GW - 44

MONITORING REPORTS

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Duke Energy®
Field Services

DUKE ENERGY FIELD SERVICES
370 17th Street
Suite 2500
Denver, CO 80202

303 595 3331

March 22, 2004

Mr. Jack Ford
New Mexico Oil Conservation Division
1220 S. St. Francis Dr.
Santa Fe, NM 87505

RE: Summary of December 2003 Groundwater Monitoring Report
DEFS Hobbs Booster Station, Lea County New Mexico (GW-044)
(Units C and D, Section 4, T19S, R38E, NMPM)

Dear Mr. Ford:

Duke Energy Field Services, LP (DEFS) is pleased to submit for your review, one copy of the Summary of December 2003 Groundwater Monitoring Report for the Hobbs Booster Station located in Lea County, New Mexico (Units C and D, Section 4, T19S, R38E NMPM). This work is being completed under the Discharge Plan (GW-044)

If you have any questions regarding this report, please call me at 303-605-1718.

Sincerely

Duke Energy Field Services, LP

Stephen Weathers, PG
Sr. Environmental Specialist

Enclosure

cc: Larry Johnson, OCD Hobbs District Office
Lynn Ward, DEFS Midland Office
Environmental Files

Remediacon Incorporated
Geological and Engineering Services
remediacon@yahoo.com

PO Box 302, Evergreen, Colorado 80437
Telephone: 303.674.4370
Facsimile: 720.528.8132

March 16, 2004

Mr. Stephen Weathers
Duke Energy Field Services, LP
370 Seventeenth Street, Suite 2500
Denver, Colorado 80202

Subject: Summary of December 2003 Groundwater Monitoring Results
Hobbs Booster Station: Hobbs, New Mexico
(Units C and D Section 4, T 19 S, R 38 E, NMPM: Discharge Plan GW-044)

Dear Steve:

This letter summarizes the activities completed and data generated during the December 2003 quarterly groundwater-sampling episode at the Hobbs Booster Station in Hobbs New Mexico (Figure 1). Forty wells have been installed at the site. The well locations are shown on Figure 2. Well elevation and construction data are summarized in Table 1. An air sparge system along the southern property boundary has been fully operational since the first part of January 2004.

Two types of monitoring wells are present at the site. Twenty-Three wells are included in the groundwater-monitoring program (MW-1 through MW-22, Figure 1). Seventeen product-characterization wells are also present at the site (TW-A through TW-S, excluding TW-E and TW-F Figure 2). These wells were installed to characterize the nature and extent of free product beneath the site. Some of the wells will also be used in the free product extraction system.

Trident Environmental of Midland Texas completed the initial sampling on December 30, 2003 using the standard protocols for this site. Additional sampling activities were completed on January 14, 2004 and January 27, 2004 to evaluate anomalous results in wells MW-19D and MW-22.

The corrected groundwater elevations as measured on December 29, 2003 are shown on Table 2 for the monitor wells and Table 3 for the product characterization wells along with the historical data. The water-table elevations for the wells containing free product were estimated using the following formula:

GWE_{corr} = MGWE + (PT*PD): where

- MGWE is the actual measured groundwater elevation;
- PT is the measured free-phase hydrocarbon thickness; and
- PD is the free phase hydrocarbon density (assumed 0.74 or 0.817 depending upon the well location).

This correction provides an accurate estimate of the water table elevation if free product was not present in the well.

A water-table contour map generated by the program Surfer using their kriging option is included as Figure 3. The groundwater flow direction continues to be almost due east. This direction has remained essentially unchanged over the duration of the project.

Hydrographs for the three southern boundary wells MW-14, MW-15 and MW-16 are presented on Figure 4. The water table declined at a constant rate of approximately 2 feet between December 2002 and December 2003. This rate is higher than the historic rate of about 1 foot per year.

The product thickness measurements are summarized on Table 4. A contour map of the measured free product thickness values was also generated using the Surfer program, and it is reproduced in Figure 5. The measured thickness was the greatest in the vicinity of wells TW-C and MW-11. A free product removal system is currently under design and should be constructed by mid-to-late summer 2004.

Free product removal began at TW-C in June 2003 as part of the design program. Product removal was interrupted for approximately 3 weeks in December 2003 to permit the free product in the well to completely recover as part of the quarterly groundwater monitoring effort. Product removal resumed in January 2004 as part of the continuing free product removal pilot test. More details on the pilot test will be provided under separate cover as part of the free product removal system design package.

Two graphs were prepared to evaluate the changes in free product thickness over time. The graphs include the wells that contain free product that have not been affected by the ongoing free product removal pilot test being conducted at TW-C. The graphs show the change in free product thickness using the June 2002 values as the baseline.

The first set of wells, shown on Figure 6, exhibit the behavior anticipated based upon the declining water table elevations discussed above. The free product thickness only decreased in TW-D. The product thickness remained essentially constant in wells MW-4 and MW-8, and they are both located in the western part of the area where free product is present. The free product in these wells appears to be draining downward as the water table elevation continues to decline.

The remaining wells in Figure 6 all exhibited free product thickness increases that appear to coincide with the falling water table. The top of the free product does not appear to be falling or it is falling at a slower rate in most of these wells.

The four wells graphed on Figure 7 all exhibited measured free product thicknesses that exceeded the decline rate for the water table. These wells are not within the same approximate area. Wells MW-11 and TW-J showed increases that were slightly higher than that measured for the water table, and their thickness increases may originate from that phenomena. Wells TW-P and TW-R both had free product thicknesses that were greater than 6 feet. Further investigation would be necessary to identify the reason for the increases. Free product collection systems are scheduled to be installed in both wells so additional characterization activities are not deemed necessary.

The analytical results for the monitoring episode are summarized in Table 5. The laboratory report is attached. The initial analytical results included anomalous concentrations from wells MW-19D and MW-22 based upon the historical data. These two wells were resampled on January 14, 2004. The results for MW-19D remained elevated so this well was resampled a third time to ensure the validity of the results. The third sample, collected January 27, 2004 did not contain detectable BTEX constituents; however, the detection limit remained elevated at 0.005 mg/l. Both MW-19D and MW-22 are on the quarterly groundwater monitoring list so evaluation will continue.

Benzene was not detected in the down-gradient boundary wells MW-19, MW-20 and MW-21. Benzene has not been detected since October 2001 in MW-19. None of the hydrocarbon constituents have been detected in wells MW-20 and MW-21 since they were installed.

Benzene was not detected in south (cross-gradient) wells MW-14 and MW-15. Benzene was detected in well MW-16 slightly above the detection limit at 0.0013 mg/l. This concentration is below any regulatory standards.

All of the analytical results for benzene are summarized in Table 6. The concentration-time distributions for southern boundary wells MW-14, MW-15 and MW-16 are graphed on Figure 8. The graphs show that the benzene concentrations in all three wells have been measured at low concentrations in the past; however, this is the first time that they have been all been at or near the detection limit for two consecutive monitoring episodes.

The monitoring results show that the dissolved phase hydrocarbons have not migrated off of this site during the past two monitoring episodes. Remediacon is currently designing a free product collection system for DEFS. The design should be provided to the OCD within the next two months.

The next sampling episode is scheduled for March 2004. Do not hesitate to contact me if you have any questions or comments on this report or any other aspects of the projects.

Sincerely,
REMEDIACON INCORPORATED

Michael H. Stewart

Michael H. Stewart, PE
Principal Engineer

MHS/tbm

attachments

TABLES

Table 1 – Summary of Hobbs Booster Station Well Construction Information

Well	Top of Casing Elevation	Total Well Depth	Screen Interval	Gravel Interval		Well	Top of Casing Elevation	Total Well Depth	Screen Interval	Gravel Interval
MW-1	3,626.06	57	37-57	34-57		MW-21	3,624.25	61	61-46	61-44
MW-2	3,623.14	53	33-53	30-53		MW-22	3,625.16	60	45-60	43-60
MW-3	3,623.01	53	33-53	30-53		TW-A	3626.74	57	42-57	40-57
MW-4	3,624.29	57	37-57	34-57		TW-B	3,626.96	57	44-59	42-59
MW-5	3,629.16	57	37-57	34-57		TW-C	3,626.85	60	45-60	43-60
MW-6	3,626.93	53	33-53	30-53		TW-D	3,628.12	50	35-50	33-50
MW-7	3,621.40	56	33-53	31-56		TW-G	3,623.62	54	39-54	34-54
MW-8	3,623.62	58	36-56	34-58		TW-H	3,622.30	51	36-51	34-51
MW-9	3,625.21	63	43-63	40-63		TW-I	3,629.44	60	45-60	43-60
MW-10	3,621.07	58	36-56	34-58		TW-J	3,628.99	60	45-60	43-60
MW-11	3,625.88	63	43-63	41-63		TW-K	3,628.95	60	45-60	43-60
MW-12	3,626.60	65	40-60	38-65		TW-L	3,628.75	60	45-60	43-60
MW-13	3,626.30	69	44-64	38-64		TW-M	3,629.62	60	45-60	43-60
MW-14	3,621.42	66	42-62	34-66		TW-N	3,631.98	60	45-60	43-60
MW-15	3,619.39	59	37-57	31-59		TW-O	3,631.60	60	45-60	42-60
MW-16	3,621.87	58	34-54	30-56		TW-P	3,629.68	60	45-60	42-60
MW-17	3,623.94	66	41-61	37-63		TW-Q	3,627.90	58	53-58	41-58
MW-18	3,624.30	68	44-64	35-65		TW-R	3,627.34	60	45-60	43-45
MW-19	3,624.12	68	43-63	40-65		TW-S	3,628.77	60	45-60	43-45
MW-19D	3,623.79	83	71-76	69-76		RW-1	3624.52	60	35-60	32-60
MW-20	3,621.49	59	59-44	59-42						

Notes: All units in feet
Wells TW-E and TW-F were plugged and abandoned in July 2
A natural sand pack is present in well MW-19D between 72 and 76 feet below ground surface (bgs). Artificially graded sand is present between 69 and 72 feet bgs.

Table 2 - Corrected Groundwater Elevations for the Groundwater Monitoring Wells

Well	Jul-99	May-00	Aug-00	Oct-00	Feb-01	May-01	Aug-01	Oct-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Sep-03	Dec-03
MW-1	3,580.50	3,580.13	3,580.19	3,579.96	3,579.89	3,579.64	3,579.65	3,579.62	3,579.00	3,578.72	3,578.55	3,578.72	3,578.46	3,578.23	3,577.87	3,577.47
MW-2	3,582.63	3,582.04	3,582.33	3,581.95	3,581.90	3,581.67	3,581.43	3,581.33	3,580.88	3,580.65	3,580.45	3,580.81	3,580.36	3,580.16	3,579.84	3,579.55
MW-3	3,582.25	3,581.68	3,582.05	3,581.64	3,581.57	3,581.36	3,581.11	3,580.97	3,580.48	3,580.29	3,580.11	3,580.52	3,580.06	3,579.79	3,579.46	3,579.08
MW-4	3,579.95	3,579.27	3,579.12	3,579.00	3,578.96	3,578.82	3,578.60	3,578.39	3,577.96	3,577.77	3,577.62	3,577.87	3,577.63	3,577.24	3,576.85	3,576.46
MW-5	3,581.01	3,580.89	3,580.66	3,580.58	3,580.59	3,580.27	3,580.68	3,580.74	3,579.81	3,579.44	3,579.32	3,579.49	3,579.16	3,579.08	3,578.79	3,578.38
MW-6	3,582.98	3,582.61	3,582.72	3,582.45	3,582.38	3,582.15	3,581.94	3,581.94	3,581.49	3,581.17	3,580.97	3,581.16	3,580.87	3,580.74	3,580.42	3,580.08
MW-7		3,582.90	3,583.22	3,582.83	3,582.75	3,582.52	3,582.24	3,582.18	3,581.70	3,581.49	3,581.28	3,581.66	3,581.52	3,580.98	3,580.70	3,580.34
MW-8		3,579.93	3,580.12	3,579.84	3,579.80	3,579.79	3,579.73	3,579.26	3,578.83	3,578.64	3,578.50	3,578.77	3,578.48	3,578.15	3,577.77	3,577.35
MW-9		3,577.62	3,577.51	3,577.46	3,577.45	3,577.31	3,577.00	3,576.81	3,576.33	3,576.21	3,576.05	3,576.30	3,576.09	3,575.58	3,575.19	3,574.77
MW-10		3,579.43	3,579.64	3,579.28	3,579.26	3,579.08	3,578.75	3,578.51	3,578.03	3,577.99	3,577.84	3,578.15	3,577.86	3,577.34	3,576.93	3,576.48
MW-11		3,577.90	3,578.00	3,577.66	3,577.69	3,577.52	3,577.34	3,577.16	3,576.70	3,576.48	3,576.32	3,576.52	3,576.32	3,575.92	3,575.56	3,575.15
MW-12				3,578.58	3,578.58	3,578.18	3,578.18	3,577.96	3,577.73	3,577.53	3,577.21	3,577.53	3,577.39	3,576.93	3,576.63	3,576.10
MW-13				3,576.41	3,576.32	3,576.29	3,575.86	3,575.81	3,575.40	3,575.23	3,575.07	3,575.25	3,575.04	3,574.62	3,574.26	3,573.70
MW-14				3,577.51	3,577.46	3,577.35	3,576.90	3,576.56	3,576.06	3,576.26	3,576.13	3,576.42	3,576.17	3,575.39	3,574.96	3,574.49
MW-15				3,579.57	3,579.53	3,579.36	3,579.02	3,578.70	3,578.21	3,578.32	3,578.14	3,578.54	3,578.18	3,577.59	3,577.16	3,576.72
MW-16				3,581.50	3,581.42	3,581.21	3,580.96	3,580.79	3,580.28	3,580.14	3,579.96	3,580.43	3,579.93	3,579.62	3,579.29	3,578.90
MW-17				3,575.36	3,575.26	3,575.15	3,574.89	3,574.68	3,574.24	3,574.07	3,573.90	3,574.09	3,573.85	3,573.44	3,573.15	3,572.65
MW-18				3,574.66	3,574.53	3,574.43	3,574.21	3,573.98	3,573.56	3,573.38	3,573.22	3,573.42	3,573.15	3,572.76	3,572.42	3,572.01
MW-19				3,573.97	3,573.88	3,573.79	3,573.55	3,573.32	3,572.90	3,572.74	3,572.58	3,572.78	3,572.49	3,572.12	3,571.78	3,571.37
MW-20										3,572.51	3,572.36	3,572.59	3,572.28	3,571.92	3,571.56	3,571.15
MW-21										3,573.46	3,573.32	3,573.62	3,573.28	3,572.82	3,572.44	3,572.00
MW-22														3,572.08	3,571.78	3,571.39

All units are feet

Table 3 - Corrected Groundwater Elevations for the Product Characterization Wells

Well	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Sep-03	Dec-03
TW-A	3,578.32	3,578.12	3,578.25	3,578.04	3,577.88	3,577.49	3,577.09
TW-B	3,577.45	3,577.28	3,577.42	3,577.25	3,577.01	3,576.62	3,576.23
TW-C	3,576.49	3,576.37	3,576.50	3,576.35	3,575.85	3,575.38	3,575.24
TW-D	3,575.85	3,576.12	3,576.15	3,576.09	3,575.78	3,575.43	3,575.02
TW-G	3,577.40	3,577.23	3,577.49	3,577.29	3,576.60	3,576.30	3,575.88
TW-H	3,579.15	3,578.99	3,614.41	3,578.96	3,578.67	3,578.27	3,577.88
TW-I	3,577.52	3,577.38	3,577.40	3,577.27	3,577.10	3,576.79	3,576.40
TW-J	3,576.50	3,576.43	3,576.45	3,576.30	3,576.07	3,575.75	3,575.38
TW-K	3,575.45	3,575.51	3,575.57	3,575.28	3,575.12	3,574.79	3,574.40
TW-L	3,574.96	3,575.07	3,575.16	3,574.98	3,574.69	3,574.37	3,574.02
TW-M		3,578.32	3,578.40	3,578.17	3,578.04	3,577.70	3,577.30
TW-N		3,577.22	3,577.13	3,576.99	3,576.88	3,576.56	3,576.18
TW-O		3,576.31	3,576.25	3,576.12	3,575.95	3,575.60	3,575.26
TW-P		3,575.20	3,575.21	3,575.08	3,574.86	3,574.56	3,574.20
TW-Q		3,579.12	3,618.98	3,579.04	3,578.89	3,578.56	3,578.19
TW-R		3,574.17	3,574.36	3,574.22	3,573.96	3,573.63	3,573.22
TW-S		3,573.90	3,618.71	3,573.76	3,573.47	3,573.13	3,572.87

All units are feet

Table 4 - Summary of Free Product Thickness Measurements

Well	6/27/02	8/26/02	09/24/02	12/10/02	3/20/03	6/23/03	9/16/03	12/29/03
MW-1	0.02	0.29	0.35	0.55	1.67	2.15	2.36	0.79
MW-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.08
MW-4	2.86	3.38	3.36	3.11	3.39	3.40	3.43	3.46
MW-8	1.88	2.50	2.53	2.47	2.66	2.56	2.53	2.55
MW-9	0.01	0.01	0.52	0.46	0.88	1.21	1.19	1.29
MW-10	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.04
MW-11	3.09	6.57	7.21	7.45	7.41	7.91	10.38	11.52
MW-12	2.79	2.83	2.81	2.70	3.10	3.33	3.51	3.93
MW-13	7.37	8.59	8.62	8.42	8.88	8.69	8.46	9.02
MW-17	0.01	0.64	0.06	0.11	0.18	0.24	0.02	0.31
TW-A	1.15	2.70	3.41	3.67	3.96	3.93	3.93	3.99
TW-B	5.24	5.28	5.22	5.17	5.48	5.59	5.94	6.34
TW-C*	9.84	10.52	10.6	10.58	11.58	2.66	2.43	12.28
TW-D	8.00	8.51	8.45	8.49	8.51	8.11	7.70	7.17
TW-G	2.29		1.84	1.75	2.09	0.49	3.44	3.77
TW-I	3.60	3.75	3.74	3.85	4.21	4.37	4.82	5.48
TW-J	1.28	5.39	6.01	6.16	6.54	6.90	7.74	8.44
TW-K	5.95	8.00	7.91	7.76	7.80	8.25	8.50	8.62
TW-L	5.34	7.91	7.88	7.79	8.05	8.09	8.23	8.30
TW-M	0.00	0.15	0.20	0.01	0.45	0.54	0.63	0.65
TW-N	0.00	0.02	0.00	0.01	0.03	0.01	0.02	0.04
TW-O	0.00	0.06	0.04	0.06	0.08	0.05	0.00	0.40
TW-P	0.00	0.00	1.33	2.53	4.21	4.91	5.42	5.90
TW-R	1.50	0.03	1.65	2.65	4.31	5.74	6.59	6.46

Notes: Units are Feet

* Well TW-C contains a product removal system that was operating when some of the measurements were made.

Table 5 - Fourth Quarter Groundwater Monitoring Results

Initial Results from the December 30, 2003 Sampling Episoce

Well	Benzene	Toluene	Ethylbenzene	Xylenes
MW-14	<0.005	<0.005	0.014	<0.005
MW-15	<0.001	<0.001	0.0615	0.001
MW-16	0.0013	<0.001	<0.001	<0.001
MW-19	<0.001	<0.001	<0.001	0.0016
MW-19D	0.0338	<0.001	<0.001	0.0014
MW-20	<0.001	<0.001	<0.001	<0.001
MW-21	<0.001	<0.001	<0.001	<0.001
MW-22	0.0249	<0.001	0.001	<0.001

Units are mg/l

January 14 and 27, 2004 Resampling Results

Well/Date	Benzene	Toluene	Ethylbenzene	Xylenes
MW-19D				
1/14/2004	0.030	<0.001	<0.001	0.00100
1/27/2004	<0.005	<0.005	<0.005	<0.005
MW-22				
1/14/2004	0.001	<0.001	0.00011	0.00240

Units are mg/l

Table 6 - Summary of Dissolved Benzene Concentrations from the Historic Groundwater Monitoring Episodes

Benzene	7/8/99	5/11/00	8/22/00	10/31/00	2/5/01	5/15/01	8/9/01	10/19/01	3/13/02	6/3/02	9/24/02	12/10/02	3/19/03	6/23/03	9/17/03	12/30/03	1/14/04 1/27/04
MW-1	0.232	0.191	0.181	0.197	0.570	LNAPL	LNAPL	0.144	LNAPL	LNAPL				LNAPL			
MW-2	0.934	1.330	1.420	1.020	2.110	0.848	1.760	1.3	0.712	LNAPL				0.277			
MW-3	0.262	0.202	0.011	<.005	0.346	<.001	0.345	0.029	<0.001	0.009				<0.001			
MW-5	<.005	<.005	<.005	<.005	<.005	<.001	<.001	<0.001	<0.001	<0.001				<0.001			
MW-6	<.005	<.005	<.005	<.005	<.005	<.001	<.001	<0.001	<0.001	<0.005				<0.001			
MW-7		<.005	<.005	<.005	<.005	<.001	<.001	<0.001	<0.001	0.0039				<0.001			
MW-8		0.824	LNAPL	LNAPL	0.950	0.294	1.230	LNAPL	LNAPL	LNAPL				LNAPL			
MW-9		0.702	LNAPL	LNAPL	LNAPL	LNAPL	LNAPL	LNAPL	LNAPL	LNAPL				LNAPL			
MW-10		LNAPL	LNAPL	0.535	LNAPL	LNAPL	LNAPL	1.13	LNAPL	LNAPL				1.030			
MW-14				<.005	0.041	0.002	0.034	0.029	<0.001	0.068	0.126	0.0685	0.0820	0.0414	<0.001	<0.005	
MW-15				<.005	0.237	0.003	0.353	0.317	<0.001	0.358	<0.005	<0.005	<0.005	0.352	<0.001/ <0.005	<0.001	
MW-16				<.005	0.094	0.01	0.098	0.012	<0.001	<0.005	0.0363	0.0042	<0.001	<0.001	<0.001	0.0013	
MW-17						LNAPL	0.04	0.076	LNAPL	LNAPL				LNAPL			
MW-18				<.005	<.005	0.004	0.007	0.036	<0.001	LNAPL				<0.005			
MW-19				<.005	<.005	0.001	<.005	0.035	<0.001	<0.001	<0.005	<0.001	<0.005	<0.001	<0.001	<0.001	
MW-19D														<0.001	<0.001	0.0338	0.030 <0/005
MW-20											<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	
MW-21											<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
MW-22														<0.001	<0.001	0.0249	0.001 NS

Notes: 1) All units mg/l
2) Wells MW-4, MW-11, MW-12 and MW-13 have contained LNAPLs during each sampling episode and have never been tested for dissolved-phase hydrocarbons in the groundwater.
3) NS well MW-22 was not resampled on January 24, 2004
4) A blank cell indicates that the well was not sampled.

FIGURES

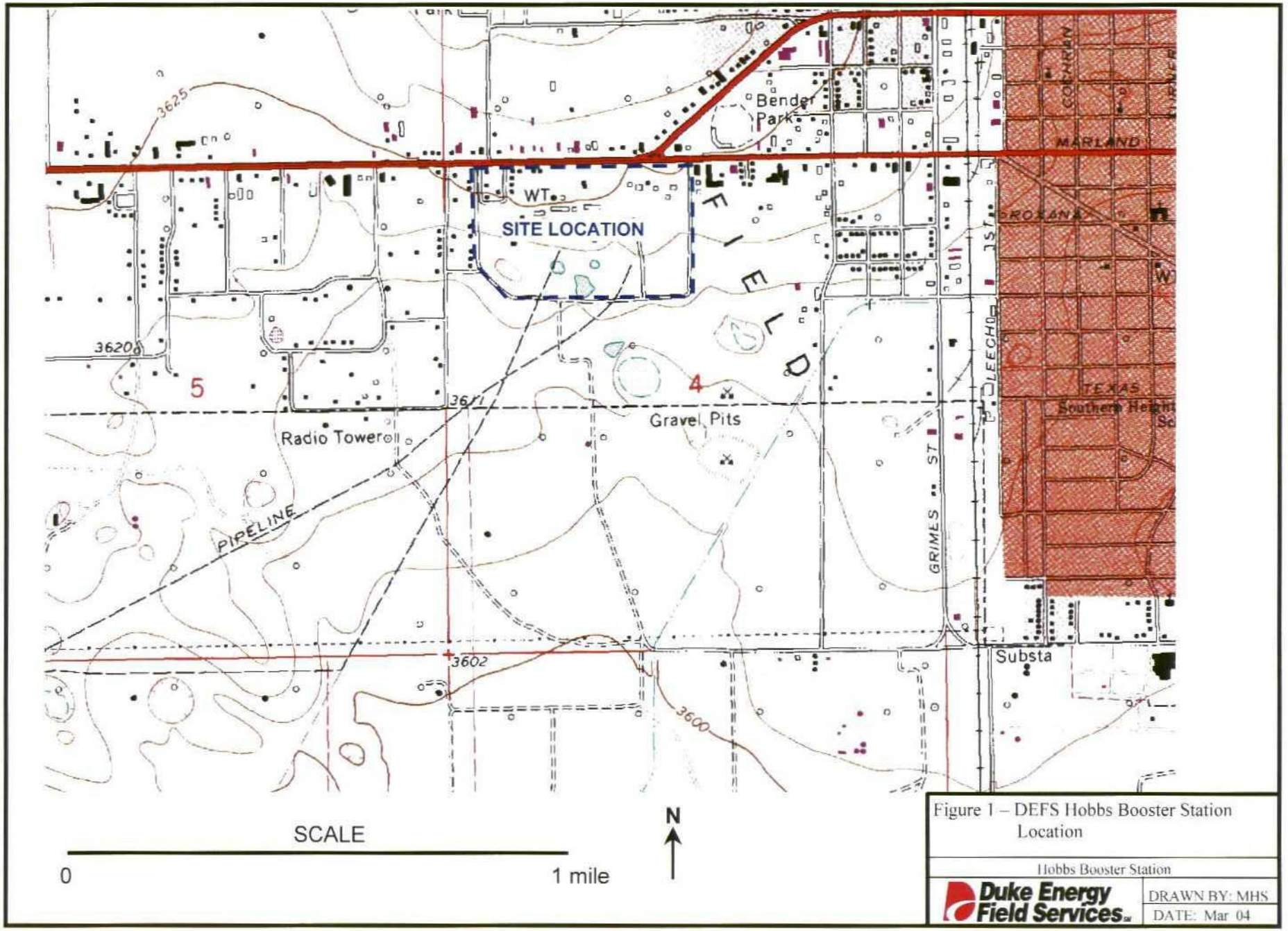


Figure 1 – DEFS Hobbs Booster Station Location

Hobbs Booster Station

Duke Energy Field Services

DRAWN BY: MHS

DATE: Mar 04

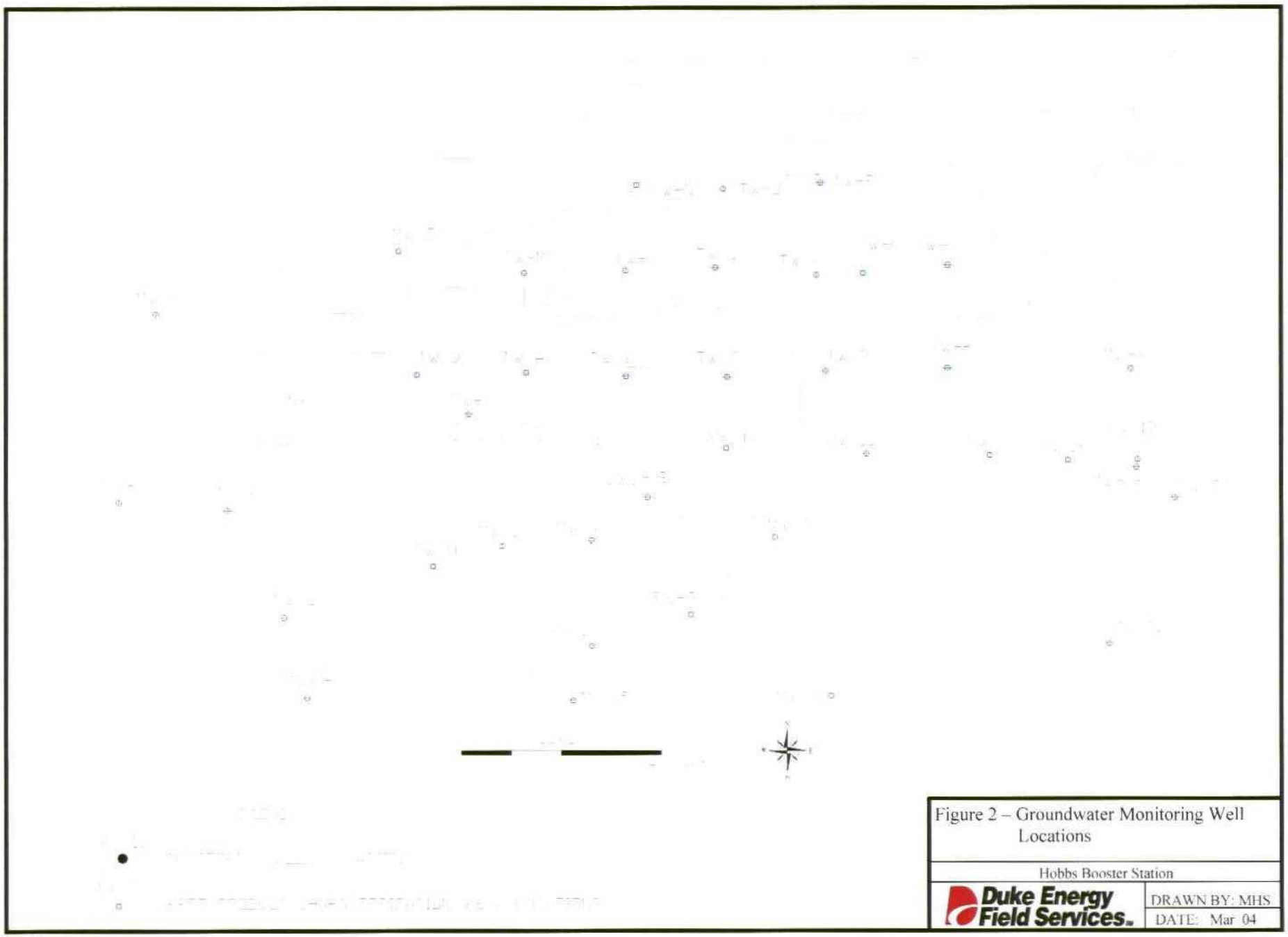


Figure 2 – Groundwater Monitoring Well Locations

Hobbs Booster Station

Duke Energy Field Services

DRAWN BY: MHS

DATE: Mar 04

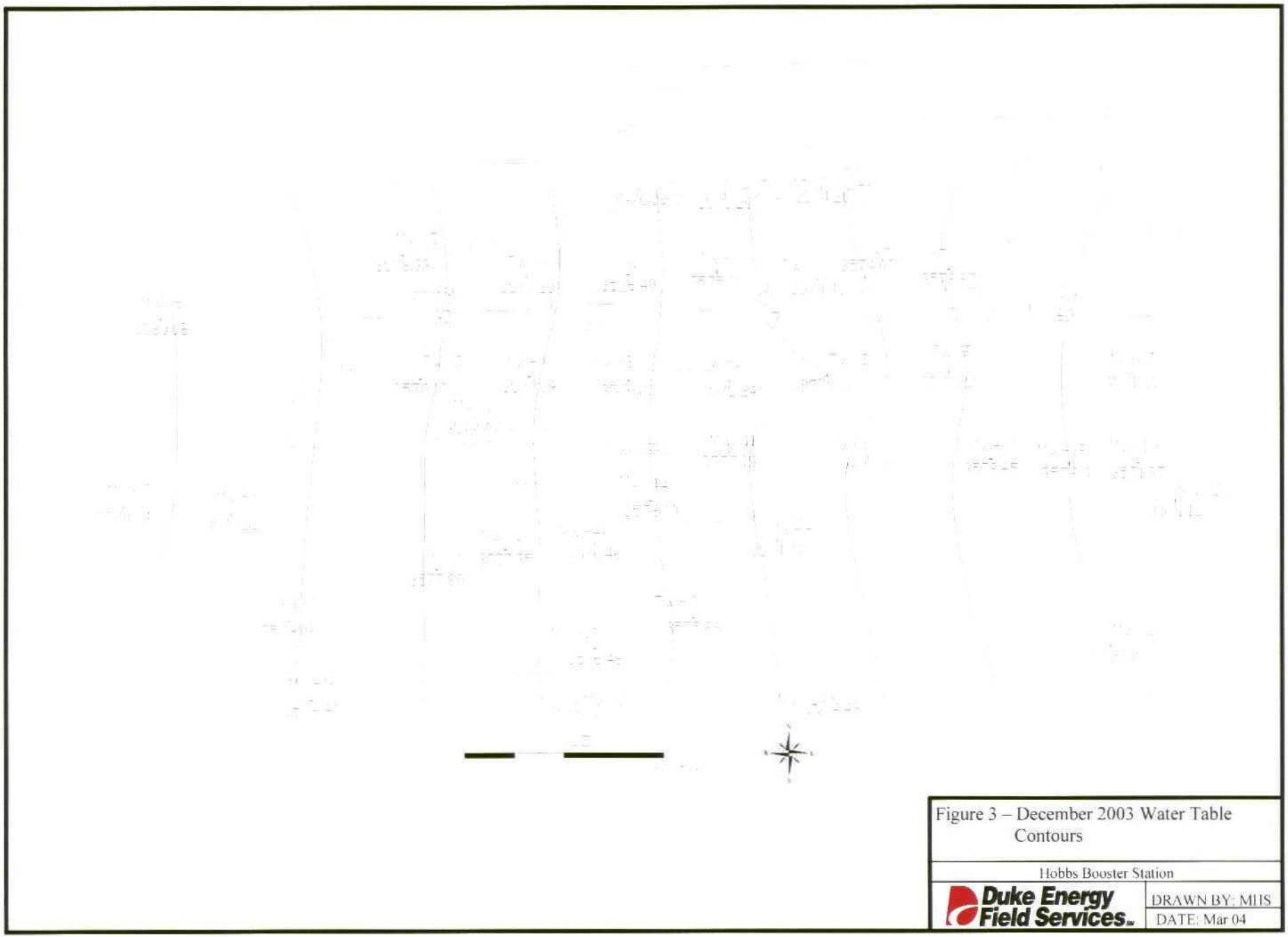


Figure 3 – December 2003 Water Table Contours

Hobbs Booster Station

Duke Energy Field Services

DRAWN BY: MHS

DATE: Mar 04

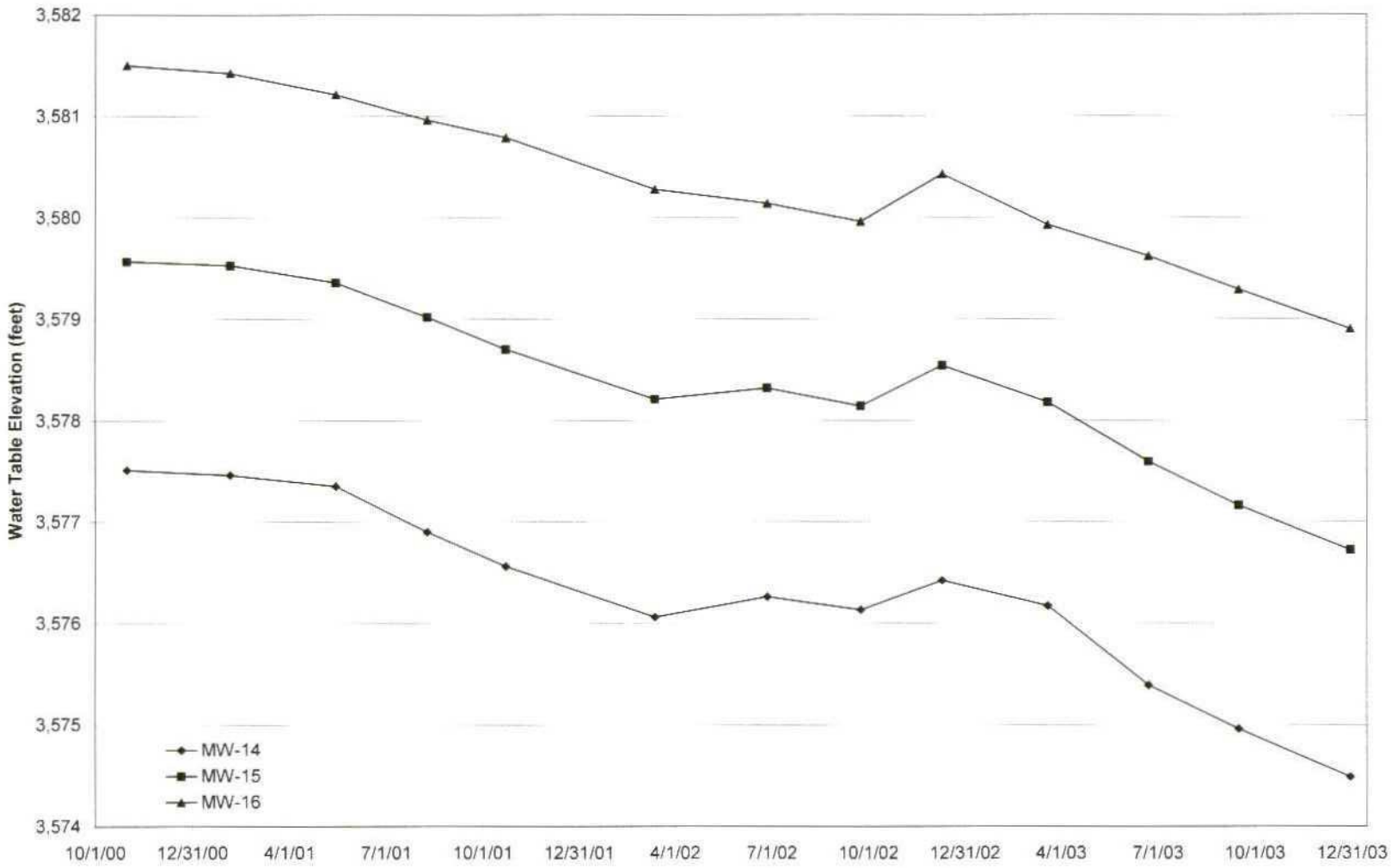


Figure 4 – Hydrographs for the Three Southern Boundary Wells

Hobbs Booster Station

Duke Energy Field Services

DRAWN BY: MHS

DATE: Mar 04

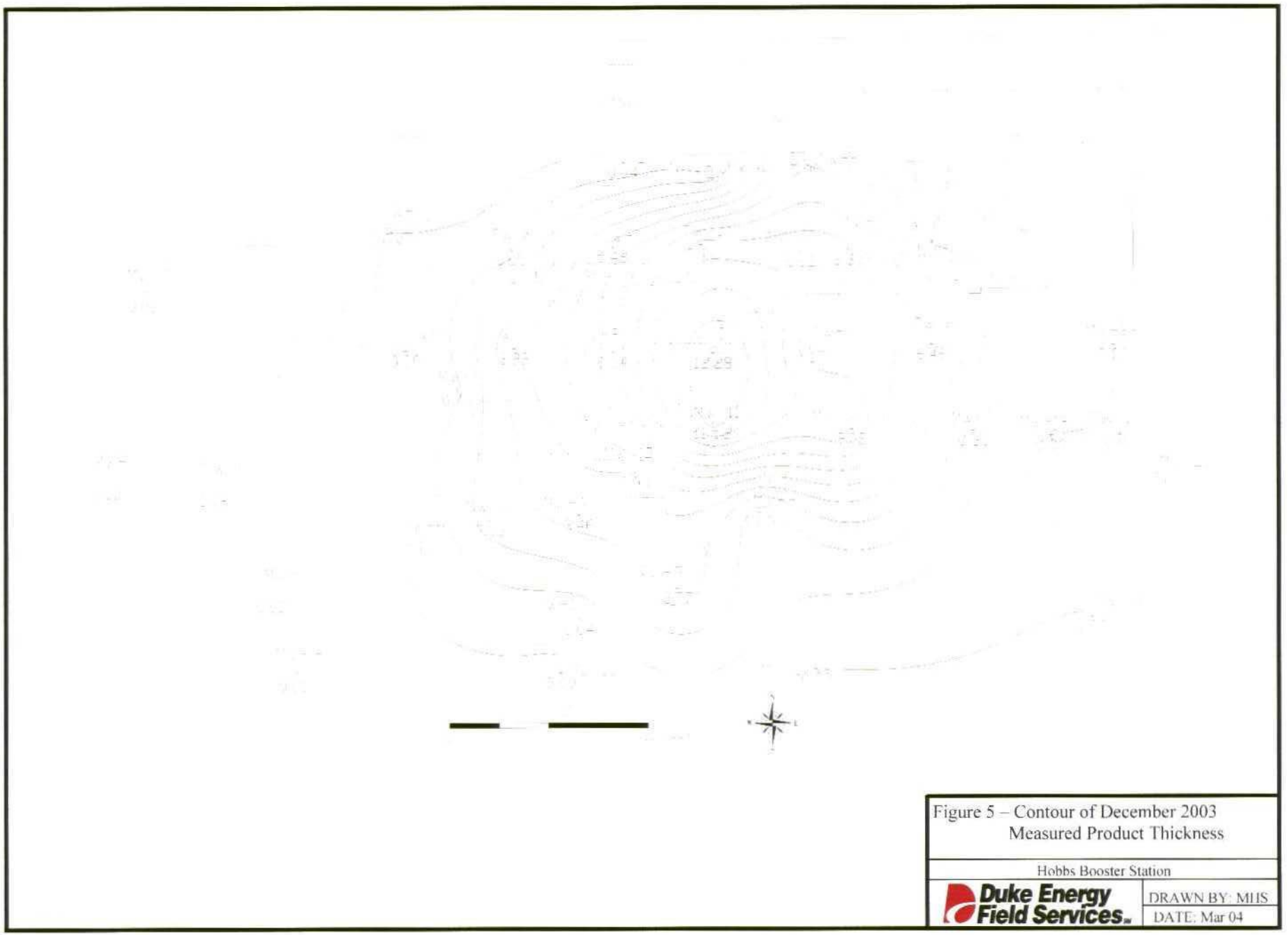


Figure 5 – Contour of December 2003
Measured Product Thickness

Hobbs Booster Station

Duke Energy Field Services

DRAWN BY: MHS

DATE: Mar 04

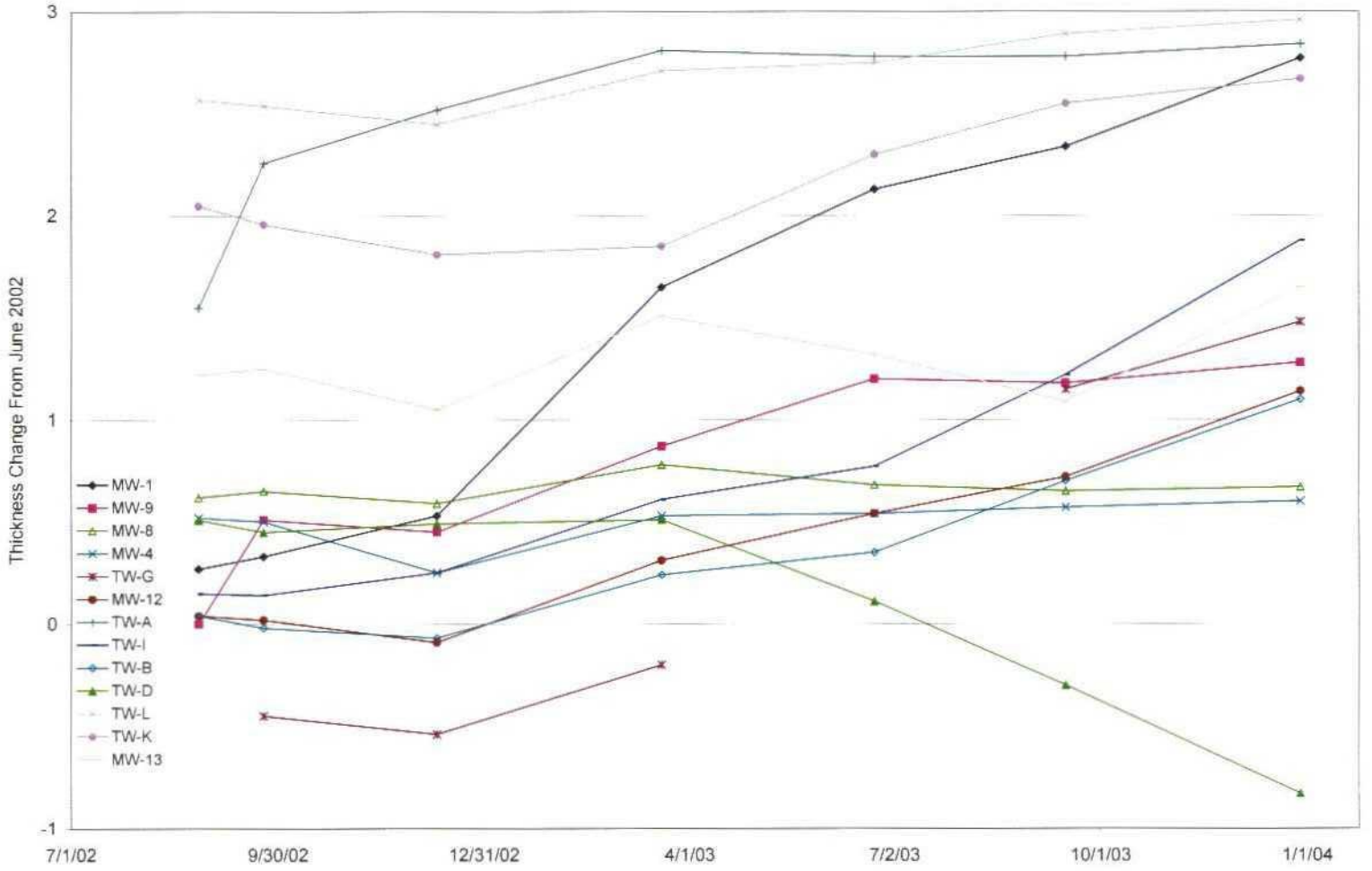


Figure 6 – Wells Exhibiting Expected Changes in Product Thickness Since June 2002 (feet)

Hobbs Booster Station

Duke Energy Field Services

DRAWN BY: MHS

DATE: Mar 04

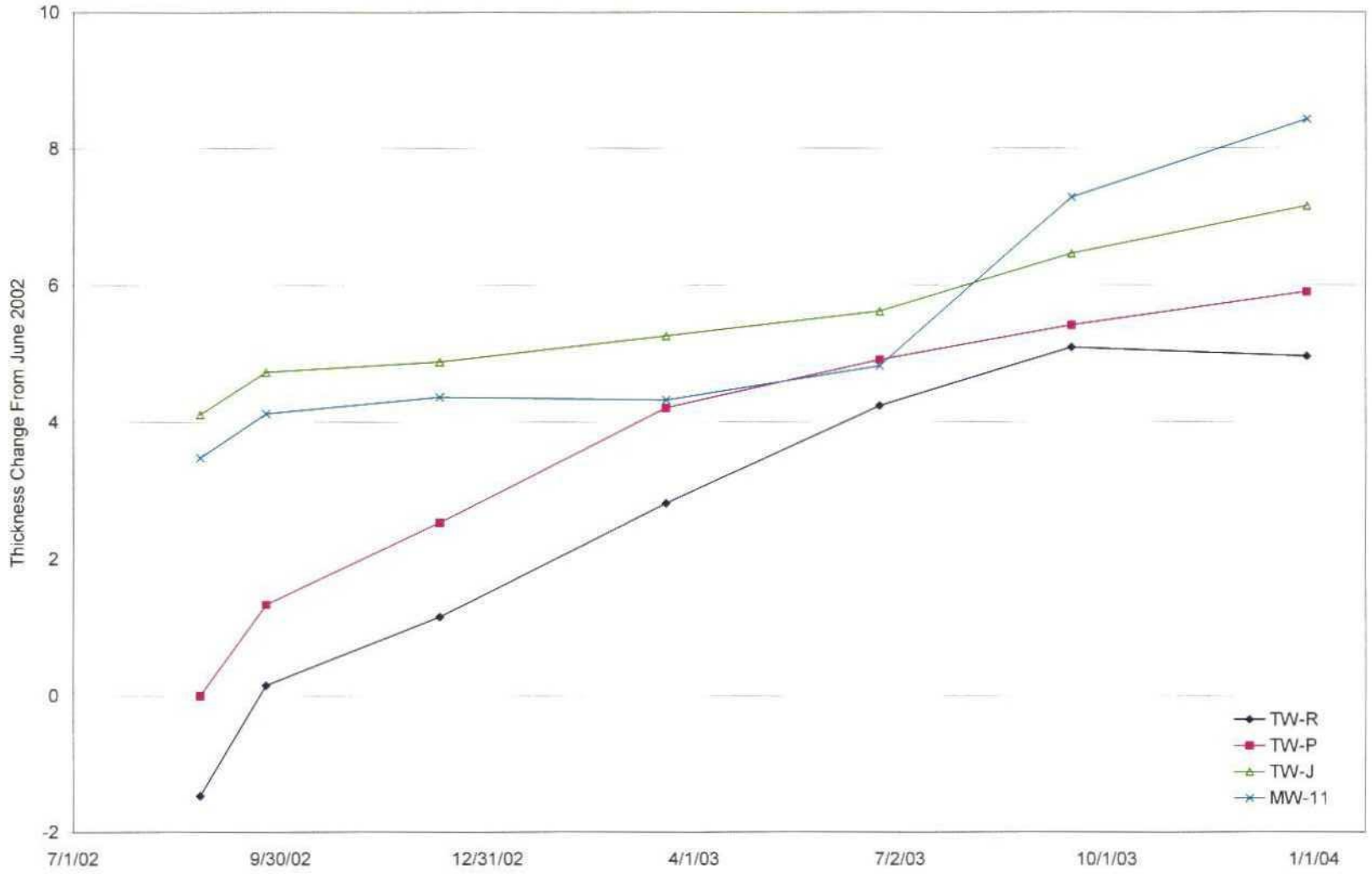


Figure 7 – Wells Exhibiting Higher Than Expected Changes in Product Thickness Since June 2002 (feet)

Hobbs Booster Station

Duke Energy Field Services

DRAWN BY: MHS

DATE: Mar 04

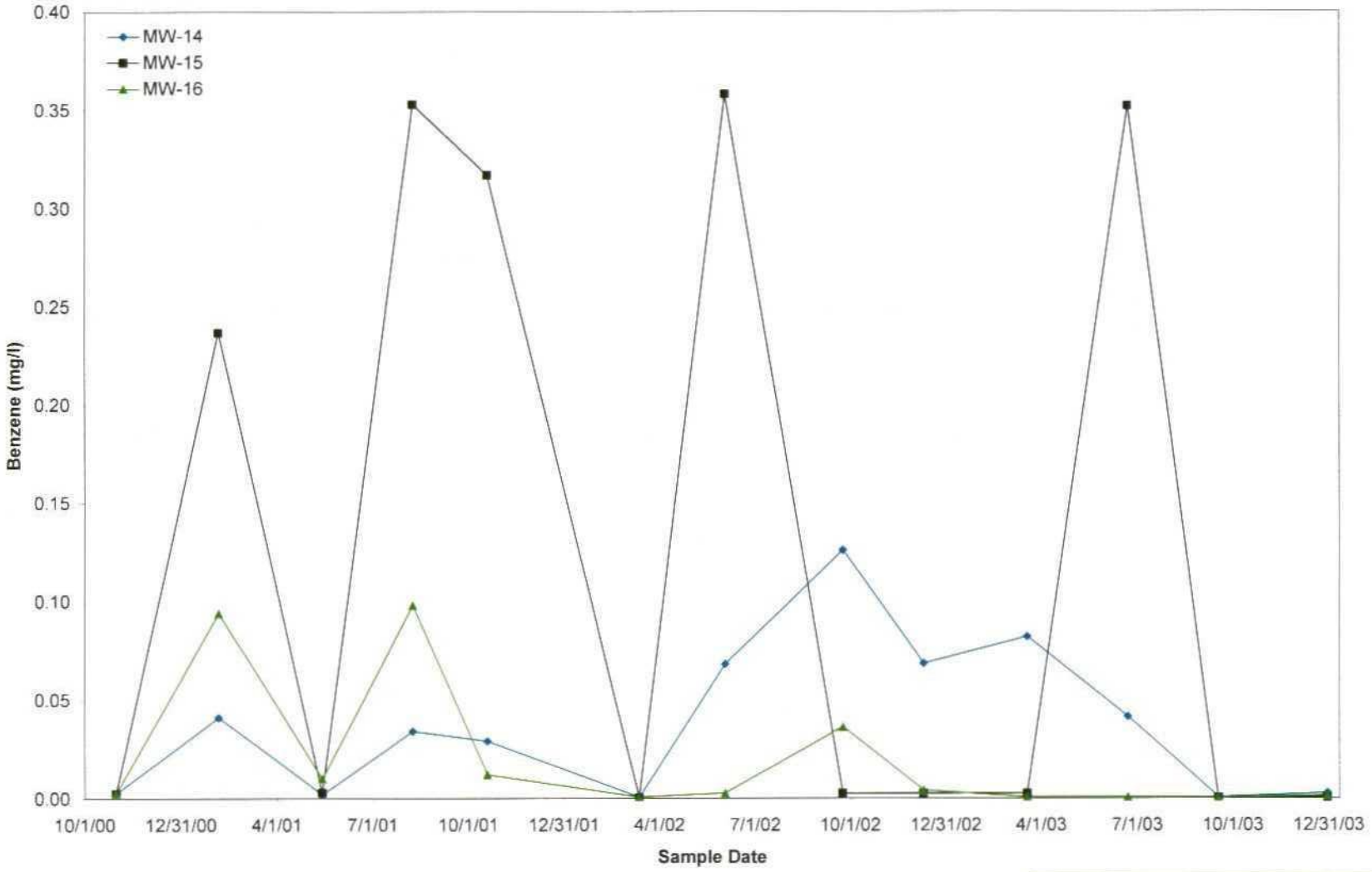


Figure 8 – Benzene concentrations (mg/l) in South Boundary Wells

Hobbs Booster Station

Duke Energy Field Services

DRAWN BY: MHS

DATE: Mar 04

ANALYTICAL LABORATORY REPORT

Summary Report

Mike Stewart
Remediacon Inc.
P.O. Box 302
Evergreen, CO 80437

Report Date: January 5, 2004

Work Order: 4010206

Project Location: Hobbs Booster Station
Project Name: Duke Energy Field Services

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
24239	MW-19D	water	2003-12-30	08:58	2004-01-02
24240	MW-19	water	2003-12-30	09:12	2004-01-02
24241	MW-22	water	2003-12-30	10:00	2004-01-02
24242	MW-21	water	2003-12-30	10:40	2004-01-02
24243	MW-20	water	2003-12-30	11:10	2004-01-02
24244	MW-14	water	2003-12-30	12:10	2004-01-02
24245	MW-15	water	2003-12-30	12:42	2004-01-02
24246	MW-16	water	2003-12-30	13:30	2004-01-02
24247	Duplicate	water	2003-12-30	20:00	2004-01-02
24248	Trip Blank	water	2003-12-30	00:00	2004-01-02

	BTEX			
Sample - Field Code	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylene (isomers) (mg/L)
24239 - MW-19D	0.0338	<0.00100	<0.00100	0.00140
24240 - MW-19	<0.00100	<0.00100	<0.00100	0.00160
24241 - MW-22	0.0249	<0.00100	0.00100	<0.00100
24242 - MW-21	<0.00100	<0.00100	<0.00100	<0.00100
24243 - MW-20	<0.00100	<0.00100	<0.00100	<0.00100
24244 - MW-14	<0.00500	<0.00500	0.0137	<0.00500
24245 - MW-15	<0.00100	<0.00100	0.0615	0.00100
24246 - MW-16	0.00130	<0.00100	<0.00100	<0.00100
24247 - Duplicate	<0.00100	<0.00100	0.0613	0.00120
24248 - Trip Blank	<0.00100	<0.00100	<0.00100	0.00110

Summary Report

Mike Stewart
Remediacon Inc.
P.O. Box 302
Evergreen, CO 80437

Report Date: January 20, 2004

Work Order: 4011603

Project Location: Hobbs Booster Station
Project Name: Duke Energy Field Services

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
25138	MW-22 (0401141455)	water	2004-01-14	14:55	2004-01-16
25139	MW-190 (0401141600)	water	2004-01-14	16:00	2004-01-16

	BTEX			
Sample - Field Code	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylene (isomers) (mg/L)
25138 - MW-22 (0401141455)	<0.00100	<0.00100	0.00110	0.00240
25139 - MW-190 (0401141600)	0.0303	<0.00100	<0.00100	0.00100

Summary Report

Mike Stewart
Remediacon Inc.
P.O. Box 302
Evergreen, CO 80437

Report Date: February 9, 2004

Work Order: 4020428

Project Location: Hobbs Booster Station
Project Name: Duke Energy Field Services

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
26709	(MW-19d)040130 1650	water	2004-01-27	16:50	2004-02-04

	BTEX			
Sample - Field Code	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylene (isomers) (mg/L)
26709 - (MW-19d)040130 1650	<0.00500	<0.00500	<0.00500	<0.00500

Duke Energy Field Services, LP

P.O. Box 5493
Denver, Colorado 80217
370 17th Street, Suite 900
Denver, Colorado 80202
Direct: 303-595-3331
Fax: 303-893-8902

November 12, 2002

Mr. Jack Ford
New Mexico Oil Conservation Division
1220 S. St. Francis Dr.
Santa Fe, NM 87505

RE: September 2002, Groundwater Monitoring Event at the Duke Energy Field Services Hobbs Booster Station (GW-044), Lea County New Mexico

Dear Mr. Ford:

Duke Energy Field Services, LP (DEFS) is pleased to submit for your review, one copy of the September, 2002 Groundwater Monitoring Report for the DEFS Hobbs Booster Station located in Hobbs, NM. This report summarizes activities associated with the 3rd Quarter 2002 groundwater sampling event.

If you have any questions regarding the above mentioned report, please call me at 303-605-1718.

Sincerely

Duke Energy Field Services, LP

Michael H. Allen for

Stephen Weathers
Environmental Specialist

Enclosure

cc: Larry Johnson, OCD Hobbs District
Environmental Files

Remediacon Incorporated
Geological and Engineering Services
remediacon@yahoo.com

PO Box 302, Evergreen, Colorado 80437
Telephone: 303.674.4370
Facsimile: 720.528.8132

November 12, 2002

Mr. Stephen Weathers
Duke Energy Field Services, LP
370 17th Street, Suite 900
Denver, CO 80202

Re: Summary of September Groundwater Monitoring Event at the Duke Energy Field Services Hobbs Booster Station, Lea County New Mexico (Discharge Plan GW-044)

Dear Stephen:

This letter presents the results of the September 2002 groundwater monitoring event at the Duke Energy Field Services (DEFS) Hobbs Booster Station. Remediacon presented a groundwater monitoring and reporting schedule in its September 5, 2002 letter to DEFS that was approved by the New Mexico Oil Conservation Division (OCD). Based upon that letter, the September, December and March summary reports must include the following information:

- A discussion of the sampling procedures including any deviations from the standard sampling protocol;
- A summary of the resulting depth to water and free-phase hydrocarbon measurements along with the calculated groundwater elevations;
- A water table contour map for that sampling event;
- A summary of the equilibrated field parameters for each well;
- Presentation of the resulting laboratory analytical results for the sampling event; and
- A discussion of the field duplicate results.

SAMPLING SUMMARY

The groundwater monitoring program includes 21 monitoring wells. The well locations are shown on Figure 1 and pertinent information is summarized in Table 1. The wells are sampled according to the schedule provided in Table 2.

The routine monitoring activities include measuring depths to free-phase hydrocarbons (if present) and water, purging the scheduled wells that do not have free phase hydrocarbons to a constant temperature, pH and conductivity and then collecting samples for analyses. The wells that contained free phase hydrocarbons are not sampled. The groundwater samples are analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX).

Trident Environmental (Trident) completed the monitoring activities on September 23 and 24, 2002. Trident gauged all of the wells on September 23 and purged and sampled wells MW-14, MW-15, MW-16, MW-19, MW-20 and MW-21 on September 24, 2002. There were no deviations from the standard monitoring protocols.

The measured depths to water, depths to product (if present), product thicknesses and calculated groundwater elevations as measured on September 23, 2002 are listed in Table 3. Table 4 summarizes the measured product thicknesses.

Table 3 includes the actual groundwater elevations for those wells that either contained no free-phase hydrocarbons or had a negligible thickness. The groundwater elevation values for those wells containing free-phase hydrocarbons (MW-4,8,9,11,12,13 and 17) were corrected using the following formula (all values in feet):

$GWE_{corr} = MGWE + (PT*PD)$: where

MGWE is the actual measured groundwater elevation;
PT is the measured free-phase hydrocarbon thickness, and
PD is the free phase hydrocarbon density.

The free phase densities are from actual hydrocarbon samples from MW-4 and MW-11.

A water table contour map base upon the calculated September 2002 water table elevations is included as Figure 2. The contours were generated using the Surfer® program with a kriging option. The calculated groundwater flow direction shown on Figure 2 has been consistent toward the east since monitoring began in 1999.

The stabilized field parameters are included in Table 5. The analytical results are included in Table 6. Table 7 summarizes the benzene concentrations in the quarterly groundwater monitoring wells beginning with the October 2001 sampling episode. The September 2002 benzene concentrations are shown on Figure 3.

A field duplicate sample was collected from well MW-15. MW-15 was selected because it had historically contained measurable benzene concentrations. None of the BTEX constituents were detected at a 0.005 mg/l concentration in either the original or the field duplicate.

A rinsate sample was collected from the dual-phase interface probe. None of the BTEX constituents were detected at a 0.001 mg/l concentration.

The next groundwater monitoring event is scheduled for December 2002 according to the schedule contained in Table 2. Do not hesitate to contact me if you have any questions or comments.

Respectfully Submitted,
REMEDIACOM INCORPORATED

Michael H. Stewart, P.E.
Principal Engineer

MHS/tbm

attachments

TABLES

Table 1 – Summary of Hobbs Booster Station Well Construction Information

Well	Ground Elevation	Top Of Casing Elevation	Total Well Depth	Well Diameter	Screen Interval	Gravel Interval
MW-1	3,623.60	3,626.06	57	2	37-57	34-57
MW-2	3,620.65	3,623.14	53	2	33-53	30-53
MW-3	3,620.08	3,623.01	53	2	33-53	30-53
MW-4	3,621.66	3,624.29	57	2	37-57	34-57
MW-5	3,626.30	3,629.16	57	2	37-57	34-57
MW-6	3,624.14	3,626.93	53	2	33-53	30-53
MW-7	3,618.93	3,621.40	56	2	33-53	31-56
MW-8	3,620.84	3,623.62	58	2	36-56	34-58
MW-9	3,622.60	3,625.21	63	2	43-63	40-63
MW-10	3,618.30	3,621.07	58	2	36-56	34-58
MW-11	3,623.05	3,625.88	63	2	43-63	41-63
MW-12	3,623.95	3,626.60	65	4	40-60	38-65
MW-13	3,623.53	3,626.30	69	4	44-64	38-64
MW-14	3,618.76	3,621.42	66	2	42-62	34-66
MW-15	3,616.79	3,619.39	59	2	37-57	31-59
MW-16	3,619.10	3,621.87	58	2	34-54	30-56
MW-17	3,621.36	3,623.94	66	4	41-61	37-63
MW-18	3,621.96	3,624.30	68	4	44-64	35-65
MW-19	3,621.42	3,624.12	68	2	43-63	40-65
MW-20	3,621.62	3,621.49	59	2	59-44	59-42
MW-21	3,621.78	3,624.25	61	2	61-46	61-44

Table 2 – Hobbs Booster Station Groundwater Monitoring Program

Well	Proposed Monitoring Frequency
MW-1	None (Free phase hydrocarbons present)
MW-2	None (Free phase hydrocarbons present)
MW-3	Annually in June
MW-4	None (Free phase hydrocarbons present)
MW-5	Annually in June
MW-6	Annually in June
MW-7	Annually in June
MW-8	None (Free phase hydrocarbons present)
MW-9	None (Free phase hydrocarbons present)
MW-10	None (Free phase hydrocarbons present)
MW-11	None (Free phase hydrocarbons present)
MW-12	None (Free phase hydrocarbons present)
MW-13	None (Free phase hydrocarbons present)
MW-14	Quarterly (March, June September and December)
MW-15	Quarterly (March, June September and December)
MW-16	Quarterly (March, June September and December)
MW-17	None (Free phase hydrocarbons present)
MW-18	Annually in June
MW-19	Quarterly (March, June September and December)
MW-20	Quarterly (March, June September and December)
MW-21	Quarterly (March, June September and December)

Notes: 1) Samples will be analyzed for benzene, toluene, ethylbenzene and xylenes
2) A minimum of one blind field duplicate will be collected for each sampling episode.

Table 3 – Summary of September 23, 2002 Groundwater Gauging Data

Well	Depth To Water	Depth To Product	Product Thickness	Corrected Groundwater Elevation
MW-1	47.78	47.43	0.35	3578.55
MW-2	42.69			3580.45
MW-3	42.9			3580.11
MW-4	49.27	45.91	3.36	3577.62
MW-5	49.84			3579.32
MW-6	45.96			3580.97
MW-7	40.12			3581.28
MW-8	47.19	44.66	2.53	3578.39
MW-9	49.58	49.06	0.52	3576.03
MW-10	43.23			3577.84
MW-11	55.45	48.24	7.21	3576.01
MW-12	51.68	48.87	2.81	3577.09
MW-13	58.27	49.65	8.62	3574.70
MW-14	45.29			3576.13
MW-15	41.25			3578.14
MW-16	41.91			3579.96
MW-17	50.09	50.03	0.06	3573.90
MW-18	51.08			3573.22
MW-19	51.54			3572.58
MW-20	49.13			3572.36
MW-21	50.93			3573.32
TW-A	51.4	47.99	3.41	3577.98
TW-B	53.94	48.72	5.22	3577.08
TW-C	59.13	48.53	10.6	3575.92
TW-D	58.9	50.45	8.45	3573.76
TW-G	47.89	46.05	1.84	3577.15

All units in feet
See text for corrected elevation formula

Table 4 – Summary of Measured Product Thicknesses

Well	10/00	2/01	5/01	8/01	10/01	3/02	6/02	8/02	9/02
MW-1	NR	NR	0.01	0.01	0.005	0	0.02	0.290	0.35
MW-4	2.68	2.92	2.82	2.60	2.64	2.62	2.86	3.380	3.36
MW-8	Sheen	0.00	0.27	0.40	0.06	0.72	1.88	2.500	2.53
MW-9	NR	0.01	NR	Sheen	0.01	0.15	Sheen	0.010	0.52
MW-11	4.45	5.42	5.47	5.97	6.26	7	3.09	6.570	7.21
MW-12	0.08	1.05	0.96	2.04	1.71	2.79	2.79	2.830	2.81
MW-13	0.17	0.76	0.84	5.22	5.69	7.62	7.37	8.590	8.62
MW-17	0.01	0.02	0.01	0.03	Sheen	0.03	0.01	0.640	0.06

NR value not recorded, product recovery system in well
All units in feet

Table 5 – Summary of Equilibrated Field Parameters from the September 2002 Groundwater Monitoring Episode

Well	Temperature (°C)	Conductivity (mS/cm)	PH (pH units)	Dissolved Oxygen (mg/l)
MW-14	20.4	2.24	6.61	0.96
MW-15	20.3	1.47	9.63	0.53
MW-16	20.2	1.35	8.01	0.89
MW-19	19.8	2.80	6.24	0.89
MW-20	19.7	2.17	5.87	1.86
MW-21	20.1	2.46	6.52	1.36

Note: pH meter listed as malfunctioning wells MW-15 to MW-21

Table 6 – Analytical Results for the September 2002 Groundwater Monitoring Episode

Well	Benzene	Toluene	Ethylbenzene	Xylenes
MW-14	0.126	<0.020	<0.020	<0.020
MW-15	<0.005	<0.005	<0.005	<0.005
MW-15 (Dup)	<0.005	<0.005	<0.005	<0.005
MW-16	0.0363	<0.005	<0.005	<0.005
MW-19	<0.005	<0.005	<0.005	<0.005
MW-20	<0.001	<0.001	<0.001	<0.001
MW-21	<0.001	<0.001	<0.001	<0.001
Rinsate blank	<0.001	<0.001	<0.001	<0.001

All units are mg/l

Table 7 – Summary of Measured Benzene Concentrations for Quarterly Monitoring Wells

Benzene	10/31/00	2/5/01	5/15/01	8/9/01	10/19/01	3/13/02	6/3/02	9/24/02
MW-14	<.005	0.041	0.002	0.034	0.029	<0.001	0.068	0.126
MW-15	<.005	0.237	0.003	0.353	0.317	<0.001	0.358	<0.005
MW-16	<.005	0.094	0.01	0.098	0.012	<0.001	<0.005	0.036
MW-19	<.005	<.005	0.001	<.005	0.035	<0.001	<0.001	<0.005
MW-20	NM	NM	NM	NM	NM	NM	<0.002	<0.005
MW-21	NM	NM	NM	NM	NM	NM	<0.001	<0.005

All units are mg/l

FIGURES

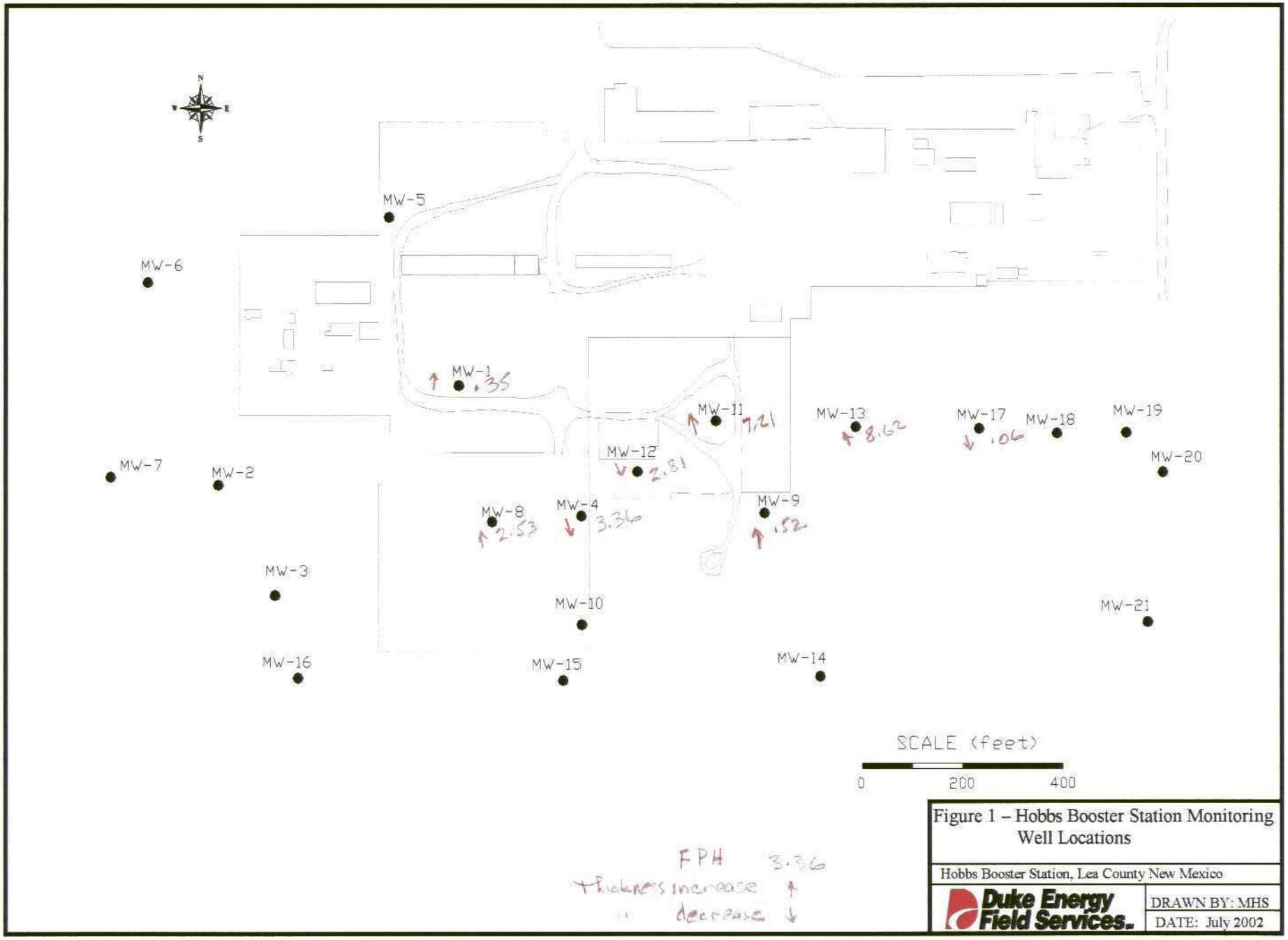


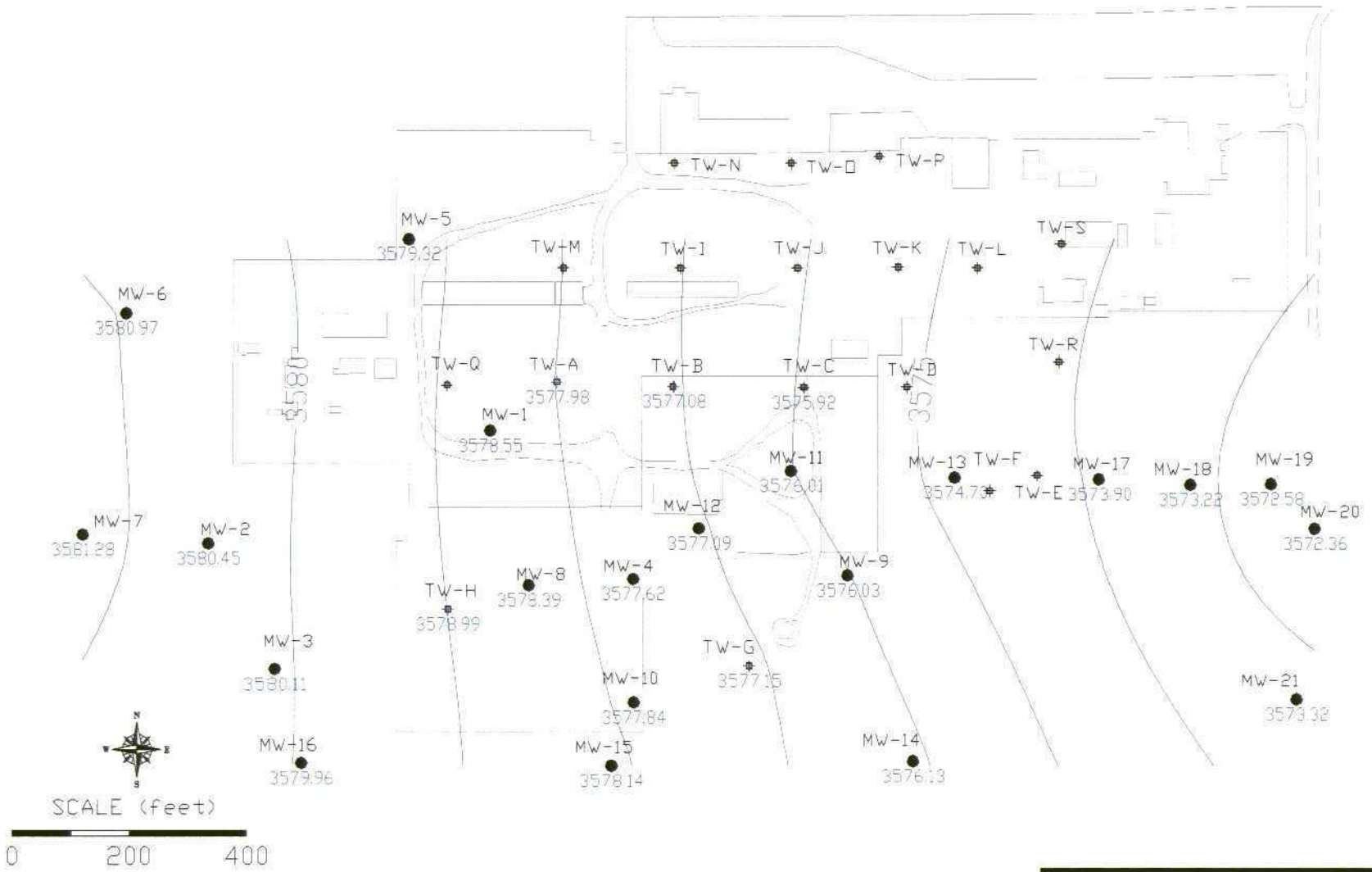
Figure 1 – Hobbs Booster Station Monitoring Well Locations

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services

DRAWN BY: MHS

DATE: July 2002



NOTE: LOCATIONS WITH NO ELEVATION VALUE WERE NOT USED IN CALCULATIONS

Figure 2 – September 2002 Water Table Elevation Contours

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services

DRAWN BY: MHS

DATE: Nov 2002

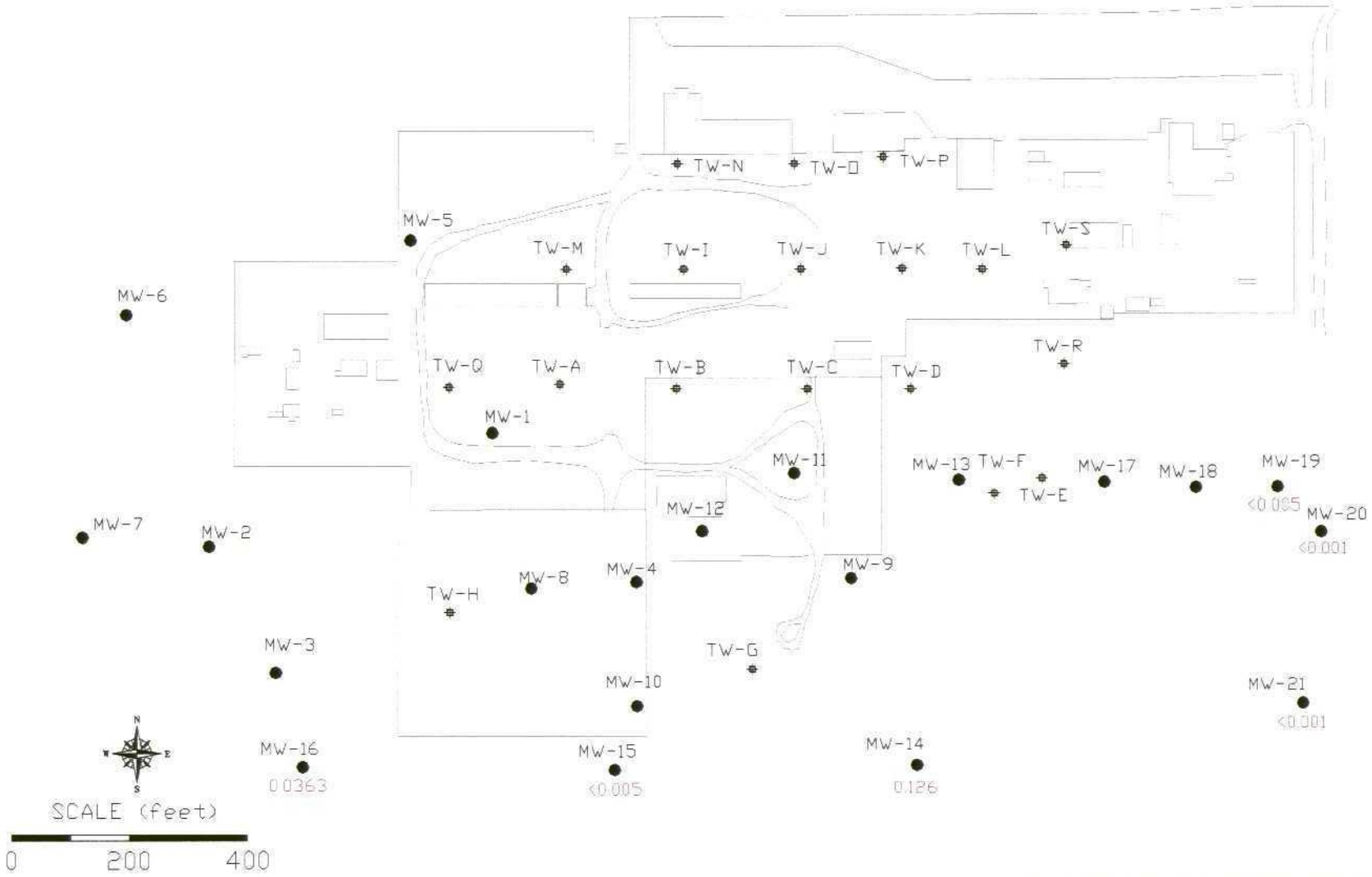


Figure 3 – September 2002 Benzene Concentrations (mg/l)

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services.

DRAWN BY: MHS

DATE: Nov 2002

ATTACHMENTS

HOBBS BOOSTER STATION SEPTEMBER 2002

WELL PURGING FORMS

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-14**
SITE NAME: Hobbs Booster
DATE: 9/24/2002
PROJECT NO. F-105
SAMPLER: D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 64.15 Feet
DEPTH TO WATER: 45.29 Feet
HEIGHT OF WATER COLUMN: 18.86 Feet
WELL DIAMETER: 2.0 Inch

9.2 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m* S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
7:54	0.0	-	-	-	-	-	Begin Hand Bailing
7:57	3.5	20.4	2.44	6.60	0.52	508	Sal = 0.11%
8:08	7.0	20.3	2.28	6.44	0.78	309	Sal = 0.11%
8:20	11.0	20.4	2.24	6.61	0.96	363	Sal = 0.10%

0:26 :Total Time (hr:min) **11** :Total Vol (gal) **0.42** :Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 020924 0826

ANALYSES: BTEX (8021-B)

COMMENTS: _____

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-15**
SITE NAME: Hobbs Booster
DATE: 9/23/2002
PROJECT NO. F-105
SAMPLER: D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.44 Feet
DEPTH TO WATER: 41.25 Feet
HEIGHT OF WATER COLUMN: 17.19 Feet
WELL DIAMETER: 2.0 Inch

8.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m* S/cm	pH	° DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
17:53	0.0	-	-	-	-	-	Begin Hand Bailing
17:56	3.0	20.4	1.46	9.49	0.41	766	Sal = 0.06%
18:03	6.0	20.4	1.47	9.57	0.73	999	Sal = 0.06%
18:13	9.0	20.3	1.47	9.63	0.53	835	Sal = 0.06%
					°		
0:20	:Total Time (hr:min)		**9**	:Total Vol (gal)		**0.45**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 020923 1820 Duplicate Sample No.: 0209000001

ANALYSES: BTEX (8021-B)

COMMENTS: pH Meter Malfunctioning.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services | WELL ID: **MW-16**

SITE NAME: Hobbs Booster | DATE: 9/23/2002

PROJECT NO. F-105 | SAMPLER: D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 56.11 Feet
DEPTH TO WATER: 41.91 Feet
HEIGHT OF WATER COLUMN: 14.20 Feet
WELL DIAMETER: 2.0 Inch

7.0 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m* S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
16:58	0.0	-	-	-	-	-	Begin Hand Bailing
17:01	3.0	20.0	1.40	8.05	0.89	999	Sal = 0.06%
17:09	6.0	19.9	1.37	8.09	1.03	999	Sal = 0.06%
17:19	9.0	20.2	1.35	8.01	0.89	999	Sal = 0.06%
0:21	:Total Time (hr:min)		**9**	:Total Vol (gal)		**0.43**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 020923 1725

ANALYSES: BTEX (8021-B)

COMMENTS: pH Meter Malfunctioning.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-19**
SITE NAME: Hobbs Booster
DATE: 9/24/2002
PROJECT NO. F-105
SAMPLER: D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 65.07 Feet
DEPTH TO WATER: 51.54 Feet
HEIGHT OF WATER COLUMN: 13.53 Feet
WELL DIAMETER: 2.0 Inch

6.6 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m* S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
9:55	0.0	-	-	-	-	-	Begin Hand Bailing
10:00	3.0	19.8	2.84	6.37	1.02	999	Sal = 0.14%
10:11	5.0	19.8	2.83	6.32	1.10	999	Sal = 0.13%
10:23	7.0	19.8	2.80	6.24	0.89	999	Sal = 0.13%
0:28	:Total Time (hr:min)		**7**	:Total Vol (gal)		**0.25**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 020924 1027

ANALYSES: BTEX (8021-B)

COMMENTS: pH Meter Malfunctioning.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services | WELL ID: **MW-20**

SITE NAME: Hobbs Booster | DATE: 9/24/2002

PROJECT NO. F-105 | SAMPLER: D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 61.00 Feet
DEPTH TO WATER: 49.13 Feet
HEIGHT OF WATER COLUMN: 11.87 Feet
WELL DIAMETER: 2.0 Inch

5.8 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m* S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
10:50	0.0	-	-	-	-	-	Begin Hand Bailing
10:57	3.5	19.8	1.92	5.87	2.74	999	Sal = 0.09%
11:05	7.0	19.7	2.08	5.86	2.19	999	Sal = 0.09%
11:14	8.5	19.7	2.17	5.87	1.86	999	Sal = 0.10%
0:24	:Total Time (hr:min)		**8.5**	:Total Vol (gal)		**0.35**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 020924 1125

ANALYSES: BTEX (8021-B)

COMMENTS: pH Meter Malfunctioning.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-21**
SITE NAME: Hobbs Booster
DATE: 9/24/2002
PROJECT NO. F-105
SAMPLER: D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.94 Feet
DEPTH TO WATER: 50.93 Feet
HEIGHT OF WATER COLUMN: 12.01 Feet
WELL DIAMETER: 2.0 Inch

5.9 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m* S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
8:55	0.0	-	-	-	-	-	Begin Hand Bailing
9:02	3.5	20.0	2.45	6.44	0.91	999	Sal = 0.11%
9:09	5.0	20.0	2.46	6.56	2.02	998	Sal = 0.12%
9:20	7.0	20.1	2.46	6.52	1.36	999	Sal = 0.12%
0:25	:Total Time (hr:min)		**7**	:Total Vol (gal)		**0.28**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 020924 0928

ANALYSES: BTEX (8021-B)

COMMENTS: pH Meter Malfunctioning.

