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REPORTS

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COMPREHENSIVE ASSESSMENT REPORT

TEXAS - NEW MEXICO PIPELINE COMPANY
MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

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COMPREHENSIVE ASSESSMENT REPORT

MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

PREPARED FOR:

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September 9, 1997

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APPENDICES

EXECUTIVE SUMMARY

This report summarizes the results of subsurface assessment activities conducted at Monument Site No. 17, located in Lea County, New Mexico. Activities were performed in general accordance with the work plan submitted with the Phase I - Preliminary Site Characterization Report prepared for the site and approved by the State of New Mexico Oil Conservation Division.

Field activities associated with the subsurface assessment consisted of advancing five soil borings and installing three monitoring wells for the collection of soil and ground water samples for laboratory analysis. A sensitive receptor survey/migration pathway evaluation was also conducted.

Results of the assessment included the following:

- Soil analytical results indicated the presence of benzene, toluene, ethylbenzene, and xylenes (BTEX), Volatile Organic Compounds (VOCs) and Semi-Volatile Organic Compounds (SVOCs) at concentrations noted within the report.

- Phase-separate hydrocarbon (PSH) was not detected in ground water within any of the on-site monitoring wells.

- Laboratory analysis of ground water samples obtained from monitoring wells indicated BTEX concentrations ranging from non-detectable (ND) to 0.772 mg/l and non-detectable polycyclic aromatic hydrocarbon (PAH) concentrations.

- Soil is impacted in Soil Borings B17-1, B17-2, B17-3, B17-4, and B17-5 based on laboratory results and field PID readings.

- Apparent impact to soils from petroleum hydrocarbons extended from the ground surface to the apparent ground water table at approximately 23 feet bgs in the identified source area based on laboratory results and field PID readings.

- Ground water is impacted with petroleum hydrocarbon based on field PID readings and soil and ground water laboratory results.

Recommended additional assessment and remediation activities to be conducted pursuant to final site closure include:

- Preparation of a closure plan presenting target closure concentrations and remediation methods for impacted media at the site.

- Quarterly monitoring and sampling of all on-site monitoring wells.

INTRODUCTION

This report summarizes the results of the subsurface assessment activities conducted in response to suspected crude oil impact at Monument Site No. 17, located in Lea County, New Mexico. Site No. 17 consisted of an area of apparent hydrocarbon surficial impact approximately 200 feet by 250 feet. A site location map is presented as FIG. 1.

A scope of work for the subsurface assessment was prepared based upon field observations obtained during a preliminary investigation of the site surface conditions. The proposed work plan was presented in the Phase I - Preliminary Site Characterization report dated June 21, 1996, and was approved by the State of New Mexico Oil Conservation Division in a letter dated August 16, 1996. The general scope of work for the subsurface investigation included:

- A sensitive receptor survey, migration pathway evaluation, and registered water well search.
- Soil borings within and on the perimeter of the suspected source area.
- Monitoring wells surrounding the suspected source area.

SUBSURFACE INVESTIGATION

SENSITIVE RECEPTOR SURVEY/MIGRATION PATHWAY EVALUATION

Receptor Survey

A sensitive receptor survey/migration pathway evaluation was conducted at the site. Potential receptors identified within a 500-foot radius of the site consisted of an active private water well used for livestock located approximately 250 feet to the southeast and a City of Monument water supply well located approximately 440 feet to the east. A plugged and abandoned well was identified approximately 240 feet to the east. Adjacent properties consisted of vacant rangeland to the north, south, east, and west, and a crude oil pump unit to the southwest.

A search of State of New Mexico water well registrations indicated 14 registered water wells potentially within a 1/2-mile radius of the site. The locations of 7 of the wells could not be determined from the well registration coordinates. Approximate locations for the 7 wells which were positively identified from the well registration coordinates are presented on FIG. 1. A copy of the well registration data is presented in APPENDIX A.

Migration Pathway Evaluation

Potential manmade migration pathways identified during the survey included a plugged and abandoned well to the east, a TNMPL crude oil pipeline extending through the center of the site from the northeast to the southwest, a Hess Petroleum pipeline extending through the southern portion of the site from the east to west, an unidentified pipeline right-of-way extending through the eastern portion of the site from north to south, and an unidentified pipeline right-of-way extending through the northeastern portion of the site from northeast to

southwest. Identified manmade potential migration pathways at the site are presented on FIG. 2.

Ground water at the site may also act as a migration pathway. The calculated ground water gradient at the site indicated a local direction of flow to the northeast. Surface drainage at the site is also to the northeast.

FIELD ACTIVITIES

Soil Borings

On March 17, 1997, soil borings B17-1 through B17-5 were advanced utilizing a direct-push hydraulic sampling system. Each of the soil borings was advanced to refusal. On April 2 and 4, 1997, the locations of soil borings B17-2 through B17-5 were advanced to the apparent depth of ground water using an air rotary rig. Field observations obtained during the soil boring advancement included the following:

- Observed depths to ground water during soil boring advancement ranged from 19 to 21 feet below ground surface (bgs).
- Phase-separate hydrocarbon (PSH) was not identified on ground water in any soil boring.
- Hydrocarbon impact extends from the ground surface to the observed depth of ground water within the suspected source area.
- Hydrocarbon impact to vadose zone soils appears to have been delineated.

Upon completion of sampling activities, each soil boring not completed as a monitoring well was backfilled to the ground surface with a cement/bentonite grout. Approximate locations of the soil borings are presented on FIG. 2.

Monitoring Wells

Following evaluation of field and analytical data obtained during soil boring advancement, monitoring wells were installed to complete a triangulation of ground water monitoring points surrounding the suspected source area. The monitoring wells were installed to depths of approximately 26 to 30 feet bgs. The well materials consisted of threaded connection two-inch ID, Schedule 40 PVC solid pipe, and 0.010-inch slotted PVC well screen. A graded, clean silica sand was placed in the annulus of the screened interval for each well. A three-foot bentonite seal was placed above the sand packing and a stick-up, steel protective cover was then concreted in place. Each well was protected with a locked cap.

The monitoring wells were installed by a well driller licensed in the State of New Mexico.

Elevations of the monitoring well PVC riser, top of cover, surface pad, and ground surface were determined by a level survey conducted by Basin Surveys of Hobbs, New Mexico. The monitoring well elevations were referenced from mean sea level.

SOIL ASSESSMENT

The subsurface profile was classified in general accordance with the Unified Soil Classification System by visually observing soil samples obtained during drilling. In general, two soil types were encountered. A general description, approximate thickness, and head-space results of each soil type are discussed as follows:

Soil Type 1

This soil type consisted of a dark gray to dark brown clay encountered at the surface of all soil boring locations. This moist clay contained gravel and organic material. Observed thicknesses of this soil type varied from approximately 0.5 to 6 feet. The head-space readings from samples of this soil type ranged from below instrument detection levels (ND) to 1,215 parts per million (ppm).

Soil Type 2

This soil type consisted of a limestone encountered beneath the upper sand at all soil boring locations. This limestone was well cemented, interbedded with poorly cemented caliche, and moist to wet. Observed thicknesses of this soil type varied from approximately 2 to 29.5 feet. The head-space readings from samples of this soil type ranged from ND to 1,289 ppm.

Graphic logs indicating the subsurface soil profile, depths at which soil samples were obtained, head-space results, laboratory results, and the monitoring well/soil boring details are indicated on FIGS. 4 through 7.

GROUND WATER MONITORING

A ground water monitoring event was conducted at the site on April 30 and May 2, 1997. The event consisted of gauging the water level in Monitoring Wells MW17-1 through MW17-3, checking for the presence of PSH, and purging and sampling all wells not containing PSH.

Ground water measurements obtained during the event indicated a general direction of flow to the northeast, with a calculated gradient of approximately 0.003 ft/ft. No PSH was observed in any of the monitoring wells. A summary of ground water gauging and elevation data is presented on TABLE IV.

LABORATORY ANALYSES

Soil

Soil samples were selected for laboratory analysis from sample intervals that, at a minimum, represented the high field screening result and the bottom of the hole of each soil boring. The selected soil samples were express mailed to Xenco Laboratories in San Antonio, Texas for determination of TPH concentrations by EPA METHOD 418.1 and BTEX concentrations by EPA Method SW846-8020. Additional analyses of SPLP Volatiles by EPA Method SW846-1312/8260, SPLP Semi-Volatiles by EPA Method SW846-1312/8270 and SPLP TPH by EPA Method 1312/418.1 were conducted on the soil boring sample with the highest TPH concentration. A determination of fraction organic carbon was conducted on an unimpacted sample collected from Soil Boring B17-5.

Analytical results indicated the following range of constituent concentrations for the soil boring samples:

CONSTITUENT	RANGE OF CONCENTRATIONS
TPH	ND to 11,200 mg/kg
BTEX	ND to 311 mg/kg
Benzene	ND to 13.10 mg/kg
SPLP VOC	
Benzene	0.054 mg/l
Ethylbenzene	0.434 mg/l
Isopropylbenzene	0.045 mg/l
Napthalene	0.060 mg/l
n-Propylbenzene	0.048 mg/l
Toluene	0.321 mg/l
1,2,4-Trimethylbenzene	0.116 mg/l
1,3,5-Trimethylbenzene	0.034 mg/l
o-Xylene	0.188 mg/l
m,p-Xylene	0.370 mg/l
SPLP SVOC	
2-Methylnaphthalene	0.039 mg/l
Napthalene	0.067 mg/l
Di-n-butylphthalate	0.013 mg/l
SPLP TPH	1.4 mg/l
Fraction Organic Carbon	0.5%

All SPLP VOC and SPLP SVOC constituent concentrations not listed above were ND.

A complete summary of analytical results for soil samples is presented in TABLES I through III. Copies of the certified laboratory reports for soils are presented in APPENDIX B.

Ground Water

Ground water samples were express mailed to Xenco Laboratories in San Antonio, Texas for a determination of BTEX, Total Metals (ICP) by EPA Method EPA 6010, total Mercury by EPA Method 7470, polycyclic aromatic hydrocarbons (PAH) by EPA Method 8100, bicarbonate by SM4500CO2D, carbonate by SM4500CO2D, TDS by EPA Method 160.1, Anions by EPA Method 300.0, and total inorganic carbon by Modified EPA Method 415.1.

Results for ground water samples indicated the following range of concentrations:

CONSTITUENT	RANGE	NMWQCC LIMIT
BTEX	ND to 0.772 mg/l	0.001 to 0.75 mg/l
PAH	ND	0.03 mg/l
ICP METALS		
Aluminum	2.36 to 21.2 mg/l	5.0 mg/l
Barium	0.35 to 0.75 mg/l	1.0 mg/l
Calcium	279 to 1,170 mg/l	N/A
Iron	1.69 to 13.4 mg/l	1.0 mg/l
Magnesium	26.3 to 40.0 mg/l	N/A
Manganese	ND to 0.29 mg/l	0.2 mg/l
Potassium	4.89 to 7.84 mg/l	N/A
Sodium	69.7 to 95.8 mg/l	N/A
Tin	0.65 to 5.53 mg/l	N/A
Vanadium	ND to 0.05 mg/l	N/A
Silicon	12.9 to 24.5 mg/l	N/A
Strontium	1.30 to 2.16 mg/l	N/A
Mercury	ND	0.002 mg/l
Bicarbonate	307 to 319 mg/l	N/A
Carbonate	ND to 1.3 mg/l	N/A
ANIONS		
Sulfate	62.0 to 70.0 mg/l	600.0 mg/l
Chloride	152 to 174 mg/l	250.0 mg/l
Total Dissolved Solids	786 to 820 mg/l	1000.0 mg/l
Total Inorganic Carbon	46.8 to 70.0 mg/l	N/A

All ICP Metals concentrations not listed above were ND. N/A indicates a New Mexico Water Quality Control Commission (NMWQCC) standard was not available.

Analytical results for ground water samples collected from monitoring wells MW17-1 and MW17-2 did not indicate hydrocarbon impact. Therefore, analyte concentrations for those wells are believed to represent background ground water quality conditions at the site. Based on the results, background ground water conditions at the site do not meet certain NMWQCC standards for drinking water sources.

A complete summary of analytical results for ground water samples is presented in TABLE IV. Copies of the certified laboratory results for ground water are presented in APPENDIX C.

WASTE MANAGEMENT AND DISPOSITION

Auger cuttings generated during the installation of Monitoring Wells MW17-1 through MW17-3 were spread over surficial hydrocarbon-stained soil at the site. Water collected during monitoring well development and purging was stored on site in sealed drums pending appropriate disposal.

QA/QC PROCEDURES

DECONTAMINATION OF EQUIPMENT

Cleaning of drilling equipment was the responsibility of the drilling company. In general, the cleaning procedures consisted of using high pressure steam to wash the drilling and sampling equipment prior to drilling and prior to starting each hole. Prior to use, the sampling equipment was cleaned with Liqui-Nox detergent and rinsed with distilled water.

SOIL SAMPLING

Samples of the subsurface soils were obtained utilizing either a direct-push continuous sampling device or air rotary drilling with split spoon samples at discrete intervals. Representative soil samples were divided into two separate portions using clean, disposable gloves and clean sampling tools. One portion of the soil sample was placed in a disposable sample bag. The bag was labeled and sealed for head-space analysis using a photo-ionization detector (PID) calibrated to a 100 ppm isobutylene standard. Each sample was allowed to volatilize for approximately 30 minutes at ambient temperature prior to conducting the analysis.

The other portion of the soil sample was placed in a sterile glass container equipped with a Teflon-lined lid furnished by the analytical laboratory. The container was filled to capacity to limit the amount of head-space present. Each container was labeled and placed on ice in an insulated cooler. Upon selection of samples for analysis, the cooler was sealed for shipment to the laboratory. Proper chain-of-custody documentation was maintained throughout the sampling process.

GROUND WATER SAMPLING

Monitoring wells were developed and purged with a clean PVC bailer. The bailer was cleaned prior to each use with Liqui-Nox detergent and rinsed with distilled water. Monitoring wells with sufficient recharge were purged by removing a minimum of three well volumes. Monitoring wells that did not recharge sufficiently were purged until no additional ground water could be obtained.

After purging the wells, ground water samples were collected with a disposable Teflon bailer and polyethylene line by personnel wearing clean, disposable gloves. Ground water sample containers were filled in the order of decreasing volatilization sensitivity (i.e., BTEX containers were filled first and PAH containers second).

Ground water samples collected for BTEX analysis were placed in sterile, 40 ml glass VOA vials equipped with Teflon-lined caps. The containers provided were pre-preserved with HCl by the analytical laboratory. The vials were filled to a positive meniscus, sealed, and visually checked to ensure the absence of air bubbles.

Ground water samples collected for PAH analysis were filled to capacity in sterile, 1 liter glass containers equipped with Teflon-lined caps. The containers were provided by the analytical laboratory.

The filled containers were labeled and placed on ice in an insulated cooler. The cooler was sealed for transportation to the analytical laboratory. Proper chain-of-custody documentation was maintained throughout the sampling process.

LABORATORY PROTOCOL

The laboratory was responsible for proper QA/QC procedures. These procedures are either transmitted with the laboratory reports or are on file at the laboratory.

CONCLUSIONS

The following conclusions are presented based on the field observations, drilling activities, and soil laboratory results:

SOIL

- Soil is impacted with petroleum hydrocarbons at the locations of Soil Borings B17-1 through B17-5 based on laboratory results and field PID readings.
- Soil impact extends from the ground surface to ground water within the impacted area.
- Standard New Mexico Oil and Conservation Division regulatory site closure concentrations for soils were exceeded by TPH concentrations in samples collected from Soil Borings B17-1 through B17-5; and by BTEX concentrations in samples collected from Soil Borings B17-1 through B17-3.

GROUND WATER

- Ground water impact was indicated at the location of Soil Boring B17-1 and Monitoring Well MW-3 by soil and ground water sample laboratory results and field PID readings near the ground water table.
- PSH was not observed on ground water during the assessment.
- Water quality data collected from MW17-1 and MW17-2 suggest that background ground water conditions at the site exceed certain NMWQCC drinking water standards.

RECOMMENDATIONS

SOIL

Recommendations for remediation of impacted soil at the site will be developed following evaluation of ground water conditions.

