

**3R - 207**

**ANNUAL  
MONITORING  
REPORT**

**04/02/2008**



**MWH**

**BUILDING A BETTER WORLD**

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2008 APR 4 PM 1 38

April 2, 2008

Mr. Glenn von Gonten  
New Mexico Oil Conservation Division (NMOCD)  
1220 South St., Francis Drive  
Santa Fe, New Mexico 87505

**RE: El Paso Tennessee Pipeline Company Pit Groundwater Remediation Sites  
2007 Annual Reports**

Dear Mr. Von Gonten:

MWH Americas, Inc., on behalf of El Paso Tennessee Pipeline Company (EPTPC), is submitting the enclosed 2007 Annual Reports for each of EPTPC's 21 remaining San Juan River Basin pit groundwater remediation Sites. The reports present the 2007 sampling and product recovery data and include recommendations for 2008 activities at these Sites.

Copies of the reports for Sites located on Federal or Navajo lands are also being sent under separate cover to the Bureau of Land Management and the Navajo Nation Environmental Protection Agency.

If you have any questions concerning the enclosed reports, please call either Nancy Prince of EPTPC (719-520-4690) or me (303-291-2276).

Sincerely,

Jed Smith  
Project Manager

cc: Brandon Powell – NMOCD, Aztec, NM  
Nancy Prince – EPTPC  
MWH Project File

**2007 ANNUAL GROUNDWATER REPORT  
NON-FEDERAL SITES VOLUME II  
EL PASO TENNESSEE PIPELINE COMPANY**

**TABLE OF CONTENTS**

METER or LINE ID	SITE NAME	TOWNSHIP	RANGE	SECTION	UNIT	
71669	State Gas Com N #1	31N	12W	16	H	3R239
93388	Horton #1E	31N	09W	28	H	3R192
72556	Knight #1	30N	13W	5	A	3R207
03906	GCU Com A #142E	29N	12W	25	G	3R179
70445	Standard Oil Com #1	29N	09W	36	N	3R074
LD087	K-31 Line Drip	25N	06W	16	N	3R205
94967	*Lindrith B #24	24N	03W	9	N	3R214

\* Lindrith B#24 Site has been submitted for closure, and is pending approval from NMOCD.

OGRID 227654  
181398



**MWH**

**EPTPC GROUNDWATER SITES  
2007 ANNUAL GROUNDWATER REPORT**

**Knight #1  
Meter Code: 72556**

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**SITE DETAILS**

**Legal Description:**                      **Town:** 30N            **Range:** 13W                      **Sec:** 5                      **Unit:** A  
**NMOCD Haz Ranking:** 30            **Land Type:** Fee            **Operator:** Fuller Petroleum Inc.

**PREVIOUS ACTIVITIES**

<b>Site Assessment:</b>	1/95	<b>Excavation:</b>	1/95 (60 cy)	<b>Soil Boring:</b>	10/95
<b>Monitor Well:</b>	10/95	<b>Geoprobe:</b>	1/97	<b>Additional MWs:</b>	11/00
<b>Downgradient MWs:</b>	12/95	<b>Replace MW:</b>	NA	<b>Quarterly Initiated:</b>	4/96
<b>ORC Nutrient Injection:</b>	11/96	<b>Re-Excavation:</b>	NA	<b>PSH Removal Initiated:</b>	9/01
<b>Annual Initiated:</b>	NA	<b>Quarterly Resumed:</b>	NA	<b>PSH Removal in 2007?</b>	No

**SUMMARY OF 2007 ACTIVITIES**

**MW-1:** Semi-annual groundwater sampling (March and September) and semi-annual water level measurements were performed in 2007.

**MW-2:** Annual groundwater sampling (September) and semi-annual water level measurements were performed during 2007.

**MW-3:** Annual groundwater sampling (September) and semi-annual water level measurements were performed in 2007.

**MW-4:** Annual groundwater sampling (September) and semi-annual water level measurements were performed during 2007.

**MW-5:** Semi-annual water level measurements were performed during 2007.

**Site-Wide Activities:** No other activities were performed during 2007.

**SITE MAP**

Site maps (March and September) are attached in Figures 1 and 2.

**SUMMARY TABLES AND GRAPHS**

- Analytical data are summarized in Table 1 and are presented graphically in Figures 3 through 7.

**EPTPC GROUNDWATER SITES  
2007 ANNUAL GROUNDWATER REPORT**

**Knight #1  
Meter Code: 72556**

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- Historic free-product recovery data are summarized on Table 2 and 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 2007.

**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 prepared for this Site; however, the attached Site maps present the potentiometric surface and analytical data collected during 2007.

**CONCLUSIONS**

- The groundwater flow direction trends to the south-southwest.
- Because there was no measurable free-product in MW-1, no product recovery was possible during 2007, leaving the cumulative total volume recovered at 0.36 gallons. Approximately 0.01 gallons of free-product were removed in 2005.
- Groundwater samples collected from MW-1 had benzene concentrations of 3,740 µg/L and 4,640 µg/L in March and September 2007, respectively. These results were well above the NMWQCC standard of 10 ppb. Total xylenes concentrations were above the applicable NMWQCC standard in March (9,210 µg/L) and September (8,180 µg/L). Toluene and ethylbenzene concentrations were below their respective standards during both events. Overall, the MW-1 results were similar to previous years.
- The annual sample collected from MW-2 during September 2007 had a benzene concentration of 317 µg/L. No other BTEX constituent exceeded its respective standard. Benzene concentrations in this well fluctuate with water level, and the 2007 sample result is at the high end of the observed concentration range.
- The annual sample collected from MW-3 during September 2007 had a benzene concentration of 288 µg/L and a total xylene concentration of 599 µg/L. This represents a substantial decrease in benzene and total xylene concentrations from what was observed in 2006 (when a sheen was present during sampling), but

