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SUBSURFACE INVESTIGATION AND PRELIMINARY REMEDIAL RESPONSE FOR THE LINAM RANCH PLANT LEA COUNTY, NEW MEXICO

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Subsurface Investigation and Preliminary Remedial Response for the Linam Ranch Plant Lea County, New Mexico

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Table of Contents

1.0 EXECUTIVE SUMMARY 1

2.0 INTRODUCTION 2
2.1 Site Description 2
2.2 Regulatory Considerations 4
2.3 Regional Hydrogeology 4

3.0 METHODS OF INVESTIGATION 7
3.1 Soil Boring and Monitoring Well Locations 7
3.2 Soil Sampling Procedures 7
3.3 Monitoring Well Construction Procedures 8
3.4 Groundwater Sampling Procedures 8

4.0 RESULTS 10
4.1 Local Geology 10
4.2 Soil Sample Analytical Results 10
4.3 Groundwater Gradient 12
4.4 Groundwater Sample Analytical Results 12
4.4.1 Hydrocarbon Analytical Results 12
4.4.2 Inorganic Analytical Results 19
4.5 Intrinsic Bioremediation Assessment 21

5.0 CONCLUSIONS 24

6.0 PRELIMINARY REMEDIAL RESPONSE 25

7.0 REFERENCES 26

List of Figures, Tables, and Appendices

Figures

1 Linam Ranch Plant Site Map 3
2 Linam Ranch Plant Geologic Map 6
3 Linam Ranch Plant Potentiometric Surface Map 13
4 Linam Ranch Plant BTEX Concentration Map 20

Tables

1 Summary of Soil Sample Analytical Results for BTEX and TPH 11
2 Summary of Groundwater Elevations 14
3 Summary of Groundwater Analytical Results for Aromatic Volatile Organic Compounds 15
4 Summary of Groundwater Analytical Results for Polynuclear Aromatic Hydrocarbons 15
5 Summary of Groundwater Analytical Results for Halogenated Volatile Organic Compounds 16
6 Summary of Groundwater Analytical Results for Total Metals 17
7 Summary of Groundwater Analytical Results for Major Ions and Field Parameters 18
8 Summary of Groundwater Analytical Results for Bacterial Activity 23

Appendices

A Lithologic Logs, Well Construction Diagrams, and Photgraphic Documentation
B Laboratory Reports and Chain-of-Custody Documentation
C Survey Plat

Section 1.0

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1.0 Executive Summary

Hydrocarbon-impacted soil and groundwater caused by historic releases at the Linam Ranch Plant (formerly Hobbs Natural Gas Processing Plant) in Lea County, New Mexico, were caused by past operations of Enron Gas and Oil Company (Enron). Preliminary subsurface investigations performed by Geoscience Consultants, Ltd. (GCL) in February 1994 and Daniel B. Stephens and Associates (DBS&A) in May 1994 verified the impact from the EOTT aboveground storage tanks (ASTs) on site. The subsurface investigation described in this report included the installation of five additional monitoring wells (MW-10, MW-10D, MW-11, MW-12, and MW-13) and two soil borings (SB-1 and SB-2) to define the areal and vertical extent of hydrocarbon-impacted soil and groundwater conditions in order to develop a suitable remedial response.

Based on the analytical results from this subsurface investigation and previous investigations conducted by DBS&A and GCL, there are no hydrocarbon-impacted soils above the New Mexico Oil Conservation Division (OCD) recommended action level of 50 parts per million (ppm) benzene, toluene, ethylbenzene, and xylenes (BTEX) and 100 ppm total petroleum hydrocarbons (TPH).

The areal extent of hydrocarbon-impacted groundwater has been estimated as covering an oval-shaped area approximately 250 feet wide by 500 feet long. Based on the analytical results for monitoring well MW-10D, the hydrocarbon-impacted groundwater does not extend below an estimated depth of 50 feet below the water table (100 feet below land surface). The hydrocarbon-impacted groundwater has not migrated off site and is well within the boundaries of the facility.

The inorganic chemical analyses of upgradient and downgradient wells indicate that water samples exceed the Water Quality Control Commission (WQCC) standards for aluminum, chromium, iron, manganese, nitrate, silver, and/or total dissolved solids.

Based on the calculation of the average linear velocity of groundwater flow (approximately 75 to 100 feet/year), the age of the release (early 1970s to late 1980s), and the documented extent of hydrocarbon impact, GCL concludes that natural processes (intrinsic bioremediation, adsorption, and volatilization) are effectively limiting the migration of dissolved-phase hydrocarbons to the on-site boundaries of the facility. While intrinsic bioremediation is occurring and the rate at which this hydrocarbon removal process appears to be sufficient to contain the plume, additional monitoring and sampling data will be required over time to evaluate its effectiveness for in situ remediation.

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Section 2.0

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2.0 Introduction

Prior to GPM Gas Corporation's (GPM) acquisition of the Linam Ranch Plant (formerly Hobbs Natural Gas Processing Plant) in December 1994, the facility was owned and operated by Enron or its subsidiaries since the 1950s. Hydrocarbon-impacted soil and groundwater caused by the historic releases at this site was previously identified during preliminary subsurface investigations performed by GCL in February 1994 and DBS&A in May 1994. The earlier investigations were conducted during the due diligence activities prior to the property transfer to establish a baseline assessment of the subsurface conditions with respect to past operations by Enron.

The purpose of the subsurface soil and groundwater investigation described in this report is to define the areal and vertical extent of hydrocarbon-impacted soil and groundwater conditions with respect to the EOTT tanks at the Linam Ranch Plant to develop a suitable remedial response. The subsurface investigation was performed in accordance with the work plan submitted by GPM to the OCD on February 23, 1995, and as approved and amended by Mr. William Olson of the OCD in his letter to GPM dated April 5, 1995. GCL initiated the subsurface investigation at the Linam Ranch Plant on May 10, 1995.

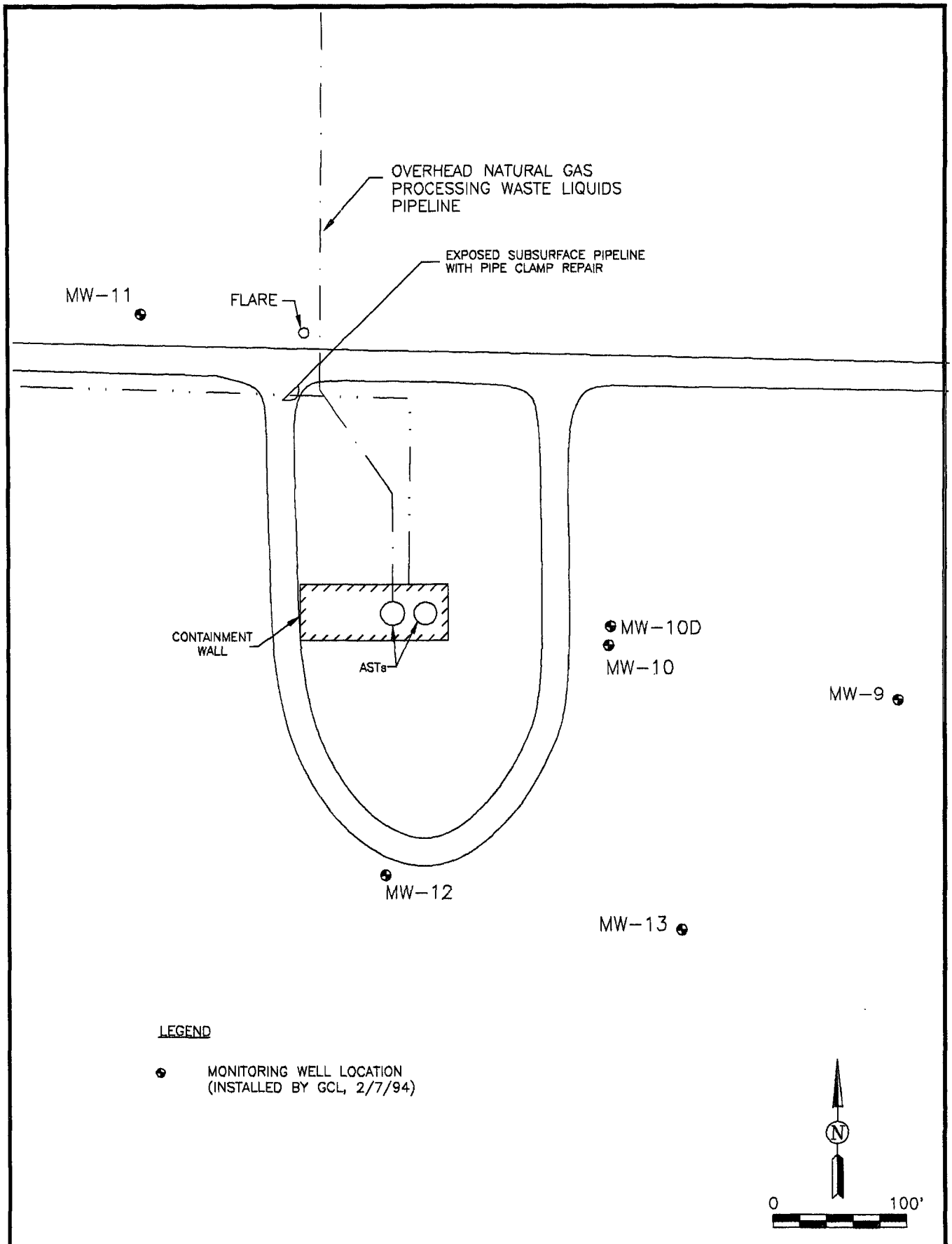
2.1 Site Description

The Linam Ranch Plant is located within the north half of section 6 township 19 south, range 37 east in Lea County, New Mexico. The site is located approximately eight miles west of Hobbs, New Mexico, and is accessed by Highway 62. According to the Monument, NM USGS 7.5-minute quadrangle map and survey data, the elevation of the site is approximately 3,720 feet above sea level.

The Linam Ranch Plant covers approximately 60 acres within a rectangular tract of land and consists of natural gas processing equipment, waste management facilities, liquids and gas storage tanks, office and maintenance buildings, and vacant land. The facility is secured by a chain-link fence and locked gate. The 24-hour manned facility is well-maintained and undergoing numerous improvements to make the facility more automated and less prone to the hydrocarbon releases that occurred under the manually controlled operations during Enron's ownership.

This investigation is focused on two approximately 210-barrel ASTs (EOTT tanks) located near the southeast portion of the plant property (Figure 1). The ASTs were used by Enron to store natural gas processing waste liquids prior to recycling. According to the GPM construction and maintenance supervisor, the ASTs are no longer in use. Based on the findings of the previous investigations by GCL and DBS&A, the EOTT tanks were the source of the hydrocarbon-impacted groundwater identified in this area of the plant.

The surrounding area is primarily used for cattle grazing and oil and gas production operations. No residential dwellings are located within one mile of the site. According to information provided in the earlier investigations by GCL and DBS&A, there are four registered water wells located within the facility. These wells were originally permitted to Northern Natural Gas Company in the early 1970s, and are used to supply the



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FIGURE 1
LINAM RANCH PLANT
SITE MAP

plant with water for natural gas processing. The plant water wells are not used for human consumption as potable water is trucked in. Some of the wells are currently not in use. The nearest off-site registered water well is located approximately one half mile east of the plant, and is owned by Mrs. V. Linam. The well is reportedly used for irrigation supply purposes. Based on the results of this investigation and previous investigations, these water wells are not likely to be adversely impacted from petroleum hydrocarbon releases from the EOTT tanks.

2.2 Regulatory Considerations

As they relate to scope of this investigation, environmental issues of concern to the Linam Ranch Plant are under the jurisdiction of the OCD. Releases of unrefined hydrocarbons to the soil and/or groundwater at this site are subject to the WQCC regulations and, generally, OCD guidelines as published in the document titled "Guidelines for the Remediation of Leaks, Spills and Releases" (August 13, 1993). These guidelines recommend soil remediation action levels based on certain ranking criteria. Based on the OCD guidelines for Category I sites (ranking score > 19 points), the soil remediation action levels for benzene, BTEX, and TPH are 10 ppm, 50 ppm, and 100 ppm, respectively. Groundwater remediation action levels are the WQCC standards as published in Section 3-103.

Pending OCD notification and approval, "procedures may deviate from the guidelines if it can be shown that the proposed procedure will either remediate, remove, isolate, or control contaminants in such a manner that fresh waters, public health, and the environment will not be impacted. Specific constituents and/or requirements for soil and groundwater analysis and/or remediation may vary depending on site-specific conditions" (OCD, August 1993, page 1).

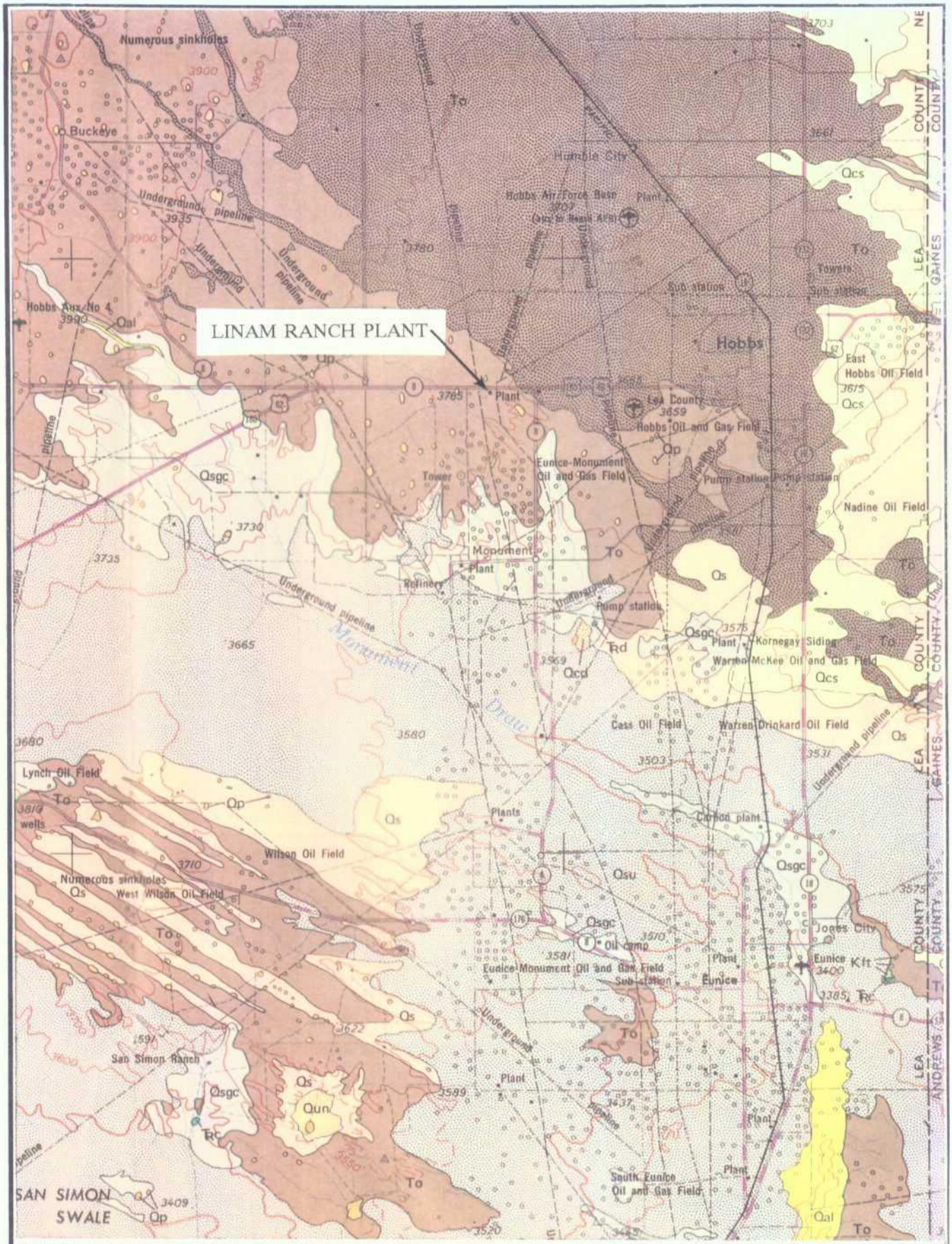
2.3 Regional Hydrogeology

The site is located along the southernmost extent of what is known as the Llano Estacado (caprock). According to published information (Nicholson and Clebsch, 1961 and Barnes, 1976), the Linam Ranch Plant is underlain by the late Tertiary Age Ogallala Formation which is composed of calcareous sands, silts, clays, and gravels. The near surface Ogallala sediments are often calichified (indurated with cemented calcium carbonate). The presence of caliche generally decreases with depth becoming negligible at depths greater than 35 to 50 feet below the surface. The thickness of the Ogallala Formation varies locally as a result of significant paleo-topography at the top of the underlying Triassic Dockum Group. Based on the depth of the on-site water wells, the thickness of the Ogallala Formation is approximately 160 to 170 feet. Cretaceous Age rocks in the region have been removed by pre-Tertiary erosion; consequently, the Ogallala Formation rests unconformably on the Triassic Dockum Group. The uppermost unit of the Dockum Group is the Chinle Formation that primarily consists of micaceous red clay and shale, but also contains thin interbeds of fine-grained sandstone and siltstone. The red clays and shale of the Chinle Formation act as an aquitard beneath the waterbearing colluvial deposits, and therefore, limit the amount of recharge to the underlying Dockum

Group. The thickness of the Dockum Group in southern Lea County varies from 0 to 1,270 feet thick (Nicholson and Clebsch, 1961). A geologic map is depicted in Figure 2.

Potable groundwater used in southern Lea County is derived primarily from the Ogallala Formation and the Quaternary alluvium. Lower yields have also been provided by waterbearing zones within the Triassic Dockum Group in a few scattered areas within southern Lea County. In this area, no potable water is known to be derived below the Triassic Dockum Group. Water from the Ogallala and alluvium aquifers in southern Lea County is used for irrigation, stock, domestic, industrial, and public supply purposes.

The regional gradient of the Ogallala aquifer in the site area generally flows toward the southeast. Based on data provided by the State Engineer Office, the hydraulic gradient varies from approximately 0.002 to 0.1 feet/feet. Recharge to the Ogallala aquifer occurs primarily by infiltration of precipitation at a rate of one quarter to one half inch of water per year due to the characteristically arid climate of southern Lea County (Nicholson and Clebsch, 1961). Hydraulic conductivity values are estimated between 26 and 50 feet per day, and specific yields of 0.23 for the Ogallala aquifer near the site area based on limited published information (McAda, 1984). However, pump testing of the aquifer would be necessary to determine actual values on site.



REFERENCE : GEOLOGIC ATLAS OF TEXAS, HOBBS SHEET, 1976

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FIGURE 2
LINAM RANCH PLANT
GEOLOGIC MAP

Section 3.0

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3.3 Monitoring Well Construction Procedures

The monitoring wells were constructed of 4-inch diameter, Schedule 40 PVC well casing and 0.01-inch slotted screen, with the exception of MW-10D, which was constructed of 2-inch diameter well casing and screen. The 20 feet of well screen for the 4-inch diameter monitoring wells was placed approximately 10 to 15 feet below the water table leaving approximately 5 to 10 feet of well screen above the water table. In the 2-inch monitoring well, the 5 feet of well screen was placed at the bottom of the well to screen a lower portion (approximately 20 feet below the top of the water table) of the aquifer. The screened portion of each monitoring well was surrounded with a filterpack composed of 8/16 or 12/20 silica sand. The filterpack was sealed from above with 3 to 4 feet of bentonite. The remaining annular space for each monitoring well was sealed using a grout composed of Portland cement with a 5 percent bentonite mixture, emplaced from the top of the bentonite plug to ground surface. A 4-foot by 4-foot concrete pad was constructed at the surface, and the top of casing protected with a locked steel well cover. The monitoring well construction diagrams are provided in Appendix A.

3.4 Groundwater Sampling Procedures

Each newly installed monitoring well was developed using a decontaminated submersible pump to reduce the amount of fine sediments and improve well yield performance. Immediately prior to collecting groundwater samples, each monitoring well was purged of a minimum of three well volumes development water using a decontaminated 2-inch diameter submersible pump (Grundfos Redi-Flo2), with the exception of the existing 2-inch diameter monitoring well MW-9, which was purged using a disposable bailer. An approximate total of 255 gallons was developed and purged from monitoring wells MW-9 through MW-13. Field parameters, including pH, conductivity, and temperature, were measured with a Hydac Model 910 meter. In addition, dissolved oxygen was measured downhole with a YSI Model 50B meter. Groundwater samples were obtained after field parameters stabilized during purging operations. The pumping rate of the submersible sampling pump was reduced to below 300 milliliters per minute for samples being obtained for volatile organic analysis to minimize the stripping of volatile organic constituents during sampling operations. The water samples were transferred into air-tight, septum-sealed 40-milliliter glass VOA sample vials with zero headspace for analysis of total BTEX, and 1-liter glass jars for analysis of polynuclear aromatic hydrocarbons (PAHs), total metals, and major cations and anions analyses in accordance with EPA protocol (EPA 600/2-82-029) using EPA-approved methods (SW-846). The water samples were placed in an ice-filled cooler immediately after collection and transported to Trace Analysis, Inc. in Lubbock, Texas.

Additional groundwater samples were collected from monitoring wells MW-10, MW-11, and MW-12 and sent to Trace Analysis, Inc. for analysis of total aerobic heterotrophic plate count and total hydrocarbon utilizing bacteria to assess the potential intrinsic bioremedial activity currently taking place. For each set of

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Additional groundwater samples were collected from monitoring wells MW-10, MW-11, and MW-12 and sent to Trace Analysis, Inc. for analysis of total aerobic heterotrophic plate count and total hydrocarbon utilizing bacteria to assess the potential intrinsic bioremedial activity currently taking place. For each set of

samples, COC forms documenting sample identification numbers, collection times, and delivery times to the laboratory were completed.

Section 4.0

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4.0 Results

4.1 Local Geology

The lithology of the subsurface soils in monitoring wells MW-10, MW-10D, MW-11, MW-12, and MW-13 and soil borings SB-1 and SB-2 were similar to those described during the previous investigations (DP-1, DP-2, MW-9 and EOTT-1 through EOTT-6). The subsurface soils generally consist of an upper silty calcareous sand unit 30 to 43 feet thick. This unit was commonly calichified (indurated with cemented calcium carbonate). Beneath this unit, an unconsolidated (loose) fine- to medium-grained sand was observed to the bottom of the borings. Indurated sandstone layers approximately 6 inches to 10 feet thick were observed in some of the borings. Groundwater was encountered at approximately 48 feet below ground surface. A more detailed description of the subsurface soils is provided on the lithologic logs in Appendix A.

PID readings varied from less than 1 ppm in various intervals from each of the soil borings to 391 ppm in the 46- to 47-foot interval of SB-1. The 391 ppm PID reading observed in SB-1 was the only sampled interval to exceed the OCD recommended action level of 100 ppm (headspace method). A complete listing of PID readings is included in the lithologic logs in Appendix A.

4.2 Soil Sample Analytical Results

Based on a Category I ranking for the site (> 19 points), no samples exceeded the OCD recommended action level of 50 ppm for BTEX and 100 ppm for TPH. Hydrocarbon-impacted soils were not observed in borings SB-2, MW-10, MW-11, MW-12, and MW-13, and PID measurements in these borings were near or below the instrument detection level of 1 ppm throughout. Soil sample analytical results are summarized in Table 1. Laboratory analytical reports and the COC documentation is provided in Appendix B.

Based on the soil sample analytical results from this investigation and the headspace measurements taken from previous investigations by GCL and DBS&A, no hydrocarbon-impacted soil concentrations above the OCD recommended action levels of 50 ppm BTEX and/or 100 ppm TPH. Although the 46- to 47-foot interval of soil boring SB-1 recorded a PID reading of 391 ppm, which exceeds the OCD recommended action level of 100 ppm (headspace method), the corresponding TPH analysis indicated a concentration of only 66 ppm. The location of soil boring SB-1 (approximately 90 feet upgradient of the EOTT tanks) suggests the possibility of an additional source. This source may be a 4-inch subsurface pipeline Enron used as a conduit to transport waste liquids from the plant to the EOTT tanks. A former break in the line, as evidenced by a pipe clamp repair in an exposed excavated portion of the pipeline, was observed approximately 60 feet northeast of soil boring SB-1. According to the GPM construction and maintenance supervisor, the leak was repaired in April 1995. These hydrocarbon-impacted soils in SB-1 are limited to a thin zone immediately above the groundwater table, which has likely absorbed hydrocarbons that have migrated downgradient from the source area (former line leak) along the groundwater pathway. Off-site impact to subsurface soils are not probable.

Table 1
Summary of Soil Sample Analytical Results for BTEX and TPH
Linam Ranch Plant - EOTT Tanks

Monitoring Well/Boring No.	Date	Sample Interval	PID Reading (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH[g] (mg/kg)	TPH[d] (mg/kg)
SB-1	05-11-95	5-6	40	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 20	< 20
		46-47	**371**	< 0.01	< 0.01	0.12	0.77	0.89	66	< 20
SB-2	05-12-95	7-7.5	13	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 20	< 20
		47-48	< 1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 20	< 20
MW-10	05-12-95	35-36	< 1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 20	< 20
		45-46	11	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 20	< 20
MW-11	05-13-95	45-46	< 1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 20	< 20
MW-12	05-10-95	45-46	< 1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 20	< 20
MW-13	05-11-95	45-46	< 1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 20	< 20

Analyses performed by Trace Analysis, Inc. of Lubbock, Texas.
BTEX indicates benzene, toluene, ethylbenzene, and xylenes and analyzed using EPA Method 8020. BTEX values rounded to two significant figures.
TPH[g] indicates total petroleum hydrocarbons (gas range) and analyzed using EPA Method 8015 (purge method).
TPH[d] indicates total petroleum hydrocarbons (diesel range) and analyzed using EPA Method 8015 (extraction method).
Values in **boldface** type indicate concentrations exceed remediation action levels as specified by the NMOCD in Guidelines For Remediation of Leaks, Spills and Releases (August 13, 1993) for sites with a NMOCD ranking score greater than 19 points.

4.3 Groundwater Gradient

The monitoring wells and soil boring locations were surveyed by John W. West Engineering of Hobbs, New Mexico, using the facilities' existing grid systems. Ground surface elevations and top-of-well casing elevations were determined within 0.01 feet relative to mean sea level. The survey plats prepared by John W. West Engineering Company are provided in Appendix C. The on-site monitoring wells were gauged on May 17, 1995 to determine the groundwater elevation, direction of groundwater flow, and the presence of free product (if any). Depth to groundwater was approximately 48 feet below ground surface across the site. A potentiometric surface map that depicts the elevation of the potentiometric surface (groundwater table) and direction of groundwater flow is illustrated in Figure 3. Groundwater elevations are summarized in Table 2. No free product (pipeline waste liquids) was encountered during drilling operations or monitoring well sampling activities.

The apparent direction of groundwater flow is toward the southeast with a hydraulic gradient of approximately 0.002 feet/feet. Assuming a hydraulic conductivity of 26 to 50 feet/day (McAda, 1984) and an estimated effective porosity of 0.25, the average linear velocity of groundwater flow on site varies from approximately 75 to 150 feet/year based on the version of the Darcy equation presented below:

$$v_{avg} = \frac{k \times i}{p_e}$$

where,
v_{avg} = average linear velocity
k = hydraulic conductivity
i = hydraulic gradient
p_e = effective porosity

$$v_{avg} = \frac{k \times i}{p_e} = \frac{26 \text{ feet/day} \times 0.002 \text{ feet/feet}}{0.25}$$

$$= 0.2 \text{ foot/day} \approx 75 \text{ feet/year}$$

$$v_{avg} = \frac{k \times i}{p_e} = \frac{50 \text{ feet/day} \times 0.002 \text{ feet/feet}}{0.25}$$

$$= 0.4 \text{ feet/day} \approx 150 \text{ feet/year}$$

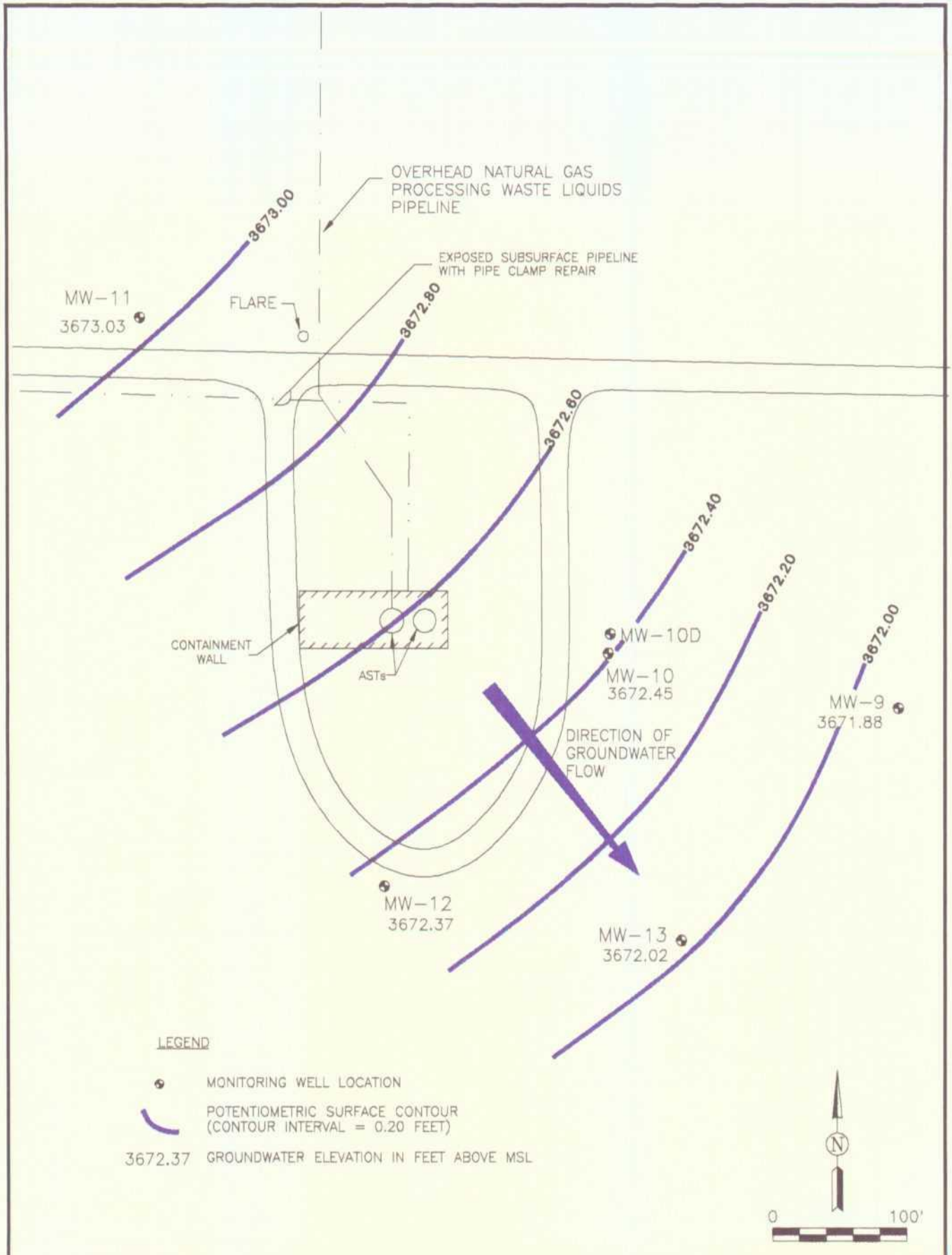
4.4 Groundwater Sample Analytical Results

The analytical results from the May 17, 1995 groundwater sampling event are listed in Tables 3 through 7 and summarized in the sections below. The WQCC standards are also presented in each table for comparison. Those constituents that recorded concentrations above the WQCC standards are highlighted in boldface type. The laboratory analytical reports and the COC documentation for the groundwater sampling operations are provided in Appendix B.

4.4.1 Hydrocarbon Analytical Results

The only hydrocarbon concentrations above WQCC standards occurred in monitoring wells MW-10 and MW-10D. The analytical results for MW-10 and MW-10D indicate benzene concentrations of 3.225 mg/L and 0.096 mg/L, respectively, which exceed the WQCC standard of 0.01 mg/L. A duplicate groundwater sample was obtained for MW-10 which indicated a concentration of 0.064 mg/l for 1,2-dichloroethane, which exceeds the WQCC standard of 0.01 mg/l. However, the

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FIGURE 3
LINAM RANCH PLANT
POTENTIOMETRIC SURFACE MAP

Table 2
Summary of Groundwater Elevations
Linam Ranch Plant - EOTT Tanks

Well	Date	Relative Ground Surface Elevations (feet)	Relative Top of Casing Elevation (feet)*	Depth to Groundwater Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)**	Phase-Separated Hydrocarbon Thickness (feet)
MW-9	05-17-95	3,720.48	3,722.48	50.60	3,671.88	0.00
MW-10	05-17-95	3,720.76	3,722.90	50.45	3,672.45	0.00
MW-10D	05-17-95	3,720.85	3,723.54	51.38	3,672.16	0.00
MW-11	05-17-95	3,722.02	3,724.53	51.50	3,673.03	0.00
MW-12	05-17-95	3,720.60	3,722.84	50.47	3,672.37	0.00
MW-13	05-17-95	3,721.63	3,723.99	51.97	3,672.02	0.00

* Elevations surveyed by John W. West Engineering Company of Hobbs, New Mexico. The monitor well casings were marked on the north side to provide consistent reference points for future gauging operations.

** Correction Equation for Phase-Separated Hydrocarbons, if present: Corrected Relative Groundwater Elevation = Top of Casing Elevation - [Depth to Groundwater Below Top of Casing - (SG) (PSH Thickness)]; Specific Gravity (SG) = 0.82 for crude oil.

PSH indicates phase separated hydrocarbons (crude oil).

Table 3
Summary of Groundwater Analytical Results for Aromatic Volatile Organic Compounds
Linam Ranch Plant - EOTT Tanks
Sampling Operations Conducted on May 17, 1995

Constituent	Monitoring Well Numbers								WQCC Standards (mg/l)
	MW-9 (mg/l)	MW-10* (mg/l)	MW-10D (mg/l)	MW-11 (mg/l)	MW-12 (mg/l)	MW-13 (mg/l)	DP-1** (mg/l)	DP-2** (mg/l)	
Benzene	<0.001	**3.225 (3.097)**	**0.096**	<0.001	<0.001	<0.001	3.300	<0.001	0.010
Toluene	<0.001	0.052 (0.045)	0.004	<0.001	<0.001	<0.001	<0.005	<0.005	0.75
Ethylbenzene	<0.001	0.049 (<0.001)	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	0.75
Xylenes (Total)	<0.001	0.169 (0.134)	0.008	<0.001	<0.001	<0.001	0.006	<0.005	0.62

Analyses performed by Trace Analysis, Inc. using EPA Method 8240.
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards.
* Numbers in parentheses represent duplicate sample results.
** Temporary drive point wells DP-1 and DP-2 were installed and sampled by GCL on February 7, 1994.

Table 4
Summary of Groundwater Analytical Results for Polynuclear Aromatic Hydrocarbons
Linam Ranch Plant - EOTT Tanks
Sampling Operations Conducted on May 17, 1995

Constituent	Monitoring Well Numbers								WQCC Standards (mg/l)
	MW-9 (mg/l)	MW-10 (mg/l)	MW-10D (mg/l)	MW-11 (mg/l)	MW-12 (mg/l)	MW-13 (mg/l)	DP-1* (mg/l)	DP-2* (mg/l)	
Naphthalene	<0.0004	0.0035	<0.0004	<0.0004	<0.0004	<0.0004	< 0.01	< 0.01	
Total monomethylnaphthalenes	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	< 0.01	< 0.01	0.03
Benzo(a)pyrene	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	< 0.01	< 0.01	0.0007

Analyses performed by Trace Analysis, Inc. using EPA Method 8270.
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards.
* Temporary drive point wells DP-1 and DP-2 were installed and sampled by GCL on February 7, 1994.

Table 5
Summary of Groundwater Analytical Results for Halogenated Volatile Organic Compounds
Linam Ranch Plant - EOTT Tanks
Sampling Operations Conducted on May 17, 1995

Constituent	Monitoring Well Numers								WQCC Standards (mg/l)
	MW-9 (mg/l)	MW-10* (mg/l)	MW-10D (mg/l)	MW-11 (mg/l)	MW-12 (mg/l)	MW-13 (mg/l)	DP-1** (mg/l)	DP-2** (mg/l)	
Carbon Tetrachloride	<0.001	<0.001 (<0.001)	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	0.01
Chloroform	<0.001	<0.001 (<0.001)	<0.001	<0.001	<0.001	0.001	<0.005	<0.005	0.1
1,1-Dichloroethane	<0.001	<0.001 (<0.001)	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	0.025
1,2-Dichloroethane	<0.001	<0.001 (**0.064**)	0.002	<0.001	<0.001	<0.001	<0.005	<0.005	0.01
1,1-Dichloroethylene	<0.001	<0.001 (<0.001)	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	0.005
Methylene chloride	<0.005	<0.005 (<0.005)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.1
1,1,2,2-Tetrachloroethane	<0.001	<0.001 (<0.001)	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	0.01
1,1,2,2-Tetrachloroethylene	<0.001	<0.005 (<0.005)	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	0.02
1,1,1-Trichloroethane	<0.001	<0.001 (<0.001)	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	0.06
1,1,2-Trichloroethane	<0.001	<0.001 (<0.001)	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	0.01
1,1,2-Trichloroethylene	<0.001	<0.001 (<0.001)	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	0.1
Vinyl chloride	<0.001	<0.001 (<0.001)	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	0.0001***

Analyses performed by Trace Analysis, Inc. using EPA Methods 8240.)
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards.
* Numbers in parentheses represent duplicate sample results.
** Temporary drive point wells DP-1 and DP-2 were installed and sampled by GCL on February 7, 1994.
*** Indicates WQCC standard is below method detection limit.

Table 6
Summary of Groundwater Analytical Results for Total Metals
Linam Ranch Plant - EOTT Tanks
Sampling Operations Conducted on May 17, 1995

Constituent	Monitoring Well Numbers						WQCC Standards (mg/l)
	MW-9 (mg/l)	MW-10 (mg/l)	MW-10D (mg/l)	MW-11 (mg/l)	MW-12 (mg/l)	MW-13 (mg/l)	
Aluminum (Al)	**26.58**	4.79	3.99	2.14	**5.35**	**14.08**	5.0
Arsenic (As)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Barium (Ba)	0.30	0.18	0.17	0.10	0.13	0.59	1.0
Boron (B)	0.20	0.16	0.10	0.33	0.16	0.16	0.75
Cadmium (Cd)	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.01
Cobalt (Co)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05
Copper (Cu)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1.0
Chromium (Cr)	**0.06**	0.02	0.02	0.05	0.03	<0.01	0.05
Iron (Fe)	**12.08**	**3.05**	**2.88**	**1.34**	**2.80**	**7.02**	1.0
Lead (Pb)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.05
Manganese (Mn)	0.15	**0.41**	**0.25**	0.15	0.07	0.11	0.2
Mercury (Hg)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
Molybdenum (Mo)	<0.05	0.06	0.08	0.06	0.06	0.07	1.0
Nickel (Ni)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.2
Selenium (Se)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.05
Silver (Ag)	<0.01	<0.01	<0.01	<0.01	<0.01	**0.18**	0.05
Zinc (Zn)	0.07	0.07	0.04	0.06	0.04	0.05	10.0

Analyses performed by Trace Analysis, Inc. using EPA Methods 200.7, 239.2, 270.2, and 272.2
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Bold values indicate concentrations exceed WQCC groundwater standards.

Table 7
Summary of Groundwater Analytical Results for Major Ions and Field Parameters
Linam Ranch Plant - EOTT Tanks
Sampling Operations Conducted on May 17, 1995

Constituent	Monitoring Well Numbers						WQCC Standards (mg/l)
	MW-9 (mg/l)	MW-10 (mg/l)	MW-10D (mg/l)	MW-11 (mg/l)	MW-12 (mg/l)	MW-13 (mg/l)	
Total Dissolved Solids (TDS)	602	903	707	890	**1,128**	629	1,000
Calcium (Ca)	162	217	171	249	274	158	NS
Fluoride (F)	0.5	0.7	0.6	0.5	0.7	0.6	1.6
Magnesium (Mg)	18.2	37.6	22.0	26.8	37.2	20.3	NS
Silica (Si)	29.4	18.0	14.1	14.3	19.0	22.6	NS
Sodium (Na)	52.7	89.2	61.4	71.5	132.2	68.9	NS
Bicarbonate (HCO_3)	283	414	303	419	494	277	NS
Chloride (Cl)	73	98	59	49	225	137	250
Nitrate (NO_3-N)	4.7	1.03	0.63	**28.6**	1.01	5.0	10.0
Sulfate (SO_4)	126	184	232	190	206	99	600
Field Parameters							
pH (standard units)	7.38	7.43	7.61	7.11	7.16	7.67	6 - 9
Conductivity (µS/cm)	1,220	1,750	1,290	1,730	2,360	1,432	NS
Temperature (°F)	65.6	67.7	63.5	67.4	68.7	67.8	NS
Dissolved Oxygen (mg/l)	1.85	1.05	0.45	1.05	0.97	1.51	NS

Analyses performed by Trace Analysis, Inc. using EPA Methods 160.1, 200.7, 340.2, 375.4, 353.3, 4500 C1-B, and 310.1
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
NM Indicates parameter was not measured (due to presence of free phase floating product).
NS Indicates no standard established or applicable.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards.

original groundwater sample for this monitoring well indicated a 1,2-dichloroethane concentration below the laboratory detection limit of 0.001 mg/l, therefore, we suspect laboratory contamination or miscalculation. All other volatile organic compounds from the duplicate sample correlate very well with the original sample. The groundwater analyses indicate that the hydrocarbon concentrations in monitoring wells MW-9, MW-11, MW-12, and MW-13 are below the laboratory detection limits.

Based on the results of this investigation and previous investigations by GCL and DBS&A, the areal extent of hydrocarbon-impacted groundwater has been estimated as covering an oval-shaped area approximately 250 feet wide by 500 feet long as depicted in Figure 4. The BTEX concentrations for the May 17, 1995 sampling event are also presented in Figure 4. The hydrocarbon-impacted groundwater from the EOTT tank and line leak sources has not migrated off site, and is well within the boundaries of the facility.

Based on the analytical results for monitoring well MW-10D, which is screened through a deeper portion of the aquifer (70 to 75 feet below ground surface), we estimate that the hydrocarbon-impacted groundwater does not extend beyond 100 feet below the ground surface.

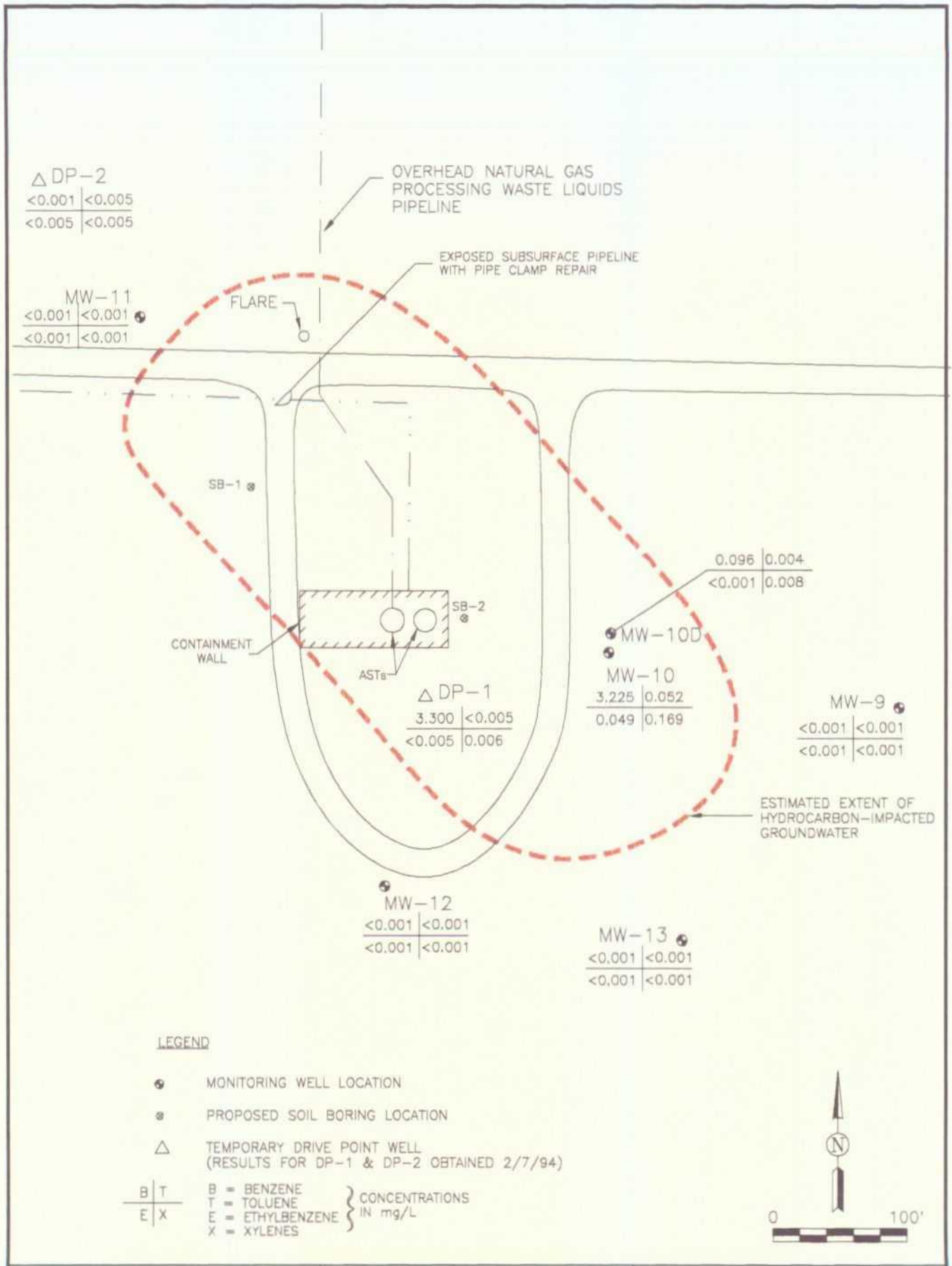
4.4.2 *Inorganic Analytical Results*

The inorganic chemical analyses indicate that water samples from several monitoring wells exceed the WQCC standards for various constituents, including aluminum, chromium, iron, manganese, nitrate, silver, and/or total dissolved solids, as discussed below.

Monitoring wells MW-9, MW-12, and MW-13 recorded aluminum concentrations of 26.58 mg/l, 5.35 mg/l, and 14.08 mg/l, respectively, which exceed the WQCC standard of 5.0 mg/l. However, aluminum does not represent a risk to human health based on WQCC classification (Section 3-103 A-C), therefore, remedial response is not necessary for the relatively low concentrations recorded for this constituent. The source of aluminum is not known, however, it is sometimes found as a constituent in groundwater where irrigation operations are conducted due to the aluminum content of irrigation pipe. The total dissolved solids concentration in one monitoring well, MW-12, is only 128 mg/l above the WQCC standard of 1,000 mg/l, and therefore, does not represent a significant risk to human health.

The elevated iron and manganese levels in some of the on-site monitoring wells may be partially due to the chemically reduced conditions caused by the presence of hydrocarbons in the on-site soils and groundwater, however, natural conditions may also be a contributing factor. Based on the observed concentrations of iron and manganese and the absence of nearby water wells used for human consumption, risk to human health and the environment is low.

The chromium concentration of 0.06 mg/l observed in monitoring well MW-9 represents a minimal exceedance over the WQCC standard of 0.05 mg/l. Chromium concentrations for the remaining monitoring wells varied from less than 0.01 mg/l in MW-13 to 0.05 mg/l in MW-11. Silver concentrations were below the laboratory detection limits of 0.01 mg/l for each monitoring well with the exception of



GCL

CLIENT: GPM GAS CORPORATION	
DATE: 5/17/95	REV. NO.: 2
AUTHOR: GJV	DRAWN BY: MP
CK'D BY: RTH	FILE: LNMRNCH

FIGURE 4
LINAM RANCH PLANT
BTEX CONCENTRATION MAP

MW-11, which recorded a level of 0.18 mg/l. This level exceeds the WQCC standard of 0.05 mg/l for silver. Nitrate concentrations were well below the WQCC standard of 10.0 mg/l for each monitoring well with the exception of MW-13 which registered a level of 28.6 mg/l. It is possible that the source of the chromium and silver is a result of the former cooling tower processes conducted by Enron at the plant. Nitrate is commonly generated from fertilizing or septic sources, however, no such operations are known to exist in the area of the EOTT tanks.

4.5 Intrinsic Bioremediation Assessment

GCL performed a preliminary evaluation of hydrocarbon remediation by intrinsic bioremediation, which relies on the degradation activity of indigenous microorganisms without implementation of an active engineered remedy. The evaluation of intrinsic bioremediation as a hydrocarbon removal mechanism requires evaluation of electron acceptor availability and use patterns, the enumeration of microorganisms with the capability to degrade the contaminant of concern, and the groundwater conditions that allow for electron acceptor and nutrient transport.

Electron acceptors that can be used by in situ microorganisms to achieve significant hydrocarbon degradation include oxygen, nitrogen, and sulfate, in relative order of preference. Often, more than one degradation process is operative during intrinsic bioremediation and the key lies in determining whether or not sufficient electron acceptors are available to arrest contaminant migration and/or attain remediation.

Hydrocarbon-impacted wells (MW-10 and MW-10D) are compared against unimpacted wells (MW-9, MW-11, MW-12, and MW-13) to observe whether or not significant differences are observed in electron acceptor concentration that may be related to subsurface biodegradation. Table 7 shows a significant depletion of nitrate in and immediately downgradient from the hydrocarbon-impacted area relative to upgradient well MW-11, which is not impacted by hydrocarbons. In fact, nitrate concentrations in MW-11 exceed WQCC standards, however, hydrocarbon degradation in the area of the release has decreased nitrate concentrations ten-fold, as nitrate is used by microorganisms in the course of hydrocarbon degradation. Results of dissolved oxygen and sulfate (Table 7) are inconclusive since the observed levels do not vary significantly.

The relative concentrations of nitrogen in wells impacted by hydrocarbons and the small size of the plume when evaluated with predicted groundwater velocity and the age of the plume suggest that natural processes, such as bacteria, have been and are actively degrading hydrocarbons. The rate of degradation is likely limited by the availability of the electron acceptors (oxygen) within the zone of hydrocarbon impact. As indicated by current water quality in downgradient wells MW-12 and MW-13, the electron acceptor concentrations may be sufficient to permit natural biodegradation to contain contaminant migration in a downgradient direction, and thereby stabilize the spreading of hydrocarbons in groundwater.

Enumeration of bacterial populations (colony forming units) was also performed

on a hydrocarbon-impacted well (MW-10), upgradient well (MW-11), and downgradient well (MW-12) to assess if hydrocarbon-degrading bacteria were stimulated to grow in the presence of hydrocarbons. As summarized in Table 8, total aerobic (oxygen-utilizing) bacterial populations in the hydrocarbon-impacted well MW-10 is one order of magnitude greater than bacterial populations observed for upgradient well MW-11 and downgradient well MW-12. Hydrocarbon degraders in MW-10 are slightly lower in number than those detected in MW-11 and MW-12. Total bacterial populations greater than 10^5 are indicators that there is significant potential for intrinsic bioremediation and/or enhanced bioremediation.

While intrinsic bioremediation is occurring and the rate at which this hydrocarbon removal process appears to be sufficient to contain the plume, additional data will be required over time to evaluate the effectiveness of in situ remediation.

Table 8
Summary of Groundwater Analytical Results for Bacterial Activity
Linam Ranch Plant - EOTT Tanks
Sampling Operations Conducted on May 17, 1995

Constituent	Monitoring Well Numbers		
	MW-10	MW-11	MW-12
Total Aerobic Bacteria Population (cfu/ml)	2,700,000	930,000	640,000
Total Hydrocarbon Degraders (cfu/ml)	78,000	480,000	450,000
Dissolved oxygen (mg/l)	1.05	1.05	0.97

Analyses performed by Trace Analysis, Inc. with assistance from the Biological Sciences Department of Texas Tech University using modified standard plate count methods (Appendix D).
Total Aerobic Bacteria Population equivalent to Total Aerobic Heterotrophic Plate Count.
Total Hydrocarbon Degraders equivalent to Total Hydrocarbon Utilizing Bacteria.
Bacteria population counts reported in colony forming units per milliliter (cfu/ml).

Section 5.0

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5.0 Conclusions

- Based on the analytical results from this subsurface investigation and previous investigations conducted by DBS&A and GCL, there are no hydrocarbon-impacted soils above the OCD recommended action level of 50 ppm BTEX and 100 ppm TPH.
- The apparent direction of groundwater flow is toward the southeast with a hydraulic gradient of approximately 0.002 feet/feet and an estimated average linear velocity of 75 to 150 feet/year.
- The areal extent of hydrocarbon-impacted groundwater has been estimated as covering an oval-shaped area approximately 250 feet wide by 500 feet long.
- The hydrocarbon-impacted groundwater has not migrated beyond the boundaries of the facility.
- Based on the analytical results for monitoring well MW-10D, the hydrocarbon-impacted groundwater does not extend below an estimated depth of 100 feet below ground surface.
- The inorganic chemical analyses indicate that water samples from several monitoring wells exceed the WQCC standards for various constituents, including aluminum, chromium, iron, manganese, nitrate, silver, and/or total dissolved solids.
- The risk to human health and the environment posed by elevated metals content is low.
- While intrinsic bioremediation is occurring and the hydrocarbon removal process appears to be sufficient to contain the plume, additional data will be required over time to evaluate its effectiveness for in situ remediation.
- Based upon the calculation of the average linear velocity of groundwater flow, the age of the release, and the documented extent of hydrocarbon-impact, GCL concludes that natural processes (intrinsic bioremediation, adsorption, and volatilization) are effectively limiting the migration of dissolved-phase hydrocarbons to the on-site boundaries of the facility.

Section 6.0

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6.0 Preliminary Remedial Response

GCL believes the following remedial response initiatives should be implemented at the Linam Ranch Plant:

- Continued sampling and monitoring of the on-site monitoring wells on a quarterly basis for three more quarters. The primary parameters to be monitored and sampled should include groundwater elevations, BTEX concentrations, dissolved oxygen, and semiannual analysis of bacteria populations. This additional data will be required over time to evaluate the effectiveness of intrinsic bioremediation in limiting the migration of dissolved-phase hydrocarbons to the on-site boundaries of the facility.
- Sampling for dissolved metals, PAHs, and major ions should be discontinued.
- An annual report should be submitted in September or October 1996 summarizing the results of the year's monitoring and recommending revisions to this proposed response.

Section 7.0

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7.0 References

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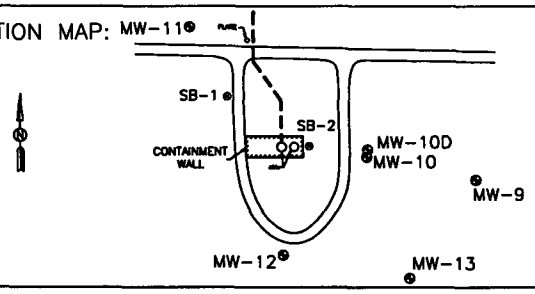
U. S. Geological Survey, 1985 (provisional edition). Monument South, NM USGS 7.5-minute quadrangle map.

Appendix A

Lithologic Logs, Well Construction Diagrams, and Photographic Documentation

LITHOLOGIC LOG (SPLIT SPOON)

LOCATION MAP:



___1/4 ___1/4 NE 1/4 NE 1/4 S 6 T 19S R 37E

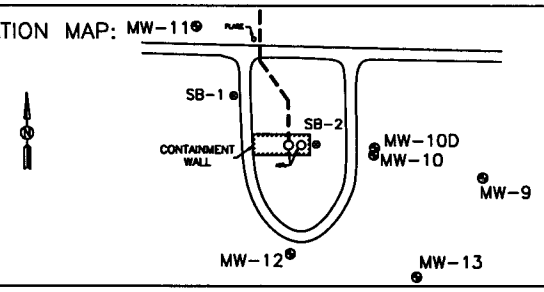
SITE ID: LINAM RANCH PLANT LOCATION ID: SB-1
SITE COORDINATES (ft.):
N _____ E _____
GROUND ELEVATION (ft. MSL): 3,720
STATE: NEW MEXICO COUNTY: LEA
DRILLING METHOD: AIR ROTARY
DRILLING CONTR.: DIVERSIFIED WATER WELL
DATE STARTED: 5/11/95 DATE COMPLETED: 5/11/95
FIELD REP.: GIL VAN DEVENTER
COMMENTS: _____

LOCATION DESCRIPTION: LOCATED APPROXIMATELY 90 FT. UPGRADIENT NORTHWEST FROM ASTs

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	FROM	TO	% REC	PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
5			SM	5	6	50	40 ppm	SILTY CALCAREOUS SAND, VERY PALE BROWN, V. FINE TO FINE GRAINED, POORLY SORTED, SUBROUNDED GRAINS, 65% SAND, 30% SILT, 5% CALCAREOUS, MOSTLY MEDIUM DENSE SAND WITH SOME VERY DENSE ZONES, DRY.
10				10	10.5	25	15 ppm	
15				15	15.5	25	13 ppm	
20				20	21	50	15 ppm	
25			SM	25	25.5	25	11 ppm	SILTY CALCAREOUS SAND AS ABOVE WITH INTERMITTENT INDURATED CALCAREOUS SANDSTONE LAYERS.
30			SW	30	31	50	7 ppm	SAND, LIGHT BROWN AND ORANGE-PINK, FINE GRAINED, MODERATELY SORTED, SUBROUNDED GRAINS, LOOSE SAND, DRY.
35			SS					SANDSTONE WITH QUARTZ-FILLED FRACTURES, LIGHT BROWN AND ORANGE-PINK, FINE GRAINED, MODERATELY SORTED, SUBROUNDED GRAINS, DRY.
40			SW	40	40.5	25	6 ppm	SAND, LIGHT BROWN AND ORANGE-PINK, FINE TO MEDIUM GRAINED, MODERATELY TO WELL SORTED, SUBROUNDED GRAINS, LOOSE SAND, STRONG HYDROCARBON ODORS AT 46 FEET.
45				46	47	50	371 ppm	
50								BOTTOM OF BORING AT 47 FEET. GROUNDWATER ENCOUNTERED AT APPROXIMATELY 47 FEET.

LITHOLOGIC LOG (SPLIT SPOON)

LOCATION MAP:



___1/4 ___1/4 NE 1/4 NE 1/4 S 6 T 192 R 37E

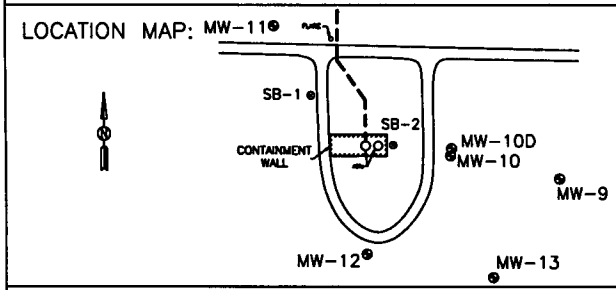
SITE ID: LINAM RANCH PLANT LOCATION ID: SB-2
SITE COORDINATES (ft.):
N _____ E _____
GROUND ELEVATION (ft. MSL): 3,720
STATE: NEW MEXICO COUNTY: LEA
DRILLING METHOD: AIR ROTARY
DRILLING CONTR.: DIVERSIFIED WATER WELL
DATE STARTED: 5/12/95 DATE COMPLETED: 5/12/95
FIELD REP.: GIL VAN DEVENTER
COMMENTS: _____

LOCATION DESCRIPTION: LOCATED ADJACENT TO EAST SIDE OF AST CONTAINMENT WALL

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	SAMPLE FROM	SAMPLE TO	SAMPLE % REC	SAMPLE PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
5			SM	7	7.5	25	13 ppm	SILTY CALCAREOUS SAND, VERY PALE BROWN, VERY FINE TO FINE GRAINED, POORLY SORTED, SUBROUNDED GRAINS, 65% SAND, 30% SILT, 5% CALCAREOUS, MOSTLY MEDIUM DENSE SAND WITH SOME VERY DENSE ZONES, DRY.
10								
15				15	16.5	75	<1 ppm	
20								
25			SM	25	26	50	4 ppm	SILTY CALCAREOUS SAND AS ABOVE, LIGHT BROWN AND ORANGE-PINK, WITH INTERMITTENT INDURATED CALCAREOUS SANDSTONE LAYERS.
30								
35			SW	35	36.5	75	2 ppm	SAND, LIGHT BROWN AND ORANGE-PINK, FINE GRAINED, MODERATELY SORTED, SUBROUNDED GRAINS, LOOSE SAND, DRY.
40								
45				46	47	50	<1 ppm	
50								BOTTOM OF BORING AT 47 FEET.

LITHOLOGIC LOG (SPLIT SPOON)

LOCATION MAP:



___1/4 ___1/4 NE 1/4 NE 1/4 S 6 T 19S R 37E

SITE ID: LINAM RANCH PLANT LOCATION ID: MW-10
SITE COORDINATES (ft.):
N _____ E _____
GROUND ELEVATION (ft. MSL): 3,720
STATE: NEW MEXICO COUNTY: LEA
DRILLING METHOD: AIR ROTARY
DRILLING CONTR.: DIVERSIFIED WATER WELL
DATE STARTED: 5/12/95 DATE COMPLETED: 5/12/95
FIELD REP.: GIL VAN DEVENTER
COMMENTS: _____

LOCATION DESCRIPTION: LOCATED APPROXIMATELY 120 FT. EAST OF ASTs

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	FROM	TO	% REC	PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
5			SM	5	5.5	25	<1 ppm	SILTY CALCAREOUS SAND, VERY PALE BROWN, VERY FINE TO FINE GRAINED, POORLY SORTED, SUBROUNDED GRAINS, 65% SAND, 30% SILT, 5% CALCAREOUS, MOSTLY MEDIUM DENSE SAND WITH SOME VERY DENSE ZONES, DRY.
15				15	16	50	<1 ppm	
25				25	25.5	25	<1 ppm	
30			SM					SILTY CALCAREOUS SAND AS ABOVE, LIGHT BROWN AND ORANGE-PINK, WITH INTERMITTENT INDURATED CALCAREOUS SANDSTONE LAYERS.
35			SW					SAND, LIGHT BROWN AND ORANGE-PINK, FINE GRAINED, MODERATELY SORTED, SUBROUNDED GRAINS, LOOSE SAND, DRY.
45			SS	35	36	50	<1 ppm	SANDSTONE WITH SOME MEDIUM DENSE SAND LAYERS, FINE GRAINED, MODERATELY SORTED, SUBROUNDED GRAINS, SOME GRAY COLORATION FROM 36 FEET TO 38 FEET BUT NO HYDROCARBON ODORS DETECTED, DRY.
50				45	46	50	11 ppm	
			SW					SAND, LIGHT BROWN AND GRAY, FINE TO MEDIUM GRAINED, MODERATELY TO WELL SORTED, SUBROUNDED GRAINS, LOOSE SAND. GROUNDWATER ENCOUNTERED AT APPROXIMATELY 48 FEET.

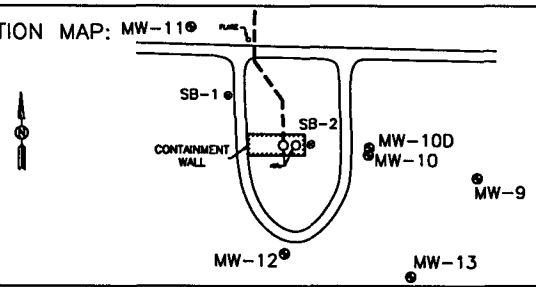
LITHOLOGIC LOG (SPLIT SPOON)
(Continued)

LOCATION ID: MW-10

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	SAMPLE FROM	SAMPLE TO	SAMPLE % REC	SAMPLE PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
60			SW					SAND LIGHT BROWN, FINE TO MEDIUM GRAINED, MODERATELY TO WELL SORTED, SUBROUNDED GRAINS, LOOSE SAND. HARD STREAK AT 63 FEET.
65								BOTTOM OF BORING AT 64 FEET.
70								
75								
80								
85								
90								
95								
100								
105								
110								
115								
120								

LITHOLOGIC LOG (SPLIT SPOON)

LOCATION MAP:



___1/4 ___1/4 NE 1/4 NE 1/4 S 6 T 19S R 37E

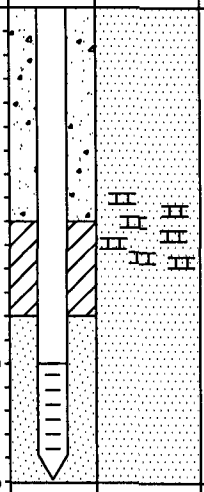
SITE ID: LINAM RANCH PLANT LOCATION ID: MW-10D
SITE COORDINATES (ft.):
N _____ E _____
GROUND ELEVATION (ft. MSL): 3,720
STATE: NEW MEXICO COUNTY: LEA
DRILLING METHOD: AIR ROTARY
DRILLING CONTR.: DIVERSIFIED WATER WELL
DATE STARTED: 5/12/95 DATE COMPLETED: 5/13/95
FIELD REP.: GIL VAN DEVENTER
COMMENTS: _____

LOCATION DESCRIPTION: LOCATED APPROXIMATELY 10 FEET NORTH OF MW-10

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	SAMPLE FROM	SAMPLE TO	SAMPLE % REC	SAMPLE PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
0–25			SM					SILTY CALCAREOUS SAND, VERY PALE BROWN, VERY FINE TO FINE GRAINED, POORLY SORTED, SUBROUNDED GRAINS, 65% SAND, 30% SILT, 5% CALCAREOUS, MOSTLY MEDIUM DENSE SAND WITH SOME VERY DENSE ZONES, DRY.
25–30			SM					SILTY CALCAREOUS SAND AS ABOVE, LIGHT BROWN AND ORANGE–PINK, WITH INTERMITTENT INDURATED CALCAREOUS SANDSTONE LAYERS.
30–35			SW					SAND, LIGHT BROWN AND ORANGE–PINK, FINE GRAINED, MODERATELY SORTED, SUBROUNDED GRAINS, LOOSE SAND, DRY.
35–45			SS					SANDSTONE WITH SOME MEDIUM DENSE AND LAYERS, FINE GRAINED, MODERATELY SORTED, SUBROUNDED GRAINS, SOME GRAY COLORATION FROM 36 FEET TO 38 FEET BUT NO HYDROCARBON ODORS DETECTED, DRY.
45–50			SW					SAND, LIGHT BROWN AND GRAY, FINE TO MEDIUM GRAINED, MODERATELY TO WELL SORTED, SUBROUNDED GRAINS, LOOSE SAND. GROUNDWATER ENCOUNTERED AT APPROXIMATELY 48 FEET.

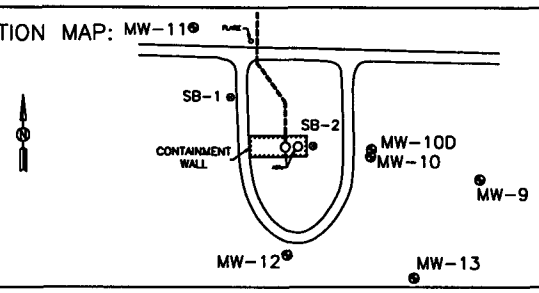
LITHOLOGIC LOG (SPLIT SPOON)
(Continued)

LOCATION ID: MW-10D

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	SAMPLE FROM	SAMPLE TO	SAMPLE % REC	SAMPLE PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
60			SW					SAND LIGHT BROWN, FINE TO MEDIUM GRAINED, MODERATELY TO WELL SORTED, SUBROUNDED GRAINS, LOOSE SAND, WET. HARD STREAK AT 63 – 65 FEET.
65								
70								
75								BOTTOM OF BORING AT 75 FEET.
80								
85								
90								
95								
100								
105								
110								
115								
120								

LITHOLOGIC LOG (SPLIT SPOON)

LOCATION MAP:



___1/4 ___1/4 NE 1/4 NE 1/4 S 6 T 19S R 37E

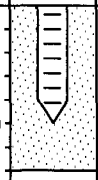
SITE ID: LINAM RANCH PLANT LOCATION ID: MW-11
SITE COORDINATES (ft.):
N _____ E _____
GROUND ELEVATION (ft. MSL): 3,720
STATE: NEW MEXICO COUNTY: LEA
DRILLING METHOD: AIR ROTARY
DRILLING CONTR.: DIVERSIFIED WATER WELL
DATE STARTED: 5/13/95 DATE COMPLETED: 5/13/95
FIELD REP.: GIL VAN DEVENTER
COMMENTS: NO HYDROCARBON ODORS OR STAINING OBSERVED

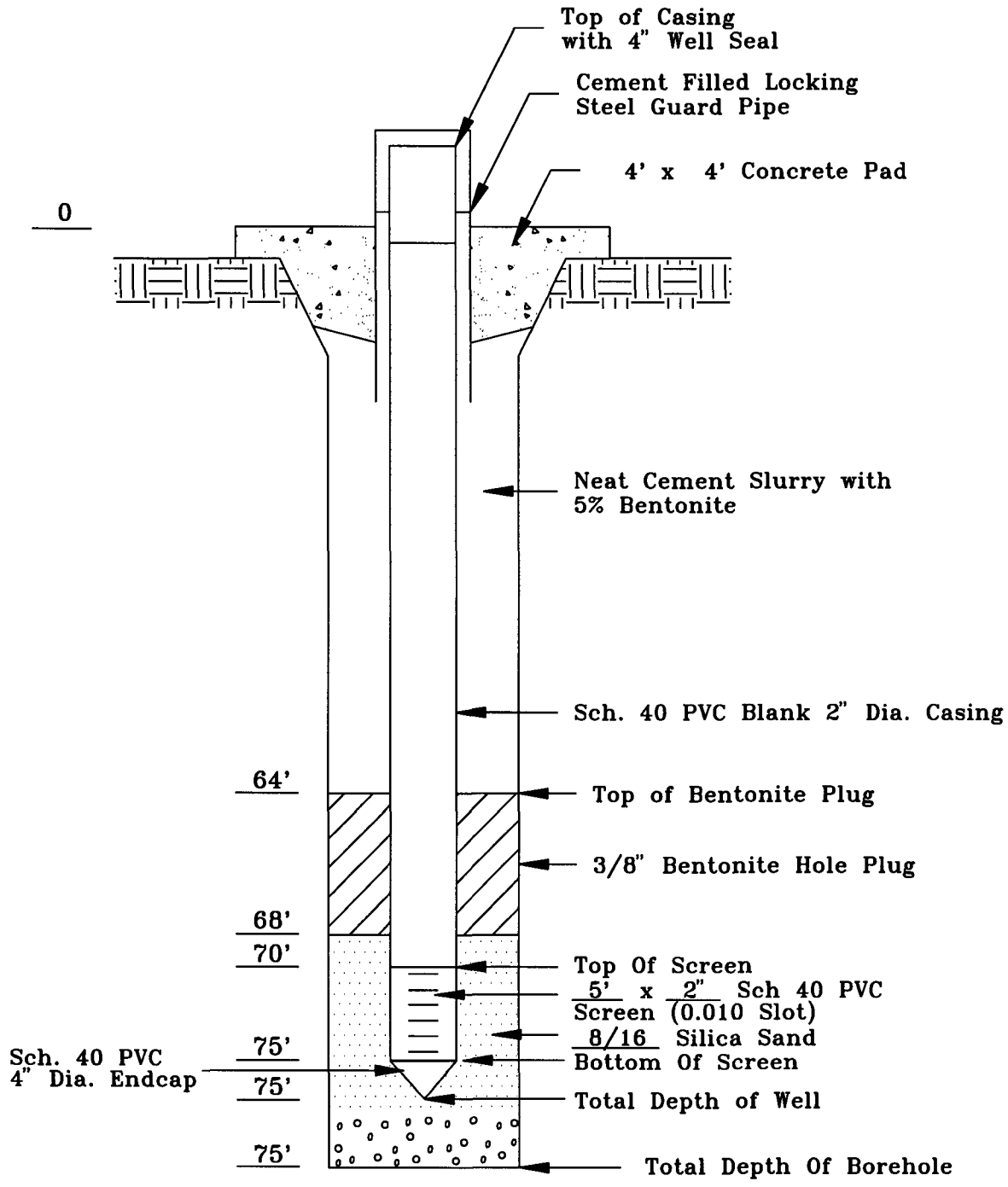
LOCATION DESCRIPTION: LOCATED APPROXIMATELY 240 FT. UPGRADIENT NORTHWEST OF ASTs

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	FROM	TO	% REC	PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
5			SM	5	6	50	<1 ppm	SILTY CALCAREOUS SAND, VERY PALE BROWN, VERY FINE TO FINE GRAINED, POORLY SORTED, SUBROUNDED GRAINS, 60-65% SAND, 30% SILT, 5-10% CALCAREOUS, MEDIUM DENSE SAND, DRY.
15				15	17	100	<1 ppm	
25				25	27	100	<1 ppm	
35			SM	35	35	0	----	SILTY CALCAREOUS SAND AS ABOVE, LIGHT BROWN AND ORANGE-PINK, WITH INTERMITTENT INDURATED CALCAREOUS SANDSTONE LAYERS. FORMATION TOO DENSE FOR SPLITSPOON SAMPLING - NO RECOVERY AT 35 FEET.
45			SW	45	46	50	<1 ppm	SAND, LIGHT BROWN AND ORANGE-PINK, FINE TO MEDIUM GRAINED, MODERATELY TO WELL SORTED, SUBROUNDED TO ROUND GRAINS, LOOSE SAND. GROUNDWATER ENCOUNTERED AT APPROXIMATELY 48 FEET.

LITHOLOGIC LOG (SPLIT SPOON)
(Continued)

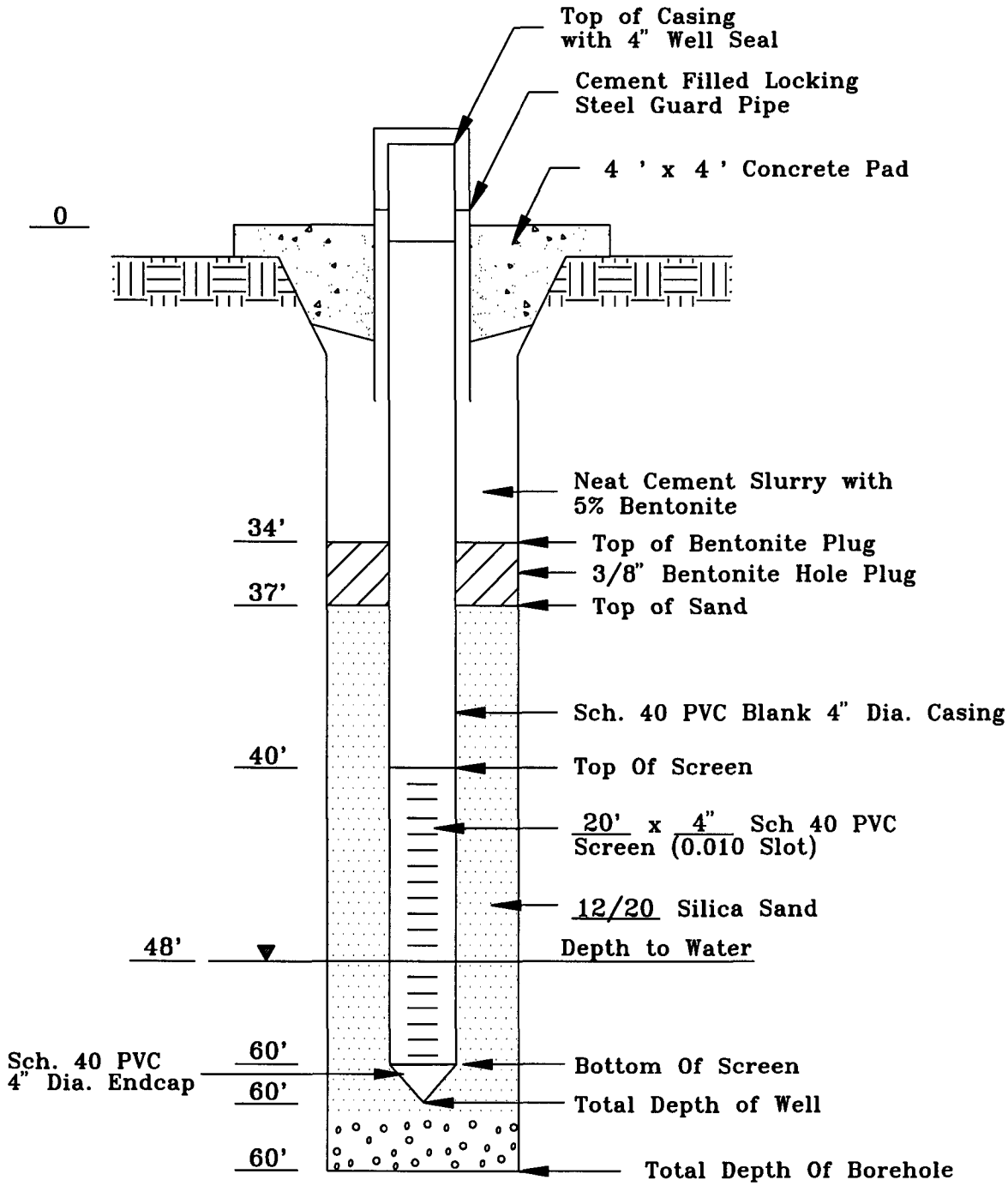
LOCATION ID: MW-13

DEPTH	WELL CONST.	LITH.	SAMPLE USCS	SAMPLE FROM	SAMPLE TO	SAMPLE % REC	SAMPLE PID READING	LITHOLOGIC DESCRIPTION (LITH., USCS, GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SORT., CONSOL., DIST. FEATURES)
60			SW					SAND, LIGHT BROWN AND ORANGE-PINK, FINE GRAINED, MODERATELY TO WELL SORTED, SUBROUNDED GRAINS, LOOSE SAND.
								BOTTOM OF BORING AT 62 FEET.
65								
70								
75								
80								
85								
90								
95								
100								
105								
110								
115								
120								



GCL	CLIENT: GPM GAS CORPORATION	
	DATE: 5/13/95	REV. NO.: 0
	AUTHOR: GJV	DRAWN BY: MP
	CK'D BY: RTH	FILE: LRM10DCD

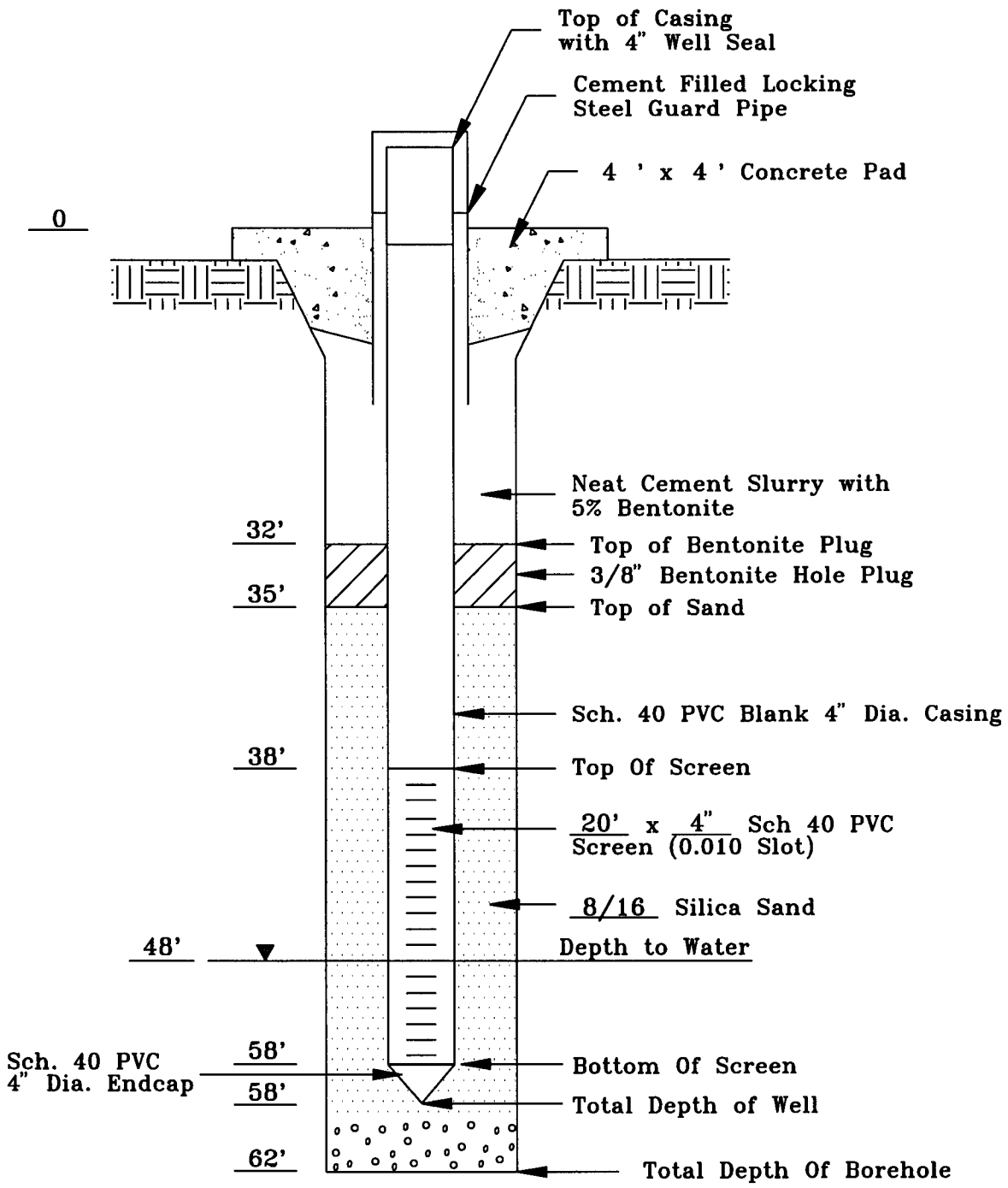
LINAM RANCH PLANT
MONITORING WELL MW-10D
COMPLETION DIAGRAM



GCL

CLIENT: GPM GAS CORPORATION	
DATE: 5/13/95	REV. NO.: 0
AUTHOR: GJV	DRAWN BY: MP
CK'D BY: RTH	FILE: LRMW11CD

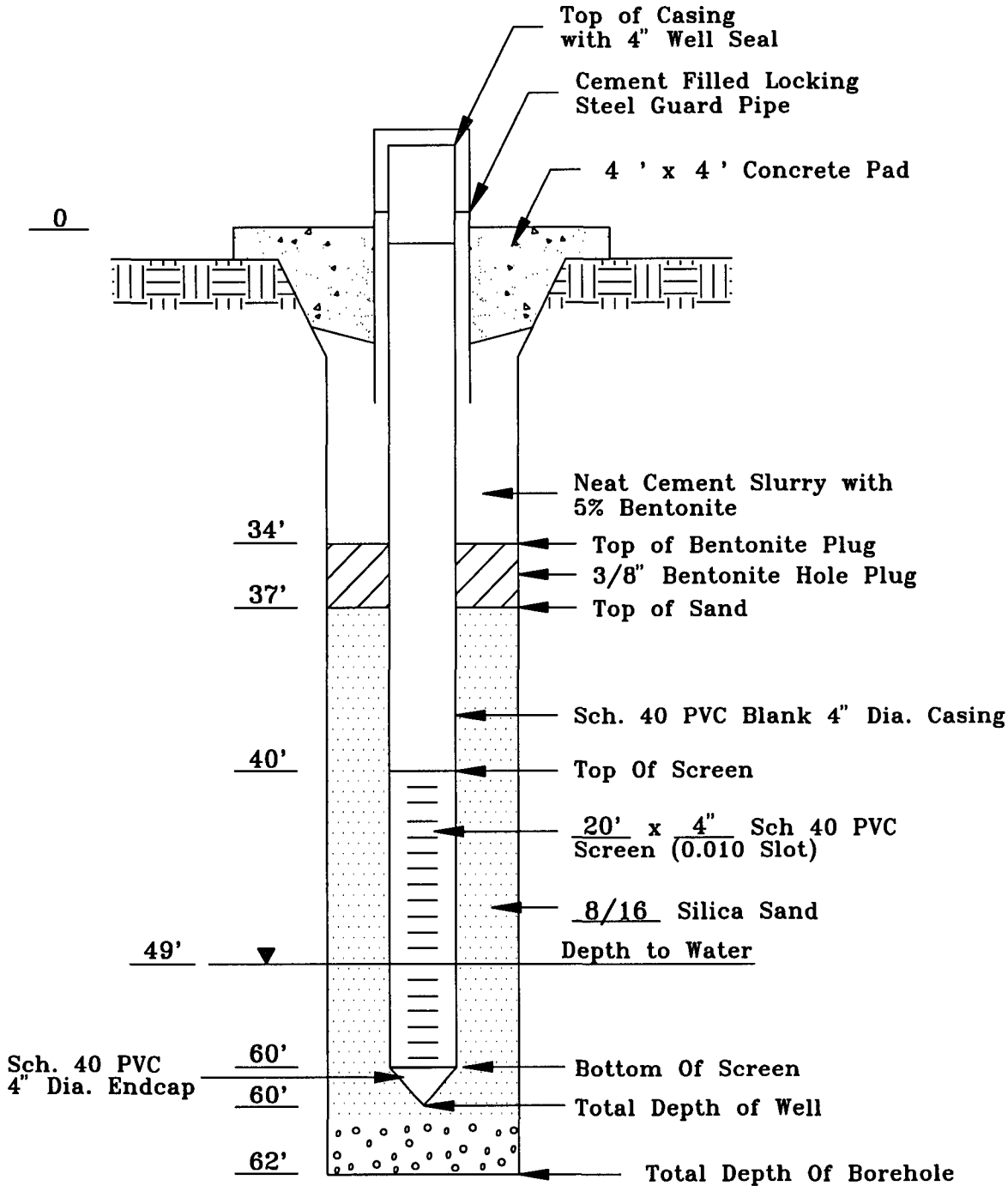
LINAM RANCH PLANT
MONITORING WELL MW-11
COMPLETION DIAGRAM



GCL

CLIENT: GPM GAS CORPORATION	
DATE: 5/11/95	REV. NO.: 0
AUTHOR: GJV	DRAWN BY: MP
CK'D BY: RTH	FILE: LR12MWCD

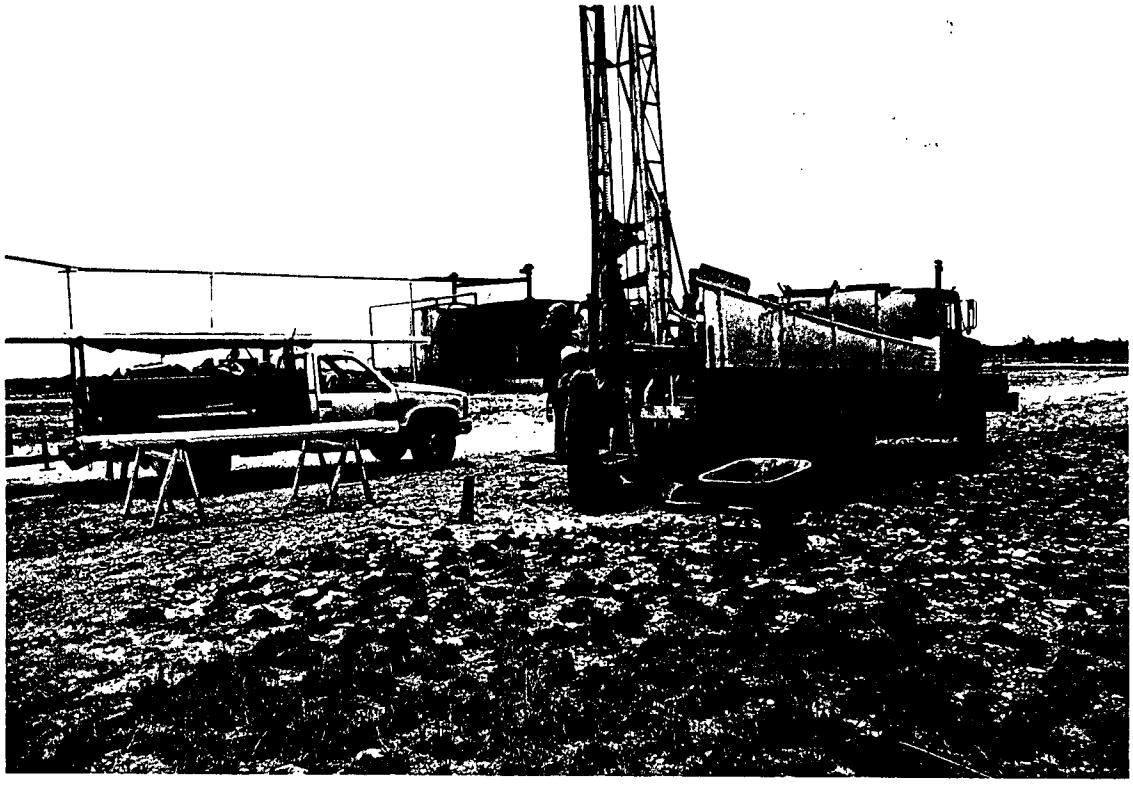
LINAM RANCH PLANT
MONITORING WELL MW-12
COMPLETION DIAGRAM



GCL

CLIENT: GPM GAS CORPORATION	
DATE: 5/12/95	REV. NO.: 0
AUTHOR: GJV	DRAWN BY: MP
CK'D BY: RTH	FILE: LRMW13CD

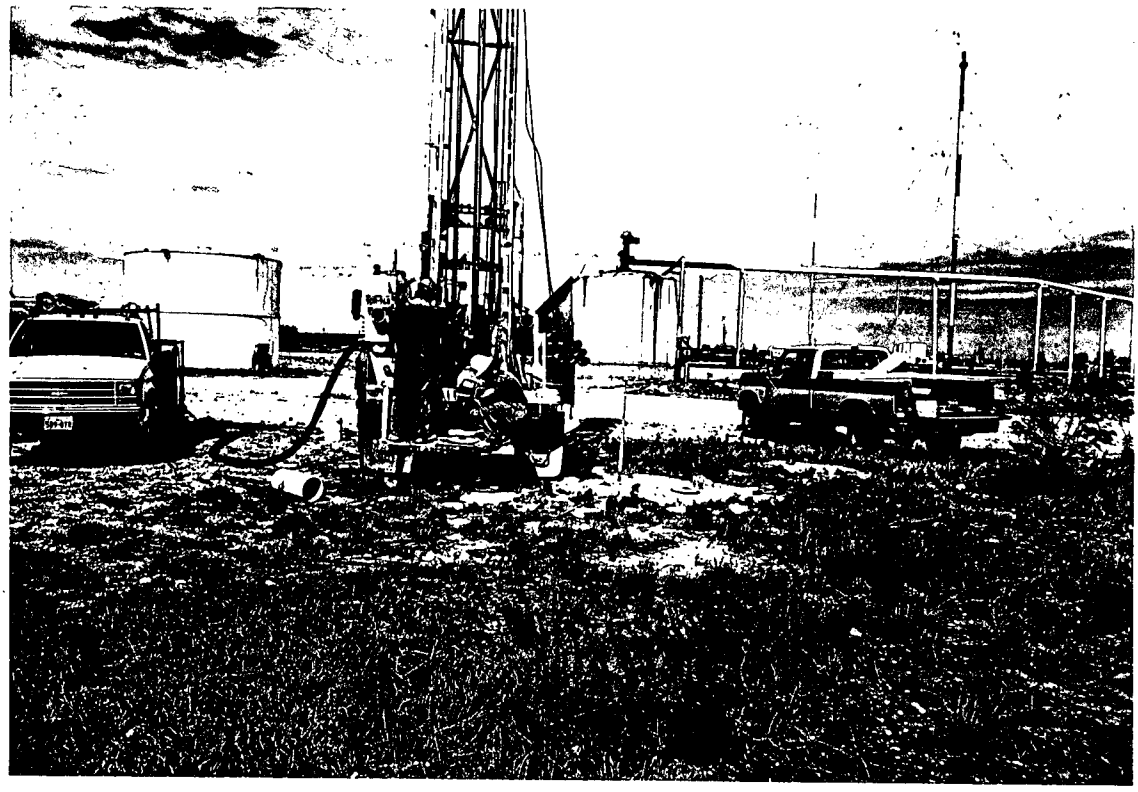
LINAM RANCH PLANT
MONITORING WELL MW-13
COMPLETION DIAGRAM



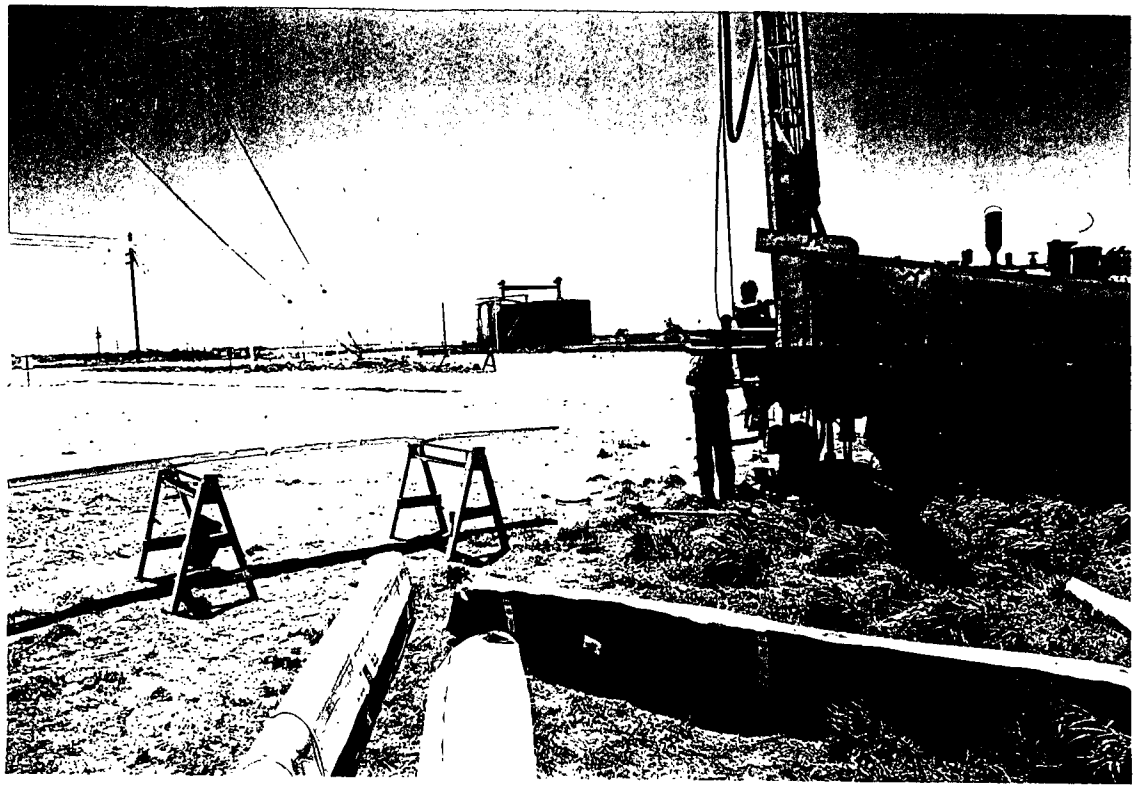
View facing southeast showing soil sampling operations for soil boring SB-1 located approximately 90 feet upgradient (northwest) from ASTs.



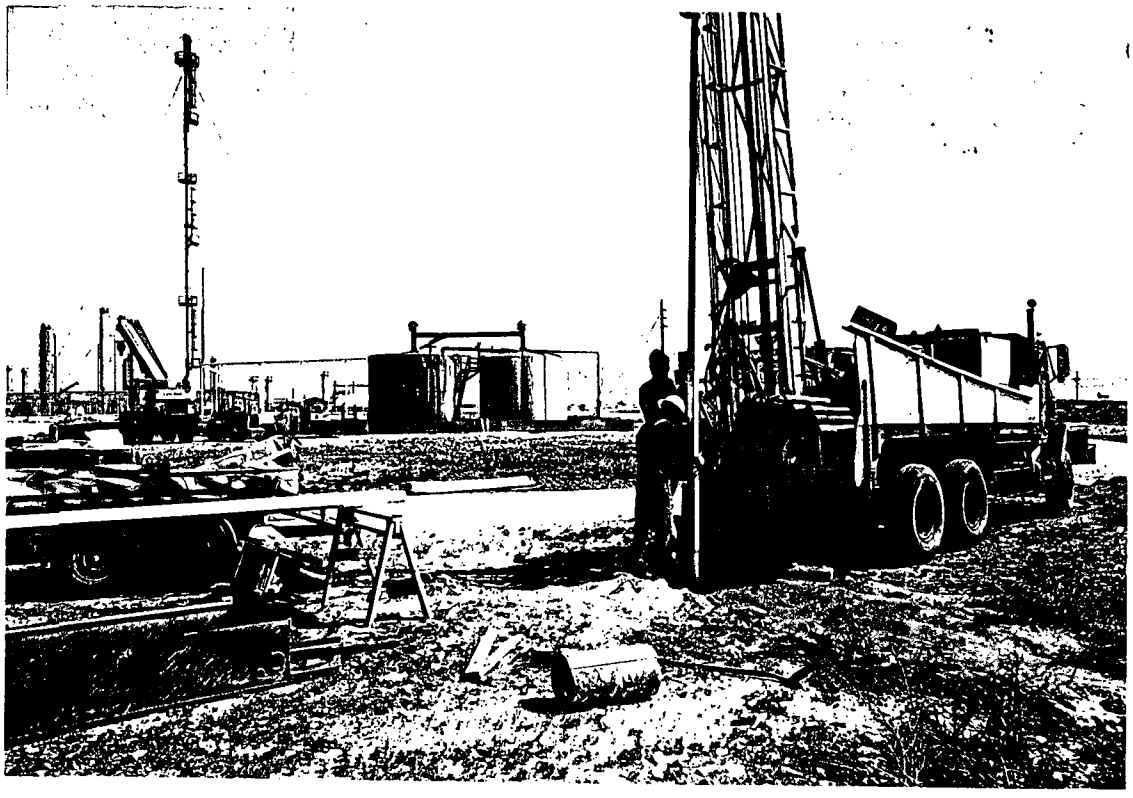
View looking west showing drilling operations for soil boring SB-2 located adjacent to AST containment wall.



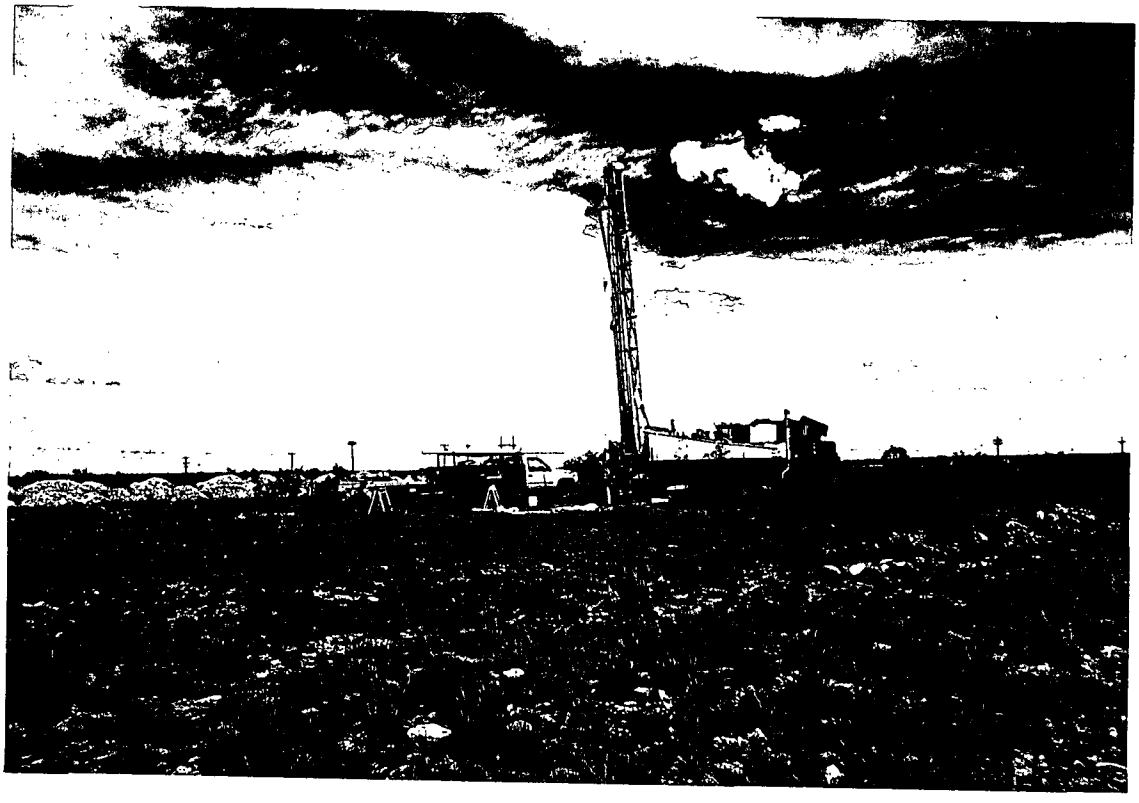
View facing west showing soil sampling operations for monitoring well MW-10 located approximately 120 feet east of ASTs.



View looking southeast showing soil sampling operations for monitoring well MW-11 located approximately 240 feet upgradient (northwest) of ASTs.



View facing north-northwest showing well completion operations for MW-12 located approximately 180 feet south of ASTs.



View looking southeast showing monitoring well completion operations for MW-13 located approximately 300 feet downgradient (southeast) from ASTs.

Appendix B

Laboratory Reports and Chain-of-Custody Documentation

GCL
Environmental Science and Engineering
A BDM International Company

☐ Albuquerque
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102
(505) 842-0001
FAX: (505) 842-0595

☐ Mid Atlantic Region
4221 Forbes Blvd., Ste. 240
Lanham, MD 20706-4325
(301) 459-9677
FAX: (301) 459-3064

☐ NASA-WSTF
PO Drawer MM
Las Cruces, NM 88004
(505) 524-5353
FAX: (505) 524-5315

№ 9722

Chain of Custody

Date 5-15-95 Page 1 Of 1

Lab Name Trace Analysis
Address 6701 Aberdeen Ave
Lubbock, Tx 79424
Telephone 806-794-1296

Samplers (SIGNATURES)

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020 BTEX	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neu/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX Modified 8015 Gas+Diesel	TCLP- Vol., Semi-Vol. Herbicides, Pesticides	TCLP- Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)					Number of Containers
956	950511 1152	Soil	SB-1 (5-6')		✓								✓																1
957	950511 1330	Soil	SB-1 (46-47')		✓								✓																1
958	950512 1150	Soil	SB-2 (7-7.5')		✓								✓																1
959	950512 1349	Soil	SB-2 (47-48')		✓								✓																1
960	950512 1052	Soil	MW-10 (35-36')		✓								✓																1
961	950512 1102	Soil	MW-10 (45-46')		✓								✓																1
962	950513 1249	Soil	MW-11 (45-46')		✓								✓																1
963	950510 1703	Soil	MW-12 (45-46')		✓								✓																1
964	950511 1552	Soil	MW-13 (45-46')		✓								✓																1

Project Information		Sample Receipt	
Project	GPM-Linam Ranch Plant	Total No. of Containers	9
Project Director	Gil Van Deventer	Chain of Custody Seals	N
Charge Code No.	LREEOT-20-300	Rec'd Good Condition/Cold	Y
Shipping ID. No.		Conforms to Record	Y
Via:		Lab No.	35936 - 64

Special Instructions/Comments: Invoice GPM direct
C/E

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
(Signature) 1600 (Time)	Helen Shelton 7:00 P.M. (Time)	(Signature) (Time)
Gil Van Deventer 5-15-95 (Printed Name) (Date)	HELEN SHELTON 5-15-95 (Printed Name) (Date)	(Printed Name) (Date)
GCL (Company)	TRACE ANALYSIS (Company)	(Company)
Received By 1.	**Received By 2.**	**Received By (Laboratory) 3.**
Helen Shelton 4:15 P.M. (Signature) (Time)	(Signature) (Time)	(Signature) 5/16/95 (Time)
HELEN SHELTON 5-15-95 (Printed Name) (Date)	(Printed Name) (Date)	DAVID HENZLER 10:05 (Printed Name) (Date)
TRACE ANALYSIS (Company)	(Company)	(Laboratory)

Distribution: White, Canary-Laboratory • Pink, GCL

TRACE ANALYSIS, INC.
6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

May 25, 1995
Receiving Date: 05/16/95
Sample Type: Soil
Charge Code No: LREEDT-20-300
Project Location: Linam Ranch Plant
COC #9722

Analysis Date: 05/16/95
Sampling Date: 05/10-13/95
Sample Condition: Intact & Cool
Sample Received by: DH
Project Name: GPM

TA#	Field Code	(Gasoline Range) TRPHC (mg/kg)	(Diesel Range) TRPHC (mg/kg)	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL-BENZENE (mg/kg)	M,P,O XYLENE (mg/kg)	TOTAL BTEX (mg/kg)
T35956	9505111152 SB-1 (5-6')	<20	<20	<0.010	<0.010	<0.010	<0.010	<0.010
T35957	9505111330 SB-1 (46-47')	66	<20	<0.010	<0.010	0.120	0.771	0.891
T35958	9505121150 SB-2 (7-7.5')	<20	<20	<0.010	<0.010	<0.010	<0.010	<0.010
T35959	9505121349 SB-2 (47-48')	<20	<20	<0.010	<0.010	<0.010	<0.010	<0.010
T35960	9505121052 MW-10 (35-36')	<20	<20	<0.010	<0.010	<0.010	<0.010	<0.010
T35961	9505121102 MW-10 (45-46')	<20	<20	<0.010	<0.010	<0.010	<0.010	<0.010
T35962	9505131249 MW-11 (45-46')	<20	<20	<0.010	<0.010	<0.010	<0.010	<0.010
T35963	9505101703 MW-12 (45-46')	<20	<20	<0.010	<0.010	<0.010	<0.010	<0.010
T35964	9505111552 MW-13 (45-46')	<20	<20	<0.010	<0.010	<0.010	<0.010	<0.010
QC	Quality Control	5	98	0.056	0.058	0.060	0.183	
Reporting Limit		20	20	0.010	0.010	0.010	0.010	
% Precision		83	115	95	95	95	95	
% Extraction Accuracy		103	103	---	---	---	---	
% Instrument Accuracy		98	98	104	106	110	112	

METHODS: EPA SW 846-8020; Modified 8015.
BTEX SPIKE AND QC: Sample and Blank Spiked with 0.05 mg/kg each volatile organics.
TRPHC (GASOLINE RANGE) SPIKE AND QC: Sample spiked with 5 mg/kg TRPHC (GASOLINE RANGE) and Blank spiked with 5 mg/kg TRPHC (GASOLINE RANGE).
TRPHC (DIESEL RANGE) SPIKE AND QC: Sample and Blank spiked with 100 mg/kg TRPHC (DIESEL RANGE).

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

5-25-95
Date

RECEIVED JUN 16 1995

139AI

GCL
Environmental Science and Engineering
A BDM International Company

☒ Albuquerque
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102
(505) 842-0001
FAX: (505) 842-0595

☐ Mid Atlantic Region
4221 Forbes Blvd., Ste. 240
Lanham, MD 20706-4325
(301) 459-9677
FAX: (301) 459-3064

☐ NASA-WSTF
PO Drawer MM
Las Cruces, NM 88004
(505) 524-5353
FAX: (505) 524-5315

№ 9765

Chain of Custody

Date 5-17-95 Page 1 Of 1

Lab Name TRACE ANALYSIS
Address 6701 ABERDEENE AVENUE
LUBBOCK, TEXAS 79424
Telephone (806) 794-1296

Samplers (SIGNATURES) Dwayne Salisbury

Sample Number	Matrix	Location
36146 9505171640	H2O	MW-8
36147 9505171115	H2O	MW-1
36148 9505171155	H2O	MW-7
36149 9505171255	H2O	MW-9
36150 9505171330	H2O	MW-13
36151 9505171331	H2O	Trip-Blank

Analysis Request

Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neu/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX Modified 8015	TCLP- Vol., Semi-Vol. Herbicides, Pesticides	TCLP- Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Total Metals	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	Bacterial Analysis & Hydrocarbon degraders		Major ions + Fe+ Si	Number of Containers
					X	X										X								X	6
					X	X										X								X	6
					X	X										X								X	6
					X	X										X								X	6
					X	X										X								X	6
					X																				2

Project Information	
Project	GPM- Linam
Project Director	Van Deventer
Charge Code No.	3100-004
Shipping ID. No.	5328207765
Via:	Fed-EX

Sample Receipt	
Total No. of Containers	31
Chain of Custody Seals	Y
Rec'd Good Condition/Cold	Y
Conforms to Record	Y
Lab No.	36146 - 36151

Special Instructions/Comments: Total Metals: Ag, Al, As, B, Ba, Cd, Cr, Co, Cu, Fe, Hg, Mn, Mo, Ni, Pb, Se, ZN, Na, Ca, Mg, Cl- F- SO4 NO3 CO3 HCO3 Si

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
Dwayne Salisbury (Signature) 1200 (Time)	(Signature) (Time)	(Signature) (Time)
Dwayne Salisbury (Printed Name) 5-18 (Date)	(Printed Name) (Date)	(Printed Name) (Date)
GCL (Company)	(Company)	(Company)
Received By 1.	**Received By 2.**	**Received By (Laboratory) 3.**
(Signature) (Time)	(Signature) (Time)	(Signature) 1030 (Time)
(Printed Name) (Date)	(Printed Name) (Date)	M DONELL 5/19/95 (Printed Name) (Date)
(Company)	(Company)	TRACE ANALYSIS (Laboratory)

* Invoice: GPM Directly - charge code = LREEGTT-20-300

Distribution: White, Canary-Laboratory • Pink, GCL

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

RECEIVED JUN 16 1995

ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1300
Albuquerque, NM 87102

June 08, 1995
Receiving Date: 05/19/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam

Prep Date: 06/05/95
Analysis Date: 06/05/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM
COC# 9765

TA#	FIELD CODE	TDS (mg/L)
T36146	9505171040 MW-8	1,366
T36147	9505171115 MW-1	2,204
T36148	9505171155 MW-7	713
T36149	9505171255 MW-9	602
T36150	9505171330 MW-13	629
RPD		0

METHODS: EPA 160.1.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

6-8-95
DATE

6701 Aberdeen Avenue
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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1300
Albuquerque, NM 87102

June 08, 1995
Receiving Date: 05/19/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam

Extraction Date: 05/22/95
Analysis Date: 05/22/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM
COC# 9765

TA#	FIELD CODE	2-methylnaphthalene/ 1-methylnaphthalene (mg/L)
T36146	9505171040 MW-8	ND
T36147	9505171115 MW-1	ND
T36148	9505171155 MW-7	ND
T36149	9505171255 MW-9	ND
T36150	9505171330 MW-13	ND
QC	Quality Control	49.2
Reporting Limit		0.001
RPD		0
% Extraction Accuracy		90
% Instrument Accuracy		98

ND = Not Detected

METHODS: EPA SW 846-8270, 3510.

6-8-95

Director, Dr. Blair Leftwich — DATE
Director, Dr. Bruce McDonell

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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

May 31, 1995
Receiving Date: 05/19/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam

Analysis Date: 05/19/95
Sampling Date: 05/17/95
Sample Condition: I & C
Sample Received by: McD
Project Name: GPM
COC# 9765

TA#	FIELD CODE		FLUORIDE (mg/L)	CHLORIDE (mg/L)	SO4 (mg/L)	NO3-N (mg/L)	CO3 as CaCO3 (mg/L)	HCO3 as CaCO3 (mg/L)
T36146	9505171040	MW-8	1.0	83	602	33.4	0	383
T36147	9505171115	MW-1	4.2	188	1,039	<0.3	0	559
T36148	9505171155	MW-7	0.5	113	161	2.8	0	283
T36149	9505171255	MW-9	0.5	73	126	4.7	0	283
T36150	9505171330	MW-13	0.6	137	99	5.0	0	277
QC	Quality Control		1.0	499	9	1.0	---	---
RPD			1	0	6	0	4	4
% Extraction Accuracy			100	98	98	106	---	---
% Instrument Accuracy			102	100	90	100	---	---
REPORTING LIMIT			0.1	1.0	1.0	0.1	1	1

METHODS: EPA 340.2, 375.4, 353.3, 130.2, 4500 Cl-B,
CHLORIDE SPIKE AND QC: Sample spiked with 500 mg/L CHLORIDE and Blank spiked with 500 mg/L CHLORIDE.
SO4 SPIKE AND QC: Sample spiked with 10 mg/L SO4 and Blank spiked with 10 mg/L SO4.
FLUORIDE SPIKE AND QC: Sample spiked with 0.5 mg/L FLUORIDE and Blank spiked with 1.0 mg/L FLUORIDE.
NO3 SPIKE AND QC: Sample spiked with 1.33 mg/L NO3 and Blank spiked with 1.0 mg/L NO3.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

5-31-95
DATE

TRACE ANALYSIS, INC.
6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

May 31, 1995
Receiving Date: 05/19/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9765

ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

Prep Date: 05/19/95
Analysis Date: 05/22/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM

TOTAL METALS

TA#	FIELD CODE	As (mg/L)	Se (mg/L)	Cr (mg/L)	Cd (mg/L)	Pb (mg/L)	Ag (mg/L)	Ba (mg/L)	Na (mg/L)	Al (mg/L)	B (mg/L)	Mg (mg/L)
T36147	9505171115 MW-1	0.2	<0.2	0.46	0.02	<0.1	<0.01	0.80	422.5	62.67	0.46	66.2
QC	Quality Control	4.82	4.76	5.19	5.23	4.79	3.92	5.46	9.11	4.81	4.8	5.1
REPORTING LIMIT		0.1	0.2	0.01	0.01	0.1	0.01	0.05	0.10	0.05	0.05	0.1
RPD		0	2	1	2	2	6	1	2	1	14	0
% Extraction Accuracy		92	90	110	101	87	108	115	115	109	99	83
% Instrument Accuracy		96	95	104	105	96	107	109	91	96	96	102

TA#	FIELD CODE	Ca (mg/L)	Mo (mg/L)	Zn (mg/L)	Ni (mg/L)	Fe (mg/L)	Co (mg/L)	Mn (mg/L)	Cu (mg/L)	Si (mg/L)	Hg (mg/L)
T36147	9505171115 MW-1	237	<0.05	0.10	<0.05	30.76	<0.5	0.56	0.05	34.6	<0.001
QC	Quality Control	10.2	4.6	4.58	4.68	4.55	4.67	4.63	4.63	2.3	0.0044
REPORTING LIMIT		0.05	0.05	0.01	0.05	0.05	0.5	0.05	0.05	0.1	0.001
RPD		1	4	2	5	5	6	5	7	1	2
% Extraction Accuracy		103	89	90	94	111	106	91	83	94	94
% Instrument Accuracy		102	92	92	94	91	93	93	93	94	88

METHODS: EPA SW 846-3015, 6010, 7470.
QC: Blank Spiked with 5.0 mg/L As,Se, Cr, Cd, Pb, A, Ba, Al, B, Mg, Mo, Zn, Ni, Fe, Co, Mn, Cu; 10.0 mg/L Na, Ca; 2.5 mg/L Si; 0.0050 mg/L Hg.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

5-31-95
DATE

TRACE ANALYSIS, INC.
6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

May 31, 1995

Receiving Date: 05/19/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9765

ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

Prep Date: 05/19/95
Analysis Date: 05/22/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM

TOTAL METALS

TA#	FIELD CODE	As (mg/L)	Se (mg/L)	Cr (mg/L)	Cd (mg/L)	Pb (mg/L)	Ag (mg/L)	Ba (mg/L)	Na (mg/L)	Al (mg/L)	B (mg/L)	Mg (mg/L)
T36146	9505171040 MW-8		<0.2	<0.01	<0.01	<0.1	<0.01	0.11	151.6	0.21	0.70	40.6
QC	Quality Control	4.82	4.76	5.19	5.23	4.79	3.92	5.46	9.11	4.81	4.8	5.1
REPORTING LIMIT		0.1	0.2	0.01	0.01	0.1	0.01	0.05	0.10	0.05	0.05	0.1
RPD		0	2	1	2	2	6	1	2	1	14	0
% Extraction Accuracy		92	90	110	101	87	108	115	115	109	99	83
% Instrument Accuracy		96	95	104	105	96	107	109	91	96	96	102

TA#	FIELD CODE	Ca (mg/L)	Mo (mg/L)	Zn (mg/L)	Ni (mg/L)	Fe (mg/L)	Co (mg/L)	Mn (mg/L)	Cu (mg/L)	Si (mg/L)	Hg (mg/L)
T36146	9505171040 MW-8	24.3	0.05	0.01	<0.05	0.17	<0.5	0.07	<0.05	9.1	<0.001
QC	Quality Control	10.2	4.6	4.58	4.68	4.55	4.67	4.63	4.63	2.3	0.0044
REPORTING LIMIT		0.05	0.05	0.01	0.05	0.05	0.5	0.05	0.05	0.1	0.001
RPD		1	4	2	5	5	6	5	7	1	2
% Extraction Accuracy		103	89	90	94	111	106	91	83	94	94
% Instrument Accuracy		102	92	92	94	91	93	93	93	94	88

METHODS: EPA SW 846-3015, 6010, 7470.
QC: Blank Spiked with 5.0 mg/L As,Se, Cr, Cd, Pb, A, Ba, Al, B, Mg, Mo, Zn, Ni, Fe, Co, Mn, Cu; 10.0 mg/L Na, Ca; 2.5 mg/L Si; 0.0050 mg/L Hg.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

5-31-95
DATE

TRACE ANALYSIS, INC.
6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

May 31, 1995
Receiving Date: 05/19/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9765

ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

Prep Date: 05/19/95
Analysis Date: 05/22/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM

TOTAL METALS

TA#	FIELD CODE	As (mg/L)	Se (mg/L)	Cr (mg/L)	Cd (mg/L)	Pb (mg/L)	Ag (mg/L)	Ba (mg/L)	Na (mg/L)	Al (mg/L)	B (mg/L)	Mg (mg/L)
T36148	9505171155 MW-7	0.1	<0.2	0.07	0.01	<0.1	<0.01	0.45	112.3	38.16	0.32	15.8
QC	Quality Control	4.82	4.76	5.19	5.23	4.79	3.92	5.46	9.11	4.81	4.8	5.1
REPORTING LIMIT		0.1	0.2	0.01	0.01	0.1	0.01	0.05	0.10	0.05	0.05	0.1
RPD		0	2	1	2	2	6	1	2	1	14	0
% Extraction Accuracy		92	90	110	101	87	108	115	115	109	99	83
% Instrument Accuracy		96	95	104	105	96	107	109	91	96	96	102

TA#	FIELD CODE	Ca (mg/L)	Mo (mg/L)	Zn (mg/L)	Ni (mg/L)	Fe (mg/L)	Co (mg/L)	Mn (mg/L)	Cu (mg/L)	Si (mg/L)	Hg (mg/L)
T36148	9505171155 MW-7	146	0.06	0.12	<0.05	18.28	<0.5	0.22	<0.05	39.9	<0.001
QC	Quality Control	10.2	4.7	4.72	4.79	4.68	4.67	4.7	4.64	2.3	0.0044
REPORTING LIMIT		0.05	0.05	0.01	0.05	0.05	0.5	0.05	0.05	0.1	0.001
RPD		1	2	3	5	0	6	2	7	1	2
% Extraction Accuracy		103	117	120	120	107	106	121	115	94	94
% Instrument Accuracy		102	94	94	96	94	93	94	93	94	88

METHODS: EPA SW 846-3015, 6010, 7470.
QC: Blank Spiked with 5.0 mg/L As,Se, Cr, Cd, Pb, A, Ba, Al, B, Mg, Mo, Zn, Ni, Fe, Co, Mn, Cu; 10.0 mg/L Na, Ca; 2.5 mg/L Si; 0.0050 mg/L Hg.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

5-31-95
DATE

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6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

May 31, 1995

ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

Receiving Date: 05/19/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9765

Prep Date: 05/19/95
Analysis Date: 05/22/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM

TOTAL METALS

TA#	FIELD CODE	As (mg/L)	Se (mg/L)	Cr (mg/L)	Cd (mg/L)	Pb (mg/L)	Ag (mg/L)	Ba (mg/L)	Na (mg/L)	Al (mg/L)	B (mg/L)	Mg (mg/L)
T36149	9505171255 MW-9	<0.1	<0.2	0.06	<0.01	<0.1	<0.01	0.30	52.7	26.58	0.20	18.2
QC	Quality Control	4.82	4.76	5.19	5.23	4.79	3.92	5.46	9.11	4.81	4.8	5.1
REPORTING LIMIT		0.1	0.2	0.01	0.01	0.1	0.01	0.05	0.10	0.05	0.05	0.1
RPD		0	2	1	2	2	6	1	2	1	14	0
% Extraction Accuracy		92	90	110	101	87	108	115	115	109	99	83
% Instrument Accuracy		96	95	104	105	96	107	109	91	96	96	102

TA#	FIELD CODE	Ca (mg/L)	Mo (mg/L)	Zn (mg/L)	Ni (mg/L)	Fe (mg/L)	Co (mg/L)	Mn (mg/L)	Cu (mg/L)	Si (mg/L)	Hg (mg/L)
T36149	9505171255 MW-9	162	<0.05	0.07	<0.05	12.08	<0.05	0.15	<0.05	29.4	<0.001
QC	Quality Control	10.2	4.7	4.72	4.79	4.68	4.67	4.7	4.64	2.3	0.0044
REPORTING LIMIT		0.05	0.05	0.01	0.05	0.05	0.05	0.05	0.05	0.1	0.001
RPD		1	2	3	5	0	6	2	7	1	2
% Extraction Accuracy		103	117	120	120	107	106	121	115	94	94
% Instrument Accuracy		102	94	94	96	94	93	94	93	94	88

METHODS: EPA SW 846-3015, 6010, 7470.
QC: Blank Spiked with 5.0 mg/L As,Se, Cr, Cd, Pb, A, Ba, Al, B, Mg, Mo, Zn, Ni, Fe, Co, Mn, Cu; 10.0 mg/L Na, Ca; 2.5 mg/L Si; 0.0050 mg/L Hg.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

5-31-95
DATE

TRACE ANALYSIS, INC.
6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

May 31, 1995
Receiving Date: 05/19/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9765

ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

Prep Date: 05/19/95
Analysis Date: 05/22/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM

TOTAL METALS

TA#	FIELD CODE	As (mg/L)	Se (mg/L)	Cr (mg/L)	Cd (mg/L)	Pb (mg/L)	Ag (mg/L)	Ba (mg/L)	Na (mg/L)	Al (mg/L)	B (mg/L)	Mg (mg/L)
T36150	9505171330 MW-13	<0.1	<0.2	<0.01	<0.01	<0.1	0.18	0.59	68.9	14.08	0.16	20.3
QC	Quality Control	4.77	4.79	4.82	4.83	4.79	3.47	4.91	9.11	4.81	4.8	5.1
REPORTING LIMIT		0.1	0.2	0.01	0.01	0.1	0.01	0.05	0.10	0.05	0.05	0.1
RPD		1	0	1	0	1	6	1	2	1	14	0
% Extraction Accuracy		85	82	84	80	83	108	82	115	109	99	83
% Instrument Accuracy		95	96	96	97	96	107	98	91	96	96	102

TA#	FIELD CODE	Ca (mg/L)	Mo (mg/L)	Zn (mg/L)	Ni (mg/L)	Fe (mg/L)	Co (mg/L)	Mn (mg/L)	Cu (mg/L)	Si (mg/L)	Hg (mg/L)
T36150	9505171330 MW-13	158	0.07	0.05	<0.05	7.02	<0.05	0.11	<0.05	22.6	<0.001
QC	Quality Control	10.2	4.7	4.72	4.79	4.68	4.67	4.7	4.64	2.3	0.0044
REPORTING LIMIT		0.05	0.05	0.01	0.05	0.05	0.05	0.05	0.05	0.1	0.001
RPD		1	2	3	5	0	6	2	7	1	2
% Extraction Accuracy		103	117	120	120	107	106	121	115	94	94
% Instrument Accuracy		102	94	94	96	94	93	94	93	94	88

METHODS: EPA SW 846-3015, 6010, 7470.
QC: Blank Spiked with 5.0 mg/L As,Se, Cr, Cd, Pb, A, Ba, Al, B, Mg, Mo, Zn, Ni, Fe, Co, Mn, Cu; 10.0 mg/L Na, Ca; 2.5 mg/L Si; 0.0050 mg/L Hg.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

5-31-95
DATE

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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

May 31, 1995
Receiving Date: 05/19/95
Sampling Date: 05/17/95
Sample Type: Water
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM
Project Location: Linam
COC# 9765
Extraction Date: 05/22/95
Analysis Date: 05/22/95

T36146
Reporting 9505171040

PAH's

EPA 8270 (mg/L)	Limit	MW-8	QC	RPD	%EA	%IA
Naphthalene	0.0004	ND	49.7			99
Acenaphthylene	0.0004	ND	47.9			96
Acenaphthene	0.0004	ND	47.5	0	88	95
Fluorene	0.0004	ND	46.8			94
Phenanthrene	0.0004	ND	47.1			94
Anthracene	0.0004	ND	46.8			94
Fluoranthene	0.0004	ND	45.7			91
Pyrene	0.0004	ND	52.4	7	89	105
Benzo[a]anthracene	0.0004	ND	48.8			98
Chrysene	0.0004	ND	49.4			99
Benzo[b]fluoranthene	0.0004	ND	49.6			99
Benzo[k]fluoranthene	0.0004	ND	46.5			93
Benzo[a]pyrene	0.0004	ND	49.2			98
Indeno[1,2,3-cd]pyrene	0.0004	ND	49.2			96
Dibenz[a,h]anthracene	0.0004	ND	49.0			98
Benzo[g,h,i]perylene	0.0004	ND	53.7			107

*ND = Not Detected

	% RECOVERY
2-Fluorophenol SURR	31
Phenol-d6 SURR	23
Nitrobenzene-d5 SURR	43
2-Fluorobiphenyl SURR	49
2,4,6-Tribromophenol SURR	42
Terphenyl-d14 SURR	125

METHODS: EPA SW 846-3510; EPA 8270.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

5-31-95
DATE

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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

May 31, 1995
Receiving Date: 05/19/95
Sampling Date: 05/17/95
Sample Type: Water
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM
Project Location: Linam
COC# 9765
Extraction Date: 05/22/95
Analysis Date: 05/22/95

T36147
Reporting 9505171115

PAH's

EPA 8270 (mg/L)	Limit	MW-1	QC	RPD	%EA	%IA
Naphthalene	0.0004	ND	49.7			99
Acenaphthylene	0.0004	ND	47.9			96
Acenaphthene	0.0004	ND	47.5	0	88	95
Fluorene	0.0004	ND	46.8			94
Phenanthrene	0.0004	ND	47.1			94
Anthracene	0.0004	ND	46.8			94
Fluoranthene	0.0004	ND	45.7			91
Pyrene	0.0004	ND	52.4	7	89	105
Benzo[a]anthracene	0.0004	ND	48.8			98
Chrysene	0.0004	ND	49.4			99
Benzo[b]fluoranthene	0.0004	ND	49.6			99
Benzo[k]fluoranthene	0.0004	ND	46.5			93
Benzo[a]pyrene	0.0004	ND	49.2			98
Indeno[1,2,3-cd]pyrene	0.0004	ND	49.2			96
Dibenz[a,h]anthracene	0.0004	ND	49.0			98
Benzo[g,h,i]perylene	0.0004	ND	53.7			107

*ND = Not Detected

	% RECOVERY
2-Fluorophenol SURR	50
Phenol-d6 SURR	37
Nitrobenzene-d5 SURR	56
2-Fluorobiphenyl SURR	51
2,4,6-Tribromophenol SURR	71
Terphenyl-d14 SURR	107

METHODS: EPA SW 846-3510; EPA 8270.

Director, Dr. Blair Leftwich — 5-31-95 DATE
Director, Dr. Bruce McDonell

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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

May 31, 1995
Receiving Date: 05/19/95
Sampling Date: 05/17/95
Sample Type: Water
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM
Project Location: Linam
COC# 9765
Extraction Date: 05/22/95
Analysis Date: 05/22/95

T36148
Reporting 9505171155

PAH's

EPA 8270 (mg/L)	Limit	MW-7	QC	RPD	%EA	%IA
Naphthalene	0.0004	ND	49.7			99
Acenaphthylene	0.0004	ND	47.9			96
Acenaphthene	0.0004	ND	47.5	0	88	95
Fluorene	0.0004	ND	46.8			94
Phenanthrene	0.0004	ND	47.1			94
Anthracene	0.0004	ND	46.8			94
Fluoranthene	0.0004	ND	45.7			91
Pyrene	0.0004	ND	52.4	7	89	105
Benzo[a]anthracene	0.0004	ND	48.8			98
Chrysene	0.0004	ND	49.4			99
Benzo[b]fluoranthene	0.0004	ND	49.6			99
Benzo[k]fluoranthene	0.0004	ND	46.5			93
Benzo[a]pyrene	0.0004	ND	49.2			98
Indeno[1,2,3-cd]pyrene	0.0004	ND	49.2			96
Dibenz[a,h]anthracene	0.0004	ND	49.0			98
Benzo[g,h,i]perylene	0.0004	ND	53.7			107

*ND = Not Detected

	% RECOVERY
2-Fluorophenol SURR	67
Phenol-d6 SURR	56
Nitrobenzene-d5 SURR	77
2-Fluorobiphenyl SURR	88
2,4,6-Tribromophenol SURR	53
Terphenyl-d14 SURR	139

METHODS: EPA SW 846-3510; EPA 8270.

Director, Dr. Blair Leftwich

5-31-95
DATE

Director, Dr. Bruce McDonell

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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

May 31, 1995
Receiving Date: 05/19/95
Sampling Date: 05/17/95
Sample Type: Water
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM
Project Location: Linam
COC# 9765
Extraction Date: 05/22/95
Analysis Date: 05/22/95

T36149
Reporting 9505171255

PAH's

EPA 8270 (mg/L)	Limit	MW-9	QC	RPD	%EA	%IA
Naphthalene	0.0004	ND	49.7			99
Acenaphthylene	0.0004	ND	47.9			96
Acenaphthene	0.0004	ND	47.5	0	88	95
Fluorene	0.0004	ND	46.8			94
Phenanthrene	0.0004	ND	47.1			94
Anthracene	0.0004	ND	46.8			94
Fluoranthene	0.0004	ND	45.7			91
Pyrene	0.0004	ND	52.4	7	89	105
Benzo[a]anthracene	0.0004	ND	48.8			98
Chrysene	0.0004	ND	49.4			99
Benzo[b]fluoranthene	0.0004	ND	49.6			99
Benzo[k]fluoranthene	0.0004	ND	46.5			93
Benzo[a]pyrene	0.0004	ND	49.2			98
Indeno[1,2,3-cd]pyrene	0.0004	ND	49.2			96
Dibenz[a,h]anthracene	0.0004	ND	49.0			98
Benzo[g,h,i]perylene	0.0004	ND	53.7			107

*ND = Not Detected

	% RECOVERY
2-Fluorophenol SURR	42
Phenol-d6 SURR	32
Nitrobenzene-d5 SURR	49
2-Fluorobiphenyl SURR	46
2,4,6-Tribromophenol SURR	33
Terphenyl-d14 SURR	92

METHODS: EPA SW 846-3510; EPA 8270.

5-31-95

Director, Dr. Blair Leftwich — DATE

Director, Dr. Bruce McDonell

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

May 31, 1995
Receiving Date: 05/19/95
Sampling Date: 05/17/95
Sample Type: Water
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM
Project Location: Linam
COC# 9765
Extraction Date: 05/22/95
Analysis Date: 05/22/95

T36150
Reporting 9505171330

PAH's

EPA 8270 (mg/L)	Limit	MW-13	QC	RPD	%EA	%IA
Naphthalene	0.0004	ND	49.7			99
Acenaphthylene	0.0004	ND	47.9			96
Acenaphthene	0.0004	ND	47.5	0	88	95
Fluorene	0.0004	ND	46.8			94
Phenanthrene	0.0004	ND	47.1			94
Anthracene	0.0004	ND	46.8			94
Fluoranthene	0.0004	ND	45.7			91
Pyrene	0.0004	ND	52.4	7	89	105
Benzo[a]anthracene	0.0004	ND	48.8			98
Chrysene	0.0004	ND	49.4			99
Benzo[b]fluoranthene	0.0004	ND	49.6			99
Benzo[k]fluoranthene	0.0004	ND	46.5			93
Benzo[a]pyrene	0.0004	ND	49.2			98
Indeno[1,2,3-cd]pyrene	0.0004	ND	49.2			96
Dibenz[a,h]anthracene	0.0004	ND	49.0			98
Benzo[g,h,i]perylene	0.0004	ND	53.7			107

*ND = Not Detected

	% RECOVERY
2-Fluorophenol SURR	27
Phenol-d6 SURR	20
Nitrobenzene-d5 SURR	43
2-Fluorobiphenyl SURR	67
2,4,6-Tribromophenol SURR	66
Terphenyl-d14 SURR	119

METHODS: EPA SW 846-3510; EPA 8270.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

5-31-95
DATE

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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102

May 31, 1995
Receiving Date: 05/19/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9765

Prep Date: 05/23/95
Analysis Date: 05/23/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36146 9505171040 MW-8	Reporting Limit
Dichlorodifluoromethane	ND	1
Chloromethane	ND	1
Vinyl chloride	ND	1
Bromomethane	ND	1
Chloroethane	ND	5
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Iodomethane	ND	1
Carbon disulfide	ND	5
Methylene chloride	ND	1
trans-1,2-Dichloroethene	ND	5
1,1-Dichloroethane	ND	1
Vinyl acetate	ND	1
2-Butanone	ND	1
Chloroform	ND	50
1,1,1-Trichloroethane	ND	1
1,2-Dichloroethane	ND	1
Benzene	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloropropane	ND	1
Trichloroethene	ND	1
Bromodichloromethane	ND	1
cis-1,3-Dichloropropene	ND	1
4-Methyl-2-pentanone	ND	1
trans-1,3-Dichloropropene	ND	50
Toluene	ND	1
1,1,2-Trichloroethane	ND	1
2-Hexanone	ND	1

GCL
Project Location: Linam
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36146 9505171040 MW-8	Reporting Limit
Dibromochloromethane	ND	1
Tetrachloroethene	ND	1
Chlorobenzene	ND	1
Ethylbenzene	ND	1
m & p-Xylene	ND	1
Bromoform	ND	1
Styrene	ND	1
o-Xylene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
trans 1,4-Dichloro-2-butene	ND	5
cis 1,4-Dichloro-2-butene	ND	5
1,4-Dichlorobenzene	ND	2
1,3-Dichlorobenzene	ND	2
1,2-Dichlorobenzene	ND	2
Acetone	ND	100

SURROGATES	% RECOVERY
Dibromofluoromethane	92
Toluene-d8	91
4-Bromofluorobenzene	90

*ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8240.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

5-31-95
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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102

May 31, 1995
Receiving Date: 05/19/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9765

Prep Date: 05/23/95
Analysis Date: 05/23/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36147 9505171115 MW-1	Reporting Limit
Dichlorodifluoromethane	ND	2
Chloromethane	ND	2
Vinyl chloride	ND	2
Bromomethane	ND	20
Chloroethane	ND	2
Trichlorofluoromethane	ND	2
1,1-Dichloroethene	ND	2
Iodomethane	ND	20
Carbon disulfide	ND	2
Methylene chloride	ND	20
trans-1,2-Dichloroethene	ND	2
1,1-Dichloroethane	ND	2
Vinyl acetate	ND	2
2-Butanone	ND	100
Chloroform	ND	2
1,1,1-Trichloroethane	ND	2
1,2-Dichloroethane	ND	2
Benzene	ND	2
Carbon Tetrachloride	ND	2
1,2-Dichloropropane	ND	2
Trichloroethene	ND	2
Bromodichloromethane	ND	2
cis-1,3-Dichloropropene	ND	2
4-Methyl-2-pentanone	ND	100
trans-1,3-Dichloropropene	ND	2
Toluene	ND	2
1,1,2-Trichloroethane	ND	2
2-Hexanone	ND	100

GCL
Project Location: Linam
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36147 9505171115 MW-1	Reporting Limit
Dibromochloromethane	ND	2
Tetrachloroethene	ND	2
Chlorobenzene	ND	2
Ethylbenzene	ND	2
m & p-Xylene	ND	2
Bromoform	ND	2
Styrene	ND	2
o-Xylene	ND	2
1,1,2,2-Tetrachloroethane	ND	2
trans 1,4-Dichloro-2-butene	ND	10
cis 1,4-Dichloro-2-butene	ND	10
1,4-Dichlorobenzene	ND	4
1,3-Dichlorobenzene	ND	4
1,2-Dichlorobenzene	ND	4
Acetone	ND	200

SURROGATES	% RECOVERY
Dibromofluoromethane	92
Toluene-d8	92
4-Bromofluorobenzene	91

*ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8240.

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May 31, 1995
Receiving Date: 05/19/95
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GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9765

Prep Date: 05/23/95
Analysis Date: 05/23/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36148 9505171155 MW-7	Reporting Limit
Dichlorodifluoromethane	ND	1
Chloromethane	ND	1
Vinyl chloride	ND	1
Bromomethane	ND	5
Chloroethane	ND	1
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Iodomethane	ND	5
Carbon disulfide	ND	1
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Vinyl acetate	ND	1
2-Butanone	ND	50
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
1,2-Dichloroethane	ND	1
Benzene	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloropropane	ND	1
Trichloroethene	ND	1
Bromodichloromethane	ND	1
cis-1,3-Dichloropropene	ND	1
4-Methyl-2-pentanone	ND	50
trans-1,3-Dichloropropene	ND	1
Toluene	ND	1
1,1,2-Trichloroethane	ND	1
2-Hexanone	ND	50

GCL
Project Location: Linam
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36148 9505171155 MW-7	Reporting Limit
Dibromochloromethane	ND	1
Tetrachloroethene	2	1
Chlorobenzene	ND	1
Ethylbenzene	ND	1
m & p-Xylene	ND	1
Bromoform	ND	1
Styrene	ND	1
o-Xylene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
trans 1,4-Dichloro-2-butene	ND	5
cis 1,4-Dichloro-2-butene	ND	5
1,4-Dichlorobenzene	ND	2
1,3-Dichlorobenzene	ND	2
1,2-Dichlorobenzene	ND	2
Acetone	ND	100

SURROGATES	% RECOVERY
Dibromofluoromethane	92
Toluene-d8	90
4-Bromofluorobenzene	89

*ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8240.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

5-31-95
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May 31, 1995
Receiving Date: 05/19/95
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Project Location: Linam
COC #9765

Prep Date: 05/23/95
Analysis Date: 05/23/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36149 9505171255 MW-9	Reporting Limit
Dichlorodifluoromethane	ND	1
Chloromethane	ND	1
Vinyl chloride	ND	1
Bromomethane	ND	5
Chloroethane	ND	1
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Iodomethane	ND	5
Carbon disulfide	ND	1
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Vinyl acetate	ND	1
2-Butanone	ND	50
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
1,2-Dichloroethane	ND	1
Benzene	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloropropane	ND	1
Trichloroethene	ND	1
Bromodichloromethane	ND	1
cis-1,3-Dichloropropene	ND	1
4-Methyl-2-pentanone	ND	50
trans-1,3-Dichloropropene	ND	1
Toluene	ND	1
1,1,2-Trichloroethane	ND	1
2-Hexanone	ND	50

GCL
Project Location: Linam
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36149 9505171255 MW-9	Reporting Limit
Dibromochloromethane	ND	1
Tetrachloroethene	ND	1
Chlorobenzene	ND	1
Ethylbenzene	ND	1
m & p-Xylene	ND	1
Bromoform	ND	1
Styrene	ND	1
o-Xylene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
trans 1,4-Dichloro-2-butene	ND	5
cis 1,4-Dichloro-2-butene	ND	5
1,4-Dichlorobenzene	ND	2
1,3-Dichlorobenzene	ND	2
1,2-Dichlorobenzene	ND	2
Acetone	ND	100

SURROGATES	% RECOVERY
Dibromofluoromethane	94
Toluene-d8	90
4-Bromofluorobenzene	89

*ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8240.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

5-31-95
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ANALYTICAL RESULTS FOR
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Attention: Annette Montoya
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May 31, 1995
Receiving Date: 05/19/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9765

Prep Date: 05/23/95
Analysis Date: 05/23/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36150 9505171330 MW-13	Reporting Limit
Dichlorodifluoromethane	ND	1
Chloromethane	ND	1
Vinyl chloride	ND	1
Bromomethane	ND	5
Chloroethane	ND	1
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Iodomethane	ND	5
Carbon disulfide	ND	1
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Vinyl acetate	ND	1
2-Butanone	ND	50
Chloroform	1	1
1,1,1-Trichloroethane	ND	1
1,2-Dichloroethane	ND	1
Benzene	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloropropane	ND	1
Trichloroethene	ND	1
Bromodichloromethane	ND	1
cis-1,3-Dichloropropene	ND	1
4-Methyl-2-pentanone	ND	50
trans-1,3-Dichloropropene	ND	1
Toluene	ND	1
1,1,2-Trichloroethane	ND	1
2-Hexanone	ND	50

GCL
Project Location: Linam
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36150 9505171330 MW-13	Reporting Limit
Dibromochloromethane	ND	1
Tetrachloroethene	ND	1
Chlorobenzene	ND	1
Ethylbenzene	ND	1
m & p-Xylene	ND	1
Bromoform	ND	1
Styrene	ND	1
o-Xylene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
trans 1,4-Dichloro-2-butene	ND	5
cis 1,4-Dichloro-2-butene	ND	5
1,4-Dichlorobenzene	ND	2
1,3-Dichlorobenzene	ND	2
1,2-Dichlorobenzene	ND	2
Acetone	ND	100

SURROGATES	% RECOVERY
Dibromofluoromethane	93
Toluene-d8	91
4-Bromofluorobenzene	91

*ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8240.

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Director, Dr. Bruce McDonell

5-31-95
Date

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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102

May 31, 1995
Receiving Date: 05/19/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9765

Prep Date: 05/23/95
Analysis Date: 05/23/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: McD
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36151 9505171331 Trip Blank	Reporting Limit
Dichlorodifluoromethane	ND	1
Chloromethane	ND	1
Vinyl chloride	ND	1
Bromomethane	ND	5
Chloroethane	ND	1
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Iodomethane	ND	5
Carbon disulfide	ND	1
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Vinyl acetate	ND	1
2-Butanone	ND	50
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
1,2-Dichloroethane	ND	1
Benzene	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloropropane	ND	1
Trichloroethene	ND	1
Bromodichloromethane	ND	1
cis-1,3-Dichloropropene	ND	1
4-Methyl-2-pentanone	ND	50
trans-1,3-Dichloropropene	ND	1
Toluene	ND	1
1,1,2-Trichloroethane	ND	1
2-Hexanone	ND	50

GCL
Project Location: Linam
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36151 9505171331 Trip Blank	Reporting Limit
Dibromochloromethane	ND	1
Tetrachloroethene	ND	1
Chlorobenzene	ND	1
Ethylbenzene	ND	1
m & p-Xylene	ND	1
Bromoform	ND	1
Styrene	ND	1
o-Xylene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
trans 1,4-Dichloro-2-butene	ND	5
cis 1,4-Dichloro-2-butene	ND	5
1,4-Dichlorobenzene	ND	2
1,3-Dichlorobenzene	ND	2
1,2-Dichlorobenzene	ND	2
Acetone	ND	100

SURROGATES	% RECOVERY
Dibromofluoromethane	90
Toluene-d8	91
4-Bromofluorobenzene	90

*ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8240.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

5-31-95
Date

36310-14

140 AG

GCL
Environmental Science and Engineering
A BDM International Company

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Las Cruces, NM 88004
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№ 9766

Chain of Custody

Date 5-17-95 Page 1 Of 1

Lab Name TRACE ANALYSIS
Address 6701 ABERDEENE AVENUE
LUBBOCK, TEXAS 79424
Telephone (806) 794-1296

Samplers (SIGNATURES)
Dwayne Salisbury

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neu/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX Modified 8015	TCLP- Vol., Semi-Vol. Herbicides, Pesticides	TCLP- Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	~~Extraction~~ Total Metals	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	Bacterial Analysis Hydrocarbon degraders		F+ Major ions + Si	Number of Containers
9505171415	H_2O	MW-12	36310					X	X										X						X		X	7
9505171530	H_2O	MW-11			11			X	X										X						X		X	7
9505171610	H_2O	MW-10			12			X	X										X						X		X	7
9505171620	H_2O	MW-10S			13			X																				3
9505171640	H_2O	MW-10D			14			X	X										X								X	6

Project Information		Sample Receipt	
Project	GPM- Linam	Total No. of Containers	30
Project Director	Van Deventer	Chain of Custody Seals	✓
Charge Code No.	3100-004-2	Rec'd Good Condition/Cold	✓
Shipping ID. No.	LREEOTT-20-300	Conforms to Record	✓
	5328807765	Lab No.	36310-14
Via:	Fed-Ex		

Special Instructions/Comments: Total Metals: Ag, Al, As, Ba, Cd, Ca, Co, Cu, Fe, Hg, Mn, Mo, Ni, Pb, Se, Zn, Na, Ca, Mg, K, Cl, FSO_4, NO_3, CO_3, HCO_3

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
Dwayne Salisbury 1200 (Signature) (Time)	(Signature) (Time)	(Signature) (Time)
Dwayne Salisbury 5-18 (Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
GCL (Company)	(Company)	(Company)
Received By 1.	**Received By 2.**	**Received By (Laboratory) 3.**
(Signature) (Time)	(Signature) (Time)	(Signature) BLAIR LEFTWICH 9:32am (Time)
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) Trace Analysis 5-20-95 (Date)
(Company)	(Company)	(Laboratory)

*Invoice GPM- directly charge code = LREEOTT-20-300

Distribution: White, Canary-Laboratory • Pink, GCL

6701 Aberdeen Avenue
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RECEIVED JUN 19 1995

ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1300
Albuquerque, NM 87102

June 13, 1995
Receiving Date: 05/20/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam

Extraction Date: 05/23/95
Analysis Date: 06/09/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: GPM
COC #9766

TA#	FIELD CODE		TOTAL AEROBIC HETEROTROPHIC PLATE COUNT cfu/mL	TOTAL HYDROCARBON UTILIZING BACTERIA cfu/mL
T36310	9505171415	MW-12	6.40E+05	4.50E+05
T36311	9505171530	MW-11	9.30E+05	4.80E+05
T36312	9505171610	MW-10	2.70E+06	7.80E+04

6-13-95

Director, Dr. Blair Leftwich — DATE
Director, Dr. Bruce McDonell

6701 Aberdeen Avenue
Lubbock, Texas 79424
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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

June 01, 1995
Receiving Date: 05/20/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam

Analysis Date: 05/20/95
Sampling Date: 05/17/95
Sample Condition: I & C
Sample Received by: BL
Project Name: GPM
COC# 9766

TA#	FIELD CODE		FLUORIDE (mg/L)	CHLORIDE (mg/L)	SO4 (mg/L)	NO3-N (mg/L)	CO3 as CaCO3 (mg/L)	HCO3 as CaCO3 (mg/L)
T36310	9505171415	MW-12	0.7	225	206	1.01	0	494
T36311	9505171530	MW-11	0.5	49	190	28.6	0	419
T36312	9505171610	MW-10	0.7	98	184	1.03	0	414
T36314	9505171640	MW-10D	0.6	59	232	0.63	0	303
QC	Quality Control		1.0	499	9	1.00	---	---
RPD			1	0	6	0	4	4
% Extraction Accuracy			100	96	98	106	---	---
% Instrument Accuracy			102	100	90	100	---	---
REPORTING LIMIT			0.1	1.0	1.0	0.1	1	1

METHODS: EPA 340.2, 375.4, 353.3, 130.2, 4500 Cl-B,
CHLORIDE SPIKE AND QC: Sample spiked with 500 mg/L CHLORIDE and Blank spiked with 500 mg/L CHLORIDE.
SO4 SPIKE AND QC: Sample spiked with 10 mg/L SO4 and Blank spiked with 10 mg/L SO4.
FLUORIDE SPIKE AND QC: Sample spiked with 0.1 mg/L FLUORIDE and Blank spiked with 1.0 mg/L FLUORIDE.
NO3 SPIKE AND QC: Sample spiked with 1.33 mg/L NO3 and Blank spiked with 1.0 mg/L NO3.

