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2011 AGWMR

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EL PASO CGP COMPANY

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HOUSTON, TX 77002

2011 ANNUAL REPORT
PIT GROUNDWATER REMEDIATION
VOLUME 2: FEE/STATE LANDS

AUGUST 2012

MWH

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2011 ANNUAL GROUNDWATER REPORT
NON-FEDERAL SITES VOLUME II

EL PASO CGP COMPANY

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METER or LINE ID	NMOCD CASE NO.	SITE NAME	TOWNSHIP	RANGE	SECTION	UNIT
03906	3RP-179-0	GCU Com A #142E	29N	12W	25	G
93388	3RP-192-0	*Horton #1E	31N	09W	28	H
70194	3RP-201-0	Johnston Fed #4	31N	09W	33	H
LD087	3RP-205-0	K-31 Line Drip	25N	06W	16	N
72556	3RP-207-0	Knight #1	30N	13W	5	A
94967	3RP-214-0	**Lindrith B #24	24N	03W	9	N
70445	3RP-074-0	Standard Oil Com #1	29N	09W	36	N
71669	3RP-239-0	State Gas Com N #1	31N	12W	16	H

*The Horton #1E site was submitted for closure in 2009 and is pending approval from NMOCD. There were no monitoring activities for this site in 2011.

**The Lindrith B#24 site was submitted for closure in 2006 and is pending approval from NMOCD. There were no monitoring activities for this site in 2011.

MWH

L:\San Juan River Basin\SJRB General\GIS\Site Locations 2011.mxd

LEGEND

- Sites on Federal Land
- Sites on Navajo Nation Land
- Sites on State/Fee "Non-Federal" Lands

*Closure Request Pending with the NMOCD.

0 2 4 6 8 Miles

MWH	PROJECT: SAN JUAN RIVER BASIN	FIGURE: 1
	TITLE: Site Locations	

LIST OF ACRONYMS

AMSL	above mean sea level
BTEX	benzene, toluene, ethylbenzene, xylenes
btoc	below top of casing
EPCGP	El Paso CGP Company
ft	foot/feet
GWEL	groundwater elevation
ID	identification
MW	monitoring well
NMWQCC	New Mexico Water Quality Control Commission
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

EPCGP GROUNDWATER SITES
2011 ANNUAL GROUNDWATER REPORT

GCU Com A #142E
Meter Code: 03906

SITE DETAILS

Legal Description:		**Town:**	29N	**Range:**	12W	**Sec:** 25	**Unit:** G
NMOCD Haz Ranking:	10	**Land Type:**	Fee	**Operator:**	BP / Amoco Production Company		

PREVIOUS ACTIVITIES

Site Assessment:	4/94	**Excavation:**	4/94 (20 cy)	**Soil Boring:**	10/95
Monitor Well:	2/97	**Geoprobe:**	12/96	**Additional MWs:**	12/01
Downgradient MWs:	1/06	**Replace MW:**	NA	**Quarterly Initiated:**	8/97
ORC Nutrient Injection:	NA	**Re-Excavation:**	10/96 (882 cy)	**PSH Removal Initiated:**	6/09
Annual Initiated:	5/98	**Quarterly Resumed:**	NA	**PSH Removal in 2011?**	Yes

SUMMARY OF 2011 ACTIVITIES

MW-1: Annual groundwater sampling (November) and quarterly product recovery were performed in 2011.

MW-2: Annual groundwater sampling (November) and quarterly product recovery were performed in 2011.

TMW-1: Annual groundwater sampling (November) and quarterly product recovery were performed in 2011.

Site-Wide Activities: No other activities were performed at this Site during 2011.

SITE MAPS

A Site map (November) is attached as Figure 1.

SUMMARY TABLES AND GRAPHS

- Historic analytical and water level data are summarized in Table 1 and presented graphically in Figures 2 through 4. Where applicable, static water level elevations were corrected for measurable thicknesses of free-product (specific gravity of 0.8).
- Historic free-product recovery data are summarized in Table 2 and presented graphically in Figure 2 through 4.
- The 2011 laboratory report is presented in Attachment 1 (included on CD).
- The 2011 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 2011.

