GW- 109R

# MONITORING REPORTS

DATE: 1994-1993

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### SUBSURFACE INVESTIGATION

TRANSWESTERN
WT-1 COMPRESSOR STATION
LEA COUNTY, NEW MEXICO

BROWN AND CALDWELL APRIL, 1994

April 29, 1994

Mr. Larry Campbell Transwestern Pipeline Company 6381 North Main Roswell, New Mexico 88202-1717

19-7976

Subject:

Subsurface Investigation at the Transwestern WT-1 Compressor Station,

Lea County, New Mexico.

## Dear Mr. Campbell:

Brown and Caldwell is pleased to present this final letter report to Transwestern Pipeline Company (Transwestern) summarizing results of the preliminary subsurface investigation conducted on land adjacent to the Transwestern WT-1 Compressor Station (WT-1 Compressor Station). Field work for this investigation was conducted from November 5 through November 10, 1993.

#### Introduction

The WT-1 Compressor Station is located approximately 28 miles east of Carlsbad, New Mexico, on the north side of Highway 180. Drilling was conducted on Bureau of Land Management (BLM) land located adjacent to the WT-1 Compressor Station. A site location map is included as Figure 1 in Appendix A.

Brown and Caldwell conducted a preliminary subsurface investigation on BLM land abutting the southwest boundary of the WT-1 Compressor Station in Lea County, New Mexico. The project scope involved drilling soil borings and investigating subsurface soil and groundwater conditions adjacent to an excavation located on the west boundary of the facility. The excavation was previously the location of dehydrator tubs. The dehydrator tubs functioned as catch basins for water and distillate. Eight soil borings were drilled on BLM land. Figure 2 in Appendix A, a

This report was prepared in accordance with the standards of the environmental consulting industry at the time it was prepared. It should not be relied upon by parties other than those for whom it was prepared, and then only to the extent of the scope of work which was authorized. This report does not guarantee that no additional environmental contamination beyond that described in this report exists at the site.

Mr. Larry Campbell April 29, 1994 Page 2

scale map of the site, identifies locations of the off-site soil borings and the excavation.

#### Field Activities

Prior to drilling activities, buried utility and gas transmission lines were located and marked by Transwestern site representatives.

Drilling was accomplished using nominal 9-inch outer diameter (O.D.) hollow-stem augers for the unconsolidated surface layers. From approximately 35 feet, the upper level of indurated rock, to total depth, samples were continuously obtained using a nominal 3-inch O.D. air rotary core barrel. Samples were collected from ground surface to total depth at two foot intervals for the first boring and at five foot intervals for the second boring. Samples were collected at ten foot intervals from approximately twenty feet below grade to total depth for the remaining six borings. Diagrammatic Boring Logs are included in Appendix A.

Auger flights were steam-cleaned prior to drilling the first borehole and following the drilling of each subsequent borehole to prevent cross-contamination. Potable water for decontamination and grouting was obtained on-site and was supplied by the local municipal water authority.

Soil samples obtained from the unconsolidated upper layers were collected using 2-foot split-spoon-samplers. Soil samples from the indurated deeper layers were collected using a 10-foot continuous core. Samples were screened for volatile organic compounds using a flame ionization detector (FID). Two soil samples from each boring were submitted for laboratory analysis. One soil sample was submitted for analyses on the basis of highest FID measurement. A second sample was collected from the either the deepest interval encountered if no groundwater was encountered or from the interval above groundwater, representing the capillary fringe. Groundwater samples were obtained from the borings via lowering a stainless steel bailer inside the hollow stem augers. No phase separated hydrocarbons (PSH) were encountered during drilling.

Soil samples collected using a split spoon were placed into a PVC collar and split lengthwise with a clean knife upon retrieval from the sampling tool. Soil samples collected using a 10-foot core barrel were laid out on clean plastic sheeting and split into five foot intervals. Sampling equipment was decontaminated prior to use with alconox and dionized water. The portions were then placed into separate plastic bags, where one was screened for volatile organic compounds (VOC's) using a FID. Soil samples selected for laboratory analyses were then transferred from

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Mr. Larry Campbell April 29, 1994 Page 3

the remaining plastic bags to laboratory supplied glass jars.

Soil and groundwater samples were collected and placed in laboratory supplied containers, properly labeled, placed on ice in shipping coolers, and shipped to the analytical laboratory by common carrier. Upon completion of soil and groundwater sampling activities, the borings were grouted from total depth to ground surface with a Portland Cement/bentonite slurry. Appendix B, Table 1, lists total depths for all borings drilled adjacent to the WT-1 Compressor Station on BLM land. Also listed are the laboratory analyses performed and field screen data in parts per million (ppm) for all submitted soil and core sample intervals.

#### Geology

The WT-1 Compressor Station is situated in an area of recent Quaternary alluvium. Soils underlying the site consist of brown, medium to coarse grained, sand with interbedded quartz gravels. The sediment encountered in the upper 35 feet at the site consists of loosely consolidated sand and gravel layers. These loosely consolidated upper layers grade into dense, well consolidated sandstones and siltstones.

A basal clay was encountered in borings B-1, B-2, B-7 and B-8 between 61 and 64 feet below ground surface. This clay layer may act as an aquitard in this area.

#### Analytical Results

Soil and groundwater samples were analyzed for total petroleum hydrocarbons (TPH) and for benzene, toluene, ethyl benzene and xylenes (BTEX), using EPA methods 418.1 and 8020, respectively. Tables 2 and 3, Appendix B, summarize the analytical results for the submitted soil and groundwater samples at the site. Analytical laboratory reports are contained in Appendix C.

As shown in Table 2, TPH was detected in soil samples collected at around 20 feet BGL in borings B-3 and B-7 and deeper in borings B-1, B-2, and B-7. Both soil samples collected from the interval around 20 feet BGL detected TPH at a concentration of 50 milligrams per kilogram (mg/kg). Boring B-1, located approximately 30 feet southwest of the excavation, reported a TPH concentration of 6,700 mg/kg in the sample collected at the 51-56 foot BGL capillary fringe interval and 15,000 mg/kg in the sample collected at the 42-46 foot BGL interval. Soil samples collected of the basal clay layer from borings B-2, B-7, and B-8 were also analyzed for TPH. TPH concentrations of 130 and 470 mg/kg were detected in the samples collected from 60-65 oot BGL and 59-66 foot BGL from borings B-2 and B-7, respectively.

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Mr. Larry Campbell April 29, 1994 Page 4

BTEX constituents were detected in the soil samples collected from the vadose zone and capillary fringe of boring B-1 and in the samples collected from the clay layer in borings B-2 and B-7. Total BTEX concentrations exceeding 318,000 and 136,000 µg/kg were detected in the samples collected from boring B-1. Total BTEX concentrations detected in the clay layer samples were 233,000 µg/kg in boring B-7 and exceeded 17,600 µg/kg in boring B-2. Precise quantification of Total BTEX in samples from B-1 and B-2 is not possible due to elevated benzene and ethylbenzene concentrations of other constituents. Higher concentrations of analytes measured in the basal clay layer may be due to clay particles having a higher indigenous organic content than the sediment above, therefore making the clay more sorptive of petroleum hydrocarbons.

Analytical data for the groundwater samples collected from the borings are presented in Table 3. As shown, all samples detected BTEX constituents and TPH. Generally, concentrations of the constituents are highest near the excavation and decrease away from it. Figure 3, in Appendix A, is a contoured map of benzene concentrations detected in groundwater samples obtained from the eight soil borings. Benzene concentrations are highest near the excavation in borings B-1 and B-2, and decrease away from the excavation. Groundwater from borings B-1 through B-8/ were analyzed to have benzene concentrations in the range of 5,800 to 720 micrograms per liter ( $\mu$ g/L) and toluene concentrations in the range of to 9,300 to 25  $\mu$ g/L. Total xylenes concentrations were reported in the range of 4,700 to 42  $\mu$ g/L and ethyl benzene concentrations in the range of 630 to 66  $\mu$ g/L were reported in groundwater samples from borings B-1 through B-7.

TPH concentrations in the groundwater samples collected also tended to decrease away from the excavation. Groundwater samples from borings B-1 through B-8 were analyzed to have TPH concentrations in the range of 3,400 to 0.4 milligrams per liter (mg/L).

If you have any questions regarding this information, contact me at (713) 759-0999.

Very truly yours,

BROWN AND CALDWELL Susone Ride

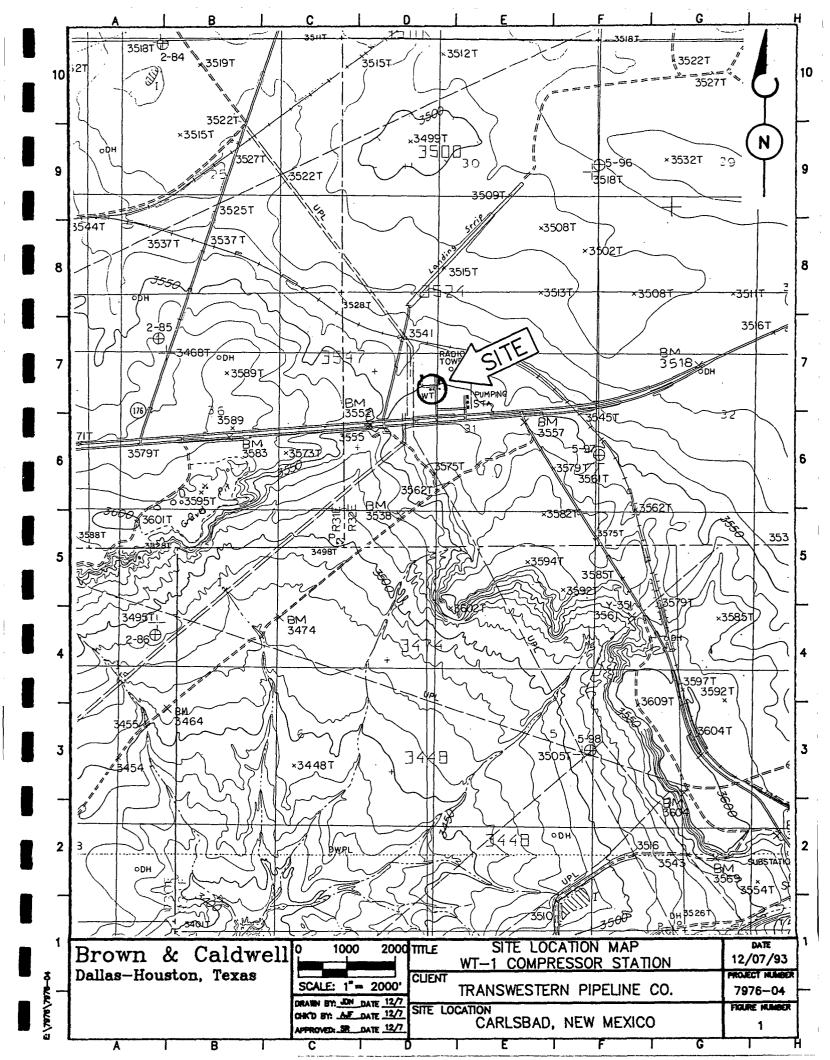
Susanne Richard, REM, REP

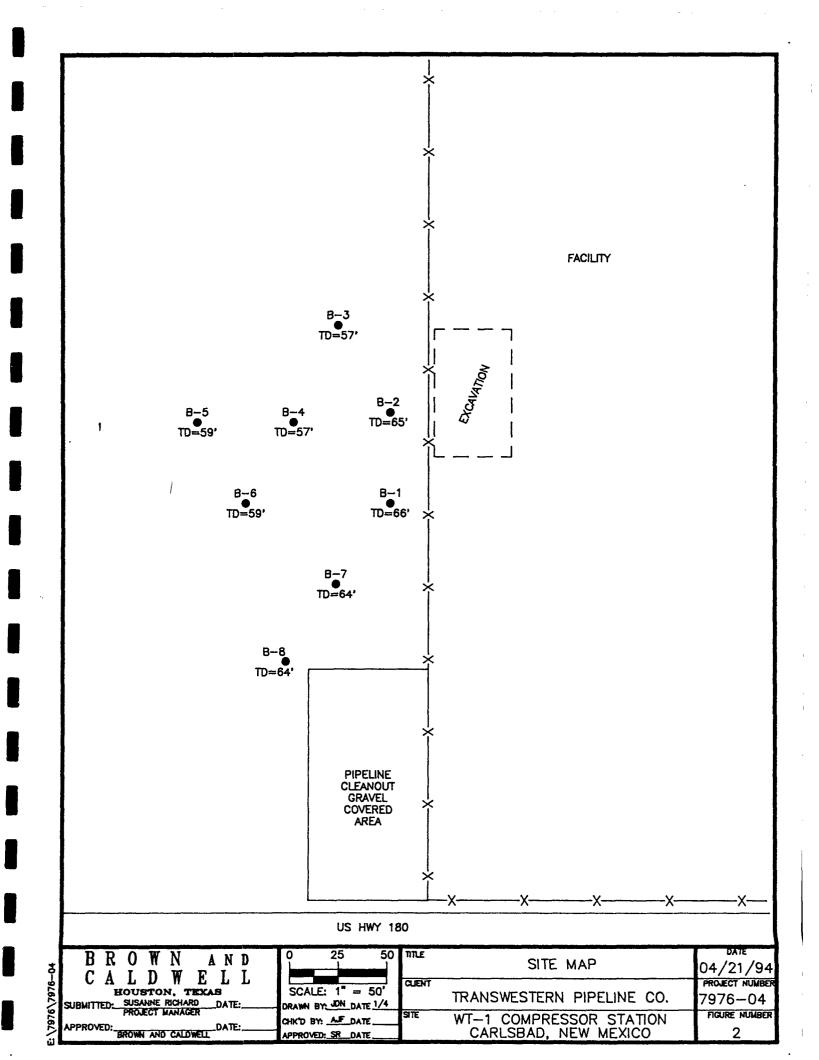
Project Manager

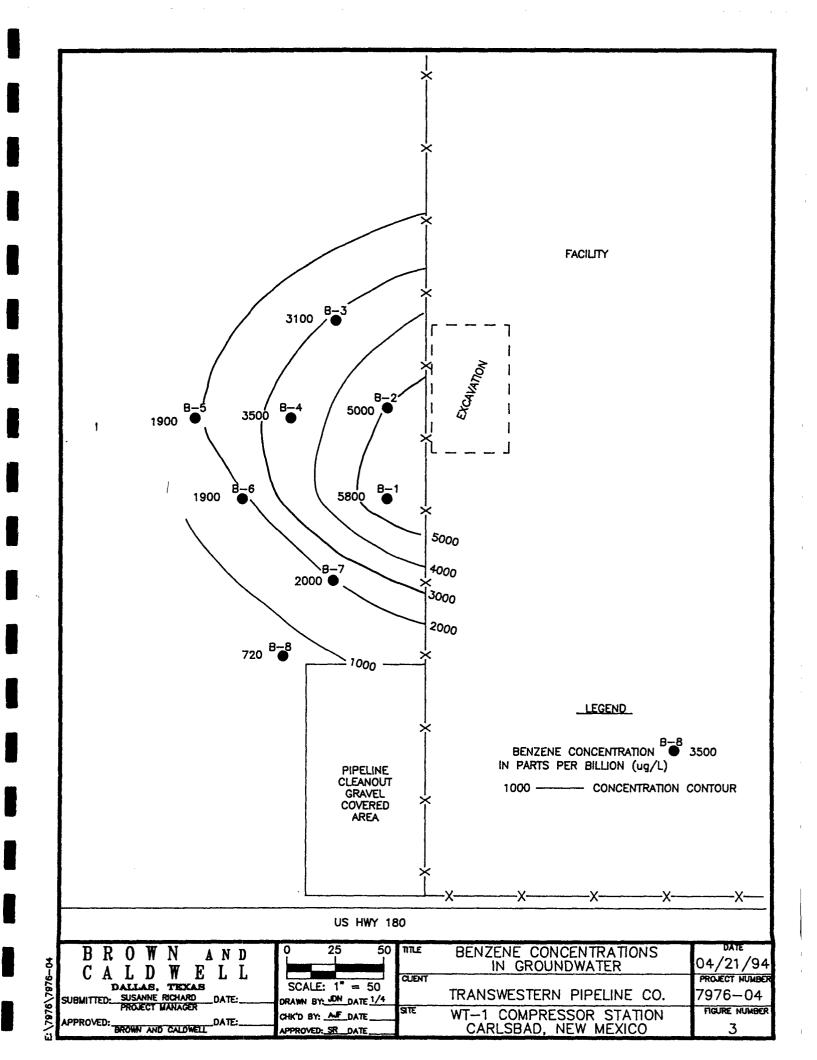
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APPENDIX A

FIGURES AND BORING LOGS







#### LOG OF EXPLORATORY BORING BORING NO. 8-1 PROJECT NUMBER 7976-04 TOTAL DEPTH 66.0 WT-1 Transwestern Compressor Station, Carlsbad, New Mexico PROJECT NAME SURFACE ELEV. BY A. Fear DATE 11/15/93 Q FT BLOWS LITHO-FID (COUNT/ DEPTH IN FT. GRAPHIC DESCRIPTION INCHES) (PPM) COLUMN 50/6 0 Brown earthy soil and gravel 50/6 Light tan to white sandstone and gravel 5 50/6 Light tan silty sandstone and gravel 50/6 Light tan sandstone and gravel 50/6 10 50/6 Reddish brown sandstone 50/8 15 50/8 50/8 10 Red sandstone, silty with clay 50/8 24 20 50/8 140 50/8 20 25 50/8 30 50/8 62 50/8 30 30 50/8 85 50/8 300 35 50/8 900 50/8 1000 40 50/8 1000 50/8 1000 Red sandstone, silty, moist 50/8 1000 Core: Red sandstone, silty, maist CORE 1000 50 . CORE 1000 $\nabla$ Core: Red sandstone, silty clay 60 CORE 65 REMARKS: Orilling Contractor: Layne Environmental Orilling Method: Hollow Stem Auger Drilling Equipment: Failing F6

#### LOG OF EXPLORATORY BORING BORING NO. B-2 PROJECT NUMBER 7976-04 TOTAL DEPTH 65.0 PROJECT NAME WT-1 Transwestern Compressor Station, Carlsbad, New Mexico BY A. Fear DATE 11/15/93 SURFACE ELEV. 0 FT BLOWS LITHO-FID (COUNT/ GROUND WATER LEVELS GRAPHIC DESCRIPTION INCHES) (PPM) COLUMN 50/8 160 50/8 Light tan sandstone and gravel 50/8 140 15 . Tan to reddish brown sendstone 50/8 150 20 1000 50/6 25 Red silty sandstone and clay 30 No sample Red silty sandstone and clay 50/6 275 35 50/6 1000 40 45 Core: Red consolidated sandstone Core 1000 50 Core: Red silty sandstone with white mottles, moist Core 1000 $\nabla$ 55 Core 1000 60 1000 1000 REMARKS: Drilling Contractor: Layne Environmental Driller: Wes Cowser Orilling Method: Hollow Stem Auger Drilling Equipment: Failing F6

### LOG OF EXPLORATORY BORING PROJECT NUMBER 7975-04 BORING NO. 8-3 PROJECT NAME WT-1 Transwestern Compressor Station, Carlsbad, New Mexico TOTAL DEPTH 57.0 BY A. Fear DATE 11/15/93 SURFACE ELEV. 0 FT BLOWS LITHO-FID SAMPLES (COUNT/ GROUND WATER LEVELS GRAPHIC DEPTH IN FT. DESCRIPTION INCHES) (PPM) COLUMN No sample 10 15 50/8 Light red sandstone 600 20 No sample 25 Core: Light brown to red sandstone, silty with white mottles $% \left( 1\right) =\left( 1\right) ^{2}$ 30 . Core 35 Core: Reddish brown sandstone 40 Core 45 Core: Red sandstone - moist Core: White sandstone / Core: Red sandstone Core 16 55 $\nabla$ REMARKS: Drilling Contractor: Layne Environmental Driller: Wes Cowser Drilling Method: Hollow Stem Auger Drilling Equipment: Failing F6

## LOG OF EXPLORATORY BORING PROJECT NUMBER 7976-04 BORING NO. B-4 PROJECT NAME WT-1 Transwestern Compressor Station, Carlsbad, New Mexico TOTAL DEPTH 57.0 DATE 11/15/93 SURFACE ELEV. BY A. Fear 0 FT BLOWS LITHO-FIO (COUNT/ GROUND WATER LEVELS GRAPHIC DEPTH IN FT. DESCRIPTION COLUMN INCHES) (PPM) No sample 10 15 Reddish brown sandstone and gravel 50/12 25 Core: Light red to reddish brown sandstone 30 Core 35 Core: Reddish brown sandstone 40 Core 45 Core: Aeddish brown sandstone, moist Core 1000 $\nabla$ 55 REMARKS: Drilling Contractor: Layne Environmental Driller: Wes Cowser Orilling Method: Hollow Stem Auger Drilling Equipment: Failing F6

## LOG OF EXPLORATORY BORING BORING NO. 8-5 PROJECT NUMBER 7976-04 TOTAL DEPTH 59.0 PROJECT NAME WT-1 Transwestern Compressor Station, Carlsbad, New Mexico DATE 11/15/93 SURFACE ELEV. 0 FT BY A. Fear BLOWS LITHO-FID (COUNT/ GRAPHIC DEPTH IN FT. DESCRIPTION COLUMN INCHES) (PPM) No sample 10 15 1 50/8 20 Reddish brown sandstone No sample 25 30 Core: Reddish brown sandstone 35 . Core 40 . 45 Core 50 Core: Red sandstone - moist $\nabla$ 55 Core REMARKS: Drilling Contractor: Layne Environmental Drilling Method: Hollow Stem Auger Orilling Equipment: Failing F6

#### LOG OF EXPLORATORY BORING BORING NO. 8-6 PROJECT NUMBER 7976-04 PROJECT NAME WT-1 Transwestern Compressor Station, Carlsbad, New Mexico TOTAL DEPTH 59.0 DATE 11/15/93 SURFACE ELEV. 0 FT BY A. Fear BLOWS LITHO-FID SAMPLES (COUNT/ GROUND WATER LEVELS GRAPHIC DEPTH IN FT. DESCRIPTION COLUMN INCHES) (PPM) No sample 5 10 15 1 50/B 3 20 Light red to reddish brown consolidated sandstone ......... No sample 25 . 30 . Core: Light red to reddish brown consolidated sandatpn Core 35 Care 2 Core: Reddish brown sandstone, consolidated with 40 gravel Core 1 45 Core 1 Core: Reddish brown sandstone, consolidated with gravel, moist Core: Reddish brown sandstone, consolidated with 50 gravel, saturated Core $\nabla$ 55 . Core REMARKS: Drilling Contractor: Layne Environmental Driller: Wes Cowser Orilling Method: Hollow Stem Auger Drilling Equipment: Failing F6

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### LOG OF EXPLORATORY BORING BORING NO. 8-7 PROJECT NUMBER 7976-04 WT-1 Transwestern Compressor Station, Carlsbad, New Mexico TOTAL DEPTH 64.0 PROJECT NAME DATE 11/15/93 SURFACE ELEV. 0 FT 8Y A. Fear BLOWS LITHO-FIO S (COUNT/ GRAPHIC DESCRIPTION INCHES) (PPM) COLUMN No sample 10 . 15 50/12 18 20 Light reddish brown sandstone 25 Core: Light reddish brown sandstone 30 Core 35 Core 40 2 Core 45 . Core 50 . Core: Light reddish brown sandstone, moist Core 30 Core: Light reddish brown sandstone 55 Core: Reddish brown and gray/green sandstone $\nabla$ Core 60 \_ Core 1000 REMARKS: Orilling Contractor: Layne Environmental Driller: Wes Cowser Drilling Method: Hollow Stem Auger Orilling Equipment: Failing F6

### LOG OF EXPLORATORY BORING BORING NO. 8-8 PROJECT NUMBER 7976-04 PROJECT NAME WT-1 Transwestern Compressor Station, Carlsbad, New Mexico TOTAL DEPTH 64.0 DATE 11/15/93 SURFACE ELEV. BY A. Fear 0 FT BLOWS LITHO-FID (COUNT/ GROUND WATER LEVELS DEPTH IN FT. GRAPHIC DESCRIPTION COLUMN INCHES) (PPM) No sample 10 15 20 25 30 Core: Light brownish red consolidated sandstone Core 35 40 Core 45 50 Core Core: Light brownish red consolidated sandstone, moist $\nabla$ Core: Reddish brown/green sandstone, moist 55 Core: Reddish brown silty clay, moist Core 50 60 Core Care 1000 REMARKS: Drilling Contractor: Layne Environmental Drilling Method: Hollow Stem Auger Drilling Equipment: Failing F6

APPENDIX B

**TABLES** 

# TABLE 1. SUMMARY OF DRILLING ACTIVITY BLM LAND ADJACENT TO TRANSWESTERN WT-1 COMPRESSOR STATION CARLSBAD, NEW MEXICO

Boring Number	Total Depth	Groundwater Sampled	Soil Interval Analyzed	Field Screen	Laboratory Analytical
B-1	66	YES	42-46 ft. BGL 51-56 ft. BGL	1000 ppm 1000 ppm	418.1, BTEX-8020
B-2	65	YES	5-10 ft. BGL 60-65 ft. BGL	300 ppm 1000 ppm	418.1, BTEX-8020
B-3	57	YES	20-30 ft. BGL 47-57 ft. BGL	600 ppm 16 ppm	418.1, BTEX-8020
B-4	57	YES	19-21 ft. BGL 47-57 ft. BGL	60 ppm 1000 ppm	418.1, BTEX-8020
B-5	59	YES	20-30 ft. BGL 52-59 ft. BGL	28 ppm 6 ppm	418.1, BTEX-8020
B-6	59	YES	20-30 ft. BGL 49-59 ft. BGL	3 ppm 40 ppm	418.1, BTEX-8020
B-7	64	YES	20-30 ft. BGL 49-59 ft. BGL 59-64 ft. BGL	18 ppm 48 ppm 1000 ppm	418.1, BTEX-8020
B-8	64	YES	54-59 ft. BGL 62-64 ft. BGL	50 ppm 1000 ppm	418.1, BTEX-8020

# TABLE 2. SOIL ANALYTICAL RESULTS BLM LAND ADJACENT TO TRANSWESTERN WT-1 COMPRESSOR STATION CARLSBAD, NEW MEXICO

Boring Number	Sample Depth	TPH (mg/kg)	Total BTEX (μg/kg)	Benzene (μg/kg)	Toluene (μg/kg)	Ethyl- benzene (µg/kg)	Total Xylenes (μg/kg)
B-1	(42-46)	15,000	318,000	< 12,000*	96,000	< 12,000*	222,000
	(51-56)	6,700	136,000	< 12,000*	49,000	< 12,000*	87,000
B-2	(05-10)	< 20	74	< 10	< 10	< 10	74
	(60-65)	130	17,600	< 3,100*	8,200	< 3,100*	9,400
B-3	(20-30)	50	< 5	< 5	< 5	< 5	< 5
	(47 <b>-</b> 57)	< 20	< 5	< 5	< 5	< 5	< 5
B-4	(19-21)	< 20	< 5	< 5	< 5	< 5	< 5
	(47-57)	< 20	< 5	< 5	< 5	< 5	< 5
B-5	/ (20-30)	< 20	< 5	< 5	< 5	< 5	< 5
	(52-59)	< 20	< 5	< 5	< 5	< 5	< 5
B-6	(20-30)	< 20	< 10	< 10	< 10	< 10	< 10
	(49-59)	< 20	< 10	< 10	< 10	< 10	< 10
B-7	(20-30)	50	< 10	< 10	< 10	< 10	< 10
	(49-59)	< 20	< 10	< 10	< 10	< 10	· < 10
	(59-64)	470	233,000	13,000	65,000	24,000	131,000
B-8	(54-59)	< 20	< 10	< 10	< 10	< 10	< 10
	(62-64)	< 20	< 10	< 10	< 10	< 10	< 10

<sup>• =</sup> The detection limits were elevated due to the dilution required because of the high concentration of target analytes. µg/kg = micrograms per kilogram

mg/kg = milligrams per kilogram

# TABLE 3. GROUNDWATER ANALYTICAL RESULTS BLM LAND ADJACENT TO TRANSWESTERN WT-1 COMPRESSOR STATION CARLSBAD, NEW MEXICO

Boring Number	TPH (mg/L)	Total BTEX (µg/L)	Benzene (μg/L)	Toluene (μg/L)	Ethyl- Benzene (µg/L)	Total Xylenes (µg/L)
B-1	3,400	20,250	5,800	9,300	450	4,700
B-2	120	15,460	5,000	7,000	360	3,100
B-3	790	11,000	3,100	4,200	480	3,300
B-4	99	11,030	3,500	3,900	630	3,000
B-5	45	3,062	1,900	230	190	742
B-6	11.1	3,334	1,900	1,200	66	168
B-7	0.4	4,052	2,000	880	200	972
B-8	0.7	787	720	25	< 10	42

 $\mu$ g/L = micrograms per liter mg/L = milligrams per liter

## APPENDIX C

LABORATORY ANALYTICAL REPORTS



November 24, 1993

Report No.: 00028884

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

Section A Page 11

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

SAMPLE ID: GRD WTR BORING-1 DATE SAMPLED: 07-NOV-93

LSG SAMPLE NO: H0258758

DATE RECEIVED: 10-Nov-93

P.O. NO.: VERBAL APPROVED BY: L Beyer

LN CODE DETERMINATION RESULT UNITS 3 1685 Petroleum Hydrocarbons 3,400 mg/L OVAROW Volatile Aromatics Benzene 5,800 ug/L Ethylbenzene 450 ug/L Toluene 9,300 ug/L m-Xylene 3,400 \* ug/L o-Xylene 1,300 ug/L p-Xylene ug/L

COMMENTS: \* The compounds m-Xylene and p-Xylene co-elute. The reported result is the sum of the two.



November 24, 1993

Report No.: 00028884

Section A Page 1

LSG CLIENT NO: 0734 0001

PACE CLIENT: 620562

H07340001

PACE PROJECT:

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

SAMPLE ID: SOIL BORING-1 (42-46)

LSG SAMPLE NO: H0258748

P.O. NO.: VERBAL

DATE SAMPLED: 05-NOV-93

DATE RECEIVED: 10-NOV-93 APPROVED BY: L Beyer

		TEST				
	LN	CODE	DETERMINATION	RESULT	UNIT	
	3	16858	Petroleum Hydrocarbons	15,000	mg/kg	
	4	OVAROS	Volatile Aromatics	.5,000		
			Benzene	< 12,000 **	ug/kg	
1			Ethlybenzene	< 12,000	ug/kg	
			Toluene	96,000	ug/kg	
			m-Xylene	180,000 *	ug/kg	
			o-Xyl ene	42,000	ug/kg	
		İ	p-Xylene	*	ug/kg	

COMMENTS: Results are reported on an "as received" basis without correction for percent

moisture unless previously specified.

\* The compounds m-Xylene and p-Xylene co-elute. The reported result is

the sum of the two.

\*\* The detection limits were elevated due to the dilution required because of the high concentrations of target analytes.

PETRIO

NOV 2 9 1993

An Équal Opportunit é Employer



November 24, 1993

Report No.: 00028884

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

Section A Page 2

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

DATE SAMPLED: 06-NOV-93 SAMPLE ID: SOIL BORING-1 (51-56)

LSG SAMPLE NO: H0258749

DATE RECEIVED: 10-NOV-93 APPROVED BY:

P.O. NO.: VERBAL

TEST LN CODE DETERMINATION 3 16858 Petroleum Hydrocarbons 6,700 mg/kg **OVAROS** Volatile Aromatics Benzene < 12,000 \*\* ug/kg Ethlybenzene < 12,000 ug/kg Toluene 49,000 ug/kg m-Xylene 71,000 \* ug/kg o-Xylene 16,000 ug/kg p-Xylene ug/kg

COMMENTS: Results are reported on an "as received" basis without correction for percent moisture unless previously specified.

<sup>\*</sup> The compounds m-Xylene and p-Xylene co-elute. The reported result is the sum of the two.

<sup>\*\*</sup> The detection limits were elevated due to the dilution required because of the high concentrations of target analytes.



November 24, 1993 Report No.: 00028884

Section A Page 12

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

SAMPLE ID: GRD WTR BORING-2

LSG SAMPLE NO: H0258759

DATE RECEIVED: 10-NOV-93

DATE SAMPLED: 06-NOV-93

P.O. NO.: VERBAL

APPROVED BY:

Povos

TEST

LN CODE DETERMINATION RESULT UNITS

3 I685 Petroleum Hydrocarbons 120 mg/L
4 OVAROW Volatile Aromatics

4 OVAKOW

Volatile Aromatics Benzene Ethylbenzene

Toluene m-Xylene o-Xylene

p-Xylene

120 mg/L
5,000 ug/L
360 ug/L
7,000 ug/L

2,000 \*

1,100 ug/L \* ug/L

ug/L

COMMENTS: \* The compounds m-Xylene and p-Xylene co-elute. The reported result is the sum of the two.

An Equal Opportunity Employer

900 Gemini Avenue Houston, TX 77058 TEL: 713-488-1810 FAX: 713-488-4661



November 24, 1993

Report No.: 00028884

Section A Page 3

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

SAMPLE ID: SOIL BORING-2 (5-10)

LSG SAMPLE NO: H0258750

DATE RECEIVED: 10-NOV-93

DATE SAMPLED: 07-NOV-93

P.O. NO.: VERBAL

APPROVED BY:

L Beyer

	LN	TEST CODE		DETERMINATION	RESULT	UNITS
	3	1685s	Petroleum Hydrocarbons		< 20	mg/kg
	4	OVAROS	Volatile Aromatics			
			Benzene		< 10	ug/kg
3			Ethlybenzene		< 10	ug/kg
			Toluene		< 10	ug/kg
			m-Xylene		54 *	ug/kg
			o-Xylene		20	ug/kg
		I	p-Xylene		*	ug/kg

COMMENTS: Results are reported on an "as received" basis without correction for percent moisture unless previously specified.

 ${}^{\star}$  The compounds m-Xylene and p-Xylene co-elute. The reported result is the sum of the two.



November 24, 1993

Report No.: 00028884

Section A Page 4

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

SAMPLE ID: SOIL BORING-2 (60-65)

LSG SAMPLE NO: H0258751

P.O. NO.: VERBAL

DATE SAMPLED: 07-NOV-93

DATE RECEIVED: 10-NOV-93

APPROVED BY:

	LN	TEST CODE	DETERI	MINATION RESULT	UNITS
	3	1685s	Petroleum Hydrocarbons	130	mg/kg
	4	OVAROS	Volatile Aromatics		
			Benzene	< 3,100 **	ug/kg
1			Ethlybenzene	< 3,100	ug/kg
			Toluene	8,200	ug/kg
			m-Xylene	9,400 *	ug/kg
			o-Xylene	< 3,100	ug/kg
		1	p-Xylene	*	ug/kg

COMMENTS: Results are reported on an "as received" basis without correction for percent moisture unless previously specified.

<sup>\*</sup> The compounds m-Xylene and p-Xylene co-elute. The reported result is the sum of the two.

<sup>\*\*</sup> The detection limits were elevated due to the dilution required because of the high concentrations of non-target analytes.



November 24, 1993

Report No.: 00028884

Section A Page 5

LSG CLIENT NO: 0734 0001

PACE CLIENT: 620562

H07340001

L Beyer

PACE PROJECT:

APPROVED BY:

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

SAMPLE ID: SOIL BORING-3 (20-30) LSG SAMPLE NO: H0258752

P.O. NO.: VERBAL

DATE SAMPLED: 07-NOV-93
DATE RECEIVED: 10-NOV-93

TEST

CODE LN DETERMINATION 3 16858 Petroleum Hydrocarbons 50 mg/kg **OVAROS** Volatile Aromatics Benzene < 5 ug/kg Ethlybenzene < 5 ug/kg Toluene < 5 ug/kg m-Xylene < 5 ug/kg o-Xylene < 5 ug/kg p-Xylene < 5 ug/kg

COMMENTS: Results are reported on an "as received" basis without correction for percent moisture unless previously specified.



November 24, 1993

Report No.: 00028884

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#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

SAMPLE ID: GRD WTR BORING-3

LSG SAMPLE NO: H0258760

P.O. NO.: VERBAL

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

DATE SAMPLED: 07-NOV-93
DATE RECEIVED: 10-NOV-93

APPROVED BY: L

L Beyer

	<u>LN</u>	TEST CODE	DETERMINATION	RESULT	UNITS
	3	1685 OVAROW	Petroleum Hydrocarbons Volatile Aromatics	790	mg/L
,	·		Benzene Ethylbenzene	3,100 480	ug/L ug/L
r			Toluene m-Xylene	4,200 2,000 *	ug/L ug/L
		1	o-Xylene p-Xylene	1,300 *	ug/L ug/L

COMMENTS: \* The compounds m-Xylene and p-Xylene co-elute. The reported result is the sum of the two.



November 24, 1993

Report No.: 00028884

Section A Page 6

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

SAMPLE ID: SOIL BORING-3 (47-57)

LSG SAMPLE NO: H0258753

P.O. NO.: VERBAL

PACE CLIENT: 620562

LSG CLIENT NO: 0734 0001

DATE SAMPLED: 07-NOV-93

PACE PROJECT:

DATE RECEIVED: 10-NOV-93

H07340001

APPROVED BY: L Beyer

	<u>LN</u>	TEST CODE	DETERMINATION	RESULT	UNITS
	3	16858	Petroleum Hydrocarbons	< 20	mg/kg
	4	OVAROS	Volatile Aromatics		
			Benzene	< 5	ug/kg
1			Ethlybenzene	< 5	ug/kg
			Toluene	< 5	ug/kg
			m-Xylene	< 5	ug/kg
			o-Xylene	< 5	ug/kg
		1	p-Xylene	< 5	ug/kg

COMMENTS: Results are reported on an "as received" basis without correction for percent

moisture unless previously specified.



November 24, 1993

Report No.: 00028884

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

Section A Page 14

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

LSG SAMPLE NO: H0258761

P.O. NO.: VERBAL

SAMPLE ID: GRD WTR BORING-4

DATE SAMPLED: 07-NOV-93

APPROVED BY:

DATE RECEIVED: 10-NOV-93

L Beyer

		TEST			
	<u>ln</u>	CODE	DETERMI	NATION RESULT	UNITS
	3	1685	Petroleum Hydrocarbons	99	ma /1
	4	OVAROW	Volatile Aromatics	77	mg/L
			Benzene	3,500	ug/L
1			Ethylbenzene	630	ug/L
			Toluene	3,900	ug/L
			m-Xylene	1,500 *	ug/L
			o-Xylene	1,500	ug/L
		1	p-Xylene	*	ug/L

COMMENTS: \* The compounds m-Xylene and p-Xylene co-elute. The reported result is the sum of the two.



November 24, 1993

Report No.: 00028884

Section A Page 7

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

SAMPLE ID: SOIL BORING-4 (19-21)

LSG SAMPLE NO: H0258754 P.O. NO.: VERBAL

DATE SAMPLED: 07-NOV-93

DATE RECEIVED: 10-NOV-93 APPROVED BY:

L Beyer

	<u>LN</u>	TEST CODE	DETERMINATION	RESULT	UNITS
	3	1685S	Petroleum Hydrocarbons	< 20	mg/kg
	4	OVAROS	Volatile Aromatics		
			Benzene	< 5	ug/kg
1			Ethlybenzene	< 5	ug/kg
			Toluene	< 5	ug/kg
			m-Xylene	< 5	ug/kg
			o-Xyl ene	< 5	ug/kg
		1	p-Xyl ene	< 5	ug/kg

COMMENTS: Results are reported on an "as received" basis without correction for percent moisture unless previously specified.



November 24, 1993

Report No.: 00028884

Section A Page 8

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

SAMPLE ID: SOIL BORING-4 (47-57)

LSG SAMPLE NO: H0258755

DATE RECEIVED: 10-NOV-93 APPROVED BY:

DATE SAMPLED: 07-NOV-93

P.O. NO.: VERBAL

L Beyer

	<u>ln</u>	TEST	DETERMINATION	RESULT	UNITS
	_				
	3	16858	Petroleum Hydrocarbons	< 20	mg/kg
	4	OVAROS	Volatile Aromatics		
			Benzene	< 5	ug/kg
1			Ethlybenzene	< 5	ug/kg
			Toluene	< 5	ug/kg
			m-Xylene	< 5	ug/kg
			o-Xylene	< 5	ug/kg
		1	p-Xylene	< 5	ug/kg

COMMENTS: Results are reported on an "as received" basis without correction for percent

moisture unless previously specified.



November 24, 1993

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#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

SAMPLE ID: GRD WTR BORING-5

LSG SAMPLE NO: H0258762

P.O. NO.: VERBAL

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

DATE SAMPLED: 08-NOV-93

DATE RECEIVED: 10-NOV-93 APPROVED BY:

L Beyer

	<u>LN</u>	TEST CODE	DETERMINATION	RESULT	UNITS
	3	1685	Petroleum Hydrocarbons	45	mg/L
	4	OVAROW	Volatile Aromatics		
			Benzene	1,900	ug/L
1			Ethylbenzene	190	ug/L
			Toluene	230	ug/L
			m-Xylene	650 *	ug/L
			o-Xylene	92	ug/L
		1	p-Xylene	*	ug/L

COMMENTS: \* The compounds m-Xylene and p-Xylene co-elute. The reported result is the sum of the two.



November 24, 1993

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Section A Page 9

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

SAMPLE ID: SOIL BORING-5 (20-30)

LSG SAMPLE NO: H0258756

P.O. NO.: VERBAL

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

DATE SAMPLED: 08-NOV-93

DATE RECEIVED: 10-NOV-93

APPROVED BY:

L Beyer

	<u>ln</u>	TEST CODE	DETERMINATION	RESULT	UNITS
	3	1685s	Petroleum Hydrocarbons	< 20	mg/kg
	4	OVAROS	Volatile Aromatics		
			Benzene	< 5	ug/kg
•			Ethlybenzene	< 5	ug/kg
			Toluene	< 5	ug/kg
			m-Xylene	< 5	ug/kg
			o-Xyl ene	< 5	ug/kg
		1	p-Xyl ene	< 5	ug/kg



THE ASSURANCE OF QUALITY

November 24, 1993

Report No.: 00028884

Section A Page 10

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

SAMPLE ID: SOIL BORING-5 (52-59)

LSG SAMPLE NO: H0258757

P.O. NO.: VERBAL

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

DATE SAMPLED: 08-NOV-93 DATE RECEIVED: 10-NOV-93

APPROVED BY:

				. <b></b>	
	<u>LN</u>	TEST CODE	DETERMINATION	RESULT	UNITS
	3 4	I 685S OVAROS	Petroleum Hydrocarbons Volatile Aromatics	20	mg/kg
			Benzene	< 5	ug/kg
1			Ethlybenzene	< 5	ug/kg
			Toluene	< 5	ug/kg
			m-Xylene	< 5	ug/kg
			o-Xylene	<b>&lt;</b> 5	ug/kg
		1	p-Xylene	< 5	ug/kg



December 01, 1993

Report No.: 00028994

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

Section A Page 8

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

LSG SAMPLE NO: H0259301

SAMPLE ID: GRD. WTR. BORING 6

P.O. NO.: VERBAL

DATE SAMPLED: 09-NOV-93 DATE RECEIVED: 13-NOV-93

APPROVED BY:

TEST

<u>LN</u> CODE DETERMINATION

RESULT

G107W

BTEX Package Benzene

Ethylbenzene

Toluene m-Xylene

o-Xylene p-Xylene

3 1685 Petroleum Hydrocarbons

1,900 ug/L

66 ug/L 1,200 ug/L

96 \* ug/L 72 ug/L

ug/L

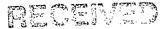
11.1 mg/L

COMMENTS: \* The compounds m-Xylene and p-Xylene co-elute. The reported result is the sum of the two.

An Equal Opportunity Employer

900 Gemini Avenue Houston, TX 77058 TEL: 713-488-1810 FAX: 713-488-4661





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December 01, 1993 Report No.: 00028994

Section A Page 1

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

SAMPLE ID: SAND: BORING 6 (20-30')

LSG SAMPLE NO: H0259294

DATE RECEIVED: 13-NOV-93

DATE SAMPLED: 09-NOV-93

P.O. NO.: VERBAL

APPROVED BY:

L Beyer

LN	TEST CODE	DETERMINATION	RESULT	UNIT
1	G107S	BTEX Package Benzene Ethylbenzene Toluene m-Xylene o-Xylene p-Xylene	< 10 < 10 < 10 < 10 < 10 < 10	ug/kg ug/kg ug/kg ug/kg ug/kg ug/kg
3	,1685S	Petroleum Hydrocarbons	< 20	mg/kg
	LN 1	LN CODE  1 G107S	LN CODE DETERMINATION  1 G107S BTEX Package Benzene Ethylbenzene Toluene m-Xylene o-Xylene p-Xylene	LN         CODE         DETERMINATION         RESULT           1         G107S         BTEX Package



December 01, 1993

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Section A Page 2

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

SAMPLE ID: SAND: BORING 6 (49-59')

LSG SAMPLE NO: H0259295

DATE SAMPLED: 09-NOV-93 DATE RECEIVED: 13-NOV-93

P.O. NO.: VERBAL

APPROVED BY:

L Beyer

	<u>LN</u>	TEST CODE		DETERMINATION	RESULT	UNITS
3	1	G107S	BTEX Package Benzene Ethylbenzene Toluene m-Xylene o-Xylene p-Xylene Petroleum Hydrocarbons		< 10 < 10 < 10 < 10 < 10 < 10 < 20	ug/kg ug/kg ug/kg ug/kg ug/kg ug/kg mg/kg



December 01, 1993

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Section A Page 9

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

SAMPLE ID: GRD. WTR. BORING 7

LSG SAMPLE NO: H0259302

P.O. NO.: VERBAL

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

DATE SAMPLED: 10-NOV-93 DATE RECEIVED: 13-NOV-93

APPROVED BY:

TEST

LN

1

DETERMINATION CODE

RESULT

UNITS

G107W

Benzene Ethylbenzene Toluene m-Xylene

BTEX Package

o-Xylene

p-Xylene Petroleum Hydrocarbons

2,000 \*

0.4

200 ug/L

880 ug/L 910 \*\* ug/L

62 ug/L ug/L

mg/L

1685

COMMENTS: \* The analysis for Benzene was done after the holding time had expired to get a result within the calibration range.

\*\* The compounds m-Xylene and p-Xylene co-elute. The reported result is the

sum of the two.

An Equal Opportunity Employer

900 Gemini Avenue Houston, TX 77058 TEL: 713-488-1810 FAX: 713-488-4661



December 01, 1993

Report No.: 00028994 Section A Page 3

LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

Petroleum Hydrocarbons

ATTENTION: LARRY CAMPBELL

SAMPLE ID: SAND: BORING 7 (20-30')

LSG SAMPLE NO: H0259296

P.O. NO.: VERBAL

3

1685s

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

DATE SAMPLED: 09-NOV-93
DATE RECEIVED: 13-NOV-93

50

APPROVED BY:

L Beyer

mg/kg

TEST CODE DETERMINATION RESULT UNITS LN 1 G107S BTEX Package < 10 Benzene ug/kg Ethylbenzene < 10 ug/kg Toluene < 10 ug/kg m-Xylene < 10 ug/kg o-Xylene < 10 ug/kg < 10 p-Xylene ug/kg



December 01, 1993

Report No.: 00028994

Section A Page 4

LSG CLIENT NO: 0734 0001

PACE PROJECT: H07340001

PACE CLIENT: 620562

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

SAMPLE ID: SAND: BORING 7 (49-59')

DATE SAMPLED: 09-NOV-93

LSG SAMPLE NO: H0259297 DATE RECEIVED: 13-NOV-93

P.O. NO.: VERBAL APPROVED BY: L Beyer

	<u>LN</u>	TEST	DETERMINATION	RESULT	UNITS
1	1	G107S	BTEX Package Benzene Ethylbenzene Toluene m-Xylene	< 10 < 10 < 10 < 10	ug/kg ug/kg ug/kg ug/kg
	3	1685s	o-Xylene p-Xylene Petroleum Hydrocarbons	< 10 < 10 < 20	ug/kg ug/kg mg/kg



February 02, 1994

Report No.: -00000001

Section A Page 1

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

SAMPLE ID: SAND: BORING 7 (59-64')

SAMPLE NO: H259298

LIMS CLIENT: 0734 0001

PACE PROJECT: HO7340001

PACE CLIENT: 620562

P.O. NO: VERBAL

DATE SAMPLED: 10-NOV-93

DATE RECEIVED: 13-NOV-93

TEST

LN CODE

DETERMINATION

RESULT UNITS

1 G107S BTEX Package

Benzene Ethylbenzene

Toluene m-Xylene

o-Xylene p-Xylene

3 I685S Petroleum Hydrocarbons

13 000 un/k

13,000 ug/kg 24,000 ug/kg

65,000 ug/kg 96,000 \* ug/kg 35,000 ug/kg

> \* ug/kg 470\* mg/kg

COMMENTS: \* Sample was rerun due to lab error.

\* The compounds m-Xylene and p-Xylene co-elute. The reported result is the

sum of the two.



December 01, 1993

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#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

LSG CLIENT NO: 0734 0001 PACE PROJECT: H07340001

PACE CLIENT: 620562

ATTENTION: LARRY CAMPBELL

SAMPLE ID: GRD. WTR. BORING 8

DATE SAMPLED: 10-NOV-93

DATE RECEIVED: 13-NOV-93

LSG SAMPLE NO: H0259303 P.O. NO.: VERBAL

APPROVED BY:

L Beyer

TEST
 CODE

	<u>LN</u>	CODE	DETERMINATION	RESULT	UNITS
	1	G107W	BTEX Package		
			Benzene	720	ug/L
			Ethylbenzene	< 10 *	ug/L
•			Toluene	25	ug/L
•			m-Xylene	42 **	ug/L
			o-Xylene	< 10	ug/L
			p-Xylene	**	ug/L
	3	1685	Petroleum Hydrocarbons	0.7	mg/L

- COMMENTS: \* The detection limits were elevated due to the dilution required because
  - of the high concentrations of target analytes.
  - \*\* The compounds m-Xylene and p-Xylene co-elute. The reported result is

the sum of the two.