**EPTPC GROUNDWATER SITES  
2007 ANNUAL GROUNDWATER REPORT**

**Knight #1  
Meter Code: 72556**

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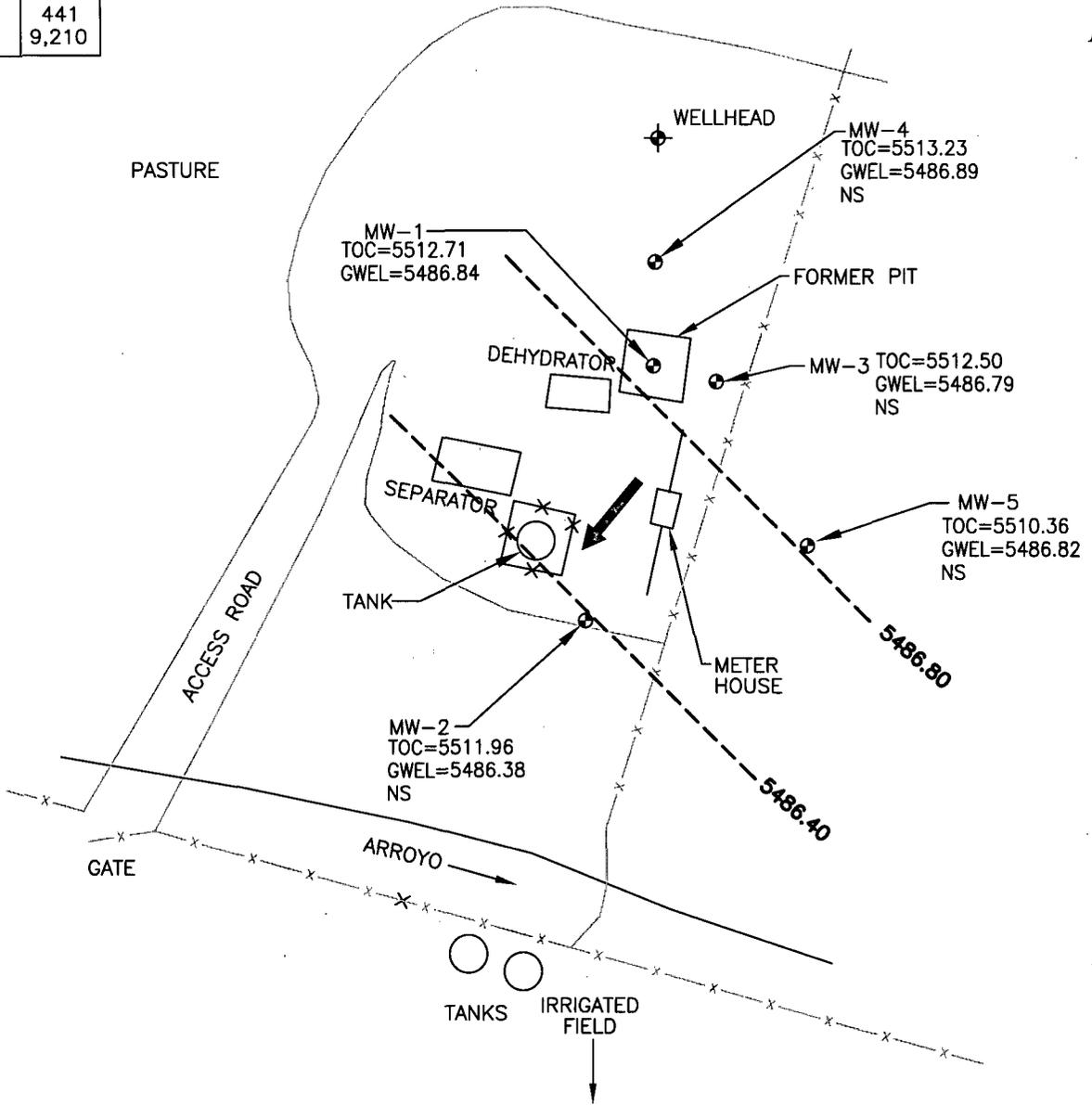
concentrations in this well fluctuate significantly with water level. The toluene and ethylbenzene concentrations were both below their respective NMWQCC standards.

- Laboratory results from the annual sample collected at upgradient well MW-4 during 2007 indicated a slight increase in benzene concentration from 180 µg/L in 2006 to 272 µg/L in 2007. All other sample results in MW-4 were below their respective standards.

**RECOMMENDATIONS**

- EPTPC will continue semi-annual water level gauging at MW-1, and free-product recovery will be re-started if product re-appears. If free-product remains absent, EPTPC recommends sampling MW-1 annually with the other wells.
- If free-product continues to be absent from MW-3, annual sampling will continue at this well, in addition to semi-annual water level measurements.
- EPTPC will continue annual groundwater sampling and semi-annual water level monitoring at MW-2 and MW-4 until concentrations of BTEX constituents approach closure criteria. These wells will then be scheduled for quarterly sample collection until closure criteria have been met.
- Because historical analytical data have indicated that BTEX concentrations are below or near detection limits at MW-5, EPTPC recommends that this well not be sampled again until closure. Water level monitoring at this well will continue on a semi-annual basis.
- The long-term monitoring data indicate that groundwater BTEX concentrations in the vicinity of the former pit remain elevated. EPTPC plans to evaluate potential additional remedial activities in this area, in order to accelerate hydrocarbon attenuation. Any recommendations will be presented in the next annual report.

	MW-1
B	3,740
T	<50
E	441
X	9,210



**LEGEND**

- ⊙ MW-1      Approximate Monitoring Well Location and Number
- B      Benzene ( $\mu\text{g/L}$ )
- T      Toluene ( $\mu\text{g/L}$ )
- E      Ethylbenzene ( $\mu\text{g/L}$ )
- X      Total Xylenes ( $\mu\text{g/L}$ )
- NS      Not Sampled
- <      Not Detected. Value Shown is Reporting Limit.
- 5483.70      Potentiometric Surface (Assumed Where Dashed)
- Direction of Groundwater Flow (Estimated)
- GWEL      Groundwater Elevation (FT Above Mean Sea Level Unless Noted Otherwise)
- TOC      Top of Casing

1	Issued for 2007 Report	10/10	D. Wade	N. Day	J. Smith
0	Issued For 2007 Report	04/07	J.Hurley	W.Grundvig	J.Smith
REV. No.	REVISIONS	REV. DATE	DESIGN BY	DRAWN BY	REVIEWED AND SIGNED BY
PROJECT No.: 1005521.0601					
AutoCAD FILE: Knight#1					
SCALE: As Shown			FIGURE No: 1		