GROUND WATER

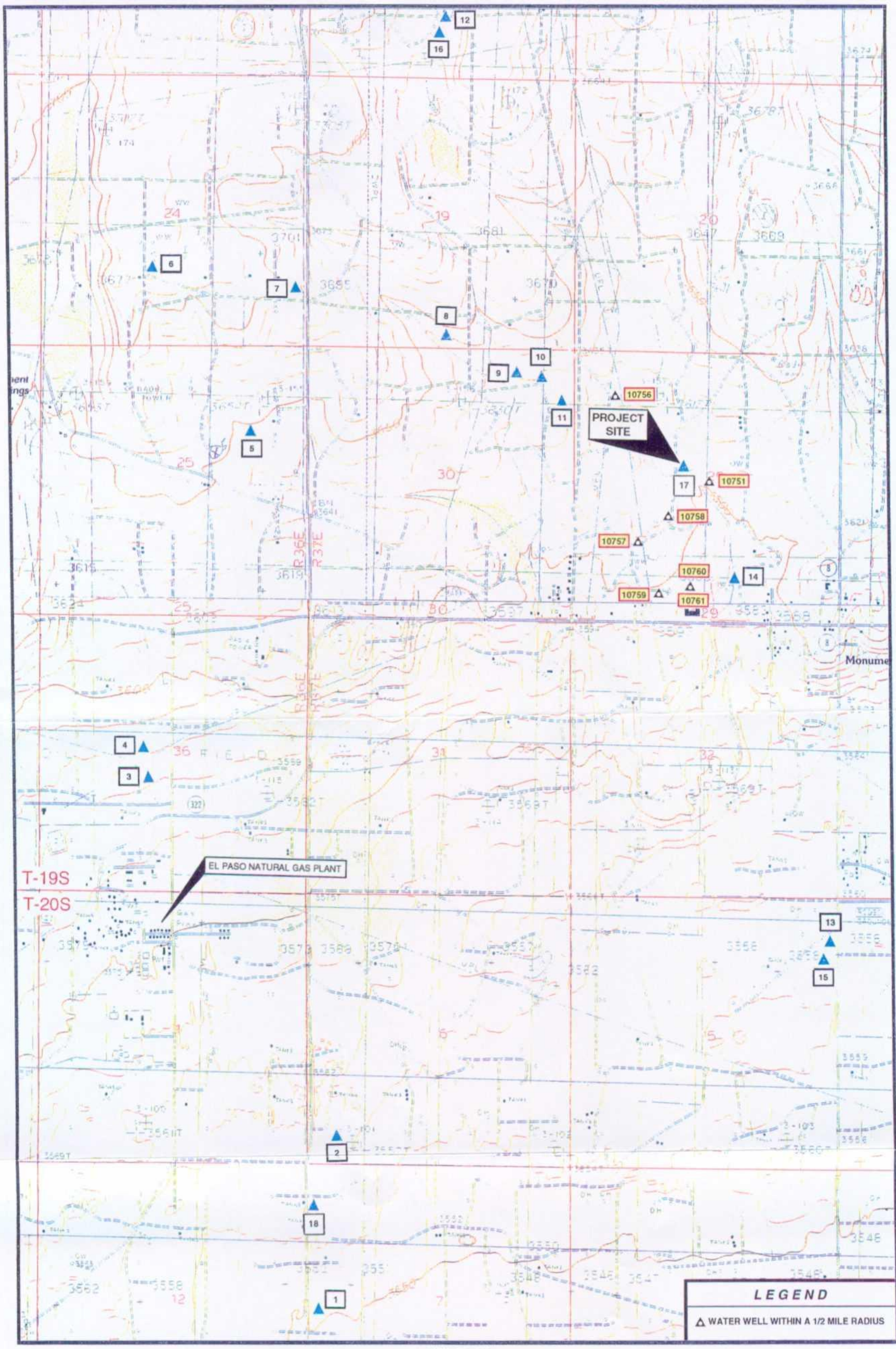
Additional characterization of ground water conditions at the site should be conducted prior to preparation of a Ground Water Remedial Alternatives report. Recommended assessment activities to be conducted include:

- Preparation of a closure plan presenting target closure concentrations for impacted media at the site.

- Quarterly monitoring and sampling of all on-site monitoring wells to verify dissolved-phase concentrations and direction of ground water flow.

MONUMENT NORTH QUADRANGLE
NEW MEXICO - LEA COUNTY
PRINTED 1985

MONUMENT SOUTH QUADRANGLE
NEW MEXICO - LEA COUNTY
PRINTED 1985



SCALE 1:24000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETRE

CONTOUR INTERVAL 5 FEET

05/21/96--JS (610057GL)

k·e·i	SITE LOCATION MAP	610057
	TEXAS - NEW MEXICO PIPE LINE CO. MONUMENT SITE NO. 17 LEA COUNTY, NEW MEXICO	FIG 1

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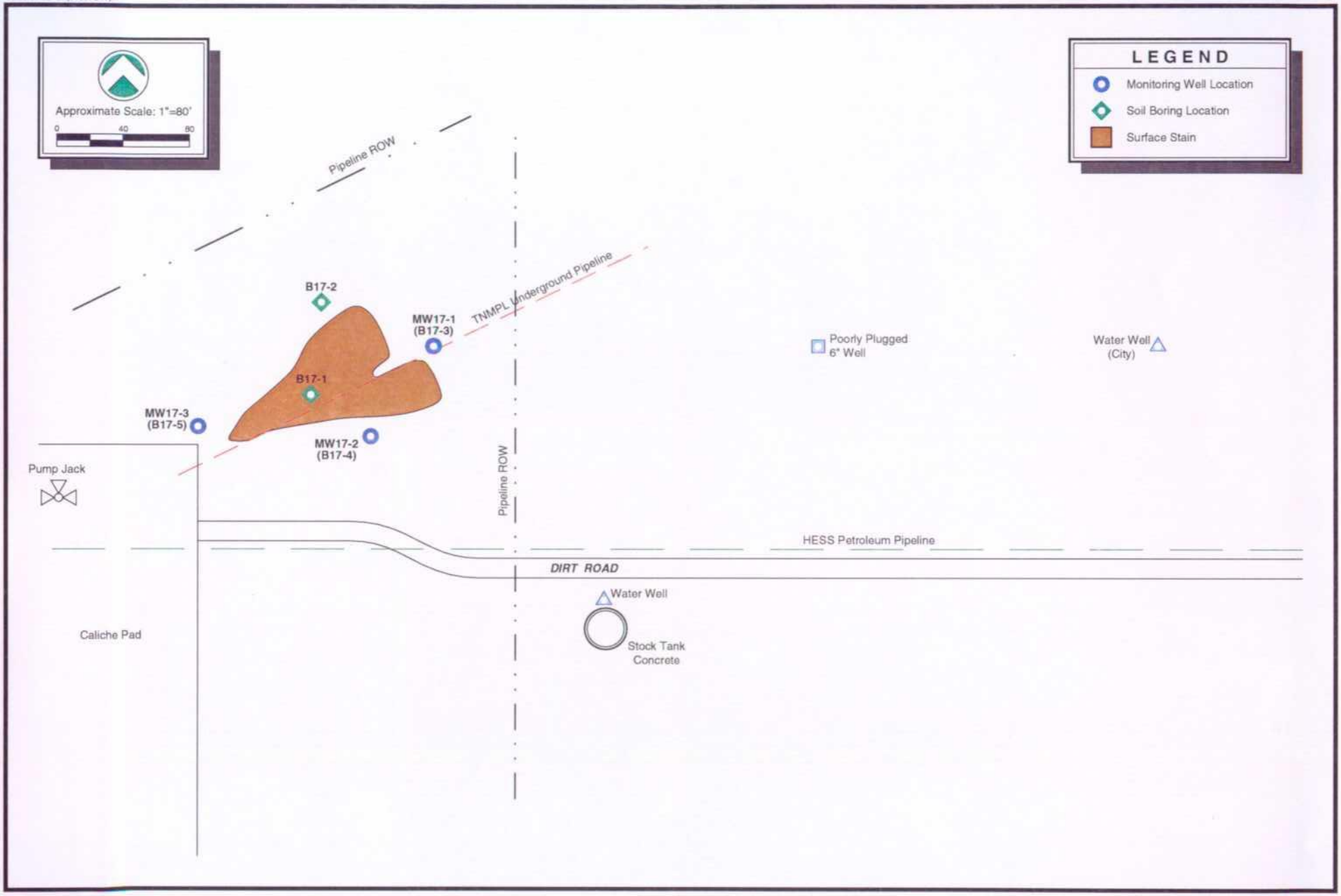

k·e·i	*SITE DETAILS*	610057
	TEXAS - NEW MEXICO PIPE LINE CO. MONUMENT SITE NO. 17 LEA COUNTY, NEW MEXICO	FIG 2

LEGEND

Clay (GC), gravelly, organics, moist, dark grey to dark brown.

Limestone (LS), well cemented, interbedded with poorly cemented caliche, moist to wet.

Indicates the depth interval from which a soil sample was selected and prepared for field head-space and/or laboratory analysis.

Indicates sample selected for laboratory analysis.

Depth of groundwater during drilling.

B = benzene concentration (mg/kg)
BTEX = total BTEX concentration (mg/kg)
TPH = total petroleum hydrocarbon concentration (mg/kg)

PID = Head-space readings in ppm obtained with a photoionization detector.

ND = Indicates the concentration was below laboratory detection limits.

NOTES:

1. Soil Borings B17-1 and B17-2 were advanced utilizing a direct-push sampling method on March 17, 1997. The location of B17-2 was re-advanced on April 2, 1997 utilizing an air rotary rig.
2. Ground water was encountered during soil boring advancement at depths of 18 and 23 feet below ground surface.
3. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
4. The depths indicated are referenced from the ground surface.
5. The soil borings were grouted to the ground surface with cement grout containing 5 percent bentonite.

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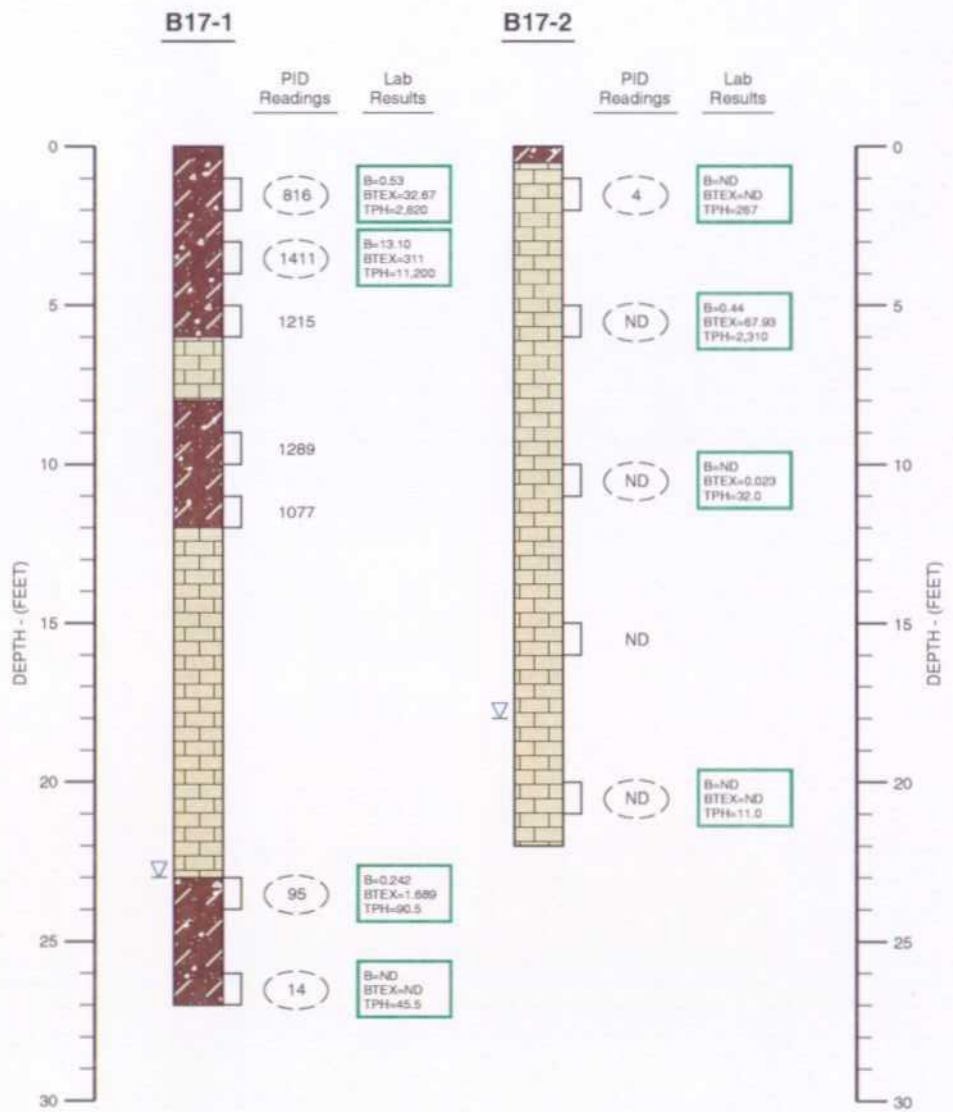
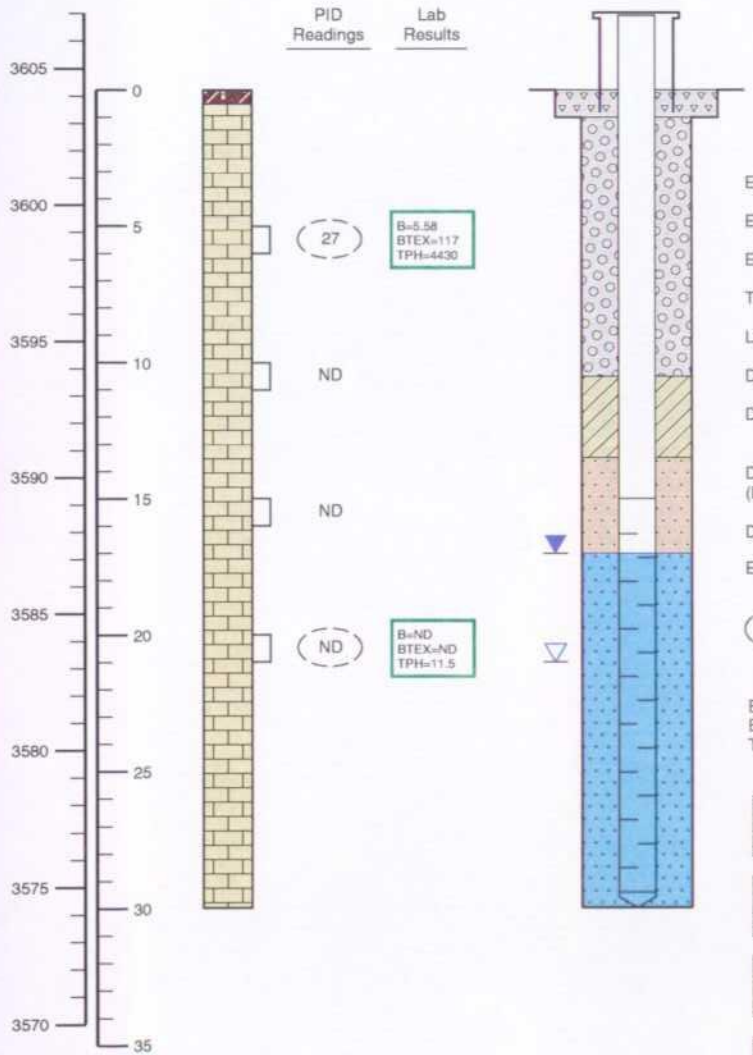
LEGEND AND NOTES FOR SOIL BORINGS			610057
TEXAS - NEW MEXICO PIPE LINE CO.	MONUMENT SITE NO. 17	LEA COUNTY, NEW MEXICO	FIG 3



k·e·i	*LOG AND DETAILS OF SOIL BORINGS*	610057
	TEXAS - NEW MEXICO PIPE LINE CO. MONUMENT SITE NO. 17 LEA COUNTY, NEW MEXICO	FIG 4

MONITORING WELL MW17-1
(SOIL BORING B17-3)



Monitoring Well Details (MW17-1)

Elev Top of Protective Cover	3606.94 ft
Elev of Ground Surface	3604.23 ft
Elev Top of PVC Well	3607.03 ft
Thickness of Bentonite Seal	3.0 ft
Length of PVC Well Screen	15.0 ft
Depth of PVC Well	30.0 ft
Depth of Exploratory Hole	30.0 ft
Depth to Ground Water (During drilling)	21.0 ft
Depth to Ground Water	17.02 ft
Elev of Ground Water	3587.21 ft

Indicates sample selected for laboratory analysis.

B = Benzene Concentration (mg/kg)
BTEX = Total BTEX Concentration (mg/kg)
TPH = Total Petroleum Hydrocarbon Concentration (mg/kg)

2' x 2' Concrete Pad

Cement / Bentonite Grout

Bentonite Pellet Seal

Sand Pack

LEGEND

Clay (CG), gravelly, organics, moist, dark grey to brown.

Limestone (LS), well cemented, interbedded with poorly cemented caliche, moist to wet.

Indicates the depth of interval from which a soil sample was selected and prepared for field head-space and/or laboratory analysis.

Indicates the ground water level measured during drilling.

Indicates the ground water level measured on April 30, 1997.

PID Head-space readings in ppm obtained with a photo-ionization detector.

ND Indicates the constituent was not detected.

NOTES

1. The monitoring well MW17-1 was installed utilizing an air rotary rig on April 4, 1997.
2. The well was constructed with 2-inch ID, 0.010-inch factory slotted, threaded joint, Schedule 40 PVC pipe.
5. The well is protected with a stick up steel cover and a locked compression cap.
4. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
5. The depths indicated are referenced from the ground surface.

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LOG AND DETAILS OF MONITORING WELL MW17-1 (SOIL BORING B17-3)

TEXAS - NEW MEXICO PIPE LINE CO. MONUMENT SITE NO. 17 LEA COUNTY, NEW MEXICO

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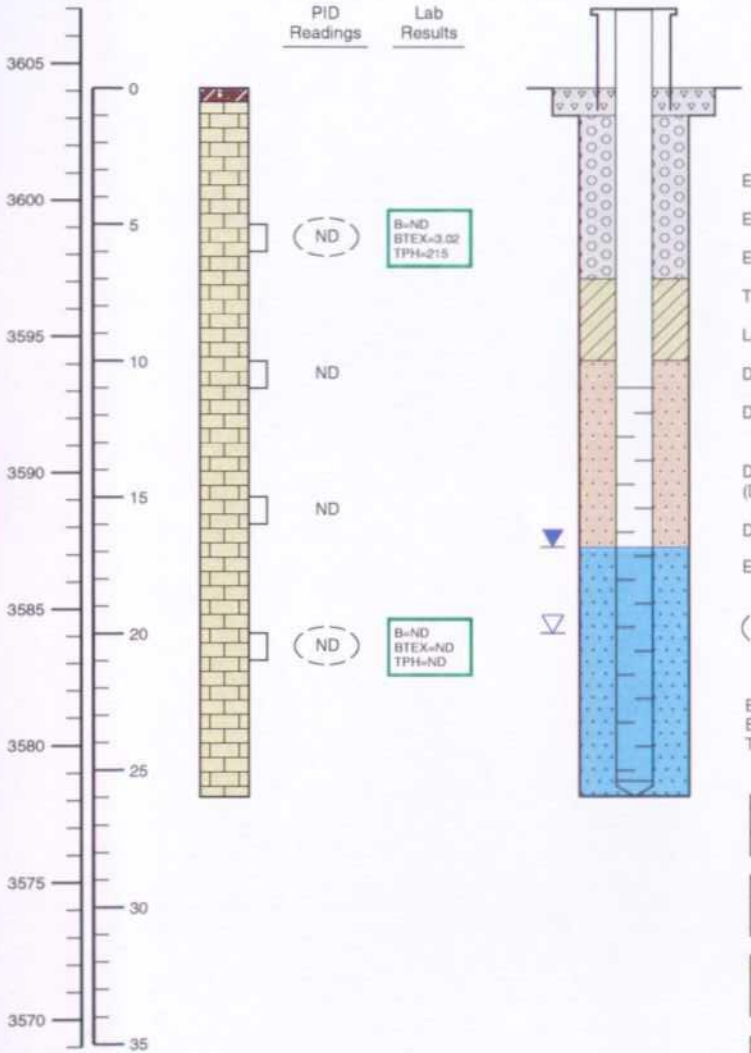
FIG 5

MONITORING WELL MW17-2
(SOIL BORING B17-4)



Monitoring Well Details (MW17-2)

Elev Top of Protective Cover	3607.01 ft
Elev of Ground Surface	3604.11 ft
Elev Top of PVC Well	3606.96 ft
Thickness of Bentonite Seal	3.0 ft
Length of PVC Well Screen	15.0 ft
Depth of PVC Well	26.0 ft
Depth of Exploratory Hole	26.0 ft
Depth to Ground Water (During drilling)	20.0 ft
Depth to Ground Water	16.84 ft
Elev of Ground Water	3587.27 ft

Indicates sample selected for laboratory analysis.

