

3R-407

**Annual Monitor
Report
2009**

**Date:
8/21/10**

312P-407



El Paso Tennessee
Pipeline Company

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San Juan Basin Pit Program
Groundwater Sites Project

Final 2009 Annual Report
Navajo Sites (Volume 3)

April 2010



MWH

1801 California Street, Suite 2900
Denver, Colorado 80202

**2009 ANNUAL GROUNDWATER REPORT
NAVAJO SITES VOLUME III
EL PASO TENNESSEE PIPELINE COMPANY**

TABLE OF CONTENTS

| METER or LINE ID | NMOCD CASE NO. | SITE NAME | TOWNSHIP | RANGE | SECTION | UNIT |
|---------------------|-------------------|-------------------------------|----------|-------|---------|------|
| 95608 | 3RP-407-0 | Gallegos Canyon Unit #124E | 28N | 12W | 35 | N |

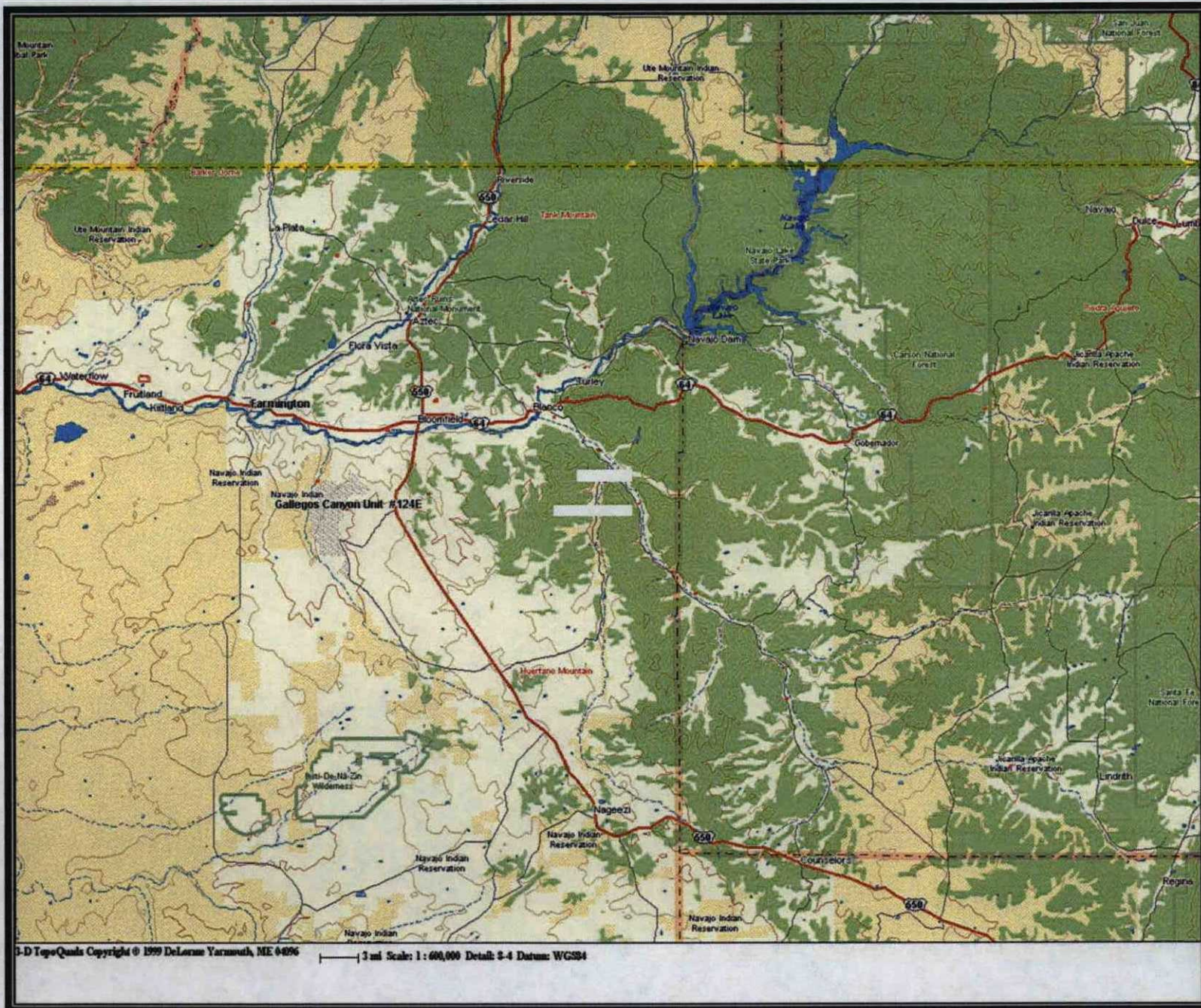


MWH

LIST OF ACRONYMS

| | |
|--------|---|
| AMSL | above mean sea level |
| B | benzene |
| btoc | below top of casing |
| E | ethylbenzene |
| EPTPC | El Paso Tennessee Pipeline Company |
| ft | foot/feet |
| GWEL | groundwater elevation |
| ID | identification |
| MW | monitor well |
| NMWQCC | New Mexico Water Quality Control Commission |
| T | toluene |
| TOC | top of casing |
| NA | not applicable |
| NMOCD | New Mexico Oil Conservation Division |
| NS | not sampled |
| ORC | oxygen-releasing compound |
| µg/L | micrograms per liter |
| X | total xylenes |

Navajo Groundwater Site Map



**EPTPC GROUNDWATER SITES
2009 ANNUAL GROUNDWATER REPORT**

**GCU #124E
Meter Code: 95608**

SITE DETAILS

| | | | | | | | | |
|-------------------------------|--------------|-----------------------|---------------|------------------|-----------------------|----|--------------|---|
| Legal Description: | Town: | 28N | Range: | 12W | Sec: | 35 | Unit: | N |
