

3R - 207

# REPORTS

DATE:

2000



**Certified Mail:** #7000 1670 0012 7260 6739

February 26, 2001

Mr. William C. Olson  
New Mexico Oil Conservation Division  
1220 St. Francis Dr.  
Santa Fe, NM 87504

**RECEIVED**

FEB 28 2001

ENVIRONMENTAL BUREAU  
OIL CONSERVATION DIVISION

**RE: 2000 Pit Project Annual Groundwater Report**

Dear Mr. Olson:

In accordance with reporting requirements, El Paso Field Services (EPFS) has enclosed annual updates for the 32 remaining groundwater impacted sites that were identified during our pit closure project of 1994 / 1995.

Of the 32 reports (Volumes 1-4), EPFS hereby requests closure of six sites. The six sites EPFS is requesting closure on are presented in one separate binder entitled "San Juan Basin Pit Closures, El Paso Field Services, Pit Closure Reports". Four of the six sites were submitted in last years report and a decision has not been made on closure. The remaining two sites have been submitted in previous years and denied closure.

The Jaquez Com. C #1 and Jaquez Com. E #1 site is not included in with this years report and will be submitted by the required deadline of April 1, 2001

EPFS has also included for your information six Navajo sites in a separate binder.

If you have any questions concerning the enclosed reports or closure requests, please call me at (505) 599-2124.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Scott T. Pope', written over a horizontal line.

Scott T. Pope P.G.  
Senior Environmental Scientist

xc: Mr. Denny Foust, NMOCD, Aztec - w / enclosures; **Certified Mail # 7000 1670 0012 7260 6722**  
Mr. Bill Liesse, BLM - w / enclosures (federal sites only), **Certified Mail # 7000 1670 0012 7260 6715**

10

**SAN JUAN BASIN PIT CLOSURES**  
**San Juan Basin, New Mexico**

**El Paso Field Services**  
**Pit Project Groundwater Report**  
**Annual Report**  
**Volume I**

**March 2001**

**Prepared For**

**El Paso Field Services**  
**Farmington, New Mexico**

**Project 62800398**



207

# EPFS GROUNDWATER PITS

## 2000 ANNUAL GROUNDWATER REPORT

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**KNIGHT #1**  
**Meter/Line ID - 72556**

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### SITE DETAILS

|                                 |           |        |                |
|---------------------------------|-----------|--------|----------------|
| Legals - Twn: 30N               | Rng: 13 W | Sec: 5 | Unit: A        |
| NMOCD Hazard Ranking: 30        |           |        | Land Type: FEE |
| Operator: FULLER PETROLEUM INC. |           |        |                |

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### PREVIOUS ACTIVITIES

|                                      |                            |                     |
|--------------------------------------|----------------------------|---------------------|
| Site Assessment: Jan-95              | Excavation: Jan-95 (60 cy) | Soil Boring: Oct-95 |
| Monitor Well: Oct-95                 | Downgradient MW's: Dec-95  | Nutrients: Nov-96   |
| Quarterly Sampling Initiated: Apr-96 |                            |                     |
| Additional Monitor Well: Nov-00      |                            |                     |

### 2000 ACTIVITIES

**Groundwater Monitoring** – Annual sampling was performed during April of 2000.

**Monitor Well Installation** – Localized surface recharge conditions appear to influence the groundwater gradient at this site. The topography and location of the La Plata River directed the placement of the fifth monitor well east of MW-3. The additional well, MW-5, was drilled based on the recommendations in the 1999 Annual Report.

### SUMMARY TABLES

Groundwater analytical data are presented in Table 1 and Figures 1 and 2. Copies of the laboratory data sheets and associated quality assurance/quality control data are presented as Attachment 1.

### SITE MAP

A site map with groundwater elevations and gradients are presented in Figures 1 and 2.

**Site Map Revision-** Please note that markings on monitor wells MW-3 and MW-4 were reversed in the field, therefore the analytical data associated with each well has been reversed to reflect the proper conditions.

### GEOLOGIC LOGS AND WELL COMPLETION DIAGRAMS

Drilling activities were conducted on November 14, 2000, and the geologic logs and well completion diagrams are presented in Attachment 2.

### DISPOSITION OF GENERATED WASTES

There were no wastes generated at this site in 2000.

### ISOCONCENTRATION MAPS

Isoconcentration maps were generated for benzene, toluene, ethyl benzene, and total xylenes and are included as Figures 3 - 6.

### CONCLUSIONS

Based on groundwater levels collected from four groundwater monitor wells in April and the five groundwater monitor wells in November, the groundwater flow exhibits a trend towards the south.

## **EPFS GROUNDWATER PITS 2000 ANNUAL GROUNDWATER REPORT**

Site topography and proximity to the La Plata River indicate that groundwater should veer east. A small arroyo is located just south of MW-2 and leads east towards the La Plata River. Contiguous to the arroyo, south of MW-2, is a considerable irrigated field that appears to contribute to the localized surface recharge conditions that potentially influences the groundwater gradient at this site.

The off-site groundwater monitor well, MW-5, did not effect the direction of the groundwater gradient, but does demonstrate the edge of hydrocarbon constituents in the groundwater does not extend east of monitor well MW-3. Isoconcentration maps show elevated levels of benzene, ethyl benzene, and total xylenes located in the former pit area.

### **RECOMMENDATIONS**

- EPFS proposes to conduct nutrient injection in monitor well MW-1 to enhance natural and bioremediation in the former pit.
- EPFS proposes to continue annual monitoring at the site until BTEX levels are below the NMWQCC groundwater standards, then conduct quarterly sampling for closure.
- EPFS will continue to work with the operator at this site.

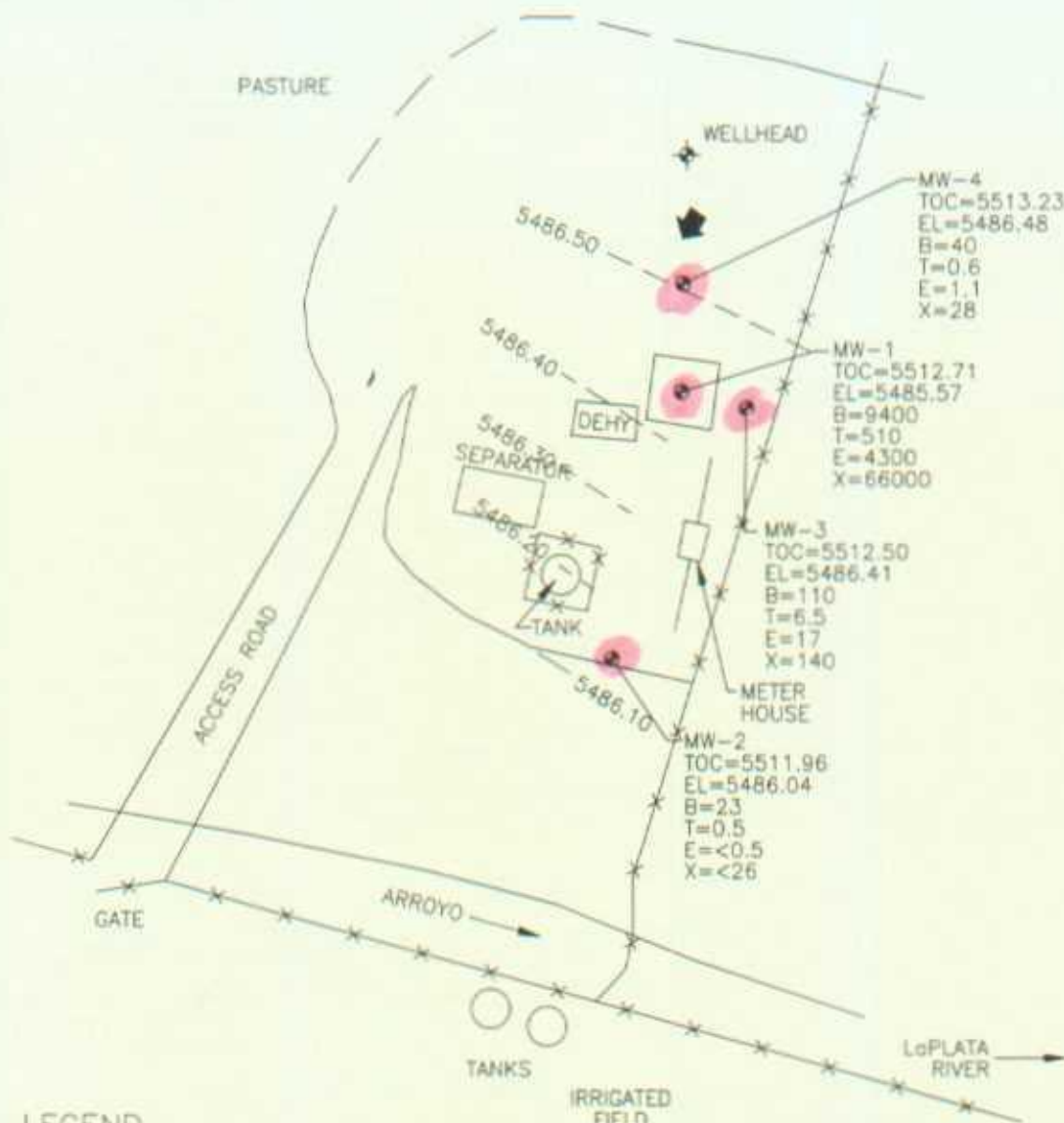
EPFS Groundwater Pits  
2000 Groundwater Report

