CLOSURE REPORT

5309 Wurzbach, Suite 100
San Antonio, Texas 78238
(210) 680-3767
(210) 680-3763 FAX

CLOSURE REPORT

TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-98-S01
SECTION 20, TOWNSHIP 19S, RANGE 37E
LEA COUNTY, NEW MEXICO

PREPARED FOR:

TEXAS - NEW MEXICO PIPE LINE COMPANY
P. O. Box 1030
Jal, New Mexico 88252

Mr. Tony Savoie

PREPARED BY:

KEI

Daryl Stacey
Project Manager

Theresa Nix
Project Manager

Pat Bullinger, P.E.

KEI Job No. 810004-1

August 27, 1998

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PURPOSE AND SCOPE

The objective of the site activities was to obtain closure based on New Mexico Oil Conservation Division (OCD) regulations. The following activities were performed to achieve this objective:

- determination of closure standards
- removal of impacted soil
- characterization of removed impacted soil
- confirmation sampling in the excavated area
- transportation and off-site landfarming of impacted soil
- backfilling with clean soil in the excavated area

PREVIOUS INVESTIGATIONS

The Texas - New Mexico Pipe Line Company (TNMPL) alleged release site no. TNM-98-S01 is located in Section 20, Township 19 South, Range 37 East as presented on FIG. 1. A subsurface investigation was conducted by KEI at the site. The results of this investigation are summarized in the Subsurface Investigation Report dated May 26, 1998. The following activities were performed as part of the subsurface investigation:

- installation of 3 monitoring wells on February 18, 1998
- installation of 3 soil borings on February 19, 1998
- collection of soil samples from native soils during monitoring well and soil boring installation
- collection of ground water samples from the monitoring wells for laboratory analyses on March 3, 1998

Soil samples collected during the advancement of soil borings and monitoring wells were submitted for determination of benzene, toluene, ethylbenzene, and xylene (BTEX), and total petroleum hydrocarbon diesel range organics (TPH-DRO) concentrations. One soil sample was submitted for SPLP TPH, SPLP Volatile Organic Compounds (VOCs) and SPLP Semi-Volatile Organic Compounds (SVOCs). One undisturbed sample was selected and analyzed for Fraction of Organic Carbon (FOC) and moisture content. Analytical results indicated the following concentration ranges:

CONSTITUENT	CONCENTRATION RANGES
BENZENE	ND
BTEX	ND
TPH	19.0 to 1650 mg/kg
SPLP TPH	0.9 mg/L
SPLP VOCs	ND
SPLP SVOCs	ND
FOC	0.6%
MOISTURE CONTENT	11.7%

Analytical results from the soil samples are summarized in TABLE I, TABLE II, and TABLE III.

A ground water monitoring event was conducted at the site on March 3, 1998. Ground water samples were submitted for determination of BTEX, polycyclic aromatic hydrocarbons (PAH), metals, cations/anions, and total dissolved solids (TDS). Analytical results for water samples indicated the following concentration ranges:

CONSTITUENT	CONCENTRATION RANGES (mg/L)
BENZENE	ND to 0.005
BTEX	ND to 0.005
BICARBONATE	314 to 494
CHLORIDE	66.48 to 109
SULFATE	30.62 to 52.95
TDS	601 to 844
ALUMINUM	ND to 5.1
BARIUM	0.14 to 1.20
BORON	ND to 0.24
CALCIUM	134 to 871
IRON	0.33 to 7.27
MAGNESIUM	18.7 to 34.3
MANGANESE	ND to 1.07
POTASSIUM	3.61 to 5.71
SILICON	26.2 to 166
SODIUM	53.5 to 79.7
STRONTIUM	1.26 to 2.44
TIN	ND to 1.34

Constituents not listed above were below laboratory detection/reporting limits (ND). Analytical results from the ground water samples are summarized in TABLE IV and TABLE V.

During the June 1, 1998, ground water monitoring event, the depth to water ranged from 14.90 to 23.89 feet. The ground water contours are presented on FIG. 3. Quality assurance/quality control methods used during sampling activities are presented as APPENDIX C.

