

Environmental Restoration Program

**CLOSURE REPORT
BUILDING 34 - AVIATION FUEL
STORAGE TANK**

**MOUND PLANT
MIAMISBURG, OHIO**

August 1992

FINAL

(Revision 0)

**Department of Energy
Albuquerque Field Office**

**Environmental Restoration Program
Technical Support Office
Los Alamos National Laboratory**



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ACRONYM LIST

ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
BUSTR	Bureau of Underground Storage Tank Regulation
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulation
CSF	carcinogenic slope factors
DOE	U.S. Department of Energy
EP	Engineering Program
EPA	U.S. Environmental Protection Agency
EPH	extractable petroleum hydrocarbon
ER	Environmental Restoration
FFA	Federal Facility Agreement
FID	flame ionization detector
FR	Federal Register
FY	fiscal year
LFI	Limited Field Investigation
mg/kg	milligrams per kilogram
NCP	National Contingency Plan
OEPA	Ohio Environmental Protection Agency
OU	operable unit
PCB	polychlorinated biphenyl
PID	photoionization detector
PRG	Preliminary Remediation Goals
QAPP	Quality Assurance Project Plan
RfD	reference dose
RI/FS	remedial investigation/feasibility study
RRU	relative response unit
SM/PP	Special Metallurgical/Plutonium Act
SVOC	semivolatile organic compound
TBC	to be considered
TIC	tentatively identified compound
TPH	total petroleum hydrocarbons
UST	underground storage tank
VOC	volatile organic compound
$\mu\text{g}/\text{kg}$	micrograms per kilogram

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BUILDING 34 AVIATION FUEL STORAGE TANK AND THE BUILDING 51
WASTE STORAGE TANK MADE IN RESPONSE TO UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY AND OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS**

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* No text changes were made to the August Final issues of these documents, only footer and page number revisions were made. The changes noted above reflect the changes between the April 1992 and July 1992 issues of these documents.

EXECUTIVE SUMMARY

This report was specifically prepared for two purposes: 1) to evaluate the need to perform a removal action at the Building 34 former aviation fuel storage tank site at the Mound Plant in Miamisburg, Ohio; and 2) to present a preliminary determination of whether additional investigation or remedial action at this site is warranted. This report also documents the proper removal of the underground storage tank at Building 34 and documents the investigations of the soil contamination at the tank site.

Removal Action

The Building 34 aviation fuel storage tank was installed in the early 1970s to supply aviation fuel through an underground pipe to the oil burn structure used to test barrels against Department of Transportation requirements. The tank was put into service in the early 1970s, reportedly removed from service in 1975 and removed from the tank site in November 1990, by the Mound Plant Engineering Program (EP) in compliance with the Ohio Bureau of Underground Storage Tank Regulation (BUSTR) requirements. EP tank removal sampling was performed on November 29, 1990, by Bowser-Morner, Inc., an environmental subcontractor.

Following removal, the aviation fuel tank was decontaminated, and then cut up for salvage as scrap steel. The tank contents were shipped to a fuel supplier for reformulation. The excavated soil was used as fill for the excavation site following the OU3 LFI sampling.

Based on the EP tank removal sampling and results associated with the EP tank removal activities, which indicated elevated total petroleum hydrocarbon (TPH) levels in the soil below the tank, the U.S. Department of Energy (DOE) initiated Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) removal action activities to mitigate the apparent hazard posed by the contaminated soil. Removal action activities included a site evaluation in accordance with 40 Code of Federal Regulations (CFR) 300.410, and preliminary planning for a removal action.

In addition to the EP tank removal sampling results, the DOE received final validated results from soil sampling conducted at the Building 34 former tank site on August 29, 1991, as a part of the Operable Unit (OU) 3 Limited Field Investigation (LFI). These results confirm the presence of trace amounts of volatile organic compounds (VOC), petroleum hydrocarbons, and metals in the former tank site soils. Specific compounds detected included methyl ethyl ketone and various metals, such as beryllium, chromium, and lead.

Based on review of the available soil contaminant data and potential routes of exposure pursuant to the CERCLA removal site evaluation requirements of 40 CFR 300.410, a removal action is not considered necessary because there is no imminent and substantial danger to the public health or welfare posed by the released hazardous substances.

Need for Additional Investigations

The second objective of this report is to assist the OU3 LFI effort by providing a preliminary determination of the need to conduct further investigation or remedial actions at the former tank site. Because action levels based on federal or state applicable or relevant and appropriate requirements (ARAR) or on risk studies have not yet been established at Mound Plant, the LFI determination presented in the report will be subject to re-evaluation as action levels are developed. Without established Plant-wide action levels to use for comparison, Building 34 former tank site soil data were compared to possible action levels. Possible action levels used in this report were developed using available regulatory and policy thresholds which include:

- Proposed Resource Conservation and Recovery Act (RCRA) 40 CFR 264 Subpart S action levels for soils.
- RCRA land disposal restriction treatment standards for waste code F039.
- Ohio Environmental Protection Agency (OEPA) petroleum soil clean-up policy standards.

When soil contaminant data are compared with the possible action levels, beryllium, which was found in concentrations up to 0.47 milligrams per kilogram (mg/kg), exceeding the 40 CFR Subpart S action level of 0.2 mg/kg. Applying the equation used to derive the possible action level for beryllium, the maximum concentration of beryllium detected equates to a carcinogenic risk of 2.6×10^{-6} (2.6 cases per 1,000,000 exposed people). No contaminants were identified above the land disposal restriction treatment standards. The total petroleum hydrocarbon (TPH) results were found to exceed the OEPA policy standard of 40 mg/kg. However, the more toxic constituents of concern at Mound Plant comprising TPH did not include significant quantities of VOCs and semivolatile organic compounds (SVOCs).

Based on this analysis, it is concluded that no need exists to conduct further investigation at the Building 34 former tank site, nor will there be a need to conduct remedial actions. This conclusion will be re-evaluated based on the results of background sampling and the development of Mound Plant action levels. DOE has committed to retaining the tank site soil data in the OU3 Remedial Investigation where it will be addressed by the risk assessment/risk management process (DOE, 1992a).

1. INTRODUCTION

This report was prepared for two purposes: 1) to evaluate the need to perform a removal action at the subject former tank site; and 2) to present a preliminary determination of whether additional investigation or remedial action at the site is warranted.

1.1. CLOSURE REPORT SCOPE AND OBJECTIVES

This report is called a "closure report" because it is intended to document the proper removal of the Building 34 aviation fuel storage tank and to further document that a previous investigation of the site indicates no additional actions are necessary. This report is also intended to evaluate the former tank site relative to the two issues discussed in Sections 1.1.1. and 1.1.2.

1.1.1 CERCLA Removal Site Evaluation

The first purpose of this report is to review the initial evaluation of the Building 34 tank site and to present the U.S. Department of Energy (DOE) decision regarding a removal action at the site. In performing its evaluation, the DOE has accomplished a removal site evaluation according to 40 Code of Federal Regulations (CFR) 300.410 of the National Contingency Plan (NCP). The removal action evaluation has been based on readily available information and on collected or reviewed data such as: site contamination data, site management practices, personal interview records, generator supplied information, literature searches, and historic photograph analysis.

In the summer of 1991, the DOE announced its intention to conduct a removal action at the Building 34 former aviation fuel tank site to mitigate the apparent hazard posed by soil contaminated with hazardous substances released from the tank. Shortly thereafter, the DOE received preliminary information from the Operable Unit (OU) 3 Limited Field Investigation (LFI) that indicated a removal action might not be necessary. Final validated results from the OU3 LFI were received on March 4, 1992. Using the OU3 LFI analytical data and the data available from the investigation conducted during the tank removal activities in November 1990, the DOE is now able to evaluate the risk posed by tank site soils and determine the need for a removal action.

1.1.2. Need for Further Investigations

The second purpose of this report is to provide a preliminary determination of the need to conduct further investigation or remedial actions at the former tank site. However, because action levels based

on applicable or relevant and appropriate requirements (ARAR) or risk studies have not yet been established at Mound Plant, the LFI determinations presented in this report will be subject to re-evaluation as action levels are developed. Moreover, DOE has committed to retaining the tank site soil data in the OU3 Remedial Investigation where it will be addressed by the risk assessment/risk management process (DOE, 1992a)

In addition to this closure report, an additional report covering all of the sampling and analysis completed for all the potential release sites within OU3 will be prepared in two steps. First, when all of the analyses have been completed and all of the data have been validated, a letter report is planned for issue during fiscal year (FY) 1992. This letter report will make conclusions about any readily apparent contamination that is significant to indicate that immediate action (either a work plan or a Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] removal action) is warranted. Second, a comprehensive OU3 LFI report is scheduled to be started in October 1993 (FY 1994).

1.2. THE ENVIRONMENTAL RESTORATION PROGRAM AND MOUND PLANT BACKGROUND

Mound Plant was placed on the National Priorities List in November 1989. Pursuant to that status, the DOE and the U.S. Environmental Protection Agency (EPA) signed a CERCLA Section 120 Federal Facility Agreement (FFA), Administrative Docket Number V-W-90-C-075, that became effective October 12, 1990. As a result of this agreement, the remedial investigation/feasibility study (RI/FS) process at Mound Plant follows the methodology that the NCP (i.e., Superfund) program has established for characterizing the nature and extent of risks posed by uncontrolled hazardous waste sites and evaluating potential remedial options.

The goal of the Environmental Restoration (ER) Program at Mound Plant is to reduce adverse impacts on public health and the environment by reducing releases of hazardous or radioactive materials, and then by bringing all inactive waste sites requiring remediation into compliance with existing state and federal ARARs. These goals will be accomplished, in part, by the following activities, which stem from the RI/FS process:

- Investigating the nature and extent of contamination.
- Performing risk assessment(s) to identify and evaluate potential threats to human health and the environment.

- Developing and evaluating remedial action alternatives to reduce these threats to acceptable levels.
- Implementing the selected remedial actions.

The FFA contains both the procedural and substantive requirements for RI/FS work. The DOE is proposing RI/FS activities for a broad geographic area including the area within the Mound Plant as well as areas beyond the Mound Plant boundaries. Because of the size and the complexity of the RI/FS, the Mound Plant has been divided into nine OUs to facilitate management of the RI/FS. Underground storage tank (UST) sites have been allocated to various OUs, as appropriate, according to their location and relationship to activities within the units. (The Building 34 former aviation fuel tank site is currently assigned to OU3).

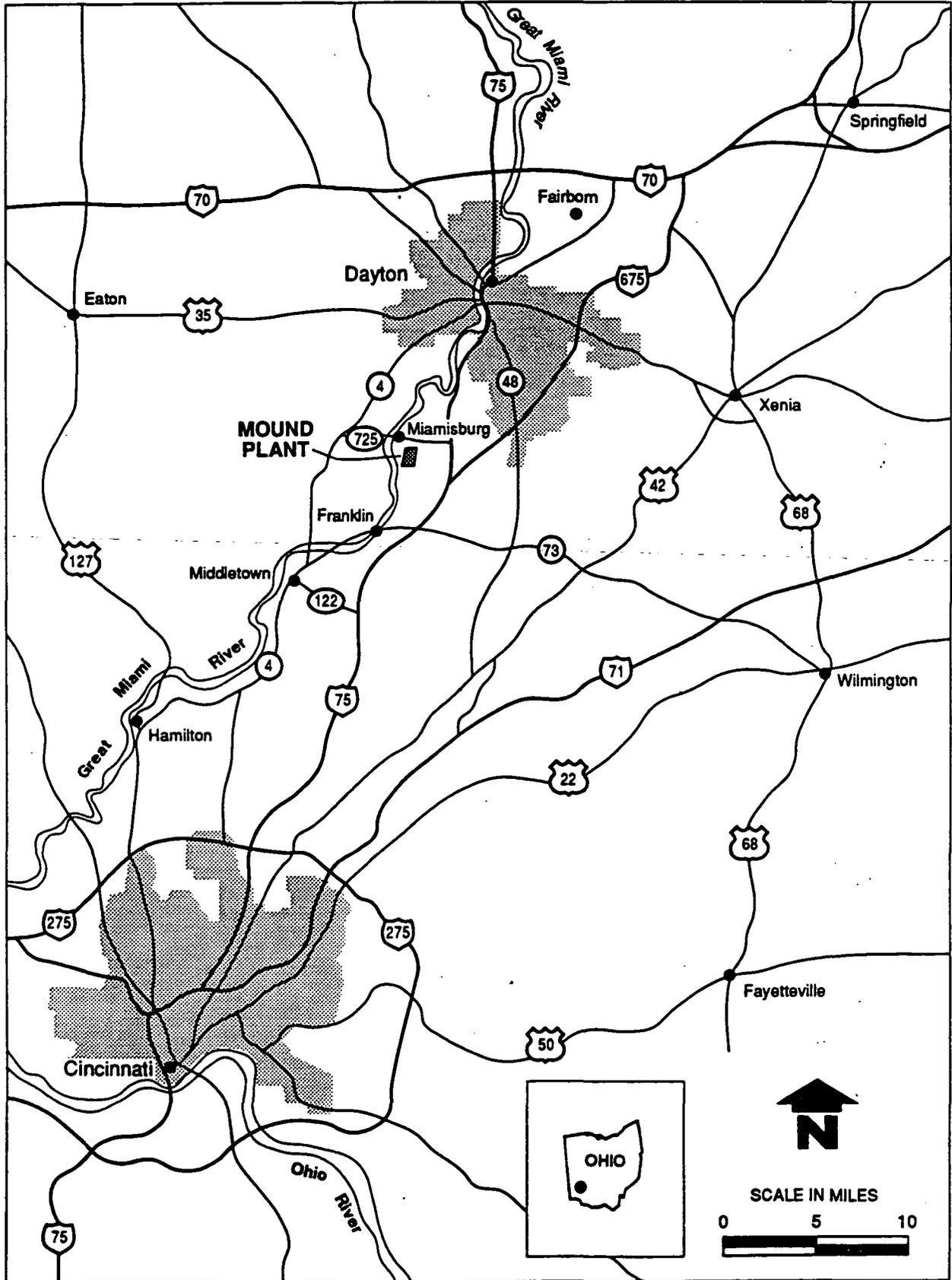
Mound Plant facility was formed in 1943 for use by a technical organization working as part of the Manhattan Engineering District to determine the chemical and metallurgical properties of polonium (DOE, 1986). This work was also conducted for the U.S. Army at several locations in the Dayton, Ohio, area. In 1946, 182 acres adjacent to the city of Miamisburg, Ohio, were purchased for the permanent Mound Plant site (Figure 1-1). Work being conducted at the Dayton units was moved to Mound Plant in 1948. Total acreage of Mound Plant was later expanded to 305 acres; however, there was no development of the new property.

The successive United States government agencies that have been the owners of Mound Plant are: the Manhattan Engineering District, the Atomic Energy Commission, the Energy Research and Development Agency, and the DOE. The Monsanto Research Corporation operated Mound Plant for each of these agencies until December 1988, when EG&G Mound Applied Technologies succeeded Monsanto as the plant operator.

Mound Plant is currently an integrated research, development, and production facility, which operates in support of the DOE weapons and energy programs (DOE, 1986). Mound Plant manufactures non-nuclear components and tritium-containing components for nuclear weapons and develops small heat sources for the space and defense programs.

1.3. TANK SITE HISTORY

The Building 34 aviation fuel storage tank was located southwest of Building 34 in the lower valley area, directly north of the overflow pond (Figure 1-2). The 5,000-gallon tank supplied aviation fuel through an underground pipe to the oil burn structure, that was used to test barrels against Department



MOUND/AreaMap 2-15-91

Figure 1-1 Regional location of Mound Plant.

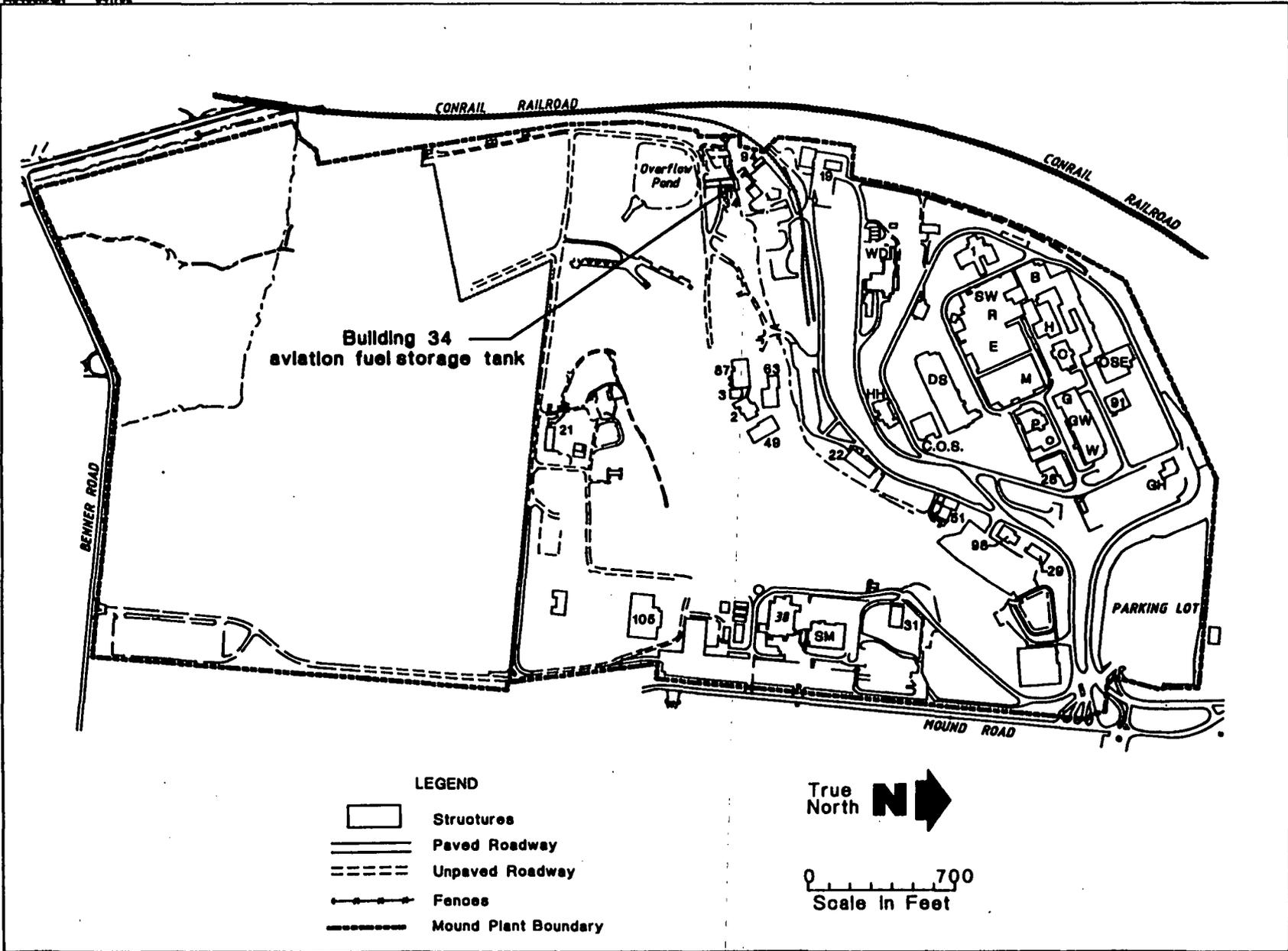


FIGURE 1-2 Operable Unit 3 Potential Release Sites

of Transportation requirements. Use of the tank began in the early 1970s and was reportedly taken out of service in 1975. Approximately 230 gallons were pumped from the aviation fuel tank in 1988 and transported off site for reformulation, leaving approximately 20 gallons in the fuel tank.

The Building 34 aviation fuel storage tank was removed by the Engineering Program (EP) as part of the Mound Plant underground tank program in November 1990. Prior to the removal, notice was provided to the Ohio Department of Commerce, Division of the State Fire Marshall, Bureau of Storage Tank Regulation (BUSTR). In addition, notice that the Building 34 tank was being removed was provided to the Ohio Environmental Protection Agency (OEPA), Division of Emergency and Remedial Response.

Based on the EP tank removal report, the part of the tank that had been in contact with the sand fill was in good condition while the part of the tank that had been surrounded by gravelly clay-type soils was severely corroded. Several small holes were detected in the upper third of the tank where it had been in contact with the clayey soils (Bowser-Morner, 1991). Although the tank was operational less than 10 years, it is evident that some leakage may have occurred while the tank was in the ground and out of service. Approximately 20 gallons of aviation fuel and sludge material remained in the tank at the time of removal, which is consistent with reports that the tank was pumped out to the capabilities of the system when the tank was taken out of service (Bower-Morner, 1991). Therefore, between the early 1970s and 1990, there was a potential, albeit limited potential, for leakage of residual materials to occur. The surrounding soil was sampled as part of the EP tank removal, and analytical results are discussed in Section 3.2.1.

1.4. SITE LOCATION AND SETTING

The Building 34 former aviation fuel storage tank site is located southwest of Building 34 in the lower valley area directly north of the overflow pond (Figure 1-2). The lower valley area is located in the west central portion of the Mound Plant site, adjacent the southern portion of the main drainage ditch. Currently, the area is largely comprised of a series of buildings, paved parking lots, and retention basins. The lower valley area has undergone numerous changes to accommodate Plant growth and has a long history of debris disposal (DOE, 1991c). The lower valley area also includes numerous sites that are known to have been used for the storage or staging of radioactive and hazardous materials (DOE, 1991a). The lower reach of the Plant drainage ditch has undergone extensive local engineering since the ditch was built to control surface water discharge from the Mound Plant.

In 1965, Building 34 was constructed near the container testing facilities to serve as a center for training emergency personnel. The fire fighter training pits would typically be flushed with diesel fuel

and ignited. Emergency personnel training activities did not involve the aviation fuel storage tank used for container testing. The area surrounding Building 34 appears to have been regularly disturbed since 1959. The activities involved with the disturbance include the re-routing of drainage patterns, expansion of the paved roadway system, and miscellaneous clearing and filling operations.

1.5. GEOLOGY

The Building 34 aviation fuel storage tank is located along the western edge of the east-west trending tributary valley that occupies lowland between the two hills at Mound Plant (DOE, 1991b). The valley is underlain by unconsolidated deposits that vary in thickness from 20 feet to greater than 75 feet. The thickness of these deposits increases to the west toward the ancestral valley of the Great Miami River. Deposits within the tributary valley include silt, sand, and gravel; in general, the sequence coarsens downward. Permeable layers of sand and gravel are common at depths greater than 30 feet.

The modern Great Miami River occupies an ancient valley that was formed by meltwater from continental glaciers. The valley is filled with thick, extensive glacial deposits of permeable sand and gravel that are referred to as the Buried Valley Aquifer, an important groundwater resource (DOE, 1989). Two distinct layers of sand and gravel, separated by glacial till, have been identified in geologic logs from off-site monitoring wells located in the Buried Valley Aquifer. The deposits in the Buried Valley Aquifer are greater than 150 feet at its maximum thickness, and are underlain by approximately 3,400 feet of flat-lying Cambrian and Ordovician-age marine shales and limestones. The site hydrogeology, including groundwater flow and quality, is discussed in the RI/FS work plan (DOE, 1991b).

According to geologic logs of two soil borings located near the Building 34 aviation fuel storage tank site, soils in the immediate vicinity are generally comprised of gravelly clays to a depth of 8 feet below ground surface (DOE, 1992b). The percentage of gravel in the soil gradually increases from ground surface to 6 feet below ground surface and then the percentage begins to decrease. Based upon visual observations, the soils consist entirely of clay at a depth of 8 feet below ground surface.

The gravel fraction of the clay is subangular to angular and the clay is firm and moist. The clay darkens in color downward from tan to brown to dark gray to black. Based upon monitoring well information available for the area, groundwater may be encountered at approximately 32 feet below ground surface. Additional detail on the Mound Plant setting is available in RI/FS reports (DOE, 1991a; 1991b).

2. CONTAMINANT CHARACTERIZATION

2.1. FIELD SAMPLING

The Building 34 aviation fuel storage tank site has recently been the subject of two field investigations. The first investigation was conducted as a part of Mound Plant EP tank removal activities in late 1990. The second investigation took place in August 1991 as part of the OU3 LFI. The sampling practices used in these investigations are described below in Sections 2.1.1. and 2.1.2. Analytical results for both investigations are presented in Section 2.2.

2.1.1. Tank Removal Sampling

As described by Bowser-Morner, Inc. (Appendix A), an attempt was made to sample the contents of the aviation fuel storage tank on October 26, 1990; however, the tank was nearly empty and therefore no sample could be obtained.

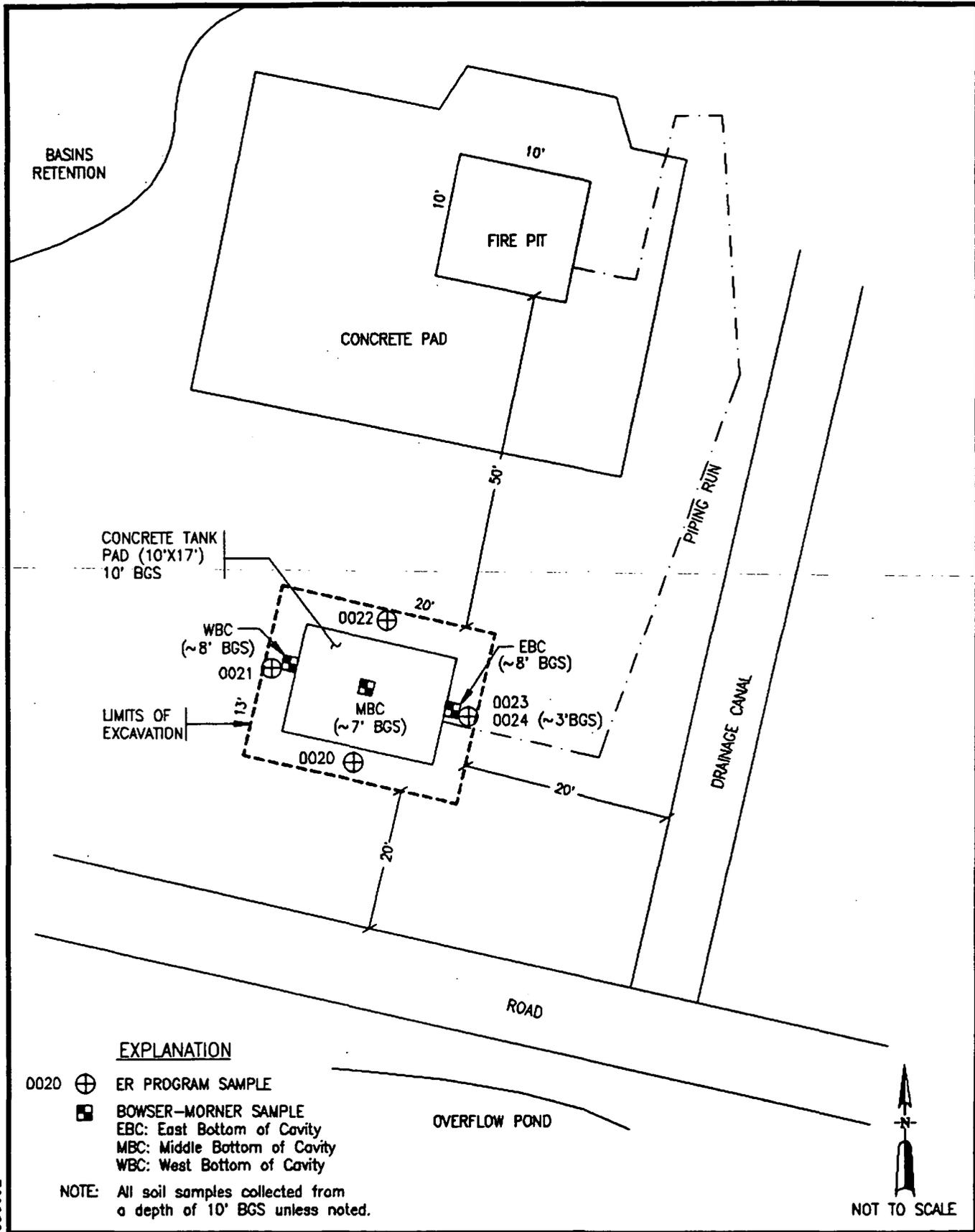
The aviation fuel storage tank system at Building 34 was removed by the Mound Plant EP on November 29, 1990. Once the tank was removed, three soil samples were collected in the excavation pursuant to BUSTR guidelines. One soil sample was collected at each end of the concrete tank pad at an approximate depth of 8 to 8½ feet below ground surface (bgs), and one soil sample was collected from the middle of the pad at an approximate depth of 7 feet bgs for a total of three samples (Figure 2-1).

Soil samples collected from the tank excavation were analyzed by Bowser-Morner, Inc. for volatile organics, heavy metals, total petroleum hydrocarbons (TPH), phenol, cyanide, sulfide, total solids, polychlorinated biphenyls (PCB), pH, and flashpoint.

Excavated soils and soil samples were monitored for volatile organic compounds (VOC) using a photoionization detector (PID). No volatile organics were measured with a PID in the soils of the tank cavity, although PID measurements ranged up to 160 RRU near the valves for the test fire units.

2.1.2. OU3 Limited Field Investigation Sampling

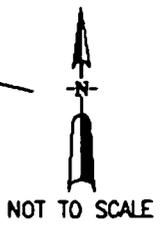
On August 29, 1991, as part of the OU3 LFI, ER Program personnel were present on site to observe the re-opening of the excavation associated with the Building 34 aviation fuel storage tank removal. Since the hole excavated to remove the tank was never backfilled, the re-opening involved excavating



EXPLANATION

- 0020 ⊕ ER PROGRAM SAMPLE
- ⊠ BOWSER-MORNER SAMPLE
- EBC: East Bottom of Cavity
- MBC: Middle Bottom of Cavity
- WBC: West Bottom of Cavity

NOTE: All soil samples collected from a depth of 10' BGS unless noted.



2744005.PJMB030692

<p>MOUND PLANT ENVIRONMENTAL RESTORATION PROGRAM CLOSURE REPORT</p>	<p>SOIL EXCAVATION SAMPLING LOCATIONS BUILDING 34 AVIATION FUEL TANK EXCAVATION AREA</p>	<p>FIGURE 2-1</p>
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additional soil at the tank site, because the walls of the original hole had caved in by December 1990. This new excavation was 13 feet wide by 20 feet long and 10 feet deep. An approximately 1-foot thick concrete tank pad was discovered at a depth of 10 feet bgs. The dimensions of the pad were 10 feet by 17 feet. Based on field observations, light brown to tan silty clay-type soils were observed in the excavation beginning at a depth approximately 6 feet bgs. Soils above 6 feet bgs were comprised of fill materials and were not classified.

Subsurface samples were collected and screened for VOCs using a PID and a flame ionization detector (FID). Soil samples were collected with a stainless steel scoop according to the OU3 Work Plan (DOE, 1991a). One soil sample was collected from the base of each of the four walls within the excavation and a fifth sample was collected 3 feet bgs on the east wall at approximately the location of the fuel distribution pipe. The sample locations are shown in Figure 2-1. No water was encountered within the excavation. All samples collected by WESTON were shipped to IT Corporation Laboratories, Oak Ridge, Tennessee, for analyses.

A summary of soil samples collected at the Building 34 site during the OU3 LFI is presented in Table II.1 and includes the sample identification number, sample interval or type of sample, date collected, and analytical testing parameters requested.

2.1.2.1. OU3 Limited Field Investigation Work Plan Consistency

The following is a summary of points of variance with the OU3 LFI Work Plan (DOE, 1991a). Except as noted, sampling was consistent with the referenced Work Plan.

- At the request of OEPA, the sampling depth for all soil samples at the Building 34 aviation fuel tank site was extended deeper than the 0 to 6 inches below the base of the excavation specified in the Work Plan due to the possible loss of VOCs after the tank was excavated. Except for caving of the sides, the excavation had remained open since tank removal activities in December 1990.
- The sampling protocol was modified to collect samples from the sides of the in-place tank foundation pad that the Work Plan did not anticipate. The Work Plan specified one sample from each end of the tank pit, one sample from the middle of the excavation, and one sample from beneath a joint in the piping leading from the tank, subject to discretionary changes made by the field manager.

Table II.1

Summary of OU3 Sample Collection, Bldg. 34
OU3 Limited Field Investigation

Sample Location	Sample Number	Sample Description
Location 0020	MND33-0020-0001 (MND33-0020)	Interval 1 to 2 feet below base of excavation next to cement foundation pad; 29 August 1991; analyses requested – TCL VOCs, SVOCs, and Pesticides/PCB, TAL Metals (including cyanide), EPH.
Location 0021	MND33-0021-0001 (MND33-0021)	Interval 1 to 2 feet below base of excavation next to cement foundation pad, 29 August 1991; analyses requested – TCL VOCs, SVOCs, and Pesticides/PCBs, TAL metals (including cyanide), EPH.
Location 0022	MND33-0022-0001 (MND33-0022)	Interval 1 to 2 feet below base of excavation next to cement foundation pad; 29 August 1991; analyses requested – TCL VOCs, SVOCs, and Pesticides/PCBs, TAL Metals (including cyanide), EPH.
Location 0023	MND33-0023-0001	Interval 1 to 2 feet below base of excavation next to cement foundation pad; 29 August 1991; analyses requested – TCL VOCs, SVOCs, and Pesticides/PCBs, TAL Metals (including cyanide), EPH.
	MND33-0023-1001 (MND33-0023)	Interval 1 to 2 feet below base of excavation next to cement foundation pad. (Duplicate); 29 August 1991; analyses requested – TCL VOCs, SVOCs, and Pesticides/PCBs, TAL Metals (including cyanide), EPH.
Location 0024	MND33-0024-0001	Interval 1 to 2 feet below former tank discharge pipe location on side wall of excavation; 29 August 1991; analyses requested – TCL VOCs, SVOCs, and Pesticides/PCBs, TAL Metals (including cyanide), EPH.
	MND33-0024-5001 (MND33-0024)	Ambient blank; 29 August 1991; analyses requested – TCL VOCs.

TCL = Target Compound List
VOC = volatile organic compound
SVOC = semivolatile organic compound
PCB = polychlorinated biphenyl
TAL = Target Analyte List
EPH = extractable petroleum hydrocarbons

2.1.2.2. Regulatory Agency Sample Collection

An OEPA representative was on site August 29, 1991, to observe OU3 sampling activities and to collect a split sample at the Building 34 site. The split sample taken at sample location 0021 was analyzed for VOCs, pesticides/PCBs, and metals (including cyanide).

OEPA split sample results serve as an additional quality control check for ER Program sampling and analysis; however, such split samples were not necessarily sampled nor analyzed in accordance with the OU3 Quality Assurance Project Plan (QAPP; DOE, 1991e). Consequently, the validity of the OEPA data cannot be ascertained. OEPA split sample data are provided in this report for completeness and are regarded as estimated.

2.2. ANALYTICAL RESULTS

Sections 2.2.1. and 2.2.2. briefly discusses the analytical results of the investigations described in Section 2.1.

2.2.1. Engineering Program Tank Removal Results

Table II.2 presents the laboratory results from the EP tank removal investigation for the soil samples collected at the Building 34 aviation fuel storage tank site. As noted in Section 2.1.1., the tank contained insufficient contents to allow collection of a sample.

No VOCs were identified in the soil samples. Each metal analyzed was detected with the exception of mercury and selenium. TPH ranged as high as 175 milligrams per kilogram (mg/kg), which was found in the sample from the middle of the concrete pad (Figure 2-1).

Laboratory reports for the tank removal results are provided in Appendix A. No laboratory precision and accuracy information was available for the tank removal analysis. As was the case with the OEPA split sample data, the EP tank removal sampling and analyses were not performed in accordance with the QAPP. Consequently, the EP analytical results are regarded as estimated.

2.2.2. OU3 Limited Field Investigation

Tables II.3, II.4, II.5, II.6, and II.7 present the analytical results from the OU3 LFI for VOCs, semivolatile organic compounds (SVOC), pesticides and PCBs, inorganics, and extractable petroleum

Table II.2
 Laboratory Results of Soil Samples Collected
 During Engineering Program BUSTP Tank Removal
 Building 34 -- Aviation Fuel Storage Tank

PARAMETER	Unit	Building End of Cavity	Middle of Cavity	Lot End of Cavity
Benzene	ug/kg	<2	<2	<2
Chloroform	ug/kg	<10	<10	<10
Ethylbenzene	ug/kg	<2	<2	<2
Methylene Chloride	ug/kg	<50	<50	<50
Tetrachloroethylene	ug/kg	<25	<25	<25
Toluene	ug/kg	<2	<2	<2
trans-1,2-Dichloroethylene	ug/kg	<25	<25	<25
1,1,1-Trichloroethane	ug/kg	<25	<25	<25
Trichloroethene	ug/kg	<25	<25	<25
Xylene	ug/kg	<2	<2	<2
Acetone	ug/kg	<500	<500	<500
Methyl Ethyl Ketone	ug/kg	<1000	<1000	<1000
Methyl Isobutyl Ketone	ug/kg	<500	<500	<500
Mercury	mg/kg	<0.02	<0.02	<0.02
Arsenic	mg/kg	4.3	5.2	5.8
Selenium	mg/kg	<0.4	<0.4	<0.4
Silver	mg/kg	3.1	1.7	0.33
Barium	mg/kg	44	23	37
Cadmium	mg/kg	0.23	0.26	0.26
Chromium	mg/kg	11	10	13
Lead	mg/kg	3.0	3.0	3.2
Sodium	mg/kg	150	200	250
Iron	mg/kg	11000	9900	11000
Manganese	mg/kg	210	190	170
Total Petroleum Hydrocarbons	mg/kg	50	175	60

Table II.2 (Continued)
 Laboratory Results of Soil Samples Collected
 During Engineering Program BUSTR Tank Removal
 Building 34 -- Aviation Fuel Storage Tank

PARAMETER	Unit	Building End of Cavity	Middle of Cavity	Lot End of Cavity
Phenol	mg/kg	<0.15	<0.15	<0.15
Cyanide	mg/kg	<0.1	<0.1	<0.1
Sulfide	mg/kg	<1	<1	<1
Total Solids	%	94	95	95
PCBs	mg/kg	<0.04	<0.04	<0.04
pH	S.U.	8.2	8.3	8.2
Flash Point	Degrees F	None to 210	None to 210	None to 210

Key

mg/kg = milligrams per kilogram
 S.U. = Standard Units
 ug/kg = micrograms per kilogram

Source: Bowser-Morner, 1991

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Table II.3
Data Table For Volatile Organic Compounds, Bldg 34*
Ou3 Limited Field Investigation

SAMPLE ID	0020-0001		0021-0001			0022-0001		0023-0001		0023-1001		0024-0001	
	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	OEPA Data (c)	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)
Chloromethane		12 U		11 U	10 U		11 U		12 U	12 UJ	12 U		11 U
Bromomethane		12 U		11 U	10 U		11 U		12 U	12 UJ	12 U		11 U
Vinyl Chloride		12 U		11 U	10 U		11 U		12 U	12 UJ	12 U		11 U
Chloroethane		12 U		11 U	10 U		11 U		12 U	12 UJ	12 U		11 U
Methylene Chloride	6 U	2 BJ	5 U	3 BJ	1100	6 U	3 BJ	6 U	5 BJ	8 UJ	8 B	5 U	4 BJ
Acetone	27 U	27 B	29 U	29 B	100 U	24 U	24 B	26 U	26 B	21 UJ	21 B	19 U	19 B
Carbon Disulfide		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
1,1-Dichloroethene		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
1,1-Dichloroethane		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
1,2-Dichloroethane (total)		6 U		5 U			6 U		6 U	6 UJ	6 U		5 U
Chloroform		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
1,2-Dichloroethane		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
2-Butanone		12 U		3 J	100 U		11 U		12 U	12 UJ	12 U		11 U
1,1,1-Trichloroethane		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
Carbon Tetrachloride		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
Vinyl Acetate		12 U		11 U	10 U		11 U		12 U	12 UJ	12 U		11 U
Bromodichloromethane		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
1,2-Dichloropropane		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
cis-1,3-Dichloropropene		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
Trichloroethene		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
Dibromochloromethane		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
1,1,2-Trichloroethane		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
Benzene		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
trans-1,3-Dichloropropene		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
2-Chloroethyl vinyl ether					10 U								
Bromoform		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
4-Methyl-2-pentanone		12 U		11 U	10 U		11 U		12 U	12 UJ	12 U		11 U
2-Hexanone		12 U		11 U	10 U		11 U		12 U	12 UJ	12 U		11 U
Tetrachloroethene		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
1,1,2,2-Tetrachloroethane		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
Toluene		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
Chlorobenzene		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
Ethylbenzene		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
Styrene		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U
Xylene (total)		6 U		5 U	5 U		6 U		6 U	6 UJ	6 U		5 U

Key

* All data presented in micrograms per kilogram (ug/kg).

- (a) OU3 Data Validation Results.
- (b) OU3 Limited Field Investigation Analytical Results.
- (c) Ohio EPA split sample results.

B = Analyte detected in laboratory blank.

J = Estimated value.

U = Compound was analyzed for but not detected. The number is the method detection limit for the sample.

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Table II.4
Data Table for Semivolatile Organic Compounds, Bldg. 34*
OU3 Limited Field Investigation

SAMPLE ID	0020-0001		0021-0001		0022-0001		0023-0001		0023-1001		0024-0001	
	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	Validated Data(a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)
3-Nitroaniline	2000 UJ	2000 U	1800 UJ	1800 U	1800 UJ	1800 U	1900 UJ	1900 U	1800 UJ	1800 U	1800 UJ	1800 U
Acenaphthene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
2,4-Dinitrophenol	2000 UJ	2000 U	1800 UJ	1800 U	1800 UJ	1800 U	1900 UJ	1900 U	1800 UJ	1800 U	1800 UJ	1800 U
4-Nitrophenol	2000 UJ	2000 U	1800 UJ	1800 U	1800 UJ	1800 U	380 UJ	1900 U	380 UJ	1800 U	360 UJ	1800 U
Dibenzofuran	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
2,4-Dinitrotoluene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Diethylphthalate	400 UJ	180 BJ	360 UJ	220 BJ	380 UJ	170 BJ	380 UJ	200 BJ	380 UJ	210 BJ	360 UJ	140 BJ
4-Chlorophenyl-phenylether	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Fluorene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
4-Nitroaniline	2000 UJ	2000 U	1800 UJ	1800 U	1800 UJ	1800 U	1900 UJ	1900 U	1800 UJ	1800 U	1800 UJ	1800 U
4,6-Dinitro-2-Methylphenol	2000 UJ	2000 U	1800 UJ	1800 U	1800 UJ	1800 U	1900 UJ	1900 U	1800 UJ	1800 U	1800 UJ	1800 U
N-Nitrosodiphenylamine	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
4-Bromophenyl-phenylether	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Hexachlorobenzene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Pentachlorophenol	2000 UJ	2000 U	1800 UJ	1800 U	1800 UJ	1800 U	1900 UJ	1900 U	1800 UJ	1800 U	1800 UJ	1800 U
Phenanthrene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Anthracene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Di-n-Butylphthalate	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Fluoranthene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Pyrene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Butylbenzylphthalate	400 UJ	400 U	53 J	53 J	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
3,3'-Dichlorobenzidine	810 UJ	810 U	720 UJ	720 U	750 UJ	750 U	760 UJ	760 U	760 UJ	760 U	730 UJ	730 U
Benzo(a)Anthracene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Chrysene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
bis(2-Ethylhexyl)Phthalate	400 UJ	400 U	360 UJ	82 BJ	380 UJ	41 BJ	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Di-n-Octyl Phthalate	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U

Table II.4 (Continued)
Data Table For Semivolatile Organic Compounds, Bldg 34*
OU3 Limited Field Investigation

SAMPLE ID	0020-0001		0021-0001		0022-0001		0023-0001		0023-1001		0024-0001	
ANALYTE	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	Validated Data(a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)
Benzo(b)Fluoranthene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Benzo(k)Fluoranthene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Benzo(a)Pyrene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Indeno(1,2,3-cd)Pyrene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Dibenz(a,h)Anthracene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Benzo(g,h,i)Perylene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Phenol	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
bis(2-Chloroethyl) Ether	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
2-Chlorophenol	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
1,3-Dichlorobenzene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
1,4-Dichlorobenzene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Benzyl Alcohol	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
1,2-Dichlorobenzene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
2-Methylphenol	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
bis(2-Chloroisopropyl)Ether	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
4-Methylphenol	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
N-Nitroso-Di-n-Propylamine	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Hexachloroethane	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Nitrobenzene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Isophorone	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
2-Nitrophenol	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
2,4-Dimethylphenol	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Benzoic Acid	2000 UJ	2000 U	1800 UJ	1800 U	1800 UJ	1800 U	1900 UJ	1900 U	1800 UJ	1800 U	1800 UJ	1800 U
bis(2-Chloroethoxy)Methan	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
2,4-Dichlorophenol	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U

Table II.4 (Continued)
Data Table For Semivolatile Organic Compounds, Bldg 34*
OU3 Limited Field Investigation

SAMPLE ID	0020-0001		0021-0001		0022-0001		0023-0001		0023-1001		0024-0001	
	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	Validated Data(a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)
1,2,4-Trichlorobenzene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Napthalene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
4-Chloroaniline	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Hexachlorobutadiene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
4-Chloro-3-Methylphenol	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
2-Methylnaphthalene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Hexachlorocyclopentadiene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
2,4,6-Trichlorophenol	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
2,4,5-Trichlorophenol	2000 UJ	2000 U	1800 UJ	1800 U	1800 UJ	1800 U	1900 UJ	1900 U	1800 UJ	1800 U	1800 UJ	1800 U
2-Chloronaphthalene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
2-Nitroaniline	2000 UJ	2000 U	1800 UJ	1800 U	1800 UJ	1800 U	1900 UJ	1900 U	1800 UJ	1800 U	1800 UJ	1800 U
Dimethyl Phthalate	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
Acenaphthylene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U
2,6-Dinitrotoluene	400 UJ	400 U	360 UJ	360 U	380 UJ	380 U	380 UJ	380 U	380 UJ	380 U	360 UJ	360 U

Key

* All data presented in micrograms per kilogram (ug/kg)

(a) OU3 Data Validation Results

(b) OU3 Limited Field Investigation Analytical Results

B = Analyte detected in laboratory blank

J = Estimated value

U = Compound was analyzed for but not detected. The number is the method detection limit for the sample.

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Table II.5
Data Table for Pesticides and PCBs, Bldg 34*
OU3 Limited Field Investigation

SAMPLE ID	0020-0001		0021-0001			0022-0001		0023-0001		0023-1001		0024-0001	
	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	OPEA Data (c)	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)
alpha-BHC	2.4 UJ	2.4 U	2.2 UJ	2.2 U	2 U	2.3 UJ	2.3 U	2.3 UJ	2.3 U	2.3 UJ	2.3 U	2.2 UJ	2.2 U
beta-BHC	4.9 UJ	4.9 U	4.4 UJ	4.4 U	2 U	4.6 UJ	4.6 U	4.6 UJ	4.6 U	4.6 UJ	4.6 U	4.4 UJ	4.4 U
delta-BHC	7.3 UJ	7.3 UY	6.5 UJ	6.5 UY	2 U	6.9 UJ	6.9 U	7 UJ	7 U	7 UJ	7 U	6.6 UJ	6.6 U
gamma-BHC (Lindane)	3.3 UJ	3.3 U	2.9 UJ	2.9 U	2 U	3.1 UJ	3.1 U	3.1 UJ	3.1 U	3.1 UJ	3.1 U	3 UJ	3 U
Heptachlor	2.4 UJ	2.4 U	2.2 UJ	2.2 U	2 U	2.3 UJ	2.3 U	2.3 UJ	2.3 U	2.3 UJ	2.3 U	2.2 UJ	2.2 U
Aldrin	3.3 UJ	3.3 U	2.9 UJ	2.9 U	2 U	3.1 UJ	3.1 U	3.1 UJ	3.1 U	3.1 UJ	3.1 U	3 UJ	3 U
Heptachlor epoxide	68 UJ	68 U	61 UJ	61 U	2 U	64 UJ	64 U	64 UJ	64 U	64 UJ	64 U	61 UJ	61 U
Endosulfan I	11 UJ	11 U	10 UJ	10 U	2 U	11 UJ	11 U	11 UJ	11 U	11 UJ	11 U	10 UJ	10 U
Dieldrin	1.6 UJ	1.6 U	1.4 UJ	1.4 U	3.3 U	1.5 UJ	1.5 U	1.5 UJ	1.5 U	1.5 UJ	1.5 U	1.4 UJ	1.4 U
4,4'-DDE	3.3 UJ	3.3 U	2.9 UJ	2.9 U	3.3 U	3.1 UJ	3.1 U	3.1 UJ	3.1 U	3.1 UJ	3.1 U	3 UJ	3 U
Endrin	4.9 UJ	4.9 U	4.4 UJ	4.4 U	3.3 U	4.6 UJ	4.6 U	4.6 UJ	4.6 U	4.6 UJ	4.6 U	4.4 UJ	4.4 U
Endosulfan II	3.3 UJ	3.3 U	2.9 UJ	2.9 U	3.3 U	3.1 UJ	3.1 U	3.1 UJ	3.1 U	3.1 UJ	3.1 U	3 UJ	3 U
4,4'-DDD	9.0 UJ	9.0 U	8.1 UJ	8.1 U	3.3 U	8.5 UJ	8.5 U	8.6 UJ	8.6 U	8.6 UJ	8.6 U	8.1 UJ	8.1 U
Endosulfan sulfate	54 UJ	54 U	48 UJ	48 U	3.3 U	50 UJ	50 U	51 UJ	51 U	57 UJ	57 U	49 UJ	49 U
4,4'-DDT	9.7 UJ	9.7 U	8.7 UJ	8.7 U	3.3 U	9.1 UJ	9.1 U	9.3 UJ	9.3 U	9.3 UJ	9.3 U	8.8 UJ	8.8 U
Methoxychlor	140 UJ	140 U	130 UJ	130 U	17 U	130 UJ	130 U	140 UJ	140 U	140 UJ	140 U	130 UJ	130 U
Endrin ketone	19 UJ	19 U	18 UJ	18 U	3.3 U	18 UJ	18 U	19 UJ	19 U	18 UJ	18 U	18 UJ	18 U
alpha-chlordane	11 UJ	11 U	10 UJ	10 U	17 U	11 UJ	11 U	11 UJ	11 U	11 UJ	11 U	10 UJ	10 U
gamma-chlordane	11 UJ	11 U	10 UJ	10 U	17 U	11 UJ	11 U	11 UJ	11 U	11 UJ	11 U	10 UJ	10 U
Toxaphene	200 UJ	200 U	180 UJ	180 U	33.0 U	180 UJ	180 U	190 UJ	190 U	190 UJ	190 U	180 UJ	180 U
Aroclor-1016	97 UJ	97 U	87 UJ	87 U	17 U	92 UJ	92 U	93 UJ	93 U	93 UJ	93 U	88 UJ	88 U
Aroclor-1221	97 UJ	97 U	87 UJ	87 U	17 U	92 UJ	92 U	93 UJ	93 U	93 UJ	93 U	88 UJ	88 U
Aroclor-1232	97 UJ	97 U	87 UJ	87 U	17 U	92 UJ	92 U	93 UJ	93 U	93 UJ	93 U	88 UJ	88 U
Aroclor-1242	97 UJ	97 U	87 UJ	87 U	17 U	92 UJ	92 U	93 UJ	93 U	93 UJ	93 U	88 UJ	88 U
Aroclor-1248	97 UJ	97 U	87 UJ	87 U	17 U	92 UJ	92 U	93 UJ	93 U	93 UJ	93 U	88 UJ	88 U
Aroclor-1254	190 UJ	190 U	170 UJ	170 U	33.0 U	180 UJ	180 U	180 UJ	180 U	180 UJ	180 U	180 UJ	180 U
Aroclor-1260	190 UJ	190 U	170 UJ	170 U	33.0 U	180 UJ	180 U	180 UJ	180 U	180 UJ	180 U	180 UJ	180 U
Endrin aldehyde	19 UJ	19 U	17 UJ	17 U		18 UJ	18 U	18 UJ	18 U	18 UJ	18 U	17 UJ	17 U

Key

* All data presented in micrograms per kilograms (ug/kg).

(a) OU3 Data Validation Results.

(b) OU3 Limited Field Investigation Analytical Results.

(c) Ohio EPA split sample results.

J = Estimated value.

U = Compound was analyzed for but not detected. The number is the method detection limit for the sample.