B = Benzene Concentration (mg/kg)
BTEX = Total BTEX Concentration (mg/kg)
TPH = Total Petroleum Hydrocarbon Concentration (mg/kg)

2' x 2' Concrete Pad

Cement / Bentonite Grout

Bentonite Pellet Seal

Sand Pack

LEGEND

Clay (CG), gravelly, organics, moist, dark grey to brown.

Limestone (LS), well cemented, interbedded with poorly cemented caliche, moist to wet.

Indicates the depth of interval from which a soil sample was selected and prepared for field head-space and/or laboratory analysis.

Indicates the ground water level measured during drilling.

Indicates the ground water level measured on April 30, 1997.

PID — Head-space readings in ppm obtained with a photo-ionization detector.

ND — Indicates the constituent was not detected.

NOTES

1. The monitoring well MW17-2 was installed utilizing an air rotary rig on April 4, 1997.
2. The well was constructed with 2-inch ID, 0.010-inch factory slotted, threaded joint, Schedule 40 PVC pipe.
5. The well is protected with a stick up steel cover and a locked compression cap.
4. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
5. The depths indicated are referenced from the ground surface.

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LOG AND DETAILS OF MONITORING WELL MW17-2 (SOIL BORING B17-4)

TEXAS - NEW MEXICO PIPE LINE CO. MONUMENT SITE NO. 17 LEA COUNTY, NEW MEXICO

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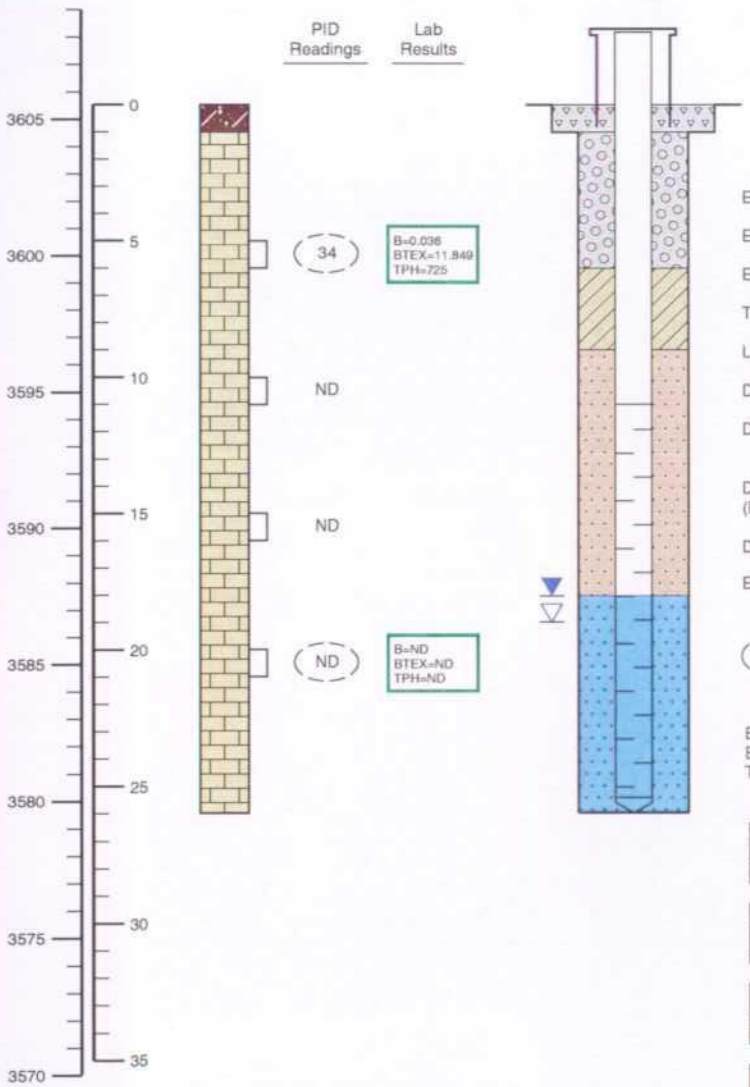
FIG 6

MONITORING WELL MW17-3
(SOIL BORING B17-5)



Monitoring Well Details (MW17-3)

Elev Top of Protective Cover	3608.19 ft
Elev of Ground Surface	3605.55 ft
Elev Top of PVC Well	3608.31 ft
Thickness of Bentonite Seal	3.0 ft
Length of PVC Well Screen	15.0 ft
Depth of PVC Well	26.0 ft
Depth of Exploratory Hole	26.0 ft
Depth to Ground Water (During drilling)	19.0 ft
Depth to Ground Water	18.03 ft
Elev of Ground Water	3587.52 ft

( ) Indicates sample selected for laboratory analysis.

B = Benzene Concentration (mg/kg)
BTEX = Total BTEX Concentration (mg/kg)
TPH = Total Petroleum Hydrocarbon Concentration (mg/kg)

2' x 2' Concrete Pad

Cement / Bentonite Grout

Bentonite Pellet Seal

Sand Pack

LEGEND

Clay (CG), gravelly, organics, moist, dark grey to brown.

Limestone (LS), well cemented, interbedded with poorly cemented caliche, moist to wet.

Indicates the depth of interval from which a soil sample was selected and prepared for field head-space and/or laboratory analysis.

Indicates the ground water level measured during drilling.

Indicates the ground water level measured on April 30, 1997.

PID Head-space readings in ppm obtained with a photo-ionization detector.

ND Indicates the constituent was not detected.

NOTES

1. The monitoring well MW17-3 was installed utilizing an air rotary rig on April 4, 1997.
2. The well was constructed with 2-inch ID, 0.010-inch factory slotted, threaded joint, Schedule 40 PVC pipe.
5. The well is protected with a stick up steel cover and a locked compression cap.
4. The lines between material types shown on the profile log represent approximate boundaries. Actual transitions may be gradual.
5. The depths indicated are referenced from the ground surface.

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LOG AND DETAILS OF MONITORING WELL MW17-3 (SOIL BORING B17-5)

TEXAS - NEW MEXICO PIPE LINE CO. MONUMENT SITE NO. 17 LEA COUNTY, NEW MEXICO

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FIG 7

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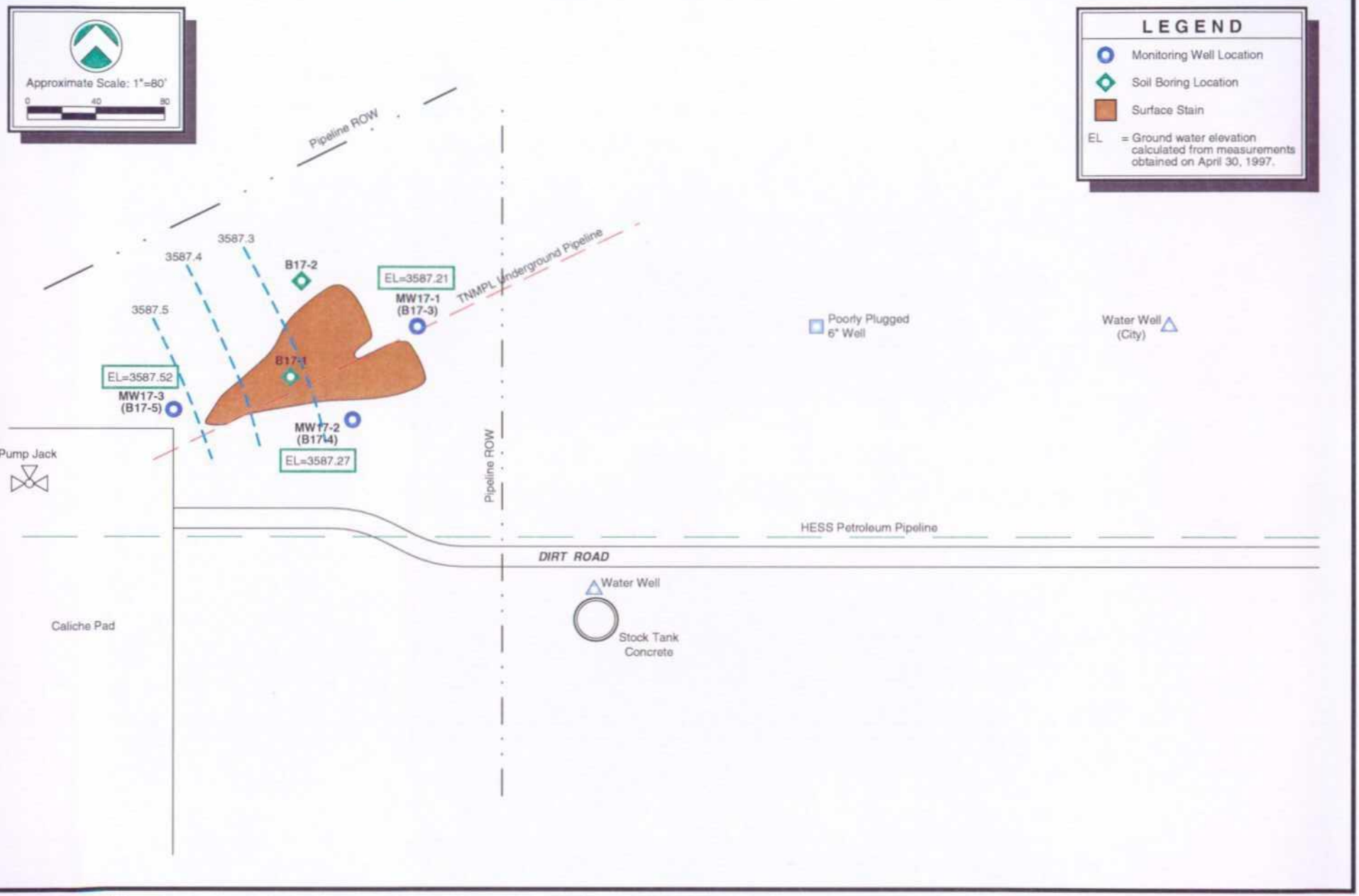

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GROUND WATER CONTOURS - APRIL 1997	610057
TEXAS - NEW MEXICO PIPE LINE CO. MONUMENT SITE NO. 17 LEA COUNTY, NEW MEXICO	FIG 8

GENERAL NOTES

ND - Indicates constituent was not detected above the method detection limit.
--- - Indicates PSH not present.

Depths are referenced from the ground surface unless otherwise specified.

Method detection limit

Soil:	Benzene	-	0.020 to 0.10 mg/kg
	Toluene	-	0.020 to 0.01 mg/kg
	Ethylbenzene	-	0.020 mg/kg
	Xylene	-	0.020 to 0.40 mg/kg
	BTEX	-	0.120 mg/kg
	TPH	-	10.0 mg/kg
Ground Water:	Benzene	-	0.001 mg/l
	Toluene	-	0.001 TO 0.005 mg/l
	Ethylbenzene	-	0.001 mg/l
	Xylenes	-	0.001 to 0.005 mg/l
	BTEX	-	0.006 mg/l
	PAH	-	0.002 mg/l

Laboratory testing method

BTEX	-	EPA Method SW846-8020
TPH	-	EPA Method 418.1
Metals	-	EPA Method 6010
PAH	-	EPA Method 8100
Bicarbonate	-	SM 4500CO2D
Carbonate	-	SM 4500CO2D
TDS	-	EPA Method 160.1
Anions	-	EPA Method 300.0
TIC	-	EPA Method 415.1

TABLE I

SUMMARY OF LABORATORY BTEX/TPH RESULTS - SOIL
TEXAS - NEW MEXICO PIPE LINE COMPANY
MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

SAMPLE LOCATION	SAMPLE DATE	DEPTH (feet)	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL-BENZENE (mg/kg)	XYLENES (mg/kg)	TOTAL BTEX (mg/kg)	TPH (mg/kg)
B17-1	03/17/97	1 - 2	0.53	4.21	13.50	14.43	32.67	2,620
B17-1	03/17/97	3 - 4	13.10	66.50	109	122.05	311	11,200
B17-1	03/17/97	23 - 24	0.242	0.298	0.652	0.497	1.689	90.5
B17-1	03/17/97	26 - 27	ND	ND	ND	ND	ND	45.5
B17-2	03/17/97	1 - 2	ND	ND	ND	ND	ND	267
B17-2	04/02/97	5 - 6	0.44	9.88	31.30	26.31	67.93	2,310
B17-2	04/02/97	10	ND	ND	0.023	ND	0.023	32.0
B17-2	04/02/97	20	ND	ND	ND	ND	ND	11.0
B17-3	04/02/97	5	5.58	10.60	49.60	51.70	117	4,430
B17-3	04/02/97	20	ND	ND	ND	ND	ND	11.5
B17-4	04/04/97	5	ND	ND	1.25	1.77	3.02	215
B17-4	04/04/97	20	ND	ND	ND	ND	ND	ND
B17-5	04/04/97	5	0.036	0.175	6.600	5.038	11.849	725
B17-5	04/04/97	20	ND	ND	ND	ND	ND	ND

TABLE II

SUMMARY OF LABORATORY SPLP RESULTS - SOIL
TEXAS - NEW MEXICO PIPE LINE COMPANY
MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

CONSTITUENT	SAMPLE LOCATION	DEPTH INTERVAL	DATE SAMPLED	CONCENTRATION (mg/l)
VOCs				
Benzene	B17-1	3 - 4	03/17/97	0.054
Ethylbenzene	B17-1	3 - 4	03/17/97	0.434
Isopropylbenzene	B17-1	3 - 4	03/17/97	0.045
Naphthalene	B17-1	3 - 4	03/17/97	0.060
n-Propylbenzene	B17-1	3 - 4	03/17/97	0.048
Toluene	B17-1	3 - 4	03/17/97	0.321
1,2,4-Trimethylbenzene	B17-1	3 - 4	03/17/97	0.116
1,3,5-Trimethylbenzene	B17-1	3 - 4	03/17/97	0.034
o-Xylene	B17-1	3 - 4	03/17/97	0.188
m,p-Xylenes	B17-1	3 - 4	03/17/97	0.370
SVOCs				
2-Methylnaphthalene	B17-1	3 - 4	03/17/97	0.039
Naphthalene	B17-1	3 - 4	03/17/97	0.067
Di-n-butylphthalate	B17-1	3 - 4	03/17/97	0.013
SPLP TPH	B17-1	3 - 4	03/17/97	1.4

Note:

1. Sample B17-1 (3 to 4 feet) was sampled on 03/17/97 and analyzed for SPLP of volatiles, semi-volatiles and TPH concentrations. Those constituents not listed were ND.

TABLE III

SUMMARY OF GEOTECHNICAL PARAMETER RESULTS
TEXAS - NEW MEXICO PIPE LINE COMPANY
MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

PARAMETER	SAMPLE LOCATION	SAMPLE DATE	DEPTH (feet)	RESULT
Fraction Organic Carbon (%)	B17-5	04/04/97	20	0.5

TABLE IV

SUMMARY OF GROUND WATER GAUGING DATA
MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

MONITORING WELL ID	DATE MEASURED	DEPTH TO WATER (feet)	ELEV. OF WATER (feet)	PSH THICKNESS (feet)
MW17-1	4/30/97	17.02	3,587.21	---
MW17-2	4/30/97	16.84	3,587.271	---
MW17-3	4/30/97	18.03	3,587.52	---

TABLE V

SUMMARY OF LABORATORY RESULTS (05/02/97) - WATER
MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

CONSTITUENT	NMWQCC LIMIT (mg/l)	MW17-1 (mg/l)	MW17-2 (mg/l)	MW17-3(mg/l)
BTEX				
Benzene	0.01	ND	ND	0.685
Toluene	0.75	ND	ND	ND
Ethylbenzene	0.75	ND	ND	0.071
Xylenes	0.62	ND	ND	0.016
PAH	0.002	ND	ND	ND
ICP METALS				
Aluminum	5.0	21.2	8.07	2.36
Barium	1.0	0.75	0.64	0.35
Calcium	N/A	1,170	743	279
Iron	1.0	13.4	5.92	1.69
Magnesium	N/A	40.0	32.9	26.3
Manganese	0.20	0.29	0.21	ND
Potassium	N/A	7.84	5.95	4.89
Sodium	N/A	80.7	69.7	95.8
Tin	N/A	5.53	2.16	0.65
Vanadium	N/A	0.05	ND	ND
Silicon	N/A	24.5	12.9	13.3
Strontium	N/A	2.16	1.69	1.30
Mercury	0.002	ND	ND	ND
BICARBONATE	N/A	319	307	315
CARBONATE	N/A	ND	1.0	1.3

TABLE V
(continued)

SUMMARY OF LABORATORY RESULTS (05/02/97) - WATER
MONUMENT SITE NO. 17
LEA COUNTY, NEW MEXICO

CONSTITUENT	NMWQCC LIMIT (mg/l)	MW17-1 (mg/l)	MW17-2 (mg/l)	MW17-3 (mg/l)
ANIONS				
Sulfate	600.0	70.0	62.0	63.2
Chloride	250.0	152	158	174
TDS	1000.0	786	820	816
TIC	N/A	64.9	70.0	46.8

Notes:

1. All metals concentrations not listed above were ND. A complete list of ICP Metals analytes and results is presented on the certified laboratory report (see APPENDIX B).