6-1-95

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell
DATE

TRACE ANALYSIS, INC.
6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

June 01, 1995
Receiving Date: 05/20/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9766

Prep Date: 05/22/95
Analysis Date: 05/23/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: GPM

TOTAL METALS

TA#	FIELD CODE	As (mg/L)	Se (mg/L)	Cr (mg/L)	Cd (mg/L)	Pb (mg/L)	Ag (mg/L)	Ba (mg/L)	Na (mg/L)	Al (mg/L)	B (mg/L)	Mg (mg/L)
T36310	9505171415 MW-12	<0.1	<0.2	0.03	<0.01	<0.1	<0.01	0.13	132.2	5.35	0.16	37.2
QC	Quality Control	4.6	5.1	4.8	4.7	4.7	4.2	4.7	9.27	4.81	4.8	5.1
REPORTING LIMIT		0.1	0.2	0.01	0.01	0.1	0.01	0.05	0.10	0.05	0.05	0.1
RPD		13	6	9	6	9	4	8	0	1	14	1
% Extraction Accuracy		75	80	82	82	82	100	82	113	109	99	87
% Instrument Accuracy		92	102	96	94	94	84	94	93	96	96	102

TA#	FIELD CODE	Ca (mg/L)	Mo (mg/L)	Zn (mg/L)	Ni (mg/L)	Fe (mg/L)	Co (mg/L)	Mn (mg/L)	Cu (mg/L)	Si (mg/L)	Hg (mg/L)
T36310	9505171415 MW-12	274	0.06	0.04	<0.05	2.80	<0.05	0.07	<0.05	19.0	<0.001
QC	Quality Control	10.4	4.7	4.72	4.79	4.68	4.67	4.7	4.64	2.34	0.0049
REPORTING LIMIT		0.05	0.05	0.01	0.05	0.05	0.05	0.05	0.05	0.1	0.001
RPD		0	2	3	5	0	6	2	7	2	0
% Extraction Accuracy		82	117	120	120	107	106	121	115	94	96
% Instrument Accuracy		104	94	94	96	94	93	94	93	94	98

METHODS: EPA SW 846-3015, 6010, 7470.
QC: Blank Spiked with 5.0 mg/L As,Se, Cr, Cd, Pb, A, Ba, Al, B, Mg, Mo, Zn, Ni, Fe, Co, Mn, Cu; 10.0 mg/L Na, Ca; 2.5 mg/L Si; 0.005 mg/L Hg.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

6-1-95
DATE

TRACE ANALYSIS, INC.
6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

June 01, 1995
Receiving Date: 05/20/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9766

Prep Date: 05/22/95
Analysis Date: 05/23/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: GPM

TOTAL METALS

TA#	FIELD CODE	As (mg/L)	Se (mg/L)	Cr (mg/L)	Cd (mg/L)	Pb (mg/L)	Ag (mg/L)	Ba (mg/L)	Na (mg/L)	Al (mg/L)	B (mg/L)	Mg (mg/L)
T36311	9505171530 MW-11	<0.1	<0.2	0.05	<0.01	<0.1	<0.01	0.10	71.5	2.14	0.33	26.8
QC	Quality Control	4.6	5.1	4.8	4.7	4.7	4.2	4.7	9.27	4.75	4.76	5.1
REPORTING LIMIT		0.1	0.2	0.01	0.01	0.1	0.01	0.05	0.10	0.05	0.05	0.1
RPD		13	6	9	6	9	4	8	0	4	0	1
% Extraction Accuracy		75	80	82	82	82	100	82	113	90	90	87
% Instrument Accuracy		92	102	96	94	94	84	94	93	95	95	102

TA#	FIELD CODE	Ca (mg/L)	Mo (mg/L)	Zn (mg/L)	Ni (mg/L)	Fe (mg/L)	Co (mg/L)	Mn (mg/L)	Cu (mg/L)	Si (mg/L)	Hg (mg/L)
T36311	9505171530 MW-11	249	0.06	0.06	<0.05	1.34	<0.05	0.15	<0.05	14.3	<0.001
QC	Quality Control	10.4	4.7	4.72	4.79	4.68	4.67	4.7	4.64	2.34	0.0049
REPORTING LIMIT		0.05	0.05	0.01	0.05	0.05	0.05	0.05	0.05	0.1	0.001
RPD		0	2	3	5	0	6	2	7	2	0
% Extraction Accuracy		82	117	120	120	107	106	121	115	94	96
% Instrument Accuracy		104	94	94	96	94	93	94	93	94	98

METHODS: EPA SW 846-3015, 6010, 7470.
QC: Blank Spiked with 5.0 mg/L As,Se, Cr, Cd, Pb, A, Ba, Al, B, Mg, Mo, Zn, Ni, Fe, Co, Mn, Cu; 10.0 mg/L Na, Ca; 2.5 mg/L Si; 0.005 mg/L Hg.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

6-1-95
DATE

TRACE ANALYSIS, INC.
6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

June 01, 1995

Receiving Date: 05/20/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9766

ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

Prep Date: 05/22/95
Analysis Date: 05/23/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: GPM

TOTAL METALS

TA#	FIELD CODE	As (mg/L)	Se (mg/L)	Cr (mg/L)	Cd (mg/L)	Pb (mg/L)	Ag (mg/L)	Ba (mg/L)	Na (mg/L)	Al (mg/L)	B (mg/L)	Mg (mg/L)
T36312	9505171610 MW-10	<0.1	<0.2	0.02	<0.01	<0.1	<0.01	0.18	89.2	4.79	0.16	37.6
QC	Quality Control	4.6	5.1	4.8	4.7	4.7	4.2	4.7	9.27	4.75	4.76	5.1
REPORTING LIMIT		0.1	0.2	0.01	0.01	0.1	0.01	0.05	0.10	0.05	0.05	0.1
RPD		13	6	9	6	9	4	8	0	4	0	1
% Extraction Accuracy		75	80	82	82	82	100	82	113	90	90	87
% Instrument Accuracy		92	102	96	94	94	84	94	93	95	95	102

TA#	FIELD CODE	Ca (mg/L)	Mo (mg/L)	Zn (mg/L)	Ni (mg/L)	Fe (mg/L)	Co (mg/L)	Mn (mg/L)	Cu (mg/L)	Si (mg/L)	Hg (mg/L)
T36312	9505171610 MW-10	217	0.06	0.07	<0.05	3.05	<0.05	0.41	<0.05	18.0	<0.001
QC	Quality Control	10.4	4.7	4.72	4.79	4.68	4.67	4.7	4.64	2.34	0.0049
REPORTING LIMIT		0.05	0.05	0.01	0.05	0.05	0.05	0.05	0.05	0.1	0.001
RPD		0	2	3	5	0	6	2	7	2	0
% Extraction Accuracy		82	117	120	120	107	106	121	115	94	96
% Instrument Accuracy		104	94	94	96	94	93	94	93	94	98

METHODS: EPA SW 846-3015, 6010, 7470.
QC: Blank Spiked with 5.0 mg/L As,Se, Cr, Cd, Pb, A, Ba, Al, B, Mg, Mo, Zn, Ni, Fe, Co, Mn, Cu; 10.0 mg/L Na, Ca; 2.5 mg/L Si; 0.005 mg/L Hg.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

6-1-95
DATE

TRACE ANALYSIS, INC.
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June 01, 1995
Receiving Date: 05/20/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9766

ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

Prep Date: 05/22/95
Analysis Date: 05/23/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: GPM

TOTAL METALS

TA#	FIELD CODE	As (mg/L)	Se (mg/L)	Cr (mg/L)	Cd (mg/L)	Pb (mg/L)	Ag (mg/L)	Ba (mg/L)	Na (mg/L)	Al (mg/L)	B (mg/L)	Mg (mg/L)
T36314	9505171640 MW-10D	<0.1	<0.2	0.02	0.01	<0.1	<0.01	0.17	61.4	3.99	0.10	22.0
QC	Quality Control	4.6	5.1	4.8	4.7	4.7	4.2	4.7	9.27	4.75	4.76	5.1
REPORTING LIMIT		0.1	0.2	0.01	0.01	0.1	0.01	0.05	0.10	0.05	0.05	0.1
RPD		13	6	9	6	9	4	8	0	4	0	1
% Extraction Accuracy		75	80	82	82	82	100	82	113	90	90	87
% Instrument Accuracy		92	102	96	94	94	84	94	93	95	95	102

TA#	FIELD CODE	Ca (mg/L)	Mo (mg/L)	Zn (mg/L)	Ni (mg/L)	Fe (mg/L)	Co (mg/L)	Mn (mg/L)	Cu (mg/L)	Si (mg/L)	Hg (mg/L)
T36314	9505171640 MW-10D	171	0.08	0.04	<0.05	2.88	<0.05	0.25	<0.05	14.1	<0.001
QC	Quality Control	10.4	5.19	5.29	5.26	5.22	5.13	5.14	4.84	2.34	0.0049
REPORTING LIMIT		0.05	0.05	0.01	0.05	0.05	0.05	0.05	0.05	0.1	0.001
RPD		0	2	2	3	2	3	2	2	2	0
% Extraction Accuracy		82	89	90	86	90	91	88	80	94	96
% Instrument Accuracy		104	104	106	105	104	103	103	97	94	98

METHODS: EPA SW 846-3015, 6010, 7470.
QC: Blank Spiked with 5.0 mg/L As,Se, Cr, Cd, Pb, A, Ba, Al, B, Mg, Mo, Zn, Ni, Fe, Co, Mn, Cu; 10.0 mg/L Na, Ca; 2.5 mg/L Si; 0.005 mg/L Hg.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

6-1-95
DATE

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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

June 01, 1995
Receiving Date: 05/20/95
Sampling Date: 05/17/95
Sample Type: Water
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: GPM
Project Location: Linam
COC# 9766
Extraction Date: 05/22/95
Analysis Date: 05/22/95

T36310
Reporting 9505171415

PAH's

EPA 8270 (mg/L)	Limit	MW-12	QC	RPD	%EA	%IA
Naphthalene	0.0004	ND	49.7			99
Acenaphthylene	0.0004	ND	47.9			96
Acenaphthene	0.0004	ND	47.5	0	90	95
Fluorene	0.0004	ND	46.8			94
Phenanthrene	0.0004	ND	47.1			94
Anthracene	0.0004	ND	46.8			94
Fluoranthene	0.0004	ND	45.7			91
Pyrene	0.0004	ND	52.4	1	109	105
Benzo[a]anthracene	0.0004	ND	48.8			98
Chrysene	0.0004	ND	49.4			99
Benzo[b]fluoranthene	0.0004	ND	49.6			99
Benzo[k]fluoranthene	0.0004	ND	46.5			93
Benzo[a]pyrene	0.0004	ND	49.2			98
Indeno[1,2,3-cd]pyrene	0.0004	ND	48.2			96
Dibenz[a,h]anthracene	0.0004	ND	49.0			98
Benzo[g,h,i]perylene	0.0004	ND	53.7			107

*ND = Not Detected

	% RECOVERY
2-Fluorophenol SURR	74
Phenol-d6 SURR	46
Nitrobenzene-d5 SURR	99
2-Fluorobiphenyl SURR	98
2,4,6-Tribromophenol SURR	88
Terphenyl-d14 SURR	137

METHODS: EPA SW 846-3510; EPA 8270.

Director, Dr. Blair Leftwich — DATE 6-1-95

Director, Dr. Bruce McDonell

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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

June 01, 1995
Receiving Date: 05/20/95
Sampling Date: 05/17/95
Sample Type: Water
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: GPM
Project Location: Linam
COC# 9766
Extraction Date: 05/22/95
Analysis Date: 05/22/95

T36311
9505171530

PAH's

EPA 8270 (mg/L)	Reporting Limit	MW-11	QC	RPD	%EA	%IA
Naphthalene	0.0004	ND	49.7			99
Acenaphthylene	0.0004	ND	47.9			96
Acenaphthene	0.0004	ND	47.5	0	90	95
Fluorene	0.0004	ND	46.8			94
Phenanthrene	0.0004	ND	47.1			94
Anthracene	0.0004	ND	46.8			94
Fluoranthene	0.0004	ND	45.7			91
Pyrene	0.0004	ND	52.4	1	109	105
Benzo[a]anthracene	0.0004	ND	48.8			98
Chrysene	0.0004	ND	49.4			99
Benzo[b]fluoranthene	0.0004	ND	49.6			99
Benzo[k]fluoranthene	0.0004	ND	46.5			93
Benzo[a]pyrene	0.0004	ND	49.2			98
Indeno[1,2,3-cd]pyrene	0.0004	ND	48.2			96
Dibenz[a,h]anthracene	0.0004	ND	49.0			98
Benzo[g,h,i]perylene	0.0004	ND	53.7			107

*ND = Not Detected

	% RECOVERY
2-Fluorophenol SURR	34
Phenol-d6 SURR	29
Nitrobenzene-d5 SURR	75
2-Fluorobiphenyl SURR	76
2,4,6-Tribromophenol SURR	71
Terphenyl-d14 SURR	145

METHODS: EPA SW 846-3510; EPA 8270.

Director, Dr. Blair Leftwich

Director, Dr. Bruce McDonell

6-1-95
DATE

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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

June 01, 1995
Receiving Date: 05/20/95
Sampling Date: 05/17/95
Sample Type: Water
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: GPM
Project Location: Linam
COC# 9766
Extraction Date: 05/22/95
Analysis Date: 05/22/95

T36312
PAH's Reporting 9505171610

EPA 8270 (mg/L)	Limit	MW-10	QC	RPD	%EA	%IA
Naphthalene	0.0004	0.0035	49.7			99
Acenaphthylene	0.0004	ND	47.9			96
Acenaphthene	0.0004	ND	47.5	0	90	95
Fluorene	0.0004	ND	46.8			94
Phenanthrene	0.0004	ND	47.1			94
Anthracene	0.0004	ND	46.8			94
Fluoranthene	0.0004	ND	45.7			91
Pyrene	0.0004	ND	52.4	1	109	105
Benzo[a]anthracene	0.0004	ND	48.8			98
Chrysene	0.0004	ND	49.4			99
Benzo[b]fluoranthene	0.0004	ND	49.6			99
Benzo[k]fluoranthene	0.0004	ND	46.5			93
Benzo[a]pyrene	0.0004	ND	49.2			98
Indeno[1,2,3-cd]pyrene	0.0004	ND	48.2			96
Dibenz[a,h]anthracene	0.0004	ND	49.0			98
Benzo[g,h,i]perylene	0.0004	ND	53.7			107

*ND = Not Detected

	% RECOVERY
2-Fluorophenol SURR	20
Phenol-d6 SURR	34
Nitrobenzene-d5 SURR	103
2-Fluorobiphenyl SURR	70
2,4,6-Tribromophenol SURR	66
Terphenyl-d14 SURR	124

METHODS: EPA SW 846-3510; EPA 8270.

Director, Dr. Blair Leftwich — DATE 6-1-95
Director, Dr. Bruce McDonell

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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

June 01, 1995
Receiving Date: 05/20/95
Sampling Date: 05/17/95
Sample Type: Water
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: GPM
Project Location: Linam
COC# 9766
Extraction Date: 05/22/95
Analysis Date: 05/22/95

T36314
PAH's Reporting 9505171640

EPA 8270 (mg/L)	Limit	MW-10D	QC	RPD	%EA	%IA
Naphthalene	0.0004	ND	49.7			99
Acenaphthylene	0.0004	ND	47.9			96
Acenaphthene	0.0004	ND	47.5	0	90	95
Fluorene	0.0004	ND	46.8			94
Phenanthrene	0.0004	ND	47.1			94
Anthracene	0.0004	ND	46.8			94
Fluoranthene	0.0004	ND	45.7			91
Pyrene	0.0004	ND	52.4	1	109	105
Benzo[a]anthracene	0.0004	ND	48.8			98
Chrysene	0.0004	ND	49.4			99
Benzo[b]fluoranthene	0.0004	ND	49.6			99
Benzo[k]fluoranthene	0.0004	ND	46.5			93
Benzo[a]pyrene	0.0004	ND	49.2			98
Indeno[1,2,3-cd]pyrene	0.0004	ND	48.2			96
Dibenz[a,h]anthracene	0.0004	ND	49.0			98
Benzo[g,h,i]perylene	0.0004	ND	53.7			107

*ND = Not Detected

	% RECOVERY
2-Fluorophenol SURR	45
Phenol-d6 SURR	30
Nitrobenzene-d5 SURR	71
2-Fluorobiphenyl SURR	65
2,4,6-Tribromophenol SURR	40
Terphenyl-d14 SURR	115

METHODS: EPA SW 846-3510; EPA 8270.

Director, Dr. Blair Leftwich

6-1-95
DATE

Director, Dr. Bruce McDonell

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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102

June 01, 1995
Receiving Date: 05/20/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9766

Prep Date: 05/27/95
Analysis Date: 05/27/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36310 9505171415 MW-12	Reporting Limit
Dichlorodifluoromethane	ND	1
Chloromethane	ND	1
Vinyl chloride	ND	1
Bromomethane	ND	5
Chloroethane	ND	1
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Iodomethane	ND	5
Carbon disulfide	ND	1
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Vinyl acetate	ND	1
2-Butanone	ND	50
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
1,2-Dichloroethane	ND	1
Benzene	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloropropane	ND	1
Trichloroethene	ND	1
Bromodichloromethane	ND	1
cis-1,3-Dichloropropene	ND	1
4-Methyl-2-pentanone	ND	50
trans-1,3-Dichloropropene	ND	1
Toluene	ND	1
1,1,2-Trichloroethane	ND	1
2-Hexanone	ND	50

GCL
Project Location: Linam
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36310 9505171415 MW-12	Reporting Limit
Dibromochloromethane	ND	1
Tetrachloroethene	ND	1
Chlorobenzene	ND	1
Ethylbenzene	ND	1
m & p-Xylene	ND	1
Bromoform	ND	1
Styrene	ND	1
o-Xylene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
trans 1,4-Dichloro-2-butene	ND	5
cis 1,4-Dichloro-2-butene	ND	5
1,4-Dichlorobenzene	ND	2
1,3-Dichlorobenzene	ND	2
1,2-Dichlorobenzene	ND	2

Trace levels: Cyclohexane
2-methyl thio propane

SURROGATES	% RECOVERY
Dibromofluoromethane	94
Toluene-d8	92
4-Bromofluorobenzene	92

*ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8240.

6-1-95

Director, Dr. Blair Leftwich — Date
Director, Dr. Bruce McDonell

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102

June 01, 1995
Receiving Date: 05/20/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9766

Prep Date: 05/27/95
Analysis Date: 05/27/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36311 9505171530 MW-11	Reporting Limit
Dichlorodifluoromethane	ND	1
Chloromethane	ND	1
Vinyl chloride	ND	1
Bromomethane	ND	5
Chloroethane	ND	1
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Iodomethane	ND	5
Carbon disulfide	ND	1
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Vinyl acetate	ND	1
2-Butanone	ND	50
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
1,2-Dichloroethane	ND	1
Benzene	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloropropane	ND	1
Trichloroethene	ND	1
Bromodichloromethane	ND	1
cis-1,3-Dichloropropene	ND	1
4-Methyl-2-pentanone	ND	50
trans-1,3-Dichloropropene	ND	1
Toluene	ND	1
1,1,2-Trichloroethane	ND	1
2-Hexanone	ND	50

GCL
Project Location: Linam
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36311 9505171530 MW-11	Reporting Limit
Dibromochloromethane	ND	1
Tetrachloroethene	ND	1
Chlorobenzene	ND	1
Ethylbenzene	ND	1
m & p-Xylene	ND	1
Bromoform	ND	1
Styrene	ND	1
o-Xylene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
trans 1,4-Dichloro-2-butene	ND	5
cis 1,4-Dichloro-2-butene	ND	5
1,4-Dichlorobenzene	ND	2
1,3-Dichlorobenzene	ND	2
1,2-Dichlorobenzene	ND	2

TENTATIVELY IDENTIFIED COMPOUNDS & ESTIMATED CONCENTRATIONS (ug/L)

(1)	2,3-dimethylbutane	6
(2)	Cyclopentane	9
(3)	Methylpentane	11
(4)	Cyclohexane	119
(5)	1,2-dimethyl cyclo pentane	17

SURROGATES	% RECOVERY
Dibromofluoromethane	94
Toluene-d8	88
4-Bromofluorobenzene	92

*ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8240.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

6-1-95
Date

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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102

June 01, 1995
Receiving Date: 05/20/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9766

Prep Date: 05/27/95
Analysis Date: 05/27/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36312 9505171610 MW-10	Reporting Limit
Dichlorodifluoromethane	ND	10
Chloromethane	ND	10
Vinyl chloride	ND	10
Bromomethane	ND	50
Chloroethane	ND	10
Trichlorofluoromethane	ND	10
1,1-Dichloroethene	ND	10
Iodomethane	ND	50
Carbon disulfide	ND	10
Methylene chloride	ND	50
trans-1,2-Dichloroethene	ND	10
1,1-Dichloroethane	ND	10
Vinyl acetate	ND	10
2-Butanone	ND	500
Chloroform	ND	10
1,1,1-Trichloroethane	ND	10
1,2-Dichloroethane	68	10
Benzene	3,225	10
Carbon Tetrachloride	ND	10
1,2-Dichloropropane	ND	10
Trichloroethene	ND	10
Bromodichloromethane	ND	10
cis-1,3-Dichloropropene	ND	10
4-Methyl-2-pentanone	ND	500
trans-1,3-Dichloropropene	ND	10
Toluene	52	10
1,1,2-Trichloroethane	ND	10
2-Hexanone	ND	500

GCL
Project Location: Linam
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36312 9505171610 MW-10	Reporting Limit
Dibromochloromethane	ND	10
Tetrachloroethene	ND	10
Chlorobenzene	ND	10
Ethylbenzene	49	10
m & p-Xylene	85	10
Bromoform	ND	10
Styrene	ND	10
o-Xylene	84	10
1,1,2,2-Tetrachloroethane	ND	10
trans 1,4-Dichloro-2-butene	ND	50
cis 1,4-Dichloro-2-butene	ND	50
1,4-Dichlorobenzene	ND	20
1,3-Dichlorobenzene	ND	20
1,2-Dichlorobenzene	ND	20

TENTATIVELY IDENTIFIED COMPOUNDS & ESTIMATED CONCENTRATIONS (ug/L)

(1)	Cyclohexane	398

SURROGATES	% RECOVERY
Dibromofluoromethane	98
Toluene-d8	91
4-Bromofluorobenzene	92

*ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8240.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

6-1-95
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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102

June 01, 1995
Receiving Date: 05/20/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9766

Prep Date: 05/27/95
Analysis Date: 05/27/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36313 9505171620 MW-10S	Reporting Limit
Dichlorodifluoromethane	ND	20
Chloromethane	ND	20
Vinyl chloride	ND	20
Bromomethane	ND	100
Chloroethane	ND	20
Trichlorofluoromethane	ND	20
1,1-Dichloroethene	ND	20
Iodomethane	ND	100
Carbon disulfide	ND	20
Methylene chloride	ND	100
trans-1,2-Dichloroethene	ND	20
1,1-Dichloroethane	ND	20
Vinyl acetate	ND	20
2-Butanone	ND	1,000
Chloroform	ND	20
1,1,1-Trichloroethane	ND	20
1,2-Dichloroethane	64	20
Benzene	3,097	20
Carbon Tetrachloride	ND	20
1,2-Dichloropropane	ND	20
Trichloroethene	ND	20
Bromodichloromethane	ND	20
cis-1,3-Dichloropropene	ND	20
4-Methyl-2-pentanone	ND	1,000
trans-1,3-Dichloropropene	ND	20
Toluene	45	20
1,1,2-Trichloroethane	ND	20
2-Hexanone	ND	1,000

Project Location: Linam
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36313 9505171620 MW-10S	Reporting Limit
Dibromochloromethane	ND	20
Tetrachloroethene	ND	20
Chlorobenzene	ND	20
Ethylbenzene	ND	20
m & p-Xylene	91	20
Bromoform	ND	20
Styrene	ND	20
o-Xylene	43	20
1,1,2,2-Tetrachloroethane	ND	20
trans 1,4-Dichloro-2-butene	ND	100
cis 1,4-Dichloro-2-butene	ND	100
1,4-Dichlorobenzene	ND	40
1,3-Dichlorobenzene	ND	40
1,2-Dichlorobenzene	ND	40

TENTATIVELY IDENTIFIED COMPOUNDS & ESTIMATED CONCENTRATIONS (ug/L)

(1) Cyclohexane	422

SURROGATES	% RECOVERY
Dibromofluoromethane	97
Toluene-d8	93
4-Bromofluorobenzene	91

*ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8240.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

6-1-95
Date

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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102

June 01, 1995
Receiving Date: 05/20/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam
COC #9766

Prep Date: 05/27/95
Analysis Date: 05/27/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36314 9505171640 MW-10D	Reporting Limit
Dichlorodifluoromethane	ND	1
Chloromethane	ND	1
Vinyl chloride	ND	1
Bromomethane	ND	5
Chloroethane	ND	1
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Iodomethane	ND	5
Carbon disulfide	ND	1
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Vinyl acetate	ND	1
2-Butanone	ND	50
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
1,2-Dichloroethane	2	1
Benzene	96	1
Carbon Tetrachloride	ND	1
1,2-Dichloropropane	ND	1
Trichloroethene	ND	1
Bromodichloromethane	ND	1
cis-1,3-Dichloropropene	ND	1
4-Methyl-2-pentanone	ND	50
trans-1,3-Dichloropropene	ND	1
Toluene	4	1
1,1,2-Trichloroethane	ND	1
2-Hexanone	ND	50

Project Location: Linam
Project Name: GPM

EPA 8240 Compounds (ug/L)	T36314 9505171640 MW-10D	Reporting Limit
Dibromochloromethane	ND	1
Tetrachloroethene	ND	1
Chlorobenzene	ND	1
Ethylbenzene	ND	1
m & p-Xylene	7	1
Bromoform	ND	1
Styrene	ND	1
o-Xylene	1	1
1,1,2,2-Tetrachloroethane	ND	1
trans 1,4-Dichloro-2-butene	ND	5
cis 1,4-Dichloro-2-butene	ND	5
1,4-Dichlorobenzene	ND	2
1,3-Dichlorobenzene	ND	2
1,2-Dichlorobenzene	ND	2

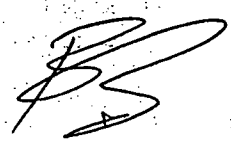
TENTATIVELY IDENTIFIED COMPOUNDS & ESTIMATED CONCENTRATIONS (ug/L)

(1)	Cyclopentane	6
(2)	Methyl Cyclopentane	12
(3)	Cyclohexane	22
(4)	Methyl Cyclohexane	15
(5)	Methyl disulfide	7

SURROGATES	% RECOVERY
Dibromofluoromethane	93
Toluene-d8	92
4-Bromofluorobenzene	91

*ND = Not Detected

METHODS: EPA SW 846-5030; EPA 8240.



Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

6-1-95
Date

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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1300
Albuquerque, NM 87102

June 08, 1995
Receiving Date: 05/20/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam

Prep Date: 06/05/95
Analysis Date: 06/05/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: GPM
COC# 9766

TA#	FIELD CODE	TDS (mg/L)
T36310	9505171415 MW-12	1,128
T36311	9505171530 MW-11	890
T36312	9505171610 MW-10	903
T36314	9505171640 MW-10D	707
RPD		0

METHODS: EPA 160.1.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

6-8-95
DATE

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Lubbock, Texas 79424
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ANALYTICAL RESULTS FOR
GCL
Attention: Annette Montoya
505 Marquette NW, Suite 1300
Albuquerque, NM 87102

June 08, 1995
Receiving Date: 05/20/95
Sample Type: Water
GPM Charge Code No: LREEOTT-20-300
Project Location: Linam

Extraction Date: 05/23/95
Analysis Date: 05/23/95
Sampling Date: 05/17/95
Sample Condition: Intact & Cool
Sample Received by: BL
Project Name: GPM
COC# 9766

TA#	FIELD CODE	2-methylnaphthalene/ 1-methylnaphthalene (mg/L)
T36310	9505171415 MW-12	ND
T36311	9505171530 MW-11	ND
T36312	9505171610 MW-10	0.001
T36314	9505171640 MW-10D	ND
QC	Quality Control	49.2
Reporting Limit		0.001
RPD		0
% Extraction Accuracy		90
% Instrument Accuracy		98

ND = Not Detected

METHODS: EPA SW 846-8270, 3510.

6-8-95

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell
DATE

Appendix C

Survey Plat

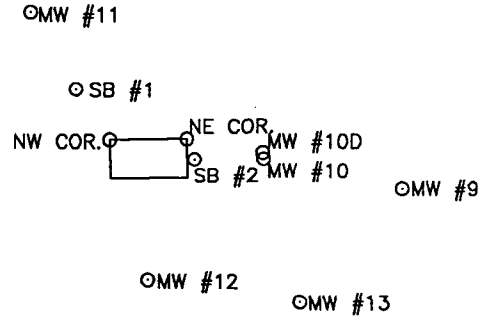
PLANT COORDINATES AND ELEVATIONS

WELL NO.	COORDINATES		ELEVATION	LOC. OF ELEVATION
MW #8	S15+65	E 5+40	3714.18 3716.18	TOP OF PLATE N. SIDE TOP OF PIPE N. EDGE
MW #9	S14+46	E15+14	3720.48 3722.48	TOP MIDDLE CONC. N SIDE TOP OF PIPE N. EDGE
MW #10	S13+99	E12+96	3720.76 3722.90	TOP OF ALU. CAP N. SIDE TOP OF PIPE N. EDGE
MW #10D	S13+89	E12+95	3720.85 3723.54	TOP OF ALU. CAP N. SIDE TOP OF PIPE N. EDGE
MW #11	S11+71	E 9+31	3722.02 3724.53	TOP OF ALU. CAP N. SIDE TOP OF PIPE N. EDGE
MW #12	S15+90	E11+13	3720.60 3722.84	TOP OF ALU. CAP N. SIDE TOP OF PIPE N. EDGE
MW #13	S16+25	E13+52	3721.63 3723.99	TOP OF ALU. CAP N. SIDE TOP OF PIPE N. EDGE
SB #1	S12+91	E10+02	3721.18	GROUND
SB #2	S13+99	E11+88	3720.66	GROUND
	S13+70	E10+54		NW COR. CONTAINMENT WALL
	S13+68	E11+75		NE COR. CONTAINMENT WALL

S 0+00
E 0+00

S 6+50
E 0+00

NOTE: BENCH MARK ELEV. = 3723.39 AT CONC. MON. WITH BRASS PLATE AT S 8+21 E 7+45



300 0 300 600

SCALE: 1"=300'

I HEREBY CERTIFY THAT THIS PLAT WAS PREPARED FROM FIELD NOTES OF AN ACTUAL SURVEY AND MEETS OR EXCEEDS ALL REQUIREMENTS FOR LAND SURVEYS AS SPECIFIED BY THIS STATE.

NEW MEXICO GARY G. EIDSON 12641 REGISTERED PROFESSIONAL SURVEYOR

JOHN W. WEST, N.M. P.E. & P.S. No. 9676
TEXAS P.L.S. No. 1138
RONALD J. EIDSON, N.M. L.S. No. 3239
TEXAS P.L.S. No. 1883
GARY G. EIDSON, N.M. P.S. No. 12641
TEXAS P.L.S. No. 4735

JOHN W. WEST ENGINEERING COMPANY
CONSULTING ENGINEERS & SURVEYORS – HOBBS, NEW MEXICO

GEOSCIENCE CONSULTANTS Ltd.

LOCATION OF MONITOR WELLS AND SOIL BORINGS AT THE GPM GAS CORP. LINAM RANCH PLANT IN SECTION 6, TOWNSHIP 19 SOUTH, RANGE 37 EAST, N..M.P.M., LEA COUNTY, NEW MEXICO.

Survey Date: 6/1/95	Sheet 1 of 1 Sheets
W.O. Number: 95-11-0860	Drawn By: JAMES L. PRESLEY
Date: 6/16/95 DISK: JLP#130	GE00860

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Environmental Science and Engineering
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DANIEL B. STEPHENS & ASSOCIATES, INC.
ENVIRONMENTAL SCIENTISTS AND ENGINEERS

RECEIVED
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OIL CON. DIV.
SANTA FE

DRAFT

Construction Specifications

Remediation System Implementation
Oil/Water Separator - Former
Liquid Waste Disposal Pit Area
ENRON-Hobbs Natural Gas Processing Plant

Prepared for
ENRON Operations Corp.
Houston, Texas

August 31, 1994

6020 ACADEMY NE • SUITE 100 • ALBUQUERQUE, NM 87109 • (505) 822-9400

REMEDIATION SYSTEM
ENRON-HOBBS NATURAL GAS PROCESSING PLANT

SPECIFICATIONS

INDEX

SECTION	TITLE
DIVISION 2 - SITE WORK	
02100	Site Preparation
02210	Earthwork
02450	Drainage Systems
02710	Air and Vapor Pipe
DIVISION 3 - CONCRETE	
03310	Concrete and Reinforcing Steel
DIVISION 11 - EQUIPMENT	
11210	Regenerative Blowers
11215	Positive Displacement Blowers
DIVISION 15 - MECHANICAL	
15095	Valves and Piping Appurtenances
DIVISION 16 - ELECTRICAL	
16010	Electrical

SECTION 02100
SITE PREPARATION

PART 1--GENERAL

1.01 DESCRIPTION

A. SCOPE:

This section specifies site preparation which consists of clearing and grubbing and demolition and removal.

B. EXISTING CONDITIONS:

The Contractor shall determine the actual condition of the site as it affects this portion of work.

C. PROTECTION:

Site preparation shall not damage structures, landscaping or vegetation adjacent to the work site. The Contractor shall repair, or replace any damaged property at the Contractor's expense.

PART 2--EXECUTION

2.01 GENERAL

The Contractor shall notify the Engineer when site preparation is complete.

2.02 PERFORMANCE

A. CLEARING AND GRUBBING:

Unless otherwise specified, the Contractor shall remove obstructions such as brush, trees, logs, stumps, roots, sod, vegetation, rock, stones larger than 6 inches in any dimension, broken or old concrete and pavement, debris, and structures where the completion of the work require their removal.

B. DEMOLITION AND REMOVAL:

1. PAVEMENT: When portions of asphalt and concrete pavements are to be removed, edges shall be saw cut, on a straight neat line.

2. SALVAGE: The Owner has the right to salvage any items scheduled for removal.

SECTION 02210
EARTHWORK

PART 1–GENERAL

1.01 DESCRIPTION

This section specifies earthwork which consists of excavation, filling, grading, trenching and excess material control.

1.02 QUALITY ASSURANCE

A. REFERENCES

Reference	Title
ASTM D1557-91	Laboratory Compaction Characteristics of Soil Using Modified Effort
ASTM D2216-92	Standard Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock

B. TESTS

The Contractor shall take samples and perform compaction tests during placement of backfill materials to check compliance with these specifications. The Contractor shall remove surface material at locations designated by the Engineer and provide such assistance as necessary for the Engineer to inspect trenches in compacted or consolidated backfill to determine that the Contractor has complied with these specifications.

Tests shall be made by the Contractor in the presence of the Engineer or designated representative in accordance with the following:

Test	Standard Procedure
Relative Density	ASTM D1557/D3017

1.03 SUBMITTALS

The Contractor shall submit documentation from the fill material supplier which identifies the material source and applicable engineering properties.

PART 2–MATERIALS

2.01 FILL MATERIALS

A. TYPE A:

Type A material shall be a clean sand or sandy soil mixture free from organic matter, all of which pass a ⅜-inch sieve and not more than ten percent passes a No. 200 sieve.

B. TYPE B:

Type B material shall be a select granular material free from organic matter and of such size and graduation that the specified compaction can be readily attained. Material shall have a sand equivalent value of not less than 20 and shall conform to the following gradation:

U.S. Standard Sieve Size	Percent by Weight Passing
3"	100
No. 4	35-100
No. 30	20-100

The coefficient of uniformity shall be 3 or greater. The material may be an imported quarry waste, clean natural sand or gravel, select trench excavation or a mixture thereof.

C. TYPE C:

Type C material shall be unclassified material which is free from peat, wood, roots, bark, debris, garbage, rubbish or other extraneous material. The maximum size of stone shall not exceed 6 inches. If the material excavated from the site meets these requirements, it may be classified as Type C.

D. TYPE D:

Type D material shall be granular material commonly known as pea gravel and shall conform to the following gradation:

U.S. Standard Sieve Size	Percent by Weight Passing
1/4"	100
No. 8	0-5

E. TYPE E:

Type E material shall be crushed rock commonly known as drain rock and shall conform to the following gradation:

U.S. Standard Sieve Size	Percent by Weight Passing
1-1/2"	100
3/4"	30-75
1/2"	15-55
1/4"	0-5

Type E material shall be composed of hard, durable, sound pieces having a specific gravity of not less than 2.65.

F. TYPE F:

Type F material shall be crushed rock and shall conform to the following gradation:

U.S. Standard Sieve Size	Percent by Weight Passing
1-1/2"	87-100
3/4"	45-90
No. 4	20-50
No. 30	6-29
No. 200	0-12

Type F material shall be composed of hard, durable, sound pieces having a specific gravity of not less than 2.65.

PART 3--EXECUTION

3.01 CONTROL OF WATER

The Contractor shall keep excavations reasonably free from water during construction so as to maintain undisturbed state of natural soils and allow the placement of any fill to the specified density. Disposal of water shall not damage property or create a public nuisance. The Contractor shall have on hand pumping equipment and machinery in good working condition for emergencies and shall have workmen available for its operation.

3.02 OVEREXCAVATION

Where the undisturbed condition of natural soils in inadequate for support of the planned construction, the Engineer will direct the Contractor to overexcavate to adequate supporting soils. The excavated space shall be filled to the specified elevation with backfill. The overexcavated space under footings may be filled with concrete.

3.03 SHORING

Trenches and excavations greater than 5 feet in depth shall be shored. The construction of sheeting, shoring, and bracing shall not disturb the state of soil adjacent to the trench and below the excavation bottom. Trench sheeting below the top of a pipe shall be left in place.

3.04 SURPLUS MATERIAL

Material that is removed and is not to be incorporated in the work shall be stockpiled at a location designated by the Engineer for testing by the Contractor prior to offsite disposal. Material shall not be stockpiled to a depth greater than 5 feet above finished grade within 25 feet of any excavation or structure. The Contractor shall maintain stability of the soil adjacent to any excavation.

3.05 BORROW MATERIAL

If the quantity of acceptable material from excavation is not sufficient for backfill required by the work, the quantity of material needed to complete the operations shall be of imported borrow from suppliers approved by the Engineer.

3.06 HAULING

When hauling of waste soil is conducted over highway or city streets, the loads shall be trimmed and the vehicle shelf areas shall be cleaned after loading. The loads shall be watered after trimming to eliminate dust.

3.07 HAUL ROUTES

The Contractor shall establish haul routes required to transport material on site. Alignment of haul routes shall be selected to avoid interferences with plant operations.

3.08 FINISH GRADING

Finished surfaces shall be smooth, compacted and free from irregularities. Rocks larger than 2-1/2 inches in maximum dimension, roots and other debris on the surface of the slope shall be removed and disposed. The degree of finish shall be that normally obtainable with a blade-grader.

Finished grade shall be specified by the contours plus or minus 0.10 foot except where a local change in elevation is required to match asphalt or concrete, curbs, or to ensure proper drainage. Allowance for topsoil and grass cover, and subbase and pavement thickness shall be made so that the specified thickness of grass cover and pavement can be applied to attain the finished grade.

When the work is an intermediate stage of completion, the lines and grades shall be as specified plus or minus 0.5 foot to provide adequate drainage.

3.09 CONTROL OF EROSION

The Contractor shall maintain earthwork surface true and smooth and protected from erosion. Where erosion occurs, the Contractor shall provide fill or shall excavate as necessary to return earthwork surfaces to the grade and finish specified.

3.10 CLASSIFICATION OF FILL

Fill material shall be placed in horizontal layers and compacted with power operated tampers, rollers, idlers, or vibrating equipment. Material type, maximum layer depth, relative compaction, and general application are specified in Table 1. Unless otherwise specified, fill classes shall be used where specified in Table 1 under general application.

TABLE 1. FILL CLASSIFICATIONS

Class	Material Type	Maximum Uncompressed Layer Depth (in)	Minimum Relative Compaction* (%)	General Application
A1	A	8	90	Slabs on grade
B1	B	8	90	Structure, backfill, bedding for pipe, initial pipeline backfill
B2	B	8	90	Site fill
C1	C	8	90-95	Subsequent pipeline backfill; compaction as specified on the drawings

*ASTM D1557

3.11 EARTHWORK FOR PIPELINES AND CONDUITS

Earthwork for pipelines and conduits is specified in Table 1 and as shown in the drawings. Maximum uncompressed layer depth shall be eight inches.

SECTION 02710

AIR AND VAPOR PIPE

PART 1–GENERAL

1.01 SCOPE

This section covers all material, labor, and other items necessary to furnish, install and test all pressure pipe for air sparging and soil vapor extraction; pipe supports; anchors; fittings; valves; specials; and all necessary appurtenances as shown, specified, and/or as required to make the work complete and operable.

1.02 RELATED WORK

A. 15095 Valves and Piping Appurtenances

PART 2–PRODUCTS

2.01 PIPE

A. CARBON STEEL PIPE

Not used.

B. POLYVINYL CHLORIDE PIPE (PVC)

All PVC pipe and fitting shall be Sch. 80 conforming to ASTM 1785. Joints shall be solvent weld conforming to ASTM D2855.

C. DUCTILE IRON PIPE

Not used.

D. STAINLESS STEEL PIPE

Not used.

2.02 FITTINGS

A. CARBON STEEL

Not used.

B. PVC

Schedule 80 PVC. PVC fittings shall conform to ASTM 1785.

C. DUCTILE IRON

Not used.

D. STAINLESS STEEL

Not used.

2.03 COUPLINGS

A. FLEXIBLE COUPLINGS

Flexible couplings shall be bolted with ductile iron sleeve and end rings as manufactured by Dresser, Style 153 or approved equal.

B. MALLEABLE IRON

Not used.

C. FLANGED COUPLING ADAPTERS

Not used.

2.04 FLANGE ASSEMBLY

Not used.

2.05 PVC PRIMER AND SOLVENT CEMENT

A. PVC SOLVENT CEMENT

Solvent cement shall be heavy bodied fast-set, high strength cement. Cement shall be IAMPO-UPC listed, NSF approved and conforming to ASTM D-2564.

B. PVC PRIMER

Primer shall be fast acting, purple colored IAPMO-UPC and NSF listed.

2.06 GASKETS

Not used.

2.07 WALL PENETRATION SEAL

Not used.

PART 3–EXECUTION

3.01 GENERAL

A. All pipes, valves, fittings, and appurtenances shall be installed in accordance with the manufacturer's recommendations and according to accepted water works practice. All pipe, fittings, and valves, etc. shall be carefully lowered into the trench in such a manner as to prevent any damage. Under no circumstances shall pipe or accessories be dropped into the trench.

B. The pipe shall be laid true and uniform to line and grade, with no visible change in alignment at any joint unless curved alignment is called for in the plans, in which case the maximum deflection at any joint shall not exceed the manufacturer's recommendation for the type of pipe and joint being used. The pipe shall have a minimum cover as shown on the drawings.

C. Pipe shall not be laid when the condition of the trench or the weather is unsuitable or when there is the possibility of foreign material entering the pipe. Whenever pipe laying is discontinued for an hour or more, the open ends of all mains and fittings shall be closed with water-tight plugs or bulkheads. The plugs or bulkheads shall not be removed unless, or until, the trench is dry and the contractor is ready to continue with the work.

D. Where necessary to properly locate valves and fittings, the pipe shall be neatly and squarely cut to length, using methods recommended by manufacturer.

E. When field cuts are made in PVC pipe, a pipe cutter, mitre box or other method as recommended by the manufacturer shall be used to provide a square end. The cut ends shall be cut square and all burrs removed from the pipe interior. The beveling of the pipe ends shall be as specified by the manufacturer. Guide marks for joining the pipe, after cutting, must be made on the pipe in accordance with the manufacturer's specification.

3.02 FABRICATION AND INSTALLATION OF STEEL AND IRON PIPE

Not used.

3.03 INSTALLATION FOR PVC PIPE

A. GENERAL

All piping shall be installed in accordance with the manufacturer's recommendations. If pipe is to be stored for a prolonged period before installation, it shall be covered with an opaque material to protect it from the sun's rays. The pipe shall be covered in a manner that will prevent excessive heat buildup.

B. JOINTS

Schedule 80 PVC pipe shall be installed in conformance with Uniform Plumbing Code IAMPO IS 10-90, Installation Standard for PVC Natural Gas Yard Piping.

Pipe shall be solvent welded unless otherwise shown on the drawings or required to meet the intent of the drawings. After cutting, and before solvent welding, all pipe shall be cleaned and any burrs removed. Primer shall be applied to the outside of the pipe end and the inside of the fitting to penetrate and soften the bonding surfaces. After priming, glue shall be applied to all surfaces to be bonded. Hand pressure shall be applied to joint for several seconds to prevent any movement while cement achieves initial set.

C. PVC SOLVENT CEMENT

Application temperature shall be 40°F to 110°F.

D. PVC PRIMER

Application temperature shall be 40°F to 110°F.

3.04 INSTALLATION FOR DUCTILE IRON PIPES

Not used.

3.05 SUPPORTS AND ANCHORS

All piping shall be supported and anchored where shown on the drawings. Where not specifically detailed, supports shall be of a standard manufactured design of a style, type, and duty appropriate to its intended use. Space of supports shall be in accordance with ASA B31.1, Section 6, except that additional supports shall be provided ear components and equipment in sufficient quantity and type to allow for disassembly of all items and to insure that excessive weight is not imposed on the equipment. The following maximum spacing of pipe supports was taken from ASA B31.1, Section 6, and is based on a combined bending and shear stress of 1,500 psi when pipe is filled with water the pitch of the line is such that a sag of 0.1 inch between supports is permissible.

Nominal Pipe Size	3/4	1	1-1/2	2	2-1/2	3	3-1/2	4	5	6	8
Max. Span Ft.	5	7	9	10	11	12	13	14	16	17	19

3.06 PIPING PENETRATIONS

Not used.

3.07 TESTING

PVC piping shall be tested as specified herein. All materials required for tests shall be furnished by the Contractor.

All systems shall be tested to 100 psig and held for 30 minutes. If the pressure has dropped more than 5.0 psi during the test period (30 minutes), the pipeline is presumed to have failed. All piping must be partially covered with backfill material, where buried, except at pipe joints, prior to testing. Testing may be completed in sections to minimize disruption of access ways.

The Engineer must witness all hydrostatic tests for approval. No exceptions shall be made. The Contractor shall record the following information for each test:

1. Location of pipe section tested
2. Time of start and completion of test
3. Pressure at start, middle and completion of test

The above information shall be submitted to the Engineer at the completion of each test.

3.08 PIPE CODING

Not used.

SECTION 03310

CONCRETE AND REINFORCING STEEL

PART 1--GENERAL

1.01 DESCRIPTION

This section specifies concrete for footings, slabs, floors, curbs, pipe bedding encasement, and reinforcing steel.

1.02 QUALITY ASSURANCE

A. QUALITY CONTROL BY CONTRACTOR

To demonstrate conformance with the specified requirements for cast-in-place concrete, the Contractor shall provide the services of an independent testing laboratory which complies with the requirements of ASTM E329.

B. BASIS FOR QUALITY

Concrete shall conform to the requirements of ACI 301, except as modified. Unless specified otherwise, all formwork shall conform to ACI 347.

C. REFERENCES

This section contains references to the following documents. They are part of this section as specified and modified. In case of conflict between the requirements of the this section and those of the listed documents, the requirements of this section shall prevail.

REFERENCE	TITLE
ACI 211.1-81	Recommended Practice for Selecting Proportions for Normal and Heavy Weight Concrete
ACI 301-84	Specifications for Structural Concrete for Buildings
ACI 305R-82	Hot Weather Concreting
ACI 306R-78	Cold Weather Concreting
ACI 347-78	Concrete Formwork
ASTM C31-84	Standard Method of Making and Curing Concrete Test Specimens in the Field
ASTM C33-84	Concrete Aggregates

REFERENCE	TITLE
ASTM C39-83a	Standard Test for Compressive Strength of Cylindrical Concrete Specimens
ASTM C42-84	Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C94-83	Ready-Mixed Concrete
ASTM C136-84	Sieve Analysis of Fine and Coarse Aggregates
ASTM C143-78	Standard Test for Slump of Portland Cement Concrete
ASTM C150-84	Portland Cement
ASTM C172-82	Sampling Fresh Concrete
ASTM C260-77	Air-Entraining Admixtures for Concrete
ASTM C309-81	Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C494-82	Chemical Admixtures for Concrete
ASTM E329-77 (1983)	Inspection and Testing Agencies for Concrete, Steel and Bituminous Materials as Used in Construction
ASTM A615-84a	Deformed and plain billet-steel bars for reinforcement
CRSI-78	Placing Reinforcing Bars
CRSI-80	Manual of Standard Practice

PART 2--PRODUCTS

2.01 MATERIALS FOR CONCRETE

A. CEMENT

Portland cement shall be ASTM C150, Type II or Type V, low alkali, containing less than 0.60 percent alkalies.

B. AGGREGATES

1. General

Except as modified herein, fine and coarse aggregates shall conform to ASTM C33. Fine and coarse aggregates shall be nonreactive and shall be washed before use.

When sources of aggregates are changed, test reports shall be provided for the new material. The tests specified shall be performed prior to commencing concrete work.

2. Fine Aggregate

Fine aggregate shall be hard, dense, durable particles of either sand or crushed stone regularly graded from coarse to fine.

3. Coarse Aggregate

Coarse aggregate shall be hard, dense, and durable gravel or crushed rock free from injurious amounts of soft and friable particles, alkali, organic matter, and other deleterious substances.

C. ADMIXTURES

1. General

Admixtures shall be compatible with the concrete. Calcium chloride or admixtures containing calcium chloride are not acceptable. Admixtures shall be used in accordance with the manufacturer's recommendations and shall be added separately to the concrete mix.

2. Water Reducing Retarder

Water reducing retarder shall be ASTM C494, Type D, and shall be Master Builders, Pozzolith 300-R; Sika Chemical Corp., Plastiment; or equal.

3. Air Entraining Agent

Air entraining agent shall be Master Builders, MB-AE10; W.R. Grace and Co., DaraVair; or equal. The air entraining agent added shall produce and entrained air content between 3 and 5 percent in accordance with ASTM C260.

D. WATER

Water for washing aggregate, for mixing, and for curing shall be free from oil and deleterious amounts of acids, alkalies, and organic materials.

2.02 MATERIALS FOR REINFORCING STEEL

A. BAR REINFORCEMENT

Reinforcing bars, except No. 2 bars, shall be deformed billet-steel conforming to ASTM A615, Grade 60, including supplementary requirements.

B. TIE WIRE

The wire shall be minimum 16 gage annealed steel conforming to FEDSPEC QQ-E-461H.

C. BAR SUPPORTS

Bar Supports shall be located and placed in accordance with CRSI standards. Concrete block supports shall be provided for footings and slabs. Standard steel supports shall be provided for other work.

2.03 CONCRETE CHARACTERISTICS

A. MIX PROPORTIONING

Concrete shall be normal weight concrete composed of specified cement, admixtures, aggregates, and water proportioned and mixed to produce a workable, strong, dense, and impermeable concrete.

Concrete shall be provided in accordance with the following:

Class of Concrete	Maximum Coarse Aggregate Size, inch	Min. Cement Content sacks/cu.yd. Concrete	Maximum Water/Cement Ratio by Weight	Maximum Slump in inches	Minimum 28-day Compressive Strength psi
B	1-1/2	5.25	0.5	4	4,000
C	3/4	5.25	0.5	4-1/2	4,000
D	2	3.25	0.7	6	2,000

B. USE

Concrete shall be provided by class for the corresponding use listed as follows:

Type of Use	Class of Concrete
Concrete greater than 12 inches thick.	B
Concrete 12 inches thick or less.	C
Pipe bedding and concrete fill.	D

2.04 BONDING COMPOUNDS

Epoxy resin bonding compounds shall be used for wet areas and shall be Adhesive Engineering, Concresive Nos. 1001, 1001-LPL or 1180 as applicable; Sika Chemical Corporation, Sikastix 350, 370, or 390 as applicable; or equal. Nonepoxy bonding compounds shall be used for dry area and shall be Burke Concrete Accessories, Inc., Standard Dry Wall Products, Inc., Acryl 60; Thorobond; or equal. Bonding compounds shall be applied in accordance with the manufacturer's instructions.

2.05 CURING AND SEALING COMPOUNDS

Curing and sealing compound shall be Master Builders, Masterseal; W.R. Grace and Co., Horn Clearseal; or equal; conforming to ASTM C309. Curing compounds shall be applied in accordance with the manufacturer's instructions.

2.06 PRODUCT DATA

The following information shall be provided:

A. TEST REPORTS

Three copies of reports from the concrete supplier shall be provided certifying that all concrete materials comply with the specifications and all test requirements.

B. READY-MIXED CONCRETE TRUCK DELIVERY TICKETS

Each load of ready-mixed concrete delivered to the job site shall be accompanied by a delivery ticket showing the information listed in ASTM C94, Section 15.

PART 3–EXECUTION

3.01 GENERAL

Construction of cast-in-place concrete shall be in accordance with the pertinent recommendations contained in ACI Manual of Concrete Practice of 300 Group.

3.02 CONCRETE

Concrete shall be truck-mixed, ready-mixed concrete conforming to the applicable portions of ASTM C94. Materials shall be proportioned by weighing. The Contractor shall be responsible for producing concrete of the specified characteristics.

Concrete shall be delivered to the site of work, and discharge shall be completed within 1-1/2 hours after introduction of the water to the mixture.

3.03 FABRICATION OF REINFORCING STEEL

Reinforcing steel shall not be bent or straightened in a manner which will injure the material. Bars with kinks or with bends not shown shall not be used. Heating or welding bars shall be performed in accordance with AWS D1.4. Bars shall not be welded at the bend. Tack welding of the cross bars is not acceptable.

3.04 PLACEMENT OF REINFORCING STEEL

Reinforcing steel shall be placed in accordance with CRSI standards.

Reinforcing steel shall be positioned accurately and secured against displacement by using annealed iron wire or clips at intersections and shall be supported by concrete or metal chairs, spacers or metal hangers. Steel rods and pegs may be used to support reinforcing steel on rock foundations. Reinforcing steel shall be placed in such a manner as to not damage waterproofing membrane or plastic lining which have been previously applied or constructed. Reinforcing steel shall be bent or slightly relocated where necessary to clear waterstop. Reinforcing steel shall not be placed on fresh concrete or forced into fresh concrete.

Positioning support of embedded items shall not be welded to the reinforcement. Additional reinforcement may be provided for this purpose.

3.05 CONVEYING AND PLACING CONCRETE

A. CONVEYING CONCRETE

Concrete shall be conveyed from the mixer to the forms in accordance with ACI 301, Chapter 8. Concrete which has segregated in conveying shall be removed from the site of the work.

B. PLACING CONCRETE

1. General

Concrete shall be placed in accordance with ACI 301, Chapter 8, and ACI 304, Chapter 6. Pumped concrete shall be the class and consistency specified in Paragraph 03301-2.02.

2. Placing Concrete in Hot Weather

In hot weather, concrete shall be placed in accordance with ACI 305R.

3. Placing Concrete in Cold Weather

In cold weather, concrete shall be placed in accordance with ACI 306R.

3.06 CONCRETE FORMWORK

Formwork shall be installed in accordance with ACI 347.

3.07 CURING AND SEALING

Concrete shall be kept wet continuously for a minimum of 10 days after placement. Absorptive mats or fabric may be used to retain moisture during the curing period. Repairs or treatment of concrete surfaces shall be coordinated so that interruption of the curing will not be necessary. Concrete surface temperature shall be maintained between 50 degrees F and 80 degrees F for at least five days.

After 48 hours of water cure, and except as specified below, concrete curing may be completed using a membrane curing compound. Curing compound shall not be used on concrete surfaces to be coated, waterproofed, or moistureproofed.

3.08 PROTECTION

Concrete shall be protected from injurious action by sun, rain, flowing water, frost, and mechanical injury.

3.09 INSERTS AND EMBEDMENTS

A. INSERTS

Where pipes, castings, or conduits are to pass through structures, the Contractor shall place such pipes or castings in the forms before placing the concrete, or he may provide openings in the concrete for subsequent insertion of such pipes, castings, or conduits. Such openings shall be provided with waterstops and V-Shaped construction joint and shall have a slight flare to facilitate grouting and permit the escape of entrained air during grouting.

B. EMBEDMENTS

Gate frames, gate thimbles, special castings, channels or other miscellaneous metal parts that are to be embedded in the concrete shall be set and secured in the forms prior to concrete placement. Unless otherwise specified, anchor bolts and inserts shall be embedded in concrete as shown. The Contractor shall provide inserts, anchors, or other bolts necessary for the attachment of piping, valves, metal parts, and equipment. Operators or sleeves for conduit, and other embedments, and to align accurately with equipment.

3.10 FORMED SURFACE FINISHES

A. REPAIR OF SURFACE DEFECTS

Surface defects, including tie holes, minor honeycombing or otherwise defective concrete shall be repaired in accordance with ACI 301, Chapter 9. Areas to be

patched shall be cleaned. Patches on exposed surfaces shall be finished to match the adjoining surfaces after they have set. Patches shall be cured as specified for the concrete.

3.11 SLAB FINISHES

A. GENERAL

Where finish is not specified, floor slabs shall receive steel troweling. Dry cement shall not be used on new concrete surfaces to absorb excess moisture. Edges shall be rounded to a radius of 1/2 inch. Joints shall be grooved to a radius and depth of 1/4 inch each.

B. FLOAT FINISH

Float finish shall conform to ACI 301, Section 11.7.2. Floating shall be performed with a hand or power-driven float. Floating of any one area shall be the minimum necessary to produce the finish specified. Floating shall compact and smooth the surface and close any cracks and checking of surfaces. Float finish shall be applied to surfaces of channel and tank bottom slabs and to footings.

C. STEEL TROWEL FINISH

Steel trowel finish shall conform to ACI 301, Section 11.7.3. Immediately after final troweling, the surface shall be cured and protected as specified in Paragraphs 03301-3.04 and 03301-3.05. Steel trowel finish shall be provided on floors unless specified otherwise.

D. BROOMED FINISH

Broomed finish shall conform to ACI 301, Section 11.7.4. Broomed finish shall be provided for walks, tops of walls, slabs on grade exposed to atmosphere, and where otherwise specified.

3.12 CLEANUP

Upon completion of the work and prior to final inspection, the Contractor shall clean all concrete surfaces, except outside sidewalks or paved areas and those having curing and sealing compound. Concrete cleanup slurry/water shall not be discharged to the storm drains or sewer.

SECTION 11210
REGENERATIVE BLOWERS

PART 1--GENERAL

1.01 DESCRIPTION

This section specifies regenerative blowers designed for continuous operation.

1.02 SUBMITTALS

The Contractor shall submit manufacturer's standard catalog data, motor data, certified performance curves, operation and maintenance information, and installation certification for each regenerative blower.

1.03 DELIVERY AND STORAGE

The Contractor shall be responsible for proper packaging and protection of materials to prevent damage during shipping, handling, and storage.

PART 2--MATERIALS

2.01 ACCEPTABLE PRODUCTS

Regenerative blower shall be EG&G Rotron EN-12 or approved equal. Operating conditions shall be as indicated on the drawings.

2.02 MATERIALS

Component	Material
Housing	Aluminum
Impeller	Aluminum
Manifold	Aluminum
Flanges	Cast Iron

PART 3–EXECUTION

3.01 INSTALLATION

The blower shall be aligned, connected, and installed at the locations specified in the drawings and in accordance with the manufacturer's recommendations.

3.02 FIELD TESTING

After the completion of installation, each pumping unit shall be field tested to demonstrate compliance with the performance requirements as specified. Testing procedures shall duplicate as nearly as possible the conditions of operation and shall be selected to demonstrate that the equipment is operational and free from damage. Each control device, item of mechanical, electrical, and instrumentation equipment, and control circuits shall be considered in the testing procedures to demonstrate that the equipment has been properly services, aligned, connected, calibrated, and adjusted prior to operation.

SECTION 11215
POSITIVE DISPLACEMENT BLOWERS

PART 1--GENERAL

1.01 DESCRIPTION

This section specifies positive displacement blowers designed for continuous operation.

1.02 SUBMITTALS

The Contractor shall submit manufacturer's standard catalog data, motor data, certified performance curves, operation and maintenance information, and installation certification for each positive displacement blower.

1.03 DELIVERY AND STORAGE

The Contractor shall be responsible for proper packaging and protection of materials to prevent damage during shipping, handling, and storage.

PART 2--MATERIALS

Positive displacement blowers shall be a Roots 32 or approved equal. Operating conditions shall be as indicated on the drawings.

PART 3--EXECUTION

3.01 INSTALLATION

The blower shall be aligned, connected, and installed at the locations specified in the drawings and in accordance with the manufacturer's recommendations.

3.02 FIELD TESTING

After the completion of installation, each pumping unit shall be field tested to demonstrate compliance with the performance requirements as specified. Testing procedures shall duplicate as nearly as possible the conditions of operation and shall be selected to demonstrate that the equipment is operational and free from damage. Each control device, item of mechanical, electrical, and instrumentation equipment, and control circuits shall be considered in the testing procedures to demonstrate that the equipment has been properly services, aligned, connected, calibrated, and adjusted prior to operation.

SECTION 15095
VALVES AND PIPING APPURTENANCES

PART 1–GENERAL

1.01 DESCRIPTION

This section specifies isolation values, check valves, throttling valves, meters, and gauges for drainage lines.

1.02 SUBMITTALS

Submit manufacturer's data or catalog information for each valve, meter, and gauge specified in this section.

PART 2–PRODUCTS

2.01 VALVES

A. BUTTERFLY VALVES

PVC-PP butterfly valve, Asahi/America, #1101050 or equal.

B. BALL VALVES

PVC ball valves, Asahi/America, #1005010, 1006025, and 1006030, or equal. Ball valves shall be manufactured by Jamesbury, Worcester, Jenkins or equal.

C. SAMPLE TAP/UNIVERSAL STOPCOCK

PVC, Harrington, #LC1002ST, or equal.

2.02 AIR FLOW METERS

Air flow meters shall be Dwyer 2000 Series Magnahelic differential pressure gauge used with pitot tube. Pressure gauges shall be fitted with a faceplate reading in cfm (ft^3/min).

2.03 VACUUM/PRESSURE GAUGES

Vacuum gauges shall be Dwyer Magnahelic Series 2000; die cast aluminum housing with ⅛-inch NPT high and low pressure taps. Accuracy shall be plus or minus 2% of full scale throughout range at 70°F.

2.04 BACKFLOW PREVENTERS

Not used.

2.05 AIR/VACUUM RELEASE VALVES

Air/vacuum release valves shall be designed to automatically release large amounts of air during continuous operation.

Acceptable manufacturer is Harrington or equal.

2.06 ELECTRICAL ACTUATORS

For butterfly valve.

Asahi, Electric-Series 92 Chief, or equal.

PART 3–EXECUTION

3.01 INSTALLATION

All valves, flow meters, and gauges shall be installed in accordance with the manufacturer's recommendations and according to accepted water works practice. Valves shall be installed in all cases so that handles clear all obstructions when moved from full-open to full-closed position. All gauges shall be installed in full view of the observer and clear of all destructions.

3.02 FIELD TESTING

Testing of all valves shall be in accordance with Section 02450, Air and Vapor Piping. Failure of a test due to improperly installed or defective valve shall necessitate replacement of that item and retesting at the Contractor's expense.

SECTION 16010
ELECTRICAL

PART 1–GENERAL

1.01 DESCRIPTION OF WORK

A. Service tools, equipment, etc., which are required for the complete installation of all electrical work, as indicated on the drawings and specified herein. Electrical work indicated on the drawings and/or specifications covering other trades shall conform to Division 16 of these specifications.

B. Work or equipment not indicated or specified, which is necessary for the complete and proper operation of the electrical systems, shall be accomplished without additional cost to the Owner.

C. Furnish all labor and materials required for electrical service and control connections to all the various items of equipment requiring electric or wiring service throughout the project. Coordinate with other trades for the installation of required connections and service.

1.02 REFERENCES

A. REGULATORY AGENCIES

Installation, materials, equipment and workmanship shall conform to the applicable provisions of the National Electrical Code (NEC), the National Electrical Safety Code (NESC), Occupational Safety and Health Act (OSHA), all national codes, ordinances and regulations governing the particular class of work involved and the terms and conditions of the electrical utility and other authorities having lawful jurisdiction pertaining to the work required. All modifications required by these codes, rules, regulations and authorities shall be made by the Contractor without additional charge to the Government. This Contractor shall secure all permits and licenses required for his work and shall pay all fees in connection with such permits and licenses.

B. UNDERWRITER'S LABORATORIES (UL)

All materials, appliances, equipment, or devices shall conform to the applicable standards of Underwriter's Laboratories, Inc. where such standards have been established.

C. STANDARDS

The following specifications and standards shall form a part of these specifications:

National Fire Protection Association Standards
National Electrical Code (Current Ed), NFPA 70 (NEC)
Life Safety Code (Current Ed), NFPA 101
NFPA 72-A
Occupational Safety and Health Act (OSHA)
National Electrical Safety Code (NESC)
Underwriter's Laboratories, Inc. (Standards)
American National Standards Institute (ANSI)
American Society of Testing and Materials (ASTM)
Institute of Electrical and Electronic Engineers (IEEE)
Insulated Power Cable Engineer's Association (IPECA)
National Electrical Manufacturer's Association (NEMA)

1.03 SUBMITTALS

A. The Contractor shall submit manufacturer's standard catalog data for all pumps, disconnect switches, seal-offs, and explosion-proof junction boxes.

B. Also, the Contractor shall submit a current electrician's license.

1.04 DRAWINGS

A. The drawings show the general arrangement of all conduit, outlets, equipment, etc. and shall be followed as closely as actual building construction and the work of other trades will permit. Because of the small scale of the electrical drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall investigate the structural and finish conditions affecting the work and shall arrange his work accordingly, providing such fittings, elbow, pullboxes, and accessories as may be required to meet such conditions.

B. The Contractor shall verify the dimensions governing the electrical work at the building. No extra compensation shall be claimed or allowed because of differences between actual dimensions and those indicated on the drawings.

C. Drawings and specifications shall be considered as complimentary. Work or materials called for by one and not mentioned in the other shall be provided as though treated by both.

D. In the case of conflict between drawings and specifications, the specifications shall govern.

E. Any question as to the intent of the drawings or specifications shall be referred to the Engineer, whose decision shall be final and conclusive.

F. Should the Contractor observe any conflict or variation in the plans and specifications, he shall notify the Engineer in writing not later than ten (10) days prior to bid opening. Failure to clarify such variations will result in the Contractor bearing all costs arising from electrical work necessary to resolve the conflict or variation.

G. Utility Service: The Government will provide utilities (electricity, gas and water) for the performance of this contract. Contractor will be responsible for connecting to existing Government outlets. Contractor shall conserve utilities wherever possible.

1.05 AS-BUILT DRAWINGS

During progress of the work, the Contractor shall maintain an accurate record of the installation of the system, locating each outlet, and note all circuiting deviations from the contract drawings. Upon completion of the installation, the Contractor shall transfer all record data to a single neat and legible set of blue line prints of the original drawings.

1.06 SITE VISIT

The Contractor shall visit the site prior to bidding and satisfy himself as to the conditions under which the systems are to be installed. No subsequent allowance shall be made in his behalf for failure to make such a visit.

1.07 FIELD MEASUREMENTS

The Contractor shall verify the dimensions covering the work. No extra compensation shall be claimed or allowed due to differences between actual dimensions and those indicated on the drawings. No waiver of responsibility for defective work shall be claimed or allowed due to failure to report unfavorable work conditions affecting the work.

1.08 PERFORMANCE TESTS

A. Thoroughly test all circuits for proper operating condition and freedom from grounds and short circuits before acceptance is requested. All equipment, appliances and devices shall be operated under load conditions.

B. After the interior wiring system installation is complete, and at such time as the Engineer may direct, conduct operating tests for approval. When requested, test all the wire, cable, devices, and equipment after installation, to assure that all material continues to possess all the original characteristics as required by governing codes and standards listed in these specifications.

C. Perform such other tests as required by other sections of these specifications or as requested to prove acceptability.

D. Furnish all instruments and labor for testing.

1.09 REMODELING WORK

Not used.

1.10 MISCELLANEOUS ITEMS

Miscellaneous items not covered in these specifications shall be as indicated on the drawings; installed and connected in the proper manner and as recommended by the manufacturer.

1.11 STANDARDS OF MATERIAL AND WORKMANSHIP

All material shall be new and shall bear the label of the Underwriter's Laboratories, Inc., or be listed under re-examination service. All material shall be of the best grade and latest pattern of manufacture as specified. All work shall be performed in a neat, workmanlike manner and shall present a neat mechanical appearance when completed.

PART 2--PRODUCTS

2.01 EQUIPMENT REQUIREMENTS

The electrical requirements for equipment specified or indicated on the drawings are based on information available at the time of design. If equipment furnished for installation has electrical requirements other than indicated on the electrical drawings, the Contractor shall make all adjustments to wire and conduit size, controls, overcurrent protection and installation as required to accommodate the equipment supplied, without additional change to the Government.

2.02 MATERIALS

A. All similar materials and equipment shall be the product of the same manufacturer.

B. Where no specific material, apparatus or appliance is mentioned, any first-class product made by a reputable manufacturer may be used, providing it conforms to the contract requirements and meets the approval of the contracting officer.

C. Materials and equipment shall be the standard products of manufacturers regularly engaged in the productions of such material and shall be the manufacturer's current and standard design.

D. Altitude: Equipment affected by altitude shall perform satisfactorily for the function intended at the altitude of the project site.

2.03 CHANGES

No changes shall be made in the electrical work as shown and herein specified, unless such changes are authorized in writing by the Engineer and such authorization shall contain a statement covering the amount of the charges involved in the change.

2.04 SUBSTITUTIONS

Substitutions may be authorized only upon written approval from the Engineer. Where materials are proposed to be substituted in lieu of the items specified, substitutions shall be equal in quality, workmanship and design. The burden of proof of equality of materials shall be placed upon the Contractor. Samples of all materials proposed for substitution shall be submitted to the Engineer, when requested, for approval.

2.05 SHOP DRAWINGS

A. Shop drawings shall be furnished for all equipment and materials. They shall be furnished by the Contractor. Where equipment will be furnished "as specified," a statement to that effect is sufficient. Where substitutions are proposed, complete data must be furnished showing performance, quality, and dimensions.

B. The Contractor shall submit to the Engineer a complete descriptive and technical data list for all items of material furnished under this contract. Complete outlines, dimensions, electrical services, control diagrams, electrical characteristics of special nature, or critical to the installation and pertinent data required for installation shall be shown. Failure to submit this information can be the basis for disapproval.

C. All descriptive and technical data and shop drawings shall bear signed certification that they have been carefully examined and found to be correct with respect to dimension, space availability, non-interference with other trades and that the equipment complies with all the requirements of these specifications.

D. After receiving approval on the make and the type of materials, the Contractor shall order such materials in sufficient time to prevent any delay or changes on the job.

PART 3–EXECUTION

3.01 GENERAL

Fabrication, erection and installation of the complete electrical system shall be done in a first class workmanlike manner by qualified personnel experienced in such work and shall proceed in an orderly manner so as not to hold up the progress of the project. This shall check all areas and surfaces where electrical equipment material is to be installed, removed or relocated and report any unsatisfactory conditions before starting work.

Commencement of work signifies this Contractor's acceptance or existing conditions. In the acceptance or rejection of the finished installation, no allowance will be made for lack of skill on the part of workmen.

3.02 EQUIPMENT

A. Equipment and materials furnished by the Contractor shall fit the spaces allocated for them. Should the equipment which the Contractor proposes to install require space conditions other than indicated on the drawings, it shall be the Contractor's responsibility to reconcile the available space with the equipment and make any changes required to accommodate the equipment. All required changes shall be made at the Contractor's expense.

B. All equipment shall be installed in accordance with the manufacturer's recommendations.

3.03 COORDINATION

The electrical plans, if shown, are diagrammatic, but shall be followed as closely as actual construction and the work of other trades will allow. Such minor changes as are necessary to make the electrical work conform to the work of other trades and to the building shall be made without cost to the Owner.

3.04 CIRCUITS AND FEEDERS

Circuits and feeders shall be as shown and no deviations from the indicated outlet-circuit grouping will be permitted, except by approval of the Engineer.

3.05 CONDUITS

The plans do not give exact details as to the elevations of conduits, exact locations, etc., and do not show all off-sets, bends, junction boxes and other installation details. The Contractor shall carefully lay out his work at the site to conform to details of installation.

3.06 LOCATION OF EQUIPMENT AND OUTLETS

The approximate locations of power outlets, etc., are indicated on the drawings; however, they are not intended to give complete and exact information. Determine the exact location after thoroughly examining the general building plans and by actual measurements during construction, subject to the approval of the Engineer.

3.07 IDENTIFICATION AND SIGNS

Mark each individual motor controller, disconnect switch, transformer and remote control device to identify each item with its respective service. Marking may be stenciled on the enclosure or adjacent surface in utility areas. Provide nameplates in finished areas.

3.08 PROTECTION OF MATERIALS AND EQUIPMENT

A. This Contractor shall be responsible for the protection of all materials and equipment under this section of the work, whether incorporated into the building or note.

B. The Contractor shall provide protection for all work done where necessary and will be responsible for all damage done to property during the construction. The above protection shall be maintained while the work is in progress. In no case shall dirt, grit, etc. be ground into the floor finish or coverings.

C. The Contractor shall provide space for storage of materials and equipment at ground level.

3.09 CUTTING AND REPAIRING

Cutting and repairing shall be the responsibility of the Contractor. Coordinate to prevent unnecessary cutting and repairing. Lay out and locate equipment, openings and chases. Install sleeves, inserts, and supports.

3.10 WARRANTY

All equipment and workmanship to be furnished under this contract shall be guaranteed for a period of one year from the date of final acceptance thereof against defective materials, design and workmanship. Upon receipt of notice from the Engineer or failure of any part of the guaranteed equipment during the guarantee period, the affected part or parts shall be replaced promptly with new parts by and at the expense of the Contractor. The labor incident to the installation of these replacements shall be furnished by the Contractor.

3.11 PRODUCT HANDLING

Use all means necessary to protect electrical materials and equipment before, during and after installation and to protect the installed work of other trades. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no extra cost to the Government.

DANIEL B. STEPHENS & ASSOCIATES, INC.
ENVIRONMENTAL SCIENTISTS AND ENGINEERS

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FINAL DRAFT

Remedial Design Report For Oil/Water Separator - Former Liquid Waste Disposal Pit Area ENRON-Hobbs Natural Gas Processing Plant

Prepared for

ENRON Operations Corp.

Houston, Texas

October 5, 1994

6020 ACADEMY NE • SUITE 100 • ALBUQUERQUE, NM 87109 • (505) 822-9400

TABLE OF CONTENTS

Section	Page
1. INTRODUCTION	1
2. SITE BACKGROUND	2
2.1 Site Hydrogeology	2
2.2 Previous Investigations	5
3. DISTRIBUTION OF CONTAMINANTS	12
3.1 Soil Contamination	12
3.2 Ground-Water Contamination	19
4. JUSTIFICATION OF REMEDIAL TECHNOLOGIES SELECTED	22
4.1 Soil Vapor Extraction	23
4.2 Air Sparging System	25
4.3 Prognosis of System Performance	27
5. REMEDIAL DESIGN	32
5.1 System Description	32
5.2 Design Assumptions	34
5.3 Design Requirements	35
5.3.1 SVE System Design	35
5.3.2 Air Sparge System Design	36
5.3.3 Vent/Sparge Well Construction	37
6. SYSTEM OPERATION AND MAINTENANCE, PERFORMANCE MONITORING, AND REPORTING PLAN	40
6.1 System Startup, Operation, and Maintenance	40
6.2 System Performance Monitoring	40
6.3 Sampling Procedures for Soil Vapors and Ground Water	42
6.4 Performance Monitoring Schedules	43
6.5 System Evaluation	44
6.6 Reporting Requirements	45
7. REFERENCES	46

LIST OF FIGURES

Figure		Page
1	Site Map	3
2	Locations of Soil Borings, Monitor Wells, and Geologic Cross Sections	4
3	Geologic Cross Section A-A'	6
4	Geologic Cross Section B-B'	7
5	Regional Water Table Elevations	8
6	Local Water Table Elevations on January 10, 1994	9
7a	Estimated Extent of Actionable Soil Contamination 0 to 10 Feet in Depth	14
7b	Estimated Extent of Actionable Soil Contamination 10 to 20 Feet in Depth	15
7c	Estimated Extent of Actionable Soil Contamination 20 to 30 Feet in Depth	16
7d	Estimated Extent of Actionable Soil Contamination 30 to 40 Feet in Depth	17
8	Cross-Sectional Profiles of Total Petroleum Hydrocarbons in Soil	18
9	Estimated Extent of Actionable BTEX in Ground Water	20
10	SVE Applicability Nomograph	24
11	VENTING Model Results For UVZ SVE System Time For 90% Mass Removal	30
12	VENTING Model Results For LVZ SVE System Time For 90% Mass Removal	31
13	Generalized Vent/Sparge Well Detail	38
14	Remediation System Installation Schedule	41

LIST OF TABLES

Table		Page
1	Estimated Volume and Mass of Contaminants in the OWS/DP Area	19
2	Physical and Chemical Properties of Primary Organic Contaminants Present in the OWS/DP Area	26
3	Summary of VENTING Model Input Parameters	28

LIST OF APPENDICES

Appendix	
A	Summary of Soil and Ground-Water Analytical Results
B	System Design Calculations

1. INTRODUCTION

Daniel B. Stephens & Associates, Inc. (DBS&A) was contracted by ENRON Operations Corporation, Houston, Texas, to design and install a system to remediate hydrocarbon contamination identified in both soil and ground water in the vicinity of the oil/water separator and the former liquid waste disposal pit (collectively OWS/DP) at its Hobbs Natural Gas Processing Plant. This work is being performed under directive from the New Mexico Oil Conservation Division (OCD) and in accordance with Sections VI.A, VI.B, and VII of the OCD *Guidelines for Remediation of Leaks, Spills and Releases* (1993).

Remediation of contaminated soil will be accomplished by soil vapor extraction (SVE) and enhanced in situ bioremediation. Contaminated ground water will be remediated by enhanced biodegradation facilitated by air sparging below the water table. These remedial technologies will constitute an integrated sparge and vent system that will focus on physical extraction of contaminants during the initial period of remediation and in situ biodegradation of contaminants near the completion of remediation.

This remedial design report is divided into 6 sections, of which this introduction is the first. Section 2 provides the site background, including the local hydrogeology and a brief summary of previous investigations. The distribution of contaminants at the site, including the volume and an estimate of the contaminant mass, is provided in Section 3. Justification and rationale for the selection of remedial technologies is presented in Section 4. Section 5 presents design considerations and the proposed remedial design. Finally, Section 6 summarizes system operation and maintenance (O&M) requirements and system performance and evaluation monitoring requirements.

2. SITE BACKGROUND

The ENRON Hobbs Natural Gas Processing Plant is located approximately 8 miles west of Hobbs, New Mexico along State Highway 62 (Figure 1). In the past, the plant wastewater was discharged to the OWS/DP. Historical photographs indicate that excess wastewater was stored at two evaporation ponds next to the OWS/DP. A skimmer pond directly south of the evaporation ponds was used to remove petroleum hydrocarbons. Apparently, these operations resulted in petroleum hydrocarbons entering the subsurface. A comprehensive discussion of site conditions is provided in the *Supplemental Environmental Investigation* [SEI] *Report* (DBS&A, 1994).

2.1 Site Hydrogeology

The site is underlain by unconsolidated and consolidated sand, silt, and clay deposits, that regionally comprise the Pliocene Ogallala Formation. The Ogallala Formation is the major freshwater-bearing formation in southeastern New Mexico. Locally, the base of the Ogallala Formation is approximately 170 feet below ground surface (bgs) based on the available driller's logs for the site water supply wells. The depth to ground-water near the OWS/DP is approximately 44 feet bgs based on January 1994 measurements by DBS&A (1994). Therefore, the saturated thickness of the Ogallala aquifer is approximately 125 feet at the site.

The Ogallala Formation near Hobbs, New Mexico is often capped by a layer of well hardened caliche which grades into underlying fine-grained sands (Nicholson and Clebsch, 1961). Strongly cemented sand units encountered at approximately 20 feet beneath the site are thought to mark the transition from alluvium into the Ogallala Formation. Nicholson and Clebsch (1961) have described the Ogallala Formation as chiefly a calcareous, unconsolidated sand that contains some clay, silt, gravel, and beds of well consolidated sandstone.

The information gathered from soil borings installed by previous investigators (Figure 2) (DBS&A, 1994; IT Corporation, 1993; Metric Corporation, 1991) is consistent with the above lithologic description. As determined during the SEI (DBS&A, 1994), the lithology under the site is as follows:

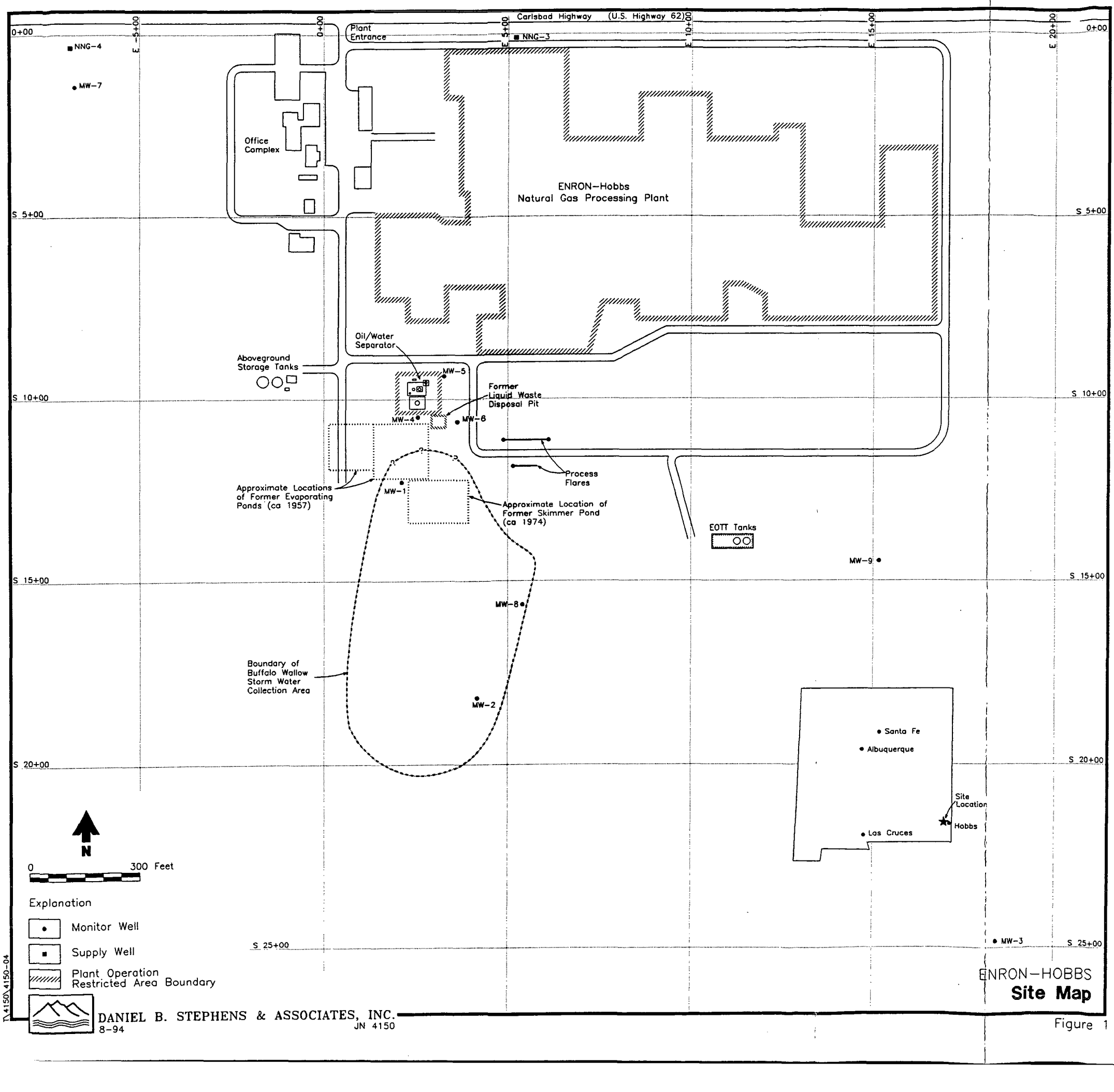
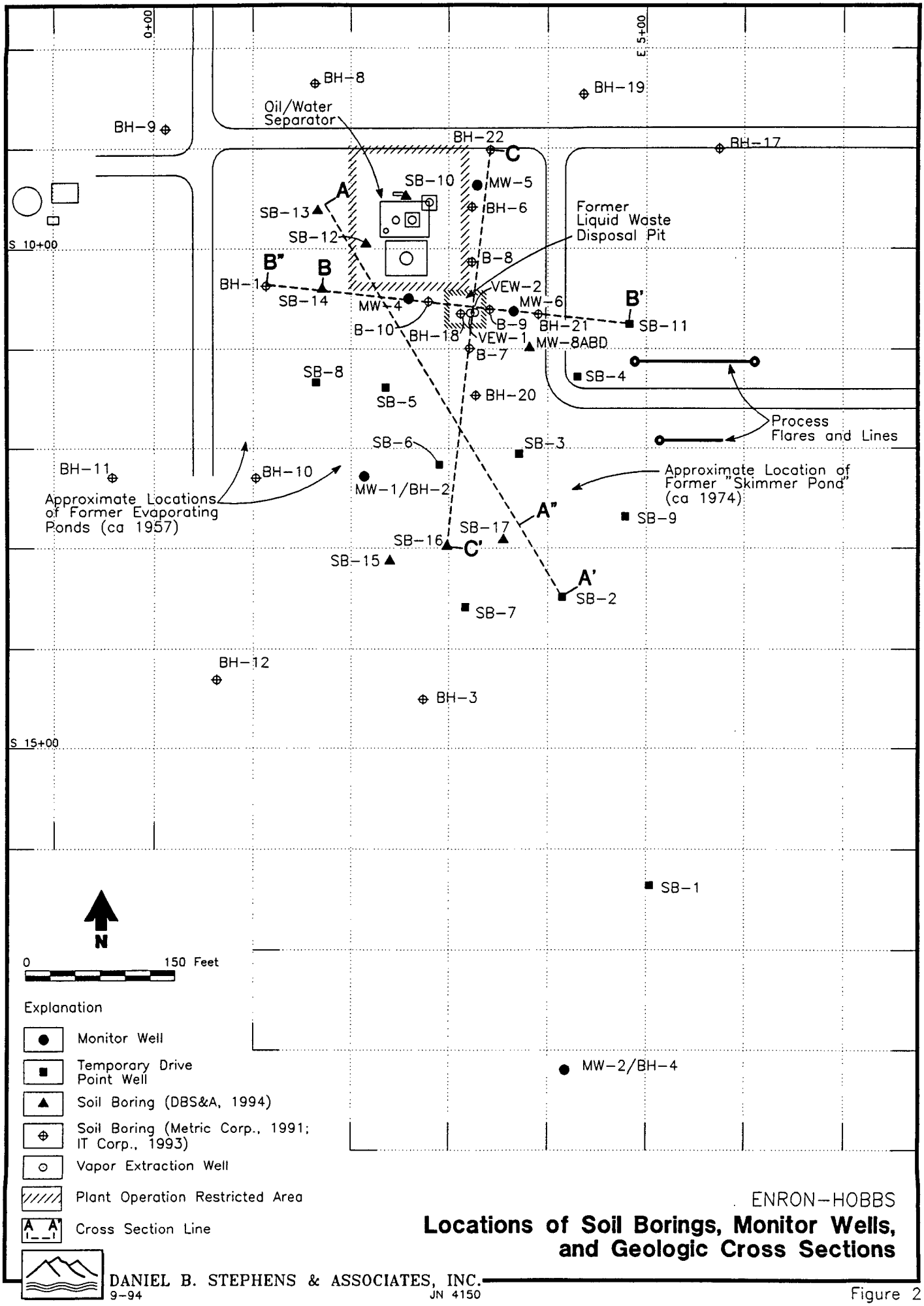

Carlsbad Highway (U.S. Highway 62)
Plant Entrance
NNG-4
NNG-3
MW-7
Office Complex
ENRON-Hobbs Natural Gas Processing Plant
Oil/Water Separator
Aboveground Storage Tanks
MW-5
Former Liquid Waste Disposal Pit
MW-4
MW-6
Process Flares
Approximate Locations of Former Evaporating Ponds (ca 1957)
MW-1
Approximate Location of Former Skimmer Pond (ca 1974)
EOTT Tanks
MW-9
MW-8
Boundary of Buffalo Wallow Storm Water Collection Area
MW-2
Santa Fe
Albuquerque
Site Location
Hobbs
Las Cruces
MW-3
0+00
E. 5+00
0+00
E. 5+00
E. 10+00
E. 15+00
E. 20+00
0+00
S 5+00
S 10+00
S 15+00
S 20+00
S 25+00
N
0
300 Feet
Explanation
Monitor Well
Supply Well
Plant Operation Restricted Area Boundary
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Site Map

Figure 1



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Locations of Soil Borings, Monitor Wells, and Geologic Cross Sections

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Figure 2

- From the ground surface to a depth of approximately 15 to 25 feet bgs, a white to pale brown calcareous sandy silt with highly calcareous clayey lenses is encountered. The sandy silt grades into pink to light brown silty sand and fine sands that contain numerous strongly cemented layers of sandstone.

- At depths of approximately 25 to 35 feet bgs, a light brown to reddish-brown, clean, mostly unconsolidated, well sorted sand with fewer and thinner cemented layers is present.

- From approximately 35 to 45 feet bgs, a light brown to reddish-brown, clean, unconsolidated, well sorted sand with infrequent cemented layers is present.

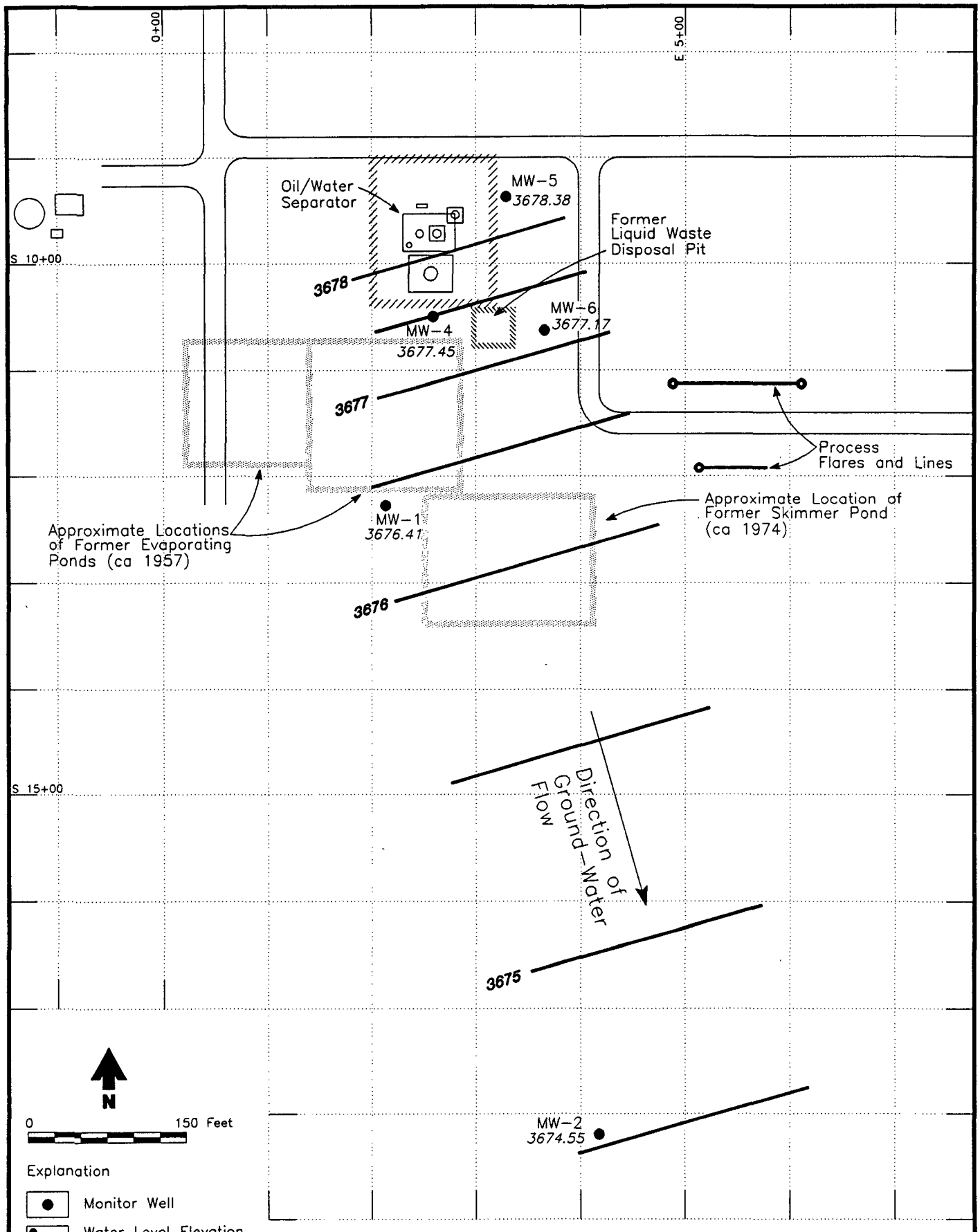
Geologic cross sections depicting the site stratigraphy are presented in Figures 3 and 4. The locations of the cross sections are shown on Figure 2.

A map of regional water table elevations (DBS&A, 1989) is provided in Figure 5. Water levels measured in the monitor wells during the SEI (DBS&A, 1994) confirm that the ground-water flow is toward the southeast (Figure 6); however, the on-site direction of ground-water flow appears to be approximately 25 degrees south of the regional flow direction. The discrepancy in flow direction may result from the scale of the investigation area along with heterogeneities in geology that affect the local flow direction.

The local hydraulic gradient decreases in the direction of flow from approximately 0.008 ft/ft near the oil/water separator to 0.003 ft/ft beneath the Buffalo Wallow (Figure 6). The change in gradient is likely the result of increasing hydraulic conductivity toward the southeast. Hydraulic testing conducted by IT Corporation (1993) indicated that the upper Ogallala Aquifer is moderately permeable with hydraulic conductivity values on the order of 10^{-3} cm/sec. This value is consistent with published values for fine sands (Freeze and Cherry, 1979).

2.2 Previous Investigations

Previous hydrogeologic investigations identified impacts to soil and ground water underlying the OWS/DP area (Metric Corporation, 1991; IT Corporation, 1993). The first hydrogeologic



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Local Water Table Elevations on January 10, 1994

Figure 6

investigation at the site was performed by Metric Corporation in 1991. Metric advanced a total of 23 borings (BH-1 through BH-23) and installed 3 monitor wells (MW-1 through MW-3) to investigate subsurface conditions throughout the plant area. Approximately 16 of their borings were located in the area surrounding the former waste pit (Figure 2). Soil samples collected during drilling were analyzed for total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene, and xylene (BTEX). New Mexico Oil Conservation Division regulatory guidelines (OCD, 1993) for these compounds were exceeded only in BH-18, which is located at the approximate center of the former liquid waste disposal pit.

Metric also analyzed soils and ground-water samples collected from monitor wells MW-1, MW-2, and MW-3 for purgeable halocarbons and the O-, F-, and M- series of the toxic characteristic leaching procedure (TCLP). For each sample, the analyses indicated that purgeable halocarbons were below detectable concentrations, and the TCLPs for organic and inorganic constituents yielded concentrations that were below regulatory standards.

In 1992 IT Corporation conducted an investigation of the area immediately surrounding the former disposal pit (IT Corporation, 1993). They found stained soils and hydrocarbon vapors in borings MW-4, MW-6, B-8, B-9, B-10, and VEW-2. TPH and BTEX results for soils and ground water indicated that the area close to the former pit contained organic concentrations above regulatory guidelines for soil. In addition to their drilling program, IT conducted two pilot SVE tests and performed tests to determine the hydraulic properties of the upper portion of the aquifer.

Although these first two investigations identified the existence of soil and ground-water contamination near the former pit, the full horizontal extents of soil and ground-water contamination resulting from prior releases within the OWS/DP area were not defined until 1994 when DBS&A conducted an SEI (DBS&A, 1994). The DBS&A investigation included the following work:

- Ground-water samples were collected and analyzed from five existing monitor wells and one plant supply well.

- Ten temporary drive point wells were drilled and installed for acquisition of additional ground-water samples.

- Seven soil borings were drilled to determine the extent of impacted soils.

- One upgradient monitor well was installed and sampled to establish background water quality.

- The location of new borings were surveyed and the current ground-water flow direction determined.

- A comprehensive summary of soil and ground-water analytical data was compiled and presented.

The results of the SEI are the foundation for part of the contaminant distribution discussion provided in Section 3.

A comprehensive summary of soil analytical results from all three of the above investigations is provided in Appendix A (Table A-1). Likewise, Tables A-2 and A-3 in Appendix A provide a summary of ground-water analytical results for organic and inorganic constituents, respectively.

At the same time DBS&A was conducting the SEI, Geoscience Consultants Limited (GCL), under contract to GPM Gas Corporation, installed monitor well MW-8 in order to establish the downgradient extent of ground-water contamination.

On March 29, 1994, ENRON and DBS&A met with the OCD to discuss remediation options for the site. At that time, OCD requested that monitor wells MW-1 through MW-8 be resampled to complete the background water quality database. These wells were resampled by DBS&A on May 14 through 21, 1994. A summary of analytical results from this sampling event is provided in Tables A-4a and A-4b.

3. DISTRIBUTION OF CONTAMINANTS

Soil and ground-water contamination at the ENRON-Hobbs Natural Gas Processing Plant is centered about the OWS/DP. The primary contaminants of concern are BTEX and gasoline-range TPH released to the subsurface near the OWS/DP. High molecular weight organic compounds such as chlorinated solvents and aliphatic hydrocarbons heavier than C_{20} have not been detected in the ground-water samples analyzed during any of the previous investigations. The contaminants of concern at the site, while not derived from gasoline, are those contained in gasoline.

OCD has set regulatory guidelines for the actionable concentrations of TPH and BTEX compounds in soil. For soil, the regulatory guideline for TPH is 100 ppm and for total BTEX it is 50 ppm. Field photoionization detector (PID) measurements of 100 ppm or greater can also be used to determine actionable soils (New Mexico OCD, 1993).

Actionable contamination in ground water is defined as any concentration that exceeds standards set forth in Section 3-103 of the New Mexico Water Quality Control Commission (NMWQCC) Regulations. The NMWQCC ground-water standards for BTEX and inorganics are listed in Tables A-2 and A-3; the standards for benzo(a)pyrene, naphthalene, and monomethyl-naphthalenes are listed in Table A-4b. Neither OCD nor the NMWQCC has provided guidelines for the maximum allowable concentration of TPH in ground water.

The following sections provide an accounting of the distribution of hydrocarbons in the subsurface soils and ground water. In addition, a discussion of secondary inorganic standards that are exceeded is provided.

3.1 Soil Contamination

Based on the field observations and analytical chemistry results from borings drilled during the previous investigations, it appears that the lateral extent of actionable hydrocarbon contamination

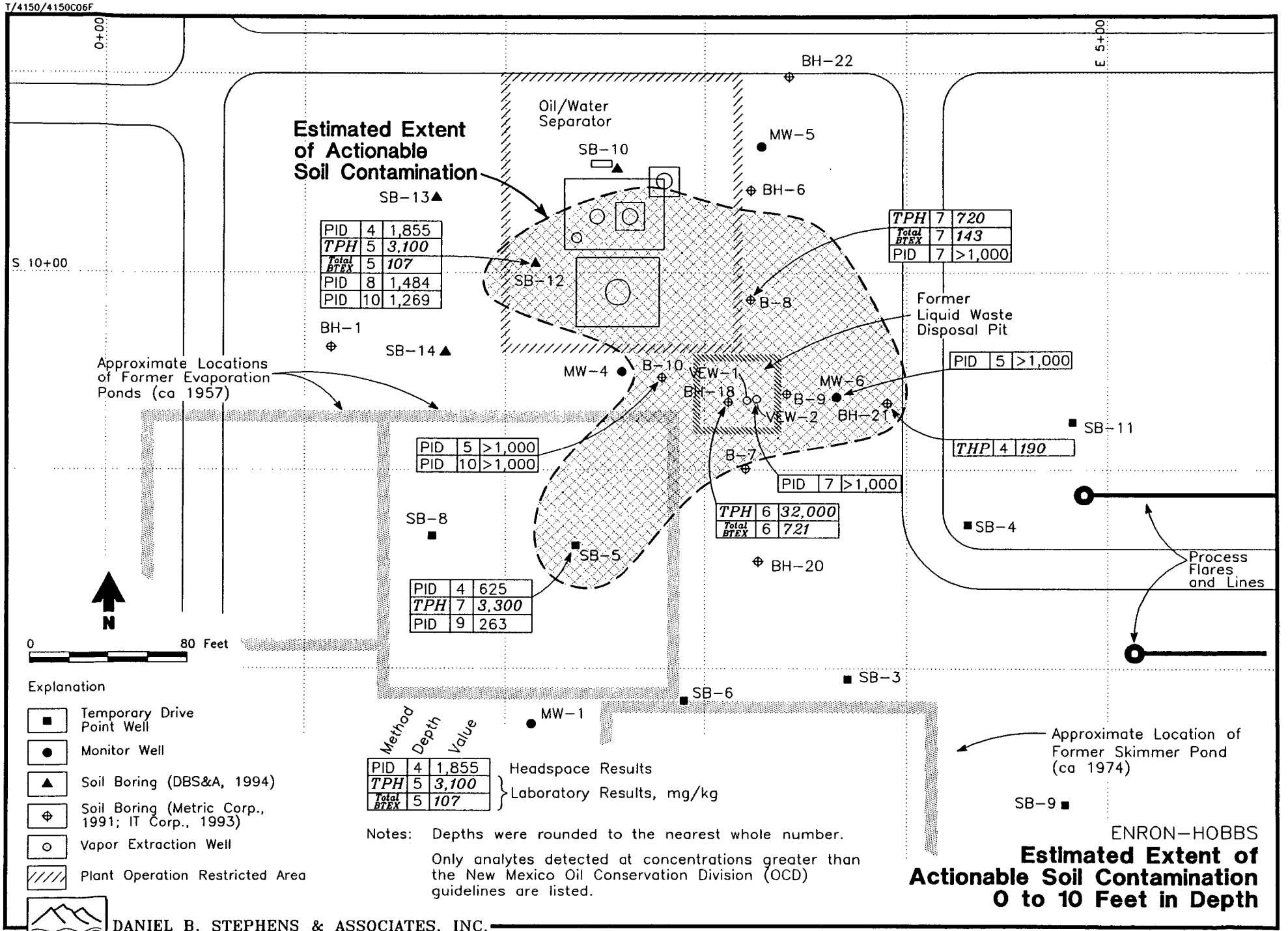
is limited to a roughly circular area, on the order of 200 feet in diameter, centered between the current oil/water separator and the former waste pit. Figures 7a through 7d provide the estimated extent of actionable soil contamination in the vicinity of the OWS/DP over the intervals 0 to 10, 10 to 20, 20 to 30, and 30 to 40 feet bgs, respectively. The areas of contamination depicted in Figures 7a through 7d are based on the OCD regulatory guidelines of 100 mg/kg for TPH and/or 100 ppmv measured in soil headspace.

Near the OWS/DP, soils are impacted from approximately land surface to the water table. The vertical extent of impacts in soil decreases non-uniformly as one moves away from the source area. It appears that hydrocarbons have spread laterally through the soil profile along preferential pathways due to local heterogeneities. Cross-sectional profiles of actionable soils are given in Figure 8 (Figure 2 shows the locations of the cross sections).

DBS&A estimated the volume of contaminated soil and the mass of contaminants by graphically integrating the areas of TPH contamination for the depth intervals depicted in Figures 7a through 7d. Once the areal extent of contamination for each depth interval was established, the contaminated soil volume was obtained by multiplying the contaminated area by the 10-foot vertical thickness of each depth interval. No attempt was made to contour TPH concentrations within each layer for the purpose of integrating the contaminant mass, as the bulk of the data was obtained by the field headspace method, which is not quantitative. To estimate the mass of contaminants, the geometric mean TPH concentration was determined from laboratory analyses for samples collected from each respective layer. Once the mean TPH concentration was obtained, the mass of contaminants in a given layer was estimated by multiplying that mean TPH concentration by the assumed field bulk density of the soil and by the volume of contaminated soil. A summary of contaminant volumes and masses is provided in Table 1.

The total estimated mass of soil contaminants listed in Table 1, 54,888 kg, appears to be a reasonable value. Converted to gallons of fluid with a density of 6 lb/gal (typical of gasoline), the computed mass of contaminants represents approximately 20,000 gallons in the liquid phase.

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Notes: Depths were rounded to the nearest whole number.

Only analytes detected at concentrations greater than the New Mexico Oil Conservation Division (OCD) guidelines are listed.

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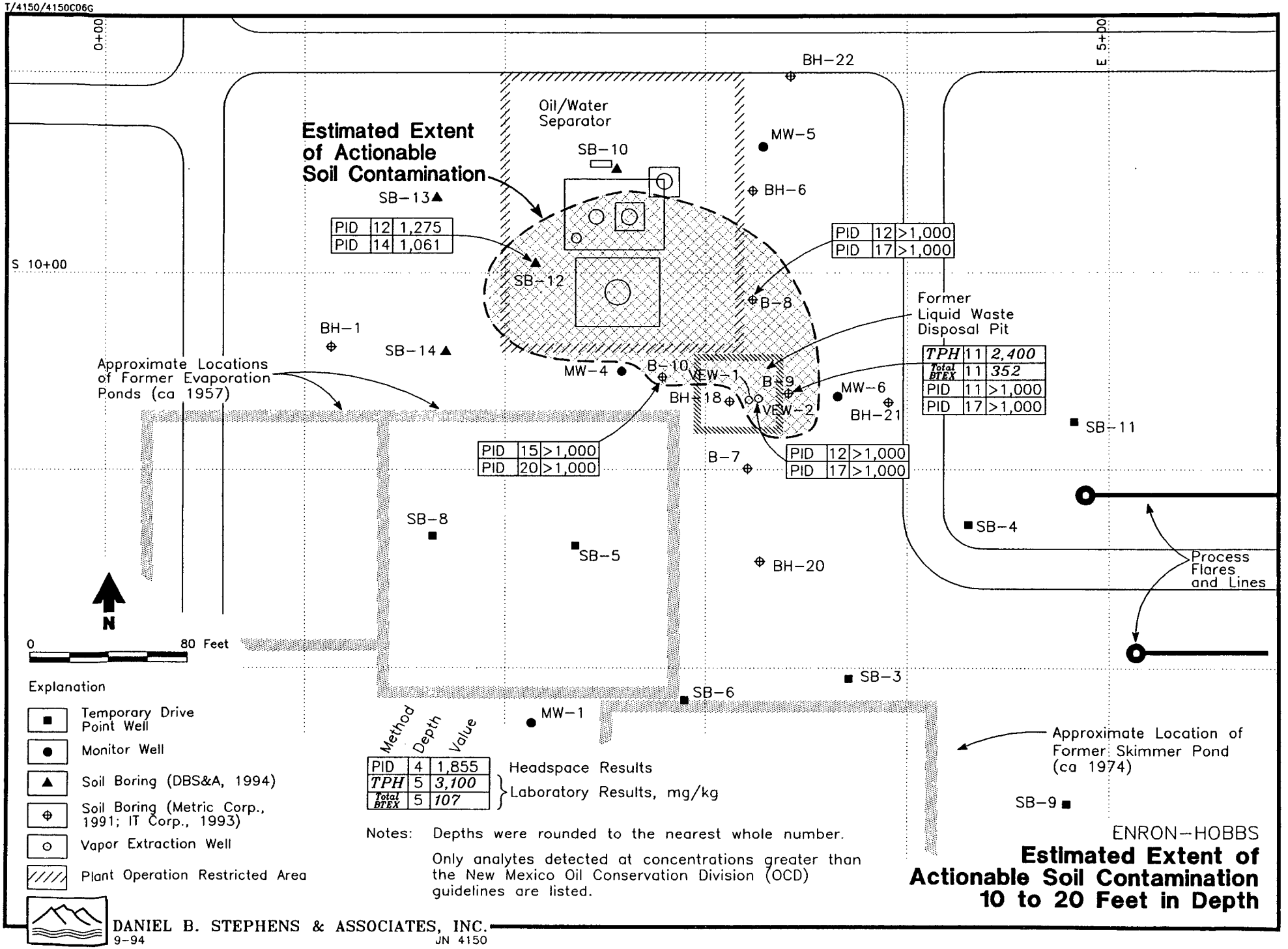
Estimated Extent of Actionable Soil Contamination 0 to 10 Feet in Depth

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Figure 7a

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Notes: Depths were rounded to the nearest whole number.

Only analytes detected at concentrations greater than the New Mexico Oil Conservation Division (OCD) guidelines are listed.

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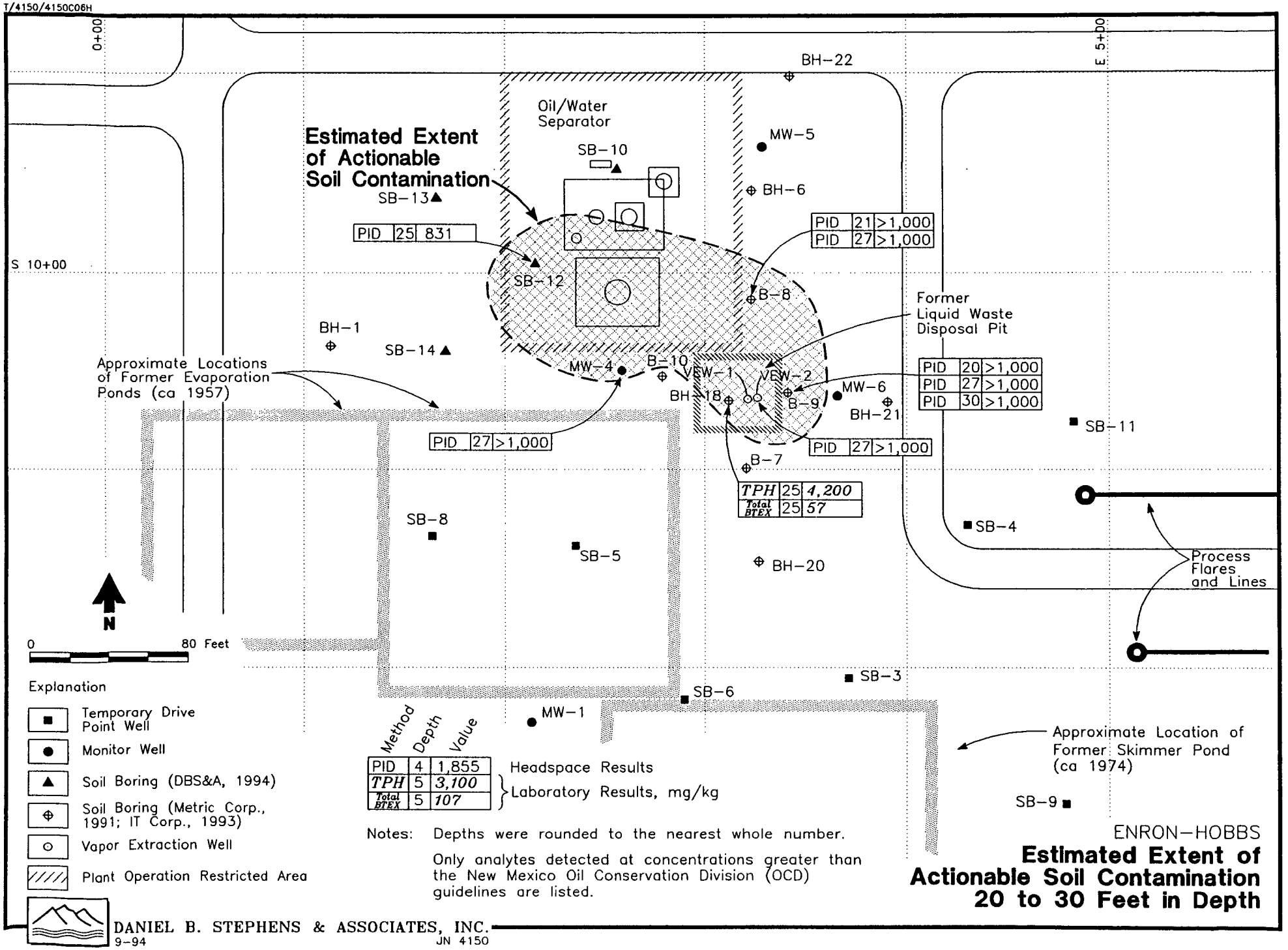
Estimated Extent of Actionable Soil Contamination 10 to 20 Feet in Depth

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Figure 7b

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Notes: Depths were rounded to the nearest whole number.

Only analytes detected at concentrations greater than the New Mexico Oil Conservation Division (OCD) guidelines are listed.

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Estimated Extent of Actionable Soil Contamination 20 to 30 Feet in Depth

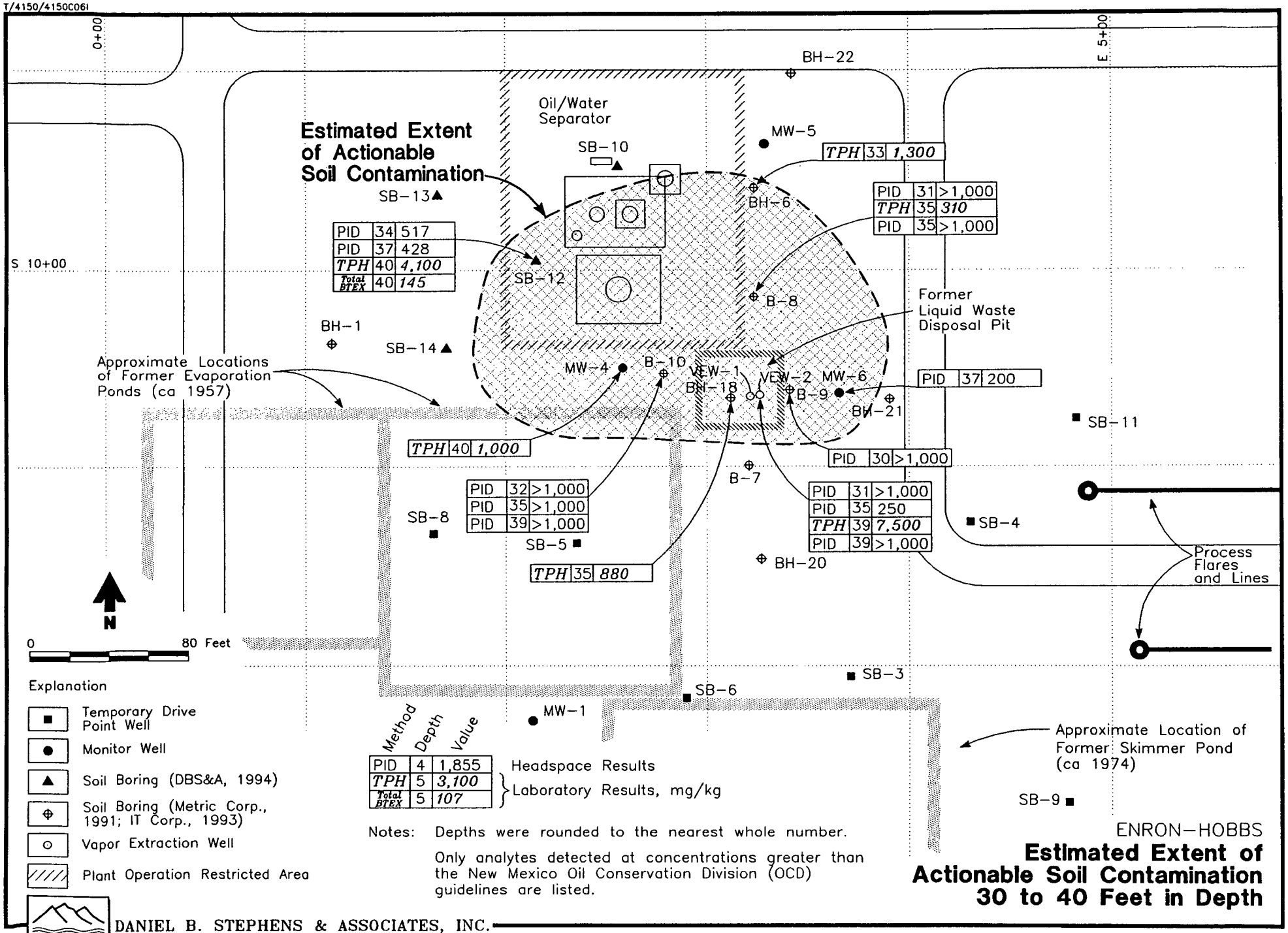
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Figure 7c

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Notes: Depths were rounded to the nearest whole number.

Only analytes detected at concentrations greater than the New Mexico Oil Conservation Division (OCD) guidelines are listed.

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Estimated Extent of Actionable Soil Contamination 30 to 40 Feet in Depth

Figure 7d

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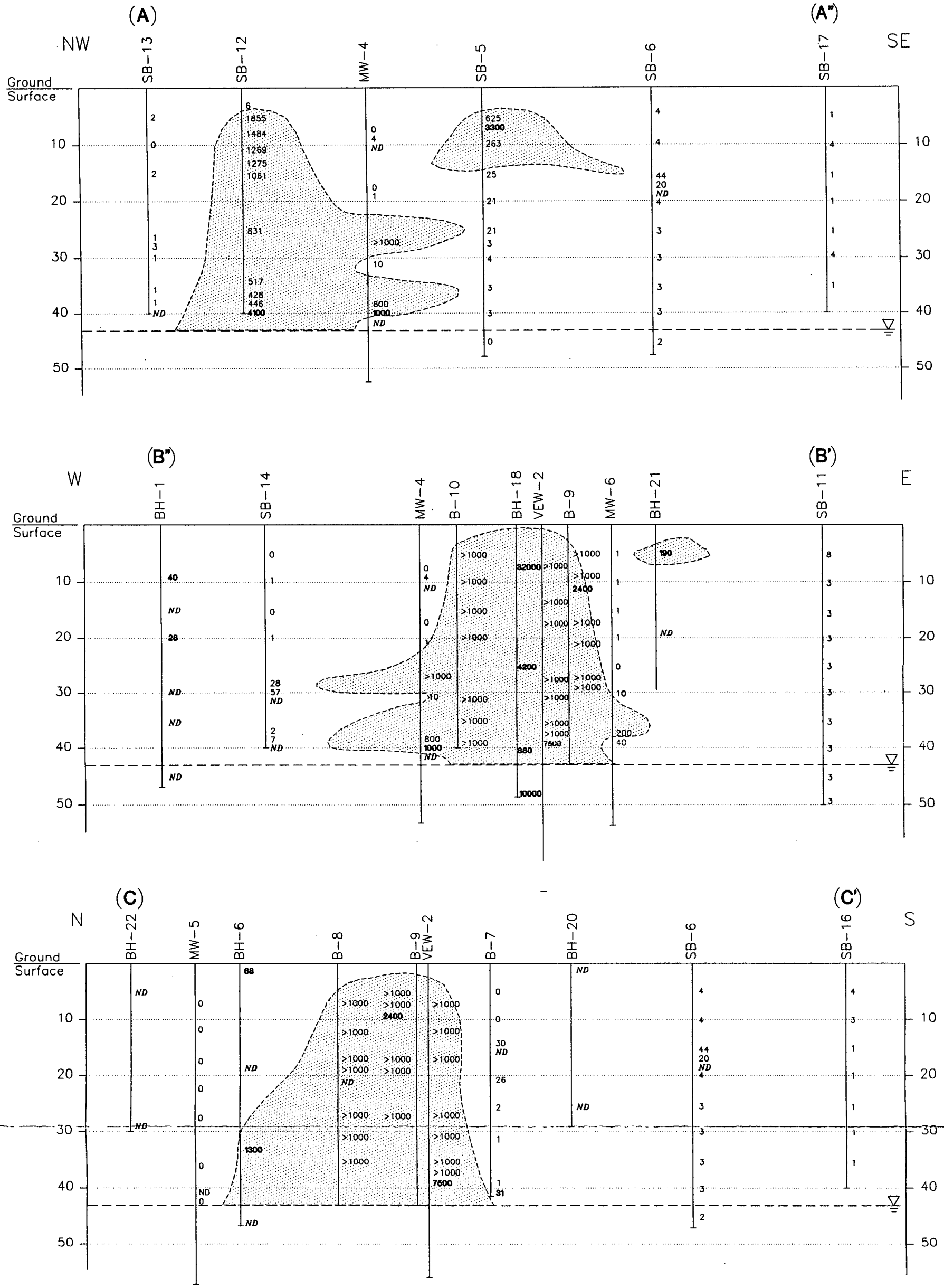


Figure 8

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Cross-Sectional Profiles of Total Petroleum Hydrocarbons in Soil

Table 1. Estimated Volume and Mass of Contaminants in the OWS/DP Area

Interval (feet bgs)	Area of Actionable Contamination (square feet)[1]	Volume (cubic feet)	Average Contaminant Concentration (mg/kg)[2]	Estimated Contaminant Mass (kg)[3]
0-10	27,000	270,000	1,330	20,469
10-20	12,900	129,000	1,480	10,882
20-30	13,400	134,000	1,868	14,268
30-40	23,500	235,000	692	9,269
Totals	NC	768,000	1,263	54,888

[1] Areas obtained by graphical integration
[2] Average concentrations are geometric means of sample analyses from each layer
[3] Based on an assumed field bulk density of 2.0 gm/cm^3

NC = Not computed

3.2 Ground-Water Contamination

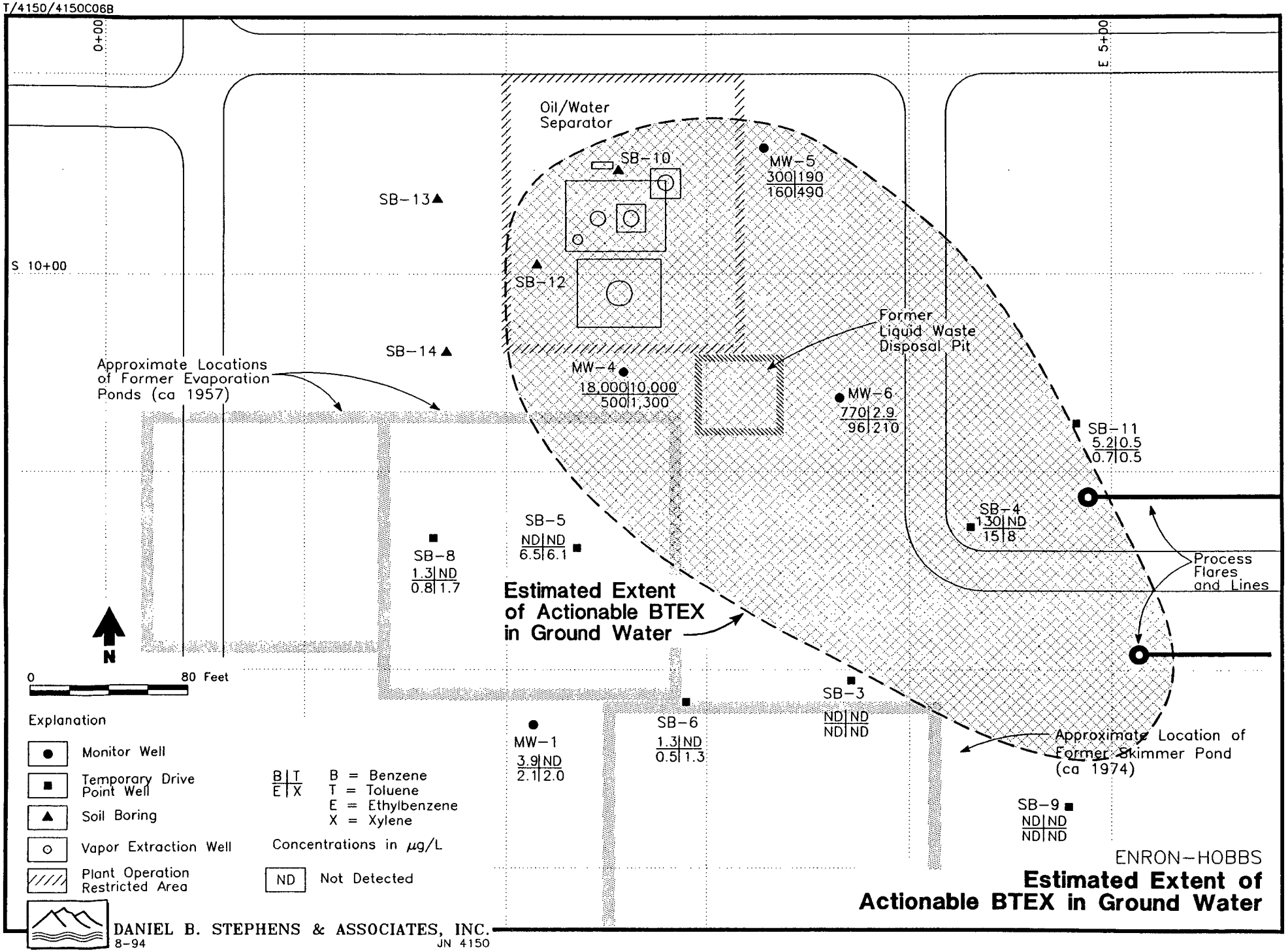
The estimated extent of actionable BTEX in ground water is shown in Figure 9. Benzene, which has the lowest regulatory standard (10 µg/L) of the BTEX constituents, has been used to determine the extent of actionable ground water. Actionable benzene is limited to a plume about 200 feet wide extending from the vicinity of the oil/water separator about 420 feet to the southeast. The discrepancy between the plume orientation indicated in Figure 9 and the measured ground-water flow direction (Figure 6) may be a local phenomenon caused by the low hydraulic gradient. Alternatively, the orientation of the benzene plume may be controlled by the distribution of impacted soils that are releasing benzene to ground water.

The plume is estimated to be about 10 feet thick as calculated using the following equation:

$$h = b\,\Delta x$$

where: h = Plume thickness
b = Dispersion parameter
Δx = Plume length

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Estimated Extent of Actionable BTEX in Ground Water

Figure 9

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8-94

JN 4150

In its calculation DBS&A used an assumed dispersion parameter (b) of 0.044 (Florida Petroleum Council, 1986) and an approximate plume length (Δx) of 225 feet (corresponding to the portion of the plume covered by the air sparging system [Section 5.1]), thus arriving at a plume thickness of 9.9 feet. DBS&A's experience on other light non-aqueous phase liquid (LNAPL) sites supports this estimated plume thickness. Nonetheless, split spoon samples will be collected below the water table in order to verify the vertical extent of contamination.

There is no actionable benzo(a)pyrene at the site. Actionable total naphthalene concentrations (naphthalene plus monomethylnaphthalenes) appear to be restricted to roughly the same area as actionable BTEX. Concentrations of total naphthalene in samples from monitor wells MW-4 and MW-6 were above the standard of 30 µg/L. However, these wells are within the estimated area of BTEX contamination depicted in Figure 9.

The results from inorganic chemical analyses (Tables A-3 and A-4a) indicate that concentrations of chloride and TDS in well MW-4 exceed NMWQCC standards. The high concentrations of TDS detected in MW-1, MW-4, and MW-6 are attributable to elevated concentrations of chloride, sulfate, and bicarbonate. The elevated anion concentrations may have resulted from local recharge of waste and storm water near the oil/water separator and former evaporation ponds. Nonetheless, the TDS concentrations within the proximal portion of the plume are all less than twice the NMWQCC standard of 1,000 mg/L.

Metals concentrations in ground water appear to be below regulatory standards with the exception of barium, iron, and manganese within the estimated area of BTEX contamination. Barium exceeds the NMWQCC standard in monitor wells MW-5 and MW-6. Iron exceeds the standard in monitor wells MW-4 and MW-6. Finally, manganese in excess of standards is observed in monitor wells MW-5 and MW-6.

4. JUSTIFICATION OF REMEDIAL TECHNOLOGIES SELECTED

DBS&A has selected two remediation technologies for the ENRON-Hobbs Natural Gas Processing Plant OWS/DP area:

- Soil vapor extraction (SVE) for remediation of the hydrocarbon-contaminated subsurface soils

- Air sparging for remediation of the hydrocarbon-contaminated ground water

Initially a preliminary design was prepared that focused on bioventing—that is, enhanced in situ degradation of contaminants with minimal if any physical removal of contaminants. However, given the (1) substantial mass of contaminants at the site, (2) likelihood of the presence of non-aqueous phase liquid in the soil column (and resultant toxic soil conditions minimizing microbial activity), (3) high capital costs in drilling and piping installation, (4) increased estimated cleanup time and commensurate O&M costs, and (5) overall complexity and inefficiency of the system, it was decided to use a combination of SVE and air sparging technologies.

Soil vapor extraction in concert with air sparging (commonly referred to as "sparge and vent") are well established technologies for remediation of C_4 to C_{16} range hydrocarbons (i.e., gasoline to diesel range) through physical and biological means. During the initial phase of operation, the system will provide high physical contaminant mass removal rates while simultaneously oxygenating the subsurface, thereby stimulating in situ microbial degradation of contaminants. As the remediation nears completion, physical contaminant removal rates will decline substantially; however, microbial degradation will continue until final closure criteria have been met.

The SVE system has been designed to address all of the actionable soil contamination in the vicinity of the OWS/DP. However, the air sparging system will only address actionable ground-water contamination in the vicinity of actionable soil contamination. Ground-water contamination in the distal portion of the plume will be allowed to naturally attenuate through dispersion and passive biodegradation. The rationale for this approach is two-fold:

- The local ground-water velocity is low: using the reported hydraulic conductivity of 10^{-3} cm/sec or 2.8 ft/day (IT Corporation, 1993), the measured gradient of 0.008 ft/ft (DBS&A, 1994) for the distal portion of the plume, and an assumed effective porosity of 0.25, the computed pore velocity is approximately 33 feet per year.

- Contaminant source removal in soil and ground water near the OWS/DP will greatly accelerate attenuation of the remainder of the contaminant plume.

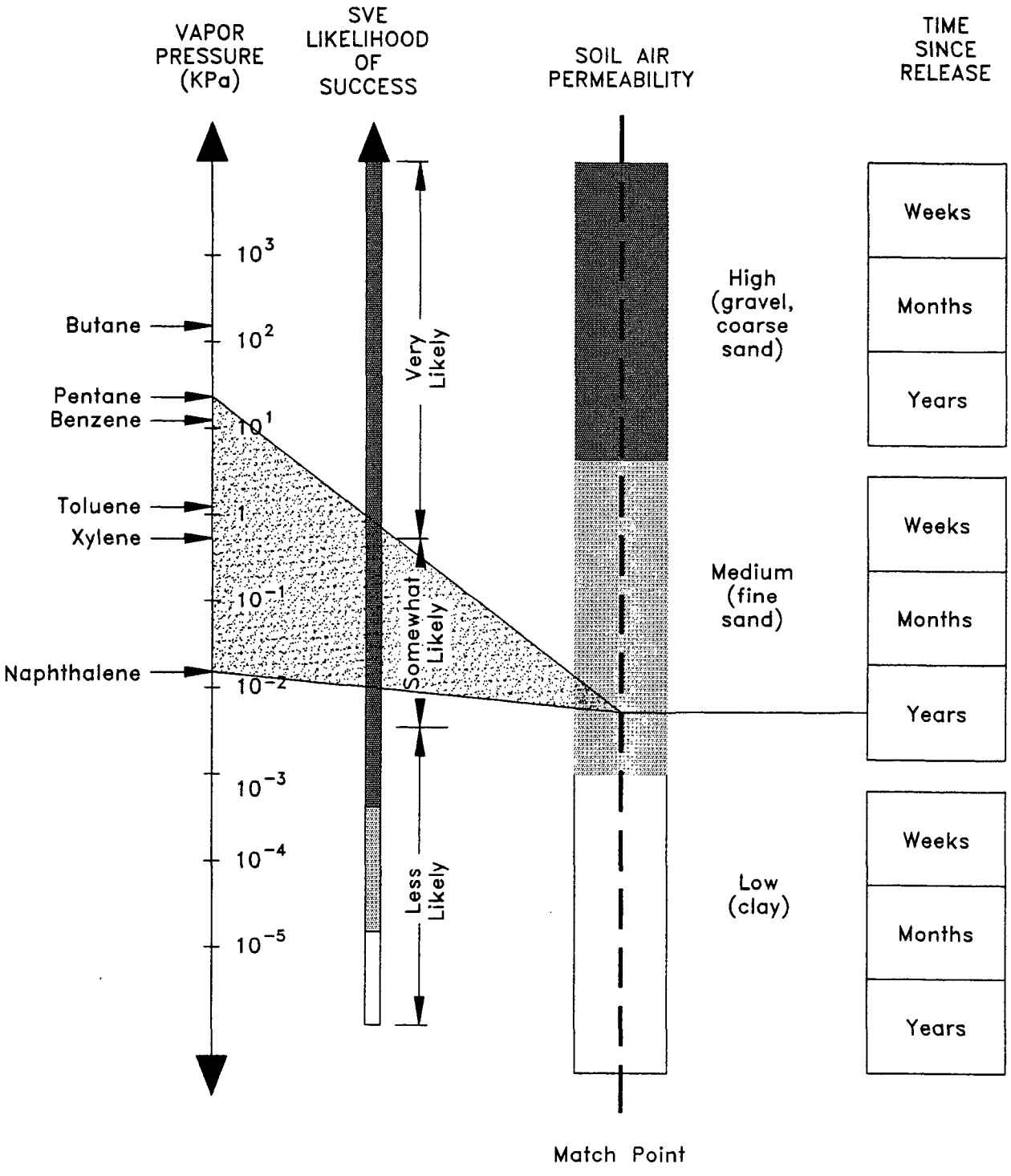
Monitor well MW-8, which is a clean downgradient well, will be used as a monitoring point to ensure acceptability of this approach.

Inorganic constituents at the site that exceed NMWQCC standards (i.e., TDS, iron, manganese, barium, chloride, sulfate) will not be actively remediated. Rather, a passive approach will be pursued whereby inorganics will either (1) disperse to levels below standards as they are advected downgradient or (2) precipitate in situ (in the case of iron and manganese) in response to changing redox conditions as the sparge and vent system operates. Again, in that a passive approach is being proposed, monitor well MW-8 will be established as a monitoring point to ensure acceptability of this approach.

Sections 4.1 and 4.2 provide a brief description and justification for the selection of the two remedial technologies.

4.1 Soil Vapor Extraction

SVE is an accepted, cost-effective technique for removing volatile organic compounds (VOCs) from contaminated soils (Pedersen and Curtis, 1991). This technology uses a known amount of vacuum applied to the subsurface to remove contaminants present in the vapor phase. The success of SVE technology depends upon the tendency of the targeted chemical to exist in the vapor phase in a subsurface environment. Figure 10 is a nomograph presented by Pedersen and Curtis (1991) that relates a contaminant's vapor pressure, the soil air permeability, and the time since release to show the likelihood of success of an SVE system.



Source: Pedersen and Curtis. 1991

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SVE Applicability Nomograph

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Figure 10

The volatility of the contaminant is directly associated with how much of that contaminant will partition into the vapor phase. The parameters that best describe a contaminant's volatility are its vapor pressure and Henry's law constant. Contaminants with a vapor pressure of 0.07 kiloPascal (KPa) or greater would be expected to volatilize to a significant degree and, therefore, to respond to SVE technology (Pedersen and Curtis, 1991). Henry's law constant describes the relative tendency for a chemical in solution to exist in the vapor phase and thus is more appropriately used outside the free product zone, where chemicals are likely to exist in solution with pore water. A high value of Henry's law constant is desirable for the successful application of the SVE technique (Pedersen and Curtis, 1991).

Applicable chemical properties of the organic contaminants present at the site are listed in Table 2. With the exception of naphthalene, all the relevant contaminants have vapor pressures more than 0.07 KPa and high values of Henry's law constant. Thus, Figure 10 shows that SVE at the site should be very successful for C_5-C_8 aliphatics and BTEX and somewhat successful for naphthalene.

The SVE system will provide the additional advantage of stimulating in situ biodegradation of contaminants. During operation of the SVE system, air is circulated through the subsurface, thereby providing additional oxygen to the indigenous microbial populations. The increase in microbial aerobic degradation of contaminants can be observed by comparing the O_2 to CO_2 ratio. During operation of the SVE system, the O_2 to CO_2 ratio should increase and eventually reach a plateau.

4.2 Air Sparging System

Air sparging is an innovative technology that has been applied successfully at several sites contaminated with hydrocarbons (Marley et al., 1992; Johnson et al., 1993; Brown et al., 1994). The remedial processes associated with air sparging are as follows:

- *In situ air stripping.* Transfer of VOCs from aqueous to vapor phase takes place due to the passage of air bubbles through ground water.

Table 2. Physical and Chemical Properties of Primary Organic Contaminants Present in the OWS/DP Area

Contaminant	Molecular Weight (g/mol)	Pure Vapor pressure (KPa @ 25°C)	Water Solubility (mg/L @ 25°C)	Henry's Law Constant (KPa m^3/mol)
Benzene	78.11	12.7	1,780	0.55
Toluene	92.13	3.8	515	0.67
Ethylbenzene	106.2	1.27	152	0.80
p-Xylene	106.2	1.17	185	0.71
m-Xylene	106.2	1.10	162	0.70
o-Xylene	106.2	0.882	175	0.50
Naphthalene	128.18	0.011	30	0.046
1-Methylnaphthalene	142.20	0.0088	28.5	0.045
2-Methylnaphthalene	142.20	0.009	24.6	NA
Ethane (gaseous)	30.7	3,990	60.4	50.6
Propane (gaseous)	44.11	941	62.4	71.6
Isobutane (gaseous)	58.13	357	48.9	120.0
n-Butane (gaseous)	58.13	243	61.4	95.9
Isopentane	72.15	92.6	47.8	138
n-Pentane	72.15	68.4	38.5	125
C_6 (n-hexane)	86.17	20.2	9.5	170
C_7 (n-heptane)	100.21	6.11	2.93	230
C_8 (n-octane)	114.23	1.88	0.66	300

Source: Mackay and Shiu, 1981.

- *In situ biodegradation.* Aerobic biodegradation will be enhanced by providing additional oxygen to the indigenous microbial populations.

For successful application of the air sparging system, the contaminants should have high strippability, high volatility, and biodegradability. The contaminants of concern present at the site all have one or more of these characteristics (Nyer and Suthersan, 1993). Therefore, air sparging is expected to perform effectively at this site.

The bioassessment report produced by IT Corporation (1994) provides the background nutrient concentrations, pH values, moisture contents, bacterial density, mineral content in ground water, and bacterial stimulation tests for vadose- and saturated-zone soils and ground water. In addition, DBS&A collected soil vapor samples from well VEW-2 in August 1994 and obtained analytical results for fixed gases. After reviewing the IT Corporation report and soil vapor analytical results, DBS&A believes that in situ biodegradation will be an effective treatment technology for any residual concentrations of heavier contaminants (e.g., naphthalenes) that may persist after one to two years of physical removal of the lighter contaminants (e.g., BTEX) by SVE and air sparging systems.

4.3 Prognosis of System Performance

Modeling was conducted using VENTING, a finite difference code developed by Environmental Systems & Technologies, Inc. (ES&T), to evaluate the anticipated performance of the SVE system and estimate the time required for remediation. VENTING estimates the temporal recovery of hydrocarbons for an SVE system operating under steady gas flow and isothermal conditions. The following paragraphs describe the VENTING model, the input data, and the modeling results.

The VENTING model was developed based on methods described by Johnson and others (1990a,b). This model assumes an equilibrium partitioning among the gas phase, water phase, solid phase, and residual organic liquid. It does not include a biodegradation component. Composition files for typical fresh and weathered gasoline are supplied with the VENTING model. These composition files include vapor pressure at 20°C, boiling point, pure component aqueous solubility, octanol-water partition coefficient, molecular weight, and initial mass fraction for each component. Total hydrocarbon recovery and component recovery versus time and composition of the remaining fluid are computed by a finite difference solution.

Hydrocarbon recovery from both the upper vadose zone (UVZ) and lower vadose zone (LVZ) SVE systems described in Section 5 was simulated using VENTING. Table 3 provides the list of parameters and their corresponding values used to simulate the effectiveness of both the UVZ and LVZ SVE systems.

Table 3. Summary of VENTING Model Input Parameters

Parameter	Value	Source
General		
Venting period	10 years	
Temperature of soil	60°F	IT Corp., March 1993
Composition file	--	Weathered gasoline, ES&T
f_{OC}	0.005	Karickhoff et al., 1979
Volumetric water content	0.0375	Estimated
Air filled porosity	0.2115	Estimated
Total porosity	25%*	Estimated
Air permeability	1.0×10^{-11} ft^2	Estimated
Radius of vacuum well and backfill	10 in	Design assumption
Radius of influence	35 ft	Calc. 4150-CE-4**
Upper Vadose Zone SVE Prediction		
Air flow rate	525 cfm	Calc. 4150-CE-1**
Spill quantity	31,351 kg	Calc. 4150-CE-5**
Contaminated soil volume	399,000 ft^3	Calc. 4150-CE-5**
Thickness of screened interval	15 ft	Design assumption
Absolute pressure at vacuum well	28.78 ft of H_2O	Calc. 4150-CE-1**
Radius of contaminated zone	110 ft	Estimated
Lower Vadoze Zone SVE Prediction		
Air flow rate	280 cfm	Calc. 4150-CE-1**
Spill quantity	23,537 kg	Calc. 4150-CE-5**
Contaminated soil volume	369,000 ft^3	Calc. 4150-CE-5**
Thickness of screened interval	20 ft	Design assumption
Absolute pressure at vacuum well	26.78 ft of H_2O	Calc. 4150-CE-1**
Radius of contaminated zone	110 ft	Estimated

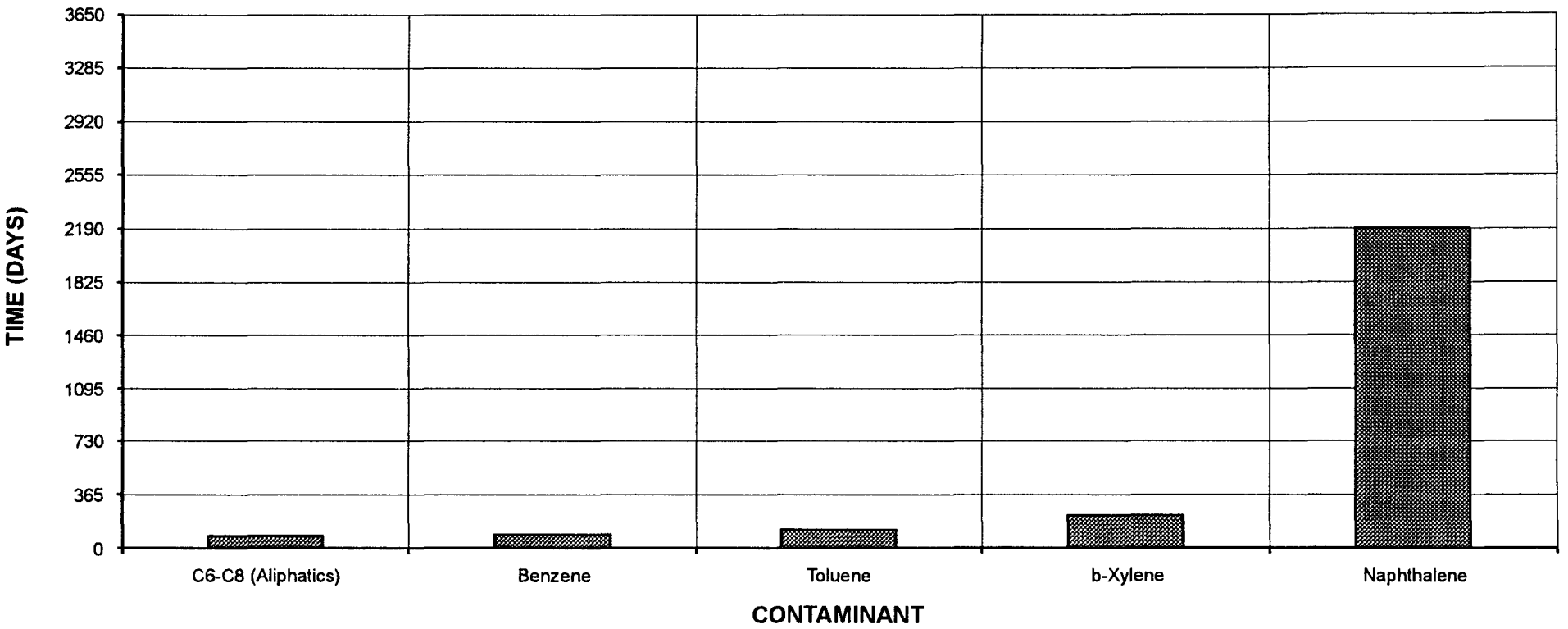
* IT Corporation laboratory results for total porosity range from 30 to 40% for two samples that were collected. For the computer simulation, a conservative value of 25% was selected to reflect loss of porosity due to cementation and local heterogeneities.

** Calculations are provided in Appendix B.

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The output from VENTING provides mass removal rates for individual contaminants. Figures 11 and 12 show the predicted time required to remove 90% of the estimated mass of aliphatics (C_6, C_7, C_8), benzene, toluene, xylene (BTX), and naphthalene for the UVZ and LVZ SVE systems, respectively. The model results show that aliphatics and BTX would be removed within one year; naphthalene and other heavier components of gasoline may take 8 to 10 years to remove. Since polynuclear aromatic hydrocarbons such as naphthalene are amenable to biodegradation, the model results suggest that the focus of remediation should shift from physical extraction of compounds to enhanced in situ biodegradation between 1.5 and 2.5 years into system operation.

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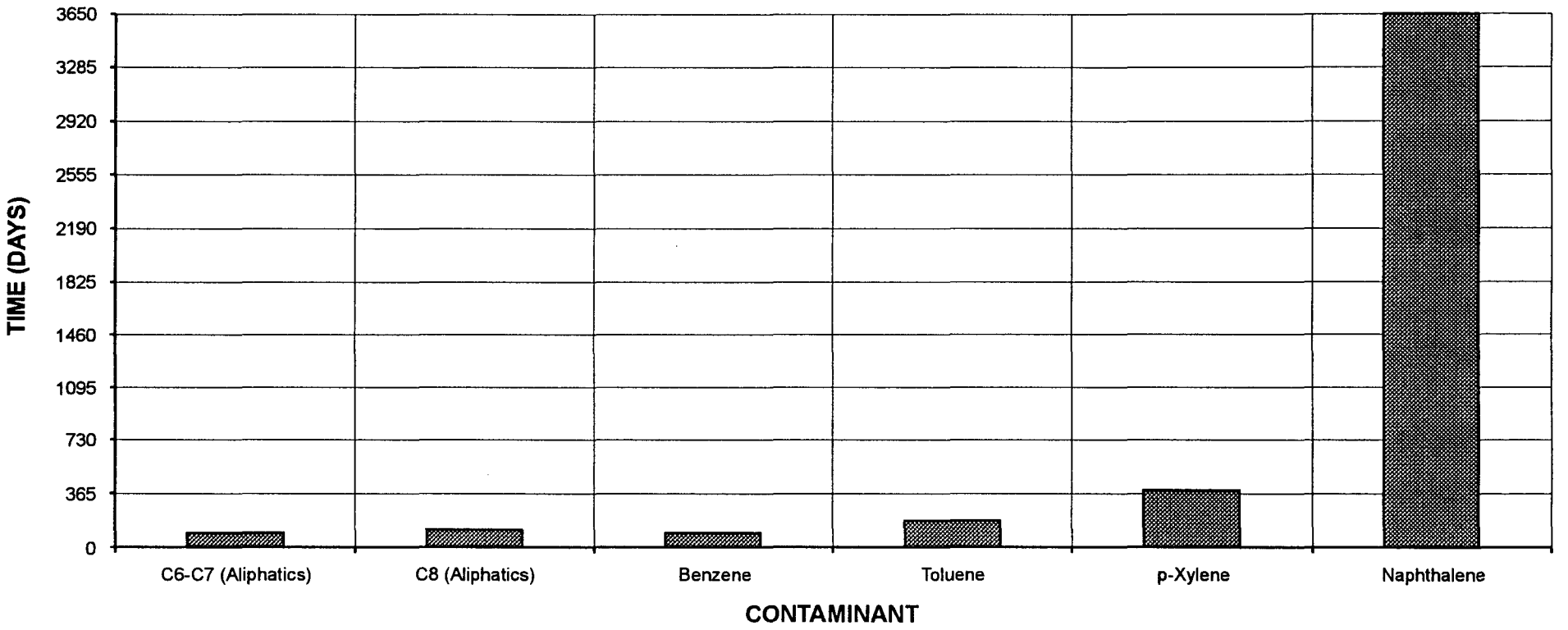
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Venting Model Results for UVZ SVE System
Time for 90% Mass Removal

Figure 11

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Venting Model Results for LVZ SVE System
Time for 90% Mass Removal

Figure 12

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5. REMEDIAL DESIGN

This section provides a general description of the remediation system for the OWS/DP area and the assumptions and requirements involved in the design.

5.1 System Description

The remediation system for the OWS/DP area consists of an SVE system for addressing soil contamination and an air sparging system to promote cleanup of ground-water contamination. During the first year or two, operation of the system will focus on physical vapor extraction of contaminants, while simultaneously stimulating indigenous bacteria for in situ biodegradation of contaminants. At such time that the rate of physical removal of contaminants is no longer cost-effective, the focus of operation will shift to bioventing. The sparging process will be an integral component throughout both phases of operation.

The bioventing phase will consist of injecting and/or extracting air and/or soil vapors at lower flow rates primarily for maintaining suitable oxygen levels in the subsurface. The SVE system design will allow conversion to bioventing with minimal difficulty. However, specifics regarding conversion to bioventing are not discussed in this report. Numerous factors that are presently unknown (i.e., mass of contaminants remaining, spatial extent of contaminants remaining, population of indigenous bacteria after application of SVE and addition of nutrients, etc.) will greatly influence the final configuration of a converted system.

The SVE system has been designed to effect remediation in two discrete zones: the upper vadose zone (UVZ), which extends from ground surface to approximately 20 feet bgs, and the lower vadose zone (LVZ), which extends from approximately 22 to 25 feet bgs to the water table (approximately 42 feet bgs). As determined by previous investigations (Section 2), the UVZ is separated from the LVZ by a layer of indurated sand with an apparently low air permeability. The results of the SVE pilot test performed by IT Corporation (1993) provided strong evidence that the zones should be treated independently. The UVZ pilot test well (VEW-1 on Figure 2) produced approximately 7 cubic feet per minute (cfm) of air flow per linear foot of screen at approximately 30 inches water column vacuum. In contrast, the LVZ pilot test well (VEW-2) produced only

3.5 cfm of air at 55 inches water column vacuum. Therefore, the system employed must be capable of operating in two distinctly different flow rate/vacuum regimes. In order to fulfill this requirement more cost-effectively, UVZ and LVZ wells will be constructed in common boreholes in a "nested" configuration as discussed in Section 5.3.3.

The air sparging well network proposed for the site will be coincident with the SVE well field in that they too will be nested with the SVE wells in a common borehole. It is unlikely that this configuration will provide overlapping zones of influence; however, it is felt that too many sparge wells would be required to ensure such overlap, compromising the system's cost-effectiveness. Nonetheless, each sparge point will produce an individual "plume" of elevated dissolved oxygen (DO). The oxygen plumes emanating from a number of sparge points will result in a larger coalesced plume of elevated DO, thereby ultimately providing oxygen to microbes throughout the plume.

During operation, the SVE system will extract contaminated soil vapors from the SVE wells through application of a vacuum to the wells. The source of the vacuum for both the UVZ and LVZ systems will be a single regenerative blower with a response curve that will satisfy the flow rate/vacuum requirements of both zones. After the vapors pass through the regenerative blower, they will be conveyed to one of the plant processes or an oxidizer for thermal destruction in compliance with State of New Mexico air quality regulations. Since it has not been determined which process will receive the waste stream, the design as prepared ends at the equipment compound. The conveyance system to the selected plant process stream will be designed at a later date.