HOBBS BOOSTER STATION SEPTEMBER 2002

ANALYTICAL LABORATORY REPORT

Summary Report

Dale Littlejohn
Trident Environmental
P.O. Box 7624
Midland, Tx. 79708

Report Date: October 7, 2002

Order ID Number: A02092507

Project Number: CC # V-103
Project Name: Duke Energy Field services
Project Location: Hobbs Booster

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
208733	Rinsate	Water	9/23/02	13:30	9/25/02
208734	MW-16	Water	9/23/02	17:25	9/25/02
208735	MW-15	Water	9/23/02	18:20	9/25/02
208736	MW-14	Water	9/23/02	8:26	9/25/02
208737	MW-21	Water	9/23/02	9:28	9/25/02
208738	MW-19	Water	9/23/02	10:27	9/25/02
208739	MW-20	Water	9/23/02	11:25	9/24/02
208740	Dup-1	Water	9/23/02	:	9/24/02

0 This report consists of a total of 1 page(s) and is intended only as a summary of results for the sample(s) listed above.

	BTEX				
Sample - Field Code	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	M,P,O-Xylene (ppm)	Total BTEX (ppm)
208733 - Rinsate	<0.001	<0.001	<0.001	<0.001	<0.001
208734 - MW-16	0.0363	<0.005	<0.005	<0.005	0.0363
208735 - MW-15	<0.005	<0.005	<0.005	<0.005	<0.010
208736 - MW-14	0.126	<0.020	<0.020	<0.020	0.126
208737 - MW-21	<0.001	<0.001	<0.001	<0.001	<0.001
208738 - MW-19	<0.005	<0.005	<0.005	<0.005	<0.005
208739 - MW-20	<0.001	<0.001	<0.001	<0.001	<0.001
208740 - Dup-1	<0.005	<0.005	<0.005	<0.005	<0.005

This is only a summary. Please, refer to the complete report package for quality control data.

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
155 McCutcheon, Suite H El Paso, Texas 79932 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Dale Littlejohn
Trident Environmental
P.O. Box 7624
Midland, Tx. 79708

Report Date: October 7, 2002

Order ID Number: A02092507

Project Number: CC # V-103
Project Name: Duke Energy Field services
Project Location: Hobbs Booster

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
208733	Rinsate	Water	9/23/02	13:30	9/25/02
208734	MW-16	Water	9/23/02	17:25	9/25/02
208735	MW-15	Water	9/23/02	18:20	9/25/02
208736	MW-14	Water	9/23/02	8:26	9/25/02
208737	MW-21	Water	9/23/02	9:28	9/25/02
208738	MW-19	Water	9/23/02	10:27	9/25/02
208739	MW-20	Water	9/23/02	11:25	9/24/02
208740	Dup-1	Water	9/23/02	:	9/24/02

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed. Note: the RDL is equal to MQL for all organic analytes including TPH.
The test results contained within this report meet all requirements of LAC 33:I unless otherwise noted.

Note: Samples will be disposed of 30 days from the report date unless the lab is contacted before the 30 days has past.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 208733 - Rinsate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23776	Date Analyzed:	9/25/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22245	Date Prepared:	9/25/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0847	mg/L	1	0.10	85	70 - 130
4-BFB		0.0703	mg/L	1	0.10	70	70 - 130

Sample: 208734 - MW-16

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23776	Date Analyzed:	9/25/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22245	Date Prepared:	9/25/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0363	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		0.0363	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0848	mg/L	5	0.10	84	70 - 130
4-BFB		0.0739	mg/L	5	0.10	73	70 - 130

Sample: 208735 - MW-15

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23942	Date Analyzed:	10/3/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22371	Date Prepared:	10/3/02

Param	Flag	Result	Units	Dilution	RDL
MTBE		<0.005	mg/L	10	0.001
Benzene		<0.005	mg/L	10	0.001
Toluene		<0.005	mg/L	10	0.001
Ethylbenzene		<0.005	mg/L	10	0.001
M,P,O-Xylene		<0.005	mg/L	10	0.001
Total BTEX		<0.010	mg/L	10	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.743	mg/L	10	0.10	74	70 - 130
4-BFB		0.640	mg/L	10	0.10	64	70 - 130

Sample: 208736 - MW-14

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23776	Date Analyzed:	9/25/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22245	Date Prepared:	9/25/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.126	mg/L	20	0.001
Toluene		<0.020	mg/L	20	0.001
Ethylbenzene		<0.020	mg/L	20	0.001
M,P,O-Xylene		<0.020	mg/L	20	0.001
Total BTEX		0.126	mg/L	20	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0915	mg/L	2	0.10	91	70 - 130
4-BFB		0.0758	mg/L	20	0.10	75	70 - 130

Sample: 208737 - MW-21

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23778	Date Analyzed:	9/25/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22246	Date Prepared:	9/25/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0875	mg/L	1	0.10	88	70 - 130
4-BFB		0.0878	mg/L	1	0.10	88	70 - 130

Sample: 208738 - MW-19

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23801	Date Analyzed:	9/26/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22261	Date Prepared:	9/26/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.098	mg/L	5	0.10	98	70 - 130
4-BFB		0.091	mg/L	5	0.10	91	70 - 130

Sample: 208739 - MW-20

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23778	Date Analyzed:	9/25/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22246	Date Prepared:	9/25/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0963	mg/L	1	0.10	96	70 - 130
4-BFB		0.0848	mg/L	1	0.10	85	70 - 130

Sample: 208740 - Dup-1

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23909	Date Analyzed:	10/2/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22345	Date Prepared:	10/2/02

Param	Flag	Result	Units	Dilution	RDL
MTBE		<0.005	mg/L	5	0.001
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.462	mg/L	5	0.10	92	70 - 130
4-BFB		0.412	mg/L	5	0.10	82	70 - 130

Quality Control Report
Method Blank

Method Blank

QCBatch: QC23776

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0862	mg/L	1	0.10	86	70 - 130
4-BFB		0.0697	mg/L	1	0.10	70	70 - 130

Method Blank

QCBatch: QC23778

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0749	mg/L	1	0.10	75	70 - 130
4-BFB	[1]	0.0665	mg/L	1	0.10	66	70 - 130

Method Blank

QCBatch: QC23801

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

[1] Low surrogate recovery due to prep. ICV, CCV show the method to be in control.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0993	mg/L	1	0.10	99	70 - 130
4-BFB		0.0957	mg/L	1	0.10	96	70 - 130

Method Blank

QCBatch: QC23909

Param	Flag	Results	Units	Reporting Limit
MTBE		<0.001	mg/L	0.001
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0933	mg/L	1	0.10	93	70 - 130
4-BFB		0.0791	mg/L	1	0.10	79	70 - 130

Method Blank

QCBatch: QC23942

Param	Flag	Results	Units	Reporting Limit
MTBE		<0.001	mg/L	0.001
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0943	mg/L	1	0.10	94	70 - 130
4-BFB		0.0707	mg/L	1	0.10	71	70 - 130

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC23776

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0904	0.095	mg/L	1	0.10	<0.001	90	5	70 - 130	20
Benzene	0.089	0.0929	mg/L	1	0.10	<0.001	89	4	70 - 130	20

Continued ...

... Continued

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Toluene	0.0828	0.0886	mg/L	1	0.10	<0.001	83	7	70 - 130	20
Ethylbenzene	0.0835	0.0897	mg/L	1	0.10	<0.001	84	7	70 - 130	20
M,P,O-Xylene	0.257	0.272	mg/L	1	0.30	<0.001	86	6	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0959	0.0997	mg/L	1	0.10	96	100	70 - 130
4-BFB	0.0978	0.100	mg/L	1	0.10	98	100	70 - 130

Laboratory Control Spikes

QCBatch: QC23778

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.109	0.0855	mg/L	1	0.10	<0.001	109	19	70 - 130	20
Benzene	0.108	0.0849	mg/L	1	0.10	<0.001	108	19	70 - 130	20
Toluene	0.108	0.0867	mg/L	1	0.10	<0.001	108	18	70 - 130	20
Ethylbenzene	0.103	0.0898	mg/L	1	0.10	<0.001	103	14	70 - 130	20
M,P,O-Xylene	0.309	0.276	mg/L	1	0.30	<0.001	103	11	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.102	0.0801	mg/L	1	0.10	102	80	70 - 130
4-BFB	0.0927	0.0893	mg/L	1	0.10	93	89	70 - 130

Laboratory Control Spikes

QCBatch: QC23801

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0979	0.0945	mg/L	1	0.10	<0.001	98	4	70 - 130	20
Benzene	0.0989	0.0981	mg/L	1	0.10	<0.001	99	1	70 - 130	20
Toluene	0.0991	0.0982	mg/L	1	0.10	<0.001	99	1	70 - 130	20
Ethylbenzene	0.0988	0.097	mg/L	1	0.10	<0.001	99	2	70 - 130	20
M,P,O-Xylene	0.290	0.285	mg/L	1	0.30	<0.001	97	2	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.103	0.102	mg/L	1	0.10	103	102	70 - 130
4-BFB	0.100	0.0996	mg/L	1	0.10	100	100	70 - 130

Laboratory Control Spikes

QCBatch: QC23909

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0905	0.0895	mg/L	1	0.10	<0.001	90	1	70 - 130	20
Benzene	0.0923	0.0927	mg/L	1	0.10	<0.001	92	0	70 - 130	20
Toluene	0.0903	0.0876	mg/L	1	0.10	<0.001	90	3	70 - 130	20
Ethylbenzene	0.0901	0.0859	mg/L	1	0.10	<0.001	90	5	70 - 130	20
M,P,O-Xylene	0.270	0.255	mg/L	1	0.30	<0.001	90	6	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0922	0.092	mg/L	1	0.10	92	92	70 - 130
4-BFB	0.0885	0.0838	mg/L	1	0.10	88	84	70 - 130

Laboratory Control Spikes

QCBatch: QC23942

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0886	0.088	mg/L	1	0.10	<0.001	89	1	70 - 130	20
Benzene	0.0895	0.0925	mg/L	1	0.10	<0.001	90	3	70 - 130	20
Toluene	0.0873	0.0884	mg/L	1	0.10	<0.001	87	1	70 - 130	20
Ethylbenzene	0.090	0.0907	mg/L	1	0.10	<0.001	90	1	70 - 130	20
M,P,O-Xylene	0.276	0.275	mg/L	1	0.30	<0.001	92	0	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0827	0.0876	mg/L	1	0.10	83	88	70 - 130
4-BFB	0.0847	0.0825	mg/L	1	0.10	85	82	70 - 130

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC23776

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0901	90	85 - 115	9/25/02
Benzene		mg/L	0.10	0.0924	92	85 - 115	9/25/02
Toluene		mg/L	0.10	0.0881	88	85 - 115	9/25/02
Ethylbenzene		mg/L	0.10	0.0882	88	85 - 115	9/25/02
M,P,O-Xylene		mg/L	0.30	0.263	88	85 - 115	9/25/02

CCV (2)

QCBatch: QC23776

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0952	95	85 - 115	9/25/02
Benzene		mg/L	0.10	0.0946	94	85 - 115	9/25/02
Toluene		mg/L	0.10	0.09	90	85 - 115	9/25/02
Ethylbenzene		mg/L	0.10	0.0938	93	85 - 115	9/25/02
M,P,O-Xylene		mg/L	0.30	0.28	93	85 - 115	9/25/02

ICV (1) QCBatch: QC23776

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0894	89	85 - 115	9/25/02
Benzene		mg/L	0.10	0.0928	93	85 - 115	9/25/02
Toluene		mg/L	0.10	0.0864	86	85 - 115	9/25/02
Ethylbenzene		mg/L	0.10	0.0864	86	85 - 115	9/25/02
M,P,O-Xylene		mg/L	0.30	0.270	90	85 - 115	9/25/02

CCV (1) QCBatch: QC23778

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0974	97	85 - 115	9/25/02
Benzene		mg/L	0.10	0.103	103	85 - 115	9/25/02
Toluene		mg/L	0.10	0.104	104	85 - 115	9/25/02
Ethylbenzene		mg/L	0.10	0.106	106	85 - 115	9/25/02
M,P,O-Xylene		mg/L	0.30	0.324	108	85 - 115	9/25/02

CCV (2) QCBatch: QC23778

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.107	107	85 - 115	9/25/02
Benzene		mg/L	0.10	0.105	105	85 - 115	9/25/02
Toluene		mg/L	0.10	0.107	107	85 - 115	9/25/02
Ethylbenzene		mg/L	0.10	0.107	107	85 - 115	9/25/02
M,P,O-Xylene		mg/L	0.30	0.326	108	85 - 115	9/25/02

ICV (1) QCBatch: QC23778

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0967	97	85 - 115	9/25/02
Benzene		mg/L	0.10	0.0967	97	85 - 115	9/25/02
Toluene		mg/L	0.10	0.0962	96	85 - 115	9/25/02
Ethylbenzene		mg/L	0.10	0.0971	97	85 - 115	9/25/02
M,P,O-Xylene		mg/L	0.30	0.298	99	85 - 115	9/25/02

CCV (1) QCBatch: QC23801

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0976	98	85 - 115	9/26/02
Benzene		mg/L	0.10	0.0986	99	85 - 115	9/26/02
Toluene		mg/L	0.10	0.0977	98	85 - 115	9/26/02
Ethylbenzene		mg/L	0.10	0.0977	98	85 - 115	9/26/02
M,P,O-Xylene		mg/L	0.30	0.286	95	85 - 115	9/26/02

CCV (2) QCBatch: QC23801

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.096	96	85 - 115	9/26/02
Benzene		mg/L	0.10	0.098	98	85 - 115	9/26/02
Toluene		mg/L	0.10	0.097	97	85 - 115	9/26/02
Ethylbenzene		mg/L	0.10	0.097	97	85 - 115	9/26/02
M,P,O-Xylene		mg/L	0.30	0.284	94	85 - 115	9/26/02

ICV (1) QCBatch: QC23801

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0984	98	85 - 115	9/26/02
Benzene		mg/L	0.10	0.0976	98	85 - 115	9/26/02
Toluene		mg/L	0.10	0.0986	99	85 - 115	9/26/02
Ethylbenzene		mg/L	0.10	0.097	97	85 - 115	9/26/02
M,P,O-Xylene		mg/L	0.30	0.285	95	85 - 115	9/26/02

CCV (1) QCBatch: QC23909

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.090	90	85 - 115	10/2/02
Benzene		mg/L	0.10	0.0895	90	85 - 115	10/2/02
Toluene		mg/L	0.10	0.0893	89	85 - 115	10/2/02
Ethylbenzene		mg/L	0.10	0.0897	90	85 - 115	10/2/02
M,P,O-Xylene		mg/L	0.30	0.269	90	85 - 115	10/2/02

CCV (2) QCBatch: QC23909

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0937	93	85 - 115	10/2/02
Benzene		mg/L	0.10	0.0954	95	85 - 115	10/2/02
Toluene		mg/L	0.10	0.0926	92	85 - 115	10/2/02
Ethylbenzene		mg/L	0.10	0.0893	89	85 - 115	10/2/02
M,P,O-Xylene		mg/L	0.30	0.263	87	85 - 115	10/2/02

ICV (1) QCBatch: QC23909

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0925	92	85 - 115	10/2/02
Benzene		mg/L	0.10	0.0931	93	85 - 115	10/2/02
Toluene		mg/L	0.10	0.0911	91	85 - 115	10/2/02
Ethylbenzene		mg/L	0.10	0.091	91	85 - 115	10/2/02
M,P,O-Xylene		mg/L	0.30	0.274	91	85 - 115	10/2/02

CCV (1) QCBatch: QC23942

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.075	75	85 - 115	10/3/02
Benzene		mg/L	0.10	0.0767	77	85 - 115	10/3/02
Toluene		mg/L	0.10	0.0736	74	85 - 115	10/3/02
Ethylbenzene		mg/L	0.10	0.0754	75	85 - 115	10/3/02
M,P,O-Xylene		mg/L	0.30	0.229	76	85 - 115	10/3/02

ICV (1) QCBatch: QC23942

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0894	89	85 - 115	10/3/02
Benzene		mg/L	0.10	0.0904	90	85 - 115	10/3/02
Toluene		mg/L	0.10	0.0908	91	85 - 115	10/3/02
Ethylbenzene		mg/L	0.10	0.0932	93	85 - 115	10/3/02
M,P,O-Xylene		mg/L	0.30	0.283	94	85 - 115	10/3/02

HD204200

TRIDENT ENVIRONMENTAL

Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0008
(915) 262-5216 (Fax)

F-105-1

Chain of Custody

Date 9/24/02 Page 1 of 1

Lab Name: Trace Analysis, Inc.
Address: 6701 Aberdeen Avenue
Lubbock, Texas 79424
Telephone: (800) 378-1296

Samplers (SIGNATURES) Dale T Littlejohn

Sample Identification	Matrix	Date	Time	Sample Type: G - Grab, C- Composite	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	Total Metals	TCLP Metals	Number of Containers
Rinsate 208733	wtr	9/23	1330	G	V														2
MW-16 34	"	9/23	1725	G	V														2
MW-15 35	"	9/23	1820	G	V														2
MW-14 36	"	9/24	0826	G	V														2
MW-21 37	"	9/24	0928	G	V														2
MW-19 38	"	9/24	1027	G	V		°											°	2
MW-20 39	"	9/24	1125	G	V														2
Dup-1 40	"	—	0001	G	V														2

Analysis Request

Project Information	
Project Name:	Duke Energy Field Services
Project Location:	Hobbs Booster
Project Manager:	John Fergerson
Cost Center No.:	F-105
Shipping ID No.:	Federal Express
Bill to (see below):	

Sample Receipt	
Total Containers:	
COC Seals:	
Rec'd Good Cond/Cold:	
Conforms to Records:	
Lab No.:	

Special Instructions/Comments: Please send invoice direct to client:
Duke Energy Field Services, Attention: Steve Weathers
P. O. Box 5493, Denver, Colorado 80217

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental		
(Printed Name) Dale T. Littlejohn	(Printed Name)	(Printed Name)
(Signature) Dale T Littlejohn	(Signature)	(Signature)
(Date) 9/24/02 (Time) 1300	(Date) (Time)	(Date) (Time)
Received By: (1) (Company)	**Received By: (2) (Company)**	**Received By: (3) (Company)**
(Printed Name) Vicki Hensley	(Printed Name)	(Printed Name)
(Signature) [illegible]	(Signature)	(Signature)
(Date) 9/24/02 (Time) 1306	(Date) (Time)	(Date) (Time)

Copy signed original form for Trident Environmental records

DIE 10/8/02

Remediacon Incorporated
Geological and Engineering Services
remediacon@yahoo.com

PO Box 302, Evergreen, Colorado 80437
Telephone: 303.674.4370
Facsimile: 617.507.6178

September 5, 2002

Mr. Stephen Weathers
Duke Energy Field Services, LP
370 17th Street, Suite 900
Denver, CO 80202

Re: Interpretation of Historical Groundwater Monitoring Data and Recommended Changes to the Monitoring Program at the Duke Energy Field Services Hobbs Booster Station, Lea County New Mexico (Discharge Plan GW-044)

Dear Stephen:

Duke Energy Field Services, LP (DEFS) retained Remediacon to review and interpret the historical groundwater monitoring data collected at their Hobbs Booster Station and recommend changes to the groundwater monitoring program based upon its evaluation. This letter presents the results of that effort. A brief background section is presented first. The data summaries and interpretations follow. The final section proposes changes to the groundwater monitoring program.

This letter is not intended to be a comprehensive analysis of the hydrogeologic setting and the distribution and extent of either the dissolved or free-phase hydrocarbon compounds. Companion documents are being prepared that address offsite migration of dissolved hydrocarbon constituents and the collection of the phase separated hydrocarbons. More comprehensive discussions will be included in those documents.

BACKGROUND INFORMATION AND DATA SUMMARY

Twenty-one groundwater monitoring wells are present at the site. The wells were installed during several phases of field activities. The well locations are shown on Figure 1, and construction information is summarized in Table 1.

Trident Environmental (formerly TRW) completed 10 rounds of groundwater sampling between July 1999 and June 2002. The routine monitoring activities included measuring depths to free-phase hydrocarbons (if present) and water, purging each well that does not have free phase hydrocarbons to a constant temperature, pH and conductivity and then collecting samples for analysis. The wells that contained free phase hydrocarbons were not routinely sampled. The analytical suite has always included the benzene, toluene, ethylbenzene, and total xylenes (BTEX) constituents. Other constituents have been tested during some of the monitoring episodes.

The calculated groundwater elevations for all sampling episodes are summarized in Table 2. Table 2 includes the actual groundwater elevations for those wells that either contained no free-phase hydrocarbons or had a negligible thickness. The groundwater

elevation for those wells containing free-phase hydrocarbons (MW-4,8,9,11,12,13 and 17) was corrected using the following formula (all values in feet):

$GWE_{corr} = MGWE + (PT*PD)$: where

MGWE is the actual measured groundwater elevation;
PT is the measured free-phase hydrocarbon thickness, and
PD is the free phase hydrocarbon density.

The free phase densities are from actual hydrocarbon samples from MW-4 and MW-11.

The calculated groundwater flow direction has been consistent toward the east since monitoring began in 1999. The June 2002 water table elevations shown on Figure 2 are representative of these uniform conditions.

Hydrographs for all wells are shown on Figure 3. Three facts are apparent from examination of this graph. First, the groundwater elevations in all of the wells have remained consistent relative to each other over the duration of the project. This consistency indicates that the entire site is subject to uniform groundwater conditions. Second, the water levels in all wells have been falling at a relatively constant rate. The groundwater elevations have fallen approximately 1.5 feet between July 1999 and June 2002. Finally, there is no evidence of seasonal groundwater fluctuations.

The measured free-phase hydrocarbon thickness values are summarized in Table 3. Wells MW-1, MW-9, MW-10, MW-17 and MW-18 (MW-9 had one 0.15 outlier) had values varying from not present to 0.03 feet. These wells are on the boundary of the area containing free-phase hydrocarbons. Wells MW-4, MW-8, MW-11, MW-12 and MW-13 have free-phase hydrocarbon thicknesses in excess of 1 foot. Their variation in thickness over time is depicted on Figure 4.

Well MW-4 has exhibited a constant free-phase hydrocarbon thickness over the duration of the project; however, MW-4 is very close to well RW-1 where an active free-phase hydrocarbon removal system has been in place for the majority of the project. The free-phase hydrocarbon thicknesses of the four other wells in this category have all increased over the duration of the project (the recent MW-11 value is believed to be an anomaly).

The decrease in the water table is the primary cause of the increase in free-phase hydrocarbon thickness as shown by the following table (all units in feet):

Well	Depth To Free-Phase Hydrocarbons	Free-Phase Hydrocarbon Thickness
MW-4	1.19	0.18
MW-8	0.86	1.88
MW-11	0.50	2.55
MW-12	0.55	2.71
MW-13	-0.14	7.20

The decrease in the measured depths to free-phase hydrocarbons in four of the above five wells from October 2000 (earliest complete record) to June 2001 was substantially less than the increase in free-phase hydrocarbon thickness. The free-phase hydrocarbons must therefore be saturating the interval that is vacated by the declining groundwater table. Well MW-4, the exception to this trend, was adjacent to the active free-phase hydrocarbon collection system in RW-1. An additional 19 free free-phase hydrocarbon characterization wells have been installed since the completion of the June 2002 monitoring episode, and further discussion of the distribution and variation of free-phase hydrocarbons will be included in the free-phase hydrocarbon collection system design documents.

The benzene concentrations measured in all wells during this project are summarized in Table 4. The wells that contain free-phase hydrocarbon (MW-4, MW-8 through MW-13 and MW-17) have not been sampled on a regular basis for dissolved phase constituents and are not included in the summary. In addition, toluene, ethylbenzene and xylenes are not discussed in this document because their lower overall concentrations coupled with their less-toxic nature makes them less important from a monitoring consideration.

The dissolved BTEX concentrations have exhibited wide ranges of variation during the 10 monitoring episodes; however, evaluation of the data in Table 4 indicates the following relative to temporal trends:

- Wells MW-5, 6, 7, 18, 19, either contain no hydrocarbons or exhibited limited BTEX detections at lower concentrations;
- Wells MW-1, 2, and 3 do not exhibit temporal trends in BTEX concentrations;
- Wells MW-14 and 15 appear to have increasing BTEX constituent concentrations;
- Well MW-16 appears to have a decreasing BTEX constituent concentration; and
- Insufficient data were available for wells MW-9, 10, 18, 20 and 21 to evaluate temporal trends.

Concentration verses time graphs are included for wells MW-1, 2, and 3 (Figure 5) and MW-14, 15 and 16 (Figure 6). The trend interpretations presented above are masked by the high seasonal constituent variation that is present in every well. It is also important to note that the hydrocarbons in wells MW-14, 15 and 16 will be removed by the south boundary control system that is currently in the design phase.

MONITORING PROGRAM MODIFICATIONS

The modified groundwater monitoring program at the HBS is based upon four objectives:

1. Ensuring no off-site migration of hydrocarbon constituents down gradient to the east;

2. Monitoring the effectiveness of the dissolved-phase control program along the southern boundary (after it is installed);

3. Measuring variations in dissolved-phase hydrocarbon constituent concentrations in the interior of the plume; and

4. Checking for onsite migration of hydrocarbons for up-gradient sources.

The proposed program and monitoring frequencies are summarized in Table 5 and depicted on Figure 7. The depth to free-phase hydrocarbons (if present) and water will be measured in all wells on a quarterly basis. Wells MW-14, 15, 16, 19, 20 and 21 are located on the boundary of the HBS and will be sampled quarterly for BTEX. Wells MW-3, 5, 6, 7 and 18 are located in the interior of the facility but outside of the area containing free-phase hydrocarbons. These wells will be sampled on an annual basis for BTEX beginning with the recently completed June 2002 monitoring episode.

A minimum of one blind field duplicate will also be collected during each sampling episode to evaluate quality control. The sample will be collected from a well with measurable BTEX concentrations so that the representative percentage difference can be calculated.

The results from the September, December and March sampling episodes will be reported in a document that includes the following information:

- A discussion of the sampling procedures including any deviations from the standard sampling protocol

- A summary of the resulting depth to water and free-phase hydrocarbon measurements along with the calculated groundwater elevations;

- A water table contour map for that sampling episode;

- A summary of the equilibrated field parameters for each well;

- Presentation of the resulting laboratory analytical results for the sampling episode; and

- A discussion of the field duplicate results.

The report for the future June sampling events will include all of the above information along with historical summaries of the corrected groundwater elevations, free-phase hydrocarbon thicknesses and BTEX measurements. The September report will also evaluate relevant trends and provide recommendations for modifications to the monitoring program.

Thank you for the opportunity to complete this work. Do not hesitate to contact me if you have any questions or comments.

Respectfully Submitted,
REMEDIACOM INCORPORATED

Michael H. Stewart

Michael H. Stewart, P.E.
Principal Engineer

MHS/tbm

attachments

TABLES

Table 1 – Summary of Hobbs Booster Station Well Construction Information

Well	Ground Elevation	Top Of Casing Elevation	Total Well Depth	Well Diameter	Screen Interval	Gravel Interval
MW-1	3,623.60	3,626.06	57	2	37-57	34-57
MW-2	3,620.65	3,623.14	53	2	33-53	30-53
MW-3	3,620.08	3,623.01	53	2	33-53	30-53
MW-4	3,621.66	3,624.29	57	2	37-57	34-57
MW-5	3,626.30	3,629.16	57	2	37-57	34-57
MW-6	3,624.14	3,626.93	53	2	33-53	30-53
MW-7	3,618.93	3,621.40	56	2	33-53	31-56
MW-8	3,620.84	3,623.62	58	2	36-56	34-58
MW-9	3,622.60	3,625.21	63	2	43-63	40-63
MW-10	3,618.30	3,621.07	58	2	36-56	34-58
MW-11	3,623.05	3,625.88	63	2	43-63	41-63
MW-12	3,623.95	3,626.60	65	4	40-60	38-65
MW-13	3,623.53	3,626.30	69	4	44-64	38-64
MW-14	3,618.76	3,621.42	66	2	42-62	34-66
MW-15	3,616.79	3,619.39	59	2	37-57	31-59
MW-16	3,619.10	3,621.87	58	2	34-54	30-56
MW-17	3,621.36	3,623.94	66	4	41-61	37-63
MW-18	3,621.96	3,624.30	68	4	44-64	35-65
MW-19	3,621.42	3,624.12	68	2	43-63	40-65
MW-20	3,621.62	3,621.49	59	2	59-44	59-42
MW-21	3,621.78	3,624.25	61	2	61-46	61-44

Table 2 – Summary of Corrected Groundwater Elevations in Hobbs Booster Station Monitoring Wells

	7/8/99	5/11/00	8/22/00	10/31/00	2/5/01	5/15/01	8/9/01	10/23/01	3/13/02	6/27/02
MW-1	3,580.50	3,580.13	3,580.19	3,579.96	3,579.89	3,579.64	3,579.65	3,579.62	3,579.00	3,578.72
MW-2	3,582.63	3,582.04	3,582.33	3,581.95	3,581.90	3,581.67	3,581.43	3,581.33	3,580.88	3,580.65
MW-3	3,582.25	3,581.68	3,582.05	3,581.64	3,581.57	3,581.36	3,581.11	3,580.97	3,580.48	3,580.29
MW-4	3,579.95	3,579.27	3,579.12	3,579.00	3,578.96	3,578.82	3,578.60	3,578.39	3,577.96	3,577.77
MW-5	3,581.01	3,580.89	3,580.66	3,580.58	3,580.59	3,580.27	3,580.68	3,580.74	3,579.81	3,579.44
MW-6	3,582.98	3,582.61	3,582.72	3,582.45	3,582.38	3,582.15	3,581.94	3,581.94	3,581.49	3,581.17
MW-7	NM	3,582.90	3,583.22	3,582.83	3,582.75	3,582.52	3,582.24	3,582.18	3,581.70	3,581.49
MW-8	NM	3,579.93	3,580.12	3,579.84	3,579.80	3,579.79	3,579.73	3,579.26	3,578.83	3,578.64
MW-9	NM	3,577.62	3,577.51	3,577.46	3,577.45	3,577.31	3,577.00	3,576.81	3,576.33	3,576.21
MW-10	NM	3,579.43	3,579.64	3,579.28	3,579.26	3,579.08	3,578.75	3,578.51	3,578.03	3,577.99
MW-11	NM	3,577.90	3,578.00	3,577.66	3,577.69	3,577.52	3,577.34	3,577.16	3,576.70	3,576.48
MW-12	NM	NM	NM	3,578.58	3,578.58	3,578.18	3,578.18	3,577.96	3,577.73	3,577.53
MW-13	NM	NM	NM	3,576.41	3,576.32	3,576.29	3,575.86	3,575.81	3,575.40	3,575.23
MW-14	NM	NM	NM	3,577.51	3,577.46	3,577.35	3,576.90	3,576.56	3,576.06	3,576.26
MW-15	NM	NM	NM	3,579.57	3,579.53	3,579.36	3,579.02	3,578.70	3,578.21	3,578.32
MW-16	NM	NM	NM	3,581.50	3,581.42	3,581.21	3,580.96	3,580.79	3,580.28	3,580.14
MW-17	NM	NM	NM	3,575.36	3,575.26	3,575.15	3,574.89	3,574.68	3,574.24	3,574.07
MW-18	NM	NM	NM	3,574.66	3,574.53	3,574.43	3,574.21	3,573.98	3,573.56	3,573.38
MW-19	NM	NM	NM	3,573.97	3,573.88	3,573.79	3,573.55	3,573.32	3,572.90	3,572.74
MW-20	NM	NM	NM	NM	NM	NM	NM	NM	NM	3,572.51
MW-21	NM	NM	NM	NM	NM	NM	NM	NM	NM	3,573.46

Notes: All units in feet
NM: Value not measured because well was not installed
See text for correction formula

Table 3 – Summary of Measured Free Phase Hydrocarbon Thicknesses in Hobbs Booster Station Monitoring Wells

	7/8/99	5/11/00	8/22/00	10/31/00	2/5/01	5/15/01	8/9/01	10/23/01	3/13/02	6/27/02
MW-1						0.01	0.01	Sheen	Sheen	0.02
MW-4	3.26	2.68	3.49	2.68	2.92	2.82	2.60	2.64	2.62	2.86
MW-8	NM		0.00	0.00	0.00	0.27	0.40	0.06	0.72	1.88
MW-9	NM				0.01		0.00	0.01	0.15	Sheen
MW-10	NM	0.01	0.00	0.00	0.02	0.02		0.01	0.02	
MW-11	NM	1.18	4.10	4.45	5.42	5.47	5.97	6.26	7	3.09
MW-12	NM	NM	NM	0.08	1.05	0.96	2.04	1.71	2.79	2.79
MW-13	NM	NM	NM	0.17	0.76	0.84	5.22	5.69	7.62	7.37
MW-17	NM	NM	NM	0.01	0.02	0.01	0.03		0.03	Sheen
MW-18	NM	NM	NM					0.01	Sheen	

Notes: All units in feet
Wells that do not contain free product are not included
NM: Value not measured because well was not installed
See text for correction formula
Cells where no product was measured were intentionally left blank to improve readability

Table 3 – Summary of Measured Free Phase Hydrocarbon Thicknesses in Hobbs Booster Station Monitoring Wells

	7/8/99	5/11/00	8/22/00	10/31/00	2/5/01	5/15/01	8/9/01	10/23/01	3/13/02	6/27/02
MW-1						0.01	0.01	Sheen	Sheen	0.02
MW-4	3.26	2.68	3.49	2.68	2.92	2.82	2.60	2.64	2.62	2.86
MW-8	NM		0.00	0.00	0.00	0.27	0.40	0.06	0.72	1.88
MW-9	NM				0.01		0.00	0.01	0.15	Sheen
MW-10	NM	0.01	0.00	0.00	0.02	0.02		0.01	0.02	
MW-11	NM	1.18	4.10	4.45	5.42	5.47	5.97	6.26	7	3.09
MW-12	NM	NM	NM	0.08	1.05	0.96	2.04	1.71	2.79	2.79
MW-13	NM	NM	NM	0.17	0.76	0.84	5.22	5.69	7.62	7.37
MW-17	NM	NM	NM	0.01	0.02	0.01	0.03		0.03	Sheen
MW-18	NM	NM	NM					0.01	Sheen	

Notes: All units in feet
Wells that do not contain free product are not included
NM: Value not measured because well was not installed
See text for correction formula
Cells where no product was measured were intentionally left blank to improve readability

Table 4 – Summary of Benzene Concentrations in Hobbs Booster Station Monitoring Wells

	7/8/99	5/11/00	8/22/00	10/31/00	2/5/01	5/15/2001	8/9/2001	10/19/2001	3/13/2002	6/3/2002
MW-1	**0.232**	**0.191**	**0.181**	**0.197**	**0.570**	LNAPL	LNAPL	**0.144**	LNAPL	LNAPL
MW-2	**0.934**	**1.330**	**1.420**	**1.020**	**2.110**	**0.848**	**1.760**	**1.3**	**0.712**	LNAPL
MW-3	**0.262**	**0.202**	**0.011**	**<.005**	**0.346**	<.001	**0.345**	**0.029**	<0.001	**0.009**
MW-5	<.005	<.005	<.005	<.005	<.005	<.001	<.001	<0.001	<0.001	<0.001
MW-6	<.005	<.005	<.005	<.005	<.005	<.001	<.001	<0.001	<0.001	<0.005
MW-7	NM	<.005	<.005	<.005	<.005	<.001	<.001	<0.001	<0.001	0.0039
MW-14	NM	NM	NM	<.005	**0.041**	0.002	**0.034**	**0.029**	<0.001	0.068
MW-15	NM	NM	NM	<.005	**0.237**	0.003	**0.353**	**0.317**	<0.001	0.358
MW-16	NM	NM	NM	<.005	**0.094**	**0.01**	**0.098**	**0.012**	<0.001	<0.005
MW-18	NM	NM	NM	<.005	<.005	0.004	**0.007**	**0.036**	<0.001	LNAPL
MW-19	NM	NM	NM	<.005	<.005	0.001	<.005	**0.035**	<0.001	<0.001
MW-20	NM	NM	NM	NM	NM	NM	NM	NM	NM	<0.002
MW-21	NM	NM	NM	NM	NM	NM	NM	NM	NM	<0.001

Notes: All units in mg/l
NM: Value not measured because well was not installed
Values listed in bold text exceed New Mexico Water Quality Control Commission Standard of 0.005 mg/l

Table 5 – Proposed Groundwater Monitoring Program

Well	Inside Area of Free Phase Hydrocarbons	Proposed Monitoring Frequency
MW-1	Boundary	None (FPH present)
MW-2	No	None (FPH present)
MW-3	No	Annual (attenuation progress)
MW-4	Yes	None (FPH present)
MW-5	No (Upgradient)	Annual for upgradient sources
MW-6	No (Upgradient)	Annual for upgradient sources
MW-7	No (Upgradient)	Annual for upgradient sources
MW-8	Boundary	None (FPH present)
MW-9	Boundary	None (FPH present)
MW-10	Boundary	None (FPH present)
MW-11	Yes	None (FPH present)
MW-12	Yes	None (FPH present)
MW-13	Yes	None (FPH present)
MW-14	No (south side)	Quarterly
MW-15	No (south side)	Quarterly
MW-16	No (south side)	Quarterly
MW-17	Boundary	None (FPH present)
MW-18	No (Downgradient)	Annual
MW-19	No (Downgradient)	Quarterly
MW-20	No (Downgradient)	Quarterly
MW-21	No (Downgradient)	Quarterly

FPH: Free phase hydrocarbons

FIGURES

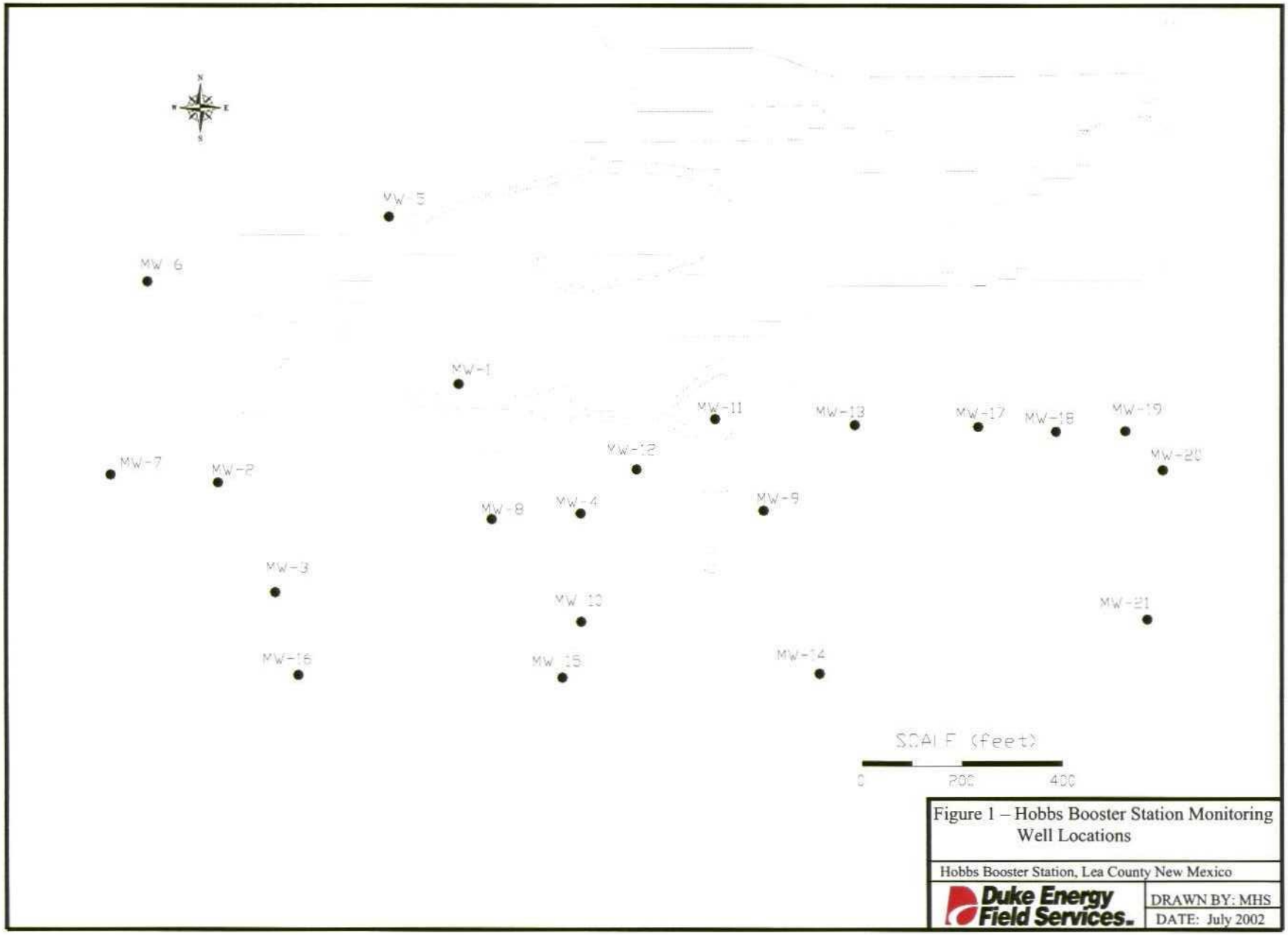


Figure 1 – Hobbs Booster Station Monitoring Well Locations

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services

DRAWN BY: MHS

DATE: July 2002

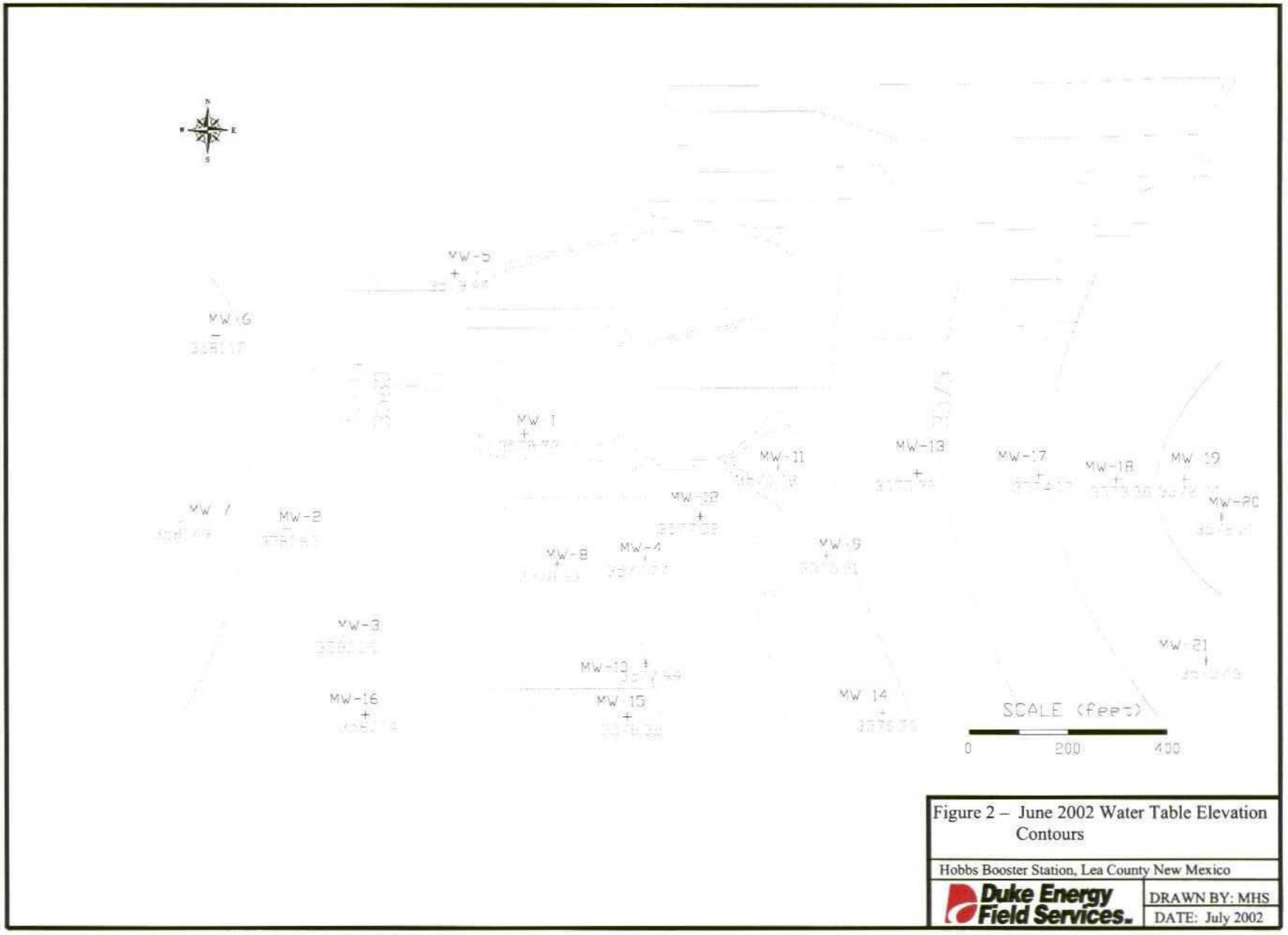


Figure 2 – June 2002 Water Table Elevation Contours

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services.

DRAWN BY: MHS

DATE: July 2002

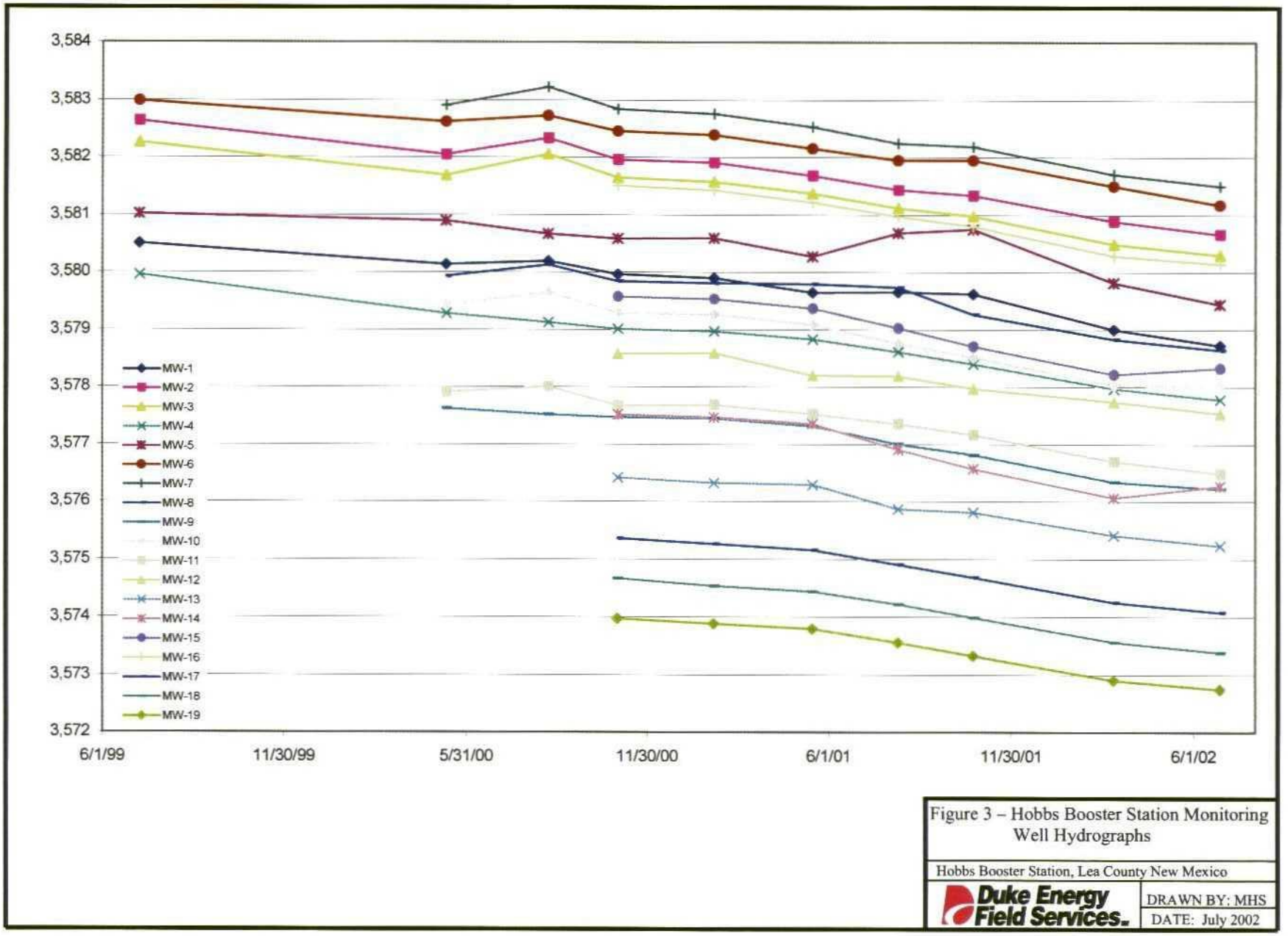


Figure 3 – Hobbs Booster Station Monitoring Well Hydrographs

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services.

DRAWN BY: MHS

DATE: July 2002

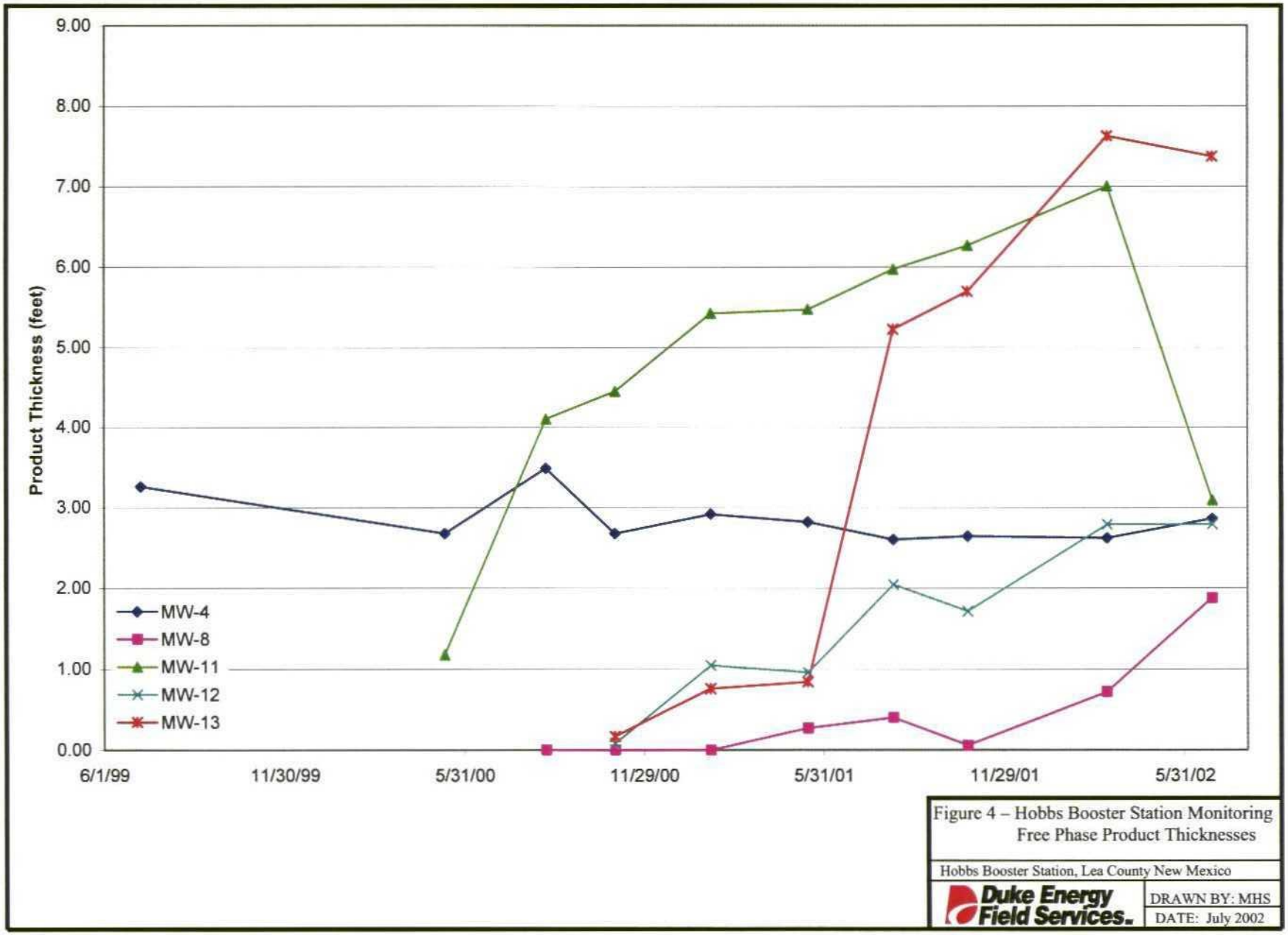


Figure 4 – Hobbs Booster Station Monitoring
Free Phase Product Thicknesses

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services.

DRAWN BY: MHS

DATE: July 2002

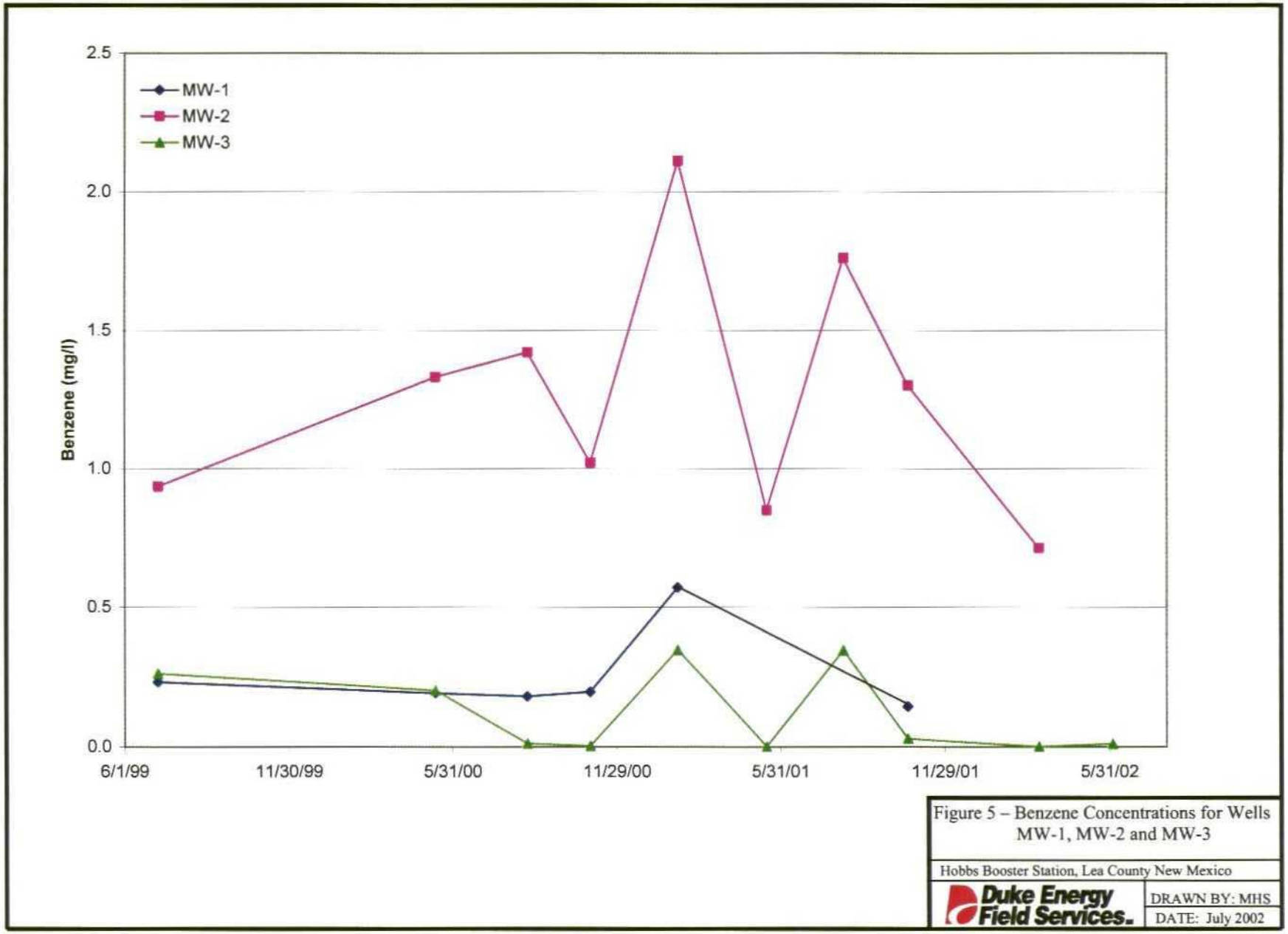


Figure 5 – Benzene Concentrations for Wells MW-1, MW-2 and MW-3

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services.

DRAWN BY: MHS

DATE: July 2002

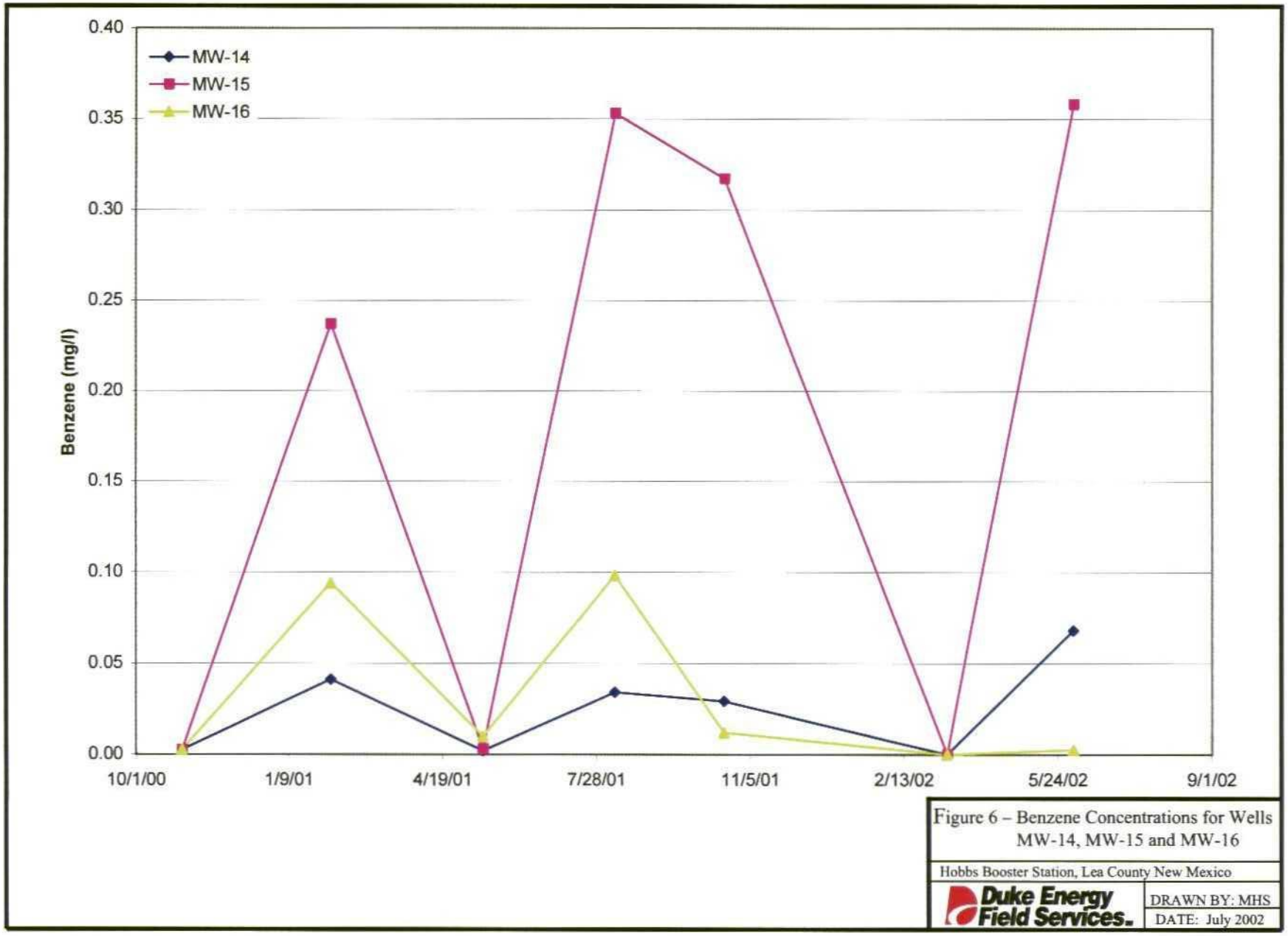


Figure 6 – Benzene Concentrations for Wells MW-14, MW-15 and MW-16

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services.

DRAWN BY: MHS

DATE: July 2002

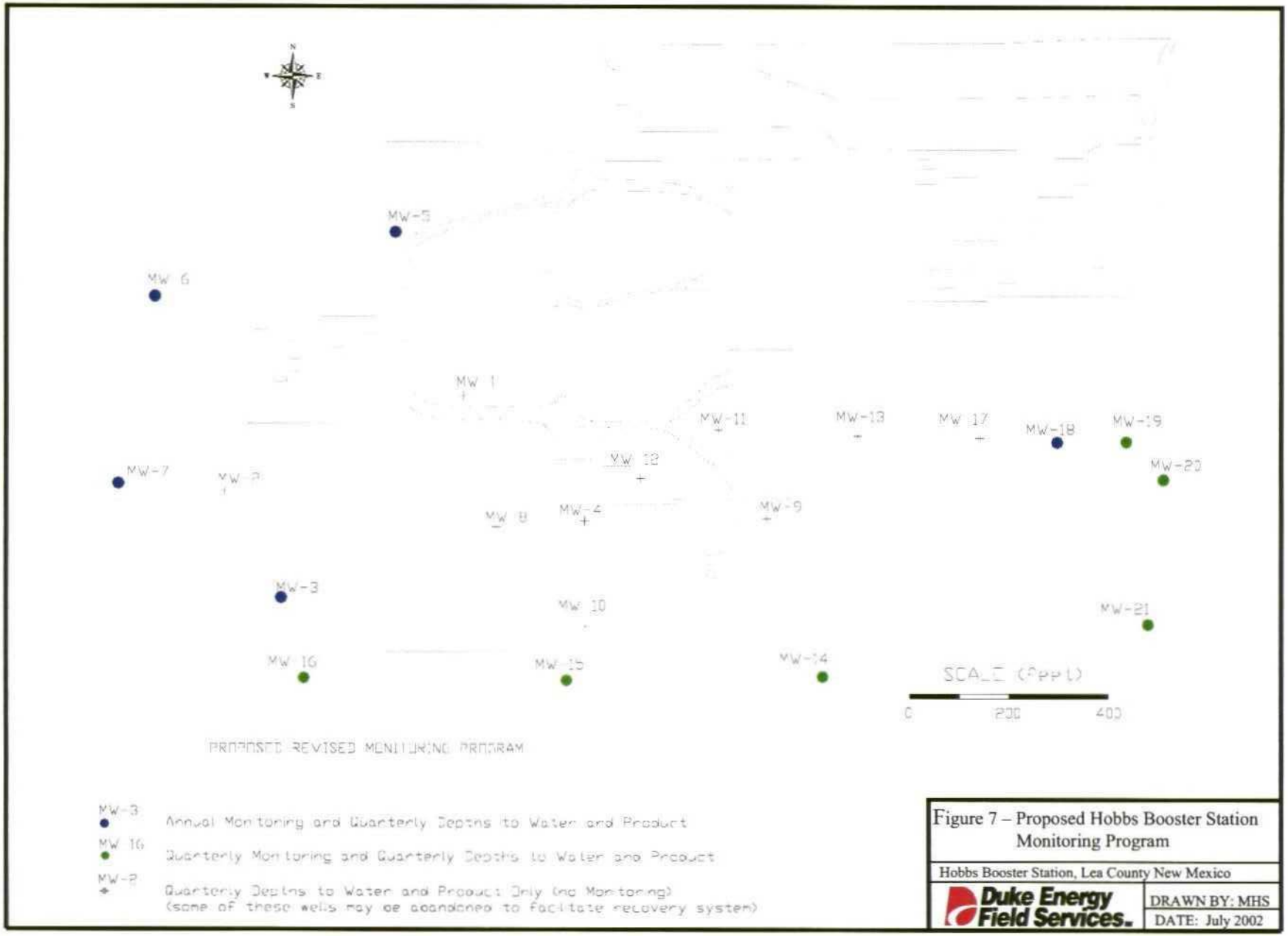


Figure 7 – Proposed Hobbs Booster Station Monitoring Program

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services.

DRAWN BY: MHS

DATE: July 2002

Remediacon Incorporated
Geological and Engineering Services
remediacon@yahoo.com

PO Box 302, Evergreen, Colorado 80437
Telephone: 303.674.4370
Facsimile: 617.507.6178

September 4, 2002

RECEIVED
SEP 0 9 2002
Environmental Bureau
Oil Conservation Division

Mr. Stephen Weathers
Duke Energy Field Services, LP
370 17th Street, Suite 900
Denver, CO 80202

Re: Summary of the Free Product Characterization Activities at the Duke Energy Field Services Hobbs Booster Station, Lea County New Mexico (Discharge Plan GW-044)

Dear Stephen:

Duke Energy Field Services, LP (DEFS) retained Remediacon to characterize the nature and distribution of the free product at the Duke Energy Field Services, LP Hobbs Booster Station in Hobbs New Mexico. This information will be primarily used in the design of a free-phase removal system. A brief background section is presented first. The data summaries and interpretations follow. The final section presents the important conclusions that result from the activities to date.

BACKGROUND INFORMATION

Free product was identified and described in some of the monitoring wells that were installed as part of the subsurface characterization effort. Twenty-one groundwater monitoring wells were installed during this effort. The wells were installed during several phases of field activities. The well locations are shown on Figure 1 and construction information is summarized in Table 1.

Trident Environmental (formerly TRW) completed 10 rounds of groundwater sampling between July 1999 and June 2002. The routine monitoring activities included measuring the depths and thickness of free-phase hydrocarbons. The measured free-phase hydrocarbon thickness values are summarized in Table 2. Wells MW-1, MW-9, MW-10, MW-17 and MW-18 (MW-9 had one 0.15-foot outlier) had values varying from not present to 0.03 feet. Wells MW-4, MW-8, MW-11, MW-12 and MW-13 have free-phase hydrocarbon thicknesses in excess of 1 foot. Their variation in thickness over time is depicted on Figure 2.

The elevational decline in the water table is the primary cause of the increase in free-phase hydrocarbon thickness in wells MW-8, MW-11, MW-12 and MW-13 as shown by the following table (all units in feet):

Well	Change in Measured Depth To Free Product (feet)[1]	Change in Free Product Thickness (feet)[1]
MW-4	1.19	0.18
MW-8	0.86	1.88
MW-11	0.50	2.55
MW-12	0.55	2.71
MW-13	-0.14	7.20

1) Between October 2000 and June 2002

The decrease in the measured depth to free-phase hydrocarbons in wells MW-8, MW-11, MW-12 and MW-13 from October 2000 (earliest complete record) to June 2002 was substantially less than the increase in the free-phase hydrocarbon thickness. The free-phase hydrocarbons must therefore be saturating the interval that is being vacated by the declining groundwater table. Well MW-4, the exception to this trend, is very close to well RW-1 where an active free-phase hydrocarbon removal system has been in place for the majority of the project.

SUMMER 2002 FREE PRODUCT CHARACTERIZATION ACTIVITIES

An additional 19 free-phase hydrocarbon characterization wells were installed in June and July 2002 at the locations shown in Figure 3. These wells were specifically installed to complete delineation of the free product beneath the site. These wells were assigned a different numbering system (TW-A through TW-S) to differentiate them from the site monitoring wells. The installation details are summarized in Table 3. These wells were installed using the same protocols that were used to install wells MW-1 through MW-21 (i.e. air rotary drilling, factory slotted Schedule 40 PVC, artificially graded sand) except that the annular space was not backfilled above the 2-foot thick hydrated bentonite seal. These wells will either be plugged and abandoned or upgraded to monitoring wells at the completion of the free product collection system design phase.

Soil samples were generally collected at three intervals. Grab samples were collected from 0 to 10 feet to identify any shallow zones of hydrocarbon-affected materials that might represent historical source areas. Samples were also collected immediately above the water table (generally 45 to 47 feet) to assess relative hydrocarbon impacts in the vadose zone. Samples were also collected from more intervals from wells that exhibited potential hydrocarbon effects in the 3 to 5 and 8 to 10 foot zones.

The samples were placed in plastic zip-lock bags, and the headspaces were allowed to equilibrate a minimum of 30 minutes prior to measurement with a photoionization detector (PID). The resulting measurements are compiled in Table 4.

Six product samples were collected and submitted for physical and chemical analysis. Two samples were submitted in 2001 (MW-4 and MW-11) for density and speciation analyses. Four samples were submitted in June 2002 (MW-1, MW-10, MW-11 and MW-13) for measurement of density and viscosity. The results are summarized in Table 5.

The product thickness in each well was measured on August 26, 2002. The resulting thickness values are summarized on Table 6. Figure 4 shows the product thickness value for all of the monitoring wells and the free product characterization wells. The actual product thickness is less than the value measured in a well. The relationship between the two thickness values (well and actual) is a function of several factors that are primarily related to the particle-size distribution of the soil and the density and surface tension of the free product. The relationship between measured and actual product thickness was evaluated using the public-domain spreadsheet provided as part of API Publication 4682 titled Free Product Recovery of Petroleum Hydrocarbon Liquids. The sandy nature of the materials resulted in a near-linear relationship at all potential product thicknesses in wells as shown on Figure 5. The derived relationship between the actual and measured thickness is:

$Fp_a = (FP_w*0.3578)-0.0312$; where FP_w is the measure product thickness in the well and Fp_a is the calculated product thickness. The near-zero y intercept in the preceding equation results in a relationship where the actual product thickness is approximately 1/3 of the thickness measured in a well.

The actual values for each well were calculated using the above equation and are included in Table 6. The resulting actual thickness were then contoured using the kriging option in a Surfer® program. The resulting free product thickness distribution is shown in Figure 6.

Five product bail down tests were also completed. These tests involve removing as much free product as possible from the well and then measuring its recovery over time. The results are depicted in two figures. Figure 7 shows the recovery results for MW-4 and RW-1, located immediately adjacent to MW-4. Figure 8 graphically depicts the results for wells MW-11, MW-12 and MW-13. Note that the time after bailing ceases is shown log rhythmically on the x-axis while the percentage to full recovery is shown on the y axis. Examination of these two figures indicates that wells MW-4 and RW-1 recovered almost fully in under a day and at least half of the recovery occurred in under 3 hours. Wells MW-11, MW-12 and MW-13 exhibited only 25 to 50 percent recovery in a day and only recovered 15 to 30 percent in three hours.

CONCLUSIONS

The following conclusions were derived based upon the information provided above:

1. Measurable free product is present under approximately14 acres of the site.

2. Locations TW-A and TW-B appear to be located within potential source areas. The well logs for wells MW-1 through MW-21 will also have to be examined to evaluated if any of them lie within potential source areas.

3. The increase in thickness in the monitoring wells results from the product filling the voids vacated by the continually-declining groundwater.

4. The actual product thickness is approximately 1/3 the thickness measured in the wells.

5. The viscosity in wells MW-1 and MW-10 was lower (liquid was more fluid) than the viscosity in wells MW-11 and MW-13. This difference may partially explain the differences in product recovery in the wells. More detailed flow evaluations will have to be completed to evaluate whether the recovery differences can be fully explained by the viscosity contrasts or if other factors such as lithology must also be considered.

6. The free product information collected to date, in conjunction with the remaining data for this site, is currently being used to design a free-product collection system.

Thank you for the opportunity to complete this work. Do not hesitate to contact me if you have any questions or comments.

Respectfully Submitted,
REMEDIACOM INCORPORATED

Michael H. Stewart

Michael H. Stewart, P.E.
Principal Engineer

MHS/tbm

attachments

TABLES

Table 1 – Summary of Hobbs Booster Station Well Construction Information

Well	Ground Elevation	Top Of Casing Elevation	Total Well Depth	Well Diameter	Screen Interval	Gravel Interval
MW-1	3,623.60	3,626.06	57	2	37-57	34-57
MW-2	3,620.65	3,623.14	53	2	33-53	30-53
MW-3	3,620.08	3,623.01	53	2	33-53	30-53
MW-4	3,621.66	3,624.29	57	2	37-57	34-57
MW-5	3,626.30	3,629.16	57	2	37-57	34-57
MW-6	3,624.14	3,626.93	53	2	33-53	30-53
MW-7	3,618.93	3,621.40	56	2	33-53	31-56
MW-8	3,620.84	3,623.62	58	2	36-56	34-58
MW-9	3,622.60	3,625.21	63	2	43-63	40-63
MW-10	3,618.30	3,621.07	58	2	36-56	34-58
MW-11	3,623.05	3,625.88	63	2	43-63	41-63
MW-12	3,623.95	3,626.60	65	4	40-60	38-65
MW-13	3,623.53	3,626.30	69	4	44-64	38-64
MW-14	3,618.76	3,621.42	66	2	42-62	34-66
MW-15	3,616.79	3,619.39	59	2	37-57	31-59
MW-16	3,619.10	3,621.87	58	2	34-54	30-56
MW-17	3,621.36	3,623.94	66	4	41-61	37-63
MW-18	3,621.96	3,624.30	68	4	44-64	35-65
MW-19	3,621.42	3,624.12	68	2	43-63	40-65
MW-20	3,621.62	3,621.49	59	2	59-44	59-42
MW-21	3,621.78	3,624.25	61	2	61-46	61-44

Table 2 – Summary of Measured Free Phase Hydrocarbon Thicknesses in Hobbs Booster Station Monitoring Wells

	7/8/99	5/11/00	8/22/00	10/31/00	2/5/01	5/15/01	8/9/01	10/23/01	3/13/02	6/27/02
MW-1						0.01	0.01	Sheen	Sheen	0.02
MW-4	3.26	2.68	3.49	2.68	2.92	2.82	2.60	2.64	2.62	2.86
MW-8	NM		0.00	0.00	0.00	0.27	0.40	0.06	0.72	1.88
MW-9	NM				0.01		0.00	0.01	0.15	Sheen
MW-10	NM	0.01	0.00	0.00	0.02	0.02		0.01	0.02	
MW-11	NM	1.18	4.10	4.45	5.42	5.47	5.97	6.26	7	3.09
MW-12	NM	NM	NM	0.08	1.05	0.96	2.04	1.71	2.79	2.79
MW-13	NM	NM	NM	0.17	0.76	0.84	5.22	5.69	7.62	7.37
MW-17	NM	NM	NM	0.01	0.02	0.01	0.03		0.03	Sheen
MW-18	NM	NM	NM					0.01	Sheen	

Notes: All units in feet
Wells that do not contain free product are not included
NM: Value not measured because well was not installed
See text for correction formula
Cells where no product was measured were intentionally left blank to improve readability

Table 3 – Summary of Hobbs Booster Station Product Evaluation Well Construction Information

Well	Total Depth	Slotted Interval	Sand Interval	Hydrated Bentonite Chip Interval
TW-A	57	42-57	40-57	38-40
TW-B	57	44-59	42-59	3-42
TW-C	60	45-60	43-60	4-43
TW-D	50	35-50	33-50	31-33
TW-E	55	40-55	38-55	36-38
TW-F	55	40-55	37-55	35-37
TW-G	54	39-54	34-54	32-34
TW-H	51	36-51	34-51	32-34
TW-I	60	45-60	43-60	40-43
TW-J	60	45-60	43-60	40-43
TW-K	60	45-60	43-60	40-43
TW-L	60	45-60	43-60	40-43
TW-M	60	45-60	43-60	40-43
TW-N	60	45-60	43-60	40-43
TW-O	60	45-60	42-60	39-42
TW-P	60	45-60	42-60	38-42
TW-Q	58	53-58	41-58	38-41
TW-R	60	45-60	43-45	38-43
TW-S	60	45-60	43-45	38-43

NOTES:

1. All units are feet
2. The annular space above the bentonitie chips was left open to a surface seal pending disposition of these wells

Table 4 - Summary of Photoionization Detector Readings in Product Evaluation Wells

Well	Depth	PID
A	8-10	78.9
A	13-15	322
A	22-24	317
A	30-32	208
A	38-40	161
A	45-47	328
B	3-5	88.7
B	8-10	1.7
B	13-15	89.3
B	23-25	1.7
B	40-42	30.8
B	45-47	256
C	3-5	0.0
C	8-10	8.5
C	45-47	1,100
E	3-4	0.0
E	8-9	0.0
E	43-45	525.3
F	3-4	0.0
F	8-9	0.0
F	45-47	424.3
G	3-5	0.0
G	8-8.5	0.0
G	40-42	70.7
H	3-5	0.0
H	8-10	2.7
H	18-20	31.1
H	40-42	940

Well	Depth	PID
M	3-5	0.0
M	7-9	0.0
M	42-43	146
M	45-47	412
N	8-10	0.0
N	45-47	0.0
N	48.0	Moderate HC odor
O	8-10	0.0
O	45-47	0.0
O	48.0	Moderate HC odor
P	3-5	0.0
P	8-10	0.0
P	45-47	162
Q	3-5	0.0
Q	8-10	0.0
Q	45-47	9.5
R	3-5	0.0
R	8-10	0.0
R	45-47	37.3
S	3-5	0.0
S	8-10	0.0
S	45-47	0.0
S	60	Slight HC odor

Table 5 - Summary of Free Product Property Measurements

Product Density

Well	Density
MW-1	0.78
MW-4	0.77
MW-10	0.79
MW-11	0.81
MW-13	0.82

Product Viscosity

Well	Kinematic Viscosity (centipoise)	Dynamic Viscosity (centipoise)
MW-1	1.35	2.02
MW-10	1.34	1.06
MW-11	2.21	1.05
MW-13	2.46	1.79

Product Composition

Constituent	MW-4	MW-11
SG-60	0.774	0.8165
API-60	51.31	41.8
Methane	0	0
Ethane	0	0
Propane	0.011	0.175
Butanes	1.685	2.996
Pentanes	9.675	8.583
Hexanes	16.122	10.731
Deptanes	18.349	7.206
Octanes	14.954	4.222
Nonanes	13.99	4.627
Decanes	7.586	3.252
C11	3.889	3.854
C12	2.536	4.32
C13	2.5	6.434
C14	3.216	11.211
C15	2.075	11.864
C16	0.763	9.239

Constituent	MW-4	MW-11
C17	0.286	4.392
C18	0.102	1.682
C19	0.061	1.028
C20	0.056	0.653
C21	0.03	0.218
C22	0.023	0.044
C23	0.037	0
C24	NR	0
C25	NR	0
C26	NR	0
Total	97.946	96.731

NR: Value not reported

Table 6 – Summary of Measured and Calculated Actual Product Thickness Values for the August 26, 2002 Measurement Episode

Location	Measured Thickness in Wells	Calculated Actual Thickness
MW-1	0.02	0.01
MW-4	2.86	0.992108
MW-8	1.88	0.641464
MW-9	0.01	0.01
MW-10	0	<0.01
MW-11	3.09	1.074402
MW-12	2.79	0.967062
MW-13	7.37	2.605786
MW-17	0.01	0.01
MW-18	0.00	0.01
TW-A	1.15	0.38027
TW-B	5.24	1.843672
TW-C	9.84	3.489552
TW-D	8	2.8312
TW-E	0.72	0.226416
TW-F	0.01	0.01
TW-G	2.29	0.788162
TW-H	0	<0.01
TW-I	3.6	1.25688
TW-J	1.28	0.426784
TW-K	5.95	2.09771
TW-L	5.34	1.879452
TW-M	0	<0.01
TW-N	0	<0.01
TW-O	0	<0.01
TW-P	0	<0.01
TW-Q	0	<0.01
TW-R	1.5	0.5055
TW-S	0	<0.01

