GW - 49

MONITORING REPORTS

DATE:

10/1993


EL PASO NATURAL GAS COMPANY
BLANCO PLANT

8/6/85

8/6/85 EPA
Blanco Plant

8/6/85 EPNG
Blanco Plant

8/6/85 EPNG
Blanco Plant

8/6/85 EPNG
Blanco Plant

9/10/85 EPNG

Blanco Plant

8/6/85 EPNG
Blanco Plant

BLANCO PLANT SOUTH FLARE PIT
SUBSURFACE DRILLING INVESTIGATION
AND MONITORING WELL INSTALLATION

October 1993

Prepared for:

El Paso Natural Gas Company
El Paso, Texas

Project 10935

BURLINGTON ENVIRONMENTAL INC.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262

EXECUTIVE SUMMARY

On September 27 and 28, 1993, Burlington Environmental Inc. (Burlington) installed three monitoring wells at El Paso Natural Gas Company's (EPNG's) Blanco plant near Bloomfield, New Mexico. Two wells, downgradient of the abandoned south flare pit, were to be used as recovery wells if floating product was found, and one well was to be used as an observation well during future pump tests. Each well was thoroughly developed after installation.

The monitoring wells were installed with hollow-stem augers and split-spoon samples were collected at 5-foot intervals. These samples were scanned for volatile hydrocarbons with a photoionization detector and their lithology described. The two wells intended for recovery operations showed no evidence of hydrocarbon contamination; however, the third well, located adjacent to the south flare pit excavation, showed hydrocarbon contamination between 13 and 20 feet below ground surface. Soil samples analyzed from this interval confirmed the presence of hydrocarbon constituents in this zone. No free-phase product was observed in any of the wells installed during this project.

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BLANCO PLANT SOUTH FLARE PIT
SUBSURFACE DRILLING INVESTIGATION AND MONITORING WELL INSTALLATION

El Paso Natural Gas Company
El Paso, Texas

1.0 INTRODUCTION

On September 27, 1993, Burlington Environmental Inc. (Burlington) initiated a subsurface drilling investigation and monitoring well installation project at El Paso Natural Gas Company's (EPNG's) Blanco plant in Bloomfield, New Mexico. A site map prepared by EPNG is presented in Figure 1.

The scope of work for this project was based on hydrogeologic information obtained during previous investigations by McBride-Ratcliff and Associates, Inc. (1988), Bechtel (1988), John Mathes and Associates, Inc. (1991), and groundwater quality information obtained by EPNG personnel.

The scope of work for project field activities included:

- installation of one monitoring well (MW-29) downgradient of the abandoned south flare pit and one monitoring well (MW-28) downgradient of MW-6;
- the installation of an observation well (MW-30) between MW-6 and MW-28;
- logging of borehole lithologies;
- screening of samples using a photoionization detector (PID) and collection of all samples above 100 needle deflection units (NDU) for submittal to EPNG's laboratory in Farmington, New Mexico; and
- developing wells and measuring water and product levels.