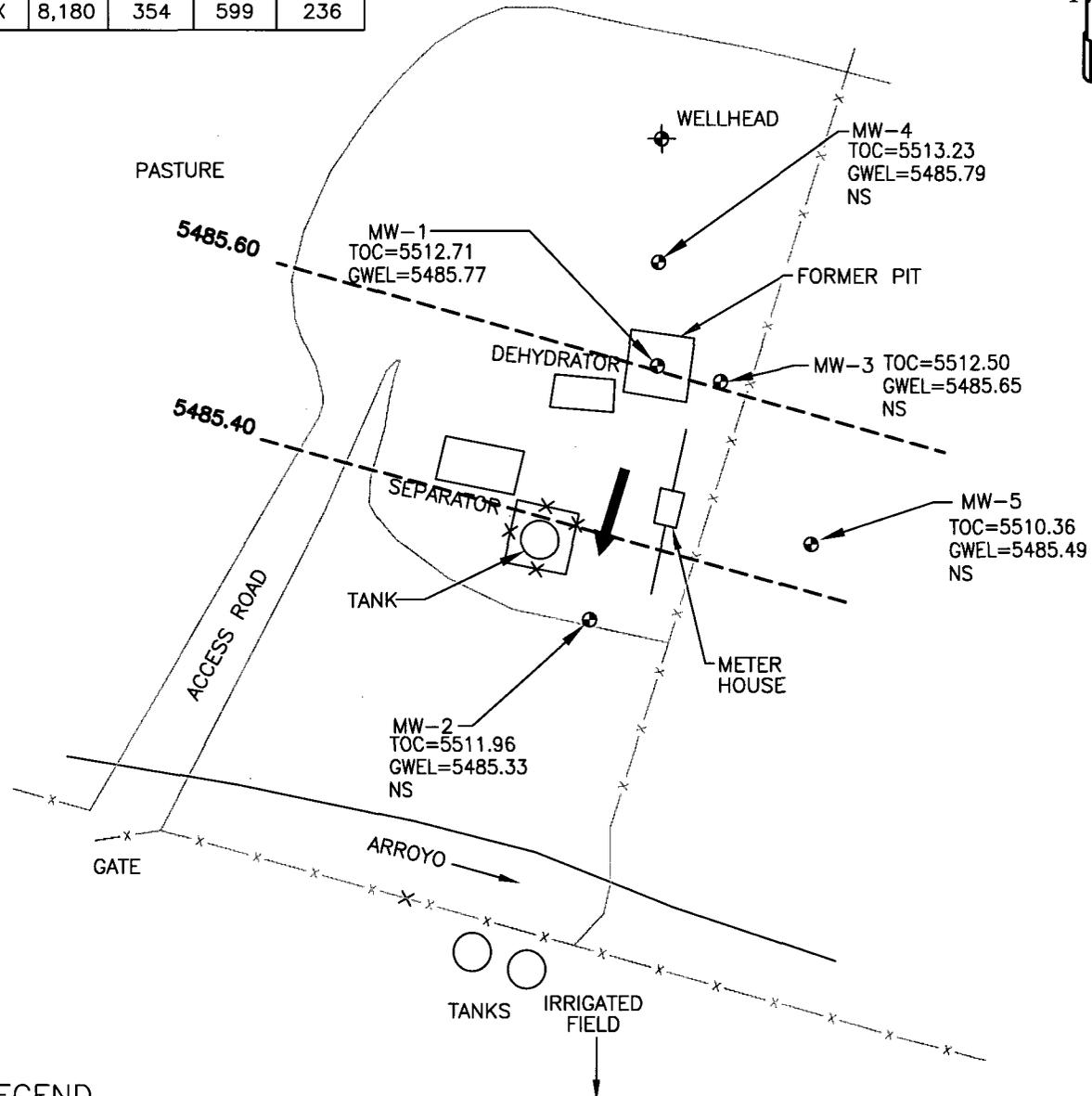


EL PASO TENNESSEE PIPELINE COMPANY  
KNIGHT #1, METER 72556



GROUNDWATER POTENTIOMETRIC SURFACE  
CONTOURS AND BTEX CONCENTRATIONS  
MARCH 2007

	MW-1	MW-2	MW-3	MW-4
B	4,640	317	288	272
T	93.3	<1.0	<1.0	4.7
E	444	12.5	65.4	21.3
X	8,180	354	599	236



**LEGEND**

- ⊙ MW-1 Approximate Monitoring Well Location and Number
- B Benzene ( $\mu\text{g/L}$ )
- T Toluene ( $\mu\text{g/L}$ )
- E Ethylbenzene ( $\mu\text{g/L}$ )
- X Total Xylenes ( $\mu\text{g/L}$ )
- NS Not Sampled
- < Not Detected. Value Shown is Reporting Limit.

- 5483.70 Potentiometric Surface (Assumed Where Dashed)
- $\rightarrow$  Direction of Groundwater Flow (Estimated)
- GWEL Groundwater Elevation (FT Above Mean Sea Level Unless Noted Otherwise)
- TOC Top of Casing

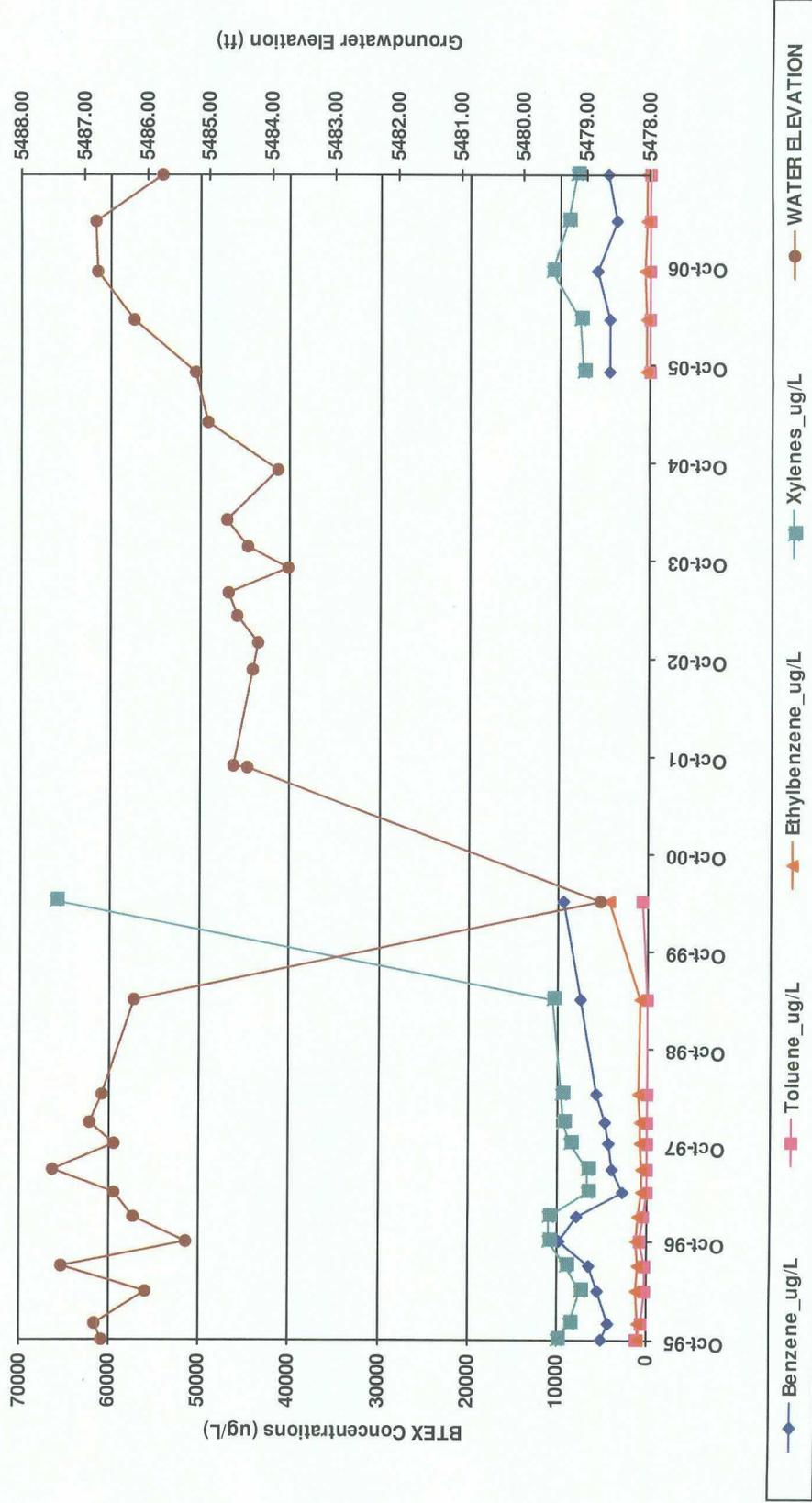
1	Issued for 2007 Report	10/10	D. Wade	N. Day	J. Smith
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REV. No.	REVISIONS	REV. DATE	DESIGN BY	DRAWN BY	REVIEWED AND SIGNED BY
PROJECT No.: 1005521.0601					
AutoCAD FILE: Knight1.dwg					
SCALE: As Shown			FIGURE No: 2		