December 01, 1993

Report No.: 00028994

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LSG CLIENT NO: 0734 0001

PACE PROJECT: HO7340001

PACE CLIENT: 620562

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

SAMPLE ID: SAND: BORING 8 (54-59')

DATE SAMPLED: 10-NOV-93

LSG SAMPLE NO: H0259299

P.O. NO.: VERBAL

DATE RECEIVED: 13-NOV-93

APPROVED BY: L Beyer

	<u>LN</u>	TEST	DETERMINATION	RESULT	UNITS
	1	G107S	BTEX Package Benzene	< 10	ug/kg
1			Ethylbenzene Toluene m-Xylene	< 10 < 10 < 10	ug/kg ug/kg ug/kg
	3	16858	o-Xylene p-Xylene Petroleum Hydrocarbons	< 10 < 10 < 20	ug/kg ug/kg mg/kg



00028994 Report No.:

Section A Page 7

#### LABORATORY ANALYSIS REPORT

CLIENT NAME: TRANSWESTERN PIPELINE COMPANY

ADDRESS: P.O. BOX 1717

ROSWELL, NM 88202-1717

ATTENTION: LARRY CAMPBELL

SAMPLE ID: SAND: BORING 8 (62-64')

LSG SAMPLE NO: H0259300 P.O. NO.: VERBAL

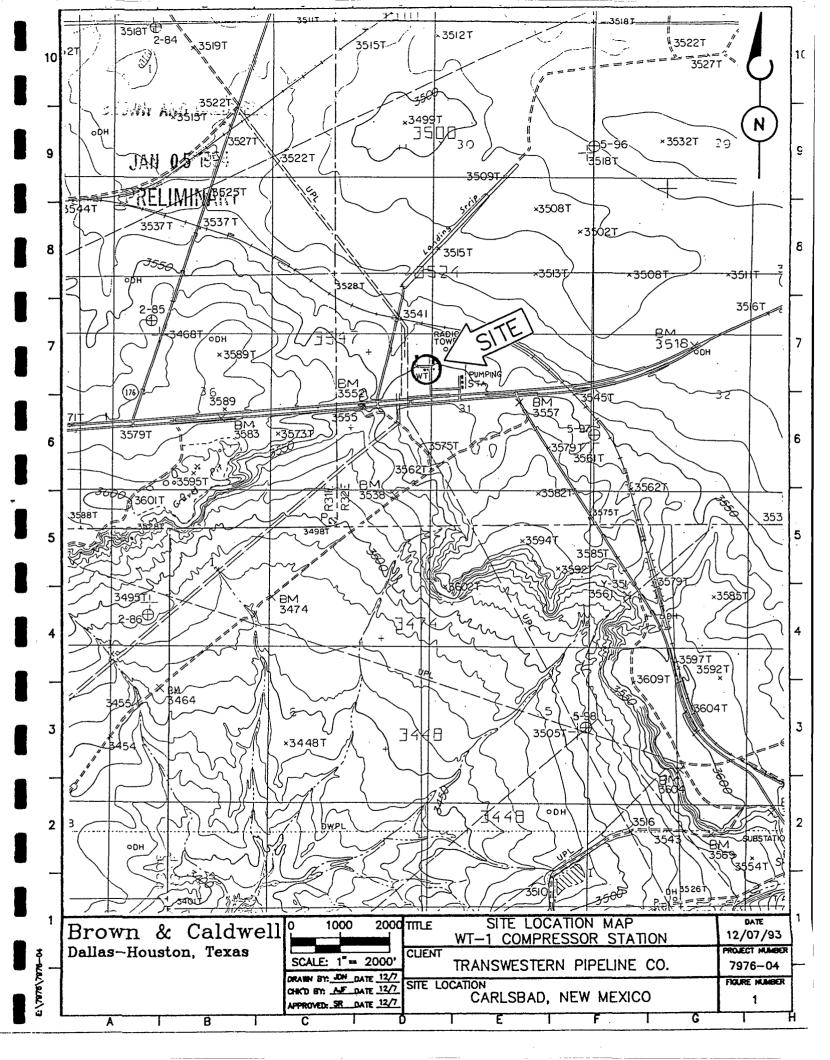
PACE PROJECT: H07340001 PACE CLIENT: 620562

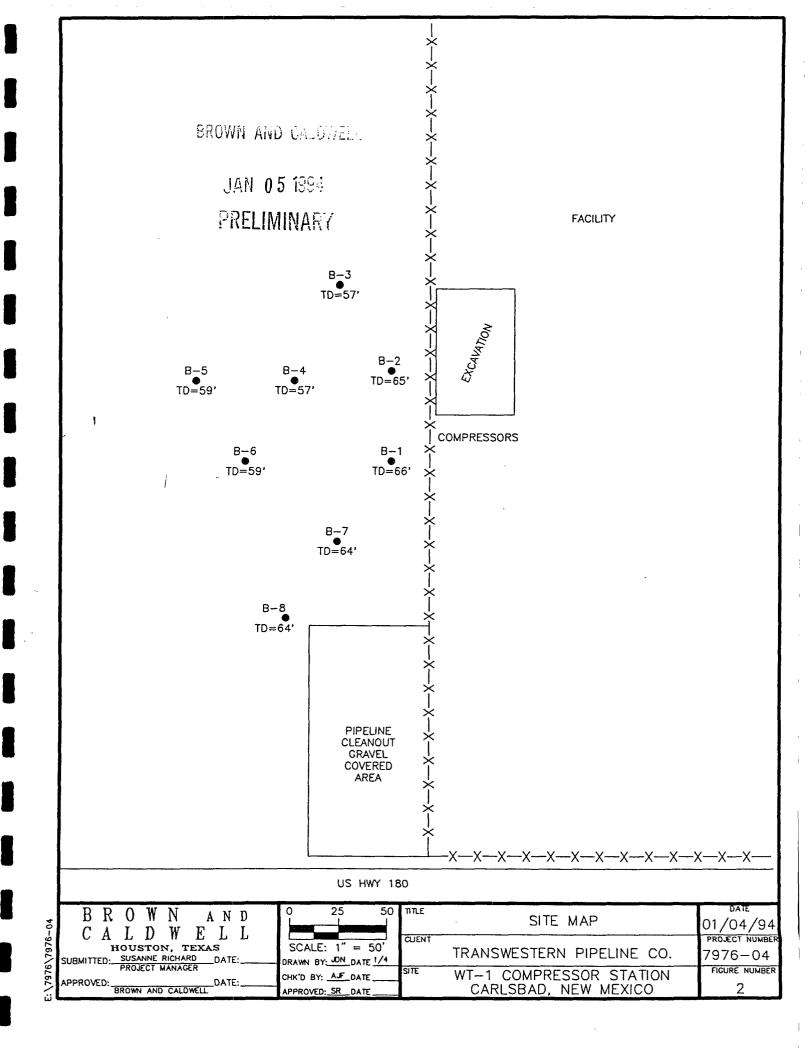
LSG CLIENT NO: 0734 0001

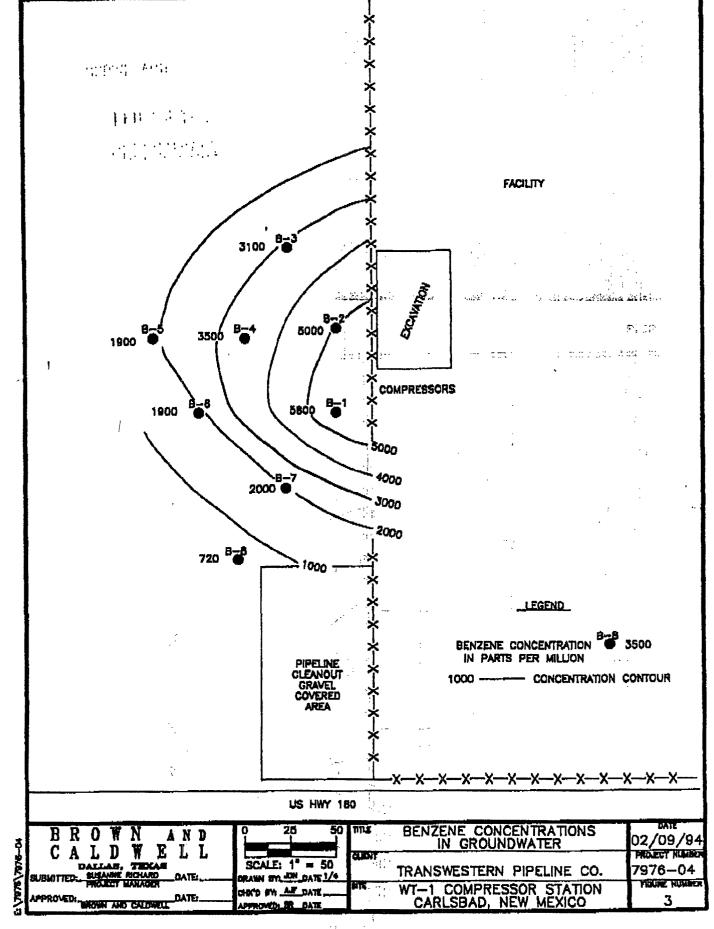
DATE SAMPLED: 10-NOV-93

DATE RECEIVED: 13-NOV-93 APPROVED BY: L Beyer

TEST RESULT DETERMINATION <u>LN</u> G107S BTEX Package 1 ug/kg < 10 Benzene < 10 ug/kg Ethylbenzene < 10 ug/kg Toluene < 10 ug/kg m-Xylene < 10 ug/kg o-Xylene ug/kg < 10 p-Xylene < 20 1685s Petroleum Hydrocarbons mg/kg







PROJECT M	MISER 7975-04	LO	G OF	EXP	LORAT		BORI	*		:	
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PROJECT NA	AME WT-1 Transmester	n Compres	yar <b>it</b> a	tion,	Garlshad, )	IRM MYXICS TOTAL DEFTH 55,4
MY A. Feur	P				DATE 11/18	/93 SURFACE ELEV. 9 FT
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	Grilling Hethod; H Grilling Equipment					
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ряружат му	MSER 7975-04		LO	3 OF	EXP	PLORATORY BORING
PROJECT NA	ME WT-1 Transweater	n Compres	sor Bla	tion, C	iorlybad, H	New Mewico TOTAL DESTH 57.0
GY A. FEET					OATE 11/35	±/93 \$LDUACE ELEV. Q FT
ENCHESO	FID (坪M)	GHOUND NATES!	DEPTY EN FT.	STANS	LITHO- GRAPHIC COLUMN	DESCRIPTION
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			10			
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50/8	600					Light-red sandstand
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			25			
CORE	1	3	30			white Moliles
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	1		45		410414041	CORE: Red sandstone
COPE	16	:	50		**************************************	
		<u></u>	55	\$7_		
Penaäke:	Orthing Contract Orthing Has Cons Orthing Method: Orthing Reviews	er Kollow St	.am Auge			

PAGUECT I	MARIER 7978-04		LO	3 DI	FEXE	LORATORY BORING BDRIMG NO. 8-4	•
PROJECT (	NAME WT-S Transmission	rn Çempres	or Sta	tion, (	Carlabad, A	WHENICO TOTAL DEPTH 87.0	· ·
by A. Fer	ar		_		DATE 11/12	93 SURFACE CLEV. O FT	
ILDH'S		1			LITHO-		
ICOUNT/ INCHES)	(FFU)	BROONS WATER LEYELS	DEPTH In FT.	SUPPLES	Shaphic Column	DESCRIPTIO	N :
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,					1	्र श <del>क्कों अस्तर्भवता गरानकः कार्यः । १००० वर्षः कार्यः । १००० वर्षः कार्यः । १००० वर्षः कार्यः । १००० वर्षः कार्य</del>	rem er fri erig afrene mit bit.
20/15	80	2	۰		00000	Raddish brown wandstone and gravel	
	,				******	No semple	
	1			_	<b>i</b> . i		
		5	5		1	Sec. 4	
					1,44	er Hemmelyett (2000-to 100 miller)	e e e e e e e e e e e e e e e e e e e
		3	·			COME: Light red to rendien brown sends	tone
care		1				<u>.</u>	•
Office	1	1			*********		1
		31	<u></u>				1 7 7 8, 20 84 1 7
	}					CORE: Raddish brown sendatons	
	1	4	o		*********	•	,
CORE	20						•
					-44724447		•
		4	5		*********	• •	** *
	:				*********	CORE: Reddish brown wandstone, moint	
	-	_					
CORK	1000	5	·		************ **********		
			3	$\overline{\Box}$	*****		
		5	5		*********		
		<u>L</u>					
RENARKE:	Orilling Contract Orillar: Wes Cove		Env\$ron	imenta:	,		
	D-1111ng Mstnad:	Hollow Sta		•	,		
	Orilling Equipmen	t: Falling	75		·		

		L	LOG OF	F EXP	LORATOR	Y BORING	3	
PROJECT N	MBER 7978-04					BORING NO. B-5		
PROJECT N	AME WT-1 Yranswaster	a Compressor	- Station, C	arlabed, N	ustagN we	TOTAL DEPTH 89.	8	
BY R. Fon	r			DATE 31/35/	<b>'1</b> 3	SURFACE ELEV.	0 FT	
BLOVE				LITHO-	•			
(COUNT/	ejū Ota	BROUND BATER LEVELS	H FF.	SHAPHIC	•	DES	CRIPTION	
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50/8	28	20		*********	A TO MAN TO THE PARTY OF THE PA	rown sandstons		Therese He is the stiff of the
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]		E.J		]	i merelja je			
					anders of a same of	4		The second second second
		30						
}					COPAL Rad	dish brown sends	tone:	
		35		*********	<del>nama</del> (2000 - 12) See See See See See			
CORE	•			********	. •		•	
		40		••••••				
					CORE; Red	dish brown sands		
		45		*********				
CORE	4							. ;
		50		414441444				
				*********	1	l sandatome - boi:	••	•
			77					
CORE	5	55		*********	· . :			
			_	420000000				
		7.177						
REMARKS	Orilling Contract: Oriller: Wes Coun		rironments!					
	Orilling Muchod: (	Hollow Stam						
	Orilling Equipmen	t; F#1110g F	' <b>.</b>					<u>·</u>

PROJECT N	к <b>ийся 797</b> 5-04 үм <b>н</b> мү-1 Техпаная	itann Engara	une Br-	tion. I	erlabed. =	BORING NO. 5-6  BU MEXICO TOTAL DEPTH 89.0	:
57 A. 766		CELLI CORPLES			DAYE \$1/18.		-!
CHIL	<u> </u>				T	•	
count/	PID			n	LITHO- MAPHIC		
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1	}	<b>)</b>			]	Superior de Service succession of the service	
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		1			1 .	· ·	
			01			CORE: Light red to reddish prove contolidated menda	iton
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CORE	9	<u> </u>	35		********	Carried Control of the Control of th	4
					*******		# # <b>  1 *</b>
	}				*********	CORE: Reguish prown sendstone, consolidated with	
CORE	3	1	10			Gravaj	
	1	11					
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CUPIK		i l			********		· · · · · · · · · · · · · · · · · · ·
					*********		
CORE	5	- }}	50				**
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CORE	40	-	55				
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renarks:	Drilling Contr	actori Lavas	Envira	内内的人工作 1	. !		4
	Oriller: Wes S	Contract.			}	,	
	Drilling Metho	di Hellow St ment; Fellin		r	•		

PROJECT N	KIMBER 7976-04		LO	G OI	EXF	LORATORY BORING BORING NO. 8-7
PROJECT N	WANTE WY-: Transmester	a Compre	sor ût.	ilion, (	Carlebad, N	NW MESICO TOTAL DEPTH 84.0
EY A. FRE	ır				DATE 11/10	/SI SURFACE ELEV. O FT
ICOUNT/	F30 SPPN	SECURO LATER LEVELS	. 10 PT.	SZT-MT	LITHO- SRAPHIC COLUMN	DESCRIPTION
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CORE	1		35		********	
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CORE	9		40		*********	COME: Light reddish brawn pendatons, motat
GIME	] *			-	*********	·
			45			
CORE	1				-114111111	1
			50		********	CORE: Light reduish brown eendatons
CORE	90					,
			55		********	/ CORE Continued from 59 feet, change in lithology
CORE	46		مبہ تال	₩.		
CDAE	\$000		60		<b></b>	
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PEHARKE:	Oriling Contract Orilian was Cows		Enviro	meen La		
	Ortlling Wathod:	Hollow Bi		ir	<u> </u>	
	Drilling Equipmen	t: F4111	ng fil		İ	

PROJECT N	LMBER 7976-04		LOC	3 OI	EXF	LORATORY BORING BORING MG. B-8
PROJECT N	AME NT-1 Transmister	o Dospræs	aer Sta	tion, (	Carlyhed, H	WE MEXICO TOTAL DEPTH E4.0
MY A. FOR	r				DATE 11/10	/93 SURFACK ELEV. 0 FT
BLOWS				•	LITHO-	
(CDUNT/	FIO	ENDLING INVIER LEVELS	ĘĽ	STAME	SRAPHIC	DESCRIPTION
INCHES)	(PPIG	859	SEPTH EN FT.	3	COLLIMI	
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CORE	80	[	55			1 · ' · ·
				$\exists$	*********	[/ <sup>/</sup>
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REMARKS:	Drilling Contract	or: Leyne	Enviro	namotá l	i	
	Driller: Hea Cons	<b>∓</b> r			7.	The second section of the section of the second section of the section of t
	Drilling Mathest			•	1	· •
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ANTE SIJIPUTAN SUMPLE ELEV., O FT  LONG ST. 1710  SEE ST. ST. ST. ST. ST. ST. ST. ST. ST. ST.	PROJECT NA	JASER 7976-04 AMÉ NT-1 Transwister	rn Gemprei	iger Sti	ston (	Carlybad, N	BORING NO. 2-8
CONTE A  CONTE B  CONTE A  CONTE B  CON			·				<u>`</u>
20  25  26  27  28  28  29  20  20  21  20  20  21  20  20  21  20  20	DUMT/		GROUND HATER LEVILE	GEPTH DX FT.	. STHEKTS	\$RAPHIC	
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CORE 2  45							a procession of the second second second second second second second second second second second second second
CORE So  CORE So  CORE So  CORE Reddien brown/preen sandatona, moist  CORE So  CO	COME	2					
CORE BO	CORE	2		50	<u> </u>	***************************************	GORE: Reddish brown/green sandatuna, Roist
		<b>80</b>		٠			, / Reddien brown milty clay, maist
CORE 1000		1000			3	**********	



November 24, 1993 Report No.: 00028884

Section B Page 1

### QUALITY CONTROL REPORT SUPPLEMENTAL INFORMATION

----- SAMPLE PREPARATION ------ SAMPLE ANALYSIS ------TEST LR-LN CODE BATCH METHOD DATE/TIME ANALYST METHOD DATE/TIME ANALYST BATCH INSTRUMENT SAMPLE ID: SOIL BORING-1 (42-46) LSG SAMPLE NO: H0258748 1685S 35865 19-3550 02-418.1 18-NOV-93 1300 Rus 35865 302WAT OVAROS 35647 19-8240 11-NOV-93 1820 E M 35480 GCMSQ LR Method Literature Reference EPA-Methods for Chemical Analysis of Water & Wastes, 1984. 19 EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986 SAMPLE ID: SOIL BORING-1 (51-56) LSG SAMPLE NO: H0258749 3 1685s 35865 19-3550 02-418.1 18-NOV-93 1300 Rus 35865 302WAT OVAROS 35647 19-8240 11-NOV-93 1845 E M 35480 GCMSQ Method Literature Reference EPA-Methods for Chemical Analysis of Water & Wastes, 1984. EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986 SAMPLE ID: SOIL BORING-2 (5-10) LSG SAMPLE NO: H0258750 1685S 35865 19-3550 02-418.1 18-NOV-93 1300 Rus 35865 302WAT OVAROS 35647 NA 19-8240 11-NOV-93 1915 E M 35480 GCMSQ Method Literature Reference LR EPA-Methods for Chemical Analysis of Water & Wastes, 1984. EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986 SAMPLE ID: SOIL BORING-2 (60-65) LSG SAMPLE NO: H0258751 02-418.1 18-NOV-93 1300 Rus 1685S 35865 19-3550 35865 302WAT OVAROS 35673 19-8240 12-NOV-93 1939 E M 35581 GCMSQ

Method Literature Reference



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### QUALITY CONTROL REPORT SUPPLEMENTAL INFORMATION

TEST LR- LN CODE BATCH METHOD DATE/TIME ANALYST METHOD DATE/TIME ANALYST METHOD DATE/TIME ANALYST BATCH INSTRUMENT

LR Method Literature Reference

02 EPA-Methods for Chemical Analysis of Water & Wastes, 1984.

19 EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986

SAMPLE ID: SOIL BORING-3 (20-30)

LSG SAMPLE NO: H0258752

3 I685\$ 35865 19-3550

02-418.1 18-NOV-93 1300 Rus

35865 302WAT

4 OVAROS 35647 NA

19-8240 11-NOV-93 2004 E M

35581 GCMSQ

LR Method Literature Reference

02 EPA-Methods for Chemical Analysis of Water & Wastes, 1984.

19 EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986

SAMPLE ID: SOIL BORING-3 (47-57)

LSG SAMPLE NO: H0258753

3 I685S 35865 19-3550

02-418.1 18-NOV-93 1300 Rus

35865 302WAT

4 OVAROS 35673 NA

19-8240 12-NOV-93 1639 E M

35581 GCMSQ

LR <u>Method Literature Reference</u>

02 EPA-Methods for Chemical Analysis of Water & Wastes, 1984.

19 EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986

SAMPLE ID: SOIL BORING-4 (19-21)

LSG SAMPLE NO: H0258754

3 I685S 35865 19-3550 4 OVAROS 35647 NA 02-418.1 18-NOV-93 1300 Rus

19-8240 11-NOV-93 2056 E M

35865 302WAT 35581 GCMSQ

LR Method Literature Reference



November 24, 1993

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Section B Page 3

### QUALITY CONTROL REPORT SUPPLEMENTAL INFORMATION

TEST LR- LN CODE BATCH METHOD DATE/TIME ANALYST METHOD DATE/TIME ANALYST BATCH INSTRUMENT

LR Method Literature Reference

02 EPA-Methods for Chemical Analysis of Water & Wastes, 1984.

19 EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986

SAMPLE ID: SOIL BORING-4 (47-57)

LSG SAMPLE NO: H0258755

**3** 1685\$ 35865 19-3550

02-418.1 18-NOV-93 1300 Rus

35865 302WAT

4 OVAROS 35673 NA

19-8240 12-NOV-93 1704 E M

35581 GCMSQ

LR | Method Literature Reference

02 EPA-Methods for Chemical Analysis of Water & Wastes, 1984.

19 EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986

SAMPLE ID: SOI/L BORING-5 (20-30)

LSG SAMPLE NO: H0258756

3 I685S 35865 19-3550

02-418.1 18-NOV-93 1300 Rus 19-8240 11-NOV-93 2148 E M 35865 302WAT 35581 GCMSQ

4 OVAROS 35647 NA

Method Literature Reference

D2 EPA-Methods for Chemical Analysis of Water & Wastes, 1984.

19 EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986

SAMPLE ID: SOIL BORING-5 (52-59)

LSG SAMPLE NO: H0258757

3 I685S 35865 19-3550 4 OVAROS 35673 NA 02-418.1 18-NOV-93 1300 Rus 19-8240 12-NOV-93 1729 E M 35865 302WAT 35581 GCMSQ

LR Method Literature Reference



November 24, 1993 Report No.: 00028884

Section B Page 4

#### QUALITY\_CONTROL\_REPORT SUPPLEMENTAL INFORMATION

----- SAMPLE PREPARATION ------ SAMPLE ANALYSIS ------LN CODE BATCH METHOD DATE/TIME ANALYST METHOD DATE/TIME ANALYST BATCH INSTRUMENT Method Literature Reference EPA-Methods for Chemical Analysis of Water & Wastes, 1984. 19 EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986 SAMPLE ID: GRD WTR BORING-1 LSG SAMPLE NO: H0258758 1685 35702 02-418.1 02-418.1 12-NOV-93 1100 T M **302WAT** OVAROW 35783 19-8240 16-NOV-93 1840 J P 35645 GCMSR LR Method Literature Reference EPA-Methods for Chemical Analysis of Water & Wastes, 1984. EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986 SAMPLE ID: GRD WTR BORING-2 LSG SAMPLE NO: H0258759 1685 35702 02-418.1 02-418.1 12-NOV-93 1100 T M **302WAT** OVAROW 35783 NA 19-8240 16-NOV-93 1908 J P 35645 GCMSR Method Literature Reference 02 EPA-Methods for Chemical Analysis of Water & Wastes, 1984. EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986 SAMPLE ID: GRD WTR BORING-3 LSG SAMPLE NO: H0258760 1685 35702 02-418.1 02-418.1 12-NOV-93 1100 T M 0 **302WAT** 19-8240 16-NOV-93 1937 J P OVAROW 35783

35645 GCMSR

Method Literature Reference



November 24, 1993 Report No.: 00028884

Section B Page 5

# QUALITY CONTROL REPORT SUPPLEMENTAL INFORMATION

TEST LR- LR- LR- LR- ANALYST METHOD DATE/TIME ANALYST BATCH INSTRUMENT

LR Method Literature Reference

02 EPA-Methods for Chemical Analysis of Water & Wastes, 1984.

19 EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986

SAMPLE ID: GRD WTR BORING-4

LSG SAMPLE NO: H0258761

3 1685 35702 02-418.1

02-418.1 12-NOV-93 1100 T M

302WAT

4 OVAROW 35783 NA

19-8240 16-NOV-93 2005 J P

35645 GCMSR

LR Method Literature Reference

02 EPA-Methods for Chemical Analysis of Water & Wastes, 1984.

19 EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986

SAMPLE ID: GRD WTR BORING-5

LSG SAMPLE NO: H0258762

3 1685 35702 02-418.1

02-418.1 12-NOV-93 1100 T M

302WAT

4 OVAROW 35683 NA

19-8240 13-NOV-93 109 J P

35645 GCMSR

LR Method Literature Reference

02 EPA-Methods for Chemical Analysis of Water & Wastes, 1984.

19 EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986



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Section C Page 1

# QUALITY CONTROL REPORT SURROGATE STANDARD RECOVERY

		TEST	SURROGATE	PERCENT	ACCEPTANCE	REF
	LN		COMPOUND	RECOVERY	LIMITS	LN
SAMPLE	ID:	SOIL	BORING-1 (42-46)	LSG SAMPLE NO:	H0258748	
	5	\$VOAS	GC/MS Volatiles Surrogates			4
			1,2-Dichloroethane-d4	*	-	
			4-Bromofluorobenzene	*	-	
٤			Toluene-d8	*	-	
* The	surr	ogates	were not recovered due to the dilution required because of			
the h	igh a	nalyte	concentration.			
04WD: 5	7.5		DODING 4 (E4 E/)	100 044015 40		
SAMPLE	19:	SOIL	BORING-1 (51-56)	LSG SAMPLE NO:	HU258749	
1	5	<b>PUOAC</b>	GC/MS Volatiles Surrogates			,
,	2	ΦVUAS		*		4
			1,2-Dichloroethane-d4 4-Bromofluorobenzene		-	
			Toluene-d8		•	
* **			were not recovered due to the dilution required because of	•	-	
			concentration.			
the n	ign u	natytt	concentration.			
SAMPLE	ID:	SOIL	BORING-2 (5-10)	LSG SAMPLE NO:	H0258750	
	5	\$VOAS	GC/MS Volatiles Surrogates			4
			1,2-Dichloroethane-d4	107	-	
			4-Bromofluorobenzene	112	•	
			Toluene-d8	87	-	
SAMPLE	ID:	SOIL	BORING-2 (60-65)	LSG SAMPLE NO:	H0258751	
	-	#WOAC	CC/NC Valatiles Currentes			
	5	∌VUA5	GC/MS Volatiles Surrogates			4
			1,2-Dichloroethane-d4	80	•	
			4-Bromoftuorobenzene	90	-	
			Toluene-d8	86	-	
CAMDI F	ın.	enti i	BORING-3 (20-30)	LSG SAMPLE NO:	U03E07E3	
SAMPLE	10.	3011	3 (E0 30)	LOG SAMPLE NU:	HU230/32	
	5	\$VOAS	GC/MS Volatiles Surrogates			4
	-		1,2-Dichloroethane-d4	106	_	•
			4-Bromofluorobenzene	96	_	
			Toluene-d8	96	_	
				,,		
SAMPLE	ID:	SOIL F	BORING-3 (47-57)	LSG SAMPLE NO:	H0258753	
	5	\$VOAS	GC/MS Volatiles Surrogates			4
			1,2-Dichloroethane-d4	98	•	
			4-Bromofluorobenzene	104	-	



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# QUALITY CONTROL REPORT SURROGATE STANDARD RECOVERY

	. <b></b> .				
		TEST SURROGATE	PERCENT	ACCEPTANCE	REF
	LN	CODE COMPOUND	RECOVERY	LIMITS	LN
		Toluene-d8	107	•	
SAMPLE	ID:	SOIL BORING-4 (19-21)	G SAMPLE NO:	H0258754	
	5	\$VOAS GC/MS Volatiles Surrogates			4
		1,2-Dichloroethane-d4	100	-	
		4-Bromofluorobenzene	87	•	
		Toluene-d8	87	-	
SAMPLE	ID:	SOIL BORING-4 (47-57)	G SAMPLE NO:	H0258755	
	_				_
3	5	\$VOAS GC/MS Volatiles Surrogates			4
. ,		1,2-Dichloroethane-d4	110	•	
•		4-Bromofluorobenzene	101	-	
		Toluene-d8	101	-	
CAMPLE	<b>1</b> D.	SOIL BORING-5 (20-30)		1100F07F (	
SAMPLE	10:	2015 ROKING-2 (50-20)	G SAMPLE NO:	н0258756	
	5	\$VOAS GC/MS Volatiles Surrogates			,
	•	1,2-Dichloroethane-d4	104	_	4
		4-Bromofluorobenzene	90	-	
		Toluene-d8	90	-	
		Totache ab	77	-	
SAMPLE	ID:	SOIL BORING-5 (52-59)	G SAMPLE NO:	H0258757	
·····			d SAMEL NO.	110230737	
	5	\$VOAS GC/MS Volatiles Surrogates			4
		1,2-Dichloroethane-d4	108	-	•
		4-Bromofluorobenzene	101	-	
		Toluene-d8	107	-	
SAMPLE	ID:	GRD WTR BORING-1	G SAMPLE NO:	H0258758	
	5	\$VOAW GC/MS Volatiles Surrogates			4
		1,2-Dichloroethane-d4	97	-	
		4-Bromofluorobenzene	103	•	
		Toluene-d8	97	-	
SAMPLE	ID:	GRD WTR BORING-2	G SAMPLE NO:	H0258759	
	_	duptil on the trailing of the			
	5	\$VOAW GC/MS Volatiles Surrogates			4
		1,2-Dichloroethane-d4	101	•	
		4-Bromofluorobenzene	105	•	
		Toluene-d8	104	-	



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# QUALITY CONTROL REPORT SURROGATE STANDARD RECOVERY

	LN	TEST SURROGATE CODE COMPOUND	PERCENT RECOVERY	ACCEPTANCE LIMITS	REF LN
SAMPLE	ID:	GRD WTR BORING-3	LSG SAMPLE NO:	но258760	
	5	\$VOAW GC/MS Volatiles Surrogates			4
		1,2-Dichloroethane-d4	97	-	
		4-Bromofluorobenzene	96	-	
		Toluene-d8	96	-	
SAMPLE	ID:	GRD WTR BORING-4	LSG SAMPLE NO:	H0258761	
	5	\$VOAW GC/MS Volatiles Surrogates			4
		1,2-Dichloroethane-d4	99	-	
3		4-Bromofluorobenzene	92	-	
		Toluene-d8	94	-	
SAMPLE	ID:	GRD WTR BORING-5	LSG SAMPLE NO:	H0258762	
	5	\$VOAW GC/MS Volatiles Surrogates			4
	,	1,2-Dichloroethane-d4	96	•	
		4-Bromofluorobenzene	93	•	
		Toluene-d8	104	-	



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# QUALITY CONTROL REPORT LABORATORY CONTROL SAMPLE RECOVERY

RECOVERY   LIMITS	TEST	PERCENT	ACCEPTANCE	
### BATCH: 35647 SAMPLE ID: Lab Control Sample   LsG SAMPLE NO: MO259846      OVARO				
OVARO   Volatile Aromatics   1,1-Dichloroethene   99				
1,1-Dichloroethene   99	BATCH: 35647 SAMPLE ID: Lab Control Sample		LSG SAMPLE NO:	н0259846
Benzene   Chlorobenzene   92	OVARO Volatile Aromatics			
Chlorobenzene	1,1-Dichloroethene	99	•	
Toluene   Trichloroethene   102	Benzene	92	-	
Name	Chlorobenzene	94	-	-
OVAID   Volatile Aromatics   1,1-Dichloroethene   100   -	Toluene	102	•	
OVARO   Volatile Aromatics   1,1-Dichloroethene   100   -	Trichloroethene	93	•	
	BATCH: 35673 SAMPLE ID: Lab Control Sample		LSG SAMPLE NO:	но259875
Benzene	OVARO Volatile Aromatics			
Chlorobenzene	1,1-Dichloroethene	100	-	
Toluene   Trichloroethene   98	Benzene	98	-	
Name	Chlorobenzene	101	•	
BATCH: 35683 SAMPLE ID: Lab Control Sample LSG SAMPLE NO: M0259893  OVARCA Volatile Aromatics	Toluene	98	-	
OVARO Volatile Aromatics         1,1-Dichloroethene       93       -         Benzene       90       -         Chlorobenzene       102       -         Toluene       96       -         Trichloroethene       97       -     BATCH: 35702 SAMPLE ID: Lab Control Sample    LSG SAMPLE NO: H0259925         BATCH: 35783 SAMPLE ID: Lab Control Sample       LSG SAMPLE NO: H0261044         OVARO Volatile Aromatics       1,1-Dichloroethene       87       -         Benzene       101       -         Chlorobenzene       103       -         Toluene       96       -	Trichloroethene	101	-	
1,1-Dichloroethene	BATCH: 35683 SAMPLE ID: Lab Control Sample		LSG SAMPLE NO:	н0259893
Benzene	OVARO Volatile Aromatics			
Chlorobenzene   102   -     70 luene   96   -	1,1-Dichloroethene	93		
Toluene   Trichloroethene   96	Benzene	90	-	
Trichloroethene   97	Chlorobenzene	102	•	
BATCH: 35702 SAMPLE ID: Lab Control Sample LSG SAMPLE NO: H0259925  1685 Petroleum Hydrocarbons 95.1 -  BATCH: 35783 SAMPLE ID: Lab Control Sample LSG SAMPLE NO: H0261044  OVARO Volatile Aromatics 1,1-Dichloroethene 87 - Benzene 101 - Chlorobenzene 103 - Toluene 96 -	Toluene	96	•	
BATCH: 35783 SAMPLE ID: Lab Control Sample LSG SAMPLE NO: H0261044  OVARO Volatile Aromatics 1,1-Dichloroethene 87 - Benzene 101 - Chlorobenzene 103 - Toluene 96 -	Trichloroethene	97	-	
BATCH: 35783 SAMPLE ID: Lab Control Sample LSG SAMPLE NO: H0261044  OVARO Volatile Aromatics 1,1-Dichloroethene 87 - Benzene 101 - Chlorobenzene 103 - Toluene 96 -	BATCH: 35702 SAMPLE ID: Lab Control Sample		LSG SAMPLE NO:	H0259925
OVARO Volatile Aromatics 1,1-Dichloroethene 87 - Benzene 101 - Chlorobenzene 103 - Toluene 96 -	1685 Petroleum Hydrocarbons	95.1	-	
1,1-Dichloroethene87-Benzene101-Chlorobenzene103-Toluene96-	BATCH: 35783 SAMPLE ID: Lab Control Sample		LSG SAMPLE NO:	H0261044
Benzene 101 - Chlorobenzene 103 - Toluene 96 -	OVARO Volatile Aromatics			
Chlorobenzene 103 - Toluene 96 -	1,1-Dichloroethene	87	-	
Chlorobenzene 103 - Toluene 96 -	·		•	
	Chlorobenzene		-	
Trichloroethene 90 -	Toluene	96	-	
	Trichloroethene	90	-	



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QUALITY CONTROL REPORT
LABORATORY CONTROL SAMPLE RECOVERY

TEST

CODE DETERMINATION

PERCENT

ACCEPTANCE

RECOVERY

STIMIL

BATCH: 35865 SAMPLE ID: Lab Control Sample

LSG SAMPLE NO: H0261179

1685S Petroleum Hydrocarbons

91



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# QUALITY CONTROL REPORT METHOD BLANK DATA

	TEST	•		
	CODE D	etermination	RESULT	UNITS
, <b></b>				
BATCH: 35647	SAMPLE ID:	Method Blank	LSG SAMPL	E NO: H0259
	OVAROS V	olatile Aromatics		
	В	enzene	< 5	ug/kg
	E	thlybenzene	< 5	ug/kg
	T	oluene	< 5	ug/kg
	m	-Xylene	< 5	ug/kg
		-Xylene	< 5	ug/kg
	F	-Xylene	< 5	ug/kg
BATCH: 35673	SAMPLE ID:	Method Blank	LSG SAMPLE	E NO: H0259
	OVAROS V	olatile Aromatics		
	В	enzene	< 5	ug/kg
	. E	thlybenzene	< 5	ug/kg
	į t	oluene	< 5	ug/kg
	m	-Xylene	< 5	ug/kg
		-Xylene	< 5	ug/kg
		-Xylene	< 5	ug/kg
ATCH: 35683	SAMPLE ID:	Method Blank	LSG SAMPLE	NO: H0259
	OVAROW V	olatile Aromatics	•	
		enzene	< 5	1.m./1
		thylbenzene	· 5	ug/L
		oluene		ug/L
		-Xylene	< 5 < 5	ug/L
		-Xylene		ug/L
		-Xylene	< 5 < 5	ug/L ug/L
ATCH: 35702	SAMPLE ID:	Method Blank	LSG SAMPLE	NO: H0259
	1685 P	etroleum Hydrocarbons	< 0.2	mg/L
ATCH: 35783	SAMPLE ID:	Method Blank	LSG SAMPLE	NO: H0261
	OVAROW V	platile Aromatics		
	В	enzene	< 2	ug/L
	E	thylbenzene	< 2	ug/L
		oluene	< 2	ug/L
		-Xylene	< 2	ug/L ug/L



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QUALITY CONTROL REPORT METHOD BLANK DATA

TEST

CODE Determination RESULT

UNITS

p-Xylene

< 2

ug/L

BATCH: 35865 SAMPLE ID: Method Blank

LSG SAMPLE NO: H0261180

1685s

Petroleum Hydrocarbons

< 20

mg/kg



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## QUALITY CONTROL REPORT MATRIX SPIKE AND MATRIX SPIKE DUPLICATE DATA

ANLS BATCH: 35480					LSG SAMPLE NO:	H0257242
	MS	MSD			MS PCT	MSD PC
TEST DETERMINATION	RESULT	RESULT	UNITS	RPD	RECOVERY	RECOVER
OVAROS 1,1-Dichloroethene	45.9	45.0	ug/kg	1.98	92	90
OVAROS Benzene	54.5	55.7	ug/kg	2.19	109	111
OVAROS Chlorobenzene	46.3	48.1	ug/kg	3.74	93	96
OVAROS Toluene	45.1	47.7	ug/kg	5.59	90	95
OVAROS Trichloroethene	51.0	50.5	ug/kg	0.981	102	101
ANLS BATCH: 35581					LSG SAMPLE NO:	но258719
	MS	MSD			MS PCT	MSD PC
TEST DETERMINATION	RESULT	RESULT	UNITS	RPD	RECOVERY	RECOVER
OVAROS 1,1-Dichloroethene	49.3	52.5	ug/kg	6.28	99	105
OVAROS Benzene	49.9	50.6	ug/kg	1.39	100	101
VAROS Chlorobenzene	48.3	49.9	ug/kg	3.40	97	100
OVAROS Toluene	48.6	50.6	ug/kg	3.94	97	101
VAROS Trichloroethene	52.8	50.5	ug/kg	4.49	106	101
INLS BATCH: 35645					LSG SAMPLE NO:	но257894
	MS	MSD			.MS PCT	MSD PC
TEST DETERMINATION	RESULT	RESULT	UNITS	RPD	RECOVERY	RECOVER
VAROW 1,1-Dichloroethene	57.1	54.4	ug/L	4.86	114	109
VAROW Benzene	53.2	51.8	ug/L	2.52	106	104
VAROW Chlorobenzene	55.2	55.8	ug/L	1.09	110	112
VAROW Toluene	55.1	54.8	ug/L	0.486	110	110
VAROW Trichloroethene	51.1	51.7	ug/L	1.32	102	103



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QUALITY CONTROL REPORT SUPPLEMENTAL INFORMATION

------ SAMPLE PREPARATION ------ SAMPLE ANALYSIS ------LR-ANLS TEST PRFP IR-METHOD DATE/TIME ANALYST BATCH INSTRUMENT LN CODE BATCH METHOD DATE/TIME ANALYST SAMPLE ID: SAND: BORING 6 (20-30') LSG SAMPLE NO: H0259294 19-8020 20-NOV-93 1844 GMW 35929 7287GC 1 G107S 35929 3 1685S 35859 19-3550 02-418.1 18-NOV-93 1950 LJH 35859 302WAT Method Literature Reference EPA-Methods for Chemical Analysis of Water & Wastes, 1984. 02 19 EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986 SAMPLE ID: SAND: BORING 6 (49-59') LSG SAMPLE NO: H0259295 G107S 35929 19-8020 20-NOV-93 1920 GMW 35929 7287GC NA 3 I685S 35859 19-3550 02-418.1 18-NOV-93 1950 LJH 35859 302WAT <u>LR</u> Method Literature Reference EPA-Methods for Chemical Analysis of Water & Wastes, 1984. 19 EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986 SAMPLE ID: SAND: BORING 7 (20-30') LSG SAMPLE NO: H0259296 . 35929 7287GC 19-8020 20-NOV-93 1956 GMW 1 G107S 35929 **3** 1685\$ 35859 19-3550 02-418.1 18-NOV-93 1950 LJH 35859 302WAT Method Literature Reference EPA-Methods for Chemical Analysis of Water & Wastes, 1984. EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986 SAMPLE ID: SAND: BORING 7 (49-59') LSG SAMPLE NO: H0259297 19-8020 20-NOV-93 2033 GMW G107S 35929 NA 35929 7287GC 02-418.1 18-NOV-93 1950 LJH 16858 35859 19-3550 35859 302WAT

LR Method Literature Reference



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## QUALITY CONTROL REPORT SUPPLEMENTAL INFORMATION

LR-TEST PREP LN CODE BATCH METHOD DATE/TIME ANALYST METHOD DATE/TIME ANALYST BATCH INSTRUMENT LR Method Literature Reference EPA-Methods for Chemical Analysis of Water & Wastes, 1984. EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986 SAMPLE ID: SAND: BORING 7 (59-64') LSG SAMPLE NO: H0259298 19-8020 23-NOV-93 47 SLB G107S 36006 NA 35929 7287GC 3 I685s 35859 19-3550 02-418.1 18-NOV-93 1950 LJH 35859 302WAT Method Literature Reference 02 EPA-Methods for Chemical Analysis of Water & Wastes, 1984. 19 EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986 SAMPLE ID: SAND: BORING 8 (54-59') LSG SAMPLE NO: H0259299 1 G107S 35929 NA 19-8020 20-NOV-93 2257 GMW 35929 7287GC 3 1685s 35859 19-3550 02-418.1 18-NOV-93 1950 LJH 35859 302WAT Method Literature Reference EPA-Methods for Chemical Analysis of Water & Wastes, 1984. 19 EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986 SAMPLE ID: SAND: BORING 8 (62-64') LSG SAMPLE NO: H0259300 19-8020 24-NOV-93 1535 GMW G107S 36165 NA 36165 7287GC 3 1685s 35859 19-3550 02-418.1 18-NOV-93 1950 LJH 35859 302WAT

LR Method Literature Reference



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## QUALITY CONTROL REPORT SUPPLEMENTAL INFORMATION

			SAMPLE P	REPARATION			SAM	IPLE AI	NALYSIS	
TEST	PREP	LR-				LR-			ANLS	
N CODE	BATCH	METHOD	DATE/TIME	ANALYST		METHOD	DATE/TIME	ANAL	ST BATCH	INSTRUMEN
R Meth	od Liter	ature Ref	erence							
EPA-	Methods	for Chemic	cal Analysis o	of Water & Wastes,	. 1984.					
			•	id Waste, 3rd ed,	•	1986				
MPLE ID	: GRD.	WTR. BO	RING 6				LSG SAMPLE	NO:	н0259301	
G107\	36087	NA				05-602	25-NOV-93 604	SLB	35804	3618GC
1685	35961	02-418.	1			02-418.1	23-NOV-93 1930	LJH	0	302WAT
Meth	od Litera	ature Ref	erence							
				f Water & Wastes,	, 1984.					
5 EPA-	40 CFR 1	36, Octobe	er 26, 1984.							
AMPLE ID	: GRD.	WTR. BO	RING 7				LSG SAMPLE	NO:	н0259302	
G107h	36179	NA				05-602	24-NOV-93 4	SLB	35329	3618GC
1685	35961	02-418.	1			02-418.1	23-NOV-93 1930	LJH	0	302WAT
R Meth	od Litera	ature Refe	erence							
EPA-	Methods	for Chemic	cal Analysis o	f Water & Wastes,	, 1984.					
5 EPA-	40 CFR 13	36, Octobe	er 26, 1984.							
MPLE ID	: GRD.	WTR. BOF	RING 8				LSG SAMPLE	NO:	н0259303	
G107W	36079	NA				05-602	24-NOV-93 35	SLB	36080	3618GC
1685	35961	02-418.1	1			02-418.1	23-NOV-93 1930	LJH	0	302WAT

LR Method Literature Reference



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## QUALITY CONTROL REPORT SUPPLEMENTAL INFORMATION

			<b></b>							<b>-</b>
					PREPARATION					
		225		JAMPLE P	REPARATION			SAMEL ANALI		
	TEST	PREP	LR-			LR-			ANLS	
LN	CODE	BATCH	METHOD	DATE/TIME	ANALYST	METHOD	DATE/TIME	ANALYST	BATCH INSTRUMENT	T

LR <u>Method Literature Reference</u>

02 EPA-Methods for Chemical Analysis of Water & Wastes, 1984.

05 EPA-40 CFR 136, October 26, 1984.



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## QUALITY CONTROL REPORT SURROGATE STANDARD RECOVERY

		TEST	SURROGATE	PERCENT	ACCEPTANCE	REF
	LN	CODE	COMPOUND	RECOVERY	LIMITS	LN
SAMPLE	ID:	SAND:	BORING 6 (20-30') L	SG SAMPLE NO:	но259294	
	2	\$VARS	GC Volatile Aromatics Surrogate			1
			alpha,alpha,alpha-Trifluorotoluene	99	-	
SAMPLE	ID:	SAND:	BORING 6 (49-59')	SG SAMPLE NO:	н0259295	
	2	\$VARS	GC Volatile Aromatics Surrogate			1
			alpha,alpha,alpha-Trifluorotoluene	94	-	
SAMPLE	ID:	SAND:	BORING 7 (20-30')	SG SAMPLE NO:	H0259296	
	2	\$VARS	GC Volatile Aromatics Surrogate			1
			alpha,alpha,alpha-Trifluorotoluene	97	-	
SAMPLE	ID:	SAND:	BORING 7 (49-59')	SG SAMPLE NO:	н0259297	
	2	\$VARS	GC Volatile Aromatics Surrogate			1
			alpha,alpha-Trifluorotoluene	99	-	
SAMPLE	ID:	SAND:	BORING 7 (59-64')	SG SAMPLE NO:	н0259298	
	2	\$VARS	GC Volatile Aromatics Surrogate		•	1
			alpha,alpha,alpha-Trifluorotoluene	286 *	-	
* The	surr	ogate i	was out of range due to matrix interferences.			
SAMPLE	ID:	SAND:	BORING 8 (54-59')	SG SAMPLE NO:	H0259299	
	2	\$VARS	GC Volatile Aromatics Surrogate			1
			alpha,alpha,alpha-Trifluorotoluene	93	•	
SAMPLE	ID:	SAND:	BORING 8 (62-64')	SG SAMPLE NO:	H0259300	
	2	\$VARS	GC Volatile Aromatics Surrogate			1
			alpha,alpha,alpha-Trifluorotoluene	92	-	
SAMPLE	ID:	GRD.	WTR. BORING 6	SG SAMPLE NO:	н0259301	
	2	\$VARW	GC Volatile Aromatics Surrogate			1
			alpha,alpha,alpha-Trifluorotoluene	101	-	
SAMPLE	ID:	GRD.	WTR. BORING 7	SG SAMPLE NO:	но259302	
	2	\$VARW	GC Volatile Aromatics Surrogate			1



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## QUALITY CONTROL REPORT SURROGATE STANDARD RECOVERY

LN	TEST	SURROGATE COMPOUND	PERCENT RECOVERY	ACCEPTANCE LIMITS	REF LN
		alpha,alpha,alpha-Trifluorotoluene	110	-	
SAMPLE ID	: GRD.	WTR. BORING 8	LSG SAMPLE NO:	но259303	
2	\$VAR	d GC Volatile Aromatics Surrogate alpha,alpha,alpha-Trifluorotoluene	100	-	1



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## QUALITY CONTROL REPORT LABORATORY CONTROL SAMPLE RECOVERY

TEST CODE DETERMINATION	PERCENT RECOVERY	ACCEPTANCE LIMITS	
	•••••		
BATCH: 35859 SAMPLE ID: Lab Control Sample		LSG SAMPLE NO:	но261167
1685S Petroleum Hydrocarbons	101.1	-	
BATCH: 35929 SAMPLE ID: Lab Control Sample		LSG SAMPLE NO:	н0261289
G107S BTEX Package			
Benzene	88	-	
Ethylbenzene	89	-	
Toluene	90	-	
m-Xylene	93 *	•	
o-Xylene	93	-	
p-Xylene	*	• .	
* The compounds m-Xylene and p-Xylene co-elute. The reported result is the			
sum of the two.			
BATCH: 35961 SAMPLE ID: Lab Control Sample		LSG SAMPLE NO:	H0261332
I685 Petroleum Hydrocarbons	104	_	
1005 Feel ocean nyarocarbons	104		
BATCH: 36006 SAMPLE ID: Lab Control Sample		LSG SAMPLE NO:	но261411
G107S BTEX Package		•	
Benzene	88	-	
Ethylbenzene	88	•	
Toluene	88	-	
m-Xylene	92 *	•	
o-Xyl ene	91	•	
p-Xyl ene	*	-	
* The compounds m-Xylene and p-Xylene co-elute. The reported result is the			
sum of the two.			•
BATCH: 36079 SAMPLE ID: Lab Control Sample		LSG SAMPLE NO:	но261530
G107W BTEX Package			
Benzene	116	•	
Ethylbenzene	116	•	
Toluene	115	-	
m-Xylene	119 *		
o-Xylene	115	-	
p-Xylene	*	-	
F 11,1010			



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## QUALITY CONTROL REPORT DUPLICATE AND MATRIX SPIKE DATA

PREP BATCH: 36079		LSG SAMPLE NO:	H0261530
* The compounds m-Xylene and p-Xylene co-elute.	The reported result is the		
sum of the two.			
DATON 7/007 CAMPLE ID. Lab Campaul Comple			1103/45//
BATCH: 36087 SAMPLE ID: Lab Control Sample		LSG SAMPLE NO:	HU201540
G107W BTEX Package			
Benzene	90	•	
Ethylbenzene	90	-	
Toluene	89	-	
m-Xylene	98 *	-	
o-Xylene	92	-	
p-Xylene	*	•	
* The compounds m-Xylene and p-Xylene co-elute.	The reported result is the		
sum of the two.	·		
BATCH: 36165 SAMPLE ID: Lab Control Sample		LSG SAMPLE NO:	но261686
G107S BTEX Package			
Benzene	98	-	
Ethylbenzene	102	-	
Toluene	100	-	•
m-Xylene	103 *	-	
o-Xyl ene	100	. <del>-</del>	
p-Xyl ene	*	-	
* The compounds m-Xylene and p-Xylene co-elute. sum of the two.	The reported result is the		
Sun of the two.			
BATCH: 36179 SAMPLE ID: Lab Control Sample		LSG SAMPLE NO:	но261710
G107W BTEX Package			
Benzene	90	-	
Ethylbenzene	90	-	
Toluene	89	•	
m-Xylene	98 *	-	
o-Xylene	92	-	
p-Xylene	*	-	
* The compounds m-Xylene and p-Xylene co-elute.	The reported result is the		
sum of the two.			



