

3R - 170

**ANNUAL  
MONITORING  
REPORTS  
DATE:**

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3/2006

**RECEIVED**

**2005 ANNUAL GROUNDWATER REPORT**  
**FEDERAL SITES VOLUME I**

**EL PASO TENNESSEE PIPELINE COMPANY MAR 17 2006**

**Oil Conservation Division**  
**Environmental Bureau**

**TABLE OF CONTENTS**

| METER or LINE ID | SITE NAME             | TOWNSHIP | RANGE | SECTION | UNIT |
|------------------|-----------------------|----------|-------|---------|------|
| 89961            | Fields A#7A           | 32N      | 11W   | 34      | E    |
| 89232            | Johnston Fed #6A      | 31N      | 09W   | 35      | F    |
| 94715            | James F. Bell #1E     | 30N      | 13W   | 10      | P    |
| 89620            | Sandoval GC A #1A     | 30N      | 09W   | 35      | C    |
| LD151            | Lat 0-21 Line Drip    | 30N      | 09W   | 12      | O    |
| 73220            | Fogelson 4-1 Com. #14 | 29N      | 11W   | 4       | P    |
| 97213            | Hamner #9             | 29N      | 09W   | 20      | A    |
| LD174            | LAT L 40              | 28N      | 04W   | 13      | H    |
| 89894            | Hammond #41A          | 27N      | 08W   | 25      | O    |
| 94810            | Miles Fed 1A          | 26N      | 07W   | 5       | F    |
| LD072            | K27 LD072             | 25N      | 06W   | 4       | E    |
| 87640            | Canada Mesa #2        | 24N      | 06W   | 24      | I    |

3R170

3R202

3R196

3R235

3R213

3R068

3R190

3R212

3R186

3R223

3R204?

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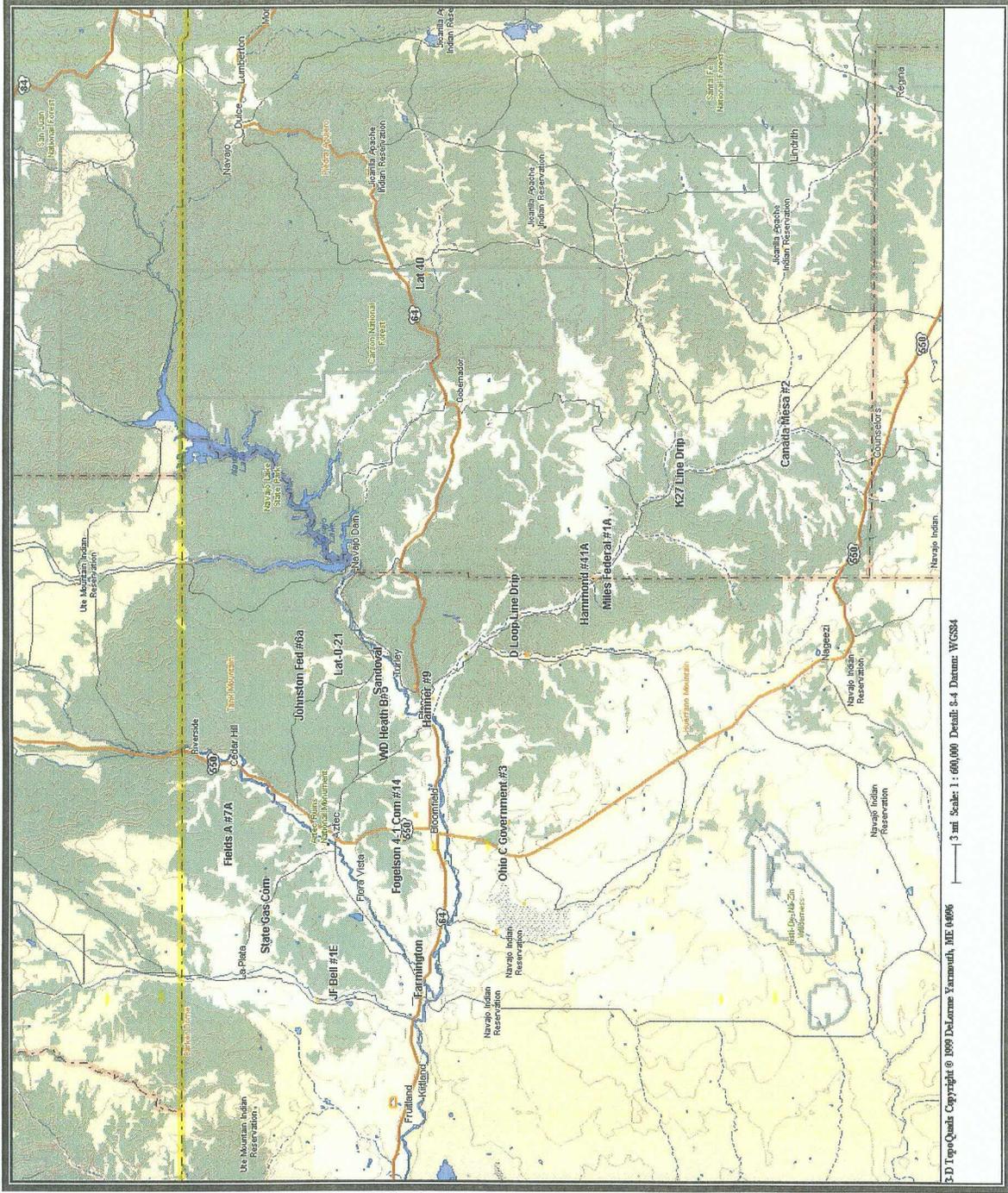