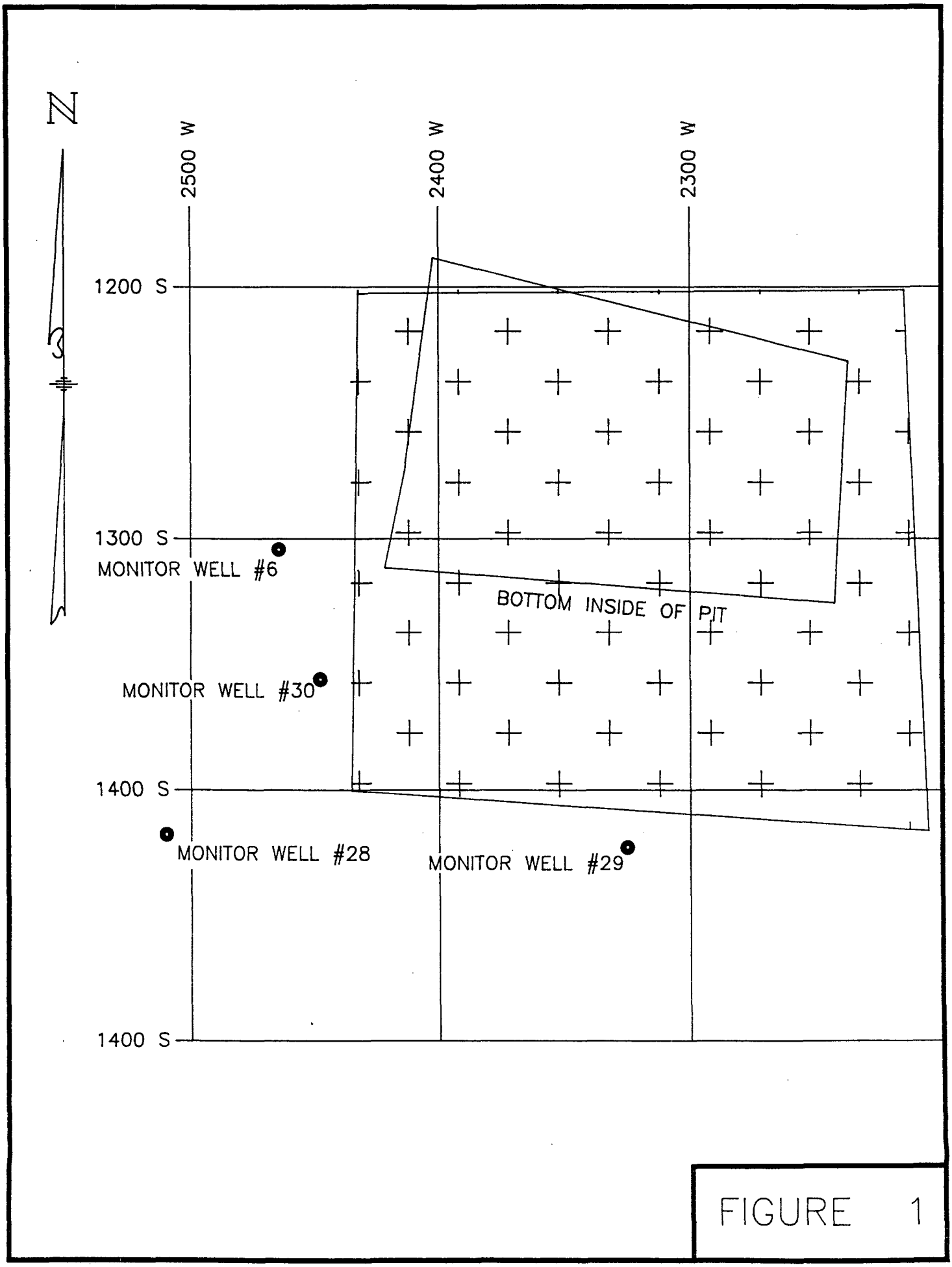

N
2500 W
2400 W
2300 W
1200 S
1300 S
MONITOR WELL #6
BOTTOM INSIDE OF PIT
MONITOR WELL #30
1400 S
MONITOR WELL #28
MONITOR WELL #29
1400 S

FIGURE 1

2

2.0 METHODS OF INVESTIGATION

Soil borings were completed using a CME-75 hollow-stem auger rig and 6.25 ID hollow-stem augers. Soil samples were collected every five feet using a 3-inch diameter, 2-foot long, split-spoon sampler. Burlington's field geologist recorded the lithologic description of the soils at each boring location on individual Record-of-Subsurface-Exploration forms, included in Appendix A.

Each split-spoon soil sample was scanned for volatile compounds with the PID immediately after opening. The result of the PID reading was recorded in NDUs on the drill logs in Appendix A. Drilling was continued to ten feet below the first sign of water to install well screens. Soil sampling, however, was discontinued below the water table.

Each monitoring well installed consisted of flush threaded, 4-inch diameter, Schedule 40 PVC riser and 15 feet of 0.010 inch, machine-slotted well screen. The well screen was capped on the bottom and installed through the augers to ensure a competent gravel pack. The gravel pack consisted of 10-20 washed silica sand which was added slowly through the augers as they were pulled upward. Once the gravel pack was extended approximately 2 feet above the well screen, 2 feet of bentonite pellet seal was installed and hydrated with five gallons of potable water. The remaining annular space was then filled with a cement/bentonite grout containing a minimum of 5% bentonite. After the borehole was grouted, an 8-inch diameter, steel, locking well protector and a 3 foot by 3 foot by 3 inch, cement well pad with three bumper posts were installed. Well-installation diagrams can be found in Appendix B.

After each well was installed well development was initiated. Each well was surged vigorously using a 1.5-inch diameter, 3-foot long, Teflon™ bailer to loosen fines within the gravel pack. Once all the fines were loosened and in suspension, a minimum of five casing volumes was removed by hand bailing. Development continued until pH, conductivity, temperature, and water clarity stabilized. Well-Development Data sheets are presented in Appendix C.

Drilling equipment, sampling tools, and well-development bailers were decontaminated prior to use at each boring location. Decontamination included cleaning all equipment with high-pressure steam or an Alconox™ solution, followed by a potable water rinse. Decontamination fluids were contained in a bermed area lined with plastic. Soil cuttings from the boreholes and well-development water were contained and stored in DOT-certified open-top drums. The drums were labeled and staged at each well location. Both soil cuttings and decontamination fluids were left on-site for disposal by EPNG.

3

3.0 RESULTS

On September 27, 1993, drilling activities began at the Blanco plant following a project health and safety meeting with EPNG plant personnel, Rodgers and Company drilling personnel, and Burlington's field representative.

3.1 Well Installation and Sample Collection

Drilling started with MW-28 located southwest and downgradient of MW-6 (See Figure 1). No evidence of hydrocarbon contamination was noted and PID readings were below instrument detection limits in the split-spoon samples. Groundwater was encountered at approximately 21 feet below ground surface (bgs). The total depth of MW-28 was 31 feet bgs.

During excavation of the flare pit, the southeast corner was highly contaminated, therefore, the second well, MW-29, was placed downgradient of this area. Water was encountered at approximately 25 feet bgs, and the total depth of the well was 35 feet bgs. No evidence of contamination was noted within the borehole and all PID readings were below instrument detection limits.

The final well, MW-30, was installed approximately 50 feet south of MW-6, adjacent to the south flare pit excavation. The well was placed so it could be used as an observation well during future pump tests. Discolored soil and hydrocarbon contamination were first observed at 13 feet and continued to 20 feet bgs. Groundwater was encountered at 24 feet bgs. PID headspace readings were:

- 200 NDUs at the 14- to 15-foot interval;
- 150 NDUs at the 17- to 18-foot interval; and
- 0 NDUs at the 23.5- to 24-foot interval.

Samples were collected from the first two intervals and submitted to EPNG's laboratory in Farmington for Total Petroleum Hydrocarbon (TPH) and benzene, toluene, ethylbenzene, and xylene (BTEX) analyses. The laboratory results are presented in Table 1. These data were provided to Burlington by EPNG. The laboratory analyses confirm the presence of hydrocarbons in soils between 14 and 18 feet bgs at MW-30. No free product was noted within the contaminated zone. PID readings are shown on the drill logs in Appendix A.

3.2 Well Development

Well development began immediately following well installation. Each well was hand bailed with a Teflon™ bailer, removing a minimum of 5 casing volumes of water. All three wells produced sufficient water to maintain hand bailing. Water clarity, pH, conductivity and temperature all stabilized prior to discontinuing development. No free product or strong hydrocarbon odor was noted during well development.