Y = Detection limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

Table II.6
Data Table For Inorganics, Bldg 34*
OU3 Limited Field Investigation

SAMPLE ID	0020-0001		0021-0001			0022-0001		0023-0001		0023-1001		0024-0001	
	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	OPEA Data (c)	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)	Validated Data (a)	Form I Data (b)
Aluminum		7020		7270	320		8510		6200		5970		9070
Antimony		5.3 U		4.4 U	<10	7.5 U	7.5	6.5 U	6.5 B		4.8 U		4.6 U
Arsenic		5.6 B		4.7 B	1.9		8.7		4.2 B		5.8		7.6
Barium	31.3 J	31.3	66.3 J	66.3	29	69.6 J	69.6	101 J	101	51.1 J	51.1	40.7 J	40.7
Beryllium		0.24 B		0.28 B	<0.5		0.42 B		0.18 B		0.21 B		0.34 B
Cadmium	0.47 UJ	0.47 U	0.40 UJ	0.40 U	<0.5	0.45 UJ	0.45 U	0.45 UJ	0.45 U	0.43 UJ	0.43 U	0.41 UJ	0.41 U
Calcium		162000		163000	140000		132000		149000		139000		130000
Chromium		7.6		7.6	5.7		8.9		6.1		6.1		9.7
Cobalt		4.1 B		3.6 B	3		4.7 B		3.7 B		4.7 B		5.3
Copper	11.9 J	11.9	11.2 J	11.2	8.3	15.1 J	15.1	11.6 J	11.6	10.6 J	10.6	13.4 J	13.4
Iron	11500 J	11500	11900 J	11900	12000	14600 J	14600	10400 J	10400	10700 J	10700	14600 J	14600
Lead		8.0		7.4	<10		8.2		7.7		8.9		9.4
Magnesium		62500		58600	50000		44100		61400		53400		48100
Manganese		238		226	190		254		234		250		265
Mercury		0.06 U		0.05 U	<0.25		0.05 U		0.06 U		0.05 U		0.05 U
Nickel	11.7 J	11.7	9.7 J	9.7	8.7	12.1 J	12.1	12.3 J	12.3	13.0 J	13.0	12.7 J	12.7
Petroleum Hydrocarbons					<25								
Percent Solids (%)					86								
Potassium		2230		2270	610		2610		2000		1720		2390
Selenium	0.12 UJ	0.12 U	0.10 UJ	0.10 U	0.3	0.12 J	0.12 B	0.12 UJ	0.12 U	0.11 UJ	0.11 U	0.11 UJ	0.11 U
Silver	0.46 U	0.46 B	0.30 UJ	0.30 U	<2	0.34 UJ	0.34 U	0.34 UJ	0.34 U	0.32 UJ	0.32 U	0.57 U	0.57 B
Sodium		225 B		195 B	120		184 B		272 B		224 B		183 B
Thallium		0.37 B		0.32 B	<0.25		0.35 B		0.35 B		0.24 B		0.22 B
Vanadium		14.1		14.3	120		16.3		11.7		12.4		16.8
Zinc		35.7		35.1	29		43.0		32.9		36.0		42.3
Cyanide		0.61 U		0.55 U			0.57 U		0.58 U		0.58 U		0.55 U

Key

* All data presented in milligrams per kilograms (mg/kg).

- (a) OU3 Data Validation Results.
- (b) OU3 Limited Field Investigation Analytical Results.
- (c) Ohio EPA split sample results.

B = Analyte detected in laboratory blank.

J = Estimated value.

U = Compound was analyzed for but not detected. The number is the method detection limit for the sample.

Table II.7
Data Table For Petroleum Hydrocarbons, Bldg 34 (a)
OU3 Limited Field Investigation

SAMPLE	VALIDATED DATA	IT LAB EPH (DIESEL)	IT LAB EPH (MOTOR OIL) (b)
0020	6	6	27
0021	17 J	17 M	44
0022		5 U	20 U
0023	8 J	8 M	34
0023-1001	7	7	29
0024		5 U	20 U

Key

(a) All data presented in milligrams per kilogram (mg/kg).

(b) Not validated. See discussion in section 3.3.

J = Estimated value.

U = Compound was analyzed for but not detected. The number is the method detection limit for the sample.

M = Hydrocarbon quantified and reported as diesel fuel; however, motor oil may also be present.

hydrocarbons (EPH), respectively. The only VOC detected was 2-butanone, in an estimated concentration of 3 micrograms per kilogram ($\mu\text{g}/\text{kg}$); the only SVOC found was butylbenzylphthalate in an estimated concentration of 53 $\mu\text{g}/\text{kg}$, which is below the contract required detection limit. Various metals were also identified in the soil samples, such as beryllium which was found in concentrations up to 0.428 mg/kg, although many were estimated values.

On the basis of the internal laboratory quality assurance program, the data were sometimes qualified using letter codes, which are defined as follows:

- B – Analyte detected in laboratory blank.
- J – Value is considered estimated.
- U – Compound was analyzed for but not detected. The number is the method detection limit for the sample.
- Y – Detection limit determined from secondary column. Peaks observed on primary column quantitated at less than contract-required detection limit on the secondary column.

Analytical results presented in Tables II.3 through II.6 include a compilation of Form I data, the data reported by the laboratory; validated data, evaluated in accordance with the OU3 QAPP, as discussed in Appendix C; and OEPA data, which are the results of the split sampling and analysis conducted by the State of Ohio. Laboratory results for the OU3 LFI are provided in Appendix B.

2.3 OU3 LFI DATA QUALITY SUMMARY

In order to obtain data of sufficient quality to meet the objectives of the OU3 LFI, a system of quality controls and quality assessment was established in the OU3 QAPP (DOE, 1991e). Methods and procedures used in the field and the laboratory for collecting and analyzing soil samples from the Building 34 former tank site were reviewed and evaluated in accordance with the QAPP (DOE, 1991e). Results of this review and evaluation are presented in preliminary form in Appendix C. A final report on the validation and quality assessment of the data will be presented in the OU3 LFI Report.

According to the preliminary OU3 data quality assessment presented in Appendix C, analytical data generated in the OU3 LFI are of sufficient quality for the purposes of this report, that is, the data will support a meaningful comparison with regulatory or health-based thresholds.

3. DISCUSSION

3.1. COMPARISON OF SAMPLING AND ANALYSIS EFFORTS AND RESULTS

Upon review of the analytical data provided in Section 2.2., it is evident that EP tank removal results and OU3 LFI results cannot be directly compared. Tank removal results reflect the OEPA data requirements for closure of a UST site. Alternately, the OU3 LFI data includes parameters of concern to the CERCLA RI/FS effort at Mound Plant. In order to conservatively evaluate the tank site soils, the two data sets are considered to be cumulative to form a single, larger analytical resource. However, certain differences between the investigation results must be discussed.

As described in Section 2.1., samples taken as part of EP tank removal activities were collected just after the tank had been removed from the ground; these sample results reflect the condition of relatively undisturbed excavation soils. In addition, the EP tank removal samples were taken from soils directly beneath the center of the tank above the concrete pad and from roughly the depth of the pad at two ends. Consequently, these samples were collected near where the tank had been positioned and conceivably represent soils most recently contaminated with the tank contents. At the time of the tank excavation, no product was reported on the tank pad, nor were there any stained soils found in the excavation area. During the tank removal process, no PID readings were noted.

In contrast, OU3 LFI samples were taken after the tank excavation had remained open for nearly 9 months, which had the unplanned result of allowing contaminants to volatilize and biodegrade, and also potentially be flushed or diluted to some degree by precipitation. Furthermore, OU3 LFI samples were collected as much as 1 foot deeper than the EP tank removal samples, which should cause the OU3 LFI samples to reflect soils contaminated by materials released at an earlier point in time than those of the tank removal samples. Because contaminant concentrations reported in the OU3 LFI results are, overall, much lower than those reported in the EP tank removal activities, because the OU3 LFI results were from deeper samples, and because of the physical evidence noted at the time of the tank excavation, the extent of contamination may be very limited.

Although analytical parameters differed somewhat between the two investigations, both included testing for VOCs, cyanide, PCBs, and metals; some of the specific parameters varied. In addition, the OU3 LFI included testing for SVOCs that would roughly correspond with the TPH testing performed in the EP tank removal investigation, as both analyses may provide data reflecting the presence of potentially hazardous heavy hydrocarbon compounds. The OU3 LFI also included testing for EPH, quantified as diesel fuel and motor oil that, when combined, provide a result comparable to the TPH

results from the tank removal effort. However, because of the potential for overlap of the motor oil and diesel fuel quantitations, the combination of EPH results may indicate more petroleum hydrocarbons than are actually present.

EP tank removal results (Table II.2) reported no detection of volatile organics. The OU3 LFI analyses did, however, report finding 2-butanone (methyl ethyl ketone) in a concentration of 3 J $\mu\text{g}/\text{kg}$ at sample location 0021 (see Figure 2-1).

With the exception of phenol, which was not detected, and TPH, EP tank removal analyses did not include SVOCs. OU3 LFI results report butylbenzylphthalate in the trace concentration of 53 J $\mu\text{g}/\text{kg}$ at sample location 0021, combined EPH results of up to 61 mg/kg, and also several tentatively identified compounds (TIC). Appendix B presents the laboratory results for the OU3 LFI testing, including SVOCs, which report the qualitative detection of some non-target compound list compounds reported as unknown hydrocarbons. Because the instrument run times were relatively long for these TICs, it appears that they represent various heavy hydrocarbon compounds. The numeric concentrations of these TICs are estimated and cannot be compared with the concentrations of TPH reported in the tank removal results; however, the TICs may indicate that TPH detected in tank site soils consists of hydrocarbon compounds not identified as a concern in the Mound Plant RI/FS efforts and not included in the VOC and SVOC target compound list.

As described in Section 2.2., various metals were detected in tank site soils in both investigations; however, because metals are common, naturally occurring soil constituents, the detected concentrations may only reflect background soil levels. At this time, background soil chemistry information is not yet available for Mound Plant and concentrations of metals detected at the tank site must be regarded as contaminants.

Beryllium is the exception, which was detected in the OU3 LFI analysis and would not be expected in background soils. The beryllium found in former tank site soils is probably the result of Mound Plant manufacturing activities that have involved the use of metal from roughly 1953 to 1965 (DOE, 1991d) and is not thought to be a tank-related contaminant. The beryllium is thought to be associated with an ineffective air filtration system used in Building 51 in conjunction with machining operations and is not considered to be a tank-related contaminant.

3.2. REMOVAL ACTION EVALUATION

Since the concentration of contaminants in the soil at the Building 34 tank site are relatively low, there is need to question whether a removal action is necessary (see Section 1.1.1.). CERCLA requirements specified in 40 CFR 300.410(e) indicate that a removal site evaluation should be terminated when:

- 1) There is no release;
- 2) The source is neither a vessel nor a facility as defined in 40 CFR 300.5 of the NCP;
- 3) The release involves neither a hazardous substance, nor a pollutant or contaminant that may present an imminent and substantial danger to public health or welfare;
- 4) The release is of a naturally occurring material, contained within structures, or results only from ordinary use-deterioration of a water supply and there is no other authority to respond in a capable and timely manner;
- 5) The amount, quantity, or concentration released does not warrant federal response;
- 6) A party responsible for the release, or any other person, is providing appropriate response, and on-scene monitoring by the government is not required; or
- 7) The removal site evaluation is completed.

The decision to terminate a removal evaluation is commonly completed on the basis of available information as a conceptual exercise. The information is evaluated to determine whether an "imminent and substantial danger to public health and welfare" exists. At the former Building 34 tank site, contaminants at the site are currently buried 9 feet or more bgs. Therefore, there is no likelihood of significant exposure to human populations or animals through the following pathways:

- Inhalation of contaminants from fugitive dust emissions.
- Contaminant exposure resulting from surface water run off to sources of drinking water or recreation (streams, lakes).
- Uptake and subsequent biomagnification of contaminants from soils by native vegetation.

The only pathway of possible significance is contamination of groundwater. Although the Building 34 former tank site was not investigated as a potential source of groundwater contamination in the OU3 LFI, this pathway is not expected to present an imminent hazard for the following reasons:

- Concentrations of contaminants in soils at the 7 to 10 foot bgs level are relatively low, as described in Section 3.1.

- Based on physical evidence (see Section 3.1.), the total volume of released contaminants from the Building 34 tank is expected to be small.
- Total depth to ground water is expected to be approximately 32 feet based on nearby monitoring wells (DOE, 1992b). Migration of contaminants through the unsaturated soil zone will result in a significant decrease in the concentration of contaminants.
- No drinking water wells are currently present in the vicinity of the Building 34 site.

Therefore, because there is no imminent and substantial danger to the public health or welfare, the criterion to terminate the removal site evaluation has been met and a removal action is not necessary.

3.3 DETERMINATION OF A NEED FOR FURTHER INVESTIGATION OR REMEDIATION

As stated in Section 1.1.2., the second objective of this report is to provide a preliminary determination of the need to conduct further investigation or remedial actions at the Building 34 former tank site. Because action levels based on ARARs or risk studies have not yet been established at Mound Plant, possible action levels were established based on available regulatory and policy thresholds.

Section 1. provides that final interpretation and reporting of all OU3 data is pending. Proposal of ARARs in accordance with the FFA will be made in conjunction with the latter report. The following discussion is provided only to place the Building 34 results in context and support a decision about whether further action is needed at this time.

With respect to ARAR determinations, the Mound Plant FFA, Section XII (F)(1), states that:

For those primary documents or secondary documents that consist of or include ARAR determinations... the project managers shall meet to identify and propose... all potential ARARs pertinent to the report being addressed.

CERCLA § 121(d) requires that ARARs be complied with when performing remedial responses. "Applicable requirements," as defined in 40 CFR 300.5, mean:

Those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances found at a CERCLA site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable.

"Relevant and appropriate requirements," also defined in 40 CFR 300.5, mean:

Those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws, that, while not 'applicable' to a hazardous substances, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are identified in a timely manner and that are more stringent than federal requirements may be relevant and appropriate.

According to CERCLA § 121(d)(2), in order to be considered an ARAR, a state requirement must have been "promulgated." As defined in 40 CFR 300.400(g)(4) of the NCP, the term "promulgated" means that the requirement is of general applicability and is legally enforceable.

In addition to ARARs, advisories, criteria, or guidance may be identified as "to be considered" (TBC) for a particular release. As defined in 40 CFR 300.400(g)(3), the TBC category consists of advisories, criteria, or guidance developed by EPA, other federal agencies, or states that may be useful in developing remedies. Use of TBCs is discretionary rather than mandatory, as opposed to ARARs, with which compliance is mandatory.

3.3.1. ARAR Categories

In general, there are three categories of ARARs. These categories are:

- Ambient or chemical-specific requirements set health- or risk-based concentration limits in various environmental media for specific hazardous substances or pollutants. At present, chemical-specific ARARs do not exist for contaminated soils and, accordingly, no regulatory numeric action levels can be established for evaluation of tank site investigation data.
- Location-specific requirements are limits placed on the concentration of hazardous substances or the conduct of activities solely because they occur in certain locations. Because this report presents an evaluation of an existing condition at Mound Plant, a detailed analysis of location-specific ARARs is not inappropriate.
- Performance, design, or other action-specific requirements set controls or restrictions on particular kinds of activities related to management of hazardous substances or pollutants. Because this report presents an evaluation of an existing condition at Mound Plant, a detailed analysis of action-specific ARARs is not appropriate.

3.3.2. Possible Action Levels

As discussed in Section 3.3.1., chemical-specific ARARs for contaminated soils do not currently exist. In order to discuss action levels for this report, the EPA proposed rule of 40 CFR Part 264 Subpart S, Corrective Action for Solid Waste Management Units (55 FR 30798), has been referenced. Specifically, the action level criteria for contaminated soil found in Appendix A (55 FR 30865) have been identified for contaminants apparently released from the Building 34 waste tank. Table III.1 presents a summary of the contaminants together with possible interim action levels. Because many of the chemicals identified had not been assigned action levels in the proposed Subpart S rule, possible action levels were calculated by using chronic oral reference doses (RfD) and carcinogenic slope factors (CSF) taken from the EPA Health Effects Assessment Summary Tables, Annual, FY 1991 (EPA, 1991) and using the risk formulas for carcinogens and systemic toxicants provided in Appendix E of the proposed rule (55 FR 30870) based on an ingestion route of exposure. The most restrictive (lowest) concentration threshold for each potential contaminant, whether taken from the proposed rule tables or calculated, are presented in Table III.1. Ensuring that Building 34 aviation fuel tank contaminants exist in concentrations not greater than the levels presented in Table III.1 will provide for a carcinogenic risk of 10^{-6} or less for each carcinogen. Similarly, if contaminant concentrations are below Table III.1 levels, they are also below the adverse effect levels for systemic toxicants.

If it becomes necessary to remove contaminated soils from the Building 34 tank site, ARARs governing the management and disposal of such soils would have to be proposed. However, because no regulatory restrictions currently exist for the tank site contaminants, petroleum hydrocarbon concentrations could be compared to those provided by the OEPA policy on petroleum-contaminated soils (OEPA, 1991). While not promulgated standards and therefore not ARARs, the OEPA thresholds do provide useful guidance and could be applied as TBCs; OEPA petroleum-contaminated soil standards are presented in Table III.1. It should be noted that the OEPA standards are reportedly being revised and a new TPH threshold of 105 mg/kg will be implemented (Gaston, 1992).

Table III.1
Summary Compounds Detected in Mound Plant Bldg. 34 Aviation Fuel
Storage Tank Soils Compared with Selected Regulatory Thresholds

PARAMETER	UNIT											OEPA SOIL PETROLEUM CLEAN UP PROPOSED 264 POLICY SUBPARTS	
		20-0001	21-0001	22-0001	23-0001	23-1001	24-0001	BMBEC	BMMOC	BMLEC	OEPA02	(ug/kg)	(mg/kg)
Aluminum	mg/kg	7020	7270	8510	6200	5970	9070				320		(a)
Arsenic	mg/kg	5.6B	4.7B	8.7	4.2B	5.8	7.6	4.3	5.2	5.8	1.9		80
Barium	mg/kg	31.3J	66.3J	69.6J	101J	51.1J	40.7J	44	23	37	29		4000
Beryllium	mg/kg	0.24B	0.28B	0.42B	0.18B	0.21B	0.34B				<0.5		0.2
Butylbenzphthalate		53J											
Cadmium	mg/kg	0.47UJ	0.4UJ	0.45UJ	0.45UJ	0.43UJ	0.41UJ	0.23	0.26	0.26	<0.5		40
Calcium	mg/kg	162000	163000	132000	149000	139000	130000				140000		(a)
Chromium	mg/kg	7.6	7.6	8.9	6.1	6.1	9.7	11	10	13	5.7		400
Cobalt	mg/kg	4.1B	3.6B	4.7B	3.7B	4.7B	5.3				3		(a)
Copper	mg/kg	11.9J	11.2J	15.1J	11.6J	10.6J	13.4J				8.3		2960
Flash Point	degrees F	None to 21 None to 21 None to 210										(a)	
Iron	mg/kg	11500J	11900J	14600J	10400J	10700J	14600J	11000	9900	11000	12000		(a)
Lead	mg/kg	8	7.4	8.2	7.7	8.9	9.4	3.0	3.0	3.2	<10		(a)
Magnesium	mg/kg	62500	58600	44100	61400	53400	48100				50000		(a)
Manganese	mg/kg	238	226	254	234	250	265	210	190	170	190		8000
Methyl Ethyl Ketone	ug/kg	12U	3J	11U	12U	12UJ	11U	<1000	<1000	<1000	100U		4000
Methylene chloride	ug/kg	6U	5U	6U	6U	8UJ	5U	<50	<50	<50	1100		90
Nickel	mg/kg	11.7J	9.7J	12.1J	12.3J	13.0J	12.7J				8.7		2000
Potassium	mg/kg	2,230	2270	2610	2000	1720	2390				610		(a)
Selenium	mg/kg	0.12UJ	0.10UJ	0.12B	0.12UJ	0.11UJ	0.11UJ	<0.4	<0.4	<0.4	0.3		(a)
Silver	mg/kg	0.46U	0.3UJ	0.34UJ	0.34UJ	0.32UJ	0.57U	3.1	1.7	0.33	<2		(a)
Sodium	mg/kg	225B	195B	184B	272B	224B	183B	150	200	250	120		(a)
Thallium	mg/kg	0.37B	0.32B	0.35B	0.35B	0.24B	0.22B				<0.25		5.6
Toluene	ug/kg	6U						<2	<2	2	5.0U	4000	20000
Total Petroleum Hydrocarbon	mg/kg		61(b)	U(c)	42(b)	36(b)	U(c)	50	175	60	<25	40000	
Total Solids	%							94	95	95	86		
Vanadium	mg/kg	14.1	14.3	16.3	11.7	12.4	16.8				120		560
Zinc	mg/kg	35.7	35.1	43.0	32.9	36.0	42.3				29		16000
pH	S.U.							8.2	8.3	8.2			

Key

20-0001: IT Labs split, sample #020
 21-0001: IT Labs split, sample #021
 22-0001: IT Labs split, sample #022
 23-0001: IT Labs split, sample #023
 23-1001: IT Labs split, duplicate sample #023

24-0001: IT Labs split, sample #024
 BMBEC: Bowser-Morner sample, East Bottom of Cavity
 BMMOC: Bowser-Morner sample, Middle Bottom of Cavity
 BMLEC: Bowser-Morner sample, West Bottom of Cavity
 OEPA021: Ohio EPA's split, sample #021

(a) No oral RFD or carcinogenic slope factor found.
 Standard was not available, nor could it be calculated.
 (b) May be biased high. Combined diesel and motor oil quantitation results.
 (c) See Laboratory Results in Appendix B

B = Analyte detected in laboratory blank.
 J = Estimated value.
 U = Compound was analyzed for but not detected. The number is the method detection limit for the sample.

When investigation results are compared with the 40 CFR 264 Subpart S action levels in Table III.1, only beryllium is found to exceed the action level. The OU3 LFI detected beryllium in concentrations ranging from 0.18B to 0.42B mg/kg with an action level of 0.2. Applying the equation used to derive the possible action level, the maximum beryllium detected equates to a carcinogenic risk of 2.6×10^{-6} . As noted in Section 3.1., beryllium contamination is thought to have resulted from Mound Plant historic manufacturing activities, such as beryllium machining area operations, rather than tank usage, and was likely a result of an ineffective air filtration system used in Mound Plant beryllium machining areas from roughly 1953 to 1965 (DOE, 1991d). Because Mound Plant soils will continue to be sampled and analyzed in forthcoming investigations, beryllium found in soils from the Building 34 former tank site should be revisited in the future to determine the extent of the contamination. However, beryllium is not considered to be a tank-related contaminant and as such is not considered a concern relative to tank closure activities.

When investigation results are compared to the OEPA petroleum-contaminated soil standards, the TPH results from the EP tank removal activities and two of the OU3 LFI results exceed the OEPA standard. However, the petroleum hydrocarbon results from the OU3 LFI represent a combining of the diesel fuel and motor oil quantitations and could be biased high. The two high OU3 results, reported as 42 and 61 mg/kg, are quite close to the OEPA standard of 40 mg/kg. When the petroleum hydrocarbon results are compared with the revised OEPA standard of 105 mg/kg, only one result from the tank removal investigation, 175 mg/kg as found in the soils on top of the tank pad, exceeds the state standard. The later OU3 LFI samples do not exceed the latter standard. As discussed in Section 3.1, the more toxic constituents, petroleum hydrocarbon compounds, were not detected in significant concentrations in VOC and SVOC analyses.

Consequently, although comparison of soil contaminant data to possible action levels indicates beryllium and petroleum hydrocarbons are somewhat elevated, the low concentrations of these parameters present minimal risk to human health and the environment. Accordingly, further investigation or remediation should not be necessary. This determination will be re-evaluated as the overall RI/FS effort at Mound Plant progresses and formal remediation goals are established.

3.4. FUTURE COMPARISON WITH ARARS AND RISK-BASED PRGS

The discussion in Section 3.3. comparing investigation results to possible interim action levels is intended to offer criteria by which to evaluate existing data. Section 1.1. of this report explains the objectives of determining the need for a removal action for the released hazardous substances and of offering a preliminary determination of the need to conduct further investigation or remediation at the

tank site. Because investigation of the Building 34 tank site is a very small part of the overall ER Program investigation of the Mound Plant, an absolute decision whether to investigate or remediate the tank site at this time would be inappropriate. Efforts to establish preliminary remediation goals (PRG) are currently in progress and are scheduled to be completed in FY 1992. As the RI/FS process at Mound Plant proceeds, action levels will evolve from PRGs to become parts of the final remedial action objectives, which will include consideration of ARARs and site risk assessments. Location-specific contaminants at the Mound Plant will ultimately be evaluated from the perspective of large areas of the Plant and from the perspective of the Plant as a whole. As a result, the significance of the contaminant concentrations in the soils at the Building 34 tank site will require measurement with criteria based on a larger perspective before the tank site may be completely dismissed from concern. DOE has committed to retaining tank site soil data in the OU3 Remedial Investigation where it will be addressed by the risk assessment/risk management process (DOE, 1992a).

3.5. POSSIBLE DATA GAPS

As noted in Section 1.1., the objective of the OU3 LFI is to primarily focus on source identification and characterization. The potential for groundwater contamination from Building 34 tank site soils was not investigated. Furthermore, the limited geologic information indicates the soils beneath the tank site may be moderately permeable. If, based on future re-evaluation of the data, the contaminants are identified as a potential threat to groundwater, additional sampling may be required. Such sampling could include testing the groundwater beneath the tank site, and soil samples could be collected and tested to determine the leachability of the constituents of concern.

4. CONCLUSIONS

On the basis of the review and discussion presented in Sections 1., 2., and 3., the following conclusions are evident:

- The EP tank removal investigation did not identify VOCs in soil samples. The only VOC detected during the OU3 LFI was 2-butanone at a concentration of 3 $\mu\text{g}/\text{kg}$.
- The EP tank removal investigation did not identify SVOCs in soil samples. The only SVOC found during the OU3 LFI was butyl benzyl phthalate at an estimated concentration of 53 mg/kg.
- The EP tank removal investigation found low levels of arsenic, barium, cadmium, chromium, lead, manganese, and silver in soil samples. The OU3 LFI also found low levels of the same metals as well as aluminum, beryllium, cobalt, copper, iron, magnesium, nickel, vanadium, and zinc. Most of these metals could be expected as background in soils; however, this expectation cannot be confirmed because background samples have not been collected off site. The exception to this is beryllium which was found at levels up to 0.42 mg/kg and would not be expected in background soils.
- The beryllium found in former tank site soils is probably the result of Mound Plant manufacturing activities that have involved the metal from 1953 to 1965 and is not considered to be a tank-related contaminant.
- On the basis of a review of the Building 34 former tank site soil contaminant data from Mound Plant EP tank removal activities and from the OU3 LFI of the site, a removal action to address the contaminated soils is not necessary.
- Upon review of the potential exposure pathways as provided in Section 3.2., there is no imminent and substantial danger to the public or welfare and, pursuant to 40 CFR 300.410(e), the DOE is hereby concluding the removal site evaluation.
- Based on comparison to these possible action levels, it is concluded that no need exists to conduct further investigation at the Building 34 tank site nor will there be a need to conduct remedial actions. This conclusion will have to be re-evaluated based on the results of background sampling and as the site-specific action levels for the Mound Plant evolve from PRGs, ARAR determination, the Baseline Risk Assessment, and the Record of Decision. DOE has committed to retaining tank site soil data in the OU3 Remedial Investigation where it will be addressed by the risk assessment/risk management process (DOE, 1992a).

5. REFERENCES

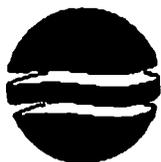
- Bowser-Morner, Inc. 1991. Preliminary Closure Site Assessment, Three (3) Underground Storage Tanks, U.S. Department of Energy's Mound Laboratories, Miamisburg, Ohio, Bowser-Morner Report No. 10813 - 491-174, April 19, 1991 and Preliminary Closure Site Assessment, Three (3) Underground Storage Tanks, U.S. Department of Energy's Mound Laboratories, Miamisburg, Ohio, Bowser-Morner Report No. 10813-1290-934, December 26, 1990. (Reference is included as Appendix A to this Report.)
- DOE (U.S. Department of Energy). 1986. "Phase I Installation Assessment, Mound [DRAFT]." Environmental Restoration Program. U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, New Mexico. April 1986.
- DOE (U.S. Department of Energy). 1989. "Remedial Investigation Mound Plant, Task AL-MD-1, Groundwater Stage 3 Supplement [DRAFT]." Environmental Restoration Program. U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, NM. February 1989.
- DOE (U.S. Department of Energy). 1991a. "Limited Field Investigation Work Plan, Mound Plant, Miscellaneous Sites Operable Unit 3." Environmental Restoration Program. U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, NM. June 1991.
- DOE (U.S. Department of Energy). 1991b. Operable Unit 9, Remedial Investigation/Feasibility Study, Site-Wide Work Plan, Draft Mound Plant, Miamisburg, Ohio, ER Program, U.S. Department of Energy, Albuquerque Operations Office, June 1991.
- DOE (U.S. Department of Energy). 1991c. Operable Unit 9, Site Scoping Report, Volume 6-Photo History Report, Mound Plant, Miamisburg, Ohio, ER Program, U.S. Department of Energy, Albuquerque Operations Office, September 1991.
- DOE (U.S. Department of Energy). 1991d. Operable Unit 9, Site Scoping Report, Volume 7-Waste Management, Working Draft, Mound Plant, Miamisburg, ER Program, Ohio, U.S. Department of Energy, Albuquerque Operations Office, September 1991.
- DOE (U.S. Department of Energy). 1991e. "Limited Field Investigation Quality Assurance Project Plan, Mound Plant, Miscellaneous Sites, Operable Unit 3." Environmental Restoration Program. U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, NM. October 1991.
- DOE (U.S. Department of Energy). 1992a. "Proposal for Additional Work, Soil Gas Survey and Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill Areas." U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, NM. February 1992.
- DOE (U.S. Department of Energy). 1992b. Operable Unit 9, Site Scoping Report, Volume 2 - Geologic Log and Well Information, Mound Plant, Miamisburg, Ohio, Environmental Restoration Program, U.S. Department of Energy, Albuquerque Field Office, Albuquerque, NM. April 1992.
- EPA (U.S. Environmental Protection Agency). 1991. EPA Health Effects Assessments Summary Tables, Annual, FY-1991, OERR #9200.6-303(91-1), January 1991.
- Gaston, S. 1992. Personal Communication from Sheila Gaston, Bureau of Underground Storage Tank Regulations, Division of the State Fire Marshall, Dayton, Ohio, to K.L. Andersen, Roy F. Weston, Inc., Lakewood, Colorado. March 1992.

OEPA (Ohio Environmental Protection Agency). 1991. Petroleum Contaminated Soil, Interim Final, Ohio EPA, PP 01 03 200, March 25, 1991.

Appendix A

APPENDIX A

BOWSER-MORNER, INC. PRELIMINARY CLOSURE SITE ASSESSMENT



**BOWSER
MORNER**
COMMITTED TO EXCELLENCE
SINCE 1911

4518 Taylorsville Road
P.O. Box 51
Dayton, OH 45401-0051
513-236-8805
513-233-2016 FAX

June 24, 1992

Roy F. Weston Inc.
Denver Co.
Att: Kris Anderson

Dear Mr. Anderson

This letter is to clarify the apparent anomalies present within BOWSER-MORNER Inc. laboratory report No.: 9010428-001. The original report issued on November 26, 1990 is correct and without error. The report was amended on April 10, 1992 at the request of Steven Kitske R F Weston Inc. to add a data qualifier statement that clarifies the accuracy of the volatile organic target analytes which exceeded the instrument calibration range. It was on this amendment sent to Mr. Kitske on April 10, 1992 that was issued containing typographical errors. We regret that this error was undetected and sincerely apologize for any inconvenience incurred. A corrected copy accompanies this letter.

If you desire further information concerning this issue please feel free to contact me at 513 - 236-8805 ext. 228

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division

Eric C. Wiegert
Eric C. Wiegert, Manager

ECW/ecw

ANALYTICAL SCIENCES • GEO-ENVIRONMENTAL SERVICES • CONSTRUCTION SERVICES

OTHER LOCATIONS: TOLEDO, OH AND LEXINGTON, KY

BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Road • P. O. Box 51 • Dayton, Ohio 45401 • 513/238-8805

LABORATORY REPORT

TO: 10813 Reliable Const-Mound
 Attn: Jeffrey Floyd

Date: 6/24/92
 BMI No.: 9010428
 Sample No.: 55588
 Authorization : WO#10813

ON: One (1) Sample Received October 26, 1990 for Chemical Analysis.

SAMPLE IDENTIFICATION:

Sample From Tank No. 3

TEST RESULTS:

Analyte	Results	Units	Method Limit
<u>----- Volatile Organics -----</u>			
Benzene	39.6	ug/l	5
Bromodichloromethane	BPQL	ug/l	10
Bromoform	BPQL	ug/l	10
Bromomethane	BPQL	ug/l	5
Carbon Tetrachloride	BPQL	ug/l	10
Chlorobenzene	BPQL	ug/l	5
Chloroethane	BPQL	ug/l	10
2-Chloroethylvinyl Ether	BPQL	ug/l	20
Chloroform	12.9	ug/l	10
Chloromethane	BPQL	ug/l	10
cis-1,3-Dichloropropene	BPQL	ug/l	5
Dibromochloromethane	BPQL	ug/l	5
1,1-Dichloroethane	BPQL	ug/l	5
1,2-Dichloroethane	BPQL	ug/l	5
1,2-Dichloropropane	BPQL	ug/l	5
Ethyl Benzene	220	ug/l	5
Methylene Chloride	260	ug/l	5
1,1,2,2-Tetrachloroethane	BPQL	ug/l	5
Tetrachloroethylene	7.6	ug/l	10
Toluene	1900 *	ug/l	5
trans-1,2-Dichloroethylene	162	ug/l	5
trans-1,3-Dichloropropene	BPQL	ug/l	5
1,1,1-Trichloroethane	10.4	ug/l	10
1,1,2-Trichloroethane	BPQL	ug/l	5
Trichloroethylene	9100 *	ug/l	5
Trichlorofluoromethane	BPQL	ug/l	5
Vinyl Chloride	BPQL	ug/l	10
Xylene	2400 *	ug/l	10
Acetone	2,000,000 *	ug/l	100
Acrolein	BPQL	ug/l	20
Acrylonitrile	BPQL	ug/l	200

All Reports Remain The Confidential Property Of BOWSER-MORNER And No Publication Or Distribution Of Reports May Be Made Without Our Express Written Consent, Except As Authorized By Contract.

10813 Reliable Construction
 BMI No. 9010428-001
 Page 2

Analyte	Results	Units	Method Limit
-----Volatile Organics-----			
Carbon Disulfide	BPQL	ug/l	10
Dibromomethane	BPQL	ug/l	10
Dichlorodifluoromethane	BPQL	ug/l	10
Methyl Butyl Ketone	BPQL	ug/l	100
Methyl Ethyl Ketone	8400 *	ug/l	200
Methyl Isobutyl Ketone	13,000 *	ug/l	100
Styrene	BPQL	ug/l	10
1,2,3-Trichloropropene	BPQL	ug/l	20
Vinyl Acetate	BPQL	ug/l	20
-----Surrogate Standards-----			
1,2-Dichloroethane-d4			
Fluorbenzene			
Pentafluorobenzene			
Ave. Percent Recovery	79	%	
Mercury	<0.002	mg/l	
Arsenic	<0.02	mg/l	
Selenium	<0.05	mg/l	
Silver	<0.1	mg/l	
Barium	<0.1	mg/l	
Cadmium	<0.01	mg/l	
Chromium	<0.01	mg/l	
Lead	<0.1	mg/l	
Sodium	510	mg/l	
Iron	8.7	mg/l	
Manganese	0.13	mg/l	
Total Petroleum Hydrocarbons	48	mg/l	
Total Phenolics	<0.008	mg/l	
Cyanide	<0.01	mg/l	
Sulfide	18	mg/l	
Total Solids	14330	mg/l	
PCBs	150	ug/l	PCB 1260
pH	9.6		
Flash Point	No Flash to	210 C	

---Notes---

* Estimated values, due to Quantitation outside instrument calibration range.

BPQL = Below Practice Quantitation Limits

Respectfully Submitted,
 BOWSER, MORNER, INC.
 Analytical Sciences Division

E. C. Wiegert
 Eric C. Wiegert, Manager
 Environmental Sciences Laboratory

ECW/ecw
 I-Client

 **EG&G MOUND APPLIED TECHNOLOGIES**

P.O. BOX 3000 MIAMISBURG, OHIO 45343-3000 • TEL (513)865-4020

July 1, 1991

Ms. Diana Mally
U. S. Environmental Protection Agency
5-HS-11
230 S. Dearborn St.
Chicago, IL 60604

Dear Ms. Mally:

Enclosed are copies of the Preliminary Closure Site Assessment Reports dated December 26, 1990 (Report #10813-1290-934) and April 9, 1990 (Report #10813-491-174). Ark Kleinrath of the USDOE, Dayton Area Office, requested that I forward the reports. The December 26, 1990 Report was submitted within 60 days of the start of tank closures but it did not address remediation. The April 9, 1991 Report addresses the remediation but does not include the site plan appendix or the laboratory report appendix.

If you have any questions, please call me at 513-865-4886 or FTS 774-4886.

Sincerely,

Katherine G. Koehler

Katherine G. Koehler
OU-3 Project Manager

KGK:db
Enclosures

cc: A. Kleinrath, DOE/DAO
M. Hatcher, OEPA
R. Neff, EG&G
D. Carfagno, EG&G
J. Price, Weston
~~D. Miller, Weston~~

W. Meyer DOE/AL

 **EG&G MOUND APPLIED TECHNOLOGIES**

P.O. BOX 3000 MIAMISBURG, OHIO 45343-3000 • TEL (513)865-4020

July 1, 1991

Ms. Martha Hatcher
Ohio Environmental Protection Agency
40 S. Main St.
Dayton, OH 45402

Dear Ms. Hatcher:

Enclosed are copies of the Preliminary Closure Site Assessment Reports dated December 26, 1990 (Report #10813-1290-934) and April 9, 1990 (Report #10813-491-174). Ark Kleinrath of the USDOE, Dayton Area Office, requested that I forward the reports. The December 26, 1990 Report was submitted within 60 days of the start of tank closures but it did not address remediation. The April 9, 1991 Report addresses the remediation but does not include the site plan appendix or the laboratory report appendix.

If you have any questions, please call me at 513-865-4886 or FTS 774-4886.

Sincerely,

KGK/db

Katherine G. Koehler
OU-3 Project Manager

KGK:db
Enclosures

cc: A. Kleinrath, DOE/DAO
D. Mally, USEPA
R. Neff, EG&G
D. Carfagno, EG&G
J. Price, Weston
D. Meyer, DOE/AL

**Preliminary Closure Site Assessment,
Three (3) Underground Storage Tanks,
U.S. Department of Energy's Mound Plant,
Miamisburg, Ohio**

For

**Reliable Construction Services
1639 Stanley Avenue
Dayton, Ohio 45404**

Report No. 10813-491-174

April 9, 1991



BOWSER-MORNER

4518 Taylorsville Road • P.O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

PRELIMINARY UNDERGROUND STORAGE TANK CLOSURE ASSESSMENT REPORT

REPORT TO: Reliable Construction Services
1639 Stanley Avenue
Dayton, Ohio 45404

REPORT DATE: April 9, 1991

REPORT NO.: 10813-491-174

Attention: Ms. Jeanette McDaniel
Mr. Dave Mitchell

REPORT ON: Preliminary Closure Site Assessment, Three (3) Underground Storage Tanks, U.S. Department of Energy's Mound Plant, Miamisburg, Ohio

1.0 SUMMARY

Three (3) underground storage tanks (UST's) were removed as part of permanent closures from the U.S. Department of Energy's Mound Plant in Miamisburg, Ohio on November 29, November 30, and December 4, 1990. The operator of the facility is EG&G Mound Applied Technologies. Before the tanks were removed, samples of the contents of the tanks were collected and analyzed to determine the proper method of disposal for the contents of each tank. The UST's were removed according to the State Fire Marshal's regulations. The surrounding soils were tested to comply with the requirements of both the State Fire Marshal, Bureau of Underground Storage Tank Regulations (BUSTR), and the Resource Conservation and Recovery Act (RCRA) governed by the Ohio Environmental Protection Agency. The initial observations and laboratory testing indicated that the soils in two of the former UST cavities will require additional remedial action. Mr. R.E. Burdge of EG&G Mound said they will remediate the tank site soil by bioremediation.

2.0 PURPOSE OF REPORT

This report, prepared for Reliable Construction Services, describes the removal of three (3) underground storage tanks (UST's) at the above location and provides data and conclusions on the preliminary closure site assessments of these tanks.

3.0 LOCATIONS AND DESCRIPTIONS OF USTS

UST #1 was to the east of the test fire facility on the south central part of the site. This 5000-gallon steel tank had been used to store aviation gasoline to fire burners in the shipping container test facility. Approximately 80 feet of supply line piping were associated with this tank.

UST #3 was directly behind Building #51. This tank had been used to store waste solvents and oils. The UST was a 1200-gallon steel tank with approximately 10 feet of associated piping.

UST #7 was next to Building #43 and had never been in service. Water found in the tank was reportedly from leak testing after the tank was installed. This 1000-gallon UST was constructed of stainless steel. All of the piping for this tank was above the ground.

The attached site plan shows the locations of these UST's.

4.0 WORK PERFORMED

On October 26, November 29, November 30, and December 4, 1990, a Bowser-Morner Associates, Inc. hydrogeologist, Mr. Jeffrey D. Floyd, was present during tank closure activities at the site. The specific tasks to be accomplished were:

- Obtain samples of the contents of the tanks for laboratory analysis
- Observe the excavation and removal of the tanks
- Obtain soil samples for laboratory analysis
- Provide a closure site assessment and final report



5.0 SAMPLING, ANALYSIS, AND CHARACTERIZATION OF UST CONTENTS

5.1 Sample Collection

On October 26, 1990, one sample of the contents of each UST was collected by lowering a pre-cleaned bailer into the tank through the fill pipe opening. Because UST #1 was nearly empty, no sample could be obtained. The samples collected were immediately placed on ice and transported to the laboratory for analyses. Strict chain-of-custody was maintained.

5.2 Laboratory Analyses

The samples were tested for the parameters specified by EG&G Mound Plant. The laboratory results are summarized below in Table 1. The laboratory reports are attached.

TABLE 1
LABORATORY RESULTS OF SAMPLES OF UST CONTENTS

<u>Parameter</u>	<u>Result</u>		<u>Unit</u>
	<u>BLDG 51</u> <u>UST #3</u>	<u>BLDG 43</u> <u>UST #7</u>	
Benzene	39.6	BPQL*	ug/L
Chloroform	12.9	BPQL	ug/L
Ethylbenzene	220	BPQL	ug/L
Methylene Chloride	260	BPQL	ug/L
Tetrachloroethylene	7.6	BPQL	ug/L
Toluene	1,900	BPQL	ug/L
Trans-1,2- Dichloroethylene	162	BPQL	ug/L



(TABLE 1, LABORATORY RESULTS OF SAMPLES OF UST CONTENTS, Continued)

Parameter	Result		Unit
	BLDG 51 UST #3	BLDG 43 UST #7	
1,1,1-trichloroethane	10.4	BPQL	ug/L
Trichloroethylene	9,100	BPQL	ug/L
Xylene	2,400	BPQL	ug/L
Acetone	2,000	BPQL	mg/L
Methyl Ethyl Ketone	8,400	BPQL	ug/L
Methyl Isobutyl Ketone	13	BPQL	mg/L
Mercury	< 0.001	< 0.001	mg/L
Arsenic	< 0.002	< 0.002	mg/L
Selenium	< 0.05	0.01	mg/L
Silver	< 0.1	< 0.1	mg/L
Barium	< 0.1	< 0.1	mg/L
Cadmium	< 0.01	< 0.01	mg/L
Chromium	< 0.01	< 0.01	mg/L
Lead	< 0.1	< 0.1	mg/L
Sodium	510	2.6	mg/L
Iron	8.7	0.26	mg/L
Manganese	0.13	0.02	mg/L
Total Petroleum Hydrocarbons	48	< 1	mg/L
Phenol	< 0.008	2.5	mg/L
Cyanide	< 0.01	< 0.01	mg/L



(TABLE 1, LABORATORY RESULTS OF SAMPLES OF UST CONTENTS, Continued)

Parameter	Result		Unit
	BLDG 51 UST #3	BLDG 43 UST #7	
Sulfide	18	16	mg/L
Total Solids	14,330	19	mg/L
PCB's	150 PCB 1260	< 0.8	ug/L
pH	9.6	7.0	S.U**
Flash Point	None to 210	None to 210	Degrees F

*Below Practical Quantification Limits

**Standard Units

5.3 Waste Characterization and Disposal

The contents of the tanks were identified and disposed of as follows:

UST #1 had reportedly only held aviation gasoline. Approximately 20 gallons of gasoline and sludge were pumped from the tank before the tank was removed. Reliable Construction Services put these waste materials in D.O.T.-approved drums and arranged for proper disposal.

UST #3 contained volatile organic compounds that are listed hazardous materials. The contents were characterized as hazardous waste, spent solvents. The contents were pumped into D.O.T. 17E approved drums for temporary storage at the site until EG&G Mound Applied Technologies could arrange for disposal.

UST #7, which was never put into service, apparently contained deionized water from the original leak testing. Mr. Richard Burdge, EG&G Project Manager, said that



phenols indicated from the laboratory tests of this substance were probably residuals from disinfecting cleansers used to clean the tank after it was installed. The common household cleaner, "Lysol," contains phenols. The tank contents were pumped out into the site's storm water management system.

6.0 UST REMOVAL

6.1 Permits

A permit to remove the UST's was obtained from the City of Miamisburg Fire Department.

6.2 Excavation and Removal of UST

Reliable Construction Services was contracted by EG&G to remove the UST's. On November 29, November 30, and December 4, 1990, the UST's were removed. A trackhoe and a backhoe were used for the excavations, which were left open pending laboratory reports.

6.3 Field Observations

6.3.1 UST #1 BLDG 34. AVIATION GAS TANK

UST #1 was removed on November 29, 1990. The tank was pumped to remove as much liquid and sludge as possible. Approximately 20 gallons of liquid and sludge were removed and placed into D.O.T. 17E approved drums. The tank was purged until the vapor levels were less than 20% of the lower explosive limit as measured by an explosive gas meter. To ensure that explosive vapors did not regenerate, the UST was monitored several times during the removal operations.

A large trackhoe was used to excavate the UST. A concrete slab that lay over the tank and the fill materials around the tank were removed. Once the UST was exposed, it



was tilted so that any remaining liquid or sludge could be pumped out. The UST was then lifted from the excavation. The tank cavity was excavated in clay-type soils; the tank was backfilled with sand and with clay soils in the upper part of the cavity. A concrete slab was on the bottom of the cavity.

Although the part of the tank that had been in contact with the sand fill was in good condition, the part of the tank that had been surrounded by the clay-type soils was severely corroded. Several small holes were in the upper third of the tank where it had been in contact with the clay soils. After the condition of the tank was determined, it was loaded onto a truck for off-site disposal. Approximately 80 feet of piping that ran from the tank to the test facility were also removed during this process. No signs of leaks were seen in the piping. No groundwater or contents from the tank were noticed in the excavation.

6.3.2 UST #3 BLDG 51

UST #3 was removed on December 4, 1990. After the liquid and sludge inside this tank were pumped out, the UST was triple-rinsed. The liquid, sludge, and rinse were drummed for temporary storage until disposal could be arranged. The rinsing process also removed the vapors in the tank to safe levels as measured by an explosive gas meter.

A concrete slab that lay over the UST was removed and excavation proceeded. The cavity was excavated in clay-type soils and backfilled with sand. A concrete slab was on the bottom of the cavity. Some of the soils at the bottom of the cavity were stained and had a slight odor. No groundwater or contents from the tank were seen in the excavation.

After the UST was removed from the cavity, it was examined. The tank was in poor condition with heavy corrosion and numerous holes. The piping that ran from this tank to Building #51 was also in poor condition.

6.3.3 UST #7 BLDG 43

UST #7 was removed on November 30, 1990. The tank was tested with an explosive gas meter to determine if any explosive vapors were present. No explosive vapors were found and a photo-ionization detector indicated that no other organic vapors were present. The piping, all of which was above the ground, was removed back to Building #43. The associated equipment was also removed and the contents of the tank were pumped into the site's storm water management system. A backhoe was used to excavate and remove the tank. The tank cavity had been excavated in clay-type soils and the tank had been backfilled with sand and with some clay-type soils. A concrete slab lay at the bottom of the cavity. No contents from the tank or groundwater were noticed in the excavation.

The UST was in excellent condition with only a small area of minor corrosion on the upper part of the tank where it had been in contact with clay soils. The tank was loaded onto a truck for disposal off-site.

6.4 Groundwater Observations

No groundwater was observed in the cavities.

6.5 Free Product

No free product was seen in any of the cavities.

7.0 SAMPLE COLLECTION AND ANALYSIS

7.1 Sample Collection

Samples were taken according to the State Fire Marshal's and the Ohio Environmental Protection Agency's guidelines.



7.2 Details of Sample Collection

All of the samples were collected by hand. Three soil samples were collected from each tank cavity for laboratory analyses. One sample was collected from the middle of each cavity on top of the concrete slab. Two samples, one from each end of the cavity, were collected 6 to 12 inches below the top of the slab in each cavity.

The samples to be tested for volatile organics were placed in glass containers with septum lids; the samples for the rest of the analyses were placed in glass containers with Teflon-lined lids. All of the samples were placed on ice for transport. The site plan, showing sample locations, is attached.

7.3 Sample Screening

The soil samples and excavated materials were screened with a photo-ionization detector (PID) to measure the levels of organic vapors. The calibration curve for the PID is attached.

The PID showed no readings for the UST #1 cavity. PID readings were taken at 20-foot intervals along the piping to the test fire units. (Please see the attached drawing for exact sample collection locations and PID readings for these samples.) Although the PID readings were minimal along the piping, readings up to 160 parts per million (ppm) were noted near the valves for the test fire units.

The PID readings of some of the excavated soils from the UST #3 cavity ranged from 10 to 15 ppm. The readings for the three soil samples from the bottom of the cavity were all 4 ppm.

No readings were found for any of the excavated materials or samples associated with UST #7.



7.4 Chain-of-Custody

Strict chain-of-custody was achieved by obtaining proper signatures as the samples were taken to the laboratory for analysis. Chain-of-custody documentation is attached.

7.5 Name and Affiliation of Person Collecting Samples

Mr. Jeffrey Floyd, a Bowser-Morner Associates, Inc. hydrogeologist, collected all of the samples.

7.6 Name and Affiliation of Third-Party Observer

Mr. Steve Meadows, Fire Inspector for the Miamisburg Fire Department, observed all of the UST removals.

7.7 Name, Address, and Telephone Number of Laboratory

Bowser-Morner, Inc., 4518 Taylorsville Road, Dayton, Ohio 45401
Telephone: (513) 236-8805

7.8 Laboratory Analyses and Results

Soil samples from the UST #1 (Building 34) cavity show elevated levels of iron. The total petroleum hydrocarbon levels are also elevated. No other parameters are higher than the expected background levels for the clay-type soils tested.

The analyses of the soil samples from the UST #3 (Building 51) cavity show low levels of organic solvents. All of the other parameters are within background levels for the clay-type soils tested.

Soil samples from the UST #7 cavity show very low levels of organic solvents. All of the other parameters are within background levels for the clay-type soil tested. The results of the laboratory tests of the samples collected when the UST's were removed are summarized in Tables 2-4. The laboratory reports are attached.