2. Values presented as NMWQCC Limits were obtained from New Mexico Water Quality Control Commission Ground Water Standards. Maximum allowable concentration values were not available for constituents listed as N/A.

[redacted]

10749	L	05565	S	L	05565	X	02	24	1965	LIC	IRR SHA	19S	37E	28	4421	19S	37E	28	0693	64	COOPER JIMMIE T ET AL	0.00	0.00	0	
10750	L	04104					04	06	1959	PMT	DOM	19S	37E	28	444	19S	37E	28	0964	64	BYRD N A	0.00	3.00	0	
10751	L	05790					10	25	1965	CAN	NOT	19S	37E	29	000	19S	37E	29	0566	64	MONUMENT WATER	0.00	0.00	0	Monument Site No. 17
10752	L	03956					08	05	1958	PMT	DOM	19S	37E	29	019	19S	37E	29	0964	64	SMITH DENNIS C	0.00	3.00	0	Monument No. 17
10753	L	03922					07	14	1959	PMT	DOM	19S	37E	29	020	19S	37E	29	0964	64	DICKERSON LEON	0.00	3.00	0	Monument No. 17
10754	L	03949					07	31	1958	PMT	DOM	19S	37E	29	028	19S	37E	29	0964	64	WHEELER ROY L	0.00	3.00	0	Monument No. 17
10755	L	03976					08	20	1958	PMT	DOM	19S	37E	29	048	19S	37E	29	0964	64	COOPER JIMMY T	0.00	3.00	0	Monument No. 17
10756	L	01251					10	18	1951	PMT	NOT	19S	37E	29	114	19S	37E	29	0564	64	GULF OIL CORP	0.00	0.00	0	Monument No. 17
10757	L	06496					03	24	1968	PMT	DOM	19S	37E	29	300	19S	37E	29	0567	64	GROVE O E	0.00	3.00	0	Monument No. 17
10758	L	02576					07	26	1954	PMT	OWD	19S	37E	29	320	19S	37E	29	0754	64	MAKIN DRILLING CO	0.00	0.00	0	Monument No. 17
10759	L	05545					01	31	1965	PMT	DOM	19S	37E	29	343	19S	37E	29	0365	64	HARSHBARGER TED	0.00	3.00	0	Monument No. 17
10760	L	04887		L	05314		04	20	1962	PMT	DOM	19S	37E	29	344	19S	37E	29	1064	64	HOBBS MUN SCHOOLS	0.00	3.00	0	Monument No. 17
10761	L	05222		L	04687		06	19	1963	CAN	NOT	19S	37E	29	344#	19S	37E	29	0765	64	HOBBS MUN SCHOOLS	0.00	0.00	0	Monument No. 17
11954	L	09633					02	28	1965	PMT	OWD	19S	37E	29	41	19S	37E	29	0285	64	ROBINETT L L	0.00	3.00	0	Monument No. 17
11955	L	09632					02	28	1965	PMT	OWD	19S	37E	29	41	19S	37E	29	0285	64	ROBINETT L L	0.00	3.00	0	Monument No. 17
11655	L	09631					02	28	1965	PMT	OWD	19S	37E	29	41	19S	37E	29	0285	64	ROBINETT L L	0.00	3.00	0	Monument No. 17
10762	L	01252					10	18	1951	PMT	NOT	19S	37E	29	431	19S	37E	29	0564	64	GULF OIL CORP	0.00	0.00	0	
10763	L	05314		L	04687		12	27	1963	LIC	MTU	19S	37E	29	431	19S	37E	29	1164	64	HOBBS MUN SCHOOLS	6.10	18.30	15	
10764	L	04799					02	05	1962	PMT	DOM	19S	37E	29	440	19S	37E	29	1064	64	WHITAKER W V	0.00	3.00	0	
10765	L	05611	I	L	05611		04	29	1965	PMT	MUN	19S	37E	29	440	19S	37E	32	0765	64	MONUMENT WATER USERS COOP	0.00	40.00	34	
10766	L	05580					11	16	1964	PMT	DOM	19S	37E	29	442	19S	37E	29	0365	64	FIRST BAPTIST CH	0.00	3.00	0	
10767	L	03905					06	30	1958	PMT	DOM	19S	37E	30	440	19S	37E	30	0964	64	LONENECKER LILLIE	0.00	3.00	0	
10768	L	03906					06	30	1958	PMT	DOM	19S	37E	30	440	19S	37E	30	0964	64	SHORT ROBERT P III	0.00	3.00	0	
10769	L	03936					07	23	1958	PMT	DOM	19S	37E	30	440	19S	37E	30	0964	64	MCKNIGHT JOY DEE	0.00	3.00	0	
10770	L	03954					08	05	1958	PMT	DOM	19S	37E	30	440	19S	37E	30	0964	64	LITTLE K W	0.00	3.00	0	
10771	L	03995					09	15	1958	PMT	DOM	19S	37E	30	440	19S	37E	30	0964	64	COPELAND W E	0.00	3.00	0	
10772	L	04720					09	22	1961	WDN	NOT	19S	37E	30	440	19S	37E	30	0765	64	CLIMAX CHEMICAL CO	0.00	0.00	0	
10773	L	02917					05	30	1955	PMT	DOM	19S	37E	30	442	19S	37E	30	0954	64	MIZE J A	0.00	3.00	0	
10774	L	05995					07	27	1966	PMT	DOM	19S	37E	30	442	19S	37E	30	1066	64	STEPHENS H L	0.00	3.00	0	
10775	L	03815					02	14	1958	PMT	DOM	19S	37E	31	111	19S	37E	31	0964	64	BYRD W C	0.00	3.00	0	
[illegible]	[illegible]	[illegible]					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.00	[illegible]	
[illegible]	[illegible]	[illegible]					[illegible]	15	1951	[illegible]	[illegible]	19S	37E	[illegible]	[illegible]	19S	37E	[illegible]	[illegible]	64	GULF OIL CORP	0.30	3.00	0	

11609	L	02540				05	10	1954	WDN	NOT	20S	36E	34	243	20S	36E	34	0764	65	AMERADA PETRO CORP	0.00	0.00	0
11610	L	08066				00	00	1945	DCL	STK	20S	37E	01	200	20S	37E	01	0884	69	B & W CATTLE CO	0.00	3.00	0
12451	L	10069				04	10	1989	PMT	STK	20S	37E	04	11	20S	37E	04	0499		COOPER JIMMIE	0.00	3.00	0
11612	L	05980				00	00	1948	DCL	DOM SHA	20S	37E	04	341	20S	37E	04	0693	69	REEVES ELSIE M ET AL	0.00	3.00	0
11613	L	01450				05	27	1952	PMT	OWD	20S	37E	05	130	20S	37E	05	0564	69	MARATHON OIL CO	0.00	0.00	0
12096	L	09779				01	08	1986	PMT	DOM	20S	37E	05	222	20S	37E	05	0186	69	DAVIS DOLORES NASH	0.00	3.00	0
11614	L	02488				02	11	1954	PMT	OWD	20S	37E	05	230	20S	37E	05	0764	69	TEXAS COMPANY THE	0.00	0.00	0
11615	L	05447		L	05447	08	06	1964	CAN	NOT	20S	37E	05	230	20S	37E	05	0776	69	COOPER BROS	0.00	0.00	0
11616	L	01572				09	19	1952	PMT	OWD	20S	37E	05	331	20S	37E	05	0664	69	EXPLORATION DRG CO	0.00	0.00	0
11617	L	02497				03	10	1954	PMT	OWD	20S	37E	05	333	20S	37E	05	0764	69	AMERADA PETRO CORP	0.00	0.00	0
11618	L	02501				03	13	1954	PMT	OWD	20S	37E	05	333	20S	37E	05	0764	69	AMERADA PETRO CORP	0.00	0.00	0
11619	L	02102				03	23	1953	PMT	OWD	20S	37E	05	340	20S	37E	05	0764	69	MORAN OIL PROD & D	0.00	0.00	0
11620	L	02278				07	09	1953	PMT	DOM SHA	20S	37E	05	430	20S	37E	05	0693	69	REEVES ELSIE M ET AL	0.00	3.00	0
11621	L	03810				03	12	1958	PMT	OWD	20S	37E	06	140	20S	37E	06	0764	69	THE TEXAS CO	0.00	0.00	0
11622	L	02801				03	07	1955	PMT	OWD	20S	37E	06	233	20S	37E	06	0764	69	AMERADA PETRO CORP	0.00	0.00	0
11623	L	02420				11	27	1953	PMT	OWD	20S	37E	06	3423	20S	37E	06	0776	69	MORAN DRILLING CO	0.00	0.00	0
11624	L	01145				06	20	1951	PMT	OWD	20S	37E	06	414	20S	37E	06	0564	69	GULF OIL CORP	0.00	0.00	0
11625	L	01487				07	14	1952	PMT	NOT	20S	37E	06	414	20S	37E	06	0664	69	GULF OIL CORP	0.00	0.00	0
11626	L	04619				03	31	1961	PMT	OWD	20S	37E	06	423	20S	37E	06	1064	69	GULF OIL CORP	0.00	0.00	0
11627	L	02553				05	14	1954	PMT	OWD	20S	37E	06	434	20S	37E	06	0764	69	AMERADA PETRO CORP	0.00	0.00	0
11628	L	02460				01	15	1954	PMT	OWD	20S	37E	07	210	20S	37E	07	0764	69	MORAN OIL PROD	0.00	0.00	0
11629	L	02533				04	21	1954	PMT	OWD	20S	37E	07	230	20S	37E	07	0764	69	MORAN OIL PROD	0.00	0.00	0
11630	L	04690				08	07	1961	CAN	NOT	20S	37E	07	310	20S	37E	07	1064	69	COOPER MRS TOMMIE	0.00	0.00	0
11631	L	02274				07	09	1953	PMT	OWD	20S	37E	08	130	20S	37E	08	0764	69	SINCLAIR OIL & GAS	0.00	0.00	0
11632	L	02483				02	17	1954	PMT	OWD	20S	37E	08	144	20S	37E	08	0764	69	MORAN OIL PROD DRG	0.00	0.00	0
11633	L	02139				04	03	1953	PMT	OWD	20S	37E	08	222	20S	37E	08	0764	69	GACKLE DRG CO INC	0.00	0.00	0
11634	L	07619 S4		L	07619	10	08	1976	PMT	IRR	20S	37E	08	230	20S	37E	08	1279	69	COOPER JIMMY	0.00	0.00	0
11635	L	01253				07	29	1953	PMT	OWD	20S	37E	08	231	20S	37E	08	0564	69	GULF OIL CORP	0.00	0.00	0
11636	L	07619 S3		L	07619	10	08	1976	PMT	IRR	20S	37E	08	240	20S	37E	08	1279	69	COOPER JIMMY	0.00	0.00	0
11637	L	07620		L		10	08	1976	PBU	COM	20S	37E	08	2441	20S	37E	08	0984	69	COOPER JIMMY	0.00	10.00	10

Monument Site No. 18

Monument Site No. 18

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-70812

K.E.I. Consultants, Inc.

Project ID: 610057-2-17
Project Name: *TNMPL Site 17*
Project Manager: Ann Baker
Project Location: Site 17

Date Received in Lab : Apr 8, 1997 12:00 by CMC
Date Report Faxed: Apr 21, 1997
XENCO contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	170812-001	170812-002	170812-003	170812-004	170812-005	170812-006	170812-007	170812-008
	Field ID:	B17-2@10'	B17-2@20'	B17-3@5'	B17-3@20'	B17-5@5'	B17-5@20'	B17-4@5'	B17-4@20'
	Depth:	10'	20'	5'	20'	5'	20'	5'	20'
Organic Content by ASTM D2974		Date Analyzed - Analytical Results					%		
							Apr 18, 1997		
Organic Content							0.5		
BTEX by EPA 8020		Date Analyzed - Analytical Results					ppm (mg/L - mg/Kg)		
		Apr 8, 1997	Apr 8, 1997	Apr 8, 1997	Apr 8, 1997	Apr 8, 1997	Apr 8, 1997	Apr 8, 1997	Apr 8, 1997
Benzene		< 0.020	< 0.020	5.58	< 0.020	0.036	< 0.020	< 0.10	< 0.020
Toluene		< 0.020	< 0.020	10.60	< 0.020	0.175	< 0.020	< 0.10	< 0.020
Ethylbenzene		0.023	< 0.020	49.60	< 0.020	6.600	< 0.020	1.25	< 0.020
m,p-Xylenes		< 0.040	< 0.040	40.20	< 0.040	4.920	< 0.040	1.13	< 0.040
o-Xylene		< 0.020	< 0.020	11.50	< 0.020	0.118	< 0.020	0.64	< 0.020
Total BTEX		0.023	< 0.120	117	< 0.120	11.849	< 0.120	3.02	< 0.120
Total Petroleum Hydrocarbons by EPA 418.1		Date Analyzed - Analytical Results					ppm (mg/L - mg/Kg)		
		Apr 9, 1997	Apr 9, 1997	Apr 9, 1997	Apr 9, 1997	Apr 9, 1997	Apr 9, 1997	Apr 9, 1997	Apr 9, 1997
Total Petroleum Hydrocarbons		32.0	11.0	4430	11.5	725	< 10.0	215	< 10.0

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A19A68

ASTM D2974 Organic Content

Date Validated: Apr 21, 1997 08:15
Date Analyzed: Apr 18, 1997 16:10
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: CG
Matrix: Solid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 170812- 006	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
Parameter	%	%	%	%	%	
Organic Content	0.53	0.46	0.1	14.1	20.0	

Relative Difference [D] = 200*(B-A)/(B+A)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A25B11

SW- 846 5030/8020 BTEX

Date Validated: Apr 9, 1997 09:00
Date Analyzed: Apr 8, 1997 15:45
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: HL
Matrix: Solid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 170811- 001 / Parameter	[A] Sample Result ppm	[B] Matrix Spike Result ppm	[C] Matrix Spike Duplicate Result ppm	[D] Matrix Spike Amount ppm	[E] Method Detection Limit ppm	Matrix Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Matrix Spike Recovery %	[H] QC M.S.D. Recovery %	[I] Matrix Spike Recovery Range %	[J] Qualifier
Benzene	< 0.020	2.100	2.140	2.000	0.020	25.0	1.9	105.0	107.0	65-135	
Toluene	< 0.020	2.120	2.100	2.000	0.020	25.0	0.9	106.0	105.0	65-135	
Ethylbenzene	< 0.020	2.100	2.140	2.000	0.020	25.0	1.9	105.0	107.0	65-135	
m,p-Xylenes	< 0.040	4.300	4.360	4.000	0.040	25.0	1.4	107.5	109.0	65-135	
o-Xylene	< 0.020	2.100	2.140	2.000	0.020	25.0	1.9	105.0	107.0	65-135	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Matrix Spike Recovery [G] = 100*(B-A)/[D]
M.S.D. = Matrix Spike Duplicate
M.S.D. Recovery [H] = 100*(C-A)/[D]
N.D. = Below detection limit or not detected
All results are based on MDL and validated for QC purposes

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A25B11

SW- 846 5030/8020 BTEX

Date Validated: Apr 9, 1997 09:00
Date Analyzed: Apr 8, 1997 15:10
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: HL
Matrix: Solid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Amount ppm	[D] Method Detection Limit ppm	[E] QC LIMITS Blank Spike Recovery %	[F] Recovery Range %	[G] Qualifier
Benzene	< 0.0010	0.1050	0.1000	0.0010	105.0	65-135	
Toluene	< 0.0010	0.1080	0.1000	0.0010	108.0	65-135	
Ethylbenzene	< 0.0010	0.1090	0.1000	0.0010	109.0	65-135	
m,p-Xylenes	< 0.0020	0.2220	0.2000	0.0020	111.0	65-135	
o-Xylene	< 0.0010	0.1080	0.1000	0.0010	108.0	65-135	

Blank Spike Recovery [E] = 100*(B-A)/(C)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A30B30

EPA 418.1 Total Petroleum Hydrocarbons

Date Validated: Apr 9, 1997 17:00
Date Analyzed: Apr 9, 1997 14:48
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: OL
Matrix: Solid

	MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY										
Q.C. Sample ID 170812- 006 / **Parameter**	[A] Sample Result	[B] Matrix Spike Result	[C] Matrix Spike Duplicate Result	[D] Matrix Spike Amount	[E] Method Detection Limit	Matrix Limit Relative Difference	[F] QC Spike Relative Difference	[G] QC Matrix Spike Recovery	[H] QC M.S.D. Recovery	[I] Matrix Spike Recovery Range	[J] Qualifier
	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	
Total Petroleum Hydrocarbons	< 7.50	153	160	198	7.50	30.0	4.5	77.4	81.0	65-135	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Matrix Spike Recovery [G] = 100*(B-A)/[D]
M.S.D. = Matrix Spike Duplicate
M.S.D. Recovery [H] = 100*(C-A)/[D]
N.D. = Below detection limit or not detected
All results are based on MDL and validated for QC purposes

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A30B30

EPA 418.1 Total Petroleum Hydrocarbons

Date Validated: Apr 9, 1997 17:00
Date Analyzed: Apr 9, 1997 14:45
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: OL
Matrix: Solid

BLANK SPIKE ANALYSIS

Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Amount ppm	[D] Method Detection Limit ppm	[E] QC Blank Spike Recovery %	[F] LIMITS Recovery Range %	[G] Qualifier
Total Petroleum Hydrocarbons	< 7.50	177	198	7.50	89.6	65-135	