The contaminated vapor stream will be conveyed from well to blower via dedicated piping runs. Although use of dedicated piping runs is slightly more expensive to construct, it will provide a system that is substantially more flexible in operation and/or modification. For example, such a design will allow injection into certain wells and extraction from others during the bioventing stage, if desired. Furthermore, dedicated piping runs will allow the regenerative blower, all valves, vacuum gauges, and flow meters to be centrally located in the equipment compound, providing ease in operation, maintenance, and performance monitoring.

The sparge system will be operated by a positive displacement pump located in the equipment compound. Single dedicated air lines will transport the compressed air to the sparge points. Air flow to individual sparge points will be monitored and adjusted with dedicated flow meters and valves.

Additional specifics regarding trenching requirements, construction of the compound, and electrical requirements are provided in the construction plans that accompany this report.

5.2 Design Assumptions

The following assumptions were made to facilitate completion of the system design calculations.

SVE System

- The radius of influence (R_e) of the SVE wells was computed for the LVZ assuming a homogenous stratum with fully penetrating wells.

- Based on IT's pilot test (1993), R_e is greater for the UVZ than for the LVZ; therefore, applying R_e from the LVZ to the UVZ will result in a UVZ well field that is more than sufficient with respect to complete vacuum coverage.

- Pilot test data compiled by IT Corporation (1993) were assumed to hold true for the entire site.

- Minimum air velocity in SVE piping was set at 2000 feet per minute to assure particulate entrainment.

- Air flow in SVE piping was assumed to be incompressible (Mott, 1990).

- SVE piping (polyvinyl chloride [PVC]) was considered to be smooth for determination of Moody friction factors.

Air Sparge System

- Homogenous subsurface site conditions are assumed to exist.
- Air flow in sparge piping was assumed to be incompressible (Mott, 1990).
- The vertical extent of ground-water contamination was assumed to not extend more than 10 feet below the water table.

5.3 Design Requirements

This subsection discusses the design requirements, parameters, and processes for both the SVE and air sparging systems.

5.3.1 SVE System Design

As discussed in Section 5.1, the SVE system will operate in both the UVZ and LVZ. The lower air permeability and commensurate lower flow rate of the LVZ demonstrated by the IT pilot test data (1993) require the application of a higher vacuum than does the UVZ. Operating the system in discrete zones will allow each zone to be stressed adequately to ensure effective remediation.

The IT pilot test indicated an R_e of 35 feet for the SVE wells. An R_e of 35 feet is further substantiated using formulae established by Johnson and others (1990b) (Appendix B, Calculation 1450-CE-4). Given the radius of influence and the areal extent of the soil contamination, SVE wells will be spaced roughly 60 feet apart and will be installed in 14 locations within the contaminated area to provide sufficient overlap of influence. The SVE extraction wells will be installed in two different configurations: (1) UVZ extraction/sparge wells (2 locations) and (2) a nested configuration for UVZ and LVZ extraction/sparge wells (the remaining 12 locations).

Based on IT Corporation pilot test data, extraction flow rates were determined for UVZ and LVZ wells. UVZ wells will yield 7 cfm per foot of well screen operating at a vacuum of 30 inches water column. LVZ wells will yield 3.5 cfm per foot of well screen operating at a vacuum of 55 inches

water column (Appendix B, Calculation 4150-CE-1). UVZ wells will be screened over 15 feet and yield 105 cfm per well, whereas LVZ wells will be screened over 20 feet and yield 70 cfm per well.

In order to allow flexibility in system operation, the UVZ and LVZ wells will each be divided into three well circuits. The six total circuits (three UVZ and three LVZ) can each be operated individually, thus limiting contaminant loading. Each circuit will be operated for approximately 4 hours per day. The 4-hour operating time will allow extraction of an estimated 1 to 1.5 pore volumes per circuit per day. Circuit operation will be controlled by electrically actuated ball valves operated by a programmable timer.

Pipe sizing and headloss calculations are included in DBS&A Calculation 4150-CE-1 (Appendix B). All UVZ extraction piping will be 3-inch nominal diameter schedule 80 PVC and all LVZ extraction piping will be 2.5-inch nominal diameter schedule 80 PVC. The extraction piping will extend from the SVE wellhead to the treatment compound, where the piping will enter a 5-inch nominal diameter schedule 80 PVC manifold. The maximum headloss in the UVZ circuits was determined to be approximately 9 inches of water column. The maximum headloss in the LVZ circuits was determined to be approximately 10 inches of water column.

5.3.2 Air Sparge System Design

Each of the 14 extraction/sparge well nests will be equipped with an air sparge pipe which will supply atmospheric air to the contaminated ground-water. The design flow rate for the air sparging system is 5 to 10 cfm, which falls within the recommended range for air sparging systems (Brown et al., 1994)

The system operating air pressure was determined to be 12 psi (Appendix B, Calculation 4150-CE-3). The operating pressure was determined by applying a factor of 1.5 to the minimum pressure required to induce bubbling in the sparge points. This minimum pressure is defined as the sum of the pressure required to overcome the hydrostatic pressure, the pressure drop across the sparge point, and the soil air entry pressure. The depth of the sparge point is assumed to be 10 feet below the water table, the pressure drop across the sparge point is 2.5 psi

(Kerfoot, 1994), and the soil air entry pressure is assumed to be 100 cm (39.4 inches) water column (Stephens et al., 1987).

For the specified schedule 80 PVC, the pipe size for the air sparging system was calculated to be 1 inch nominal diameter (Appendix B, Calculation 4150-CE-3). Headloss in the air supply pipes was calculated to be 3 inches water column.

The air supply pump selected is a Roots PD Blower Frame size #33. This pump operates at a pressure of 12 psi and two flow rates of 82 cfm (approximately 6 cfm per point) and 118 cfm (approximately 8 cfm per point). To protect the sparge points and the pump mechanicals, atmospheric air will be filtered for particulates before entry into the sparge system.

5.3.3 Vent/Sparge Well Construction

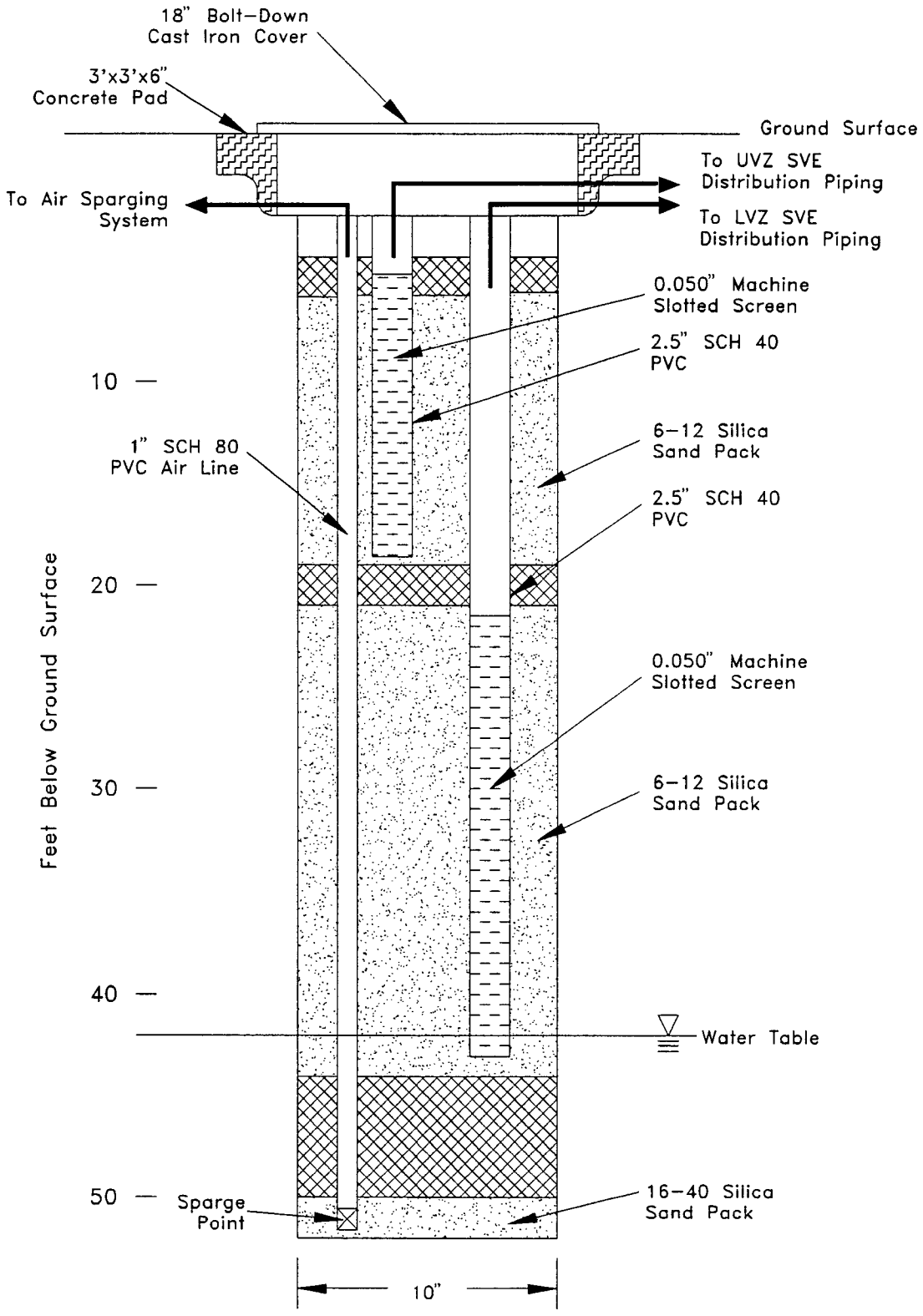
The 14 vent/sparge well clusters will be constructed in the locations depicted on the Well Field Plan of the accompanying design drawings. Each SVE/sparge well cluster will include a UVZ vent well and/or an LVZ vent well and a sparge point, all constructed in a single 10-inch-diameter borehole.

A schematic diagram of a vent/sparge well cluster is presented in Figure 13. The construction of each vent/sparge well cluster will proceed as follows:

1. A 10-inch-diameter borehole will be drilled to 52 feet bgs using the hollow stem auger method. If necessary, an air rotary drill rig will be used to drill through highly cemented layers. While drilling, split-spoon samples will be collected every 5 feet and analyzed by the field headspace method for contaminants.

2. A sparge point connected to 52 feet of 1-inch-diameter schedule 80 PVC piping will be lowered to the total depth of the borehole.

3. The borehole will be backfilled from 50 to 52 feet bgs with 16-40 silica sand. Auger flights will be retracted from the borehole as well materials are added.



Explanation

Hydrated Bentonite Plug

6-12 Silica Sand Pack

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Generalized Vent/Sparge Well Detail

Figure 13

4. A hydrated bentonite plug will be emplaced from 43 to 50 feet bgs.

5. The LVZ vent well, consisting of 20 feet of 2.5-inch-diameter, 0.050-inch machine-cut slotted schedule 40 PVC screen and 23 feet of 2.5-inch, flush-threaded schedule 40 PVC blank casing, will be emplaced in the borehole.

6. A 6-12 mesh silica sand filter pack will be emplaced from 21 to 43 feet bgs.

7. A hydrated bentonite plug will be emplaced from 19 to 21 feet bgs.

9. The UVZ vent well, consisting of 15 feet of 2.5-inch, 0.050-inch machine-cut slotted schedule 40 PVC screen and 4 feet of flush-threaded schedule 40 PVC blank casing, will be lowered to 19 feet bgs.

10. A 6-12 mesh silica sand filter pack will be emplaced from 4 to 19 feet bgs.

11. A hydrated bentonite plug will be emplaced from 2 to 4 feet bgs.

12. Each wellhead completion will consist of a 2.5-inch pressure tee connection with one leg attached to each vent well, one attached to a schedule 80 PVC vacuum/injection line, and one fitted with a screw plug.

13. The surface completion will consist of a flush-mounted 18-inch manhole set in a 3-foot by 3-foot by 6-inch-thick concrete pad.

for BTEX, TPH, and polynuclear aromatic hydrocarbons (PAHs). The analytical results obtained from the TPH analysis will help to evaluate the overall bacterial activity in the system. After 1 to 2 years of system operation it is likely that BTEX concentrations will be below regulatory standards; thus naphthalene concentrations will determine compliance with the NMWQCC regulations. Accordingly, we recommend quarterly analysis for PAHs to monitor progress toward reclamation. Collection of soil vapor and ground-water samples will proceed as described in Section 6.3.

6.3 Sampling Procedures for Soil Vapors and Ground Water

Monitor well purging and sampling will be completed using dedicated, disposable polyethylene bailers. Prior to collecting samples, the water levels will be measured and approximately three casing volumes will be purged. During purging, field parameters (pH, temperature, and electrical conductivity) will be measured and recorded every half casing volume. Purged ground water will be contained in 55-gallon drums and appropriately disposed of by ENRON personnel upon receipt of the analytical results.

Following sample collection, samples will be immediately labeled and placed in ice-filled coolers, logged on a chain of custody (COC) form, and shipped to the proper analytical laboratory. The cooler will be periodically checked to ensure that a temperature of 4°C is maintained; temperature measurements will be recorded in the field log book and documented on the COC form. Upon receipt of the samples, the analytical laboratory will measure the cooler temperature and document it appropriately. Samples will be shipped to Hall Environmental Analysis Laboratory in Albuquerque, New Mexico, for analysis of organic compounds and to Analytical Technologies, Inc., also in Albuquerque, for analysis of inorganic compounds. All samples will be analyzed under normal turnaround conditions.

Soil vapor samples will be collected from the SVE system downstream of the vacuum blower. A sampling port installed in the discharge line will allow sample collection. Samples will be collected in Tedlar® bags in the following manner. First, a short (4- to 6-inch) piece of suitable tubing (preferably Tygon® rated for fuel hydrocarbons) will be attached to the nipple on the sampling port. The nipple on the Tedlar® bag will then be attached to the tubing, and the valve

APPENDIX A

SUMMARY OF SOIL AND GROUND-WATER ANALYTICAL RESULTS

Table A-1. Soil Chemistry Results
ENRON - Hobbs
Page 1 of 4

Sample ID[1]	Sample Depth (ft)	Date	Source[2]	Lab[3]	Concentration (mg/kg)							
					TPH[4]	Hydro-carbon Range	DL	Benzene[5]	Toluene[5]	Ethyl-benzene[5]	Total Xylenes[5]	DL
BH-1	8.8-9.2	8/91	Metric	AAL	40	NQ	5.0	NA	NA	NA	NA	0.1
	15.0-15.5	8/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
	19.9-20.2	8/91	Metric	AAL	28	NQ	5.0	ND	ND	ND	ND	0.1
	30.0-30.3	8/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
	36.5-36.7	8/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
	45.2-45.5	8/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
BH-2	0.0-1.0	8/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
	15.0-15.3	8/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
	30.0-30.3	8/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
	40.1-40.4	8/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
	51.2-51.4	8/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
BH-3	2.0-2.5	8/22/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
	10.5-10.7	8/22/91	Metric	AAL	24	NQ	5.0	ND	ND	ND	ND	0.1
	30.0-30.3	8/22/91	Metric	AAL	36	NQ	5.0	ND	ND	ND	ND	0.1
	45.0-45.3	8/22/91	Metric	AAL	20	NQ	5.0	ND	ND	ND	ND	0.1
BH-4	29.0-29.3	8/23/91	Metric	AAL	28	NQ	5.0	ND	ND	ND	ND	0.1
	37.9-38.2	8/23/91	Metric	AAL	20	NQ	5.0	ND	ND	ND	ND	0.1

[1] Refer to Figure 2 for sample locations

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DBS&A = Daniel B. Stephens & Associates, Inc., 1994

[3] AAL = Assaigai Analytical Laboratories
ITAS = IT Analytical Services
ATI = Analytical Technologies, Inc.

[4] OCD soil standards for TPH = 100 mg/kg

[5] OCD soil standards for total BTEX = 50 mg/kg

TPH = Total petroleum hydrocarbons
DL = Detection limit
NQ = Not quantified
NA = Not analyzed
ND = Not detected

Table A-1. Soil Chemistry Results
ENRON - Hobbs
Page 2 of 4

Sample ID[1]	Sample Depth (ft)	Date	Source[2]	Lab[3]	Concentration (mg/kg)							
					TPH[4]	Hydro-carbon Range	DL	Benzene[5]	Toluene[5]	Ethyl-benzene[5]	Total Xylenes[5]	DL
BH-6	0.0-2.0	8/29/91	Metric	AAL	68	NQ	5.0	ND	ND	ND	ND	0.1
	18.9-19.5	8/27/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
	33.0-33.5	8/27/91	Metric	AAL	1,300	NQ	5.0	ND	ND	ND	ND	0.1
	46.0-46.3	8/27/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
BH-8	21.4-21.7	8/28/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
BH-9	22.7-23.4	9/91	Metric	AAL	8	NQ	5.0	ND	ND	ND	ND	0.1
	44.2-44.5	9/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
BH-10	19.6-19.9	9/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
BH-11	45.2-45.4	9/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
BH-12	44.2-44.4	9/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
BH-18	6.1-6.3	9/19/91	Metric	AAL	32,000	NQ	5.0	61	160	130	370	2.5
	24.6-24.8	9/19/91	Metric	AAL	4,200	NQ	5.0	0.65	5.5	15	36	0.1
	35.3-35.5	9/19/91	Metric	AAL	880	NQ	5.0	ND	ND	0.19	0.67	0.1
	48.0-48.2	9/19/91	Metric	AAL	10,000	NQ	5.0	0.69	1.6	11	35	0.1
BH-20	1.0-1.3	10/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
	26.2-26.5	10/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1

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[4] OCD soil standards for TPH = 100 mg/kg

[5] OCD soil standards for total BTEX = 50 mg/kg

TPH = Total petroleum hydrocarbons
DL = Detection limit
NQ = Not quantified
NA = Not analyzed
ND = Not detected

Table A-1. Soil Chemistry Results
ENRON - Hobbs
Page 3 of 4

Sample ID[1]	Sample Depth (ft)	Date	Source[2]	Lab[3]	Concentration (mg/kg)							
					TPH[4]	Hydro-carbon Range	DL	Benzene[5]	Toluene[5]	Ethyl-benzene[5]	Total Xylenes[5]	DL
BH-21	3.8-4.3	10/91	Metric	AAL	190	NQ	5.0	ND	ND	ND	ND	0.1
	18.6-19.0	10/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
BH-22	3.9-4.3	10/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
	29.2-29.6	10/91	Metric	AAL	ND	NQ	5.0	ND	ND	ND	ND	0.1
B-7-16	16	11/02/92	IT	ITAS	ND	NQ	2	0.071	ND	ND	ND	0.050
B-7-41	41	11/02/92	IT	ITAS	31	NQ	2	ND	ND	ND	ND	0.050
B-8-6.5	6.5	10/30/92	IT	ITAS	720	NQ	100	1.1	9.1	13	120	1.0
B-8-35	35	10/30/92	IT	ITAS	310	NQ	9	ND	0.42	4.6	6.2	0.20
B-9-10.5	10.5	10/30/92	IT	ITAS	2,400	NQ	96	5.4	17	160	170	1.0
MW-4-10.5	10.5	10/31/92	IT	ITAS	ND	NQ	2	ND	ND	ND	0.16	0.050
MW-4-40	40	10/31/92	IT	ITAS	1,000	NQ	9	ND	0.084	0.23	0.17	0.050
MW-5-41	41	10/27/92	IT	ITAS	ND	NQ	2	ND	ND	ND	ND	0.050
VEW-2-39	39	10/30/92	IT	ITAS	7,500	NQ	89	3.1	2.2	13	13	0.20
SB-5 @ 6.5'	6.5	1/18/94	DBS&A	ATI	3,300	C_6-C_{16}	10	ND	ND	18	ND	0.5
SB-6 @ 18.5'	18.5	1/13/94	DBS&A	ATI	ND	C_6-C_{16}	5.0	ND	ND	ND	ND	0.025
SB-7 @ 16'	16	1/13/94	DBS&A	ATI	29	C_9-C_{16}	5.0	ND	ND	ND	ND	0.025

[1] Refer to Figure 2 for sample locations

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[4] OCD soil standards for TPH = 100 mg/kg

[5] OCD soil standards for total BTEX = 50 mg/kg

TPH = Total petroleum hydrocarbons
DL = Detection limit
NQ = Not quantified
NA = Not analyzed
ND = Not detected

Table A-1. Soil Chemistry Results
ENRON - Hobbs
Page 4 of 4

Sample ID[1]	Sample Depth (ft)	Date	Source[2]	Lab[3]	Concentration (mg/kg)							
					TPH[4]	Hydro-carbon Range	DL	Benzene[5]	Toluene[5]	Ethyl-benzene[5]	Total Xylenes[5]	DL
SB-10 @ 10'	10	1/14/94	DBS&A	ATI	ND	C_6-C_{16}	5.0	ND	ND	ND	ND	0.025
SB-10 @ 40'	40	1/15/94	DBS&A	ATI	ND	C_6-C_{16}	5.0	ND	ND	ND	ND	0.025
SB-12 @ 5'	5	1/14/94	DBS&A	ATI	3,100	C_6-C_{16}	250	ND	4.6	21	82	1.2
SB-12 @ 40'	40	1/14/94	DBS&A	ATI	4,100	C_6-C_{16}	250	9.4	60	18	58	1.2
SB-13 @ 40'	40	1/15/94	DBS&A	ATI	ND	C_6-C_{16}	5.0	ND	ND	ND	ND	0.025
SB-14 @ 30'	30	1/15/94	DBS&A	ATI	ND	C_6-C_{16}	5.0	ND	ND	ND	ND	0.025
SB-14 @ 40'	40	1/15/94	DBS&A	ATI	ND	C_6-C_{16}	5.0	ND	ND	ND	ND	0.025

[1] Refer to Figure 2 for sample locations

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IT = IT Corporation, 1993
DBS&A = Daniel B. Stephens & Associates, Inc., 1994

[3] AAL = Assaigai Analytical Laboratories
ITAS = IT Analytical Services
ATI = Analytical Technologies, Inc.

[4] OCD soil standards for TPH = 100 mg/kg

[5] OCD soil standards for total BTEX = 50 mg/kg

TPH = Total petroleum hydrocarbons
DL = Detection limit
NQ = Not quantified
NA = Not analyzed
ND = Not detected

Table A-2. Water Chemistry Results
ENRON - Hobbs
Page 1 of 2

Sample ID	Date	Source[1]	Lab[2]	Concentration (mg/L)			Concentration (µg/L)				
				TPH	Hydro-carbon Range	DL	Benzene[3]	Toluene[3]	Ethyl-benzene[3]	Total Xylenes[3]	DL
MW-1	9/91	Metric	AAL	NA	NA	NA	5.3	6.7	1.0	NA	NA
	11/92	IT	ITAS	4.3	NQ	0.05	1.5	1.5	ND	10	1.0
	12/92	IT	ITAS	5.9	NQ	0.05	1.3	1.4	ND	6.0	1.0
	1/12/93	DBS&A	ATI	1.0	C_6-C_{16}	0.050	3.9	ND	2.1	2.0	0.5
MW-2	9/91	Metric	AAL	NA	NA	NA	ND	ND	ND	NA	NA
	1/12/94	DBS&A	ATI	ND	C_6-C_{16}	0.050	ND	ND	ND	ND	0.5
MW-4	11/92	IT	ITAS	50	NQ	0.5	16,000	8,000	700	1,800	200
	12/92	IT	ITAS	15	NQ	0.5	17,000	8,200	530	1,300	200
	1/10/94	DBS&A	ATI	42	C_6-C_{18}	0.050	18,000	10,000	500	1,300	250
MW-4A	12/92	IT	ITAS	10	NQ	0.25	15,000	6,200	400	1,000	100
MW-5	11/92	IT	ITAS	0.69	NQ	0.05	3.0	3.4	3.0	34	1.0
	12/92	IT	ITAS	1.3	NQ	0.05	9.1	4.1	8.2	37	1.0
	1/16/94	DBS&A	ATI	4.0	C_6-C_{14}	0.250	300	190	160	490	2.5
MW-6	11/92	IT	ITAS	35	NQ	0.5	340	23	51	120	5.0
	12/92	IT	ITAS	10	NQ	0.5	520	20	58	120	5.0
	1/10/94	DBS&A	ATI	3	C_6-C_{20}	0.050	770[D]	2.9	96	210	2.5

[D] Detection limit is 250 µg/L

[1] Metric = Metric Corporation, 1991
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DBS&A = Daniel B. Stephens & Associates, Inc., 1994

[2] AAL = Assaigai Analytical Laboratories
ITAS = IT Analytical Services
ATI = Analytical Technologies, Inc.

[3] New Mexico Water Quality Control Commission standards (µg/L):
Benzene = 10 Ethylbenzene = 750
Toluene = 750 Xylene = 620

TPH = Total petroleum hydrocarbons
DL = Detection limit
NA = Not analyzed
NQ = Not quantified
ND = Not detected

Table A-3. Inorganic Analysis of Ground Water
ENRON - Hobbs

Parameter	Concentration (mg/L)						NMWQCC Standard (mg/L)
	MW-1	MW-2	MW-3	MW-4	MW-7	NNG-4	
Date sampled	*09/23/91*	*09/91*	*09/23/91*	*01/10/94*	*01/10/94*	*01/10/94*	---
Source[1]	*Metric*	*Metric*	*Metric*	*DBS&A*	*DBS&A*	*DBS&A*	---
Major ions							
Calcium	310	76	160	104	112	75.3	None
Potassium	90	13	3.2	21.5	4.7	2.4	None
Magnesium	66	6.5	12	70	11.5	10.0	None
Sodium	410	13	11	553	145	52.6	None
Bicarbonate ($CaCO_3$)	NA	NA	NA	706	262	184	None
Total alkalinity (as $CaCO_3$)	NA	NA	NA	706	262	184	None
Chloride	NA	NA	NA	770	120	66	250
NO_2/NO_3-N, total	NA	NA	NA	<0.06	2.7	2.6	10.0
Sulfate	NA	NA	NA	0.4	140	51	600
Total dissolved solids	NA	NA	NA	1,900	720	410	1,000
Metals							
Silver	NA	NA	NA	<0.010	<0.010	NA	0.05
Arsenic	NA	NA	NA	0.077	<0.005	NA	0.1
Barium	ND	ND	ND	0.667	0.059	NA	1.0
Cadmium	NA	NA	NA	<0.0005	<0.0005	NA	0.01
Chromium	NA	NA	NA	<0.010	<0.010	NA	0.05
Mercury	NA	NA	NA	<0.0002	<0.0002	NA	0.002
Lead	ND	ND	ND	<0.002	<0.002	NA	0.05
Selenium	NA	NA	NA	<0.005	<0.005	NA	0.05

[1] Metric = Metric Corporation, 1991
DBS&A = Daniel B. Stephens & Associates, Inc., 1994

NMWQCC = New Mexico Water Quality Control Commission
NA = Not analyzed
ND = Not detected

Table A-4a. Summary of Ground-Water Analysis for Inorganic Constituents

Constituent	Detection Limit	Well/Boring No. (Sample Date) MW-1 (05/14/94)	MW-2 (05/21/94)	MW-3 (05/14/94)	MW-4 (05/15/94)	MW-5 (05/15/94)	MW-6 (05/15/94)	MW-7 (05/14/94)	MW-8 (05/21/94)	NMWQCC Standard
Major ions (mg/L)										
Total alkalinity (as $CaCO_3$)	1.0	653	286	152	NA	630	769	NA	288	None
Chloride	0.5	210	7.3	5.7	NA	200	150	NA	10.9	250
NO_2/NO_3-N, total	0.06	ND	5.9	1.6	NA	ND	ND	NA	8.5	10.0
Sulfate	0.3	640	11.6	39	NA	1.2	ND	NA	56	600
Total dissolved solids	10	1,900	380	260	NA	940	1,000	NA	480	1,000
Metals (mg/L)										
Silver	0.010	ND	ND	ND	NA	ND	ND	NA	ND	0.05
Arsenic	0.005	0.019	ND	0.007	NA	0.069	0.038	NA	0.012	0.1
Barium	0.01	NA	NA	NA	NA	3.36	3.31	NA	0.115	1.0
Cadmium	0.0005	NA	NA	NA	NA	ND	ND	NA	NA	0.01
Chromium	0.010	NA	NA	NA	NA	ND	ND	NA	NA	0.05
Copper	0.010	NA	ND	NA	ND	0.011	0.012	ND	ND	1.0
Iron	0.020	NA	NA	NA	3.49	0.064	3.49	ND	ND	1.0
Mercury	0.0002	ND	NA	ND	NA	ND	ND	NA	ND	0.002
Manganese	0.010	NA	NA	NA	0.129	0.578	0.257	ND	0.012	0.2
Lead	0.002	NA	NA	NA	NA	ND	ND	NA	NA	0.05
Selenium	0.005	ND	ND	ND	NA	ND	ND	NA	ND	0.05
Zinc	0.020	NA	ND	NA	ND	ND	ND	ND	0.029	10

Note: All analyses performed by Analytical Technologies, Inc., Albuquerque, NM

NMWQCC = New Mexico Water Quality Control Commission
NA = Not analyzed
ND = Not detected

Table A-4b. Summary of Ground-Water Analysis for Organic Constituents

Constituent	Detection Limit	Well/Boring No. (Sample Date)								NMWQCC Standard
		MW-1 (05/14/94)	MW-2 (05/21/94)	MW-3 (05/14/94)	MW-4 (05/15/94)	MW-5 (05/15/94)	MW-6 (05/15/94)	MW-7 (05/14/94)	MW-8 (05/21/94)	
Halogenated VOCs by EPA Method 8010 (µg/L)										
Tetrachloroethene	0.2	NA	NA	NA	NA	ND	NA	0.9	NA	20
Polynuclear Aromatic Hydrocarbons by EPA Method 8100 (µg/L)										
Naphthalene	0.5	ND	ND	ND	50	27	24	ND	ND	30
1-Methylnaphthalene	0.5	2.1	ND	ND	250	14	90	ND	ND	
2-Methylnaphthalene	0.5	ND	ND	ND	140	13	63	ND	ND	
Acenaphthene	0.5	ND	ND	ND	ND	1.1	ND	ND	ND	None
Fluorene	0.5	ND	ND	ND	5.1	0.9	3.8	ND	ND	None
Phenanthrene	0.5	ND	ND	ND	3.1	7.7	2.4	ND	ND	None
Anthracene	0.5	2.7	ND	ND	ND	ND	ND	ND	ND	None
Fluoranthrene	0.5	1.3	ND	ND	ND	ND	ND	ND	ND	None

Note: All analyses performed by Hall Environmental Analysis Laboratory, Albuquerque, NM

NMWQCC = New Mexico Water Quality Control Commission
NA = Not analyzed
ND = Not detected
VOCs = Volatile organic compounds

APPENDIX B

DESIGN CALCULATIONS

Calculation 4150-CE-1

DANIEL B. STEPHENS & ASSOCIATES, INC.

Calculation Cover Sheet

Project Name HOBBS - ENRON Project Number 4150

Calculation Number 4150 - CE - 1 Discipline ENGINEERING/CIVIL No. of Sheets 9

PROJECT

ENRON NATURAL GAS PROCESSING PLANT

SITE

HOBBS, NEW MEXICO

FEATURE

SVE DESIGN

SOURCES OF DATA

- IT CORP. PILOT TEST DATA

SOURCES OF FORMULAE & REFERENCES

- APPLIED FLUID MECHANICS, MOTT, 3rd ED.
- EIT REFERENCE MANUAL

☐ Preliminary Calculation ☒ Final Calculation Supersedes Calculation No. _____

Rev. No	Revision	Calculation By	Date	Checked By	Date	Approved By	Date
Ø	ORIGINAL	PICKENS	8/17/94	PA	8/24	Jmc	8/31/94

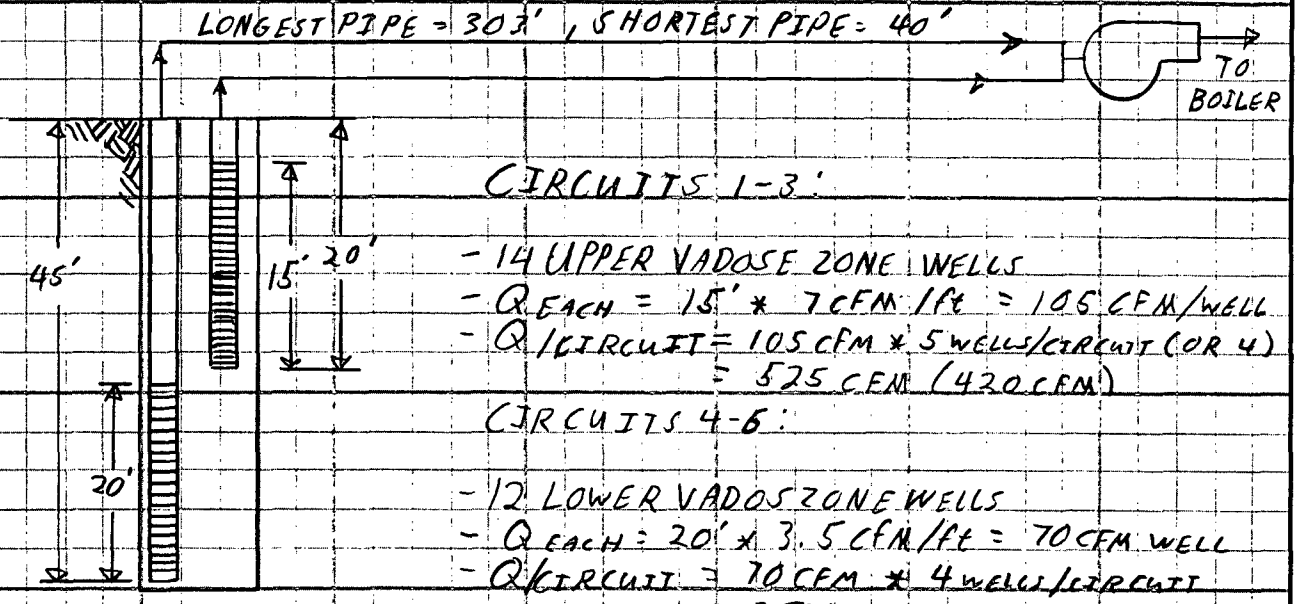
DBS&A SOP Form No. 14-4-1 5/93

Project No. 4150 Date 8/23/94

Subject SVE DESIGN Sheet 1 of 9

By PICKENS Checked By DA Calculation No. 4150-CE-1

1.0 PURPOSE: DETERMINATION OF SVE PIPE SIZES, HEADLOSS, AND CORRESPONDING EQUIPMENT REQUIREMENT



CIRCUITS 1-3:

- 14 UPPER VADOSE ZONE WELLS
- Q_{EACH} = 15' * 7 CFM/ft = 105 CFM/WELL
- Q/CIRCUIT = 105 CFM * 5 WELLS/CIRCUIT (OR 4)
  = 525 CFM (420 CFM)

CIRCUITS 4-6:

- 12 LOWER VADOSE ZONE WELLS
- Q_{EACH} = 20' * 3.5 CFM/ft = 70 CFM WELL
- Q/CIRCUIT = 70 CFM * 4 WELLS/CIRCUIT
  = 280 CFM

2.0 METHOD:

2.1 PIPING SIZE DETERMINED BY:

$Q = VA$ WHERE, Q = VOLUMETRIC FLOW RATE
V = FLUID VELOCITY
A = PIPE CROSS-SECTIONAL AREA

2.2 HEADLOSSES DETERMINED BY DARCY'S EQUATION:

$h_L = f\left(\frac{L}{D}\right)\frac{V^2}{2g}$ WHERE, h_L = MAJOR HEAD LOSS
f = FRICTION FACTOR
L = PIPE LENGTH
D = PIPE DIAMETER
g = GRAVITATIONAL ACCELER.

2.2 : HEADLOSSES (CONTINUED)

AND, $h_L = K \frac{v^2}{2g}$ WHERE, K = FITTING COEFFICIENT

3.0 ASSUMPTIONS & CRITERIA:

A) IT CORP. PILOT TEST DATA HOLDS TRUE FOR ENTIRE SITE.

B) MINIMUM PIPE VELOCITIES SET AT 2000 FT/MIN FOR PARTICULATE ENTRAINMENT.

C) INCOMPRESSIBLE FLOW IN PIPES (MOTT, 1990)

- IF PRESSURE CHANGE FROM INLET TO OUTLET IS:

a) < 10%, CHANGES IN SPECIFIC WEIGHT CAN BE IGNORED
b) 10% to 40%, AVERAGE SPECIFIC WEIGHT SHOULD BE USED
c) >40%, CHANGES IN SPECIFIC WEIGHT MUST BE ACCOUNTED FOR.

D) CALCULATIONS WILL USE AIR @ 4000' ELEVATION, THIS IS MORE DENSE THAN AIR UNDER THE APPLIED VACUME, THEREFORE CONSERVATIVE.

4.0 MATERIAL PROPERTIES:

- WELL CASING SHALL BE CONSTRUCTED OF SCH. 40 PVC
- PIPE RUNS TO COMPOUND SHALL BE CONSTRUCTED OF SCH. 80 PVC

BOTH MATERIALS CAN BE CONSIDERED SMOOTH FOR DETERMINATION OF f FROM MOODY'S DIAGRAM.

5.0 DATA SOURCES:

A) IT CORP. VAPOR EXTRACTION PILOT TEST

- UVZ - WELL VEW-1 - 7 CFM/FT SCREEN @ 30" H_2O VACUUM
- LVZ - WELL VEW-2 - 3.5 CFM/FT SCREEN @ 55" H_2O VACUUM

B) EIT REFERENCE MANUAL FOR PHYSICAL DATA ON AIR

6.0 CALCULATIONS

6.1 UPPER VADOSE ZONE WELL CIRCUITS

- Q = 105 CFM @ 30" H_2O VACUME

6.1.1 PIPE SIZING FROM WELL TO COMPOUND MANIFOLD

$$D = \left(\frac{Q * 4}{v * \pi}\right)^{1/2} = \left(\frac{105\ CFM * 4}{2000\ ft/min * \pi}\right)^{1/2} * \frac{12"}{ft} = 3.1" \checkmark$$

CHECK $v > 2000$ IN 3" PIPE

$$v = \frac{Q}{A} = \frac{Q}{(\pi/4) * D} = \frac{105\ CFM}{(\pi/4)(0.25\ ft)^2} = 2139\ ft/min \checkmark$$

USE 3" NOMINAL PVC PIPE.

6.1.2 HEADLOSS FROM WELL INLET TO COMPOUND MANIFOLD

- WELL - 2½" I.D. PVC CASING - 20' DEEP
- LONGEST PIPE RUN = 303' W/ FITTINGS:
  - 6 - 90° ELBOWS (K = 0.3) ✓
  - 1 - BRANCH TEE (K = 1.0) ✓
  - 1 - GATE VALVE (K = 0.15) - FULLY OPEN ✓

6.1.2 (CONTINUED)

h_L FOR WELL

$$R_e = \frac{VD}{\nu} = \frac{QD}{A\nu} = \left(\frac{105\ CFM}{0.034'}\right)\left(\frac{0.208\ ft}{1.73\times10^{-4}\ ft^2/s}\right)*\left(\frac{min}{60s}\right)$$

$R_e = 6.2\times10^4$ ✓

$f = 0.0195$ (FROM MOODY'S DIAGRAM) ✓

$$h_L = \left(f\frac{L}{D} + \Sigma K\right)\frac{V^2}{2g} = (0.0195)\left(\frac{20'}{0.208'}\right)\left(\frac{(3088\ ft/min)^2}{2*32.2\ ft/s^2}*\left(\frac{min}{60s}\right)^2\right)$$

$$h_L = \cancel{77.12'}\ 76.72'\ Air = 76.72'\ Air\left(\frac{0.0651\ lb/ft^3\ Air}{62.4\ lb/ft^3\ H_2O}\right) = 0.0804'$$

$h_L = 0.965"\ H_2O$

h_L FOR PIPING (LONGEST RUN)

$$R_e = \frac{VD}{\nu} = \frac{(2139\ ft/min)(0.25\ ft)}{(1.73\times10^{-4}\ ft^2/sec)}\left(\frac{min}{60s}\right)$$

$R_e = 5.15\times10^4$

$f = 0.0205$

$$h_L = \left(f\frac{L}{D} + \Sigma K\right)\frac{V^2}{2g} = \left[(0.0205)\left(\frac{303'}{0.25}\right) + (6*0.3 + 1.0 + 0.15)\right]\frac{(2139)^2}{2g(60)}$$

$h_L = 548.5'\ Air = 6.86"\ H_2O$

6.1.2 (CONTINUED)

h_L PIPING (SHORTEST RUN)

L = 50' FITTINGS: 5 - 90° ELBOWS - (K = 0.3)
1 - BRANCH TEE - (K = 1.0)
1 - GATE VALVE - (K = 0.15)

$R_e = 5.15 \times 10^4$

$f = 0.025$

$$h_L = \left[0.025\left(\frac{50'}{0.25'}\right) + (5 \times 0.3 + 1.0 + 0.15)\right]\frac{(2139)^2}{2g\,(60)^2}$$

$h_L = 117.0'$ AIR $= 1.46''$ H_2O

6.2 LOWER VADOS ZONE WELL CIRCUIT

- Q = 70 CFM @ 55" H_2O VACUME

6.2.1 PIPING SIZE FROM WELL TO COMPOUND MANIFOLD

$$D = \left(\frac{Q \times 4}{V \times \pi}\right)^{1/2} = \left(\frac{70\,CFM \times 4}{2000\,ft/min \times \pi}\right)^{1/2} \times \frac{12''}{ft} = 2.53''$$

CHECK V FOR 2½" PIPE

$$V = \frac{Q}{A} = \frac{70\,CFM}{(\pi/4)(0.208')^2} = 2053.5\ ft/min$$

USE 2½" I.D. PVC PIPE

6.2.2 HEAD LOSS FROM WELL INLET TO COMPOUND MANIFOLD

COMBINE WELL LENGTH WITH PIPE RUN LENGTH

WELL DEPTH = 45'

h_L LONGEST PIPE RUN

- $L = 45' + 303' = 348'$

$$Re = \frac{VD}{\nu} \quad \frac{(2053.5\ ft/min)(0.208')}{1.73 \times 10^{-4}\ ft^3/sec} \times \left(\frac{min}{60s}\right) = 4.1 \times 10^4$$

$f = 0.0215$

$$h_L = \left[f\frac{L}{D} + \Sigma K\right]\frac{V^2}{2g} = \left[0.0215\left(\frac{348}{0.208}\right) + 2.95\right]\frac{(2053.5)^2}{2g(60)^2}$$

$h_L = 707.9'\ AIR = 8.86''\ H_2O$

h_L SHORTEST PIPING RUN

- $L = 45' + 95' = 140'$

$Re = 4.1 \times 10^4$

$f = 0.0215$

$$h_L = \left[0.0215\left(\frac{140'}{0.208'}\right) + 2.65\right]\frac{(2053.5)^2}{2g(60)^2} = 311.4'\ AIR$$

$h_L = 3.9''\ H_2O$

6.3 MANIFOLD

- BOTH THE UV2 & LV2 CIRCUITS ARE FURTHER DIVIDED INTO THREE CIRCUITS EACH. THE UV1 MANIFOLDS WILL HAVE 5, 5, AND 4 WELLS IN EACH CIRCUIT. THE LV2 MANIFOLD WILL HAVE 4 WELLS IN EACH CIRCUIT.
- ONLY ONE CIRCUIT WILL BE OPERATIONAL AT ANY TIME.
- Q_{UV2} PER CIRCUIT = 525 CFM (W/ 5 WELL CIRCUIT)
- Q_{LV2} PER CIRCUIT = 280 CFM

6.3.1 PIPE SIZE

- USE FLOW OF 280 CFM DUE TO MINIMUM V CONSTRAINT.
- PIPE SIZED FOR EXIT FROM MANIFOLD

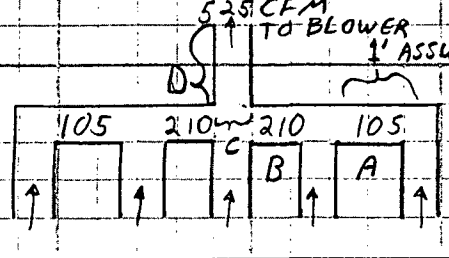
$$D = \left(\frac{280\ CFM * 4}{2000\ ft/min * \pi}\right)^{1/2} * \frac{12"}{ft} = 5.06"$$

CHECK V IN 5" ID PIPE

$$V = \frac{280}{0.1371} = 2041.2\ \frac{ft}{min}$$

6.3.2 HEADLOSS IN MANIFOLD

- USE FLOW OF 525 CFM DUE TO HIGHER V AND THUS HIGHER HEADLOSS
- MANIFOLD SET UP W/ 5 WELL CIRCUIT



6.3.2 (CONTINUED)

ANALYSIS BY SECTIONS A-D

SUMMARY TABLE OF MANIFOLD HEADLOSS

SECTION	V (ft/min)	Re	ξ	ΣK *	h_L ** (ft of AIR)
A	770	1.9×10^6	0.0105	1.4	3.64
B	1540	3.7×10^6	0.0095	2.1	21.48
C	770	1.9×10^6	0.0105	0.2	0.576
D	3850	9.3×10^6	0.0085	1.0	65.24

* ΣK = 90° ELBOW ($K = 0.3$), BRANCH TEE ($K = 1.0$), IN-LINE TEE ($K = 0.2$), SUDDEN ENLARGEMENT ($K = [1 - (D_1/D_2)^2]^2$)

** $h_L = \left[\xi\left(\frac{L}{D}\right) + \Sigma K\right]\frac{V^2}{2g}$

* NOTE: A THEORETICAL DESIGN OF THE MANIFOLD WOULD SIZE THE INDIVIDUAL 1' SEGMENTS ACCORDING TO THE FLOW IN THAT SEGMENT, HOWEVER, THE MANIFOLD IS CONSTRUCTED OF ONE SIZE FOR EASE OF CONSTRUCTION.

Σh_L = 90.93' AIR = 1.14" H_2O

6.4 HEAD LOSS TOTALS

- UVZ: 0.965" + 6.86" + 1.14" = 8.965" H_2O MAX.
- LVZ: 8.86" + 1.14" = 10.0" H_2O MAX.

Project No. 4150 Date 8-23-96

Subject SVE DESIGN Sheet 9 of 9

By DP Checked By PA Calculation No. 4150-CE-1

7.0 RESULTS

UVZ SUMMARY

Q/WELL = 105 CFM
BLOWER VACUME = 30" H_2O
Q/CIRCUIT = 525 CFM (5 WELLS)
= 420 CFM (4 WELLS)
MIN. WELL VACUME = 21.03" H_2O
PIPE SIZE = 3" SCH. 80 PVC
WELL SIZE = 2½", 0.050" SLOT SCH. 40 PVC
MANIFOLD SIZE = 5" SCH. 80 PVC

LVZ SUMMARY

Q/WELL = 70 CFM
Q/CIRCUIT = 280 CFM (4 WELLS)
BLOWER VACUME = 55" H_2O
MIN. WELL VACUME = 45" H_2O
PIPE SIZE = 2½" SCH. 80 PVC
WELL SIZE = 2½" SCH. 40 PVC
MANIFOLD SIZE = 5" SCH. 80 PVC

8.0 CONCLUSIONS

* BLOWER : ROTRON REGENERATIVE BLOWER #EN12BG12WL
* MOISTURE SEPARATOR: ROTRON #MS600B
* PARTICULATE FILTER : ROTRON #S16463
* CONTROLLER FOR BUTTERFLY VALVES: GRANGER #2A515
* BUTTERFLY VALVES-ELECTRONICALLY ACTUATED : 5" ASAHI SERIES 92 "CHIEF"

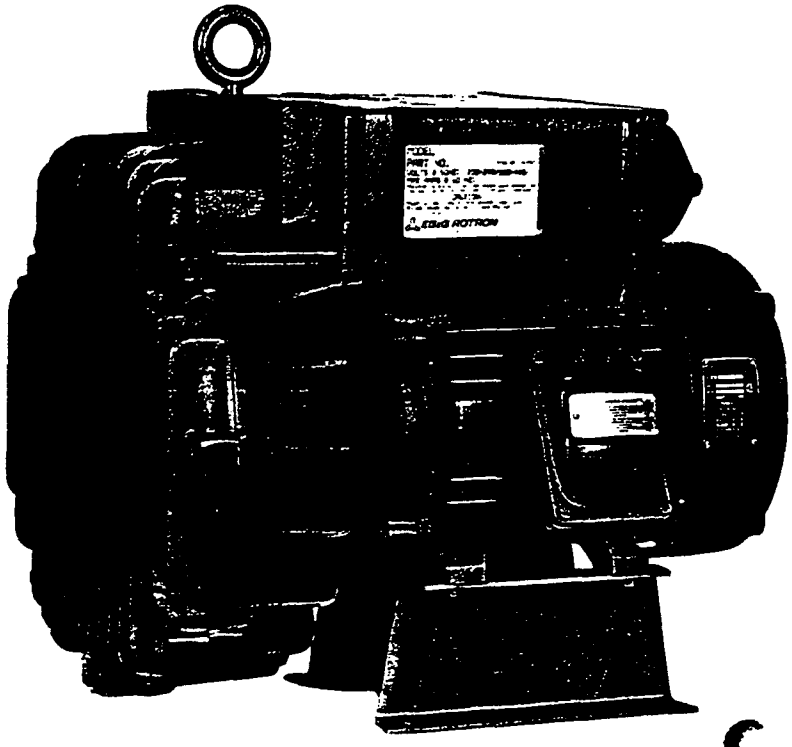
* SEE ATTACHMENT 1

ATTACHMENT 2.1
PC
4150-CE-1

EN 12
Explosion-Proof Regenerative Blower

FEATURES

- Manufactured in the USA
- Maximum flow: 600 SCFM
- Maximum pressure: 120" WG
- Maximum vacuum: 100" WG
- Standard motor: 15 HP
- Blower construction — cast aluminum housing, cover, impeller & manifold; cast iron flanges
- UL & CSA approved motors for Class I, Group D atmospheres
- Sealed blower assembly
- Quiet operation within OSHA standards



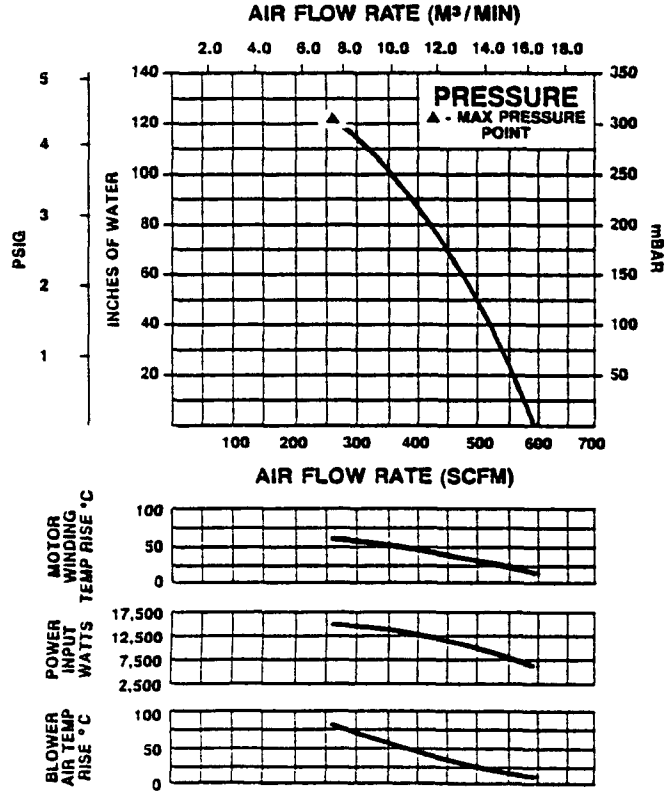
OPTIONS

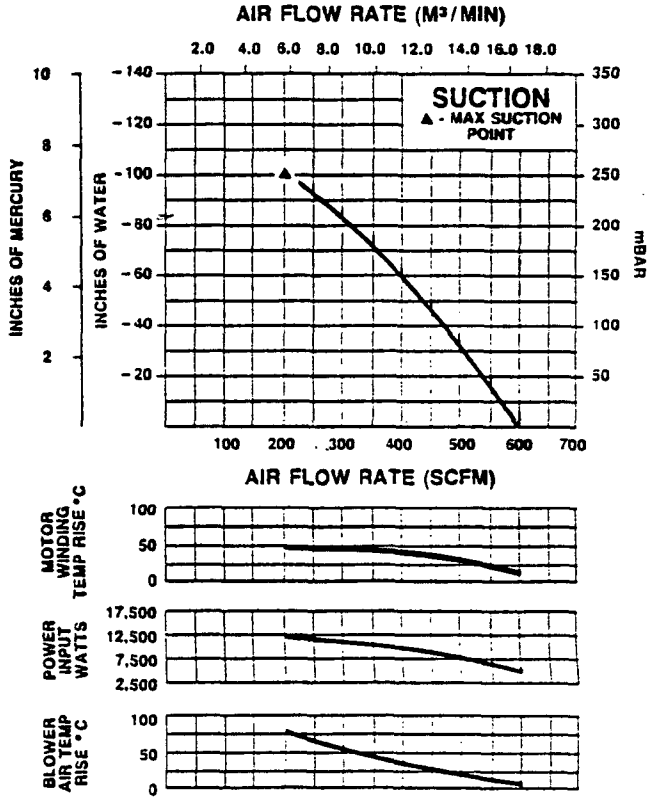
- TEFC motors
- 50 Hz motors
- International voltages
- Other HP motors
- Corrosion resistant surface treatments
- Remote drive (motorless) models

ACCESSORIES

- Moisture separators
- Explosion-proof motor starters
- Inline & inlet filters
  Vacuum & pressure gauges
  Relief valves
- External mufflers

BLOWER PERFORMANCE AT STANDARD CONDITIONS



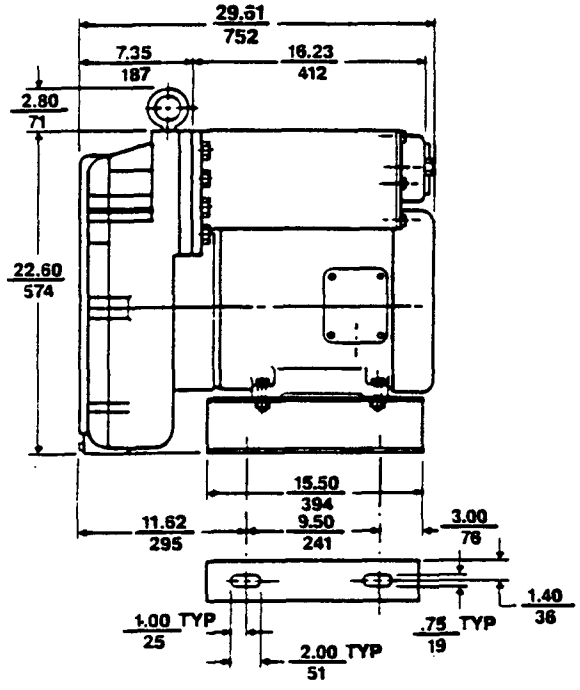


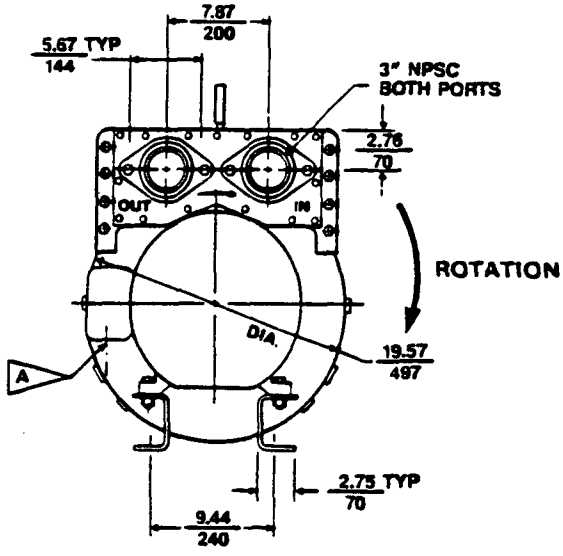
EG&G ROTRON

ATTACHMENT 1.2 DP
4150-CE-1

EN 12

Explosion-Proof Regenerative Blower





DIMENSIONS: IN / MM
TOLERANCES: .XX ± .1 / 2.5
(UNLESS OTHERWISE NOTED)

A 1.25" NPT CONDUIT CONNECTION AT 6 O'CLOCK POSITION

SPECIFICATIONS

MODEL	EN12BG72WL	
Part No.	038186	
Motor Enclosure Type	Explosion-proof	
Horsepower	15	
Phase — Frequency	Three - 60 Hz	
Voltage	230	460
Motor Nameplate Amps	36	18
Maximum Blower Amps[1]	44	22
Inrush Amps	318	159
Starter Size	2	2
Service Factor	1.0	
Thermal Protection	Pilot Duty	
Bearing Type	Sealed, Ball	
Shipping Weight	584 lb (265 kg)	

BLOWER LIMITATIONS

Min. Flow @ Max. Suction	200 SCFM @ –100" WG
Min. Flow @ Max. Pressure	260 SCFM @ 120" WG

[1]Corresponds to the performance point at which the blower and/or motor temperature rise reaches the limit of the thermal protection in the motor.

Specifications subject to change without notice. Please contact factory for specification updates.

ATTACHMENT 1.3
DP
4150-CE-1

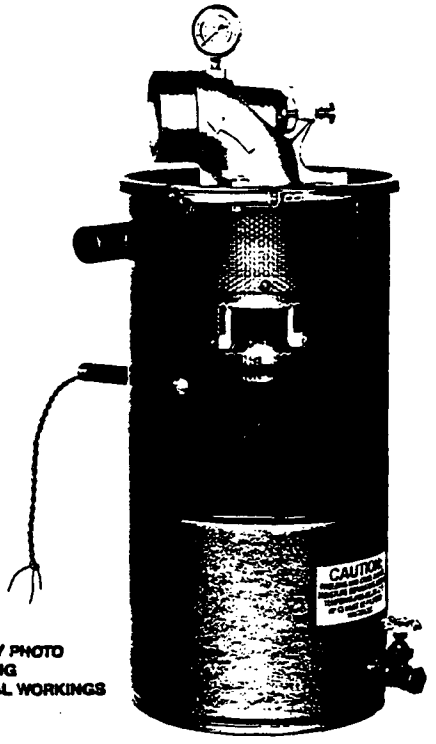
Accessories

Moisture Separator

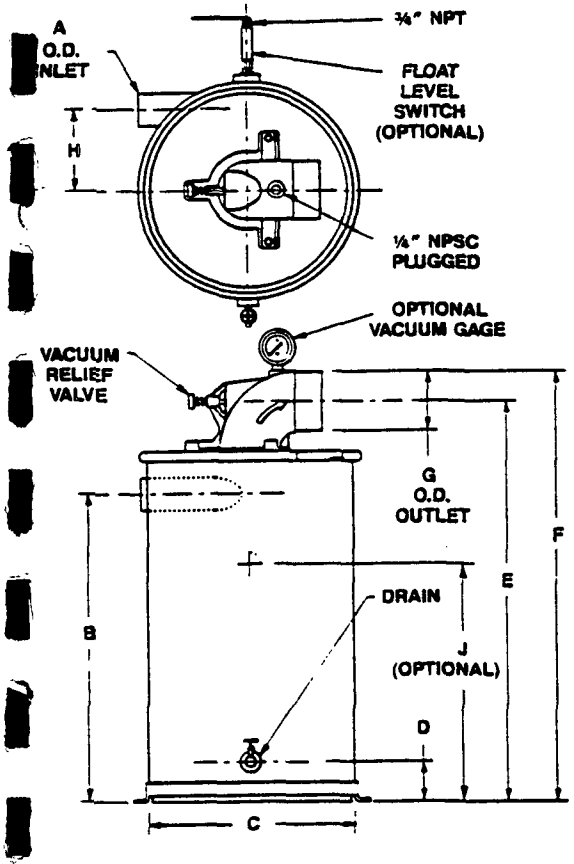
By separating and containing entrained liquids, Rotron's moisture separator helps protect our regenerative blowers and the end treatment system from corrosion and mineralization damage. Recommended for all soil vacuum extraction applications.

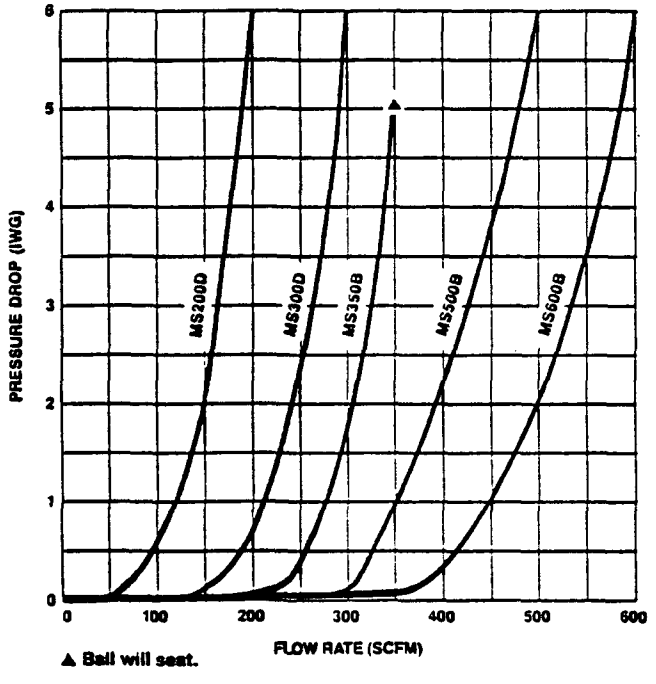
SPECIFICATIONS:

SEPARATION METHOD — High Efficiency Cyclonic
RELIEF VALVE MATERIAL — Brass & Stainless Steel
INTERIOR — Epoxy Coated Steel
FLOAT MATERIAL — Copper
OPTIONAL FLOAT SWITCH — SPDT, Explosion-proof NEMA 7&9, 5 Amp max.



CUTAWAY PHOTO DEPICTING INTERNAL WORKINGS





▲ Ball will seat.

Model	Part Number	Capacity Gal.	CFM Max.	Dimensions (Inches)									Drain Internal THD	Shipping Weight
				A Dia.	B	C Dia.	D	E	F	G Dia.	H	J		
MS200D	038275	10	200	2.00	24.50	14.00	3.00	30.75	33.00	4.50	8.00	16.06	¾" NPT	42 lb.
MS300D	038276	10	300	2.50	24.50	14.00	3.00	30.75	33.00	4.50	8.25	16.06	¾" NPT	42 lb.
MS350B	038277	40	350	3.00	28.37	23.00	5.00	39.00	41.25	4.50	9.75	19.87	1" NPT	82 lb.
MS500B	038075	40	500	3.00	28.37	23.00	5.00	37.37	54.50	6.63	9.75	19.87	1" NPT	95 lb.
MS600B	038003	40	600	4.00	27.87	23.00	5.00	37.37	54.50	6.63	9.25	19.87	1" NPT	98 lb.

*For optional installed level switch, contact factory for correct part number.

Blower Model Reference Key	
A =	E = EN 606, EN 6, EN 707
B = EN 101	F = EN 808, EN 8
C = EN 303	G = EN 12
D = EN 404, EN 454, EN 513, EN 505, EN 523	H = EN 14

ATTACHMENT 1.4
SP 4150-CE-1

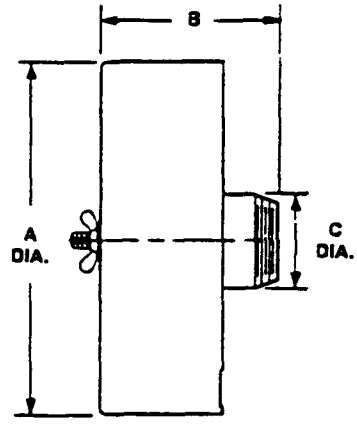
Accessories

Inlet Filter (Single Connection)

Inlet Filters protect the blower and the air distribution system from dust, and other airborne particles and contaminants. Normally used in pressure systems.

SPECIFICATIONS:

HOUSING — Steel
MEDIA — Polyester
EFFICIENCY — 97-98% (8 to 10 micron particle size)
FILTER ELEMENT — Replaceable (see filter elements)
NOTE: "Z" MEDIA (1 to 3 micron particle size) available



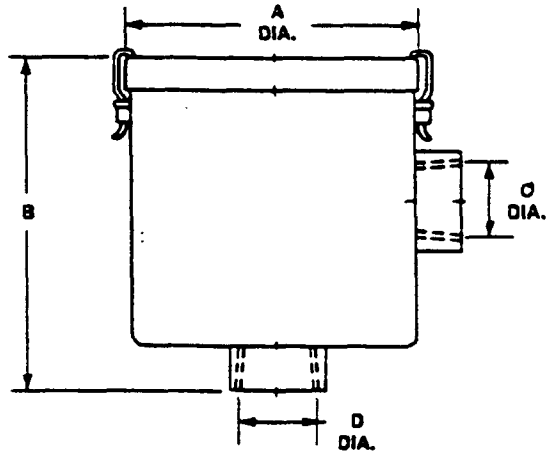
Part Number	Z Media Filter	Reference Blower Model	Connection Inlet	Dimensions (Inches) A	B	C	Filter Element
516466	517865	B	1.00 NPT	6.00	6.50	1.00	515132
515122	517866	C,D	1.50 NPT	6.00	6.50	1.50	515132
515123	517867	E	2.00 NPT	7.75	7.25	2.00	515133
515124	517868	E	2.00 NPT	10.00	12.25	2.00	515134
515125	517869	F	2.50 NPT	10.00	12.50	2.50	515134
515145	517870	G	3.00 NPT	10.00	13.00	3.00	515134
515151	517871	H	4.00 NPT	10.00	14.00	4.00	515135
516511	517872	H	6.00 NPT	16.00	15.00	6.00	516515

Inline Filter (Dual Connection)

Inline Filters protect the blower from harmful dust and other particles that may be drawn into the blower through the air distribution system. Normally used in vacuum systems.

SPECIFICATIONS:

HOUSING — Steel
MEDIA — Polyester
EFFICIENCY — 97-98% (8 to 10 micron particle size)
FILTER ELEMENT — Replaceable (see filter elements)
NOTE: "Z" MEDIA (1 to 3 micron particle size) available



Part Number	Z Media Filter	Reference Blower Model	Connection Inlet	Connection Outlet	Dimensions (Inches) A	B	C	D	Filter Element
516461	517886	B	1.00 NPSC	1.00 NPSC	7.25	6.50	1.00	1.00	516434
515254	517887	C,D	1.50 NPSC	1.50 NPSC	7.25	6.50	1.50	1.50	516434
515255	517888	E	2.00 NPSC	2.00 NPSC	8.00	10.25	2.00	2.00	516435
515256	517889	F	2.50 NPSC	2.50 NPSC	8.00	10.25	2.50	2.50	516435
516463	517890	G	3.00 NPSC	3.00 NPSC	14.00	26.50	3.00	3.00	515135
516465	517891	H	4.00 NPSC	4.00 NPSC	14.00	27.00	4.00	4.00	515135
517611	517892	H	6.00 NPSC	6.00 NPSC	18.00	28.00	6.00	6.00	516515

Accessories

Blower Connection Key
NPT — American National Standard Taper Pipe Thread (Male)
NPSC — American National Standard Straight Pipe Thread for Coupling (Female)
SO — Slip On (Smooth — No Threads)

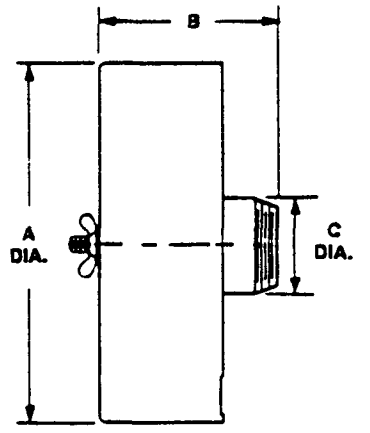
Filter Silencers (Single Connection)

*For Supplemental silencing only. (Used to augment existing muffling systems.)

Filter/Silencers reduce noise levels while ensuring clean air is provided to the blower and the air distribution system. Normally used in pressure applications.

SPECIFICATIONS:

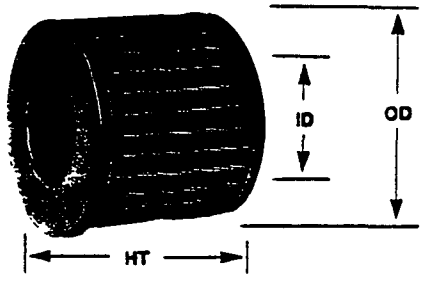
HOUSING — Steel
MEDIA — Polyester
EFFICIENCY — 97-98% (8 to 10 micron particle size)
FILTER ELEMENT — Replaceable (see filter elements)



Part Number	Z Media Filter	Reference Blower Model	Connection Inlet	Dimensions (Inches) A	B	C	Filter Element
516487	517878	B	1.00 NPT	6.00	6.50	1.00	515132
516489	517879	C,D	1.50 NPT	6.00	6.50	1.50	515132
516491	517880	E	2.00 NPT	10.00	7.25	2.00	515133
516493	517881	E	2.00 NPT	10.00	12.25	2.00	515134
516495	517882	F	2.50 NPT	10.00	12.50	2.50	515134
516497	517883	G	3.00 NPT	10.00	12.50	3.00	515134
516499	517884	H	4.00 NPT	16.00	14.00	4.00	515135
516513	517885	H	6.00 NPT	16.00	15.50	6.00	516515

Filter Element

All Rotron Air Filters and Filter/Silencers have replaceable filter elements. The filter media is polyester designed for high efficiency over a wide spectrum of industrial applications. See filter element cross reference table.



FOR DR BLOWER MODELS

Standard Replacement Filter Element Cross Reference Table					
		515158	515134	516489	515132
		515254	516434	516491	515133
515122	515132	515255	516435	516493	515134
515123	515133	515256	516435	516495	515134
515124	515134	516461	516434	516497	515134
515125	515134	516463	515135	516499	515135
515145	515134	516465	515135	516511	516515
515151	515135	516466	515132	516513	516515
515157	515133	516467	515133	517611	516515

Part Number	Z Media Filter	ID (Inches)	OD (Inches)	HT (Inches)	Area (Sq/Ft)
515132	517873	3.00	4.38	4.75	1.5
515133	517874	3.63	5.88	4.75	2.3
515134	517875	3.63	5.88	9.50	4.5
515135	517876	4.75	7.88	9.63	8.3
516434	517893	2.56	5.00	4.75	2.0
516435	517894	3.50	5.88	8.75	4.5
516515	517877	8.00	11.75	9.63	19.0

ATTACHMENT 1.6
DP 4150-CE-1

365-DAY PROGRAMMABLE TIMERS

ELECTRONIC 4-CHANNEL TIMER

- 4 independent channels, each capable of daily programming
- 3 programs plus skip feature per channel; manual override
- 365 day programming, includes 32 holidays, daylight savings, and leap year adjustment
- Provides one channel with astro-dial; auto-adjust program changes length of day during year, eliminates photoelectric cell
- Momentary contacts adjustable from 1 to 99 seconds
- 4 month battery carry-over protects program
- Provides normal line isolation for electronic circuitry
- Applications include time-of-day scheduling of HVAC equipment, indoor and outdoor lighting and bell ringing
- Indoor (NEMA 1) housing with display window, blue enamel finish, 10⅞L x 7¼W x 3⅛"D

PARAGON

E10597

ENERGY RIGHT

LR8376



No. 1A404. 4-Channel Timer. Paragon brand (EC74/192MA). Shpg. wt. 7.0 lbs. List $1101.75. Each $716.50

No. Poles	Form	Contact Load Ratings @ 60 Hz: Max. Amps/Pole Resistive 24VAC	120VAC	240VAC	Pilot Duty 24VAC	120/240VAC	Timer Input Volts @ 60 Hz	Time Settings Minimum	Maximum
4	SPDT	—	10	10	—	200/345VA	120/240	1 Minute	365 Days

(†) Maintained/Momentary

ELECTRONIC 7 AND 12-CHANNEL TIMERS

- 12 independent channels, on No. 2W542, with daily programming capability; 7 on No. 2A515
- 365-day programming, includes 32 holidays with No. 2W542, 16 with No. 2A515, daylight savings and leap year adjustment
- Repeat programming feature allows a specific daily program to be repeated for other days—expands ON/OFF capabilities
- Manual and timed program override
- 4 month battery carryover protects program
- Provides normal line isolation for electronic circuitry
- Indoor (NEMA 1) steel housing with display window, blue enamel finish
- Dimensions: No. 2W542 13¼L x 8¾W x 4¼"D
- Dimensions: No. 2A515 10⅞L x 7⅜W x 3"D

PARAGON

E10597

ENERGY RIGHT

LR8376



These units provide 2 methods of energy management time control. One method is time-of-day scheduling, where the timer turns off the power to electrical devices during times when they are not in use. The other method is time-based duty cycling, where one cycles various pieces of electrical equipment in a system to be on for an interval and off for an interval. This is typical for heating and air conditioning systems where several units may be used. This method may be used to reduce the peak demand level of daily electricity usage, which usually carries a penalty charge from the power companies. Paragon brand.

No. 2A515. 7-Channel Timer (EC77-140/120-240). Shpg. wt. 8.0 lbs. List $1538.02. Each $1000.00

No. 2W542. 12-Channel Timer (EC712-120/240). Shpg. wt. 10.0 lbs. List $1894.46. Each $1232.00

No. Poles	Stock No.	Contact Load Ratings @ 60 Hz: Maximum Amps/Pole Resistive Form	120VAC	240VAC	Pilot Duty 120/240VAC	Timer Input Volts @ 60 Hz	Time Settings Minimum	Maximum
7	2A515	SPST	4	2	200VA	120/240	1 Minute	365 Days
12	2W542*	SPDT	2.5	1.5	120			

(*) Complies with FCC limits for class A and B computing devices.

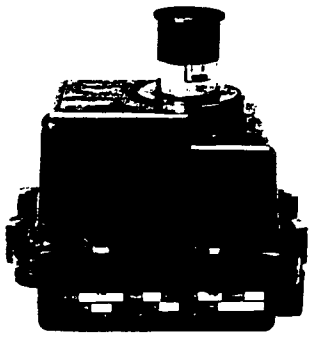
ATTACHMENT 1.1 dp

4150-CE-1

ASAHI ELECTRIC ACTUATORS

ELECTRIC - SERIES 92 CHIEF

For ball,multiport, butterfly, diaphragm and gate valves.
Meets both NEMA IV and VII Standards.



FEATURES:

- Reversing type motor, 115V/60Hz.
- Brushless, capacitor run motor (AC models).
- Permanently lubricated gear train.
- Thermally-bonded epoxy powder coating.
- Declutchable manual override.
- Visual position indicator (beacon). Visible from a distance.
- Combination Nema IV and VII enclosure.
- Duty cycle 25% at 10 seconds.
- Auxiliary contacts for light indication.
- ISO bolt circle
- Mechanical brake: 5" butterfly valve and larger sizes.

SERIES 92 CHIEF

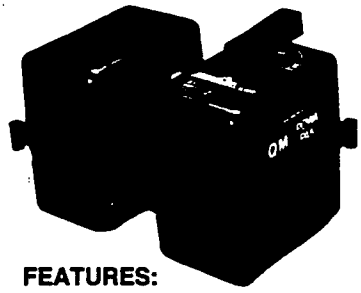
SIZE (IN.)	PART NUMBER	CYCLE TIME (SEC.)	PRICE EACH ($)
1/2	2001005	10	520.00
3/4	2001007	10	520.00
1	2001010	10	520.00
1-1/4	2001012	10	530.00
1-1/2	2001015	10	530.00
2	2001020	10	540.00
2-1/2	2001025	10	730.00
3	2001030	10	730.00
4	2001040	10	730.00

OPTIONS - SERIES 92 CHIEF	PART NUMBER	PRICE EACH ($)
• Extra Limit Switch	2126001	71.00
• Double Extra Limit Switch	2126002	142.00
• Hearter & Thermostat	2127001	120.00
• Feedback Potentiometer	2129001	191.00
• 4-20 MA Positioner	2130762	1,365.00
• Cycle Length Control	2131001	183.00
• Mechanical Brake	2136001	158.00
• Center OFF Switch	2132001	108.00
• 2-Wire Control	2102001	78.00
• Voltages:		
12 VDC	2135749	168.00
24 VDC	2135750	168.00
12 VAC	2135751	211.00
24 VAC	2135752	211.00
220 VAC	2135753	168.00

ELECTRIC - QUARTER MASTER II

(REVERSIBLE W/OPTIONAL POWAPAK)

For ball and multiport valves data avaiiable on request



(Shown with optional Powapak battery backup for failsafe applications).

FEATURES:

- Reversing type motor, 115V/60Hz.
- Low cost/high quality Quarter turn electric actuators.
- Corrosion proof/waterproof Nema IV thermoplastic housing with stainless steel trim.
- Compact design perfect for OEM's and customer with space limitations.
- Position indicator, easy to see from a distance.
- Manual override large handle, easy to see and use, an unusual feature on such a low cost unit.
- Duty cycle 75% for high cycle applications.
- Auxillary contacts for light indication.
- Powapak for battery backup power.
- For ball valves and multiport valves 1/2" - 2" and butterfly valves 1-1/2" - 2" (Type 75) 2" -2-1/2" (Omni Style).

QUARTER MASTER II

SIZE (IN.)	PART NUMBER	CYCLE TIME (SEC.)	PRICE EACH ($)
1/2	2085005	10	312.00
3/4	2085007	10	312.00
1	2085010	10	312.00
1-1/4	2085012	10	312.00
1-1/2	2085015	10	312.00
2	2085020	10	312.00

QUARTER MASTER II (WITH POWAPAK)

SIZE (IN.)	PART NUMBER	CYCLE TIME (SEC.)		PRICE EACH ($)
		OPEN	CLOSE	
1/2	2048005	10	3	1,915.00
3/4	2048007	10	3	1,915.00
1	2048010	10	3	1,915.00
1-1/4	2048012	10	3	1,915.00
1-1/2	2048015	10	3	1,915.00
2	2048020	10	3	1,915.00
2-1/2	2048025	10	3	1,915.00
3	2048030	10	3	1,990.00

OPTIONS - QUARTER MASTER II	PART NUMBER	PRICE EACH ($)
• Extra Limit Switch	2157000	24.00
• 2-Wire Control	2102000	74.00
• Voltages:		
12 VDC	2160749	24.00
24 VDC	2160750	24.00
12 VAC	2160751	36.00
24 VAC	2160752	36.00
220 VAC	2160753	57.00
Failsafe Battery Pack	2155000	312.00

Calculation 4150-CE-2

DANIEL B. STEPHENS & ASSOCIATES, INC.

Calculation Cover Sheet

Project Name HOBBS - ENRON Project Number 4150

Calculation Number 4150 - CE - 2 Discipline ENGINERING/CIVIL No. of Sheets 2

PROJECT

ENRON NATURAL GAS PROCESSINGPLANT

SITE

HOBBS, NEW MEXICO

FEATURE

MAXIMUM UNCONTROLLED EMISSIONS

SOURCES OF DATA

- IT CORPORATION PILOT TEST DATA
- CALCULATION 4150-CE-1

SOURCES OF FORMULAE & REFERENCES

☐ Preliminary Calculation ☒ Final Calculation Supersedes Calculation No. _____

Rev. No	Revision	Calculation By	Date	Checked By	Date	Approved By	Date
0	ORIGINAL	SNYDER	8/19/94	DP	8/30	[illegible]	8/31/94

DANIEL B. STEPHENS & ASSOCIATES, INC.
ENVIRONMENTAL SCIENTISTS AND ENGINEERS

Calculation Sheet

Project No. 4150 Date 8/19/94

Subject MAXIMUM UNCONTROLLED EMISSIONS Sheet 1 of 2

By SNYDER Checked By DP Calculation No. 4150-CE-2

1.0 PURPOSE: DETERMINE THE MASS OF CONTAMINANT RELEASED TO THE ATMOSPHERE BY THE SVE SYSTEM IF UNTREATED.

2.0 CRITERIA & ASSUMPTIONS:

- ASSUME IT CORP. DATA ON CONTAMINANT VAPOR CONCENTRATIONS HOLDS TRUE FOR ENTIRE SITE.

3.0 DATA

- TPH CONC. IN VEW-1 ⇒ 340,000 µg/l [mg/m³]
- TPH CONC. IN VEW-2 ⇒ 380,000 µg/l [mg/m³]
- UPPER VADOS ZONE Q ⇒ 525 ft³/min (ONE CIRCUIT)
- LOWER VADOS ZONE Q ⇒ 280 ft³/min (ONE CIRCUIT)

4.0 METHOD

THE MASS OF EMISSIONS IS CALCULATED BY THE FOLLOWING FORMULA:

$M = C * Q$ WHERE, M = MASS FLOW RATE OF CONTAMINANT
C = CONCENTRATION OF CONTAMINANT
Q = FLOW RATE OF MEDIUM

5.0 CALCULATIONS

5.1: UPPER ZONE

$$C = 340{,}000 \frac{mg}{m^3} * \frac{m^3}{(3.28 ft)^3} * \frac{lb}{454{,}000 mg} = 0.0212 \frac{lb}{ft^3}$$

$$M = 0.0212 \frac{lb}{ft^3} * 525 \frac{ft^3}{min} * 60 \frac{min}{hr} = 667.8 \frac{lb}{hr}$$

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

Calculation Sheet

Project No. 4150

Date 8/19/94

Subject Maximum Uncontrolled Emissions

Sheet 2 of 2

By JFS Checked By DP Calculation No. 4150-CE-2

5.2: LOWER ZONE:

$$C = 380{,}000 \frac{mg}{m^3} \times \frac{m^3}{(3.28\,ft)^3} \times \frac{lb}{454{,}000\,mg} = 0.0237 \frac{lb}{ft^3} \checkmark$$

$$M = 0.0237 \frac{lb}{ft^3} \times 280 \frac{ft^3}{min} \times 60 \frac{min}{hr} = 398.16 \frac{lb}{hr} \checkmark$$

6.0 RESULTS & CONCLUSIONS:

TOTAL MAXIMUM UNCONTROLED EMISSIONS = 667.8 lb/hr

DBS&A Form No. 026 Rev. 5/93

Calculation 4150-CE-3

DANIEL B. STEPHENS & ASSOCIATES, INC.

Calculation Cover Sheet

Project Name HOBBS - ENRON Project Number 4150

Calculation Number 4150 - CE - 3 Discipline ENGINEERING/CIVIL No. of Sheets 4

PROJECT

ENRON NATURAL GAS PROCESSING PLANT

SITE

HOBBS, NEW MEXICO

FEATURE

AIR SPARGE SYSTEM DESIGN

SOURCES OF DATA

- STEPHENS, ETAL., WATER RESOURCES RESEARCH, VOL. 23, NO 12, DEC. 1987.
- KVA & ASSOCIATES (BILL KERFOOT)
- E^3 CONFERENCE ON SOIL & VENTING TECHNOLOGIES

SOURCES OF FORMULAE & REFERENCES

- APPLIED FLUID MECHANICS, MOTT, 1990
- EIT REFERENCE MANUAL, 3rd ED.
- CRANE AIR CONDITIONING MANUAL, 1982

☐ Preliminary Calculation ☑ Final Calculation Supersedes Calculation No. _____

Rev. No	Revision	Calculation By	Date	Checked By	Date	Approved By	Date
Ø	Original	Pickens	8/19/94	PA	8/26	[signature]	8/31/94

DBS&A SOP Form No. 14.4.1 5/93

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

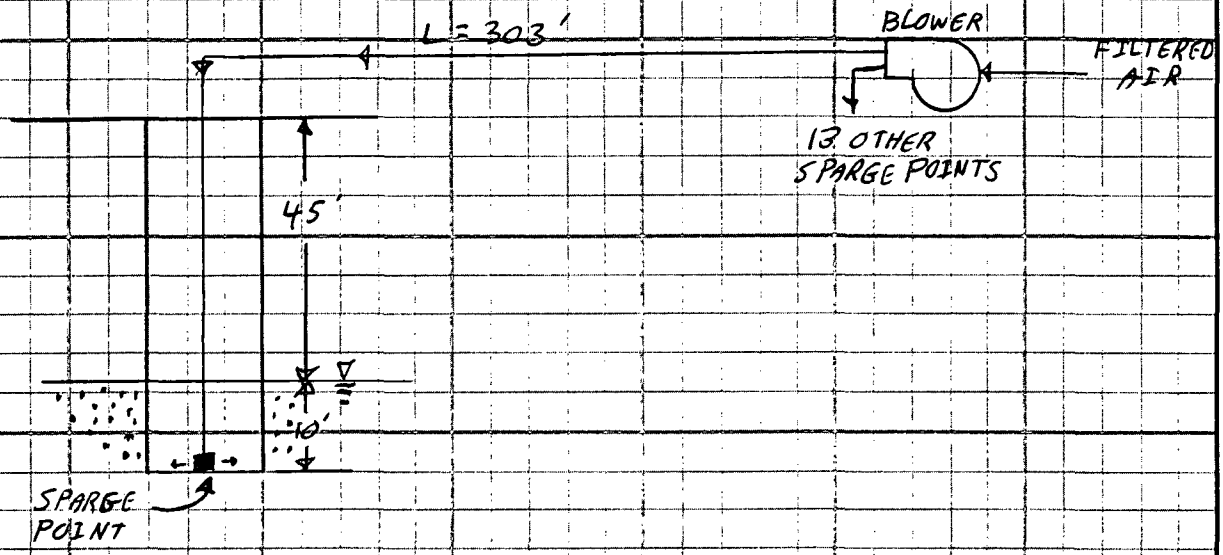
Calculation Sheet

Project No. 4150 Date 8/19/94

Subject AIR SPARGE DESIGN Sheet 1 of 4

By PICKENS Checked By PA Calculation No. 4150-CE-3

1.0 PURPOSE: DETERMINE AIR SPARGE RATES, PIPE SIZES & CORRESPONDING HEAD LOSSES



2.0 METHOD

2.1 FLOW RATE

Q FOR EACH POINT = 5 to 10 CFM

2.2 SYSTEM PRESSURE

$P_{MIN} = H_w + H_D + AEP$

WHERE, P_{MIN} = MINIMUM PRESSURE REQUIRED AT SPARGE POINT TO INITIATE BUBBLING

H_w = HYDROSTATIC PRESSURE

H_D = HEADLOSS ACROSS SPARGE POINT

AEP = SOIL AIR ENTRY PRESSURE

2.3 PIPE SIZES

ALL PIPES WILL RUN FROM A MANIFOLD AT THE COMPOUND TO THE INDIVIDUAL WELLS.

PIPE SIZES WILL BE DETERMINED BY THE EQUATION:

$$Q = \frac{V}{A}$$

WHERE, Q = VOLUMETRIC FLOW RATE
V = VELOCITY IN PIPE
A = PIPE CROSS-SECTIONAL AREA

2.4 HEADLOSSES

HEADLOSSES WILL BE DETERMINED BY DARCY'S EQUATION:

MAJOR LOSS $h_L = f\left(\frac{L}{D}\right)\left(\frac{V^2}{2g}\right)$ WHERE, f = FRICTION FACTOR
L = PIPE LENGTH
D = PIPE DIAMETER
g = GRAVITATIONAL ACCELERATION

AND MINOR LOSS $h_L = \Sigma K\left(\frac{V^2}{2g}\right)$

WHERE K = THE FITTING COEFFICIENT

3.0 CRITERIA & ASSUMPTIONS

- UNIFORM GEOLOGIC PARAMETERS OVER ENTIRE SITE.
- SPARGE POINT IS SET 10' BELOW THE WATER TABLE
- INCOMPRESSIBLE FLOW IN THE PIPES (MOTT, 1990)
  - IF PRESSURE CHANGES FROM INLET TO OUTLET ARE:
    a) < 10%, CHANGES IN SPECIFIC WEIGHT CAN BE IGNORED
    b) 10% TO 40%, THE AVERAGE SPECIFIC WEIGHT CAN BE USED
    c) > 40%, CHANGES IN SPECIFIC WEIGHT MUST BE TAKEN INTO ACCOUNT

4.0 MATERIAL PROPERTIES

- PIPES SHALL BE SCH 80 PVC PIPE

MATERIAL CAN BE CONSIDERED TO BE SMOOTH FOR PURPOSES OF DETERMINATION OF THE FRICTION FACTOR FROM MOODY'S DIAGRAM.

5.0 DATA SOURCES

- THE AEP (AIR ENTRY PRESSURE) WAS OBTAINED FROM STEPHENS, ET AL., WATER RESOURCES RESEARCH, VOL. 23, NO 12, PAGES 2207-2214, DEC. 1987.

USE AEP = 100 cm H_2O FOR SITE.

- H_L FOR THE SPARGE POINT WAS OBTAINED FROM BILL KERFOOT OF KVA & ASSOC. (MANUFACTURER) H_p = 2.5 psi

6.0 CALCULATIONS

6.1 PIPE SIZES

SET PIPE SIZE @ 1" NOMINAL ID PVC FOR EASE OF CONSTRUCTION

CHECK V

$$V = \frac{Q_{max}}{A} = \frac{10\ cfm}{(\pi/4)(1/12)^2} = 1833\ ft/min$$

6.2 PIPE PRESSURES

$$P_{MIN} = H_w + H_p + AEP = \left(10'H_2O \times \frac{0.4331\ psi}{ft\ H_2O}\right) + (2.5\ psi) + \left(100\ cm\ H_2O \times \frac{0.0142\ psi}{cm\ H_2O}\right)$$

P_{MIN} = 8.25 psi ⇒ USE A F.S. OF 1.5

∴ P_{MIN} = (8.25 * 1.5) = 12.4 psi ⇒ USE 12 PSI

DANIEL B. STEPHENS & ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS AND ENGINEERS

Calculation Sheet

Project No. 4150 Date 8-19-96

Subject AIR SPARGE DESIGN Sheet 4 of 4

By DP Checked By PA Calculation No. 4150-CE-3

6.3 HEADLOSSES

USE MAXIMUM FLOW RATE = 10 CFM

$$R_e = \frac{vD}{\nu} = \frac{(1833\ ft/min)\left(\frac{1}{12}'\right)}{1.73\times10^{-4}\ ft^2/sec}\left(\frac{min}{60\ sec}\right) = 2.94\times10^4$$

$f = 0.023$

$L_{LONGEST\ RUN} = 55' + 303' = 358'$

$\Sigma K \Rightarrow$ 6-90° ELBOWS (K=0.3), 1-TEE (K=1.0) (1-GATE VALVE (K=0.15)

$\Sigma K = 2.95$

$$h_L = \left(f\left(\frac{L}{D}\right) + \Sigma K\right)\frac{v^2}{2g} = \left(0.023\left(\frac{358'}{\left(\frac{1}{12}\right)'}\right) + 2.95\right)\frac{(1833)^2}{2g}\left(\frac{min}{60\ sec}\right)^2$$

$$h_L = 1474.7'\ AIR * \left(\frac{0.06511\ lb/ft^3\ AIR\ @\ 4000'}{62.4\ lb/ft^3\ H_2O}\right) * \left(\frac{13.2\ psia}{13.2\ psia + 12.4\ psig}\right)$$

$h_L = 2.98'\ H_2O$

7.0 RESULTS

- AIR SPARGE POINTS WILL DELIVER 5-10 CFM EACH
- TOTAL # OF POINTS = 14
- TOTAL FLOW FROM BLOWER = 70 to 140 CFM @ 12 psi

8.0 CONCLUSIONS

★ - BLOWER: ROOTS POSITIVE DISPLACEMENT PUMP FRAME 42 OPERATING AT 12 PSIG

★ SEE ATTACHMENT A

Attachment A.1
4150-CE-4
DP

SPECIFICATIONS
ROOTSPAK™
Universal RAI®
Packaged units (Patent pending)

BASIC PACKAGE DESCRIPTION

Roots offers 5 RootsPak sizes of completely assembled, factory engineered and guaranteed packages incorporating 16 frame sizes of Universal RAI rotary positive blowers with flows to 1600 ICFM, pressures to 15 psig or vacuums to 16" Hg.

The basic package consists of the blower, V-belt drive, OSHA guard, motor slide base, inlet filter and inlet silencer all mounted on top of a heavy-duty, unitized base/discharge silencer in one compact, easy to install package. A pressure relief valve is mounted on the discharge silencer. *Motor and other accessories optional.

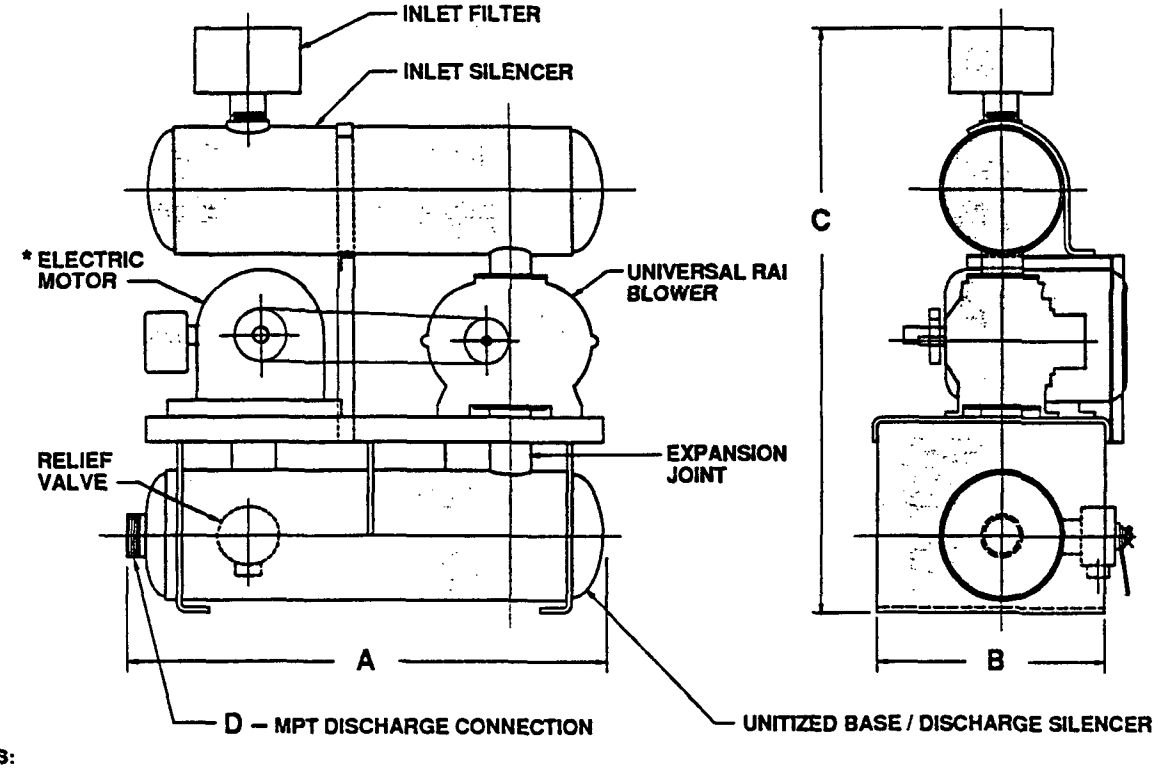
The combination base/discharge silencer is a rigid, one-piece weldment, reinforced for minimal vibration. The inlet filter is supplied with a 10 micron pleated paper element. All standard components are designed for indoor or outdoor operation.

The Universal RAI blower consists of a cast iron casing, carburized and ground alloy steel timing gears secured to steel shafts with a taper mounting and locknut, and cast iron involute impellers. Oversized anti-friction bearings are used, with a cylindrical roller bearing at the drive shaft on all models to provide increased bearing life and to withstand V-belt pull. The Universal RAI features thrust control, with splash oil lube on the gear end and grease lube on the drive end.

RootsPak units are factory painted and skidded for shipping and handling.

EVERY GROWING PLANT NEEDS ROOTS

OUTLINE DRAWING & DIMENSIONAL TABLE



NOTES:
1. All dimensions are in inches.
2. Dimensions are approximate – do not use for construction. Packages may not be exactly as shown.
3. Basic package weights do not include blower and motor. For blower weight, see reverse side of sheet.
4. V-belt guard is furnished, but not shown in above drawing.

RootsPak Size	Blower Frame Sizes	A	B	C	D	Approx. net weight (3)
2	22, 24, 32, 33, 42	35	22	48	2	190 lbs.
2-1/2	36, 45, 53	40	24	65	2-1/2	230 lbs.
3	47, 65	46	26	70	3	320 lbs.
4	56, 59, 76	56	28	75	4	460 lbs.
6	68, 615, 711	70	36	84	6	680 lbs.

Attachment A-2

4150-CE-4

PERFORMANCE TABLE

BLOWER FRAME SIZE (WEIGHT)	SPEED RPM	1 PSI		2 PSI		3 PSI		4 PSI		5 PSI		6 PSI		7 PSI		10 PSI		11 PSI		12 PSI		15 PSI		MAX. VACUUM		
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	"Hg	CFM	BHP
	1160	10	0.2	7	0.3	4	0.3	2	0.4															4	6	0.3
22	3600	49	0.6	46	0.8	43	1.1	41	1.3	39	1.6	38	1.8	36	2.1	32	2.8	31	3.1	29	3.3			14	28	2.0
(32)	5275	76	0.8	73	1.2	70	1.6	68	1.9	66	2.3	64	2.7	63	3.1	59	4.2	57	4.5	56	4.9			14	55	3.0
	1160	24	0.3	19	0.4	15	0.6	11	0.8	8	0.9													6	12	0.6
24	3600	102	0.8	97	1.3	93	1.8	89	2.3	86	2.8	83	3.3	81	3.8									14	69	3.8
(43)	5275	156	1.2	150	1.9	146	2.7	143	3.4	140	4.2	137	4.9	135	5.6									14	122	5.5
	1160	40	0.4	34	0.6	30	0.9	27	1.1	24	1.3	21	1.6	19	1.8									10	18	1.3
32	2800	113	1.0	108	1.6	104	2.1	101	2.7	98	3.2	95	3.8	93	4.3	86	6.0	84	6.5	82	7.1	77	8.7	15	78	4.5
(69)	3600	149	1.3	144	2.0	140	2.7	137	3.4	134	4.1	131	4.8	129	5.5	122	7.7	120	8.4	118	9.1	113	11.2	15	114	5.8
	1160	55	0.5	48	0.8	43	1.1	39	1.4	35	1.7	31	2.1	28	2.4									10	27	1.7
33	2800	156	1.2	149	2.0	144	2.7	140	3.5	136	4.2	132	5.0	129	5.7	120	8.0	118	8.7	116	9.5			14	113	5.6
(74)	3600	205	1.6	199	2.5	193	3.5	189	4.5	185	5.4	181	6.4	178	7.4	170	10.3	167	11.2	165	12.2			14	163	7.2
	1160	95	0.7	85	1.2	78	1.7	72	2.3	66	2.8	61	3.3	57	3.8									10	55	2.7
36	2800	262	1.7	253	3.0	245	4.2	239	5.4	234	6.7	229	7.9	224	9.2									12	213	7.8
(102)	3600	344	2.2	334	3.8	327	5.4	321	7.0	315	8.6	310	10.2	306	11.8									14	284	11.6
	860	38	0.4	32	0.6	28	0.9	24	1.1	21	1.3	18	1.5	15	1.8									8	19	1.1
42	1760	92	0.8	87	1.3	82	1.8	78	2.2	75	2.7	72	3.1	69	3.6	62	5.0	60	5.5	58	5.9			14	56	3.5
(88)	3600	204	1.7	198	2.6	194	3.6	190	4.5	186	5.5	183	6.4	181	7.4	173	10.2	171	11.2	169	12.1	163	15.0	14	167	7.2
	860	79	0.6	68	1.1	60	1.5	53	2.0	48	2.4	42	2.9	37	3.4									8	46	1.9
45	1760	188	1.3	177	2.2	169	3.1	162	4.1	156	5.0	151	5.9	146	6.9	133	9.6							12	134	5.8
(109)	3600	410	2.6	400	4.5	392	6.4	385	8.3	379	10.2	374	12.1	369	14.0	356	19.7							14	345	13.7
	860	109	0.8	97	1.4	89	2.0	81	2.6	74	3.2	68	3.8	63	4.4									8	72	2.5
47	1760	253	1.6	241	2.8	232	4.0	225	5.3	218	6.5	212	7.7	206	8.9									12	193	7.5
(128)	3600	546	3.2	535	5.7	526	8.2	518	10.7	511	13.2	505	15.8	500	18.3									14	473	17.9
	700	72	0.6	63	1.0	56	1.4	51	1.8	46	2.2	42	2.6	38	3.0									10	36	2.2
53	1760	211	1.5	203	2.6	196	3.6	191	4.6	186	5.6	181	6.6	177	7.6	167	10.7	163	11.7	160	12.7			14	158	7.5
(143)	2850	355	2.5	346	4.1	340	5.8	334	7.4	329	9.1	325	10.7	321	12.3	310	17.2	307	18.9	304	20.5	295	25.4	14	301	12.1
	700	123	0.9	110	1.6	100	2.2	92	2.9	85	3.6	78	4.3	72	4.9									10	70	3.5
56	1760	358	2.2	345	3.9	335	5.6	326	7.3	319	9.0	312	10.7	306	12.4	290	17.5							14	276	12.1
(170)	2850	598	3.6	585	6.4	575	9.1	567	11.9	560	14.6	553	17.3	547	20.1	531	28.3							14	517	19.7
	700	187	1.2	170	2.2	158	3.2	147	4.2	138	5.1	130	6.1											8	135	4.1
59	1760	529	3.0	513	5.5	500	8.0	490	10.5	480	12.9	472	15.4	464	17.9									12	445	15.1
(204)	2850	881	4.9	865	8.9	852	12.9	842	16.9	832	20.9	824	25.0	816	29.0									14	779	28.3
	700	140	1.0	126	1.8	116	2.6	107	3.3	100	4.1	93	4.8	86	5.5	70	7.8							12	71	4.7
65	1760	400	2.6	387	4.5	377	6.4	368	8.3	360	10.2	353	12.1	347	13.9	330	19.6	325	15.3	320	23.4	307	29.1	16	300	15.5
(45)	2350	546	3.5	532	6.0	522	8.5	513	11.1	506	13.6	499	16.1	492	18.6	475	26.2	470	28.7	466	31.2	452	38.8	16	445	20.7
	700	224	1.5	203	2.7	187	3.9	172	5.1	160	6.3	149	7.5	139	8.7									10	135	6.2
68	1760	643	3.8	621	6.8	605	9.8	591	12.9	579	15.9	567	18.9	557	22.0	530	31.0	522	34.1	515	37.1			15	495	23.0
(285)	2350	876	5.0	855	9.1	838	13.1	824	17.2	812	21.2	801	25.3	790	29.3	763	41.5	755	45.5	748	49.6			16	715	32.6
	700	420	2.6	380	4.8	351	7.1	323	9.3	301	11.6	279	13.8											8	292	9.1
615	1760	1205	6.4	1164	12.1	1133	17.8	1107	23.5	1084	29.1	1063	34.8											12	997	34.1
(425)	2350	1641	8.6	1601	16.1	1570	23.7	1544	31.3	1521	38.9	1500	46.5											12	1433	45.5
	575	195	1.3	179	2.3	168	3.3	158	4.3	150	5.4	142	6.4	134	7.4	115	10.4							12	117	6.2
76	1400	526	3.2	511	5.7	500	8.1	490	10.6	481	13.0	473	15.5	466	17.9	447	25.3	441	27.8	436	30.2	421	37.6	16	413	20.0
(400)	2050	788	4.7	772	8.3	761	11.9	751	15.5	742	19.1	734	22.7	727	26.3	708	37.1	703	40.7	697	44.2	682	55.0	16	674	29.2
	575	362	2.2	336	4.0	316	5.9	299	7.7	284	9.6	271	11.4	258	13.3	226	18.8							12	228	11.2
711	1400	970	5.3	944	9.8	925	14.3	908	18.8	893	23.3	880	27.8	867	32.3	835	45.8							15	793	33.8
(530)	2050	1450	7.7	1424	14.3	1404	20.9	1387	27.5	1373	34.1	1359	40.7	1347	47.3	1315	67.1							16	1256	52.7

Notes:
1. Pressure ratings based on inlet air at standard pressure of 14.7 psia, standard temperature of 68°F, and specific gravity of 1.0.
2. Vacuum ratings based on inlet air at standard temperature of 68°F, discharge pressure of 30" Hg and specific gravity of 1.0. Consult factory for RootsPak optional vacuum packages.
3. Blower weights shown are approximate net weights in pounds.

DESIGN & CONSTRUCTION FEATURES

1. Factory engineered, factory guaranteed
2. Compact package designed for ease of handling and installation
3. Indoor or outdoor operation (when ordered with suitable motor enclosure)
4. Blower covered by 18/24 month uncontested warranty
5. Refer to bulletin B-5125 for Universal RAI blower details

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Regression Models for Hydraulic Conductivity and Field Test of the Borehole Permeameter

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The saturated hydraulic conductivity K_s of sediments in the vadose zone is an important parameter in predicting the seepage rates of water and contaminants. The borehole permeameter is an in situ technique to test a relatively large sample size at any depth. Solutions are presented which account for the effects of unsaturated flow. These solutions are derived from a regression analysis of results of numerical simulations in which unsaturated hydraulic conductivity is represented by one or two parameters. The results of a borehole permeameter test in a uniform sand are compared with field ponding tests and air entry permeameter tests. The regression-based solutions for the borehole permeameter which account for capillarity provide very good agreement with other permeameter results. Depending upon the approach used to solve the borehole problem K_s values determined by methods which neglected and included capillary effects varied by a factor of only about two for the soil tested.

INTRODUCTION

Methods to determine the saturated hydraulic conductivity K_s above the water table are applicable to a wide range of problems, including artificial recharge, impoundment seepage, drainage of agricultural land, and hazardous waste disposal, among others. A recent series of articles [*Stephens and Neuman*, 1982*a*, *b*, *c*] discussed one of these methods to obtain saturated hydraulic conductivity in situ in the vadose zone, namely, borehole infiltration tests. *Philip* [1985] recently referred to this method as the borehole permeameter, and others have applied the terms well permeameter, shallow well pump-in test, and reverse auger hole method. The test involves filling a borehole of known geometry with water and maintaining a constant water level in the hole until the flow rate into the soil is steady. *Reynolds et al.* [1985] advocate the use of a Mariotte siphon to control head in the borehole and refer to this particular apparatus as the "Guelph permeameter."

Stephens and Neuman [1982*a*] presented field procedures, as well as analytical solutions which were developed mostly by the U.S. Bureau of Reclamation. One of the solutions [*Glover*, 1953] has the form

$$K_s = \frac{Q[\sinh^{-1}(H_D) - 1]}{2\pi H^2} \tag{1}$$

where Q is the steady flow rate into the borehole ($L^3\ T^{-1}$); H is the constant depth of water in the borehole (L); and H_D (LL^{-1}) is the ratio of water depth to borehole radius r (L). This solution assumes that the pore space is fully saturated and neglects capillarity; that is to say, pressure heads less than zero are not included in the conceptual model. Another analytical solution which neglects capillarity was recently derived by *Reynolds et al.* [1983].

Through the use of numerical simulations, *Stephens and Neuman* [1982*b*, *c*] evaluated the simplified solutions and found them to have limitations, particularly with respect to the significance of unsaturated flow. They employed four different soils to predict the steady flow rate for a range of borehole conditions. The soils included silt loam GE3, Del Monte fine sand, Yolo light clay, and a hypothetical coarse sand similar to sand 4107 in *Mualem and Dagan*'s [1976] catalog. A multiple linear regression analysis between dimensionless flow rate, borehole geometry, and capillary factors showed that differences in capillarity between soils contributed significantly to the variability in the model-predicted steady flow rate. On the basis of this statistical analysis applied to 27 data sets reflecting different combinations of borehole and soil properties, an equation was derived to predict K_s. The capillary factor selected, α_1 (L^{-1}), was arbitrarily based on the relative unsaturated hydraulic conductivity K_r versus pressure head ψ relationship, defined as

$$\alpha_1 = \frac{\ln(1) - \ln(0.5)}{0 - \psi\ (\text{at } K_r = 0.5)} = -\frac{0.693}{\psi\ (\text{at } K_r = 0.5)} \qquad \psi < 0 \tag{2}$$

The regression-based solution is

$$\log_{10} C_u = 0.658 \log_{10} H_D - 0.238\alpha_1^{0.5} - 0.398 \log_{10} H + 1.343 \tag{3}$$

where C_u is a dimensionless steady flow rate defined as

$$C_u = Q/(rHK_s) \tag{4}$$

and the 95% confidence limits on the coefficients on the right-hand side of (3) are ± 0.057, 0.057, 0.100, 0.123, respectively [*Stephens*, 1979].

The numerical simulations clearly showed that the zone of saturation was limited to the vicinity of the borehole, and the significance of capillary effects on the flow rate was a function of soil texture and borehole conditions. In fact, the decrease in water content with increasing distance from the borehole led *Stephens* [1985] to suggest that flow nets could be used to determine unsaturated hydraulic conductivity in situ, provided that sufficient data were available to map the hydraulic head field.

Philip [1985] recently addressed the same problem of saturated-unsaturated flow from a borehole in the vadose zone. He developed a quasi-analytical solution to predict K_s

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$(0 < M < 1; N > 1)$. Based on a theoretical model of *Mualem* [1976b] the parameters α_v and N are then used to calculate $K_r = K_r(-h)$ directly, according to

$$K_{r(v)} = K_r(-h) = \frac{\{1 - (\alpha_v h)^{N-1}[1 + (\alpha_v h)^N]^{-M}\}^2}{[1 + (\alpha h)^N]^{M/2}} \quad (10)$$

These fitting parameters to moisture retention data in (7) and (9) will be used in deriving empirical expressions to determine K_s from borehole permeameter data that incorporate capillary effects.

The hydraulic properties for developing the capillary parameters and running the numerical simulations were obtained from the four soils used to generate (3) plus two other soils, Gilat loam and Ida silt loam. Details of numerical simulations of saturated-unsaturated flow are described in detail by *Stephens* [1979] and *Stephens and Neuman* [1980; 1982b]. Simulations of the steady infiltration rate were obtained for different borehole diameters and depths of water in the borehole. The results of the numerical simulations led to as many as 29 sets of data, with each set consisting of the steady simulated infiltration rate, soil hydraulic properties, borehole radius, and head of water. For each of three different methods to characterize capillary effects (equations (2), (7), and (9)), a multiple linear regression analysis [*Kim and Kohout*, 1975] was applied to the data sets. The parameters used to characterize capillary effects are given in Table 1; in each case, these parameters were obtained from the main wetting curve of the soil moisture characteristic. The three empirical equations developed from the simulation data and the capillarity parameters in equations (2), (7), and (9) are as follows.

α_1 model

$$\log_{10} C_u = 0.486 \log_{10} H_D + 0.004\alpha_1^{-1} - 0.454 \log_{10} H + 0.019 H_D^{0.5} + 0.828 \qquad R^2 = 0.983 \quad (11)$$

where α_1 is in inverse centimeters, H is in meters, and the 95% confidence limits on $\log_{10} C_u$ and the other coefficients are 0.114, 0.086, 0.061, 0.073, and ± 0.008, respectively.

Brooks-Corey model

$$\log_{10} C_u = 0.484 \log_{10} H_D + 0.027(-\psi_w)^{0.5} - 0.466 \log_{10} H + 0.018 H_D^{0.5} + 0.846 \qquad R^2 = 0.979 \quad (12)$$

where ψ_w is in centimeters, H is in meters, and the 95% confidence limits on $\log C_u$ and the other coefficients are 0.130 and 0.098, 0.005, 0.084, ± 0.009, respectively.

TABLE 1. Unsaturated Flow Parameters Used to Develop Empirical Solutions for K_s

Soil	Mualem Catalog Number	Brooks-Corey α_1, cm^{-1}	Brooks-Corey λ, cm^{-1}	Brooks-Corey ψ_w, cm	van Genuchten α_v, cm^{-1}	van Genuchten N	van Genuchten θ_r
Delhi sand fine sand	4108	0.012	2.41	−55.0	0.016	4.36	0.05
Yolo light clay	3102	0.040	0.49	−28.0	0.027	1.60	0.18
Silt loam G.E. 3	3310	0.010	1.09	−200.0	0.004	2.06	0.13
Coarse sand	4107	0.046	1.96	−12.0	0.060	2.46	0.04
Gilat loam	3402	0.018	0.16	−0.7	0.017	2.30	0.08
Ida silt loam	3305	1.98			0.040	1.27	0.00

van Genuchten model

$$\log_{10} C_u = 0.653 \log_{10} H_D - 0.257 \log_{10} \alpha_v - 0.633 \log_{10} H + 0.021 H_D^{0.5} - 0.313 N^{-0.5} + 1.456r + 0.453 \qquad R^2 = 0.993 \quad (13)$$

where α_v is in centimeters^{-1}, H and r are in meters, and 95% confidence limits on $\log C_u$ are 0.078 and 0.147, 0.032, 0.152, 0.006, 0.177, and ± 1.525 on the other coefficients, respectively. Twenty eight data sets were used to develop (12) and (13) and 29 data sets were used for (11). In the multiple linear regression analysis, only those terms which contributed significantly to predicting $\log C_u$ on the basis of an F statistic, were included in the above equations.

The regression equation chosen should be that which produces accurate results and contains parameters that are convenient for the user. Methods to estimate capillary parameters for the empirical solutions will be summarized. In the Brooks-Corey [*Brooks and Corey*, 1949] approach (equation (12)), one needs to determine the water entry pressure head. This value, which is roughly half of the air entry pressure head, can be estimated in the field with the air entry parameter described by *Bouwer* [1966]. Using a hanging water column apparatus, air and water entry pressure may be determined in the laboratory. Particle size analysis of representative samples and soil texture classification on the U.S. Department of Agriculture soil texture triangle are all that are required to estimate the water entry pressure head using compilations by *Clapp and Hornberger* [1978] or *McCuen et al.* [1981].

The parameters in *van Genuchten*'s [1978] procedure (equation (13)) may be obtained by selecting a representative soil from among 34 moisture retention curves for imbibition in *Mualem*'s [1976] catalog. We applied van Genuchten's computer procedure to these 34 soils to calculate unsaturated flow parameters using the Mualem three-parameter model (Table 2). The resulting values of a α_v and N may be used to estimate the capillary effects for similar soils.

An approach to obtain the θ-ψ relationship indirectly for a specific soil, and therefore to estimate the Brooks-Corey [*Brooks and Corey*, 1964] or *Mualem* [1978] parameters, is to use the recent work by *Arya and Paris* [1981], which produces a θ-ψ curve from particle size analyses and bulk density. However, this procedure has not been extensively validated in the published literature.

Perhaps the best method to obtain the unsaturated flow parameters may be to actually collect θ-ψ data pairs from simultaneous measurements with a neutron probe and tensiometers located around the borehole. Even at steady state the moisture content from background to saturation can be determined with proper location of instrumentation, owing to the three-dimensional distribution of moisture content surrounding the borehole. For example, the in situ θ-ψ relationship could be used to generate *Mualem*'s [1978] parameters in (13); then, steady borehole infiltration rate and borehole geometry could be used to calculate K_s.

For the third regression model, equation (11), to obtain α_1, one could utilize the flow net procedure described by *Stephens* [1985]. This is an in situ technique which requires mapping the hydraulic head field near a constant head source, such as that created during the borehole infiltration test. Alternatively, conductivity could be calculated from moisture retention data

Calculation 4150-CE-4

DANIEL B. STEPHENS & ASSOCIATES, INC.

Calculation Cover Sheet

Project Name HOBBS-ENRON Project Number 4150

Calculation Number 4150-CE-4 Discipline ENGINEERING/CIVIL No. of Sheets 2

PROJECT

ENRON NATURAL GAS PROCESSING PLANT

SITE

HOBBS, NEW MEXICO

FEATURE

SVE RADIUS OF INFLUENCE

SOURCES OF DATA

IT CORP. PILOT TEST DATA

SOURCES OF FORMULAE & REFERENCES

"A PRACTICAL APPROACH TO THE DESIGN, OPERATION AND MONITORING OF IN-SITU SOIL VENTING SYSTEMS", JOHNSON, KEMBLOWSKI, ET. AL.

☐ Preliminary Calculation ☒ Final Calculation Supersedes Calculation No. _____

Rev. No	Revision	Calculation By	Date	Checked By	Date	Approved By	Date
0	Original	RE	8/24/94	TJF	8/31/94	[signature]	8/31/94

DBS&A SOP Form No. 14.4.1 5/93

DANIEL B. STEPHENS & ASSOCIATES, INC.
ENVIRONMENTAL SCIENTISTS AND ENGINEERS

MATHCAD CALCULATION

Project No.:

Subject: SVE WELL DESIGN ANALYSIS (LVZ WELLS)

Date: 8/24/94

By: R. EDERER Checked By: TJF

Calculation No.: 4150-CE-4

1.0 PURPOSE: Estimate the radiuss of influence and pressure at desired radius of influence using the radial flow steady state pressure equations. The final results will provide the design well head vacuum for equipment specs.

2.0 ASSUMPTIONS AND CRITERIA:

1. REFERENCES: IT CORPORATION, PRELIMINARY FIELD INVESTIGATION REPORT, FORMER LIQUID WASTE DISPOSAL PIT, ENRON GAS PROCESSING CO., MARCH 1993.

   JOHNSON, P.C, KEMBLOWSKI, M.W., ET. AL, A PRACTICAL APPRACH TO THE DESIGN, OPERATION, AND MONITORING OF IN SITU SOIL VENTING SYSTEMS, ~~JUNE 1989.~~ GWMR, SPRING 1990.

2. DATA BELOW IS BASED ON IT PILOT TEST WHERE Q=58.9 CFM AT t=1930: SEE ATTACHMENT 1 ✓

3.0 CALCULATIONS AND ASSUMPTIONS:

1. CALCULATE RADIUSS OF INFLUENCE BASED ON THE FOLLOWING INPUT DATA:

Absolute ambient pressure: $P_{atm} := .85$ ✓

Extraction well radius (including backfil): $R_w := \frac{4}{12}$ $R_w = 0.333$ feet [Well VEW-2] ✓

Distance from VEW $r := 35$ feet

Absolute pressure at distance r: $P_r := \left(P_{atm} + \frac{-0.24}{407.09}\right)$ $P_r = 0.8494$ atm [ATTACHMENT 1]

Absolute pressure applied at VEW: $P_w := \left[P_{atm} + \left(-\frac{55}{407.09}\right)\right]$ $P_w = 0.7149$ atm [ATTACHMENT 1]

Calculate Radiuss of Influence:

$$R_i := e^{\left[\left(\frac{P_{atm}^2 - P_w^2}{P_r^2 - P_w^2}\right)\cdot \ln\left(\frac{r}{R_w}\right)\right]} \cdot R_w \qquad R_i = 35.8 \text{ feet}$$

2. ASSUMING A DESIGN WELL FLOW OF 70 CFM, ESTIMATE THE PRESSURE AT R_i:

Volumetric vapor flowrate $Q := 70$ cfm $Q := Q \cdot \frac{30.48^3}{60}$ $Q = 3.304 \cdot 10^4$ cm3/s ✓

Stratum thickness (or screen interval): $m := 42$ $m := m \cdot 30.48$ cm $m = 1.280 \cdot 10^3$ [IT CORP WELL LOG] ✓

Soil permeability to air flow: (iterated to match pilot test results) $k := 3.44 \cdot 10^{-10}$ m2 $k := k \cdot 100^2$ $k = 3.440 \cdot 10^{-6}$ cm2 [IT CORP SOILS DATA] ✓

Viscosity of air: $\mu := 1.8 \cdot 10^{-4}$ gm/cm-s ✓

Air filled soil void fraction $\varepsilon := .43$ [IT CORP SOILS DATA] ✓

time: $t := 7$ hours $t := t \cdot 24 \cdot 60$ seconds [ATTACHMENT 1] = 10080 sec

radial distance from VEW: $r := R_i$ $r := r \cdot 30.48$ $r = 1.091 \cdot 10^3$ cm ✓

Ambient atmospheric pressure: $P_{atm} := .85$

$P_{atm} := P_{atm} \cdot 1.013 \cdot 10^6$ g/cm-s2 = 8.610×10^5 Pa ✓

3. X <0.1 THEREFORE, THE FOLLOWING EQUATION APPLIES: $X := \frac{r^2 \cdot \varepsilon \cdot \mu}{4 \cdot k \cdot P_{atm} \cdot t}$ $X = 7.710 \cdot 10^{-4}$

$$P_x := \frac{Q}{\left[4 \cdot \pi \cdot m \cdot \left(\frac{k}{\mu}\right)\right]} \cdot \left(-0.5772 - \ln\left(\frac{r^2 \cdot \varepsilon \cdot \mu}{4 \cdot k \cdot P_{atm}}\right) + \ln(t)\right)$$

$P_x = 708.205$ g/cm-s2 OR: $P_x := \frac{P_x}{1.013 \cdot 10^6} \cdot 407.98$ $P_x = 0.285$ "In H2O

4. BASED ON THE THE CALCULATION P_X AND R_I FROM ABOVE, ESTIMATE THE WELL HEAD VACUUM FROM THE FOLLOWING:

Absolute ambient pressure: $P_{atm} := .85$

Extraction well radius (including backfil): $R_w := \frac{8}{12}$ $R_w = 0.667$ feet

Distance from VEW $r := 35$ feet

Absolute pressure at distance r: $P_r := P_{atm} + \frac{P_x}{407.09}$ $P_r = 0.8507$ atm

The following equation was iterated such that P_r =let:

$P_g := 48$ "H2O gauge vacuum AT WELL HEAD

$$P_w := P_{atm} + \frac{P_g}{407.09} = 0.9679 \text{ atm}$$

$P_x = 0.285$ "H20 (gauge) AT A DISTANCE R_i

$$P_r := P_{atm} + \frac{P_x}{407.09} \qquad P_r = 0.85070 \text{ atm}$$

$$x := P_w \cdot \left[1 + \left[1 - \left(\frac{P_{atm}}{P_w}\right)^2\right] \cdot \frac{\ln\left(\frac{r}{R_w}\right)}{\ln\left(\frac{R_w}{R_i}\right)}\right]^{\frac{1}{2}} \qquad x = 0.85070$$

4.0 CONCLUSION AND RECOMMENDATIONS:

Pr = x: or $P_g = 48.0$ "H20 **USE P_g FOR DESIGN OF THE BLOWER FOR THE SVE SYSTEM**

ATTACHMENT #1
CALC#-4150-CE-4.

PRELIMINARY FIELD INVESTIGATION REPORT
FORMER LIQUID WASTE DISPOSAL PIT
ENRON GAS PROCESSING COMPANY,
MAIN PLANT
HOBBS, NEW MEXICO
OCTOBER–DECEMBER 1992

Prepared for:

Enron Liquid Fuels Company

Prepared by:

IT Corporation
5301 Central Avenue NE, Suite 700
Albuquerque, New Mexico 87108

March 1993

Table 4

Summary of VES Pilot Test Monitoring Parameters
Enron Liquid Fuels Company, Main Gas Processing Plant
Hobbs, New Mexico

Date Vapor Extraction Well ID	Time	Vacuum[a] (in. H_2O)	Flow Rate[b] (ft/min)	Temperature[c] (°F)	% LEL[d]	FID Effluent Concentration[e] Parts Per Million
04-Nov-92	1230	54	2000	60	100	NA
VEW-2	1330	54	2700	65	100	NA
	1430	54	2300	60	100	NA
	1530	54	2300	60	100	NA
	1630	54	2200	60	100	NA
	1730	55	2600	60	100	NA
	1830	55	2500	60	100	NA
	1930	55	2700	53	100	NA
05-Nov-92	0700	30	1400[f]	95[f]	100	NA
VEW-1	0800	29	1800[f]	90[f]	100	NA
	0900	28	3000	60	100	NA
	1000	29	4800	60	100	NA
	1100	29	4200	60	100	NA
	1200	29	4200	65	100	NA
	1300	29	3800	65	NA	>1000
	1420	29	3800	65	NA	>1000

[a]Vacuum measured in inches of water.
[b]Airflow velocity measured with a hot-wire anemometer in a 2-inch-inside-diameter pipe in feet per minute.
[c]Temperature in degrees Fahrenheit as measured by a hot-wire anemometer.
[d]Lower explosive limit, percent.
[e]Organic vapor concentrations measured with an FID in parts per million by volume.
[f]During the first two readings on 12-5-92, the hot-wire anemometer was out of calibration.
NA = Not analyzed.

Table 5

Vapor Extraction System Pilot Test Soil Observation Probe Data
Enron Liquid Fuels Company, Main Gas Processing Plant
Hobbs, New Mexico

Date Vapor Extraction Well ID	Time	Soil Observation Probe Boring B-7				Soil Observation Probe Boring B-8				Soil Observation Probe Boring B-9				Soil Observation Probe Boring B-10	
		Distance From Extraction Well (feet)	Vacuum (inches of water) at Given Depth			Distance From Extraction Well (feet)	Vacuum (inches of water) of Given Depth			Distance From Extraction Well (Feet)	Vacuum (inches of water) at Given Depth			Distance From Extraction Well (feet)	Vacuum (inches of water)
			10 ft	16 ft	32 ft		9 ft	15 ft	30 ft		10 ft	16 ft	27 ft		
04-Nov-92	1230	35	0.00	.09	.21	50	0.00	0.00	0.00	15	.17	1.8	.25	45	.85
VEW-2	1330	35	0.00	.11	.23	50	0.00	0.00	0.00	15	.17	1.7	.24	45	.10
LVZ	1430	35	0.00	.14	.30	50	0.00	.005	0.00	15	.17	.8	.30	45	.12
	1530	35	0.00	.12	.20	50	0.00	.005	0.00	15	.18	1.7	.30	45	.12
	1630	35	0.00	.12	.23	50	.01	.01	0.00	15	.18	1.7	.20	45	.11
	1730	35	0.00	.10	.23	50	.03	.02	0.00	15	.17	1.7	.20	45	.15
	1830	35	0.00	.10	.20	50	.01	.01	0.00	15	.18	1.7	.20	45	.13
	1930	35	0.00	.11	.24	50	.02	.01	0.00	15	.18	1.7	.20	45	.14
05-Nov-92	0700	35	0.00	.21	.25	50	.10	.12	.11	15	.90	.60	1.0	45	.30
VEW-1	0800	35	0.00	.25	.25	50	.14	.14	.11	15	.90	.70	1.2	45	.35
LVZ	0900	35	0.00	.25	.30	50	.10	.10	.09	15	.90	.60	1.2	45	.30
	1000	35	0.00	.20	.30	50	.095	.10	.08	15	.90	.60	1.1	45	.30
	1100	35	0.00	.20	.30	50	.07	.06	.05	15	.90	.60	1.1	45	.25
	1200	35	0.00	.20	.30	50	.08	.07	.05	15	.90	.60	1.1	45	.30
	1300	35	0.00	.20	.30	50	.11	.10	.08	15	.90	.60	1.1	45	.30
	1430	35	0.00	.20	.30	50	.07	.08	.06	15	.90	.60	1.1	45	.30

Calculation 4150-CE-5

DANIEL B. STEPHENS & ASSOCIATES, INC.

Calculation Cover Sheet

Project Name HOBBS-ENRON Project Number 4150

Calculation Number 4150-CE-5 Discipline CE No. of Sheets 5

PROJECT

HOBBS-ENRON REMEDIAL DESIGN

SITE

HOBBS-ENRON NATURAL GAS PROCESSING PLANT

FEATURE

COMPUTATION OF CONTAMINANT VOLUME/MASS

SOURCES OF DATA

IT, METRIC, DBS&A

SOURCES OF FORMULAE & REFERENCES

☐ Preliminary Calculation ☑ Final Calculation Supersedes Calculation No. _____

Rev. No	Revision	Calculation By	Date	Checked By	Date	Approved By	Date
		PA	8/22/94	JTS	8/22/94	[illegible]	8/31/94

DBS&A SOP Form No. 14.4.1 5/93

DANIEL B. STEPHENS & ASSOCIATES, INC.
ENVIRONMENTAL SCIENTISTS AND ENGINEERS

Calculation Sheet

Project No. 4150 Date 8-22-94

Subject Computation of Contaminant Vol/Mass Sheet 1 of 4

By PA Checked By JTS Calculation No. 4150-CE-5

0-10 feet

TPH Conc's mg/Kg

190, 263, 625, 720, 3,100, 3,300, 32,000

n = 7 ; Geometric Mean = 1,330 mg/Kg

Assume: $\rho_B = 2.65 \frac{gm}{cm^3} \times 0.75 + 0 \frac{gm}{cm^3} \times 0.25$

i.e., 25% porosity sand (quartz)

$\therefore \rho_B = 2.0 \frac{gm}{cm^3}$ or $57 \frac{Kg}{ft^3}$

Area (see attached graphic representation)

= 27,000 ft^2

Volume = $27{,}000\ ft^2 \times 10\ ft = 270{,}000\ ft^3$

Mass = $1{,}330 \frac{mg}{Kg} \times 57 \frac{Kg}{ft^3} \times 270{,}000\ ft^3 \times \frac{Kg}{10^6\ mg}$

= 20,469 Kg

Project No. 4150 Date 8-22-94

Subject Computation of Contaminant Vol/Mass Sheet 2 of 4

By PA Checked By JTS Calculation No. 4150-CS-5

10-20 feet

TPH Conc's mg/Kg

1,061 , 1,275 , 2,400

n = 3 Geometric Mean = 1,480

Assume $\rho_B = 2.0 \frac{gm}{cm^3}$ or $57 \frac{kg}{ft^3}$

Area = 12,900 ft^2

Volume = 12,900 ft^2 x 10 ft = 129,000 ft^3

Mass = $1,480 \frac{mg}{kg} \times 57 \frac{kg}{ft^3} \times 129,000\ ft^3 \times \frac{kg}{10^6\ mg}$

= 10,882 Kg

Project No. 4150 Date 8-22-94

Subject Computation of Contaminant Vol/Mass Sheet 3 of 4

By PA Checked By JTS Calculation No. 4150-CS-5

20-30 feet

TPH Conc's mg/Kg

831, 4,200

n = 2 Geometric Mean = 1,868 mg/Kg

Assume ρ_b = 2.0 $\frac{gm}{cm^3}$ or 57 $\frac{Kg}{ft^3}$

Area = 13,400 ft^2

Volume = 13,400 ft^2 × 10 ft = 134,000 ft^3

Mass = 1,868 $\frac{mg}{kg}$ × 57 $\frac{kg}{ft^3}$ × 134,000 ft^3 × $\frac{Kg}{10^6 mg}$

= 14,268 Kg

DANIEL B. STEPHENS & ASSOCIATES, INC.
ENVIRONMENTAL SCIENTISTS AND ENGINEERS

Calculation Sheet

Project No. 4150
Subject Computation of Contaminant Vol/Mass
Date 8-22-94
Sheet 4 of 4
By PA Checked By JTS Calculation No. 4150-C8-5

30-40 feet

TPH Conc's (mg/Kg)

145, 200, 250, 310, 428, 517, 880,
1,000, 1,300, 4,100, 7,500

n = 11 Geometric Mean = 692 $\frac{mg}{Kg}$

Assume ρ_B = 2.0 $\frac{gm}{cm^3}$ or 57 $\frac{Kg}{ft^3}$

Area = 23,500 ft^2

Volume = 23,500 ft^2 × 10 ft = 235,000 ft^3

Mass = 692 $\frac{mg}{Kg}$ × 57 $\frac{Kg}{ft^3}$ × 235,000 ft^3 × $\frac{Kg}{10^6 mg}$

= 9,269 Kg

DBS&A Form No. 026 Rev. 5/93

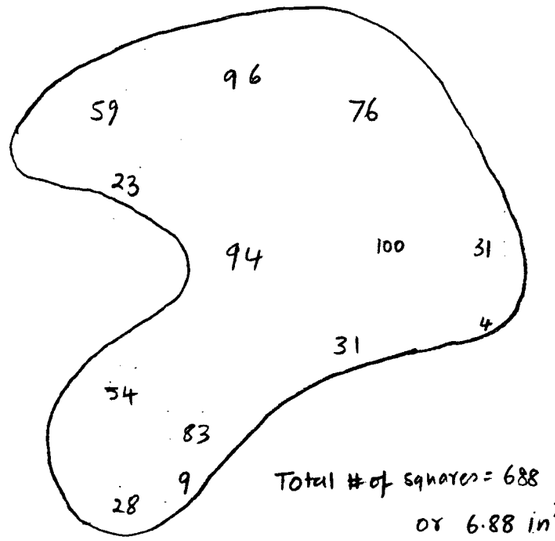
Table XX. Estimated Volume and Mass of Contaminants

ENRON Hobbs FLWDP Area

Interval (feet bgs)	Area of Actionable Contamination (square feet)[1]	Volume (cubic feet)	Average Contaminant Concentration (mg/Kg)[2]	Estimated Contaminant Mass (Kg)[3]
0-10	27,000	270,000	1,330	20,469
10-20	12,900	129,000	1,480	10,882
20-30	13,400	134,000	1,868	14,268
30-40	23,500	235,000	692	9,269
Totals	NA	768,000	NA	54,888

5.2 Ground-Water Impacts

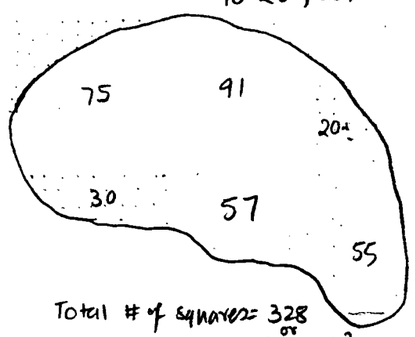
The estimated extent of actionable BTEX in ground water is shown in Figure 9. Benzene, which has the lowest regulatory standard (10 μg/L) of the BTEX constituents, has been used to determine the extent of actionable ground water. Actionable benzene is limited to a plume about 200 feet wide extending from the vicinity of the oil/water separator about 420 feet to



Total # of squares = 688
or 6.88 in^2
Total area = 27,086 ft^2

0-10 Feet

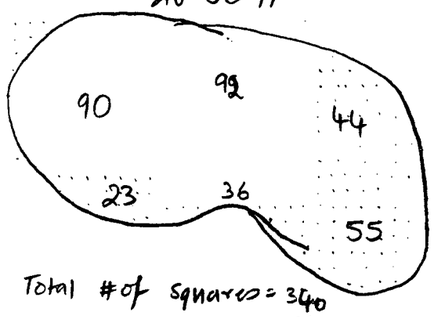
10-20 feet



Total # of squares = 328
or 3.28 in^2

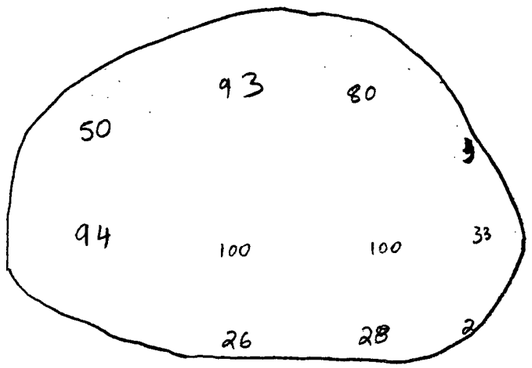
Total area = 12,913 ft^2

20-30 ft



Total # of squares = 340
or 3.4 in^2

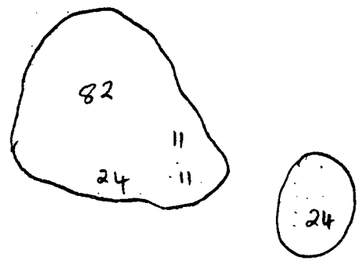
Total area = 13,386 ft^2



30-40 feet

Total # of squares = 609
or 6.09 in^2

Total area = 23,976 ft^2



40 Feet plus

Total # of Squares = 152
or 1.52 in^2

Total area = 5,984 ft^2

scale = 1" = 62.75 feet

$1\ in^2 = 3{,}937\ ft^2$

Ft bgs	Area (ft^2)	Depth (ft)	Volume (ft^3)
0-10	27,000	10	270,860
10-20	12,900	10	129,30
20-30	13,400	10	13 3860
30-40	23,600	10	239,760
40-	5,984	10	59,840
			833,450 ft^3

Assuming a porosity of 0.25, Vol. of sol. = 625,087 ft^3

Void Space = 208,363 ft^3

$\rho_B = \frac{100\ lbs}{1\ ft^3}$

DANIEL B. STEPHENS & ASSOCIATES, INC.
ENVIRONMENTAL SCIENTISTS AND ENGINEERS

SUBSURFACE INVESTIGATION AT HOBBS COMPRESSOR STATION NO. 2

AND

HOBBS NATURAL GAS PROCESSING PLANT

Prepared for

ENRON Operations Corp.

Environmental Affairs Department

Houston, Texas

August 10, 1994

6020 ACADEMY NE • SUITE 100 • ALBUQUERQUE, NM 87109 • (505) 822-9400

TABLE OF CONTENTS

Section	Page
EXECUTIVE SUMMARY	1
1. INTRODUCTION	2
2. BACKGROUND	5
2.1 Facility Descriptions	5
2.2 Physical Setting	7
2.3 Regional Hydrogeology	9
3. SUBSURFACE INVESTIGATIONS	11
3.1 Drilling and Sampling Procedures	11
3.2 Hobbs Compressor Station No. 2	14
3.2.1 Sampling and Closure of Open Excavations	14
3.2.2 Site Hydrogeology	16
3.2.3 Delineation of Subsurface Impacts	17
3.3 Hobbs Natural Gas Processing Plant	25
3.3.1 Monitor Well Installation	25
3.3.2 Site Hydrogeology	25
3.3.3 Delineation of Subsurface Impacts	28
4. SUMMARY AND CONCLUSIONS	34
REFERENCES	36

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LIST OF FIGURES

Figure		Page
1	Location Map	3
2	Site Map, ENRON-Hobbs Compressor Station No. 2	6
3	Site Map, ENRON-Hobbs Natural Gas Processing Plant	8
4	Regional Water Table Elevations	10
5	Geologic Cross Section A-A', ENRON-Hobbs Compressor Station No. 2	18
6	Approximate Water Table Elevations, May 1994, ENRON-Hobbs Compressor Station No. 2	19
7	Estimated Extent of Actionable Soil Contamination, ENRON-Hobbs Compressor Station No. 2	20
8	Estimated Extent of Actionable BTEX in Ground Water, ENRON-Hobbs Compressor Station No. 2	24
9	Area of Investigation, ENRON-Hobbs Natural Gas Processing Plant	26
10	Geologic Cross Section A-A', ENRON-Hobbs Natural Gas Processing Plant	27
11	Water Table Elevations, May 22, 1994, ENRON-Hobbs Natural Gas Processing Plant	29
12	Estimated Extent of Actionable BTEX in Ground Water, ENRON-Hobbs Natural Gas Processing Plant	33

LIST OF TABLES

Table		Page
1	Monitor Well and Soil Boring Locations	13
2	Summary of Headspace Analysis of Soils Removed from the UST Excavations Hobbs Compressor Station No. 2	15
3	Summary of Ground-Water Analysis for Organic Constituents, Hobbs Compressor Station No. 2	22
4	Summary of Ground-Water Analysis for Inorganic Constituents, Hobbs Compressor Station No. 2	23
5	Summary of Ground-Water Analysis for Organic Constituents, Hobbs Natural Gas Processing Plant	30
6	Summary of Ground-Water Analysis for Inorganic Constituents, Hobbs Natural Gas Processing Plant	31

LIST OF APPENDICES

Appendix	
A	Boring Logs and Survey Data
B	Analytical Laboratory Reports

EXECUTIVE SUMMARY

Daniel B. Stephens & Associates, Inc. was retained by ENRON Operations Corp. to conduct an environmental investigation at the Hobbs Compressor Station No. 2 and the Hobbs Natural Gas Processing Plant, located in southeastern New Mexico. This investigation supplements the previous work performed by Geoscience Consultants Limited in February 1994. The objective of this current investigation was to characterize the distribution of organic and inorganic constituents in underlying soils and ground water near three former underground storage tanks (USTs) at Hobbs Compressor Station No. 2 and in the vicinity of the aboveground ENRON Oil Transport and Trading (EOTT) tanks at the Hobbs Natural Gas Processing Plant.

At the Hobbs Compressor Station No. 2, soil from three existing open excavations was sampled and analyzed using field screening techniques to determine if volatile organic compounds (VOCs) were present. Additionally, six borings were advanced to the water table to evaluate the areal extent of subsurface impacts resulting from the release of petroleum hydrocarbons from the former USTs. The soils surrounding two of the former USTs are impacted from approximately the land surface to the ground-water table, which is roughly 22 feet below ground surface. Soils surrounding the third excavation did not contain detectable VOCs. The extent of actionable ground-water impacts extends from the former USTs to at least the property boundary. The New Mexico Water Quality Control Commission (NMWQCC) numerical standards for several organic and inorganic constituents were exceeded at five of the six ground-water sampling locations. In addition, ground-water impacts were detected along the eastern (downgradient) property fenceline for approximately 500 feet, suggesting that off-site impacts to ground-water quality may have occurred.

At the Hobbs Natural Gas Processing Plant, 8 borings were advanced to the water table, approximately 47 feet below ground surface, to determine the areal distribution of impacts to the subsurface resulting from the release of petroleum hydrocarbons from the EOTT Tanks. No soil samples analyzed during this investigation contained VOC concentrations above action levels. However, VOC impacts to ground water were identified east of the EOTT tanks for a distance of approximately 300 feet. The actionable VOC plume is approximately 250 feet wide at a distance of 150 feet downgradient of the EOTT tanks.

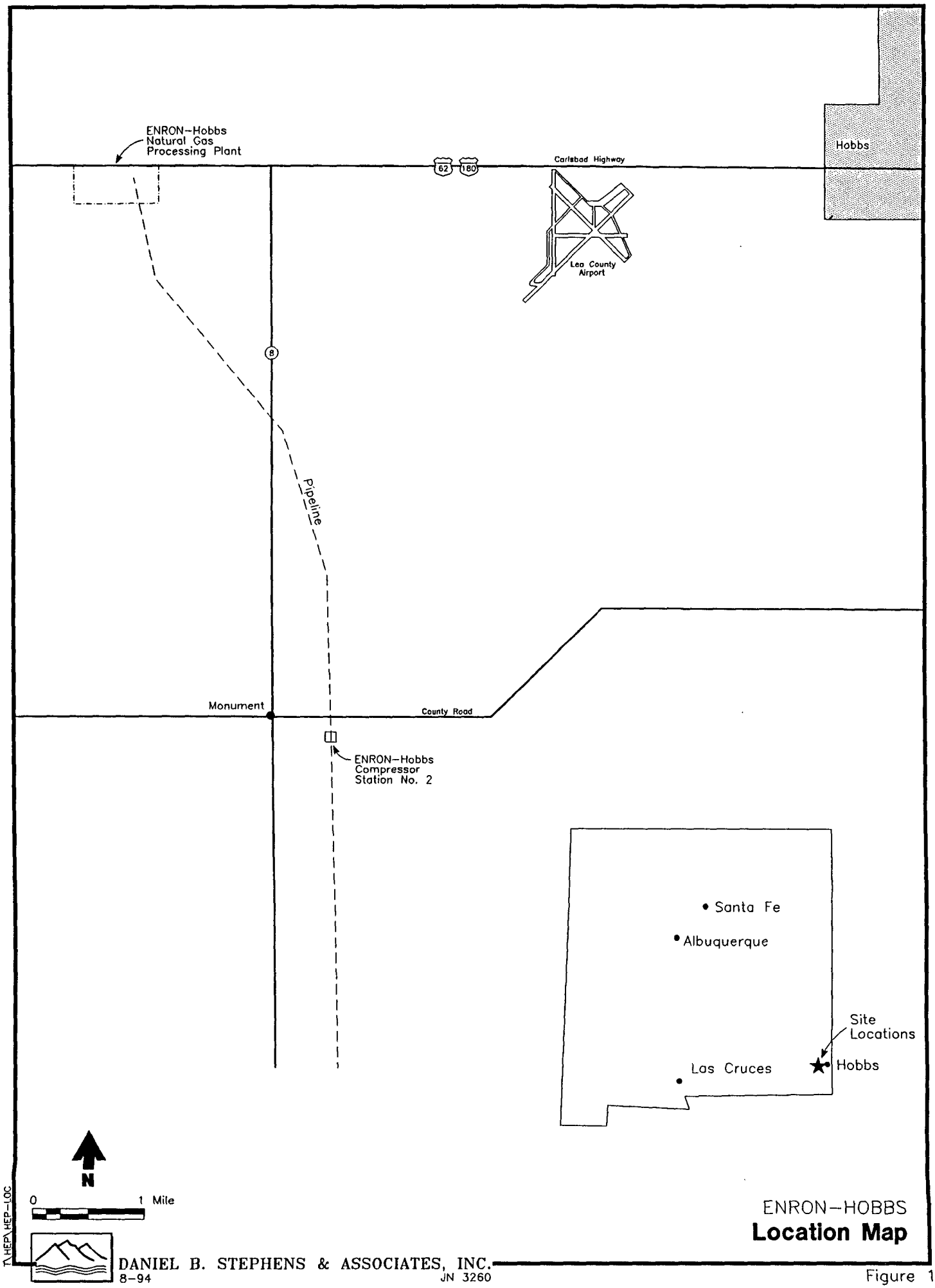
1. INTRODUCTION

ENRON Corporation retained Daniel B. Stephens & Associates, Inc. (DBS&A) to investigate petroleum hydrocarbon-impacted soil and ground water at ENRON Corporation's Hobbs Compressor Station No. 2 (compressor station) and Hobbs Natural Gas Processing Plant (processing plant), both located near Hobbs, New Mexico. The compressor station is 5.2 miles south of the processing plant, which in turn is located approximately 8 miles west of Hobbs along the Carlsbad Highway (U.S. Highway 62). The location of each site is shown on Figure 1.

A limited field investigation by Geoscience Consultants Limited (GCL, 1994) identified areas impacted with organic compounds near the former underground storage tanks (USTs) at the compressor station and the ENRON Oil Transport and Trading (EOTT) tanks at the processing plant. GCL determined that the New Mexico Water Quality Control Commission (NMWQCC) standards for ground water were exceeded for several aromatic volatile organic compounds (VOCs) and polynuclear aromatic hydrocarbons (PAHs). Although their investigation identified subsurface impacts near these storage areas, the extent of the impacts remained to be defined.

During the period of May 16 through 22, 1994, DBS&A conducted an investigation to determine the extent of the subsurface impacts identified by GCL. In order to evaluate the hydrocarbon releases, DBS&A analyzed soils for VOCs using field screening techniques and submitted ground-water samples for analyses of organic and inorganic constituents to determine if water quality standards set by the NMWQCC were exceeded. The DBS&A investigation included the following tasks:

- Sample two existing monitor wells at the compressor station
- Drill and sample six temporary drive point wells to obtain ground-water samples at the compressor station
- Analyze soils, using the headspace method, from three existing open UST excavations at the compressor station



ENRON–HOBBS
Location Map

DANIEL B. STEPHENS & ASSOCIATES, INC.
8–94 JN 3260

Figure 1

- Oversee the closure of the three open UST excavations at the compressor station
- Drill and sample eight temporary drive point wells to obtain ground-water samples at the processing plant
- Install one downgradient monitor well at the processing plant
- Survey the locations of new borings at both sites

This report presents the methods and results of the investigations of subsurface impacts originating from the liquid storage areas investigated at the two sites. Section 2 provides background information on the two facilities, the physical setting, and the regional hydrogeologic framework. Section 3 describes the field procedures used during the investigations and the findings of the subsurface investigations conducted at the two facilities. Finally, Section 4 provides a summary and the conclusions derived from the investigation.

2. BACKGROUND

The compressor station and processing plant are located southwest and west, respectively, of Hobbs, New Mexico, approximately 5½ miles apart from each other. Section 2.1 describes each facility in more detail. Sections 2.2 and 2.3 discuss the physical setting and regional hydrogeology of the area.

2.1 Facility Descriptions

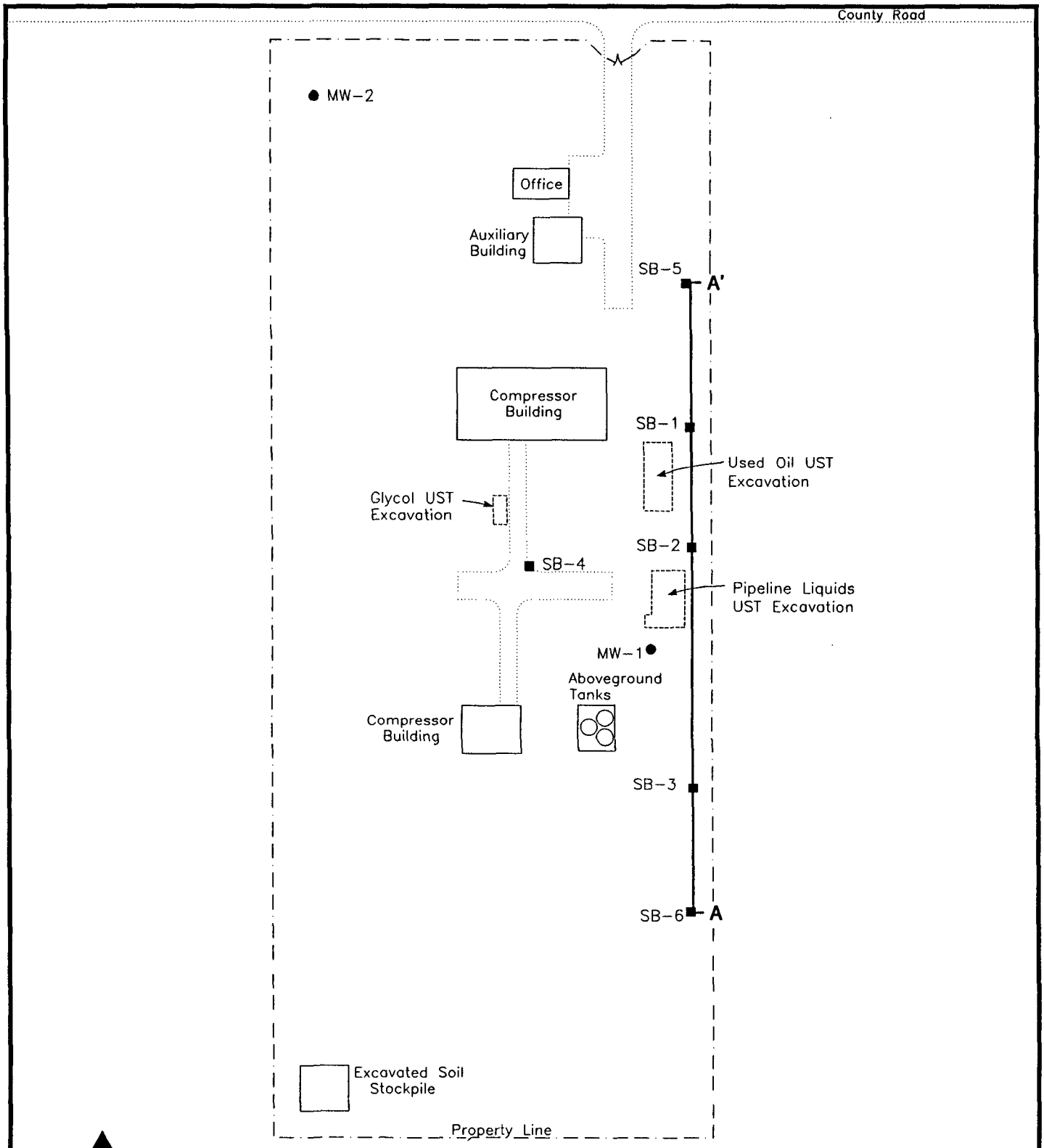
Hobbs Compressor Station No. 2. The compressor station is situated on approximately 6 acres of land within Township 19S, Range 37E, Section 33 of Lea County, New Mexico. The site is accessed via a county road heading east of the community of Monument (Figure 1).