DISPOSITION OF GENERATED WASTES

All purge water was taken to the El Paso Natural Gas Rio Vista Compressor Station. Spent absorbent socks were managed as non-hazardous solid waste.

ISOCONCENTRATION MAPS

No isoconcentration maps were generated for this Site; however, the attached Site map presents the analytical data collected during 2011.

RESULTS

- The groundwater flow direction generally trends to the south-southeast.

- Approximately 0.15 gallons of free-product was recovered from MW-1 in 2011, bringing the cumulative total recovered to approximately 0.25 gallons. In the sample collected at MW-1, the benzene concentration (229 µg/L) exceeded its NMWQCC standard. Benzene decreased from the 2010 sampling event but remains within the historical range for this well. The other BTEX constituents were detected below their respective standards.

- Approximately 0.07 gallons of free-product was recovered from MW-2 in 2011, bringing the cumulative total recovered to approximately 0.37 gallons since the product appeared in 2009. Groundwater concentrations of benzene, toluene and total xylenes remain elevated above the NMWQCC standards in MW-2. These results appear to reflect the increased oil saturation near the well starting in 2009.

- Temporary well TMW-01 was installed in January 2006 in order to determine the site hydraulic gradient. The hydraulic gradient was confirmed to be to the south/southeast. Beginning with the May 2010 low-groundwater period, measurable free-product was observed in TMW-01 at thicknesses of up to 0.90 feet. The occurrence of free-product in this well coincided with a dip of the static water table into a thick layer of gravel and cobbles that underlies the predominantly clayey soils found at this site. Groundwater and accumulated product were bailed quarterly for the remainder of 2010, resulting in a total 2010 recovery of 0.26 gallons. In 2011 a total of 0.13 gallons were removed from TMW-01, for a two year total product removed of 0.39 gallons.

- The November 2011 sample from TMW-1 was the third groundwater sample collected from this well, and 0.13 feet of orange free-product was present at the time of sampling. The concentrations of benzene (3,890 µg/L), toluene (6,250µg/L), and total xylenes (3,610 µg/L) all exceeded their respective NMWQCC standards. Ethylbenzene dropped below its standard. These results

were a decrease from the 2010 concentrations but in-line with the 2009 sample from this well. The significant presence of product leads to significant variability in the measured concentrations.

REMAINING CLOSURE REQUIREMENTS

- This site is being managed per the procedures set forth in the document entitled, "Remediation Plan for Groundwater Encountered During Pit Closure Activities" (El Paso Natural Gas Company / El Paso Field Services Company, 1995). This remediation plan was conditionally approved by the New Mexico Oil Conservation Division (OCD) in correspondence dated November 30, 1995; and the OCD approval conditions were adopted into El Paso's program methods.

- In order to meet the remaining closure requirements at this site, the following conditions must be achieved:

    1. The extent of the contaminant plume must be delineated. Additional site delineation activities have not yet been conducted due to ongoing operations, which are believed to have contributed to the subsurface petroleum hydrocarbon impacts.

    2. Recoverable free-product must been removed from the subsurface. Generally, this corresponds with an absence of measurable free-product in the monitor wells. Currently, product recovery efforts are required at MW-2 and TMW-1.

    3. Groundwater contaminant concentrations in the monitor wells must meet the NMWQCC standards for at least 4 consecutive quarters. Alternatively, concentrations must be reduced to below background levels; however, there are no established background concentrations for the remaining constituents of concern. Currently, all three wells require additional monitoring. The remaining applicable standards are:

Constituent	NMWQCC GW Standard (µg/L)
Benzene	10
Toluene	750
Ethylbenzene	750
Total Xylenes	620