Blank Spike Recovery [E] = 100*(B-A)/(C)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A30B29

EPA 418.1 Total Petroleum Hydrocarbons

Date Validated: Apr 9, 1997 17:00
Date Analyzed: Apr 9, 1997 13:57
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: OL
Matrix: Solid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Amount ppm	[D] Method Detection Limit ppm	[E] QC LIMITS Blank Spike Recovery %	[F] LIMITS Recovery Range %	[G] Qualifier
Total Petroleum Hydrocarbons	< 7.50	152	198	7.50	76.9	65-135	

Blank Spike Recovery [E] = 100*(B-A)/(C)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A30B29

EPA 418.1 Total Petroleum Hydrocarbons

Date Validated: Apr 9, 1997 17:00
Date Analyzed: Apr 9, 1997 14:00
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: OL
Matrix: Solid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 170813- 012 / Parameter	[A] Sample Result ppm	[B] Matrix Spike Result ppm	[C] Matrix Spike Duplicate Result ppm	[D] Matrix Spike Amount ppm	[E] Method Detection Limit ppm	Matrix Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Matrix Spike Recovery %	[H] QC M.S.D. Recovery %	[I] Matrix Spike Recovery Range %	[J] Qualifier
Total Petroleum Hydrocarbons	< 7.50	154	178	198	7.50	30.0	14.5	77.9	90.1	65-135	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Matrix Spike Recovery [G] = 100*(B-A)/[D]
M.S.D. = Matrix Spike Duplicate
M.S.D. Recovery [H] = 100*(C-A)/[D]
N.D. = Below detection limit or not detected
All results are based on MDL and validated for QC purposes

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

ANALYTICAL CHAIN OF CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 610057-2-17
Project Manager: Ann Baker
Project Location: Site 17

Project Name: TNMPL Site 17

XENCO COC#: 1-70812
Date Received in Lab: Apr 8, 1997 12:00 by CMC
XENCO contact : Carlos Castro/Edward Yonemoto

	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Date and Time: Sample Collected	Date and Time: Addition Requested	Date and Time: Extraction	Date and Time: Analysis
1	B17-2@10' Soil	170812-001	BTEX	SW-846	ppm	Standard	Apr 2, 1997 12:41		Apr 8, 1997 by HL	Apr 8, 1997 16:36 by HL
2			TPH	EPA 418.1	ppm	Standard	Apr 2, 1997 12:41		Apr 9, 1997 by OL	Apr 9, 1997 14:24 by OL
3	B17-2@20' Soil	170812-002	BTEX	SW-846	ppm	Standard	Apr 2, 1997 13:09		Apr 8, 1997 by HL	Apr 8, 1997 16:54 by HL
4			TPH	EPA 418.1	ppm	Standard	Apr 2, 1997 13:09		Apr 9, 1997 by OL	Apr 9, 1997 14:27 by OL
5	B17-3@5' Soil	170812-003	BTEX	SW-846	ppm	Standard	Apr 2, 1997 14:02		Apr 8, 1997 by HL	Apr 8, 1997 17:11 by HL
6			TPH	EPA 418.1	ppm	Standard	Apr 2, 1997 14:02		Apr 9, 1997 by OL	Apr 9, 1997 14:30 by OL
7	B17-3@20' Soil	170812-004	BTEX	SW-846	ppm	Standard	Apr 2, 1997 15:05		Apr 8, 1997 by HL	Apr 8, 1997 17:28 by HL
8			TPH	EPA 418.1	ppm	Standard	Apr 2, 1997 15:05		Apr 9, 1997 by OL	Apr 9, 1997 14:33 by OL
9	B17-5@5' Soil	170812-005	BTEX	SW-846	ppm	Standard	Apr 4, 1997 09:48		Apr 8, 1997 by HL	Apr 8, 1997 17:45 by HL
10			TPH	EPA 418.1	ppm	Standard	Apr 4, 1997 09:48		Apr 9, 1997 by OL	Apr 9, 1997 14:54 by OL
11	B17-5@20' Soil	170812-006	BTEX	SW-846	ppm	Standard	Apr 4, 1997 10:55		Apr 8, 1997 by HL	Apr 8, 1997 18:02 by HL
12			TPH	EPA 418.1	ppm	Standard	Apr 4, 1997 10:55		Apr 9, 1997 by OL	Apr 9, 1997 14:57 by OL
13			Org. Content	ASTM D2974	%	Standard	Apr 4, 1997 10:55	Apr14,1997 16:30	Apr 18, 1997 by CG	Apr 18, 1997 16:05 by CG
14	B17-4@5' Soil	170812-007	BTEX	SW-846	ppm	Standard	Apr 4, 1997 08:20		Apr 8, 1997 by HL	Apr 8, 1997 18:20 by HL
15			TPH	EPA 418.1	ppm	Standard	Apr 4, 1997 08:20		Apr 9, 1997 by OL	Apr 9, 1997 15:00 by OL
16	B17-4@20' Soil	170812-008	BTEX	SW-846	ppm	Standard	Apr 4, 1997 09:05		Apr 8, 1997 by HL	Apr 8, 1997 18:37 by HL
17			TPH	EPA 418.1	ppm	Standard	Apr 4, 1997 09:05		Apr 9, 1997 by OL	Apr 9, 1997 15:03 by OL

XENCO Laboratories

11381 Meadowglen Suite L Houston, Texas 77082
(713) 589-0692 Fax (713) 589-0695

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Page 1 of 1

Lab. Batch # 170812-SA

Contractor: KEI | Phone: (210) 680-3767

Address: 5309 WURZBACH SUITE 100 SA TX 78238

Project Name: TRMPL SITE 17 | Project Director: PAUL HARTNET

Project Location: SITE 17 | Project Manager: ANN BAKER

Sampler Signature: | Project No.: 610057-2-17

No. coolers this shipment: 1 | Contractor COC #

Carrier: UPS | Quote #:

Airbill No. | P.O. No.: 7202

Turn-around: * ASAP; * 24 hrs; 48 hrs; (Standard)

	Field ID	Date	Time	Depth	Soil	Water	Comp	Grab	Container Size	Container Type P, G	Preservative Ice	Preservative Other	Sample Description	No of Containers Total	BTEX (5030/8020-602)	TPH (418.1)	Please Hold	Remarks	LAB ONLY ID #
1	B17-2@10'	4/2/97	1241	10'	X			X	1-8oz 1-4oz	G	X		SOIL	2	X	X	X	HOLD 8oz	1
2	B17-2@20'	4/2/97	1309	20'	X			X	1-8oz 1-4oz	G	X		SOIL	2	X	X	X	HOLD 8oz	2
3	B17-3@5'	4/2/97	1402	5'	X			X	1-8oz 1-4oz	G	X		SOIL	2	X	X	X	HOLD 8oz	3
4	B17-3@20'	4/2/97	1505	20'	X			X	1-8oz 1-4oz	G	X		SOIL	2	X	X	X	HOLD 8oz	4
5	B17-5@5'	4/4/97	948	5'	X			X	1-8oz 1-4oz	G	X		SOIL	2	X	X	X	" "	5
6	B17-5@20'	4/4/97	1055	20'	X			X	1-8oz 1-4oz	G	X		SOIL	2	X	X	X	" "	6
7	B17-4	4/4/97	0820	5	X			X	1-8oz 1-4oz	G	X		SOIL	2	X	X	X	" "	7
8	B17-4	4/4/97	0905	20	X			X	1-8oz 1-4oz	G	X		SOIL	2	X	X	X	" "	8
9																			9
10																			10

Unl Dies Ker Unknown
Waste Oil
PIT No: Tank No:

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	DATE	TIME
	4/7/97	1600			
			Received For Laboratory by: Colleen McCrimin	4/8/97	1200

Remarks: VIA UPS

Pink (Contractor), Yellow & White (Lab).

* Pre-scheduling is recommended

Precision Analytical Services

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-70662

K.E.I. Consultants, Inc.

Project Name: TNMPL Monument

Project ID: 610057-2-17
Project Manager: Ann Baker
Project Location: Site 17

Date Received in Lab: Mar 20, 1997 11:30 by CC
Date Report Faxed: Apr 8, 1997
XENCO contact: Carlos Castro/Edward Yonemoto

Analysis Requested	*Lab ID:*	170662-001	170662-002	170662-003	170662-004	170662-005	
	Field ID:	B-17-1	B-17-1	B-17-1	B-17-1	B-17-2	
	Depth:	1-2'	3-4'	23-24'	26-27'	1-2'	
BTEX Analyzed by EPA 8020		Date Analyzed - Analytical Results					**ppm (mg/L - mg/Kg)**
		Mar 21, 1997	Mar 21, 1997	Mar 21, 1997	Mar 21, 1997	Mar 21, 1997	
Benzene		0.53	13.10	0.242	< 0.020	< 0.020	
Toluene		4.21	66.50	0.298	< 0.020	< 0.020	
Ethylbenzene		13.50	109	0.652	< 0.020	< 0.020	
m,p-Xylenes		10.10	90.50	0.360	< 0.040	< 0.040	
o-Xylene		4.33	31.55	0.137	< 0.020	< 0.020	
Total BTEX		32.67	311	1.689	< 0.120	< 0.120	
SPLP Volatiles by 1312/8260		Date Analyzed - Analytical Results					**ppm (mg/L - mg/Kg)**
			Apr 7, 1997				
Benzene			0.054				
Bromobenzene			< 0.025				
Bromodichloromethane			< 0.025				
Bromoform			< 0.025				
Bromomethane			< 0.025				
n-Butylbenzene			< 0.025				
sec-Butylbenzene			< 0.025				
tert-Butylbenzene			< 0.025				
Carbon Tetrachloride			< 0.025				
Chloroethane			< 0.050				
Chloroform			< 0.025				
Chloromethane			< 0.050				
2-Chlorotoluene			< 0.025				
4-Chlorotoluene			< 0.025				
1,2-Dibromo-3-chloropropane			< 0.025				
Dibromochloromethane			< 0.025				
1,2-Dibromoethane			< 0.025				

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-70662

K.E.I. Consultants, Inc.

Project Name: TNMPL Monument

Project ID: 610057-2-17
Project Manager: Ann Baker
Project Location: Site 17

Date Received in Lab: Mar 20, 1997 11:30 by CC
Date Report Faxed: Apr 8, 1997
XENCO contact: Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	170662-001	170662-002	170662-003	170662-004	170662-005	
	Field ID:	B-17-1	B-17-1	B-17-1	B-17-1	B-17-2	
	Depth:	1-2'	3-4'	23-24'	26-27'	1-2'	
Dibromomethane			< 0.025				
1,2-Dichlorobenzene			< 0.025				
1,3-Dichlorobenzene			< 0.025				
1,4-Dichlorobenzene			< 0.025				
Dichlorodifluoromethane			< 0.025				
1,1-Dichloroethane			< 0.025				
1,2-Dichloroethane			< 0.025				
1,1-Dichloroethene			< 0.025				
cis-1,2-Dichloroethene			< 0.025				
trans-1,2-Dichloroethene			< 0.025				
1,2-Dichloropropane			< 0.025				
1,3-Dichloropropane			< 0.025				
2,2-Dichloropropane			< 0.025				
1,1-Dichloropropene			< 0.025				
Ethylbenzene			0.434				
Hexachlorobutadiene			< 0.025				
Isopropylbenzene			0.045				
p-Isopropyltoluene			< 0.025				
Methylene chloride			< 0.025				
Naphthalene			0.060				
n-Propylbenzene			0.048				
Styrene			< 0.025				
1,1,1,2-Tetrachloroethane			< 0.025				
1,1,2,2-Tetrachloroethane			< 0.025				
Tetrachloroethene			< 0.025				
Toluene			0.321				
1,2,3-Trichlorobenzene			< 0.025				
1,2,4-Trichlorobenzene			< 0.025				

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-70662

K.E.I. Consultants, Inc.

Project Name: TNMPL Monument

Project ID: 610057-2-17
Project Manager: Ann Baker
Project Location: Site 17

Date Received in Lab: Mar 20, 1997 11:30 by CC
Date Report Faxed: Apr 8, 1997
XENCO contact: Carlos Castro/Edward Yonemoto

Analysis Requested	*Lab ID:*	170662-001	170662-002	170662-003	170662-004	170662-005	
	Field ID:	B-17-1	B-17-1	B-17-1	B-17-1	B-17-2	
	Depth:	1-2'	3-4'	23-24'	26-27'	1-2'	
1,1,1-Trichloroethane			< 0.025				
1,1,2-Trichloroethane			< 0.025				
Trichloroethene			< 0.025				
Trichlorofluoromethane			< 0.025				
1,2,3-Trichloropropane			< 0.025				
1,2,4-Trimethylbenzene			0.116				
1,3,5-Trimethylbenzene			0.034				
Vinyl chloride			< 0.025				
o-Xylene			0.188				
m,p-Xylenes			0.370				
Bromochloromethane			< 0.025				
Chlorobenzene			< 0.025				
MTBE			< 0.050				
SPLP Semivolatiles by 1312/8270		Date Analyzed	- Analytical Results				**ppm (mg/L - mg/Kg)**
			Mar 28, 1997				
Acenaphthene			< 0.010				
Acenaphthylene			< 0.010				
Anthracene			< 0.010				
Benzo[a]anthracene			< 0.010				
Benzo[a]pyrene			< 0.010				
Benzo[b]fluoranthene			< 0.010				
Benzo[ghi]perylene			< 0.010				
Benzo[k]fluoranthene			< 0.010				
Butyl benzyl phthalate			< 0.010				
Carbazole			< 0.010				
4-Chloroaniline			< 0.010				

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-70662

K.E.I. Consultants, Inc.

Project Name: TNMPL Monument

Project ID: 610057-2-17
Project Manager: Ann Baker
Project Location: Site 17

Date Received in Lab: Mar 20, 1997 11:30 by CC
Date Report Faxed: Apr 8, 1997
XENCO contact: Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	170662-001	170662-002	170662-003	170662-004	170662-005	
	Field ID:	B-17-1	B-17-1	B-17-1	B-17-1	B-17-2	
	Depth:	1-2'	3-4'	23-24'	26-27'	1-2'	
bis [2-Chloroethoxy] methane			< 0.010				
bis [2-Chloroethyl] ether			< 0.010				
bis [2-Chloroisopropyl] ether			< 0.010				
2-Chloronaphthalene			< 0.010				
2-Chlorophenol			< 0.010				
4-Chlorophenyl-phenyl ether			< 0.010				
Chrysene			< 0.010				
Dibenzofuran			< 0.010				
Dibenzo[a,h]anthracene			< 0.010				
1,2-Dichlorobenzene			< 0.010				
1,3-Dichlorobenzene			< 0.010				
1,4-Dichlorobenzene			< 0.010				
3,3'-Dichlorobenzidine			< 0.010				
2,4-Dichlorophenol			< 0.010				
Diethyl phthalate			< 0.010				
2,4-Dimethylphenol			< 0.010				
Dimethyl phthalate			< 0.010				
4,6-Dinitro-2-methylphenol			< 0.025				
2,4-Dinitrophenol			< 0.025				
2,4-Dinitrotoluene			< 0.010				
2,6-Dinitrotoluene			< 0.010				
Di-n-octyl phthalate			< 0.010				
bis [2-Ethylhexyl] phthalate			< 0.010				
Fluoranthene			< 0.010				
Fluorene			< 0.010				
Hexachlorobenzene			< 0.010				
Hexachlorobutadiene			< 0.010				
Hexachlorocyclopentadiene			< 0.010				

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-70662

K.E.I. Consultants, Inc.

Project Name: TNMPL Monument

Project ID: 610057-2-17
Project Manager: Ann Baker
Project Location: Site 17

Date Received in Lab: Mar 20, 1997 11:30 by CC
Date Report Faxed: Apr 8, 1997
XENCO contact: Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID:	170662-001	170662-002	170662-003	170662-004	170662-005	
	Field ID:	B-17-1	B-17-1	B-17-1	B-17-1	B-17-2	
	Depth:	1-2'	3-4'	23-24'	26-27'	1-2'	
Hexachloroethane			< 0.010				
Indeno[1,2,3-cd]pyrene			< 0.010				
Isophorone			< 0.010				
2-Methylnaphthalene			0.039				
2-Methylphenol			< 0.010				
4-Methylphenol			< 0.010				
Naphthalene			0.067				
2-Nitroaniline			< 0.025				
3-Nitroaniline			< 0.025				
4-Nitroaniline			< 0.025				
Nitrobenzene			< 0.010				
2-Nitrophenol			< 0.010				
4-Nitrophenol			< 0.010				
N-Nitroso-di-n-propylamine			< 0.010				
N-Nitrosodiphenylamine			< 0.010				
Pentachlorophenol			< 0.025				
Phenanthrene			< 0.010				
Phenol			< 0.010				
Pyrene			< 0.010				
Pyridine			< 0.010				
1,2,4-Trichlorobenzene			< 0.010				
2,4,5-Trichlorophenol			< 0.025				
2,4,6-Trichlorophenol			< 0.010				
4-Bromophenyl-phenylether			< 0.010				
4-Chloro-3-Methylphenol			< 0.010				
Di-n-butyl phthalate			0.013				

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-70662

K.E.I. Consultants, Inc.