The compressor station is one of several ENRON facilities in the Hobbs area that direct natural gas to the processing plant. The primary function of the compressor station is to boost the pressure of the natural gas stream.

As part of routine system maintenance, pipeline condensate and used lubricating oils are periodically removed from the gas pipeline and engines. Currently, all waste liquids removed from the system are collected and stored in aboveground tanks prior to off-site disposal. Formerly, waste liquids were stored in USTs near the main compressor building. The USTs were removed in July 1992, and the excavations remained open when the subsurface investigation began in May 1994. The general site layout, showing the locations of buildings, the UST excavations, and ground-water monitoring points, is shown in Figure 2.

Use of the former USTs resulted in the release of waste liquids to the subsurface primarily by UST overflows. The extent of subsurface impacts originating from the former USTs are the subject of this DBS&A investigation.

Hobbs Natural Gas Processing Plant. The processing plant is situated on approximately 60 acres of land within Township 19S, Range 37E, Section 6 of Lea County, New Mexico. Site access is via the Carlsbad Highway (U.S. Highway 62/180) (Figure 1). The plant contains gas processing



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ENRON-HOBBS
COMPRESSOR STATION NO. 2
Site Map

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Figure 2

equipment, waste management facilities and storage areas, office and maintenance buildings, and open land. The primary function of the processing plant is to remove impurities, including hydrogen sulfide, from the natural gas stream after its collection from supply wells. The general site layout, showing the locations of buildings, liquid storage areas, and monitor wells installed during and prior to this investigation, is shown in Figure 3.

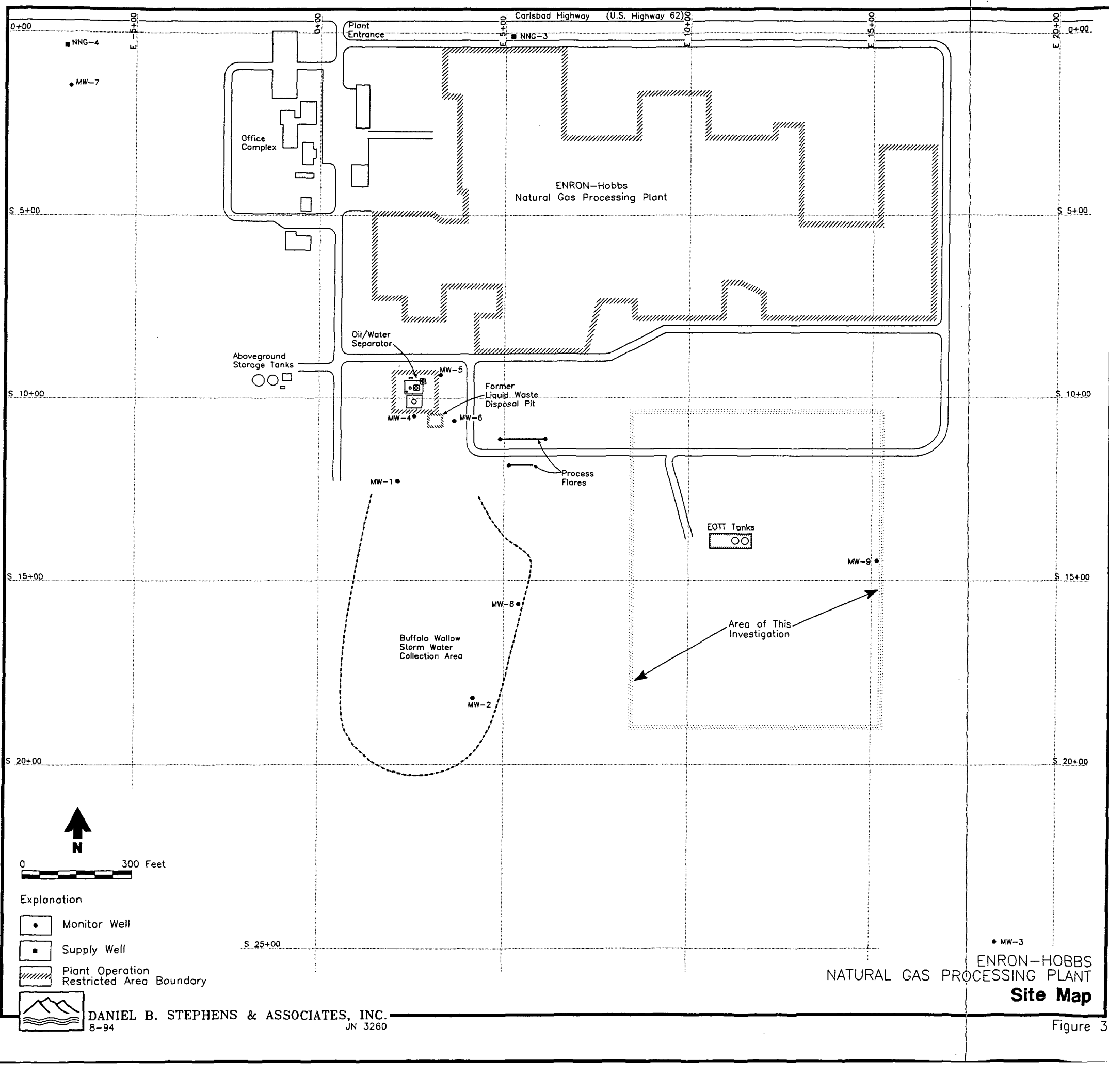
Waste liquids from the processing area are routed to the EOTT tanks for recycling. As identified by GCL (1994), past operations may have resulted in release of liquids to the subsurface near the EOTT tanks. The extent of subsurface impacts near the EOTT tanks is the focus of this investigation conducted at the processing plant by DBS&A.

2.2 Physical Setting

Both facilities are located within the southern portion of the High Plains of southeastern New Mexico. The High Plains are comprised of a relatively flat surface that regionally slopes to the southeast. The southern edge of the High Plains is distinguished by a topographic feature called the Mescalero Ridge. The relative difference in elevation between the two sites is approximately 130 feet, with the higher point being the processing plant, at approximately 3,700 feet above mean sea level (msl).

Shallow depressions and small sand dunes are the only significant topographic features on the relatively flat plains. The majority of the surface runoff is retained in these shallow depressions, which are locally referred to as buffalo wallows. The surface runoff remains in the buffalo wallows until it seeps into the ground or evaporates. The shallow depressions are often connected by poorly defined drainage patterns.

The area surrounding the two facilities is sparsely vegetated with native grasses and mesquite. The climate is semi-arid, with a mean annual precipitation of about 15 inches (Nicholson and Clebsch, 1961). The annual precipitation occurs primarily during intense summer thunderstorms.



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8-94 JN 3260

ENRON-HOBBS
NATURAL GAS PROCESSING PLANT
Site Map

Figure 3

2.3 Regional Hydrogeology

As discussed in a previous DBS&A report (1994), the Hobbs area is underlain by unconsolidated and consolidated sand, silt, and clay deposits which regionally comprise the Ogallala Formation of Pliocene Age. The Ogallala Formation is often capped by a layer of well hardened caliche which grades into underlying fine-grained sands. Nicholson and Clebsch (1961) have described the Ogallala Formation as chiefly a calcareous, unconsolidated sand that contains some clay, silt, gravel, and beds of well consolidated sandstone. The information gathered from the borings advanced by DBS&A are consistent with this lithologic description.

The Ogallala Formation unconformably overlies the Triassic Dockum Group. The top of the Dockum Group is approximately 170 feet below ground surface (bgs) at the processing plant and 32 feet bgs at the compressor station. The uppermost formation of the Dockum Group is the Chinle Formation, which consists of reddish siltstone and claystone units ranging in thickness from 0 to 1,270 feet in southern Lea County (Nicholson and Clebsch, 1961).

The Ogallala Formation is the major fresh-water bearing formation in southeast New Mexico. Recharge to the aquifer occurs primarily by infiltration of precipitation within the depressions on the High Plains surface. The regional ground-water flow is toward the southeast (Figure 4).

GCL (1994) estimated hydraulic conductivity (K) values of between 26 and 50 feet per day and specific yields (S_y) of 0.23 for the Ogallala aquifer near the sites. Hydraulic conductivity values reported by IT Corporation (1992) were on the order of 1 to 6 feet per day based on slug tests performed within three processing plant monitor wells (monitor wells MW-4, MW-5, and MW-6) near the oil/water separator (Figure 3).

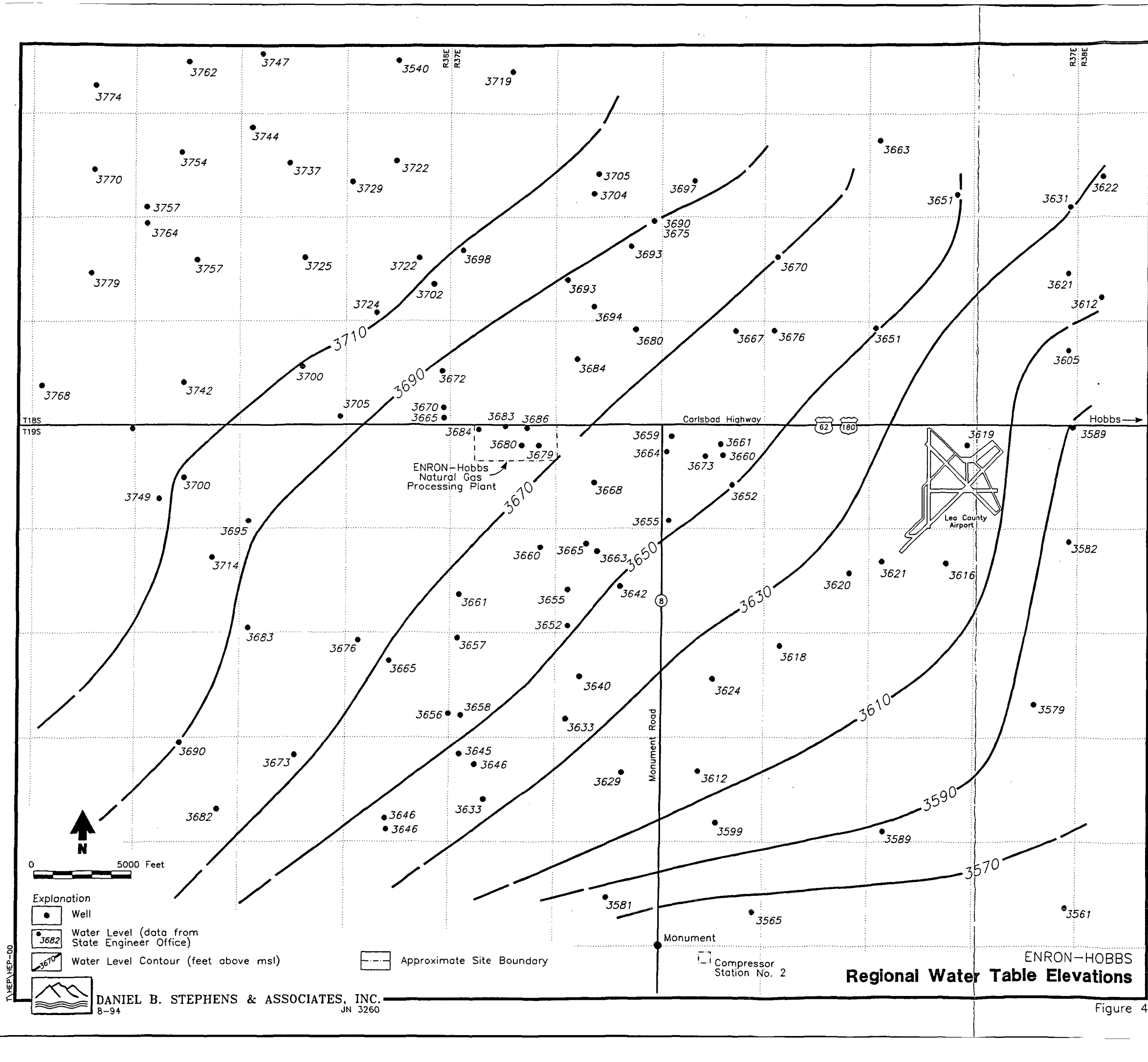

R36E
R37E
R37E
R38E
T18S
T19S
Carlsbad Highway
62
180
Hobbs
ENRON–Hobbs
Natural Gas
Processing Plant
Lea County
Airport
Monument Road
Monument
8
3710
3690
3670
3650
3630
3610
3590
3570
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3762
3747
3540
3719
3744
3754
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3652
3683
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3665
3657
3618
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3658
3633
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3690
3673
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3629
3612
3682
3646
3646
3633
3599
3589
3581
3565
3561
N
0
5000 Feet
Explanation
Well
3682
Water Level (data from State Engineer Office)
3670
Water Level Contour (feet above msl)
Approximate Site Boundary
Compressor Station No. 2
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ENRON–HOBBS
Regional Water Table Elevations

Figure 4

3. SUBSURFACE INVESTIGATIONS

The following sections describe the subsurface investigations conducted at the two sites to define the on-site extent of impacts identified by GCL. The general field procedures followed during the investigations are outlined in Section 3.1. Sections 3.2 and 3.3 describe site-specific procedures and the outcomes of the investigations at the compressor station and the processing plant, respectively.

3.1 Drilling and Sampling Procedures

This section describes field procedures used by DBS&A during the exploratory drilling program at each site. Additional field procedures specific to each site are described in Sections 3.2.1 and 3.3.1.

Drilling at both sites was completed by Eades Drilling Company of Hobbs, New Mexico, using a Midway-10m air-rotary rig. As each borehole was advanced, grab and split-spoon samples were collected at 5-foot intervals for geologic logging. Appendix A contains the lithologic logs produced for each boring. Lithologic descriptions were produced using the Unified Soil Classification System (USCS) and the Munsell color system.

The soil samples collected during drilling were tested for the presence of VOCs using an organic vapor meter equipped with a photoionization detector (PID). Field PID measurements were used to determine the presence of actionable soils (PID reading greater than 100 parts per million volume [ppmv]) as defined in the Oil Conservation Division (OCD) guidelines for abandonment of unlined surface impoundments (1993). Drill cuttings with concentrations above the OCD limits were containerized for appropriate disposal; cuttings below the OCD guideline were spread around the boring in a thin lift. Following data collection, each boring was filled with a cement-bentonite slurry to ground surface.

Boring locations were surveyed by John W. West Engineering Company of Hobbs, New Mexico using the facilities' grid systems, and surface elevations were determined relative to msl. Survey

data for both sites are presented in Table 1. The survey plats prepared by John W. West Engineering Company are included in Appendix A.

Ground-water samples from both sites were collected from each boring through temporary wells consisting of a 2-inch-diameter galvanized steel pipe attached to a drive point. After the drive point was advanced into the aquifer, the drill rig moved off-hole and proceeded with decontamination prior to setting up at the next drilling location.

After each drive point was inserted into the open boring, the depth to water was measured and the temporary drive point well was bailed until approximately three casing volumes were purged. During purging, field parameters (pH, temperature, and electrical conductivity) were measured and recorded every half casing volume. Purged ground water was contained in 55-gallon drums to be disposed of by ENRON upon receipt of the analytical results. A ground-water sample from each well was collected using a dedicated, disposable polyethylene bailer.

Ground-water samples from both sites were analyzed for halogenated and aromatic VOCs (EPA method 8010/8020), total petroleum hydrocarbons (TPH) (EPA method 8015 modified), PAHs (EPA method 8100), major ions, total dissolved solids (TDS), and metals regulated by the NMWQCC. Samples were shipped in ice-filled chests to Hall Environmental Analysis Laboratory (HEAL) for the analysis of organic compounds and to Analytical Technologies, Inc. (ATI) for the analysis of inorganic compounds. Both laboratories are located in Albuquerque, New Mexico. HEAL provided DBS&A with facsimile copies of the analytical results within 24 hours of sample collection so that the analytical results could be used to determine the locations of subsequent borings.

All sampling equipment was decontaminated prior to each use by washing with Liquinox® detergent followed by a deionized water rinse. Drilling equipment and sampling devices were steam-cleaned and inspected by DBS&A personnel prior to beginning another boring. One field equipment blank was collected by running deionized water through the screened portion of the sampling device and collecting a sample of the runoff. The field blank was submitted blind with the other ground-water samples for organic analyses to verify that the sampling device was decontaminated between borings.

Table 1. Monitor Well and Soil Boring Locations

Well/Boring	South[1] (feet)	East[1] (feet)	Measuring Point Elevation (feet above msl)
ENRON-Hobbs Compressor Station No. 2[2]			
SB-1	169.27	204.57	3590.29
SB-2	252.89	205.38	3589.16
SB-3	423.84	205.77	3587.95
SB-4	265.92	90.76	3590.59
SB-5	68.01	202.31	3590.60
SB-6	508.86	204.07	3587.33
MW-1	324.42	176.46	3591.14
MW-2	-64.84	59.94	3598.83
ENRON-Hobbs Natural Gas Processing Plant[3]			
EOTT-1	1619	1254	3720.79
EOTT-2	1539	1213	3720.16
EOTT-3	1456	1291	3720.37
EOTT-4	1575	1129	3720.20
EOTT-5	1389	1290	3720.41
EOTT-7	1304	1297	3721.03
EOTT-8	1158	1290	3722.81
DP-1	1448	1167	3720.32
DP-2	1065	855	3722.36
MW-8	1565	540	3716.17
MW-9	1446	1515	3722.46

Note: Survey conducted by John W. West Engineering Company, Hobbs, NM

[1] South and east coordinates relative to facility survey grid
[2] For locations of wells/borings, refer to Figure 2
[3] For locations of wells/borings, refer to Figure 9

During the field program quality assurance/quality control samples, consisting of trip blanks, field equipment blanks, and sample replicates, comprised approximately 5 to 10 percent of the total number of water samples in order to check intralaboratory precision during the field program. Appendix B contains the HEAL and ATI reports with the supporting quality assurance and chain-of-custody documents for all water samples submitted for analysis.

3.2 Hobbs Compressor Station No. 2

The investigation at the compressor station was undertaken to evaluate the extent of actionable soils remaining near the open UST excavations and actionable ground-water impacts downgradient of the former tanks. In order to characterize the impacts originating from the former USTs, soil samples were collected from the walls of the open excavations, and six temporary drive point wells were installed in the upper portion of the aquifer to collect ground-water samples for chemical analysis. The temporary wells were located downgradient of the former USTs and along the eastern property boundary (Figure 2). To obtain access to the property east of the compressor station, ENRON will contact the property owner.

Section 3.2.1 describes the procedures used during the sampling and closure of the three UST excavations. Sections 3.2.2 and 3.2.3 provide a discussion of the information gathered from the sampling of the open excavations and the ground-water sampling borings and provides an interpretation of the subsurface impacts.

3.2.1 Sampling and Closure of Open Excavations

In July 1992, Benge Construction Company of Lovington, New Mexico removed the three USTs near the main compressor building shown on Figure 2. Upon tank removal, hydrocarbon vapors were detected above the 100-ppmv action level enforced by OCD. Actionable soils were removed from each excavation to depths of approximately 16 feet bgs, at which point the trackhoe in use could no longer operate effectively in the partially to well cemented caliche.

As part of the DBS&A investigation, Benge Construction Company returned on May 17, 1994 with a larger trackhoe (Caterpillar 325) capable of removing additional actionable soils, if needed.

Where possible, the trackhoe exposed fresh surfaces on the walls and bottom of each excavation prior to the collection of soil samples. The collected soil samples were analyzed for the presence of VOCs using the headspace field method described in the OCD regulations (OCD, 1993).

A summary of the headspace analysis for soils removed from each excavation during the May 1994 investigation is provided in Table 2. Several of the samples collected from the pipeline liquids UST excavation and used oil UST excavation exceeded the 100-ppmv criterion for the headspace analysis. The highest headspace readings were measured on the western walls of these two excavations. In comparison, the samples collected from the glycol UST excavation

Table 2. Summary of Headspace Analysis of Soils Removed from the UST Excavations Hobbs Compressor Station No. 2

Location[1]	Date	Side	Number of PID Readings	Average PID Reading (ppmv)
Pipeline Liquids UST Excavation	05/17/94	North wall	1	18
		South wall	3	57
		East wall	1	8
		West wall	11	183
Used Oil UST Excavation	05/18/94 to 05/19/94	Bottom	1	50
		North wall	4	156
		South wall	2	125
		East wall	3	367
		West wall	6	442
Glycol UST Excavation	05/19/94	Bottom	2	2.5
		North wall	1	2
		South wall	1	2
		East wall	1	0
		West wall	1	0

PID = Photoionization detector
ppmv = Parts per million by volume

Note: Background PID measurements ranged from 2 to 4 ppmv

[1] For locations of UST excavations, refer to Figure 2.

ranged from 0 to 2.5 ppmv, which is within the background fluctuations measured with the PID. The background PID measurements indicate that VOCs were not present in the former glycol UST.

Significant volumes of actionable soils were removed from the two impacted excavations prior to closure. The trackhoe was able to remove an additional 35 cubic yards from the pipeline liquids UST excavation and 322 cubic yards from the used oil UST excavation prior to the closure of the excavations. The soils from the pipeline liquids and used oil UST excavations were removed primarily from the western walls of each excavation. A heavily stained zone between 8 and 15 feet bgs along the western wall accounted for the bulk of the 322 cubic yards removed from the used oil UST excavation. To the extent possible, visibly stained soils were removed.

The presence of pressurized gas lines along the western walls of the two impacted excavations and the practical limits of removing well cemented caliche prevented complete excavation of the actionable soils. At the request of ENRON Corporation, the three excavations were backfilled with clean soils. Approximately 448, 616, and 140 cubic yards were required to backfill the pipeline liquids, the used oil, and the glycol UST excavations, respectively. The dimensions of each excavation, prior to closure, are shown on Figure 2.

Excavated soils were stockpiled on a double layer of plastic sheeting near the southwest corner of the facility. Upon completion of excavation activities, a double layer of plastic sheeting was placed on top of the excavated soils and anchored on each side by placing clean soils on top of the plastic.

3.2.2 Site Hydrogeology

The lithology of soils directly underlying the site, as determined from the borings advanced during the GCL and DBS&A investigations, consists generally of limestone and calcareous sandstone that are moderately to well cemented from ground surface to approximately 25 feet bgs. Locally this caprock is referred to as caliche. Below the 25-foot depth the soils consist primarily of fine-grained, well sorted sands. As mentioned in Section 2.3, the base of the Ogallala deposits at the

station is approximately 32 feet bgs. A geologic cross section developed from lithologic descriptions is provided as Figure 5; Figure 2 shows the cross section location.

Ground water beneath the site is unconfined and occurs approximately 22 feet bgs based on May 1994 measurements (Appendix A). An approximate water table elevation map generated from May 1994 measurements is shown in Figure 6. The water table elevation map indicates that ground water generally flows toward the south-southeast, which concurs with the regional flow direction shown on Figure 4.

The hydraulic gradient is estimated to be approximately 0.01 ft/ft based on the May 1994 measurements. The K and S_y of the aquifer are presently unknown; however, based on the observed grain size distribution, the aquifer is probably moderately permeable, with K values on the order of 10^{-3} cm/sec (1 ft/day) and S_y values on the order of 0.15 to 0.25 (Freeze and Cherry, 1979).

3.2.3 Delineation of Subsurface Impacts

Soil Impacts. Headspace analysis of the soil samples collected during the drilling program revealed concentrations generally below the 100-ppmv action level with the exception of samples from temporary drive point wells SB-1 and SB-2. Samples from temporary drive point well SB-1 exceeded the 100-ppmv criterion from 15 feet bgs to the water table (approximately 22 feet bgs). In addition, headspace measurements from monitor well MW-1 and temporary drive point well SB-2 indicate that actionable soil contamination is present along the water table interface.

The estimated extent of actionable soil contamination based on the PID headspace measurements from the UST excavations and the temporary drive point wells is shown on Figure 7. Near the former used oil UST excavation, soils are impacted from approximately ground surface to the water table. The vertical extent of impacted soil diminishes as one moves laterally away from the former used oil and pipeline liquids UST excavations. The distribution of actionable soils to the west and off-site to the east is not completely delineated.

South
A

North
A'

South Wall of Used Oil UST Excavation

North Wall of Used Oil UST Excavation

SB-6 | SB-3 | MW-1 | SB-2 | SB-1 | SB-5

Depth Below Ground Surface (feet)

0
10
20
30
40
50

SB-6: 2, 8, 6, 0, 0 — SP
SB-3: 0, 0, 0, 0, 0 — SP
MW-1: >350 — SM — ? — ? — CH
SB-2: 4, 4, 4, 125, 156, 110 — SP
SB-1: 4, 0, 160, 300, 125, 300 — SP
SB-5: Gravel — GW, 0, 8, 0, 0, 0 — SP

Potentiometric Surface May 1994

Sandy Limestone (caliche)

Sand and Silty Sand

Clay

Note: Information for MW-1 is from GCL (1994).

0 50 Feet
Horizontal Scale

Explanation

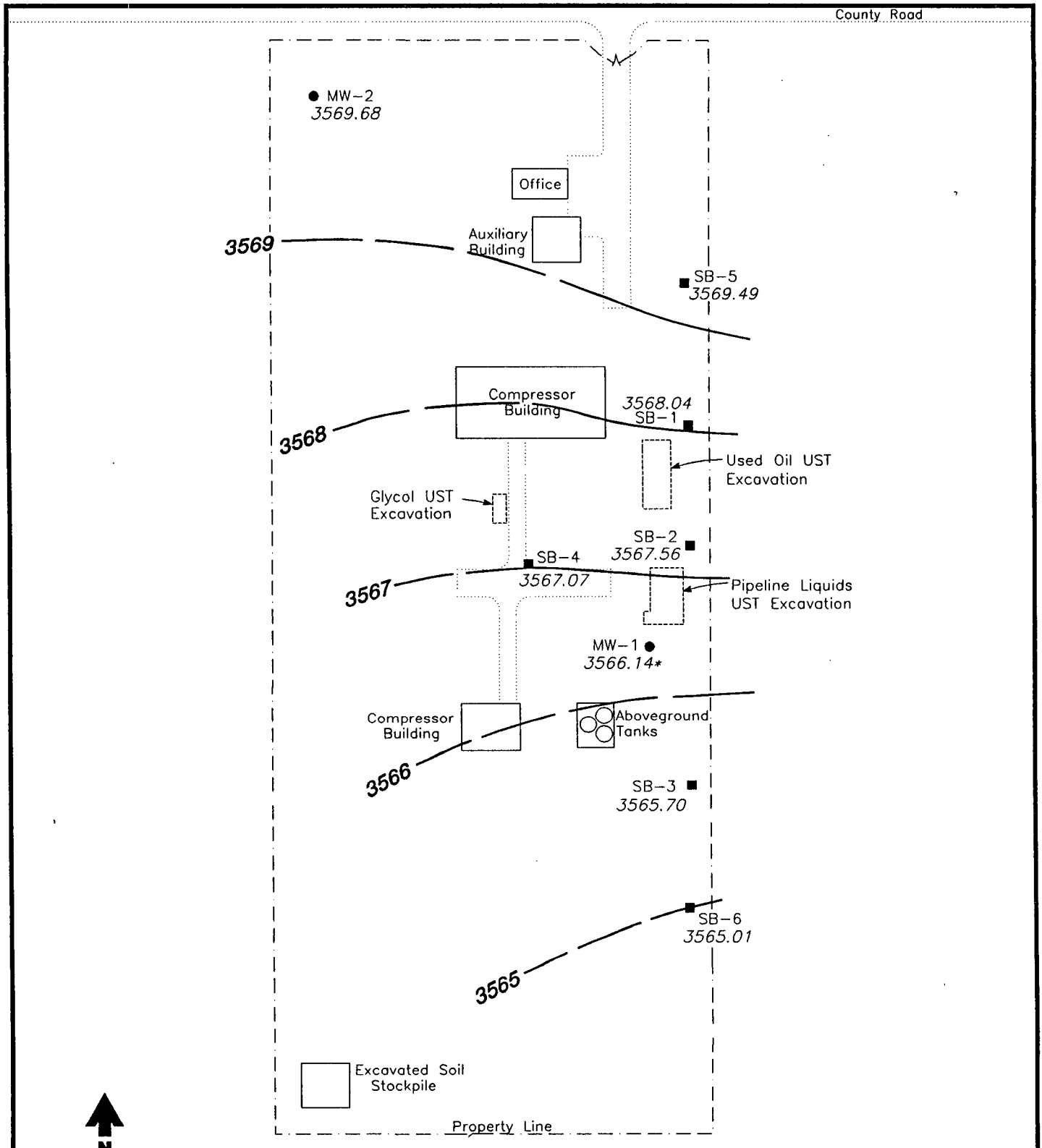
- SP — USCS Symbol
- 110 — PID Reading (ppmv)
- Estimated Extent of Actionable Soil Contamination

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ENRON-HOBBS
COMPRESSOR STATION NO. 2
Geologic Cross Section A-A'

Figure 5



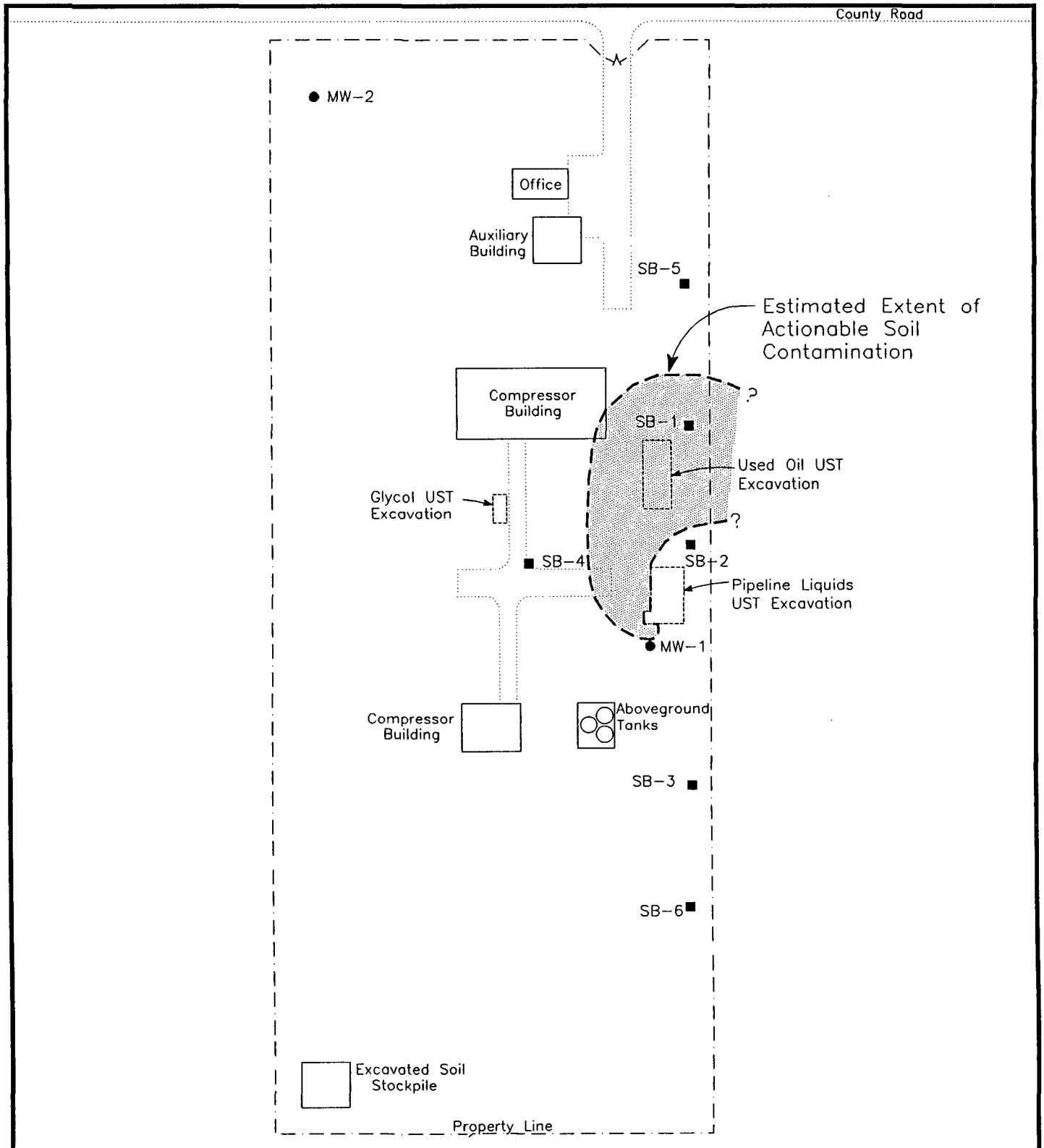
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ENRON-HOBBS
COMPRESSOR STATION NO. 2

Approximate Water Table Elevations, May 1994

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Figure 6



ENRON–HOBBS
COMPRESSOR STATION NO. 2

Estimated Extent of Actionable Soil Contamination

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Figure 7

Ground-Water Impacts. As mentioned in Section 3.1, ground-water samples were collected from monitor wells and temporary drive point wells and analyzed for organic and inorganic constituents. Tables 3 and 4 provide summaries of the constituents detected in the ground water beneath the site. The NMWQCC standard is also given in each table for comparison. Based on these results, it appears that the ground water underlying the eastern portion of the site has been impacted by the release of pipeline liquids and used oils.

Ground-water samples from five of the six temporary drive point wells exceeded the NMWQCC standards for several organic constituents. Ground water containing the highest concentrations of organic constituents is immediately downgradient of the former used oil and pipeline liquids UST excavations, as represented by the analytical results from monitor well MW-1. In addition, approximately 3.4 feet of phase-separated hydrocarbons (PSH) were measured on top of the water table in monitor well MW-1.

Based on the analysis of aromatic and halogenated VOCs and PAHs, the compounds that exceed the NMWQCC standards are benzene, toluene, ethylbenzene, and xylene (BTEX) and total naphthalenes (naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene). Figure 8 shows the estimated extent of actionable ground water based on the BTEX concentrations. Actionable ground-water contains one or more regulated constituent at a concentration that exceeds the NMWQCC standards for that constituent. The areal extent of total naphthalenes exceeding the NMWQCC standard of 30 ug/L appears to be coincident with the BTEX plume.

The TPH analyses indicate that the petroleum hydrocarbon concentrations are a mixture of light- (gasoline range) and high-molecular-weight (diesel range) hydrocarbons. The concentration of higher-molecular-weight hydrocarbons are greatest near monitor well MW-1 (Table 3).

The inorganic chemical analyses indicate that water samples from monitor well MW-1 and several of the temporary drive point wells exceed NMWQCC standards for TDS, chloride, iron, manganese, and barium (Table 4). However, monitor well MW-2, which is upgradient of the excavations and therefore should represent the background inorganic chemistry, also contains TDS and chloride concentrations that are above the NMWQCC standards. When compared to the MW-2 results, the only well containing TDS and chloride concentrations significantly above

Table 3. Summary of Ground-Water Analysis for Organic Constituents Hobbs Compressor Station No. 2

Constituent	Detection Limit	Well/Boring No.[1] (Sample Date) SB-1 (05/17/94)	SB-2 (05/16/94)	SB-3 (05/17/94)	SB-4 (05/18/94)	SB-5 (05/18/94)	SB-6 (05/19/94)	MW-1 (05/22/94)	MW-2 (05/19/94)	NMWQCC Standard
Total petroleum hydrocarbons										
Gasoline range (C_6-C_{16}) (mg/L)	0.1	15[a]	19[a]	4.5[b]	5.2[c]	ND	2.8[a]	23[c]	ND	None
Diesel range (C_{16}-C_{36}) (mg/L)	1.0	2.9	3.3	ND	ND	ND	ND	69[d]	ND	None
Aromatic VOCs										
Benzene (µg/L)	0.5	**200**[a]	**1,900**[a]	**1,600**	**350**[b]	ND	**880**[b]	**1,500**[d]	ND	10
Toluene (µg/L)	0.5	85[a]	**1,600**[a]	ND	550[b]	ND	6.4[b]	410[d]	ND	750
Ethylbenzene (µg/L)	0.5	690[a]	620[a]	490	**1,300**[b]	ND	230[b]	**1,000**[d]	ND	750
Total xylenes (µg/L)	0.5	**1,500**[a]	1,300[a]	29	**1,500**[b]	ND	62[b]	**1,800**[d]	ND	620
Halogenated VOCs										
1,1-Dichloroethane (µg/L)	0.2	ND[a]	3.1[a]	3.3	ND[b]	ND	ND[b]	ND[d]	ND	25
Tetrachloroethene (µg/L)	0.2	ND[a]	ND[a]	0.9	ND[b]	ND	ND[b]	ND[d]	ND	20
Trichloroethene (µg/L)	0.2	ND[a]	ND[a]	1.0	ND[b]	ND	ND[b]	ND[d]	ND	100
Polynuclear aromatic hydrocarbons										
Naphthalene (µg/L)	0.5	**69**	**38**	**28**	**20**	ND	**30**	**99**[e]	ND	30[2]
1-Methylnaphthalene (µg/L)	0.5	**55**	**22**	**17**	**13**	ND	**9.7**	**250**[e]	ND	
2-Methylnaphthalene (µg/L)	0.5	**55**	**23**	**18**	**15**	ND	**10**	**240**[e]	ND	
Fluorene (µg/L)	0.5	5.4	2.9	ND	0.9	ND	0.9	ND[e]	ND	None

Notes: All analyses performed by Hall Environmental Analysis Laboratory, Albuquerque, NM
Bold values indicate concentration exceeds NMWQCC ground-water standard

NMWQCC = New Mexico Water Quality Control Commission
ND = Not detected
VOCs = Volatile organic compounds

[a] Sample analyzed at 10x dilution
[b] Sample analyzed at 5x dilution
[c] Sample analyzed at 50x dilution
[d] Sample analyzed at 20x dilution
[e] Sample analyzed at 100x dilution

[1] For locations of wells/borings, refer to Figure 2
[2] NMWQCC standard is for total naphthalene, which includes naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene

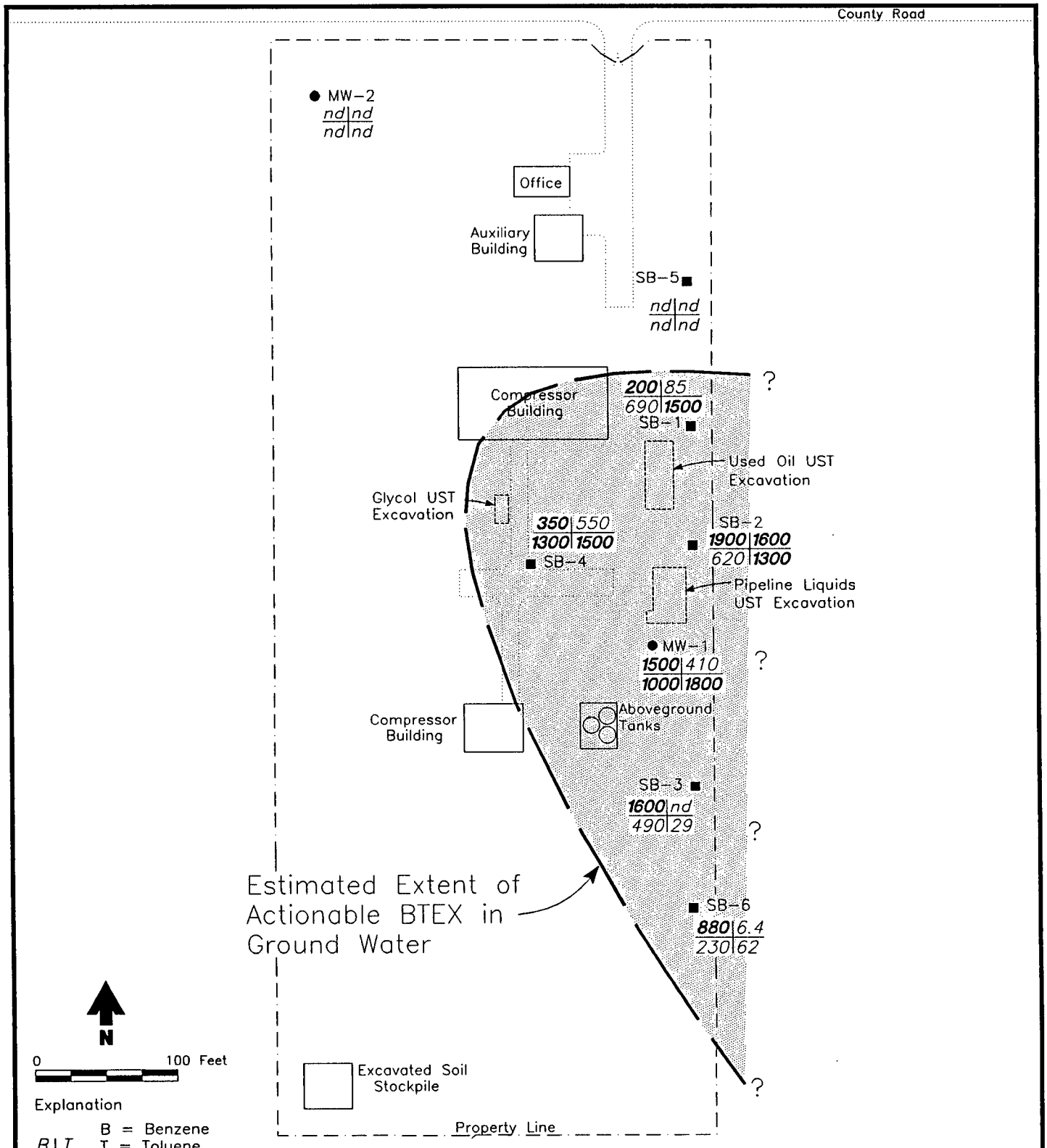
Table 4. Summary of Ground-Water Analysis for Inorganic Constituents
Hobbs Compressor Station No. 2

Constituent	Detection Limit	Well/Boring No.[1] (Sample Date)								NMWQCC Standard
		SB-1 (05/17/94)	SB-2 (05/16/94)	SB-3 (05/17/94)	SB-4 (05/18/94)	SB-5 (05/18/94)	SB-6 (05/19/94)	MW-1 (05/22/94)	MW-2 (05/19/94)	
Major ions										
Calcium (mg/L)	0.1	125	139	187	156	128	150	116	180	None
Potassium (mg/L)	1.0	2.2	26.9	3.1	4.2	3.2	2.0	2.2	2.4	None
Magnesium (mg/L)	0.1	66.5	70.4	107	42.4	23.1	66.5	48.9	40.4	None
Sodium (mg/L)	0.1	89.9	131	372	100	69.4	235	143	139	None
Total alkalinity (as $CaCO_3$) (mg/L)	1.0	644	779	675	675	220	610	497	194	None
Chloride (mg/L)	0.5	80	120	**670**	62	150	**400**	160	**300**	250
NO_2/NO_3-N, total (mg/L)	0.06	ND	ND	0.22	ND	4.3	ND	ND	3.7	10.0
Sulfate (mg/L)	0.3	15	23	120	18	100	12.9	80	290	600
Total dissolved solids (mg/L)	10	840	**1,100**	**2,000**	890	690	**1,400**	**1,500**	**1,100**	1,000
Metals										
Silver (mg/L)	0.010	ND	ND	ND	ND	ND	ND	ND	ND	0.05
Arsenic (mg/L)	0.005	0.050	0.026	0.029	0.041	ND	0.040	0.040	ND	0.1
Barium (mg/L)	0.01	**1.94**	0.645	0.516	**2.26**	0.095	0.226	0.484	0.082	1.0
Cadmium (mg/L)	0.0005	ND	ND	ND	ND	ND	ND	ND	ND	0.01
Chromium (mg/L)	0.010	ND	ND	ND	ND	ND	ND	ND	ND	0.05
Copper (mg/L)	0.010	ND	ND	ND	ND	ND	ND	ND	ND	1.0
Iron (mg/L)	0.020	0.215	0.035	**2.42**	**5.65**	ND	**2.18**	**3.69**	0.026	1.0
Mercury (mg/L)	0.0002	ND	ND	ND	ND	ND	ND	ND	ND	0.002
Manganese (mg/L)	0.010	0.140	0.102	**0.976**	**0.216**	ND	**0.994**	**0.425**	ND	0.2
Lead (mg/L)	0.002	ND	ND	ND	ND	ND	ND	ND	ND	0.05
Selenium (mg/L)	0.005	ND	ND	ND	ND	ND	ND	ND	0.009	0.05
Zinc (mg/L)	0.020	0.450	1.14	0.394	3.63	0.661	0.475	ND	ND	10

Notes: All analyses performed by Analytical Technologies, Inc., Phoenix, AZ
Bold values indicate concentration exceeds NMWQCC ground-water standard

NMWQCC = New Mexico Water Quality Control Commission
ND = Not detected

[1] For locations of wells/borings, refer to Figure 2



ENRON–HOBBS
COMPRESSOR STATION NO. 2

Estimated Extent of Actionable BTEX in Ground Water

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Figure 8

background levels is temporary drive point well SB-3. The elevated iron and manganese concentrations likely result from a depletion of the dissolved oxygen in the aquifer near the hydrocarbon source areas, thus allowing the mobilization of these metals under reducing conditions.

3.3 Hobbs Natural Gas Processing Plant

In order to delineate the plume originating from the EOTT tanks at the processing plant, eight borings were advanced to just below the water table to acquire ground-water samples in the manner described in Section 3.1. The location of each boring is shown on Figure 9. Once the extent of ground-water impacts was determined, monitor well MW-9 was installed within boring EOTT-6 to allow continued monitoring of the apparent downgradient edge of the plume. Section 3.3.1 describes procedures used for the construction and installation of monitor well MW-9. Sections 3.3.2 and 3.3.3 provide a discussion of the information gathered during the investigation and provide an interpretation of the subsurface impacts at the processing plant.

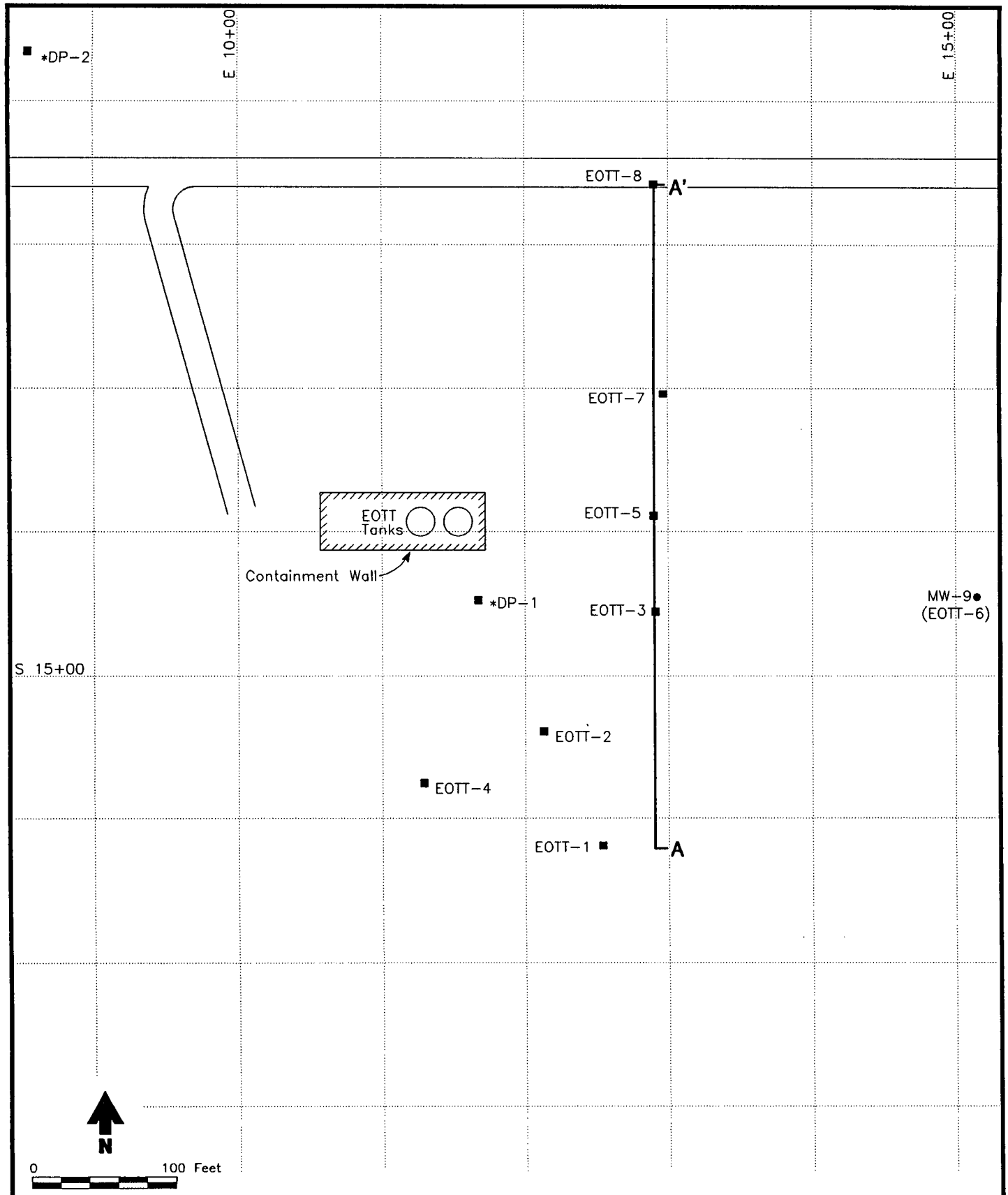
3.3.1 Monitor Well Installation

Monitor well MW-9 was constructed using 25 feet of 2-inch, 0.010-slot polyvinyl chloride (PVC) screen, 35 feet of flush-threaded, 2-inch PVC blank casing, 12-20 silica sand filter pack, and a cement-bentonite grout seal from the top of the filter pack to ground surface. The surface completion consisted of an above-grade locking well cover set within a 4-inch-thick concrete pad.

Additional construction details and lithologic logs for the borings are provided in Appendix A. Survey coordinates for the borings and monitor well are provided in Table 1.

3.3.2 Site Hydrogeology

As determined from the soil borings, the soils near the EOTT tanks grade from interbedded pale brown to pinkish white, silty, fine-grained sands and sandy limestones near ground surface to light brown silty sands and sands near the water table (Figure 10). As discussed in Section 2.3, the



Explanation

- A A' Geologic Cross Section Line
- Temporary Drive Point Well (* GCL, 1994)
- Monitor Well

ENRON-HOBBS
NATURAL GAS PROCESSING PLANT
Area of Investigation

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Figure 9

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South
A

North
A'

EOTT–1 | EOTT–3 | EOTT–5 | EOTT–7 | EOTT–8

Depth Below Ground Surface (feet)

0 10 20 30 40 50

EOTT–1: SM 0 0 0 0; SW 0 0 0 0; SP 0 0 0

EOTT–3: CH 0 4; SW 0 6 0 0; SP 0 22

EOTT–5: CH 2 0; Clay; SW 0 2 0; SP 0 1.2 0.4 0 0.2

EOTT–7: CH 7 0; SW 0 2 1.5 0 0 4 4

EOTT–8: GC 42 34; SW 10 18 16 14; SP 10 8 6 8

Silty Limestone and Sand (caliche)

Sand and Silty Sand with Numerous Strongly Cemented Layers

Potentiometric Surface May 1994

0 50 Feet
Horizontal Scale

Explanation

SP USCS Symbol

1.2 PID Reading (ppmv)

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ENRON–HOBBS
NATURAL GAS PROCESSING PLANT
Geologic Cross Section A-A'

Figure 10

Ogallala Formation extends to approximately 170 feet bgs at the processing plant. Ground water is unconfined and located approximately 47 to 49 feet bgs near the EOTT tanks (Appendix A).

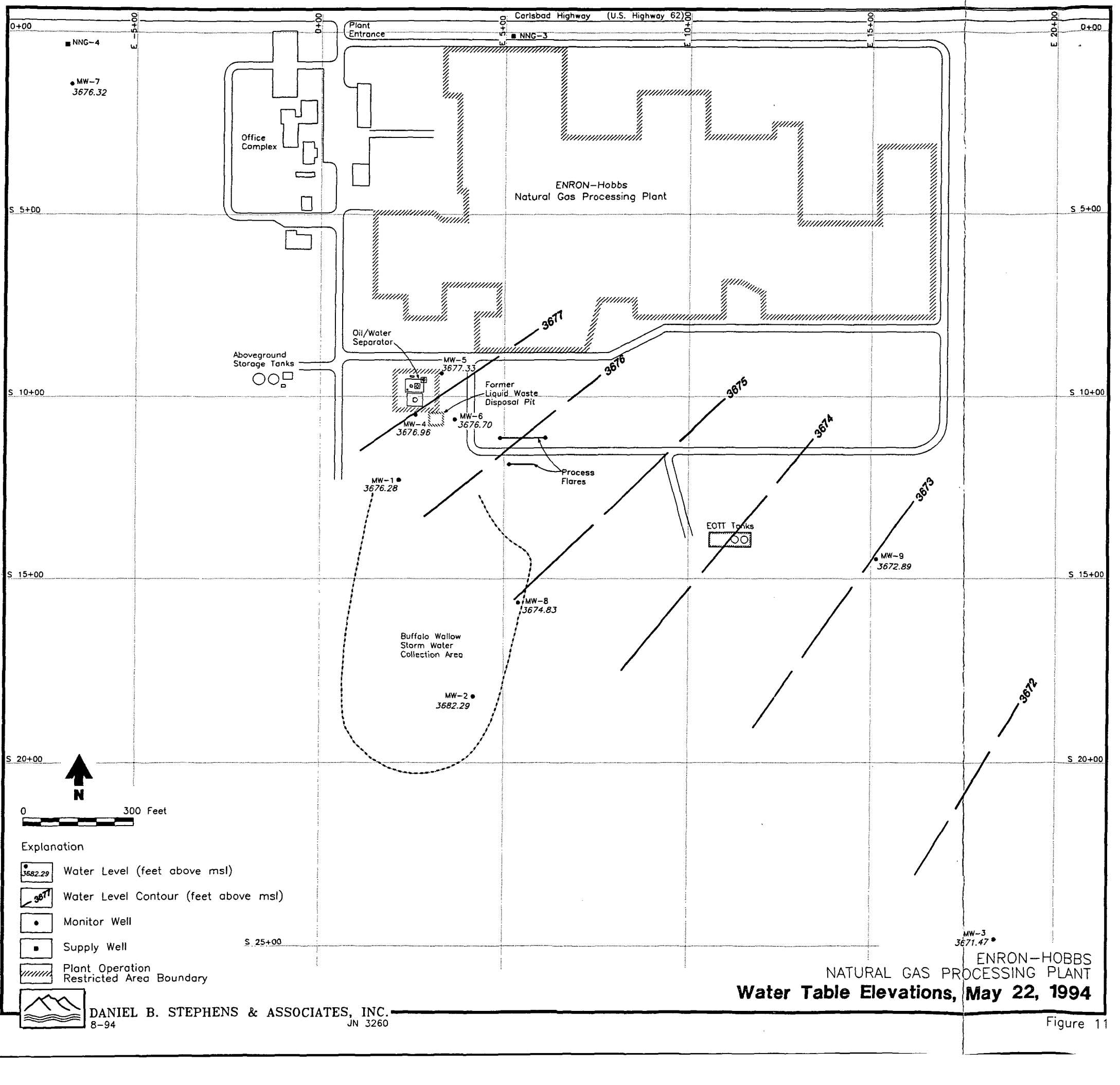
Figure 11 shows the on-site water table elevations based on measurements made in MW-9 and eight previously installed monitor wells (MW-1 through MW-8). The map indicates that ground water generally flows to the southeast, which is in agreement with the regional flow direction shown on Figure 4. However, the on-site direction of flow appears to have shifted approximately 20 degrees east from the flow direction determined from January 1994 measurements made by DBS&A. The shift in flow direction may be attributable to local recharge within the buffalo wallow storm water collection area south of the oil/water separator (Figure 11). Several feet of ponded water were present in the buffalo wallow during the period of this field program. Also, the water table elevation appears to be influenced by supply well pumping in the northwest corner of the facility as evidenced by the water level measurement in monitor well MW-7.

The hydraulic gradient is approximately 0.003 ft/ft based on the May 1994 measurements. The K and S_y of the aquifer are presently poorly defined; however, based on the observed grain size distribution and K values estimated by IT Corporation (1992), the aquifer is probably moderately permeable with K values on the order of 10^{-3} cm/sec (1 ft/day) and S_y values on the order of 0.15 to 0.25 (Freeze and Cherry, 1979).

3.3.3 Delineation of Subsurface Impacts

Soil Impacts. Based on the field observations, it appears that actionable hydrocarbon impacts are limited to the soils immediately surrounding the EOTT tanks. Soil headspace analysis determined that soil VOC concentrations were below the 100-ppmv action level for every boring drilled during the investigation (Appendix A).

Ground-Water Impacts. Ground-water samples from both sites were analyzed for halogenated and aromatic VOCs (EPA method 8010/8020), TPH (EPA method 8015 modified), PAHs (EPA method 8100), major ions, TDS, and metals regulated by the NMWQCC. Tables 5 and 6 provide summaries of the constituents detected in the samples collected during the field program. Based



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ENRON-HOBBS
NATURAL GAS PROCESSING PLANT

Water Table Elevations, May 22, 1994

Figure 11

Table 5. Summary of Ground-Water Analysis for Organic Constituents Hobbs Natural Gas Processing Plant

Constituent	Detection Limit	Well/Boring No. (Sample Date) EOTT-1 (05/18/94)	EOTT-2 (05/19/94)	EOTT-3 (05/20/94)	EOTT-4 (05/20/94)	EOTT-5 (05/20/94)	EOTT-6 (05/21/94)	EOTT-7 (05/21/94)	EOTT-8 (05/22/94)	MW-9 (05/22/94)	NMWQCC Standard
Total petroleum hydrocarbons											
Gasoline range (C_6-C_{16}) (mg/L)	0.1	ND	0.2	8.4[a]	ND	44[a]	ND	6.0[b]	ND	ND	None
Diesel range (C_{16}-C_{36}) (mg/L)	1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	None
Aromatic VOCs											
Benzene (µg/L)	0.5	ND	ND	**2,200**	ND	**4,800**[b]	ND	**1,500**[c]	ND	ND	10
Toluene (µg/L)	0.5	ND	ND	12	ND	**6,700**[b]	ND	2.7[c]	ND	ND	750
Ethylbenzene (µg/L)	0.5	ND	ND	680	ND	**1,400**[b]	ND	ND[c]	ND	ND	750
Total xylenes (µg/L)	0.5	ND	5.2	240	ND	**1,800**[b]	ND	55[c]	ND	ND	620
Halogenated VOCs											
Tetrachloroethene (µg/L)	0.2	ND	0.8	ND	ND	ND[b]	ND	ND[c]	ND	ND	20
Polynuclear aromatic hydrocarbons											
Naphthalene (µg/L)	0.5	ND	ND	ND	ND	**33**	ND	ND	ND	ND	30[2]
1-Methylnaphthalene (µg/L)	0.5	ND	ND	2.1	ND	**11**	ND	ND	ND	ND	
2-Methylnaphthalene (µg/L)	0.5	ND	ND	ND	ND	**7.5**	ND	ND	ND	ND	
Acenaphthalene (µg/L)	0.5	ND	ND	ND	ND	3.0	ND	ND	ND	ND	None

Notes: All analyses performed by Hall Environmental Analysis Laboratory, Albuquerque, NM
Bold values indicate concentration exceeds NMWQCC ground-water standard

[a] Sample analyzed at 50x dilution
[b] Sample analyzed at 10x dilution
[c] Sample analyzed at 5x dilution

NMWQCC = New Mexico Water Quality Control Commission
ND = Not detected
VOCs = Volatile organic compounds

[1] For locations of wells/borings, refer to Figure 9
[2] NMWQCC standard is for total naphthalene, which includes naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene

Table 6. Summary of Ground-Water Analysis for Inorganic Constituents Hobbs Natural Gas Processing Plant

Constituent	Detection Limit	Well/Boring No.[1] (Sample Date)									NMWQCC Standard
		EOTT-1 (05/18/94)	EOTT-2 (05/19/94)	EOTT-3 (05/20/94)	EOTT-4 (05/20/94)	EOTT-5 (05/20/94)	EOTT-6 (05/21/94)	EOTT-7 (05/21/94)	EOTT-8 (05/22/94)	MW-9 (05/22/94)	
Major ions											
Calcium (mg/L)	0.1	155	156	163	130	148	153	189	148	136	None
Potassium (mg/L)	1.0	3.3	3.4	2.6	4.2	2.0	2.8	4.2	3.0	3.8	None
Magnesium (mg/L)	0.1	19.3	19.1	22.7	19.0	34.7	16.5	23.5	17.2	14.3	None
Sodium (mg/L)	0.1	65.3	48.6	70.0	60.2	95.0	45.2	58.8	48.0	55.9	None
Total alkalinity (as $CaCO_3$) (mg/L)	1.0	284	399	550	271	637	345	390	436	238	None
Chloride (mg/L)	0.5	130	80	47	97	47	90	64	6.4	107	250
NO_2/NO_3-N, total (mg/L)	0.06	5.3	2.1	ND	1.90	ND	6.0	0.09	3.6	5.6	10.0
Sulfate (mg/L)	0.3	100	63	56	100	14.7	61	180	73	110	600
Total dissolved solids (mg/L)	10	770	680	760	660	850	670	890	630	670	1,000
Metals											
Silver (mg/L)	0.010	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05
Arsenic (mg/L)	0.005	ND	ND	0.015	ND	0.031	ND	ND	ND	ND	0.1
Barium (mg/L)	0.01	0.080	0.155	0.192	0.108	0.399	0.141	0.148	0.088	0.114	1.0
Cadmium (mg/L)	0.0005	0.0006	ND	ND	ND	ND	ND	ND	ND	ND	0.01
Chromium (mg/L)	0.010	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05
Copper(mg/L)	0.010	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0
Iron (mg/L)	0.020	0.021	0.030	0.021	ND	ND	0.036	0.063	ND	ND	1.0
Mercury (mg/L)	0.0002	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.002
Manganese (mg/L)	0.010	0.024	0.033	0.125	0.028	**0.402**	0.013	0.037	0.013	0.012	0.2
Lead (mg/L)	0.002	ND	0.010	ND	ND	ND	ND	ND	0.012	ND	0.05
Selenium (mg/L)	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05
Zinc (mg/L)	0.020	1.20	1.87	0.917	0.221	0.423	0.768	0.440	2.76	0.028	10

Notes: All analyses performed by Analytical Technologies, Inc., Phoenix, AZ
Bold values indicate concentration exceeds NMWQCC ground-water standard

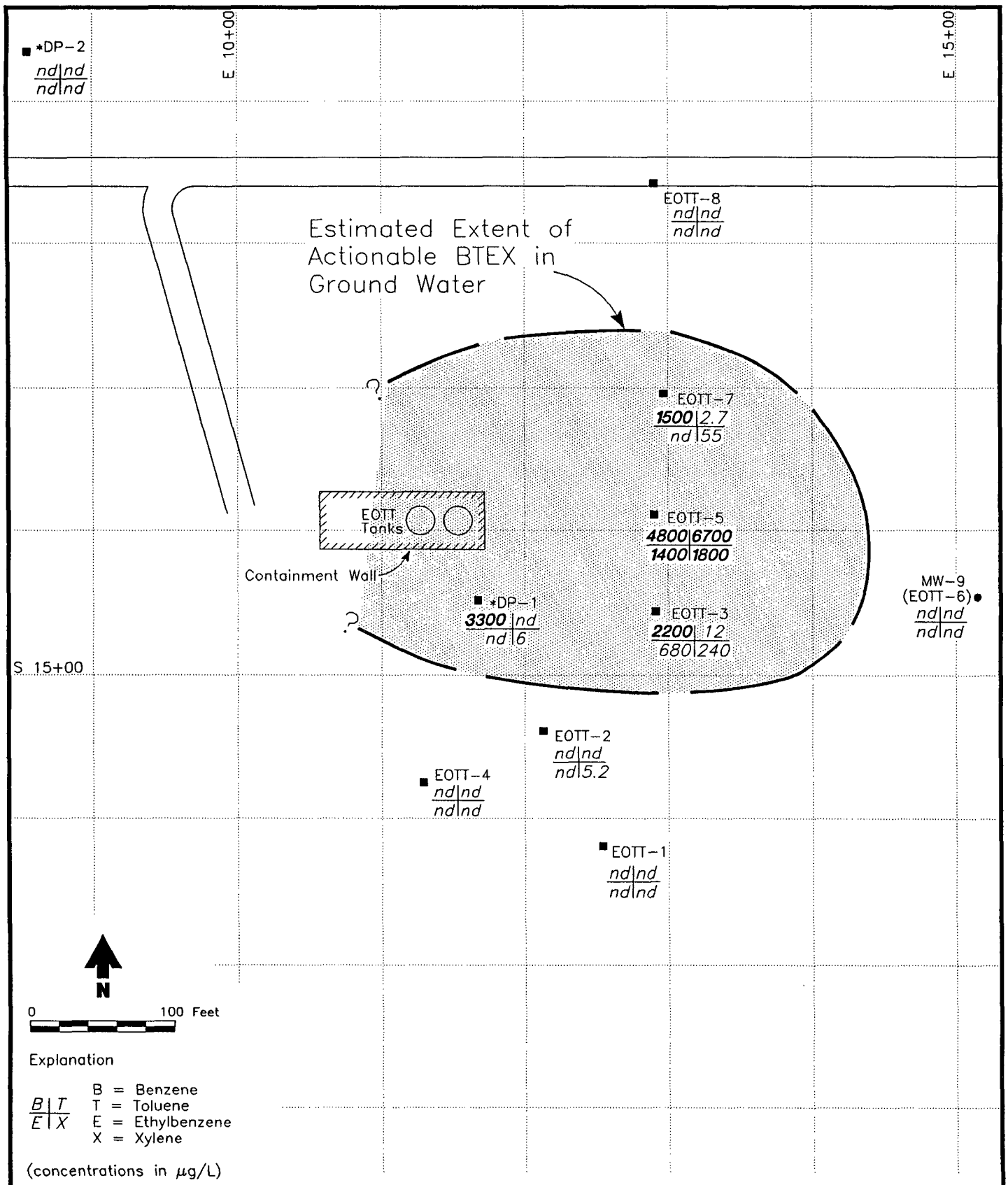
NMWQCC = New Mexico Water Quality Control Commission
ND = Not detected

[1] For locations of wells/borings, refer to Figure 9

on the analytical results, it appears that the ground water underlying the EOTT tanks and immediately east of the tanks has been impacted by the release of waste liquids.

The ground-water constituents that exceeded the NMWQCC standards are primarily BTEX compounds (Table 5). PAHs were above the NMWQCC standard only in boring EOTT-5. Benzene, which has the lowest regulatory standard (10 µg/L) of the BTEX constituents, was used as the basis for estimating the extent of actionable ground water shown on Figure 12. The actionable ground water appears to be limited to a plume roughly 250 feet wide which extends from the vicinity of the EOTT tanks approximately 300 feet to the east.

The inorganic chemical analyses indicate that samples from all the temporary drive point wells contained concentrations below the NMWQCC standards for major ions and metals with the exception of manganese concentrations in temporary drive point well EOTT-5 (Table 6). As mentioned in Section 3.2.3, the presence of manganese above the NMWQCC standard most likely results from the reducing or oxygen-limited environment present within the hydrocarbon plume.



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NATURAL GAS PROCESSING PLANT

Estimated Extent of Actionable BTEX in Ground Water

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8-94 JN 3260

Figure 12

\\HEP\ HEP-07A

4. SUMMARY AND CONCLUSIONS

This report summarizes the May 16 through May 22, 1994 subsurface investigation undertaken at the ENRON Hobbs Compressor Station No. 2 and the ENRON Hobbs Natural Gas Processing Plant. The purpose of the investigation was to evaluate the extent of subsurface impacts related to the storage of waste liquids at the two facilities. During the course of the investigation, 14 borings were drilled and sampled, and 1 permanent monitor well was installed. Specifically, the investigatory drilling program has revealed the following at each site:

Hobbs Compressor Station No. 2

- Actionable volatile organic compound (VOC) concentrations (PID reading greater than 100 ppmv) appear to be limited to the area surrounding the former used oil and pipeline liquid UST excavations.

- The vertical extent of actionable soils varies from approximately a 20-foot soil column near the former USTs to a thin layer along the water table interface at boring SB-2. The extent of soil impacts may extend beyond the eastern property boundary.

- Benzene, toluene, ethylbenzene and xylene (BTEX), and polyaromatic hydrocarbon (PAH) concentrations above the New Mexico Water Quality Control Commission (NMWQCC) standards are present in ground water beneath the site. The total petroleum hydrocarbons (TPH) in ground water are composed of both gasoline- and diesel-range constituents. The plume extends south-southeast from near the former USTs to the property boundary. Chemical analyses of ground water indicate that the area of actionable contamination may extend beyond the eastern property boundary.

- Phase-separated hydrocarbons (PSH) are present south of the former pipeline liquids and used oil UST excavations, as evidenced by the 3.4 feet of PSH measured in monitor well MW-1.

- Inorganic chemical analyses of water samples indicate that NMWQCC standards were exceeded for total dissolved solids (TDS), chloride, barium, iron, and manganese. However, TDS and chloride concentrations were also exceeded in the upgradient well, which should be an indicator of background water quality. The elevated manganese and iron concentrations are present at locations that are heavily impacted by hydrocarbons, suggesting that reducing conditions have mobilized these metals.

Hobbs Natural Gas Processing Plant

- No actionable concentrations of VOCs (PID readings greater than 100 ppmv) were detected in any of the soil samples collected during the drilling program.

- BTEX concentrations exceeded the NMWQCC standards in ground water from four of the borings near the EOTT tanks. PAHs were above the NMWQCC standard only in ground water from boring EOTT-5. The TPH in ground water are composed of gasoline-range constituents. The plume extends from the EOTT tanks toward the east for a distance of approximately 300 feet and appears to be within the confines of the plant property.

- Inorganic chemical analyses of water samples indicate that no regulatory standards were exceeded with the exception of manganese concentrations in temporary drive point well EOTT-5.

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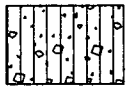
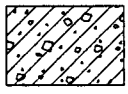
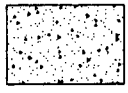
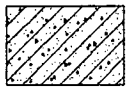
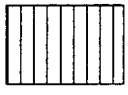
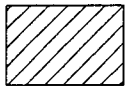
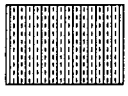
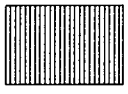
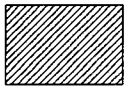
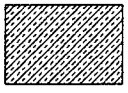
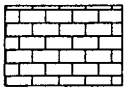
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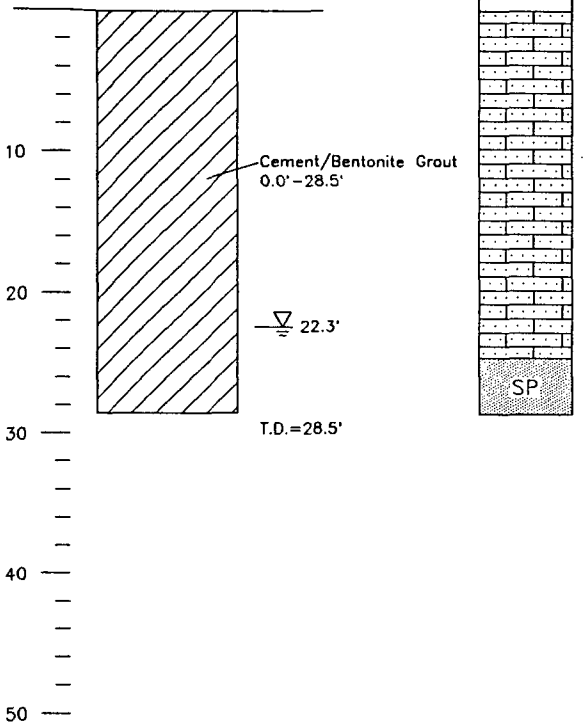
APPENDIX A

BORING LOGS AND SURVEY DATA

	GW	Well graded gravels, gravel–sand mixtures, little or no fines
	GP	Poorly graded gravels, gravel–sand mixtures, little or no fines
	GM	Silty gravels, gravel–sand–silt mixtures
	GC	Clayey gravels, gravel–sand–clay mixtures
	SW	Well graded sands, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines
	SM	Silty sands, sand–silt mixtures
	SC	Clayey sands, sand–clay mixtures
	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silt with slight plasticity
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity
	MH	Elastic silts, sandy silts, and clayey silts with low to moderate plasticity
	CH	Inorganic clays of high plasticity, fat clays
	OH	Organic clays of medium to high plasticity, organic silts
		Sandy Limestone

ENRON–HOBBS

Graphic Symbols and General Descriptions for Soil Boring Logs



Graphic Log	PID Reading (ppm)	Sampling Device	Comments and Lithology
		Grab	2' – Limestone and calcareous sandstone, very light gray (10 YR 8/2 rock) to yellowish gray (5 Y 7/2 rock), sands are fine- to medium-grained
	4	Split Spoon	5' – Sand, dark brown (7.5 YR 3/3) coarse sand with silt and clay, hydrocarbon stained, possible previous road surface before excavation
	0	Split Spoon	10' – Sand with interbedded limestone, pinkish white (7.5 YR 8/2), very fine- to coarse-grained, angular to subrounded grains, poorly sorted
	160	Split Spoon	15' – Sand with interbedded limestone, pinkish white (7.5 YR 8/2) to light brown (7.5 YR 6/3), sand brown, limestone white, sand fine- to medium-grained, poorly sorted, subangular grains
	300	Grab	19-20' – Sandstone, calcareous, pinkish gray (5 YR 8/1 rock), fine- to medium-grained, well sorted, rounded grains, strongly cemented
	125		
	220-300	Split Spoon	25-26' – Sand, calcareous, dark grayish brown (2.5 Y 4/2), fine-grained, well sorted, subangular to rounded grains, saturated, phase-separated hydrocarbons present

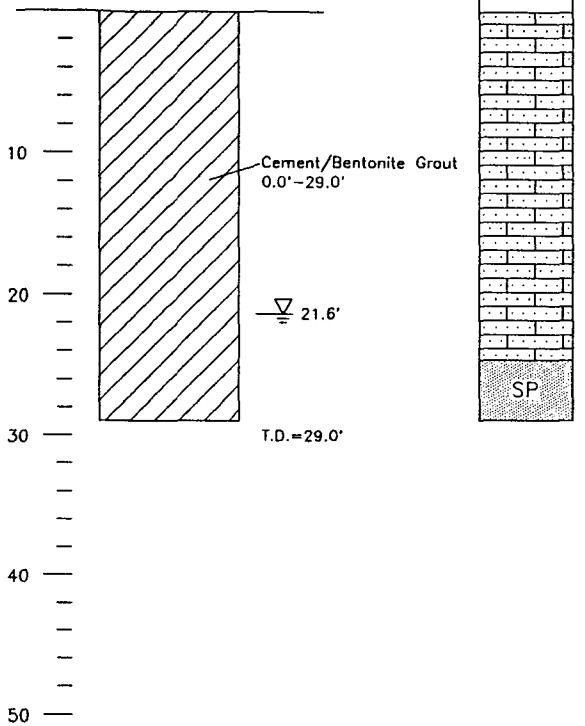
Hydrologists: CMP
Driller: Eades Drilling
Date Completed: 5/17/94

Drilling Method: Air Rotary
Bit Diameter: 5.5 In.

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8-94 JN 3260

ENRON-HOBBS
Compressor Station No. 2

BORING LOG: SB-1



Graphic Log	PID Reading (ppm)	Sampling Device	Comments and Lithology
		Grab	2' – Limestone and sandy limestone, very light gray (10 YR 8/2 rock) to yellowish gray (5 Y 7/2 rock), sand grains fine-grained
	4	Split Spoon	5' – Same as above
	4	Split Spoon	10' – Calcareous sandstone, very pale orange (10 YR 8/2), very fine- to fine-grained, poorly sorted, subangular to rounded grains, interbedded with limestone
	4	Split Spoon	15' – Limestone and interbedded sands, pale orange (10 YR 8/2) to grayish orange (10 YR 7/4), sands are fine grained, moderately sorted and grayish orange
		Split Spoon	No recovery
		Split Spoon	
SP	110	Split Spoon	26–27.2' – Sand, brown (7.5 YR 5/3 soil), very fine-grained, well sorted, rounded grains, unconsolidated, saturated, strong hydrocarbon odor

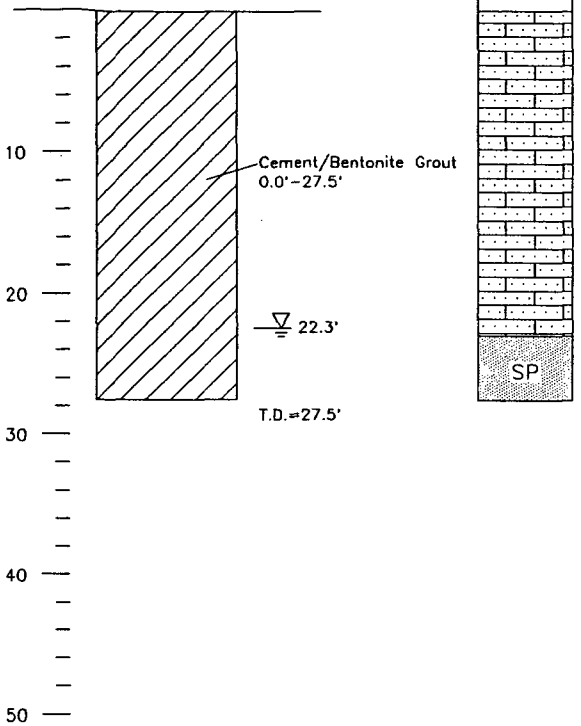
Hydrologists: CMP
Driller: Eades Drilling
Date Completed: 5/17/94

Drilling Method: Air Rotary
Bit Diameter: 5.5 In.

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ENRON–HOBBS
Compressor Station No. 2

BORING LOG: SB–2



PID Reading (ppm)	Sampling Device	Comments and Lithology
0	Split Spoon	5–5.2' – Calcareous sand, very pale brown (10 YR 7/3), very fine– to medium–grained, poorly sorted, angular to subangular grains, moderately to strongly cemented, damp
0	Split Spoon	10–10.2' – Same as above, pinkish, very strongly cemented, very fine–grained beds
0	Split Spoon	15–15.8' – Sandstone with interbeds of limestone, very pale brown (10 YR 7/3), fine– to coarse–grained, poorly sorted, angular to subrounded grains, strongly cemented
0	Cuttings	19–20' – Siliceous limestone, yellowish gray (5 YR 7/2), very strongly cemented
0	Split Spoon	23–23.3' – Sand, brown (7.5 YR 5/3), fine– to medium–grained, well sorted, subangular to subrounded grains, unconsolidated, saturated
0	Cuttings	25–26' Same as above

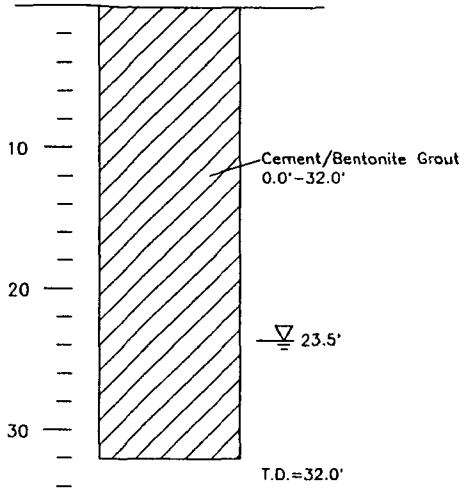
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Driller: Eades Drilling
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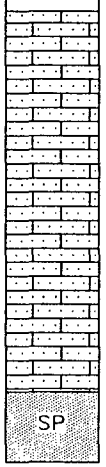
Drilling Method: Air Rotary
Bit Diameter: 5.5 In.

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8-94 JN 3260

ENRON–HOBBS
Compressor Station No. 2

BORING LOG: SB–3





Graphic Log	PID Reading (ppm)	Sampling Device	Comments and Lithology
		Grab	2' – Sand and limestone interbedded, light yellowish brown (10 YR 6/4) sand, fine– to coarse–grained, moderately sorted, subangular grains, slightly to moderately cemented
		Split Spoon	
	0	Grab	6–7' – Siliceous limestone, grayish orange pink (5 YR 7/2 rock), strongly cemented, resistant to drilling
	4	Split Spoon	10 –10.1'– Limestone with interbedded sandstone, pale yellowish brown (10 YR 6/2 rock)
	8	Split Spoon	15–16' – Sand with interbedded limestone, pinkish (gray 5 YR 8/1 rock), sand is very fine– to fine–grained, poorly sorted, subangular grains
	6	Split Spoon	20–20.5' – Same as above, resistant layer at 21 feet, pinkish, fine–grained sandstone, strongly cemented with carbonate
	7	Grab Split Spoon	24–25' – Sandstone, very light gray (N 8 rock), very fine–grained, well sorted, subangular grains, strongly cemented with carbonate
	10	Split Spoon	30–31' – Sand, brown (7.5 YR 5/2 soil), very fine– to fine–grained, well sorted, subrounded to rounded grains, saturated, unconsolidated

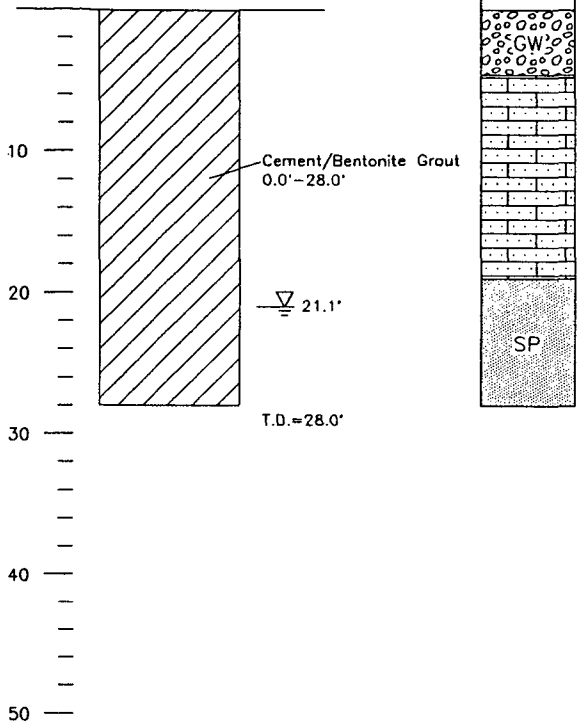
Hydrologists: CMP
Driller: Eades Drilling
Date Completed: 5/17/94

Drilling Method: Air Rotary
Bit Diameter: 5.5 In.

DANIEL B. STEPHENS & ASSOCIATES, INC.
8-94 JN 3260

ENRON–HOBBS
Compressor Station No. 2

BORING LOG: SB–4



PID Reading (ppm)	Sampling Device	Comments and Lithology
	Grab	2–3' – Sandy gravel, light gray (5 YR 7/1 rock) to gray, some clay (dark gray), clay to gravel, poorly sorted, angular clasts, dry, unconsolidated
0	Split Spoon	5' – Limestone and coarse sand, very pale orange (10 YR 8/2 rock) to dusky yellowish brown (10 YR 2/2 rock), sand is poorly sorted, angular grains, limestone is well indurated
8	Split Spoon	10–10.5' – Sandy silt, pinkish gray (7.5 YR 7/2 soil), 60% silt, 10% sand, 30% carbonate, poorly indurated
0	Split Spoon	15–15.2' – Limestone, very pale orange (10 YR 8/2 rock), with interbeds of sandstone, pinkish gray (5 YR 8/1), moderately indurated
0	Grab	21–21.1' – Sandstone, pinkish gray (5 YR 8/1 rock), very fine– to fine–grained, well sorted, rounded grains, strongly cemented with carbonate
0	Split Spoon	
	Split Spoon	25' – Sand, brown, fine–grained, unconsolidated with layers of cemented sands, saturated

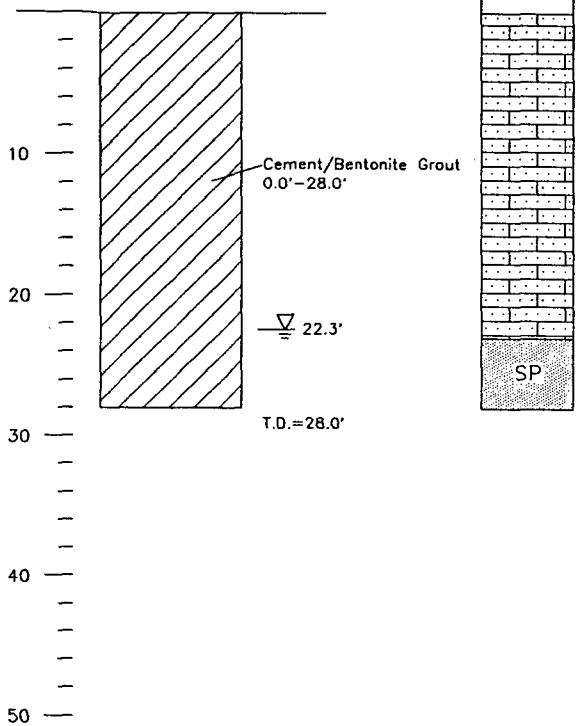
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Driller: Eades Drilling
Date Completed: 5/18/94

Drilling Method: Air Rotary
Bit Diameter: 5.5 In.

DANIEL B. STEPHENS & ASSOCIATES, INC.
8–94 JN 3260

ENRON–HOBBS
Compressor Station No. 2

BORING LOG: SB–5



Graphic Log	PID Reading (ppm)	Sampling Device	Comments and Lithology
	2	Split Spoon	5–5.2' – Limestone with silt, very pale brown (10 YR 8/3 soil)
	8	Split Spoon	10' – Limestone with silt, pinkish gray (5 YR 8/1 rock), with interbeds of calcareous sandstone, sandstone medium-grained, well sorted, rounded grains
	6	Split Spoon	15–15.4' – Silty limestone with sand, pinkish gray (5 YR 8/1 rock) with interbeds of fine-grained sandstone
	0	Grab	18.5–19' – Silty limestone interbedded with calcareous sandstone, limestone is pinkish gray (5 YR 8/1 rock), sandstone is grayish orange pink (5 YR 7/2), sandstone fine-grained, well sorted
SP	0	Split Spoon	23–24.1' – Sand, strong brown (7.5 YR 5/6 soil), fine-grained, well sorted, subrounded grains, unconsolidated, saturated

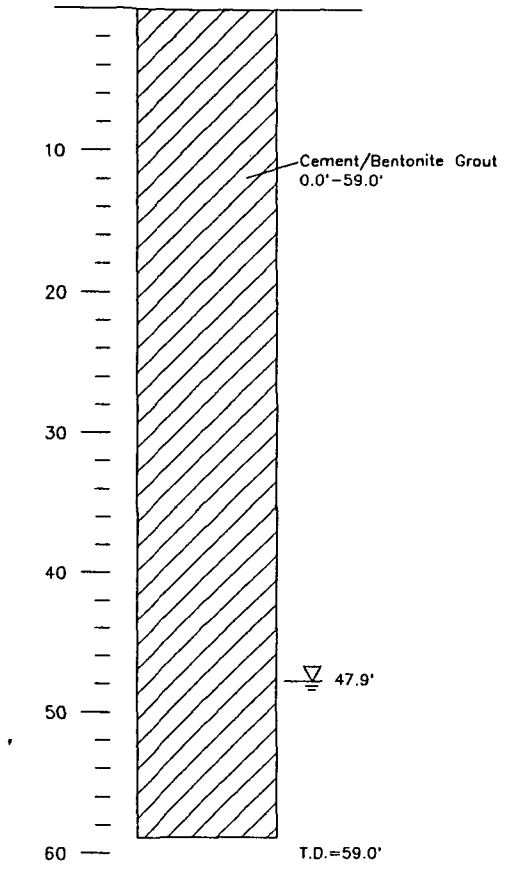
Hydrologists: CMP
Driller: Eades Drilling
Date Completed: 5/19/94

Drilling Method: Air Rotary
Bit Diameter: 5.5 In.

DANIEL B. STEPHENS & ASSOCIATES, INC.
8-94 JN 3260

ENRON–HOBBS
Compressor Station No. 2

BORING LOG: SB–6



Graphic Log	PID Reading (ppm)	Sampling Device	Comments and Lithology
SM	0	Grab/Split Spoon	5–5.4' – Silty sand, very pale brown (10 YR 8/3), fine– to medium–grained, poorly sorted, subrounded to rounded grains, 60% sand in 40% calcareous silty matrix, damp
	0	Split Spoon	10–10.2' – Silty sand, same as above, with some moderately indurated thin layers
	0	Split Spoon	15–15.4' – Silty sand, white (10 YR 8/2), fine– to medium–grained, moderately sorted, subrounded grains, 60% sand in calcareous silty matrix, damp, some moderately indurated layers
SW	0	Split Spoon	20–21.2' – Sand with silt, light brown (7.5 YR 6/4) very fine– to medium–grained, moderately sorted, subrounded to rounded grains, unconsolidated, moist
	0	Split Spoon	25–25.2' – Sand with silt, pinkish white (7.5 YR 8/2), very fine– to medium–grained, poorly sorted, subangular to subrounded grains, mostly unconsolidated with thin layers of strongly cemented sandstone, 90% sand, 10% silt, carbonate cement
SW	0	Split Spoon	30–30.4' – Sand, brown (7.5 YR 5/4), very fine– to medium–grained, moderately sorted, subangular grains, numerous layers of strongly cemented sandstone, carbonate cement
	0	Grab	34–35' – Silty sand, light brown (7.5 YR 6/4), very fine– to fine–grained, moderately sorted, subangular grains, numerous layers of strongly cemented sandstone, carbonate cement, 85% sand, 15% silt
	0	Split Spoon	40–40.4' – Sand with silt, same as above, at 41 feet drill into unconsolidated, darker brown moist sands
	0	Split Spoon	45–45.9' – Sand, brown (7.5 YR 5/4), fine– to medium–grained, well sorted, subrounded grains, unconsolidated, moist, 95% sand, 5% silt (clean sand)
SP	0	Split Spoon	50–50.4' – Sand, brown (7.5 YR 5/4), very fine– to fine–grained, well sorted, subrounded grains, unconsolidated, wet, 95% sand, 5% silt
	0	Split Spoon/ Grab	55–56' – Saturated

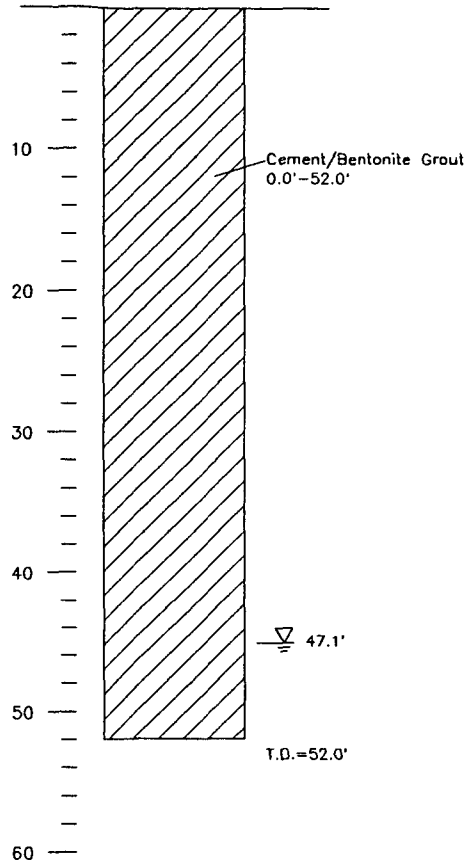
Hydrologists: CMP
Driller: Eades Drilling
Date Completed: 5/18/94

Drilling Method: Air Rotary
Bit Diameter: 5.5 In.

DANIEL B. STEPHENS & ASSOCIATES, INC.
8–94
JN 3260

ENRON–HOBBS
Natural Gas Processing Plant

BORING LOG: EOTT–1



Graphic Log	PID Reading (ppm)	Sampling Device	Comments and Lithology
CH	0	Grab	2.5–3' – Clay with sand, black (5 Y 2.5/2) fat clay, plastic
	0	Split Spoon	5–5.3' – Carbonate sand (weathered limestone), very pale brown (10 YR 8/3), very fine- to coarse-grained, poorly sorted, angular grains
	4	Grab	9–10' – Carbonate sand and silt (weathered sandy limestone), pink (7.5 YR 8/3) 15% quartz sand, quartz sand is fine-grained, rounded grains, carbonate sand is angular, poorly sorted, damp
SW	0	Split Spoon	15–16.2' – Silty sand, pink (7.5 YR 7/3), very fine- to fine-grained, poorly sorted, angular to subrounded grains, 80% sand, 20% silt, unconsolidated, damp
	0	Split Spoon	20–20.1' – Silty sand, same as above
	0	Grab	25–26' – Sand, light brown (7.5 YR 6/4), fine- to medium-grained, well sorted, subrounded grains, damp, mostly unconsolidated with 0.2- to 0.5-foot-thick well cemented layers
SP	0	Grab	32–32.7' – Sand, light brown, same as above
	4	Split Spoon	40–40.2' – Sand with silt, light brown (7.5 YR 6/4), very fine- to medium-grained, moderately sorted, subangular to rounded grains, most unconsolidated
SP	4	Grab	44–45' – Sand, yellowish red (5 YR 5/6), fine-grained, well sorted, subangular grains, unconsolidated, moist
	4	Split Spoon	50–51.2' – Sand, light brown (7.5 YR 6/4), fine- to medium-grained, moderately sorted, subrounded grains, saturated

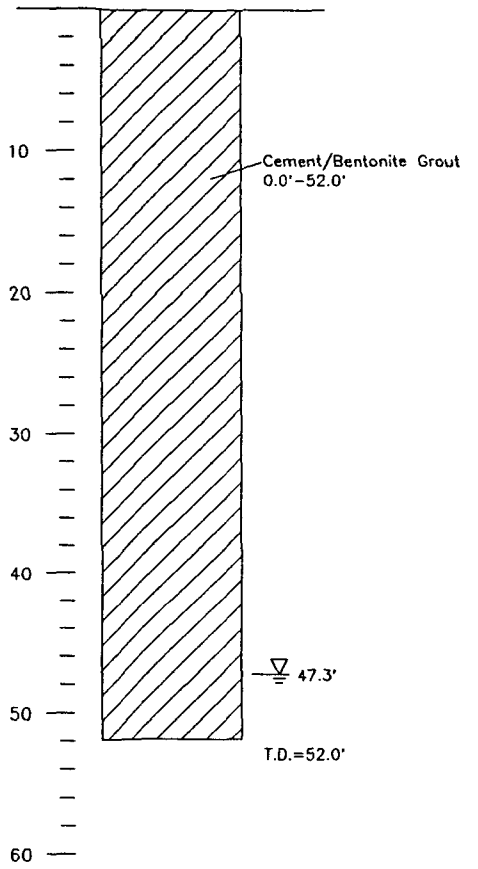
Hydrologists: CMP
Driller: Eades Drilling
Date Completed: 5/19/94

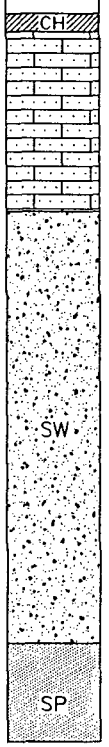
Drilling Method: Air Rotary
Bit Diameter: 5.5 In.

DANIEL B. STEPHENS & ASSOCIATES, INC.
8-94 JN 3260

ENRON–HOBBS
Natural Gas Processing Plant

BORING LOG: EOTT–2





Graphic Log	PID Reading (ppm)	Sampling Device	Comments and Lithology
CH	0	Grab	0.5' – Black clay
	4	Split Spoon	5–5.2' – Silty limestone with sand, very pale brown (10 YR 8/3), 90% carbonate, 10% quartz sand
	0	Split Spoon	10–10.2' – Same as above
	0	Split Spoon	15–16.5' – Silty sand, pink (7.5 YR 7/4), very fine- to fine-grained, poorly sorted, angular to subrounded grains, unconsolidated, damp, few cemented layers
	6	Split Spoon	20–20.5' – Silty sand, same as above, with more numerous cemented layers, damp
	0	Split Spoon	25–26.3' – Sand with silt, reddish yellow (7.5 YR 6/6), very fine- to medium-grained, moderately sorted, subrounded grains, damp, mostly unconsolidated with cemented sandstone interbeds
SW	6	Split Spoon	30–30.8' – Silty sand, pink (7.5 YR 7/3), very fine- to fine-grained, poorly sorted, subangular to subrounded grains, damp, unconsolidated with numerous well cemented layers
	0	Split Spoon	36–37' – Sand with silt, light brown (7.5 YR 6/4), very fine- to fine-grained, moderately sorted, subrounded grains, moist, unconsolidated with few well cemented layers
	0	Split Spoon	40–40.1' – Sand with silt, light brown (7.5 YR 6/4), very fine- to fine-grained, moderately sorted, same as above
	0	Split Spoon	45–46.2' – Sand, brown (7.5 YR 5/4), fine- to medium-grained, well sorted, subangular to subrounded grains, unconsolidated, wet
	0	Grab	46–47' – Same as above
SP	22	Split Spoon	50–51' – Sand, strong brown (7.5 YR 5/6), fine- to medium-grained, well sorted, subrounded grains, unconsolidated, saturated

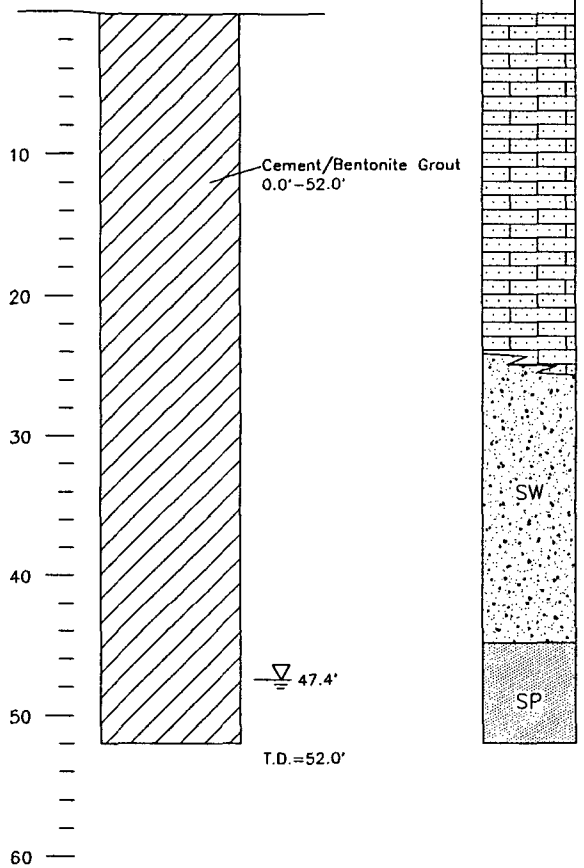
Hydrologists: CMP
Driller: Eades Drilling
Date Completed: 5/20/94

Drilling Method: Air Rotary
Bit Diameter: 5.5 In.

DANIEL B. STEPHENS & ASSOCIATES, INC.
8-94
JN 3260

ENRON–HOBBS
Natural Gas Processing Plant

BORING LOG: EOTT–3



Graphic Log	PID Reading (ppm)	Sampling Device	Comments and Lithology
	6	Split Spoon	5–5.1' – Limestone with sand, pinkish white (7.5 YR 8/2), 95% carbonate, 5% sand
	0	Split Spoon	10–10.1' – Sandy limestone, white (10 YR 8/2), limestone with interbeds of sandstone, 15% sandstone, sandstone is fine–grained, well sorted, subrounded quartz grains, damp
	0	Split Spoon	15–15.2' – Calcareous silty sand, very pale brown (10 YR 7/3), very fine– to medium–grained, poorly sorted, angular to subrounded grains, moist
	0	Split Spoon	20–20.1' – Calcareous sand, same as above
	4	Split Spoon	25–25.7' – Silty sand, pink (7.5 YR 8/3), very fine– to medium–grained, poorly sorted, angular to subrounded grains, mostly unconsolidated with interbeds of limestone and well cemented sandstone, moist
	0	Split Spoon	30–30.7' – Silty sand, light brown (7.5 YR 6/4), very fine– to medium–grained, moderately sorted, subangular to subrounded grains, moist, mostly unconsolidated with interbeds of sandstone and sandy limestone
	0	Split Spoon/ Grab	36–37' – Silty sand, light brown (7.5 YR 6/4), same as above
	0	Split Spoon	40–40.7' – Silty sand, light brown (7.5 YR 6/4), very fine– to medium–grained, same as above except wet
	4	Split Spoon	45–45.8' – Sand, light brown (7.5 YR 6/4), fine– to medium–grained, well sorted, subrounded grains, mostly unconsolidated, few thin interbeds of sandstone, wet
	4	Split Spoon	50–51.5' – Sand, brown (7.5 YR 5/4), very fine– to fine–grained, same as above only saturated

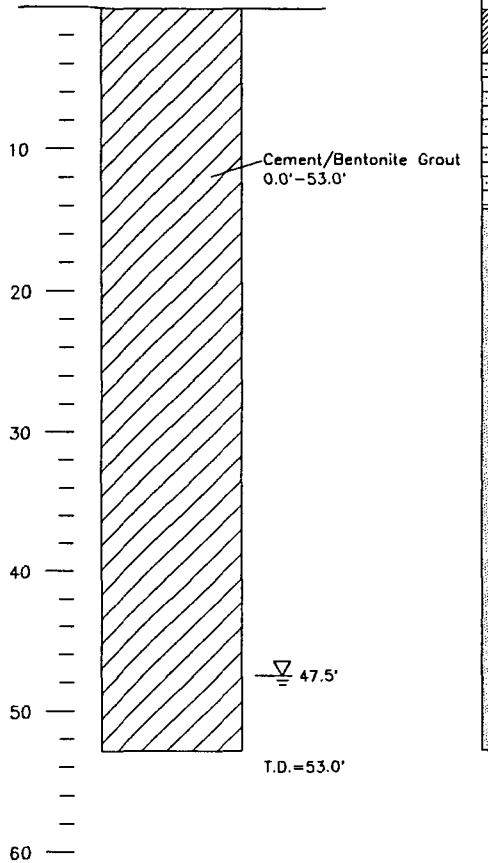
Hydrologists: CMP
Driller: Eades Drilling
Date Completed: 5/20/94

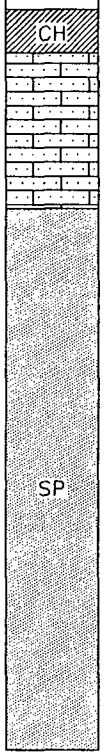
Drilling Method: Air Rotary
Bit Diameter: 5.5 In.

DANIEL B. STEPHENS & ASSOCIATES, INC.
B-94 JN 3260

ENRON–HOBBS
Natural Gas Processing Plant

BORING LOG: EOTT–4





Graphic Log	PID Reading (ppm)	Sampling Device	Comments and Lithology
		Grab	0–2' – Clay, black, plastic
	2	Split Spoon	5–5.1' – Silty limestone and calcareous sandstone, interbedded, very pale brown (10 YR 8/3), 15% sand, 85% carbonate, moderately to poorly indurated
	0	Split Spoon	10–10.4' – Calcareous sand and sandstone, very pale brown (10 YR 8/4), varies from 50% to 80% quartz sand in carbonate matrix, moderately to poorly indurated
	0	Split Spoon	15–16.2' – Sand with silt, pink (7.5 YR 7/4), very fine– to fine–grained, moderately to well sorted, subrounded grains, unconsolidated, moist
	2	Split Spoon	20–21.3' – Sand, light brown (7.5 YR 6/4), fine– to medium–grained, well sorted, subrounded grains, mostly unconsolidated, with few cemented layers, wet
	0	Grab	25–26' – Silty sand, white (10 YR 8/2), very fine– to fine–grained, poorly sorted, angular to subrounded grains, unconsolidated sands with interbeds of strongly cemented sandstone, damp
	0	Split Spoon	30–30.2' – Silty sand, pink (7.5 YR 7/3), same as above except moist
	1.2	Split Spoon	35–35.5' – Sand, brown (7.5 YR 5/4), fine– to medium–grained, well sorted, subrounded grains, mostly unconsolidated with interbeds of cemented sandstone, wet
	0.4	Split Spoon	40–40.3' – Sand with silt, light brown (7.5 YR 6/4), very fine– to medium–grained, poorly to moderately sorted, subangular to subrounded grains, mostly unconsolidated with cemented sandstone layers
	0	Split Spoon	45–45.4' – Sand, light brown (7.5 YR 6/4), fine– to medium–grained, well sorted, subrounded grains, mostly unconsolidated with few cemented sandstone layers, wet
	0.2	Split Spoon	50–50.4' – Sand, same as above

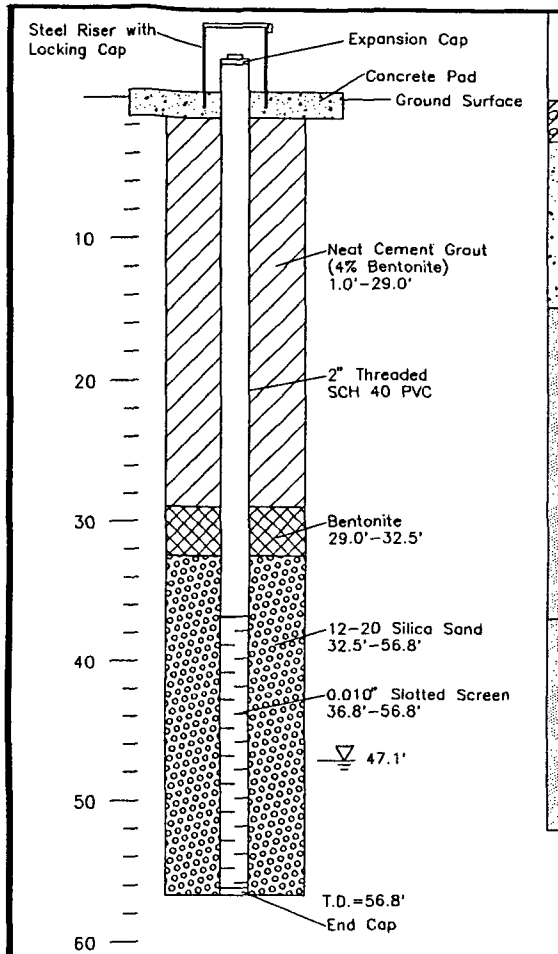
Hydrologists: CMP
Driller: Eades Drilling
Date Completed: 5/20/94

Drilling Method: Air Rotary
Bit Diameter: 5.5 In.

DANIEL B. STEPHENS & ASSOCIATES, INC.
8-94 JN 3260

ENRON–HOBBS
Natural Gas Processing Plant

BORING LOG: EOTT–5



Graphic Log	PID Reading (ppm)	Sampling Device	Comments and Lithology
GC		Grab	0-3' - Mixture of black clay and white sandy limestone gravel
SM	0	Grab/Split Spoon	5-5.4' - Silty carbonate sand and limestone, 95% carbonate with 5 to 10% silt (noncarbonate), very pale brown (10 YR 7/3), very fine- to medium-grained, poorly sorted, some well cemented beds
	0	Split Spoon	10-10.3' - Silty carbonate sand, pink (7.5 YR 7/3), same as above
	0	Grab	14-15' - Silty sand, pink (7.5 YR 7/3), very fine- to fine-grained, poorly sorted, subangular grains, mostly unconsolidated with cemented layers of highly calcareous sandstone, damp
SP	0	Split Spoon	20-20.5 - Silty sand (with carbonate), pink (7.5 YR 7/3), same as above
	0	Grab	24-25' - Sand with silt, pink (7.5 YR 7/3), fine-grained, well sorted, subrounded grains, unconsolidated with numerous strongly cemented layers of sandstone, damp
	2	Grab	29-30' - Silty sand, pink (7.5 YR 7/3), very fine- to fine-grained, poorly sorted, subangular grains, numerous well cemented sandstone layers with interbeds of unconsolidated sands, dry
	0	Split Spoon	35-35.2' - Sand with silt, pink (7.5 YR 8/3), very fine- to fine-grained, poorly sorted, subrounded grains, mostly unconsolidated sand with numerous well cemented sandstone beds
SP	1	Split Spoon	40-40.3' - Sand with silt, light brown (7.5 YR 6/3), very fine- to fine-grained, moderately to well sorted, subrounded grains, mostly unconsolidated with few cemented layers, damp
	0	Grab	44-45' - Sand, light brown (7.5 YR 6/4), fine- to medium-grained, well sorted, subrounded grains, mostly unconsolidated, wet
		Grab	50' - Sand, light brown (7.5 YR 6/4), fine-grained, unconsolidated, saturated

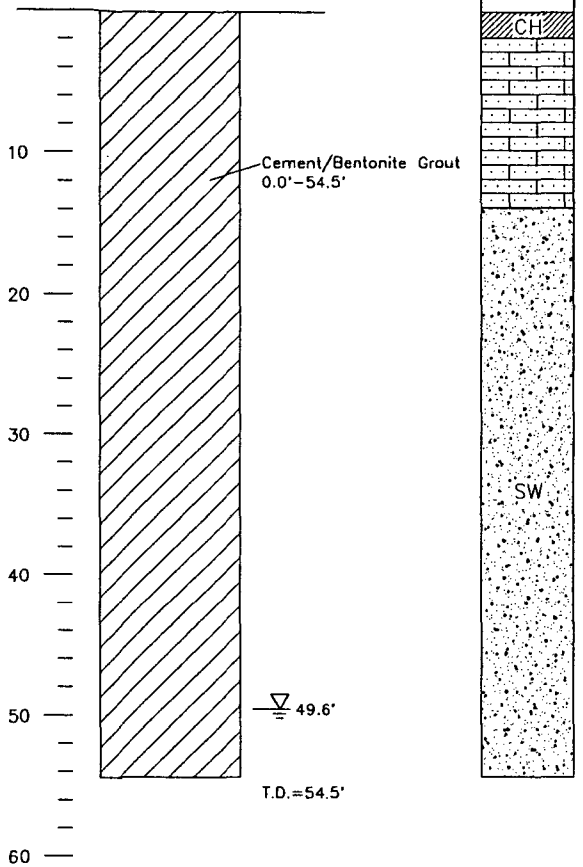
Hydrologists: CMP
Driller: Eades Drilling
Date Completed: 5/21/94

Drilling Method: Air Rotary
Bit Diameter: 5.5 In.

DANIEL B. STEPHENS & ASSOCIATES, INC.
8-94 JN 3260

ENRON-HOBBS
Natural Gas Processing Plant

WELL LOG: MW-9(EOTT-6)



PID Reading (ppm)	Sampling Device	Comments and Lithology
	Grab	0–1.5' – Black clayey soil
7	Split Spoon	5–5.1' – Limestone and carbonate sand with silt, very pale brown (10 YR 8/3), very fine- to medium-grained, 95% carbonate with approximately 5% silt, dry, moderately to well indurated
0	Split Spoon	10–11.5' – Calcareous sand and carbonate sand, pink (7.5 YR 8/3), very fine- to medium-grained, poorly sorted, subrounded grains, 50% carbonate, 50% quartz, feldspar and rock fragment sand, damp, mostly unconsolidated
0	Grab	14.5–15' – Sand with silt, light brown (7.5 YR 6/4), very fine- to medium-grained, moderately sorted, subrounded grains, mostly unconsolidated, damp
0	Split Spoon	20–21.8' – Silty sand, pink (7.5 YR 7/3), very fine- to fine-grained, poorly sorted, subangular grains, mostly unconsolidated with few well cemented sandstone layers, moist
2	Grab	24–25' – Sand with silt, pink (7.5 YR 7/3), very fine- to coarse-grained, poorly sorted, subangular grains, unconsolidated with numerous well cemented sandstone layers, damp, hydrocarbon odor
1.5	Split Spoon	30–31.5' – Silty calcareous sand, pinkish white (7.5 YR 8/2), very fine- to medium-grained, poorly sorted, subangular grains, unconsolidated with numerous strongly cemented layers
0	Split Spoon	35–35.5' – Sand with silt, light brown (7.5 YR 6/4), fine- to medium-grained, well sorted, subrounded grains, mostly unconsolidated with strongly cemented beds, moist, hydrocarbon odor
0	Split Spoon	40–40.2' – Sand with silt, light brown (7.5 YR 6/3), same as above
4	Grab	44–45' – Sand, light brown (7.5 YR 6/4), very fine- to medium-grained, moderately sorted, subrounded grains, unconsolidated, moist, faint hydrocarbon odor
4	Split Spoon	50–51' – Sand, same as above, wet, hydrocarbon odor

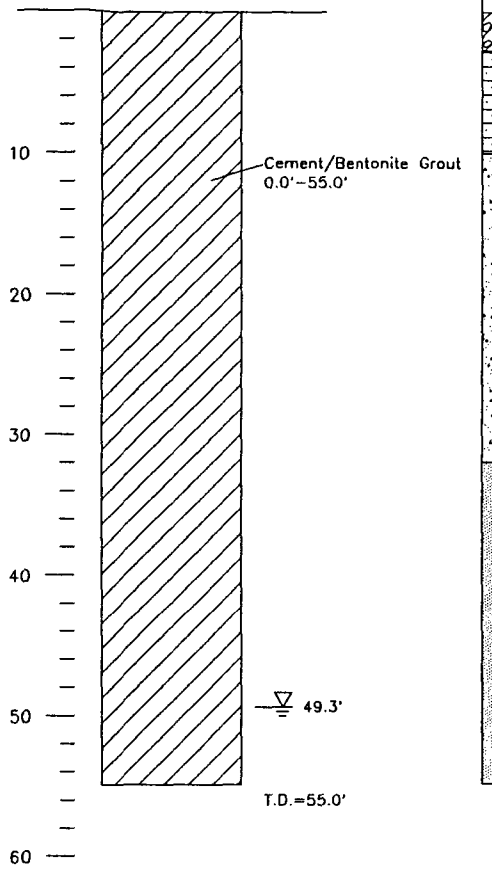
Hydrologists: CMP
Driller: Eades Drilling
Date Completed: 5/21/94

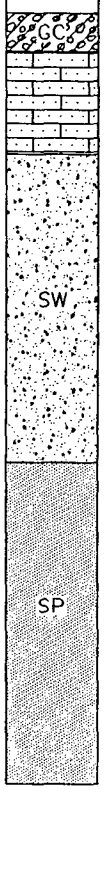
Drilling Method: Air Rotary
Bit Diameter: 5.5 In.

DANIEL B. STEPHENS & ASSOCIATES, INC.
8-94 JN 3260

ENRON–HOBBS
Natural Gas Processing Plant

BORING LOG: EOTT–7





Graphic Log	PID Reading (ppm)	Sampling Device	Comments and Lithology
		Grab	0–2.5' – Clayey gravel, black clay with white limestone gravel
	42	Split Spoon	5–6.5' – Silty carbonate sand, pinkish white (7.5 YR 8/2), very fine- to coarse-grained, poorly sorted, subangular grains, well indurated to unconsolidated, dry
	34	Split Spoon	10–11.8' – Sand with silt, light brown (7.5 YR 6/4), fine- to medium-grained, moderately sorted, subrounded grains, unconsolidated, damp
	10	Grab	15–16' – Silty sand, pink (7.5 YR 7/3), very fine- to fine-grained, poorly sorted, subangular grains, unconsolidated, damp
	18	Split Spoon	20–20.3' – Silty sand, same as above
	16	Grab	24.5–25' – Sand, light brown (7.5 YR 6/4), fine- to medium-grained, moderately sorted to well sorted, subrounded grains, mostly unconsolidated with few thin well cemented layers, moist
	14	Split Spoon	30–30.6' – Silty sand, pink (7.5 YR 7/3), very fine- to fine-grained, poorly sorted, subrounded grains, mostly unconsolidated with several well cemented layers, damp
	10	Grab	34–35' – Sand, light brown (7.5 YR 6/4), fine- to medium-grained, well sorted, unconsolidated with numerous strongly cemented sandstone layers, moist
	8	Split Spoon	40–40.5' – Sand, light brown (7.5 YR 6/4), fine- to medium-grained, well sorted, rounded grains, mostly unconsolidated with few strongly cemented layers, moist
	6	Split Spoon	45–47' – Sand, brown (7.5 YR 5/4), fine- to medium-grained, well sorted, rounded grains, mostly unconsolidated, moist to wet, few well cemented sandstone layers
	8	Split Spoon	50–50.8' – Same as above but very wet to saturated

Hydrologists: CMP
Driller: Eades Drilling
Date Completed: 5/22/94

Drilling Method: Air Rotary
Bit Diameter: 5.5 In.

DANIEL B. STEPHENS & ASSOCIATES, INC.
8-94 JN 3260

ENRON–HOBBS
Natural Gas Processing Plant

BORING LOG: EOTT–8

DESC. WELL No.	SOUTH	EAST	ELEVATION	POINT OF ELEVATION
MONITOR WELL #1	53+24.42	E1+76.46	3591.14'	PVC PIPE SE RIM
MONITOR WELL #1	53+24.42	E1+76.46	3588.86'	BRASS PLATE IN CONC. 1' NORTH
MONITOR WELL #2	N0+64.84	W0+59.94	3598.83'	PVC PIPE NORTH RIM
MONITOR WELL #2	N0+64.84	W0+59.94	3594.14'	BRASS PLAT IN CONC. 1' NORTH
SB #1 TEST HOLE	51+69.27	E2+04.57	3590.29'	
SB #2 TEST HOLE	52+52.89	E2+05.38	3589.16'	
SB #3 TEST HOLE	54+23.84	E2+05.77	3587.95'	
SB #4 TEST HOLE	52+65.92	E0+90.76	3590.59'	
SB #5 TEST HOLE	50+68.01	E2+02.31	3590.60'	
SB #6 TEST HOLE	55+08.86	E2+04.07	3587.33'	
SB #7 TEST HOLE	56+68.00	E2+00.12	3585.89'	
3 1/2" I.P. W/3" B.P.	N0+00.31	W0+00.16	3594.14'	3 1/2" I.P. W/3" B.P.
4 1/2" I.P. CORD.	N0+00.00	E2+00.00	3591.89'	4 1/2" I.P. CORD.
3 1/2" I.P. W/3" B.P.	53+20.00	E2+00.00	3588.26'	3 1/2" I.P. W/3" B.P.
NE COR. OF AST PIT	52+69.00	E2+00.36	3589.16'	NE COR. OF AST PIT
NE COR. OF GLYCO PIT	52+17.27	E0+75.46	3591.20'	NE COR. OF GLYCO PIT
NE COR OF USED OIL PIT	51+79.38	E1+92.10	3590.09'	NE COR OF USED OIL PIT

I HEREBY CERTIFY THAT THIS PLAT WAS PREPARED FROM FIELD NOTES OF AN ACTUAL SURVEY AND MEETS OR EXCEEDS ALL REQUIREMENTS FOR LAND SURVEYS AS SPECIFIED BY THIS STATE.

7977

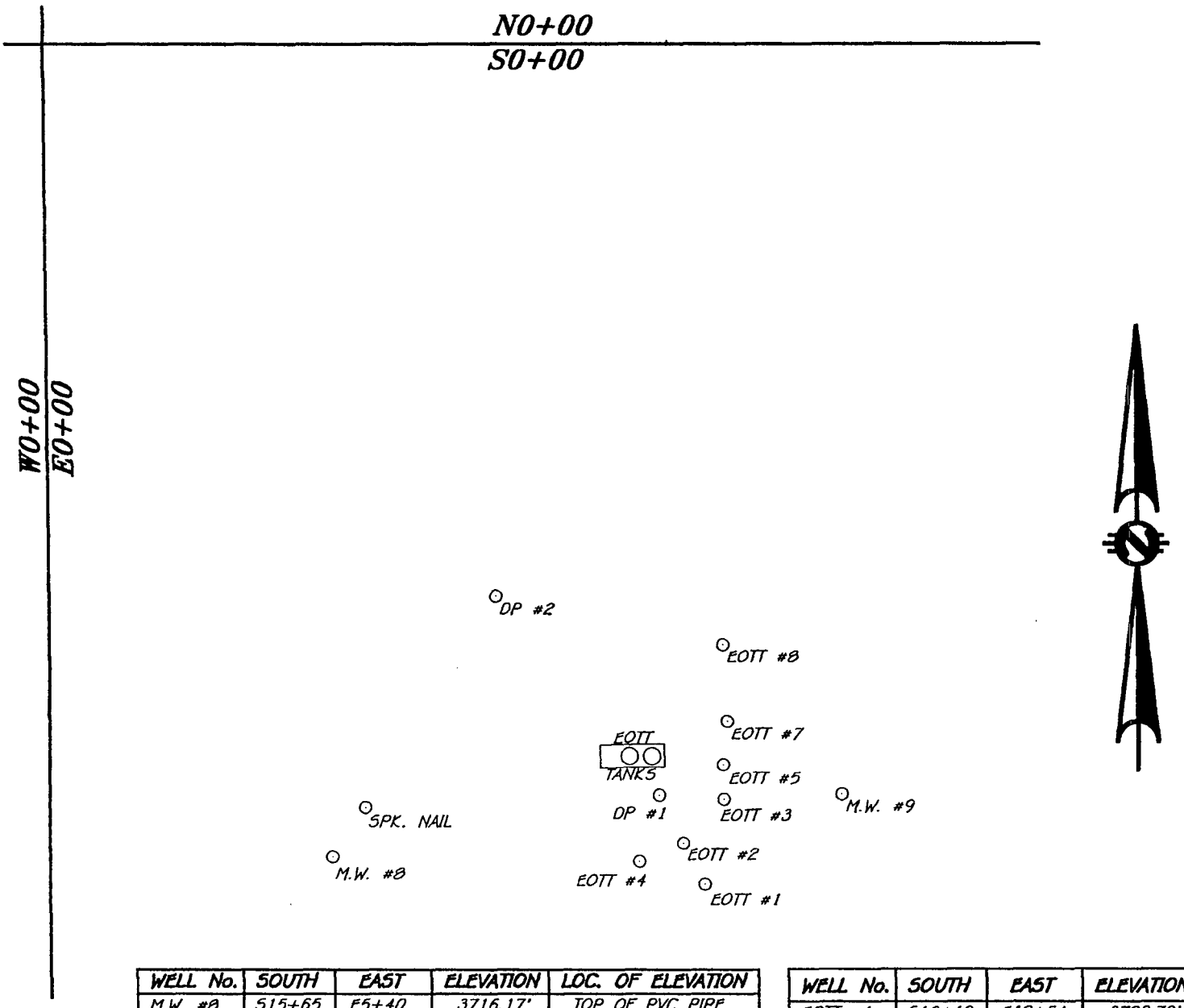
JOHN W. WEST	N.M. P.S.	No. 677
	TEXAS P.L.S.	No. 1138
RONALD J. EIDSON	N.M. P.S.	No. 3239
	TEXAS P.L.S.	No. 1883
GARY L. JONES	N.M. P.S.	No. 7977
	TEXAS P.L.S.	No. 5074
GARY G. EIDSON	TEXAS P.L.S.	No. 4735

DANIEL B. STEPHENS & ASSOCIATES, INC.

X-Y-Z CORDINATES OF MONITOR WELLS AND OTHER FACILITIES IN THE ENRON HOBBS No. 2 PLAT LOCATED IN SECTION 33, T-19-S, R-37-E, LEA COUNTY, NEW MEXICO.

JOHN W. WEST ENGINEERING COMPANY
CONSULTING ENGINEERS & SURVEYORS – HOBBS, NEW MEXICO

Survey Date: 05-20-94	Sheet 1 of 1 Sheets
W.O. Number: 94-11-0908	Drawn By: S.C. NICHOLS
Date: 06-01-94	DBS0908B | Scale: N.T.S.



WELL No.	SOUTH	EAST	ELEVATION	LOC. OF ELEVATION
M.W. #8	515+65	E5+40	3716.17'	TOP OF PVC PIPE
M.W. #8	515+65	E5+40	3714.17'	BRASS PLATE
M.W. #9	514+46	E15+15	3722.46	TOP OF PVC PIPE
M.W. #9	514+46	E15+15	3720.44'	TOP OF CONC.

WELL No.	SOUTH	EAST	ELEVATION
EOTT #1	516+19	E12+54	3720.79'
EOTT #2	515+39	E12+13	3720.16'
EOTT #3	514+56	E12+91	3720.37'
EOTT #4	515+75	E11+29	3720.20'
EOTT #5	513+09	E12+90	3720.41'
EOTT #7	513+04	E12+97	3721.03'
EOTT #8	511+50	E12+90	3722.01'
D.P. #1	514+40	E11+67	3720.32'
D.P. #2	510+65	E0+55	3722.36'

I HEREBY CERTIFY THAT THIS PLAT WAS PREPARED FROM FIELD NOTES OF AN ACTUAL SURVEY AND MEETS OR EXCEEDS ALL REQUIREMENTS FOR LAND SURVEYS AS SPECIFIED BY THIS STATE.

GARY L. JONES — NEW MEXICO — 7977 — REGISTERED PROFESSIONAL LAND SURVEYOR

JOHN W. WEST	N.M. P.S.	No. 677
	TEXAS P.L.S.	No. 1138
RONALD J. EIDSON	N.M. P.S.	No. 3239
	TEXAS P.L.S.	No. 1883
GARY L. JONES	N.M. P.S.	No. 7977
	TEXAS P.L.S.	No. 5074
GARY G. EIDSON	TEXAS P.L.S.	No. 4735

DANIEL B. STEPHENS & ASSOCIATES, INC.

CORDINATES OF MONITOR WELLS IN THE ENRON HOBBS PLANT IN SECTION 6, TOWNSHIP 19 SOUTH, RANGE 37 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO.

JOHN W. WEST ENGINEERING COMPANY
CONSULTING ENGINEERS & SURVEYORS – HOBBS, NEW MEXICO

Survey Date: 05-23-94	Sheet 1 of 1 Sheets
W.O. Number: 94-11-0920	Drawn By: S.C. NICHOLS
Date: 05-24-94	DBS0920 — Scale: 1" = 300'

APPENDIX B

ANALYTICAL LABORATORY RESULTS

Organic Analysis

Hall Environmental Analysis Laboratory

Hall Environmental Analysis Laboratory
2403 San Mateo NE, Suite P-13
Albuquerque, NM 87018

6/1/94

Daniel B. Stephens and Associates, Inc.
6020 Academy NE, Suite 100
Albuquerque, NM 87109

Dear Mr. Bob Marley,

Enclosed are the results for the analyses that were requested. These were done according to EPA procedures or the equivalent.

Detection limits are determined by EPA methodology. Unless noted on sample page, all criteria for QA/QC acceptance levels fall within established parameters. These parameters are modeled from the EPA-600 14-79 019, March 1979, "Handbook for Analytical Quality Control in Water and Waste Water."

Please don't hesitate to contact me for any additional information or clarifications.

Sincerely,

Scott Hallenbeck 8/5/94

Scott Hallenbeck, Lab Manager

Project: Enron - Hobbs

Results for sample: SB-2

Date collected: 5/16/94	Date received: 5/17/94
Date extracted: NA	Date analyzed: 5/17/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron Hobbs Sta 2	Heal #: 9405052-1
Project Manager: Bob Marley	Sampled by: C. Pigman
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	1,900	5.0	PPB (UG/L)
Bromodichloromethane	nd	2.0	PPB (UG/L)
Bromoform	nd	10	PPB (UG/L)
Bromomethane	nd	10	PPB (UG/L)
Carbon Tetrachloride	nd	2.0	PPB (UG/L)
Chlorobenzene	nd	2.0	PPB (UG/L)
Chloroethane	nd	2.0	PPB (UG/L)
Chloroform	nd	2.0	PPB (UG/L)
Chloromethane	nd	2.0	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	10	PPB (UG/L)
Dibromochloromethane	nd	2.0	PPB (UG/L)
1,3-Dichlorobenzene	nd	2.0	PPB (UG/L)
1,2-Dichlorobenzene	nd	2.0	PPB (UG/L)
1,4-Dichlorobenzene	nd	2.0	PPB (UG/L)
Dichlorodifluoromethane	nd	2.0	PPB (UG/L)
1,1-Dichloroethane	3.1	2.0	PPB (UG/L)
1,2-Dichloroethane	nd	2.0	PPB (UG/L)
1,1-Dichloroethene	nd	2.0	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	2.0	PPB (UG/L)
1,2-Dichloropropane	nd	2.0	PPB (UG/L)
cis-1,3-Dichloropropene	nd	2.0	PPB (UG/L)
trans-1,3-Dichloropropene	nd	2.0	PPB (UG/L)
Ethylbenzene	620	5.0	PPB (UG/L)
Dichloromethane	nd	20	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	2.0	PPB (UG/L)
Tetrachloroethene (PCE)	nd	2.0	PPB (UG/L)
Toluene	1,600	5.0	PPB (UG/L)
1,1,1-Trichloroethane	nd	2.0	PPB (UG/L)
1,1,2-Trichloroethane	nd	2.0	PPB (UG/L)
Trichloroethene (TCE)	nd	2.0	PPB (UG/L)
Vinyl Chloride	nd	2.0	PPB (UG/L)
Xylenes (Total)	1,300	5.0	PPB (UG/L)
Trichlorofluoromethane	nd	2.0	PPB (UG/L)
MTBE	nd	25	PPB (UG/L)

BFB (Surrogate) Recovery = 111 %
BCM (Surrogate) Recovery = 85 %
Dilution Factor = 10

Results for sample: SB-2

Date collected: 5/16/94	Date received: 5/17/94
Date extracted: 5/17/94	Date analyzed: 5/17/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron Hobbs Sta 2	Heal #: 9405052-1
Project Manager: Bob Marley	Sampled by: C. Pigman
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	19	1.0	PPM (MG/L)

BFB (Surrogate) Recovery = 104 %

Dilution Factor = 10

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	3.3	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 108 %

Dilution Factor = 1

Results for sample: SB-2

Date collected: 5/16/94	Date received: 5/17/94
Date extracted: 5/19/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron Hobbs Sta 2	Heal #: 9405052-1
Project Manager: Bob Marley	Sampled by: C. Pigman
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	38	0.5	PPB (UG/L)
2-Methyl Naphthalene	23	0.5	PPB (UG/L)
1-Methyl Naphthalene	22	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	2.9	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 101 %

Dilution Factor = 1

Results for sample: SB-1

Date collected: 5/17/94	Date received: 5/17/94
Date extracted: NA	Date analyzed: 5/17/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron Hobbs Sta 2	Heal #: 9405052-2
Project Manager: Bob Marley	Sampled by: C. Pigman
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	200	5.0	PPB (UG/L)
Bromodichloromethane	nd	2.0	PPB (UG/L)
Bromoform	nd	10	PPB (UG/L)
Bromomethane	nd	10	PPB (UG/L)
Carbon Tetrachloride	nd	2.0	PPB (UG/L)
Chlorobenzene	nd	2.0	PPB (UG/L)
Chloroethane	nd	2.0	PPB (UG/L)
Chloroform	nd	2.0	PPB (UG/L)
Chloromethane	nd	2.0	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	10	PPB (UG/L)
Dibromochloromethane	nd	2.0	PPB (UG/L)
1,3-Dichlorobenzene	nd	2.0	PPB (UG/L)
1,2-Dichlorobenzene	nd	2.0	PPB (UG/L)
1,4-Dichlorobenzene	nd	2.0	PPB (UG/L)
Dichlorodifluoromethane	nd	2.0	PPB (UG/L)
1,1-Dichloroethane	nd	2.0	PPB (UG/L)
1,2-Dichloroethane	nd	2.0	PPB (UG/L)
1,1-Dichloroethene	nd	2.0	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	2.0	PPB (UG/L)
1,2-Dichloropropane	nd	2.0	PPB (UG/L)
cis-1,3-Dichloropropene	nd	2.0	PPB (UG/L)
trans-1,3-Dichloropropene	nd	2.0	PPB (UG/L)
Ethylbenzene	690	5.0	PPB (UG/L)
Dichloromethane	nd	20	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	2.0	PPB (UG/L)
Tetrachloroethene (PCE)	nd	2.0	PPB (UG/L)
Toluene	85	5.0	PPB (UG/L)
1,1,1-Trichloroethane	nd	2.0	PPB (UG/L)
1,1,2-Trichloroethane	nd	2.0	PPB (UG/L)
Trichloroethene (TCE)	nd	2.0	PPB (UG/L)
Vinyl Chloride	nd	2.0	PPB (UG/L)
Xylenes (Total)	1,500	5.0	PPB (UG/L)
Trichlorofluoromethane	nd	2.0	PPB (UG/L)
MTBE	nd	25	PPB (UG/L)

BFB (Surrogate) Recovery = 93 %
BCM (Surrogate) Recovery = 91 %
Dilution Factor = 10

Results for sample: SB-1

Date collected: 5/17/94	Date received: 5/17/94
Date extracted: 5/17/94	Date analyzed: 5/17/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron Hobbs Sta 2	Heal #: 9405052-2
Project Manager: Bob Marley	Sampled by: C. Pigman
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	15	1.0	PPM (MG/L)

BFB (Surrogate) Recovery = 107 %

Dilution Factor = 10

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	2.9	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 99 %

Dilution Factor = 1

Results for sample: SB-1

Date collected: 5/17/94	Date received: 5/17/94
Date extracted: 5/19/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron Hobbs Sta 2	Heal #: 9405052-2
Project Manager: Bob Marley	Sampled by: C. Pigman
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	69	0.5	PPB (UG/L)
2-Methyl Naphthalene	55	0.5	PPB (UG/L)
1-Methyl Naphthalene	55	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	5.4	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 148* %

Dilution Factor = 1

* Indicates matrix interference

Results for sample: SB-3

Date collected: 5/17/94	Date received: 5/17/94
Date extracted: NA	Date analyzed: 5/17/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron Hobbs Sta 2	Heal #: 9405052-3
Project Manager: Bob Marley	Sampled by: C. Pigman
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	1,600	0.5	PPB (UG/L)
Bromodichloromethane	nd	0.2	PPB (UG/L)
Bromoform	nd	1.0	PPB (UG/L)
Bromomethane	nd	1.0	PPB (UG/L)
Carbon Tetrachloride	nd	0.2	PPB (UG/L)
Chlorobenzene	nd	0.2	PPB (UG/L)
Chloroethane	nd	0.2	PPB (UG/L)
Chloroform	nd	0.2	PPB (UG/L)
Chloromethane	nd	0.2	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	1.0	PPB (UG/L)
Dibromochloromethane	nd	0.2	PPB (UG/L)
1,3-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,2-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,4-Dichlorobenzene	nd	0.2	PPB (UG/L)
Dichlorodifluoromethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethane	3.3	0.2	PPB (UG/L)
1,2-Dichloroethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethene	nd	0.2	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	0.2	PPB (UG/L)
1,2-Dichloropropane	nd	0.2	PPB (UG/L)
cis-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
trans-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
Ethylbenzene	490	0.5	PPB (UG/L)
Dichloromethane	nd	2.0	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	0.2	PPB (UG/L)
Tetrachloroethene (PCE)	0.9	0.2	PPB (UG/L)
Toluene	nd	0.5	PPB (UG/L)
1,1,1-Trichloroethane	nd	0.2	PPB (UG/L)
1,1,2-Trichloroethane	nd	0.2	PPB (UG/L)
Trichloroethene (TCE)	1.0	0.2	PPB (UG/L)
Vinyl Chloride	nd	0.2	PPB (UG/L)
Xylenes (Total)	29	0.5	PPB (UG/L)
Trichlorofluoromethane	nd	0.2	PPB (UG/L)
MTBE	nd	2.5	PPB (UG/L)

BFB (Surrogate) Recovery = 81 %
BCM (Surrogate) Recovery = 91 %
Dilution Factor = 1

Results for sample: SB-3

Date collected: 5/17/94	Date received: 5/17/94
Date extracted: 5/17/94	Date analyzed: 5/17/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron Hobbs Sta 2	Heal #: 9405052-3
Project Manager: Bob Marley	Sampled by: C. Pigman
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	4.5	0.5	PPM (MG/L)

BFB (Surrogate) Recovery = 95 %

Dilution Factor = 5

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	nd	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 116 %

Dilution Factor = 1

Results for sample: SB-3

Date collected: 5/17/94	Date received: 5/17/94
Date extracted: 5/19/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron Hobbs Sta 2	Heal #: 9405052-3
Project Manager: Bob Marley	Sampled by: C. Pigman
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	28	0.5	PPB (UG/L)
2-Methyl Naphthalene	18	0.5	PPB (UG/L)
1-Methyl Naphthalene	17	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	nd	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 77 %

Dilution Factor = 1

Results for sample: SB-4

Date collected: 5/18/94	Date received: 5/18/94
Date extracted: NA	Date analyzed: 5/18/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron Hobbs	Heal #: 9405056-1
Project Manager: Bob Marley	Sampled by: Marley/Pigman
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	350	2.5	PPB (UG/L)
Bromodichloromethane	nd	1.0	PPB (UG/L)
Bromoform	nd	5.0	PPB (UG/L)
Bromomethane	nd	5.0	PPB (UG/L)
Carbon Tetrachloride	nd	1.0	PPB (UG/L)
Chlorobenzene	nd	1.0	PPB (UG/L)
Chloroethane	nd	1.0	PPB (UG/L)
Chloroform	nd	1.0	PPB (UG/L)
Chloromethane	nd	1.0	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	5.0	PPB (UG/L)
Dibromochloromethane	nd	1.0	PPB (UG/L)
1,3-Dichlorobenzene	nd	1.0	PPB (UG/L)
1,2-Dichlorobenzene	nd	1.0	PPB (UG/L)
1,4-Dichlorobenzene	nd	1.0	PPB (UG/L)
Dichlorodifluoromethane	nd	1.0	PPB (UG/L)
1,1-Dichloroethane	nd	1.0	PPB (UG/L)
1,2-Dichloroethane	nd	1.0	PPB (UG/L)
1,1-Dichloroethene	nd	1.0	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	1.0	PPB (UG/L)
1,2-Dichloropropane	nd	1.0	PPB (UG/L)
cis-1,3-Dichloropropene	nd	1.0	PPB (UG/L)
trans-1,3-Dichloropropene	nd	1.0	PPB (UG/L)
Ethylbenzene	1,300	2.5	PPB (UG/L)
Dichloromethane	nd	10	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	1.0	PPB (UG/L)
Tetrachloroethene (PCE)	nd	1.0	PPB (UG/L)
Toluene	550	2.5	PPB (UG/L)
1,1,1-Trichloroethane	nd	1.0	PPB (UG/L)
1,1,2-Trichloroethane	nd	1.0	PPB (UG/L)
Trichloroethene (TCE)	nd	1.0	PPB (UG/L)
Vinyl Chloride	nd	1.0	PPB (UG/L)
Xylenes (Total)	1,500	2.5	PPB (UG/L)
Trichlorofluoromethane	nd	1.0	PPB (UG/L)
MTBE	nd	13	PPB (UG/L)

BFB (Surrogate) Recovery = 107 %
BCM (Surrogate) Recovery = 105 %
Dilution Factor = 5

Results for sample: SB-4

Date collected: 5/18/94	Date received: 5/18/94
Date extracted: 5/18/94	Date analyzed: 5/18,19/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron Hobbs	Heal #: 9405056-1
Project Manager: Bob Marley	Sampled by: Marley/Pigman
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	5.2	5.0	PPM (MG/L)

BFB (Surrogate) Recovery = 104 %

Dilution Factor = 50

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	nd	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 122 %

Dilution Factor = 1

Results for sample: SB-4

Date collected: 5/18/94	Date received: 5/18/94
Date extracted: 5/19/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron Hobbs	Heal #: 9405056-1
Project Manager: Bob Marley	Sampled by: Marley/Pigman
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	20	0.5	PPB (UG/L)
2-Methyl Naphthalene	15	0.5	PPB (UG/L)
1-Methyl Naphthalene	13	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	0.9	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 100 %

Dilution Factor = 1

Results for sample: SB-5

Date collected: 5/18/94	Date received: 5/18/94
Date extracted: NA	Date analyzed: 5/18/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron Hobbs	Heal #: 9405056-2
Project Manager: Bob Marley	Sampled by: Marley/Pigman
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	nd	0.5	PPB (UG/L)
Bromodichloromethane	nd	0.2	PPB (UG/L)
Bromoform	nd	1.0	PPB (UG/L)
Bromomethane	nd	1.0	PPB (UG/L)
Carbon Tetrachloride	nd	0.2	PPB (UG/L)
Chlorobenzene	nd	0.2	PPB (UG/L)
Chloroethane	nd	0.2	PPB (UG/L)
Chloroform	nd	0.2	PPB (UG/L)
Chloromethane	nd	0.2	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	1.0	PPB (UG/L)
Dibromochloromethane	nd	0.2	PPB (UG/L)
1,3-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,2-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,4-Dichlorobenzene	nd	0.2	PPB (UG/L)
Dichlorodifluoromethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethane	nd	0.2	PPB (UG/L)
1,2-Dichloroethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethene	nd	0.2	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	0.2	PPB (UG/L)
1,2-Dichloropropane	nd	0.2	PPB (UG/L)
cis-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
trans-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
Ethylbenzene	nd	0.5	PPB (UG/L)
Dichloromethane	nd	2.0	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	0.2	PPB (UG/L)
Tetrachloroethene (PCE)	nd	0.2	PPB (UG/L)
Toluene	nd	0.5	PPB (UG/L)
1,1,1-Trichloroethane	nd	0.2	PPB (UG/L)
1,1,2-Trichloroethane	nd	0.2	PPB (UG/L)
Trichloroethene (TCE)	nd	0.2	PPB (UG/L)
Vinyl Chloride	nd	0.2	PPB (UG/L)
Xylenes (Total)	nd	0.5	PPB (UG/L)
Trichlorofluoromethane	nd	0.2	PPB (UG/L)
MTBE	nd	2.5	PPB (UG/L)

BFB (Surrogate) Recovery = 81 %
BCM (Surrogate) Recovery = 86 %
Dilution Factor = 1

Results for sample: SB-5

Date collected: 5/18/94	Date received: 5/18/94
Date extracted: 5/18/94	Date analyzed: 5/18,19/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron Hobbs	Heal #: 9405056-2
Project Manager: Bob Marley	Sampled by: Marley/Pigman
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	nd	0.1	PPM (MG/L)

BFB (Surrogate) Recovery = 93 %

Dilution Factor = 1

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	nd	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 120 %

Dilution Factor = 1

Results for sample: SB-5

Date collected: 5/18/94	Date received: 5/18/94
Date extracted: 5/19/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron Hobbs	Heal #: 9405056-2
Project Manager: Bob Marley	Sampled by: Marley/Pigman
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	nd	0.5	PPB (UG/L)
2-Methyl Naphthalene	nd	0.5	PPB (UG/L)
1-Methyl Naphthalene	nd	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	nd	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 90 %

Dilution Factor = 1

Results for sample: Trip Blank

Date collected: NA	Date received: 5/18/94
Date extracted: NA	Date analyzed: 5/18/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron Hobbs	Heal #: 9405056-3
Project Manager: Bob Marley	
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	nd	0.5	PPB (UG/L)
Bromodichloromethane	nd	0.2	PPB (UG/L)
Bromoform	nd	1.0	PPB (UG/L)
Bromomethane	nd	1.0	PPB (UG/L)
Carbon Tetrachloride	nd	0.2	PPB (UG/L)
Chlorobenzene	nd	0.2	PPB (UG/L)
Chloroethane	nd	0.2	PPB (UG/L)
Chloroform	nd	0.2	PPB (UG/L)
Chloromethane	nd	0.2	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	1.0	PPB (UG/L)
Dibromochloromethane	nd	0.2	PPB (UG/L)
1,3-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,2-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,4-Dichlorobenzene	nd	0.2	PPB (UG/L)
Dichlorodifluoromethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethane	nd	0.2	PPB (UG/L)
1,2-Dichloroethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethene	nd	0.2	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	0.2	PPB (UG/L)
1,2-Dichloropropane	nd	0.2	PPB (UG/L)
cis-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
trans-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
Ethylbenzene	nd	0.5	PPB (UG/L)
Dichloromethane	nd	2.0	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	0.2	PPB (UG/L)
Tetrachloroethene (PCE)	nd	0.2	PPB (UG/L)
Toluene	nd	0.5	PPB (UG/L)
1,1,1-Trichloroethane	nd	0.2	PPB (UG/L)
1,1,2-Trichloroethane	nd	0.2	PPB (UG/L)
Trichloroethene (TCE)	nd	0.2	PPB (UG/L)
Vinyl Chloride	nd	0.2	PPB (UG/L)
Xylenes (Total)	nd	0.5	PPB (UG/L)
Trichlorofluoromethane	nd	0.2	PPB (UG/L)
MTBE	nd	2.5	PPB (UG/L)

BFB (Surrogate) Recovery = 84 %
BCM (Surrogate) Recovery = 104 %
Dilution Factor = 1

Results for sample: Trip Blank

Date collected: NA	Date received: 5/18/94
Date extracted: 5/18/94	Date analyzed: 5/18/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron Hobbs	Heal #: 9405056-3
Project Manager: Bob Marley	
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	nd	0.1	PPM (MG/L)

BFB (Surrogate) Recovery = 99 %

Dilution Factor = 1

Results for sample: EOTT-1

Date collected: 5/18/94	Date received: 5/18/94
Date extracted: NA	Date analyzed: 5/18/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405057-1
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	nd	0.5	PPB (UG/L)
Bromodichloromethane	nd	0.2	PPB (UG/L)
Bromoform	nd	1.0	PPB (UG/L)
Bromomethane	nd	1.0	PPB (UG/L)
Carbon Tetrachloride	nd	0.2	PPB (UG/L)
Chlorobenzene	nd	0.2	PPB (UG/L)
Chloroethane	nd	0.2	PPB (UG/L)
Chloroform	nd	0.2	PPB (UG/L)
Chloromethane	nd	0.2	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	1.0	PPB (UG/L)
Dibromochloromethane	nd	0.2	PPB (UG/L)
1,3-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,2-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,4-Dichlorobenzene	nd	0.2	PPB (UG/L)
Dichlorodifluoromethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethane	nd	0.2	PPB (UG/L)
1,2-Dichloroethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethene	nd	0.2	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	0.2	PPB (UG/L)
1,2-Dichloropropane	nd	0.2	PPB (UG/L)
cis-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
trans-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
Ethylbenzene	nd	0.5	PPB (UG/L)
Dichloromethane	nd	2.0	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	0.2	PPB (UG/L)
Tetrachloroethene (PCE)	nd	0.2	PPB (UG/L)
Toluene	nd	0.5	PPB (UG/L)
1,1,1-Trichloroethane	nd	0.2	PPB (UG/L)
1,1,2-Trichloroethane	nd	0.2	PPB (UG/L)
Trichloroethene (TCE)	nd	0.2	PPB (UG/L)
Vinyl Chloride	nd	0.2	PPB (UG/L)
Xylenes (Total)	nd	0.5	PPB (UG/L)
Trichlorofluoromethane	nd	0.2	PPB (UG/L)
MTBE	nd	2.5	PPB (UG/L)

BFB (Surrogate) Recovery = 83 %
BCM (Surrogate) Recovery = 94 %
Dilution Factor = 1

Results for sample: EOTT-1

Date collected: 5/18/94	Date received: 5/18/94
Date extracted: 5/18/94	Date analyzed: 5/18,19/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405057-1
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	nd	0.1	PPM (MG/L)

BFB (Surrogate) Recovery = 95 %

Dilution Factor = 1

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	nd	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 104 %

Dilution Factor = 1

Results for sample: EOTT-1

Date collected: 5/18/94	Date received: 5/18/94
Date extracted: 5/19/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405057-1
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	nd	0.5	PPB (UG/L)
2-Methyl Naphthalene	nd	0.5	PPB (UG/L)
1-Methyl Naphthalene	nd	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	nd	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 94 %

Dilution Factor = 1

Results for sample: SB-6

Date collected: 5/19/94	Date received: 5/19/94
Date extracted: NA	Date analyzed: 5/19/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405059-1
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	880	2.5	PPB (UG/L)
Bromodichloromethane	nd	1.0	PPB (UG/L)
Bromoform	nd	5.0	PPB (UG/L)
Bromomethane	nd	5.0	PPB (UG/L)
Carbon Tetrachloride	nd	1.0	PPB (UG/L)
Chlorobenzene	nd	1.0	PPB (UG/L)
Chloroethane	nd	1.0	PPB (UG/L)
Chloroform	nd	1.0	PPB (UG/L)
Chloromethane	nd	1.0	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	5.0	PPB (UG/L)
Dibromochloromethane	nd	1.0	PPB (UG/L)
1,3-Dichlorobenzene	nd	1.0	PPB (UG/L)
1,2-Dichlorobenzene	nd	1.0	PPB (UG/L)
1,4-Dichlorobenzene	nd	1.0	PPB (UG/L)
Dichlorodifluoromethane	nd	1.0	PPB (UG/L)
1,1-Dichloroethane	nd	1.0	PPB (UG/L)
1,2-Dichloroethane	nd	1.0	PPB (UG/L)
1,1-Dichloroethene	nd	1.0	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	1.0	PPB (UG/L)
1,2-Dichloropropane	nd	1.0	PPB (UG/L)
cis-1,3-Dichloropropene	nd	1.0	PPB (UG/L)
trans-1,3-Dichloropropene	nd	1.0	PPB (UG/L)
Ethylbenzene	230	2.5	PPB (UG/L)
Dichloromethane	nd	10	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	1.0	PPB (UG/L)
Tetrachloroethene (PCE)	nd	1.0	PPB (UG/L)
Toluene	6.4	2.5	PPB (UG/L)
1,1,1-Trichloroethane	nd	1.0	PPB (UG/L)
1,1,2-Trichloroethane	nd	1.0	PPB (UG/L)
Trichloroethene (TCE)	nd	1.0	PPB (UG/L)
Vinyl Chloride	nd	1.0	PPB (UG/L)
Xylenes (Total)	62	2.5	PPB (UG/L)
Trichlorofluoromethane	nd	1.0	PPB (UG/L)
MTBE	nd	13	PPB (UG/L)