| NMOCD Haz Ranking: | 20 | Land Type: | Navajo | Operator: | BP / Amoco Production | | | |

PREVIOUS ACTIVITIES

| | | | | | |
|------------------------------------|--------|---------------------------|--------------------|-----------------------------------|--------|
| Site Assessment: | Jan/95 | Excavation: | Oct/95 (196 cy) | Soil Boring: | Mar/98 |
| Monitor Well: | Jun/98 | Geoprobe: | NA | Additional MWs: | * |
| Downgradient MWs: | * | Replace MW: | NA | Quarterly Initiated: | Jun/98 |
| ORC Nutrient Injection: | NA | Re-Excavation: | NA | PSH Removal Initiated: | Apr/99 |
| Annual Initiated: | NA | Quarterly Resumed: | NA | PSH Removal in 2009? | No |

* Attempts were made in November 2000 to install additional wells that resulted in dry holes.

SUMMARY OF 2009 ACTIVITIES

MW-1: Semiannual groundwater sampling (January and August) was performed in 2009. An additional water level monitoring event was conducted in November 2009.

Site-Wide Activities: No other activities were performed at this Site during 2009.

SITE MAP

Site maps (January and August) are attached as Figures 1 and 2.

SUMMARY TABLES AND GRAPHS

- Historic analytical and water level data are summarized in Table 1 and presented graphically in Figure 3.
- Historic free-product recovery data are summarized in Table 2 and presented graphically in Figure 3.
- The 2009 laboratory reports are presented in Attachment 1 (included on CD).
- The 2009 field documentation is presented in Attachment 2 (included on CD).

**EPTPC GROUNDWATER SITES
2009 ANNUAL GROUNDWATER REPORT**

**GCU #124E
Meter Code: 95608**

GEOLOGIC LOGS AND WELL COMPLETION DIAGRAMS

No subsurface activities were performed at this Site during 2009.

DISPOSITION OF GENERATED WASTES

All purge water was taken to the El Paso Natural Gas Rio Vista Compressor Station.