EL PASO TENNESSEE PIPELINE COMPANY  
KNIGHT #1, METER 72556

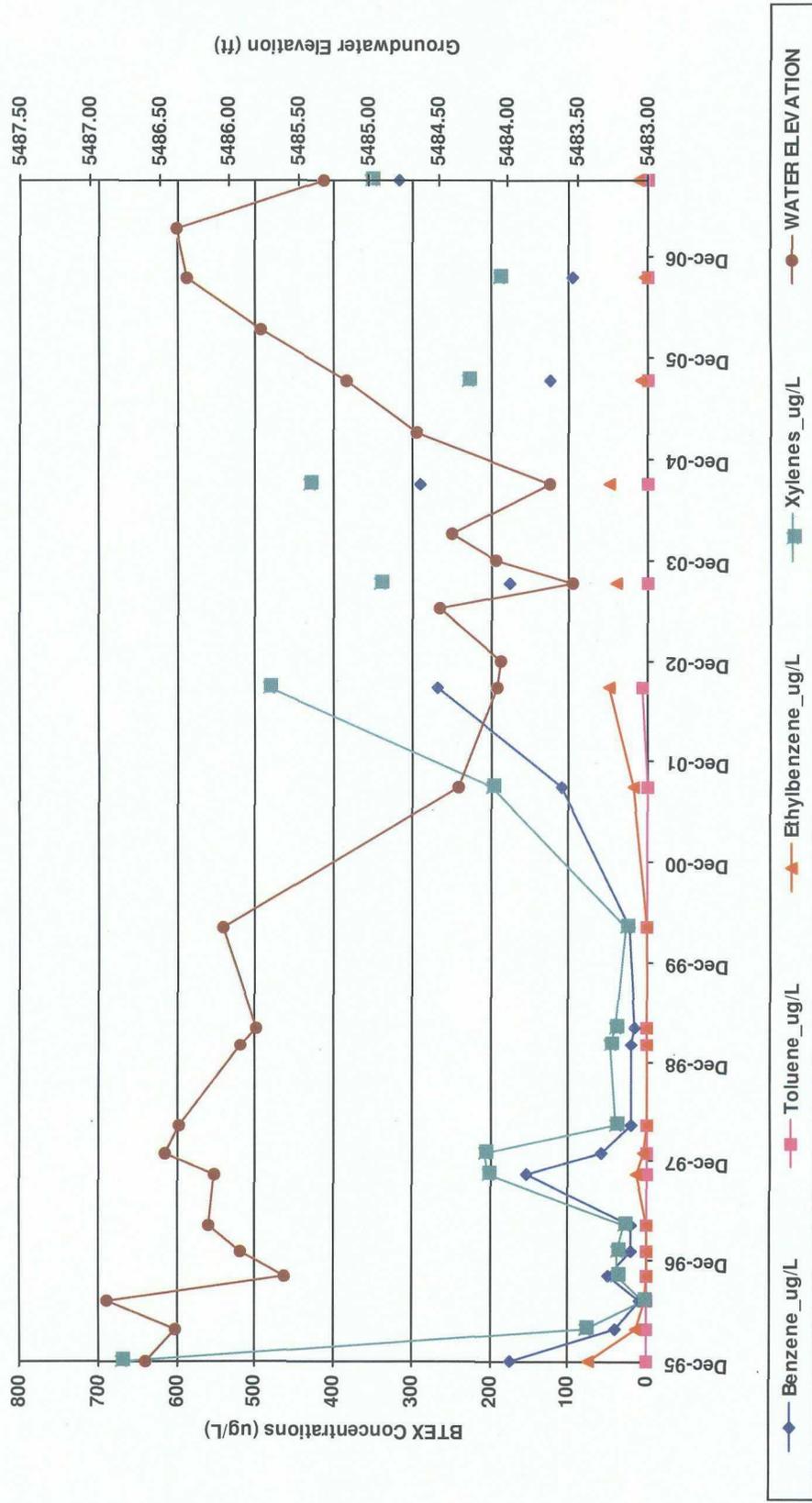
**GROUNDWATER POTENTIOMETRIC SURFACE  
CONTOURS AND BTEX CONCENTRATIONS  
SEPTEMBER 2007**

