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REPORTS

DATE:

1993

CURA, INC.
3001 North Big Spring
Suite 101
Midland, Texas 79705
(915) 570-8408
FAX (915) 570-8409

PHASE II
ENVIRONMENTAL SITE ASSESSMENT

EUNICE STATION
LEA COUNTY, NEW MEXICO

CURA PROJECT NO. 15-92567017.3

SHELL PIPE LINE CORPORATION
TWO SHELL PLAZA
P.O. BOX 2099
HOUSTON, TEXAS 77252-2099

March 9, 1993

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Project Manager

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Director of Geology/Hydrogeology

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1.0 REPORT SUMMARY

1.1 EXECUTIVE SUMMARY

The site, Eunice Station, is located approximately 5 miles west of the city of Eunice in Lea County, New Mexico (Appendix A, Figure 1) and is utilized as a crude oil pipeline pump station.

A review of the analytical results from the Preliminary Site Assessment conducted during December 1992 indicated hydrocarbon-impacted soils (> 100 ppm TPH) at a depth of 1 to 3 feet in boring B-1 (370 ppm TPH) and 5 to 7 feet in B-4 (1,800 ppm TPH). Based on these analytical results, the tank battery and associated equipment located in the northern portion of the site were identified as potential sources of the crude oil contamination observed on site. Based on the findings of the Preliminary Site Assessment, four additional soil borings (B-5 through B-8) were performed on February 4, 1993 to further delineate the horizontal and vertical extent of the hydrocarbon-impacted soils previously identified in borings B-1 through B-4.

Benzene levels measured below method detection limits of 0.001 ppm in the sampled intervals of borings B-5 through B-8. The total BTEX levels ranged from below method detection limits of 0.001 ppm to 9.1 ppm. TPH levels ranged from 20 ppm to 42,000 ppm. The current New Mexico Oil Conservation Division (OCD) recommended remediation levels for crude oil impacted soils are 10 ppm benzene, 50 ppm total BTEX, and either 100 ppm, 1,000 ppm, or 5,000 ppm TPH depending upon the risk assessment ranking for the site.

Based on the data obtained, the extent of hydrocarbon-impacted soils identified in the 10 to 12 foot interval of boring B-8 near the tank battery and

associated equipment in the northeast corner of the site is limited in size and contains relatively low hydrocarbon concentrations (TPH <200). Subsurface piping (north of boring B-8) is a potential source of the contamination since no near surface hydrocarbon-impacted soils were identified in boring B-8.

The relative hydrocarbon concentrations recorded in borings B-1, B-4, B-6, and B-7 (elevated OVA reading) indicate the two pipeline clean-outs south of boring B-6 and the subsurface piping between the pumping station and the tank battery are potential sources of the crude oil impact identified in the borings. Based on the data obtained, the extent of hydrocarbon-impacted soils is limited to an area approximately 120 feet west of boring B-7 and 200 feet long (north-south). Due to the close proximity of B-1 and B-7 to the property boundary (fence line) the eastern extent of soil impact has not been identified.

Groundwater was not encountered during this subsurface investigation. Based on the analytical data from borings B-1 through B-8 and field observations, the crude oil contamination was absorbed by the impacted soils and did not migrate downward to groundwater.

1.2 SCOPE OF SERVICES

The following scope of services was conducted for the Phase II - Environmental Site Assessment:

- Met with Shell Pipe Line Corporation to determine additional boring locations in order to further delineate the extent of hydrocarbon-impacted soils found during the Preliminary Site Assessment conducted in December 1992.

- Conducted a preliminary literature search of the geology and hydrogeology of the site area.

- Performed soil borings and obtained soil samples to aid in classifying subsurface conditions with respect to petroleum hydrocarbons.

- Constructed a soil hydrocarbon concentration map to help delineate the horizontal and vertical extent of hydrocarbon-affected soils.

- Assembled soil profile columns from soil boring logs and reviewed the soil classification for the site area.

- Summarized findings in the Phase II - Environmental Site Assessment Report.

2.0 INTRODUCTION

During December 1992, CURA was contracted by Shell Pipe Line Corporation to conduct a Preliminary Site Assessment prior to a planned site divestment. Based on the discovery of hydrocarbon-impacted soils in borings B-1 and B-4, the tank battery and associated equipment located in the northern portion of the site were identified as potential sources.

A Phase II - Environmental Site Assessment (this report) was performed on February 4, 1992 to further delineate the extent of hydrocarbon-impacted soils near borings B-1 and B-4, and to provide a more comprehensive assessment of the subsurface soil conditions. The site, Eunice Station, is located approximately 5 miles west of the city of Eunice in Lea County, New Mexico (Appendix A, Figure 1).

3.0 SITE DESCRIPTION

Eunice Station is utilized as a crude oil pipeline pumping station in which subsurface crude oil field lines from various oil field leases are manifolded into the main subsurface discharge pipeline currently operated by Shell Pipe Line Corporation. An aboveground crude oil storage tank (Tank 351-H) is located on the northeastern portion of the site (Appendix A, Figure 2) and is surrounded by an earthen dike. A pumping station and small single-walled steel sump are located near the center of the south half of the site. Three pipeline clean outs and catch basins are located in the southeast corner of the site.

Eunice Station is surrounded by barbed-wire fencing with a locked gate located near the southwest corner of the facility. The site is located in a rural area within the Monument-Jal Oil Field. No residences, public buildings, surface bodies of water, or water wells were observed within a 1,000 foot radius of the facility. The southern end of the Lea County - Eunice Airport landing strip is located approximately 1/2-mile north-northeast of the site.

4.0 SITE HYDROGEOLOGY

The site is located in Lea County, New Mexico, within the Great Plains physiographic province along the southwestern edge of the High Plains Region of New Mexico and Texas.

Water wells in the site area typically produce water from three principal geologic units (from oldest to youngest), the Dockum group, the Ogallala formation, and Quaternary alluvium. The Ogallala formation is the major water-bearing formation in the area, with well yields ranging from 30 gpm to 700 gpm. The Ogallala formation is of Pliocene age and consists of semiconsolidated fine-grained calcareous sand overlain by a thick layer of caliche. The formation contains some clay, silt, and often a basal gravel. It is a heterogeneous complex of terrestrial sediments deposited over an irregular erosional surface cut into the Triassic rocks and ranges in thickness from a few inches to approximately 300 feet.

Eolian and alluvial deposits of Recent to Pleistocene age overlie the Ogallala formation in the site area. These deposits consist of fine to medium grained sands, and calcareous silt and clays. Ranging in thickness from 0 to 400 feet, these Quaternary deposits often form a continuous aquifer with the underlying Ogallala formation and are considered to act as one aquifer beneath the site area. Where the Ogallala is not present, the Quaternary alluvium produces limited quantities of groundwater, with well yields generally less than 30 gpm.

The Triassic age Dockum group consists of the Chinle formation and the underlying Santa Rosa sandstone. The Chinle formation is a 0 to 1270 foot thick claystone containing minor fine-grained sandstones and siltstones. Wells completed in the Chinle formation generally yield less than 10 gpm. The Santa Rosa sandstone is a 140 to 300 foot thick fine to coarse-grained sandstone which generally yields small

quantities of water, but some wells yield up to 100 gpm. Produced waters from both the Chinle formation and the Santa Rosa sandstone are high in sulfate content.

According to published data (Nicholson, 1961), there are no registered water wells within a 1,000 foot radius of the site. The closest known water well is located approximately 1.5 miles west of the site based on the Oil Center, New Mexico USGS topographic map (1984). The current status and construction data on this well is unknown.

According to the U.S.G.S. Eunice, New Mexico, topographic quadrangle, the site is approximately 3,550 feet above mean sea level (Figure 4). The general trend of the local topography and surface drainage of the site area is to the northeast.