**MWH**  
 MONTGOMERY WATSON HARZA

## LIST OF ACRONYMS

|        |   |
|--------|---|
| B      | benzene                                     |
| btoc   | below top of casing                         |
| E      | ethylbenzene                                |
| EPFS   | El Paso Field Services                      |
| ft     | foot/feet                                   |
| GWEL   | groundwater elevation                       |
| ID     | identification                              |
| MW     | monitoring well                             |
| PSH    | phase-separated hydrocarbons                |
| NMWQCC | New Mexico Water Quality Control Commission |
| T      | toluene                                     |
| TOC    | top of casing                               |
| NA     | not applicable                              |
| NE     | not established                             |
| NM     | not measured                                |
| NMOCD  | New Mexico Oil Conservation Division        |
| NS     | not sampled                                 |
| ORC    | oxygen-releasing compound                   |
| ppb    | parts per billion                           |
| µg/L   | micrograms per liter                        |
| X      | total xylenes                               |

# Federal Groundwater Site Map



EPTPC GROUNDWATER SITES  
2005 ANNUAL GROUNDWATER REPORT

3R170

Fields A#7A  
Meter Code: 89961

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**SITE DETAILS**

**Legal Description:**      **Town:** 32n      **Range:** 11w      **Sec:** 34      **Unit:** E  
**NMOCD Haz Ranking:** 40      **Land Type:** Federal      **Operator:** BP \ Amoco Production Company

**PREVIOUS ACTIVITIES**

**Site Assessment:** 8/94      **Excavation:** 9/94 (70cy)      **Soil Boring:** 7/95  
**Monitor Well:** 7/95      **Geoprobe:** NA      **Additional MWs:** 12/95  
**Downgradient MWs:** 12/95      **Replace MW:** NA      **Quarterly Initiated:** NA  
**ORC Nutrient Injection:** NA      **Re-Excavation:** NA      **PSH Removal Initiated:** 8/97  
**Annual Initiated:** 4/97      **Quarterly Resumed:** NA

**SUMMARY OF 2005 ACTIVITIES**

**MW-1:** Semi-annual monitoring was conducted at this well for free-product recovery. No free-product was detected during quarterly monitoring. Groundwater samples were collected in April and October 2005.

**MW-2:** Quarterly water level monitoring was performed during 2005. An annual groundwater sample was collected in April 2005.

**MW-3:** Quarterly water level monitoring was performed during 2005. An annual groundwater sample was collected in April 2005.

**MW-4:** Quarterly monitoring was conducted at this well for free-product recovery. This well was dry during each event.

**Site-Wide Activities:** Evaluation of additional areas of investigation to include: additional monitoring wells, natural attenuation potential, and upgradient sources were performed for this site in 2005. Access grant applications for groundwater monitoring well installation were prepared for submission in 2006.

**SITE MAPS**

Site maps (April, October, and showing the location of TMW-5) are attached in Figures 1, 2 and 3.

**EPTPC GROUNDWATER SITES  
2005 ANNUAL GROUNDWATER REPORT**

**Fields A#7A  
Meter Code: 89961**

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**SUMMARY TABLES AND GRAPHS**

- Analytical data from 2005 are presented in Table 1, and historic groundwater data are presented graphically in Figures 4 through 7.
- Free-product recovery data for 2005 are summarized in Table 2, and historic data are presented graphically in Figures 8 and 9.
- Laboratory reports are presented in Attachment 1 (included on CD).
- Field documentation is presented in Attachment 2 (included on CD).

**GEOLOGIC LOGS AND WELL COMPLETION DIAGRAMS**

No subsurface activities were performed at this site during 2005.

**DISPOSITION OF GENERATED WASTES**

All purge water was taken to the El Paso Natural Gas Rio Vista Compressor Station. Phase separated hydrocarbons are stored in a 55 gallon drum and are periodically picked up by Mesa Oil for recycling.

**ISOCONCENTRATION MAPS**

No isoconcentration maps were prepared for this site, however, the attached site maps present the water level data collected during 2005.

**CONCLUSIONS**

- The groundwater flow direction at this site is to the southwest, based on water level measurements from the April 2005 sampling event.
- No free-product was recovered from MW-1 in 2005.
- No free-product was recovered from MW-4 in 2005. This well was dry during each event.
- Based on the technology review and free-product removal data for this site, it was concluded that MW-1 should continue to be monitored, only.
- BTEX concentrations in MW-1 were substantially lower than in 1997 (benzene 951 µg/L), when the first phase of sampling ceased. However, benzene concentrations were 108 and 180 µg/L in April and October, respectively, which are above NMWQCC standards and slightly elevated from concentrations in 2003, when sampling was re-started. All other BTEX constituents were below standards.

**EPTPC GROUNDWATER SITES  
2005 ANNUAL GROUNDWATER REPORT**

**Fields A#7A  
Meter Code: 89961**

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- Annual groundwater samples were scheduled to be collected from MW-4 during 2005. This well was not sampled due to insufficient quantity of water; MW-4 has been dry since May 2002.

**RECOMMENDATIONS**

- Assuming that free-product continues to be absent from MW-1, this well will be sampled semi-annually (April and October) until BTEX concentrations approach NMWQCC standards. MW-1 will then be scheduled for quarterly sampling until BTEX concentrations are below standards for four, consecutive quarters, at which time this site will be submitted for closure.
- EPTPC will attempt semi-annual groundwater level measurements and annual groundwater sampling in April at MW-2, MW-3 and MW-4. Based on the April sampling results, groundwater sampling may be performed again in October 2005 at these wells.
- EPTPC will sample MW-2 for parameters to assess natural attenuation potential at this site in April 2006.
- In order to assess possible upgradient sources, EPTPC will attempt to install TMW-5 (shown in Figure 3) upgradient of MW-1 in 2006.