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#### QUALITY CONTROL REPORT METHOD BLANK DATA

	TEST CODE Determination	RESULT UNITS
BATCH: 35859	SAMPLE ID: Method Blank	LSG SAMPLE NO: H0261168
	1685S Petroleum Hydrocarbons	< 20 mg/kg
BATCH: 35929	SAMPLE ID: Method Blank	LSG SAMPLE NO: H0261290
	G107S BTEX Package	
	Benzene	< 10 ug/kg
	Ethylbenzene	< 10 ug/kg
	Toluene	< 10 ug/kg
	m-Xylene	< 10 ug/kg
1	o-Xyl ene	< 10 ug/kg
	p-Xyl ene	< 10 ug/kg
BATCH: 35961	SAMPLE ID: Method Blank	LSG SAMPLE NO: H0261333
	I685 Petroleum Hydrocarbons	< 0.2 mg/L
BATCH: 36006	SAMPLE ID: Method Blank	LSG SAMPLE NO: H0261412
	G107S BTEX Package	
	Benzene	< 10 ug/kg
	Ethylbenzene	< 10 ug/kg
	Toluene	< 10 ug/kg
	m-Xylene	< 10 ug/kg
	o-Xylene	< 10 ug/kg
	p-Xylene	< 10 ug/kg
BATCH: 36079	SAMPLE ID: Method Blank	LSG SAMPLE NO: H0261531
	G107W BTEX Package	
	Benzene	< 2 ug/L
	Ethylbenzene	< 2 ug/L
	Toluene	< 2 ug/L
	m-Xylene	< 2 ug/L
	o-Xylene	< 2 ug/L
	p- Xyl ene	< 2 ug/L
BATCH: 36087	SAMPLE ID: Method Blank	LSG SAMPLE NO: H0261547
	G107W BTEX Package	
	BTEX (Total)	< 6 ug/L



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Section E Page 2

## QUALITY CONTROL REPORT METHOD BLANK DATA

	TEST			
	CODE	Determination	RESULT	UNITS
		Benzene	< 1	ug/L
		Ethylbenzene	< 1	ug/L
		Toluene	< 1	ug/L
		m-Xylene	< 1	ug/L
		o-Xylene	< 1	ug/L
		p-Xylene	< 1	ug/L
BATCH: 36165	SAMPLE	ID: Method Blank	LSG SAMPLE	NO: H0261687
	G107S	BTEX Package		
		Benzene	< 10	ug/kg
		Ethylbenzene	< 10	ug/kg
1		Toluene	< 10	ug/kg
		m-Xylene	< 10	ug/kg
		o-Xyl ene	< 10	ug/kg
	1	p-Xyl ene	< 10	ug/kg
BATCH: 36179	SAMPLE	ID: Method Blank	LSG SAMPLE	NO: H0261711
	G107W	BTEX Package	•	
		Benzene	< 2	ug/L
		Ethylbenzene	< 2	ug/L
		Toluene	.< 2	ug/L
		m-Xylene	< 2	ug/L
		o-Xyl ene	< 2	ug/L
		p-Xyl ene	< 2	ug/L



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Section F Page 1

QUALITY CONTROL REPORT
DUPLICATE AND MATRIX SPIKE DATA

PREP BATCH: 35859

LSG SAMPLE NO: H0259296

RANGE / MS % ORIGINAL DUPLICATE MS RESULT RPD RCVRY <u>TEST</u> DETERMINATION RESULT UNITS UNITS <u>RESULT</u> 1685S Petroleum Hydrocarbons mg/kg 10 mg/kg 82.2



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## QUALITY CONTROL REPORT MATRIX SPIKE AND MATRIX SPIKE DUPLICATE DATA

REP BATCH: 35929					LSG SAMPLE NO:	H0259294
	MS	MSD			MS PCT	MSD PC
TEST DETERMINATION	RESULT	RESULT	UNITS	RPD	RECOVERY	RECOVER
107S Benzene	0.0109	0.0104	mg/kg	4.69	54 *	52 *
07S Ethylbenzene	0.0137	0.0119	mg/kg	14.1	68	60 *
07S Toluene	0.0109	0.00956	mg/kg	13.1	54 *	48 *
07S m-Xylene	0.0111	0.00956	mg/kg	14.9	56 *	48 *
07S o-Xylene	0.0111	0.00932	mg/kg	17.4	56 *	47 *
07S p-Xylene	0.0109	0.00901	mg/kg	18.9	54 *	45 *
Recovery of the spike indicates the p		ix interference	e.			
his should be considered in evaluating	the data.					
1						
† REP BATCH: 35929		••••			LSG SAMPLE NO:	но259299
	мs	MSD			MS PCT	MSD PC
<u>EST</u> <u>DETERMINATION</u>	RESULT	RESULT	UNITS	<u>RPD</u>	MS PCT RECOVERY	MSD PCT
EST DETERMINATION 07S Benzene	RESULT 17.3	RESULT 16.4	ug/kg	<u>RPD</u> 5.34	MS PCT RECOVERY 86	MSD PCT RECOVERY 82
<u>DETERMINATION</u> 07S Benzene 07S Ethylbenzene	RESULT 17.3 17.3	RESULT 16.4 15.0	ug/kg ug/kg	RPD 5.34 14.2	MS PCT RECOVERY 86 86	MSD PCT RECOVERY 82 75
DETERMINATION 107S Benzene 107S Ethylbenzene 107S Toluene	RESULT 17.3 17.3 17.3	RESULT 16.4 15.0 15.7	ug/kg ug/kg ug/kg	RPD 5.34 14.2 9.70	MS PCT RECOVERY  86  86  86	MSD PCT <u>RECOVERY</u> 82 75 78
DETERMINATION DOTS Benzene Totuene Totuene Totuene Totuene	RESULT 17.3 17.3 17.3 34.0 *	RESULT 16.4 15.0 15.7 28.9 *	ug/kg ug/kg ug/kg ug/kg	RPD 5.34 14.2 9.70 16.8	MS PCT RECOVERY  86 86 86 86	MSD PC <u>RECOVER'</u> 82 75 78 72
DETERMINATION  O7S Benzene  O7S Ethylbenzene  O7S Toluene  O7S m-Xylene  O7S o-Xylene	RESULT 17.3 17.3 17.3 34.0 * 17.0	RESULT 16.4 15.0 15.7 28.9 * 14.8	ug/kg ug/kg ug/kg ug/kg ug/kg	RPD 5.34 14.2 9.70 16.8 17.3	MS PCT RECOVERY  86 86 86 85	MSD PC <u>RECOVER</u> 82 75 78 72 64 **
DETERMINATION DOTS Benzene DOTS Ethylbenzene DOTS Toluene DOTS m-Xylene DOTS o-Xylene DOTS p-Xylene	RESULT 17.3 17.3 17.3 34.0 * 17.0	RESULT 16.4 15.0 15.7 28.9 * 14.8	ug/kg ug/kg ug/kg ug/kg ug/kg ug/kg	RPD 5.34 14.2 9.70 16.8	MS PCT RECOVERY  86 86 86 86	MSD PC <u>RECOVER</u> 82 75 78 72
DETERMINATION  107S Benzene  107S Ethylbenzene  107S Toluene  107S m-Xylene  107S o-Xylene  107S p-Xylene  107Recovery of the spike indicates the	RESULT 17.3 17.3 17.3 34.0 * 17.0 *	RESULT 16.4 15.0 15.7 28.9 * 14.8	ug/kg ug/kg ug/kg ug/kg ug/kg ug/kg	RPD 5.34 14.2 9.70 16.8 17.3	MS PCT RECOVERY  86 86 86 85	MSD PC <u>RECOVER</u> 82 75 78 72 64 **
DETERMINATION  107S Benzene  107S Ethylbenzene  107S Toluene  107S m-Xylene  107S o-Xylene  107S p-Xylene  1 Recovery of the spike indicates the spike should be considered in evaluating	RESULT 17.3 17.3 17.3 34.0 * 17.0 * presence of a mather the data.	RESULT 16.4 15.0 15.7 28.9 * 14.8 *	ug/kg ug/kg ug/kg ug/kg ug/kg ug/kg	RPD 5.34 14.2 9.70 16.8 17.3	MS PCT RECOVERY  86 86 86 85	MSD PC <u>RECOVER</u> 82 75 78 72 64 **
TEST DETERMINATION  107S Benzene 107S Ethylbenzene 107S Toluene 107S m-Xylene 107S o-Xylene	RESULT 17.3 17.3 17.3 34.0 * 17.0 * presence of a mather the data.	RESULT 16.4 15.0 15.7 28.9 * 14.8 *	ug/kg ug/kg ug/kg ug/kg ug/kg ug/kg	RPD 5.34 14.2 9.70 16.8 17.3	MS PCT RECOVERY  86 86 86 85	MSD PORECOVER 82 75 78 72 64 ***

PREP BATCH: 36165 LSG SAMPLE NO: H0259300

		MS	MSD			MS PCT	MSD PCT
TEST	DETERMINATION	RESULT	RESULT	STINU	<u>RPD</u>	RECOVERY	RECOVERY
G107S	Benzene	18.0	19.0	ug/kg	5.40	90	95
G107S	Ethylbenzene	19.3	20.4	ug/kg	5.54	96	102
G107S	Toluene	18.6	19.5	ug/kg	4.72	93	98
G107S	m-Xylene	38.8 *	41.4 *	ug/kg	6.48	97	104
G107S	o-Xyl ene	18.7	20.3	ug/kg	8.20	94	102
G107S	p-Xyl ene	*	*	ug/kg	6.48	97	104

<sup>\*</sup> The compounds m-Xylene and p-Xylene co-elute. The reported result is the



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## QUALITY CONTROL REPORT MATRIX SPIKE AND MATRIX SPIKE DUPLICATE DATA

PREP BAT	CH: 36165					LSG SAMPLE NO:	H0259300
sum of the			• • • • • • • • • • • • • • • • • • • •				
ANLS BAT	·сн: 35329					LSG SAMPLE NO:	H0257077
		MS	MSD			MS PCT	MSD PC
TEST	DETERMINATION	RESULT	RESULT	UNITS	RPD	RECOVERY	RECOVER
3107W Ben	nzene	19.9	19.4	ug/L	2.54	100	97
G107W Eth	nylbenzene	18.2	18.0	ug/L	1.10	91	90
	uene	18.1	17.6	ug/L	3.92	90	88
	(ylene	36.2 *	35.2 *	ug/L	2.80	90	88
G1,07W o-X	(ylene	19.8	18.1	ug/L	8.97	99	90
1	(ylene	*	*	ug/L	2.80	90	88
The comp	oounds m-Xylene and p-Xylene c	o-elute. The rep	orted result i	s the			
um of the							
t The comp	to the West and an West area.	a aluma The see.					
THE COMP	oounds m-Xylene and p-Xylene c	o-etute. The rep	ortea result i	s the			
•	e two.	o-etute. The rep		s the			
sum of the	e two.	•		s the		LSG SAMPLE NO:	но257795
sum of the	e two.	•		s the		LSG SAMPLE NO:	
sum of the	e two.			<u>UNITS</u>	RPD		н0257795 MSD PC <u>RECOVER</u>
Sum of the	CH: 35804	MS	MSD		RPD 5.82	MS PCT	MSD PC
Sum of the ANLS BAT  TEST G107W Ben	ch: 35804  DETERMINATION	MS <u>Result</u>	MSD <u>result</u>	<u>UNITS</u>		MS PCT RECOVERY	MSD PO
ANLS BAT  TEST G107W Ben G107W Eth	DETERMINATION	MS <u>RESULT</u> 21.2	MSD <u>RESULT</u> 20.0	<u>UNITS</u> ug/L	5.82	MS PCT . <u>RECOVERY</u> 106	MSD PORES
ANLS BAT  TEST G107W Ben G107W Tol	DETERMINATION nzene nylbenzene	MS <u>RESULT</u> 21.2 23.3	MSD RESULT 20.0 22.0	<u>UNITS</u> ug/L ug/L	5.82 5.74	MS PCT RECOVERY 106 116	MSD POR RECOVER 100 110
ANLS BAT  TEST G107W Ben G107W Eth G107W Tol G107W m-X	DETERMINATION nzene nylbenzene uene (ylene	MS <u>RESULT</u> 21.2 23.3 22.6	MSD <u>RESULT</u> 20.0 22.0 21.5	<u>UNITS</u> ug/L ug/L ug/L	5.82 5.74 4.99	MS PCT <u>RECOVERY</u> 106 116 113	MSD PO RECOVER 100 110 108
SUM OF THE  ANLS BAT  TEST G107W Ben G107W Eth G107W Tol G107W m-X G107W o-X	DETERMINATION nzene nylbenzene uuene (ylene (ylene	MS <u>RESULT</u> 21.2 23.3 22.6 46.8 *	MSD <u>RESULT</u> 20.0 22.0 21.5 44.8 *	<u>UNITS</u> ug/L ug/L ug/L ug/L	5.82 5.74 4.99 4.37	MS PCT <u>RECOVERY</u> 106 116 113 117	MSD PO RECOVER 100 110 108 112
Sum of the ANLS BAT  TEST G107W Ben G107W Tol G107W m-X G107W o-X G107W p-X	DETERMINATION nzene nylbenzene uuene (ylene (ylene	MS <u>RESULT</u> 21.2 23.3 22.6 46.8 * 23.3 *	MSD <u>RESULT</u> 20.0 22.0 21.5 44.8 * 22.2 *	UNITS ug/L ug/L ug/L ug/L ug/L ug/L	5.82 5.74 4.99 4.37 4.84	MS PCT RECOVERY 106 116 113 117 116	MSD PC RECOVER 100 110 108 112 111
Sum of the ANLS BAT  TEST G107W Ben G107W Tol G107W m-X G107W o-X G107W p-X * The comp	DETERMINATION  DETERM	MS <u>RESULT</u> 21.2 23.3 22.6 46.8 * 23.3 *	MSD <u>RESULT</u> 20.0 22.0 21.5 44.8 * 22.2 *	UNITS ug/L ug/L ug/L ug/L ug/L ug/L	5.82 5.74 4.99 4.37 4.84	MS PCT RECOVERY 106 116 113 117 116	MSD PC RECOVER 100 110 108 112 111
Sum of the ANLS BAT  TEST G107W Ben G107W Tol G107W m-X G107W o-X G107W p-X * The comp	DETERMINATION  DETERM	MS <u>RESULT</u> 21.2 23.3 22.6 46.8 * 23.3 *	MSD <u>RESULT</u> 20.0 22.0 21.5 44.8 * 22.2 *	UNITS ug/L ug/L ug/L ug/L ug/L ug/L	5.82 5.74 4.99 4.37 4.84	MS PCT RECOVERY 106 116 113 117 116	MSD PC RECOVER 100 110 108 112
TEST G107W Ben G107W Tol G107W o-X G107W p-X The comp	DETERMINATION  DETERM	MS <u>RESULT</u> 21.2 23.3 22.6 46.8 * 23.3 *	MSD <u>RESULT</u> 20.0 22.0 21.5 44.8 * 22.2 *	UNITS ug/L ug/L ug/L ug/L ug/L ug/L	5.82 5.74 4.99 4.37 4.84	MS PCT RECOVERY 106 116 113 117 116	MSD PC <u>RECOVER</u> 100 110 108 112 111 112
TEST G107W Ben G107W Tol G107W o-X G107W p-X The comp	DETERMINATION nzene nylbenzene uene (ylene (ylene (ylene opunds m-Xylene and p-Xylene co	MS <u>RESULT</u> 21.2 23.3 22.6 46.8 * 23.3 *	MSD <u>RESULT</u> 20.0 22.0 21.5 44.8 * 22.2 *	UNITS ug/L ug/L ug/L ug/L ug/L ug/L	5.82 5.74 4.99 4.37 4.84	MS PCT <u>RECOVERY</u> 106 116 113 117 116 117	MSD PC RECOVER 100 110 108 112 111 112 H0259007
Sum of the  ANLS BAT  TEST G107W Ben G107W Tol G107W m-X G107W o-X G107W p-X * The comp sum of the	DETERMINATION nzene nylbenzene uene (ylene (ylene (ylene opunds m-Xylene and p-Xylene co	MS  RESULT  21.2  23.3  22.6  46.8 *  23.3  * po-elute. The repo	MSD RESULT 20.0 22.0 21.5 44.8 * 22.2 *	UNITS ug/L ug/L ug/L ug/L ug/L ug/L	5.82 5.74 4.99 4.37 4.84	MS PCT RECOVERY  106 116 113 117 116 117	MSD PC <u>RECOVER</u> 100 110 108 112 111 112
TEST TEST G107W Ben G107W Tol G107W m-X G107W p-X * The comp sum of the	DETERMINATION  DETERM	MS  RESULT  21.2  23.3  22.6  46.8 *  23.3  * po-elute. The repo	MSD RESULT 20.0 22.0 21.5 44.8 * 22.2 * ported result i	UNITS  ug/L  ug/L  ug/L  ug/L  ug/L  ug/L  s the	5.82 5.74 4.99 4.37 4.84 4.37	MS PCT  RECOVERY  106 116 113 117 116 117  LSG SAMPLE NO:  MS PCT	MSD PC RECOVER 100 110 108 112 111 112 H0259007



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Section H Page 3

## QUALITY CONTROL REPORT MATRIX SPIKE AND MATRIX SPIKE DUPLICATE DATA

ANLS BATCH: 36080

LSG SAMPLE NO: H0259007

		MS	MSD			MS PCT	MSD PCT
TEST	DETERMINATION	RESULT	RESULT	UNITS	RPD	RECOVERY	RECOVERY
G107W	Toluene	17.4	17.9	ug/L	2.83	87	90
G107W	m-Xylene	36.4 *	37.3 *	ug/L	2.44	91	93
G107W	o-Xylene	17.4	18.1	ug/L	3.94	87	90
G107W	p-Xylene	*	*	ug/L	2.44	91	93

 $<sup>\</sup>star$  The compounds m-Xylene and p-Xylene co-elute. The reported result is the sum of the two.

#### **VOLUME I**

#### FINAL REPORT

SITE INVESTIGATION

TRANSWESTERN PIPELINE COMPANY

COMPRESSOR STATION WT-1

CARLSBAD, NEW MEXICO

PROJECT NO. 1548/7P54



MAR 2 2 1993

OIL CONSCHVATION DIV. SANTA FE

FEBRUARY 1993
BROWN & ROOT ENVIRONMENTAL

#### **VOLUME I**

#### FINAL REPORT

SITE INVESTIGATION

TRANSWESTERN PIPELINE COMPANY

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CARLSBAD, NEW MEXICO

PROJECT NO. 1548/7P54

## FEBRUARY 1993 BROWN & ROOT ENVIRONMENTAL

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#### NOTICE

Effective January 1, 1993, the environmental unit of HALLIBURTON NUS Environmental Corporation became a part of the Brown & Root group and began doing business as Brown & Root Environmental.

Brown & Root Environmental will operate as a division of Halliburton NUS Corporation. Our proper legal name is now "Brown & Root Environmental, a division of Halliburton NUS Corporation." (As a part of this change, the word "Environmental" has been dropped from the corporate name.)

Since there is no change in the corporate entity, all general services agreements and basic ordering agreements, etc., are still valid and no novation or assignment of those contracts is required.

#### 1.0 INTRODUCTION

The purpose of this report is to present the findings of the Site Investigation (SI) conducted by HALLIBURTON NUS Environmental Corporation (HALLIBURTON NUS) at Transwestern Pipeline Company (Transwestern) Compressor Station WT-1 located approximately 32 miles east of Carlsbad, New Mexico on Highway 62-180 in Lea County. Figure 1-1 is a site location map.

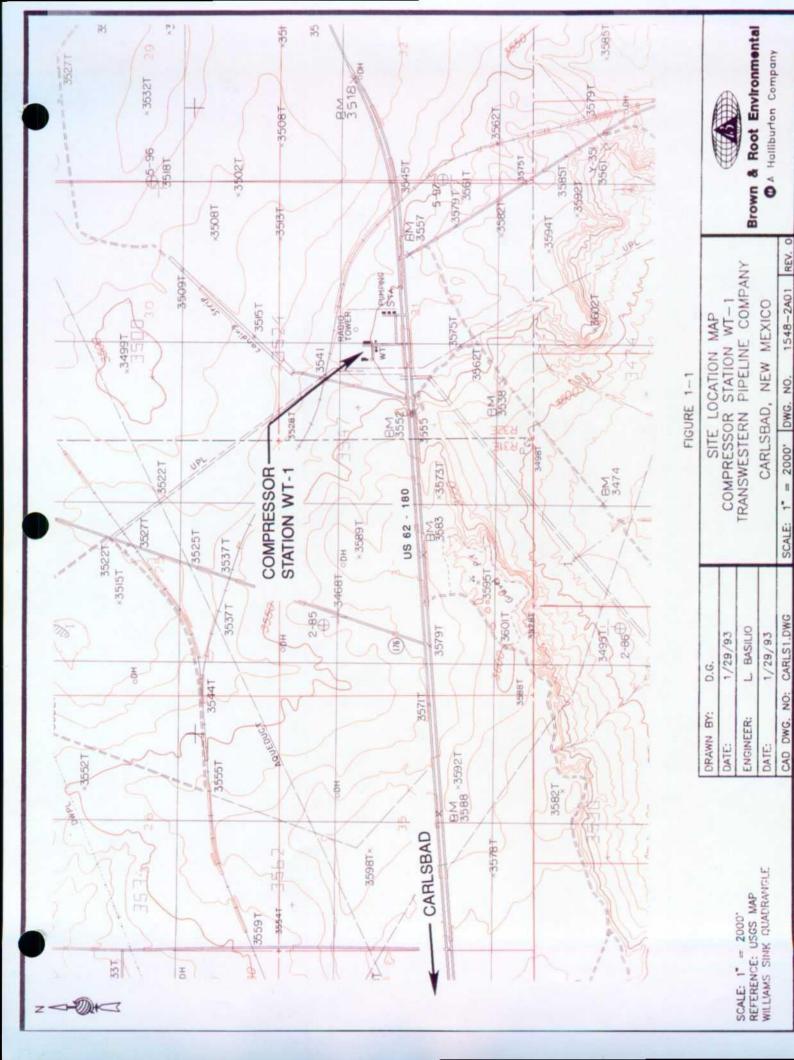
Field activities conducted during the investigation included characterization of site specific geologic and hydrologic conditions and the collection of environmental samples for laboratory analysis. Specific elements included the installation of three monitor wells, 28 soil borings and the collection of 70 soil and 15 groundwater samples. Sergent, Hauskins & Beckwith (SH&B) of Albuquerque, New Mexico, and Layne Environmental Services (Layne) of San Antonio, Texas, provided drilling services. Pettigrew & Associates of Hobbs, New Mexico, was the surveying subcontractor. Laboratory analysis was performed by Assaigai Laboratories of Albuquerque, New Mexico, and HALLIBURTON NUS Laboratory of Houston, Texas.

#### 1.1 **OBJECTIVE**

The objective of the SI was to:

• Delineate the horizontal and vertical extent of soil and groundwater impact, if any, at selected locations at the compressor station.

The approach to meeting the SI objective was to drill soil borings, install monitor wells, collect soil and groundwater samples for laboratory analysis, evaluate the data collected, and submit a report detailing the results.



#### 1.2 BACKGROUND

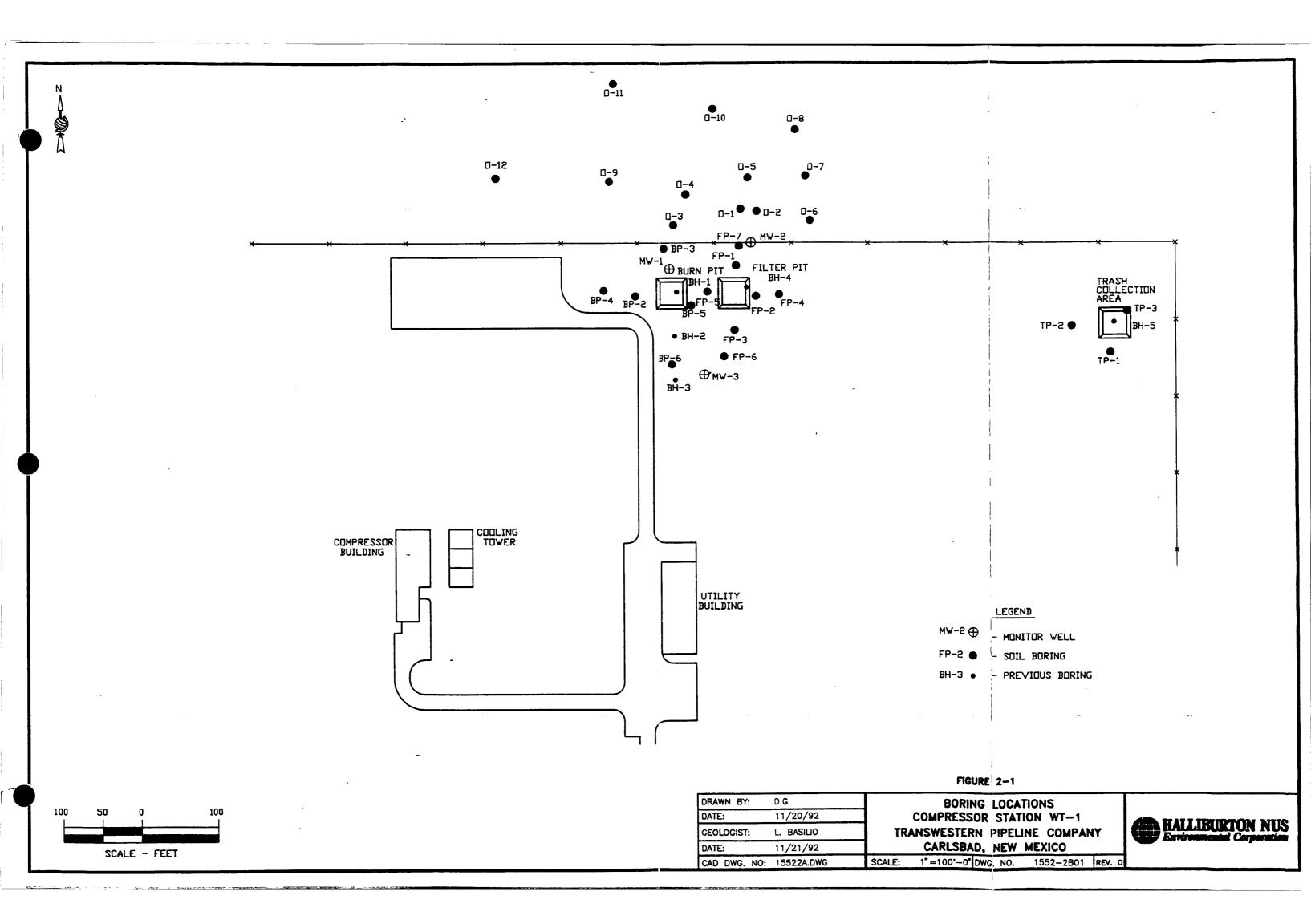
Three areas at Compressor Station WT-1 were previously identified for evaluation. The areas are: 1) the Burn Collection Area, 2) the Filter Collection Area, and 3) the Trash Collection Area. All three collection areas were put out of service in the second quarter of 1989 and backfilled. An investigation performed by Metric Corporation (report dated December 1991) indicated hydrocarbon impact at the Burn Collection Area and Filter Collection Area.

#### 2.0 FIELD ACTIVITIES

The following sections describe the field activities that were performed as part of the site investigation. Prior to mobilization, a site specific Health and Safety Plan (HASP) was developed. The HASP is contained in Appendix A. HALLIBURTON NUS conducted site investigation activities at Compressor Station WT-1, located near Carlsbad, New Mexico, between August 3, 1992 and October 23, 1992. All field activities were conducted under OSHA Level D personal protection protocols. Figure 2-1 depicts boring locations and general site layout.

#### 2.1 DRILLING

Drilling activities conducted by SH&B utilized a CME-55 drilling rig. advanced using a NQ size (2.98-inch outside diameter) core barrel sampling system utilizing air as the drilling fluid. Drilling activities conducted by Layne utilized a Mobile B-61 drilling rig. Borings were advanced using a NWD4 size (2.98-inch outside diameter) core barrel sampling system. Core samples were continuously collected from each boring to determine lithology beneath the site and for laboratory analysis, where appropriate. The length of the core barrel was 10-feet long. Most of the samples collected, however, were 5-feet in length in order to have better control over defining lithologic and impacted horizons. All cores recovered were described in the field by a HALLIBURTON NUS geologist and were scanned using a photoionization detector (PID) and/or a flame ionization detector (FID). Upon completion, borings were grouted from total depth to ground surface with a cement/bentonite slurry. Three borings were drilled in the vicinity of the Trash Collection Area, seven borings were drilled in the vicinity of the Filter Collection Area, six borings were drilled in the vicinity of the Burn Collection Area and 12 borings were drilled off-site to the north of the collection areas. Boring logs are included in Appendix B.



At each collection area, three to five soil borings were initially drilled at locations to the exterior of the collection area. Borings situated outside the collection area were located as far as approximately 35 feet from the perimeter of the collection area. At locations where samples collected from the exterior borings displayed evidence of hydrocarbon impact based on PID/FID field screening and visual examination of recovered cores, step out borings were drilled at locations further removed from the collection area. The step out process continued until groundwater samples recovered from the step out borings displayed no PID/FID evidence of hydrocarbon impact.

#### 2.2 SUBSURFACE SOIL SAMPLING

Subsurface soil samples were collected by using a NQ or NWD4 size core barrel sampling system. The diameter of the NQ and NWD4 core samples retrieved was 1.875 and 2.060 inches, respectively. The length of the core run was between 1 and 10 feet in length. In general however, the length was kept to 5 feet in order to have better control over defining lithologic and impacted horizons. A 65/8-inch hollow-stem auger was inserted into the ground to a depth of approximately 4 to 5 feet below land surface (BLS) to serve as a guide shoe for the core barrel. When a sample was brought to the surface it was described, placed in a zip-lock bag, scanned with a PID/FID, and kept on ice until total depth of the boring was reached. Criteria for selection of samples for laboratory analysis were: 1) any sample which exhibited a PID/FID reading greater than 5 ppm; 2) the sample from the bottom of the hole. When the appropriate samples were selected for laboratory analysis, they were placed in laboratory-supplied containers, sealed, labeled, and placed in zip-lock bags in a cooler filled with ice. Soil sample log sheets are presented in Appendix C.

#### 2.3 MONITOR WELL INSTALLATION

A total of three monitor wells were installed to collect groundwater samples and to determine the direction of groundwater flow at the site. As-built well diagrams for each

well are presented in Appendix B. Locations of the wells are shown on Figure 2-1. Well specifications are summarized in Table 2-1.

The monitor wells were screened in the shallowest zone of saturated materials encountered. The boreholes for all monitor wells installed at the site were advanced using a NQ size core barrel sampling system utilizing air as the drilling fluid. Core samples were continuously collected as previously described.

Upon reaching total depth in the borehole, the monitor well installation began by placing the casing and well screen through the hollow-stem auger. The monitor wells consisted of two-inch outside diameter flush-threaded Schedule 40 PVC casing, horizontally machine-slotted screen sections, and a flush-threaded cap at the bottom of each well. The slot size for all screens was 0.020 inches. A 10-foot screen length was used in all wells. PVC casing was added to each well so that the well extended approximately 2 to 3 feet above grade.

Well completion involved installation of a filter pack, consisting of 10-20 Colorado silica packsand, a minimum of two feet above the top of the screen. A seal, consisting of a minimum thickness of two feet of fine bentonite flakes, was added above the filter pack. A thick grout consisting of Type I/II Portland cement and bentonite was placed in the hole from the bentonite seal to the surface. A steel protective casing was then placed over the PVC well and embedded in the wet grout. Well installation was completed by the placing of a 2-foot by 2-foot concrete pad around the well.

The wells were developed by bailing with a nominal 2-inch disposable bailer until the well was relatively clear of sediment or the well was bailed dry.

#### 2.4 GROUNDWATER SAMPLING

Groundwater samples were collected from all three wells installed. Immediately after each well was uncapped, a PID was used to measure the headspace and the results were noted

TABLE 2-1

# COMPRESSOR STATION WT-1 CARLSBAD, NEW MEXICO WELL SPECIFICATIONS

Station	North Coordinate <sup>(1)</sup>	East Coordinate <sup>(1)</sup>	Natural Ground Elevation	Top of Casing Elevation (2)	Total Depth of Well (feet below grade)	Screened Interval (feet below grade)	Filter Pack Interval (feet below grade)
MW-1	9960.10	9337.66	3592.5	3594.67	53.5	43.5 - 53.5	41 - 53.5
MW-2	9993.11	9447.15	3591.1	3593.32	50	40 - 50	38 - 50
MW-3	9821.95	9379.61	3593.7	3596.04	48.5	38.5 - 48.5	35.5 - 48.5

Coordinates based on northeast corner of property being N 10000 E 10000. Elevations based on benchmark, northeast footing of maintenance building, El. 3598.50. All measurements in feet. 363

on the sample log sheet. The initial water level (below the top of casing) was measured in each well to the nearest 0.01 foot using an electronic water level indicator. The total depth of the well (below the top of casing) was also measured and recorded. After measuring the water level the cable and probe were thoroughly rinsed with distilled water before moving on to the next well. The height of the water column in each well was calculated using the measurements obtained. The water column height was multiplied by 0.16 gallons/foot to determine the quantity of water in one well volume for each of the 2-inch diameter wells.

After measuring the water, a semi-opaque disposable bailer was used to determine whether floating free product was present in the well. The bailer was slowly lowered into the well until partial submergence of the bailer occurred. The bailer was then removed and the water observed for signs of floating free product.

The wells were purged of three to five well volumes or until "dry," whichever came first. Purging was accomplished using a disposable bailer and dedicated bailer rope. Purge volumes were measured by pouring the purge water into a pail of known volume and keeping track of the number of pails filled. Each pail of purge water was poured into a 55-gallon drum adjacent to the well. Conductivity, pH, temperature, color, turbidity and visual observations of the water were recorded after each well volume was removed. The groundwater sample sheets are located in Appendix C.

After purging and allowing the wells to recover, each well was sampled using a disposable bailer. Sample containers were filled to nearly full, with the exception of the sample containers designated for volatile organics analysis. Bottles containing samples designated for volatile organic analysis were collected prior to collection of other samples and were filled so that no head space remained in the sample bottle.

In addition to the groundwater samples collected from monitor wells, groundwater samples were collected from borings that intersected the water table. Initially a 1-inch diameter PVC well casing was inserted into the borehole and a groundwater sample collected through

it. Field experience then showed that the lithified nature of the sediments would keep the borehole open. Thereafter, groundwater samples were collected directly from the borehole using a 1-inch PVC bailer or a 2-inch disposable bailer. No purging was performed in association with these borehole samples.

#### 2.5 SAMPLE HANDLING PROCEDURES

After placement in appropriate sample bottles, samples were sealed and the containers labeled to uniquely identify the samples. The sample containers were then sealed in ziplock bags and placed in coolers containing ice. Chain-of-custody forms were filled out for each cooler and the coolers prepared for shipment to the laboratory by common carrier. Sample coolers at the WT-1 site were delivered to Transwestern personnel who took responsibility for shipping the coolers to the laboratory.

#### 2.6 WASTE MANAGEMENT

Drill cuttings generated during the installation of monitor wells and soil borings were containerized and stored at the respective locations pending the results of laboratory analysis of soil and groundwater samples. The containers were appropriately marked to indicate the source of the material. At boring locations where no significant soil impact relative to regulatory standards was detected as a result of laboratory analysis, cuttings will be spread on the ground surface and raked level. Development water, purge water, and decontamination fluids were properly disposed based upon the analytical results of the representative soil and/or groundwater samples.

#### 2.7 DECONTAMINATION PROCEDURES

The following decontamination procedures were performed to minimize the potential for cross contamination:

- The drilling tools, augers, and core barrels were steam cleaned with hot water from a pressure sprayer after completion of each boring. In the event free product was encountered, a small amount of Alconox, a laboratory grade detergent, was added to the reservoir of the pressure sprayer.
- The inner core barrels were steam cleaned after each use. In the event free product was encountered, a small amount of Alconox, a laboratory grade detergent, was added to the reservoir of the pressure sprayer.
- Sampling equipment (e.g., PVC bailers) was cleaned with distilled water and isopropyl alcohol.
- Disposable bailers, bailer rope, gloves and other disposable material were discarded after a sample was collected.

#### 2.8 SURVEYING

Land surveying was provided by Pettigrew and Associates, Hobbs, New Mexico, in order to establish horizontal and vertical positions of borings and monitor wells. Horizontal position (north and east) is site relative and is tied to the northeast corner of the property at the fenceline. Vertical position is tied to mean sea level. Ground elevation is determined to an accuracy of 0.1 foot and top of casing elevation is determined to an accuracy of 0.01 foot.

Survey information for borings drilled during the SI is presented in Appendix D.

#### 3.0 GEOLOGY

The following sections present findings based on the field investigation portion of the site investigation.

#### 3.1 REGIONAL GEOLOGY

The WT-1 compressor station is located within the Pecos Valley section of the Southern Great Plains physiographic province. The area surrounding the site is a slightly hummocky plain covered with caliche and sand.

The site is located in the northern portion of the Delaware Basin, which is the most prominent regional geologic structure in the area. Geologic units in the area range from early Paleozoic to Recent.

The Delaware Basin also lies within the groundwater boundaries of the Unglaiciated Central Region which includes some of the least productive aquifers in the nation. Water bearing strata in the area include the Santa Rosa Sandstone and Rustler Formation. Depths to these strata average 300 feet below land surface. Groundwater is also found in small, isolated, near-surface perched bodies (Sandia Laboratories, 1978).

#### 3.2 SITE GEOLOGY

The geological setting of the site for this report was determined through the drilling of 28 soil borings during this investigation.

The boring log data indicate that the subsurface consists of two distinct formations, the Mescalero Caliche and the underlying Gatuna Formation.

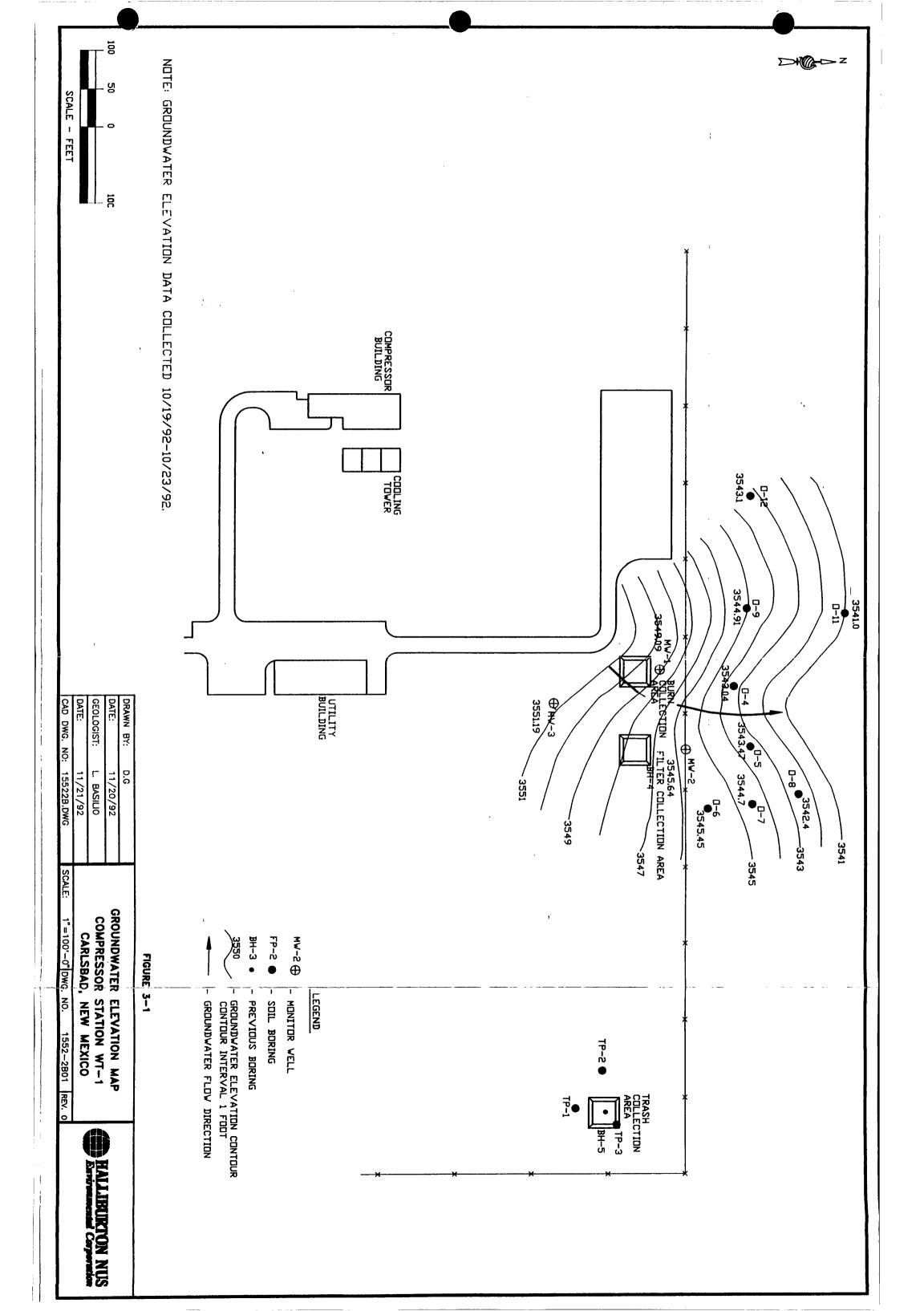
The first sequence of sediments encountered is the Mescalero Caliche. This sequence consists of white to reddish-white to tan calcium carbonate which cements a fine silty sand. The caliche is hard to very hard. The sands range from hard and well indurated to very friable. The interval is generally dry with some occasional damp areas, and the cores recovered were generally broken. Thickness of this sequence ranges generally from 10 to 20 feet. The Mescalero Caliche grades downward into the underlying Gatuna Formation.

The Gatuna Formation is a reddish-brown fine-grained, cemented sandstone. Localized thin layers of siltstone, shale, and claystone are found. The degree of cementation varies from strong to poor. The cementing agents are aluminum and ferric oxides which give the sandstone its color. The sandstone is slightly to very micaceous. The top of the formation is encountered approximately 10 to 20 feet below grade. It is in this formation that groundwater was first encountered during the SI conducted by HALLIBURTON NUS. Porosity and permeability estimates are difficult to determine without running geotechnical tests. Field observations indicate that porosity/permeability of the cemented sandstone is variable. Zones above the water table exhibit alternating dry and moist areas, indicating preferred pathways for fluid migration. Fractures at varying angles were found to contain fluids and it is believed that migration along the fractures is a primary method of fluid migration through the lithified sediments.

#### 3.3 SITE HYDROGEOLOGY

Groundwater at the site is encountered approximately 45 feet below land surface. A groundwater contour map is presented in Figure 3-1. The direction of groundwater flow is to the northeast across the collection areas and more towards the north farther down gradient. The groundwater gradient across the site is approximately 0.025 ft/ft. The flow direction is coincident with the surface topography, which also dips to the northeast.

It should be noted that the data used in generation of the groundwater elevation map depicted in Figure 3-1 were collected over a four-day period. Water level data from



Monitor Wells MW-1 through MW-3 were collected October 23, 1992, but water level data from the soil borings were collected as the soil borings were drilled during the period from October 19, 1992 through October 23, 1992. Upon completion of the soil borings, they were left open and undisturbed over night, and water level data were collected the following morning. The groundwater elevation and flow direction map generated using this data is considered to be technically valid as a result of the following considerations:

- There was no rainfall during the period between October 19, 1992 through October 23, 1992
- Groundwater at the site was encountered at a depth of approximately 40 feet below grade, indicating the likelihood of equilibrium on a day-to-day basis throughout the period of investigationn.
- The indicated flow direction is in general conformance with the surface topography.

# 4.0 ANALYTICAL RESULTS

This section summarizes the results of laboratory analysis of samples collected during the HALLIBURTON NUS SI. Samples collected were analyzed by Assaigai Laboratory of Albuquerque, New Mexico and HALLIBURTON NUS Laboratory of Houston, Texas. Laboratory reports are located in Appendix E. Chain-of-Custody sheets are located in Appendix F. Figure 2-1 shows the sampling locations. Soil samples were analyzed for a combination of the following parameters:

- Total Petroleum Hydrocarbons (TPH)
- Benzene, Toluene, Ethylbenzene, and Xylene (BTEX)
- TCLP-O
- TCLP-M
- · TCLP-F

The specific analytical parameters pertaining to TCLP-O, TCLP-M, and TCLP-F are listed in Table 4-1.

Soil and groundwater samples collected from Soil Borings O-4 to O-12 were analyzed for BTEX and TPH only. At this point in the investigation, the extent of impacted soil had been delineated; therefore, a reduced analytical program would determine the extent of the dissolved phase in the groundwater.

#### 4.1 SOIL

# 4.1.1 Trash Collection Area

Soil samples collected from the Trash Collection Area were analyzed for TPH, BTEX, TCLP-F, TCLP-O, and TCLP-M constituents. Table 4-1 presents the analytical results for samples collected from the Trash Collection area.

TPH concentrations were detected in all six samples submitted for laboratory analysis. Concentrations ranged from 11 mg/kg to 55 mg/kg.

BTEX, TCLP-F, and TCLP-O constituents were not detected in samples submitted for laboratory analysis from the Trash Collection Area.

A varied distribution of arsenic, barium, cadmium, chromium, mercury, selenium, and silver concentrations were detected in the samples submitted for laboratory analysis. All concentrations, however, are well below TCLP regulatory levels.

## 4.1.2 Filter Collection Area

Soil samples collected from the Filter Collection Area were analyzed for TPH, BTEX, and TCLP-M constituents. Table 4-2 presents the analytical results for samples collected from the Filter Collection Area.

TPH concentrations were detected in all but two samples submitted for laboratory analysis. Detected concentrations ranged from 21 mg/kg to 25,760 mg/kg. Samples collected from Borings FP-2, -3, -5, -6, and -7 exhibited concentrations in excess of 100 mg/kg. Within Boring FP-2, the duplicate samples collected from the 23.5- to 28.5-foot depth interval displayed TPH concentrations of 3,600 and 6,600 mg/kg. Additionally, the 28.5- to 33.5-foot sample collected from Boring FP-2 displayed a TPH concentration of 3,050 mg/kg, and the

TABLE 4-1
ANALYTICAL RESULTS - TRASH COLLECTION AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARI SRAD NEW MEXICO

		CARLSBAD, NEW MEXICO	OOIX			
Parameter	T-1A	T-1B	T-2A	T-28	T-3A	1-38
Depths (ft)	6.5 - 8.5	23.5 - 30.0	13.5 - 18.5	23.5 - 30.0	13.5 - 18.5	23.5 - 30.0
TCLP-F (mg/l)						
Alcohols						
Acetone	ND	ND	QN	ND	QN	QN
Ethyl Acetate	ON	ON	QN	ND	ND	QN
Isobutanol	QN	QN	ON	QN	QN	QN
n-Butyl Alcohol	ND	ND	QN	QN	QN	QN
Methanol	QN	QN	QΝ	ON	ON	ON
Volatiles						
Methylene Chloride	QN	QN	QN	ND	QN	QN
1,1,1-Trichloroethane	QN	NO	GN	ON	QN	QN
Trichloro-Trifluoroethane	QN	ND	QN	ON	QN	QN
Ortho-Dichlorobenzene	QN	QN	dΝ	ON	ON	QN
Trichlorofluoromethane	QN	QN	QN	QN	QN	QN
Xylene	QN	ND	QN	QN	QN	QN
Ethyl Benzene	QN	ON	QN	ON	QN	QN
Toluene	QN	QN	QN	QN	Q	QV
Ethyl Ester	QN	QN	QN	QN	Q	QN
Methyl Isobutyl Ketone	QN	QN	QN	Q	Q	QV
Cyclohexanone	QN	QN	QN	QN	Q	QN

8

TABLE 4-1 (Continued)
ANALYTICAL RESULTS - TRASH COLLECTION AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

Parameter	T-1A	T-18	T-2A	1-28	T-3A	T-3B
Depths (#)	6.5 - 8.5	23.5 - 30.0	13.5 - 18.5	23.5 - 30.0	13.5 - 18.5	23.5 - 30.0
TCLP-O (mg/l)			-			
Semivolatiles						
Pyridine	ND	QN	ON	QN	ND	QN
O-Cresol/2-Methylphenol	ND	QN	ON	ΩN	ND	QN
M/P-Cresol/3,4-Methylphenol	ND	QN	ON	QN	QN	QN
2,4,5-Trichlorophenol	QN	QN	QN	QN	QN	QN
Hexachlorobenzene	QN	QN	ND	ON	QN	Q
Hexachlorobutadiene	QN	QN	QN	ON	QN	QN
Hexachloroethane	ND	QN	ON	QN	QN	QN
2,4,6-Trichlorophenol	QN	QN	DN	ΟN	QN	CIN
Pentachlorophenol	QN	QN	ON	ON	QN	QN
1,4-Dichlorobenzene	ND	QN	QN	QN	ON	QN
Volatiles					8 8 8 9 9 9 8	
Benzene	ND	QN	, QN	QN	QN	QN
Carbon Tetrachloride	ND	QN	QN	QN	QN	QN
Chlorobenzene	ND	ND	ΟN	QN	ON	QN
1,2-Dichloroethane	ND	QN	QN	QN	QN	QN
1,1-Dichloroethylene	QN	QN	ND	QN	ND	QN

TABLE 4-1 (Continued)
ANALYTICAL RESULTS - TRASH COLLECTION AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

Parameter	T-1A	T-18 ·	T-2A	T-2B	T-3A	T-3B
Depths (ft)	6.5 - 8.5	23.5 - 30.0	13.5 - 18.5	23.5 - 30.0	13.5 - 18.5	23,5 - 30.0
Tetrachloroethylene	ON	QN	Ņ	ND	QN	ΟN
Trichloroethylene	QN	ΟN	QN	ND	QN	QN
Vinyl Chloride	ND	QN	QN	QN	QN	ΟN
1,4-Dichlorobenzene	QN	QN	QN	QN	QN	QN
Methyl Ethyl Ketone	QN	QN	QN	QN	QN	QN
TCLP-M (mg/l)						
Arsenic	0.011	9000	0.015	QN	0.043	0.051
Barium	QN	QN	QN	QN	QN	2.3
Cadmium	QN	QN	900:0	QN	QN	QN
Chromium	90:0	ON	0.05	0.03	90:0	0.05
Lead	QN	QN	QN	QN	QN	QN
Mercury	0.0006	0.0003	0.0003	0.0002	0.0007	0.0003
Selenium	ND	ND	, QN	0.006	ND	QN
Silver	ND	ND	0.04	N	ND	QN
ТРН (mg/kg)	55	23	30	11	21	25

TABLE 4-1 (Continued)
ANALYTICAL RESULTS - TRASH COLLECTION AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

Parameter	T-1A	T-18 ··	T-2A	T-2B	T-3A	T-3B
Depths (ft)	6.5 - 8.5	23.5 - 30.0	13.5 - 18.5	23.5 - 30.0	135 - 185	235-300
			-			200 - 200
Benzene	QV	QN	QN	GN	CN	
Toluene	S.	QV	QN	S	Ş	2 2
Ethylbenzene	GN	Q	Q	2	2 2	2 2
P&M-Xylene	QN	Ð	QN	Q.	S	2 2
O-Xylene	QN	Q	Q	Q	S S	2 2
Total BTEX	0	0	0	0	0	0

ANALYTICAL RESULTS - FILTER COLLECTION AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSRAD, NEW MEXICO

			CARLSBAD, 1	CARLSBAD, NEW MEXICO				
Parameter	FP-1A 23.5-28.5	FP-1B 33.5-36.5	FP-1C 41.5-43.5	FP-2A 23.5-28.5	FP-2A-D Duplicate	FP-2B 28.5-33.5	FP-2C 33.5-38.5	FP-2D 38.5-43.5
TCLP-M (mg/l)								
Arsenic	0.005	QN	QN	0.007	0.015	QN	QN	ND
Barium	2	2.1	4.7	1.1	ND	1.2	5.2	4.1
Cadmium	QN QN	0.007	0.011	0.007	0.003	0.005	ND	0.003
Chromium	0.04	ND	ND	0.03	0.04	0.04	0.04	0.03
Lead	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	0.0004	ND	0.0007	ND
Selenium	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.02	ND	ND	ND	ND	ND	ND	ND
TPH (mg/kg)	22	21	32	3600	0099	3050	8500	ND
BTEX (mg/kg)								
Benzene	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	0.111	1.18	0.427	3.52	ND
Ethylbenzene	ΩN	ND	ND	0.175	2.14	0.325	1.72	ND
P&M-Xylene	ND	ND	ND	0.549	9.12	0.781	29.9	ND
O-Xylene	ND	ND	ND	0.389	5.28	0.657	4.18	ND
Total BTEX	0	0	0	1.224	17.72	2.19	16.09	0

TABLE 4-2 (Continued)
ANALYTICAL RESULTS - FILTER COLLECTION AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

Parameter	FP-3A 28.5-33.5	FP-3B 39-43.5	FP-3C 45.5-48	FP-4A 28.5-33.5	FP-4B 33.5-40	FP-5A 13.5-18.5	FP-5B 18.5-23.5
TCLP-M (mg/l)							
Arsenic	0.005	ND	ND	ND	ND	ND	ND
Barium	1.9	1.4	ND	1.9	2.1	1.6	3.2
Cadmium	0.006	0.006	0.008	0.006	0.008	0.007	0.009
Chromium	0.06	ND	ND	ND	ND	ND	ND
Lead	QN	ND	ND	ND	ND	ND	ND
Mercury	0.0011	0.0002	ND	ND	0.0002	ND	0.0003
Selenium	ND	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND	ND
TPH (mg/kg)	008	7500	38	25	64	340	1190
BTEX (mg/kg)						F	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Benzene	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	1.76	ND	ND	ND	ND	QN
Ethylbenzene	QN	1.39	ND	ND	ND	ND	QN
P&M-Xylene	ND	6.42	ND	ND	ND	ND	QN
O-Xylene	ND	4.22	ND	QN	ND	ND	ND
Total BTEX	0	13.79	0	0	0	0	0

TABLE 4-2 (Continued)
ANALYTICAL RESULTS - FILTER COLLECTION AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

Parameter	FP-5C 23.5-28.5	FP-6A 18.5-23.5	FP-6B 38-40	FP-7A 8.5-13.5	FP-7B 38.5-43	FP-7C 43.5-47	FP-7D 47-48	FP-7E 48-50
TCLP-M (mg/l)					·			
Arsenic	ND	QN	ND	0.005	ND	ND	ND	ND
Barium	0.8	1.9	4.4	6.0	1.7	3.9	ND	ND
Cadmium	0.006	0.008	0.009	0.01	0.01	0.008	0.01	0.016
Chromium	ND	QN	QN	0.02	0.02	QN	ND	ND
Lead	ND	ND	ND	0.11	0.11	0.1	ND	ND
Mercury	0.0002	ND	ND	ND	ND	0.0002	ND	ND
Selenium	ND	ND	0.005	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND	ND	ND
TPH (mg/kg)	25760	42	156	30	QN	21030	10620	7.1
BTEX (mg/kg)							1	
Benzene	ND	ND	ND	ND	ND	ΝD	ΩN	ND
Toluene	0.22	ND	ND	ND	ND	0.57	0.2	ND
Ethylbenzene	ND	ND	QN	ND	ND	0.34	0.14	ND
P&M-Xylene	0.28	ND	ND	ND	ND	4.62	1.89	ND
O-Xylene	0.21	ND	ND	ND	ND	0.95	0.43	ND
Total BTEX	0.71	0	0	0	0	6.48	2.66	0

33.5- to 38.5-foot sample from this boring displayed a TPH concentration of 8,500 mg/kg. In Boring FP-3, samples collected from the 28.5- to 33.5-foot and 39- to 43.5-foot depth intervals displayed TPH concentrations of 800 and 7,500 mg/kg, respectively. Within Boring FP-5, TPH concentrations of 340 mg/kg in the 13.5- to 18.5-foot interval, 1,190 mg/kg in the 18.5- to 23.5-foot interval, and 25,760 mg/kg in the 23.5- to 28.5-foot depth interval were recorded. The sample collected from 38 to 40 feet below grade in Boring SB-6 contained TPH at a concentration of 156 mg/kg. Samples collected from the 43.5- to 47-foot interval and the 47- to 48-foot interval of Boring FP-7 displayed TPH concentrations of 21,030 and 10,620 mg/kg, respectively.