The soils on site belong to the Berino Series consisting of well-drained, sandy loam soils that have a sandy clay loam subsoil. These soils formed in wind-worked sands overlying alluvial, sandy, calcareous sediments on upland plains. Typically, the surface layer is reddish-brown loamy fine sand about 6 inches thick. The subsoil is red sandy clay loam to a depth of 42 inches. This is underlain by pink calcareous sandy clay loam (caliche) to a depth of 60 inches. The soils described in the soil survey are generally consistent with the observed soil on site.

Subsurface conditions were similar for borings B-1 through B-8. The soils consisted of 2 feet to 7 feet of red-brown to dark gray silty sand (SM) or clayey silt (ML) underlain by pink to pink-white calcareous sand (caliche) to a depth of approximately 22 feet (maximum boring depth). The 2 to 3 foot thick black sand present from a depth of 0 to 3 feet in borings B-6 and B-7 was saturated with hydrocarbons. The soil boring logs included in Appendix B provide a more detailed description of the subsurface conditions.

Currently, the groundwater in the site area is used primarily for stock and industrial use. The drinking water in Eunice, the nearest municipality, is supplied from a well field located approximately 12 miles north-northeast of the site that produces from the Ogallala Formation at a depth of 80 to 120 feet.

A field survey of the site and surrounding area was conducted during the Preliminary Site Assessment to identify potential receptors (residences, public buildings, water supply wells, and surface bodies of water) in the site vicinity. No residences, public buildings, or water supply wells were identified within a 1000 foot radius of the site.

5.0 HYDROGEOLOGICAL INVESTIGATION AND FINDINGS

5.1 SOIL INVESTIGATION

5.1.1 SOIL BORING LOCATIONS

The locations of borings B-5 through B-8 were chosen based on the discovery of hydrocarbon-impacted soils in borings B-1 and B-4 during the Preliminary Site Assessment which indicated the potential source of the crude oil contamination is the tank battery and associated equipment in the northeast portion of the site.

Borings B-5 and B-7 were placed west and east, respectively, of the hydrocarbon-impacted soils identified in boring B-4 along the south end of the tank battery. Boring B-6 was located approximately 75 feet southeast of B-4 and downgradient (northeast, based on observed local surface drainage) from the pipeline clean-outs. Borings B-7 and B-8 were placed south and north, respectively of the hydrocarbon-impacted soils identified in B-1 between the tank battery and the east property boundary.

5.1.2 SOIL SAMPLING OPERATIONS

Soil samples were retrieved from the borings to be analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX) and total petroleum hydrocarbons (TPH). Samples were obtained at five foot intervals in each boring using a split spoon sampling device. The soil sample obtained from each interval was split into two separate containers. One sample was placed into a glass jar with teflon-lined lids and zero head space and preserved at 4°C in accordance with EPA protocol for

shipment to the laboratory. The other soil sample from each interval was placed in a sample jar and field-screened (head space analysis) with a flame ionization detector (FID) Century 128 Organic Vapor Analyzer (OVA). The OVA detects volatile petroleum and non-petroleum organic compounds in parts per million (ppm) methane equivalent.

5.1.3 SOIL SAMPLE ANALYTICAL RESULTS

OVA readings ranged from <1 ppm in a majority of the sampled intervals of borings B-5 through B-8 to 250 ppm in the 1 to 3 foot interval of boring B-6. Two samples from each boring were submitted for laboratory analyses. The sample with the highest relative OVA reading and the sample at the total depth of each boring unless noted otherwise were submitted to the laboratory for BTEX and TPH analyses using EPA-approved analytical methods (EPA Method 8020 and EPA Method 418.1, respectively). Complete OVA readings and a listing of those samples submitted to the laboratory are presented in Table 1. Strong hydrocarbon staining and odors were observed in the 1 to 3 foot interval of borings B-6 and B-7. Only the 1 to 3 foot sample from B-6 was submitted to the laboratory for analysis, since both intervals exhibited physical characteristics of soils containing TPH levels >5,000 ppm.

TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS

Boring	Date Sampled	Sample Interval (feet)	OVA	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH
B-1	12-09-93	1 - 3	4	<0.001	0.010	<0.001	0.001	0.011	370
		5 - 7	<1						
		10 - 12	<1	<0.001	0.001	<0.001	0.003	0.004	34
B-2	12-09-92	1 - 3	<1	<0.001	<0.001	<0.001	<0.001	0.001	16
		5 - 7	<1	<0.001	0.001	<0.001	<0.001	0.001	21
B-3	12-09-92	1 - 3	2	<0.001	0.004	0.001	0.004	0.009	15
		5 - 7	<1						
		10 - 12	<1	<0.001	0.005	<0.001	0.005	0.010	13
B-4	12-09-92	1 - 3	2						
		5 - 7	<1	<0.001	0.012	<0.001	0.005	0.017	1,800
B-5	02-04-93	1 - 3	<1						
		5 - 7	<1	<0.001	<0.001	<0.001	0.001	0.001	20
		10 - 12	<1						
		15 - 17	<1						
		20 - 22	<1	<0.001	<0.001	<0.001	0.001	0.001	20
B-6	02-04-93	1 - 3	250	<0.001	<0.001	7.000	2.100	9.100	42,000
		5 - 7	<1						
		10 - 12	<1						
		15 - 17	<1						
		20 - 22	<1	<0.001	<0.001	<0.001	<0.001	<0.001	50
B-7	02-04-93	1 - 3	40						
		5 - 7	1	<0.001	<0.001	<0.001	0.007	0.008	30
		10 - 12	<1						
		15 - 17	<1						
		20 - 22	<1	<0.001	<0.001	<0.001	0.001	0.001	40

TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS

Boring	Date Sampled	Sample Interval (feet)	OVA	Benzene	Toluene	Ethyl-benzene	Xylenes	Total BTEX	TPH
B-8	02-04-93	1 - 3	1	<0.001	<0.001	<0.001	0.002	0.002	20
		5 - 7	<1						
		10 - 12	<1	<0.001	<0.001	0.002	0.005	0.007	150

OVA results listed in parts per million (ppm) equivalent methane.
BTEX results in mg/kg (parts per million; ppm) with method detection limits in Appendix D.
TPH results in mg/kg (parts per million; ppm) with method detection limits in Appendix D.
Analyses were conducted using EPA Method 8020 (BTEX) and EPA Method 418.1 (TPH) by SPL Environmental Laboratories.

A review of the analytical results from the Preliminary Site Assessment conducted during December 1992 indicated hydrocarbon-impacted soils (>100 ppm TPH) at a depth of 1 to 3 feet in boring B-1 (370 ppm TPH) and 5 to 7 feet in B-4 (1,800 TPH).

Results from this phase of the investigation recorded benzene levels below method detection limits of 0.001 ppm in every sampled interval of Borings B-5 through B-8. The total BTEX (benzene, toluene, ethylbenzene, xylenes) levels ranged from below method detection limits of 0.001 ppm in the 20 to 22 foot interval to 9.1 ppm in the 1 to 3 foot interval of boring B-6. TPH (total petroleum hydrocarbons) levels ranged from 20 ppm in the sampled intervals of several borings to 42,000 ppm in the 1 to 3 foot interval of boring B-6. Hydrocarbon concentrations are illustrated on the site map (Appendix B, Figure 2) to indicate soil sample depths and the corresponding hydrocarbon concentration levels.

A summary of the analytical results is presented in Table 1. Laboratory reports and the chain-of-custody are included in Appendix C.

5.2 GROUNDWATER ASSESSMENT

Groundwater was not expected or encountered during drilling operations. Based on the analytical data, OVA readings, and visual observations noted during sampling operations, the crude oil contamination was absorbed by the impacted soils and did not migrate downward to groundwater. Monitor wells were not installed on site.

6.0 CONCLUSIONS

1. No potential receptors were identified within a 1,000 foot radius of the site.

2. Based on the data obtained, the extent of hydrocarbon-impacted soils identified in the 10 to 12 foot interval of boring B-8 near the tank battery and associated equipment in the northeast corner of the site is limited in size and contains relatively low hydrocarbon concentrations (TPH <200). Subsurface piping (north of B-8) is a potential source since no near surface hydrocarbon-impacted soils were identified in boring B-8.