TABLE 2
 LABORATORY RESULTS OF SAMPLES COLLECTED
 DURING INITIAL EXCAVATION
UST #1 (BLDG 34)

<u>Parameter</u>	<u>Result</u>			<u>Unit</u>
	<u>East Bottom Cavity</u>	<u>Middle Bottom Cavity</u>	<u>West Bottom Cavity</u>	
Benzene	< 2	< 2	< 2	ug/kg
Chloroform	< 10	< 10	< 10	ug/kg
Ethylbenzene	< 2	< 2	< 2	ug/kg
Methylene Chloride	< 50	< 50	< 50	ug/kg
Tetrachloroethylene	< 25	< 25	< 25	ug/kg
Toluene	< 2	< 2	2	ug/kg
Trans-1,2-Dichloroethylene	< 25	< 25	< 25	ug/kg
1,1,1-trichloroethane	< 25	< 25	< 25	ug/kg
Trichloroethylene	< 25	< 25	< 25	ug/kg
Xylene	< 2	< 2	< 2	ug/kg
Acetone	< 500	< 500	< 500	ug/kg
Methyl Ethyl Ketone	< 1000	< 1000	< 1000	ug/kg
Methyl Isoburyl Ketone	< 500	< 500	< 500	ug/kg
Mercury	< 0.02	< 0.02	< 0.02	mg/kg
Arsenic	4.3	5.2	5.8	mg/kg
Selenium	< 0.4	< 0.4	< 0.4	mg/kg



(TABLE 2, LABORATORY RESULTS OF SAMPLES COLLECTED DURING INITIAL
 EXCAVATION, UST #1, Continued)

Parameter	Result			Unit
	East Bottom Cavity	Middle Bottom Cavity	West Bottom Cavity	
Silver	3.1	1.7	0.33	mg/kg
Barium	44	23	37	mg/kg
Cadmium	0.23	0.26	0.26	mg/kg
Chromium	11	10	13	mg/kg
Lead	3.0	3.0	3.2	mg/kg
Sodium	150	200	250	mg/kg
Iron	11,000	9,900	11,000	mg/kg
Manganese	210	190	170	mg/kg
Total Petroleum Hydrocarbons	50	175	60	mg/kg
Phenol	< 0.15	< 0.15	< 0.15	mg/kg
Cyanide	< 0.1	< 0.1	< 0.1	mg/kg
Sulfide	< 1	< 1	< 1	mg/kg
Total Solids	94	95	95	%
PCB's	< 0.04	< 0.04	< 0.04	ug/kg
pH	8.2	8.3	8.2	S.U**
Flash Point	None to 210	None to 210	None to 210	Degrees F

*Below Practical Quantification Limits

**Standard Units



TABLE 3
 LABORATORY RESULTS OF SAMPLES COLLECTED
 DURING INITIAL EXCAVATION
UST #3 (BLDG 51)

Parameter	Result			Unit
	Building End of Cavity	Middle of Cavity	Lot End of Cavity	
Benzene	< 2	< 2	< 2	ug/kg
Chloroform	21	21	< 10	ug/kg
Ethylbenzene	< 2	< 2	< 2	ug/kg
Methylene Chloride	< 50	< 50	< 50	ug/kg
Tetrachloroethylene	< 25	< 25	< 25	ug/kg
Toluene	< 2	< 2	< 2	ug/kg
Trans-1,2-Dichloroethylene	< 25	< 25	< 25	ug/kg
1,1,1-trichloroethane	< 25	< 25	< 25	ug/kg
Trichloroethylene	53	210	< 25	ug/kg
Xylene	< 2	< 2	< 2	ug/kg
Acetone	< 500	< 500	< 500	ug/kg
Methyl Ethyl Ketone	< 1000	< 1000	< 1000	ug/kg
Methyl Isobutyl Ketone	< 500	< 500	< 500	ug/kg
Mercury	0.17	0.06	0.03	mg/kg
Arsenic	2.3	2.4	5.8	mg/kg
Selenium	< 0.4	< 0.4	< 0.4	mg/kg
Silver	< 2	< 2	< 2	mg/kg



(TABLE 3, LABORATORY RESULTS OF SAMPLES COLLECTED DURING INITIAL
 EXCAVATION, UST #3, Continued)

<u>Parameter</u>	<u>Result</u>			<u>Unit</u>
	<u>Building End of Cavity</u>	<u>Middle of Cavity</u>	<u>Lot End of Cavity</u>	
Barium	16	8.5	38	mg/kg
Cadmium	0.61	0.44	0.41	mg/kg
Chromium	4.8	3.8	20	mg/kg
Lead	6.1	2.3	6.4	mg/kg
Sodium	95	140	< 10	mg/kg
Iron	5,000	4,800	21,000	mg/kg
Manganese	100	120	470	mg/kg
Total Petroleum Hydrocarbons	75	560	35	mg/kg
Phenol	< 0.15	< 0.15	< 0.15	mg/kg
Cyanide	< 0.1	< 0.1	< 0.1	mg/kg
Sulfide	< 1	< 1	< 1	mg/kg
Total Solids	93	96	87	%
PCB's	0.12 PCB 1254	< 0.04	< 0.04	ug/kg
pH	8.7	8.8	7.7	S.U**
Flash Point	None to 210	None to 210	None to 210	Degrees F

*Below Practical Quantification Limits

**Standard Units



TABLE 4
 LABORATORY RESULTS OF SAMPLES COLLECTED
 DURING INITIAL EXCAVATION

<u>Parameter</u>	<u>UST #7</u>			<u>Unit</u>
	<u>North End of Cavity</u>	<u>Middle of Cavity</u>	<u>South End of Cavity</u>	
Benzene	< 2	< 2	< 2	ug/kg
Chloroform	< 10	18	18	ug/kg
Ethylbenzene	< 2	< 2	< 2	ug/kg
Methylene Chloride	< 50	< 50	< 50	ug/kg
Tetrachloroethylene	< 25	< 25	< 25	ug/kg
Toluene	< 2	3	< 2	ug/kg
Trans-1,2-Dichloroethylene	< 25	< 25	< 25	ug/kg
1,1,1-trichloroethane	< 25	< 25	31	ug/kg
Trichloroethylene	< 25	< 25	< 25	ug/kg
Xylene	< 2	3	< 2	ug/kg
Acetone	< 500	< 500	< 500	ug/kg
Methyl Ethyl Ketone	< 1000	< 1000	< 1000	ug/kg
Methyl Isobutyl Ketone	< 500	< 500	< 500	ug/kg
Mercury	< 0.02	< 0.02	0.03	mg/kg
Arsenic	1.2	1.6	< 0.4	mg/kg
Selenium	< 0.4	< 0.4	< 0.4	mg/kg
Silver	< 2	< 2	< 2	mg/kg



(TABLE 4, LABORATORY RESULTS OF SAMPLES COLLECTED DURING INITIAL
 EXCAVATION, UST #7, Continued)

Parameter	Result			Unit
	<u>North End of Cavity</u>	<u>Middle of Cavity</u>	<u>South End of Cavity</u>	
Barium	4	5	12	mg/kg
Cadmium	< 0.2	< 0.2	< 0.2	mg/kg
Chromium	1.8	2.4	5.1	mg/kg
Lead	< 2	< 2	< 2	mg/kg
Sodium	53	64	87	mg/kg
Iron	2,000	2,600	4,400	mg/kg
Manganese	53	71	160	mg/kg
Total Petroleum Hydrocarbons	25	17	30	mg/kg
Phenol	< 0.15	< 0.15	< 0.15	mg/kg
Cyanide	< 0.1	< 0.1	< 0.1	mg/kg
Sulfide	< 1	< 1	< 1	mg/kg
Total Solids	81	97	85	%
PCB's	0.15 PCB 1260	< 0.04	< 0.04	ug/kg
pH	8.0	7.8	7.5	S.U**
Flash Point	None to 210	None to 210	None to 210	Degrees F

*Below Practical Quantification Limits

**Standard Units



8.0 CONCLUSIONS

Based on the findings of this preliminary closure assessment, additional remedial actions will be required at the former locations of Building 34 UST #1 and Building 51 UST #3. Elevated levels of petroleum hydrocarbons (TPH) are the primary concern that needs to be addressed.

The higher-than-normal level of TPH found in the UST #1 Building 34 cavity indicates that a small release of product has occurred. This TPH level exceeds the Ohio State Fire Marshal's allowable level for clean closure (<40mg/kg). The elevated level of iron in the samples collected from the UST #1 Building 34 cavity are probably due to rust from the tank. The excavated soils from this cavity will need to be remediated as waste materials. Mr. R.E. Burdge of EG&G Mound said they will remediate the tank site soil by bioremediation. This soil, and probably soils from further remedial actions, will be permitted to be disposed of in a sanitary landfill.

The low levels of organic solvents found in the soil samples from the Building 51 UST #3 cavity will not show toxicity in Toxic Characteristic Leaching Procedure (TCLP) testing and these soils are not likely to be classified as hazardous waste. The State Fire Marshal will require additional remedial action to reduce the elevated levels of total petroleum hydrocarbons found at this location (<40mg/kg). All of the other parameters are within background levels for the clay-type soils tested. The excavated soils from this cavity will need to be remediated as waste materials. Mr. R.E. Burdge of EG&G Mound said they will remediate the tank site soil by bioremediation. The soils should be tested using the TCLP method to determine the proper method of disposal although they will probably be allowed to be disposed of in a sanitary landfill.

At the levels of organic solvents found in the soil samples from the Building 43 UST #7 cavity, no further remedial action is be required. The other parameters tested for were all within background levels.

Thank you for selecting Bowser-Morner Associates, Inc. for this project. Your business is appreciated, and we look forward to working with you again soon. In the meantime, if you have any questions or if we can help you in any way, please let us know.

Sincerely,

Bowser-Morner Associates, Inc.



Jeffrey D. Floyd
Hydrogeologist
Project Manager

JDF/mlf
4-Client
2-File



LABORATORY REPORTS



**Preliminary Closure Site Assessment,
Three (3) Underground Storage Tanks,
U.S. Department of Energy's Mound Laboratories,
Miamisburg, Ohio**

For

**Reliable Construction Services
1639 Stanley Avenue
Dayton, Ohio 45404**

Report No. 10813-1290-934

December 26, 1990

BOWSER-MORNER

4518 Taylorsville Road • P.O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

PRELIMINARY UNDERGROUND STORAGE TANK CLOSURE ASSESSMENT REPORT

REPORT TO: Reliable Construction Services
1639 Stanley Avenue
Dayton, Ohio 45404

REPORT DATE: December 26, 1990

REPORT NO.: 10813-1290-934

Attention: Ms. Jeanette McDaniel
Mr. Dave Mitchell

REPORT ON: Preliminary Closure Site Assessment, Three (3) Underground Storage Tanks, U.S. Department of Energy's Mound Laboratories, Miamisburg, Ohio

1.0 SUMMARY

Three (3) underground storage tanks (UST's) were removed as part of permanent closures from the U.S. Department of Energy's Mound Laboratories in Miamisburg, Ohio on November 29, November 30, and December 4, 1990. The operator of the facility is EG&G Mound Applied Technologies. Before the tanks were removed, samples of the contents of the tanks were collected and analyzed to determine the proper method of disposal for the contents of each tank. The UST's were removed according to the State Fire Marshal's regulations. The surrounding soils were tested to comply with the requirements of both the State Fire Marshal, Bureau of Underground Storage Tank Regulations (BUSTR), and the Resource Recovery and Conservation Act (RCRA) governed by the Ohio Environmental Protection Agency. The initial observations and laboratory testing indicated that the soils in two of the former UST cavities will require additional remedial action.

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2.0 PURPOSE OF REPORT

This report, prepared for Reliable Construction Services, describes the removal of three (3) underground storage tanks (UST's) at the above location and provides data and conclusions on the preliminary closure site assessments of these tanks.

3.0 LOCATIONS AND DESCRIPTIONS OF UST'S

UST #1 was to the east of the test fire facility on the south central part of the site. This 5000-gallon steel tank had been used to store aviation gasoline to fire burners in the test fire facility. Approximately 80 feet of supply line piping were associated with this tank.

UST #3 was directly behind Building #51. This tank had been used to store waste solvents and oils. The UST was a 1200-gallon steel tank with approximately 10 feet of associated piping.

UST #7 was next to Building #43 and had never been in service. Water found in the tank was reportedly from leak testing after the tank was installed. This 1000-gallon UST was constructed of stainless steel. All of the piping for this tank was above the ground.

The attached site plan shows the locations of these UST's.

4.0 WORK PERFORMED

On October 26, November 29, November 30, and December 4, 1990, a Bowser-Morner Associates, Inc. hydrogeologist, Mr. Jeffrey D. Floyd, was present during tank closure activities at the site. The specific tasks to be accomplished were:

- Obtain samples of the contents of the tanks for laboratory analysis
- Observe the excavation and removal of the tanks
- Obtain soil samples for laboratory analysis
- Provide a closure site assessment and final report

5.0 SAMPLING, ANALYSIS, AND CHARACTERIZATION OF UST CONTENTS

5.1 Sample Collection

On October 26, 1990, one sample of the contents of each UST was collected by lowering a pre-cleaned bailer into the tank through the fill pipe opening. Because UST #1 was nearly empty, no sample could be obtained. The samples collected were immediately placed on ice and transported to the laboratory for analyses. Strict chain-of-custody was maintained.

5.2 Laboratory Analyses

The samples were tested for the parameters specified by Mound Laboratories. The laboratory results are summarized below in Table 1. The laboratory reports are attached.

TABLE 1
LABORATORY RESULTS OF SAMPLES OF UST CONTENTS

<u>Parameter</u>	<u>Result</u>		<u>Unit</u>
	<u>UST #3</u>	<u>UST #7</u>	
Benzene	39.6	BPQL*	ug/L
Chloroform	12.9	BPQL	ug/L
Ethylbenzene	220	BPQL	ug/L
Methylene Chloride	260	BPQL	ug/L
Tetrachloroethylene	7.6	BPQL	ug/L
Toluene	1,900	BPQL	ug/L
Trans-1,2-Dichloroethylene	162	BPQL	ug/L

(TABLE 1, LABORATORY RESULTS OF SAMPLES OF UST CONTENTS, Continued)

<u>Parameter</u>	<u>Result</u>		<u>Unit</u>
	<u>UST #3</u>	<u>UST #7</u>	
1,1,1-trichloroethane	10.4	BPQL	ug/L
Trichloroethylene	9,100	BPQL	ug/L
Xylene	2,400	BPQL	ug/L
Acetone	2,000	BPQL	mg/L
Methyl Ethyl Ketone	8,400	BPQL	ug/L
Methyl Isobutyl Ketone	13	BPQL	mg/L
Mercury	< 0.001	< 0.001	mg/L
Arsenic	< 0.002	< 0.002	mg/L
Selenium	< 0.05	0.01	mg/L
Silver	< 0.1	< 0.1	mg/L
Barium	< 0.1	< 0.1	mg/L
Cadmium	< 0.01	< 0.01	mg/L
Chromium	< 0.01	< 0.01	mg/L
Lead	< 0.1	< 0.1	mg/L
Sodium	510	2.6	mg/L
Iron	8.7	0.26	mg/L
Manganese	0.13	0.02	mg/L
Total Petroleum Hydrocarbons	48	< 1	mg/L
Phenol	< 0.008	2.5	mg/L
Cyanide	< 0.01	< 0.01	mg/L

(TABLE 1, LABORATORY RESULTS OF SAMPLES OF UST CONTENTS, Continued)

<u>Parameter</u>	<u>Result</u>		<u>Unit</u>
	<u>UST #3</u>	<u>UST #7</u>	
Sulfide	18	16	mg/L
Total Solids	14,330	19	mg/L
PCB's	150 PCB 1260	< 0.8	ug/L
pH	9.6	7.0	S.U**
Flash Point	None to 210	None to 210	Degrees F

*Below Practical Quantification Limits

**Standard Units

5.3 Waste Characterization and Disposal

The contents of the tanks were identified and disposed of as follows:

UST #1 had reportedly only held aviation gasoline. Approximately 20 gallons of gasoline and sludge were pumped from the tank before the tank was removed. Reliable Construction Services put these waste materials in D.O.T.-approved drums and arranged for proper disposal.

UST #3 contained volatile organic compounds that are listed hazardous materials. The contents were characterized as hazardous waste, spent solvents. The contents were pumped into D.O.T.-approved drums for temporary storage at the site until EG&G Mound Applied Technologies could arrange for disposal.

UST #7, which was never put into service, apparently contained deionized water from the original leak testing. Mr. Richard Burdg, EG&G Project Manager, said that

phenols indicated from the laboratory tests of this substance were residuals from disinfecting cleansers used to clean the tank after it was installed. The common household cleaner, "Lysol," contains phenols. The tank contents were pumped out into the site's storm water management system.

6.0 UST REMOVAL

6.1 Permits

A permit to remove the USTs was obtained from the City of Miamisburg Fire Department.

6.2 Excavation and Removal of UST

Reliable Construction Services was hired to remove the USTs. On November 29, November 30, and December 4, 1990, the USTs were removed. A trackhoe and a backhoe were used for the excavations, which were left open pending laboratory reports.

6.3 Field Observations

6.3.1 UST #1

UST #1 was removed on November 29, 1990. The tank was pumped to remove as much liquid and sludge as possible. Approximately 20 gallons of liquid and sludge were removed and placed into D.O.T.-approved drums. The tank was purged until the vapor levels were less than 20% of the lower explosive limit as measured by an explosive gas meter. To ensure that explosive vapors did not regenerate, the UST was monitored several times during the removal operations.

A large trackhoe was used to excavate the UST. A concrete slab that lay over the tank and the fill materials around the tank were removed. Once the UST was exposed, it was tilted so that any remaining liquid or sludge could be pumped out. The UST was then

lifted from the excavation. The tank cavity was excavated in clay-type soils; the tank was backfilled with sand and with clay soils in the upper part of the cavity. A concrete slab was on the bottom of the cavity.

Although the part of the tank that had been in contact with the sand fill was in good condition, the part of the tank that had been surrounded by the clay-type soils was severely corroded. Several small holes were in the upper third of the tank where it had been in contact with the clay soils. After the condition of the tank was determined, it was loaded onto a truck for off-site disposal. Approximately 80 feet of piping that ran from the tank to the test fire facility were also removed during this process. No signs of leaks were seen in the piping. No groundwater or contents from the tank were noticed in the excavation.

6.3.2 UST #3

UST #3 was removed on December 4, 1990. After the liquid and sludge inside this tank were pumped out, the UST was triple-rinsed with water. The liquid, sludge, and rinse water were drummed for temporary storage until disposal could be arranged. The rinsing process also removed the vapors in the tank to safe levels as measured by an explosive gas meter.

A concrete slab that lay over the UST was removed and excavation proceeded. The cavity was excavated in clay-type soils and backfilled with sand. A concrete slab was on the bottom of the cavity. Some of the soils at the bottom of the cavity were stained and had a slight odor. No groundwater or contents from the tank were seen in the excavation.

After the UST was removed from the cavity, it was examined. The tank was in poor condition with heavy corrosion and numerous holes. The piping that ran from this tank to Building #51 was also in poor condition.

6.3.3 UST #7

UST #7 was removed on November 30, 1990. The tank was tested with an explosive gas meter to determine if any explosive vapors were present. No explosive vapors were found and a photo-ionization detector indicated that no other organic vapors were present. The piping, all of which was above the ground, was removed back to Building #43. The associated equipment was also removed and the contents of the tank were pumped into the site's storm water management system. A backhoe was used to excavate and remove the tank. The tank cavity had been excavated in clay-type soils and the tank had been backfilled with sand and with some clay-type soils. A concrete slab lay at the bottom of the cavity. No contents from the tank or groundwater were noticed in the excavation.

The UST was in excellent condition with only a small area of minor corrosion on the upper part of the tank where it had been in contact with clay soils. The tank was loaded onto a truck for disposal off-site.

6.4 Groundwater Observations

No groundwater was observed in the cavities.

6.5 Free Product

No free product was seen in any of the cavities.

7.0 SAMPLE COLLECTION AND ANALYSIS

7.1 Sample Collection

Samples were taken according to the State Fire Marshal's and the Ohio Environmental Protection Agency's guidelines.

7.2 Details of Sample Collection

All of the samples were collected by hand. Three soil samples were collected from each tank cavity for laboratory analyses. One sample was collected from the middle of each cavity on top of the concrete slab. Two samples, one from each end of the cavity, were collected 6 to 12 inches below the top of the slab in each cavity.

The samples to be tested for volatile organics were placed in glass containers with septum lids; the samples for the rest of the analyses were placed in glass containers with Teflon-lined lids. All of the samples were placed on ice for transport. The site plan, showing sample locations, is attached.

7.3 Sample Screening

The soil samples and excavated materials were screened with a photo-ionization detector (PID) to measure the levels of organic vapors. The calibration curve for the PID is attached.

The PID showed no readings for the UST #1 cavity. PID readings were taken at 20-foot intervals along the piping to the test fire units. (Please see the attached drawing for exact sample collection locations and PID readings for these samples.)

Although the PID readings were minimal along the piping, readings up to 160 parts per million (ppm) were noted near the valves for the test fire units.

The PID readings of some of the excavated soils from the UST #3 cavity ranged from 10 to 15 ppm. The readings for the three soil samples from the bottom of the cavity were all 4 ppm.

No readings were found for any of the excavated materials or samples associated with UST #7.

7.4 Chain-of-Custody

Strict chain-of-custody was achieved by obtaining proper signatures as the samples were taken to the laboratory for analysis. Chain-of-custody documentation is attached.

7.5 Name and Affiliation of Person Collecting Samples

Mr. Jeffrey Floyd, a Bowser-Morner Associates, Inc. hydrogeologist, collected all of the samples.

7.6 Name and Affiliation of Third-Party Observer

Mr. Steve Meadows, Fire Inspector for the Miamisburg Fire Department, observed all of the UST removals.

7.7 Name, Address, and Telephone Number of Laboratory

Bowser-Morner, Inc., 4518 Taylorsville Road, Dayton, Ohio 45401

Telephone: (513) 236-8805

7.8 Laboratory Analyses and Results

Soil samples from the UST #1 cavity show elevated levels of iron. The total petroleum hydrocarbon levels are also elevated. No other parameters are higher than the expected background levels for the clay-type soils tested.

The analyses of the soil samples from the UST #3 cavity show low levels of organic solvents. All of the other parameters are within background levels for the clay-type soils tested.

Soil samples from the UST #7 cavity show very low levels of organic solvents. All of the other parameters are within background levels for the clay-type soil tested. The results of the laboratory tests of the samples collected when the UST's were removed are summarized in Tables 2-4. The laboratory reports are attached.

TABLE 2
 LABORATORY RESULTS OF SAMPLES COLLECTED
 DURING INITIAL EXCAVATION

<u>Parameter</u>	<u>UST #1</u>			<u>Unit</u>
	<u>East Bottom Cavity</u>	<u>Middle Bottom Cavity</u>	<u>West Bottom Cavity</u>	
Benzene	< 2	< 2	< 2	ug/kg
Chloroform	< 10	< 10	< 10	ug/kg
Ethylbenzene	< 2	< 2	< 2	ug/kg
Methylene Chloride	< 50	< 50	< 50	ug/kg
Tetrachloroethylene	< 25	< 25	< 25	ug/kg
Toluene	< 2	< 2	2	ug/kg
Trans-1,2-Dichloroethylene	< 25	< 25	< 25	ug/kg
1,1,1-trichloroethane	< 25	< 25	< 25	ug/kg
Trichloroethylene	< 25	< 25	< 25	ug/kg
Xylene	< 2	< 2	< 2	ug/kg
Acetone	< 500	< 500	< 500	ug/kg
Methyl Ethyl Ketone	< 1000	< 1000	< 1000	ug/kg
Methyl Isobutyl Ketone	< 500	< 500	< 500	ug/kg
Mercury	< 0.02	< 0.02	< 0.02	mg/kg
• Arsenic	4.3	5.2	5.8	mg/kg
Selenium	< 0.4	< 0.4	< 0.4	mg/kg

(TABLE 2, LABORATORY RESULTS OF SAMPLES COLLECTED DURING INITIAL
 EXCAVATION, UST #1, Continued)

<u>Parameter</u>	<u>Result</u>			<u>Unit</u>
	<u>East Bottom Cavity</u>	<u>Middle Bottom Cavity</u>	<u>West Bottom Cavity</u>	
Silver	3.1	1.7	0.33	mg/kg
Barium	44	23	37	mg/kg
Cadmium	0.23	0.26	0.26	mg/kg
Chromium	11	10	13	mg/kg
Lead	3.0	3.0	3.2	mg/kg
Sodium	150	200	250	mg/kg
Iron	11,000	9,900	11,000	mg/kg
Manganese	210	190	170	mg/kg
Total Petroleum Hydrocarbons	50	175	60	mg/kg
Phenol	< 0.15	< 0.15	< 0.15	mg/kg
Cyanide	< 0.1	< 0.1	< 0.1	mg/kg
Sulfide	< 1	< 1	< 1	mg/kg
Total Solids	94	95	95	%
PCB's	< 0.04	< 0.04	< 0.04	ug/kg
pH	8.2	8.3	8.2	S.U**
Flash Point	None to 210	None to 210	None to 210	Degrees F

*Below Practical Quantification Limits

**Standard Units

TABLE 3
 LABORATORY RESULTS OF SAMPLES COLLECTED
 DURING INITIAL EXCAVATION

UST #3

Result

<u>Parameter</u>	<u>Building End of Cavity</u>	<u>Middle of Cavity</u>	<u>Lot End of Cavity</u>	<u>Unit</u>
Benzene	< 2	< 2	< 2	ug/kg
Chloroform	21	21	< 10	ug/kg
Ethylbenzene	< 2	< 2	< 2	ug/kg
Methylene Chloride	< 50	< 50	< 50	ug/kg
Tetrachloroethylene	< 25	< 25	< 25	ug/kg
Toluene	< 2	< 2	< 2	ug/kg
Trans-1,2- Dichloroethylene	< 25	< 25	< 25	ug/kg
1,1,1-trichloroethane	< 25	< 25	< 25	ug/kg
Trichloroethylene	53	210	< 25	ug/kg
Xylene	< 2	< 2	< 2	ug/kg
Acetone	< 500	< 500	< 500	ug/kg
Methyl Ethyl Ketone	< 1000	< 1000	< 1000	ug/kg
Methyl Isobutyl Ketone	< 500	< 500	< 500	ug/kg
Mercury	0.17	0.06	0.03	mg/kg
Arsenic	2.3	2.4	5.8	mg/kg
Selenium	< 0.4	< 0.4	< 0.4	mg/kg
Silver	< 2	< 2	< 2	mg/kg



(TABLE 3, LABORATORY RESULTS OF SAMPLES COLLECTED DURING INITIAL
 EXCAVATION, UST #3, Continued)

Parameter	Result			Unit
	Building End of Cavity	Middle of Cavity	Lot End of Cavity	
Barium	16	8.5	38	mg/kg
Cadmium	0.61	0.44	0.41	mg/kg
Chromium	4.8	3.8	20	mg/kg
Lead	6.1	2.3	6.4	mg/kg
Sodium	95	140	< 10	mg/kg
Iron	5,000	4,800	21,000	mg/kg
Manganese	100	120	470	mg/kg
Total Petroleum Hydrocarbons	75	560	35	mg/kg
Phenol	< 0.15	< 0.15	< 0.15	mg/kg
Cyanide	< 0.1	< 0.1	< 0.1	mg/kg
Sulfide	< 1	< 1	< 1	mg/kg
Total Solids	93	96	87	%
PCB's	0.12 PCB 1254	< 0.04	< 0.04	ug/kg
pH	8.7	8.8	7.7	S.U.**
Flash Point	None to 210	None to 210	None to 210	Degrees F

*Below Practical Quantification Limits

**Standard Units



TABLE 4
 LABORATORY RESULTS OF SAMPLES COLLECTED
 DURING INITIAL EXCAVATION

UST #7

Result

<u>Parameter</u>	<u>North End of Cavity</u>	<u>Middle of Cavity</u>	<u>South End of Cavity</u>	<u>Unit</u>
Benzene	< 2	< 2	< 2	ug/kg
Chloroform	< 10	18	18	ug/kg
Ethylbenzene	< 2	< 2	< 2	ug/kg
Methylene Chloride	< 50	< 50	< 50	ug/kg
Tetrachloroethylene	< 25	< 25	< 25	ug/kg
Toluene	< 2	3	< 2	ug/kg
Trans-1,2- Dichloroethylene	< 25	< 25	< 25	ug/kg
1,1,1-trichloroethane	< 25	< 25	31	ug/kg
Trichloroethylene	< 25	< 25	< 25	ug/kg
Xylene	< 2	3	< 2	ug/kg
Acetone	< 500	< 500	< 500	ug/kg
Methyl Ethyl Ketone	< 1000	< 1000	< 1000	ug/kg
Methyl Isobutyl Ketone	< 500	< 500	< 500	ug/kg
Mercury	< 0.02	< 0.02	0.03	mg/kg
Arsenic	1.2	1.6	< 0.4	mg/kg
Selenium	< 0.4	< 0.4	< 0.4	mg/kg
Silver	< 2	< 2	< 2	mg/kg

(TABLE 4; LABORATORY RESULTS OF SAMPLES COLLECTED DURING INITIAL
 EXCAVATION, UST #7, Continued)

<u>Parameter</u>	<u>Result</u>			<u>Unit</u>
	<u>North End of Cavity</u>	<u>Middle of Cavity</u>	<u>South End of Cavity</u>	
Barium	4	5	12	mg/kg
Cadmium	< 0.2	< 0.2	< 0.2	mg/kg
Chromium	1.8	2.4	5.1	mg/kg
Lead	< 2	< 2	< 2	mg/kg
Sodium	53	64	87	mg/kg
Iron	2,000	2,600	4,400	mg/kg
Manganese	53	71	160	mg/kg
Total Petroleum Hydrocarbons	25	17	30	mg/kg
Phenol	< 0.15	< 0.15	< 0.15	mg/kg
Cyanide	< 0.1	< 0.1	< 0.1	mg/kg
Sulfide	< 1	< 1	< 1	mg/kg
Total Solids	81	97	85	%
PCB's	0.15 PCB 1260	< 0.04	< 0.04	ug/kg
pH	8.0	7.8	7.5	S.U**
Flash Point	None to 210	None to 210	None to 210	Degrees F

*Below Practical Quantification Limits

**Standard Units



8.0 CONCLUSIONS

Based on the findings of this preliminary closure assessment, additional remedial actions will be required at the former locations of UST #1 and UST #3. Elevated levels of petroleum hydrocarbons (TPH) are the primary concern that needs to be addressed.

The higher-than-normal level of TPH found in the UST #1 cavity indicates that a small release of product has occurred. This TPH level exceeds the Ohio State Fire Marshal's allowable level for clean closure. The elevated level of iron in the samples collected from the UST #1 cavity are probably due to rust from the tank. The excavated soils from this cavity will need to be disposed of as waste materials. This soil, and probably soils from further remedial actions, will be permitted to be disposed of in a sanitary landfill.

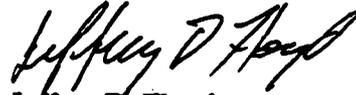
The low levels of organic solvents found in the soil samples from the UST #3 cavity will not show toxicity in Toxic Characteristic Leaching Procedure (TCLP) testing and these soils are not likely to be classified as hazardous waste. The State Fire Marshal will require additional remedial action to reduce the elevated levels of total petroleum hydrocarbons found at this location. All of the other parameters are within background levels for the clay-type soils tested. The excavated soils from this cavity will need to be disposed of as waste materials. The soils should be tested using the TCLP method to determine the proper method of disposal although they will probably be allowed to be disposed of in a sanitary landfill.

At the levels of organic solvents found in the samples from the UST #7 cavity, no further remedial action should be required. The other parameters tested for were all within background levels.

Thank you for selecting Bowser-Morner Associates, Inc. for this project. Your business is appreciated, and we look forward to working with you again soon. In the meantime, if you have any questions or if we can help you in any way, please let us know.

Sincerely,

Bowser-Morner Associates, Inc.

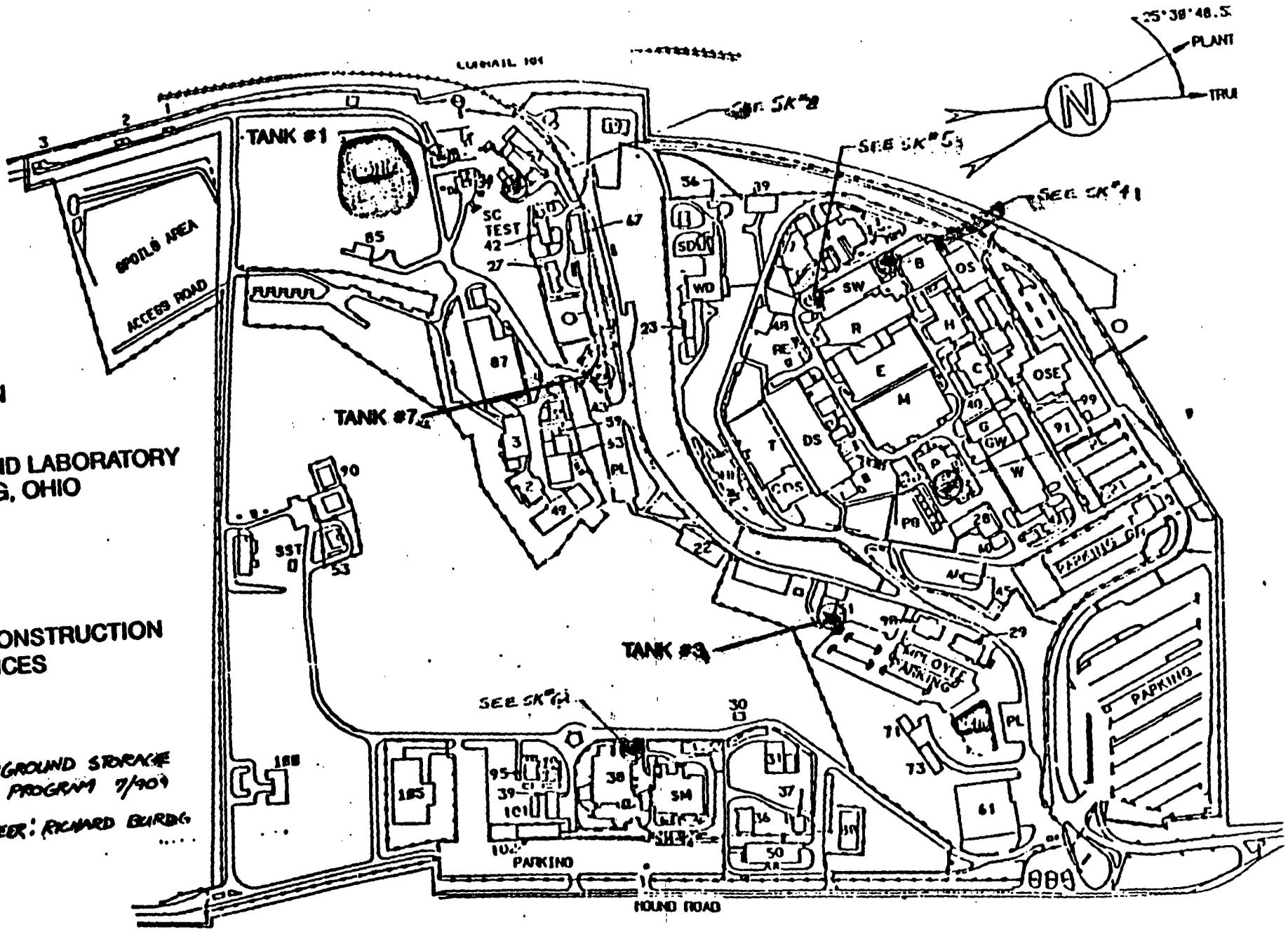


Jeffrey D. Floyd
Hydrogeologist
Project Manager

JDF/mwt
4-Client
2-File



SITE PLANS

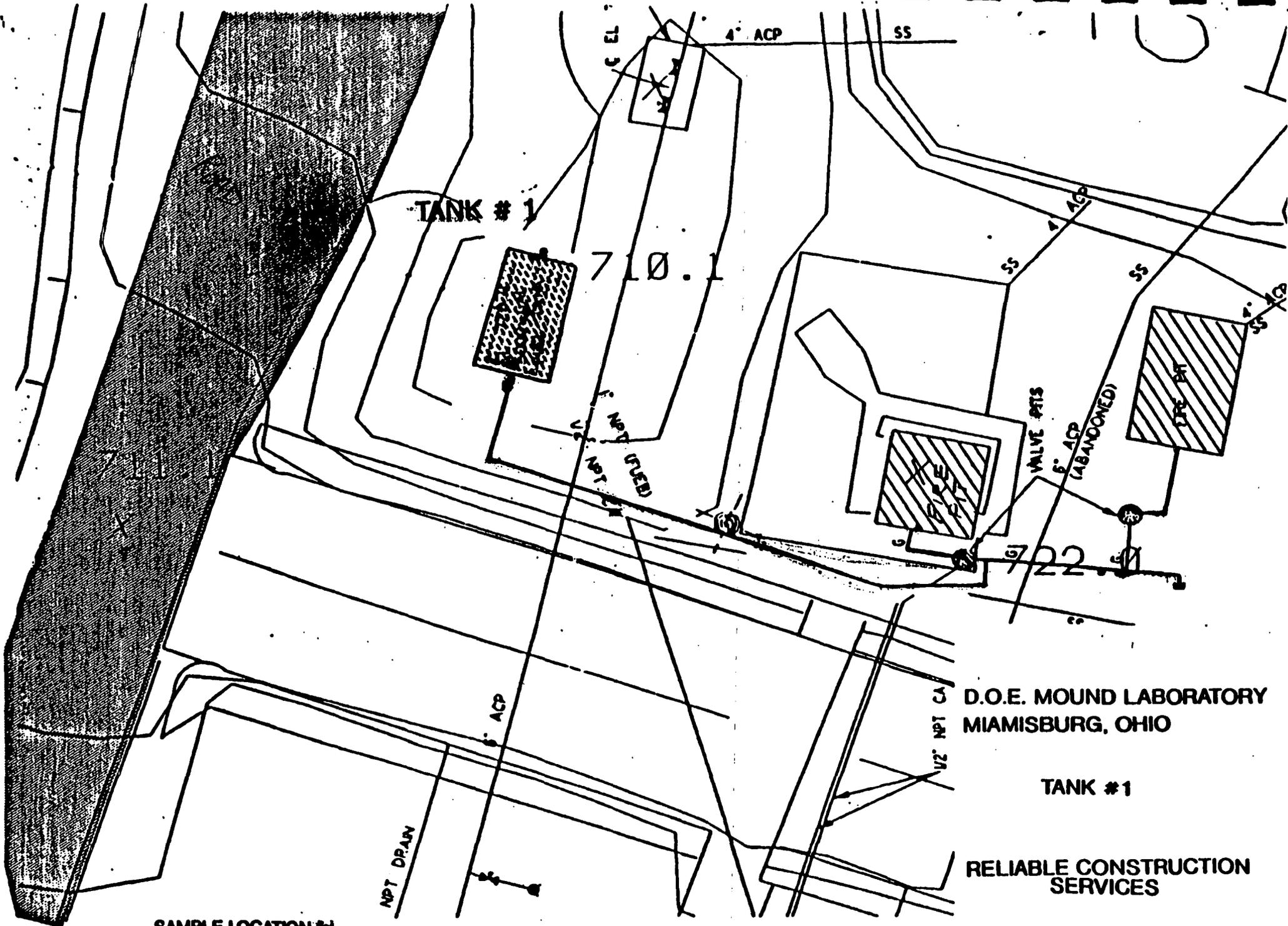


SITE PLAN

**D.O.E. MOUND LABORATORY
MIAMISBURG, OHIO**

**RELIABLE CONSTRUCTION
SERVICES**

**UNDERGROUND STORAGE
TANK PROGRAM 7/909
ENGINEER: RICHARD BURDG**

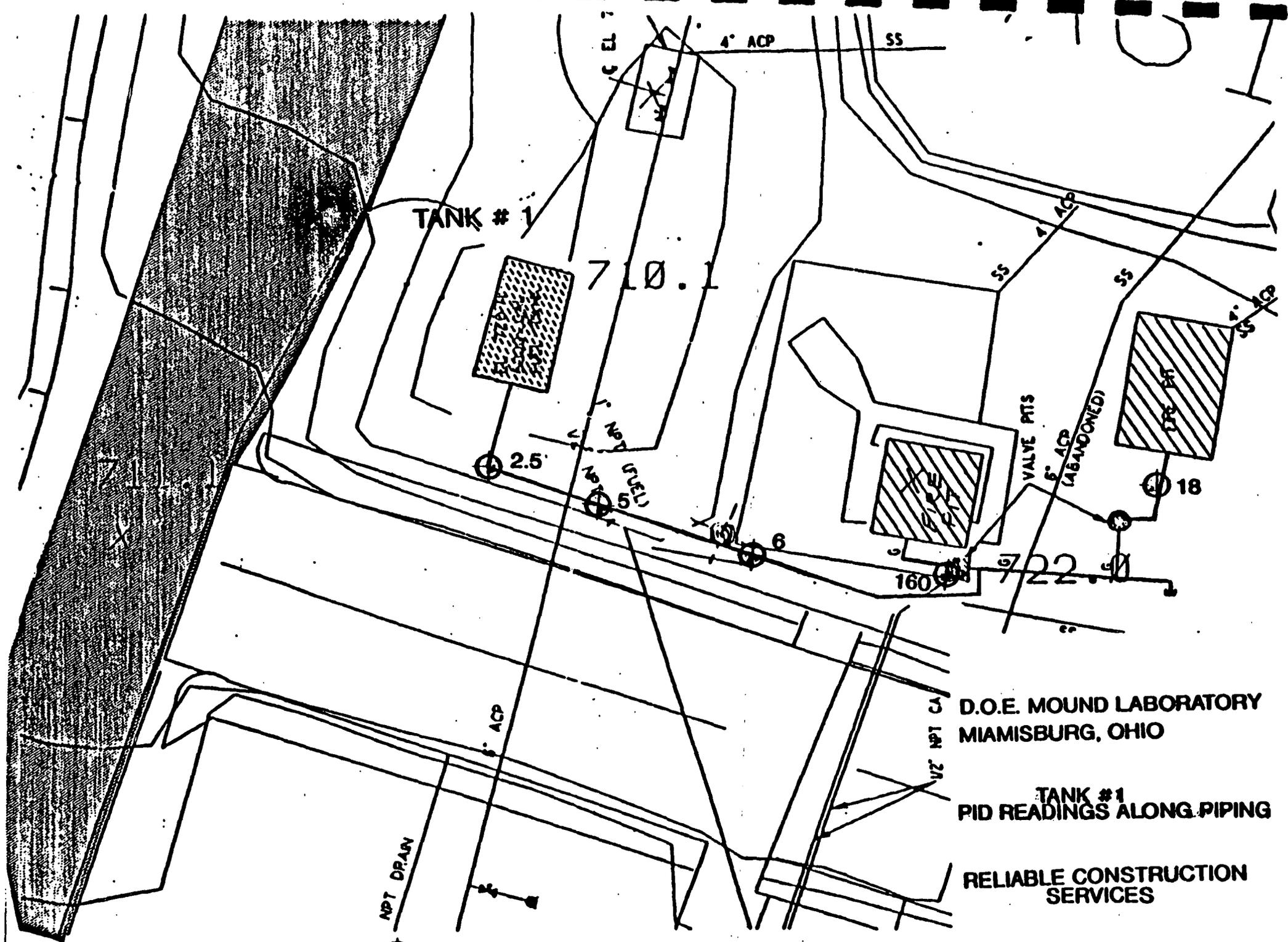


SAMPLE LOCATION

D.O.E. MOUND LABORATORY
MIAMISBURG, OHIO

TANK #1

RELIABLE CONSTRUCTION
SERVICES



TANK # 1

710.1

2.5

5

6

18

160

722

D.O.E. MOUND LABORATORY
MIAMISBURG, OHIO

TANK #1
PID READINGS ALONG PIPING

RELIABLE CONSTRUCTION
SERVICES

PID READING 

NPT DRAIN

8" ACP

4" ACP

SS

SS

SS

VALVE PTS

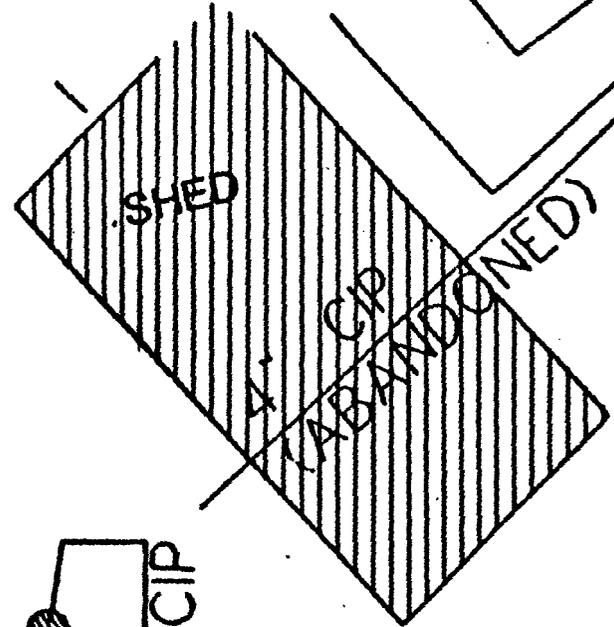
8" ACP
(ABANDONED)

CEL

12" NPT CA

2"

REMOVE 1000 GAL.
STAINLESS STEEL
TANK AND ASSOCIATED
PUMP/PIPING;



PUMP

18" CON

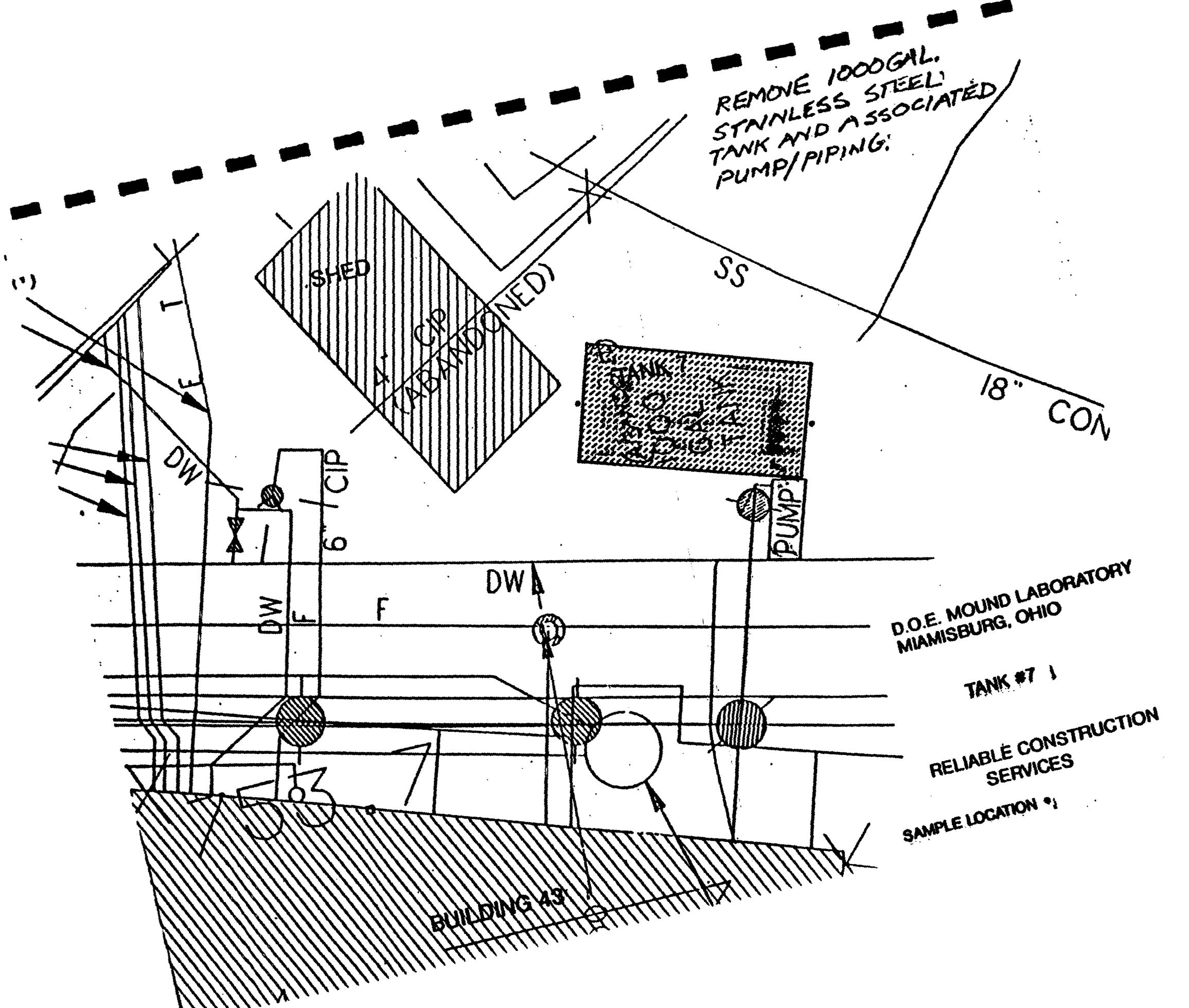
D.O.E. MOUND LABORATORY
MIAMISBURG, OHIO

TANK #7 1

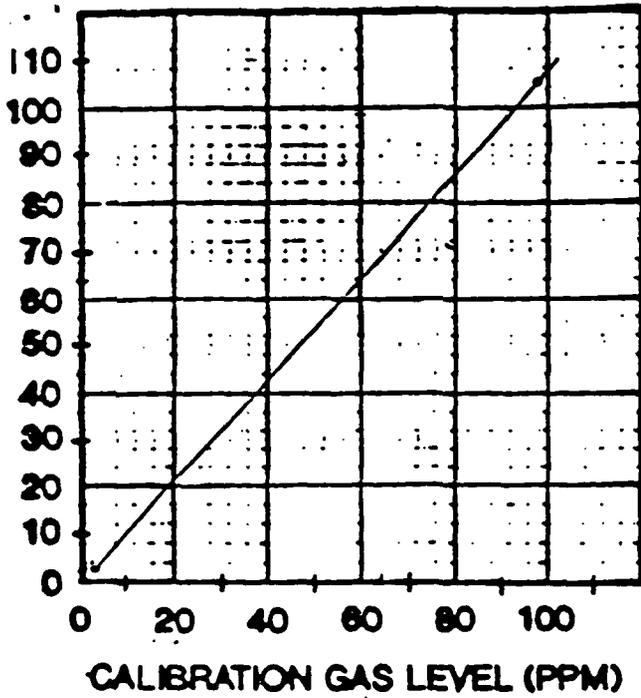
RELIABLE CONSTRUCTION
SERVICES

SAMPLE LOCATION #1

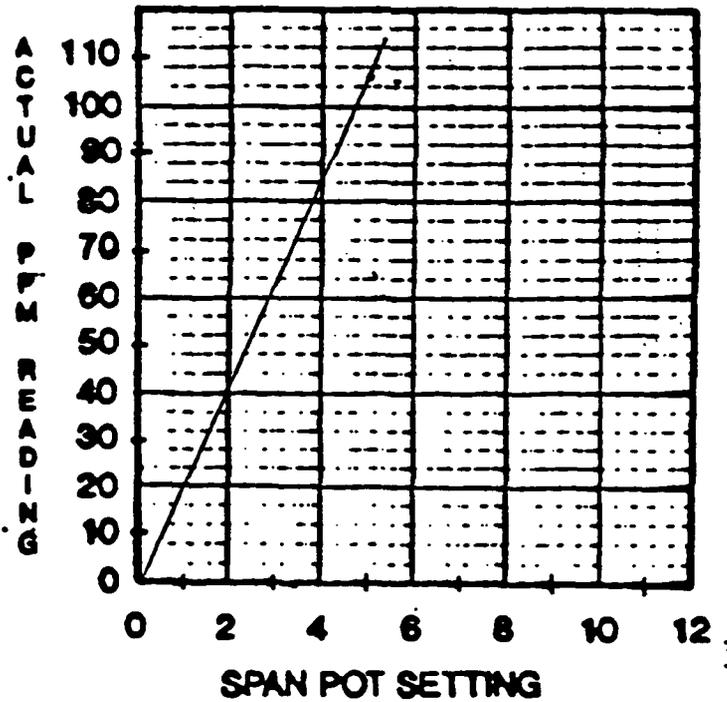
BUILDING 43



STANDARD CALIBRATION



SPAN POTENTIOMETER LINEARITY



INSTRUMENT DESCRIPTION: HNU P1 101.11.7ev

MFG. SERIAL#: A0 1242

BOWSER MORNER SERIAL#: 009505

CALIBRATION DATE: 10-31-90

TECHNICIAN: Sommer

LABORATORY REPORTS

**BOWSER
MORNER**

BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 11/26/90
Lab. No.: 9010428 001
Sample No.: 55588
Authorization: WO#10813

On: One (1) Water Sample Submitted October 26, 1990 for
Chemical Analysis.