BFB (Surrogate) Recovery = 97 %
BCM (Surrogate) Recovery = 110 %
Dilution Factor = 5

Results for sample: SB-6

Date collected: 5/19/94	Date received: 5/19/94
Date extracted: 5/19/94	Date analyzed: 5/19,20/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405059-1
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	2.8	1.0	PPM (MG/L)

BFB (Surrogate) Recovery = 136 %

Dilution Factor = 10

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	nd	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 92 %

Dilution Factor = 1

Results for sample: SB-6

Date collected: 5/19/94	Date received: 5/19/94
Date extracted: 5/24/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405059-1
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	30	0.5	PPB (UG/L)
2-Methyl Naphthalene	10	0.5	PPB (UG/L)
1-Methyl Naphthalene	9.7	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	0.9	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 91 %

Dilution Factor = 1

Results for sample: MW-2

Date collected: 5/19/94	Date received: 5/19/94
Date extracted: NA	Date analyzed: 5/19/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405059-2
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	nd	0.5	PPB (UG/L)
Bromodichloromethane	nd	0.2	PPB (UG/L)
Bromoform	nd	1.0	PPB (UG/L)
Bromomethane	nd	1.0	PPB (UG/L)
Carbon Tetrachloride	nd	0.2	PPB (UG/L)
Chlorobenzene	nd	0.2	PPB (UG/L)
Chloroethane	nd	0.2	PPB (UG/L)
Chloroform	nd	0.2	PPB (UG/L)
Chloromethane	nd	0.2	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	1.0	PPB (UG/L)
Dibromochloromethane	nd	0.2	PPB (UG/L)
1,3-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,2-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,4-Dichlorobenzene	nd	0.2	PPB (UG/L)
Dichlorodifluoromethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethane	nd	0.2	PPB (UG/L)
1,2-Dichloroethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethene	nd	0.2	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	0.2	PPB (UG/L)
1,2-Dichloropropane	nd	0.2	PPB (UG/L)
cis-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
trans-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
Ethylbenzene	nd	0.5	PPB (UG/L)
Dichloromethane	nd	2.0	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	0.2	PPB (UG/L)
Tetrachloroethene (PCE)	nd	0.2	PPB (UG/L)
Toluene	nd	0.5	PPB (UG/L)
1,1,1-Trichloroethane	nd	0.2	PPB (UG/L)
1,1,2-Trichloroethane	nd	0.2	PPB (UG/L)
Trichloroethene (TCE)	nd	0.2	PPB (UG/L)
Vinyl Chloride	nd	0.2	PPB (UG/L)
Xylenes (Total)	nd	0.5	PPB (UG/L)
Trichlorofluoromethane	nd	0.2	PPB (UG/L)
MTBE	nd	2.5	PPB (UG/L)

BFB (Surrogate) Recovery = 95 %
BCM (Surrogate) Recovery = 103 %
Dilution Factor = 1

Results for sample: MW-2

Date collected: 5/19/94	Date received: 5/19/94
Date extracted: 5/19/94	Date analyzed: 5/19,20/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405059-2
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	nd	0.1	PPM (MG/L)

BFB (Surrogate) Recovery = 102 %

Dilution Factor = 1

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	nd	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 90 %

Dilution Factor = 1

Results for sample: MW-2

Date collected: 5/19/94	Date received: 5/19/94
Date extracted: 5/24/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405059-2
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	nd	0.5	PPB (UG/L)
2-Methyl Naphthalene	nd	0.5	PPB (UG/L)
1-Methyl Naphthalene	nd	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	nd	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 89 %

Dilution Factor = 1

Results for sample: EOTT-2

Date collected: 5/19/94	Date received: 5/19/94
Date extracted: NA	Date analyzed: 5/19/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405061-1
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	nd	0.5	PPB (UG/L)
Bromodichloromethane	nd	0.2	PPB (UG/L)
Bromoform	nd	1.0	PPB (UG/L)
Bromomethane	nd	1.0	PPB (UG/L)
Carbon Tetrachloride	nd	0.2	PPB (UG/L)
Chlorobenzene	nd	0.2	PPB (UG/L)
Chloroethane	nd	0.2	PPB (UG/L)
Chloroform	nd	0.2	PPB (UG/L)
Chloromethane	nd	0.2	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	1.0	PPB (UG/L)
Dibromochloromethane	nd	0.2	PPB (UG/L)
1,3-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,2-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,4-Dichlorobenzene	nd	0.2	PPB (UG/L)
Dichlorodifluoromethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethane	nd	0.2	PPB (UG/L)
1,2-Dichloroethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethene	nd	0.2	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	0.2	PPB (UG/L)
1,2-Dichloropropane	nd	0.2	PPB (UG/L)
cis-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
trans-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
Ethylbenzene	nd	0.5	PPB (UG/L)
Dichloromethane	nd	2.0	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	0.2	PPB (UG/L)
Tetrachloroethene (PCE)	0.8	0.2	PPB (UG/L)
Toluene	nd	0.5	PPB (UG/L)
1,1,1-Trichloroethane	nd	0.2	PPB (UG/L)
1,1,2-Trichloroethane	nd	0.2	PPB (UG/L)
Trichloroethene (TCE)	nd	0.2	PPB (UG/L)
Vinyl Chloride	nd	0.2	PPB (UG/L)
Xylenes (Total)	5.2	0.5	PPB (UG/L)
Trichlorofluoromethane	nd	0.2	PPB (UG/L)
MTBE	nd	2.5	PPB (UG/L)

BFB (Surrogate) Recovery = 85 %
BCM (Surrogate) Recovery = 114 %
Dilution Factor = 1

Results for sample: EOTT-2

Date collected: 5/19/94	Date received: 5/19/94
Date extracted: 5/19/94	Date analyzed: 5/20/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405061-1
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	0.2	0.1	PPM (MG/L)

BFB (Surrogate) Recovery = 114 %

Dilution Factor = 1

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	nd	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 110 %

Dilution Factor = 1

Results for sample: EOTT-2

Date collected: 5/19/94	Date received: 5/19/94
Date extracted: 5/24/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405061-1
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	nd	0.5	PPB (UG/L)
2-Methyl Naphthalene	nd	0.5	PPB (UG/L)
1-Methyl Naphthalene	nd	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	nd	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 77 %

Dilution Factor = 1

Results for sample: EOTT-3

Date collected: 5/20/94	Date received: 5/20/94
Date extracted: NA	Date analyzed: 5/20/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405067-1
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	2,200	0.5	PPB (UG/L)
Bromodichloromethane	nd	0.2	PPB (UG/L)
Bromoform	nd	1.0	PPB (UG/L)
Bromomethane	nd	1.0	PPB (UG/L)
Carbon Tetrachloride	nd	0.2	PPB (UG/L)
Chlorobenzene	nd	0.2	PPB (UG/L)
Chloroethane	nd	0.2	PPB (UG/L)
Chloroform	nd	0.2	PPB (UG/L)
Chloromethane	nd	0.2	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	1.0	PPB (UG/L)
Dibromochloromethane	nd	0.2	PPB (UG/L)
1,3-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,2-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,4-Dichlorobenzene	nd	0.2	PPB (UG/L)
Dichlorodifluoromethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethane	nd	0.2	PPB (UG/L)
1,2-Dichloroethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethene	nd	0.2	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	0.2	PPB (UG/L)
1,2-Dichloropropane	nd	0.2	PPB (UG/L)
cis-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
trans-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
Ethylbenzene	680	0.5	PPB (UG/L)
Dichloromethane	nd	2.0	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	0.2	PPB (UG/L)
Tetrachloroethene (PCE)	nd	0.2	PPB (UG/L)
Toluene	12	0.5	PPB (UG/L)
1,1,1-Trichloroethane	nd	0.2	PPB (UG/L)
1,1,2-Trichloroethane	nd	0.2	PPB (UG/L)
Trichloroethene (TCE)	nd	0.2	PPB (UG/L)
Vinyl Chloride	nd	0.2	PPB (UG/L)
Xylenes (Total)	240	0.5	PPB (UG/L)
Trichlorofluoromethane	nd	0.2	PPB (UG/L)
MTBE	nd	2.5	PPB (UG/L)

BFB (Surrogate) Recovery = 76 %
BCM (Surrogate) Recovery = 104 %
Dilution Factor = 1

Results for sample: EOTT-3

Date collected: 5/20/94	Date received: 5/20/94
Date extracted: 5/20/94	Date analyzed: 5/20,21/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405067-1
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	8.4	5.0	PPM (MG/L)

BFB (Surrogate) Recovery = 100 %

Dilution Factor = 50

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	nd	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 99 %

Dilution Factor = 1

Results for sample: EOTT-3

Date collected: 5/20/94	Date received: 5/20/94
Date extracted: 5/24/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405067-1
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	nd	0.5	PPB (UG/L)
2-Methyl Naphthalene	nd	0.5	PPB (UG/L)
1-Methyl Naphthalene	2.1	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	nd	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 98 %

Dilution Factor = 1

Results for sample: EOTT-4

Date collected: 5/20/94	Date received: 5/20/94
Date extracted: NA	Date analyzed: 5/20/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405067-2
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	nd	0.5	PPB (UG/L)
Bromodichloromethane	nd	0.2	PPB (UG/L)
Bromoform	nd	1.0	PPB (UG/L)
Bromomethane	nd	1.0	PPB (UG/L)
Carbon Tetrachloride	nd	0.2	PPB (UG/L)
Chlorobenzene	nd	0.2	PPB (UG/L)
Chloroethane	nd	0.2	PPB (UG/L)
Chloroform	nd	0.2	PPB (UG/L)
Chloromethane	nd	0.2	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	1.0	PPB (UG/L)
Dibromochloromethane	nd	0.2	PPB (UG/L)
1,3-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,2-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,4-Dichlorobenzene	nd	0.2	PPB (UG/L)
Dichlorodifluoromethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethane	nd	0.2	PPB (UG/L)
1,2-Dichloroethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethene	nd	0.2	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	0.2	PPB (UG/L)
1,2-Dichloropropane	nd	0.2	PPB (UG/L)
cis-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
trans-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
Ethylbenzene	nd	0.5	PPB (UG/L)
Dichloromethane	nd	2.0	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	0.2	PPB (UG/L)
Tetrachloroethene (PCE)	nd	0.2	PPB (UG/L)
Toluene	nd	0.5	PPB (UG/L)
1,1,1-Trichloroethane	nd	0.2	PPB (UG/L)
1,1,2-Trichloroethane	nd	0.2	PPB (UG/L)
Trichloroethene (TCE)	nd	0.2	PPB (UG/L)
Vinyl Chloride	nd	0.2	PPB (UG/L)
Xylenes (Total)	nd	0.5	PPB (UG/L)
Trichlorofluoromethane	nd	0.2	PPB (UG/L)
MTBE	nd	2.5	PPB (UG/L)

BFB (Surrogate) Recovery = 79 %
BCM (Surrogate) Recovery = 112 %
Dilution Factor = 1

Results for sample: EOTT-4

Date collected: 5/20/94	Date received: 5/20/94
Date extracted: 5/20/94	Date analyzed: 5/20,21/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405067-2
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	nd	0.1	PPM (MG/L)

BFB (Surrogate) Recovery = 97 %

Dilution Factor = 1

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	nd	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 104 %

Dilution Factor = 1

Results for sample: EOTT-4

Date collected: 5/20/94	Date received: 5/20/94
Date extracted: 5/24/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405067-2
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	nd	0.5	PPB (UG/L)
2-Methyl Naphthalene	nd	0.5	PPB (UG/L)
1-Methyl Naphthalene	nd	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	nd	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 88 %

Dilution Factor = 1

Results for sample: EOTT-5

Date collected: 5/20/94	Date received: 5/20/94
Date extracted: NA	Date analyzed: 5/20/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405068-1
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	4,800	5.0	PPB (UG/L)
Bromodichloromethane	nd	2.0	PPB (UG/L)
Bromoform	nd	10	PPB (UG/L)
Bromomethane	nd	10	PPB (UG/L)
Carbon Tetrachloride	nd	2.0	PPB (UG/L)
Chlorobenzene	nd	2.0	PPB (UG/L)
Chloroethane	nd	2.0	PPB (UG/L)
Chloroform	nd	2.0	PPB (UG/L)
Chloromethane	nd	2.0	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	10	PPB (UG/L)
Dibromochloromethane	nd	2.0	PPB (UG/L)
1,3-Dichlorobenzene	nd	2.0	PPB (UG/L)
1,2-Dichlorobenzene	nd	2.0	PPB (UG/L)
1,4-Dichlorobenzene	nd	2.0	PPB (UG/L)
Dichlorodifluoromethane	nd	2.0	PPB (UG/L)
1,1-Dichloroethane	nd	2.0	PPB (UG/L)
1,2-Dichloroethane	nd	2.0	PPB (UG/L)
1,1-Dichloroethene	nd	2.0	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	2.0	PPB (UG/L)
1,2-Dichloropropane	nd	2.0	PPB (UG/L)
cis-1,3-Dichloropropene	nd	2.0	PPB (UG/L)
trans-1,3-Dichloropropene	nd	2.0	PPB (UG/L)
Ethylbenzene	1,400	5.0	PPB (UG/L)
Dichloromethane	nd	20	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	2.0	PPB (UG/L)
Tetrachloroethene (PCE)	nd	2.0	PPB (UG/L)
Toluene	6,700	5.0	PPB (UG/L)
1,1,1-Trichloroethane	nd	2.0	PPB (UG/L)
1,1,2-Trichloroethane	nd	2.0	PPB (UG/L)
Trichloroethene (TCE)	nd	2.0	PPB (UG/L)
Vinyl Chloride	nd	2.0	PPB (UG/L)
Xylenes (Total)	1,800	5.0	PPB (UG/L)
Trichlorofluoromethane	nd	2.0	PPB (UG/L)
MTBE	nd	25	PPB (UG/L)

BFB (Surrogate) Recovery = 78 %
BCM (Surrogate) Recovery = 98 %
Dilution Factor = 10

Results for sample: EOTT-5

Date collected: 5/20/94	Date received: 5/20/94
Date extracted: 5/20/94	Date analyzed: 5/21/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405068-1
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	44	5.0	PPM (MG/L)

BFB (Surrogate) Recovery = 119 %

Dilution Factor = 50

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	nd	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 110 %

Dilution Factor = 1

Results for sample: EOTT-5

Date collected: 5/20/94	Date received: 5/20/94
Date extracted: 5/24/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405068-1
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	33	0.5	PPB (UG/L)
2-Methyl Naphthalene	7.5	0.5	PPB (UG/L)
1-Methyl Naphthalene	11	0.5	PPB (UG/L)
Acenaphthalene	3.0	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	nd	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 88 %

Dilution Factor = 1

Results for sample: EOTT-6

Date collected: 5/21/94	Date received: 5/21/94
Date extracted: NA	Date analyzed: 5/21/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405069-1
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	nd	0.5	PPB (UG/L)
Bromodichloromethane	nd	0.2	PPB (UG/L)
Bromoform	nd	1.0	PPB (UG/L)
Bromomethane	nd	1.0	PPB (UG/L)
Carbon Tetrachloride	nd	0.2	PPB (UG/L)
Chlorobenzene	nd	0.2	PPB (UG/L)
Chloroethane	nd	0.2	PPB (UG/L)
Chloroform	nd	0.2	PPB (UG/L)
Chloromethane	nd	0.2	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	1.0	PPB (UG/L)
Dibromochloromethane	nd	0.2	PPB (UG/L)
1,3-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,2-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,4-Dichlorobenzene	nd	0.2	PPB (UG/L)
Dichlorodifluoromethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethane	nd	0.2	PPB (UG/L)
1,2-Dichloroethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethene	nd	0.2	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	0.2	PPB (UG/L)
1,2-Dichloropropane	nd	0.2	PPB (UG/L)
cis-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
trans-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
Ethylbenzene	nd	0.5	PPB (UG/L)
Dichloromethane	nd	2.0	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	0.2	PPB (UG/L)
Tetrachloroethene (PCE)	nd	0.2	PPB (UG/L)
Toluene	nd	0.5	PPB (UG/L)
1,1,1-Trichloroethane	nd	0.2	PPB (UG/L)
1,1,2-Trichloroethane	nd	0.2	PPB (UG/L)
Trichloroethene (TCE)	nd	0.2	PPB (UG/L)
Vinyl Chloride	nd	0.2	PPB (UG/L)
Xylenes (Total)	nd	0.5	PPB (UG/L)
Trichlorofluoromethane	nd	0.2	PPB (UG/L)
MTBE	nd	2.5	PPB (UG/L)

BFB (Surrogate) Recovery = 84 %
BCM (Surrogate) Recovery = 83 %
Dilution Factor = 1

Results for sample: EOTT-6

Date collected: 5/21/94	Date received: 5/21/94
Date extracted: 5/21/94	Date analyzed: 5/21/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405069-1
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	nd	0.1	PPM (MG/L)

BFB (Surrogate) Recovery = 94 %

Dilution Factor = 1

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	nd	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 101 %

Dilution Factor = 1

Results for sample: EOTT-6

Date collected: 5/21/94	Date received: 5/21/94
Date extracted: 5/24/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405069-1
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	nd	0.5	PPB (UG/L)
2-Methyl Naphthalene	nd	0.5	PPB (UG/L)
1-Methyl Naphthalene	nd	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	nd	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 96 %

Dilution Factor = 1

Results for sample: EOTT-7

Date collected: 5/21/94	Date received: 5/21/94
Date extracted: NA	Date analyzed: 5/21/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405069-2
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	1,500	2.5	PPB (UG/L)
Bromodichloromethane	nd	1.0	PPB (UG/L)
Bromoform	nd	5.0	PPB (UG/L)
Bromomethane	nd	5.0	PPB (UG/L)
Carbon Tetrachloride	nd	1.0	PPB (UG/L)
Chlorobenzene	nd	1.0	PPB (UG/L)
Chloroethane	nd	1.0	PPB (UG/L)
Chloroform	nd	1.0	PPB (UG/L)
Chloromethane	nd	1.0	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	5.0	PPB (UG/L)
Dibromochloromethane	nd	1.0	PPB (UG/L)
1,3-Dichlorobenzene	nd	1.0	PPB (UG/L)
1,2-Dichlorobenzene	nd	1.0	PPB (UG/L)
1,4-Dichlorobenzene	nd	1.0	PPB (UG/L)
Dichlorodifluoromethane	nd	1.0	PPB (UG/L)
1,1-Dichloroethane	nd	1.0	PPB (UG/L)
1,2-Dichloroethane	nd	1.0	PPB (UG/L)
1,1-Dichloroethene	nd	1.0	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	1.0	PPB (UG/L)
1,2-Dichloropropane	nd	1.0	PPB (UG/L)
cis-1,3-Dichloropropene	nd	1.0	PPB (UG/L)
trans-1,3-Dichloropropene	nd	1.0	PPB (UG/L)
Ethylbenzene	nd	2.5	PPB (UG/L)
Dichloromethane	nd	10	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	1.0	PPB (UG/L)
Tetrachloroethene (PCE)	nd	1.0	PPB (UG/L)
Toluene	2.7	2.5	PPB (UG/L)
1,1,1-Trichloroethane	nd	1.0	PPB (UG/L)
1,1,2-Trichloroethane	nd	1.0	PPB (UG/L)
Trichloroethene (TCE)	nd	1.0	PPB (UG/L)
Vinyl Chloride	nd	1.0	PPB (UG/L)
Xylenes (Total)	55	2.5	PPB (UG/L)
Trichlorofluoromethane	nd	1.0	PPB (UG/L)
MTBE	nd	13	PPB (UG/L)

BFB (Surrogate) Recovery = 82 %
BCM (Surrogate) Recovery = 72 %
Dilution Factor = 5

Results for sample: EOTT-7

Date collected: 5/21/94	Date received: 5/21/94
Date extracted: 5/21/94	Date analyzed: 5/21/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405069-2
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	6.0	1.0	PPM (MG/L)

BFB (Surrogate) Recovery = 104 %

Dilution Factor = 10

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	nd	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 100 %

Dilution Factor = 1

Results for sample: EOTT-7

Date collected: 5/21/94	Date received: 5/21/94
Date extracted: 5/24/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405069-2
Project Manager: Bob Marley	Sampled by: B. Marley
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	nd	0.5	PPB (UG/L)
2-Methyl Naphthalene	nd	0.5	PPB (UG/L)
1-Methyl Naphthalene	nd	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	nd	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 90 %

Dilution Factor = 1

Results for sample: Trip Blank

Date collected: NA	Date received: 5/21/94
Date extracted: NA	Date analyzed: 5/21/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405069-3
Project Manager: Bob Marley	
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	nd	0.5	PPB (UG/L)
Bromodichloromethane	nd	0.2	PPB (UG/L)
Bromoform	nd	1.0	PPB (UG/L)
Bromomethane	nd	1.0	PPB (UG/L)
Carbon Tetrachloride	nd	0.2	PPB (UG/L)
Chlorobenzene	nd	0.2	PPB (UG/L)
Chloroethane	nd	0.2	PPB (UG/L)
Chloroform	nd	0.2	PPB (UG/L)
Chloromethane	nd	0.2	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	1.0	PPB (UG/L)
Dibromochloromethane	nd	0.2	PPB (UG/L)
1,3-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,2-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,4-Dichlorobenzene	nd	0.2	PPB (UG/L)
Dichlorodifluoromethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethane	nd	0.2	PPB (UG/L)
1,2-Dichloroethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethene	nd	0.2	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	0.2	PPB (UG/L)
1,2-Dichloropropane	nd	0.2	PPB (UG/L)
cis-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
trans-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
Ethylbenzene	nd	0.5	PPB (UG/L)
Dichloromethane	nd	2.0	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	0.2	PPB (UG/L)
Tetrachloroethene (PCE)	nd	0.2	PPB (UG/L)
Toluene	nd	0.5	PPB (UG/L)
1,1,1-Trichloroethane	nd	0.2	PPB (UG/L)
1,1,2-Trichloroethane	nd	0.2	PPB (UG/L)
Trichloroethene (TCE)	nd	0.2	PPB (UG/L)
Vinyl Chloride	nd	0.2	PPB (UG/L)
Xylenes (Total)	nd	0.5	PPB (UG/L)
Trichlorofluoromethane	nd	0.2	PPB (UG/L)
MTBE	nd	2.5	PPB (UG/L)

BFB (Surrogate) Recovery = 81 %
BCM (Surrogate) Recovery = 94 %
Dilution Factor = 1

Results for sample: Trip Blank

Date collected: NA	Date received: 5/23/94
Date extracted: NA	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405072-1
Project Manager: Bob Marley	
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	nd	0.5	PPB (UG/L)
Bromodichloromethane	nd	0.2	PPB (UG/L)
Bromoform	nd	1.0	PPB (UG/L)
Bromomethane	nd	1.0	PPB (UG/L)
Carbon Tetrachloride	nd	0.2	PPB (UG/L)
Chlorobenzene	nd	0.2	PPB (UG/L)
Chloroethane	nd	0.2	PPB (UG/L)
Chloroform	nd	0.2	PPB (UG/L)
Chloromethane	nd	0.2	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	1.0	PPB (UG/L)
Dibromochloromethane	nd	0.2	PPB (UG/L)
1,3-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,2-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,4-Dichlorobenzene	nd	0.2	PPB (UG/L)
Dichlorodifluoromethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethane	nd	0.2	PPB (UG/L)
1,2-Dichloroethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethene	nd	0.2	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	0.2	PPB (UG/L)
1,2-Dichloropropane	nd	0.2	PPB (UG/L)
cis-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
trans-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
Ethylbenzene	nd	0.5	PPB (UG/L)
Dichloromethane	nd	2.0	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	0.2	PPB (UG/L)
Tetrachloroethene (PCE)	nd	0.2	PPB (UG/L)
Toluene	nd	0.5	PPB (UG/L)
1,1,1-Trichloroethane	nd	0.2	PPB (UG/L)
1,1,2-Trichloroethane	nd	0.2	PPB (UG/L)
Trichloroethene (TCE)	nd	0.2	PPB (UG/L)
Vinyl Chloride	nd	0.2	PPB (UG/L)
Xylenes (Total)	nd	0.5	PPB (UG/L)
Trichlorofluoromethane	nd	0.2	PPB (UG/L)
MTBE	nd	2.5	PPB (UG/L)

BFB (Surrogate) Recovery = 92 %
BCM (Surrogate) Recovery = 103 %
Dilution Factor = 1

Results for sample: MW-1

Date collected: 5/22/94	Date received: 5/23/94
Date extracted: NA	Date analyzed: 5/27/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405072-2
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	1,500	10	PPB (UG/L)
Bromodichloromethane	nd	4.0	PPB (UG/L)
Bromoform	nd	20	PPB (UG/L)
Bromomethane	nd	20	PPB (UG/L)
Carbon Tetrachloride	nd	4.0	PPB (UG/L)
Chlorobenzene	nd	4.0	PPB (UG/L)
Chloroethane	nd	4.0	PPB (UG/L)
Chloroform	nd	4.0	PPB (UG/L)
Chloromethane	nd	4.0	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	20	PPB (UG/L)
Dibromochloromethane	nd	4.0	PPB (UG/L)
1,3-Dichlorobenzene	nd	4.0	PPB (UG/L)
1,2-Dichlorobenzene	nd	4.0	PPB (UG/L)
1,4-Dichlorobenzene	nd	4.0	PPB (UG/L)
Dichlorodifluoromethane	nd	4.0	PPB (UG/L)
1,1-Dichloroethane	nd	4.0	PPB (UG/L)
1,2-Dichloroethane	nd	4.0	PPB (UG/L)
1,1-Dichloroethene	nd	4.0	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	4.0	PPB (UG/L)
1,2-Dichloropropane	nd	4.0	PPB (UG/L)
cis-1,3-Dichloropropene	nd	4.0	PPB (UG/L)
trans-1,3-Dichloropropene	nd	4.0	PPB (UG/L)
Ethylbenzene	1,000	10	PPB (UG/L)
Dichloromethane	nd	20	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	4.0	PPB (UG/L)
Tetrachloroethene (PCE)	nd	4.0	PPB (UG/L)
Toluene	410	10	PPB (UG/L)
1,1,1-Trichloroethane	nd	4.0	PPB (UG/L)
1,1,2-Trichloroethane	nd	4.0	PPB (UG/L)
Trichloroethene (TCE)	nd	4.0	PPB (UG/L)
Vinyl Chloride	nd	4.0	PPB (UG/L)
Xylenes (Total)	1,800	10	PPB (UG/L)
Trichlorofluoromethane	nd	4.0	PPB (UG/L)
MTBE	nd	50	PPB (UG/L)

BFB (Surrogate) Recovery = 105 %
BCM (Surrogate) Recovery = 97 %
Dilution Factor = 20

Results for sample: MW-1

Date collected: 5/22/94	Date received: 5/23/94
Date extracted: 5/23/94	Date analyzed: 5/25,31/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405072-2
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	23	5.0	PPM (MG/L)

BFB (Surrogate) Recovery = 109 %

Dilution Factor = 50

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	69	20	PPM (MG/L)

DNOP (Surrogate) Recovery = 99 %

Dilution Factor = 20

Results for sample: MW-1

Date collected: 5/22/94	Date received: 5/23/94
Date extracted: 5/26/94	Date analyzed: 5/27/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405072-2
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	99	50	PPB (UG/L)
2-Methyl Naphthalene	240	50	PPB (UG/L)
1-Methyl Naphthalene	250	50	PPB (UG/L)
Acenaphthalene	nd	50	PPB (UG/L)
Acenaphthene	nd	50	PPB (UG/L)
Fluorene	nd	50	PPB (UG/L)
Phenanthrene	nd	50	PPB (UG/L)
Anthracene	nd	50	PPB (UG/L)
Fluoranthrene	nd	50	PPB (UG/L)
Pyrene	nd	50	PPB (UG/L)
Benzo (a) anthracene	nd	50	PPB (UG/L)
Chrysene	nd	50	PPB (UG/L)
Benzo (b) fluoranthene	nd	50	PPB (UG/L)
Benzo (k) fluoranthene	nd	50	PPB (UG/L)
Benzo (a) pyrene	nd	50	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	100	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	100	PPB (UG/L)
Benzo (g,h,i) perylene	nd	100	PPB (UG/L)

Hexadecane (Surrogate) Recovery = ** %

Dilution Factor = 100

** Surrogate non-recoverable due to sample dilution

Results for sample: EOTT-8

Date collected: 5/22/94	Date received: 5/23/94
Date extracted: NA	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405073-1
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	nd	0.5	PPB (UG/L)
Bromodichloromethane	nd	0.2	PPB (UG/L)
Bromoform	nd	1.0	PPB (UG/L)
Bromomethane	nd	1.0	PPB (UG/L)
Carbon Tetrachloride	nd	0.2	PPB (UG/L)
Chlorobenzene	nd	0.2	PPB (UG/L)
Chloroethane	nd	0.2	PPB (UG/L)
Chloroform	nd	0.2	PPB (UG/L)
Chloromethane	nd	0.2	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	1.0	PPB (UG/L)
Dibromochloromethane	nd	0.2	PPB (UG/L)
1,3-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,2-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,4-Dichlorobenzene	nd	0.2	PPB (UG/L)
Dichlorodifluoromethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethane	nd	0.2	PPB (UG/L)
1,2-Dichloroethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethene	nd	0.2	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	0.2	PPB (UG/L)
1,2-Dichloropropane	nd	0.2	PPB (UG/L)
cis-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
trans-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
Ethylbenzene	nd	0.5	PPB (UG/L)
Dichloromethane	nd	2.0	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	0.2	PPB (UG/L)
Tetrachloroethene (PCE)	nd	0.2	PPB (UG/L)
Toluene	nd	0.5	PPB (UG/L)
1,1,1-Trichloroethane	nd	0.2	PPB (UG/L)
1,1,2-Trichloroethane	nd	0.2	PPB (UG/L)
Trichloroethene (TCE)	nd	0.2	PPB (UG/L)
Vinyl Chloride	nd	0.2	PPB (UG/L)
Xylenes (Total)	nd	0.5	PPB (UG/L)
Trichlorofluoromethane	nd	0.2	PPB (UG/L)
MTBE	nd	2.5	PPB (UG/L)

BFB (Surrogate) Recovery = 96 %
BCM (Surrogate) Recovery = 90 %
Dilution Factor = 1

Results for sample: EOTT-8

Date collected: 5/22/94	Date received: 5/23/94
Date extracted: 5/23/94	Date analyzed: 5/24,31/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405073-1
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	nd	0.1	PPM (MG/L)

BFB (Surrogate) Recovery = 100 %

Dilution Factor = 1

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	nd	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 90 %

Dilution Factor = 1

Results for sample: EOTT-8

Date collected: 5/22/94	Date received: 5/23/94
Date extracted: 5/24/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405073-1
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	nd	0.5	PPB (UG/L)
2-Methyl Naphthalene	nd	0.5	PPB (UG/L)
1-Methyl Naphthalene	nd	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	nd	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 86 %

Dilution Factor = 1

Results for sample: EOTT Tanks Decon

Date collected: 5/22/94	Date received: 5/23/94
Date extracted: NA	Date analyzed: 5/26,31/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405073-2
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8020

Compound	Result	Detection Limit	Units
Benzene	nd	2.5	PPB (UG/L)
Toluene	nd	2.5	PPB (UG/L)
Ethylbenzene	nd	2.5	PPB (UG/L)
Total Xylenes	nd	2.5	PPB (UG/L)

BFB (Surrogate) Recovery = 93 %

Dilution Factor = 5

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	nd	0.5	PPM (MG/L)

BFB (Surrogate) Recovery = 90 %

Dilution Factor = 5

Results for sample: EOTT Tanks Decon

Date collected: 5/22/94	Date received: 5/23/94
Date extracted: 5/24/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405073-2
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	nd	0.5	PPB (UG/L)
2-Methyl Naphthalene	nd	0.5	PPB (UG/L)
1-Methyl Naphthalene	nd	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	nd	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 87 %

Dilution Factor = 1

Results for sample: Replicate

Date collected: NA	Date received: 5/23/94
Date extracted: NA	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405073-3
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	nd	0.5	PPB (UG/L)
Bromodichloromethane	nd	0.2	PPB (UG/L)
Bromoform	nd	1.0	PPB (UG/L)
Bromomethane	nd	1.0	PPB (UG/L)
Carbon Tetrachloride	nd	0.2	PPB (UG/L)
Chlorobenzene	nd	0.2	PPB (UG/L)
Chloroethane	nd	0.2	PPB (UG/L)
Chloroform	nd	0.2	PPB (UG/L)
Chloromethane	nd	0.2	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	1.0	PPB (UG/L)
Dibromochloromethane	nd	0.2	PPB (UG/L)
1,3-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,2-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,4-Dichlorobenzene	nd	0.2	PPB (UG/L)
Dichlorodifluoromethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethane	nd	0.2	PPB (UG/L)
1,2-Dichloroethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethene	nd	0.2	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	0.2	PPB (UG/L)
1,2-Dichloropropane	nd	0.2	PPB (UG/L)
cis-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
trans-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
Ethylbenzene	nd	0.5	PPB (UG/L)
Dichloromethane	nd	2.0	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	0.2	PPB (UG/L)
Tetrachloroethene (PCE)	nd	0.2	PPB (UG/L)
Toluene	nd	0.5	PPB (UG/L)
1,1,1-Trichloroethane	nd	0.2	PPB (UG/L)
1,1,2-Trichloroethane	nd	0.2	PPB (UG/L)
Trichloroethene (TCE)	nd	0.2	PPB (UG/L)
Vinyl Chloride	nd	0.2	PPB (UG/L)
Xylenes (Total)	nd	0.5	PPB (UG/L)
Trichlorofluoromethane	nd	0.2	PPB (UG/L)
MTBE	nd	2.5	PPB (UG/L)

BFB (Surrogate) Recovery = 91 %
BCM (Surrogate) Recovery = 95 %
Dilution Factor = 1

Results for sample: Replicate

Date collected: NA	Date received: 5/23/94
Date extracted: 5/23/94	Date analyzed: 5/24,31/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405073-3
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	nd	0.1	PPM (MG/L)

BFB (Surrogate) Recovery = 95 %

Dilution Factor = 1

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	nd	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 102 %

Dilution Factor = 1

Results for sample: Replicate

Date collected: NA	Date received: 5/23/94
Date extracted: 5/24/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405073-3
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	nd	0.5	PPB (UG/L)
2-Methyl Naphthalene	nd	0.5	PPB (UG/L)
1-Methyl Naphthalene	nd	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	nd	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 101 %

Dilution Factor = 1

Results for sample: Equipment Blank

Date collected: 5/22/94	Date received: 5/23/94
Date extracted: NA	Date analyzed: 5/26,31/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405073-4
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8020

Compound	Result	Detection Limit	Units
Benzene	nd	0.5	PPB (UG/L)
Toluene	nd	0.5	PPB (UG/L)
Ethylbenzene	nd	0.5	PPB (UG/L)
Total Xylenes	nd	0.5	PPB (UG/L)

BFB (Surrogate) Recovery = 87 %

Dilution Factor = 1

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	nd	0.1	PPM (MG/L)

BFB (Surrogate) Recovery = 92 %

Dilution Factor = 1

Results for sample: Equipment Blank

Date collected: 5/22/94	Date received: 5/23/94
Date extracted: 5/24/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405073-4
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	nd	0.5	PPB (UG/L)
2-Methyl Naphthalene	nd	0.5	PPB (UG/L)
1-Methyl Naphthalene	nd	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	nd	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 76 %

Dilution Factor = 1

Results for sample: MW-9

Date collected: 5/22/94	Date received: 5/23/94
Date extracted: NA	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405073-5
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8010/8020

Analyte:	Result	Detection Limit	Units
Benzene	nd	0.5	PPB (UG/L)
Bromodichloromethane	nd	0.2	PPB (UG/L)
Bromoform	nd	1.0	PPB (UG/L)
Bromomethane	nd	1.0	PPB (UG/L)
Carbon Tetrachloride	nd	0.2	PPB (UG/L)
Chlorobenzene	nd	0.2	PPB (UG/L)
Chloroethane	nd	0.2	PPB (UG/L)
Chloroform	nd	0.2	PPB (UG/L)
Chloromethane	nd	0.2	PPB (UG/L)
2-Chloroethylvinyl Ether	nd	1.0	PPB (UG/L)
Dibromochloromethane	nd	0.2	PPB (UG/L)
1,3-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,2-Dichlorobenzene	nd	0.2	PPB (UG/L)
1,4-Dichlorobenzene	nd	0.2	PPB (UG/L)
Dichlorodifluoromethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethane	nd	0.2	PPB (UG/L)
1,2-Dichloroethane	nd	0.2	PPB (UG/L)
1,1-Dichloroethene	nd	0.2	PPB (UG/L)
1,2-Dichloroethene (Cis and Trans)	nd	0.2	PPB (UG/L)
1,2-Dichloropropane	nd	0.2	PPB (UG/L)
cis-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
trans-1,3-Dichloropropene	nd	0.2	PPB (UG/L)
Ethylbenzene	nd	0.5	PPB (UG/L)
Dichloromethane	nd	2.0	PPB (UG/L)
1,1,2,2-Tetrachloroethane	nd	0.2	PPB (UG/L)
Tetrachloroethene (PCE)	nd	0.2	PPB (UG/L)
Toluene	nd	0.5	PPB (UG/L)
1,1,1-Trichloroethane	nd	0.2	PPB (UG/L)
1,1,2-Trichloroethane	nd	0.2	PPB (UG/L)
Trichloroethene (TCE)	nd	0.2	PPB (UG/L)
Vinyl Chloride	nd	0.2	PPB (UG/L)
Xylenes (Total)	nd	0.5	PPB (UG/L)
Trichlorofluoromethane	nd	0.2	PPB (UG/L)
MTBE	nd	2.5	PPB (UG/L)

BFB (Surrogate) Recovery = 93 %
BCM (Surrogate) Recovery = 90 %
Dilution Factor = 1

Results for sample: MW-9

Date collected: 5/22/94	Date received: 5/23/94
Date extracted: 5/23/94	Date analyzed: 5/24,31/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405073-5
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	nd	0.1	PPM (MG/L)

BFB (Surrogate) Recovery = 92 %

Dilution Factor = 1

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	nd	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 79 %

Dilution Factor = 1

Results for sample: MW-9

Date collected: 5/22/94	Date received: 5/23/94
Date extracted: 5/24/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405073-5
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	nd	0.5	PPB (UG/L)
2-Methyl Naphthalene	nd	0.5	PPB (UG/L)
1-Methyl Naphthalene	nd	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	nd	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 83 %

Dilution Factor = 1

Results for sample: Hobbs 2 Decon

Date collected: 5/22/94	Date received: 5/23/94
Date extracted: NA	Date analyzed: 5/26,31/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405073-6
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8020

Compound	Result	Detection Limit	Units
Benzene	nd	0.5	PPB (UG/L)
Toluene	nd	0.5	PPB (UG/L)
Ethylbenzene	nd	0.5	PPB (UG/L)
Total Xylenes	nd	0.5	PPB (UG/L)

BFB (Surrogate) Recovery = 87 %

Dilution Factor = 1

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Gasoline	nd	0.5	PPM (MG/L)

BFB (Surrogate) Recovery = 88 %

Dilution Factor = 5

Test: EPA 8015 Modified

Compound	Result	Detection Limit	Units
Diesel	nd	1.0	PPM (MG/L)

DNOP (Surrogate) Recovery = 99 %

Dilution Factor = 1

Results for sample: Hobbs 2 Decon

Date collected: 5/22/94	Date received: 5/23/94
Date extracted: 5/24/94	Date analyzed: 5/26/94
Client: Daniel B. Stephens and Associates, Inc.	
Project Name: Enron - Hobbs	Heal #: 9405073-6
Project Manager: Bob Marley	Sampled by: BM/CP
Matrix: Aqueous	

Test: EPA 8100

Compound	Result	Detection Limit	Units
Naphthalene	nd	0.5	PPB (UG/L)
2-Methyl Naphthalene	1.7	0.5	PPB (UG/L)
1-Methyl Naphthalene	1.8	0.5	PPB (UG/L)
Acenaphthalene	nd	0.5	PPB (UG/L)
Acenaphthene	nd	0.5	PPB (UG/L)
Fluorene	nd	0.5	PPB (UG/L)
Phenanthrene	nd	0.5	PPB (UG/L)
Anthracene	nd	0.5	PPB (UG/L)
Fluoranthrene	nd	0.5	PPB (UG/L)
Pyrene	nd	0.5	PPB (UG/L)
Benzo (a) anthracene	nd	0.5	PPB (UG/L)
Chrysene	nd	0.5	PPB (UG/L)
Benzo (b) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (k) fluoranthene	nd	0.5	PPB (UG/L)
Benzo (a) pyrene	nd	0.5	PPB (UG/L)
Indeno (1,2,3-cd) pyrene	nd	1.0	PPB (UG/L)
Dibenzo (a,h) anthracene	nd	1.0	PPB (UG/L)
Benzo (g,h,i) perylene	nd	1.0	PPB (UG/L)

Hexadecane (Surrogate) Recovery = 100 %

Dilution Factor = 1

CHAIN-OF-CUSTODY RECORD

HALL ENVIRONMENTAL ANALYSIS LABORATORY
2403 San Mateo NE, Suite P-13
Albuquerque, New Mexico 87110
505.880.1803

Client: DANIEL B. STEPHENS & ASSOC.	Project Name: ENRON HOBBS STA 2
Address: 6020 ACADEMY NE #100	Project #: 3260
ALBUQUERQUE, NM 87109	Project Manager: BOB MARLEY
Phone #: 822-9400	Sampler: CLARENCE PIGMAN
Fax #: 822-8877	Samples Cold? ☒ Yes ☐ No

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative: $HgCl_2$	Preservative: HCl	Preservative: Other	HEAL No.
5/16/94	1648	H_2O	SB-2	5/40ml	X			9405052-1
5/16/94	1648	H_2O	SB-2	1/1l			HNO3	-1
5/17/94	1035	H_2O	SB-1	5-40ml	X			-2
5/17/94	1035	H_2O	SB-1	1-1l			HNO3	-2
5/17/94	1230	H_2O	SB-3	5-40ml	X			-3
5/17/94	1230	H_2O	SB-3	1-1l	X			-3

ANALYSIS REQUEST

BTEX (Method 602/8020) + 8010 + HALOCHC	BTEX + MTBE (602/8020)	TPH Method 8015 MOD (Gas/Diesel)	BTEX + TPH + MTBE (Gasoline Only)	BTEX + MTBE + TPH (Gas + Diesel)	TPH (Method 418.1)	601/602 Volatiles	EDB (Method 504.1)	EDC	610 (PNA or PAH)	PAH (8100)			Air Bubbles or Headspace (Y or N)
X		X											
										X			
X		X								X	1311		
										X			
X		X											
										X			

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)	
5/17/94	1723	Bob Marley	Nicky Jones	5/5/94 1723
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)	

Remarks:

CHAIN-OF-CUSTODY RECORD

HALL ENVIRONMENTAL ANALYSIS LABORATORY
2403 San Mateo NE, Suite P-13
Albuquerque, New Mexico 87110
505.880.1803

Client: Daniel B. Stephens & Assoc

Project Name: ENRON – Hobbs

Address: 6020 Academy NE suite loc Alb, NM 87109

Project #: 3260

Project Manager: Bob Marley

Phone #: 822-9400

Sampler: Marley / Pigman

Fax #: 822-8877

Samples Cold? ☒ Yes ☐ No

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative			HEAL No.
					$HgCl_2$	HCl	Other	
5/18/94	0905	H_2O	SB-4	5-40ml	X			9405056-1
5/18/94	0905	H_2O	SB-4	1-1l			None	-1
5/18/94	1025	H_2O	SB-5	5-40ml	X			-2
5/18/94	1025	H_2O	SB-5	1-1l			None	-2
5/12/94	—	H_2O	Trip Blank	1-40ml	X			-3

ANALYSIS REQUEST

BTEX (Method 602/8020)	BTEX + MTBE (602/8020)	TPH Method 8015 MOD (Gas/Diesel)	BTEX + TPH + MTBE (Gasoline Only)	BTEX + MTBE + TPH (Gas + Diesel)	TPH (Method 418.1)	601/602 Volatiles 8010/8020	EDB (Method 504.1)	EDC	610 (PNA or PAH) 8100				Air Bubbles or Headspace (Y or N)
		X				X							
									X				
		X				X							
		~~X~~	BM			~~X~~	BM		X				
						X							

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)
5/18/94	1130	Bob Marley	Lisa Jones 1715 Mesa Airlines 5/18/94
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)

Remarks: 24-hr Rush (1200pm on 5/19/94)

.AIN-OF-CUSTODY RECORD

HALL ENVIRONMENTAL ANALYSIS LABORATORY
2403 San Mateo NE, Suite P-13
Albuquerque, New Mexico 87110
505.880.1803

ient: D.B. STEPHENS & ASSOCIATES, INC.

Project Name: ENRON - HOBBS

Address:

Project #:

Project Manager: BOB MARLEY

Phone #: 822-9400

Sampler: BOB MARLEY

Fax #:

Samples Cold? ☒ Yes ☐ No

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative			HEAL No.
					$HgCl_2$	HCl	Other	
5/16/94	1735	AQ	EOTT-1	1-1L 5-40mL	none X			940557-1

ANALYSIS REQUEST

BTEX (Method 602/8020)	BTEX + MTBE (602/8020)	TPH Method 8015 MOD (Gas/Diesel)	BTEX + TPH + MTBE (Gasoline Only)	BTEX + MTBE + TPH (Gas + Diesel)	TPH (Method 418.1)	601/602 Volatiles	EDB (Method 504.1)	EDC	610 (PNA or PAH)				Air Bubbles or Headspace (Y or N)
				X		X			X				N Y

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)
5/18/94	935 P.M.		
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)

Remarks:

CHAIN-OF-CUSTODY RECORD

HALL ENVIRONMENTAL ANALYSIS LABORATORY
2403 San Mateo NE, Suite P-13
Albuquerque, New Mexico 87110
505.880.1803

Client: Daniel B. Stephens & Assoc
Project Name: ENRON - Hobbs
Address: 6020 Academy NE Suite 100 Albuq, NM 87109
Project #: 3260
Project Manager: Bob Marley
Phone #: 822 9400
Sampler: BM/CP
Fax #: 822 8877
Samples Cold? ☒ Yes ☐ No

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative: $HgCl_2$	Preservative: HCl	Preservative: Other	HEAL No.	BTEX (Method 602/8020)	BTEX + MTBE (602/8020)	TPH Method 8015 MOD (Gas/Diesel)	BTEX + TPH + MTBE (Gasoline Only)	BTEX + MTBE + TPH (Gas + Diesel)	TPH (Method 418.1)	601/602 Volatiles 8010/8020	EDB (Method 504.1)	EDC	610 (PNA or PAH) 8100				Air Bubbles or Headspace (Y or N)
5/19/94	0945	H_2O	SB-6	5-40ml	X			9405059-1			X				X							N
5/19/94	1130	H_2O	MW-2	5-40ml	X			-2			X				X							N
5/19/94	0945	H_2O	SB-6	1-1l			None	-1										X				Y
5/19/94	1130	H_2O	MW-2	1-1l			None	-2										X				Y

ANALYSIS REQUEST

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)
19/94	1300	Bob Marley	Lisa Jones 1712 5/18/94 Mesa Airlines
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)

Remarks: Rush SB-6 (by 1200 on 5/20) 8010/8015/8020
Normal TAT for MW-2

CHAIN-OF-CUSTODY RECORD

HALL ENVIRONMENTAL ANALYSIS LABORATORY
2403 San Mateo NE, Suite P-13
Albuquerque, New Mexico 87110
505.880.1803

Client: Daniel B. Stephens & Assoc.

Project Name: ENRON - Hobbs

Address: 6020 Academy NE suite 100
Alb. NM 87109

Project #: 3260

Project Manager: Bob Marley

Phone #: 822 9400

Sampler: BM/CP

Fax #: 822 8877

Samples Cold? ☒ Yes ☐ No

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative: $HgCl_2$	Preservative: HCl	Preservative: Other	HEAL No.
5/19/94	1650	H_2O	EOTT-2	5-40ml	X			9405061-1
5/19/94	1650	H_2O	EOTT-2	1-1l	NP BM		None	" -1

ANALYSIS REQUEST

BTEX (Method 602/8020)	BTEX + MTBE (602/8020)	TPH Method 8015 MOD (Gas/Diesel)	BTEX + TPH + MTBE (Gasoline Only)	BTEX + MTBE + TPH (Gas + Diesel)	TPH (Method 418.1)	601/602 Volatiles 8010/8020	EDB (Method 504.1)	EDC	610 (PNA or PAH) 8100				Air Bubbles or Headspace (Y or N)
		X				X			X BM				N
									X				T

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)
5/19/94	1740	Bob Marley	Mesa Airlines 7204
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)

Remarks: Rush Analysis 8010/8015/8020 by 1200 tomorrow

Hall Environmental Analysis Laboratory

Analytical Technologies, Inc., Albuquerque, NM

San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 5/20/94 PAGE ____ OF ____

ATI LAB I.D.

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER: Bob Marley

COMPANY: Daniel B. Stephens & Assoc.

ADDRESS: 6020 Academy NE suite 100
Alb. NM 87109

PHONE: 822 9400

FAX: 822 8877

BILL TO:

COMPANY:

ADDRESS:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)			Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.			Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310 8100			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal		The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
EOTT-3	5/20/94	1015	H_2O	9405067-1		X					X	X								X												6
EOTT-4	5/20/94	1330	H_2O	" -2		X					X	X								X												6

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ. NO.:	ENRON-16665	NO. CONTAINERS	12
PROJ. NAME:	3260	CUSTODY SEALS	(Y) N / NA
P.O. NO.:		RECEIVED INTACT	Y
SHIPPED VIA:	Mesa Airlines	RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐ 2 WEEK

Comments:

Z4-Rush 8010/8015/8020
by Noon 5/21/94

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Bob Marley	Signature:	Signature:
Time: 1400	Time:	Time:
Printed Name: Bob Marley	Printed Name:	Printed Name:
Date: 5/20/94	Date:	Date:
Company: DBS&A	Company:	Company:
Phone: 822-9400		

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY:(LAB) 3.
Signature:	Signature:	Signature:
Time: 1750	Time:	Time:
Printed Name: Jeffrey Richardson	Printed Name:	Printed Name:
Date: 5/20/94	Date:	Date:
Company: Hall Environmental	Company:	Analytical Technologies, Inc.

[redacted] Environmental Analysis Laboratory

~~Analytical~~ **Technologies,** Inc., Albuquerque, NM

~~San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque~~

CHAIN OF CUSTODY

DATE: 5/20/94 PAGE 1 OF 1

ATI LAB I.D.

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER: Bob Marley

COMPANY: Daniel B. Stephens & Assoc

ADDRESS: 6020 Academy NE Suite 100
Alb. NM 87109

PHONE: 822 9400

FAX: 822 8877

BILL TO:

COMPANY:

ADDRESS:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics ~~(610/8310)~~ 8100	SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal	The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)	NUMBER OF CONTAINERS
EOTT-5	5/20/94	1630	H2O	9405218-			X		X	X						X								6

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ. NO.:	3260	NO. CONTAINERS	6
PROJ. NAME:	Enron-Hobbs	CUSTODY SEALS	(Y) N / NA
P.O. NO.:		RECEIVED INTACT	Y
SHIPPED VIA:	Mesa Arlene's	RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐ 2 WEEK

Comments:
24-Rush 8010/8015/8020 Analysis
by 1200 pm on 5/21/94

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Bob Marley Time: 1730	Signature: Time:	Signature: Time:
Printed Name: Bob Marley Date: 5/20/94	Printed Name: Date:	Printed Name: Date:
Company: DBSA Phone: 822 9400	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY:(LAB) 3.
Signature: Time: 2130	Signature: Time:	Signature: Time:
Printed Name: Jeffrey Richardson Date: 5/20/94	Printed Name: Date:	Printed Name: Date:
Company: Hall Environmental	Company:	Analytical Technologies, Inc.

Analytical Technologies, Inc., Albuquerque, NM

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CHAIN OF CUSTODY

DATE: 5/21/94 PAGE 1 OF 1

ATI LAB I.D.

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER: Bob Marley

COMPANY: DBS/A

ADDRESS: 6020 Academy NE Suite 100
Alb. NM 87109

PHONE: 822-9400

FAX: 822-8877

BILL TO:

COMPANY:

ADDRESS:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)			Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.			Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (~~610/8310~~ 8100)			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
EOTT - 6	5/21/94	0920		9405067-1	X						X	X								X													5- 40 VL
EOTT - 7	5/21/94	1200		-2	X						X	X								X													5- 40 VL
Trip blank	5/12/94	—		-3	X						X	X																					1 VL

PROJECT INFORMATION

PROJ. NO.: 3260

PROJ. NAME: ENRON - Hobbs

P.O. NO.:

SHIPPED VIA: Mesa Airlines

SAMPLE RECEIPT

NO. CONTAINERS		
CUSTODY SEALS	Y / N / NA	
RECEIVED INTACT		
RECEIVED COLD		

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐ 2 WEEK

Comments:

24-Rush EOTT-6, EOTT-7 by 1200 on 5/22/94, EOTT-6 is TOP priority

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Bob Marley Time: 1300	Signature: Luke Jones Time: 1548	Signature: Time:
Printed Name: Date: 5/21/94	Printed Name: Date: 5/21/94	Printed Name: Date:
Company: DBS/A Phone: 822-9400	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY:(LAB) 3.
Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Analytical Technologies, Inc.

CHAIN-OF-CUSTODY RECORD

HALL ENVIRONMENTAL ANALYSIS LABORATORY
2403 San Mateo NE, Suite P-13
Albuquerque, New Mexico 87110
505.880.1803

Client: DANIEL B. STEPHENS & ASSOC.
Address: 6020 ACADEMY NE #100 ALBUQUERQUE, NM 87109
Phone #: 505-822-9400
Fax #:

Project Name: ENRON HOBBS
Project #: 3260
Project Manager: BOB MARLEY
Sampler: BM/CP
Samples Cold? ☒ Yes ☐ No

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative: $HgCl_2$	Preservative: HCl	Preservative: Other	HEAL No.
5/22/94	1230	H_2O	EDTT-8	5/40ml	X			9405073-1
5/22/94	1645	H_2O	EDTT TANKS DECON	1/l			ACIDIFIED	-2
—	—	H_2O	REPLICATE	5/40ml	X			-3
—	—	H_2O	REPLICATE	1/l			ACIDIFIED	-3
5/22/94	1645	H_2O	EDTT TANKS DECON	2/40ml	X			-2
5/22/94	0945	H_2O	EQUIPMENT BLANK	3/40ml	X			-4
5/22/94	1230	H_2O	EDTT-8	1/l			ACIDIFIED	-1
5/22/94	1110	H_2O	MW-9	5/40ml	X			-5
5/22/94	1430	H_2O	HOBBS DECON	3/40ml	X			-6
5/22/94	0945	H_2O	EQUIPMENT BLANK	1/l			ACIDIFIED	-4
5/22/94	1430	H_2O	HOBBS DECON	1/l			ACIDIFIED	-6
5/22/94	1110	H_2O	MW-9	1/l			ACIDIFIED	-5

ANALYSIS REQUEST

Date	Time	Relinquished By: (Signature)	Received By: (Signature)
5/23/94	1209	Clarena Pizzini	Edd Hall
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)

Remarks:

CHAIN-OF-CUSTODY RECORD

HALL ENVIRONMENTAL ANALYSIS LABORATORY
2403 San Mateo NE, Suite P-13
Albuquerque, New Mexico 87110
505.880.1803

Client: DANIEL B. STEPHENS & ASSOC
Project Name: ENRON HOBBS
Address: 6020 ACADEMY NE #100 ALBUQUERQUE NM 87109
Project #: 3260
Project Manager: BOB MARLEY
Phone #: 505-822-9400
Sampler: BM/CP
Fax #:
Samples Cold? ☒ Yes ☐ No

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative $HgCl_2$	Preservative HCl	Preservative Other	HEAL No.	BTEX (Method 602/8020)	BTEX + MTBE (602/8020)	TPH Method 8015 MOD (Gas/Diesel)	BTEX + TPH + MTBE (Gasoline Only)	BTEX + MTBE + TPH (Gas + Diesel)	TPH (Method 418.1)	601/602 Volatiles	EDB (Method 504.1)	EDC	610 (PNA or PAH)				Air Bubbles or Headspace (Y or N)
5/21/94	1420	H_2O	TRIP BLANK	1/40ml	X			9405072-1	X		X				X							N
5/22/94	1430	H_2O	MW-1	5/40ml	X			-2	X		X				X							N
5/22/94	1430	H_2O	MW-1	1/L	X			-2										X				~~N~~

ANALYSIS REQUEST

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)
5/23/94	1209	Elena Reyes	
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)

Remarks:

Inorganic Analysis

RECEIVED JUN 2 2 1994

Analytical **Technologies,** Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **406335**

June 21, 1994

Daniel B. Stephens & Associates
6020 Academy, NE - Suite 100
Albuquerque, NM 87109

Project Name/Number: ENRON-HOBBS 3260

Attention: Robert Marley

On **05/18/94**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Due to laboratory error, samples received under ATI accession #405380 were not analyzed for RCRA metals. The samples were reaccessioned as ATI #406335 and analyzed for RCRA metals.

All analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letitia Krakowski, Ph.D.
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jd

Enclosure

Analytical Technologies, Inc.

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON-HOBBS

DATE RECEIVED : 05/18/94
REPORT DATE : 06/21/94

ATI I.D. : 406335

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	SB-1	AQUEOUS	05/17/94
02	SB-2	AQUEOUS	05/16/94
03	SB-3	AQUEOUS	05/17/94
04	SB-4	AQUEOUS	05/18/94
05	SB-5	AQUEOUS	05/18/94

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	5

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 406335

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON-HOBBS

DATE RECEIVED : 05/18/94
REPORT DATE : 06/21/94

PARAMETER	UNITS	01	02	03	04	05
SILVER (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010	<0.010	<0.010
ARSENIC (EPA 206.2/7060)	MG/L	0.050	0.026	0.029	0.041	<0.005
BARIUM (EPA 200.7/6010)	MG/L	1.94	0.645	0.516	2.26	0.095
CADMIUM (EPA 213.2/7131)	MG/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
CHROMIUM (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010	<0.010	<0.010
MERCURY (EPA 245.1/7470)	MG/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
LEAD (EPA 239.2/7421)	MG/L	<0.002	<0.002	<0.002	<0.002	<0.002
SELENIUM (EPA 270.2/7740)	MG/L	<0.005	<0.005	<0.005	<0.005	<0.005

Analytical Technologies, Inc., Albuquerque, NM
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CHAIN OF CUSTODY

DATE: 5/18/94 PAGE 1 OF 1

LAB 405380

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PROJECT MANAGER: Bob Murley

COMPANY: Daniel B. Stephens & Assoc.
ADDRESS: 6020 Academy NE Suite 100
Albuq. NM 87109
PHONE: 822 9400
FAX: 822 8877

BILL TO: Akhtar Alvi
COMPANY: ENRON Corp
ADDRESS: 1400 Smith St
Houston, TX

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	NUMBER OF CONTAINERS
SB-1	5/17/94	1035	H_2O	01	3
SB-2	5/16/94	1648	H_2O	02	3
SB-3	5/17/94	1230	H_2O	03	3
SB-4	5/18/94	0905	H_2O	04	3
SB-5	5/18/94	1025	H_2O	05	3

Analysis columns: Petroleum Hydrocarbons (418.1); (MOD 8015) Gas/Diesel; Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020); BTXE/MTBE (8020); Chlorinated Hydrocarbons (601/8010); Aromatic Hydrocarbons (602/8020); SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.; Pesticides/PCB (608/8080); Herbicides (615/8150); Base/Neutral/Acid Compounds GC/MS (625/8270); Volatile Organics GC/MS (624/8240); Polynuclear Aromatics (610/8310); Cl, SO_4, T-Alk, TDS; SDWA Primary Standards - Arizona; SDWA Secondary Standards - Arizona; SDWA Primary Standards - Federal; SDWA Secondary Standards - Federal; NO_2/NO_3; Cu, Fe, Mg, Mn, Ca, Na, K; The 13 Priority Pollutant Metals; RCRA Metals by Total Digestion; RCRA Metals by TCLP (1311)

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ. NO.: 3260		NO. CONTAINERS	15
PROJ. NAME: ENRON - Hobbs		CUSTODY SEALS	Y / N / (NA)
P.O. NO.:		RECEIVED INTACT	Y
SHIPPED VIA: Mesa Airlines		RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐ 2 WEEK

Comments:
Metals were filtered in the field for each sample
*C.o.C. seal intact on outside of cooler.

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Bob Murley Time: 1200	Signature: Mesa Air BM	Signature: Time:
Printed Name: Bob Murley Date: 5/18/94	Printed Name: Date:	Printed Name: Date:
Company: DBSA Phone: 822 9400	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Mesa Airlines Time:	Signature: Time:	Signature: Time: 1900
Printed Name: Date:	Printed Name: Date:	Printed Name: Date: 5/18/94
Company:	Company:	Analytical Technologies, Inc.

Chain of Custody

DATE 5/19/94 PAGE 1 OF 1

NETWORK PROJECT MANAGER: BETH PROFFITT

COMPANY: Analytical Technologies, Inc.

ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER: Ed Hadlock

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)	SO_4, Alk, TDS	632/632 MOD	619/619 MOD	610/6310	NO3 NO2	Cu, Fe, Mn, Ca, Na, K	8240 (TCLP 1311) ZHE	Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)	NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM	GROSS ALPHA/BETA	RADIUM 226/228	AIR - O2, CO2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
405380-1	5/17/94	1035	AQ	1						X				X	X													3
-2	5/16/94	1648		2						X				X	X													
-3	5/17/94	1230		3						X				X	X													
-4	5/18/94	0905		4						X				X	Y													
-5	5/18/94	1025		5						X				X	Y													

PROJECT INFORMATION

PROJECT NUMBER: 405.380

PROJECT NAME: OBS

QC LEVEL: STD. IV

QC REQUIRED: MS MSD BLANK

TAT: STANDARD RUSHI

DUE DATE: 6/2/94

RUSH SURCHARGE:

CLIENT DISCOUNT: 10 %

W.O. # 12764

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS	15
CHAIN OF CUSTODY SEALS	N/A
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	405380

SAMPLES SENT TO:

- SAN DIEGO
- FT. COLLINS
- RENTON
- PENSACOLA
- PHOENIX
- BARRINGER
- FIBERQUANT

RELINQUISHED BY: 1.

Signature: Terri Dotte Time: 1730

Printed Name: Terri Dotte Date: 5/19/94

Analytical Technologies, Inc. Albuquerque

RECEIVED BY: (LAB) 1.

Signature: Time:

Printed Name: Date:

Company:

RELINQUISHED BY: 2.

Signature: Time:

Printed Name: Date

Company:

RECEIVED BY: (LAB) 2.

Signature: Al Fortner Time: 10:02

Printed Name: AL FORTNER Date: 5-20-94

Company: ATI

RECEIVED JUN 10 1994

Analytical **Technologies,** Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **405380**

June 9, 1994

Daniel B. Stephens & Associates
6020 Academy NE, Suite 100
Albuquerque, NM 87109

Project Name/Number: 3260 ENRON-HOBBS

Attention: Bob Marley

On **05/18/94**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Zinc analysis was added on 05/25/94 for all samples per Bob Marley.

This report is incomplete. Due to laboratory error, the RCRA metals were not analyzed at the same time as the other parameters. The RCRA metals analyses will be performed on the original sample submitted to the laboratory on 05/18/94. The subsequent data will be reported in a separate report (ATI ID 406335). We apologize for any inconvience.

All analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letitia Krakowski, Ph.D.
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jd

Enclosure

Analytical Technologies, Inc.

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON-HOBBS
ATI I.D. : 405380

DATE RECEIVED : 05/18/94
REPORT DATE : 06/09/94

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	SB-1	AQUEOUS	05/17/94
02	SB-2	AQUEOUS	05/16/94
03	SB-3	AQUEOUS	05/17/94
04	SB-4	AQUEOUS	05/18/94
05	SB-5	AQUEOUS	05/18/94

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	5

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 405380

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON-HOBBS

DATE RECEIVED : 05/18/94
REPORT DATE : 06/09/94

PARAMETER	UNITS	01	02	03	04	05
CARBONATE (CACO3)	MG/L	<1	<1	<1	<1	<1
BICARBONATE (CACO3)	MG/L	644	779	675	675	220
HYDROXIDE (CACO3)	MG/L	<1	<1	<1	<1	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	644	779	675	675	220
CHLORIDE (EPA 325.2)	MG/L	80	120	670	62	150
NO2/NO3-N, TOTAL (353.2)	MG/L	<0.06	<0.06	0.22	<0.06	4.3
SULFATE (EPA 300.0)	MG/L	15	23	120	18	100
T. DISSOLVED SOLIDS (160.1)	MG/L	840	1100	2000	890	690

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 405380

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON-HOBBS

DATE RECEIVED : 05/18/94
REPORT DATE : 06/09/94

PARAMETER	UNITS	01	02	03	04	05
CALCIUM (EPA 200.7/6010)	MG/L	125	139	187	156	128
COPPER (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010	<0.010	<0.010
IRON (EPA 200.7/6010)	MG/L	0.215	0.035	2.42	5.65	<0.020
POTASSIUM (EPA 200.7/6010)	MG/L	2.2	26.9	3.1	4.2	3.2
MAGNESIUM (EPA 200.7/6010)	MG/L	66.5	70.4	107	42.4	23.1
MANGANESE (EPA 200.7/6010)	MG/L	0.140	0.102	0.976	0.216	<0.010
SODIUM (EPA 200.7/6010)	MG/L	89.9	131	372	100	69.4
ZINC (EPA 200.7/6010)	MG/L	0.450	1.14	0.394	3.63	0.661

Analytical Technologies, Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 5/18/94 PAGE 1 OF 1

ATI LAB I.D.: 405380

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PROJECT MANAGER: Bob Murley

COMPANY: Daniel B. Stephens & Assoc.
ADDRESS: 6020 Academy NE Suite 100
Albuq. NM 87109
PHONE: 822 9400
FAX: 822 8877

BILL TO: Akhtar Alvi
COMPANY: ENRON Corp
ADDRESS: 1400 Smith St
Houston, TX

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)			Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.			Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)		Cl, SO4, T-Alk, TDS	SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal	NO2/NO3	Cu, Fe, Mg, Mn, Ca, Na, K	The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
SB-1	5/17/94	1035	H_2O	01																		X					X	X		X			3
SB-2	5/16/94	1648	H_2O	02																		X					X	X		X			3
SB-3	5/17/94	1230	H_2O	03																		X					X	X		X			3
SB-4	5/18/94	0905	H_2O	04																		X					X	X		X			3
SB-5	5/18/94	1025	H_2O	05																		X					X	X		X			3

PROJECT INFORMATION

PROJ. NO.: 3260
PROJ. NAME: ENRON - Hobbs
P.O. NO.:
SHIPPED VIA: Mesa Airlines

SAMPLE RECEIPT

NO. CONTAINERS	5
CUSTODY SEALS	Y / N / (NA)
RECEIVED INTACT	Y
RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐ 2 WEEK

Comments:
Metals were filtered in the field for each sample
*C.o.C seal intact on outside of cooler.

SAMPLED & RELINQUISHED BY: 1.
Signature: Bob Murley Time: 1200
Printed Name: Bob Murley Date: 5/18/94
Company: DBSA Phone: 822 9400

RELINQUISHED BY: 2.
Signature: Mesa Airlines BM Time:
Printed Name: Date:
Company:

RELINQUISHED BY: 3.
Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: 1.
Signature: Mesa Airlines Time:
Printed Name: Date:
Company:

RECEIVED BY: 2.
Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY:(LAB) 3.
Signature: Time: 1700
Printed Name: Tom Date: 5/18/94
Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 • Portland (503) 684-0447 • Albuquerque (505) 344-3777 DISTRIBUTION: White, Canary - ATI • Pink - ORIGINATOR

Analytical Technologies, Inc. Albuquerque, NM

Chain of Custody

DATE 5/19/94 PAGE 1 OF 1

NETWORK PROJECT MANAGER: BETH PROFFITT

COMPANY: **Analytical Technologies, Inc.**

ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER: D Yalk

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)	SO_4, Alk, TDS	632/632 MOD	619/619 MOD	610/8310	NO3 / NO2	Cu, Fe, Pb, Mn, Ca, Na, K	8240 /TCLP 1311 ZHE	Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)	NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM	GROSS ALPHA/BETA	RADIUM 226/228	AIR - O_2, CO_2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
405380-1	5/17/94	1035	WW	1						X				X	Y													3
-2	5/16/94	1648		2						X				X	X													3
-3	5/17/94	1230		3						X				X	X													3
-4	5/18/94	0905		4						X				X	Y													3
-5	5/18/94	1025		5						X				X	Y													3

PROJECT INFORMATION

PROJECT NUMBER: 405380

PROJECT NAME: UBS

QC LEVEL: STD. IV

QC REQUIRED: MS MSD BLANK

TAT: STANDARD RUSH!

DUE DATE: 6/2/94

RUSH SURCHARGE:

CLIENT DISCOUNT: 10 %

W.O. #4764

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS	15
CHAIN OF CUSTODY SEALS	N/A
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	405380

SAMPLES SENT TO:

- SAN DIEGO
- FT. COLLINS
- RENTON
- PENSACOLA
- PHOENIX X
- BARRINGER
- FIBERQUANT

RELINQUISHED BY: 1.

Signature: Time: 1720

Printed Name: Date: 5/19/94

Analytical Technologies, Inc. Albuquerque

RECEIVED BY: (LAB) 1.

Signature: Time:

Printed Name: Date:

Company:

RELINQUISHED BY: 2.

Signature: Time:

Printed Name: Date

Company:

RECEIVED BY: (LAB) 2.

Signature: Time: 10:02

Printed Name: Date: 5-20-94

Company: ATI

RECEIVED JUN - 5 1994

Analytical **Technologies,** Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. 405393

June 14, 1994

Daniel B. Stephens & Assoc.
6020 Academy, NE #100
Albuquerque, NM 87109

Project Name/Number: 3260 ENRON HOBBS

Attention: Bob Marley

On **05/21/94**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Zinc analysis was added on 05/25/94 for samples EOTT-1, MW-2, SB-6 and EOTT-2.

Sulfate, Total Dissolved Solids, Alkalinity and Chloride analyses were added on 05/23/94 for all samples per Bob Marley.

RCRA metals analyses were cancelled on 05/23/94 for sample EOTT-3 AND EOTT-4 per Bob Marley.

All analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Létitia Krakowski, Ph.D.
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jd

Enclosure

Analytical Technologies, Inc.

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON-HOBBS

DATE RECEIVED : 05/20/94
REPORT DATE : 06/14/94

ATI I.D. : 405393

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	EOTT-1	AQUEOUS	05/18/94
02	MW-2	AQUEOUS	05/19/94
03	SB-6	AQUEOUS	05/19/94
04	EOTT-2	AQUEOUS	05/19/94
05	EOTT-3	AQUEOUS	05/20/94
06	EOTT-4	AQUEOUS	05/20/94

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	6

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 405393

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON-HOBBS

DATE RECEIVED : 05/20/94
REPORT DATE : 06/14/94

PARAMETER	UNITS	01	02	03	04	05
CARBONATE (CACO3)	MG/L	<1	<1	<1	<1	<1
BICARBONATE (CACO3)	MG/L	284	194	610	399	550
HYDROXIDE (CACO3)	MG/L	<1	<1	<1	<1	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	284	194	610	399	550
CHLORIDE (EPA 325.2)	MG/L	130	300	400	80	47
NO2/NO3-N, TOTAL (353.2)	MG/L	5.3	3.7	<0.06	2.1	<0.06
SULFATE (EPA 300.0)	MG/L	100	290	12.9	63	56
TOTAL DISSOLVED SOLIDS (160.1)	MG/L	770	1100	1400	680	760

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 405393

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON-HOBBS

DATE RECEIVED : 05/20/94
REPORT DATE : 06/14/94

PARAMETER	UNITS	06
CARBONATE (CACO3)	MG/L	<1
BICARBONATE (CACO3)	MG/L	271
HYDROXIDE (CACO3)	MG/L	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	271
CHLORIDE (EPA 325.2)	MG/L	97
NO2/NO3-N, TOTAL (353.2)	MG/L	1.90
SULFATE (EPA 300.0)	MG/L	100
T. DISSOLVED SOLIDS (160.1)	MG/L	660

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 405393

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON-HOBBS

DATE RECEIVED : 05/20/94
REPORT DATE : 06/14/94

PARAMETER	UNITS	01	02	03	04
SILVER (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010	<0.010
ARSENIC (EPA 206.2/7060)	MG/L	<0.005	<0.005	0.040	<0.005
BARIUM (EPA 200.7/6010)	MG/L	0.080	0.082	0.226	0.155
CALCIUM (EPA 200.7/6010)	MG/L	155	180	150	156
CADMIUM (EPA 213.2/7131)	MG/L	0.0006	<0.0005	<0.0005	<0.0005
CHROMIUM (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010	<0.010
COPPER (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010	<0.010
IRON (EPA 200.7/6010)	MG/L	0.021	0.026	2.18	0.030
MERCURY (EPA 245.1/7470)	MG/L	<0.0002	<0.0002	<0.0002	<0.0002
POTASSIUM (EPA 200.7/6010)	MG/L	3.3	2.4	2.0	3.4
MAGNESIUM (EPA 200.7/6010)	MG/L	19.3	40.4	66.5	19.1
MANGANESE (EPA 200.7/6010)	MG/L	0.024	<0.010	0.994	0.033
SODIUM (EPA 200.7/6010)	MG/L	65.3	139	235	48.6
LEAD (EPA 239.2/7421)	MG/L	<0.002	<0.002	<0.002	0.010
SELENIUM (EPA 270.2/7740)	MG/L	<0.005	0.009	<0.005	<0.005
ZINC (EPA 200.7/6010)	MG/L	1.20	<0.020	0.475	1.87

Analytical Technologies, Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 5/20/94 PAGE 1 OF 1

ATI LAB I.D.: 405393

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER: Bob Marley

COMPANY: Daniel B. Stephens & Assoc
ADDRESS: 6020 Academy NE Suite 100
Alb, NM 87109
PHONE: 822 9400
FAX: 822-8877

BILL TO: Atchter Alvi
COMPANY: ENRON Corp
ADDRESS: 1400 South St
Houston, TX

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	NUMBER OF CONTAINERS
EOTT-1	5/18/94	1735	H_2O	01	5
MW-2	5/19/94	1130	H_2O	02	3
SB-6	5/19/94	0945	H_2O	03	3
EOTT-2	5/19/94	1650	H_2O	04	3
EOTT-3	5/20/94	1015	H_2O	05	2
EOTT-4	5/20/94		H_2O	06	2

Petroleum Hydrocarbons (418.1); (MOD 8015) Gas/Diesel; Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020); BTXE/MTBE (8020); Chlorinated Hydrocarbons (601/8010); Aromatic Hydrocarbons (602/8020); SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.; Pesticides/PCB (608/8080); Herbicides (615/8150); Base/Neutral/Acid Compounds GC/MS (625/8270); Volatile Organics GC/MS (624/8240); Polynuclear Aromatics (610/8310); SDWA Primary Standards - Arizona; SDWA Secondary Standards - Arizona; SDWA Primary Standards - Federal; SDWA Secondary Standards - Federal; NO3/NO2; Cu, Fe, Mg, Mn, Ca, Na, K; The 13 Priority Pollutant Metals; RCRA Metals by Total Digestion; RCRA Metals by TCLP (1311)

| MW-2 | X | X | | X | | |

RECEIVED JUN 15 1994

Analytical **Technologies,** Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **405396**

June 14, 1994

Daniel B. Stephens & Assoc.
6020 Academy NE, Suite 100
Albuquerque, NM 87109

Project Name/Number: ENRON HOBBS 3260

Attention: Bob Marley

On **05/23/94**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Zinc analysis was added on 05/25/94 for all samples.

All analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letitia Krakowski, Ph.D.
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jd

Enclosure

Analytical Technologies, Inc.

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON HOBBS

DATE RECEIVED : 05/23/94
REPORT DATE : 06/14/94

ATI I.D. : 405396

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	EOTT-8	AQUEOUS	05/22/94
02	MW-1	AQUEOUS	05/22/94
03	MW-9	AQUEOUS	05/22/94
04	EOTT-7	AQUEOUS	05/21/94
05	EOTT-6	AQUEOUS	05/21/94
06	EOTT-5	AQUEOUS	05/20/94
07	EOTT-4	AQUEOUS	05/20/94
08	EOTT-3	AQUEOUS	05/20/94

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	8

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 405396

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON HOBBS

DATE RECEIVED : 05/23/94
REPORT DATE : 06/14/94

PARAMETER	UNITS	01	02	03	04	05
CARBONATE (CACO3)	MG/L	<1	<1	<1	<1	<1
BICARBONATE (CACO3)	MG/L	436	497	238	390	345
HYDROXIDE (CACO3)	MG/L	<1	<1	<1	<1	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	436	497	238	390	345
CHLORIDE (EPA 325.2)	MG/L	6.4	160	107	64	90
NO2/NO3-N, TOTAL (353.2)	MG/L	3.6	<0.06	5.6	0.09	6.0
SULFATE (EPA 300.0)	MG/L	73	80	110	180	61
T. DISSOLVED SOLIDS (160.1)	MG/L	630	1500	670	890	670

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 405396

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON HOBBS

DATE RECEIVED : 05/23/94
REPORT DATE : 06/14/94

PARAMETER	UNITS	06
CARBONATE (CACO3)	MG/L	<1
BICARBONATE (CACO3)	MG/L	637
HYDROXIDE (CACO3)	MG/L	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	637
CHLORIDE (EPA 325.2)	MG/L	47
NO2/NO3-N, TOTAL (353.2)	MG/L	<0.06
SULFATE (EPA 300.0)	MG/L	14.7
T. DISSOLVED SOLIDS (160.1)	MG/L	850

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 405396

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON HOBBS

DATE RECEIVED : 05/23/94
REPORT DATE : 06/14/94

PARAMETER	UNITS	01	02	03	04	05
SILVER (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010	<0.010	<0.010
ARSENIC (EPA 206.2/7060)	MG/L	<0.005	0.040	<0.005	<0.005	<0.005
BARIUM (EPA 200.7/6010)	MG/L	0.088	0.484	0.114	0.148	0.141
CALCIUM (EPA 200.7/6010)	MG/L	148	116	136	189	153
CADMIUM (EPA 213.2/7131)	MG/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
CHROMIUM (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010	<0.010	<0.010
COPPER (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010	<0.010	<0.010
IRON (EPA 200.7/6010)	MG/L	<0.020	3.69	<0.020	0.063	0.036
MERCURY (EPA 245.1/7470)	MG/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
POTASSIUM (EPA 200.7/6010)	MG/L	3.0	2.2	3.8	4.2	2.8
MAGNESIUM (EPA 200.7/6010)	MG/L	17.2	48.9	14.3	23.5	16.5
MANGANESE (EPA 200.7/6010)	MG/L	0.013	0.425	0.012	0.037	0.013
SODIUM (EPA 200.7/6010)	MG/L	48.0	143	55.9	58.8	45.2
LEAD (EPA 239.2/7421)	MG/L	0.012	<0.002	<0.002	<0.002	<0.002
SELENIUM (EPA 270.2/7740)	MG/L	<0.005	<0.005	<0.005	<0.005	<0.005
ZINC (EPA 200.7/6010)	MG/L	2.76	<0.020	0.028	0.440	0.768

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 405396

CLIENT : D.B. STEPHENS & ASSOCIATES
DATE RECEIVED : 05/23/94
PROJECT # : 3260
PROJECT NAME : ENRON HOBBS
REPORT DATE : 06/14/94

PARAMETER	UNITS	06	07	08
SILVER (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010
ARSENIC (EPA 206.2/7060)	MG/L	0.031	<0.005	0.015
BARIUM (EPA 200.7/6010)	MG/L	0.399	0.108	0.192
CALCIUM (EPA 200.7/6010)	MG/L	148	130	163
CADMIUM (EPA 213.2/7131)	MG/L	<0.0005	<0.0005	<0.0005
CHROMIUM (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010
COPPER (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010
IRON (EPA 200.7/6010)	MG/L	<0.020	<0.020	0.021
MERCURY (EPA 245.1/7470)	MG/L	<0.0002	<0.0002	<0.0002
POTASSIUM (EPA 200.7/6010)	MG/L	2.0	4.2	2.6
MAGNESIUM (EPA 200.7/6010)	MG/L	34.7	19.0	22.7
MANGANESE (EPA 200.7/6010)	MG/L	0.402	0.028	0.125
SODIUM (EPA 200.7/6010)	MG/L	95.0	60.2	70.0
LEAD (EPA 239.2/7421)	MG/L	<0.002	<0.002	<0.002
SELENIUM (EPA 270.2/7740)	MG/L	<0.005	<0.005	<0.005
ZINC (EPA 200.7/6010)	MG/L	0.423	0.221	0.917

Analytical Technologies, Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 5/23/94 PAGE 1 OF 1

ATI LAB NO. 405 39.6

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER: Bob Marley

COMPANY: DANIEL B. STEPHENS & ASSOC
ADDRESS: 6020 ACADEMY NE #100
ALBUQUERQUE NM
PHONE: 822-9400 87109
FAX:

BILL TO: DBS&A
COMPANY:
ADDRESS:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	NITRATE/NITRITE	Cl, SO4, TDS, T-AK	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.			Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion + Ag, Mg, Na	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
EOTT-8	5/22/94	1230	H_2O	01					X	X																				X			3
MW-1	5/21/94	1430	H_2O	02					X	X																				X			3
MW-9	5/21/94	1110	H_2O	03					X	X																				X			3
EOTT-7	5/21/94	1200	H_2O	04					X	X																				X			3
EOTT-6	5/21/94	0920	H_2O	05					X	X																				X			3
EOTT-5	5/20/94	1630	H_2O	06					X	X																				X			3
EOTT-4	5/20/94	1330	H_2O	07																										X			1
EOTT-3	5/20/94	1015	H_2O	08																										X			1

PROJECT INFORMATION

PROJ. NO.: 3260
PROJ. NAME: ENRON HDBBS
P.O. NO.:
SHIPPED VIA:

SAMPLE RECEIPT

NO. CONTAINERS: 20
CUSTODY SEALS: Y / N (NA)
RECEIVED INTACT: Y
RECEIVED COLD: Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments:

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 1320	Signature: Time:	Signature: Time:
Printed Name: CLARENCE PIGMAN Date: 5/23/94	Printed Name: Date:	Printed Name: Date:
Company: Phone:	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: Time: 1320
Printed Name: Date:	Printed Name: Date:	Printed Name: LINDA CAMPBELL Date: 5/23/94
Company:	Company:	Analytical Technologies, Inc.

Analytical Technologies, Inc. Albuquerque, NM

Chain of Custody

DATE 5/23/94 PAGE 1 OF 1

NETWORK PROJECT MANAGER: BETH PROFFITT

COMPANY: **Analytical Technologies, Inc.**

ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)	632/632 MOD	619/619 MOD	610/8310	NO2/NO3	Cl, SO4, TDS, Alk	8240 (TCLP 1311) ZHE	Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)	RCRA Metals by T-Digestion + Cu, Fe, Mg, Mn, Ca, Na, K	ASBESTOS		BOD	TOTAL COLIFORM	FECAL COLIFORM	GROSS ALPHA/BETA	RADIUM 226/228	AIR - O2, CO2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
405396-1	5/22/94	1230	DW	1									X	X				X	X									3
-2	"	1430		2									X	X				X	X									
-3	"	1110		3									X	X				X	X									
-4	5/21/94	1200		4									X	X				X	X									
-5	"	0920		5									X	X				X	X									
-6	5/20/94	1630		6									X	X				X	X									
-7	"	1330		7														X	X									1
-8	"	1015		8														X	X									1

PROJECT INFORMATION	
PROJECT NUMBER:	405396
PROJECT NAME:	DBS
QC LEVEL:	STD IV
QC REQUIRED:	MS MSD BLANK
TAT:	STANDARD RUSH!

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	20
CHAIN OF CUSTODY SEALS	NA
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	405396

DUE DATE: 6/7/94
RUSH SURCHARGE:
CLIENT DISCOUNT: 10 %

W.O. #4773

SAMPLES SENT TO:
SAN DIEGO
FT. COLLINS
RENTON
PENSACOLA
PHOENIX X
BARRINGER
FIBERQUANT

RELINQUISHED BY: 1.
Signature: [signature] Time: 1730
Printed Name: Lori Dottre Date: 5/23/94
Analytical Technologies, Inc. Albuquerque

RECEIVED BY: (LAB) 1.
Signature: Time:
Printed Name: Date:
Company:

RELINQUISHED BY: 2.
Signature: Time:
Printed Name: Date
Company:

RECEIVED BY: (LAB) 2.
Signature: Rosella Vidal Time: 1028
Printed Name: Rosella Vidal Date: 5/24/94
Company: ATI

AnalyticalTechnologies, Inc., Albuquerque, NM

San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 5/21/94 PAGE 1 OF 1

ATI LAB I.D.

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER: Bob Marley

COMPANY: DBS&A

ADDRESS: 6020 Academy NE Suite 100
Alb. NM 87109

PHONE: 822-9400

FAX: 822-8877

BILL TO:

COMPANY:

ADDRESS:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (~~610/8310~~) 8100	SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal	The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)	NUMBER OF CONTAINERS
EOTT - 6	5/21/94	0920		9405069-1		X			X	X						X								5=40 1-VL
EOTT - 7	5/21/94	1200		-2		X			X	X						X								5=40 1-VL
Trip blank	5/12/94	—		-3		X			X	X														1

PROJECT INFORMATION

PROJ. NO.: 3260

PROJ. NAME: ENRON - Hobbs

P.O. NO.:

SHIPPED VIA: Mesa Airlines

SAMPLE RECEIPT

NO. CONTAINERS	
CUSTODY SEALS	Y / N / NA
RECEIVED INTACT	
RECEIVED COLD	

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐ 2 WEEK

Comments:

24-Rush EOTT-6, EOTT-7 by 1200 on 5/22/94, EOTT-6 is TOP priority

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Bob Marley Time: 1300	Signature: Time: 1548	Signature: Time:
Printed Name: Date: 5/21/94	Printed Name: Date: 5/21/94	Printed Name: Date:
Company: DBS&A Phone: 822-9400	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY:(LAB) 3.
Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Analytical Technologies, Inc.

CHAIN-OF-CUSTODY RECORD

HALL ENVIRONMENTAL ANALYSIS LABORATORY
2403 San Mateo NE, Suite P-13
Albuquerque, New Mexico 87110
505.880.1803

Client: DANIEL B. STEPHENS & ASSOC.
Address: 6020 ACADEMY NE #100, ALBUQUERQUE, NM 87109
Phone #: 505-822-9400
Fax #:

Project Name: ENRON HOBBS
Project #: 3260
Project Manager: BOB MARLEY
Sampler: BM/CP
Samples Cold? ☒ Yes ☐ No

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative: $HgCl_2$	Preservative: HCl	Preservative: Other	HEAL No.
5/22/94	1230	H_2O	EDTT-8	5/40ml	X	X		9405073-1
5/22/94	1645	H_2O	EDTT TANKS DECON	1/l			ACIDIFY	-2
—	—	H_2O	REPLICATE	5/40ml	X	X		-3
—	—	H_2O	REPLICATE	1/l			ACIDIFY	-3
5/22/94	1645	H_2O	EDTT TANKS DECON	2/40ml	X	X		-2
5/22/94	0945	H_2O	EQUIPMENT BLANK	3/40ml	X	X		-4
5/22/94	1230	H_2O	EDTT-8	1/l			ACIDIFY	-1
5/22/94	1110	H_2O	MW-9	5/40ml	X	X		-5
5/22/94	1430	H_2O	HOBBS DECON	3/40ml	X	X		-6
5/22/94	0945	H_2O	EQUIPMENT BLANK	1/l			ACIDIFY	-4
5/22/94	1430	H_2O	HOBBS DECON	1/l			ACIDIFY	-6
5/22/94	1110	H_2O	MW-9	1/l			ACIDIFY	-5

ANALYSIS REQUEST

BTEX (Method 602/8020)	BTEX + MTBE (602/8020)	TPH Method 8015 MOD (Gas/Diesel)	BTEX + TPH + MTBE (Gasoline Only)	BTEX + MTBE + TPH (Gas + Diesel)	TPH (Method 418.1)	601/602 Volatiles	EDB (Method 504.1)	EDC	610 (PNA or PAH)				Air Bubbles or Headspace (Y or N)
X		X				X			X				N
									X				Y
X		X				X							N
			GASONLY						X				Y
X													N
X			X										N
									X				Y
X		X				X							N
X		X											N
									X				Y
									X				Y
									X				Y

Date	Time	Relinquished By: (Signature)	Received By: (Signature)
5/23/94	1209	Clarena Pizzini	Scott Hall
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)

Remarks:

CHAIN-OF-CUSTODY RECORD

HALL ENVIRONMENTAL ANALYSIS LABORATORY
2403 San Mateo NE, Suite P-13
Albuquerque, New Mexico 87110
505.880.1803

Client: DANIEL B. STEPHENS & ASSOC.
Project Name: ENRON HOBBS
Address: 6020 ACADEMY NE #100 ALBUQUERQUE NM 87109
Project #: 3260
Project Manager: BOB MARLEY
Phone #: 505-822-9400
Sampler: BM/CP
Fax #:
Samples Cold? ☒ Yes ☐ No

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative $HgCl_2$	Preservative HCl	Preservative Other	HEAL No.
5/21/94	1420	H_2O	TRIP BLANK	1/40mL	X			94:3072-1
5/22/94	1430	H_2O	MW-1	5/40mL	X			-2
5/22/94	1430	H_2O	MW-1	1/L	X			-2

ANALYSIS REQUEST

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative $HgCl_2$	Preservative HCl	Preservative Other	HEAL No.	BTEX (Method 602/8020)	BTEX + MTBE (602/8020)	TPH Method 8015 MOD (Gas/Diesel)	BTEX + TPH + MTBE (Gasoline Only)	BTEX + MTBE + TPH (Gas + Diesel)	TPH (Method 418.1)	601/602 Volatiles	EDB (Method 504.1)	EDC	610 (PNA or PAH)				Air Bubbles or Headspace (Y or N)
5/21/94	1420	H_2O	TRIP BLANK	1/40mL	X			94:3072-1	X		X				X							N
5/22/94	1430	H_2O	MW-1	5/40mL	X			-2	X		X				X							N
5/22/94	1430	H_2O	MW-1	1/L	X			-2										X				~~N~~

Date	Time	Relinquished By: (Signature)	Received By: (Signature)
5/23/94	1209	Chavara Pegnin	
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)

Remarks:

Inorganic Analysis

RECEIVED JUN 2 2 1994

Analytical **Technologies,** Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **406335**

June 21, 1994

Daniel B. Stephens & Associates
6020 Academy, NE - Suite 100
Albuquerque, NM 87109

Project Name/Number: ENRON-HOBBS 3260

Attention: Robert Marley

On **05/18/94**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Due to laboratory error, samples received under ATI accession #405380 were not analyzed for RCRA metals. The samples were reaccessioned as ATI #406335 and analyzed for RCRA metals.

All analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letitia Krakowski, Ph.D.
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jd

Enclosure

Analytical Technologies, Inc.

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON-HOBBS

DATE RECEIVED : 05/18/94
REPORT DATE : 06/21/94

ATI I.D. : 406335

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	SB-1	AQUEOUS	05/17/94
02	SB-2	AQUEOUS	05/16/94
03	SB-3	AQUEOUS	05/17/94
04	SB-4	AQUEOUS	05/18/94
05	SB-5	AQUEOUS	05/18/94

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	5

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 406335

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON-HOBBS

DATE RECEIVED : 05/18/94
REPORT DATE : 06/21/94

PARAMETER	UNITS	01	02	03	04	05
SILVER (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010	<0.010	<0.010
ARSENIC (EPA 206.2/7060)	MG/L	0.050	0.026	0.029	0.041	<0.005
BARIUM (EPA 200.7/6010)	MG/L	1.94	0.645	0.516	2.26	0.095
CADMIUM (EPA 213.2/7131)	MG/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
CHROMIUM (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010	<0.010	<0.010
MERCURY (EPA 245.1/7470)	MG/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
LEAD (EPA 239.2/7421)	MG/L	<0.002	<0.002	<0.002	<0.002	<0.002
SELENIUM (EPA 270.2/7740)	MG/L	<0.005	<0.005	<0.005	<0.005	<0.005

Analytical Technologies, Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 5/18/94 PAGE 1 OF 1

LAB # 405380

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER: Bob Murley

COMPANY: Daniel B. Stephens & Assoc.
ADDRESS: 6020 Academy NE Suite 100
Albuq. NM 87109
PHONE: 822 9400
FAX: 822 8877

BILL TO: Aktar Alvi
COMPANY: ENRON Corp
ADDRESS: 1400 Smith St
Houston, TX

SAMPLE ID	DATE	TIME	MATRIX	LAB ID
SB-1	5/17/94	1035	H_2O	01
SB-2	5/16/94	1648	H_2O	02
SB-3	5/17/94	1230	H_2O	03
SB-4	5/18/94	0905	H_2O	04
SB-5	5/18/94	1025	H_2O	05

ANALYSIS REQUEST

Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)			Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.			Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)		SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
																Cl, SO4, T-Alk, TDS					NO2/NO3	Cu, Fe, Mg, Mn, Ca, Na, K				
																X					X	X		X			3
																X					X	X		X			3
																X					X	X		X			3
																X					X	X		X			3
																X					X	X		X			3

PROJECT INFORMATION

PROJ. NO.: 3260
PROJ. NAME: ENRON - Hobbs
P.O. NO.:
SHIPPED VIA: Mesa Airlines

SAMPLE RECEIPT

NO. CONTAINERS	5
CUSTODY SEALS	Y / N / (NA)
RECEIVED INTACT	Y
RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐ 2 WEEK

Comments:
Metals were filtered in the field for each sample
*C.o.C. seal intact on outside of cooler.

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Bob Murley Time: 1200	Signature: Mesa Air BM Time:	Signature: Time:
Printed Name: Bob Murley Date: 5/18/94	Printed Name: Date:	Printed Name: Date:
Company: DBSA Phone: 822 9400	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Mesa Airlines Time:	Signature: Time:	Signature: Time: 1700
Printed Name: Date:	Printed Name: Date:	Printed Name: Terri Dotre Date: 5/18/94
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 • Portland (503) 684-0447 • Albuquerque (505) 344-3777 DISTRIBUTION: White, Canary - ATI • Pink - ORIGINATOR

Chain of Custody

DATE 5/19/94 PAGE 1 OF 1

NETWORK PROJECT MANAGER: BETH PROFFITT

COMPANY: Analytical Technologies, Inc.

ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER: D Hall

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)	SO_4, Alk, TDS	632/632 MOD	619/619 MOD	610/8310	NO3 / NO3	Cu, Fe, Mn, Ca, Na, K	8240 (TCLP 1311) ZHE	Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)	NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM	GROSS ALPHA/BETA	RADIUM 226/228	AIR - O_2, CO_2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
405380-1	5/17/94	1035	AQ	1						X			X	X	Y													3
-2	5/16/94	1648		2						X			X	X	X													3
-3	5/17/94	1230		3						X			X	X	X													3
-4	5/18/94	0905		4						X			X	X	Y													3
-5	5/18/94	1025		5						X			X	X	Y													3

PROJECT INFORMATION

PROJECT NUMBER: 405380
PROJECT NAME: UBS
QC LEVEL: STD. IV
QC REQUIRED: MS MSD BLANK
TAT: STANDARD RUSHI

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS	15
CHAIN OF CUSTODY SEALS	NA
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	405380

DUE DATE: 6/2/94
RUSH SURCHARGE:
CLIENT DISCOUNT: 10 %

W.O. #14764

SAMPLES SENT TO:
SAN DIEGO
FT. COLLINS
RENTON
PENSACOLA
PHOENIX X
BARRINGER
FIBERQUANT

RELINQUISHED BY: 1.
Signature: Time: 1730
Printed Name: Teri Dolle Date 5/19/94
Analytical Technologies, Inc. Albuquerque

RECEIVED BY: (LAB) 1.
Signature: Time:
Printed Name: Date:
Company:

RELINQUISHED BY: 2.
Signature: Time:
Printed Name: Date
Company:

RECEIVED BY: (LAB) 2.
Signature: Time: 10:02
Printed Name: Date: AL FORTNER 5-20-94
Company: ATI

RECEIVED JUN 10 1994

Analytical Technologies, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **405380**

June 9, 1994

Daniel B. Stephens & Associates
6020 Academy NE, Suite 100
Albuquerque, NM 87109

Project Name/Number: 3260 ENRON-HOBBS

Attention: Bob Marley

On **05/18/94**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Zinc analysis was added on 05/25/94 for all samples per Bob Marley.

This report is incomplete. Due to laboratory error, the RCRA metals were not analyzed at the same time as the other parameters. The RCRA metals analyses will be performed on the original sample submitted to the laboratory on 05/18/94. The subsequent data will be reported in a separate report (ATI ID 406335). We apologize for any inconvience.

All analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letitia Krakowski, Ph.D.
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jd

Enclosure

Analytical Technologies, Inc.

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON-HOBBS

DATE RECEIVED : 05/18/94
REPORT DATE : 06/09/94

ATI I.D. : 405380

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	SB-1	AQUEOUS	05/17/94
02	SB-2	AQUEOUS	05/16/94
03	SB-3	AQUEOUS	05/17/94
04	SB-4	AQUEOUS	05/18/94
05	SB-5	AQUEOUS	05/18/94

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	5

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 405380

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON-HOBBS

DATE RECEIVED : 05/18/94
REPORT DATE : 06/09/94

PARAMETER	UNITS	01	02	03	04	05
CARBONATE (CACO3)	MG/L	<1	<1	<1	<1	<1
BICARBONATE (CACO3)	MG/L	644	779	675	675	220
HYDROXIDE (CACO3)	MG/L	<1	<1	<1	<1	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	644	779	675	675	220
CHLORIDE (EPA 325.2)	MG/L	80	120	670	62	150
NO2/NO3-N, TOTAL (353.2)	MG/L	<0.06	<0.06	0.22	<0.06	4.3
SULFATE (EPA 300.0)	MG/L	15	23	120	18	100
T. DISSOLVED SOLIDS (160.1)	MG/L	840	1100	2000	890	690

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 405380

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON-HOBBS

DATE RECEIVED : 05/18/94
REPORT DATE : 06/09/94

PARAMETER	UNITS	01	02	03	04	05
CALCIUM (EPA 200.7/6010)	MG/L	125	139	187	156	128
COPPER (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010	<0.010	<0.010
IRON (EPA 200.7/6010)	MG/L	0.215	0.035	2.42	5.65	<0.020
POTASSIUM (EPA 200.7/6010)	MG/L	2.2	26.9	3.1	4.2	3.2
MAGNESIUM (EPA 200.7/6010)	MG/L	66.5	70.4	107	42.4	23.1
MANGANESE (EPA 200.7/6010)	MG/L	0.140	0.102	0.976	0.216	<0.010
SODIUM (EPA 200.7/6010)	MG/L	89.9	131	372	100	69.4
ZINC (EPA 200.7/6010)	MG/L	0.450	1.14	0.394	3.63	0.661

Analytical Technologies, Inc., Albuquerque, NM

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CHAIN OF CUSTODY

DATE: 5/18/94 PAGE 1 OF 1

ATI LAB I.D.: 405380

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER: Bob Murley

COMPANY: Daniel B. Stephens & Assoc.
ADDRESS: 6020 Academy NE Suite 100
Albuq. NM 87109
PHONE: 822 9400.
FAX: 822 8877

BILL TO: Akhtar Alvi
COMPANY: ENRON Corp
ADDRESS: 1400 Smith St
Houston, TX

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)			Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.			Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)		Cl, SO4, T-Alk, TDS	SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal	NO2/NO3	Cu, Fe, Mg, Mn, Ca, Na, K	The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
SB-1	5/17/94	1035	H_2O	01																		X					X	X		X			3
SB-2	5/16/94	1648	H_2O	02																		X					X	X		X			3
SB-3	5/17/94	1230	H_2O	03																		X					X	X		X			3
SB-4	5/18/94	0905	H_2O	04																		X					X	X		X			3
SB-5	5/18/94	1025	H_2O	05																		X					X	X		X			3

PROJECT INFORMATION

PROJ. NO.: 3260
PROJ. NAME: ENRON - Hobbs
P.O. NO.:
SHIPPED VIA: Mesa Airlines

SAMPLE RECEIPT

NO. CONTAINERS	15
CUSTODY SEALS	Y / N / (NA)
RECEIVED INTACT	Y
RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐ 2 WEEK

Comments:
Metals were filtered in the field for each sample
*C.o.C. seal intact on outside of cooler.

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Bob Murley Time: 1200	Signature: Mesa Airlines Time: BM	Signature: Time:
Printed Name: Bob Murley Date: 5/18/94	Printed Name: Date:	Printed Name: Date:
Company: DBSA Phone: 822 9400	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY:(LAB) 3.**
Signature: Mesa Airlines Time:	Signature: Time:	Signature: Time: 1700
Printed Name: Date:	Printed Name: Date:	Printed Name: Date: 5/18/94
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 • Portland (503) 684-0447 • Albuquerque (505) 344-3777 DISTRIBUTION: White, Canary - ATI • Pink - ORIGINATOR

Analytical Technologies, Inc. Albuquerque, NM

Chain of Custody

DATE 5/19/94 PAGE 1 OF 1

NETWORK PROJECT MANAGER: BETH PROFFITT

COMPANY: **Analytical Technologies, Inc.**

ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER: D Yarbrough

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)	Cl, SO4, Alk, TDS	632/632 MOD	619/619 MOD	610/8310	NO3 / NO2	Cu, Fe, Mn, Ca, Na, K	8240 /TCLP 1311 ZHE	Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)	NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM	GROSS ALPHA/BETA	RADIUM 226/228	AIR - O2, CO2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
405380-1	5/17/94	1035	WW	1						X				X	X													1
-2	5/16/94	1648		2						X				X	X													1
-3	5/17/94	1230		3						X				X	X													1
-4	5/18/94	0905		4						X				X	X													1
-5	5/18/94	1025		5						X				X	X													1

PROJECT INFORMATION	
PROJECT NUMBER:	405.380
PROJECT NAME:	DBS
QC LEVEL:	STD. IV
QC REQUIRED:	MS MSD BLANK
TAT:	STANDARD RUSH!

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	15
CHAIN OF CUSTODY SEALS	N/A
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	405380

DUE DATE: 6/2/94
RUSH SURCHARGE:
CLIENT DISCOUNT: 10 %

W.O. #42764

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	
PHOENIX	X
BARRINGER	
FIBERQUANT	

RELINQUISHED BY: 1.	
Signature:	Time: 1730
Printed Name: Terri Lotthe	Date 5/18/94
Company: Analytical Technologies, Inc. Albuquerque	

RECEIVED BY: (LAB) 1.	
Signature:	Time:
Printed Name:	Date:
Company:	

RELINQUISHED BY: 2.	
Signature:	Time:
Printed Name:	Date
Company:	

RECEIVED BY: (LAB) 2.	
Signature: Al Fortner	Time: 10:02
Printed Name: AL FORTNER	Date: 5-20-94
Company: ATI	

RECEIVED JUN 15 1994

Analytical **Technologies,** Inc.

2709-D Pan American Freeway. NE Albuquerque. NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. 405393

June 14, 1994

Daniel B. Stephens & Assoc.
6020 Academy, NE #100
Albuquerque, NM 87109

Project Name/Number: 3260 ENRON HOBBS

Attention: Bob Marley

On **05/21/94**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Zinc analysis was added on 05/25/94 for samples EOTT-1, MW-2, SB-6 and EOTT-2.

Sulfate, Total Dissolved Solids, Alkalinity and Chloride analyses were added on 05/23/94 for all samples per Bob Marley.

RCRA metals analyses were cancelled on 05/23/94 for sample EOTT-3 AND EOTT-4 per Bob Marley.

All analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Létitia Krakowski, Ph.D.
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jd

Enclosure

Analytical Technologies, Inc.

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON-HOBBS

DATE RECEIVED : 05/20/94
REPORT DATE : 06/14/94

ATI I.D. : 405393

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	EOTT-1	AQUEOUS	05/18/94
02	MW-2	AQUEOUS	05/19/94
03	SB-6	AQUEOUS	05/19/94
04	EOTT-2	AQUEOUS	05/19/94
05	EOTT-3	AQUEOUS	05/20/94
06	EOTT-4	AQUEOUS	05/20/94

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	6

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 405393

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON-HOBBS

DATE RECEIVED : 05/20/94
REPORT DATE : 06/14/94

PARAMETER	UNITS	01	02	03	04	05
CARBONATE (CACO3)	MG/L	<1	<1	<1	<1	<1
BICARBONATE (CACO3)	MG/L	284	194	610	399	550
HYDROXIDE (CACO3)	MG/L	<1	<1	<1	<1	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	284	194	610	399	550
CHLORIDE (EPA 325.2)	MG/L	130	300	400	80	47
NO2/NO3-N, TOTAL (353.2)	MG/L	5.3	3.7	<0.06	2.1	<0.06
SULFATE (EPA 300.0)	MG/L	100	290	12.9	63	56
TOTAL DISSOLVED SOLIDS (160.1)	MG/L	770	1100	1400	680	760

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

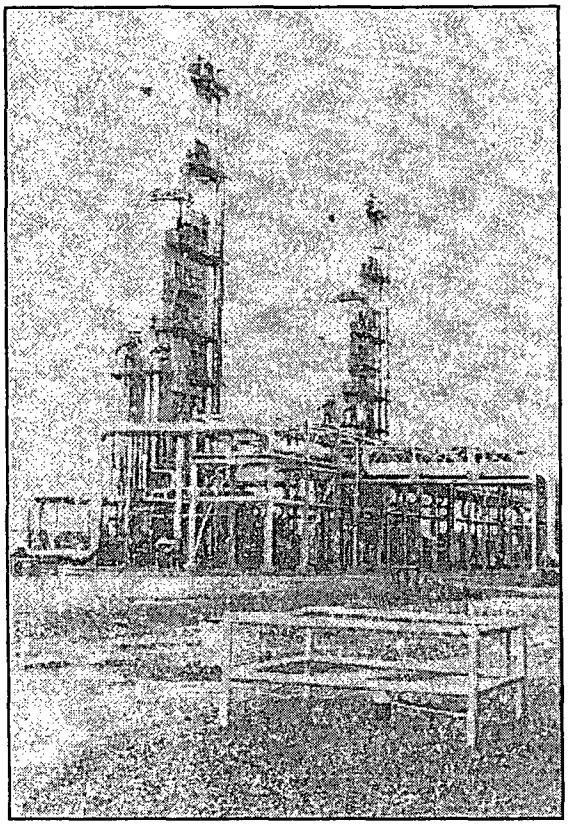
ATI I.D. : 405393

CLIENT : D.B. STEPHENS & ASSOCIATES
PROJECT # : 3260
PROJECT NAME : ENRON-HOBBS

DATE RECEIVED : 05/20/94
REPORT DATE : 06/14/94

PARAMETER	UNITS	06
CARBONATE (CACO3)	MG/L	<1
BICARBONATE (CACO3)	MG/L	271
HYDROXIDE (CACO3)	MG/L	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	271
CHLORIDE (EPA 325.2)	MG/L	97
NO2/NO3-N, TOTAL (353.2)	MG/L	1.90
SULFATE (EPA 300.0)	MG/L	100
T. DISSOLVED SOLIDS (160.1)	MG/L	660

EVALUATION OF GROUNDWATER CONTAMINATION AT THE HOBBS GAS PLANT AND HOBBS COMPRESSOR STATION NO. 2



Prepared for:

ENRON

MR. BILL KENDRICK
ENRON
1400 SMITH STREET
HOUSTON, TX 77002

March 9, 1994

Submitted By:

GCL
Environmental Science and Engineering
A BDM International Company
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102
(505) 842-0001

TECHNICAL REPORT

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY 1

2.0 INTRODUCTION 2
2.1 Description of Facilities and Contaminant Sources 2
2.2 Goals and Objectives 2
2.3 Hydrogeologic Setting 2

3.0 GROUNDWATER CONTAMINATION 8
3.1 Subsurface Assessment: Main Hobbs Gas Plant 8
3.2 Subsurface Assessment: Compressor Station No. 2 8
3.3 Fate and Transport of Contaminants 8
3.4 Limited Pathway/Risk Assessment 12

List of Tables, Figures, and Appendices

Figures

Figure 1 — ENRON Hobbs Gas Plant 3
Figure 2 — Geologic Map 4
Figure 3 — Water Elevation Contour Map 7
Figure 4 — BTEX Contamination Plumes at ENRON Gas Processing Plant 10
Figure 5 — Estimated BTEX Contamination Plume at Hobbs No. 2 Gathering Station 11

Tables

Table 1 — Downgradient and Cross-Gradient Well Inventory 6
Table 2 — Summary of Contamination Detected in February 7, 1994 Investigation 9

Appendices

Appendix A — Lithologic Logs and Monitoring Well Completion Diagrams
Appendix B — Analytical Reports

Section 1.0

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1.0 EXECUTIVE SUMMARY

GCL was retained by ENRON Operations Corporation (ENRON) to address groundwater contamination at certain ENRON properties scheduled for acquisition by GPM Corporation. GCL reviewed several investigative reports, interviewed employees, performed a site inspection, and drilled three wells at the Hobbs Gas Plant and two wells at the Hobbs Compressor Station No. 2.

Utilizing the subsurface data collected from our work, our knowledge of existing and proposed state regulations, and the environmental and demographic setting of the site, GCL has reached the following conclusions and opinions regarding contamination at the facilities involved with this sale:

- Groundwater contamination is documented at two locations at the Hobbs Gas Plant. No evidence exists to lead us to believe that these plumes extend beyond the property boundary. One plume emanates from the former flare pit/oil-water separator area. The second plume most likely originates from the condensate storage tanks.

- Groundwater contamination is documented at the Hobbs Compressor Station No. 2. The source of this contamination appears to be the condensate storage tanks. The plume emanating from this area may have impacted groundwater quality beneath adjacent property.

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Section 2.0

2.0 INTRODUCTION

The main purpose of this report is the general quantification of groundwater contamination at certain ENRON properties scheduled to be acquired by GPM Corporation. In the first phase of our study, GCL reviewed several site investigation reports for the gas plant and compressor stations, interviewed ENRON employees, and conducted a site visit of the gas plant.

Based upon this first phase of our investigation, GCL identified two facilities that required additional investigation. These were the Hobbs Gas Plant and Hobbs Compressor Station No. 2. A second phase of the investigation at these sites consisted of installing two permanent monitor wells at the compressor station, one permanent monitor well at the gas plant, and two exploratory temporary wells at the gas plant.

After receipt of groundwater analysis from the compressor station (February 13, 1994), GCL concluded that the observed contamination from the Hobbs Compressor Station No. 2 resulted from reported overflows of the condensate storage tank.

This report addresses only the Hobbs Gas Plant and Hobbs Compressor Station No 2.

2.1 DESCRIPTION OF FACILITIES AND CONTAMINANT SOURCES

The facilities addressed in this report are the Hobbs Gas Plant and Hobbs Compressor Station No. 2. The Hobbs Gas Plant is located west of Hobbs, New Mexico, on the Carlsbad Highway. It occupies approximately 60 acres of land, which is comprised of vacant land, natural gas processing plant equipment, waste management facilities, liquids and gas storage tanks, and office and maintenance buildings. The plant location and layout are displayed in Figure 1. The street address is 11525 West Carlsbad Highway, Hobbs, New Mexico.

The Hobbs Compressor Station is located near Monument, New Mexico, as shown on Figure 1.

2.2 GOALS AND OBJECTIVES

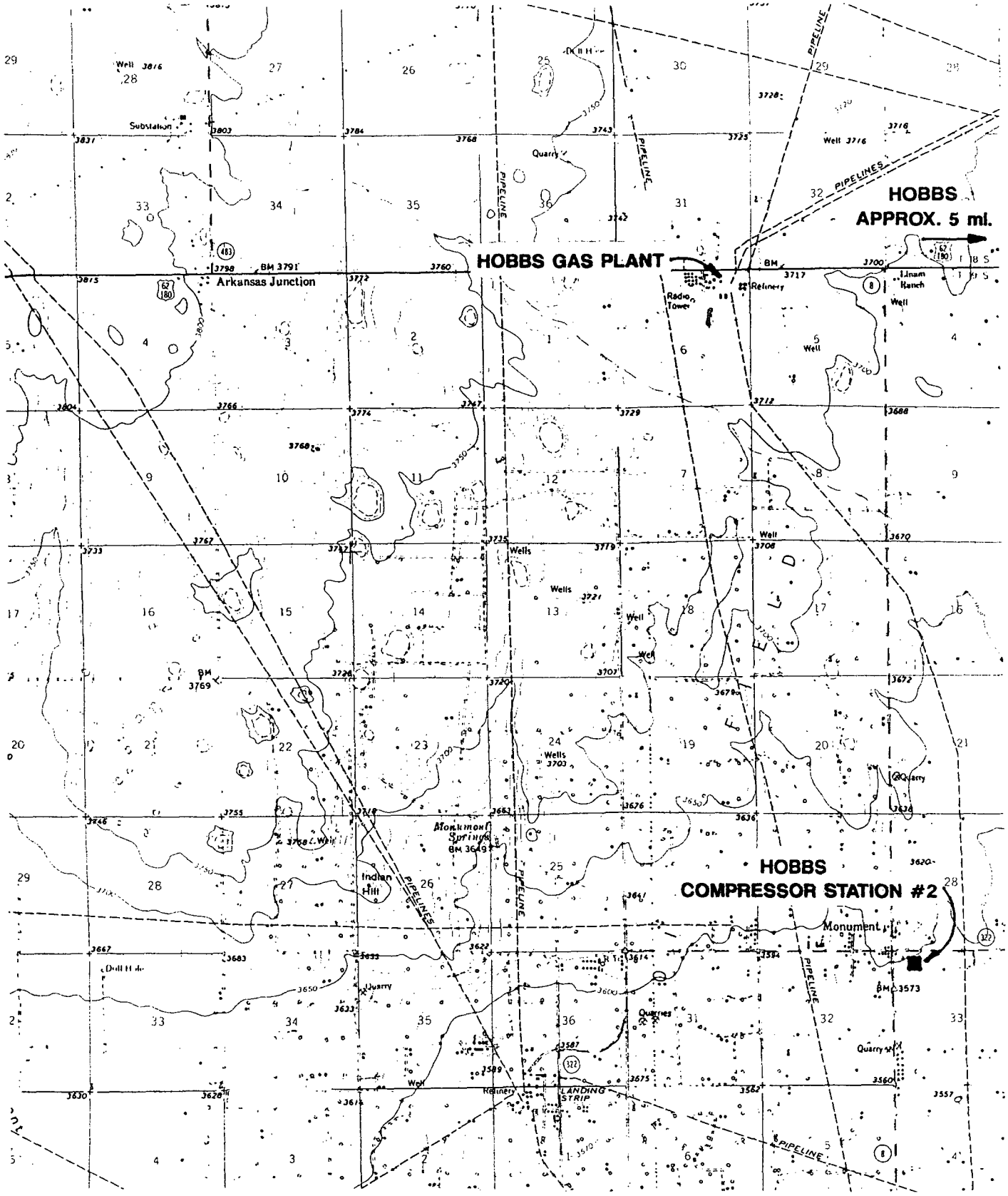
Groundwater contamination issues at the Hobbs Gas Plant and Hobbs Compressor Station No. 2 must be evaluated prior to finalization of ENRON's sale of these facilities to GPM. The primary goal of this project is to evaluate the potential extent of existing groundwater contamination at these sites.

To accomplish this primary goal, the following objectives must be realized:

- Determination or estimation of the magnitude and extent of groundwater contamination
- Prediction of the fate and transport mechanisms of identified contaminants
- Identification of potential receptors and any other threats to human health and the environment resulting from the contamination.

2.3 HYDROGEOLOGIC SETTING

ENRON's main processing plant is located at 11525 West Carlsbad Highway, approximately eight miles west of Hobbs, New Mexico. The plant overlies the late Tertiary Age Ogallala Formation (Figure 2). The Ogallala Formation unconformably overlies the Triassic Age Dockum Group. The Ogallala is erosionally truncated against the underlying Cretaceous and Triassic rocks in the northern and western part of Lea County and increases in thickness near Mescalero Ridge (Ash, 1963). The Dockum Group ranges in thickness from 1,400 to 2,100 feet in northern Lea County (Ash, 1963).

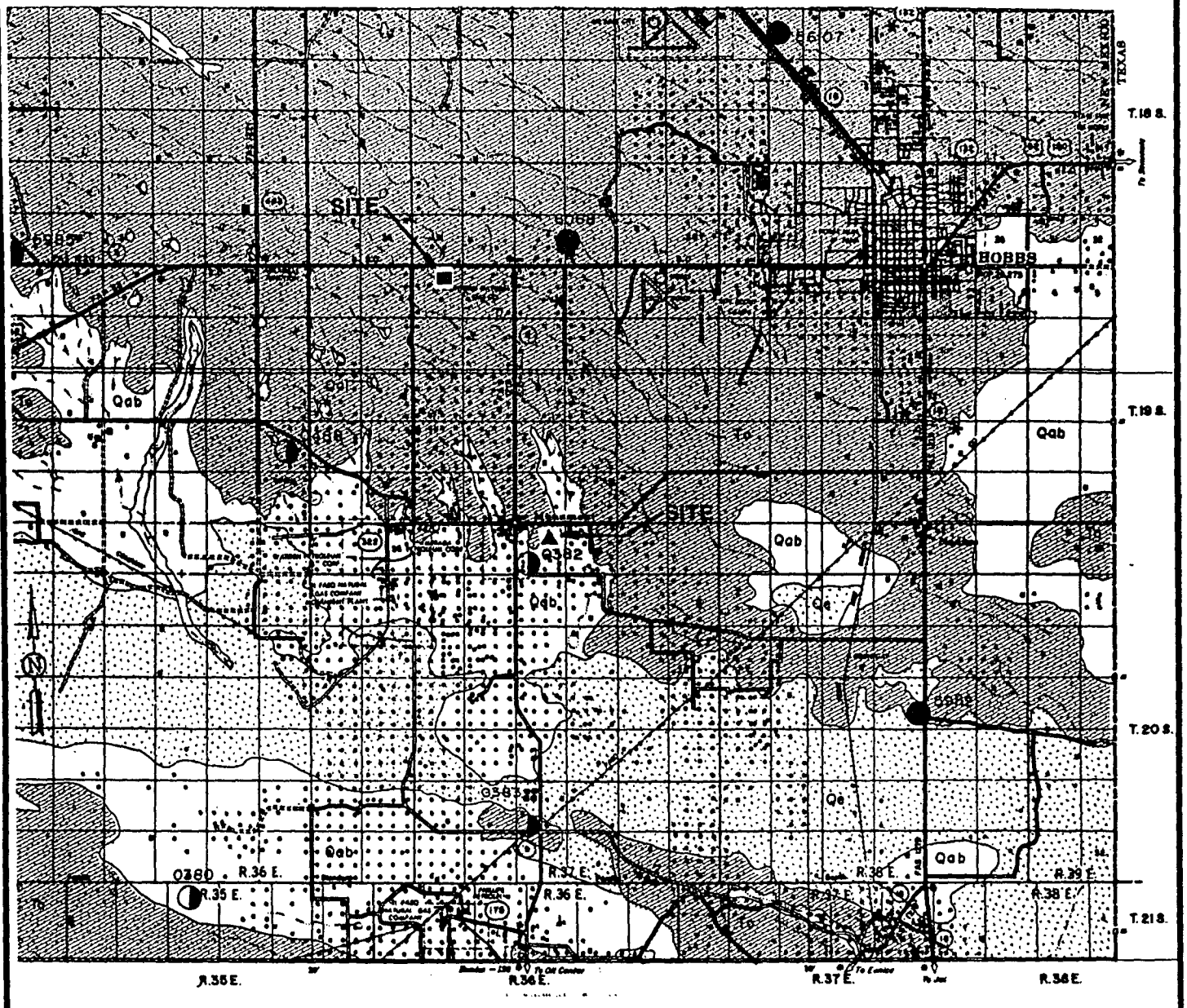


(MONUMENT QUADRANGLE) N.M. – LEA CO. 15 MINUTES SERIES TOPO

GCL

CLIENT: ENRON – HOBBS	
DATE: 2/16/94	REV. NO.: 0
AUTHOR: M.G.	DRAWN BY: HCC
CK'D BY: M.G.	FILE:

FIGURE 1
ENRON HOBBS GAS PLANT
LOCATION MAP



EXPLANATION

QUATERNARY

- **Qal** — Alluvium: Sand, silt and clay
- **Qe** — Eolian deposits: Wind-blown sand, active or recently active dune areas
- **Qab** — Alluvial and bolson deposits: Sand, silt and clay with local deposits of soft to nodular caliche and relatively well-stabilized, non-dunal sand
- **Qc** — Caliche: Medium to well-indurated, nodular caliche; locally having a well-cemented, laminar caprock

TERTIARY

- **To** — Ogallala Formation: Usually exposed, well-indurated, laminated, often brecciated caliche caprock that grades downward into nodular caliche overlying soft sandstone, clay and cemented gravel

- Developed pit or quarry
- Prospect pit or quarry
- Selected exploration sites and local rock outcrops
- Enron Gas Processing Plant Main Facility
- Enron Gas Processing Plant Compressor Station No. 2

Scale 1/63360 or 1 Inch = 1 Mile

1963

REFERENCE FROM NEW MEXICO HIGHWAY DEPT. GEOLOGY & AGGREGATE RESOURCES DIST. II 1972

GCL

CLIENT: ENRON – HOBBS	
DATE: 2/16/94	REV. NO.: 0
AUTHOR: R.C.	DRAWN BY: HCC
CK'D BY: R.C.	FILE:

FIGURE 2
GEOLOGIC MAP

The thickness of the Ogallala Formation beneath the plant site was determined from lithologic logs of Northern Natural Gas Company wells installed at the main plant that extend through the Ogallala. The Ogallala is approximately 160 to 170 feet thick and comprised chiefly of calcareous sands, silts, clays, and gravels. Sediments near the surface of the Ogallala are cemented with calcium carbonate to form a caliche cap rock (McAda, 1984). Cementation is present within the formation, but generally decreases with depth (Nye, 1932) becoming negligible at depths greater than 35 to 50 feet below the surface (Ash, 1963).

The Hobbs Compressor Station No. 2 is located approximately 5.2 miles south-southwest of the main plant. The compressor station also overlies the Ogallala Formation at this location, but is bordered by Quaternary alluvial deposits (Figure 2).

Site-specific lithologic logs for monitoring well MW-8 and temporary drive point wells DP-1 and DP-2 at the main processing plant and monitoring wells MW-1 and MW-2 at the Compressor Station No. 2 are included in Appendix A.

The Ogallala Formation is the principal aquifer in the High Plains in Lea County. Quaternary alluvium deposits present near Monument are hydraulically connected to the Ogallala Formation (Nicholson and Clebsch, 1961). All surrounding wells in the area are completed in the Ogallala aquifer. A list of surrounding wells within a one-mile downgradient and eastern cross-gradient radius of the Hobbs Gas Plant are listed in Table 1. One windmill in Section 33 and one windmill in Section 34 of Township 19S Range 37E are within a one-mile downgradient and cross-gradient radius of the Hobbs Compressor Station No. 2, respectively. These wells are identified using the Hobbs SW Quadrangle Map Photorevised 1979, and are not listed in Table 1.

Recharge to the Ogallala aquifer occurs from precipitation falling on the High Plains surface. Discharge from the Ogallala aquifer occurs through pumpage and surface flow. The general direction of groundwater flow in the aquifer is southeastward. The largest amount of discharge is the subsurface flow moving into Texas. A small amount of the groundwater discharges through the Quaternary alluvial to the southern part of Lea County (Nicholson and Clebsch, 1961).

The hydraulic conductivity and specific yield for the Ogallala aquifer in Lea County were calculated from aquifer tests and drillers logs described in McAda, 1984. The Ogallala aquifer in Lea County has an average hydraulic conductivity of 40 feet per day. The hydraulic conductivity and specific yield was estimated in the area of the plant and compressor station from maps included in the McAda (1984) report. The hydraulic conductivity in these areas is between 26 and 50 feet per day. The specific yield is 0.23 (McAda, 1984).

Groundwater at the Hobbs Gas Plant flows south-southeast as shown in Figure 3. Only two monitoring wells were installed at the Hobbs Compressor Station No. 2, and the groundwater could not be contoured from site data. The groundwater flow direction for the compressor station is presumed to be the same as the regional flow direction, which is to the southeast.

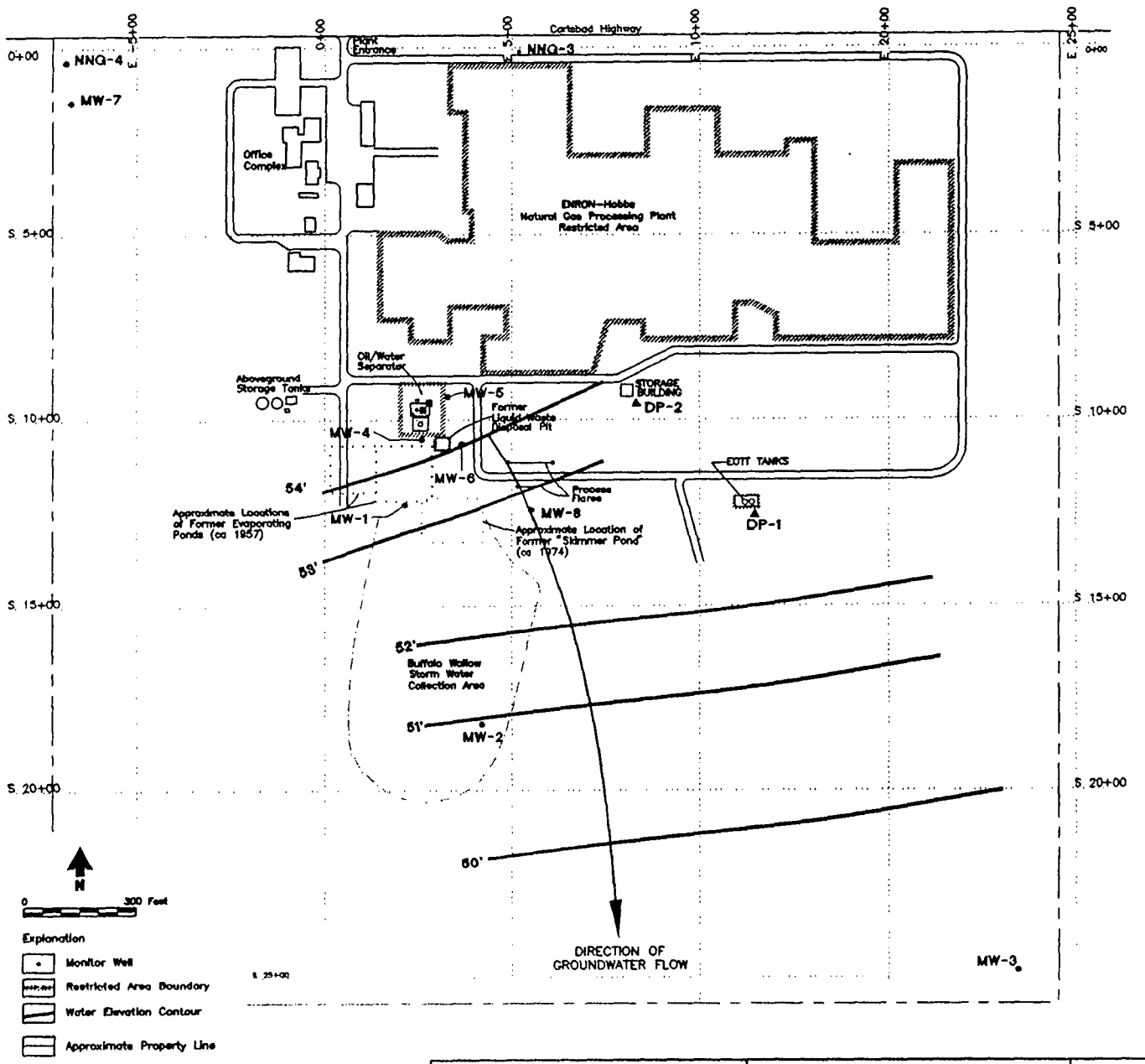
Table 1—Downgradient and Cross-Gradient Well Inventory

(Modified from D.B. Stephens Letter Report, December 7, 1989)

Site No.	Location	Owner	Depth to Water (ft)	Date Measured	Depth of Hole (ft)	Land Surface Elevation (ft > MSL)	Water Surface Elevation (ft > MSL)	Contrib Aquifer	Use	Source	Screened Interval (ft)
1	19S 37E 04.113	Mrs. V. Linam	28.26	02/26/86	127	3692	3664	OGLL	DOM	USGS	67-127
2	19S 37E 04.113	Mrs. V. Linam			NA			OGLL	IRR		NA
3	19S 37E 04.213	E. W. Cox	38.94	02/26/86	137	3700	3661	OGLL	STK	USGS	117-137
4	19S 37E 04.231	E. W. Cox	35.00	02/11/76	NA	3695	3660	OGLL	STK	USGS	90-166
5	19S 37E 04.333	Cities Service Oil	34.72	01/15/81	50	3690	3655	OGLL	OWD	USGS	25-45
6	19S 37E 04.412	E. W. Cox	20.26	06/10/76	NA	3672	3652	OGLL	DOM	USGS	Not Cased
7	19S 37E 05.321	Mrs. V. Linam	38.93	01/08/86	128	3707	3668	OGLL	IRR	USGS	63-123
8	19S 37E 06.112	Northern Nat. #5	47.50	09/21/89	NA	3731	3683	OGLL	COM	FIELD	NA
9	19S 37E 06.211	Northern Nat. #4	43.58	09/21/89	173	3727	3683	OGLL	COM	FIELD	
10	19S 37E 06.212	Northern Nat. #3	53.82	01/12/86	177	3726	3672	OGLL	COM	USGS	123-173
			39.73	01/21/89		3726	3686	OGLL	COM	FIELD	
11	19S 37E 06.213	Northern Nat. #1	47.41	09/21/89	173	3727	3680	OGLL	COM	FIELD	133-173
12	19S 37E 07.223	H. Huston	47.55	01/08/86	142	3708	3660	OGLL	NOT	USGS	75-133
13	19S 37E 07.313	Gulf-Warren	58.04	01/15/81	142	3719	3661	OGLL	PPP	USGS	60-142
14	19S 37E 08.112	Famariss	56.42	02/10/76	150	3721	3665	OGLL	PPP	USGS	85-145
15	19S 37E 08.123	NA	56.42	02/10/76	NA	3719	3663	OGLL	NA	USGS	NA
16	19S 37E 08.311	H. Huston	42.89	01/08/86	80	3698	3655	OGLL	STK	USGS	NA
17	19S 37E 08.333	Famariss	56.14	01/08/86	142	3708	3652	OGLL	PPP	USGS	NA
18	19S 37E 08.411	H. Huston	39.11	01/08/86	132	3681	3642	OGLL	IRR	USGS	52-125

Not - Not in Use Probably Abandoned
MSL - Mean Sea Level
NA - Not Available
OGLL - Ogallala
USGS - United States Geologic Survey
COM - Community Commercial
IRR - Irrigation
DOM - Domestic
PPP - Petroleum Processing Plant
STK - Stock
OWD - Oil Well Drilling

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REFERENCE D.B. STEPHENS AS REVISED BY GCL

GCL

CLIENT: ENRON – HOBBS	
DATE: 3/8/94	REV. NO.: 3
AUTHOR:	DRAWN BY: HCC
CK'D BY: R.C.	FILE: LOCATMAP

FIGURE 3
WATER ELEVATION CONTOUR MAP

Section 3.0

3.0 GROUNDWATER CONTAMINATION

BTEX contamination was detected in groundwater beneath the Hobbs Gas Plant. Contamination was detected downgradient of the wastewater treatment facility and condensate storage tanks. During this phase of the investigation, one additional groundwater monitoring well (MW-8) and two temporary drive point wells (DP-1 and DP-2) were installed at the main plant. Two groundwater monitoring wells (MW-1 and MW-2) were installed at the Hobbs Compressor Station No. 2. Groundwater analytical results of volatile and semi-volatile compounds for these wells are in Appendix B and summarized in Table 2. No metals above Water Quality Control Commission (WQCC) standards were detected in groundwater at either site.

3.1 SUBSURFACE ASSESSMENT: MAIN HOBBS GAS PLANT

BTEX contamination downgradient of the former flare pit and existing wastewater treatment facility has been detected in groundwater at monitoring wells MW-1, 4, 5, and 6 and temporary drive point wells SB-4, 6, and 8. The highest level of BTEX contamination was detected in MW-4 at 29,800 parts per billion (ppb). Figure 4 shows the approximate BTEX plume boundaries.

A second BTEX plume was detected in groundwater downgradient of the condensate storage tank area (EOTT Tanks) (Figure 4). BTEX contamination in DP-1 was detected at 3,306 ppb. The exact dimensions of the plume have not been established, but are believed to be no larger than the plume emanating from the flare pit wastewater treatment area.

Groundwater contamination has not been detected in the downgradient monitoring well MW-3, therefore it is believed that the BTEX contamination has not moved off site.

3.2 SUBSURFACE ASSESSMENT: COMPRESSOR STATION NO. 2

BTEX contamination was detected in groundwater downgradient of the condensate storage tanks in MW-1. Total BTEX detected in MW-1 at the compressor station is 789 ppb. No groundwater contamination was detected in the upgradient monitoring well MW-2. However, there were 4 ppb total petroleum hydrocarbon found in this well that may represent background concentrations. The plume at this location is depicted in Figure 5. We believe this plume is no larger than the plume observed at the former flare pit at the gas plant.

3.3 FATE AND TRANSPORT OF CONTAMINANTS

Groundwater contamination at the main plant was created by migration of contaminants through the soil from discharge, spills, or leaks at or near the ground surface. Contamination migrates downward through the soil, spreading laterally due to stratigraphic variations, until groundwater is encountered. The contamination is transported in groundwater chiefly by advection, dispersion, and diffusion. The groundwater contamination is transported downgradient decreasing in concentration as a function of distance from the source due to natural biodegradation, volatilization, and dilution.

We believe soil and groundwater conditions at the Hobbs Compressor Station No. 2 are similar to those at the main plant site. Therefore, it can be presumed that the same transport and degradation mechanisms working at the main plant are present and working at the compressor station.

Table 2—Summary of Contamination Detected in February 7, 1994 Investigation

Main Plant

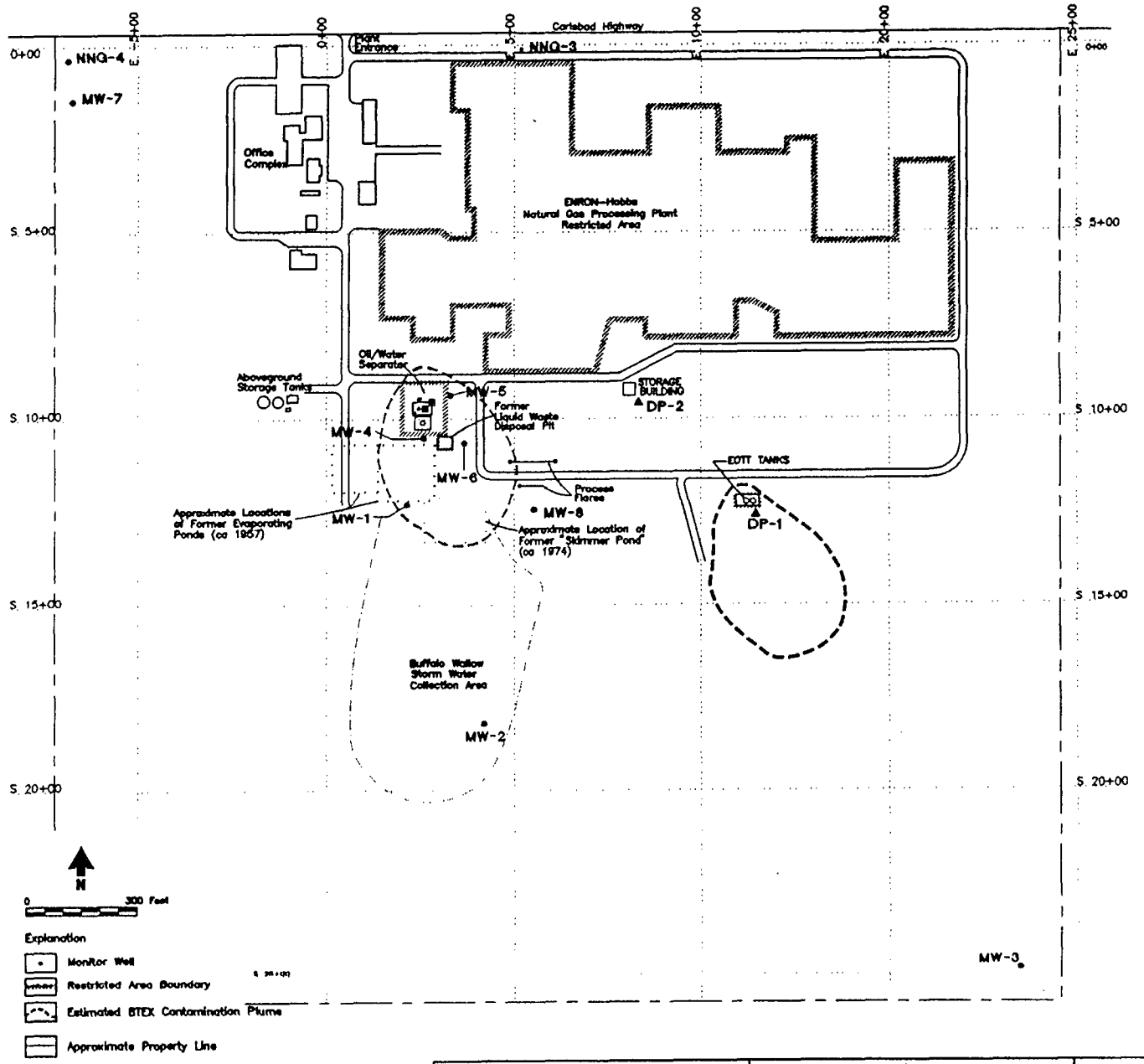
Constituent	Units	Detection Limits (water)	MW-1 (water)	MW-2 (water)	MW-3 (water)	DP-1 (water)	DP-2 (water)	MW-8 (water)	NMWQCC (water)
Volatile Organics (8240)									
Acetone	ug/L	100	ND	ND	ND	980	ND	ND	(n/s)
Benzene	ug/L	50	ND	ND	ND	3300	ND	ND	0.01 (mg/L)
Xylenes - total	ug/L	5	ND	ND	ND	6	ND	ND	0.62 (mg/L)
Base/Neutral/Acids (8270)									
Bis (2-ethylhexyl)phthalate	ug/L	10	12	ND	ND	ND	ND	ND	(n/s)
TPH (I.R.)	mg/L	1	ND	ND	ND	31	12	<1	(n/s)
Metals									
Cadmium, Diss.	mg/L	0.005	(n/a)	(n/a)	(n/a)	(n/a)	<0.005	<0.005	0.05 (mg/L)
Chromium, Diss.	mg/L	0.01	(n/a)	(n/a)	(n/a)	(n/a)	<0.01	<0.01	0.01 (mg/L)
Lead, Diss.	mg/L	0.05	(n/a)	(n/a)	(n/a)	(n/a)	<0.05	<0.05	0.05 (mg/L)
General Chemistry									
pH*			6.87	7.36	7.86	(n/a)	(n/a)	(n/a)	(n/s)
Specific Conductivity*			2230	397	289	1625	1145	1075	(n/s)
Dissolved Oxygen*	mg/L		2.0	2.5	5.75	3.8	4.6	5.6	(n/s)

Compressor Station No. 2

Constituent	Units	Detection Limits (water/soil)	MW-1 (soil)	MW-1 (water)	MW-2 (water)	NMWQCC (water)
Volatile Organics (8240)						
Benzene	(ug/L)(ug/Kg)	5/125	ND	210	ND	0.01 (mg/L)
Ethylbenzene	(ug/L)(ug/Kg)	25/625	4100	200	ND	0.75 (mg/L)
Toluene	(ug/L)(ug/Kg)	5/625	730	49	ND	0.75 (mg/L)
Xylenes - total	(ug/L)(ug/Kg)	5/625	11000	330	ND	0.62 (mg/L)
Base/Neutral/Acids (8270)						
Dibenzofuran	(ug/L)(ug/Kg)	10/330	330	ND	ND	(n/s)
Fluorene	(ug/L)(ug/Kg)	10/330	440	ND	ND	(n/s)
2 - Methylnapthalene	(ug/L)(ug/Kg)	10/330	2600	17	ND	(n/s)
Naphthalene	(ug/L)(ug/Kg)	10/330	1500	12	ND	(n/s)
Phenanthrene	(ug/L)(ug/Kg)	10/330	740	ND	ND	(n/s)
TPH (I.R.)	(mg/L)(mg/Kg)	1/50	2730	12	4	(n/s)
Metals						
Cadmium, Diss.	mg/L	0.005	(n/a)	<0.005	(n/a)	0.05 (mg/L)
Chromium, Diss.	mg/L	0.01	(n/a)	<0.01	(n/a)	0.01 (mg/L)
Lead, Diss.	mg/L	0.05	(n/a)	<0.05	(n/a)	0.05 (mg/L)
General Chemistry						
pH*			(n/a)	7.18	7.64	(n/s)
Specific Conductivity*			(n/a)	962	1386	(n/s)
Dissolved Oxygen*	mgL		(n/a)	2.0	5.0	(n/s)

ND = Not Detected
n/a = Not Analyzed
n/s = No Standard
* = Field Parameters

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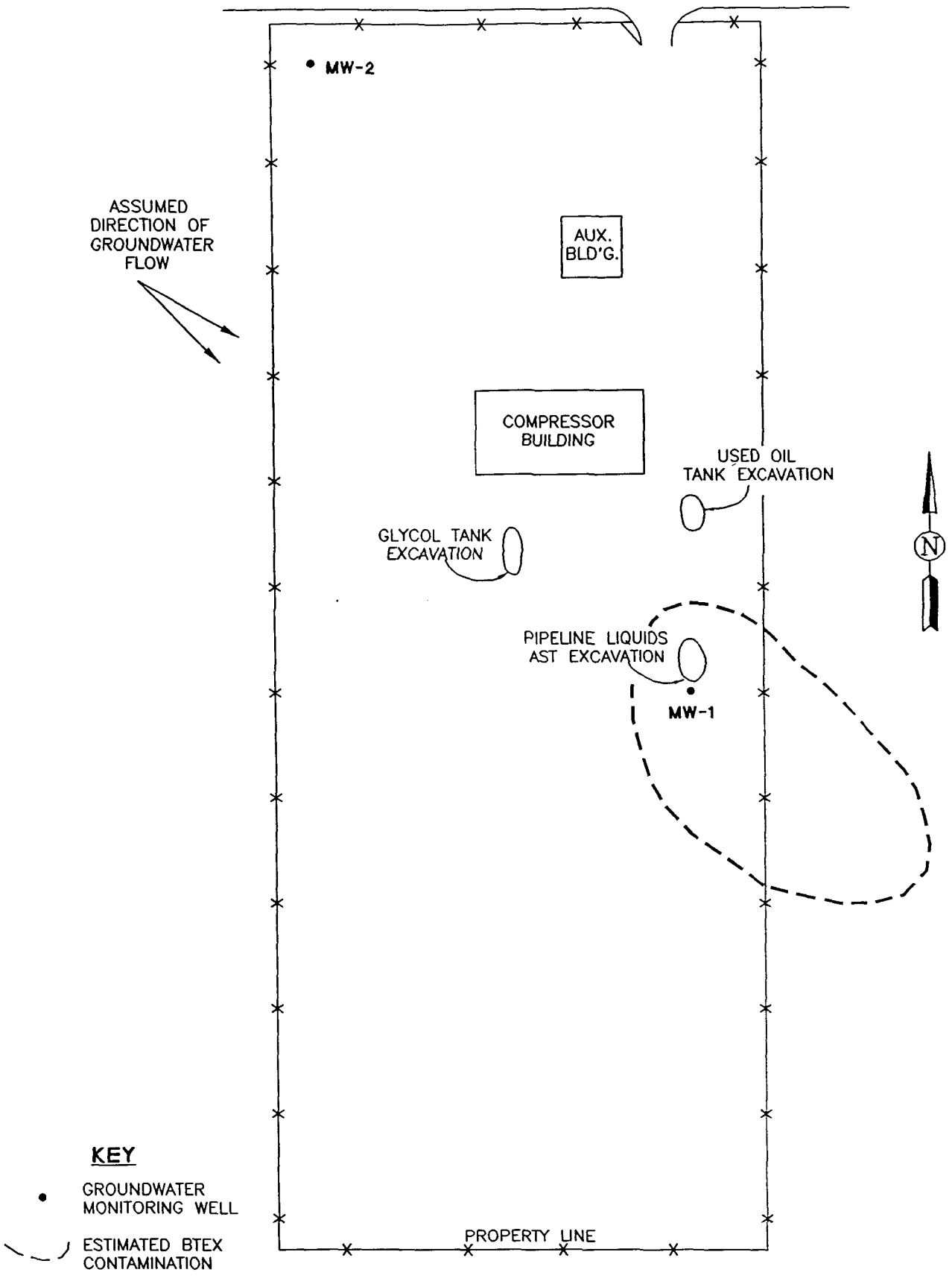


REFERENCE D.B. STEPHENS AS REVISED BY GCL

GCL

CLIENT: ENRON – HOBBS	
DATE: 3/8/94	REV. NO.: 3
AUTHOR:	DRAWN BY: HCC
CK'D BY: R.C.	FILE: LOCATMAP

FIGURE 4
BTEX CONTAMINATION PLUMES AT ENRON GAS PROCESSING PLANT
LOCATION MAP



GCL

CLIENT: ENRON	
DATE: 2/17/94	REV. NO.: 3
AUTHOR: R.J.H.	DRAWN BY: HCC
CK'D BY: R.C.	FILE:ENRON.DWG

FIGURE 5
ESTIMATED BTEX CONTAMINATION PLUME AT HOBBS No. 2 GATHERING STATION

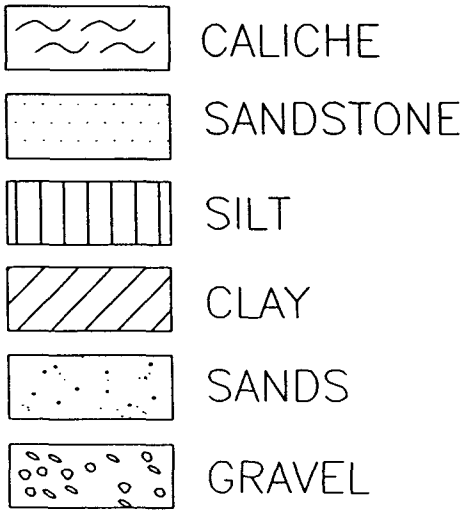
3.4 Limited Pathway/Risk Assessment

Groundwater and surface water are the main exposure mechanisms of BTEX contamination at the main plant. The stormwater runoff collects in the Buffalo Wallow and evaporates or migrates downward to groundwater. Groundwater at the site flows south-southeast. There are no groundwater receptors within one-half mile downgradient or cross-gradient of the site. Since groundwater contamination does not extend beyond the site boundaries, natural degradation may be sufficient to remediate the leading edge of the plume, leaving only the groundwater contaminated above state standards that must be cleaned up.

Groundwater at the Hobbs Compressor Station No. 2 is the only potential exposure pathway. Potential contamination at the compressor station may be moving off site in the direction of groundwater flow presumed to be in a southeasterly direction. There are no existing groundwater receptors within a half mile downgradient and cross-gradient of the site. Therefore, as above, clean up should be sufficient by remediating the main portion of the contaminant plume that is above state standards and allowing the leading edge of the plume to naturally biodegradate.