ISOCONCENTRATION MAPS

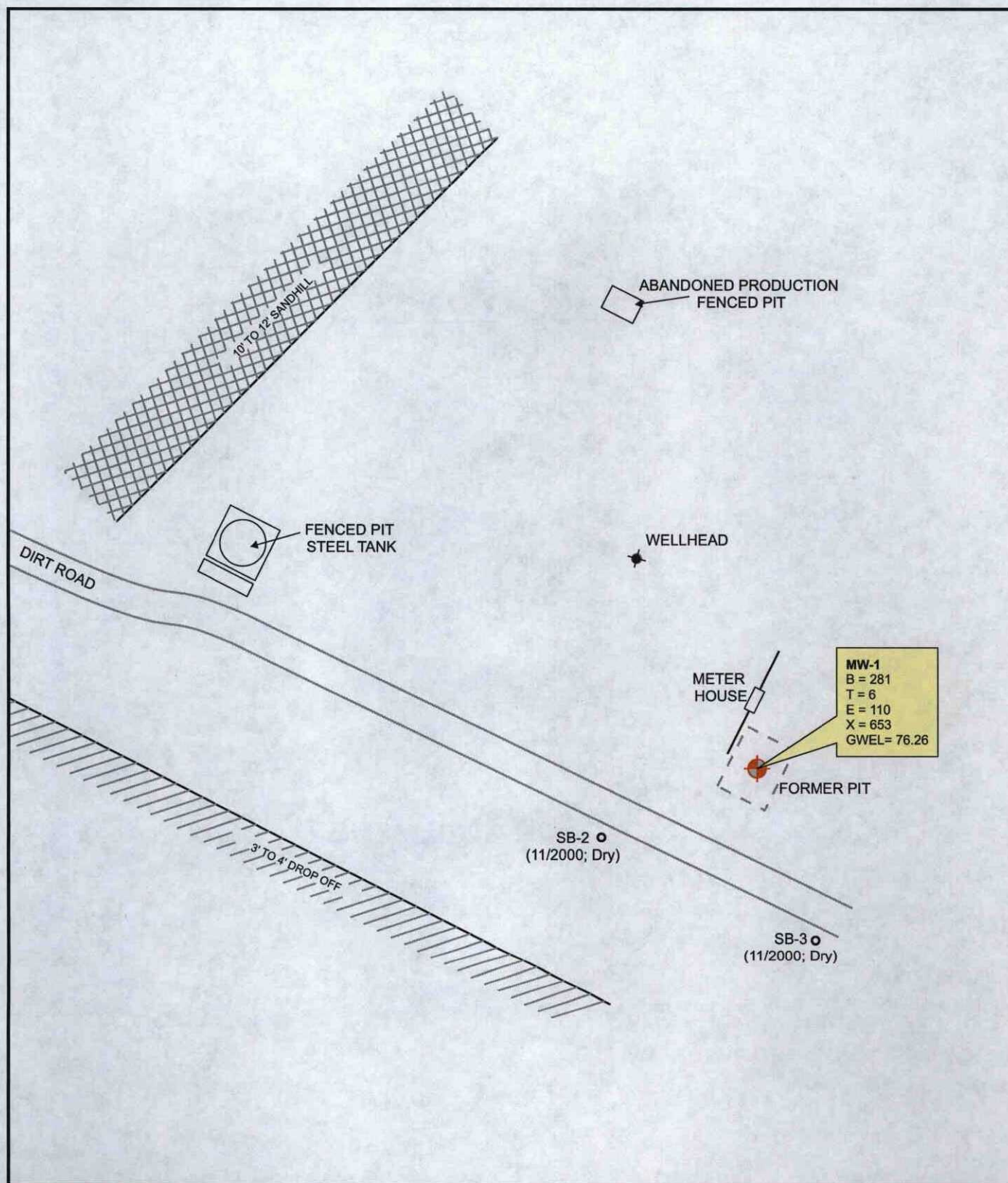
No isoconcentration maps were generated for this Site; however, the attached Site maps present the analytical data collected during 2009.