CLOSURE ACTIVITIES

CLOSURE STANDARDS

The New Mexico OCD Guidelines for Remediation of Leaks, Spills, and Releases contains the standard criteria for remediation activities. A ranking analysis for the site was performed to determine appropriate soil remediation levels. The ranking analysis is as follows:

Depth to Ground Water	Less Than 50 Feet	20 Points
Well Head Protection	Greater Than 1000 Feet to Water Source Greater Than 200 Feet to Private Water Source	0 Points
Surface Water Body	Greater Than 1000 Feet	0 Points
	Total Ranking Score	**20 Points**

Based on the total ranking score, the closure objectives for concentrations of benzene, BTEX, and TPH are summarized below.

CONSTITUENT	CLOSURE CONCENTRATIONS (mg/kg)
BENZENE	10
BTEX	50
TPH	100 + Background Concentration

The New Mexico Quality Control Commission Ground Water Standards for BTEX are as follows:

CONSTITUENT	GROUND WATER STANDARD (mg/l)
BENZENE	0.01
TOLUENE	0.75
ETHYLBENZENE	0.75
TOTAL XYLENES	0.62

EXCAVATION, LANDFARMING, AND BACKFILL

Impacted soils were excavated and placed on plastic on-site. Soils were characterized and transported off-site to C&C Landfarm located approximately 2 miles south of Monument. Approximately 14,200 cubic yards were transported to the landfarm on May 1, 1998. An area covering approximately 13,750 square feet was excavated to the water table (approximately 19 feet below ground surface). Approximately 11,600 cubic yards of clean soil were used to backfill the excavation on May 13, 1998.

CONFIRMATION SOIL SAMPLING

Confirmation soil samples were collected by TNMPL on February 27, March 3, and March 12, 1998, from the bottom and sidewalls of 4 sections of the excavation. The samples were submitted for determination of BTEX and TPH concentrations. Analytical results for soil confirmation samples indicated the following concentration ranges:

CONSTITUENT	CONCENTRATION RANGES
BENZENE	ND to 0.185
BTEX	ND to 1.13
TPH	ND to 29

Analytical results from the soil samples are summarized in TABLE I. Soil analytical reports are presented as APPENDIX A. Soil sample locations are presented on FIG. 2.

CONFIRMATION GROUND WATER SAMPLING

Ground water samples from 4 sections of the bottom of the excavation were collected by TNMPL on March 3 and March 12, 1998, and submitted for determination of BTEX concentrations. Analytical results for ground water confirmation samples indicated the following concentration ranges:

CONSTITUENT	CONCENTRATION RANGES
BENZENE	ND
TOLUENE	ND
ETHYLBENZENE	ND
TOTAL XYLENES	ND

Ground water analytical results are summarized on TABLE IV and TABLE V. Water analytical reports are presented as APPENDIX B. The locations of the water samples are presented on FIG. 2.

CLOSURE SUMMARY

The following can be summarized from field and analytical data:

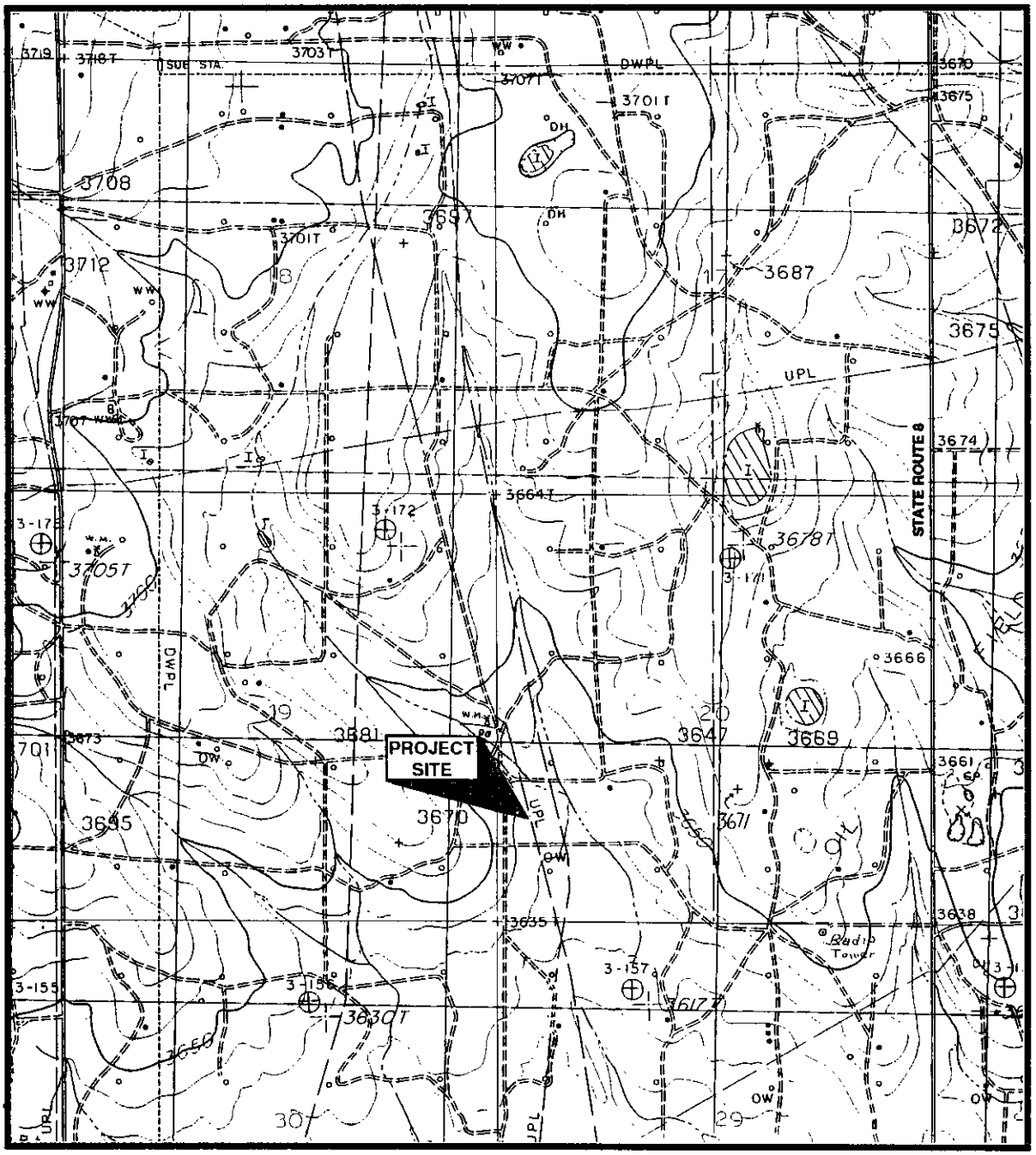
- Approximately 14,200 cubic yards of impacted soil was excavated and landfarmed off-site.
- Approximately 11,600 cubic yards of clean soil was backfilled in the excavation.
- Confirmation samples taken from the bottom and sidewalls of the excavation indicated BTEX and TPH concentrations below OCD closure standards.
- Water samples taken from water wells MW-1, MW-2, and MW-3, and samples taken from the bottom of the excavation indicated BTEX concentrations below New Mexico Water Quality Control Commission Ground Water Standards.

Based on activities completed at the site and analytical results from selected soil samples, we request the site be closed under OCD regulations.

MONUMENT NORTH QUADRANGLE

NEW MEXICO - LEA CO.