Appendix A—Lithologic Logs and Monitoring Well Completion Diagrams

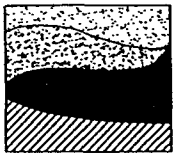
LITH COLUMN



VISUAL % COLUMN



GCL

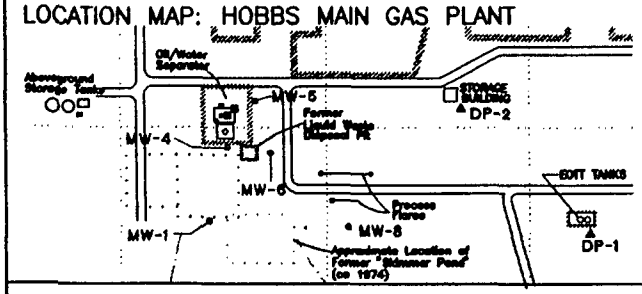


CLIENT: ENRON – HOBBS	
DATE: 2/24/94	REV. NO.: 0
AUTHOR: R.C.	DRAWN BY: HCC
CK'D BY: R.C.	FILE: LTHLEGND

LITHOLOGIC SYMBOLS

LITHOLOGIC LOG (CUTTINGS)

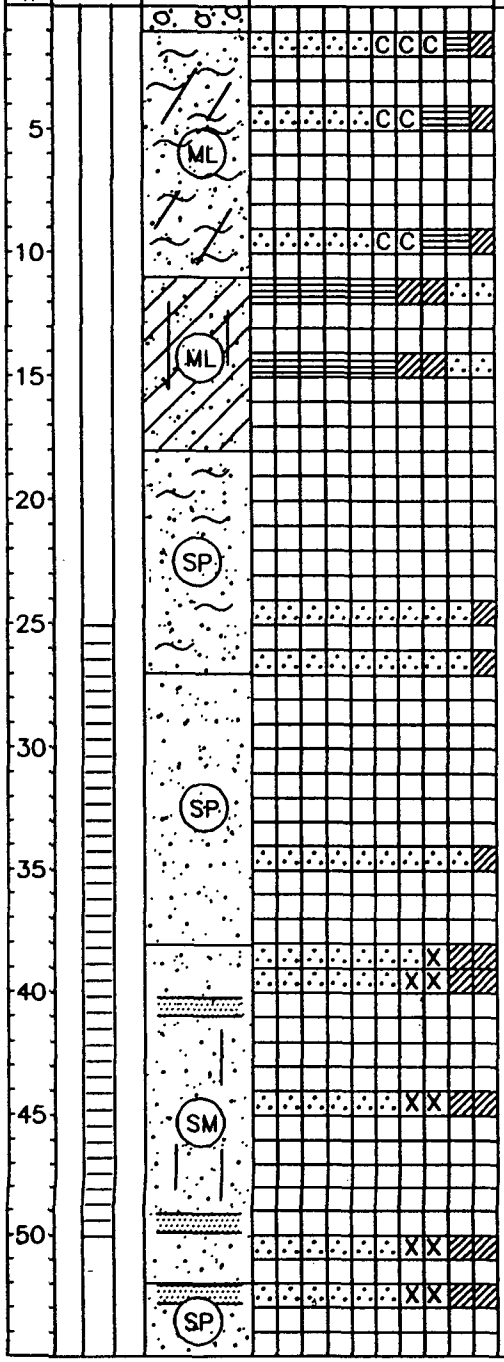
LOCATION MAP: HOBBS MAIN GAS PLANT



___1/4 ___1/4 NE 1/4 NE 1/4 S 6 T 19S R 37E

SITE ID: ENRON MAIN PLANT LOCATION ID: MW-8
SITE COORDINATES (ft.):
N _____ E _____
GROUND ELEVATION (ft. MSL): _____
STATE: NEW MEXICO COUNTY: LEA
DRILLING METHOD: AIR ROTARY
DRILLING CONTR.: EADES
DATE STARTED: 2/8/94 DATE COMPLETED: 2/8/94
FIELD REP.: K. SUMMERS
COMMENTS: _____

LOCATION DESCRIPTION: DOWN-GRADIENT OF FLARES AT MAIN PLANT



SAMPLE TYPE	SAMPLE INTERVAL	LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)
		0– 1 GRADED FILL APPEARS TO BE GRADED OR PLOWED CALICHE GRAVEL AND SILTY SANDS
		1–11 CALICHE/SILTY CLAY PALE YELLOWISH BROWN 10 YR 6/2 CALICHE COBBLES MIXED W/ SILTY, CLAYEY SANDS 50% FINE TO FINE SANDS, 20% SILT TO CLAY.
		11–18 SILTY CLAY PALE BROWN 5 YR 5/2 40% SILT TO FINE SAND, 60% BROWN CLAY (RANDALL CLAY?)
		18–27 SAND/CALICHE GRAYISH ORANGE PINK 5 YR 7/2 80% SILTY SAND, 10% CLAY, 10% THIN CALICHE BEDS. SAND IS V. FINE TO FINE, UNCONS.
		27–38 SAND LT. BRN. 5 YR 5/6 V. FINE SANDS, VERY SLIGHT SILT CONTENT. WELL SORTED. PRIMARILY SBRDD, UNCONS.
		38–53 SAND LT. BRN. 5 YR 6/4 80% V. FINE TO FINE SAND, 20% SILT. SAND IS WELL SORTED, SEMI-CONSOLIDATED IN THIN LAYERS, SBANG TO RDD. CCHE PROBABLY CEMENTING AGENT.
		53–55 SAND LT. BRN. 5 YR 6/4 SAME AS 38–53 WITH SLIGHT CONSOLIDATION. MOST OF SAND IS STILL FINE. CEMENTING AGENT IS PROBABLY CALICHE

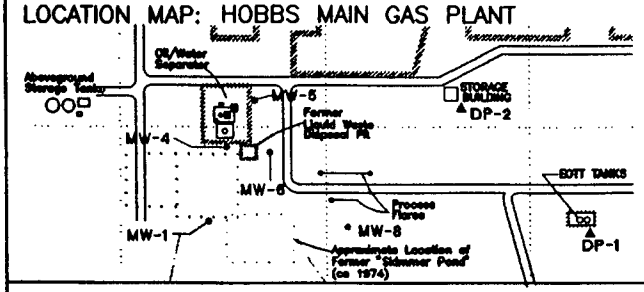
LITHOLOGIC LOG (CUTTINGS)
(Continued)

LOCATION ID: MW-8

DEPTH	WELL CONST.	LITH.	VISUAL %	SAMPLE TYPE	SAMPLE INTERVAL	LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)
55						55–60 NO RECOVERY ASSUMED SAME AS FROM 53'–55'
60						
65						
70						
75						
80						
85						
90						
95						
100						
105						
110						
115						
120						

LITHOLOGIC LOG (CUTTINGS)

LOCATION MAP: HOBBS MAIN GAS PLANT



__1/4 __1/4 NE 1/4 NE 1/4 S 6 T 19S R 37E

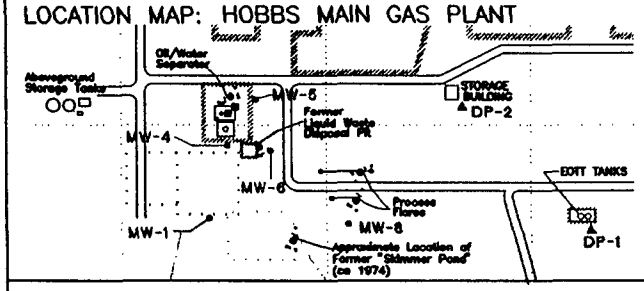
SITE ID: ENRON MAIN PLANT LOCATION ID: DP-1
SITE COORDINATES (ft.):
N _____ E _____
GROUND ELEVATION (ft. MSL): _____
STATE: NEW MEXICO COUNTY: LEA
DRILLING METHOD: AIR ROTARY
DRILLING CONTR.: EADES
DATE STARTED: 2/7/94 DATE COMPLETED: 2/7/94
FIELD REP.: K. SUMMERS
COMMENTS: _____

LOCATION DESCRIPTION: DOWN-GRADIENT OF CONDENSATE STORAGE TANKS AT MAIN PLANT

DEPTH	WELL CONST.	LITH.	VISUAL %	SAMPLE TYPE	SAMPLE INTERVAL	LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)
0						0- 2 FILL VARIOUS CCHE GRAVEL AND SAND
			C C C C C C C C			2-13 CALICHE GRAYISH ORANGE PINK 5 YR 7/2 MOD TO WELL CONSOLIDATED CALICHE CUTTINGS UP TO 1" DIA. SOME THIN SAND ZONES.
5			C C C C C C C C			
10			C C C C C C C C			
						13-24 SAND LT. BRN. 5 YR 6/4 PRIMARILY V. FINE TO FINE SANDS, SBRDD. SLIGHT CONSOLIDATION AND SOME CCHE.
15			C C			
		SP	C C			
20			C C			24-26 SANDY CALICHE/SANDSTONE GRAYISH ORANGE PINK 5 YR 7/2 THIN ZONE OF MOD TO WELL CEMENTED SAND AND CALICHE. SANDS ARE V. FINE TO FINE CEMENTING AGENT IS PROBABLY CALICHE
25			X X X X X X X X C C			26-46 SAND/SANDY CALICHE (SANDSTONE) INTERBEDDED LOOSE SANDS AND CCHE SANDSTONE. LAYERS OF CONSOLIDATION UP TO 1.5' THICK. SANDS ARE V. FINE TO SBANG-RDD.
30			X X X X C C			
		SM				
35			X X X X C C			
40			X X X X C C			
45			X X X X C			46-49 SANDSTONE GRAYISH ORANGE PINK 5 YR 7/2 VERY HARD LAYER OF CEMENTED V. FINE TO FINE SANDS. CCHE PROBABLY CEMENTING AGENT, ALTHOUGH SILICIFICATION IS POSSIBLE.
			X X X X X X X X X X			49-55 SAND LT. BRN 5 YR 6/4 80% V. FINE TO FINE SANDS. 20% SILT
50		SM				

LITHOLOGIC LOG (CUTTINGS)

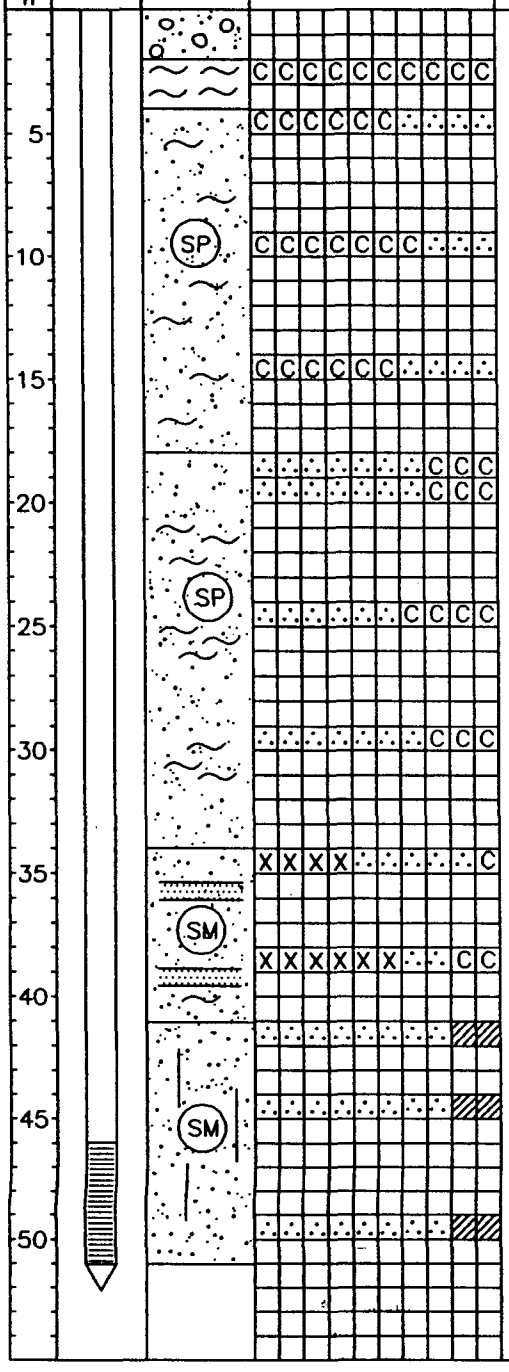
LOCATION MAP: HOBBS MAIN GAS PLANT



___1/4 ___1/4 NE 1/4 NE 1/4 S 6 T 19S R 37E

SITE ID: ENRON MAIN PLANT LOCATION ID: DP-2
SITE COORDINATES (ft.):
N _____ E _____
GROUND ELEVATION (ft. MSL): _____
STATE: NEW MEXICO COUNTY: LEA
DRILLING METHOD: AIR ROTARY
DRILLING CONTR.: EADES
DATE STARTED: 2/8/94 DATE COMPLETED: 2/8/94
FIELD REP.: K. SUMMERS
COMMENTS: _____

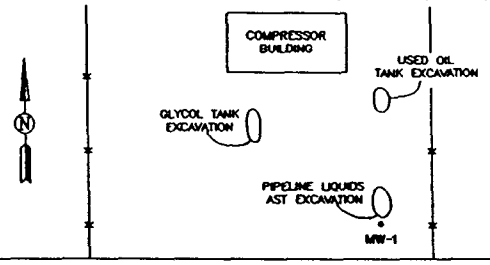
LOCATION DESCRIPTION: DOWN-GRADIENT OF MAIN PLANT



SAMPLE TYPE	SAMPLE INTERVAL	LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)
		0– 2 FILL VARIOUS CCHE GRAVEL AND SAND
		2– 4 CALICHE GRAYISH ORANGE PINK 5 YR 7/2 MOD-WELL TO WELL CONSOLIDATED
		4–18 SANDY CALICHE GRAYISH ORANGE PINK 5 YR 7/2 CONSOLIDATION VARIES FROM POOR TO WELL, WITH MODERATE TO POOR BEING THE NORMAL. SAND GRAINS ARE V. FINE TO FINE
		18–34 SAND/SANDY CALICHE ALTERNATING LAYERS OF SAND AND SANDY CALICHE. THIN ZONES OF CCHE ARE WELL CEMENTED. SANDS ARE V. FINE TO FINE.
		34–41 SAND/SANDY CALICHE (SANDSTONE) INTERBEDDED ZONES OF FINE SANDS AND CEMENTED SANDS.
		41–51 SAND LT. BRN. 5 YR 6/4 80% V. FINE TO FINE SAND, 20% SILT, SAND IS WELL SORTED, SEMI-CONSOLIDATED IN THIN LAYERS, SBANG TO RDD. CEMENTING AGENT IS PROBABLY CALICHE.

LITHOLOGIC LOG (CUTTINGS)

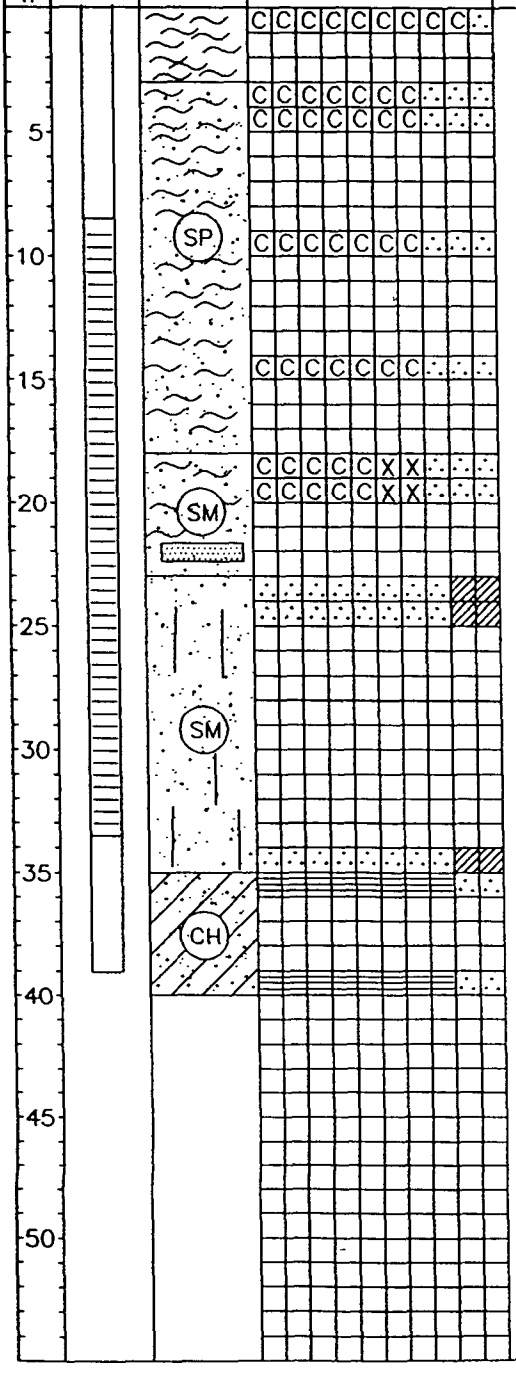
LOCATION MAP: HOBBS COMPRESSOR STATION NO. 2



1/4 NW 1/4 NW 1/4 NE 1/4 S 33 T 19S R 37E

SITE ID: ENRON COMP #2 LOCATION ID: MW-1
SITE COORDINATES (ft.):
N _____ E _____
GROUND ELEVATION (ft. MSL): _____
STATE: NEW MEXICO COUNTY: LEA
DRILLING METHOD: AIR ROTARY
DRILLING CONTR.: EADES
DATE STARTED: 2/3/94 DATE COMPLETED: 2/3/94
FIELD REP.: K. SUMMERS
COMMENTS: _____

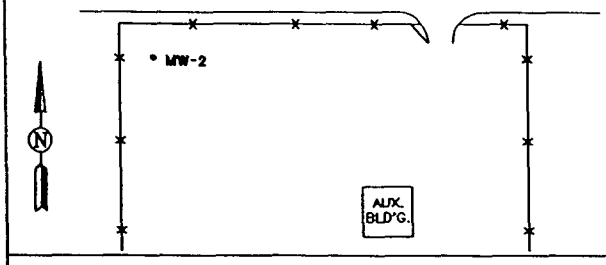
LOCATION DESCRIPTION: DOWN-GRADIENT OF CONDENSATE STORAGE TANKS AT COMPRESSOR STATION #2



SAMPLE TYPE	SAMPLE INTERVAL	LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)
		0- 3 CALICHE GRAYISH ORANGE PINK 5 YR 7/2 CALICHE, CONSOLIDATED AFTER 1'. SLIGHT SAND CONTENT
		3-18 SAND AND CALICHE SAME AS 0-3' W/ THIN SAND LENSES. SAND IS V. FINE TO FINE, UNCONS. SBRDD TO RDD.
		13' HEADSPACE <2 ppm
		18' HEADSPACE 2.8 ppm
		18-23 SANDY CALICHE/SANDSTONE GRAYISH ORANGE PINK 5 YR 7/2 WELL CONSOLIDATED SANDY CALICHE, VERY HARD.
		23-35 SAND LT. BRN. 5 YR 5/6 80% V. FINE TO FINE SANDS, VERY LITTLE CONSOL. 20% SILT SANDS ARE SBRDD.
		23' > 350 ppm FROM SPLIT SPOON
		35-40 CLAY/SAND COMPETENT CLAYS W/ SLIGHT SAND. SAND IS V. FINE TO FINE.

LITHOLOGIC LOG (CUTTINGS)

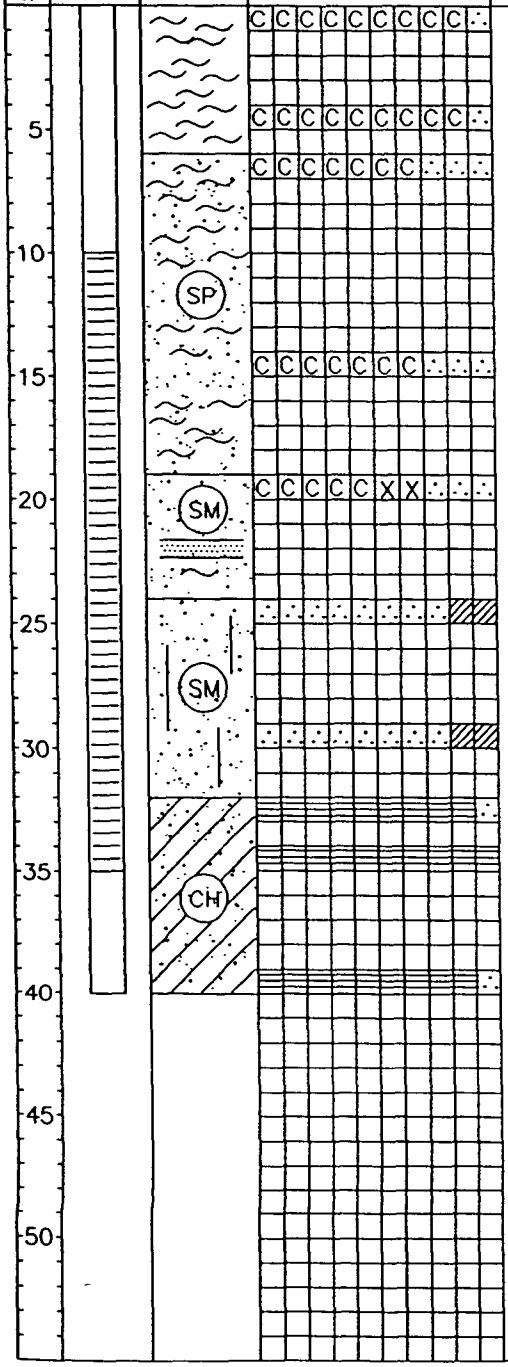
LOCATION MAP: HOBBS COMPRESSOR STATION NO. 2



1/4 NW 1/4 NW 1/4 NE 1/4 S 33 T 19S R 37S

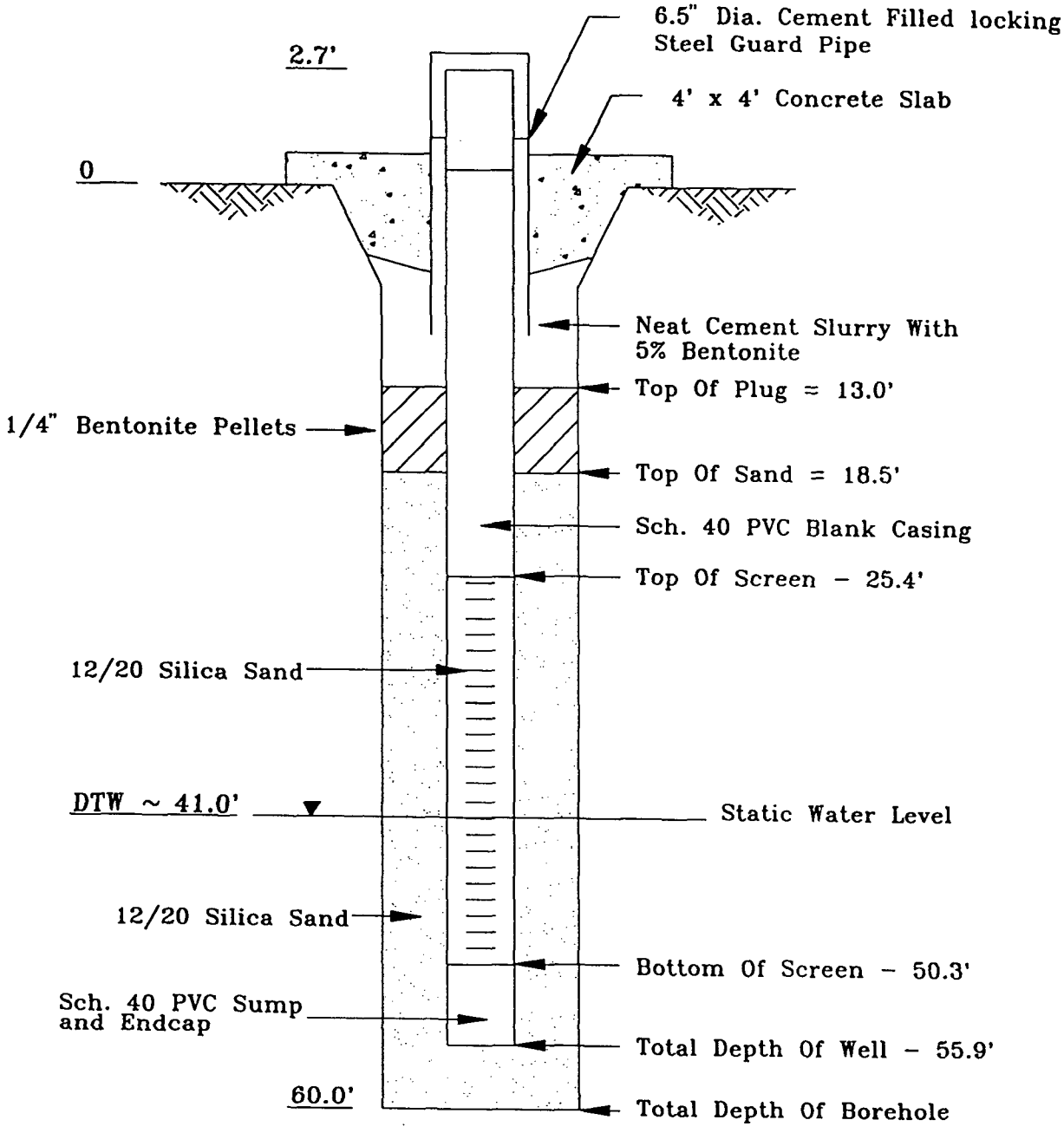
SITE ID: ENRON COMP #2 LOCATION ID: MW-2
SITE COORDINATES (ft.):
N _____ E _____
GROUND ELEVATION (ft. MSL): _____
STATE: NEW MEXICO COUNTY: LEA
DRILLING METHOD: AIR ROTARY
DRILLING CONTR.: EADES
DATE STARTED: 2/4/94 DATE COMPLETED: 2/4/94
FIELD REP.: K. SUMMERS
COMMENTS: _____

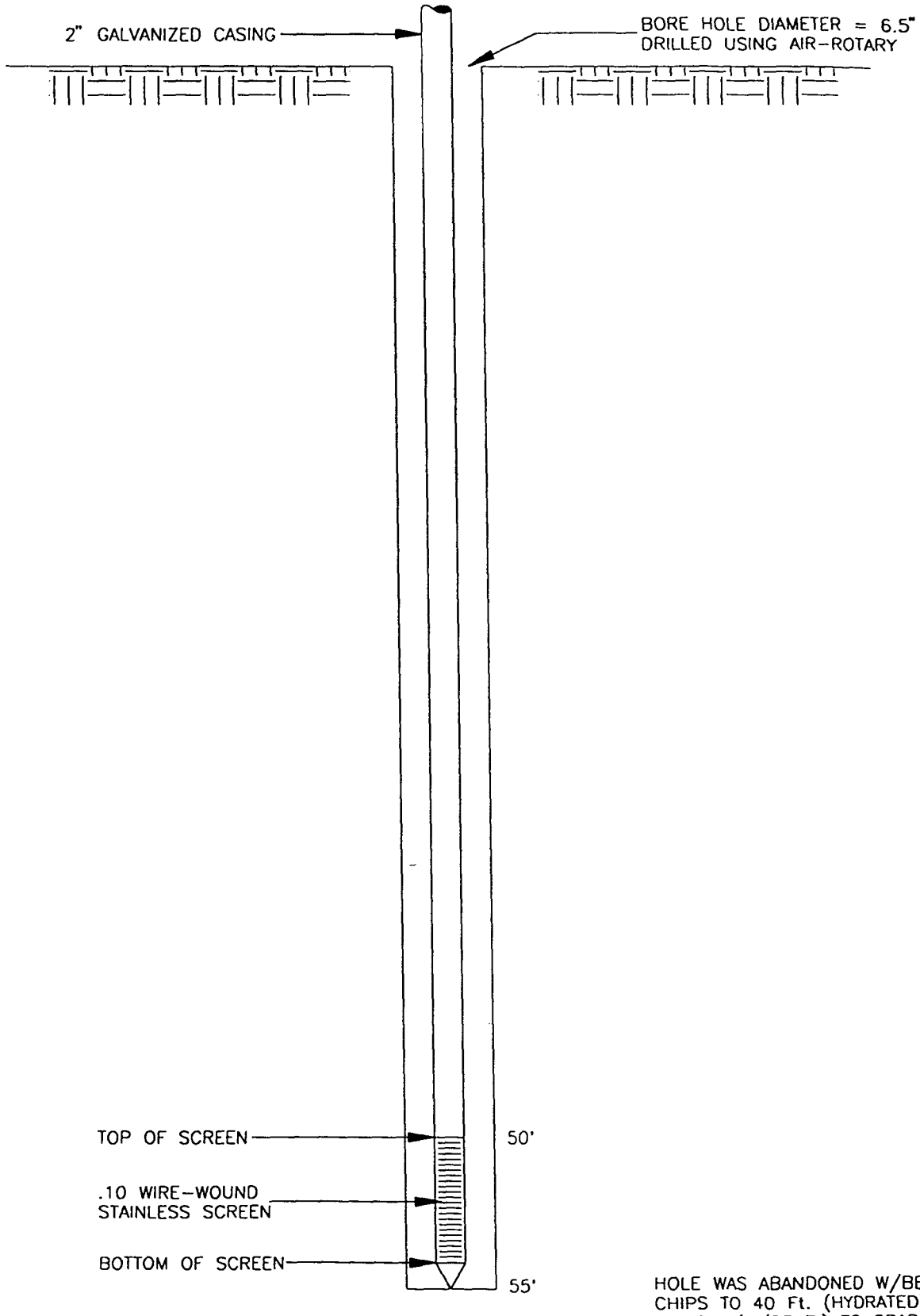
LOCATION DESCRIPTION: UP-GRADIENT WELL AT COMPRESSOR STATION #2



SAMPLE TYPE	SAMPLE INTERVAL	LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)
		0– 6 CALICHE GRAYISH ORANGE PINK 5 YR 7/2 CALICHE CONSOLIDATED AFTER – 1' OF DEPTH. SLIGHT SAND CONTENT.
		6–19 SAND/CALICHE SAME AS 0–6' W/ THIN SAND LENSES. SAND IS V. FINE TO FINE, UNCONS. SBRDD.
		19–24 SAND/CALICHE GRAYISH ORANGE PINK VERY HARD, WELL CONSOLIDATED SANDS. CALICHE IS PROBABLY CEMENTING AGENT. SANDS ARE V. FINE TO FINE.
		24–32 SAND LT. BRN. 5 YR 5/6 80% V. FINE TO FINE SANDS, SOME SLIGHT CONSOLIDATION. 20% SILT. SANDS ARE SBRDD TO RDD.
		32–40 CLAY/SAND COMPETENT CLAYS W/ LITTLE V. FINE TO FINE SANDS SEEM TO BE MORE CLAY AND LESS SAND THAN MW-1-C

Enron Gas Processing Plant
Monitor Well MW-8 Completion Diagram





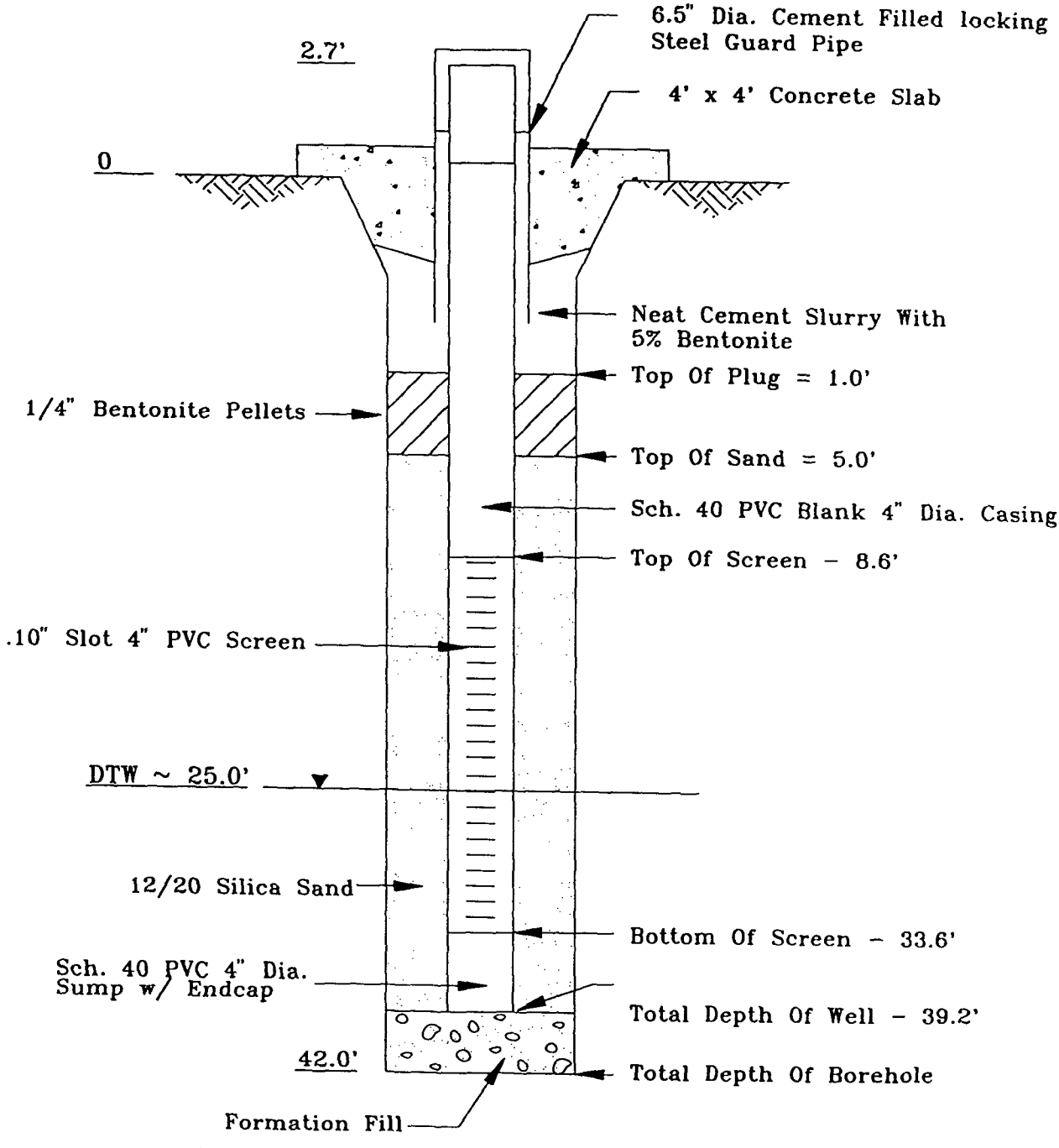
HOLE WAS ABANDONED W/BENTONITE CHIPS TO 40 Ft. (HYDRATED). CEMENT (W/BENT.) TO GRADE. WELL POINTS WERE REMOVED.

GCL

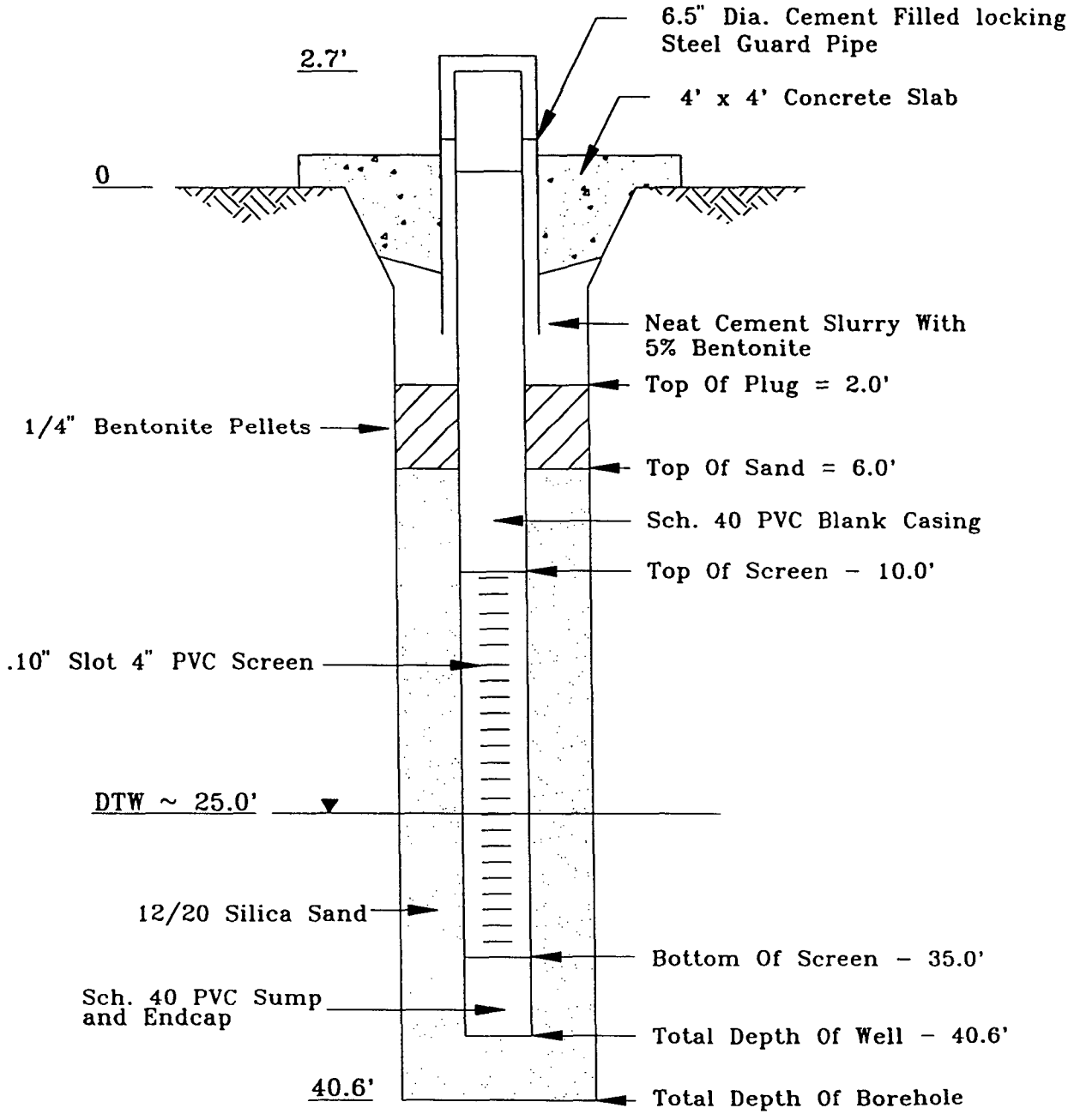
CLIENT: ENRON - HOBBS	
DATE: 2/22/94	REV. NO.: 0
AUTHOR: R.C.	DRAWN BY: HCC
CK'D BY: R.C.	FILE:CD-DP1.DWG

DP-1
TEMPORARY DRIVE POINT WELL

Enron Compressor Station No. 2
Monitor Well MW-1 Completion Diagram



Enron Compressor Station No. 2
Monitor Well MW-2 Completion Diagram



Appendix B—Analytical Reports

RECEIVED FEB 15 1994

WESTERN ATLAS

Core Laboratories

CORE LABORATORIES
A N A L Y T I C A L R E P O R T

Job Number: 940263
Prepared For:

HYGIENETICS/GCL

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ALBUQUERQUE, NM 87102

Date: 02/14/94

Linda L. Benkers
Signature

2-14-94
Date:

Name: Linda L. Benkers

Core Laboratories
10703 East Bethany Drive
Aurora, CO 80014

Title: QA/QC COORDINATOR

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FAX: (301) 459-3064

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FAX: (212) 983-8795

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7724

Chain of Custody

Date 2/7/94 Page 2 of 2

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Samplers (SIGNATURES)

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624(8240)	Base/Neu/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons(418.1)	TPH/BTEX Modified 8015	TCLP- Vol., Semi-Vol. Herbicides, Pesticides	TCLP- Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)					Number of Containers
9402071500	H_2O	OP-1						X																					3
√ 9402071510	H_2O	OP-1										X																	1
Trip Blank								X																					1

Project Information	
Project	GPM/ENRON
Project Director	Bob Cooper
Charge Code No.	54191.02
Shipping ID No.	8609629114
Via:	Fed Ex.

Sample Receipt	
Total No. of Containers	5
Chain of Custody Seals	Y
Rec'd Good Condition/Cold	Y
Conforms to Record	Y
Lab No.	940263

Special Instructions/Comments:
24 hr TAT on #'s 9402071500
9402071510

Rest of Samples 5 day TAT

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
Kyl L 0800		
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
KYLE Summers 2/8/94		
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
H+GCL		
(Company)	(Company)	(Company)
Received By 1.	**Received By 2.**	**Received By (Laboratory) 3.**
		Mary Scott 0915
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
		Mary Scott 2-9-94
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
		Core
(Company)	(Company)	(Laboratory)

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WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
02/14/94

JOB NUMBER: 940263 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ENRON COC #7724
DATE SAMPLED.....: 02/07/94
TIME SAMPLED.....: 15:00
WORK DESCRIPTION...: 9402071500

LABORATORY I.D...: 940263-0001
DATE RECEIVED....: 02/09/94
TIME RECEIVED....: 09:15
REMARKS.....: DP-1

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8240 - VOLATILE ORGANICS		*1		8240 (2)	02/09/94	JMC
Acetone	980	100	ug/L			
Benzene	3300	50	ug/L			
Bromodichloromethane	ND	5	ug/L			
Bromoform	ND	5	ug/L			
Bromomethane	ND	10	ug/L			
2-Butanone	ND	100	ug/L			
Carbon disulfide	ND	5	ug/L			
Carbon tetrachloride	ND	5	ug/L			
Chlorobenzene	ND	5	ug/L			
Chloroethane	ND	10	ug/L			
2-Chloroethylvinyl ether	ND	10	ug/L			
Chloroform	ND	5	ug/L			
Chloromethane	ND	10	ug/L			
Dibromochloromethane	ND	5	ug/L			
1,1-Dichloroethane	ND	5	ug/L			
1,2-Dichloroethane	ND	5	ug/L			
1,1-Dichloroethene	ND	5	ug/L			
trans-1,2-Dichloroethene	ND	5	ug/L			
1,2-Dichloropropane	ND	5	ug/L			
cis-1,3-Dichloropropene	ND	5	ug/L			
trans-1,3-Dichloropropene	ND	5	ug/L			
Ethylbenzene	ND	5	ug/L			
2-Hexanone	ND	50	ug/L			
Methylene chloride	ND	5	ug/L			
4-Methyl-2-pentanone	ND	50	ug/L			
Styrene	ND	5	ug/L			
1,1,2,2-Tetrachloroethane	ND	5	ug/L			
Tetrachloroethene	ND	5	ug/L			
Toluene	ND	5	ug/L			
1,1,1-Trichloroethane	ND	5	ug/L			
1,1,2-Trichloroethane	ND	5	ug/L			
Trichloroethene	ND	5	ug/L			
Vinyl acetate	ND	50	ug/L			
Vinyl chloride	ND	10	ug/L			
Xylenes-total	6	5	ug/L			
1,2-Dichloroethane-d4	106	0	% Recovery	76-114% Limit		
Toluene-d8	96	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	107	0	% Recovery	86-115% Limit		
Time Analyzed	1802	0				
Volatile Organics - Surrogates		*1		8240(2)/624(6)	02/10/94	JMC
1,2-Dichloroethane-d4	109	0	% Recovery	76-114% Limit		

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LABORATORY TESTS RESULTS
02/14/94

JOB NUMBER: 940263 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ENRON COC #7724
DATE SAMPLED.....: 02/07/94
TIME SAMPLED.....: 15:00
WORK DESCRIPTION...: 9402071500

LABORATORY I.D...: 940263-0001
DATE RECEIVED....: 02/09/94
TIME RECEIVED....: 09:15
REMARKS.....: DP-1

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Toluene-d8	95	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	103	0	% Recovery	86-115% Limit		
Time Analyzed	1133	0				

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LABORATORY TESTS RESULTS
02/14/94

JOB NUMBER: 940263 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ENRON COC #7724
DATE SAMPLED.....: 02/07/94
TIME SAMPLED.....: 15:10
WORK DESCRIPTION...: 9402071510

LABORATORY I.D...: 940263-0002
DATE RECEIVED....: 02/09/94
TIME RECEIVED....: 09:15
REMARKS.....: DP-1

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon (I.R.)	31	1	mg/L	418.1 (1)	02/09/94	LM

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LABORATORY TESTS RESULTS
02/14/94

JOB NUMBER: 940263 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ENRON COC #7724
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: TRIP BLANK

LABORATORY I.D...: 940263-0003
DATE RECEIVED....: 02/09/94
TIME RECEIVED....: 09:15
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8240 - VOLATILE ORGANICS		*1		8240 (2)	02/09/94	JMC
Acetone	ND	100	ug/L			
Benzene	ND	1	ug/L			
Bromodichloromethane	ND	5	ug/L			
Bromoform	ND	5	ug/L			
Bromomethane	ND	10	ug/L			
2-Butanone	ND	100	ug/L			
Carbon disulfide	ND	5	ug/L			
Carbon tetrachloride	ND	5	ug/L			
Chlorobenzene	ND	5	ug/L			
Chloroethane	ND	10	ug/L			
2-Chloroethylvinyl ether	ND	10	ug/L			
Chloroform	ND	5	ug/L			
Chloromethane	ND	10	ug/L			
Dibromochloromethane	ND	5	ug/L			
1,1-Dichloroethane	ND	5	ug/L			
1,2-Dichloroethane	ND	5	ug/L			
1,1-Dichloroethene	ND	5	ug/L			
trans-1,2-Dichloroethene	ND	5	ug/L			
1,2-Dichloropropane	ND	5	ug/L			
cis-1,3-Dichloropropene	ND	5	ug/L			
trans-1,3-Dichloropropene	ND	5	ug/L			
Ethylbenzene	ND	5	ug/L			
2-Hexanone	ND	50	ug/L			
Methylene chloride	ND	5	ug/L			
4-Methyl-2-pentanone	ND	50	ug/L			
Styrene	ND	5	ug/L			
1,1,2,2-Tetrachloroethane	ND	5	ug/L			
Tetrachloroethene	ND	5	ug/L			
Toluene	ND	5	ug/L			
1,1,1-Trichloroethane	ND	5	ug/L			
1,1,2-Trichloroethane	ND	5	ug/L			
Trichloroethene	ND	5	ug/L			
Vinyl acetate	ND	50	ug/L			
Vinyl chloride	ND	10	ug/L			
Xylenes-total	ND	5	ug/L			
1,2-Dichloroethane-d4	114	0	% Recovery	76-114% Limit		
Toluene-d8	96	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	105	0	% Recovery	86-115% Limit		
Time Analyzed	1848	0				

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LABORATORY TESTS RESULTS
02/14/94

JOB NUMBER: 940263 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: METHOD BLANK

LABORATORY I.D...: 940263-0004
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8240 - VOLATILE ORGANICS		*1		8240 (2)	02/09/94	JMC
Acetone	ND	100	ug/L			
Benzene	ND	1	ug/L			
Bromodichloromethane	ND	5	ug/L			
Bromoform	ND	5	ug/L			
Bromomethane	ND	10	ug/L			
2-Butanone	ND	100	ug/L			
Carbon disulfide	ND	5	ug/L			
Carbon tetrachloride	ND	5	ug/L			
Chlorobenzene	ND	5	ug/L			
Chloroethane	ND	10	ug/L			
2-Chloroethylvinyl ether	ND	10	ug/L			
Chloroform	ND	5	ug/L			
Chloromethane	ND	10	ug/L			
Dibromochloromethane	ND	5	ug/L			
1,1-Dichloroethane	ND	5	ug/L			
1,2-Dichloroethane	ND	5	ug/L			
1,1-Dichloroethene	ND	5	ug/L			
trans-1,2-Dichloroethene	ND	5	ug/L			
1,2-Dichloropropane	ND	5	ug/L			
cis-1,3-Dichloropropene	ND	5	ug/L			
trans-1,3-Dichloropropene	ND	5	ug/L			
Ethylbenzene	ND	5	ug/L			
2-Hexanone	ND	50	ug/L			
Methylene chloride	ND	5	ug/L			
4-Methyl-2-pentanone	ND	50	ug/L			
Styrene	ND	5	ug/L			
1,1,2,2-Tetrachloroethane	ND	5	ug/L			
Tetrachloroethene	ND	5	ug/L			
Toluene	ND	5	ug/L			
1,1,1-Trichloroethane	ND	5	ug/L			
1,1,2-Trichloroethane	ND	5	ug/L			
Trichloroethene	ND	5	ug/L			
Vinyl acetate	ND	50	ug/L			
Vinyl chloride	ND	10	ug/L			
Xylenes-total	ND	5	ug/L			
1,2-Dichloroethane-d4	109	0	% Recovery	76-114% Limit		
Toluene-d8	95	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	105	0	% Recovery	86-115% Limit		
Time Analyzed	1543	0				

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LABORATORY TESTS RESULTS
02/14/94

JOB NUMBER: 940263 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: METHOD BLANK

LABORATORY I.D...: 940263-0005
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8240 - VOLATILE ORGANICS		*1		8240 (2)	02/10/94	JMC
Acetone	ND	100	ug/L			
Benzene	ND	1	ug/L			
Bromodichloromethane	ND	5	ug/L			
Bromoform	ND	5	ug/L			
Bromomethane	ND	10	ug/L			
2-Butanone	ND	100	ug/L			
Carbon disulfide	ND	5	ug/L			
Carbon tetrachloride	ND	5	ug/L			
Chlorobenzene	ND	5	ug/L			
Chloroethane	ND	10	ug/L			
2-Chloroethylvinyl ether	ND	10	ug/L			
Chloroform	ND	5	ug/L			
Chloromethane	ND	10	ug/L			
Dibromochloromethane	ND	5	ug/L			
1,1-Dichloroethane	ND	5	ug/L			
1,2-Dichloroethane	ND	5	ug/L			
1,1-Dichloroethene	ND	5	ug/L			
trans-1,2-Dichloroethene	ND	5	ug/L			
1,2-Dichloropropane	ND	5	ug/L			
cis-1,3-Dichloropropene	ND	5	ug/L			
trans-1,3-Dichloropropene	ND	5	ug/L			
Ethylbenzene	ND	5	ug/L			
2-Hexanone	ND	50	ug/L			
Methylene chloride	ND	5	ug/L			
4-Methyl-2-pentanone	ND	50	ug/L			
Styrene	ND	5	ug/L			
1,1,2,2-Tetrachloroethane	ND	5	ug/L			
Tetrachloroethene	ND	5	ug/L			
Toluene	ND	5	ug/L			
1,1,1-Trichloroethane	ND	5	ug/L			
1,1,2-Trichloroethane	ND	5	ug/L			
Trichloroethene	ND	5	ug/L			
Vinyl acetate	ND	50	ug/L			
Vinyl chloride	ND	10	ug/L			
Xylenes-total	ND	5	ug/L			
1,2-Dichloroethane-d4	102	0	% Recovery	76-114% Limit		
Toluene-d8	98	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	107	0	% Recovery	86-115% Limit		
Time Analyzed	1000	0				

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WESTERN ATLAS

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QUALITY CONTROL REPORT
02/14/94

JOB NUMBER: 940263 CUSTOMER: HYGIENETICS/GCL ATTN:

ANALYSIS				DUPLICATES		REFERENCE STANDARDS		MATRIX SPIKES		
ANALYSIS TYPE	ANALYSIS SUB-TYPE	ANALYSIS I.D.	ANALYZED VALUE (A)	DUPLICATE VALUE (B)	RPD or (|A-B|)	TRUE VALUE	PERCENT RECOVERY	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY
PARAMETER:Total Petroleum Hydrocarbon (I.R.)			DATE/TIME ANALYZED:02/09/94 13:30							QC BATCH NUMBER:288457
REPORTING LIMIT/DF: 1	UNITS:mg/L		METHOD REFERENCE :418.1 (1)							TECHNICIAN:LM
BLANK	ICB	S0	<1							
BLANK	MB	940209	<1							
BLANK	CCB	S0	<1							
STANDARD	ICV/LCS	940114	43			46	93			
STANDARD	CCV	S50	52			50	104			

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WESTERN ATLAS

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QUALITY CONTROL FOOTER

METHOD REFERENCES

(1) EPA 600/4-79-020, Methods For Chemical Analysis Of Water And Wastes, March 1983

(2) EPA SW-846, Test Methods For Evaluating Solid Waste, Third Edition, November 1986

(3) Standard Methods For The Examination Of Water And Wastewater, 17th Edition, 1989

(4) EPA 600/4-80-032, Prescribed Procedures For Measurement Of Radioactivity In Drinking Water, August 1980

(5) EPA 600/8-78-017, Microbiological Methods For Monitoring The Environment, December 1978

(6) Federal Register, July 1, 1990 (40 CFR Part 136)

(7) EPA 600/4-88-039, Methods For The Determination Of Organics Compounds In Drinking Water, December 1988

(8) U.S.G.S. Methods For The Determination Of Inorganic Substances In Water And Fluvial Sediments, Book 5, Chapter A1, 1985

(9) Federal Register, Friday, June 7, 1991, (40 CFR Parts 141 and 142)

(10) Standard Methods For The Examination Of Water And Wastewater, 16th Edition, 1985

(11) ASTM, Section 11 Water And Environmental Technology, Volume 11.01 Water (1), 1991

(12) Methods Of Soil Analysis, American Society Of Agronomy, Agronomy No. 9, 1965

(13) EPA SW-846, Test Methods For Evaluating Solid Waste, Third Edition, Revision 1, November 1990

(14) ASTM, Section 5, Petroleum Products, Lubricants, and Fossil Fuels, Volume 05.05, Gaseous Fuels, Coal and Coke

(15) EPA 600/2-78-054, Field and Laboratory Methods Applicable To Overburdens and Mine Soils, March 1978

(16) ASTM, Part 19, Soils and Rock; Building Stones, 1981

COMMENTS: Data in QA report may differ from final results due to digestion and/or dilution of sample into analytical ranges. The "Time Analyzed" in the QA report refers to the start time of the analytical batch which may not reflect the actual time of each analysis. The "Date Analyzed" is the actual date of analysis.

NC = Not Calculable Due To Value(s) Lower Than The Detection Limit.

Analyses performed by a subcontract laboratory are indicated on the analytical and/or quality control reports under "Technician" using the following codes:

Subcontract Laboratory	Code	
Core Laboratories - Anaheim, CA	*AN	
Core Laboratories - Casper, WY	*CA	
Core Laboratories - Corpus Christi, TX	*CC	
Core Laboratories - Houston, TX	*HP	
Core Laboratories - Lake Charles, LA	*LC	
Core Laboratories - Long Beach, CA	*LB	
Other Subcontract Laboratories	*XX	Laboratory ID Provided Upon Request

* The asterisk in the "Technician" data field signifies that the analysis was performed by a subcontract laboratory.

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RECEIVED FEB 16 1994

CORE LABORATORIES
A N A L Y T I C A L R E P O R T

Job Number: 940258
Prepared For:

HYGIENETICS/GCL

505 MARQUETTE NW STE 1100
ALBUQUERQUE, NM 87102

Date: 02/15/94

Linda L. Benkers
Signature

2-15-94
Date:

Name: Linda L. Benkers

Title: QA/QC COORDINATOR

Core Laboratories
10703 East Bethany Drive
Aurora, CO 80014

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☐ San Francisco
2200 Powell Street, Ste. 880
Emeryville, CA 94608
(510) 547-3886
FAX: (510) 547-3631

7722

Chain of Custody

Date 2/4/94 Page 1 of 1

Lab Name CORE LABORATORIES
Address 10703 East Bethany Drive
Aurora, CO 80014-2696
Telephone 303/751-1780

Samplers (SIGNATURES)

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neu/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons (418.1)	TPH/BTEX Modified 8015	TCLP- Vol., Semi-Vol. Herbicides, Pesticides	TCLP- Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	TDS	Crcd,Pb FILTERED METALS	major cations/anions Ca, Mg, Na, K	major anions Cl, SO4, HCO3, NO3	Number of Containers
9402031300	Soil	MW-1-C						X	X			X												DN	X	X	DN		3
9402041400	H2O	MW-1-C						X	X			X													X	X	X	X	9
9402041030	H2O	MW-3						X																					3
9402041145	H2O	MW-1							X																				1
9402040930	H2O	MW-2							X																				1
9402041500	H2O	TRIP BLANK																											1

Per Annette Montoya, cancel NO3 analysis. Filter + preserve metals sample in lab. Filter anion sample in lab + report all on a dissolved basis for 9402041400.
2-8-94 JJB

Project Information		Sample Receipt	
Project	ENRON	Total No. of Containers	18
Project Director	Hick	Chain of Custody Seals	Y
Charge Code No.	54199.02	Rec'd Good Condition/Cold	Y
Shipping ID No.	904810099	Conforms to Record	Y
Via:	Fed X	Lab No.	940258

Special Instructions/Comments:

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
D Nee 1515		
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
DAVID NEE 2/4/94		
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
H+GCL		
(Company)	(Company)	(Company)
Received By 1.	**Received By 2.**	**Received By (Laboratory) 3.**
		Mary Scott 0915
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
		Mary Scott 2-8-94
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
		Core
(Company)	(Company)	(Laboratory)

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WESTERN ATLAS

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LABORATORY TESTS RESULTS
02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: ENRON COC #7722
DATE SAMPLED.....: 02/03/94
TIME SAMPLED.....: 13:00
WORK DESCRIPTION...: 9402031300

LABORATORY I.D...: 940258-0001
DATE RECEIVED....: 02/08/94
TIME RECEIVED....: 09:15
REMARKS.....: MW-1-C

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	2730	50	mg/Kg	418.1 (1)	02/09/94	JD
8240 - VOLATILE ORGANICS		*125		8240 (2)	02/10/94	JMC
Acetone	ND	12500	ug/Kg			
Benzene	ND	125	ug/Kg			
Bromodichloromethane	ND	625	ug/Kg			
Bromoform	ND	625	ug/Kg			
Bromomethane	ND	1250	ug/Kg			
2-Butanone	ND	12500	ug/Kg			
Carbon disulfide	ND	625	ug/Kg			
Carbon tetrachloride	ND	625	ug/Kg			
Chlorobenzene	ND	625	ug/Kg			
Chloroethane	ND	1250	ug/Kg			
2-Chloroethylvinyl ether	ND	1250	ug/Kg			
Chloroform	ND	625	ug/Kg			
Chloromethane	ND	1250	ug/Kg			
Dibromochloromethane	ND	625	ug/Kg			
1,1-Dichloroethane	ND	625	ug/Kg			
1,2-Dichloroethane	ND	625	ug/Kg			
1,1-Dichloroethene	ND	625	ug/Kg			
trans-1,2-Dichloroethene	ND	625	ug/Kg			
1,2-Dichloropropane	ND	625	ug/Kg			
cis-1,3-Dichloropropene	ND	625	ug/Kg			
trans-1,3-Dichloropropene	ND	625	ug/Kg			
Ethylbenzene	4100	625	ug/Kg			
2-Hexanone	ND	6250	ug/Kg			
Methylene chloride	ND	625	ug/Kg			
4-Methyl-2-pentanone	ND	6250	ug/Kg			
Styrene	ND	625	ug/Kg			
1,1,2,2-Tetrachloroethane	ND	625	ug/Kg			
Tetrachloroethene	ND	625	ug/Kg			
Toluene	730	625	ug/Kg			
1,1,1-Trichloroethane	ND	625	ug/Kg			
1,1,2-Trichloroethane	ND	625	ug/Kg			
Trichloroethene	ND	625	ug/Kg			
Vinyl acetate	ND	6250	ug/Kg			
Vinyl chloride	ND	1250	ug/Kg			
Xylenes-total	11000	625	ug/Kg			
1,2-Dichloroethane-d4	107	0	% Recovery	70-121% Limit		
Toluene-d8	93	0	% Recovery	81-117% Limit		
4-Bromofluorobenzene	110	0	% Recovery	74-121% Limit		
Time Analyzed	1305	0				
8270 - BASE/NEUTRAL/ACID ORGANICS		*1		8270 (2)	02/10/94	DMJ

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02/15/94

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TIME SAMPLED.....: 13:00
WORK DESCRIPTION...: 9402031300

LABORATORY I.D...: 940258-0001
DATE RECEIVED....: 02/08/94
TIME RECEIVED....: 09:15
REMARKS.....: MW-1-C

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Acenaphthene	ND	330	ug/Kg			
Acenaphthylene	ND	330	ug/Kg			
Anthracene	ND	330	ug/Kg			
Benzo(a)anthracene	ND	330	ug/Kg			
Benzo(b)fluoranthene	ND	330	ug/Kg			
Benzo(k)fluoranthene	ND	330	ug/Kg			
Benzo(ghi)perylene	ND	330	ug/Kg			
Benzo(a)pyrene	ND	330	ug/Kg			
Benzyl Alcohol	ND	660	ug/Kg			
Butyl benzyl phthalate	ND	330	ug/Kg			
Bis(2-chloroethoxy)methane	ND	330	ug/Kg			
Bis(2-chloroethyl)ether	ND	330	ug/Kg			
Bis(2-chloroisopropyl)ether	ND	330	ug/Kg			
Bis(2-ethylhexyl)phthalate	ND	330	ug/Kg			
4-Bromophenyl phenyl ether	ND	330	ug/Kg			
4-Chloroaniline	ND	660	ug/Kg			
2-Chloronaphthalene	ND	330	ug/Kg			
4-Chlorophenyl phenyl ether	ND	330	ug/Kg			
Chrysene	ND	330	ug/Kg			
Dibenzo(a,h)anthracene	ND	330	ug/Kg			
Dibenzofuran	330	330	ug/Kg			
1,2-Dichlorobenzene	ND	330	ug/Kg			
1,3-Dichlorobenzene	ND	330	ug/Kg			
1,4-Dichlorobenzene	ND	330	ug/Kg			
3,3-Dichlorobenzidine	ND	660	ug/Kg			
Diethyl phthalate	ND	330	ug/Kg			
Dimethyl phthalate	ND	330	ug/Kg			
Di-n-butyl phthalate	ND	330	ug/Kg			
Di-n-octyl phthalate	ND	330	ug/Kg			
2,4-Dinitrotoluene	ND	330	ug/Kg			
2,6-Dinitrotoluene	ND	330	ug/Kg			
Fluoranthene	ND	330	ug/Kg			
Fluorene	440	330	ug/Kg			
Hexachlorobenzene	ND	330	ug/Kg			
Hexachlorobutadiene	ND	330	ug/Kg			
Hexachlorocyclopentadiene	ND	330	ug/Kg			
Hexachloroethane	ND	330	ug/Kg			
Indeno(1,2,3-cd)pyrene	ND	330	ug/Kg			
Isophorone	ND	330	ug/Kg			
2-Methylnaphthalene	2600	330	ug/Kg			
Naphthalene	1500	330	ug/Kg			
o-Nitroaniline	ND	1650	ug/Kg			
m-Nitroaniline	ND	1650	ug/Kg			
p-Nitroaniline	ND	1650	ug/Kg			
Nitrobenzene	ND	330	ug/Kg			

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02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: ENRON COC #7722
DATE SAMPLED.....: 02/03/94
TIME SAMPLED.....: 13:00
WORK DESCRIPTION...: 9402031300

LABORATORY I.D...: 940258-0001
DATE RECEIVED....: 02/08/94
TIME RECEIVED....: 09:15
REMARKS.....: MW-1-C

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
N-Nitrosodi-n-propylamine	ND	330	ug/Kg			
N-Nitrosodiphenylamine	ND	330	ug/Kg			
Phenanthrene	740	330	ug/Kg			
Pyrene	ND	330	ug/Kg			
1,2,4-Trichlorobenzene	ND	330	ug/Kg			
Benzoic Acid	ND	1650	ug/Kg			
4-Chloro-3-methylphenol	ND	660	ug/Kg			
2-Chlorophenol	ND	330	ug/Kg			
2,4-Dichlorophenol	ND	330	ug/Kg			
2,4-Dimethylphenol	ND	330	ug/Kg			
2,4-Dinitrophenol	ND	1650	ug/Kg			
2-Methyl-4,6-dinitrophenol	ND	1650	ug/Kg			
o-Cresol (2-Methylphenol)	ND	330	ug/Kg			
4-Methylphenol	ND	330	ug/Kg			
2-Nitrophenol	ND	330	ug/Kg			
4-Nitrophenol	ND	1650	ug/Kg			
Pentachlorophenol	ND	1650	ug/Kg			
Phenol	ND	330	ug/Kg			
2,4,5-Trichlorophenol	ND	330	ug/Kg			
2,4,6-Trichlorophenol	ND	330	ug/Kg			
Nitrobenzene-d5	65	0	% Recovery	23-120% Limit		
2-Fluorobiphenyl	93	0	% Recovery	30-115% Limit		
4-Terphenyl-d14	117	0	% Recovery	18-137% Limit		
Phenol-d6	65	0	% Recovery	24-113% Limit		
2-Fluorophenol	60	0	% Recovery	25-121% Limit		
2,4,6-Tribromophenol	66	0	% Recovery	19-122% Limit		
Time Analyzed	0217	0				
Date Extracted	02/09/94	0				

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LABORATORY TESTS RESULTS
02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: ENRON COC #7722
DATE SAMPLED.....: 02/04/94
TIME SAMPLED.....: 14:00
WORK DESCRIPTION...: 9402041400

LABORATORY I.D...: 940258-0002
DATE RECEIVED....: 02/08/94
TIME RECEIVED....: 09:15
REMARKS.....: MW-1-C

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Ethylbenzene	200	25	ug/L			
2-Hexanone	ND	50	ug/L			
Methylene chloride	ND	5	ug/L			
4-Methyl-2-pentanone	ND	50	ug/L			
Styrene	ND	5	ug/L			
1,1,2,2-Tetrachloroethane	ND	5	ug/L			
Tetrachloroethene	ND	5	ug/L			
Toluene	49	5	ug/L			
1,1,1-Trichloroethane	ND	5	ug/L			
1,1,2-Trichloroethane	ND	5	ug/L			
Trichloroethene	ND	5	ug/L			
Vinyl acetate	ND	50	ug/L			
Vinyl chloride	ND	10	ug/L			
Xylenes-total	330	5	ug/L			
1,2-Dichloroethane-d4	105	0	% Recovery	76-114% Limit		
Toluene-d8	96	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	110	0	% Recovery	86-115% Limit		
Time Analyzed	1934	0				
Volatile Organics - Surrogates		*1		8240(2)/624(6)	02/10/94	JMC
1,2-Dichloroethane-d4	105	0	% Recovery	76-114% Limit		
Toluene-d8	96	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	106	0	% Recovery	86-115% Limit		
Time Analyzed	1219	0				
8270 - BASE/NEUTRAL/ACID ORGANICS		*1		8270 (2)	02/09/94	DMJ
Acenaphthene	ND	10	ug/L			
Acenaphthylene	ND	10	ug/L			
Anthracene	ND	10	ug/L			
Benzo(a)anthracene	ND	10	ug/L			
Benzo(b)fluoranthene	ND	10	ug/L			
Benzo(k)fluoranthene	ND	10	ug/L			
Benzo(ghi)perylene	ND	10	ug/L			
Benzo(a)pyrene	ND	10	ug/L			
Benzyl Alcohol	ND	20	ug/L			
Butyl benzyl phthalate	ND	10	ug/L			
Bis(2-chloroethoxy)methane	ND	10	ug/L			
Bis(2-chloroethyl)ether	ND	10	ug/L			
Bis(2-chloroisopropyl)ether	ND	10	ug/L			
Bis(2-ethylhexyl)phthalate	ND	10	ug/L			
4-Bromophenyl phenyl ether	ND	10	ug/L			
4-Chloroaniline	ND	10	ug/L			
2-Chloronaphthalene	ND	10	ug/L			

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LABORATORY TESTS RESULTS
02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: ENRON COC #7722
DATE SAMPLED.....: 02/04/94
TIME SAMPLED.....: 11:45
WORK DESCRIPTION...: 9402041145

LABORATORY I.D...: 940258-0004
DATE RECEIVED....: 02/08/94
TIME RECEIVED....: 09:15
REMARKS.....: MW-1

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8270 - BASE/NEUTRAL/ACID ORGANICS		*1		8270 (2)	02/09/94	DMJ
Acenaphthene	ND	10	ug/L			
Acenaphthylene	ND	10	ug/L			
Anthracene	ND	10	ug/L			
Benzo(a)anthracene	ND	10	ug/L			
Benzo(b)fluoranthene	ND	10	ug/L			
Benzo(k)fluoranthene	ND	10	ug/L			
Benzo(ghi)perylene	ND	10	ug/L			
Benzo(a)pyrene	ND	10	ug/L			
Benzyl Alcohol	ND	20	ug/L			
Butyl benzyl phthalate	ND	10	ug/L			
Bis(2-chloroethoxy)methane	ND	10	ug/L			
Bis(2-chloroethyl)ether	ND	10	ug/L			
Bis(2-chloroisopropyl)ether	ND	10	ug/L			
Bis(2-ethylhexyl)phthalate	12	10	ug/L			
4-Bromophenyl phenyl ether	ND	10	ug/L			
4-Chloroaniline	ND	10	ug/L			
2-Chloronaphthalene	ND	10	ug/L			
4-Chlorophenyl phenyl ether	ND	10	ug/L			
Chrysene	ND	10	ug/L			
Dibenzo(a,h)anthracene	ND	10	ug/L			
Dibenzofuran	ND	10	ug/L			
1,2-Dichlorobenzene	ND	10	ug/L			
1,3-Dichlorobenzene	ND	10	ug/L			
1,4-Dichlorobenzene	ND	10	ug/L			
3,3-Dichlorobenzidine	ND	20	ug/L			
Diethyl phthalate	ND	10	ug/L			
Dimethyl phthalate	ND	10	ug/L			
Di-n-butyl phthalate	ND	10	ug/L			
Di-n-octyl phthalate	ND	10	ug/L			
2,4-Dinitrotoluene	ND	10	ug/L			
2,6-Dinitrotoluene	ND	10	ug/L			
Fluoranthene	ND	10	ug/L			
Fluorene	ND	10	ug/L			
Hexachlorobenzene	ND	10	ug/L			
Hexachlorobutadiene	ND	10	ug/L			
Hexachlorocyclopentadiene	ND	10	ug/L			
Hexachloroethane	ND	10	ug/L			
Indeno(1,2,3-cd)pyrene	ND	10	ug/L			
Isophorone	ND	10	ug/L			
2-Methylnaphthalene	ND	10	ug/L			
Naphthalene	ND	10	ug/L			
o-Nitroaniline	ND	50	ug/L			
m-Nitroaniline	ND	50	ug/L			

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TIME SAMPLED.....: 11:45
WORK DESCRIPTION...: 9402041145

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DATE RECEIVED....: 02/08/94
TIME RECEIVED....: 09:15
REMARKS.....: MW-1

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
p-Nitroaniline	ND	50	ug/L			
Nitrobenzene	ND	10	ug/L			
N-Nitrosodi-n-propylamine	ND	10	ug/L			
N-Nitrosodiphenylamine	ND	10	ug/L			
Phenanthrene	ND	10	ug/L			
Pyrene	ND	10	ug/L			
1,2,4-Trichlorobenzene	ND	10	ug/L			
Benzoic Acid	ND	50	ug/L			
4-Chloro-3-methylphenol	ND	10	ug/L			
2-Chlorophenol	ND	10	ug/L			
2,4-Dichlorophenol	ND	10	ug/L			
2,4-Dimethylphenol	ND	10	ug/L			
2,4-Dinitrophenol	ND	50	ug/L			
2-Methyl-4,6-dinitrophenol	ND	50	ug/L			
o-Cresol (2-Methylphenol)	ND	10	ug/L			
4-Methylphenol	ND	10	ug/L			
2-Nitrophenol	ND	10	ug/L			
4-Nitrophenol	ND	50	ug/L			
Pentachlorophenol	ND	50	ug/L			
Phenol	ND	10	ug/L			
2,4,5-Trichlorophenol	ND	10	ug/L			
2,4,6-Trichlorophenol	ND	10	ug/L			
Nitrobenzene-d5	59	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl	85	0	% Recovery	43-116% Limit		
4-Terphenyl-d14	101	0	% Recovery	33-141% Limit		
Phenol-d6	25	0	% Recovery	10-94% Limit		
2-Fluorophenol	31	0	% Recovery	21-100% Limit		
2,4,6-Tribromophenol	90	0	% Recovery	10-123% Limit		
Time Analyzed	2310	0				
Date Extracted	02/09/94	0				

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LABORATORY TESTS RESULTS
02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: ENRON COC #7722
DATE SAMPLED.....: 02/04/94
TIME SAMPLED.....: 09:30
WORK DESCRIPTION...: 9402040930

LABORATORY I.D...: 940258-0005
DATE RECEIVED....: 02/08/94
TIME RECEIVED....: 09:15
REMARKS.....: MW-2

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8270 - BASE/NEUTRAL/ACID ORGANICS		*1		8270 (2)	02/10/94	DMJ
Acenaphthene	ND	10	ug/L			
Acenaphthylene	ND	10	ug/L			
Anthracene	ND	10	ug/L			
Benzo(a)anthracene	ND	10	ug/L			
Benzo(b)fluoranthene	ND	10	ug/L			
Benzo(k)fluoranthene	ND	10	ug/L			
Benzo(ghi)perylene	ND	10	ug/L			
Benzo(a)pyrene	ND	10	ug/L			
Benzyl Alcohol	ND	20	ug/L			
Butyl benzyl phthalate	ND	10	ug/L			
Bis(2-chloroethoxy)methane	ND	10	ug/L			
Bis(2-chloroethyl)ether	ND	10	ug/L			
Bis(2-chloroisopropyl)ether	ND	10	ug/L			
Bis(2-ethylhexyl)phthalate	ND	10	ug/L			
4-Bromophenyl phenyl ether	ND	10	ug/L			
4-Chloroaniline	ND	10	ug/L			
2-Chloronaphthalene	ND	10	ug/L			
4-Chlorophenyl phenyl ether	ND	10	ug/L			
Chrysene	ND	10	ug/L			
Dibenzo(a,h)anthracene	ND	10	ug/L			
Dibenzofuran	ND	10	ug/L			
1,2-Dichlorobenzene	ND	10	ug/L			
1,3-Dichlorobenzene	ND	10	ug/L			
1,4-Dichlorobenzene	ND	10	ug/L			
3,3-Dichlorobenzidine	ND	20	ug/L			
Diethyl phthalate	ND	10	ug/L			
Dimethyl phthalate	ND	10	ug/L			
Di-n-butyl phthalate	ND	10	ug/L			
Di-n-octyl phthalate	ND	10	ug/L			
2,4-Dinitrotoluene	ND	10	ug/L			
2,6-Dinitrotoluene	ND	10	ug/L			
Fluoranthene	ND	10	ug/L			
Fluorene	ND	10	ug/L			
Hexachlorobenzene	ND	10	ug/L			
Hexachlorobutadiene	ND	10	ug/L			
Hexachlorocyclopentadiene	ND	10	ug/L			
Hexachloroethane	ND	10	ug/L			
Indeno(1,2,3-cd)pyrene	ND	10	ug/L			
Isophorone	ND	10	ug/L			
2-Methylnaphthalene	ND	10	ug/L			
Naphthalene	ND	10	ug/L			
o-Nitroaniline	ND	50	ug/L			
m-Nitroaniline	ND	50	ug/L			

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WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: ENRON COC #7722
DATE SAMPLED.....: 02/04/94
TIME SAMPLED.....: 15:00
WORK DESCRIPTION...: 9402041500

LABORATORY I.D...: 940258-0006
DATE RECEIVED....: 02/08/94
TIME RECEIVED....: 09:15
REMARKS.....: TRIP BLANK

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8240 - VOLATILE ORGANICS		*1		8240 (2)	02/09/94	JMC
Acetone	ND	100	ug/L			
Benzene	ND	1	ug/L			
Bromodichloromethane	ND	5	ug/L			
Bromoform	ND	5	ug/L			
Bromomethane	ND	10	ug/L			
2-Butanone	ND	100	ug/L			
Carbon disulfide	ND	5	ug/L			
Carbon tetrachloride	ND	5	ug/L			
Chlorobenzene	ND	5	ug/L			
Chloroethane	ND	10	ug/L			
2-Chloroethylvinyl ether	ND	10	ug/L			
Chloroform	ND	5	ug/L			
Chloromethane	ND	10	ug/L			
Dibromochloromethane	ND	5	ug/L			
1,1-Dichloroethane	ND	5	ug/L			
1,2-Dichloroethane	ND	5	ug/L			
1,1-Dichloroethene	ND	5	ug/L			
trans-1,2-Dichloroethene	ND	5	ug/L			
1,2-Dichloropropane	ND	5	ug/L			
cis-1,3-Dichloropropene	ND	5	ug/L			
trans-1,3-Dichloropropene	ND	5	ug/L			
Ethylbenzene	ND	5	ug/L			
2-Hexanone	ND	50	ug/L			
Methylene chloride	ND	5	ug/L			
4-Methyl-2-pentanone	ND	50	ug/L			
Styrene	ND	5	ug/L			
1,1,2,2-Tetrachloroethane	ND	5	ug/L			
Tetrachloroethene	ND	5	ug/L			
Toluene	ND	5	ug/L			
1,1,1-Trichloroethane	ND	5	ug/L			
1,1,2-Trichloroethane	ND	5	ug/L			
Trichloroethene	ND	5	ug/L			
Vinyl acetate	ND	50	ug/L			
Vinyl chloride	ND	10	ug/L			
Xylenes-total	ND	5	ug/L			
1,2-Dichloroethane-d4	106	0	% Recovery	76-114% Limit		
Toluene-d8	96	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	109	0	% Recovery	86-115% Limit		
Time Analyzed	2107	0				

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LABORATORY TESTS RESULTS
02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: METHOD BLANK

LABORATORY I.D...: 940258-0007
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon	<10	10	mg/Kg	418.1 (1)	02/09/94	JD
8240 - VOLATILE ORGANICS		*1		8240 (2)	02/09/94	JMC
Acetone	ND	100	ug/L			
Benzene	ND	1	ug/L			
Bromodichloromethane	ND	5	ug/L			
Bromoform	ND	5	ug/L			
Bromomethane	ND	10	ug/L			
2-Butanone	ND	100	ug/L			
Carbon disulfide	ND	5	ug/L			
Carbon tetrachloride	ND	5	ug/L			
Chlorobenzene	ND	5	ug/L			
Chloroethane	ND	10	ug/L			
2-Chloroethylvinyl ether	ND	10	ug/L			
Chloroform	ND	5	ug/L			
Chloromethane	ND	10	ug/L			
Dibromochloromethane	ND	5	ug/L			
1,1-Dichloroethane	ND	5	ug/L			
1,2-Dichloroethane	ND	5	ug/L			
1,1-Dichloroethene	ND	5	ug/L			
trans-1,2-Dichloroethene	ND	5	ug/L			
1,2-Dichloropropane	ND	5	ug/L			
cis-1,3-Dichloropropene	ND	5	ug/L			
trans-1,3-Dichloropropene	ND	5	ug/L			
Ethylbenzene	ND	5	ug/L			
2-Hexanone	ND	50	ug/L			
Methylene chloride	ND	5	ug/L			
4-Methyl-2-pentanone	ND	50	ug/L			
Styrene	ND	5	ug/L			
1,1,2,2-Tetrachloroethane	ND	5	ug/L			
Tetrachloroethene	ND	5	ug/L			
Toluene	ND	5	ug/L			
1,1,1-Trichloroethane	ND	5	ug/L			
1,1,2-Trichloroethane	ND	5	ug/L			
Trichloroethene	ND	5	ug/L			
Vinyl acetate	ND	50	ug/L			
Vinyl chloride	ND	10	ug/L			
Xylenes-total	ND	5	ug/L			
1,2-Dichloroethane-d4	109	0	% Recovery	76-114% Limit		
Toluene-d8	95	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	105	0	% Recovery	86-115% Limit		
Time Analyzed	1543	0				
8270 - BASE/NEUTRAL/ACID ORGANICS		*1		8270 (2)	02/09/94	DMJ

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LABORATORY TESTS RESULTS
02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: METHOD BLANK

LABORATORY I.D...: 940258-0007
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Acenaphthene	ND	10	ug/L			
Acenaphthylene	ND	10	ug/L			
Anthracene	ND	10	ug/L			
Benzo(a)anthracene	ND	10	ug/L			
Benzo(b)fluoranthene	ND	10	ug/L			
Benzo(k)fluoranthene	ND	10	ug/L			
Benzo(ghi)perylene	ND	10	ug/L			
Benzo(a)pyrene	ND	10	ug/L			
Benzyl Alcohol	ND	20	ug/L			
Butyl benzyl phthalate	ND	10	ug/L			
Bis(2-chloroethoxy)methane	ND	10	ug/L			
Bis(2-chloroethyl)ether	ND	10	ug/L			
Bis(2-chloroisopropyl)ether	ND	10	ug/L			
Bis(2-ethylhexyl)phthalate	ND	10	ug/L			
4-Bromophenyl phenyl ether	ND	10	ug/L			
4-Chloroaniline	ND	10	ug/L			
2-Chloronaphthalene	ND	10	ug/L			
4-Chlorophenyl phenyl ether	ND	10	ug/L			
Chrysene	ND	10	ug/L			
Dibenzo(a,h)anthracene	ND	10	ug/L			
Dibenzofuran	ND	10	ug/L			
1,2-Dichlorobenzene	ND	10	ug/L			
1,3-Dichlorobenzene	ND	10	ug/L			
1,4-Dichlorobenzene	ND	10	ug/L			
3,3-Dichlorobenzidine	ND	20	ug/L			
Diethyl phthalate	ND	10	ug/L			
Dimethyl phthalate	ND	10	ug/L			
Di-n-butyl phthalate	ND	10	ug/L			
Di-n-octyl phthalate	ND	10	ug/L			
2,4-Dinitrotoluene	ND	10	ug/L			
2,6-Dinitrotoluene	ND	10	ug/L			
Fluoranthene	ND	10	ug/L			
Fluorene	ND	10	ug/L			
Hexachlorobenzene	ND	10	ug/L			
Hexachlorobutadiene	ND	10	ug/L			
Hexachlorocyclopentadiene	ND	10	ug/L			
Hexachloroethane	ND	10	ug/L			
Indeno(1,2,3-cd)pyrene	ND	10	ug/L			
Isophorone	ND	10	ug/L			
2-Methylnaphthalene	ND	10	ug/L			
Naphthalene	ND	10	ug/L			
o-Nitroaniline	ND	50	ug/L			
m-Nitroaniline	ND	50	ug/L			
p-Nitroaniline	ND	50	ug/L			
Nitrobenzene	ND	10	ug/L			

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LABORATORY TESTS RESULTS
02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: METHOD BLANK

LABORATORY I.D...: 940258-0007
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
2-Nitrophenol	ND	330	ug/Kg			
4-Nitrophenol	ND	1650	ug/Kg			
Pentachlorophenol	ND	1650	ug/Kg			
Phenol	ND	330	ug/Kg			
2,4,5-Trichlorophenol	ND	330	ug/Kg			
2,4,6-Trichlorophenol	ND	330	ug/Kg			
Nitrobenzene-d5	53	0	% Recovery	23-120% Limit		
2-Fluorobiphenyl	75	0	% Recovery	30-115% Limit		
4-Terphenyl-d14	78	0	% Recovery	18-137% Limit		
Phenol-d6	53	0	% Recovery	24-113% Limit		
2-Fluorophenol	50	0	% Recovery	25-121% Limit		
2,4,6-Tribromophenol	48	0	% Recovery	19-122% Limit		
Time Analyzed	0114	0				
Date Extracted	02/09/94	0				
Total Petroleum Hydrocarbon (I.R.)	<1	1	mg/L	418.1 (1)	02/09/94	LM

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LABORATORY TESTS RESULTS
02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: METHOD BLANK

LABORATORY I.D...: 940258-0008
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8240 - VOLATILE ORGANICS		*1		8240 (2)	02/10/94	JMC
Acetone	ND	100	ug/Kg			
Benzene	ND	1	ug/Kg			
Bromodichloromethane	ND	5	ug/Kg			
Bromoform	ND	5	ug/Kg			
Bromomethane	ND	10	ug/Kg			
2-Butanone	ND	100	ug/Kg			
Carbon disulfide	ND	5	ug/Kg			
Carbon tetrachloride	ND	5	ug/Kg			
Chlorobenzene	ND	5	ug/Kg			
Chloroethane	ND	10	ug/Kg			
2-Chloroethylvinyl ether	ND	10	ug/Kg			
Chloroform	ND	5	ug/Kg			
Chloromethane	ND	10	ug/Kg			
Dibromochloromethane	ND	5	ug/Kg			
1,1-Dichloroethane	ND	5	ug/Kg			
1,2-Dichloroethane	ND	5	ug/Kg			
1,1-Dichloroethene	ND	5	ug/Kg			
trans-1,2-Dichloroethene	ND	5	ug/Kg			
1,2-Dichloropropane	ND	5	ug/Kg			
cis-1,3-Dichloropropene	ND	5	ug/Kg			
trans-1,3-Dichloropropene	ND	5	ug/Kg			
Ethylbenzene	ND	5	ug/Kg			
2-Hexanone	ND	50	ug/Kg			
Methylene chloride	ND	5	ug/Kg			
4-Methyl-2-pentanone	ND	50	ug/Kg			
Styrene	ND	5	ug/Kg			
1,1,2,2-Tetrachloroethane	ND	5	ug/Kg			
Tetrachloroethene	ND	5	ug/Kg			
Toluene	ND	5	ug/Kg			
1,1,1-Trichloroethane	ND	5	ug/Kg			
1,1,2-Trichloroethane	ND	5	ug/Kg			
Trichloroethene	ND	5	ug/Kg			
Vinyl acetate	ND	50	ug/Kg			
Vinyl chloride	ND	10	ug/Kg			
Xylenes-total	ND	5	ug/Kg			
1,2-Dichloroethane-d4	102	0	% Recovery	70-121% Limit		
Toluene-d8	98	0	% Recovery	81-117% Limit		
4-Bromofluorobenzene	107	0	% Recovery	74-121% Limit		
Time Analyzed	1000	0				

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LABORATORY TESTS RESULTS
02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: MEDIUM LEVEL EXTRACTION BLANK

LABORATORY I.D...: 940258-0009
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8240 - VOLATILE ORGANICS		*125		8240 (2)	02/10/94	JMC
Acetone	ND	12500	ug/Kg			
Benzene	ND	125	ug/Kg			
Bromodichloromethane	ND	625	ug/Kg			
Bromoform	ND	625	ug/Kg			
Bromomethane	ND	1250	ug/Kg			
2-Butanone	ND	12500	ug/Kg			
Carbon disulfide	ND	625	ug/Kg			
Carbon tetrachloride	ND	625	ug/Kg			
Chlorobenzene	ND	625	ug/Kg			
Chloroethane	ND	1250	ug/Kg			
2-Chloroethylvinyl ether	ND	1250	ug/Kg			
Chloroform	ND	625	ug/Kg			
Chloromethane	ND	1250	ug/Kg			
Dibromochloromethane	ND	625	ug/Kg			
1,1-Dichloroethane	ND	625	ug/Kg			
1,2-Dichloroethane	ND	625	ug/Kg			
1,1-Dichloroethene	ND	625	ug/Kg			
trans-1,2-Dichloroethene	ND	625	ug/Kg			
1,2-Dichloropropane	ND	625	ug/Kg			
cis-1,3-Dichloropropene	ND	625	ug/Kg			
trans-1,3-Dichloropropene	ND	625	ug/Kg			
Ethylbenzene	ND	625	ug/Kg			
2-Hexanone	ND	6250	ug/Kg			
Methylene chloride	ND	625	ug/Kg			
4-Methyl-2-pentanone	ND	6250	ug/Kg			
Styrene	ND	625	ug/Kg			
1,1,2,2-Tetrachloroethane	ND	625	ug/Kg			
Tetrachloroethene	ND	625	ug/Kg			
Toluene	ND	625	ug/Kg			
1,1,1-Trichloroethane	ND	625	ug/Kg			
1,1,2-Trichloroethane	ND	625	ug/Kg			
Trichloroethene	ND	625	ug/Kg			
Vinyl acetate	ND	6250	ug/Kg			
Vinyl chloride	ND	1250	ug/Kg			
Xylenes-total	ND	625	ug/Kg			
1,2-Dichloroethane-d4	106	0	% Recovery	70-121% Limit		
Toluene-d8	94	0	% Recovery	81-117% Limit		
4-Bromofluorobenzene	105	0	% Recovery	74-121% Limit		
Time Analyzed	1047	0				

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LABORATORY TESTS RESULTS
02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: BLANK SPIKE

LABORATORY I.D...: 940258-0010
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Semi-Volatile Organic - Surrogates		*1		8270(2)/625(6)	02/10/94	DMJ
Nitrobenzene-d5	65	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl	87	0	% Recovery	43-116% Limit		
4-Terphenyl-d14	104	0	% Recovery	33-141% Limit		
Phenol-d6	21	0	% Recovery	10-94% Limit		
2-Fluorophenol	35	0	% Recovery	21-100% Limit		
2,4,6-Tribromophenol	74	0	% Recovery	10-123% Limit		
Date Extracted	02/09/94	0				
Time Analyzed	0319	0				

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LABORATORY TESTS RESULTS
02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: BLANK SPIKE DUPLICATE

LABORATORY I.D...: 940258-0011
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Semi-Volatile Organic - Surrogates		*1		8270(2)/625(6)	02/10/94	DMJ
Nitrobenzene-d5	70	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl	82	0	% Recovery	43-116% Limit		
4-Terphenyl-d14	103	0	% Recovery	33-141% Limit		
Phenol-d6	24	0	% Recovery	10-94% Limit		
2-Fluorophenol	38	0	% Recovery	21-100% Limit		
2,4,6-Tribromophenol	74	0	% Recovery	10-123% Limit		
Date Extracted	02/09/94	0				
Time Analyzed	0421	0				

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WESTERN ATLAS

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QUALITY CONTROL REPORT
02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

ANALYSIS				DUPLICATES		REFERENCE STANDARDS		MATRIX SPIKES		
ANALYSIS TYPE	ANALYSIS SUB-TYPE	ANALYSIS I.D.	ANALYZED VALUE (A)	DUPLICATE VALUE (B)	RPD or (|A-B|)	TRUE VALUE	PERCENT RECOVERY	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY
PARAMETER:Calcium, Diss. (Ca)			DATE/TIME ANALYZED:02/09/94 22:52							QC BATCH NUMBER:288387
REPORTING LIMIT/DF: 1.0	UNITS:mg/L		METHOD REFERENCE :6010 (2)							TECHNICIAN:GAG
BLANK	ICB	1228R	<1.0							
BLANK	CCB	1228R	<1.0							
BLANK	CCB	1228R	<1.0							
BLANK	CCB	1228R	<1.0							
BLANK	CCB	1228R	<1.0							
BLANK	CCB	1228R	<1.0							
BLANK	CCB	1228R	<1.0							
BLANK	CCB	1228R	<1.0							
BLANK	CCB	1228R	<1.0							
BLANK	CCB	1228R	<1.0							
STANDARD	CCV	0207H	260			250	104			
STANDARD	CCV	0207H	263			250	105			
STANDARD	ICV	1020E	214			200	107			
STANDARD	CCV	0207H	272			250	109			
STANDARD	CCV	0207H	270			250	108			
STANDARD	CCV	0207H	260			250	104			
STANDARD	ISA	0110A	509			500	102			
STANDARD	ISB	0111K	492			500	98			
STANDARD	CCV	0207H	268			250	107			
STANDARD	CCV	0207H	263			250	105			
STANDARD	ISA	0110A	490			500	98			
STANDARD	ISB	0111K	483			500	97			
STANDARD	CCV	0207H	264			250	106			
STANDARD	CCV	0207H	264			250	106			
SPIKE	PDS	940138-014	167					113	50.0	108
SPIKE	PDS	940138-002	174					121	50.0	106
DUPLICATE	MD	940138-001	116	114	2					
DUPLICATE	MD	940138-011	143	136	5					
PARAMETER:Cadmium, Diss. (Cd)			DATE/TIME ANALYZED:02/10/94 00:07							QC BATCH NUMBER:288388
REPORTING LIMIT/DF: 0.005	UNITS:mg/L		METHOD REFERENCE :6010 (2)							TECHNICIAN:GAG
BLANK	ICB	1228R	<0.005							
BLANK	CCB	1228R	<0.005							
BLANK	CCB	1228R	<0.005							
BLANK	CCB	1228R	<0.005							
BLANK	CCB	1228R	<0.005							
BLANK	CCB	1228R	<0.005							
BLANK	CCB	1228R	<0.005							
BLANK	CCB	1228R	<0.005							
BLANK	CCB	1228R	<0.005							
BLANK	CCB	1228R	<0.005							
STANDARD	CCV	0125D	2.51			2.50	100			
STANDARD	CCV	0125D	2.45			2.50	98			
STANDARD	CCV	0125D	2.44			2.50	98			
STANDARD	ICV	0820E	2.06			2.00	103			

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QUALITY CONTROL REPORT
02/15/94

JOB NUMBER: 94025B CUSTOMER: HYGIENETICS/GCL ATTN:

ANALYSIS				DUPLICATES		REFERENCE STANDARDS		MATRIX SPIKES		
ANALYSIS TYPE	ANALYSIS SUB-TYPE	ANALYSIS I.D.	ANALYZED VALUE (A)	DUPLICATE VALUE (B)	RPD or (|A-B|)	TRUE VALUE	PERCENT RECOVERY	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY
PARAMETER:Cadmium, Diss. (Cd)				DATE/TIME ANALYZED:02/10/94 00:07						QC BATCH NUMBER:288388
REPORTING LIMIT/DF: 0.005 UNITS:mg/L				METHOD REFERENCE :6010 (2)						TECHNICIAN:GAG
STANDARD	CCV	0125D	2.45			2.50	98			
STANDARD	CCV	0125D	2.53			2.50	101			
STANDARD	CCV	0125D	2.37			2.50	95			
STANDARD	ISB	0111K	0.850			1.00	85			
STANDARD	CCV	0125D	2.44			2.50	98			
STANDARD	CCV	0125D	2.39			2.50	96			
STANDARD	ISB	0111K	0.833			1.00	83			
STANDARD	CCV	0125D	2.47			2.50	99			
SPIKE	PDS	940138-002	0.992					0.049	1.00	94
SPIKE	PDS	940138-014	0.902					0.016	1.00	89
SPIKE	PDS	940201-004	0.915					<0.005	1.00	92
DUPLICATE	MD	940138-011	0.050	0.050	0					
DUPLICATE	MD	940138-001	0.132	0.129	2					
DUPLICATE	MD	940201-005	<0.005	<0.005	NC					
PARAMETER:Chromium, Diss. (Cr)				DATE/TIME ANALYZED:02/10/94 00:07						QC BATCH NUMBER:288389
REPORTING LIMIT/DF: 0.01 UNITS:mg/L				METHOD REFERENCE :6010 (2)						TECHNICIAN:GAG
BLANK	ICB	1228R	<0.01							
BLANK	CCB	1228R	<0.01							
BLANK	CCB	1228R	<0.01							
BLANK	CCB	1228R	<0.01							
BLANK	CCB	1228R	<0.01							
BLANK	CCB	1228R	<0.01							
BLANK	CCB	1228R	<0.01							
BLANK	CCB	1228R	<0.01							
BLANK	CCB	1228R	<0.01							
STANDARD	CCV	0125D	2.48			2.50	99			
STANDARD	CCV	0125D	2.51			2.50	100			
STANDARD	CCV	0125D	2.37			2.50	95			
STANDARD	ICV	0820E	2.06			2.00	103			
STANDARD	CCV	0125D	2.46			2.50	98			
STANDARD	CCV	0125D	2.60			2.50	104			
STANDARD	CCV	0125D	2.35			2.50	94			
STANDARD	ISB	0111K	0.42			0.50	84			
STANDARD	CCV	0125D	2.41			2.50	96			
STANDARD	CCV	0125D	2.36			2.50	94			
STANDARD	ISB	0111K	0.50			0.50	100			
STANDARD	CCV	0125D	2.40			2.50	96			
SPIKE	PDS	940138-002	0.99					0.03	1.00	96
SPIKE	PDS	940138-014	0.93					0.10	1.00	83
SPIKE	PDS	940201-004	0.87					<0.01	1.00	87
DUPLICATE	MD	940138-011	0.06	0.06	0					
DUPLICATE	MD	940138-001	0.04	0.04	0.00					
DUPLICATE	MD	940201-005	<0.01	<0.01	NC					

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QUALITY CONTROL REPORT
02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

ANALYSIS				DUPLICATES		REFERENCE STANDARDS		MATRIX SPIKES		
ANALYSIS TYPE	ANALYSIS SUB-TYPE	ANALYSIS I.D.	ANALYZED VALUE (A)	DUPLICATE VALUE (B)	RPD or (|A-B|)	TRUE VALUE	PERCENT RECOVERY	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY
PARAMETER:Chromium, Diss. (Cr)				DATE/TIME ANALYZED:02/10/94 00:07						QC BATCH NUMBER:288389
REPORTING LIMIT/DF: 0.01 UNITS:mg/L				METHOD REFERENCE :6010 (2)						TECHNICIAN:GAG
PARAMETER:Magnesium, Diss. (Mg)				DATE/TIME ANALYZED:02/09/94 21:13						QC BATCH NUMBER:288393
REPORTING LIMIT/DF: 0.1 UNITS:mg/L				METHOD REFERENCE :6010 (2)						TECHNICIAN:GAG
BLANK	ICB	1228R	<0.1							
BLANK	CCB	1228R	<0.1							
BLANK	CCB	1228R	<0.1							
BLANK	CCB	1228R	<0.1							
BLANK	CCB	1228R	<0.1							
BLANK	CCB	1228R	<0.1							
BLANK	CCB	1228R	<0.1							
BLANK	CCB	1228R	<0.1							
BLANK	CCB	1228R	<0.1							
BLANK	CCB	1228R	<0.1							
STANDARD	CCV	0125D	25.5			25.0	102			
STANDARD	CCV	0125D	24.7			25.0	99			
STANDARD	CCV	0125D	24.4			25.0	98			
STANDARD	ICV	E1020	20.2			20.0	101			
STANDARD	CCV	0125D	25.1			25.0	100			
STANDARD	CCV	0125D	25.7			25.0	103			
STANDARD	CCV	0125D	24.2			25.0	97			
STANDARD	CCV	0125D	24.6			25.0	98			
STANDARD	CCV	0125D	24.2			25.0	97			
STANDARD	CCV	0125D	24.7			25.0	99			
SPIKE	PDS	940138-014	47.2					2.1	50.0	90
SPIKE	PDS	940201-004	47.6					0.5	50.0	94
DUPLICATE	MD	940138-011	3.2	3.3	3					
DUPLICATE	MD	940201-005	0.5	0.5	0.0					
DUPLICATE	MD	940138-001	0.9	0.9	0					
PARAMETER:Sodium, Diss. (Na)				DATE/TIME ANALYZED:02/10/94 00:07						QC BATCH NUMBER:288395
REPORTING LIMIT/DF: 1 UNITS:mg/L				METHOD REFERENCE :6010 (2)						TECHNICIAN:GAG
BLANK	ICB	1228R	<1							
BLANK	CCB	1228R	<1							
BLANK	CCB	1228R	<1							
BLANK	CCB	1228R	<1							
BLANK	CCB	1228R	<1							
BLANK	CCB	1228R	<1							
BLANK	CCB	1228R	<1							
BLANK	CCB	1228R	<1							
BLANK	CCB	1228R	<1							
BLANK	CCB	1228R	<1							
STANDARD	CCV	0125D	48			50	96			
STANDARD	CCV	0125D	49			50	98			
STANDARD	CCV	0125D	46			50	92			

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QUALITY CONTROL REPORT
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JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

ANALYSIS				DUPLICATES		REFERENCE STANDARDS		MATRIX SPIKES		
ANALYSIS TYPE	ANALYSIS SUB-TYPE	ANALYSIS I.D.	ANALYZED VALUE (A)	DUPLICATE VALUE (B)	RPD or (|A-B|)	TRUE VALUE	PERCENT RECOVERY	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY
PARAMETER:Sodium, Diss. (Na)				DATE/TIME ANALYZED:02/10/94 00:07						QC BATCH NUMBER:288395
REPORTING LIMIT/DF: 1	UNITS:mg/L			METHOD REFERENCE :6010 (2)						TECHNICIAN:GAG
STANDARD	ICV	E1020	21			20	105			
STANDARD	CCV	0125D	47			50	94			
STANDARD	CCV	0125D	51			50	102			
STANDARD	CCV	0125D	46			50	92			
STANDARD	CCV	0125D	46			50	92			
STANDARD	CCV	0125D	46			50	92			
STANDARD	CCV	0125D	47			50	94			
SPIKE	PDS	940201-004	46					1	50	90
DUPLICATE	MD	940201-005	1	1	0					
PARAMETER:Lead, Diss. (Pb)				DATE/TIME ANALYZED:02/10/94 00:07						QC BATCH NUMBER:288397
REPORTING LIMIT/DF: 0.05	UNITS:mg/L			METHOD REFERENCE :6010 (2)						TECHNICIAN:GAG
BLANK	ICB	1228R	<0.05							
BLANK	CCB	1228R	<0.05							
BLANK	CCB	1228R	<0.05							
BLANK	CCB	1228R	<0.05							
BLANK	CCB	1228R	<0.05							
BLANK	CCB	1228R	<0.05							
BLANK	CCB	1228R	<0.05							
BLANK	CCB	1228R	<0.05							
BLANK	CCB	1228R	<0.05							
STANDARD	CCV	0125D	2.51			2.50	100			
STANDARD	CCV	0125D	2.47			2.50	99			
STANDARD	CCV	0125D	2.44			2.50	98			
STANDARD	ICV	0820E	2.05			2.00	102			
STANDARD	CCV	0125D	2.48			2.50	99			
STANDARD	CCV	0125D	2.53			2.50	101			
STANDARD	CCV	0125D	2.39			2.50	96			
STANDARD	ISB	0111K	0.88			1.00	88			
STANDARD	CCV	0125D	2.43			2.50	97			
STANDARD	CCV	0125D	2.40			2.50	96			
STANDARD	ISB	0111K	0.95			1.00	95			
STANDARD	CCV	0125D	2.45			2.50	98			
SPIKE	PDS	940138-002	0.98					<0.05	1.00	98
SPIKE	PDS	940138-014	0.88					<0.05	1.00	88
SPIKE	PDS	940201-004	0.89					<0.05	1.00	89
DUPLICATE	MD	940138-011	<0.05	<0.05	NC					
DUPLICATE	MD	940138-001	0.05	0.06	0.01					
DUPLICATE	MD	940201-005	<0.05	<0.05	NC					
PARAMETER:Chloride (Filt.)				DATE/TIME ANALYZED:02/09/94 13:10						QC BATCH NUMBER:288423
REPORTING LIMIT/DF: 0.5	UNITS:mg/L			METHOD REFERENCE :325.2 (1)						TECHNICIAN:DME
BLANK	ICB	940209	<0.5							

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QUALITY CONTROL REPORT
02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

ANALYSIS				DUPLICATES		REFERENCE STANDARDS		MATRIX SPIKES		
ANALYSIS TYPE	ANALYSIS SUB-TYPE	ANALYSIS I.D.	ANALYZED VALUE (A)	DUPLICATE VALUE (B)	RPD or (|A-B|)	TRUE VALUE	PERCENT RECOVERY	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY
PARAMETER:Chloride (Filt.)				DATE/TIME ANALYZED:02/09/94 13:10						QC BATCH NUMBER:288423
REPORTING LIMIT/DF: 0.5 UNITS:mg/L				METHOD REFERENCE :325.2 (1)						TECHNICIAN:DME
BLANK	CCB	940209	<0.5							
STANDARD	ICV/LCS	G930413A	104			100	104			
STANDARD	CCV	S160	164			160	102			
SPIKE	MS	940092-8	157					108	50.0	98
DUPLICATE	MD	940092-8	108	114	5					
PARAMETER:Potassium, Diss. (K)				DATE/TIME ANALYZED:02/10/94 14:00						QC BATCH NUMBER:288455
REPORTING LIMIT/DF: 0.1 UNITS:mg/L				METHOD REFERENCE :7610 (2)						TECHNICIAN:LMT
BLANK	ICB	02104	<0.1							
BLANK	CCB	02104	<0.1							
BLANK	CCB	02104	<0.1							
STANDARD	ICV	1020E	2.2			2.0	110			
STANDARD	CCV	0207H	2.6			2.5	104			
STANDARD	CCV	0207H	2.6			2.5	104			
SPIKE	PDS	940138-012	8.6					6.0	2.5	104
DUPLICATE	MD	940138-011	6.8	6.8	0					
PARAMETER:Total Petroleum Hydrocarbon (I.R.)				DATE/TIME ANALYZED:02/09/94 13:30						QC BATCH NUMBER:288457
REPORTING LIMIT/DF: 1 UNITS:mg/L				METHOD REFERENCE :418.1 (1)						TECHNICIAN:LM
BLANK	ICB	S0	<1							
BLANK	MB	940209	<1							
BLANK	CCB	S0	<1							
STANDARD	ICV/LCS	940114	43			46	93			
STANDARD	CCV	S50	52			50	104			
PARAMETER:Total Petroleum Hydrocarbon				DATE/TIME ANALYZED:02/09/94 15:00						QC BATCH NUMBER:288458
REPORTING LIMIT/DF: 1 UNITS:mg/L				METHOD REFERENCE :418.1 (1)						TECHNICIAN:JD
BLANK	ICB	S0	<1							
BLANK	MB	R020794M	<1							
BLANK	CCB	S0	<1							
STANDARD	ICV/LCS	940114	45			48	94			
STANDARD	CCV	S50	51			50	102			
DUPLICATE	MD	940246-10	5	5	0					
PARAMETER:Sulfate (Filt.)				DATE/TIME ANALYZED:02/11/94 14:00						QC BATCH NUMBER:288522
REPORTING LIMIT/DF: 10 UNITS:mg/L				METHOD REFERENCE :375.2 (1)						TECHNICIAN:DME
BLANK	ICB	940211	<10							
BLANK	CCB	940211	<10							
BLANK	CCB	940211	<10							
STANDARD	ICV/LCS	G930413B	51			50	102			
STANDARD	CCV	S160	158			160	99			
STANDARD	CCV	S160	159			160	99			

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QUALITY CONTROL REPORT
02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

ANALYSIS				DUPLICATES		REFERENCE STANDARDS		MATRIX SPIKES		
ANALYSIS TYPE	ANALYSIS SUB-TYPE	ANALYSIS I.D.	ANALYZED VALUE (A)	DUPLICATE VALUE (B)	RPD or (|A-B|)	TRUE VALUE	PERCENT RECOVERY	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY
PARAMETER:Sulfate (Filt.) REPORTING LIMIT/DF: 10 UNITS:mg/L			DATE/TIME ANALYZED:02/11/94 14:00 METHOD REFERENCE :375.2 (1)							QC BATCH NUMBER:288522 TECHNICIAN:DME
SPIKE	MS	940173-34	175					129	50	92
SPIKE	MS	940196-15	78					34	50	88
DUPLICATE	MD	940173-34	129	134	4					
DUPLICATE	MD	940196-15	34	29	5					
PARAMETER:Solids, Total Dissolved (TDS) REPORTING LIMIT/DF: 10 UNITS:mg/L			DATE/TIME ANALYZED:02/10/94 06:20 METHOD REFERENCE :160.1 (1)							QC BATCH NUMBER:288525 TECHNICIAN:RJC
BLANK	MB	940210	<10							
STANDARD	LCS	G931110D	502			500	100			
DUPLICATE	MD	940173-19	2410	2410	0					
DUPLICATE	MD	940173-26	2570	2570	0					
DUPLICATE	MD	940173-36	2870	2860	0					
DUPLICATE	MD	940258-2	779	760	2					
DUPLICATE	MD	940259-3	43	41	2					
PARAMETER:Bicarbonate (Filt.) REPORTING LIMIT/DF: 5 UNITS:mg/L			DATE/TIME ANALYZED:02/11/94 19:50 METHOD REFERENCE :2320 B (3)							QC BATCH NUMBER:288536 TECHNICIAN:KDS
BLANK	MB	940211	<5							
DUPLICATE	MD	940258-2	566	566	0					

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QUALITY CONTROL REPORT
02/15/94

JOB NUMBER: 940258 CUSTOMER: HYGIENETICS/GCL ATTN:

BNA SPIKED ANALYSIS-WATER DATE ANALYZED: 02/10/94 TIME ANALYZED: 03:19 METHOD: 8270 (2) QC NUMBER:288616

REFERENCE STANDARDS

TEST DESCRIPTION	ANALYSIS SUB-TYPE	ANALYSIS I. D.	DILUTION FACTOR	ANALYZED VALUE	TRUE VALUE	PERCENT RECOVERY	DETECTION LIMITS	UNITS OF MEASURE
Phenol	SB	B931011D	1	12	50	24	10	ug/L
	SBD	B931011D	1	14	50	28	10	ug/L
2-Chlorophenol	SB	B931011D	1	31	50	62	10	ug/L
	SBD	B931011D	1	32	50	64	10	ug/L
1,4-Dichlorobenzene	SB	B931011D	1	39	50	78	10	ug/L
	SBD	B931011D	1	36	50	72	10	ug/L
N-Nitrosodi-n-propylamine	SB	B931011D	1	42	50	84	10	ug/L
	SBD	B931011D	1	39	50	78	10	ug/L
1,2,4-Trichlorobenzene	SB	B931011D	1	33	50	66	10	ug/L
	SBD	B931011D	1	30	50	60	10	ug/L
4-Chloro-3-methylphenol	SB	B931011D	1	39	50	78	10	ug/L
	SBD	B931011D	1	40	50	80	10	ug/L
Acenaphthene	SB	B931011D	1	42	50	84	10	ug/L
	SBD	B931011D	1	42	50	84	10	ug/L
4-Nitrophenol	SB	B931011D	1	17	50	34	1	ug/L
	SBD	B931011D	1	15	50	30	1	ug/L
2,4-Dinitrotoluene	SB	B931011D	1	37	50	74	10	ug/L
	SBD	B931011D	1	38	50	76	10	ug/L
Pentachlorophenol	SB	B931011D	1	6	50	12	1	ug/L
	SBD	B931011D	1	7	50	14	1	ug/L
Pyrene	SB	B931011D	1	53	50	106	10	ug/L
	SBD	B931011D	1	56	50	112	10	ug/L

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METHOD REFERENCES

(1) EPA 600/4-79-020, Methods For Chemical Analysis Of Water And Wastes, March 1983

(2) EPA SW-846, Test Methods For Evaluating Solid Waste, Third Edition, November 1986

(3) Standard Methods For The Examination Of Water And Wastewater, 17th Edition, 1989

(4) EPA 600/4-80-032, Prescribed Procedures For Measurement Of Radioactivity In Drinking Water, August 1980

(5) EPA 600/8-78-017, Microbiological Methods For Monitoring The Environment, December 1978

(6) Federal Register, July 1, 1990 (40 CFR Part 136)

(7) EPA 600/4-88-039, Methods For The Determination Of Organics Compounds In Drinking Water, December 1988

(8) U.S.G.S. Methods For The Determination Of Inorganic Substances In Water And Fluvial Sediments, Book 5, Chapter A1, 1985

(9) Federal Register, Friday, June 7, 1991, (40 CFR Parts 141 and 142)

(10) Standard Methods For The Examination Of Water And Wastewater, 16th Edition, 1985

(11) ASTM, Section 11 Water And Environmental Technology, Volume 11.01 Water (1), 1991

(12) Methods Of Soil Analysis, American Society Of Agronomy, Agronomy No. 9, 1965

(13) EPA SW-846, Test Methods For Evaluating Solid Waste, Third Edition, Revision 1, November 1990

(14) ASTM, Section 5, Petroleum Products, Lubricants, and Fossil Fuels, Volume 05.05, Gaseous Fuels, Coal and Coke

(15) EPA 600/2-78-054, Field and Laboratory Methods Applicable To Overburdens and Mine Soils, March 1978

(16) ASTM, Part 19, Soils and Rock; Building Stones, 1981

COMMENTS: Data in QA report may differ from final results due to digestion and/or dilution of sample into analytical ranges. The "Time Analyzed" in the QA report refers to the start time of the analytical batch which may not reflect the actual time of each analysis. The "Date Analyzed" is the actual date of analysis.

NC = Not Calculable Due To Value(s) Lower Than The Detection Limit.

Analyses performed by a subcontract laboratory are indicated on the analytical and/or quality control reports under "Technician" using the following codes:

Subcontract Laboratory	Code	
Core Laboratories - Anaheim, CA	*AN	
Core Laboratories - Casper, WY	*CA	
Core Laboratories - Corpus Christi, TX	*CC	
Core Laboratories - Houston, TX	*HP	
Core Laboratories - Lake Charles, LA	*LC	
Core Laboratories - Long Beach, CA	*LB	
Other Subcontract Laboratories	*XX	Laboratory ID Provided Upon Request

* The asterisk in the "Technician" data field signifies that the analysis was performed by a subcontract laboratory.

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WESTERN ATLAS

Core Laboratories

CORE LABORATORIES
A N A L Y T I C A L R E P O R T

Job Number: 940261
Prepared For:

HYGIENETICS/GCL

505 MARQUETTE NW STE 1100
ALBUQUERQUE, NM 87102

Date: 02/17/94

Linda L Benkers
Signature

2-17-94
Date:

Name: Linda L. Benkers

Core Laboratories
10703 East Bethany Drive
Aurora, CO 80014

Title: QA/QC COORDINATOR

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FAX: (212) 983-8795

❑ San Francisco
2200 Powell Street, Ste. 880
Emeryville, CA 94608
(510) 547-3886
FAX: (510) 547-3631

7725

Chain of Custody

Date 2-8-94 Page 1 of ____

Lab Name CORE LABORATORIES
Address 10703 East Bethany Drive
Aurora, CO 80014-2696
Telephone 303/751-1780

Samplers (SIGNATURES)

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neu/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX Modified 8015	TCLP - Vol., Semi-Vol. Herbicides, Pesticides	TCLP - Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)		Filtered Metals Cr, Cd, Pb			Number of Containers
9402081100	H_2O	DP-2						X																				3
9402081110	H_2O	DP-2							X																			1
9402081120	H_2O	DP-2									X																	1
9402081130	H_2O	DP-2																								X		1
Trip Blank	H_2O							X																				1

Per Annette Montoya, cancel metals analysis - they will submit new sample.
2-9-94 JAB

Project Information		Sample Receipt		Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
Project	GPM/ENRON	Total No. of Containers	7	(Signature) 1135 (Time)	(Signature) (Time)	(Signature) (Time)
Project Director	Bob Cooper	Chain of Custody Seals	Y	KYLE SUMMERS 2/8/94	(Printed Name) (Date)	(Printed Name) (Date)
Charge Code No.	54191.02	Rec'd Good Condition/Cold	Y	(Printed Name) (Date)	(Company)	(Company)
Shipping ID. No.	860962908 1	Conforms to Record	N	HGCL (Company)	Received By 1.	Received By 2.
Via:	Fed Ex	Lab No.	940261	Received By 1.	(Signature) (Time)	(Signature) (Time)
				(Signature) (Time)	(Printed Name) (Date)	(Printed Name) (Date)
				(Printed Name) (Date)	(Company)	(Company)
				(Company)		

Received By (Laboratory) 3.
Mary Scott 0915
(Signature) Mary Scott 2-9-94 (Time)
(Printed Name) (Date)
Core
(Laboratory)

Special Instructions/Comments:
24hr TAT on 8240 and 418.1
5 day TAT on Rest
Metals have not been filtered

Please obtain pH from 8270 sample

DISTRIBUTION: WHITE, CANARY - LABORATORY • PINK, H+GCL

WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940261 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ ENRON COC #7725
DATE SAMPLED.....: 02/08/94
TIME SAMPLED.....: 11:00
WORK DESCRIPTION...: 9402081100

LABORATORY I.D...: 940261-0001
DATE RECEIVED....: 02/09/94
TIME RECEIVED....: 09:15
REMARKS.....: DP-2

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8240 - VOLATILE ORGANICS		*1		8240 (2)	02/09/94	JMC
Acetone	ND	100	ug/L			
Benzene	ND	1	ug/L			
Bromodichloromethane	ND	5	ug/L			
Bromoform	ND	5	ug/L			
Bromomethane	ND	10	ug/L			
2-Butanone	ND	100	ug/L			
Carbon disulfide	ND	5	ug/L			
Carbon tetrachloride	ND	5	ug/L			
Chlorobenzene	ND	5	ug/L			
Chloroethane	ND	10	ug/L			
2-Chloroethylvinyl ether	ND	10	ug/L			
Chloroform	ND	5	ug/L			
Chloromethane	ND	10	ug/L			
Dibromochloromethane	ND	5	ug/L			
1,1-Dichloroethane	ND	5	ug/L			
1,2-Dichloroethane	ND	5	ug/L			
1,1-Dichloroethene	ND	5	ug/L			
trans-1,2-Dichloroethene	ND	5	ug/L			
1,2-Dichloropropane	ND	5	ug/L			
cis-1,3-Dichloropropene	ND	5	ug/L			
trans-1,3-Dichloropropene	ND	5	ug/L			
Ethylbenzene	ND	5	ug/L			
2-Hexanone	ND	50	ug/L			
Methylene chloride	ND	5	ug/L			
4-Methyl-2-pentanone	ND	50	ug/L			
Styrene	ND	5	ug/L			
1,1,2,2-Tetrachloroethane	ND	5	ug/L			
Tetrachloroethene	ND	5	ug/L			
Toluene	ND	5	ug/L			
1,1,1-Trichloroethane	ND	5	ug/L			
1,1,2-Trichloroethane	ND	5	ug/L			
Trichloroethene	ND	5	ug/L			
Vinyl acetate	ND	50	ug/L			
Vinyl chloride	ND	10	ug/L			
Xylenes-total	ND	5	ug/L			
1,2-Dichloroethane-d4	114	0	% Recovery	76-114% Limit		
Toluene-d8	96	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	108	0	% Recovery	86-115% Limit		
Time Analyzed	1630	0				

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WESTERN ATLAS

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940261 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ ENRON COC #7725
DATE SAMPLED.....: 02/08/94
TIME SAMPLED.....: 11:10
WORK DESCRIPTION...: 9402081110

LABORATORY I.D...: 940261-0002
DATE RECEIVED....: 02/09/94
TIME RECEIVED....: 09:15
REMARKS.....: DP-2

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
pH (Unfilt.)	7.38	0.01	pH Units	150.1 (1)	02/09/94	KDS
8270 - BASE/NEUTRAL/ACID ORGANICS		*1		8270 (2)	02/15/94	DMJ
Acenaphthene	ND	10	ug/L			
Acenaphthylene	ND	10	ug/L			
Anthracene	ND	10	ug/L			
Benzo(a)anthracene	ND	10	ug/L			
Benzo(b)fluoranthene	ND	10	ug/L			
Benzo(k)fluoranthene	ND	10	ug/L			
Benzo(ghi)perylene	ND	10	ug/L			
Benzo(a)pyrene	ND	10	ug/L			
Benzyl Alcohol	ND	20	ug/L			
Butyl benzyl phthalate	ND	10	ug/L			
Bis(2-chloroethoxy)methane	ND	10	ug/L			
Bis(2-chloroethyl)ether	ND	10	ug/L			
Bis(2-chloroisopropyl)ether	ND	10	ug/L			
Bis(2-ethylhexyl)phthalate	ND	10	ug/L			
4-Bromophenyl phenyl ether	ND	10	ug/L			
4-Chloroaniline	ND	10	ug/L			
2-Chloronaphthalene	ND	10	ug/L			
4-Chlorophenyl phenyl ether	ND	10	ug/L			
Chrysene	ND	10	ug/L			
Dibenzo(a,h)anthracene	ND	10	ug/L			
Dibenzofuran	ND	10	ug/L			
1,2-Dichlorobenzene	ND	10	ug/L			
1,3-Dichlorobenzene	ND	10	ug/L			
1,4-Dichlorobenzene	ND	10	ug/L			
3,3-Dichlorobenzidine	ND	20	ug/L			
Diethyl phthalate	ND	10	ug/L			
Dimethyl phthalate	ND	10	ug/L			
Di-n-butyl phthalate	ND	10	ug/L			
Di-n-octyl phthalate	ND	10	ug/L			
2,4-Dinitrotoluene	ND	10	ug/L			
2,6-Dinitrotoluene	ND	10	ug/L			
Fluoranthene	ND	10	ug/L			
Fluorene	ND	10	ug/L			
Hexachlorobenzene	ND	10	ug/L			
Hexachlorobutadiene	ND	10	ug/L			
Hexachlorocyclopentadiene	ND	10	ug/L			
Hexachloroethane	ND	10	ug/L			
Indeno(1,2,3-cd)pyrene	ND	10	ug/L			
Isophorone	ND	10	ug/L			
2-Methylnaphthalene	ND	10	ug/L			
Naphthalene	ND	10	ug/L			

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940261 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ ENRON COC #7725
DATE SAMPLED.....: 02/08/94
TIME SAMPLED.....: 11:10
WORK DESCRIPTION...: 9402081110

LABORATORY I.D...: 940261-0002
DATE RECEIVED....: 02/09/94
TIME RECEIVED....: 09:15
REMARKS.....: DP-2

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
o-Nitroaniline	ND	50	ug/L			
m-Nitroaniline	ND	50	ug/L			
p-Nitroaniline	ND	50	ug/L			
Nitrobenzene	ND	10	ug/L			
N-Nitrosodi-n-propylamine	ND	10	ug/L			
N-Nitrosodiphenylamine	ND	10	ug/L			
Phenanthrene	ND	10	ug/L			
Pyrene	ND	10	ug/L			
1,2,4-Trichlorobenzene	ND	10	ug/L			
Benzoic Acid	ND	50	ug/L			
4-Chloro-3-methylphenol	ND	10	ug/L			
2-Chlorophenol	ND	10	ug/L			
2,4-Dichlorophenol	ND	10	ug/L			
2,4-Dimethylphenol	ND	10	ug/L			
2,4-Dinitrophenol	ND	50	ug/L			
2-Methyl-4,6-dinitrophenol	ND	50	ug/L			
o-Cresol (2-Methylphenol)	ND	10	ug/L			
4-Methylphenol	ND	10	ug/L			
2-Nitrophenol	ND	10	ug/L			
4-Nitrophenol	ND	50	ug/L			
Pentachlorophenol	ND	50	ug/L			
Phenol	ND	10	ug/L			
2,4,5-Trichlorophenol	ND	10	ug/L			
2,4,6-Trichlorophenol	ND	10	ug/L			
Nitrobenzene-d5	44	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl	48	0	% Recovery	43-116% Limit		
4-Terphenyl-d14	47	0	% Recovery	33-141% Limit		
Phenol-d6	18	0	% Recovery	10-94% Limit		
2-Fluorophenol	25	0	% Recovery	21-100% Limit		
2,4,6-Tribromophenol	52	0	% Recovery	10-123% Limit		
Time Analyzed	1351	0				
Date Extracted	02/11/94	0				

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940261 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ ENRON COC #7725
DATE SAMPLED.....: 02/08/94
TIME SAMPLED.....: 11:20
WORK DESCRIPTION...: 9402081120

LABORATORY I.D...: 940261-0003
DATE RECEIVED....: 02/09/94
TIME RECEIVED....: 09:15
REMARKS.....: DP-2

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon (I.R.)	12	1	mg/L	418.1 (1)	02/09/94	LM

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940261 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ ENRON COC #7725
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: TRIP BLANK

LABORATORY I.D...: 940261-0005
DATE RECEIVED....: 02/09/94
TIME RECEIVED....: 09:15
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8240 - VOLATILE ORGANICS		*1		8240 (2)	02/09/94	JMC
Acetone	ND	100	ug/L			
Benzene	ND	1	ug/L			
Bromodichloromethane	ND	5	ug/L			
Bromoform	ND	5	ug/L			
Bromomethane	ND	10	ug/L			
2-Butanone	ND	100	ug/L			
Carbon disulfide	ND	5	ug/L			
Carbon tetrachloride	ND	5	ug/L			
Chlorobenzene	ND	5	ug/L			
Chloroethane	ND	10	ug/L			
2-Chloroethylvinyl ether	ND	10	ug/L			
Chloroform	ND	5	ug/L			
Chloromethane	ND	10	ug/L			
Dibromochloromethane	ND	5	ug/L			
1,1-Dichloroethane	ND	5	ug/L			
1,2-Dichloroethane	ND	5	ug/L			
1,1-Dichloroethene	ND	5	ug/L			
trans-1,2-Dichloroethene	ND	5	ug/L			
1,2-Dichloropropane	ND	5	ug/L			
cis-1,3-Dichloropropene	ND	5	ug/L			
trans-1,3-Dichloropropene	ND	5	ug/L			
Ethylbenzene	ND	5	ug/L			
2-Hexanone	ND	50	ug/L			
Methylene chloride	ND	5	ug/L			
4-Methyl-2-pentanone	ND	50	ug/L			
Styrene	ND	5	ug/L			
1,1,2,2-Tetrachloroethane	ND	5	ug/L			
Tetrachloroethene	ND	5	ug/L			
Toluene	ND	5	ug/L			
1,1,1-Trichloroethane	ND	5	ug/L			
1,1,2-Trichloroethane	ND	5	ug/L			
Trichloroethene	ND	5	ug/L			
Vinyl acetate	ND	50	ug/L			
Vinyl chloride	ND	10	ug/L			
Xylenes-total	ND	5	ug/L			
1,2-Dichloroethane-d4	106	0	% Recovery	76-114% Limit		
Toluene-d8	97	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	107	0	% Recovery	86-115% Limit		
Time Analyzed	1716	0				

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940261 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: METHOD BLANK

LABORATORY I.D...: 940261-0006
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8240 - VOLATILE ORGANICS		*1		8240 (2)	02/09/94	JMC
Acetone	ND	100	ug/L			
Benzene	ND	1	ug/L			
Bromodichloromethane	ND	5	ug/L			
Bromoform	ND	5	ug/L			
Bromomethane	ND	10	ug/L			
2-Butanone	ND	100	ug/L			
Carbon disulfide	ND	5	ug/L			
Carbon tetrachloride	ND	5	ug/L			
Chlorobenzene	ND	5	ug/L			
Chloroethane	ND	10	ug/L			
2-Chloroethylvinyl ether	ND	10	ug/L			
Chloroform	ND	5	ug/L			
Chloromethane	ND	10	ug/L			
Dibromochloromethane	ND	5	ug/L			
1,1-Dichloroethane	ND	5	ug/L			
1,2-Dichloroethane	ND	5	ug/L			
1,1-Dichloroethene	ND	5	ug/L			
trans-1,2-Dichloroethene	ND	5	ug/L			
1,2-Dichloropropane	ND	5	ug/L			
cis-1,3-Dichloropropene	ND	5	ug/L			
trans-1,3-Dichloropropene	ND	5	ug/L			
Ethylbenzene	ND	5	ug/L			
2-Hexanone	ND	50	ug/L			
Methylene chloride	ND	5	ug/L			
4-Methyl-2-pentanone	ND	50	ug/L			
Styrene	ND	5	ug/L			
1,1,2,2-Tetrachloroethane	ND	5	ug/L			
Tetrachloroethene	ND	5	ug/L			
Toluene	ND	5	ug/L			
1,1,1-Trichloroethane	ND	5	ug/L			
1,1,2-Trichloroethane	ND	5	ug/L			
Trichloroethene	ND	5	ug/L			
Vinyl acetate	ND	50	ug/L			
Vinyl chloride	ND	10	ug/L			
Xylenes-total	ND	5	ug/L			
1,2-Dichloroethane-d4	109	0	% Recovery	76-114% Limit		
Toluene-d8	95	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	105	0	% Recovery	86-115% Limit		
Time Analyzed	1543	0				
8270 - BASE/NEUTRAL/ACID ORGANICS		*1		8270 (2)	02/15/94	DMJ
Acenaphthene	ND	10	ug/L			

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940261 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: METHOD BLANK

LABORATORY I.D...: 940261-0006
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Acenaphthylene	ND	10	ug/L			
Anthracene	ND	10	ug/L			
Benzo(a)anthracene	ND	10	ug/L			
Benzo(b)fluoranthene	ND	10	ug/L			
Benzo(k)fluoranthene	ND	10	ug/L			
Benzo(ghi)perylene	ND	10	ug/L			
Benzo(a)pyrene	ND	10	ug/L			
Benzyl Alcohol	ND	20	ug/L			
Butyl benzyl phthalate	ND	10	ug/L			
Bis(2-chloroethoxy)methane	ND	10	ug/L			
Bis(2-chloroethyl)ether	ND	10	ug/L			
Bis(2-chloroisopropyl)ether	ND	10	ug/L			
Bis(2-ethylhexyl)phthalate	ND	10	ug/L			
4-Bromophenyl phenyl ether	ND	10	ug/L			
4-Chloroaniline	ND	10	ug/L			
2-Chloronaphthalene	ND	10	ug/L			
4-Chlorophenyl phenyl ether	ND	10	ug/L			
Chrysene	ND	10	ug/L			
Dibenzo(a,h)anthracene	ND	10	ug/L			
Dibenzofuran	ND	10	ug/L			
1,2-Dichlorobenzene	ND	10	ug/L			
1,3-Dichlorobenzene	ND	10	ug/L			
1,4-Dichlorobenzene	ND	10	ug/L			
3,3-Dichlorobenzidine	ND	20	ug/L			
Diethyl phthalate	ND	10	ug/L			
Dimethyl phthalate	ND	10	ug/L			
Di-n-butyl phthalate	ND	10	ug/L			
Di-n-octyl phthalate	ND	10	ug/L			
2,4-Dinitrotoluene	ND	10	ug/L			
2,6-Dinitrotoluene	ND	10	ug/L			
Fluoranthene	ND	10	ug/L			
Fluorene	ND	10	ug/L			
Hexachlorobenzene	ND	10	ug/L			
Hexachlorobutadiene	ND	10	ug/L			
Hexachlorocyclopentadiene	ND	10	ug/L			
Hexachloroethane	ND	10	ug/L			
Indeno(1,2,3-cd)pyrene	ND	10	ug/L			
Isophorone	ND	10	ug/L			
2-Methylnaphthalene	ND	10	ug/L			
Naphthalene	ND	10	ug/L			
o-Nitroaniline	ND	50	ug/L			
m-Nitroaniline	ND	50	ug/L			
p-Nitroaniline	ND	50	ug/L			
Nitrobenzene	ND	10	ug/L			
N-Nitrosodi-n-propylamine	ND	10	ug/L			

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WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940261 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: BLANK SPIKE

LABORATORY I.D...: 940261-0007
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Semi-Volatile Organic - Surrogates		*1		8270(2)/625(6)	02/15/94	DMJ
Nitrobenzene-d5	68	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl	74	0	% Recovery	43-116% Limit		
4-Terphenyl-d14	89	0	% Recovery	33-141% Limit		
Phenol-d6	24	0	% Recovery	10-94% Limit		
2-Fluorophenol	39	0	% Recovery	21-100% Limit		
2,4,6-Tribromophenol	69	0	% Recovery	10-123% Limit		
Date Extracted	02/11/94	0				
Time Analyzed	2100	0				

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940261 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: BLANK SPIKE DUPLICATE

LABORATORY I.D...: 940261-0008
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Semi-Volatile Organic - Surrogates		*1		8270(2)/625(6)	02/16/94	DMJ
Nitrobenzene-d5	75	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl	79	0	% Recovery	43-116% Limit		
4-Terphenyl-d14	96	0	% Recovery	33-141% Limit		
Phenol-d6	29	0	% Recovery	10-94% Limit		
2-Fluorophenol	46	0	% Recovery	21-100% Limit		
2,4,6-Tribromophenol	73	0	% Recovery	10-123% Limit		
Date Extracted	02/11/94	0				
Time Analyzed	0855	0				

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WESTERN ATLAS

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QUALITY CONTROL REPORT
02/17/94

JOB NUMBER: 940261 CUSTOMER: HYGIENETICS/GCL ATTN:

ANALYSIS				DUPLICATES		REFERENCE STANDARDS		MATRIX SPIKES		
ANALYSIS TYPE	ANALYSIS SUB-TYPE	ANALYSIS I.D.	ANALYZED VALUE (A)	DUPLICATE VALUE (B)	RPD or (|A-B|)	TRUE VALUE	PERCENT RECOVERY	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY
PARAMETER:pH (Unfilt.) DATE/TIME ANALYZED:02/09/94 19:00 QC BATCH NUMBER:288375										
REPORTING LIMIT/DF: 0.01 UNITS:pH Units METHOD REFERENCE :150.1 (1) TECHNICIAN:KDS										
STANDARD	ICV	G931124A	4.04			4.00	101			
STANDARD	CCV	S7.00	7.00			7.00	100			
DUPLICATE	MD	940261-2	7.38	7.39	0					
PARAMETER:Total Petroleum Hydrocarbon (I.R.) DATE/TIME ANALYZED:02/09/94 13:30 QC BATCH NUMBER:288457										
REPORTING LIMIT/DF: 1 UNITS:mg/L METHOD REFERENCE :418.1 (1) TECHNICIAN:LM										
BLANK	ICB	S0	<1							
BLANK	MB	940209	<1							
BLANK	CCB	S0	<1							
STANDARD	ICV/LCS	940114	43			46	93			
STANDARD	CCV	S50	52			50	104			

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940261 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: METHOD BLANK

LABORATORY I.D...: 940261-0006
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
N-Nitrosodiphenylamine	ND	10	ug/L			
Phenanthrene	ND	10	ug/L			
Pyrene	ND	10	ug/L			
1,2,4-Trichlorobenzene	ND	10	ug/L			
Benzoic Acid	ND	50	ug/L			
4-Chloro-3-methylphenol	ND	10	ug/L			
2-Chlorophenol	ND	10	ug/L			
2,4-Dichlorophenol	ND	10	ug/L			
2,4-Dimethylphenol	ND	10	ug/L			
2,4-Dinitrophenol	ND	50	ug/L			
2-Methyl-4,6-dinitrophenol	ND	50	ug/L			
o-Cresol (2-Methylphenol)	ND	10	ug/L			
4-Methylphenol	ND	10	ug/L			
2-Nitrophenol	ND	10	ug/L			
4-Nitrophenol	ND	50	ug/L			
Pentachlorophenol	ND	50	ug/L			
Phenol	ND	10	ug/L			
2,4,5-Trichlorophenol	ND	10	ug/L			
2,4,6-Trichlorophenol	ND	10	ug/L			
Nitrobenzene-d5	58	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl	52	0	% Recovery	43-116% Limit		
4-Terphenyl-d14	61	0	% Recovery	33-141% Limit		
Phenol-d6	23	0	% Recovery	10-94% Limit		
2-Fluorophenol	32	0	% Recovery	21-100% Limit		
2,4,6-Tribromophenol	46	0	% Recovery	10-123% Limit		
Time Analyzed	1127	0				
Date Extracted	02/11/94	0				

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QUALITY CONTROL REPORT
02/17/94

JOB NUMBER: 940261 CUSTOMER: HYGIENETICS/GCL ATTN:

BNA SPIKED ANALYSIS-WATER DATE ANALYZED: 02/15/94 TIME ANALYZED: 21:00 METHOD: 8270 (2) QC NUMBER:288736

REFERENCE STANDARDS

TEST DESCRIPTION	ANALYSIS SUB-TYPE	ANALYSIS I. D.	DILUTION FACTOR	ANALYZED VALUE	TRUE VALUE	PERCENT RECOVERY	DETECTION LIMITS	UNITS OF MEASURE
Phenol	SB	B931011D	1	14	50	28	10	ug/L
	SBD	B931011D	1	17	50	34	10	ug/L
2-Chlorophenol	SB	B931011D	1	34	50	68	10	ug/L
	SBD	B931011D	1	36	50	72	10	ug/L
1,4-Dichlorobenzene	SB	B931011D	1	32	50	64	10	ug/L
	SBD	B931011D	1	34	50	68	10	ug/L
N-Nitrosodi-n-propylamine	SB	B931011D	1	39	50	78	10	ug/L
	SBD	B931011D	1	39	50	78	10	ug/L
1,2,4-Trichlorobenzene	SB	B931011D	1	27	50	54	10	ug/L
	SBD	B931011D	1	28	50	56	10	ug/L
4-Chloro-3-methylphenol	SB	B931011D	1	42	50	84	10	ug/L
	SBD	B931011D	1	42	50	84	10	ug/L
Acenaphthene	SB	B931011D	1	41	50	82	10	ug/L
	SBD	B931011D	1	40	50	80	10	ug/L
4-Nitrophenol	SB	B931011D	1	10	50	20	50	ug/L
	SBD	B931011D	1	11	50	22	50	ug/L
2,4-Dinitrotoluene	SB	B931011D	1	36	50	72	10	ug/L
	SBD	B931011D	1	37	50	74	10	ug/L
Pentachlorophenol	SB	B931011D	1	28	50	56	50	ug/L
	SBD	B931011D	1	27	50	54	50	ug/L
Pyrene	SB	B931011D	1	53	50	106	10	ug/L
	SBD	B931011D	1	51	50	102	10	ug/L

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QUALITY CONTROL FOOTER

METHOD REFERENCES

(1) EPA 600/4-79-020, Methods For Chemical Analysis Of Water And Wastes, March 1983

(2) EPA SW-846, Test Methods For Evaluating Solid Waste, Third Edition, November 1986

(3) Standard Methods For The Examination Of Water And Wastewater, 17th Edition, 1989

(4) EPA 600/4-80-032, Prescribed Procedures For Measurement Of Radioactivity In Drinking Water, August 1980

(5) EPA 600/8-78-017, Microbiological Methods For Monitoring The Environment, December 1978

(6) Federal Register, July 1, 1990 (40 CFR Part 136)

(7) EPA 600/4-88-039, Methods For The Determination Of Organics Compounds In Drinking Water, December 1988

(8) U.S.G.S. Methods For The Determination Of Inorganic Substances In Water And Fluvial Sediments, Book 5, Chapter A1, 1985

(9) Federal Register, Friday, June 7, 1991, (40 CFR Parts 141 and 142)

(10) Standard Methods For The Examination Of Water And Wastewater, 16th Edition, 1985

(11) ASTM, Section 11 Water And Environmental Technology, Volume 11.01 Water (1), 1991

(12) Methods Of Soil Analysis, American Society Of Agronomy, Agronomy No. 9, 1965

(13) EPA SW-846, Test Methods For Evaluating Solid Waste, Third Edition, Revision 1, November 1990

(14) ASTM, Section 5, Petroleum Products, Lubricants, and Fossil Fuels, Volume 05.05, Gaseous Fuels, Coal and Coke

(15) EPA 600/2-78-054, Field and Laboratory Methods Applicable To Overburdens and Mine Soils, March 1978

(16) ASTM, Part 19, Soils and Rock; Building Stones, 1981

COMMENTS: Data in QA report may differ from final results due to digestion and/or dilution of sample into analytical ranges.

The "Time Analyzed" in the QA report refers to the start time of the analytical batch which may not reflect the actual time of each analysis. The "Date Analyzed" is the actual date of analysis.

NC = Not Calculable Due To Value(s) Lower Than The Detection Limit.

Analyses performed by a subcontract laboratory are indicated on the analytical and/or quality control reports under "Technician" using the following codes:

Subcontract Laboratory	Code	
Core Laboratories - Anaheim, CA	*AN	
Core Laboratories - Casper, WY	*CA	
Core Laboratories - Corpus Christi, TX	*CC	
Core Laboratories - Houston, TX	*HP	
Core Laboratories - Lake Charles, LA	*LC	
Core Laboratories - Long Beach, CA	*LB	
Other Subcontract Laboratories	*XX	Laboratory ID Provided Upon Request

* The asterisk in the "Technician" data field signifies that the analysis was performed by a subcontract laboratory.