All units in feet

FIGURES

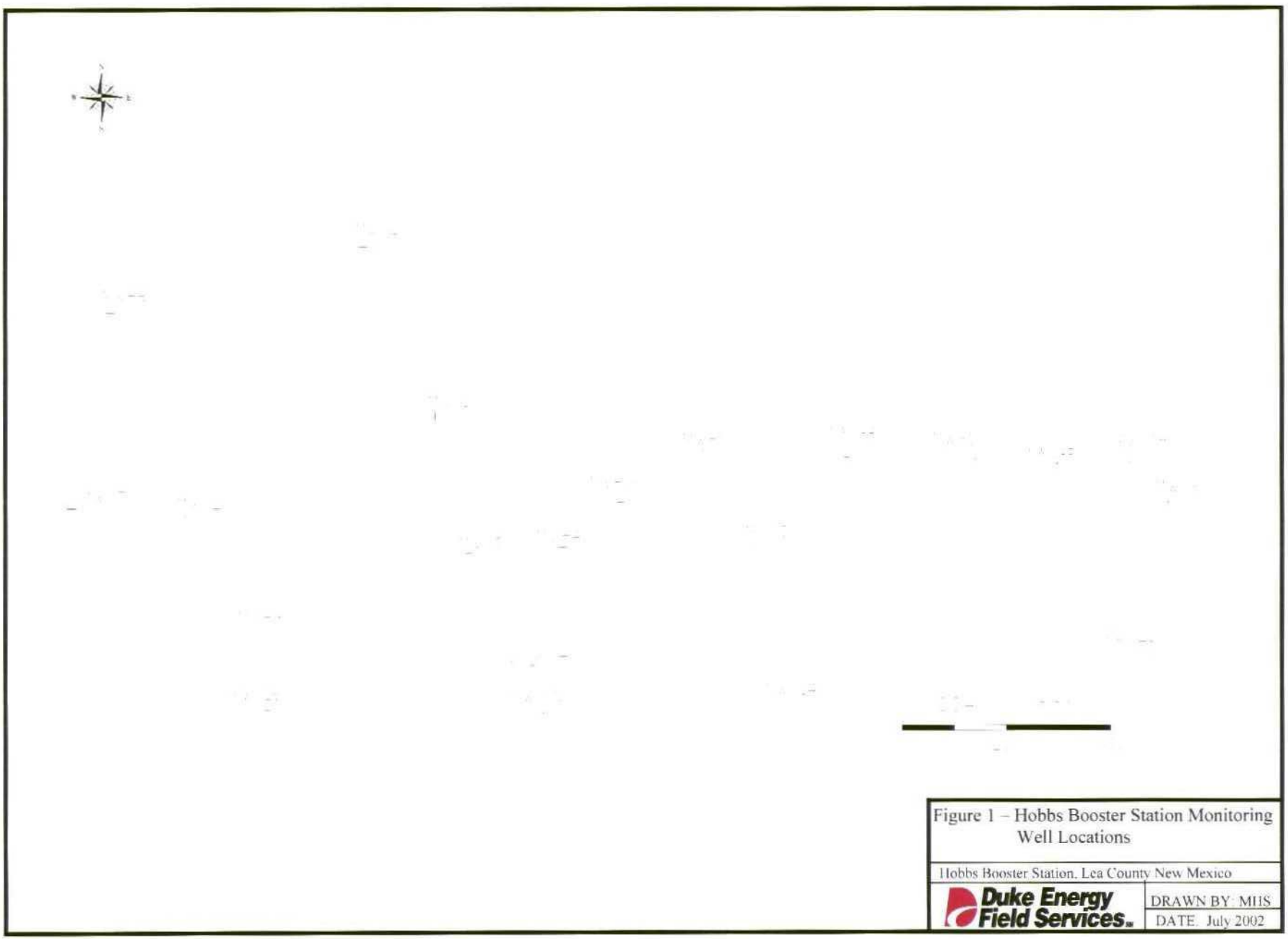


Figure 1 – Hobbs Booster Station Monitoring Well Locations

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services

DRAWN BY: MHS

DATE: July 2002

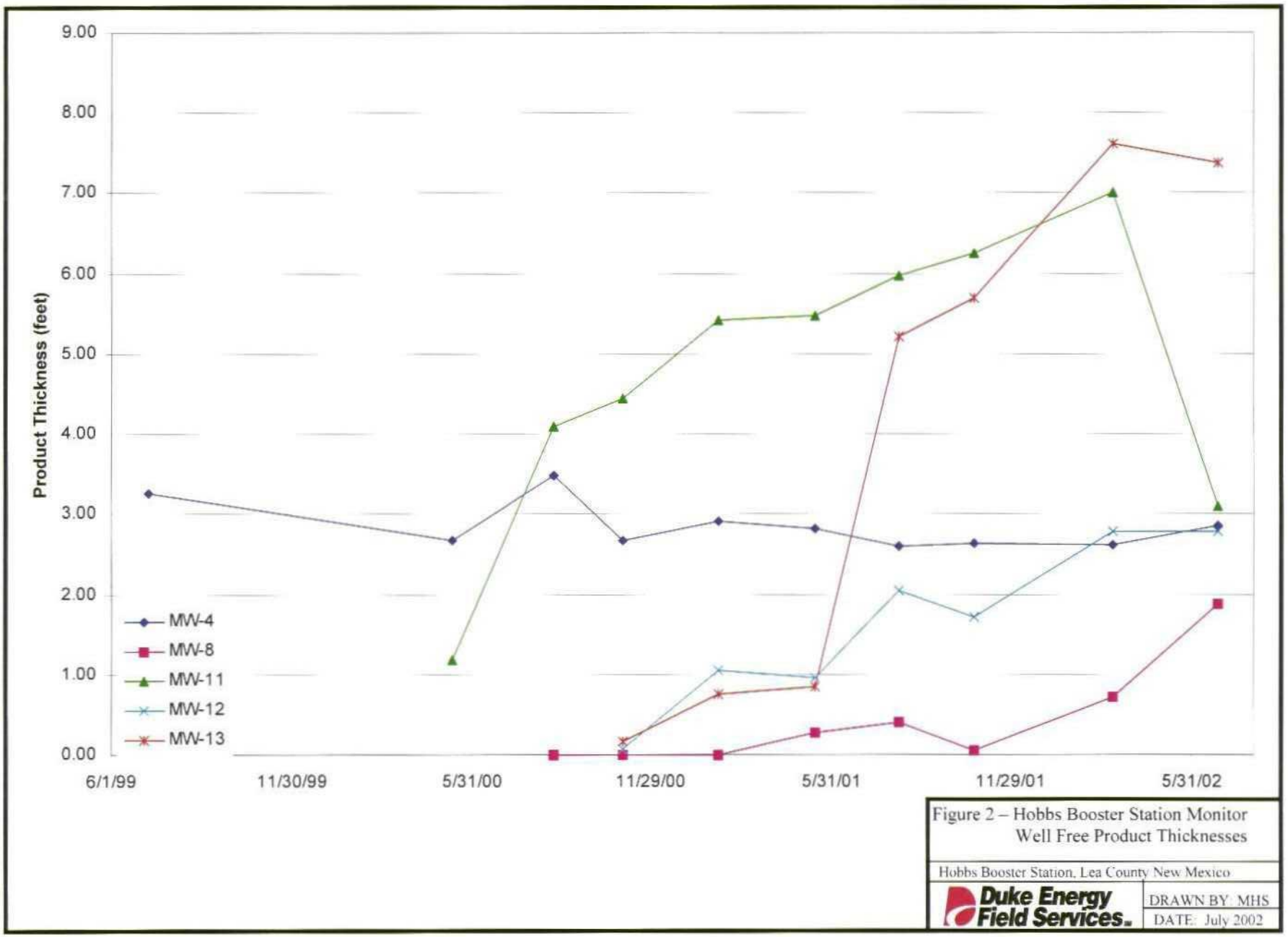


Figure 2 – Hobbs Booster Station Monitor Well Free Product Thicknesses

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services

DRAWN BY: MHS

DATE: July 2002

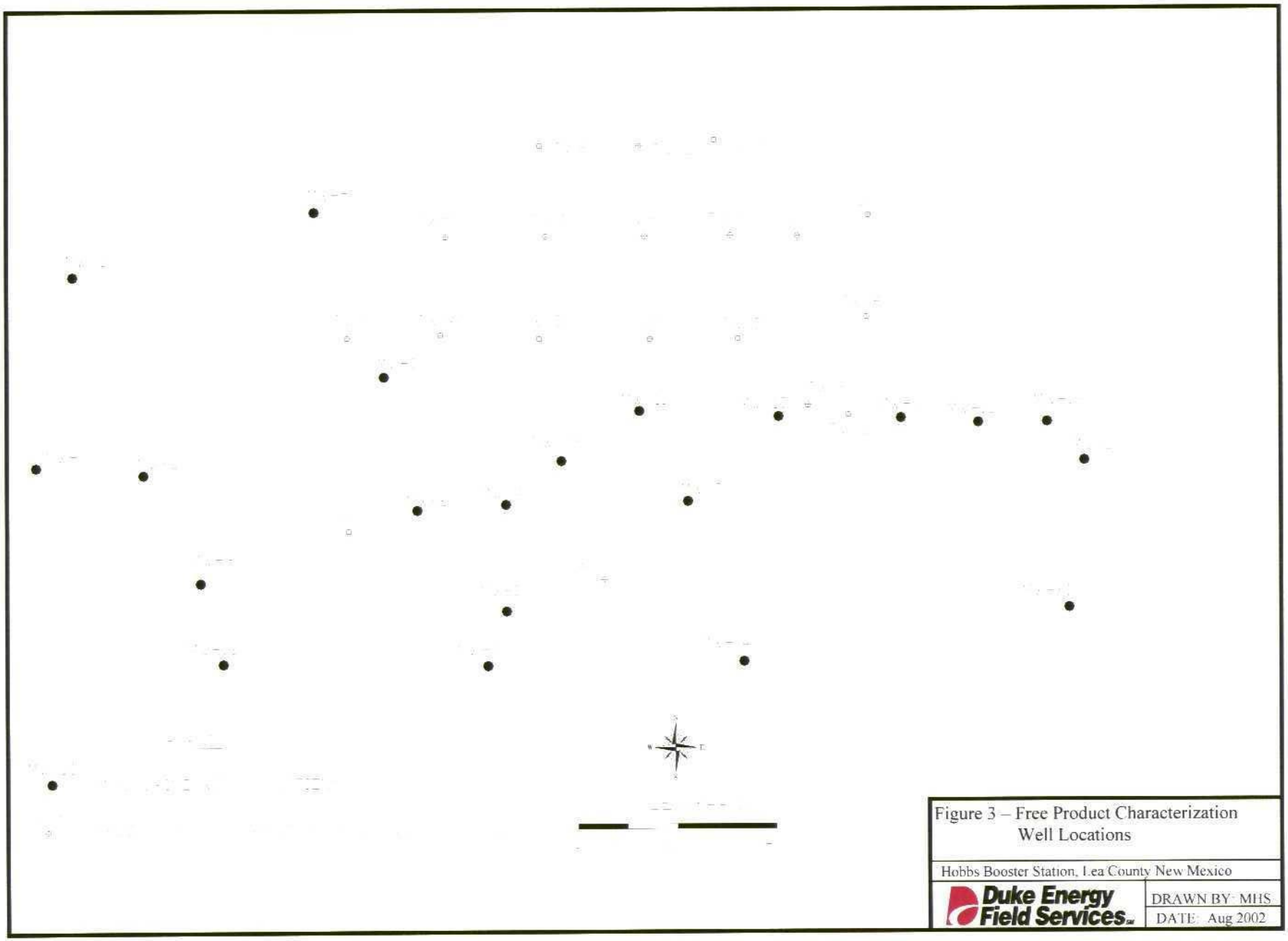


Figure 3 – Free Product Characterization
Well Locations

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services

DRAWN BY: MHS

DATE: Aug 2002

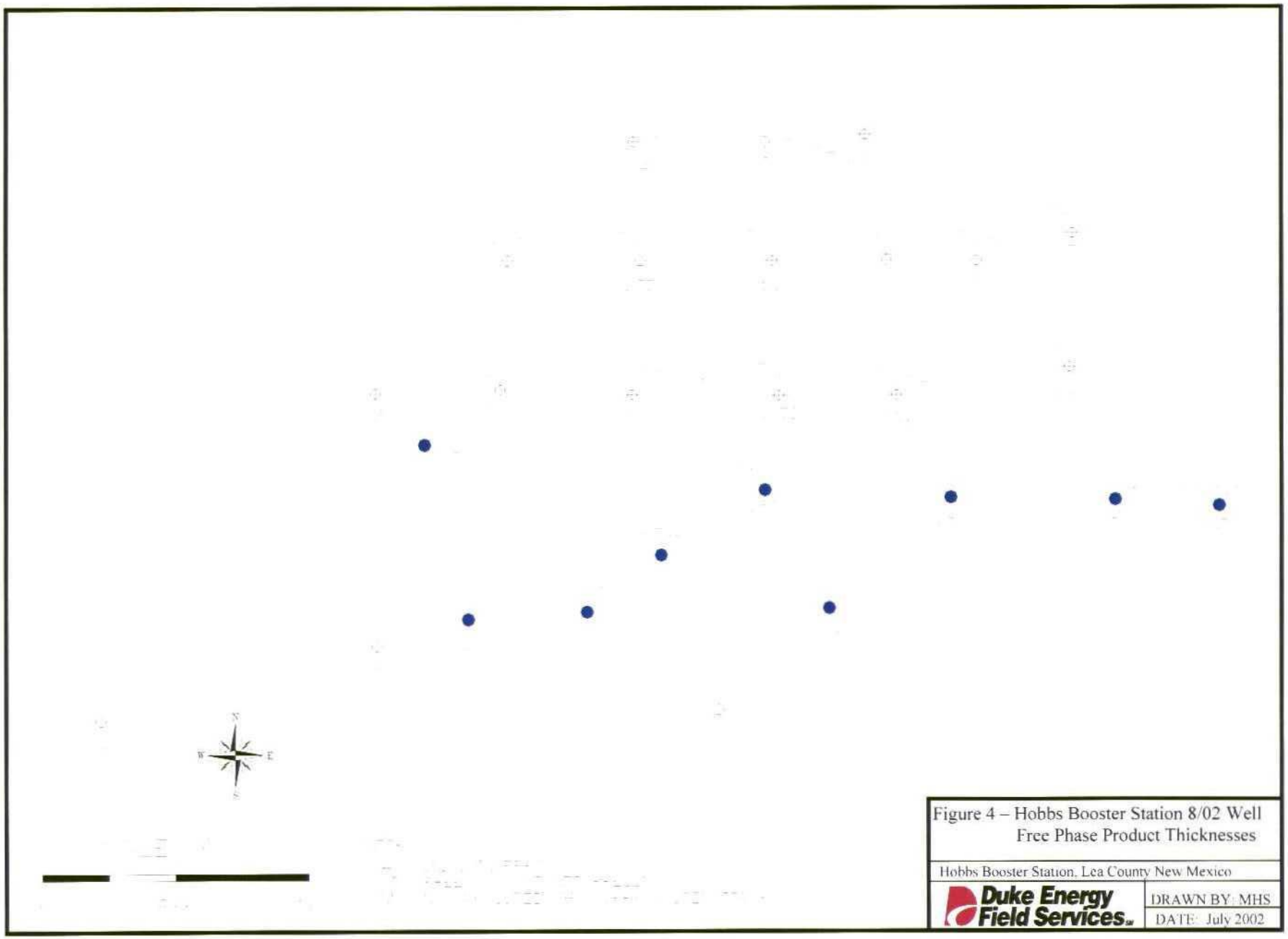


Figure 4 – Hobbs Booster Station 8/02 Well Free Phase Product Thicknesses

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services

DRAWN BY: MHS

DATE: July 2002

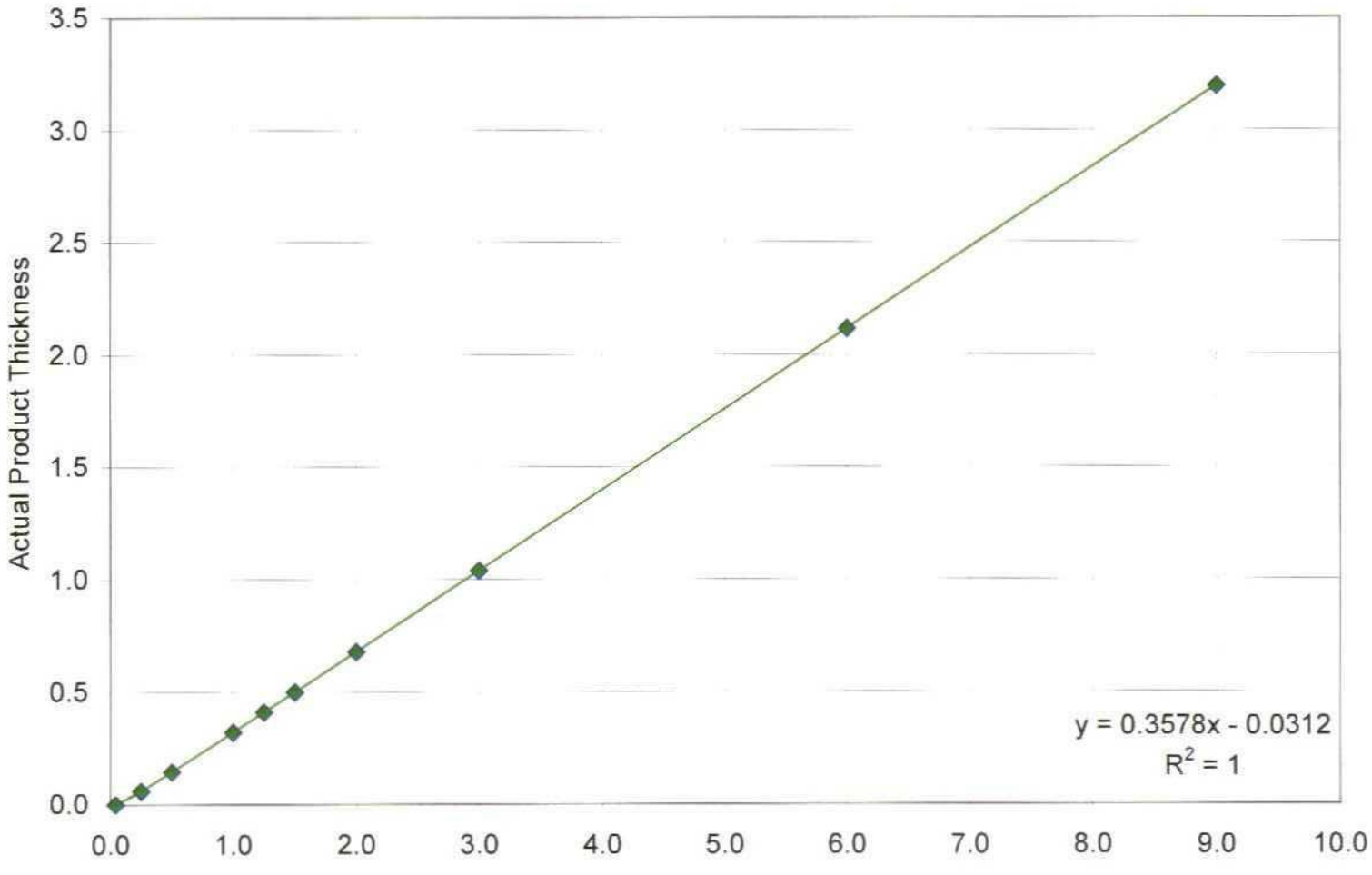


Figure 5 – Well Verses Actual Product Thickness

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services

DRAWN BY: MHS

DATE: Aug 2002

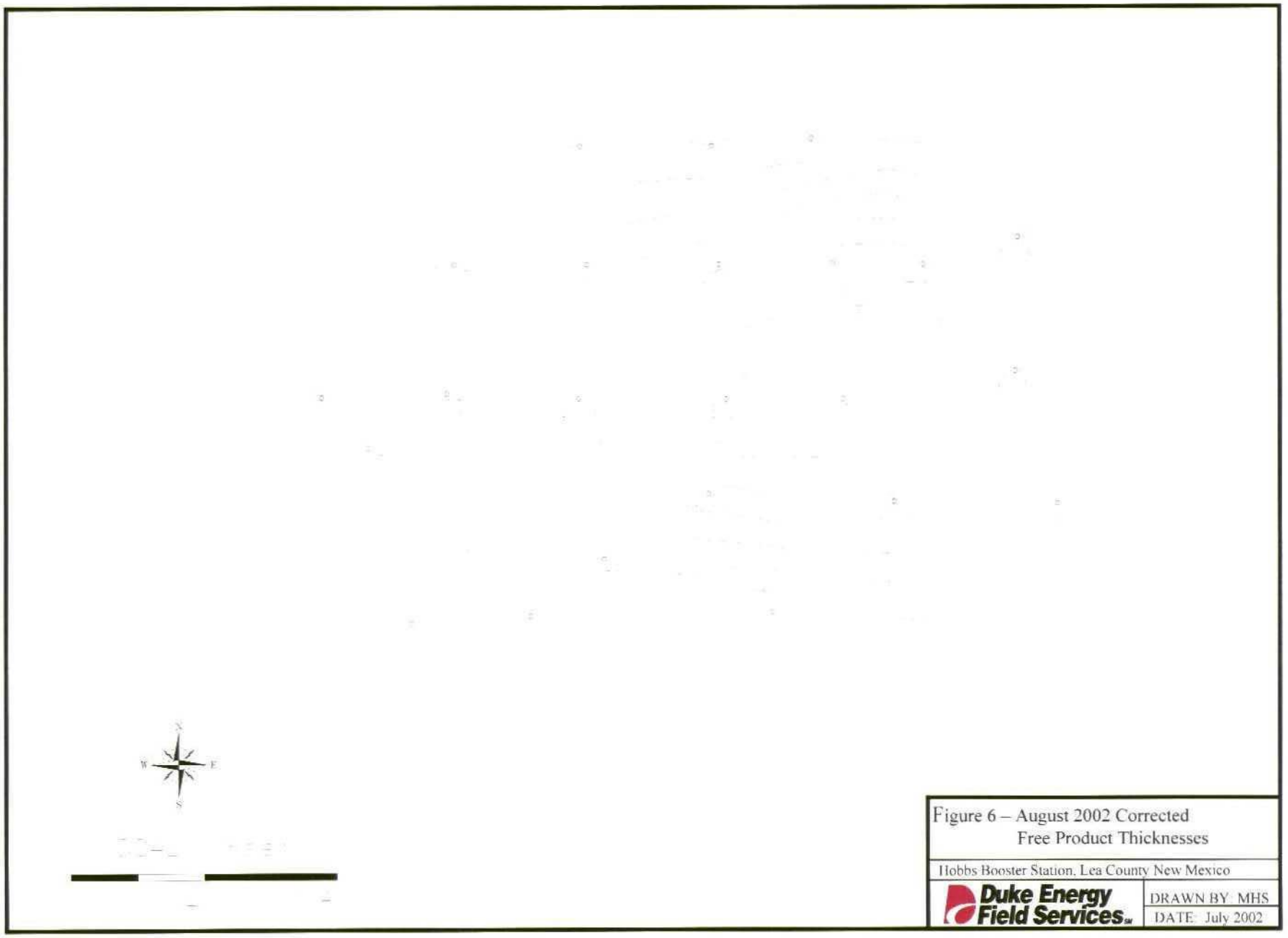


Figure 6 – August 2002 Corrected
Free Product Thicknesses

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services

DRAWN BY: MHS

DATE: July 2002

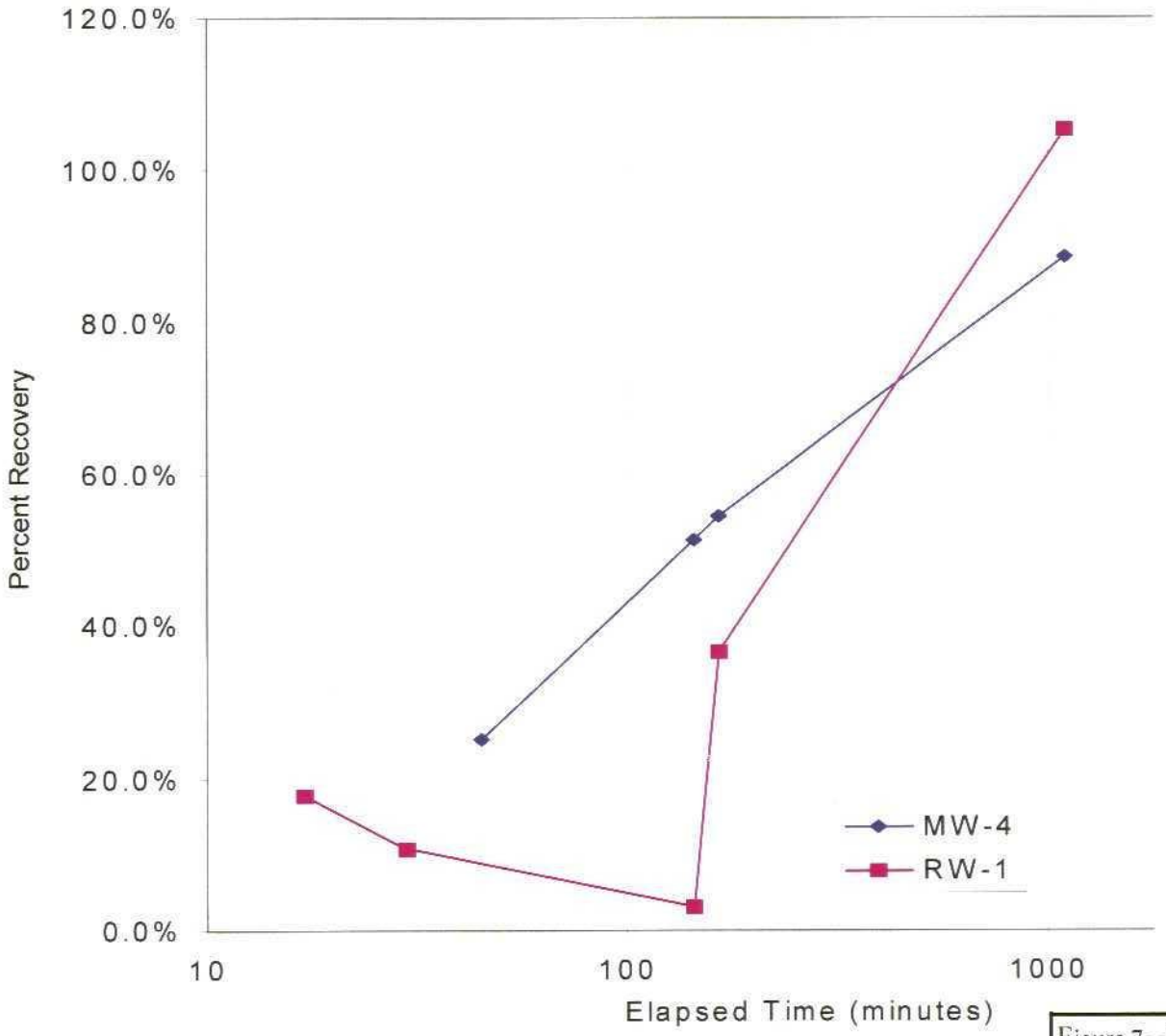


Figure 7 – Bail Down Test Results for Wells MW-4 and RW-1

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services

DRAWN BY: MHS

DATE: July 2002

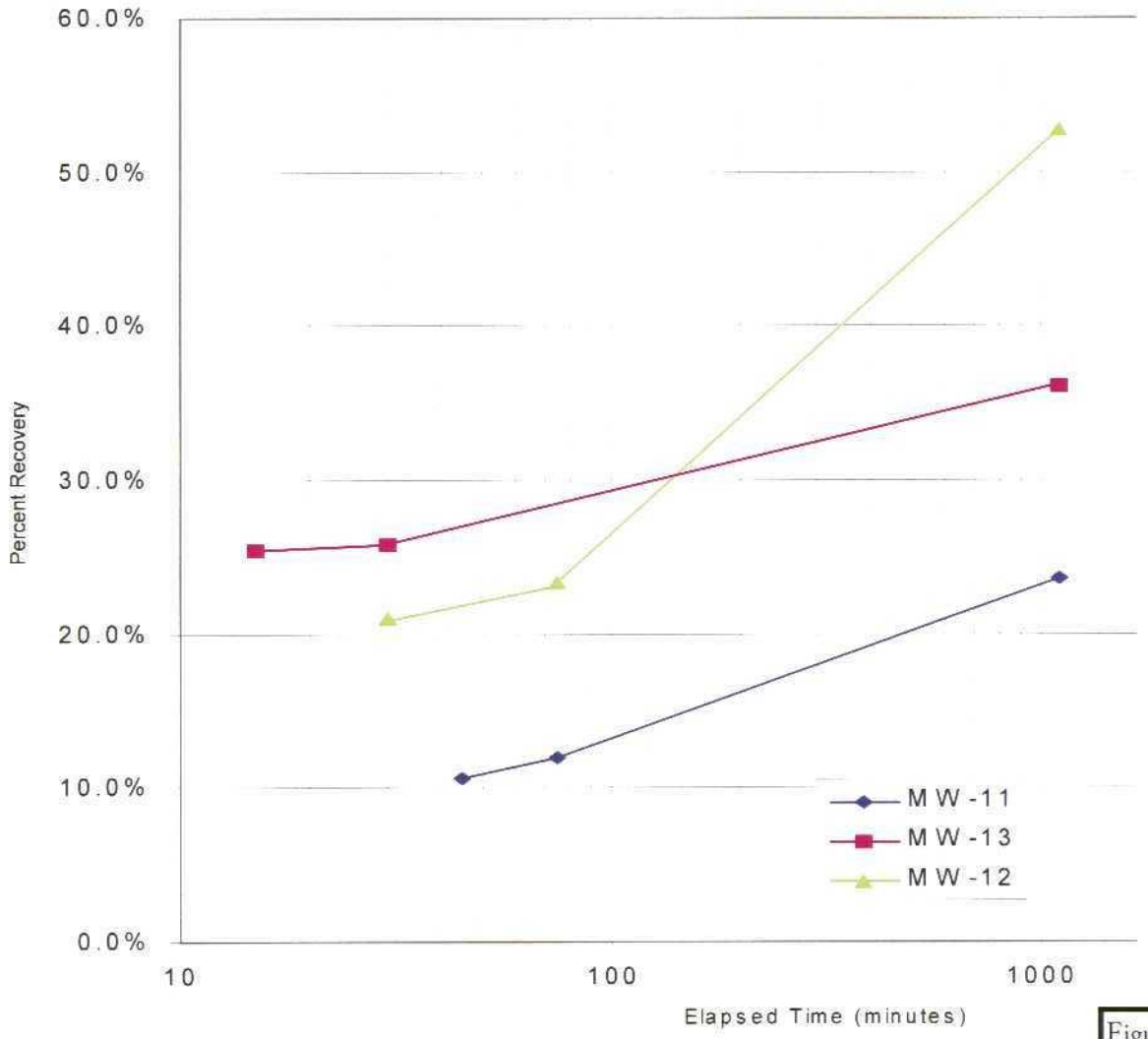


Figure 8 – Bail Down Test Results for Wells MW-11, MW-2 and MW-13

Hobbs Booster Station, Lea County New Mexico

Duke Energy Field Services

DRAWN BY: MHS

DATE: July 2002

TRIDENT ENVIRONMENTAL

April 4, 2002

Mr. Steve Weathers
Duke Energy Field Services LP
P. O. Box 5493
Denver, Colorado 80217

RE: First Quarter 2002 Sampling Event
Hobbs Booster Station
Discharge Plan GW-044
Lea County, New Mexico

Dear Mr. Weathers:

Trident Environmental has completed the first quarter 2002 groundwater sampling and monitoring event at the Hobbs Booster Station in accordance with the requirements specified by Mr. Jack Ford in his letter dated October 10, 2000. This report briefly documents the results of the sampling and monitoring activities conducted by Trident Environmental on March 13-14, 2002 (first quarter).

Groundwater Elevations, Flow Direction and Hydraulic Gradient

Depth to water measurements were obtained on March 13, 2002. An updated groundwater elevation map depicting the water table elevations and direction of groundwater flow using the most recent data obtained by Trident Environmental is presented in Figure 1. Groundwater elevation data for the current monitoring event is summarized in Table 1.

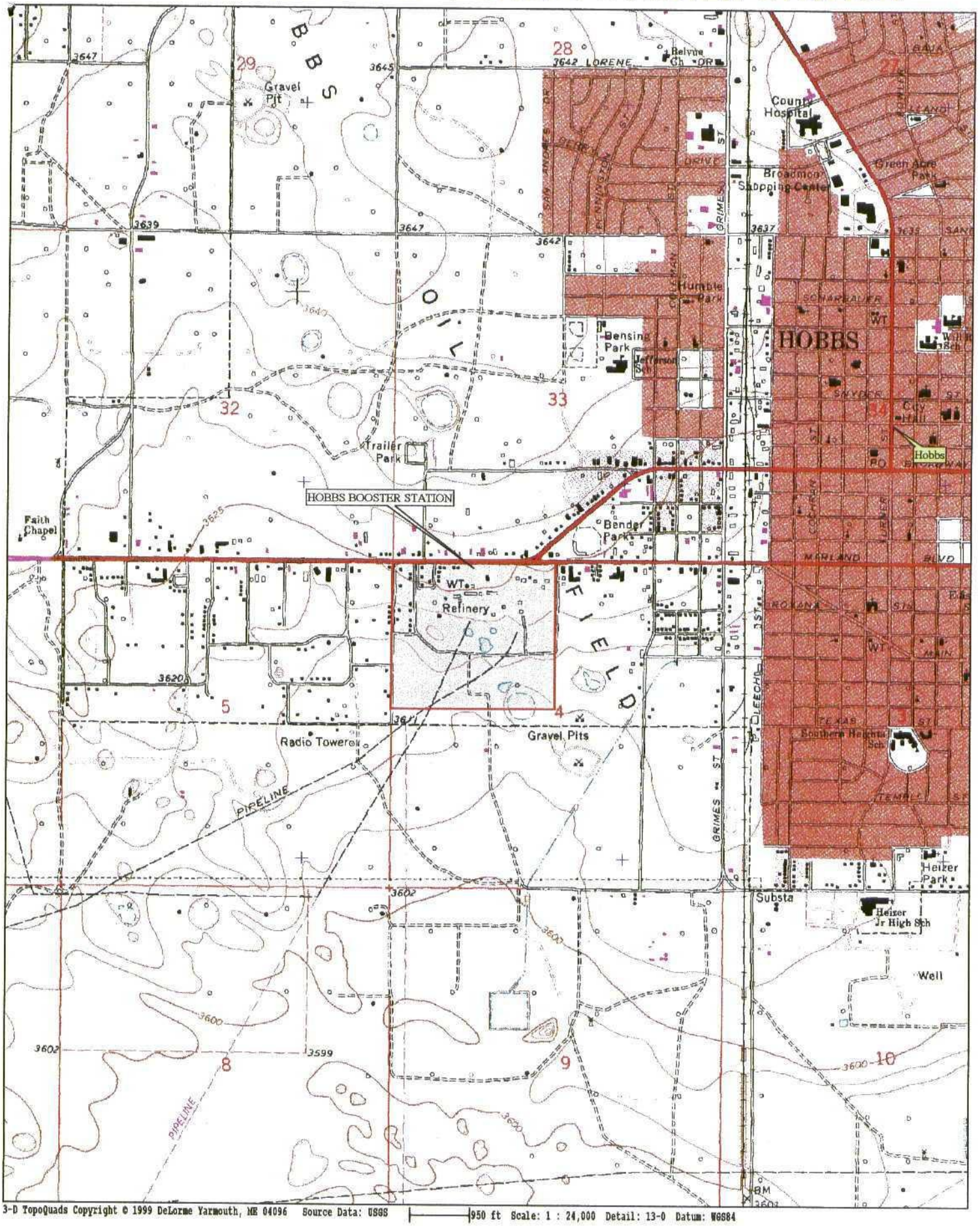
Depth to groundwater in the site area occurs at 36 to 48 feet below ground surface across the site. The direction of groundwater flow is to the southeast with a hydraulic gradient of approximately 0.004 feet/foot, which is consistent with determinations made from previous gauging events. The water table elevation has decreased approximately 0.3 feet per year during the monitoring history (July 1999 to present).

Less dense non-aqueous phase liquids (LNAPL) in the form of weathered condensate were present in monitoring wells MW-1, MW-4, MW-8, MW-9, MW-10, MW-11, MW-12, MW-13, and MW-17 according to gauging measurements obtained on March 13, 2002 as listed in Table 1.

Monitoring Well Sampling Procedures

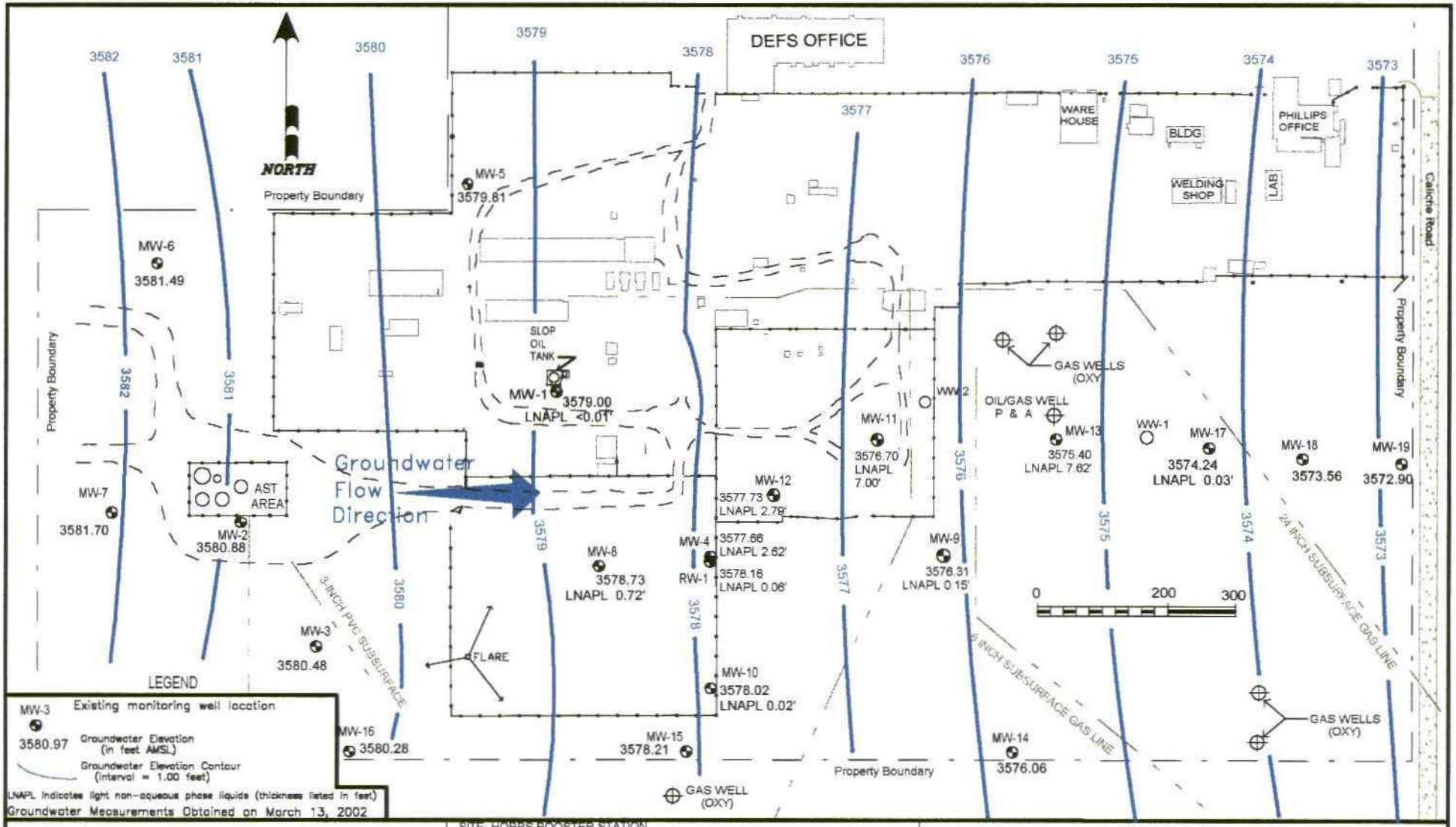
Prior to sampling, the monitoring wells (MW-1 through MW-19) were gauged for depth to groundwater using a Heron Model H.01L oil/water interface meter. Immediately prior to collecting groundwater samples, each monitoring well was purged of a minimum of three well casing volumes of water using a clean, decontaminated submersible pump, with the exception of MW-18 which was hand bailed. A total of approximately 177 gallons of water was purged from the sampled monitoring wells. Groundwater samples were obtained using a new, decontaminated, disposable bailer for each well after purging. Groundwater parameters, including pH, conductivity, temperature, and dissolved oxygen (DO) were monitored during purging. Conductivity, temperature, pH, and turbidity were measured using a Horiba Model U10 meter. Dissolved oxygen was measured using a Hanna Model 9143 DO Meter. Monitoring wells MW-1, MW-4, MW-8, MW-9, MW-10, MW-11, MW-12, MW-13, were not sampled due to the presence of LNAPL.

TOPOGRAPHIC MAP / HOBBS BOOSTER STATION



3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS 950 ft Scale: 1 : 24,000 Detail: 13-0 Datum: WGS84

Hobbs West, Lea County, NM USGS Topographic Quadrangle, 1969



TRIDENT ENVIRONMENTAL
PO Box 7624 Midland, Texas 79708

SITE: HOBBS BOOSTER STATION	
DATE: 03/13/02	REV. NO.: 3
AUTHOR: GJV	DRN BY: GJV
CK'D BY: DTL	SCALE: 1 INCH = 225 FEET

FIGURE 1
GROUNDWATER ELEVATION MAP

Table 1
Summary of Groundwater Elevations
Measurements Obtained on March 13, 2002

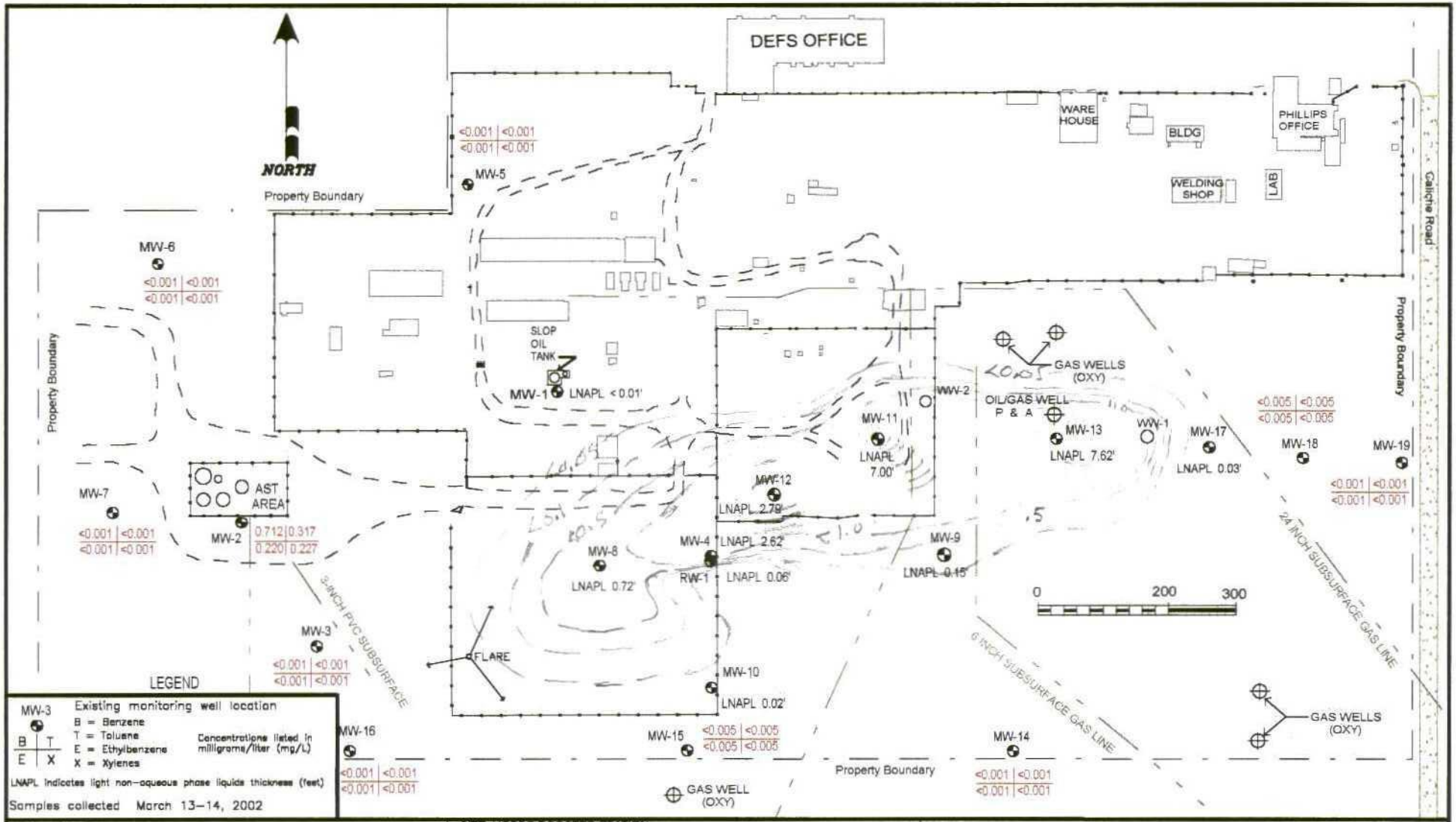
Monitoring Well	Ground Surface Elevation (Feet)	Top of Casing Elevation (Feet)	Depth to Groundwater (Feet)	Depth to LNAPL (Feet)	LNAPL Thickness (Feet)	Corrected Groundwater Elevation (Feet)
MW-1	3623.60	3626.06	47.06	47.06	<0.01	3579.00
MW-2	3620.65	3623.14	42.26	ND	0.00	3580.88
MW-3	3620.08	3623.01	42.53	ND	0.00	3580.48
MW-4	3621.66	3624.29	48.36	45.74	2.62	3577.96
MW-5	3626.30	3629.16	49.35	ND	0.00	3579.81
MW-6	3624.14	3626.93	45.44	ND	0.00	3581.49
MW-7	3618.93	3621.40	39.70	ND	0.00	3581.70
MW-8	3620.84	3623.62	45.38	44.66	0.72	3578.73
MW-9	3622.60	3625.21	49.00	48.85	0.15	3576.31
MW-10	3618.30	3621.07	43.06	43.04	0.02	3578.02
MW-11	3623.05	3625.88	54.90	47.90	7.00	3576.70
MW-12	3623.95	3626.60	51.15	48.36	2.79	3577.73
MW-13	3623.53	3626.30	57.12	49.50	7.62	3575.40
MW-14	3618.76	3621.42	45.36	ND	0.00	3576.06
MW-15	3616.79	3619.39	41.18	ND	0.00	3578.21
MW-16	3619.10	3621.87	41.59	ND	0.00	3580.28
MW-17	3621.36	3623.94	49.72	49.69	0.03	3574.24
MW-18	3621.96	3624.30	50.74	50.74	0.00	3573.56
MW-19	3621.42	3624.12	51.22	ND	0.00	3572.90
RW-1	3621.53	3624.52	46.41	46.35	0.06	3578.16

LNAPL = Light Non-Aqueous Phase Liquid, AMSL = Above Mean Sea Level, ND = Not Detected
Corrected Groundwater Elevation = Casing Elevation - Depth to Groundwater + (LNAPL Thickness x Specific Gravity of LNAPL)
Specific Gravity of LNAPL (MW-4) = 0.7740; Specific Gravity of LNAPL (MW-11) = 0.8165

Water samples were transferred into air-tight, septum-sealed, 40-ml glass VOA sample vials with zero head space for analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8021B. Chain-of-custody (COC) forms documenting sample identification numbers, collection times, and delivery times to the laboratories were completed for each set of samples. The water samples were placed in an ice-filled cooler immediately after collection and shipped to Trace Analysis, Inc. of Lubbock, Texas for laboratory analysis.

Distribution of Hydrocarbons in Groundwater

The most recent total dissolved BTEX concentrations are depicted in Figure 2. A summary of BTEX concentrations in groundwater obtained during the current sampling event is presented in Table 2. The New Mexico Water Quality Control Commission (WQCC) standards are also presented for comparison. Constituents with concentrations above the WQCC standards are highlighted in boldface type. A list of historical BTEX concentrations is provided in Attachment A (Table 3). The laboratory reports and COC documentation are included in Attachment B.



TRIDENT ENVIRONMENTAL
PO Box 7624 Midland, Texas 79708

SITE: HOBBS BOOSTER STATION	
DATE: 03/13-14/02	REV. NO.: 3
AUTHOR: GJV	DRN BY: GJV
CK'D BY: DTL	SCALE: 1 INCH = 225 FEET

FIGURE 2
BTEX CONCENTRATION MAP

Table 2
Summary of BTEX Concentrations
Groundwater Samples Collected on March 13-14, 2002

Monitoring Well	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-2	**0.712**	0.317	0.220	0.227
MW-3	< 0.001	0.006	< 0.001	0.008
MW-5	< 0.001	< 0.001	< 0.001	< 0.001
MW-6	< 0.001	< 0.001	< 0.001	< 0.001
MW-7	< 0.001	< 0.001	< 0.001	< 0.001
MW-14	< 0.001	0.002	< 0.001	0.002
MW-15	< 0.005	< 0.005	< 0.005	< 0.005
MW-16	< 0.001	< 0.001	< 0.001	0.002
MW-18	< 0.005	< 0.005	< 0.005	< 0.005
MW-19	< 0.001	< 0.001	< 0.001	0.002
WQCC Standards	0.010	0.75	0.75	0.62

Analyses performed by Trace Analysis, Inc., Lubbock, Texas using EPA Method 8021B.
Values listed in **boldface** type indicate concentrations exceed New Mexico Water Quality Control Commission (WQCC) standards.

The groundwater samples obtained from monitoring wells MW-3, MW-5, MW-6, MW-7, MW-14, MW-15, MW-16, MW-18, and MW-19 during the latest sampling event had dissolved BTEX concentrations (Table 2) below the WQCC standards. The only concentration that exceeded the WQCC standards was a benzene value of 0.712 mg/L in MW-2. BTEX concentrations in all the sampled monitoring wells have decreased significantly from previous sampling events.

Product Recovery

As of March 14, 2002, a total of approximately 462 gallons of LNAPL (condensate) has been removed from RW-1, MW-4, and MW-8 through MW-18 using a combination of hand bailing, pneumatic pump, oil absorbent sock, and manual product skimming pump (Spill Buddy) recovery methods.

Trident Environmental will notify you and the OCD at least one week prior to the next quarterly sampling event, which is tentatively scheduled for May 2002. We appreciate the opportunity to work with you on this project. Please feel free to call me if you have any questions.

Sincerely,

Gilbert J. Van Deventer, REM
Project Manager

Attachments

ATTACHMENTS

ATTACHMENT A

SUMMARY OF HISTORICAL BTEX CONCENTRATIONS

Table 3
Summary of BTEX Concentrations in Groundwater
Hobbs Booster Station

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-1	06/17/99	**0.232**	0.029	0.168	0.229
	05/11/00	**0.191**	0.034	0.344	0.604
	08/22/00	**0.181**	0.035	0.273	0.450
	10/31/00	**0.197**	0.028	0.285	0.466
	02/05/01	**0.57**	0.020	0.287	0.461
	05/15/01	LNAPL	LNAPL	LNAPL	LNAPL
	08/09/01	LNAPL	LNAPL	LNAPL	LNAPL
	10/11/01	**0.144**	< 0.020	0.236	0.120
	03/13/02	LNAPL	LNAPL	LNAPL	LNAPL
MW-2	06/17/99	**0.934**	**0.993**	0.192	0.359
	05/11/00	**1.33**	**1.22**	0.309	0.501
	08/22/00	**1.42**	**1.38**	0.298	0.541
	10/31/00	**1.02**	0.539	0.235	0.394
	02/05/01	**2.11**	1.07	0.334	0.597
	05/15/01	**0.848**	0.488	0.396	**0.772**
	08/09/01	**1.76**	0.211	0.255	0.452
	10/10/01	**1.30**	0.246	0.314	0.243
	03/13/02	**0.71**	0.317	0.220	0.227
MW-3	06/17/99	**0.262**	0.029	0.222	0.287
	05/11/00	**0.202**	0.022	0.245	0.291
	08/22/00	**0.011**	0.023	0.218	0.264
	10/31/00	< 0.005	0.014	0.203	0.290
	02/05/01	**0.346**	0.009	0.259	0.285
	05/15/01	< 0.001	0.017	0.324	0.346
	08/09/01	**0.345**	< 0.005	0.207	0.316
	10/10/01	**0.029**	< 0.010	0.207	0.146
	03/13/02	< 0.001	< 0.001	< 0.001	< 0.001
MW-5	06/17/99	< 0.005	< 0.005	< 0.005	< 0.005
	05/11/00	< 0.005	< 0.005	< 0.005	< 0.005
	08/22/00	< 0.005	< 0.005	< 0.005	< 0.005
	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
	02/05/01	< 0.005	< 0.005	< 0.005	< 0.005
	05/15/01	< 0.001	< 0.001	< 0.001	< 0.001
	08/09/01	< 0.001	< 0.001	< 0.001	< 0.001
	10/10/01	< 0.001	< 0.001	< 0.001	< 0.001
	03/13/02	< 0.001	< 0.001	< 0.001	< 0.001
MW-6	06/18/99	< 0.005	< 0.005	< 0.005	< 0.005
	05/11/00	< 0.005	< 0.005	< 0.005	0.038
	08/22/00	< 0.005	0.008	< 0.005	0.007
	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
	02/05/01	< 0.005	< 0.005	< 0.005	< 0.005
	05/15/01	< 0.001	< 0.001	< 0.001	< 0.001
	08/09/01	< 0.001	< 0.001	< 0.001	< 0.001
	10/10/01	< 0.001	< 0.001	< 0.001	< 0.001
	03/13/02	< 0.001	< 0.001	< 0.001	< 0.001
WQCC Standards		0.010	0.75	0.75	0.62

Analyses performed by Trace Analysis, Inc., Lubbock, Texas using EPA Method 8021B.

Values listed in **boldface** type indicate concentrations exceed New Mexico Water Quality Control Commission (WQCC) standards.

LNAPL - No sample analyzed due to presence of Light Non-Aqueous Phase Liquid.

MW-4 never analyzed due to presence of LNAPL.

Table 3 (Continued)
Summary of BTEX Concentrations in Groundwater
Hobbs Booster Station

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-7	05/11/00	< 0.005	< 0.005	< 0.005	< 0.005
	08/22/00	< 0.005	0.008	< 0.005	0.008
	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
	02/05/01	< 0.005	< 0.005	< 0.005	< 0.005
	05/15/01	< 0.001	< 0.001	< 0.001	< 0.001
	08/09/01	< 0.001	< 0.001	< 0.001	< 0.001
	10/10/01	< 0.001	< 0.001	< 0.001	< 0.001
	03/13/02	< 0.001	< 0.001	< 0.001	< 0.001
MW-8	05/11/00	**0.824**	< 0.05	0.375	**0.742**
	08/22/00	LNAPL	LNAPL	LNAPL	LNAPL
	10/31/00	LNAPL	LNAPL	LNAPL	LNAPL
	02/05/01	**0.95**	0.008	0.173	0.286
	05/15/01	**0.294**	0.008	0.226	0.340
	08/09/01	**1.23**	< 0.01	0.201	0.449
	10/10/01	LNAPL	LNAPL	LNAPL	LNAPL
	03/13/02	LNAPL	LNAPL	LNAPL	LNAPL
MW-9	05/11/00	**0.702**	0.016	0.096	0.208
	08/22/00	LNAPL	LNAPL	LNAPL	LNAPL
	10/31/00	LNAPL	LNAPL	LNAPL	LNAPL
	02/05/01	LNAPL	LNAPL	LNAPL	LNAPL
	05/15/01	LNAPL	LNAPL	LNAPL	LNAPL
	08/09/01	LNAPL	LNAPL	LNAPL	LNAPL
	10/10/01	LNAPL	LNAPL	LNAPL	LNAPL
	03/13/02	LNAPL	LNAPL	LNAPL	LNAPL
MW-10	05/11/00	LNAPL	LNAPL	LNAPL	LNAPL
	08/22/00	LNAPL	LNAPL	LNAPL	LNAPL
	10/31/00	**0.535**	0.061	0.170	**1.28**
	02/05/01	LNAPL	LNAPL	LNAPL	LNAPL
	05/15/01	LNAPL	LNAPL	LNAPL	LNAPL
	08/09/01	LNAPL	LNAPL	LNAPL	LNAPL
	10/10/01	**1.130**	**0.85**	**0.889**	**2.38**
	03/13/02	LNAPL	LNAPL	LNAPL	LNAPL
MW-14	10/31/00	< 0.005	< 0.005	0.007	< 0.005
	02/05/01	**0.041**	< 0.005	< 0.005	< 0.005
	05/15/01	0.002	< 0.001	0.004	< 0.001
	08/09/01	**0.034**	< 0.005	< 0.005	< 0.005
	10/10/01	**0.029**	< 0.001	0.018	< 0.001
	03/13/02	< 0.001	< 0.001	< 0.001	< 0.001
MW-15	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
	02/05/01	**0.237**	< 0.005	< 0.005	< 0.005
	05/15/01	0.003	0.003	0.004	< 0.001
	08/09/01	**0.353**	< 0.005	< 0.005	< 0.005
	10/10/01	**0.317**	< 0.020	< 0.020	< 0.020
	03/13/02	< 0.005	< 0.005	< 0.005	< 0.005
WQCC Standards		0.010	0.75	0.75	0.62

Analyses performed by Trace Analysis, Inc., Lubbock, Texas using EPA Method 8021B.

Values listed in **boldface** type indicate concentrations exceed New Mexico Water Quality Control Commission (WQCC) standards.

LNAPL - No sample analyzed due to presence of Light Non-Aqueous Phase Liquid.

MW-4 never analyzed due to presence of LNAPL.

Table 3 (Continued)
Summary of BTEX Concentrations in Groundwater
Hobbs Booster Station

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-16	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
	02/05/01	**0.094**	< 0.005	< 0.005	< 0.005
	05/15/01	0.01	0.004	0.003	0.004
	08/09/01	**0.098**	< 0.005	< 0.005	< 0.005
	10/10/01	**0.012**	< 0.001	0.007	0.002
	03/13/02	< 0.001	< 0.001	< 0.001	< 0.001
MW-17	10/31/00	LNAPL	LNAPL	LNAPL	LNAPL
	02/05/01	LNAPL	LNAPL	LNAPL	LNAPL
	05/15/01	LNAPL	LNAPL	LNAPL	LNAPL
	08/09/01	**0.040**	< 0.001	0.057	0.12
	10/10/01	**0.076**	< 0.005	0.101	0.278
	03/13/02	LNAPL	LNAPL	LNAPL	LNAPL
MW-18	10/31/00	< 0.005	< 0.005	0.017	0.143
	02/05/01	< 0.005	< 0.005	< 0.005	< 0.005
	05/15/01	0.004	0.003	0.02	0.009
	08/09/01	0.007	< 0.001	< 0.001	0.030
	10/10/01	**0.036**	< 0.005	0.089	0.238
	03/13/02	< 0.005	< 0.005	< 0.005	< 0.005
MW-19	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
	02/05/01	< 0.005	< 0.005	< 0.005	< 0.005
	05/15/01	0.001	< 0.001	< 0.001	< 0.001
	08/09/01	< 0.005	< 0.005	< 0.005	< 0.005
	10/10/01	**0.035**	< 0.005	< 0.005	< 0.005
	03/13/02	< 0.001	< 0.001	< 0.001	< 0.001
WQCC Standards		0.010	0.75	0.75	0.62

Analyses performed by Trace Analysis, Inc., Lubbock, Texas using EPA Method 8021B..
Values listed in **boldface** type indicate concentrations exceed New Mexico Water Quality Control Commission (WQCC) standards.
LNAPL - No sample analyzed due to presence of Light Non-Aqueous Phase Liquid.
MW-11, MW-12, and MW13 never analyzed due to presence of LNAPL.

ATTACHMENT B

LABORATORY ANALYTICAL REPORTS

AND

CHAIN OF CUSTODY DOCUMENTATION

Summary Report

Gil Van Deventer
Trident Environmental
P.O. Box 7624
Midland, Tx. 79708

Report Date: March 25, 2002

Order ID Number: A02031416

Project Number: CC # V-103
Project Name: Duke Energy Field services
Project Location: Hobbs Booster

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
192804	MW-6	Water	3/13/02	:	3/14/02
192805	MW-7	Water	3/13/02	:	3/14/02
192806	MW-5	Water	3/13/02	:	3/14/02
192807	MW-19	Water	3/13/02	:	3/14/02
192808	MW-16	Water	3/13/02	:	3/14/02
192809	MW-3	Water	3/13/02	:	3/14/02
192810	MW-14	Water	3/13/02	:	3/14/02
192811	Trip Blank	Water	3/13/02	:	3/14/02

0 This report consists of a total of 3 page(s) and is intended only as a summary of results for the sample(s) listed above.

	BTEX				
Sample - Field Code	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	M,P,O-Xylene (ppm)	Total BTEX (ppm)
192804 - MW-6	<0.001	<0.001	<0.001	<0.001	<0.001
192805 - MW-7	<0.001	<0.001	<0.001	<0.001	<0.001
192806 - MW-5	<0.001	<0.001	<0.001	<0.001	<0.001
192807 - MW-19	<0.001	<0.001	<0.001	0.0016	0.0016
192808 - MW-16	<0.001	<0.001	<0.001	0.0021	0.0021
192809 - MW-3	<0.001	<0.001	0.0056	0.0076	0.0132
192810 - MW-14	<0.001	<0.001	0.0022	0.0016	0.0038
192811 - Trip Blank	<0.001	<0.001	<0.001	<0.001	<0.001

Sample: 192804 - MW-6

Param	Flag	Result	Units
ferrous iron	[1]	0.56	mg/L
Nitrate-N		8.30	mg/L
Sulfate	[2]	360	mg/L
Total Iron		<0.050	mg/L
Total Manganese		<0.025	mg/L

[1]Sample was received out of hold time. Ferrous iron should be ran in the field. Sample was tested the day it was received.
[2]Sulfate was re-ran on IC031902A-1.sch (PB18351; QC18951). ICV %IA = 92; CCV %IA = 92; matrix spikes RPD = 0, %EA = 92; LCS spikes RPD = 0, %EA = 92.

This is only a summary. Please, refer to the complete report package for quality control data.

Sample: 192805 - MW-7

Param	Flag	Result	Units
ferrous iron	[3]	0.56	mg/L
Nitrate-N		6.74	mg/L
Sulfate		142	mg/L
Total Iron		<0.050	mg/L
Total Manganese		<0.025	mg/L

Sample: 192806 - MW-5

Param	Flag	Result	Units
ferrous iron	[4]	0.56	mg/L
Nitrate-N		<1.00	mg/L
Sulfate	[5]	496	mg/L
Total Iron		0.360	mg/L
Total Manganese		0.642	mg/L

Sample: 192807 - MW-19

Param	Flag	Result	Units
ferrous iron	[6]	0.56	mg/L
Nitrate-N		<1.00	mg/L
Sulfate		23.8	mg/L
Total Iron		<0.050	mg/L
Total Manganese		0.131	mg/L

Sample: 192808 - MW-16

Param	Flag	Result	Units
ferrous iron	[7]	0.56	mg/L
Nitrate-N		2.80	mg/L
Sulfate		106	mg/L
Total Iron		0.348	mg/L
Total Manganese		0.203	mg/L

Sample: 192809 - MW-3

Param	Flag	Result	Units
ferrous iron	[8]	0.56	mg/L
Nitrate-N		2.60	mg/L
Sulfate		82.8	mg/L
Total Iron		0.836	mg/L
Total Manganese		0.179	mg/L

[3]Sample was received out of hold time. Ferrous iron should be ran in the field. Sample was tested the day it was received.
[4]Sample was received out of hold time. Ferrous iron should be ran in the field. Sample was tested the day it was received.
[5]Sulfate was re-ran on IC031902A-1.sch (PB18351; QC18951). ICV %IA = 92; CCV %IA = 92; matrix spikes RPD = 0, %EA = 92; LCS spikes RPD = 0, %EA = 92.
[6]Sample was received out of hold time. Ferrous iron should be ran in the field. Sample was tested the day it was received.
[7]Sample was received out of hold time. Ferrous iron should be ran in the field. Sample was tested the day it was received.
[8]Sample was received out of hold time. Ferrous iron should be ran in the field. Sample was tested the day it was received.

This is only a summary. Please, refer to the complete report package for quality control data.

Sample: 192810 - MW-14

Param	Flag	Result	Units
ferrous iron	[9]	0.56	mg/L
Nitrate-N		<1.00	mg/L
Sulfate		31.9	mg/L
Total Iron		0.334	mg/L
Total Manganese		0.0592	mg/L

[9]Sample was received out of hold time. Ferrous iron should be ran in the field. Sample was tested the day it was received.

Summary Report

Gil Van Deventer
Trident Environmental
P.O. Box 7624
Midland, Tx. 79708

Report Date: March 20, 2002

Order ID Number: A02031512

Project Number: CC # V-103
Project Name: Duke Energy Field services
Project Location: Hobbs Booster

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
192973	MW-15	Water	3/13/02	15:40	3/15/02
192974	MW-2	Water	3/13/02	16:40	3/15/02
192975	MW-18	Water	3/13/02	8:40	3/15/02
192976	Duplicate	Water	3/13/02	17:40	3/15/02
192977	Rinsate	Water	3/13/02	17:00	3/15/02

0 This report consists of a total of 2 page(s) and is intended only as a summary of results for the sample(s) listed above.

	BTEX				
Sample - Field Code	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	M,P,O-Xylene (ppm)	Total BTEX (ppm)
192973 - MW-15	<0.005	<0.005	0.0376	<0.005	0.0376
192974 - MW-2	0.712	0.317	0.220	0.227	1.476
192975 - MW-18	<0.005	<0.005	<0.005	<0.005	<0.005
192976 - Duplicate	0.732	0.341	0.241	0.252	1.566
192977 - Rinsate	<0.005	<0.005	<0.005	<0.005	<0.005

Sample: 192973 - MW-15

Param	Flag	Result	Units
ferrous iron	[1]	0.56	mg/L
Nitrate-N		<1.00	mg/L
Sulfate	[2]	<2.00	mg/L
Total Iron		7.91	mg/L
Total Manganese		0.236	mg/L

Sample: 192974 - MW-2

Param	Flag	Result	Units
ferrous iron	[3]	0.56	mg/L
Nitrate-N		<1.00	mg/L

Continued on next page ...

[1]Sample was received out of hold time. Test should be ran in the field. Sample was tested as soon as it came in.
[2]Sulfate was re-ran on IC031902A-1.sch (PB18351; QC18951). ICV %IA = 92; CCV %IA = 92; matrix spikes RPD = 0, %EA = 92; LCS spikes RPD = 0, %EA = 92.
[3]Sample was received out of hold time. Test should be ran in the field. Sample was tested as soon as it came in.

Sample 192974 continued ...

Param	Flag	Result	Units
Sulfate		30.5	mg/L
Total Iron		2.13	mg/L
Total Manganese		0.202	mg/L

Sample: 192975 - MW-18

Param	Flag	Result	Units
ferrous iron	[4]	0.56	mg/L
Nitrate-N		<1.00	mg/L
Sulfate		14.9	mg/L
Total Iron		<0.050	mg/L
Total Manganese		0.110	mg/L

[4]Sample was received out of hold time. Test should be ran in the field. Sample was tested as soon as it came in.

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
155 McCutcheon, Suite H El Paso, Texas 79932 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Gil Van Deventer
Trident Environmental
P.O. Box 7624
Midland, Tx. 79708

Report Date: March 20, 2002

Order ID Number: A02031512

Project Number: CC # V-103
Project Name: Duke Energy Field services
Project Location: Hobbs Booster

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
192973	MW-15	Water	3/13/02	15:40	3/15/02
192974	MW-2	Water	3/13/02	16:40	3/15/02
192975	MW-18	Water	3/13/02	8:40	3/15/02
192976	Duplicate	Water	3/13/02	17:40	3/15/02
192977	Rinsate	Water	3/13/02	17:00	3/15/02

0
These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed. Note: the RDL is equal to MQL for all organic analytes including TPH.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 192973 - MW-15

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18928	Date Analyzed:	3/19/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB18328	Date Prepared:	3/19/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		0.0376	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		0.0376	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.090	mg/L	5	0.10	90	70 - 130
4-BFB		0.092	mg/L	5	0.10	92	70 - 130

Sample: 192973 - MW-15

Analysis:	Ferrous Iron	Analytical Method:	Hach IR-1	QC Batch:	QC18887	Date Analyzed:	3/15/02
Analyst:	JSW	Preparation Method:	N/A	Prep Batch:	PB18292	Date Prepared:	3/15/02

Param	Flag	Result	Units	Dilution	RDL
ferrous iron	[1]	0.56	mg/L	1	0.01

Sample: 192973 - MW-15

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC18897	Date Analyzed:	3/15/02
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB18300	Date Prepared:	3/15/02

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		<1.00	mg/L	5	0.20
Sulfate	[2]	<2.00	mg/L	1	0.50

Sample: 192973 - MW-15

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC18933	Date Analyzed:	3/19/02
Analyst:	RR	Preparation Method:	S 3010A	Prep Batch:	PB18278	Date Prepared:	3/18/02

Param	Flag	Result	Units	Dilution	RDL
Total Iron		7.91	mg/L	1	0.05
Total Manganese		0.236	mg/L	1	0.02

[1]Sample was received out of hold time. Test should be ran in the field. Sample was tested as soon as it came in.

[2]Sulfate was re-ran on IC031902A-1.sch (PB18351; QC18951). ICV %IA = 92; CCV %IA = 92; matrix spikes RPD = 0, %EA = 92; LCS spikes RPD = 0, %EA = 92.

Sample: 192974 - MW-2

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18899	Date Analyzed:	3/18/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB18302	Date Prepared:	3/18/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.712	mg/L	10	0.001
Toluene		0.317	mg/L	10	0.001
Ethylbenzene		0.220	mg/L	10	0.001
M,P,O-Xylene		0.227	mg/L	10	0.001
Total BTEX		1.476	mg/L	10	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.095	mg/L	10	0.10	95	70 - 130
4-BFB		0.094	mg/L	10	0.10	94	70 - 130

Sample: 192974 - MW-2

Analysis:	Ferrous Iron	Analytical Method:	Hach IR-1	QC Batch:	QC18887	Date Analyzed:	3/15/02
Analyst:	JSW	Preparation Method:	N/A	Prep Batch:	PB18292	Date Prepared:	3/15/02

Param	Flag	Result	Units	Dilution	RDL
ferrous iron	[3]	0.56	mg/L	1	0.01

Sample: 192974 - MW-2

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC18897	Date Analyzed:	3/15/02
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB18300	Date Prepared:	3/15/02

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		<1.00	mg/L	5	0.20
Sulfate		30.5	mg/L	5	0.50

Sample: 192974 - MW-2

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC18933	Date Analyzed:	3/19/02
Analyst:	RR	Preparation Method:	S 3010A	Prep Batch:	PB18278	Date Prepared:	3/18/02

Param	Flag	Result	Units	Dilution	RDL
Total Iron		2.13	mg/L	1	0.05
Total Manganese		0.202	mg/L	1	0.02

Sample: 192975 - MW-18

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18899	Date Analyzed:	3/18/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB18302	Date Prepared:	3/18/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001

Continued ...

[3]Sample was received out of hold time. Test should be ran in the field. Sample was tested as soon as it came in.

... *Continued* Sample: 192975 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.090	mg/L	5	0.10	90	70 - 130
4-BFB		0.091	mg/L	5	0.10	91	70 - 130

Sample: 192975 - MW-18

Analysis: Ferrous Iron Analytical Method: Hach IR-1 QC Batch: QC18887 Date Analyzed: 3/15/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB18292 Date Prepared: 3/15/02

Param	Flag	Result	Units	Dilution	RDL
ferrous iron	[4]	0.56	mg/L	1	0.01

Sample: 192975 - MW-18

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC18897 Date Analyzed: 3/15/02
Analyst: JS Preparation Method: N/A Prep Batch: PB18300 Date Prepared: 3/15/02

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		<1.00	mg/L	5	0.20
Sulfate		14.9	mg/L	5	0.50

Sample: 192975 - MW-18

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC18933 Date Analyzed: 3/19/02
Analyst: RR Preparation Method: S 3010A Prep Batch: PB18278 Date Prepared: 3/18/02

Param	Flag	Result	Units	Dilution	RDL
Total Iron		<0.050	mg/L	1	0.05
Total Manganese		0.110	mg/L	1	0.02

Sample: 192976 - Duplicate

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC18899 Date Analyzed: 3/18/02
Analyst: CG Preparation Method: S 5030B Prep Batch: PB18302 Date Prepared: 3/18/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.732	mg/L	5	0.001
Toluene		0.341	mg/L	5	0.001
Ethylbenzene		0.241	mg/L	5	0.001
M,P,O-Xylene		0.252	mg/L	5	0.001
Total BTEX		1.566	mg/L	5	0.001

[4]Sample was received out of hold time. Test should be ran in the field. Sample was tested as soon as it came in.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.092	mg/L	5	0.10	92	70 - 130
4-BFB		0.095	mg/L	5	0.10	95	70 - 130

Sample: 192977 - Rinsate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18899	Date Analyzed:	3/18/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB18302	Date Prepared:	3/18/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.087	mg/L	5	0.10	87	70 - 130
4-BFB		0.089	mg/L	5	0.10	89	70 - 130

Quality Control Report
Method Blank

Method Blank QCBatch: QC18887

Param	Flag	Results	Units	Reporting Limit
ferrous iron		0.56	mg/L	0.01

Method Blank QCBatch: QC18897

Param	Flag	Results	Units	Reporting Limit
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<2.0	mg/L	0.50

Method Blank QCBatch: QC18899

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.096	mg/L	1	0.10	96	70 - 130
4-BFB		0.093	mg/L	1	0.10	93	70 - 130

Method Blank QCBatch: QC18928

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0923	mg/L	1	0.10	92	70 - 130
4-BFB		0.0925	mg/L	1	0.10	92	70 - 130

Method Blank

QCBatch: QC18933

Param	Flag	Results	Units	Reporting Limit
Total Iron		0.0863	mg/L	0.05
Total Manganese		<0.025	mg/L	0.02

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC18897

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	11.92	11.94	mg/L	1	12.50	<2.0	95	0	90 - 110	20
Fluoride	2.29	2.30	mg/L	1	2.50	<0.2	91	0	90 - 110	20
Nitrate-N	2.35	2.33	mg/L	1	2.50	<0.2	94	0	90 - 110	20
Sulfate	12.29	12.41	mg/L	1	12.50	<2.0	98	0	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes

QCBatch: QC18899

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0902	0.0909	mg/L	1	0.10	<0.001	90	1	82 - 111	20
Benzene	0.095	0.0972	mg/L	1	0.10	<0.001	95	2	86 - 106	20
Toluene	0.0959	0.0974	mg/L	1	0.10	<0.001	96	2	82 - 108	20
Ethylbenzene	0.0975	0.0989	mg/L	1	0.10	<0.001	98	1	86 - 115	20
M,P,O-Xylene	0.291	0.294	mg/L	1	0.30	<0.001	97	1	79 - 122	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0886	0.0908	mg/L	1	0.10	89	91	70 - 130
4-BFB	0.0912	0.0934	mg/L	1	0.10	91	93	70 - 130

Laboratory Control Spikes

QCBatch: QC18928

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.101	0.0986	mg/L	1	0.10	<0.001	101	2	82 - 111	20
Benzene	0.100	0.101	mg/L	1	0.10	<0.001	100	1	86 - 106	20
Toluene	0.101	0.101	mg/L	1	0.10	<0.001	101	0	82 - 108	20
Ethylbenzene	0.103	0.104	mg/L	1	0.10	<0.001	103	1	86 - 115	20
M,P,O-Xylene	0.307	0.308	mg/L	1	0.30	<0.001	102	0	79 - 122	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0913	0.0912	mg/L	1	0.10	91	91	70 - 130
4-BFB	0.0946	0.0943	mg/L	1	0.10	95	94	70 - 130

Laboratory Control Spikes

QCBatch: QC18933

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Iron	0.559	0.632	mg/L	1	0.50	0.0863	111	12	75 - 125	20
Total Manganese	0.254	0.254	mg/L	1	0.25	<0.025	101	0	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report
Matrix Spikes and Duplicate Spikes

Matrix Spikes

QCBatch: QC18897

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Nitrate-N	[5] 24.69	[6] 24.49	mg/L	1	25	<1.00	98	0	84 - 105	20
Sulfate	[7] 152.57	[8] 150.67	mg/L	1	125	14.9	110	1	79 - 104	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

QCBatch: QC18933

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Iron	[9] 8.19	8.21	mg/L	1	0.50	7.91	55	6	75 - 125	20
Total Manganese	0.451	0.450	mg/L	1	0.25	0.236	86	0	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC18897

[5]The *10 dilution was used for the matrix spikes, but the *5 dilution was reported.
[6]The *10 dilution was used for the matrix spikes, but the *5 dilution was reported
[7]The *10 dilution was used for the matrix spikes, but the *5 dilution was reported. The correct %Rec = 99.
[8]The *10 dilution was used for the matrix spikes, but the *5 dilution was reported. The correct %Rec = 97.
[9]Matrix spike recovery low due to matrix problems. LCS demonstrates process under control.

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.93	95	90 - 110	3/15/02
Fluoride		mg/L	2.50	2.30	92	90 - 110	3/15/02
Nitrate-N		mg/L	2.50	2.36	94	90 - 110	3/15/02
Sulfate		mg/L	12.50	12.46	99	90 - 110	3/15/02

ICV (1)

QCBatch: QC18897

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.87	94	90 - 110	3/15/02
Fluoride		mg/L	2.50	2.34	93	90 - 110	3/15/02
Nitrate-N		mg/L	2.50	2.35	94	90 - 110	3/15/02
Sulfate		mg/L	12.50	12.43	99	90 - 110	3/15/02

CCV (1)

QCBatch: QC18899

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0927	93	85 - 115	3/18/02
Benzene		mg/L	0.10	0.0935	93	85 - 115	3/18/02
Toluene		mg/L	0.10	0.0937	94	85 - 115	3/18/02
Ethylbenzene		mg/L	0.10	0.0958	96	85 - 115	3/18/02
M,P,O-Xylene		mg/L	0.30	0.284	95	85 - 115	3/18/02

CCV (2)

QCBatch: QC18899

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.097	97	85 - 115	3/18/02
Benzene		mg/L	0.10	0.094	94	85 - 115	3/18/02
Toluene		mg/L	0.10	0.093	93	85 - 115	3/18/02
Ethylbenzene		mg/L	0.10	0.095	95	85 - 115	3/18/02
M,P,O-Xylene		mg/L	0.30	0.284	94	85 - 115	3/18/02

ICV (1)

QCBatch: QC18899

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0967	97	85 - 115	3/18/02
Benzene		mg/L	0.10	0.100	100	85 - 115	3/18/02
Toluene		mg/L	0.10	0.100	100	85 - 115	3/18/02

Continued ...

... Continued

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Ethylbenzene		mg/L	0.10	0.102	102	85 - 115	3/18/02
M,P,O-Xylene		mg/L	0.30	0.305	102	85 - 115	3/18/02

CCV (1)

QCBatch: QC18928

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0996	100	85 - 115	3/19/02
Benzene		mg/L	0.10	0.0975	98	85 - 115	3/19/02
Toluene		mg/L	0.10	0.0965	96	85 - 115	3/19/02
Ethylbenzene		mg/L	0.10	0.0994	99	85 - 115	3/19/02
M,P,O-Xylene		mg/L	0.30	0.294	98	85 - 115	3/19/02

CCV (2)

QCBatch: QC18928

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.099	99	85 - 115	3/19/02
Benzene		mg/L	0.10	0.094	94	85 - 115	3/19/02
Toluene		mg/L	0.10	0.095	95	85 - 115	3/19/02
Ethylbenzene		mg/L	0.10	0.098	98	85 - 115	3/19/02
M,P,O-Xylene		mg/L	0.30	0.29	96	85 - 115	3/19/02

ICV (1)

QCBatch: QC18928

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.093	93	85 - 115	3/19/02
Benzene		mg/L	0.10	0.0898	90	85 - 115	3/19/02
Toluene		mg/L	0.10	0.0909	91	85 - 115	3/19/02
Ethylbenzene		mg/L	0.10	0.0943	94	85 - 115	3/19/02
M,P,O-Xylene		mg/L	0.30	0.281	94	85 - 115	3/19/02

CCV (1)

QCBatch: QC18933

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Iron		mg/L	1	1.02	102	90 - 110	3/19/02
Total Manganese		mg/L	0.50	0.508	101	90 - 110	3/19/02

ICV (1)

QCBatch: QC18933

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Iron		mg/L	1	1.01	101	90 - 110	3/19/02
Total Manganese		mg/L	0.50	0.496	99	90 - 110	3/19/02

HU203512

TRIDENT ENVIRONMENTAL

Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (fax)

V-103-0302-2

Chain of Custody

Date 3-14-02 Page 2 of 2

Lab Name: Trace Analysis Inc.
Address: 6701 Aberdeen, Suite 9
Lubbock, Texas 79424
Telephone: (806) 794-1296

Samplers (SIGNATURES): Gil Van Deventer

Sample Identification	Matrix	Date	Time	Sample Type: G - Grab, C - Composite	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	TCLP Metals	Total Metals	Sulfate, Nitrate, & Ferric Iron	Ferric Iron & Manganese	Number of Containers
MW-15 192973	Water	3-13-02	1540		✓														✓	✓	4
MW-2 74	Water	3-13-02	1640		✓														✓	✓	4
MW-18 75	Water	3-14-02	0840		✓	1 voa rc'd broken													✓	✓	4 3
Duplicate 76	Water	3-13-02	1740		✓																2
Rinsate 77	Water	3-13-02	1700		✓																2

Project Information

Project Name:	Duke Energy Field Services
Project Location:	Hobbs Booster Station
Project Manager:	Gil Van Deventer
Cost Center No.:	V-103
Shipping ID No.:	
Bill to (see below):	

Sample Receipt

Total Containers:	
COC Seals:	
Rec'd Good Cond/Cold:	
Conforms to Records:	
Lab No.:	

Special Instructions/Comments: Please send invoice direct to client:
Duke Energy Field Svcs, Attn: Steve Weathers, PO Box 5493, Denver, CO 80217

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental	TRACE ANALYSIS	
(Printed Name) Gil Van Deventer	(Printed Name) HELEN SHELTON	(Printed Name)
(Signature) Gil Van Deventer	(Signature) Helen Shelton	(Signature)
(Date) 3-14-02 (Time) 5:50pm	(Date) 3/14/02 (Time) 1830	(Date) (Time)
Received By: (1) (Company)	**Received By: (2) (Company)**	**Received By: (3) (Company)**
TRACE ANALYSIS		TRACE Analysis
(Printed Name) HELEN SHELTON	(Printed Name)	(Printed Name) Vicki Hanstey
(Signature) Helen Shelton	(Signature)	(Signature) Vicki Hanstey
(Date) 3/14/02 (Time) 5:50 PM	(Date) (Time)	(Date) 3-15-02 (Time) 10:00

Copy signed original form for Trident Environmental records

ns 2° Bus GLI 1250 3/20/02 P+F

	Week											
	1	2	3	4	5	6	7	8	9	10	11	12
FIELD CHARACTERIZATION AND DATA ANALYSES												
Installation of Perimeter Monitoring Wells	X											
Installation of Product Characterization Wells	X	X										
Groundwater Sampling	X											
Aquifer Testing			X									
Additional Laboratory Testing			X	X	X	X						
Optional Product Recovery Test			X	X	X	X	X	X	X	X	X	X
Data Review and Validation							X					
Data Analysis							X	X				
BOUNDARY CONTROL PROGRAM												
Preparation of Boundary Control CAP				X	X							
ODC Review						X	X					
Design of boundary control system				X	X	X	X					
Begin implementation of CAP (contractor procurement)							X	X				
System Construction									X	X	X	
FREE PRODUCT REMOVAL PROGRAM												
Identification of Additional Data Needs								X				
Preparation of Supplemental Workplan									X			
Completion of Additional Field Work (if necessary)										X	X	
Begin Preparation of Free Product Removal CAP												X

Note: Start time based upon OCD approval and scheduling of contractors.

Figure 14 – Proposed Project Schedule

Hobbs Booster Station, Lea County New Mexico (GW-0444)

Duke Energy Field Services

DRAWN BY: MHS

REVISED:

DATE: 2/02

Duke Energy Field Services, LP

P.O. Box 5493
Denver, Colorado 80217
370 17th Street, Suite 900
Denver, Colorado 80202
Direct: 303-595-3331
Fax: 303-893-8902

RECEIVED
MAR 25 2002
Environmental Bureau
Oil Conservation Division

March 22, 2002

Mr. Jack Ford
New Mexico Oil Conservation Division
1220 S. St. Francis Dr.
Santa Fe, NM 87505

RE: Workplan for Additional Site Characterization and Design of a Comprehensive Remediation System for the Hobbs Booster Station (GW-044), Lea County New Mexico

Dear Mr. Ford:

Per your request in the letter dated February 21, 2002, Duke Energy Field Services, LP (DEFS) is pleased to submit for your review, two copies of the Workplan for Additional Site Characterization and Design of a Comprehensive Remediation System for the Hobbs Booster Station located in Hobbs, New Mexico.

Upon your approval of the above mentioned workplan, DEFS will schedule the field activities. If you have any questions regarding the report, please call me at 303-605-1718.

Sincerely

Duke Energy Field Services, LP

Stephen Weathers ms

Stephen Weathers
Environmental Specialist

Enclosure

cc: Paul Sheeley, OCD Hobbs District
Environmental Files

Remediacon Incorporated
Geological and Engineering Services
remediacon@yahoo.com

PO Box 302, Evergreen, Colorado 80439
Telephone: 303.674.4370
Facsimile: 617.507.6178

March 22, 2002

Mr. Stephen Weathers
Duke Energy Field Services, LP
370 17th Street, Suite 900
Denver, CO 80202

Re: Workplan to Collect Data for Site Characterization and Design of a Comprehensive Remediation System for the Hobbs Booster Station, Lea County, New Mexico (ODC# GW-044)

Dear Stephen:

Duke Energy Field Services, LP (Duke) retained Remediacon to review and analyze the data for the Duke Hobbs Booster Station, formulate a conceptual remedation program, identify data deficiencies and prepare a workplan to address the deficiencies. This letter presents the results of the program.

The document includes the following sections:

- A brief summary of relevant background information;
- A discussion of the conceptual remediation program and the associated data deficiencies; and
- A description of the activities that must be completed before a CAP can be prepared.

BACKGROUND INFORMATION

Site activities began in June 1999 when Trident Environmental (Trident, formerly TRW) installed wells MW-1 through MW-6. Additional wells were installed by Trident in May 2000 (MW-7 through MW-11 and RW-1) and October 2000 (MW-12 through MW-19). Figure 1 shows the locations of the monitoring wells and recovery well RW-1. Table 1 summarizes well construction information.

Trident has also completed seven episodes of groundwater monitoring. Free hydrocarbon product is present on the groundwater beneath part of the site. Dissolved hydrocarbon compounds are also present in the groundwater beneath much of the site. The remainder of this section discusses the topics of free product distribution, the groundwater setting and the distribution of dissolved hydrocarbons.

Free Product Distribution

Floating hydrocarbons have been measured in 10 monitoring wells. The product thicknesses measured in each well in March 2002 are shown on Figure 2. The wells can

be grouped by relative thickness. Wells MW-4, MW-11, MW-12 and MW-13 currently contain more than 2 feet of floating product. Wells MW-8 and MW-9 contain more than 0.1 foot of product. Wells MW-1, MW-10 MW-17 and MW-18 have measured product thicknesses of less than ¼ inch (0.03 feet). Note that the area containing free product is well defined on the south, partially defined on the east and west, and undefined on the north.

Figure 3 shows the changes in product thickness in time in wells MW-4, MW-11, MW-12 and MW-13. Examination of Figure 3 indicates that the thickness in well MW-4 has remained essentially constant. This consistency may result from the presence of an active product removal system in RW-1, located approximately 8 feet to the south. The thicknesses in wells MW-11 and MW-12 increased by between approximately 1.5 and 1.75 feet between February 2001 and March 2002. The thickness in MW-13 has increased by approximately 6.5 feet. It is important to remember that these values, as measured in wells, do not represent the actual product thicknesses on top of the water; however, they do demonstrate that the product appears to be increasing in thickness in the three wells that do not have active free product removal.

Remediacon completed product bail-down tests in December 2001. The product in RW-1, MW-4, MW-11, MW-12 and MW-13 was bailed down to a constant thickness and the resulting inflow of product to the well was measured over time. The results are shown graphically on Figures 4 through 8. These tests cannot be used to predict long-term removal rates but they do provide an indication of the relationship between the product and the materials containing the product.

Examination of the above figures indicates that the product-recovery response was different in MW-4 and RW-1 (Figures 4 and 5), than it was in MW-11, MW-12 and MW-13 (Figures 6,7 and 8). The recovery rates on MW-4 and RW-1 were higher than the rates for MW-11, MW-12 and MW13. In addition, MW-4 and RW-1 exhibited complete recovery over the approximate 12 hour test period while the recovery in wells MW-11, MW-12 and MW-13 varied between 25 and 50 percent. The recovery differences probably result from differing product properties (density and viscosity), material property differences, or a combination of both.

Groundwater Setting

The groundwater gradient at this site based upon historical measurements is consistent from west to east at an approximate gradient of 0.004 feet per foot based upon the Trident data. This gradient has remained constant over the 2 ½ years of site characterization and monitoring activities. The water levels beneath the site appear to be uniformly declining at a rate of approximately 0.5 feet per year.

Remediacon completed a 9-hour aquifer test in December 2001. The test involved extracting water from RW-1 and measuring the response in both RW-1 and MW-4. Remediacon also measured depths to water in wells MW-8 and MW-12 during the test

but neither of these wells exhibited any response to the pumping of RW-1. Analysis of the data indicated that the saturated materials in the vicinity of RW-1/MW-4 have a hydraulic conductivity of approximately 15 feet per day. This value is considered to be moderately high but is probably representative of the subsurface materials given their granular nature.

Distribution Of Dissolved Hydrocarbons

This section describes the distribution of dissolved hydrocarbons based upon benzene. Benzene was selected because it is generally the primary constituent of concern because of its higher toxicity relative to other hydrocarbon compounds.