RESULTS

- Benzene concentrations decreased during 2009, apparently related to the decrease in water level elevations. The semiannual benzene results were 281 µg/L and 57.9 µg/L for January and August 2009, respectively. As a long-term trend, the benzene concentrations appear to be attenuating steadily from a high of 2,960 µg/L observed in 1999.
- With the exception of the January concentration of total xylenes (653 µg/L), the other BTEX constituent concentrations were below all applicable standards during 2009. While concentrations of total xylenes still fluctuate with static water level, they are well below the historical highs, indicating continued attenuation.
- Gauging at MW-1 did not detect any free-product in 2009. Measurable free-product has not been detected in the well since 2003. Virtually all of the free-product recovery was completed by the end of 2002 (approximately 19 gallons). At times, a sheen is still observed on the water during bailing activities.

RECOMMENDATIONS

- EPTPC recommends continued semiannual sampling at MW-1, along with quarterly water level gauging.
- Once the benzene concentrations again approach the standard, sampling will return to a quarterly frequency until BTEX concentrations are below the applicable NNEPA/USEPA standards for three consecutive quarters and NMWQCC standards for four consecutive quarters.



LEGEND

MW-4 Existing Monitoring / Observation Well

B Benzene (ug/L)

T Toluene (ug/L)

E Ethylbenzene (ug/L)

X Total Xylenes (ug/L)

GWEL Groundwater Elevation (ft. *)

* = Elevations in feet relative to a 100 ft benchmark.

ND Not Detected; Reporting Limit Shown in Parentheses

0 10 20 40 60 80 Feet



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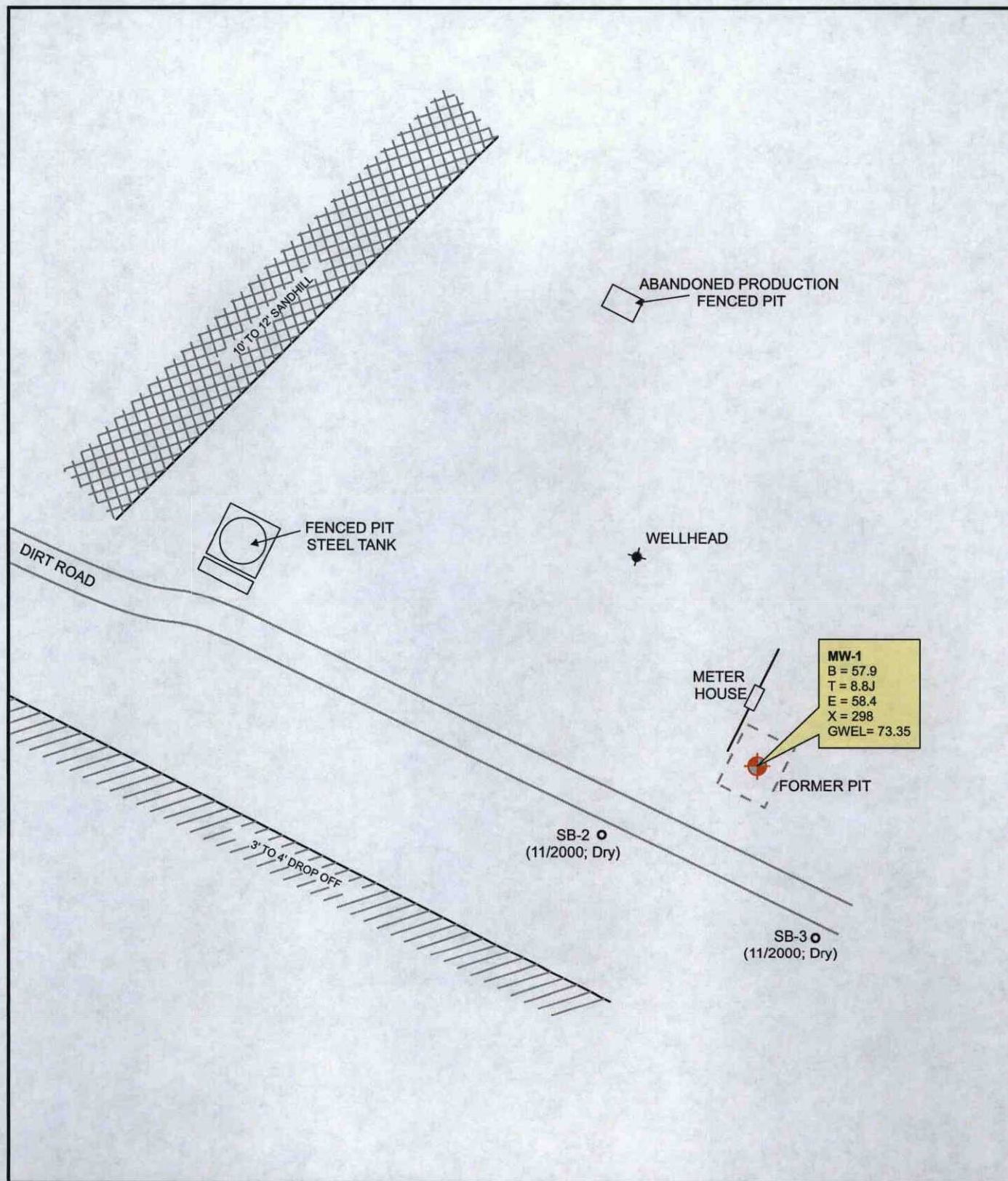