**EPTPC GROUNDWATER SITES  
2005 ANNUAL GROUNDWATER REPORT**

**Canada Mesa #2  
Meter Code: 87640**

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**SITE DETAILS**

|                               |                  |                       |                |  |
|-------------------------------|------------------|-----------------------|----------------|--|
| <b>Legal Description:</b>     | <b>Town:</b> 24N | <b>Range:</b> 6W      | <b>Sec:</b> 24 | <b>Unit:</b> I                             |
| <b>NMOCD Haz<br/>Ranking:</b> | 40               | <b>Land<br/>Type:</b> | Federal        | <b>Operator:</b> Merrion Oil & Gas Company |

**PREVIOUS ACTIVITIES**

|                                    |       |                           |      |                                   |       |
|------------------------------------|-------|---------------------------|------|-----------------------------------|-------|
| <b>Site Assessment:</b>            | 7/94  | <b>Excavation:</b>        | 8/94 | <b>Soil Boring:</b>               | 8/95  |
| <b>Monitor Well:</b>               | 8/95  | <b>Geoprobe:</b>          | NA   | <b>Additional MWs:</b>            | 10/00 |
| <b>Downgradient MWs:</b>           | 10/00 | <b>Replace MW:</b>        | NA   | <b>Quarterly<br/>Initiated:</b>   | 8/95  |
| <b>ORC Nutrient<br/>Injection:</b> | NA    | <b>Re-Excavation:</b>     | NA   | <b>PSH Removal<br/>Initiated:</b> | 8/97  |
| <b>Annual Initiated:</b>           | 11/00 | <b>Quarterly Resumed:</b> | NA   |                                   |       |

**SUMMARY OF 2005 ACTIVITIES**

**MW-1:** Quarterly free-product recovery was conducted at this well in 2005.

**MW-2:** Annual groundwater sampling was performed in December 2005. Quarterly water level monitoring was performed.

**MW-3:** Annual groundwater sampling was performed in December 2005. Quarterly water level monitoring was performed.

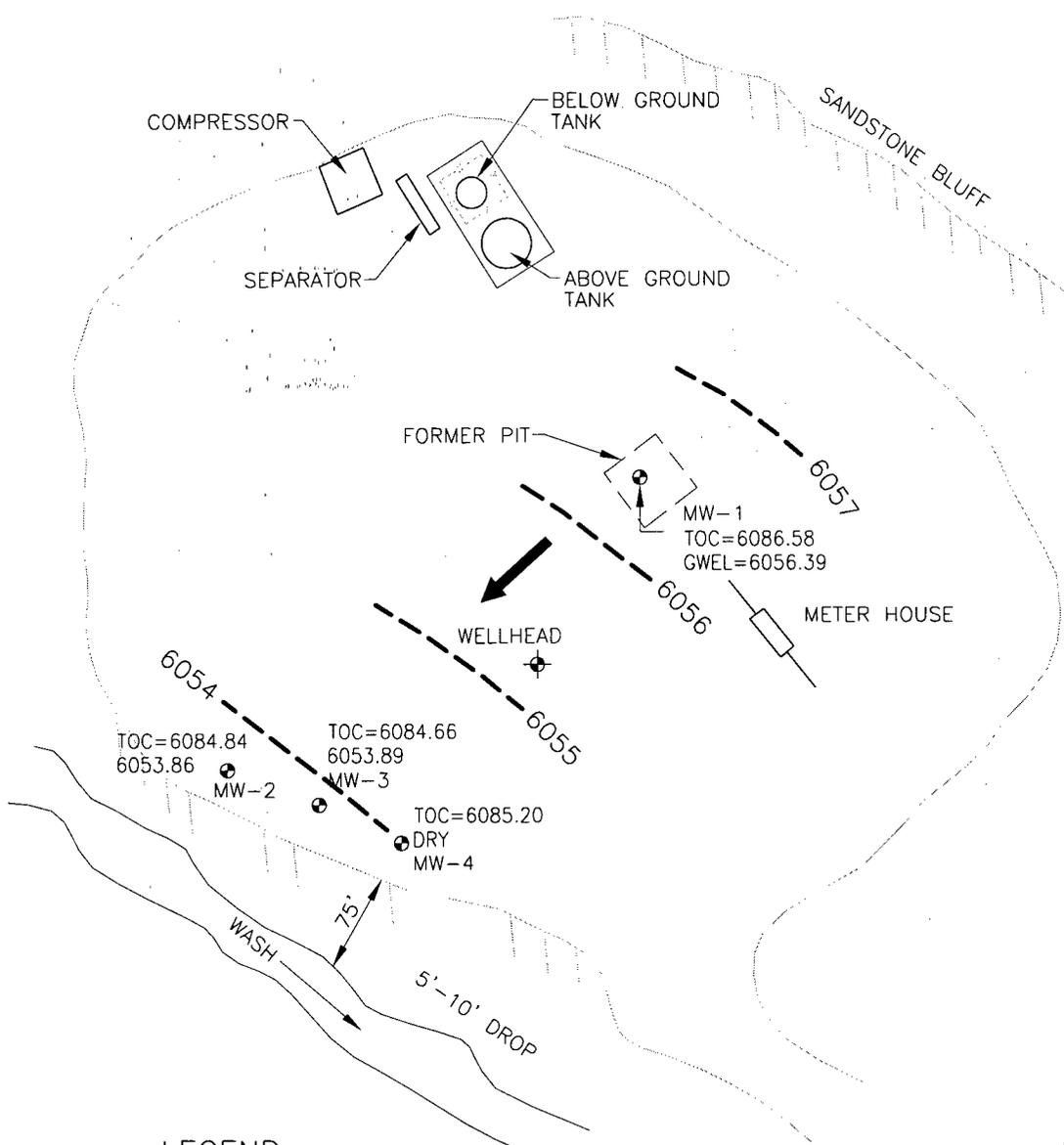
**Site-Wide Activities:** A technology review and data assessment to evaluate free-product removal was performed in 2005.

**SITE MAPS**

A site map (December) is attached in Figure 1.