The benzene concentrations from the October 2001 monitoring episode are shown on Figure 9. The results indicate that benzene is present in the groundwater at the south boundary in wells MW-14, MW-15 and MW-16 and near (within 80 feet) of the east boundary at well MW-19.

The measured benzene concentrations in wells MW-14, MW-15 and MW-16 over time are depicted in Figure 10. These wells have been installed for five monitoring episodes, and the results indicate that the concentrations in wells MW-14 and MW-16 fluctuate seasonally. Well MW-15 also exhibits seasonal fluctuation, but the August 2001 concentration falls well above the prior measured concentrations.

The benzene concentrations for wells MW-17, MW-18 and MW-19 are summarized below:

Benzene	10/31/00	2/5/01	5/15/01	8/9/01	10/19/01
MW-17	NS	NS	NS	0.04	0.076
MW-18	<.005	<.005	0.004	0.007	0.036
MW-19	<.005	<.005	0.001	<.005	0.035

Note: All concentrations in ug/l: NS, well not sampled due to LNAPL

The benzene concentrations in these wells do not exhibit seasonal variation. Instead the benzene concentrations increased from below 0.005 mg/l to .035 mg/l in slightly less than two months.

The differing concentration behaviors between the southern and eastern wells indicate that they may be affected by different plumes. In addition, the eastward groundwater flow pattern indicates that advective transport should be primarily toward the eastern boundary with dispersion governing the transport of hydrocarbons across the southern boundary.

CONCEPTUAL REMEDIATION PROGRAM AND DATA DEFICIENCIES

The scope of the initial components of the remediation program are dictated by the presence of a potentially-large volume of free product and dissolved-phase hydrocarbons at elevated concentrations along the southern and near the eastern property boundaries. The mobile free product must be collected before other source-abatement options can even be considered. In addition, removal of dissolved-phase hydrocarbons must begin at the southern and eastern boundaries to prevent further offsite migration and permit natural offsite attenuation of any existing hydrocarbon constituents.

Remediacon has completed a preliminary evaluation of the potential remediation options for both free product removal and boundary groundwater control. This section describes the status of the evaluation process and the resulting data deficiencies identified for each one. The section that immediately follows proposes a field program to collect data to satisfy the deficiencies.

Free Product Removal

All of the mobile free product must be removed before supplementary technologies such as soil venting or bioremediation can become potentially effective. Remediacon evaluated two options to identify data deficiencies that must be satisfied before a final decision on the appropriate technology can be made. The first option is to remove only the mobile free product using closely-spaced collection points and product-only pumps. The second option is to extract groundwater to establish enhanced product migration pathways to a limited number of extraction points. Considerations for each option are described below.

Removal of only free product is generally limited to small areas unless a trench is used; however, the depth to the product at this location precludes the use of a trench(es). This limitation generally originates from the inability of the free product to move laterally because of the composition of the matrix it must pass through. This option may be viable at the Hobbs Booster Station Site because of the relatively high intrinsic hydraulic conductivity of the materials coupled with the potential that the product-saturated materials contain relatively low percentages of silts and clays (fines). If: 1) the thickness of the mobile product approaches the thickness measured in the wells; 2) the hydraulic conductivity in the vicinity of wells MW-11, MW-12 and MW-13 is similar to that measured at MW-4; and 3) the percentage of fines in the product-saturated materials is limited, then Duke may be able to extract a significant volume of product with a reasonable number of wells without having to extract groundwater. The data deficiencies that must be addressed before this technology can be more fully evaluated include:

1. The extent of the area with free product, particularly the area north towards the existing plant.

2. The relationship between the thickness of product in the wells and the actual thickness of the saturated materials.

3. The ability of the product-saturated materials to transmit product laterally to extraction points.

4. The relationship between product thickness and the resulting radius of product removal if it is extracted to a resulting nominal product thickness at the well.

Removal of free product by extracting groundwater to form hydraulic low regions for the product to migrate to for capture is the more traditional removal technique for larger areas. This method should work at this location; however, the relatively high hydraulic conductivity may result in the generation large volumes of water that would have to be managed.

The data deficiencies that must be addressed before this technology can be more fully evaluated include:

1. The extent of the area with free product, particularly the area north towards the existing plant.

2. The relationship between the thickness of product in the wells and the actual thickness of the saturated materials.

3. The hydraulic conductivity of the water saturated zone to accurately estimate the rate of water that would have to be extracted to establish the product collection points based upon an optimized spacing.

4. The inorganic composition of the groundwater to evaluate what, if any, treatment would be necessary to potentially reinject the groundwater at an upgradient location to form a closed-loop system.

5. The concentrations of dissolved hydrocarbons in the groundwater where free product is present.

Boundary Control

The removal of the dissolved hydrocarbon constituents, such as at the boundary of the Hobbs Booster Station, is typically completed by volatizing the amenable compounds and/or enhancing natural aerobic biodegradation through the introduction of oxygen. The only additional data that must be collected before any boundary control system can be designed is the completion of the boundary characterization activities by installing wells in the southeastern corner of the property and at the property boundary approximately 75 feet due east of existing well MW-19.

Remediacon evaluated two potential remediation technologies. The first technology, air sparging, could be implemented at the site following the completion of a pilot test to calculated the radius of influence for an individual sparge well.

The second technology involves the introduction of oxygen into the groundwater to increase and sustain aerobic biodegradation. Historic methods have relied upon injection of chemicals in a liquid media directly into wells on a regular basis or the introduction of oxygen release compounds that rely on advective groundwater transport and diffusion to deliver the oxygen to the affected groundwater.

A new technology was recently developed that oxygenates the water to a greater degree than most other technologies and then distributes it by vertical recirculation within the well. A schematic of the process that was taken directly from the manufacturer's web site (http://www.environmentalh2o.com/isogen/index2.html) is shown on Figure 10. The system pulls water in from the bottom of the well, oxygenates it using electrolysis as it passes up through the well bore and then reinjects the water into the saturated materials at the top of the bore without ever removing it from the well. This vertical circulation scheme results in the establishment of a radial convection cell that greatly enhances the distribution of the oxygenated water into the saturated materials. The manufacturer indicates that a 100-foot radius of influence is possible in materials with high hydraulic conductivities such as those in the saturated materials beneath the site. The manufacturer also indicated that no additional site-specific information is needed to complete the design of the system.

A more detailed discussion of the Iso-Gen product can be found at the above web page. More detailed information on both the system and the site-specific design will also be provided in the CAP should OCD approve use of this system.

FIELD PROGRAM DESCRIPION

The following deficiencies, described above, have been identified and must be filled before the CAP can be prepared:

1. The area with free product must be delineated;

2. The relationship between the thickness of product in the wells and the actual thickness of the saturated materials must be evaluated.

3. The ability of the product-saturated materials to transmit product laterally to extraction points must be evaluated.

4. The radius of product removal must be assessed for a product only system.

5. The hydraulic conductivity of the water saturated zone must be measured in the vicinity of wells MW-11, MW-12 and MW-13.

6. The inorganic composition of the groundwater must be measured.

7. The concentrations of dissolved hydrocarbons must be measured in the groundwater where free product is present.

8. The delineation of dissolved phase plume must be completed on the southeastern and eastern property boundaries.

The above deficiencies will be addressed by completing a field program that includes the following components:

- Installation of monitoring wells
- Supplementary groundwater sampling
- Aquifer testing
- Laboratory testing of samples
- Optional Long-Term Product Recovery Test

The objectives and procedures for each component are described below.

Installation Of Monitoring Wells

Ten monitoring wells will be installed at the site. The proposed locations are shown on Figure 12. The two wells labeled MW-20 and MW-21 will be used to complete down-gradient boundary characterization (deficiency 8 above). The remaining eight wells, labeled A thorough H on Figure 12, will be used to delineate the extent of free product (deficiency 1 above). Additional free product characterization wells may be installed if necessary.

All 10 wells will be installed using the protocols used to install the previous 19 wells. Wells MW-20 and MW-21 will be completed with 2-inch Schedule 40 PVC casing. The free product characterization wells will be completed with 4-inch Schedule 40 PVC casing in case they are later used to remove free product.

Supplementary Groundwater Sampling

Supplementary groundwater sampling will be completed to fulfill deficiencies 6, 7 and 8. Samples will be collected from wells MW-20 and MW-21 using the development and sampling protocols established for this site. The two samples will be analyzed for benzene, toluene, ethylbenzene and xylenes (BTEX).

Samples will also be collected from wells RW-1, MW-12, MW-13 and two additional wells completed with 4-inch casing. These wells will be sampled in the following manner:

1. Two-inch diameter PVC casing will be placed in the well to a depth below the base of the measured free product.

2. The product inside the 2-inch casing will be removed using a disposable bailer. The fact that then bottom of the casing is below the water table prevents any additional product from entering the 2-inch casing.

3. A two-stage 12-volt submersible pump with disposable tubing will be inserted through the PVC casing to a depth approximately 1-foot above the bottom of the well.

4. The well will be purged and a sample collected using the sampling protocols established for this site.

The samples from these wells will be analyzed for calcium, magnesium, sodium, potassium, manganese, iron, chloride, floride, sulfate, carbonate, bicarbonate, silica, total dissolved solids, benzene, toluene, ethylbenzene and xylenes

Aquifer Testing

An aquifer test will be completed using well MW-13 to address deficiency 5 and to assess whether the permeability in the area of MW-11 and MW-13 is similar to the materials tapped by RW-1/MW-4. In addition, a more complete test that that conducted on RW-1 is necessary to more accurately design a free product removal system that includes the extraction, and perhaps reinjection, of groundwater.

The proposed test layout is shown on Figure 13. Well MW-13 was selected because it lies within the area containing the free product, it is a 4-inch well and it is completed to a depth of 69 feet so it provides the maximum possible saturated thickness.

Two additional observation wells will be installed approximately 20 and 50 feet away from the MW-13. The wells may have to be installed in another configuration based upon pipelines and other subsurface considerations. Proposed wells D, E, and F will also be used as observations wells during this test.

The test will be completed by setting a submersible pump set at a depth of approximately 67 feet to ensure the generation of the maximum possible drawdown. If necessary, a step test will be completed prior to the beginning of the aquifer test to calculate to most efficient pumping rate. MW-13 will then be allowed to fully re-equilibrate prior to the start of the aquifer test.

The aquifer test will be run for approximately 24 hours at a pumping rate between 5 and 10 gallons per minute. The water will be placed in a frac tank for subsequent off-site disposal. A recovery tests will also be completed following the completion of the pumping phase.

The results will be analyzed using standard methods for unconfined groundwater systems. The product thickness will be adjusted to corrected water thickness to refine the accuracy of the tests.

Laboratory Testing Of Samples

Additional laboratory testing soil and product samples will be necessary to accurately estimate the volume of mobile free product (deficiency 2). The soil tests will include grain-size distribution tests to accurately estimate unsaturated zone parameters. Samples will also be analyzed for total organic carbon. This parameter may not be required for the design phase but may be necessary in subsequent dissolved phase hydrocarbon fate and transport calculations.

For laboratory safety and handling reasons, the soil samples will be collected from unaffected materials if the materials appear to be homogeneous across the site. Affected materials will be used if necessary if the materials are heterogeneous. A sufficient number of samples will be analyzed to sufficiently characterize differing materials across the site.

Product samples will also be collected from wells MW-4, MW-11, MW-12, MW-13 and any new wells that contain product in excess of 1-foot thick. The samples will be sent to a laboratory for analyses for density and viscosity. The results can then be used to assess product homogeneity and to refine the design of the free product removal system.

Optional Long-Term Product Recovery Test

An optional long-term product recovery test will also be completed if Duke is still considering a product-only removal system at the completion of the field program. This test is design to address data deficiencies 3 and 4.

The test would use MW-13 and the two associated observation wells. The test would be completed by installing a product-only removal in MW-13 following the completion of the aquifer test. The pump would be configured so that it maintained a constant product thickness of approximately 4 inches in MW-13. The resulting declines (if any) would be measured in the two observation wells on a weekly basis until sufficient data is generated to accurately assess product drawdown associated with removal from well MW-13.

SCHEDULE

The proposed project schedule is shown on Figure 14. The schedule includes three components. The first component includes field characterization and data analyses. This phase is scheduled for completion eight weeks after project startup. The product recovery test will take longer if it is run.

The second phase is the implementation of the boundary control program. Duke has already selected the Iso-Gen™ technology but would like OCD concurrence on the acceptability of the technology before starting the detailed design. Preparation of the boundary control CAP would begin after OCD concurrence and upon receipt of the analytical results from new well MW-21 in order to finalize the final eastern-boundary alignment. The schedule is very aggressive and calls for completion of the system between 2 ½ and 3 months after the start of field activities.

The third phase is the product recovery program. This program requires the collection of more long-term data, such as the product recovery test, before the final selection of a collection technique and preparation of a CAP. The proposed schedule calls for the preparation of the CAP to begin approximately 3 months after the start of the field program. Duke's goal is to have this system installed and functioning by fall.

Respectfully submitted,

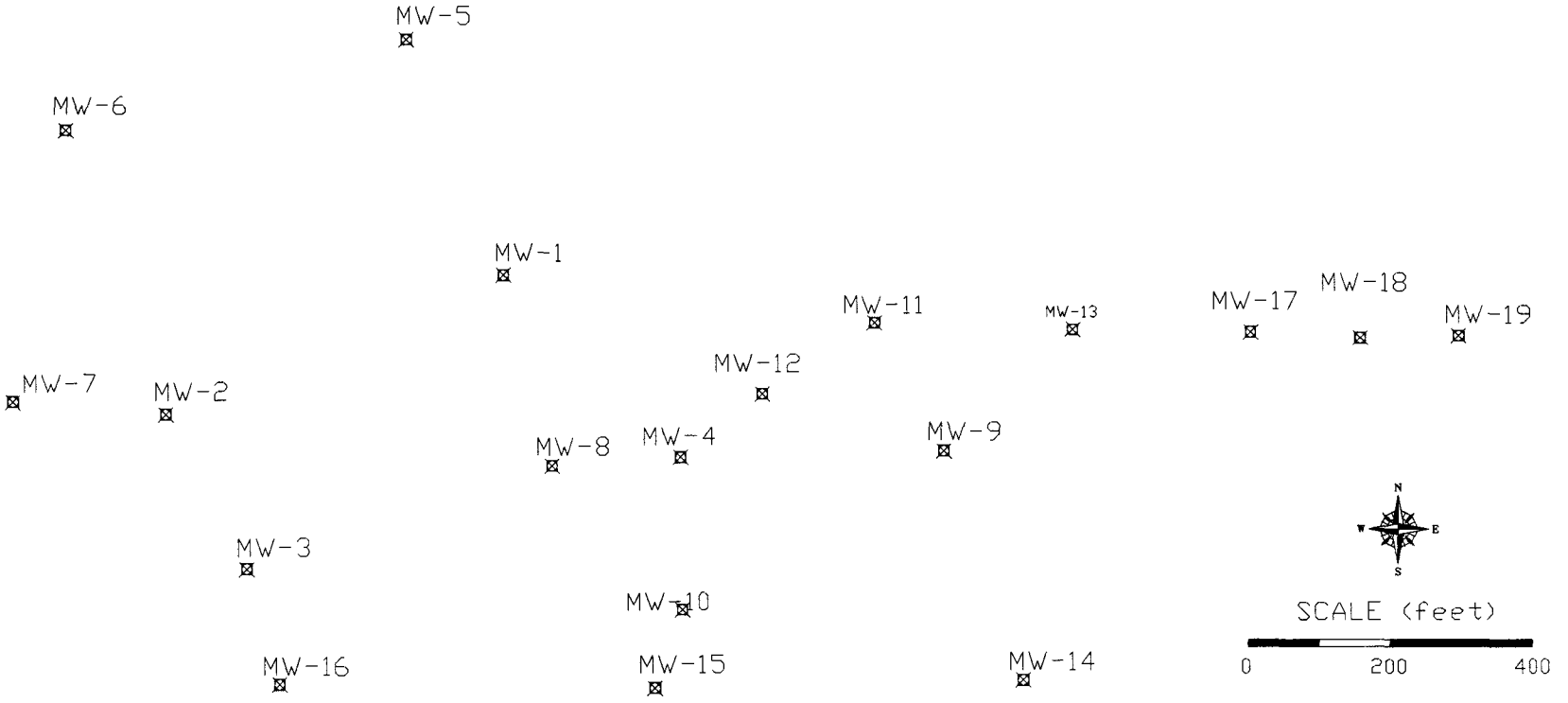
Michael H. Stewart, PE, CPG

TABLES

Table 1 – Monitoring Well Construction Information

Well	Ground Elevation (feet)	Top Casing Elevation (feet)	Well Diameter (inches)	Total Depth (feet)	Top of Screen (feet)	Top of Sand Pack (feet)
MW-1	3,623.60	3,626.06	2	57	37	34
MW-2	3,620.65	3,623.14	2	53	33	30
MW-3	3,620.08	3,623.01	2	53	33	30
MW-4	3,621.66	3,624.29	2	57	37	34
MW-5	3,626.30	3,629.16	2	57	37	34
MW-6	3,624.14	3,626.93	2	53	33	30
MW-7	3,618.93	3,621.40	2	56	33	31
MW-8	3,620.84	3,623.62	2	58	36	34
MW-9	3,622.60	3,625.21	2	63	43	40
MW-10	3,618.30	3,621.07	2	58	36	34
MW-11	3,623.05	3,625.88	2	63	43	41
MW-12	3,623.95	3,626.60	4	65	41	38
MW-13	3,623.53	3,626.30	4	69	44	38
MW-14	3,618.76	3,621.42	2	66	42	36
MW-15	3,616.79	3,619.39	2	59	37	31
MW-16	3,619.10	3,621.87	2	58	34	30
MW-17	3,621.36	3,623.94	4	66	41	37
MW-18	3,621.96	3,624.30	4	68	43	35
MW-19	3,621.42	3,624.12	2	68	43	40
RW-1	3,621.53	3,624.52	4	60	35	32

FIGURES



Note: RW-1 is located ~8 feet south of MW-4

Figure 1 – Monitoring Well Locations

Hobbs Booster Station, Lea County New Mexico (GW-0444)

Duke Energy Field Services

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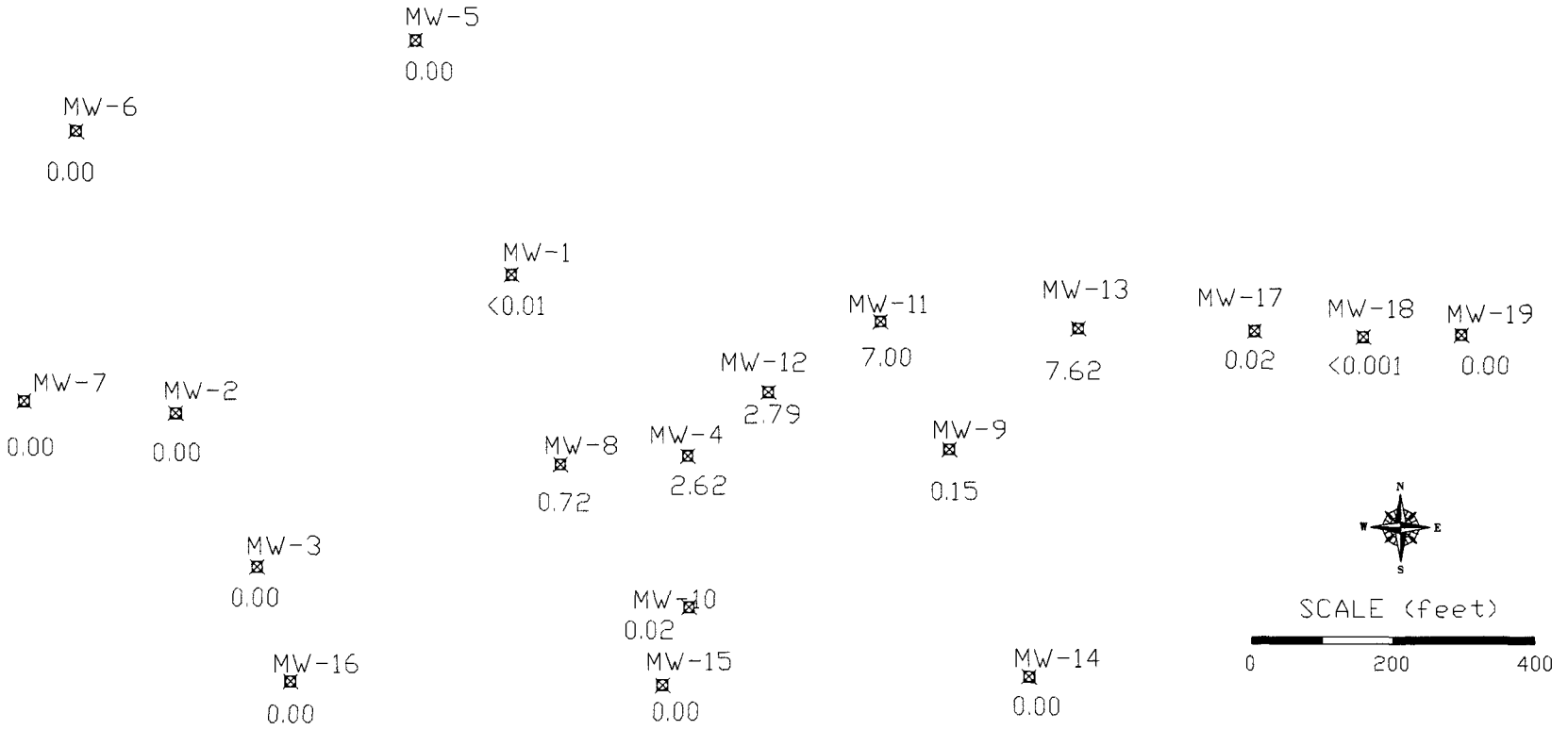
DATE: 2/02



Note: Locations with a sheen are labeled as <0.01

Figure 2 – March 2002 Measured Product Thicknesses

Hobbs Booster Station, Lea County New Mexico (GW-0444)

Duke Energy Field Services

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DATE: 2/02

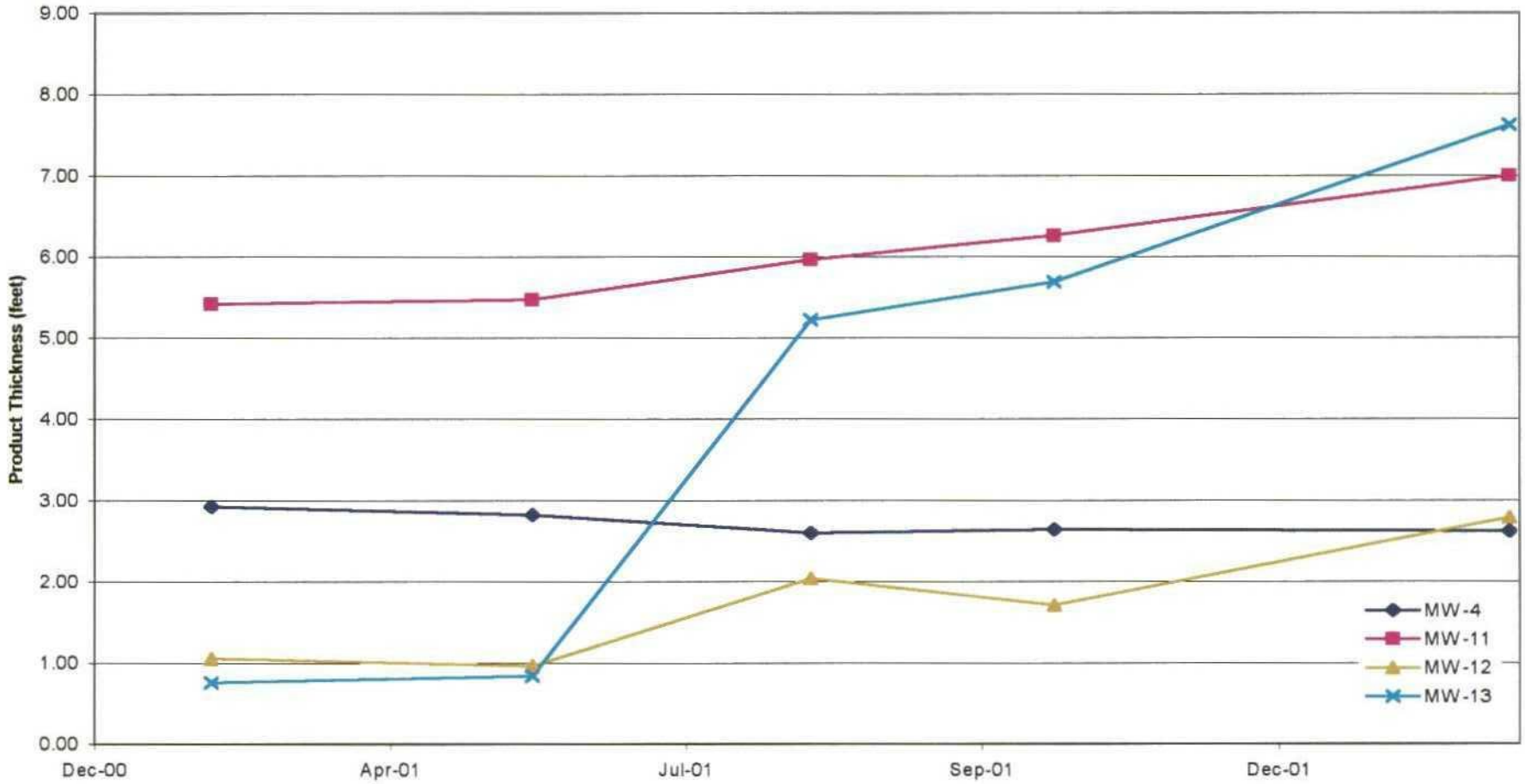

Figure 3 – Product Thickness Over Time in Wells MW-4, MW-11, MW-12 and MW-13

Hobbs Booster Station, Lea County New Mexico (GW-0444)

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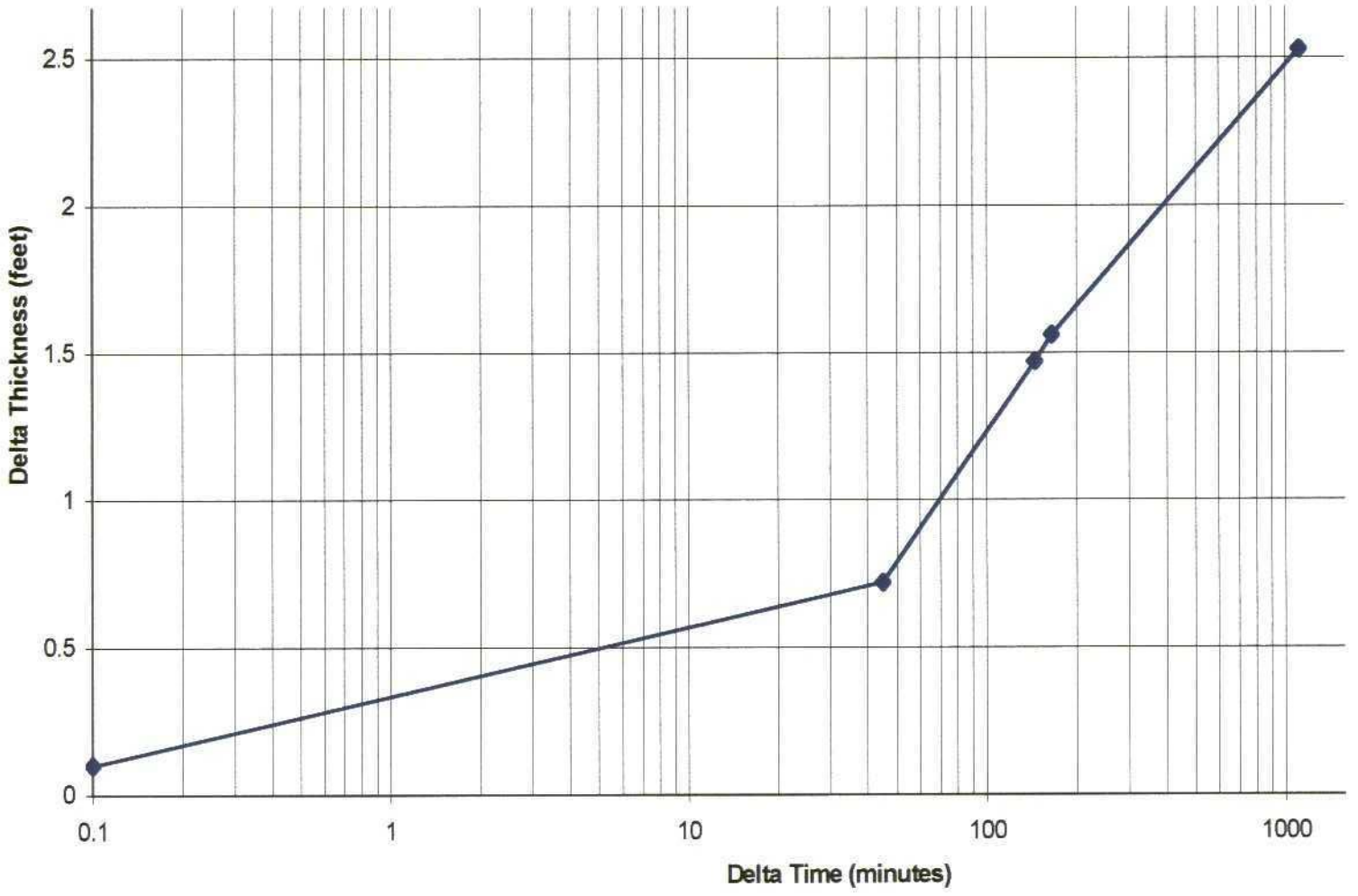

Note:Initial product thickness was 2.86 feet

Figure 4 – Baildown Test Results for MW-4

Hobbs Booster Station, Lea County New Mexico (GW-0444)

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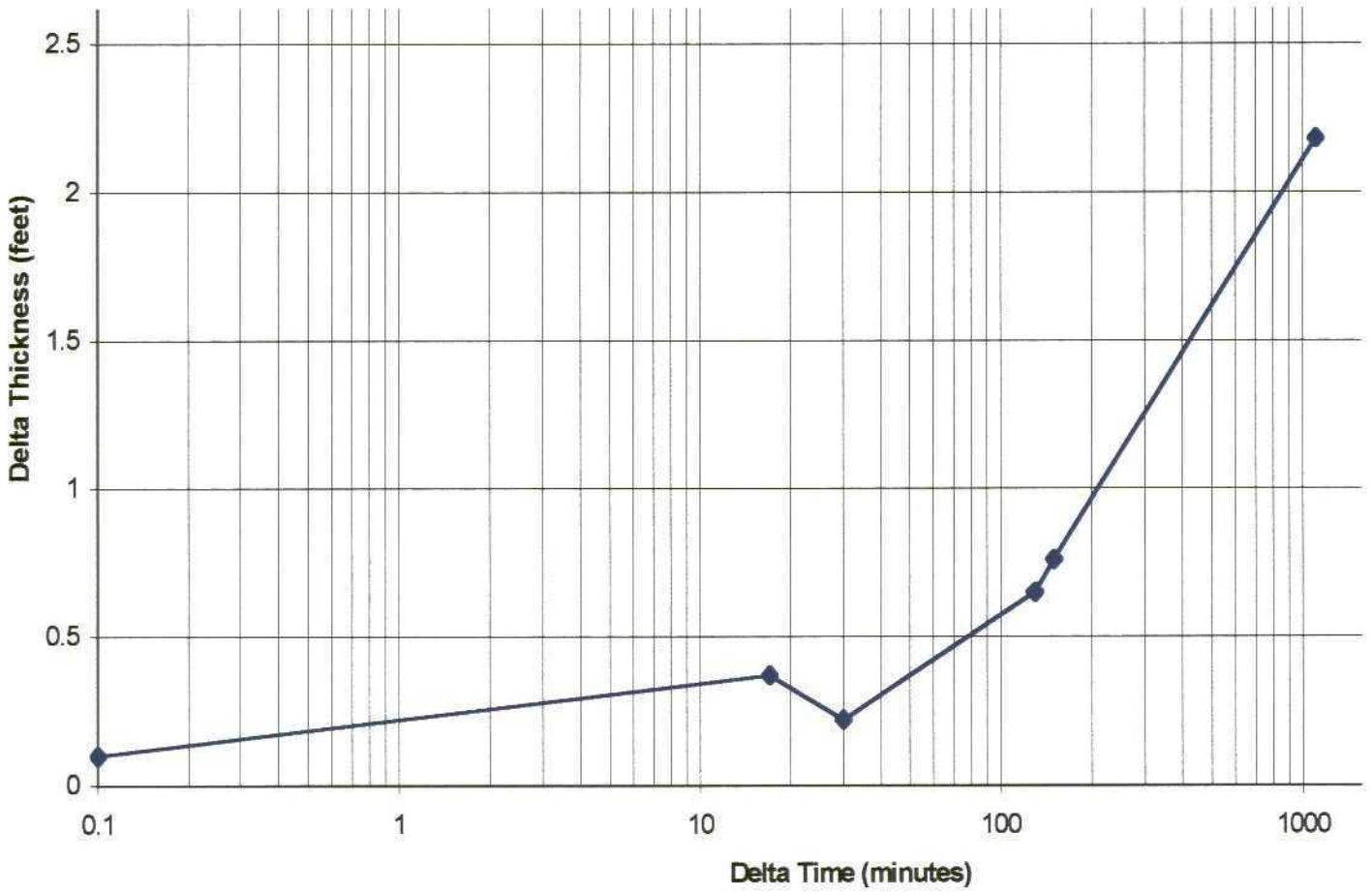
DATE: 2/02



Note:Initial product thickness was 2.07 feet

Figure 5 - Baildown Test Results for RW-1

Hobbs Booster Station, Lea County New Mexico (GW-0444)

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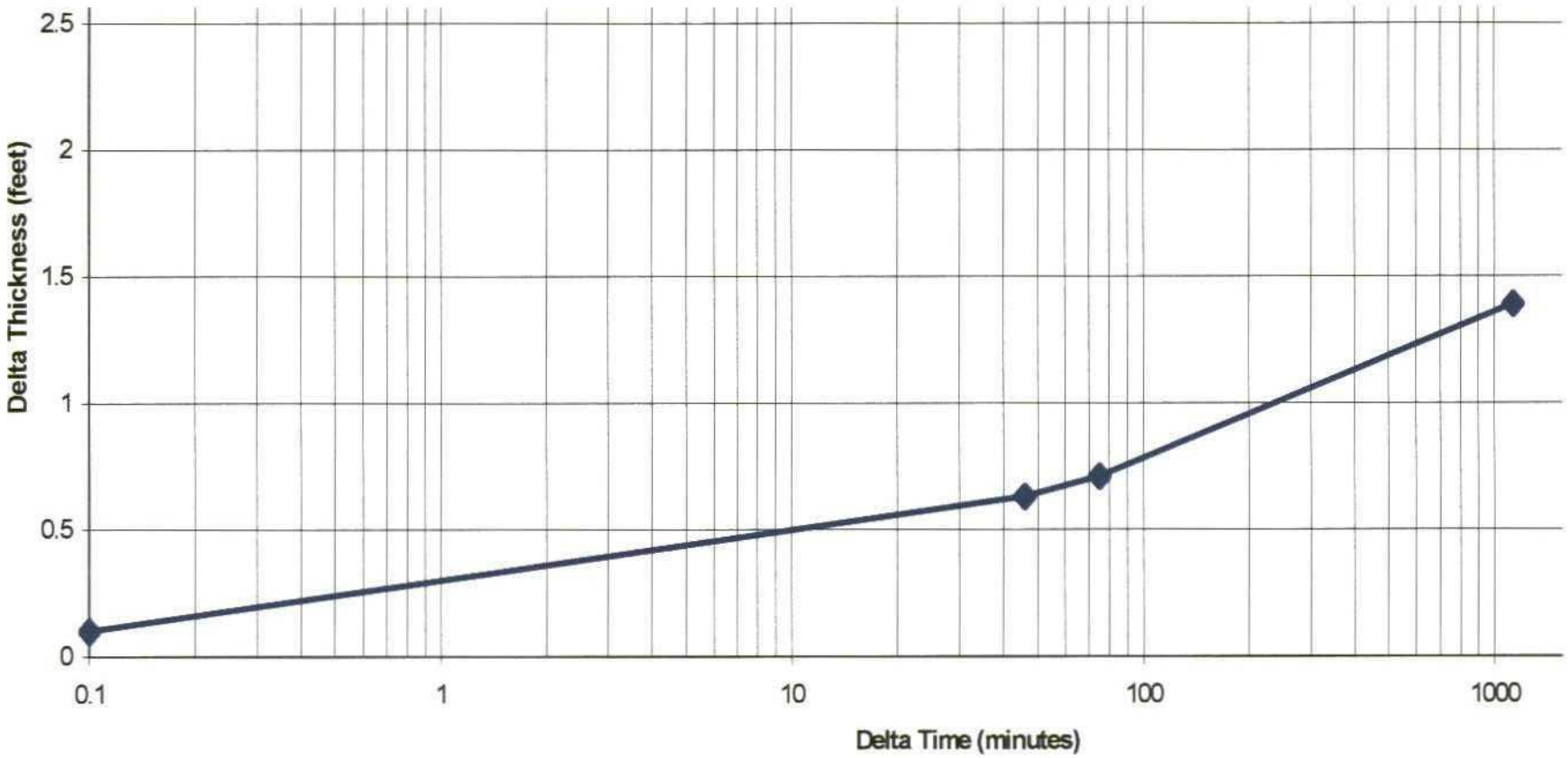
DATE: 2/02



Note:Initial product thickness was 5.89 feet

Figure 6 - Baildown Test Results for MW-11

Hobbs Booster Station, Lea County New Mexico (GW-0444)

Duke Energy Field Services

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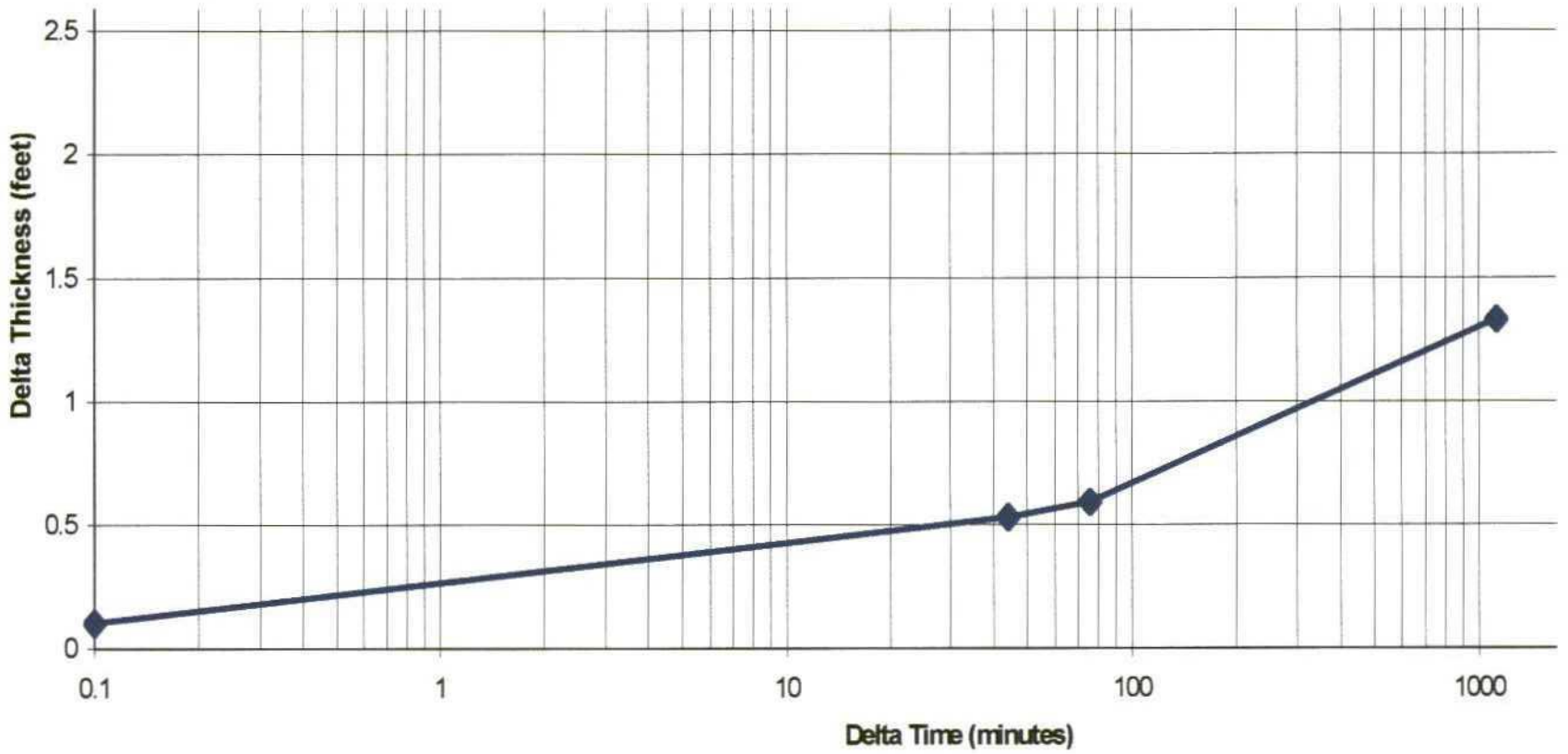
DATE: 2/02



Note:Initial product thickness was 2.52 feet

Figure 7 - Baildown Test Results for MW-12

Hobbs Booster Station, Lea County New Mexico (GW-0444)

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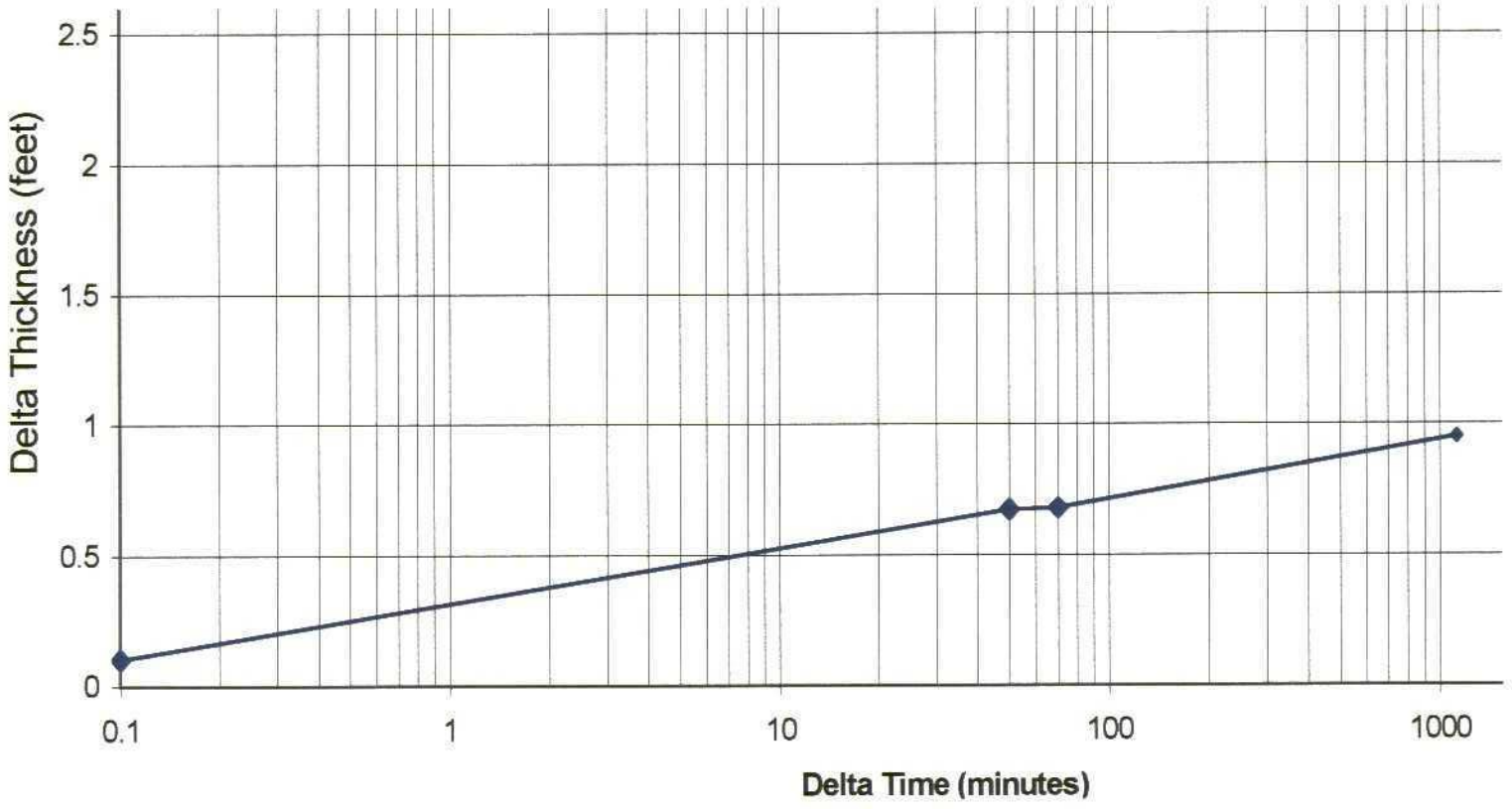

Note:Initial product thickness was 2.63 feet

Figure 8 - Baildown Test Results for MW-13

Hobbs Booster Station, Lea County New Mexico (GW-0444)

Duke Energy Field Services

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DATE: 2/02

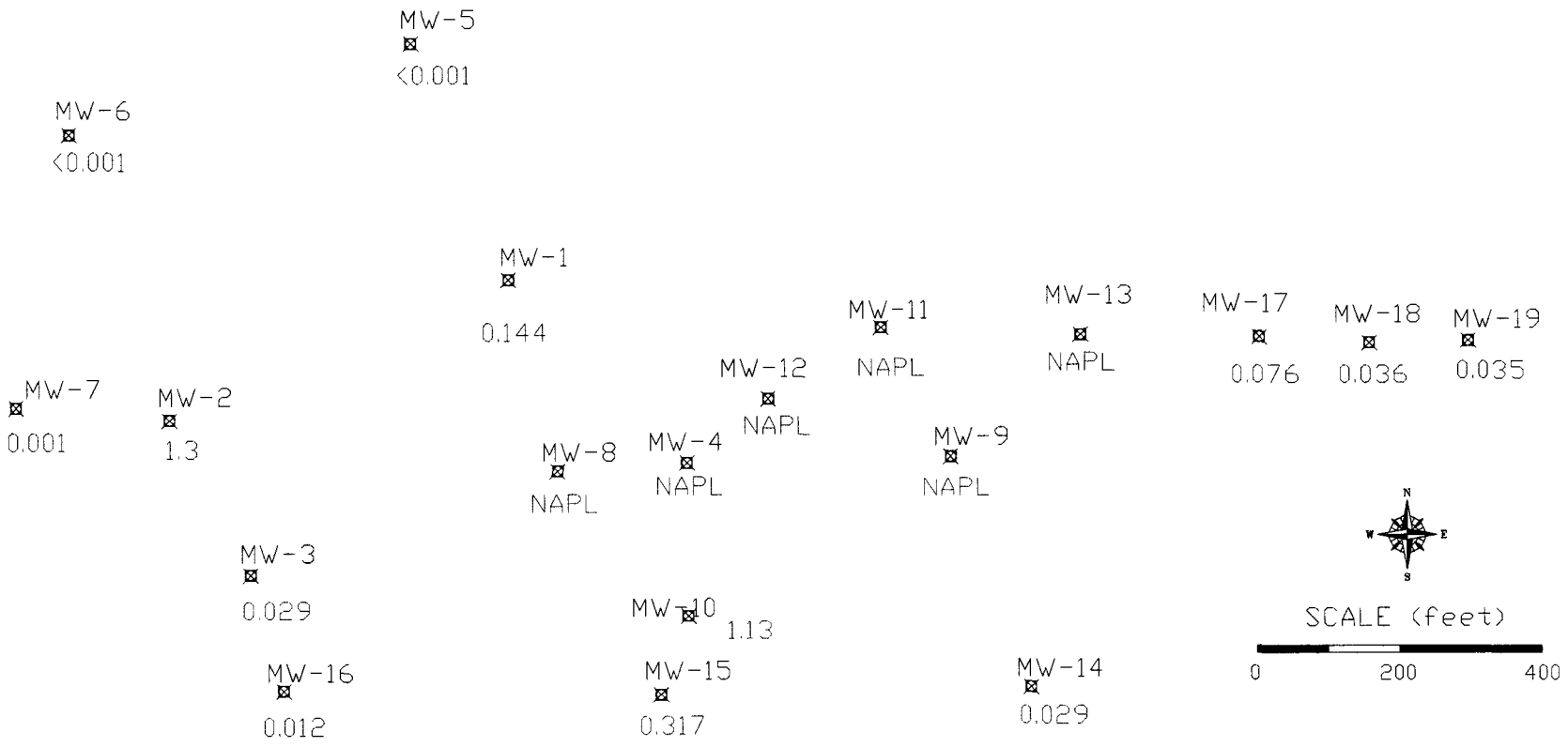

Figure 9 – Benzene Concentrations (ug/l) From October 2001 Monitoring Episode

Hobbs Booster Station, Lea County New Mexico (GW-0444)

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DATE:	2/02

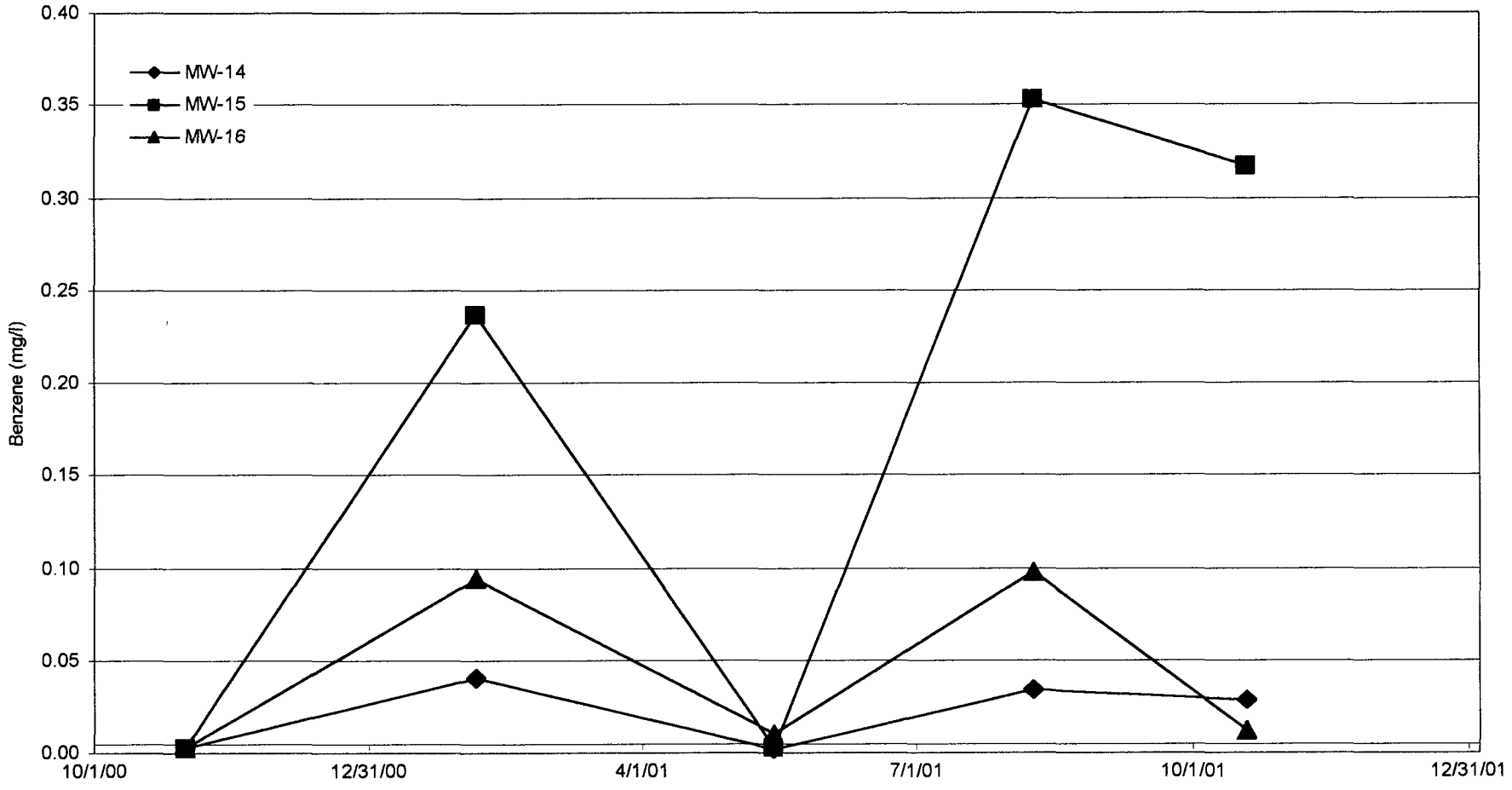

Figure 10 – Benzene Concentrations in Wells MW-14, MW-15 and MW-16

Hobbs Booster Station, Lea County New Mexico (GW-0444)

Duke Energy Field Services

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DATE: 2/02

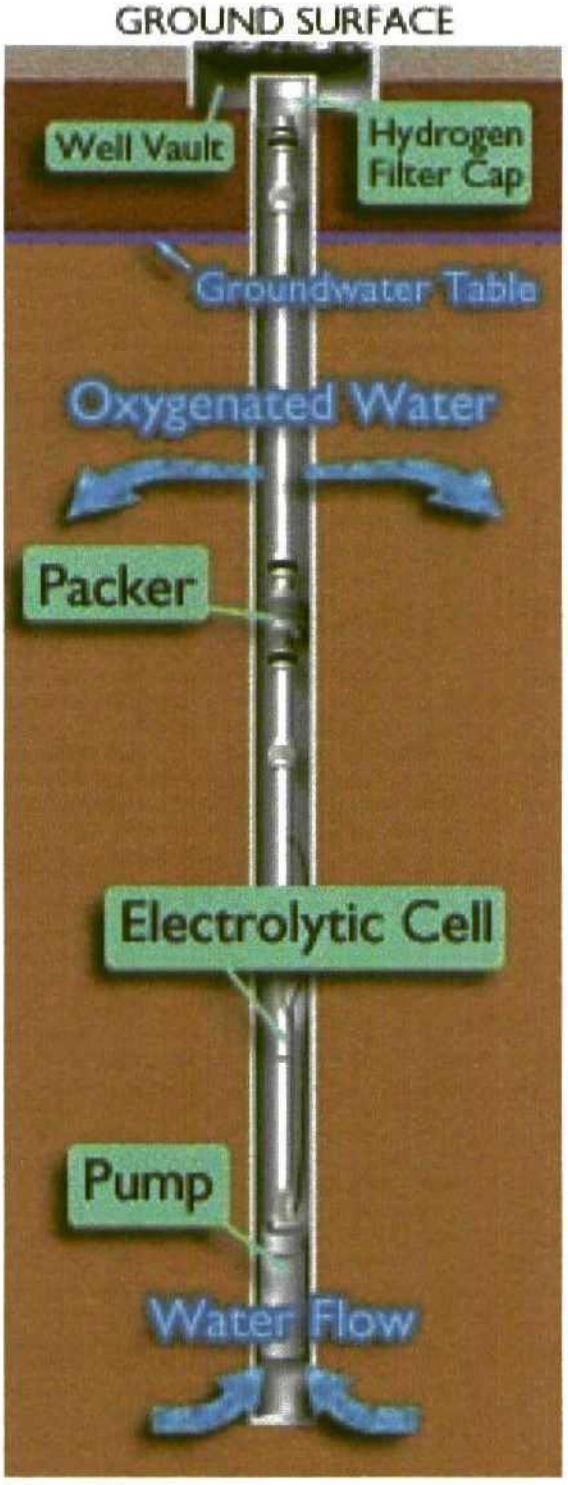

Figure 11 – Schematic of an Iso-Gen Well

Hobbs Booster Station, Lea County New Mexico (GW-0444)

Duke Energy Field Services

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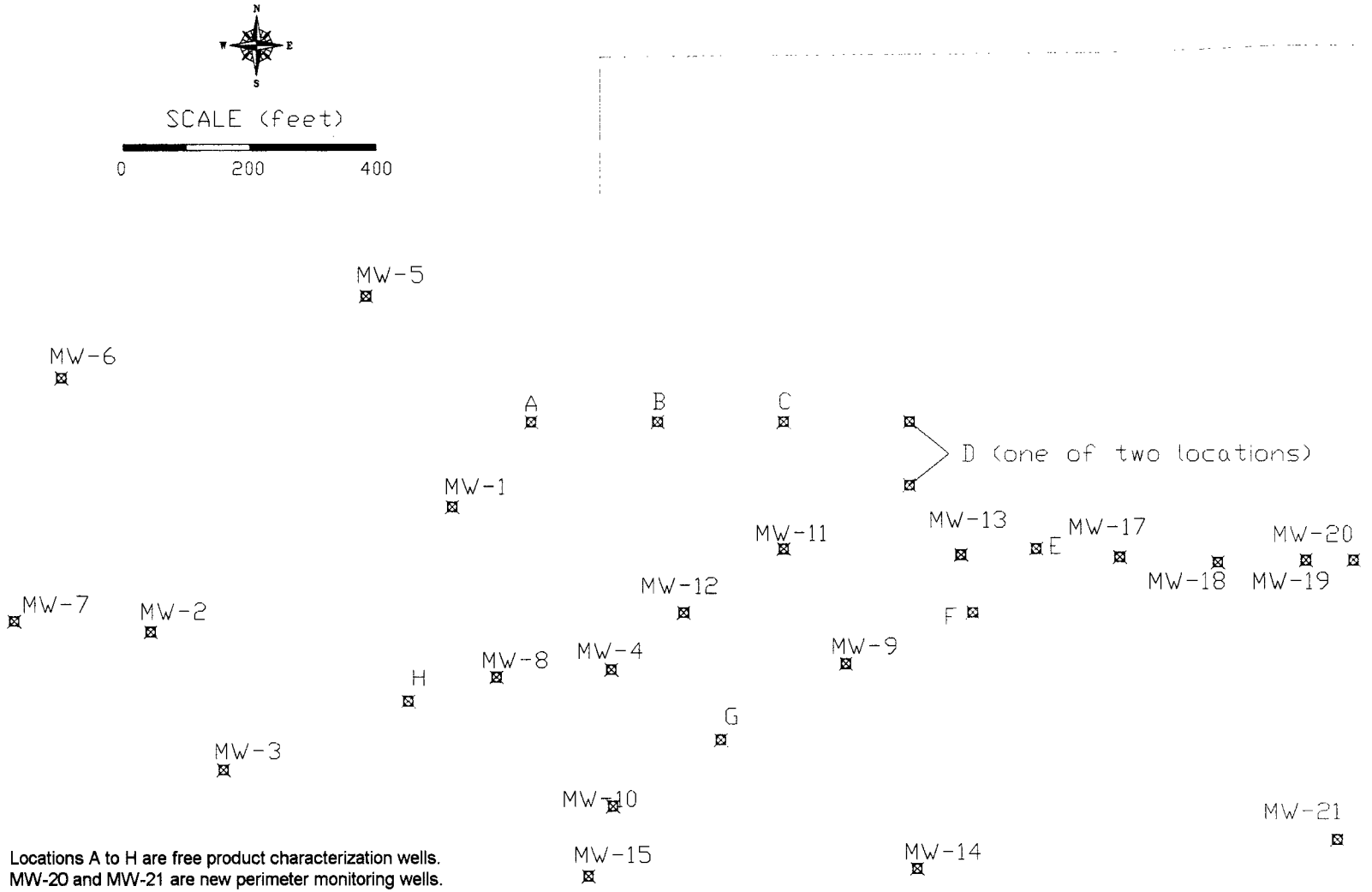
REVISED:

DATE: 4/01



Notes
1) Locations A to H are free product characterization wells.
2) MW-20 and MW-21 are new perimeter monitoring wells.
3) Only one of the two locations shown for location D are scheduled to be drilled
4) Final locations may be changed based upon subsurface piping or other obstructions

Figure 12 – Proposed Well Locations

Hobbs Booster Station, Lea County New Mexico (GW-0444)

Duke Energy Field Services

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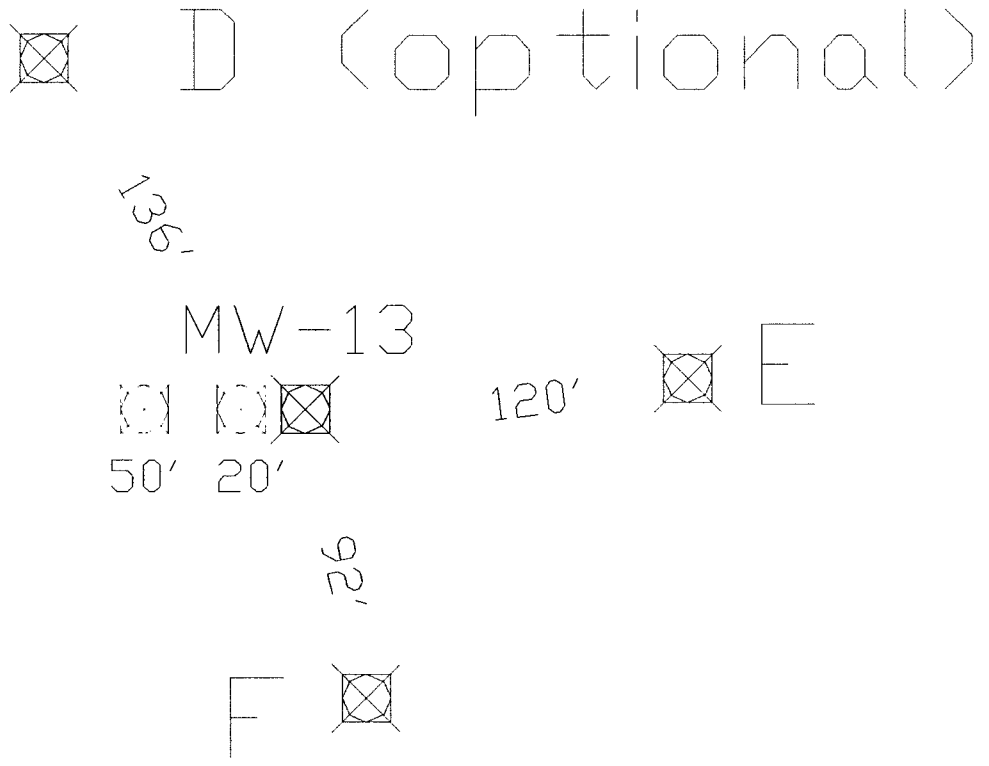
DATE: 2/02



Note: The final locations for the two observation wells, shown in yellow, as well as the free product characterization wells will depend upon buried pipelines and other subsurface considerations; however, the 20 and 50 foot observation well spacing will be maintained if possible.

Figure 13 – Proposed Aquifer Test Layout

Hobbs Booster Station, Lea County New Mexico (GW-0444)

Duke Energy Field Services

DRAWN BY: MHS

REVISED:

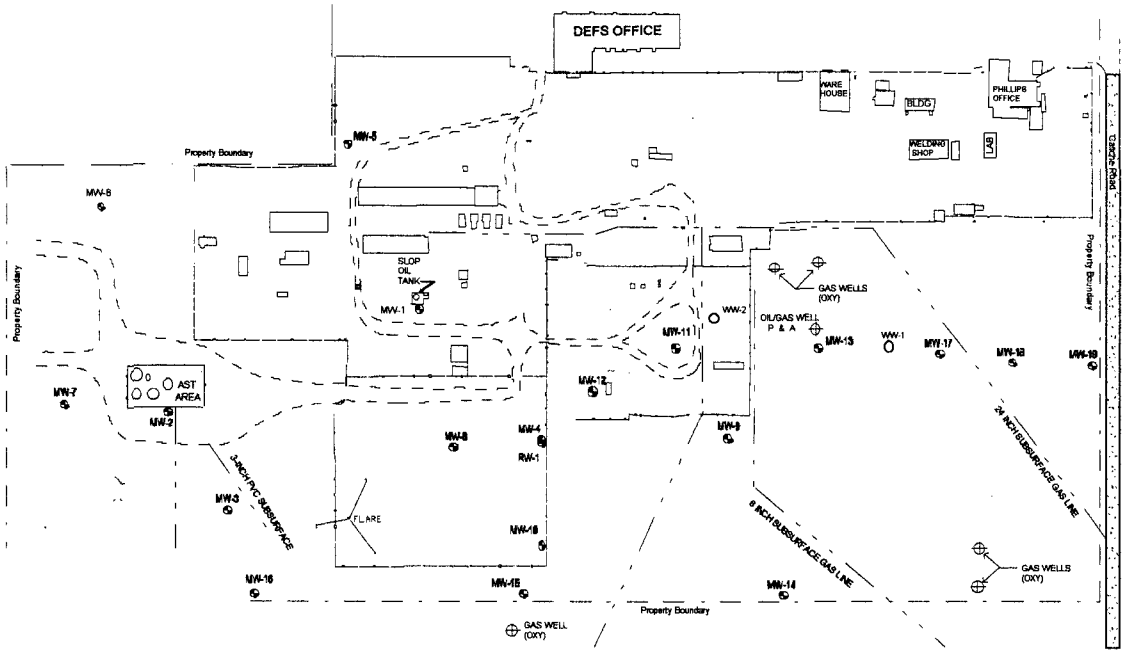
DATE: 4/01

2001 ANNUAL GROUNDWATER MONITORING AND REMEDIATION PERFORMANCE REPORT HOBBS BOOSTER STATION LEA COUNTY, NEW MEXICO

FEBRUARY 5, 2002

Prepared For:

Duke Energy Field Services, Inc.
P. O. Box 5493
Denver, Colorado 80217



Prepared By:

TRIDENT ENVIRONMENTAL

P O Box 7624
Midland, Texas 79708

2001 Annual Groundwater Monitoring and Remediation Performance Report Hobbs Booster Station Lea County, New Mexico

Prepared by:

Trident Environmental
P. O. Box 7624
Midland, Texas 79708
(915) 682-0808

SUBMITTED BY:

DATE: 2-5-02

Gilbert J. Van Deventer, REM
Project Manager

2-5-02

Dale T. Littlejohn
Quality Assurance Officer

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APPENDICES

1.0 Executive Summary

Trident Environmental (Trident), was retained by Duke Energy Field Services LP (DEFS) to perform quarterly groundwater sampling and product recovery operations at the Hobbs Booster Station. Hobbs Booster Station is located at 1625 West Marland Boulevard, in Hobbs, New Mexico. The legal description of the site is described as Section 4, Township 19 South, and Range 38 East. This 2001 annual report summarizes the four sampling events performed by Trident at the DEFS Hobbs Booster Station on February 5-6, 2001, May 15-16, 2001, August 9-10, 2001, and October 10-11, 2001.

Based on the most recent groundwater monitoring and sampling data, the following conclusions at the Hobbs Booster Station are evident:

- Benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations in monitoring wells MW-5, MW-6, and MW-7 are below New Mexico Water Quality Control Commission (WQCC) standards.

- Benzene levels in monitoring well MW-1 (0.144 mg/L), MW-2 (1.0230 mg/L), MW-3 (0.029 mg/L), MW-10 (1.13 mg/L) , MW-14 (0.029 mg/L), MW-15 (0.317 mg/L), MW-16 (0.012 mg/L), MW-17 (0.076 mg/L), MW-18 (0.036 mg/L), and MW-19 (0.035 mg/L) are above the WQCC standard of 0.010 mg/L.

- During the first, third and fourth quarter sampling events, dissolved benzene in groundwater has extended offsite of the southern property boundary. Although no consistent trend has been observed, benzene levels in cross-gradient (south) monitoring wells MW-14, MW-15, and MW-16 have decreased since the previous third quarter sampling event.

- During the fourth quarter sampling event, the benzene level in downgradient monitoring well MW-19 along the eastern property boundary has increased to a level above the WQCC standard for the first time indicating offsite migration.

- Light non-aqueous phase liquids (LNAPL) were measured in monitoring wells MW-4 (2.64 ft), MW-8 (0.06 ft), MW-9 (0.01 ft), MW-10 (0.01 ft), MW-11 (6.26 ft), MW-12 (1.17 ft), and MW-13 (5.69 ft).

- As of December 10, 2001, a total of approximately 284 gallons of LNAPL (condensate) have been removed from recovery well RW-1 and monitoring wells MW-1, MW-4, MW-8, MW-9, MW-10, and MW-17 using a combination of the Xitech product recovery system (PRS), hand bailing, passive skimmers, absorbent socks, and a portable product recovery pump (Spill Buddy™).

The following recommendations are suggested for the remediation system and monitoring operations at the Hobbs Booster Station.

- Continue LNAPL recovery operations using the Xitech PRS in RW-1 and the absorbent socks or passive bailers in monitoring wells with greater than 0.01 feet of product.

- Begin a program of monitoring natural attenuation that includes the analysis of dissolved oxygen (DO), nitrate (NO_3), sulfate (SO_4), ferric iron (Fe^{3+}), ferrous iron (Fe^{2+}), and manganese (Mn) to assess the efficacy of intrinsic bioremediation processes occurring on site.

- Continue the groundwater-monitoring program on a quarterly frequency. The next sampling event is scheduled during the first quarter of 2002.

- Submit a corrective action work plan and remediation system design based on the results of remediation feasibility tests and monitoring data.

2.0 Chronology of Events

August 13, 1998	At the request of GPM, TRW submitted a subsurface soil investigation work plan and proposal to determine soil and groundwater conditions at Hobbs Booster Station.
June 15-17, 1999	TRW installed and sampled four soil borings (HB-1 through HB-4) and six monitoring wells (MW-1 through MW-6) during a subsurface investigation. Hydrocarbon-impacted groundwater was confirmed in MW-1, MW-2, MW-3, and MW-4.
July 28, 1999	TRW submitted the Subsurface Soil and Groundwater Investigation report for the Hobbs Booster Station to GPM.
January 5, 2000	GPM submitted a work plan to the OCD for the additional groundwater investigation and remediation activities at the Hobbs Booster Station.
February 23, 2000	Mr. Jack Ford, of the OCD Environmental Bureau, approved the subsurface investigation work plan for Hobbs Booster Station.
April 1, 2000	Duke Energy Field Services Inc. (DEFS) acquired ownership and operation of the Hobbs Booster Station through a joint venture with GPM.
May 8-10, 2000	TRW completed a subsurface investigation for DEFS/GPM to delineate the extent of the hydrocarbon-impacted groundwater. The investigation included the installation of five monitoring wells (MW-7 through MW-11) and one recovery well (RW-1).
May 11, 2000	TRW conducted the second quarter 2000 sampling event and product recovery operations at the Hobbs Booster Station. Second quarter operation and maintenance of the Xitech PRS and product recovery activities were also conducted on June 15, 2000.
July 12, 2000	TRW submitted the Groundwater Investigation report for the Hobbs Booster Station to DEFS.
August 22, 2000	TRW conducted the third quarter 2000 sampling event and product recovery operations at the Hobbs Booster Station. Third quarter operation and maintenance of the Xitech PRS and product recovery activities were also conducted on July 12, 2000 and September 21, 2000.
September 28, 2000	DEFS submitted a work plan to the OCD for a Phase III Groundwater Investigation at the Hobbs Booster Station.
October 23-27, 2000	TRW completed a subsurface investigation for DEFS to delineate the horizontal extent of the hydrocarbon-impacted groundwater. The investigation included the installation of eight monitoring wells (MW-12 through MW-19).

October 31, 2000	TRW conducted the fourth quarter 2000 sampling event and product recovery operations at the Hobbs Booster Station. Fourth quarter operation and maintenance of the Xitech PRS and product recovery activities were also conducted on October 11, 2000, November 1, 2000, and December 14, 2000.
January 22, 2001	TRW installed three vapor extraction monitoring wells and one air sparge well near the current Xitech PRS.
January 23, 2001	TRW conducted vapor extraction feasibility testing using the newly installed vapor monitoring wells.
February 5-6, 2001	TRW conducted the first quarter 2001 sampling event and product recovery operations at Hobbs Booster Station. First quarter operation and maintenance of the Xitech PRS and product recovery activities were also conducted on January 22, 2001and March 21, 2001.
May 1, 2001	Trident Environmental acquired the assets and staff of the Midland, Texas office of TRW Inc.
May 15-16, 2001	Trident conducted the second quarter 2001 sampling event and product recovery operations at the Hobbs Booster Station. Second quarter operation and maintenance of the Xitech PRS and product recovery activities were also conducted on June 18, 2001.
August 9-10, 2001	Trident conducted the third quarter 2001 sampling event and product recovery operations at the Hobbs Booster Station. Third quarter operation and maintenance of the Xitech PRS and product recovery activities were also conducted on July 20, 2001 and September 10, 2001.
December 10, 2001	Trident conducted the fourth quarter 2001 sampling event and product recovery operations and product recovery operations at the Hobbs Booster Station. Fourth quarter operation and maintenance of the Xitech PRS and product recovery activities were also conducted on October 11, 2001 and November 7, 2001.

3.0 Site Background

The Hobbs Booster Station is located in the city of Hobbs, New Mexico at 1625 West Marland Boulevard. The facility occupies the north half of section 4, township 19 south, and range 38 east (approximately 620 acres), with the exception of approximately 16 acres of the property in the northwest corner of the section which was deeded to Jones Brothers Construction and the City of Hobbs in the 1970s. The facility was initially built as a gasoline plant in the 1930s and operated as a lean oil plant from the 1950s to 1970s. The plant switched to cryogenic operations in the early 1970s and continued that operation until 1976. Between 1976 and the 1980s the facility operated as a gas compressor (booster) station. Most of the plant was decommissioned in 1986. From 1986 to the present, the facility has operated as a natural gas liquid gathering station.

The facility is zoned as industrial property and is adjacent to commercial properties along the north, west and east sides. The facility is bordered on the north by State Highway 62/180. Harbison Fisher Sales Company borders the site at the northwest corner and Key Energy Services abuts the plant on the west side. The transportation office and facility of Phillips Petroleum Company occupies the northeast corner of the property. To the south is undeveloped property used primarily for oil and gas production and pastureland. Approximately five gas wells owned by Oxy USA Inc. (Oxy) are located within the property boundaries. Another Oxy gas well is located near the south property boundary of the plant.

The nearest residence to the site is located on Texaco Street approximately 400 feet west (upgradient) of the western boundary of the site property.

4.0 Procedures

Immediately prior to each sampling event, the monitoring wells were gauged for depth to groundwater using a Solinst Model 101 electronic water indicator. If LNAPL were present in the well, a Heron Model H.01L oil/water interface probe was used to measure product thickness.

After gauging, each monitoring well was purged using a decontaminated 2-inch diameter submersible pump. Groundwater parameters, including pH, conductivity, temperature, turbidity, and dissolved oxygen (DO) were measured during purging using a Horiba Model U10 multiparameter meter and Hanna Model 9143 DO meter. A total of 616 gallons of water was purged from the sampled monitoring wells during the four sampling events conducted in 2001.

Groundwater samples were obtained using a new, decontaminated, disposable bailer for each well after purging. Each groundwater sample was transferred into two air-tight, septum-sealed, 40-ml glass volatile organic analysis (VOA) sample vials with zero head space and preserved with hydrochloric acid (HCl) for analysis of BTEX using EPA Method 8021B. Chain-of-custody (COC) forms documenting sample identification numbers, collection times, and delivery times to the laboratory were completed for each set of samples. One duplicate sample and one rinsate sample was collected during each sampling event. The water samples were placed into an ice-filled cooler immediately after collection and shipped next day delivery to Trace Analysis Inc. in Lubbock, Texas for laboratory analysis.

Monitoring wells with LNAPL or installed product recovery equipment were not sampled during each sampling event. A summary of the purging and sampling methods is provided in Table 1.

Table 1
Summary of Purging and Sampling Methods

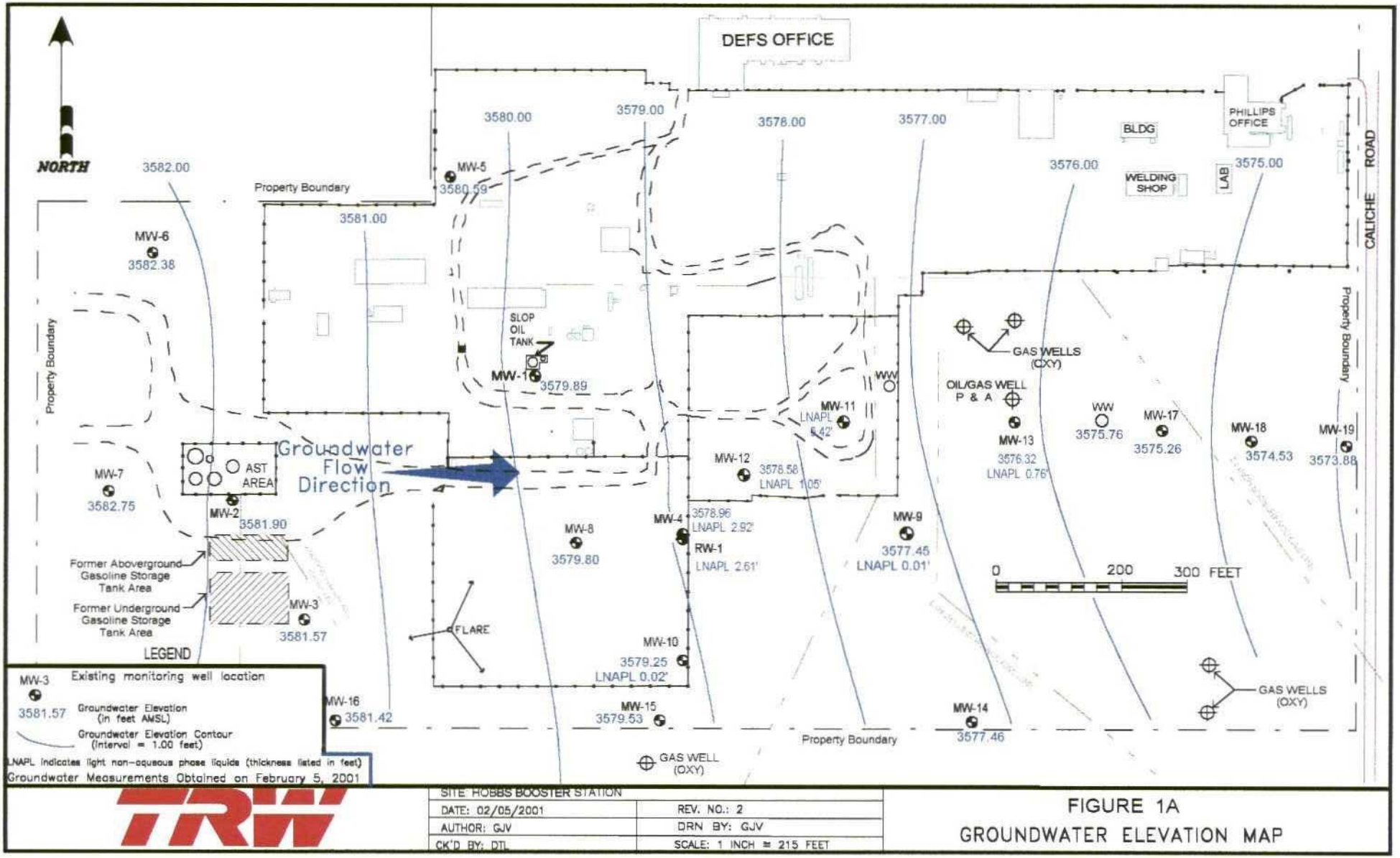
Monitoring Well No.	Sample Date	Purge Method	Purge Volume (gallons)	Sampling Method
MW-1	02/05/01	Pump	12	Disposable bailer
	10/11/01	Bailer	9	Disposable bailer
MW-2	02/05/01	Pump	12	Disposable bailer
	05/15/01	Pump	12	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
	10/10/01	Pump	9	Disposable bailer
MW-3	02/05/01	Pump	12	Disposable bailer
	05/15/01	Pump	12	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
	10/10/01	Pump	9	Disposable bailer
MW-5	02/05/01	Pump	12	Disposable bailer
	05/15/01	Pump	12	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
	10/10/01	Pump	9	Disposable bailer
MW-6	02/05/01	Pump	9	Disposable bailer
	05/15/01	Pump	9	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
	10/10/01	Pump	9	Disposable bailer
MW-7	02/05/01	Pump	15	Disposable bailer
	05/15/01	Pump	12	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
	10/10/01	Pump	9	Disposable bailer
MW-8	02/05/01		12	Disposable bailer
	05/15/01	Pump	12	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
MW-9	10/10/01	Bailer	9	Disposable bailer
MW-10	08/09/01	Pump	12	Disposable bailer
	10/10/01	Bailer	9	Disposable bailer
MW-14	02/05/01	Pump	12	Disposable bailer
	05/15/01	Pump	9	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
	10/10/01	Pump	9	Disposable bailer
MW-15	02/05/01	Pump	12	Disposable bailer
	05/15/01	Pump	12	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
	10/10/01	Pump	12	Disposable bailer
MW-16	02/05/01	Pump	12	Disposable bailer
	05/15/01	Pump	15	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
	10/10/01	Pump	9	Disposable bailer
MW-17	08/09/01	Pump	21	Disposable bailer
	10/10/01	Bailer	24	Disposable bailer
MW-18	02/05/01	Pump	12	Disposable bailer
	05/15/01	Pump	25	Disposable bailer
	08/09/01	Pump	18	Disposable bailer
	10/10/01	Bailer	24	Disposable bailer
MW-19	02/05/01	Pump	12	Disposable bailer
	05/15/01	Pump	12	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
	10/10/01	Pump	9	Disposable bailer

5.0 Groundwater Elevations, Hydraulic Gradient and Flow Direction

Based on the most recent gauging data collected by Trident on December 9, 2001, the groundwater conditions at the Hobbs Booster Station are characterized below.

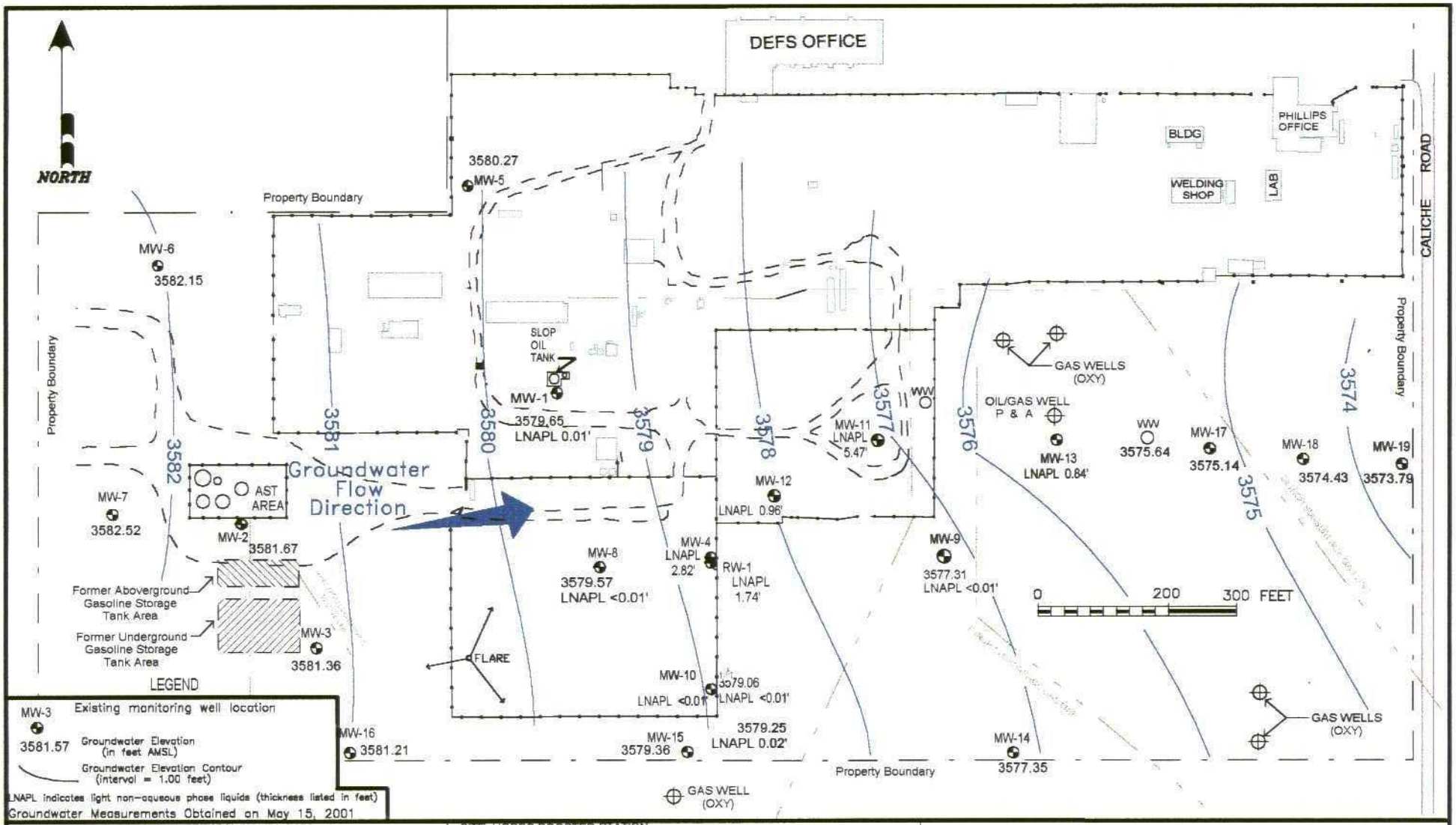
- The depth to groundwater varies from approximately 38 feet below ground surface on the east side of the site (MW-7) to approximately 48 feet on the west side (MW-19).
- The hydraulic gradient is approximately 0.0014 feet/foot
- The direction of groundwater flow is to the east

Groundwater elevation maps depicting the water table elevation and direction of groundwater flow using the gauging data obtained during the February 5, 2001, May 15, 2001, August 9, 2001, and December 10, 2001 gauging events are presented in Figures 1A, 1B, 1C, and 1D, respectively. Historical groundwater elevations and depth to water measurements are summarized in Table 2 and depicted graphically in Figures 2A and 2B.