Table 1

March 2001

| Sample #     | Meter /<br>Line # | Site Name | Sample<br>Date | MW<br># | Project               | Benzene<br>(PPB) | Toluene<br>(PPB) | Ethyl<br>Benzene<br>(PPB) | Total<br>Xylenes<br>(PPB) | Total<br>BTEX<br>(PPB) |
|--------------|-------------------|-----------|----------------|---------|-----------------------|------------------|------------------|---------------------------|---------------------------|------------------------|
| KNI-0004-MW1 | 72556             | KNIGHT #1 | 04/19/2000     | 1       | Sample 1 - 11th Event | = 9,400          | = 510            | = 4,300                   | = 66,000                  | 80,210                 |
| KNI-0004-MW2 | 72556             | KNIGHT #1 | 04/19/2000     | 2       | Sample 1 - 11th Event | = 23             | = 0.5            | < 0.5                     | = 26                      | 49.5                   |
| KNI-0004-MW3 | 72556             | KNIGHT #1 | 04/19/2000     | 3       | Sample 1 - 11th Event | = 110            | = 6.5            | = 17                      | = 140                     | 273.5                  |
| KNI-0004-MW4 | 72556             | KNIGHT #1 | 04/19/2000     | 4       | Sample 1 - 11th Event | = 40             | = 0.6            | = 1.1                     | = 28                      | 69.7                   |
| KNI-0011-MW5 | 72556             | KNIGHT #1 | 11/15/2000     | 5       | Sample 1 - 11th Event | < 0.5            | < 0.5            | < 0.5                     | < 0.5                     | ND                     |

ND = No detectable levels  
Sample 1 - Annual Sampling



# LEGEND

- MW-1 APPROXIMATE MONITORING WELL LOCATION AND NUMBER
- TOC TOP OF CASING ELEVATION
- EL GROUNDWATER ELEVATION
- B BENZENE (ug\L)
- T TOLUENE (ug\L)
- E ETHYL BENZENE (ug\L)
- X XYLENE (ug\L)
- 77.3 GROUNDWATER POTENTIOMETRIC SURFACE
- ug\L MICROGRAMS PER LITER
- APPROXIMATE GROUNDWATER GRADIENT

NOTE: Well locations are to scale, relative to each other. The surface features are not to scale.

0 40  
FEET



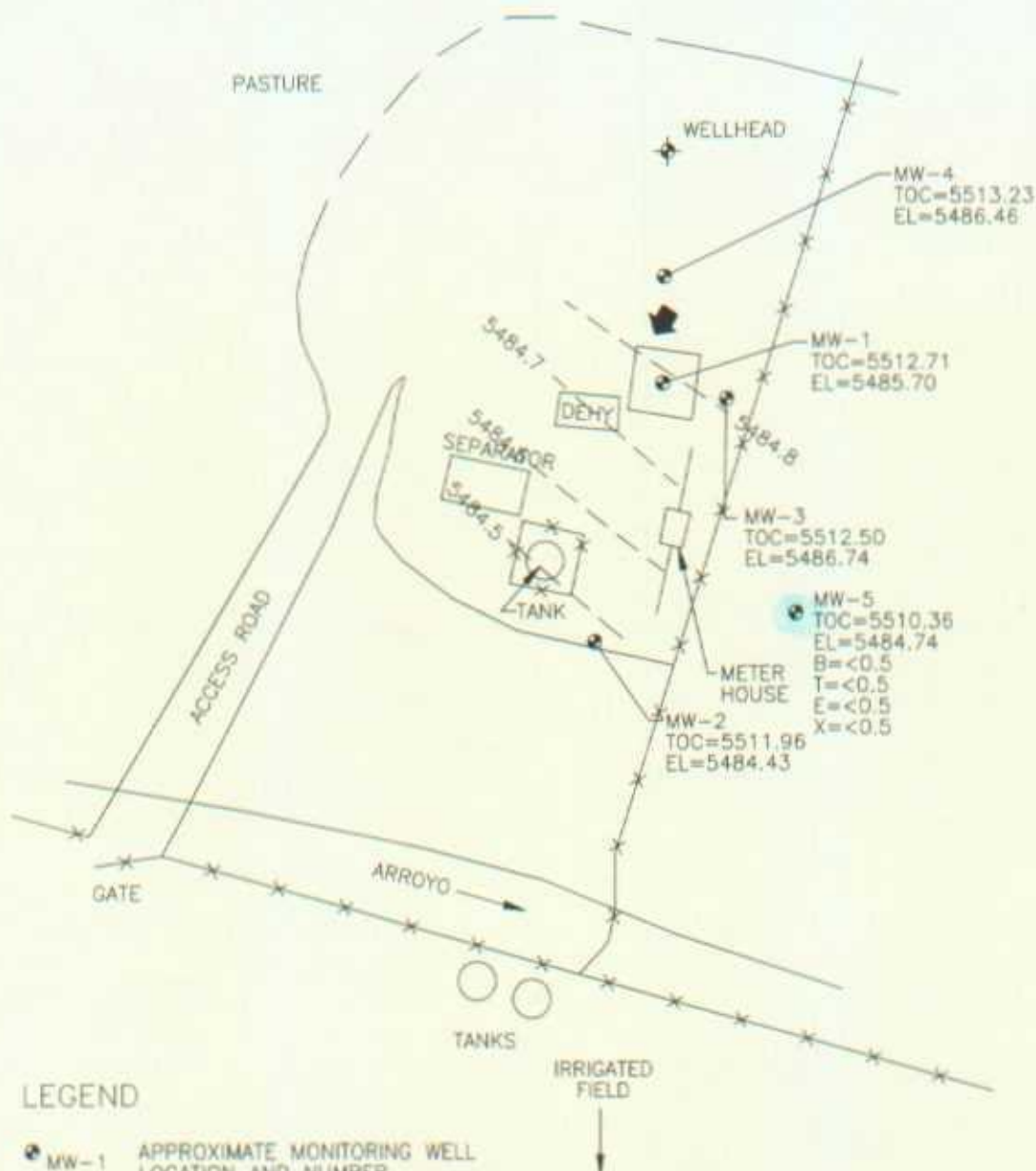
TITLE:  
KNIGHT #1  
METER 72556  
APRIL 19, 2000

DRP: TMM  
CHKD: LW  
DATE: 2/19/01

DES: LW  
APPR: MN  
REV: 0

PROJECT NO.: 62800219  
EPFS GW PITS

FIGURE 1



TITLE:

KNIGHT #1

METER 72556

NOVEMBER 15, 2000

DWN: TMM

CHKD: LW

DATE: 2/19/01

DES: LW

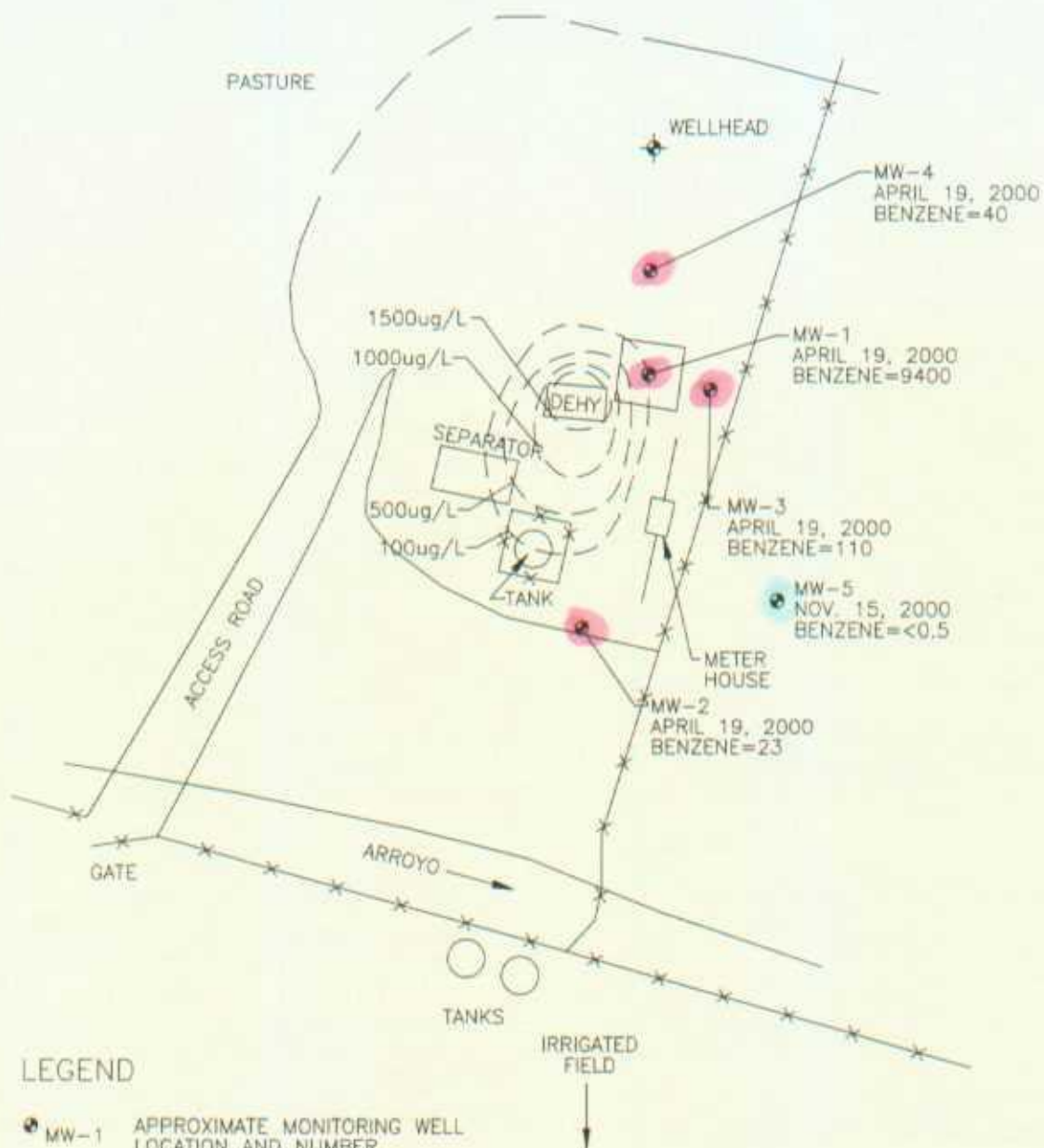
APPD: MN

REV: 0

PROJECT NO.: 62800219

EPFS GW PITS

FIGURE 2



# LEGEND

- MW-1 APPROXIMATE MONITORING WELL LOCATION AND NUMBER
- B BENZENE (ug/L)
- 77.3 GROUNDWATER POTENTIOMETRIC SURFACE
- ug/L MICROGRAMS PER LITER

0 40  
FEET

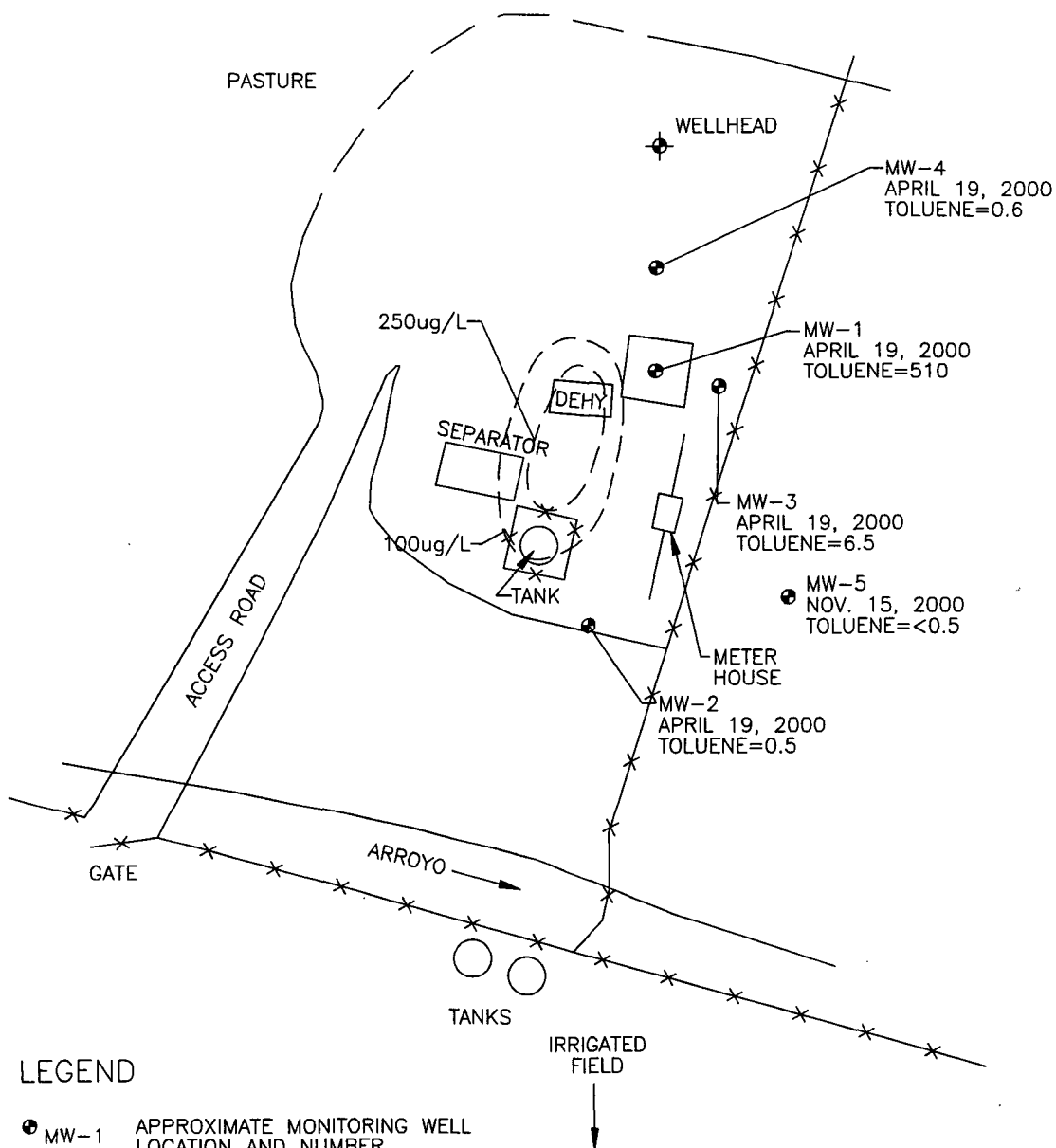


TITLE:  
KNIGHT #1 - METER 72556  
NOV. 15, 2000 ISOCONCENTRATION  
MAP - BENZENE

DATE: 2/20/01  
DESIGN: TMM  
CHECKED: LW  
APPROVED: MN  
REV: 0

PROJECT NO.: 62800219  
EPFS GW PITS

FIGURE 3



# LEGEND

- MW-1 APPROXIMATE MONITORING WELL LOCATION AND NUMBER
- T TOLUENE (ug\L)
- 77.3— GROUNDWATER POTENTIOMETRIC SURFACE
- ug\L MICROGRAMS PER LITER