PRINTED 1985



SCALE 1:24000

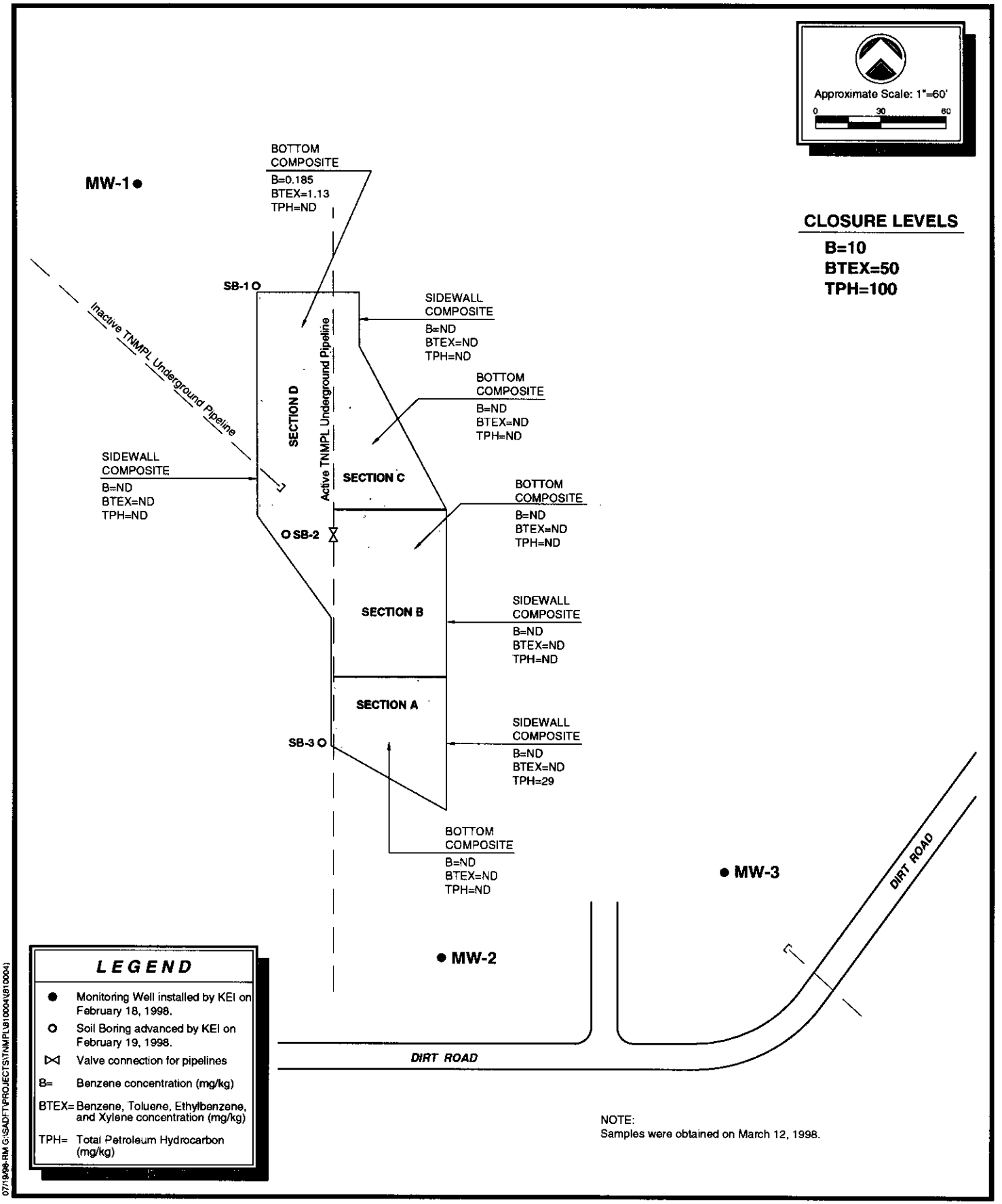
1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