Total BTEX concentrations ranged from non-detect in samples from Borings FP-1, -4, and -6 to a maximum of 17.72 mg/kg in Boring FP-2 (23.5 - 28.5 foot interval). Benzene was not detected in any of these samples.

A varied distribution of arsenic, barium, cadmium, chromium, mercury, and silver concentrations were detected in the samples submitted for laboratory analysis. All metals concentrations, however, are well below TCLP regulatory levels.

# 4.1.3 Burn Collection Area

Soil samples collected from the Burn Collection Area were analyzed for BTEX and TCLP-O constituents. Table 4-3 presents the analytical results for samples collected from the Burn Collection Area.

BTEX concentrations ranged from non-detect in several samples to a maximum of concentration of 14.08 mg/kg in Sample BP-1E. Benzene was not detected in any of these samples.

ANALYTICAL RESULTS - BURN COLLECTION AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARISRAD NEW MEXICO

Parameter BP-1A TCLP-O (mg/l) Semivolatiles NA	-14					
(1)	-28.5	BP-1B 28.5-31.5	BP-1C 18.5-23.5	BP-1D 38.5-43.5	BP-1E 48.5-53.5	BP-2A 23.5-28.5
	Ą	NA	NA	ND	ND	NA
O-Cresol/2-Methylphenol NA	Ą	NA	NA	ND	ND	NA
M/P-Cresol/3,4- Methylphenol	A	NA	NA	0.002	ND	NA
2,4,5-Trichlorophenol ND	0	ND	ND	ND	ND	ND
Hexachlorobenzene 0.0	0.039	0.018	0.006	ND	ND	ND
Hexachlorobutadiene 0.0	0.013	0.005	0.003	ND	ND	ND
Hexachloroethane NA	4	A A	NA A	ND	QN	NA
2,4,6-Trichlorophenol ND		QN	QN	ND	ND	ND
Pentachlorophenol NA		N A	NA	ND	ND	NA
1,4-Dichlorobenzene NA	4	NA	NA	ND	ND	NA
Volatiles		   1   1   1   1	} 1 1 1 1 1 1 1 1	1		0 0 0 0 0 0 0 0 0 0
Benzene		QN QN	ND	ND	ND	QN
Carbon Tetrachloride ND		ND	ND	ND	ND	ND
Chlorobenzene		QN	QN ON	ND	ND	ND
1,2-Dichloroethane ND		ND	ND	ND	ND	ND

TABLE 4-3 (Continued)
ANALYTICAL RESULTS - BURN COLLECTION AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

Parameter	BP-1A 23.5-28.5	BP-1B 28.5-31.5	BP-1C 18.5-23.5	BP-1D 38.5-43.5	BP-1E 48.5-53.5	BP-2A 23.5-28.5
1,1-Dichloroethylene	ND	ND	ND	ND	QN	0.003
Tetrachloroethylene	NA	NA	NA	0.008	0.008	NA
Trichloroethylene	0.026	0.016	0.001	ND	ND	0.145
Vinyl Chloride	NA	NA	NA	ND	ND	NA
1,4-Dichlorobenzene	NA	NA	NA	ND	QN	NA
Methyl Ethyl Ketone	QN	ND	ND	QN	QN	QN
BTEX (mg/kg)						
Benzene	ND	ND	ND	QN	ND	ND
Toluene	ND	ND	ND	ND	1.76	0.21
Ethylbenzene	ND	0.13	ND	ND	0.44	0.27
P&M-Xylene	0.53	0.4	ND	ND	8.8	0.82
O-Xylene	0.44	0.49	ND	ND	3.08	0.78
Total BTEX	0.97	1.02	0	0	14.08	2.08

TABLE 4-3 (Continued)
ANALYTICAL RESULTS - BURN COLLECTION AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

Parameter	BP-2B 28.5-33.5	BP-2C 33.5-38.5	BP-2D 38.5-43.5	BP-2E 43.5-48.5	BP-3A 28.5-31	BP-3B 32.5-39
TCLP-0 (mg/l)						
Semivolatiles			r	F=		#
Pyridine	NA	NA	NA	NA	NA	NA
O-Cresol/2-Methylphenol	NA	NA	NA	NA	NA	NA
M/P-Cresol/3,4- Methylphenol	NA	NA	NA	NA	NA	AN
2,4,5-Trichlorophenol	ND	QN	QN	ND	ND	ND
Hexachlorobenzene	0.004	ND	0.004	0.01	ND	ND
Hexachlorobutadiene	ND	ND	ND	0.004	ND	ND
Hexachloroethane	AN	AN	NA	NA	NA	NA
2,4,6-Trichlorophenol	ΩN	ND	QN	ΩN	ND	ND
Pentachlorophenol	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	N.A	NA	NA	NA
				-		
Volatiles						
Benzene	ND	ND	QN	QN	QN	ΩN
Carbon Tetrachloride	ND	ND	QN	ND	ND	QN
Chlorobenzene	ND	ND	ND	ND	ND	QN
				ı		

TABLE 4-3 (Continued)
ANALYTICAL RESULTS - BURN COLLECTION AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

Parameter	BP-2B 28.5-33.5	BP-2C	BP-2D 38.5-43.5	BP-2E 43.5-48.5	BP-3A 28.5-31	BP-3B 32.5-39
	QN	ND	ND	ND	QX	QN
1,2-Dichloroethane			1	4	4	67
1,1-Dichloroethylene	ON.	ON	ND	ON	QN	QN
Tetrachloroethylene	NA A	NA	NA	NA	NA	NA
Trichloroethylene	0.129	ND	0.001	ND	0.001	QN
Vinyl Chloride	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA
Methyl Ethyl Ketone	QN	ND	QN	ND	ND	QN
BTEX (mg/kg)						
Benzene	ND	ND	QN	ND	ND	QN
Toluene	0.13	0.38	0.14	QN	ND	ND
Ethylbenzene	0.17	0.23	ND	ND	ND	QN
P&M-Xylene	1.65	1.42	0.7	ND	ND	QN
0-Xylene	0.52	0.82	0.43	ND	ND	QN
Total BTEX	2.47	2.85	1.27	0	0	0

TABLE 4-3 (Continued)
ANALYTICAL RESULTS - BURN COLLECTION AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

Parameter	BP-3C 39-43	BP-4A 38-40	BP-5A 8.5-13.5	BP-5B 15-18.5	BP-5C 18.5-23.5	BP-5D 23.5-27
TCLP-O (mg/l)			-			
Semivolatiles						
Pyridine	NA	NA	NA	NA	NA	NA
O-Cresol/2-Methylphenol	NA	NA	NA	AN	NA	NA
M/P-Cresol/3,4- Methylphenol	NA	NA	NA	NA	NA	AN
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	QN
Hexachlorobenzene	ND	ND	QN	QN	ND	0.005
Hexachlorobutadiene	ND	ND	QN	ND	ND	QN
Hexachloroethane	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	ND	ND	ND	ND	QN	QN
Pentachlorophenol	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA
Volatiles						
Benzene	ND	ND	ND	QN	ND	QN
Carbon Tetrachloride	ND	ND	ND	ND	ND	QN
Chlorobenzene	ND	S	Z	ND	ND	ND

TABLE 4-3 (Continued)
ANALYTICAL RESULTS - BURN COLLECTION AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

Parameter	BP-3C 39-43	BP-4A 38-40	BP-5A 8.5-13.5	BP-5B 15-18.5	BP-5C 18.5-23.5	BP-5D 23.5-27
1,2-Dichloroethane	QΝ	QN	ND	ΩN	QN	QN
1,1-Dichloroethylene	ND	ND	ND	ND	ND	QN
Tetrachloroethylene	NA	NA	NA	NA	NA	NA
Trichloroethylene	ND	ND	0.019	0.057	0.007	0.003
Vinyl Chloride	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA
Methyl Ethyl Ketone	ND	ND	ND	ND	ND	QN
BTEX (mg/kg)						
Benzene	ND	ND	QN	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	0.17
Ethylbenzene	ND	ND	0.17	ND	ND	0.16
P&M-Xylene	ND	ND	0.55	0.23	0.24	0.45
O-Xylene	ND	NO	0.63	0.23	0.21	0.41
Total BTEX	0	0	1.35	0.46	0.45	1.19

TABLE 4-3 (Continued)
ANALYTICAL RESULTS - BURN COLLECTION AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

Parameter	BP-5E 27-28.5	BP-5F 28.5-33	BP-5G 34.5-36	BP-5H 42-43	BP-6A 18.5-23.5	BP-6B 38-40
TCLP-0 (mg/l)						
Semivolatiles	f 1 1 1 1 1 1 1 1					
Pyridine	NA	NA	NA	NA	NA	NA
O-Cresol/2-Methylphenol	NA	NA	NA	NA	NA	NA
M/P-Cresol/3,4- Methylphenol	NA	NA	NA	NA	NA	NA V
2,4,5-Trichlorophenol	ND	ND	ND	ND	N	ND
Hexachlorobenzene	0.017	ND	ND	ND	ND	ND
Hexachlorobutadiene	0.004	QN	ND	ND	ND	ND
Hexachloroethane	NA .	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	ON	ND	ND	ND	ND	QN
Pentachlorophenol	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA
				<i>+</i> ,		
Volatiles						
Benzene	QN	QN	QN	QN	ND	QN
Carbon Tetrachloride	ND	QN	ND	ND	ND	ND
Chlorobenzene	ND ON	ND	QN	ND	QN	ND

TABLE 4-3 (Continued)
ANALYTICAL RESULTS - BURN COLLECTION AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

Parameter	BP-5E 27-28.5	BP-5F 28.5-33	BP-5G 34.5-36	BP-5H 42-43	BP-6A 18.5-23.5	BP-6B 38-40
1,2-Dichloroethane	ND	ND	ND	QN	QN	QN
1,1-Dichloroethylene	0.005	ND	ND	ND	ND	ND
Tetrachloroethylene	NA	NA	NA	NA	NA	NA
Trichloroethylene	0.037	0.035	0.017	ND	ND	ND
Vinyl Chloride	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA
Methyl Ethyl Ketone	QN	ND	ND	ND	ND	ND
BTEX (mg/kg)						
Benzene	ND	ND	ND	QN	NO	ND
Toluene	0.26	ND	0.81	ND	NO	ND
Ethylbenzene	0.26	ND	0.65	ND	ND	ND
P&M-Xylene	0.75	0.33	3.04	ND	ND	ND
O-Xylene	0.74	0.33	2.04	ND	ND	ND
Total BTEX	2.01	0.66	6.54	0	0	0

A varied distribution of TCLP-O volatile and semivolatile constituents were detected at low concentrations in the samples submitted for laboratory analysis from the Burn Collection Area. All concentrations are well below TCLP regulatory levels, however.

#### 4.1.4 Off-Site Area

Soil samples were collected from soil borings placed north of the Filter Collection Area and Burn Collection Area on property controlled by the Bureau of Land Management. These samples were analyzed for BTEX, TPH, TCLP-O and TCLP-M constituents. Table 4-4 presents analytical results for sample collected from the off-site area.

BTEX was only detected in Sample O-3C, collected from the 48.5 - 51 foot interval. The total BTEX concentration was reported as 0.44 mg/kg. Benzene was not detected in any of the samples collected from the off-site area.

TPH concentrations ranged from non-detect to a maximum of 32 mg/kg in Sample O-1A.

TCLP-O constituent concentrations were determined in Soil Boring O-3 only. No TCLP-O constituents were detected.

TCLP-M constituent concentrations were determined in samples from Soil Borings O-1 and O-2. A varied distribution of barium, cadmium, selenium and silver concentrations were detected. All detections are well below 40 CFR 261 TCLP regulatory levels.

#### 4.2 GROUNDWATER

Groundwater samples collected from monitor wells and soil borings were analyzed for TPH and BTEX. One groundwater sample was also analyzed for TCLP-O semivolatile and volatile constituents. Table 4-5 presents the analytical results for groundwater samples.

ANALYTICAL RESULTS - OFF-SITE AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

			CANLIDBAI	CANESDAD, NEW MEAICO	2				
Parameter	0-1A 18.5-23.5	0-1B 43.5-48.5	0-2A 13.5-18.5	0-2B 38.5-43.5	0-2C 43.5-47	O-2C-D Duplicate	0-3A 27-32	0-3B 43.5-48.5	0-3C 48.5-51
TCLP-O (mg/l)									
Semivolatiles									
Pyridine	NA	NA	NA	NA	NA	NA	ND	QN	ND
O-Cresol/2-Methylphenol	NA	NA	NA	NA	NA	NA	QN	QN	ND
M/P-Cresol/3,4- Methylphenol	NA	NA	NA	NA	NA A	NA	ND	ΩN	ND
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	ND	QN	ND
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	QN	QN	ND
Hexachlorobutadiene	Y V	NA	NA	NA	NA	NA	ND	ND	ND
Hexachloroethane	NA	NA	NA	NA	Y Y	NA	ND	ND	ND
2,4,6-Trichlorophenol	NA AN	NA	NA	NA	NA AN	NA	ND	ND	ND
Pentachlorophenol	NA AN	NA	NA	NA	NA	NA	ND	ND	ND
1,4-Dichlorobenzene	NA AN	NA	NA	NA	NA	NA	ND	ND	QN
			i						
Volatiles									
Benzene	NA A	NA	NA	NA	NA	NA	ND	QN	ND
Carbon Tetrachloride	NA AN	NA	NA	NA	NA	NA	ND	ND	ND
Chlorobenzene	NA	NA	NA	NA	NA	NA	ND	ND	ND
1,2-Dichloroethane	NA A	NA	NA	NA	NA	NA	ND	ND	ND
1,1-Dichloroethylene	NA	NA	NA	NA	NA	NA	ND	ND	ND

TABLE 4-4 (Continued)
ANALYTICAL RESULTS - OFF-SITE AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

Parameter	0-1A 18.5-23.5	0-1B 43.5-48.5	0-2A 13.5-18.5	0-2B 38.5-43.5	0-2C 43.5-47	O-2C-D Duplicate	0-3A 27-32	0-3B 43.5-48.5	0-3C 48.5-51
Tetrachloroethylene	NA	NA	NA	NA	NA	NA	ND	ND	ND
Trichloroethylene	NA	NA	NA	NA	NA	NA	ND	ND	ND
Vinyl Chloride	NA	NA	NA	NA	NA	NA	ND	ND	ND
1,4-Dichlorobenzene	NA	NA	NA	NA	NA V	NA	ND	ND	ND
Methyl Ethyl Ketone	NA	NA	NA	NA	NA	NA	ND	ND	ND
TCLP-M (mg/l)									
Arsenic	ND	QN	ND	ND	ND	ND	NA	NA	NA
Barium	0.64	0.58	ND	ND	1.89	0.5	NA	NA	NA
Cadmium	0.008	0.012	0.012	0.013	0.01	0.012	NA A	NA	NA
Chromium	ND	ND	ND	ND	ND	ND	NA	NA	NA
Lead	ND	ND	ND	ND	ND	ND	NA	NA	NA
Mercury	ND	ND	ND	ND	ND	ND	NA	NA	NA
Selenium	ND	0.03	0.023	0.023	0.024	0.033	NA A	NA	NA
Silver	ND	0.01	ND	0.03	ND	ND	NA	NA	NA
							:		
TPH (mg/kg)	32	16	8.7	5.3	2.0	18	NA	NA	NA

TABLE 4-4 (Continued)
ANALYTICAL RESULTS - OFF-SITE AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

Parameter	0-1A 18.5-23.5	0-1B 43.5-48.5	0-2A 13.5-18.5	0-2B 38.5-43.5	0-2C 43.5-47	O-2C-D Duplicate	0-3A 27-32	O-3B 43.5-48.5	0-3C 48.5-51
BTEX (mg/kg)									
Benzene	ND	QN	QN	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	QN	QN	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
P&M-Xylene	QN	ND	ΩN	ND	ND	ND	ND	ND	0.33
O-Xylene	ND	ND	ND	QN	QN	ND	ND	ND	0.11
Total BTEX	0	0	0	0	0	0	0	0	0.44

TABLE 4-4 (Continued)
ANALYTICAL RESULTS - OFF-SITE AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

Parameter	0-4A 34-39	0-4B 39-44	0-5A 42-47	O-6A 39-44	0-7A 39-44	O-8A 39-44	0-9A 42-44	O-10A 39-44	0-11A 39-44	O-12A 39-44
TCLP-O (mg/1)					-					
Semivolatiles										
Pyridine	NA	NA	NA							
O-Cresol/2-Methylphenol	NA	NA	NA							
M/P-Cresol/3,4- Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA							
Hexachlorobenzene	NA	NA	NA							
Hexachlorobutadiene	NA	Z A	NA A	NA	NA	N.	NA	NA	NA	NA A
Hexachloroethane	NA	NA	NA							
2,4,6-Trichlorophenol	NA	ΝΑ	NA A	Ϋ́	NA	AN	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	AN	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA							
Volatiles										
Benzene	NA	NA	NA	NA	NA	NA A	NA	NA	NA	AN
Carbon Tetrachloride	NA	NA	NA							
Chlorobenzene	NA	NA	NA							
1,2-Dichloroethane	NA	NA	NA							
1,1-Dichloroethylene	NA	NA	NA							

TABLE 4-4 (Continued)
ANALYTICAL RESULTS - OFF-SITE AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

Doromotor	0-4A	0-4B	0-5A	0-6A	0-7A	O-8A	O-9A	0-10A	0-11A	0-12A
1 Alamotei	34-39	39-44	42-47	39-44	39-44	39-44	42-44	39-44	39-44	39-44
Tetrachloroethylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	NA	NA	NA	NA	AN	N A	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl Ethyl Ketone	NA	NA	NA	NA	NA	NA	NA	AN	NA A	NA
TCLP-M (mg/l)										
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA A	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA A	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	A'N
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	A'A	NA	NA
Selenium	NA	NA	NA	NA	NA A	NA	NA A	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	A'A	NA	NA
TPH (mg/kg)	QN	ND	20	ND	ND	ND	ND	ND	ND	ND

TABLE 4-4 (Continued)
ANALYTICAL RESULTS - OFF-SITE AREA SOIL SAMPLES
COMPRESSOR STATION WT-1
CARLSBAD, NEW MEXICO

Parameter	0-4A 34-39	0-4B 39-44	0-5A 42-47	0-6A 39-44	0-7A 39-44	O-8A 39-44	0-9A 42-44	O-10A 39-44	0-11A 39-44	O-12A 39-44
BTEX (mg/kg)										
Benzene	ΩN	dΝ	QN	ND	ND	ND	ND	ND	ΩN	QN
Toluene	ND	QN	QN	QN	ND	QN	QN	ND	QN	ND
Ethylbenzene	ND	QN	ND	ND	ND	ND	ΩN	ND	ND	ND
P&M-Xylene	ND	QN	ND	ND	ND	ND	ND	ND	ND	ND
O-Xylene	ND	QN	ND	ND	ND	ND	ND	ND	ND	ND
Total BTEX	0	0	0	0	0	0	0	0	0	0

TABLE 45
GROUNDWATER ANALITYICAL RESULTS
COMPRESSOR STATION WT-1
CARI SRAD NEW MENCO

						CARLSBA	CARLSBAD, NEW MEXICO	န္ဌ							
Parameter	W1-0	MW-1	WW-2	MW-3	FP-2W	FP-3W	BP-2W	<b>0</b> ₩	O-5W	O-6W	W-0	W8-O	W6-0	O-10W	0-12W
TPH (mg/l)	1.5	12	3	0.52	65	240	ΝΑ	9.0	0.2	2	Q	Q	110	Q	2.5
BTEX (ug/l)															
Benzene	45.5	14	45	24.4	218	47.7	9	2	2	8	QN	QN	45	QN	4
Toluene	5	91	101	QN	825	120	18.7	3	QN	QN	ON	QN	6	QN	QN
Ethylbenzene	4.6	QN	17	22.6	130	31.7	3.5	7	QN	QN	QN	QN	59	QN	QN
P&M-Xylene	2.7	43	66	20.4	482	93.1	13.7	7	QN	QN	ND	ND	25	ND	ND
O-Xylene	3.3	26	51	5.7	316	73.5	12.3	2	QN	QN	QN	ND	43	QN	QN
Total BTEX	61.1	174	313	73.1	1971	366	54.2	59	7	8	0	0	181	0	4
TCLP-O (mg/l)															
Semivolatiles															
2,4,5- Trichlorophenol	NA	NA	NA	NA	NA	NA	QN	NA	NA	N	NA	NA	NA	NA	NA
Hexachlorobenzene	A Z	Ą	Ϋ́	ΝΑ	ΑN	AN	2.65	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA A	A A	Ą	ΑN	Ā	Ą	1.01	A	A A	NA	NA	NA	NA	NA	A A
2,4,6- Trichlorophenol	A A	Ā	A A	AN A	Ν	A A	QN	NA A	A	NA	NA	NA	NA	NA	NA

TABLE 45 (Continued)
GROUNDWATER ANALYTICAL RESULTS
COMPRESSOR STATION Wf-1
CARLSBAD, NEW MEXICO

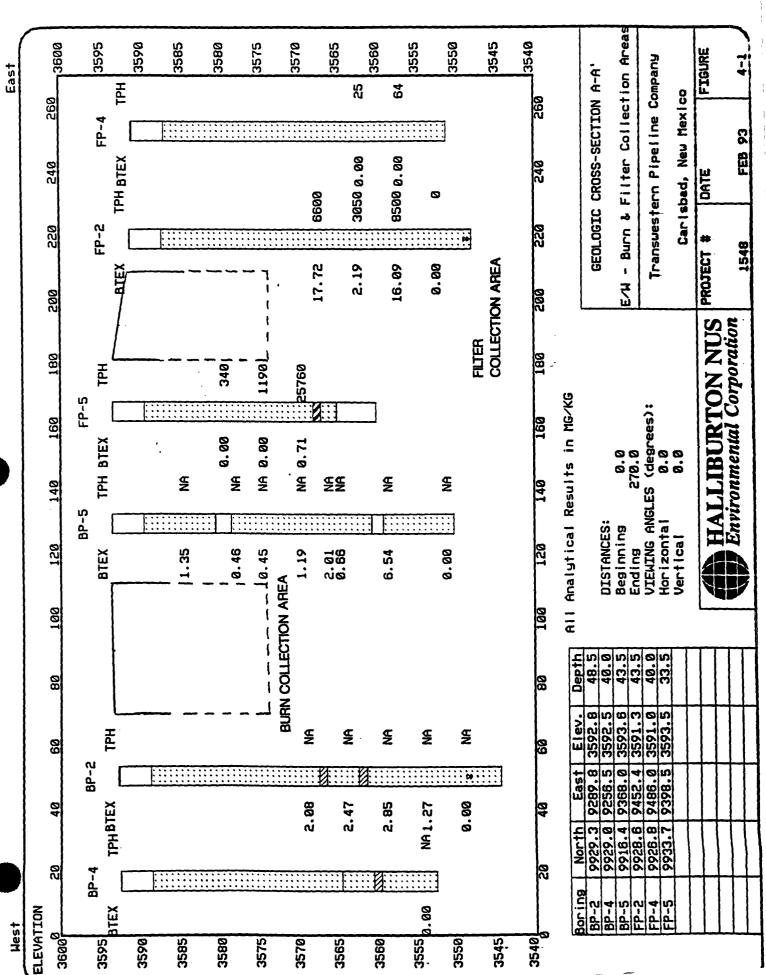
Parameter	0-1W	MW-1	MW-2	MW-3	FP-2W	FP-3W	BP-2W	O-4W	O-5W	W9-0	W-0	O-8W	O-9W	O-10W	O-12W
Volatiles															
Benzene	ĄN	ΑN	AN	Ą	NA	NA	ND	, AN	NA	NA	A'A	A N	A N	NA	NA
Carbon Tetrachloride	NA	Ā	A A	NA	NA	NA	QN	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	٩×	Ϋ́	¥	ΑA	NA	NA	ND	NA	NA	NA	ΑN	A A	NA	NA	NA
1,2-Dichloroethane	ΑN	Ą	Ą	Ą	ΝA	ΑN	QN	NA	NA	NA	NA	NA	A V	NA	NA
1,1-Dichloroethylene	ΑN	ΑX	Ą Z	Ϋ́	AN AN	ΑN	QN	NA	NA	NA	NA	NA A	A N	NA	NA
Trichloroethylene	ΑN	ΑN	NA	NA	ΝA	NA	0.013	NA	NA	NA	A A	NA A	NA	NA	NA
Methyl Ethyl Ketone	ΝΑ	ΑN	ĄN	NA	NA	NA	ND	NA	NA	δ A	A A	NA	NA	NA	NA

TPH concentrations in groundwater samples ranged from non-detect to a maximum of 240 mg/l in the groundwater sample collected from Boring FP-3. BTEX concentrations ranged from non-detect to a maximum of 1971  $\mu$ g/l in the groundwater sample collected from Boring FP-3. Two semivolatiles, hexachlorobenzene and hexachlorobutadiene, along with the volatile organic compound trichloroethylene were detected in the groundwater sample collected from Boring BP-2.

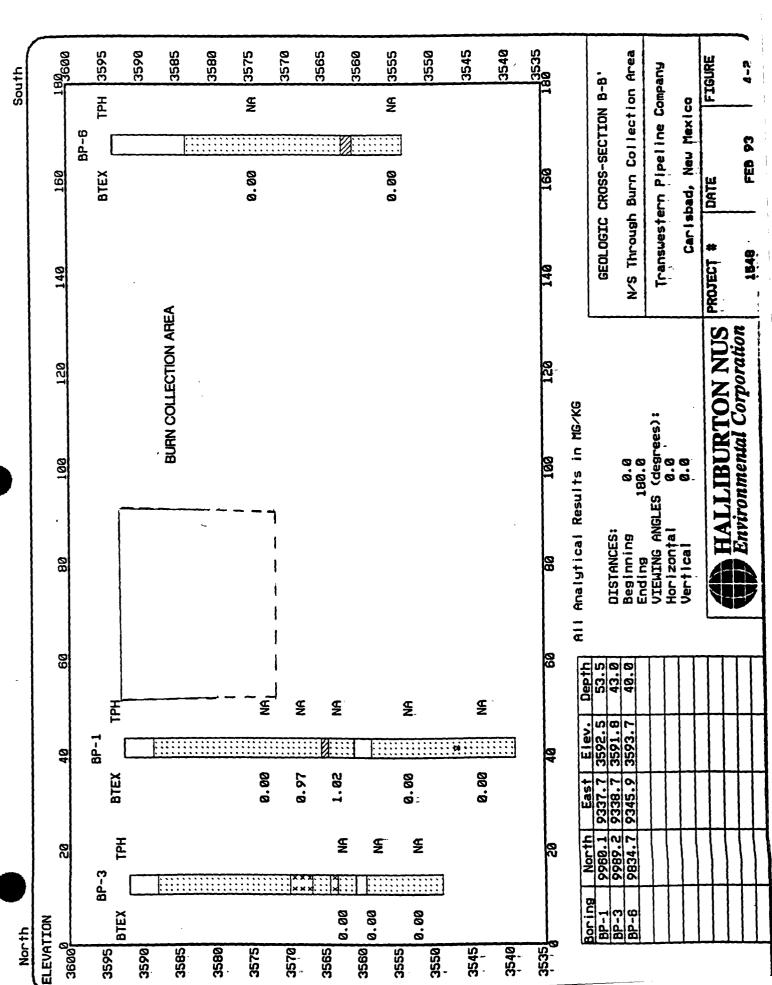
#### 4.3 IMPACTED SOIL AND GROUNDWATER

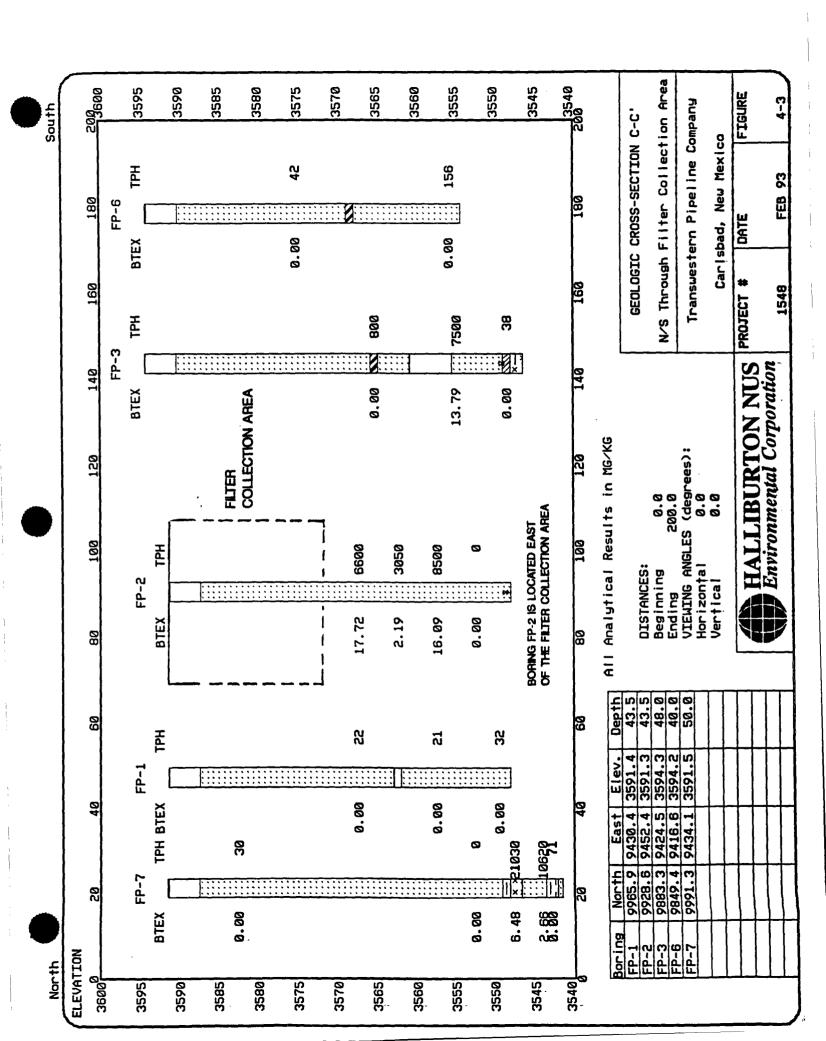
Evidence of soil impact and free product was discovered in several borings located around the Burn Collection Area and Filter Collection Area. These two collection areas are located approximately 60 feet apart, though their exact locations and depths are not known. The tops of both collection areas are slightly elevated from the surrounding terrain. This is probably due to the backfill cap which was previously placed on them. The area above the Filter Collection Area has exposed filter material on the surface in several locations.

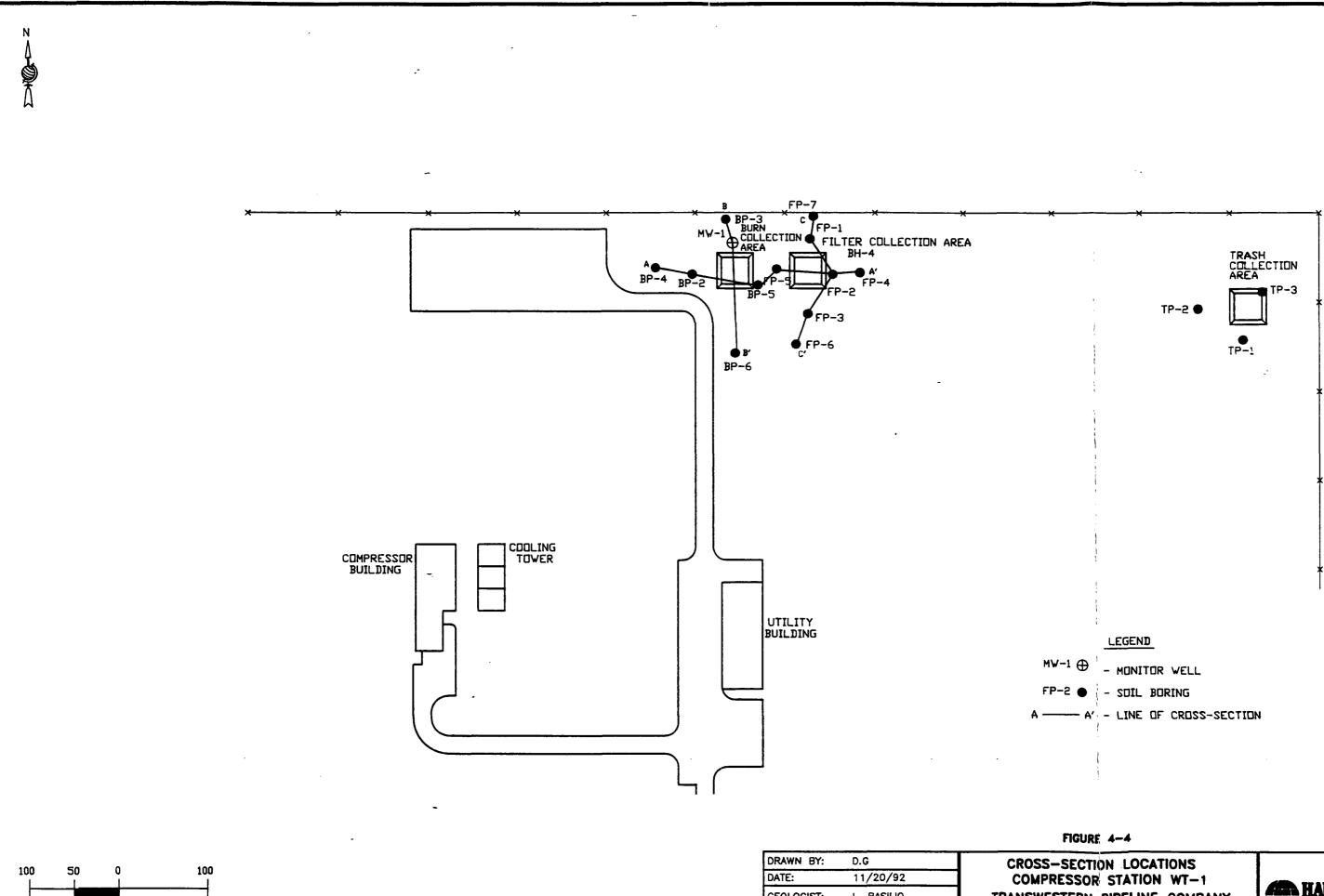
The presence of free product in recovered core samples was noted in three soil borings located outside the perimeter of the Burn Collection Area. These soil borings, BP-1, BP-5, and BP-2, were located to the north, east, and west, respectively of the Burn Collection Area. The oil impacted zones ranged from 8 to 20 feet in thickness. The largest zone occurred in Boring BP-5, which is located to the east of the Burn Collection Area, between the Burn Collection Area and Filter Collection Area. All samples collected from these zones for laboratory analysis exhibited elevated total BTEX concentrations. Three soil borings installed around the Filter Collection Area also displayed the presence of free product in recovered core samples. The affected borings were Soil Borings FP-7, FP-2, and FP-5, which are located north, south, and west, respectively of the Filter Collection Area. The oil impacted zones ranged from 3 to 4 feet in thickness. The samples collected from these borings exhibited elevated TPH and BTEX concentrations. Cross-sections A-A', B-B', and C-C' (i.e., Figures 4-1, 4-2, and 4-3) depict lithology and analytical results. The locations of Cross-Sections A-A', B-B', and C-C' are shown in Figure 4-4.



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SCALE - FEET

DRAWN BY:	D.G	CROSS-SECTION LOC	ATIONS		
DATE:	11/20/92	COMPRESSOR STATIC			
GEOLOGIST:	L. BASILIO	TRANSWESTERN PIPELIN	E COMPAN	ΙY	
DATE:	11/21/92	CARLSBAD, NEW M	IEXICO		
CAD DWG. NO	: 15522A.DWG	SCALE: 1"=100'-0" DWG. NO.	1552-2B01	REV.	0

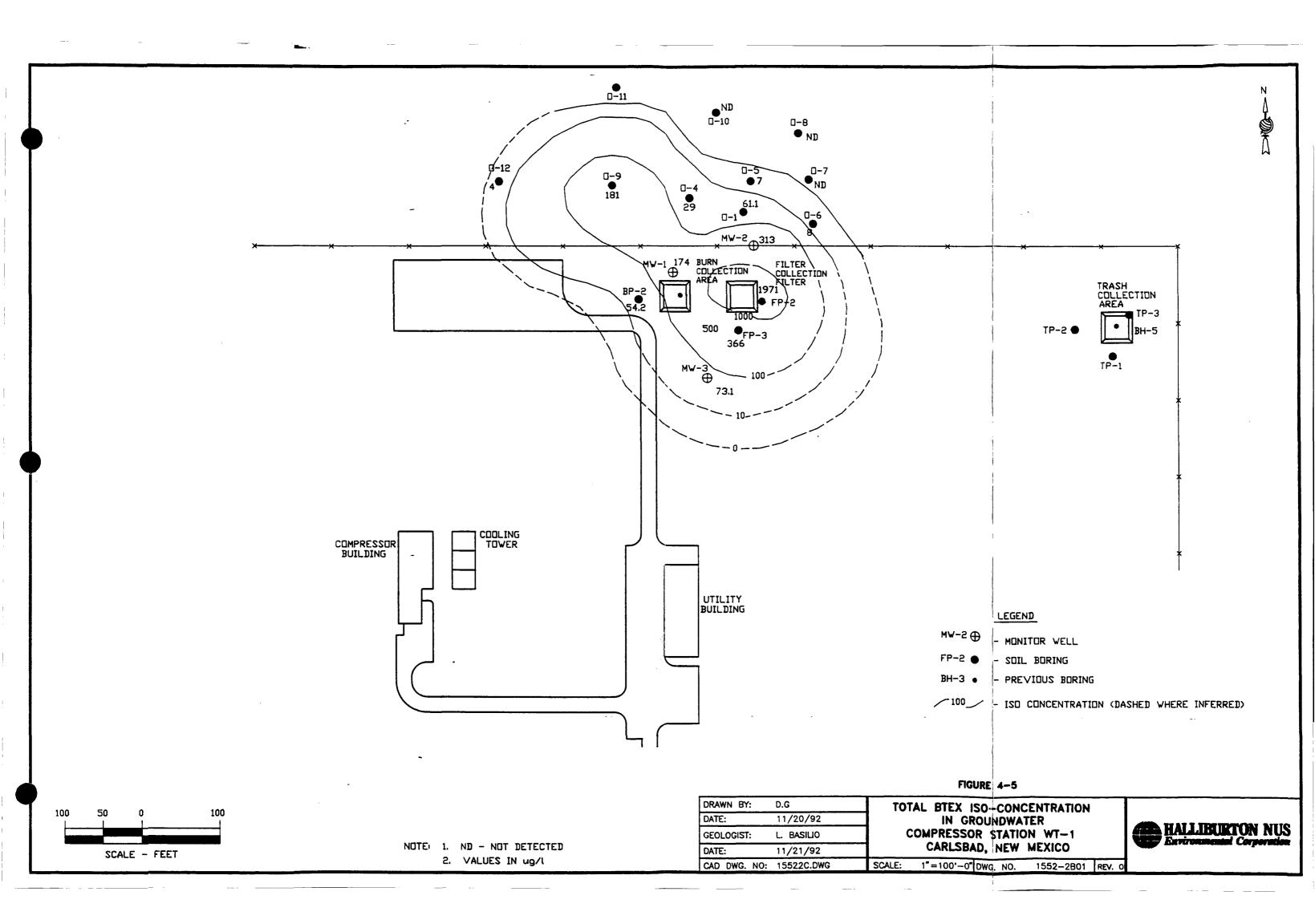


Step out borings were drilled where soil impact was discovered. Soil impact included physical presence of free product and/or elevated PID/FID readings. These borings were drilled to depths of approximately 40 to 50 feet. Step out borings continued until a boring was found to be free of soil impact, as previously described.

Twelve soil borings were placed north of the WT-1 property boundary to determine the extent of soil and groundwater contamination. Only one of these off-site borings, Boring O-3, contained free product in a core sample. Free product was also observed in onsite Borings FB-5, FP-7, BP-1, BP-2, and BP-5. Therefore, it appears that soil impact by free product is limited to the areas immediately surrounding the collection areas.

Groundwater was encountered in numerous borings drilled at the WT-1 site. Samples were collected from the three monitor wells installed at the site and from 12 borings that encountered groundwater. Borings O-3 and MW-2 were the only borings in which free product was discovered in direct association with groundwater. Free product thicknesses in Boring O-3 and Monitor Well MW-2 were 2.08 feet and 0.34 feet, respectively. Boring O-3 is located approximately 80 feet north of the Burn Collection Area and Monitor Well MW-2 is located approximately 30 feet north of the Filter Collection Area. When Monitor Well MW-2 was developed, pinhead-sized droplets of oil were observed floating on the water surface of the bailer during the development process. Purging prior to groundwater sample collection removed any sign of these droplets. Upon inspection of the groundwater recovered from Borings FP-2 and FP-3 approximately one month after completion of groundwater sampling, sheens were observed on the surface of the recovered groundwater contained within the 55-gallon drums. Groundwater samples collected from all other monitor wells and borings showed no evidence of free product or sheen on the water surface.

A dissolved phase plume was detected at the site based on BTEX analysis of groundwater samples. Figure 4-5 is an iso-concentration map depicting total BTEX in groundwater. The highest concentration is centered around the Filter Collection Area. The plume also shows a small lobe extending to the northwest of this collection area. The impacted groundwater plume does not exactly coincide with the hydraulic gradient depicted. Therefore, it is likely that the migration of the containment is along preferential transport pathways (i.e., fractures or porosity zones). Also, it should be noted that the movement of chemical compounds in the groundwater is further complicated by the effects of dilution, dispersion, absorption, and degradation within the subsurface environment.



## 5.0 CONCLUSIONS

The following conclusions are based on the results of the field investigation and analytical data.

- The lithology of the site consists of poorly to well indurated sandstone and caliche.

  Geologic formations encountered at the site are the Mescalaro Caliche and the

  Gatuna Formation.
- The primary means of downward migration of fluids through the lithified surficial materials into the subsurface appears to be by migration along fractures within the surficial sedimentary rocks.
- Groundwater at the site is encountered approximately 45 feet below grade.

  Groundwater flow direction is to the north-northeast, coincident with surface topography.
- The northwestward extension of the total BTEX contaminant plume from the presumed source area(s) (i.e., the Burn Collection Area and/or the Filter Collection Area), as depicted in Figure 4-5, is somewhat at variance with the north to northeast direction of groundwater flow at the site, as depicted in Figure 3-1. This phenomenon suggests that BTEX constituents may be migrating preferentially northwestward along near-surface fractures.
- Impact to soils from hydrocarbons was noted in several borings around both the Filter Collection Area and Burn Collection Area. Impact included both free product (i.e., phase-separated hydrocarbons) and elevated analytical results.

- Impact to groundwater by hydrocarbons was evidenced within groundwater samples collected. Both free product and dissolved phase impacts were noted.
- Impact to groundwater extends off-site to the north of the Burn and Filter Collection

  Areas approximately 60 to 180 feet north, respectively, of the north fenceline.

### 6.0 REFERENCES

Sandia Laboratories, 1978, Geological Characterization Report, Waste Isolation Pilot Plant (WIPP) Site, Southeastern New Mexico, Volume II, August 1978: Sandia Laboratories Report SAND 78-1596.

## APPENDIX A HEALTH AND SAFETY PLAN

## SITE-SPECIFIC HEALTH AND SAFETY PLAN

#### PREPARED FOR

#### TRANSWESTERN GAS PIPELINE COMPANY

WT-1 COMPRESSOR STATION, CARLSBAD, NEW MEXICO

#### PREPARED BY

HALLIBURTON NUS ENVIRONMENTAL CORPORATION
ENVIRONMENTAL SERVICES
SOUTHWEST REGION
FEBRUARY 1993
HALLIBURTON NUS PROJECT NUMBER 1548/7P54



Project Name:	Compressor Station WT-1	Project No.:	6250		
	Subsurface Investigation				
Scope of Work and Pu	rpose of Visit:				
B. WT-1 - Carlsbad C	Compressor Station - To delinea	te the lateral and vertica	l extent of contamination.		
	Il be drilled; four surrounding o				
pit.					
Site V	isit Personnel:	Respo	nsibility:		
Larry Basilio		Geologist & SSO			
Other	Contacts:	Phone	Nos.:		
S. Richard - HALLIBUR	RTON Project Manager	(713) 492-1888			
	swestern Env. Affairs Manager	(505) 625-8022			
	estern NM Operation Man	(505) 625-8031			
	id, NM, WT-1 C.S. Man	(505) 885-8525			
Dave Tanner - SH&B I		(505) 884-0950			

**Emergency Information:** 

WT-1 Compressor Station; Carlsbad, New Mexico

Туре	Name	Phone Nos.
Sheriff		911
Ambulance		911
Hospital	Guadalupe Medical Center	(505) 887-4100
Rescue Service		911
Poison Control Center	N.M. Poison Control	1-800-432-6866
Site Manager	Susanne Richard	(713) 492-1888
PMHS	Tom Samson	713-561-1564

Inclement Weather Procedures:
No working during electrical storm, extremely high ambient heat loads, or other extreme weather conditions
as determined by the SSO.
Site Background/Overall Information:
WT-1 - Carlsbad Compressor Station - Previous investigations have determined that activities associated with
the former oil pit, burn pit, and trash pit had impacted the sediments below these structures. Soils in
borings were found impacted by total petroleum hydrocarbons (TPH) down to 30 feet, TD of borings.
Hazard Assessment:
Hazards expected to be present include:
1 Fire and explosion from flammable/combustible materials
2 Moving machinery
3 Animal hazards - i.e., snakes, and ticks
5 Manual lifting and slip/trip hazards
6 Heat stress
7 Underground utilities, underground gas pipelines
Standard Operating Procedures: (i.e., basic hygiene, buddy system, no hand-to-mouth activities when
working on site, etc.)
Other: SSO will perform air monitoring during drilling and sampling activities.

Minimum - Steel toe/shank shoes or boots, standard field clothes. (If hard hats and safety glasses not worn, indicate why.)
Other: Hard hat and safety glass to be worn in vicinity of drilling operations. Rubber gloves to be worn during sampling activities.
Modified Level CPPE will be available on site and used if so determined by the SSO.
· · · · · · · · · · · · · · · · · · ·
PPE Selection Criteria:
Upgrade to modified Level C PPE if HNU reading in the breathing zone is greater than 60 ppm.
<del></del>
PPE Decon/Disposal (if applicable):
Inspection - generated waste will be placed in plastic bags and disposed of properly.
Monitoring Equipment and Calibration Information:
HNU - Calibrate daily with known calibration gas.
OVA - Factor calibrated. Check for positive response with a marking pen.

PPE Requirements: Level D

# HNU - 10.2 eV probe to scan for organic and inorganic vapor concentrations. OVA - Used to monitor organic vapor concentrations. Action Levels for Upgrading of PPE and/or Site Withdrawal: Begin work in Level D and upgrade PPE as site conditions warrant. Level D - <60 ppm reading on HNU in breathing zone. Modified Level C - >60 ppm reading on HNU/OVA in breathing zone or if workers are affected by vapors. Note:

Monitoring Equipment Selection Criteria:

Incident Report, Site Safety Follow-up Report, and Site Map must be attached.

#### MEDICAL DATA SHEET FOR FIELD TEAM MEMBERS

This brief Medical Data Sheet will be completed by all on site personnel and will be kept in the command post during the conduct of site operations. This data sheet will accompany any personnel when medical assistance is needed or if transport to hospital facilities is required.