RECOMMENDATIONS

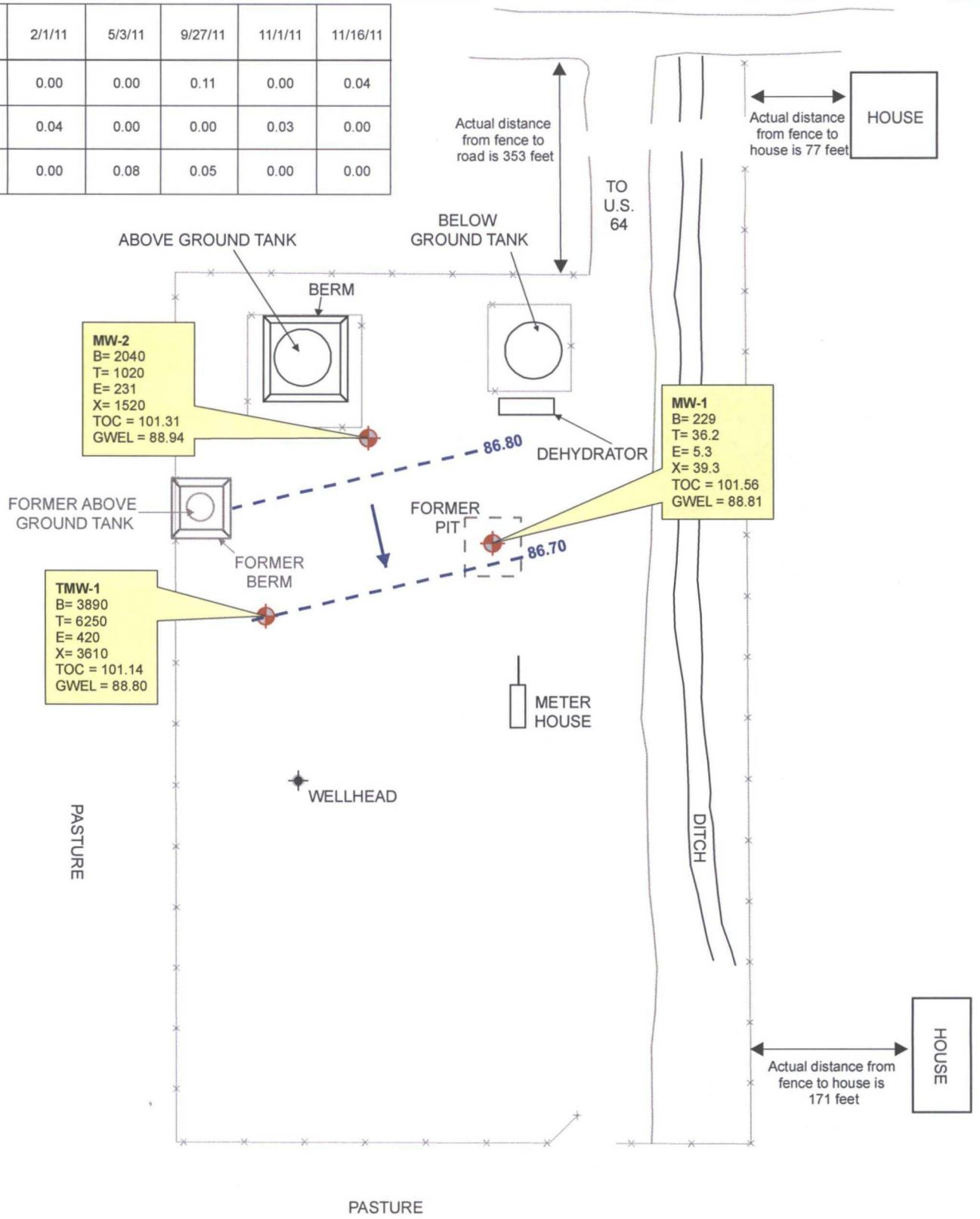
- EPCGP recommends that quarterly product recovery continue at MW-1. This well will be sampled annually.

- EPCGP recommends that quarterly product recovery continue at MW-2, which is located adjacent to production equipment. This well will continue to be sampled annually.