Project Name: TNMPL Monument

Project ID: 610057-2-17
Project Manager: Ann Baker
Project Location: Site 17

Date Received in Lab: Mar 20, 1997 11:30 by CC
Date Report Faxed: Apr 8, 1997
XENCO contact: Carlos Castro/Edward Yonemoto

Analysis Requested	*Lab ID:*	170662-001	170662-002	170662-003	170662-004	170662-005	
	Field ID:	B-17-1	B-17-1	B-17-1	B-17-1	B-17-2	
	Depth:	1-2'	3-4'	23-24'	26-27'	1-2'	
TPH Analyzed by EPA 418.1		Date Analyzed - Analytical Results					**ppm (mg/L - mg/Kg)**
		Mar 20, 1997	Mar 20, 1997	Mar 20, 1997	Mar 20, 1997	Mar 20, 1997	
Total Petroleum Hydrocarbons		2620	11200	90.5	45.5	267	
SPLP TPH by 1312/418.1		Date Analyzed - Analytical Results					**ppm (mg/L - mg/Kg)**
			Apr 1, 1997				
Total Petroleum Hydrocarbons			1.4				

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A25A94

SW- 846 5030/8020 BTEX

Date Validated: Mar 21, 1997 16:00
Date Analyzed: Mar 21, 1997 09:53
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: CB
Matrix: Solid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Amount ppm	[D] Method Detection Limit ppm	[E] QC Blank Spike Recovery %	[F] LIMITS Recovery Range %	[G] Qualifier
Benzene	< 0.0010	0.1090	0.1000	0.0010	109.0	65-135	
Toluene	< 0.0010	0.1050	0.1000	0.0010	105.0	65-135	
Ethylbenzene	< 0.0010	0.1070	0.1000	0.0010	107.0	65-135	
m,p-Xylenes	< 0.0020	0.2200	0.2000	0.0020	110.0	65-135	
o-Xylene	< 0.0010	0.1060	0.1000	0.0010	106.0	65-135	

Blank Spike Recovery [E] = 100*(B-A)/(C)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A25A94

SW- 846 5030/8020 BTEX

Date Validated: Mar 21, 1997 16:00
Date Analyzed: Mar 21, 1997 10:10
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: CB
Matrix: Solid

	MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY										
Q.C. Sample ID 170662- 005	[A] Sample Result	[B] Matrix Spike Result	[C] Matrix Spike Duplicate Result	[D] Matrix Spike Amount	[E] Method Detection Limit	Matrix Limit Relative Difference	[F] QC Spike Relative Difference	[G] QC Matrix Spike Recovery	[H] QC M.S.D. Recovery	[I] Matrix Spike Recovery Range	[J] Qualifier
Parameter	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	
Benzene	< 0.020	2.100	2.140	2.000	0.020	25.0	1.9	105.0	107.0	65-135	
Toluene	< 0.020	1.996	2.040	2.000	0.020	25.0	2.2	99.8	102.0	65-135	
Ethylbenzene	< 0.020	2.080	2.120	2.000	0.020	25.0	1.9	104.0	106.0	65-135	
m,p-Xylenes	< 0.040	4.140	4.240	4.000	0.040	25.0	2.4	103.5	106.0	65-135	
o-Xylene	< 0.020	1.928	1.986	2.000	0.020	25.0	3.0	96.4	99.3	65-135	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Matrix Spike Recovery [G] = 100*(B-A)/[D]
M.S.D. = Matrix Spike Duplicate
M.S.D. Recovery [H] = 100*(C-A)/[D]
N.D. = Below detection limit or not detected
All results are based on MDL and validated for QC purposes

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A01B57

SW846- 8260 Volatile Organic Analysis

Date Validated: Apr 8, 1997 14:25
Date Analyzed: Apr 7, 1997 20:07
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: CE
Matrix: Solid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 170664- 001 / Parameter	[A] Sample Result mg/L	[B] Matrix Spike Result mg/L	[C] Matrix Spike Duplicate Result mg/L	[D] Matrix Spike Amount mg/L	[E] Method Detection Limit mg/L	Matrix Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Matrix Spike Recovery %	[H] QC M.S.D. Recovery %	[I] Matrix Spike Recovery Range %	[J] Qualifier
Benzene	< 0.0050	0.2460	0.2535	0.2500	0.0050	21.0	3.0	98.4	101.4	66-142	
Chlorobenzene	< 0.0050	0.2405	0.2540	0.2500	0.0050	21.0	5.5	96.2	101.6	60-133	
1,1-Dichloroethene	< 0.0200	0.2105	0.2160	0.2500	0.0200	22.0	2.6	84.2	86.4	59-172	
Toluene	0.0100	0.2460	0.2590	0.2500	0.0050	21.0	5.1	94.4	99.6	59-139	
Trichloroethene	< 0.0150	0.2240	0.2350	0.2500	0.0150	24.0	4.8	89.6	94.0	62-137	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Matrix Spike Recovery [G] = 100*(B-A)/[D]
M.S.D. = Matrix Spike Duplicate
M.S.D. Recovery [H] = 100*(C-A)/[D]
N.D. = Below detection limit or not detected
All results are based on MDL and validated for QC purposes

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A02B29

SW846-8270 Semivolatiles (SVOCs TCL)

Date Validated: Apr 2, 1997 11:53
Date Analyzed: Mar 28, 1997 00:37
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: MM
Matrix: Liquid

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Duplicate Result mg/L	[D] Blank Spike Amount mg/L	[E] Method Detection Limit mg/L	Blank Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Blank Spike Recovery %	[H] QC B.S.D. Recovery %	[I] Blank Spike Recovery Range %	[J] Qualifier
Acenaphthene	< 0.0050	0.0496	0.0508	0.1000	0.0050	31.0	2.4	49.6	50.8	46-118	
4-Chloro-3-Methylphenol	< 0.0080	0.0600	0.0596	0.1000	0.0080	42.0	0.7	60.0	59.6	23-97	
2-Chlorophenol	< 0.0100	0.0606	0.0606	0.1000	0.0100	40.0	0.0	60.6	60.6	27-123	
1,4-Dichlorobenzene	< 0.0080	0.0502	0.0500	0.1000	0.0080	28.0	0.4	50.2	50.0	36-97	
2,4-Dinitrotoluene	< 0.0100	0.0502	0.0518	0.1000	0.0100	38.0	3.1	50.2	51.8	24-96	
N-Nitroso-di-n-propylamine	< 0.0080	0.0608	0.0602	0.1000	0.0080	38.0	1.0	60.8	60.2	41-116	
4-Nitrophenol	< 0.0080	0.0270	0.0270	0.1000	0.0080	50.0	0.0	27.0	27.0	10-80	
Pentachlorophenol	< 0.0170	0.0514	0.0512	0.1000	0.0170	50.0	0.4	51.4	51.2	9-103	
Phenol	< 0.0070	0.0376	0.0370	0.1000	0.0070	42.0	1.6	37.6	37.0	12-89	
Pyrene	< 0.0040	0.0500	0.0502	0.1000	0.0040	31.0	0.4	50.0	50.2	26-127	
1,2,4-Trichlorobenzene	< 0.0110	0.0478	0.0470	0.1000	0.0110	28.0	1.7	47.8	47.0	39-98	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Blank Spike Recovery [G] = 100*(B-A)/[D]
B.S.D. = Blank Spike Duplicate
B.S.D. Recovery [H] = 100*(C-A)/[D]
N.D. = Below detection limit or not detected
All results are based on MDL and validated for QC purposes

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A30B03

EPA 418.1 Total Petroleum Hydrocarbons

Date Validated: Mar 21, 1997 12:00
Date Analyzed: Mar 20, 1997 17:03
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: HL
Matrix: Solid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 170664- 002 / Parameter	[A] Sample Result ppm	[B] Matrix Spike Result ppm	[C] Matrix Spike Duplicate Result ppm	[D] Matrix Spike Amount ppm	[E] Method Detection Limit ppm	Matrix Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Matrix Spike Recovery %	[H] QC M.S.D. Recovery %	[I] Matrix Spike Recovery Range %	[J] Qualifier
Total Petroleum Hydrocarbons	43.00	201	197	198	7.50	30.0	2.0	80.0	77.9	65-135	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Matrix Spike Recovery [G] = 100*(B-A)/[D]
M.S.D. = Matrix Spike Duplicate
M.S.D. Recovery [H] = 100*(C-A)/[D]
N.D. = Below detection limit or not detected
All results are based on MDL and validated for QC purposes

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A30B03

EPA 418.1 Total Petroleum Hydrocarbons

Date Validated: Mar 21, 1997 12:00
Date Analyzed: Mar 20, 1997 16:36
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: HL
Matrix: Solid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Amount ppm	[D] Method Detection Limit ppm	[E] QC LIMITS Blank Spike Recovery %	[F] Recovery Range %	[G] Qualifier
Total Petroleum Hydrocarbons	< 7.50	184	198	7.50	93.1	65-135	

Blank Spike Recovery [E] = 100*(B-A)/(C)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A07C23

EPA 418.1 Total Petroleum Hydrocarbons

Date Validated: Apr 1, 1997 10:05
Date Analyzed: Apr 1, 1997 08:36
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: CG
Matrix: Liquid

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Duplicate Result ppm	[D] Blank Spike Amount ppm	[E] Method Detection Limit ppm	Blank Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Blank Spike Recovery %	[H] QC B.S.D. Recovery %	[I] Blank Spike Recovery Range %	[J] Qualifier
Total Petroleum Hydrocarbons	< 0.68	4.01	4.01	4.04	0.68	25.0	0.0	99.3	99.3	70-125	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Blank Spike Recovery [G] = 100*(B-A)/[D]
B.S.D. = Blank Spike Duplicate
B.S.D. Recovery [H] = 100*(C-A)/[D]
N.D. = Below detection limit or not detected
All results are based on MDL and validated for QC purposes

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

11381 Meadowglen Suite L Houston, Texas 77082
(713) 589-0692 Fax (713) 589-0695

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Page 1 of 1

Lab. Batch # 170662-SA

Contractor: KEI | Phone: (210) 680 3767

Address: 5309 WURZBACH STE 100 SAN ANTONIO TX 78238

Project Name: TRMPL/Monument | Project Director: PAUL HARNETT

Project Location: SITE 17 | Project Manager: ANN BAKER

Sampler Signature: | Project No.: 61005-1-2-17

No. coolers this shipment: | Contractor COC # 0011

Carrier: | Quote #:

Airbill No. | P.O. No.: 7202

Turn-around: * ASAP * 24 hrs 48 hrs (Standard)

	Field ID	Date	Time	Depth	Soil	Water	Comp	Grab	Container Size	Container Type P, G	Preservative Ice	Preservative Other	Sample Description	No of Containers Total	BTEX (8030/8020-602)	TPH (418.1)	Please Hold	Remarks	LAB ONLY ID #
1	B-17-1 1-21	3/17/97	0920	1-2	X			X	4,8	G	X		B17-1, 1-21	2	X	X		Hold 8oz	1
2	B-17-1, 3-4		0920	3-4									B17-1, 3-4						2
3	B-17-1, 23-24		1045	23-24									B17-1, 23-24						3
4	B17-1 26-27		1045	26-27									B17-1, 26-27						4
5	B17-2 1-21		1115	1-2									B17-2, 1-2						5
6																			6
7																			7
8																			8
9																			9
10																			10

Unl Dies Ker Unknown
Waste Oil
PIT No: Tank No:

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	DATE	TIME
Gerald J Carrillo	3/18/97		Gerald J Carrillo	3-18-97	1200
			Received For Laboratory by	3-20-97	11:30 → Via UPS

Remarks: As Hold 8oz pending TPH.

Pink (Contractor), Yellow & White (Lab).

* Pre-scheduling is recommended

Precision Analytical Services

XENCO Laboratories

11381 Meadowglen Suite L Houston, Texas 77082
(713) 589-0692 Fax (713) 589-0695

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Page 1 of 1

Lab. Batch # 170662-SA

Contractor: KEI | Phone: (210) 680 3767

Address: 5309 WURZBACH STE 100 San Antonio TX 78238

Project Name: TUMPL/Monument | Project Director: PAUL HARNETT

Project Location: SITE 17 | Project Manager: Ann Baker

Sampler Signature: | Project No.: 610051-2-17

No. coolers this shipment: | Contractor COC # 0011

Carrier: | Quote #:

Airbill No. | P.O. No.: 7202

Turn-around: * ASAP * 24 hrs 48 hrs (Standard)

	Field ID	Date	Time	Depth	Soil	Water	Comp	Grab	Container Size	Container Type P, G	Preservative Ice	Preservative Other	Sample Description	No of Containers Total	BTEX (8020/8020-602)	TPH (418.1)	SPLP-VOLATILES	SPLP-SEMI VOLATILES	SPLP-TPH	Please Hold	Remarks	LAB ONLY ID #
1	B-17-1 1-21	3/17/97	0920	1-2	X			X	4,1	G	X		B17-1, 1-21	2	X	X					Hold 8oz	1
2	B-17-1 3-4		0920	3-4									B17-1, 3-4				⊗	⊗	⊗			2
3	B-17-1, 23-24		1045	23-24									B17-1, 23-24									3
4	B17-1 26-27		1045	26-27									B17-1, 26-27									4
5	B17-2 1-21		1115	1-2									B17-2, 1-2									5
6																						6
7																						7
8																						8
9																						9
10																						10

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	DATE	TIME
Gerald J Carroll.	3/18/97		Gerald J Carroll.	3-18-97	1200
			Received For Laboratory by	3-20-97	11:30

Remarks

As Hold 8oz per PM JPH.

⊗ ADDITION - Requested by A. Baker 3/26/97 14:00 5-7 days.

→ Via UPS

Unl Dies Ker Unknown

Waste Oil

PIT No: Tank No:

Sample Description

Pink (Contractor), Yellow & White (Lab).

* Pre-scheduling is recommended

Precision Analytical Services

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-70872

K.E.I. Consultants, Inc.

Project Name: TNMPL

Project ID: 610057-2-17
Project Manager: Ann Baker
Project Location: Site 17

Date Received in Lab: Apr 14, 1997 17:20 by CC
Date Report Faxed: Apr 16, 1997
XENCO contact: Carlos Castro/Edward Yonemoto

Analysis Requested	*Lab ID:*	170872-001					
	Field ID:	B17-2					
	Depth:	5-6'					
BTEX Analyzed by EPA 8020	Date Analyzed - Analytical Results						**ppm (mg/L - mg/Kg)**
	Apr 14, 1997						
Benzene	0.44						
Toluene	9.88						
Ethylbenzene	31.30						
m,p-Xylenes	25.30						
o-Xylene	1.01						
Total BTEX	67.93						
TPH Analyzed by EPA 418.1	Date Analyzed - Analytical Results						**ppm (mg/L - mg/Kg)**
	Apr 15, 1997						
Total Petroleum Hydrocarbons	2310						

Edward T. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A25B23

SW- 846 5030/8020 BTEX

Date Validated: Apr 15, 1997 09:30
Date Analyzed: Apr 14, 1997 12:40
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: HL
Matrix: Solid

BLANK SPIKE ANALYSIS

Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Amount ppm	[D] Method Detection Limit ppm	[E] QC Blank Spike Recovery %	[F] LIMITS Recovery Range %	[G] Qualifier
Benzene	< 0.0010	0.1060	0.1000	0.0010	106.0	65-135	
Toluene	< 0.0010	0.1060	0.1000	0.0010	106.0	65-135	
Ethylbenzene	< 0.0010	0.1070	0.1000	0.0010	107.0	65-135	
m,p-Xylenes	< 0.0020	0.2130	0.2000	0.0020	106.5	65-135	
o-Xylene	< 0.0010	0.1060	0.1000	0.0010	106.0	65-135	

Blank Spike Recovery [E] = 100*(B-A)/(C)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A25B23

SW- 846 5030/8020 BTEX

Date Validated: Apr 15, 1997 09:30
Date Analyzed: Apr 14, 1997 13:14
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: HL
Matrix: Solid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 170852- 001 / Parameter	[A] Sample Result ppm	[B] Matrix Spike Result ppm	[C] Matrix Spike Duplicate Result ppm	[D] Matrix Spike Amount ppm	[E] Method Detection Limit ppm	Matrix Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Matrix Spike Recovery %	[H] QC M.S.D. Recovery %	[I] Matrix Spike Recovery Range %	[J] Qualifier
Benzene	< 0.020	1.946	1.870	2.000	0.020	25.0	4.0	97.3	93.5	65-135	
Toluene	< 0.020	1.960	1.912	2.000	0.020	25.0	2.5	98.0	95.6	65-135	
Ethylbenzene	< 0.020	1.962	1.944	2.000	0.020	25.0	0.9	98.1	97.2	65-135	
m,p-Xylenes	< 0.040	4.020	3.960	4.000	0.040	25.0	1.5	100.5	99.0	65-135	
o-Xylene	< 0.020	1.964	1.942	2.000	0.020	25.0	1.1	98.2	97.1	65-135	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Matrix Spike Recovery [G] = 100*(B-A)/[D]
M.S.D. = Matrix Spike Duplicate
M.S.D. Recovery [H] = 100*(C-A)/[D]
N.D. = Below detection limit or not detected
All results are based on MDL and validated for QC purposes

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A30B42

EPA 418.1 Total Petroleum Hydrocarbons

Date Validated: Apr 15, 1997 18:00
Date Analyzed: Apr 15, 1997 15:14
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: OL
Matrix: Solid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 170867- 009 / Parameter	[A] Sample Result ppm	[B] Matrix Spike Result ppm	[C] Matrix Spike Duplicate Result ppm	[D] Matrix Spike Amount ppm	[E] Method Detection Limit ppm	Matrix Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Matrix Spike Recovery %	[H] QC M.S.D. Recovery %	[I] Matrix Spike Recovery Range %	[J] Qualifier
Total Petroleum Hydrocarbons	24.00	185	174	198	7.50	30.0	6.1	81.5	75.9	65-135	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Matrix Spike Recovery [G] = 100*(B-A)/[D]
M.S.D. = Matrix Spike Duplicate
M.S.D. Recovery [H] = 100*(C-A)/[D]
N.D. = Below detection limit or not detected
All results are based on MDL and validated for QC purposes

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A30B42

EPA 418.1 Total Petroleum Hydrocarbons

Date Validated: Apr 15, 1997 18:00
Date Analyzed: Apr 15, 1997 15:11
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: OL
Matrix: Solid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Amount ppm	[D] Method Detection Limit ppm	[E] QC Blank Spike Recovery %	[F] LIMITS Recovery Range %	[G] Qualifier
Total Petroleum Hydrocarbons	< 7.50	182	198	7.50	92.1	65-135	

Blank Spike Recovery [E] = 100*(B-A)/(C)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

ANALYTICAL CHAIN OF CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 610057-2-17
Project Manager: Ann Baker
Project Location: Site 17

Project Name: TNMPL

XENCO COC#: 1-70872
Date Received in Lab: Apr 14, 1997 17:20 by CC
XENCO contact : Carlos Castro/Edward Yonemoto

	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Date and Time: Sample Collected	Date and Time: Addition Requested	Date and Time: Extraction	Date and Time: Analysis
1	B17-2	170872-001	TPH	EPA 418.1	ppm	Standard	Apr 2, 1997 12:32		Apr 15, 1997 by OL	Apr 15, 1997 15:26 by OL
2			BTEX	SW-846	ppm	Standard	Apr 2, 1997 12:32		Apr 14, 1997 by HL	Apr 14, 1997 18:06 by HL

XENCO Laboratories

11381 Meadowglen Suite L Houston, Texas 77082
(713) 589-0692 Fax (713) 589-0695

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Lab. Batch # 170872-SA

Contractor: KEI Consultants | Phone: (210) 680-3767

Address: 5309 Wurzbach Rd Suite 100

Project Name: TNMPL | Project Director: Paul Hartnett

Project Location: Site 17 | Project Manager: Ann Baker

Sampler Signature: Jeff McCann | Project No.: 610057-2-17

No. coolers this shipment: | Contractor COC #

Carrier: | Quote #:

Airbill No. | P.O. No.:

Turn-around: * ASAP, * 24 hrs, 48 hrs, (Standard)

Field ID	Date	Time	Depth	Soil	Water	Comp	Grab	Container Size	Container Type P, G	Preservative Ice	Preservative Other	Sample Description	No of Containers Total	BTEX (8030/8020-602)	TPH (418.1)	Please Hold	Remarks	LAB ONLY ID #
1 B17-2 (5-6')	4/2/97	1232	5-6	X			X	402	G	X		B17-2 (5-6')	1		X			1
2																		2
3																		3
4																		4
5																		5
6																		6
7																		7
8																		8
9																		9
10																		10

Unl Dies Ker Unknown

Waste Oil

PIT No: Tank No:

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	DATE	TIME
Jeff McCann	4/14/97	1715	Ann D Baker	4/14/97	1715
Ann D Baker	4/14/97	1720			
			Received For Laboratory by:	4/14/97	17:20

Remarks

Pink (Contractor), Yellow & White (Lab).