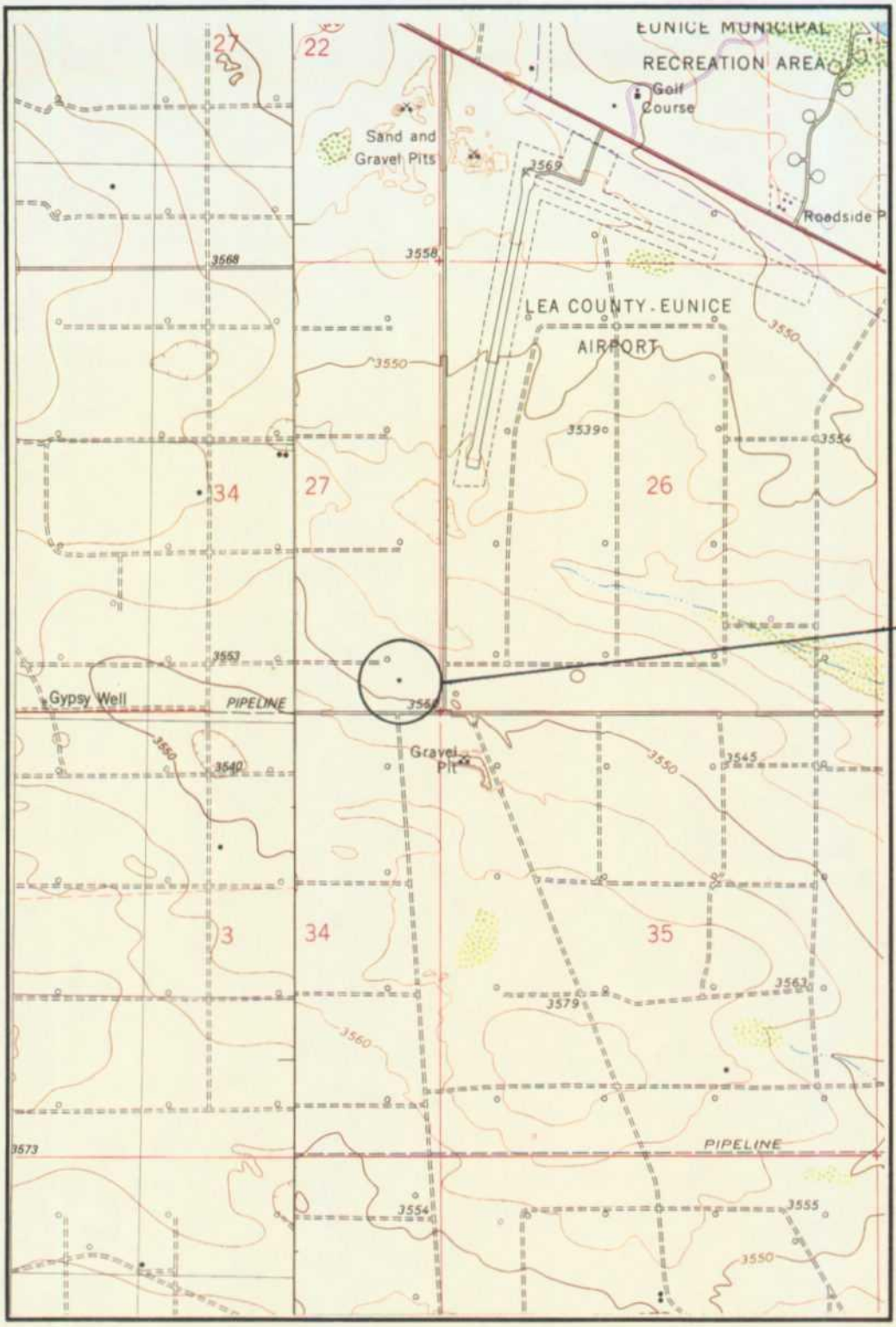
3. The relative hydrocarbon concentrations recorded in borings B-1, B-4, B-6, and B-7 indicate the two pipeline clean-outs south of boring B-6 and the subsurface piping between the pumping station and the tank battery are potential sources of the crude oil impact present in the borings. Based on the data obtained, the extent of hydrocarbon-impacted soils is limited to an area approximately 120 feet west of boring B-7 and 200 feet long (north-south). Due to the close proximity of B-1 and B-7 to the property boundary (fence line), the eastern extent of hydrocarbon-impacted soils has not been identified.

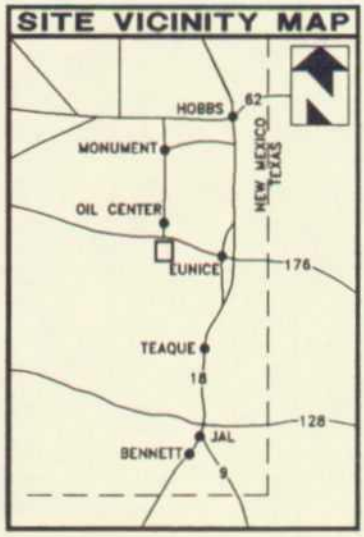
4. Groundwater was not encountered during this investigation. Based on the analytical results and field observations, the crude oil contamination was absorbed by the impacted soils and did not migrate downward to groundwater.