**SUMMARY TABLES AND GRAPHS**

- Groundwater analytical data for 2005 are summarized in Table 1, and historic data are presented graphically in Figures 2 through 4.
- Free-product recovery data in 2005 from MW-1 are summarized in Table 2 and are presented graphically in Figure 5.

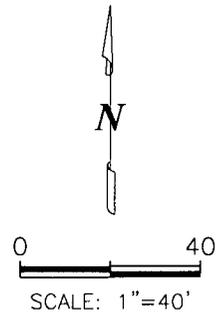


**LEGEND**

- ⊕ MW-1      Approximate Monitoring Well Location and Number
- GWEL      Groundwater Elevation (FT Above Mean Sea Level Unless Noted Otherwise)
- Potentiometric Surface (Dashed where inferred)
- ←      Direction of Groundwater Flow (Estimated)
- NS      Not Sampled
- TOC      Top of Casing

|   | MW-1 | MW-2 | MW-3 |
|---|------|------|------|
| B | 108  | <1.0 | <1.0 |
| T | 29.0 | <1.0 | <1.0 |
| E | 14.2 | <1.0 | <1.0 |
| X | 274  | <2.0 | <2.0 |

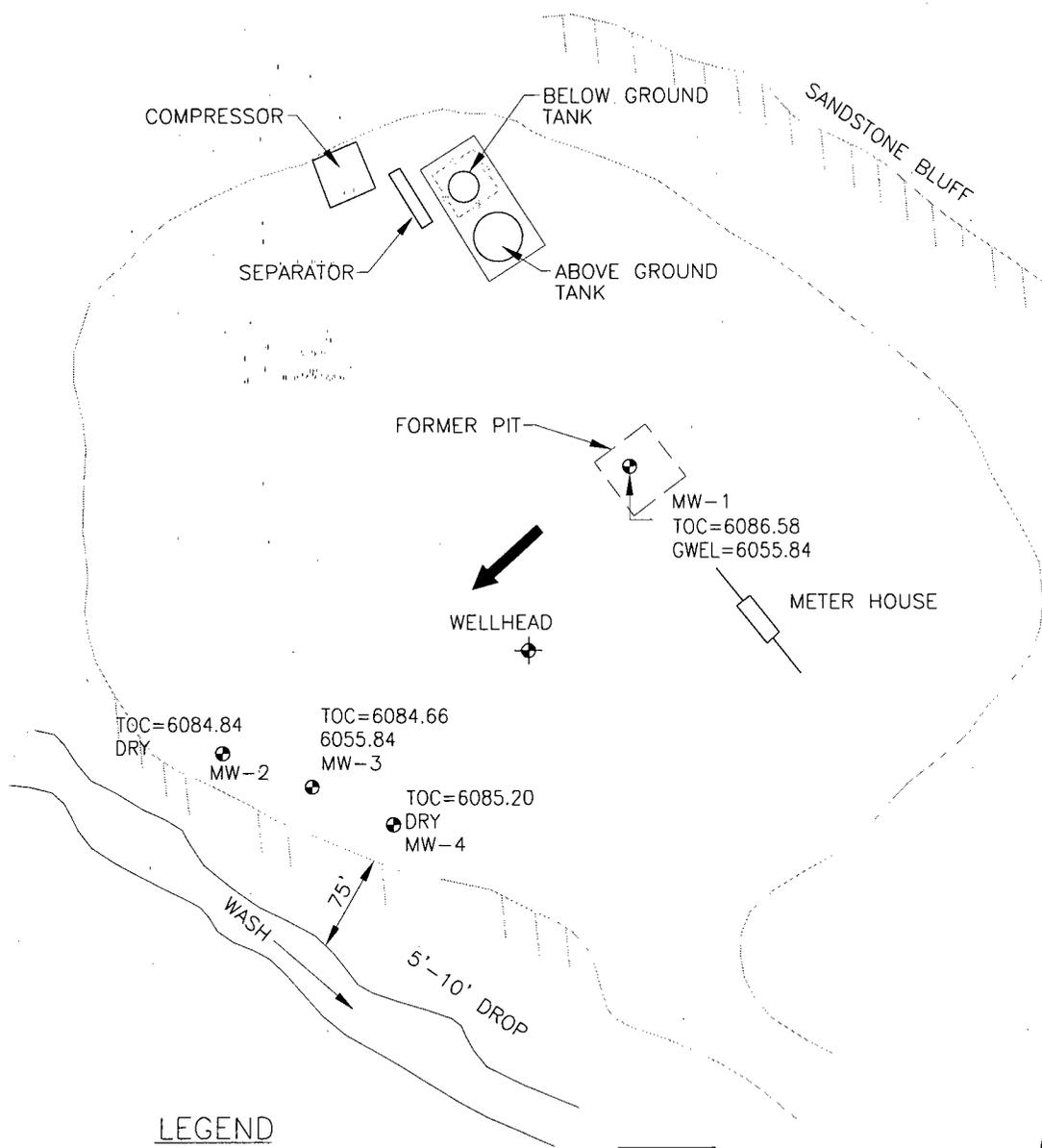
- B      Benzene (µg/L)
- T      Toluene (µg/L)
- E      Ethylbenzene (g/L)
- X      Total Xylenes (g/L)



FIELDS A#7A, METER 89961/97546  
APRIL 2005

GROUNDWATER SITES  
EL PASO TENNESSEE PIPELINE COMPANY

FIGURE 1

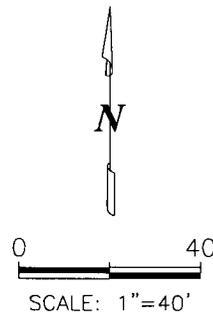


**LEGEND**

- MW-1 Approximate Monitoring Well Location and Number
- GWEL Groundwater Elevation (FT Above Mean Sea Level Unless Noted Otherwise)
- Potentiometric Surface (Dashed where inferred)
- Direction of Groundwater Flow (Estimated)
- NS Not Sampled
- TOC Top of Casing

| MW-1 |      |
|------|------|
| B    | 180  |
| T    | 69.2 |
| E    | 6.3  |
| X    | 154  |

- B Benzene ( $\mu\text{g/L}$ )
- T Toluene ( $\mu\text{g/L}$ )
- E Ethylbenzene (g/L)
- X Total Xylenes (g/L)