* Pre-scheduling is recommended

Precision Analytical Services

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-71051

K.E.I. Consultants, Inc.

Project Name: Monument

Project ID: 610057 Site #17
Project Manager: Ann Baker
Project Location: Site #17

Date Received in Lab: May 6, 1997 10:00 by RT
Date Report Faxed: May 22, 1997
XENCO contact: Carlos Castro/Edward Yonemoto

Analysis Requested	*Lab ID:*	171051-001	171051-002	171051-003			
	Field ID:	MW-1	MW-2	MW-3			
	Depth:						
Metals (ICP) Analyzed by EPA 6010		Date Analyzed - Analytical Results					ppm (mg/L - mg/Kg)
		May 13, 1997	May 13, 1997	May 13, 1997			
Aluminum		21.2	8.07	2.36			
Arsenic		< 0.05	< 0.05	< 0.05			
Barium		0.75	0.64	0.35			
Beryllium		< 0.005	< 0.005	< 0.005			
Cadmium		< 0.01	< 0.01	< 0.01			
Calcium		1170	743	279			
Chromium		< 0.05	< 0.05	< 0.05			
Cobalt		< 0.10	< 0.10	< 0.10			
Iron		13.4	5.92	1.69			
Lead		< 0.05	< 0.05	< 0.05			
Magnesium		40.0	32.9	26.3			
Manganese		0.29	0.21	< 0.20			
Molybdenum		< 0.20	< 0.20	< 0.20			
Potassium		7.84	5.95	4.89			
Silver		< 0.02	< 0.02	< 0.02			
Sodium		80.7	69.7	95.8			
Tin		5.53	2.16	0.65			
Vanadium		0.05	< 0.05	< 0.05			
Zinc		< 0.25	< 0.25	< 0.25			
Nickel		< 0.10	< 0.10	< 0.10			
Copper		< 0.25	< 0.25	< 0.25			
Boron		< 0.25	< 0.25	< 0.25			
Silicon		24.5	12.9	13.3			
Strontium		2.16	1.69	1.30			

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-71051

K.E.I. Consultants, Inc.

Project Name: Monument

Project ID: 610057 Site #17
Project Manager: Ann Baker
Project Location: Site #17

Date Received in Lab: May 6, 1997 10:00 by RT
Date Report Faxed: May 22, 1997
XENCO contact: Carlos Castro/Edward Yonemoto

Analysis Requested	*Lab ID:*	171051-001	171051-002	171051-003			
	Field ID:	MW-1	MW-2	MW-3			
	Depth:						
Mercury, Tot Analyzed by EPA 7470		Date Analyzed - Analytical Results					ppm (mg/L - mg/Kg)
		May 12, 1997	May 12, 1997	May 12, 1997			
Mercury		< 0.0010	< 0.0010	< 0.0010			
BTEX Analyzed by EPA 8020		Date Analyzed - Analytical Results					ppm (mg/L - mg/Kg)
		May 9, 1997	May 9, 1997	May 9, 1997			
Benzene		< 0.001	< 0.001	0.685			
Toluene		< 0.001	< 0.001	< 0.005			
Ethylbenzene		< 0.001	< 0.001	0.071			
m,p-Xylenes		< 0.002	< 0.002	0.016			
o-Xylene		< 0.001	< 0.001	< 0.005			
Total BTEX		< 0.006	< 0.006	0.772			
PAH Analyzed by EPA 8100		Date Analyzed - Analytical Results					ppm (mg/L - mg/Kg)
		May 15, 1997	May 15, 1997	May 15, 1997			
Acenaphthene		< 0.002	< 0.002	< 0.002			
Acenaphthylene		< 0.002	< 0.002	< 0.002			
Anthracene		< 0.002	< 0.002	< 0.002			
Benzo(a)anthracene		< 0.002	< 0.002	< 0.002			
Benzo(a)pyrene		< 0.002	< 0.002	< 0.002			
Benzo(b)fluoranthene		< 0.002	< 0.002	< 0.002			
Benzo(g,h,i)perylene		< 0.002	< 0.002	< 0.002			
Benzo(k)fluoranthene		< 0.002	< 0.002	< 0.002			
Chrysene		< 0.002	< 0.002	< 0.002			
Dibenzo(a,e)pyrene		< 0.002	< 0.002	< 0.002			
Dibenzo(a,h)anthracene		< 0.002	< 0.002	< 0.002			
Dibenz(a,j)acridine		< 0.002	< 0.002	< 0.002			
Fluoranthene		< 0.002	< 0.002	< 0.002			
Fluorene		< 0.002	< 0.002	< 0.002			

Edward T. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-71051

K.E.I. Consultants, Inc.

Project Name: Monument

Project ID: 610057 Site #17
Project Manager: Ann Baker
Project Location: Site #17

Date Received in Lab: May 6, 1997 10:00 by RT
Date Report Faxed: May 22, 1997
XENCO contact: Carlos Castro/Edward Yonemoto

Analysis Requested	Lab ID: / Field ID: / Depth:	171051-001 MW-1	171051-002 MW-2	171051-003 MW-3			
Indeno(1,2,3-cd)pyrene		< 0.002	< 0.002	< 0.002			
3-Methylcholanthrene		< 0.002	< 0.002	< 0.002			
Naphthalene		< 0.002	< 0.002	< 0.002			
Phenanthrene		< 0.002	< 0.002	< 0.002			
Pyrene		< 0.002	< 0.002	< 0.002			
Dibenz(a,h)acridine		< 0.002	< 0.002	< 0.002			
Benzo(j)fluoranthene		< 0.002	< 0.002	< 0.002			
7H-Dibenzo(c,g)carbazole		< 0.002	< 0.002	< 0.002			
Dibenzo(a,h)pyrene		< 0.002	< 0.002	< 0.002			
Dibenzo(a,i)pyrene		< 0.002	< 0.002	< 0.002			
Bicarbonate Analyzed by SM 4500CO2D		Date Analyzed - Analytical Results					ppm (mg/L - mg/Kg)
		May 10, 1997	May 10, 1997	May 10, 1997			
Bicarbonate		319	307	315			
Carbonate Analyzed by SM4500CO2D		Date Analyzed - Analytical Results					ppm (mg/L - mg/Kg)
		May 10, 1997	May 10, 1997	May 10, 1997			
Carbonate		< 1.0	1.0	1.3			
TDS Analyzed by EPA 160.1		Date Analyzed - Analytical Results					ppm (mg/L - mg/Kg)
		May 9, 1997	May 9, 1997	May 9, 1997			
Total Dissolved Solids		786	820	816			
Anions Analyzed by EPA 300.0		Date Analyzed - Analytical Results					ppm (mg/L - mg/Kg)
		May 8, 1997	May 8, 1997	May 8, 1997			
Sulfate		70.0	62.0	63.2			
Chloride		152	158	174			
TIC Mod. Analyzed by Mod. 415.1		Date Analyzed - Analytical Results					ppm (mg/L - mg/Kg)
		May 14, 1997	May 14, 1997	May 14, 1997			

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

CERTIFICATE OF ANALYSIS SUMMARY 1-71051

K.E.I. Consultants, Inc.

Project Name: Monument

Project ID: 610057 Site #17
Project Manager: Ann Baker
Project Location: Site #17

Date Received in Lab: May 6, 1997 10:00 by RT
Date Report Faxed: May 22, 1997
XENCO contact: Carlos Castro/Edward Yonemoto

Analysis Requested	*Lab ID* / *Field ID:* / *Depth:*	171051-001 MW-1	171051-002 MW-2	171051-003 MW-3			
Total Inorganic Carbon		64.9	70.0	46.8			

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A18C05

EPA 6010 Metals by ICP

Date Validated: May 15, 1997 09:00
Date Analyzed: May 13, 1997 11:30
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: SA
Matrix: Liquid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Amount mg/L	[D] Method Detection Limit mg/L	[E] QC LIMITS Blank Spike Recovery %	[F] Recovery Range %	[G] Qualifier
Aluminum	< 0.01	0.72	1.00	0.01	72.0	70-125	
Arsenic	< 0.050	0.869	1.000	0.050	86.9	70-125	
Barium	< 0.002	0.429	0.500	0.002	85.8	70-125	
Beryllium	< 0.0050	0.1808	0.2000	0.0050	90.4	70-125	
Boron	< 0.03	1.20	1.56	0.03	76.9	70-125	
Cadmium	< 0.010	0.162	0.200	0.010	81.0	70-125	
Calcium	< 0.01	1.82	2.00	0.01	91.0	70-125	
Chromium	< 0.013	0.433	0.500	0.013	86.6	70-125	
Cobalt	< 0.003	0.423	0.500	0.003	84.6	70-125	
Copper	< 0.008	0.443	0.500	0.008	88.6	70-125	
Iron	< 0.006	0.814	1.000	0.006	81.4	70-125	
Lead	< 0.03	0.85	1.00	0.03	85.0	70-125	
Magnesium	< 0.01	1.79	2.00	0.01	89.5	70-125	
Nickel	< 0.03	0.46	0.50	0.03	92.0	70-125	
Potassium	< 0.0250	2.1275	2.0000	0.0250	106.4	70-125	
Silver	< 0.010	0.334	0.400	0.010	83.5	70-125	
Sodium	< 0.0250	1.8363	2.0000	0.0250	91.8	70-125	
Strontium	< 0.025	1.171	1.560	0.025	75.1	70-125	
Vanadium	< 0.00	0.44	0.50	0.00	88.0	70-125	
Zinc	< 0.008	0.431	0.500	0.008	86.2	70-125	

Blank Spike Recovery [E] = 100*(B-A)/(C)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A18C05

EPA 6010 Metals by ICP

Date Validated: May 15, 1997 09:00
Date Analyzed: May 13, 1997 19:46
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: SA
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 171051- 001	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC LIMITS Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	
Aluminum	21.16	16.94	0.01	22.2	25.0	
Arsenic	< 0.050	< 0.050	0.050	N.C	25.0	
Barium	0.746	0.766	0.002	2.6	25.0	
Beryllium	< 0.0050	< 0.0050	0.0050	N.C	25.0	
Boron	0.148	0.139	0.025	6.3	25.0	
Cadmium	< 0.010	< 0.010	0.010	N.C	25.0	
Calcium	1170	1110	0.01	5.3	25.0	
Chromium	0.039	0.039	0.013	0.0	25.0	
Cobalt	0.011	0.013	0.003	16.7	25.0	
Copper	0.014	0.014	0.008	0.0	25.0	
Iron	13.43	13.26	0.01	1.3	25.0	
Lead	< 0.025	< 0.025	0.025	N.C	25.0	
Magnesium	39.95	37.77	0.01	5.6	25.0	
Manganese	0.291	0.300	0.006	3.0	25.0	
Molybdenum	< 0.025	< 0.025	0.025	N.C	25.0	
Nickel	< 0.025	0.157	0.025	N.C	25.0	
Potassium	7.841	7.730	0.025	1.4	25.0	
Silicon	24.49	16.18	0.03	40.9	25.0	A
Silver	< 0.010	< 0.010	0.010	N.C	25.0	

(A) Variability in duplicate measurement attributed to sample non-homogeneity.
Relative Difference [D] = 200*(B-A)/(B+A)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A18C05

EPA 6010 Metals by ICP

Date Validated: May 15, 1997 09:00
Date Analyzed: May 13, 1997 19:46
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: SA
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 171051- 001	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC LIMITS Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	
Sodium	80.69	76.85	0.03	4.9	25.0	
Strontium	2.164	2.036	0.025	6.1	25.0	
Tin	5.533	5.160	0.025	7.0	25.0	
Vanadium	0.054	0.058	0.003	7.1	25.0	
Zinc	0.090	0.087	0.008	3.4	25.0	

(A) Variability in duplicate measurement attributed to sample non-homogeneity.
Relative Difference [D] = 200*(B-A)/(B+A)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A18C05

EPA 6010 Metals by ICP

Date Validated: May 15, 1997 09:00
Date Analyzed: May 13, 1997 11:30
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: SA
Matrix: Liquid

Q.C. Sample ID 171046- 001	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[G]
				QC	LIMITS			QC	LIMITS	
Parameter	Sample Result	Duplicate Result	Method Detection Limit	Relative Difference	Relative Difference	Matrix Spike Result	Matrix Spike Amount	Matrix Spike Recovery	Recovery Range	Qualifier
	mg/L	mg/L	mg/L	%	%	mg/L	mg/L	%	%	
Aluminum	30.68	30.75	0.01	0.2	25.0	40.7	12.5	79.8	70-125	
Arsenic	< 0.050	< 0.050	0.050	N.C	25.0	0.89	1.00	88.7	70-125	
Barium	1.031	1.233	0.002	17.8	25.0	1.25	0.50	44.6	70-125	B
Beryllium	< 0.0050	< 0.0050	0.0050	N.C	25.0	0.179	0.200	89.3	70-125	
Boron	0.173	0.178	0.025	2.8	25.0	2.51	3.13	74.8	70-125	
Cadmium	< 0.010	< 0.010	0.010	N.C	25.0	0.16	0.20	79.5	70-125	
Calcium	114	134	0.01	16.1	25.0	133	12.5	152.0	70-125	A,B
Chromium	0.031	0.030	0.013	3.3	25.0	0.44	0.50	81.0	70-125	
Cobalt	0.037	0.032	0.003	14.5	25.0	0.39	0.50	69.8	70-125	B
Copper	0.026	0.030	0.008	14.3	25.0	0.46	0.50	86.8	70-125	
Iron	38.92	37.58	0.01	3.5	25.0	45.1	12.5	49.5	70-125	A,B
Lead	< 0.025	< 0.025	0.025	N.C	25.0	0.80	1.00	80.2	70-125	
Magnesium	21.29	23.91	0.01	11.6	25.0	31.9	12.5	85.0	70-125	

(A) High analyte concentration affects spike recovery.
(B) Post-digestion spike within acceptance limits.
Relative Difference [D] = 200*(B-A)/(B+A)
Matrix Spike Recovery [H] = 100*(F-A)/[G]
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A18C05

EPA 6010 Metals by ICP

Date Validated: May 15, 1997 09:00
Date Analyzed: May 13, 1997 11:30
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: SA
Matrix: Liquid

Q.C. Sample ID 171046- 001	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
Parameter	[A] Sample Result mg/L	[B] Duplicate Result mg/L	[C] Method Detection Limit mg/L	[D] QC Relative Difference %	[E] LIMITS Relative Difference %	[F] Matrix Spike Result mg/L	[G] Matrix Spike Amount mg/L	[H] QC Matrix Spike Recovery %	[I] LIMITS Recovery Range %	[G] Qualifier
Manganese	1.263	1.503	0.006	17.4	25.0	12.16	12.50	87.2	70-125	
Molybdenum	< 0.025	< 0.025	0.025	N.C	25.0	0.55	0.63	88.6	70-125	
Nickel	< 0.025	< 0.025	0.025	N.C	25.0	0.40	0.50	80.2	70-125	
Potassium	7.715	8.064	0.025	4.4	25.0	19.08	12.50	90.9	70-125	
Silver	< 0.010	< 0.010	0.010	N.C	25.0	0.33	0.40	81.3	70-125	
Sodium	56.80	67.17	0.03	16.7	25.0	72.3	12.5	123.7	70-125	
Strontium	0.921	1.095	0.025	17.3	25.0	3.05	3.13	68.1	70-125	B
Vanadium	0.128	0.142	0.003	10.4	25.0	0.51	0.50	77.2	70-125	
Zinc	0.180	0.201	0.008	11.0	25.0	0.57	0.50	78.6	70-125	

(A) High analyte concentration affects spike recovery.
(B) Post-digestion spike within acceptance limits.
Relative Difference [D] = 200*(B-A)/(B+A)
Matrix Spike Recovery [H] = 100*(F-A)/[G]
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A05B25