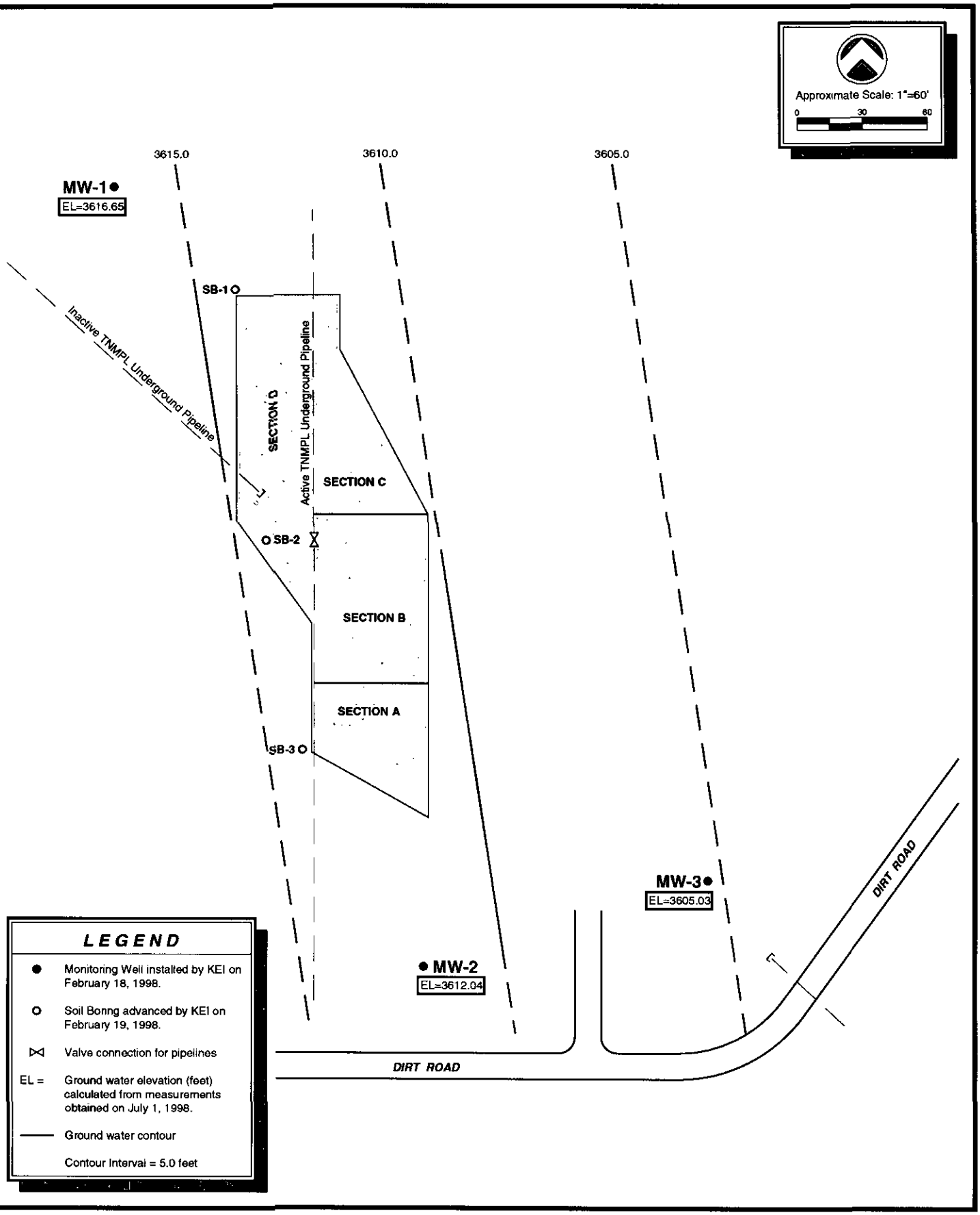
k·e·i	*SITE LOCATION MAP*	810004
	TEXAS - NEW MEXICO PIPE LINE CO. TNM - 98-S01 LEA COUNTY, NEW MEXICO	FIG 1



NOTE:
Samples were obtained on March 12, 1998.

07/19/98-RM G:\SAD\TXPROJECTS\TNMPL\810004\(810004)

k·e·i	SITE DETAILS - SAMPLING LOCATIONS	810004
	TEXAS - NEW MEXICO PIPE LINE CO. TNM-98-S01 LEA COUNTY, NEW MEXICO	FIG 2



k·e·i

GROUND WATER CONTOURS - JULY 1998	810004
TEXAS - NEW MEXICO PIPE LINE CO. TNM-98-S01 LEA COUNTY, NEW MEXICO	FIG 3

GENERAL NOTES

ND - Indicates constituent was not detected above the method detection or laboratory reporting limit.
--- - Indicates no depth was referenced on the chain-of-custody (TABLE I)

Method detection/reporting limits:

Soil:

TPH	-	10.0 to 200 mg/kg
BTEX	-	0.020 to 0.20 mg/kg
SPLP TPH	-	0.7 mg/L
SPLP VOCs	-	0.025 to 0.050 mg/L
SPLP SVOCs	-	0.010 to 0.025 mg/L
FOC	-	0.1%
Moisture Content	-	0.1%

Water:

BTEX	-	0.001 to 0.008 mg/L
PAH	-	0.002 mg/L
Cations	-	1.0 mg/L
Anions	-	1.00 mg/L
TDS	-	4.0 mg/L
Metals	-	0.05 to 2.2 mg/L
Total Mercury	-	0.0011 mg/L

Laboratory test methods:

Soil:

TPH	-	Modified EPA Method 8015 DRO
BTEX	-	EPA Method SW846-8020
SPLP TPH	-	EPA Method 1312/418.1
SPLP VOCs	-	EPA Method 1312/8260
SPLP SVOCs	-	EPA Method 1312/8270
FOC	-	ASTM Method D2974
Moisture Content	-	ASTM Method 2216-7

Water:

BTEX	-	EPA Method 846-8020
PAH	-	EPA Method 8270
Cations	-	SM 4500CO2D
Anions	-	EPA Method 300.0
TDS	-	EPA Method 160.1
Metals	-	EPA ICP Method 6010
Total Mercury	-	EPA Method 7470