- EPCGP recommends that quarterly product recovery continue at temporary monitor well TMW-1. This well will be sampled annually.

- EPCGP will be evaluating this site for a potential third party source, as the impacts in MW-2 and TMW-1 are either upgradient or crossgradient of the former El Paso pit and historic records suggest potential issues with the former production pit. Free-product had not been measured before 2009 in MW-2, even when the static water table was at comparable elevations.

Product Removed (Gallons)	2/1/11	5/3/11	9/27/11	11/1/11	11/16/11
MW-1	0.00	0.00	0.11	0.00	0.04
MW-2	0.04	0.00	0.00	0.03	0.00
TMW-1	0.00	0.08	0.05	0.00	0.00



LEGEND

MW-1 Existing Monitoring / Observation Well

Groundwater Flow Direction

86 Potentiometric Surface Contour (Inferred Where Dashed)

B	Benzene (ug/L)
T	Toluene (ug/L)
E	Ethylbenzene (ug/L)
X	Total Xylenes (ug/L)
TOC	Top of Casing (ft. *)
GWEL	Groundwater Elevation (ft. *)

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

0 10 20 40 Feet

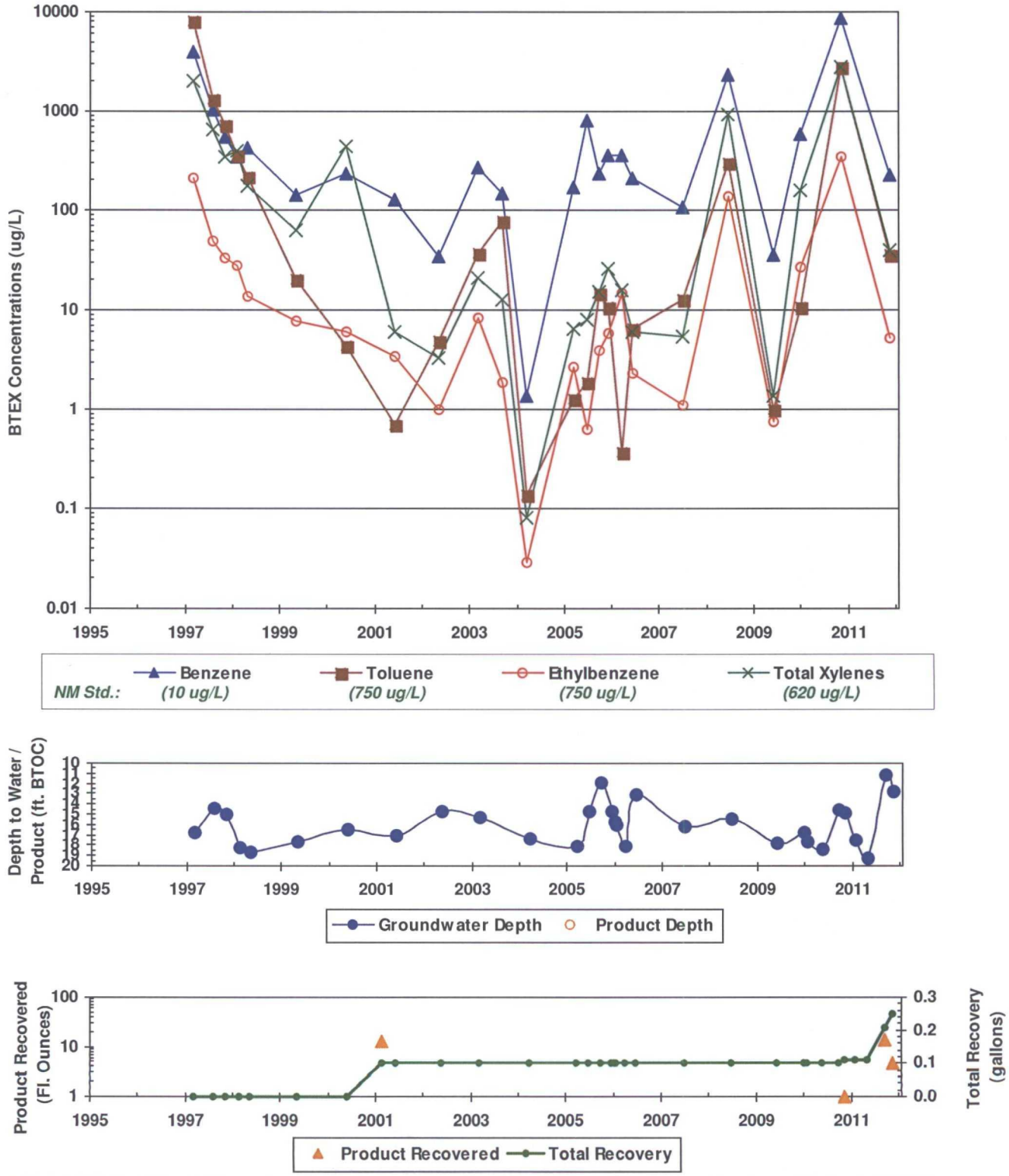
MWH

PROJECT: GALLEGOS CANYON UNIT COM A #142E

TITLE: Groundwater Potentiometric Surface Map, and BTEX Concentrations November 16, 2011