0 40  
FEET



COL 628\00219BJ-017



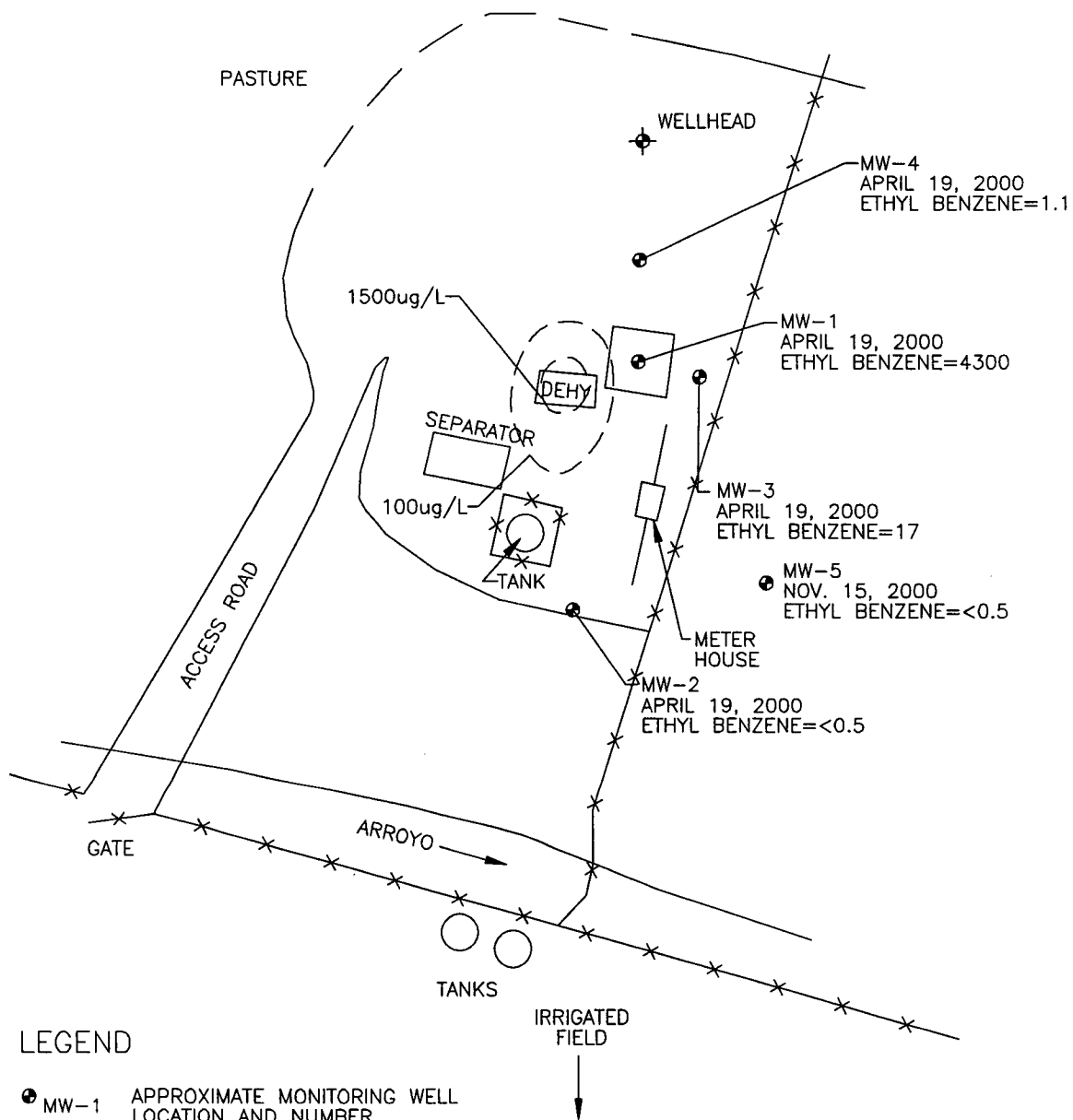
TITLE:  
KNIGHT #1 - METER 72556  
NOV. 15, 2000 ISOCONCENTRATION  
MAP - TOLUENE

DWN: TMM  
CHKD: LW  
DATE: 2/20/01

DES: LW  
APPD: MN  
REV: 0

PROJECT NO.: 62800219  
EPFS GW PITS

FIGURE 4



# LEGEND

- MW-1 APPROXIMATE MONITORING WELL LOCATION AND NUMBER
- E ETHYL BENZENE (ug\L)
- 77.3 GROUNDWATER POTENTIOMETRIC SURFACE
- ug\L MICROGRAMS PER LITER

0 40  
FEET



COL 62800219BJ-018



TITLE:

KNIGHT #1 - METER 72556  
NOV. 15, 2000 ISOCONCENTRATION  
MAP - ETHYL BENZENE

DWN:

TMM

DES.:

LW

CHKD:

LW

APPD:

MN

DATE:

2/20/01

REV.:

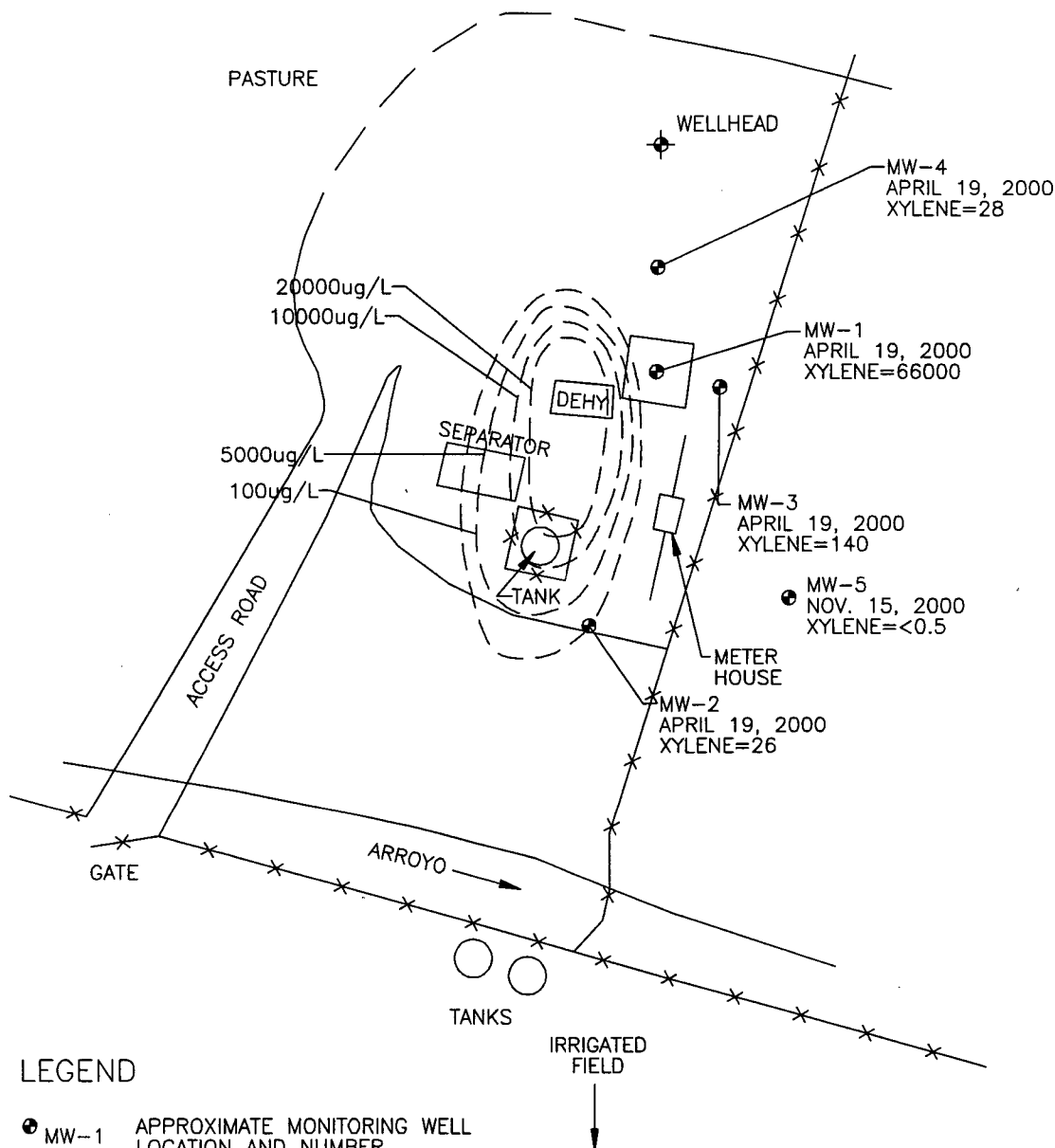
0

PROJECT NO.:

62800219

EPFS GW PITS

FIGURE 5



## LEGEND

- MW-1 APPROXIMATE MONITORING WELL LOCATION AND NUMBER
- X XYLENE (ug/L)
- 77.3 GROUNDWATER POTENTIOMETRIC SURFACE
- ug/L MICROGRAMS PER LITER



TITLE:  
KNIGHT #1 - METER 72556  
NOV. 15, 2000 ISOCONCENTRATION  
MAP - XYLENES

DWN: TMM  
CHKD: LW  
DATE: 2/20/01

DES.: LW  
APPD: MN  
REV.: 0

PROJECT NO.: 62800219  
EPFS GW PITS

FIGURE 6

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**ATTACHMENT 1**

**2000 GROUNDWATER ANALYTICAL**

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Well Number MW-04

Serial No. WDPD-

Project Name EPFS QUARTERLY SAMPLING

Client Company: EL PASO FIELD SERVICES

Site Name KNIGHT #1 (72556)

## Development Criteria

☒ 3 to 5 Casing Volumes of Water Removal  
☒ Stabilization of Indicator Parameters  
☐ Other

## Methods of Development

☐ Centrifugal

☐ Submersible

☐ Peristaltic

☐ Other

Pump

☐ Bottom Valve

☐ Double Check Valve

☐ Stainless-steel Kemmerer

Ballor

## Water Removal Data

[illegible]

Circle the date and time that the development criteria are met.

|          |                                                      |
|----------|------------------------------------------------------|
| Comments | LIGHT PRODUCT SHEEN ON WATER. SAMPLED AT 1305. Coc # |
|----------|------------------------------------------------------|

COLLECTED A DUPLICATE SAMPLE. SAMPLED AT 1310

Developer's Signature(s) Robert Youngson

Date 4/19/00

Reviewer \_\_\_\_\_ Date: \_\_\_\_\_

Well Number MW-01

# WELL DEVELOPMENT AND PURGING DATA

Serial No. WDPD.