TABLE I

SUMMARY OF SOIL RESULTS - BTEX AND TPH
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-98-S01
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)
SB-1	02/19/98	5 - 5.5	ND	ND	ND	ND	ND	27.8
SB-1	02/19/98	10 - 12	ND	ND	ND	ND	ND	24.3
SB-1	02/19/98	14 - 16	ND	ND	ND	ND	ND	31.3
SB-2	02/19/98	5 - 6.5	ND	ND	ND	ND	ND	41.4
SB-2	02/19/98	10 - 11.5	ND	ND	ND	ND	ND	1,650
SB-2	02/19/98	14 - 16	ND	ND	ND	ND	ND	913
SB-3	02/19/98	5 - 7	ND	ND	ND	ND	ND	52.1
SB-3	02/19/98	10 - 12	ND	ND	ND	ND	ND	29.9
SB-3	02/19/98	14 - 16	ND	ND	ND	ND	ND	51.7
MW-1	02/18/98	5 - 6	ND	ND	ND	ND	ND	34.1
MW-1	02/18/98	10 - 12	ND	ND	ND	ND	ND	28.4
MW-1	02/18/98	14 - 16	ND	ND	ND	ND	ND	27.5
MW-2	02/18/98	5 - 6	ND	ND	ND	ND	ND	26.2
MW-2	02/18/98	10 - 11	ND	ND	ND	ND	ND	32.6
MW-2	02/18/98	14 - 16	ND	ND	ND	ND	ND	24.6
MW-3	02/18/98	5 - 5.5	ND	ND	ND	ND	ND	19.0
MW-3	02/18/98	10 - 12	ND	ND	ND	ND	ND	20.6
MW-3	02/18/98	14 - 16	ND	ND	ND	ND	ND	23.2
MW-3	02/18/98	16 - 18	ND	ND	ND	ND	ND	28.2
Excavation Bottom								
Section A	02/27/98	---	ND	ND	ND	ND	ND	ND
Section B	02/27/98	---	ND	ND	ND	ND	ND	ND
Section C	03/12/98	---	ND	ND	ND	ND	ND	ND
Section D	03/12/98	---	0.185	0.249	0.173	0.523	1.13	ND
Side Wall								
Section A	02/27/98	---	ND	ND	ND	ND	ND	29
Section A South	03/03/98	---	ND	ND	ND	ND	ND	ND
Section B	02/27/98	---	ND	ND	ND	ND	ND	ND
Section C	03/12/98	---	ND	ND	ND	ND	ND	ND
Section D	03/12/98	---	ND	ND	ND	ND	ND	ND

TABLE II

SUMMARY OF SOIL RESULTS - SPLP
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-98-S01
LEA COUNTY, NEW MEXICO

PARAMETER	CONCENTRATION (mg/L)
VOCs	ND
SVOCs	ND
TPH	0.9

NOTES:

1. The sample was obtained on 02/19/98 from SB-2 at 10 to 11.5 feet.
2. Those constituents not listed were ND.

TABLE III

SUMMARY OF SOIL RESULTS - GEOTECHNICAL
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-98-S01
LEA COUNTY, NEW MEXICO

PARAMETER	CONCENTRATION (%)
Organic Content (FOC)	0.6
Moisture Content	11.7

NOTE:
The sample was obtained on 02/18/98 from MW-3 at approximately 14 to 16 feet below ground surface.

TABLE IV

SUMMARY OF GROUND WATER RESULTS - BTEX
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-98-S01
LEA COUNTY, NEW MEXICO

SAMPLE LOCATION	DATE SAMPLED	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYL-BENZENE (mg/l)	XYLENES (mg/l)	BTEX (mg/l)
MW-1	03/03/98	0.001	ND	ND	ND	0.001
MW-2	03/03/98	ND	ND	ND	ND	ND
MW-3	03/03/98	0.005	ND	ND	ND	0.005
Section A	03/03/98	ND	ND	ND	ND	ND
Section B	03/03/98	ND	ND	ND	ND	ND
Section C	03/12/98	ND	ND	ND	ND	ND
Section D	03/12/98	ND	ND	ND	ND	ND