Sample Identification: Tank #3 10-26-90

ANALYTE	RESULT	UNITS	METHOD LIMIT
<u>Volatile Organics</u>			
Benzene	39.6	ug/L	5
Bromodichloromethane	BPQL	ug/L	10
Bromoform	BPQL	ug/L	10
Bromomethane	BPQL	ug/L	5
Carbon Tetrachloride	BPQL	ug/L	10
Chlorobenzene	BPQL	ug/L	5
Chloroethane	BPQL	ug/L	10
2-Chloroethylvinyl Ether	BPQL	ug/L	20
Chloroform	12.9	ug/L	10
Chloromethane	BPQL	ug/L	10
cis-1,3-Dichloropropene	BPQL	ug/L	5
Dibromochloromethane	BPQL	ug/L	5
1,1-Dichloroethane	BPQL	ug/L	5
1,2-Dichloroethane	BPQL	ug/L	5
1,1-Dichloroethylene	BPQL	ug/L	5
1,2-Dichloropropane	BPQL	ug/L	5
Ethylbenzene	220	ug/L	5
Methylene Chloride	260	ug/L	10
1,1,2,2-Tetrachloroethane	BPQL	ug/L	5
Tetrachloroethylene	7.6	ug/L	5
Toluene	1900	ug/L	5
trans-1,2-Dichloroethylene	162	ug/L	5
trans-1,3-Dichloropropene	BPQL	ug/L	5
1,1,1-Trichloroethane	10.4	ug/L	10
1,1,2-Trichloroethane	BPQL	ug/L	5
Trichloroethylene	9100	ug/L	5
Trichlorofluoromethane	BPQL	ug/L	5
Vinyl Chloride	BPQL	ug/L	10

The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.

BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

LABORATORY REPORT No: 9010428-001 Page 2

Xylene	2400	ug/L	10
Acetone	2000	mg/L	100
Acrolein	BPQL	ug/L	20
Acrylonitrile	BPQL	ug/L	200
Carbon Disulfide	BPQL	ug/L	10
Dibromomethane	BPQL	ug/L	10
Dichlorodifluoromethane	BPQL	ug/L	10
Methyl Butyl Ketone	BPQL	ug/L	100
Methyl Ethyl Ketone	8400	ug/L	200
Methyl Isobutyl Ketone	13	mg/L	100
Stryene	BPQL	ug/L	10
1,2,3 Trichloropropane	BPQL	ug/L	20
Vinyl Acetate	BPQL	ug/L	20

.....
SURROGATE STANDARD

...1,2-dichloroethane-d4

...Fluorobenzene

...Pentafluorobenzene

PERCENT RECOVERY

79 %

.....
-- NOTES --

BPQL = Below Practical
Quantitation Limits

Mercury	0.002	mg/L
Arsenic	<0.02	mg/L
Selenium	<0.05	mg/L
Silver	<0.1	mg/L
Barium	<0.1	mg/L
Cadmium	<0.01	mg/L
Chromium	<0.01	mg/L
Lead	<0.1	mg/L
Sodium	510	mg/L
Iron	8.7	mg/L
Manganese	0.13	mg/L
Total Petroleum Hydrocarbons	48	mg/L
Phenol	<0.008	mg/L
Cyanide	<0.01	mg/L
Sulfide	18	mg/L
Total Solids	14330	mg/L
PCB	150	ug/L PCB 1260
pH	9.6	
Flash Point Testing	No Flash	to 210' F

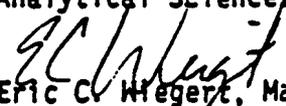
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LABORATORY REPORT No: 9010428-001
Page 3

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division


Eric C. Heger, Manager
Environmental Sciences Laboratory

ECH/ECH
1 -Client
2 -File

BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 11/26/90
Lab. No.: 9010428 002
Sample No.: 55589
Authorization: WO#10813

On: One (1) Water Sample Submitted October 26, 1990 for
Chemical Analysis.

Sample Identification: Tank #7 10-26-90

ANALYTE	RESULT	UNITS	METHOD LIMIT
<u>Volatile Organics</u>			
Benzene	BPQL	ug/L	5
Bromodichloromethane	BPQL	ug/L	10
Bromoform	BPQL	ug/L	10
Bromomethane	BPQL	ug/L	5
Carbon Tetrachloride	BPQL	ug/L	10
Chlorobenzene	BPQL	ug/L	5
Chloroethane	BPQL	ug/L	10
2-Chloroethylvinyl Ether	BPQL	ug/L	20
Chloroform	BPQL	ug/L	10
Chloromethane	BPQL	ug/L	10
cis-1,3-Dichloropropene	BPQL	ug/L	5
Dibromochloromethane	BPQL	ug/L	5
1,1-Dichloroethane	BPQL	ug/L	5
1,2-Dichloroethane	BPQL	ug/L	5
1,1-Dichloroethylene	BPQL	ug/L	5
1,2-Dichloropropane	BPQL	ug/L	5
Ethylbenzene	BPQL	ug/L	5
Methylene Chloride	BPQL	ug/L	10
1,1,2,2-Tetrachloroethane	BPQL	ug/L	5
Tetrachloroethylene	BPQL	ug/L	5
Toluene	BPQL	ug/L	5
trans-1,2-Dichloroethylene	BPQL	ug/L	5
trans-1,3-Dichloropropene	BPQL	ug/L	5
1,1,1-Trichloroethane	BPQL	ug/L	10
1,1,2-Trichloroethane	BPQL	ug/L	5
Trichloroethylene	BPQL	ug/L	5
Trichlorofluoromethane	BPQL	ug/L	5
Vinyl Chloride	BPQL	ug/L	10

The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.

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LABORATORY REPORT No: 9010428-002

Page 2

Xylene	BPQL	ug/L	10
Acetone	BPQL	ug/L	100
Acrolein	BPQL	ug/L	20
Acrylonitrile	BPQL	ug/L	200
Carbon Disulfide	BPQL	ug/L	10
Dibromomethane	BPQL	ug/L	10
Dichlorodifluoromethane	BPQL	ug/L	10
Methyl Butyl Ketone	BPQL	ug/L	100
Methyl Ethyl Ketone	BPQL	ug/L	200
Methyl Isobutyl Ketone	BPQL	ug/L	100
Stryene	BPQL	ug/L	10
1,2,3 Trichloropropane	BPQL	ug/L	20
Vinyl Acetate	BPQL	ug/L	20

.....
SURROGATE STANDARD

...1,2-dichloroethane-d4

...Fluorobenzene

...Pentafluorobenzene

PERCENT RECOVERY

94 %

.....
-- NOTES --

BPQL = Below Practical
Quantitation Limits

Mercury	<0.001	mg/L
Arsenic	<0.002	mg/L
Selenium	0.006	mg/L
Silver	<0.1	mg/L
Barium	<0.1	mg/L
Cadmium	<0.01	mg/L
Chromium	<0.01	mg/L
Lead	<0.1	mg/L
Sodium	2.6	mg/L
Iron	0.26	mg/L
Manganese	0.02	mg/L
Total Petroleum Hydrocarbons	<1	mg/L
Phenol	2.5	mg/L
Cyanide	<0.01	mg/L
Sulfide	16	mg/L
Total Solids	19	mg/L
PCB	<0.8	ug/L
pH	7.0	
Flash Point Testing	No Flash	to 210' F

BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

LABORATORY REPORT No: 9010428-002
Page 3

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division


Eric C. Wiegert, Manager
Environmental Sciences Laboratory

ECW/ECW
1 -Client
2 -File

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BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/20/90
Lab. No.: 9011421 001
Sample No.: 58267
Authorization: WO#10813

On: One (1) Soil Sample Submitted November 29, 1990 for
Chemical Analysis.

Sample Identification: #1 11-29-90 East Bottom TANK 1

ANALYTE	RESULT	UNITS

Volatile Organics		

Benzene	<25	ug/Kg
Bromodichloromethane	<50	ug/Kg
Bromoform	<50	ug/Kg
Bromomethane	<25	ug/Kg
Carbon Tetrachloride	<50	ug/Kg
Chlorobenzene	<25	ug/Kg
Chloroethane	<50	ug/Kg
2-Chloroethylvinyl Ether	<100	ug/Kg
Chloroform	<10	ug/Kg
Chloromethane	<50	ug/Kg
cis-1,3-Dichloropropene	<25	ug/Kg
Dibromochloromethane	<25	ug/Kg
1,1-Dichloroethane	<25	ug/Kg
1,2-Dichloroethane	<25	ug/Kg
1,1-Dichloroethylene	<25	ug/Kg
1,2-Dichloropropane	<25	ug/Kg
Ethylbenzene	<25	ug/Kg
Methylene Chloride	<50	ug/Kg
1,1,2,2-Tetrachloroethane	<25	ug/Kg
Tetrachloroethylene	<25	ug/Kg
Toluene	<25	ug/Kg
trans-1,2-Dichloroethylene	<25	ug/Kg
trans-1,3-Dichloropropene	<25	ug/Kg
1,1,1-Trichloroethane	<25	ug/Kg
1,1,2-Trichloroethane	<25	ug/Kg
Trichloroethylene	<25	ug/Kg
Trichlorofluoromethane	<25	ug/Kg
Vinyl Chloride	<50	ug/Kg

The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.

BOWSER-MORNER, INC.

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LABORATORY REPORT

Lab No.: 9011421 001
Page 2

Xylene	<50	ug/Kg
Acetone	<500	ug/Kg
Acrolein	<100	ug/Kg
Acrylonitrile	<1000	ug/Kg
Carbon Disulfide	<50	ug/Kg
Dibromomethane	<50	ug/Kg
Dichlorodifluoromethane	<50	ug/Kg
Methyl Butyl Ketone	<500	ug/Kg
Methyl Ethyl Ketone	<1000	ug/Kg
Methyl Isobutyl Ketone	<500	ug/Kg
Stryene	<50	ug/Kg
1,2,3 Trichloropropane	<100	ug/Kg
Vinyl Acetate	<100	ug/Kg

.....
SURROGATE STANDARD

...1,2-dichloroethane-d4

...Fluorobenzene

...Pentafluorobenzene

PERCENT RECOVERY

119 %

.....
-- NOTES --

BPQL = Below Practical
Quantitation Limits

Arsenic	4.3	mg/Kg
Barium	44	mg/Kg
Cadmium	0.23	mg/Kg
Chromium	11	mg/Kg
Lead	3.0	mg/Kg
Mercury	<0.02	mg/Kg
Selenium	<0.4	mg/Kg
Silver	3.1	mg/Kg
Iron	11000	mg/Kg
Manganese	210	mg/Kg

Total Petroleum Hydrocarbons	50	mg/Kg
Free Liquids	None	
Phenol	<0.15	mg/Kg
Cyanide	<0.1	mg/Kg
Sulfide	<1	mg/Kg
Total Solids	94	%
PCB	<0.04	mg/Kg

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LABORATORY REPORT Lab No.: 9011421 001
Page 3

pH	8.2		
Flash Point Testing	No Flash	to 210' F	
Sodium	150	mg/Kg	
Benzene	<2	ug/Kg	GC/PID
Toluene	<2	ug/Kg	GC/PID
Ethylbenzene	<2	ug/Kg	GC/PID
Xylene	<2	ug/Kg	GC/PID

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division


Eric C. Wiegert, Manager
Environmental Sciences Laboratory

ECH/ECH
1 -Client
2 -File

BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/20/90
Lab. No.: 9011421 002
Sample No.: 58268
Authorization: WO#10813

On: One (1) Soil Sample Submitted November 29, 1990 for
Chemical Analysis.

Sample Identification: #2 11-29-90 Middle Bottom TANK 1

ANALYTE	RESULT	UNITS

Volatile Organics		

Benzene	<25	ug/Kg
Bromodichloromethane	<50	ug/Kg
Bromoform	<50	ug/Kg
Bromomethane	<25	ug/Kg
Carbon Tetrachloride	<50	ug/Kg
Chlorobenzene	<25	ug/Kg
Chloroethane	<50	ug/Kg
2-Chloroethylvinyl Ether	<100	ug/Kg
Chloroform	<10	ug/Kg
Chloromethane	<50	ug/Kg
cis-1,3-Dichloropropene	<25	ug/Kg
Dibromochloromethane	<25	ug/Kg
1,1-Dichloroethane	<25	ug/Kg
1,2-Dichloroethane	<25	ug/Kg
1,1-Dichloroethylene	<25	ug/Kg
1,2-Dichloropropane	<25	ug/Kg
Ethylbenzene	<25	ug/Kg
Methylene Chloride	<50	ug/Kg
1,1,2,2-Tetrachloroethane	<25	ug/Kg
Tetrachloroethylene	<25	ug/Kg
Toluene	<25	ug/Kg
trans-1,2-Dichloroethylene	<25	ug/Kg
trans-1,3-Dichloropropene	<25	ug/Kg
1,1,1-Trichloroethane	<25	ug/Kg
1,1,2-Trichloroethane	<25	ug/Kg
Trichloroethylene	<25	ug/Kg
Trichlorofluoromethane	<25	ug/Kg
Vinyl Chloride	<50	ug/Kg

The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.

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LABORATORY REPORT Lab No.: 9011421 002 Page 2

Xylene	<50	ug/Kg
Acetone	<500	ug/Kg
Acrolein	<100	ug/Kg
Acrylonitrile	<1000	ug/Kg
Carbon Disulfide	<50	ug/Kg
Dibromomethane	<50	ug/Kg
Dichlorodifluoromethane	<50	ug/Kg
Methyl Butyl Ketone	<500	ug/Kg
Methyl Ethyl Ketone	<1000	ug/Kg
Methyl Isobutyl Ketone	<500	ug/Kg
Stryene	<50	ug/Kg
1,2,3 Trichloropropane	<100	ug/Kg
Vinyl Acetate	<100	ug/Kg

.....
SURROGATE STANDARD

...1,2-dichloroethane-d4

...Fluorobenzene

...Pentafluorobenzene

PERCENT RECOVERY

99

%

.....
-- NOTES --

BPQL = Below Practical
Quantitation Limits

Arsenic	5.2	mg/Kg
Barium	23	mg/Kg
Cadmium	0.26	mg/Kg
Chromium	10	mg/Kg
Lead	3.0	mg/Kg
Mercury	<0.02	mg/Kg
Selenium	<0.4	mg/Kg
Silver	1.7	mg/Kg
Iron	9900	mg/Kg
Manganese	190	mg/Kg

Total Petroleum Hydrocarbons	175	mg/Kg
Free Liquids	None	
Phenol	<0.15	mg/Kg
Cyanide	<0.1	mg/Kg
Sulfide	<1	mg/Kg
Total Solids	95	%
PCB	<0.04	mg/Kg

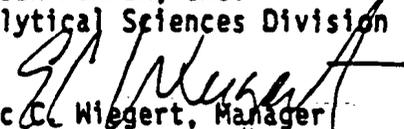
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LABORATORY REPORT Lab No.: 9011421 002
Page 3

pH	8.3		
Flash Point Testing	No Flash	to 210' F	
Sodium	200	mg/Kg	
Benzene	<2	ug/Kg	GC/PID
Toluene	<2	ug/Kg	GC/PID
Ethylbenzene	<2	ug/Kg	GC/PID
Xylene	<2	ug/Kg	GC/PID

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division


Eric C. Wiegert, Manager
Environmental Sciences Laboratory

ECW/ECW
1 -Client
2 -File

BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/20/90
Lab. No.: 9011421 003
Sample No.: 58269
Authorization: WO#10813

On: One (1) Soil Sample Submitted November 29, 1990 for
Chemical Analysis.

Sample Identification: #3 11-29-90 West Bottom TANK 1

ANALYTE	RESULT	UNITS

Volatile Organics		

Benzene	<25	ug/Kg
Bromodichloromethane	<50	ug/Kg
Bromoform	<50	ug/Kg
Bromomethane	<25	ug/Kg
Carbon Tetrachloride	<50	ug/Kg
Chlorobenzene	<25	ug/Kg
Chloroethane	<50	ug/Kg
2-Chloroethylvinyl Ether	<100	ug/Kg
Chloroform	<10	ug/Kg
Chloromethane	<50	ug/Kg
cis-1,3-Dichloropropene	<25	ug/Kg
Dibromochloromethane	<25	ug/Kg
1,1-Dichloroethane	<25	ug/Kg
1,2-Dichloroethane	<25	ug/Kg
1,1-Dichloroethylene	<25	ug/Kg
1,2-Dichloropropane	<25	ug/Kg
Ethylbenzene	<25	ug/Kg
Methylene Chloride	<50	ug/Kg
1,1,2,2-Tetrachloroethane	<25	ug/Kg
Tetrachloroethylene	<25	ug/Kg
Toluene	<25	ug/Kg
trans-1,2-Dichloroethylene	<25	ug/Kg
trans-1,3-Dichloropropene	<25	ug/Kg
1,1,1-Trichloroethane	<25	ug/Kg
1,1,2-Trichloroethane	<25	ug/Kg
Trichloroethylene	<25	ug/Kg
Trichlorofluoromethane	<25	ug/Kg
Vinyl Chloride	<50	ug/Kg

The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.

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LABORATORY REPORT Lab No.: 9011421 003 Page 2

Xylene	<50	ug/Kg
Acetone	<500	ug/Kg
Acrolein	<100	ug/Kg
Acrylonitrile	<1000	ug/Kg
Carbon Disulfide	<50	ug/Kg
Dibromomethane	<50	ug/Kg
Dichlorodifluoromethane	<50	ug/Kg
Methyl Butyl Ketone	<500	ug/Kg
Methyl Ethyl Ketone	<1000	ug/Kg
Methyl Isobutyl Ketone	<500	ug/Kg
Stryene	<50	ug/Kg
1,2,3 Trichloropropane	<100	ug/Kg
Vinyl Acetate	<100	ug/Kg

.....
SURROGATE STANDARD

...1,2-dichloroethane-d4

...Fluorobenzene

...Pentafluorobenzene

PERCENT RECOVERY

104 %

.....
-- NOTES --

BPQL = Below Practical
Quantitation Limits

Arsenic	5.8	mg/Kg
Barium	37	mg/Kg
Cadmium	0.26	mg/Kg
Chromium	13	mg/Kg
Lead	3.2	mg/Kg
Mercury	<0.02	mg/Kg
Selenium	<0.4	mg/Kg
Silver	0.33	mg/Kg
Iron	11000	mg/Kg
Manganese	170	mg/Kg

Total Petroleum Hydrocarbons	60	mg/Kg
Free Liquids	None	
Phenol	<0.15	mg/Kg
Cyanide	<0.1	mg/Kg
Sulfide	<1	mg/Kg
Total Solids	95	%
PCB	<0.04	mg/Kg

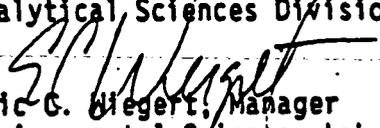
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LABORATORY REPORT Lab No.: 9011421 003
Page 3

pH	8.2		
Flash Point Testing	No Flash	to 210' F	
Sodium	250	mg/Kg	
Benzene	<2	ug/Kg	GC/PID
Toluene	2	ug/Kg	GC/PID
Ethylbenzene	<2	ug/Kg	GC/PID
Xylene	<2	ug/Kg	GC/PID

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division


Eric G. Wiegert, Manager
Environmental Sciences Laboratory

ECH/ECH
1 -Client
2 -File

BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/21/90
Lab. No.: 9012106 001
Sample No.: 58505
Authorization: WO#10813

On: One (1) Soil Sample Submitted for Chemical Analysis
December 4, 1990.

Sample Identification: #1 12-4-90 Tank 3 Building
End

ANALYTE	RESULT	UNITS

Volatile Organics		

Benzene	<25	ug/Kg
Bromodichloromethane	<50	ug/Kg
Bromoform	<50	ug/Kg
Bromomethane	<25	ug/Kg
Carbon Tetrachloride	<50	ug/Kg
Chlorobenzene	<25	ug/Kg
Chloroethane	<50	ug/Kg
2-Chloroethylvinyl Ether	<100	ug/Kg
Chloroform	21	ug/Kg
Chloromethane	<50	ug/Kg
cis-1,3-Dichloropropene	<25	ug/Kg
Dibromochloromethane	<25	ug/Kg
1,1-Dichloroethane	<25	ug/Kg
1,2-Dichloroethane	<25	ug/Kg
1,1-Dichloroethylene	<25	ug/Kg
1,2-Dichloropropane	<25	ug/Kg
Ethylbenzene	<25	ug/Kg
Methylene Chloride	<50	ug/Kg
1,1,2,2-Tetrachloroethane	<25	ug/Kg
Tetrachloroethylene	<25	ug/Kg
Toluene	<25	ug/Kg
trans-1,2-Dichloroethylene	<25	ug/Kg
trans-1,3-Dichloropropene	<25	ug/Kg
1,1,1-Trichloroethane	<25	ug/Kg
1,1,2-Trichloroethane	<25	ug/Kg
Trichloroethylene	53	ug/Kg
Trichlorofluoromethane	<25	ug/Kg

The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.

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LABORATORY REPORT

Lab No.: 9012106 001
Page 2

Vinyl Chloride	<50	ug/Kg
Xylene	<50	ug/Kg
Acetone	<500	ug/Kg
Acrolein	<100	ug/Kg
Acrylonitrile	<1000	ug/Kg
Carbon Disulfide	<50	ug/Kg
Dibromomethane	<50	ug/Kg
Dichlorodifluoromethane	<50	ug/Kg
Methyl Butyl Ketone	<500	ug/Kg
Methyl Ethyl Ketone	<1000	ug/Kg
Methyl Isobutyl Ketone	<500	ug/Kg
Stryene	<50	ug/Kg
1,2,3 Trichloropropane	<100	ug/Kg
Vinyl Acetate	<100	ug/Kg

.....
SURROGATE STANDARD

...1,2-dichloroethane-d4

...Fluorobenzene

...Pentafluorobenzene

PERCENT RECOVERY

118 %

.....
-- NOTES --

BPQL = Below Practical
Quantitation Limits

Arsenic	2.3	mg/Kg
Barium	16	mg/Kg
Cadmium	0.61	mg/Kg
Chromium	4.8	mg/Kg
Lead	6.1	mg/Kg
Mercury	0.17	mg/Kg
Selenium	<0.4	mg/Kg
Silver	<2	mg/Kg
Iron	5000	mg/Kg
Manganese	100	mg/Kg
Total Petroleum Hydrocarbons	75	mg/Kg
Free Liquids	None	
Cyanide	<0.1	mg/Kg
Sulfide	<1	mg/Kg
Total Solids	93	%
PCB	0.12	mg/Kg PCB 1254

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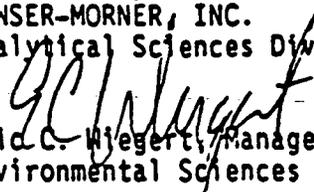
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LABORATORY REPORT

Lab No.: 9012106 001
Page 3

pH	8.7		
Flash Point Testing	No Flash	to 210' F	
Sodium	95	mg/Kg	
Phenol	<0.15	mg/Kg	
Benzene	<2	ug/Kg	GC/PID
Toluene	<2	ug/Kg	GC/PID
Ethylbenzene	<2	ug/Kg	GC/PID
Xylene	<2	ug/Kg	GC/PID

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division


Eric C. Wiegert, Manager
Environmental Sciences Laboratory

ECW/SAB
1 -Client
2 -File

BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

LABORATORY REPORT

To: 10913 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/21/90
Lab. No.: 9012106 002
Sample No.: 58506
Authorization: WO#10813

On: One (1) Soil Sample Submitted for Chemical Analysis
December 4, 1990.

Sample Identification: #2 12-4-90 Tank 3 Middle

ANALYTE	RESULT	UNITS

Volatile Organics		

Benzene	<25	ug/Kg
Bromodichloromethane	<50	ug/Kg
Bromoform	<50	ug/Kg
Bromomethane	<25	ug/Kg
Carbon Tetrachloride	<50	ug/Kg
Chlorobenzene	<25	ug/Kg
Chloroethane	<50	ug/Kg
2-Chloroethylvinyl Ether	<100	ug/Kg
Chloroform	21	ug/Kg
Chloromethane	<50	ug/Kg
cis-1,3-Dichloropropene	<25	ug/Kg
Dibromochloromethane	<25	ug/Kg
1,1-Dichloroethane	<25	ug/Kg
1,2-Dichloroethane	<25	ug/Kg
1,1-Dichloroethylene	<25	ug/Kg
1,2-Dichloropropane	<25	ug/Kg
Ethylbenzene	<25	ug/Kg
Methylene Chloride	<50	ug/Kg
1,1,2,2-Tetrachloroethane	<25	ug/Kg
Tetrachloroethylene	<25	ug/Kg
Toluene	<25	ug/Kg
trans-1,2-Dichloroethylene	<25	ug/Kg
trans-1,3-Dichloropropene	<25	ug/Kg
1,1,1-Trichloroethane	<25	ug/Kg
1,1,2-Trichloroethane	<25	ug/Kg
Trichloroethylene	210	ug/Kg
Trichlorofluoromethane	<25	ug/Kg
Vinyl Chloride	<50	ug/Kg

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LABORATORY REPORT

Lab No.: 9012106 002

Page 2

Xylene	<50	ug/Kg
Acetone	<500	ug/Kg
Acrolein	<100	ug/Kg
Acrylonitrile	<1000	ug/Kg
Carbon Disulfide	<50	ug/Kg
Dibromomethane	<50	ug/Kg
Dichlorodifluoromethane	<50	ug/Kg
Methyl Butyl Ketone	<500	ug/Kg
Methyl Ethyl Ketone	<1000	ug/Kg
Methyl Isobutyl Ketone	<500	ug/Kg
Stryene	<50	ug/Kg
1,2,3 Trichloropropane	<100	ug/Kg
Vinyl Acetate	<100	ug/Kg

.....
SURROGATE STANDARD

...1,2-dichloroethane-d4

...Fluorobenzene

...Pentafluorobenzene

PERCENT RECOVERY

100

%

.....
-- NOTES --

BPQL = Below Practical
Quantitation Limits

Arsenic	2.4	mg/Kg
Barium	8.5	mg/Kg
Cadmium	0.44	mg/Kg
Chromium	3.8	mg/Kg
Lead	2.3	mg/Kg
Mercury	0.06	mg/Kg
Selenium	0.40	mg/Kg
Silver	<2	mg/Kg
Iron	4800	mg/Kg
Manganese	120	mg/Kg

Total Petroleum Hydrocarbons	560	mg/Kg
Free Liquids	None	
Cyanide	<0.1	mg/Kg
Sulfide	<1	mg/Kg
Total Solids	96	%
PCB	<0.04	mg/Kg
pH	8.8	

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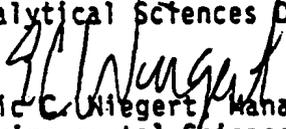
LABORATORY REPORT

Lab No.: 9012106 002

Page 3

Flash Point Testing	No Flash	to 210' F	
Sodium	140	mg/Kg	
Phenol	<0.15	mg/Kg	
Benzene	<2	ug/Kg	GC/PID
Toluene	<2	ug/Kg	GC/PID
Ethylbenzene	<2	ug/Kg	GC/PID
Xylene	<2	ug/Kg	GC/PID

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division


Eric C. Wiegert, Manager
Environmental Sciences Laboratory

ECH/SAB
1 -Client
2 -File

BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/21/90
Lab. No.: 9012106 003
Sample No.: 58507
Authorization: WO#10813

On: One (1) Soil Sample Submitted for Chemical Analysis
December 4, 1990.

Sample Identification: #3 12-4-90 Tank 3 Lot End

ANALYTE	RESULT	UNITS

Volatile Organics		

Benzene	<25	ug/Kg
Bromodichloromethane	<50	ug/Kg
Bromoform	<50	ug/Kg
Bromomethane	<25	ug/Kg
Carbon Tetrachloride	<50	ug/Kg
Chlorobenzene	<25	ug/Kg
Chloroethane	<25	ug/Kg
2-Chloroethylvinyl Ether	<100	ug/Kg
Chloroform	<10	ug/Kg
Chloromethane	<50	ug/Kg
cis-1,3-Dichloropropene	<25	ug/Kg
Dibromochloromethane	<25	ug/Kg
1,1-Dichloroethane	<25	ug/Kg
1,2-Dichloroethane	<25	ug/Kg
1,1-Dichloroethylene	<25	ug/Kg
1,2-Dichloropropane	<25	ug/Kg
Ethylbenzene	<25	ug/Kg
Methylene Chloride	<50	ug/Kg
1,1,2,2-Tetrachloroethane	<25	ug/Kg
Tetrachloroethylene	<25	ug/Kg
Toluene	<25	ug/Kg
trans-1,2-Dichloroethylene	<25	ug/Kg
trans-1,3-Dichloropropene	<25	ug/Kg
1,1,1-Trichloroethane	<25	ug/Kg
1,1,2-Trichloroethane	<25	ug/Kg
Trichloroethylene	<25	ug/Kg
Trichlorofluoromethane	<25	ug/Kg
Vinyl Chloride	<50	ug/Kg

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LABORATORY REPORT Lab No.: 9012106 003 Page 2

Xylene	<50	ug/Kg
Acetone	<500	ug/Kg
Acrolein	<100	ug/Kg
Acrylonitrile	<1000	ug/Kg
Carbon Disulfide	<50	ug/Kg
Dibromomethane	<50	ug/Kg
Dichlorodifluoromethane	<50	ug/Kg
Methyl Butyl Ketone	<500	ug/Kg
Methyl Ethyl Ketone	<1000	ug/Kg
Methyl Isobutyl Ketone	<500	ug/Kg
Stryene	<50	ug/Kg
1,2,3 Trichloropropane	<100	ug/Kg
Vinyl Acetate	<100	ug/Kg

.....
SURROGATE STANDARD

...1,2-dichloroethane-d4

...Fluorobenzene

...Pentafluorobenzene

PERCENT RECOVERY 106 %

.....
-- NOTES --

BPQL = Below Practical
Quantitation Limits

Arsenic	5.8	mg/Kg
Barium	38	mg/Kg
Cadmium	0.41	mg/Kg
Chromium	20	mg/Kg
Lead	6.4	mg/Kg
Mercury	0.03	mg/Kg
Selenium	<0.4	mg/Kg
Silver	<2	mg/Kg
Iron	21000	mg/Kg
Manganese	470	mg/Kg

Total Petroleum Hydrocarbons	35	mg/Kg
Free Liquids	None	
Cyanide	<0.1	mg/Kg
Sulfide	<1	mg/Kg
Total Solids	87	%
PCB	<0.04	mg/Kg
pH	7.7	

The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.

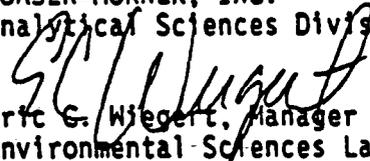
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LABORATORY REPORT Lab No.: 9012106 003 Page 3

Flash Point Testing	No Flash	to 210' F	
Sodium	<10	mg/Kg	
Phenol	<0.15	mg/Kg	
Benzene	<2	ug/Kg	GC/PID
Toluene	<2	ug/Kg	GC/PID
Ethylbenzene	<2	ug/Kg	GC/PID
Xylene	<2	ug/Kg	GC/PID

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division


Eric G. Wiegert, Manager
Environmental Sciences Laboratory

ECW/SAB
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2 -File

The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.

BOWSER MORNER

BOWSER-MORNER
 4518 Taylorsville Road
 P.O. Box 51
 Dayton, OH 45401-0838

CHAIN OF CUSTODY RECORD

BOWSER-MORNER, INC., DISTRICT OFFICE
 122 S. St. Clair St.
 P.O. Box 838
 Lexington, KY 40510 Toledo, OH 43696

JOB NO.		PROJECT NAME				NO. OF CONTAINERS	Preservatives					Container Type		
10873		Reliable - Mound					Sulfuric Acid	Nitric Acid	Non-Preserved/Iced	Other	40 ml. VOA	Seal/VOA	REMARKS	
SAMPLER'S (Signature)														
BMI Sample No	DATE	TIME	Composite	Grab	SAMPLE LOCATION/DESCRIPTION									
1	12/4/90			x	Tank 3, Swilling water end	2								
2				x	Tank 3, middle	2								
3				x	Tank 3, Lot end	2								

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	
<i>J. Floyd</i>	12/4/90 3:34					
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Cooler No.	Cooler Temp °C	Remarks:
		<i>V. ...</i>				

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LABORATORY REPORT

Lab No.: 9011421 004
Page 2

Xylene	<50	ug/Kg
Acetone	<500	ug/Kg
Acrolein	<100	ug/Kg
Acrylonitrile	<1000	ug/Kg
Carbon Disulfide	<50	ug/Kg
Dibromomethane	<50	ug/Kg
Dichlorodifluoromethane	<50	ug/Kg
Methyl Butyl Ketone	<500	ug/Kg
Methyl Ethyl Ketone	<1000	ug/Kg
Methyl Isobutyl Ketone	<500	ug/Kg
Stryene	<50	ug/Kg
1,2,3 Trichloropropane	<100	ug/Kg
Vinyl Acetate	<100	ug/Kg

.....
SURROGATE STANDARD

...1,2-dichloroethane-d4

...Fluorobenzene

...Pentafluorobenzene

PERCENT RECOVERY

105

%

.....
-- NOTES --

BPQL = Below Practical
Quantitation Limits

Arsenic	1.2	mg/Kg
Barium	4	mg/Kg
Cadmium	<0.2	mg/Kg
Chromium	1.8	mg/Kg
Lead	<2	mg/Kg
Mercury	<0.02	mg/Kg
Selenium	<0.4	mg/Kg
Silver	<2	mg/Kg
Iron	2000	mg/Kg
Manganese	53	mg/Kg

Total Petroleum Hydrocarbons

25

mg/Kg

Free Liquids

None

Phenol

<0.15

mg/Kg

Cyanide

<0.1

mg/Kg

Sulfide

<1

mg/Kg

Total Solids

81

%

PCB

0.15

mg/Kg PCB 1260

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LABORATORY REPORT

To: 10013 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/21/90
Lab. No.: 9011421 004
Sample No.: 58360
Authorization: WO#10813

On: One (1) Soil Sample Submitted November 30, 1990 for
Chemical Analysis.

Sample Identification: #1 11/30 Tank 7 North

ANALYTE	RESULT	UNITS

Volatile Organics		

Benzene	<25	ug/Kg
Bromodichloromethane	<50	ug/Kg
Bromoform	<50	ug/Kg
Bromomethane	<25	ug/Kg
Carbon Tetrachloride	<50	ug/Kg
Chlorobenzene	<25	ug/Kg
Chloroethane	<50	ug/Kg
2-Chloroethylvinyl Ether	<100	ug/Kg
Chloroform	<10	ug/Kg
Chloromethane	<50	ug/Kg
cis-1,3-Dichloropropene	<25	ug/Kg
Dibromochloromethane	<25	ug/Kg
1,1-Dichloroethane	<25	ug/Kg
1,2-Dichloroethane	<25	ug/Kg
1,1-Dichloroethylene	<25	ug/Kg
1,2-Dichloropropane	<25	ug/Kg
Ethylbenzene	<25	mg/Kg
Methylene Chloride	<50	ug/Kg
1,1,2,2-Tetrachloroethane	<25	ug/Kg
Tetrachloroethylene	<25	ug/Kg
Toluene	<25	ug/Kg
trans-1,2-Dichloroethylene	<25	ug/Kg
trans-1,3-Dichloropropene	<25	ug/Kg
1,1,1-Trichloroethane	<25	ug/Kg
1,1,2-Trichloroethane	<25	ug/Kg
Trichloroethylene	<25	ug/Kg
Trichlorofluoromethane	<25	ug/Kg
Vinyl Chloride	<50	ug/Kg

The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.

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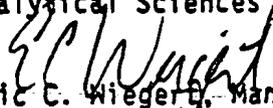
LABORATORY REPORT

Lab No.: 9011421 004

Page 3

pH	8.0		
Flash Point Testing	No Flash	to 210' F	
Sodium	53	mg/Kg	
Benzene	<2	ug/Kg	GC/PID
Toluene	<2	ug/Kg	GC/PID
Ethylbenzene	<2	ug/Kg	GC/PID
Xylene	<2	ug/Kg	GC/PID

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division


Eric C. Wiegand, Manager
Environmental Sciences Laboratory

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LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/21/90
Lab. No.: 9011421 006
Sample No.: 58362
Authorization: WO#10813

On: One (1) Soil Sample Submitted November 30, 1990 for
Chemical Analysis.

Sample Identification: #3 1/30 Tank 7 Middle

ANALYTE	RESULT	UNITS

Volatile Organics		

Benzene	<25	ug/Kg
Bromodichloromethane	<50	ug/Kg
Bromoform	<50	ug/Kg
Bromomethane	<25	ug/Kg
Carbon Tetrachloride	<25	ug/Kg
Chlorobenzene	<25	ug/Kg
Chloroethane	<50	ug/Kg
2-Chloroethylvinyl Ether	<100	ug/Kg
Chloroform	18	ug/Kg
Chloromethane	<50	ug/Kg
cis-1,3-Dichloropropene	<25	ug/Kg
Dibromochloromethane	<25	ug/Kg
1,1-Dichloroethane	<25	ug/Kg
1,2-Dichloroethane	<25	ug/Kg
1,1-Dichloroethylene	<25	ug/Kg
1,2-Dichloropropane	<25	ug/Kg
Ethylbenzene	<25	ug/Kg
Methylene Chloride	<50	ug/Kg
1,1,2,2-Tetrachloroethane	<25	ug/Kg
Tetrachloroethylene	<25	ug/Kg
Toluene	<25	ug/Kg
trans-1,2-Dichloroethylene	<25	ug/Kg
trans-1,3-Dichloropropene	<25	ug/Kg
1,1,1-Trichloroethane	<25	ug/Kg
1,1,2-Trichloroethane	<25	ug/Kg
Trichloroethylene	<25	ug/Kg
Trichlorofluoromethane	<25	ug/Kg
Vinyl Chloride	<50	ug/Kg

The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.

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LABORATORY REPORT

Lab No.: 9011421 006

Page 2

Xylene	<50	ug/Kg
Acetone	<500	ug/Kg
Acrolein	<100	ug/Kg
Acrylonitrile	<1000	ug/Kg
Carbon Disulfide	<50	ug/Kg
Dibromomethane	<50	ug/Kg
Dichlorodifluoromethane	<50	ug/Kg
Methyl Butyl Ketone	<500	ug/Kg
Methyl Ethyl Ketone	<1000	ug/Kg
Methyl Isobutyl Ketone	<500	ug/Kg
Stryene	<50	ug/Kg
1,2,3 Trichloropropane	<100	ug/Kg
Vinyl Acetate	<100	ug/Kg

.....
SURROGATE STANDARD

...1,2-dichloroethane-d4

...Fluorobenzene

...Pentafluorobenzene

PERCENT RECOVERY

109

%

.....
-- NOTES --

BPQL = Below Practical
Quantitation Limits

Arsenic	1.6	mg/Kg
Barium	5	mg/Kg
Cadmium	<0.2	mg/Kg
Chromium	2.4	mg/Kg
Lead	<2	mg/Kg
Mercury	<0.02	mg/Kg
Selenium	<0.4	mg/Kg
Silver	<2	mg/Kg
Iron	2600	mg/Kg
Manganese	71	mg/Kg

Total Petroleum Hydrocarbons	17	mg/Kg
Free Liquids	None	
Phenol	<0.15	mg/Kg
Cyanide	<0.1	mg/Kg
Sulfide	<1	mg/Kg
Total Solids	97	%
PCB	<0.04	mg/Kg

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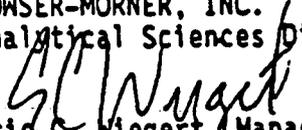
LABORATORY REPORT

Lab No.: 9011421 006

Page 3

pH	7.8		
Flash Point Testing	No Flash	to 210' F	
Sodium	64	mg/Kg	
Benzene	<2	ug/Kg	GC/PID
Toluene	3	ug/Kg	GC/PID
Ethylbenzene	<2	ug/Kg	GC/PID
Xylene	3	ug/Kg	GC/PID

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division


Eric C. Wiegert, Manager
Environmental Sciences Laboratory

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LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/21/90
Lab. No.: 9011421 005
Sample No.: 58361
Authorization: WO#10813

On: One (1) Soil Sample Submitted November 30, 1990 for
Chemical Analysis.

Sample Identification: #2 1/30 Tank 7 South

ANALYTE	RESULT	UNITS

Volatile Organics		

Benzene	<25	ug/Kg
Bromodichloromethane	<50	ug/Kg
Bromoform	<50	ug/Kg
Bromomethane	<25	ug/Kg
Carbon Tetrachloride	<50	ug/Kg
Chlorobenzene	<25	ug/Kg
Chloroethane	<50	ug/Kg
2-Chloroethylvinyl Ether	<100	ug/Kg
Chloroform	18	ug/Kg
Chloromethane	<50	ug/Kg
cis-1,3-Dichloropropene	<25	ug/Kg
Dibromochloromethane	<25	ug/Kg
1,1-Dichloroethane	<25	ug/Kg
1,2-Dichloroethane	<25	ug/Kg
1,1-Dichloroethylene	<25	ug/Kg
1,2-Dichloropropane	<25	ug/Kg
Ethylbenzene	<25	ug/Kg
Methylene Chloride	<50	ug/Kg
1,1,2,2-Tetrachloroethane	<25	ug/Kg
Tetrachloroethylene	<25	ug/Kg
Toluene	<25	ug/Kg
trans-1,2-Dichloroethylene	<25	ug/Kg
trans-1,3-Dichloropropene	<25	ug/Kg
1,1,1-Trichloroethane	31	ug/Kg
1,1,2-Trichloroethane	<25	ug/Kg
Trichloroethylene	<25	ug/Kg
Trichlorofluoromethane	<25	ug/Kg
Vinyl Chloride	<50	ug/Kg

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LABORATORY REPORT

Lab No.: 9011421 005

Page 2

Xylene	<50	ug/Kg
Acetone	<500	ug/Kg
Acrolein	<100	ug/Kg
Acrylonitrile	<1000	ug/Kg
Carbon Disulfide	<50	ug/Kg
Dibromomethane	<50	ug/Kg
Dichlorodifluoromethane	<50	ug/Kg
Methyl Butyl Ketone	<500	ug/Kg
Methyl Ethyl Ketone	<1000	ug/Kg
Methyl Isobutyl Ketone	<500	ug/Kg
Stryene	<50	ug/Kg
1,2,3 Trichloropropane	<100	ug/Kg
Vinyl Acetate	<100	ug/Kg

.....
SURROGATE STANDARD

...1,2-dichloroethane-d4

...Fluorobenzene

...Pentafluorobenzene

PERCENT RECOVERY

119

%

.....
-- NOTES --

BPQL = Below Practical
Quantitation Limits

.....

Arsenic	<0.4	mg/Kg
Barium	12	mg/Kg
Cadmium	<0.2	mg/Kg
Chromium	5.1	mg/Kg
Lead	<2	mg/Kg
Mercury	0.03	mg/Kg
Selenium	<0.4	mg/Kg
Silver	<2	mg/Kg
Iron	4400	mg/Kg
Manganese	160	mg/Kg
Total Petroleum Hydrocarbons	30	mg/Kg
Free Liquids	None	
Phenol	<0.15	mg/Kg
Cyanide	<0.1	mg/Kg
Sulfide	<1	mg/Kg
Total Solids	85	%
PCB	<0.04	mg/Kg

The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.

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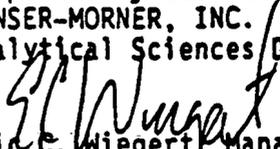
LABORATORY REPORT

Lab No.: 9011421 005

Page 3

pH	7.5		
Flash Point Testing	No Flash	to 210' F	
Sodium	87	mg/Kg	
Benzene	<2	ug/Kg	GC/PID
Toluene	<2	ug/Kg	GC/PID
Ethylbenzene	<2	ug/Kg	GC/PID
Xylene	<2	ug/Kg	GC/PID

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division


Eric C. Wiegert, Manager
Environmental Sciences Laboratory

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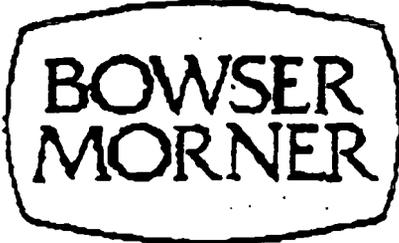
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4518 Taylorville Road
P.O. Box 51
Dayton, OH 45401-0838

CHAIN OF CUSTODY RECORD

BOWSER-MORNER, INC., DISTRICT C.
122 S. St. Clair St.
P.O. Box 038
2416-B Overdrive Lexington, KY 40510
Toledo, OH 43696

JOB NO.		PROJECT NAME					NO. OF CON- TAINERS	Preservatives						Container Type		REMARKS
10813		Reliable - Mound						Sulfuric Acid	Nitric Acid	Non-Preserved-Iced	Other	40 ml. VOA	Seal Vol			
SAMPLER'S (Signature)		DATE	TIME	Composite	Grab	SAMPLE LOCATION / DESCRIPTION										
J. J. D. Boyd																
BMI Sample No.																
1	11/27				X	Tank 7 North	2			X			-		SAME AS SAMPLE	
2	70				X	Tank 7 South	2			X			-	brought in 11-29-90		
3					X	Tank 7 Middle	2			X			-			
Relinquished by: (Signature)		Date/Time		Received by: (Signature)			Relinquished by: (Signature)		Date/Time		Received by: (Signature)					
J. J. D. Boyd		11/30 357														
Relinquished by: (Signature)		Date/Time		Received by: (Signature)			Relinquished by: (Signature)		Date/Time		Received by: (Signature)					
Relinquished by: (Signature)		Date/Time		Received for Laboratory by: (Signature)			Date/Time		Cooler No.		Cooler Temp. °C		Remarks:			



LEXINGTON DISTRICT
2416-B OVER DRIVE
LEXINGTON, KY 40510

CORPORATE OFFICE
P.O. BOX 51
DAYTON, OH 45401

TOLEDO DISTRICT
P.O. BOX 838
TOLEDO, OH 43696

FACSIMILE TRANSMISSION

PANAFAX UF-260

DAYTON, OH	:	513 233 2016
ANALYTICAL DIV	:	513 237 9947
TOLEDO, OH	:	419 255 7935
LEXINGTON, KY	:	606 253 0183

DATE: 10-3-91
TOTAL PAGES (EXCLUDING LEAD): 3

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NAME: Steve Kufner
COMPANY: _____
ADDRESS: _____
TELEPHONE: _____

FROM:

NAME: E.C. Wagon
TELEPHONE: _____

MESSAGE:

BOWSER-MORNER, INC.

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LABORATORY REPORT

TO: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/21/90
BMI No.: 9012106
Sample No.: 58505-07
Authorization : WO#10813

ON: Three (3) Samples Received December 4, 1990 for Chemical Analysis.

SAMPLE IDENTIFICATION:

- # 1 12-4-90 tank 3 Building End
- # 2 12-4-90 tank 3 Middle
- # 3 12-4-90 tank 3 Lot End

TEST METHODS:

Organics

Volatile Organics	Method 8240, GC/MS
B.T.E.X.	Method 8020, GC/PID
Total Petroleum Hydrocarbons	Method 9071/418.1 IR **
PolyChlorinated Biphenyls	Method 8080, GC/ECD

* Methods from EPA Document SW846 Test Methods for Evaluating Solid Waste
** Methods from EPA Document 600/4-79-020

Trace Metals

Arsenic	Method 7060	Selenium	Method 7740
Mercury	Method 7470	Silver	Method 6010
Barium	Method 6010	Cadmium	Method 6010
Chromium	Method 6010	Lead	Method 6010
Iron	Method 6010	Manganese	Method 6010
Sodium	Method 6010		

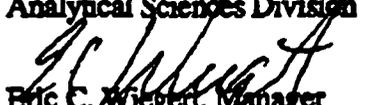
* Methods from EPA Document SW846 Test Methods for Evaluating Solid Waste

Inorganics/Physical

Total Solids	Method 160.3**	PH	Method 9045
Total Phenol	Method 9065	Total Sulfide	Method 9030
Total Cyanide	Method 9010	Free Liquids	Methods 9095
Flash Point	Method 1010		

* Methods from EPA Document SW846 Test Methods for Evaluating Solid Waste
** Methods from EPA Document 600/4-79-020

Respectfully Submitted,
BOWSER-MORNER, INC
Analytical Sciences Division


Eric C. Wiegert, Manager
Environmental Sciences Laboratory

ECW/ecw
I-Client

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LABORATORY REPORT

TO: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 11/26/90
BMI No.: 9010428
Sample No.: 55588-89
Authorization : WO#10813

ON: Two (2) Samples Received October 26, 1990 for Chemical Analysis.

SAMPLE IDENTIFICATION:

Tank # 3 10-26-90
Tank # 7 10-26-90

TEST METHODS:

Organics

Volatile Organics	Method 8240, GC/MS
Total Petroleum Hydrocarbons	Method 9071/418.1 IR **
PolyChlorinated Biphenyls	Method 8080, GC/ECD

* Methods from EPA Document SW846 Test Methods for Evaluating Solid Waste
** Methods from EPA Document 600/4-79-020

Trace Metals

Arsenic	Method 7060	Selenium	Method 7740
Mercury	Method 7470	Silver	Method 6010
Barium	Method 6010	Cadmium	Method 6010
Chromium	Method 6010	Lead	Method 6010
Iron	Method 6010	Manganese	Method 6010
Sodium	Method 6010		

* Methods from EPA Document SW846 Test Methods for Evaluating Solid Waste

Inorganics/Physical

Total Solids	Method 160.3**	PH	Method 9045
Total Phenol	Method 9065	Total Sulfide	Method 9030
Total Cyanide	Method 9010	Free Liquids	Methods 9095
Flash Point	Method 1010		

* Methods from EPA Document SW846 Test Methods for Evaluating Solid Waste
** Methods from EPA Document 600/4-79-020

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division


Eric C. Wiegert, Manager
Environmental Sciences Laboratory

ECW/acw
I-Client

BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Road- P. O. Box 51 • Dayton, Ohio 45401 • 519/236-8805

LABORATORY REPORT

TO: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/20/90
BMI No.: 9011421
Sample No.: 58267-69
Authorization : WO#10813

ON: Three (3) Samples Received November 29, 1990 for Chemical Analysis.

SAMPLE IDENTIFICATION:

- # 1 11-29-90 East Bottom
- # 2 11-29-90 Middle Bottom
- # 3 11-29-90 West Bottom

TEST METHODS:

Organics

Volatile Organics	Method 8240, GC/MS
B.T.E.X.	Method 8020, GC/PID
Total Petroleum Hydrocarbons	Method 9071/418.1 IR **
PolyChlorinated Biphenyls	Method 8060, GC/ECD

* Methods from EPA Document 8W846 Test Methods for Evaluating Solid Waste
** Methods from EPA Document 600/4-79-020

Trace Metals

Arsenic	Method 7060	Selenium	Method 7740
Mercury	Method 7470	Silver	Method 6010
Barium	Method 6010	Cadmium	Method 6010
Chromium	Method 6010	Lead	Method 6010
Iron	Method 6010	Manganese	Method 6010
Sodium	Method 6010		

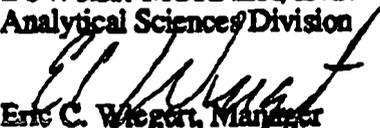
* Methods from EPA Document 8W846 Test Methods for Evaluating Solid Waste

Inorganics/Physical

Total Solids	Method 160.3**	PH	Method 9045
Total Phenol	Method 9065	Total Sulfide	Method 9030
Total Cyanide	Method 9010	Free Liquids	Methods 9095
Flash Point	Method 1010		

* Methods from EPA Document 8W846 Test Methods for Evaluating Solid Waste
** Methods from EPA Document 600/4-79-020

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division


Eric C. Wiegert, Manager
Environmental Sciences Laboratory

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Appendix B

APPENDIX B

OPERABLE UNIT 3 LIMITED FIELD INVESTIGATION ANALYTICAL RESULTS



CASE NARRATIVE

Roy F. Weston Inc.
33 Triangle Park Drive
Cincinnati, OH 45246

October 1, 1991

Attention: Ms. Cematha Davisson

This is the Case Narrative for the following:

Project Number: 251-02
Contract Number: G0626-OU3-0001
Sample Delivery Group: MND33-0016-0001
Date Received by Lab: August 29-30, 1991
Sample Type: 11 Soils / 2 Waters

I. Introduction

On August 29, 1991 and August 30, 1991; thirteen (13) samples were received at ITAS - St. Louis Laboratory from Roy F. Weston Inc. The complete CLP lists of analytical test: Volatile, semivolatile, pesticide/PCB and inorganics can be found in the attached CLP data package. The samples were labeled as follows:

<u>Client ID</u>	<u>ITAS ID</u>	<u>Parameter</u>
MND33-0016-0001	1530-001	Full TCL, TAL List
MND33-0017-0001	1530-002	Full TCL, TAL List
MND33-0018-0001	1530-003	Full TCL, TAL List
MND33-0019-0001	1530-004	Full TCL, TAL List
MND33-0019-1001	1530-005	Full TCL, TAL List
MND33-0020-0001	1530-006	Full TCL, TAL List
MND33-0021-0001	1530-007	Full TCL, TAL List
MND33-0022-0001	1530-008	Full TCL, TAL List
MND33-0023-0001	1530-009	Full TCL, TAL List
MND33-0023-1001	1530-010	Full TCL, TAL List
MND33-0023-1001	1530-010 DUP	Full TAL list
MND33-0023-1001	1530-010 MS	Full TCL, TAL List
MND33-0023-1001	1530-010 MSD	Full TCL list
MND33-0024-0001	1530-011	Full TCL, TAL List
MND33-0024-5001	1530-012	Volatile only
MND33-0016-5001	1530-013	Volatile only

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Roy F. Weston Inc.
October 1, 1991
Project Number: 251-02

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification information, the analytical results, and the appropriate detection limits.