7.0 APPENDICES

APPENDIX A

FIGURES





* 2 QUADRANGLES USED

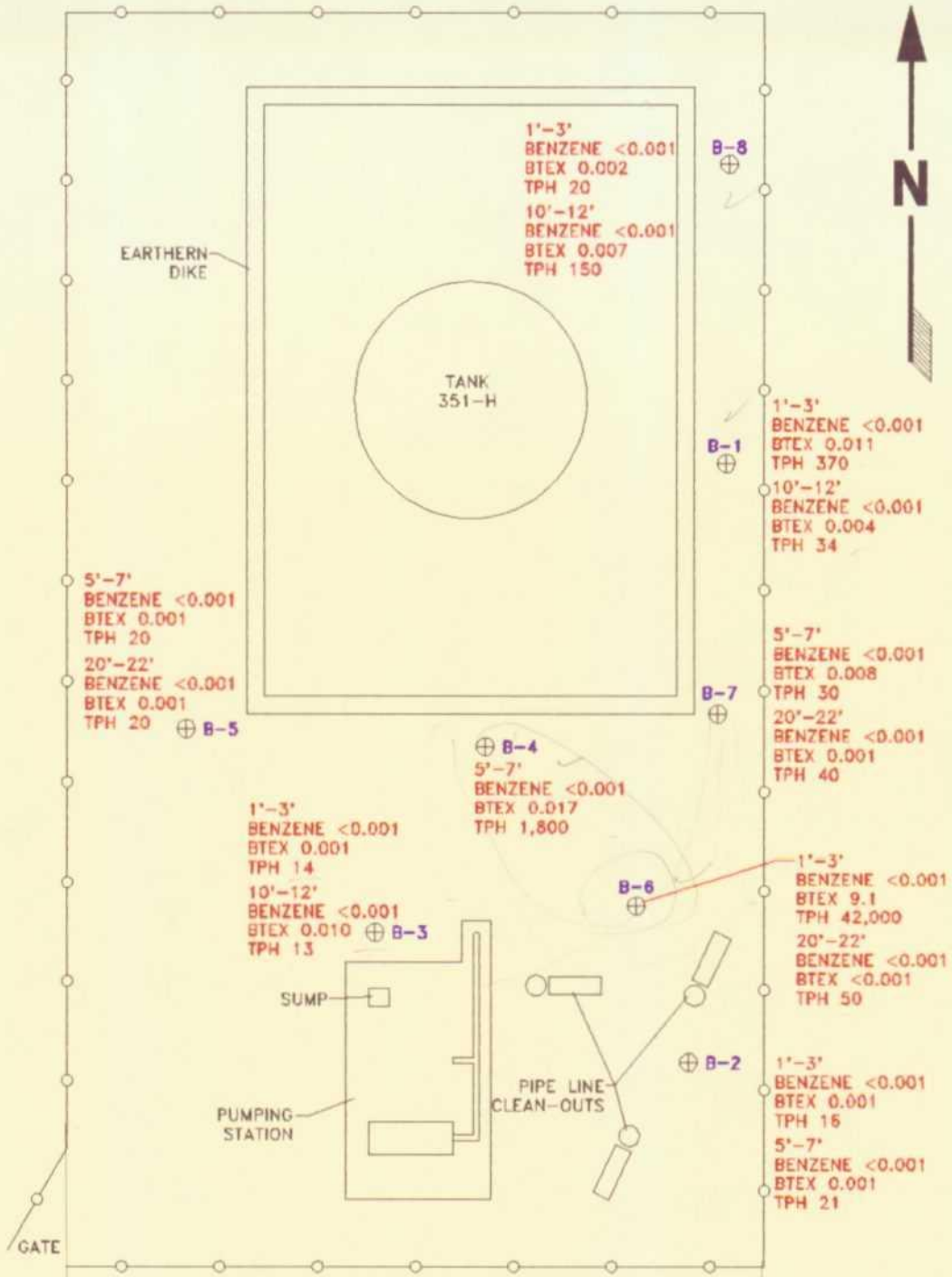
SITE LOCATION MAP

REF: USGS EUNICE, NEW MEXICO TOPOGRAPHIC QUADRANGLE (1979)
USGS OIL CENTER, NEW MEXICO TOPOGRAPHIC QUADRANGLE (1984)

CLRA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

EUNICE STATION
SHELL PIPE LINE CORPORATION
LEA COUNTY, NEW MEXICO

DATE:	SCALE:
MAR 1993	1"≃2000'
PROJECT NO.	FIGURE NO.
15-92567	1



SITE MAP

RED NUMBERS INDICATE
BENZENE, TOTAL BTEX, AND TPH CONCENTRATIONS IN mg/kg (ppm)

0 60'
APPROXIMATE SCALE

CURA INC. 2735 VILLA CREEK DRIVE - TWO METRO SQUARE BLDG. C - SUITE 250 - DALLAS, TX 75234 620-7117 FAX - 620-6219	EUNICE STATION SHELL PIPE LINE CORPORATION LEA COUNTY, NEW MEXICO	DATE: MAR 1993	SCALE: SEE ABOVE
		PROJECT NO. 15-92567	FIGURE NO. 2

APPENDIX B
BORING/WELL LOGS

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-92567
Project: EUNICE STATION
LEA COUNTY, NEW MEXICO
-
Drilling Co: HI PLAINS DRILLING
Driller: B.S.
Drilling Method: AIR ROTARY

Well/Boring #: B-1
Depth of Boring: 12 FEET
Depth of Well: -
Length of Screen: -
Length of Casing: -
Logged By: F.W.R.

Date Drilled: 12/09/92
Diameter of Boring: 5 1/8 INCHES
Diameter of Screen: -
Diameter of Casing: -
Slot Size: -
Well Material: GROUT

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
0	Red-brown clayey SILT (ML)					
2.5		1	SS	4	■	Benzene <0.001 mg/kg BTEX=0.011 mg/kg TPH=370 mg/kg
	Pink calcareous SAND (caliche)					
5.0		2	SS	<1		
7.5						
10.0		3	SS	<1	■	Benzene <0.001 mg/kg BTEX=0.004 mg/kg TPH=34 mg/kg
12.5	Bottom of boring @ 12.0 feet					
15.0						
17.5						
20.0						
22.5						
25.0						
27.5						
30.0						

SS-Driven Split Spoon
ST-Pressed Shelby Tube
CA-Continuous Flight Auger
RC-Rock Core
THD-Texas Highway Department Cone
CT-5' Continuous Sampler

ABBREVIATIONS AND SYMBOLS

HSA-Hollow Stem Augers
CFA-Continuous Flight Augers
DC-Driving Casing
MD-Mud Drilling

WATER LEVEL
▽ At Completion
▼ After Hours
● Water on Rods

■ Sample submitted to lab
Bottom Cap
Factory-Slotted Well Screen
Sand Pack
Well Casing
Bentonite Seal
Voloclay Grout Seal

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-92567
Project: EUNICE STATION
LEA COUNTY, NEW MEXICO
-
Drilling Co: HI PLAINS DRILLING
Driller: B.S.
Drilling Method: AIR ROTARY

Well/Boring #: B-2
Depth of Boring: 7 FEET
Depth of Well: -
Length of Screen: -
Length of Casing: -
Logged By: F.W.R.

Date Drilled: 12/09/92
Diameter of Boring: 5 1/8 INCHES
Diameter of Screen: -
Diameter of Casing: -
Slot Size: -
Well Material: GROUT

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
0	Red silty CLAY (ML)			--		
		1	SS	<1	■	Benzene <0.001 mg/kg BTEX=0.001 mg/kg TPH=16 mg/kg
2.5	Pink calcareous SAND (caliche)					
5.0		2	SS	<1	■	Benzene <0.001 mg/kg BTEX=0.001 mg/kg TPH=21 mg/kg
7.5	Bottom of boring @ 7.0 feet					
10.0						
12.5						
15.0						
17.5						
20.0						
22.5						
25.0						
27.5						
30.0						

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▼ After Hours
● Water on Rods

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Factory-Slotted Well Screen
Sand Pack
Well Casing
Bentonite Seal
Volclay Grout Seal

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-92567
Project: EUNICE STATION
LEA COUNTY, NEW MEXICO
-
Drilling Co: HI PLAINS DRILLING
Driller: B.S.
Drilling Method: AIR ROTARY

Well/Boring #: B-3
Depth of Boring: 12 FEET
Depth of Well: -
Length of Screen: -
Length of Casing: -
Logged By: F.W.R.

Date Drilled: 12/09/92
Diameter of Boring: 5 1/8 INCHES
Diameter of Screen: -
Diameter of Casing: -
Slot Size: -
Well Material: GROUT

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
0	Dark gray sandy CLAY (ML)					
2.5		1	SS	2	■	Benzene <0.001 mg/kg BTEX=0.001 mg/kg TPH=14 mg/kg
5.0	Pink calcareous SAND (caliche)	2	SS	<1		
7.5						
10.0		3	SS	<1	■	Benzene <0.001 mg/kg BTEX=0.01 mg/kg TPH=13 mg/kg
12.5	Bottom of boring @ 12.0 feet					
15.0						
17.5						
20.0						
22.5						
25.0						
27.5						
30.0						

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620-7117 FAX - 620-8219

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Project No.: 15-92567
Project: EUNICE STATION
LEA COUNTY, NEW MEXICO
-
Drilling Co: HI PLAINS DRILLING
Driller: B.S.
Drilling Method: AIR ROTARY

Well/Boring #: B-4
Depth of Boring: 7 FEET
Depth of Well: -
Length of Screen: -
Length of Casing: -
Logged By: F.W.R.

Date Drilled: 12/09/92
Diameter of Boring: 5 1/8 INCHES
Diameter of Screen: -
Diameter of Casing: -
Slot Size: -
Well Material: GROUT

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
0	Brown & white mottled calcareous SAND (caliche)					
2.5		1	SS	2		
5.0	Pink calcareous SAND (caliche)	2	SS	<1	■	Benzene <0.001 mg/kg BTEX=0.017 mg/kg TPH=1,800 mg/kg
7.5	Bottom of boring @ 7.0 feet					
10.0						
12.5						
15.0						
17.5						
20.0						
22.5						
25.0						
27.5						
30.0						

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BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

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Project No.: 15-92567
Project: EUNICE STATION
LEA COUNTY, NEW MEXICO
-
Drilling Co: HI PLAINS DRILLING
Driller: B.S.
Drilling Method: AIR ROTARY

Well/Boring #: B-5
Depth of Boring: 22 FEET
Depth of Well: -
Length of Screen: -
Length of Casing: -
Logged By: F.W.R.