FIGURE 3  
 SUMMARY OF BTEX COMPOUNDS IN GROUNDWATER SAMPLES  
 KNIGHT #1 (METER #72556)  
 MW01



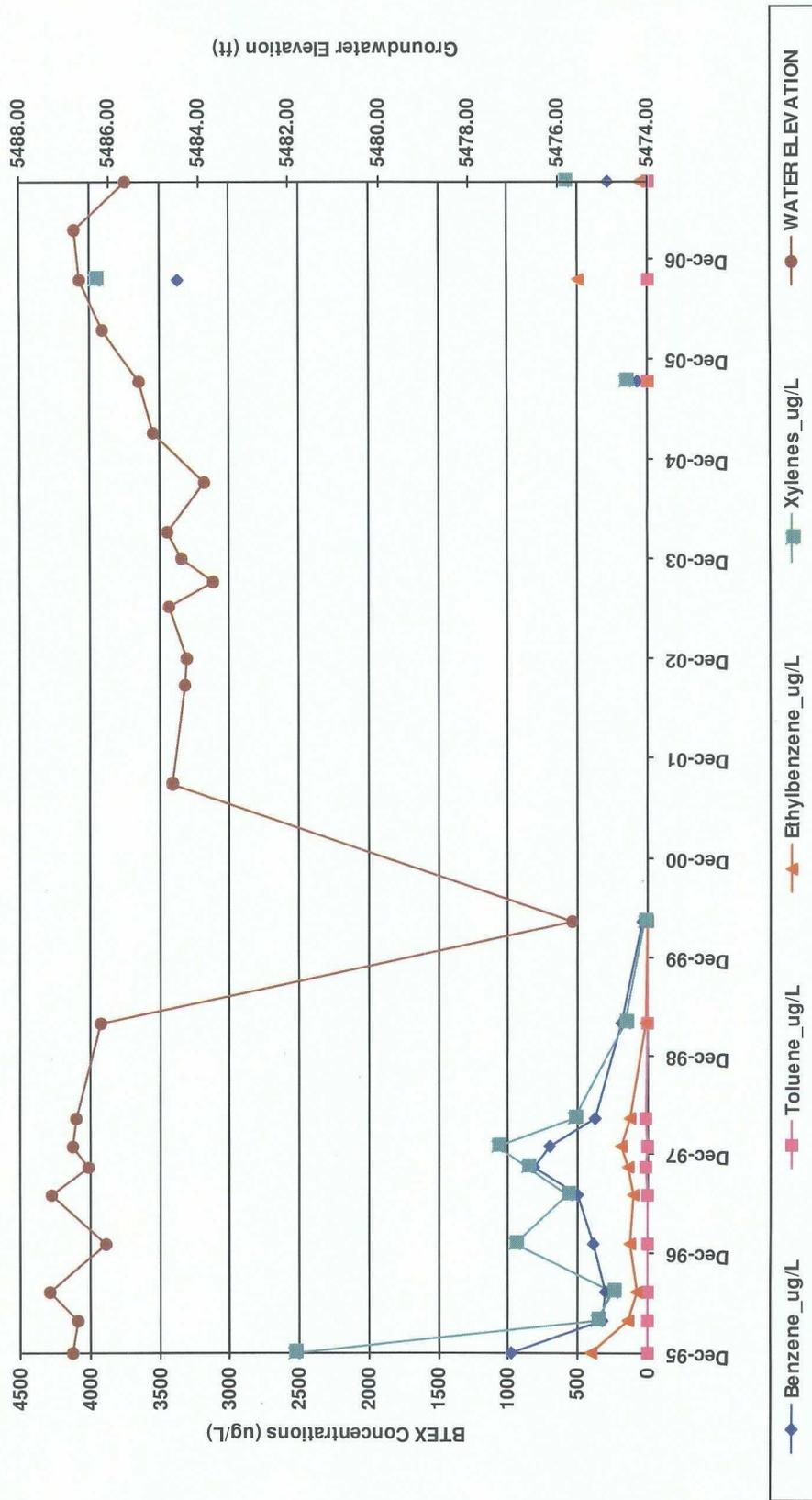
Note: Non Detects are represented by a value of 1.

FIGURE 4  
 SUMMARY OF BTEX COMPOUNDS IN GROUNDWATER SAMPLES  
 KNIGHT #1 (METER #72556)  
 MW02



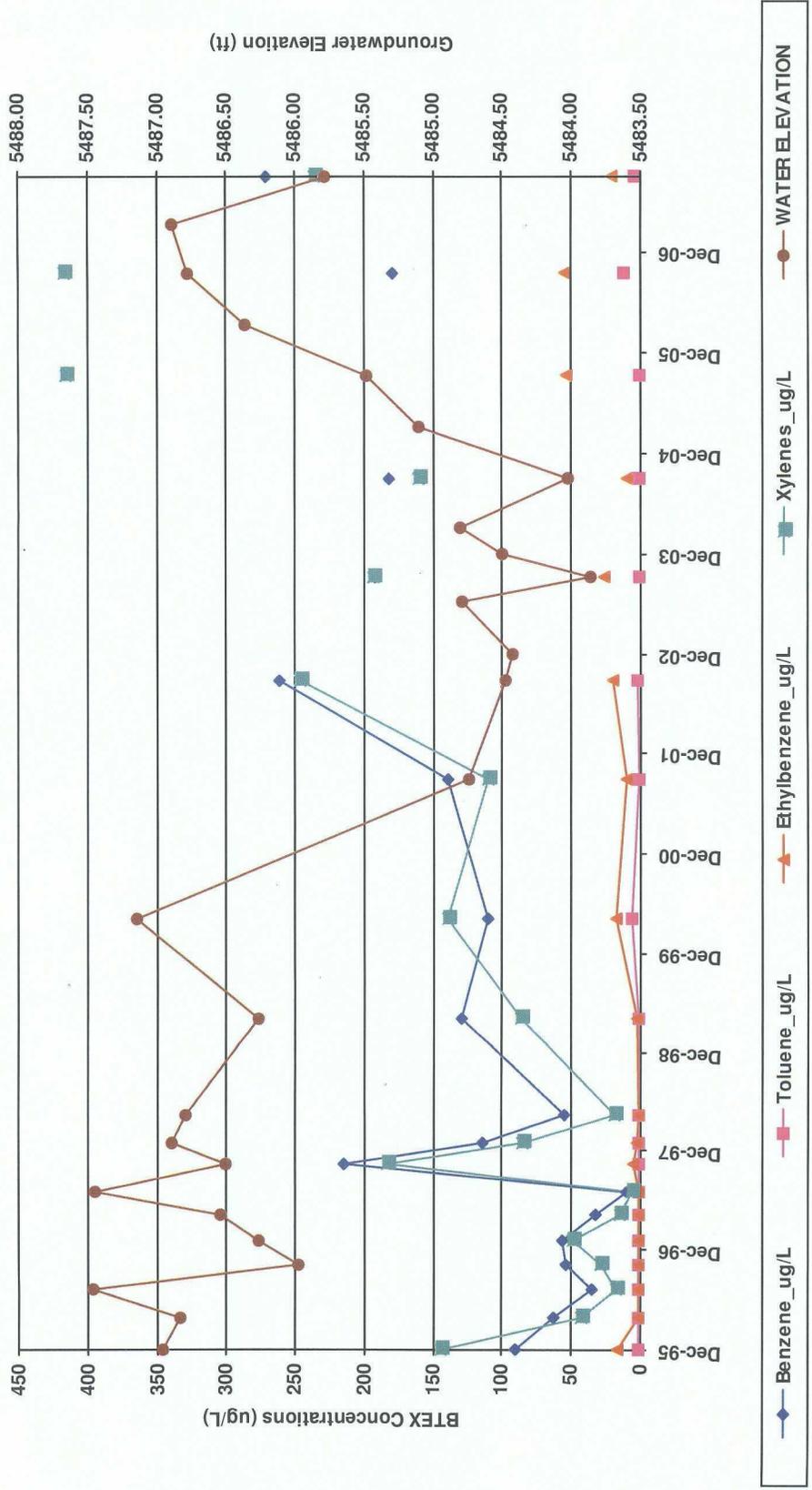
Note: Non Detects are represented by a value of 1.