TABLE 1

Soil Sample Results from Borings Drilled for Monitoring Well MW-30

Parameter	Result (mg/kg) 14-15 ft.	Result (mg/kg) 17-18 ft.
Benzene	< 0.02	< 0.01
Toluene	0.024	< 0.01
Ethylbenzene	0.570	0.307
Total Xylenes	6.29	4.10
Total BTEX	6.88	4.41
TPH by EPA 418.1	8,700	1,800

mg/kg milligrams per kilogram

ft. feet

4.0 SUMMARY

The two monitoring wells and the observation well installed during this project currently have no free-phase floating product. All of the split-spoon samples from MW-28 and MW-29 had no evidence of contamination and PID readings were below instrument detection limits. Hydrocarbon-contaminated soil was recorded between 13 and 20 feet bgs in MW-30, adjacent to the south flare pit excavation.

APPENDIX A

RECORDS OF SUBSURFACE EXPLORATION

RECORD OF SUBSURFACE EXPLORATION

Burlington Environmental Inc.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Borehole # MW - 30
Well # MW - 30
Page 1 of 1

Project Name EPNG - Blanco South Flare Pit
Project Number 10935 Phase 2001 / 77
Project Location Bloomfield, NM

Elevation
Borehole Location MW - 30
GWL Depth 24'
Logged By Scott Pope
Drilled By Rodgers Inc.
Date/Time Started 9-28-93 / 1115
Date/Time Completed 9-28-93 / 1230

Well Logged By Scott Pope
Personnel On-Site Scott Pope
Contractors On-Site Rodgers Inc.
Client Personnel On-Site Gerry Garibay

Drilling Method HSA 6 1/4" ID
Air Monitoring Method HNU, CGI

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: NDU BZ	BH	S	Drilling Conditions & Blow Counts
0				Brown Silty SAND, fine-medium grained,						
	1	5	SS 24	trace Clay, trace Organic Matter, trace fine Gravel, moist, loose.	SM		0	0	0	
5						8.0				
	2	10	SS 24	Brown Clayey SAND, fine-medium grained, with Silt, moist, medium dense.	SC		0	0	0	-Noted evaporite filling of voids throughout.
10						13.0				
	3	15	SS 24	Gray-Dark Gray Clayey SAND, fine-medium grained, with Silt, moist, medium dense.	SC		0	2	40	-Contamination begins @ 13'. Strong hydrocarbon odor, gray discoloration.
15						18.0	0	2	50	- 18' Contamination continues
	4	20	SS 24	Gray Silty Sandy CLAY, fine-medium Sand, medium plasticity, moist, medium stiff.	CL		0	2	10	- 19' Contamination decreasing @ 20'
20						22.0				
				Brown CLAY with fine-medium Sand and Silt,	CL		0	0	1	- No odor. No visible impact.
	5	25	SS 24	Oxi stains, moist, medium stiff.		24.0				- Will set well @ 34'.
25				Brown SAND, medium-coarse grained, trace Silt, saturated, loose.	SW		0	0	0	- Saturated @24' No additional samples taken below water per Work Plan.
				Same as above based on cuttings.						
30				Brown SAND, medium-coarse grained, saturated, loose (based on cuttings).	SW		0	0	0	
				TOB - 34'						
35										
40										

Headspace (depth)	NDU
* 14 - 15'	200
17 - 18'	150
23.5 - 24'	0

Comments: * Sample collected and sent to EPNG's Lab in Farmington.

Geologist Signature Scott T. Pope

RECORD OF SUBSURFACE EXPLORATION

Burlington Environmental Inc.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Borehole # MW - 29
Well # MW - 29
Page 1 of 1

Project Name EPNG - Blanco South Flare Pit
Project Number 10935 Phase 2001 / 77
Project Location Bloomfield, NM

Elevation
Borehole Location MW - 29
GWL Depth 25'
Logged By Scott Pope
Drilled By Rodgers Inc.
Date/Time Started 9-27-93 / 1600
Date/Time Completed 9-28-93 / 0845

Well Logged By Scott Pope
Personnel On-Site Scott Pope
Contractors On-Site Rodgers Inc.
Client Personnel On-Site Gerry Garibay

Drilling Method HSA 6 1/4" ID
Air Monitoring Method HNU, CGI

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: NDU BZ	BH	S	Drilling Conditions & Blow Counts
0										
5	1	5	SS 22	Brown Silty SAND, fine-medium Sand, dry, loose.	SM		0	0	0	
10	2	10	SS 24	Same as above Trace fine Gravel, moist.			0	0	0	- Driller noted hard gravelly layer @ 9'.
15	3	15	SS 24	Same as above with Clay.			0	0	0	
						16.0				- Driller noted change @ 16'.
20	4	20	SS 18	Brown Silty CLAY, trace fine Sand, medium placticity, moist, medium stiff.	CL		0	0	0	
25	5	25	SS 22	Brown Sandy CLAY with Silt, fine-medium Sand, medium plasticity, wet at bottom, soft.			0	0	0	
	6	27	24	Brown, Clayey SAND, with Silt, fine-medium Sand, wet, loose.	SC	26	0	0	0	
						28				
30	7	30	SS 24	Brown CLAY with Silt and Sand, medium plasticity, fine-medium Sand, moist, stiff.	CL		0	0	0	
						33.0				- Checked with WLI water at 33' and rising. Will set well at 35'.
35	8	35	SS 24	Brown Sandy CLAY with Silt, fine to medium grained Sand, medium plasticity, medium stiff. TOB - 35'			0	0	0	
40										

Comments: Will stop at 25' to see if water accumulates in borehole 1700.
0720 9/28/93 No free water in borehole. Did note soupy clay on bottom. Will continue drilling.