Date Drilled: 02/04/93
Diameter of Boring: 5 1/8 INCHES
Diameter of Screen: -
Diameter of Casing: -
Slot Size: -
Well Material: GROUT

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
0	Pink calcareous SAND (SM) and limestone rubble					
2.5	Pink and white mottled calcareous SAND (caliche)	1	SS	<1		
5.0		2	SS	<1		Benzene <0.001 mg/kg BTEX=0.001 mg/kg TPH=20 mg/kg
7.5						
10.0		3	SS	<1		
12.5						
15.0		4	SS	<1		
17.5						
20.0		5	SS	<1		Benzene <0.001 mg/kg BTEX <0.001 mg/kg TPH=20 mg/kg
22.5	Bottom of boring @ 22.0 feet					
25.0						
27.5						
30.0						

ABBREVIATIONS AND SYMBOLS

SS-Driven Split Spoon
ST-Pressed Shelby Tube
CA-Continuous Flight Auger
RC-Rock Core
THD-Texas Highway Department Cone
CT-5' Continuous Sampler

HSA-Hollow Stem Augers
CFA-Continuous Flight Augers
DC-Driving Casing
MD-Mud Drilling

WATER LEVEL
▽ At Completion
▼ After Hours
● Water on Rods

■ Sample submitted to lab
Bottom Cap
Sand Pack
Bentonite Seal
Factory-Slotted Well Screen
Well Casing
Volclay Grout Seal

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-92567
Project: EUNICE STATION
LEA COUNTY, NEW MEXICO
-
Drilling Co: HI PLAINS DRILLING
Driller: B.S.
Drilling Method: AIR ROTARY

Well/Boring #: B-6
Depth of Boring: 22 FEET
Depth of Well: -
Length of Screen: -
Length of Casing: -
Logged By: F.W.R.

Date Drilled: 02/04/93
Diameter of Boring: 5 1/8 INCHES
Diameter of Screen: -
Diameter of Casing: -
Slot Size: -
Well Material: GROUT

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
0	Black silty calcareous SAND (SM) hydrocarbon saturated					
2.5	Pink and white mottled calcareous SAND (caliche)	1	SS	250	■	Benzene <0.001 mg/kg BTEX=9.100 mg/kg TPH=42,000 mg/kg
5.0		2	SS	<1		
7.5						
10.0		3	SS	<1		
12.5						
15.0		4	SS	<1		
17.5						
20.0		5	SS	<1	■	Benzene <0.001 mg/kg BTEX <0.001 mg/kg TPH=50 mg/kg
22.5	Bottom of boring @ 22.0 feet					
25.0						
27.5						
30.0						

SS-Driven Split Spoon
ST-Pressed Shelby Tube
CA-Continuous Flight Auger
RC-Rock Core
THD-Texas Highway Department Cone
CT-5' Continuous Sampler

ABBREVIATIONS AND SYMBOLS

HSA-Hollow Stem Augers
CFA-Continuous Flight Augers
DC-Driving Casing
MD-Mud Drilling

WATER LEVEL
▽ At Completion
▼ After Hours
● Water on Rods

■ Sample submitted to lab
Bottom Cap
Sand Pack
Bentonite Seal
Factory-Slotted Well Screen
Well Casing
Voloclay Grout Seal

CURA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-92567
Project: EUNICE STATION
LEA COUNTY, NEW MEXICO
-
Drilling Co: HI PLAINS DRILLING
Driller: B.S.
Drilling Method: AIR ROTARY

Well/Boring #: B-7
Depth of Boring: 22 FEET
Depth of Well: -
Length of Screen: -
Length of Casing: -
Logged By: F.W.R.

Date Drilled: 02/04/93
Diameter of Boring: 5 1/8 INCHES
Diameter of Screen: -
Diameter of Casing: -
Slot Size: -
Well Material: GROUT

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
0	Black silty calcareous SAND (SM)					
2.5		1	SS	40		
	Pink and white mottled calcareous SAND (caliche)					
5.0		2	SS	1	■	Benzene <0.001 mg/kg BTEX <0.008 mg/kg TPH=30 mg/kg
7.5						
10.0		3	SS	<1		
12.5						
15.0	Pink fine-grained slightly calcareous SAND (SM)	4	SS	<1		
17.5						
20.0		5	SS	<1	■	Benzene <0.001 mg/kg BTEX =0.001 mg/kg TPH=40 mg/kg
22.5	Bottom of boring @ 22.0 feet					
25.0						
27.5						
30.0						

SS-Driven Split Spoon
ST-Pressed Shelby Tube
CA-Continuous Flight Auger
RC-Rock Core
THD-Texas Highway Department Cone
CT-5' Continuous Sampler

ABBREVIATIONS AND SYMBOLS

HSA-Hollow Stem Augers
CFA-Continuous Flight Augers
DC-Driving Casing
MD-Mud Drilling

WATER LEVEL
▽ At Completion
▼ After Hours
● Water on Rods

■ Sample submitted to lab
Bottom Cap
Sand Pack
Bentonite Seal
Factory-Slotted Well Screen
Well Casing
Volclay Grout Seal

CRA INC.
2735 VILLA CREEK DRIVE - TWO METRO SQUARE
BLDG. C - SUITE 250 - DALLAS, TX 75234
620-7117 FAX - 620-8219

RECORD OF SUBSURFACE EXPLORATION

Project No.: 15-92567
Project: EUNICE STATION
LEA COUNTY, NEW MEXICO
-
Drilling Co: HI PLAINS DRILLING
Driller: B.S.
Drilling Method: AIR ROTARY

Well/Boring #: B-8
Depth of Boring: 12 FEET
Depth of Well: -
Length of Screen: -
Length of Casing: -
Logged By: F.W.R.

Date Drilled: 02/04/93
Diameter of Boring: 5 1/8 INCHES
Diameter of Screen: -
Diameter of Casing: -
Slot Size: -
Well Material: GROUT

DEPTH FEET	SOIL DESCRIPTION	SAMPLE NUMBER	SAMPLE TYPE	OVA (PPM)	WELL DESIGN	REMARKS
0	Red and white mottled silty fine-grained SAND (SM)					
2.5		1	SS	1	■	Benzene <0.001 mg/kg BTEX=0.002 mg/kg TPH=20 mg/kg
5.0		2	SS	<1		
7.5	Pink and white mottled calcareous SAND (caliche)					
10.0		3	SS	<1	■	Benzene <0.001 mg/kg BTEX=0.007 mg/kg TPH=150 mg/kg
12.5	Bottom of boring @ 12.0 feet					
15.0						
17.5						
20.0						
22.5						
25.0						
27.5						
30.0						

SS-Driven Split Spoon
ST-Pressed Shelby Tube
CA-Continuous Flight Auger
RC-Rock Core
THD-Texas Highway Department Cone
CT-5' Continuous Sampler

ABBREVIATIONS AND SYMBOLS

HSA-Hollow Stem Augers
CFA-Continuous Flight Augers
DC-Driving Casing
MD-Mud Drilling

WATER LEVEL
▽ At Completion
▼ After Hours
● Water on Rods

■ Sample submitted to lab
Bottom Cap
Factory-Slotted Well Screen
Sand Pack
Well Casing
Bentonite Seal
Voloclay Grout Seal

APPENDIX C
ANALYTICAL RESULTS

SPL, INC.