FIGURE 5  
 SUMMARY OF BTEX COMPOUNDS IN GROUNDWATER SAMPLES  
 KNIGHT #1 (METER #72556)  
 MW03



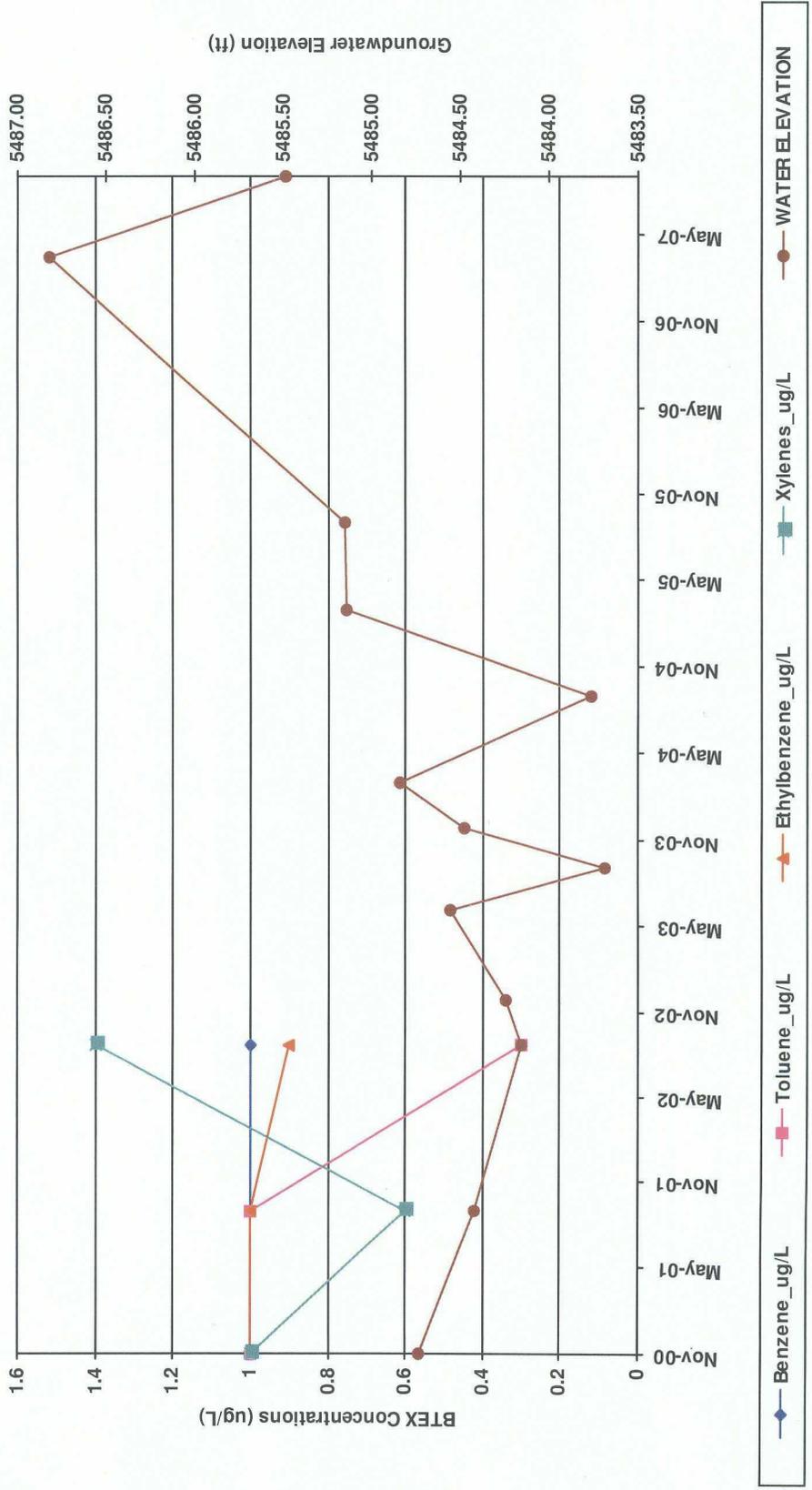
Note: Non Detects are represented by a value of 1.

FIGURE 6  
 SUMMARY OF BTEX COMPOUNDS IN GROUNDWATER SAMPLES  
 KNIGHT #1 (METER #72556)  
 MW04



Note: Non Detects are represented by a value of 1.

FIGURE 7  
 SUMMARY OF BTEX COMPOUNDS IN GROUNDWATER SAMPLES  
 KNIGHT #1 (METER #72556)  
 MW05



Note: Non Detects are represented by a value of 1.