Project									
Name Home Telephone									
Address									
Age	Height	Weight							
Name of	Next of Kin								
Drug or	other Allergies								
Particula	Sensitivities								
Do You \	Vear Contacts?								
	-	Exposure to Hazardous Chemicals.							
	·								
What me	dications are you presently using?								
Name, A	ddress, and Phone Number of per	sonal physician:							
		·							
-									
I am the	individual described above. I have	e read and understand this HASP.							
	Signature	Date							



T-1

**Transwestern Pipeline Company** 

PROJECT

LOCATION Carlsbad, New Mexico

COORDINATES N 9,855 E 9,912

PROJECT NUMBER 1548

SHEET 1 OF 1

SURFA	ACE ELEVATION 3590.6 DATUM MSL	<del>,</del>	LOG	GED BY	L. Basilio	DATE DRILLED 8/4/92			
Z				SAME	PLE INF	ORMA			
ELEVATION FEET	SOIL DESCRIPTION GROUND SURFACE	STRATA	Depth Feet	Sample Type	Sample ID	Inches Adv. / Inches Rec.	Penetr- ometer Blow Counts	PID/ FID (ppm)	REMARKS
	Tan dry rocky soil		-	AUGER		1.001		1/0	Surface Conditions: Vegetated, dry rocky soil.
-3585 - - - -3580	SANDSTONE - red, hard, cemented, broken  SANDSTONE - red, hard, clayey in spots, moist in clay zones  SANDSTONE - red, very, broken, crumbly, white caliche lenses		- 5 -	CORE	T-1A	26/12 28/24 60/24		1/0 0/0	Auger to 4 feet BLS.
- - -3575	SANDSTONE - red to brick red at base, dry, cemented, white caliche at top  SANDSTONE - dark red, hard, cemented,		- 15 -	CORE		60/30		0/0	
-3570 -	dry, friable at top,  CLAY - red to gray, very silty to sandy,		- 20 -	CORE		60/54		0/0	
- -3565 - -	moist, grades to sandstone  SANDSTONE - dark red, firm, cemented, occasional thin gray red clay lenses which are moist, friable to crumbly		25 -	CORE	T-18	78/78		0/0	
	Total depth = 30 feet BLS		- 30 -						

DRILLING CONTRACTOR: SH&B

COMMENTS: Boring located south of Trash Collection Area.

DRILLER:

E. Adams

**DRILLING METHOD:** 

**NQ** Core Barrel

**DRILLING EQUIPMENT:** 



PROJECT

**T-2** 

SHEET 1 OF 1

**Transwestern Pipeline Company** 

LOCATION Carlsbad, New Mexico

COORDINATES N 9,886 E 9,861

PROJECT NUMBER 1548

SURFACE ELEVATION 3590.7

DATUM MSI

SURFA	CE ELEVATION 3590.7 DATUM MSL		LOG	GED BY	L. E	Basilio	)			DATE DRILLED 8/4/92
NO		4	SAMPLE INFORMATION							
ELEVATION FEET	SOIL DESCRIPTION	STRATA	Depth	Sample	Sa	mple	Inches Adv.	Penetr- ometer	PID/ FID	REMARKS
ELE	GROUND SURFACE	S	Feet	Туре		D	inches Rec.	Blow Counts	ا د ــ ــ د ا	
-3590 -	Tan rocky soil		-	AUGER						Surface Conditions: Vegetated, dry rocky soil.
	SANDSTONE - tan, hard, dry, caliche, broken	::::	-	11						Auger to 4 feet BLS.
-3585			5 -	CORE			54/12		0/0	
-	SANDSTONE - tan, hard, dry		-	H						
-3580 -	SANDSTONE - tan to red, dry, slightly friable		- 10 -	CORE			60/18		0/0	
	SANDSTONE - tan to red, slightly moist, friable, dark red towards base				∦.	T-2A				
-3575 -	masio, dark rod to wards basis		- 15 -	CORE	X		60/54		0/0	
	, SANDSTONE - dark red, dry, clayey, friable, micaceous			H						
-3570 -	micaceous		- 20 -	CORE			60/42		0/0	
<u> </u>	SANDSTONE - red, cemented, broken		-			Т-2В				
-3565 -	CLAY - red, sandy, moist		- 25 -	CORE	VI.		78 <b>/</b> 54		0/0	
} '	SANDSTONE - gray, dry, dark inclusions		_		N					•
-	SANDSTONE - dark red, cemented, dry, micaceous	:::::	- 30 -							
	Total depth = 30 feet BLS									

DRILLING CONTRACTOR: SH&B

COMMENTS: Boring located west of Trash Collection Area.

DRILLER:

E. Adams

**DRILLING METHOD:** 

**NQ** Core Barrel

**DRILLING EQUIPMENT:** 



T-3

SHEET 1 OF 1

**PROJECT** 

Transwestern Pipeline Company

1548

LOCATION Carlsbad, New Mexico

COORDINATES N 9,906 E 9,932

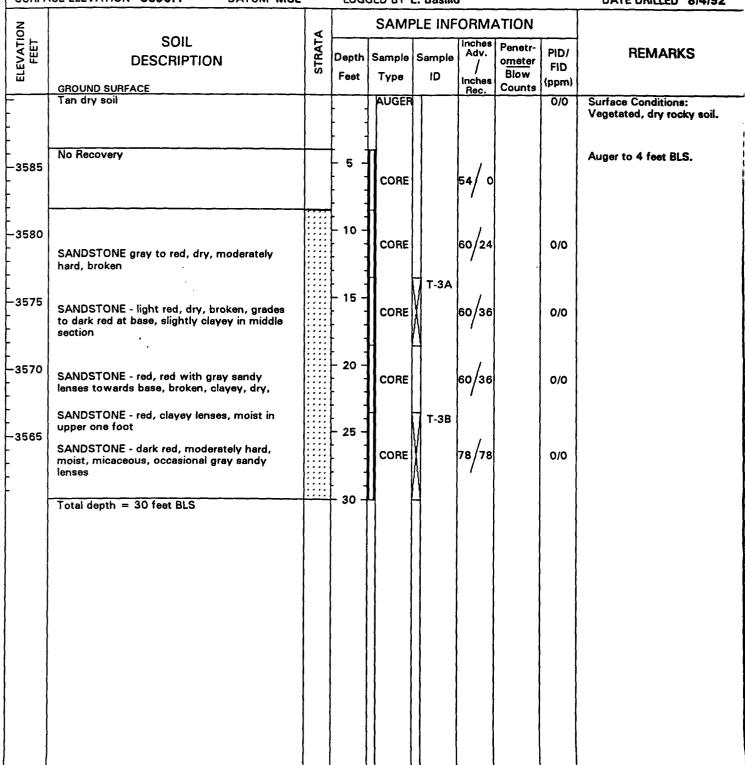
PROJECT NUMBER

SURFACE ELEVATION 3590.4

DATUM MSL

LOGGED BY L. Basilio

DATE DRILLED 8/4/92



DRILLING CONTRACTOR:

SH&B

COMMENTS: Boring located northeast of Trash Collection Area.

DRILLER:

E. Adams

DRILLING METHOD:

NQ Core Barrel

DRILLING EQUIPMENT:



BORING FP-1

SHEET 1 OF 1

PROJECT

Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

PROJECT NUMBER 1548

SURFACE ELEVATION 3591.4

COORDINATES N 9,966 E 9,430

DATUM MSL

LOGGED BY L. Basilio

DATE DRILLED 8/5/92

301117	ACE ELEVATION 3551.4 DATUM MSL		LUG	350 61 (	L. Basilio	<u> </u>			DATE DRILLED 8/5/92
NO									
ELEVATION FEET	SOIL DESCRIPTION	STRATA	Depth Feet	Sample Type	Sample	Inches Adv.	Penetr- ometer Blow	PID/ FID	REMARKS
ш	GROUND SURFACE	<u> </u>	1 001			Inches Rec.	Counts	(ppm)	
-3590 -	Tan dry rocky soil		-	AUGER				0/0	Surface Conditions: Vegetated, dry rocky soil.
- - -3585 -	SANDSTONE - tan with red tint, broken, dry, slightly friable, cemented white caliche at top		5 -	CORE		54/18		0/0	Auger to 4 feet BLS.
- -3580 -	SANDSTONE - tan with red tint, occasionally gray, dry, slightly clayey, moderately hard, broken at top		- 10 - - - -	CORE		60/24		0/0	
- -3575 -	SANDSTONE - ten to gray, reddish tint, red at base, cemented, calcareous inclusions, dry, black nodules		- 15 - -	CORE		60/54		0/0	
- - -3570	SANDSTONE - red, broken, moist, slightly clayey SANDSTONE - tan to red, dry SANDSTONE - dark red, dry, micaceous,		- 20 -	CORE		60/60		1/0	
- - -3565	clayey lenses at base SANDSTONE - red, cemented, slightly moist, clayey lenses, gray sandy lense at base SANDSTONE - dark red, hard, micaceous, dry, clay laminae		25 -	CORE	FP-1A	60/60		0/0	
- - -3560	No sample collected in the 28.5 to 29.5 foot interval SANDSTONE - red, damp, micaceous, clayey with clay laminae at top, hard to slightly friable, moist to wet 33.5 to 36.5 feet		- 30 -	CORE		48/48		0/0	Re-enter hole on 8/18/92. Auger to 29.5 feet BLS and resume coring.
- -3555 -	SANDSTONE - red brown, hard, dry, massive, micaceous		- 35 -	CORE	FP-1B	12020		50/15	
- - -3550 -	Total donth = 43.5 fact RIS		40 -		VFP-1C	/		1/8	
-	Total depth ≈ 43.5 feet BLS				Δ 			1/8	

DRILLING CONTRACTOR: SH&B

COMMENTS: Boring located north of Filter Collection Area.

**DRILLER:** 

E. Adams

**DRILLING METHOD:** 

**NQ Core Barrel** 

DRILLING EQUIPMENT:



BORING FP-2 SHEET 1 OF 1

PROJECT

Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

PROJECT NUMBER 1548

COORDINATES N 9,929 E 9,452

SURFA	CE ELEVATION 3591.3 DATUM MSL		LOGGED BY L. Basilio						DATE DRILLED 8/6/92
NO	_	4		SAME	PLE INF				
ELEVATION FEET	SOIL DESCRIPTION GROUND SURFACE	STRATA	Depth Feet	Sample Type	Sample ID	Inches Adv. / Inches Rec.	Penetr- ometer Blow Counts	PID (ppm)	REMARKS
- -3590 -	Tan dry rocky soil			AUGER				1	Surface Conditions: Not vegetated, dry rocky soil.
- - -3585	SANDSTONE - light tan to tan with depth,		- 5 -	CORE		54/24		o	Auger to 4 feet BLS.
	cemented, dry, broken		- 10 -				<b>.</b>		FID not operational.
-3580 - -	SANDSTONE - tan to gray, clayey in spots, black gravel at top, slightly moist  SANDSTONE - tan with gray mottling, hard,		-	CORE		60/36		0	
- -3575 -	grades to red, dry, slightly friable		15 -	CORE		60/60		o	
- -3570 -	SANDSTONE - gray with red staining, interbedded with red silty clay SANDSTONE - dark red, hard, micaceous, dry SANDSTONE - dark red, micaceous, hard,		20 -	CORE		60/48		1	
- -3565 -	moist at bottom, clay lenses at top		- 25 -	CORE	FP-2A	60/60		200	
- -3560	SANDSTONE - dark red, hard, micaceous, thin clayey laminae, slightly moist		- 30 -	CORE	FP-2B	60/60		280	
- -3555	SANDSTONE - dark red, upper two feet is oily and moist, clayey lenses toward base		- 35 -	CORE	FP-2C	60/60		320	
- 3550 -	SANDSTONE - red, hard, dry, micaceous, clayey with clay laminae at base		40 -	CORE	FP-2D	60/60		3	
	Total depth = 43.5 feet BLS								<sup>몰</sup> Water level 43. 0 feet BLS after 16 hours
			لـــــا		1				<u> </u>

DRILLING CONTRACTOR: SH&B

COMMENTS: Boring located east of Filter Collection Area.

**DRILLER:** 

E. Adams

**DRILLING METHOD:** 

**NQ** Core Barrel

DRILLING EQUIPMENT:



FP-3

SHEET 1 OF 1

PROJECT

Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

PROJECT NUMBER 1548

SURFACE FLEVATION 3594.3

COORDINATES N 9,883 E 9,424

DATUM MSI

LOGGED BY L. Basilio

DATE DOLLED 0/7/02

SURFA	ACE ELEVATION 3594.3 DATUM MSL		LOG	SED BY	L. Basilio	0			DATE DRILLED 8/7/92
Z		a		SAMI	PLE INF				
ELEVATION	SOIL DESCRIPTION GROUND SURFACE	STRATA	Depth Feet	Sample Type	Sample ID	Inches Adv. / Inches Rec.	Penetr- ometer Blow Counts	PID/ FID (ppm)	REMARKS
	Tan, dry, rocky soil			AUGER				0/0	Surface Conditions: sparse vegetation, dry rocky soil.
3590			- 5 -						Auger to 4 feet BLS.
<u>-</u>	SANDSTONE - tan, cemented, brown calcareous laminae and inclusions, slightly moist at top		-	CORE		54/24		0/0	
-3585 -	SANDSTONE - tan, slightly red towards base, hard, slightly clayey, dry, slightly moist at top, slightly friable with black and white inclusions towards base, broken		- 10 -	CORE		60/48		0/0	
-3580 -	SANDSTONE - light red with gray to tan tint, dry, calcareous lenses SANDSTONE - gray with red tint, dry SANDSTONE - light red, dry, hard, tan inclusions, very broken		- 15 -	CORE		60/54		0/0	
-3575 -	SANDSTONE - light red to gray, moist at top, broken  SANDSTONE - red, dry, slightly clayey,		- 20 -	CORE		60/54		0/0	
- -3570 -	slightly friable, black nodules at top and base SANDSTONE - gray to tan, crumbly, dry, broken SANDSTONE - red, dry, massive, micaceous		25 -	CORE		60/54		1/0	
- -3565	SANDSTONE - red, clayey, clay laminae, slightly moist				FP-3A	'			
	CLAY - red, moist, sandy lenses SANDSTONE - red, hard, slightly moist, micaceous, occasional clayey laminae		- 30 -	CORE	$\bigvee$	60/60		70/50	
-3560 - -			- 35 -						Interval from 33.5 feet to 39 feet not sampled.
3555	SANDSTONE - red, massive, micaceous, clayey lenses at top, moist at top		- 40 -	CORE	FP-3B	54/48		200/45	<b>5</b>
-3550 -	CLAY - red hard, silty, moist, gray clay	×	- 45 -	CORE	√ FP-3C	54/54		0/10	☑ Water level 45.6 feet BLS after 1 hour
	SILTSTONE - red, clayey, hard, dry Total depth = 48 feet BLS	- × -		Ц					gitar i nour

DRILLING CONTRACTOR: SH&B

DRILLER:

E. Adams

**DRILLING METHOD:** 

**NQ** Core Barrel

COMMENTS: Boring originally drilled to 33.5 feet BLS on 8/7/92 where hole conditions did not permit further drilling at that time. Boring continued 5 feet to west in auger hole which was previously drilled on 7/23/92 to 38 feet BLS. Continue coring from 39 feet BLS.

DRILLING EQUIPMENT: **CME-55** 



FP-4

SHEET 1 OF 1

PROJECT Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

PROJECT NUMBER 1548

SURFACE ELEVATION 3591.0 DATUM MSL

COORDINATES N 9,927 E 9,486

LOGGED BY L. Basilio

DATE DRILLED 8/11/92

SURFA	CE ELEVATION 3591.0 DATUM MSL		LOG	GED BY I	Basilio	)			DATE DRILLED 8/11/92
NO		SAMPLE INFORMATION							
ELEVATION	SOIL	STRATA	Danet	Sample	Samala	Inches Adv.	Penetr-	PID/	REMARKS
J. F.	DESCRIPTION	STF	Feet	Туре	Sample	/	o <u>meter</u> Blow	FID	
ш	GROUND SURFACE		1 001			Inches Rec.	Counts	(ppm)	
-3590	Tan dry rocky soil		} -	AUGER		]		0/0	Surface Conditions: sparse vegetation, dry rocky soil.
]			-						
+		::::	<u> </u>						Auger to 4 feet BLS.
-3585	SANDSTONE - tan to gray with red staining, dry, broken at top, friable, brown limestone		- 5 -	CORE	.	54/42		0/0	
}	lenses and nodules		-			7-7-		"	
-	SANDSTONE - tan, hard, broken, dry, moist		-	H					
-3580	at top, abundant brown limestone nodules at top, chalky towards base	::::	10 -	CORE		60/54		1/0	
-	top, charky towards buse		-			00/34		',0	
-	SANDSTONE - tan with red tint, grades to			H					
0575	red, hard, chalky	:::::	- 15 -			_/_			
-3575 -	SANDSTONE - red, slightly micaceous, silty,			CORE		60/60		0/1	
t i	dry, broken SANDSTONE - red, clayey with clay lenses,			H					
-	slightly moist SANDSTONE - light to dark red to golden,		- 20 -			/			
<b>-3570</b>	hard, massive, micaceous, dry, occasional	::::		CORE		60/60		0/1	
}	clay laminae		-					}	
Į į	SANDSTONE - red, clayey, broken, dry		- 25 -			,		]	
-3565	SANDSTONE - dark red, hard, micaceous, slightly friable, dry, occasional clay laminae	::::	-	CORE		60/48		0/0	
		::::	-			/			
<u> </u>	SANDSTONE - dark red, hard, micaceous, slightly friable, occasional clay laminae at top		- 30 -		FP-4A	,			
-3560	, , ,	:::::	- 30 -	CORE	YI .	60/60		3/2	
<u>t</u> !					$\mathbb{N}$	/			
}			-	H	FP-4B				
-3555	SANDSTONE - red, hard, moist		- 35 -		V				
}	SANDSTONE - red, hard, dry, occasional clay	::::	-	CORE		78/54		0/1	
	laminae	::::			$\mathbb{N}$	′	!		
}	Total depth = 40 feet BLS		- 40 -	4	-				
							i		
							İ		•
		<u> </u>		LL	1			l	

DRILLING CONTRACTOR: SH&B

COMMENTS: Boring located east of Filter Collection Area.

DRILLER:

E. Adams

DRILLING METHOD:

**NQ Core Barrel** 

DRILLING EQUIPMENT:



FP-5

SHEET 1 OF 1

PROJECT

Transwestern Pipeline Company

1548

LOCATION Carlsbad. New Mexico

COORDINATES N 9,934 E 9,399

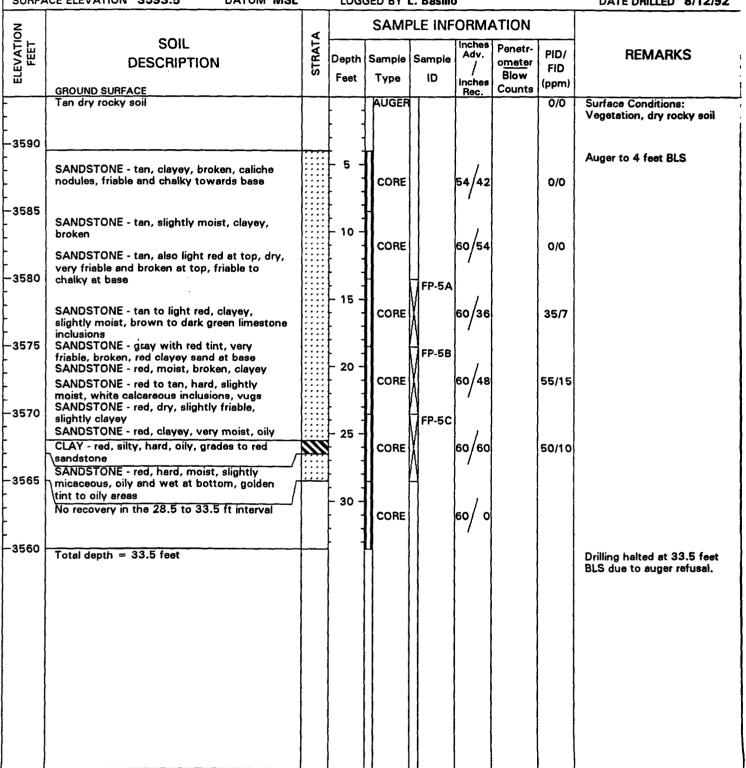
PROJECT NUMBER

SURFACE ELEVATION 3593.5

DATUM MSL

LOGGED BY L. Basilio

DATE DRILLED 8/12/92



DRILLING CONTRACTOR:

SH&B

COMMENTS: Boring located west of Filter Collection Area.

DRILLER:

E. Adams

DRILLING METHOD:

**NQ Core Barrel** 

DRILLING EQUIPMENT:



FP-6

SHEET 1 OF 1

PROJECT

Transwestern Pipeline Company

LOCATION Carisbad, New Mexico

PROJECT NUMBER 1548

COORDINATES N 9,849 E 9,417

SURFA	CE ELEVATION 3594.2 DATUM MSL	<del>,</del>	LOG	SED BY	Basilio				DATE DRILLED 8/18/92
Z		ا بر		SAME	LE INF	ORMA			
ELEVATION FEET	SOIL DESCRIPTION GROUND SURFACE	STRATA	Depth Feet	Sample Type	Sample ID	Inches Adv. / Inches Rec.	Penetrometer Blow Counts	PID/ FID (ppm)	REMARKS
-	Tan dry rocky soil			AUGER				1/0	Surface Conditions: Vegetation, dry rocky soil.
- -3590 -	CANDSTONE Assurith and think dury harden		- 5 -	CORE		54/24		0/0	Auger to 4 feet BLS.
- -3585	SANDSTONE - tan with red tint, dry, broken, slightly friable, white caliche that increases with depth		- 10 -			,			
-  -  -	<u>.</u>			CORE		60/24		0/0	
-3580 - - -	SANDSTONE - tan to red, gray tint, dry, broken at top, slightly friable, slightly chalky, white caliche		- 15 -	CORE		60/54		0/0	
- 3575 - -	CANOCTONS and day offers of the		- 20 -	CORE	FP-6A	60/48		0/0	
- -3570	SANDSTONE - red, dry, silty, slightly micaceous, chalky, grades to red brown sandstone SANDSTONE - red brown with black and gold staining, very micaceous, dry, hard,		- 25 -			/			
-	slightly friable SANDSTONE - red, micaceous, dry, clayey at base			CORE		60/54		0/0	
-3565 - -	CLAY - red, dry, sandstone lenses, broken, gray sandstone at base SANDSTONE - light red, gray at top, red brown with depth, dry, micaceous, very		30 -	CORE		60/42		0/0	
- -3560 -	friable, crumbly SANDSTONE - red brown, damp, finer grained with depth, very micaceous, friable SANDSTONE - red, damp, micaceous, very micaceous towards base, clay laminae in		- - 35 -			,			
- -3555	upper portion, occasional thin gray sandy lenses, damp to moist in upper section SANDSTONE - red brown, very micaceous,		· .	CORE	FP-6B	78/78		0/0 2/0	
	damp, friable  Total depth = 40 feet BLS		- 40 -						
			i						

DRILLING CONTRACTOR: SH&B

COMMENTS: Boring located south of Filter Collection Area.

**DRILLER:** 

R. Godfrey

**DRILLING METHOD:** 

**NQ Core Barrel** 

DRILLING EQUIPMENT:



FP-7

SHEET 1 OF 1

PROJECT

Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

PROJECT NUMBER 1548

SURFACE ELEVATION 3591.5

COORDINATES N 9,991 E 9,434

DATUM MSL

LOGGED BY L. Basilio

DATE DRILLED 8/25/92

201117	CELEVATION 3331.5 DATON MISE		LOG	JED BI		<u>,                                     </u>			DATE DRILLED 8/25/32
ELEVATION FEET		4		SAME	LE INF	ORM	ATION		
ATI	SOIL	STRATA	Damat	Same and	S	inches Adv.	Penetr-	PID/	REMARKS
3 = 1	DESCRIPTION	STR	l i	Sample		1	ometer	FID	I ILIVIA III.O
	GROUND SURFACE	"	Feet	Type	ID	Inches	Blow Counts	(ppm)	
0.55	Tan dry soil	$\vdash$		AUGER	<del> </del>	Rec.	3031118	0/0	Surface Conditions: Sparse
-3590		İ	} -					] ]	vegetation, dry rocky soil
<b>†</b>		1	-	$\mathbb{H}$					Auger to 4 feet BLS
<b> </b>			_	CORE		54/18		1/0	Auger to 4 leet BLS
<b>!</b>	SANDSTONE - tan to off-white, dry, broken,			"				',"	
-	chalky, white caliche		- 10 -	П	FP-7A	1			
3580	SANDSTONE - tan, pinkish, reddish tint, dry,		10	CORE	XI .	60/36		5/1	
	broken, chalky, friable, abundant white caliche			Ц	Δ	/		[	
	SANDSTONE - tan to red, silty to clayey,		_	ll	П	1	1		
	slightly micaceous, damp in spots, white caliche nodules	::::	1	CORE		60/60		2/0	
	Callotte Wodalob	:::::	- 1	H		'		-	
1		:::::	- 20 -			00/10			
-3570	SANDSTONE - red brown, dry, micaceous, friable, silty, interbedded with tan sandstone,			CORE		60/48		2/0	
+ 1	occasional dark red dry clay laminae		_	H i		l ' . I			i
<b> </b>	SANDSTONE - red, damp, micaceous,	::::		CORE		60/42		2/0	
	massive, slightly friable, slightly clayey in spots, occasional clay laminae towards base		,		ı	00/42		2,0	
<b>'</b>	spots, occasional day laminas towards base	:::::		H I		, ,		į	
-3560	SANDSTONE - red, hard, damp, micaceous,	:::::	- 30 -	CORE		60/48	i	1/0	
73300	massive, slightly clayey, occasional clay laminae towards base, 2-inch thick damp to	:::::	1			/	i	.,.	
1	moist silty clay at 32.5 feet		+	Ħ ·	.	,			
†	SANDSTONE - red, hard, clayey to silty, damp, slight micaceous, coarser and more	::::		CORE	.	60/60		1/1	
+	micaceous towards base	:::::	-	[]		/			
+ 1	CANDSTONE and describe	:::::	- 40 -		FP-7B				
3550	SANDSTONE - red, damp to moist, micaceous, clayey, slightly friable	:::::		CORE	λl	54/48		3/4	
}	CLAYSTONE - dark red, dry to damp at top,	<b>-</b>		片	H =	',			
<u> </u>	very sandy at top, very broken to crushed	<del>2</del> . <del>2</del> .	1	CORE	FP-7C	42/42		50/15	
	SILTSTONE - dark red, slightly micaceous, slightly moist, clayey laminae, even breaks		†		Λ				
}	}along planes }[		† †	CORE	FP-7D FP-7E	36/36		5/1	
ſ	SANDSTONE - red, moist, micaceous, massive, coarser towards base, clay laminae	1	- 50 -	M !	4			1/0	
1 1	in upper portion, oily along side of core, oil			1				1	
	along fracture in sandstone at 45.5 feet SANDSTONE - red. moist, silty, micaceous,	1		i				1	
	oily along fractures				1				
	CLAYSTONE - red to gray, silty, micaceous,	1 1			1				
] ]	dry to damp SANDSTONE - dark red, silty to clayey,				1		ı İ		
1	micaceous, damp, slightly friable			1			İ		
1	Total Depth = 50 feet BLS								
1 1									
			Í						
					1	\ 			
<b></b> -		لــــــا						لــــا	· · · · · · · · · · · · · · · · · · ·

fenceline.

DRILLING CONTRACTOR: SH&B

COMMENTS: Boring located north of Filter Collection Area along

DRILLER:

C. Elms

DRILLING METHOD:

**NQ** Core Barrel

**DRILLING EQUIPMENT:** 



**BORING/WELL NUMBER** BP-1 SHEET 1 OF

PROJECT Transwestern Pipeline Company

1548

LOCATION Carlsbad, New Mexico

N 9,960 E 9,338 COORDINATES

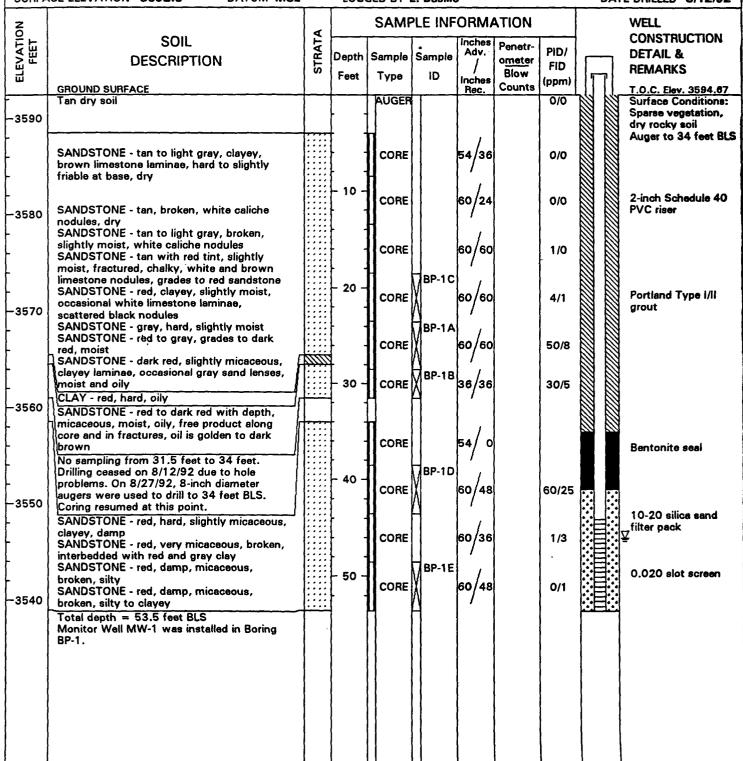
SURFACE ELEVATION 3592.5

DATUM MSL

LOGGED BY L. Basilio

PROJECT NUMBER

DATE DRILLED 8/12/92



DRILLING CONTRACTOR: SH&B

**DRILLER:** 

E. Adams

CME-55

DRILLING METHOD:

DRILLING EQUIPMENT:

**NQ Core Barrel** 

DIAMETER, TYPE & INTERVAL OF CASING:

WELL SCREEN/INTERVAL:

FILTER PACK-INTERVAL/QUANTITY:

WELL SEAL-INTERVAL/QUANTITY:

2-inch Schedule 40 PVC 0.020 Slot/43.5-53.5 feet BLS

10-20 Silica sand/41-53.5 feet

Bentonite flakes/35-41 feet BLS



BORING BP-2 SHEET 1 OF 1

PROJECT

Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

PROJECT NUMBER 1548

SURFACE FLEVATION 3592 8

COORDINATES N 9,929 E 9,290

DATURA BECT

SUNT	ACE ELEVATION 3592.8 DATUM MSL		LOG	SED BY	L. Basilio	DATE DRILLED 8/12/92			
N C		4		SAME	PLE INF	ORM	ATION		
ELEVATION FEET	SOIL DESCRIPTION GROUND SURFACE	STRATA	Depth Feet	Sample Type	Sample ID	Inches Adv. / Inches Rec.	Penetr- ometer Blow Counts	PID/ FID (ppm)	REMARKS
- -3590	Tan dry soil			AUGER				0/0	Surface Conditions: Sparse vegetation, dry rocky soil
-			5 -			,			Auger to 4 feet BLS
-3585 -				CORE		54/6		0/0	
- - - -3580	SANDSTONE - tan to light gray, broken, slightly clayey, limestone nodules, dry, friable and chalky towards base		- 10 - -	CORE		60/48		0/0	
- - -	SANDSTONE - light red to red at base, clayey, hard, broken, abundant white to brown calcareous nodules, damp		- 15 -	CORE		60/42		0/0	
-3575 - - -	SANDSTONE - red, clayey to silty, clayey towards base, slightly micaceous in spots, moist, hard, slightly friable, gray sandy laminae in middle section, white nodules in		- 20 -	CORE		60/60		1/0	
-3570 -	SANDSTONE - gray, slightly clayey				BP-2A	,			
- 3565 -	CLAY - red to tan, broken, dry SANDSTONE - red, hard, slightly micaceous, clayey laminae, wet to moist with oil in several spots		- 25 -	CORE	BP-2B	60/60		65/40	
- - - -3560	SANDSTONE - dark red, moist to wet with oil CLAY - dark red brown, indurated, silty, broken, oily		- 30 -	CORE	V	60/60		150/ 100	
-	SANDSTONE - red, micaceous, clayey laminae, oily at top SANDSTONE - red, hard, micaceous, clayey laminae at top, oil along fractures at 36 feet		- 35 -	CORE	BP-2C	60/60		22/9	
-3555 -	SANDSTONE - red, hard, massive, micaceous, oily interval at 39.5 to 40.5 feet, occasional clay laminae, red to black broken		- 40 -	CORE	BP-2D	60/60		. :	
- -3550 -	sandy clay at base SANDSTONE - red brown, hard, massive,			CORE	BP-2E	30/80		48/25	_
-3545 ∣	micaceous, clayey laminae in lower section Red and black sandy clay lens, 2 inches thick		- 45 - -	CORE	VI I	60/60		3/3	₩Water level 44.6 feet BLS after 22 hours
3343	Total Depth = 48.5 feet BLS			4	4 1				

DRILLING CONTRACTOR: SH&B

COMMENTS: Boring located west of Burn Collection Area.

DRILLER:

E. Adams

**DRILLING METHOD:** 

**NQ** Core Barrel

DRILLING EQUIPMENT:



BP-3

SHEET 1 OF 1

PROJECT

Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

PROJECT NUMBER 1548

SURFACE ELEVATION 3591.8 DATUM MSL

COORDINATES N 9,989 E 9,339

LOGGED BY L. Basilio

DATE DRILLED 8/14/92

-	TOUR LEED A TOWN WISE				L. Dasiiic				DATE DRILLED 8/14/92
NO	2011	<		SAME	PLE INF	ORMA	ATION		
ELEVATION FEET	SOIL DESCRIPTION	STRATA		,	Sample	Inches Adv.	Penetr- ometer	PID/ FID	REMARKS
<u> </u>	GROUND SURFACE	"	Feet	Туре	ID	Inches Rec.	Blow Counts	(ppm)	
- -3590	Tan dry soil			AUGER				0/0	Surface Conditions: Vegetation, dry rocky soil
- - -3585	SANDSTONE - off-white to tan, calcareous, hard, broken, caliche		5 -	CORE		54/12		0/0	Auger to 4 feet BLS
- -3580	SANDSTONE - tan with red tint, red with depth, damp, moderately hard, slightly friable, caliche		- 10 -	CORE		60/48		0/0	
- - -3575	SANDSTONE - light red to red at base, tan to gray mottling, slightly clayey, damp in spots, abundant white and brown nodules, silty and slightly chalky at base, occasional black nodules		- 15 -	CORE		60/60		0/0	
- - -3570	SILTSTONE - red, slightly micaceous, sandy in spots	* * * * * * * * * * * * * * * * * * *	- 20 -	CORE		60/18		0/0	
- - -3565	SANDSTONE - light to dark red, micaceous, silty, broken, friable		- 25 -	CORE		60/36		0/1	
-	SILTSTONE - dark red, clayey, slightly fissile, broken, red micaceous sandstone at base SANDSTONE - red, hard, moist, clayey, wet clay at base	× × ×, ×,	- 30 -	CORE	ВР-ЗА	30/24		0/0	
-3560 -	Interval from 31 to 32.5 feet not sampled due to hole problems. Auger to 32.5 feet and resume coring at that point.  SANDSTONE - red, hard, dry to damp at		35 -	CORE	ВР-ЗВ	12/12		0/0	
- -3555 -	base, slightly clayey, micaceous at base			CORE	N N	66/60		0/10	
3550 -	SANDSTONE - red brown, hard, massive, micaceous, wet at bottom, sandy clay at base  Total depth = 43 feet BLS		- 40 -	CORE	ВР-ЗС	48/48		0/2	

DRILLING CONTRACTOR: SH&B

COMMENTS: Boring located north of Burn Collection Area.

**DRILLER:** 

R. Godfrey

**DRILLING METHOD:** 

**NQ** Core Barrel

DRILLING EQUIPMENT:



BP-4

SHEET 1 OF 1

PROJECT

Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

**COORDINATES N 9,929 E 9,257** 

PROJECT NUMBER 1548

SURFA	CE ELEVATION 3592.5 DATUM MSL		LOG	GED BY I	L. Basilio	)			DATE DRILLED 8/15/92
Z		4		SAME	PLE INF	ORMA	NOITA		
ELEVATION FEET	SOIL DESCRIPTION GROUND SURFACE	STRATA	Depth Feet	Sample Type	Sample ID	Inches Adv. / Inches Rec.	Penetr- ometer Blow Counts	PID/ FID (ppm)	REMARKS
-3590	Brown dry rocky soil			AUGER				0/0	Surface Conditions: Sparse vegetation, dry rocky soil
- - - -3585	SANDSTONE - tan to gray to off-white, hard, dry, chalky, caliche		5 -	CORE		54/24		0/0	Auger to 4 feet BLS
- -3580	SANDSTONE - tan with red tint, grades to red with depth, dry, chalky, broken, slightly friable		- 10 -	CORE		60/30		0/0	
- - - -3575 -	SANDSTONE - red, hard, damp, friable, silty, slightly micaceous SANDSTONE - red, broken, slightly clayey to		- 15 -	CORE		60/54		0/0	,
- - -3570	silty  SANDSTONE - red, damp, silty to very silty, slightly micaceous, grades to siltstone in spots, brown calcareous laminae and nodules		- 20 -	CORE		60/60		0/0	-
-3565	SANDSTONE - red, hard, tan mottling, pitted, slightly micaceous SANDSTONE - red, silty, crushed, large white limestone nodules		- 25 - - - -	CORE		42/18 12/ 3		0/0	
- - -3560	SANDSTONE - red to gray at base, hard, micaceous, gray and red clayey lenses, damp  CLAY - red with red and gray sandy lenses, broken, slightly fissile, micaceous, dry		- 30 -	CORE		54/48		0/0	Auger to 29 feet BLS. No samples collected in the 28 to 29 foot interval due to auger refusal.
- - - -3555	SANDSTONE - red, hard, micaceous, dry, occasional clay laminae towards base, broken along bedding planes  SANDSTONE - dark red, damp, slightly		- 35 -	CORE	VBP-4A	78/60		0/0	
	Clayey, silty, moderately hard  Total depth = 40 feet BLS		40 -		X			0/0	

DRILLING CONTRACTOR: SH&B

COMMENTS: Boring located west of Burn Collection Area.

DRILLER:

R. Godfrey

**DRILLING METHOD:** 

**NQ** Core Barrel

DRILLING EQUIPMENT:



BP-5

SHEET 1 OF 1

PROJECT

**Transwestern Pipeline Company** 

LOCATION Carlsbad, New Mexico

COORDINATES N 9,916 E 9,368

PROJECT NUMBER 1548

SURFA	CE ELEVATION 3593.6 DATUM MSL		LOG	GED BY	L. Basilio	)			DATE DRILLED 8/16/92
NO		4		SAME	PLE INF	ORM	ATION		
ELEVATION FEET	SOIL	STRATA	Depth	Sample	Sample	Inches Adv.	Penetr-	PID	REMARKS
, je	DESCRIPTION	ST	Feet	Туре	ID	]. /	o <u>meter</u> Blow		
ļ <u> </u>	GROUND SURFACE	<u> </u>				Rec.	Counts	(ppm)	
-	Tan dry rocky soil		} -	AUGER				0	Surface Conditions: Sparse vegetation, dry rocky soil
2500			[ -						
⊢3590 ⊦			- 5 -	Н					Auger to 4 feet BLS
<u> </u>		::::	-	CORE		54/18		0	
-	SANDSTONE - tan to off-white, hard, very broken, white caliche					/	!		FID not operational
-3585 -	Process, write callerie		-	Ħ	BP-5A	,			
}		::::	- 10 -	CORE	Y Y	54/24		8	
ļ	SANDSTONE - gray with natural black	::::	} -		N	/		.~	
-3580	staining, broken, friable, wet, dark gray to tan with black naturally stained caliche at			Π					
Ţ.,	No samples collected in the 13 to 15 foot	::::	15 -	h	BP-5B	, ,			
}	interval due to hole problems			CORE	X	42/42		20	
3575	SANDSTONE - gray to green to tan, natural black staining, moderately hard, fractured,			H	BP-5C	'			
Ł.	moist to wet in spots with greenish yellow slightly oily liquid, abundant black to white	::::	- 20 -		Marac	/			
+	to brown nodules SANDSTONE - red, gray green at 22.5 feet,			CORE	XI	60/48		15	
- -3570	silty, fractured, slightly friable, moist to wet	\ :::::	} -			,		į	
-	with green yellow oily liquid  SANDSTONE - red to gray, micaceous,		- 25 -	CORE	BP-5D	42/24		10	
ļ	moderately hard, slightly friable, moist,	:::::	} -	CORE	N	72/24		10	
-	occasionally wet with green yellow oil SANDSTONE - dark red brown, micaceous,		-	CORE	BP-5E	18/18		20	
⊢3565 ⊦	very friable, moist SANDSTONE - gray black, black staining,		- 30 -		BP-5F	,			
<u> </u>	micaceous, crumbly, very friable, wet with oil		- 30 -	CORE		54/54		50	
F :	SANDSTONE - red, hard, massive, ¬micaceous, occasional clay laminae, clay lens	::::			$\Lambda$	'			
3560	at base, wet with oil on side of core	,,,,	}						
-	No samples collected in the 33 to 35 foot interval due to hole problems	:::::	- 35 -		BP-5G			]	
1	SANDSTONE - red, slightly micaceous, slightly clayey, oily in upper 2 feet		} -						
-3555	Silgitity Ciayby, Oily in appear 2 1661			CORE		10802		38	
]		 	- 40 -			/		-	
<u> </u>	SANDSTONE - gray, micaceous, damp,	::::	[		VBP-5H				
	slightly friable SANDSTONE - dark red brown, hard,	:::::	† †	Ц ;	Δ				
	micaceous, slightly friable  Total depth = 43.5 feet BLS								
	•								
			<u> </u>		1				

DRILLING CONTRACTOR: SH&B

COMMENTS: Boring located east of Burn Collection Area.

DRILLER:

R. Godfrey

DRILLING METHOD:

**NQ** Core Barrel

DRILLING EQUIPMENT:



BP-6

SHEET 1 OF 1

**PROJECT** 

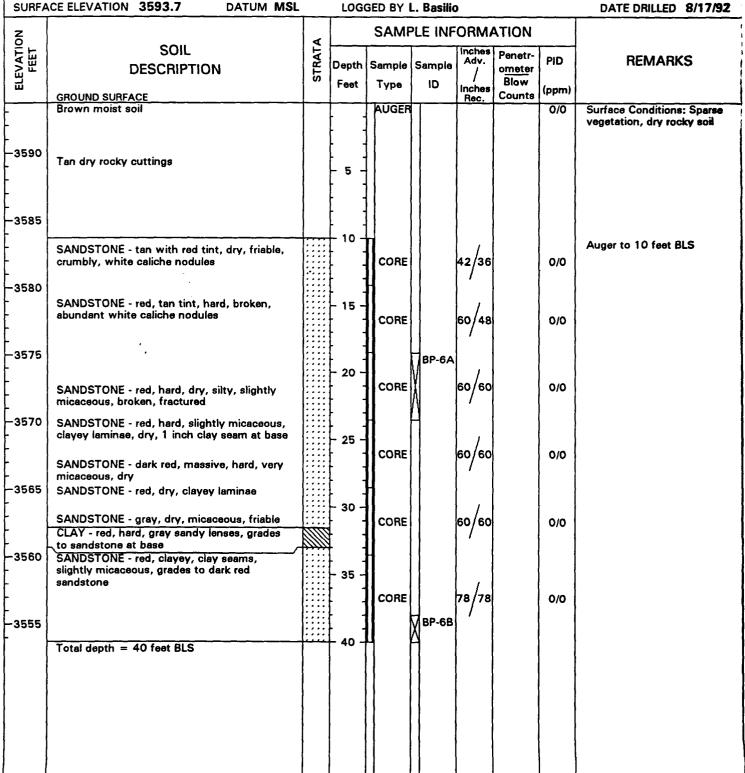
Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

COORDINATES N 9,835 E 9,346

PROJECT NUMBER 1548

DATE DRILLED 8/17/92



DRILLING CONTRACTOR:

SH&B

Boring located south of Burn Collection Area. COMMENTS:

**DRILLER:** 

R. Godfrey

**DRILLING METHOD:** 

**NQ** Core Barrel

DRILLING EQUIPMENT:



BORING 0-1

SHEET 1 OF 1

PROJECT Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

COORDINATES N 10,037 E 9,435

PROJECT NUMBER 1548

SURFACE ELEVATION 3590.9

DATUM MSL

LOGGED BY L. Basilio

DATE DRILLED 9/1/92

30117	ACCELEVATION 3550.5 DATON NISL		LUG	JED DI	L. Basilio	,			DATE DRILLED 9/1/92
NO		A		SAMI	PLE INF	ORMA	NOITA	_	
ELEVATION FEET	SOIL DESCRIPTION	STRATA	Depth	Sample	Sample	Inches Adv.	Penetr- ometer	PID/	REMARKS
ELE	GROUND SURFACE	S	Feet	Туре	ID	Inches Rec.	Blow Counts	FID (ppm)	
-3590	Tan dry sandy soil		-	AUGER				0/0	Surface Conditions: Sparse vegetation, moist rocky soil
-						,		,	Auger to 4 feet BLS
-	SANDSTONE - off-white, very broken, dry, white caliche		-	CORE		54/18		0/0	
-3580	SANDSTONE - tan to off-white, reddish with depth, broken at top, hard, white caliche		- 10 -	CORE		60/54		0/0	
-	SANDSTONE - tan to light red, grades to red					/			
-	tan, dry, silty to clayey, white caliche SANDSTONE - red tan, dry, slightly chalky,		_	CORE		60/60		0/0	
-	white caliche	:::::	- - 20 -	H	O-1A	,			
-3570	SANDSTONE - red brown, micaceous to very micaceous in spots, damp, occasional clay			CORE	Ň	60/54		2/1	
-	laminae SANDSTONE - red to tan, dry, slightly micaceous, occasional caliche		-	CORE		60 / 0			
	No recovery in the 23.5 to 38.5 foot interval due to mechanical problems with the core			H					
-3560	barrel sampling system		- 30 -	CORE		60/0			
				-		,			
-				CORE		60/ 0	,		
- 3550			- 40 -	CORE		60/6		1/0	
-	SANDSTONE - red, micaceous, damp to wet,			CORE				1/0	
	broken			CORE	O-1B	60/18		3/0	abla
	Total depth = 48.5 feet BLS	::::		4		′			Water level 46.7 feet BLS after 18.5 hours
									,

DRILLING CONTRACTOR: SH&B

COMMENTS: Boring located off-site on BLM land north of WT-1 site.

DRILLER:

C. Elms

DRILLING METHOD:

**NQ** Core Barrel

DRILLING EQUIPMENT:



0-2

SHEET 1 OF 1

PROJECT

Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

COORDINATES N 10,033 E 9,449

PROJECT NUMBER 1548

SURFACE ELEVATION 3591.1 DATUM MSL

LOGGED BY L. Basilio

DATE DRILLED 9/2/92

SURF	ACE ELEVATION 3591.1 DATUM MSL	_	LOGG	GED BY	L. Basili	0			DATE DRILLED 9/2/92
ELEVATION		a		SAM	PLE IN	FORMA	ATION		
H H	SOIL	A <sub>T</sub>		<u> </u>		Inches	Penetr-	PID/	DEMARKS
N S E	DESCRIPTION	STRATA		Sample	Sample	Adv.	ometer	FID	REMARKS
ដ	GROUND SURFACE	"	Feet	Type	ID	Inches	Blow Counts	(ppm)	
-3590		<del>                                     </del>		AUGER	1	Rec.	Counts	0/0	Surface Conditions: Sparse
1		1	-						vegetation, dry rocky soil
	No recovery in the 4 to 8.5 foot interval.	$\vdash$	-	h		,			Auger to 4 feet BLS
-			-	CORE		54/ 0			
1		1::::	-	H		'	:		
-3580	SANDSTONE - tan, pinkish to off-white, dry,	1::::	10 -	CORE		60/36		1/0	
-	broken, white caliche	::::	-	}}					
1	SANDSTONE - tan to pinkish to reddish, dry,		-	П	0-2A	1			
	broken at top, white caliche, silty, slightly micaceous	:::::	-	CORE	X	60/48		5/1	
L	micaceous		-	H	Д	'			
-3570	SANDSTONE - gray with tan tint, dry, hard,	::::	- 20 -	CORE		60/60		0/0	
-	slightly friable, micaceous, coarser with	<del>x -</del> -	-	1				0,0	
_	depth, occasional red clay laminae at base grades to claystone	::::	-	1					
\	CLAYSTONE - red to gray, dry, very silty to sandy, micaceous, grades to red sandstone		-	CORE		60/54		1/1	
<b>!</b>	SANDSTONE = red, dry, broken		-	H		'			
-3560	SANDSTONE - tan to gold to gray, coarse, very micaceous, friable, grades to red		- 30 -	CORE		60/48		0/0	
	sandstone		+	11 30112		00/40		0,0	
	SANDSTONE - red, damp, silty, micaceous, occasional red clay laminae, coarse at top	:::::	+	II i					
L	and base SANDSTONE - gray, dry, very micaceous,		-	CORE		60/18		1/1	
	friable, silty		-	H	O-2B	'			
-3550	SANDSTONE - red brown, dry, very micaceous, very friable, occasional red clay		- 40 -	CORE	M 0-26	60/48		0/5	
	laminae, silty		1		$\mathbb{N}$	00/40		0/5	
L	SANDSTONE - red, dry, micaceous, very friable, crumbly, occasional gray sandstone				√ 0-2C	1/			
[	SANDSTONE - red, damp, micaceous, clayey to silty, broken	:::::		CORE	N	42/30		1/2	
1	SANDSTONE - red brown, gold tint, very micaceous, hard, occasional clay laminae.						1		
	ldry						i	į	
l	SANDSTONE - red, broken, moist to damp, silty, micaceous								
	Total depth = 47 feet BLS							ļ	·
									į
								ļ	
							i	l	
								l	
		L				<del></del> .			

DRILLING CONTRACTOR: SH&B

COMMENTS: Boring located off-site on BLM land north of WT-1 site.

DRILLER:

C. Elms

**DRILLING METHOD:** 

**NQ** Core Barrel

DRILLING EQUIPMENT:



0-3

SHEET 1 OF 1

PROJECT

Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

COORDINATES N 10,015 E 9,352

PROJECT NUMBER 1548

SURFACE FLEVATION 3591.1

DATUM MSI

LOGGED BY L. Basilio

DATE DRILLED 9/2/92

SURFA	ACE ELEVATION 3591.1 DATUM MSL		LOG	GED BY	L. Basili	0			DATE DRILLED 9/2/92
ELEVATION FEET		a		SAME	PLE INF	ORMA	NOITA		
P ET	SOIL	STRATA				Inches Adv.	Penetr-	PID/	REMARKS
3.11	DESCRIPTION	TR	1	Sample	•	/	ometer	FID	HEMAINS
<b>T</b>	GROUND SURFACE	"	Feet	Түре	ID	Inches Rec.	Blow Counts	(ppm)	
-3590	Tan dry sandy soil	1		AUGER		Mec.		0/0	Surface Conditions: Sparse
			<u> </u>	[					vegetation, dry rocky soil
		::::	+	n		1			Auger to 4 feet BLS
	CANDOTONE A TAKE SELVING A LAND	1::::	-	CORE		54/18		0/1	
	SANDSTONE - tan to off-white, dry, hard, broken, white caliche	::::	-	H		'			
-3580	SANDSTONE - tan to off-white, reddish tint towards base, dry, hard, white caliche,		- 10 -	CORE		60/48		0/2	
	slightly chalky	  :::::	-			7		0,_	
	SANDSTONE - tan to light red to red at base, dry, broken, white caliche, slightly chalky	::::	-						
	dry, broken, write caucile, siightly charky	1	-	CORE	1	60/60		0/0	
		1::::	-	ij.		'			
-3570	SANDSTONE - red, dry, broken, silty,	:::::	- 20 -	CORE		60/48		0/0	•
3570	borders on siltstone		-	COME		00/48		0,0	
[ ]	SANDSTONE - red, damp, silty to clayey,		} -	1		10/00			
	very friable, crumbly, very broken, occasional red clay and gray sandstone at base	:::::	-	CORE		42/36		0/0	
	SANDSTONE - red and gray, damp, micaceous, friable, crumbly, grades to gray		} -		<b>∏</b> 0-3A	1	:		
T	sandstone at base.		- 30 -	CORE	Χl	60/54		1/0	
3560	SANDSTONE - gray, dry, micaceous, silty, coccasionally clayey at base, friable to	<del></del>	+	H	4	'			
<b>†</b>	forumbly		-	[]		/	=		
<b>†</b>	CLAYSTONE - red, dry, interbedded with gray sandstone	:::::	} -	CORE		78/24		0/1	
	SANDSTONE - red, damp, micaceous, silty,	1:::::	} -			'			
	occasional clay laminae		- 40 -			/			
3550		:::::		CORE		60/12		0/0	
<b>†</b>	SANDSTONE - red, damp, micaceous, friable	:::::		H	O-3B	'			
+	SANDSTONE - dark red brown, damp,			CORE	M 0-30	60/48		3/1	
-	micaceous, friable, broken				$\mathbb{N}$	/ /		٥,,	Water level 46.1 feet BLS after 14.5 hours
<b>†</b> 1	SANDSTONE - red, moist, core coated with	:::::	- 50 -	CORE	Ø 0-3C	30/24		180	
	oil Total depth = 51 feet BLS	····		4	4	/			FID not operational
	·			1					
1 1					}				
}					1	}			
1									

DRILLING CONTRACTOR: SH&B

COMMENTS: Boring located off-site on BLM land north of WT-1 site.