REPORT APPROVAL SHEET

WORK ORDER NUMBER: 93-02-194

Approved for release by:

for M. Kyle Landers Date: 2/15/93
S. Sample, Laboratory Director

Ed Fry Date: 2/15/93
Ed Fry, Project Manager

****SUMMARY REPORT*****

02/12/93

Company: Shell Pipe Line Corporation
Site: Lea County. New Mexico
Project No: 15-92567.173
Project: Eunice Station

ANALYTICAL DATA
NOTE: ND - Not Detected

SPL ID	CLIENT ID	MATRIX	BENZENE	TOLUENE	ETHYLBENZ.	XYLENE	TPH-IR	TPH-GC	LEAD	MTBE
9302194-01	B-5 (5-7')	SOIL	NDµg/Kg	NDµg/Kg	NDµg/Kg	1µg/Kg	20mg/Kg			
9302194-02	B-5 (20-22	SOIL	NDµg/Kg	NDµg/Kg	NDµg/Kg	1µg/Kg	20mg/Kg			
9302194-03	B-6 (1-3')	SOIL	NDµg/Kg	NDµg/Kg	7000µg/Kg	2100µg/Kg	42000mg/Kg			
9302194-04	B-6 (20-22	SOIL	NDµg/Kg	NDµg/Kg	NDµg/Kg	NDµg/Kg	50mg/Kg			
9302194-05	B-7 (5-7')	SOIL	NDµg/Kg	1µg/Kg	NDµg/Kg	7µg/Kg	20mg/Kg			
9302194-06	B-7 (5-7')	SOIL	NDµg/Kg	NDµg/Kg	NDµg/Kg	NDµg/Kg	30mg/Kg			
9302194-07	B-7 (20-22	SOIL	NDµg/Kg	NDµg/Kg	NDµg/Kg	1µg/Kg	40mg/Kg			
9302194-08	B-8 (1-3')	SOIL	NDµg/Kg	NDµg/Kg	NDµg/Kg	2µg/Kg	20mg/Kg			
9302194-09	B-8 (10-12	SOIL	NDµg/Kg	NDµg/Kg	2µg/Kg	5µg/Kg	150mg/Kg			

BTEX - METHOD 5030/8020 ***
TPH-IR - METHOD Mod. 418.1

Shari L. Grice

SPL, Inc. - Shari L. Grice

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Certificate of Analysis No. 9302194-01

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# MESA-1312-HOE
DATE: 02/15/93

PROJECT: Eunice Station
SITE: Lea County. New Mexico
SAMPLED BY: CURA
SAMPLE ID: B-5 (5-7')

PROJECT NO: 15-92567.173
MATRIX: SOIL
DATE SAMPLED: 02/04/93 12:15:00
DATE RECEIVED: 02/09/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	0.0010 P	mg/Kg
ETHYLBENZENE	ND	0.0010 P	mg/Kg
TOLUENE	ND	0.0010 P	mg/Kg
TOTAL XYLENE	0.0010	0.0010 P	mg/Kg
TOTAL BTEX	0.001		mg/Kg
METHOD 5030/8020 ***			
Analyzed by: LT			
Date: 02/11/93			
Petroleum extractables	20	10	mg/Kg
METHOD Mod. 418.1			
Analyzed by: BV			
Date: 02/10/93			

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

Shari L. Grice

SPL, Inc., - Shari L. Grice

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Certificate of Analysis No. 9302194-02

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# MESA-1312-HOE
DATE: 02/15/93

PROJECT: Eunice Station
SITE: Lea County. New Mexico
SAMPLED BY: CURA
SAMPLE ID: B-5 (20-22')

PROJECT NO: 15-92567.173
MATRIX: SOIL
DATE SAMPLED: 02/04/93 12:30:00
DATE RECEIVED: 02/09/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	0.0010 P	mg/Kg
ETHYLBENZENE	ND	0.0010 P	mg/Kg
TOLUENE	ND	0.0010 P	mg/Kg
TOTAL XYLENE	0.0010	0.0010 P	mg/Kg
TOTAL BTEX	0.001		mg/Kg
METHOD 5030/8020 ***			
Analyzed by: LT			
Date: 02/11/93			
Petroleum extractables	20	10	mg/Kg
METHOD Mod. 418.1			
Analyzed by: BV			
Date: 02/10/93			

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

Shari L. Grice

SPL, Inc., - Shari L. Grice

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Certificate of Analysis No. 9302194-03

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# MESA-1312-HOE
DATE: 02/15/93

PROJECT: Eunice Station
SITE: Lea County. New Mexico
SAMPLED BY: CURA
SAMPLE ID: B-6 (1-3')

PROJECT NO: 15-92567.173
MATRIX: SOIL
DATE SAMPLED: 02/04/93 12:40:00
DATE RECEIVED: 02/09/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	0.010 P	mg/Kg
ETHYLBENZENE	7.0	0.010 P	mg/Kg
TOLUENE	ND	0.010 P	mg/Kg
TOTAL XYLENE	2.1	0.010 P	mg/Kg
TOTAL BTEX	9.1		mg/Kg
METHOD 5030/8020 ***			
Analyzed by: LT			
Date: 02/11/93			
Petroleum extractables	42000	250	mg/Kg
METHOD Mod. 418.1			
Analyzed by: BV			
Date: 02/10/93			

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

Shari L. Grice

SPL, Inc., - Shari L. Grice

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Certificate of Analysis No. 9302194-04

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# MESA-1312-HOE
DATE: 02/15/93

PROJECT: Eunice Station
SITE: Lea County. New Mexico
SAMPLED BY: CURA
SAMPLE ID: B-6 (20-22')

PROJECT NO: 15-92567.173
MATRIX: SOIL
DATE SAMPLED: 02/04/93 13:00:00
DATE RECEIVED: 02/09/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	0.0010 P	mg/Kg
ETHYLBENZENE	ND	0.0010 P	mg/Kg
TOLUENE	ND	0.0010 P	mg/Kg
TOTAL XYLENE	ND	0.0010 P	mg/Kg
TOTAL BTEX	ND		mg/Kg
METHOD 5030/8020 ***			
Analyzed by: LT			
Date: 02/11/93			
Petroleum extractables	50	10	mg/Kg
METHOD Mod. 418.1			
Analyzed by: BV			
Date: 02/10/93			

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

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Certificate of Analysis No. 9302194-05

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# MESA-1312-HOE
DATE: 02/15/93

PROJECT: Eunice Station
SITE: Lea County. New Mexico
SAMPLED BY: CURA
SAMPLE ID: B-7 (5-7')

PROJECT NO: 15-92567.173
MATRIX: SOIL
DATE SAMPLED: 02/04/93 13:10:00
DATE RECEIVED: 02/09/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	0.0010 P	mg/Kg
ETHYLBENZENE	ND	0.0010 P	mg/Kg
TOLUENE	0.0010	0.0010 P	mg/Kg
TOTAL XYLENE	0.0070	0.0010 P	mg/Kg
TOTAL BTEX	0.008		mg/Kg
METHOD 5030/8020 ***			
Analyzed by: LT			
Date: 02/11/93			
Petroleum extractables	20	10	mg/Kg
METHOD Mod. 418.1			
Analyzed by: BV			
Date: 02/10/93			

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

Shari L. Grice

SPL, Inc., - Shari L. Grice

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Certificate of Analysis No. 9302194-06

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# MESA-1312-HOE
DATE: 02/15/93

PROJECT: Eunice Station
SITE: Lea County. New Mexico
SAMPLED BY: CURA
SAMPLE ID: B-7 (5-7') DUP

PROJECT NO: 15-92567.173
MATRIX: SOIL
DATE SAMPLED: 02/04/93 13:10:00
DATE RECEIVED: 02/09/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	0.0010 P	mg/Kg
ETHYLBENZENE	ND	0.0010 P	mg/Kg
TOLUENE	ND	0.0010 P	mg/Kg
TOTAL XYLENE	ND	0.0010 P	mg/Kg
TOTAL BTEX	ND		mg/Kg
METHOD 5030/8020 ***			
Analyzed by: LT			
Date: 02/11/93			
Petroleum extractables	30	10	mg/Kg
METHOD Mod. 418.1			
Analyzed by: BV			
Date: 02/10/93			

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

Shari L. Grice

SPL, Inc., - Shari L. Grice

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Certificate of Analysis No. 9302194-07

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# MESA-1312-HOE
DATE: 02/15/93

PROJECT: Eunice Station
SITE: Lea County. New Mexico
SAMPLED BY: CURA
SAMPLE ID: B-7 (20-22')

PROJECT NO: 15-92567.173
MATRIX: SOIL
DATE SAMPLED: 02/04/93 13:25:00
DATE RECEIVED: 02/09/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	0.0010 P	mg/Kg
ETHYLBENZENE	ND	0.0010 P	mg/Kg
TOLUENE	ND	0.0010 P	mg/Kg
TOTAL XYLENE	0.0010	0.0010 P	mg/Kg
TOTAL BTEX	0.001		mg/Kg
METHOD 5030/8020 ***			
Analyzed by: LT			
Date: 02/11/93			
Petroleum extractables	40	10	mg/Kg
METHOD Mod. 418.1			
Analyzed by: BV			
Date: 02/10/93			