Geologist Signature Steven T. Pope

RECORD OF SUBSURFACE EXPLORATION

Burlington Environmental Inc.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Borehole # MW - 28
Well # MW - 28
Page 1 of 1

Project Name EPNG - Blanco South Flare Pit
Project Number 10935 Phase 2001 / 77
Project Location Bloomfield, NM

Elevation
Borehole Location MW - 28
GWL Depth 20.7'
Logged By Scott Pope
Drilled By Rodgers Inc.
Date/Time Started 9-27-93 / 1230
Date/Time Completed 9-27-93 / 1415

Well Logged By Scott Pope
Personnel On-Site Scott Pope
Contractors On-Site Rodgers Inc.
Client Personnel On-Site Gerry Garibay

Drilling Method HSA 6 1/4" ID
Air Monitoring Method HNU, CGI

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: NDU BZ	BH	S	Drilling Conditions & Blow Counts
0										
5	1	5	SS 12	Brown, Silty SAND, fine-medium grained, trace Gravel, trace Organic Matter, Oxistains, dry, loose.	SM		0	0	0	
10	2	10	SS 18	Same as above, no Organics, trace Clay, moist, medium dense.			0	0	0	- Driller noted hard drilling at 8.5', out of it by 9'.
						12.0				- Noted firm drilling and clay in cuttings at 12'.
15	3	15	SS 24	Brown Silty Sandy CLAY, fine-medium Sand, trace Gravel, med. plasticity, moist, med. stiff.	CL		0	0	0	
						18.0				
20	4	20	SS 24	Brown SAND, medium-coarse grained with Clay and Silt, moist-wet, loose. Clay content decreasing with depth.	SW		0	0	0	- Water at 21'.
						23.0				- Let water accumulate in hole. Water came up to 20.7'.
25	5	25	SS 24	Brown SAND, coarse grained, trace Silt, saturated, loose.	SP		0	0	0	
30	6	30	SS 24	Same as above, trace Gravel.			0	0	0	
				TOB - 31'						
35										
40										

Comments: Will set well at 31'.

Geologist Signature Scott T. Pope

APPENDIX B

WELL INSTALLATION DIAGRAMS

MONITORING WELL INSTALLATION RECORD

Burlington Environmental Inc.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Borehole # MW-30
Well # MW-30
Page 1 of 1

Project Name EPNG BLANCO SOUTH FLARE
Project Number 10935 Phase 2001
Project Location BLOOMFIELD, NM

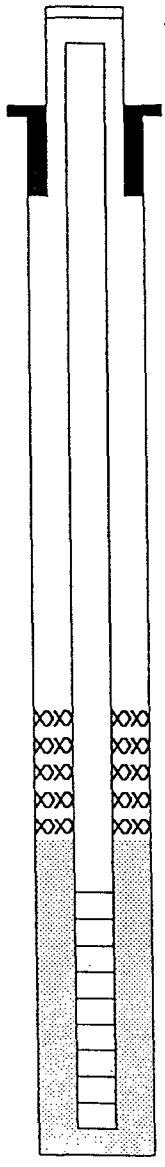
Elevation
Well Location BLANCO SOUTH FLARE
GWL Depth 24'
Installed By RODGERS INC.

Date/Time Started 9/28/93 1230
Date/Time Completed 9/28/93 1400

On-Site Geologist S. POPE
Personnel On-Site S. POPE
Contractors On-Site RODGERS INC.
Client Personnel On-Site GERRY GARIBAY

Depths in Reference to Ground Surface

Item	Material	Depth (feet)
Top of Protective Casing	8" STEEL	+2.8
Bottom of Protective Casing		-1.2
Top of Permanent Borehole Casing		N/A
Bottom of Permanent Borehole Casing		N/A
Top of Concrete	PREMIX	+.3
Bottom of Concrete		0.0
Top of Grout	5% BENTONITE	0.0
Bottom of Grout		-17.0
Top of Well Riser	4" SCH 40 PVC	+2.5
Bottom of Well Riser		-18.8
Top of Well Screen	4" SCH 40 PVC	-18.8
Bottom of Well Screen	.010 SLOT	-34.0
Top of Peltonite Seal	1/4" BENTONITE PELLETS	-15.0
Bottom of Peltonite Seal		-17.0
Top of Gravel Pack	10-20 SILICA	-17.0
Bottom of Gravel Pack		-34.0
Top of Natural Cave-In		N/A
Bottom of Natural Cave-In		N/A
Top of Groundwater		-24.0
Total Depth of Borehole		-34.0



Top of Protective Casing +2.8
Top of Riser +2.5
Ground Surface 0.0
Top of Seal -15.0
Top of Gravel Pack -17.0
Top of Screen -18.8
Bottom of Screen -34.0
Bottom of Borehole -34.0

Comments: 6 BAGS OF SAND, 1.5 BUCKETS OF PELLETS
WELL WAS LOCKED IN AUGERS AND PULLED UP 2" BUT WAS PUSHED BACK TO 34".

Geologist Signature Scott T. Pope

MONITORING WELL INSTALLATION RECORD

Burlington Environmental Inc.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Borehole # MW-29
Well # MW-29
Page 1 of 1

Project Name EPNG BLANCO SOUTH FLARE
Project Number 10935 Phase 2001
Project Location BLOOMFIELD, NM

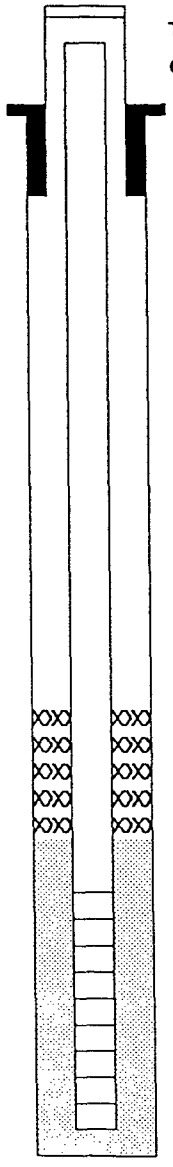
Elevation
Well Location MW-29
GWL Depth 25'
Installed By RODGERS, INC.