Page 1 of 1Project Name EPB QUARTERLY SAMPLING

Project Manager: ROBERT THOMPSON

Project No. 62800107

Client Company: EL PASO FIELD SERVICES

Phase.Task No. 0301

File Name KNIGHT #1 (72556)

Site Address RURAL SAN JUAN COUNTY

## Development Criteria

~~3~~ 3 to 5 Casing Volumes of Water Removal

### Stabilization of Indicator Parameters

☐ Other

## Methods of Development

Pump  
Bailer

☐ Centrifugal ☒ Bottom Valve

☐ Submersible    ☐ Double Check Valve

☐ Peristaltic      ☐ Stainless-steel Kemmerer

☐ Other

## Water Volume Calculation

Initial Depth of Well (feet) 33.95' TOR

Initial Depth to Water (feet) 27.14' 70R

Height of Water Column in Well (feet) 6.81'

Diameter (inches): Well 4" Gravel Pack

| Item            | Water Volume in Well |          | Gallons to be Removed |
|-----------------|----------------------|----------|-----------------------|
|                 | Cubic Feet           | Gallons  |                       |
| Well Casing     | 6.81                 | 4.45 x 3 | 13.35                 |
| Gravel Pack     |                      |          |                       |
| Drilling Fluids |                      |          |                       |
| Total           |                      |          | 13.35                 |

## Instruments

~~X~~ pH Meter

☐ DO Monitor

☒ Conductivity Meter

☒ Temperature Meter

☐ Other

## Water Disposal

KUTZ SEPARATOR

## Water Removal Data

[illegible]

Circle the date and time that the development criteria are met.

| Comments | PRODUCT MEASURED AT 27.07' TOR. | MEASURED .07' OF PRODUCT IN WELL | NO WATER QUALITY |
|----------|---------------------------------|----------------------------------|------------------|
|          |                                 |                                  |                  |

READINGS DOCUMENTED DUE TO PRESENCE OF FREE PHASE PRODUCT. WELL BAILED DRY AT 5 GAL. SAMPLED AT 1350.

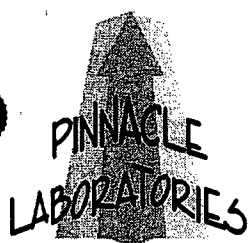
Developer's Signature(s) Robert Thompson

Date 4/19/00

Reviewer \_\_\_\_\_ Date: \_\_\_\_\_







2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

APR 26

Pinnacle Lab ID number 004080  
April 25, 2000

PHILIP ENVIRONMENTAL  
4000 MONROE ROAD  
FARMINGTON, NM 87401

Project Name EPFS QUARTERLY SAMPLING  
Project Number 62800107

Attention: ROBERT THOMPSON

On 04/20/00 Pinnacle Laboratories, Inc. Inc., (ADHS License No. AZ0592 pending), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

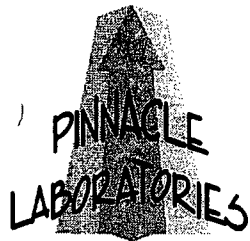
If you have any questions or comments, please do not hesitate to contact us at (505)344-3777.

Kimberly D. McNeill  
Project Manager

H. Mitchell Rubenstein, Ph. D.  
General Manager

MR: jt

Enclosure



2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

|              |                           |               |            |
|--------------|---------------------------|---------------|------------|
| CLIENT       | : PHILIP ENVIRONMENTAL    | PINNACLE ID   | : 004080   |
| PROJECT #    | : 62800107                | DATE RECEIVED | : 04/20/00 |
| PROJECT NAME | : EPFS QUARTERLY SAMPLING | REPORT DATE   | : 04/25/00 |

---

| PIN   |                    |         | DATE      |
|-------|--------------------|---------|-----------|
| ID. # | CLIENT DESCRIPTION | MATRIX  | COLLECTED |
| 01    | KNI-0004-MW02      | AQUEOUS | 04/19/00  |
| 02    | KNI-0004-MW04      | AQUEOUS | 04/19/00  |
| 03    | KNI-0004-MW54      | AQUEOUS | 04/19/00  |
| 04    | KNI-0004-MW01      | AQUEOUS | 04/19/00  |
| 05    | KNI-0004-MW03      | AQUEOUS | 04/19/00  |
| 06    | TRIP BLANK         | AQUEOUS | 04/19/00  |



2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

### GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021 MODIFIED  
CLIENT : PHILIP ENVIRONMENTAL  
PROJECT # : 62800107  
PROJECT NAME : EPFS QUARTERLY SAMPLING

PINNACLE I.D.: 004080

| SAMPLE |               |         | DATE     | DATE      | DATE     | DIL.   |
|--------|---------------|---------|----------|-----------|----------|--------|
| ID. #  | CLIENT I.D.   | MATRIX  | SAMPLED  | EXTRACTED | ANALYZED | FACTOR |
| 01     | KNI-0004-MW02 | AQUEOUS | 04/19/00 | NA        | 04/20/00 | 1      |
| 02     | KNI-0004-MW04 | AQUEOUS | 04/19/00 | NA        | 04/20/00 | 1      |
| 03     | KNI-0004-MW54 | AQUEOUS | 04/19/00 | NA        | 04/20/00 | 1      |

| PARAMETER     | DET. LIMIT | UNITS | KNI-0004-MW02 | KNI-0004-MW04 | KNI-0004-MW54 |
|---------------|------------|-------|---------------|---------------|---------------|
| BENZENE       | 0.5        | UG/L  | 23            | 110           | 110           |
| TOLUENE       | 0.5        | UG/L  | 0.5           | 6.5           | 5.4           |
| ETHYLBENZENE  | 0.5        | UG/L  | < 0.5         | 17            | 16            |
| TOTAL XYLENES | 0.5        | UG/L  | 26            | 140           | 130           |

#### SURROGATE:

BROMOFLUOROBENZENE (%)

96

97

84

SURROGATE LIMITS ( 80 - 120 )

#### CHEMIST NOTES:

N/A



2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

### GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021 MODIFIED  
CLIENT : PHILIP ENVIRONMENTAL  
PROJECT # : 62800107  
PROJECT NAME : EPFS QUARTERLY SAMPLING

PINNACLE I.D.: 004080

| SAMPLE ID. # | CLIENT I.D.   | MATRIX  | DATE SAMPLED | DATE EXTRACTED | DATE ANALYZED | DIL. FACTOR |
|--------------|---------------|---------|--------------|----------------|---------------|-------------|
| 04           | KNI-0004-MW01 | AQUEOUS | 04/19/00     | NA             | 04/20/00.     | 200         |
| 05           | KNI-0004-MW03 | AQUEOUS | 04/19/00     | NA             | 04/20/00      | 1           |
| 06           | TRIP BLANK    | AQUEOUS | 04/19/00     | NA             | 04/20/00      | 1           |

| PARAMETER     | DET. LIMIT | UNITS | KNI-0004-MW01 | KNI-0004-MW03 | TRIP BLANK |
|---------------|------------|-------|---------------|---------------|------------|
| BENZENE       | 0.5        | UG/L  | 9400          | 40            | < 0.5      |
| TOLUENE       | 0.5        | UG/L  | 510           | 0.6           | < 0.5      |
| ETHYLBENZENE  | 0.5        | UG/L  | 4300          | 1.1           | < 0.5      |
| TOTAL XYLENES | 0.5        | UG/L  | 66000         | 28            | < 0.5      |

#### SURROGATE:

|                               |     |     |     |
|-------------------------------|-----|-----|-----|
| BROMOFLUOROBENZENE (%)        | 120 | 100 | 106 |
| SURROGATE LIMITS ( 80 - 120 ) |     |     |     |