DRILLER:

C. Elms

DRILLING METHOD:

**NQ** Core Barrel

**DRILLING EQUIPMENT:** 



0-4

SHEET 1 OF 1

PROJECT

Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

PROJECT NUMBER 1548

SURFACE ELEVATION 3590.2

COORDINATES N 10,058 E 9,364

DATUM MSL

LOGGED BY L. Basilio

DATE DRILLED 10/19/92

SURFA	ACE ELEVATION 3590.2 DATUM MSL		LOG	GED BY	L. Ba	oilise	)			DATE DRILLED 10/19/92
ELEVATION FEET	_	4		SAMI	PLE	INF	ORMA	ATION		
A Ti	SOIL	STRATA					inches Adv.	Penetr-	PID	REMARKS
\ \frac{1}{2} \	DESCRIPTION	T.	1	Sample	1	1	1	ometer	110	HEWARKS
} ਜ਼	GROUND SURFACE	"	Feet	Туре	10	P	inches	Blow Counts	(ppm)	
	Tan dry rocky soil			AUGEF	1		Rec.	Counts		Surface Conditions: Sparse
+			} -	1	11					vegetation, dry rocky soil
}-			-	┧	11	1				
ŀ	SANDSTONE - tan to white, poorly consolidated, silty, dry, slightly micaceous,	::::	} -	X SPT	11	]	24/24		1	Auger to 5 feet BLS
-	slightly indurated in spots	::::	} -	X SPT	П	1	24/18		0	
-3580	SANDSTONE - A/A, harder, caliche present SANDSTONE - red to tan to off-white, hard,	:::::	- 10 -	П		]	·/ ]			
ļ.	friable white caliche abundant towards base	:::::	} -	CORE	11	l	60/54		0	
			-	<b>[</b> ]	11	[	′			
L	CANDSTONE and become head plinkship		_	II CORE			60/40			
	SANDSTONE - red brown, hard, slightly micaceous, friable, slightly clayey in spots,			CORE	$\ \cdot\ $	ľ	60/48		1	
-3570	abundant caliche	:::::	- 20 -	H		j	٠, ١		· i	
-35/0	SANDSTONE - red brown, gray, pinkish in		[ 20 ]	CORE		ļ	60/60		1	
ſ	spots, medium to coarse grained, friable,						1			
Ī	micaceous, 3-inch thick gray brown siltstone at 22.5 ft			П	11	ļ	- ; }		İ	
, †	SANDSTONE - red brown to light gray, medium grained, slightly friable, micaceous,			CORE		ŀ	60/60		0	
` <b>†</b>	slightly clayey		-	H	[ ]	1				
<b>-3560</b>	SANDSTONE - red brown, damp, friable, micaceous, clayey, clay laminae	:::::	- 30 -	ll cons		ı	00/00			
}	CLAY - red, silty, broken, interbedded with		-	CORE		ľ	60/60		0	
}	gray sandstone   SANDSTONE - dark red brown, micaceous,		-	H	Ho.	-4A	٠, ١			
}	clayey, clay laminae, damp		-	CORE	ĸn	- 1	60/60		20	
}	SANDSTONE - dark red, silty, micaceous, clay laminae, damp, core surface moist in	::::	-	11	M	}	/			
-3550	spots	:::::	- 40 -	Π	0	-4B	/			
-	SANDSTONE red brown, very micaceous, clayey, damp	:::::	-	CORE	X		60/60		50	
}	SANDSTONE - dark red, micaceous, fine	:::::		Ц	Ц		' ]			
1	grain, friable, very clayey, clay laminae,			1			00/00			☑ Water level 45.8 ft BLS after
L	SANDSTONE - A/A, moist in spots	××		CORE	[[	ľ	60/60		80	14 hours
Į.	CLAY - dark red, silty broken, damp	-		M						
	sandstone									
	Total depth = 49 feet BLS									
į į							į			
							İ			
}						- {	1			
}						{	1			
							}			
1						- {	}	:		
						}		i		,
							}			
<b> </b>		لــــا	لـــــا	Ц	Ц_					<u> </u>

DRILLING CONTRACTOR: Layne Environmental

COMMENTS: Boring located off-site on BLM land north of WT-1 site.

DRILLER:

W. Cowsur

DRILLING METHOD:

**NWD4** Core Barrel

DRILLING EQUIPMENT:



0-5

SHEET 1 OF 1

PROJECT

Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

PROJECT NUMBER 1548

SURFACE ELEVATION 3590.4

COORDINATES N 10,081 E 9,447

DATUM MSL

LOGGED BY L. Basilio

DATE DRILLED 10/20/92

SURFA	CE ELEVATION 3590.4 DATUM MSL		LOG	GED BY	L. Basili	0			DATE DRILLED 10/20/92
Z		a		SAMI	PLE IN	ORM	ATION		
ELEVATION FEET	SOIL	STRATA				Inches Adv.	Penetr-	PID	REMARKS
	DESCRIPTION	STR	1	Sample	1	1	o <u>meter</u> Blow		TIEM ATTICO
🖷	GROUND SURFACE		Feet	Туре	ID	Inches Rec.	Counts	(ppm)	
	Tan dry rocky soil			AUGER	1			i	Surface Conditions: Sparse
<u> </u>			Ţ -						vegetation, dry rocky soil
t l	SANDSTONE - tan to off-white, pinkish tint	1::::		SPT		24/18		,	Auger to 5 feet BLS
<u> </u>	with depth,broken, hard, dry, slightly friable and silty, white caliche			W		24/10		<b>'</b> '	•
	and anty, write canone	::::	- 10 -	CORE		60/24		0	
-3580				Ш		/		1	
	SANDSTONE - tan to off-white, pinkish tint, dry, very broken at top, hard, slightly friable,			<u> </u>		1./			
[ ]	white caliche	:::::		CORE		60/48		1	
	SANDSTONE - light red to tan, darker red at		_	H				ļ	
-3570	base, pinkish tint, dry to damp, pitted, hard, friable in spots, abundant caliche, white and	:::::	- 20 -	CORE		60/60		0	
[35/0]	black calcareous nodules			Ц		/			
[		:::::		CORE		00/00			
	SANDSTONE - red brown, medium grained,			CORE		60/60		0	
	dry, moderately friable, gypsum flakes, calcite filled 45 degree fracture at 27 feet	:::::		H	{	,			
-3560	SANDSTONE - light red brown, red at base, medium grained, hard, micaceous, silty,		- 30 -	CORE	<b>{                                    </b>	60/36		0	
_ 5555	slightly friable	::::	-		} }	/			
L I	SANDSTONE - red, dry, hard, micaceous,	:::::	-	CORE		60/60		0	
]	slightly friable, silty to clayey, abundant clay		-	CORE	} }	00/00			
<u> </u>	laminae and inclusions SANDSTONE - dark red, damp, micaceous,	:::::	} -	Ħ	}	1			
-3550	slightly friable, clay laminae, silty, grades to		- 40 -	CORE	H	60/60		1	
-	siltstone in spots (<1/4-inch thick layers) SANDSTONE - red, hard, damp, micaceous,		-	H	O-5A	'			
<u> </u>	silty, occasional clay laminae		-	CORE	N/I	60/36		20	
ļ					M	00/00		20	TV
<u> </u>			-	CORE		24/24		20	Water level 46.9 ft BLS after
1	Total depth = 49 feet BLS				1	1			21 hours
1 1					<b>}</b>				
1 1		1					!		
	•						ı		
							!		
							}		
			:						
						\		·	
			نا	Ц	Щ		L	L	<u></u>

DRILLING CONTRACTOR: Layne Environmental

COMMENTS: Boring located off-site on BLM land north of WT-1 site.

**DRILLER:** 

W. Cowsur

**DRILLING METHOD:** 

**NWD4 Core Barrel** 

DRILLING EQUIPMENT:



0-6

SHEET 1 OF 1

PROJECT

**Transwestern Pipeline Company** 

LOCATION Carlsbad, New Mexico

PROJECT NUMBER 1548

SURFACE ELEVATION 3590.1

COORDINATES N 10,023 E 9,522

DATUM MSL

LOGGED BY L. Basilio

DATE DRILLED 10/20/92

SURFA	CE ELEVATION 3590.1 DATUM MSL		LOG	GED BY	L. Basili	0			DATE DRILLED 10/20/92
Z O		-		SAMI	PLE INF	ORMA	ATION		
ELEVATION FEET	SOIL DESCRIPTION GROUND SURFACE	STRATA	Depth Feet	Sample Type	Sample ID	Inches	Penetr- ometer Blow Counts	FID (ppm)	REMARKS
-	Tan dry rocky soil		-	AUGER		Rec.	Counto		Surface Conditions: Sparse vegetation, dry rocky soil
- - -3580	SANDSTONE - off-white to tan, light red with depth, slight pink tint, very broken, dry, caliche towards base		- 10 -	X SPT		24/18 24/12		0	Auger to 5 feet BLS
1	SANDSTONE - off-white to red with depth, pink tint, hard, dry, massive white caliche			CORE		42/42		] 1     1  -	
-3570 - -	SANDSTONE - red brown, micaceous, dry, clayey, white caliche at base SANDSTONE - light red brown, dry, micaceous, very friable, clayey and broken at base		- 20 -	CORE		60/60		o	
- -3560	SANDSTONE - red brown, damp, slightly micaceous, friable SANDSTONE - A/A, interbedded with dark red brown siltstone SANDSTONE - red brown, damp, micaceous, friable, occasional clay laminae		 - 30 -	CORE		60/48		0	
- - -	SANDSTONE - dark red, damp, micaceous, friable, broken at top, clay laminae			CORE		60/60		1	
-3550 -	SANDSTONE - red brown, damp, silty, micaceous, friable, clay laminae		- 40 - -	CORE	O-6A	60/60		1	
  -  -  -	SILTSTONE - dark red, hard, interbedded with clay and sandstone SANDSTONE - red, damp, frieble, micaceous, occasional clay laminae	X X X X X X X X X X X X X X X X X X X	- 	CORE		60/54		o	☑ Water level 44.6 ft BLS after 18 hours
	Total depth = 49 feet BLS								

DRILLING CONTRACTOR: Layne Environmental

COMMENTS: Boring located off-site on BLM land north of WT-1 site.

DRILLER:

W. Cowsur

**DRILLING METHOD:** 

**NWD4 Core Barrel** 

DRILLING EQUIPMENT:



0-7

SHEET 1 OF 1

PROJECT

**Transwestern Pipeline Company** 

LOCATION Carlsbad, New Mexico

PROJECT NUMBER 1548

SURFACE FLEVATION 3589 1

COORDINATES N 10,082 E 9,520

DATUM MSI

SURFA	CE ELEVATION 3589.1 DATUM MSL		LOG	GED	BY I	L.	Basilio	<b>)</b>			DATE DRILLED 10/20/92
Z		7	SAMPLE INFORMATION								
ELEVATION FEET	SOIL DESCRIPTION GROUND SURFACE	STRATA	Depth Feet	Į	ype	s	Sample	Inches Adv. Inches Rec.	Penetr- ometer Blow Counts	FID (ppm)	REMARKS
-	Tan dry rocky soil			AI	UGER						Surface Conditions: Sparse vegetation, dry rocky soil
- - -3580	SANDSTONE - tan to off-white, pink tint with depth, broken, dry, white caliche		- 10 -	ш	SPT SPT		ľ	24/18 24/18	l .	0	Auger to 5 feet BLS
- -	SANDSTONE - light tan, off-white, pink tint, dark red at base, dry, hard, broken at base,		-		CORE		,	60/42 60/60		0	
- -3570 -	white caliche  SANDSTONE - red to off-white, hard, silty, clay laminae, abundant white caliche, gypsum flakes, grades to red brown sandstone		- 20 - 	$\mathbb{H}$	CORE			60/60		0	
- - 3560	SANDSTONE - red brown, grades to brown in spots, medium grained, micaceous, slightly friable SANDSTONE - red brown, dark red brown at top, hard, dry, friable, interbedded with clay seams, very friable with calcite seams at top		30 -	c	ORE			60/60		0	
-	SANDSTONE - red, damp, slightly micaceous and friable, occasional clay laminae SANDSTONE - red brown, damp, slightly micaceous, clayey at top, occasional silt laminae at top		-	H	ORE			60/60 60/54		0	
-3550 - -	SANDSTONE - red, damp to moist, micaceous, slightly friable, clayey laminae		- 40 -	c	ORE	W W	O-7A	60/60		0	
} }  -	Total depth = 49 feet BLS			c	ORE			60/60		0	♥ Water level 44.4 ft BLS after 15.5 hours
								  - 			

DRILLING CONTRACTOR: Layne Environmental

COMMENTS: Boring located off-site on BLM land north of WT-1 site.

**DRILLER:** 

W. Cowsur

DRILLING METHOD:

**NWD4** Core Barrel

DRILLING EQUIPMENT:



0-8

SHEET 1 OF 1

PROJECT

**Transwestern Pipeline Company** 

LOCATION Carlsbad, New Mexico

PROJECT NUMBER 1548

SURFACE ELEVATION 3589.1

COORDINATES N 10,144 E 9,508

DATUM MSL

LOGGED BY L. Basilio

DATE DRILLED 10/21/92

SUR	FACE ELEVATION 3589.1 DATUM MISE		LOG	GED RA	r. Rasili	)			DATE DRILLED 10/21/92	
N O		A		SAMPLE INFORMATION						
ELEVATION	SOIL DESCRIPTION	STRATA	Depth Feet	Sample Type	Sample !D	Inches Adv.	Penetr- ometer Blow	FID	REMARKS	
	GROUND SURFACE	<b></b>		İ		Inches Rec.	Counts	(ppm)		
<u>-</u>	Tan dry rock soil		- - - -	AUGER					Surface Conditions: Sparse vegetation, dry rocky soil	
-358	SANDSTONE - tan to off-white, dry, hard, broken at top, slightly friable, white caliche		- 10 - 10 -	CORE		60/30		0	Auger to 9 feet BLS	
- - -357	SANDSTONE - red, darker red towards base, pink tint, dry, hard, slightly friable, abundant white caliche, occasional black staining at base  SANDSTONE - red to tan, dry, hard, broken		20	CORE		60/60		. 1		
<u> -</u>	in upper section, slightly micaceous, white caliche at top, gypsum flakes  SANDSTONE - brown, dry, hard, micaceous,		- 20 -	CORE		60/54		1		
356	slightly friable, gray siltstone at base, gypsum flakes SANDSTONE - light brown, dry, very micaceous, very friable, gypsum flakes, clay		- 30 -	CORE		60/54		o		
	lamina towards base SANDSTONE - red brown, dry, micaceous, slightly friable, gypsum flakes, occasional clay laminae towards base		-	CORE		60/60		0		
-355	SANDSTONE - dark red, damp, very friable, very micaceous SANDSTONE - red, damp, silty, micaceous,		- 40 -	CORE	O-8A	60/48		0		
[	slightly friable, clay laminae towards base  SILTSTONE - dark red, broken, damp, very	××	-	CORE	Ä	60/60		0		
-	clayey, grades to clay in parts, occasional gray sandstone lenses  SANDSTONE - red damp, micaceous, friable  CLAY - dark red, silty, sandy, broken			CORE		60/60		0	☑ Water level 46.7 ft BLS after 16 hours	
	SANDSTONE - red, silty, micaceous, core wet on surface  Total depth = 49 feet BLS									
							<u> </u>			

DRILLING CONTRACTOR: Layne Environmental

COMMENTS: Boring located off-site on BLM land north of WT-1 site.

DRILLER:

W. Cowsur

**DRILLING METHOD:** 

**NWD4** Core Barrel

DRILLING EQUIPMENT:



0-9

SHEET 1 OF 1

PROJECT

**Transwestern Pipeline Company** 

LOCATION Carisbad, New Mexico

COORDINATES N 10,075 E 9,262

PROJECT NUMBER 1548

SURFACE ELEVATION 3590.7

DATUM MSL

LOGGED BY L. Basilio

DATE DRILLED 10/21/92

SURFA	ACE ELEVATION 3590.7 DATUM MSL		LOG	SED BY	L. Basili	D			DATE DRILLED 10/21/92
Z		4		SAME	PLE INF	ORM	ATION		
ELEVATION FEET	SOIL	STRATA				Inches Adv.	Penetr-		REMARKS
N. E.	DESCRIPTION	STR	i	Sample	1	1	ometer Blow	FID	TEMATICO .
\ <del></del>	GROUND SURFACE	1	Feet	Туре	ID	Inches Rec.	Counts	(ppm)	
F	Tan dry rocky soil			AUGER					Surface Conditions: Sparse vegetation, dry rocky soil
t		1			} }			į	vogotation, dry rocky son
f									
<u> </u>			l .						
2500	SANDSTONE - light brown, broken, damp,	::::	- 10 -	П		,			Auger to 9 feet BLS
<del>-3580</del>	friable, occasional white caliche	::::	-	CORE		60/36	!	1	
			} -	H		'			
	SANDSTONE - red brown, moist in spots, very clayey, white caliche		-	CORE	<b>!</b>	60/36		1	
1	vory diayoy, wince dancine		-			1775			
-3570	-		- 20 -	Π		1.			
-	SANDSTONE - red, damp, hard, slightly	::::	-	CORE		60/48		0	
}	friable, abundant gypsum	::::	-	H	}				
}-	SANDSTONE - red, damp, clayey, broken, gypsum flakes		} -	CORE		48/48		0	
F	SANDSTONE - brown, dry, slightly friable, slightly micaceous	::::		H .		/			
-3560	SANDSTONE - brown to gray at top, micaceous, slightly friable, clay seam at top,		- 30 -	CORE		60/60		0	
}	dry, occasional clay laminae towards base		-		1	7			
<b>†</b>	SANDSTONE - red brown, damp, micaceous,	::::				1			
<b>†</b>	slightly friable, abundant clay laminae and inclusions, clay is red, silty, moderately firm			CORE		60/54		0	
<b>†</b>	SANDSTONE - dark red, damp, silty, very friable, crumbly, broken, micaceous	****	40 -		1	,			
-3550	CLAY - red, broken, silty to sandy,	::::		CORE		60/60		40	
ţ	interbedded with gray sandstone SANDSTONE - dark red, moist from 42.5 to			Ц.	O-9A	/		i	
	<b>∬</b> 53.5 ft <b>/</b>		] .	CORE	} }	60/48		55	☑ Water level 45.8 ft BLS after
	CLAY - red, moderately soft, broken, gray silt seams	::::	-	COME		00/70		33	23.5 hours
Ţ.	SANDSTONE - red, hard, slightly micaceous		1						
	and friable, damp SANDSTONE - red, medium to coarse								
	grained, micaceous, friable, broken, labundant clay seams and gray silt seams				} }	1		i	
1	SILTSTONE - red, hard, micaceous, broken						ı		
	Total depth = 49 feet BLS						!		
							,		
}			}					İ	
			<u></u>		<u> </u>		<u> </u>		
1									

DRILLING CONTRACTOR: Layne Environmental

COMMENTS: Boring located off-site on BLM land north of WT-1 site.

DRILLER:

W. Cowsur

**DRILLING METHOD:** 

**NWD4** Core Barrel

DRILLING EQUIPMENT:



0-10

SHEET 1 OF 1

PROJECT

Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

PROJECT NUMBER 1548

SURFACE ELEVATION 3589.1

COORDINATES N 10,169 E 9,402

DATUM MSL

LOGGED BY L. Basilio

SURFA	ACE ELEVATION 3589.1 DATUM MSL		LOG	GED BY	L. Basilio	)			DATE DRILLED 10/22/92
Z O		4		SAME					
ELEVATION	SOIL DESCRIPTION	STRATA		Sample	· ·	Inches Adv.	Penetr- ometer	FID	REMARKS
<u></u>	GROUND SURFACE		Feet	Туре	ID	Inches Rec.	Blow Counts	(ppm)	
- - -	Brown dry soil  Tan dry silty, white caliche			AUGER					Surface Conditions: Sparse vegetation, dry rocky soil
-3580 -	SANDSTONE - tan to light brown, pink tint, broken, damp to moist in spots, friable, white caliche		- 10 -	CORE		60/30		o	Auger to 9 feet BLS
-3570	SANDSTONE - red, damp, broken, very clayey, gypsum flakes		- 20 -	CORE		60/60		0	
- -	SANDSTONE - red, silty to clayey, damp, micaceous, friable, gypsum flakes			CORE		60/60		o	٠
- 3560	SANDSTONE - red brown, hard, damp, slightly friable and micaceous, gypsum flakes, calcite filled fractures in upper portion		- 30 -	CORE		60/60		0	
	SANDSTONE - brown, red, micaceous, damp, slightly friable, silty  CLAY - red, broken, silty, damp  SANDSTONE - dark red, damp, micaceous,	<b>***</b>		CORE		60/48		0	
-3550	clayey, slightly friable, increasingly silty with depth SANDSTONE - A/A, coarse grained, very micaceous		- 40 -	CORE	0-10A	60/60		3	
-	SANDSTONE - red, damp, micaceous, slightly friable SANDSTONE - red brown, coarse, very micaceous, slightly friable, abundant clay	××		CORE	Å	60/60		4	
-	laminae and inclusions   SILTSTONE - dark red, hard, micaceous   SANDSTONE - dark red, damp, micaceous.			CORE		60/60		15	
	\friable, occasional clay laminae Total depth = 49 feet BLS								

DRILLING CONTRACTOR: Layne Environmental

Boring located off-site on BLM land north of WT-1 site. COMMENTS:

DRILLER:

W. Cowsur

DRILLING METHOD:

**NWD4** Core Barrel

**DRILLING EQUIPMENT:** 



BORING

0-11

SHEET 1 OF 1

**PROJECT** 

Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

COORDINATES N 10,200 E 9,270

PROJECT NUMBER 1548

SURFACE ELEVATION 3589.5

DATUM MSL

LOGGED BY L. Basilio

DATE DRILLED 10/22/92

301117	ACE ELEVATION 3589.5 DATUM MSL		LOGG	PED BA I	L. Basilio	<u> </u>			DATE DRILLED 10/22/92
NO		4	SAMPLE INFORMATION						
ELEVATION FEET	SOIL DESCRIPTION GROUND SURFACE	STRATA	Depth Feet	Sample Type	Sample ID	Inches Adv. / Inches Rec.	Penetrometer Blow Counts	FID (ppm)	REMARKS
	Tan dry rocky soil			AUGER		100.			Surface Conditions: Sparse vegetation, dry rocky soil
3580	SANDSTONE - off-white to tan, pink tint, dry, broken, friable to crumbly, white caliche		- 10 <b>-</b>	CORE		60/36		1	Auger to 9 feet BLS
3570	SANDSTONE - light red brown, darker red with depth, pink tint, dry, broken at top, slightly micaceous, friable to crumbly in spots, white caliche, gypsum flakes		- 20 -	CORE		60/60		1	
	Yellow and white crystals SILTSTONE - red, black streaks, dry, hard, slightly micaceous, abundant gypsum flakes, broken towards base	X X X X X X X X X X X X X X X X X X X	20 -	CORE		60/60		1	
3560	SANDSTONE - brown, dry, micaceous, very friable, scattered gypsum, calcite laminae at top	× ×	- 30 - 	CORE		60/54 60/60		1	·
2550	SANDSTONE - red, damp, silty, micaceous, slightly friable, clay laminae  SANDSTONE - red, damp, micaceous, abundant clay laminae and inclusions, clay is			CORE		60/54		0	
3550	dark red  CLAY - dark red, silty to sandy, broken, slightly friable, interbedded with gray sandstone and clay		- 40 -	CORE	O-11A	60/48		1	
	SANDSTONE - red, moist, micaceous, friable, clayey with clay laminae towards base, gray sandstone at base SILTSTONE - red, hard, sandy to clayey,	хх	-	CORE		60/48		5	
	micaceous Total depth = 49 feet BLS								

DRILLING CONTRACTOR: Layne Environmental

COMMENTS: Boring was dry, no water produced.

Boring located off-site on BLM land north of WT-1 site.

DRILLER:

W. Cowsur

**DRILLING METHOD:** 

**NWD4** Core Barrel

DRILLING EQUIPMENT:

Mobile B-61



BORING 0-12 SHEET 1 OF 1

Transwestern Pipeline Company PROJECT

LOCATION Carlsbad, New Mexico

COORDINATES N 10,083 E 9,119

PROJECT NUMBER 1548

SUBFACE FLEVATION 3590 9

DATUM MSI

LOGGED BY I Recilio

DATE DOLLED

SURFA	ACE ELEVATION 3590.9 DATUM MSL		LOG	GED BY	L. Basilio				DATE DRILLED 10/22/9
Z		4	SAMPLE INFORMATION						
ELEVATION FEET	SOIL DESCRIPTION GROUND SURFACE	STRATA	Depth Feet	Sample Type	Sample !D	Inches Adv. / Inches Rec.	Penetr- ometer Blow Counts	FID (ppm)	REMARKS
3590	Tan dry silty soil			AUGEF					Surface Conditions: Sparse vegetation, dry rocky soil
·3580	SANDSTONE - tan to light red, dry, slightly micaceous and friable, white caliche at base		- 10 -	CORE		60/48		1	Auger to 9 feet BLS
	SANDSTONE - light red, off-white, darker with depth, drγ, hard, broken at top, white caliche			CORE		60/60		0	
-3570	SILTSTONE - dark red, hard, clayey in spots, broken, micaceous SANDSTONE - red, dry, hard, silty, gypsum	× × × × ×	- 20 -	CORE		60/48		0	
	\flakes SILTSTONE - red to dark red, dry, broken, slightly clayey and micaceous, gypsum flakes	× × × × × × × × × × × × × × × × × × ×		CORE		60/48		2	
3560	SANDSTONE - red, damp, very silty, slightly friable, calcareous nodules, gypsum flakes CLAY - red, slightly fissile, broken, silty SANDSTONE - dark red, damp, micaceous,	****	- 30 -	CORE		60/60		o	
	crumbly, clay and silt laminae at top SANDSTONE - dark red, damp, slightly micaceous, friable, broken Brown sandy silt zone at 35 ft BLS			CORE		60/60		0	
3550	Red brown hard silty clay at 37.5 ft BLS SANDSTONE - dark red, damp to moist in spots, slightly micaceous, very friable, crumbly, clayey with clay and silt laminae		- 40 -	CORE	O-12A	60/48		o	
	towards base			CORE		60/48		2	☑ Water level 47.8 ft BLS afte
!	Total depth = 49 feet BLS								14.5 hours
									·
			<u> </u>	<u> </u>		<u> </u>		<u></u>	<u> </u>

DRILLING CONTRACTOR: Layne Environmental

COMMENTS: Boring located off-site on BLM land north of WT-1 site.

**DRILLER:** 

W. Cowsur

DRILLING METHOD:

**NWD4** Core Barrel

**DRILLING EQUIPMENT:** 

Mobile B-61



BORING/WELL NUMBER BP-1 SHEET 1 OF 1

PROJECT Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

COORDINATES N 9,960 E 9,338

PROJECT NUMBER 1548

SURFACE ELEVATION 3592.5 DATUM MSL

LOGGED BY L. Basilio

DATE DRILLED 8/12/92

SURFA	ACE ELEVATION 3592.5 DATUM MSL		LOGG	SED BY	Basilio	)			DAT	TE DRILLED 8/12/92
z				SAME	LE INF	ORMA	ATION			WELL
ELEVATION	SOIL	¥				Inches	,			CONSTRUCTION
<b>₩</b>	DESCRIPTION	STRATA	Depth	Sample	Sample	Adv.	Penetr- ometer	PID/		DETAIL &
l ä	DESCRIPTION	ST	Feet	Туре	ID.	/	Blow	FID		REMARKS
W	GROUND SURFACE		1 000	1 4 6 6	10	Inches Rec.	Counts	(ppm)		T.O.C. Elev. 3594.67
	Tan dry soil			AUGER				0/0	M M	Surface Conditions:
-3590			-		1	}	}			Sparse vegetation, dry rocky soil
<b> </b>			+	ri i		, ,		<u> </u>		Auger to 34 feet BLS
ļ	SANDSTONE - tan to light gray, clayey,		-	CORE		54/36		0/0		İ
	brown limestone laminae, hard to slightly friable at base, dry	1:::::				/		)		
	Intable at base, dry	:::::	- 10 -			, ,				
	SANDSTONE - tan, broken, white caliche		, 0	CORE		60/24		0/0		2-inch Schedule 40 PVC riser
-3580	nodules, dry			<u> </u>		/				PVC riser
-	SANDSTONE - tan to light gray, broken,		+	1	İ	1				
-	slightly moist, white caliche nodules SANDSTONE - tan with red tint, slightly	:::::		CORE		60/60		1/0		
1	moist, fractured, chalky, white and brown	:::::	-			] / ]				]
	limestone nodules, grades to red sandstone SANDSTONE - red, clayey, slightly moist,	:::::	- 20 -	1	BP-1C	1 1				
	occasional white limestone laminae,	::::		CORE	XI	60/60		4/1		Portland Type I/II arout
3570	scattered black nodules	::::			4	/				grout
}	SANDSTONE - gray, hard, slightly moist SANDSTONE - red to gray, grades to dark			1	BP-1A					
ŀ	red, moist	::::	1	CORE	XI	60/60		50/8		
	SANDSTONE - dark red, slightly micaceous, clayey laminae, occasional gray sand lenses,			L I	4	′,				
<b>,</b>	moist and oily		- 30 -	CORE	BP-1B	36/36		30/5		1
-3560	CLAY - red, hard, oily			LI i	4 :	/				
-3560	SANDSTONE - red to dark red with depth,				1 .					
<b> </b>	micaceous, moist, oily, free product along core and in fractures, oil is golden to dark	::::			1	/			70 70	
<b> </b>	brown			CORE		54/ 0				Bentonite seal
+	No sampling from 31.5 feet to 34 feet. Drilling ceased on 8/12/92 due to hole	::::	1		BP-1D	'				
<u> </u>	problems. On 8/27/92, 8-inch diameter	:::::	- 40 -	0005	M :	- / l		20125		
-3550	augers were used to drill to 34 feet BLS.	1::::		CORE	٨	60/48		60/25		
	Coring resumed at this point.  SANDSTONE - red, hard, slightly micaceous.	::::		H	4 ,		1			10-20 silica sand
	clayey, damp	::::		CORE		60/36		4 10		⊽filter pack
	SANDSTONE - red, very micaceous, broken,	::::		CORE		00/36		1/3		*
-	interbedded with red and gray clay SANDSTONE - red, damp, micaceous,			H I	BP-1E					
ļ ,	broken, silty	::::	- 50 -	CORE	VI -	60/48		0/1		0.020 slot screen
-3540	SANDSTONE - red, damp, micaceous, broken, silty to clayey			COME	Al I	00/70		0/1		
	Total depth = 53.5 feet BLS	·····		4	4				DE CO	
	Monitor Well MW-1 was installed in Boring			Į [					1 1	
	BP-1.			1 1						
1		]		1			'			
									] [	
] ]		]								
1									} {	
1 1			l						, ,	
	<u> </u>	L			1					

DRILLING CONTRACTOR: SH&B

DRILLING METHOD:

DRILLING EQUIPMENT:

DRILLER:

E. Adams

NO Core Barrel

**CME-55** 

DIAMETER, TYPE & INTERVAL OF CASING: 2-inch Schedule 40 PVC

WELL SCREEN/INTERVAL:

FILTER PACK-INTERVAL/QUANTITY:

WELL SEAL-INTERVAL/QUANTITY:

0.020 Slot/43.5-53.5 feet BLS 10-20 Silica sand/41-53.5 feet

Bentonite flakes/35-41 feet BLS



**BORING/WELL NUMBER** MW-2 SHEET 1 OF 1

PROJECT Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

PROJECT NUMBER 1548

SURFACE ELEVATION 3591.1

COORDINATES N 9,993 E 9,447

DATUM MSL

LOGGED BY L. Basilio

DATE DRILLED 9/1/92

SURFA	ACE ELEVATION 3591.1 DATUM MSL		LOG	GED BY	L. Basilio				DAT	E DRILLED 9/1/92
z				SAMPLE INFORMATIO						WELL
	SOIL	STRATA				Inches	Penetr-			CONSTRUCTION
× ∃	DESCRIPTION	1 2	Depth	Sample	Sample	Adv.	ometer	PID/		DETAIL &
1 11	32331 113.1	S	Feet	Type	מו	/	Blow	1 1		REMARKS
	GROUND SURFACE	<u> </u>		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		Rec.	Counts	(ppm)	_	T.O.C. Elev. 3593.32
3580 - 3580 - 3560		<b>Γ</b> σ		Туре	ID	  Inches	Blow	FID (ppm)		Portland Type I/II grout  Bentonite seal
+		<b> </b> ::::	40				i			
3550	SANDSTONE - red, damp to moist,	::::	- 40 -							10-20 silica sand
	micaceous, clayey, slightly friable	<del>  = -</del>	<b>†</b> -							filter pack
ſ	CLAYSTONE - dark red, dry to damp at top, very sandy at top, very broken to crushed	88	} -							0.020 slot screen
<b>†</b>	SILTSTONE - dark red, slightly micaceous,	1							::目::	
}	slightly moist, clayey laminae, even breaks	<u> :::</u> ::							:: <b> </b>  ::	7
-	along planes	E								<b>=</b>
	SANDSTONE - red, moist, micaceous, massive, coarser towards base, clay laminae	····	- 50 -				İ		اجت	
	in upper portion, oily along side of core, oil					İ				
1	along fracture in sandstone at 45.5 feet				] ]		'			
	SANDSTONE - red. moist, silty, micaceous,	1					i	ļ	}	
1	oily along fractures CLAYSTONE - red to gray, silty, micaceous,	1							[ [	
	dry to damp	1							] [	
1	SANDSTONE - dark red, silty to clayey,	1			<b>                                     </b>				1	
	micaceous, damp, slightly friable	1			{ {					
	Total Depth = 50 feet BLS									
									] ]	
1				}	<b>[ ]</b>				1	
									1 1	
									]]	
7 (										

DRILLING CONTRACTOR: SH&B

DRILLER:

C. Elms

**CME-55** 

**DRILLING METHOD:** 

DRILLING EQUIPMENT:

Hollow Stem Augers

WELL SCREEN/INTERVAL:

FILTER PACK-INTERVAL/QUANTITY:

**WELL SEAL-INTERVAL/QUANTITY:** 

DIAMETER, TYPE & INTERVAL OF CASING: 2-inch Schedule 40 PVC 0.020 slot/40-50 feet BLS 10-20 silica sand/38-50 feet

Bentonite flakes-fine/36-38 feet BLS



N 9,822 E 9,380

**BORING/WELL NUMBER** MW-3 SHEET 1 OF 1

**PROJECT** 

Transwestern Pipeline Company

LOCATION Carlsbad, New Mexico

PROJECT NUMBER

1548

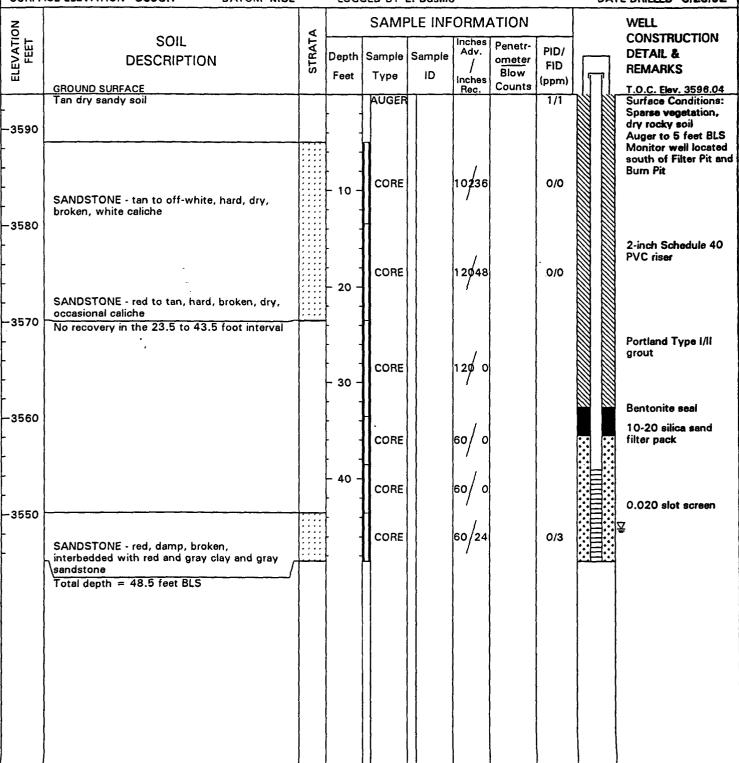
SURFACE ELEVATION 3593.7

COORDINATES

DATUM MSL

LOGGED BY L. Basilio

DATE DRILLED 8/28/92



DRILLING CONTRACTOR: SH&B

**DRILLER:** 

C. Elms

**CME-55** 

**DRILLING METHOD:** DRILLING EQUIPMENT: **NQ** Core Barrel

DIAMETER, TYPE & INTERVAL OF CASING:

WELL SCREEN/INTERVAL:

FILTER PACK-INTERVAL/QUANTITY:

WELL SEAL-INTERVAL/QUANTITY:

2-inch Schedule 40 PVC

0.020 slot/38.5-48.5 feet BLS 10-20 Silica sand/35.5 to 48.5

feet BLS

Bentonite flakes/32.5-35.5 feet

## APPENDIX C SOIL SAMPLE LOG SHEETS



A Halliburton Company  16360 PARK 10 PLACE DRIVE. SUITE 300  HOUSTON. TEXAS 77084  (713) 492-1888	SURFACE SOIL SUBSURFACE SOIL SEDIMENT POND/LAGOON OTHER								
PROJECT NAME Transmistern Pipeline	Compa	ny	PROJECT NUMBE	R	6250				
NUS SAMPLE NO. FP-1A		sou	RCE Filter	Area		W7-1			
SAMPLE METHOD:		COM			COMPOSITE SAMPLE DATA				
NQ Core burrel	SAMP	LE	TIME		COLOR/DE	SCRIPTION			
DEPTH SAMPLED:									
SAMPLE DATE & TIME: 8/6/92 /220									
SAMPLED BY: BASILIO									
SI GNATUREI SI: Bash									
TYPE, OF SAMPLE									
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION				ļ		<del></del>			
GRAB	<b> </b>		!						
SECOMPOSITE  ☐ GRAB - COMPOSITE			SAMP	LE DAT	A	<del></del>			
	COLOR	DESC	RIPTION: (SAND.			ST, WET, ETC.)			
		Sand				MICACTORS, day			
ANALYSI S:	ļ		claye.	19 M	41444	<u> </u>			
TPH	OBSERVA	TI ONS/I	NOTES:		<del></del>				
BTEX	4								
TCLA M	-}								
	1								
						,			
	]								
HNU-D									
DUA - D									
1	I								



#### A Halliburton Company

16360 PARK 10 PLACE DRIVE, SUITE 300 HOUSTON, TEXAS 77084 (713) 492-1888	SUBSUI	RFACE :	SOI L			
PROJECT NAME Transwestern fine		upan y	PROJECT NUMB	ER 🔞	250	
NUS SAMPLE NO. FP-18		SOL	IRCE Filter	Area	WT	~ /
SAMPLE METHOD:	T			ITE SAMP		
NQ Core barrel	SAMP	LE	TIME		COLOR/DESCR	IPTION
DEPTH SAMPLED: 33,5-36.5				<del> </del>		
SAMPLE DATE & TIME: 8/18/92 /345						
SAMPLED BY:			<u> </u>	+		
BASILIO				<del>                                     </del>		
SI GNATURELSI:						
1 Dans				<del> </del>		·
TYPE OF SAMPLE  LOW CONCENTRATION						<del></del>
☐ HI GH CONCENTRATION	<del></del>		<del> </del>	<del> </del>		
☐ GRAB  SCOMPOSITE		<del></del>	<del> </del>	+		<del></del>
GRAB - COMPOSITE			SAM	PLE DATA		
	COLOR		RIPTION: (SAND			
ANALYSIS	_	San	dstone - ve			
ANALYSI S:			, ,		•	ne, Moist
TrH	OBSERVA	TI ONS/		14 5	poTS	
BTEX				,		
TCLP-M	7					
	_					
	4					
	-					
HNU - 50	1					
ULA - 15						



#### A Halliburton Company

16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON. TEXAS 77084 (713) 492-1888

☐ SURFACE SOIL
SUBSURFACE SOIL
SEDI MENT
☐ POND/LAGOON
☐ OTHER

PROJECT NAME Transwestern Pipel NUS SAMPLE NO. FP-1C	ine con	114ny PRI	DJECT NUMBE	R 6250				
NUS SAMPLE NO. FP-1C		SOURCE	Filter	Area WT-1				
SAMPLE METHOD:	COMPOSITE SAMPLE DATA							
NQ Core barrel	SAMP	LE	TIME	COLOR/DESCRIPTION				
DEPTH SAMPLED:								
41.5-43.5	<u> </u>							
SAMPLE DATE & TIME:								
8/18/92 1350								
SAMPLED BY:								
BASILIO								
SI GNATURELS):			<del></del>					
1 Banks	<b></b>							
TYPE OF SAMPLE			·· <del>·</del>					
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION								
GRAB	<b> </b>							
GRAB - COMPOSITE	ļ							
GRAB - COMPOSITE	SAMPLE DATA  COLOR   DESCRIPTION: (SAND, CLAY, DRY, MOIST, WET, ETC.)							
	COLOR			وماوسات مناك بالمكال المناكر والمراجع بمساوي والمراجع والماثا كالأكارا				
AVALVET C	<del> </del>	1		d brown, hard, dry,				
ANALYSI S:	<del> </del>	,	4955/ve,	MICGIEROUS dry				
7010	ODSEDVA	TI ONS/NOTI						
1 F H	OBSERVA	11 01/27 40 11	<b>.</b> 3:					
TIP-M	┨							
/(LF-1/)	1							
	-							
<del> </del>	-							
	╡							
	7							
	7							
+ HNC1 - 1	1		, <del></del>	<del></del>				
0								
UUA - 8	1							
1								
	1							
	l							



16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON. TEXAS 77084 (713) 492-1888	SURFACE SUBSURE SEDIME POND/L DTHER	RFACE ENT LAGOON	SOIL					
PROJECT NAME Transmistern Pirel NUS SAMPLE NO FP-2A	ine om	rany	_PROJECT_NUMBE	ER	0520			
NUS SAMPLE NO. FP-2A		SOL	IRCE Fillor	Area	w7-1			
SAMPLE METHOD:			COMPOS	ITE SAN	PLE DATA			
NQ (on barrel	SAMP	LE	TIME	COLOR/DESCRIPTION				
DEPTH SAMPLED:				<u> </u>				
23.5 - 28.5				ļ				
SAMPLE DATE & TIME: 8/6/92 / 457								
SAMPLED BY:								
SI GNATURE(S): Baih.								
TYPE OF SAMPLE	_		<del> </del>	<del> </del>	<del></del>			
LOW CONCENTRATION				<del> </del>				
HI GH CONCENTRATION								
☐ GRAB ☐ GRAB ☐ GRAPOSI TE								
GRAB - COMPOSITE	SAMPLE DATA							
	COLOR	DESC	CRIPTION: (SAND	. CLAY,	DRY, MOIST, WET, ETC.)			
		San	istone - car	h ree	micaceous, have,			
ANALYSI S:			moist at	OOTION	4			
					<del></del>			
TPH	OBSERVA	TI ONS/	NOTES:					
BTEX								
Tilp-M								
	<b>-</b> ∤ '							
<u> </u>	-							
- HRU- 200								
,								



16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON. TEXAS 77084

(713) 492-1888

		SUR	FAC	Ε	SOI	L
	図	SUB	SUR	FΑ	CE	SOIL
		SED	I ME	NT		
		PON	D/L	AG	00N	l
		OTH	ER			
İ.		1				-

PROJECT NAME Transmistern Pipeli	ne Jam	Man PR	OJECT NUMBE	R250						
NUS SAMPLE NO. FP-2B		SOURCE	Filter A	rea WT-1						
SAMPLE METHOD:	T	COMPOSITE SAMPLE DATA								
NR Core barrel	SAMP	LE	TIME	COLOR/DESCRIPTION						
DEPTH SAMPLED:										
28.5 - 33.5										
SAMPLE DATE & TIME:										
8/6/92 1510	<u> </u>									
SAMPLED BY:	<u> </u>									
BAS/4/0	<u> </u>									
SI GNATURE(S):			:							
TYPE, OF SAMPLE	<del> </del>									
LOW CONCENTRATION										
☐ HI GH CONCENTRATION		<del></del>	<del></del>							
☐ GRAB  ☐ GRAB  ☐ GRAB										
GRAB - COMPOSITE	SAMPLE DATA									
	COLOR DESCRIPTION: (SAND, CLAY, DRY, MOIST, WET, ETC.)									
		Saudst		ties, have, micacrous, whin						
ANALYSI S:			clevey 1.	imma, slightly moist						
		1								
7 P.H	OBSERVA	TI ONS/NOT	ES:							
OTEX	4									
TCLP-M	4									
	-									
	4									
	-									
	1									
	┪									
HVU-280										
CULTA -										
1										
}		•								



16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON. TEXAS 77084 (713) 492-1888

☐ SURFACE SOIL
SUBSURFACE SOIL
☐ SEDI MENT
☐ POND/LAGOON
☐ OTHER

PROJECT NAME Transwestern Preine	(om pa	iny	PROJECT NUMBE	R6250		
NUS SAMPLE NO. FP-2C				Area WT-1		
SAMPLE METHOD:			COMPOSI	TE SAMPLE DATA		
NQ (ore barrel	SAMP	LE	TIME	COLOR/DESCRIPTION		
DEPTH SAMPLED:						
33,5 - 38,5						
SAMPLE DATE & TIME:						
8/6/42 1525						
SAMPLED BY:						
15AS/LIO.						
SI GNATURE(S):			-			
TYPE.OF SAMPLE						
LOW CONCENTRATION						
☐ HIGH CONCENTRATION ☐ GRAB						
E-COMPOSI TE			<del></del>			
GRAB - COMPOSITE	SAMPLE DATA					
	COLOR	DESCR	IPTION: (SAND.	CLAY, DRY, MOIST, WET, ETC.)		
		Sand	stone - dar	k red, moust, only and		
ANALYSI S:	<del> </del>	<u> </u>		ver 2 kt, clayer lammar		
T 211	OBSERVA	TI ONE (N	at base			
TPH BTEX	DESERVA	I I DINOV N	n153:			
TCLP-M	1					
7 2 2 7 701	1					
	1					
	1					
	1					
	1					
1/2//1: 220						
1-1NU-320						
1	1					



A Haliburton Company 6360 PARK 10 PLACE DRIVE. SUITE 300 10USTON. TEXAS 77084 713) 492-1888	SURFACT SUBSURED SEDIME POND/L	RFACE INT .AGOON	SOI L	(2					
PROJECT NAME Transwistern Pipe	eline Comp								
NUS SAMPLE NO. FP-2D		SOL	IRCE <u>Filter</u>	Area	<u>w7-(</u>				
SAMPLE METHOD:		COMPOSITE SAMPLE DATA							
NQ Core barrel	SAMPI	E	TIME	C	OLOR/DESCRIPT	I ON			
DEPTH SAMPLED: 38.5-43.5									
SAMPLE DATE & TIME: 8/6/92 /540									
SAMPLED BY: (S.AS/L/2)									
SI GNATUREI SI: Bash									
TYPE.OF SAMPLE									
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION ☐ GRAB ☑ COMPOSITE									
GRAB - COMPOSITE			SAM	PLE DATA		<del></del>			
	COLOR		CRIPTION: (SAND						
ANALYSIS:		<i>) a u</i>	dstone - re	d, hard,	MICACHOUS,	Clayer			
					<del></del>	······································			
TCLP-M	OBSERVA	TI ONS/	NOTES:						
, со,	3								
HWU - 3									



16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON. TEXAS 77084 (713) 492-1888

☐ SURFACE SOIL

SUBSURFACE SOIL

SOIL/SEDIMENT

SAMPLE LOG SHEET

☐ SEDI MENT ☐ POND/LAGOON

	U DIHER				<b>←</b> ≫		
PROJECT NAME Transwestern Pipelin-	· Comp	444	PROJECT NUMBE	R <u>3 &amp; .</u>	30		
NUS SAMPLE NO. FP-3A		SOUR	CE <u>filter</u>	Area	W 7-7		
SAMPLE METHOD:	COMPOSITE SAMPLE DATA						
NQ Core pariel	SAMP	LE	TIME	COL	OR/DESCRIPTION		
DEPTH SAMPLED: 24.5 - 33.5							
SAMPLE DATE, &, TIME:							
8/7/92 /025					·····		
SAMPLED BY:	<del>                                     </del>						
BASILID:							
SI GNATURE( S):							
2 Basili							
TYPE.OF SAMPLE			· · · · · · · · · · · · · · · · · · ·				
☐ HIGH CONCENTRATION							
GRAB  SHOMPOSI TE							
GRAB - COMPOSITE	SAMPLE DATA						
	COLOR				, MOIST, WET, ETC.)		
		Sands	tone - red,				
ANALYSI S:			MICACHOUS	, clave,	aminar		
TPH	OBSERVA	TT ONG /N	ntes.				
BTEX	]	11 01107 11	J123.				
TCLP-M	1						
	]						
	_						
<u> </u>	1						
	-						
	1						
HNU - 70							
OUA - 50							
1	i						



A Halliburton Company  16360 PARK 10 PLACE DRIVE, SUITE 300  1001STON. TEXAS 77084  1713) 492-1888  PROJECT NAME Transwestern Pige	SURFACE SUBSURE SEDI ME POND/L OTHER	RFACE S ENT LAGOON	OIL	·n - 2	Jo	
NUS SAMPLE NO. FP-3B	IIIA COM	SOUR	RCE <u>Cilter</u>	Acea	1117-1	
SAMPLE METHOD:	7					
NQ (ore barrel	SAMPI	COMPOSITE SAMPLE DATA SAMPLE TIME COLOR/DESCRIPTION				
DEPTH SAMPLED:			, 2 , 1	<del> </del>	OLDIN DESCRIPT	11 011
39-43,5						
SAMPLE DATE, & TIME: 8/11/92 915						
SAMPLED BY:	<del></del>				<del></del>	
BASILIO	<del></del>					
SI GNATURE(S):						
2 Baille			· · · · · · · · · · · · · · · · · · ·			
TYPE.OF SAMPLE				<u> </u>		
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION				<u> </u>		
GRAB  COMPOSITE	<del></del>			<del> </del>		<del></del>
GRAB - COMPOSITE		1	SAM	LE DATA		
	COLOR	DESC	RIPTION: (SAND,	CLAY, DI	RY, MOIST, WE	T, ETC.)
		Sand	Istone - re	d dark	, massive, 1	MICGEROUS
ANALYSI S:			clayer	lenses	at top	
					·	
TPH	OBSERVA	TI ONS/N	(OTES:			
BTEX						
7CLP-M	-					
	-					
	_					
HNU - 200						
HNU-200 DUA-450						