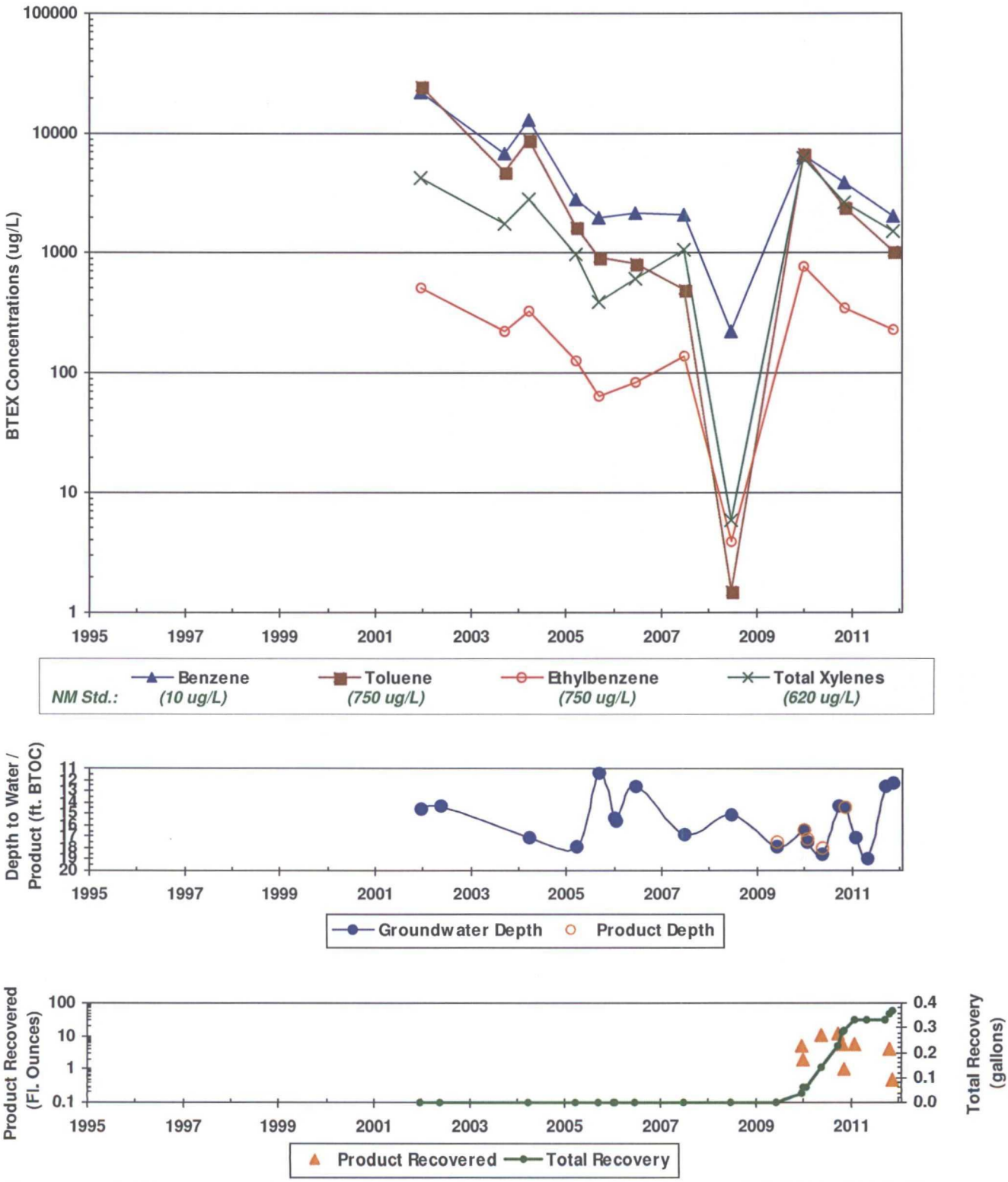
FIGURE: 1

FIGURE 2
SUMMARY OF GROUNDWATER BTEX CONCENTRATIONS, FLUID LEVELS, AND PRODUCT RECOVERY
GCU COM A #142E (METER #03906)