#### CHEMIST NOTES:

N/A



2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS  
REAGENT BLANK

|              |                           |                |            |
|--------------|---------------------------|----------------|------------|
| TEST         | : EPA 8021 MODIFIED       | PINNACLE I.D.  | : 004080   |
| BLANK I. D.  | : 042000                  | DATE EXTRACTED | : NA       |
| CLIENT       | : PHILIP ENVIRONMENTAL    | DATE ANALYZED  | : 04/20/00 |
| PROJECT #    | : 62800107                | SAMPLE MATRIX  | : AQUEOUS  |
| PROJECT NAME | : EPFS QUARTERLY SAMPLING |                |            |

| PARAMETER     | UNITS |      |
|---------------|-------|------|
| BENZENE       | UG/L  | <0.5 |
| TOLUENE       | UG/L  | <0.5 |
| ETHYLBENZENE  | UG/L  | <0.5 |
| TOTAL XYLENES | UG/L  | <0.5 |

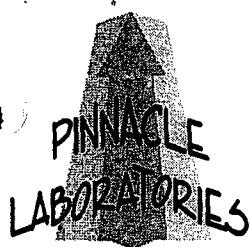
SURROGATE:

|                        |     |
|------------------------|-----|
| BROMOFLUOROBENZENE (%) | 100 |
|------------------------|-----|

SURROGATE LIMITS: ( 80 - 120 )

CHEMIST NOTES:

N/A



2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

GAS CHROMATOGRAPHY QUALITY CONTROL  
MSMSD

|              |                           |                |            |
|--------------|---------------------------|----------------|------------|
| TEST         | : EPA 8021 MODIFIED       | PINNACLE I.D.  | : 004080   |
| MSMSD #      | : 042000                  | DATE EXTRACTED | : NA       |
| CLIENT       | : PHILIP ENVIRONMENTAL    | DATE ANALYZED  | : 04/20/00 |
| PROJECT #    | : 62800107                | SAMPLE MATRIX  | : AQUEOUS  |
| PROJECT NAME | : EPFS QUARTERLY SAMPLING | UNITS          | : UG/L     |

| PARAMETER     | SAMPLE<br>RESULT | CONC<br>SPIKE | SPIKED<br>SAMPLE | %<br>REC | DUP<br>SPIKE | DUP<br>% REC | RPD | REC<br>LIMITS | RPD<br>LIMITS |
|---------------|------------------|---------------|------------------|----------|--------------|--------------|-----|---------------|---------------|
| BENZENE       | <0.5             | 20.0          | 18.0             | 90       | 18.5         | 93           | 3   | ( 80 - 120 )  | 20            |
| TOLUENE       | <0.5             | 20.0          | 19.4             | 97       | 19.6         | 98           | 1   | ( 80 - 120 )  | 20            |
| ETHYLBENZENE  | <0.5             | 20.0          | 19.9             | 100      | 19.9         | 100          | 0   | ( 80 - 120 )  | 20            |
| TOTAL XYLENES | <0.5             | 60.0          | 62.8             | 105      | 60.4         | 101          | 4   | ( 80 - 120 )  | 20            |

CHEMIST NOTES:  
N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

**PHILIP**

**ENVIRONMENTAL**

# Chain of Custody Record

4000 Monroe Road  
Farmington, NM 87401  
(505) 326-2262 Phone  
(505) 326-2388 FAX

Lab ID 004082

COC Serial No. C 2540

| Project Name EPFS QUARTERLY SAMPLING |         | Project Number 62800107 Phase Task 0301 |                  | Sampers R. THOMPSON     |                             | Laboratory Name PINNACLE LABS |  | Location ALBUQUERQUE, NM |                              |
|--------------------------------------|---------|-----------------------------------------|------------------|-------------------------|-----------------------------|-------------------------------|--|--------------------------|------------------------------|
| Sample Number (and depth)            | Date    | Time                                    | Matrix           | Total Number of Bottles | Type of Analysis and Bottle | BTX 8021                      |  |                          |                              |
| KN1-0004-MW02                        | 4/19/00 | 1140                                    | H <sub>2</sub> O | 2                       | X                           | 01                            |  |                          | KNIGHT #1 - 72556            |
| KN1-0004-MW04                        | 4/19/00 | 1305                                    | H <sub>2</sub> O | 2                       | X                           | 02                            |  |                          | KNIGHT #1 - 72556            |
| KN1-0004-MW54                        | 4/19/00 | 1310                                    | H <sub>2</sub> O | 2                       | X                           | 03                            |  |                          | KNIGHT #1 - 72556            |
| KN1-0004-MW01                        | 4/19/00 | 1350                                    | H <sub>2</sub> O | 2                       | X                           | 04                            |  |                          | KNIGHT #1 - 72556            |
| KN1-0004-MW03                        | 4/19/00 | 1455                                    | H <sub>2</sub> O | 2                       | X                           | 05                            |  |                          | KNIGHT #1 - 72556            |
| TRIP BLANK                           | 4/19/00 | 1130                                    | H <sub>2</sub> O | 4                       | X                           | 06                            |  |                          | <del>KNIGHT #1 - 72556</del> |

Relinquished by:

Signature

*Robert Thompson*

Date

4/19/00

Time

1555

Received By:

Signature

*Amelia*

Date

4/20/00

Time

1000

Samples Iced: ☒ Yes ☐ No

Preservatives (ONLY for Water Samples)

☐ Cyanide ☐ Sodium hydroxide (NaOH)

☒ Volatile Organic Analysis ☐ Hydrochloric acid (HCl)

☐ Metals ☐ Nitric acid (HNO<sub>3</sub>)

☐ TPH (418.1) ☐ Sulfuric acid (H<sub>2</sub>SO<sub>4</sub>)

☐ Other (Specify) \_\_\_\_\_

☐ Other (Specify) \_\_\_\_\_

Carrier: GREYHOUND LINES

Shipping and Lab Notes:

rec. on file 4°C

SD

Airbill No. GLI160 665 0782

Well Number MW 05

Serial No. WDPD-

**WELL DEVELOPMENT AND PURGING DATA**

Page 1 of 1

Project Name EPFS well Sampling

Project Manager LISA Winn

Project No. 628002191

Client Company El Paso Field Services

Phase/Task No. 0301

Site Name Knight # 1 (72556)

Site Address Russell San Juan Co

**Development Criteria**

- ☒ Do 5 Casing Volumes of Water Removal  
☒ Stabilization of Indicator Parameters  
☐ Other

**Water Volume Calculation**

Initial Depth of Well (feet) 33.04  
Initial Depth to Water (feet) 25.52  
Height of Water Column in Well (feet) 7.52  
Diameter (inches): Well \_\_\_\_\_ Gravel Pack \_\_\_\_\_

**Methods of Development**

- Pump \_\_\_\_\_  
Bailer \_\_\_\_\_  
☐ Centrifugal ☒ Bottom Valve  
☐ Submersible ☐ Double Check Valve  
☐ Peristaltic ☐ Stainless-steel Kemmerer  
☐ Other

**Instruments**

- ☒ pH Meter  
☐ DO Monitor  
☒ Conductivity Meter  
☒ Temperature Meter  
☐ Other

Serial No. (if applicable)

Hydac

Hydac

Hydac

**Water Disposal**

R-72 separator Bloomfield NM

**Water Removal Data**

| Date | Time | Development Method | Removal Rate (gal/min) | Intake Depth (feet) | Ending Water Depth (feet) | Water Volume Removed (gallons) |            | Product Volume Removed (gallons) |            | Temperature (°C) | pH   | Conductivity (umhos/cm) | Dissolved Oxygen (mg/l) | Comments    |
|------|------|--------------------|------------------------|---------------------|---------------------------|--------------------------------|------------|----------------------------------|------------|------------------|------|-------------------------|-------------------------|-------------|
|      |      |                    |                        |                     |                           | Incremental                    | Cumulative | Incremental                      | Cumulative |                  |      |                         |                         |             |
|      | 1444 | X                  |                        |                     |                           | 1                              |            |                                  |            | 14.2             | 6.36 | 3000                    |                         | cloudy odor |
|      | 1457 | X                  |                        |                     |                           | 1                              |            |                                  |            | 12.5             | 6.54 | 2910                    |                         | "           |
|      | 1450 | X                  |                        |                     |                           | 1                              |            |                                  |            | 12.3             | 6.60 | 2860                    |                         | "           |
|      | 1454 | X                  |                        |                     |                           | 1                              |            |                                  |            | 11.6             | 6.62 | 2760                    |                         | "           |
|      | 1459 | X                  |                        |                     |                           | 1                              |            |                                  |            | 11.2             | 6.58 | 2730                    |                         | "           |
|      | 1503 | X                  |                        |                     |                           | 1                              |            |                                  |            | 10.8             | 6.56 | 2650                    |                         | "           |
|      | 1506 | X                  |                        |                     |                           | 1                              |            |                                  |            | 10.8             | 6.50 | 2650                    |                         | "           |
|      | 1510 | X                  |                        |                     |                           | 1                              |            |                                  |            | 10.9             | 6.51 | 2670                    |                         | no change   |

Circle the date and time that the development criteria are met.