**FIELDS A #7A, METER 89961/97546**  
**OCTOBER 2005**

**GROUNDWATER SITES**  
**EL PASO TENNESSEE PIPELINE COMPANY**

**FIGURE 2**



TABLE 1

SUMMARY OF BTEX COMPOUNDS IN 2005 GROUNDWATER SAMPLES  
 FIELDS A#7A (METER #89961)

| Site Name   | Sample Date | Monitoring Well | Benzene (ug/L) | Toluene (ug/L) | Ethylbenzene (ug/L) | Total Xylenes (ug/L) | Depth to Water (ug/L) |
|-------------|-------------|-----------------|----------------|----------------|---------------------|----------------------|-----------------------|
| Fields A#7A | 4/18/05     | MW-1            | 108            | 29             | 14.2                | 274                  | 30.19                 |
| Fields A#7A | 10/22/05    | MW-1            | 180            | 69.2           | 6.3                 | 154                  | 30.74                 |
| Fields A#7A | 4/18/05     | MW-2            | 1              | 1              | 1                   | 2                    | 30.98                 |
| Fields A#7A | 4/18/05     | MW-3            | 1              | 1              | 1                   | 2                    | 30.77                 |

TABLE 2

SUMMARY OF FREE-PRODUCT REMOVAL DRUING 2005  
 FIELDS A#7A (METER #89961)

| Site Name   | Monitoring Well | Removal Date | Depth to Product<br>(feet bgs) | Depth to Water<br>(feet bgs) | Product Thickness<br>(feet) | Volume of Product Removed<br>(gallons) | Cumulative Volume of Product<br>Removed (gallons) |
|-------------|-----------------|--------------|--------------------------------|------------------------------|-----------------------------|--|---|
| Fields A#7A | MW-1            | 1/25/05      | NA                             | 31.15                        | 0.00                        | 0.00                                   | 12.36   |
| Fields A#7A | MW-1            | 4/18/05      | NA                             | 30.19                        | 0.00                        | 0.00                                   | 12.36   |
| Fields A#7A | MW-4            | 1/25/05      | dry                            | dry                          | 0.00                        | 0.00                                   | 1.36  |
| Fields A#7A | MW-4            | 4/18/05      | dry                            | dry                          | 0.00                        | 0.00                                   | 1.36  |
| Fields A#7A | MW-4            | 10/22/05     | dry                            | dry                          | 0.00                        | 0.00                                   | 1.36  |