MW-1



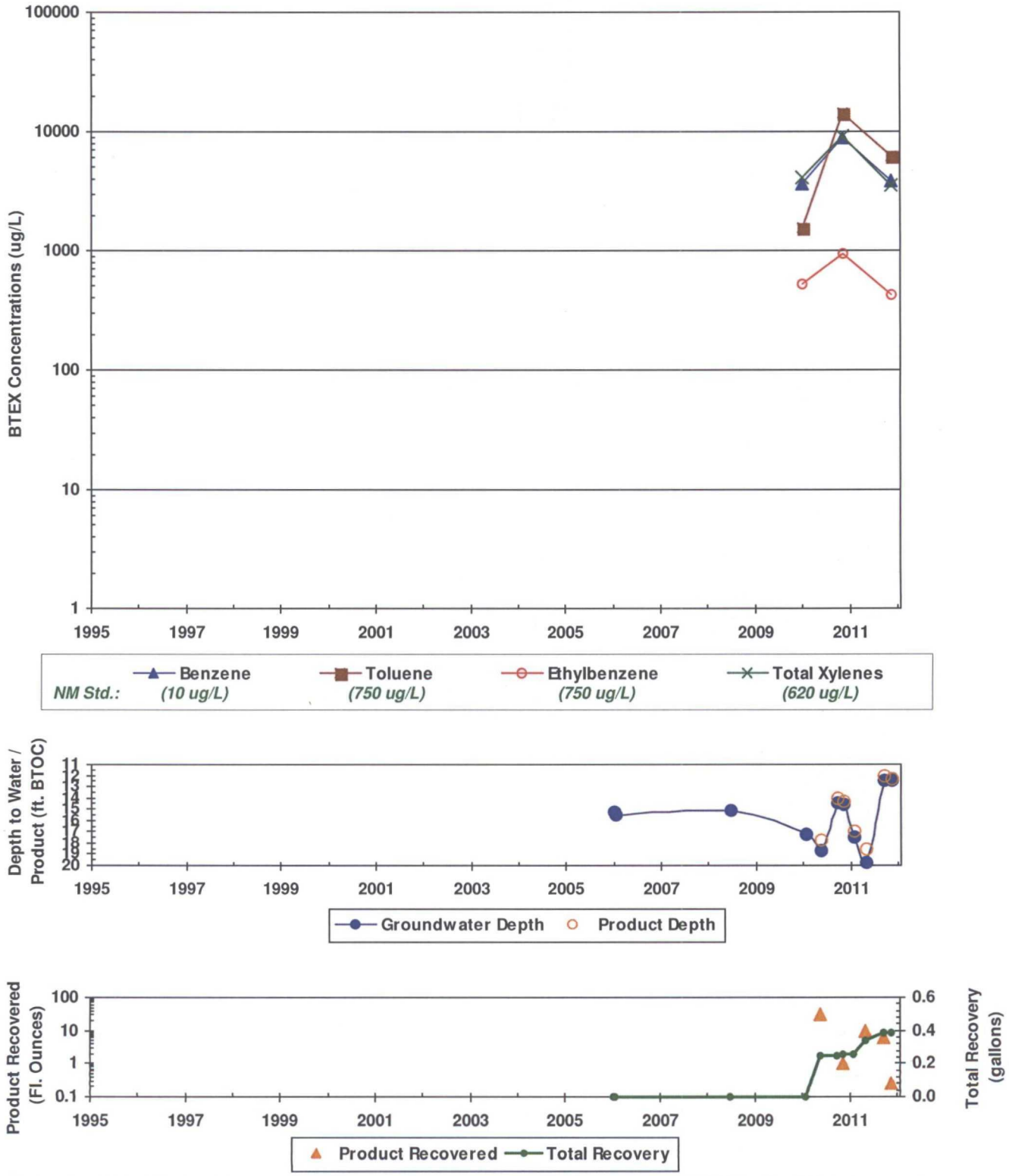
*In some cases, older recovery event data are not available. However, the cumulative totals still include all historic recovery.