Comments Bailed 30 gallons then started water quality readings sampled for

BTX 1520

Developer's Signature(s) Chris A. May

Date 11-15-00

Reviewer \_\_\_\_\_

Date \_\_\_\_\_

# Chain of Custody Record

(505) 326-2262 Phone  
(505) 326-2388 FAX

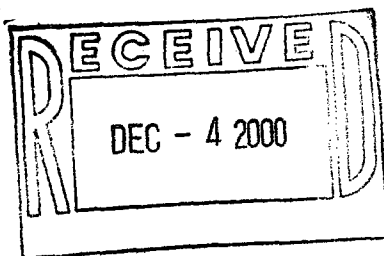
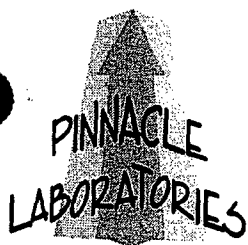
COC Serial No. C 2784

**Relinquished by:**

**Received By:**

| Received by: |            | Received by: |      |
|--------------|------------|--------------|------|
| Signature    | Date       | Signature    | Date |
| Chris May    | 11/20/2016 |              |      |
|              |            |              |      |
|              |            |              |      |
|              |            |              |      |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                  |                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------|------------------------------------------|
| <b>Samples Iced:</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                                                                                                                                                                                                                                                                                                                               |  | <b>Carrier:</b> <i>Greyhound</i> | <b>Airbill No.</b> <i>GLE 1605919996</i> |
| <b>Preservatives (ONLY for Water Samples)</b><br><input type="checkbox"/> Cyanide ..... Sodium hydroxide (NaOH)<br><input type="checkbox"/> Volatile Organic Analysis ..... Hydrochloric acid (HCl)<br><input type="checkbox"/> Metals ..... Nitric acid (HNO <sub>3</sub> )<br><input type="checkbox"/> TPH (418.1) ..... Sulfuric acid (H <sub>2</sub> SO <sub>4</sub> )<br><input checked="" type="checkbox"/> Other (Specify) <i>Hg/Cd</i> .....<br><input type="checkbox"/> Other (Specify) ..... |  | <b>Shipping and Lab Notes:</b>   |                                          |



2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

Pinnacle Lab ID number      **011072**  
November 28, 2000

PHILIP ENVIRONMENTAL  
4000 MONROE ROAD  
FARMINGTON, NM      87401

EL PASO FIELD SERVICES  
614 RIELLY STREET  
FARMINGTON, NM      87401

Project Name      EPFS  
Project Number      62800219

Attention:      ROBERT THOMPSON/SCOTT POPE

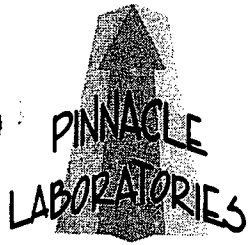
On 11/21/00 Pinnacle Laboratories, Inc., (ADHS License No. AZ0592 pending), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

If you have any questions or comments, please do not hesitate to contact us at (505)344-3777.

H. Mitchell Rubenstein, Ph. D.  
General Manager

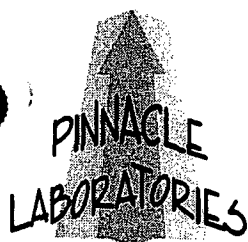
MR: ft

Enclosure



2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

|              |                        |               |            |
|--------------|------------------------|---------------|------------|
| CLIENT       | : PHILIP ENVIRONMENTAL | PINNACLE ID   | : 011072   |
| PROJECT #    | : 62800219             | DATE RECEIVED | : 11/21/00 |
| PROJECT NAME | : EPFS                 | REPORT DATE   | : 11/28/00 |
| PIN          |                        |               | DATE       |
| ID. #        | CLIENT DESCRIPTION     | MATRIX        | COLLECTED  |
| 01           | KNI-0011-MW05          | AQUEOUS       | 11/15/00   |
| 02           | TRIP BLANK             | AQUEOUS       | 11/20/00   |



2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

### GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021 MODIFIED  
CLIENT : PHILIP ENVIRONMENTAL  
PROJECT # : 62800219  
PROJECT NAME : EPFS

PINNACLE I.D.: 011072

| SAMPLE |               |         | DATE     | DATE      | DATE     | DIL.   |
|--------|---------------|---------|----------|-----------|----------|--------|
| ID. #  | CLIENT I.D.   | MATRIX  | SAMPLED  | EXTRACTED | ANALYZED | FACTOR |
| 01     | KNI-0011-MW05 | AQUEOUS | 11/15/00 | NA        | 11/21/00 | 1      |
| 02     | TRIP BLANK    | AQUEOUS | 11/20/00 | NA        | 11/21/00 | 1      |

| PARAMETER     | DET. LIMIT | UNITS | KNI-0011-MW05 | TRIP BLANK |
|---------------|------------|-------|---------------|------------|
| BENZENE       | 0.5        | UG/L  | < 0.5         | < 0.5      |
| TOLUENE       | 0.5        | UG/L  | < 0.5         | < 0.5      |
| ETHYL BENZENE | 0.5        | UG/L  | < 0.5         | < 0.5      |
| XYLENES       | 0.5        | UG/L  | < 0.5         | < 0.5      |

#### SURROGATE:

BROMOFLUOROBENZENE (%)

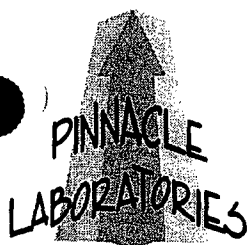
115

117

SURROGATE LIMITS ( 80 - 120 )

#### CHEMIST NOTES:

N/A



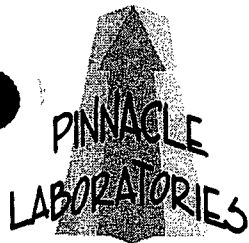
2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS  
REAGENT BLANK

|              |                        |                |            |
|--------------|------------------------|----------------|------------|
| TEST         | : EPA 8021 MODIFIED    | PINNACLE I.D.  | : 011072   |
| BLANK I. D.  | : 112100               | DATE EXTRACTED | : NA       |
| CLIENT       | : PHILIP ENVIRONMENTAL | DATE ANALYZED  | : 11/21/00 |
| PROJECT #    | : 62800219             | SAMPLE MATRIX  | : AQUEOUS  |
| PROJECT NAME | : EPFS                 |                |            |

| PARAMETER     | UNITS |      |
|---------------|-------|------|
| BENZENE       | UG/L  | <0.5 |
| TOLUENE       | UG/L  | <0.5 |
| ETHYLBENZENE  | UG/L  | <0.5 |
| TOTAL XYLENES | UG/L  | <0.5 |

SURROGATE:  
BROMOFLUOROBENZENE (%) 112  
SURROGATE LIMITS: ( 80 - 120 )  
CHEMIST NOTES:  
N/A



2709-D Pan American Freeway NE  
Albuquerque, New Mexico 87107  
Phone (505) 344-3777  
Fax (505) 344-4413

GAS CHROMATOGRAPHY QUALITY CONTROL  
MSMSD

TEST : EPA 8021 MODIFIED  
MSMSD # : 011057-26  
CLIENT : PHILIP ENVIRONMENTAL  
PROJECT # : 62800219  
PROJECT NAME : EPFS

PINNACLE I.D. : 011072  
DATE EXTRACTED : NA  
DATE ANALYZED : 11/21/00  
SAMPLE MATRIX : AQUEOUS  
UNITS : UG/L

| PARAMETER     | SAMPLE<br>RESULT | CONC<br>SPIKE | SPIKED<br>SAMPLE | %<br>REC | DUP<br>SPIKE | DUP<br>% REC | RPD | REC<br>LIMITS | RPD<br>LIMITS |
|---------------|------------------|---------------|------------------|----------|--------------|--------------|-----|---------------|---------------|
| BENZENE       | <0.5             | 20.0          | 20.3             | 102      | 19.2         | 96           | 6   | ( 80 - 120 )  | 20            |
| TOLUENE       | <0.5             | 20.0          | 21.0             | 105      | 19.9         | 100          | 5   | ( 80 - 120 )  | 20            |
| ETHYLBENZENE  | <0.5             | 20.0          | 22.0             | 110      | 21.2         | 106          | 4   | ( 80 - 120 )  | 20            |
| TOTAL XYLENES | <0.5             | 60.0          | 63.9             | 107      | 61.6         | 103          | 4   | ( 80 - 120 )  | 20            |