**FIGURE 4**  
**HISTORIC BTEX CONCENTRATIONS AND GROUNDWATER ELEVATIONS**  
**FIELDS A #7A**  
**MW-1**

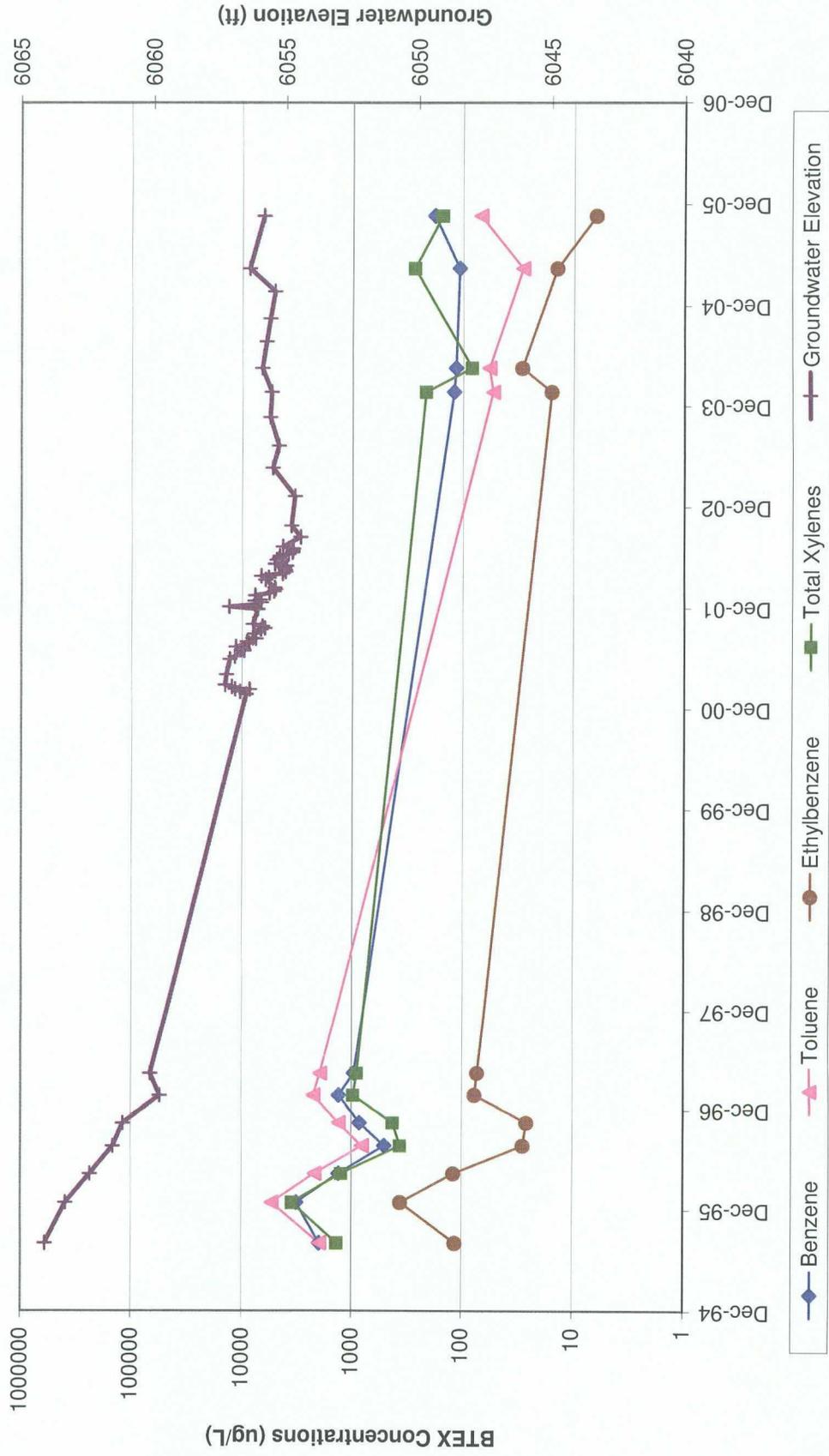
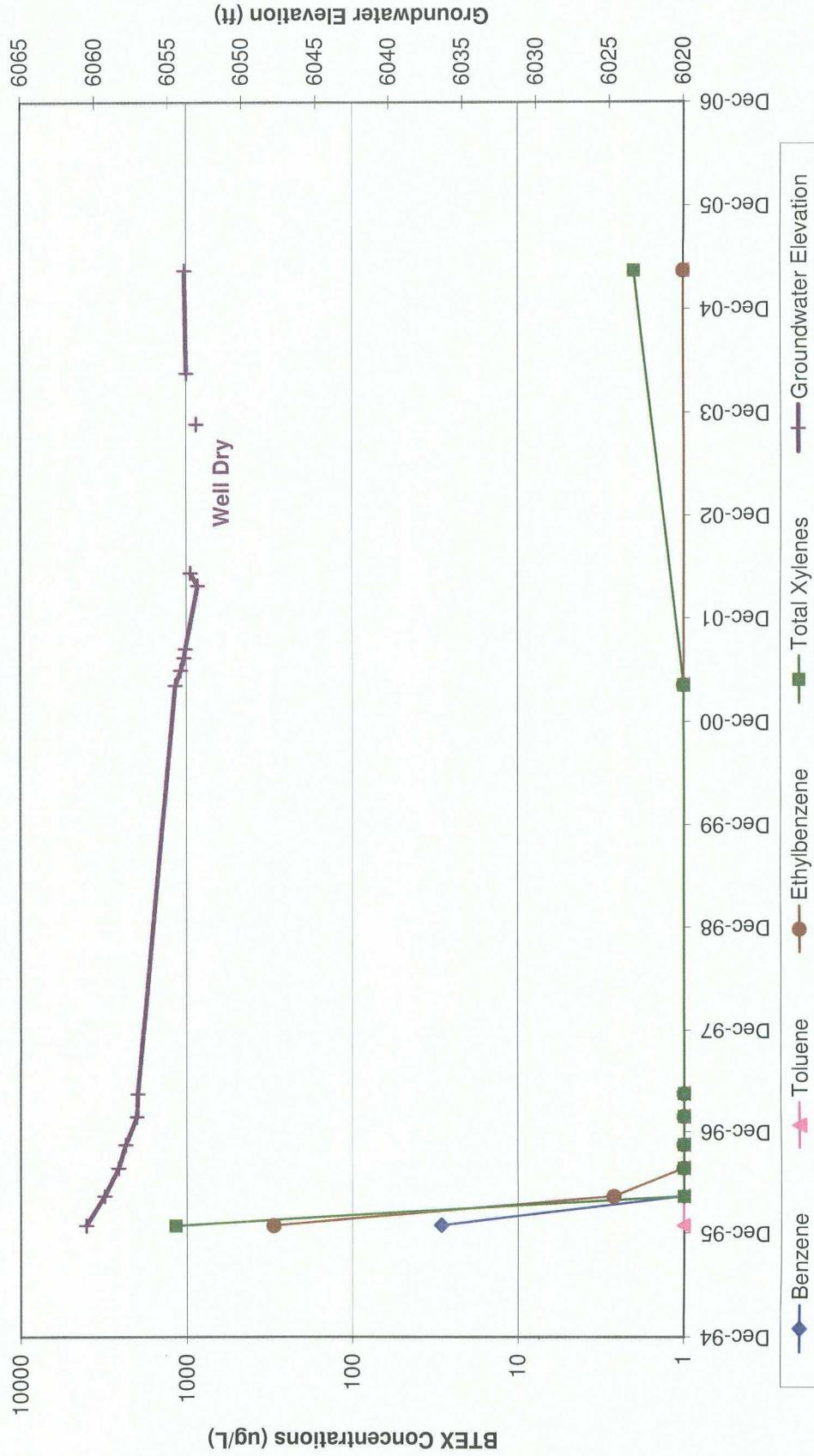
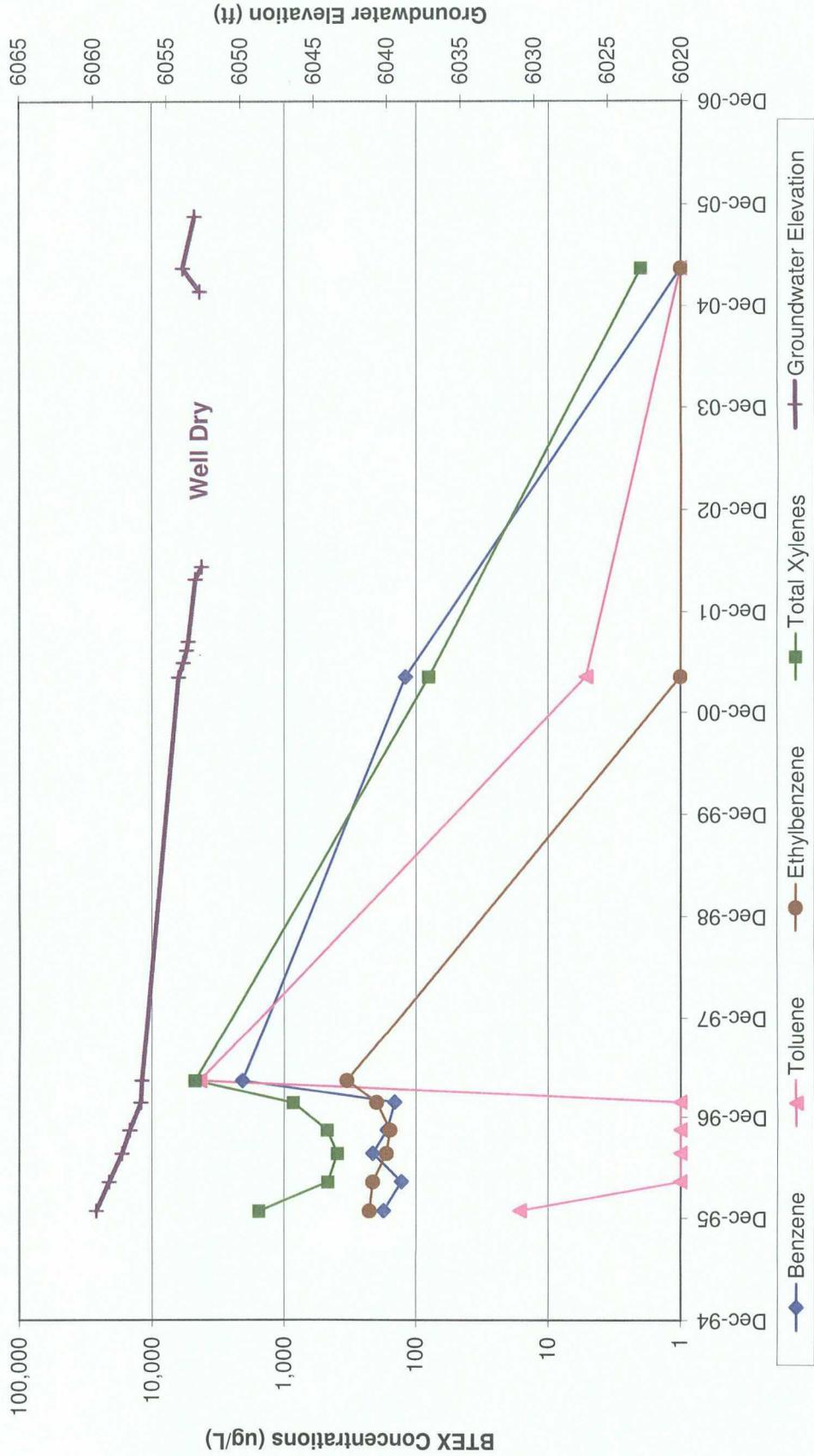