The sample and blank results have not been adjusted to account for matrix spike and matrix spike duplicate recoveries. The matrix spike and matrix spike duplicate recoveries are included in this report. The sample and blank results should be calculated to incorporate matrix spike and matrix spike duplicate recoveries before they are reported to EPA regulators.

III. Quality Control

The QA/QC information can be found immediately following the analytical data. QA/QC data is used to assess the laboratory's performance. All quality control samples were performed upon sample MND33-0023-1001 (ITAS ID 1530-010). The matrix spike was analyzed for the full TCL and TAL list. The matrix spike duplicate was performed on the full TCL list. The duplicate was performed on the full TAL list.

All of the samples were extracted and analyzed within the required CLP holding time.

V. Nonconformances / Problems

The following problems were observed during the analyses:

General:

All samples were received at a temperature of 10 degrees centigrade.

The sample delivery group (SDG) number was too long for our computerized forms therefore the SDG number was shortened from MND33-0016-0001 to 0016-0001 on all CLP forms.

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For Volatile:

Quantitation of 2-Butanone is performed using ion 43 m/z (amu) instead of 72 m/z due to our greater sensitivity to this ion.

Sample MND33-0023-1001 (1530-010) and its associated matrix spike and matrix spike duplicate have the percent recovery for 1,2-Dichloroethane-d4 outside of the contract required QC limits due to matrix effect.

Sample MND33-0023-1001 MSD (1530-010 MSD) has the percent recovery for Chlorobenzene outside of the contract required QC limits.

For Semivolatile:

No problems were observed with these analyses.

For Pesticide/PCB:

Samples MND33-0023-1001-MS1 DL (1530-010 MS1 DL) and MND33-0023-1001-MSD DL (1530-010 MSD1 DL) required a dilution of 1:2 because the original responses were greater than determined range for the calibration curve. Upon dilution, all responses were within calibration range.

Due to the presence of sulfur, samples MND33-0016-0001 (1530-001), MND33-0017-0001 (1530-002), MND33-0018-0001 (1530-003), MND33-0019-0001 (1530-004) and MND33-0020-0001 (1530-005) required cleanup with mercury. The associated blank was also taken through the cleanup process. The cleanup procedure was successful. The data from the cleaned-up samples, the blank before cleanup and the blank after cleanup are submitted.

Sample 1530-001 shows a positive hit for delta-BHC, which was confirmed by a second column analysis. The quantitated value from the primary column was 64 ug/kg, but was 14 ug/kg when quantitated from the secondary column. All calibration criteria from both columns were "in-control", therefore we associate the discrepancy in values to be due to a co-eluting interference on the primary column and thus we are reporting the value from the second column.

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Project Number: 251-02

For Inorganics:

Due to the length of the TAL list, the dilutions and MSA's are indicated on the form I's.

An "M" flag incorrectly appears for all of the GFAA, mercury and cyanide results. No "M" flags should appear within this data package. This is an unresolved computer error within the Ward software and the form I's will be resubmitted when corrected. Sorry for any inconvenience this may cause.

Ward software rounding percent solids and sample weights differ slightly from the hand calculated values.

Sample MND33-0023-1001 S (1530-010 S) has the percent recoveries for Cadmium and Selenium outside of the contract required QC limits. Beryllium has a matrix spike percent recovery of 74.9 %. No bench spike was analyzed due to EPA rounding rules which indicate that the value would be 75 % and this would be within the required QC limits.

The final spiked concentration for all matrices of cyanide was 50 ug/L. This resulted a matrix spike concentration of 5 ug/g for soils instead of the suggested 25 ug/g and 25 ug/ 500 mL for waters instead of the suggested 50 ug/500 mL.

Sample MND33-0023-1001 D (1530-010 D) has the relative percent recovery for lead outside of the contract required QC limits.

Sample MND33-0016-0001 L (1530-001 L) has the percent difference for Copper, Iron and Lead outside of the contract required QC limits. The serial dilution results utilizing a "B" and "U" flag uses the uncorrected dilution (1:5) values.

Regarding the ICAP laboratory control sample (LCS) for silver, a low recovery of 4.92 percent was observed. The cause was associated with a spiking level of 1000 ug/L. This matter has been investigated and the preliminary results indicate lowering the LCS spiking level to 500 ug/L will result in a recovery of approximately 90 percent. The corrective action for this issue is to spike the LCS at 500 ug/L for future analyses. The matrix spike had a recovery of 96 percent which indicates the analysis was performed properly. Therefore, we consider these results valid.

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CORPORATION

Roy F. Weston Inc.
October 1, 1991
Project Number: 251-02

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 has been authorized by the laboratory manager or his designee, as verified by the following signature.

Reviewed and Approved:

Robert E. White
Robert E. White
Project Manager

10/01/91
Date

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPH SAMPLE NO. 0000098

Lab Name: ITAS-ST. LOUIS

Contract: 90s26-003-0001

0020-0001

Lab Code: ITSL

Case No.: 953001

SAS No.:

SDG No.: 0015-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-00a

Sample wt/vol: 5.0 ug/mL:G

Lab File ID: E2640

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 18

Date Analyzed: 09/04/91

Column: (pack/cap) CAP

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	2	BJ	
67-64-1	Acetone	27	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	
1330-20-7	Xylene (total)	6	U	

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

000099

0020-0001

Lab Name: ITAS-ST. LOUIS

Contract: G0636-DUC-0001

Lab Code: ITSL

Case No.: V53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-006

Sample wt/vol: 5.0 (g/mL)G

Lab File ID: E2640

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 18

Date Analyzed: 09/04/91

Column (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
-----	-----	-----	-----	0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

0000107
EPA SAMPLE NO.

0021-0001

Lab Name: ITAS-ST. LOUIS

Contract: 90618-003-0001

Lab Code: ITSL

Case No.: V53001

SAS No.:

SDG No.: 0018-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-007

Sample wt/vol: 5.0 (g/mL) G

Lab File ID: E2651

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 9

Date Analyzed: 09/05/91

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		Q
74-87-3	Chloromethane	11		U
74-83-9	Bromomethane	11		U
75-01-4	Vinyl Chloride	11		U
75-00-3	Chloroethane	11		U
75-09-2	Methylene Chloride	3		B
67-64-1	Acetone	29		B
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	3		J
71-55-6	1,1,1-Trichloroethane	5		U
56-23-5	Carbon Tetrachloride	5		U
108-05-4	Vinyl Acetate	11		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	11		U
591-78-6	2-Hexanone	11		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
1330-20-7	Xylene (total)	5		U

0000108

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

0021-0001

Lab Name: ITAS-ST.LOUIS

Contract: G0628-DUS-0001

Lab Code: ITSL

Case No.: V53001

SAS No.:

SEG No.: 0015-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-007

Sample wt/vol: 5.0 (g/mL)G

Lab File ID: E2651

Level: (low/med) LDW

Date Received: 08/30/91

% Moisture: not dec. 9

Date Analyzed: 09/05/91

Column (pack/cap) CAP

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
-----	-----	-----	-----	-----

0000117

EPA SAMPLE NO.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

0022-0001

Lab Name: ITAS-ST. LOUIS

Contract: 60626-003-0001

Lab Code: ITSL

Case No.: V53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-008

Sample wt/vol: 5.0 (g/mL)G

Lab File ID: E2652

Level: (low/med) LDW

Date Received: 08/30/91

% Moisture: not dec. 13

Date Analyzed: 09/05/91

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)	UG/KG
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	3	B
67-64-1	Acetone	24	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	11	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
108-05-4	Vinyl Acetate	11	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	1,1,1-Trichloroethane	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	11	U
591-78-6	2-Hexanone	11	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
1330-20-7	Xylene (total)	6	U

0000118

EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

0022-0001

Lab Name: ITAS-ST. LOUIS

Contract: G0626-DUS-0001

Lab Code: ITSL

Case No.: V53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-008

Sample wt/vol: 5.0 (g/mL) G

Lab File ID: E2652

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 13

Date Analyzed: 09/05/91

Column (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.
1.	Unknown Alkane	22.44	6.3

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: ITAS-ST. LOUIS

Contract: 60626-003-0001

0023-0001

Lab Code: ITSL

Case No.: V53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-009

Sample wt/vol: 5.0 (g/mL)G

Lab File ID: E2653

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 14

Date Analyzed: 09/05/91

Column: (pack/cap) CAP

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	B*
67-64-1	Acetone	26	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
1330-20-7	Xylene (total)	6	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

0000128
EPA SAMPLE NO.

9023-0001

Lab Name: ITAS-ST. LOUIS

Contract: 90626-003-0001

Lab Code: ITSL

Case No.: V53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-009

Sample wt/vol: 5.0 (g/mL)G

Lab File ID: E2653

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 14

Date Analyzed: 09/05/91

Column (pack/cap) CAP

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
				0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0023-1001

Lab Name: ITAS-ST.LOUIS

Contract: G0626-OU3-0001

Lab Code: ITSL

Case No.: V53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-010

Sample wt/vol: 5.0 (g/mL)G

Lab File ID: E2644

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 14

Date Analyzed: 09/04/91

Column: (pack/cap) CAP

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	8	8
67-64-1	Acetone	21	8
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
1330-20-7	Xylene (total)	6	U

0000137

EPA SAMPLE NO.

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

0023-1001

Lab Name: ITAS-ST. LOUIS

Contract: 80626-003-0001

Lab Code: ITSL

Case No.: V53001

SAS No.:

SDG No.: 001a-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-010

Sample wt/vol: 5.0 (g/mL)G

Lab File ID: E2644

Level: (low/med) LDW

Date Received: 08/30/91

% Moisture: not dec. 14

Date Analyzed: 09/04/91

Column (pack/cap) CAP

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
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

000014

0024-0001

Lab Name: ITAS-ST. LOUIS

Contract: G0626-OU3-0001

Lab Code: ITSL

Case No.: V53001

SAS No.:

SDG No.: 0015-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-011

Sample wt/vol: 5.0 (g/mL)G

Lab File ID: E2655

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 9

Date Analyzed: 09/05/91

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	4	BJ
67-64-1	Acetone	19	B
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	11	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	11	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	1,1,2-Trichloroethane	5	U
79-00-5	1,1,1-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	11	U
591-78-6	2-Hexanone	11	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
1330-20-7	Xylene (total)	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

0000141

0024-0001

Lab Name: ITAS-ST. LOUIS

Contract: 60626-003-0001

Lab Code: ITSL

Case No.: V53001

SAS No.:

SDG No.: 0012-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-011

Sample wt/vol: 5.0 (g/mL)G

Lab File ID: E2655

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 9

Date Analyzed: 09/05/91

Column (pack/cap) CAP

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
				0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

0000153
EPA SAMPLE NO.

0024-5001

Lab Name: ITAS-ST. LOUIS

Contract: 60626-U03-0001

Lab Code: ITSL

Case No.: V53001

SAS No.:

SDS No.: 0016-0001

Matrix: (soil/water) WATER

Lab Sample ID: 1530-012

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: F2183

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec.

Date Analyzed: 09/04/91

Column: (pack/cap) CAP

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	6	B
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
1330-20-7	Xylene (total)	5	U

0000154

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

0024-0001

Lab Name: ITAS-ST. LOUIS

Contract: 60626-003-0001

Lab Code: ITSL

Case No.: V53001

SAS No.:

SDG No.: 0015-0001

Matrix: (soil/water) WATER

Lab Sample ID: 1530-012

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: F2183

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec.

Date Analyzed: 09/04/91

Column (pack/cap) CAP

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
-----	-----	-----	-----	-----

18
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. **08004**

0020-0001

Lab Name: ITAS-ST. LOUIS Contract: G0625-DU3-0001
 Lab Code: ITSL Case No.: S53001 SAS No.: SDG No.: 0016-0001
 Matrix: (soil/water)SOIL Lab Sample ID: 1530-006
 Sample wt/vol: 30.0 (g/mL)G Lab File ID: A1086
 Level: (low/med) LOW Date Received: 08/30/91
 % Moisture: not dec. 18 dec. Date Extracted: 09/06/91
 Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09/13/91
 GPC Cleanup: (Y/N)N pH: 8.3 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/KG	
108-95-2	Phenol	400	
111-44-4	bis(2-Chloroethyl)Ether	400	
95-57-8	2-Chlorophenol	400	
341-73-1	1,3-Dichlorobenzene	400	
106-46-7	1,4-Dichlorobenzene	400	
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
120-85-1	Chlorophenol	400	U
120-82-1	Trichlorobenzene	400	U
91-20-3	Styrene	400	U
106-47-8	Daniline	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	2000	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. **000049**

0020-0001

Lab Name: ITAS-ST. LOUIS

Contract: 60626-OU3-0001

Lab Code: ITSL

Case No.: S53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-006

Sample wt/vol: 30.0 (g/mL)G

Lab File ID: A1086

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 18 dec.

Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 09/13/91

GPC Cleanup: (Y/N)N

pH: 8.3

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/KG	
99-09-2	3-Nitroaniline	2000	
83-32-9	Acenaphthene	400	
51-28-5	2,4-Dinitrophenol	2000	
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	180	BJ
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-10-6	4-Nitroaniline	2000	U
534-52-1	4,6-Dinitro-2-Methylphenol	2000	U
86-30-6	N-Nitrosodiphenylamine (1)	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	Fluorene	400	U
84-74-2	Diethylphthalate	400	U
206-44-0	Fluorene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3-Dichlorobenzidine	810	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-Octyl Phthalate	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.

000049

0020-0001

Lab Name: ITAS-ST. LOUIS

Contract: 60626-0U3-0001

Lab Code: ITSL

Case No.: S53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-006

Sample wt/vol: 30.0 (g/mL)G

Lab File ID: A1086

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 18 dec.

Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 09/13/91

GPC Cleanup: (Y/N)N

pH: 8.3

Dilution Factor: 1.00

Number TICs found: 14

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
1.	Aldol Condensation	4.44	40000	JA
2. 0	UNKNOWN	5.60	630	BJ
3. 0	UNKNOWN	12.91	210	BJ
4. 0	UNKNOWN	13.19	170	BJ
5.	UNKNOWN	14.85	170	J
6. 0	UNKNOWN	16.17	190	BJ
7.	UNKNOWN	17.42	200	J
8.	UNKNOWN	18.60	170	J
9. 57103	Hexadecanoic acid (9CI)	20.24	580	BJ
10.	UNKNOWN	21.63	180	J
11. 0	Hydrocarbon	25.18	1000	BJ
12.	UNKNOWN	26.81	190	J
13.	UNKNOWN	28.31	170	J
14.	UNKNOWN	29.77	390	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 000051

Lab Name: ITAS-ST. LOUIS

Contract: G0626-OU3-0001

0021-0001

Lab Code: ITSL

Case No.: S53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-007

Sample wt/vol: 30.1 (g/mL)G

Lab File ID: A1087

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 9 dec.

Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 09/13/91

GPC Cleanup: (Y/N)N

pH: 8.1

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/KG	g
108-95-2	Phenol	360	U
111-44-4	bis(2-Chloroethyl)Ether	360	U
95-57-8	2-Chlorophenol	360	U
541-73-1	1,3-Dichlorobenzene	360	U
106-46-7	1,4-Dichlorobenzene	360	U
100-51-6	Benzyl Alcohol	360	U
95-50-1	1,2-Dichlorobenzene	360	U
95-48-7	2-Methylphenol	360	U
39638-32-9	bis(2-Chloroisopropyl)Ether	360	U
106-44-5	4-Methylphenol	360	U
621-64-7	N-Nitroso-Di-n-Propylamine	360	U
67-72-1	Hexachloroethane	360	U
98-95-3	Nitrobenzene	360	U
78-59-1	Isophorone	360	U
88-75-5	2-Nitrophenol	360	U
105-67-9	2,4-Dimethylphenol	360	U
65-85-0	Benzoic Acid	1800	U
111-91-1	bis(2-Chloroethoxy)Methane	360	U
120-83-2	2,4-Dichlorophenol	360	U
120-82-1	1,2,4-Trichlorobenzene	360	U
91-20-3	Naphthalene	360	U
106-47-8	4-Chloroaniline	360	U
87-68-3	Hexachlorobutadiene	360	U
59-50-7	4-Chloro-3-Methylphenol	360	U
91-57-6	2-Methylnaphthalene	360	U
77-47-4	Hexachlorocyclopentadiene	360	U
88-06-2	2,4,6-Trichlorophenol	360	U
95-95-4	2,4,5-Trichlorophenol	1800	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	1800	U
131-11-3	Dimethyl Phthalate	360	U
208-96-8	Acenaphthylene	360	U
606-20-2	2,6-Dinitrotoluene	360	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. **000051**

Lab Name: ITAS-ST. LOUIS

Contract: G0626-DUS-0001

0021-0001

Lab Code: ITSL

Case No.: S53001

SAS No.:

SDG No.: 0015-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-007

Sample wt/vol: 30.1 (g/mL)G

Lab File ID: A1087

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 9 dec.

Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 09/13/91

GPC Cleanup: (Y/N)N

pH: 8.1

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) UG/KG	Q
99-09-2	3-Nitroaniline	1800	U
83-32-9	Acenaphthene	360	U
51-28-5	2,4-Dinitrophenol	1800	U
100-02-7	4-Nitrophenol	1800	U
132-64-9	Dibenzofuran	360	U
121-14-2	2,4-Dinitrotoluene	360	U
84-66-2	Diethylphthalate	220	BJ
7005-72-3	4-Chlorophenyl-phenylether	360	U
86-73-7	Fluorene	360	U
100-10-6	4-Nitroaniline	1800	U
534-52-1	4,6-Dinitro-2-Methylphenol	1800	U
86-30-6	N-Nitrosodiphenylamine (1)	360	U
101-55-3	4-Bromophenyl-phenylether	360	U
118-74-1	Hexachlorobenzene	360	U
87-86-5	Pentachlorophenol	1800	U
85-01-8	Phenanthrene	360	U
120-12-7	Anthracene	360	U
84-74-2	Di-n-Butylphthalate	360	U
206-44-0	Fluoranthene	360	U
129-00-0	Pyrene	360	U
85-68-7	Butylbenzylphthalate	53	J
91-94-1	3,3'-Dichlorobenzidine	720	U
56-55-3	Benzo(a)Anthracene	360	U
218-01-9	Chrysene	360	U
117-81-7	bis(2-Ethylhexyl)Phthalate	82	BJ
117-84-0	Di-n-Octyl Phthalate	360	U
205-99-2	Benzo(b)Fluoranthene	360	U
207-08-9	Benzo(k)Fluoranthene	360	U
50-32-8	Benzo(a)Pyrene	360	U
193-39-5	Indeno(1,2,3-cd)Pyrene	360	U
53-70-3	Dibenz(a,h)Anthracene	360	U
191-24-2	Benzo(g,h,i)Perylene	360	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

0000520

0021-0001

Lab Name: ITAS-ST.LOUIS

Contract: G0626-0U3-0001

Lab Code: ITSL

Case No.: 553001

SAS No.:

SDG No.: 0018-0001

Matrix: (soil/water)SOIL

Lab Sample ID: 1530-007

Sample wt/vol: 30.1 (g/mL)G

Lab File ID: A1087

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 9 dec.

Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 09/13/91

GPC Cleanup: (Y/N)N

pH: 8.1

Dilution Factor: 1.0

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 0	Aldol Condensation	4.50	38000	BJA
2. 0	UNKNOWN	5.61	580	BJ
3. 0	UNKNOWN	12.90	230	BJ
4. 0	UNKNOWN	13.19	160	BJ
5.	UNKNOWN	13.49	160	J
6. 0	UNKNOWN	16.17	240	BJ
7.	UNKNOWN	17.42	160	J
8. 57103	Hexadecanoic acid (9CI)	20.24	370	BJ
9.	Hydrocarbon	21.63	150	J
10. 0	Hydrocarbon	25.18	490	BJ

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0000543

0022-0001

Lab Name: ITAS-ST. LOUIS

Contract: G0626-003-0001

Lab Code: ITSL

Case No.: S53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-008

Sample wt/vol: 30.2 (g/mL)G

Lab File ID: A1088

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 13 dec.

Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 09/13/91

GPC Cleanup: (Y/N)N

pH: 8.4

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/KG	Q
108-95-2	Phenol	380	U
111-44-4	bis(2-Chloroethyl)Ether	380	U
95-57-8	2-Chlorophenol	380	U
541-73-1	1,3-Dichlorobenzene	380	U
106-46-7	1,4-Dichlorobenzene	380	U
100-51-6	Benzyl Alcohol	380	U
95-50-1	1,2-Dichlorobenzene	380	U
95-48-7	2-Methylphenol	380	U
39638-32-9	bis(2-Chloroisopropyl)Ether	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-Di-n-Propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
65-85-0	Benzoic Acid	1800	U
111-91-1	bis(2-Chloroethoxy)Methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
120-82-1	1,2,4-Trichlorobenzene	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
59-50-7	4-Chloro-3-Methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	1800	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	1800	U
131-11-3	Dimethyl Phthalate	380	U
208-96-8	Acenaphthylene	380	U
606-20-2	2,6-Dinitrotoluene	380	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0000544

0022-0001

Lab Name: ITAS-ST. LOUIS

Contract: G0626-DU3-0001

Lab Code: ITSL

Case No.: S53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-008

Sample wt/vol: 30.2 (g/mL)G

Lab File ID: A1088

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 13 dec.

Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 09/13/91

GPC Cleanup: (Y/N)N

pH: 8.4

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
99-09-2	3-Nitroaniline	1800	U
83-32-9	Acenaphthene	380	U
51-28-5	2,4-Dinitrophenol	1800	U
100-02-7	4-Nitrophenol	1800	U
132-64-9	Dibenzofuran	380	U
121-14-2	2,4-Dinitrotoluene	380	U
84-66-2	Diethylphthalate	170	BJ
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-10-6	4-Nitroaniline	1800	U
534-52-1	4,6-Dinitro-2-Methylphenol	1800	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
87-86-5	Pentachlorophenol	1800	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
84-74-2	Diethylphthalate	380	U
206-44-0	Anthracene	380	U
129-00-0	Anthracene	380	U
85-68-7	Bis(2-ethylphenyl)phthalate	380	U
91-94-1	1,3-Dichlorobenzidine	750	U
56-55-3	Benzo(a)Anthracene	380	U
218-01-9	Chrysene	380	U
117-81-7	bis(2-Ethylhexyl)Phthalate	41	BJ
117-84-0	Di-n-Octyl Phthalate	380	U
205-99-2	Benzo(b)Fluoranthene	380	U
207-08-9	Benzo(k)Fluoranthene	380	U
50-32-8	Benzo(a)Pyrene	380	U
193-39-5	Indeno(1,2,3-cd)Pyrene	380	U
53-70-3	Dibenz(a,h)Anthracene	380	U
191-24-2	Benzo(g,h,i)Perylene	380	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
0000545

0022-0001

Lab Name: ITAS-ST.LOUIS Contract: G0626-0U3-0001

Lab Code: ITSL Case No.: S53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water)SOIL Lab Sample ID: 1530-008

Sample wt/vol: 30.2 (g/mL)G Lab File ID: A1088

Level: (low/med) LOW Date Received: 08/30/91

% Moisture: not dec. 13 dec. Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09/13/91

GPC Cleanup: (Y/N)N pH: 8.4 Dilution Factor: 1.00

Number TICs found: 7 CONCENTRATION UNITS:
(ug/L or ug/Kg)UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
1. 0	Aldol Condensation.	4.54	45000	BJA
2. 0	UNKNOWN	5.61	690	BJ
3. 0	UNKNOWN	12.90	180	BJ
4. 0	UNKNOWN	16.17	240	BJ
5. 57103	Hexadecanoic acid (9CI)	20.23	380	BJ
6. 0	Hydrocarbon	25.18	570	BJ
7.	UNKNOWN	29.78	160	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0000564

0023-0001

Lab Name: ITAS-ST.LOUIS

Contract: G0626-OU3-0001

Lab Code: ITSL

Case No.: S53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water)SOIL

Lab Sample ID: 1530-009

Sample wt/vol: 30.1 (g/mL)G

Lab File ID: A1090

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 14 dec.

Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 09/15/91

GPC Cleanup: (Y/N)N

pH: 8.4

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/KG	
108-95-2	Phenol	380	U
111-44-4	bis(2-Chloroethyl)Ether	380	U
95-57-8	2-Chlorophenol	380	U
541-73-1	1,3-Dichlorobenzene	380	U
106-46-7	1,4-Dichlorobenzene	380	U
100-51-6	Benzyl Alcohol	380	U
95-50-1	1,2-Dichlorobenzene	380	U
95-48-7	2-Methylphenol	380	U
39638-32-9	bis(2-Chloroisopropyl)Ether	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-Di-n-Propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Diethylphenol	380	U
65-85-0	Benzoic Acid	1900	U
111-91-1	bis(2-Chloroethoxy)Methane	380	U
120-81-7	Chlorophenol	380	U
120-82-1	Trichlorobenzene	380	U
91-20-3	ylene	380	U
106-47-8	aniline	380	U
87-68-3	isopropylbutadiene	380	U
59-50-7	2,4-Dinitro-3-Methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	1900	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	1900	U
131-11-3	Dimethyl Phthalate	380	U
208-96-8	Acenaphthylene	380	U
606-20-2	2,6-Dinitrotoluene	380	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

000056

0023-0001

Lab Name: ITAS-ST. LOUIS

Contract: G0626-OU3-0001

Lab Code: ITSL

Case No.: S53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-009

Sample wt/vol: 30.1 (g/mL)G

Lab File ID: A1090

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 14 dec.

Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 09/15/91

GPC Cleanup: (Y/N)N

pH: 8.4

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/KG	
99-09-2	3-Nitroaniline	1900	U
83-32-9	Acenaphthene	380	U
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	1900	U
132-64-9	Dibenzofuran	380	U
121-14-2	2,4-Dinitrotoluene	380	U
84-66-2	Diethylphthalate	200	BJ
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-10-6	4-Nitroaniline	1900	U
534-52-1	4,6-Dinitro-2-Methylphenol	1900	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
87-86-5	Pentachlorophenol	1900	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
84-74-2	Diethylphthalate	380	U
206-44-0	Fluorene	380	U
129-00-0	Fluorene	380	U
85-68-7	Diethylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	760	U
56-55-3	Benzo(a)Anthracene	380	U
218-01-9	Chrysene	380	U
117-81-7	bis(2-Ethylhexyl)Phthalate	380	U
117-84-0	Di-n-Octyl Phthalate	380	U
205-99-2	Benzo(b)Fluoranthene	380	U
207-08-9	Benzo(k)Fluoranthene	380	U
50-32-8	Benzo(a)Pyrene	380	U
193-39-5	Indeno(1,2,3-cd)Pyrene	380	U
53-70-3	Dibenz(a,h)Anthracene	380	U
191-24-2	Benzo(g,h,i)Perylene	380	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

0000566

0023-0001

Lab Name: ITAS-ST. LOUIS

Contract: 60626-OU3-0001

Lab Code: ITSL

Case No.: S53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-009

Sample wt/vol: 30.1 (g/mL) G

Lab File ID: A1090

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 14 dec.

Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 09/15/91

GPC Cleanup: (Y/N) N pH: 8.4

Dilution Factor: 1.0

Number TICs found: 17

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 0	Aldol Condensation.	4.52	53000	BJA
2. 0	UNKNOWN	5.58	900	BJ
3. 0	UNKNOWN	12.88	210	BJ
4. 0	UNKNOWN	13.16	210	BJ
5.	UNKNOWN	13.47	160	J
6.	UNKNOWN	14.82	200	J
7. 0	UNKNOWN	16.15	210	BJ
8.	Hydrocarbon	17.32	220	J
9.	Hydrocarbon	17.40	280	J
10.	Hydrocarbon	18.58	220	J
11.	Hydrocarbon	19.57	210	J
12. 57103	Hexadecanoic acid (9CI)	20.22	630	BJ
13.	Hydrocarbon	20.61	180	J
14.	Hydrocarbon	21.60	230	J
15. 0	Hydrocarbon	25.16	400	BJ
16.	Hydrocarbon	26.80	220	J
17.	Hydrocarbon	29.75	400	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 00005

0023-1001

Lab Name: ITAS-ST. LOUIS Contract: 80626-QU3-0001
 Lab Code: ITSL Case No.: S53001 SAS No.: SDG No.: 0016-0001
 Matrix: (soil/water) SOIL Lab Sample ID: 1530-010
 Sample wt/vol: 30.2 (g/mL) G Lab File ID: A1091
 Level: (low/med) LOW Date Received: 08/30/91
 % Moisture: not dec. 14 dec. Date Extracted: 09/06/91
 Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09/15/91
 GPC Cleanup: (Y/N) N pH: 8.4 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
108-95-2	Phenol	380	U
111-44-4	bis(2-Chloroethyl) Ether	380	U
95-57-8	2-Chlorophenol	380	U
541-73-1	1,3-Dichlorobenzene	380	U
106-46-7	1,4-Dichlorobenzene	380	U
100-51-6	Benzyl Alcohol	380	U
95-50-1	1,2-Dichlorobenzene	380	U
95-48-7	2-Methylphenol	380	U
39638-32-9	bis(2-Chloroisopropyl) Ether	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-Di-n-Propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
65-85-0	Benzoic Acid	1800	U
111-91-6	bis(2-Chloroethoxy) Methane	380	U
120-83-2	3-Chlorophenol	380	U
120-82-1	1,2,4-Trichlorobenzene	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
59-50-7	4-Chloro-3-Methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	1800	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	1800	U
131-11-3	Dimethyl Phthalate	380	U
208-96-8	Acenaphthylene	380	U
606-20-2	2,6-Dinitrotoluene	380	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0000595

0023-1001

Lab Name: ITAS-ST.LOUIS

Contract: G0626-OU3-0001

Lab Code: ITSL

Case No.: S53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water)SOIL

Lab Sample ID: 1530-010

Sample wt/vol: 30.2 (g/mL)G

Lab File ID: A1091

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 14 dec.

Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 09/15/91

GPC Cleanup: (Y/N)N

pH: 8.4

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/KG	
99-09-2	3-Nitroaniline	1800	
83-32-9	Acenaphthene	380	
51-28-5	2,4-Dinitrophenol	1800	
100-02-7	4-Nitrophenol	1800	U
132-64-9	Dibenzofuran	380	U
121-14-2	2,4-Dinitrotoluene	380	U
84-66-2	Diethylphthalate	210	BJ
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-10-6	4-Nitroaniline	1800	U
534-52-1	4,6-Dinitro-2-Methylphenol	1800	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
87-86-5	Pentachlorophenol	1800	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
84-74-2	Diethylphthalate	380	U
206-4-0	Anthene	380	U
129-00-0		380	U
85-68-7	Benzylphthalate	380	U
91-94-1	Dichlorobenzidine	760	U
56-55-3	Benzo(a)Anthracene	380	U
218-01-9	Chrysene	380	U
117-81-7	bis(2-Ethylhexyl)Phthalate	380	U
117-84-0	Di-n-Octyl Phthalate	380	U
205-99-2	Benzo(b)Fluoranthene	380	U
207-08-9	Benzo(k)Fluoranthene	380	U
50-32-8	Benzo(a)Pyrene	380	U
193-39-5	Indeno(1,2,3-cd)Pyrene	380	U
53-70-3	Dibenz(a,h)Anthracene	380	U
191-24-2	Benzo(g,h,i)Perylene	380	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO. **000059**

0023-1001

Lab Name: ITAS-ST. LOUIS

Contract: G0626-003-0001

Lab Code: ITSL

Case No.: S53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-010

Sample wt/vol: 30.2 (g/mL)G

Lab File ID: A1091

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 14 dec.

Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 09/15/91

GPC Cleanup: (Y/N)N

pH: 8.4

Dilution Factor: 1.0

Number TICs found: 16

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
1.	Aldol Condensation.	4.43	34000	JA
2. 0	UNKNOWN	5.58	770	BJ
3. 19089475	1-Propanol, 2-ethoxy- (8CI9C)	7.15	200	J
4. 0	UNKNOWN	12.87	230	BJ
5. 0	UNKNOWN	13.16	260	BJ
6.	UNKNOWN	14.82	180	J
7. 0	UNKNOWN	16.14	260	BJ
8.	UNKNOWN	17.31	200	J
9.	UNKNOWN	17.39	260	J
10.	Hydrocarbon	18.57	210	J
11.	Hydrocarbon	19.55	200	J
12. 57103	Hexadecanoic acid (9CI)	20.21	480	BJ
13.	Hydrocarbon	20.60	160	J
14.	Hydrocarbon	21.59	190	J
15. 0		25.16	380	BJ
16.		28.27	160	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0024-0001

Lab Name: ITAS-ST.LOUIS

Contract: 60625-OU3-0001

Lab Code: ITSL

Case No.: S53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water)SOIL

Lab Sample ID: 1530-011

Sample wt/vol: 30.0 (g/mL)G

Lab File ID: A1094

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 9 dec.

Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 09/15/91

GPC Cleanup: (Y/N)N

pH: 8.6

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/KG	g
108-95-2	Phenol	360	U
111-44-4	bis(2-Chloroethyl)Ether	360	U
95-57-8	2-Chlorophenol	360	U
541-73-1	1,3-Dichlorobenzene	360	U
106-46-7	1,4-Dichlorobenzene	360	U
100-51-6	Benzyl Alcohol	360	U
95-50-1	1,2-Dichlorobenzene	360	U
95-48-7	2-Methylphenol	360	U
39638-32-9	bis(2-Chloroisopropyl)Ether	360	U
106-44-5	4-Methylphenol	360	U
621-64-7	N-Nitroso-Di-n-Propylamine	360	U
67-72-1	Hexachloroethane	360	U
98-95-3	Nitrobenzene	360	U
78-59-1	Isophorone	360	U
88-75-5	2-Nitrophenol	360	U
105-67-9	2,4-Dimethylphenol	360	U
65-85-0	Benzoic Acid	1800	U
111-91-1	bis(2-Chloroethoxy)Methane	360	U
120-83-2	2,4-Dichlorophenol	360	U
120-82-1	1,2,4-Trichlorobenzene	360	U
91-20-3	Naphthalene	360	U
106-47-8	4-Chloroaniline	360	U
87-68-3	Hexachlorobutadiene	360	U
59-50-7	4-Chloro-3-Methylphenol	360	U
91-57-6	2-Methylnaphthalene	360	U
77-47-4	Hexachlorocyclopentadiene	360	U
88-06-2	2,4,6-Trichlorophenol	360	U
95-95-4	2,4,5-Trichlorophenol	1800	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	1800	U
131-11-3	Dimethyl Phthalate	360	U
208-96-8	Acenaphthylene	360	U
606-20-2	2,6-Dinitrotoluene	360	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0024-0001

Lab Name: ITAS-ST. LOUIS

Contract: G0626-OU3-0001

Lab Code: ITSL

Case No.: S53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water) SOIL

Lab Sample ID: 1530-011

Sample wt/vol: 30.0 (g/mL)G

Lab File ID: A1094

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 9 dec.

Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 09/15/91

GPC Cleanup: (Y/N)N

pH: 8.6

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
99-09-2	3-Nitroaniline	1800	
83-32-9	Acenaphthene	360	
51-28-5	2,4-Dinitrophenol	1800	
100-02-7	4-Nitrophenol	1800	
132-64-9	Dibenzofuran	360	U
121-14-2	2,4-Dinitrotoluene	360	U
84-66-2	Diethylphthalate	140	BJ
7005-72-3	4-Chlorophenyl-phenylether	360	U
86-73-7	Fluorene	360	U
100-10-6	4-Nitroaniline	1800	U
534-52-1	4,6-Dinitro-2-Methylphenol	1800	U
86-30-6	N-Nitrosodiphenylamine (1)	360	U
101-55-3	4-Bromophenyl-phenylether	360	U
118-74-1	Hexachlorobenzene	360	U
87-86-5	Pentachlorophenol	1800	U
85-01-8	Phenanthrene	360	U
120-12-7	Anthracene	360	U
84-74-2	Diethylphthalate	360	U
206-4	Phenanthrene	360	U
129-00	Phenanthrene	360	U
85-68-7	Diethylphthalate	360	U
91-94-1	2,4-Dichlorobenzidine	730	U
56-55-3	Benzo(a)Anthracene	360	U
218-01-9	Chrysene	360	U
117-81-7	bis(2-Ethylhexyl)Phthalate	360	U
117-84-0	Di-n-Octyl Phthalate	360	U
205-99-2	Benzo(b)Fluoranthene	360	U
207-08-9	Benzo(k)Fluoranthene	360	U
50-32-8	Benzo(a)Pyrene	360	U
193-39-5	Indeno(1,2,3-cd)Pyrene	360	U
53-70-3	Dibenz(a,h)Anthracene	360	U
191-24-2	Benzo(g,h,i)Perylene	360	U

(1) - Cannot be separated from Diphenylamine

0000625

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

0024-0001

Lab Name: ITAS-ST.LOUIS

Contract: G0626-OU3-0001

Lab Code: ITSL

Case No.: S53001

SAS No.:

SDG No.: 0016-0001

Matrix: (soil/water)SOIL

Lab Sample ID: 1530-011

Sample wt/vol: 30.0 (g/mL)G

Lab File ID: A1094

Level: (low/med) LOW

Date Received: 08/30/91

% Moisture: not dec. 9 dec.

Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 09/15/91

GPC Cleanup: (Y/N)N

pH: 8.6

Dilution Factor: 1.00

Number TICs found: 5

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC	
1.	Aldol Condensation	4.47	41000	JA
2. 0	UNKNOWN	5.59	710	BJ
3. 0	UNKNOWN	16.15	170	BJ
4. 57103	Hexadecanoic acid (9CI)	20.21	240	BJ
5. 0	Unknown Hydrocarbon	25.16	330	BJ

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO
0000719

Lab Name: ITAS-ST.LOUIS	Contract: 60626-OU3-0001
Lab Code: ITSL	Case No.: S53001
Matrix: (soil/water)SOIL	SDG No.: 0016-0001
Sample wt/vol: 30.1 (g/mL)G	Lab Sample ID: 1530-010MSD
Level: (low/med) LOW	Lab File ID: A1093
% Moisture: not dec. 14 dec.	Date Received: 08/30/91
Extraction: (SepF/Cont/Sonc) SONC	Date Extracted: 09/06/91
GPC Cleanup: (Y/N)N	Date Analyzed: 09/15/91
pH: 8.3	Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/KG	G
108-95-2	Phenol	380	U
111-44-4	bis(2-Chloroethyl)Ether	380	U
95-57-8	2-Chlorophenol	380	U
541-73-1	1,3-Dichlorobenzene	380	U
106-46-7	1,4-Dichlorobenzene	380	U
100-51-6	Benzyl Alcohol	380	U
95-50-1	1,2-Dichlorobenzene	380	U
95-48-7	2-Methylphenol	380	U
39638-32-9	bis(2-Chloroisopropyl)Ether	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-Di-n-Propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
65-85-0	Benzoic Acid	1900	U
111-91-1	bis(2-Chloroethoxy)Methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
120-82-1	Trichlorobenzene	380	U
91-20-3	1,2,4-Trichlorobenzene	380	U
106-47-8	4-Nitroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
59-50-7	4-Chloro-3-Methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	1900	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	1900	U
131-11-3	Dimethyl Phthalate	380	U
208-96-8	Acenaphthylene	380	U
606-20-2	2,6-Dinitrotoluene	380	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
0000720

0023-1001MSD

Lab Name: ITAS-ST. LOUIS Contract: G0626-OU3-0001
 Lab Code: ITSL Case No.: S53001 SAS No.: SDG No.: 0016-0001
 Matrix: (soil/water)SOIL Lab Sample ID: 1530-010MSD
 Sample wt/vol: 30.1 (g/mL)G Lab File ID: A1093
 Level: (low/med) LOW Date Received: 08/30/91
 % Moisture: not dec. 14 dec. Date Extracted: 09/06/91
 Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09/15/91
 GPC Cleanup: (Y/N)N pH: 8.3 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/KG	Q
99-09-2	3-Nitroaniline	1900	U
83-32-9	Acenaphthene	380	U
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	1900	U
132-64-9	Dibenzofuran	380	U
121-14-2	2,4-Dinitrotoluene	380	U
84-66-2	Diethylphthalate	190	BJ
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-10-6	4-Nitroaniline	1900	U
534-52-1	4,6-Dinitro-2-Methylphenol	1900	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
87-86-5	Pentachlorophenol	1900	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
84-74-2	Di-n-Butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	760	U
56-55-3	Benzo(a)Anthracene	380	U
218-01-9	Chrysene	380	U
117-81-7	bis(2-Ethylhexyl)Phthalate	380	U
117-84-0	Di-n-Octyl Phthalate	380	U
205-99-2	Benzo(b)Fluoranthene	380	U
207-08-9	Benzo(k)Fluoranthene	380	U
50-32-8	Benzo(a)Pyrene	380	U
193-39-5	Indeno(1,2,3-cd)Pyrene	380	U
53-70-3	Dibenz(a,h)Anthracene	380	U
191-24-2	Benzo(g,h,i)Perylene	380	U

(1) - Cannot be separated from Diphenylamine

2F
SOIL PESTICIDE SURROGATE RECOVERY

0000725

Lab Name: ITAS-St. Louis Contract: Go 626-043-0001
 Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001
 Level: (low/med) low

	EPA SAMPLE NO.	S1 (DBC) #	S2 (TCMX) #
01	P3LK01	111	96
02	MND33-0016-0001	116	90
03	MND33-0017-0001	114	89
04	MND33-0018-0001	125	104
05	MND33-0019-0001	125	103
06	MND33-0019-1001	125	109
07	MND33-0020-0001	90	83
08	MND33-0021-0001	87	81
09	MND33-0022-0001	83	81
10	MND33-0023-0001	107	85
11	MND33-0023-1001	89	84
12	MND33-0023-1001-MSA	96	87
13	MND33-0023-1001-MSO1	100	89
14	MND33-0023-1001-MSO2	104	90
15	MND33-0023-1001-MSO3	90	84
16	MND33-0024-0001	98	92
17	PEIK01 RE	104	95
18			
19			
20			
21			
22			
23			
24			
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27			
28			
29			
30			

**ADVISORY
QC LIMITS
(24-150)**

S1 (DBC) = Dibutylchlorodate

Column to be used to flag recovery values

* Values outside of QC limits

D Surrogates diluted out

S2 (TCMX) = 2,4,5,6-tetrachloro-meta-xylene

3P
SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

0000726

Lab Name: ITAS-St. Louis Contract: 30626-043-0001
 Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001
 Matrix Spike - EPA Sample No.: MND33-0023-1001 Level: (low/med) low

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
gamma-BHC (Lindane)	31	3.1 u	26	86	46-127
Heptachlor	31	2.3 u	31	107	35-130
Aldrin	31	3.1 u	26	85	34-132
Dieldrin	77	1.5 u	68	88	31-134
Endrin	77	4.6 u	64	84	42-139
4,4'-DDT	77	9.2 u	68	89	23-134
Aroclor-1254	190	1 POU	180	91	

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD REC.
gamma-BHC (Lindane)	31	28	92	7	50 46-127
Heptachlor	31	33	107	6	31 35-130
Aldrin	31	27	87	5	43 34-132
Dieldrin	77	70	90	2	38 31-134
Endrin	77	70	90	7	45 42-139
4,4'-DDT	77	72	94	5	50 23-134
Aroclor 1254	190	170	89	2	

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 7 outside limits
 Spike Recovery: 0 out of 14 outside limits

COMMENTS: No limits established for Aroclor 1254.

4C
PESTICIDE METHOD BLANK SUMMARY

0000727

Lab Name: ITAS St. Louis Contract: 60676-
6113-0001

Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001

Lab Sample ID: B1K10008 Lab File ID: NA

Matrix: (soil/water) soil Level: (low/med) low

Date Extracted: 09-09-91 Extraction: (SepF/Cont/Sonc) Sonic

Date Analyzed (1): 09-18-91 Date Analyzed (2): 09-23-91

Time Analyzed (1): 15:30 Time Analyzed (2): 06:27

Instrument ID (1): GCE Instrument ID (2): GCA

GC Column ID (1): DB-1701 GC Column ID (2): DB-5

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	<u>HN073-0020-0001</u>	<u>1530-006</u>	<u>09-18-91</u>	<u>09-23-91</u>
02	<u>HN073-0021-0001</u>	<u>1530-007</u>	<u>09-18-91</u>	<u>09-23-91</u>
03	<u>HN073-0022-0001</u>	<u>1530-008</u>	<u>09-18-91</u>	
04	<u>HN073-0023-0001</u>	<u>1530-009</u>	<u>09-18-91</u>	
05	<u>HN073-0023-1001</u>	<u>1530-010</u>	<u>09-18-91</u>	
06	<u>HN073-0023-1001MS1</u>	<u>1530-010MS1</u>	<u>09-18-91</u>	
07	<u>HN073-0023-1001MS2</u>	<u>1530-010MS2</u>	<u>09-19-91</u>	
08	<u>HN073-0023-1001MS2</u>	<u>1530-010MS2</u>	<u>09-19-91</u>	
09	<u>HN073-0023-1001MS2</u>	<u>1530-010MS2</u>	<u>09-19-91</u>	
10	<u>HN073-0024-0001</u>	<u>1530-011</u>	<u>09-19-91</u>	
11	<u>HN073-0023-1001MS1-DL</u>	<u>1530-010MS1-DL</u>	<u>09-19-91</u>	
12	<u>HN073-0023-1001MS2-DL</u>	<u>1530-010MS2-DL</u>	<u>09-19-91</u>	
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COMMENTS: _____

ID
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: ITAS-St. Louis Contract: 60626-043-1001 BLK 01
 Lab Code: IISL Case No.: NA SAS No.: _____ SDG No.: 0016-0001
 Matrix: (soil/water) oil Lab Sample ID: BLK 10008
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: NA
 Level: (low/med) low Date Collected: NA
 % Moisture: not dec. 0 dec. NA Date Extracted: 09-09-91
 Extraction: (SepF/Cont/Sonc) Sonc Date Analyzed: 09-18-91
 GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)	u/L/Kg
319-84-6	alpha-BHC	2.0	u
319-85-7	beta-BHC	4.0	u
319-86-8	delta-BHC	6.0	u
58-89-9	gamma-BHC (Lindane)	2.7	u
76-44-8	Heptachlor	2.0	u
309-00-2	Aldrin	2.7	u
1024-57-3	Heptachlor epoxide	56.	u
959-98-8	Endosulfan I	9.7	u
60-57-1	Dieldrin	1.3	u
72-55-9	4,4'-DDE	2.7	u
72-20-8	Endrin	4.0	u
33213-65-9	Endosulfan II	2.7	u
72-54-8	4,4'-DDD	7.4	u
1031-07-8	Endosulfan sulfate	14.	u
50-29-3	4,4'-DDT	8.0	u
72-43-5	Methoxychlor	120.	u
53494-70-5	Endrin ketone	16.	u
5103-71-9	alpha-Chlordane	9.4	u
5103-74-2	gamma-Chlordane	9.4	u
8001-35-2	Toxaphene	160	u
12674-11-2	Aroclor-1016	80	u
11104-28-2	Aroclor-1221	80	u
11141-16-5	Aroclor-1232	80	u
53469-21-9	Aroclor-1242	80	u
12672-29-6	Aroclor-1248	80	u
11097-69-1	Aroclor-1254	160	u
11096-82-5	Aroclor-1260	160	u
7421-93-4	Endrin Aldehyde	15	u

X: Quantitation performed from secondary column.
 Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

4C
PESTICIDE METHOD BLANK SUMMARY

0000729

Lab Name: IFAS - St. Louis Contract: ⁶⁰⁶⁷⁶⁻043-0001
 Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001
 Lab Sample ID: BIK 10008 Hg Clean Lab File ID: NA
 Matrix: (soil/water) soil Level: (low/med) low
 Date Extracted: 09-09-91 Extraction: (SepF/Cont/Sonc) SEMC
 Date Analyzed (1): 09-18-91 Date Analyzed (2): 09-23-91
 Time Analyzed (1): 15:59 Time Analyzed (2): 06:50
 Instrument ID (1): GCE Instrument ID (2): GCA
 GC Column ID (1): DB-1701 GC Column ID (2): DB-5

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	MND73-0016-0001	1530-001	09-18-91	09-23-91
02	MND73-0017-0001	1530-002	09-18-91	
03	MND73-0019-0001	1530-003	09-18-91	
04	MND73-0019-0001	1530-004	09-18-91	09-23-91
05	MND73-0020-0001	1530-005	09-18-91	09-23-91
06				
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COMMENTS: _____

0000730

ID
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: ITAS-St. LouisContract: 60676-
2117-0001

PBK01 RE

Lab Code: JTSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001Matrix: (soil/water) soilLab Sample ID: BIK 10008 Hg cleanSample wt/vol: 30.0 (g/mL) gLab File ID: NALevel: (low/med) lowDate Collected: NA% Moisture: not dec. 0 dec. NADate Extracted: 09-09-91Extraction: (SepF/Cont/Sonc) SoncDate Analyzed: 09-18-91GPC Cleanup: (Y/N) N pH: NADilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)	ug/Kg
319-84-6	alpha-BHC	2.0	u
319-85-7	beta-BHC	4.0	u
319-86-8	delta-BHC	6.0	u
58-89-9	gamma-BHC (Lindane)	2.7	u
76-44-8	Heptachlor	2.0	u
309-00-2	Aldrin	2.7	u
1024-57-3	Heptachlor epoxide	56.	u
959-98-8	Endosulfan I	9.4	u
60-57-1	Dieldrin	1.3	u
72-55-9	4,4'-DDE	2.7	u
72-20-8	Endrin	4.0	u
33213-65-9	Endosulfan II	2.7	u
72-54-8	4,4'-DDD	7.4	u
1031-07-8	Endosulfan sulfate	44.	u
50-29-3	4,4'-DDT	2.0	u
72-43-5	Methoxychlor	120.	u
53494-70-5	Endrin ketone	16.	u
5103-71-9	alpha-Chlordane	9.4	u
5103-74-2	gamma-Chlordane	9.4	u
8001-35-2	Toxaphene	160.	u
12674-11-2	Aroclor-1016	80	u
11104-28-2	Aroclor-1221	80	u
11141-16-5	Aroclor-1232	80	u
53469-21-9	Aroclor-1242	80	u
12672-29-6	Aroclor-1248	80	u
11097-69-1	Aroclor-1254	160	u
11096-82-5	Aroclor-1260	160	u
7421-93-4	Endrin Aldehyde	15	u

X: Quantitation performed from secondary column.

Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 0000731

Lab Name: ITAS-St. Louis Contract: 60626-043001 MND33-0016-0001
 Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-009
 Matrix: (soil/water) soil Lab Sample ID: 1530-001
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: NA
 Level: (low/med) low Date Collected: 08-28-91
 % Moisture: not dec. 21 dec. NA Date Extracted: 09-09-91
 Extraction: (SepF/Cont/Sonc) Sonc Date Analyzed: 09-18-91
 GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) <u>ug/kg</u>	Q
319-84-6	alpha-BHC	2.5	U
319-85-7	beta-BHC	5.1	U
319-86-8	delta-BHC	14	X
58-89-9	gamma-BHC (Lindane)	2.4	U
76-44-8	Heptachlor	2.5	U
309-00-2	Aldrin	3.4	U
1024-57-3	Heptachlor epoxide	30	U
959-98-8	Endosulfan I	1.6	U
60-57-1	Dieldrin	1.6	U
72-55-9	4,4'-DDE	3.4	U
72-20-8	Endrin	5.1	U
33213-65-9	Endosulfan II	2.4	U
72-54-8	4,4'-DDD	2.4	U
1031-07-8	Endosulfan sulfate	5.1	U
50-29-3	4,4'-DDT	10	U
72-43-5	Methoxychlor	150	U
53494-70-5	Endrin ketone	20	U
5103-71-9	alpha-Chlordane	12	U
5103-74-2	gamma-Chlordane	12	U
8001-35-2	Toxaphene	200	U
12674-11-2	Acrochlor-1016	100	U
11104-28-2	Acrochlor-1221	100	U
11141-16-2	Acrochlor-1232	100	U
53469-21-9	Acrochlor-1242	100	U
12672-28-6	Acrochlor-1248	100	U
11097-69-1	Acrochlor-1254	200	U
11096-82-5	Acrochlor-1260	200	U
7421-93-4	Endrin Aldehyde	20	U

X: Quantitation performed from secondary column.
 Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

0000744

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: ITAS-St. Louis Contract: 30626-043-0001 MND33-0017-0001

Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001

Matrix: (soil/water) soil Lab Sample ID: 1530-002

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

Level: (low/med) low Date Collected: 08-28-91

% Moisture: not dec. 27 dec. NA Date Extracted: 09-09-91

Extraction: (SepF/Cont/Sonc) Sonc Date Analyzed: 09-18-91

GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

CONCENTRATION UNITS:
(ug/L or ug/kg) ug/kg

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) <u>ug/kg</u>	Q
319-84-6	alpha-BHC	2.7	U
319-85-7	beta-BHC	5.5	U
319-86-8	delta-BHC	6.2	U
58-89-9	gamma-BHC (Lindane)	3.7	U
76-44-8	Heptachlor	2.7	U
309-00-2	Aldrin	3.7	U
1024-57-3	Heptachlor epoxide	76	U
959-98-8	Endosulfan I	13	U
60-57-1	Dieldrin	1.8	U
72-55-9	4,4'-DDE	3.7	U
72-20-8	Endrin	5.5	U
33213-65-9	Endosulfan II	2.7	U
72-54-8	4,4'-DDD	10	U
1031-07-8	Endosulfan sulfate	60	U
50-29-3	4,4'-DDT	11	U
72-43-5	Methoxychlor	160	U
53494-70-5	Endrin ketone	22	U
5103-71-9	alpha-Chlordane	13	U
5103-74-2	gamma-Chlordane	13	U
8001-35-2	Toluene	220	U
12674-11-2	Acetone-1016	110	U
11104-28-2	Acetone-1221	110	U
11141-16-2	Acetone-1232	110	U
53469-21-3	Acetone-1242	110	U
12672-28-6	Acetone-1248	110	U
11097-69-1	Acetone-1254	220	U
11096-82-5	Acetone-1260	230	U
7421-93-4	Endrin Aldehyde	21	U

X: Quantitation performed from secondary column.
 Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 0000748

Lab Name: ITAS-St. Louis Contract: 0626-043-001 MND33-001F-0001
 Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001
 Matrix: (soil/water) Soil Lab Sample ID: 1530-003
 Sample wt/vol: 30.1 (g/mL) g Lab File ID: NA
 Level: (low/med) low Date Collected: 08-28-91
 % Moisture: not dec. 22 dec. NA Date Extracted: 09-09-91
 Extraction: (SepF/Cont/Sonc) Sonc Date Analyzed: 09-18-91
 GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)	ug/Kg
319-84-6	alpha-BHC	2.6	U
319-85-7	beta-BHC	5.1	U
319-86-8	delta-BHC	7.7	U
58-89-9	gamma-BHC (Lindane)	1.5	U
76-44-8	Heptachlor	2.6	U
309-00-2	Aldrin	3.5	U
1024-57-3	Heptachlor epoxide	71	U
959-98-8	Endosulfan I	12	U
60-57-1	Dieldrin	1.7	U
72-55-9	4,4'-DDE	3.5	U
72-20-8	Endrin	5.1	U
33213-65-9	Endosulfan II	2.5	U
72-54-8	4,4'-DDD	9.5	U
1031-07-8	Endosulfan sulfate	57	U
50-29-3	4,4'-DDT	10	U
72-43-5	Methoxychlor	150	U
53494-70-5	Endrin ketone	21	U
5103-71-9	alpha-Chlordane	12	U
5103-74-2	gamma-Chlordane	12	U
8001-35-2	Toxaphene	210	U
12674-11-2	Aroclor-1216	100	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	100	U
53469-21-9	Aroclor-1242	100	U
12672-29-6	Aroclor-1248	100	U
11097-69-1	Aroclor-1254	200	U
11096-82-5	Aroclor-1260	200	U
7421-93-4	Endrin Aldehyde	20	U

X: Quantitation performed from secondary column.
 Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

0000752

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: ITAS-St. Louis Contract: 80626-043-0001 MN033-0019-0001
 Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001
 Matrix: (soil/water) Soil Lab Sample ID: 1530-004
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: NA
 Level: (low/med) low Date Collected: 08-28-91
 ‡ Moisture: not dec. 18 dec. NA Date Extracted: 09-09-91
 Extraction: (SepF/Cont/Sonc) Sonc Date Analyzed: 09-18-91
 GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>ug/kg</u>	Q
319-84-6	alpha-BHC	2.4	U
319-85-7	beta-BHC	4.9	UY
319-86-8	delta-BHC	7.3	UY
58-89-9	gamma-BHC (Lindane)	3.3	U
76-44-8	Heptachlor	2.4	U
309-00-2	Aldrin	3.3	U
1024-57-3	Heptachlor epoxide	6.8	U
959-98-8	Endosulfan I	11	U
60-57-1	Dieldrin	1.6	U
72-55-9	4,4'-DDE	3.3	U
72-20-8	Endrin	4.9	U
33213-65-9	Endosulfan II	3.3	U
72-54-8	4,4'-DDD	9.0	U
1031-07-8	Endosulfan sulfate	5.4	U
50-29-3	4,4'-DDT	7.7	U
72-43-5	Methoxychlor	14.0	U
53494-70-5	Endrin ketone	20	U
5103-71-9	alpha-Chlordane	11	U
5103-74-2	gamma-Chlordane	11	U
8001-35-2	Toxaphene	300	U
12674-11-2	Aldrin-1216	9.7	U
11104-28-2	Aldrin-1221	9.7	U
11141-16-3	Aldrin-1232	9.7	U
53469-21-9	Aldrin-1242	9.7	U
12672-29-6	Aldrin-1248	9.7	U
11097-69-1	Aldrin-1254	14.0	U
11096-82-5	Aldrin-1260	14.0	U
7421-93-4	Endrin Aldehyde	1.9	U

X: Quantitation performed from secondary column.
 Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0000762

Lab Name: ITAS-St. Louis Contract: 30626-003-00DL PND33-0019-1001
 Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001
 Matrix: (soil/water) Soil Lab Sample ID: 1530-005
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: NA
 Level: (low/med) low Date Collected: 08-28-91
 % Moisture: not dec. 22 dec. NA Date Extracted: 09-09-91
 Extraction: (Sep/Cont/Sonc) Sonc Date Analyzed: 09-18-91
 GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

CONCENTRATION UNITS:

(ug/L or ug/kg) ug/kg

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) <u>ug/kg</u>	Q
319-84-6	alpha-BHC	2.6	U
319-85-7	beta-BHC	5.1	UY
319-86-8	delta-BHC	8.6	UZ
58-89-9	gamma-BHC (Lindane)	3.4	U
76-44-8	Heptachlor	2.6	U
309-00-2	Aldrin	3.4	U
1024-57-3	Heptachlor epoxide	71	U
959-98-8	Endosulfan I	12	U
60-57-1	Dieldrin	1.7	U
72-55-9	4,4'-DDE	3.4	UY
72-20-8	Endrin	5.1	U
33213-65-9	Endosulfan II	3.4	U
72-54-8	4,4'-DDD	4.4	U
1031-07-8	Endosulfan sulfate	56	U
50-29-3	4,4'-DDT	10	U
72-43-5	Methoxychlor	150	U
53494-70-5	Endrin ketone	20	U
5103-71-9	alpha-Chlordane	12	U
5103-74-2	gamma-Chlordane	12	U
8001-35-2	Toxaphene	200	U
12674-11-2	Arbor-1016	100	U
11104-28-2	Arbor-1221	100	U
11141-16-2	Arbor-1232	100	U
53469-27-0	Arbor-1242	100	U
12672-25-4	Arbor-1248	100	U
11097-62-1	Arbor-1254	200	U
11096-82-5	Arbor-1260	200	U
7421-93-4	Endrin Aldehyde	20	U

- X: Quantitation performed from secondary column.
 Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.
 Z: Elevated Detection Limit due to a small amount of Arbor-1248 which interferes with this compound. The Arbor-1248 concentration is less than the CRDL.

FORM I PEST

0000771

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: ITAS-St. LouisContract: 20626-843-0001

MNO33-0020-0001

Lab Code: ITSCase No.: NA

SAS No.:

SDG No.: 0016-0001Matrix: (soil/water) SoilLab Sample ID: 1530-006Sample wt/vol: 30.1 (g/mL) gLab File ID: NALevel: (low/med) lowDate Collected: 08-29-91* Moisture: not dec. 18 dec. NADate Extracted: 09-04-91Extraction: (Sep/Cont/Sonc) SoncDate Analyzed: 09-18-91GPC Cleanup: (Y/N) NpH: NADilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
319-84-6	alpha-BHC	2.4	u
319-85-7	beta-BHC	4.4	u
319-86-8	delta-BHC	7.3	u
58-89-9	gamma-BHC (Lindane)	3.3	u
76-44-8	Heptachlor	2.4	u
309-00-2	Aldrin	3.3	u
1024-57-3	Heptachlor epoxide	6.8	u
959-98-8	Endosulfan I	11	u
60-57-1	Dieldrin	1.6	u
72-55-9	4,4'-DDE	3.3	u
72-20-8	Endrin	4.4	u
33213-65-9	Endosulfan II	3.3	u
72-54-8	4,4'-DDD	7.0	u
1031-07-8	Endosulfan sulfate	5.4	u
50-29-3	4,4'-DDT	9.7	u
72-43-5	Methoxychlor	140	u
53494-70-5	Endrin ketone	1.9	u
5103-71-9	alpha-Chlordane	11	u
5103-74-2	gamma-Chlordane	11	u
8001-35-2	Toxaphene	200	u
12674-11-2	Aroclor-1216	97	u
11104-28-2	Aroclor-1221	97	u
11141-16-3	Aroclor-1232	97	u
53469-21-8	Aroclor-1242	97	u
12672-29-6	Aroclor-1248	97	u
11097-69-1	Aroclor-1254	190	u
11096-82-5	Aroclor-1260	190	u
7421-93-4	Endrin Aldehyde	1.9	u

X: Quantitation performed from secondary column.

Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

FORM I PEST

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 0000778

Lab Name: ITAS-St. Louis Contract: 30626 - 043-0001 MN933-0021-0001

Lab Code: IISL Case No.: NA SAS No.: _____ SDG No.: 0016001

Matrix: (soil/water) Soil Lab Sample ID: 1530-007

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

Level: (low/med) low Date Collected: 08-29-91

Moisture: not dec. 9 dec. NA Date Extracted: 09-09-91

Extraction: (SepF/Cont/Sonc) Sonc Date Analyzed: 09-18-91

GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
319-84-6	alpha-BHC	2.2	U
319-85-7	beta-BHC	4.4	U
319-86-8	delta-BHC	6.5	UY
58-89-9	gamma-BHC (Lindane)	2.9	U
76-44-8	Heptachlor	2.2	U
309-00-2	Aldrin	2.9	U
1024-57-3	Heptachlor epoxide	61	U
959-98-8	Endosulfan I	10	U
60-57-1	Dieldrin	1.4	U
72-55-9	4,4'-DDE	2.9	U
72-20-8	Endrin	4.4	U
33213-65-9	Endosulfan II	2.9	U
72-54-8	4,4'-DDD	8.1	U
1031-07-8	Endosulfan sulfate	48	U
50-29-3	4,4'-DDT	8.7	U
72-43-5	Methoxychlor	130	U
53494-70-5	Endrin ketone	18	U
5103-71-9	alpha-Chlordane	10	U
5103-74-2	gamma-Chlordane	10	U
8001-35-2	Toxaphene	180	U
12674-11-2	Aroclor-1016	87	U
11104-28-2	Aroclor-1221	87	U
11141-16-3	Aroclor-1232	87	U
53469-21-9	Aroclor-1242	87	U
12672-29-6	Aroclor-1248	87	U
11097-69-1	Aroclor-1254	170	U
11096-82-5	Aroclor-1260	170	U
7421-93-4	Endrin Aldehyde	17	U

X: Quantitation performed from secondary column.
 Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: ITAS-St. Louis Contract: 80626-003-0001 MND33-0022-0001
 Lab Code: IITSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001
 Matrix: (soil/water) Soil Lab Sample ID: 1530-008
 Sample wt/vol: 30.1 (g/mL) g Lab File ID: NA
 Level: (low/med) low Date Collected: 08-29-91
 % Moisture: not dec. 13 dec. NA Date Extracted: 09-09-91
 Extraction: (SepF/Cont/Sonc) Sonc Date Analyzed: 09-18-91
 GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg)	ug/Kg	Q
319-84-6	alpha-BHC	2.3		U
319-85-7	beta-BHC	4.6		U
319-86-8	delta-BHC	6.9		U
58-89-9	gamma-BHC (Lindane)	3.1		U
76-44-8	Heptachlor	2.3		U
309-00-2	Aldrin	3.1		U
1024-57-3	Heptachlor epoxide	64		U
959-98-8	Endosulfan I	11		U
60-57-1	Dieldrin	1.5		U
72-55-9	4,4'-DDE	2.1		U
72-20-8	Endrin	4.6		U
33213-65-9	Endosulfan II	3.1		U
72-54-8	4,4'-DDD	8.5		U
1031-07-8	Endosulfan sulfate	50		U
50-29-3	4,4'-DDT	9.1		U
72-43-5	Methoxychlor	180		U
53494-70-5	Endrin ketone	18		U
5103-71-9	alpha-Chlordane	11		U
5103-74-2	gamma-Chlordane	11		U
8001-35-2	Toxaphene	180		U
12674-11-2	Aroclor-1216	92		U
11104-28-2	Aroclor-1221	92		U
11141-16-3	Aroclor-1232	92		U
53469-21-9	Aroclor-1242	92		U
12672-29-6	Aroclor-1248	92		U
11097-62-1	Aroclor-1254	180		U
11096-82-5	Aroclor-1260	180		U
7421-93-4	Endrin Aldehyde	18		U

X: Quantitation performed from secondary column.
 Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

ID
 PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: ITAS-St. Louis Contract: G0626-003-0001 RWD33-003-0001
 Lab Code: IISL Case No.: NA SAS No.: _____ SDG No.: 0016-0001
 Matrix: (soil/water) Soil Lab Sample ID: 1530-009
 Sample wt/vol: 30.1 (g/mL) g Lab File ID: NA
 Level: (low/med) low Date Collected: 08-29-91
 † Moisture: not dec. 14 dec. NA Date Extracted: 09-09-91
 Extraction: (SepF/Cont/Sonc) Sonc Date Analyzed: 09-18-91
 GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
319-84-6	alpha-BHC	2.3	U
319-85-7	beta-BHC	4.6	U
319-86-8	delta-BHC	7.0	U
58-89-9	gamma-BHC (Lindane)	3.1	U
76-44-8	Heptachlor	2.3	U
309-00-2	Aldrin	3.1	U
1024-57-3	Heptachlor epoxide	64	U
959-98-8	Endosulfan I	11	U
60-57-1	Dieldrin	1.5	U
72-55-9	4,4'-DDE	3.1	U
72-20-8	Endrin	4.6	U
33213-65-9	Endosulfan II	3.1	U
72-54-8	4,4'-DDD	8.6	U
1031-07-8	Endosulfan sulfate	51	U
50-29-3	4,4'-DDT	9.3	U
72-43-5	Methoxychlor	140	U
53494-70-5	Endrin ketone	19	U
5103-71-9	alpha-Chlordane	11	U
5103-74-2	gamma-Chlordane	11	U
8001-35-2	Toxaphene	190	U
12674-11-2	Aroclor-1016	93	U
11104-28-2	Aroclor-1221	93	U
11141-16-5	Aroclor-1232	93	U
53469-21-9	Aroclor-1242	93	U
12672-29-6	Aroclor-1248	93	U
11097-69-1	Aroclor-1254	180	U
11096-82-5	Aroclor-1260	180	U
7421-93-4	Endrin Aldehyde	18	U

X: Quantitation performed from secondary column.
 Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

ID
 PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: ITAS-St. Louis Contract: G0626-043-0001 MND33-0023-1001
 Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001
 Matrix: (soil/water) Soil Lab Sample ID: 1530-010
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: NA
 Level: (low/med) low Date Collected: 08-29-91
 % Moisture: not dec. 14 dec. NA Date Extracted: 09-09-91
 Extraction: (SepF/Cont/Sonc) Sonc Date Analyzed: 09-18-91
 GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)	ug/kg
319-84-6	alpha-BHC	2.3	u
319-85-7	beta-BHC	4.6	u
319-86-8	delta-BHC	3.0	u
58-89-9	gamma-BHC (Lindane)	3.1	u
76-44-8	Heptachlor	2.3	u
309-00-2	Aldrin	3.1	u
1024-57-3	Heptachlor epoxide	64	u
959-98-8	Endosulfan I	11	u
60-57-1	Dieldrin	1.5	u
72-55-9	4,4'-DDE	3.1	u
72-20-8	Endrin	4.6	u
33213-65-9	Endosulfan II	7.1	u
72-54-8	4,4'-DDD	8.6	u
1031-07-8	Endosulfan sulfate	51	u
50-29-3	4,4'-DDT	4.3	u
72-43-5	Methoxychlor	140	u
53494-70-5	Endrin ketone	18	u
5103-71-9	alpha-Chlordane	11	u
5103-74-2	gamma-Chlordane	11	u
8001-35-2	Toxaphene	140	u
12674-11-2	Aroclor-1016	93	u
11104-28-2	Aroclor-1221	93	u
11141-16-5	Aroclor-1232	93	u
53469-21-9	Aroclor-1242	93	u
12672-29-6	Aroclor-1248	93	u
11097-69-1	Aroclor-1254	180	u
11096-82-5	Aroclor-1260	180	u
7421-93-4	Endrin Aldehyde	18	u

X: Quantitation performed from secondary column.
 Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

ID
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: ITAS-St. Louis Contract: 20626-013-0001 MN033-0024-0001

Lab Code: IISI Case No.: NA SAS No.: _____ SDG No.: 0016-0001

Matrix: (soil/water) Soil Lab Sample ID: 1530-011

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

Level: (low/med) low Date Collected: 08-29-91

% Moisture: not dec. 9 dec. NA Date Extracted: 09-09-91

Extraction: (Sep/Cont/Sonc) Sonc Date Analyzed: 09-19-91

GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)	u/kg
319-84-6	alpha-BHC	2.2	u
319-85-7	beta-BHC	4.4	u
319-86-8	delta-BHC	6.6	u
58-89-9	gamma-BHC (Lindane)	3.0	u
76-44-8	Heptachlor	2.2	u
309-00-2	Aldrin	3.0	u
1024-57-3	Heptachlor epoxide	61	u
959-98-8	Endosulfan I	10	u
60-57-1	Dieldrin	1.4	u
72-55-9	4,4'-DDE	3.0	u
72-20-8	Endrin	4.4	u
33213-65-9	Endosulfan II	3.0	u
72-54-8	4,4'-DDD	8.1	u
1031-07-8	Endosulfan sulfate	49	u
50-29-3	4,4'-DDT	8.8	u
72-43-5	Methoxychlor	130	u
53494-70-5	Endrin ketone	18	u
5103-71-9	alpha-Chlordane	10	u
5103-74-2	gamma-Chlordane	10	u
8001-35-2	Toxaphene	180	u
12674-11-2	Aroclor-1016	88	u
11104-28-2	Aroclor-1221	88	u
11141-16-5	Aroclor-1232	88	u
53469-21-9	Aroclor-1242	88	u
12672-29-6	Aroclor-1248	88	u
11097-69-1	Aroclor-1254	180	u
11096-82-5	Aroclor-1260	180	u
7421-93-4	Endrin Aldehyde	17	u

X: Quantitation performed from secondary column.
 Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

20-0001

Lab Name: ITAS_ST._LOUIS Contract: GO626/OU3000

Lab Code: ITSL Case No.: SAS No.: SDG No.: 0016-0001

Matrix (soil/water): SOIL Lab Sample ID: 1530-006

Level (low/med): LOW Date Received: 08/30/91

% Solids: 82.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7020	-		P
7440-36-0	Antimony	5.3	U		P
7440-38-2	Arsenic	5.6	B	M	F
7440-39-3	Barium	31.3			P
7440-41-7	Beryllium	0.24	B	N	P
7440-43-9	Cadmium	0.47	U	N	P
7440-70-2	Calcium	162000			P
7440-47-3	Chromium	7.6			P
7440-48-4	Cobalt	4.1	B		P
7440-50-8	Copper	11.9		E	P
7439-89-6	Iron	11500		E	P
7439-92-1	Lead	8.0		M*	F
7439-95-4	Magnesium	62500			P
7439-96-5	Manganese	238			P
7439-97-6	Mercury	0.06	U	M	CV
7440-02-0	Nickel	11.7			P
7440-09-7	Potassium	2230			P
7782-49-2	Selenium	0.12	U	WMN	F
7440-22-4	Silver	0.46	B		P
7440-23-5	Sodium	225	B		P
7440-28-0	Thallium	0.37	B	M	F
7440-62-2	Titanium	14.1			P
7440-50-6	Zinc	35.7			P
	Cyanide	0.61	U	M	AS

Color Before: GREY Clarity Before: OPAQUE Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

PB-5X_DILUTION
AS-5X_DILUTION
CA-200X_DILUTION; MG-20X_DILUTION

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

21-0001

Lab Name: ITAS ST. LOUIS Contract: G0626/OU3000

Lab Code: ITSL Case No.: SAS No.: SDG No.: 0016-0001

Matrix (soil/water): SOIL Lab Sample ID: 1530-007

Level (low/med): LOW Date Received: 08/30/91

% Solids: 91.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7270	-		P
7440-36-0	Antimony	4.4	U		P
7440-38-2	Arsenic	4.7	B	M	F
7440-39-3	Barium	66.3	-		P
7440-41-7	Beryllium	0.28	B	N	P
7440-43-9	Cadmium	0.40	U	N	P
7440-70-2	Calcium	163000	-		P
7440-47-3	Chromium	7.6	-		P
7440-48-4	Cobalt	3.6	B		P
7440-50-8	Copper	11.2	-	E	P
7439-89-6	Iron	11900	-	E	P
7439-92-1	Lead	7.4	-	M*	F
7439-95-4	Magnesium	58600	-		P
7439-96-5	Manganese	226	-		P
7439-97-6	Mercury	0.05	U	M	CV
7440-02-0	Nickel	9.7	-		P
7440-09-7	Potassium	2270	-		P
7782-49-2	Selenium	0.10	U	WMN	F
7440-22-4	Silver	0.30	U		P
7440-23-5	Sodium	195	B		P
7440-28-0	Thallium	0.32	B	M	F
7440-62-2	Vanadium	14.3	-		P
7440-68-4	Zinc	35.1	-		P
	Cyanide	0.55	U	M	AS

Color Before: GREY Clarity Before: OPAQUE Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

PB-5X DILUTION

AS-5X DILUTION

CA, MG- 50X DILUTION

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

22-0001

Lab Name: ITAS_ST._LOUIS Contract: G0626/OU30001

Lab Code: ITSL Case No.: SAS No.: SDG No.: 0016-0001

Matrix (soil/water): SOIL Lab Sample ID: 1530-008

Level (low/med): LOW Date Received: 08/30/91

* Solids: 87.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8510			P
7440-36-0	Antimony	7.5			P
7440-38-2	Arsenic	8.7		MS	F
7440-39-3	Barium	69.6			P
7440-41-7	Beryllium	0.42	B	N	P
7440-43-9	Cadmium	0.45	U	N	P
7440-70-2	Calcium	132000			P
7440-47-3	Chromium	8.9			P
7440-48-4	Cobalt	4.7	B		P
7440-50-8	Copper	15.1		E	P
7439-89-6	Iron	14600		E	P
7439-92-1	Lead	8.2		M*	F
7439-95-4	Magnesium	44100			P
7439-96-5	Manganese	254			P
7439-97-6	Mercury	0.05	U	M	CV
7440-02-0	Nickel	12.1			P
7440-09-7	Potassium	2610			P
7782-49-2	Selenium	0.12	B	WMN	F
7440-22-4	Silver	0.34	U		P
7440-23-5	Sodium	184	B		P
7440-28-0	Thallium	0.35	B		F
7440-62-1	Vanadium	16.3			P
7440-66-6	Zinc	43.0			P
	Cyanide	0.57	U	M	AS

Color Before: GREY Clarity Before: OPAQUE Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

PB-5X DILUTION
AS-5X DILUTION, MSA
CA, MG- 50X DILUTION

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

23-0001

Lab Name: ITAS_ST. LOUIS Contract: GO626/OU3000

Lab Code: ITSL Case No.: SAS No.: SDG No.: 0016-0001

Matrix (soil/water): SOIL Lab Sample ID: 1530-009

Level (low/med): LOW Date Received: 08/30/91

‡ Solids: 86.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6200			P
7440-36-0	Antimony	6.5	B		P
7440-38-2	Arsenic	4.2	B	M	P
7440-39-3	Barium	101			P
7440-41-7	Beryllium	0.18	B	N	P
7440-43-9	Cadmium	0.45	U	N	P
7440-70-2	Calcium	149000			P
7440-47-3	Chromium	6.1			P
7440-48-4	Cobalt	3.7	B		P
7440-50-8	Copper	11.6		E	P
7439-89-6	Iron	10400		E	P
7439-92-1	Lead	7.7		M	F
7439-95-4	Magnesium	61400			P
7439-96-5	Manganese	234			P
7439-97-6	Mercury	0.06	U	M	CV
7440-02-0	Nickel	12.3			P
7440-09-7	Potassium	2000			P
7782-49-2	Selenium	0.12	U	WMN	F
7440-22-4	Silver	0.34	U		P
7440-23-5	Sodium	272	B		P
7440-28-0	Thallium	0.35	B	M	F
7440-50-8	Titanium	11.7			P
7440-50-8	Zinc	32.9			P
7440-50-8	Vanadate	0.58	U	M	AS

Color Before: GAY Clarity Before: OPAQUE Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

PB-5X DILUTION
AS-5X DILUTION
CA, MG- 50X DILUTION

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

23-1001

Lab Name: ITAS_ST._LOUIS _____ Contract: G0626/OU300

Lab Code: ITSL _____ Case No.: _____ SAS No.: _____ SDG No.: 0016-0001

Matrix (soil/water): SOIL _____ Lab Sample ID: 1530-010 _____

Level (low/med): LOW _____ Date Received: 08/30/91

‡ Solids: _____ 86.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5970			P
7440-36-0	Antimony	4.8	U		P
7440-38-2	Arsenic	5.8		M	F
7440-39-3	Barium	51.1			P
7440-41-7	Beryllium	0.21	B	N	P
7440-43-9	Cadmium	0.43	U	N	P
7440-70-2	Calcium	139000			P
7440-47-3	Chromium	6.1			P
7440-48-4	Cobalt	4.7	B		P
7440-50-8	Copper	10.6		E	P
7439-89-6	Iron	10700		E	P
7439-92-1	Lead	8.9		M*	F
7439-95-4	Magnesium	53400			P
7439-96-5	Manganese	250			P
7439-97-6	Mercury	0.05	U	M	CV
7440-02-0	Nickel	13.0			P
7440-09-7	Potassium	1720			P
7782-49-2	Selenium	0.11	U	WMN	F
7440-22-4	Silver	0.32	U		P
7440-23-5	Sodium	224	B		P
7440-28-0	Thallium	0.24	B	M	F
7440-62-2	Vanadium	12.4			P
7440-46-0	Zinc	36.0			P
	Cyanide	0.58	U	M	AS

Color Before: GREY _____ Clarity Before: OPAQUE _____ Texture: MEDIUM

Color After: COLORLESS _____ Clarity After: CLEAR _____ Artifacts: _____

Comments:

PB-5X DILUTION _____

AS-5X DILUTION _____

CA, MG- 50X DILUTION _____

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

24-0001

Lab Name: ITAS_ST._LOUIS _____ Contract: G0626/OU3000

Lab Code: ITSL _____ Case No.: _____ SAS No.: _____ SDG No.: 0016-0001

Matrix (soil/water): SOIL _____ Lab Sample ID: 1530-011 _____

Level (low/med): LOW _____ Date Received: 08/30/91

‡ Solids: _____ 90.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9070			P
7440-36-0	Antimony	4.6	U		P
7440-38-2	Arsenic	7.6		M	F
7440-39-3	Barium	40.7			P
7440-41-7	Beryllium	0.34	B	N	P
7440-43-9	Cadmium	0.41	U	N	P
7440-70-2	Calcium	130000			P
7440-47-3	Chromium	9.7			P
7440-48-4	Cobalt	5.3			P
7440-50-8	Copper	13.4		E	P
7439-89-6	Iron	14600		E	P
7439-92-1	Lead	9.4		M*	F
7439-95-4	Magnesium	48100			P
7439-96-5	Manganese	265			P
7439-97-6	Mercury	0.05	U	M	CV
7440-02-0	Nickel	12.7			P
7440-09-7	Potassium	2390			P
7782-49-2	Selenium	0.11	U	WMN	F
7440-22-4	Silver	0.57	B		P
7440-23-5	Sodium	183	B		P
7440-28-0	Thallium	0.22	B	M	F
7440-62-1	Vanadium	16.8			P
7440-50-8	Zinc	42.3			P
7440-55-6	Cyanide	0.55	U	M	AS

Color Before: GREY _____ Clarity Before: OPAQUE _____ Texture: MEDIUM

Color After: COLORLESS _____ Clarity After: CLEAR _____ Artifacts: _____

Comments:

PB-5X_DILUTION _____
 AS-5X_DILUTION _____

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

23-10015

Lab Name: ITAS ST. LOUIS _____

Contract: G0626/OU30
001

Lab Code: ITSL _____

Case No.: _____

SAS No.: _____

SDG No.: 0016-000

Matrix (soil/water): SOIL _____

Level (low/med): LOW _____

‡ Solids for Sample: 86.2

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

Analyte	Control Limit %R	Spiked Sample Result (SSR) C	Sample Result (SR) C	Spike Added (SA)	%R	Q	M
Aluminum							NR
Antimony	75-125	44.8663	4.7894 U	56.32	79.7		P
Arsenic	75-125	10.0374	5.7656	4.22	101.2		F
Barium	75-125	242.2071	51.1175	225.26	84.8		P
Beryllium	75-125	4.4286	0.2139 B	5.63	74.9	N	P
Cadmium	75-125	3.6661	0.4257 U	5.63	65.1	N	P
Calcium							NR
Chromium	75-125	25.6673	6.1368	22.53	86.7		P
Cobalt	75-125	49.2048	4.6617 B	56.32	79.1		P
Copper	75-125	34.5967	10.5505	28.16	85.4		P
Iron							NR
Lead		9.2992	8.9236	2.11	17.8		F
Magnesium							NR
Manganese		291.9807	249.8361	56.32	74.8		P
Mercury	75-125	0.5336	0.0527 U	0.58	92.0		CV
Nickel	75-125	57.7569	13.0143	56.32	79.4		P
Potassium							NR
Selenium	75-125	0.7377	0.1074 U	1.05	70.3	N	F
Silver	75-125	5.3984	0.3193 U	5.63	95.9		P
Sodium							NR
Thallium	75-125	5.3232	0.2411 B	5.27	96.4		F
Vanadium	75-125	4.3844	12.3938	56.32	83.4		P
Zinc	75-125	32.0364	35.9905	56.32	80.0		P
Cyanide	75-125	2.4301	0.5847 U	11.49	82.1		AS

Comments:

PB-10X DILUTION

AS-5X DILUTION

5B
POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

23-1001A

Lab Name: ITAS ST. LOUIS Contract: G0626/OU30001

Lab Code: ITSL Case No.: SAS No.: SDG No.: 0016-000

Matrix (soil/water) : SOIL Level (low/med): LOW

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR) C	Sample Result (SR) C	Added (SA)	%R	Q	M
Aluminum							NR
Antimony							NR
Arsenic							NR
Barium							NR
Beryllium							NR
Cadmium		4.00 U	4.00 U	10.0	0.0		P
Calcium							NR
Chromium							NR
Cobalt							NR
Copper							NR
Iron							NR
Lead							NR
Magnesium							NR
Manganese							NR
Mercury							NR
Nickel							NR
Potassium							NR
Selenium		11.17	4.43	10.0	62.4		NR
Silver							NR
Sodium							NR
Thallium							NR
Vanadium							NR
Zinc							NR
Cyanide							NR

Comments:

6
DUPLICATES

EPA SAMPLE NO.

23-1001D

Lab Name: ITAS_ST._LOUIS Contract: G0626/OU3000

Lab Code: ITSL Case No.: SAS No.: SDG No.: 0016-0001

Matrix (soil/water): SOIL Level (low/med): LOW

‡ Solids for Sample: 86.2 ‡ Solids for Duplicate: 86.5

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

Analyte	Control Limit	Sample (S) C	Duplicate (D) C	RPD	Q	M
Aluminum		5969.0638	6799.3943	13.0		P
Antimony		4.7894	5.5651	200.0		P
Arsenic	1.1	5.7656	4.8579	17.1		F
Barium	21.3	51.1175	58.1151	12.8		P
Beryllium		0.2139	0.4261	66.3		P
Cadmium		0.4257	0.4462			P
Calcium		138526.5118	134248.6280	3.1		P
Chromium		6.1368	7.4614	19.5		P
Cobalt		4.6617	4.8289	3.5		P
Copper	2.7	10.5505	11.3087	6.9		P
Iron		10707.7726	11744.6234	9.2		P
Lead		8.9236	6.9364	25.1	*	F
Magnesium		53364.2691	50196.3234	6.1		P
Manganese		249.8361	253.0809	1.3		P
Mercury		0.0527	0.0552			CV
Nickel	4.3	13.0143	13.0711	0.4		P
Potassium	532.2	1716.0774	2233.5345	26.2		P
Selenium		0.1074	0.1074			P
Silver		0.3193	0.5220	200.0		P
Sodium		223.5818	227.3804	1.7		P
Thallium		0.2411	0.1638	38.2		F
Vanadium	5.3	12.3938	13.5039	8.6		P
Zinc		35.9905	37.8001	4.9		P
Cyanide		0.5847	0.5720			AS

Inter-Office Memorandum



TO: Kris Anderson (DEN)
Lyn Lawlor (5-2)
cc: Cemantha Davisson (w/att)
William Little (w/o att)

FROM: John Price *JBP*

DATE: 28 October 1991

PROJECT: Mound W.O. NO.:
SUBJECT: Ohio EPA Data Building 51 and Building 34 sites

ACTION:

Attached you will find the results of split samples that Ohio EPA collected at the Building 34 and Building 51 tank sites. Please retain for your records.

jp\

REPORT Ohio EPA DERR
TO P.O. Box 1049
Columbus, OH 43266-0149
614-644-2295
ATTEN Steve McBride

PREPARED KEMRON ENVIRONMENTAL SERVICES
BY 109 STARLITE PARK
MARIETTA, OHIO 45750

David J. Benjamin
CERTIFIED BY

ATTEN _____
PHONE (614) 373-4071

CONTACT D HILL

CLIENT OEPA 56664 SAMPLES 3
COMPANY Ohio EPA
FACILITY 1800 Watermark Dr.
Columbus, Ohio 43215

ANALYTICAL METHODS AND DOCUMENTATION ARE FOUND AT THE END OF
THIS REPORT. ALL RESULTS ON SOILS/SLUDGES ARE REPORTED
"AS RECEIVED" UNLESS OTHERWISE SPECIFIED.

WORK ID K910828-1/Doe Mound
TAKEN Martha Hatcher
TRANS Fed Ex
TYPE _____
P.O. # 348504/072591
INVOICE under separate cover

SAMPLE IDENTIFICATION

- 01 K910828-1/MND33-0016-0001
- 02 K910828-1/MND33-0019-0001
- 03 K910828-1/MND33-0021-0001

TEST CODES and NAMES used on this workorder

<u>AG S</u>	<u>Silver, Total</u>	<u>SB S</u>	<u>Antimony, Total</u>
<u>AL S</u>	<u>Aluminum, Total</u>	<u>SE S</u>	<u>Selenium, Total</u>
<u>AS S</u>	<u>Arsenic, Total</u>	<u>TL S</u>	<u>Thallium, Total</u>
<u>BA S</u>	<u>Barium, Total</u>	<u>TPH S</u>	<u>Petroleum Hydrocarbons</u>
<u>BE S</u>	<u>Beryllium, Total</u>	<u>V S</u>	<u>Vanadium, Total</u>
<u>CA S</u>	<u>Calcium, Total</u>	<u>ZN S</u>	<u>Zinc, Total</u>
<u>CD S</u>	<u>Cadmium, Total</u>		
<u>CO S</u>	<u>Cobalt, Total</u>		
<u>CR S</u>	<u>Chromium, Total</u>		
<u>CU S</u>	<u>Copper, Total</u>		
<u>FE S</u>	<u>Iron, Total</u>		
<u>HG S</u>	<u>Mercury, Total</u>		
<u>K S</u>	<u>Potassium, Total</u>		
<u>M8080</u>	<u>Pesticides and PCB's</u>		
<u>M8240</u>	<u>Volatile Organics</u>		
<u>MG S</u>	<u>Magnesium, Total</u>		
<u>MN S</u>	<u>Manganese, Total</u>		
<u>NA S</u>	<u>Sodium, Total</u>		
<u>NI S</u>	<u>Nickel, Total</u>		
<u>PB S</u>	<u>Lead, Total</u>		
<u>PCT S</u>	<u>Percent Solids</u>		

91001-3
RECEIVED
KEMRON ENVIRONMENTAL SERVICES

SAMPLE ID <u>K910828-1/MND33-0016-0001</u>		SAMPLE # <u>01</u>		FRACTIONS: <u>A, B</u>	
		Date & Time Collected <u>08/28/91</u>		Category <u>SOIL</u>	
AG_S <u><2</u> mg/kg Ag	AL_S <u>930</u> mg/kg Al	AS_S <u>2.2</u> mg/kg As	BA_S <u>45</u> mg/kg Ba	BE_S <u>1</u> mg/kg Be	CA_S <u>40,000</u> mg/kg Ca
CD_S <u><0.5</u> mg/kg Cd	CO_S <u>8</u> mg/kg Co	CR_S <u>12</u> mg/kg Cr	CU_S <u>14</u> mg/kg Cu	FE_S <u>19,000</u> mg/kg Fe	HG_S <u><0.25</u> mg/kg Hg
K_S <u>1300</u> mg/kg K	MG_S <u>9800</u> mg/kg Mg	MN_S <u>480</u> mg/kg Mn	NA_S <u>150</u> mg/kg Na	NI_S <u>15</u> mg/kg Ni	PB_S <u>10</u> mg/kg Pb
PCT_S <u>79</u> % wt.	SB_S <u><10</u> mg/kg Sb	SE_S <u>0.3</u> mg/kg Se	TL_S <u><0.25</u> mg/kg Tl	TPH_S <u><25</u> mg/kg	V_S <u>41</u> mg/kg V
ZN_S <u>44</u> mg/kg Zn					

SAMPLE ID K910828-1/MND33-0016-0001 FRACTION 01B TEST CODE M8080 NAME Pesticides and PCB's
Date & Time Collected 08/28/91 Category SOIL

ANALYST: SLN EXTRACTED: 09/03/91 FILE #: 4570
INSTRMT: HP_IV INJECTED: 09/10/91 FACTOR: 165 * UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
319-84-6	alpha-BHC	BDL	8
319-85-7	beta-BHC	BDL	8
319-86-8	delta-BHC	BDL	8
58-89-9	gamma-BHC (Lindane)	BDL	8
76-44-8	Heptachlor	BDL	8
309-00-2	Aldrin	BDL	8
1024-57-3	Heptachlor epoxide	BDL	8
959-98-8	Endosulfan I	BDL	8
60-57-1	Dieldrin	BDL	17
72-55-9	4,4'-DDE	BDL	17
72-20-8	Endrin	BDL	17
33213-65-9	Endosulfan II	BDL	17
72-54-8	4,4'-DDD	BDL	17
1031-07-8	Endosulfan sulfate	BDL	17
50-29-3	4,4'-DDT	BDL	17
72-43-5	Methoxychlor	BDL	83
53494-70-5	Endrin ketone	BDL	17
5103-71-9	alpha-Chlordane	BDL	83
5103-74-2	gamma-Chlordane	BDL	83
8001-35-2	Toxaphene	BDL	165
12674-11-2	Aroclor-1016	BDL	83
11104-28-2	Aroclor-1221	BDL	83
11141-16-5	Aroclor-1232	BDL	83
5369-21-9	Aroclor-1242	BDL	83
12672-29-6	Aroclor-1248	BDL	83
11097-69-1	Aroclor-1254	BDL	165
11096-82-5	Aroclor-1260	BDL	165

NOTES AND DEFINITIONS FOR THIS REPORT.

BDL=BELOW DETECTION LIMIT

NA = NOT ANALYZED

* = ELEVATED DETECTION LIMIT DUE TO SAMPLE MATRIX INTERFERENCE

SAMPLE ID K910828-1/MND33-0016-0001 FRACTION 01A TEST CODE M8240 NAME Volatile Organics
Date & Time Collected 08/28/91 Category SOIL

ANALYST: JLK FILE #: 20E19525
INSTRMT: FINN2 INJECTED: 09/08/91 FACTOR: 1 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	PQL
74-87-3	Chloromethane	BQL	10
74-83-9	Bromomethane	BQL	10
75-01-4	Vinyl chloride	BQL	10
75-00-3	Chloroethane	BQL	10
75-09-2	Methylene chloride	940	5.0
67-64-1	Acetone	440	100
75-15-0	Carbon disulfide	BQL	5.0
75-35-4	1,1-Dichloroethene	BQL	5.0
75-34-3	1,1-Dichloroethane	BQL	5.0
156-60-5	trans-1,2-Dichloroethene	BQL	
67-66-3	Chloroform	BQL	5.0
107-06-2	1,2-Dichloroethane	BQL	5.0
78-93-3	2-Butanone	190	100
71-55-6	1,1,1-Trichloroethane	7	5.0
56-23-5	Carbon tetrachloride	BQL	5.0
108-05-4	Vinyl acetate	BQL	10
75-27-4	Bromodichloromethane	BQL	5.0
78-87-5	1,2-Dichloropropane	BQL	5.0
10061-01-5	cis-1,3-Dichloropropene	BQL	5.0
79-01-6	Trichloroethene	BQL	5.0
124-48-1	Dibromochloromethane	BQL	5.0
79-00-5	1,1,2-Trichloroethane	BQL	5.0
71-43-2	Benzene	BQL	5.0
10061-02-6	trans-1,3-Dichloropropene	BQL	5.0
110-75-8	2-Chloroethyl vinyl ether	BQL	10
75-25-2	Bromoform	BQL	5.0
591-78-6	2-Hexanone	BQL	10
108-10-1	4-Methyl-2-pentanone	BQL	10
127-18-4	Tetrachloroethene	BQL	5.0
108-88-3	Toluene	25	5.0
79-34-5	1,1,2,2,-Tetrachloroethane	BQL	5.0
108-90-7	Chlorobenzene	14	5.0

SAMPLE ID K910828-1/MND33-0016-0001 FRACTION 01A TEST CODE M8240 NAME Volatile Organics
Date & Time Collected 08/28/91 Category SOIL

CAS#	COMPOUND	RESULT	PQL
100-41-4	Ethyl benzene	8	5.0
100-42-5	Styrene	BQL	5.0
1330-20-7	Xylenes (Total)	37	5.0

SURROGATES	
1,2-Dichloroethane-d4	<u>103</u> % Recovery
Toluene-d8	<u>142</u> ** % Recovery
p-Bromofluorobenzene	<u>87</u> % Recovery

NOTES AND DEFINITIONS FOR THIS REPORT
BQL = BELOW PRACTICAL QUANTITATION LIMIT (PQL)
* = SEMI-QUANTITATIVE SCREEN ONLY
** = DILUTION ANALYSIS CONFIRMS SAMPLE MATRIX INTERFERENCE

SAMPLE ID <u>K910828-1/MND33-0019-0001</u>		SAMPLE # <u>02</u>		FRACTIONS: <u>A,B</u>	
		Date & Time Collected <u>08/28/91</u>		Category <u>SOIL</u>	
AG_S <u><2</u> mg/kg Ag	AL_S <u>1200</u> mg/kg Al	AS_S <u>2.3</u> mg/kg As	BA_S <u>45</u> mg/kg Ba	BE_S <u>1</u> mg/kg Be	CA_S <u>32,000</u> mg/kg Ca
CD_S <u><0.5</u> mg/kg Cd	CO_S <u>10</u> mg/kg Co	CR_S <u>15</u> mg/kg Cr	CU_S <u>16</u> mg/kg Cu	FE_S <u>27,000</u> mg/kg Fe	HG_S <u><0.25</u> mg/kg Hg
K_S <u>1400</u> mg/kg K	MG_S <u>6600</u> mg/kg Mg	MN_S <u>530</u> mg/kg Mn	NA_S <u>160</u> mg/kg Na	NI_S <u>19</u> mg/kg Ni	PB_S <u>10</u> mg/kg Pb
PCT_S <u>80</u> % wt.	SB_S <u><10</u> mg/kg Sb	SE_S <u>0.2</u> mg/kg Se	TL_S <u><0.25</u> mg/kg Tl	TPH_S <u><25</u> mg/kg	V_S <u>32</u> mg/kg V
ZN_S <u>50</u> mg/kg Zn					

SAMPLE ID K910828-1/MND33-0019-0001 FRACTION 02B TEST CODE M8080 NAME Pesticides and PCB's
Date & Time Collected 08/28/91 Category SOIL

ANALYST: SLN EXTRACTED: 09/03/91 FILE #: 4571
INSTRMT: HP_IV INJECTED: 09/10/91 FACTOR: 330* UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
319-84-6	alpha-BHC	BDL	20
319-85-7	beta-BHC	BDL	20
319-86-8	delta-BHC	BDL	20
58-89-9	gamma-BHC (Lindane)	BDL	20
76-44-8	Heptachlor	BDL	20
309-00-2	Aldrin	BDL	20
1024-57-3	Heptachlor epoxide	BDL	20
959-98-8	Endosulfan I	BDL	20
60-57-1	Dieldrin	BDL	33
72-55-9	4,4'-DDE	BDL	33
72-20-8	Endrin	BDL	33
33213-65-9	Endosulfan II	BDL	33
72-54-8	4,4'-DDD	BDL	33
1031-07-8	Endosulfan sulfate	BDL	33
50-29-3	4,4'-DDT	BDL	33
72-43-5	Methoxychlor	BDL	170
53494-70-5	Endrin ketone	BDL	33
5103-71-9	alpha-Chlordane	BDL	170
5103-74-2	gamma-Chlordane	BDL	170
8001-35-2	Toxaphene	BDL	330
12674-11-2	Aroclor-1016	BDL	170
11104-28-2	Aroclor-1221	BDL	170
11141-16-5	Aroclor-1232	BDL	170
5369-21-9	Aroclor-1242	BDL	170
12672-29-6	Aroclor-1248	BDL	170
11097-69-1	Aroclor-1254	BDL	330
11096-82-5	Aroclor-1260	BDL	330

NOTES AND DEFINITIONS FOR THIS REPORT.