TABLE V

SUMMARY OF GROUND WATER RESULTS - MISCELLANEOUS
TEXAS - NEW MEXICO PIPE LINE COMPANY
TNM-98-S01
LEA COUNTY, NEW MEXICO

SAMPLE ID	MW-1	MW-2	MW-3
PARAMETER	CONCENTRATION (mg/L)		
Aluminum	5.1	ND	ND
Barium	0.41	0.14	1.20
Boron	0.24	ND	ND
Calcium	871	134	738
Iron	7.27	0.34	0.33
Magnesium	34.3	18.7	29.5
Manganese	0.45	ND	1.07
Potassium	5.71	3.61	3.87
Silicon	166	27.4	26.2
Sodium	79.7	53.5	59.6
Strontium	2.44	1.26	2.04
Tin	1.34	ND	ND
Mercury	ND	ND	ND
Cations/Anions:			
Bicarbonate	494	314	350
Chloride	97.97	66.48	109
Sulfate	40.67	52.95	30.62
Total Dissolved Solids	844	601	701

NOTES:

1. Ground water samples were obtained on 03/03/98
2. Those constituents not listed were ND.

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt"

TEXAS NEW MEXICO PIPE LINE
ATTN: MR. TONY SAVOIE
P.O. BOX 1030
JAL, NEW MEXICO 88252
FAX: 505-395-2636
FAX: 505-397-5125

Receiving Date: 03/13/98
Sample Type: Soil
Project #: Continental A-17
Project Name: None given
Project Location: Monument, N.M

Analysis Date: BTEX 03/16/98
Analysis Date: DRO 03/13/98
Sampling Date: 03/12/98
Sample Condition: Intact/Iced

ELT#	FIELD CODE	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYLBENZENE (mg/kg)	m,p-XYLENE (mg/kg)	o-XYLENE (mg/kg)	TPH (DRO) C10-C28 (mg/kg)
13973	03-12-98 Sec. C BH Comp.	<0.100	<0.100	<0.100	<0.100	<0.100	<10
13974	03-12-98 Sec. D BH Comp.	0.185	0.249	0.173	0.346	0.177	<10
13975	03-12-98 Sec. C SW Comp.	<0.100	<0.100	<0.100	<0.100	<0.100	<10
13976	03-12-98 Sec. D SW Comp	<0.100	<0.100	<0.100	<0.100	<0.100	<10
	% IA	106	102	100	99	101	92
	% EA	111	107	104	103	104	100
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001	<10

METHODS: EPA SW 846-8020,5030, 8015M DRO

Michael R. Fowler

5-16-98
Date

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TEXAS NEW MEXICO PIPE LINE
ATTN: MR. TONY SAVOIE
P.O. BOX 1030
JAL, NEW MEXICO 88252
FAX: 505-395-2636

Receiving Date: 02/27/98
Sample Type: SOIL
Project #: TNM CONTINENTAL A-17
Project Name: NONE GIVEN
Project Location: 2 MILES NW OF MONUMENT, NM

Analysis Date: 03/02/98
Sampling Date: 02/27/98
Sample Condition: Intact/Iced

ELT#	FIELD CODE	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYLBENZENE (mg/kg)	m,p-XYLENE (mg/kg)	o-XYLENE (mg/kg)	TPH (DRO) C10-C28 (mg/kg)
13836	02-27-98 BH COMP SEC A	<.100	<.100	< 100	<.100	<.100	<10
13837	02-27-98 BH COMP SEC B	<.100	<.100	<.100	<.100	<.100	<10
13838	02-27-98 SW COMP SEC A	<.100	<.100	<.100	<.100	<.100	29
13839	02-27-98 SW COMP SEC B	<.100	<.100	<.100	<.100	<.100	<10
	% IA	100	104	107	107	110	111
	% EA	89	94	96	95	98	105
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001	<10

METHODS: EPA SW 846-8020,5030, 8015M DRO

Michael R. Fowler

3-3-98
Date

P.02

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"Don't Treat Your Soil Like Dirt!"