FIGURE 8  
 SUMMARY OF FREE-PRODUCT REMOVAL  
 KNIGHT #1 (METER #72556)  
 MW01

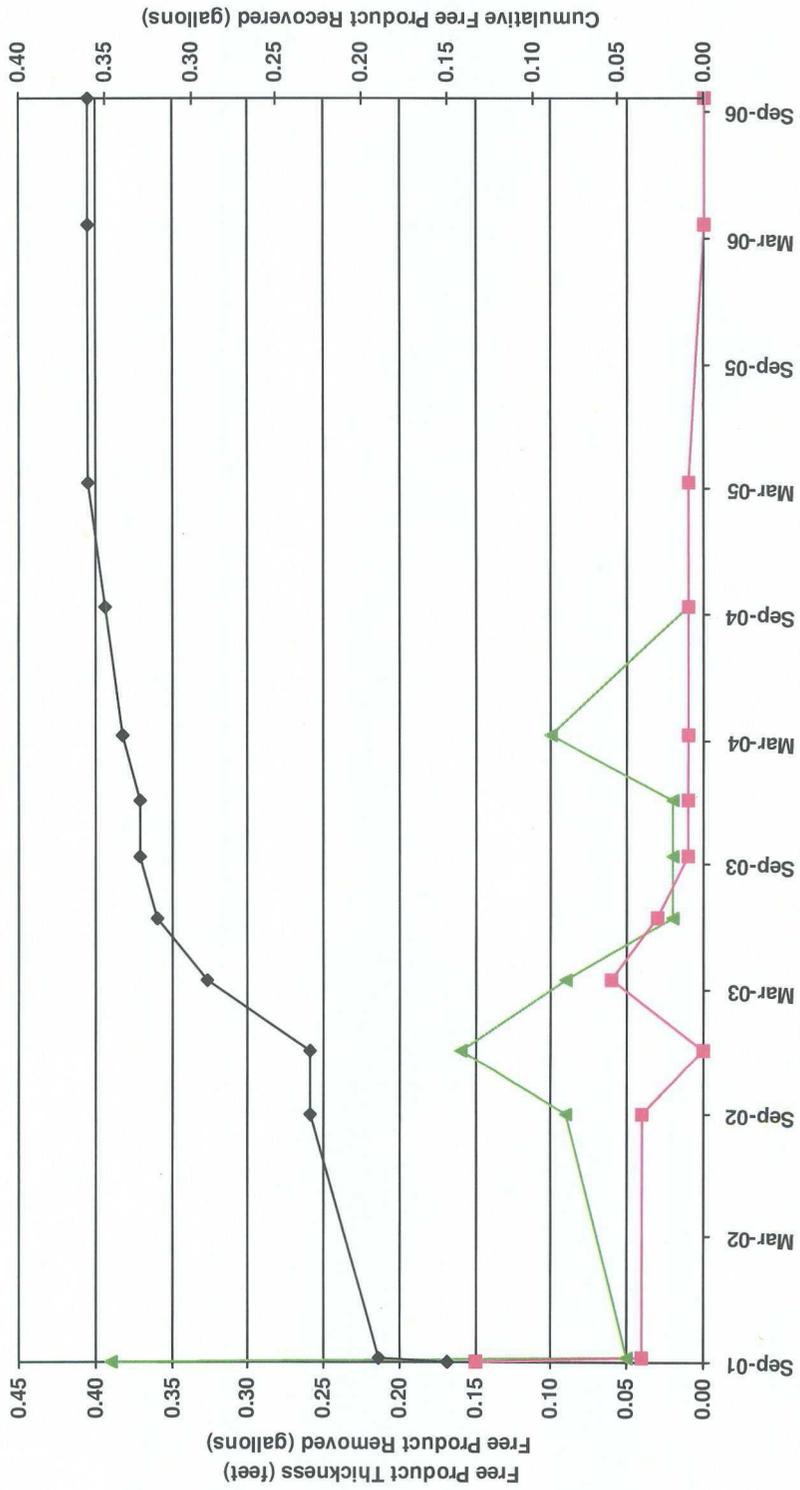


FIGURE 9  
 SUMMARY OF FREE-PRODUCT REMOVAL  
 KNIGHT #1 (METER #72556)  
 MW03

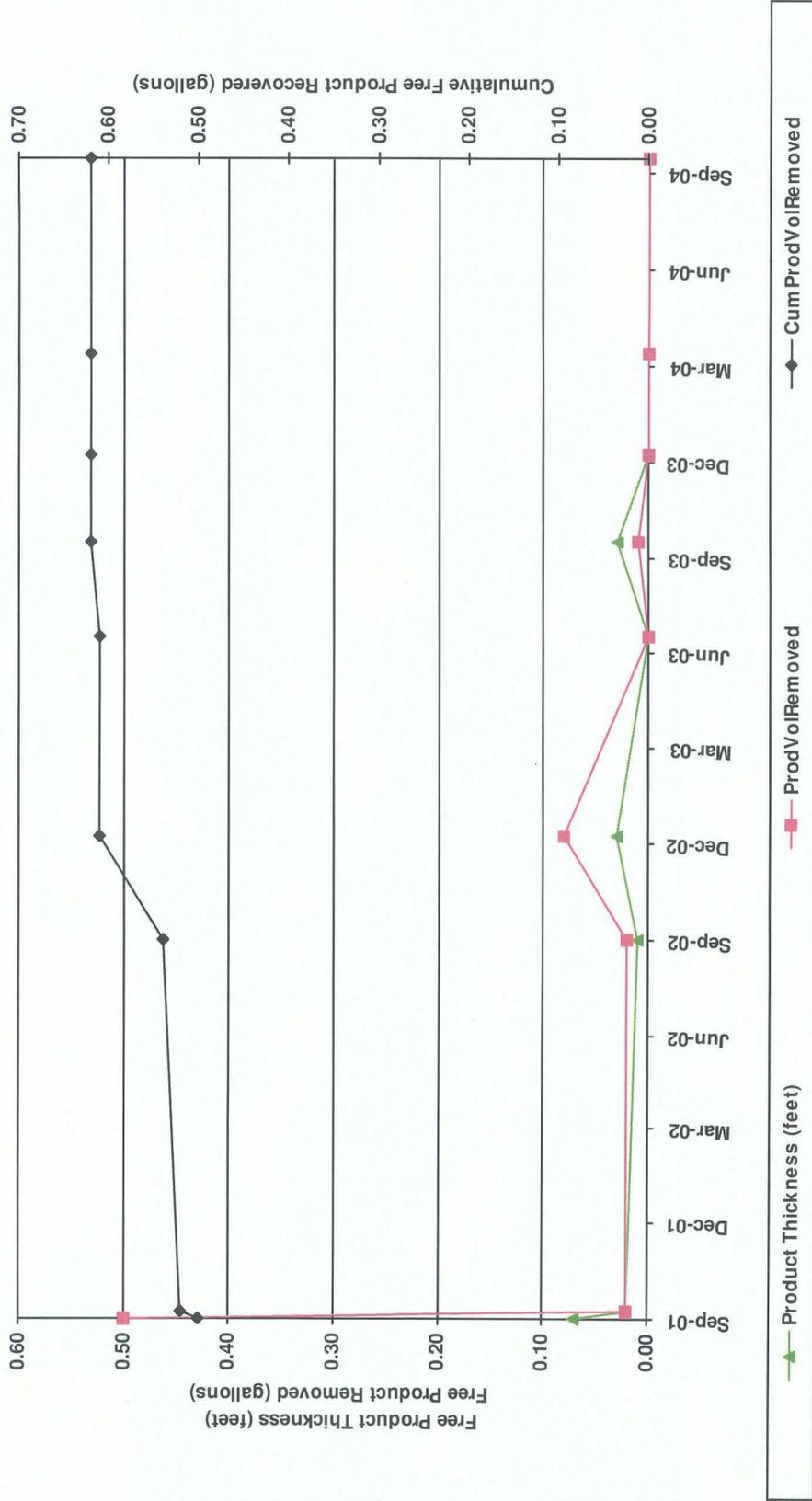


TABLE 1

**SUMMARY OF BTEX COMPOUNDS IN GROUNDWATER SAMPLES  
KNIGHT #1 (METER #72556)**

Monitoring Well	Sample Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	Depth to Water (ft BTOC)
MW01	10/16/1995	5080	1180	1050	9970	26.03
	12/12/1995	4330	679	1010	8560	25.91
	4/9/1996	5490	208	1100	7370	26.71
	7/17/1996	6450	279	990	9060	25.39
	10/15/1996	9870	840	1120	10900	27.35
	1/13/1997	7760	332	914	10900	26.53
	4/22/1997	2700	1	492	6690	26.23
	7/14/1997	3900	36.7	530	6700	25.25
	10/22/1997	4270	48.7	728	8580	26.22
	1/9/1998	4750	24.2	819	9480	25.82
	4/24/1998	5610	44.7	898	9530	26.01
	4/16/1999	7340	42.8	853	10600	26.52
	4/19/2000	9400	510	4300	66000	33.95
	9/19/2005	4430	23.7	487	7370	27.47
	3/27/2006	4410	26.6	337	7860	26.49
	9/26/2006	5880	36.5	633	11000	25.91
	3/28/2007	3740	1	441	9210	25.87
9/17/2007	4640	93.3	444	8180	26.94	
MW02	12/12/1995	175	1	74.3	671	25.37
	4/9/1996	39.2	1	13.4	77.9	25.58
	7/17/1996	9.55	1	2.39	3.65	25.09
	10/15/1996	49.7	1	1	38.4	26.36
	1/13/1997	20.3	1	1	37.3	26.05
	4/22/1997	19.4	1	1	29.8	25.82
	10/22/1997	155	1	12.6	204	25.86
	1/9/1998	58	1	3.85	207	25.50
	4/24/1998	19.4	1	1	40.7	25.60
	2/9/1999	19	1	1	48	26.05
	4/16/1999	16.7	1	1	41	26.16
	4/19/2000	23	0.5	1	26	25.92
	9/11/2001	110	1	17	200	27.60
	9/4/2002	269	7.4	48.9	482.4	27.88
	9/17/2003	177	1	41	343	28.42
	9/15/2004	291	1	48.9	431	28.25
	9/19/2005	126	1	9.5	231	26.80

Note: Non Detects are represented by a value of 1.

TABLE 1

**SUMMARY OF BTEX COMPOUNDS IN GROUNDWATER SAMPLES  
KNIGHT #1 (METER #72556)**

Monitoring Well	Sample Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	Depth to Water (ft BTOC)
MW02	9/26/2006	95.8	1	5.5	189	25.66
	9/17/2007	317	1	12.5	354	26.63
MW03	12/12/1995	979	1	398	2540	25.67
	4/9/1996	328	1	132	369	25.78
	7/17/1996	299	1	76.7	251	25.15
	1/13/1997	395	1	126	955	26.41
	7/14/1997	499	1	104	583	25.21
	10/22/1997	817	7.22	141	869	26.01
	1/9/1998	702	1	185	1080	25.69
	4/24/1998	377	11.8	126	525	25.76