PROJECT: GALLEGOS CANYON UNIT #124E

TITLE: Groundwater Potentiometric Surface Map,
and BTEX Concentrations - January 7, 2009

FIGURE:

1



LEGEND

MW-4 Existing Monitoring / Observation Well

B Benzene (ug/L)

T Toluene (ug/L)

E Ethylbenzene (ug/L)

X Total Xylenes (ug/L)

GWEL Groundwater Elevation (ft. *)

* = Elevations in feet relative to a 100 ft benchmark.

ND Not Detected; Reporting Limit Shown in Parentheses

J Result Flagged as Estimated

0 10 20 40 60 80 Feet



MWH



PROJECT:

GALLEGOS CANYON UNIT #124E

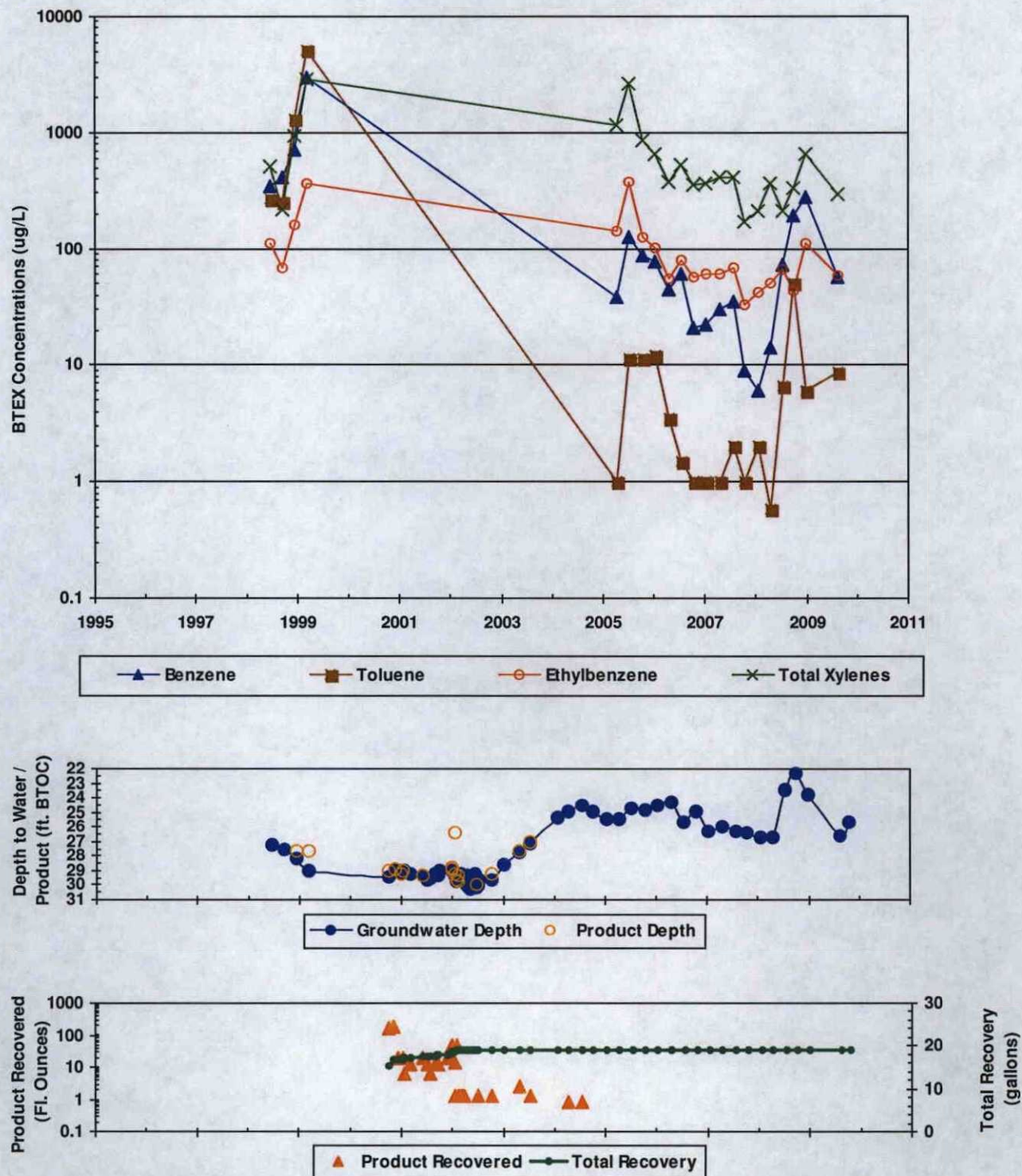
TITLE:

Groundwater Potentiometric Surface Map,
and BTEX Concentrations - August 25, 2009

FIGURE:

2

FIGURE 3
SUMMARY OF GROUNDWATER BTEX CONCENTRATIONS, FLUID LEVELS, AND PRODUCT RECOVERY
GCU #124E (METER #95608)
MW01



*In some cases, older recovery event data are not available. However, the cumulative totals still include all historic recovery.