SITE: HOBBS BOOSTER STATION	
DATE: 02/05/2001	REV. NO.: 2
AUTHOR: GJV	DRN BY: GJV
CK'D BY: DTL	SCALE: 1 INCH ≅ 215 FEET

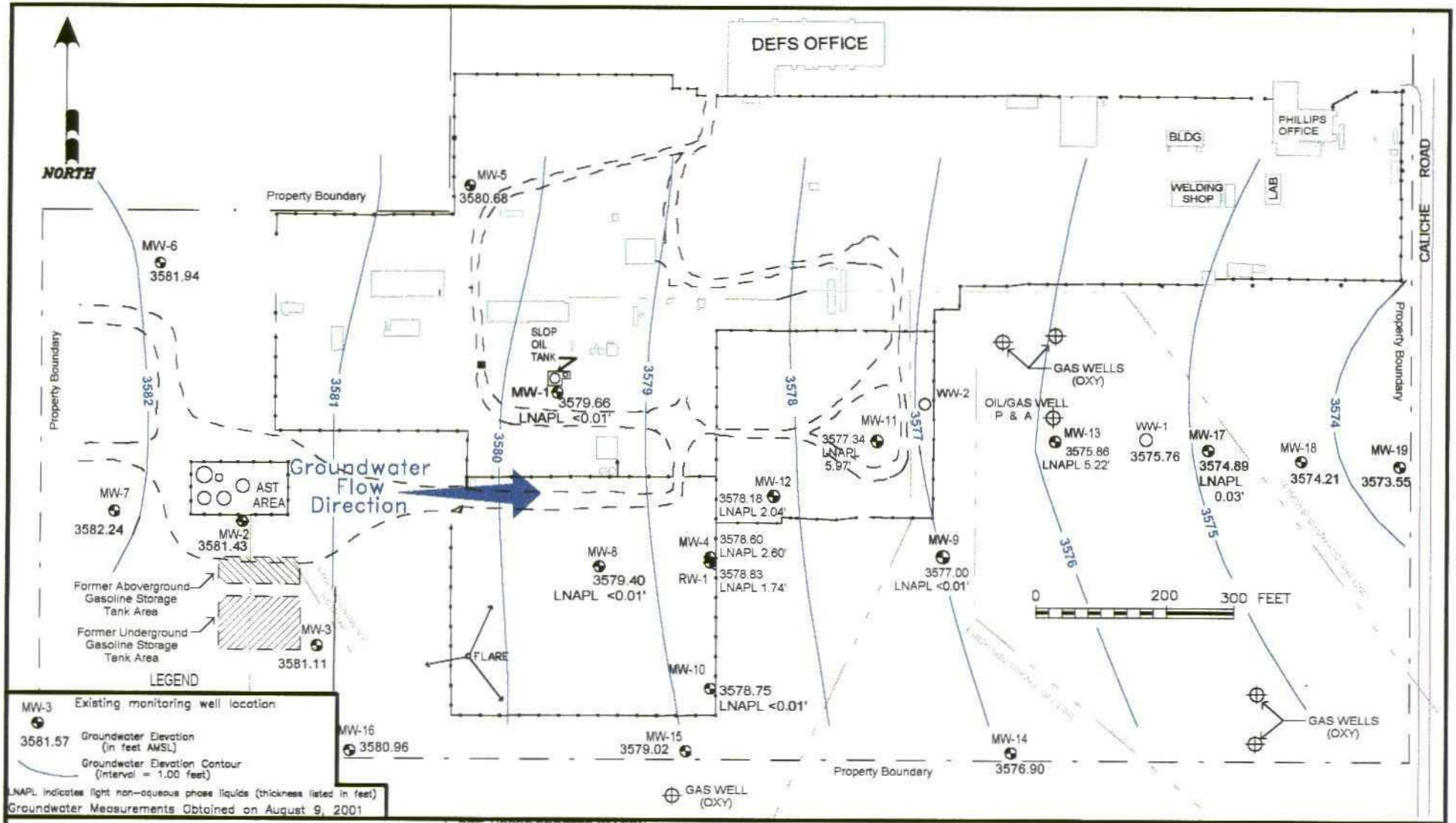
FIGURE 1A
GROUNDWATER ELEVATION MAP



TRIDENT ENVIRONMENTAL
PO Box 7624 Midland, Texas 79708

SITE: HOBBS BOOSTER STATION	
DATE: 05/16/2001	REV. NO.: 3
AUTHOR: GJV	DRN BY: GJV
CK'D BY: DTL	SCALE: 1 INCH = 215 FEET

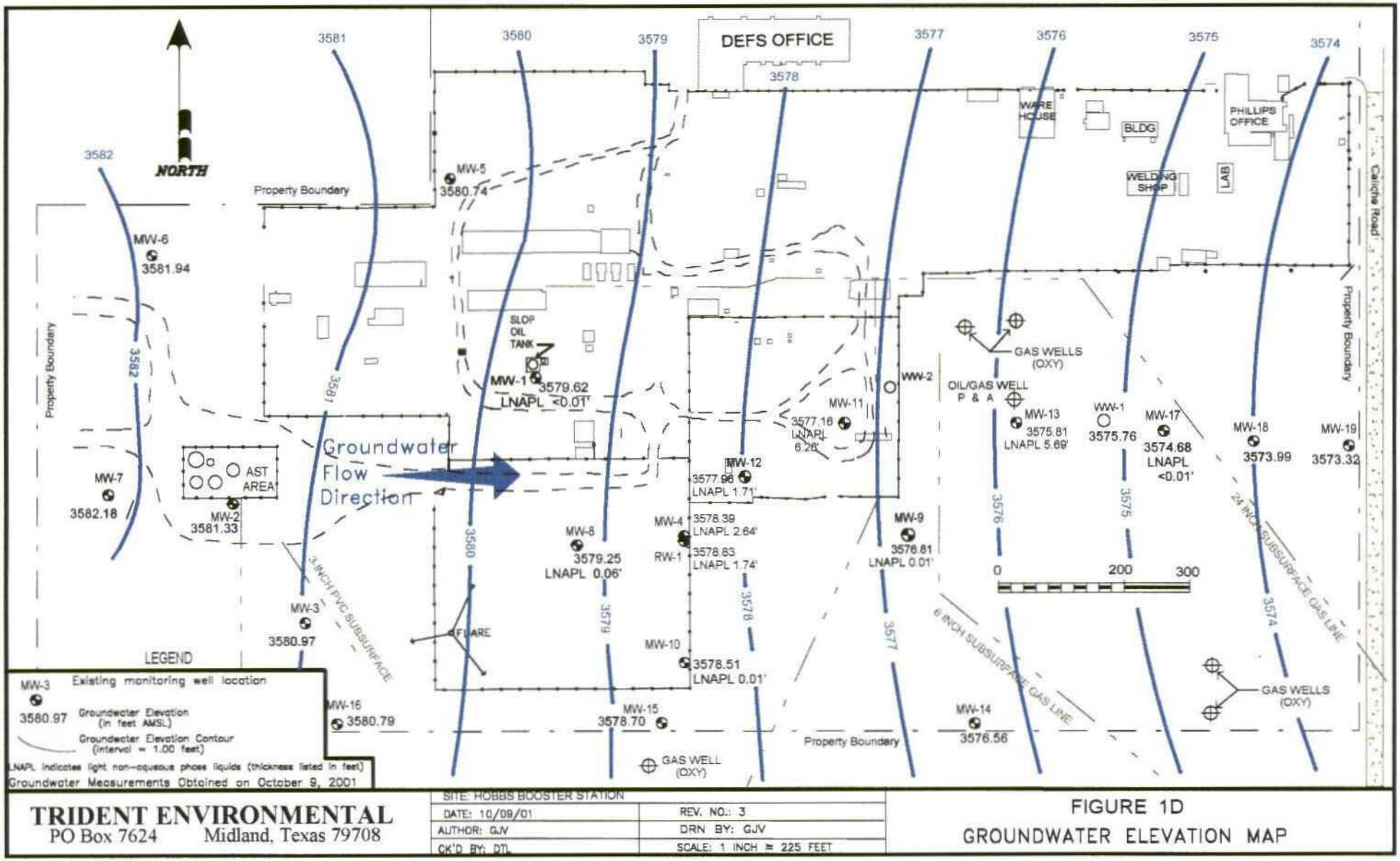
FIGURE 1B
GROUNDWATER ELEVATION MAP



TRIDENT ENVIRONMENTAL
PO Box 7624 Midland, Texas 79708

SITE: HOBBS BOOSTER STATION	
DATE: 08/9/2001	REV. NO.: 3
AUTHOR: GJV	DRN BY: GJV
CK'D BY: DTL	SCALE: 1 INCH = 215 FEET

FIGURE 1C
GROUNDWATER ELEVATION MAP



TRIDENT ENVIRONMENTAL
PO Box 7624 Midland, Texas 79708

SITE: HOBBS BOOSTER STATION	
DATE: 10/09/01	REV. NO.: 3
AUTHOR: GJV	DRN BY: GJV
CK'D BY: DTL	SCALE: 1 INCH = 225 FEET

FIGURE 1D
GROUNDWATER ELEVATION MAP

Table 2
Summary of Groundwater Level Measurements

Monitoring Well	Date Gauged	Ground Surface Elevation (feet AMSL)	Top of Casing Elevation (feet AMSL)	Depth to Groundwater (feet AMSL)	Depth to LNAPL (feet AMSL)	LNAPL Thickness (feet)	Corrected Groundwater Elevation (feet AMSL)
MW-1	07/08/99	3623.60	3626.06	45.56	ND	0.00	3580.50
	05/11/00	3623.60	3626.06	45.93	ND	0.00	3580.13
	08/22/00	3623.60	3626.06	45.87	ND	0.00	3580.19
	10/31/00	3623.60	3626.06	46.10	ND	0.00	3579.96
	02/05/01	3623.60	3626.06	46.17	ND	0.00	3579.89
	05/15/01	3623.60	3626.06	46.42	46.41	0.01	3579.65
	08/09/01	3623.60	3626.06	46.41	46.40	0.01	3579.66
	10/09/01	3623.60	3626.06	46.44	46.44	<0.01	3579.62
MW-2	07/08/99	3620.65	3623.14	40.51	ND	0.00	3582.63
	05/11/00	3620.65	3623.14	41.10	ND	0.00	3582.04
	08/22/00	3620.65	3623.14	40.81	ND	0.00	3582.33
	10/31/00	3620.65	3623.14	41.19	ND	0.00	3581.95
	02/05/01	3620.65	3623.14	41.24	ND	0.00	3581.90
	05/15/01	3620.65	3623.14	41.47	ND	0.00	3581.67
	08/09/01	3620.65	3623.14	41.71	ND	0.00	3581.43
	10/09/01	3620.65	3623.14	41.81	ND	0.00	3581.33
MW-3	07/08/99	3620.08	3623.01	40.76	ND	0.00	3582.25
	05/11/00	3620.08	3623.01	41.33	ND	0.00	3581.68
	08/22/00	3620.08	3623.01	40.96	ND	0.00	3582.05
	10/31/00	3620.08	3623.01	41.37	ND	0.00	3581.64
	02/05/01	3620.08	3623.01	41.44	ND	0.00	3581.57
	05/15/01	3620.08	3623.01	41.65	ND	0.00	3581.36
	08/09/01	3620.08	3623.01	41.90	ND	0.00	3581.11
	10/09/01	3620.08	3623.01	42.04	ND	0.00	3580.97
MW-4	07/08/99	3621.66	3624.29	46.86	43.60	3.26	3579.64
	05/11/00	3621.66	3624.29	47.09	44.41	2.68	3579.02
	08/22/00	3621.66	3624.29	47.87	44.38	3.49	3579.12
	10/31/00	3621.66	3624.29	47.36	44.68	2.68	3579.00
	02/05/01	3621.66	3624.29	47.59	44.67	2.92	3578.96
	05/15/01	3621.66	3624.29	47.65	44.83	2.82	3578.82
	08/09/01	3621.66	3624.29	47.70	45.10	2.60	3578.60
	10/09/01	3621.66	3624.29	47.94	45.30	2.64	3578.39
MW-5	07/08/99	3626.30	3629.16	48.15	ND	0.00	3581.01
	05/11/00	3626.30	3629.16	48.27	ND	0.00	3580.89
	08/22/00	3626.30	3629.16	48.50	ND	0.00	3580.66
	10/31/00	3626.30	3629.16	48.58	ND	0.00	3580.58
	02/05/01	3626.30	3629.16	48.57	ND	0.00	3580.59
	05/15/01	3626.30	3629.16	48.89	ND	0.00	3580.27
	08/09/01	3626.30	3629.16	48.48	ND	0.00	3580.68
	10/09/01	3626.30	3629.16	48.42	ND	0.00	3580.74
MW-6	07/08/99	3624.14	3626.93	43.95	ND	0.00	3582.98
	05/11/00	3624.14	3626.93	44.32	ND	0.00	3582.61
	08/22/00	3624.14	3626.93	44.21	ND	0.00	3582.72
	10/31/00	3624.14	3626.93	44.48	ND	0.00	3582.45
	02/05/01	3624.14	3626.93	44.55	ND	0.00	3582.38
	05/15/01	3624.14	3626.93	44.78	ND	0.00	3582.15
	08/09/01	3624.14	3626.93	44.99	ND	0.00	3581.94
	10/09/01	3624.14	3626.93	44.99	ND	0.00	3581.94

LNAPL = Light Non-Aqueous Phase Liquid, AMSL = Above Mean Sea Level, ND = Not Detected
Corrected Groundwater Elevation = Casing Elevation - Depth to Groundwater + (LNAPL Thickness x Specific Gravity of LNAPL)
Specific Gravity of LNAPL (MW-4) = 0.7740; Specific Gravity of LNAPL (MW-11) = 0.8165

Table 2 (Continued)
Summary of Groundwater Level Measurements

Monitoring Well	Date Gauged	Ground Surface Elevation (feet AMSL)	Top of Casing Elevation (feet AMSL)	Depth to Groundwater (feet AMSL)	Depth to LNAPL (feet AMSL)	LNAPL Thickness (feet)	Corrected Groundwater Elevation (feet AMSL)
MW-7	05/11/00	3618.93	3621.40	38.50	ND	0.00	3582.90
	08/22/00	3618.93	3621.40	38.18	ND	0.00	3583.22
	10/31/00	3618.93	3621.40	38.57	ND	0.00	3582.83
	02/05/01	3618.93	3621.40	38.65	ND	0.00	3582.75
	05/15/01	3618.93	3621.40	38.88	ND	0.00	3582.52
	08/09/01	3618.93	3621.40	39.16	ND	0.00	3582.24
	10/09/01	3618.93	3621.40	39.22	ND	0.00	3582.18
MW-8	05/11/00	3620.84	3623.62	43.69	ND	0.00	3579.93
	08/22/00	3620.84	3623.62	43.50	43.50	<0.01	3580.12
	10/31/00	3620.84	3623.62	43.78	43.78	0.00	3579.84
	02/05/01	3620.84	3623.62	43.85	43.82	0.03	3579.77
	05/15/01	3620.84	3623.62	44.05	44.05	<0.01	3579.57
	08/09/01	3620.84	3623.62	43.85	43.82	0.03	3579.77
	10/09/01	3620.84	3623.62	44.41	44.35	0.06	3579.25
MW-9	05/11/00	3622.60	3625.21	47.59	ND	0.00	3577.62
	08/22/00	3622.60	3625.21	47.70	ND	0.00	3577.51
	10/31/00	3622.60	3625.21	47.75	0.00	0.00	3577.46
	02/05/01	3622.60	3625.21	47.77	47.76	0.01	3577.45
	05/15/01	3622.60	3625.21	47.90	47.90	<0.01	3577.31
	08/09/01	3622.60	3625.21	48.21	48.21	<0.01	3577.00
	10/09/01	3622.60	3625.21	48.41	48.40	0.01	3576.81
MW-10	05/11/00	3618.30	3621.07	41.65	41.64	0.01	3579.43
	08/22/00	3618.30	3621.07	41.43	41.43	<0.01	3579.64
	10/31/00	3618.30	3621.07	41.79	41.79	<0.01	3579.28
	02/05/01	3618.30	3621.07	41.83	41.81	0.02	3579.25
	05/15/01	3618.30	3621.07	42.01	41.99	<0.01	3579.06
	08/09/01	3618.30	3621.07	42.32	42.32	<0.01	3578.75
	10/09/01	3618.30	3621.07	42.57	42.56	0.01	3578.51
MW-11	05/11/00	3623.05	3625.88	48.94	47.76	1.18	3577.91
	08/22/00	3623.05	3625.88	51.23	47.13	4.10	3578.00
	10/31/00	3623.05	3625.88	51.85	47.40	4.45	3577.66
	02/05/01	3623.05	3625.88	52.62	47.20	5.42	3577.69
	05/15/01	3623.05	3625.88	52.83	47.36	5.47	3577.52
	08/09/01	3623.05	3625.88	53.41	47.44	5.97	3577.34
	10/09/01	3623.05	3625.88	53.83	47.57	6.26	3577.16
MW-12	10/31/00	3623.95	3626.60	48.09	48.01	0.08	3578.58
	02/05/01	3623.95	3626.60	48.88	47.83	1.05	3578.58
	05/15/01	3623.95	3626.60	49.20	48.24	0.96	3578.18
	08/09/01	3623.95	3626.60	50.09	48.05	2.04	3578.18
	10/09/01	3623.95	3626.60	50.04	48.33	1.71	3577.96
MW-13	10/31/00	3623.53	3626.30	50.03	49.86	0.17	3576.41
	02/05/01	3623.53	3626.30	50.60	49.84	0.76	3576.32
	05/15/01	3623.53	3626.30	50.70	49.86	0.84	3576.29
	08/09/01	3623.53	3626.30	54.70	49.48	5.22	3575.86
	10/09/01	3623.53	3626.30	55.14	49.45	5.69	3575.81
MW-14	10/31/00	3618.76	3621.42	43.91	ND	0.00	3577.51
	02/05/01	3618.76	3621.42	43.96	ND	0.00	3577.46
	05/15/01	3618.76	3621.42	44.07	ND	0.00	3577.35
	08/09/01	3618.76	3621.42	44.52	ND	0.00	3576.90
	10/09/01	3618.76	3621.42	44.86	ND	0.00	3576.56

LNAPL = Light Non-Aqueous Phase Liquid, AMSL = Above Mean Sea Level, ND = Not Detected
Corrected Groundwater Elevation = Casing Elevation - Depth to Groundwater + (LNAPL Thickness x Specific Gravity of LNAPL)
Specific Gravity of LNAPL (MW-4) = 0.7740; Specific Gravity of LNAPL (MW-11) = 0.8165

Table 2 (Continued)
Summary of Groundwater Level Measurements

Monitoring Well	Date Gauged	Ground Surface Elevation (feet AMSL)	Top of Casing Elevation (feet AMSL)	Depth to Groundwater (feet AMSL)	Depth to LNAPL (feet AMSL)	LNAPL Thickness (feet)	Corrected Groundwater Elevation (feet AMSL)
MW-15	10/31/00	3616.79	3619.39	39.82	ND	0.00	3579.57
	02/05/01	3616.79	3619.39	39.86	ND	0.00	3579.53
	05/15/01	3616.79	3619.39	40.03	ND	0.00	3579.36
	08/09/01	3616.79	3619.39	40.37	ND	0.00	3579.02
	10/09/01	3616.79	3619.39	40.69	ND	0.00	3578.70
MW-16	10/31/00	3619.10	3621.87	40.37	ND	0.00	3581.50
	02/05/01	3619.10	3621.87	40.45	ND	0.00	3581.42
	05/15/01	3619.10	3621.87	40.66	ND	0.00	3581.21
	08/09/01	3619.10	3621.87	40.91	ND	0.00	3580.96
	10/09/01	3619.10	3621.87	41.08	ND	0.00	3580.79
MW-17	10/31/00	3621.36	3623.94	48.59	48.58	<0.01	3575.36
	02/05/01	3621.36	3623.94	48.70	48.68	0.02	3575.26
	05/15/01	3621.36	3623.94	48.80	48.79	0.01	3575.14
	08/09/01	3621.36	3623.94	49.07	49.04	0.03	3574.89
	10/09/01	3621.36	3623.94	49.26	49.26	<0.01	3574.68
MW-18	10/31/00	3621.96	3624.30	49.64	ND	0.00	3574.66
	02/05/01	3621.96	3624.30	49.77	ND	0.00	3574.53
	05/15/01	3621.96	3624.30	49.87	ND	0.00	3574.43
	08/09/01	3621.96	3624.30	50.09	ND	0.00	3574.21
	10/09/01	3621.96	3624.30	50.32	50.31	0.01	3573.99
MW-19	10/31/00	3621.42	3624.12	50.15	ND	0.00	3573.97
	02/05/01	3621.42	3624.12	50.24	ND	0.00	3573.88
	05/15/01	3621.42	3624.12	50.33	ND	0.00	3573.79
	08/09/01	3621.42	3624.12	50.57	ND	0.00	3573.55
	10/09/01	3621.42	3624.12	50.80	ND	0.00	3573.32
RW-1	05/11/00	3621.53	3624.52	46.00	45.05	0.95	3579.16
	08/22/00	3621.53	3624.52	45.20	45.00	0.20	3579.47
	10/31/00	3621.53	3624.52	46.00	45.00	1.00	3579.29
	02/05/01	3621.53	3624.52	47.31	44.70	2.61	3579.23
	03/21/01	3621.53	3624.52	47.63	44.77	2.86	3579.10
	08/09/01	3621.53	3624.52	47.04	45.30	1.74	3578.83
	10/09/01	3621.53	3624.52	47.89	45.32	2.57	3578.62

LNAPL = Light Non-Aqueous Phase Liquid, AMSL = Above Mean Sea Level, ND = Not Detected
Corrected Groundwater Elevation = Casing Elevation - Depth to Groundwater + (LNAPL Thickness x Specific Gravity of LNAPL)
Specific Gravity of LNAPL (MW-4) = 0.7740; Specific Gravity of LNAPL (MW-11) = 0.8165

Figure 2A
Groundwater Elevation Versus Time
(MW-1 through MW-10)

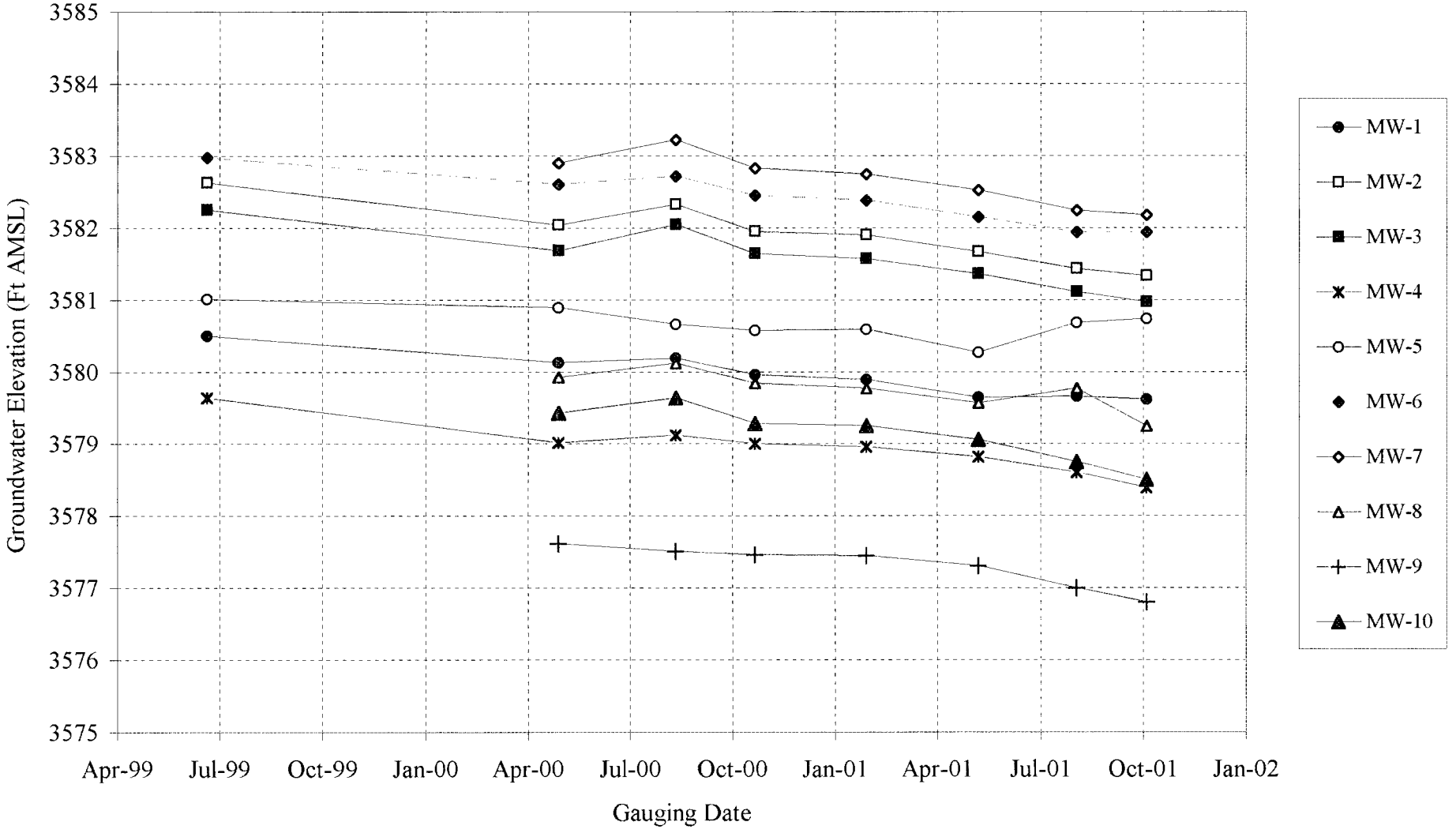
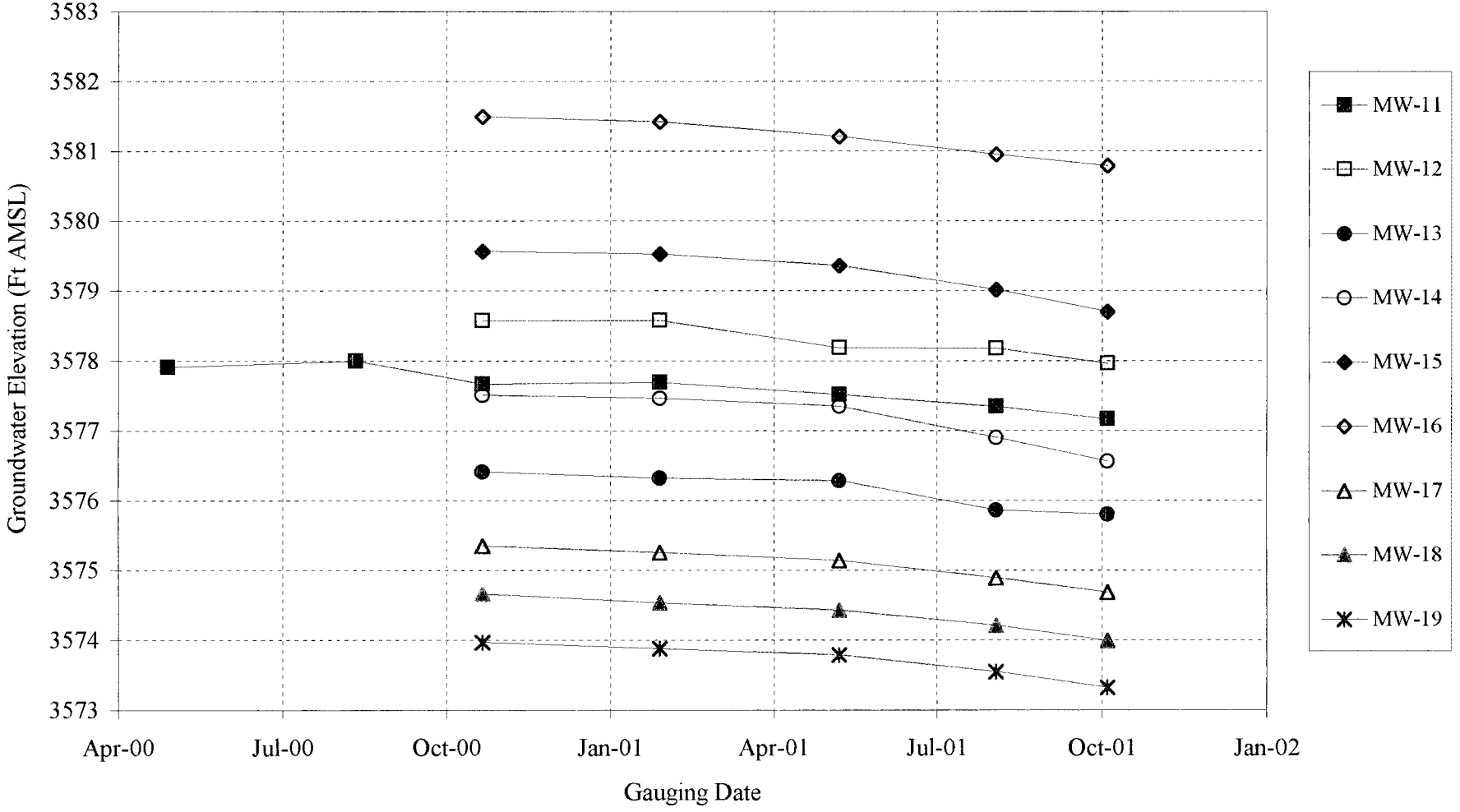


Figure 2B
Groundwater Elevation Versus Time
(MW-11 through MW-19)



6.0 Distribution of Hydrocarbons in Groundwater

A historical listing of BTEX concentrations obtained from the on site monitoring wells is summarized in Table 3. Hydrocarbon concentration maps depicting the BTEX concentrations for the February 5-6, 2001, May 15-16, 2001, August 9-10, 2001, and October 10-11, 2001 sampling events are presented in Figures 3A, 3B, 3C, and 3D, respectively. BTEX concentration and Groundwater Elevation versus time graphs for MW-1, MW-2, MW-3, MW-8, MW-14, MW-15, MW-16, MW-18, and MW-19 are provided in Figures 4A through 4I, respectively. Laboratory analytical reports and chain-of-custody documentation for the groundwater sampling operations are provided in Appendix B. Based on the most recent analytical data, the distribution of hydrocarbons dissolved in groundwater at the Hobbs Booster Station is described below.

- Benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations in monitoring wells MW-5, MW-6, and MW-7 are below New Mexico Water Quality Control Commission (WQCC) standards.

- Benzene levels in monitoring well MW-1 (0.144 mg/L), MW-2 (1.0230 mg/L), MW-3 (0.029 mg/L), MW-10 (1.13 mg/L) , MW-14 (0.029 mg/L), MW-15 (0.317 mg/L), MW-16 (0.012 mg/L), MW-17 (0.076 mg/L), MW-18 (0.036 mg/L), and MW-19 (0.035 mg/L) are above the WQCC standard of 0.010 mg/L.

- During the first, third and fourth quarter sampling events, dissolved benzene in groundwater has extended offsite of the southern property boundary. Although no consistent trend has been observed, benzene levels in cross-gradient (south) monitoring wells MW-14, MW-15, and MW-16 have decreased since the previous third quarter sampling event.

- During the fourth quarter sampling event, the benzene level in downgradient monitoring well MW-19 along the eastern property boundary has increased to a level above the WQCC standard for the first time indicating offsite migration.

Table 3
Summary of BTEX Concentrations in Groundwater
Hobbs Booster Station

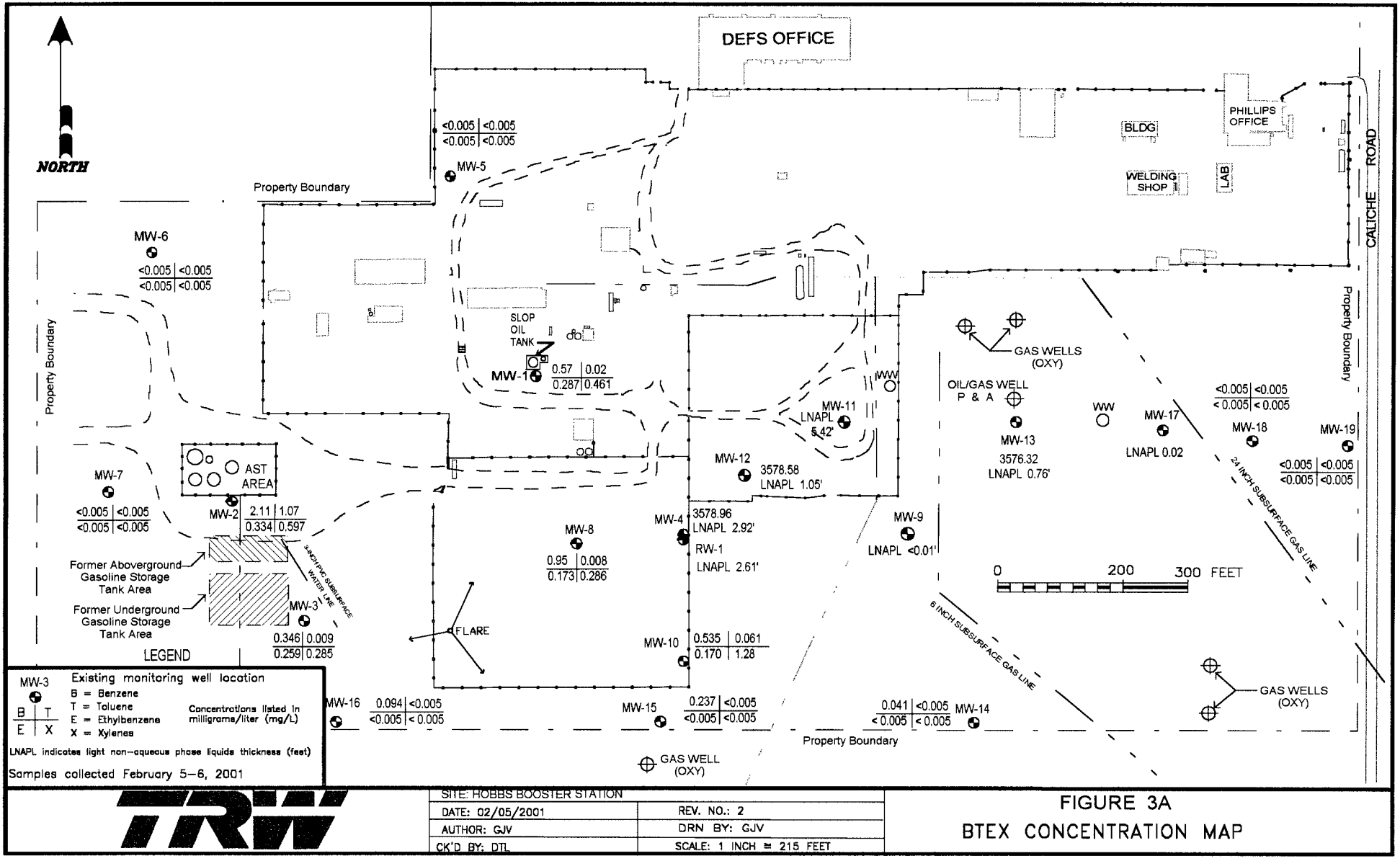
Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-1	06/17/99	**0.232**	0.029	0.168	0.229
	05/11/00	**0.191**	0.034	0.344	0.604
	08/22/00	**0.181**	0.035	0.273	0.450
	10/31/00	**0.197**	0.028	0.285	0.466
	02/05/01	**0.57**	0.020	0.287	0.461
	05/15/01	LNAPL	LNAPL	LNAPL	LNAPL
	08/09/01	LNAPL	LNAPL	LNAPL	LNAPL
	10/11/01	**0.144**	< 0.020	0.236	0.120
MW-2	06/17/99	**0.934**	**0.993**	0.192	0.359
	05/11/00	**1.33**	**1.22**	0.309	0.501
	08/22/00	**1.42**	**1.38**	0.298	0.541
	10/31/00	**1.02**	0.539	0.235	0.394
	02/05/01	**2.11**	1.07	0.334	0.597
	05/15/01	**0.848**	0.488	0.396	**0.772**
	08/09/01	**1.76**	0.211	0.255	0.452
	10/10/01	**1.30**	0.246	0.314	0.243
MW-3	06/17/99	**0.262**	0.029	0.222	0.287
	05/11/00	**0.202**	0.022	0.245	0.291
	08/22/00	**0.011**	0.023	0.218	0.264
	10/31/00	< 0.005	0.014	0.203	0.290
	02/05/01	**0.346**	0.009	0.259	0.285
	05/15/01	< 0.001	0.017	0.324	0.346
	08/09/01	**0.345**	< 0.005	0.207	0.316
	10/10/01	**0.029**	< 0.010	0.207	0.146
MW-5	06/17/99	< 0.005	< 0.005	< 0.005	< 0.005
	05/11/00	< 0.005	< 0.005	< 0.005	< 0.005
	08/22/00	< 0.005	< 0.005	< 0.005	< 0.005
	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
	02/05/01	< 0.005	< 0.005	< 0.005	< 0.005
	05/15/01	< 0.001	< 0.001	< 0.001	< 0.001
	08/09/01	< 0.001	< 0.001	< 0.001	< 0.001
	10/10/01	< 0.001	< 0.001	< 0.001	< 0.001
MW-6	06/18/99	< 0.005	< 0.005	< 0.005	< 0.005
	05/11/00	< 0.005	< 0.005	< 0.005	0.038
	08/22/00	< 0.005	0.008	< 0.005	0.007
	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
	02/05/01	< 0.005	< 0.005	< 0.005	< 0.005
	05/15/01	< 0.001	< 0.001	< 0.001	< 0.001
	08/09/01	< 0.001	< 0.001	< 0.001	< 0.001
	10/10/01	< 0.001	< 0.001	< 0.001	< 0.001
MW-7	05/11/00	< 0.005	< 0.005	< 0.005	< 0.005
	08/22/00	< 0.005	0.008	< 0.005	0.008
	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
	02/05/01	< 0.005	< 0.005	< 0.005	< 0.005
	05/15/01	< 0.001	< 0.001	< 0.001	< 0.001
	08/09/01	< 0.001	< 0.001	< 0.001	< 0.001
	10/10/01	< 0.001	< 0.001	< 0.001	< 0.001
WQCC Standards		0.010	0.75	0.75	0.62

Analyses performed by Trace Analysis, Inc., Lubbock, Texas using EPA Method 8021B..
Values listed in **boldface** type indicate concentrations exceed New Mexico Water Quality Control Commission (WQCC) standards.
LNAPL - No sample analyzed due to presence of Light Non-Aqueous Phase Liquid.
MW-4 never analyzed due to presence of LNAPL.

Table 3 (Continued)
Summary of BTEX Concentrations in Groundwater

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-8	05/11/00	**0.824**	< 0.05	0.375	**0.742**
	08/22/00	LNAPL	LNAPL	LNAPL	LNAPL
	10/31/00	LNAPL	LNAPL	LNAPL	LNAPL
	02/05/01	**0.95**	0.008	0.173	0.286
	05/15/01	**0.294**	0.008	0.226	0.340
	08/09/01	**1.23**	< 0.01	0.201	0.449
	10/10/01	LNAPL	LNAPL	LNAPL	LNAPL
MW-9	05/11/00	**0.702**	0.016	0.096	0.208
	08/22/00	LNAPL	LNAPL	LNAPL	LNAPL
	10/31/00	LNAPL	LNAPL	LNAPL	LNAPL
	02/05/01	LNAPL	LNAPL	LNAPL	LNAPL
	05/15/01	LNAPL	LNAPL	LNAPL	LNAPL
	08/09/01	LNAPL	LNAPL	LNAPL	LNAPL
	10/10/01	LNAPL	LNAPL	LNAPL	LNAPL
MW-10	05/11/00	LNAPL	LNAPL	LNAPL	LNAPL
	08/22/00	LNAPL	LNAPL	LNAPL	LNAPL
	10/31/00	**0.535**	0.061	0.170	**1.28**
	02/05/01	LNAPL	LNAPL	LNAPL	LNAPL
	05/15/01	LNAPL	LNAPL	LNAPL	LNAPL
	08/09/01	LNAPL	LNAPL	LNAPL	LNAPL
	10/10/01	**1.130**	**0.85**	**0.889**	**2.38**
MW-14	10/31/00	< 0.005	< 0.005	0.007	< 0.005
	02/05/01	**0.041**	< 0.005	< 0.005	< 0.005
	05/15/01	0.002	< 0.001	0.004	< 0.001
	08/09/01	**0.034**	< 0.005	< 0.005	< 0.005
	10/10/01	**0.029**	< 0.001	0.018	< 0.001
MW-15	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
	02/05/01	**0.237**	< 0.005	< 0.005	< 0.005
	05/15/01	0.003	0.003	0.004	< 0.001
	08/09/01	**0.353**	< 0.005	< 0.005	< 0.005
	10/10/01	**0.317**	< 0.020	< 0.020	< 0.020
MW-16	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
	02/05/01	**0.094**	< 0.005	< 0.005	< 0.005
	05/15/01	0.01	0.004	0.003	0.004
	08/09/01	**0.098**	< 0.005	< 0.005	< 0.005
	10/10/01	**0.012**	< 0.001	0.007	0.002
MW-17	10/31/00	LNAPL	LNAPL	LNAPL	LNAPL
	02/05/01	LNAPL	LNAPL	LNAPL	LNAPL
	05/15/01	LNAPL	LNAPL	LNAPL	LNAPL
	08/09/01	**0.040**	< 0.001	0.057	0.12
	10/10/01	**0.076**	< 0.005	0.101	0.278
MW-18	10/31/00	< 0.005	< 0.005	0.017	0.143
	02/05/01	< 0.005	< 0.005	< 0.005	< 0.005
	05/15/01	0.004	0.003	0.02	0.009
	08/09/01	0.007	< 0.001	< 0.001	0.030
	10/10/01	**0.036**	< 0.005	0.089	0.238
MW-19	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
	02/05/01	< 0.005	< 0.005	< 0.005	< 0.005
	05/15/01	0.001	< 0.001	< 0.001	< 0.001
	08/09/01	< 0.005	< 0.005	< 0.005	< 0.005
	10/10/01	**0.035**	< 0.005	< 0.005	< 0.005
WQCC Standards		0.010	0.75	0.75	0.62

Analyses performed by Trace Analysis, Inc., Lubbock, Texas using EPA Method 8021B..
Values listed in **boldface** type indicate concentrations exceed New Mexico Water Quality Control Commission (WQCC) standards.
LNAPL - No sample analyzed due to presence of Light Non-Aqueous Phase Liquid.
MW-11, MW-12, and MW13 never analyzed due to presence of LNAPL.



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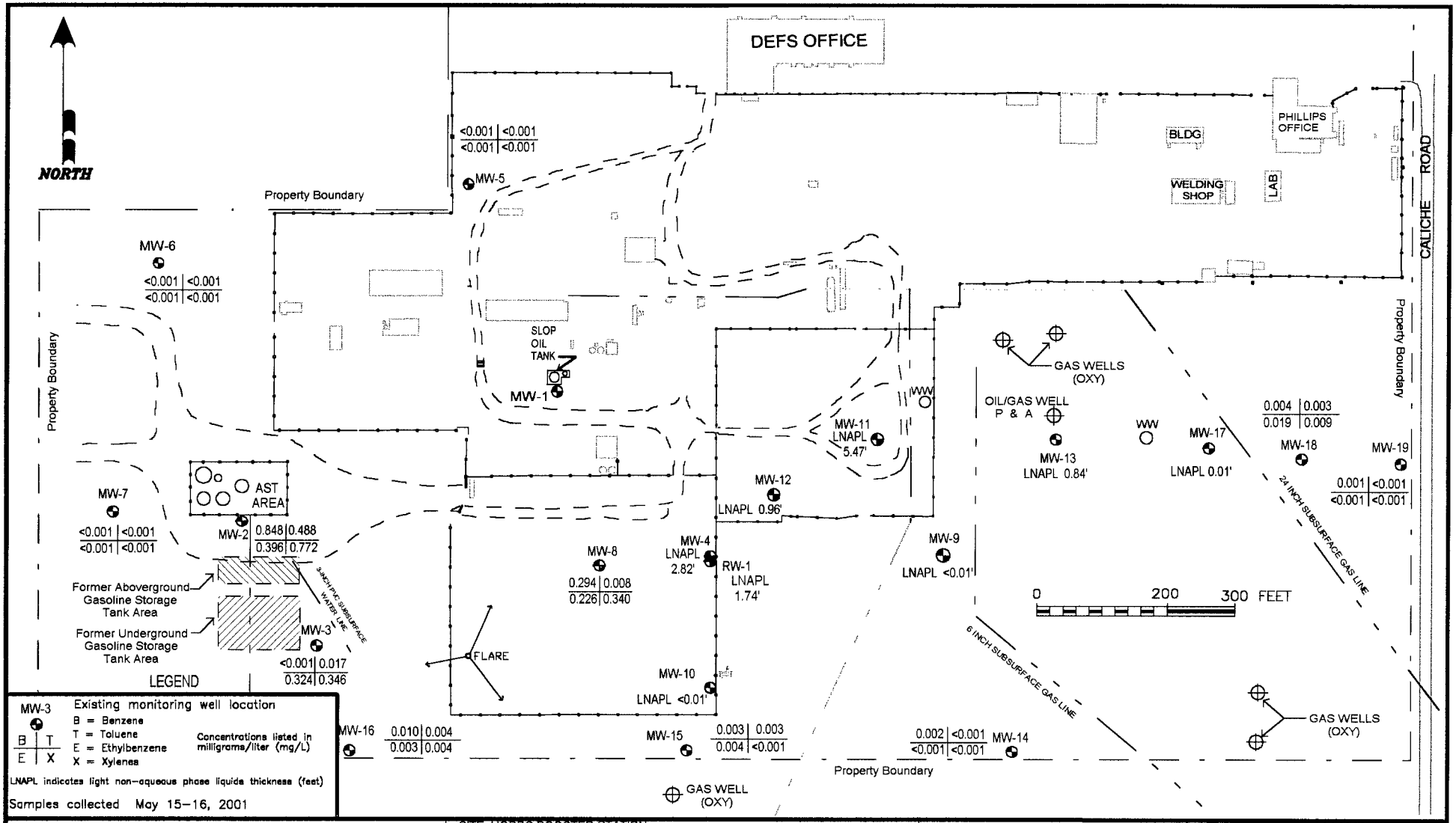
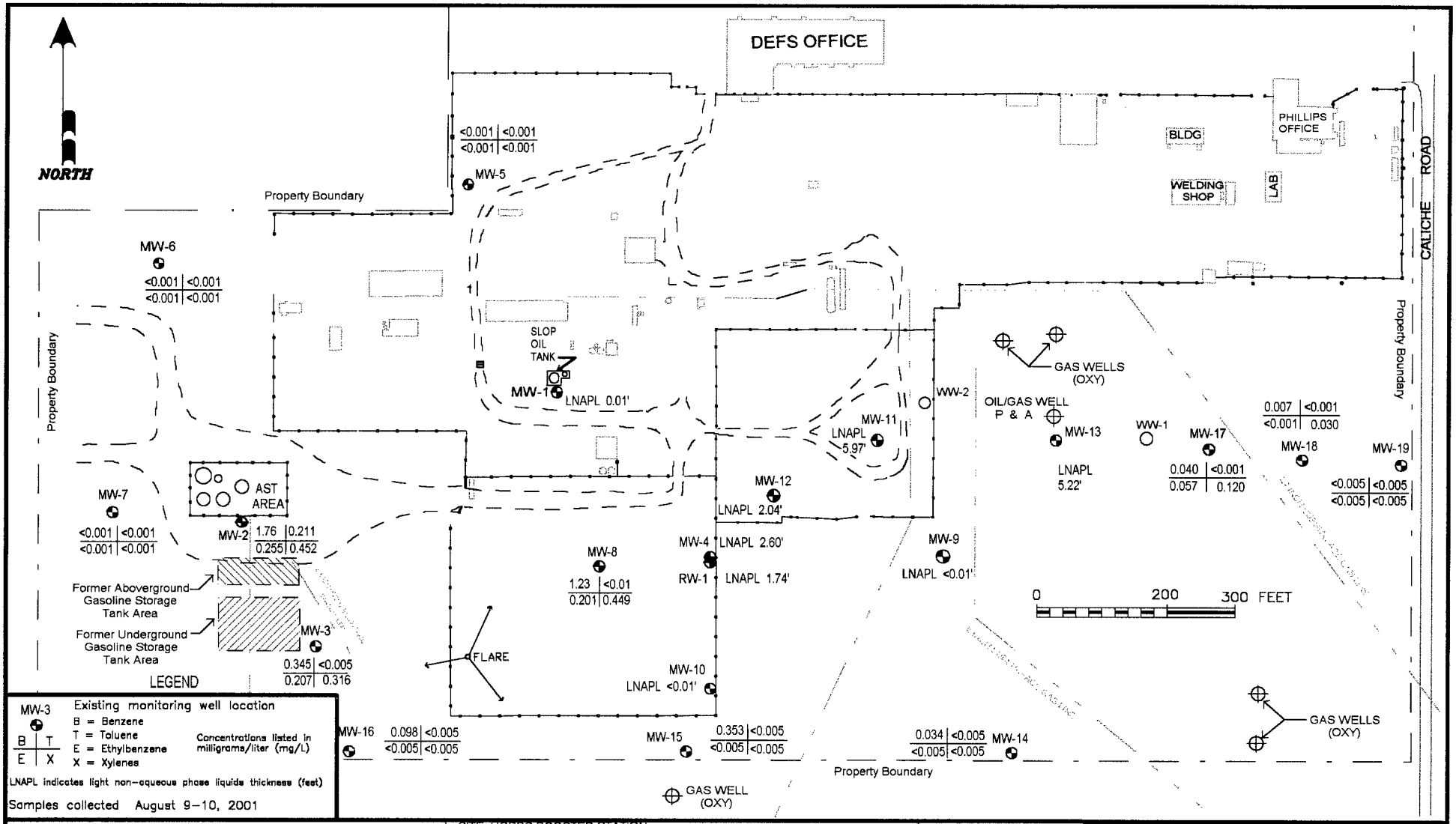
DATE: 02/05/2001	REV. NO.: 2
AUTHOR: GJV	DRN BY: GJV
CK'D BY: DTL	SCALE: 1 INCH ≅ 215 FEET

FIGURE 3A
BTEX CONCENTRATION MAP



TRIDENT ENVIRONMENTAL	SITE: HOBBS BOOSTER STATION
PO Box 7624 Midland, Texas 79708	DATE: 05/16/2001 / REV. NO.: 3
	AUTHOR: GJV / DRN BY: GJV
	CK'D BY: DTL / SCALE: 1 INCH = 215 FEET

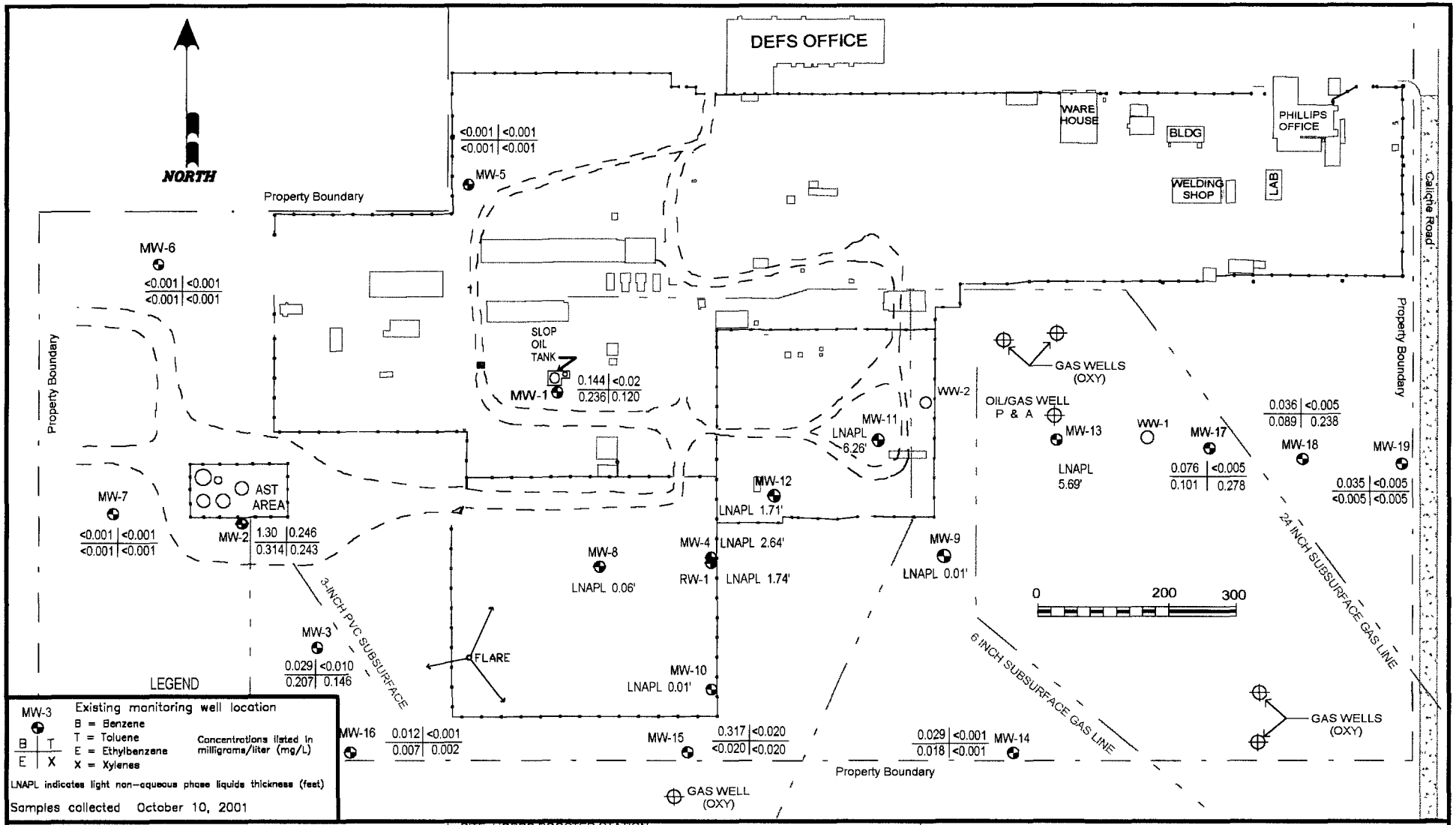
FIGURE 3B
BTEX CONCENTRATION MAP



TRIDENT ENVIRONMENTAL
PO Box 7624 Midland, Texas 79708

SITE: HOBBS BOOSTER STATION	
DATE: 08/9/2001	REV. NO.: 3
AUTHOR: GJV	DRN BY: GJV
CK'D BY: DTL	SCALE: 1 INCH = 215 FEET

FIGURE 3C
BTEX CONCENTRATION MAP



TRIDENT ENVIRONMENTAL
PO Box 7624 Midland, Texas 79708

SITE: HOBBS BOOSTER STATION	
DATE: 10/10-11/01	REV. NO.: 3
AUTHOR: GJV	DRN BY: GJV
CK'D BY: DTL	SCALE: 1 INCH = 225 FEET

FIGURE 3D
BTEX CONCENTRATION MAP

Figure 4A
BTEX Concentration and Groundwater Elevation Vs. Time (MW-1)

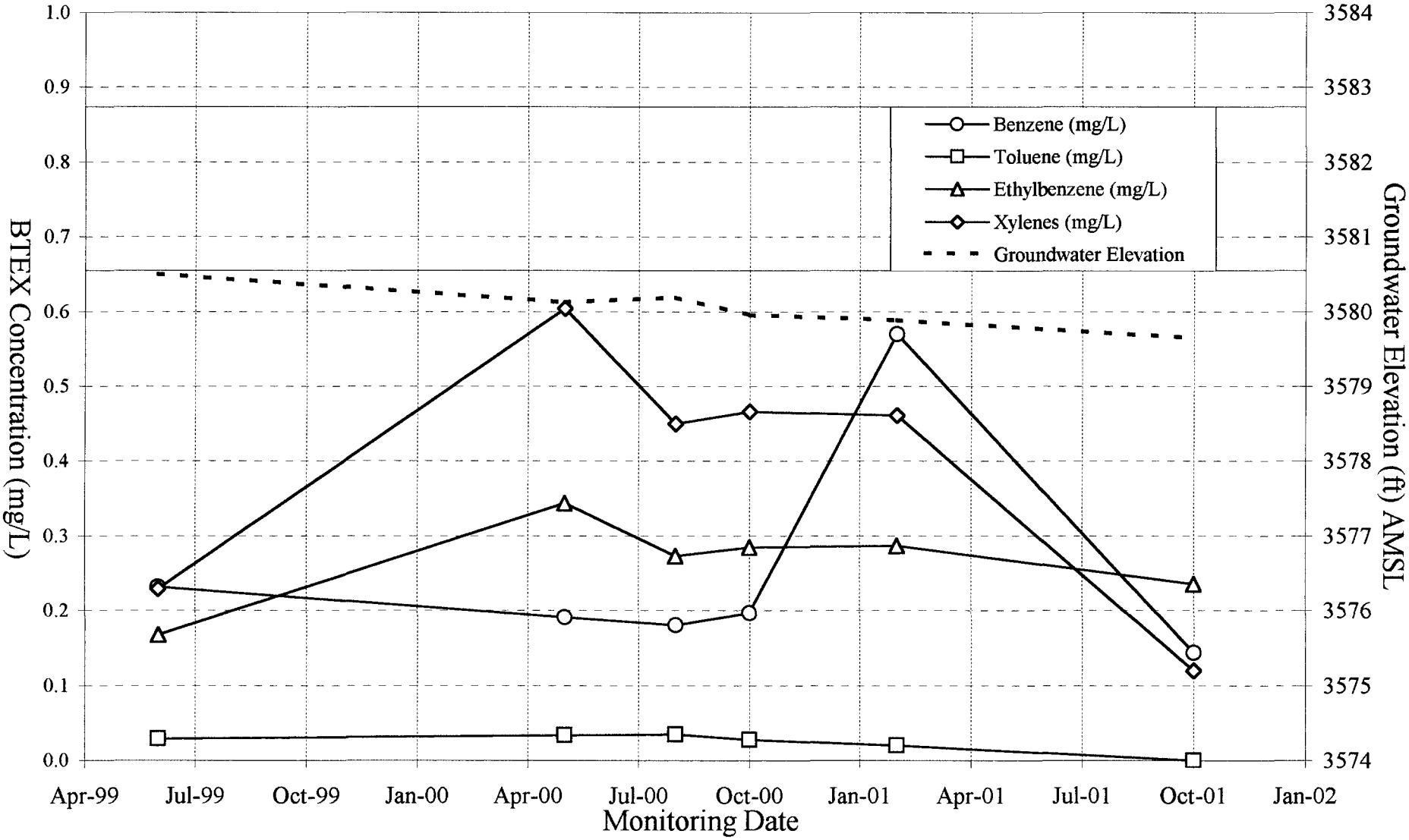


Figure 4B
BTEX Concentration and Groundwater Elevation Vs. Time (MW

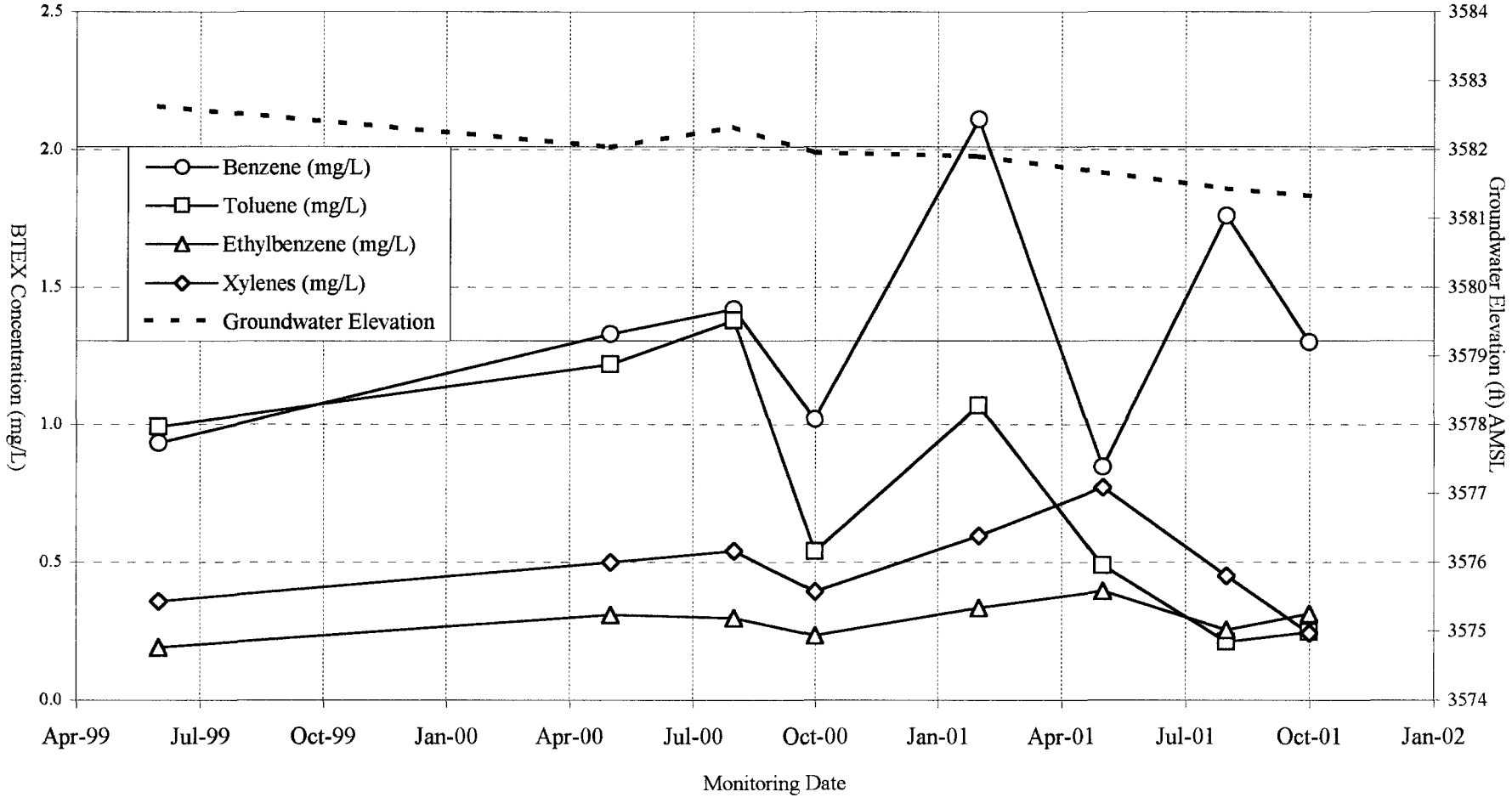


Figure 4C
BTEX Concentration and Groundwater Elevation Vs. Time (MW-3)

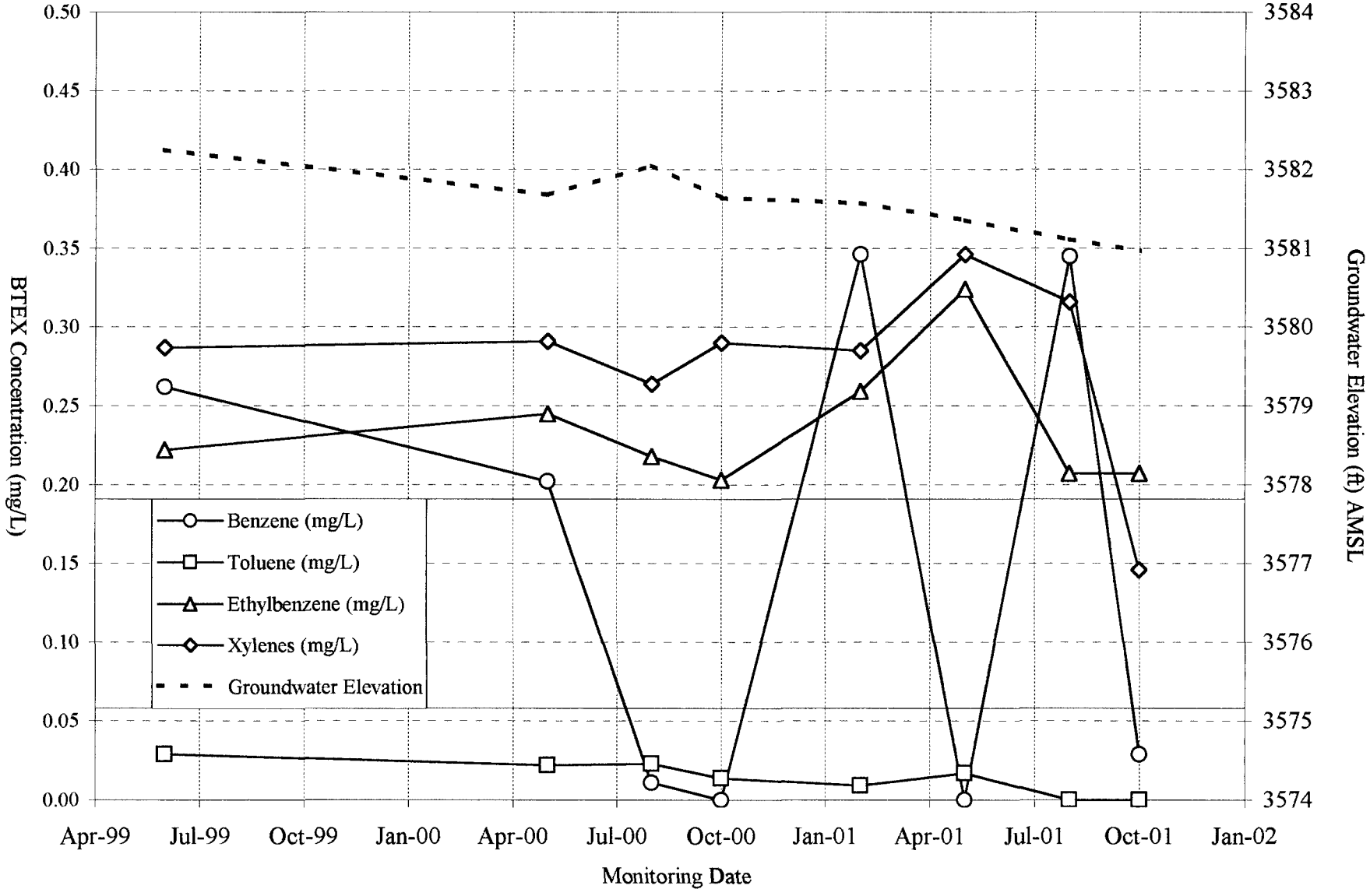


Figure 4D
BTEX Concentration and Groundwater Elevation Vs. Time (MW-8)

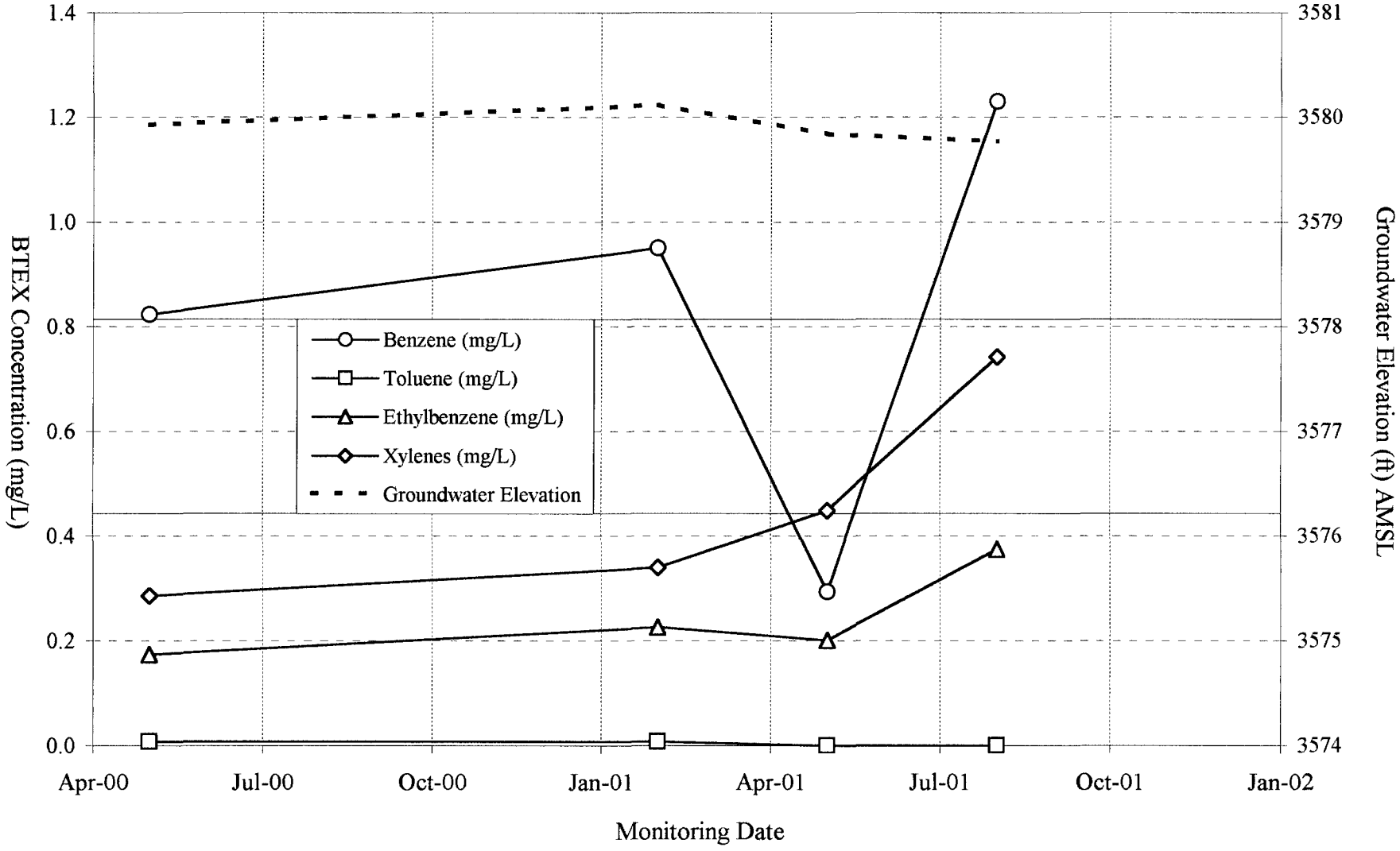


Figure 4E
BTEX Concentration and Groundwater Elevation Vs. Time (MW-14)

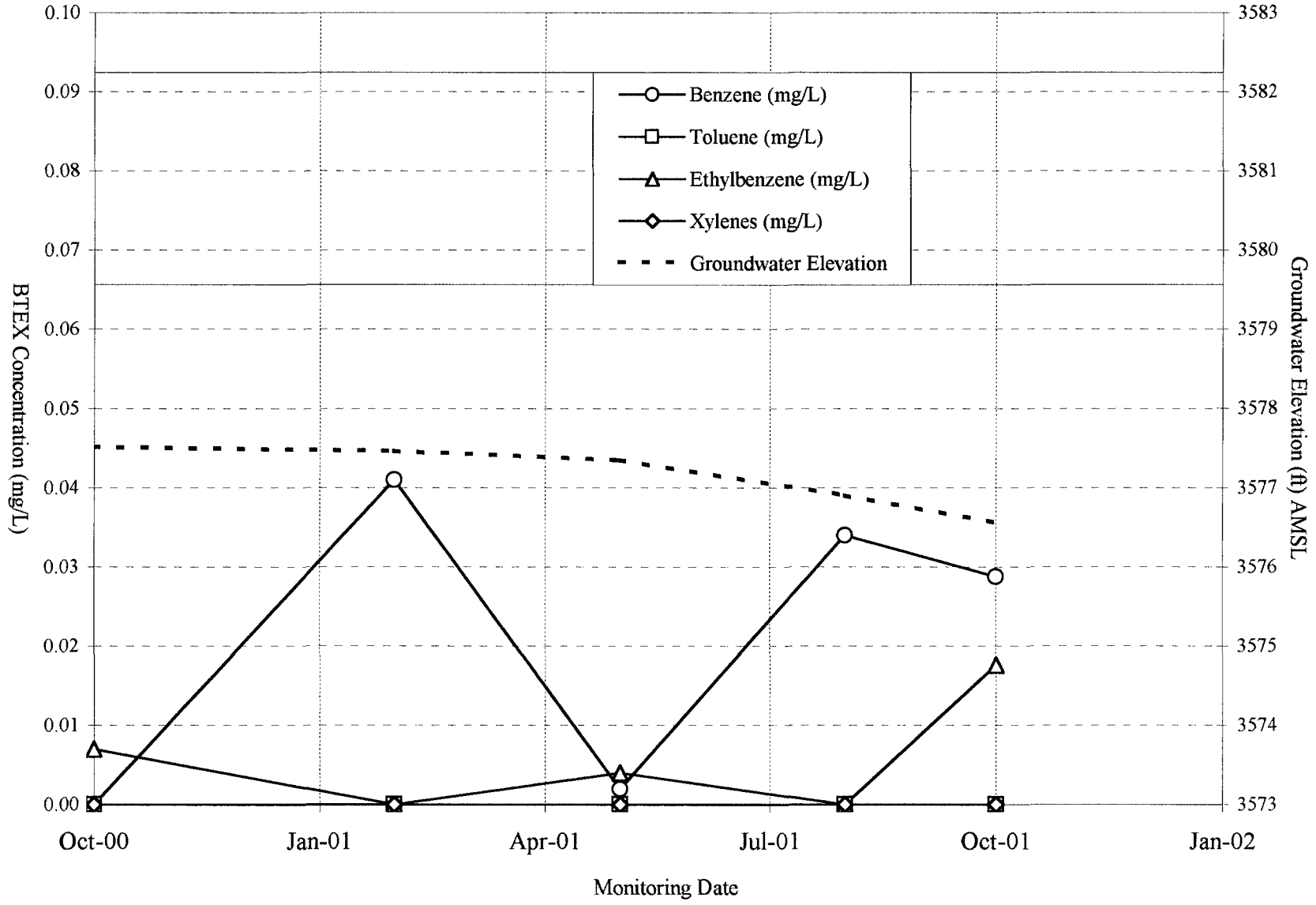


Figure 4F
BTEX Concentration and Groundwater Elevation Vs. Time (MW-15)

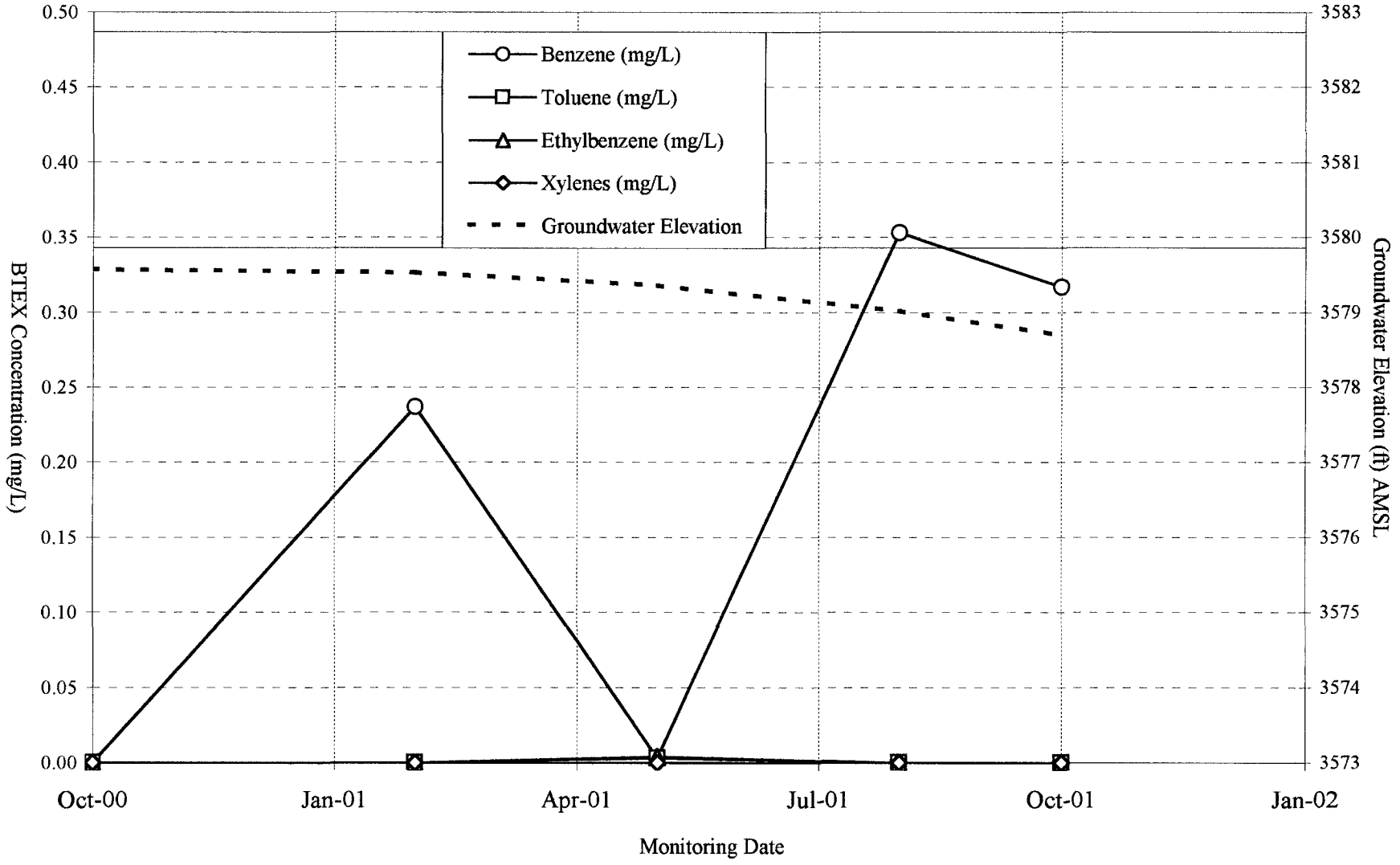


Figure 4G
BTEX Concentration and Groundwater Elevation Vs. Time (MW-16)

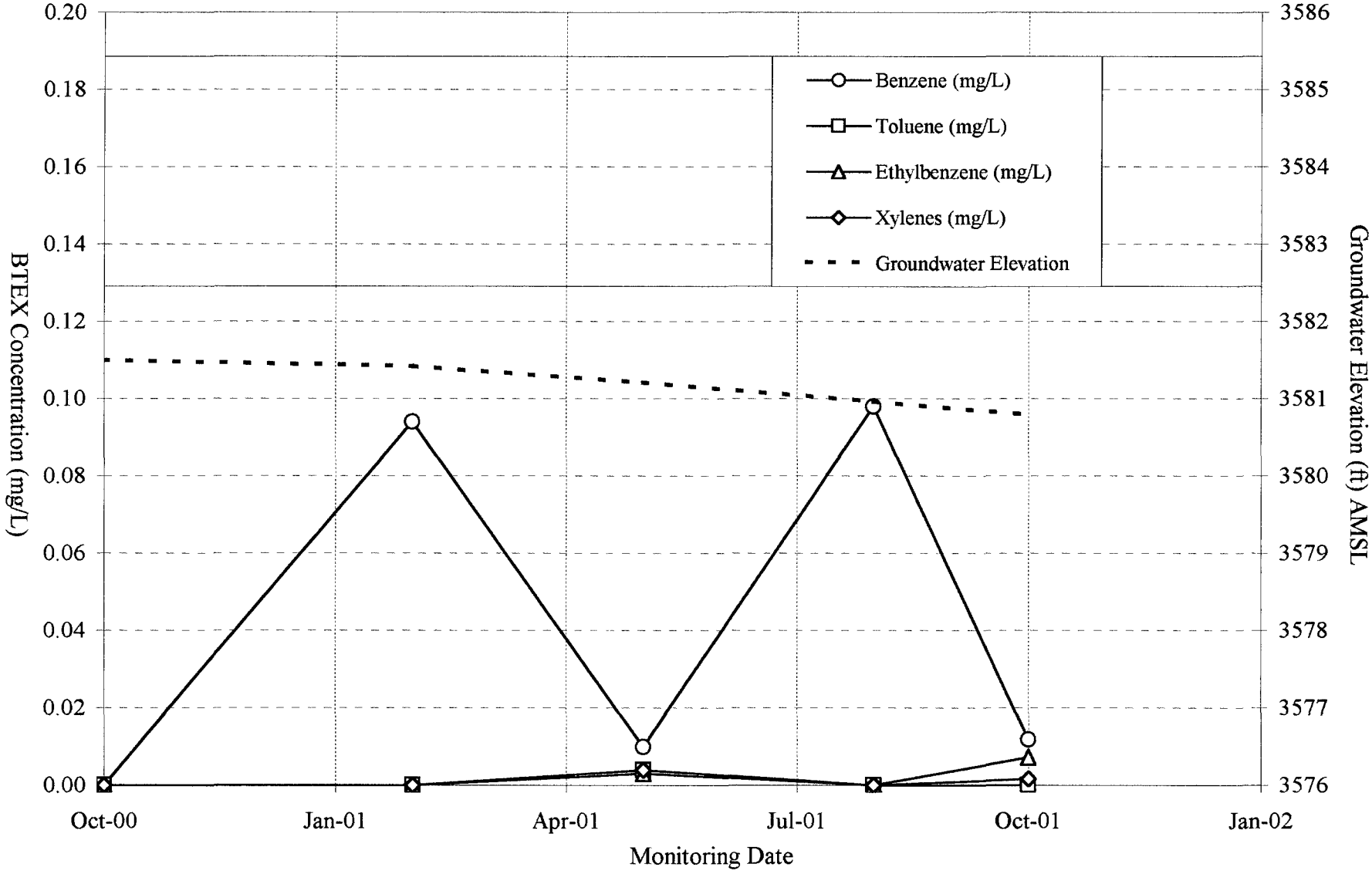


Figure 4H
BTEX Concentration and Groundwater Elevation Vs. Time (MW-18)

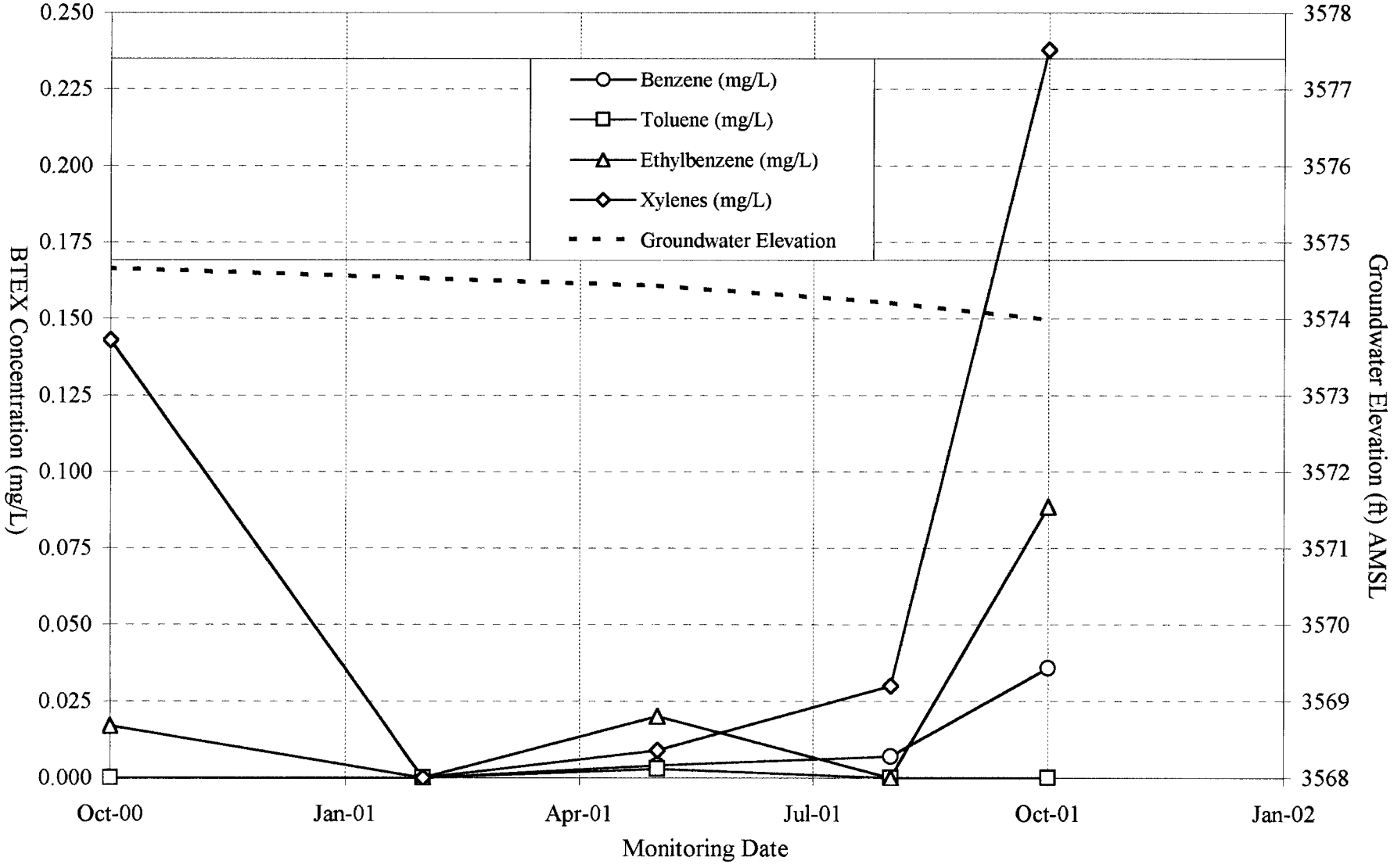
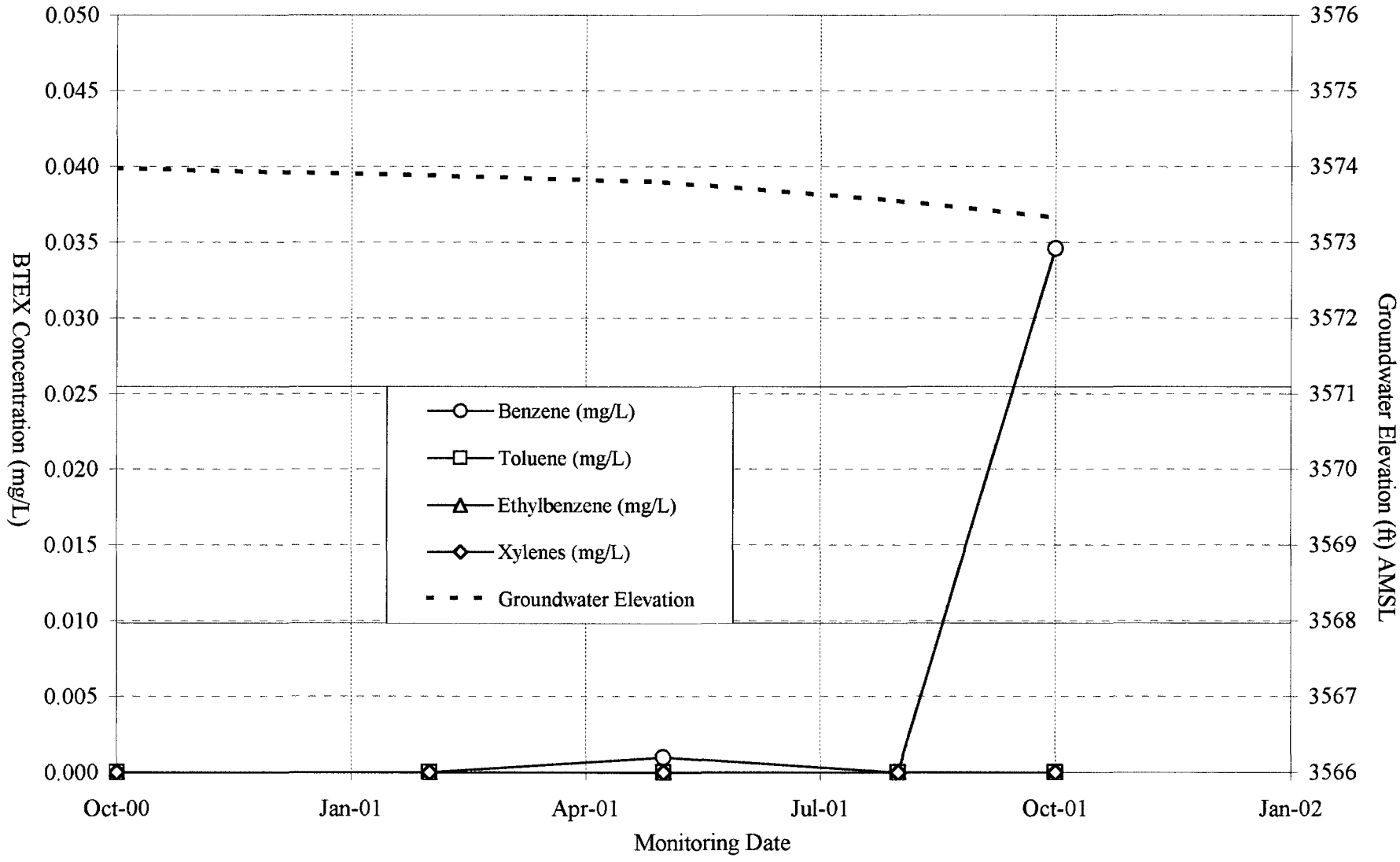


Figure 4I
BTEX Concentration and Groundwater Elevation Vs. Time (MW-19)



7.0 Remediation System Performance

The remediation system at the Hobbs Booster Station includes one Xitech pneumatic product recovery system that was installed in recovery well RW-1 on May 10, 2000. Also, passive skimmers are installed in MW-1 and MW-4 and hydrophobic (oil absorbent) socks in MW-8, MW-9, MW-10, MW-12, MW-13, MW-17, and MW-18. Since July 9, 1999, a total of approximately 284 gallons of LNAPL (condensate) has been removed from the on site wells as summarized in Table 4 below.