A Halliburton Company	☐ SURFA	CE SOI!	L				
	SUBSURFACE SOIL						
HOUSTON, TEXAS 77084 (713) 492-1888	SEDI MENT						
(1137-132-1030	☐ POND/	LAGDON					
	☐ OTHER						
PROJECT NAME Transwestern Pipelis NUS SAMPLE NO. FP-3 C	in Com	yany	_PROJECT_NUMBE	R 5270			
NUS SAMPLE NO. FP-3 C			JRCE <u>Filter</u>	Area U	<u> ソブー1</u>		
SAMPLE METHOD:			COMPOSI	TE SAMPLE DATA			
NR Core barrel	SAMP	LE	TIME	COLOR/DES	CRIPTION		
DEPTH SAMPLED:	<b> </b>		<b></b>				
45.5-48	<b></b>		<b></b>				
SAMPLE DATE & TIME: 8/11/42 945	<del></del>				<del></del>		
SAMPLED BY:	<del> </del>	<del></del>					
13 ASILIO				-			
SI GNATUREI SI:							
	<u> </u>						
TYPE OF SAMPLE	<u> </u>						
☐ LOW CONCÉNTRATION ☐ HIGH CONCENTRATION	<del></del>		<del> </del>	<del> </del>	<del></del>		
☐ GRAB  YESEOMPOSITE	<b> </b>		<del> </del>				
GRAB - COMPOSITE			SAMP	LE DATA			
	COLOR	DESC	CRIPTION: (SAND.	CLAY, DRY, MOIS	T, WET. ETC.)		
		Sand	store - red	hard, micaccous,			
ANALYSI S:		Clay	- red, hard	silty, moist			
	0000000						
TOH	OBSERVA	HI UNS/	NUTES:				
BTEX	-{						
Telp-m	1						
	7						
	]						
	]				·		
	4						
HNU - O							
HNU - 0 DUA - 10							
1	1						



A Halliburton Company	☐ SURFA	CE SOI	L			
	X SUBSUR	RFACE	SOIL			
HOUSTON. TEXAS 77084 (713) 492-1888	☐ SEDI ME	ENT				
	☐ POND/L	_AGOON				
~ ^ 1	☐ OTHER			,	/ <b>^</b> -	
PROJECT NAME Transwestern Pirelin- NUS SAMPLE NO. FP-4A	· Comp	any	_PROJECT_NUMBE	R	, 250	
NUS SAMPLE NO. FP-4A		sou	JRCE <u>Lilter</u>	Area	w7-1	
SAMPLE METHOD:			COMPOS	ITE SAM	PLE DATA	
NQ Cove barnl	SAMP	LE	TIME		COLOR/DESCRIPTION	
DEPTH SAMPLED:	<u> </u>	<del></del>		<u> </u>	<del></del>	
28.5-33.5	<del> </del>			ļ		
SAMPLE DATE & TIME: 8/11/92 /3/5					<del></del>	
SAMPLED BY:	<del> </del>			<del> </del>		
13 AS/L10		·		<del>                                     </del>		
SI GNATURELSI: Basilo						
TYPE OF SAMPLE			<del> </del>			
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION	<del></del>		ļ	<del> </del>		
☐ GRAB				<del> </del>		<del></del>
☐ GRAB - COMPOSITE			SAM	PLE DATA	<del></del>	
	COLOR	DES			DRY, MOIST, WET, I	FTC.)
	502011				d, hard, micaca	
ANALYSI S:		341			occ clas lami	
	1		377, 1114	31-7	<u> </u>	<del>-1-1-1</del>
TPH	OBSERVA	TI ONS/	NOTES:			
BTCX	_					
TCLP-M						
	_					
	_]					
	4					
	4					
	4					
HNU- 3.						
OUA - 2						
1 007 - 2						
(	1					



16360 PARK 10 PLACE DRIVE, SUITE 300 HOUSTON, TEXAS 77084 (713) 492-1888	SURFACE SUBSUF SEDIME SEDIME POND/L OTHER	RFACE S INT LAGOON	SOIL		
PROJECT NAME Transwestern Pipe	line Con	مرسهم	PROJECT NUMBE	r	TO
NUS SAMPLE NO. FP-48		Ś0U	RCE Februar	Area	W7-1
SAMPLE METHOD:	T		COMPOSI	TE SAMPLE	DATA
Na lore barrel	SAMPI	E	TIME	COL	OR/DESCRIPTION
DEPTH SAMPLED:					
33.5 - 40	<u> </u>			<u> </u>	
SAMPLE DATE & TIME:		<del></del>			
SAMPLED BY:	<del> </del>				<del></del>
BASILIO	ļ				
SI GNATURE(S):	<del> </del>			<u> </u>	
1 banh					<del></del>
TYPE OF SAMPLE					
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION					
GRAB				ļ	
GRAB - COMPOSITE			CANG	I C SAYA	
	COLOR	DECL		LE DATA	, MOIST, WET, ETC.)
	COLON		dstone - ve		
ANALYSI S:			Clay		
				7,000,000	
TPH	OBSERVA	TI ONS/I	NOTES:		
BTEX	_				
TCIP-M	_				
	4				
	4				
	-{				
	1				
HN4 - 0				·	
OUA - 1					



TA Halliburton Company	☐ SURFAC	CE SOI	L			
16360 PARK 10 PLACE DRIVE, SUITE 300	SUBSUF		SOIL			
HOUSTON. TEXAS 77084 (713) 492-1888	☐ SEDIME					
	POND/L	_AGOON				
<del></del>	☐ OTHER					
PROJECT NAME Transwestern Pira NUS SAMPLE NO. FP-5A	clins com	pavy	_PROJECT NUMB	ER		
NUS SAMPLE NO. FP-5A	·	sou	JRCE <u>Filter</u>	Area WT-(		
SAMPLE METHOD:	COMPOSITE SAMPLE DATA					
NQ Core barrel	SAMP	LE	TIME	COLOR/DESCRIPTION		
DEPTH SAMPLED:						
13,5-18.5						
SAMPLE DATE & TIME:						
8/12/92 835						
SAMPLED BY:						
BASILIE						
CT CMATHDE/ CL.						
2 Bash						
TYPE OF SAMPLE						
LOW CONCENTRATION						
☐ HIGH CONCENTRATION☐ GRAB						
EFCOMPOSI TE						
GRAB - COMPOSITE			SAM	PLE DATA		
ł	COLOR	DES	CRIPTION: (SAND	. CLAY, DRY, MOIST, WET, ETC	. )	
		Sand	Istone - tan	to light med to gray, cla	yey	
ANALYSI S:			friaste			
TrH	OBSERVA	TI ONS/	NOTES:			
BTCX						
TCLP-M						
HWU- 35 DUA-7						
DUA - 7						



16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON. TEXAS 77084 (713) 492-1888

☐ SURFACE SOIL
SUBSURFACE SOIL
SEDI MENT
☐ POND/LAGOON
☐ OTHER

PROJECT NAME Transwestern Pire NUS SAMPLE NO. FP-5B					w T-1	
SAMPLE METHOD:	<b></b>		COMPOSI	TE SAMPLE D	IATA	
NQ (ore barrel	SAMP	LE	TIME	COLO	DR/DESCRIPTION	
DEPTH SAMPLED:						
18.5 - 23.5			· · · · · · · · · · · · · · · · · · ·			
SAMPLE DATE & TIME:						
8/12/92 855						
SAMPLED BY:						
BASILIO.						
SI GNATURE(S):						
2 Bash						
TYPE OF SAMPLE						
LOW CONCENTRATION						
☐ HI GH CONCENTRATION ☐ GRAB						
<b>₩</b> COMPOSI TE						
GRAB - COMPOSITE	SAMPLE DATA					
	COLOR				MOIST, WET, ETC.)	
		Sandsi	lone - red	l, hard,	clayer in spots,	
ANALYSIS:			slishtly			
		<u> </u>	·			
TPH	OBSERVA	TI ONS/NOT	ES:			
BTEX	_					
TCLP-M	_					
	_					
HNC2 - 55 OVA - 15						
Citta						
UVA - 15						
	1					



	SURFACE SOIL						
	⊠ SUBSURFACE SOIL						
(713) 492-1888	☐ SEDIMENT ☐ POND/LAGOON						
	OTHER						
PROJECT NAME Transmestern Pineline	Comp	410	PROJECT NU	imber	250		
PROJECT NAME Transwestern Pipeline NUS SAMPLE NO. FP-5C		SOL	IRCE Silt.	er Area		WT-1	
SAMPLE METHOD:				POSITE SAM			
NQ Core barnel	SAMP	LE	TIME		COLOR/DESCR	IPTI ON	
DEPTH SAMPLED: 23,5 - 28.5							
SAMPLE DATE & TIME:							
8/12/92 920							
SAMPLED BY:	ļ						
BASILIO							
SI GNATURELSI: Barilo		<del></del>					
TYPE OF SAMPLE							
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION							
GRAB		<del></del>					
☐ GRAB - COMPOSITE	ļ		<u> </u>	NAME OF BATA			
GRAB - COM OSTIE	COLOR	DEC		SAMPLE DATA		LET STO	
	COLOR				DRY. MOIST.		
ANALYSI S:	<del> </del>	2440	) FORE TE		MINST, OUY	·	
	<b>†</b>	<del>                                     </del>			<del></del>	<u> </u>	
TPH	OBSERVA	TI ONS/	NOTES:				
BTEX	1						
TCLP-M	]						
	}						
HNU-50.							
OUA - 10							
}							

en the same who is at a first



6360 PARK 10 PLACE DRIVE, SUITE 300 - SUSTON, TEXAS 77084

☐ SURFACE SOIL
SUBSURFACE SOIL
☐ SEDIMENT
☐ POND/LAGOON
☐ OTHER

PROJECT NAME I ranswestern C. reline	(onpu	и.,	PROJECT NU	JMBER_	62	51)	
NUS SAMPLE NO. FP-6A		sou	RCE	er A	rea	WTY	
SAMPLE METHOD:	COMPOSITE SAMPLE DATA						<del></del>
NQ Con barrel	SAMP	LE			COLOR/DESCRIPTION		
DEPTH SAMPLED:	1			i			
18.5 - 23.5				-	<del></del>		
SAMPLE DATE, & TIME:				1			
8/15/92 940							
SAMPLED BY:							
BASILIO.				i	-		
SI GNATURE(S):							
TYPE OF SAMPLE							
☐ LOW CONCÉNTRATION ☐ HIGH CONCENTRATION							
GRAB							
XETEOMPOSI TE	<b></b>						
☐ GRAB - COMPOSITE	SAMPLE DATA						
	COLOR					MOIST, WET, ET	
ANALYCI C	<del> </del>	San	Jyone re			y cliphely me	
ANALYSI S:	<del> </del>		ed brown	ار , میں	h slack	and sold stal	ч
TOIL	ODCEDVA	77.0110.4	ULVY MICH	ليان	= 1/4		
TPH	OBSERVA	II UNSZ	NUTES:				
PTEX	-{						
TUP-M	4						
	-						
	1						
	1					•	
	1						
	†						
HNU- D							
DUA - 0							



18360 PARK 10 PLACE DRIVE, SUITE 300 -CUSTON, TEXAS 77084

☐ SURFACE SOIL
SUBSURFACE SOIL
☐ SEDI MENT
☐ POND/LAGOON
□ OTHER

PROJECT NAME Transmistera Pine	live (om	<u>ոսս </u> PR0.	JECT NUMBE	R	-D			
NUS SAMPLE NO. FP-68		SOURCE	Filter	Area	WT-1			
SAMPLE METHOD:	COMPOSITE SAMPLE DATA							
NQ (ore harrel	SAMPL	E	TIME	COLO	OR/DESCRIPTION			
DEPTH SAMPLED:								
38-40								
SAMPLE DATE & TIME:	<u> </u>							
8/18/92 1055								
SAMPLED BY:				<u> </u>				
BASIL13								
SI GNATURE(S):								
7. Bank								
TYPE OF SAMPLE	ļ			ļ				
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION								
☐ GRAB								
GRAB - COMPOSITE								
GRAB - COMPOSITE	COLOR   DESCRIPTION: (SAND. CLAY, DRY, MOIST, WET. ETC.)							
	COLOR							
AVALVOTO		Jan Jito	14 - 14 E	brown u	very MICACIOUS			
ANALYSI S:	-	da	mo Eve	95.6	<del></del>			
701/	OBCEDVA	TI ONO MOTE						
TPH	UBSERVA	TI ONS/NOTE:	<b>5:</b>					
BTEX	-							
TCLP-M	-							
	-							
	-							
	-							
	-							
	-							
HNU- 2								
CUA- O								



15360 PARK 10 PLACE DRIVE, SUITE 300 -CUSTON, TEXAS 77084

☐ SURFACE SOIL
SUBSURFACE SOIL
☐ SEDI MENT
☐ POND/LAGOON
☐ OTHER

PROJECT NAME Transwestern Pirelin	e Comm	any	PROJECT NUMBE	1250				
NUS SAMPLE NO. FP-7A		,		ea W 7-1				
SAMPLE METHOD:	COMPOSITE SAMPLE DATA							
NQ Core barrel	SAMP	LE	TIME	COLOR/DESCRIPTION				
DEPTH SAMPLED:		·		ĺ				
8.5-13.5								
SAMPLE DATE, & TIME:								
8/25/42 1110								
SAMPLED BY:								
BASILIO.								
SI GNATURE(S):								
2 Banto				1				
TYPE OF SAMPLE								
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION	ļ							
☐ GRAB								
SCOMPOSITE  ☐ GRAB - COMPOSITE	CANCE FATA							
CON CONTROL	SAMPLE DATA  COLOR   DESCRIPTION: (SAND. CLAY. DRY. MOIST. WET. ETC.)							
	COLOR	UESL	RIPTIUNI (SANU	CLAT, DRY, MOISI, WEI, EIC.)				
ANALYSI S:	<del> </del>	Dand	store - tan	runtich, reddish tent day,				
HINE TOTO:			where calich					
TPH	OBSERVA	TI ONS/						
BTEX	1	11 0110						
TCLP-M	1							
	7							
	7							
	7							
1/0/// = 5								
HNU-5								
DUA - 1	}							
L OUT 1								
}	1							



DUA - 4

A Halliburton Company	SURFACE SOIL							
16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON. TEXAS 77084	SUBSURFACE SOIL							
(713) 492–1888	☐ SEDI MENT ☐ POND/LAGOON							
		_AGUUN						
T 1 1				13.50				
PROJECT NAME /vanswestern Mipeli.	ne compo	ery	_PROJECT ,NUMBE	R 0230				
NUS SAMPLE NO. FP-7B		SCU	IRCE <u>Filter</u> A	trea WT-1				
SAMPLE METHOD:	COMPOSITE SAMPLE DATA							
NQ Core barrel	SAMP	LE	TIME	COLOR/DESCRIPTION				
DEPTH SAMPLED:								
38,5-43								
SAMPLE DATE & TIME:								
8/26/92 930								
SAMPLED BY:								
BASILIO				-				
SI GNATURE(SI:								
Carente.								
TYPE OF SAMPLE								
LOW CONCENTRATION								
☐ HI GH CONCENTRATION☐ GRAB			_					
⊠COMPOSI TE								
GRAB - COMPOSITE			SAMP	LE DATA				
	COLOR	DESC	RIPTION: (SAND.	CLAY, DRY, MOIST, WET, ETC.)				
		Sano	Istone - red	TAME TO MOUT Clayer				
ANALYSIS:		~	MILALYOUS, SI	Same to most clayer				
TPH	OBSERVA	TI ONS/	NOTES:					
G TEX								
TCCP-M								
	7							
	7							
	<del></del>							



16360 PARK 10 PLACE DRIVE, SUITE 300 HOUSTON, TEXAS 77084 (713) 492-1888

☐ SURFACE SOIL
SUBSURFACE SOIL
☐ SEDIMENT
☐ POND/LAGOON
☐ OTHER

	eline Company PROJECT NUMBER 250						
IUS SAMPLE NO. FP-7C	SOURCE Felter Area WT-1						
SAMPLE METHOD:	COMPOSITE SAMPLE DATA						
NQ (cre barrel	SAMPLE TIME COLOR/DESCRIPTION	ri on					
DEPTH SAMPLED:							
43.5-47							
SAMPLE DATE & TIME:							
8/26/92 1250							
SAMPLED BY:							
13 ASILIO							
SI GNATURE(SI:							
TYPE OF SAMPLE							
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION		<u></u>					
GRAB							
SCOMPOSITE  ☐ GRAB - COMPOSITE	CANOLE DATA						
	SAMPLE DATA  COLOR   DESCRIPTION: (SAND, CLAY, DRY, MOIST, WET, ETC						
ANALYSI S:	Sandstone - red moist, micaceous, massive, oily along sides of core, oil at frac						
HINE I St S.		rune					
TPH	OBSERVATIONS/NOTES:						
BTEX							
TCLP-M							
HNU- 50	·						
DUA- 15							
UUM 13							



A Halliburton Company

PROJECT NAME Transwestern P.P.

NQ Core barrel

1450

47-48

BASILIO

☐ LOW CONCENTRATION☐ HIGH CONCENTRATION

GRAB - COMPOSITE

TYPE OF SAMPLE

16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON. TEXAS 77084 (713) 492-1888

NUS SAMPLE NO. \_

SAMPLE METHOD:

DEPTH SAMPLED:

SAMPLED BY:

SI GNATURE(S):

GRAB

COMPOSI TE

**ANALYSIS:** 

SAMPLE DATE & TIME: 8/26/92

#### SOIL/SEDIMENT SAMPLE LOG SHEET

	SURFACE SUBSURED SEDIMED POND/L	RFACE S INT LAGOON	OIL PROJE	ECT NUMBE Filter	R	<u> </u>	0 W	T-(		
				COMPOSI	TE SAM	PLE DA	TA			
	SAMP	LE		TIME	<u> </u>	COLOR	IPTIO	ION		
				·						
	<del></del>									
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		7 -								
		·· <u>·</u> ····								
					<del>                                     </del>					
i					5 547					
į		<del>,</del>			LE DAT					
Ì	COLOR			DN: ( SAND.						
		لسدكا	0 \$ 1 4 -	- 4.1	so ret		L. na	1000	201.5	

TPH	OBSERVATIONS/NOTES:
BTEX	
TCLP-M	

HNU. 5 DVA. 1



A Halliburton Company	SURFACE SOIL SUBSURFACE SOIL SEDIMENT POND/LAGOON OTHER						
16360 PARK 10 PLACE DRIVE, SUITE 300 HOUSTON, TEXAS 77084 (713) 492-1888							
PROJECT NAME Transwestern Pu		any_	PROJECT NUMB	ER Z	50		
NUS SAMPLE NO. FP-7E		soul	RCE Filter	Aven	WT-1		
SAMPLE METHOD:			COMPOS	ITE SAMPL	E DATA		
NQ Core burre	SAMPI	LE	TIME		COLOR/DESCRIPTION		
DEPTH SAMPLED:							
48-50							
SAMPLE DATE & TIME:							
8/26/92 1455							
SAMPLED BY:				<b>.</b>			
BAS1210			- <del></del>		<del></del>		
SI GNATURELS):	<del></del>			<u> </u>			
- Manta							
TYPE OF SAMPLE							
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION	<del></del>						
GRAB	<del> </del>		· <del></del>	<del> </del> -			
☐ GRAB - COMPOSITE			CAN	DI E DATA			
	COLOR	SAMPLE DATA  COLOR   DESCRIPTION: (SAND, CLAY, DRY, MOIST, WET.					
	COCOIL	<del></del>			Silty, Mica.		
ANALYSI S:					silty - clavey,		
			MILALYOU	1			
IPH	OBSERVA	TI ONS/N					
BTEX	7						
TCCP-M							
HNU 1							
D124 - D							



16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON. TEXAS 77084 (713) 492-1888

## SOIL/SEDIMENT SAMPLE LOG SHEET

☐ SURFACE SOIL
SUBSURFACE SOIL
☐ SEDI MENT
T POND/LAGOON

☐ OTHER

PROJECT NAME   Vans Western Pireline	(ompa	N V	_PROJECT NUI	MBER	.250	0
NUS SAMPLE NO. BP-1A			RCE Burn			
SAMPLE METHOD:			COMP	OSI TE SA	PLE DA	TA
NQ Core barre!	SAMP	LE	TIME		COLOR	R/DESCRIPTION
DEPTH SAMPLED:						
23,5-28,5	<del>-</del>					
SAMPLE DATE & TIME:  8/12/9.3 / 320	<u> </u>	· · · · · · · · · · · · · · · · · · ·				
SAMPLED BY:				_		
BASILIO						
SI GNATURE(S):						
SI GNATURE(S): Basila						
TYPE OF SAMPLE						
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION						
GRAB	<u> </u>		<u> </u>			
© COMPOSITE ☐ GRAB - COMPOSITE						
CON COLLECTION	SAMPLE DATA  COLOR   DESCRIPTION: (SAND, CLAY, DRY, MOIST, WET, ETC.)					
	COLOR					
ANALYSI S:		2440	370H2 - da	R year	<u> </u>	nicquous, mast,
			<u> </u>	<u>Least Jakat</u>	-> - 3 - 3 - 9	) 44(0/04)
BTEX	OBSERVA	TI ONS/I	NOTES:			
BTEX TCLP-O	_					
	4					
	4					
<del></del>	╡					
	4					
	1					
HNU 50.	1					
OUA- 3						



SUBSURFACE SOIL  16360 PARK 10 PLACE DRIVE. SUITE 300  HOUSTON. TEXAS 77084  (713) 492-1888  SEDI MENT  POND/LAGOON  OTHER  PROJECT NAME Transwiston Pyeline Company PROJECT NUMBER 6250  NUS SAMPLE NO. BP-1B  SOURCE Bayn Area WT-1								
PROJECT NAME IVANSWESTERN PU	eline lom	pany PRO	JECT NUMBER	6230				
NUS SAMPLE NO. BP-1B		SOURCE_	Burn Area	WT-1				
SAMPLE METHOD:			COMPOSI TE	SAMPLE DATA				
NQ Core barrel	SAMPL	LE	TIME	COLOR/DESCRIPTION				
DEPTH SAMPLED:								
28.5-31.5								
SAMPLE DATE & TIME:								
8/12/92 1340								
SAMPLED BY:			·					
BASILID								
SI GNATURE(S):  2 Basilis				· · · · · · · · · · · · · · · · · · ·				
TYPE OF CAMPIE								
TYPE OF SAMPLE								
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION								
☐ GRAB	ļ							
SECOMPOSITE  ☐ GRAB - COMPOSITE	<del></del>		SAMPLE	DATA				
	COLOR	DESCRIPT		AY, DRY, MOIST, WET, ETC.)				
	COLON			ed, MICGCTOUS ONLY				
ANALYSI S:		Jan 65 TO	ine dain i	Les picacros orig				
		fract	1 2017 01	ly along sides and				
BTEX	OBSERVA	TI ONS/NOTE:	S:					
TCLP-0								
· HNU - 30								
HNU - 30								



16360 PARK 10 PLACE DRIVE, SUITE 300 HOUSTON, TEXAS 77084 (713) 492-1888

☐ SURFACE SOIL
SUBSURFACE SOIL
☐ SEDI MENT
☐ POND/LAGOON
□ OTHER

PROJECT NAME Transwestern Pir	eline Con	7/94hy 1	PROJECT NUMBE	ER62	TO			
NUS SAMPLE NO. BP-10		SOUR	CE Barn 1	Area	WT-1			
SAMPLE METHOD:			COMPOS	ITE SAMPLE D	ATA			
NR Core barrel	SAMP	PLE	TIME	COLO	DR/DESCRIPTION			
DEPTH SAMPLED:								
18.5-23.5								
SAMPLE DATE & TIME:								
8/12/92 1300			···					
SAMPLED BY:								
BASIL10				<u> </u>				
SI GNATURE(S):				· ·				
TYPE OF SAMPLE	<del></del>			<del> </del>				
LOW CONCENTRATION	<del></del>							
HIGH CONCENTRATION					·····			
☐ GRAB >== €0MPOSITE			<del></del>		<del> </del>			
GRAB - COMPOSITE	SAMPLE DATA							
	COLOR	COLOR   DESCRIPTION: (SAND. CLAY, DRY, MOIST, WET. ETC.)						
		Sandstone - ved, clayer, slighty most,						
ANALYSIS:				<del></del>	ous noduks			
		50	attend black	undules				
BTEX	OBSERVA	TI ONS/NO	DTES:					
TCLP-0								
	_							
	_							
	_							
HNU- 4								
OUA - 1								
DUA - 1								
·								
	l l							



A Halliburton Company 16360 PARK 10 PLACE DRIVE. SUITE 300	SURFACE SUBSUF						
HDUSTON. TEXAS 77084 (713) 492-1888	☐ SEDI ME	NT					
	☐ POND/L ☐ OTHER	_AGOON					
PROJECT NAME Transwestern Py		•			150		
NUS SAMPLE NO. BP-1D	reline (or	COU	PROJECT NUMBE	.∺ <u>-</u> ⊿		)T-1	
			TLE 13414	Hrea		77-1	
SAMPLE METHOD:	<b></b>		COMPOSITE SAMPLE DATA				
NQ (ore burrel	SAMP	LE	TIME	COLOR/DESCRI PTI ON		PTION	
DEPTH SAMPLED: 38.5-43.5							
SAMPLE DATE & TIME: \$127/92 1450							
SAMPLED BY:	<del></del>						
BASILIO							
SI GNATURE(S):					<u> </u>		
2 Baech							
TYPE OF SAMPLE							
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION							
GRAB	<u> </u>						
⊠COMPOSI TE ☐ GRAB - COMPOSI TE	SAMPLE DATA						
	COLOR	DESC	RIPTION: (SAND.		Y. MOIST.	WET. ETC.)	
					10201		
ANALYSI S:							
BTEX	OBSERVA	TI ONS/I	NOTES:		-		
TCLP-O							
HNU : 60							
HNU: 60							
	1						



☐ SURFACE SOIL

15360 PARK 10 PLACE DRIVE, SUITE 300 -BUSTON, TEXAS 77084 -713) 492-1888	SEDI ME	NT	SOIL				
	☐ POND/L	AGOON					
	☐ OTHER						
PROJECT NAME Transwestern Pirel NUS SAMPLE NO. BP-1E	ine (om	Panyo	PROJECT NUMBE	= 62	20		
NUS SAMPLE NO. BP-1E	<del></del>	sou	RCE Burn	Area	WT-1		
SAMPLE METHOD:			COMPOSI	TE SAMPLE	DATA		
NQ Lore barrel	SAMP	LE	TIME	ı co	LOR/DESCRIPTION		
DEPTH SAMPLED:				!	·		
48.5-53.5		·		1			
SAMPLE DATE &, TIME:				<u> </u>			
8/27/92 1605				!			
SAMPLED BY:				:			
BASILIO							
SI GNATUREL SI:				<u> </u>			
Pressin							
TYPE OF SAMPLE	<u></u>						
LOW CONCENTRATION				<u> </u>			
☐ HIGH CONCENTRATION ☐ GRAB							
<b>⊠-€</b> 0MPOSI TE							
GRAB - COMPOSITE	SAMPLE DATA						
	COLOR	DESC	RIPTION: (SANO.	CLAY, DR	Y, MOIST, WET, ETC.)		
		Sand	stour - re	dam	p. Micaceous,		
ANALYSI S:	,	1	broken s	1/ty to	clayey		
BTUX	OBSERVA	TI ONS/	NOTES:				
TCLP-0	]						
	1						
	7						
	7	•					
	}						
	ļ						
	1						



A Halliburton Company	☐ SURFACE	SOIL					
'6360 PARK 10 PLACE DRIVE. SUITE 300	SUBSURF	ACE SOIL					
-OUSTON, TEXAS 77084 .713) 492-1888	☐ SEDI MEN	T					
	☐ POND/LA	GOON					
<u> </u>							
PROJECT NAME Transwestern Pire		•					
NUS SAMPLE NO. BP-24		SOURCE BC	ern Area	W7-1			
SAMPLE METHOD:		CO	IMPOSITE SAN	PLE DATA			
NQ (ove barrel	SAMPLE	TIME		COLOR/DESCRIPTION			
DEPTH SAMPLED:							
2.3.5- 28.5			-				
SAMPLE DATE & TIME:							
8/13/92 815			<u> </u>				
SAMPLED BY:			<u> </u>				
BASILIO							
SI GNATURE(S):							
/ Crash							
TYPE OF SAMPLE							
LOW CONCENTRATION	<u> </u>						
☐ HIGH CONCENTRATION ☐ GRAB							
E-COMPOSI TE							
GRAB - COMPOSITE	SAMPLE DATA						
Ì	COLOR	DESCRIPTION: (	SAND. CLAY.	DRY, MOIST, WET, ETC	.)		
		Sandstone -	· red har	d, slightly mica.			
ANALYSIS:		clayer la	MINGT LUC	t to moist, only	и		
		scueval si		,			
BTEX	OBSERVATI	ONS/NOTES:					
TCLP-O							
	7						
	7						
	7						
1102/1- /5							
HNU - 65 OVA - 40							
044 - 40							
) OUT (D							
1	i						



16360 PARK 10 PLACE DRIVE, SUITE 300 GUSTON, TEXAS 77084

7131 492-1888

☐ SURFACE SOIL
X SUBSURFACE SOIL
☐ SEDI MENT
☐ POND/LAGOON
רו חדעבם

PROJECT NAME Transwestera Pirelin	U UINER	12:41	TECT NUMBE	250				
NUS SAMPLE NO. BP-2B	ic Corty	SOURCE	Burn Ar	ica WT-1				
SAMPLE METHOD:	COMPOSITE SAMPLE DATA							
NQ (ore barrel	SAMP	LE	TIME	COLOR/DESCRIPTION				
DEPTH SAMPLED:								
28.5 - 33.5								
SAMPLE DATE & TIME: 8/13/42 845								
SAMPLED BY:								
BASILIO								
SI GNATURE(S): Bank								
TYPE. OF SAMPLE								
LOW CONCENTRATION	<del></del>							
☐ HI GH CONCENTRATION								
☐ GRAB ☐ COMPOSITE								
GRAB - COMPOSITE	SAMPLE DATA							
	COLOR	DESCRI P	TI ON: ( SAND.	CLAY. DRY, MOIST, WET, ETC.)				
		Saudite	ne - ved	must, only mica,				
ANALYSIS:	<u> </u>		oily					
2.5	ļ		···					
BTEX	OBSERVA	TI ONS/NOTE	:S:					
T(LB-0	-							
	+							
<del></del>	1							
<del></del>	†							
	†							
HNU - 150								
,								
HNU - 150 OUA - 100								



A Halliburton Company	☐ SURFAC	E SOIL							
6360 PARK 10 PLACE DRIVE. SUITE 300	SUBSUR	FACE SOIL							
-GUSTON: TEXAS 77084	☐ SEDI ME	☐ SEDI MENT							
	☐ POND/L	POND/LAGOON							
	OTHER		-						
PROJECT NAME Transwestern Pi	reline Com	yar PROJECT NUM	18ER	250					
NUS SAMPLE NO. 13 P-2C		SOURCE Dave	Area	WT-1					
SAMPLE METHOD:		COMPOSITE SAMPLE DATA							
Na Love barrel	SAMPI	E TIME	(	COLOR/DESCRIPTION	ĺ				
DEPTH SAMPLED:			1						
33,5-38,5									
SAMPLE DATE, & TIME:									
8/13/92 920									
SAMPLED BY:			İ						
BASILIO									
SI GNATURE( S):			1						
- Bants									
TYPE OF SAMPLE									
LOW CONCENTRATION									
HIGH CONCENTRATION									
GRAB SCOMPOSI TE									
GRAB - COMPOSITE	SAMPLE DATA								
-	COLOR								
}	COCOIN								
ANALYCIC.	<del></del>			MICACCOUS, CI	/				
ANALYSI S:		laminar at	+00	oil along fract	rure				
		at 36 F	<u></u>						
BTGX	OBSERVA	TI ONS/NOTES:							
TCLP-0									
	<del></del>								
HN10 - 22									
1 4010 - 44	1								



16360 PARK 10 PLACE DRIVE. SUITE 300 -GUSTON. TEXAS 77084 .7131 492-1888

☐ SURFACE SOIL
SURFACE SOIL SUBSURFACE SOIL
☐ SEDI MENT
☐ POND/LAGOON
☐ OTHER

	☐ OTHER				
PROJECT NAME Transwestern Pire	line Con				
NUS SAMPLE NO					rea WT-1
SAMPLE METHOD:			C	COMPOSI	TE SAMPLE DATA
NQ Con barrel	SAMPL	Ε	TIM	Ε	COLOR/DESCRIPTION
DEPTH SAMPLED:					
38.5- 43.5	<u> </u>		<u> </u>		1
SAMPLE DATE & TIME: 8//3/92 945	<del></del>	·· <u>·</u> ····		-	
SAMPLED BY:					!
BASILIO					
SI GNATURELSI:					
TYPE. OF SAMPLE					
LOW CONCENTRATION					
☐ HIGH CONCENTRATION☐ GRAB					
COMPOSITE GRAB - COMPOSITE			<u> </u>		
GINAD - CON OST IE	COLOR	0566	201 077 014		LE DATA
	COLOR				CLAY, DRY, MOIST, WET, ETC.)
ANALYSI S:		Jane	1. 1.	<u>Ked</u>	cleary - silty, moist, hard
			andy 1		
BTEX	OBSERVAT				
TCLP-D	]				
	_				
<u> </u>	-				
	1				
	1				
	†				
HNY I DUA O	1				
DUA O					



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16360 PAR	RK 10 PLACE DRI	VE. SUITE 300
-GUSTON.	TEXAS 77084	
.7131 492	2-1888	

SURFACE SOIL
SUBSURFACE SOIL

☐ SEDI MENT

☐ POND/LAGOON

☐ OTHER

PROJECT NAME Transwestern Pipeline	om pany	p	ROJECT NUMBE	R 6250	
NUS SAMPLE NO. 3P-2E		SOUR	E Burn A	Irra WT-1	
SAMPLE METHOD:	1		COMPOST	TE SAMPLE DATA	
NQ Core burrel	SAMP	LE	TIME	COLOR/DESCRIPTION	
DEPTH SAMPLED:	<del> </del>				
43.5-48.5					
SAMPLE DATE & TIME:			<del> </del>		
8/13/92 /020					
SAMPLED BY:					
15 HSILIO					
SI GNATURE(S):					
1 bails					
TYPE OF SAMPLE					
LOW CONCENTRATION					
☐ HI GH CONCENTRATION ☐ GRAB					
☑ COMPOSI TE					
☐ GRAB - COMPOSITE	SAMPLE DATA				
	COLOR	DESCRI	PTI ON: ( SAND.	CLAY. DRY, MOIST. WET. ETC.)	
		Sands	tone - rel	brown hard, massive,	
ANALYSI S:	,	MIC	ACTUUS L"	reliblach sand clay at	
		4.3.5	clay lam	me at 503e	
BTEX	OBSERVAT	TI ONS/NO	ÍES: '		
TCLP-0	4				
	_				
	4				
	4				
	4				
	4				
	4				
HN4 - 3					
OUA- 3					
0UA- 3					
	1				
Ī	1				



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#### SOIL/SEDIMENT SAMPLE LOG SHEET

☐ SURFACE SOIL

5360 PARK 10 PLACE DRIVE, SUITE 300 -BUSTON, TEXAS 77084 1131 492-1888	SEDI ME POND/I						
PROJECT NAME Transmistern Pireling	(on pur	<u>,</u>	PROJECT NUMBE	R 6250			
NUS SAMPLE NO. BP-3 A	• '		RCE Burn A		WT-1		
SAMPLE METHOD:	COMPOSITE SAMPLE DATA						
NQ Core barrel	SAMP	LE	TIME	COLOR	/DESCRIPTION		
DEPTH SAMPLED: 28,5-31							
SAMPLE DATE & TIME:	<del> </del>						
8/15/92 940		<del></del>					
SAMPLED BY:							
BAS1610							
SI GNATUREI SI: Basily							
TYPE OF SAMPLE		<del> </del>					
LOW CONCENTRATION							
☐ HIGH CONCENTRATION ☐ GRAB							
<b>⊠</b> COMPOSI TE				<u> </u>			
GRAB - COMPOSITE		7		LE DATA			
	COLOR				MOIST. WET. ETC.)		
ANALYSIS:	Sandstora ved hard, moist, clayer,						
HNAC 1313:		<u>                                      </u>	wat clay	at base			
BTEX	OBSERVA	TI ONS/	NOTES:				
TCLP-O							
	-						
	-						



16360 PARK 10 PLACE DRIVE, SUITE 300 -BUSTON, TEXAS 17084 7131 492-1888

	SURFACE	SOI	L
X	SUBSURFA	4CE	SOIL
	SEDI MENT	•	

	☐ PONO/L☐ OTHER						
PROJECT NAME Transwestern Pipe	line (or	nparo	_PROJECT NUMBE	R 625	0		
NUS SAMPLE NO. 18 P-3 B		Sou	RCE BUNA	Area	WT-1		
SAMPLE METHOD:	COMPOSITE SAMPLE DATA						
DEPTH SAMPLED:	SAMP	LE	TIME	COL	OR/DESCRIPTION		
32.5-39		<del></del> -					
SAMPLE DATE & TIME:							
8/15/92 /350				<u> </u>			
SAMPLED BY: BASILIO		· · · · · · · · · · · · · · · · · · ·	1				
SI GNATUREI SI: Bash							
TYPE OF SAMPLE  LOW CONCENTRATION	<u> </u>			<u> </u>			
☐ HI GH CONCENTRATION							
☐ GRAB ZCOMPOSI TE							
GRAB - COMPOSITE	SAMPLE DATA  COLOR   DESCRIPTION: (SAND, CLAY, DRY, MOIST, WET, ETC.)						
	COLOR				damp, militars		
ANALYSI S:	<u> </u>	1	et base	G MANA,	200 PH (41734)		
BTEX	OBSERVA	TI ONS/	NOTES:				
TLLP-0	1						
	1						
	1						
	-						
	1						
HNU- 0			-				
DUA- 10							
004-10							



7131 492-1888

☐ SURFACE SOIL
SUBSURFACE SOIL
☐ SEDI MENT
☐ POND/LAGOON
CT ATUCA

PROJECT NAME Transwestern Pipe	line (on	pane- P	PROJECT NUMBER	6250			
NUS SAMPLE NO. BP-3C		1	E Burn A				
SAMPLE METHOD:	COMPOSITE SAMPLE DATA						
NQ (ore barrel	SAMP	LE	TIME	COLOR/DESCRIPTION			
DEPTH SAMPLED:							
39-43				·			
SAMPLE DATE & TIME:							
8/15/92 1415							
SAMPLED BY:	<b> </b>						
BASILIO.	_			<u> </u>			
SI GNATURE(S):  2 Barilin							
TYPE OF SAMPLE	_}						
LOW CONCENTRATION				The second secon			
HIGH CONCENTRATION							
☐ GRAB  COMPOSI TE							
GRAB - COMPOSITE		E DATA					
	COLOR   DESCRIPTION: (SAND, CLAY, DRY, MOIST, WET.						
				brown hard, massive			
ANALYSIS:	micaceous, wet sundy cley at base.						
BTEX	OBSERVA	TI ONS/NO	ITES:				
TCLP-D							
	_						
	_						
	4						
	4						
HNU, O							
DUA 2							



A Hambarton Company	TI SOKE H						
16360 PARK 10 PLACE DRIVE, SUITE 300	SUBSURFACE SOIL						
-GUSTON, TEXAS 77084 .713) 492-1888	☐ SEDI MENT						
	☐ POND/I	LAGOON					
	☐ OTHER						
PROJECT NAME Transwestern Pipe	line (or	nyavny	PROJECT NUMBER	i 62	50		
NUS SAMPLE NO. BP-44		souf	RCE BULLA A	ren	WT-1		
SAMPLE METHOD:	COMPOSITE SAMPLE DATA						
NQ (pre barrel	SAMP	LE	TIME	COL	OR/DESCRIPTION		
DEPTH SAMPLED:							
38-40							
SAMPLE DATE & TIME:							
8/16/92 1030							
SAMPLED BY:							
BASILIO		ı					
SI GNATURE(S):		Ì					
2 Bash							
TYPE OF SAMPLE							
LOW CONCENTRATION							
HIGH CONCENTRATION		1					
☐ GRAB  ©COMPOSI TE				<del>-</del>	······································		
GRAB - COMPOSITE	SAMPLE DATA						
	COLOR	DESCI	RIPTION: ( SAND.	CLAY, DRY	, MOIST, WET, ETC.)		
			Iston doch				
ANALYSI S:			silty, mod		nard		
BTEX	OBSERVA	TI ONS/N	IOTES:				
TCLP-D	7						
	7						
	7						
	7						
	-						
HNU 1							
	}						
OUA (							
1	1						



**Sago PARK 10 PLACE DRIVE, SUITE 300 -SUSTON, TEXAS 77084 7131 492-1888	SURFACE SUBSURED SEDIME	RFACE ENT	SOIL				
PROJECT NAME Transwestern Pire	line long	<i>16 A</i>	- PROJECT NUMB	FR 6250			
NUS SAMPLE NO. BP-5A		SOI	URCE Burn	Ara.			
SAMPLE METHOD: NQ Core barrel	CAME			TITE SAMPLE DATA			
DEPTH SAMPLED:	SAMP	LE	TIME	COLOR/DESCRIPTION			
8,5 - 13		<del></del>		<del> </del>			
SAMPLE DATE & TIME:							
8/16/92 1325							
SAMPLED BY:				·			
BASILIO							
SI GNATURE(S): Bash			<u> </u>				
ومرور والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع			<del> </del>				
TYPE OF SAMPLE	<b> </b>		<del>                                     </del>	<del> </del>			
☐ HIGH CONCENTRATION		,	-				
GRAB			<del> </del>				
GRAB - COMPOSITE		SAMPLE DATA					
	COLOR	DES		. CLAY, DRY, MOIST, WET, ETC.)			
}				ex with black staining			
ANALYSI S:			brotien, Pri	able, wit			
			tan to svin				
BTEX	OBSERVA						
TCLP-0							
HNU · 8							
1							
HNU. 8							



-5360 PARK 10 PLACE DRIVE, SUITE 300 SUBSURFA
-GUSTON, TEXAS 77084 SEDI MENT

☐ SURFACE SOIL
SUBSURFACE SOIL
☐ SEDIMENT
☐ POND/LAGOON
CT OTHER

PROJECT NAME Transwestern P.	OTHER	~ 4 4 4 C	ופה זכרד /	II IMDED	62	70
NUS SAMPLE NO. BP-5B	reline (	,	E BC			WT-1
SAMPLE METHOD:			CO	MPOSI TE	SAMPLE E	)ATA
NQ (ove barrel	SAMP	LE	TIME	İ	COL	DR/DESCRIPTION
DEPTH SAMPLED:						
12-18.5						
SAMPLE DATE & TIME:				<u> </u>		
8/16/92 1425				1		
SAMPLED BY:				<u> </u>		
BASILIO					-	
SI GNATURE(S): Basili	<b></b>					
TYPE OF SAMPLE	<del>-</del>					
LOW CONCENTRATION	<b></b>					
☐ HI GH CONCENTRATION	<del></del>					
GRAB SEIZOMPOSI TE						
GRAB - COMPOSITE				SAMPLE I	DATA	
	COLOR	DESCR	PTION: (	SAND. CL	AY. DRY.	MOIST, WET, ETC.)
		Sands	tona c	voy,	icen to	tan with black
ANALYSIS:	· ·	I		art -	ractured	mast to wet 14
		5 pors		ly oils	1 100	, ts
BTEX	OBSERVA	TI ONS/NO	ITES:	•		
TLLP-0	_					
	_]					
	_					
	_					
	_					
	_					
HN4-20						
DUA						



	☐ SURFAC		_			
CHETON TIVE TIRE	SUBSUR		SOIL			
, 121 432 1000	□ SEDIME □ POND/L					
	OTHER					
PROJECT NAME Transmistern Pirelin	ie Com	pany	_PROJECT NUMBE	R	6250	
NUS SAMPLE NO. BP-5C		śau	IRCE Burn	Area_	WT-1	
SAMPLE METHOD:		<del> </del>	COMPOSI	TE SAM	PLE DATA	
NQ Love Barrel	SAMP	E	1	ŧ		ON
DEPTH SAMPLED:			İ	i		
18,5 - 53.5				ļ		
SAMPLE DATE &, TIME:				İ		
8/16/92 1445				i		
SAMPLED BY:				:		
BASILIO			<u> </u>	<u> </u>		
SI GNATURE(S):  Bash				1		
				<u> </u>		
TYPE OF SAMPLE				<u> </u>		
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION				-		
GRAB				<u> </u>		
☐ GRAB - COMPOSITE				1 5 5 5 5		
33.7 33.7	COLOR	DECC		LE DATA	DRY, MOIST, WET	ETC \
	COLUN				y fractioned,	
ANALYSI S:	,				vet with gra	
			ocly /194.6		wet with gra	th yellow
BTEX	OBSERVA			<u>-</u>		
TUP-0						
HNU - 15	٠		-		·	
HNU - 15						



-GUSTON. TEXAS 77084

7131 492-1888

## SOIL/SEDIMENT SAMPLE LOG SHEET

☐ SURFACE SOIL

SUBSURFACE SOIL

SEDIMENT

POND/LAGOON

·	☐ OTHER			
PROJECT NAME Transwestern Pire	lina Com	pany - P	ROJECT NUMBE	R 6250
NUS SAMPLE NO. BP-SE		SOURC	E Burn A	rea W7-1
SAMPLE METHOD:			COMPOS	ITE SAMPLE DATA
NQ Con haviel	SAMP	LE	TIME	COLOR/DESCRIPTION
DEPTH SAMPLED:				
27-28.5				
SAMPLE DATE & TIME:				
8/16/92 1525	<del>-</del>			
SAMPLED BY:				
SI GNATUREI SI:				
2 Bashi				
TYPE OF SAMPLE				
LOW CONCENTRATION				
☐ HIGH CONCENTRATION☐ GRAB				
XCOMPOSI TE				
GRAB - COMPOSITE				PLE DATA
i	COLOR			. CLAY. DRY. MOIST. WET. ETC.)
<b>\$</b>				
ANNA MOLE		Sandst	14E - 7 1944	black, black staining evenbly
ANALYSI S:	`	I	011 - JVAY 01104; W	
	OBSERVA	MIL	96434); W	
BTEX	OBSERVA	I	96434); W	
	OBSERVA	MIL	96434); W	
BTEX	OBSERVA	MIL	96434); W	
BTEX	OBSERVA	MIL	96434); W	
BTEX	OBSERVA	MIL	96434); W	
BTEX	OBSERVA	MIL	96434); W	
BTEX	OBSERVA	MIL	96434); W	
BTEX TCLP-0	OBSERVA	MIL	96434); W	
BTEX	OBSERVA	MIL	96434); W	
BTEX TCLP-0	OBSERVA	MIL	96434); W	



CULF COAST DIVISION	SAMELE	LUG SHEE!					
*** A Halliburton Company  ***********************************	SUBSUR	SURFACE SOIL SUBSURFACE SOIL SEDIMENT					
.713) 492-1888	☐ SEDIME ☐ POND/L ☐ OTHER						
PROJECT NAME Trans western P.	reline Compa	PROJECT NUMB	ER 4250				
NUS SAMPLE NO. BP-5D		SOURCE Burn	Area WT-1				
SAMPLE METHOD:		COMPOSITE SAMPLE DATA					
NQ (our havel	SAMP	E TIME	COLOR/DESCRIPTION				
DEPTH SAMPLED:			<u> </u>				
SAMPLE DATE & TIME:							
8/16/92 15	12						
SAMPLED BY:							
BASILIO							
SI GNATURE(S): 2 Bashin							
TYPE OF SAMPLE		<del></del>	<del>                                     </del>				
LOW CONCENTRATION	<del></del>						
☐ HIGH CONCENTRATION☐ GRAB							
∑H€OMPOSI TE							
☐ GRAB - COMPOSITE		SAM	PLE DATA				
	COLOR		D. CLAY. DRY. MOIST. WET. ETC.)				
ANALYSIS:			say is have bravy micecrows,				
HAHLISIS:		friable mois	T. recassionally wer whoil				
BTEX	OBSERVAT	TI ONS/NOTES:					
TUP-0			·				
HNU- 10							



16360 PARK 10 PLACE DRIVE. SUITE 300 -BUSTON. TEXAS 17034

7131 492-1888

☐ SURFACE SOIL
SUBSURFACE SOIL
☐ SEDI MENT
☐ POND/LAGOCN
CT OTUED

PROJECT NAME Transmistern P.	OTHER	✓ PROJECT NUMB!	6250
NUS SAMPLE NO. 13 P-56			Area WT-1
SAMPLE METHOD:		COMPOS	ITE SAMPLE DATA
NQ Core havrel	SAMPLE	TIME	COLOR/DESCRIPTION
DEPTH SAMPLED:			
34.5 - 36.5			
SAMPLE DATE & TIME:			
SAMPLED BY:	<u> </u>		
BAS1610.			
SI GNATUREI S):  Basile			
TYPE OF SAMPLE			<u> </u>
LOW CONCENTRATION		- <del> </del>	
☐ HIGH CONCENTRATION☐ GRAB			
SECOMPOSI TE			
GRAB - COMPOSITE			PLE DATA
			. CLAY, DRY, MOIST, WET, ETC.)
	Sav	idstant - red	, lightly micocrows and clare
ANALYSIS:		ody on se	inv 2 ft.
0.7.5.4	000000000000000000000000000000000000000		
BTEX	OBSERVATI ONS	NU152:	
TCLP-0		·	
	7		
	$\neg$		
HNU-38			



HNU- 50

A Halliburton Company	☐ SURFAC	CE SOIT	L		
5360 PARK 10 PLACE DRIVE. SUITE 300	SUBSUF				
-CUSTON, TEXAS 77084	SEDI ME				
113) 492-1888	☐ POND/L				
	☐ OTHER				
	, —		_	/ = =	• _
PROJECT NAME Transwestern Pirel	ine (simi	Pany	_PROJECT NUMBER	625	<u>C</u>
NUS SAMPLE NO. BP-5F		sou	IRCE Burn A	<b></b>	WT-1
SAMPLE METHOD:			COMPOSI:	E SAMPLE D	ATA
NQ love barrel	SAMP	LE	TIME	COLO	DR/DESCRIPTION
DEPTH SAMPLED:					
28.5-33			1		
SAMPLE DATE & TIME:	1				
8/10/92 1605					
SAMPLED BY:					
BASILIU	<del></del>		İ	<del></del>	<del></del>
SI GNATURE(S): 1			į ;		
Vash			i	······································	
TYPE OF SAMPLE			ı		
LOW CONCENTRATION					
☐ HIGH CONCENTRATION	<del> </del>	<del> </del>	<u> </u>	<del></del>	
GRAB	<del></del>		<del>                                     </del>		
GRAB - COMPOSITE			<u> </u>		
CONHO - CON COLIE		,		E DATA	
İ	COLOR	DESC	RIPTION: (SANO.	CLAY, DRY,	MOIST, WET, ETC.)
		San	distany - ye	a hard,	M455 IVE, MICA,
ANALYSIS:	,				ie, core sides
			ut with v.	•	
BTCX	OBSERVA				
T/LP-0	-	1 01107	110123.		
1/2010					
	<b>-</b> ∤				
	_				
	7				
	7				
	•				



☐ SURFACE SOIL
SUBSURFACE SOIL
☐ SEDI MENT
☐ POND/LAGOON
רה הדעבם

	☐ OTHER				
PROJECT NAME Transwestern Pipelin	e Compa	; n y	PROJECT NUM	MBER	250
NUS SAMPLE NO. BP-5H	, -	sou	RCE Bur	n Area	WT-1
SAMPLE METHOD:	<del></del>			OSITE SAM	
NQ Love barrel	SAMP	LE	TIME	1	
DEPTH SAMPLED:				i	
42 - 43,5				<u> </u>	
SAMPLE DATE & TIME: 4750				!	
SAMPLED BY:				·	
MASILIO					
SI GNATURE(S):					
TYPE OF SAMPLE					
LOW CONCENTRATION				<del></del>	
HIGH CONCENTRATION	<del></del>		<u></u>	<del>-  </del>	
GRAB  COMPOSI TE					
GRAB - COMPOSITE			SA	AMPLE DATE	A
	COLOR	DESC	RIPTION: (SAI	ND, CLAY,	DRY, MOIST, WET, ETC.)
		San	dston1 - v	ed brown	us grey at lop,
ANALYSIS:	<u> </u>	<u> </u>	hark in	11417743	Stickely frieble
2005	-				
BTEX	OBSERVA	TI ONS/	NOTES:		
TUP-0	4				
	4				
	-{				
	-{				
	-				
<u> </u>	1				
14NU- 0					



PROJECT NAME Transwestern

☐ LOW CONCENTRATION HIGH CONCENTRATION

GRAB - COMPOSITE

BTEX

TCLP-0

-CUSTON: TEXAS 77084 7131 492-1888

NUS SAMPLE NO.