TEXAS NEW MEXICO PIPE LINE
ATTN: MR. TONY SAVOIE
P.O. BOX 1030
JAL, NEW MEXICO 88252
FAX: 505-395-2636
FAX: 505-397-5125

Receiving Date: 03/03/98
Sample Type: SOIL
Project #: CONTINENTAL A-17
Project Name: TNM
Project Location: 2 MI. NW MONUMENT, NM

Analysis Date: 03/03/98
Sampling Date: 03/03/98
Sample Condition: Intact/Iced

ELT#	FIELD CODE	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYLBENZENE (mg/kg)	m,p-XYLENE (mg/kg)	o-XYLENE (mg/kg)	TPH (DRO) C10-C28 (mg/kg)
13643	3-3-98 SW Comp Sec S. Wall A	<0.100	<0.100	<0.100	<0.100	<0.100	<10
	% IA	105	108	108	108	109	114
	% EA	113	114	113	114	114	122
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001	<10

METHODS: EPA SW 846-8020,5030, 8015M DRO

Michael R. Fowler

3-4-98
Date

P.01

ENVIRONMENTAL LAB OF , INC.

81004

"Don't Treat Your Soil Like Dirt"

TEXAS NEW MEXICO PIPE LINE
ATTN: MR TONY SAVOIE
P.O. BOX 1030
JAL, NEW MEXICO 88252
FAX: 505-395-2635
FAX: 505-397-5125

Receiving Date: 03/13/98
Sample Type: Water
Project #: Continental A-17
Project Name: None given
Project Location: Monument, N.M

Analysis Date: 03/13/98
Sampling Date: 03/12/98
Sample Condition: Intact/iced

ELT#	FIELD CODE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYLBENZENE (mg/L)	m,p-XYLENE (mg/L)	o-XYLENE (mg/L)
13971	03-12-98 Sec. C Water	<0.001	<0.001	<0.001	<0.001	<0.001
13972	03-12-98 Sec. D Water	<0.001	<0.001	<0.001	<0.001	<0.001
	% IA	101	98	96	95	97
	% EA	93	80	88	86	88
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: EPA SW 846-8020,5030.

Michael R. Fowler

3-16-98
Date

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

TEXAS NEW MEXICO PIPE LINE
ATTN: MR. TONY SAVOIE
P.O. BOX 1030
JAL, NEW MEXICO 88252
FAX: 505-395-2636
FAX: 505-397-5125

Receiving Date: 03/03/98
Sample Type: WATER
Project #: CONTINENTAL A-17
Project Name: TNM
Project Location: 2 MI. NW MONUMENT, NM

Analysis Date: 03/03/98
Sampling Date: 03/03/98
Sample Condition: Intact/Iced

ELT#	FIELD CODE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYLBENZENE (mg/L)	m,p-XYLENE (mg/L)	o-XYLENE (mg/L)
13844	03-3-98 SEC A	<0.001	<0.001	<0.001	<0.001	<0.001
13845	03-3-98 SEC B	<0.001	<0.001	<0.001	<0.001	<0.001
	% IA	105	108	108	108	109
	% EA	107	109	108	108	107
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: EPA SW 846-8020,5030

Michael R. Fowler

3-4-98
Date

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 collected by KEI were obtained utilizing an air rotary drilling device with split spoon samples at discrete intervals. Representative soil samples were divided into 2 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.

Soil samples collected by KEI were express mailed to Xenco Laboratories of San Antonio, Texas for BTEX, TPH-DRO, SPLP SVOC, SPLP VOC, SPLP TPH, FOC, and moisture content analysis using the methods described below. Soil samples collected by TNMPL were express mailed to Environmental Labs of Texas, Inc., Odessa, Texas. Soil samples were analyzed for BTEX and TPH within 14 days following the collection date.

The soil samples were analyzed in accordance with the methods as follows:

- BTEX concentrations in accordance with EPA Method SW846-8020
- TPH concentrations in accordance with modified EPA Method 8015-DRO
- SPLP TPH concentrations in accordance with EPA Method 1312/418.1
- SPLP VOC concentrations in accordance with EPA Method SW846-1312/8260
- SPLP SVOC concentrations in accordance with EPA Method SW846-1312/8270
- FOC concentrations in accordance with ASTM Method D2974
- moisture content in accordance with ASTM 2216-71

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 3 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 40 ml glass VOA vials equipped with Teflon-lined caps and 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.

Purged water collected during each event is stored in drums on-site pending disposal.

The ground water samples were analyzed in accordance with the methods as follows:

- BTEX concentrations in accordance with EPA Method SW846-8020
- Metal concentrations in accordance with EPA ICP Method 6010
- PAH concentrations in accordance with EPA Method 8270
- Cations in accordance with SM 4500CO2D
- Anions in accordance with EPA Method 300.0
- TDS in accordance with EPA Method 160.1
- Total Mercury in accordance with EPA Method 7470

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.