Date/Time Started 9/28/93 0845
Date/Time Completed 9/28/93 1015

On-Site Geologist S. POPE
Personnel On-Site S. POPE
Contractors On-Site RODGERS, INC.
Client Personnel On-Site GERRY GARIBAY

Depths in Reference to Ground Surface

Item	Material	Depth (feet)
Top of Protective Casing	8" STEEL	+2.6
Bottom of Protective Casing		-1.4
Top of Permanent Borehole Casing		N/A
Bottom of Permanent Borehole Casing		N/A
Top of Concrete	PREMIX	+.3
Bottom of Concrete		0.0
Top of Grout	5% BENTONITE	0.0
Bottom of Grout		-15.5
Top of Well Riser	4" SCH 40 PVC	+2.3
Bottom of Well Riser		-19.6
Top of Well Screen	4" SCH 40 PVC	-19.6
Bottom of Well Screen	.010 SLOT	-35.0
Top of Peltonite Seal	1/4" BENTONITE PELLETS	-15.5
Bottom of Peltonite Seal		-17.5
Top of Gravel Pack	10-20 SILICA	-17.5
Bottom of Gravel Pack		-35.0
Top of Natural Cave-In		N/A
Bottom of Natural Cave-In		N/A
Top of Groundwater		-25.0
Total Depth of Borehole		-35.0



Top of Protective Casing +2.6
Top of Riser +2.3
Ground Surface 0.0
Top of Seal -15.5
Top of Gravel Pack -17.5
Top of Screen -19.6
Bottom of Screen -35.0
Bottom of Borehole -35.0

Comments: 5 BAGS OF SAND, 1½ BUCKETS OF PELLETS

Geologist Signature Scott T. Pope

JAL_MW2.WK1

MONITORING WELL INSTALLATION RECORD

Burlington Environmental Inc.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Borehole # MW-28
Well # MW-28
Page 1 of 1

Project Name EPNG BLANCO SOUTH FLARE
Project Number 10935 Phase 2001
Project Location BLOOMFIELD, NM

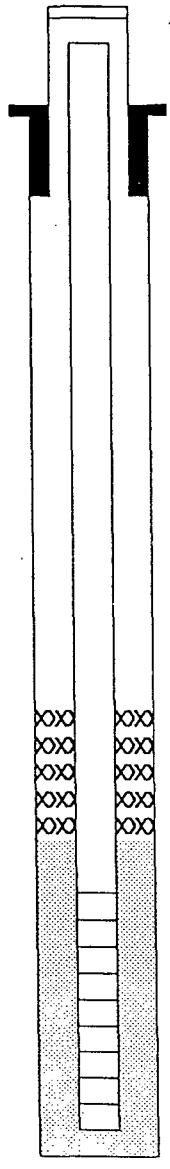
Elevation
Well Location MW-28
GWL Depth 20.7
Installed By RODGERS, INC.

Date/Time Started 9/27/93 1415
Date/Time Completed 9/27/93 1545

On-Site Geologist S. POPE
Personnel On-Site S. POPE
Contractors On-Site RODGERS, INC.
Client Personnel On-Site GERRY GARIBAY

Depths in Reference to Ground Surface

Item	Material	Depth (feet)
Top of Protective Casing	8" STEEL	+2.8
Bottom of Protective Casing		-1.2
Top of Permanent Borehole Casing		N/A
Bottom of Permanent Borehole Casing		N/A
Top of Concrete	PREMIX	+.3
Bottom of Concrete		0.0
Top of Grout	5% BENTONITE	0.0
Bottom of Grout		-12.0
Top of Well Riser	4" SCH 40 PVC	+2.5
Bottom of Well Riser		-15.0
Top of Well Screen	4" SCH 40 PVC	-15.8
Bottom of Well Screen	.010 SLOT	-31.0
Top of Peltonite Seal	1/4" BENTONITE PELLETS	-12.0
Bottom of Peltonite Seal		-14.0
Top of Gravel Pack	10-20 SILICA	-14.0
Bottom of Gravel Pack		-31.0
Top of Natural Cave-In		N/A
Bottom of Natural Cave-In		N/A
Top of Groundwater		-20.7
Total Depth of Borehole		-31.0



Top of Protective Casing +2.8
Top of Riser +2.5
Ground Surface 0.0
Top of Seal -12.0
Top of Gravel Pack -14.0
Top of Screen -15.8
Bottom of Screen -31.0
Bottom of Borehole -31.0

Comments: 5 BAGS OF SAND, 1½ BUCKETS OF PELLETS

Geologist Signature Scott T. Pope

JAL_MW2.WK1

APPENDIX C

WELL DEVELOPMENT DATA SHEETS

WELL DEVELOPMENT & PURGING

BURLINGTON ENVIRONMENTAL

GENERAL DATA

SERIAL NO. WD _____
PAGE ___ OF ___

PROJECT NAME BLANCO WELL NO. MW-28
PROJECT NO. 10935 MAJOR TASK 2002 SUB TASK 77
DATE 9-28-93 FORM COMPLETED BY WILL A. SMITH

WELL CONSTRUCTION

TOTAL DEPTH (FT) 33.5' BOREHOLE DIAMETER (IN) 10"
GRAVEL PACK INTERVAL (FT) 17' WELL DIAMETER INSIDE (IN) 4"
WELL PROTECTOR: X YES ___ NO PADLOCK NO. 2532
QUANTITY OF FLUID INJECTED DURING DRILLING (GALLONS) N/A

WATER VOLUME CALCULATION

DATE OF MEASUREMENT 9-28-93
MEASURING POINT TOR ELEV. _____
WATER LEVEL INSTRUMENT USED SOLINST
INITIAL WATER LEVEL (FT) 23.12
LINEAR FEET OF WATER 10.38
LINEAR FEET SATURATED GRAVEL PACK 10.38

ITEM	WATER VOLUME	
	FT^3	GAL
WELL CASING		6.78
GRAVEL PACK		—
DRILLING FLUIDS		—
TOTAL		6.78

NOTE: QUANTITIES ARE TO BE CALCULATED PRIOR TO DEVELOPMENT.