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CORE LABORATORIES
A N A L Y T I C A L R E P O R T

Job Number: 940262
Prepared For:

HYGIENETICS/GCL

505 MARQUETTE NW STE 1100
ALBUQUERQUE, NM 87102

Date: 02/17/94

Linda L. Benkers
Signature

2-17-94
Date:

Name: Linda L. Benkers

Core Laboratories
10703 East Bethany Drive
Aurora, CO 80014

Title: QA/QC COORDINATOR

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Emeryville, CA 94608
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7723

Chain of Custody

Date 2/7/94 Page 1 Of 2

Lab Name CORE LABORATORIES
Address 10703 East Bethany Drive
Aurora, CO 80014-2696
Telephone 303/751-1780

Samplers (SIGNATURES)

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624(240)	Base/Neu/Acid Compounds GC/MS 625(270)	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons (418.)	TPH/BTEX Modified 8015	TCLP- Vol., Semi-Vol. Herbicides, Pesticides	TCLP- Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	Filtered Metals Cr, Cd, Pb			Number of Containers
~~9402071040~~																												
9402071050	H_2O	MW-2-C										X																1
9402071100	H_2O	MW-2-C							X																			1
9402071110	H_2O	MW-2-C						X																				3
9402071125	H_2O	MW-2-C																						X				1
9402071315	H_2O	DP-1						X																				3
9402071505	H_2O	DP-1							X																			1
9402071515	H_2O	DP-1																						X				1

Per Annette Montoya, cancel metals analysis.
2-9-94 JAB

Project Information		Sample Receipt	
Project	GPM ENRON	Total No. of Containers	11
Project Director	Bob Capar	Chain of Custody Seals	Y
Charge Code No.	54191.02	Rec'd Good Condition/Cold	Y
Shipping ID. No.	860962914	Conforms to Record	Y
Via:	Fed Ex	Lab No.	940262

Special Instructions/Comments:
~~24 hr TAT on 8240~~
5 day TAT ~~or Rest~~
5 day TAT on ~~all~~ this sheet

You must filter metals

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
(Signature) 0800 (Time)	(Signature) (Time)	(Signature) (Time)
Kyle Summers 2/8/94 (Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
H+GCL (Company)	(Company)	(Company)
Received By 1.	**Received By 2.**	**Received By (Laboratory) 3.**
(Signature) (Time)	(Signature) (Time)	Mary Scott 0915 (Signature) (Time)
(Printed Name) (Date)	(Printed Name) (Date)	Mary Scott 2-9-94 (Printed Name) (Date)
(Company)	(Company)	Core (Laboratory)

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WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940262 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM ENRON COC #7723
DATE SAMPLED.....: 02/07/94
TIME SAMPLED.....: 10:50
WORK DESCRIPTION...: 9402071050

LABORATORY I.D...: 940262-0001
DATE RECEIVED....: 02/09/94
TIME RECEIVED....: 09:15
REMARKS.....: MW-2-C

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon (I.R.)	4	1	mg/L	418.1 (1)	02/09/94	LM

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940262 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM ENRON COC #7723
DATE SAMPLED.....: 02/07/94
TIME SAMPLED.....: 11:00
WORK DESCRIPTION...: 9402071100

LABORATORY I.D...: 940262-0002
DATE RECEIVED....: 02/09/94
TIME RECEIVED....: 09:15
REMARKS.....: MW-2-C

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8270 - BASE/NEUTRAL/ACID ORGANICS		*1		8270 (2)	02/15/94	DMJ
Acenaphthene	ND	10	ug/L			
Acenaphthylene	ND	10	ug/L			
Anthracene	ND	10	ug/L			
Benzo(a)anthracene	ND	10	ug/L			
Benzo(b)fluoranthene	ND	10	ug/L			
Benzo(k)fluoranthene	ND	10	ug/L			
Benzo(ghi)perylene	ND	10	ug/L			
Benzo(a)pyrene	ND	10	ug/L			
Benzyl Alcohol	ND	20	ug/L			
Butyl benzyl phthalate	ND	10	ug/L			
Bis(2-chloroethoxy)methane	ND	10	ug/L			
Bis(2-chloroethyl)ether	ND	10	ug/L			
Bis(2-chloroisopropyl)ether	ND	10	ug/L			
Bis(2-ethylhexyl)phthalate	ND	10	ug/L			
4-Bromophenyl phenyl ether	ND	10	ug/L			
4-Chloroaniline	ND	10	ug/L			
2-Chloronaphthalene	ND	10	ug/L			
4-Chlorophenyl phenyl ether	ND	10	ug/L			
Chrysene	ND	10	ug/L			
Dibenzo(a,h)anthracene	ND	10	ug/L			
Dibenzofuran	ND	10	ug/L			
1,2-Dichlorobenzene	ND	10	ug/L			
1,3-Dichlorobenzene	ND	10	ug/L			
1,4-Dichlorobenzene	ND	10	ug/L			
3,3-Dichlorobenzidine	ND	20	ug/L			
Diethyl phthalate	ND	10	ug/L			
Dimethyl phthalate	ND	10	ug/L			
Di-n-butyl phthalate	ND	10	ug/L			
Di-n-octyl phthalate	ND	10	ug/L			
2,4-Dinitrotoluene	ND	10	ug/L			
2,6-Dinitrotoluene	ND	10	ug/L			
Fluoranthene	ND	10	ug/L			
Fluorene	ND	10	ug/L			
Hexachlorobenzene	ND	10	ug/L			
Hexachlorobutadiene	ND	10	ug/L			
Hexachlorocyclopentadiene	ND	10	ug/L			
Hexachloroethane	ND	10	ug/L			
Indeno(1,2,3-cd)pyrene	ND	10	ug/L			
Isophorone	ND	10	ug/L			
2-Methylnaphthalene	ND	10	ug/L			
Naphthalene	ND	10	ug/L			
o-Nitroaniline	ND	50	ug/L			
m-Nitroaniline	ND	50	ug/L			

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WESTERN ATLAS

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940262 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM ENRON COC #7723
DATE SAMPLED.....: 02/07/94
TIME SAMPLED.....: 11:00
WORK DESCRIPTION...: 9402071100

LABORATORY I.D...: 940262-0002
DATE RECEIVED....: 02/09/94
TIME RECEIVED....: 09:15
REMARKS.....: MW-2-C

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
p-Nitroaniline	ND	50	ug/L			
Nitrobenzene	ND	10	ug/L			
N-Nitrosodi-n-propylamine	ND	10	ug/L			
N-Nitrosodiphenylamine	ND	10	ug/L			
Phenanthrene	ND	10	ug/L			
Pyrene	ND	10	ug/L			
1,2,4-Trichlorobenzene	ND	10	ug/L			
Benzoic Acid	ND	50	ug/L			
4-Chloro-3-methylphenol	ND	10	ug/L			
2-Chlorophenol	ND	10	ug/L			
2,4-Dichlorophenol	ND	10	ug/L			
2,4-Dimethylphenol	ND	10	ug/L			
2,4-Dinitrophenol	ND	50	ug/L			
2-Methyl-4,6-dinitrophenol	ND	50	ug/L			
o-Cresol (2-Methylphenol)	ND	10	ug/L			
4-Methylphenol	ND	10	ug/L			
2-Nitrophenol	ND	10	ug/L			
4-Nitrophenol	ND	50	ug/L			
Pentachlorophenol	ND	50	ug/L			
Phenol	ND	10	ug/L			
2,4,5-Trichlorophenol	ND	10	ug/L			
2,4,6-Trichlorophenol	ND	10	ug/L			
Nitrobenzene-d5	55	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl	55	0	% Recovery	43-116% Limit		
4-Terphenyl-d14	53	0	% Recovery	33-141% Limit		
Phenol-d6	22	0	% Recovery	10-94% Limit		
2-Fluorophenol	31	0	% Recovery	21-100% Limit		
2,4,6-Tribromophenol	47	0	% Recovery	10-123% Limit		
Time Analyzed	1504	0				
Date Extracted	02/11/94	0				

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940262 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM ENRON COC #7723
DATE SAMPLED.....: 02/07/94
TIME SAMPLED.....: 11:10
WORK DESCRIPTION...: 9402071110

LABORATORY I.D...: 940262-0003
DATE RECEIVED....: 02/09/94
TIME RECEIVED....: 09:15
REMARKS.....: MW-2-C

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8240 - VOLATILE ORGANICS		*1		8240 (2)	02/09/94	JMC
Acetone	ND	100	ug/L			
Benzene	ND	1	ug/L			
Bromodichloromethane	ND	5	ug/L			
Bromoform	ND	5	ug/L			
Bromomethane	ND	10	ug/L			
2-Butanone	ND	100	ug/L			
Carbon disulfide	ND	5	ug/L			
Carbon tetrachloride	ND	5	ug/L			
Chlorobenzene	ND	5	ug/L			
Chloroethane	ND	10	ug/L			
2-Chloroethylvinyl ether	ND	10	ug/L			
Chloroform	ND	5	ug/L			
Chloromethane	ND	10	ug/L			
Dibromochloromethane	ND	5	ug/L			
1,1-Dichloroethane	ND	5	ug/L			
1,2-Dichloroethane	ND	5	ug/L			
1,1-Dichloroethene	ND	5	ug/L			
trans-1,2-Dichloroethene	ND	5	ug/L			
1,2-Dichloropropane	ND	5	ug/L			
cis-1,3-Dichloropropene	ND	5	ug/L			
trans-1,3-Dichloropropene	ND	5	ug/L			
Ethylbenzene	ND	5	ug/L			
2-Hexanone	ND	50	ug/L			
Methylene chloride	ND	5	ug/L			
4-Methyl-2-pentanone	ND	50	ug/L			
Styrene	ND	5	ug/L			
1,1,2,2-Tetrachloroethane	ND	5	ug/L			
Tetrachloroethene	ND	5	ug/L			
Toluene	ND	5	ug/L			
1,1,1-Trichloroethane	ND	5	ug/L			
1,1,2-Trichloroethane	ND	5	ug/L			
Trichloroethene	ND	5	ug/L			
Vinyl acetate	ND	50	ug/L			
Vinyl chloride	ND	10	ug/L			
Xylenes-total	ND	5	ug/L			
1,2-Dichloroethane-d4	108	0	% Recovery	76-114% Limit		
Toluene-d8	95	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	105	0	% Recovery	86-115% Limit		
Time Analyzed	2153	0				

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940262 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM ENRON COC #7723
DATE SAMPLED.....: 02/07/94
TIME SAMPLED.....: 13:15
WORK DESCRIPTION...: 9402071315

LABORATORY I.D...: 940262-0005
DATE RECEIVED....: 02/09/94
TIME RECEIVED....: 09:15
REMARKS.....: DP-1

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8240 - VOLATILE ORGANICS		*1		8240 (2)	02/09/94	JMC
Acetone	ND	100	ug/L			
Benzene	ND	1	ug/L			
Bromodichloromethane	ND	5	ug/L			
Bromoform	ND	5	ug/L			
Bromomethane	ND	10	ug/L			
2-Butanone	ND	100	ug/L			
Carbon disulfide	ND	5	ug/L			
Carbon tetrachloride	ND	5	ug/L			
Chlorobenzene	ND	5	ug/L			
Chloroethane	ND	10	ug/L			
2-Chloroethylvinyl ether	ND	10	ug/L			
Chloroform	ND	5	ug/L			
Chloromethane	ND	10	ug/L			
Dibromochloromethane	ND	5	ug/L			
1,1-Dichloroethane	ND	5	ug/L			
1,2-Dichloroethane	ND	5	ug/L			
1,1-Dichloroethene	ND	5	ug/L			
trans-1,2-Dichloroethene	ND	5	ug/L			
1,2-Dichloropropane	ND	5	ug/L			
cis-1,3-Dichloropropene	ND	5	ug/L			
trans-1,3-Dichloropropene	ND	5	ug/L			
Ethylbenzene	ND	5	ug/L			
2-Hexanone	ND	50	ug/L			
Methylene chloride	ND	5	ug/L			
4-Methyl-2-pentanone	ND	50	ug/L			
Styrene	ND	5	ug/L			
1,1,2,2-Tetrachloroethane	ND	5	ug/L			
Tetrachloroethene	ND	5	ug/L			
Toluene	ND	5	ug/L			
1,1,1-Trichloroethane	ND	5	ug/L			
1,1,2-Trichloroethane	ND	5	ug/L			
Trichloroethene	ND	5	ug/L			
Vinyl acetate	ND	50	ug/L			
Vinyl chloride	ND	10	ug/L			
Xylenes-total	ND	5	ug/L			
1,2-Dichloroethane-d4	107	0	% Recovery	76-114% Limit		
Toluene-d8	95	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	107	0	% Recovery	86-115% Limit		
Time Analyzed	2239	0				

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940262 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM ENRON COC #7723
DATE SAMPLED.....: 02/07/94
TIME SAMPLED.....: 15:05
WORK DESCRIPTION...: 9402071505

LABORATORY I.D...: 940262-0006
DATE RECEIVED....: 02/09/94
TIME RECEIVED....: 09:15
REMARKS.....: DP-1

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8270 - BASE/NEUTRAL/ACID ORGANICS		*1		8270 (2)	02/15/94	DMJ
Acenaphthene	ND	10	ug/L			
Acenaphthylene	ND	10	ug/L			
Anthracene	ND	10	ug/L			
Benzo(a)anthracene	ND	10	ug/L			
Benzo(b)fluoranthene	ND	10	ug/L			
Benzo(k)fluoranthene	ND	10	ug/L			
Benzo(ghi)perylene	ND	10	ug/L			
Benzo(a)pyrene	ND	10	ug/L			
Benzyl Alcohol	ND	20	ug/L			
Butyl benzyl phthalate	ND	10	ug/L			
Bis(2-chloroethoxy)methane	ND	10	ug/L			
Bis(2-chloroethyl)ether	ND	10	ug/L			
Bis(2-chloroisopropyl)ether	ND	10	ug/L			
Bis(2-ethylhexyl)phthalate	ND	10	ug/L			
4-Bromophenyl phenyl ether	ND	10	ug/L			
4-Chloroaniline	ND	10	ug/L			
2-Chloronaphthalene	ND	10	ug/L			
4-Chlorophenyl phenyl ether	ND	10	ug/L			
Chrysene	ND	10	ug/L			
Dibenzo(a,h)anthracene	ND	10	ug/L			
Dibenzofuran	ND	10	ug/L			
1,2-Dichlorobenzene	ND	10	ug/L			
1,3-Dichlorobenzene	ND	10	ug/L			
1,4-Dichlorobenzene	ND	10	ug/L			
3,3-Dichlorobenzidine	ND	20	ug/L			
Diethyl phthalate	ND	10	ug/L			
Dimethyl phthalate	ND	10	ug/L			
Di-n-butyl phthalate	ND	10	ug/L			
Di-n-octyl phthalate	ND	10	ug/L			
2,4-Dinitrotoluene	ND	10	ug/L			
2,6-Dinitrotoluene	ND	10	ug/L			
Fluoranthene	ND	10	ug/L			
Fluorene	ND	10	ug/L			
Hexachlorobenzene	ND	10	ug/L			
Hexachlorobutadiene	ND	10	ug/L			
Hexachlorocyclopentadiene	ND	10	ug/L			
Hexachloroethane	ND	10	ug/L			
Indeno(1,2,3-cd)pyrene	ND	10	ug/L			
Isophorone	ND	10	ug/L			
2-Methylnaphthalene	ND	10	ug/L			
Naphthalene	ND	10	ug/L			
o-Nitroaniline	ND	50	ug/L			
m-Nitroaniline	ND	50	ug/L			

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940262 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM ENRON COC #7723
DATE SAMPLED.....: 02/07/94
TIME SAMPLED.....: 15:05
WORK DESCRIPTION...: 9402071505

LABORATORY I.D...: 940262-0006
DATE RECEIVED....: 02/09/94
TIME RECEIVED....: 09:15
REMARKS.....: DP-1

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
p-Nitroaniline	ND	50	ug/L			
Nitrobenzene	ND	10	ug/L			
N-Nitrosodi-n-propylamine	ND	10	ug/L			
N-Nitrosodiphenylamine	ND	10	ug/L			
Phenanthrene	ND	10	ug/L			
Pyrene	ND	10	ug/L			
1,2,4-Trichlorobenzene	ND	10	ug/L			
Benzoic Acid	ND	50	ug/L			
4-Chloro-3-methylphenol	ND	10	ug/L			
2-Chlorophenol	ND	10	ug/L			
2,4-Dichlorophenol	ND	10	ug/L			
2,4-Dimethylphenol	ND	10	ug/L			
2,4-Dinitrophenol	ND	50	ug/L			
2-Methyl-4,6-dinitrophenol	ND	50	ug/L			
o-Cresol (2-Methylphenol)	ND	10	ug/L			
4-Methylphenol	ND	10	ug/L			
2-Nitrophenol	ND	10	ug/L			
4-Nitrophenol	ND	50	ug/L			
Pentachlorophenol	ND	50	ug/L			
Phenol	ND	10	ug/L			
2,4,5-Trichlorophenol	ND	10	ug/L			
2,4,6-Trichlorophenol	ND	10	ug/L			
Nitrobenzene-d5	64	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl	59	0	% Recovery	43-116% Limit		
4-Terphenyl-d14	55	0	% Recovery	33-141% Limit		
Phenol-d6	26	0	% Recovery	10-94% Limit		
2-Fluorophenol	34	0	% Recovery	21-100% Limit		
2,4,6-Tribromophenol	70	0	% Recovery	10-123% Limit		
Time Analyzed	1616	0				
Date Extracted	02/11/94	0				

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940262 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: METHOD BLANK

LABORATORY I.D...: 940262-0008
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8240 - VOLATILE ORGANICS		*1		8240 (2)	02/09/94	JMC
Acetone	ND	100	ug/L			
Benzene	ND	1	ug/L			
Bromodichloromethane	ND	5	ug/L			
Bromoform	ND	5	ug/L			
Bromomethane	ND	10	ug/L			
2-Butanone	ND	100	ug/L			
Carbon disulfide	ND	5	ug/L			
Carbon tetrachloride	ND	5	ug/L			
Chlorobenzene	ND	5	ug/L			
Chloroethane	ND	10	ug/L			
2-Chloroethylvinyl ether	ND	10	ug/L			
Chloroform	ND	5	ug/L			
Chloromethane	ND	10	ug/L			
Dibromochloromethane	ND	5	ug/L			
1,1-Dichloroethane	ND	5	ug/L			
1,2-Dichloroethane	ND	5	ug/L			
1,1-Dichloroethene	ND	5	ug/L			
trans-1,2-Dichloroethene	ND	5	ug/L			
1,2-Dichloropropane	ND	5	ug/L			
cis-1,3-Dichloropropene	ND	5	ug/L			
trans-1,3-Dichloropropene	ND	5	ug/L			
Ethylbenzene	ND	5	ug/L			
2-Hexanone	ND	50	ug/L			
Methylene chloride	ND	5	ug/L			
4-Methyl-2-pentanone	ND	50	ug/L			
Styrene	ND	5	ug/L			
1,1,2,2-Tetrachloroethane	ND	5	ug/L			
Tetrachloroethene	ND	5	ug/L			
Toluene	ND	5	ug/L			
1,1,1-Trichloroethane	ND	5	ug/L			
1,1,2-Trichloroethane	ND	5	ug/L			
Trichloroethene	ND	5	ug/L			
Vinyl acetate	ND	50	ug/L			
Vinyl chloride	ND	10	ug/L			
Xylenes-total	ND	5	ug/L			
1,2-Dichloroethane-d4	109	0	% Recovery	76-114% Limit		
Toluene-d8	95	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	105	0	% Recovery	86-115% Limit		
Time Analyzed	1543	0				
8270 - BASE/NEUTRAL/ACID ORGANICS		*1		8270 (2)	02/15/94	DMJ
Acenaphthene	ND	10	ug/L			

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940262 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: METHOD BLANK

LABORATORY I.D...: 940262-0008
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Acenaphthylene	ND	10	ug/L			
Anthracene	ND	10	ug/L			
Benzo(a)anthracene	ND	10	ug/L			
Benzo(b)fluoranthene	ND	10	ug/L			
Benzo(k)fluoranthene	ND	10	ug/L			
Benzo(ghi)perylene	ND	10	ug/L			
Benzo(a)pyrene	ND	10	ug/L			
Benzyl Alcohol	ND	20	ug/L			
Butyl benzyl phthalate	ND	10	ug/L			
Bis(2-chloroethoxy)methane	ND	10	ug/L			
Bis(2-chloroethyl)ether	ND	10	ug/L			
Bis(2-chloroisopropyl)ether	ND	10	ug/L			
Bis(2-ethylhexyl)phthalate	ND	10	ug/L			
4-Bromophenyl phenyl ether	ND	10	ug/L			
4-Chloroaniline	ND	10	ug/L			
2-Chloronaphthalene	ND	10	ug/L			
4-Chlorophenyl phenyl ether	ND	10	ug/L			
Chrysene	ND	10	ug/L			
Dibenzo(a,h)anthracene	ND	10	ug/L			
Dibenzofuran	ND	10	ug/L			
1,2-Dichlorobenzene	ND	10	ug/L			
1,3-Dichlorobenzene	ND	10	ug/L			
1,4-Dichlorobenzene	ND	10	ug/L			
3,3-Dichlorobenzidine	ND	20	ug/L			
Diethyl phthalate	ND	10	ug/L			
Dimethyl phthalate	ND	10	ug/L			
Di-n-butyl phthalate	ND	10	ug/L			
Di-n-octyl phthalate	ND	10	ug/L			
2,4-Dinitrotoluene	ND	10	ug/L			
2,6-Dinitrotoluene	ND	10	ug/L			
Fluoranthene	ND	10	ug/L			
Fluorene	ND	10	ug/L			
Hexachlorobenzene	ND	10	ug/L			
Hexachlorobutadiene	ND	10	ug/L			
Hexachlorocyclopentadiene	ND	10	ug/L			
Hexachloroethane	ND	10	ug/L			
Indeno(1,2,3-cd)pyrene	ND	10	ug/L			
Isophorone	ND	10	ug/L			
2-Methylnaphthalene	ND	10	ug/L			
Naphthalene	ND	10	ug/L			
o-Nitroaniline	ND	50	ug/L			
m-Nitroaniline	ND	50	ug/L			
p-Nitroaniline	ND	50	ug/L			
Nitrobenzene	ND	10	ug/L			
N-Nitrosodi-n-propylamine	ND	10	ug/L			

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940262 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: METHOD BLANK

LABORATORY I.D...: 940262-0008
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
N-Nitrosodiphenylamine	ND	10	ug/L			
Phenanthrene	ND	10	ug/L			
Pyrene	ND	10	ug/L			
1,2,4-Trichlorobenzene	ND	10	ug/L			
Benzoic Acid	ND	50	ug/L			
4-Chloro-3-methylphenol	ND	10	ug/L			
2-Chlorophenol	ND	10	ug/L			
2,4-Dichlorophenol	ND	10	ug/L			
2,4-Dimethylphenol	ND	10	ug/L			
2,4-Dinitrophenol	ND	50	ug/L			
2-Methyl-4,6-dinitrophenol	ND	50	ug/L			
o-Cresol (2-Methylphenol)	ND	10	ug/L			
4-Methylphenol	ND	10	ug/L			
2-Nitrophenol	ND	10	ug/L			
4-Nitrophenol	ND	50	ug/L			
Pentachlorophenol	ND	50	ug/L			
Phenol	ND	10	ug/L			
2,4,5-Trichlorophenol	ND	10	ug/L			
2,4,6-Trichlorophenol	ND	10	ug/L			
Nitrobenzene-d5	58	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl	52	0	% Recovery	43-116% Limit		
4-Terphenyl-d14	61	0	% Recovery	33-141% Limit		
Phenol-d6	23	0	% Recovery	10-94% Limit		
2-Fluorophenol	32	0	% Recovery	21-100% Limit		
2,4,6-Tribromophenol	46	0	% Recovery	10-123% Limit		
Time Analyzed	1127	0				
Date Extracted	02/11/94	0				

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WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940262 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: BLANK SPIKE

LABORATORY I.D...: 940262-0009
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Semi-Volatile Organic - Surrogates		*1		8270(2)/625(6)	02/15/94	DMJ
Nitrobenzene-d5	68	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl	74	0	% Recovery	43-116% Limit		
4-Terphenyl-d14	89	0	% Recovery	33-141% Limit		
Phenol-d6	24	0	% Recovery	10-94% Limit		
2-Fluorophenol	39	0	% Recovery	21-100% Limit		
2,4,6-Tribromophenol	69	0	% Recovery	10-123% Limit		
Date Extracted	02/11/94	0				
Time Analyzed	2100	0				

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940262 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: BLANK SPIKE DUPLICATE

LABORATORY I.D...: 940262-0010
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Semi-Volatile Organic - Surrogates		*1		8270(2)/625(6)	02/16/94	DMJ
Nitrobenzene-d5	75	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl	79	0	% Recovery	43-116% Limit		
4-Terphenyl-d14	96	0	% Recovery	33-141% Limit		
Phenol-d6	29	0	% Recovery	10-94% Limit		
2-Fluorophenol	46	0	% Recovery	21-100% Limit		
2,4,6-Tribromophenol	73	0	% Recovery	10-123% Limit		
Date Extracted	02/11/94	0				
Time Analyzed	0855	0				

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QUALITY CONTROL REPORT
02/17/94

JOB NUMBER: 940262 CUSTOMER: HYGIENETICS/GCL ATTN:

ANALYSIS				DUPLICATES		REFERENCE STANDARDS		MATRIX SPIKES		
ANALYSIS TYPE	ANALYSIS SUB-TYPE	ANALYSIS I.D.	ANALYZED VALUE (A)	DUPLICATE VALUE (B)	RPD or (|A-B|)	TRUE VALUE	PERCENT RECOVERY	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY
PARAMETER:Total Petroleum Hydrocarbon (I.R.) DATE/TIME ANALYZED:02/09/94 13:30 QC BATCH NUMBER:288457										
REPORTING LIMIT/DF: 1 UNITS:mg/L METHOD REFERENCE :418.1 (1) TECHNICIAN:LM										
BLANK	ICB	S0	<1							
BLANK	MB	940209	<1							
BLANK	CCB	S0	<1							
STANDARD	ICV/LCS	940114	43			46	93			
STANDARD	CCV	S50	52			50	104			

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QUALITY CONTROL REPORT
02/17/94

JOB NUMBER: 940262 CUSTOMER: HYGIENETICS/GCL ATTN:

BNA SPIKED ANALYSIS-WATER DATE ANALYZED: 02/15/94 TIME ANALYZED: 21:00 METHOD: 8270 (2) QC NUMBER:288736

REFERENCE STANDARDS

TEST DESCRIPTION	ANALYSIS SUB-TYPE	ANALYSIS I. D.	DILUTION FACTOR	ANALYZED VALUE	TRUE VALUE	PERCENT RECOVERY	DETECTION LIMITS	UNITS OF MEASURE
Phenol	SB	B931011D	1	14	50	28	10	ug/L
	SBD	B931011D	1	17	50	34	10	ug/L
2-Chlorophenol	SB	B931011D	1	34	50	68	10	ug/L
	SBD	B931011D	1	36	50	72	10	ug/L
1,4-Dichlorobenzene	SB	B931011D	1	32	50	64	10	ug/L
	SBD	B931011D	1	34	50	68	10	ug/L
N-Nitrosodi-n-propylamine	SB	B931011D	1	39	50	78	10	ug/L
	SBD	B931011D	1	39	50	78	10	ug/L
1,2,4-Trichlorobenzene	SB	B931011D	1	27	50	54	10	ug/L
	SBD	B931011D	1	28	50	56	10	ug/L
4-Chloro-3-methylphenol	SB	B931011D	1	42	50	84	10	ug/L
	SBD	B931011D	1	42	50	84	10	ug/L
Acenaphthene	SB	B931011D	1	41	50	82	10	ug/L
	SBD	B931011D	1	40	50	80	10	ug/L
4-Nitrophenol	SB	B931011D	1	10	50	20	50	ug/L
	SBD	B931011D	1	11	50	22	50	ug/L
2,4-Dinitrotoluene	SB	B931011D	1	36	50	72	10	ug/L
	SBD	B931011D	1	37	50	74	10	ug/L
Pentachlorophenol	SB	B931011D	1	28	50	56	50	ug/L
	SBD	B931011D	1	27	50	54	50	ug/L
Pyrene	SB	B931011D	1	53	50	106	10	ug/L
	SBD	B931011D	1	51	50	102	10	ug/L

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QUALITY CONTROL FOOTER

METHOD REFERENCES

(1) EPA 600/4-79-020, Methods For Chemical Analysis Of Water And Wastes, March 1983

(2) EPA SW-846, Test Methods For Evaluating Solid Waste, Third Edition, November 1986

(3) Standard Methods For The Examination Of Water And Wastewater, 17th Edition, 1989

(4) EPA 600/4-80-032, Prescribed Procedures For Measurement Of Radioactivity In Drinking Water, August 1980

(5) EPA 600/8-78-017, Microbiological Methods For Monitoring The Environment, December 1978

(6) Federal Register, July 1, 1990 (40 CFR Part 136)

(7) EPA 600/4-88-039, Methods For The Determination Of Organics Compounds In Drinking Water, December 1988

(8) U.S.G.S. Methods For The Determination Of Inorganic Substances In Water And Fluvial Sediments, Book 5, Chapter A1, 1985

(9) Federal Register, Friday, June 7, 1991, (40 CFR Parts 141 and 142)

(10) Standard Methods For The Examination Of Water And Wastewater, 16th Edition, 1985

(11) ASTM, Section 11 Water And Environmental Technology, Volume 11.01 Water (1), 1991

(12) Methods Of Soil Analysis, American Society Of Agronomy, Agronomy No. 9, 1965

(13) EPA SW-846, Test Methods For Evaluating Solid Waste, Third Edition, Revision 1, November 1990

(14) ASTM, Section 5, Petroleum Products, Lubricants, and Fossil Fuels, Volume 05.05, Gaseous Fuels, Coal and Coke

(15) EPA 600/2-78-054, Field and Laboratory Methods Applicable To Overburdens and Mine Soils, March 1978

(16) ASTM, Part 19, Soils and Rock; Building Stones, 1981

COMMENTS: Data in QA report may differ from final results due to digestion and/or dilution of sample into analytical ranges. The "Time Analyzed" in the QA report refers to the start time of the analytical batch which may not reflect the actual time of each analysis. The "Date Analyzed" is the actual date of analysis.

NC = Not Calculable Due To Value(s) Lower Than The Detection Limit.

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Core Laboratories - Casper, WY	*CA	
Core Laboratories - Corpus Christi, TX	*CC	
Core Laboratories - Houston, TX	*HP	
Core Laboratories - Lake Charles, LA	*LC	
Core Laboratories - Long Beach, CA	*LB	
Other Subcontract Laboratories	*XX	Laboratory ID Provided Upon Request

* The asterisk in the "Technician" data field signifies that the analysis was performed by a subcontract laboratory.

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A N A L Y T I C A L R E P O R T

Job Number: 940278
Prepared For:

HYGIENETICS/GCL

505 MARQUETTE NW STE 1100
ALBUQUERQUE, NM 87102

Date: 02/17/94

Linda L. Benkers
Signature

2-17-94
Date:

Name: Linda L. Benkers

Core Laboratories
10703 East Bethany Drive
Aurora, CO 80014

Title: QA/QC COORDINATOR

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7728

Chain of Custody

Date 2/9/94 Page 1 of 2

Lab Name CORE LABORATORIES
Address 10703 East Bethany Drive
Aurora, CO 80014-2696
Telephone 303/751-1780

Samplers (SIGNATURES)

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neu/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX Modified 8015	TCLP- Vol., Semi-Vol. Herbicides, Pesticides	TCLP- Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	Reactivity	TDS	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	Metals 6010 Cr, Cd, Pb	Nitrates / Ca, Mg, Na, K	Cl, SO4, HCO3 NO3	Number of Containers
9402090800	H_2O	DP-2																							X			2
9402090810	H_2O	DP-2																								X		1
9402090845	H_2O	MW-8						X																				3
9402090850	H_2O	MW-8							X																			1
9402090855	H_2O	MW-8										X																1
9402090900	H_2O	MW-8																							X			1
9402090905	H_2O	MW-8																									X	1
9402090910	H_2O	MW-8																									X	1
9402090915	H_2O	MW-8		Per Annette Montoya, NO2+NO3 on MW-8 2-10-94																		X						1
9402090920	H_2O	MW-8																								X		1

Project Information		Sample Receipt	
Project	GPM/ENRON	Total No. of Containers	12
Project Director	Bob Cooper	Chain of Custody Seals	Y
Charge Code No.	54191.02	Rec'd Good Condition/Cold	Y
Shipping ID. No.	8609629070	Conforms to Record	Y
Via:	Fed Ex	Lab No.	940278

Special Instructions/Comments:
24hr TAT on 8240, 418.1
5day TAT on OTHERS

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
(Signature) 1330 (Time)	(Signature) (Time)	(Signature) (Time)
(Printed Name) Kyle Summers 2/9/94 (Date)	(Printed Name) (Date)	(Printed Name) (Date)
(Company) HGCL	(Company)	(Company)
Received By 1.	**Received By 2.**	**Received By (Laboratory) 3.**
(Signature) (Time)	(Signature) (Time)	(Signature) Mary Scott (Time) 1035
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) Mary Scott (Date) 2-10-94
(Company)	(Company)	(Laboratory) Core

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Chain of Custody

Date 2/9/94 Page 2 Of 2

Lab Name CORE LABORATORIES
Address 10703 East Bethany Drive
Aurora, CO 80014-2696
Telephone 303/751-1780

Samplers (SIGNATURES)

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neu/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX Modified 8015	TCLP- Vol., Semi-Vol. Herbicides, Pesticides	TCLP- Metals	RCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)					Number of Containers
Trip Blank	H_2O							X																					1

Project Information		Sample Receipt	
Project	GPM/ENRON	Total No. of Containers	1
Project Director	Bob Cooper	Chain of Custody Seals	Y
Charge Code No.	54191.02	Rec'd Good Condition/Cold	Y
Shipping ID No.	8609629070	Conforms to Record	Y
Via:	FedEx	Lab No.	940278

Special Instructions/Comments:

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
(Company)	(Company)	(Company)
Received By 1.	**Received By 2.**	**Received By (Laboratory) 3.**
(Signature) (Time)	(Signature) (Time)	(Signature) Mary Scott (Time) 1035
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) Mary Scott (Date) 2-10-94
(Company)	(Company)	(Laboratory) Core

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ENRON COC #7728
DATE SAMPLED.....: 02/09/94
TIME SAMPLED.....: 08:00
WORK DESCRIPTION...: 9402090800

LABORATORY I.D...: 940278-0001
DATE RECEIVED....: 02/10/94
TIME RECEIVED....: 10:35
REMARKS.....: DP-2

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Cadmium, Diss. (Cd)	<0.005	0.005	mg/L	6010 (2)	02/16/94	GAG
Chromium, Diss. (Cr)	<0.01	0.01	mg/L	6010 (2)	02/16/94	GAG
Lead, Diss. (Pb)	<0.05	0.05	mg/L	6010 (2)	02/16/94	GAG

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ENRON COC #7728
DATE SAMPLED.....: 02/09/94
TIME SAMPLED.....: 08:10
WORK DESCRIPTION...: 9402090810

LABORATORY I.D...: 940278-0002
DATE RECEIVED....: 02/10/94
TIME RECEIVED....: 10:35
REMARKS.....: DP-2

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECH
Nitrate + Nitrite (as N) [Filt.]	15.2	0.5	mg/L (as N)	353.2 (1)	02/16/94	DME

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

LIENT I.D.....: GPM/ENRON COC #7728
DATE SAMPLED.....: 02/09/94
TIME SAMPLED.....: 08:45
ORK DESCRIPTION...: 9402090845

LABORATORY I.D...: 940278-0003
DATE RECEIVED....: 02/10/94
TIME RECEIVED....: 10:35
REMARKS.....: MW-8

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
240 - VOLATILE ORGANICS		*1		8240 (2)	02/10/94	JMC
Acetone	ND	100	ug/L			
Benzene	ND	1	ug/L			
Bromodichloromethane	ND	5	ug/L			
Bromoform	ND	5	ug/L			
Bromomethane	ND	10	ug/L			
2-Butanone	ND	100	ug/L			
Carbon disulfide	ND	5	ug/L			
Carbon tetrachloride	ND	5	ug/L			
Chlorobenzene	ND	5	ug/L			
Chloroethane	ND	10	ug/L			
2-Chloroethylvinyl ether	ND	10	ug/L			
Chloroform	ND	5	ug/L			
Chloromethane	ND	10	ug/L			
Dibromochloromethane	ND	5	ug/L			
1,1-Dichloroethane	ND	5	ug/L			
1,2-Dichloroethane	ND	5	ug/L			
1,1-Dichloroethene	ND	5	ug/L			
trans-1,2-Dichloroethene	ND	5	ug/L			
1,2-Dichloropropane	ND	5	ug/L			
cis-1,3-Dichloropropene	ND	5	ug/L			
trans-1,3-Dichloropropene	ND	5	ug/L			
Ethylbenzene	ND	5	ug/L			
2-Hexanone	ND	50	ug/L			
Methylene chloride	ND	5	ug/L			
4-Methyl-2-pentanone	ND	50	ug/L			
Styrene	ND	5	ug/L			
1,1,2,2-Tetrachloroethane	ND	5	ug/L			
Tetrachloroethene	ND	5	ug/L			
Toluene	ND	5	ug/L			
1,1,1-Trichloroethane	ND	5	ug/L			
1,1,2-Trichloroethane	ND	5	ug/L			
Trichloroethene	ND	5	ug/L			
Vinyl acetate	ND	50	ug/L			
Vinyl chloride	ND	10	ug/L			
Xylenes-total	ND	5	ug/L			
1,2-Dichloroethane-d4	104	0	% Recovery	76-114% Limit		
Toluene-d8	95	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	107	0	% Recovery	86-115% Limit		
Time Analyzed	1451	0				

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WESTERN ATLAS

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ENRON COC #7728
DATE SAMPLED.....: 02/09/94
TIME SAMPLED.....: 08:50
WORK DESCRIPTION...: 9402090850

LABORATORY I.D...: 940278-0004
DATE RECEIVED....: 02/10/94
TIME RECEIVED....: 10:35
REMARKS.....: MW-8

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8270 - BASE/NEUTRAL/ACID ORGANICS		*1		8270 (2)	02/15/94	DMJ
Acenaphthene	ND	10	ug/L			
Acenaphthylene	ND	10	ug/L			
Anthracene	ND	10	ug/L			
Benzo(a)anthracene	ND	10	ug/L			
Benzo(b)fluoranthene	ND	10	ug/L			
Benzo(k)fluoranthene	ND	10	ug/L			
Benzo(ghi)perylene	ND	10	ug/L			
Benzo(a)pyrene	ND	10	ug/L			
Benzyl Alcohol	ND	20	ug/L			
Butyl benzyl phthalate	ND	10	ug/L			
Bis(2-chloroethoxy)methane	ND	10	ug/L			
Bis(2-chloroethyl)ether	ND	10	ug/L			
Bis(2-chloroisopropyl)ether	ND	10	ug/L			
Bis(2-ethylhexyl)phthalate	ND	10	ug/L			
4-Bromophenyl phenyl ether	ND	10	ug/L			
4-Chloroaniline	ND	10	ug/L			
2-Chloronaphthalene	ND	10	ug/L			
4-Chlorophenyl phenyl ether	ND	10	ug/L			
Chrysene	ND	10	ug/L			
Dibenzo(a,h)anthracene	ND	10	ug/L			
Dibenzofuran	ND	10	ug/L			
1,2-Dichlorobenzene	ND	10	ug/L			
1,3-Dichlorobenzene	ND	10	ug/L			
1,4-Dichlorobenzene	ND	10	ug/L			
3,3-Dichlorobenzidine	ND	20	ug/L			
Diethyl phthalate	ND	10	ug/L			
Dimethyl phthalate	ND	10	ug/L			
Di-n-butyl phthalate	ND	10	ug/L			
Di-n-octyl phthalate	ND	10	ug/L			
2,4-Dinitrotoluene	ND	10	ug/L			
2,6-Dinitrotoluene	ND	10	ug/L			
Fluoranthene	ND	10	ug/L			
Fluorene	ND	10	ug/L			
Hexachlorobenzene	ND	10	ug/L			
Hexachlorobutadiene	ND	10	ug/L			
Hexachlorocyclopentadiene	ND	10	ug/L			
Hexachloroethane	ND	10	ug/L			
Indeno(1,2,3-cd)pyrene	ND	10	ug/L			
Isophorone	ND	10	ug/L			
2-Methylnaphthalene	ND	10	ug/L			
Naphthalene	ND	10	ug/L			
o-Nitroaniline	ND	50	ug/L			
m-Nitroaniline	ND	50	ug/L			

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ENRON COC #7728
DATE SAMPLED.....: 02/09/94
TIME SAMPLED.....: 08:50
WORK DESCRIPTION...: 9402090850

LABORATORY I.D...: 940278-0004
DATE RECEIVED....: 02/10/94
TIME RECEIVED....: 10:35
REMARKS.....: MW-8

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
p-Nitroaniline	ND	50	ug/L			
Nitrobenzene	ND	10	ug/L			
N-Nitrosodi-n-propylamine	ND	10	ug/L			
N-Nitrosodiphenylamine	ND	10	ug/L			
Phenanthrene	ND	10	ug/L			
Pyrene	ND	10	ug/L			
1,2,4-Trichlorobenzene	ND	10	ug/L			
Benzoic Acid	ND	50	ug/L			
4-Chloro-3-methylphenol	ND	10	ug/L			
2-Chlorophenol	ND	10	ug/L			
2,4-Dichlorophenol	ND	10	ug/L			
2,4-Dimethylphenol	ND	10	ug/L			
2,4-Dinitrophenol	ND	50	ug/L			
2-Methyl-4,6-dinitrophenol	ND	50	ug/L			
o-Cresol (2-Methylphenol)	ND	10	ug/L			
4-Methylphenol	ND	10	ug/L			
2-Nitrophenol	ND	10	ug/L			
4-Nitrophenol	ND	50	ug/L			
Pentachlorophenol	ND	50	ug/L			
Phenol	ND	10	ug/L			
2,4,5-Trichlorophenol	ND	10	ug/L			
2,4,6-Trichlorophenol	ND	10	ug/L			
Nitrobenzene-d5	59	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl	61	0	% Recovery	43-116% Limit		
4-Terphenyl-d14	59	0	% Recovery	33-141% Limit		
Phenol-d6	24	0	% Recovery	10-94% Limit		
2-Fluorophenol	32	0	% Recovery	21-100% Limit		
2,4,6-Tribromophenol	56	0	% Recovery	10-123% Limit		
Time Analyzed	1239	0				
Date Extracted	02/11/94	0				

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02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ENRON COC #7728
DATE SAMPLED.....: 02/09/94
TIME SAMPLED.....: 08:55
WORK DESCRIPTION...: 9402090855

LABORATORY I.D...: 940278-0005
DATE RECEIVED....: 02/10/94
TIME RECEIVED....: 10:35
REMARKS.....: MW-8

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Total Petroleum Hydrocarbon (I.R.)	<1	1	mg/L	418.1 (1)	02/10/94	LM

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02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ENRON COC #7728
DATE SAMPLED.....: 02/09/94
TIME SAMPLED.....: 09:00
WORK DESCRIPTION...: 9402090900

LABORATORY I.D...: 940278-0006
DATE RECEIVED....: 02/10/94
TIME RECEIVED....: 10:35
REMARKS.....: MW-8

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Cadmium, Diss. (Cd)	<0.005	0.005	mg/L	6010 (2)	02/16/94	GAG
Chromium, Diss. (Cr)	<0.01	0.01	mg/L	6010 (2)	02/16/94	GAG
Lead, Diss. (Pb)	<0.05	0.05	mg/L	6010 (2)	02/16/94	GAG

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02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ENRON COC #7728
DATE SAMPLED.....: 02/09/94
TIME SAMPLED.....: 09:05
WORK DESCRIPTION...: 9402090905

LABORATORY I.D...: 940278-0007
DATE RECEIVED....: 02/10/94
TIME RECEIVED....: 10:35
REMARKS.....: MW-8

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Calcium, Diss. (Ca)	149	1.0	mg/L	6010 (2)	02/15/94	GAG
Magnesium, Diss. (Mg)	19.9	0.1	mg/L	6010 (2)	02/15/94	GAG
Potassium, Diss. (K)	6.2	0.1	mg/L	7610 (2)	02/16/94	LMT
Sodium, Diss. (Na)	70	1	mg/L	6010 (2)	02/15/94	GAG

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02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ENRON COC #7728
DATE SAMPLED.....: 02/09/94
TIME SAMPLED.....: 09:10
WORK DESCRIPTION...: 9402090910

LABORATORY I.D...: 940278-0008
DATE RECEIVED....: 02/10/94
TIME RECEIVED....: 10:35
REMARKS.....: MW-8

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Bicarbonate (Filt.)	417	5	mg/L	2320 B (3)	02/14/94	SLS
Chloride (Filt.)	49.7	0.5	mg/L	325.2 (1)	02/14/94	DME
Sulfate (Filt.)	248	20	mg/L	375.2 (1)	02/11/94	DME

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02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

LIENT I.D.....: GPM/ENRON COC #7728
DATE SAMPLED.....: 02/09/94
TIME SAMPLED.....: 09:15
ORK DESCRIPTION...: 9402090915

LABORATORY I.D...: 940278-0009
DATE RECEIVED....: 02/10/94
TIME RECEIVED....: 10:35
REMARKS.....: MW-8

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
olids, Total Dissolved (TDS)	951	10	mg/L	160.1 (1)	02/16/94	RJC

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METHOD REFERENCES

(1) EPA 600/4-79-020, Methods For Chemical Analysis Of Water And Wastes, March 1983

(2) EPA SW-846, Test Methods For Evaluating Solid Waste, Third Edition, November 1986

(3) Standard Methods For The Examination Of Water And Wastewater, 17th Edition, 1989

(4) EPA 600/4-80-032, Prescribed Procedures For Measurement Of Radioactivity In Drinking Water, August 1980

(5) EPA 600/8-78-017, Microbiological Methods For Monitoring The Environment, December 1978

(6) Federal Register, July 1, 1990 (40 CFR Part 136)

(7) EPA 600/4-88-039, Methods For The Determination Of Organics Compounds In Drinking Water, December 1988

(8) U.S.G.S. Methods For The Determination Of Inorganic Substances In Water And Fluvial Sediments, Book 5, Chapter A1, 1985

(9) Federal Register, Friday, June 7, 1991, (40 CFR Parts 141 and 142)

(10) Standard Methods For The Examination Of Water And Wastewater, 16th Edition, 1985

(11) ASTM, Section 11 Water And Environmental Technology, Volume 11.01 Water (1), 1991

(12) Methods Of Soil Analysis, American Society Of Agronomy, Agronomy No. 9, 1965

(13) EPA SW-846, Test Methods For Evaluating Solid Waste, Third Edition, Revision 1, November 1990

(14) ASTM, Section 5, Petroleum Products, Lubricants, and Fossil Fuels, Volume 05.05, Gaseous Fuels, Coal and Coke

(15) EPA 600/2-78-054, Field and Laboratory Methods Applicable To Overburdens and Mine Soils, March 1978

(16) ASTM, Part 19, Soils and Rock; Building Stones, 1981

COMMENTS: Data in QA report may differ from final results due to digestion and/or dilution of sample into analytical ranges. The "Time Analyzed" in the QA report refers to the start time of the analytical batch which may not reflect the actual time of each analysis. The "Date Analyzed" is the actual date of analysis.

NC = Not Calculable Due To Value(s) Lower Than The Detection Limit.

Analyses performed by a subcontract laboratory are indicated on the analytical and/or quality control reports under "Technician" using the following codes:

Subcontract Laboratory	Code	
Core Laboratories - Anaheim, CA	*AN	
Core Laboratories - Casper, WY	*CA	
Core Laboratories - Corpus Christi, TX	*CC	
Core Laboratories - Houston, TX	*HP	
Core Laboratories - Lake Charles, LA	*LC	
Core Laboratories - Long Beach, CA	*LB	
Other Subcontract Laboratories	*XX	Laboratory ID Provided Upon Request

* The asterisk in the "Technician" data field signifies that the analysis was performed by a subcontract laboratory.

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ENRON COC #7728
DATE SAMPLED.....: 02/09/94
TIME SAMPLED.....: 09:20
WORK DESCRIPTION...: 9402090920

LABORATORY I.D...: 940278-0010
DATE RECEIVED....: 02/10/94
TIME RECEIVED....: 10:35
REMARKS.....: MW-8

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Nitrate + Nitrite (as N) [Filt.]	16.5	0.5	mg/L (as N)	353.2 (1)	02/16/94	DME

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....: GPM/ENRON COC #7292
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: TRIP BLANK

LABORATORY I.D...: 940278-0011
DATE RECEIVED....: 02/10/94
TIME RECEIVED....: 10:35
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8240 - VOLATILE ORGANICS		*1		8240 (2)	02/10/94	JMC
Acetone	ND	100	ug/L			
Benzene	ND	1	ug/L			
Bromodichloromethane	ND	5	ug/L			
Bromoform	ND	5	ug/L			
Bromomethane	ND	10	ug/L			
2-Butanone	ND	100	ug/L			
Carbon disulfide	ND	5	ug/L			
Carbon tetrachloride	ND	5	ug/L			
Chlorobenzene	ND	5	ug/L			
Chloroethane	ND	10	ug/L			
2-Chloroethylvinyl ether	ND	10	ug/L			
Chloroform	ND	5	ug/L			
Chloromethane	ND	10	ug/L			
Dibromochloromethane	ND	5	ug/L			
1,1-Dichloroethane	ND	5	ug/L			
1,2-Dichloroethane	ND	5	ug/L			
1,1-Dichloroethene	ND	5	ug/L			
trans-1,2-Dichloroethene	ND	5	ug/L			
1,2-Dichloropropane	ND	5	ug/L			
cis-1,3-Dichloropropene	ND	5	ug/L			
trans-1,3-Dichloropropene	ND	5	ug/L			
Ethylbenzene	ND	5	ug/L			
2-Hexanone	ND	50	ug/L			
Methylene chloride	ND	5	ug/L			
4-Methyl-2-pentanone	ND	50	ug/L			
Styrene	ND	5	ug/L			
1,1,2,2-Tetrachloroethane	ND	5	ug/L			
Tetrachloroethene	ND	5	ug/L			
Toluene	ND	5	ug/L			
1,1,1-Trichloroethane	ND	5	ug/L			
1,1,2-Trichloroethane	ND	5	ug/L			
Trichloroethene	ND	5	ug/L			
Vinyl acetate	ND	50	ug/L			
Vinyl chloride	ND	10	ug/L			
Xylenes-total	ND	5	ug/L			
1,2-Dichloroethane-d4	105	0	% Recovery	76-114% Limit		
Toluene-d8	97	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	105	0	% Recovery	86-115% Limit		
Time Analyzed	1405	0				

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: METHOD BLANK

LABORATORY I.D...: 940278-0012
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
8240 - VOLATILE ORGANICS		*1		8240 (2)	02/10/94	JMC
Acetone	ND	100	ug/L			
Benzene	ND	1	ug/L			
Bromodichloromethane	ND	5	ug/L			
Bromoform	ND	5	ug/L			
Bromomethane	ND	10	ug/L			
2-Butanone	ND	100	ug/L			
Carbon disulfide	ND	5	ug/L			
Carbon tetrachloride	ND	5	ug/L			
Chlorobenzene	ND	5	ug/L			
Chloroethane	ND	10	ug/L			
2-Chloroethylvinyl ether	ND	10	ug/L			
Chloroform	ND	5	ug/L			
Chloromethane	ND	10	ug/L			
Dibromochloromethane	ND	5	ug/L			
1,1-Dichloroethane	ND	5	ug/L			
1,2-Dichloroethane	ND	5	ug/L			
1,1-Dichloroethene	ND	5	ug/L			
trans-1,2-Dichloroethene	ND	5	ug/L			
1,2-Dichloropropane	ND	5	ug/L			
cis-1,3-Dichloropropene	ND	5	ug/L			
trans-1,3-Dichloropropene	ND	5	ug/L			
Ethylbenzene	ND	5	ug/L			
2-Hexanone	ND	50	ug/L			
Methylene chloride	ND	5	ug/L			
4-Methyl-2-pentanone	ND	50	ug/L			
Styrene	ND	5	ug/L			
1,1,2,2-Tetrachloroethane	ND	5	ug/L			
Tetrachloroethene	ND	5	ug/L			
Toluene	ND	5	ug/L			
1,1,1-Trichloroethane	ND	5	ug/L			
1,1,2-Trichloroethane	ND	5	ug/L			
Trichloroethene	ND	5	ug/L			
Vinyl acetate	ND	50	ug/L			
Vinyl chloride	ND	10	ug/L			
Xylenes-total	ND	5	ug/L			
1,2-Dichloroethane-d4	102	0	% Recovery	76-114% Limit		
Toluene-d8	98	0	% Recovery	88-110% Limit		
4-Bromofluorobenzene	107	0	% Recovery	86-115% Limit		
Time Analyzed	1000	0				
8270 - BASE/NEUTRAL/ACID ORGANICS		*1		8270 (2)	02/15/94	DMJ
Acenaphthene	ND	10	ug/L			

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: METHOD BLANK

LABORATORY I.D...: 940278-0012
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Acenaphthylene	ND	10	ug/L			
Anthracene	ND	10	ug/L			
Benzo(a)anthracene	ND	10	ug/L			
Benzo(b)fluoranthene	ND	10	ug/L			
Benzo(k)fluoranthene	ND	10	ug/L			
Benzo(ghi)perylene	ND	10	ug/L			
Benzo(a)pyrene	ND	10	ug/L			
Benzyl Alcohol	ND	20	ug/L			
Butyl benzyl phthalate	ND	10	ug/L			
Bis(2-chloroethoxy)methane	ND	10	ug/L			
Bis(2-chloroethyl)ether	ND	10	ug/L			
Bis(2-chloroisopropyl)ether	ND	10	ug/L			
Bis(2-ethylhexyl)phthalate	ND	10	ug/L			
4-Bromophenyl phenyl ether	ND	10	ug/L			
4-Chloroaniline	ND	10	ug/L			
2-Chloronaphthalene	ND	10	ug/L			
4-Chlorophenyl phenyl ether	ND	10	ug/L			
Chrysene	ND	10	ug/L			
Dibenzo(a,h)anthracene	ND	10	ug/L			
Dibenzofuran	ND	10	ug/L			
1,2-Dichlorobenzene	ND	10	ug/L			
1,3-Dichlorobenzene	ND	10	ug/L			
1,4-Dichlorobenzene	ND	10	ug/L			
3,3-Dichlorobenzidine	ND	20	ug/L			
Diethyl phthalate	ND	10	ug/L			
Dimethyl phthalate	ND	10	ug/L			
Di-n-butyl phthalate	ND	10	ug/L			
Di-n-octyl phthalate	ND	10	ug/L			
2,4-Dinitrotoluene	ND	10	ug/L			
2,6-Dinitrotoluene	ND	10	ug/L			
Fluoranthene	ND	10	ug/L			
Fluorene	ND	10	ug/L			
Hexachlorobenzene	ND	10	ug/L			
Hexachlorobutadiene	ND	10	ug/L			
Hexachlorocyclopentadiene	ND	10	ug/L			
Hexachloroethane	ND	10	ug/L			
Indeno(1,2,3-cd)pyrene	ND	10	ug/L			
Isophorone	ND	10	ug/L			
2-Methylnaphthalene	ND	10	ug/L			
Naphthalene	ND	10	ug/L			
o-Nitroaniline	ND	50	ug/L			
m-Nitroaniline	ND	50	ug/L			
p-Nitroaniline	ND	50	ug/L			
Nitrobenzene	ND	10	ug/L			
N-Nitrosodi-n-propylamine	ND	10	ug/L			

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WESTERN ATLAS

Core Laboratories

LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: METHOD BLANK

LABORATORY I.D...: 940278-0012
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
N-Nitrosodiphenylamine	ND	10	ug/L			
Phenanthrene	ND	10	ug/L			
Pyrene	ND	10	ug/L			
1,2,4-Trichlorobenzene	ND	10	ug/L			
Benzoic Acid	ND	50	ug/L			
4-Chloro-3-methylphenol	ND	10	ug/L			
2-Chlorophenol	ND	10	ug/L			
2,4-Dichlorophenol	ND	10	ug/L			
2,4-Dimethylphenol	ND	10	ug/L			
2,4-Dinitrophenol	ND	50	ug/L			
2-Methyl-4,6-dinitrophenol	ND	50	ug/L			
o-Cresol (2-Methylphenol)	ND	10	ug/L			
4-Methylphenol	ND	10	ug/L			
2-Nitrophenol	ND	10	ug/L			
4-Nitrophenol	ND	50	ug/L			
Pentachlorophenol	ND	50	ug/L			
Phenol	ND	10	ug/L			
2,4,5-Trichlorophenol	ND	10	ug/L			
2,4,6-Trichlorophenol	ND	10	ug/L			
Nitrobenzene-d5	58	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl	52	0	% Recovery	43-116% Limit		
4-Terphenyl-d14	61	0	% Recovery	33-141% Limit		
Phenol-d6	23	0	% Recovery	10-94% Limit		
2-Fluorophenol	32	0	% Recovery	21-100% Limit		
2,4,6-Tribromophenol	46	0	% Recovery	10-123% Limit		
Time Analyzed	1127	0				
Date Extracted	02/11/94	0				

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: BLANK SPIKE

LABORATORY I.D...: 940278-0013
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Semi-Volatile Organic - Surrogates		*1		8270(2)/625(6)	02/15/94	DMJ
Nitrobenzene-d5	68	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl	74	0	% Recovery	43-116% Limit		
4-Terphenyl-d14	89	0	% Recovery	33-141% Limit		
Phenol-d6	24	0	% Recovery	10-94% Limit		
2-Fluorophenol	39	0	% Recovery	21-100% Limit		
2,4,6-Tribromophenol	69	0	% Recovery	10-123% Limit		
Date Extracted	02/11/94	0				
Time Analyzed	2100	0				

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LABORATORY TESTS RESULTS
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

CLIENT I.D.....:
DATE SAMPLED.....: / /
TIME SAMPLED.....: :
WORK DESCRIPTION...: BLANK SPIKE DUPLICATE

LABORATORY I.D...: 940278-0014
DATE RECEIVED....: / /
TIME RECEIVED....: :
REMARKS.....:

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Semi-Volatile Organic - Surrogates		*1		8270(2)/625(6)	02/16/94	DMJ
Nitrobenzene-d5	75	0	% Recovery	35-114% Limit		
2-Fluorobiphenyl	79	0	% Recovery	43-116% Limit		
4-Terphenyl-d14	96	0	% Recovery	33-141% Limit		
Phenol-d6	29	0	% Recovery	10-94% Limit		
2-Fluorophenol	46	0	% Recovery	21-100% Limit		
2,4,6-Tribromophenol	73	0	% Recovery	10-123% Limit		
Date Extracted	02/11/94	0				
Time Analyzed	0855	0				

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WESTERN ATLAS

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QUALITY CONTROL REPORT
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

ANALYSIS				DUPLICATES		REFERENCE STANDARDS		MATRIX SPIKES		
ANALYSIS TYPE	ANALYSIS SUB-TYPE	ANALYSIS I.D.	ANALYZED VALUE (A)	DUPLICATE VALUE (B)	RPD or (|A-B|)	TRUE VALUE	PERCENT RECOVERY	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY
PARAMETER:Total Petroleum Hydrocarbon (I.R.)			DATE/TIME ANALYZED:02/10/94 13:30							QC BATCH NUMBER:288477
REPORTING LIMIT/DF: 1	UNITS:mg/L		METHOD REFERENCE :418.1 (1)							TECHNICIAN:LM
BLANK	ICB	S0	<1							
BLANK	MB	940210	<1							
BLANK	CCB	S0	<1							
STANDARD	ICV/LCS	940114	43			46	93			
STANDARD	CCV	S50	51			50	102			
PARAMETER:Sulfate (Filt.)			DATE/TIME ANALYZED:02/11/94 14:00							QC BATCH NUMBER:288522
REPORTING LIMIT/DF: 10	UNITS:mg/L		METHOD REFERENCE :375.2 (1)							TECHNICIAN:DME
BLANK	ICB	940211	<10							
BLANK	CCB	940211	<10							
BLANK	CCB	940211	<10							
STANDARD	ICV/LCS	G930413B	51			50	102			
STANDARD	CCV	S160	158			160	99			
STANDARD	CCV	S160	159			160	99			
SPIKE	MS	940173-34	175					129	50	92
SPIKE	MS	940196-15	78					34	50	88
DUPLICATE	MD	940173-34	129	134	4					
DUPLICATE	MD	940196-15	34	29	5					
PARAMETER:Chloride (Filt.)			DATE/TIME ANALYZED:02/14/94 11:00							QC BATCH NUMBER:288604
REPORTING LIMIT/DF: 0.5	UNITS:mg/L		METHOD REFERENCE :325.2 (1)							TECHNICIAN:DME
BLANK	ICB	940214	<0.5							
BLANK	CCB	940214	<0.5							
BLANK	CCB	940214	<0.5							
BLANK	CCB	940214	<0.5							
STANDARD	ICV/LCS	G931229C	52.6			50.0	105			
STANDARD	CCV	S160	158			160	99			
STANDARD	CCV	S160	158			160	99			
STANDARD	CCV	S160	158			160	99			
SPIKE	MS	940196-15	78.0					27.3	50.0	101
SPIKE	MS	940173-20	68.2					15.8	50.0	105
SPIKE	MS	940173-27	66.4					18.4	50.0	96
DUPLICATE	MD	940196-15	28.3	28.1	1					
DUPLICATE	MD	940173-20	15.7	16.1	3					
DUPLICATE	MD	940173-27	18.4	17.4	6					
PARAMETER:Bicarbonate (Filt.)			DATE/TIME ANALYZED:02/14/94 10:10							QC BATCH NUMBER:288659
REPORTING LIMIT/DF: 5	UNITS:mg/L		METHOD REFERENCE :2320 B (3)							TECHNICIAN:SLS
BLANK	MB	940214	<5							
DUPLICATE	MD	940297-17	941	942	0					

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QUALITY CONTROL REPORT
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

ANALYSIS				DUPLICATES		REFERENCE STANDARDS		MATRIX SPIKES		
ANALYSIS TYPE	ANALYSIS SUB-TYPE	ANALYSIS I.D.	ANALYZED VALUE (A)	DUPLICATE VALUE (B)	RPD or (|A-B|)	TRUE VALUE	PERCENT RECOVERY	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY
PARAMETER:Calcium, Diss. (Ca)				DATE/TIME ANALYZED:02/15/94 22:49						QC BATCH NUMBER:288716
REPORTING LIMIT/DF: 1.0 UNITS:mg/L				METHOD REFERENCE :6010 (2)						TECHNICIAN:GAG
BLANK	ICB	1228R	<1.0							
BLANK	CCB	1228R	<1.0							
BLANK	CCB	1228R	<1.0							
BLANK	CCB	1228R	<1.0							
BLANK	CCB	0215J	<1.0							
BLANK	CCB	0215J	<1.0							
STANDARD	CCV	0207H	260			250	104			
STANDARD	ICV	1020E	203			200	101			
STANDARD	CCV	0207H	265			250	106			
STANDARD	ISA	0110A	489			500	98			
STANDARD	ISB	0111K	476			500	95			
STANDARD	CCV	0207H	269			250	108			
STANDARD	CCV	0207H	263			250	105			
STANDARD	ISA	0110A	481			500	96			
STANDARD	ISB	0111K	477			500	95			
STANDARD	CCV	0207H	268			250	107			
SPIKE	PDS	940284-003	204					156	50.0	96
SPIKE	PDS	940278-001	233					187	50.0	92
DUPLICATE	MD	932491-037	31.5	31.6	0					
DUPLICATE	MD	940148-020	21.8	22.6	4					
DUPLICATE	MD	940284-002	236	236	0					
DUPLICATE	MD	940278-006	168	168	0					
PARAMETER:Cadmium, Diss. (Cd)				DATE/TIME ANALYZED:02/16/94 00:22						QC BATCH NUMBER:288717
REPORTING LIMIT/DF: 0.005 UNITS:mg/L				METHOD REFERENCE :6010 (2)						TECHNICIAN:GAG
BLANK	ICB	1228R	<0.005							
BLANK	CCB	1228R	<0.005							
BLANK	CCB	1228R	<0.005							
BLANK	CCB	1228R	<0.005							
BLANK	CCB	0215J	<0.005							
BLANK	CCB	0215J	<0.005							
STANDARD	CCV	0125D	2.43			2.50	97			
STANDARD	ICV	0820E	2.04			2.00	102			
STANDARD	CCV	0125D	2.49			2.50	100			
STANDARD	ISB	0111K	0.819			1.00	82			
STANDARD	CCV	0125D	2.47			2.50	99			
STANDARD	CCV	0125D	2.47			2.50	99			
STANDARD	ISB	0111K	0.810			1.00	81			
STANDARD	CCV	0125D	2.49			2.50	100			
SPIKE	PDS	940284-003	0.884					<0.005	1.00	88
SPIKE	PDS	932491-040	1.00					<0.005	1.00	100
SPIKE	PDS	940148-021	1.04					<0.005	1.00	104
SPIKE	PDS	940278-001	0.896					<0.005	1.00	90
DUPLICATE	MD	940284-002	<0.005	<0.005	NC					
DUPLICATE	MD	940278-006	<0.005	<0.005	NC					

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QUALITY CONTROL REPORT
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

ANALYSIS				DUPLICATES		REFERENCE STANDARDS		MATRIX SPIKES		
ANALYSIS TYPE	ANALYSIS SUB-TYPE	ANALYSIS I.D.	ANALYZED VALUE (A)	DUPLICATE VALUE (B)	RPD or (|A-B|)	TRUE VALUE	PERCENT RECOVERY	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY
PARAMETER:Cadmium, Diss. (Cd)				DATE/TIME ANALYZED:02/16/94 00:22						QC BATCH NUMBER:288717
REPORTING LIMIT/DF: 0.005 UNITS:mg/L				METHOD REFERENCE :6010 (2)						TECHNICIAN:GAG
DUPLICATE	MD	932491-037	<0.005	<0.005	NC					
DUPLICATE	MD	940148-020	<0.005	<0.005	NC					
PARAMETER:Chromium, Diss. (Cr)				DATE/TIME ANALYZED:02/16/94 00:22						QC BATCH NUMBER:288718
REPORTING LIMIT/DF: 0.01 UNITS:mg/L				METHOD REFERENCE :6010 (2)						TECHNICIAN:GAG
BLANK	ICB	1228R	<0.01							
BLANK	CCB	1228R	<0.01							
BLANK	CCB	1228R	<0.01							
BLANK	CCB	1228R	<0.01							
BLANK	CCB	0215J	<0.01							
BLANK	CCB	0215J	<0.01							
STANDARD	CCV	0125D	2.56			2.50	102			
STANDARD	ICV	0820E	2.09			2.00	104			
STANDARD	CCV	0125D	2.60			2.50	104			
STANDARD	ISB	0111K	0.42			0.50	84			
STANDARD	CCV	0125D	2.62			2.50	105			
STANDARD	CCV	0125D	2.63			2.50	105			
STANDARD	ISB	0111K	0.42			0.50	84			
STANDARD	CCV	0125D	2.61			2.50	104			
SPIKE	PDS	940284-003	0.90					<0.01	1.00	90
SPIKE	PDS	932491-040	0.99					0.02	1.00	97
SPIKE	PDS	940148-021	1.02					<0.01	1.00	102
SPIKE	PDS	940278-001	0.91					<0.01	1.00	91
DUPLICATE	MD	940284-002	<0.01	<0.01	NC					
DUPLICATE	MD	940278-006	<0.01	<0.01	NC					
DUPLICATE	MD	932491-037	<0.01	<0.01	NC					
DUPLICATE	MD	940148-020	<0.01	<0.01	NC					
PARAMETER:Magnesium, Diss. (Mg)				DATE/TIME ANALYZED:02/15/94 22:49						QC BATCH NUMBER:288721
REPORTING LIMIT/DF: 0.1 UNITS:mg/L				METHOD REFERENCE :6010 (2)						TECHNICIAN:GAG
BLANK	ICB	1228R	<0.1							
BLANK	CCB	1228R	<0.1							
BLANK	CCB	1228R	<0.1							
BLANK	CCB	1228R	<0.1							
BLANK	CCB	0215J	<0.1							
BLANK	CCB	0215J	<0.1							
STANDARD	CCV	0125D	25.0			25.0	100			
STANDARD	ICV	E1020	19.8			20.0	99			
STANDARD	CCV	0125D	25.5			25.0	102			
STANDARD	CCV	0125D	25.6			25.0	102			
STANDARD	CCV	0125D	25.6			25.0	102			
STANDARD	CCV	0125D	25.6			25.0	102			
SPIKE	PDS	940278-001	70.4					19.3	50.0	102
SPIKE	PDS	940284-003	80.6					29.9	50.0	101

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QUALITY CONTROL REPORT
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

ANALYSIS				DUPLICATES		REFERENCE STANDARDS		MATRIX SPIKES		
ANALYSIS TYPE	ANALYSIS SUB-TYPE	ANALYSIS I.D.	ANALYZED VALUE (A)	DUPLICATE VALUE (B)	RPD or (|A-B|)	TRUE VALUE	PERCENT RECOVERY	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY
PARAMETER:Magnesium, Diss. (Mg)				DATE/TIME ANALYZED:02/15/94 22:49						QC BATCH NUMBER:288721
REPORTING LIMIT/DF: 0.1 UNITS:mg/L				METHOD REFERENCE :6010 (2)						TECHNICIAN:GAG
DUPLICATE	MD	932491-037	1.2	1.2	0					
DUPLICATE	MD	940148-020	6.6	6.6	0					
DUPLICATE	MD	940284-002	20.6	20.7	0					
DUPLICATE	MD	940278-006	22.8	22.8	0					
PARAMETER:Sodium, Diss. (Na)				DATE/TIME ANALYZED:02/15/94 22:49						QC BATCH NUMBER:288722
REPORTING LIMIT/DF: 1 UNITS:mg/L				METHOD REFERENCE :6010 (2)						TECHNICIAN:GAG
BLANK	ICB	1228R	<1							
BLANK	CCB	1228R	<1							
BLANK	CCB	1228R	<1							
BLANK	CCB	1228R	<1							
BLANK	CCB	0215J	<1							
BLANK	CCB	0215J	<1							
STANDARD	CCV	0125D	49			50	98			
STANDARD	ICV	E1020	20			20	100			
STANDARD	CCV	0125D	49			50	98			
STANDARD	CCV	0125D	49			50	98			
STANDARD	CCV	0125D	49			50	98			
STANDARD	CCV	0125D	49			50	98			
SPIKE	PDS	940284-003	345					302	50	86
SPIKE	PDS	940278-001	97					52	50	90
DUPLICATE	MD	940148-020	24	25	4					
DUPLICATE	MD	940278-006	93	93	0					
PARAMETER:Lead, Diss. (Pb)				DATE/TIME ANALYZED:02/16/94 00:22						QC BATCH NUMBER:288724
REPORTING LIMIT/DF: 0.05 UNITS:mg/L				METHOD REFERENCE :6010 (2)						TECHNICIAN:GAG
BLANK	ICB	1228R	<0.05							
BLANK	CCB	1228R	<0.05							
BLANK	CCB	1228R	<0.05							
BLANK	CCB	1228R	<0.05							
BLANK	CCB	0215J	<0.05							
BLANK	CCB	0215J	<0.05							
STANDARD	CCV	0125D	2.45			2.50	98			
STANDARD	ICV	0820E	2.06			2.00	103			
STANDARD	CCV	0125D	2.52			2.50	101			
STANDARD	ISB	0111K	0.98			1.00	98			
STANDARD	CCV	0125D	2.49			2.50	100			
STANDARD	CCV	0125D	2.52			2.50	101			
STANDARD	ISB	0111K	0.86			1.00	86			
STANDARD	CCV	0125D	2.52			2.50	101			
SPIKE	PDS	940284-003	0.87					<0.05	1.00	87
SPIKE	PDS	932491-040	0.98					<0.05	1.00	98
SPIKE	PDS	940148-021	0.99					<0.05	1.00	99
SPIKE	PDS	940278-001	0.89					<0.05	1.00	89

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WESTERN ATLAS

Core Laboratories

QUALITY CONTROL REPORT
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

ANALYSIS				DUPLICATES		REFERENCE STANDARDS		MATRIX SPIKES		
ANALYSIS TYPE	ANALYSIS SUB-TYPE	ANALYSIS I.D.	ANALYZED VALUE (A)	DUPLICATE VALUE (B)	RPD or (|A-B|)	TRUE VALUE	PERCENT RECOVERY	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY
PARAMETER:Lead, Diss. (Pb)				DATE/TIME ANALYZED:02/16/94 00:22						QC BATCH NUMBER:288724
REPORTING LIMIT/DF: 0.05 UNITS:mg/L				METHOD REFERENCE :6010 (2)						TECHNICIAN:GAG
DUPLICATE	MD	940284-002	<0.05	<0.05	NC					
DUPLICATE	MD	940278-006	<0.05	<0.05	NC					
DUPLICATE	MD	932491-037	<0.05	<0.05	NC					
DUPLICATE	MD	940148-020	<0.05	<0.05	NC					
PARAMETER:Potassium, Diss. (K)				DATE/TIME ANALYZED:02/16/94 14:00						QC BATCH NUMBER:288758
REPORTING LIMIT/DF: 0.1 UNITS:mg/L				METHOD REFERENCE :7610 (2)						TECHNICIAN:LMT
BLANK	ICB	02164	<0.1							
BLANK	MB	MWMP	<0.1							
BLANK	CCB	02164	<0.1							
BLANK	CCB	02164	<0.1							
STANDARD	ICV	0426A	1.8			2.0	90			
STANDARD	CCV	0216C	2.6			2.5	104			
STANDARD	CCV	0216C	2.6			2.5	104			
SPIKE	PDS	940173-023	6.9					4.9	2.5	80
SPIKE	PDS	940279-003	3.7					1.2	2.5	100
DUPLICATE	MD	940173-026	6.1	6.0	2					
DUPLICATE	MD	940278-007	6.2	6.1	2					
PARAMETER:Nitrate + Nitrite (as N) [Filt.]				DATE/TIME ANALYZED:02/16/94 07:50						QC BATCH NUMBER:288816
REPORTING LIMIT/DF: 0.05 UNITS:mg/L (as N)				METHOD REFERENCE :353.2 (1)						TECHNICIAN:DME
BLANK	ICB	940216	<0.05							
BLANK	CCB	940216	<0.05							
STANDARD	ICV/LCS	G931013B	1.00			1.00	100			
STANDARD	CCV	S3.00	2.97			3.00	99			
SPIKE	MS	940298-1	1.06					0.08	1.00	98
DUPLICATE	MD	940298-1	0.08	0.08	0.00					
PARAMETER:Solids, Total Dissolved (TDS)				DATE/TIME ANALYZED:02/16/94 06:30						QC BATCH NUMBER:288847
REPORTING LIMIT/DF: 10 UNITS:mg/L				METHOD REFERENCE :160.1 (1)						TECHNICIAN:RJC
BLANK	MB	940216	<10							
STANDARD	LCS	G931110D	512			500	102			
DUPLICATE	MD	940278-9	951	959	1					

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WESTERN ATLAS

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QUALITY CONTROL REPORT
02/17/94

JOB NUMBER: 940278 CUSTOMER: HYGIENETICS/GCL ATTN:

NA SPIKED ANALYSIS-WATER DATE ANALYZED: 02/15/94 TIME ANALYZED: 21:00 METHOD: 8270 (2) QC NUMBER:288736

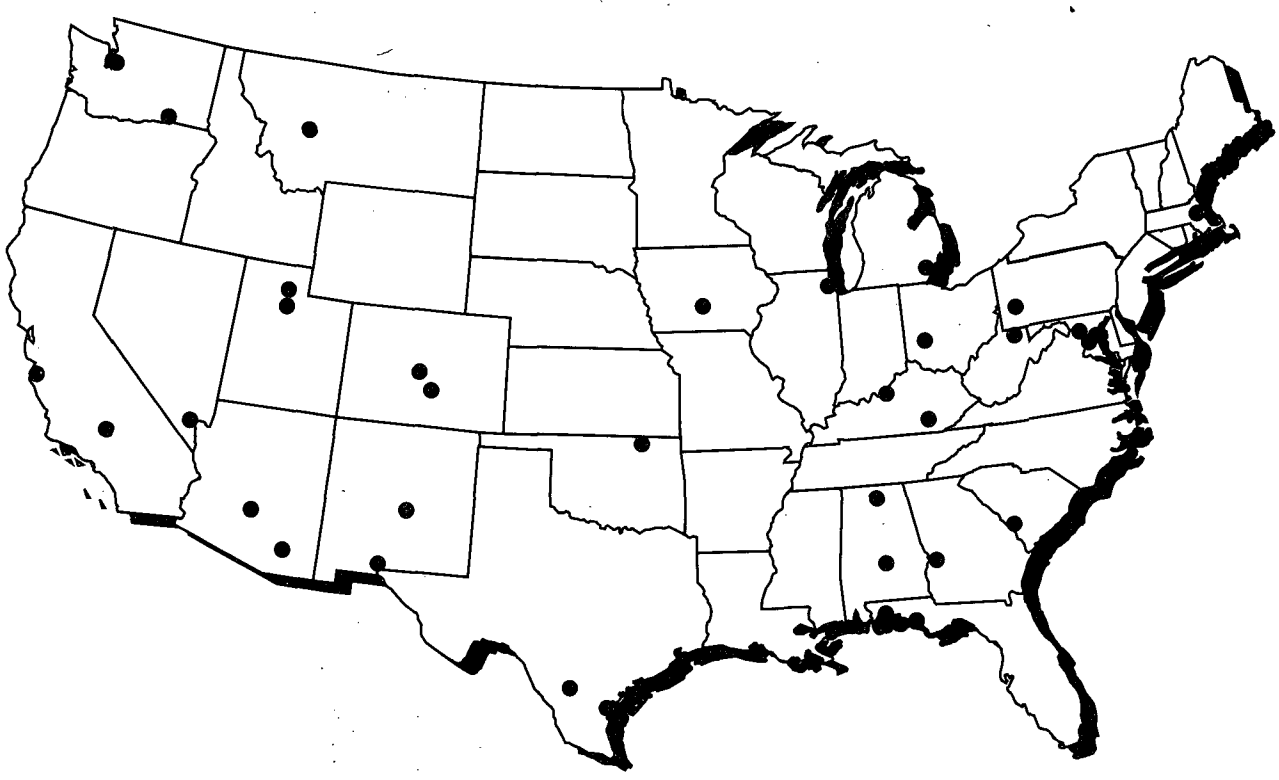
REFERENCE STANDARDS

TEST DESCRIPTION	ANALYSIS SUB-TYPE	ANALYSIS I. D.	DILUTION FACTOR	ANALYZED VALUE	TRUE VALUE	PERCENT RECOVERY	DETECTION LIMITS	UNITS OF MEASURE
henol	SB	B931011D	1	14	50	28	10	ug/L
	SBD	B931011D	1	17	50	34	10	ug/L
-Chlorophenol	SB	B931011D	1	34	50	68	10	ug/L
	SBD	B931011D	1	36	50	72	10	ug/L
,4-Dichlorobenzene	SB	B931011D	1	32	50	64	10	ug/L
	SBD	B931011D	1	34	50	68	10	ug/L
-Nitrosodi-n-propylamine	SB	B931011D	1	39	50	78	10	ug/L
	SBD	B931011D	1	39	50	78	10	ug/L
1,2,4-Trichlorobenzene	SB	B931011D	1	27	50	54	10	ug/L
	SBD	B931011D	1	28	50	56	10	ug/L
-Chloro-3-methylphenol	SB	B931011D	1	42	50	84	10	ug/L
	SBD	B931011D	1	42	50	84	10	ug/L
Acenaphthene	SB	B931011D	1	41	50	82	10	ug/L
	SBD	B931011D	1	40	50	80	10	ug/L
-Nitrophenol	SB	B931011D	1	10	50	20	50	ug/L
	SBD	B931011D	1	11	50	22	50	ug/L
2,4-Dinitrotoluene	SB	B931011D	1	36	50	72	10	ug/L
	SBD	B931011D	1	37	50	74	10	ug/L
entachlorophenol	SB	B931011D	1	28	50	56	50	ug/L
	SBD	B931011D	1	27	50	54	50	ug/L
yrene	SB	B931011D	1	53	50	106	10	ug/L
	SBD	B931011D	1	51	50	102	10	ug/L

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METRIC Corporation

SHALLOW SUBSURFACE INVESTIGATION AT HOBBS GAS TREATING PLANT LEA COUNTY, NEW MEXICO

PREPARED FOR

TRANSWESTERN PIPELINE COMPANY
ROSWELL, NEW MEXICO

PREPARED BY

METRIC CORPORATION
ALBUQUERQUE, NEW MEXICO

DECEMBER 1991

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TABLE OF CONTENTS

PAGE

SUMMARY

INTRODUCTION 1

BOREHOLE SAMPLING AND ANALYTICAL FIELD SCREENING 2

ANALYTICAL RESULTS 3

INVESTIGATION RESULTS 14

BIBLIOGRAPHY 17

APPENDIX A - BOREHOLE SAMPLE LOGS

APPENDIX B - MONITOR WELL CONSTRUCTION DIAGRAMS

APPENDIX C - LABORATORY REPORTS FOR BOREHOLE AND GROUNDWATER SAMPLING

LIST OF TABLES

TABLE 1 - SUMMARY OF ANALYTICAL RESULTS FOR BTEX AND TOTAL RECOVERABLE PETROLEUM HYDROCARBONS . . . . . 4&5

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS FOR TCLP-M (METALS) . . . . . 6&7

TABLE 3 - SUMMARY OF ANALYTICAL RESULTS FOR TCLP-0 (ENRON LIST) 8

TABLE 4 - SUMMARY OF ANALYTICAL RESULTS FOR TCLP-F (ENRON LIST) 9

TABLE 5 - SUMMARY OF ANALYTICAL RESULTS FOR MONITOR WELL 1, 2 AND 3 . . . . . 12&13

L I S T O F F I G U R E S

FIGURE 1 - PIT 1 CROSS SECTION A - A' 15

FIGURE 2 - PIT 1 CROSS SECTION B - B' 16

L I S T O F P L A T E S

PLATE 1 - BOREHOLE LOCATIONS

PLATE 2 - BOREHOLE DATA

SHALLOW SUBSURFACE INVESTIGATION
AT HOBBS GAS TREATING PLANT
LEA COUNTY, NEW MEXICO

Summary

During August, September and October 1991, METRIC Corporation assisted Transwestern Pipeline Company, in conducting soil borings and assessment of the presence of organic constituents at the Hobbs Gas Treating Plant. Borehole samplings were conducted at the Buffalo Wallow Ponding Area, Burn Pit 1, Burn Pit 2, Pig Receiver, Caustic Pit (Pit 3), Sulfur Plant, North and South Lube Oil Tanks and the Lean Oil Tank. Three monitor wells were installed to sample the shallow groundwater that occurs in the area. BTEX constituents in soil borings were detected only in BH-18 located in the center of Burn Pit 1. TRPH levels were found to be over 100 mg/kg at the Burn Pit 1 and 2 sites and also at the Sulfur Plant site. TCLP-O and-F series analyses were below detection limits for all the samples. TCLP-M for metals produced hits at all the sites. Groundwater sample analyses indicated hits for BTEX and nine metals. Purgeable halocarbons were below detection limits for all the groundwater samples.

SHALLOW SUBSURFACE INVESTIGATION
AT HOBBS GAS TREATING PLANT
LEA COUNTY, NEW MEXICO

Introduction

During August, September and October 1991, METRIC Corporation assisted Transwestern Pipeline Company, operator for the Hobbs Gas Treating Plant, in conducting soil borings and assessment of the presence of organic constituents. Results of this subsurface investigation are presented in this report.

The gas treating plant is located approximately 6 miles west of Hobbs, New Mexico. Initially, six sites at the plant were considered for evaluation with three additional sites added after the project was underway. The initial sites were as follows:

Buffalo Wallow Ponding Area,
Burn Pit 1,
Burn Pit 2,
Pig Receiver,
Caustic Pit,
Sulfur Plant.

The additional sites were as follows:

North Lube Oil Tank,
South Lube Oil Tank,
Lean Oil Tank.

These sites are regulated under the environmental jurisdiction of the Oil Conservation Division for the State of New Mexico and as such are exempt from hazardous waste regulations under the Resource Conservation and Recovery Act (RCRA) Subtitle C. Twenty-two boreholes were developed on the plant property at the nine investigation sites (BH-1 to 22). One additional borehole

was drilled (BH-23), for the purpose of installing a ground water monitoring well for a soil landfarm but was unsuccessful due to a suspected hard rock layer in the area. Borehole locations are indicated on PLATE 1.

Borehole Sampling and Analytical Field Screening

Borehole drilling at the Hobbs Plant was provided for the investigation by METRIC Corporation using a CME-55 auger drilling rig equipped with 3 1/4-inch hollow stem augers and a CME continuous sampling system. Augers and continuous samplers were steam cleaned to eliminate contamination within a borehole and potential cross contamination among boreholes.

Drilling was generally conducted to rig refusal at a hard caliche layer, or to the water table. Soil cores withdrawn using the continuous sampler were scanned with a portable organic vapor analyzer (OVA), also called a flame ionization detector, in order to guide sample selection. If OVA readings indicated the presence of organic compounds in the soil core, a lab sample was taken at the point of highest reading. At the lube oil tank boreholes (BH-16, BH-17, and BH-18), no samples were taken at the request of District Office personnel. OVA readings only were taken. Lab samples were also collected if soil cores were discolored. Samples were collected in 8 oz. jars, placed on ice, and accompanied with a properly completed chain of custody form and shipped by Federal Express overnight delivery to Assaigai Laboratories in Albuquerque, New Mexico. Analyses for benzene, toluene, ethylbenzene and xylene (BTEX) (EPA 602/8020), total recoverable petroleum hydrocarbons (TRPH) (EPA 418.1), toxicity characteristic leaching procedure TCLP-F series, TCLP-O series and TCLP-M series were performed on all the collected samples except sample BH-1 8.8-9.2. Total recoverable petroleum hydrocarbons was the only analysis performed on this sample as

well as the sulfur plant. The Lube Oil Tanks and the Lean Oil Tank soil cores were only scanned with the OVA. No laboratory analyses were performed at these sites. In addition to the above analyses soil pH was run on selected samples. Borehole sample logs are provided in
APPENDIX A.

Boreholes were plugged using a 2% bentonite/cement mixture or redi-mix concrete. The plugging material was poured slowly into the boreholes from the top.

The occurrence of shallow groundwater prompted the installation of three monitor wells in boreholes BH-2, BH-4 and BH-5. They are labeled MW-1, MW-2 and MW-3, respectively (see PLATE-1). Construction diagrams are provided in APPENDIX B. Each monitor well was bailed to remove at least fifteen casing volumes then sampled. All samples were shipped to Assaigai Laboratories in Albuquerque, New Mexico to be analyzed for selected purgeable aromatics (EPA 602), selected purgeable halocarbons (EPA 601), total aluminum (EPA 202), total barium (EPA 208), total calcium (EPA 215.1), total chromium (EPA 218), total copper (EPA 220), total iron (EPA 236), total lead (EPA 239), total lithium (EPA 200), total magnesium (EPA 242.1), total manganese (EPA 243), total potassium (EPA 258.1), total sodium (EPA 273.1), total strontium (EPA 200) and total zinc (EPA 289).

Analytical Results

The analyses performed for the soil sampling at the Hobbs Plant, are presented in TABLES 1 for BTEX and TRPH, TABLE 2 for TCLP-M, TABLE 3 for TCLP-O, and TABLE 4 for TCLP-F. Laboratory reports are provided in APPENDIX C.

TABLE 1

SUMMARY OF ANALYTICAL RESULTS FOR BTEX
AND TOTAL RECOVERABLE PETROLEUM HYDROCARBONS

BOREHOLE NUMBER	SAMPLE DEPTH	PARAMETER (MG/KG) BENZENE	TOLUENE	ETHYL BENZENE	XYLENES	418.1 TRPH
BW BH-1	8.8 - 9.2	NA	NA	NA	NA	40
	15.0 - 15.5	BDL	BDL	BDL	BDL	BDL
	19.9 - 20.2	BDL	BDL	BDL	BDL	28
	30.0 - 30.3	BDL	BDL	BDL	BDL	BDL
	36.5 - 36.7	BDL	BDL	BDL	BDL	BDL
	45.3 - 45.5	BDL	BDL	BDL	BDL	BDL
BW BH-2	0.0 - 1.2	BDL	BDL	BDL	BDL	BDL
	15.0 - 15.3	BDL	BDL	BDL	BDL	BDL
	30.0 - 30.3	BDL	BDL	BDL	BDL	BDL
	40.1 - 40.4	BDL	BDL	BDL	BDL	BDL
	51.2 - 51.4	BDL	BDL	BDL	BDL	BDL
BW BH-3	2.0 - 2.5	BDL	BDL	BDL	BDL	BDL
	10.5 - 10.7	BDL	BDL	BDL	BDL	24
	30.0 - 30.3	BDL	BDL	BDL	BDL	36
	45.0 - 45.3	BDL	BDL	BDL	BDL	20
BW BH-4	29.0 - 29.3	BDL	BDL	BDL	BDL	28
	37.9 - 38.2	BDL	BDL	BDL	BDL	20
PR BH-5	0.0 - 2.0	BDL	BDL	BDL	BDL	8
PIT 1 BH-6	0.0 - 2.2	BDL	BDL	BDL	BDL	68
	18.9 - 19.5	BDL	BDL	BDL	BDL	BDL
	33.0 - 33.5	BDL	BDL	BDL	BDL	1300
	46.0 - 46.3	BDL	BDL	BDL	BDL	BDL
PIT 2 BH-7	0.0 - 2.4	BDL	BDL	BDL	BDL	6200
	11.4 - 11.6	BDL	BDL	BDL	BDL	BDL
BW BH-8	21.4 - 21.7	BDL	BDL	BDL	BDL	BDL
BW BH-9	22.7 - 23.4	BDL	BDL	BDL	BDL	8
	44.2 - 44.5	BDL	BDL	BDL	BDL	BDL
BW BH-10	19.6 - 19.9	BDL	BDL	BDL	BDL	BDL

TABLE 1 (CONTINUED)

SUMMARY OF ANALYTICAL RESULTS FOR BTEX
AND TOTAL RECOVERABLE PETROLEUM HYDROCARBONS

		PARAMETER (MG/KG)				
						418.1
BOREHOLE NUMBER	SAMPLE DEPTH	BENZENE	TOLUENE	ETHYL BENZENE	XYLENES	TRPH
BW BH-11	45.2 - 45.4	BDL	BDL	BDL	BDL	BDL
BW BH-12	44.2 - 44.4	BDL	BDL	BDL	BDL	BDL
CP BH-13	9.4 - 9.6	BDL	BDL	BDL	BDL	BDL
	15.3 - 15.5	BDL	BDL	BDL	BDL	BDL
	35.0 - 35.2	BDL	BDL	BDL	BDL	BDL
	46.6 - 47.1	BDL	BDL	BDL	BDL	BDL
SP BH-14	1.2 - 2.1	BDL	BDL	BDL	BDL	2400
SP BH-15	0.0 - 2.1	BDL	BDL	BDL	BDL	120
	5.7 - 5.9	BDL	BDL	BDL	BDL	BDL
	17.4 - 17.6	BDL	BDL	BDL	BDL	BDL
	25.3 - 25.4	BDL	BDL	BDL	BDL	BDL
	51.5 - 51.7	BDL	BDL	BDL	BDL	BDL
	56.2 - 56.9	BDL	BDL	BDL	BDL	BDL
PIT 1 BH-18	6.1 - 6.3	61.00	160.00	130.00	370.00	2,000
	24.6 - 24.8	0.65	5.50	15.00	36.00	4,200
	35.3 - 35.5	BDL	BDL	0.19	0.67	880
	48.0 - 48.2	0.69	1.60	11.00	35.00	10,000
PIT 1 BH-20	1.0 - 1.3	BDL	BDL	BDL	BDL	BDL
	26.2 - 26.5	BDL	BDL	BDL	BDL	BDL
PIT 1 BH-21	3.8 - 4.3	BDL	BDL	BDL	BDL	190
	18.6 - 19.0	BDL	BDL	BDL	BDL	BDL
PIT 1 BH-22	3.9 - 4.3	BDL	BDL	BDL	BDL	BDL
	29.0 - 29.6	BDL	BDL	BDL	BDL	BDL

NOTE: BW - BUFFALO WALLOW
BDL - BELOW DETECTION LEVELS
PR - PIG RECEIVER
CP - CAUSTIC PIT
SP - SULFUR PLANT
NA - NOT ANALYZED

TABLE 2

SUMMARY OF ANALYTICAL RESULTS FOR TCLP-M FOR METALS

BOREHOLE NUMBER	SAMPLE DEPTH	PARAMETER (MG/KG) ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
BW BH-1	8.8 - 9.2	NA	NA	NA	NA	BDL	NA	BDL	NA
	15.0 - 15.5	BDL	BDL	0.024	0.04	BDL	0.0003	BDL	0.012
	19.9 - 20.2	BDL	BDL	0.007	BDL	BDL	0.0003	BDL	BDL
	30.0 - 30.3	BDL	BDL	0.01	BDL	BDL	0.0003	BDL	BDL
	36.5 - 36.7	BDL	BDL	0.024	0.04	BDL	0.0003	BDL	BDL
	45.3 - 45.5	BDL	BDL	0.013	BDL	BDL	0.0004	BDL	BDL
BW BH-2	0.0 - 1.2	BDL	BDL	0.023	0.05	BDL	0.0004	BDL	BDL
	15.0 - 15.3	BDL	BDL	0.024	0.04	BDL	0.0003	BDL	BDL
	30.0 - 30.3	BDL	BDL	0.024	0.03	BDL	0.0004	BDL	0.031
	40.1 - 40.4	0.014	BDL	0.024	0.03	BDL	0.0003	BDL	0.012
	51.2 - 51.4	0.006	BDL	0.019	0.04	BDL	0.0003	BDL	BDL
BW BH-3	2.0 - 2.5	0.008	0.63	0.010	0.02	BDL	0.0003	BDL	BDL
	10.5 - 10.7	BDL	BDL	0.030	0.04	BDL	0.0002	BDL	BDL
	30.0 - 30.3	BDL	BDL	0.020	0.03	BDL	0.0003	BDL	0.012
	45.0 - 45.3	0.012	BDL	0.012	BDL	BDL	0.0003	BDL	BDL
BW BH-4	29.0 - 29.3	BDL	BDL	0.010	BDL	BDL	0.0002	BDL	BDL
	37.9 - 38.2	BDL	BDL	0.025	0.04	BDL	0.0002	BDL	0.012
PR BH-5	0.0 - 2.0	0.016	BDL	BDL	BDL	BDL	0.0005	BDL	BDL
PIT 1 BH-6	0.0 - 2.2	0.005	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	18.9 - 19.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	33.0 - 33.5	BDL	BDL	BDL	BDL	0.0002	BDL	BDL	BDL
	46.0 - 46.3	0.005	BDL	BDL	BDL	0.0002	BDL	BDL	BDL
PIT 2 BH-7	0.0 - 2.4	BDL	BDL	BDL	0.05	0.0003	BDL	BDL	BDL
	11.4 - 11.6	0.013	BDL	BDL	BDL	0.0003	BDL	BDL	BDL
BW BH-8	21.4 - 21.7	BDL	BDL	BDL	BDL	0.0003	BDL	BDL	BDL
BW BH-9	22.7 - 23.4	BDL	BDL	BDL	0.00	BDL	BDL	BDL	BDL
	44.2 - 44.5	0.007	BDL	BDL	0.03	BDL	0.019	BDL	BDL
BW BH-10	19.6 - 19.9	0.007	BDL	BDL	BDL	0.0002	BDL	BDL	BDL

TABLE 2 (CONTINUED)

SUMMARY OF ANALYTICAL RESULTS FOR TCLP-M FOR METALS

BOREHOLE NUMBER	SAMPLE DEPTH	PARAMETER (MG/KG) ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
BW BH-11	45.2 - 45.4	0.012	BDL	BDL	0.03	BDL	BDL	BDL	BDL
BW BH-12	44.2 - 44.4	0.016	BDL	BDL	0.02	BDL	BDL	BDL	0.015
CP BH-13	9.4 - 9.6	0.017	BDL	BDL	0.03	BDL	BDL	BDL	0.017
	15.3 - 15.5	0.012	BDL	BDL	0.02	BDL	BDL	BDL	0.017
	35.0 - 35.2	0.007	BDL	BDL	BDL	BDL	BDL	BDL	0.015
	46.6 - 47.1	0.006	BDL	BDL	BDL	BDL	BDL	BDL	0.016
SP BH-14	1.2 - 2.1	0.005	BDL	0.005	BDL	BDL	BDL	BDL	BDL
SP BH-15	0.0 - 2.1	BDL	BDL	0.004	0.02	0.0022	BDL	BDL	BDL
	5.7 - 5.9	0.006	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	17.4 - 17.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	25.3 - 25.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	51.5 - 51.7	BDL	BDL	BDL	BDL	0.0015	BDL	BDL	BDL
	56.2 - 56.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PIT 1 BH-18	6.1 - 6.3	0.029	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	24.6 - 24.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	35.3 - 35.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	48.0 - 48.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PIT 1 BH-20	1.0 - 1.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	26.2 - 26.5	BDL	BDL	BDL	BDL	0.0002	BDL	BDL	BDL
PIT 1 BH-21	3.8 - 4.3	BDL	BDL	BDL	BDL	0.0002	0.86	BDL	BDL
	18.6 - 19.0	BDL	BDL	BDL	BDL	0.0002	BDL	BDL	BDL
PIT 1 BH-22	3.9 - 4.3	0.056	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	29.0 - 29.6	BDL	0.97	BDL	BDL	BDL	BDL	BDL	BDL

NOTE: BW - BUFFALO WALLOW
BDL - BELOW DETECTION LEVELS
PR - PIG RECEIVER
CP - CAUSTIC PIT
SP - SULFUR PLANT
NA - NOT ANALYZED

TABLE 3

SUMMARY OF ANALYTICAL RESULTS FOR TCLP-O (ENRON LIST)

BOREHOLE NUMBER	SAMPLE DEPTH	PARAMETER (MG/KG) BENZENE	CARBON TETRACHLORIDE	CHLOROBENZENE	CHLOROFORM	1,2-DICHLOROETHANE	1,1-DICHLOROETHYLENE	METHYL ETHYL KETONE	TETRACHLOROETHYLENE	TRICHLOROETHYLENE	VINYL CHLORIDE	O-CRESOL	M-CRESOL	P-CRESOL	1,4- DICHLOROBENZENE	2,4-DINITROTOLUENE	HEXACHLOROBENZENE	HEXACHLORO-1, 3-BUTADIENE	HEXACHLOROETHANE	NITROBENZENE	PENTACHLOROPHENOL	PYRIDINE	2,4,5-TRICHLOROPHENOL	2,4,6-TRICHLOROPHENOL
BM-BH-1	8.8 - 9.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	15.0 - 15.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	19.9 - 20.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	30.0 - 30.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	36.5 - 36.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	45.3 - 45.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BM-BH-2	0.0 - 1.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	15.0 - 15.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	30.0 - 30.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	40.1 - 40.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	51.2 - 51.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BM-BH-3	2.0 - 2.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	10.5 - 10.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	30.0 - 30.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	45.0 - 45.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BM-BH-4	29.0 - 29.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	37.9 - 38.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PR BH-5	0.0 - 2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PIT 1 BH-6	0.0 - 2.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	18.9 - 19.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	33.0 - 33.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	46.0 - 46.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PIT 2 BH-7	0.0 - 2.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	11.4 - 11.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BM BH-8	21.4 - 21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BM-BH-9	22.7 - 23.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	44.2 - 44.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BH-10	19.6 - 19.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BM-BH-11	45.2 - 45.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BM BH-12	44.2 - 44.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
CP BH-13	9.4 - 9.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	15.3 - 15.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	35.0 - 35.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	46.6 - 47.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
SP BH-14	1.2 - 2.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
SP BH-15	0.0 - 2.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	5.7 - 5.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	17.6 - 17.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	25.3 - 25.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	51.5 - 51.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	56.2 - 56.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PIT 1 BH-18	6.1 - 6.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	24.6 - 24.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	35.3 - 35.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	48.0 - 48.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PIT 1 BH-20	1.0 - 1.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	26.2 - 26.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PIT 1 BH-21	3.8 - 4.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	18.6 - 19.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PIT 1 BH-22	3.9 - 4.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	29.0 - 29.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

NOTE: BDL - BELOW DETECTION LEVELS

TABLE 4

SUMMARY OF ANALYTICAL RESULTS FOR TCLP-F (ENRON LIST)

BOREHOLE NUMBER	SAMPLE DEPTH	PARAMETER (MG/KG) METHYLENE CHLORIDE	1,1,1-TRICHLOROETHANE	TRICHLORO-TRIFLUOROETHANE	ORTHO-DICHLOROBENZENE	TRICHLOROFLUOROMETHANE	XYLENE	ACETONE	ETHYLE ACETATE	ETHYL BENZENE	ETHYL ETHER	METHYL ISOBUTYL KETONE	n-BUTYL ALCOHOL	CYCLOHEXANONE	METHANOL	CRESYLIC ACID	TOLUENE	PARAMETER (MG/KG) CARBON DISULFIDE	ISOBUTANOL	2-ETHOXYETHANOL	2-NITROPROPANE
BW BH-1	8.8 - 9.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	15.0 - 15.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	19.9 - 20.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	30.0 - 30.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	36.5 - 36.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	45.3 - 45.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BW BH-2	0.0 - 1.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	15.0 - 15.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	30.0 - 30.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	40.1 - 40.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	51.2 - 51.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BW BH-3	2.0 - 2.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	10.5 - 10.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	30.0 - 30.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	45.0 - 45.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BW BH-4	29.0 - 29.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	37.9 - 38.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PR BH-5	0.0 - 2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PIT 1 BH-6	0.0 - 2.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	18.9 - 19.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	33.0 - 33.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	46.0 - 46.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PIT 2 BH-7	0.0 - 2.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	11.4 - 11.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BW BH-8	21.4 - 21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BW BH-9	22.7 - 23.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	44.2 - 44.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BW BH-10	19.6 - 19.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BW BH-11	45.2 - 45.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BW BH-12	44.2 - 44.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
CP BH-13	9.4 - 9.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	15.3 - 15.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	35.0 - 35.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	46.6 - 47.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
SP BH-14	1.2 - 2.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
SP BH-15	0.0 - 2.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	5.7 - 5.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	17.4 - 17.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	25.3 - 25.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	51.5 - 51.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	56.2 - 56.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PIT 1 BH-18	6.1 - 6.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	24.6 - 24.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	35.3 - 35.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	48.0 - 48.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PIT 1 BH-20	1.0 - 1.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	26.2 - 26.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PIT 1 BH-21	3.8 - 4.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	18.6 - 19.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PIT 1 BH-22	3.9 - 4.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	29.0 - 29.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

NOTE: BDL - BELOW DETECTION LEVELS

At the Buffalo Wallow ponding site, no BTEX compounds were detected at any of the sample intervals. Results of TRPH analyses were determined to be below 100 mg/kg. In the TCLP test for metals, all metals were below toxic characterisic (TC) values for RCRA metals (USEPA, 40CFR, 1991). Hits for cadmium were indicated at all sample intervals in boreholes within the ponding area (BH-1, 2, 3 and 4). Cadmium levels were below detectable limits in boreholes outside the ponding area (BH-8,9,10,11 and 12). Arsenic levels were reported within the ponding area with the higher levels occurring at the water table. Outside the ponding area, low arsenic levels were also detected. Low levels for arsenic also occurred at the water table in these boreholes. Barium was below detection limits in all samples with the exception of the sample taken between 2.0' - 2.5' deep in BH-3. Mercury was detected in 18 of the samples taken within and outside the ponding area. Silver was detected sporadically in all the Buffalo Wallow boreholes. Hit levels of arsenic, barium, lead, chromium, mercury, and silver.

BTEX results for the Pig Receiver sample (BH-5), were below detection limits. TRPH results were well below 100 mg/kg. TCLP-M for metals showed low hits for arsenic and mercury which were below TC levels for RCRA metals.

BTEX constituents were detected only in BH-18 at the Pit 1 site. Benzene levels ranged from 0.65 mg/kg to 61 mg/kg. Toluene ranged from 1.6 mg/kg to 160 mg/kg. Ethyl benzene levels ranged from 0.19 mg/kg to 130 mg/kg. Xylenes ranged from 0.67 mg/kg to 370 mg/kg. The higher concentrations occurred near the surface while the lower concentrations occurred at the 35 ft level. TRPH results showed hits ranging from 880 mg/kg to 32,000 mg/kg in BH-18 with hits of 68 mg/kg and 1300 mg/kg in BH-6 and a hit of 120 mg/kg in BH-21. The Pit 1 TCLP-M for metals results indicated isolated hits for arsenic, barium and mercury which were below RCRA metals TC levels.

The Pit 2 BTEX analysis results were below detection limits. TRPH results indicated a hit of 6200 mg/kg at the surface. TCLP-M for metals showed hits for arsenic, chromium and mercury which were below TC levels for RCRA metals.

BTEX and TRPH results from the Caustic Pit (Pit 3) borehole samples were all below detection limits. TCLP-M for metals showed concentration levels decreasing with depth, but below RCRA metals TC levels. Chromium was detected above the 15 ft level. Silver was detected in all the samples from the surface to 47.1 feet deep.

BTEX results at the Sulfur Plant were below detection limits. TRPH was detected within 2 feet of the surface in each of the Sulfur Plant boreholes (BH-14 and 15). These concentration levels were 2400 mg/kg in BH-14 and 120 mg/kg in BH-15. TCLP-M for metals showed hits below TC levels for RCRA metals for arsenic, cadmium, chromium and mercury. The BH-14 sample had a pH of 7.1 and the BH-15 samples had pH's of 7.61 and 8.80 at the 0 to 2.1' and 51.0 to 57.0' depths.

OVA readings for the two Lube Oil Tanks and the Lean Oil Tank were below detectable limits with the exception of the 0 to 1.2 ft interval at the North Lube Oil Tank (BH-16). This interval had a reading of 3.0 ppm.

Analysis results for BTEX from the MW-1 samples showed hits of 5.3, 1.0 and 6.7 ug/L for benzene, ethyl benzene and toluene. MW-2 samples were below detection limits for all BTEX species and MW-3 indicated a hit for toluene of 2.1 ug/L. Purgeable halocarbons were below detection limits for all the samples. Hits for metals are summarized in TABLE 5.

TABLE 5

SUMMARY OF ANALYTICAL RESULTS FOR
MONITOR WELLS 1, 2 AND 3

Test	MW-1 (ug/L)	MW-2 (ug/L)	MW-3 (ug/L)
Purgeable Aromatics			
Benzene	5.3	BDL	BDL
Chlorobenzene	BDL	BDL	BDL
1,4-Dichlorobenzene	BDL	BDL	BDL
1,3-Dichlorobenzene	BDL	BDL	BDL
1,2-Dichlorobenzene	BDL	BDL	BDL
Ethyl Benzene	1.0	BDL	BDL
Toluene	6.7	BDL	2.1
Xylene	BDL	BDL	BDL
Purgeable Halocarbons			
Bromodichloromethane	BDL	BDL	BDL
Bromoform	BDL	BDL	BDL
Bromomethane	BDL	BDL	BDL
Carbon Tetrachloride	BDL	BDL	BDL
Chlorobenzene	BDL	BDL	BDL
Chloroethane	BDL	BDL	BDL
Chloroform	BDL	BDL	BDL
2-Chloroethyl Vinyl Ether	BDL	BDL	BDL
Chloromethane	BDL	BDL	BDL
Dibromochloromethane	BDL	BDL	BDL
1,2-Dichlorobenzene	BDL	BDL	BDL
1,3-Dichlorobenzene	BDL	BDL	BDL
1,4-Dichlorobenzene	BDL	BDL	BDL
Dichlorodifluoromethane	BDL	BDL	BDL
1,1-Dichloroethane	BDL	BDL	BDL
1,2-Dichloroethane	BDL	BDL	BDL
1,1-Dichloroethene	BDL	BDL	BDL
trans-1,2-Dichloroethene	BDL	BDL	BDL
1,2-Dichloropropane	BDL	BDL	BDL
cis-1,3-Dichloropropene	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	BDL	BDL	BDL
trans-1,3-Dichloropropene	BDL	BDL	BDL
Methylene Chloride	BDL	BDL	BDL
1,1,1-Trichloroethane	BDL	BDL	BDL
1,1,2-Trichloroethane	BDL	BDL	BDL
Tetrachloroethene	BDL	BDL	BDL

TABLE 5 (Continued)

SUMMARY OF ANALYTICAL RESULTS FOR
MONITOR WELLS 1, 2 AND 3

Test	MW-1 (ug/L)	MW-2 (ug/L)	MW-3 (ug/L)
Purgeable Halocarbons			
Trichlorofluoromethane	BDL	BDL	BDL
Trichloroethene	BDL	BDL	BDL
Vinyl Chloride	BDL	BDL	BDL
Metals			
Aluminum	BDL	BDL	BDL
Calcium	310.00	76.00	160.00
Iron	2.44	0.12	1.43
Lithium	0.17	BDL	BDL
Magnesium	66.00	6.50	12.00
Manganese	1.03	0.05	0.10
Potassium	90.00	13.00	3.20
Sodium	410.00	13.00	11.00
Strontium	4.24	BDL	0.57
Zinc	6.10	0.05	0.05

BDL - Below Detection Levels

Investigation Results

Borehole data for Pit 1 is presented in cross section form in FIGURE 1 and FIGURE 2. The hard layer indicated in the cross sections represent the top of a hard pink sandstone in BH-20, BH-21, and BH-22, caliche in BH-6 and BH-18, and a tan cemented silty sand. The vertical extent of TRPH contamination was not determined as levels in BH-18 were high and below the water table. The horizontal extent appears to extend to BH-6, 130 feet north of the pit, but is within 60 feet on the east, 85 feet on the south and 230 feet on the west side of the pit.

Pit 2 and the sulfur plant pit showed high levels of TRPH at the surface, but not below 3 feet. The contamination is probably contained within the limits of the pits at these sites.

Based on the three monitor wells, groundwater generally flows to the east southeast with a gradient of 0.0031 ft/ft. The high BTEX levels in MW-1 indicate further investigation of the groundwater in this area is warranted.

FIGURE 1

FIGURE 2

Bibliography

The following bibliographic sources document the methods utilized in performing laboratory analyses for the investigation. Specific laboratory tests performed are indicated in parentheses.

Methods for Chemical Analysis of Water and Wastes, EPA 600/79/020, revised March 1983. (Test for TCLP Metals).

USEPA Method #1311 - Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, 1986 - Federal Register Vol. 55, No. 126, Friday June 29, 1990. (Procedures for TCLP Extraction and TCLP Zero Head Space Extraction).

USEPA Method #602/8020 - Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition 1986 - Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act, 40 CFR Part 136, October 1984. (Test for BTEX).

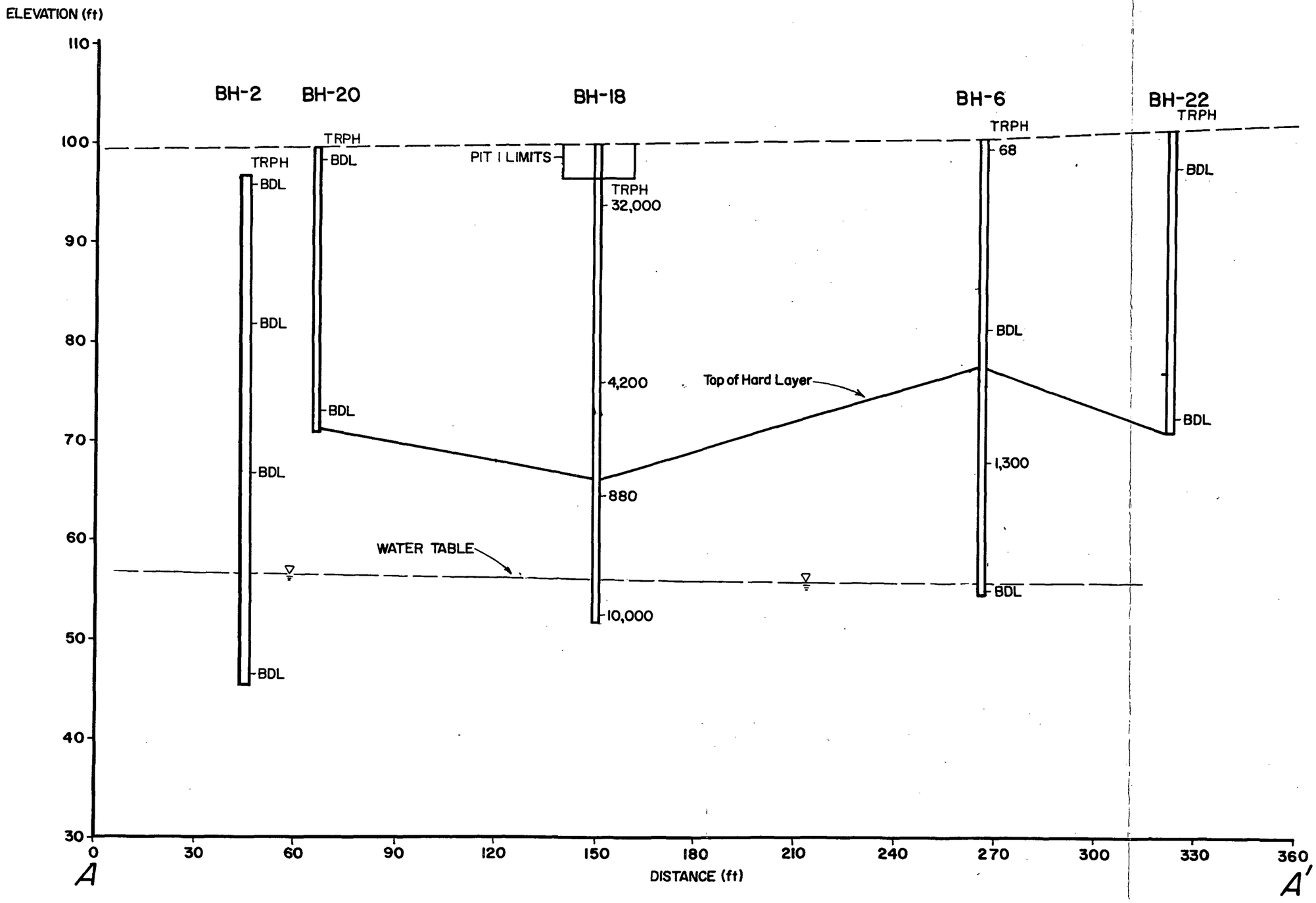
USEPA Method #418.1 - Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, revised March 1983. (Test for TRPH).

USEPA Method #1501 - Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, revised March 1983. (Test for pH).

USEPA Method #8240/8270 - Test Methods for Evaluating Solid Wastes: Physical Chemical Methods, SW-846, 3rd Edition, 1986. (Test for TCLP F and TCLP 0).

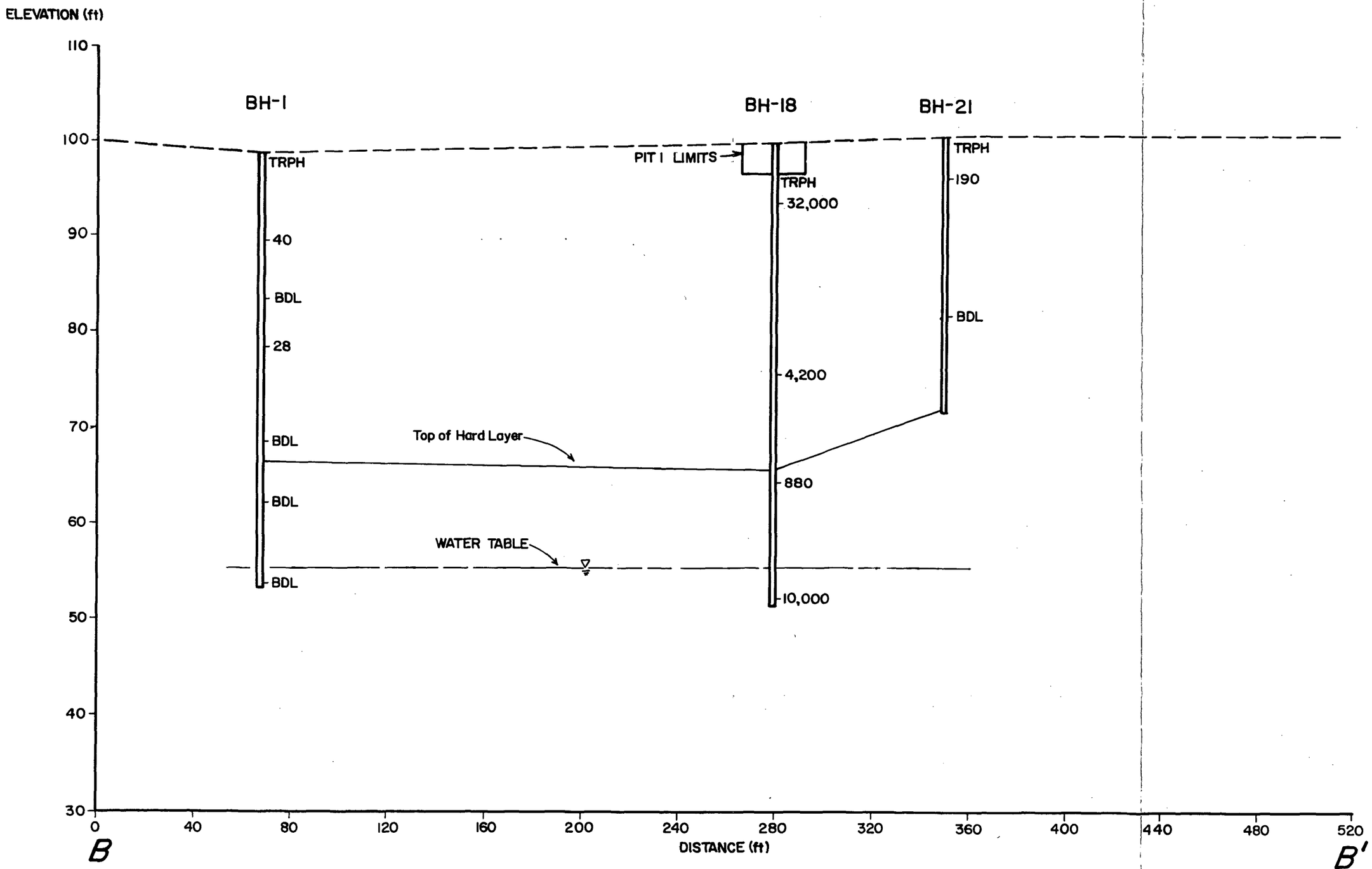
USEPA Method #602 - Guidelines Establishing Test Procedures for the Analysis of Pollutants under the Clean Water Act, 40 CFR Part 136, October 1984. (Test for TCLP xylene).

USEPA, 40 Code of Federal Regulations, Part 261.24, Revised July 1, 1991, Maximum Concentration of Contaminants for the Toxicity Characteristic, page 46.



PIT I CROSS SECTION *A-A'*

Figure I



PIT I CROSS SECTION *B-B'*

Figure 2

APPENDIX A
BOREHOLE SAMPLE LOGS

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SAMPLE LOG

Borehole Number BH-1 **Borehole Location** Buffalo Wallow

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 8-21-91 **Ground Elev.** 98.86' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 1.8	1.8	Black silty clay sand loam
1.8 - 2.5	0.7	No recovery
2.5 - 4.0	1.5	Brown silty clay sand loam
4.0 - 4.4	0.4	Tan silty sand
4.4 - 6.4	2.0	White silty sand
6.4 - 7.5	1.1	No recovery
7.5 - 17.5	10.0	White caliche
17.5 - 20.2	2.7	Tan medium sand
20.2 - 20.9	0.7	White caliche with gravel
20.9 - 22.5	1.6	No recovery
22.5 - 25.1	2.6	Tan sand
25.1 - 26.9	1.8	Red sand
26.9 - 27.5	0.6	No recovery
27.5 - 31.8	4.3	Red sand
31.8 - 32.5	0.7	No recovery
32.5 - 36.9	4.4	Tan to white silty sand, slightly cemented
36.9 - 40.3	3.4	No recovery
40.3 - 42.5	2.2	Tan sand
42.5 - 45.7	3.2	Tan fine sand

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-2 **Borehole Location** Buffalo Wallow

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 8-21-91 **Ground Elev.** 97.72' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 1.0	1.0	Dark brown silty clay sand
1.0 - 3.1	2.1	No recovery
3.1 - 4.1	1.0	Green silty sand
4.1 - 4.6	0.5	White caliche with gray streaks
4.6 - 8.1	3.5	No recovery
8.1 - 11.8	3.7	White caliche with gray streaks
11.8 - 13.1	1.3	White caliche
13.1 - 18.1	5.0	Gray caliche
18.1 - 19.0	0.9	Gray sand
19.0 - 21.5	2.5	Gray sand with gravel
21.5 - 21.8	0.3	Gray very fine sand
21.8 - 23.1	1.3	No recovery
23.1 - 24.8	1.7	Gray fine sand
24.8 - 26.7	1.9	Red sand with gray streaks
26.7 - 28.1	1.4	No recovery
28.1 - 29.1	1.0	Gray sand
29.1 - 31.5	2.4	Red sand with gravel

METRIC Corporation

SAMPLE LOG

Continued

Borehole Number BH-2 Borehole Location Buffalo Wallow

(Continued from Previous Page)

Depth (feet)	Thickness (feet)	Stratigraphic Description
31.5 - 36.1	4.6	No recovery
36.1 - 40.6	4.5	Tan sand, slightly cemented
40.6 - 43.1	2.5	No recovery
43.1 - 45.1	2.0	Tan silty sand, cemented
45.1 - 48.1	3.0	No recovery
48.1 - 51.6	3.5	Tan sand

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-3 **Borehole Location** Buffalo Wallow

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 8-22-91 **Ground Elev.** 95.05' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 0.5	0.5	Brown silty sand
0.5 - 2.5	2.0	Gray silty sand
2.5 - 2.9	0.4	Black silty sand
2.9 - 4.3	1.4	Black silty sand
4.3 - 5.3	1.0	Gray silty sand
5.3 - 7.0	1.7	Tan silty sand
7.0 - 7.9	0.9	No recovery
7.9 - 10.0	2.1	Tan silty sand
10.0 - 10.8	0.8	White caliche
10.8 - 12.9	2.1	No recovery
12.9 - 15.0	2.1	Green caliche
15.0 - 17.9	2.9	Gray caliche
17.9 - 18.8	0.9	Gravel, cemented
18.8 - 19.5	0.7	Gray sandy gravel
19.5 - 21.6	2.1	Green sand with gravel
21.6 - 22.2	0.6	Red and green sand
22.9 - 26.2	3.3	Red sand

METRIC Corporation

SAMPLE LOG
Continued

Borehole Number BH-3 Borehole Location Buffalo Wallow

(Continued from Previous Page)

Depth (feet)	Thickness (feet)	Stratigraphic Description
26.2 - 27.9	1.7	No recovery
27.9 - 30.9	3.0	Red sand
30.9 - 32.9	2.0	No recovery
32.9 - 37.9	5.0	Red sand
37.9 - 41.1	3.2	Red sand
41.1 - 42.9	1.8	No recovery
42.9 - 45.5	2.6	Red sand

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-4 **Borehole Location** Buffalo Wallow

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 8-22-91 **Ground Elev.** 94.14' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 0.6	0.6	Brown silty clay sand
0.6 - 1.2	0.6	Yellow caliche
1.2 - 2.2	1.0	No recovery
2.2 - 5.3	3.1	White caliche
5.3 - 7.2	1.9	No recovery
7.2 - 10.5	3.3	White caliche
10.5 - 12.2	1.7	No recovery
12.2 - 13.9	1.7	White caliche
13.9 - 14.7	0.8	White cemented gravel with pink sandstone
14.7 - 17.2	2.5	No recovery
17.2 - 19.6	2.4	Tan fine sand with pink sandstone
19.6 - 22.2	2.6	No recovery
22.2 - 24.2	2.0	Tan fine sand with pink sandstone
24.2 - 27.2	3.0	No recovery
27.2 - 29.4	2.2	Red sand
29.4 - 32.2	2.8	No recovery

METRIC Corporation

SAMPLE LOG
Continued

Borehole Number BH-4 Borehole Location Buffalo Wallow

(Continued from Previous Page)

Depth (feet)	Thickness (feet)	Stratigraphic Description
32.3 - 34.8	2.6	Red sand
34.8 - 35.9	1.1	Light red silty sand, cemented
35.9 - 37.2	1.3	No recovery
37.2 - 38.2	1.0	Red sand
38.2 - 42.2	4.0	No recovery
42.2 - 44.7	2.5	Red sand

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-5 **Borehole Location** Pig Receiver

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 8-27-91 **Ground Elev.** 94.80' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 0.8	0.8	Red silty sand with gravel
0.8 - 2.2	1.4	White caliche, hard
2.2 - 3.0	0.8	No recovery
3.0 - 4.0	1.0	Tan sand with caliche
4.0 - 5.7	1.7	No recovery
5.7 - 7.1	1.4	White caliche
7.1 - 12.7	5.6	No recovery
12.7 - 15.2	2.5	Tan sand with caliche
15.2 - 19.7	4.5	Tan sand with caliche
19.7 - 20.3	0.6	Caliche
20.3 - 22.7	2.4	No recovery
22.7 - 24.2	1.5	White caliche
24.2 - 24.9	0.7	Tan sand with caliche
24.9 - 27.7	2.8	No recovery
27.7 - 30.7	3.0	Tan sand with gravel
30.7 - 32.7	2.0	Tan sand with gravel
32.7 - 38.9	6.2	Tan sand with gravel

METRIC Corporation

SAMPLE LOG
Continued

Borehole Number BH-5 Borehole Location Pig Receiver

(Continued from Previous Page)

Depth (feet)	Thickness (feet)	Stratigraphic Description
38.9 - 41.0	2.1	Tan sand, cemented
41.0 - 42.7	1.7	No recovery
42.7 - 52.2	9.5	Tan sand, cemented

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-6 **Borehole Location** Pit 1

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 8-27-91 **Ground Elev.** 100.6' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 2.0	2.0	Black silty clay sandy loam
2.0 - 2.4	0.4	White caliche
2.4 - 2.8	0.4	No recovery
2.8 - 4.2	1.4	Tan sand with gravel
4.2 - 7.8	3.6	No recovery
7.8 - 8.9	1.1	White caliche
8.9 - 12.8	3.9	No recovery
12.8 - 15.2	2.4	Tan sand with caliche
15.2 - 17.8	2.6	No recovery
17.8 - 19.6	1.2	Tan sand with caliche
19.6 - 22.8	3.2	No recovery
22.8 - 23.7	0.9	Caliche rock
23.7 - 27.8	4.1	No recovery
27.8 - 30.7	2.9	Tan sand with caliche
30.7 - 32.8	2.1	No recovery
32.8 - 34.4	1.6	Gray sand with caliche

METRIC Corporation

SAMPLE LOG

Continued

Borehole Number BH-6 Borehole Location Pit 1

(Continued from Previous Page)

Depth (feet)	Thickness (feet)	Stratigraphic Description
34.4 - 35.5	1.1	Tan sand with caliche
35.5 - 37.8	2.3	No recovery
37.8 - 41.4	3.6	Tan sand, cemented
41.4 - 42.8	1.4	No recovery
42.8 - 46.5	3.7	Tan cemented sand

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-7 **Borehole Location** Pit 2

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 8-28-91 **Ground Elev.** 101.4' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 0.7	0.7	Brown silty sand
0.7 - 1.2	0.5	Black silty sand
1.2 - 2.4	1.2	Tan sand with caliche
2.4 - 2.9	0.5	No recovery
2.9 - 4.4	1.5	White caliche
4.4 - 7.9	3.5	No recovery
7.9 - 11.7	3.8	Tan sand with caliche, cemented
11.7 - 12.9	1.2	No recovery
12.9 - 16.6	3.7	Tan sand with caliche

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-8 **Borehole Location** Buffalo Wallow

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 8/28/91 **Ground Elev.** 100.4' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 2.6	2.6	Brown silty clay loam
2.6 - 5.0	2.4	White caliche
5.0 - 7.6	2.6	No recovery
7.6 - 9.2	1.6	Tan sand with gravel
9.2 - 12.6	3.4	No recovery
12.6 - 13.9	1.3	Tan sand with gravel
13.9 - 15.6	1.7	White caliche
15.6 - 17.6	2.0	No recovery
17.6 - 21.8	4.2	Caliche

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-9 **Borehole Location** Buffalo Wallow

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 8/29/91 **Ground Elev.** 100.5' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 2.9	2.9	Dark brown silty clay loam
2.9 - 5.3	2.4	Dark brown sand with gravel
5.3 - 7.9	2.6	No recovery
7.9 - 8.4	0.5	Dark brown sand with caliche
8.4 - 12.9	4.5	No recovery
12.9 - 15.2	2.3	Tan sand with caliche
15.2 - 17.9	2.7	No recovery
17.9 - 20.1	2.2	Caliche
20.1 - 22.9	2.8	No recovery
22.9 - 23.8	0.9	Tan sand with caliche
23.8 - 27.9	4.1	No recovery
27.9 - 29.3	1.4	Tan sand with caliche
29.3 - 32.9	3.6	No recovery
32.9 - 36.5	3.6	Tan sand, cemented with caliche
36.5 - 37.9	1.4	No recovery
37.9 - 41.6	3.7	Tan sand, cemented with caliche
41.6 - 42.9	1.3	No recovery
42.9 - 44.7	1.8	Tan sand with caliche

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-10 **Borehole Location** Buffalo Wallow

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 8-29-91 **Ground Elev.** 99.5' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 4.0	4.0	Brown silty clay loam
4.0 - 7.2	3.2	White soft caliche
7.2 - 7.7	0.5	No recovery
7.7 - 12.2	4.5	White caliche, soft
12.2 - 12.7	0.5	No recovery
12.7 - 15.5	2.8	White caliche, soft
15.5 - 17.7	2.2	No recovery
17.7 - 21.2	3.5	Gray caliche, soft

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-11 **Borehole Location** Buffalo Wallow

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 8-29-91 **Ground Elev.** 100.6' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 1.0	1.0	Brown silty clay loam
1.0 - 7.6	6.6	No recovery
7.6 - 11.1	3.5	White caliche, soft
11.1 - 12.6	1.5	No recovery
12.6 - 16.0	3.4	White caliche, soft
16.0 - 17.6	1.6	No recovery
17.6 - 19.2	1.6	White caliche, soft
19.2 - 21.0	1.8	Tan medium sand
21.0 - 22.6	1.6	No recovery
22.6 - 23.2	0.6	Pink quartzite
23.2 - 24.7	1.5	Tan sand with pink gravel
24.7 - 25.7	1.0	Red to tan sand
25.7 - 27.6	1.9	No recovery
27.6 - 28.8	1.2	Red to tan sand
28.8 - 30.2	1.4	Red to tan sand with gravel
30.2 - 32.6	2.4	No recovery

METRIC Corporation

SAMPLE LOG
Continued

Borehole Number BH-11 Borehole Location Buffalo Wallow

(Continued from Previous Page)

Depth (feet)	Thickness (feet)	Stratigraphic Description
32.6 - 34.4	1.8	Red to tan sand with gravel
34.4 - 37.6	3.2	No recovery
37.6 - 41.3	3.7	Tan sand, cemented
41.3 - 42.6	1.3	No recovery
42.6 - 50.0	7.4	Tan cemented sand

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-12 **Borehole Location** Buffalo Wallow

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 8-29-91 **Ground Elev.** 99.3' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 2.8	2.8	Brown silty clay loam
2.8 - 3.6	0.8	Tan sand
3.6 - 7.8	4.2	White caliche, soft
7.8 - 17.5	9.7	White caliche, soft
17.5 - 17.8	0.3	No recovery
17.8 - 19.5	1.7	White caliche
19.5 - 22.5	3.0	Tan sand
22.5 - 26.3	3.8	No recovery
26.3 - 27.5	1.2	Tan sand
27.5 - 27.8	0.3	No recovery
27.8 - 30.8	3.0	Red to tan sand
30.8 - 32.8	2.0	No recovery
32.8 - 36.1	3.3	Tan sand
36.1 - 37.8	1.7	No recovery
37.8 - 41.6	3.8	Tan sand
41.6 - 42.8	1.2	No recovery
42.8 - 44.8	2.0	Tan sand, cemented

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-13 **Borehole Location** Caustic Pit

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 9/17/91 **Ground Elev.** 101.3' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 1.8	1.8	Dark brown fine silty sand with gravel
1.8 - 2.4	0.6	No recovery
2.4 - 3.8	1.4	Tan sand with caliche
3.8 - 7.8	4.0	No recovery
7.8 - 9.7	1.9	Tan caliche
9.7 - 12.8	3.1	No recovery
12.8 - 14.1	1.3	White caliche
14.1 - 15.7	1.6	Tan sand
15.7 - 17.8	2.1	No recovery
17.8 - 19.6	1.8	Tan sand with caliche
19.6 - 22.8	3.2	No recovery
22.8 - 23.1	0.3	Dark brown sand with caliche
23.1 - 24.1	1.0	Tan sand with gravel
24.1 - 25.1	1.0	White caliche, hard
25.1 - 27.8	2.7	No recovery
27.8 - 29.8	2.0	White caliche

METRIC Corporation

SAMPLE LOG
Continued

Borehole Number BH-13 Borehole Location Caustic Pit

(Continued from Previous Page)

Depth (feet)	Thickness (feet)	Stratigraphic Description
29.8 - 32.8	3.0	No recovery
32.8 - 35.2	2.4	Tan to red sand with gravel
35.2 - 37.8	2.6	No recovery
37.8 - 38.0	0.2	Tan to red sand
38.0 - 42.8	4.8	No recovery
42.8 - 47.5	4.7	Tan to red sand, cemented

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-14 **Borehole Location** Sulfur Plant

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 9-17-91 **Ground Elev.** 106.8' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 1.2	1.2	Brown sand
1.2 - 2.2	1.0	Black sand

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-15 **Borehole Location** Sulfur Plant

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 9-18-91 **Ground Elev.** 106.5' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 0.8	0.8	Brown silty sand with gravel
0.8 - 2.0	1.2	Gray sand with gravel
2.0 - 2.8	0.8	No recovery
2.8 - 6.1	3.3	Gray sand with gravel
6.1 - 12.8	6.7	No recovery
12.8 - 15.5	2.7	Gray caliche
15.5 - 21.8	6.3	Tan sand
21.8 - 22.8	1.0	No recovery
22.8 - 23.0	0.2	Tan sand
23.0 - 25.5	2.5	Gray sand
25.5 - 27.8	2.3	No recovery
27.8 - 30.0	2.2	Gray sand with gravel
30.0 - 32.8	2.8	No recovery
32.8 - 33.9	1.1	Gray sand, cemented
33.9 - 37.8	3.9	No recovery
37.8 - 38.2	0.4	Gray sand, cemented
38.2 - 39.2	1.0	Brown sand
39.2 - 42.8	3.6	No recovery
42.8 - 47.0	4.2	Brown sand

METRIC Corporation

SAMPLE LOG
Continued

Borehole Number BH-15 Borehole Location Sulfur Plant

(Continued from Previous Page)

Depth (feet)	Thickness (feet)	Stratigraphic Description
47.0 - 47.8	0.8	No recovery
47.8 - 48.7	0.9	Brown sand
48.7 - 50.6	1.9	Gray sand
50.6 - 51.8	1.2	Black sand
51.8 - 52.8	1.0	No recovery
52.8 - 53.7	0.9	Gray to black silty sand
53.7 - 56.5	2.8	Gray to black sand, mottled, cemented.

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-16 **Borehole Location** North Lube Oil Tank

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 9-18-91 **Ground Elev.** 105.4' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 0.9	0.9	Black silty sand
0.9 - 1.2	0.3	Tan sand
1.2 - 2.8	1.6	No recovery
2.8 - 5.1	2.3	Tan sand with caliche
5.1 - 7.8	2.7	No recovery
7.8 - 9.2	1.4	Tan sand with caliche
9.2 - 12.8	3.6	No recovery
12.8 - 14.1	1.3	Tan sand with caliche
14.1 - 17.8	3.7	No recovery
17.8 - 19.7	1.9	Tan sand with caliche

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-17 **Borehole Location** South Lube Oil Tank

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 9-18-91 **Ground Elev.** 103.9' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 1.0	1.0	Tan sand
1.0 - 2.7	1.7	No recovery
2.7 - 4.6	1.9	Tan sand with gravel
4.6 - 7.7	3.1	No recovery
7.7 - 8.6	0.9	Tan sand with caliche
8.6 - 22.7	14.1	No Recovery

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-18 **Borehole Location** Pit 1

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 9-19-91 **Ground Elev.** 100.0' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 2.9	2.9	No recovery
2.9 - 4.2	1.3	Tan brown sand
4.2 - 6.7	2.5	Black sand with caliche
6.7 - 7.9	1.2	No recovery
7.9 - 8.5	0.6	Black sand with caliche
8.5 - 12.9	4.4	No recovery
12.9 - 14.7	1.8	Black sand with caliche
14.7 - 17.9	3.2	No recovery
17.9 - 19.2	1.3	Black sand with caliche
19.2 - 22.9	3.7	No recovery
22.9 - 24.8	1.9	Black sand
24.8 - 27.9	3.1	No recovery
27.9 - 29.3	1.4	Black sand with caliche
29.3 - 32.9	3.6	No recovery
32.9 - 34.2	1.3	Black sand with caliche
34.2 - 35.6	1.4	White caliche
35.6 - 37.9	2.3	No recovery
37.9 - 39.4	1.5	Tan cemented sand
39.4 - 43.9	4.5	No recovery
43.9 - 48.2	4.3	Tan cemented sand

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-19 **Borehole Location** Lean Oil Tank

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 9-19-91 **Ground Elev.** 102.0' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 1.0	1.0	Brown silty sand with catalyst pellets
1.0 - 2.5	1.5	Tan sand with caliche
2.5 - 2.9	0.4	No recovery
2.9 - 3.8	0.9	Tan sand with caliche
3.8 - 7.9	4.1	No recovery
7.9 - 10.3	2.4	Tan sand with caliche
10.3 - 15.0	4.7	No recovery

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-20 **Borehole Location** Pit 1

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 10/17/91 **Ground Elev.** 99.8' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 1.0	1.0	Brown silty sand with gravel
1.0 - 1.5	0.5	Black silty clay sand
1.5 - 3.0	1.5	No Recovery
3.0 - 4.5	1.5	Brown silty clay sand
4.5 - 4.9	0.4	Tan sand
4.9 - 7.7	2.8	White caliche
7.7 - 8.0	0.3	No Recovery
8.0 - 10.0	2.0	White caliche
10.0 - 13.0	3.0	No Recovery
13.0 - 13.7	0.7	White caliche
13.7 - 18.0	4.3	No Recovery
18.0 - 21.6	3.6	White sand
21.6 - 23.0	1.4	No Recovery
23.0 - 24.5	1.5	White sand
24.5 - 26.7	2.2	Tan sand
26.7 - 28.0	1.3	No Recovery
28.0 - 29.0	1.0	Pink Sandstone

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-21 **Borehole Location** Pit 1

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 10/17/91 **Ground Elev.** 100.5' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 1.0	1.0	Brown silty sand
1.0 - 1.7	0.7	Black silty clay sand
1.7 - 2.2	0.5	Brown coarse sand with gravel
2.2 - 2.7	0.5	No Recovery
2.7 - 3.8	1.1	Brown coarse sand with gravel
3.8 - 4.5	0.7	Tan sand
4.5 - 7.7	3.2	No Recovery
7.7 - 9.9	2.2	Tan sand
9.9 - 12.7	2.8	No Recovery
12.7 - 13.8	1.1	Tan sand with caliche
13.8 - 14.9	1.1	White caliche
14.9 - 15.1	0.2	Gray caliche
15.1 - 17.7	7.6	No Recovery
17.7 - 19.0	1.3	Gray caliche
19.0 - 19.6	0.6	Pink sandstone
19.6 - 22.7	3.1	No Recovery
22.7 - 23.7	1.0	Tan sand

METRIC Corporation

SAMPLE LOG
Continued

Borehole Number BH-21 Borehole Location Pit 1

(Continued from Previous Page)

Depth (feet)	Thickness (feet)	Stratigraphic Description
23.7 - 27.7	4.0	No Recovery
27.7 - 29.0	1.3	Pink Sandstone

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-22 **Borehole Location** Pit 1

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

Date of Completion 10/18/91 **Ground Elev.** 101.3' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 0.1	0.1	White very fine silty sand
0.1 - 1.3	1.2	Brown silty sand
1.3 - 2.8	1.5	Tan sandy caliche
2.8 - 3.0	0.2	No Recovery
3.0 - 4.3	1.3	Tan sand
4.3 - 6.0	1.7	Tan sandy caliche
6.0 - 8.0	2.0	No Recovery
8.0 - 9.0	1.0	White caliche
9.0 - 13.0	4.0	No Recovery
13.0 - 14.7	1.7	White caliche with tan sand
14.7 - 18.0	3.3	No Recovery
18.0 - 19.0	1.0	White caliche with tan sand
19.0 - 23.0	4.0	No Recovery
23.0 - 24.0	1.0	White caliche with tan sand
24.0 - 28.0	4.0	No Recovery
28.0 - 29.6	1.6	Tan sand
24.6 - 30.5	0.9	Pink sandstone

METRIC
Corporation

SAMPLE LOG

Borehole Number BH-23 **Borehole Location** Landfarm Well

Property Owner Northern Natural Gas Company

Sample Logger Don Briggs, METRIC Corporation

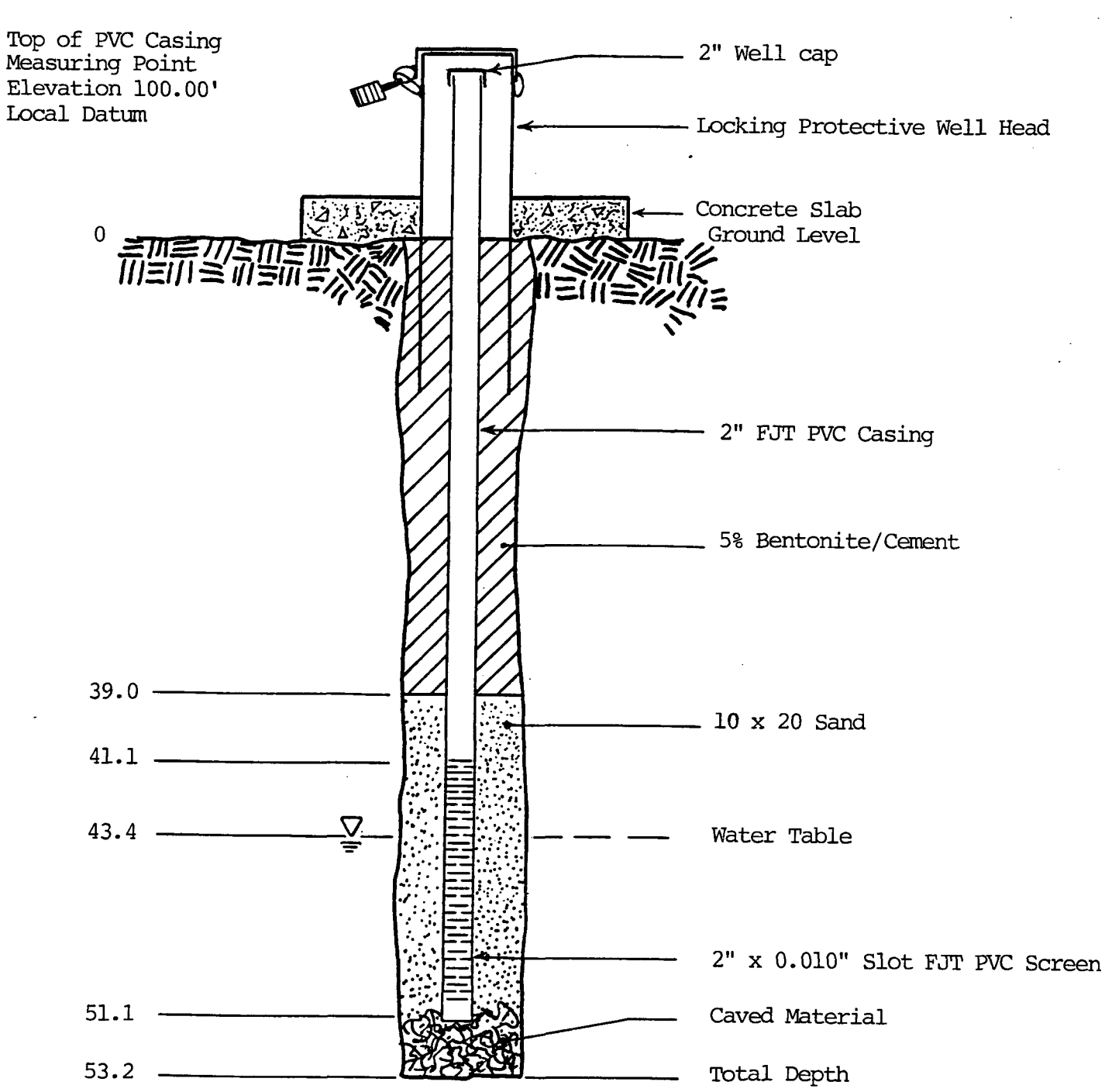
Driller METRIC Corporation

Drilling Medium Hollow Stem Auger

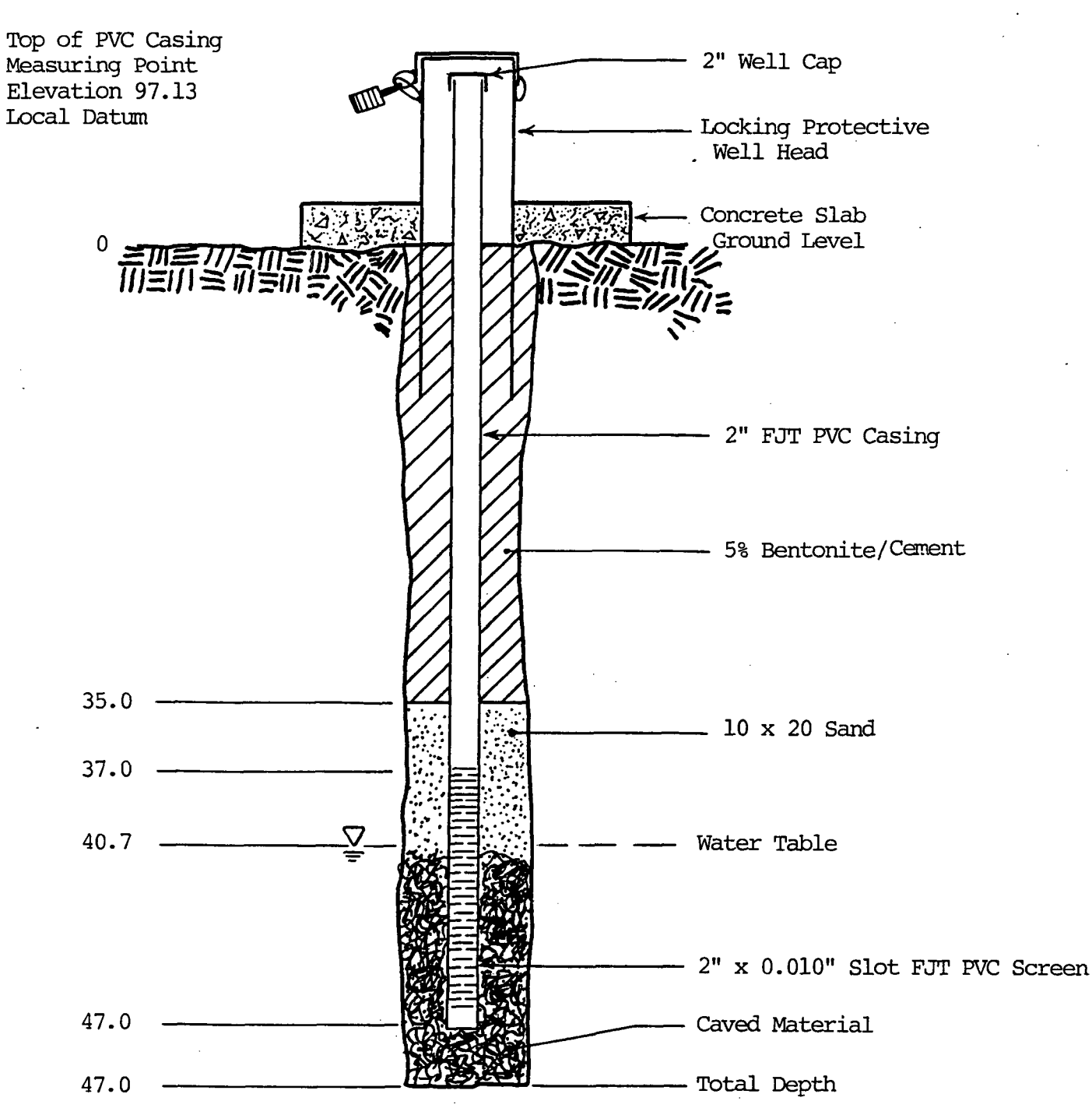
Date of Completion 10/18/91 **Ground Elev.** 101.0' Local

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 0.3	0.3	Brown silty sand
0.3 - 1.6	1.3	Brown silty sand with caliche
1.6 - 3.0	1.4	No Recovery
3.0 - 5.9	2.9	Brown silty clay
5.9 - 6.6	0.7	Tan silty clay sand
6.6 - 8.0	1.4	No Recovery
8.0 - 8.5	0.5	Tan silty clay sand
8.5 - 11.0	2.5	Red silty clay sand
11.0 - 12.2	1.2	White caliche
12.2 - 13.0	0.8	No Recovery
13.0 - 16.2	3.2	White caliche
16.2 - 16.5	0.3	Tan sand
16.5 - 18.0	1.5	No Recovery
18.0 - 19.6	1.6	Tan sand
19.6 - 24.5	4.9	No Recovery

APPENDIX B
MONITOR WELL CONSTRUCTION DIAGRAMS

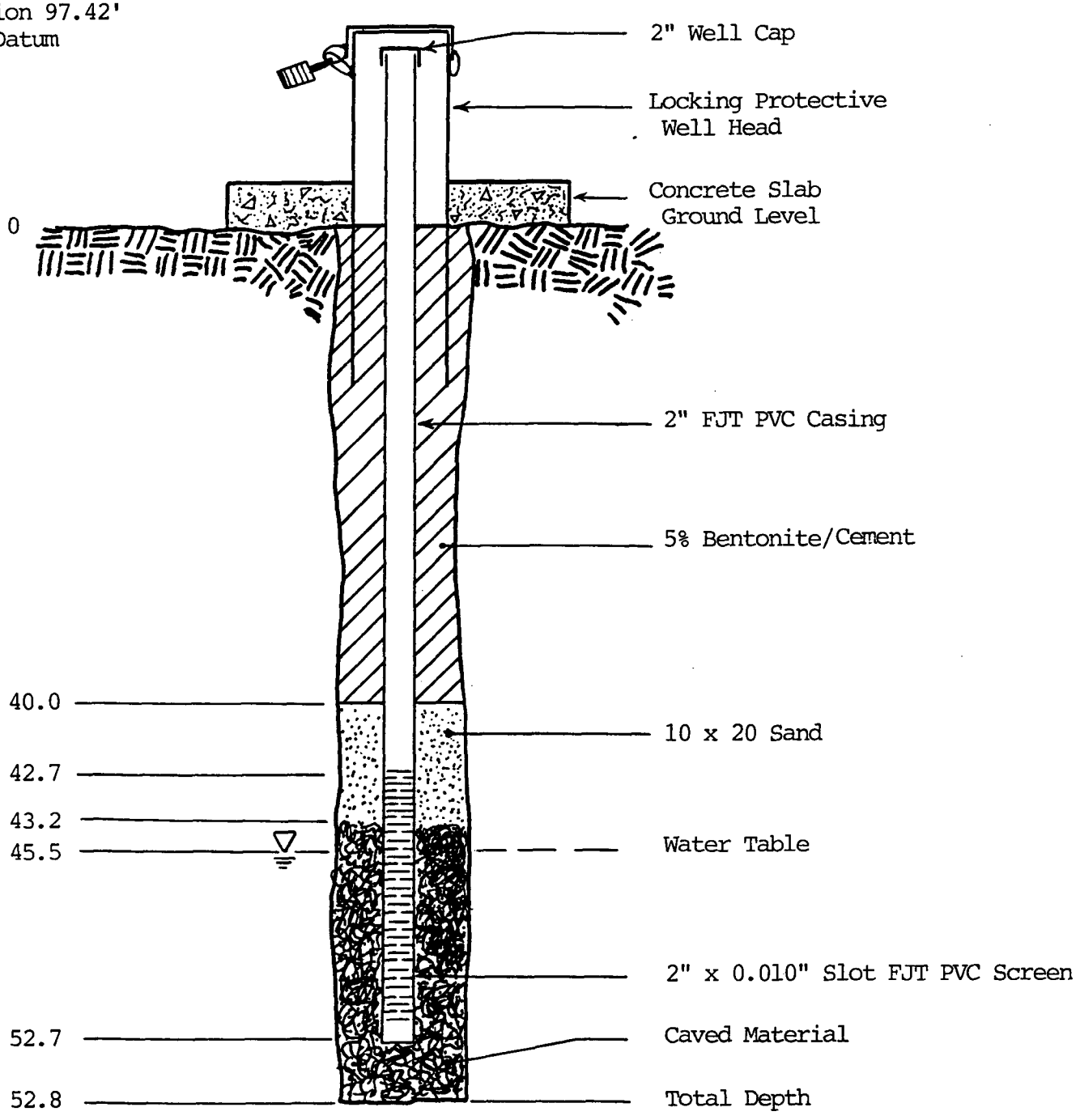


Well Construction Diagram
Monitor Well MW-1
Hobbs Plant



Well Construction Diagram
Monitor Well MW-2
Hobbs Plant

Top of PVC Casing
Measuring Point
Elevation 97.42'
Local Datum



Well Construction Diagram
Monitor Well MW-3
Hobbs Plant

APPENDIX C
LABORATORY REPORTS FOR BOREHOLE SAMPLING

ASSAIGAI
ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109

Assaigai Analytical Labs
7300 Jefferson NE
Albuquerque, NM 87109

Attn: SYED RIZVI
Phone: (505)345-8964

ENRON/TRANSWESTERN PIPELINE
HOBBS PLANT
2626 WEST MARLAND
HOBBS, NM 88240
Attn: MICHAEL KNEESE
Invoice Number: 912104

Order #: 91-09-210
Date: 10/02/91 12:10
Work ID: HOBBS 5160 8313
Date Received: 09/20/91
Date Completed: 10/01/91

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
01	MW-1	02	MW-3

QUESTIONS ABOUT THIS REPORT SHOULD BE ADDRESSED TO:
LABORATORY OPERATIONS MANAGER/ASSAIGAI ANALYTICAL
7300 JEFFERSON N.E.,ALBUQUERQUE,N.M. 87109

Syed Rizvi
Certified By
SYED N. RIZVI

Member: American Council of Independent Laboratories, Inc.