BDL=BELOW DETECTION LIMIT

NA = NOT ANALYZED

* = ELEVATED DETECTION LIMIT DUE TO SAMPLE MATRIX INTERFERENCE

SAMPLE ID K910828-1/MND33-0019-0001 FRACTION 02A TEST CODE M8240 NAME Volatile Organics
Date & Time Collected 08/28/91 Category SOIL

ANALYST: JLK FILE #: 20E19526
INSTRMT: FINN2 INJECTED: 09/08/91 FACTOR: 1 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	PQL
74-87-3	Chloromethane	BQL	10
74-83-9	Bromomethane	BQL	10
75-01-4	Vinyl chloride	BQL	10
75-00-3	Chloroethane	BQL	10
75-09-2	Methylene chloride	430	5.0
67-64-1	Acetone	170	100
75-15-0	Carbon disulfide	BQL	5.0
75-35-4	1,1-Dichloroethene	BQL	5.0
75-34-3	1,1-Dichloroethane	BQL	5.0
156-60-5	trans-1,2-Dichloroethene	BQL	
67-66-3	Chloroform	BQL	5.0
107-06-2	1,2-Dichloroethane	BQL	5.0
78-93-3	2-Butanone	BQL	100
71-55-6	1,1,1-Trichloroethane	5	5.0
56-23-5	Carbon tetrachloride	BQL	5.0
108-05-4	Vinyl acetate	BQL	10
75-27-4	Bromodichloromethane	BQL	5.0
78-87-5	1,2-Dichloropropane	BQL	5.0
10061-01-5	cis-1,3-Dichloropropene	BQL	5.0
79-01-6	Trichloroethene	BQL	5.0
124-48-1	Dibromochloromethane	BQL	5.0
79-00-5	1,1,2-Trichloroethane	BQL	5.0
71-43-2	Benzene	BQL	5.0
10061-02-6	trans-1,3-Dichloropropene	BQL	5.0
110-75-8	2-Chloroethyl vinyl ether	BQL	10
75-25-2	Bromoform	BQL	5.0
591-78-6	2-Hexanone	BQL	10
108-10-1	4-Methyl-2-pentanone	BQL	10
127-18-4	Tetrachloroethene	BQL	5.0
108-88-3	Toluene	16	5.0
79-34-5	1,1,2,2,-Tetrachloroethane	BQL	5.0
108-90-7	Chlorobenzene	12	5.0

Page 9
Received: 08/30/91

KEMRON REPORT
Results by Sample

Work Order # N1-08-409
Continued From Above

SAMPLE ID K910828-1/MND33-0019-0001 FRACTION 02A TEST CODE M8240 NAME Volatile Organics
Date & Time Collected 08/28/91 Category SOIL

CAS#	COMPOUND	RESULT	PQL
100-41-4	Ethyl benzene	6	5.0
100-42-5	Styrene	BQL	5.0
1330-20-7	Xylenes (Total)	28	5.0

SURROGATES	
1,2-Dichloroethane-d4	<u>103</u> % Recovery
Toluene-d8	<u>132</u> ** % Recovery
p-Bromofluorobenzene	<u>89</u> % Recovery

NOTES AND DEFINITIONS FOR THIS REPORT

BQL = BELOW PRACTICAL QUANTITATION LIMIT (PQL)

* = SEMI-QUANTITATIVE SCREEN ONLY

** = DILUTION ANALYSIS CONFIRMS SAMPLE MATRIX INTERFERENCE

SAMPLE ID K910828-1/MND33-0021-0001 FRACTION 03B TEST CODE M8080 NAME Pesticides and PCB's
Date & Time Collected 08/29/91 Category SOIL

ANALYST: SLN EXTRACTED: 09/03/91 FILE #: 4574
INSTRMT: HP_IV INJECTED: 09/10/91 FACTOR: 33 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
319-84-6	alpha-BHC	BDL	2
319-85-7	beta-BHC	BDL	2
319-86-8	delta-BHC	BDL	2
58-89-9	gamma-BHC (Lindane)	BDL	2
76-44-8	Heptachlor	BDL	2
309-00-2	Aldrin	BDL	2
1024-57-3	Heptachlor epoxide	BDL	2
959-98-8	Endosulfan I	BDL	2
60-57-1	Dieldrin	BDL	3.3
72-55-9	4,4'-DDE	BDL	3.3
72-20-8	Endrin	BDL	3.3
33213-65-9	Endosulfan II	BDL	3.3
72-54-8	4,4'-DDD	BDL	3.3
1031-07-8	Endosulfan sulfate	BDL	3.3
50-29-3	4,4'-DDT	BDL	3.3
72-43-5	Methoxychlor	BDL	17
53494-70-5	Endrin ketone	BDL	3.3
5103-71-9	alpha-Chlordane	BDL	17
5103-74-2	gamma-Chlordane	BDL	17
8001-35-2	Toxaphene	BDL	33.0
12674-11-2	Aroclor-1016	BDL	17
11104-28-2	Aroclor-1221	BDL	17
11141-16-5	Aroclor-1232	BDL	17
5369-21-9	Aroclor-1242	BDL	17
12672-29-6	Aroclor-1248	BDL	17
11097-69-1	Aroclor-1254	BDL	33.0
11096-82-5	Aroclor-1260	BDL	33.0

NOTES AND DEFINITIONS FOR THIS REPORT.
BDL=BELOW DETECTION LIMIT
NA = NOT ANALYZED

SAMPLE ID K910828-1/MND33-0021-0001 FRACTION 03A TEST CODE M8240 NAME Volatile Organics
Date & Time Collected 08/29/91 Category SOIL

ANALYST: BCW FILE #: 20E19606
INSTRMT: FINN2 INJECTED: 09/11/91 FACTOR: 1 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	PQL
74-87-3	Chloromethane	BQL	10
74-83-9	Bromomethane	BQL	10
75-01-4	Vinyl chloride	BQL	10
75-00-3	Chloroethane	BQL	10
75-09-2	Methylene chloride	1100	5.0
67-64-1	Acetone	BQL	100
75-15-0	Carbon disulfide	BQL	5.0
75-35-4	1,1-Dichloroethene	BQL	5.0
75-34-3	1,1-Dichloroethane	BQL	5.0
156-60-5	trans-1,2-Dichloroethene	BQL	
67-66-3	Chloroform	BQL	5.0
107-06-2	1,2-Dichloroethane	BQL	5.0
78-93-3	2-Butanone	BQL	100
71-55-6	1,1,1-Trichloroethane	BQL	5.0
56-23-5	Carbon tetrachloride	BQL	5.0
108-05-4	Vinyl acetate	BQL	10
75-27-4	Bromodichloromethane	BQL	5.0
78-87-5	1,2-Dichloropropane	BQL	5.0
10061-01-5	cis-1,3-Dichloropropene	BQL	5.0
79-01-6	Trichloroethene	BQL	5.0
124-48-1	Dibromochloromethane	BQL	5.0
79-00-5	1,1,2-Trichloroethane	BQL	5.0
71-43-2	Benzene	BQL	5.0
10061-02-6	trans-1,3-Dichloropropene	BQL	5.0
110-75-8	2-Chloroethyl vinyl ether	BQL	10
75-25-2	Bromoform	BQL	5.0
591-78-6	2-Hexanone	BQL	10
108-10-1	4-Methyl-2-pentanone	BQL	10
127-18-4	Tetrachloroethene	BQL	5.0
108-88-3	Toluene	BQL	5.0
79-34-5	1,1,2,2,-Tetrachloroethane	BQL	5.0
108-90-7	Chlorobenzene	BQL	5.0

SAMPLE ID K910828-1/MND33-0021-0001 FRACTION 03A TEST CODE M8240 NAME Volatile Organics
Date & Time Collected 08/29/91 Category SOIL

CAS#	COMPOUND	RESULT	PQL
100-41-4	Ethyl benzene	BQL	5.0
100-42-5	Styrene	BQL	5.0
1330-20-7	Xylenes (Total)	BQL	5.0

SURROGATES	
1,2-Dichloroethane-d4	<u>95</u> % Recovery
Toluene-d8	<u>117</u> % Recovery
p-Bromofluorobenzene	<u>84</u> % Recovery

NOTES AND DEFINITIONS FOR THIS REPORT

BQL = BELOW PRACTICAL QUANTITATION LIMIT (PQL)

* = SEMI-QUANTITATIVE SCREEN ONLY

TEST CODE AG_S NAME Silver, Total

SW3050 followed by SW6010 or SW7760

TEST CODE AL_S NAME Aluminum, Total

SW3050 followed by SW6010 or SW7020

TEST CODE AS_S NAME Arsenic, Total

SW3050 followed by SW7061 - Arsenic

TEST CODE BA_S NAME Barium, Total

SW3050 followed by SW6010

TEST CODE BE_S NAME Beryllium, Total

SW3050 followed by SW6010

TEST CODE CA_S NAME Calcium, Total

SW 3050 followed by SW6010 or SW7140

TEST CODE CD_S NAME Cadmium, Total

SW3050 followed by SW6010 - Cadmium

TEST CODE CO_S NAME Cobalt, Total

SW3050 followed by SW6010

TEST CODE CR_S NAME Chromium, Total

SW3050 followed by SW6010 or SW7190 - Chromium

TEST CODE CU_S NAME Copper, Total

SW3050 followed by SW6010

Test Methodology

TEST CODE FE_S NAME Iron, Total

SW3050 followed by SW6010 or SW7420

TEST CODE HG_S NAME Mercury, Total

SW7471 (AA - Cold Vapor Method)

TEST CODE K_S NAME Potassium, Total

SW3050 followed by SW6010 or SW7610

TEST CODE M8080 NAME Pesticides and PCB's

EPA Method 608/8080 (SW-846)

TEST CODE M8240 NAME Volatile Organics

EPA Method 8240 (SW-846)

TEST CODE MN_S NAME Manganese, Total

SW3050 followed by SW6010 or SW7460

TEST CODE NA_S NAME Sodium, Total

SW3050 followed by SW6010 or SW7770

TEST CODE NI_S NAME Nickel, Total

SW3050 followed by SW6010

TEST CODE PB_S NAME Lead, Total

SW3050 followed by SW6010 or SW7421 - Lead

TEST CODE PCT_S NAME Percent Solids

EPA Method 160.3 - Gravimetric, Dried at 103-105 Degrees C
To convert test results to "Dry Weight Basis" use this formula:

RESULT (REPORTED) X 100

TEST CODE PCT_S NAME Percent Solids

RESULT (DRY WT.) = -----
PERCENT SOLIDS

TEST CODE SB_S NAME Antimony, Total

SW3050 followed by SW6010 or SW7041

TEST CODE SE_S NAME Selenium, Total

SW3050 followed by SW7741

TEST CODE TL_S NAME Thallium, Total

SW3050 followed by SW7841

TEST CODE TPH_S NAME Petroleum Hydrocarbons

EPA Method 418.1 (IR)

TEST CODE V_S NAME Vanadium, Total

SW3050 followed by SW6010

TEST CODE ZN_S NAME Zinc, Total

SW3050 followed by SW6010 or SW7950

CHAIN-OF-CUSTODY RECORD

Project Contact: Steve McBride, OEPA/DEER
 Turn Around Requirements: NORMAL

Page 1 of 1

Project No.: K910828-1 Project Name: DOE MOUND

Sampler (print): MARTHA L. HATCHER Signature: Martha L. Hatcher

Sample I.D. No.	Comp	Grab	Date	Time	Sample Location	NUMBER OF SAMPLES	HOLD	% SOLIDS	VOA	ACID EXTRACT.	BASE/NEUTR. EXT.	EP TOX.-METALS	EP TOX.-ORGAN.	TOT. METALS-PPL.	PCBs	PESTICIDES	TPH	BETX	PHENOLICS	TAL METALS	ADDITIONAL REQUIREMENTS
MND-016-0001		X	8/28/91		Building 51	1		X						X	X	X			X		If not enough sample volume in larger jar (blue cap), sample analysed should follow in this order: ① Metals ② TPH ③ Pesticides/PCBs
MND33-0009-0001		X	8/28/91		Building 51	1		X						X	X	X			X		
MND33-0021-0001		X	8/27/91		Building 3A	1		X						X	X	X			X		
<p>Chain of Custody Sealed in Cooler</p>																					

Relinquished by: (Signature) <u>Martha Hatcher</u>	Date <u>8/29/91</u>	Time <u>1430</u>	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature) <u>Janet Williams</u>	Date <u>8/30</u>	Time <u>11:30</u>	Remarks: <u>COC Sealed</u> <u>MND33-0016 per bottle</u> <u>Samples in vial</u>	

Appendix C

APPENDIX C

**PRELIMINARY OU3 DATA QUALITY ASSESSMENT AND
OPERABLE UNIT 3 DATA VALIDATION RESULTS**

PRELIMINARY OU3 DATA QUALITY ASSESSMENT

Quality assurance is a system of measures taken to ensure that a desired product meets a defined level of quality. A system of quality assurance consists of two elements: quality control and quality assessment. Quality control is a system of procedures performed to control the quality of the product, usually with defined standards of performance for those procedures. Quality assessment is a program of activities to evaluate the performance of implemented quality control procedures and the quality of the product.

Relative to data generated in the OU3 Limited Field Investigation (LFI). The OU3 Quality Assurance Project Plan (QAPP; DOE, 1991) prescribed the following quality control measures were specified in the OU3 QAPP (DOE, 1991) in order to obtain data of the desired level of quality:

- Field and laboratory analytical methodology.
- Calibration procedures.
- Internal quality control checks.
- Accuracy and precision goals.
- Completeness, representativeness, and comparability goals.

The analytical data have been assessed to determine whether the criteria for the quality control measures were met. The following discusses the assessment procedures.

Field and Laboratory Analytical Methods

The field and laboratory measurements were performed according to the methods specified in the QAPP.

- | <u>Field Measurements</u> | <u>Method</u> |
|---------------------------|-----------------------------------|
| Organic vapors | Mound Plant ER Program
SOP 6.2 |

(The following field measurements were conducted for health and safety purposes and are not discussed in terms of data quality: low energy radiation, alpha scintillation, aerosols, and combustible gas.)

- | <u>Laboratory Measurements</u> | <u>Method</u> |
|--------------------------------|-----------------|
| Target Compound List – | |
| Volatile organic compounds | CLP SOW 2/88 |
| Semivolatile organic compounds | CLP SOW 2/88 |
| Pesticides/PCBs | EPA method 8080 |

Calibration Procedures and Internal Quality Control Checks

The laboratory calibration procedures and internal quality control checks (e.g., method blanks, matrix spikes, surrogates, etc.) performed for these analyses were assessed as part of the validation performed on these data. Reports of the data validation are presented following this assessment. Data validation for the Contract Laboratory Program Statement of Work (CLP SOW) analyses was performed according to U.S. Environmental Protection Agency (EPA) laboratory data validation procedures (EPA, 1988a; 1988b). Pesticide/PCB results were evaluated using the EPA guidelines; however, the acceptance criteria for quality control checks, such as calibration, specified in the QAPP were implemented. Petroleum hydrocarbons were reviewed for the required internal quality control checks noted in Table III.2 in the QAPP (DOE, 1991). The chromatographs from this analysis were reviewed for proper identification and for potential interferences.

Internal quality control checks conducted in the field for laboratory measurements (ambient blanks and field duplicates) were collected at the required frequency stated in the QAPP. Results for these checks were within the acceptance criteria established in the QAPP with the exception of some field duplicate results. Field duplicates were collected for sample location 0023. Barium exceeded the 35 relative percent difference criteria for sample 0023. The variance is most likely due to sample inhomogeneity. Methylene chloride was detected in the ambient blank collected for the site, however, it was qualified in the data validation as "not detected" due to laboratory method blank contamination.

Analytical results were qualified by the validators or were accepted without qualification from the laboratory. The data qualifiers applied to the results are one or more of the following:

- U – Not detected. Associated numerical value is the sample quantitation limit.
- J – Value is considered estimated.

Accuracy and Precision Goals

Precision and accuracy goals were established in the QAPP in terms of the field and laboratory quality control checks performed (see Tables III.1 and III.2 in the QAPP (DOE, 1991)). The data validation reports discuss whether the specific criteria for the laboratory quality control checks were met. All quality control checks performed for field measurements were performed consistent with the requirements of the QAPP.

Completeness

Completeness is a measure of the amount of data obtained from a measurement system that achieves the project goals, compared to the amount expected under normal conditions. Completeness is expressed in the QAPP for three activities: the number of samples collected, the number of field measurements made, and the number of "valid" laboratory measurements made. The laboratory measurements, completeness goals for sample collection and field measurements are 90% and 95%, respectively. These completeness goals were designed for the overall OU3 Field Investigation; however, they can also be discussed for the Building 34 tank site. The final completeness goals for the OU3 program will be calculated and reported in the final OU3 investigation report. The completeness of sample collection points for the tank site is 100%; the completeness for field measurements is 100%. The number of "valid" laboratory results compared to the number of results generated are identified by the data validation as those results that are qualified as usable. All laboratory results were deemed usable for closure with the qualifications made and, therefore, the completeness is 100%.

Representativeness and Comparability

As discussed in the QAPP, measures were taken to obtain representative and comparable data such as conducting sample collection using techniques to obtain representative samples and reporting data in comparable measurement units. Numerical goals cannot be applied to representativeness and comparability; however, the measures taken to obtain this aspect of data quality in accordance with the QAPP were performed.

Overall Data Quality Assessment

The overall data quality can be assessed by considering the results of the control measures discussed above. All the requirements and criteria for these measures were met, with the exceptions discussed in the validation reports for internal laboratory quality control checks. The impact of these exceptions is discussed in the following text.

Although not quantifiable, the semivolatile organic compounds and the pesticide/PCB results were all qualified as "estimated" due to exceeded extraction holding times of 1 to 2 days (semivolatiles) and 4 to 5 days (pesticides/PCBs). The amount of negative bias in the sample results due to the delayed extraction time is considered minimal because the extractions were performed only a few days past the holding time. No target semivolatile organic compounds were detected in the samples with the exception of a low-level detection of butylbenzylphthalate. This detection is potentially biased low. Semivolatile concentrations in the samples prior to the extraction would have been most likely near the quantitation limits. Negatively biased positive results would have been reported if semivolatile

compounds were present at significant levels. A complete degradation or volatilization of semivolatile compounds is not likely to have occurred as only a few days extraction holding time were exceeded. The amount of suspected bias in the low-level results for semivolatile organic compounds and pesticide/PCBs is not considered to affect the usability of the data for comparison to closure criteria.

One volatile organic compound (VOC) was detected at a low level, and was qualified as not detected due to laboratory method blank contamination. Specifically, methylene chloride results were qualified as not detected for all samples, and acetone was qualified similarly for samples 0020 through 0024. The qualifications at these concentrations do not impact a comparison with closure criteria. The method detection limits reported by the data validation allow meaningful evaluation of the results against closure criteria because the criteria are often two to three orders of magnitude greater.

VOC data from the duplicate sample, matrix spike, and matrix spike duplicate of sample 0023 were qualified as "estimated" due to a surrogate outlier. These estimated data do not impact the usability of sample data and did not affect spike recoveries or precision.

Several metal results were qualified as "estimated" because of one or more of the following: ICP serial dilution, field duplicate results, matrix spike recoveries, post-digestion spike, interference check sample, or method of standard addition. The amount of error associated with the results due to these outliers is not considered to affect a comparison of the results to the closure criteria, which are at least an order of magnitude greater. Other metal results were qualified as "not detected" because of calibration blank contamination. The levels at which they were qualified is at least an order of magnitude lower than closure criteria; therefore, the qualifications are not considered to impact the usability of the data.

Extractable petroleum hydrocarbon data for samples 0021 and 0023 were qualified as estimated as a result of interferences from potential motor oil. The diesel data may be potentially biased high, and the quantitation for motor oil and diesel for these samples may overlap. The estimated concentration of petroleum in the samples can be obtained using both results; however, the combined value may report more petroleum hydrocarbon than is actually present. It is important to note that EPA quantification for motor oil was not a part of the requested protocol and was provided for informational purposes only. Because the data was not part of the validated data set it must be regarded as estimated.

REFERENCES

- DOE (Department of Energy). 1991. "Limited Field Investigation Quality Assurance Project Plan, Mound Plant, Miscellaneous Sites, Operable Unit 3." Environmental Restoration Program. U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, NM. October 1991.
- EPA (U.S. Environmental Protection Agency). 1988a. "Laboratory Data Validation - Functional Guidelines for Evaluation of Organic Analyses." U.S. Environmental Protection Agency, Hazardous Site Evaluation Division. February 1988.
- EPA (U.S. Environmental Protection Agency). 1988b. "Laboratory Data Validation - Functional Guidelines for Evaluation of Inorganics Analyses." U.S. Environmental Protection Agency, Hazardous Site Evaluation Division. July 1, 1988.

OPERABLE UNIT 3 DATA VALIDATION RESULTS



1 WESTON WAY
WEST CHESTER, PA 19380-1449
PHONE: 215-692-3030
FAX: 215-430-3124

REPORT OF DATA VALIDATION RESULTS

PROJECT: LANL Mound

PROJECT NUMBER: 27444001

TACK: Operable Unit 3

DATE: February 21, 1992

LABORATORY: IT Analytical Services

LAB BATCH: REA37051

ANALYSIS: Volatile Organic Compounds

1. CASE SUMMARY

Eleven soil samples and two trip blanks were collected on August 28,29-91 for volatile organic compounds and were assigned IT Laboratory batch number REA37051. Samples were apparently received by the laboratory in good condition.

Sample analysis was performed according to the USEPA Contract Laboratory Program (CLP 2/88 Organic Statement of Work (SOW) by IT laboratories in Earth City, Missouri. The following samples apply to this data validation report:

Batch REA37051

MND33-0016-0001

MND33-0023-0001

MND33-0017-0001

MND33-0023-1001

MND33-0018-0001

MND33-0023-1001MS

MND33-0019-0001

MND33-0023-1001MSD

MND33-0019-1001

MND33-0024-0001

MND33-0020-0001

MND33-0024-5001 (Trip Blank)

MND33-0021-0001

MND33-0016-5001 (Trip Blank)

MND33-0022-0001

2. SAMPLE HOLDING TIMES

Samples were analyzed within the required holding time for volatile organic compounds.

Reviewer:

Kelly Marie Spitzer



REPORT OF DATA VALIDATION RESULTS

LAB BATCH: REA37051

3. RESULTS OF LABORATORY QUALITY CONTROL CHECKS

a. GC/MS Tuning

GC/MS complied with the mass and ion abundance criteria for BFB. However, the tune raw data for the initial calibration analyzed on 09-03-91 @ 09:54 (File ID FF175) was missing from the data package. The laboratory has been contacted for resubmission.

b. Calibration

Initial and continuing calibrations for the analysis were evaluated against the CLP Statement of Work No 2/88 criteria. Results which did not meet these criteria are noted in Table 5. Several compounds had the %RSD and/or %D results exceed the 30% and 25% QC limits in the initial and continuing calibrations, respectively. The acetone %D in the continuing calibration on 09-06-91 exceeded 50%. The associated positive result in sample MND-33-0019-1001 is qualified in reference to method blank contamination, no additional qualification is applied to this sample result. The VBLK04 blank result for this compound is considered estimated. All other outliers were below 50%; therefore, only the associated positive results are qualified as estimated. However, the only positive results for these compounds were for acetone and since these results are qualified due to blank contamination, no additional qualification is applied.

c. Method Blanks

All method blanks contained common contaminants methylene chloride and acetone at levels less than 3x the CRQL. Sample results less than the CRQL are elevated to the CRQL, and results less than 10x the blank levels are flagged "U". All of these results are believed to be artifacts of laboratory contamination, and are considered not detected.

d. Surrogate Spikes

The 1,2-dichloroethane surrogate recoveries exceeded the QC limit in samples MND33-0023-1001, MS/MSD. This sample was not reanalyzed as a straight sample but rather as the MS/MSD QC analysis. This sample is exhibiting a matrix effect. However, these sample data are considered as estimated due to the surrogate outliers.

Reviewer: 



REPORT OF DATA VALIDATION RESULTS

LAB BATCH: REA37051

e. Matrix spike and Matrix Spike Duplicates

The RPD result for chlorobenzene exceeded the QC limit in the analysis of sample MND33-0023-1001. This compound was not detected in the unspiked samples; therefore, no qualification is applied on this basis.

f. Internal Standards

All internal standard areas were below the control limits for sample MND33-0023-1001MS, and the chlorobenzene area was below the control limit for sample MND33-0023-1001MSD. This QC sample is exhibiting a matrix effect. These samples have already been qualified due to surrogate outliers, no additional qualification is applied.

g. Compound Identification

The compound identifications were satisfactory for all analyses. Ion intensities in the mass spectra were within the criteria.

h. System Performance

The instrument performance was stable throughout these analyses.

i. Compound Quantitation and Reported Detection Limits

All calculations of the detected compounds were confirmed. The CRQLs were adjusted accordingly.

j. Tentatively Identified Compounds

All criteria were met in the identification of the tentatively identified compounds.

Reviewer: 



REPORT OF DATA VALIDATION RESULTS

LAB BATCH: REA37051

4. RESULTS OF ASSOCIATED QUALITY CONTROL CHECKS

a. Field Duplicates

No field duplicate was reported with this data set.

b. Field Blanks

Two trip blanks are associated with these samples. These samples were analyzed for volatile compounds only, and also contained methylene chloride; however, have already been considered not detected due to the associated method blank contamination.

5. OVERALL ASSESSMENT OF THE DATA

Table 6 presents a summary of the sample results, and any qualification that has been described in this report.

Batch REA37051

All data has been accepted within the applied qualifier codes. Positive results have been qualified due to surrogate and internal standard outliers along with calibration outliers in the volatile fraction. Other results have been considered not detected due to blank contamination.

6. REFERENCES

EPA, 1988. Contract Laboratory Program 2/88 Organic Statement of Work

EPA, 1988. "Laboratory Data Validation - Functional Guidelines for Evaluation of Organic Analyses," U.S. Environmental Protection Agency, Hazardous Site Evaluation Division. February 1988.

Reviewer: *Kelly Brown*



REPORT OF DATA VALIDATION RESULTS

LAB BATCH: REA37051

ATTACHMENTS

- TABLE 1 - EXCEEDED HOLDING TIME**
- TABLE 2 - SURROGATE RECOVERY OUTLIERS**
- TABLE 3 - MATRIX SPIKE RECOVERY OUTLIERS**
- TABLE 4 - METHOD BLANK OUTLIERS**
- TABLE 5 - CALIBRATION OUTLIERS**
- TABLE 6 - QUALIFIED DATA SUMMARY TABLE**

CALIBRATION OUTLIERS VOLATILE TCL COMPOUNDS CLP SOW - 2/88

PREPARED BY: Kelly Spittler

DATE: 2-16-88

LANL MOUND PROJECT

LABORATORY BATCH #: PEA 37051

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: ITAS - St. Louis

COLLECTION DATE(s): 03-28, 29-91

PREPARATION BLANK MATRIX (SOIL/WATER): Soil

PREPARATION BLANK CONCENTRATION UNITS (UG/L OR MG/KG): ug/kg

INSTRUMENT # DATE/TIME:	INIT. CAL.		CONT. CAL.		CONT. CAL.		CONT. CAL.	
	RF	%RSD	RF	%D	RF	%D	RF	%D
CHLOROMETHANE								
BROMOMETHANE								
VINYL CHLORIDE								
CHLOROETHANE								
METHYLENE CHLORIDE								
ACETONE		36						-56.2
CARBON DISULFIDE								
1,1-DICHLOROETHENE								
1,1-DICHLOROETHANE								
1,2-DICHLOROETHANE(TOTAL)								
CHLOROFORM								
1,2-DICHLOROETHANE								
2-BUTANONE								
1,1,1-TRICHLOROETHANE								
CARBON TETRACHLORIDE								
VINYL ACETATE								
BROMODICHLOROMETHANE								
1,2-DICHLOROPROPANE								
CIS-1,3-DICHLOROPROPENE								
TRICHLOROETHENE								
DIBROMOCHLOROMETHANE								
1,1,2-TRICHLOROETHANE								
BENZENE								
TRANS-1,3-DICHLOROPROPENE								
BROMOFORM								

AFFECTED SAMPLES:	46002 (MND 35)	46103 (MND 35)	(MND-35)
ALL LISTED TO	0016-0001	0019-0001	013604
	0017-0001	0021-0001	
RIGHT	0018-0001	0022-0001	0019-1001
	0020-0001	0023-0001	
	0023-1001	0023-1001 MSD	
	0023-1001 MS	0024-0001	

REVIEWER: _____ INITIALS: MS
DATE: 2-16-88

* THESE FLAGS SHOULD BE APPLIED TO THE ANALYTES ON THE SAMPLE DATA SHEETS.

CALIBRATION OUTLIERS VOLATILE TCL COMPOUNDS CLP SOW - 2/88

LABORATORY BATCH #: REL 3257

COLLECTION DATE(s): 09-03-91

INSTRUMENT # DATE/TIME:	INIT. CAL			CONT. CAL			CONT. CAL			CONT. CAL		
	RF	%RSD	%D									
1-METHYL-2-PENTANONE												
2-HEXANONE												
TETRACHLOROETHENE												
1,1,2,2-TETRACHLOROETHANE												
TOLUENE												
CHLOROBENZENE												
ETHYLBENZENE												
STYRENE												
XYLENE (TOTAL)												

AFFECTED SAMPLES:	VBLK 02 (MND 33-)	VBLK 03 (MND 33-)	(MND 33-)
ALL LISILD 70	0016-0001	0019-0001	LISILD
	0017-0001	0021-0001	
KIC/11	0018-0001	0022-0001	0019-1001
	0020-0001	0023-0001	
	0023-0001	0023-1001 MSD	
	0023-1001 MS	0024-0001	

REVIEWER: _____ INITIALS: KMS
DATE: 12-16-91

* THESE FLAGS SHOULD BE APPLIED TO THE ANALYTES ON THE SAMPLE DATA SHEETS.

CALIBRATION OUTLIERS VOLATILE TCL COMPOUNDS CLP SOW - 2/88

PREPARED BY: Lisa Spittler

DATE: 2-2-88

LANL MOUND PROJECT

LABORATORY BATCH #: REF 27051

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: ITAC - St Louis

COLLECTION DATE(S): 08-28, 29-91

PREPARATION BLANK MATRIX (SOIL/WATER): Water

PREPARATION BLANK CONCENTRATION UNITS (UG/L OR MG/KG): ug/L

INSTRUMENT # <u>MSF</u> DATE/TIME:	INIT. CAL		CONT. CAL		CONT. CAL		CONT. CAL	
	RF	%RSD	RF	%D	RF	%D	RF	%D
CHLOROMETHANE								
BROMOMETHANE								
VINYL CHLORIDE								
CHLOROETHANE								
METHYLENE CHLORIDE								
ACETONE								
CARBON DISULFIDE								
1,1-DICHLOROETHENE								
1,1-DICHLOROETHANE								
1,2-DICHLOROETHANE(TOTAL)								
CHLOROFORM								
1,2-DICHLOROETHANE								
2-BUTANONE		<u>38.9</u>		<u>25.3</u>				
1,1,1-TRICHLOROETHANE								
CARBON TETRACHLORIDE								
VINYL ACETATE								
BROMODICHLOROMETHANE								
1,2-DICHLOROPROPANE								
CIS-1,3-DICHLOROPROPENE								
TRICHLOROETHENE								
DIBROMOCHLOROMETHANE								
1,1,2-TRICHLOROETHANE								
BENZENE								
TRANS-1,3-DICHLOROPROPENE								
BROMOFORM								

AFFECTED SAMPLES:	<u>1001-500 to 1002-500</u>	<u>1003-500</u>	<u>(MND-53-)</u>	
	<u>1004-500</u>	<u>1005-500</u>		
	<u>1006-500</u>			

REVIEWER

INITIALS: KPS
DATE: 12-16-91

* THESE FLAGS SHOULD BE APPLIED TO THE ANALYTIS ON THE SAMPLE DATA SHEETS.

**CALIBRATION OUTLIERS
VOLATILE TCL COMPOUNDS
CLP SOW - 2/88**

LABORATORY BATCH #: REP 37051COLLECTION DATE(S): 03-28-91

INSTRUMENT # <i>MSF</i> DATE/TIME:	INIT. CAL.			CONT. CAL.			CONT. CAL.			CONT. CAL.		
	<i>09-03-91/16:46</i>			<i>09-04-91/11:41</i>								
	RF	%RSD	*	RF	%D	*	RF	%D	*	RF	%D	*
-METHYL-2-FENTANONE												
2-HEXANONE												
TETRACHLOROETHENE												
1,1,2-TETRACHLOROETHANE					<i>26.6</i>							
TOLUENE												
CHLOROBENZENE												
ETHYLBENZENE												
STYRENE												
XYLENE (TOTAL)												
AFFECTED SAMPLES:	<i>ALL LISTED TO</i>			<i>(MND 55-)</i>								
	<i>RIGHT</i>			<i>VBK01</i>								
				<i>0024-5001</i>								
				<i>0016-5001</i>								

REVIEWER

INITIALS: *BMS*DATE: *12-16-91*

QUALIFIED DATA SUMMARY TABLE VOLATILE ORGANIC COMPOUNDS

PREPARED BY: H. Sealey

DATE: 3/17/92

LABORATORY BATCH #: KEA 37051

LABORATORY NAME/LOCATION: ETAS - St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: 3

COLLECTION DATE(S): 8/28, 29/92

ANALYTE	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID
	MW033-0016-0001	MW033-0016-5001	MW033-0017-0001	MW033-0018-0001
CHLOROMETHANE				
BROMOMETHANE				
VINYL CHLORIDE				
CHLOROETHANE				
METHYLENE CHLORIDE	6 u	7 u		6 u
ACETONE	69 u		240	250
CARBON DISULFIDE				
1,1-DICHLOROETHENE				
1,1-DICHLOROETHANE				
1,2-DICHLOROETHANE(TOTAL)				
CHLOROPFORM				
1,2-DICHLOROETHANE				
2-BUTANONE				
1,1,1-TRICHLOROETHANE				
CARBON TETRACHLORIDE				
VINYL ACETATE				
BROMODICHLOROMETHANE				
1,2-DICHLOROPROPANE				
CIS-1,3-DICHLOROPROPENE				
TRICHLOROETHENE				
DIBROMOCHLOROMETHANE				
1,1,2-TRICHLOROETHANE				
BENZENE				
TRANS-1,3-DICHLOROPROPENE				
BROMOPFORM				
4-METHYL-2-PENTANONE				
2-HEXANONE				
TETRACHLOROETHENE				
1,1,2,2-TETRACHLOROETHANE				
TOLUENE				
CHLOROBENZENE				
ETHYLENENZENE				
STYRENE				
XYLENE (TOTAL)				

REVIEWER INITIALS: _____

DATE: _____

QUALIFIED DATA SUMMARY TABLE VOLATILE ORGANIC COMPOUNDS

PREPARED BY: H. Serley

DATE: 3/3/92

LABORATORY BATCH #: RCA 37051

LABORATORY NAME/LOCATION: FHS-St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: 3

COLLECTION DATE(S): 5/28, 29/92

ANALYTE	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID
	NU033-0019-0001	MW033-0019-1001	MW033-0020-0001	MW033-0021-0001
CHLOROMETHANE				
BROMOMETHANE				
VINYL CHLORIDE				
CHLOROETHANE				
METHYLENE CHLORIDE	6 U	6 U	6 U	5 U
ACETONE		140 U	27 U	29 U
CARBON DISULFIDE				
1,1-DICHLOROETHENE				
1,1-DICHLOROETHANE				
1,2-DICHLOROETHANE(TOTAL)				
CHLOROFORM				
1,2-DICHLOROETHANE				
2-BUTANONE				
1,1,1-TRICHLOROETHANE				
CARBON TETRACHLORIDE				
VINYL ACETATE				
BROMODICHLOROMETHANE				
1,2-DICHLOROPROPANE				
CIS-1,3-DICHLOROPROPENE				
TRICHLOROETHENE				
DIBROMOCHLOROMETHANE				
1,1,2-TRICHLOROETHANE				
BENZENE				
TRANS-1,3-DICHLOROPROPENE				
BROMOFORM				
4-METHYL-2-PENTANONE				
2-HEXANONE				
TETRACHLOROETHENE				
1,1,2,2-TETRACHLOROETHANE				
TOLUENE				
CHLOROBENZENE				
ETHYLBENZENE				
STYRENE				
XYLENE (TOTAL)				

REVIEWER INITIALS: _____

DATE: _____

QUALIFIED DATA SUMMARY TABLE VOLATILE ORGANIC COMPOUNDS

PREPARED BY: H. Sealey

DATE: 3/3/92

LANL MOUND PROJECT

LABORATORY BATCH #: REA 37051

OPERABLE UNIT NO.: 3

LABORATORY NAME/LOCATION: 7745-St. Louis

COLLECTION DATE(s): 8/28, 29/92

ANALYTE	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID
	MA033-0022-0001	MA033-0023-0001	MA033-0023-1001	MA033-0024-0001
CHLOROMETHANE			12 UJ	
BROMOMETHANE			12 UJ	
VINYL CHLORIDE			12 UJ	
CHLOROETHANE			12 UJ	
METHYLENE CHLORIDE	6 U	6 U	8 UJ	5 U
ACETONE	24 U	26 U	21 UJ	19 U
CARBON DISULFIDE			6 UJ	
1,1-DICHLOROETHENE			6 UJ	
1,1-DICHLOROETHANE			6 UJ	
1,2-DICHLOROETHANE(TOTAL)			6 UJ	
CHLOROFORM			6 UJ	
1,2-DICHLOROETHANE			6 UJ	
2-BUTANONE			12 UJ	
1,1,1-TRICHLOROETHANE			6 UJ	
CARBON TETRACHLORIDE			6 UJ	
VINYL ACETATE			12 UJ	
BROMODICHLOROMETHANE			6 UJ	
1,2-DICHLOROPROPANE			6 UJ	
CIS-1,3-DICHLOROPROPENE			6 UJ	
TRICHLOROETHENE			6 UJ	
DIBROMOCHLOROMETHANE			6 UJ	
1,1,2-TRICHLOROETHANE			6 UJ	
BENZENE			6 UJ	
TRANS-1,3-DICHLOROPROPENE			6 UJ	
BROMOFORM			6 UJ	
4-METHYL-2-PENTANONE			12 UJ	
2-HEXANONE			12 UJ	
TETRACHLOROETHENE			6 UJ	
1,1,2,2-TETRACHLOROETHANE			6 UJ	
TOLUENE			6 UJ	
CHLOROBENZENE			6 UJ	
ETHYLBENZENE			6 UJ	
STYRENE			6 UJ	
XYLENE (TOTAL)			6 UJ	

REVIEWER INITIALS: _____

DATE: _____

QUALIFIED DATA SUMMARY TABLE VOLATILE ORGANIC COMPOUNDS

PREPARED BY: H. Sealey

DATE: 3/3/92

LABORATORY BATCH #: REA 37051

LABORATORY NAME/LOCATION: FAB - St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: 3

COLLECTION DATE(S): 8/28, 29/92

ANALYTE	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID
CHLOROMETHANE	MAN033 0024-5001			
BROMOMETHANE				
VINYL CHLORIDE				
CHLOROETHANE				
METHYLENE CHLORIDE	6 U			
ACETONE				
CARBON DISULFIDE				
1,1-DICHLOROETHENE				
1,1-DICHLOROETHANE				
1,2-DICHLOROETHANE(TOTAL)				
CHLOROFORM				
1,2-DICHLOROETHANE				
2-BUTANONE				
1,1,1-TRICHLOROETHANE				
CARBON TETRACHLORIDE				
VINYL ACETATE				
BROMODICHLOROMETHANE				
1,2-DICHLOROPROPANE				
CIS-1,3-DICHLOROPROPENE				
TRICHLOROETHENE				
DIBROMOCHLOROMETHANE				
1,1,2-TRICHLOROETHANE				
BENZENE				
TRANS-1,3-DICHLOROPROPENE				
BROMOFORM				
4-METHYL-2-PENTANONE				
2-HEXANONE				
TETRACHLOROETHENE				
1,1,2,2-TETRACHLOROETHANE				
TOLUENE				
CHLOROBENZENE				
ETHYLBENZENE				
STYRENE				
XYLENE (TOTAL)				

REVIEWER INITIALS: _____

DATE: _____



1 WESTON WAY
WEST CHESTER, PA 19380-1449
PHONE: 215-692-3030
FAX: 215-430-3124

REPORT OF DATA VALIDATION RESULTS

PROJECT: LANL Mound

PROJECT NUMBER: 27444001

TACK: Operable Unit 3

DATE: February 21, 1992

LABORATORY: IT Analytical Services

LAB BATCH: REA37051

ANALYSIS: Semivolatile Organic Compounds

1. CASE SUMMARY

Eleven soil samples were collected on August 28,29-91 for semivolatile organic compounds and were assigned IT Laboratory batch number REA37051. Samples were apparently received by the laboratory in good condition.

Sample analysis was performed according to the USEPA Contract Laboratory Program (CLP 2/88 Organic Statement of Work (SOW) by IT laboratories in Earth City, Missouri. The following samples apply to this data validation report:

Batch REA37051

MND33-0016-0001

MND33-0023-0001

MND33-0017-0001

MND33-0023-1001

MND33-0018-0001

MND33-0023-1001MS

MND33-0019-0001

MND33-0023-1001MSD

MND33-0019-1001

MND33-0024-0001

MND33-0020-0001

MND33-0021-0001

MND33-0022-0001

2. SAMPLE HOLDING TIMES

All sample analyses exceeded the 7 day EPA extraction holding time requirement from 1 to 2 days. Therefore, all sample data is considered as estimated.

Reviewer: *Kelly Min Spittle*



REPORT OF DATA VALIDATION RESULTS

LAB BATCH: REA37051

3. RESULTS OF LABORATORY QUALITY CONTROL CHECKS

a. GC/MS Tuning

GC/MS complied with the mass and ion abundance criteria for DFTPP.

b. Calibration

The calibrations were evaluated against the CLP-SOW. All %RSD and %D criteria were met for the initial and continuing calibrations. No qualification is applied; however, the calibration information is summarized in Table 5.

c. Method Blanks

The method blank contained common phthalates (diethylphthalate and bis(2-ethylhexyl)phthalate) at levels less than the CRQL. The samples contained similar contamination at levels less than the CRQL. Therefore, these results are elevated to the CRQL, flagged "U," and considered not detected because they are believed to be artifacts of laboratory contamination.

d. Surrogate Spikes

All surrogate recoveries were within the CLP - SOW QC limits.

e. Matrix spike and Matrix Spike Duplicates

All spike recoveries were within the QC criteria established in the CLP-SOW.

f. Internal Standards

All internal standard areas were within the established control limits.

Reviewer: *Kelly M. J. [Signature]*



REPORT OF DATA VALIDATION RESULTS

LAB BATCH: REA37051

g. Compound Identification

The compound identifications were satisfactory for all analyses. Ion intensities in the mass spectra were within the criteria.

h. System Performance

The instrument performance was stable throughout these analyses.

i. Compound Quantitation and Reported Detection Limits

All calculations of the detected compounds were confirmed. The CRQLs were adjusted accordingly.

j. Tentatively Identified Compounds

All criteria were met in the identification of the tentatively identified compounds.

4. **RESULTS OF ASSOCIATED QUALITY CONTROL CHECKS**

a. Field Duplicates

No field duplicate analysis was reported with this data set.

b. Field Blanks

No field blanks analyses were reported with this data set.

Reviewer: *Kelly Mini Fatti*



REPORT OF DATA VALIDATION RESULTS

LAB BATCH: REA37051

5. OVERALL ASSESSMENT OF THE DATA

Table 6 presents a summary of the sample results, and any qualification that has been described in this report.

Batch REA37051

All data has been accepted within the applied qualifier codes. Positive results have been qualified due to exceeded holding time and blank contamination in the semivolatile fraction.

6. REFERENCES

EPA, 1988. Contract Laboratory Program 2/88 Organic Statement of Work

EPA, 1988. "Laboratory Data Validation - Functional Guidelines for Evaluation of Organic Analyses," U.S. Environmental Protection Agency, Hazardous Site Evaluation Division. February 1988.

Reviewer: *Kelly M. Johnson*



REPORT OF DATA VALIDATION RESULTS

LAB BATCH: REA37051

ATTACHMENTS

- TABLE 1 - EXCEEDED HOLDING TIME**
- TABLE 2 - SURROGATE RECOVERY OUTLIERS**
- TABLE 3 - MATRIX SPIKE RECOVERY OUTLIERS**
- TABLE 4 - METHOD BLANK OUTLIERS**
- TABLE 5 - CALIBRATION OUTLIERS**
- TABLE 6 - QUALIFIED DATA SUMMARY TABLE**

**EXCEEDED HOLDING TIMES
SEMIVOLATILE ORGANIC COMPOUNDS
CLP SOW - 2/88**

PREPARED BY: Kelly Spittler

DATE: 12-16-91

LABORATORY BATCH # REA 37051

LABORATORY NAME/LOCATION: ITAS - St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: _____

COLLECTION DATE(s): 08-28-91

LABORATORY SAMPLE ID	MOUND SAMPLE ID (MND33-)	DATE COLLECTED	DATE EXTRACTED	DATE ANALYZED	NUMBER OF DAYS PAST HOLDING TIME	
1530-001	0016-0001	08-28-91	09-06-91	09-13-91	2	
1530-002	0017-0001	↓	↓	↓	2	
1530-003	0018-0001				2	
1530-004	0019-0001				2	
1530-005	0019-1001				2	
1530-006	0020-0001				08-29-91	1
1530-007	0021-0001	↓	↓	↓	1	
1530-008	0022-0001				1	
1530-009	0023-0001				09-15-91	1
1530-010	0023-1001				1	
1530-011	0024-0001				1	
1530-010MS	0023-1001MS				1	
1530-010MSD	0023-1001MSD				1	

CALIBRATION OUTLIERS SEMIVOLATILE TCL COMPOUNDS CLP SOW - 2/88

PREPARED BY: Kelly Spitzer

DATE: 12-16-91

LANL MOUND PROJECT

LABORATORY BATCH #: REA 37051

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: ITAS - St Louis

COLLECTION DATE(s): 08-28-29-91

PREPARATION BLANK MATRIX (SOIL/WATER): Soil

PREPARATION BLANK CONCENTRATION UNITS (UG/L OR MG/KG): ug/kg

INSTRUMENT # <u>MSA</u> DATE/TIME:	INIT. CAL.		CONT. CAL.		CONT. CAL.		CONT. CAL.	
	RF	%RSD	RF	%D	RF	%D	RF	%D
PITENOL								
MS(2-CHLOROETHYL)ETHER								
2-CHLOROPITENOL								
1,3-DICHLOROBENZENE								
1,4-DICHLOROBENZENE								
BENZYL ALCOHOL								
1,2-DICHLOROBENZENE								
2-METHYLPHENOL								
BIS(2-CHLOROISOPROPYL)ETHER								
4-METHYLPHENOL								
N-NITROSO-DI-N-PROPYLAMINE								
HEXACHLOROETHANE								
NITROBENZENE								
ISOPHTHORENE								
2-NITROPHENOL								
2,4-DIMETHYLPHENOL								
BENZOIC ACID								
BIS(2-CHLOROETHOXY)METHANE								
2,4-DICHLOROPHENOL								
1,2,4-TRICHLOROBENZENE								
NAFTHYLENE								
4-CHLOROANILINE								
HEXACHLOROBTADIENE								
4-CHLORO-3-METHYLPHENOL								
2-METHYLNAPHTHYLENE								

AFFECTED SAMPLES:

SO 201 (MND 33-3)	MND 33-3
0016-0001	0023-0001
0017-0001	0023-1001
0018-0001	0023-1001A2
0019-0001	0023-1001 MSD
0019-1001	0024-0001
0020-0001	
0021-0001	
0022-0001 + LISTED TO RIGHT	

REVIEWER _____ INITIALS: K/RS
DATE: 12-16-91

* THESE FLAGS SHOULD BE APPLIED TO THE ANALYTES ON THE SAMPLE DATA SHEETS.

QUALIFIED DATA SUMMARY TABLE SEMIVOLATILE ORGANIC COMPOUNDS

PREPARED BY: H. Sealey

LANL MOUND PROJECT

DATE: 3/3/92OPERABLE UNIT NO.: 3LABORATORY BATCH #: REA 37051COLLECTION DATE(S): 8/28,29/92LABORATORY NAME/LOCATION: ICMS - St. Louis

ANALYTE	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID
	MND33-0016-0001	MND33-0017-0001	MND33-0018-0001	MND33-0019-0001
PHENOL	420 UJ	450 UJ	420 UJ	400 UJ
BIS(2-CHLOROETHYL)ETHER	420 UJ	450 UJ	420 UJ	400 UJ
2-CHLOROPHENOL	420 UJ	450 UJ	420 UJ	400 UJ
1,3-DICHLOROBENZENE	420 UJ	450 UJ	420 UJ	400 UJ
1,4-DICHLOROBENZENE	420 UJ	450 UJ	420 UJ	400 UJ
BENZYL ALCOHOL	420 UJ	450 UJ	420 UJ	400 UJ
1,2-DICHLOROBENZENE	420 UJ	450 UJ	420 UJ	400 UJ
2-METHYLPHENOL	420 UJ	450 UJ	420 UJ	400 UJ
BIS(2-CHLOROISOPROPYL)ETHER	420 UJ	450 UJ	420 UJ	400 UJ
4-METHYLPHENOL	420 UJ	450 UJ	420 UJ	400 UJ
N-NITROSO-DI-N-PROPYLAMINE	420 UJ	450 UJ	420 UJ	400 UJ
HEXACHLOROETHANE	420 UJ	450 UJ	420 UJ	400 UJ
NITROBENZENE	420 UJ	450 UJ	420 UJ	400 UJ
ISOPHORONE	420 UJ	450 UJ	420 UJ	400 UJ
2-NITROPHENOL	420 UJ	450 UJ	420 UJ	400 UJ
2,4-DIMETHYLPHENOL	420 UJ	450 UJ	420 UJ	400 UJ
BENZOIC ACID	3000 UJ	2200 UJ	2100 UJ	1900 UJ
BIS(2-CHLOROETHOXY)METHANE	420 UJ	450 UJ	420 UJ	400 UJ
2,4-DICHLOROPHENOL	420 UJ	450 UJ	420 UJ	400 UJ
1,2,4-TRICHLOROBENZENE	420 UJ	450 UJ	420 UJ	400 UJ
NAPHTHALENE	420 UJ	450 UJ	420 UJ	400 UJ
4-CHLOROANILINE	420 UJ	450 UJ	420 UJ	400 UJ
HEXACHLOROBUTADIENE	420 UJ	450 UJ	420 UJ	400 UJ
4-CHLORO-3-METHYLPHENOL	420 UJ	450 UJ	420 UJ	400 UJ
2-METHYLNAPHTHALENE	420 UJ	450 UJ	420 UJ	400 UJ
HEXACHLOROCYCLOPENTADIENE	420 UJ	450 UJ	420 UJ	400 UJ
2,4,6-TRICHLOROPHENOL	420 UJ	450 UJ	420 UJ	400 UJ
2,4,5-TRICHLOROPHENOL	2000 UJ	2200 UJ	2100 UJ	1900 UJ
2-CHLORONAPHTHALENE	420 UJ	450 UJ	420 UJ	400 UJ
2-NITROANILINE	2000 UJ	2200 UJ	2100 UJ	1900 UJ

REVIEWER INITIALS: _____

DATE: _____

QUALIFIED DATA SUMMARY TABLE SEMIVOLATILE ORGANIC COMPOUNDS

ANALYTE	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID
	MWD33-0016-0001	MWD33-0017-0001	MWD33-0018-0001	MWD33-0019-0001
DIMETHYL PHTHALATE	420 UJ	450 UJ	420 UJ	400 UJ
ACENAPHTHYLENE	420 UJ	450 UJ	420 UJ	400 UJ
3-NITROANILINE	2000 UJ	2200 UJ	2100 UJ	1900 UJ
ACENAPHTHENE	420 UJ	47 J	420 UJ	400 UJ
2,4-DINITROPHENOL	2000 UJ	2200 UJ	2100 UJ	1900 UJ
4-NITROPHENOL	2000 UJ	2200 UJ	2100 UJ	1900 UJ
DIBENZOFURAN	420 UJ	450 UJ	420 UJ	400 UJ
2,4-DINITROTOLUENE	420 UJ	450 UJ	420 UJ	400 UJ
2,6-DINITROTOLUENE	420 UJ	450 UJ	420 UJ	400 UJ
DIETHYLPHTHALATE	420 UJ	450 UJ	420 UJ	400 UJ
4-CHLOROPHENYL-PHENYLETHER	420 UJ	450 UJ	420 UJ	400 UJ
FLUORENE	420 UJ	450 UJ	420 UJ	400 UJ
4-NITROANILINE	2000 UJ	2200 UJ	2100 UJ	1900 UJ
4,6-DINITRO-2-METHYLPHENOL	2000 UJ	2200 UJ	2100 UJ	1900 UJ
N-NITROSODIPHENYLAMINE	420 UJ	450 UJ	420 UJ	400 UJ
4-BROMOPHENYL-PHENYLETHER	420 UJ	450 UJ	420 UJ	400 UJ
HEXACHLOROBENZENE	420 UJ	450 UJ	420 UJ	400 UJ
PENTACHLOROPHENOL	2000 UJ	2200 UJ	2100 UJ	1900 UJ
PHENANTHRENE	420 UJ	450 UJ	420 UJ	400 UJ
ANTHRACENE	420 UJ	450 UJ	420 UJ	400 UJ
DI-N-BUTYLPHTHALATE	420 UJ	450 UJ	420 UJ	400 UJ
FLUORANTHENE	420 UJ	160 J	420 UJ	400 UJ
FRYENE	420 UJ	86 J	420 UJ	400 UJ
BUTYLBENZYLPHTHALATE	420 UJ	48 J	420 UJ	400 UJ
3,5-DICHLOROBENZIDINE	840 UJ	960 UJ	850 UJ	800 UJ
BENZO(A)ANTHRACENE	420 UJ	450 UJ	420 UJ	400 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	420 UJ	450 UJ	420 UJ	400 UJ
CYRSENE	420 UJ	450 UJ	420 UJ	400 UJ
DI-N-OCTYL PHTHALATE	420 UJ	450 UJ	420 UJ	400 UJ
BENZO(B)FLUORANTHENE	420 UJ	450 UJ	420 UJ	400 UJ
BENZO(K)FLUORANTHENE	420 UJ	450 UJ	420 UJ	400 UJ
BENZO(A)PYRENE	420 UJ	450 UJ	420 UJ	400 UJ
INDENO(1,2,3-CD)PYRENE	420 UJ	450 UJ	420 UJ	400 UJ
DIBENZ(A,B)ANTHRACENE	420 UJ	450 UJ	420 UJ	400 UJ
BENZO(G,H,I)PERYLENE	420 UJ	450 UJ	420 UJ	400 UJ

REVIEWER INITIALS: _____

DATE: _____

QUALIFIED DATA SUMMARY TABLE SEMIVOLATILE ORGANIC COMPOUNDS

PREPARED BY: H. Seely

LANL MOUND PROJECT

DATE: 3/3/92OPERABLE UNIT NO.: 3LABORATORY BATCH #: REA 37051COLLECTION DATE(s): 8/25/92LABORATORY NAME/LOCATION: ETAS-A. Co. 3

ANALYTE	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID
	MND33-0019-1001	MND33-0020-0001	MND33-0021-0001	MND33-0022-0001
PHENOL	420 UJ	400 UJ	360 UJ	380 UJ
BIS(2-CHLOROETHYL)ETHER	420 UJ	400 UJ	360 UJ	380 UJ
2-CHLOROPHENOL	420 UJ	400 UJ	360 UJ	380 UJ
1,3-DICHLOROBENZENE	420 UJ	400 UJ	360 UJ	380 UJ
1,4-DICHLOROBENZENE	420 UJ	400 UJ	360 UJ	380 UJ
BENZYL ALCOHOL	420 UJ	400 UJ	360 UJ	380 UJ
1,2-DICHLOROBENZENE	420 UJ	400 UJ	360 UJ	380 UJ
2-METHYLPHENOL	420 UJ	400 UJ	360 UJ	380 UJ
BIS(2-CHLOROISOPROPYL)ETHER	420 UJ	400 UJ	360 UJ	380 UJ
4-METHYLPHENOL	420 UJ	400 UJ	360 UJ	380 UJ
N-NITROSO-DI-N-PROPYLAMINE	420 UJ	400 UJ	360 UJ	380 UJ
HEXACHLOROETHANE	420 UJ	400 UJ	360 UJ	380 UJ
NITROBENZENE	420 UJ	400 UJ	360 UJ	380 UJ
ISOPHORONE	420 UJ	400 UJ	360 UJ	380 UJ
2-NITROPHENOL	420 UJ	400 UJ	360 UJ	380 UJ
2,4-DIMETHYLPHENOL	420 UJ	400 UJ	360 UJ	380 UJ
BENZOIC ACID	2500 UJ	2000 UJ	1800 UJ	1800 UJ
BIS(2-CHLOROETHOXY)METHANE	420 UJ	400 UJ	360 UJ	380 UJ
2,4-DICHLOROPHENOL	420 UJ	400 UJ	360 UJ	380 UJ
1,2,4-TRICHLOROBENZENE	420 UJ	400 UJ	360 UJ	380 UJ
NAFTHALENE	420 UJ	400 UJ	360 UJ	380 UJ
4-CHLOROANILINE	420 UJ	400 UJ	360 UJ	380 UJ
HEXACHLOROBUTADIENE	420 UJ	400 UJ	360 UJ	380 UJ
4-CHLORO-3-METHYLPHENOL	420 UJ	400 UJ	360 UJ	380 UJ
2-METHYLNAPHTHALENE	420 UJ	400 UJ	360 UJ	380 UJ
HEXACHLOROCYCLOPENTADIENE	420 UJ	400 UJ	360 UJ	380 UJ
2,4,6-TRICHLOROPHENOL	420 UJ	400 UJ	360 UJ	380 UJ
2,4,5-TRICHLOROPHENOL	2000 UJ	2000 UJ	1800 UJ	1800 UJ
2-CHLORONAPHTHALENE	420 UJ	400 UJ	360 UJ	380 UJ
2-NITROANILINE	2000 UJ	2000 UJ	1800 UJ	1800 UJ