CHEMIST NOTES:  
N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

**PHILIP**



# Chain of Custody Record

4000 Montrose Road  
Farmington, NM 87401  
(505) 326-2262 Phone  
(505) 326-2388 FAX

011072

COC Serial No. C 2784

| Project Name <u>EpiFS</u>                                   |                 | Project Number <u>62800219</u> |                       | Phase . Task              |                             |
|-------------------------------------------------------------|-----------------|--------------------------------|-----------------------|---------------------------|-----------------------------|
| Samplers <u>C. MacZ</u>                                     |                 | Name <u>DINNACLE</u>           |                       | Location <u>ALBQ N.M.</u> |                             |
| Sample Number (and depth)                                   | Date            | Time                           | Matrix                | Total Number of Bottles   | Type of Analysis and Bottle |
| <u>KNIT-0011-MW0811-15-00</u>                               | <u>15-00</u>    | <u>1520</u>                    | <u>H<sub>2</sub>O</u> | <u>2</u>                  | <u>X</u>                    |
| <u>Trip Blank</u>                                           | <u>11-20-00</u> | <u>1630</u>                    | <u>H<sub>2</sub>O</u> | <u>1</u>                  | <u>X</u>                    |
| (The following section is crossed out with a diagonal line) |                 |                                |                       |                           |                             |

| Comments                 |
|--------------------------|
| <u>KNIGHT #1 (22556)</u> |
| <u>" "</u>               |
| <u>" "</u>               |

Relinquished by:

Received By:

| Signature            | Date            | Time        | Signature             | Date            | Time        |
|----------------------|-----------------|-------------|-----------------------|-----------------|-------------|
| <u>Chris A. MacZ</u> | <u>11-20-00</u> | <u>1630</u> | <u>Shamone Sandoz</u> | <u>11/21/00</u> | <u>1016</u> |

Samples Iced: ☒ Yes ☐ No

Preservatives (ONLY for Water Samples)

- ☐ Cyanide
- ☐ Volatile Organic Analysis
- ☐ Metals
- ☐ TPH (418.1)
- ☒ Other (Specify) HgCd
- ☐ Other (Specify)
- ☐ Sodium hydroxide (NaOH)
- ☐ Hydrochloric acid (HCl)
- ☐ Nitric acid (HNO<sub>3</sub>)
- ☐ Sulfuric acid (H<sub>2</sub>SO<sub>4</sub>)

Carrier: Greyhound

Shipping and Lab Notes:

Rec'd @ 3.5c

Airbill No. GLI/606919996

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**ATTACHMENT 2**

**2000 MONITOR WELL  
INSTALLATION RECORDS**

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# MONITORING WELL INSTALLATION RECORD

## Philip Services Corporation

4000 Monroe Road

Farmington, New Mexico 87401

(505) 326-2262 FAX (505) 326-2388

Borehole #

Well # MW-5

Page 1 of 1

Project Name EPFS Drilling

Project Number 62800219 Cost Code

Project Location Knight #1

On-Site Geologist Don Fernald

Personnel On-Site Lisa Wynn, Danny Padilla, Ryan LaFaire

Contractors On-Site NONE

Client Personnel On-Site NONE

Elevation

Well Location L: S: T: R:

GWL Depth ~ 23-24' bgs

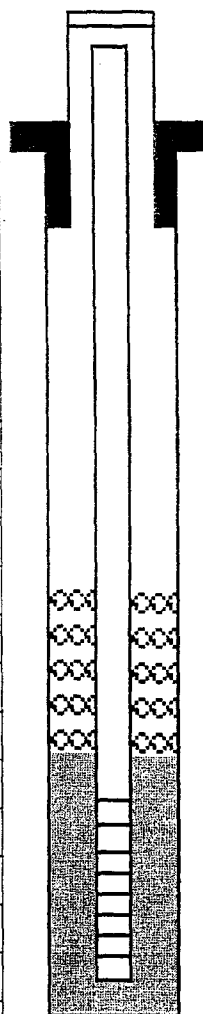
Installed By Danny Padilla

Date/Time Started 10:45 11-14-00

Date/Time Completed 11-14-00

### Depths in Reference to Ground Surface

| Item                                | Material       | Depth (feet) |
|-------------------------------------|----------------|--------------|
| Top of Protective Casing            | Steel          | +3.5'        |
| Bottom of Protective Casing         |                | -1'          |
| Top of Permanent Borehole Casing    |                | +3'          |
| Bottom of Permanent Borehole Casing |                |              |
| Top of Concrete                     |                | 6"           |
| Bottom of Concrete                  |                | -6"          |
| Top of Grout                        |                | -6"          |
| Bottom of Grout                     |                | 11"          |
| Top of Well Riser                   |                | +3'          |
| Bottom of Well Riser                |                | 15'          |
| Top of Well Screen                  | .010 SCREEN    | 15'          |
| Bottom of Well Screen               | .010 SCREEN    | 30'          |
| Top of Peltonite Seal               | 3/8" bentonite | 11'          |
| Bottom of Peltonite Seal            | 3/8" bentonite | 13'          |
| Top of Gravel Pack                  |                | 13'          |
| Bottom of Gravel Pack               | 10-20 Sand     | 30'          |
| Top of Natural Cave-In              |                | N/A          |
| Bottom of Natural Cave-In           |                | N/A          |
| Top of Groundwater                  |                |              |
| Total Depth of Borehole             |                | 30'          |



Top of Protective Casing ~3.5'

Top of Riser ~3'

Ground Surface 0

Top of Seal 11'

Top of Gravel Pack 13'

Top of Screen 15'

Bottom of Screen 30'

Bottom of Borehole 30'

Comments:

Geologist Signature

# RECORD OF SUBSURFACE EXPLORATION

Philip Environmental Services Corp.

4000 Monroe Road

Farmington, New Mexico 87401

(505) 326-2282 FAX (505) 326-2388

Borehole #

Well #

Page

MW-5

1 of 1

Project Name

Project Number

Project Location

EPFS Drilling

62800219

Phase

Knight #1

Well Logged By

Personnel On-Site

Contractors On-Site

Client Personnel On-Site

Don Fernald

Lisa Wynn, Danny Padilla, Ryan Ltee

NONE

NONE

Drilling Method

Air Monitoring Method

HSA

PID

Elevation

Borehole Location

GWL Depth

Logged By

Drilled By

Date/Time Started

Date/Time Completed

Don Fernald

Danny Padilla

9:00 A.M. 11-14-00

10:45 A.M. 11-14-00

| Depth<br>(Feet) | Sample<br>Interval | Sample<br>Type &<br>Recovery<br>(inches) | Sample Description<br>Classification System: USCS                                                                   | USCS<br>Symbol | Depth<br>Lithology<br>Change<br>(feet) | PID<br>Air Monitoring<br>Change<br>BZ SH S | Drilling Conditions<br>& Blow Counts |
|-----------------|--------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------|--------------------------------------------|--------------------------------------|
| 0               |                    |                                          | Initiated sampling<br>@ 15' bgs                                                                                     |                |                                        |                                            |                                      |
| 10              |                    |                                          |                                                                                                                     |                |                                        |                                            |                                      |
| 15              |                    |                                          |                                                                                                                     |                |                                        |                                            |                                      |
| 18              | X                  | 18"                                      | Moderate yellowish brown<br>silty soil with medium<br>to dark reddish brown<br>mottles or streaking                 |                | 4.7                                    |                                            |                                      |
| 20              | X                  | 8"                                       | Moderate to dark yellowish<br>brown silty soil grading to<br>black sandy silt, then to<br>cobbles (slight HC odors) |                | 3.7                                    |                                            |                                      |
| 25              | X                  | 10"                                      | Moderate brown silt sand<br>with cobbles/gravel (very wet)                                                          |                | N/A                                    |                                            |                                      |
| 30              |                    |                                          | 20% cobbles-gravel<br>50% med. grained sand<br>30% silt                                                             |                |                                        |                                            |                                      |
| 35              |                    |                                          | Terminated boring<br>@ 30' and converted<br>to MW-5                                                                 |                |                                        |                                            |                                      |
| 40              |                    |                                          |                                                                                                                     |                |                                        |                                            |                                      |

Comments:

Geologist Signature

Don Fernald