SAMPLE METHOD:

DEPTH SAMPLED:

SAMPLED BY:

SI GNATURE( S):

☐ GRAB **EXCOMPOSI TE** 

ANALYSIS:

SAMPLE DATE & TIME: 8/17/92

SOIL/SEDIMENT SAMPLE LOG SHEET

**OBSERVATIONS/NOTES:** 

NAME Transwestern Pigeline	SUBSUID SEDIMING POND/I	RFACE : ENT LAGOON	SOIL _PROJECT NUM	8er <u> </u>	25 <sup>-</sup> 0		
PLE NO. BP-6A		SOL	IRCE Burn	Area	$\omega$	T-1	
METHOD:			COMPO	SITE SAME	LE DATA		
NQ Core barrel	SAMP	LE	TIME	i	COLOR/DESC	RI PTI ON	
SAMPLED:				!			
14.5-23.5				1			
DATE & TIME:							
117/92 1300				Ì			
BY:							
BASILIO							
JREI SI: 2 Basila	ļ			-			
TYPE OF SAMPLE							
LOW CONCENTRATION							
HIGH CONCENTRATION GRAB							
COMPOSI TE	L						
GRAB - COMPOSITE	SAMPLE DATA						
	COLOR		RIPTION: (SAN		<del></del>	7	
	<del> </del>	San	dstonr - v	ed nov	d. dry	silty,	
S:	1	1	broken	-VACTUIES		•	

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13) 492-1888

# SOIL/SEDIMENT SAMPLE LOG SHEET

☐ SURFACE SOIL

SUBSURFACE SOIL

SEDIMENT
☐ POND/LAGOON

	OTHER				( - m
PROJECT NAME Transwestern Pipe NUS SAMPLE NO. 130-60	line (Di		PROJECT NU RCE <u>Bur</u>		
SAMPLE METHOD:	1		COMP	POSITE S	SAMPLE DATA
NQ (ore barrel	SAMP	LE	TIME	1	COLOR/DESCRIPTION
DEPTH SAMPLED:				į	
38-40	<u> </u>				
SAMPLE DATE & TIME:					
8/17/92 /510 SAMPLED BY:	<u> </u>			· 	
BASILIO					
SI GNATURE(S):					· · · · · · · · · · · · · · · · · · ·
2 Basilho	-			1	
TYPE OF SAMPLE					
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION					
☐GRAB					
GRAB - COMPOSITE				SAMPLE D	IATA
	COLOR	DESC			AY, DRY, MOIST, WET. ETC.)
	-				brown red, damp,
ANALYSI S:				17345	
BTEX	OBSERVA	TI ONS/I	NOTES:		
TCLP-0	4				
	-{				
	1				
	1				
	1				
	]				
HINU-D					
FINU - D CUA - O					



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DUA - O

A Halliburton Company	☐ SURFA					
	SUBSUF		501 L			
HOUSTON, TEXAS 77084 (713) 492-1888	☐ SEDI ME					
	☐ POND/L	_AGOON				
	☐ OTHER					
PROJECT NAME Transmistern Pipeline	Compan	y	PROJECT NUMBE	R 6250		
PROJECT NAME Transmistery Pipeline NUS SAMPLE NO		sou	RCE Toush A	rea W	7-1	
SAMPLE METHOD:	T	_=	COMPOSI	TE SAMPLE DATA		
NQ Core barrel	SAMP	LE			ESCRIPTION	
DEPTH SAMPLED:						
6.2 - 8.5						
SAMPLE DATE & TIME:						
8/4/92 910						
SAMPLED BY:		<u></u>				
BASILIO						
SI GNATURE(S);						
Z Barila.						
TYPE. OF SAMPLE						
LOW CONCENTRATION						
HIGH CONCENTRATION						
GRAB  SEPCOMPOSITE						
GRAB - COMPOSITE			CAMO	LE DATA		
	501.00	5505				
	COLOR			CLAY, DRY, MOIST		
		Sand	stone - red.	hart, Clayer 1	4 spots,	
ANALYSI S:			Moist 1	hard, clayer i		
TPH	OBSERVA	TI ONS/	NOTES:			
BTEX						
TCLT-D	7					
TCCP-M						
TCLP-F	7					
	7					
	7					
	-					



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A Hallburton Company	☐ SURFAC	CE SOIL	_					
	SUBSURFACE SOIL							
HOUSTON: TEXAS 77084 (713) 492-1888	☐ SEDI ME	ENT						
(113) 432 1000	☐ POND/L	AGOON						
	☐ OTHER							
PROJECT NAME Transwestern Pipelin NUS SAMPLE NO. T- 18	e Comp	any.	PROJECT NUMBE	R	6250			
NUS SAMPLE NO		sou	RCE Trash	Area	W7	-1		
SAMPLE METHOD:			COMPOSI	TE SAME	LE DATA			
NR (pre barrel	SAMPLE TIME COLOR/DESCRIPTION				RIPTION			
DEPTH SAMPLED:								
23.5-30								
SAMPLE DATE & TIME:		,						
8/4/92 1045						<del></del>		
SAMPLED BY:								
BASIL10.								
SI GNATURE(S):								
2 Bash								
TYPE. OF SAMPLE								
LOW CONCENTRATION								
☐ HIGH CONCENTRATION								
GRAB SECOMPOSITE	\							
GRAB - COMPOSITE			SAMP	LE DATA	<u> </u>			
_	COLOR	DESC	RIPTION: ( SAND.			WET ETC 1		
	COLON							
ANALYSI S:		Jano	detone - vec					
HNHL 1515:	<del> </del>	<del> </del>	gray red co	<u> </u>	ses which	que moist		
				Coumor	<u></u>	<del></del>		
TPH	OBSERVA	TI ONS/	NOTES:					
BTEX								
766-0								
TCLP-M								
TCLP-M TCLP-F	1							
	1							
	1							
	-							
- Harl - C -								



☐ SURFACE SOIL

16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON, TEXAS 77084 (713) 492-1888	SUBSURFACE SOIL SEDIMENT POND/LAGOON OTHER							
PROJECT NAME Transmistern Pipeline	Compa	Company PROJECT NUMBER 3250						
NUS SAMPLE NO	SOURCE Trail Area WT-1							
SAMPLE METHOD:			COMPOSI	TE SAMPL	E DATA			
NQ Core barrel	SAMP	LE	TIME	(	COLOR/DESCRIPTION			
DEPTH SAMPLED: /3.5 - /8.5								
SAMPLE DATE & TIME: 8/4/92 /3/5								
SAMPLED BY: BASILIO				·				
SI GNATURE(S):								
TYPE. OF SAMPLE								
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION ☐ GRAB								
≥ COMPOSI TE								
GRAB - COMPOSITE		SAMPLE DATA						
	COLOR				DRY, MOIST, WET, ETC.)			
ANALYSIS	<del>- </del>	Jands			slightly mout, friable,			
ANALYSI S:			broten,	51.54+14	ilayey			
TPH	OBSERVA	TI ONG (N	OTEC.					
	- UBSERYH	II UNSYN	0152:					
BTEX TCLP- D								
	<del></del>							
TCLP-M TCLP-F								
HNU. O								
OUA - O								



16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON. TEXAS 77084 (713) 492-1888

#### SOIL/SEDIMENT SAMPLE LOG SHEET

	SURFACE	SOI	L
<b>D</b>	SUBSURFA	CE	SOIL
	<b>SEDI MENT</b>	•	
	POND/LAC	300N	ľ

☐ OTHER

PROJECT NAME_	Transmestern Pirelin	· Company	PROJECT NUMBER	1250	
NITIC CAMPLE NO	T-7B	Sui	IRCE Trees 1-	ルブ-1	

NUS SAMPLE NO		SOURC	E Trash A	rea WT-1
SAMPLE METHOD:			COMPOSI	TE SAMPLE DATA
NQ (ore barrel	SAMPI	LE	TIME	COLOR/DESCRIPTION
DEPTH SAMPLED:				
23.5 - 30				
SAMPLE DATE & TIME:				
8/4/92 1435				
SAMPLED BY:				
BASILIZ				
SI GNATURE(S):				
2 Bashis				
TYPE. OF SAMPLE	<b> </b>		· i	
LOW CONCENTRATION HIGH CONCENTRATION	<b> </b>			
☐ GRAB				
GRAB - COMPOSITE	<b> </b>			
GOING COIL COIL	COLOD	DECCO		LE DATA
	COLOR			CLAY, DRY, MOIST, WET, ETC.)
ANALYSI S:	<del></del>	ોલં પત	stone - 10 d	to sand ved, Micacous,
INITIAL ISLA				can and svay sand
TPH	OBSERVA	TI ONS/NO	TEC.	
BTEX		11 042/110	163:	
766-0	-			
TCCP-M	-			
T(LP-F				
	7			
	7			
11044 - 0	7			
HNU - 0.				
0.11/0 - 0				
00/+- 0				
	1			



16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON. TEXAS 77084 (713) 492-1888

	SURFACE SOIL
	M SUBSURFACE SOIL
	☐ SEDI MENT
	☐ POND/LAGOON
,	□ OTHER

PROJECT NAME Transmistern Perelina	Com	gany-	PROJECT NUMBE	R	6250		
NUS SAMPLE NO. 7-3A		Ś0U	RCE 62.	70	Trash Area	w1-1	
SAMPLE METHOD:			COMPOSI	TE SA	MPLE DATA	<del></del>	
NQ Core barrel	SAMP	LE	TIME		COLOR/DESCRIPTION		
DEPTH SAMPLED:							
/3,5 - /8.5							
SAMPLE DATE & TIME:				ļ			
8/5/92 835				ļ			
SAMPLED BY: BASILIO					<del></del>		
SI GNATURE! SI:							
L Vasili							
THE OF SHIPEE							
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION				<u> </u>			
GRAB							
☐ COMPOSITE ☐ GRAB - COMPOSITE							
GRAB - COMPOSITE	SAMPLE DATA  COLOR DESCRIPTION: (SAND, CLAY, DRY, MOIST, WET, ETC.)						
	COLOR						
ANALYSI S:		Sand	stone - light		duy broken	slightly	
MINE 1313.	}		clayey	<u></u>			
TPH	OBSERVA	TT ONS /I	NOTES:		<del></del>		
BTEX							
TCLP-M	i						
T(LP-0							
TCLP-F	1						
HNU. O							
DUA · O							
DUA - D							
	l						



16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON. TEXAS 77084 (713) 492-1888

☐ SURFACE SOIL
SUBSURFACE SOIL
☐ SEDIMENT
☐ POND/LAGOON
☐ OTHER

	☐ OTHER							
PROJECT NAME Transwestern Pipeli	PROJECT NAME Transwestern Pigeline Company PROJECT NUMBER 2250							
NUS SAMPLE NO. 7-3 B		SOURCE	Tuash Are	iea W7-1				
SAMPLE METHOD:			COMPOSI	TE SAMPLE DATA				
NQ Com barrel	SAMPI	E	TIME	COLOR/DESCRIPTION				
DEPTH SAMPLED:								
13.5-30	<del> </del>							
SAMPLE DATE & TIME: 8/5/92 935								
SAMPLED BY:								
BASILIO								
SI GNATURE(S): 2 Bank	<b> </b> -							
TYPE OF SAMPLE								
LOW CONCENTRATION								
HIGH CONCENTRATION								
☐ GRAB >☐ COMPOSI TE			<del></del>					
GRAB - COMPOSITE	SAMPLE DATA							
	COLOR							
	<u> </u>	Sandst	one - ve	d. hard, moist, occ sandy lenses.				
ANALYSI S:	<u> </u>		SVAV	sandy lenses.				
TPH	UBGEDAY.	TI ONS/NOTI						
	UDSERVH	I T ON 25 NO 11	23:					
BTEX TCCP-D	1							
TCLP-M	1							
TCLP-F	1							
	]							
	1							
	1							
HNU C								
DVA · O								
1								



16360 PARK 10 PLACE DRIVE, SUITE 300 HOUSTON, TEXAS 77084 (713) 492-1888

SURFACE SOIL
SUBSURFACE SOIL

SEDI MENT

☐ POND/LAGOON

□ OTHER

US SAMPLE NO	<del></del>	SOURCE				
SAMPLE METHOD:			COMPOS	ITE SAMPLE	DATA	
NQ Core barrel	SAMP	LE T	IME	C	OLOR/DESCR	I PTI ON
DEPTH SAMPLED:						
18.5 - 23.5						
SAMPLE DATE & TIME:				<u> </u>	<del></del>	
9/1/92 1025				<del> </del>		
SAMPLED BY:				<del> </del>		
BASILIU				ļ		
SI GNATURELS):				<del> </del>		
TYPE OF CAMPLE	<del></del>			<del> </del>	<del></del>	
TYPE OF SAMPLE	ļ			<del> </del>		
HIGH CONCENTRATION				+		
GRAB	<del> </del>			<del> </del>	<del></del> -	
MICOMPOSITE ☐ GRAB - COMPOSITE	<u> </u>		SAM	PLE DATA	<del></del>	
	COLOR	DESCRIPTIO			RY. MOIST.	WET, ETC.)
						us damp
ANALYSIS:		12660	Simal	clay la	Minar	
		~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	27 54 4	···/	<u>* -                                   </u>	
TPH	OBSERVA	TI ONS/NOTES:				
BTCX						
TCLP-M						
HNU 2	1					
, ., - 01						
OUA						
<del>-</del> - · ·						
	1					



16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON. TEXAS 77084 (713) 492-1888

SURFACE SOIL
SUBSURFACE SOIL
☐ SEDI MENT
☐ POND/LAGOON
CT ATUEN

	OTHER			
PROJECT NAME Transwestern Pipelle NUS SAMPLE NO. 0-18	ue (on	1/any	PROJECT NUMBE	R <u>6250</u>
NUS SAMPLE NO. O-18		SOUR	RCE	<del></del>
SAMPLE METHOD:			COMPOSI	TE SAMPLE DATA
NQ Core barrel	SAMP	LE	TIME	COLOR/DESCRIPTION
DEPTH SAMPLED:				
43.5-48.5				
SAMPLE DATE; & TIME: 9/1/92 1445	 			
SAMPLED BY:			<del></del>	
BASILIO				
SI GNATURELSI:				
· L Beils				
TYPE OF SAMPLE	<u> </u>			
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION	<b> </b>			
☐GRAB	<del></del>			
☐ GRAB - COMPOSITE  ☐ GRAB - COMPOSITE		1	SAMD	le data
	COLOR	DESC		CLAY, DRY, MOIST, WET, ETC.)
				, micaceous damp to wet
ANALYSI S:			broken	
TPH	OBSERVA	TI ONS/N	OTES:	
BTEX	}			
TCLP-M	}			
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	i			
HINU 3				
1	1			
UVA D	1			
<b>'</b> }	}			
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16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON. TEXAS 77084 (713) 492-1888

☐ SURFACE SOIL
SUBSURFACE SOIL
☐ SEDIMENT
☐ POND/LAGOON
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PROJECT NAME Transwestern Pich NUS SAMPLE NO. 0-2A		SOURCE					
SAMPLE METHOD:		COMPOSITE SAMPLE DATA					
NQ Core barrel	SAMP	LE TIME	COLOR/DESCRIPTION				
DEPTH SAMPLED:							
13,5-18,5							
SAMPLE DATE & TIME:			<u> </u>				
9/2/92 1235							
SAMPLED BY:							
BASILIO			<u> </u>				
SI GNATURELSI:			<del> </del>				
TYPE OF SAMPLE							
LOW CONCENTRATION							
☐ HI GH CONCENTRATION ☐ GRAB							
<b>⊠</b> COMPOSI TE			T				
☐ GRAB - COMPOSITE		<del></del>	PLE DATA				
	COLOR		D. CLAY, DRY, MOIST, WET, ETC.)				
		1	purish reddish dry				
ANALYSI S:			top, silty, slight mica				
TPH	DOSERVA	L white co	aliche				
BTEX	OBSEVAN	וז מאפי אח ו בפ:					
TCLP-M							
1001 [7]	$\dashv$						
	-						
	-						
	$\dashv$						
	7						
HINU 5							
UVA 1							
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16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON: TEXAS 77084 (713) 492-1888	SURFACE SOIL SUBSURFACE SOIL SEDIMENT POND/LAGOON						
	☐ OTHER						
PROJECT NAME Transmestern fixel	ine Com	yany	PROJECT NUMBE	R 6250			
PROJECT NAME Transwestern fixel			RCE				
SAMPLE METHOD:	}			TE SAMPLE DATA			
NQ Core barrel	SAMPL	E	TIME	COLOR/DESCRIPTION			
DEPTH SAMPLED:							
38,5-43.5							
SAMPLE DATE, & TIME: 9/2/92 /400							
SAMPLED BY:							
BASILIO	ļ						
SI GNATURELS):							
TYPE OF SAMPLE							
LOW CONCENTRATION							
☐ HI GH CONCENTRATION☐ GRAB	ļ						
SCOMPOSITE  ☐ GRAB - COMPOSITE							
GRAD - CON USI IE	COLOR	DECC		CLAY DRY WOLST LET ETC.)			
	COLOR			CLAY, DRY, MOIST, WET, ETC.)			
ANALYSI S:				brown, red, gold tint,			
			dry	clayer to selfy, broken			
TOH	OBSERVAT	I ONS/					
BTCX	]						
TCLP-M	]						
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	1						
HNU O							
UL'A 5							
. 1							



16360 PARK 10 PLACE DRIVE. SUITE 300

HOUSTON, TEXAS 77084 (713) 492-1888

SURFACE SOIL
SUBSURFACE SOIL
☐ SEDI MENT
☐ POND/LAGOON
□ OTHER

PROJECT NAME Transwestern Pipeli NUS SAMPLE NO. 0-2 C	ne (on	1pany F	PROJECT NUMBER	R6250		
NUS SAMPLE NO. 0-2 C	· · · · · · · · · · · · · · · · · · ·	SOUR	CE			
SAMPLE METHOD:	COMPOSITE SAMPLE DATA					
NG Core barrel	SAMP	LE	TIME	COLOR/DESCRIPTION		
DEPTH SAMPLED:						
43.5 - 47				<u> </u>		
SAMPLE DATE & TIME: 9/2/92 /510						
SAMPLED BY:						
BASILIO						
SI GNATURELSI:						
1 Banks						
TYPE OF SAMPLE						
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION						
☐ GRAB SECOMPOSI TE						
GRAB - COMPOSITE			SAMP	LE DATA		
	COLOR	DESCR		CLAY, DRY, MOIST, WET, ETC.)		
				brown, broken, damy to		
ANALYSI S:			mo15+, 51	lty, micalrous		
211		<u> </u>				
TOH	OBSERVA					
BTEX	Duep	licate	sample (01	lfreta d		
TCLP-M						
HIN'LI 1						
. UVA 2	  -					
	,					
}	! !					



### COPPORATION GULF COAST DIVISION A Halliburton Company

#### SOIL/SEDIMENT SAMPLE LOG SHEET

SURFACE SOIL

16360 PARK 10 PLACE DRIVE, SUITE 300 HOUSTON, TEXAS 77084	SUBSUF		OIL	
(713) 492–1888	SEDI ME			
	☐ POND/L	LAGUUN		
PROJECT NAME Town of the P				- /250
PROJECT NAME Transwestern fine	line (on	11anx	PROJECT NUMB	ER623-27
NUS SAMPLE NO. 0-3A		SOUP	RCE	
SAMPLE METHOD:			COMPOS	TITE SAMPLE DATA
NG Love barrel	SAMPI	LE	TIME	COLOR/DESCRIPTION
DEPTH SAMPLED:				
27-32				
SAMPLE DATE, & TIME:				
9/2/92 1800				
SAMPLED BY:				
BASILIO -				
SI GNATURELSI:				
L Davids				
TYPE OF SAMPLE				
LOW CONCENTRATION HIGH CONCENTRATION				
GRAB				<u> </u>
<u>⊠</u> COMPOSI TE				<u> </u>
☐ GRAB - COMPOSITE		,		PLE DATA
	COLOR			D. CLAY, DRY, MOIST, WET, ETC.)
ANALYSIS	<del></del>	Sand	tone-yed	wigh gray damp, mica, wades to gray SS
ANALYSIS:		00	(vams/- s	ivades to gray 55
	ODCEDVA	SS I	3444 CVV	, mica, silto, triable
BTEX	OBSERVA	11 042/1	IU1ES:	
TCLP-O				
1001				
	-			
	-			
	-			
HING	1			
ULA D				
,	1			
				•



16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON. TEXAS 77084 (713) 492-1888

☐ SURFACE SOIL
SUBSURFACE SOIL
SEDI MENT
☐ POND/LAGOON
CT OTHER

PROJECT NAME   ranswestern Pipel	ine (on	11any	PROJECT NUMBE	R <u>6250</u>		
NUS SAMPLE NO. D-3 B	·	/	RCE			
SAMPLE METHOD:	COMPOSITE SAMPLE DATA					
NG Core barrel	SAMPI	LE	TIME	COLOR/DESCRIPTION		
DEPTH SAMPLED:	1					
43.5-48,5						
SAMPLE DATE & TIME:						
9/2/92 1915						
SAMPLED BY:						
BASILIO	<u> </u>					
SI GNATURELS):						
I Bails						
TYPE OF SAMPLE						
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION						
☐GRAB						
			1			
CONFOST IE	601.00	2506		LE DATA		
1	COLOR			CLAY, DRY, MOIST, WET, ETC.)		
ANALYSI S:	<del> </del>	Jana	STone - dark	e red brown, damp, mice		
HAME 1313:	<del> </del>	<u> </u>	broken.	friebla		
	OBSERVA	TI ONS/	NOTES.			
BTEX	-	110107	1101L3.			
T(LP-D	1					
	†					
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	]					
HINLI 3						
UVA						
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16360 PARK 10 PLACE DRIVE, SUITE 300 HOUSTON, TEXAS 77084 (713) 492-1888

#### SOIL/SEDIMENT SAMPLE LOG SHEET

☐ SURFACE SOIL SUBSURFACE SOIL SEDI MENT ☐ POND/LAGOON □ OTHER

PROJECT NAME Transwestern Pipeli	ne (on	<i>yany</i>	PROJECT NUMBE	R 6350		
NUS SAMPLE NO. 0-3C		soul	RCE			
SAMPLE METHOD:	COMPOSITE SAMPLE DATA					
NQ Core barrel	SAMP	LE	TIME	COLOR/DESCRIPTION		
DEPTH SAMPLED:						
48.5 - 51	· 					
SAMPLE DATE & TIME: 9/3/92 935	<del></del>					
SAMPLED BY:						
BASILIO						
SI GNATURELSI:						
TYPE OF SAMPLE			<del></del>			
LOW CONCENTRATION						
HIGH CONCENTRATION			<del></del>			
☐ GRAB ☐ GRAB  ☐ GRAB						
☐ GRAB - COMPOSITE		<del></del>	SAMP	LE DATA		
}	COLOR	DESC	RIPTION: (SAND,	CLAY, DRY, MOIST, WET, ETC.)		
		Sand	stone - red	, regted with oil		
ANALYSI S:						
BTEX	OBSERVA	TI ONS/N	NOTES:			
TCLP-0						
HINLI 180						
UVA -						



Environmental Corporation	SURFACE SOIL SUBSURFACE SOIL SEDIMENT POND/LAGOON OTHER							
PROJECT NAME Transwestern PI	reline (	ompan	PROJECT NUME	BER 7P54				
HNUS SAMPLE NO. O-YA			JRCE W					
SAMPLE METHOD:			COMPO	SITE SAMPLE DATA				
NW Core barrel	SAMP	LE	TIME	COLOR/DESCRIPTION				
DEPTH SAMPLED: 3-1-39								
SAMPLE DATE & TIME:								
10/19/92 1700								
SAMPLED BY: 13 14 SILIO				<del> </del>				
SI GNATURELSI:								
TYPE OF SAMPLE	┪		<u> </u>	<u> </u>				
LOW CONCENTRATION	<b> </b>							
HIGH CONCENTRATION			1					
☐ COMPOSITE								
GRAB - COMPOSITE	SAMPLE DATA							
	COLOR			D, CLAY, DRY, MOIST, WET, ETC.)				
	<u> </u>	San	Istona dan	in ind, solty, mica, clay				
ANALYSI S:	<del>- </del>	<del> </del>		eve moist on surface in				
	ODOEDVA	77.000	Stots					
TPH	OBSERVA	11 UNS/	NUIES:					
BTEX	-							
	-{							
	-							
	7							
	7							
DUA - 20	1							
014 - 20	1							
0077 = 1	}							



SURFACE SOIL

☐ SEDIMENT ☐ POND/LAGOON , ☐ OTHER	
PROJECT NAME Transwestern Pierline PROJECT NUMBER 7854	
PROJECT NAME Trans western Pipeline PROJECT NUMBER 7954  HNUS SAMPLE NO. 0-48 SOURCE WT-1	
SAMPLE METHOD: COMPOSITE SAMPLE DATA	
NW Core SAMPLE TIME COLOR/DESCRI	PTION
DEPTH SAMPLED: 39-44	
SAMPLE DATE & TIME: 10/19/91 1710	
SAMPLED BY: BASILIO	
SI GNATURE(S):	
- Marile	·_ · · · · · · · · · · · · · · · · · ·
TYPE OF SAMPLE	
HIGH CONCENTRATION	
☐ COMPOSI TE	<del></del>
☐ GRAB - COMPOSITE SAMPLE DATA	
COLOR DESCRIPTION: (SAND. CLAY, DRY, MOIST, V	
Sandstone red brown, coarse	very
ANALYSIS: mica clayer	
TPH OBSERVATIONS/NOTES:	_=
BTEX	
<u> </u>	
004-50	
0014 - 50	
0014 - 50	
0014 - 50	



☐ SURFACE SOIL

	,	SED PON	D/LAGOON				
PROJECT NAME Transwestern y	Ocelina		PROJECT NUMBI	ER	7P.	54	
HNUS SAMPLE NO. O-5A	SOURCE W7-/						
SAMPLE METHOD:	COMPOSITE SAMPLE DATA						
NW Core	SAMP	LE	TIME		COLO	R/DESCRIPTIO	N
DEPTH SAMPLED: リューリフ					·		
SAMPLE DATE & TIME: 1011							
SAMPLED BY: BASILID							
SI GNATUREI SI:	<b> </b>						
TYPE OF SAMPLE	1						· · · ·
LOW CONCENTRATION							
☐ HI GH CONCENTRATION ☐ GRAB							
COMPOSITE GRAB - COMPOSITE			<u> </u>	OL E DAY	<u> </u>		
GIGNAD - COM COLLE	SAMPLE DATA  COLOR DESCRIPTION: (SAND, CLAY, DRY, MOIST, WET, ETC.)						
	COLOR						
ANALYSI S:		JUN	stour - x	<del>(                                    </del>	194	Jaminas	Court
	1		3(11,7)		172		
TPH	OBSERVA	TI ONS/	NOTES:				
BTEX							
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<u> </u>	1						
OUA - 20			. <del>.</del> .			<b>-</b> ≠	



Environmental Corporation	SUBSURFACE SOIL SEDIMENT POND/LAGOON OTHER								
PROJECT NAME Transwestern HNUS SAMPLE NO. 0-6A	Pipeline		PROJECT NUMB	ER 7P54					
HNUS SAMPLE NO. O-6A		sou	RCE	VT-1					
SAMPLE METHOD:	COMPOSITE SAMPLE DATA								
NW Core	SAMP	LE	TIME	COLOR/DESCRI PTI ON					
DEPTH SAMPLED: 39-44									
SAMPLE DATE & TIME:									
SAMPLED BY: BASILID									
SI GNATURE(S):									
TYPE OF SAMPLE									
☐ LOW CONCENTRATION ☐ HIGH CONCENTRATION			·						
<b>™</b> GRAB				<u> </u>					
COMPOSI TE	SAMPLE DATA								
	COLOR	, CLAY, DRY, MOIST, WET, ETC.)							
		Suna	stone - re	I brown soft mica.					
ANALYSI S:			damp, f	viable, clay laminar					
= 211	ODOEDVA	T 01/0 (1							
1 PA	OBSERVA	II UNSZN	WIES:						
BTEX	-								
	-								
	_								
	$\dashv$								
OVA -1									



16360 PARK 10 PLACE DRIVE. SUITE 300 -OUSTON. TEXAS 77084 .713) 492-1888

☐ SURFACE SOIL X SUBSURFACE SOIL

SOIL/SEDIMENT

SAMPLE LOG SHEET

☐ SEDI MENT

☐ POND/LAGOON

☐ OTHER

PROJECT NAME Transwestern Pig	eline		_PROJECT NUM	BER	7854		
NUS SAMPLE NO. 0-7A		sou	IRCE <u>v</u>	V7-	1		
SAMPLE METHOD:	COMPOSITE SAMPLE DATA						
NW Core barrel	SAMPLE		TIME		COLOR/DESCRIPTION		
DEPTH SAMPLED:							
39-44							
SAMPLE DATE & TIME:		<del></del>					
10/20/92	<del></del>	<del></del> :					
SAMPLED BY:	ļ						
SI GNATURE(S):	<del></del>						
Janilio Sandio							
TYPE OF SAMPLE				+		<u></u>	
LOW CONCENTRATION					<del></del>		
☐ HIGH CONCENTRATION  ☑GRAB							
☐ COMPOSI TE							
☐ GRAB - COMPOSITE	SAMPLE DATA						
	COLOR				. DRY, MOIST, WET, ET	rc. )	
AVALVOTO		San	dstone - r	rd, 1	nica, friable,		
ANALYSI S:	<del></del>	<del>                                     </del>	clayey 1	amina	e, damp, Mois	<u> </u>	
TPH	OBSERVATI ONS/NOTES:						
BTEX	OBSERVA	I I UNSVI	NO 1 E 2 :				
D / L X	-						
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	7						
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OVA - O							
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16360 PARK 10 PLACE DRIVE, SUITE 300 HOUSTON, TEXAS 77084 (713) 492-1888

☐ SURFACE SOIL
SUBSURFACE SOIL
☐ SEDI MENT
☐ POND/LAGOON
☐ OTHER

PROJECT NAME Transwestern P.	reline		PROJECT NUMBE	R 7P54	,		
NUS SAMPLE NO. O-8 A	SOURCE W7-1						
SAMPLE METHOD:	COMPOSITE SAMPLE DATA						
NW Core barrel	SAMPLE		TIME	COLOR/O	DESCRIPTION		
DEPTH SAMPLED: 39-44				ļ			
SAMPLE DATE & TIME:					· · · · · · · · · · · · · · · · · · ·		
10/21/92 1620	ļ ———	<del></del>					
SAMPLED BY:							
BAS/L10	ļ			·			
SI GNATURE(S):	<b> </b>			ļ	· · · · · · · · · · · · · · · · · · ·		
TYPE OF SAMPLE	<del> </del>			<b></b>			
☐ LOW CONCENTRATION							
☐ HI GH CONCENTRATION  ☐ GRAB							
COMPOSITE	<u> </u>						
GONAD CONTOCTIC	SAMPLE DATA  COLOR DESCRIPTION: (SAND. CLAY. DRY. MOIST. WET. ETC.)						
	COLOR			, damp so			
ANALYSI S:		Jake	s/ friash	Clar lam	ina towards		
		l	base	,			
7 17	OBSERVA	TI ONS/I	NOTES:				
BTEX	1						
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16360 PARK 10 PLACE DRIVE. SUITE 300 HOUSTON. TEXAS 77C84 (713) 492-1888

# SOIL/SEDIMENT SAMPLE LOG SHEET

☐ SURFACE SOIL SUBSURFACE SOIL ☐ SEDI MENT T POND/I AGOON

	OTHER				
PROJECT NAME Transmestern Py					·
NUS SAMPLE NOO-9/4		SOURCE	W	/-/	
SAMPLE METHOD:			COMPOSI	TE SAMPLE DATA	
NW Core barrel	SAMP	LE T	I ME	COLOR/DE	SCRIPTION
DEPTH SAMPLED:	ļ				
42-44					
SAMPLE DATE & TIME:					
10/22/92 823	_				
SAMPLED BY: BASILID	<del></del>				
SI GNATURE( S):		<del></del>			
1- Builin		<del></del>		<del>, </del>	<del></del>
TYPE OF SAMPLE	<del></del>				<u> </u>
☐ LOW CONCENTRATION					<del></del>
☐ HI GH CONCENTRATION  ☐ GRAB					<del></del>
COMPOSI TE					
☐ GRAB - COMPOSITE			SAMPI	LE DATA	
	COLOR			CLAY, DRY, MOI	
		Sandstone	dark	- red, selty	<del></del>
ANALYSI S:		mica	, ( ) ) 1-	wet from	43.5-43,5
-TO11	ODOEDWA	77.010.0107.07.50			
1 P M	- UBSEKVA	TI ONS/NOTES:			
BTEX					
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OVA - 40					
000					



# SOIL/SEDIMENT SAMPLE LOG SHEET

A Halliburton Company	☐ SURFAC	E SOI	L		
1636D PARK 10 PLACE DRIVE. SUITE 300	X SUBSUF	RFACE	SOIL		
HOUSTON, TEXAS 77084 (713) 492-1888	☐ SEDI ME	ENT			
	☐ POND/L	AGOON			
·	☐ OTHER				
PROJECT NAME Transwestern 1					54
NUS SAMPLE NO. 0-10 A	<del></del>	sol	IRCE h	17-1	
SAMPLE METHOD:	<del></del>		COMBOS	ITE SAMPLE [	λτα
	SAMPI		<del>,</del>		
NW Love barrel	SAMPI	LE	TIME	LUL	OR/DESCRI PTI ON
DEPTH SAMPLED:			ļ		
39-44				<u> </u>	······
SAMPLE DATE & TIME:					
10/22/92 1119					
SAMPLED BY:				1	
BASILIO				<u> </u>	
SI GNATURE(S):					
1 Basilio					
TYPE OF SAMPLE					•
LOW CONCENTRATION					
HIGH CONCENTRATION			1	<del>                                     </del>	
GRAB  COMPOSI TE		···	<del> </del>		
GRAB - COMPOSITE			SAM	PLE DATA	
1	COLOR	DESC			MOIST, WET, ETC.)
	- OOLON				
ANALYSI S:	<del>-</del>	Jan	dstone - r		iyi parca
HINE TOTO:	<del></del>		sl friab	<u> </u>	
-T 118	0005044	77.01/0			
TOM	OBSERVA	11 UNS/	NUTES:		
BTEX	4				•
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## A Halliburton Company

# SOIL/SEDIMENT SAMPLE LOG SHEET

A riambul ton Company	☐ SURFA	CE SOI	L			
16360 PARK 10 PLACE DRIVE, SUITE 300	<b>X</b> SUBSUI	RFACE	SOIL			
HOUSTON. TEXAS 77084 (713) 492-1888	SEDI ME					
	☐ POND/I					
	☐ OTHER					
PROJECT NAME Transwestern P.	peline		_PROJECT NUMBE	R	7054	
NUS SAMPLE NOO-11A	· ————	SOL	IRCE L	NT-1	·	
SAMPLE METHOD:		<del></del>	COMPOSI	TE SAMP	LE DATA	
NW Core barrel	SAMP	LE	TIME		COLOR/DESCRI	PTION
DEPTH SAMPLED:						
39-44				1		
SAMPLE DATE & TIME:	1				<del></del>	<del></del>
10/22/92 1459	<b></b>			<del> </del>		
SAMPLED BY:	1					
BASILIO				<b>†</b>		<del></del>
SI GNATURE(S):						
1 Darilin	<b>———</b>					
TYPE OF SAMPLE						
LOW CONCENTRATION						,
HIGH CONCENTRATION					<del></del>	
COMPOSI TE			<del> </del>			<del></del>
GRAB - COMPOSITE	<del> </del>		SAMP	LE DATA	<del> </del>	**************************************
	COLOR	DESC	RIPTION: (SAND.			JET ETP )
	COLOIN					
ANALYSIS:	<del></del>	Sand	Istone - re	<u>d</u> , <u>d</u> e	imp, Mica	<u>, SL</u>
HNHL1212:			friable			
=011	000000	1				
	OBSERVATI ONS/NOTES:					
1372X	_					
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(91)// - 1	1					



SOIL/SEDIMENT SAMPLE LOG SHEET

The interior company	☐ 20KFH	-F 201	L			
:6360 PARK 10 PLACE DRIVE. SUITE 300	X SUBSUI	RFACE	SOIL			
HOUSTON, TEXAS 77084 (713) 492-1888	☐ SEDI ME	ENT				
	☐ POND/I	_AGOON				
PROJECT NAME Transwestern Pi					54	
NUS SAMPLE NO. 0-12 14		SOL	IRCE h	17-1		
SAMPLE METHOD:				TE SAMPLE I		
NW Core barrel	SAMP	LE	TIME	COL	OR/DESCRIPT	ri on
DEPTH SAMPLED:						
39-44						
SAMPLE DATE & TIME:						
10/22/92						
SAMPLED BY:						
BASILIO:				-		
SI GNATURE(SH)	1					
1 Das lin				1		
TYPE OF SAMPLE						
☐ LOW CONCENTRATION	<del></del>					
HIGH CONCENTRATION	<b> </b>			<u> </u>		
<b>G</b> CRAB	ļ <del></del>		<del> </del>	<b></b>		
☐ COMPOSITE ☐ GRAB - COMPOSITE	<b>}</b>		<u> </u>	<u> </u>		
GONHA - CONFOSTIE	<u> </u>			LE DATA		
}	COLOR	DESC	RIPTION: (SAND,	CLAY, DRY,	MOIST, WE	T. ETC.)
		San	dstone - d	ark red	dame	10
ANALYSIS:			1015+ 14 SI			
			clau lamin			
TOH	OBSERVA					
BTEX	-	110/10/	110123.			
BIEX	<b></b> -{					
	}					
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	}					
10UA - 0						



MONITORING WELL DATA DOMESTIC WELL DATA ☐ OTHER

PROJECT NAME Trans			iny PRO	DJECT N	JMBER	250	)
NUS SAMPLE NO.	BP-1 / MV	v -1	SOURCE	<u>w7</u>	r-1 5it	<u> </u>	<del></del>
TOTAL WELL DEPTH:					PURGE	DATA	
WELL CASING SIZE &	DEPTH:	VOLUM	E PH	S. C.	TEMP. ( °C)	TDS	COLOR & TURBIDITY
1" PUC	55.2 TOC		6.25	4000	19		Light red brown
STATIC WATER LEVEL:	45.96 TOC						turbed
ONE CASING VOLUME:	1.57						
START PURGE (HRS.):	900	2	6.29	4125	9		A/A
END PURGE (HRS.):	923						
TOTAL PURGE TIME (	(IN.): 23	3	6.40	4000	: 9 -		AIA
TOTAL AMOUNT PURGE	O (GAL.): 5						
MONITOR READING:							
HNU-	5						
PURGE METHOD: DIST	sable bailer						
SAMPLE METHOD: DISC							
DEPTH METHOD: Elec	try line						
SAMPLE DATE & TIME:	_				SAMPLE DATA		
9/3/92	1130	PH	S. C.	TEN	P.(°C)	TOS	COLOR & TURBIDITY
SAMPLED BY:		1112	1/2	1	?		Clear, Slubby
BASIL	10	6.47 4260 19 turbil					
SI GNATURE(S):		OBSERVA	TI ONS/NOTE	S:			
1/4							
1 (for	2/1						
TYPE OF	SAMPLE	7					
LOW CONCENTRA							
☐ HI GH CONCENTI	RATION						
COMPOSI TE							
GRAB - COMPOS	SITE	]					
ANALYSIS:	PRESERVATI VE	]					
		] .					
TPH		1					
BTEX	HCL						
		<u> </u>					
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MONITORING WELL DATA
DOMESTIC WELL DATA ☐ OTHER

NUS SAMPLE NO. MW-2		SOURCE	W	7-1 51	14			
TOTAL WELL DEPTH:	1	<del></del>		PURGE	DATA			
WELL CASING SIZE & DEPTH:	VOLUME	PH	S. C.	TEMP. ( °C)	TDS	COLOR & TURBIDITY		
2" PUC 52.2 TOC		6.27	4060	20		Brun w/black tent		
STATIC WATER LEVEL: 48,07 TO	c					Aurbid		
ONE CASING VOLUME: 0.7								
START PURGE (HRS.): 825	2	6.43	3910	20		Brown, turbid,		
END PURGE (HRS.): 849						Slicher sheen		
TOTAL PURGE TIME (MIN.): 24	4	6.37	4010	19:		AIA		
TOTAL AMOUNT PURGED (GAL.): 3,5	2	6.46	4040	19		A/A no sheen		
MONI TOR READING:								
HAU-17								
PURGE METHOD: Disposable bailer								
SAMPLE METHOD: Dispisable bailer								
DEPTH METHOD: Electric line								
SAMPLE DATE ,& TIME:			5	SAMPLE DATA	1			
9/3/92 1250	PH	S.C.	TEM	P.(°C)	TOS	COLOR & TURBIDITY		
SAMPLED BY:	7200	3900	190			Light brown svay		
BASILIU	7.00	3700	, ,			turbid		
SI GNATURE(S):	OBSERVA	TI ONS/NOTE	S:			· · · · · · · · · · · · · · · · · · ·		
A Kail	1 1.	, 1	1	<b>0</b> :		had pin		
- 1 Venni	<b>→</b> + 5	F 591	HV	ou purs	ins	ure pin		
TYPE OF SAMPLE	,	1	,	. /				
LOW CONCENTRATION	ho	hole size oil dvorlets.						
☐ HIGH CONCENTRATION >>> GRAB	1							
E-COMPOSI TE								
☐ GRAB - COMPOSITE								
ANALYSIS: PRESERVATIVE	╛.							
TPH								
TPH BTEX HCL								
	]							



MONITORING WELL DATA
DOMESTIC WELL DATA ☐ OTHER

PROJECT NAME Tran	swestern Pi	reline (	ompery PRI	DJECT NU	IMBER	258	>
NUS SAMPLE NO.							
TOTAL WELL DEPTH:	* · · · · · · · · · · · · · · · · · · ·	T			PURGE	DATA	
WELL CASING SIZE &		VOLUME	E PH	S. C.	TEMP. ( ° C)	TDS	COLOR & TURBIDITY
2" PUC	50' TOC	1	6.78	2920	19		Brown, turbed
STATIC WATER LEVEL:	45.13 TOC	T					
ONE CASING VOLUME:		2 45	6.90	2970	19		A/A
START PURGE (HRS.):	1104						
END PURGE (HRS.):	1113						
TOTAL PURGE TIME (M							
TOTAL AMOUNT PURGED	(GAL.): 1,5	<u> </u>					
MONITOR READING:							
HNU-	_3						
PURGE METHOD: 0130	sask backer						
SAMPLE METHOD: DISP							
DEPTH METHOD: Elect							
SAMPLE DATE &, TIME:				S	AMPLE DATA	}	
9/3/92 /310		PH	S.C.	TEM	P.(°C)	TDS	COLOR & TURBIDITY
SAMPLED BY: BASIL	10	7.09	2910				slyhtly turbid
SI GNATURE(S):		OBSERVA	TI ONS/NOTE	S:			
1 Car	ilis				after	/, 5	sallous
TYPE OF	SAMPLE	7					
LOW CONCENTRA		ŀ					
☐ HI GH CONCENTR  □ HI GH CONCENTR	ATION	Ì					
☐ COMPOSI TE							
☐ GRAB - COMPOS		]					
ANALYSIS:	PRESERVATI VE	]					
TPH							
BTEX	HCL	_					
		_					
	<del></del>	4					
		_					
		4					
		4					
		1					

APPENDIX D
SURVEY DATA

mmmmm (JGC ===== Friday November 5, 1992 4:19 PM prdinate File Name: HALIBNUS.CRD Lowest pt #: 1 Highest pt #: 39 Description: HALLIBURTON NUS bor. & mon. wells at transwestern comp sta. E. of C arlsbad # of chars. in point descr.: 18 BEARING DISTANCE TO NORTHING EASTING LIST POINTS POINT NORTHING EASTING ELEVATION DESCR 10000.000000 10000.000000 5' N OF NE FN COR 2 10001.470745 9405.171818 NBC ON N PPTY LINE 9854.909147 3 9912.409391 3590.600000 BORING TP-1 4 9886.130392 3590.700000 BORING TP-2 9861.357797  $\Box$ 9906.382233 9931.809194 3590.400000 BORING TP-3 6 10036.821365 9434.916964 3590.900000 BORING 0-1 ? 7 3591.100000 BORING D-2 ? 10033.136997 9448.826067 3 10014.563573 9352.360589 3591.100000 BORING 0-3 ? 9960.107807 Q 9337,666291 3592.500000 MW-1. BORING BP-1 9929.309276 10 9289.788932 3592.800000 BORING BP-2 11 9989.193929 3591.800000 BORING BP-3 9338.716298 12 9928.981573 9256.525041 3592.500000 BORING BP-4 13 9916.429638 9367.975548 3593.600000 BORING BP-5 14 9834.682005 9345.922209 3593.700000 BORING BF-6 15 9993.112822 9447,158021 3591.100000 MONITOR WELL #2 9965.890229 16 9430.388062 3591.400000 BORING FP-1 1.7 9928.625288 9452.352784 3591.300000 BORING FP-2 18 9883.289992 9424.494656 3594.300000 BORING FP-3 19 9924.785989 9486.040809 3591.000000 BORING FP-4 20 9933.743785 9398.549033 3593.500000 BORING FP-5 9849.355756 21 9416.550814 3594.200000 BORING FP-6 22 9991.255145 9434.079899 3591.500000 BORING FF-7 23 9821.950747 9379.515235 3593.700000 MONITOR WELL #3. 24 10003.280180 8673.364055 25 0.000000 1.000000 3594.670000 MON. WELL #1 CASIN 26 0.000000 2.000000 3593.320000 MON. WELL #2 CASIN 27 0.000000 3.000000 3596.040000 MON. WELL #3 CASIN 28 0.000000 4.000000 3598.500000 11-6.92 BM NE COR MAIN. BL

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10081.425222

10023.162445

10081.761990

10144,316184

10074.730181

10168.951033

10200.119950

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### BASIC ORDERING AGREEMENT NO. BO-92-048H

### **WORK RELEASE DOCUMENT**

To:		Pettigrew and Associates  1110 N. Grimes  Hobbs. New Mexico. 88240  (903) 596-4421	Date: Project No.: Work Release No.: Rev. No.:	November 2, 1992 2048-7P54 * CA BO-92-048H-01
Attn Sub	: <del>jec</del> t:	W.M. Tres Hicks, III PE-LSI Surveying at Transwestern Pipeline facility		
1)		nitions		
		Project is <u>surveying of 9 borings and 3</u> ted at <u>Transwestern Pipeline</u> in <u>Carl</u>		•
	1.2	OWNER or CLIENT shall mean <u>Transwis</u> CONTRACTOR or HALLIBURTON NO Corporation. SUBCONTRACTOR shall mean <u>Pettigra</u>	US shall mean HALLIBU	RTON NUS Environmental
2)	Sco	pe of Work		
	nece	CONTRACTOR shall provide all labor, to perform the scope of work 92-048H and the attached Exhibit "A".	ools, equipment, supplies, as described in Basic Or	meterial, and all other items idering Agraement Number
3)	Cost	t of Sublet Work		•
	A.D	andan ababba a baran	** .	

All services shall be performed in accordance with the rates and charges set forth in the attached Exhibit "C". SUBCONTRACTOR shall not exceed the total estimated cost of \$300.00 plus applicable taxes without prior written approval of HALLIBURTON NUS Project Manager.

### Schedule

Services shall commence on or about September 7, 1992 and SUBCONTRACTOR shall exercise its. best efforts to complete the work no later than September 30, 1992. Time is of the essence in the performance of work under this agreement. SUBCONTRACTOR shall not receive payment for services. performed beyond this schedule without prior written approval of HALLIBURTON NUS Project Manager.

### 5) Invoices

SUBCONTRACTOR shall submit its invoice monthly, in such detail as HALLIBURTON NUS may require, invoices shall be sent to:

> HALLIBURTON NUS Environmental Corporation 16360 Park Ten Place, Suite 300 Houston, Texas 77084 Attn: Susanne Richard Project Manager

All invoices must include HALLIBURTON NUS' Basic Ordering Agreement Number, Work Release Number, and Sublet Work Description.

### Order of Precedence

All services shall be performed in strict accordance with the terms and conditions set forth in Basic Ordering Agreement No. <u>BO-92-048H</u>.

SUBCON	RACTOR Project Manager: W.M. Tres Hick	3. 11	
HALLIBUF	TON NUS Project Manager: Susanne Rich	ard	"
HALLIBUF	TON NUS Charge Number: 2048-7P54*CA		
2048 Res	sponsibility Center	RC	Suffix <u>1548</u>
HALLIBUR Corporation	TON NUS Environmental	SUBCONT	1. 11
Signature:		Signature:	Whan Mildes
Name:	Stephen T. Garland, P.E.	Name:	William M. Hicks
Title:	General Manager, Houston District	Title:	SECRETHAY
Date:	•	Data:	November 6 1992

### EXHIBIT 'A'

### DETAILED SCOPE OF WORK

SUBCONTRACTOR shall provide all labor, tools, equipment, supplies, licenses, transportation, and insurance, and all other items necessary to perform groundwater sampling services. Services shall be performed in accordance with the terms and conditions set forth in Basic Ordering Agreement No. BO-92-048H and the more detailed Scope of Work as described below:

Pettigrew and Associates shall determine local X, Y, and Z Coordinates for 9 borings and 3 monitor wells located at a site approximately 26 miles east of Carlsbad, New Mexico just off US Highway 62-180. The site is roughly 400 square feet, relatively free from obstruction to visual surveying. The borings and wells will be marked, and HALLIBURTON NUS will provide right of way, access and survey permission as required for the area.

Pettigrew and Associates will locate the borings and wells from a known point as described by the client and provide the location and elevation information results in tabular form.

EXHIBIT 'B'

# SPECIAL CONDITIONS

NONE

## EXHIBIT 'C'

## COST OF SUBLET WORK

SUBCONTRACTOR shall provide all labor, tools, equipment, supplies, licenses, transportation, and insurance, and all other items necessary to perform groundwater sampling services. Services shall be performed in accordance with the all-inclusive unit rates set forth below:

SUBCONTRACTOR shall not exceed the total estimated cost of THREE HUNDRED DOLLARS (\$300.00) plus applicable taxes without prior written approval of HALLIBURTON NUS.