FIGURE 3
SUMMARY OF GROUNDWATER BTEX CONCENTRATIONS, FLUID LEVELS, AND PRODUCT RECOVERY
GCU COM A #142E (METER #03906)
MW-2



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

FIGURE 4
SUMMARY OF GROUNDWATER BTEX CONCENTRATIONS, FLUID LEVELS, AND PRODUCT RECOVERY
GCU COM A #142E (METER #03906)
TMW-1



*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
GCU COM A #142E (METER #03906)

Monitor Well	Sample Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes	Depth to Water (ft BTOC)	Corr. GW Elevation (Feet*)
NMWQCC GW Std.:		10	750	750	620		
MW-1	3/10/1997	**4010**	**7960**	213	**2050**	16.78	84.78
MW-1	8/6/1997	**1040**	**1310**	49.4	**647**	14.46	87.10
MW-1	11/5/1997	**543**	719	33.9	342	15.02	86.54
MW-1	2/13/1998	**343**	354	27.6	394	18.18	83.38
MW-1	5/6/1998	**429**	216	13.6	176	18.69	82.87
MW-1	5/4/1999	**143**	20.4	7.78	63.3	17.61	83.95
MW-1	5/25/2000	**230**	4.4	6	450	16.44	85.12
MW-1	6/1/2001	**130**	0.7	3.5	6.1	17.08	84.48
MW-1	5/14/2002	**34**	4.9	1.0	3.3	14.70	86.86
MW-1	3/7/2003	**270**	36.8	8.3	21.1	15.31	86.24
MW-1	9/17/2003	**150**	77	1.9	12.8	NA	NA
MW-1	3/22/2004	1.4	<0.1	<0.0	<0.1	17.38	84.18
MW-1	3/17/2005	**169**	1.3	2.7	6.6	18.15	83.41
MW-1	6/23/2005	**810**	1.9	0.62	8.1	14.72	86.84
MW-1	9/26/2005	**232**	14.9	4.0	15.1	11.95	89.61
MW-1	12/14/2005	**354**	10.6	5.9	25.6	14.67	86.89
MW-1	3/28/2006	**362**	0.37J	15.0	15.7	18.16	83.40
MW-1	6/14/2006	**210**	6.5	2.3	6.1	13.08	88.48
MW-1	6/28/2007	**109**	12.6	1.1	5.5	16.18	85.38
MW-1	6/23/2008	**2320**	305	140	**934**	15.45	86.11
MW-1	6/2/2009	**35.3**	<1.0	0.75J	1.4J	17.80	83.76
MW-1	12/30/2009	**597**	10.7J	26.5	159	16.82	84.74
MW-1	11/9/2010	**8610**	**2770**	348	**2810**	14.86	86.70
MW-1	11/16/2011	**229**	36.2	5.3	39.3	12.75	88.81
MW-2	12/13/2001	**22000**	**25000**	500	**4300**	14.52	86.79
MW-2	9/17/2003	**6890**	**4760**	219	**1770**	NA	NA
MW-2	3/22/2004	**13000**	**8880**	321	**2850**	17.06	84.25
MW-2	3/17/2005	**2800**	**1640**	125	**978**	17.83	83.48
MW-2	9/14/2005	**1980**	**915**	63.8	391	11.45	89.86
MW-2	6/14/2006	**2140**	**811**	83.5	610	12.64	88.67
MW-2	6/28/2007	**2100**	492	140	**1050**	16.86	84.45
MW-2	6/23/2008	**221**	1.5J	3.9	5.8	15.15	86.16
MW-2	12/30/2009	**6660**	**6750**	**764**	**6210**	16.48	84.85
MW-2	11/9/2010	**3900**	**2450**	342	**2660**	14.50	86.82