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

Shari L. Grice

SPL, Inc., - Shari L. Grice

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Certificate of Analysis No. 9302194-08

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# MESA-1312-HOE
DATE: 02/15/93

PROJECT: Eunice Station
SITE: Lea County. New Mexico
SAMPLED BY: CURA
SAMPLE ID: B-8 (1-3')

PROJECT NO: 15-92567.173
MATRIX: SOIL
DATE SAMPLED: 02/04/93 13:40:00
DATE RECEIVED: 02/09/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	0.0010 P	mg/Kg
ETHYLBENZENE	ND	0.0010 P	mg/Kg
TOLUENE	ND	0.0010 P	mg/Kg
TOTAL XYLENE	0.0020	0.0010 P	mg/Kg
TOTAL BTEX	0.002		mg/Kg
METHOD 5030/8020 ***			
Analyzed by: LT			
Date: 02/11/93			
Petroleum extractables	20	10	mg/Kg
METHOD Mod. 418.1			
Analyzed by: BV			
Date: 02/10/93			

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

Shari L. Grice

SPL, Inc., - Shari L. Grice

Certificate of Analysis No. 9302194-09

Shell Pipe Line Corporation
P.O. Box 2099
Houston, TX 77252-2099
ATTN: John Hite

P.O.# MESA-1312-HOE
DATE: 02/15/93

PROJECT: Eunice Station
SITE: Lea County. New Mexico
SAMPLED BY: CURA
SAMPLE ID: B-8 (10-12')

PROJECT NO: 15-92567.173
MATRIX: SOIL
DATE SAMPLED: 02/04/93 13:50:00
DATE RECEIVED: 02/09/93

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT		UNITS
BENZENE	ND	0.0010	P	mg/Kg
ETHYLBENZENE	0.0020	0.0010	P	mg/Kg
TOLUENE	ND	0.0010	P	mg/Kg
TOTAL XYLENE	0.0050	0.0010	P	mg/Kg
TOTAL BTEX	0.007			mg/Kg
METHOD 5030/8020 ***				
Analyzed by: LT				
Date: 02/12/93				
Petroleum extractables	150	10		mg/Kg
METHOD Mod. 418.1				
Analyzed by: BV				
Date: 02/10/93				

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 17th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

Shari L. Grice

SPL, Inc., - Shari L. Grice

SPL®

**** SPL Quality Control Report ****
BTEX MATRIX SPIKE/MATRIX SPIKE DUPLICATE
Method 8020/602

SPL Sample ID: 9302190-20A **Reported on:** 02/12/93
Matrix: Soil **Analyzed on:** 02/11/93

This sample was randomly selected for use in the SPL quality control program. One in twenty samples is fortified, in duplicate, with a known concentration of the substance being analyzed.
The results are as follows:

---- S P I K E A N A L Y S I S -----

Compound	Blank Value	Spike Added µg/Kg	Original Sample Concentration µg/Kg	MS Concentration µg/Kg	MS % Rec#	QC Limits Range
BENZENE	ND	20	ND	21	105	39 - 150 %
TOLUENE	ND	20	ND	19	95	46 - 148 %
ETHYL_BENZENE	ND	20	ND	19	95	32 - 160 %
O XYLENE	ND	20	9	20	55	32 - 160 %
M AND P XYLENE	ND	40	ND	41	102	32 - 160 %

---- S P I K E D U P L I C A T E A N A L Y S I S -----

Compound	Spike Added µg/Kg	MSD Concentration µg/Kg	MSD % Rec#	% RPD	RPD Limit	QC Rec Range
BENZENE	20	24	120	13	20	39 - 150 %
TOLUENE	20	22	110	15	20	46 - 148 %
ETHYL_BENZENE	20	22	110	15	20	32 - 160 %
O XYLENE	20	21	60	9	20	32 - 160 %
M AND P XYLENE	40	44	110	8	20	32 - 160 %

VARE930211053800

Cynthia Schreiner, QC Officer

** SPL Quality Control Report **
BTEX MATRIX SPIKE/MATRIX SPIKE DUPLICATE
Method 8020/602

SPL Sample ID: 9302193-06A **Reported on:** 02/12/93
Matrix: Soil **Analyzed on:** 02/12/93

This sample was randomly selected for use in the SPL quality control program. One in twenty samples is fortified, in duplicate, with a known concentration of the substance being analyzed.
The results are as follows:

---- **S P I K E A N A L Y S I S** -----

Compound	Blank Value	Spike Added µg/Kg	Original Sample Concentration µg/Kg	MS Concentration µg/Kg	MS % Rec#	QC Limits Range
BENZENE	ND	20	ND	17	85	39 - 150 %
TOLUENE	ND	20	ND	15	75	46 - 148 %
ETHYL_BENZENE	ND	20	ND	14	70	32 - 160 %
O XYLENE	ND	20	ND	16	80	32 - 160 %
M AND P XYLENE	ND	40	2	32	75	32 - 160 %

---- **S P I K E D U P L I C A T E A N A L Y S I S** -----

Compound	Spike Added µg/Kg	MSD Concentration µg/Kg	MSD % Rec#	% RPD	RPD Limit	QC Rec Range
BENZENE	20	19	95	11	20	39 - 150 %
TOLUENE	20	17	85	12	20	46 - 148 %
ETHYL_BENZENE	20	17	85	19	20	32 - 160 %
O XYLENE	20	18	90	12	20	32 - 160 %
M AND P XYLENE	40	36	85	12	20	32 - 160 %

VARE930212032000

Cynthia Schreiner, QC Officer

** SPL QUALITY CONTROL REPORT **
TOTAL PETROLEUM HYDROCARBONS [TPH]

SPL sample Id: 9302190-06B **Reported on:** 02/12/93
Matrix: SOIL **Analyzed on:** 02/10/93

This sample was randomly selected for use in the SPL quality control program. One in ten samples is fortified with a known concentration of the substance being analyzed and one in ten samples is analyzed in duplicate. The result are as follows:

-- **SPIKE ANALYSIS** --

Sample Id	Blank Value	Spike Added mg/L	Original Sample Concentration mg/Kg	MS Concentration mg/Kg	MS % Rec
9302190-06B	ND	357	12	320	86

-- **SPIKE DUPLICATE ANALYSIS** --

Sample Id	Spike Added mg/L	MSD Concentration mg/Kg	MSD % Rec	% RPD
9302190-06B	357	330	89	4

SPL, Incorporated

Cynthia Schreiner

Cynthia Schreiner, QC Officer

9302194

6 BH 2/10/93

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY RECORD NO. 04932

Date: 2-7-93
Page 1 of 1

SHELL PIPE LINE CORP

SITE ADDRESS: EUNICE STATION
LEA COUNTY, NEW MEXICO

WIC #: PROJ# 15-92567.173

CONSULTANT NAME & ADDRESS: CORA INC.
3001 N. Big Spring, Ste 101, Midland, TX 79705

CONSULTANT CONTACT: F. Wesley Root

PHONE: 915-570-8403 FAX: 915-570-8409

SAMPLED BY: F. Wesley Root

CHECK ONE BOX ONLY CT/DT

- QUARTERLY MONITORING ☐ 5461
- SITE INVESTIGATION ☒ 5441
- SOIL FOR DISPOSAL ☐ 5442
- WATER FOR DISPOSAL ☐ 5443
- AIR SAMPLER - SYS O+M ☐ 5452
- WATER SAMPLE - SYS O+M ☐ 5453
- OTHER _____ ☐