Table 4
Product Recovery Volumes
Hobbs Booster Station

Date	Product Recovered (gallons)									Total (gallons)
	RW-1	MW-1	MW-4	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	
07/09/99	---	0.00	3.00	---	---	---	---	---	---	3.0
06/15/00	0.5	0.00	0.00	---	---	---	---	---	---	0.5
07/12/00	0.0	0.00	1.38	0.00	0.00	0.00	2.05	---	---	3.4
08/22/00	3.0	0.00	2.11	0.00	0.00	0.00	2.25	---	---	7.4
09/21/00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	---	---	0.0
10/12/00	1.6	0.00	2.44	0.00	0.00	0.00	4.00	---	---	8.0
11/01/00	2.0	0.00	1.64	0.00	0.00	0.00	2.09	---	---	5.7
12/14/00	8.0	0.00	2.43	2.36	0.00	0.00	2.36	---	---	15.1
01/22/01	7.0	0.00	0.46	0.00	0.00	0.00	2.19	1.34	1.99	11.0
02/06/01	3.0	0.00	2.49	0.00	0.00	0.00	2.41	0.87	0.46	8.8
03/21/01	2.0	0.00	2.41	0.00	0.00	0.00	0.00	1.30	1.74	5.7
05/15/01	7.0	0.00	0.46	0.00	0.00	0.00	2.09	0.17	0.21	9.7
06/18/01	60.0	0.00	1.70	0.00	0.00	0.00	3.05	1.71	3.39	66.5
07/20/01	3.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.0
08/10/01	3.0	0.01	2.87	0.02	0.00	0.00	2.42	2.02	3.10	10.3
09/10/01	9.0	0.03	1.70	0.00	0.00	0.00	1.00	1.95	4.62	13.7
10/03/01	60.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.0
10/11/01	5.0	0.04	2.45	0.00	0.00	0.00	2.44	1.84	4.30	11.8
11/07/01	0.0	0.07	0.46	0.03	0.00	0.00	2.77	1.56	2.34	4.9
12/11/01	27.5	0.09	2.92	0.02	0.00	0.00	2.83	2.00	6.24	35.4
Totals	201.6	0.25	27.92	2.42	0.00	0.00	33.96	14.75	28.38	283.9

Product recovery methods used:
RW-1 (4-inch diameter well): Xitech ADJ 1000 Smart Skimmer (Product Recovery System)
MW-1 (2-inch diameter well): Passive bailer
MW-4 (2-inch diameter well): Passive bailer, hand bailing, Spill Buddy pump
MW-8 (2-inch diameter well): Hydrophobic (oil adsorbent) sock
MW-9 (2-inch diameter well): Hydrophobic (oil adsorbent) sock
MW-10 (2-inch diameter well): Hydrophobic (oil adsorbent) sock
MW-11 (2-inch diameter well): Passive bailer, hand bailing, Spill Buddy pump
MW-12 (4-inch diameter well): Hydrophobic (oil adsorbent) sock and Spill Buddy pump
MW-13 (4-inch diameter well): Hydrophobic (oil adsorbent) sock and Spill Buddy pump

On January 22, 2001, TRW supervised the installation of three vapor monitoring wells (VE-1, VE-2, and VE-3) and one air sparge well (AS-1) near the Xitech PRS. On January 23, 2001, TRW conducted a vapor extraction feasibility test using the vapor extraction wells and existing monitoring wells as monitoring points. A report of the results of the vapor extraction feasibility test is included in Appendix C. Further analysis of the site data is underway to assess the appropriate remedial actions for the site.

8.0 Conclusions

Conclusions relevant to groundwater conditions and the remediation performance at the Hobbs Booster Station are presented below.

- Benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations in monitoring wells MW-5, MW-6, and MW-7 are below New Mexico Water Quality Control Commission (WQCC) standards.

- Benzene levels in monitoring well MW-1 (0.144 mg/L), MW-2 (1.0230 mg/L), MW-3 (0.029 mg/L), MW-10 (1.13 mg/L) , MW-14 (0.029 mg/L), MW-15 (0.317 mg/L), MW-16 (0.012 mg/L), MW-17 (0.076 mg/L), MW-18 (0.036 mg/L), and MW-19 (0.035 mg/L) are above the WQCC standard of 0.010 mg/L.

- During the first, third and fourth quarter sampling events, dissolved benzene in groundwater has extended offsite of the southern property boundary. Although no consistent trend has been observed, benzene levels in cross-gradient (south) monitoring wells MW-14, MW-15, and MW-16 have decreased since the previous third quarter sampling event.

- During the fourth quarter sampling event, the benzene level in downgradient monitoring well MW-19 along the eastern property boundary has increased to a level above the WQCC standard for the first time indicating offsite migration.

- Light non-aqueous phase liquids (LNAPL) were measured in monitoring wells MW-4 (2.64 ft), MW-8 (0.06 ft), MW-9 (0.01 ft), MW-10 (0.01 ft), MW-11 (6.26 ft), MW-12 (1.17 ft), and MW-13 (5.69 ft).

- As of December 10, 2001, a total of approximately 284 gallons of LNAPL (condensate) have been removed from recovery well RW-1 and monitoring wells MW-1, MW-4, MW-8, MW-9, MW-10, and MW-17 using a combination of the Xitech product recovery system (PRS), hand bailing, passive skimmers, absorbent socks, and a portable product recovery pump (Spill Buddy™).

9.0 Recommendations

The following recommendations are proposed for the remediation system and monitoring operations at the Hobbs Booster Station.

- Continue LNAPL recovery operations using the Xitech PRS in RW-1 and the absorbent socks or passive bailers in monitoring wells with greater than 0.01 feet of product.
- Begin a program of monitoring natural attenuation that includes the analysis of dissolved oxygen (DO), nitrate (NO_3), sulfate (SO_4), ferric iron (Fe^{3+}), ferrous iron (Fe^{2+}), and manganese (Mn) to assess the efficacy of intrinsic bioremediation processes occurring on site.
- Continue the groundwater-monitoring program on a quarterly frequency. The next sampling event is scheduled during the first quarter of 2002.
- Submit a corrective action work plan and remediation system design based on the results of remediation feasibility tests and monitoring data.

Appendix A

Well Sampling Data Forms

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-1**
SITE NAME: Hobbs Booster Station
DATE: 5/16/01
PROJECT NO. V-103
SAMPLER: Fergerson

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 53.00 Feet
DEPTH TO WATER: 46.42 Feet
HEIGHT OF WATER COLUMN: 6.58 Feet
WELL DIAMETER: 2.0 Inch

3.2 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1007	0	-	-	-	-	-	Pump turned on.
1014	3	22.2	1730	6.88	-	-	
1022	6	21.9	1780	6.90	-	-	
1037	9	22.0	1640	6.87	-	-	
1045	12	22.2	1680	6.87	-	-	Pump turned off

COMMENTS: Not sampled due to presence of LNAPL (< 0.01 ft) after pump was removed from well.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-2**
SITE NAME: Hobbs Booster Station
DATE: 5/16/01
PROJECT NO. V-103
SAMPLER: Fergerson

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 53.00 Feet
DEPTH TO WATER: 41.47 Feet
HEIGHT OF WATER COLUMN: 11.53 Feet
WELL DIAMETER: 2.0 Inch

5.6 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1135	0	-	-	-	-	-	Pump turned on.
1144	3	21.7	1430	6.83	-	-	
1150	6	21.2	1730	6.89	-	-	
1157	9	21.3	1780	6.90	-	-	
1203	12	21.7	1890	6.92	-	-	Pump turned off
							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-3**
SITE NAME: Hobbs Booster Station
DATE: 5/16/01
PROJECT NO. V-103
SAMPLER: Fergerson

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 53.00 Feet
DEPTH TO WATER: 41.65 Feet
HEIGHT OF WATER COLUMN: 11.35 Feet
WELL DIAMETER: 2.0 Inch

5.6 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
	0	-	-	-	-	-	Pump turned on.
0813	3	20.7	2540	7.02	-	-	
0820	6	20.4	2300	6.99	-	-	
0827	9	20.6	2460	7.04	-	-	
0834	12	20.6	2490	7.02	-	-	Pump turned off
0845							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS: Collected Sample for BTEX 8021B (Two 40-ml VOA containers).

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-5**
SITE NAME: Hobbs Booster Station
DATE: 5/15/01
PROJECT NO. V-103
SAMPLER: Fergerson

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 57.00 Feet
DEPTH TO WATER: 48.89 Feet
HEIGHT OF WATER COLUMN: 8.11 Feet
WELL DIAMETER: 2.0 Inch

4.0 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1327	0	-	-	-	-	-	Pump turned on.
1336	3	21.9	1290	6.80	-	-	
1346	6	21.5	1270	6.80	-	-	
1356	9	21.7	1600	6.86	-	-	
1406	12	21.6	1490	6.84	-	-	Pump turned off
							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-6**
SITE NAME: Hobbs Booster Station
DATE: 5/15/01
PROJECT NO. V-103
SAMPLER: Fergerson

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 53.00 Feet
DEPTH TO WATER: 44.78 Feet
HEIGHT OF WATER COLUMN: 8.22 Feet
WELL DIAMETER: 2.0 Inch

4.0 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1037	0	-	-	-	-	-	Pump turned on.
1046	3	21.2	1800	6.90	-	-	
1055	6	20.6	1620	6.87	-	-	
1103	9	20.3	1650	6.87	-	-	
1105					-	-	Pump turned off
							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-7**
SITE NAME: Hobbs Booster Station
DATE: 5/15/01
PROJECT NO. V-103
SAMPLER: Fergerson

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 53.00 Feet
DEPTH TO WATER: 38.88 Feet
HEIGHT OF WATER COLUMN: 14.12 Feet
WELL DIAMETER: 2.0 Inch

6.9 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1238	0	-	-	-	-	-	Pump turned on.
1244	3	21.2	920	6.39	-	-	
1251	6	21.0	120*	6.60	-	-	* Erratic conductivity reading
1257	9	20.8	750*	6.71	-	-	
1304	12	21.1	1040	6.76	-	-	Pump turned off
							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-14**
SITE NAME: Hobbs Booster Station
DATE: 5/15/01
PROJECT NO. V-103
SAMPLER: Fergerson

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 63.00 Feet
DEPTH TO WATER: 44.07 Feet
HEIGHT OF WATER COLUMN: 18.93 Feet
WELL DIAMETER: 2.0 Inch

9.3 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1741	0	-	-	-	-	-	Pump turned on.
1747	3	22.0	479	7.44	-	-	
1753	6	21.6	509	7.50	-	-	
1800	9	21.6	505	7.50	-	-	Pump turned off
1805							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-15**
SITE NAME: Hobbs Booster Station
DATE: 5/16/01
PROJECT NO. V-103
SAMPLER: Fergerson

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:
☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.00 Feet
DEPTH TO WATER: 40.03 Feet
HEIGHT OF WATER COLUMN: 17.97 Feet
WELL DIAMETER: 2.0 Inch

8.8 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
0914	0	-	-	-	-	-	Pump turned on.
0920	3	21.6	1390	6.82	-	-	
0926	6	21.5	1780	6.90	-	-	
0937	9	21.9	1790	6.89	-	-	
0948	12	22.1	1890	6.91			Pump turned off
1000							Collected sample
							Placed sample in two 40-ml VOAs
0000							Collected duplicate sample from this well
							Placed duplicate sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-16**
SITE NAME: Hobbs Booster Station
DATE: 5/16/01
PROJECT NO. V-103
SAMPLER: Fergerson

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.00 Feet
DEPTH TO WATER: 40.66 Feet
HEIGHT OF WATER COLUMN: 14.34 Feet
WELL DIAMETER: 2.0 Inch

7.0 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
0720	0	-	-	-	-	-	Pump turned on.
0725	3	20.0	260	6.60	-	-	
0730	6	20.2	2090	6.95	-	-	
0736	9	20.2	2440	7.02	-	-	
0743	12	20.3	2640	7.05	-	-	
0749	15	20.3	2770	7.08			Pump turned off
0750							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-18**
SITE NAME: Hobbs Booster Station
DATE: 5/15/01
PROJECT NO. V-103
SAMPLER: Fergerson

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:
☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 63.00 Feet
DEPTH TO WATER: 49.87 Feet
HEIGHT OF WATER COLUMN: 13.13 Feet
WELL DIAMETER: 4.0 Inch

25.7 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1543	0	-	-	-	-	-	Pump turned on.
1559	5	20.0	260	6.60	-	-	
1619	10	20.2	2090	6.95	-	-	
1639	15	20.2	2440	7.02	-	-	
1654	20	20.3	2640	7.05	-	-	
1709	25	20.3	2770	7.08			Pump turned off
							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS: Pump & hose had product when removed from well, however, product not detected with ORS interface probe. Disposable bailer had only a small amount of product (about size of dime) stain on outside. No floating product was observed inside disposable bailer.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-19**
SITE NAME: Hobbs Booster Station
DATE: 5/15/01
PROJECT NO. V-103
SAMPLER: Fergerson

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 64.00 Feet
DEPTH TO WATER: 50.33 Feet
HEIGHT OF WATER COLUMN: 13.67 Feet
WELL DIAMETER: 2.0 Inch

6.7 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1431	0	-	-	-	-	-	Pump turned on.
1443	3	23.1	1320	6.81	-	-	
1455	6	22.9	1870	6.91	-	-	
1507	9	22.8	1800	6.90	-	-	
1519	12	27.2	1730	6.88	-	-	
1530							Pump turned off
							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-2**
SITE NAME: Hobbs Booster Station
DATE: 8/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☑ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☐ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 53.00 Feet
DEPTH TO WATER: 41.71 Feet
HEIGHT OF WATER COLUMN: 11.29 Feet
WELL DIAMETER: 2.0 Inch

5.5 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
0944	0	-	-	-	-	-	Pump turned on.
0948	3	20.6	258	7.13	2.15	94	
0952	6	20.1	260	7.17	2.19	-	
0956	9	19.9	260	7.19	2.18	-	
1000	12	20.0	261	7.21	2.11	-	Pump turned off
1000							Collected sample
							Placed sample in two 40-ml VOAs
0950							Collected duplicate sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-3**
SITE NAME: Hobbs Booster Station
DATE: 8/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 53.00 Feet
DEPTH TO WATER: 41.90 Feet
HEIGHT OF WATER COLUMN: 11.10 Feet
WELL DIAMETER: 2.0 Inch

5.4 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
0905	0	-	-	-	-	-	Pump turned on.
0910	3	20.6	1240	7.25	2.14	999	
0914	6	20.1	1250	7.24	2.18	-	
0918	9	20.0	1250	7.25	2.05	-	
0923	12	19.9	1250	7.26	2.33	-	Pump turned off
0930							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS: Collected Sample for BTEX 8021B (Two 40-ml VOA containers).

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-5**
SITE NAME: Hobbs Booster Station
DATE: 8/9/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 57.00 Feet
DEPTH TO WATER: 48.48 Feet
HEIGHT OF WATER COLUMN: 8.52 Feet
WELL DIAMETER: 2.0 Inch

4.2 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1057	0	-	-	-	-	-	Pump turned on.
1103	3	20.9	1360	7.11	2.02	235	
1108	6	20.3	1480	7.13	2.11	-	
1115	9	20.5	1520	7.16	2.47	-	
1120	12	20.3	1540	7.13	2.06	-	Pump turned off
							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-6**
SITE NAME: Hobbs Booster Station
DATE: 8/9/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 53.00 Feet
DEPTH TO WATER: 44.99 Feet
HEIGHT OF WATER COLUMN: 8.01 Feet
WELL DIAMETER: 2.0 Inch

3.9 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. mS/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1010	0	-	-	-	-	-	Pump turned on.
1017	3	20.4	1680	7.25	3.54	999	
1022	6	20.0	1670	7.22	2.55	94	
1027	9	19.8	1660	7.20	2.42	0	
1032	12	19.7	1660	7.20	2.42	0	Pump turned off
							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-7**
SITE NAME: Hobbs Booster Station
DATE: 8/9/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:
☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 53.00 Feet
DEPTH TO WATER: 39.16 Feet
HEIGHT OF WATER COLUMN: 13.84 Feet
WELL DIAMETER: 2.0 Inch

6.8 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1000	0	-	-	-	-	-	Pump turned on.
1006	3	19.7	1240	7.24	3.17	94	
1010	6	19.5	1210	7.26	3.21	-	
1015	9	19.3	1210	7.27	3.43	-	
1019	12	19.3	1210	7.27	3.51	-	Pump turned off
1025							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-8**
SITE NAME: Hobbs Booster Station
DATE: 8/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 56.00 Feet
DEPTH TO WATER: 44.22 Feet
HEIGHT OF WATER COLUMN: 11.78 Feet
WELL DIAMETER: 2.0 Inch

5.8 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1028	0	-	-	-	-	-	Pump turned on.
1033	3	21.1	1660	7.28	2.44	59	
1037	6	20.8	1680	7.26	2.11	-	
1041	9	20.7	1660	7.28	2.31	-	
1045	12	20.7	1650	7.30	2.58	-	Pump turned off
1050							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-10**
SITE NAME: Hobbs Booster Station
DATE: 8/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 56.00 Feet
DEPTH TO WATER: 42.32 Feet
HEIGHT OF WATER COLUMN: 13.68 Feet
WELL DIAMETER: 2.0 Inch

6.7 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1117	0	-	-	-	-	-	Pump turned on.
1121	3	21.5	2950	7.77	1.61	-	
1125	6	20.8	2970	7.79	2.04	-	
1129	9	20.5	2970	7.83	1.61	-	
1133	12	20.5	3010	7.84	1.88	-	Pump turned off
1140							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-14**
SITE NAME: Hobbs Booster Station
DATE: 8/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 63.00 Feet
DEPTH TO WATER: 44.52 Feet
HEIGHT OF WATER COLUMN: 18.48 Feet
WELL DIAMETER: 2.0 Inch

9.0 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
0726	0	-	-	-	-	-	Pump turned on.
0730	3	20.6	2040	7.45	2.19	13	
0734	6	20.6	1900	7.52	1.93	10	
0739	9	20.6	1890	7.57	2.4	10	Pump turned off
0743	12	20.6	1870	7.56	2.21	10	Collected sample
0750							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-15**
SITE NAME: Hobbs Booster Station
DATE: 8/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.00 Feet
DEPTH TO WATER: 40.37 Feet
HEIGHT OF WATER COLUMN: 17.63 Feet
WELL DIAMETER: 2.0 Inch

8.6 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
0643	0	-	-	-	-	-	Pump turned on.
0648	3	20.5	1620	6.81	1.81	503	
0651	6	20.5	1620	6.83	2.08	90	
0655	9	20.5	1620	6.85	1.99	10	
0700	12	20.6	1600	6.91	2.08	10	Pump turned off
0710							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-16**
SITE NAME: Hobbs Booster Station
DATE: 8/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.00 Feet
DEPTH TO WATER: 40.91 Feet
HEIGHT OF WATER COLUMN: 14.09 Feet
WELL DIAMETER: 2.0 Inch

6.9 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
0821	0	-	-	-	-	-	Pump turned on.
0825	3	20.4	1.35	7.19	2.12	-	
0829	6	20.3	1.33	7.27	2.02	-	
0834	9	20.3	1.33	7.29	2.06	-	
0838	12	20.3	1.33	7.34	2.02	-	
0840							Pump turned off
							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-17**
SITE NAME: Hobbs Booster Station
DATE: 8/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:
☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.00 Feet
DEPTH TO WATER: 49.07 Feet
HEIGHT OF WATER COLUMN: 12.93 Feet
25.3 Minimum Gallons to purge 3 well volumes
WELL DIAMETER: 4.0 Inch

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1639	0	-	-	-	-	-	Pump turned on.
1643	3	22.3	2980	7.30	1.58	-	
1649	6	21.6	2920	7.35	2.08	-	
1655	9	21.4	2860	7.35	2.13	-	
1701	12	21.4	2740	7.38	2.04	-	
1708	15	21.5	2770	7.41	1.88	999	Pump turned off
1714	18	21.2	2490	7.49	1.39	999	Collected sample
1720	21	21.2	2550	7.5	1.79	82	Placed sample in two 40-ml VOAs
1730							

COMMENTS: Installed hydrophobic(oil absorbent) sock into well

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-18**
SITE NAME: Hobbs Booster Station
DATE: 8/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:
☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 63.00 Feet
DEPTH TO WATER: 50.09 Feet
HEIGHT OF WATER COLUMN: 12.91 Feet
WELL DIAMETER: 4.0 Inch

25.3 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1534	0	-	-	-	-	-	Pump turned on.
1541	3	23.5	1890	7.20	-	-	
1548	6	22.2	1920	7.28	1.70	-	
1554	9	21.8	1930	7.31	1.94	-	
1601	12	21.5	1890	7.32	1.78	-	
1606	15	21.3	1850	7.34	1.72		Pump turned off
1612	18	21.3	1880	7.34	1.83		Collected sample
1620							Placed sample in two 40-ml VOAs

COMMENTS: Installed hydrophobic(oil absorbent) sock into well

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-19**
SITE NAME: Hobbs Booster Station
DATE: 8/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 64.00 Feet
DEPTH TO WATER: 50.57 Feet
HEIGHT OF WATER COLUMN: 13.43 Feet
WELL DIAMETER: 2.0 Inch

6.6 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1541	0	-	-	-	-	-	Pump turned on.
1547	3	21.4	2360	7.12	2.67	999	
1553	6	20.8	2400	7.14	2.20	160	
1559	9	20.3	2400	7.12	2.13	21	
1604	12	20.3	2390	7.13	2.05	10	
1610							Pump turned off
							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-1**
SITE NAME: Hobbs Booster Station
DATE: 10/11/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 53.00 Feet
DEPTH TO WATER: 46.44 Feet
HEIGHT OF WATER COLUMN: 6.56 Feet
WELL DIAMETER: 2.0 Inch

3.2 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
	0	-	-	-	-	-	
0816	3	18.7	1750	7.42	3.64	999	
0829	6	19.2	1800	7.33	3.65	999	
0838	9	19.5	1820	7.35	3.82	999	
0845							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS: Re-installed passive bailer into well after sampling.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-2**
SITE NAME: Hobbs Booster Station
DATE: 10/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☑ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☐ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 53.00 Feet
DEPTH TO WATER: 41.81 Feet
HEIGHT OF WATER COLUMN: 11.19 Feet
WELL DIAMETER: 2.0 Inch

5.5 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1718	0	-	-	-	-	-	Turned pump on
1722	3	19.8	2530	7.45	2.38	622	
1727	6	19.7	2500	7.47	2.70	8	
1731	9	19.6	2510	7.48	2.64	0	Turned pump off
1745							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

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WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-3**
SITE NAME: Hobbs Booster Station
DATE: 10/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 53.00 Feet
DEPTH TO WATER: 42.04 Feet
HEIGHT OF WATER COLUMN: 10.96 Feet
WELL DIAMETER: 2.0 Inch

5.4 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1638	0	-	-	-	-	-	Turned pump on
1643	3	20.1	1260	7.50	2.70	999	
1648	6	19.5	1260	7.50	2.53	999	
1652	9	19.5	1270	7.47	1.79	999	Turned pump off
1700							Collected sample
							Placed sample in two 40-ml VOAs
0000							Collected duplicate sample
							Placed duplicate sample in two 40-ml VOAs

COMMENTS: Collected Sample for BTEX 8021B (Two 40-ml VOA containers).

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-5**
SITE NAME: Hobbs Booster Station
DATE: 10/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 57.00 Feet
DEPTH TO WATER: 48.42 Feet
HEIGHT OF WATER COLUMN: 8.58 Feet
WELL DIAMETER: 2.0 Inch

4.2 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
0749	0	-	-	-	-	-	Turned pump on
0755	3	18.8	877	6.98	2.74	0	
0801	6	18.9	1230	7.08	2.35	0	
0806	9	18.9	1310	7.15	2.47	0	
0815							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-6**
SITE NAME: Hobbs Booster Station
DATE: 10/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 53.00 Feet
DEPTH TO WATER: 44.99 Feet
HEIGHT OF WATER COLUMN: 8.01 Feet
WELL DIAMETER: 2.0 Inch

3.9 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
0843	0	-	-	-	-	-	Turned pump on
0848	3	18.8	1690	7.25	3.08	608	
0853	6	19.1	1660	7.24	3.11	6	
0858	9	19.1	1650	7.26	3.07	61	
0910							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-7**
SITE NAME: Hobbs Booster Station
DATE: 10/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 53.00 Feet
DEPTH TO WATER: 39.22 Feet
HEIGHT OF WATER COLUMN: 13.78 Feet
WELL DIAMETER: 2.0 Inch

6.7 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
0925	0	-	-	-	-	-	Turned pump on
0929	3	18.9	1210	7.32	3.48	156	
0935	6	19.0	1200	7.34	3.43	0	
0942	9	19.2	1210	7.38	3.39	10	
0950							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

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WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-10**
SITE NAME: Hobbs Booster Station
DATE: 10/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 56.00 Feet
DEPTH TO WATER: 42.57 Feet
HEIGHT OF WATER COLUMN: 13.43 Feet
WELL DIAMETER: 2.0 Inch

6.6 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
	0	-	-	-	-	-	Turned pump on
1429	3	19.8	3100	8.05	3.44	138	
1438	6	19.7	3110	8.14	3.21	284	
1447	9	19.8	3080	8.15	3.23	314	
1455							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-14**
SITE NAME: Hobbs Booster Station
DATE: 10/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 63.00 Feet
DEPTH TO WATER: 44.86 Feet
HEIGHT OF WATER COLUMN: 18.14 Feet
WELL DIAMETER: 2.0 Inch

8.9 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1525	0	-	-	-	-	-	Turned pump on
1531	3	22.0	2130	7.74	2.40	228	
1537	6	21.5	2040	7.82	2.54	81	
1542	9	21.5	2010	7.79	2.23	42	
1550							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-15**
SITE NAME: Hobbs Booster Station
DATE: 10/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.00 Feet
DEPTH TO WATER: 40.69 Feet
HEIGHT OF WATER COLUMN: 17.31 Feet
WELL DIAMETER: 2.0 Inch

8.5 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1420	0	-	-	-	-	-	Turned pump on
1425	3	21.8	1680	7.23	2.49	326	
1430	6	21.5	1680	7.34	2.39	153	
1435	9	21.2	1640	7.40	2.25	0	
1441	12	21.3	1640	7.39	2.18	0	Pump turned off
1450							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-16**
SITE NAME: Hobbs Booster Station
DATE: 10/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.00 Feet
DEPTH TO WATER: 41.08 Feet
HEIGHT OF WATER COLUMN: 13.92 Feet
WELL DIAMETER: 2.0 Inch

6.8 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1606	0	-	-	-	-	-	Turned pump on
1611	3	20.9	1350	7.38	1.74	999	
1616	6	20.5	1330	7.47	1.59	999	
1621	9	20.6	1340	7.51	1.80	999	
1630							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-17**
SITE NAME: Hobbs Booster Station
DATE: 10/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.00 Feet
DEPTH TO WATER: 49.26 Feet
HEIGHT OF WATER COLUMN: 12.74 Feet
WELL DIAMETER: 4.0 Inch

24.9 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
	0	-	-	-	-	-	
1138	4	20.2	3000	7.49	3.23	999	
1147	8	20.2	2930	7.46	2.51	999	
1153	12	20.2	2800	7.51	2.58	999	
1200	16	20.1	2730	7.51	2.79	999	
1207	20	20.2	2540	7.60	2.83	999	
1214	24	20.1	2620	7.56	2.91	999	
1220							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS: Recovered 30 ml from sock prior to purging. Installed new hydrophobic(oil absorbent) sock into well after sampling.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-18**
SITE NAME: Hobbs Booster Station
DATE: 10/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 63.00 Feet
DEPTH TO WATER: 50.32 Feet
HEIGHT OF WATER COLUMN: 12.68 Feet
WELL DIAMETER: 4.0 Inch

24.8 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
	0	-	-	-	-	-	
1042	8	20.0	1910	7.38	2.48	999	
1048	12	20.0	1860	7.48	2.45	999	
1101	16	20.3	1890	7.46	2.48	999	
1106	20	20.2	1840	7.50	2.65	999	
1111	24	20.0	1840	7.52	2.78	999	
1115							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS: No recovery from hydrophobic(oil absorbent) sock prior to purging. Re-installed sock into well after sampling.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-19**
SITE NAME: Hobbs Booster Station
DATE: 10/10/01
PROJECT NO. V-103
SAMPLER: Fergerson / Littlejohn

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: Whaler Super Purger submersible pump
SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 64.00 Feet
DEPTH TO WATER: 50.80 Feet
HEIGHT OF WATER COLUMN: 13.20 Feet
WELL DIAMETER: 2.0 Inch

6.5 Minimum Gallons to purge 3 well volumes

TIME	VOLUME PURGED	TEMP. °C / °F	COND. *m*S/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
	0	-	-	-	-	-	Turned pump on
1036	3	20.6	2500	7.20	2.30	203	
1043	6	20.2	2470	7.25	2.20	9	
1049	9	20.0	2430	7.30	2.58	14	
1055							Collected sample
							Placed sample in two 40-ml VOAs

COMMENTS:

Appendix B

Laboratory Analytical Reports and Chain-of-Custody Documentation

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
155 McCutcheon, Suite H El Paso, Texas 79932 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Gil Van Deventer
TRW
415 West Wall Suite 1818
Midland, TX 79701

Report Date: February 15, 2001

Order ID Number: A01020912

Project Number: P/6494/3C
Project Name: Duke Energy Field Services
Project Location: Hobbs Booster

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
164689	MW-2	Water	2/6/01	15:50	2/9/01
164690	Duplicate	Water	2/6/01	:	2/9/01
164691	MW-8	Water	2/6/01	16:40	2/9/01
164692	Rinsate	Water	2/6/01	17:00	2/9/01
164693	Trip Blank 969A &B	Water	2/6/01	:	2/9/01
164694	MW-5	Water	2/5/01	12:55	2/9/01
164695	MW-6	Water	2/5/01	13:40	2/9/01
164696	MW-7	Water	2/5/01	14:30	2/9/01
164697	MW-19	Water	2/5/01	15:50	2/9/01
164698	MW-14	Water	2/5/01	16:30	2/9/01
164699	MW-16	Water	2/5/01	17:20	2/9/01
164700	MW-15	Water	2/6/01	9:30	2/9/01
164701	MW-18	Water	2/6/01	11:25	2/9/01
164702	MW-3	Water	2/6/01	14:00	2/9/01
164703	MW-1	Water	2/6/01	15:00	2/9/01

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 164689 - MW-2

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09012	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07764	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		2.11	mg/L	5	0.001
Toluene		1.07	mg/L	5	0.001
Ethylbenzene		0.334	mg/L	5	0.001
M,P,O-Xylene		0.597	mg/L	5	0.001
Total BTEX		4.11	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.481	mg/L	1	0.10	96	72 - 128
4-BFB		0.493	mg/L	1	0.10	98	72 - 128

Sample: 164690 - Duplicate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09012	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07764	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		2.07	mg/L	5	0.001
Toluene		1.02	mg/L	5	0.001
Ethylbenzene		0.32	mg/L	5	0.001
M,P,O-Xylene		0.577	mg/L	5	0.001
Total BTEX		3.98	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.473	mg/L	1	0.10	94	72 - 128
4-BFB		0.482	mg/L	1	0.10	96	72 - 128

Sample: 164691 - MW-8

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09012	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07764	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.95	mg/L	5	0.001
Toluene		0.008	mg/L	5	0.001
Ethylbenzene		0.173	mg/L	5	0.001
M,P,O-Xylene		0.286	mg/L	5	0.001
Total BTEX		1.42	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.474	mg/L	1	0.10	94	72 - 128

Continued . . .

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
4-BFB		0.482	mg/L	1	0.10	96	72 - 128

Sample: 164692 - Rinsate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09012	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07764	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.037	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		0.004	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.041	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.103	mg/L	1	0.10	103	72 - 128
4-BFB		0.093	mg/L	1	0.10	93	72 - 128

Sample: 164693 - Trip Blank 969A &B

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09012	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07764	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.454	mg/L	1	0.10	90	72 - 128
4-BFB		0.404	mg/L	1	0.10	80	72 - 128

Sample: 164694 - MW-5

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09012	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07764	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.479	mg/L	1	0.10	95	72 - 128
4-BFB		0.422	mg/L	1	0.10	84	72 - 128

Sample: 164695 - MW-6

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09012	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07764	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.465	mg/L	1	0.10	93	72 - 128
4-BFB		0.408	mg/L	1	0.10	81	72 - 128

Sample: 164696 - MW-7

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09012	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07764	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.45	mg/L	1	0.10	90	72 - 128
4-BFB		0.401	mg/L	1	0.10	80	72 - 128

Sample: 164697 - MW-19

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09014	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07765	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.458	mg/L	1	0.10	91	72 - 128
4-BFB		0.416	mg/L	1	0.10	83	72 - 128

Sample: 164698 - MW-14

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09014	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07765	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.041	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		0.041	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.467	mg/L	1	0.10	93	72 - 128
4-BFB		0.425	mg/L	1	0.10	85	72 - 128

Sample: 164699 - MW-16

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09014	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07765	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.094	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		0.094	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.486	mg/L	1	0.10	97	72 - 128
4-BFB		0.451	mg/L	1	0.10	90	72 - 128

Sample: 164700 - MW-15

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09014	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07765	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.237	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		0.237	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.458	mg/L	1	0.10	91	72 - 128
4-BFB		0.426	mg/L	1	0.10	85	72 - 128

Sample: 164701 - MW-18

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09014	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07765	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.466	mg/L	1	0.10	93	72 - 128
4-BFB		0.433	mg/L	1	0.10	86	72 - 128

Sample: 164702 - MW-3

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09014	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07765	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.346	mg/L	5	0.001
Toluene		0.009	mg/L	5	0.001
Ethylbenzene		0.259	mg/L	5	0.001
M,P,O-Xylene		0.285	mg/L	5	0.001
Total BTEX		0.899	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.493	mg/L	1	0.10	98	72 - 128
4-BFB		0.489	mg/L	1	0.10	97	72 - 128

Sample: 164703 - MW-1

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09014	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07765	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.57	mg/L	5	0.001
Toluene		0.02	mg/L	5	0.001
Ethylbenzene		0.287	mg/L	5	0.001
M,P,O-Xylene		0.461	mg/L	5	0.001
Total BTEX		1.34	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.476	mg/L	1	0.10	95	72 - 128
4-BFB		0.528	mg/L	1	0.10	105	72 - 128

Quality Control Report
Method Blank

Method Blank

QCBatch: QC09012

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Spike Amount	Percent Recovery	Recovery Limit
TFT		0.098	mg/L	0.10	98	72 - 128
4-BFB		0.091	mg/L	0.10	91	72 - 128

Method Blank

QCBatch: QC09014

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Spike Amount	Percent Recovery	Recovery Limit
TFT		0.101	mg/L	0.10	101	72 - 128
4-BFB		0.088	mg/L	0.10	88	72 - 128

Quality Control Report
Lab Control Spikes and Duplicate Spikes

LCS

QC Batch: QC09012

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.113	mg/L	1	0.10	<0.001	113		80 - 120	20
Benzene		0.099	mg/L	1	0.10	<0.001	99		80 - 120	20
Toluene		0.1	mg/L	1	0.10	<0.001	100		80 - 120	20
Ethylbenzene		0.103	mg/L	1	0.10	<0.001	103		80 - 120	20
M,P,O-Xylene		0.322	mg/L	1	0.30	<0.001	107		80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.096	mg/L	1	0.10	96	72 - 128
4-BFB		0.1	mg/L	1	0.10	100	72 - 128

LCSD

QC Batch: QC09012

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.111	mg/L	1	0.10	<0.001	111	2	80 - 120	20
Benzene		0.101	mg/L	1	0.10	<0.001	101	2	80 - 120	20
Toluene		0.103	mg/L	1	0.10	<0.001	103	3	80 - 120	20
Ethylbenzene		0.106	mg/L	1	0.10	<0.001	106	3	80 - 120	20
M,P,O-Xylene		0.334	mg/L	1	0.30	<0.001	111	4	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.098	mg/L	1	0.10	98	72 - 128
4-BFB		0.103	mg/L	1	0.10	103	72 - 128

LCS

QC Batch: QC09014

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.097	mg/L	1	0.10	<0.001	97		80 - 120	20
Benzene		0.1	mg/L	1	0.10	<0.001	100		80 - 120	20
Toluene		0.101	mg/L	1	0.10	<0.001	101		80 - 120	20
Ethylbenzene		0.101	mg/L	1	0.10	<0.001	101		80 - 120	20
M,P,O-Xylene		0.31	mg/L	1	0.30	<0.001	103		80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.098	mg/L	1	0.10	98	72 - 128
4-BFB		0.099	mg/L	1	0.10	99	72 - 128

LCSD

QC Batch: QC09014

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.092	mg/L	1	0.10	<0.001	92	5	80 - 120	20
Benzene		0.098	mg/L	1	0.10	<0.001	98	2	80 - 120	20
Toluene		0.099	mg/L	1	0.10	<0.001	99	2	80 - 120	20
Ethylbenzene		0.1	mg/L	1	0.10	<0.001	100	1	80 - 120	20
M,P,O-Xylene		0.297	mg/L	1	0.30	<0.001	99	4	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.099	mg/L	1	0.10	99	72 - 128
4-BFB		0.1	mg/L	1	0.10	100	72 - 128

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QC Batch: QC09012

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.097	97	85 - 115	2/12/01
Benzene		mg/L	0.10	0.092	92	85 - 115	2/12/01
Toluene		mg/L	0.10	0.092	92	85 - 115	2/12/01
Ethylbenzene		mg/L	0.10	0.093	93	85 - 115	2/12/01
M,P,O-Xylene		mg/L	0.30	0.285	95	85 - 115	2/12/01

CCV (2)

QC Batch: QC09012

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.085	85	85 - 115	2/12/01
Benzene		mg/L	0.10	0.098	98	85 - 115	2/12/01
Toluene		mg/L	0.10	0.099	99	85 - 115	2/12/01
Ethylbenzene		mg/L	0.10	0.096	96	85 - 115	2/12/01
M,P,O-Xylene		mg/L	0.30	0.305	101	85 - 115	2/12/01

ICV (1)

QC Batch: QC09012

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.106	106	85 - 115	2/12/01
Benzene		mg/L	0.10	0.096	96	85 - 115	2/12/01
Toluene		mg/L	0.10	0.097	97	85 - 115	2/12/01
Ethylbenzene		mg/L	0.10	0.099	99	85 - 115	2/12/01
M,P,O-Xylene		mg/L	0.30	0.31	103	85 - 115	2/12/01

CCV (1)

QC Batch: QC09014

Continued ...

... Continued

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.094	94	85 - 115	2/12/01
Benzene		mg/L	0.10	0.103	103	85 - 115	2/12/01
Toluene		mg/L	0.10	0.105	105	85 - 115	2/12/01
Ethylbenzene		mg/L	0.10	0.102	102	85 - 115	2/12/01
M,P,O-Xylene		mg/L	0.30	0.318	106	85 - 115	2/12/01

CCV (2)

QC Batch: QC09014

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.099	99	85 - 115	2/12/01
Benzene		mg/L	0.10	0.103	103	85 - 115	2/12/01
Toluene		mg/L	0.10	0.104	104	85 - 115	2/12/01
Ethylbenzene		mg/L	0.10	0.103	103	85 - 115	2/12/01
M,P,O-Xylene		mg/L	0.30	0.318	106	85 - 115	2/12/01

ICV (1)

QC Batch: QC09014

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.085	85	85 - 115	2/12/01
Benzene		mg/L	0.10	0.098	98	85 - 115	2/12/01
Toluene		mg/L	0.10	0.099	99	85 - 115	2/12/01
Ethylbenzene		mg/L	0.10	0.096	96	85 - 115	2/12/01
M,P,O-Xylene		mg/L	0.30	0.305	101	85 - 115	2/12/01

A0102091Z

TRW Inc.
Energy & Environmental Systems
415 West Wall St. Suite. 1818
Midland, Texas 79701
(915) 682-0008
FAX: (915) 682-0028

№ 13617

Chain of Custody

Date 2/7/01 Page 2 of 2

Lab Name: TRACE ANALYSIS, INC.
Address: 6701 Aberdeen
Lubbock, Texas 79424
Telephone: 800-378-1296

Samplers (SIGNATURES)

Sample Identification	Matrix	Date	Time	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	Total Metals	TCLP Metals							Number of Containers
MW-5 (010205 1255)	Water	2/5/01	1255	✓															1646	94				2
MW-6 (010205 1340)	Water	2/5/01	1340	✓																95				2
MW-7 (010205 1430)	Water	2/5/01	1430	✓																96				2
MW-19 (010205 1550)	Water	2/5/01	1550	✓																97				2
MW-14 (010205 1630)	Water	2/5/01	1630	✓																98				2
MW-16 (010205 1720)	Water	2/5/01	1720	✓																99				2
MW-15 (010206 0930)	Water	2/6/01	0930	✓															700					2
MW-18 (010206 1125)	Water	2/6/01	1125	✓															701					2
MW-3 (010206 1400)	Water	2/6/01	1400	✓															702					2
MW-1 (010206 1500)	Water	2/6/01	1500	✓															703					2

Analysis Request

Project Information

Project Name: Duke Energy Field Srvcs
Project Location: Hobbs Booster Station
Project Manager: Gil Van Deventer
Cost Center No.: P/6494/3AC
Shipping ID No.:
P O No.:

Sample Receipt

Total Containers:
COC Seals:
Rec'd Good Cond/Cold:
Conforms to Records:
Lab No.:

Special Instructions/Comments:
Invoice direct to Duke Energy Field Services
Attn: Steve Weathers

Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
(Signature) 4:10PM (Time)	(Signature) 1830 (Time)	(Signature) (Time)
(Printed Name) Gil Van Deventer 2/8/01 (Date)	(Printed Name) HELEN SHELTON 2/08/01 (Date)	(Printed Name) (Date)
(Company) TRW	(Company) TRACE ANALYSIS	(Company)
Received By: (1)	**Received By: (2)**	**Received By: (3)**
(Signature) 4:10PM (Time)	(Signature) (Time)	(Signature) (Time)
(Printed Name) HELEN SHELTON 2/08/01 (Date)	(Printed Name) (Date)	(Printed Name) (Date)
(Company) TRACE ANALYSIS	(Company)	(Company)

A01020912

TRW Inc.
Energy & Environmental Systems
415 West Wall St. Suite. 1818
Midland, Texas 79701
(915) 682-0008
FAX: (915) 682-0028

№ 13618

Chain of Custody

Date 2/8/01 Page 1 of 2

Lab Name: TRACE ANALYSIS, INC.
Address: 6701 Aberdeen
Lubbock, Texas 79424
Telephone: 800-378-1296

Samplers (SIGNATURES)

Analysis Request

Sample Identification	Matrix	Date	Time	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	Total Metals	TCLP Metals								Number of Containers
MW-2(010206 1550)	Water	2/6/01	1550	✓																164689					2
Duplicate(0102060000)	Water	2/6/01	0000	✓																164690					2
MW-8(010206	Water	2/6/01	1640	✓																		91			2
Rinsate	Water	2/6/01	1900	✓																		92			2
Trip Blank 969A&B	Water			✓																		93			2

Project Information	Sample Receipt
Project Name: Duke Energy Field Svcs	Total Containers:
Project Location: Hobbs Booster Station	COC Seals:
Project Manager: Gil Van Deventer	Rec'd Good Cond/Cold:
Cost Center No.: P1G494/3AC	Conforms to Records:
Shipping ID No.:	Lab No.:
P O No.:	

Special Instructions/Comments:
Invoice direct to Duke Energy Field Services
Attn: Steve Weathers

Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
Gil Van Deventer 4:10PM	Helen Shelton 1830	
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
Gil Van Deventer 2/8/01	HELEN SHELTON 2/08/01	
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
TRW	TRACE ANALYSIS	
(Company)	(Company)	(Company)
Received By: (1)	**Received By: (2)**	**Received By: (3)**
Helen Shelton 4:10PM		
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
HELEN SHELTON 2/08/01		2/16/01
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
Trace Analysis		
(Company)	(Company)	(Company)

Summary Report

Gil Van Deventer
Trident Environmental
P.O. Box 7624
Midland, Tx. 79708

Report Date: May 24, 2001

Order ID Number: A01051812

Project Number: Duke Energy Field Services
Project Name: V-103
Project Location: Hobbs Booster

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
171433	MW-6	Water	5/15/01	11:00	5/18/01
171434	MW-7	Water	5/15/01	13:00	5/18/01
171435	MW-5	Water	5/15/01	14:00	5/18/01
171436	MW-19	Water	5/15/01	15:30	5/18/01
171437	MW-18	Water	5/15/01	16:30	5/18/01
171438	MW-14	Water	5/15/01	18:05	5/18/01
171439	MW-16	Water	5/16/01	7:50	5/18/01
171440	MW-3	Water	5/16/01	8:45	5/18/01
171441	MW-15	Water	5/16/01	10:00	5/18/01
171442	MW-2	Water	5/16/01	12:00	5/18/01
171443	Duplicate	Water	5/16/01	:	5/18/01
171444	MW-8	Water	5/16/01	13:00	5/18/01
171445	Rinsate	Water	5/16/01	14:00	5/18/01
171446	Trip Blank	Water	5/16/01	:	5/18/01

This report consists of a total of 1 page(s) and is intended only as a summary of results for the sample(s) listed above.

	BTEX				
Sample - Field Code	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	M,P,O-Xylene (mg/L)	Total BTEX (mg/L)
171433 - MW-6	<0.001	<0.001	<0.001	<0.001	<0.001
171434 - MW-7	<0.001	<0.001	<0.001	<0.001	<0.001
171435 - MW-5	<0.001	<0.001	<0.001	<0.001	<0.001
171436 - MW-19	0.0011	<0.001	<0.001	<0.001	0.0011
171437 - MW-18	0.004	0.0029	0.0193	0.0085	0.0347
171438 - MW-14	0.0023	<0.001	0.0041	<0.001	0.0064
171439 - MW-16	0.0101	0.0038	0.0033	0.0044	0.0216
171440 - MW-3	<0.001	0.0171	0.324	0.346	0.6871
171441 - MW-15	0.0026	0.0028	0.0041	<0.001	0.0095
171442 - MW-2	0.848	0.488	0.396	0.772	2.5
171443 - Duplicate	0.0104	0.0041	0.0035	0.0039	0.0219
171444 - MW-8	0.294	0.0083	0.226	0.34	0.868
171445 - Rinsate	<0.001	<0.001	<0.001	<0.001	<0.001
171446 - Trip Blank	<0.001	<0.001	<0.001	<0.001	<0.001

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
155 McCutcheon, Suite H El Paso, Texas 79932 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Gil Van Deventer
Trident Environmental
P.O. Box 7624
Midland, Tx. 79708

Report Date: May 24, 2001

Order ID Number: A01051812

Project Number: Duke Energy Field Services
Project Name: V-103
Project Location: Hobbs Booster

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
171433	MW-6	Water	5/15/01	11:00	5/18/01
171434	MW-7	Water	5/15/01	13:00	5/18/01
171435	MW-5	Water	5/15/01	14:00	5/18/01
171436	MW-19	Water	5/15/01	15:30	5/18/01
171437	MW-18	Water	5/15/01	16:30	5/18/01
171438	MW-14	Water	5/15/01	18:05	5/18/01
171439	MW-16	Water	5/16/01	7:50	5/18/01
171440	MW-3	Water	5/16/01	8:45	5/18/01
171441	MW-15	Water	5/16/01	10:00	5/18/01
171442	MW-2	Water	5/16/01	12:00	5/18/01
171443	Duplicate	Water	5/16/01	:	5/18/01
171444	MW-8	Water	5/16/01	13:00	5/18/01
171445	Rinsate	Water	5/16/01	14:00	5/18/01
171446	Trip Blank	Water	5/16/01	:	5/18/01

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 9 pages and shall not be reproduced except in its entirety including the chain of custody (COC), without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 171433 - MW-6

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11377	Date Analyzed:	5/21/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB09731	Date Prepared:	5/21/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.102	mg/L	1	0.10	102	72 - 128
4-BFB		0.0966	mg/L	1	0.10	96	72 - 128

Sample: 171434 - MW-7

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11377	Date Analyzed:	5/21/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB09731	Date Prepared:	5/21/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0994	mg/L	1	0.10	99	72 - 128
4-BFB		0.0944	mg/L	1	0.10	94	72 - 128

Sample: 171435 - MW-5

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11377	Date Analyzed:	5/21/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB09731	Date Prepared:	5/21/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Continued ...

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0967	mg/L	1	0.10	96	72 - 128
4-BFB		0.092	mg/L	1	0.10	92	72 - 128

Sample: 171436 - MW-19

Analysis: BTEX | Analytical Method: S 8021B | QC Batch: QC11377 | Date Analyzed: 5/21/01
Analyst: JW | Preparation Method: E 5030B | Prep Batch: PB09731 | Date Prepared: 5/21/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0011	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.0011	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.1	mg/L	1	0.10	100	72 - 128
4-BFB		0.0957	mg/L	1	0.10	95	72 - 128

Sample: 171437 - MW-18

Analysis: BTEX | Analytical Method: S 8021B | QC Batch: QC11377 | Date Analyzed: 5/21/01
Analyst: JW | Preparation Method: E 5030B | Prep Batch: PB09731 | Date Prepared: 5/21/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.004	mg/L	1	0.001
Toluene		0.0029	mg/L	1	0.001
Ethylbenzene		0.0193	mg/L	1	0.001
M,P,O-Xylene		0.0085	mg/L	1	0.001
Total BTEX		0.0347	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0914	mg/L	1	0.10	91	72 - 128
4-BFB		0.0919	mg/L	1	0.10	91	72 - 128

Sample: 171438 - MW-14

Analysis: BTEX | Analytical Method: S 8021B | QC Batch: QC11377 | Date Analyzed: 5/21/01
Analyst: JW | Preparation Method: E 5030B | Prep Batch: PB09731 | Date Prepared: 5/21/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0023	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		0.0041	mg/L	1	0.001

Continued ...

... *Continued* Sample: 171438 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.0064	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0921	mg/L	1	0.10	92	72 - 128
4-BFB		0.0853	mg/L	1	0.10	85	72 - 128

Sample: 171439 - MW-16

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11377	Date Analyzed:	5/21/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB09731	Date Prepared:	5/21/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0101	mg/L	1	0.001
Toluene		0.0038	mg/L	1	0.001
Ethylbenzene		0.0033	mg/L	1	0.001
M,P,O-Xylene		0.0044	mg/L	1	0.001
Total BTEX		0.0216	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0966	mg/L	1	0.10	96	72 - 128
4-BFB		0.113	mg/L	1	0.10	113	72 - 128

Sample: 171440 - MW-3

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11377	Date Analyzed:	5/21/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB09731	Date Prepared:	5/21/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		0.0171	mg/L	1	0.001
Ethylbenzene		0.324	mg/L	1	0.001
M,P,O-Xylene		0.346	mg/L	1	0.001
Total BTEX		0.6871	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0983	mg/L	1	0.10	98	72 - 128
4-BFB		0.12	mg/L	1	0.10	120	72 - 128

Sample: 171441 - MW-15

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11377	Date Analyzed:	5/21/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB09731	Date Prepared:	5/21/01

Continued ...

... *Continued* Sample: 171441 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0026	mg/L	1	0.001
Toluene		0.0028	mg/L	1	0.001
Ethylbenzene		0.0041	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.0095	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0872	mg/L	1	0.10	87	72 - 128
4-BFB		0.0839	mg/L	1	0.10	83	72 - 128

Sample: 171442 - MW-2

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11377	Date Analyzed:	5/21/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB09731	Date Prepared:	5/21/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.848	mg/L	1	0.001
Toluene		0.488	mg/L	1	0.001
Ethylbenzene		0.396	mg/L	1	0.001
M,P,O-Xylene		0.772	mg/L	1	0.001
Total BTEX		2.5	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0918	mg/L	1	0.10	91	72 - 128
4-BFB		0.105	mg/L	1	0.10	105	72 - 128

Sample: 171443 - Duplicate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11377	Date Analyzed:	5/21/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB09731	Date Prepared:	5/21/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0104	mg/L	1	0.001
Toluene		0.0041	mg/L	1	0.001
Ethylbenzene		0.0035	mg/L	1	0.001
M,P,O-Xylene		0.0039	mg/L	1	0.001
Total BTEX		0.0219	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.112	mg/L	1	0.10	112	72 - 128
4-BFB		0.112	mg/L	1	0.10	112	72 - 128

Sample: 171444 - MW-8

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11377	Date Analyzed:	5/21/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB09731	Date Prepared:	5/21/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.294	mg/L	1	0.001
Toluene		0.0083	mg/L	1	0.001
Ethylbenzene		0.226	mg/L	1	0.001
M,P,O-Xylene		0.34	mg/L	1	0.001
Total BTEX		0.868	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.103	mg/L	1	0.10	103	72 - 128
4-BFB	[1]	0.137	mg/L	1	0.10	137	72 - 128

Sample: 171445 - Rinsate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11374	Date Analyzed:	5/21/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB09729	Date Prepared:	5/21/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0946	mg/L	1	0.10	94	72 - 128
4-BFB		0.0854	mg/L	1	0.10	85	72 - 128

Sample: 171446 - Trip Blank

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11374	Date Analyzed:	5/21/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB09729	Date Prepared:	5/21/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0917	mg/L	1	0.10	91	72 - 128
4-BFB		0.0824	mg/L	1	0.10	82	72 - 128

[1]SURROGATE OUT OF LIMITS DUE TO PEAK INTERFERENCE

Quality Control Report
Method Blank

Method Blank

QCBatch: QC11374

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.106	mg/L	1	0.10	106	72 - 128
4-BFB		0.0914	mg/L	1	0.10	91	72 - 128

Method Blank

QCBatch: QC11377

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0953	mg/L	1	0.10	95	72 - 128
4-BFB		0.0923	mg/L	1	0.10	92	72 - 128

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC11374

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0925	0.0902	mg/L	1	0.10	<0.001	92	2	80 - 120	20
Benzene	0.0969	0.0894	mg/L	1	0.10	<0.001	96	8	80 - 120	20
Toluene	0.0962	0.0891	mg/L	1	0.10	<0.001	96	7	80 - 120	20
Ethylbenzene	0.0972	0.0899	mg/L	1	0.10	<0.001	97	7	80 - 120	20
M,P,O-Xylene	0.263	0.243	mg/L	1	0.30	<0.001	87	7	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0977	0.0961	mg/L	1	0.10	97	96	72 - 128
4-BFB	0.0964	0.0937	mg/L	1	0.10	96	93	72 - 128

Laboratory Control Spikes

QCBatch: QC11377

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0949	0.0895	mg/L	1	0.10	<0.001	94	5	80 - 120	20
Benzene	0.0984	0.0937	mg/L	1	0.10	<0.001	98	4	80 - 120	20
Toluene	0.0977	0.0937	mg/L	1	0.10	<0.001	97	4	80 - 120	20
Ethylbenzene	0.0982	0.0933	mg/L	1	0.10	<0.001	98	5	80 - 120	20
M,P,O-Xylene	0.315	0.299	mg/L	1	0.30	<0.001	105	5	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0997	0.098	mg/L	1	0.10	99	98	72 - 128
4-BFB	0.1	0.0982	mg/L	1	0.10	100	98	72 - 128

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC11374

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0967	96	85 - 115	5/21/01
Benzene		mg/L	0.10	0.0988	98	85 - 115	5/21/01
Toluene		mg/L	0.10	0.0988	98	85 - 115	5/21/01
Ethylbenzene		mg/L	0.10	0.0989	98	85 - 115	5/21/01
M,P,O-Xylene		mg/L	0.30	0.267	89	85 - 115	5/21/01

CCV (2)

QCBatch: QC11374

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.094	94	85 - 115	5/21/01
Benzene		mg/L	0.10	0.0975	97	85 - 115	5/21/01
Toluene		mg/L	0.10	0.0979	97	85 - 115	5/21/01
Ethylbenzene		mg/L	0.10	0.0986	98	85 - 115	5/21/01
M,P,O-Xylene		mg/L	0.30	0.267	89	85 - 115	5/21/01

ICV (1)

QCBatch: QC11374

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0926	92	85 - 115	5/21/01
Benzene		mg/L	0.10	0.0968	96	85 - 115	5/21/01
Toluene		mg/L	0.10	0.0971	97	85 - 115	5/21/01
Ethylbenzene		mg/L	0.10	0.0984	98	85 - 115	5/21/01
M,P,O-Xylene		mg/L	0.30	0.267	89	85 - 115	5/21/01

CCV (1)

QCBatch: QC11377

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.088	88	85 - 115	5/21/01
Benzene		mg/L	0.10	0.0978	97	85 - 115	5/21/01
Toluene		mg/L	0.10	0.097	97	85 - 115	5/21/01
Ethylbenzene		mg/L	0.10	0.0967	96	85 - 115	5/21/01
M,P,O-Xylene		mg/L	0.30	0.311	103	85 - 115	5/21/01

CCV (2)

QCBatch: QC11377

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.092	92	85 - 115	5/21/01
Benzene		mg/L	0.10	0.097	97	85 - 115	5/21/01
Toluene		mg/L	0.10	0.0967	96	85 - 115	5/21/01
Ethylbenzene		mg/L	0.10	0.0965	96	85 - 115	5/21/01
M,P,O-Xylene		mg/L	0.30	0.309	103	85 - 115	5/21/01

ICV (1)

QCBatch: QC11377

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0954	95	85 - 115	5/21/01
Benzene		mg/L	0.10	0.0965	96	85 - 115	5/21/01
Toluene		mg/L	0.10	0.0964	96	85 - 115	5/21/01
Ethylbenzene		mg/L	0.10	0.0961	96	85 - 115	5/21/01
M,P,O-Xylene		mg/L	0.30	0.309	103	85 - 115	5/21/01

AH0198

TRIDENT ENVIRONMENTAL

Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (Fax)

V-103-05-01A

Chain of Custody

Date 5-15-01 Page 1 of 2

Lab Name: Trace Analysis, Inc.
Address: 6701 Aberdeen Avenue
Lubbock, Texas 79424
Telephone: (800) 378-1296

Samplers (SIGNATURES)

Sample Identification	Matrix	Date	Time	Sample Type: G - Grab, C- Composite	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	Total Metals	TCLP Metals	Number of Containers
MW-6 171433	Water	5-15-01	1100		✓														2
MW-7 34	Water	5-15-01	1300		✓														2
MW-5 35	Water	5-15-01	1400		✓														2
MW-19 36	Water	5-15-01	1530		✓														2
MW-18 37	Water	5-15-01	1630		✓														2
MW-14 38	Water	5-15-01	1805		✓														2
MW-16 39	Water	5-16-01	0750		✓														2
MW-3 40	Water	5-16-01	0845		✓														2
MW-15 41	Water	5-16-01	1000		✓														2
MW-2 42	Water	5-16-01	1200		✓														2

Analysis Request

Project Information		Sample Receipt	Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Project Name:	Duke Energy Field Services	Total Containers:	Trident Environmental	TRACE ANALYSIS	
Project Location:	Hobbs Booster	COC Seals:	(Printed Name) John Ferguson	(Printed Name) HELEN SHELTON	(Printed Name)
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	(Signature)	(Signature) Helen Shelton	(Signature)
Cost Center No.:	v-103	Conforms to Records:	(Date) 5/17/01 (Time) 1240	(Date) 5/17/01 (Time) 1800	(Date) (Time)
Shipping ID No.:	Greyhound	Lab No.:	Received By: (1) (Company) TRACE ANALYSIS HELEN SHELTON	Received By: (2) (Company)	Received By: (3) (Company)
Bill to (see below):	Client		(Printed Name) Helen Shelton	(Printed Name)	(Printed Name) Vicki Hensley
Special Instructions/Comments:	Please invoice directly to:		(Signature)	(Signature)	(Signature)
Duke Energy Field Services, ATTN: Steve Weathers			(Date) 5/17/01 (Time) 1240	(Date) (Time)	(Date) 5-18-01 (Time) 10:00
P. O. Box 5493, Denver, CO 80217					

Sediment in vials

AR Please analyze to 0.001 mg/l detection limit where possible ☆☆

Copy signed original form for Trident Environmental records

20 samples - HS .11

A0105181

TRIDENT ENVIRONMENTAL

Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (Fax)

V-103-05-01B

Chain of Custody

Date 5-16-01 Page 2 of 2

Lab Name: Trace Analysis, Inc.
Address: 6701 Aberdeen Avenue
Lubbock, Texas 79424
Telephone: (800) 378-1296

Samplers (SIGNATURES)

Sample Identification	Matrix	Date	Time	Sample Type: G - Grab, C- Composite	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	Total Metals	TCLP Metals	Number of Containers
Duplicate 171443 ~~171443~~	Water	05-16-01	0000		✓														2
MW-8 44	Water	05-16-01	1300		✓														2
Rinsate 45	Water	05-16-01	1400		✓														2
Trip Blank 964A & 964B (171446)	Water	—	—		✓														2

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Hobbs Booster	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	
Cost Center No.:	v-103	Conforms to Records:	
Shipping ID No.:	Greyhound	Lab No.:	
Bill to (see below):	Client		

Special Instructions/Comments: Please invoice directly to:
Duke Energy Field Services, ATTN: Steve Weathers
P. O. Box 5493, Denver, CO 80217
Document in mail

Relinquished By:	Relinquished By:	Relinquished By:
(1) (Company) Trident Environmental	(2) (Company) TRACE ANALYSIS	(3) (Company)
(Printed Name) John Fergerson	(Printed Name) HELEN SHELTON	(Printed Name)
(Signature) John Fergerson	(Signature) Helen Shelton	(Signature)
(Date) 5/17/01 (Time) 1240	(Date) 5/17/01 (Time) 1800	(Date) (Time)
Received By: (1) (Company) TRACE ANALYSIS HELEN SHELTON	Received By: (2) (Company)	Received By: (3) (Company) Vicki Henshaw
(Printed Name) Helen Shelton	(Printed Name)	(Printed Name) Vicki Henshaw
(Signature) 5/17/01	(Signature)	(Signature) 5-18-01 10:00
(Date) (Time) 1240	(Date) (Time)	(Date) (Time)

Copy signed original form for Trident Environmental records

NM & samples - HS

Summary Report

Gil Van Deventer
Trident Environmental
P.O. Box 7624
Midland, Tx. 79708

Report Date: August 15, 2001

Order ID Number: A01081409

Project Number: CC # V-103
Project Name: Duke Energy Field services
Project Location: Hobbs Booster

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
177049	MW-6	Water	8/9/01	9:45	8/14/01
177050	MW-7	Water	8/9/01	10:25	8/14/01
177051	MW-5	Water	8/9/01	11:30	8/14/01
177052	MW-19	Water	8/9/01	16:10	8/14/01
177053	MW-15	Water	8/10/01	7:10	8/14/01
177054	MW-14	Water	8/10/01	7:50	8/14/01
177055	MW-16	Water	8/10/01	8:40	8/14/01
177056	MW-3	Water	8/10/01	9:30	8/14/01
177057	MW-2	Water	8/10/01	10:00	8/14/01
177058	Duplicate	Water	8/10/01	9:50	8/14/01
177059	MW-8	Water	8/10/01	10:50	8/14/01
177060	MW-10	Water	8/10/01	11:40	8/14/01
177061	Rinsate	Water	8/10/01	11:55	8/14/01
177062	MW-18	Water	8/10/01	16:20	8/14/01
177063	MW-17	Water	8/10/01	17:30	8/14/01

This report consists of a total of 1 page(s) and is intended only as a summary of results for the sample(s) listed above.

	BTEX				
Sample - Field Code	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	M,P,O-Xylene (ppm)	Total BTEX (ppm)
177049 - MW-6	<0.001	<0.001	<0.001	<0.001	<0.001
177050 - MW-7	<0.001	<0.001	<0.001	<0.001	<0.001
177051 - MW-5	<0.001	<0.001	<0.001	<0.001	<0.001
177052 - MW-19	0.004	<0.001	<0.001	<0.001	0.004
177053 - MW-15	0.353	<0.005	<0.005	<0.005	0.353
177054 - MW-14	0.034	<0.005	<0.005	<0.005	0.034
177055 - MW-16	0.098	<0.005	<0.005	<0.005	0.098
177056 - MW-3	0.345	<0.005	0.207	0.316	0.868
177057 - MW-2	1.76	0.211	0.255	0.452	2.68
177058 - Duplicate	1.72	0.205	0.25	0.43	2.6
177059 - MW-8	1.23	<0.01	0.201	0.449	1.88
177060 - MW-10	0.85	0.202	0.148	0.3	1.5
177061 - Rinsate	0.004	<0.001	<0.001	<0.001	0.004
177062 - MW-18	0.007	<0.001	<0.001	0.030	0.036
177063 - MW-17	0.040	<0.001	0.057	0.12	0.217

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
155 McCutcheon, Suite H El Paso, Texas 79932 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Gil Van Deventer
Trident Environmental
P.O. Box 7624
Midland, Tx. 79708

Report Date: August 15, 2001

Order ID Number: A01081409

Project Number: CC # V-103
Project Name: Duke Energy Field services
Project Location: Hobbs Booster

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
177049	MW-6	Water	8/9/01	9:45	8/14/01
177050	MW-7	Water	8/9/01	10:25	8/14/01
177051	MW-5	Water	8/9/01	11:30	8/14/01
177052	MW-19	Water	8/9/01	16:10	8/14/01
177053	MW-15	Water	8/10/01	7:10	8/14/01
177054	MW-14	Water	8/10/01	7:50	8/14/01
177055	MW-16	Water	8/10/01	8:40	8/14/01
177056	MW-3	Water	8/10/01	9:30	8/14/01
177057	MW-2	Water	8/10/01	10:00	8/14/01
177058	Duplicate	Water	8/10/01	9:50	8/14/01
177059	MW-8	Water	8/10/01	10:50	8/14/01
177060	MW-10	Water	8/10/01	11:40	8/14/01
177061	Rinsate	Water	8/10/01	11:55	8/14/01
177062	MW-18	Water	8/10/01	16:20	8/14/01
177063	MW-17	Water	8/10/01	17:30	8/14/01

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 9 pages and shall not be reproduced except in its entirety including the chain of custody (COC), without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 177049 - MW-6

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13346	Date Analyzed:	8/14/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11391	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	[1]	0.0519	mg/L	1	0.10	52	72 - 128
4-BFB	[2]	0.0393	mg/L	1	0.10	39	72 - 128

Sample: 177050 - MW-7

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13346	Date Analyzed:	8/14/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11391	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0757	mg/L	1	0.10	76	72 - 128
4-BFB	[3]	0.0586	mg/L	1	0.10	59	72 - 128

Sample: 177051 - MW-5

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13346	Date Analyzed:	8/14/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11391	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

[1] Poor surrogate recovery due to lack of mixing.
[2] Poor surrogate recovery due to lack of mixing.
[3] Poor surrogate recovery due to matrix difficulties.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0828	mg/L	1	0.10	83	72 - 128
4-BFB	[4]	0.0658	mg/L	1	0.10	66	72 - 128

Sample: 177052 - MW-19

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13346	Date Analyzed:	8/14/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11391	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.004	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.004	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	[5]	0.0659	mg/L	1	0.10	66	72 - 128
4-BFB	[6]	0.0541	mg/L	1	0.10	54	72 - 128

Sample: 177053 - MW-15

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13346	Date Analyzed:	8/14/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11391	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.353	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		0.353	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.467	mg/L	5	0.10	93	72 - 128
4-BFB		0.392	mg/L	5	0.10	78	72 - 128

Sample: 177054 - MW-14

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13346	Date Analyzed:	8/14/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11391	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.034	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001

Continued ...

[4] Poor surrogate recovery due to matrix difficulties.
[5] Poor surrogate recovery due to lack of mixing.
[6] Poor surrogate recovery due to lack of mixing.

... *Continued* Sample: 177054 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		0.034	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.487	mg/L	5	0.10	97	72 - 128
4-BFB		0.385	mg/L	5	0.10	77	72 - 128

Sample: 177055 - MW-16

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13346	Date Analyzed:	8/14/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11391	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.098	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		0.098	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.476	mg/L	5	0.10	95	72 - 128
4-BFB		0.393	mg/L	5	0.10	78	72 - 128

Sample: 177056 - MW-3

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13346	Date Analyzed:	8/14/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11391	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.345	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		0.207	mg/L	5	0.001
M,P,O-Xylene		0.316	mg/L	5	0.001
Total BTEX		0.868	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.492	mg/L	5	0.10	98	72 - 128
4-BFB		0.423	mg/L	5	0.10	84	72 - 128

Sample: 177057 - MW-2

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13346	Date Analyzed:	8/14/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11391	Date Prepared:	8/14/01

Continued ...

... *Continued* Sample: 177057 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
Benzene		1.76	mg/L	5	0.001
Toluene		0.211	mg/L	5	0.001
Ethylbenzene		0.255	mg/L	5	0.001
M,P,O-Xylene		0.452	mg/L	5	0.001
Total BTEX		2.68	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.518	mg/L	5	0.10	103	72 - 128
4-BFB		0.453	mg/L	5	0.10	90	72 - 128

Sample: 177058 - Duplicate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13346	Date Analyzed:	8/14/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11391	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		1.72	mg/L	5	0.001
Toluene		0.205	mg/L	5	0.001
Ethylbenzene		0.25	mg/L	5	0.001
M,P,O-Xylene		0.43	mg/L	5	0.001
Total BTEX		2.6	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.519	mg/L	5	0.10	103	72 - 128
4-BFB		0.451	mg/L	5	0.10	90	72 - 128

Sample: 177059 - MW-8

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13346	Date Analyzed:	8/14/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11391	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		1.23	mg/L	10	0.001
Toluene		<0.01	mg/L	10	0.001
Ethylbenzene		0.201	mg/L	10	0.001
M,P,O-Xylene		0.449	mg/L	10	0.001
Total BTEX		1.88	mg/L	10	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		1.02	mg/L	10	0.10	102	72 - 128
4-BFB		0.856	mg/L	10	0.10	85	72 - 128

Sample: 177060 - MW-10

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13346	Date Analyzed:	8/14/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11391	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.85	mg/L	5	0.001
Toluene		0.202	mg/L	5	0.001
Ethylbenzene		0.148	mg/L	5	0.001
M,P,O-Xylene		0.3	mg/L	5	0.001
Total BTEX		1.5	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.49	mg/L	5	0.10	98	72 - 128
4-BFB		0.477	mg/L	5	0.10	95	72 - 128

Sample: 177061 - Rinsate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13346	Date Analyzed:	8/14/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11391	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.004	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.004	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	[7]	0.0622	mg/L	1	0.10	62	72 - 128
4-BFB	[8]	0.044	mg/L	1	0.10	44	72 - 128

Sample: 177062 - MW-18

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13346	Date Analyzed:	8/14/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11391	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.007	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		0.030	mg/L	1	0.001
Total BTEX		0.036	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0729	mg/L	1	0.10	73	72 - 128
4-BFB		0.0583	mg/L	1	0.10	58	72 - 128

[7]Poor surrogate recovery due to lack of mixing.
[8]Poor surrogate recovery due to lack of mixing.

Sample: 177063 - MW-17

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13346	Date Analyzed:	8/14/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11391	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.040	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		0.057	mg/L	1	0.001
M,P,O-Xylene		0.12	mg/L	1	0.001
Total BTEX		0.217	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	[9]	0.0538	mg/L	1	0.10	54	72 - 128
4-BFB	[10]	0.0685	mg/L	1	0.10	69	72 - 128

[9] Poor surrogate recovery due to lack of mixing.
[10] Poor surrogate recovery due to lack of mixing.

Quality Control Report
Method Blank

Method Blank

QCBatch: QC13346

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.109	mg/L	1	0.10	109	72 - 128
4-BFB		0.0895	mg/L	1	0.10	90	72 - 128

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC13346

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.098	0.097	mg/L	1	0.10	<0.001	98	1	80 - 120	20
Benzene	0.091	0.087	mg/L	1	0.10	<0.001	91	4	80 - 120	20
Toluene	0.085	0.081	mg/L	1	0.10	<0.001	85	4	80 - 120	20
Ethylbenzene	0.084	0.079	mg/L	1	0.10	<0.001	84	6	80 - 120	20
M,P,O-Xylene	0.255	0.241	mg/L	1	0.30	<0.001	85	5	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.103	0.1	mg/L	1	0.10	103	100	72 - 128
4-BFB	0.093	0.091	mg/L	1	0.10	93	91	72 - 128

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC13346

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.096	96	85 - 115	8/14/01
Benzene		mg/L	0.10	0.094	94	85 - 115	8/14/01

Continued ...

... Continued

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Toluene		mg/L	0.10	0.086	86	85 - 115	8/14/01
Ethylbenzene		mg/L	0.10	0.085	85	85 - 115	8/14/01
M,P,O-Xylene		mg/L	0.30	0.258	86	85 - 115	8/14/01

CCV (2)

QCBatch: QC13346

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.097	97	85 - 115	8/14/01
Benzene		mg/L	0.10	0.098	98	85 - 115	8/14/01
Toluene		mg/L	0.10	0.088	88	85 - 115	8/14/01
Ethylbenzene		mg/L	0.10	0.086	86	85 - 115	8/14/01
M,P,O-Xylene		mg/L	0.30	0.262	87	85 - 115	8/14/01

ICV (1)

QCBatch: QC13346

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.087	87	85 - 115	8/14/01
Benzene		mg/L	0.10	0.086	86	85 - 115	8/14/01
Toluene		mg/L	0.10	0.081	81	85 - 115	8/14/01
Ethylbenzene		mg/L	0.10	0.08	80	85 - 115	8/14/01
M,P,O-Xylene		mg/L	0.30	0.241	80	85 - 115	8/14/01

H0108140

TRIDENT ENVIRONMENTAL

Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (Fax)

V-103-8/01

Chain of Custody

Date 8/10/01 Page 1 of 2

Lab Name: Trace Analysis, Inc.
Address: 6701 Aberdeen Avenue
Lubbock, Texas 79424
Telephone: (800) 378-1296

Samplers (SIGNATURES)

Sample Identification		Matrix	Date	Time	Sample Type: G - Grab, C- Composite	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	Total Metals	TCLP Metals							Number of Containers
MW-6	177049	wtr	8/9/01	0945	G	✓																				2
MW-7	50	"	"	1025	G	✓																				2
MW-5	51	"	"	1130	G	✓																				2
MW-19	52	"	8/9/01	1610	G	✓																				2
MW-15	53	wtr	8/10/01	0710	G	✓																				2
MW-14	54	"	"	0750	G	✓																				2
MW-16	55	"	"	0840	G	✓																				2
MW-3	56	"	"	0930	G	✓																				2
MW-2	57	"	"	1000	G	✓																				2
Dublicate	58	"	"	0950	G	✓																				2

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Hobbs Booster	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	
Cost Center No.:	V-103	Conforms to Records:	
Shipping ID No.:		Lab No.:	
Bill to (see below):			

	Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
(Company)	Trident Environmental	TRACE ANALYSIS	
(Printed Name)	Dale T. Littlejohn	HELEN SHELTON	
(Signature)	Dale T Littlejohn	Helen Shelton	
(Date) / (Time)	8/13/01 10:45 AM	8/13/01 1830	

	Received By: (1)	Received By: (2)	Received By: (3)
(Company)	TRACE ANALYSIS		Vicki Hensley
(Printed Name)	HELEN SHELTON		Vicki Hensley
(Signature)	Helen Shelton		Trace Analysis
(Date) / (Time)	8/13/01 10:45 AM		8-14-01 8-10:00

Special Instructions/Comments: Please send invoice direct to client:
Duke Energy Field Services, Attention: Steve Weathers
P. O. Box 5493, Denver, Colorado 80217

Copy signed original form for Trident Environmental records

Rush [illegible] Shipped Greyhound 20 samples-HS

AO108140

TRIDENT ENVIRONMENTAL

Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (Fax)

V-103-8/01

Chain of Custody

Date 8/10/01 Page 2 of 2

Lab Name: Trace Analysis, Inc.
Address: 6701 Aberdeen Avenue
Lubbock, Texas 79424
Telephone: (800) 378-1296

Samplers (SIGNATURES)
Dale T Littlejohn

Sample Identification	Matrix	Date	Time	Sample Type: G - Grab, C- Composite	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	Total Metals	TCLP Metals	Number of Containers
MW-8 77059	Water	8/10/01	1050	G	✓														2
MW-10 60	"	"	1140	G	✓														2
Rinsate 61	"	"	1155	G	✓														2
MW-18 62	"	"	1620	G	✓														2
MW-17 63	"	"	1730	G	✓														2

Analysis Request

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Hobbs Booster	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	
Cost Center No.:	V-103	Conforms to Records:	
Shipping ID No.:		Lab No.:	
Bill to (see below):			

Special Instructions/Comments: Please send invoice direct to client:
Duke Energy Field Services, Attention: Steve Weathers
P. O. Box 5493, Denver, Colorado 80217

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental	TRACE ANALYSIS	
(Printed Name) Dale T Littlejohn	(Printed Name) HELEN SHELTON	(Printed Name)
(Signature) Dale T Littlejohn	(Signature) Helen Shelton	(Signature)
(Date) 8/13/01 (Time) 10:45 AM	(Date) 8/13/01 (Time) 1830	(Date) (Time)
Received By: (1) (Company)	**Received By: (2) (Company)**	**Received By: (3) (Company)**
TRACE ANALYSIS		TRACE Analysis
(Printed Name) HELEN SHELTON	(Printed Name)	(Printed Name) Vicki Hensley
(Signature) Helen Shelton	(Signature)	(Signature) Vicki Hensley
(Date) 8/13/01 (Time) 10:45 AM	(Date) (Time)	(Date) 8-14-01 (Time) 10:00

Shipped Greyhound 10 samples - HS

Copy signed original form for Trident Environmental records

Summary Report

Gil Van Deventer
Trident Environmental
P.O. Box 7624
Midland, Tx. 79708

Report Date: October 18, 2001

Order ID Number: A01101513

Project Number: CC # V-103
Project Name: Duke Energy Field services
Project Location: Hobbs Booster

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
181800	MW-5	Water	10/10/01	8:15	10/15/01
181801	MW-6	Water	10/10/01	9:10	10/15/01
181802	MW-7	Water	10/10/01	9:50	10/15/01
181803	MW-19	Water	10/10/01	10:55	10/15/01
181804	MW-18	Water	10/10/01	11:15	10/15/01
181805	MW-17	Water	10/10/01	12:20	10/15/01
181806	MW-15	Water	10/10/01	14:50	10/15/01
181807	MW-10	Water	10/10/01	14:55	10/15/01
181808	MW-14	Water	10/10/01	15:50	10/15/01
181809	MW-16	Water	10/10/01	16:30	10/15/01
181810	MW-3	Water	10/10/01	17:00	10/15/01
181811	MW-2	Water	10/10/01	17:45	10/15/01
181812	MW-9	Water	10/10/01	18:40	10/15/01
181813	MW-1	Water	10/10/01	8:45	10/15/01
181814	Duplicate	Water	10/10/01	:	10/15/01
181815	Rinsate	Water	10/10/01	9:00	10/15/01
181816	Field Blank	Water	10/10/01	9:15	10/15/01

This report consists of a total of 1 page(s) and is intended only as a summary of results for the sample(s) listed above.