REVIEWER INITIALS: _____

DATE: _____

QUALIFIED DATA SUMMARY TABLE SEMIVOLATILE ORGANIC COMPOUNDS

ANALYTE	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID
	MM033-0019-001	MM033-0020-001	MM033-0021-001	MM033-0022-001
DIMETHYL PHTHALATE	420 UJ	400 UJ	360 UJ	380 UJ
ACENAPHTHYLENE	420 UJ	400 UJ	360 UJ	380 UJ
3-NITROANILINE	2000 UJ	2000 UJ	1800 UJ	1800 UJ
ACENAPHTHENE	420 UJ	400 UJ	360 UJ	380 UJ
2,4-DINITROPHENOL	2000 UJ	2000 UJ	1800 UJ	1800 UJ
4-NITROPHENOL	2000 UJ	2000 UJ	1800 UJ	1800 UJ
DIBENZOFURAN	420 UJ	400 UJ	360 UJ	380 UJ
2,4-DINITROTOLUENE	420 UJ	400 UJ	360 UJ	380 UJ
2,6-DINITROTOLUENE	420 UJ	400 UJ	360 UJ	380 UJ
DIETHYLPHTHALATE	420 UJ	400 UJ	360 UJ	380 UJ
4-CHLOROPHENYL-PHENYLETHER	420 UJ	400 UJ	360 UJ	380 UJ
FLUORENE	420 UJ	400 UJ	360 UJ	380 UJ
4-NITROANILINE	2000 UJ	2000 UJ	1800 UJ	1800 UJ
4,6-DINITRO-2-METHYLPHENOL	2000 UJ	2000 UJ	1800 UJ	1800 UJ
N-NITROSODIPHENYLAMINE	420 UJ	400 UJ	360 UJ	380 UJ
4-BROMOPHENYL-PHENYLETHER	420 UJ	400 UJ	360 UJ	380 UJ
HEXACHLOROBENZENE	420 UJ	400 UJ	360 UJ	380 UJ
PENTACHLOROPHENOL	2000 UJ	2000 UJ	1800 UJ	1800 UJ
PHENANTHRENE	420 UJ	400 UJ	360 UJ	380 UJ
ANTHRACENE	420 UJ	400 UJ	360 UJ	380 UJ
DI-N-BUTYLPHTHALATE	420 UJ	400 UJ	360 UJ	380 UJ
FLUORANTHENE	69 J	400 UJ	360 UJ	380 UJ
FRYENE	44 J	400 UJ	360 UJ	380 UJ
BUTYLBENZYLPHthalate	420 UJ	400 UJ	53 J	380 UJ
3,5-DICHLOROBENZIDINE	840 UJ	810 UJ	720 UJ	750 UJ
BENZO(A)ANTHRACENE	420 UJ	400 UJ	360 UJ	380 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	420 UJ	400 UJ	360 UJ	380 UJ
CYRSENE	420 UJ	400 UJ	360 UJ	380 UJ
DI-N-OCTYL PHTHALATE	420 UJ	400 UJ	360 UJ	380 UJ
BENZO(B)FLUORANTHENE	420 UJ	400 UJ	360 UJ	380 UJ
BENZO(K)FLUORANTHENE	420 UJ	400 UJ	360 UJ	380 UJ
BENZO(A)PYRENE	420 UJ	400 UJ	360 UJ	380 UJ
INDENO(1,2,3-CD)PYRENE	420 UJ	400 UJ	360 UJ	380 UJ
DIBENZO(A,H)ANTHRACENE	420 UJ	400 UJ	360 UJ	380 UJ
BENZO(G,H,I)PERYLENE	420 UJ	400 UJ	360 UJ	380 UJ

REVIEWER INITIALS: _____

DATE: _____

QUALIFIED DATA SUMMARY TABLE SEMIVOLATILE ORGANIC COMPOUNDS

PREPARED BY: H. Serley

LANL MOUND PROJECT

DATE: 3/3/92OPERABLE UNIT NO.: 3LABORATORY BATCH #: PCA 37051COLLECTION DATE(s): 8/23, 29, 9/2LABORATORY NAME/LOCATION: THS-8/10

ANALYTE	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID
	MND33-0023-0001	MND33-0023-1001	MND33-0024-0001	
PHENOL	380 UJ	380 UJ	360 UJ	
BIS(2-CHLOROETHYL)ETHER	380 UJ	380 UJ	360 UJ	
2-CHLOROPHENOL	380 UJ	380 UJ	360 UJ	
1,3-DICHLOROBENZENE	380 UJ	380 UJ	360 UJ	
1,4-DICHLOROBENZENE	380 UJ	380 UJ	360 UJ	
BENZYL ALCOHOL	380 UJ	380 UJ	360 UJ	
1,2-DICHLOROBENZENE	380 UJ	380 UJ	360 UJ	
2-METHYLPHENOL	380 UJ	380 UJ	360 UJ	
BIS(2-CHLOROISOPROPYL)ETHER	380 UJ	380 UJ	360 UJ	
4-METHYLPHENOL	380 UJ	380 UJ	360 UJ	
N-NITROSO-DI-N-PROPYLAMINE	380 UJ	380 UJ	360 UJ	
HEXACHLOROETHANE	380 UJ	380 UJ	360 UJ	
NITROBENZENE	380 UJ	380 UJ	360 UJ	
ISOPHORONE	380 UJ	380 UJ	360 UJ	
2-NITROPHENOL	380 UJ	380 UJ	360 UJ	
2,4-DIMETHYLPHENOL	380 UJ	380 UJ	360 UJ	
BENZOIC ACID	1900 UJ	1800 UJ	1800 UJ	
BIS(2-CHLOROETHOXY)METHANE	380 UJ	380 UJ	360 UJ	
2,4-DICHLOROPHENOL	380 UJ	380 UJ	360 UJ	
1,2,4-TRICHLOROBENZENE	380 UJ	380 UJ	360 UJ	
NAPHTHALENE	380 UJ	380 UJ	360 UJ	
4-CHLOROANILINE	380 UJ	380 UJ	360 UJ	
HEXACHLOROBUTADIENE	380 UJ	380 UJ	360 UJ	
4-CHLORO-3-METHYLPHENOL	380 UJ	380 UJ	360 UJ	
2-METHYLNAPHTHALENE	380 UJ	380 UJ	360 UJ	
HEXACHLOROCYCLOPENTADIENE	380 UJ	380 UJ	360 UJ	
2,4,6-TRICHLOROPHENOL	380 UJ	380 UJ	360 UJ	
2,4,5-TRICHLOROPHENOL	1900 UJ	1800 UJ	1800 UJ	
2-CHLORONAPHTHALENE	380 UJ	380 UJ	360 UJ	
2-NITROANILINE	1900 UJ	1800 UJ	1800 UJ	

REVIEWER INITIALS: _____

DATE: _____

QUALIFIED DATA SUMMARY TABLE

SEMIVOLATILE ORGANIC COMPOUNDS

ANALYTE	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID
	MWD33-0023-0001	MWD33-0023-1001	MWD33-0024-0001	
DIMETHYL PHTHALATE	380 UJ	380 UJ	360 UJ	
ACENAPHTHYLENE	380 UJ	380 UJ	360 UJ	
3-NITROANILINE	1900 UJ	1800 UJ	1800 UJ	
ACENAPHTHENE	380 UJ	380 UJ	360 UJ	
2,4-DINITROPHENOL	1900 UJ	1800 UJ	1800 UJ	
4-NITROPHENOL	380 UJ	380 UJ	360 UJ	
DIBENZOFURAN	380 UJ	380 UJ	360 UJ	
2,4-DINITROTOLUENE	380 UJ	380 UJ	360 UJ	
2,6-DINITROTOLUENE	380 UJ	380 UJ	360 UJ	
DIETHYLPHTHALATE	380 UJ	380 UJ	360 UJ	
4-CHLOROPHENYL-PHENYLETHER	380 UJ	380 UJ	360 UJ	
FLUORENE	380 UJ	380 UJ	360 UJ	
4-NITROANILINE	1900 UJ	1800 UJ	1800 UJ	
4,6-DINITRO-2-METHYLPHENOL	1900 UJ	1800 UJ	1800 UJ	
N-NITROSODIPHENYLAMINE	380 UJ	380 UJ	360 UJ	
4-BROMOPHENYL-PHENYLETHER	380 UJ	380 UJ	360 UJ	
HEXACHLOROENZENE	380 UJ	380 UJ	360 UJ	
PENTACHLOROPHENOL	1900 UJ	1800 UJ	1800 UJ	
PHENANTHRENE	380 UJ	380 UJ	360 UJ	
ANTHRACENE	380 UJ	380 UJ	360 UJ	
DI-N-BUTYLPHTHALATE	380 UJ	380 UJ	360 UJ	
FLUORANTHENE	380 UJ	380 UJ	360 UJ	
FRYENE	380 UJ	380 UJ	360 UJ	
BUTYLBENZYLPHTHALATE	380 UJ	380 UJ	360 UJ	
3,5'-DICHLOROENZIDINE	760 UJ	760 UJ	730 UJ	
BENZO(A)ANTHRACENE	380 UJ	380 UJ	360 UJ	
BIS(2-ETHYLHEXYL)PHTHALATE	380 UJ	380 UJ	360 UJ	
CYRSENE	380 UJ	380 UJ	360 UJ	
DI-N-OCTYL PHTHALATE	380 UJ	380 UJ	360 UJ	
BENZO(B)FLUORANTHENE	380 UJ	380 UJ	360 UJ	
BENZO(E)FLUORANTHENE	380 UJ	380 UJ	360 UJ	
BENZO(A)PYRENE	380 UJ	380 UJ	360 UJ	
INDENO(1,2,3-CD)PYRENE	380 UJ	380 UJ	360 UJ	
DIBENZO(A,B)ANTHRACENE	380 UJ	380 UJ	360 UJ	
BENZO(G,H,I)PERYLENE	380 UJ	380 UJ	360 UJ	

REVIEWER INITIALS: _____

DATE: _____



1 WESTON WAY
WEST CHESTER, PA 19380-1449
PHONE: 215-692-3030
FAX: 215-430-3124

REPORT OF DATA VALIDATION RESULTS

PROJECT: LANL Mound

PROJECT NUMBER: 27444001

TACK: Operable Unit 3

DATE: February 21, 1992

LABORATORY: IT Analytical Services

LAB BATCH: REA37051

ANALYSIS: Pesticide/PCB Organic Compounds

1. CASE SUMMARY

Eleven soil samples were collected on August 28,29-91 for pesticide/PCB organic compounds and were assigned IT Laboratory batch number REA37051. Samples were apparently received by the laboratory in good condition.

Sample analysis was performed according to the Method 8080, SW846 by IT laboratories in Earth City, Missouri. The following samples apply to this data validation report:

Batch REA37051

MND33-0016-0001

MND33-0023-0001

MND33-0017-0001

MND33-0023-1001

MND33-0018-0001

MND33-0023-1001MS

MND33-0019-0001

MND33-0023-1001MSD

MND33-0019-1001

MND33-0024-0001

MND33-0020-0001

MND33-0021-0001

MND33-0022-0001

2. SAMPLE HOLDING TIMES

All sample analyses exceeded the 7-day EPA extraction holding time requirement from 4 to 5 days; therefore, all sample data is considered as estimated.

Reviewer: *Kelly Mairguter*



REPORT OF DATA VALIDATION RESULTS

LAB BATCH: REA37051

3. RESULTS OF LABORATORY QUALITY CONTROL CHECKS

a. Calibration

Several %RSD results exceeded the QC limit in the initial 5-point calibration. These compounds were not detected in the samples. All data have been qualified in reference to the exceeded holding time; therefore, no additional qualifier codes have been applied.

b. Method Blanks

The method blanks were free of target compound contamination.

c. Surrogate Spikes

All surrogate recoveries were within the CLP-SOW QC limits. However, the surrogate recoveries for QC samples MND33-0023-1001 MS/MSD 1 DL were not listed on the Form II. Since these dilution analyses were only for two of the compounds, addition of this information on the Form II is not required.

d. Matrix spike and Matrix Spike Duplicates

All spike recoveries were within the QC criteria established in the CLP-SOW.

e. Compound Identification

All positive sample results fell within the required retention time windows. Chromatographic quality and peak separation were satisfactory.

f. System Performance

The instrument performance was stable throughout these analyses.

Reviewer: Kelly M. Smith



REPORT OF DATA VALIDATION RESULTS

LAB BATCH: REA37051

g. Compound Quantitation and Reported Detection Limits

All calculations of the detected compounds were confirmed. The CRQLs were adjusted accordingly.

4. **RESULTS OF ASSOCIATED QUALITY CONTROL CHECKS**

a. Field Duplicates

No field duplicate was reported with this data set.

b. Field Blanks

No field blanks were reported with this data set.

5. **OVERALL ASSESSMENT OF THE DATA**

Table 6 presents a summary of the sample results, and any qualification that has been described in this report.

Batch REA37051

All data has been accepted within the applied qualifier codes. Positive results have been qualified due to exceeded holding time in the pesticide/PCB fraction.

6. **REFERENCES**

EPA, November 1986. Test Methods for Evaluating Solid Waste, SW846.

EPA, 1988. "Laboratory Data Validation - Functional Guidelines for Evaluation of Organic Analyses," U.S. Environmental Protection Agency, Hazardous Site Evaluation Division. February 1988.

Reviewer: Kelly Meinhardt



REPORT OF DATA VALIDATION RESULTS

LAB BATCH: REA37051

ATTACHMENTS

- TABLE 1 - EXCEEDED HOLDING TIME**
- TABLE 2 - SURROGATE RECOVERY OUTLIERS**
- TABLE 3 - MATRIX SPIKE RECOVERY OUTLIERS**
- TABLE 4 - METHOD BLANK OUTLIERS**
- TABLE 5 - CALIBRATION OUTLIERS**
- TABLE 6 - QUALIFIED DATA SUMMARY TABLE**

**EXCEEDED HOLDING TIMES
PESTICIDE/PCB'S COMPOUNDS
SW846 - METHOD 8080**

PREPARED BY: Kelly Spittler

DATE: 12-16-91

LABORATORY BATCH # REA 37051

LABORATORY NAME/LOCATION: ITAS - St. Louis

LANI MOUND PROJECT

OPERABLE UNIT NO.: _____

COLLECTION DATE(s): 09-09-91

LABORATORY SAMPLE ID	MOUND SAMPLE ID	DATE COLLECTED	DATE EXTRACTED	DATE ANALYZED	NUMBER OF DAYS PAST HOLDING TIME	
1530-006	(MND33-) 0000-0001	08-27-91	09-09-91	09-18-91	4	
1530-007	0021-0001	↓	↓	↓	4	
1530-008	0022-0001				4	
1530-009	0023-0001				4	
1530-010	0023-1001				4	
1530-010 MS1	0023-1001 MS1				4	
1530-010 MS01	0023-1001 MS01				09-19-91	4
1530-010 MS2	0023-1001 MS2				4	
1530-010 MS02	0023-1001 MS02				4	
1530-011	0024-0001				4	
1530-010 MS1 DL	0023-1001 MS1 DL				4	
1530-010 MS0-DL	0023-1001 MS0 DL				4	

**CALIBRATION OUTLERS
PESTICIDE/PCB COMPOUNDS
SW846 - METHOD 8080**

PREPARED BY: Kelly Gordon

DATE: 12-15-11

LANL MOUND PROJECT

LABORATORY BATCH/CASE #: PCA 37051

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: 2743 - 14 Zone

COLLECTION DATE(S): 12-15-11

PREPARATION BLANK MATRIX (SOIL/WATER): Soil

PREPARATION BLANK CONCENTRATION UNITS (UG/L OR MG/KG): ug/kg

INSTRUMENT #: <u>GCE-1701</u> COLUMN TYPE: <u>P&CK</u> DATE/TIME	INIT. CAL		CONT. CAL			CONT. CAL		
	CF	%RSD	CF	%D	CF	%D	CF	%D
ALPHA-BHC								
BETA-BHC		30						
DELTA-BHC								
GAMMA-BHC (LINDANE)								
HEPTACLOR		21						
ALDRIN								
HEPTACLOR EPOXIDE		20						
ENDOSULFAN I								
DELDRIN								
4,4'-DDE								
ENDRIN								
ENDOSULFAN II								
4,4'-DDD								
ENDOSULFAN SULFATE								
4,4'-DDT								
METHOXYCLOR		20						
ENDRIN KETONE								
ENDRIN ALDEHYDE								
ALPHA-CILORDANE								
GAMMA-CILORDANE								
TOXAPIENE								
AROCLOR 1016								
AROCLOR 121								
AROCLOR 122		21						
AROCLOR 1242		23						
AROCLOR 1248								
AROCLOR 1254		24						
AROCLOR 1260								
DIBUTYLCHLORODATE		25						
TETRACHLORO-M-XYLENE		21						
AFFECTED SAMPLES								

REVIEWER INITIALS: [Signature]

DATE: 12-15-11

* THESE FLAGS SHOULD BE APPLIED TO THE ANALYTES ON THE SAMPLE DATA SHEETS.

**CALIBRATION OUTLERS
PESTICIDE/PCB COMPOUNDS
SW846 - METHOD 8080**

PREPARED BY: Kelly Martin

DATE: 12-16-91

LANL MOUND PROJECT

LABORATORY BATCH/CASE #: REG 37051

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: TPS - Ft. Lewis

COLLECTION DATE(S): 8-28-89-91

PREPARATION BLANK MATRIX (SOIL/WATER): Soil

PREPARATION BLANK CONCENTRATION UNITS (UG/L OR MG/KG): ug/kg

INSTRUMENT #: <u>GCA-DB-5</u> COLUMN TYPE: <u>Pack</u> DATE/TIME	INIT. CAL		CONT. CAL		CONT. CAL	
	CF	%RSD	CF	%D	CF	%D
ALPHA-BHC						
BETA-BHC						
DELTA-BHC						
GAMMA-BHC (LINDANE)						
HEPTACHLOR						
ALDRIN						
HEPTACHLOR EPOXIDE						
ENDOSULFAN I						
DIELDRIN						
4,4'-DDE						
ENDRIN						
ENDOSULFAN II						
4,4'-DDD						
ENDOSULFAN SULFATE						
4,4'-DDT						
METHOXYCLOR						
ENDRIN KETONE						
ENDRIN ALDEHYDE						
ALPHA-CITLORDANE						
GAMMA-CITLORDANE						
TOXAPHENE						
AROCLOR 1016						
AROCLOR 1221						
AROCLOR 1222						
AROCLOR 1242						
AROCLOR 1248						
AROCLOR 1254						
AROCLOR 1260						
DIBUTYLCELORENDATE						
TETRACHLORO-M-XYLENE						
AFFECTED SAMPLES						

REVIEWER INITIALS: KMS

DATE: 12-16-91

* THESE FLAGS SHOULD BE APPLIED TO THE ANALYTES ON THE SAMPLE DATA SHEETS.

QUALIFIED DATA SUMMARY TABLE PESTICIDE/PCB COMPOUNDS

PREPARED BY: H. Seely

LANL MOUND PROJECT

DATE: 3/3/92

OPERABLE UNIT NO.: 3

LABORATORY BATCH/CASE #: ROA 3.7051

COLLECTION DATE(S): 8/28, 29/72

LABORATORY NAME/LOCATION: FAS St. Louis

ANALYTE	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID
	MND33-0016-0001	MND33-0017-0001	MND33-0018-0001	MND33-0019-0001
ALPHA-BHC	2.5 UJ	2.7 UJ	2.6 UJ	2.4 UJ
BETA-BHC	5.1 UJ	5.5 UJ	5.1 UJ	4.9 UJ
DELTA-BHC	14 J	8.2 UJ	7.7 UJ	7.3 UJ
GAMMA-BHC (LINDANE)	3.4 UJ	3.7 UJ	3.5 UJ	3.3 UJ
HEPTACLOR	2.5 UJ	2.7 UJ	2.6 UJ	2.4 UJ
ALDRIN	3.4 UJ	3.7 UJ	3.5 UJ	3.3 UJ
HEPTACLOR EPOXIDE	70 UJ	76 UJ	71 UJ	68 UJ
ENDOSULFAN I	12 UJ	13 UJ	12 UJ	11 UJ
DELDRIN	1.6 UJ	1.8 UJ	1.7 UJ	1.6 UJ
4,4'-DDE	3.4 UJ	3.7 UJ	3.5 UJ	3.3 UJ
ENDRIN	5.1 UJ	5.5 UJ	5.1 UJ	4.9 UJ
ENDOSULFAN II	3.4 UJ	3.7 UJ	3.5 UJ	3.3 UJ
4,4'-DDD	9.4 UJ	10 UJ	9.5 UJ	9.0 UJ
ENDOSULFAN SULFATE	56 UJ	60 UJ	59 UJ	54 UJ
4,4'-DDT	10 UJ	11 UJ	10 UJ	9.7 UJ
METHOXYCLOR	150 UJ	160 UJ	150 UJ	140 UJ
ENDRIN KETONE	20 UJ	22 UJ	21 UJ	20 UJ
ENDRIN ALDEHYDE	20 UJ	21 UJ	20 UJ	19 UJ
ALPHA-CHLORDANE	12 UJ	13 UJ	12 UJ	11 UJ
GAMMA-CHLORDANE	12 UJ	13 UJ	12 UJ	11 UJ
TOXAPHENE	200 UJ	220 UJ	210 UJ	200 UJ
AROCLOR 1016	100 UJ	110 UJ	100 UJ	97 UJ
AROCLOR 1221	100 UJ	110 UJ	100 UJ	97 UJ
AROCLOR 1232	100 UJ	110 UJ	100 UJ	97 UJ
AROCLOR 1242	100 UJ	110 UJ	100 UJ	97 UJ
AROCLOR 1248	100 UJ	110 UJ	100 UJ	97 UJ
AROCLOR 1254	200 UJ	220 UJ	200 UJ	190 UJ
AROCLOR 1260	200 UJ	220 UJ	200 UJ	190 UJ
DEBUTYLCHLORENDATE				
TETRACHLORO-M-XYLENE				

REVIEWER INITIALS: _____

DATE: _____

QUALIFIED DATA SUMMARY TABLE PESTICIDE/PCB COMPOUNDS

PREPARED BY: H. Serley

LANL MOUND PROJECT

DATE: 3/3/72

OPERABLE UNIT NO.: 3

LABORATORY BATCH/CASE #: KEA 37051

COLLECTION DATE(s): 8/23, 24/72

LABORATORY NAME/LOCATION: ITAS-St. Louis

ANALYTE	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID
	MW033-0019-0001	MW037-0020-0001	MW033-0021-0001	MW037-0022-0001
ALPHA-BHC	2.6 UJ	2.4 UJ	2.2 UJ	2.3 UJ
BETA-BHC	5.1 UJ	4.9 UJ	4.4 UJ	4.6 UJ
DELTA-BHC	8.6 UJ	7.3 UJ	6.5 UJ	6.9 UJ
GAMMA-BHC (LINDANE)	3.4 UJ	3.3 UJ	2.9 UJ	3.1 UJ
HEPTACLOR	2.6 UJ	2.4 UJ	2.2 UJ	2.3 UJ
ALDRIN	3.4 UJ	3.3 UJ	2.9 UJ	3.1 UJ
HEPTACLOR EPOXIDE	71 UJ	68 UJ	61 UJ	64 UJ
ENDOSULFAN I	12 UJ	11 UJ	10 UJ	11 UJ
DELDRIN	1.7 UJ	1.6 UJ	1.4 UJ	1.5 UJ
4,4'-DDE	3.4 UJ	3.3 UJ	2.9 UJ	3.1 UJ
ENDRIN	5.1 UJ	4.9 UJ	4.4 UJ	4.6 UJ
ENDOSULFAN II	3.4 UJ	3.3 UJ	2.9 UJ	3.1 UJ
4,4'-DDD	9.4 UJ	9.0 UJ	8.1 UJ	8.5 UJ
ENDOSULFAN SULFATE	56 UJ	54 UJ	48 UJ	50 UJ
4,4'-DDT	10 UJ	9.7 UJ	8.7 UJ	9.1 UJ
METHOXYCLOR	150 UJ	140 UJ	130 UJ	130 UJ
ENDRIN KETONE	20 UJ	19 UJ	18 UJ	18 UJ
ENDRIN ALDEHYDE	20 UJ	19 UJ	17 UJ	18 UJ
ALPHA-CHLORDANE	12 UJ	11 UJ	10 UJ	11 UJ
GAMMA-CHLORDANE	12 12 UJ	11 UJ	10 UJ	11 UJ
TOXAPHENE	200 UJ	200 UJ	180 UJ	180 UJ
AROCLOR 1016	100 UJ	97 UJ	87 UJ	92 UJ
AROCLOR 1221	100 UJ	97 UJ	87 UJ	92 UJ
AROCLOR 1232	100 UJ	97 UJ	87 UJ	92 UJ
AROCLOR 1242	100 UJ	97 UJ	87 UJ	92 UJ
AROCLOR 1248	100 UJ	97 UJ	87 UJ	92 UJ
AROCLOR 1254	200 UJ	190 UJ	170 UJ	180 UJ
AROCLOR 1260	200 UJ	190 UJ	170 UJ	180 UJ
DEBUTYLCHLORENDATE				
TETRACHLORO-M-XYLENE				

REVIEWER INITIALS: _____

DATE: _____

QUALIFIED DATA SUMMARY TABLE PESTICIDE/PCB COMPOUNDS

PREPARED BY: H. Seeley

LANL MOUND PROJECT

DATE: 3/3/92

OPERABLE UNIT NO.: 3

LABORATORY BATCH/CASE #: REA 37051

COLLECTION DATE(s): 8/28, 29, 92

LABORATORY NAME/LOCATION: FMS-St. Louis

ANALYTE	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID	MOUND SAMPLE ID
	W033-0023-0001	W033-0023-1001	W023-0024-0001	
ALPHA-BHC	2.3 UJ	2.3 UJ	2.2 UJ	
BETA-BHC	4.6 UJ	4.6 UJ	4.4 UJ	
DELTA-BHC	7.0 UJ	7.0 UJ	6.6 UJ	
GAMMA-BHC (LINDANE)	3.1 UJ	3.1 UJ	3.0 UJ	
HEPTACLOR	2.3 UJ	2.3 UJ	2.2 UJ	
ALDRIN	3.1 UJ	3.1 UJ	3.0 UJ	
HEPTACLOR EPOXIDE	64 UJ	64 UJ	61 UJ	
ENDOSULFAN I	11 UJ	11 UJ	10 UJ	
DELDRIN	1.5 UJ	1.5 UJ	1.4 UJ	
4,4'-DDE	3.1 UJ	3.1 UJ	3.0 UJ	
ENDRIN	4.6 UJ	4.6 UJ	4.4 UJ	
ENDOSULFAN II	3.1 UJ	3.1 UJ	3.0 UJ	
4,4'-DDD	8.6 UJ	8.6 UJ	8.1 UJ	
ENDOSULFAN SULFATE	51 UJ	57 UJ	49 UJ	
4,4'-DDT	9.3 UJ	9.3 UJ	8.8 UJ	
METHOXYCLOR	140 UJ	140 UJ	130 UJ	
ENDRIN KETONE	19 UJ	18 UJ	18 UJ	
ENDRIN ALDEHYDE	18 UJ	18 UJ	17 UJ	
ALPHA-CHLORDANE	11 UJ	11 UJ	10 UJ	
GAMMA-CHLORDANE	11 UJ	11 UJ	10 UJ	
TOXAPHENE	190 UJ	190 UJ	180 UJ	
AROCLOR 1016	93 UJ	93 UJ	88 UJ	
AROCLOR 1221	93 UJ	93 UJ	88 UJ	
AROCLOR 1232	93 UJ	93 UJ	88 UJ	
AROCLOR 1242	93 UJ	93 UJ	88 UJ	
AROCLOR 1248	93 UJ	93 UJ	88 UJ	
AROCLOR 1254	180 UJ	180 UJ	180 UJ	
AROCLOR 1260	180 UJ	180 UJ	180 UJ	
DEBUTYLCHLORENDATE				
TETRACHLORO-M-XYLENE				

REVIEWER INITIALS: _____

DATE: _____



REPORT OF DATA VALIDATION RESULTS

PROJECT: LANL Mound PROJECT NUMBER: 27444001
TASK: Operable Unit 3 DATE: February 21, 1992
LABORATORY: ITAS - ST. LOUIS
LAB BATCH: REA37051
ANALYSIS: Metals

1. CASE SUMMARY

Eleven soil samples collected on 8/28,29/91 were assigned IT Laboratory Batch number REA37051. The samples were apparently received by the laboratory in good condition.

Sample analysis was performed according to the USEPA Contract Laboratory Program (CLP method) 3/90 Inorganic Statement of Work (SOW) by IT Laboratories in St. Louis. The following samples apply to this validation report.

Batch REA37051

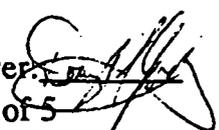
MND3300160001	MND3300190001	MND3300210001	MND3300231001
MND3300170001	MND3300191001	MND3300220001	MND3300240001
MND3300180001	MND3300200001	MND3300230001	

2. DATA COMPLETENESS

The Chain of Custody (page 325) was not signed or dated. This does not severely impact the data validation.

3. SAMPLE HOLDING TIMES

All samples for metals analysis were analyzed within the 28 day holding time for mercury and 180 day holding time for the other analytes. All samples for CN analysis were analyzed within the 14 day holding time.

Reviewer: 
page 1 of 5



4. RESULTS OF LABORATORY QUALITY CONTROL CHECKS

a. Calibration

Initial and continuing calibration check standards (ICV's and CCV's) and the CRDL standards were evaluated against CLP Inorganic SOW 3/90 criteria and the Functional Guidelines for Evaluation Inorganics Analyses (7/88). All results were deemed to be acceptable.

The beginning CCV sample was not performed for As, Se, Tl, Cn, or Hg as required by SOW 3/90 (E-11). The data, however, is considered to be acceptable unqualified because the samples are bracketed by acceptable ICV and CCV samples.

RESULTS OF LABORATORY QUALITY CONTROL CHECKS

b. Blanks

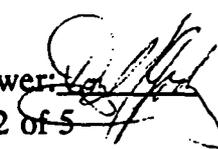
1. Prep blanks

The preparation blank contained Sb (48.65 ug/L), Ba (1.01 ug/L), Ca (18.72 ug/L), Co (4.11 ug/L), Cu (3.0 ug/L), Fe(5.13 ug/L), Pb (1.43 ug/L), Mg (14.06 ug/L), Na (148.92 ug/L), and Zn (2.76) above the IDL. All associated sample results \geq IDL but \leq 5x the blank values are qualified "U" due to laboratory contamination. All results $<$ IDL or $>$ 5x the blank value are accepted unqualified.

The preparation blank should have been reported as a soil (MG/KG).

2. Calibration blanks

The calibration blanks contained Ba (2.0 ug/L), Cd (4.5 ug/L), Ca (13.0 ug/L), Co (6.2 ug/L), Cu (6.0 ug/L), Fe (10.7 ug/L), Pb (1.4 ug/L),mg (3.3 ug/L), Ag (7.8 ug/L), Na (16.9 ug/L), Zn (3.8 ug/L). All associated sample results \geq IDL but \leq 5x the blank values are qualified "U" due to field contamination. All results $<$ IDL or $>$ 5x the blank value are accepted unqualified.

Reviewer: 
page 2 of 5



The calibration blanks contained Cr (-3.2 ug/L) and Ni (-17.4 ug/L) below the negative IDL. All associated sample results $\leq 5x$ the blank value are qualified as estimated and considered to be biased low.

c. Interference check sample

The interference check sample contained Ag, Ba, Cu, Na, Sb, and Zn above the IDL. All associated sample results with interfering element values $>50\%$ of the ICS values are qualified as estimated.

The interference check sample contained Cd, Co Mn, Ni, and V below the negative IDL. All associated sample results with interfering element values $>50\%$ of the ICS values are qualified as estimated, and considered to be biased low (or false negatives).

The ICSA (initial) sample result for Mg should be 519600, and the ICSAB (initial) sample result should be 517100.

d. Laboratory Control Samples

A water LCS was reported for soil samples. This is an acceptable practice when the laboratory is unable to obtain a soil LCS.

e. Duplicate Sample Analysis

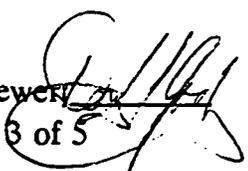
1. Laboratory duplicates

The duplicate digestion sample for Pb was outside the CLP control limit (20% RSD) but within validation control limits (35% RSD) so no qualification was required.

b. Field duplicates

The field duplicate digestion sample (191001) was outside the validation control limits (35% RPD) for Ca, Mg, and Mn. All associated sample results are qualified as estimated due to the lack of sample homogeneity, or field contamination.

The field duplicate digestion sample (231001) was outside the validation control limits (35% RPD) for Ba. All associated sample results are qualified as estimated due to the lack of sample homogeneity, or field contamination.

Reviewed 

page 3 of 5



f. Matrix Spike Sample Analysis

The matrix spike sample percent recovery for Cd (65.1), and Se (70.3) were below the CLP control limits. All associated sample results are qualified as estimated and are considered to be biased low.

RESULTS OF LABORATORY QUALITY CONTROL CHECKS

g. Furnace Atomic Absorption QC

1. Post digestion spike percent recoveries:

The post digestion spike sample percent recoveries for Se were below the CLP validation control limits (<85%). All associated sample results are qualified as estimated and are considered to be biased low (20-0001, 21-0001, 22-0001, 23-0001, 23-1001, 24-001).

2. Method of Standard Addition:

The MSA correlation coefficient for As and Se was <0.995. All associated sample results are qualified as estimated (As=16-0001, Se=16-0001, 18-0001, 19,0001).

h. ICP Serial Dilution

The serial dilution sample percent difference for Cu, and Fe were above the CLP validation control limits (10%). All associated sample results are qualified as estimated.

i. Sample Result Verification

The Linear Range (page 70) is reported in PPM not PPB. This does not severely impact the data validation.

Form XIII did not list duplicate and spike digestions. This does not severely impact the data validation.

The "M" flag for GFAA, Hg and CN analyses was not required.

Reviewer:
page 4 of 5



6. OVERALL ASSESSMENT OF THE DATA

Table 6 presents a summary of sample results which have been qualified as described in the report.

7. REFERENCES

USEPA, 1990. Contract Laboratory Program 3/90 Inorganic Statement of Work.

USEPA, 1988. "Laboratory Data Validation - Functional Guidelines for Evaluation Inorganics Analyses", U.S. Environmental Protection Agency, Hazardous Site Evaluation Division. July 1, 1988.

Reviewer: 
page 5 of 9



ATTACHMENTS

- TABLE 1 - EXCEEDED HOLDING TIMES
- TABLE 2 - CALIBRATION OUTLIERS
- TABLE 3 - MATRIX SPIKE RECOVERY OUTLIERS
- TABLE 4 - SAMPLE DUPLICATE OUTLIERS
- TABLE 5 - BLANK OUTLIERS
- TABLE 6 - QUALIFIED DATA SUMMARY TABLE

**CALIBRATION OUTLIERS
INORGANIC COMPOUNDS
CLP SOW - ILM 01.0**

PREPARED BY: D. Godfrey

DATE: 12-20-91

LANL MOUND PROJECT

LABORATORY BATCH #: 1530

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: ITAS-STOUTS

COLLECTION DATE(s): 8-28-91

INITIAL CALIBRATION SOURCE: SPEX

CONTINUING CALIBRATION SOURCE: SPEX

ANALYTE	INITIAL CALIBRATION			CONTINUING CALIBRATION				M	
	TRUE	FOUND	%R(1)	TRUE	FOUND	%R(1)	FOUND		%R(1)
ALUMINUM									
ANTIMONY									
ARSENIC									
BARIUM									
BERYLLIUM									
CADMIUM									
CALCIUM									
CHROMIUM									
COBALT									
COPPER									
IRON									
LEAD									
MAGNESIUM									
MERCURY									
NICKEL									
POTASSIUM									
SELENIUM									
SILVER									
SODIUM									
TALLIUM									
VANADIUM									
ZINC									
CYANIDE									

No outliers observed CD

ASSOCIATED SAMPLES:

REVIEWER

INITIALS: DJG

DATE: 12-30-91

**SAMPLE DUPLICATE (REPLICATE) OUTLIERS
INORGANIC COMPOUNDS
CLP SOW - ILM 01.0 (% RPD)**

PREPARED BY: D. Godfrey

DATE: 11-20-91

LABORATORY BATCH #: 1530

LABORATORY NAME/LOCATION: ITAS-ST LOUIS

LANL MOUND PROJECT

OPERABLE UNIT NO.: _____

COLLECTION DATE(s): 8-28, 29-91

• ACCEPTANCE CRITERIA

IF RESULT \geq 5 X CRDL: \pm 20% RPD

IF RESULT $<$ 5 X CRDL: \pm CRDL

LABORATORY SAMPLE ID	MOUND SAMPLE ID	Pb	Ca	Mg	Ba		
1530-010	23-1001	25.1					
* 1530-005	19-1001		73.1	67.3			
* 1530-010	23-1001				65.6		

* Field dup's - \pm 35% for soils

BLANK OUTLIERS INORGANIC COMPOUNDS CLP SOW - ILM 01.0

PREPARED BY: D. Godfrey

DATE: 2-20-11

LANL MOUND PROJECT

LABORATORY BATCH #: 530

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: ITAS - ST LOUIS

COLLECTION DATE(S): 8-28, 29-91

PREPARATION BLANK MATRIX (SOIL/WATER): WATER

Samples are soils
PREPARATION BLANK CONCENTRATION UNITS (UG/L OR MG/KG): UG/L

ANALYTE	INITIAL CALIB.		CONTINUING CALIBRATION						PREPARATION		
	BLANK (UG/L)	C	1	C	2	C	3	C	BLANK	C	M
ALUMINUM											
ANTIMONY									43.65	B	P
ARSENIC											
BARIUM			2.0	✓ B			1.0	B	1.01	B	P
BERYLLIUM											
CADMIUM							4.2	B			P
CALCIUM			3.9	B	6.6	B			18.72	B	P
CHROMIUM							-3.2	B			P
COBALT	4.1	B							4.11	B	P
COPPER	4.5	B	3.0	B	6.0	B	3.3	B	3.00	B	P
IRON	7.2	B	7.7	B	16.7	✓ B			5.13	B	P
LEAD							1.0	B	1.43	B	P
MAGNESIUM			1.3	B	1.3	B			14.06	B	
MANGANESE											
MERCURY											
NICKEL											
POTASSIUM											
SELENIUM											
SILVER	2.6	B			6.4	B					P
SODIUM									148.92	B	P
THALLIUM											
VANADIUM											
ZINC			2.5	B					2.76	B	P
CYANIDE											
ASSOCIATED SAMPLES	All samples		PB, LCS		16-0001, 17-0001		19-0001, 20-0001		All samples		
			16-0001, 17-0001		18-0001, 19-0001		23-0001, 25-0001				
			18-0001, 17-0001				24-0001				
					19-0001, 22-0001		(PB) 16-0001				
					21-0001, 22-0001		17-0001, 21-0001				
	All samples		(PB) PB, LCS		(PB) PB, LCS						

BLANK OUTLIERS INORGANIC COMPOUNDS CLP SOW - ILM 01.0

PREPARED BY: DAG

DATE: 2-22-91

LANL MOUND PROJECT

LABORATORY BATCH #: 1530

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: IT/IS - STUO, IS

COLLECTION DATE(s): 8-28, 29-91

PREPARATION BLANK MATRIX (SOIL/WATER): WATER

PREPARATION BLANK CONCENTRATION UNITS (UG/L OR MG/KG): UG/L

ANALYTE	INITIAL CALIB. BLANK (UG/L)	CONTINUING CALIBRATION BLANK (UG/L)						PREPARATION BLANK		
		C	1	C	2	C	3	C	C	M
ALUMINUM										
ANTIMONY										
ARSENIC										
BARIUM								1.4	B	P
BERYLLIUM										P
CADMIUM					4.5	B				
CALCIUM					8.2	B		13.0	B	P
CHROMIUM										
COBALT			6.2	B				4.6	B	P
COPPER			3.0	B	4.5	B		6.0	B	P
IRON								6.9	B	P
LEAD					1.2	B		1.1	B	F
MAGNESIUM					1.3	B		3.3	B	P
MANGANESE										
MERCURY										
NICKEL								-17.4	B	P
POTASSIUM										
SELENIUM										
SILVER			7.8	B				4.3	B	P
SODIUM					16.9	B		15.8	B	P
THALLIUM										
VANADIUM										
ZINC			2.1	B	2.1	B		3.8	B	P
CYANIDE										
ASSOCIATED SAMPLES		19-1001, 20-001	23-0001, 23-1001	All samples						
		21-0001, 22-001	24-0001							
		23-0001, 23-1001	24-0001							
		16-0001, 17-001	(P) 19-0001, 19-1001	(P) 20-0001,						
		18-0001, 19-0001	20-0001, 21-0001	23-0001, 23-1001						
		19-1001, 20-0001	21-0001, 22-0001	23-0001						
		22-0001	23-0001, 23-1001	24-0001						

BLANK OUTLIERS INORGANIC COMPOUNDS CLP SOW - ILM 01.0

PREPARED BY: D. Gooding

DATE: 12-20-91

LANL MOUND PROJECT

LABORATORY BATCH #: 1630

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: STATS - STOVES

COLLECTION DATE(S): 8-28,29-91

PREPARATION BLANK MATRIX (SOIL/WATER): WATER

samples are soils.
PREPARATION BLANK CONCENTRATION UNITS (UG/L OR MG/KG): UG/L

ANALYTE	INITIAL CALIB.		CONTINUING CALIBRATION						PREPARATION			
	BLANK (UG/L)	C	1	C	2	C	3	C	BLANK	C	M	
ALUMINUM												
ANTIMONY									43.65	B	P	
ARSENIC												
BARIUM			2.0	✓	B			1.0	B	1.01	B	P
BERYLLIUM												
CADMIUM							4.2	B				P
CALCIUM			3.9	B	6.6	B				18.72	B	P
CHROMIUM							-3.2	B				P
COBALT	4.1	B								4.11	B	P
COPPER	4.5	B	3.0	B	6.0	B	3.8	B		3.00	B	P
IRON	7.2	B	7.7	B	10.7	✓	B			5.13	B	P
LEAD							1.0	B		1.43	B	F
MAGNESIUM			1.3	B	1.3	B				14.06	B	
MANGANESE												
MERCURY												
NICKEL												
POTASSIUM												
SELENIUM												
SILVER	2.6	B			6.4	B						P
SODIUM										148.92	B	P
THALLIUM												
VANADIUM												
ZINC			2.5	B						2.76	B	P
CYANIDE												
ASSOCIATED SAMPLES	All samples		PB, LCS		16-0001, 17-0001		19-0001, 20-0001		All samples			
			16-0001, 17-0001		18-0001, 19-0001		21-0001, 22-0001					
			18-0001, 17-0001				23-0001, 25-0001					
					19-0001, 20-0001		(PB) 16-0001					
					21-0001, 22-0001		17-0001, 18-0001					
	All samples		(PB) PB, LCS		(PB) PB, LCS							

QUALIFIED DATA SUMMARY TABLE INORGANIC COMPOUNDS

PREPARED BY: H. Sealey

DATE: 3/3/92

LABORATORY BATCH #: REA 37051

LABORATORY NAME/LOCATION: ITAS - St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: 3

COLLECTION DATE(s): 8/28, 29/91

ANALYTE	MOUND SAMPLE ID				
	MWDJ3-0016-0001	MWDJ3-0017-0001	MWDJ3-0018-0001	MWDJ3-0019-0001	MWDJ3-0020-0001
ALUMINUM					
ANTIMONY	6.1 U				
ARSENIC	10.5 J				
BARIUM					31.3 J
BERYLLIUM					
CADMIUM	0.5 UJ	0.52 UJ	0.51 UJ	0.48 UJ	0.47 UJ
CALCIUM	53700 J	15300 J	11300 J	26200 J	
CHROMIUM					
COBALT					
COPPER	20.4 J	26.0 J	20.2 J	28.0 J	11.9 J
IRON	25100 J	34100 J	33200 J	30000 J	11500 J
LEAD					
MAGNESIUM	16000 J	8600 J	5560 J	8940 J	
MERCURY					
NICKEL	22.1 J	28.2 J	22.0 J	20.3 J	11.7 J
POTASSIUM					
SELENIUM	1.7 J	1.9 J	1.6 J	1.4 J	0.12 UJ
SILVER	0.62 U	0.94 U	0.38 UJ	0.86 U	0.46 U
SODIUM					
THALLIUM					
VANADIUM					
ZINC					
CYANIDE					

REVIEWER INITIALS: _____
DATE: _____

QUALIFIED DATA SUMMARY TABLE INORGANIC COMPOUNDS

PREPARED BY: H. Serley

DATE: 3/3/92

LABORATORY BATCH #: LEA 37051

LABORATORY NAME/LOCATION: ITIS - St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: 3

COLLECTION DATE(S): 2/25, 29/92

ANALYTE	MOUND SAMPLE ID				
	MND33-021-0001	MND33-0022-0001	MND33-0023-0001	MND33-0024-0001	
ALUMINUM					
ANTIMONY		7.5 U	6.5 U		
ARSENIC					
BARIUM	66.3 J	69.6 J	101 J	40.7 J	
BERYLLIUM					
CADMIUM	0.40 UJ	0.45 UJ	0.45 UJ	0.41 UJ	
CALCIUM					
CHROMIUM					
COBALT					
COPPER	11.2 J	15.1 J	11.6 J	13.4 J	
IRON	11900 J	14600 J	10400 J	14600 J	
LEAD					
MAGNESIUM					
MERCURY					
NICKEL	9.7 J	12.1 J	12.3 J	12.7 J	
POTASSIUM					
SELENIUM	0.10 UJ	0.12 J	0.12 UJ	0.11 UJ	
SILVER	0.30 UJ	0.34 UJ	0.34 UJ	0.57 U	
SODIUM					
THALLIUM					
VANADIUM					
ZINC					
CYANIDE					

REVIEWER INITIALS: _____
DATE: _____

QUALIFIED DATA SUMMARY TABLE INORGANIC COMPOUNDS

PREPARED BY: H. Sealey

DATE: 3/3/72

LABORATORY BATCH #: RCA 37051

LABORATORY NAME/LOCATION: FAS - St. Louis

LANL MOUND PROJECT

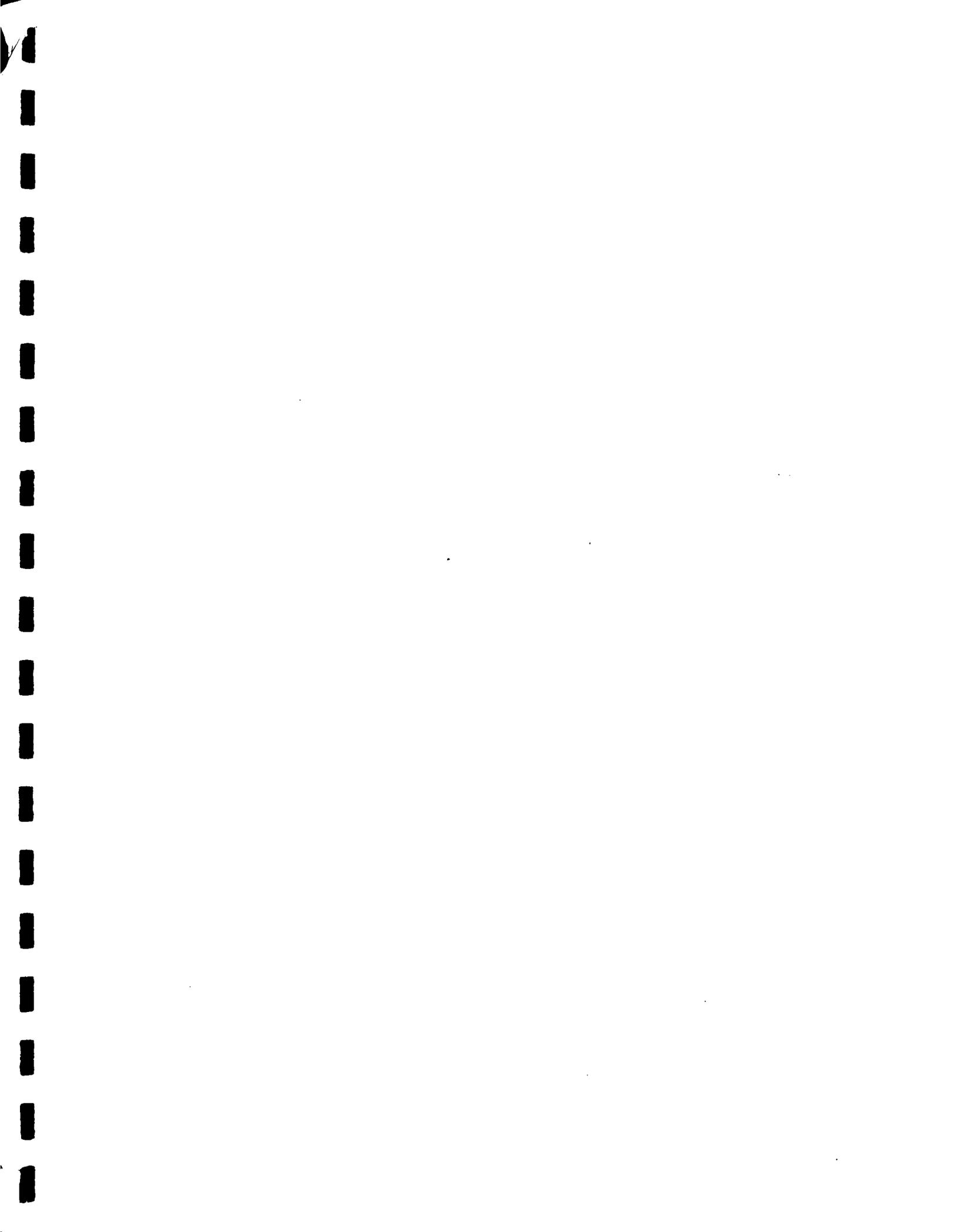
OPERABLE UNIT NO.: 3

COLLECTION DATE(s): 8/28, 29/72

ANALYTE	MOUND SAMPLE ID				
	MAN33-0019-1001	MAN33-0023-1001			
ALUMINUM					
ANTIMONY					
ARSENIC					
BARIUM		51.1 J			
BERYLLIUM					
CADMIUM	0.51 UJ	0.43 UJ			
CALCIUM					
CHROMIUM					
COBALT					
COPPER	38.2 J	10.6 J			
IRON	26500 J	10700 J			
LEAD					
MAGNESIUM	18000 J				
MERCURY					
NICKEL	23.0 J	13.0 J			
POTASSIUM					
SELENIUM	1.7 J	0.11 UJ			
SILVER	0.83 U	0.32 UJ			
SODIUM					
THALLIUM					
VANADIUM					
ZINC					
CYANIDE					

REVIEWER INITIALS: _____
DATE: _____





EG+G-23-01-10-06-11
#9502230012

DATE: April 22, 1992

University of California
Los Alamos National Laboratory
Attention: Dr. Kenneth Rea
Environmental Restoration Program
Technical Support Office
P.O. Box 1663, MS K-485
Los Alamos, NM 87545

DOCUMENT TRANSMITTAL

TITLE OF DOCUMENT: Closure Report, Building 34 Aviation Fuel Storage Tank

REVISION NO.: 0 DATE OF DOCUMENT: April 1992

	<u>Working Draft</u>	<u>Draft</u>	<u>Draft Final</u>
TYPE OF DOCUMENT: Work Plan	_____	_____	_____
Report	_____	_____	<u>X</u>
Technical Memo	_____	_____	_____
_____	_____	_____	_____

ACTION: Review By: TSO DOE-AL DOE-AO DOE-HQ
 Transmit to Regulatory Authority

DRAFT: Working Draft (Preliminary)
 Draft (Program)
 Draft Final (External) - Regulatory Approval
 Concept of Document

COMMENTS EXPECTED: May 23, 1992
(Date)

RETURN COMMENTS TO: John Price / Kris Andersen
(Installation Manager)

Distribution: see attached

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