TABLE 1

**SUMMARY OF BTEX COMPOUNDS IN GROUNDWATER SAMPLES
GCU #124E (METER #95608)**

| Monitor Well | Sample Date | Benzene (ug/L) | Toluene (ug/L) | Ethylbenzene (ug/L) | Total Xylenes (ug/L) | Depth to Water (ft BTOC) | Corrected GW Elevation (Feet*) |
|-----------------|-------------|----------------|----------------|---------------------|----------------------|--------------------------|--------------------------------|
| NMWQCC GW Std.: | | 10 | 750 | 750 | 620 | | |
| MW01 | 6/25/1998 | 340 | 271 | 111 | 510 | 27.21 | 72.79 |
| MW01 | 9/14/1998 | 410 | 251 | 68.3 | 220 | 27.50 | 72.50 |
| MW01 | 12/15/1998 | 710 | 1300 | 160 | 940 | 28.16 | 72.28 |
| MW01 | 3/16/1999 | 2960 | 5130 | 367 | 2890 | 29.02 | 72.12 |
| MW01 | 4/19/2005 | 38.8 | <1.0 | 142 | 1160 | 25.45 | 74.55 |
| MW01 | 7/20/2005 | 125 | 11.4 | 371 | 2640 | 24.73 | 75.27 |
| MW01 | 10/20/2005 | 86.8 | 11.3 | 125 | 864 | 24.85 | 75.15 |
| MW01 | 1/19/2006 | 77.9 | 12.0 | 101 | 656 | 24.53 | 75.47 |
| MW01 | 4/24/2006 | 45.1 | 3.5J | 56.1 | 377 | 24.25 | 75.75 |
| MW01 | 7/31/2006 | 60.8 | 1.5J | 79.3 | 524 | 25.68 | 74.32 |
| MW01 | 10/24/2006 | 21.1 | <1.0 | 56.6 | 349 | 24.94 | 75.06 |
| MW01 | 1/19/2007 | 22.4 | <1.0 | 60.0 | 367 | 26.33 | 73.67 |
| MW01 | 4/24/2007 | 30.3 | <1.0 | 60.6 | 407 | 25.97 | 74.03 |
| MW01 | 7/31/2007 | 35.3 | <2.0 | 68.4 | 416 | 26.26 | 73.74 |
| MW01 | 10/25/2007 | 9.0 | <1.0 | 33.2 | 173 | 26.44 | 73.56 |
| MW01 | 1/28/2008 | 6.0 | <2.0 | 41.6 | 210 | 26.67 | 73.33 |
| MW01 | 4/23/2008 | 14.1 | 0.59J | 50.1 | 360 | 26.67 | 73.33 |
| MW01 | 7/23/2008 | 72.7 | 6.7 | 65.8 | 210 | 23.49 | 76.51 |
| MW01 | 10/8/2008 | 194 | <50 | 43.6J | 328 | 22.30 | 77.70 |
| MW01 | 1/7/2009 | 281 | 6J | 110 | 653 | 23.74 | 76.26 |
| MW01 | 8/25/2009 | 57.9 | 8.8J | 58.4 | 298 | 26.65 | 73.35 |

Notes:

Results shown in bold typeface exceed their respective New Mexico Water Quality Control Commission standards.

"J" = result is qualified as estimated. See laboratory report and/or supplemental data validation report for further detail.

"<" = analyte was not detected at the indicated reporting limit.

Static groundwater elevations have been corrected for product thickness where applicable. Specific gravity of 0.8 used.

*This site has a benchmark elevation of 100 feet rather than mean sea level.