SAMPLE I.D.	DATE	TIME	COMP.	GRAB	MATRIX: H2O	SOIL	AIR	SLUDGE	OTHER	METHOD PRESERVED: HCl	HNO3	H2SO4	NONE	OTHER: ICE	NO. OF CONTAINERS	CONTAINER SIZE	BTEX 602 ☐ 8020 ☒ WITH MTBE ☐	BTEX/GAS HYDROCARBONS PID/FID ☐ WITH MTBE	VOL 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	PNA/PAH 8310 ☐ 8100 ☐ 610 ☐	SEMI-VOL 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	TPH/IR 418.1 ☒ SM503 ☐ ☐ ☐	TPH/GC 8015 Mod. GAS ☐ 8015 Mod DIESEL ☐	TCLP METALS ☐ VOL ☐ SEMI-VOL ☐ PEST ☐ HERB ☐	EP TOX METALS ☐ PESTICIDES ☐ HERBICIDES ☐	REACTIVITY ☐ CORROSIVITY ☐ IGNITABILITY ☐	OTHER	REMARKS
B-5 (5-7')	2-4-93	12:15		X		X								X	1	4oz	X					X						
B-5 (20-22')	2-4-93	12:30		X		X								X	1	4oz	X					X						
B-6 (1-3')	2-4-93	12:40		X		X								X	1	4oz	X					X						
B-6 (20-22')	2-4-93	13:00		X		X								X	1	4oz	X					X						
B-7 (5-7')	2-4-93	13:10		X		X								X	2	4oz	X					X						Field Duplicate
B-7 (20-22')	2-4-93	13:25		X		X								X	1	4oz	X					X						
B-8 (1-3')	2-4-93	13:40		X		X								X	1	4oz	X					X						
B-8 (10-12')	2-4-93	13:50		X		X								X	1	4oz	X					X						

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Frank Wesley Root	2-8-93	5:00	Todd Cook	2/9/93	11:30
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

BILL NO.: _____

LABORATORY: _____

SHELL CONTACT: Van Thompson PHONE: 7132413036 FAX: 7132411124

TURN AROUND TIME (CHECK ONE)

7 DAYS ☒ (NORMAL) 14 DAYS ☐

48 HOURS ☐ extract 1°C OTHER ☐ _____

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN OF CUSTODY WITH INVOICE AND RESULTS

[redacted] STRI[redacted]: PIN[redacted]pling [redacted]nator [redacted]HITE [redacted]LOW [redacted]panies [redacted]ment [redacted] WHITE Returned with Report

SPL HOUSTON ENVIRONMENTAL LABORATORY

SAMPLE LOGIN CHECKLIST

DATE: 2/9/93 TIME: 10:30 CLIENT NO. CURA SHELL PIPE
LOT NO. _____ CONTRACT NO. _____

CLIENT SAMPLE NOS. _____

9302194

SPL SAMPLE NOS.: _____

		YES	NO
1.	Is a Chain-of-Custody form present?	✓	
2.	Is the COC properly completed?	✓	
	If no, describe what is incomplete:		
	If no, has the client been contacted about it? (Attach subsequent documentation from client about the situation)		
3.	Is airbill/packing list/bill of lading with shipment?	✓	
	If yes, ID#: FEDEX # 1548913152		
4.	Is a USEPA Traffic Report present?		✓
5.	Is a USEPA SAS Packing List present?		✓
6.	Are custody seals present on the package?	✓	
	If yes, were they intact upon receipt?	✓	
7.	Are all samples tagged or labeled?	✓	
	Do the sample tags/labels match the COC?	✓	
	If no, has the client been contacted about it? (Attach subsequent documentation from client about the situation)		
8.	Do all shipping documents agree?	✓	
	If no, describe what is in nonconformity:		

9. Condition/temperature of shipping container: Good Intact 1°C
10. Condition/temperature of sample bottles: _____
11. Sample Disposal?: SPL disposal ✓ Return to client _____

NOTES (reference item number if applicable): _____

ATTEST: Todd Caudle DATE: 2/9/93
DELIVERED FOR RESOLUTION: REC'D _____ DATE: _____
RESOLVED: _____ DATE: _____

APPENDIX D

PHOTO-DOCUMENTATION

Photograph 1: View looking north of the area between the eastern wall of the tank battery and the fenced property boundary where borings B-1, B-7, and B-8 are located.

Photograph 2: View looking south of drilling operations at boring B-7 with the three pipeline clean-outs in the background.

8.0 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

8.1 SAMPLING PROCEDURES

A strict Quality Assurance Plan was incorporated throughout all phases of the drilling and sampling operations. The sampling and drilling equipment was decontaminated by a high-pressure steam cleaner before the start of sampling operations and between the borings. The soil samples were collected with decontaminated stainless steel sampling trowels. The sampling equipment was cleaned between sample collections to eliminate the potential of cross-contamination between sampling stations. Groundwater samples were obtained with new disposable bailers after each monitor well was purged.

The soil and water samples were placed in glass jars and sample vials with teflon-lined lids and preserved at 4°C with zero head space in accordance with EPA requirements (EPA 600/4-82-029). A chain-of-custody (COC) that documents sample collection times and delivery times to the laboratory was completed for each set of samples. The COCs are included with the analytical results in the Appendices. Analyses were performed using EPA-recommended analytical methods on all samples.

CURA maintains the highest quality assurance standards with direct supervision of operations (sample handling and storage). Drilling operations were conducted using a licensed water well driller. CURA provides management oversight for laboratory procedures and analytical results and uses laboratories that maintain strict quality control, i.e., equipment calibration and standardization, EPA-recommended analytical methods, preparing spiked samples, and complete chains-of-custody.

9.0 SITE SAFETY PLAN

The sampling operations were performed at level D personal protection. All CURA personnel involved in on-site activities have completed the Hazardous Waste Field Operation training course (OSHA 29 CFR 1910.120). Applicable safety equipment was available on site to CURA personnel.

SITE SAFETY PLAN

Site Name: SPLC - Eunice Station

Site Address: 5 miles south-southeast of Eunice in Lea County, New Mexico

Site Owner: Shell Pipe Line Corporation

Contacts: John B. Hite (713) 241-1001

Work Description: Environmental site assessment activities: soil borings, soil sampling, and site mapping.

Proposed Date of Work: February 4, 1993

Work Team: Team Leader - F. Wesley Root (CURA, Inc.)

Site Safety Officer - F. Wesley Root (CURA, Inc.)

Team Member - Leon Moore (Shell Pipe Line Corporation)

Team Member - Barry Simmons (Hi-Plains Drilling Company)

Team Member - Freddy Tovar (Hi-Plains Drilling Company)

Plan prepared by: Greg C. Walterscheid, R.E.M.

Reviewed by: Richard Wilson, Ph.D.

EMERGENCY INFORMATION

Site Name: SPLC - Eunice Station

Site Address: 5 miles west of Eunice in Lea County, New Mexico

Site Owner: Shell Pipe Line Corporation

Telephone Numbers:

Ambulance Service: 911

Hospital: Lea Regional Hospital 505-392-6581

Norte Vista Medical Center 505-392-5571

Poison Control Center: 911

Police: 505-394-2112

Fire Department: 505-394-2111

Emergency Contacts

Company Health and Safety Officer: Dr. Richard Wilson
Work: (214) 620-7117
Home: (214) 241-5803

Project Manager: Greg C. Walterscheid

Work: 1-800-486-7117
Mobile Phone: 1-214-202-9320
Pager: 1-214-807-8154
Home: 1-214-317-0518

10.0 REFERENCES

Code of Federal Regulations, Title 40 §§ 280 and 281.

Dinwiddie, G. A., 1963. Municipal Water Supplies and Uses, Southeastern New Mexico. Technical Report 29A. New Mexico State Engineer, Santa Fe, New Mexico.

Groat, C. G., 1976. Geologic Atlas of Texas (Hobbs Sheet). Bureau of Economic Geology, The University of Texas at Austin. Austin, Texas.

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Nicholson, Alexander, Jr., 1961. Geology and Ground-Water Conditions in Southern Lea County, New Mexico. United States Geological Survey, Ground-Water Report 6. New Mexico Bureau of Mines and Mineral Resources, Campus Station, Socorro, New Mexico.

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