SW846- 7470 Total Mercury

Date Validated: May 15, 1997 14:15
Date Analyzed: May 12, 1997 13:22
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: EZ
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
Q.C. Sample ID 171051- 002	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Matrix Spike Result	[G] Matrix Spike Amount	[H] QC Matrix Spike Recovery	[I] LIMITS Recovery Range	[G] Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	mg/L	mg/L	%	%	
Mercury	< 0.0010	< 0.0010	0.0010	N.C	25.0	0.0025	0.0025	100.0	70-125	

Relative Difference [D] = 200*(B-A)/(B+A)
Matrix Spike Recovery [H] = 100*(F-A)/[G]
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A05B25

SW846- 7470 Total Mercury

Date Validated: May 15, 1997 14:15
Date Analyzed: May 12, 1997 12:58
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: EZ
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
Q.C. Sample ID 171047- 001	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Matrix Spike Result	[G] Matrix Spike Amount	[H] QC Matrix Spike Recovery	[I] LIMITS Recovery Range	[G] Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	mg/L	mg/L	%	%	
Mercury	< 0.0010	< 0.0010	0.0010	N.C	25.0	0.0026	0.0025	104.0	70-125	

Relative Difference [D] = 200*(B-A)/(B+A)
Matrix Spike Recovery [H] = 100*(F-A)/[G]
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A05B25

SW846- 7470 Total Mercury

Date Validated: May 15, 1997 14:15
Date Analyzed: May 12, 1997 12:55
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: EZ
Matrix: Liquid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Amount mg/L	[D] Method Detection Limit mg/L	[E] QC Blank Spike Recovery %	[F] LIMITS Recovery Range %	[G] Qualifier
Mercury	< 0.0010	0.0022	0.0025	0.0010	88.0	70-125	

Blank Spike Recovery [E] = 100*(B-A)/(C)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A04B61

SW- 846 5030/8020 BTEX

Date Validated: May 12, 1997 14:50
Date Analyzed: May 9, 1997 10:17
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: IF
Matrix: Liquid

BLANK SPIKE ANALYSIS

Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Amount ppm	[D] Method Detection Limit ppm	[E] QC Blank Spike Recovery %	[F] LIMITS Recovery Range %	[G] Qualifier
Benzene	< 0.0010	0.1130	0.1000	0.0010	113.0	65-135	
Toluene	< 0.0010	0.1160	0.1000	0.0010	116.0	65-135	
Ethylbenzene	< 0.0010	0.1170	0.1000	0.0010	117.0	65-135	
m,p-Xylenes	< 0.0020	0.2410	0.2000	0.0020	120.5	65-135	
o-Xylene	< 0.0010	0.1150	0.1000	0.0010	115.0	65-135	

Blank Spike Recovery [E] = 100*(B-A)/(C)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A04B61

SW- 846 5030/8020 BTEX

Date Validated: May 12, 1997 14:50
Date Analyzed: May 9, 1997 13:42
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: IF
Matrix: Liquid

MATRIX SPIKE / MATRIX SPIKE DUPLICATE AND RECOVERY

Q.C. Sample ID 171048- 001 / Parameter	[A] Sample Result ppm	[B] Matrix Spike Result ppm	[C] Matrix Spike Duplicate Result ppm	[D] Matrix Spike Amount ppm	[E] Method Detection Limit ppm	Matrix Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Matrix Spike Recovery %	[H] QC M.S.D. Recovery %	[I] Matrix Spike Recovery Range %	[J] Qualifier
Benzene	< 0.0010	0.0868	0.0864	0.1000	0.0010	25.0	0.5	86.8	86.4	65-135	
Toluene	< 0.0010	0.1160	0.1120	0.1000	0.0010	25.0	3.5	116.0	112.0	65-135	
Ethylbenzene	< 0.0010	0.1180	0.1130	0.1000	0.0010	25.0	4.3	118.0	113.0	65-135	
m,p-Xylenes	< 0.0020	0.2420	0.2330	0.2000	0.0020	25.0	3.8	121.0	116.5	65-135	
o-Xylene	< 0.0010	0.1160	0.1120	0.1000	0.0010	25.0	3.5	116.0	112.0	65-135	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Matrix Spike Recovery [G] = 100*(B-A)/[D]
M.S.D. = Matrix Spike Duplicate
M.S.D. Recovery [H] = 100*(C-A)/[D]
N.D. = Below detection limit or not detected
All results are based on MDL and validated for QC purposes

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A34B35

SW-846 8100 PAHs by GC-MS

Date Validated: May 15, 1997 17:56
Date Analyzed: May 14, 1997 22:20
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: MM
Matrix: Liquid

BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY

Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Duplicate Result mg/L	[D] Blank Spike Amount mg/L	[E] Method Detection Limit mg/L	Blank Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Blank Spike Recovery %	[H] QC B.S.D. Recovery %	[I] Blank Spike Recovery Range %	[J] Qualifier
Acenaphthene	< 0.0020	0.0658	0.0670	0.1000	0.0020	31.0	1.8	65.8	67.0	46-118	
4-Chloro-3-Methylphenol	< 0.0020	0.0398	0.0332	0.1000	0.0020	42.0	18.1	39.8	33.2	23-97	
2-Chlorophenol	< 0.0020	0.0630	0.0644	0.1000	0.0020	40.0	2.2	63.0	64.4	27-123	
1,4-Dichlorobenzene	< 0.0020	0.0702	0.0724	0.1000	0.0020	28.0	3.1	70.2	72.4	36-97	
2,4-Dinitrotoluene	< 0.0020	0.0628	0.0632	0.1000	0.0020	38.0	0.6	62.8	63.2	24-96	
N-Nitroso-di-n-propylamine	< 0.0040	0.0742	0.0738	0.1000	0.0040	38.0	0.5	74.2	73.8	41-116	
4-Nitrophenol	< 0.0040	0.0250	0.0248	0.1000	0.0040	50.5	0.8	25.0	24.8	10-80	
Pentachlorophenol	< 0.0010	0.0738	0.0706	0.1000	0.0010	50.0	4.4	73.8	70.6	9-103	
Phenol	< 0.0010	0.0222	0.0224	0.1000	0.0010	42.0	0.9	22.2	22.4	12-89	
Pyrene	< 0.0020	0.0852	0.0840	0.1000	0.0020	31.0	1.4	85.2	84.0	26-127	
1,2,4-Trichlorobenzene	< 0.0010	0.0736	0.0714	0.1000	0.0010	28.0	3.0	73.6	71.4	39-98	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Blank Spike Recovery [G] = 100*(B-A)/[D]
B.S.D. = Blank Spike Duplicate
B.S.D. Recovery [H] = 100*(C-A)/[D]
N.D. = Below detection limit or not detected
All results are based on MDL and validated for QC purposes

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A20A24

SM4500CO2D Carbonate

Date Validated: May 14, 1997 15:30
Date Analyzed: May 10, 1997 09:20
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: CG
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 171047- 001	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
Parameter	ppm	ppm	ppm	%	%	
Carbonate	< 1.00	< 1.00	1.00	N.C	25.0	

Relative Difference [D] = 200*(B-A)/(B+A)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A20A22

SM 4500CO2D Bicarbonate

Date Validated: May 14, 1997 15:30
Date Analyzed: May 10, 1997 09:20
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: CG
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 171047- 001	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	
Bicarbonate	127	127	0.5	0.0	25.0	

Relative Difference [D] = 200*(B-A)/(B+A)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A19A95

EPA 160.1 Total Dissolved Solids

Date Validated: May 9, 1997 13:45
Date Analyzed: May 9, 1997 09:40
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: CG
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 171046- 001	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	
Total Dissolved Solids	526	504	4.0	4.3	25.0	

Relative Difference [D] = 200*(B-A)/(B+A)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A10A40

EPA 300.0 Anions by Ion Chromatography

Date Validated: May 9, 1997 12:00
Date Analyzed: May 8, 1997 12:55
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: JS
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					
Q.C. Sample ID 171046- 001	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Qualifier
Parameter	mg/L	mg/L	mg/L	%	%	
Chloride	72.400	75.900	0.050	4.7	20.0	
Sulfate	59.60	62.30	0.10	4.4	20.0	

Relative Difference [D] = 200*(B-A)/(B+A)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17A10A40

EPA 300.0 Anions by Ion Chromatography

Date Validated: May 9, 1997 12:00
Date Analyzed: May 8, 1997 12:23
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: JS
Matrix: Liquid

	BLANK SPIKE / BLANK SPIKE DUPLICATE AND RECOVERY										
Parameter	[A] Blank Result mg/L	[B] Blank Spike Result mg/L	[C] Blank Spike Duplicate Result mg/L	[D] Blank Spike Amount mg/L	[E] Method Detection Limit mg/L	Blank Limit Relative Difference %	[F] QC Spike Relative Difference %	[G] QC Blank Spike Recovery %	[H] QC B.S.D. Recovery %	[I] Blank Spike Recovery Range %	[J] Qualifier
Chloride	< 0.050	5.070	5.090	5.000	0.050	20.0	0.4	101.4	101.8	70-125	
Sulfate	< 0.10	4.97	5.06	5.00	0.10	20.0	1.8	99.4	101.2	70-125	

Spike Relative Difference [F] = 200*(B-C)/(B+C)
Blank Spike Recovery [G] = 100*(B-A)/[D]
B.S.D. = Blank Spike Duplicate
B.S.D. Recovery [H] = 100*(C-A)/[D]
N.D. = Below detection limit or not detected
All results are based on MDL and validated for QC purposes

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17Z99A23

MOD. 415.1 Total Inorganic Carbon

Date Validated: May 19, 1997 09:00
Date Analyzed: May 14, 1997 09:22
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: IF
Matrix: Liquid

	BLANK SPIKE ANALYSIS						
Parameter	[A] Blank Result ppm	[B] Blank Spike Result ppm	[C] Blank Spike Amount ppm	[D] Method Detection Limit ppm	[E] QC LIMITS Blank Spike Recovery %	[F] Recovery Range %	[G] Qualifier
Total Inorganic Carbon	< 1.0	20.6	20.0	1.0	103.0	70-120	

Blank Spike Recovery [E] = 100*(B-A)/(C)
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

Certificate Of Quality Control for Batch : 17Z99A23

MOD. 415.1 Total Inorganic Carbon

Date Validated: May 19, 1997 09:00
Date Analyzed: May 14, 1997 11:41
QA/QC Manager: Edward H. Yonemoto, Ph.D.

Analyst: IF
Matrix: Liquid

	MATRIX DUPLICATE ANALYSIS					MATRIX SPIKE ANALYSIS				
Q.C. Sample ID 171049- 002	[A] Sample Result	[B] Duplicate Result	[C] Method Detection Limit	[D] QC Relative Difference	[E] LIMITS Relative Difference	[F] Matrix Spike Result	[G] Matrix Spike Amount	[H] QC Matrix Spike Recovery	[I] LIMITS Recovery Range	[G] Qualifier
Parameter	ppm	ppm	ppm	%	%	ppm	ppm	%	%	
Total Inorganic Carbon	56.61	55.44	1.00	2.1	20.0	74.6	20.0	90.0	70-120	

Relative Difference [D] = 200*(B-A)/(B+A)
Matrix Spike Recovery [H] = 100*(F-A)/[G]
N.C. = Not calculated, data below detection limit
N.D. = Below detection limit
All results are based on MDL and validated for QC purposes only

Edward H. Yonemoto, Ph.D.
QA/QC Manager

XENCO Laboratories

ANALYTICAL CHAIN OF CUSTODY REPORT
CHRONOLOGY OF SAMPLES

K.E.I. Consultants, Inc.

Project ID: 610057 Site #17
Project Manager: Ann Baker
Project Location: Site #17

Project Name: Monument

XENCO COC#: 1-71051
Date Received in Lab: May 6, 1997 10:00 by RT
XENCO contact : Carlos Castro/Edward Yonemoto

	Field ID	Lab. ID	Method Name	Method ID	Units	Turn Around	Date and Time: Sample Collected	Date and Time: Addition Requested	Date and Time: Extraction	Date and Time: Analysis
1	MW-1	171051-001	BTEX	SW-846	ppm	Standard	May 2, 1997 13:45		May 9, 1997 by IF	May 9, 1997 16:04 by IF
2			PAH	SW-846 8100	mg/L	Standard	May 2, 1997 13:45		May 9, 1997 by CY	May 15, 1997 07:35 by MM
3			TDS	EPA 160.1	mg/L	Standard	May 2, 1997 13:45		May 8, 1997 by CG	May 9, 1997 10:30 by CG
4			Anions	EPA 300.0	mg/L	Standard	May 2, 1997 13:45		May 8, 1997 by JS	May 8, 1997 15:45 by JS
5			Carbonate	SM4500CO2D	ppm	Standard	May 2, 1997 13:45		May 10, 1997 by CG	May 10, 1997 10:05 by CG
6			Bicarbonate	SM 4500CO2D	mg/L	Standard	May 2, 1997 13:45		May 10, 1997 by CG	May 10, 1997 10:05 by CG
7			Metals (ICP)	EPA 6010	mg/L	Standard	May 2, 1997 13:45		May 9, 1997 by EZ	May 13, 1997 19:46 by SA
8			Mercury, Tot	SW846-7470	mg/L	Standard	May 2, 1997 13:45		May 9, 1997 by EZ	May 12, 1997 13:28 by EZ
9			TIC Mod.	MOD. 415.1	ppm	Standard	May 2, 1997 13:45		May 14, 1997 by IF	May 14, 1997 13:54 by IF
10	MW-2	171051-002	BTEX	SW-846	ppm	Standard	May 2, 1997 13:55		May 9, 1997 by IF	May 9, 1997 16:22 by IF
11			PAH	SW-846 8100	mg/L	Standard	May 2, 1997 13:55		May 9, 1997 by CY	May 15, 1997 08:21 by MM
12			TDS	EPA 160.1	mg/L	Standard	May 2, 1997 13:55		May 8, 1997 by CG	May 9, 1997 10:35 by CG
13			Anions	EPA 300.0	mg/L	Standard	May 2, 1997 13:55		May 8, 1997 by JS	May 8, 1997 15:53 by JS
14			Carbonate	SM4500CO2D	ppm	Standard	May 2, 1997 13:55		May 10, 1997 by CG	May 10, 1997 10:10 by CG
15			Bicarbonate	SM 4500CO2D	mg/L	Standard	May 2, 1997 13:55		May 10, 1997 by CG	May 10, 1997 10:10 by CG
16			Metals (ICP)	EPA 6010	mg/L	Standard	May 2, 1997 13:55		May 9, 1997 by EZ	May 13, 1997 20:07 by SA
17			Mercury, Tot	SW846-7470	mg/L	Standard	May 2, 1997 13:55		May 9, 1997 by EZ	May 12, 1997 13:20 by EZ
18			TIC Mod.	MOD. 415.1	ppm	Standard	May 2, 1997 13:55		May 14, 1997 by IF	May 14, 1997 14:02 by IF
19	MW-3	171051-003	BTEX	SW-846	ppm	Standard	May 2, 1997 14:05		May 9, 1997 by IF	May 9, 1997 17:17 by IF
20			PAH	SW-846 8100	mg/L	Standard	May 2, 1997 14:05		May 9, 1997 by CY	May 15, 1997 09:06 by MM
21			TDS	EPA 160.1	mg/L	Standard	May 2, 1997 14:05		May 8, 1997 by CG	May 9, 1997 10:40 by CG
22			Anions	EPA 300.0	mg/L	Standard	May 2, 1997 14:05		May 8, 1997 by JS	May 8, 1997 16:00 by JS
23			Carbonate	SM4500CO2D	ppm	Standard	May 2, 1997 14:05		May 10, 1997 by CG	May 10, 1997 10:15 by CG
24			Bicarbonate	SM 4500CO2D	mg/L	Standard	May 2, 1997 14:05		May 10, 1997 by CG	May 10, 1997 10:15 by CG
25			Metals (ICP)	EPA 6010	mg/L	Standard	May 2, 1997 14:05		May 9, 1997 by EZ	May 13, 1997 20:14 by SA
26			Mercury, Tot	SW846-7470	mg/L	Standard	May 2, 1997 14:05		May 9, 1997 by EZ	May 12, 1997 13:28 by EZ
27			TIC Mod.	MOD. 415.1	ppm	Standard	May 2, 1997 14:05		May 14, 1997 by IF	May 14, 1997 14:09 by IF

XENCO Laboratories

11381 Meadowglen Suite L Houston, Texas 77082
(713) 589-0692 Fax (713) 589-0695

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Lab. Batch # 171051-H

Contractor: KEI Consultants
Phone: (800) 253-0507
Address: 4800 Wurzbach Drive Suite 100 San Antonio, Tx
Project Name: Monument
Project Director: Paul Hartnet
Project Location: Site #17
Project Manager: Ann Baker
Sampler Signature:
Project No.: 610057 site #17

No. coolers this shipment:
Carrier: UPS
Airbill No.
Contractor COC #
Quote #:
P.O. No:

	Field ID	Date	Time	DEPTH	SOIL	WATER	COMP	GRAB	Container Size	Container Type P, G	Preservative Ice	Preservative Other	Sample Description	No of CONTAINERS Total	BTEX (8020/8020-602)	TPH (418.1)	HEAVY METALS	PAH (8100)	TDS (160.1)	CATIONS/ANIONS	Please Hold	LAB ONLY ID #
1	MW-1	5-2-97	1345			/					/	/		7	/	/	/	/	/	/		1
2	MW-2	5-2-97	1355			/					/	/		7	/	/	/	/	/	/		2
3	MW-3	5-2-97	1405			/					/	/		7	/	/	/	/	/	/		3
4																						4
5																						5
6																						6
7																						7
8																						8
9																						9
10																						10

SAMPLE CHARACTERIZATION: Unl Dies Ker Unknown; Waste Oil; PIT No: Tank No:

Turn-around: * ASAP; * 24 hrs; 48 hrs; (Standard)

Remarks

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	DATE	TIME
	5-5-97	0600			
			Received For Laboratory by	5-6-97	1000

Remarks

Pink (Contractor), Yellow & White (Lab).

* Pre-scheduling is recommended

Precision Analytical Services