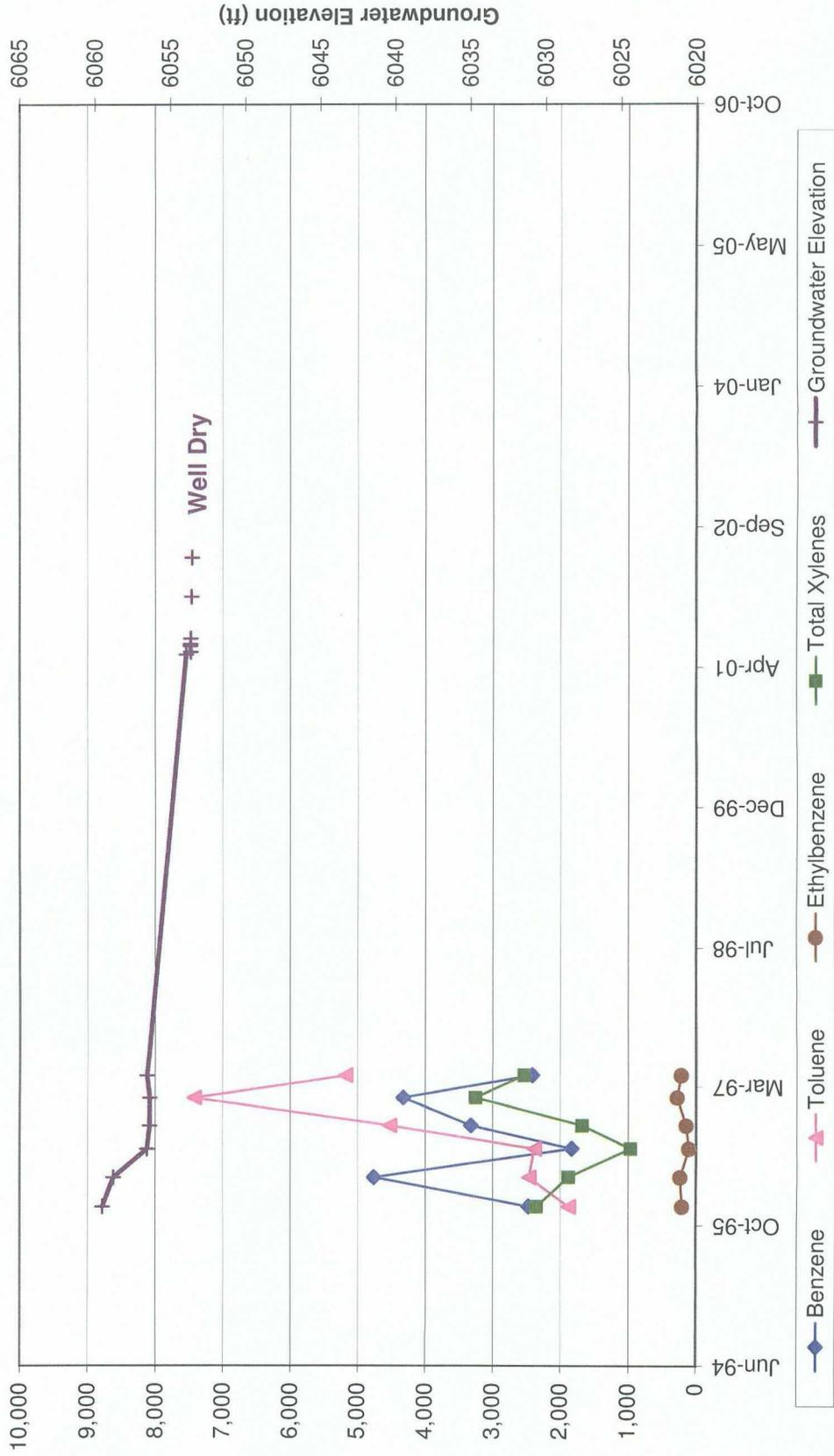
FIGURE 5  
 HISTORIC BTEX CONCENTRATIONS AND GROUNDWATER ELEVATIONS  
 FIELDS A #7A  
 MW-2