	4/16/1999	191	4.11	18.1	169	26.30
	4/19/2000	40	0.6	1.1	28	36.81
	9/19/2005	73.8	1	5.2	158	27.16
	9/26/2006	3370	1	498	3960	25.83
	9/17/2007	288	1	65.4	599	26.85
MW04	12/12/1995	90.1	1	16.8	144	26.27
	4/9/1996	63.1	1	1	42.5	26.40
	7/17/1996	35	1	1	17.8	25.77
	10/15/1996	53.5	1	1	28.4	27.26
	1/13/1997	56.2	1	1	48.4	26.96
	4/22/1997	32.8	1	1	15.2	26.69
	7/14/1997	10.4	1	1	5.79	25.78
	10/22/1997	215	1	5.5	184	26.72
	1/9/1998	114	1	2.66	85.7	26.34
	4/24/1998	55.4	1	1	19.3	26.44
	4/16/1999	129	1	2.03	87.3	26.97
	4/19/2000	110	6.5	17	140	26.09
	9/11/2001	140	1	9.6	110	28.48
	9/4/2002	261	3.1	20.1	246.5	28.75
	9/17/2003	192	1	26.3	194	29.36
	9/15/2004	182	1	9.8	161	29.20
	9/19/2005	199	1	53.8	416	27.74
9/26/2006	180	12.5	55.9	417	26.45	
9/17/2007	272	4.7	21.3	236	27.44	
MW05	11/15/2000	1	1	1	1	25.62

Note: Non Detects are represented by a value of 1.

TABLE 1

SUMMARY OF BTEX COMPOUNDS IN GROUNDWATER SAMPLES  
KNIGHT #1 (METER #72556)

Monitoring Well	Sample Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	Depth to Water (ft BTOC)
MW05	9/11/2001	1	1	1	0.6	25.94
	9/4/2002	1	0.3	0.9	1.4	26.20

Note: Non Detects are represented by a value of 1.

TABLE 2

**SUMMARY OF FREE-PRODUCT REMOVAL  
KNIGHT #1 (METER #72556)**

Monitoring Well	Removal Date	Depth to Product (feet btoc)	Depth to Water (feet btoc)	Product Thickness (feet)	Volume Removed (gallons)	Cumulative Volume of Product Removed (gallons)
MW01	9/5/2001	27.93	28.32	0.39	0.15	0.15
	9/11/2001	28.05	28.1	0.05	0.04	0.19
	9/4/2002	28.31	28.39	0.08	0.04	0.23
	12/10/2002	28.31	28.47	0.16	0	0.23
	3/20/2003	28.05	28.14	0.09	0.06	0.29
	6/19/2003	28	28.02	0.02	0.03	0.32
	9/17/2003	28.95	28.965	0.01	0.01	0.33
	12/9/2003	28.3	28.315	0.02	0.01	0.33
	3/15/2004	27.89	27.99	0.10	0.01	0.34
	9/15/2004	28.77	28.78	0.01	0.01	0.35
	3/16/2005	27.67	27.675	0.00	0.01	0.36
	3/27/2006		26.49	0	0	0.36
	9/26/2006		25.91	0	0	0.36
MW03	9/5/2001	27.84	27.91	0.07	0.5	0.50
	9/11/2001	27.89	27.91	0.02	0.02	0.52
	9/4/2002	28.16	28.168	0.01	0.02	0.54
	12/10/2002	28.17	28.2	0.03	0.08	0.61
	6/19/2003		27.81	0	0	0.61
	9/17/2003	28.76	28.79	0.03	0.01	0.62
	12/9/2003		28.11	0	0	0.62
	3/15/2004		27.78	0	0	0.62
	9/15/2004	28.6	28.6	0.00	0	0.62