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ASSAIGAI
ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109

TEST RESULTS BY SAMPLE

Sample: 01A MW-1 **Collected:**

Test Description	Result	Limit	Units	Analyzed	By
PURGEABLE AROMATICS		1.0			
BENZENE	5.3	1.0	UG/L	09/30/91	DD
CHLOROBENZENE	<1.0	1.0	UG/L	09/30/91	DD
1,4-DICHLOROBENZENE	<1.0	1.0	UG/L	09/30/91	DD
1,3-DICHLOROBENZENE	<1.0	1.0	UG/L	09/30/91	DD
1,2-DICHLOROBENZENE	<1.0	1.0	UG/L	09/30/91	DD
ETHYL BENZENE	1.0	1.0	UG/L	09/30/91	DD
TOLUENE	6.7	1.0	UG/L	09/30/91	DD
PURGEABLE HALOCARBONS		1.0			
BROMODICHLOROMETHANE	<1.0	1.0	UG/L	09/30/91	DD
BROMOFORM	<1.0	1.0	UG/L	09/30/91	DD
BROMOMETHANE	<1.0	1.0	UG/L	09/30/91	DD
CARBON TETRACHLORIDE	<1.0	1.0	UG/L	09/30/91	DD
CHLOROBENZENE	<1.0	1.0	UG/L	09/30/91	DD
CHLOROETHANE	<1.0	1.0	UG/L	09/30/91	DD
CHLOROFORM	<1.0	1.0	UG/L	09/30/91	DD
2-CHLOROETHYL VINYL ETHER	<1.0	1.0	UG/L	09/30/91	DD
CHLOROMETHANE	<1.0	1.0	UG/L	09/30/91	DD
DIBROMOCHLOROMETHANE	<1.0	1.0	UG/L	09/30/91	DD
1,2-DICHLOROBENZENE	<1.0	1.0	UG/L	09/30/91	DD
1,3-DICHLOROBENZENE	<1.0	1.0	UG/L	09/30/91	DD
1,4-DICHLOROBENZENE	<1.0	1.0	UG/L	09/30/91	DD
DICHLORODIFLUOROMETHANE	<1.0	1.0	UG/L	09/30/91	DD

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Test Description	Result	Limit	Units	Analyzed	By
1,1-DICHLOROETHANE	<1.0	1.0	UG/L	09/30/91	DD
1,2-DICHLOROETHANE	<1.0	1.0	UG/L	09/30/91	DD
1,1-DICHLOROETHENE	<1.0	1.0	UG/L	09/30/91	DD
trans-1,2-DICHLOROETHENE	<1.0	1.0	UG/L	09/30/91	DD
1,2-DICHLOROPROPANE	<1.0	1.0	UG/L	09/30/91	DD
cis-1,3-DICHLOROPROPENE	<1.0	1.0	UG/L	09/30/91	DD
1,1,2,2-TETRACHLOROETHANE	<1.0	1.0	UG/L	09/30/91	DD
trans-1,3-DICHLOROPROPENE	<1.0	1.0	UG/L	09/30/91	DD
METHYLENE CHLORIDE	<1.0	1.0	UG/L	09/30/91	DD
1,1,1-TRICHLOROETHANE	<1.0	1.0	UG/L	09/30/91	DD
1,1,2-TRICHLOROETHANE	<1.0	1.0	UG/L	09/30/91	DD
TETRACHLOROETHENE	<1.0	1.0	UG/L	09/30/91	DD
TRICHLOROFLUOROMETHANE	<1.0	1.0	UG/L	09/30/91	DD
TRICHLOROETHENE	<1.0	1.0	UG/L	09/30/91	DD
VINYL CHLORIDE	<1.0	1.0	UG/L	09/30/91	DD

Sample: 01C MW-1 **Collected:**

Test Description	Result	Limit	Units	Analyzed	By
ALUMINUM (TOTAL)	<1.0	1.0	MG/L	09/24/91	JC
BARIUM (TOTAL)	<0.50	0.50	MG/L	09/24/91	JC
CALCIUM (TOTAL)	310	0.1	MG/L	09/24/91	JC
CHROMIUM (TOTAL)	<0.02	0.02	MG/L	09/24/91	JC
COPPER (TOTAL)	<0.02	0.02	MG/L	09/24/91	JC
IRON (TOTAL)	2.44	0.05	MG/L	09/24/91	JC
LEAD (TOTAL)	<0.10	0.1	MG/L	09/24/91	JC

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Test Description	Result	Limit	Units	Analyzed	By
LITHIUM (TOTAL)	0.17	0.05	MG/L	09/24/91	JC
MAGNESIUM (TOTAL)	66	0.005	MG/L	09/24/91	JC
MANGANESE (TOTAL)	1.03	0.02	MG/L	09/24/91	JC
POTASSIUM (TOTAL)	90	0.05	MG/L	09/24/91	JC
SODIUM (TOTAL)	410	0.02	MG/L	09/24/91	JC
STRONTIUM (TOTAL)	4.24	0.005	MG/L	09/24/91	JC
ZINC (TOTAL)	6.1	0.01	MG/L	09/24/91	JC

Sample: 02A MW-3 **Collected:**

Test Description	Result	Limit	Units	Analyzed	By
PURGEABLE AROMATICS		1.0			
BENZENE	<1.0	1.0	UG/L	09/30/91	DD
CHLOROBENZENE	<1.0	1.0	UG/L	09/30/91	DD
1,4-DICHLOROBENZENE	<1.0	1.0	UG/L	09/30/91	DD
1,3-DICHLOROBENZENE	<1.0	1.0	UG/L	09/30/91	DD
1,2-DICHLOROBENZENE	<1.0	1.0	UG/L	09/30/91	DD
ETHYL BENZENE	<1.0	1.0	UG/L	09/30/91	DD
TOLUENE	2.1	1.0	UG/L	09/30/91	DD
PURGEABLE HALOCARBONS		1.0			
BROMODICHLOROMETHANE	<1.0	1.0	UG/L	09/30/91	DD
BROMOFORM	<1.0	1.0	UG/L	09/30/91	DD
BROMOMETHANE	<1.0	1.0	UG/L	09/30/91	DD
CARBON TETRACHLORIDE	<1.0	1.0	UG/L	09/30/91	DD
CHLOROBENZENE	<1.0	1.0	UG/L	09/30/91	DD
CHLOROETHANE	<1.0	1.0	UG/L	09/30/91	DD
CHLOROFORM	<1.0	1.0	UG/L	09/30/91	DD
2-CHLOROETHYL VINYL ETHER	<1.0	1.0	UG/L	09/30/91	DD

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Test Description	Result	Limit	Units	Analyzed	By
CHLOROMETHANE	<1.0	1.0	UG/L	09/30/91	DD
DIBROMOCHLOROMETHANE	<1.0	1.0	UG/L	09/30/91	DD
1,2-DICHLOROBENZENE	<1.0	1.0	UG/L	09/30/91	DD
1,3-DICHLOROBENZENE	<1.0	1.0	UG/L	09/30/91	DD
1,4-DICHLOROBENZENE	<1.0	1.0	UG/L	09/30/91	DD
DICHLORODIFLUOROMETHANE	<1.0	1.0	UG/L	09/30/91	DD
1,1-DICHLOROETHANE	<1.0	1.0	UG/L	09/30/91	DD
1,2-DICHLOROETHANE	<1.0	1.0	UG/L	09/30/91	DD
1,1-DICHLOROETHENE	<1.0	1.0	UG/L	09/30/91	DD
trans-1,2-DICHLOROETHENE	<1.0	1.0	UG/L	09/30/91	DD
1,2-DICHLOROPROPANE	<1.0	1.0	UG/L	09/30/91	DD
cis-1,3-DICHLOROPROPENE	<1.0	1.0	UG/L	09/30/91	DD
1,1,2,2-TETRACHLOROETHANE	<1.0	1.0	UG/L	09/30/91	DD
trans-1,3-DICHLOROPROPENE	<1.0	1.0	UG/L	09/30/91	DD
METHYLENE CHLORIDE	<1.0	1.0	UG/L	09/30/91	DD
1,1,1-TRICHLOROETHANE	<1.0	1.0	UG/L	09/30/91	DD
1,1,2-TRICHLOROETHANE	<1.0	1.0	UG/L	09/30/91	DD
TETRACHLOROETHENE	<1.0	1.0	UG/L	09/30/91	DD
TRICHLOROFLUOROMETHANE	<1.0	1.0	UG/L	09/30/91	DD
TRICHLOROETHENE	<1.0	1.0	UG/L	09/30/91	DD
VINYL CHLORIDE	<1.0	1.0	UG/L	09/30/91	DD

Sample: 02C MW-3 **Collected:**

Test Description	Result	Limit	Units	Analyzed	By
ALUMINUM (TOTAL)	2.0	1.0	MG/L	09/24/91	JC

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Test Description	Result	Limit	Units	Analyzed	By
BARIUM (TOTAL)	<0.50	0.50	MG/L	09/24/91	JC
CALCIUM (TOTAL)	160	0.1	MG/L	09/24/91	JC
CHROMIUM (TOTAL)	<0.02	0.02	MG/L	09/24/91	JC
COPPER (TOTAL)	<0.02	0.02	MG/L	09/24/91	JC
IRON (TOTAL)	1.43	0.05	MG/L	09/24/91	JC
LEAD (TOTAL)	<0.10	0.1	MG/L	09/24/91	JC
LITHIUM (TOTAL)	<0.05	0.05	MG/L	09/24/91	JC
MAGNESIUM (TOTAL)	12	0.005	MG/L	09/24/91	JC
MANGANESE (TOTAL)	0.10	0.02	MG/L	09/24/91	JC
POTASSIUM (TOTAL)	3.24	0.05	MG/L	09/24/91	JC
SODIUM (TOTAL)	11	0.02	MG/L	09/24/91	JC
STRONTIUM (TOTAL)	0.57	0.005	MG/L	09/24/91	JC
ZINC (TOTAL)	0.05	0.01	MG/L	09/24/91	JC

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REGULAR TEST RESULTS BY TEST

ALUMINUM (TOTAL) **Minimum: 1.0** **Maximum: 20**
Method: EPA 202

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01C	MW-1	<1.0	MG/L	09/23/91	09/24/91	JC
02C	MW-3	2.0	MG/L	09/23/91	09/24/91	JC

BARIUM (TOTAL) **Minimum: 0.50** **Maximum: 20**
Method: EPA 208

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01C	MW-1	<0.50	MG/L	09/23/91	09/24/91	JC
02C	MW-3	<0.50	MG/L	09/23/91	09/24/91	JC

CALCIUM (TOTAL) **Minimum: 0.1** **Maximum: 100**
Method: EPA 215.1

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01C	MW-1	310	MG/L	09/23/91	09/24/91	JC
02C	MW-3	160	MG/L	09/23/91	09/24/91	JC

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CHROMIUM (TOTAL) **Minimum: 0.02** **Maximum: 20**
Method: EPA 218

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01C	MW-1	<0.02	MG/L	09/23/91	09/24/91	JC
02C	MW-3	<0.02	MG/L	09/23/91	09/24/91	JC

COPPER (TOTAL) **Minimum: 0.02** **Maximum: 20**
Method: EPA 220

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01C	MW-1	<0.02	MG/L	09/23/91	09/24/91	JC
02C	MW-3	<0.02	MG/L	09/23/91	09/24/91	JC

IRON (TOTAL) **Minimum: 0.05** **Maximum: 20**
Method: EPA 236

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01C	MW-1	2.44	MG/L	09/23/91	09/24/91	JC
02C	MW-3	1.43	MG/L	09/23/91	09/24/91	JC

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LEAD (TOTAL) **Minimum: 0.1** **Maximum: 20**
Method: EPA 239

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01C	MW-1	<0.10	MG/L	09/23/91	09/24/91	JC
02C	MW-3	<0.10	MG/L	09/23/91	09/24/91	JC

LITHIUM (TOTAL) **Minimum: 0.05** **Maximum: 20**
Method: EPA 200

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01C	MW-1	0.17	MG/L	09/23/91	09/24/91	JC
02C	MW-3	<0.05	MG/L	09/23/91	09/24/91	JC

MAGNESIUM (TOTAL) **Minimum: 0.005** **Maximum: 20**
Method: EPA 242.1

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01C	MW-1	66	MG/L	09/23/91	09/24/91	JC
02C	MW-3	12	MG/L	09/23/91	09/24/91	JC

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MANGANESE (TOTAL) **Minimum:** **0.02** **Maximum:** **20**
Method: EPA 243

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01C	MW-1	1.03	MG/L	09/23/91	09/24/91	JC
02C	MW-3	0.10	MG/L	09/23/91	09/24/91	JC

POTASSIUM (TOTAL) **Minimum:** **0.05** **Maximum:** **20**
Method: EPA 258.1

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01C	MW-1	90	MG/L	09/23/91	09/24/91	JC
02C	MW-3	3.24	MG/L	09/23/91	09/24/91	JC

SODIUM (TOTAL) **Minimum:** **0.02** **Maximum:** **20**
Method: EPA 273.1

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01C	MW-1	410	MG/L	09/23/91	09/24/91	JC
02C	MW-3	11	MG/L	09/23/91	09/24/91	JC

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STRONTIUM (TOTAL) **Minimum: 0.005** **Maximum: 20**
Method: EPA 200

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01C	MW-1	4.24	MG/L	09/23/91	09/24/91	JC
02C	MW-3	0.57	MG/L	09/23/91	09/24/91	JC

ZINC (TOTAL) **Minimum: 0.01** **Maximum: 20**
Method: EPA 289

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01C	MW-1	6.1	MG/L	09/23/91	09/24/91	JC
02C	MW-3	0.05	MG/L	09/23/91	09/24/91	JC

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Assaigai Analytical Labs
7300 Jefferson NE
Albuquerque, NM 87109

Attn: SYED RIZVI
Phone: (505)345-8964

ENRON/TRANSWESTERN PIPELINE
HOBBS PLANT
2626 WEST MARLAND
HOBBS, NM 88240
Attn: MIKE KNEESE
Invoice Number: 912274

Order #: 91-09-325
Date: 10/16/91 10:04
Work ID: HOBBS 5160 8399
Date Received: 09/30/91
Date Completed: 10/16/91

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
01	MW-2 HOBBS	02	MW-2

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LABORATORY OPERATIONS MANAGER/ASSAIGAI ANALYTICAL
7300 JEFFERSON N.E.,ALBUQUERQUE,N.M. 87109

Syed Rizvi

Certified By
SYED N. RIZVI

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TEST RESULTS BY SAMPLE

Sample: 01A MW-2 HOBBS **Collected:**

Test Description	Result	Limit	Units	Analyzed	By
PURGEABLE AROMATICS		1.0			
BENZENE	<1.0	1.0	UG/L	10/08/91	DD
CHLOROBENZENE	<1.0	1.0	UG/L	10/08/91	DD
1,4-DICHLOROBENZENE	<1.0	1.0	UG/L	10/08/91	DD
1,3-DICHLOROBENZENE	<1.0	1.0	UG/L	10/08/91	DD
1,2-DICHLOROBENZENE	<1.0	1.0	UG/L	10/08/91	DD
ETHYL BENZENE	<1.0	1.0	UG/L	10/08/91	DD
TOLUENE	<1.0	1.0	UG/L	10/08/91	DD
PURGEABLE HALOCARBONS		1.0			
BROMODICHLOROMETHANE	<1.0	1.0	UG/L	10/08/91	DD
BROMOFORM	<1.0	1.0	UG/L	10/08/91	DD
BROMOMETHANE	<1.0	1.0	UG/L	10/08/91	DD
CARBON TETRACHLORIDE	<1.0	1.0	UG/L	10/08/91	DD
CHLOROBENZENE	<1.0	1.0	UG/L	10/08/91	DD
CHLOROETHANE	<1.0	1.0	UG/L	10/08/91	DD
CHLOROFORM	<1.0	1.0	UG/L	10/08/91	DD
2-CHLOROETHYL VINYL ETHER	<1.0	1.0	UG/L	10/08/91	DD
CHLOROMETHANE	<1.0	1.0	UG/L	10/08/91	DD
DIBROMOCHLOROMETHANE	<1.0	1.0	UG/L	10/08/91	DD
1,2-DICHLOROBENZENE	<1.0	1.0	UG/L	10/08/91	DD
1,3-DICHLOROBENZENE	<1.0	1.0	UG/L	10/08/91	DD
1,4-DICHLOROBENZENE	<1.0	1.0	UG/L	10/08/91	DD
DICHLORODIFLUOROMETHANE	<1.0	1.0	UG/L	10/08/91	DD

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Test Description	Result	Limit	Units	Analyzed	By
1,1-DICHLOROETHANE	<1.0	1.0	UG/L	10/08/91	DD
1,2-DICHLOROETHANE	<1.0	1.0	UG/L	10/08/91	DD
1,1-DICHLOROETHENE	<1.0	1.0	UG/L	10/08/91	DD
trans-1,2-DICHLOROETHENE	<1.0	1.0	UG/L	10/08/91	DD
1,2-DICHLOROPROPANE	<1.0	1.0	UG/L	10/08/91	DD
cis-1,3-DICHLOROPROPENE	<1.0	1.0	UG/L	10/08/91	DD
1,1,2,2-TETRACHLOROETHANE	<1.0	1.0	UG/L	10/08/91	DD
trans-1,3-DICHLOROPROPENE	<1.0	1.0	UG/L	10/08/91	DD
METHYLENE CHLORIDE	<1.0	1.0	UG/L	10/08/91	DD
1,1,1-TRICHLOROETHANE	<1.0	1.0	UG/L	10/08/91	DD
1,1,2-TRICHLOROETHANE	<1.0	1.0	UG/L	10/08/91	DD
TETRACHLOROETHENE	<1.0	1.0	UG/L	10/08/91	DD
TRICHLOROFLUOROMETHANE	<1.0	1.0	UG/L	10/08/91	DD
TRICHLOROETHENE	<1.0	1.0	UG/L	10/08/91	DD
VINYL CHLORIDE	<1.0	1.0	UG/L	10/08/91	DD

Sample: 02A MW-2 **Collected:**

Test Description	Result	Limit	Units	Analyzed	By
ALUMINUM (TOTAL)	<1.0	1.0	MG/L	10/09/91	JC
BARIUM (TOTAL)	<0.50	0.50	MG/L	10/09/91	JC
CALCIUM (TOTAL)	76	0.1	MG/L	10/09/91	JC
CHROMIUM (TOTAL)	<0.02	0.02	MG/L	10/09/91	JC
IRON (TOTAL)	0.12	0.05	MG/L	10/09/91	JC
LEAD (TOTAL)	<0.10	0.1	MG/L	10/09/91	JC
LITHIUM (TOTAL)	<0.05	0.05	MG/L	10/09/91	JC

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Test Description	Result	Limit	Units	Analyzed	By
MAGNESIUM (TOTAL)	6.5	0.005	MG/L	10/09/91	JC
MANGANESE (TOTAL)	0.05	0.02	MG/L	10/09/91	JC
POTASSIUM (TOTAL)	13	0.05	MG/L	10/09/91	JC
SODIUM (TOTAL)	13	0.02	MG/L	10/09/91	JC
STRONTIUM (TOTAL)	<0.005	0.005	MG/L	10/09/91	JC
ZINC (TOTAL)	0.05	0.01	MG/L	10/09/91	JC

Sample: 03A BH-2 0-2.7 **Collected:**

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	10/09/91	DD
TOLUENE	<0.1	0.1	MG/KG	10/09/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	10/09/91	DD
XYLENES	<0.1	0.1	MG/KG	10/09/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	10/04/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	10/04/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	10/04/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	10/04/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	10/04/91	SS
XYLENE	<0.02	0.02	MG/L	10/04/91	SS
ACETONE	<10	10	MG/L	10/04/91	SS
ETHYL ACETATE	<10	10	MG/L	10/04/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	10/04/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	10/04/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	10/04/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	10/04/91	SS

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Assaigai Analytical Labs
7300 Jefferson NE
Albuquerque, NM 87109

Attn: SYED RIZVI
Phone: (505)345-8964

ENRON/TRANSWESTERN PIPELINE
HOBBS PLANT
2626 WEST MARLAND
HOBBS, NM 88240
Attn: MICHAEL KNEESE
Invoice Number: 911894

Order #: 91-08-253
Date: 09/16/91 14:04
Work ID: HOBBS - BUFFALO WALLOW 8072
Date Received: 08/23/91
Date Completed: 09/13/91

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	BH-1 30.0 - 30.3
03	BH-2 ~~42.8 - 43.0~~ 48.1 - 48.4
05	BH-2 0 - 1.0
07	BH-1 19.9 - 20.2
09	BH-2 - 15.0 - 15.3
11	
13	BH-1 15.0 - 15.5

Sample Number	Sample Description
02	BH-1 - 45.2 - 45.5
04	BH-2 51.2 - 51.4
06	BH-1 8.8 - 9.2
10	BH-2 30.0 - 30.3
12	BH-1 36.5 - 36.7

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Certified By
SYED N. RIZVI

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TEST RESULTS BY SAMPLE

Sample: 01A BH-1 30.0 - 30.3 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/05/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/05/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/05/91	DD
XYLENES	<0.1	0.1	MG/KG	09/05/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/09/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/09/91	SS
XYLENE	<0.02	0.02	MG/L	09/09/91	SS
ACETONE	<10	10	MG/L	09/09/91	SS
ETHYL ACETATE	<10	10	MG/L	09/09/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/09/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/09/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/09/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/09/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/09/91	SS
METHANOL	<10	10	MG/L	09/09/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/09/91	SS
TOLUENE	<0.02	0.02	MG/L	09/09/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/09/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
ISOBUTANOL	<10	10	MG/L	09/09/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/09/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/09/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	91	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	105	Min: 76	Max: 114		
TOLUENE-d8	96	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JC
BARIUM	<0.50	0.50	MG/L		JC
CADMIUM	0.01	0.003	MG/L		JC
CHROMIUM	<0.02	0.02	MG/L		JC
LEAD	<0.10	0.10	MG/L		JC
MERCURY	0.0003	0.0002	MG/L		JC
SELENIUM	<0.005	0.005	MG/L		JC
SILVER	<0.010	0.010	MG/L		JC
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/04/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/04/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/04/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/04/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/04/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/04/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/04/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/04/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
M-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/04/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/04/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
Surrogates					
NITROBENZENE-d5	79	Min: 35	Max: 114		
2-FLUOROBIPHENYL	79	Min: 43	Max: 116		
TERPHENYL-d14	83	Min: 33	Max: 141		
PHENOL-d5	66	Min: 10	Max: 94		
2-FLUOROPHENOL	82	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/09/91	PV

Sample: 02A BH-1 - 45.2 - 45.5 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/05/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/05/91	DD

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Test Description	Result	Limit	Units	Analyzed	By
ETHYL BENZENE	<0.1	0.1	MG/KG	09/05/91	DD
XYLENES	<0.1	0.1	MG/KG	09/05/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/06/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/06/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/06/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/06/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/06/91	SS
XYLENE	<0.02	0.02	MG/L	09/06/91	SS
ACETONE	<10	10	MG/L	09/06/91	SS
ETHYL ACETATE	<10	10	MG/L	09/06/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/06/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/06/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/06/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/06/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/06/91	SS
METHANOL	<10	10	MG/L	09/06/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/06/91	SS
TOLUENE	<0.02	0.02	MG/L	09/06/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/06/91	SS
ISOBUTANOL	<10	10	MG/L	09/06/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/06/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/06/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	96	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	102	Min: 76	Max: 114		
TOLUENE-d8	94	Min: 88	Max: 110		
TCLP METALS					

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Test Description	Result	Limit	Units	Analyzed	By
ARSENIC	<0.005	0.005	MG/L		JC
BARIUM	<0.50	0.50	MG/L		JC
CADMIUM	0.013	0.003	MG/L		JC
CHROMIUM	<0.02	0.02	MG/L		JC
LEAD	<0.10	0.10	MG/L		JC
MERCURY	0.0004	0.0002	MG/L		JC
SELENIUM	<0.005	0.005	MG/L		JC
SILVER	<0.010	0.010	MG/L		JC
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/04/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/04/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/04/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/04/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/04/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/04/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/04/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/04/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/04/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/04/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
Surrogates					
NITROBENZENE-d5	82	Min: 35	Max: 114		
2-FLUOROBIPHENYL	92	Min: 43	Max: 116		
TERPHENYL-d14	89	Min: 33	Max: 141		
PHENOL-d5	67	Min: 10	Max: 94		
2-FLUOROPHENOL	86	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/09/91	PV

Sample: 03A BH-2 ~~-42.8 - 43.0~~ 40.1 - 40.4 DT Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/06/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
XYLENES	<0.1	0.1	MG/KG	09/06/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/06/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/06/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/06/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/06/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/06/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
XYLENE	<0.02	0.02	MG/L	09/06/91	SS
ACETONE	<10	10	MG/L	09/06/91	SS
ETHYL ACETATE	<10	10	MG/L	09/06/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/06/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/06/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/06/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/06/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/06/91	SS
METHANOL	<10	10	MG/L	09/06/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/06/91	SS
TOLUENE	<0.02	0.02	MG/L	09/06/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/06/91	SS
ISOBUTANOL	<10	10	MG/L	09/06/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/06/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/06/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	91	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	100	Min: 76	Max: 114		
TOLUENE-d8	92	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	0.014	0.005	MG/L		JC
BARIUM	<0.50	0.50	MG/L		JC
CADMIUM	0.021	0.003	MG/L		JC
CHROMIUM	0.03	0.02	MG/L		JC
LEAD	<0.10	0.10	MG/L		JC
MERCURY	0.0003	0.0002	MG/L		JC
SELENIUM	<0.005	0.005	MG/L		JC
SILVER	0.012	0.010	MG/L		JC

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Test Description	Result	Limit	Units	Analyzed	By
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/11/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/11/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/11/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/11/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/11/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/11/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/11/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/11/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/11/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
Surrogates					
NITROBENZENE-d5	67	Min: 35	Max: 114		
2-FLUOROBIPHENYL	64	Min: 43	Max: 116		
TERPHENYL-d14	60	Min: 33	Max: 141		
PHENOL-d5	52	Min: 10	Max: 94		
2-FLUOROPHENOL	51	Min: 21	Max: 100		

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Test Description	Result	Limit	Units	Analyzed	By
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/09/91	PV

Sample: 04A BH-2 51.2 - 51.4 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/06/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
XYLENES	<0.1	0.1	MG/KG	09/06/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/06/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/06/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/06/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/06/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/06/91	SS
XYLENE	<0.02	0.02	MG/L	09/06/91	SS
ACETONE	<10	10	MG/L	09/06/91	SS
ETHYL ACETATE	<10	10	MG/L	09/06/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/06/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/06/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/06/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/06/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/06/91	SS
METHANOL	<10	10	MG/L	09/06/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/06/91	SS
TOLUENE	<0.02	0.02	MG/L	09/06/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/06/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
ISOBUTANOL	<10	10	MG/L	09/06/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/06/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/06/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	92	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	104	Min: 76	Max: 114		
TOLUENE-d8	95	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	0.006	0.005	MG/L		JC
BARIUM	<0.50	0.50	MG/L		JC
CADMIUM	0.019	0.003	MG/L		JC
CHROMIUM	0.04	0.02	MG/L		JC
LEAD	<0.10	0.10	MG/L		JC
MERCURY	0.0003	0.0002	MG/L		JC
SELENIUM	<0.005	0.005	MG/L		JC
SILVER	<0.010	0.010	MG/L		JC
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/11/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/11/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/11/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/11/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/11/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/11/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/11/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/11/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
M-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/11/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/11/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
Surrogates					
NITROBENZENE-d5	75	Min: 35	Max: 114		
2-FLUOROBIPHENYL	72	Min: 43	Max: 116		
TERPHENYL-d14	71	Min: 33	Max: 141		
PHENOL-d5	53	Min: 10	Max: 94		
2-FLUOROPHENOL	77	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/09/91	PV

Sample: 05A BH-2 0 - 1.0 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/06/91	DD

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Test Description	Result	Limit	Units	Analyzed	By
ETHYL BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
XYLENES	<0.1	0.1	MG/KG	09/06/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/10/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/10/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/10/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/10/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/10/91	SS
XYLENE	<0.02	0.02	MG/L	09/10/91	SS
ACETONE	<10	10	MG/L	09/10/91	SS
ETHYL ACETATE	<10	10	MG/L	09/10/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/10/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/10/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/10/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/10/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/10/91	SS
METHANOL	<10	10	MG/L	09/10/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/10/91	SS
TOLUENE	<0.02	0.02	MG/L	09/10/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/10/91	SS
ISOBUTANOL	<10	10	MG/L	09/10/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/10/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/10/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	87	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	92	Min: 76	Max: 114		
TOLUENE-d8	105	Min: 88	Max: 110		
TCLP METALS					

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Test Description	Result	Limit	Units	Analyzed	By
ARSENIC	<0.005	0.005	MG/L		JC
BARIUM	<0.50	0.50	MG/L		JC
CADMIUM	0.023	0.003	MG/L		JC
CHROMIUM	0.05	0.02	MG/L		JC
LEAD	<0.10	0.10	MG/L		JC
MERCURY	0.0004	0.0002	MG/L		JC
SELENIUM	<0.005	0.005	MG/L		JC
SILVER	<0.010	0.010	MG/L		JC
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/11/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/11/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/11/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/11/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/11/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/11/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/11/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/11/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/11/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/11/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
Surrogates					
NITROBENZENE-d5	80	Min: 35	Max: 114		
2-FLUOROBIPHENYL	71	Min: 43	Max: 116		
TERPHENYL-d14	52	Min: 33	Max: 141		
PHENOL-d5	37	Min: 10	Max: 94		
2-FLUOROPHENOL	34	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/09/91	PV

Sample: 06A BH-1 8.8 - 9.2 **Collected:**

Test Description	Result	Limit	Units	Analyzed	By
TOTAL REC PET HYDROCARBONS	40	5.0	MG/KG	09/09/91	PV

Sample: 07A BH-1 19.9 - 20.2 **Collected:**

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/06/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/06/91	DD

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Test Description	Result	Limit	Units	Analyzed	By
XYLENES	<0.1	0.1	MG/KG	09/06/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/06/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/06/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/06/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/06/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/06/91	SS
XYLENE	<0.02	0.02	MG/L	09/06/91	SS
ACETONE	<10	10	MG/L	09/06/91	SS
ETHYL ACETATE	<10	10	MG/L	09/06/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/06/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/06/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/06/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/06/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/06/91	SS
METHANOL	<10	10	MG/L	09/06/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/06/91	SS
TOLUENE	<0.02	0.02	MG/L	09/06/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/06/91	SS
ISOBUTANOL	<10	10	MG/L	09/06/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/06/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/06/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	93	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	101	Min: 76	Max: 114		
TOLUENE-d8	96	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JC

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Test Description	Result	Limit	Units	Analyzed	By
BARIUM	<0.50	0.50	MG/L		JC
CADMIUM	0.007	0.003	MG/L		JC
CHROMIUM	<0.02	0.02	MG/L		JC
LEAD	<0.10	0.10	MG/L		JC
MERCURY	0.0003	0.0002	MG/L		JC
SELENIUM	<0.005	0.005	MG/L		JC
SILVER	<0.010	0.010	MG/L		JC
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/11/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/11/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/11/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/11/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/11/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/11/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/11/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/11/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
PYRIDINE	<0.001	0.001	MG/L	09/11/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
Surrogates					
NITROBENZENE-d5	75	Min: 35	Max: 114		
2-FLUOROBIPHENYL	70	Min: 43	Max: 116		
TERPHENYL-d14	88	Min: 33	Max: 141		
PHENOL-d5	57	Min: 10	Max: 94		
2-FLUOROPHENOL	60	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	28	5.0	MG/KG	09/09/91	PV

Sample: 09A BH-2 - 15.0 - 15.3 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/06/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
XYLENES	<0.1	0.1	MG/KG	09/06/91	DD

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Test Description	Result	Limit	Units	Analyzed	By
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/06/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/06/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/06/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/06/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/06/91	SS
XYLENE	<0.02	0.02	MG/L	09/06/91	SS
ACETONE	<10	10	MG/L	09/06/91	SS
ETHYL ACETATE	<10	10	MG/L	09/06/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/06/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/06/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/06/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/06/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/06/91	SS
METHANOL	<10	10	MG/L	09/06/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/06/91	SS
TOLUENE	<0.02	0.02	MG/L	09/06/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/06/91	SS
ISOBUTANOL	<10	10	MG/L	09/06/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/06/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/06/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	91	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	101	Min: 76	Max: 114		
TOLUENE-d8	93	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JC
BARIUM	<0.50	0.50	MG/L		JC
CADMIUM	0.024	0.003	MG/L		JC
CHROMIUM	0.04	0.02	MG/L		JC

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Test Description	Result	Limit	Units	Analyzed	By
LEAD	<0.10	0.10	MG/L		JC
MERCURY	0.0003	0.0002	MG/L		JC
SELENIUM	<0.005	0.005	MG/L		JC
SILVER	<0.010	0.010	MG/L		JC
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/11/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/11/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/11/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/11/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/11/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/11/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/11/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/11/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/11/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
Surrogates					
NITROBENZENE-d5	79	Min: 35	Max: 114		
2-FLUOROBIPHENYL	71	Min: 43	Max: 116		
TERPHENYL-d14	77	Min: 33	Max: 141		
PHENOL-d5	62	Min: 10	Max: 94		
2-FLUOROPHENOL	64	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/09/91	PV

Sample: 10A BH-2 30.0 - 30.3 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/06/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
XYLENES	<0.1	0.1	MG/KG	09/06/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/06/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/06/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/06/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/06/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/06/91	SS
XYLENE	<0.02	0.02	MG/L	09/06/91	SS
ACETONE	<10	10	MG/L	09/06/91	SS
ETHYL ACETATE	<10	10	MG/L	09/06/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/06/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
ETHYL ETHER	<0.02	0.02	MG/L	09/06/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/06/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/06/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/06/91	SS
METHANOL	<10	10	MG/L	09/06/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/06/91	SS
TOLUENE	<0.02	0.02	MG/L	09/06/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/06/91	SS
ISOBUTANOL	<10	10	MG/L	09/06/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/06/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/06/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	93	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	100	Min: 76	Max: 114		
TOLUENE-d8	98	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JC
BARIUM	<0.50	0.50	MG/L		JC
CADMIUM	0.024	0.003	MG/L		JC
CHROMIUM	0.03	0.02	MG/L		JC
LEAD	<0.10	0.10	MG/L		JC
MERCURY	0.0004	0.0002	MG/L		JC
SELENIUM	<0.005	0.005	MG/L		JC
SILVER	0.031	0.010	MG/L		JC
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/11/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/11/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/11/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
CHLOROFORM	<0.02	0.02	MG/L	09/11/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/11/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/11/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/11/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/11/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/11/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
Surrogates					
NITROBENZENE-d5	95	Min: 35	Max: 114		
2-FLUOROBIPHENYL	82	Min: 43	Max: 116		
TERPHENYL-d14	70	Min: 33	Max: 141		
PHENOL-d5	74	Min: 10	Max: 94		
2-FLUOROPHENOL	88	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/09/91	PV

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Sample: 12A BH-1 36.5 - 36.7 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/06/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
XYLENES	<0.1	0.1	MG/KG	09/06/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/06/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/06/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/06/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/06/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/06/91	SS
XYLENE	<0.02	0.02	MG/L	09/06/91	SS
ACETONE	<10	10	MG/L	09/06/91	SS
ETHYL ACETATE	<10	10	MG/L	09/06/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/06/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/06/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/06/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/06/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
CYCLOHEXANONE	<0.02	0.02	MG/L	09/06/91	SS
METHANOL	<10	10	MG/L	09/06/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/06/91	SS
TOLUENE	<0.02	0.02	MG/L	09/06/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/06/91	SS
ISOBUTANOL	<10	10	MG/L	09/06/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/06/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/06/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	93	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	101	Min: 76	Max: 114		
TOLUENE-d8	96	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JC
BARIUM	<0.50	0.50	MG/L		JC
CADMIUM	0.024	0.003	MG/L		JC
CHROMIUM	0.04	0.02	MG/L		JC
LEAD	<0.10	0.10	MG/L		JC
MERCURY	0.0003	0.0002	MG/L		JC
SELENIUM	<0.005	0.005	MG/L		JC
SILVER	<0.010	0.010	MG/L		JC
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/11/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/11/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/11/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/11/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/11/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/11/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/11/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/11/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/11/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/11/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/11/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/11/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/11/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/11/91	SS
Surrogates					
NITROBENZENE-d5	85	Min: 35	Max: 114		
2-FLUOROBIPHENYL	73	Min: 43	Max: 116		
TERPHENYL-d14	78	Min: 33	Max: 141		
PHENOL-d5	73	Min: 10	Max: 94		
2-FLUOROPHENOL	59 Q	Min: 210	Max: 100		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/09/91	PV

THIS REPORT MAY NOT BE REPRODUCED IN PART OR IN FULL WITHOUT THE EXPRESS WRITTEN CONSENT OF THE LABORATORY

Sample: 13A BH-1 15.0 - 15.5 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/06/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
XYLENES	<0.1	0.1	MG/KG	09/06/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/09/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/09/91	SS
XYLENE	<0.02	0.02	MG/L	09/09/91	SS
ACETONE	<10	10	MG/L	09/09/91	SS
ETHYL ACETATE	<10	10	MG/L	09/09/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/09/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/09/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/09/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/09/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/09/91	SS
METHANOL	<10	10	MG/L	09/09/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/09/91	SS
TOLUENE	<0.02	0.02	MG/L	09/09/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/09/91	SS
ISOBUTANOL	<10	10	MG/L	09/09/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/09/91	SS

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Test Description	Result	Limit		Units	Analyzed	By
2-NITROPROPANE	<0.02	0.02		MG/L	09/09/91	SS
Surrogates						
4-BROMOFLUOROBENZENE	97	Min: 86		Max: 115		
1,2-DICHLOROETHANE-d4	102	Min: 76		Max: 114		
TOLUENE-d8	99	Min: 88		Max: 110		
TCLP METALS						
ARSENIC	<0.005	0.005		MG/L		JC
BARIUM	<0.50	0.50		MG/L		JC
CADMIUM	0.024	0.003		MG/L		JC
CHROMIUM	0.04	0.02		MG/L		JC
LEAD	<0.10	0.10		MG/L		JC
MERCURY	0.0003	0.0002		MG/L		JC
SELENIUM	<0.005	0.005		MG/L		JC
SILVER	0.012	0.010		MG/L		JC
TCLP ORGANICS ENRON LIST						
BENZENE	<0.02	0.02	MG/L	MG/L	09/11/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	MG/L	09/11/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	MG/L	09/11/91	SS
CHLOROFORM	<0.02	0.02	MG/L	MG/L	09/11/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	MG/L	09/11/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	MG/L	09/11/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	MG/L	09/11/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	MG/L	09/11/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	MG/L	09/11/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	MG/L	09/11/91	SS
O-CRESOL	<0.001	0.001	MG/L	MG/L	09/11/91	SS
M-CRESOL	<0.001	0.001	MG/L	MG/L	09/11/91	SS
P-CRESOL	<0.001	0.001	MG/L	MG/L	09/11/91	SS

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Test Description	Result	Limit		Units	Analyzed	By
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	MG/L	09/11/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	MG/L	09/11/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	MG/L	09/11/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	MG/L	09/11/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	MG/L	09/11/91	SS
NITROBENZENE	<0.001	0.001	MG/L	MG/L	09/11/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	MG/L	09/11/91	SS
PYRIDINE	<0.001	0.001	MG/L	MG/L	09/11/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	MG/L	09/11/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	MG/L	09/11/91	SS
Surrogates						
NITROBENZENE-d5	88	Min: 35		Max: 114		
2-FLUOROBIPHENYL	82	Min: 43		Max: 116		
TERPHENYL-d14	71	Min: 33		Max: 141		
PHENOL-d5	53	Min: 10		Max: 94		
2-FLUOROPHENOL	49	Min: 21		Max: 100		
TOTAL REC PET HYDROCARBONS	<5.0	5.0		MG/KG	09/09/91	PV

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TEST METHODOLOGIES

TCLP METALS: USEPA 200 SERIES METHODOLOGY

TCLP EXTRACTION: USEPA METHOD # 1311

BENZENE, TOLUENE, ETHYLBENZENE, XYLENES: USEPA METHOD # 602/8020

USEPA METHOD # 418.1

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ASSAIGAI ANALYTICAL LABORATORIES

WORK ORDER 8072

☐ HAZARDOUS ☐ NON-HAZARDOUS	DATE RECEIVED 8/23/91	ESTIMATED COST
CUSTOMER P.O. NUMBER	TIME RECEIVED 1:00	DUE DATE 9/9/91

ACCOUNT INFORMATION

CUSTOMER'S NAME Conoco Environmental Pipeline Inc.	CONTACT Michael Kovacs
ADDRESS	PHONE NUMBER 397-6000
CITY / STATE / ZIP Hobbs.	

PARTY RESPONSIBLE FOR PAYMENT IF OTHER THAN ABOVE

NAME	CONTACT
ADDRESS	PHONE NUMBER
CITY / STATE / ZIP	

ACCOUNT STATUS

PAYMENT REC'D. ____
OPEN ACCOUNT X
CASH ____
CHECK NUMBER ____

SPECIAL BILLING INSTRUCTIONS

SAMPLE INFORMATION

TYPE OF SAMPLE	NO. OF SAMPLES	*TURN AROUND TIME	SAMPLE IDENTIFICATION AND / OR SAMPLE SITE
☐ WATER ☑ SOIL ☐ OIL ☐ SLUDGE ☐ OTHER	13 NO. OF CONTAINERS 13	☑ REGULAR (10 WKG DAYS) ☐ RUSH (3 DAYS) ☐ EMERGENCY (STAT) *(SUBJECT TO WORK LOG)	Hobbs Plant - Buffalo Wells (0)

SAMPLE DELIVERED BY 1-40 X SIGNATURE DATE 8/23/91

ANALYSIS REQUEST

WORK DESCRIPTION

TRPH, BTEX, TCLP-0,2,4-E,C

see attached CofC.

SPECIAL INSTRUCTIONS

BILLING: ☐ PICKUP ☐ MAIL LOGGED IN BY

7300 Jefferson NE • Albuquerque, New Mexico 87109 • (505) 345-8964 • FAX (505) 345-7259

ASSAIGAI ANALYTICAL LABS, INC.

Albuquerque, New Mexico

CHAIN OF CUSTODY RECORD

DATE 8-22-91
WORK ORDER NO. _____
PURCHASE ORDER NO. _____

CLIENT NAME Transwestern Pipeline Co. / Enron
ADDRESS 2626 W. Marland
Hobbs, N. M. 88240
CONTACT PERSON Michael Kneese TELEPHONE (505) 397-6000
BILLING ADDRESS 2626 W. Marland
Hobbs, N. M. 88240
SAMPLE COLLECTION SITE Hobbs Plant - Buffalo Wallow
DATE OF COLLECTION 8-20 — 8-22-91 TIME 9:04 BY WHOM Don Briggs / Metric Corp
DATE OF SHIPMENT TO ASSAIGAI 8-22-91

SAMPLE IDENTIFICATION	TYPE	NUMBER OF CONTAINERS	PRESERVED	ANALYSIS REQUESTED
[redacted] -30.0 - 30.3	Grab	ONE	ICE	TRPH / BTEX / TCLP-O-M-F
BH1 - 45.2 - 45.5	Grab	ONE	ICE	TRPH / BTEX / TCLP-O-M-F
BH2 - 42.8 - 43.0	Grab	ONE	Ice	TRPH / BTEX / TCLP-O-M-F
BH2 - 51.2 - 51.4	Grab	ONE	ICE	TRPH / BTEX / TCLP-O-M-F
BH2 - [redacted] - 1.0	Grab	ONE	Ice	TRPH / BTEX / TCLP-O-M-F
BH1 - 8.8 - 9.2	Grab	ONE	Ice	TRPH
BH1 - 19.9 - 20.2	Grab	ONE	Ice	TRPH / BTEX / TCLP-O-M-F
[illegible]				
BH2 - 15.0 - 15.3	Grab	ONE	Ice	TRPH / BTEX / TCLP-O-M-F
BH2 - 30.0 - 30.3	Grab	ONE	Ice	TRPH / BTEX / TCLP-O-M-F
BH1 - 36.4 - 36.7	Grab	ONE	ICE	TRPH / BTEX / TCLP-O-M-F
BH1 - 15.0 - 15.5	Grab	ONE	ICE	TRPH / BTEX / TCLP-O-M-F

EPA METHODS REQUESTED _____

LAB CAUTION ---------- TOXIC ---------- HAZARDOUS SUBSTANCE

RELINQUISHED BY Michael N. Kneese DATE 8-22-91

RELINQUISHED BY _____ DATE _____

RECEIVED & LOGGED IN BY _____ DATE 8/23/91

ASSAIGAI
ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109

Assaigai Analytical Labs
7300 Jefferson NE
Albuquerque, NM 87109

Attn: SYED RIZVI
Phone: (505)345-8964

ENRON/TRANSWESTERN PIPELINE
HOBBS PLANT
2626 WEST MARLAND
HOBBS, NM 88240
Attn: MICHAEL KNEESE
Invoice Number: 911852

Order #: 91-08-278
Date: 09/11/91 17:20
Work ID: HOBBS PLANT 5610 8082
Date Received: 08/26/91
Date Completed: 09/11/91

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
01	BH-3 2.0 - 2.5	02	BH-3 10.5 - 10.7
03	BH-3 29.0 - 29.3	04	BH-3 30.0 - 30.3
05	BH-3 45.0 - 45.3	06	BH-4 27.9 - 38.2

Member: American Council of Independent Laboratories, Inc.

QUESTIONS ABOUT THIS REPORT SHOULD BE ADDRESSED TO:
LABORATORY OPERATIONS MANAGER/ASSAIGAI ANALYTICAL
7300 JEFFERSON N.E.,ALBUQUERQUE,N.M. 87109

Syed Rizvi

Certified By
SYED N. RIZVI

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TEST RESULTS BY SAMPLE

Sample: 01A BH-3 2.0 - 2.5 Collected: 08/22/91 13:29

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/06/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
XYLENES	<0.1	0.1	MG/KG	09/06/91	DD
TCLP F SERIES ENRON LIST		0.001			
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/09/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/09/91	SS
XYLENE	<0.02	0.02	MG/L	09/09/91	SS
ACETONE	<10	10	MG/L	09/09/91	SS
ETHYL ACETATE	<10	10	MG/L	09/09/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/09/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/09/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/09/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/09/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/09/91	SS
METHANOL	<300	300	MG/L	09/09/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/09/91	SS
TOLUENE	<0.02	0.02	MG/L	09/09/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/09/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
ISOBUTANOL	<10	10	MG/L	09/09/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/09/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/09/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	98	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	100	Min: 76	Max: 114		
TOLUENE-d8	98	Min: 88	Max: 110		
TCLP METALS		0.0002			
ARSENIC	0.008	0.005	MG/L		JB
BARIUM	0.63	0.50	MG/L		JB
CADMIUM	0.01	0.003	MG/L		JB
CHROMIUM	0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	0.0003	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST		0.001			
BENZENE	<0.02	0.02	MG/L	09/04/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/04/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/04/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/04/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/04/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/04/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/04/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/04/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
M-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/04/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/04/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
Surrogates					
NITROBENZENE-d5	100	Min: 35	Max: 114		
2-FLUOROBIPHENYL	91	Min: 43	Max: 116		
TERPHENYL-d14	109	Min: 33	Max: 141		
PHENOL-d5	76	Min: 10	Max: 94		
2-FLUOROPHENOL	73	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/10/91	PV

Sample: 02A BH-3 10.5 - 10.7 Collected: 08/22/91 14:07

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/06/91	DD

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Test Description	Result	Limit	Units	Analyzed	By
ETHYL BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
XYLENES	<0.1	0.1	MG/KG	09/06/91	DD
TCLP F SERIES ENRON LIST		0.001			
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/09/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/09/91	SS
XYLENE	<0.02	0.02	MG/L	09/09/91	SS
ACETONE	<10	10	MG/L	09/09/91	SS
ETHYL ACETATE	<10	10	MG/L	09/09/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/09/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/09/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/09/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/09/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/09/91	SS
METHANOL	<300	300	MG/L	09/09/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/09/91	SS
TOLUENE	<0.02	0.02	MG/L	09/09/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/09/91	SS
ISOBUTANOL	<10	10	MG/L	09/09/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/09/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/09/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	97	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	101	Min: 76	Max: 114		
TOLUENE-d8	99	Min: 88	Max: 110		
TCLP METALS		0.0002			

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Test Description	Result	Limit	Units	Analyzed	By
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	0.03	0.003	MG/L		JB
CHROMIUM	0.04	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST		0.001			
BENZENE	<0.02	0.02	MG/L	09/09/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/09/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/09/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/09/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/09/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/09/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/09/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/09/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/09/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/09/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/09/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/09/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/09/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/09/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/09/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/09/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/09/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/09/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/09/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/09/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/09/91	SS
Surrogates					
NITROBENZENE-d5	74	Min: 35	Max: 114		
2-FLUOROBIPHENYL	82	Min: 43	Max: 116		
TERPHENYL-d14	101	Min: 33	Max: 141		
PHENOL-d5	84	Min: 10	Max: 94		
2-FLUOROPHENOL	61	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	24	5.0	MG/KG	09/10/91	PV

Sample: 03A BH-3 4 29.0 - 29.3 Collected: 08/23/91 11:30

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/06/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
XYLENES	<0.1	0.1	MG/KG	09/06/91	DD
TCLP F SERIES ENRON LIST		0.001			
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/09/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/09/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
XYLENE	<0.02	0.02	MG/L	09/09/91	SS
ACETONE	<10	10	MG/L	09/09/91	SS
ETHYL ACETATE	<10	10	MG/L	09/09/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/09/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/09/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/09/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/09/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/09/91	SS
METHANOL	<300	300	MG/L	09/09/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/09/91	SS
TOLUENE	<0.02	0.02	MG/L	09/09/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/09/91	SS
ISOBUTANOL	<10	10	MG/L	09/09/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/09/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/09/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	96	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	101	Min: 76	Max: 114		
TOLUENE-d8	98	Min: 88	Max: 110		
TCLP METALS		0.0002			
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	0.01	0.003	MG/L		JB
CHROMIUM	<0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB

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Test Description	Result	Limit	Units	Analyzed	By
TCLP ORGANICS ENRON LIST		0.001			
BENZENE	<0.02	0.02	MG/L	09/04/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/04/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/04/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/04/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/04/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/04/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/04/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/04/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/04/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
Surrogates					
NITROBENZENE-d5	95	Min: 35	Max: 114		
2-FLUOROBIPHENYL	93	Min: 43	Max: 116		
TERPHENYL-d14	110	Min: 33	Max: 141		
PHENOL-d5	86	Min: 10	Max: 94		
2-FLUOROPHENOL	90	Min: 21	Max: 100		

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Test Description	Result	Limit	Units	Analyzed	By
TOTAL REC PET HYDROCARBONS	28	5.0	MG/KG	09/10/91	PV

Sample: 04A BH-3 30.0 - 30.3 Collected: 08/22/91 15:29

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/06/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
XYLENES	<0.1	0.1	MG/KG	09/06/91	DD
TCLP F SERIES ENRON LIST		0.001			
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/09/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/09/91	SS
XYLENE	<0.02	0.02	MG/L	09/09/91	SS
ACETONE	<10	10	MG/L	09/09/91	SS
ETHYL ACETATE	<10	10	MG/L	09/09/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/09/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/09/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/09/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/09/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/09/91	SS
METHANOL	<300	300	MG/L	09/09/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/09/91	SS
TOLUENE	<0.02	0.02	MG/L	09/09/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/09/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
ISOBUTANOL	<10	10	MG/L	09/09/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/09/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/09/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	99	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	100	Min: 76	Max: 114		
TOLUENE-d8	99	Min: 88	Max: 110		
TCLP METALS		0.0002			
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	0.02	0.003	MG/L		JB
CHROMIUM	0.03	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	0.0003	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	0.012	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST		0.001			
BENZENE	<0.02	0.02	MG/L	09/04/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/04/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/04/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/04/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/04/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/04/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/04/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/04/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
M-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/04/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/04/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
Surrogates					
NITROBENZENE-d5	98	Min: 35	Max: 114		
2-FLUOROBIPHENYL	96	Min: 43	Max: 116		
TERPHENYL-d14	122	Min: 33	Max: 141		
PHENOL-d5	87	Min: 10	Max: 94		
2-FLUOROPHENOL	84	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	36	5.0	MG/KG	09/10/91	PV

Sample: 05A BH-3 45.0 - 45.3 Collected: 08/22/91 16:31

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/06/91	DD

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Test Description	Result	Limit	Units	Analyzed	By
ETHYL BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
XYLENES	<0.1	0.1	MG/KG	09/06/91	DD
TCLP F SERIES ENRON LIST		0.001			
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/09/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/09/91	SS
XYLENE	<0.02	0.02	MG/L	09/09/91	SS
ACETONE	<10	10	MG/L	09/09/91	SS
ETHYL ACETATE	<10	10	MG/L	09/09/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/09/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/09/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/09/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/09/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/09/91	SS
METHANOL	<300	300	MG/L	09/09/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/09/91	SS
TOLUENE	<0.02	0.02	MG/L	09/09/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/09/91	SS
ISOBUTANOL	<10	10	MG/L	09/09/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/09/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/09/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	98	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	102	Min: 76	Max: 114		
TOLUENE-d8	97	Min: 88	Max: 110		
TCLP METALS		0.0002			

Test Description	Result	Limit	Units	Analyzed	By
ARSENIC	0.012	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	0.012	0.003	MG/L		JB
CHROMIUM	<0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	0.0003	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST		0.001			
BENZENE	<0.02	0.02	MG/L	09/04/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/04/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/04/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/04/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/04/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/04/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/04/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/04/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/04/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/04/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
Surrogates					
NITROBENZENE-d5	90	Min: 35	Max: 114		
2-FLUOROBIPHENYL	88	Min: 43	Max: 116		
TERPHENYL-d14	101	Min: 33	Max: 141		
PHENOL-d5	82	Min: 10	Max: 94		
2-FLUOROPHENOL	82	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	20	5.0	MG/KG	09/10/91	PV

Sample: 06A BH-4 ~~27.9~~ 37.9 - 38.2 Collected: 08/23/91 12:00

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/06/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/06/91	DD
XYLENES	<0.1	0.1	MG/KG	09/06/91	DD
TCLP F SERIES ENRON LIST		0.001			
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/09/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/09/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
XYLENE	<0.02	0.02	MG/L	09/09/91	SS
ACETONE	<10	10	MG/L	09/09/91	SS
ETHYL ACETATE	<10	10	MG/L	09/09/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/09/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/09/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/09/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/09/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/09/91	SS
METHANOL	<300	300	MG/L	09/09/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/09/91	SS
TOLUENE	<0.02	0.02	MG/L	09/09/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/09/91	SS
ISOBUTANOL	<10	10	MG/L	09/09/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/09/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/09/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	99	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	102	Min: 76	Max: 114		
TOLUENE-d8	99	Min: 88	Max: 110		
TCLP METALS		0.0002			
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	0.025	0.003	MG/L		JB
CHROMIUM	0.04	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	0.012	0.010	MG/L		JB

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Test Description	Result	Limit	Units	Analyzed	By
TCLP ORGANICS ENRON LIST		0.001			
BENZENE	<0.02	0.02	MG/L	09/04/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/04/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/04/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/04/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/04/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/04/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/04/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/04/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/04/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/04/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/04/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/04/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/04/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/04/91	SS
Surrogates					
NITROBENZENE-d5	95	Min: 35	Max: 114		
2-FLUOROBIPHENYL	96	Min: 43	Max: 116		
TERPHENYL-d14	123	Min: 33	Max: 141		
PHENOL-d5	80	Min: 10	Max: 94		
2-FLUOROPHENOL	84	Min: 21	Max: 100		

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Test Description	Result	Limit	Units	Analyzed	By
TOTAL REC PET HYDROCARBONS	20	5.0	MG/KG	09/10/91	PV

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REGULAR TEST RESULTS BY TEST

TOTAL REC PET HYDROCARBONS **Minimum: 5.0** **Maximum: 100**
Method: EPA 418.1

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01A	BH-3 2.0 - 2.5	<5.0	MG/KG	09/10/91	09/10/91	PV
02A	BH-3 10.5 - 10.7	24	MG/KG	09/10/91	09/10/91	PV
03A	BH-3 29.0 - 29.3	28	MG/KG	09/10/91	09/10/91	PV
04A	BH-3 30.0 - 30.3	36	MG/KG	09/10/91	09/10/91	PV
05A	BH-3 45.0 - 45.3	20	MG/KG	09/10/91	09/10/91	PV
06A	BH-4 27.9 - 38.2	20	MG/KG	09/10/91	09/10/91	PV

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TEST METHODOLOGIES

TCLP METALS: USEPA 200 SERIES METHODOLOGY

TCLP EXTRACTION: USEPA METHOD # 1311

BENZENE, TOLUENE, ETHYLBENZENE, XYLENES: USEPA METHOD # 602/8020

USEPA METHOD # 418.1

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TRANSWESTERN PIPELINE/ENRON
CLIENT LOG-IN PROBLEMS/INCONSISTENCIES

DATE RECEIVED: 8/20/91 WO #: 8082

DISTRICT: Hobbs 5160 CONTACT: Mike Kneese

PROBLEMS/INCONSISTENCIES ON CHAIN OF CUSTODY(COC):

NO CHAIN OF CUSTODY INCLUDED WITH SAMPLES..... ☐

DISTRICT LEFT BLANK..... ☐

DATE SAMPLED LEFT BLANK..... ☒

NO ANALYTES REQUESTED..... ☐

ILLEGIBLE HANDWRITING..... ☐

SAMPLE SITE LEFT BLANK..... ☒

TURN AROUND TIME NOT INDICATED..... ☒

SAMPLE ID ON CONTAINER & COC INCONSISTENT..... ☐

CHAIN OF CUSTODY NOT RELINQUISHED..... ☐

SAMPLES RECEIVED DAMAGED..... ☐

SAMPLES RECEIVED UNSEALED..... ☐

COMMENTS: Also - No Sampler Indicated -

SAMPLES LOGGED IN BY: CJ King

TRANSWESTERN PIPELINE COMPANY

CHAIN OF CUSTODY

District: Hobbs 5160 Date: 8-23-91

Sample Location Valve or Receiver No.	Vol. Collect. During Flush	Sampler

SAMPLE ID NUMBER	SOLVENT USED	SAMPLE ICED	ANALYSES REQUESTED
BH-3 10.5-10.7	NO	Yes	TRPH/BTEX/TCLP-O-M-F
BH-3 2.0-2.5	NO	Yes	TRPH/BTEX/TCLP-O-M-F
BH-3 29.0-29.3	NO	Yes	TRPH/BTEX/TCLP-O-M-F
BH-3 45.0-45.3	NO	Yes	TRPH/BTEX/TCLP-O-M-F
BH-4 37.9-38.2	No	Yes	TRPH/BTEX/TCLP-O-M-F
BH-3 30.0-30.03	No	Yes	TRPH/BTEX/TCLP-O-M-F

Relinquished By Michael P. Kuce Date 8-23-91
Relinquished To Assaigai Analytical Date 8-23-91

Relinquished By _____ Date _____
Relinquished To _____ Date _____

Relinquished By _____ Date _____
Relinquished To _____ Date _____

Relinquished By _____ Date _____
Relinquished By _____ Date _____

Laboratory: Assaigai
Received: _____ Date 8/26/91

ASSAIGAI ANALYTICAL LABORATORIES

WORK ORDER 8082

☐ HAZARDOUS ☐ NON-HAZARDOUS	DATE RECEIVED 8/26/91	ESTIMATED COST
CUSTOMER P.O. NUMBER	TIME RECEIVED 10:00	DUE DATE 9/10/91

ACCOUNT INFORMATION

CUSTOMER'S NAME Enron / Transwestern	CONTACT Mike Beaver
ADDRESS	PHONE NUMBER 397-6000
CITY / STATE / ZIP	

PARTY RESPONSIBLE FOR PAYMENT IF OTHER THAN ABOVE

NAME	CONTACT
ADDRESS	PHONE NUMBER
CITY / STATE / ZIP	

ACCOUNT STATUS

PAYMENT REC'D. ____
OPEN ACCOUNT ✓
CASH ____
CHECK NUMBER ____

SPECIAL BILLING INSTRUCTIONS

SAMPLE INFORMATION

TYPE OF SAMPLE	NO. OF SAMPLES	*TURN AROUND TIME	SAMPLE IDENTIFICATION AND / OR SAMPLE SITE
☐ WATER ☒ SOIL ☐ OIL ☐ SLUDGE ☐ OTHER	6 NO. OF CONTAINERS 6	☒ REGULAR (10 WKG DAYS) ☐ RUSH (3 DAYS) ☐ EMERGENCY (STAT) *(SUBJECT TO WORK LOG)	Hobbs 5160

SAMPLE DELIVERED BY Fed X | SIGNATURE | DATE 8/26/91

ANALYSIS REQUEST

WORK DESCRIPTION

TRPH-S BTEX TCLP-0, TCLP-2, TCLP-F, TCLP-6, TCLP-Z

SPECIAL INSTRUCTIONS

BILLING: ☐ PICKUP ☐ MAIL | LOGGED IN BY

7300 Jefferson NE • Albuquerque, New Mexico 87109 • (505) 345-8964 • FAX (505) 345-7259

Assaigai Analytical Labs
7300 Jefferson NE
Albuquerque, NM 87109

Attn: SYED RIZVI
Phone: (505)345-8964

ENRON/TRANSWESTERN PIPELINE
HOBBS PLANT
2626 WEST MARLAND
HOBBS, NM 88240
Attn: MICHAEL KNEESE
Invoice Number: 911916

Order #: 91-08-336
Date: 09/18/91 09:52
Work ID: HOBBS 5160 8132
Date Received: 08/30/91
Date Completed: 09/17/91

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	BH-5 0-2.0
03	BH-5 18.9 - 19.5
05	BH-6 46.0 - 46.3
07	BH-7 11.4 - 11.7

Sample Number	Sample Description
02	BH-6 0 - 2.0
04	BH-6 33.0 - 33.5
06	BH-7 0 - 2.4
08	BH-8 21.4 - 21.7

QUESTIONS ABOUT THIS REPORT SHOULD BE ADDRESSED TO:
LABORATORY OPERATIONS MANAGER/ASSAIGAI ANALYTICAL
7300 JEFFERSON N.E.,ALBUQUERQUE,N.M. 87109

Syed Rizvi

Certified By
SYED N. RIZVI

ASSAIGAI
ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109

TEST RESULTS BY SAMPLE

Sample: 01A BH-5 0-2.0 **Collected: 08/26/91 16:37**

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/13/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/13/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/13/91	DD
XYLENES	<0.1	0.1	MG/KG	09/13/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.1	0.1	MG/L	09/09/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.1	0.1	MG/L	09/09/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/09/91	SS
XYLENE	<0.02	0.02	MG/L	09/09/91	SS
ACETONE	<10	10	MG/L	09/09/91	SS
ETHYL ACETATE	<10	10	MG/L	09/09/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/09/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/09/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/09/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/09/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/09/91	SS
METHANOL	<10	10	MG/L	09/09/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/09/91	SS
TOLUENE	<0.02	0.02	MG/L	09/09/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/09/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
ISOBUTANOL	<10	10	MG/L	09/09/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/09/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/09/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	95	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	102	Min: 76	Max: 114		
TOLUENE-d8	99	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	0.016	0.005	MG/L		JC
BARIUM	<0.50	0.50	MG/L		JC
CADMIUM	<0.003	0.003	MG/L		JC
CHROMIUM	<0.02	0.02	MG/L		JC
LEAD	<0.10	0.10	MG/L		JC
MERCURY	0.0005	0.0002	MG/L		JC
SELENIUM	<0.005	0.005	MG/L		JC
SILVER	<0.010	0.010	MG/L		JC
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/12/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/12/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/12/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/12/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/12/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/12/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/12/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/12/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/12/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/12/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/12/91	SS

Test Description	Result	c	Limit	Units	Analyzed	By
M-CRESOL	<0.001		0.001	MG/L	09/12/91	SS
P-CRESOL	<0.001		0.001	MG/L	09/12/91	SS
1,4-DICHLOROBENZENE	<0.001		0.001	MG/L	09/12/91	SS
2,4-DINITROTOLUENE	<0.001		0.001	MG/L	09/12/91	SS
HEXACHLOROBENZENE	<0.001		0.001	MG/L	09/12/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001		0.001	MG/L	09/12/91	SS
HEXACHLOROETHANE	<0.001		0.001	MG/L	09/12/91	SS
NITROBENZENE	<0.001		0.001	MG/L	09/12/91	SS
PENTACHLOROPHENOL	<0.001		0.001	MG/L	09/12/91	SS
PYRIDINE	<0.001		0.001	MG/L	09/12/91	SS
2,4,5-TRICHLOROPHENOL	<0.001		0.001	MG/L	09/12/91	SS
2,4,6-TRICHLOROPHENOL	<0.001		0.001	MG/L	09/12/91	SS
Surrogates						
NITROBENZENE-d5	70		Min: 35	Max: 114		
2-FLUOROBIPHENYL	72		Min: 43	Max: 116		
TERPHENYL-d14	74		Min: 33	Max: 141		
PHENOL-d5	53		Min: 10	Max: 94		
2-FLUOROPHENOL	60		Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	8.0		5.0	MG/KG	09/16/91	PV

Sample: 02A BH-6 0 - 2.0 **Collected: 08/29/91 11:30**

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/13/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/13/91	DD

Test Description	Result	Limit	Units	Analyzed	By
ETHYL BENZENE	<0.1	0.1	MG/KG	09/13/91	DD
XYLENES	<0.1	0.1	MG/KG	09/13/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.1	0.1	MG/L	09/09/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.1	0.1	MG/L	09/09/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/09/91	SS
XYLENE	<0.02	0.02	MG/L	09/09/91	SS
ACETONE	<10	10	MG/L	09/09/91	SS
ETHYL ACETATE	<10	10	MG/L	09/09/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/09/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/09/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/09/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/09/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/09/91	SS
METHANOL	<10	10	MG/L	09/09/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/09/91	SS
TOLUENE	<0.02	0.02	MG/L	09/09/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/09/91	SS
ISOBUTANOL	<10	10	MG/L	09/09/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/09/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/09/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	94	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	101	Min: 76	Max: 114		
TOLUENE-d8	100	Min: 88	Max: 110		
TCLP METALS					

Test Description	Result	Limit	Units	Analyzed	By
ARSENIC	0.005	0.005	MG/L		JC
BARIUM	<0.50	0.50	MG/L		JC
CADMIUM	<0.003	0.003	MG/L		JC
CHROMIUM	<0.02	0.02	MG/L		JC
LEAD	<0.10	0.10	MG/L		JC
MERCURY	<0.0002	0.0002	MG/L		JC
SELENIUM	<0.005	0.005	MG/L		JC
SILVER	<0.010	0.010	MG/L		JC
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/12/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/12/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/12/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/12/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/12/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/12/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/12/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/12/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/12/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/12/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/12/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/12/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/12/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/12/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/12/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/12/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/12/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/12/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/12/91	SS

Test Description	Result	Limit	Units	Analyzed	By
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/12/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/12/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/12/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/12/91	SS
Surrogates					
NITROBENZENE-d5		Min:	Max:		
2-FLUOROBIPHENYL		Min:	Max:		
TERPHENYL-d14		Min:	Max:		
PHENOL-d5		Min:	Max:		
2-FLUOROPHENOL		Min:	Max:		
TOTAL REC PET HYDROCARBONS	68	5.0	MG/KG	09/16/91	PV

Sample: 03A BH-5 (6) 18.9 - 19.5 Collected: 08/27/91 13:45

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/13/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/13/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/13/91	DD
XYLENES	<0.1	0.1	MG/KG	09/13/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.1	0.1	MG/L	09/09/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.1	0.1	MG/L	09/09/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/09/91	SS

Test Description	Result	Limit	Units	Analyzed	By
XYLENE	<0.02	0.02	MG/L	09/09/91	SS
ACETONE	<10	10	MG/L	09/09/91	SS
ETHYL ACETATE	<10	10	MG/L	09/09/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/09/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/09/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/09/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/09/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/09/91	SS
METHANOL	<10	10	MG/L	09/09/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/09/91	SS
TOLUENE	<0.02	0.02	MG/L	09/09/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/09/91	SS
ISOBUTANOL	<10	10	MG/L	09/09/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/09/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/09/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	95	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	102	Min: 76	Max: 114		
TOLUENE-d8	100	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JC
BARIUM	<0.50	0.50	MG/L		JC
CADMIUM	<0.003	0.003	MG/L		JC
CHROMIUM	<0.02	0.02	MG/L		JC
LEAD	<0.10	0.10	MG/L		JC
MERCURY	<0.0002	0.0002	MG/L		JC
SELENIUM	<0.005	0.005	MG/L		JC
SILVER	<0.010	0.010	MG/L		JC

Test Description	Result	Limit	Units	Analyzed	By
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/12/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/12/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/12/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/12/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/12/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/12/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/12/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/12/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/12/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/12/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/12/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/12/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/12/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/12/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/12/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/12/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/12/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/12/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/12/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/12/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/12/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/12/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/12/91	SS
Surrogates					
NITROBENZENE-d5	60	Min: 35	Max: 114		
2-FLUOROBIPHENYL	63	Min: 43	Max: 116		
TERPHENYL-d14	56	Min: 33	Max: 141		
PHENOL-d5	52	Min: 10	Max: 94		
2-FLUOROPHENOL	61	Min: 21	Max: 100		

Test Description	Result	Limit	Units	Analyzed	By
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/16/91	PV

Sample: 04A BH-6 33.0 - 33.5 Collected: 08/27/91 14:50

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/13/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/13/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/13/91	DD
XYLENES	<0.1	0.1	MG/KG	09/13/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.1	0.1	MG/L	09/09/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.1	0.1	MG/L	09/09/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/09/91	SS
XYLENE	<0.02	0.02	MG/L	09/09/91	SS
ACETONE	<10	10	MG/L	09/09/91	SS
ETHYL ACETATE	<10	10	MG/L	09/09/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/09/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/09/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/09/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/09/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/09/91	SS
METHANOL	<10	10	MG/L	09/09/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/09/91	SS
TOLUENE	<0.02	0.02	MG/L	09/09/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/09/91	SS

Test Description	Result	Limit	Units	Analyzed	By
ISOBUTANOL	<10	10	MG/L	09/09/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/09/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/09/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	95	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	105	Min: 76	Max: 114		
TOLUENE-d8	100	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JC
BARIUM	<0.50	0.50	MG/L		JC
CADMIUM	<0.003	0.003	MG/L		JC
CHROMIUM	<0.02	0.02	MG/L		JC
LEAD	<0.10	0.10	MG/L		JC
MERCURY	0.0002	0.0002	MG/L		JC
SELENIUM	<0.005	0.005	MG/L		JC
SILVER	<0.010	0.010	MG/L		JC
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/12/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/12/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/12/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/12/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/12/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/12/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/12/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/12/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/12/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/12/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/12/91	SS

Test Description	Result	Limit	Units	Analyzed	By
M-CRESOL	<0.001	0.001	MG/L	09/12/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/12/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/12/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/12/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/12/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/12/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/12/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/12/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/12/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/12/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/12/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/12/91	SS
Surrogates					
NITROBENZENE-d5	72	Min: 35	Max: 114		
2-FLUOROBIPHENYL	66	Min: 43	Max: 116		
TERPHENYL-d14	91	Min: 33	Max: 141		
PHENOL-d5	59	Min: 10	Max: 94		
2-FLUOROPHENOL	53	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	1300	5.0	MG/KG	09/16/91	PV

Sample: 05A BH-6 46.0 - 46.3 Collected: 08/27/91 15:44

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/13/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/13/91	DD

Test Description	Result	Limit	Units	Analyzed	By
ETHYL BENZENE	<0.1	0.1	MG/KG	09/13/91	DD
XYLENES	<0.1	0.1	MG/KG	09/13/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.1	0.1	MG/L	09/09/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.1	0.1	MG/L	09/09/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/09/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/09/91	SS
XYLENE	<0.02	0.02	MG/L	09/09/91	SS
ACETONE	<10	10	MG/L	09/09/91	SS
ETHYL ACETATE	<10	10	MG/L	09/09/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/09/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/09/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/09/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/09/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/09/91	SS
METHANOL	<10	10	MG/L	09/09/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/09/91	SS
TOLUENE	<0.02	0.02	MG/L	09/09/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/09/91	SS
ISOBUTANOL	<10	10	MG/L	09/09/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/09/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/09/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	95	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	105	Min: 76	Max: 114		
TOLUENE-d8	99	Min: 88	Max: 110		
TCLP METALS					

Test Description	Result	Limit	Units	Analyzed	By
ARSENIC	0.005	0.005	MG/L		JC
BARIUM	<0.50	0.50	MG/L		JC
CADMIUM	<0.003	0.003	MG/L		JC
CHROMIUM	<0.02	0.02	MG/L		JC
LEAD	<0.10	0.10	MG/L		JC
MERCURY	0.0002	0.0002	MG/L		JC
SELENIUM	<0.005	0.005	MG/L		JC
SILVER	<0.010	0.010	MG/L		JC
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/15/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/15/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/15/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/15/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/15/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/15/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/15/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/15/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/15/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/15/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/15/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/15/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/15/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/15/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/15/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/15/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/15/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/15/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/15/91	SS

Test Description	Result	Limit	Units	Analyzed	By
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/15/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/15/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/15/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/15/91	SS
Surrogates					
NITROBENZENE-d5	80	Min: 35	Max: 114		
2-FLUOROBIPHENYL	75	Min: 43	Max: 116		
TERPHENYL-d14	74	Min: 33	Max: 141		
PHENOL-d5	62	Min: 10	Max: 94		
2-FLUOROPHENOL	51	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/16/91	PV

Sample: 06A BH-7 0 - 2.4 **Collected: 08/27/91 17:42**

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/13/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/13/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/13/91	DD
XYLENES	<0.1	0.1	MG/KG	09/13/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.1	0.1	MG/L	09/17/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/17/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.1	0.1	MG/L	09/17/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/17/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/17/91	SS

Test Description	Result	Limit	Units	Analyzed	By
XYLENE	<0.02	0.02	MG/L	09/17/91	SS
ACETONE	<10	10	MG/L	09/17/91	SS
ETHYL ACETATE	<10	10	MG/L	09/17/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/17/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/17/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/17/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/17/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/17/91	SS
METHANOL	<10	10	MG/L	09/17/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/17/91	SS
TOLUENE	<0.02	0.02	MG/L	09/17/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/17/91	SS
ISOBUTANOL	<10	10	MG/L	09/17/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/17/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/17/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	94	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	78	Min: 76	Max: 114		
TOLUENE-d8	101	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JC
BARIUM	<0.50	0.50	MG/L		JC
CADMIUM	<0.003	0.003	MG/L		JC
CHROMIUM	0.05	0.02	MG/L		JC
LEAD	<0.10	0.10	MG/L		JC
MERCURY	0.0003	0.0002	MG/L		JC
SELENIUM	<0.005	0.005	MG/L		JC
SILVER	<0.010	0.010	MG/L		JC

Test Description	Result	Limit	Units	Analyzed	By
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/15/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/15/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/15/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/15/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/15/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/15/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/15/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/15/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/15/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/15/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/15/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/15/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/15/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/15/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/15/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/15/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/15/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/15/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/15/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/15/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/15/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/15/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/15/91	SS
Surrogates					
NITROBENZENE-d5	62	Min: 35	Max: 114		
2-FLUOROBIPHENYL	57	Min: 43	Max: 116		
TERPHENYL-d14	41	Min: 33	Max: 141		
PHENOL-d5	58	Min: 10	Max: 94		
2-FLUOROPHENOL	69	Min: 21	Max: 100		

Test Description	Result	Limit	Units	Analyzed	By
TOTAL REC PET HYDROCARBONS	6200	5.0	MG/KG	09/16/91	PV

Sample: 07A BH-7 11.4 - 11.7 Collected: 08/28/91 08:00

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/14/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/14/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/14/91	DD
XYLENES	<0.1	0.1	MG/KG	09/14/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.1	0.1	MG/L	09/17/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/17/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.1	0.1	MG/L	09/17/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/17/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/17/91	SS
XYLENE	<0.02	0.02	MG/L	09/17/91	SS
ACETONE	<10	10	MG/L	09/17/91	SS
ETHYL ACETATE	<10	10	MG/L	09/17/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/17/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/17/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/17/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/17/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/17/91	SS
METHANOL	<10	10	MG/L	09/17/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/17/91	SS
TOLUENE	<0.02	0.02	MG/L	09/17/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/17/91	SS

Test Description	Result	Limit	Units	Analyzed	By
ISOBUTANOL	<10	10	MG/L	09/17/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/17/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/17/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	96	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	74 Q	Min: 76	Max: 114		
TOLUENE-d8	101	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	0.013	0.005	MG/L		JC
BARIUM	<0.50	0.50	MG/L		JC
CADMIUM	<0.003	0.003	MG/L		JC
CHROMIUM	<0.02	0.02	MG/L		JC
LEAD	<0.10	0.10	MG/L		JC
MERCURY	0.0003	0.0002	MG/L		JC
SELENIUM	<0.005	0.005	MG/L		JC
SILVER	<0.010	0.010	MG/L		JC
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/15/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/15/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/15/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/15/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/15/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/15/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/15/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/15/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/15/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/15/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/15/91	SS

Test Description	Result	Limit	Units	Analyzed	By
M-CRESOL	<0.001	0.001	MG/L	09/15/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/15/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/15/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/15/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/15/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/15/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/15/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/15/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/15/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/15/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/15/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/15/91	SS
Surrogates					
NITROBENZENE-d5	78	Min: 35	Max: 114		
2-FLUOROBIPHENYL	69	Min: 43	Max: 116		
TERPHENYL-d14	73	Min: 33	Max: 141		
PHENOL-d5	64	Min: 10	Max: 94		
2-FLUOROPHENOL	73	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/16/91	PV

Sample: 08A BH-8 21.4 - 21.7 Collected: 08/28/91 10:15

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/14/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/14/91	DD

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Test Description	Result	Limit	Units	Analyzed	By
ETHYL BENZENE	<0.1	0.1	MG/KG	09/14/91	DD
XYLENES	<0.1	0.1	MG/KG	09/14/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.1	0.1	MG/L	09/17/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/17/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.1	0.1	MG/L	09/17/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/17/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/17/91	SS
XYLENE	<0.02	0.02	MG/L	09/17/91	SS
ACETONE	<10	10	MG/L	09/17/91	SS
ETHYL ACETATE	<10	10	MG/L	09/17/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/17/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/17/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/17/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/17/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/17/91	SS
METHANOL	<10	10	MG/L	09/17/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/17/91	SS
TOLUENE	<0.02	0.02	MG/L	09/17/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/17/91	SS
ISOBUTANOL	<10	10	MG/L	09/17/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/17/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/17/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	94	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	74 Q	Min: 76	Max: 114		
TOLUENE-d8	97	Min: 88	Max: 110		
TCLP METALS					

Test Description	Result	Limit	Units	Analyzed	By
ARSENIC	<0.005	0.005	MG/L		JC
BARIUM	<0.50	0.50	MG/L		JC
CADMIUM	<0.003	0.003	MG/L		JC
CHROMIUM	<0.02	0.02	MG/L		JC
LEAD	<0.10	0.10	MG/L		JC
MERCURY	0.0003	0.0002	MG/L		JC
SELENIUM	<0.005	0.005	MG/L		JC
SILVER	<0.010	0.010	MG/L		JC
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/15/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/15/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/15/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/15/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/15/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/15/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/15/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/15/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/15/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/15/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/15/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/15/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/15/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/15/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/15/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/15/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/15/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/15/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/15/91	SS

Test Description	Result	Limit	Units	Analyzed	By
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/15/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/15/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/15/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/15/91	SS
Surrogates					
NITROBENZENE-d5	60	Min: 35	Max: 114		
2-FLUOROBIPHENYL	50	Min: 43	Max: 116		
TERPHENYL-d14	47	Min: 33	Max: 141		
PHENOL-d5	42	Min: 10	Max: 94		
2-FLUOROPHENOL	46	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/16/91	PV

REGULAR TEST RESULTS BY TEST

TOTAL REC PET HYDROCARBONS **Minimum: 5.0** **Maximum: 100**
Method: EPA 418.1

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01A	BH-5 0-2.0	8.0	MG/KG	09/16/91	09/16/91	PV
02A	BH-6 0 - 2.0	68	MG/KG	09/16/91	09/16/91	PV
03A	BH-5 18.9 - 19.5	<5.0	MG/KG	09/16/91	09/16/91	PV
04A	BH-6 33.0 - 33.5	1300	MG/KG	09/16/91	09/16/91	PV
05A	BH-6 46.0 - 46.3	<5.0	MG/KG	09/16/91	09/16/91	PV
06A	BH-7 0 - 2.4	6200	MG/KG	09/16/91	09/16/91	PV
07A	BH-7 11.4 - 11.7	<5.0	MG/KG	09/16/91	09/16/91	PV
08A	BH-8 21.4 - 21.7	<5.0	MG/KG	09/16/91	09/16/91	PV

TEST METHODOLOGIES

TCLP METALS: USEPA 200 SERIES METHODOLOGY

TCLP EXTRACTION: USEPA METHOD # 1311

BENZENE, TOLUENE, ETHYLBENZENE, XYLENES: USEPA METHOD # 602/8020

USEPA METHOD # 418.1

ASSAIGAI ANALYTICAL LABORATORIES

WORK ORDER 8132

☐ HAZARDOUS ☐ NON-HAZARDOUS	DATE RECEIVED 8/30/91	ESTIMATED COST
CUSTOMER P.O. NUMBER	TIME RECEIVED 10:30	DUE DATE 9/16/91

ACCOUNT INFORMATION

CUSTOMER'S NAME Enron/TOTC	CONTACT Michael Greene
ADDRESS	PHONE NUMBER
CITY / STATE / ZIP	

PARTY RESPONSIBLE FOR PAYMENT IF OTHER THAN ABOVE

NAME	CONTACT
ADDRESS	PHONE NUMBER
CITY / STATE / ZIP	

SPECIAL BILLING INSTRUCTIONS

ACCOUNT STATUS

PAYMENT REC'D. ____
OPEN ACCOUNT tcv
CASH ____
CHECK NUMBER ____

SAMPLE INFORMATION

TYPE OF SAMPLE	NO. OF SAMPLES	*TURN AROUND TIME	SAMPLE IDENTIFICATION AND / OR SAMPLE SITE
☐ WATER ☑ SOIL ☐ OIL ☐ SLUDGE ☐ OTHER	8 NO. OF CONTAINERS 8	☑ REGULAR (10 WKG DAYS) ☐ RUSH (3 DAYS) ☐ EMERGENCY (STAT) *(SUBJECT TO WORK LOG)	Hobbs S160

SAMPLE DELIVERED BY: UPS NEXT DAY
SIGNATURE
DATE 8/30/91

ANALYSIS REQUEST

WORK DESCRIPTION: TKPH, BTEX, TCLP-6, TCLP-8, TCLP-1, TCLP-E, TCLP-Z

SPECIAL INSTRUCTIONS

BILLING: ☐ PICKUP ☐ MAIL

LOGGED IN BY

300 Jefferson NE • Albuquerque, New Mexico 87109 • (505) 345-8964 • FAX (505) 345-7259

TRANSWESTERN PIPELINE COMPANY

CHAIN OF CUSTODY

District: Hobbs 5160 Date: 8/29/91

Sample Location Valve or Receiver No.	Vol. Collect. During Flush	Sampler

SAMPLE ID NUMBER	SOLVENT USED	SAMPLE ICED	ANALYSES REQUESTED
BH-5-0-2.0	—	Yes	TRPH/BTEX/TCLP-OM-F
BH-6-0-2.0	—	Yes	TRPH/BTEX/TCLP-O-M-F
BH-6-18.9-19.5	—	Yes	TRPH/BTEX/TCLP-O-M-F
BH-6-33.0-33.5	—	Yes	TRPH/BTEX/TCLP-O-M-F
BH-6-46.0-46.3	—	Yes	TRPH/BTEX/TCLP-O-M-F
BH-7-0-2.4	—	Yes	TRPH/BTEX/TCLP-O-M-F
BH-7-11.4-11.7	—	Yes	TRPH/BTEX/TCLP-O-M-F
BH-8-21.5-21.7	—	Yes	TRPH/BTEX/TCLP-O-M-F

Relinquished By Michael Kneese Date 8/29/91
Relinquished To Assaigai Analytical Date 8/29/91

Relinquished By _____ Date _____
Relinquished To _____ Date _____

Relinquished By _____ Date _____
Relinquished To _____ Date _____

Relinquished By _____ Date _____
Relinquished By _____ Date _____

Laboratory: Assaigai Labs
Received: _____ Date 8/30/91

ASSAIGAI
ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109

Assaigai Analytical Labs
7300 Jefferson NE
Albuquerque, NM 87109

Attn: SYED RIZVI
Phone: (505)345-8964

ENRON/TRANSWESTERN PIPELINE
HOBBS PLANT
2626 WEST MARLAND
HOBBS, NM 88240
Attn: MICHAEL KNEESE
Invoice Number: 912093

Order #: 91-09-187
Date: 09/30/91 17:13
Work ID: HOBBS 5160 8293
Date Received: 09/18/91
Date Completed: 09/30/91

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
01	BH-9 22.7 - 23.4	02	BH-9 44.2 - 44.5
03	BH-10 19.6 - 19.9	04	BH-11 45.2 - 45.4
05	BH-12 44.2 - 44.4	06	BH-13 9.4 - 9.6
07	BH-13 15.3 - 15.5	08	BH-13 35.0 - 35.2
09	BH-13 46.6 - 47.1		

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QUESTIONS ABOUT THIS REPORT SHOULD BE ADDRESSED TO:
LABORATORY OPERATIONS MANAGER/ASSAIGAI ANALYTICAL
7300 JEFFERSON N.E.,ALBUQUERQUE,N.M. 87109

Syed Rizvi

Certified By
SYED N. RIZVI

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TEST RESULTS BY SAMPLE

Sample: 01A BH-9 22.7 - 23.4 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/27/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/27/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/27/91	DD
XYLENES	<0.1	0.1	MG/KG	09/27/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/25/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/25/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/25/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/25/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/25/91	SS
XYLENE	<0.02	0.02	MG/L	09/25/91	SS
ACETONE	<10	10	MG/L	09/25/91	SS
ETHYL ACETATE	<10	10	MG/L	09/25/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/25/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/25/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/25/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/25/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/25/91	SS
METHANOL	<20	20	MG/L	09/25/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/25/91	SS
TOLUENE	<0.02	0.02	MG/L	09/25/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/25/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
ISOBUTANOL	<10	10	MG/L	09/25/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/25/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/25/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	92	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	108	Min: 76	Max: 114		
TOLUENE-d8	101	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	0.03	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/27/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/27/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/27/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/27/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/27/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/27/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/27/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/27/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
M-CRESOL	<0.001	0.001	MG/L	09/27/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/27/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/27/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/27/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/27/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/27/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
Surrogates					
NITROBENZENE-d5	82	Min: 23	Max: 120		
2-FLUOROBIPHENYL	76	Min: 30	Max: 115		
TERPHENYL-d14	50	Min: 18	Max: 137		
PHENOL-d5	93	Min: 24	Max: 113		
2-FLUOROPHENOL	103	Min: 25	Max: 121		
TOTAL REC PET HYDROCARBONS	8.0	5.0	MG/KG	09/24/91	PV

Sample: 02A BH-9 44.2 - 44.5 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/27/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/27/91	DD

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Test Description	Result	Limit	Units	Analyzed	By
ETHYL BENZENE	<0.1	0.1	MG/KG	09/27/91	DD
XYLENES	<0.1	0.1	MG/KG	09/27/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/25/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/25/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/25/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/25/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/25/91	SS
XYLENE	<0.02	0.02	MG/L	09/25/91	SS
ACETONE	<10	10	MG/L	09/25/91	SS
ETHYL ACETATE	<10	10	MG/L	09/25/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/25/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/25/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/25/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/25/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/25/91	SS
METHANOL	<20	20	MG/L	09/25/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/25/91	SS
TOLUENE	<0.02	0.02	MG/L	09/25/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/25/91	SS
ISOBUTANOL	<10	10	MG/L	09/25/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/25/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/25/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	92	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	110	Min: 76	Max: 114		
TOLUENE-d8	102	Min: 88	Max: 110		
TCLP METALS					

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Test Description	Result	Limit	Units	Analyzed	By
ARSENIC	0.007	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	0.03	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	0.019	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/26/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/26/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/26/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/26/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/26/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/26/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/26/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/26/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/26/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/26/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/26/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/26/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/26/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/26/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/26/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/26/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/26/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/26/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/26/91	SS
Surrogates					
NITROBENZENE-d5	78	Min: 23	Max: 120		
2-FLUOROBIPHENYL	68	Min: 30	Max: 115		
TERPHENYL-d14	45	Min: 18	Max: 137		
PHENOL-d5	84	Min: 24	Max: 113		
2-FLUOROPHENOL	95	Min: 25	Max: 121		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/24/91	PV

Sample: 03A BH-10 19.6 - 19.9 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/27/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/27/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/27/91	DD
XYLENES	<0.1	0.1	MG/KG	09/27/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/25/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/25/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/25/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/25/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/25/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
XYLENE	<0.02	0.02	MG/L	09/25/91	SS
ACETONE	<10	10	MG/L	09/25/91	SS
ETHYL ACETATE	<10	10	MG/L	09/25/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/25/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/25/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/25/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/25/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/25/91	SS
METHANOL	<20	20	MG/L	09/25/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/25/91	SS
TOLUENE	<0.02	0.02	MG/L	09/25/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/25/91	SS
ISOBUTANOL	<10	10	MG/L	09/25/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/25/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/25/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	89	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	108	Min: 76	Max: 114		
TOLUENE-d8	102	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	0.007	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	<0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB

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Test Description	Result	Limit	Units	Analyzed	By
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/27/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/27/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/27/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/27/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/27/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/27/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/27/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/27/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/27/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/27/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/27/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/27/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/27/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/27/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
Surrogates					
NITROBENZENE-d5	83	Min: 23	Max: 120		
2-FLUOROBIPHENYL	61	Min: 30	Max: 115		
TERPHENYL-d14	59	Min: 18	Max: 137		
PHENOL-d5	98	Min: 24	Max: 113		
2-FLUOROPHENOL	97	Min: 25	Max: 121		

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Test Description	Result	Limit	Units	Analyzed	By
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/24/91	PV

Sample: 04A BH-11 45.2 - 45.4 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/27/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/27/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/27/91	DD
XYLENES	<0.1	0.1	MG/KG	09/27/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/25/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/25/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/25/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/25/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/25/91	SS
XYLENE	<0.02	0.02	MG/L	09/25/91	SS
ACETONE	<10	10	MG/L	09/25/91	SS
ETHYL ACETATE	<10	10	MG/L	09/25/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/25/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/25/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/25/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/25/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/25/91	SS
METHANOL	<20	20	MG/L	09/25/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/25/91	SS
TOLUENE	<0.02	0.02	MG/L	09/25/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/25/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
ISOBUTANOL	<10	10	MG/L	09/25/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/25/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/25/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	88	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	109	Min: 76	Max: 114		
TOLUENE-d8	102	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	0.012	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	0.03	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	0.021	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/27/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/27/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/27/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/27/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/27/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/27/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/27/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/27/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
ETHYL BENZENE	<0.1	0.1	MG/KG	09/27/91	DD
XYLENES	<0.1	0.1	MG/KG	09/27/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/25/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/25/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/25/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/25/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/25/91	SS
XYLENE	<0.02	0.02	MG/L	09/25/91	SS
ACETONE	<10	10	MG/L	09/25/91	SS
ETHYL ACETATE	<10	10	MG/L	09/25/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/25/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/25/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/25/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/25/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/25/91	SS
METHANOL	<20	20	MG/L	09/25/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/25/91	SS
TOLUENE	<0.02	0.02	MG/L	09/25/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/25/91	SS
ISOBUTANOL	<10	10	MG/L	09/25/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/25/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/25/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	89	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	111	Min: 76	Max: 114		
TOLUENE-d8	100	Min: 88	Max: 110		
TCLP METALS					

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Test Description	Result	Limit	Units	Analyzed	By
ARSENIC	0.016	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	0.015	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/27/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/27/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/27/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/27/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/27/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/27/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/27/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/27/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/27/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/27/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/27/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/27/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/27/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/27/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
Surrogates					
NITROBENZENE-d5	83	Min: 23	Max: 120		
2-FLUOROBIPHENYL	67	Min: 30	Max: 115		
TERPHENYL-d14	60	Min: 18	Max: 137		
PHENOL-d5	96	Min: 24	Max: 113		
2-FLUOROPHENOL	113	Min: 25	Max: 121		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/24/91	PV

Sample: 06A BH-13 9.4 - 9.6 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/27/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/27/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/27/91	DD
XYLENES	<0.1	0.1	MG/KG	09/27/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/25/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/25/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/25/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/25/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/25/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
XYLENE	<0.02	0.02	MG/L	09/25/91	SS
ACETONE	<10	10	MG/L	09/25/91	SS
ETHYL ACETATE	<10	10	MG/L	09/25/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/25/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/25/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/25/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/25/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/25/91	SS
METHANOL	<20	20	MG/L	09/25/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/25/91	SS
TOLUENE	<0.02	0.02	MG/L	09/25/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/25/91	SS
ISOBUTANOL	<10	10	MG/L	09/25/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/25/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/25/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	87	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	114	Min: 76	Max: 114		
TOLUENE-d8	99	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	0.017	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	0.03	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	0.017	0.010	MG/L		JB

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Test Description	Result	Limit	Units	Analyzed	By
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/27/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/27/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/27/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/27/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/27/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/27/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/27/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/27/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/27/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/27/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/27/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/27/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/27/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/27/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
Surrogates					
NITROBENZENE-d5	81	Min: 23	Max: 120		
2-FLUOROBIPHENYL	61	Min: 30	Max: 115		
TERPHENYL-d14	52	Min: 18	Max: 137		
PHENOL-d5	100	Min: 24	Max: 113		
2-FLUOROPHENOL	102	Min: 25	Max: 121		

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Test Description	Result	Limit	Units	Analyzed	By
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/24/91	PV

Sample: 07A BH-13 15.3 - 15.5 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/27/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/27/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/27/91	DD
XYLENES	<0.1	0.1	MG/KG	09/27/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/26/91	SS
XYLENE	<0.02	0.02	MG/L	09/26/91	SS
ACETONE	<10	10	MG/L	09/26/91	SS
ETHYL ACETATE	<10	10	MG/L	09/26/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/26/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/26/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/26/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/26/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/26/91	SS
METHANOL	<20	20	MG/L	09/26/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/26/91	SS
TOLUENE	<0.02	0.02	MG/L	09/26/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/26/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
ISOBUTANOL	<10	10	MG/L	09/26/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/26/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/26/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	89	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	113	Min: 76	Max: 114		
TOLUENE-d8	100	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	0.012	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	0.017	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/27/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/27/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/27/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/27/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/27/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/27/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/27/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/27/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
M-CRESOL	<0.001	0.001	MG/L	09/27/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/27/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/27/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/27/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/27/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/27/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
Surrogates					
NITROBENZENE-d5	73	Min: 23	Max: 120		
2-FLUOROBIPHENYL	61	Min: 30	Max: 115		
TERPHENYL-d14	62	Min: 18	Max: 137		
PHENOL-d5	84	Min: 24	Max: 113		
2-FLUOROPHENOL	88	Min: 25	Max: 121		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/24/91	PV

Sample: 08A BH-13 35.0 - 35.2 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/27/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/27/91	DD

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Test Description	Result	Limit	Units	Analyzed	By
ETHYL BENZENE	<0.1	0.1	MG/KG	09/27/91	DD
XYLENES	<0.1	0.1	MG/KG	09/27/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/26/91	SS
XYLENE	<0.02	0.02	MG/L	09/26/91	SS
ACETONE	<10	10	MG/L	09/26/91	SS
ETHYL ACETATE	<10	10	MG/L	09/26/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/26/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/26/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/26/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/26/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/26/91	SS
METHANOL	<20	20	MG/L	09/26/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/26/91	SS
TOLUENE	<0.02	0.02	MG/L	09/26/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/26/91	SS
ISOBUTANOL	<10	10	MG/L	09/26/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/26/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/26/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	89	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	114	Min: 76	Max: 114		
TOLUENE-d8	99	Min: 88	Max: 110		
TCLP METALS					

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Test Description	Result	Limit	Units	Analyzed	By
ARSENIC	0.007	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	<0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	0.015	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/27/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/27/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/27/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/27/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/27/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/27/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/27/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/27/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/27/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/27/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/27/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/27/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/27/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/27/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/27/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/27/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/27/91	SS
Surrogates					
NITROBENZENE-d5	77	Min: 23	Max: 120		
2-FLUOROBIPHENYL	63	Min: 30	Max: 115		
TERPHENYL-d14	61	Min: 18	Max: 137		
PHENOL-d5	94	Min: 24	Max: 113		
2-FLUOROPHENOL	88	Min: 25	Max: 121		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/24/91	PV

Sample: 09A BH-13 46.6 - 47.1 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/27/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/27/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/27/91	DD
XYLENES	<0.1	0.1	MG/KG	09/27/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/26/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
XYLENE	<0.02	0.02	MG/L	09/26/91	SS
ACETONE	<10	10	MG/L	09/26/91	SS
ETHYL ACETATE	<10	10	MG/L	09/26/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/26/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/26/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/26/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/26/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/26/91	SS
METHANOL	<20	20	MG/L	09/26/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/26/91	SS
TOLUENE	<0.02	0.02	MG/L	09/26/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/26/91	SS
ISOBUTANOL	<10	10	MG/L	09/26/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/26/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/26/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	97	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	104	Min: 76	Max: 114		
TOLUENE-d8	108	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	0.006	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	<0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	0.016	0.010	MG/L		JB

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Test Description	Result	Limit	Units	Analyzed	By
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/29/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/29/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/29/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/29/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/29/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/29/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/29/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/29/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/29/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/29/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/29/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/29/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/29/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/29/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/29/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/29/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/29/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/29/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/29/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/29/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/29/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/29/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/29/91	SS
Surrogates					
NITROBENZENE-d5	73	Min: 23	Max: 120		
2-FLUOROBIPHENYL	57	Min: 30	Max: 115		
TERPHENYL-d14	64	Min: 18	Max: 137		
PHENOL-d5	94	Min: 24	Max: 113		
2-FLUOROPHENOL	99	Min: 25	Max: 121		

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Test Description	Result	Limit	Units	Analyzed	By
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/24/91	PV

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REGULAR TEST RESULTS BY TEST

TOTAL REC PET HYDROCARBONS **Minimum: 5.0** **Maximum: 100**
Method: EPA 418.1

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01A	BH-9 22.7 - 23.4	8.0	MG/KG	09/24/91	09/24/91	PV
02A	BH-9 44.2 - 44.5	<5.0	MG/KG	09/24/91	09/24/91	PV
03A	BH-10 19.6 - 19.9	<5.0	MG/KG	09/24/91	09/24/91	PV
04A	BH-11 45.2 - 45.4	<5.0	MG/KG	09/24/91	09/24/91	PV
05A	BH-12 44.2 - 44.4	<5.0	MG/KG	09/24/91	09/24/91	PV
06A	BH-13 9.4 - 9.6	<5.0	MG/KG	09/24/91	09/24/91	PV
07A	BH-13 15.3 - 15.5	<5.0	MG/KG	09/24/91	09/24/91	PV
08A	BH-13 35.0 - 35.2	<5.0	MG/KG	09/24/91	09/24/91	PV
09A	BH-13 46.6 - 47.1	<5.0	MG/KG	09/24/91	09/24/91	PV

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TEST METHODOLOGIES

TCLP METALS: USEPA 200 SERIES METHODOLOGY

TCLP EXTRACTION: USEPA METHOD # 1311

BENZENE, TOLUENE, ETHYLBENZENE, XYLENES: USEPA METHOD # 602/8020

USEPA METHOD # 418.1

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ASSAIGAI ANALYTICAL LABORATORIES

WORK ORDER 8293

☐ HAZARDOUS ☐ NON-HAZARDOUS	DATE RECEIVED 9/18/91	ESTIMATED COST
CUSTOMER P.O. NUMBER	TIME RECEIVED 10:30	DUE DATE 10/2/91

ACCOUNT INFORMATION

CUSTOMER'S NAME Enron / TWPL	CONTACT Michael Kneese
ADDRESS	PHONE NUMBER 397-6000.
CITY / STATE / ZIP Hobbs.	

PARTY RESPONSIBLE FOR PAYMENT IF OTHER THAN ABOVE

NAME	CONTACT
ADDRESS	PHONE NUMBER
CITY / STATE / ZIP	

ACCOUNT STATUS

PAYMENT REC'D. ____
OPEN ACCOUNT XO
CASH ____
CHECK NUMBER ____

SPECIAL BILLING INSTRUCTIONS

SAMPLE INFORMATION

TYPE OF SAMPLE	NO. OF SAMPLES	*TURN AROUND TIME	SAMPLE IDENTIFICATION AND / OR SAMPLE SITE
☐ WATER ☒ SOIL ☐ OIL ☐ SLUDGE ☐ OTHER	9 NO. OF CONTAINERS 9	☒ REGULAR (10 WKG DAYS) ☐ RUSH (3 DAYS) ☐ EMERGENCY (STAT) *(SUBJECT TO WORK LOG)	Hobbs 5160

SAMPLE DELIVERED BY UPS SIGNATURE DATE 9/18/91

ANALYSIS REQUEST

WORK DESCRIPTION TPH-S BTEX 1CCP_0,-2,-F,-E,-R

SPECIAL INSTRUCTIONS

BILLING: ☐ PICKUP ☐ MAIL LOGGED IN BY

7300 Jefferson NE • Albuquerque, New Mexico 87109 • (505) 345-8964 • FAX (505) 345-7259

TRANSWESTERN PIPELINE COMPANY

CHAIN OF CUSTODY

District: Hobbs 5160 Date: 9-17-91

Sample Location Valve or Receiver No.	Vol. Collect. During Flush	Sampler

SAMPLE ID NUMBER	SOLVENT USED	SAMPLE ICED	ANALYSES REQUESTED
BH-9 22.7-23.4	—	Yes	TRPH/BTEX/TCLP-O-M-F
BH-9 44.2-44.5	—	Yes	TRPH/BTEX/TCLP-O-M-F
BH-10 19.6-19.9	—	Yes	TRPH/BTEX/TCLP-O-M-F
BH-11 45.2-45.4	—	Yes	TRPH/BTEX/TCLP-O-M-F
BH-12 44.2-44.4	—	Yes	TRPH/BTEX/TCLP-O-M-F
BH-13 9.4-9.6	—	Yes	TRPH/BTEX/TCLP-O-M-F
BH-13 15.3-15.5	—	Yes	TRPH/BTEX/TCLP-O-M-F
BH-13 35.0-35.2	—	Yes	TRPH/BTEX/TCLP-O-M-F
BH-13 46.6-47.1	—	Yes	TRPH/BTEX/TCLP-O-M-F

Relinquished By Michael N. Keese Date 9-17-91
Relinquished To Federal Express Date 9-17-91

Relinquished By _____ Date _____
Relinquished To _____ Date _____

Relinquished By _____ Date _____
Relinquished To _____ Date _____

Relinquished By _____ Date _____
Relinquished By _____ Date _____

Laboratory: Assayai
Received: _____ Date 9/18/91

TRANSWESTERN PIPELINE/ENRON
CLIENT LOG-IN PROBLEMS/INCONSISTENCIES

DATE RECEIVED: 9/18/91 WO #: 8293/ 9109187

DISTRICT: HOBBS 5160 CONTACT: Mike Kneese

PROBLEMS/INCONSISTENCIES ON CHAIN OF CUSTODY(COC):

NO CHAIN OF CUSTODY INCLUDED WITH SAMPLES..... ☐

DISTRICT LEFT BLANK..... ☐

DATE SAMPLED LEFT BLANK..... ✓

NO ANALYTES REQUESTED..... ☐

ILLEGIBLE HANDWRITING..... ☐

SAMPLE SITE LEFT BLANK..... ✓

TURN AROUND TIME NOT INDICATED..... ✓

SAMPLE ID ON CONTAINER & COC INCONSISTENT..... ☐

CHAIN OF CUSTODY NOT RELINQUISHED..... ☐

SAMPLES RECEIVED DAMAGED..... ☐

SAMPLES RECEIVED UNSEALED..... ☐

COMMENTS: _____

SAMPLES LOGGED IN BY: CTK

ASSAIGAI
ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109

Assaigai Analytical Labs
7300 Jefferson NE
Albuquerque, NM 87109

Attn: SYED RIZVI
Phone: (505)345-8964

ENRON/TRANSWESTERN PIPELINE
HOBBS PLANT
2626 WEST MARLAND
HOBBS, NM 88240
Attn: MICHAEL KNEESE
Invoice Number: 912168

Order #: 91-09-208
Date: 10/09/91 09:44
Work ID: HOBBS 5160 8313
Date Received: 09/20/91
Date Completed: 10/04/91

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	BH-14 1.2 - 2.1
02	BH-15 0 - 21
03	BH-15 5.7 - 5.9
04	BH-15 17.4 - 17.6
05	BH-15 25.3 - 25.5
06	BH-15 51.5 - 51.7
07	BH-15 56.2 - 56.9

ember: American Council of
dependent Laboratories, Inc.

QUESTIONS ABOUT THIS REPORT SHOULD BE ADDRESSED TO:
LABORATORY OPERATIONS MANAGER/ASSAIGAI ANALYTICAL
7300 JEFFERSON N.E.,ALBUQUERQUE,N.M. 87109

Syed Rizvi

Certified By
SYED N. RIZVI

TEST RESULTS BY SAMPLE

Sample: 01A BH-14 1.2 - 2.1 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/30/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/30/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/30/91	DD
XYLENES	<0.1	0.1	MG/KG	09/30/91	DD
PH ON SOILS & SOLIDS	7.10	1.0	pH UNITS	10/03/91	RF
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/26/91	SS
XYLENE	<0.02	0.02	MG/L	09/26/91	SS
ACETONE	<10	10	MG/L	09/26/91	SS
ETHYL ACETATE	<10	10	MG/L	09/26/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/26/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/26/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/26/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/26/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/26/91	SS
METHANOL	<50	50	MG/L	09/26/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/26/91	SS
TOLUENE	<0.02	0.02	MG/L	09/26/91	SS

Test Description	Result	Limit	Units	Analyzed	By
CARBON DISULFIDE	<0.02	0.02	MG/L	09/26/91	SS
ISOBUTANOL	<10	10	MG/L	09/26/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/26/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/26/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	99	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	106	Min: 76	Max: 114		
TOLUENE-d8	108	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	0.005	0.003	MG/L		JB
CHROMIUM	<0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/28/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/28/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/28/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/28/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/28/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/28/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/28/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/28/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/28/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/28/91	SS

Test Description	Result	Limit	Units	Analyzed	By
O-CRESOL	<0.001	0.001	MG/L	09/28/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/28/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/28/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/28/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/28/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/28/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/28/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/28/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/28/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/28/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/28/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/28/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/28/91	SS
Surrogates					
NITROBENZENE-d5	34	Min: 23	Max: 120		
2-FLUOROBIPHENYL	37	Min: 30	Max: 115		
TERPHENYL-d14	65	Min: 18	Max: 137		
PHENOL-d5	87	Min: 24	Max: 113		
2-FLUOROPHENOL	77	Min: 25	Max: 121		
TOTAL REC PET HYDROCARBONS	2400	5.0	MG/KG	09/26/91	PV

Sample: 02A BH-15 0 - 21 **Collected:**

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/30/91	DD

Test Description	Result	Limit	Units	Analyzed	By
TOLUENE	<0.1	0.1	MG/KG	09/30/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/30/91	DD
XYLENES	<0.1	0.1	MG/KG	09/30/91	DD
PH ON SOILS & SOLIDS	7.61	1.0	pH UNITS	10/03/91	RF
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/26/91	SS
XYLENE	<0.02	0.02	MG/L	09/26/91	SS
ACETONE	<10	10	MG/L	09/26/91	SS
ETHYL ACETATE	<10	10	MG/L	09/26/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/26/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/26/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/26/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/26/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/26/91	SS
METHANOL	<50	50	MG/L	09/26/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/26/91	SS
TOLUENE	<0.02	0.02	MG/L	09/26/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/26/91	SS
ISOBUTANOL	<10	10	MG/L	09/26/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/26/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/26/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	100	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	105	Min: 76	Max: 114		

Test Description	Result	Limit	Units	Analyzed	By
TOLUENE-d8	109	Min: 88 Max: 110			
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	0.004	0.003	MG/L		JB
CHROMIUM	0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	0.0022	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/30/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/30/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/30/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/30/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/30/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/30/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/30/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/30/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/30/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/30/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/30/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/30/91	SS

Test Description	Result	Limit	Units	Analyzed	By
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/30/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/30/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS
Surrogates					
NITROBENZENE-d5	67	Min: 23	Max: 120		
2-FLUOROBIPHENYL	51	Min: 30	Max: 115		
TERPHENYL-d14	46	Min: 18	Max: 137		
PHENOL-d5	80	Min: 24	Max: 113		
2-FLUOROPHENOL	51	Min: 25	Max: 121		
TOTAL REC PET HYDROCARBONS	120	5.0	MG/KG	09/26/91	PV

Sample: 03A BH-15 5.7 - 5.9 **Collected:**

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/30/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/30/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/30/91	DD
XYLENES	<0.1	0.1	MG/KG	09/30/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/26/91	SS

Test Description	Result	Limit	Units	Analyzed	By
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/26/91	SS
XYLENE	<0.02	0.02	MG/L	09/26/91	SS
ACETONE	<10	10	MG/L	09/26/91	SS
ETHYL ACETATE	<10	10	MG/L	09/26/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/26/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/26/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/26/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/26/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/26/91	SS
METHANOL	<50	50	MG/L	09/26/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/26/91	SS
TOLUENE	<0.02	0.02	MG/L	09/26/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/26/91	SS
ISOBUTANOL	<10	10	MG/L	09/26/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/26/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/26/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	100	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	111	Min: 76	Max: 114		
TOLUENE-d8	108	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	0.006	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	<0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB

Test Description	Result	Limit	Units	Analyzed	By
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/30/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/30/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/30/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/30/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/30/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/30/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/30/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/30/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/30/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/30/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/30/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/30/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/30/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/30/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS

Test Description	Result	Limit	Units	Analyzed	By
Surrogates					
NITROBENZENE-d5	92	Min: 23 Max: 120			
2-FLUOROBIPHENYL	97	Min: 30 Max: 115			
TERPHENYL-d14	42	Min: 18 Max: 137			
PHENOL-d5	55	Min: 24 Max: 113			
2-FLUOROPHENOL	66	Min: 25 Max: 121			
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/26/91	PV

Sample: 04A BH-15 17.4 - 17.6 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/30/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/30/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/30/91	DD
XYLENES	<0.1	0.1	MG/KG	09/30/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/26/91	SS
XYLENE	<0.02	0.02	MG/L	09/26/91	SS
ACETONE	<10	10	MG/L	09/26/91	SS
ETHYL ACETATE	<10	10	MG/L	09/26/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/26/91	SS

Test Description	Result	Limit	Units	Analyzed	By
ETHYL ETHER	<0.02	0.02	MG/L	09/26/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/26/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/26/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/26/91	SS
METHANOL	<50	50	MG/L	09/26/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/26/91	SS
TOLUENE	<0.02	0.02	MG/L	09/26/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/26/91	SS
ISOBUTANOL	<10	10	MG/L	09/26/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/26/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/26/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	97	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	109	Min: 76	Max: 114		
TOLUENE-d8	105	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	<0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/30/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/30/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/30/91	SS

Test Description	Result	Limit	Units	Analyzed	By
CHLOROFORM	<0.02	0.02	MG/L	09/30/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/30/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/30/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/30/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/30/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/30/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/30/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/30/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/30/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/30/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/30/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS
Surrogates					
NITROBENZENE-d5	82	Min: 23	Max: 120		
2-FLUOROBIPHENYL	66	Min: 30	Max: 115		
TERPHENYL-d14	53	Min: 18	Max: 137		
PHENOL-d5	50	Min: 24	Max: 113		
2-FLUOROPHENOL	54	Min: 25	Max: 121		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/26/91	PV

Sample: 05A BH-15 25.3 - 25.5 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/30/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/30/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/30/91	DD
XYLENES	<0.1	0.1	MG/KG	09/30/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/26/91	SS
XYLENE	<0.02	0.02	MG/L	09/26/91	SS
ACETONE	<10	10	MG/L	09/26/91	SS
ETHYL ACETATE	<10	10	MG/L	09/26/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/26/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/26/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/26/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/26/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/26/91	SS
METHANOL	<50	50	MG/L	09/26/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/26/91	SS
TOLUENE	<0.02	0.02	MG/L	09/26/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/26/91	SS
ISOBUTANOL	<10	10	MG/L	09/26/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/26/91	SS

Test Description	Result	Limit	Units	Analyzed	By
2-NITROPROPANE	<0.02	0.02	MG/L	09/26/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	100	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	114	Min: 78	Max: 114		
TOLUENE-d8	103	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	<0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/30/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/30/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/30/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/30/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/30/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/30/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/30/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/30/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/30/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/30/91	SS

Test Description	Result	Limit	Units	Analyzed	By
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/30/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/30/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/30/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/30/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS
Surrogates					
NITROBENZENE-d5	120	Min: 23	Max: 120		
2-FLUOROBIPHENYL	92	Min: 30	Max: 115		
TERPHENYL-d14	41	Min: 18	Max: 137		
PHENOL-d5	95	Min: 24	Max: 113		
2-FLUOROPHENOL	89	Min: 25	Max: 121		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/26/91	PV

Sample: 06A BH-15 51.5 - 51.7 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/30/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/30/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/30/91	DD
XYLENES	<0.1	0.1	MG/KG	09/30/91	DD

Test Description	Result	Limit	Units	Analyzed	By
PH ON SOILS & SOLIDS	8.80	1.0	pH UNITS	10/03/91	RF
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/26/91	SS
XYLENE	<0.02	0.02	MG/L	09/26/91	SS
ACETONE	<10	10	MG/L	09/26/91	SS
ETHYL ACETATE	<10	10	MG/L	09/26/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/26/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/26/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/26/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/26/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/26/91	SS
METHANOL	<50	50	MG/L	09/26/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/26/91	SS
TOLUENE	<0.02	0.02	MG/L	09/26/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/26/91	SS
ISOBUTANOL	<10	10	MG/L	09/26/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/26/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/26/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	107	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	123 Q	Min: 76	Max: 114		
TOLUENE-d8	112 Q	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB

Test Description	Result	Limit	Units	Analyzed	By
CHROMIUM	<0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	0.0015	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/30/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/30/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/30/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/30/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/30/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/30/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/30/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/30/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/30/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/30/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/30/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/30/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/30/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/30/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS

Test Description	Result	Limit	Units	Analyzed	By
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS
Surrogates					
NITROBENZENE-d5	120	Min: 23	Max: 120		
2-FLUOROBIPHENYL	96	Min: 30	Max: 115		
TERPHENYL-d14	34	Min: 18	Max: 137		
PHENOL-d5	52	Min: 24	Max: 113		
2-FLUOROPHENOL	68	Min: 25	Max: 121		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/26/91	PV

Sample: 07A BH-15 56.2 - 56.9 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	09/30/91	DD
TOLUENE	<0.1	0.1	MG/KG	09/30/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	09/30/91	DD
XYLENES	<0.1	0.1	MG/KG	09/30/91	DD
PH ON SOILS & SOLIDS	8.80	1.0	pH UNITS	10/03/91	RF
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/26/91	SS
XYLENE	<0.02	0.02	MG/L	09/26/91	SS
ACETONE	<10	10	MG/L	09/26/91	SS

Test Description	Result	Limit	Units	Analyzed	By
ETHYL ACETATE	<10	10	MG/L	09/26/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/26/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/26/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/26/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/26/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/26/91	SS
METHANOL	<50	50	MG/L	09/26/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/26/91	SS
TOLUENE	<0.02	0.02	MG/L	09/26/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/26/91	SS
ISOBUTANOL	<10	10	MG/L	09/26/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/26/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/26/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	102	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	122 Q	Min: 76	Max: 114		
TOLUENE-d8	108	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	<0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/30/91	SS

Test Description	Result	Limit	Units	Analyzed	By
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/30/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/30/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/30/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/30/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/30/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/30/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/30/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/30/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/30/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/30/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/30/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/30/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/30/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/30/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/30/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/30/91	SS
Surrogates					
NITROBENZENE-d5	95	Min: 23	Max: 120		
2-FLUOROBIPHENYL	100	Min: 30	Max: 115		
TERPHENYL-d14	38	Min: 18	Max: 137		
PHENOL-d5	78	Min: 24	Max: 113		
2-FLUOROPHENOL	97	Min: 25	Max: 121		

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Test Description	Result	Limit	Units	Analyzed	By
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	09/26/91	PV

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REGULAR TEST RESULTS BY TEST

PH ON SOILS & SOLIDS **Minimum: 1.0 Maximum: 14**
Method: EPA 150.1

Sample	Sample Description	Result		Units	Extracted	Analyzed	By
01A	BH-14 1.2 - 2.1	7.10	pH	UNITS	10/03/91	10/03/91	RF
02A	BH-15 0 - 21	7.61	pH	UNITS	10/03/91	10/03/91	RF
06A	BH-15 51.5 - 51.7	8.80	pH	UNITS	10/03/91	10/03/91	RF
07A	BH-15 56.2 - 56.9	8.80	pH	UNITS	10/03/91	10/03/91	RF

TOTAL REC PET HYDROCARBONS **Minimum: 5.0 Maximum: 100**
Method: EPA 418.1

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01A	BH-14 1.2 - 2.1	2400	MG/KG	09/26/91	09/26/91	PV
02A	BH-15 0 - 21	120	MG/KG	09/26/91	09/26/91	PV
03A	BH-15 5.7 - 5.9	<5.0	MG/KG	09/26/91	09/26/91	PV
04A	BH-15 17.4 - 17.6	<5.0	MG/KG	09/26/91	09/26/91	PV
05A	BH-15 25.3 - 25.5	<5.0	MG/KG	09/26/91	09/26/91	PV
06A	BH-15 51.5 - 51.7	<5.0	MG/KG	09/26/91	09/26/91	PV
07A	BH-15 56.2 - 56.9	<5.0	MG/KG	09/26/91	09/26/91	PV

TEST METHODOLOGIES

TCLP METALS: USEPA 200 SERIES METHODOLOGY

TCLP EXTRACTION: USEPA METHOD # 1311

BENZENE, TOLUENE, ETHYLBENZENE, XYLENES: USEPA METHOD # 602/8020

USEPA METHOD # 418.1

USEPA METHOD # 150.1

ASSAIGAI ANALYTICAL LABORATORIES

WORK ORDER 8312

☐ HAZARDOUS ☐ NON-HAZARDOUS	DATE RECEIVED 9/20/91	ESTIMATED COST
CUSTOMER P.O. NUMBER	TIME RECEIVED	DUE DATE 10/4/91

ACCOUNT INFORMATION

CUSTOMER'S NAME Enron / Transwestern Pipeline	CONTACT Mike Kneese
ADDRESS	PHONE NUMBER 397-6000
CITY / STATE / ZIP	

PARTY RESPONSIBLE FOR PAYMENT IF OTHER THAN ABOVE

NAME	CONTACT
ADDRESS	PHONE NUMBER
CITY / STATE / ZIP	

ACCOUNT STATUS

PAYMENT REC'D. ____
OPEN ACCOUNT XX
CASH ____
CHECK NUMBER ____

SPECIAL BILLING INSTRUCTIONS

SAMPLE INFORMATION

TYPE OF SAMPLE	NO. OF SAMPLES	*TURN AROUND TIME	SAMPLE IDENTIFICATION AND / OR SAMPLE SITE
☐ WATER ☒ SOIL ☐ OIL ☐ SLUDGE ☐ OTHER	7 NO. OF CONTAINERS 7	☒ REGULAR (10 WKG DAYS) ☐ RUSH (3 DAYS) ☐ EMERGENCY (STAT) *(SUBJECT TO WORK LOG)	5160 Hobbs.

SAMPLE DELIVERED BY: ELP FED Y AIR — SIGNATURE — DATE: 9/20/91

ANALYSIS REQUEST

WORK DESCRIPTION

TRPH / BTEX / TCLP-0/2/-F/-E/-2

PH-2 on 1, 2, 6, 7

SPECIAL INSTRUCTIONS

BILLING: ☐ PICKUP ☐ MAIL

LOGGED IN BY

300 Jefferson NE • Albuquerque, New Mexico 87109 • (505) 345-8964 • FAX (505) 345-8259

TRANSWESTERN PIPELINE COMPANY

CHAIN OF CUSTODY

District: 5160 Hobbs Date: 9-19-91

Sample Location Valve or Receiver No.	Vol. Collect. During Flush	Sampler

SAMPLE ID NUMBER	SOLVENT USED	SAMPLE ICED	ANALYSES REQUESTED
BH-14 1.2-2.1	—	yes	TRPH/BTEX/TCLP-O-M-F/PH
BH-15 0-21	—	yes	TRPH/BTEX/TCLP-O-M-F/PH
BH-15 5.7-5.9	—	yes	TRPH/BTEX/TCLP-O-M-F
BH-15 17.4-17.6	—	yes	TRPH/BTEX/TCLP-O-M-F
BH-15 25.3-25.5	—	yes	TRPH/BTEX/TCLP-O-M-F
BH-15 51.5-51.7	—	yes	TRPH/BTEX/TCLP-O-M-F PH
BH-15 56.2-56.9	—	yes	TRPH/BTEX/TCLP-O-M-F/PH

Relinquished By Michael P. Keese Date 9-19-91
Relinquished To Federal Express Date 9-19-91

Relinquished By _____ Date _____
Relinquished To _____ Date _____

Relinquished By _____ Date _____
Relinquished To _____ Date _____

Relinquished By _____ Date _____
Relinquished By _____ Date _____

Laboratory: Assaigai Labs
Received: _____ Date 9/20/91

Approx: 48 oz
Standard Turnaround

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Assaigai Analytical Labs
7300 Jefferson NE
Albuquerque, NM 87109

Attn: SYED RIZVI
Phone: (505)345-8964

ENRON/TRANSWESTERN PIPELINE
HOBBS PLANT
2626 WEST MARLAND
HOBBS, NM 88240
Attn: MIKE KNEESE
Invoice Number: 912167

Order #: 91-09-275
Date: 10/09/91 09:19
Work ID: HOBBS 5160 8357
Date Received: 09/25/91
Date Completed: 10/08/91

SOME SURROGATE SPIKES WERE NOT RECOVERED DUE TO MATRIX INTERFERENCES.

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
01	BH-18 24.6-24.8	02	BH-18 35.3-35.5
03	BH-18 48.0-48.2	04	BH-18 6.1-6.3

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QUESTIONS ABOUT THIS REPORT SHOULD BE ADDRESSED TO:
LABORATORY OPERATIONS MANAGER/ASSAIGAI ANALYTICAL
7300 JEFFERSON N.E.,ALBUQUERQUE,N.M. 87109

Syed Rizvi

Certified By
SYED N. RIZVI

Order # 91-09-275 Assaigai Analytical Labs
10/09/91 09:19

TEST RESULTS BY SAMPLE

Sample: 01A BH-18 24.6-24.8 **Collected: 09/19/91**

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	0.65	0.1	MG/KG	10/03/91	DD
TOLUENE	5.5	0.1	MG/KG	10/03/91	DD
ETHYL BENZENE	15	0.1	MG/KG	10/03/91	DD
XYLENES	36	0.1	MG/KG	10/03/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/26/91	SS
XYLENE	0.13	0.02	MG/L	09/26/91	SS
ACETONE	<10	10	MG/L	09/26/91	SS
ETHYL ACETATE	<10	10	MG/L	09/26/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/26/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/26/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/26/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/26/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/26/91	SS
METHANOL	<10	10	MG/L	09/26/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/26/91	SS
TOLUENE	<0.02	0.02	MG/L	09/26/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/26/91	SS

Test Description	Result	Limit	Units	Analyzed	By
ISOBUTANOL	<10	10	MG/L	09/26/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/26/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/26/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	102	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	121 Q	Min: 76	Max: 114		
TOLUENE-d8	109	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	<0.020	0.020	MG/L		JB
LEAD	<0.100	0.100	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/26/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/26/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/26/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/26/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/26/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/26/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/26/91	SS

Test Description	Result	Limit	Units	Analyzed	By
M-CRESOL	<0.001	0.001	MG/L	09/26/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/26/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/26/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/26/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/26/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/26/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/26/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/26/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/26/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/26/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/26/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/26/91	SS
Surrogates					
NITROBENZENE-d5	83	Min: 35	Max: 114		
2-FLUOROBIPHENYL	68	Min: 43	Max: 116		
TERPHENYL-d14	51	Min: 33	Max: 141		
PHENOL-d5	85	Min: 10	Max: 94		
2-FLUOROPHENOL	90	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	4200	5.0	MG/KG	10/02/91	PV

Sample: 02A BH-18 35.3-35.5 Collected: 09/19/91

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	10/03/91	DD
TOLUENE	<0.1	0.1	MG/KG	10/03/91	DD

Test Description	Result	Limit	Units	Analyzed	By
ETHYL BENZENE	0.19	0.1	MG/KG	10/03/91	DD
XYLENES	0.67	0.1	MG/KG	10/03/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	09/26/91	SS
XYLENE	<0.02	0.02	MG/L	09/26/91	SS
ACETONE	<10	10	MG/L	09/26/91	SS
ETHYL ACETATE	<10	10	MG/L	09/26/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	09/26/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	09/26/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	09/26/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	09/26/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	09/26/91	SS
METHANOL	<10	10	MG/L	09/26/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	09/26/91	SS
TOLUENE	<0.02	0.02	MG/L	09/26/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	09/26/91	SS
ISOBUTANOL	<10	10	MG/L	09/26/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	09/26/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	09/26/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	100	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	121 Q	Min: 76	Max: 114		
TOLUENE-d8	107	Min: 88	Max: 110		
TCLP METALS					

Order # 91-09-275 Assaigai Analytical Labs Page 7
10/09/91 09:19

Test Description	Result	Limit	Units	Analyzed	By
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	<0.020	0.020	MG/L		JB
LEAD	<0.100	0.100	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	09/26/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	09/26/91	SS
CHLOROFORM	<0.02	0.02	MG/L	09/26/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	09/26/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	09/26/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	09/26/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	09/26/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	09/26/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	09/26/91	SS
O-CRESOL	<0.001	0.001	MG/L	09/26/91	SS
M-CRESOL	<0.001	0.001	MG/L	09/26/91	SS
P-CRESOL	<0.001	0.001	MG/L	09/26/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	09/26/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	09/26/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	09/26/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	09/26/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	09/26/91	SS
NITROBENZENE	<0.001	0.001	MG/L	09/26/91	SS

Test Description	Result	Limit	Units	Analyzed	By
PENTACHLOROPHENOL	<0.001	0.001	MG/L	09/26/91	SS
PYRIDINE	<0.001	0.001	MG/L	09/26/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/26/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	09/26/91	SS
Surrogates					
NITROBENZENE-d5	59	Min: 35	Max: 114		
2-FLUOROBIPHENYL	84	Min: 43	Max: 116		
TERPHENYL-d14	63	Min: 33	Max: 141		
PHENOL-d5	73	Min: 10	Max: 94		
2-FLUOROPHENOL	87	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	880	5.0	MG/KG	10/02/91	PV

Sample: 03A BH-18 48.0-48.2 Collected: 09/19/91

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	0.69	0.1	MG/KG	10/03/91	DD
TOLUENE	1.6	0.1	MG/KG	10/03/91	DD
ETHYL BENZENE	11	0.1	MG/KG	10/03/91	DD
XYLENES	35	0.1	MG/KG	10/03/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	10/02/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	10/02/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	10/02/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	10/02/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	10/02/91	SS

Test Description	Result	Limit	Units	Analyzed	By
XYLENE	0.37	0.02	MG/L	10/02/91	SS
ACETONE	<10	10	MG/L	10/02/91	SS
ETHYL ACETATE	<10	10	MG/L	10/02/91	SS
ETHYL BENZENE	0.18	0.02	MG/L	10/02/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	10/02/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	10/02/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	10/02/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	10/02/91	SS
METHANOL	<10	10	MG/L	10/02/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	10/02/91	SS
TOLUENE	0.056	0.02	MG/L	10/02/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	10/02/91	SS
ISOBUTANOL	<10	10	MG/L	10/02/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	10/02/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	10/02/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	85 Q	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	107	Min: 76	Max: 114		
TOLUENE-d8	103	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	<0.020	0.020	MG/L		JB
LEAD	<0.100	0.100	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB

Test Description	Result	Limit	Units	Analyzed	By
TCLP ORGANICS ENRON LIST					
BENZENE	0.060	0.02	MG/L	10/07/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	10/07/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	10/07/91	SS
CHLOROFORM	<0.02	0.02	MG/L	10/07/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	10/07/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	10/07/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	10/07/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	10/07/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	10/07/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	10/07/91	SS
O-CRESOL	<0.001	0.001	MG/L	10/07/91	SS
M-CRESOL	<0.001	0.001	MG/L	10/07/91	SS
P-CRESOL	<0.001	0.001	MG/L	10/07/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	10/07/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	10/07/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	10/07/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	10/07/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	10/07/91	SS
NITROBENZENE	<0.001	0.001	MG/L	10/07/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	10/07/91	SS
PYRIDINE	<0.001	0.001	MG/L	10/07/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	10/07/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	10/07/91	SS
Surrogates					
NITROBENZENE-d5	56	Min: 35	Max: 114		
2-FLUOROBIPHENYL	80	Min: 43	Max: 116		
TERPHENYL-d14	40	Min: 33	Max: 141		
PHENOL-d5	75	Min: 10	Max: 94		
2-FLUOROPHENOL	80	Min: 21	Max: 100		

Test Description	Result	Limit	Units	Analyzed	By
TOTAL REC PET HYDROCARBONS	10,000	5.0	MG/KG	10/02/91	PV

Sample: 04A BH-18 6.1-6.3 **Collected: 09/19/91**

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	61	2.5	MG/KG	10/03/91	DD
TOLUENE	160	2.5	MG/KG	10/03/91	DD
ETHYL BENZENE	130	2.5	MG/KG	10/03/91	DD
XYLENES	370	2.5	MG/KG	10/03/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.05	0.05	MG/L	10/03/91	SS
1,1,1-TRICHLOROETHANE	<0.05	0.05	MG/L	10/03/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.05	0.05	MG/L	10/03/91	SS
ORTHO-DICHLOROBENZENE	<0.05	0.05	MG/L	10/03/91	SS
TRICHLOROFLUOROMETHANE	<0.05	0.05	MG/L	10/03/91	SS
XYLENE	2.0	0.05	MG/L	10/03/91	SS
ACETONE	<10	10	MG/L	10/03/91	SS
ETHYL ACETATE	<10	10	MG/L	10/03/91	SS
ETHYL BENZENE	0.84	0.05	MG/L	10/03/91	SS
ETHYL ETHER	<0.05	0.05	MG/L	10/03/91	SS
METHYL ISOBUTYL KETONE	<0.05	0.05	MG/L	10/03/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	10/03/91	SS
CYCLOHEXANONE	<0.05	0.05	MG/L	10/03/91	SS
METHANOL	15	10	MG/L	10/03/91	SS
CRESYLIC ACID	0.020	0.02	MG/L	10/03/91	SS
TOLUENE	4.2	0.05	MG/L	10/03/91	SS
CARBON DISULFIDE	<0.05	0.05	MG/L	10/03/91	SS

Order # 91-09-275 Assaigai Analytical Labs Page 12
10/09/91 09:19

Test Description	Result	Limit	Units	Analyzed	By
ISOBUTANOL	<10	10	MG/L	10/03/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	10/03/91	SS
2-NITROPROPANE	<0.05	0.05	MG/L	10/03/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	95	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	114	Min: 76	Max: 114		
TOLUENE-d8	102	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	0.029	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	<0.020	0.020	MG/L		JB
LEAD	<0.100	0.100	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	6.1	0.05	MG/L	10/03/91	SS
CARBON TETRACHLORIDE	<0.05	0.05	MG/L	10/03/91	SS
CHLOROBENZENE	<0.05	0.05	MG/L	10/03/91	SS
CHLOROFORM	<0.05	0.05	MG/L	10/03/91	SS
1,2-DICHLOROETHANE	<0.05	0.05	MG/L	10/03/91	SS
1,1-DICHLOROETHYLENE	<0.05	0.05	MG/L	10/03/91	SS
METHYL ETHYL KETONE	<0.05	0.05	MG/L	10/03/91	SS
TETRACHLOROETHYLENE	<0.05	0.05	MG/L	10/03/91	SS
TRICHLOROETHYLENE	<0.05	0.05	MG/L	10/03/91	SS
VINYL CHLORIDE	<0.05	0.05	MG/L	10/03/91	SS
O-CRESOL	0.013	0.001	MG/L	10/03/91	SS

Test Description	Result	Limit	Units	Analyzed	By
M-CRESOL	0.003	0.001	MG/L	10/03/91	SS
P-CRESOL	0.003	0.001	MG/L	10/03/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	10/03/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	10/03/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	10/03/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	10/03/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	10/03/91	SS
NITROBENZENE	<0.001	0.001	MG/L	10/03/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	10/03/91	SS
PYRIDINE	<0.001	0.001	MG/L	10/03/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	10/03/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	10/03/91	SS
Surrogates					
NITROBENZENE-d5	Q	Min: 35	Max: 114		
2-FLUOROBIPHENYL	90	Min: 43	Max: 116		
TERPHENYL-d14	126	Min: 33	Max: 141		
PHENOL-d5	Q	Min: 10	Max: 94		
2-FLUOROPHENOL	Q	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	32,000	5.0	MG/KG	10/02/91	PV

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REGULAR TEST RESULTS BY TEST

TOTAL REC PET HYDROCARBONS **Minimum: 5.0** **Maximum: 100**
Method: EPA 418.1

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01A	BH-18 24.6-24.8	4200	MG/KG	10/02/91	10/02/91	PV
02A	BH-18 35.3-35.5	880	MG/KG	10/02/91	10/02/91	PV
03A	BH-18 48.0-48.2	10,000	MG/KG	10/02/91	10/02/91	PV
04A	BH-18 6.1-6.3	32,000	MG/KG	10/02/91	10/02/91	PV

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TEST METHODOLOGIES

TCLP METALS: USEPA 200 SERIES METHODOLOGY

TCLP EXTRACTION: USEPA METHOD # 1311

BENZENE, TOLUENE, ETHYLBENZENE, XYLENES: USEPA METHOD # 602/8020

USEPA METHOD # 418.1

ASSAIGAI ANALYTICAL LABORATORIES

WORK ORDER 8357

☐ HAZARDOUS ☐ NON-HAZARDOUS	DATE RECEIVED 9/25	ESTIMATED COST
CUSTOMER P.O. NUMBER	TIME RECEIVED 9:35A	DUE DATE 10/9

ACCOUNT INFORMATION

CUSTOMER'S NAME IVANSWESTERN PIPELINE CO	CONTACT Mike Kneese
ADDRESS	PHONE NUMBER
CITY / STATE / ZIP Hobbs	

PARTY RESPONSIBLE FOR PAYMENT IF OTHER THAN ABOVE

NAME	CONTACT
ADDRESS	PHONE NUMBER
CITY / STATE / ZIP	

ACCOUNT STATUS

PAYMENT REC'D. ____
OPEN ACCOUNT XX
CASH ____
CHECK NUMBER ____

SPECIAL BILLING INSTRUCTIONS

SAMPLE INFORMATION

TYPE OF SAMPLE	NO. OF SAMPLES	*TURN AROUND TIME	SAMPLE IDENTIFICATION AND / OR SAMPLE SITE
☐ WATER ☒ SOIL ☐ OIL ☐ SLUDGE ☒ OTHER	4 NO. OF CONTAINERS 4	☒ REGULAR (10 WKG DAYS) ☐ RUSH (3 DAYS) ☐ EMERGENCY (STAT) *(SUBJECT TO WORK LOG)	Hobbs 5160

SAMPLE DELIVERED BY Federal Express SIGNATURE DATE 9/25

ANALYSIS REQUEST

WORK DESCRIPTION TRPH, BTEX, TCLP-0, 2, F, E, Z

SPECIAL INSTRUCTIONS

BILLING: ☐ PICKUP ☐ MAIL

LOGGED IN BY

'300 Jefferson NE • Albuquerque, New Mexico 87109 • (505) 345-8964 • FAX (505) 345-7259

TRANSWESTERN PIPELINE COMPANY

CHAIN OF CUSTODY

District: Hobbs 5160 Date: 9-20-91

Sample Location Valve or Receiver No.	Vol. Collect. During Flush	Sampler

SAMPLE ID NUMBER	SOLVENT USED	SAMPLE ICED	ANALYSES REQUESTED
BH-18 24.6-24.8	—	yes	TRPH/BTEX/TCLP-O-M-F
BH-18 35.3-35.5	—	yes	TRPH/BTEX/TCLP-O-M-F
BH-18 48.0-48.2	—	yes	TRPH/BTEX/TCLP-O-M-F
BH-18 6.1-6.3	—	yes	TRPH/BTEX/TCLP-O-M-F

Relinquished By Michael W. Keane Date 9-20-91
Relinquished To Federal Express Date 9-20-91

Relinquished By _____ Date _____
Relinquished To _____ Date _____

Relinquished By _____ Date _____
Relinquished To _____ Date _____

Relinquished By _____ Date _____
Relinquished By _____ Date _____

Laboratory: ASSOCIATED LABS P. BMS
Received: _____ Date 9/25/91

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Assaigai Analytical Labs
7300 Jefferson NE
Albuquerque, NM 87109

Attn: SYED RIZVI
Phone: (505)345-8964

ENRON/TRANSWESTERN PIPELINE
HOBBS PLANT
2626 WEST MARLAND
HOBBS, NM 88240
Attn: MIKE KNEESE
Invoice Number: 912540

Order #: 91-10-294
Date: 11/06/91 15:06
Work ID: HOBBS 5160 8623
Date Received: 10/23/91
Date Completed: 11/06/91

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
01	LEAN OIL TANK 1011	02	BH-20 1.0-1.3
03	BH-20 26.2-26.5	04	BH-21 3.8-4.3
05	BH-21 18.6-19.0	06	BH-22 3.9-4.3
07	BH-22 29.2-29.6		

COPY

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QUESTIONS ABOUT THIS REPORT SHOULD BE ADDRESSED TO:
LABORATORY OPERATIONS MANAGER/ASSAIGAI ANALYTICAL
7300 JEFFERSON N.E.,ALBUQUERQUE,N.M. 87109

Syed Rizvi

Certified By
SYED N. RIZVI

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ASSAIGAI
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TEST RESULTS BY SAMPLE

Sample: 01A LEAN OIL TANK 1011 Collected:

Test Description	Result	Limit	Units	Analyzed	By
TCLP XYLENE	0.36	1.0	MG/L	11/04/91	DD

Sample: 02A BH-20 1.0-1.3 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	11/04/91	DD
TOLUENE	<0.1	0.1	MG/KG	11/04/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	11/04/91	DD
XYLENES	<0.1	0.1	MG/KG	11/04/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	11/04/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	11/04/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	11/04/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	11/04/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	11/04/91	SS
XYLENE	<0.02	0.02	MG/L	11/04/91	SS
ACETONE	<10	10	MG/L	11/04/91	SS
ETHYL ACETATE	<10	10	MG/L	11/04/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	11/04/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	11/04/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	11/04/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	11/04/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	11/04/91	SS
METHANOL	<10	10	MG/L	11/04/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	11/04/91	SS
TOLUENE	<0.02	0.02	MG/L	11/04/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	11/04/91	SS
ISOBUTANOL	<10	10	MG/L	11/04/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	11/04/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	11/04/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	99	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	101	Min: 76	Max: 114		
TOLUENE-d8	103	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	<0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	11/05/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	11/05/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	11/05/91	SS
CHLOROFORM	<0.02	0.02	MG/L	11/05/91	SS

Test Description	Result	Limit	Units	Analyzed	By
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	11/05/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	11/05/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	11/05/91	SS
O-CRESOL	<0.001	0.001	MG/L	11/05/91	SS
M-CRESOL	<0.001	0.001	MG/L	11/05/91	SS
P-CRESOL	<0.001	0.001	MG/L	11/05/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	11/05/91	SS
NITROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS
PYRIDINE	<0.001	0.001	MG/L	11/05/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS
Surrogates					
NITROBENZENE-d5	79	Min: 35	Max: 114		
2-FLUOROBIPHENYL	75	Min: 43	Max: 116		
TERPHENYL-d14	92	Min: 33	Max: 141		
PHENOL-d5	69	Min: 10	Max: 94		
2-FLUOROPHENOL	92	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	10/25/91	PV

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Sample: 03A BH-20 26.2-26.5 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	11/04/91	DD
TOLUENE	<0.1	0.1	MG/KG	11/04/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	11/04/91	DD
XYLENES	<0.1	0.1	MG/KG	11/04/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	11/04/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	11/04/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	11/04/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	11/04/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	11/04/91	SS
XYLENE	<0.02	0.02	MG/L	11/04/91	SS
ACETONE	<10	10	MG/L	11/04/91	SS
ETHYL ACETATE	<10	10	MG/L	11/04/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	11/04/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	11/04/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	11/04/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	11/04/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	11/04/91	SS
METHANOL	<10	10	MG/L	11/04/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	11/04/91	SS
TOLUENE	<0.02	0.02	MG/L	11/04/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	11/04/91	SS
ISOBUTANOL	<10	10	MG/L	11/04/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	11/04/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
2-NITROPROPANE	<0.02	0.02	MG/L	11/04/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	110	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	122 Q	Min: 76	Max: 114		
TOLUENE-d8	107	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	<0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	11/05/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	11/05/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	11/05/91	SS
CHLOROFORM	<0.02	0.02	MG/L	11/05/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	11/05/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	11/05/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	11/05/91	SS
O-CRESOL	<0.001	0.001	MG/L	11/05/91	SS
M-CRESOL	<0.001	0.001	MG/L	11/05/91	SS
P-CRESOL	<0.001	0.001	MG/L	11/05/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	11/05/91	SS
NITROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS
PYRIDINE	<0.001	0.001	MG/L	11/05/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS
Surrogates					
NITROBENZENE-d5	82	Min: 35	Max: 114		
2-FLUOROBIPHENYL	75	Min: 43	Max: 116		
TERPHENYL-d14	105	Min: 33	Max: 141		
PHENOL-d5	69	Min: 10	Max: 94		
2-FLUOROPHENOL	84	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	10/25/91	PV

Sample: 04A BH-21 3.8-4.3 **Collected:**

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	11/04/91	DD
TOLUENE	<0.1	0.1	MG/KG	11/04/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	11/04/91	DD
XYLENES	<0.1	0.1	MG/KG	11/04/91	DD

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Test Description	Result	Limit	Units	Analyzed	By
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	11/04/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	11/04/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	11/04/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	11/04/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	11/04/91	SS
XYLENE	<0.02	0.02	MG/L	11/04/91	SS
ACETONE	<10	10	MG/L	11/04/91	SS
ETHYL ACETATE	<10	10	MG/L	11/04/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	11/04/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	11/04/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	11/04/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	11/04/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	11/04/91	SS
METHANOL	<10	10	MG/L	11/04/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	11/04/91	SS
TOLUENE	<0.02	0.02	MG/L	11/04/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	11/04/91	SS
ISOBUTANOL	<10	10	MG/L	11/04/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	11/04/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	11/04/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	103	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	83	Min: 76	Max: 114		
TOLUENE-d8	107	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	0.86	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	<0.02	0.02	MG/L		JB

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Test Description	Result	Limit	Units	Analyzed	By
LEAD	<0.10	0.10	MG/L		JB
MERCURY	0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	11/05/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	11/05/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	11/05/91	SS
CHLOROFORM	<0.02	0.02	MG/L	11/05/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	11/05/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	11/05/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	11/05/91	SS
O-CRESOL	<0.001	0.001	MG/L	11/05/91	SS
M-CRESOL	<0.001	0.001	MG/L	11/05/91	SS
P-CRESOL	<0.001	0.001	MG/L	11/05/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	11/05/91	SS
NITROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS
PYRIDINE	<0.001	0.001	MG/L	11/05/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS

Test Description	Result	Limit	Units	Analyzed	By
Surrogates					
NITROBENZENE-d5	78	Min: 35	Max: 114		
2-FLUOROBIPHENYL	71	Min: 43	Max: 116		
TERPHENYL-d14	105	Min: 33	Max: 141		
PHENOL-d5	60	Min: 10	Max: 94		
2-FLUOROPHENOL	73	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	190	5.0	MG/KG	10/25/91	PV

Sample: 05A BH-21 18.6-19.0 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	11/04/91	DD
TOLUENE	<0.1	0.1	MG/KG	11/04/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	11/04/91	DD
XYLENES	<0.1	0.1	MG/KG	11/04/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	11/04/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	11/04/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	11/04/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	11/04/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	11/04/91	SS
XYLENE	<0.02	0.02	MG/L	11/04/91	SS
ACETONE	<10	10	MG/L	11/04/91	SS
ETHYL ACETATE	<10	10	MG/L	11/04/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	11/04/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
ETHYL ETHER	<0.02	0.02	MG/L	11/04/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	11/04/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	11/04/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	11/04/91	SS
METHANOL	<10	10	MG/L	11/04/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	11/04/91	SS
TOLUENE	<0.02	0.02	MG/L	11/04/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	11/04/91	SS
ISOBUTANOL	<10	10	MG/L	11/04/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	11/04/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	11/04/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	100	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	90	Min: 76	Max: 114		
TOLUENE-d8	98	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	<0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	11/05/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	11/05/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	11/05/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
CHLOROFORM	<0.02	0.02	MG/L	11/05/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	11/05/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	11/05/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	11/05/91	SS
O-CRESOL	<0.001	0.001	MG/L	11/05/91	SS
M-CRESOL	<0.001	0.001	MG/L	11/05/91	SS
P-CRESOL	<0.001	0.001	MG/L	11/05/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	11/05/91	SS
NITROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS
PYRIDINE	<0.001	0.001	MG/L	11/05/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS
Surrogates					
NITROBENZENE-d5	81	Min: 35	Max: 114		
2-FLUOROBIPHENYL	76	Min: 43	Max: 116		
TERPHENYL-d14	92	Min: 33	Max: 141		
PHENOL-d5	58	Min: 10	Max: 94		
2-FLUOROPHENOL	71	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	10/25/91	PV

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Sample: 06A BH-22 3.9-4.3 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	11/04/91	DD
TOLUENE	<0.1	0.1	MG/KG	11/04/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	11/04/91	DD
XYLENES	<0.1	0.1	MG/KG	11/04/91	DD
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	11/04/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	11/04/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	11/04/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	11/04/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	11/04/91	SS
XYLENE	<0.02	0.02	MG/L	11/04/91	SS
ACETONE	<10	10	MG/L	11/04/91	SS
ETHYL ACETATE	<10	10	MG/L	11/04/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	11/04/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	11/04/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	11/04/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	11/04/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	11/04/91	SS
METHANOL	<10	10	MG/L	11/04/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	11/04/91	SS
TOLUENE	<0.02	0.02	MG/L	11/04/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	11/04/91	SS
ISOBUTANOL	<10	10	MG/L	11/04/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	11/04/91	SS

Test Description	Result	Limit	Units	Analyzed	By
2-NITROPROPANE	<0.02	0.02	MG/L	11/04/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	102	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	102	Min: 76	Max: 114		
TOLUENE-d8	104	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	0.056	0.005	MG/L		JB
BARIUM	<0.50	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	<0.02	0.02	MG/L		JB
LEAD	<0.10	0.10	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	11/05/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	11/05/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	11/05/91	SS
CHLOROFORM	<0.02	0.02	MG/L	11/05/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	11/05/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	11/05/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	11/05/91	SS
O-CRESOL	<0.001	0.001	MG/L	11/05/91	SS
M-CRESOL	<0.001	0.001	MG/L	11/05/91	SS
P-CRESOL	<0.001	0.001	MG/L	11/05/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	11/05/91	SS
NITROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS
PYRIDINE	<0.001	0.001	MG/L	11/05/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS
Surrogates					
NITROBENZENE-d5	80	Min: 35	Max: 114		
2-FLUOROBIPHENYL	77	Min: 43	Max: 116		
TERPHENYL-d14	92	Min: 33	Max: 141		
PHENOL-d5	75	Min: 10	Max: 94		
2-FLUOROPHENOL	89	Min: 21	Max: 100		
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	10/25/91	PV

Sample: 07A BH-22 29.2-29.6 Collected:

Test Description	Result	Limit	Units	Analyzed	By
BENZENE,TOLUENE,EBENZ,XYLE		0.1			
BENZENE	<0.1	0.1	MG/KG	11/04/91	DD
TOLUENE	<0.1	0.1	MG/KG	11/04/91	DD
ETHYL BENZENE	<0.1	0.1	MG/KG	11/04/91	DD
XYLENES	<0.1	0.1	MG/KG	11/04/91	DD

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Test Description	Result	Limit	Units	Analyzed	By
TCLP F SERIES ENRON LIST					
METHYLENE CHLORIDE	<0.02	0.02	MG/L	11/04/91	SS
1,1,1-TRICHLOROETHANE	<0.02	0.02	MG/L	11/04/91	SS
TRICHLORO-TRIFLUOROETHANE	<0.02	0.02	MG/L	11/04/91	SS
ORTHO-DICHLOROBENZENE	<0.02	0.02	MG/L	11/04/91	SS
TRICHLOROFLUOROMETHANE	<0.02	0.02	MG/L	11/04/91	SS
XYLENE	<0.02	0.02	MG/L	11/04/91	SS
ACETONE	<10	10	MG/L	11/04/91	SS
ETHYL ACETATE	<10	10	MG/L	11/04/91	SS
ETHYL BENZENE	<0.02	0.02	MG/L	11/04/91	SS
ETHYL ETHER	<0.02	0.02	MG/L	11/04/91	SS
METHYL ISOBUTYL KETONE	<0.02	0.02	MG/L	11/04/91	SS
n-BUTYL ALCOHOL	<10	10	MG/L	11/04/91	SS
CYCLOHEXANONE	<0.02	0.02	MG/L	11/04/91	SS
METHANOL	<10	10	MG/L	11/04/91	SS
CRESYLIC ACID	<0.001	0.001	MG/L	11/04/91	SS
TOLUENE	<0.02	0.02	MG/L	11/04/91	SS
CARBON DISULFIDE	<0.02	0.02	MG/L	11/04/91	SS
ISOBUTANOL	<10	10	MG/L	11/04/91	SS
2-ETHOXYETHANOL	<10	10	MG/L	11/04/91	SS
2-NITROPROPANE	<0.02	0.02	MG/L	11/04/91	SS
Surrogates					
4-BROMOFLUOROBENZENE	102	Min: 86	Max: 115		
1,2-DICHLOROETHANE-d4	94	Min: 76	Max: 114		
TOLUENE-d8	108	Min: 88	Max: 110		
TCLP METALS					
ARSENIC	<0.005	0.005	MG/L		JB
BARIUM	0.97	0.50	MG/L		JB
CADMIUM	<0.003	0.003	MG/L		JB
CHROMIUM	<0.02	0.02	MG/L		JB

Test Description	Result	Limit	Units	Analyzed	By
LEAD	<0.10	0.10	MG/L		JB
MERCURY	<0.0002	0.0002	MG/L		JB
SELENIUM	<0.005	0.005	MG/L		JB
SILVER	<0.010	0.010	MG/L		JB
TCLP ORGANICS ENRON LIST					
BENZENE	<0.02	0.02	MG/L	11/05/91	SS
CARBON TETRACHLORIDE	<0.02	0.02	MG/L	11/05/91	SS
CHLOROBENZENE	<0.02	0.02	MG/L	11/05/91	SS
CHLOROFORM	<0.02	0.02	MG/L	11/05/91	SS
1,2-DICHLOROETHANE	<0.02	0.02	MG/L	11/05/91	SS
1,1-DICHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
METHYL ETHYL KETONE	<0.02	0.02	MG/L	11/05/91	SS
TETRACHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
TRICHLOROETHYLENE	<0.02	0.02	MG/L	11/05/91	SS
VINYL CHLORIDE	<0.02	0.02	MG/L	11/05/91	SS
O-CRESOL	<0.001	0.001	MG/L	11/05/91	SS
M-CRESOL	<0.001	0.001	MG/L	11/05/91	SS
P-CRESOL	<0.001	0.001	MG/L	11/05/91	SS
1,4-DICHLOROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
2,4-DINITROTOLUENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLOROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLORO-1,3-BUTADIENE	<0.001	0.001	MG/L	11/05/91	SS
HEXACHLOROETHANE	<0.001	0.001	MG/L	11/05/91	SS
NITROBENZENE	<0.001	0.001	MG/L	11/05/91	SS
PENTACHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS
PYRIDINE	<0.001	0.001	MG/L	11/05/91	SS
2,4,5-TRICHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS
2,4,6-TRICHLOROPHENOL	<0.001	0.001	MG/L	11/05/91	SS

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Test Description	Result	Limit	Units	Analyzed	By
Surrogates					
NITROBENZENE-d5	73	Min: 35 Max: 114			
2-FLUOROBIPHENYL	77	Min: 43 Max: 116			
TERPHENYL-d14	105	Min: 33 Max: 141			
PHENOL-d5	47	Min: 10 Max: 94			
2-FLUOROPHENOL	78	Min: 21 Max: 100			
TOTAL REC PET HYDROCARBONS	<5.0	5.0	MG/KG	10/25/91	PV

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REGULAR TEST RESULTS BY TEST

TCLP XYLENE **Minimum: 1.0** **Maximum: 100**
Method: EPA 602

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
01A	LEAN OIL TANK 1011	0.36	MG/L	11/04/91	11/04/91	DD

TOTAL REC PET HYDROCARBONS **Minimum: 5.0** **Maximum: 100**
Method: EPA 418.1

Sample	Sample Description	Result	Units	Extracted	Analyzed	By
02A	BH-20 1.0-1.3	<5.0	MG/KG	10/25/91	10/25/91	PV
03A	BH-20 26.2-26.5	<5.0	MG/KG	10/25/91	10/25/91	PV
04A	BH-21 3.8-4.3	190	MG/KG	10/25/91	10/25/91	PV
05A	BH-21 18.6-19.0	<5.0	MG/KG	10/25/91	10/25/91	PV
06A	BH-22 3.9-4.3	<5.0	MG/KG	10/25/91	10/25/91	PV
07A	BH-22 29.2-29.6	<5.0	MG/KG	10/25/91	10/25/91	PV

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TEST METHODOLOGIES

TCLP METALS: USEPA 200 SERIES METHODOLOGY

TCLP EXTRACTION: USEPA METHOD # 1311

BENZENE, TOLUENE, ETHYLBENZENE, XYLENES: USEPA METHOD # 602/8020

TCLP F SERIES ENRON LIST = USEPA METHOD # 8240/8270

TCLP ORGANICS ENRON LIST = USEPA METHOD # 8240/8270

TCLP ZERO HEAD SPACE EXTRACTION = USEPA METHOD # 1311

TCLP XYLENE = USEPA METHOD # 602

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS = USEPA METHOD # 418.1

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KOOGLE & POULS ENGINEERING
8338A COMANCHE N.E. ALBUQUERQUE, N.M. 87110

PLATE 1

METRIC Corporation

BOREHOLE/MONITOR WELL LOCATIONS

HOBBS PLANT COMPLEX
NE 1/4 SEC. 6 T19S-R37E
LEA COUNTY, NEW MEXICO

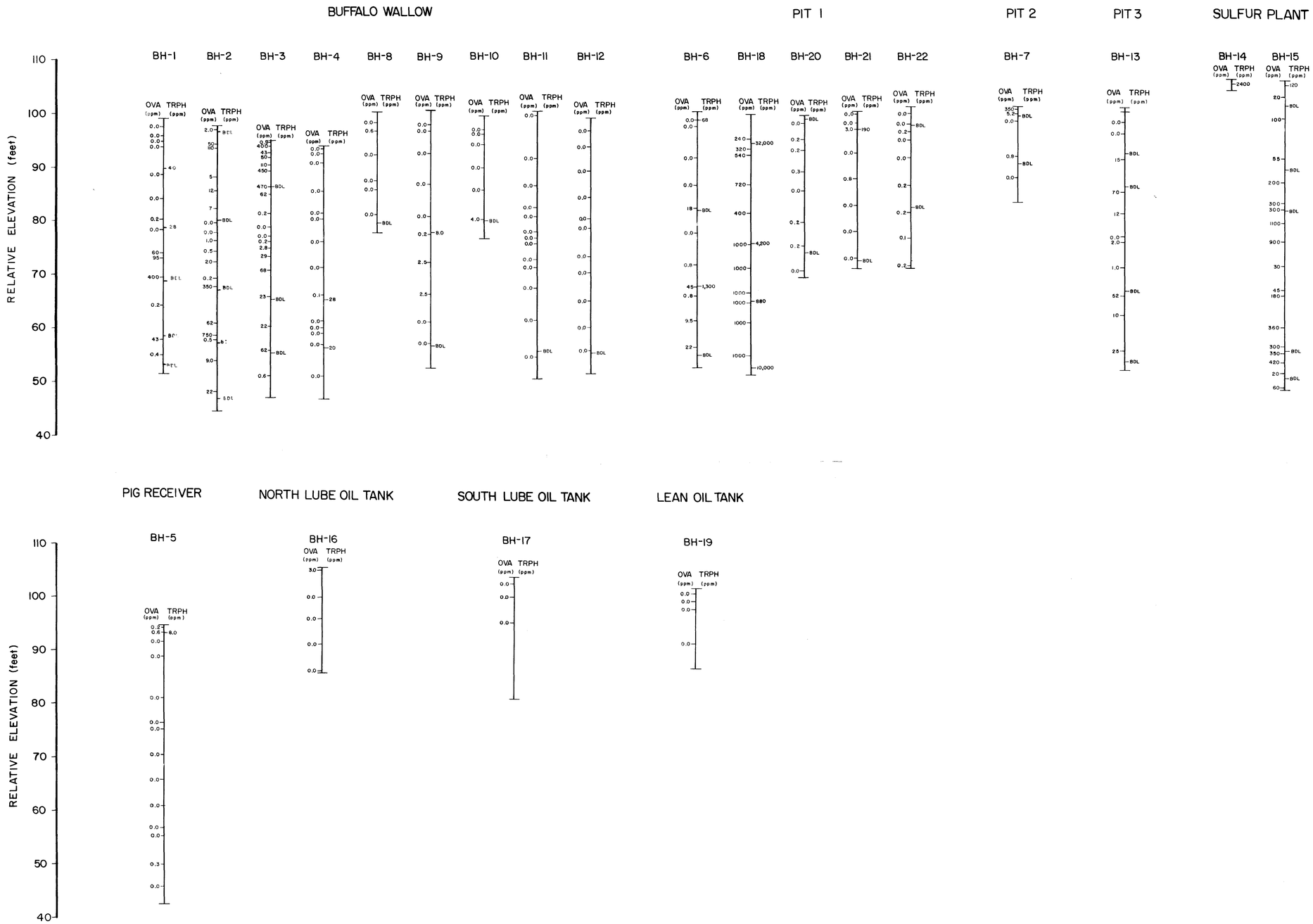
STA. NO. N.M.-95

7-20-81

SCALE 1" = 100'

Northern Natural Gas Company

AP-100



METRIC Corporation

BOREHOLE DATA

HOBBS GAS TREATING PLANT
LEA COUNTY, NEW MEXICO

TRANSWESTERN PIPELINE COMPANY

Date 12-91

PLATE 2