TABLE 2

**SUMMARY OF FREE-PRODUCT REMOVAL
GCU #124E (METER #95608)**

| Monitor Well | Removal Date | Depth to Product (ft BTOC) | Depth to Water (ft BTOC) | Product Thickness (feet) | Volume Removed (gallons) | Cumulative Removal (gallons) | Corrected GW Elevation (Feet*) |
|--------------|--------------|----------------------------|--------------------------|--------------------------|--------------------------|------------------------------|--------------------------------|
| MW01 | 12/15/1998 | 27.61 | 28.16 | 0.55 | NA | NA | 72.28 |
| MW01 | 3/16/1999 | 27.60 | 29.02 | 1.42 | NA | NA | 72.12 |
| MW01 | 10/5/2000 | 29.04 | 29.46 | 0.42 | 1.25 | 15.30 | 70.88 |
| MW01 | 11/15/2000 | 28.93 | 28.93 | 0.00 | 1.50 | 16.80 | 71.07 |
| MW01 | 12/20/2000 | -- | 28.98 | 0.00 | 0.15 | 16.95 | 71.02 |
| MW01 | 1/9/2001 | 29.18 | 29.21 | 0.03 | -- | 16.95 | 70.81 |
| MW01 | 1/15/2001 | 29.04 | 29.07 | 0.03 | -- | 16.95 | 70.95 |
| MW01 | 1/22/2001 | -- | 28.99 | 0.00 | 0.15 | 17.10 | 71.01 |
| MW01 | 1/30/2001 | -- | 29.09 | 0.00 | 0.05 | 17.15 | 70.91 |
| MW01 | 3/12/2001 | -- | 29.26 | 0.00 | 0.10 | 17.25 | 70.74 |
| MW01 | 6/5/2001 | 29.28 | 29.32 | 0.04 | 0.15 | 17.40 | 70.71 |
| MW01 | 7/13/2001 | -- | 29.65 | 0.00 | 0.10 | 17.50 | 70.35 |
| MW01 | 8/2/2001 | -- | 29.53 | 0.00 | 0.05 | 17.55 | 70.47 |
| MW01 | 8/31/2001 | -- | 29.27 | 0.00 | 0.10 | 17.65 | 70.73 |
| MW01 | 9/21/2001 | -- | 29.33 | 0.00 | 0.10 | 17.75 | 70.67 |
| MW01 | 10/2/2001 | -- | 28.98 | 0.00 | 0.10 | 17.85 | 71.02 |
| MW01 | 12/5/2001 | NA | NA | NA | 0.16 | 18.01 | NA |
| MW01 | 1/2/2002 | 28.85 | 28.96 | 0.11 | 0.16 | 18.16 | 71.13 |
| MW01 | 1/7/2002 | 28.94 | 28.99 | 0.05 | 0.38 | 18.54 | 71.05 |
| MW01 | 1/23/2002 | 26.35 | 29.35 | 3.00 | 0.11 | 18.65 | 73.05 |
| MW01 | 1/30/2002 | 29.22 | 29.24 | 0.02 | 0.01 | 18.66 | 70.78 |