DEVELOPMENT CRITERIA

METHOD OF DEVELOPMENT TEFLON BAILER
WATER QUALITY MEASUREMENTS X YES ___ NO
WELL VOLUME (ANNULUS) (GAL) N/A WELL CASING VOLUME (PIPE) (GAL) 6.78
WATER VOLUME TO BE REMOVED (GAL) MINIMUM 33.90 MAXIMUM 67.8

NOTE: DEVELOPMENT IS TO BE PERFORMED IN ACCORDANCE WITH PROJECT-SPECIFIC WELL DEVELOPMENT PLAN.

WATER QUALITY INSTRUMENTS

DATE	INSTRUMENT	SERIAL NO.	CALIBRATION PERFORMED (/)	TECH	COMMENTS
9-28-93	HYDAC - CONDUCTIVITY TEMP. PH TESTER		✓	W.S.	

COMMENTS _____

WELL DEVELOPMENT & PURGING

BURLINGTON ENVIRONMENTAL

GENERAL DATA

SERIAL NO. WD _____
PAGE ___ OF ___

PROJECT NAME BLANCO SOUTH FLARE WELL NO. MW-29
PROJECT NO. 10935 MAJOR TASK 2002 SUB TASK 77
DATE 9/28/93 FORM COMPLETED BY ROBERT THOMPSON

WELL CONSTRUCTION

TOTAL DEPTH (FT) 37.11 BOREHOLE DIAMETER (IN) 10"
GRAVEL PACK INTERVAL (FT) 17' WELL DIAMETER INSIDE (IN) 4"
WELL PROTECTOR: X YES ___ NO PADLOCK NO. 0532
QUANTITY OF FLUID INJECTED DURING DRILLING (GALLONS) N/A

WATER VOLUME CALCULATION

DATE OF MEASUREMENT 9.28.93
MEASURING POINT TOR ELEV. _____
WATER LEVEL INSTRUMENT USED SOUNST
INITIAL WATER LEVEL (FT) 26.40
LINEAR FEET OF WATER 10.71
LINEAR FEET SATURATED GRAVEL PACK 10.71

ITEM	WATER VOLUME	
	FT³	GAL
WELL CASING		6.99
GRAVEL PACK		—
DRILLING FLUIDS		—
TOTAL		6.99

NOTE: QUANTITIES ARE TO BE CALCULATED PRIOR TO DEVELOPMENT.

DEVELOPMENT CRITERIA

METHOD OF DEVELOPMENT TEFLON BAILER
WATER QUALITY MEASUREMENTS X YES ___ NO
WELL VOLUME (ANNULUS) (GAL) N/A WELL CASING VOLUME (PIPE) (GAL) 6.99
WATER VOLUME TO BE REMOVED (GAL) MINIMUM 34.95 MAXIMUM 69.9

NOTE: DEVELOPMENT IS TO BE PERFORMED IN ACCORDANCE WITH PROJECT-SPECIFIC WELL DEVELOPMENT PLAN.

WATER QUALITY INSTRUMENTS

DATE	INSTRUMENT	SERIAL NO.	CALIBRATION PERFORMED (/)	TECH	COMMENTS
9.28.93	HYDAC CONDUCTIVITY, TEMP., PH, TESTER		✓	R.T.	

COMMENTS _____

WELL DEVELOPMENT & PURGING

BURLINGTON ENVIRONMENTAL

GENERAL DATA

SERIAL NO. WD _____
PAGE 1 OF 1

PROJECT NAME BLANCO SOUTH FLARE WELL NO. MW-30
PROJECT NO. 16935 MAJOR TASK 2002 SUB TASK 77
DATE 9/29/93 FORM COMPLETED BY ROBERT THOMPSON

WELL CONSTRUCTION

TOTAL DEPTH (FT) 36.64 BOREHOLE DIAMETER (IN) 10"
GRAVEL PACK INTERVAL (FT) 17' WELL DIAMETER INSIDE (IN) 4"
WELL PROTECTOR: X YES ___ NO PADLOCK NO. 2532
QUANTITY OF FLUID INJECTED DURING DRILLING (GALLONS) N/A

WATER VOLUME CALCULATION

DATE OF MEASUREMENT 9.29.93
MEASURING POINT TOR ELEV. _____
WATER LEVEL INSTRUMENT USED SOLINST
INITIAL WATER LEVEL (FT) 25.63
LINEAR FEET OF WATER 11.01
LINEAR FEET SATURATED GRAVEL PACK 11.01

ITEM	WATER VOLUME FT³	WATER VOLUME GAL
WELL CASING		7.18
GRAVEL PACK		—
DRILLING FLUIDS		—
TOTAL		7.18

NOTE: QUANTITIES ARE TO BE CALCULATED PRIOR TO DEVELOPMENT.

DEVELOPMENT CRITERIA

METHOD OF DEVELOPMENT TEFLON BAILER
WATER QUALITY MEASUREMENTS X YES ___ NO
WELL VOLUME (ANNULUS) (GAL) N/A WELL CASING VOLUME (PIPE) (GAL) 7.18
WATER VOLUME TO BE REMOVED (GAL) MINIMUM 35.90 MAXIMUM 71.8

NOTE: DEVELOPMENT IS TO BE PERFORMED IN ACCORDANCE WITH PROJECT-SPECIFIC WELL DEVELOPMENT PLAN.

WATER QUALITY INSTRUMENTS

DATE	INSTRUMENT	SERIAL NO.	CALIBRATION PERFORMED (/)	TECH	COMMENTS
9.29.93	HYDAC CONDUCTIVITY, TEMP., PH, TESTER		✓	RT.	