TABLE 1

SUMMARY OF BTEX COMPOUNDS IN GROUNDWATER
GCU COM A #142E (METER #03906)

Monitor Well	Sample Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes	Depth to Water (ft BTOC)	Corr. GW Elevation (Feet*)
NMWQCC GW Std.:		10	750	750	620		
MW-2	11/16/2011	**2040**	**1020**	231	**1520**	12.37	88.94
TMW-1	12/30/2009	**3660**	**1550**	520	**4110**	NA	NA
TMW-1	11/9/2010	**8880**	**14400**	**956**	**9040**	14.62	86.72
TMW-1	11/16/2011	**3890**	**6250**	420	**3610**	12.44	88.80

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 (some historic data were reported at the detection 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 COM A #142E (METER #03906)

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*)
MW-1	2/20/2001	NA	NA	NA	0.10	0.10	NA
MW-1	11/9/2010	--	14.86	0.00	0.01	0.11	86.70
MW-1	9/27/2011	--	11.12	0.00	0.11	0.21	90.44
MW-1	11/16/2011	--	12.75	0.00	0.04	0.25	88.81
MW-2	6/2/2009	17.42	17.84	0.42	--	0.00	83.81
MW-2	12/23/2009	NA	NA	NA	0.04	0.04	NA
MW-2	12/30/2009	16.45	16.48	0.03	0.02	0.06	84.85
MW-2	1/25/2010	17.27	17.45	0.18	--	0.06	84.00
MW-2	5/21/2010	NA	NA	NA	0.09	0.14	NA
MW-2	5/25/2010	18.05	18.55	0.50	--	0.14	83.16
MW-2	9/24/2010	--	14.25	0.00	0.09	0.23	87.06
MW-2	11/3/2010	NA	NA	NA	0.04	0.28	NA
MW-2	11/9/2010	14.49	14.50	0.01	0.01	0.29	86.82
MW-2	2/1/2011	--	17.15	0.00	0.04	0.33	84.16
MW-2	11/1/2011	NA	NA	NA	0.03	0.36	NA
MW-2	11/16/2011	--	12.37	0.00	0.00	0.37	88.94
TMW-1	5/25/2010	17.80	18.70	0.90	0.25	0.25	83.16
TMW-1	9/24/2010	14.10	14.45	0.35	--	0.25	86.97
TMW-1	11/9/2010	14.37	14.62	0.25	0.01	0.26	86.72
TMW-1	2/1/2011	17.00	17.45	0.45	--	0.26	84.05
TMW-1	5/3/2011	18.55	19.76	1.21	0.08	0.34	82.35
TMW-1	9/27/2011	12.03	12.43	0.40	0.05	0.39	89.03
TMW-1	11/16/2011	12.31	12.44	0.13	0.00	0.39	88.80

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.