| MW01 | 2/7/2002 | 29.66 | 29.70 | 0.04 | 0.38 | 19.04 | 70.33 |
| MW01 | 2/14/2002 | 29.28 | 29.29 | 0.01 | 0.01 | 19.05 | 70.72 |
| MW01 | 2/20/2002 | 29.75 | 29.76 | 0.01 | 0.01 | 19.06 | 70.25 |
| MW01 | 3/4/2002 | -- | 29.30 | 0.00 | 0.01 | 19.07 | 70.70 |
| MW01 | 3/11/2002 | -- | 29.17 | 0.00 | 0.01 | 19.08 | 70.83 |
| MW01 | 3/21/2002 | -- | 29.47 | 0.00 | 0.01 | 19.09 | 70.53 |
| MW01 | 3/28/2002 | -- | 29.33 | 0.00 | 0.01 | 19.10 | 70.67 |
| MW01 | 4/3/2002 | -- | 29.33 | 0.00 | 0.01 | 19.11 | 70.67 |
| MW01 | 7/2/2002 | 29.98 | 29.99 | 0.01 | -- | 19.11 | 70.02 |
| MW01 | 7/15/2002 | -- | 29.63 | 0.00 | 0.01 | 19.12 | 70.37 |
| MW01 | 10/16/2002 | 29.24 | 29.65 | 0.41 | 0.01 | 19.13 | 70.68 |
| MW01 | 5/5/2003 | 27.69 | 27.72 | 0.03 | 0.02 | 19.15 | 72.30 |
| MW01 | 7/18/2003 | 27.06 | 27.08 | 0.02 | 0.01 | 19.16 | 72.94 |

TABLE 2

**SUMMARY OF FREE-PRODUCT REMOVAL
GCU #124E (METER #95608)**

| Monitor Well | Removal Date | Depth to Product (ft BTOC) | Depth to Water (ft BTOC) | Product Thickness (feet) | Volume Removed (gallons) | Cumulative Removal (gallons) | Corrected GW Elevation (Feet*) |
|--------------|--------------|----------------------------|--------------------------|--------------------------|--------------------------|------------------------------|--------------------------------|
| MW01 | 4/15/2004 | -- | 24.98 | 0.00 | 0.01 | 19.17 | 75.02 |
| MW01 | 7/26/2004 | -- | 24.50 | 0.00 | 0.01 | 19.18 | 75.50 |

Notes:

"--" indicates either that product was not measurably detected or that product was not recovered.

"NA" indicates that the respective data point is not available.

Groundwater elevations may not be static due to removal of equipment. Corrections for product thickness utilize SG of 0.8.

*This site has a benchmark elevation of 100 feet rather than mean sea level.