COMMENTS _____

APPENDIX D

ANALYTICAL RESULTS

El Paso Natural Gas Company

MEMORANDUM

TO: (Distribution)

DATE: October 8, 1993

FROM: John Lambdin

PLACE: Field Services
Engineering Lab

Project: Blanco Plant, New Monitor Well Soil Results

On September 28, 1993 the Farmington Field Services Engineering Laboratory collected three (3) soil samples from the new monitor well (MW-30) located at Blanco Plant. The soils were collected when hydrocarbon contamination was encountered during drilling. The samples were assigned Field Services Laboratory numbers N31025 to N31027. Sample N31026 was a field duplicate for QA/QC purposes.

The samples were analyzed by our lab for BTEX in accordance with EPA Method 8020 (BTEX) and TPH in accordance with EPA method 418.1 modified to accommodate soil samples. Enclosed you will find copies of all analytical reports as well as any QA/QC reports required for these methods of analysis.

The NMOCD limits for petroleum hydrocarbons in soil are Benzene <10 MG/KG, Total BTEX <50 and TPH <100 MG/KG. The samples tested were found to contain less than the limit for all components except TPH.

Please let me know, if you have any questions.

John Lambdin

Distribution:

David Hall
Nancy Prince
Anu Pundari
Results Log Book
File
Scott Pope

Enclosures

El Paso Natural Gas Company

FIELD SERVICES LABORATORY
ANALYTICAL REPORT

SAMPLE IDENTIFICATION

SAMPLE NUMBER:	N31025
MATRIX:	Soil
SAMPLE DATE:	28-Sep-93
SAMPLE TIME (Hrs.):	1245
SAMPLED BY:	Dennis Bird
PROJECT:	Blanco Plant Monitor Well Installation
FACILITY ID:	5200
SAMPLE LOCATION:	South Flare Pit, MW-30
SAMPLE POINT:	14 - 15 Foot Level
DATE OF ANALYSIS:	5-Oct-93

REMARKS: The sample's chromatogram indicates additional late eluting Hydrocarbons.

EPA Method 8020 (BTEX) and Method 418.1 (TPH) RESULTS

PARAMETER	RESULT MG/KG	QUALIFIER	LIMIT MG/KG
BENZENE	<0.02	None	10
TOLUENE	0.024	None	None
ETHYLBENZENE	0.570	None	None
TOTAL XYLENES	6.29	None	None
TOTAL BTEX	6.88	None	50
TPH by EPA 418.1	8,700	D1	100
PERCENT SOLIDS	86		
SURROGATE % RECOVERY	78	Allowed Range 80 to 120 %	

NOTES:

The "D1" Qualifier incicates that the analyte concentration in the sample exceeded the method calibration curve limit. The surrogate % recovery is low due to matrix interference from late eluting hydrocarbons.

Approved By: _____ 8-Oct-93

Date

El Paso Natural Gas Company

FIELD SERVICES LABORATORY
ANALYTICAL REPORT

SAMPLE IDENTIFICATION

SAMPLE NUMBER: N31026 Field Duplicate
MATRIX: Soil
SAMPLE DATE: 28-Sep-93
SAMPLE TIME (Hrs.): 1245
SAMPLED BY: Dennis Bird
PROJECT: Blanco Plant Monitor Well Installation
FACILITY ID: 5200
SAMPLE LOCATION: South Flare Pit, MW-30
SAMPLE POINT: 14 - 15 Foot Level
DATE OF ANALYSIS: 5-Oct-93

REMARKS: The sample's chromatogram indicates additional late eluting Hydrocarbons.

EPA Method 8020 (BTEX) and Method 418.1 (TPH) RESULTS

PARAMETER	RESULT MG/KG	QUALIFIER	LIMIT MG/KG
BENZENE	<0.02	None	10
TOLUENE	0.020	None	None
ETHYLBENZENE	0.525	None	None
TOTAL XYLENES	6.73	None	None
TOTAL BTEX	7.28	None	50
TPH by EPA 418.1	7,800	D1	100
PERCENT SOLIDS	86		
SURROGATE % RECOVERY	81	Allowed Range 80 to 120 %	

NOTES:

The "D1" Qualifier incicates that the analyte concentration in the sample exceeded the method calibration curve limit. The surrogate % recovery is low due to matrix interference from late eluting hydrocarbons.

Approved By: John Kalch

8-Oct-93
Date

El Paso Natural Gas Company

FIELD SERVICES LABORATORY
ANALYTICAL REPORT

SAMPLE IDENTIFICATION

SAMPLE NUMBER:	N31027
MATRIX:	Soil
SAMPLE DATE:	28-Sep-93
SAMPLE TIME (Hrs.):	1252
SAMPLED BY:	Dennis Bird
PROJECT:	Blanco Plant Monitor Well Installation
FACILITY ID:	5200
SAMPLE LOCATION:	South Flare Pit, MW-30
SAMPLE POINT:	17 - 18 Foot Level
DATE OF ANALYSIS:	5-Oct-93

REMARKS: The sample's chromatogram indicates additional late eluting Hydrocarbons.

EPA Method 8020 (BTEX) and Method 418.1 (TPH) RESULTS

PARAMETER	RESULT MG/KG	QUALIFIER	LIMIT MG/KG
BENZENE	<0.01	None	10
TOLUENE	<0.01	None	None
ETHYLBENZENE	0.307	None	None
TOTAL XYLENES	4.10	D1	None
TOTAL BTEX	4.41	None	50
TPH by EPA 418.1	1,800	None	100
PERCENT SOLIDS	74		
SURROGATE % RECOVERY	73	Allowed Range 80 to 120 %	

NOTES:

The "D1" Qualifier incicates that the analyte concentration in the sample exceeded the method calibration curve limit. The surrogate % recovery is low due to matrix interference from late eluting hydrocarbons.