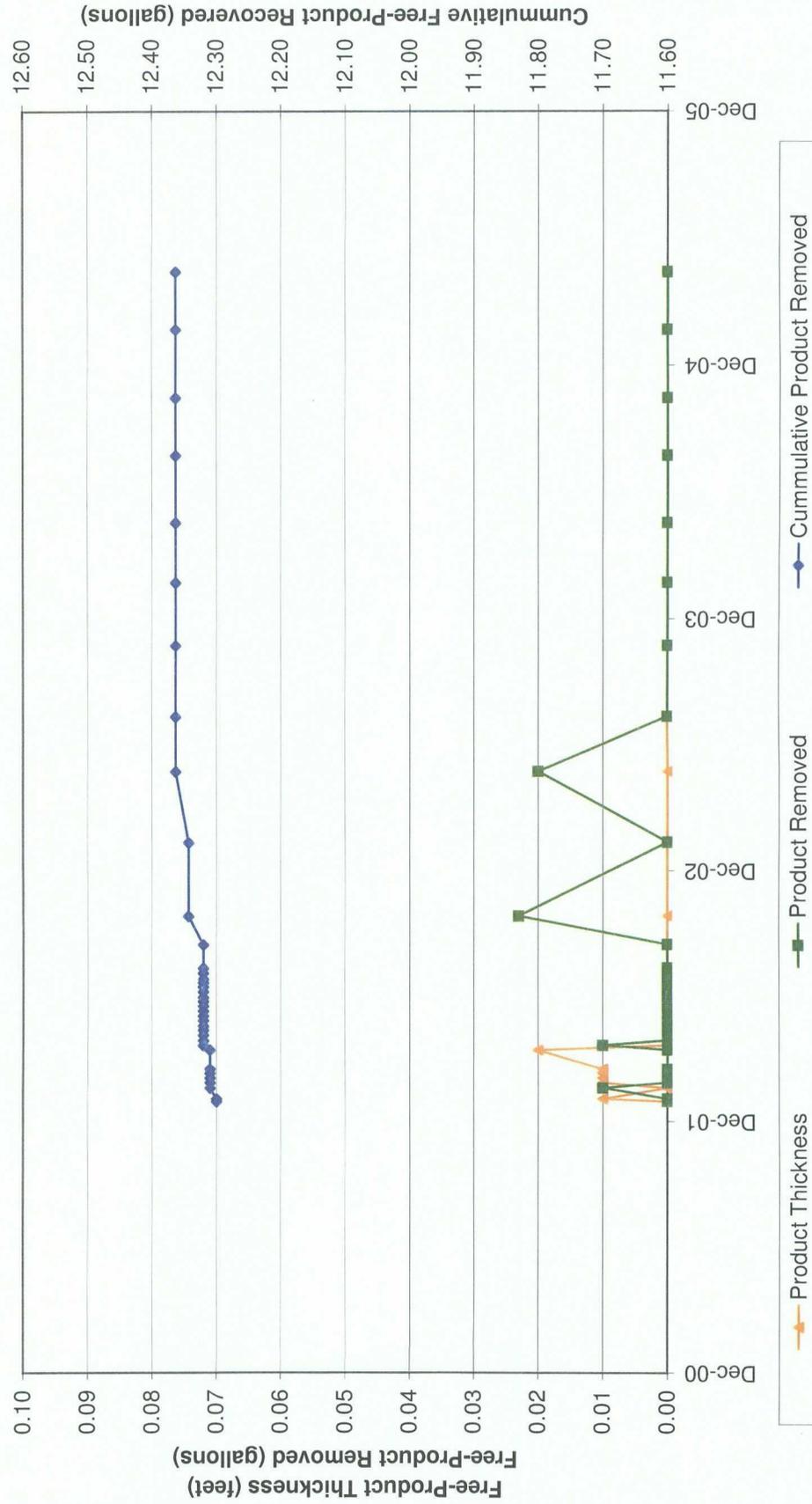
**FIGURE 6**  
**HISTORIC BTEX CONCENTRATIONS AND GROUNDWATER ELEVATIONS**  
**FIELDS A #7A**  
**MW-3**



**FIGURE 7**  
**HISTORIC BTEX CONCENTRATIONS AND GROUNDWATER ELEVATIONS**  
**FIELDS A #7A**  
**MW-4**



**FIGURE 8**  
**HISTORIC FREE-PRODUCT RECOVERY**  
**FIELDS A #7A**  
**MW-1**



**FIGURE 9**  
**HISTORIC FREE-PRODUCT RECOVERY**  
**FIELDS A #7A**  
**MW-4**