Approved By: _____ 8-Oct-93
Date

QUALITY CONTROL REPORT

EPA METHOD 8020 - BTEX

Samples: N31025 to N31029, and 3-04A17-2-V-01

LABORATORY DUPLICATES:

SAMPLE NUMBER N31029	TYPE	SAMPLE RESULT (S) (PPB/KG)	DUPLICATE RESULT (D) (PPB/KG)	RPD	ACCEPTABLE RANGE < 20% YES	NO
Benzene	2nd Run	<0.01	<0.01	0.0	X	
Toluene	2nd Run	<0.01	<0.01	0.0	X	
Ethylbenzene	2nd Run	<0.01	<0.01	0.0	X	
Total Xylenes	2nd Run	<0.01	<0.01	0.0	X	

Narrative: Acceptable!

LABORATORY CONTROL, CALIBRATION CHECK:

SAMPLE NUMBER 100 PPB Standard	TYPE	KNOWN RESULT (PPB)	FOUND RESULT (PPB)	%R	ACCEPTABLE RANGE 75 - 125 % YES	NO
Benzene	Standard	100.0	105.1	105.1	X	
Toluene	Standard	100.0	103.9	103.9	X	
Ethylbenzene	Standard	100.0	103.6	103.6	X	
Total Xylenes	Standard	300.0	320	106.7	X	

Narrative: Acceptable!

LABORATORY SPIKES:

SAMPLE NUMBER N31029	SPIKE ADDED (SA) PPB	SAMPLE RESULT (S) (PPB)	SPIKE SAMPLE RESULT (SR) (PPB)	%R	ACCEPTABLE RANGE 65-135.5% YES	NO
Benzene	100.0	0.0	100.9	101	X	
Toluene	100.0	0.0	97.4	97	X	
Ethylbenzene	100.0	0.0	98.2	98	X	
Total Xylenes	300.0	0.0	290	97	X	

Narrative: Acceptable.

LABORATORY AND TRIP BLANKS:

SAMPLE ID	SOURCE	Component (PPB)	STATUS
Benzene	EPNG Water	<2.0	ACCEPTABLE
Toluene	EPNG Water	<2.0	ACCEPTABLE
Ethylbenzene	EPNG Water	<2.0	ACCEPTABLE
Total Xylenes	EPNG Water	<2.0	ACCEPTABLE

Narrative: Acceptable!

Approved By: _____

10/7/93

Date

QUALITY CONTROL REPORT
TPH by Modified 418.1 by Infrared
Samples N31025 to N31029, N31048, 3-04A17-2-V-01

LABORATORY CONTROL SAMPLES: CALIBRATION CHECKS

SAMPLE ID	SOURCE	TRUE VALUE (PPM)	FOUND (MG/KG)	%R	ACCEPTABLE RANGE 75-125 %R YES	NO
INITIAL CALIBRATION VERIF. "B" Heavy Oil (Lot MOR9480)	HORIBA	200.0	235.0	117.5	X	

Narrative: Acceptable.

LABORATORY AND FIELD DUPLICATES:

SAMPLE NUMBER	TYPE	SAMPLE RESULT (S)MG/KG	DUPLICATE RESULT (D)MG/KG	RPD	ACCEPTABLE RANGE +/- 35% YES	NO
N31029/N31029D	2nd Extract	<10	<10	0	X	

Narrative : Acceptable.

LABORATORY SPIKES:

SAMPLE NUMBER	SPIKE ADDED (SA)MG/KG	SAMPLE RESULT (S)MG/KG	SPIKE SAMPLE RESULT (SR)MG/KG	%R	ACCEPTABLE RANGE 75-125 %R YES	NO
N31029/N31029S	2850	0	3378	119	X	

Narrative: Acceptable.

REFERENCE SOIL (Laboratory Control Sample):

SAMPLE ID	SOURCE	KNOWN VALUE (MG/KG)	SAMPLE RESULT FOUND (MG/KG)	RPD	ACCEPTABLE RANGE +/- 35% YES	NO
ERA TPH STANDARD #1 LOT # 91022	ENVIRONMENTAL RESOURCE ASS.	1820	2149	16.6	X	
ERA TPH STANDARD #2 w/int LOT # 91016	ENVIRONMENTAL RESOURCE ASS.	1450	1488	2.6	X	

Narrative: Acceptable.

LABORATORY REAGENT BLANK:

SAMPLE ID	SOURCE	TPH LEVEL (MG/KG)	STATUS
Freon Solvent	HORIBA	<10.0	ACCEPTABLE
Reagent Blank	EPNG Lab	<10.0	ACCEPTABLE

Narrative: Acceptable.

Approved By: _____ 10/7/93
Date

El Paso Natural Gas Company

CHAIN OF CUSTODY RECORD

Project No.	Project Name			Total No. of Containers	Chain of Custody Seals	Intact?	Requested Analysis					Contract Laboratory
	BLANCO PLANT						Composite or Grab	See Attached	TPH	BTXE		EL PASO NATURAL GAS CO.
Samplers: (Signature)		Date	Receiving Temp. (°F)									770 WEST NAVAJO
Dennis Bird		9-28-93										FARMINGTON N.M.
Lab ID	Date	Time	Matrix	Sample Number								Remarks
	9-28-93	1245	SOIL	N31025					X	X		MW-30 14-15 FEET
	9-28-93	1245	SOIL	N31026					X	X		MW-30 14-15 FEET FIELD DU
	9-28-93	1252	SOIL	N31027					X	X		MW-30 17-18 FEET

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Dennis Bird	9-28-93 1745				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks:	
		Richard Boucher	9/28/93 1752		
Results & Invoices to::		Charge Code		Date Results Reported / by: (Signature)	

WHITE-Testing Laboratory YELLOW-EPNG Lab PINK-Field Sampler

san juan repro Form 7