	BTEX				
Sample - Field Code	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	M,P,O-Xylene (ppm)	Total BTEX (ppm)
181800 - MW-5	<0.001	<0.001	<0.001	<0.001	< 0.001
181801 - MW-6	<0.001	<0.001	<0.001	<0.001	< 0.001
181802 - MW-7	<0.001	<0.001	<0.001	<0.001	< 0.001
181803 - MW-19	0.0346	<0.005	<0.005	<0.005	0.0346
181804 - MW-18	0.0359	<0.005	0.0885	0.238	0.3624
181805 - MW-17	0.076	<0.005	0.101	0.278	0.455
181806 - MW-15	0.317	<0.020	<0.020	<0.020	0.317
181807 - MW-10	1.13	0.85	0.889	2.38	5.249
181808 - MW-14	0.0288	<0.001	0.0176	<0.001	0.0464
181809 - MW-16	0.0118	<0.001	0.0073	0.0017	0.0208
181810 - MW-3	0.0293	<0.010	0.207	0.146	0.3823
181811 - MW-2	1.30	0.246	0.314	0.243	2.103
181812 - MW-9	0.907	<0.050	0.385	0.051	1.343
181813 - MW-1	0.144	<0.020	0.236	0.120	0.5
181814 - Duplicate	0.0293	<0.010	0.207	0.146	0.3823
181815 - Rinsate	<0.005	<0.005	<0.005	<0.005	<0.005
181816 - Field Blank	<0.005	<0.005	<0.005	<0.005	<0.005

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
155 McCutcheon, Suite H El Paso, Texas 79932 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Gil Van Deventer
Trident Environmental
P.O. Box 7624
Midland, Tx. 79708

Report Date: October 18, 2001

Order ID Number: A01101513

Project Number: CC # V-103
Project Name: Duke Energy Field services
Project Location: Hobbs Booster

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
181800	MW-5	Water	10/10/01	8:15	10/15/01
181801	MW-6	Water	10/10/01	9:10	10/15/01
181802	MW-7	Water	10/10/01	9:50	10/15/01
181803	MW-19	Water	10/10/01	10:55	10/15/01
181804	MW-18	Water	10/10/01	11:15	10/15/01
181805	MW-17	Water	10/10/01	12:20	10/15/01
181806	MW-15	Water	10/10/01	14:50	10/15/01
181807	MW-10	Water	10/10/01	14:55	10/15/01
181808	MW-14	Water	10/10/01	15:50	10/15/01
181809	MW-16	Water	10/10/01	16:30	10/15/01
181810	MW-3	Water	10/10/01	17:00	10/15/01
181811	MW-2	Water	10/10/01	17:45	10/15/01
181812	MW-9	Water	10/10/01	18:40	10/15/01
181813	MW-1	Water	10/10/01	8:45	10/15/01
181814	Duplicate	Water	10/10/01	:	10/15/01
181815	Rinsate	Water	10/10/01	9:00	10/15/01
181816	Field Blank	Water	10/10/01	9:15	10/15/01

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 181800 - MW-5

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14862	Date Analyzed:	10/15/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12639	Date Prepared:	10/15/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		< 0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.117	mg/L	1	0.10	117	72 - 128
4-BFB		0.0898	mg/L	1	0.10	90	72 - 128

Sample: 181801 - MW-6

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14862	Date Analyzed:	10/15/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12639	Date Prepared:	10/15/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		< 0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.116	mg/L	1	0.10	116	72 - 128
4-BFB		0.0912	mg/L	1	0.10	91	72 - 128

Sample: 181802 - MW-7

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14862	Date Analyzed:	10/15/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12639	Date Prepared:	10/15/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		< 0.001	mg/L	1	0.001

Continued ...

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.119	mg/L	1	0.10	119	72 - 128
4-BFB		0.0926	mg/L	1	0.10	93	72 - 128

Sample: 181803 - MW-19

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14949	Date Analyzed:	10/17/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12713	Date Prepared:	10/17/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0346	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		0.0346	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.433	mg/L	5	0.10	87	72 - 128
4-BFB		0.335	mg/L	5	0.10	67	72 - 128

Sample: 181804 - MW-18

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14922	Date Analyzed:	10/16/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12687	Date Prepared:	10/16/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0359	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		0.0885	mg/L	5	0.001
M,P,O-Xylene		0.238	mg/L	5	0.001
Total BTEX		0.3624	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.566	mg/L	5	0.10	113	72 - 128
4-BFB		0.440	mg/L	5	0.10	88	72 - 128

Sample: 181805 - MW-17

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14949	Date Analyzed:	10/17/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12713	Date Prepared:	10/17/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.076	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		0.101	mg/L	5	0.001

Continued ...

... Continued Sample: 181805 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
M,P,O-Xylene		0.278	mg/L	5	0.001
Total BTEX		0.455	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		10.7	mg/L	100	0.10	107	72 - 128
4-BFB		8.35	mg/L	100	0.10	84	72 - 128

Sample: 181806 - MW-15

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14862	Date Analyzed:	10/15/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12639	Date Prepared:	10/15/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.317	mg/L	20	0.001
Toluene		<0.020	mg/L	20	0.001
Ethylbenzene		<0.020	mg/L	20	0.001
M,P,O-Xylene		<0.020	mg/L	20	0.001
Total BTEX		0.317	mg/L	20	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		2.27	mg/L	20	0.10	114	72 - 128
4-BFB		1.73	mg/L	20	0.10	86	72 - 128

Sample: 181807 - MW-10

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14862	Date Analyzed:	10/15/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12639	Date Prepared:	10/15/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		1.13	mg/L	50	0.001
Toluene		0.85	mg/L	50	0.001
Ethylbenzene		0.889	mg/L	50	0.001
M,P,O-Xylene		2.38	mg/L	50	0.001
Total BTEX		5.249	mg/L	50	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		5.62	mg/L	50	0.10	112	72 - 128
4-BFB		4.36	mg/L	50	0.10	87	72 - 128

Sample: 181808 - MW-14

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14862	Date Analyzed:	10/15/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12639	Date Prepared:	10/15/01

Continued ...

... *Continued* Sample: 181808 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0288	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		0.0176	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.0464	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.104	mg/L	1	0.10	104	72 - 128
4-BFB		0.0755	mg/L	1	0.10	76	72 - 128

Sample: 181809 - MW-16

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14868	Date Analyzed:	10/15/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12643	Date Prepared:	10/15/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0118	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		0.0073	mg/L	1	0.001
M,P,O-Xylene		0.0017	mg/L	1	0.001
Total BTEX		0.0208	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	[1]	0.0445	mg/L	1	0.10	44	72 - 128
4-BFB	[2]	0.0584	mg/L	1	0.10	58	72 - 128

Sample: 181810 - MW-3

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14868	Date Analyzed:	10/15/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12643	Date Prepared:	10/15/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0293	mg/L	10	0.001
Toluene		<0.010	mg/L	10	0.001
Ethylbenzene		0.207	mg/L	10	0.001
M,P,O-Xylene		0.146	mg/L	10	0.001
Total BTEX		0.3823	mg/L	10	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.992	mg/L	10	0.10	99	72 - 128
4-BFB		0.907	mg/L	10	0.10	91	72 - 128

[1]Low surrogate due to prep error. QC show method to be in control.
[2]Low surrogate due to prep error, QC showed method to be in control

Sample: 181811 - MW-2

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14868	Date Analyzed:	10/15/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12643	Date Prepared:	10/15/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		1.30	mg/L	20	0.001
Toluene		0.246	mg/L	20	0.001
Ethylbenzene		0.314	mg/L	20	0.001
M,P,O-Xylene		0.243	mg/L	20	0.001
Total BTEX		2.103	mg/L	20	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		1.95	mg/L	20	0.10	98	72 - 128
4-BFB		1.78	mg/L	20	0.10	89	72 - 128

Sample: 181812 - MW-9

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14868	Date Analyzed:	10/15/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12643	Date Prepared:	10/15/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.907	mg/L	50	0.001
Toluene		<0.050	mg/L	50	0.001
Ethylbenzene		0.385	mg/L	50	0.001
M,P,O-Xylene		0.051	mg/L	50	0.001
Total BTEX		1.343	mg/L	50	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		4.95	mg/L	50	0.10	99	72 - 128
4-BFB		4.43	mg/L	50	0.10	89	72 - 128

Sample: 181813 - MW-1

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14868	Date Analyzed:	10/15/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12643	Date Prepared:	10/15/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.144	mg/L	20	0.001
Toluene		<0.020	mg/L	20	0.001
Ethylbenzene		0.236	mg/L	20	0.001
M,P,O-Xylene		0.120	mg/L	20	0.001
Total BTEX		0.5	mg/L	20	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		1.93	mg/L	20	0.10	96	72 - 128
4-BFB		1.78	mg/L	20	0.10	89	72 - 128

Sample: 181814 - Duplicate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14868	Date Analyzed:	10/15/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12643	Date Prepared:	10/15/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0293	mg/L	10	0.001
Toluene		<0.010	mg/L	10	0.001
Ethylbenzene		0.207	mg/L	10	0.001
M,P,O-Xylene		0.146	mg/L	10	0.001
Total BTEX		0.3823	mg/L	10	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.977	mg/L	10	0.10	98	72 - 128
4-BFB		0.886	mg/L	10	0.10	89	72 - 128

Sample: 181815 - Rinsate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14868	Date Analyzed:	10/15/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12643	Date Prepared:	10/15/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.383	mg/L	5	0.10	77	72 - 128
4-BFB	[3]	0.344	mg/L	5	0.10	68	72 - 128

Sample: 181816 - Field Blank

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14868	Date Analyzed:	10/15/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12643	Date Prepared:	10/15/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.443	mg/L	5	0.10	89	72 - 128
4-BFB		0.400	mg/L	5	0.10	80	72 - 128

[3]Low surrogate due to prep error, QC showed method to be in control.

Quality Control Report
Method Blank

Method Blank

QCBatch: QC14862

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		< 0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.116	mg/L	1	0.10	116	72 - 128
4-BFB		0.0906	mg/L	1	0.10	91	72 - 128

Method Blank

QCBatch: QC14868

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		0.0071	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		0.0071	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0967	mg/L	1	0.10	97	72 - 128
4-BFB		0.0874	mg/L	1	0.10	87	72 - 128

Method Blank

QCBatch: QC14922

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		< 0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.105	mg/L	1	0.10	105	72 - 128
4-BFB		0.078	mg/L	1	0.10	78	72 - 128

Method Blank

QCBatch: QC14949

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.120	mg/L	1	0.10	120	72 - 128
4-BFB		0.0945	mg/L	1	0.10	94	72 - 128

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC14862

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.112	0.117	mg/L	1	0.10	<0.001	112	4	80 - 120	20
Benzene	0.110	0.113	mg/L	1	0.10	<0.001	110	3	80 - 120	20
Toluene	0.099	0.103	mg/L	1	0.10	<0.001	82	4	80 - 120	20
Ethylbenzene	0.102	0.107	mg/L	1	0.10	<0.001	102	5	80 - 120	20
M,P,O-Xylene	0.308	0.320	mg/L	1	0.30	<0.001	103	4	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.106	0.118	mg/L	1	0.10	106	118	72 - 128
4-BFB	0.0972	0.105	mg/L	1	0.10	97	105	72 - 128

Laboratory Control Spikes

QCBatch: QC14868

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.102	0.103	mg/L	1	0.10	<0.001	102	1	80 - 120	20
Benzene	0.0987	0.099	mg/L	1	0.10	<0.001	99	0	80 - 120	20
Toluene	0.100	0.101	mg/L	1	0.10	0.0071	93	1	80 - 120	20
Ethylbenzene	0.0963	0.0973	mg/L	1	0.10	<0.001	96	1	80 - 120	20
M,P,O-Xylene	0.276	0.278	mg/L	1	0.30	<0.001	92	1	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0962	0.0947	mg/L	1	0.10	96	95	72 - 128
4-BFB	0.0917	0.0917	mg/L	1	0.10	92	92	72 - 128

Laboratory Control Spikes

QCBatch: QC14922

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.112	0.111	mg/L	1	0.10	<0.001	112	1	80 - 120	20
Benzene	0.114	0.114	mg/L	1	0.10	<0.001	114	0	80 - 120	20
Toluene	0.101	0.103	mg/L	1	0.10	<0.001	84	2	80 - 120	20
Ethylbenzene	0.104	0.106	mg/L	1	0.10	<0.001	104	2	80 - 120	20
M,P,O-Xylene	0.316	0.318	mg/L	1	0.30	<0.001	105	1	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.109	0.108	mg/L	1	0.10	109	108	72 - 128
4-BFB	0.0944	0.093	mg/L	1	0.10	94	93	72 - 128

Laboratory Control Spikes

QCBatch: QC14949

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.111	0.111	mg/L	1	0.10	<0.001	111	0	80 - 120	20
Benzene	0.111	0.113	mg/L	1	0.10	<0.001	111	2	80 - 120	20
Toluene	0.101	0.103	mg/L	1	0.10	<0.001	101	2	80 - 120	20
Ethylbenzene	0.104	0.106	mg/L	1	0.10	<0.001	104	2	80 - 120	20
M,P,O-Xylene	0.314	0.318	mg/L	1	0.30	<0.001	105	1	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.120	0.120	mg/L	1	0.10	120	120	72 - 128
4-BFB	0.107	0.106	mg/L	1	0.10	107	106	72 - 128

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC14862

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.121	121	85 - 115	10/15/01
Benzene		mg/L	0.10	0.115	115	85 - 115	10/15/01
Toluene		mg/L	0.10	0.102	85	85 - 115	10/15/01
Ethylbenzene		mg/L	0.10	0.106	106	85 - 115	10/15/01
M,P,O-Xylene		mg/L	0.30	0.318	106	85 - 115	10/15/01

CCV (2)

QCBatch: QC14862

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.111	111	85 - 115	10/15/01
Benzene		mg/L	0.10	0.109	109	85 - 115	10/15/01
Toluene		mg/L	0.10	0.097	97	85 - 115	10/15/01
Ethylbenzene		mg/L	0.10	0.101	101	85 - 115	10/15/01
M,P,O-Xylene		mg/L	0.30	0.306	102	85 - 115	10/15/01

ICV (1) QCBatch: QC14862

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.116	116	85 - 115	10/15/01
Benzene		mg/L	0.10	0.115	115	85 - 115	10/15/01
Toluene		mg/L	0.10	0.104	87	85 - 115	10/15/01
Ethylbenzene		mg/L	0.10	0.107	107	85 - 115	10/15/01
M,P,O-Xylene		mg/L	0.30	0.319	106	85 - 115	10/15/01

CCV (1) QCBatch: QC14868

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.101	101	85 - 115	10/15/01
Benzene		mg/L	0.10	0.0958	96	85 - 115	10/15/01
Toluene		mg/L	0.10	0.0966	90	85 - 115	10/15/01
Ethylbenzene		mg/L	0.10	0.0937	94	85 - 115	10/15/01
M,P,O-Xylene		mg/L	0.30	0.268	89	85 - 115	10/15/01

CCV (2) QCBatch: QC14868

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.088	88	85 - 115	10/15/01
Benzene		mg/L	0.10	0.092	92	85 - 115	10/15/01
Toluene		mg/L	0.10	0.088	88	85 - 115	10/15/01
Ethylbenzene		mg/L	0.10	0.086	86	85 - 115	10/15/01
M,P,O-Xylene		mg/L	0.30	0.257	85	85 - 115	10/15/01

ICV (1) QCBatch: QC14868

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.105	105	85 - 115	10/15/01

Continued ...

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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.105	105	85 - 115	10/15/01
Toluene		mg/L	0.10	0.108	101	85 - 115	10/15/01
Ethylbenzene		mg/L	0.10	0.105	105	85 - 115	10/15/01
M,P,O-Xylene		mg/L	0.30	0.301	100	85 - 115	10/15/01

CCV (1) QCBatch: QC14922

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.114	114	85 - 115	10/16/01
Benzene		mg/L	0.10	0.111	111	85 - 115	10/16/01
Toluene		mg/L	0.10	0.098	81	85 - 115	10/16/01
Ethylbenzene		mg/L	0.10	0.102	102	85 - 115	10/16/01
M,P,O-Xylene		mg/L	0.30	0.309	103	85 - 115	10/16/01

CCV (2) QCBatch: QC14922

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.113	113	85 - 115	10/16/01
Benzene		mg/L	0.10	0.112	112	85 - 115	10/16/01
Toluene		mg/L	0.10	0.1	100	85 - 115	10/16/01
Ethylbenzene		mg/L	0.10	0.105	105	85 - 115	10/16/01
M,P,O-Xylene		mg/L	0.30	0.315	105	85 - 115	10/16/01

ICV (1) QCBatch: QC14922

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.111	111	85 - 115	10/16/01
Benzene		mg/L	0.10	0.117	117	85 - 115	10/16/01
Toluene		mg/L	0.10	0.104	87	85 - 115	10/16/01
Ethylbenzene		mg/L	0.10	0.107	107	85 - 115	10/16/01
M,P,O-Xylene		mg/L	0.30	0.327	109	85 - 115	10/16/01

CCV (1) QCBatch: QC14949

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.112	112	85 - 115	10/17/01

Continued ...

... Continued

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.114	114	85 - 115	10/17/01
Toluene		mg/L	0.10	0.101	101	85 - 115	10/17/01
Ethylbenzene		mg/L	0.10	0.104	104	85 - 115	10/17/01
M,P,O-Xylene		mg/L	0.30	0.316	105	85 - 115	10/17/01

CCV (2)

QCBatch: QC14949

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.114	114	85 - 115	10/17/01
Benzene		mg/L	0.10	0.111	111	85 - 115	10/17/01
Toluene		mg/L	0.10	0.101	101	85 - 115	10/17/01
Ethylbenzene		mg/L	0.10	0.105	105	85 - 115	10/17/01
M,P,O-Xylene		mg/L	0.30	0.315	105	85 - 115	10/17/01

ICV (1)

QCBatch: QC14949

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.110	110	85 - 115	10/17/01
Benzene		mg/L	0.10	0.115	115	85 - 115	10/17/01
Toluene		mg/L	0.10	0.11	110	85 - 115	10/17/01
Ethylbenzene		mg/L	0.10	0.111	111	85 - 115	10/17/01
M,P,O-Xylene		mg/L	0.30	0.329	110	85 - 115	10/17/01

AOHU0515

Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (Fax)

V-103-10-01-1

Chain of Custody

Date 10-10-01 Page 1 of 2

Lab Name: Trace Analysis Inc.
Address: 6701 Aberdeen, Suite 9
Lubbock, Texas 79424
Telephone: (806) 794-1296

Samplers (SIGNATURES)

Sample Identification		Matrix	Date	Time	Sample Type: G - Grab, C- Composite	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	TCLP Metals	Total Metals	Ions:						Number of Containers
MW-5	181800	Water	10-10-01	0815		✓																				2
MW-6	801	Water	10-10-01	0910		✓																				2
MW-7	802	Water	10-10-01	0950		✓																				2
MW-19	803	Water	10-10-01	1055		✓																				2
MW-18	804	Water	10-10-01	1115		✓																				2
MW-17	805	Water	10-10-01	1220		✓																				2
MW-15	806	Water	10-10-01	1450		✓																				2
MW-10	807	Water	10-10-01	1455		✓																				2
MW-14	808	Water	10-10-01	1550		✓																				2
MW-16	MW-12 MS 809	Water	10-10-01	1630		✓																				2

Project Information

Project Name: Duke Energy Field Services
Project Location: Hobbs Booster Station
Project Manager: Gil Van Deventer
Cost Center No.: V-103
Shipping ID No.:
Bill to (see below):

Sample Receipt

Total Containers:
COC Seals:
Rec'd Good Cond/Cold: 4°
Conforms to Records:
Lab No.:

Relinquished By: (1) (Company) Trident Environmental
(Printed Name)
(Signature)
(Date) 10/15/01 (Time) 1035

Relinquished By: (2) (Company)
(Printed Name)
(Signature)
(Date) (Time)

Relinquished By: (3) (Company)
(Printed Name)
(Signature)
(Date) (Time)

Received By: (1) (Company)
(Printed Name)
(Signature)
(Date) (Time)

Received By: (2) (Company)
(Printed Name)
(Signature)
(Date) (Time)

Received By: (3) (Company) Trace Analysis
(Printed Name) Vicki Hensley
(Signature)
(Date) 10-15-01 (Time) 10:35

Special Instructions/Comments: **Please send invoice direct to client:**
Duke Energy Field Svcs, Attn: Steve Weathers, PO Box 5493, Denver, CO 80217

10/19

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AU1107513

TRIDENT ENVIRONMENTAL

Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (Fax)

V-103-10-01-2

Chain of Custody

Date 10/10/01 Page 2 of 2

Lab Name: Trace Analysis Inc.
Address: 6701 Aberdeen, Suite 9
Lubbock, Texas 79424
Telephone: (806) 794-1296

Samplers (SIGNATURES): John Fuyn

Sample Identification		Matrix	Date	Time	Sample Type: G - Grab, C - Composite	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	TCLP Metals	Total Metals	Ions:	Number of Containers
MW-3	181810	Water	10-10-01	1700		✓															2
MW-2	811	Water	10-10-01	1945		✓															2
MW-9	812	Water	10-10-01	1940		✓															2
MW-1	813	Water	10-11-01	0845		✓															2
Duplicate	814	Water	10-10-01	0000		✓															2
Rinsate	815	Water	10-11-01	0900		✓															~~2~~
Field Blank	816	Water	10-11-01	0915		✓															~~2~~

Analysis Request

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Hobbs Booster Station	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	4 ✓
Cost Center No.:	V-103	Conforms to Records:	
Shipping ID No.:		Lab No.:	Carry
Bill to (see below):			

Special Instructions/Comments: Please send invoice direct to client:
Duke Energy Field Svcs, Attn: Steve Weathers, PO Box 5493, Denver, CO 80217

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental		
(Printed Name) John Fuyn	(Printed Name)	(Printed Name)
(Signature)	(Signature)	(Signature)
(Date) 10/15/01 (Time) 1035	(Date) (Time)	(Date) (Time)
Received By: (1) (Company)	**Received By: (2) (Company)**	**Received By: (3) (Company)**
		TRACE Analysis
(Printed Name)	(Printed Name)	(Printed Name) Vicki Hensley
(Signature)	(Signature)	(Signature) Vicki Hensley
(Date) (Time)	(Date) (Time)	(Date) 10-15-01 (Time) 10:35

Copy signed original form for Trident Environmental records

ANNUAL GROUNDWATER MONITORING, REMEDIATION AND INVESTIGATION REPORT HOBBS BOOSTER STATION LEA COUNTY, NEW MEXICO

DECEMBER 12, 2000

Prepared For:

Duke Energy Field Services, Inc.
P. O. Box 5493
Denver, Colorado 80217

TRW

Annual Groundwater Monitoring, Remediation, and Investigation Report
Hobbs Booster Station
Lea County, New Mexico

Prepared by:

TRW Inc. - Energy & Environmental Integration Services
415 West Wall Street, Suite 1818
Midland, Texas 79701

SUBMITTED BY: DATE: 1/3/01

Gilbert J. Van Deventer, REM
Project Manager

1/3/01

Dale T. Littlejohn
Quality Assurance Officer

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1.0 Executive Summary

The Energy & Environmental Integration Services Business Unit of TRW Inc. (TRW), was retained by Duke Energy Field Services Inc. (DEFS) to perform quarterly groundwater sampling, product recovery operations, and a groundwater investigation at the Hobbs Booster Station. TRW has completed the installation and sampling of eight additional monitoring wells (MW-12 through MW-19) at the Hobbs Booster Station. The investigation was conducted in accordance with the work plan prepared by TRW (September 28, 2000) and as approved by Mr. Jack Ford of the New Mexico Oil Conservation Division (OCD) in his letter dated October 10, 2000. This report also serves as the annual groundwater monitoring report for the site.

Based on the groundwater monitoring and sampling data to date, the following conclusions at the Hobbs Booster Station are evident:

- Benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations in monitoring wells MW-3, MW-5, MW-6, MW-7, MW-14, MW-15, MW-16, MW-18, and MW-19 are below New Mexico Water Quality Control Commission (WQCC) standards.
- Benzene levels in monitoring well MW-1 (0.197 mg/L), MW-2 (1.02 mg/L), and MW-10 (0.535 mg/L) are above the WQCC standard of 0.010 mg/L.
- With the addition of downgradient and cross gradient monitoring wells there is no indication that the hydrocarbon plume in groundwater has migrated beyond the property boundary.
- Non-aqueous phase liquids (LNAPL) thickness measurements for monitoring wells MW-4, MW-11, MW-12, and MW-13 were 2.68 ft., 4.45 ft., 0.08 ft., and 0.17 ft., respectively.
- Gauging measurements for monitoring wells MW-8, MW-9, and MW-10 indicated LNAPL thicknesses were reduced to less than 0.01 feet due product recovery from absorbent socks.
- As of November 1, 2000, a total of approximately 24.6 gallons of LNAPL (condensate) have been removed from recovery well RW-1 and monitoring wells MW-8, MW-9, and MW-10 using a combination of the Xitech product recovery system, hand bailing, passive skimmers, and absorbent socks.

The following recommendations are suggested for the remediation system and monitoring operations at the Hobbs Booster Station.

- Continue LNAPL recovery operations since the present system has been effective in recovering LNAPL from RW-1, MW-4, MW-8, MW-9, MW-10, and MW-11.
- Install absorbent socks in newly installed monitoring wells MW-12 and MW-17 to recover LNAPL.

- Perform remediation feasibility testing to determine the efficacy of an air sparging and soil vapor extraction system.

- Continue the groundwater monitoring program on a quarterly frequency. The next sampling event is scheduled during the first quarter of 2001.

- Submit a corrective action work plan and remediation system design based on the results of the remediation feasibility test and monitoring data.

2.0 Chronology of Events

August 13, 1998	At the request of GPM, TRW submitted a subsurface soil investigation work plan and proposal to determine soil and groundwater conditions at Hobbs Booster Station.
June 15-17, 1999	TRW installed and sampled four soil borings (HB-1 through HB-4) and six monitoring wells (MW-1 through MW-6) during a subsurface investigation. Hydrocarbon-impacted groundwater was confirmed in MW-1, MW-2, MW-3, and MW-4.
July 28, 1999	TRW submitted the Subsurface Soil and Groundwater Investigation report for the Hobbs Booster Station to GPM.
January 5, 2000	GPM submitted a work plan to the OCD for the additional groundwater investigation and remediation activities at the Hobbs Booster Station.
February 23, 2000	Mr. Jack Ford, of the OCD Environmental Bureau, approved the subsurface investigation work plan for Hobbs Booster Station.
April 1, 2000	Duke Energy Field Services Inc. (DEFS) acquired ownership and operation of the Hobbs Booster Station through a joint venture with GPM.
May 8-10, 2000	TRW completed a subsurface investigation for DEFS/GPM to delineate the extent of the hydrocarbon-impacted groundwater. The investigation included the installation of five monitoring wells (MW-7 through MW-11) and one recovery well (RW-1).
May 11, 2000	TRW conducted the second quarter 2000 sampling event at Hobbs Booster Station.
July 12, 2000	TRW submitted the Groundwater Investigation report for the Hobbs Booster Station to DEFS.
August 22, 2000	TRW conducted the third quarter 2000 sampling event at Hobbs Booster Station.
September 28, 2000	DEFS submitted a work plan to the OCD for a Phase III Groundwater Investigation at the Hobbs Booster Station.
October 23-27, 2000	TRW completed a subsurface investigation for DEFS to delineate the horizontal extent of the hydrocarbon-impacted groundwater. The investigation included the installation of eight monitoring wells (MW-12 through MW-19).
October 31, 2000	TRW conducted the fourth quarter 2000 sampling event at Hobbs Booster Station.

3.0 Site Background

The Hobbs Booster Station is located approximately one mile west of the city limits in Hobbs, New Mexico at 1625 West Marland Boulevard. The facility occupies the north half of section 4, township 19 south, and range 38 east (approximately 620 acres), with the exception of approximately 16 acres of the property in the northwest corner of the section which was deeded to Jones Brothers Construction and the City of Hobbs in the 1970s. The facility was initially built as a gasoline plant in the 1930s. The facility operated as a lean oil plant from the 1950s to 1970s. The plant switched to cryogenic operations in the early 1970s and continued that operation until 1976. Between 1976 and the 1980s the facility operated as a gas compressor (booster) station. Most of the plant was decommissioned in 1986. From 1986 to the present, the facility has operated as a natural gas liquid gathering station.

The facility is zoned as industrial property and is adjacent to commercial properties along the north, west and east sides. The facility is bordered on the north by State Highway 62/180. Harbison Fisher Sales Company borders the site at the northwest corner and Key Energy Services abuts the plant on the west side. The transportation office and facility of Phillips Petroleum Company occupies the northeast corner of the property. To the south is undeveloped property used primarily for oil and gas production and pastureland. Approximately five gas wells owned by Oxy USA Inc. (Oxy) are located within the property boundaries. Another OXY gas well is located near the south property boundary of the plant.

The nearest residence to the site is located along Texaco Street approximately 400 feet west of the western boundary of the site property.

4.0 Procedures

Drilling operations were conducted by Diversified Water Well Drilling using an air-rotary drilling rig. Soil cuttings were collected and field-screened using an organic vapor meter (OVM, Thermo Environmental Instrument Model 580B). Soil cutting samples were placed in plastic ziplock bags and allowed to reach ambient temperature (85° F or above). Field OVM measurements of the headspace were then recorded on the lithologic logs (Appendix A).

Four monitoring wells (MW-12, MW13, MW-17, and MW-18) were constructed of 4-inch diameter schedule 40 PVC well casing and 20 feet of 0.010-inch slotted well screen. Four monitoring wells (MW-14, MW-15, MW-16, and MW-19) were constructed of 2-inch diameter schedule 40 PVC well casing and 20 feet of 0.010-inch slotted well screen. Approximately 5 feet of well screen in each well was installed above the water table leaving approximately 15 feet of well screen below the water table. The screened portion of each monitoring well was surrounded with a filterpack consisting of 12/20 Brady sand, which extended to approximately 2 to 3 feet above the top of the screen. The filterpack was capped with approximately bentonite up to approximately 10 feet below ground surface. The remaining 10 feet of annular space in each monitoring well was sealed using a grout composed of portland cement with a 5 percent bentonite mixture, emplaced from the top of the bentonite plug to ground surface. A 3-foot by 3-foot concrete pad was constructed at the surface and the top of casing protected with an above ground, locked steel well cover. The monitoring well construction diagrams are provided in Appendix A.

The monitoring well locations and elevations were surveyed by John West Engineering of Hobbs, New Mexico, using the facilities' existing grid systems. Ground surface elevations and top- of-well casing elevations were determined within 0.01 feet relative to mean sea level. A copy of the survey plat is included in Appendix B.

The monitoring wells were gauged for depth to groundwater using a Solinst Model 101 electronic water indicator. If light non-aqueous phase liquids (LNAPL) were present in the well, a Heron Model H.01L oil/water interface probe was used to measure product thickness.

Immediately prior to collecting groundwater samples, each monitoring well was purged using a decontaminated 2-inch diameter submersible pump. Groundwater parameters, including pH, conductivity, temperature, turbidity, and dissolved oxygen (DO) were measured during purging using a Horiba Model U10 multiparameter meter and Hanna Model 9143 DO meter. A total of 66 gallons of water was purged from monitoring wells MW-1, MW-2, MW-3, MW-5, MW-6, and MW-7, during the third quarter sampling event on August 22, 2000. On October 31, 2000 and November 1, 2000 (fourth quarter sampling event), a total of 268 gallons of water was purged from monitoring wells MW-1, MW-2, MW-3, MW-5, MW-6, MW-7, MW-10, MW-14, MW-15, MW-16, MW-18, and MW-19. Monitoring wells with LNAPL or installed product recovery equipment were not sampled during either sampling event. A summary of the purging and sampling methods is provided in the table below.

Monitoring Well No.	Sample Date	Purge Method	Purge Volume	Sampling Method
MW-1	08/22/00	Pump	10	Disposable bailer
	10/31/00	Pump	15	Disposable bailer
MW-2	08/22/00	Bailer	14	Disposable bailer
	10/31/00	Bailer	15	Disposable bailer
MW-3	08/22/00	Pump	10	Disposable bailer
	10/31/00	Pump	15	Disposable bailer
MW-5	08/22/00	Pump	12	Disposable bailer
	10/31/00	Pump	15	Disposable bailer
MW-6	08/22/00	Pump	10	Disposable bailer
	10/31/00	Pump	15	Disposable bailer
MW-7	08/22/00	Pump	10	Disposable bailer
	10/31/00	Pump	15	Disposable bailer
MW-10	10/31/00	Bailer	8	Disposable bailer
MW-14	10/31/00	Pump	30	Disposable bailer
MW-15	10/31/00	Pump	30	Disposable bailer
MW-16	10/31/00	Pump	35	Disposable bailer
MW-18	10/31/00	Pump	50	Disposable bailer
MW-19	10/31/00	Pump	25	Disposable bailer
Monitoring wells MW-4, MW-8, MW-9, MW-11, MW-13, and MW-17 were not sampled due to presence of free product				

Groundwater samples were obtained using a new, decontaminated, disposable bailer for each well after purging. The water samples were transferred into airtight, septum-sealed, 40-milliliter glass VOA sample vials with zero headspace for analysis of total BTEX (EPA Method 8021B). For each set of samples, chain of custody forms documenting sample identification numbers, collection times, and delivery times to the laboratory were completed. All water samples were placed in an ice-filled cooler immediately after collection and transported to Trace Analysis, Inc. in Lubbock, Texas.

5.0 Geology

The lithology of the subsurface soils in monitoring wells MW-12 through MW-19 was similar. Generally, the unsaturated zone is composed of a hard, weathered and fractured, light gray caliche layer to a depth of approximately 17 to 20 feet. A hard pale brown siliceous sandstone stringer (approximately 2 feet thick) occurred at approximately 20 to 22 feet. Below the sandstone unit, an approximately 35 to 40-foot thick light brownish gray, very fine-grained calcareous sand was present. This unit changed gradationally with depth to a fine-grained noncalcareous sand. Thin stringers of siliceous sandstone were present at various depths in the borings. Groundwater was encountered in the light brown, fine-grained sand unit at depths ranging from 36 to 48 feet below ground surface. A more detailed description of the subsurface soils is provided on the lithologic logs in Appendix A.

6.0 Groundwater Elevations, Hydraulic Gradient and Flow Direction

Based on the most recent gauging data collected by TRW on October 31, 2000, the groundwater conditions at the Hobbs Booster Station are characterized below.

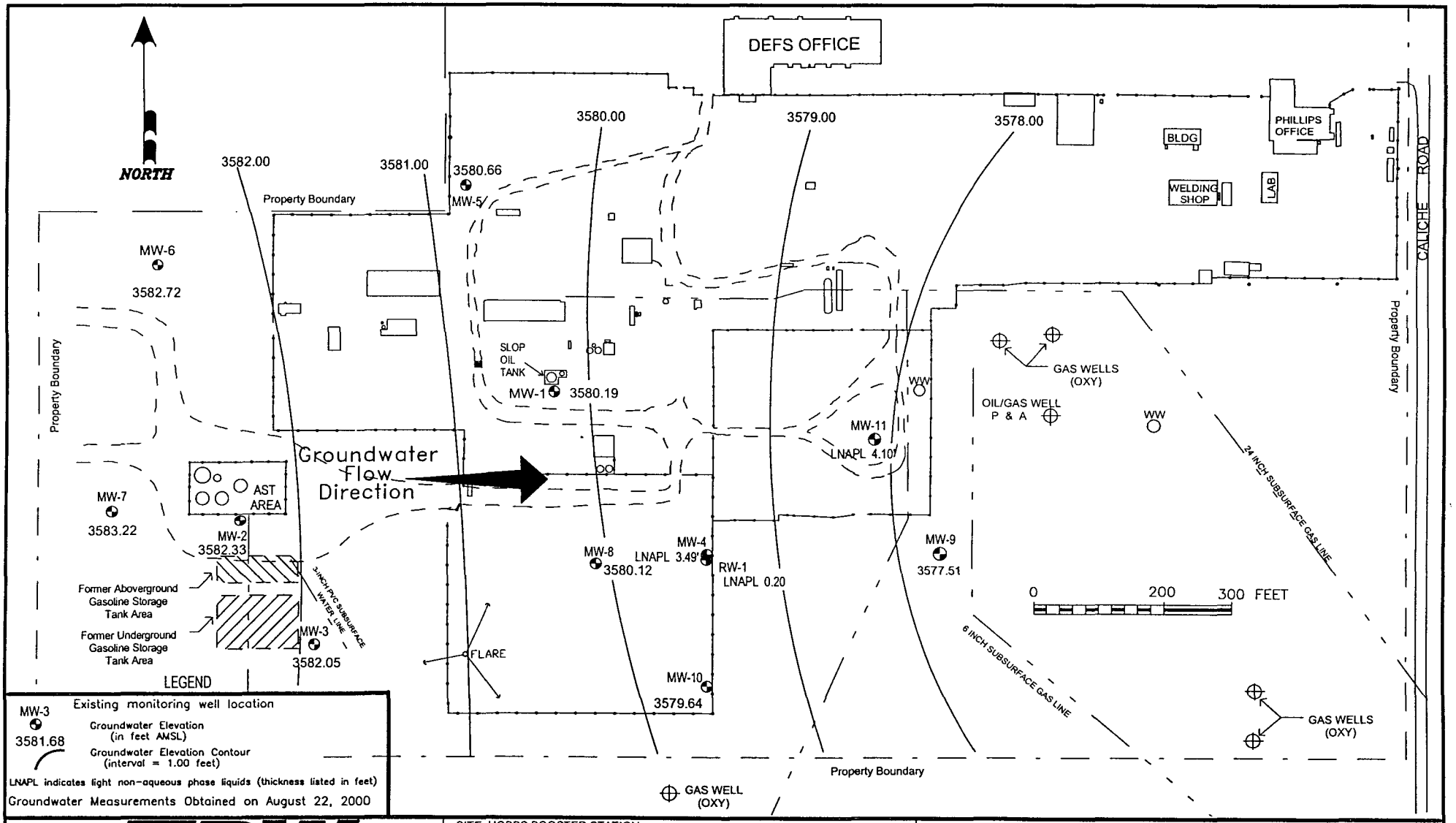
- The depth to groundwater varies from approximately 36 feet below ground surface on the east side of the site (MW-7) to approximately 48 feet on the west side (MW-11).
- The hydraulic gradient is approximately 0.004 feet/foot
- The direction of groundwater flow is to the east

Groundwater elevation maps depicting the water table elevation and direction of groundwater flow using the gauging data obtained during the August 22, 2000 and October 31, 2000 monitoring events are presented in Figure 1A and 1B, respectively. Historical groundwater elevations and depth to water measurements are summarized in Table 1 and depicted graphically in Figure 2.

7.0 Distribution of Hydrocarbons in Groundwater

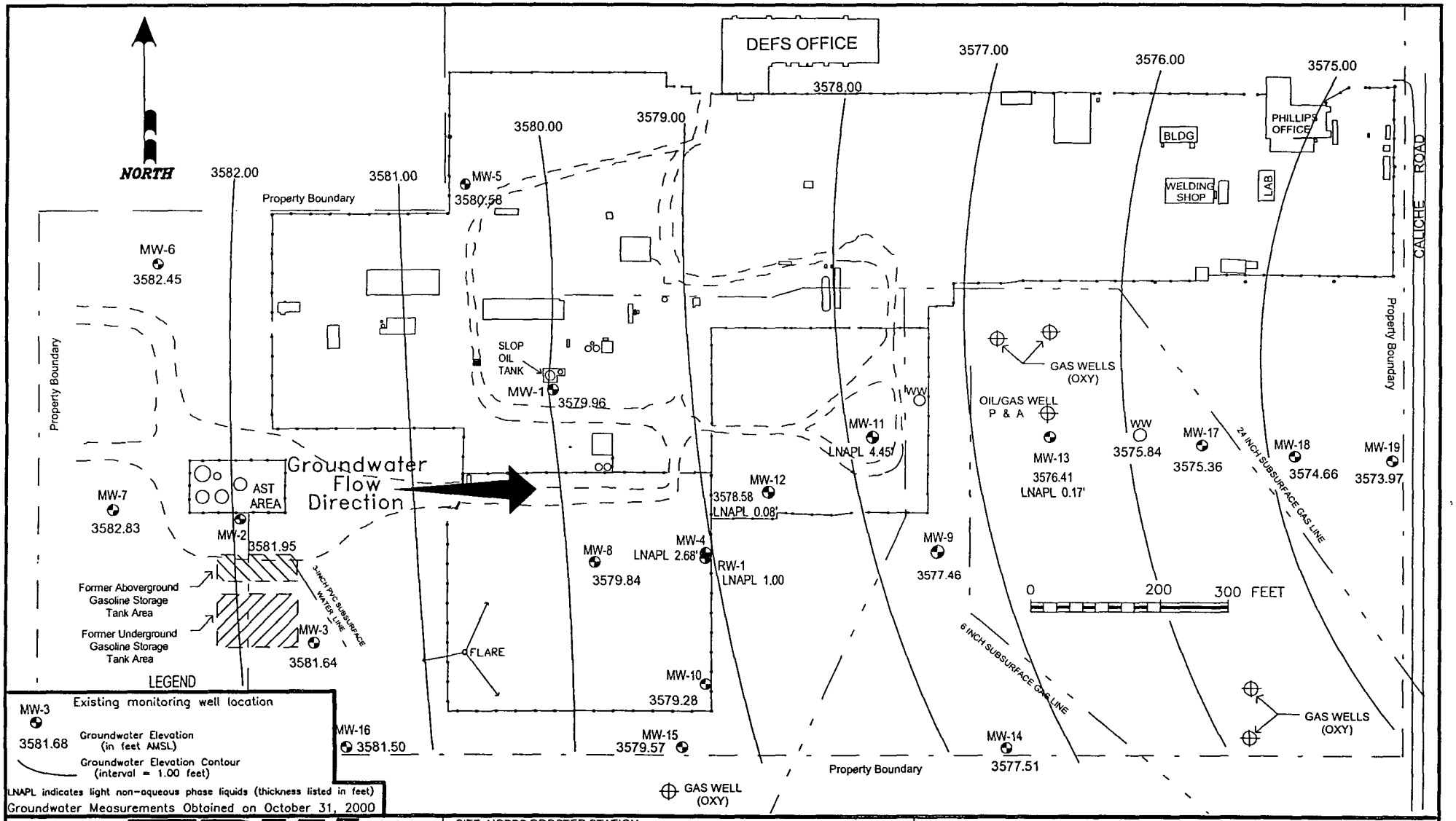
A historical listing of BTEX concentrations obtained from the on site monitoring wells is summarized in Table 2. Hydrocarbon concentration maps depicting the BTEX concentrations for the Saugust 22, 2000 and October 31, 2000 sampling events are presented in Figures 3A and 3B, respectively. Laboratory analytical reports and chain-of-custody documentation for the groundwater sampling operations are provided in Appendix D. Based on the most recent analytical data, the distribution of hydrocarbons at the Hobbs Booster Station is described below.

- BTEX concentrations in monitoring wells MW-3, MW-5, MW-6, MW-7, MW-14, MW-15, MW-16, MW-18, and MW-19 are below New Mexico Water Quality Control Commission (WQCC) standards.
- Benzene levels in monitoring well MW-1 (0.197 mg/L), MW-2 (1.02 mg/L), and MW-10 (0.535 mg/L) are above the WQCC standard of 0.010 mg/L.



SITE: HOBBS BOOSTER STATION	
DATE: 8/22/2000	REV. NO.: 2
AUTHOR: GJV	DRN BY: GJV
CK'D BY: DTL	SCALE: 1 INCH = 215 FEET

FIGURE 1 A
GROUNDWATER ELEVATION MAP



SITE: HOBBS BOOSTER STATION	
DATE: 10/31/2000	REV. NO.: 2
AUTHOR: GJV	DRN BY: GJV
CK'D BY: DTL	SCALE: 1 INCH = 215 FEET

FIGURE 1 B
GROUNDWATER ELEVATION MAP

Table 1
Summary of Groundwater Level Measurements

Monitoring Well	Date Gauged	Ground Surface Elevation (feet AMSL)	Top of Casing Elevation (feet AMSL)	Depth to Groundwater (feet AMSL)	Depth to LNAPL (feet AMSL)	LNAPL Thickness (feet)	Corrected Groundwater Elevation (feet AMSL)
MW-1	07/08/99	3623.60	3626.06	45.56	ND	0.00	3580.50
	05/11/00	3623.60	3626.06	45.93	ND	0.00	3580.13
	08/22/00	3623.60	3626.06	45.87	ND	0.00	3580.19
	10/31/00	3623.60	3626.06	46.10	ND	0.00	3579.96
MW-2	07/08/99	3620.65	3623.14	40.51	ND	0.00	3582.63
	05/11/00	3620.65	3623.14	41.10	ND	0.00	3582.04
	08/22/00	3620.65	3623.14	40.81	ND	0.00	3582.33
	10/31/00	3620.65	3623.14	41.19	ND	0.00	3581.95
MW-3	07/08/99	3620.08	3623.01	40.76	ND	0.00	3582.25
	05/11/00	3620.08	3623.01	41.33	ND	0.00	3581.68
	08/22/00	3620.08	3623.01	40.96	ND	0.00	3582.05
	10/31/00	3620.08	3623.01	41.37	ND	0.00	3581.64
MW-4	07/08/99	3621.66	3624.29	46.86	43.60	3.26	3579.64
	05/11/00	3621.66	3624.29	47.09	44.41	2.68	3579.02
	08/22/00	3621.66	3624.29	47.87	44.38	3.49	3579.12
	10/31/00	3621.66	3624.29	47.36	44.68	2.68	3579.00
MW-5	07/08/99	3626.30	3629.16	48.15	ND	0.00	3581.01
	05/11/00	3626.30	3629.16	48.27	ND	0.00	3580.89
	08/22/00	3626.30	3629.16	48.50	ND	0.00	3580.66
	10/31/00	3626.30	3629.16	48.58	ND	0.00	3580.58
MW-6	07/08/99	3624.14	3626.93	43.95	ND	0.00	3582.98
	05/11/00	3624.14	3626.93	44.32	ND	0.00	3582.61
	08/22/00	3624.14	3626.93	44.21	ND	0.00	3582.72
	10/31/00	3624.14	3626.93	44.48	ND	0.00	3582.45
MW-7	05/11/00	3618.93	3621.40	38.50	ND	0.00	3582.90
	08/22/00	3618.93	3621.40	38.18	ND	0.00	3583.22
	10/31/00	3618.93	3621.40	38.57	ND	0.00	3582.83
MW-8	05/11/00	3620.84	3623.62	43.69	ND	0.00	3579.93
	08/22/00	3620.84	3623.62	43.50	43.50	<0.01	3580.12
	10/31/00	3620.84	3623.62	43.78	43.78	<0.01	3579.84
MW-9	05/11/00	3622.60	3625.21	47.59	ND	0.00	3577.62
	08/22/00	3622.60	3625.21	47.70	ND	0.00	3577.51
	10/31/00	3622.60	3625.21	47.75	ND	0.00	3577.46
MW-10	05/11/00	3618.30	3621.07	41.65	41.64	0.01	3579.43
	08/22/00	3618.30	3621.07	41.43	41.43	<0.01	3579.64
	10/31/00	3618.30	3621.07	41.79	41.79	<0.01	3579.28
MW-11	05/11/00	3623.05	3625.88	48.94	47.76	1.18	3577.91
	08/22/00	3623.05	3625.88	51.23	47.13	4.10	3578.00
	10/31/00	3623.05	3625.88	51.85	47.40	4.45	3577.66
MW-12	10/31/00	3623.95	3626.60	48.09	48.01	0.08	3578.58
MW-13	10/31/00	3623.53	3626.30	50.03	49.86	0.17	3576.41
MW-14	10/31/00	3618.76	3621.42	43.91	ND	0.00	3577.51
MW-15	10/31/00	3616.79	3619.39	39.82	ND	0.00	3579.57
MW-16	10/31/00	3619.10	3621.87	40.37	ND	0.00	3581.50
MW-17	10/31/00	3621.36	3623.94	48.59	48.58	<0.01	3575.36
MW-18	10/31/00	3621.96	3624.30	49.64	49.64	<0.01	3574.66
MW-19	10/31/00	3621.42	3624.12	50.15	ND	0.00	3573.97
RW-1	05/11/00	3621.53	3624.52	46.00	45.05	0.95	3579.16
	08/22/00	3621.53	3624.52	45.20	45.00	0.20	3579.47
	10/31/00	3621.53	3624.52	46.00	45.00	1.00	3579.29

LNAPL = Light Non-Aqueous Phase Liquid, AMSL = Above Mean Sea Level, ND = Not Detected

Corrected Groundwater Elevation = Casing Elevation - Depth to Groundwater + (LNAPL Thickness x Specific Gravity of LNAPL)

Specific Gravity of LNAPL (MW-4) = 0.7740; Specific Gravity of LNAPL (MW-11) = 0.8165

Figure 4A

BTEX Concentration and Groundwater Elevation Vs. Time (MW-1)

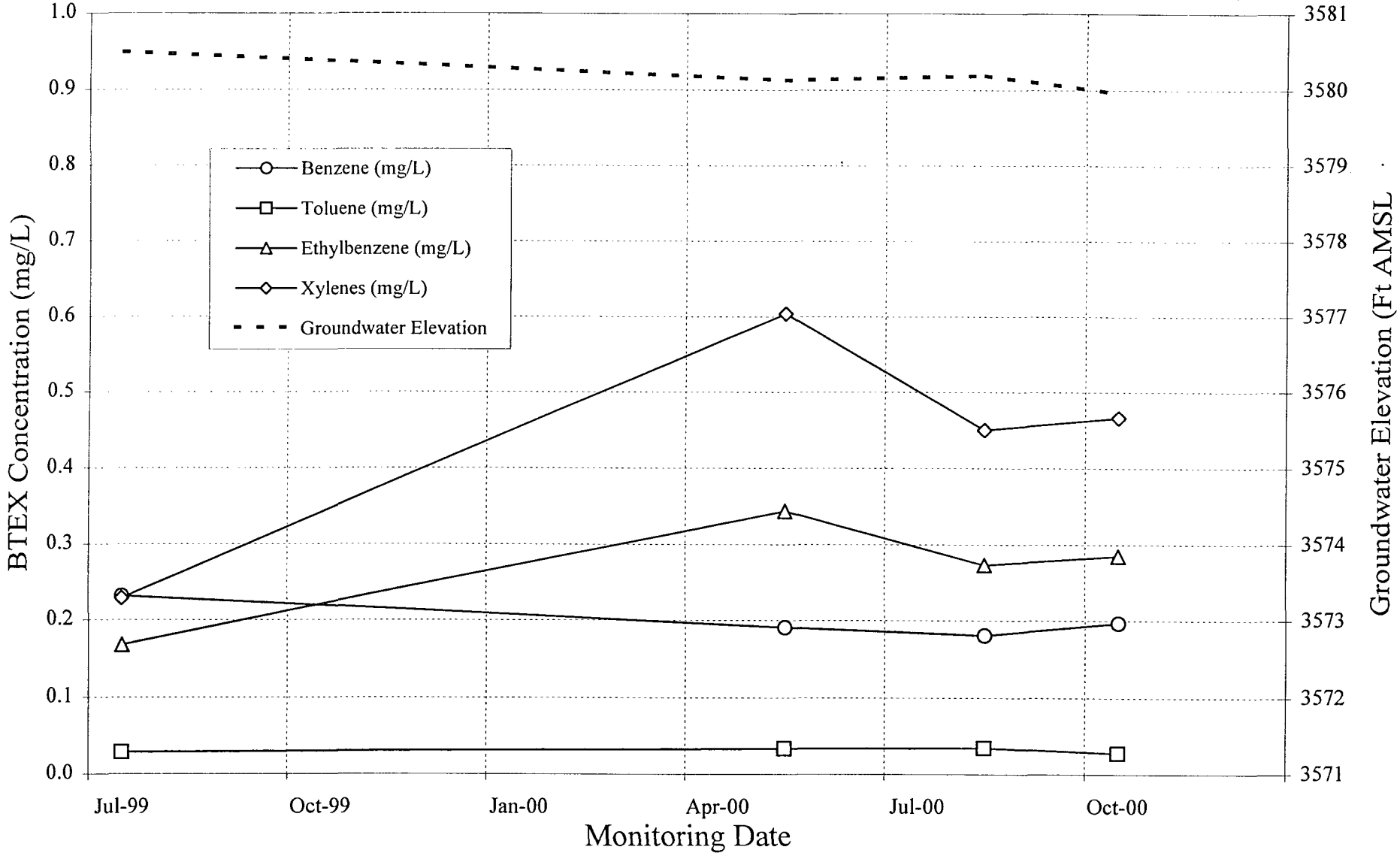


Figure 4B

BTEX Concentration and Groundwater Elevation Vs. Time (MW-2)

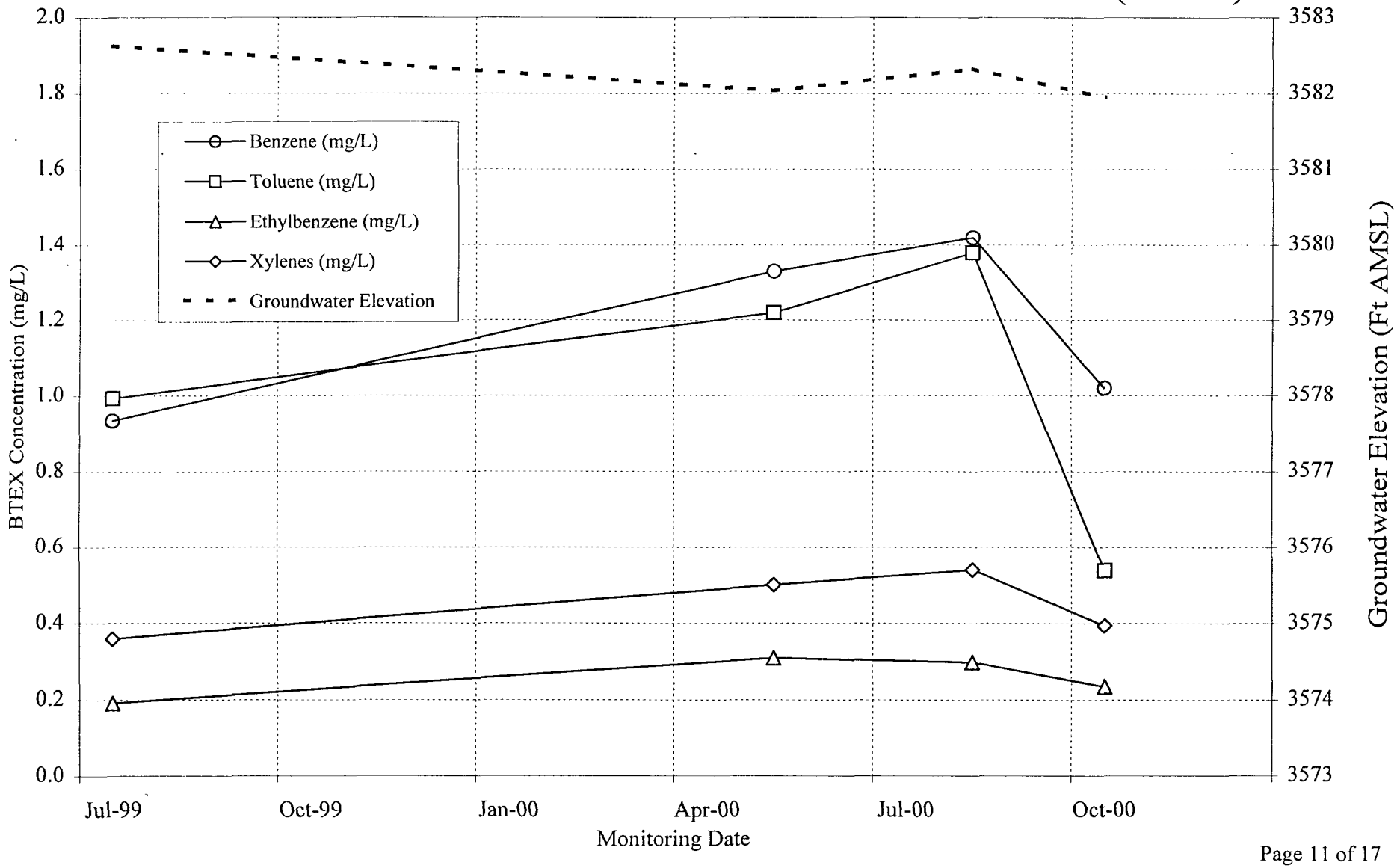


Figure 4C

BTEX Concentration and Groundwater Elevation Vs. Time (MW-3)

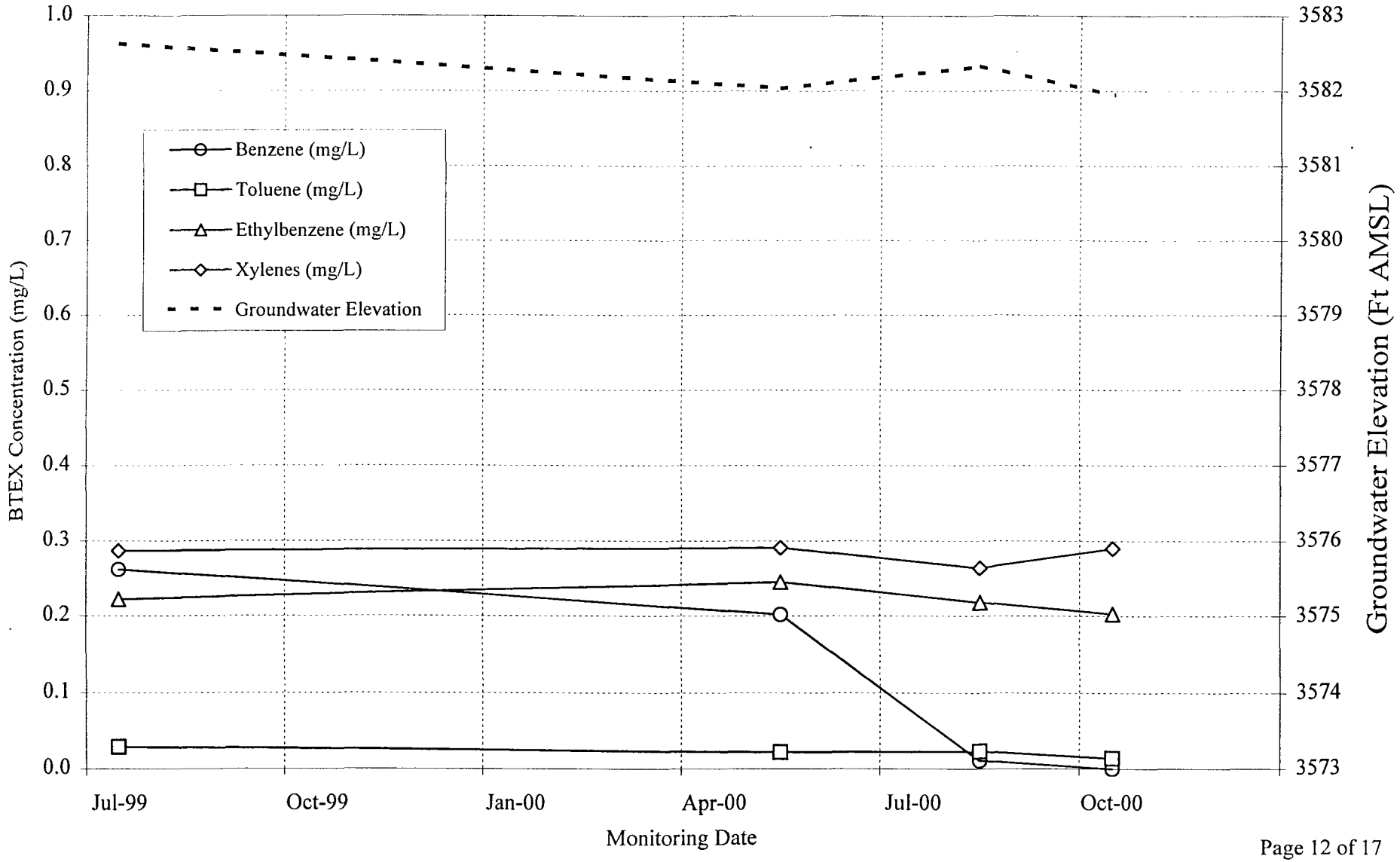
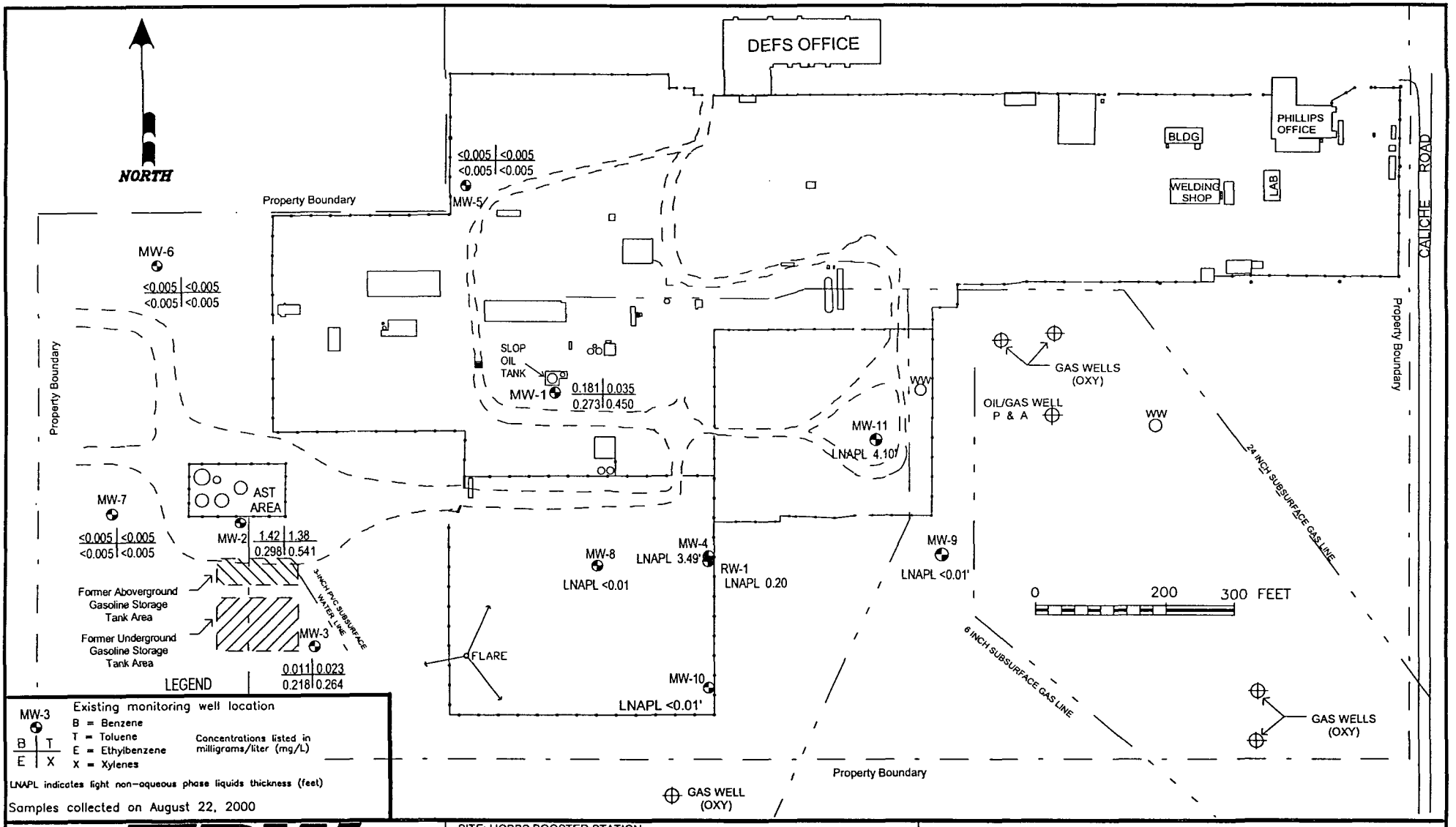


Table 2
Summary of BTEX Concentrations in Groundwater
Hobbs Booster Station

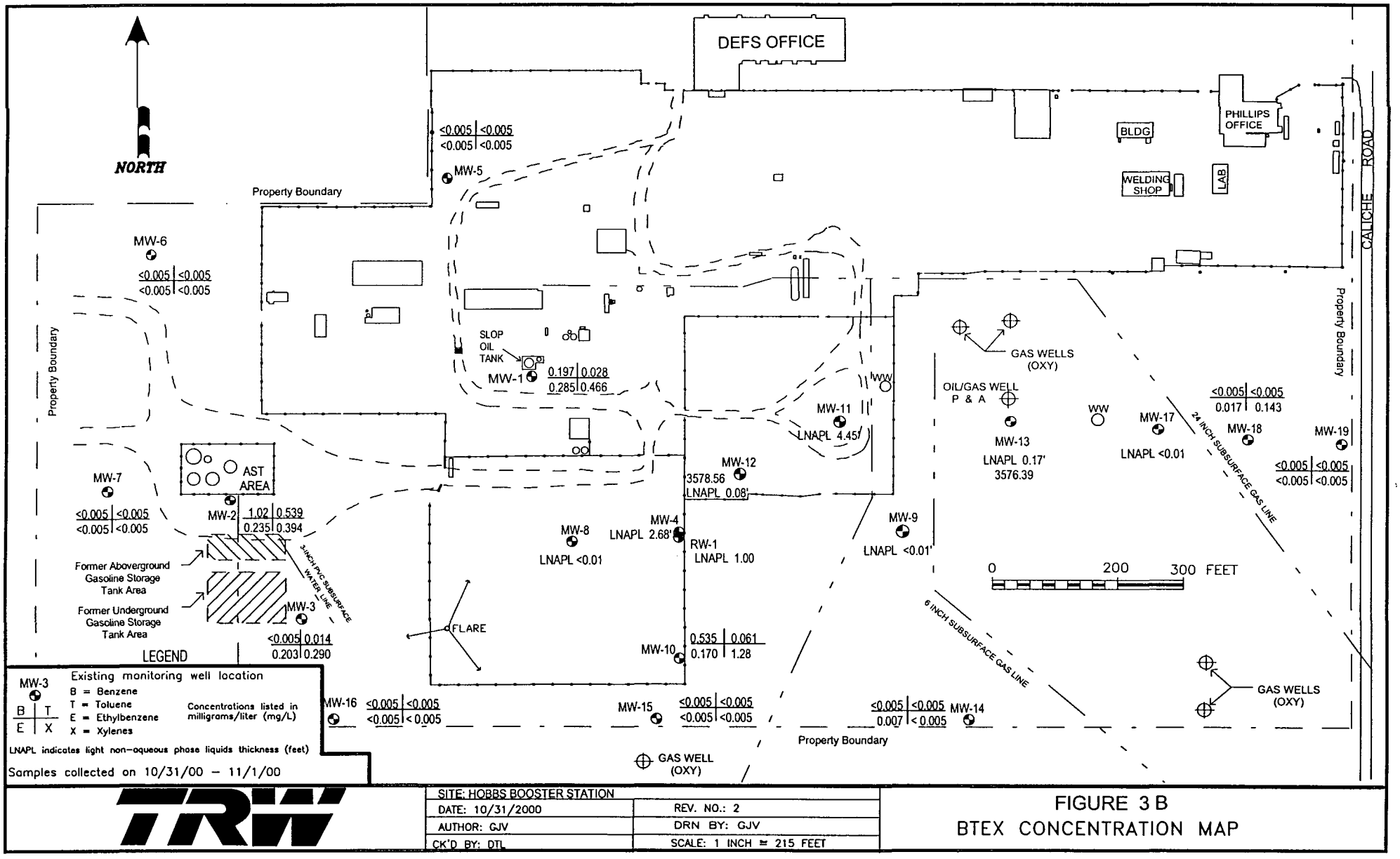
Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-1	06/17/99	**0.232**	0.029	0.168	0.229
	05/11/00	**0.191**	0.034	0.344	0.604
	08/22/00	**0.181**	0.035	0.273	0.450
	10/31/00	**0.197**	0.028	0.285	0.466
MW-2	06/17/99	**0.934**	**0.993**	0.192	0.359
	05/11/00	**1.33**	**1.22**	0.309	0.501
	08/22/00	**1.42**	**1.38**	0.298	0.541
	10/31/00	**1.02**	0.539	0.235	0.394
MW-3	06/17/99	**0.262**	0.029	0.222	0.287
	05/11/00	**0.202**	0.022	0.245	0.291
	08/22/00	**0.011**	0.023	0.218	0.264
	10/31/00	< 0.005	0.014	0.203	0.290
MW-4	06/17/99	LNAPL	LNAPL	LNAPL	LNAPL
	05/11/00	LNAPL	LNAPL	LNAPL	LNAPL
	08/22/00	LNAPL	LNAPL	LNAPL	LNAPL
	10/31/00	LNAPL	LNAPL	LNAPL	LNAPL
MW-5	06/17/99	< 0.005	< 0.005	< 0.005	< 0.005
	05/11/00	< 0.005	< 0.005	< 0.005	< 0.005
	08/22/00	< 0.005	< 0.005	< 0.005	< 0.005
	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
MW-6	06/18/99	< 0.005	< 0.005	< 0.005	< 0.005
	05/11/00	< 0.005	< 0.005	< 0.005	0.038
	08/22/00	< 0.005	0.008	< 0.005	0.007
	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
MW-7	05/11/00	< 0.005	< 0.005	< 0.005	< 0.005
	08/22/00	< 0.005	0.008	< 0.005	0.008
	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
MW-8	05/11/00	**0.824**	< 0.05	0.375	**0.742**
	08/22/00	LNAPL	LNAPL	LNAPL	LNAPL
	10/31/00	LNAPL	LNAPL	LNAPL	LNAPL
MW-9	05/11/00	**0.702**	0.016	0.096	0.208
	08/22/00	LNAPL	LNAPL	LNAPL	LNAPL
	10/31/00	LNAPL	LNAPL	LNAPL	LNAPL
MW-10	05/11/00	LNAPL	LNAPL	LNAPL	LNAPL
	08/22/00	LNAPL	LNAPL	LNAPL	LNAPL
	10/31/00	**0.535**	0.061	0.17	**1.28**
MW-11	05/11/00	LNAPL	LNAPL	LNAPL	LNAPL
	08/22/00	LNAPL	LNAPL	LNAPL	LNAPL
	10/31/00	LNAPL	LNAPL	LNAPL	LNAPL
MW-14	10/31/00	< 0.005	< 0.005	0.007	< 0.005
MW-15	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
MW-16	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
MW-18	10/31/00	< 0.005	< 0.005	0.017	0.143
MW-19	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
WQCC Standards		0.010	0.75	0.75	0.62

Analyses performed by Trace Analysis, Inc., Lubbock, Texas.
All samples analyzed for BTEX using EPA Method 8021B.
Values listed in **boldface** type indicate concentrations exceed New Mexico Water Quality Control Commission (WQCC) standards.
LNAPL - No sample analyzed due to presence of Light Non-Aqueous Phase Liquid.



SITE: HOBBS BOOSTER STATION	
DATE: 8/22/2000	REV. NO.: 2
AUTHOR: GJV	DRN BY: GJV
CK'D BY: DTL	SCALE: 1 INCH = 215 FEET

FIGURE 3 A
BTEX CONCENTRATION MAP



SITE: HOBBS BOOSTER STATION	
DATE: 10/31/2000	REV. NO.: 2
AUTHOR: GJV	DRN BY: GJV
CK'D BY: DTL	SCALE: 1 INCH = 215 FEET

FIGURE 3 B
BTEX CONCENTRATION MAP

8.0 Remediation System Performance

The remediation system at the Hobbs Booster Station consists of one Xitech pneumatic product recovery system that was installed in recovery well RW-1 on May 10, 2000. Passive skimmers are installed in MW-4 and MW-11 and hydrophobic (oil absorbent) socks in MW-8 and MW-9. The hydrophobic sock in MW-10 was removed on October 31, 2000 since there was no longer any indication of LNAPL present. As of May 31, 2000, a total of approximately 24.6 gallons of LNAPL (condensate) has been removed from RW-1, MW-4, MW-9, MW-10, and MW-11.

Table 3
Product Recovery Volumes

Date	Product Recovered (gallons)						Cumulative Product Recovered (gallons)
	RW-1	MW-4	MW-8	MW-9	MW-10	MW-11	
7/9/99	---	3.00	---	---	---	---	3.0
06/15/00	0.5	0.0	---	---	---	---	3.5
07/12/00	0.0	1.38	<0.0	<0.0	<0.0	2.05	6.9
08/22/00	3.0	2.11	<0.0	<0.0	<0.0	2.25	14.3
09/21/00	0.0	0.00	<0.0	<0.0	<0.0	0.00	14.3
10/11/00	0.0	2.44	<0.0	0.13	<0.0	4.00	20.9
11/01/00	0.0	1.64	<0.0	<0.0	<0.0	2.09	24.6
Total Volume of Product Recovered On Site:							24.6

Product recovery methods used:
RW-1: Xitech ADJ 1000 Smart Skimmer (Product Recovery System)
MW-4: Passive bailer and hand bailing
MW-8: Hydrophobic (oil adsorbent) sock
MW-9: Hydrophobic (oil adsorbent) sock
MW-10: Hydrophobic (oil adsorbent) sock
MW-11: Passive bailer and hand bailing

9.0 Conclusions

Conclusions relevant to groundwater conditions and the remediation performance at the Hobbs Booster Station are presented below.

- BTEX concentrations in monitoring wells MW-3, MW-5, MW-6, MW-7, MW-14, MW-15, MW-16, MW-18, and MW-19 are below New Mexico Water Quality Control Commission (WQCC) standards.
- Benzene levels in monitoring well MW-1 (0.197 mg/L), MW-2 (1.02 mg/L), and MW-10 (0.535 mg/L) are above the WQCC standard of 0.010 mg/L.
- With the addition of downgradient and cross gradient monitoring wells there is no indication that the hydrocarbon plume in groundwater has migrated beyond the property boundary.
- Non-aqueous phase liquids (LNAPL) thickness measurements for monitoring wells MW-4, MW-11, MW-12, and MW-13 were 2.68 ft., 4.45 ft., 0.08 ft., and 0.17 ft., respectively.
- Gauging measurements for monitoring wells MW-8, MW-9, and MW-10 indicated LNAPL thicknesses were reduced to less than 0.01 feet due to product recovery from absorbent socks.
- As of November 1, 2000, a total of approximately 24.6 gallons of LNAPL (condensate) have been removed from recovery well RW-1 and monitoring wells MW-4, MW-8, MW-9, MW-10, and MW-11 using a combination of the Xitech product recovery system, hand bailing, passive skimmers, and absorbent socks.

10.0 Recommendations

The following recommendations are proposed for the remediation system and monitoring operations at the Hobbs Booster Station.

- Continue LNAPL recovery operations since the present system has been effective in recovering LNAPL from RW-1, MW-4, MW-8, MW-9, MW-10, and MW-11.
- Install absorbent socks in newly installed monitoring wells MW-12 and MW-17 to recover LNAPL.
- Perform remediation feasibility testing to determine the efficacy of an air sparging and soil vapor extraction system for removal of LNAPL and dissolved hydrocarbons.
- Continue the groundwater monitoring program on a quarterly frequency. The next sampling event is scheduled during the first quarter of 2001.
- Submit a corrective action work plan and remediation system design based on the results of the remediation feasibility test and monitoring data.

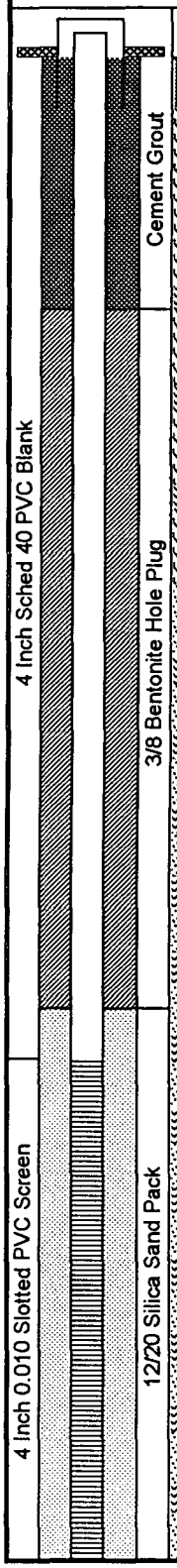
Appendix A

Lithologic Logs and Well Construction Diagrams

LITHOLOGIC LOG (MONITORING WELL)

TRW
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW-12	TOTAL DEPTH:	65 Feet
SITE ID:	Hobbs Booster Station	CLIENT:	Duke Energy Field Services
SURFACE ELEVATION:	3623.95	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	10/23/00	FIELD REP.:	J. Fergerson
COMPLETION DATE:	10/24/00	FILE NAME:	
COMMENTS:	Approximately 114' south & 166' west of MW-11.		



LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
	ML		1348				Clayey silt, dk brown, v moist, no hydrocarbon odor, w frac caliche in matrix.
	CAL	4-5	1354	Cuttings	2.0	5	Caliche, v pale orange-grayish orange, no hydrocarbon odor, weathered, w/dense layers interbedded.
	CAL/SS	9-10	1359	Cuttings	0.9	10	Caliche, v pale orange, no hydrocarbon odor, weathered, w dense layers & mod-well cemented vf grain sand interbedded.
		14-15	1401	Cuttings	0.0	15	
		19-20	1403	Cuttings	2.0	20	
		24-25	1410	Cuttings	0.0	25	Sand, grayish orange pink-v pale orange, vf grain, unconsol, no hydrocarbon odor, w/mod-well cemented vf grain sand & sandstone interbeds.
		29-30	1413	Cuttings	0.0	30	Sand, grayish orange pink-lt brown, vf grain, unconsol, no hydrocarbon odor, w/mod-well cemented vf grain sand and sandstone interbeds.
		34-35	1416	Cuttings	0.0	35	
	SW/SS	39-40	1420	Cuttings	0.0	40	Sand, grayish orange pink-lt brown, vf grain, unconsol, slight hydrocarbon odor, w/mod-well cemented vf grain sand and sandstone interbedded.
		42-43	1425	Cuttings	186	45	Sand, grayish orange pink-lt brown, vf grain, unconsol, moist, mod hydrocarbon odor, w/mod-well cemented vf grain sand and sandstone interbeds. Groundwater Encountered @ 45 Feet
						50	
						55	
						60	

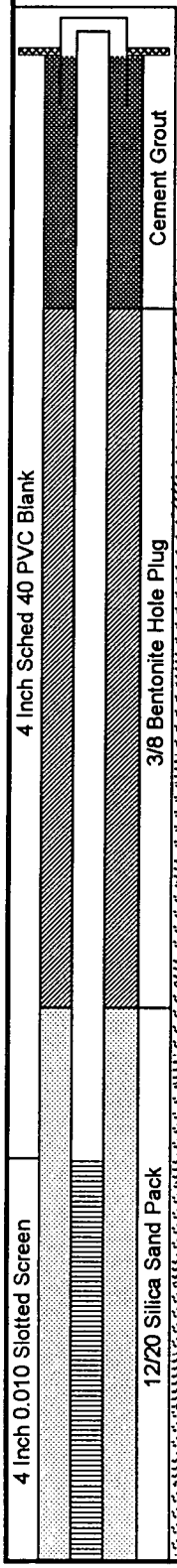
MONITORING WELL NO: MW-12 TOTAL DEPTH: 65 Feet

	LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
Natural Sand 12/20		SW/SS						Sand, grayish orange pink-lt brown, vf grain, unconsol, wet, good hydrocarbon odor, w/mod-well, cemented vf grain sand and sandstone interbeds.
							65	TD @ 65 Feet
							70	
							75	
							80	
							85	
							90	
							95	
							100	
							105	
							110	
							105	

LITHOLOGIC LOG (MONITORING WELL)

TRW
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW-13	TOTAL DEPTH:	69 Feet
SITE ID:	Hobbs Booster Station	CLIENT:	Duke Energy Field Services
SURFACE ELEVATION:	3623.53	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	10/24/00	FIELD REP.:	J. Fergerson
COMPLETION DATE:	10/24/00	FILE NAME:	
COMMENTS:	Approximately 192' east & 170' north of MW-9.		



LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
	ML		1103				Clayey silt, dk brown, v moist, no hydrocarbon odor, w frac caliche in matrix.
	CAL	4-5	1123	Cuttings	23.2	5	Caliche, v pale orange-grayish orange, sl hydrocarbon odor, weathered, w/ dense layers interbedded.
	CAL/ SS	9-10	1130	Cuttings	0.9	10	Caliche, v pale orange, no hydrocarbon odor, weathered, w dense layers and mod-well cemented vf grain sand interbeds.
		14-15	1133	Cuttings	0.1	15	
		19-20	1136	Cuttings	0.8	20	
	SW/SS	24-25	1203	Cuttings	0.1	25	Sand, grayish orange pink-v pale orange, vf grain, unconsol, no hydrocarbon odor, w/mod-well cemented vf grain sand & sandstone interbeds.
		29-30	1206	Cuttings	0.1	30	
		34-35	1209	Cuttings	0.4	35	Sand, grayish orange pink-lt brown, vf grain, unconsol, no hydrocarbon odor, w/mod-well cemented vf grain sand and sandstone interbeds.
		39-40	1215	Cuttings	0.1	40	
		44-45	1219	Cuttings	8.9	45	Sand, grayish orange pink-lt brown, vf grain, unconsol, moist, sl hydrocarbon odor, w/mod-well cemented vf grain sand and sandstone interbeds.
		49-50	1223	Cuttings	56.3	50	Groundwater Encountered @ 49 Feet Sand, light brown, vf grain, unsonsol, wet, good hydrocarbon odor, w/mod-well cemented vf grain sand and sandstone interbeds.
						55	
						60	

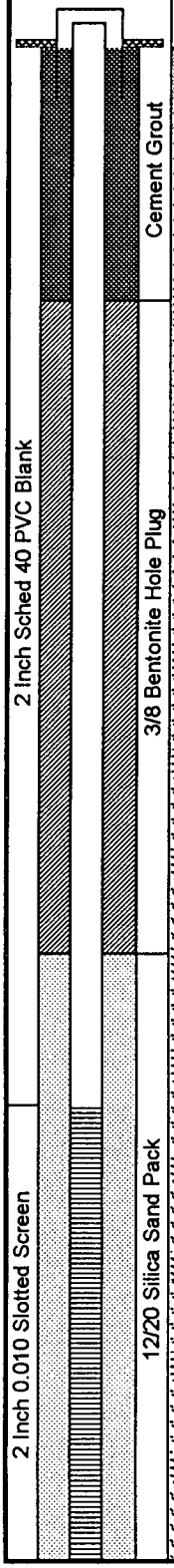
MONITORING WELL NO: MW-13 TOTAL DEPTH: 69 Feet

	LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
Screen / 12/20 Silica Sand / Natural / Sand		SW/SS						Sand, light brown, vf grain, unsonsol, wet, good hydrocarbon odor, w/mod-well cemented vf grain sand and sandstone interbeds.
							65	
								TD @ 69 Feet
							70	
							75	
							80	
							85	
							90	
							95	
							100	
							105	
							110	
							105	

LITHOLOGIC LOG (MONITORING WELL)

TRW
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW-14	TOTAL DEPTH:	66 Feet
SITE ID:	Hobbs Booster Station	CLIENT:	Duke Energy Field Services
SURFACE ELEVATION:	3618.76	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	10/24/00	FIELD REP.:	J. Fergerson
COMPLETION DATE:	10/24/00	FILE NAME:	
COMMENTS:	Approximately 125' east & 324' south of MW-9		



LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
	ML		1510				Clayey silt, dk brown, v moist, no hydrocarbon odor, w frac caliche in matrix.
	CAL	4-5	1515	Cuttings	0.1	5	Caliche, v pale orange-grayish orange, no hydrocarbon odor, weathered, w/ dense layers interbedded.
	CAL/ SS	9-10	1518	Cuttings	0.1	10	Caliche, v pale orange, no hydrocarbon odor, weathered, w dense layers and mod-well cemented vf grain sand and sandstone interbeds.
		14-15	1520	Cuttings	0.4	15	
		19-20	1523	Cuttings	0.4	20	Caliche, v pale orange, no hydrocarbon odor, weathered, w dense layers and mod-well cemented vf grain sand and sandstone interbeds.
	SW/SS	24-25	1531	Cuttings	0.6	25	Sand, grayish orange pink-light brown, vf grain, unconsol, no hydrocarbon odor, w/mod-well cemented vf grain sand and sandstone interbeds
		29-30	1533	Cuttings	0.3	30	
		34-35	1535	Cuttings	0.3	35	
		39-40	1537	Cuttings	0.4	40	Sand, light brown, vf grain, unconsol, no hydrocarbon odor, w/mod-well cemented vf grain sand and sandstone interbeds.
		44-45	1548	Cuttings	0.8	45	Sand, light brown, vf grain, unconsol, moist, no hydrocarbon odor, w/mod-well cemented vf grain sand and sandstone interbeds. Groundwater Encountered @ 47 Feet
		49-50	1555	Cuttings	0.6	50	Sand, light brown, vf grain, unsonsol, wet, no hydrocarbon odor, w/mod-well cemented vf grain sand and sandstone interbeds.
						55	
						60	

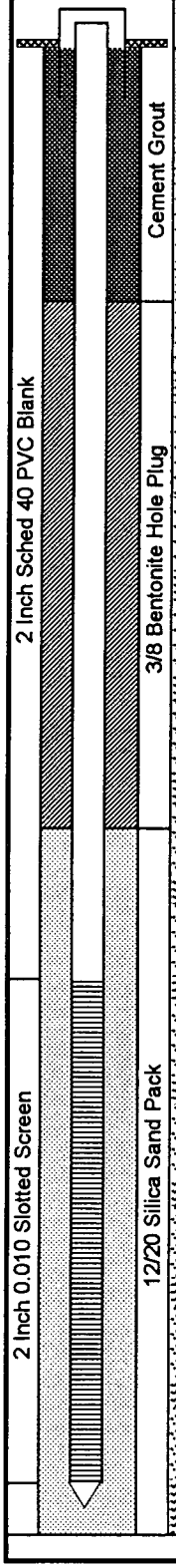
MONITORING WELL NO: MW-14 TOTAL DEPTH: 66 Feet

	LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
Screen 12/20 / Natural Sand		SW/SS						Sand, light brown, vf grain, unsonsol, wet, moderate hydrocarbon odor, w/mod-well cemented vf grain sand and sandstone interbeds.
							65	TD @ 66 Feet
							70	
							75	
							80	
							85	
							90	
							95	
							100	
							105	
							110	
							105	

LITHOLOGIC LOG (MONITORING WELL)

TRW
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW-15	TOTAL DEPTH:	59 Feet
SITE ID:	Hobbs Booster Station	CLIENT:	Duke Energy Field Services
SURFACE ELEVATION:	3616.79	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	10/23/00	FIELD REP.:	J. Fergerson
COMPLETION DATE:	10/23/00	FILE NAME:	
COMMENTS:	Approximately 33' west & 114' south of MW-10		

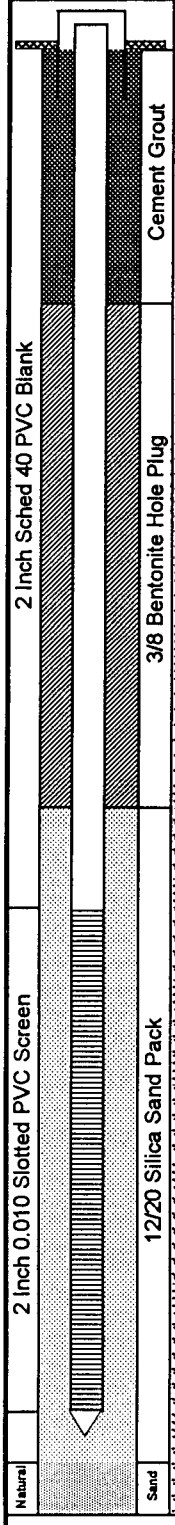


LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
	ML		0920				Clayey silt, dk brown, sl moist, no hydrocarbon odor, w frac caliche in matrix.
	CAL	4-5	0935	Cuttings	0.1	5	Caliche, v pale orange, no hydrocarbon odor, weathered, with dense layers interbedded.
	CAL/SS	9-10	0944	Cuttings	3.9	10	Caliche, v pale orange, slight hydrocarbon odor, weathered, with dense layers and mod-well cemented vf grain sand and sandstone interbeds.
		14-15	0950	Cuttings	1.2	15	
	SW/SS	19-20	0952	Cuttings	0.6	20	Sand, grayish orange pink-v pale orange, vf grain, unconsol, no hydrocarbon odor, withmod-well cemented vf grain sand and sandstone interbeds.
		24-25	1001	Cuttings	0.6	25	Sand, pale yellowish brown-grayish orange pink, vf grain, unconsol, no hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds.
		29-30	1003	Cuttings	0.6	30	Sand, light-med gray-pale yellowish brown, vf grain, unconsol, no hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds.
		34-35	1005	Cuttings	0.4	35	
		39-40	1012	Cuttings	47.0	40	Sand, lt-med gray-pale yellowish brown, vf grain, unconsol, moderate hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds. Groundwater Encountered @ 42 Feet
		44-45	1018	Cuttings	2.2	45	
						50	Sand, lt gray-pale yellowish brown, vf grain, unconsol, sl hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds.
						55	
							TD @ 59 Feet
						60	

LITHOLOGIC LOG (MONITORING WELL)

415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW-16	TOTAL DEPTH:	58 Feet
SITE ID:	Hobbs Booster Station	CLIENT:	Duke Energy Field Services
SURFACE ELEVATION:	3619.10	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	10/25/00	FIELD REP.:	J. Fergerson
COMPLETION DATE:	10/25/00	FILE NAME:	
COMMENTS:	Approximately 37' east & 174' south of MW-3		

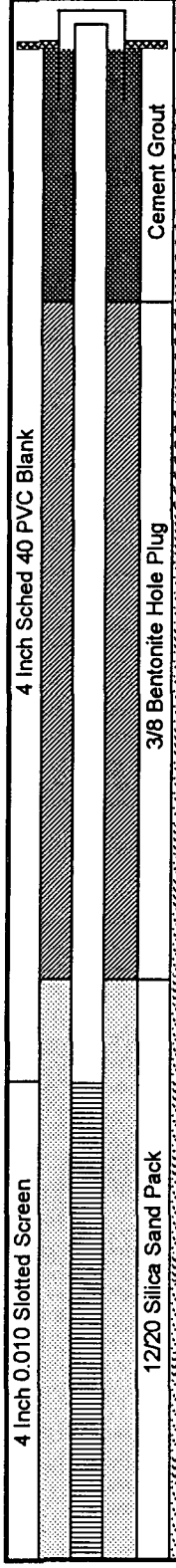


LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
	ML		1225				Clayey silt, dk brown, v moist, no hydrocarbon odor, w frac caliche in matrix.
	CAL	4-5	1241	Cuttings	0.0	5	Caliche, v pale orange-grayish orange, no hydrocarbon odor, weathered, with dense layers interbedded.
	CAL/ SS	9-10	1246	Cuttings	0.1	10	Caliche, white-v pale orange, no hydrocarbon odor, weathered, with dense layers & mod-well cemented vf grain sand interbeds.
		14-15	1252	Cuttings	0.0	15	
	SW/SS	19-20	1257	Cuttings	0.0	20	Sand, grayish orange pink-v pale orange, vf grain, unconsol, no hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds.
		24-25	1316	Cuttings	0.4	25	Sand, grayish orange pink-light brown, vf grain, unconsol, no hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds.
		29-30	1320	Cuttings	0.3	30	
		34-35	1323	Cuttings	0.0	35	Sand, grayish orange pink-light brown, vf grain, unconsol, moist, no hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds.
							Groundwater Encountered @ 38 Feet
		39-40	1327	Cuttings	20.0	40	Sand, light brown-pale yellowish brown, vf grain, unconsol, moist, no hydrocarbon odor, with mod-well cemented vf grain sand interbeds.
						45	
						50	
						55	
							TD @ 58 Feet
						60	

LITHOLOGIC LOG (MONITORING WELL)

TRW
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW-17	TOTAL DEPTH:	66 Feet
SITE ID:	Hobbs Booster Station	CLIENT:	Duke Energy Field Services
SURFACE ELEVATION:	3621.36	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	10/25/00	FIELD REP.:	J. Fergerson
COMPLETION DATE:	10/26/00	FILE NAME:	
COMMENTS:	Approximately 257' east & 10' south of MW-13		



LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
	ML		0930				Clayey silt, dk brown, v moist, no hydrocarbon odor, with fractured caliche in matrix.
	CAL/SS	4-5	0950	Cuttings	0.0	5	Caliche, v pale orange, no hydrocarbon odor, weathered, w/dense layers and mod cemented vf grain sand interbeds.
		9-10	0955	Cuttings	0.0	10	
		14-15	0958	Cuttings	0.0	15	
	SW/SS	19-20	1002	Cuttings	0.3	20	Sand, v pale orange, vf grain, unconsol, no hydrocarbon odor,with mod-well cemented vf grain sand and sandstone interbeds.
		24-25	1016	Cuttings	0.3	25	Sand, grayish orange pink-lt brown, vf grain, unconsol, no hydrocarbon odor, with mod-well cemented vf grain sand interbeds.
		29-30	1019	Cuttings	0.3	30	
		34-35	1022	Cuttings	0.3	35	Sand, grayish orange pink-lt brown, vf grain, unconsol, no hydrocarbon odor, w/mod-well cemented vf grain sand and sandstone interbeds.
		39-40	1025	Cuttings	0.2	40	
		44-45	1035	Cuttings	101.2	45	Sand, pale yellowish brown-grayish orange, vf grain, unconsol, moist, strong hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds. Groundwater Encountered @ 46 Feet
		49-50	1038	Cuttings	10.6	50	Sand, pale yellowish brown-grayish orange, vf grain, unconsol, wet, strong hydrocarbon odor, with mod-well cemented vf grain sand interbeds.
						55	
						60	

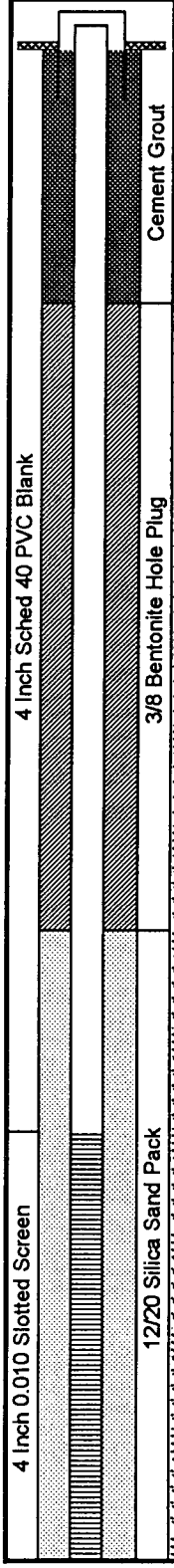
MONITORING WELL NO: MW-17 TOTAL DEPTH: 66 Feet

	LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
4 / Natural / 12/20 / Sand		SW/SS						Sand, pale yellowish brown-grayish orange, vf grain, unconsol, wet, strong hydrocarbon odor, with mod-well cemented vf grain sand interbeds.
							65	TD @ 66 Feet
							70	
							75	
							80	
							85	
							90	
							95	
							100	
							105	
							110	
							105	

LITHOLOGIC LOG (MONITORING WELL)

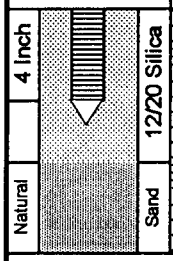
TRW
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW-18	TOTAL DEPTH:	68 Feet
SITE ID:	Hobbs Booster Station	CLIENT:	Duke Energy Field Services
SURFACE ELEVATION:	3621.96	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	10/26/00	FIELD REP.:	J. Fergerson
COMPLETION DATE:	10/26/00	FILE NAME:	
COMMENTS:	Aprroximately 162' east and 4' south of MW-17		



LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
	ML		1350				Clayey silt, dk brown, v moist, no hydrocarbon odor, with fractured caliche in matrix.
	CAL	4-5	1401	Cuttings	0.2	5	Caliche, v pale orange-v light gray, no hydrocarbon odor, weathered, with dense layers interbeds.
	CAL/SS	9-10	1406	Cuttings	0.2	10	Caliche, white-v pale orange, no hydrocarbon odor, weathered, with dense layers and mod cemented vf grain sand interbeds.
		14-15	1410	Cuttings	0.2	15	
		19-20	1413	Cuttings	0.5	20	Sand, v pale orange, vf grain, unconsol, no hydrocarbon odor, with mod cemented vf grain sand interbeds.
		24-25	1422	Cuttings	0.3	25	Sand, mod orange pink-v pale orange, vf grain, unconsol, no hydrocarbon odor, with mod-well cemented vf grain sand interbeds.
		29-30	1423	Cuttings	0.2	30	
		34-35	1425	Cuttings	0.4	35	
	SW/SS	39-40	1427	Cuttings	0.2	40	Sand, grayish orange pink-grayish orange, vf grain, unconsol, slight hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds.
		44-45	1433	Cuttings	78.2	45	Sand, grayish orange pink-grayish orange, vf grain, unconsol, moist, good hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds.
							Groundwater Encountered @ 48 Feet
		49-50	1436	Cuttings	23.4	50	
		54-55	1439	Cuttings	9.0	55	
						60	

MONITORING WELL NO: MW-18 TOTAL DEPTH: 68 Feet

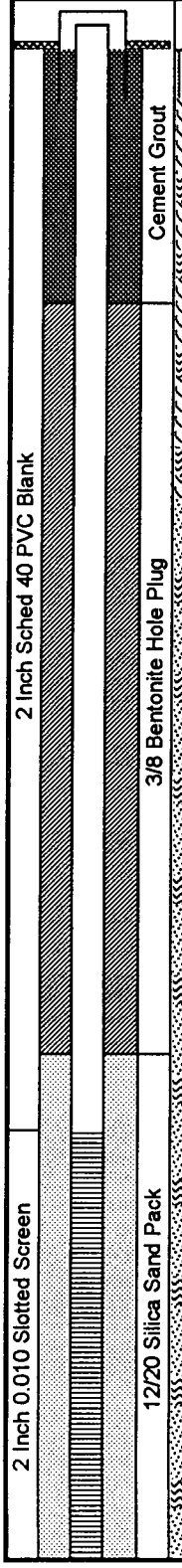


LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
	SW/SS						Sand, grayish orange pink-grayish orange, vf grain, unconsol, moist, good hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds.
						65	
							TD @ 68 Feet
						70	
						75	
						80	
						85	
						90	
						95	
						100	
						105	
						110	
						105	

LITHOLOGIC LOG (MONITORING WELL)

415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW-19	TOTAL DEPTH:	68 Feet
SITE ID:	Hobbs Booster Station	CLIENT:	Duke Energy Field Services
SURFACE ELEVATION:	3621.42	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	10/26/00	FIELD REP.:	J. Fergerson
COMPLETION DATE:	10/27/00	FILE NAME:	
COMMENTS:	Aprroximately 140' east and 8' north of MW-18		

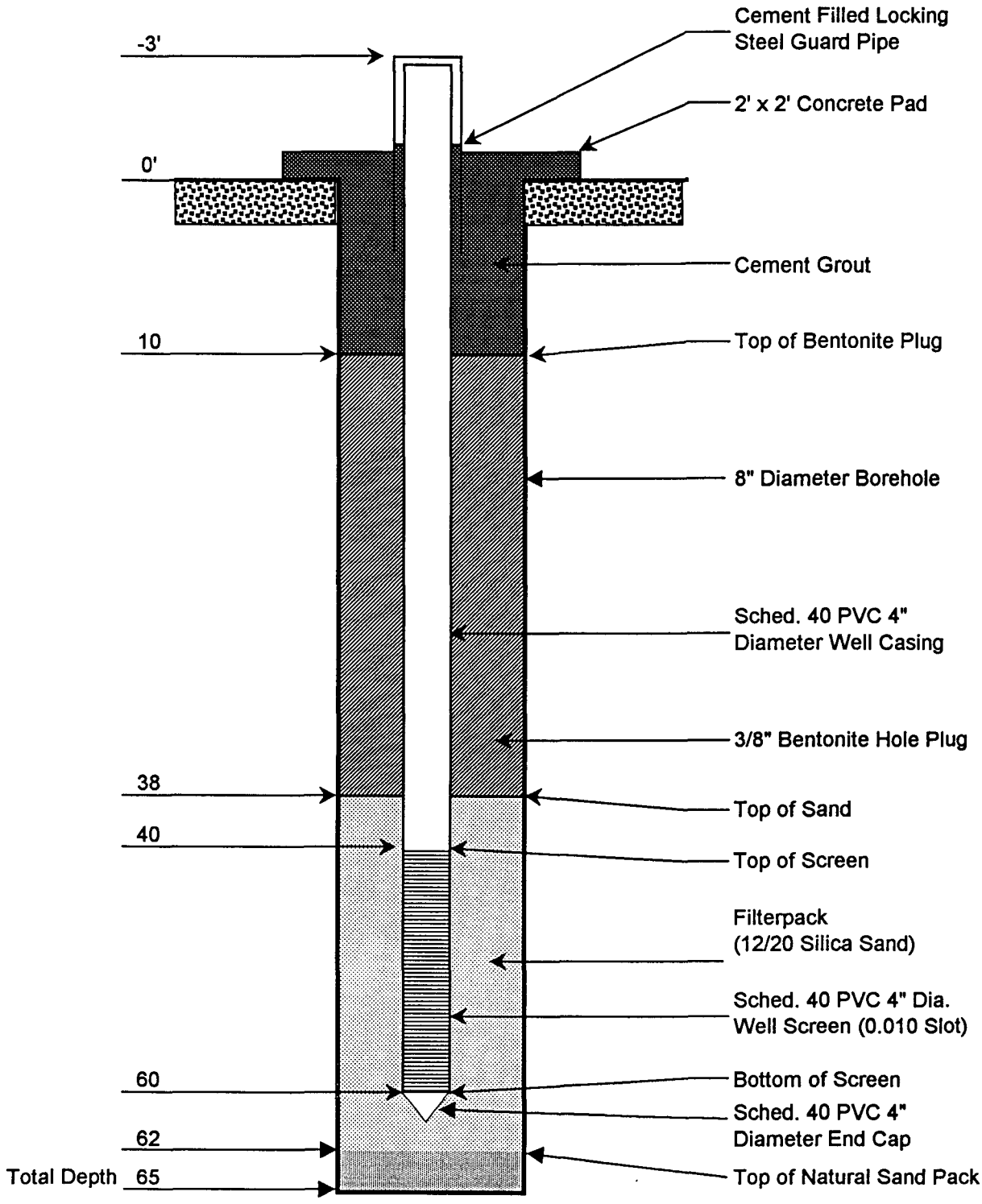


LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
	ML		1650				Clayey silt, dk brown, v moist, no hydrocarbon odor, with fractured caliche in matrix
	CAL	4-5	1701	Cuttings	0.0	5	Caliche, mod orange pink-v pale orange, no hydrocarbon odor, weathered, with dense layers and mod-well cemented vf grain sand interbeds.
	CAL/SS	9-10	1703	Cuttings	0.0	10	Caliche, v pale orange-pinkish gray, no hydrocarbon odor, weathered, with mod-well cemented vf grain sand interbeds.
		14-15	1705	Cuttings	0.5	15	
	SW/SS	19-20	1708	Cuttings	0.0	20	Sand,mod-orange pink-v pale orange, vf grain, unconsol, no hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds.
		24-25	1716	Cuttings	0.0	25	Sand, mod orange pink-v pale orange, vf grain, unconsol, no hydrocarbon odor, with mod-well cemented vf grain sand interbeds.
		29-30	1718	Cuttings	0.0	30	
		34-35	1720	Cuttings	2.1	35	Sand, mod orange pink-v pale orange, vf grain, unconsol, moist, no hydrocarbon odor, with mod-well cemented vf grain sand interbeds.
		39-40	1721	Cuttings	0.2	40	
		44-45	1725	Cuttings	0.2	45	Sand, mod orange pink-grayish orange, vf grain, unconsol, v moist, no hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds.
							Groundwater Encountered @ 48 Feet
		49-50	1731	Cuttings	0	50	
		54-55	1732	Cuttings	0.2	55	
						60	

MONITORING WELL NO: MW-19 TOTAL DEPTH: 68 Feet

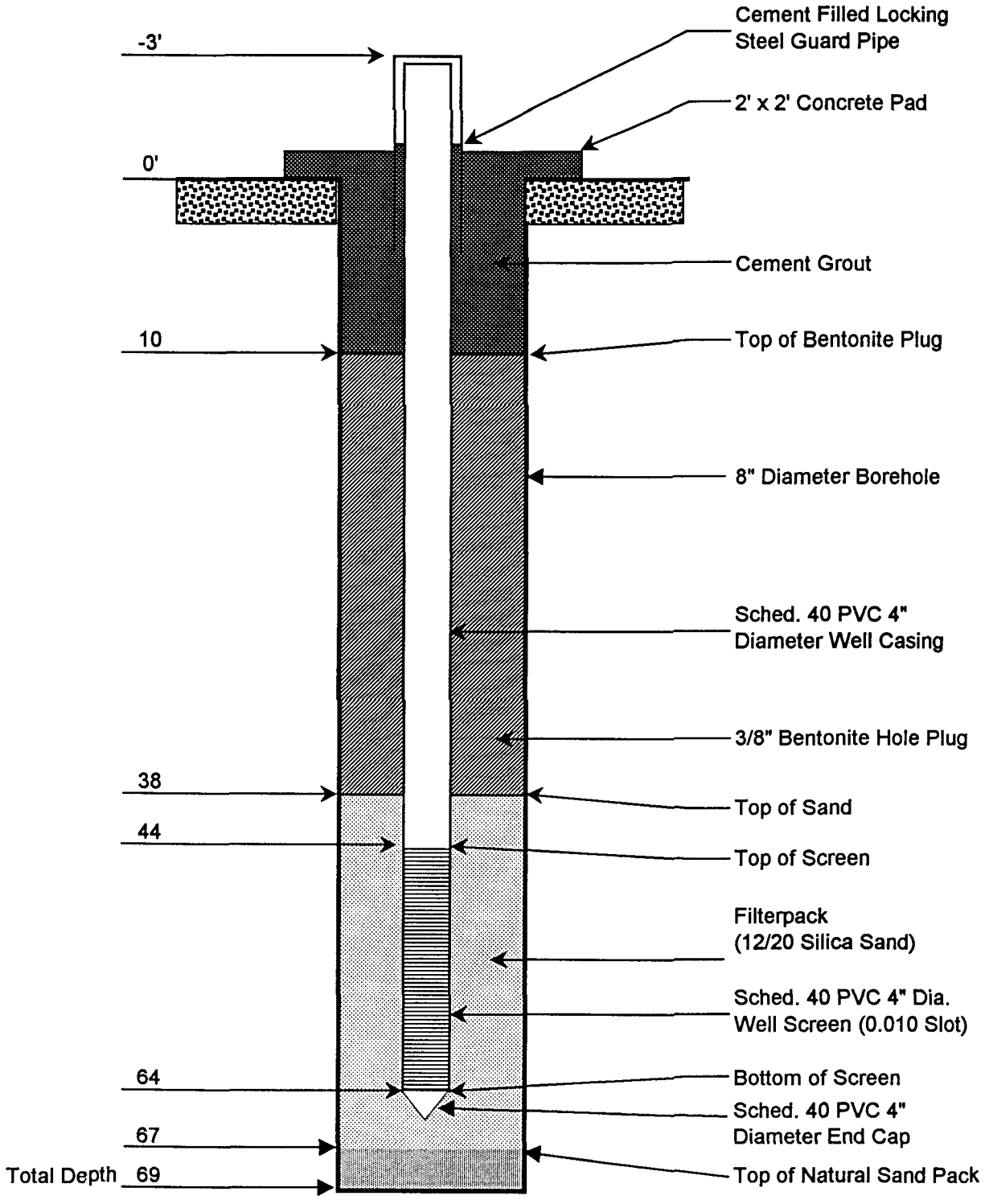
	LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
2 Inch / 12/20 Silica / Natural / Sand		SW/SS						Sand, mod orange pink-grayish orange, vf grain, unconsol, v moist, no hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds.
							65	
								TD @ 68 Feet
							70	
							75	
							80	
							85	
							90	
							95	
							100	
							105	
							110	
							105	

MONITORING WELL CONSTRUCTION DIAGRAM (MW-12)



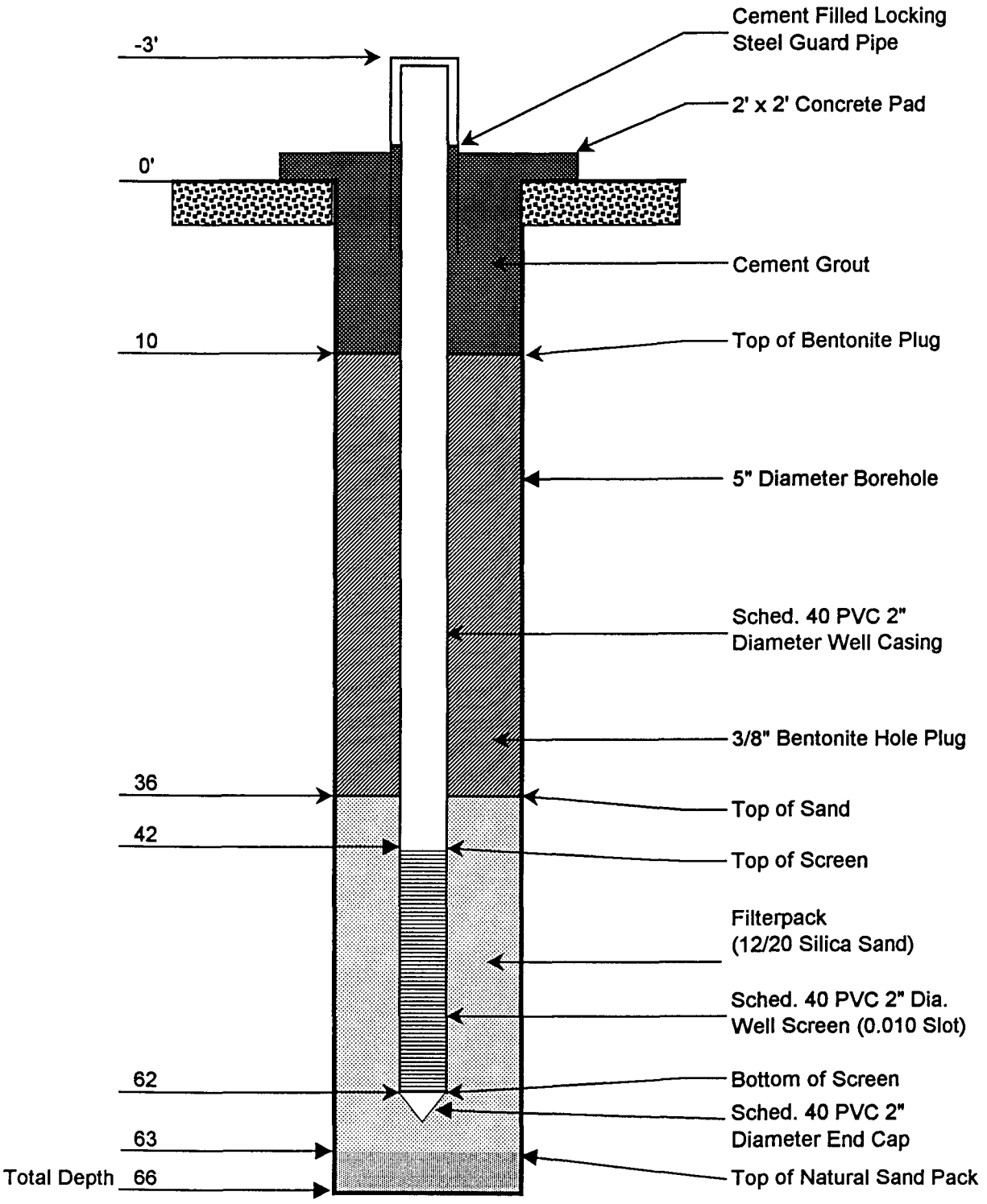
TRW Energy & Environmental Systems	SITE: Duke Energy-Hobbs Booster Station		**MW-12 Monitoring Well Construction Diagram**
	DATE: 10/24/00	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: JMF	
	CK'D BY: DTL	FILE: Well Bore Diagram	

MONITORING WELL CONSTRUCTION DIAGRAM (MW-13)



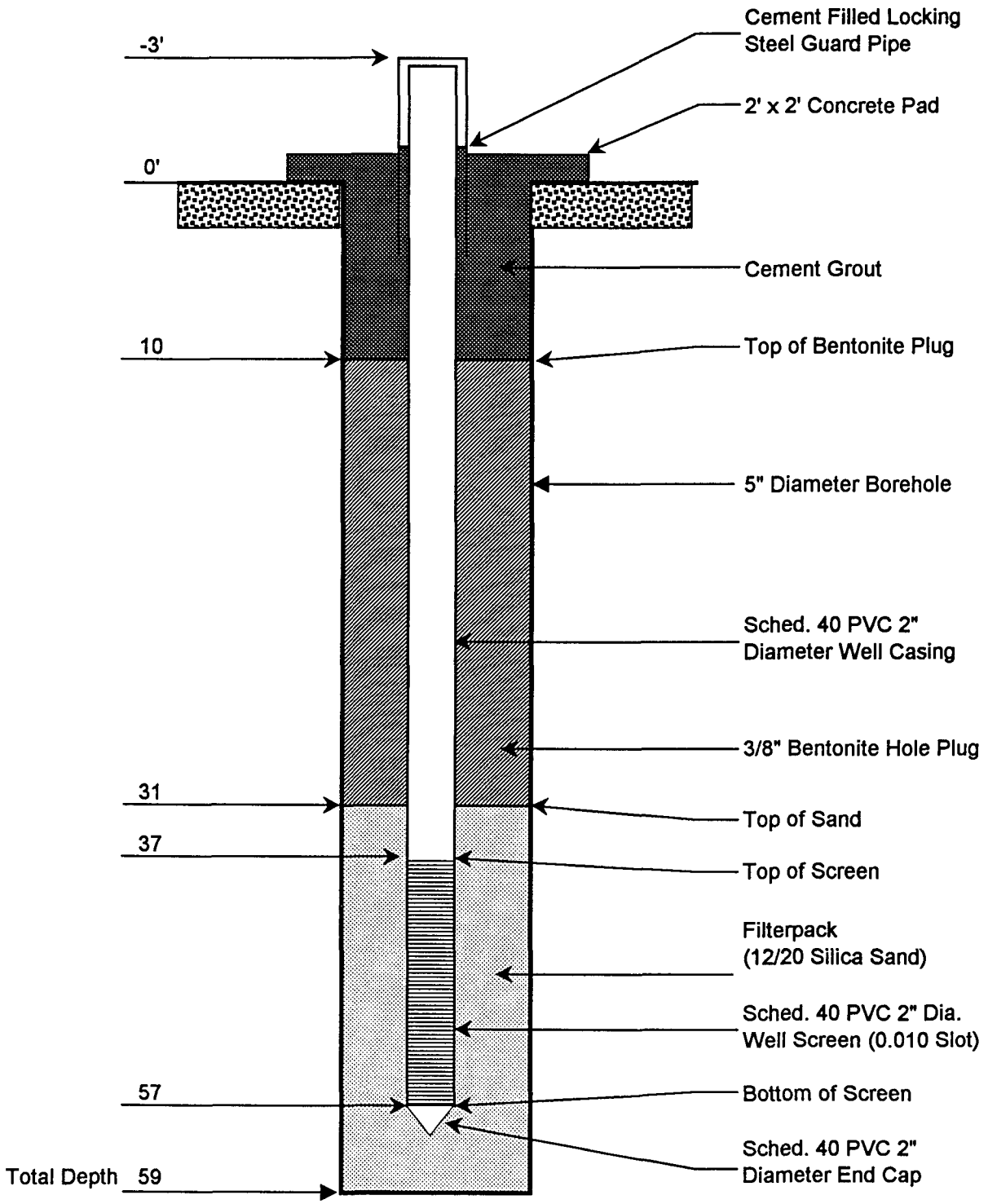
TRW Energy & Environmental Systems	SITE: Duke Energy-Hobbs Booster Station		**MW-13 Monitoring Well Construction Diagram**
	DATE: 10/24/00	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: JMF	
	CK'D BY: DTL	FILE: Well Bore Diagram	

MONITORING WELL CONSTRUCTION DIAGRAM (MW-14)



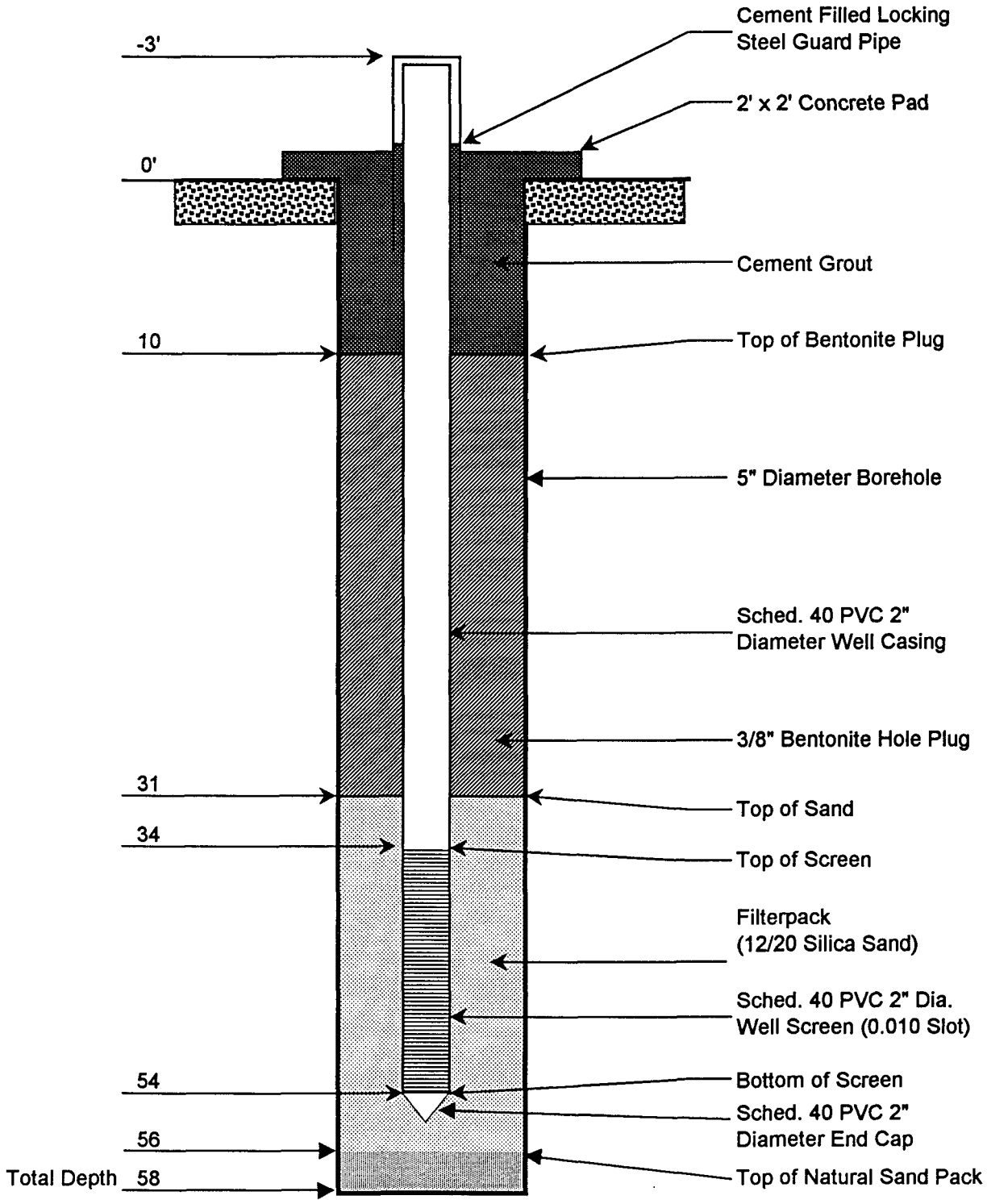
TRW Energy & Environmental Systems	SITE: Duke Energy-Hobbs Booster Station		
	DATE: 10/24/00	REV. NO.: 1	**MW-14 Monitoring Well Construction Diagram**
	AUTHOR: GJV	DRAWN BY: JMF	
	CK'D BY: DTL	FILE: Well Bore Diagram	

MONITORING WELL CONSTRUCTION DIAGRAM (MW-15)



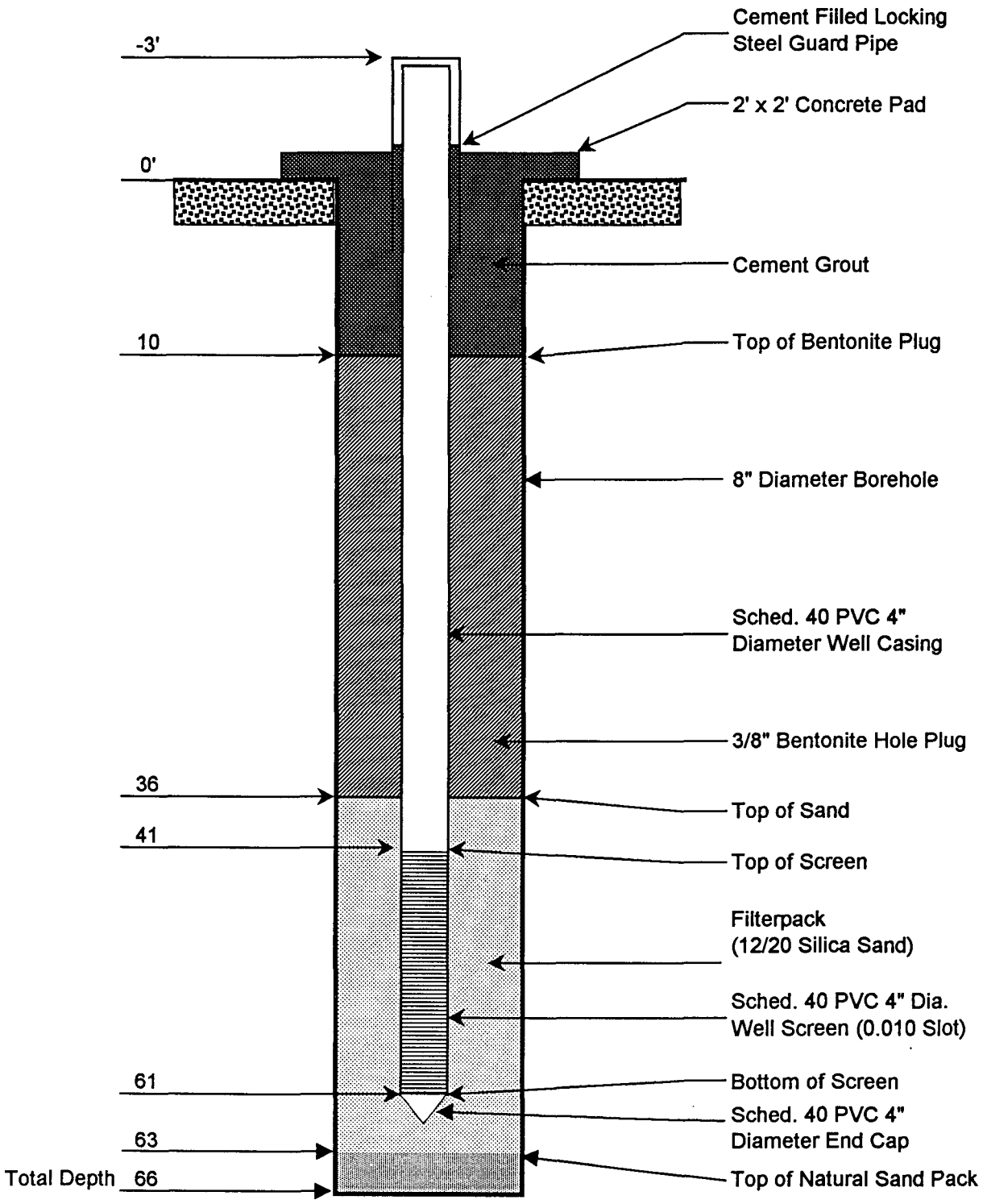
TRW Energy & Environmental Systems	SITE: Duke Energy-Hobbs Booster Station		**MW-15 Monitoring Well Construction Diagram**
	DATE: 10/23/00	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: JMF	
	CK'D BY: DTL	FILE: Well Bore Diagram	

MONITORING WELL CONSTRUCTION DIAGRAM (MW-16)



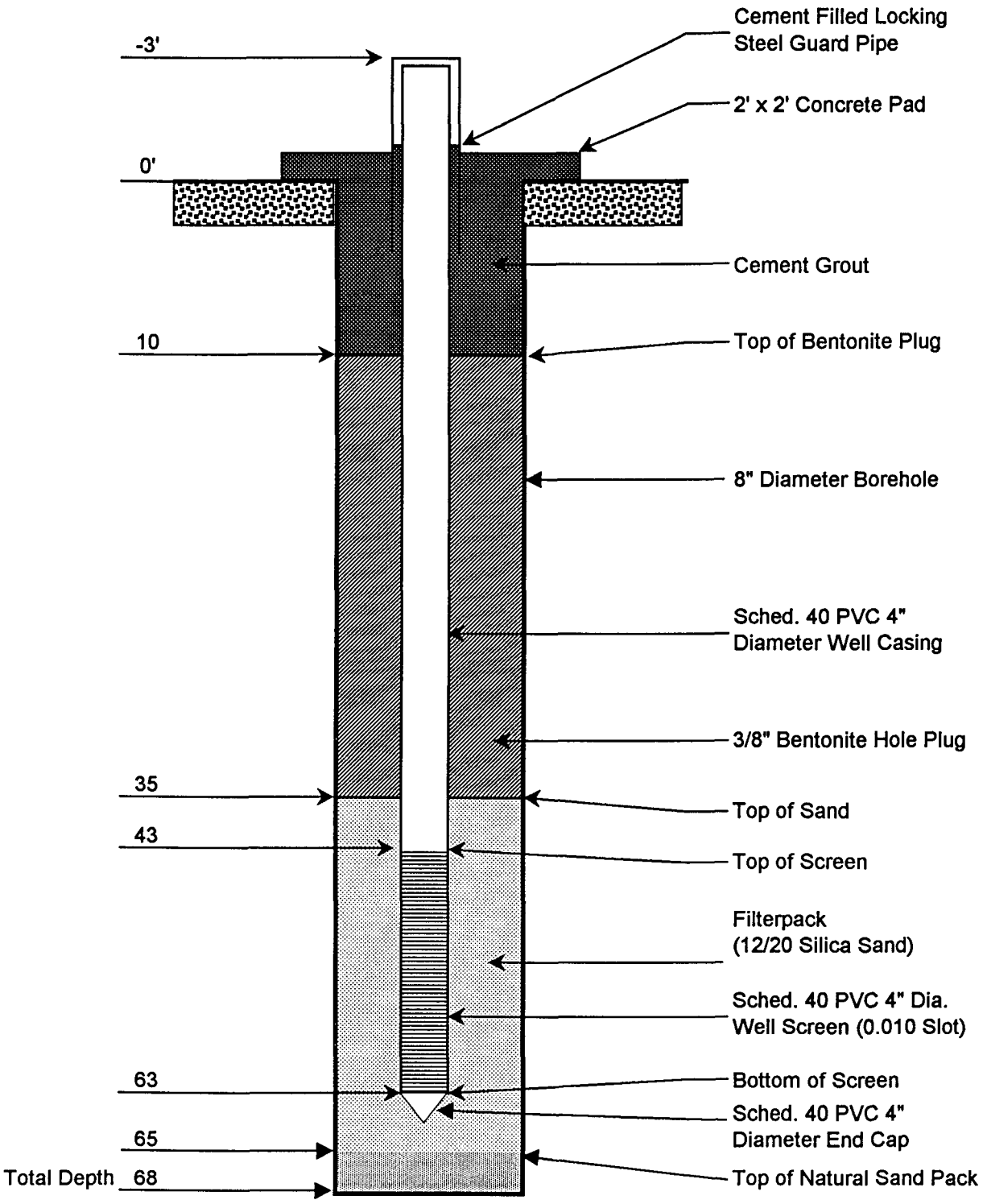
TRW Energy & Environmental Systems	SITE: Duke Energy-Hobbs Booster Station		**MW-16 Monitoring Well Construction Diagram**
	DATE: 10/25/00	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: JMF	
	CK'D BY: DTL	FILE: Well Bore Diagram	

MONITORING WELL CONSTRUCTION DIAGRAM (MW-17)



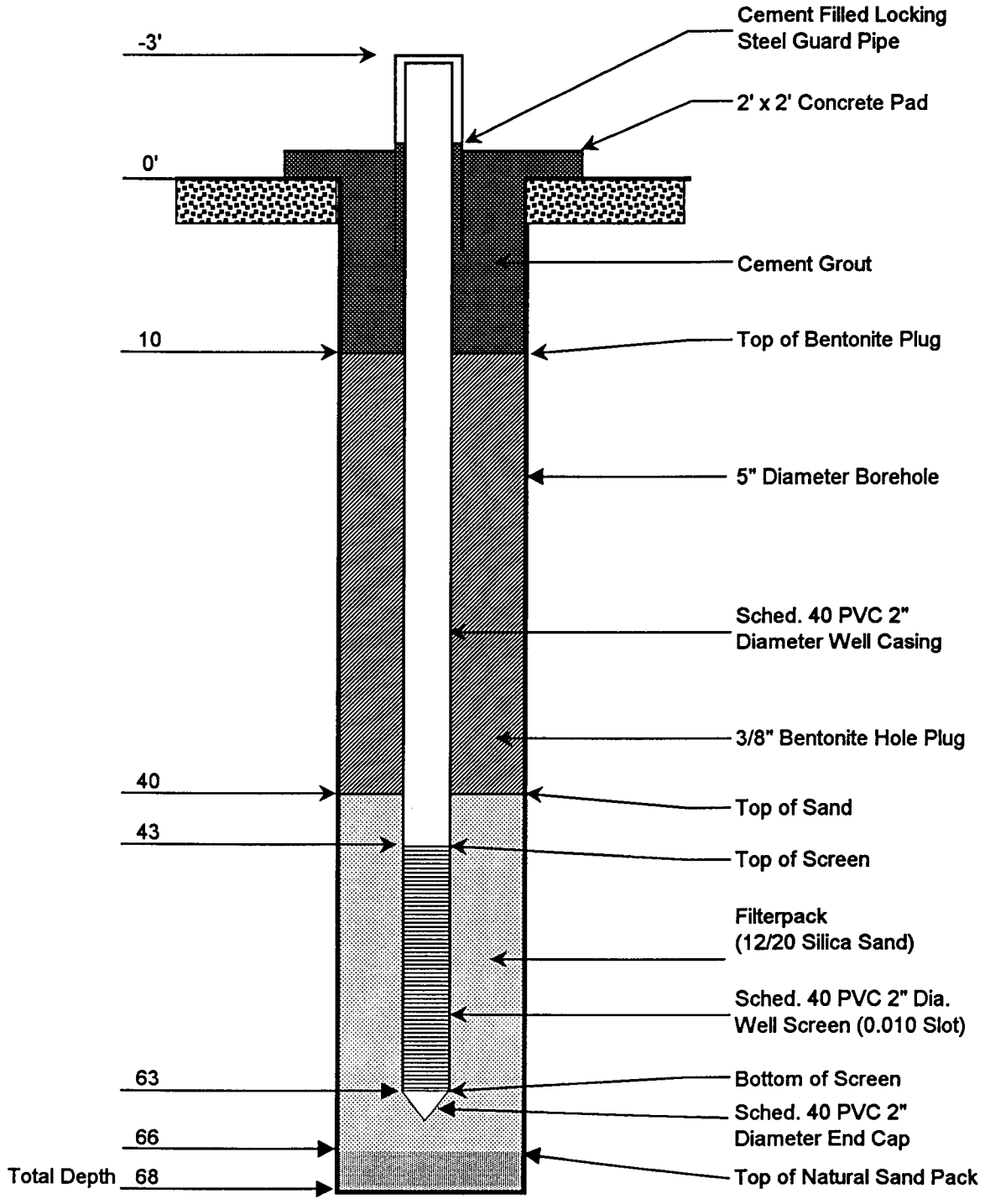
TRW Energy & Environmental Systems	SITE: Duke Energy-Hobbs Booster Station		**MW-17 Monitoring Well Construction Diagram**
	DATE: 10/26/00	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: JMF	
	CK'D BY: DTL	FILE: Well Bore Diagram	

MONITORING WELL CONSTRUCTION DIAGRAM (MW-18)



TRW Energy & Environmental Systems	SITE: Duke Energy-Hobbs Booster Station		**MW-18 Monitoring Well Construction Diagram**
	DATE: 10/26/00	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: JMF	
	CK'D BY: DTL	FILE: Well Bore Diagram	

MONITORING WELL CONSTRUCTION DIAGRAM (MW-19)

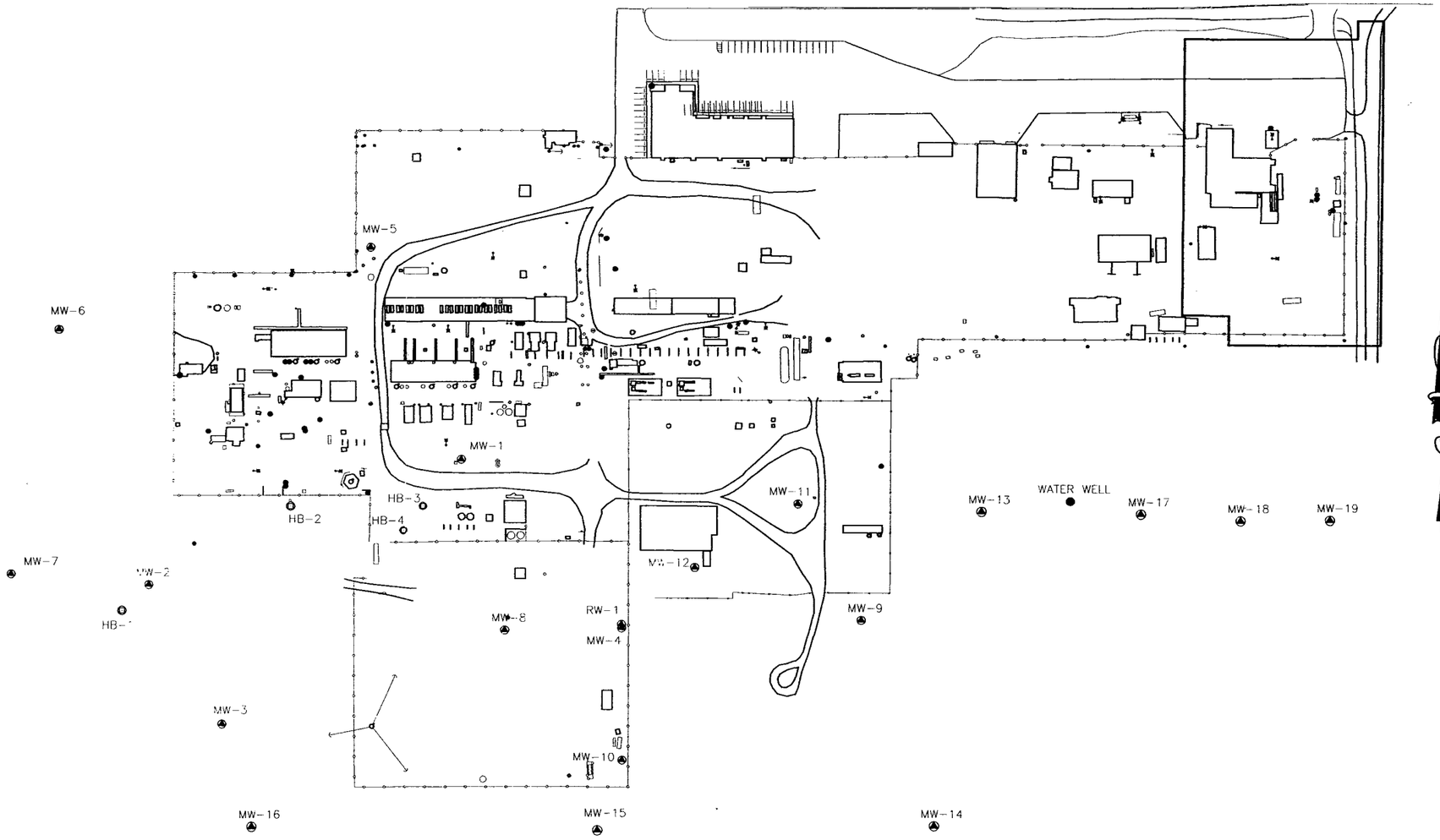


TRW Energy & Environmental Systems	SITE: Duke Energy-Hobbs Booster Station		**MW-19 Monitoring Well Construction Diagram**
	DATE: 10/26/00	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: JMF	
	CK'D BY: DTL	FILE: Well Bore Diagram	

Appendix B

Survey Plat of Hobbs Booster Station

MONITOR WELLS & BORE HOLES	PLANT COORDINATES X	Y	NAVD 88 ELEVATIONS IN FEET
MW-1	E-12+44.9	S-7+43.2	NATURAL GROUND: 3623.43
			ALUM. CAP IN CONCRETE: 3623.60
			TOP 2" PVC CASING: 3626.06
MW-2	E-7+62.6	S-9+35.9	NATURAL GROUND: 3620.52
			ALUM. CAP IN CONCRETE: 3620.65
			TOP 2" PVC CASING: 3623.14
MW-3	E-8+76.5	S-11+50.0	NATURAL GROUND: 3619.81
			ALUM. CAP IN CONCRETE: 3620.08
			TOP 2" PVC CASING: 3623.01
MW-4	E-14+90.1	S-9+96.2	NATURAL GROUND: 3621.51
			ALUM. CAP IN CONCRETE: 3621.66
			TOP 2" PVC CASING: 3624.29
MW-5	E-11+05.0	S-4+16.5	NATURAL GROUND: 3626.12
			ALUM. CAP IN CONCRETE: 3626.30
			TOP 2" PVC CASING: 3629.16
MW-6	E-6+21.0	S-5+43.0	NATURAL GROUND: 3623.87
			ALUM. CAP IN CONCRETE: 3624.14
			TOP 2" PVC CASING: 3626.93
MW-7	E-5+47.2	S-9+20.5	NATURAL GROUND: 3618.78
			ALUM. CAP IN CONCRETE: 3618.93
			TOP 2" PVC CASING: 3621.40
MW-8	E-13+11.2	S-10+07.3	NATURAL GROUND: 3620.61
			ALUM. CAP IN CONCRETE: 3620.84
			TOP 2" PVC CASING: 3623.62
MW-9	E-18+57.2	S-9+90.4	NATURAL GROUND: 3622.40
			ALUM. CAP IN CONCRETE: 3622.60
			TOP 2" PVC CASING: 3625.21
MW-10	E-14+91.2	S-12+06.9	NATURAL GROUND: 3618.30
			ALUM. CAP IN CONCRETE: 3618.30
			TOP 2" PVC CASING: 3621.07
MW-11	E-17+60.0	S-8+11.6	NATURAL GROUND: 3622.99
			ALUM. CAP IN CONCRETE: 3623.05
			TOP 2" PVC CASING: 3625.88
MW-12	E-16+02.4	S-9+10.1	NATURAL GROUND: 3623.95
			BRASS CAP IN CONCRETE: 3624.16
			TOP 4" PVC CASING: 3626.60
MW-13	E-20+40.7	S-8+23.2	NATURAL GROUND: 3623.53
			BRASS CAP IN CONCRETE: 3623.87
			TOP 4" PVC CASING: 3626.30
MW-14	E-19+69.6	S-13+07.2	NATURAL GROUND: 3618.76
			BRASS CAP IN CONCRETE: 3618.87
			TOP 2" PVC CASING: 3621.42
MW-15	E-14+53.4	S-13+15.1	NATURAL GROUND: 3616.79
			BRASS CAP IN CONCRETE: 3617.01
			TOP 2" PVC CASING: 3619.39
MW-16	E-9+22.1	S-13+10.2	NATURAL GROUND: 3619.10
			BRASS CAP IN CONCRETE: 3619.20
			TOP 2" PVC CASING: 3621.87
MW-17	E-22+87.0	S-8+26.5	NATURAL GROUND: 3621.36
			BRASS CAP IN CONCRETE: 3621.62
			TOP 4" PVC CASING: 3623.94
MW-18	E-24+42.8	S-8+35.9	NATURAL GROUND: 3621.96
			BRASS CAP IN CONCRETE: 3622.18
			TOP 4" PVC CASING: 3624.30
MW-19	E-25+81.2	S-8+34.8	NATURAL GROUND: 3621.42
			BRASS CAP IN CONCRETE: 3621.59
			TOP 2" PVC CASING: 3624.12
RW-1	E-14+89.5	S-10+03.6	NATURAL GROUND: 3621.40
			ALUM. CAP IN CONCRETE: 3621.53
			TOP 4" PVC CASING: 3624.52
HB-1	E-9+75.5	S-7+19.7	NATURAL GROUND: 3619.08
HB-2	E-9+82.4	S-8+14.7	NATURAL GROUND: 3619.22
HB-3	E-11+86.3	S-8+14.7	NATURAL GROUND: 3622.32
HB-4	E-11+56.6	S-8+52.4	NATURAL GROUND: 3621.61
WATER WELL	E-2177.56	S-8+06.8	TOP OF WELL: 3622.91



200 0 200 400 FEET

Scale:1"=200'

REVISIONS		
DATE	WO#	BY
11/13/2000	00111371	CDG
05/26/2000	00110648	CDG

I HEREBY CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

GARY G. EIDSON NEW MEXICO 12641

Gary G. Eidson 11/30/00

RONALD J. EIDSON, N.M. P.S. No. 3239
GARY G. EIDSON N.M. P.S. No. 12641
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO – HOBBS, NEW MEXICO – 505-393-3117

DUKE ENERGY FIELD SERVICES

LOCAL HORIZONTAL AND VERTICAL COORDINATE LOCATIONS OF MONITOR WELLS AND BORE HOLES AT THE HOBBS BOOSTER STATION
SECTION 4, TOWNSHIP 19 SOUTH, RANGE 38 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO

Survey Date: 6/23/99		Sheet 1 of 1 Sheets	
W.O. Number: 99-11-0540		Drawn By:D.McCARLEY	
Date: 6/24/99	GPM	GPMC0540	Scale:1"=200'

Appendix C

Laboratory Analytical Reports and Chain-of-Custody Documentation

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Gil Van Deventer
TRW
415 West Wall Suite 1818
Midland, TX 79701

Report Date: November 14, 2000

Order ID Number: A00110616

Project Number: P/6494/3BC
Project Name: Duke Energy Field Services
Project Location: Hobbs Booster

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
158168	MW-19 (0010311315)	Water	10/31/00	13:15	11/4/00
158169	MW-14 (0010311435)	Water	10/31/00	14:35	11/4/00
158170	MW-5 (0010311530)	Water	10/31/00	15:30	11/4/00
158171	MW-7 (0010311610)	Water	10/31/00	16:10	11/4/00
158172	MW-6 (0011010805)	Water	11/1/00	8:05	11/4/00
158173	MW-16 (0011010905)	Water	11/1/00	9:05	11/4/00
158174	MW-15 (00110101015)	Water	11/1/00	10:15	11/4/00
158175	MW-1 (0011010028)	Water	11/1/00	11:28	11/4/00
158176	MW-3 (0011011210)	Water	11/1/00	12:10	11/4/00
158177	Duplicate (0011011230)	Water	11/1/00	12:30	11/4/00
158178	MW-2 (0011011255)	Water	11/1/00	12:55	11/4/00
158179	Rinsate (0011011315)	Water	11/1/00	13:15	11/4/00
158180	MW-10 (0011011530)	Water	11/1/00	15:30	11/4/00
158181	DW-18 (0011011730)	Water	11/1/00	17:30	11/4/00
158182	Trip Blank	Water	11/1/00	:	11/4/00

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

Dr. Blair Leftwich, Director

Analytical and Quality Control Report

Sample: 158168 - MW-19 (0010311315)

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC06532	Date Analyzed:	11/13/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB05696	Date Prepared:	11/13/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.526	mg/L	1	0.10	105	72 - 128
4-BFB		0.505	mg/L	1	0.10	101	72 - 128

Sample: 158169 - MW-14 (0010311435)

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC06532	Date Analyzed:	11/13/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB05696	Date Prepared:	11/13/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		0.007	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		0.007	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.522	mg/L	1	0.10	104	72 - 128
4-BFB		0.504	mg/L	1	0.10	100	72 - 128

Sample: 158170 - MW-5 (0010311530)

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC06532	Date Analyzed:	11/13/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB05696	Date Prepared:	11/13/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.524	mg/L	1	0.10	104	72 - 128
4-BFB		0.5	mg/L	1	0.10	100	72 - 128

Sample: 158171 - MW-7 (0010311610)

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC06532 Date Analyzed: 11/13/00
Analyst: RC Preparation Method: 5035 Prep Batch: PB05696 Date Prepared: 11/13/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.532	mg/L	1	0.10	106	72 - 128
4-BFB		0.516	mg/L	1	0.10	103	72 - 128

Sample: 158172 - MW-6 (0011010805)

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC06532 Date Analyzed: 11/13/00
Analyst: RC Preparation Method: 5035 Prep Batch: PB05696 Date Prepared: 11/13/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.542	mg/L	1	0.10	108	72 - 128
4-BFB		0.521	mg/L	1	0.10	104	72 - 128

Sample: 158173 - MW-16 (0011010905)

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC06532 Date Analyzed: 11/13/00
Analyst: RC Preparation Method: 5035 Prep Batch: PB05696 Date Prepared: 11/13/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001

Continued ...

... *Continued* Sample: 158173 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.535	mg/L	1	0.10	107	72 - 128
4-BFB		0.512	mg/L	1	0.10	102	72 - 128

Sample: 158174 - MW-15 (00110101015)

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC06532	Date Analyzed:	11/13/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB05696	Date Prepared:	11/13/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.531	mg/L	1	0.10	106	72 - 128
4-BFB		0.521	mg/L	1	0.10	104	72 - 128

Sample: 158175 - MW-1 (0011010028)

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC06532	Date Analyzed:	11/13/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB05696	Date Prepared:	11/13/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.197	mg/L	5	0.001
Toluene		0.028	mg/L	5	0.001
Ethylbenzene		0.285	mg/L	5	0.001
M,P,O-Xylene		0.466	mg/L	5	0.001
Total BTEX		0.976	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.557	mg/L	1	0.10	111	72 - 128
4-BFB		0.515	mg/L	1	0.10	103	72 - 128

Sample: 158176 - MW-3 (0011011210)

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC06532	Date Analyzed:	11/13/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB05696	Date Prepared:	11/13/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		0.014	mg/L	5	0.001
Ethylbenzene		0.203	mg/L	5	0.001
M,P,O-Xylene		0.29	mg/L	5	0.001
Total BTEX		0.508	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.555	mg/L	1	0.10	111	72 - 128
4-BFB		0.509	mg/L	1	0.10	101	72 - 128

Sample: 158177 - Duplicate (0011011230)

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC06532 Date Analyzed: 11/13/00
Analyst: RC Preparation Method: 5035 Prep Batch: PB05696 Date Prepared: 11/13/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		1.07	mg/L	5	0.001
Toluene		0.604	mg/L	5	0.001
Ethylbenzene		0.233	mg/L	5	0.001
M,P,O-Xylene		0.402	mg/L	5	0.001
Total BTEX		2.31	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.523	mg/L	1	0.10	104	72 - 128
4-BFB		0.507	mg/L	1	0.10	101	72 - 128

Sample: 158178 - MW-2 (0011011255)

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC06532 Date Analyzed: 11/13/00
Analyst: RC Preparation Method: 5035 Prep Batch: PB05696 Date Prepared: 11/13/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		1.02	mg/L	5	0.001
Toluene		0.539	mg/L	5	0.001
Ethylbenzene		0.235	mg/L	5	0.001
M,P,O-Xylene		0.394	mg/L	5	0.001
Total BTEX		2.19	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.547	mg/L	1	0.10	109	72 - 128
4-BFB		0.51	mg/L	1	0.10	102	72 - 128

Sample: 158179 - Rinsate (0011011315)

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC06532	Date Analyzed:	11/13/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB05696	Date Prepared:	11/13/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.53	mg/L	1	0.10	106	72 - 128
4-BFB		0.513	mg/L	1	0.10	102	72 - 128

Sample: 158180 - MW-10 (0011011530)

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC06532	Date Analyzed:	11/13/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB05696	Date Prepared:	11/13/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.535	mg/L	50	0.001
Toluene		0.061	mg/L	50	0.001
Ethylbenzene		0.17	mg/L	50	0.001
M,P,O-Xylene		1.28	mg/L	50	0.001
Total BTEX		2.05	mg/L	50	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		5.25	mg/L	1	0.10	105	72 - 128
4-BFB		5.08	mg/L	1	0.10	101	72 - 128

Sample: 158181 - DW-18 (0011011730)

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC06532	Date Analyzed:	11/13/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB05696	Date Prepared:	11/13/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		0.017	mg/L	5	0.001
M,P,O-Xylene		0.143	mg/L	5	0.001
Total BTEX		0.16	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.519	mg/L	1	0.10	103	72 - 128

Continued ...

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
4-BFB		0.492	mg/L	1	0.10	98	72 - 128

Sample: 158182 - Trip Blank

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC06532	Date Analyzed:	11/13/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB05696	Date Prepared:	11/13/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.109	mg/L	1	0.10	109	72 - 128
4-BFB		0.102	mg/L	1	0.10	102	72 - 128

Quality Control Report
Method Blank

Sample: Method Blank QCBatch: QC06532

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Spike Amount	Percent Recovery	Recovery Limit
TFT		0.11	mg/L	0.10	110	72 - 128
4-BFB		0.106	mg/L	0.10	106	72 - 128

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Sample: LCS QC Batch: QC06532

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.103	mg/L	1	0.10	<0.001	103		80 - 120	20
Benzene		0.102	mg/L	1	0.10	<0.001	102		80 - 120	20
Toluene		0.099	mg/L	1	0.10	<0.001	99		80 - 120	20
Ethylbenzene		0.096	mg/L	1	0.10	<0.001	96		80 - 120	20
M,P,O-Xylene		0.266	mg/L	1	0.30	<0.001	88		80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.102	mg/L	1	0.10	102	72 - 128
4-BFB		0.098	mg/L	1	0.10	98	72 - 128

Sample: LCSD QC Batch: QC06532

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.102	mg/L	1	0.10	<0.001	102	0	80 - 120	20
Benzene		0.101	mg/L	1	0.10	<0.001	101	0	80 - 120	20
Toluene		0.098	mg/L	1	0.10	<0.001	98	0	80 - 120	20
Ethylbenzene		0.095	mg/L	1	0.10	<0.001	95	0	80 - 120	20
M,P,O-Xylene		0.264	mg/L	1	0.30	<0.001	88	0	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.101	mg/L	1	0.10	101	72 - 128
4-BFB		0.097	mg/L	1	0.10	97	72 - 128

Quality Control Report
Continuing Calibration Verification Standards

Sample: CCV (1) QC Batch: QC06532

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.103	103	80 - 120	11/13/00
Toluene		mg/L	0.10	0.1	100	80 - 120	11/13/00
Ethylbenzene		mg/L	0.10	0.097	97	80 - 120	11/13/00
M,P,O-Xylene		mg/L	0.30	0.269	89	80 - 120	11/13/00

Sample: CCV (2)

QC Batch: QC06532

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.097	97	80 - 120	11/13/00
Toluene		mg/L	0.10	0.094	94	80 - 120	11/13/00
Ethylbenzene		mg/L	0.10	0.094	94	80 - 120	11/13/00
M,P,O-Xylene		mg/L	0.30	0.254	84	80 - 120	11/13/00

Sample: ICV (1)

QC Batch: QC06532

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.105	105	80 - 120	11/13/00
Toluene		mg/L	0.10	0.103	103	80 - 120	11/13/00
Ethylbenzene		mg/L	0.10	0.1	100	80 - 120	11/13/00
M,P,O-Xylene		mg/L	0.30	0.277	92	80 - 120	11/13/00

AQ0110616

TRW Inc.
Energy & Environmental Systems
415 West Wall St. Suite. 1818
Midland, Texas 79701
(915) 682-0008
FAX: (915) 682-0028

№ 13564

Chain of Custody

Date 11/2/00 Page 1 of 2

Lab Name: Trace Analysis Inc
Address: 6701 Aberdeen Av. Ste 9
Lubbock, TX 79424
Telephone: 800/378-1296

Samplers (SIGNATURES)

John Ferguson

Sample Identification	Matrix	Date	Time	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	Total Metals	TCLP Metals							Number of Containers
MW-19 (001031 1315)	Water	10/31/00	1315	✓																158	168			2
MW-14 (001031 1435)	Water	10/31/00	1435	✓																	169			2
MW-5 (001031 1530) ~~Hobbs Booster~~	Water	10/31/00	1530	✓																	170			2
MW-7 (001031 1610)	Water	10/31/00	1610	✓																	171			2
MW-6 (001101 0805)	Water	~~10~~ 11/1/00	0805	✓																	172			2
MW-16 (001101 0905)	Water	11/1/00	0905	✓																	173			2
MW-15 (001101 1015)	Water	11/1/00	1015	✓																	174			2
MW-1 (001101 1128)	Water	11/1/00	1128	✓																	175			2
MW-3 (001101 1210)	Water	11/1/00	1210	✓																	176			2
Duplicate (001101 1230)	Water	11/1/00	1230	✓																	177			2

Analysis Request

Project Information	Sample Receipt
Project Name: Duke Energy Field Services	Total Containers:
Project Location: Hobbs Booster	COC Seals:
Project Manager: Gil Van Deventer	Rec'd Good Cond/Cold:
Cost Center No.: P/6494/3BC	Conforms to Records:
Shipping ID No.:	Lab No.:
P O No.:	

Special Instructions/Comments: Please invoice direct to:
Duke Energy Field Services Inc., ATTN: Steve Weathers
PO Box 5493, Denver, CO 80217

Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
John Ferguson 2:50 PM (Signature) (Time)	Helen Shelton 6:30PM (Signature) (Time)	(Signature) (Time)
John Ferguson 11/3/00 (Printed Name) (Date)	HELEN SHELTON 11/03/00 (Printed Name) (Date)	(Printed Name) (Date)
TRW Inc. (Company)	TRACE ANALYSIS (Company)	(Company)
Received By: (1)	**Received By: (2)**	**Received By: (3)**
Helen Shelton 2:50PM (Signature) (Time)	Lydia DeSpain 0460 (Signature) (Time)	11/15/00 (Signature) (Time)
HELEN SHELTON 11/3/00 (Printed Name) (Date)	LISA DeSpain 11-4 (Printed Name) (Date)	(Printed Name) (Date)
TRACE ANALYSIS (Company)	Trace Analysis (Company)	(Company)

Shipped Greyhound 1635734111490 20 samples - HS

Distribution: White, Canary-Laboratory / Pink-TRW

A001100616

TRW Inc.
Energy & Environmental Systems
415 West Wall St. Suite. 1818
Midland, Texas 79701
(915) 682-0008
FAX: (915) 682-0028

№ 13565

Chain of Custody

Date 11/2/00 Page 2 of 2

Lab Name: Trace Analysis
Address: 6701 Aberdeen Ave Ste 9
Lubbock, TX 79424
Telephone: 800-378-1296

Samplers (SIGNATURES)

John Ferguson

Analysis Request

Sample Identification	Matrix	Date	Time	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	Total Metals	TCLP Metals							Number of Containers
MW-2 (001101 1255)	Water	11/1/00	1255	✓																			178	2
Rinsate (001101 1315)	Water	11/1/00	1315	✓																			179	2
MW-10 (001101 1530)	Water	11/1/00	1530	✓																			180	2
MW-18 (001101 ~~1715~~ 1730)	Water	11/1/00	~~1715~~ 1730	✓																			181	2
Trip Blank	Water	963A	963B	✓																			182	2

Project Information	Sample Receipt
Project Name: Duke Energy Field Services	Total Containers:
Project Location: Hobbs Booster	COC Seals:
Project Manager: Gil Van Deventer	Rec'd Good Cond/Cold:
Cost Center No.: P/C494/3BC	Conforms to Records:
Shipping ID No.:	Lab No.:
P O No.:	

Special Instructions/Comments: Please Invoice Direct to Duke Energy Field Services Inc. Attn: Steve Weathers
P.O Box 5493, Denver, CO 80217

Shipped Greyhound ps 10 samples in

Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
John Ferguson 2:58p (Signature) (Time)	Helen Shelton 6:30PM (Signature) (Time)	(Signature) (Time)
John Ferguson 11/3/00 (Printed Name) (Date)	HELEN SHELTON 11/03/00 (Printed Name) (Date)	(Printed Name) (Date)
TRW Inc. (Company)	Trace Analysis (Company)	(Company)
Received By: (1)	**Received By: (2)**	**Received By: (3)**
Helen Shelton 2:58p (Signature) (Time)	Lisa DeSpain 0400 (Signature) (Time)	(Signature) (Time)
HELEN SHELTON 11/3/00 (Printed Name) (Date)	LISA DESPAIN 11-3 (Printed Name) (Date)	(Printed Name) (Date)
TRACE ANALYSIS (Company)	Trace Analysis (Company)	(Company)

Distribution: White, Canary-Laboratory / Pink-TRW

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Gil Van Deventer
TRW
415 West Wall Suite 1818
Midland, TX 79701

Report Date: September 5, 2000

Order ID Number: A00082515

Project Number: P/6494/3AC
Project Name: Duke Energy Field Services
Project Location: Hobbs Booster

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
152196	MW-7	Water	8/22/00	9:50	8/25/00
152197	MW-6	Water	8/22/00	10:20	8/25/00
152198	MW-5	Water	8/22/00	10:55	8/25/00
152199	MW-2	Water	8/22/00	11:30	8/25/00
152200	MW-1	Water	8/22/00	13:30	8/25/00
152201	MW-3	Water	8/22/00	15:20	8/25/00
152202	Rinsate	Water	8/22/00	16:00	8/25/00
152203	Duplicate	Water	8/22/00	:	8/25/00
152204	Trip Blank	Water	8/22/00	:	8/25/00

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 8 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical and Quality Control Report

Sample: 152196 - MW-7

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC04582	Date Analyzed:	8/30/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB03988	Date Prepared:	8/30/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		0.008	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		0.008	mg/L	5	0.001
Total BTEX		0.016	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.456	mg/L	1	0.10	91	72 - 128
4-BFB		0.537	mg/L	1	0.10	107	72 - 128

Sample: 152197 - MW-6

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC04582	Date Analyzed:	8/30/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB03988	Date Prepared:	8/30/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		0.008	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		0.007	mg/L	5	0.001
Total BTEX		0.014	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.378	mg/L	1	0.10	75	72 - 128
4-BFB		0.477	mg/L	1	0.10	95	72 - 128

Sample: 152198 - MW-5

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC04582	Date Analyzed:	8/30/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB03988	Date Prepared:	8/30/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.459	mg/L	1	0.10	91	72 - 128
4-BFB		0.54	mg/L	1	0.10	108	72 - 128

Sample: 152199 - MW-2

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC04582	Date Analyzed:	8/30/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB03988	Date Prepared:	8/30/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		1.42	mg/L	5	0.001
Toluene		1.38	mg/L	5	0.001
Ethylbenzene		0.298	mg/L	5	0.001
M,P,O-Xylene		0.541	mg/L	5	0.001
Total BTEX		3.64	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.533	mg/L	1	0.10	106	72 - 128
4-BFB		0.549	mg/L	1	0.10	109	72 - 128

Sample: 152200 - MW-1

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC04582	Date Analyzed:	8/30/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB03988	Date Prepared:	8/30/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.181	mg/L	5	0.001
Toluene		0.035	mg/L	5	0.001
Ethylbenzene		0.273	mg/L	5	0.001
M,P,O-Xylene		0.45	mg/L	5	0.001
Total BTEX		0.938	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.478	mg/L	1	0.10	95	72 - 128
4-BFB		0.52	mg/L	1	0.10	104	72 - 128

Sample: 152201 - MW-3

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC04583	Date Analyzed:	8/30/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB03988	Date Prepared:	8/30/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.011	mg/L	5	0.001
Toluene		0.023	mg/L	5	0.001
Ethylbenzene		0.218	mg/L	5	0.001
M,P,O-Xylene		0.264	mg/L	5	0.001

Continued ...

... Continued Sample: 152201 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
Total BTEX		0.516	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.474	mg/L	1	0.10	94	72 - 128
4-BFB		0.512	mg/L	1	0.10	102	72 - 128

Sample: 152202 - Rinsate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC04583	Date Analyzed:	8/30/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB03988	Date Prepared:	8/30/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		0.002	mg/L	1	0.001
Total BTEX		0.002	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.087	mg/L	1	0.10	87	72 - 128
4-BFB		0.104	mg/L	1	0.10	104	72 - 128

Sample: 152203 - Duplicate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC04583	Date Analyzed:	8/30/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB03988	Date Prepared:	8/30/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.008	mg/L	5	0.001
Toluene		0.017	mg/L	5	0.001
Ethylbenzene		0.173	mg/L	5	0.001
M,P,O-Xylene		0.183	mg/L	5	0.001
Total BTEX		0.381	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.467	mg/L	1	0.10	93	72 - 128
4-BFB		0.533	mg/L	1	0.10	106	72 - 128

Sample: 152204 - Trip Blank

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC04583	Date Analyzed:	8/30/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB03988	Date Prepared:	8/30/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.086	mg/L	1	0.10	86	72 - 128
4-BFB		0.104	mg/L	1	0.10	104	72 - 128

Quality Control Report
Method Blank

Sample: Method Blank

QCBatch: QC04582

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Spike Amount	Percent Recovery	Recovery Limit
TFT		0.071	mg/L	0.10	72	72 - 128
4-BFB		0.082	mg/L	0.10	82	72 - 128

Sample: Method Blank

QCBatch: QC04583

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Spike Amount	Percent Recovery	Recovery Limit
TFT		0.089	mg/L	0.10	89	72 - 128
4-BFB		0.106	mg/L	0.10	106	72 - 128

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Sample: LCS

QC Batch: QC04582

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.099	mg/L	1	0.10	<0.001	99		80 - 120	20
Benzene		0.094	mg/L	1	0.10	<0.001	94		80 - 120	20
Toluene		0.093	mg/L	1	0.10	<0.001	93		80 - 120	20
Ethylbenzene		0.093	mg/L	1	0.10	<0.001	93		80 - 120	20
M,P,O-Xylene		0.276	mg/L	1	0.30	<0.001	92		80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.087	mg/L	1	0.10	87	72 - 128
4-BFB		0.101	mg/L	1	0.10	101	72 - 128

Sample: LCSD

QC Batch: QC04582

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.096	mg/L	1	0.10	<0.001	96	3	80 - 120	20
Benzene		0.092	mg/L	1	0.10	<0.001	92	2	80 - 120	20
Toluene		0.09	mg/L	1	0.10	<0.001	90	3	80 - 120	20
Ethylbenzene		0.088	mg/L	1	0.10	<0.001	88	6	80 - 120	20
M,P,O-Xylene		0.263	mg/L	1	0.30	<0.001	87	5	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.084	mg/L	1	0.10	84	72 - 128
4-BFB		0.097	mg/L	1	0.10	97	72 - 128

Sample: LCS

QC Batch: QC04583

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.104	mg/L	1	0.10	<0.001	104	3	80 - 120	20
Benzene		0.098	mg/L	1	0.10	<0.001	98	2	80 - 120	20
Toluene		0.096	mg/L	1	0.10	<0.001	96	3	80 - 120	20
Ethylbenzene		0.095	mg/L	1	0.10	<0.001	95	6	80 - 120	20
M,P,O-Xylene		0.282	mg/L	1	0.30	<0.001	94	5	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.089	mg/L	1	0.10	89	72 - 128
4-BFB		0.103	mg/L	1	0.10	103	72 - 128

Sample: LCSD QC Batch: QC04583

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.106	mg/L	1	0.10	<0.001	106	2	80 - 120	20
Benzene		0.1	mg/L	1	0.10	<0.001	100	2	80 - 120	20
Toluene		0.098	mg/L	1	0.10	<0.001	98	2	80 - 120	20
Ethylbenzene		0.096	mg/L	1	0.10	<0.001	96	1	80 - 120	20
M,P,O-Xylene		0.283	mg/L	1	0.30	<0.001	94	0	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.091	mg/L	1	0.10	91	72 - 128
4-BFB		0.104	mg/L	1	0.10	104	72 - 128

Quality Control Report
Continuing Calibration Verification Standards

Sample: CCV (1) QC Batch: QC04582

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.098	98	80 - 120	8/30/00
Toluene		mg/L	0.10	0.097	97	80 - 120	8/30/00
Ethylbenzene		mg/L	0.10	0.094	94	80 - 120	8/30/00
M,P,O-Xylene		mg/L	0.30	0.284	94	80 - 120	8/30/00

Sample: CCV (2) QC Batch: QC04582

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.096	96	80 - 120	8/30/00
Toluene		mg/L	0.10	0.095	95	80 - 120	8/30/00
Ethylbenzene		mg/L	0.10	0.094	94	80 - 120	8/30/00
M,P,O-Xylene		mg/L	0.30	0.277	92	80 - 120	8/30/00

Sample: ICV (1)

QC Batch: QC04582

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.1	100	80 - 120	8/30/00
Toluene		mg/L	0.10	0.099	99	80 - 120	8/30/00
Ethylbenzene		mg/L	0.10	0.096	96	80 - 120	8/30/00
M,P,O-Xylene		mg/L	0.30	0.285	95	80 - 120	8/30/00

Sample: CCV (1)

QC Batch: QC04583

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.101	101	80 - 120	8/30/00
Toluene		mg/L	0.10	0.1	100	80 - 120	8/30/00
Ethylbenzene		mg/L	0.10	0.1	100	80 - 120	8/30/00
M,P,O-Xylene		mg/L	0.30	0.295	98	80 - 120	8/30/00

Sample: CCV (2)

QC Batch: QC04583

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.098	98	80 - 120	8/30/00
Toluene		mg/L	0.10	0.096	96	80 - 120	8/30/00
Ethylbenzene		mg/L	0.10	0.095	95	80 - 120	8/30/00
M,P,O-Xylene		mg/L	0.30	0.28	93	80 - 120	8/30/00

Sample: ICV (1)

QC Batch: QC04583

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.096	96	80 - 120	8/30/00
Toluene		mg/L	0.10	0.095	95	80 - 120	8/30/00
Ethylbenzene		mg/L	0.10	0.096	96	80 - 120	8/30/00
M,P,O-Xylene		mg/L	0.30	0.284	94	80 - 120	8/30/00

TRW Inc.
Energy & Environmental Systems
415 West Wall St. Suite. 1818
Midland, Texas 79701
(915) 682-0008
FAX: (915) 682-0028

№ 13517

Chain of Custody

Date _____ Page 1 of 2

Lab Name: Trace Analysis Inc.
Address: 6701 Aberdeen Ave, Ste 9
Lubbock, Tx 79424
Telephone: 806/794-1296

Samplers (SIGNATURES): Gil Van Deventer, John Ingram

Sample Identification	Matrix	Date	Time	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	Total Metals	TCLP Metals	Number of Containers
MW-7 152196	Water	8-22-00	0950	✓														2
MW-6 97			1020	✓														2
MW-5 98			1055	✓														2
MW-2 99			1130	✓														2
MW-1 200			1330	✓														2
MW-3 201			1520	✓														2
Rinsate 202			1600	✓														2
Duplicate 203			0000	✓														2
Trip Blank 204				✓														2

Analysis Request

Project Information

Project Name: Duke Energy Field Services
Project Location: Hobbs Booster
Project Manager: Gil Van Deventer
Cost Center No.: P/6494/13AC
Shipping ID No.:
P O No.:

Sample Receipt

Total Containers:
COC Seals:
Rec'd Good Cond/Cold:
Conforms to Records:
Lab No.:

Special Instructions/Comments: Invoice directly to DEFS (Vicki Gunter

Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
Gil Van Deventer 1:10pm	Helen Shelton 6:30pm	
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
Gil Van Deventer 8-24-00	HELEN SHELTON 8/24/00	
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
TRW	TRACE ANALYSIS	
(Company)	(Company)	(Company) 9/5/00
Received By: (1)	**Received By: (2)**	**Received By: (3)**
Helen Shelton 11:10AM		Vicki Hensley
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
HELEN SHELTON 8/24/00		Vicki Hensley 10:00A
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
TRACE ANALYSIS		Trace Analysis 8-25-00
(Company)	(Company)	(Company)

2° 159-384-839-9 Airbill Attached MS 12 Analysis-HC

Distribution: White, Canary-Laboratory / Pink-TRW

Groundwater Investigation

Hobbs Booster Station

Lea County, New Mexico

Prepared by:

TRW Inc. - Energy & Environmental Integration Services
415 West Wall Street, Suite 1818
Midland, Texas 79701

SUBMITTED BY: DATE: 7/27/00

Gilbert J. Van Deventer, REM
Project Manager

7/27/00

Dale T. Littlejohn
Quality Assurance Officer

TABLE OF CONTENTS

1.0 Executive Summary

The Energy & Environmental Integration Services Business Unit of TRW Inc. (TRW), was retained by GPM Gas Company LLC (GPM) to perform a groundwater investigation at the Hobbs Booster Station. TRW has completed the installation and sampling of five additional monitoring wells (MW-7 through MW-11) and one product recovery well (RW-1) at the Hobbs Booster Station. The investigation was conducted in accordance with the work plan prepared by TRW (January 4, 2000) and as approved by Mr. Jack Ford of the New Mexico Oil Conservation Division (OCD) in his letter dated February 23, 2000.

Based on the groundwater monitoring and sampling data to date, the following conclusions at the Hobbs Booster Station are evident:

- Benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations in monitoring wells MW-5, MW-6, and MW-7 remain well below New Mexico Water Quality Control Commission (WQCC) standards.
- Benzene levels in monitoring well MW-1 (0.191 mg/L), MW-2 (1.33 mg/L), MW-3 (0.202 mg/L), MW-8 (0.824 mg/L), and MW-9 (0.702 mg/L) are above the WQCC standard of 0.010 mg/L.
- The toluene concentration in MW-2 (1.22 mg/L) exceeds the WQCC standard of 0.75 mg/L.
- The xylene concentration in MW-8 (0.742 mg/L) exceeds the WQCC standard of 0.62 mg/L.
- Non-aqueous phase liquids (LNAPL) thickness measurements for monitoring wells MW-4, MW10, and MW-11 were 2.68 ft., 0.01 ft., and 1.18 ft., respectively.
- As of May 31, 2000, a total of approximately 2.5 gallons of LNAPL (condensate) have been removed from recovery well RW-1 using the Xitech product recovery system, which was installed on May 10, 2000.

The following recommendations are suggested for the remediation system and monitoring operations at the Hobbs Booster Station.

- Continue LNAPL recovery operations since the present system has been effective in recovering LNAPL from RW-1.
- Install passive bailers in monitoring wells MW-4 and MW-11 and absorbent socks in MW-8 and MW-10 to recover LNAPL.
- Perform more extensive assessment of site using historical aerial photographs, inventory of area water wells, and identification of subsurface pipelines).
- Complete delineation of the hydrocarbon plume with the installation and sampling of additional downgradient and crossgradient monitoring wells.
- Continue the groundwater monitoring program on a quarterly basis until the fourth quarter this year. The next sampling event is scheduled during the third quarter of 2000.

2.0 Chronology of Events

August 13, 1998	At the request of GPM, TRW submitted a subsurface soil investigation work plan and proposal to determine soil and groundwater conditions at Hobbs Booster Station.
June 15-17, 1999	TRW installed and sampled four soil borings (HB-1 through HB-4) and six monitoring wells (MW-1 through MW-6) during a subsurface investigation. Hydrocarbon-impacted groundwater was confirmed in MW-1, MW-2, MW-3, and MW-4.
July 28, 1999	TRW submitted the Subsurface Soil and Groundwater Investigation report for the Hobbs Booster Station to GPM.
January 5, 2000	GPM submitted a work plan to the OCD for the additional groundwater investigation and remediation activities at the Hobbs Booster Station.
February 23, 2000	Mr. Jack Ford, of the OCD Environmental Bureau, approved the subsurface investigation work plan for Hobbs Booster Station.
April 1, 2000	Duke Energy Field Services Inc. (DEFS) acquired ownership and operation of the Hobbs Booster Station through a joint venture with GPM.
May 8-10, 2000	TRW completed a subsurface investigation for DEFS/GPM to delineate the extent of the hydrocarbon-impacted groundwater. The investigation included the installation of five monitoring wells (MW-7 through MW-11) and one recovery well (RW-1).
May 11, 2000	TRW conducted the second quarter 2000 sampling event at Hobbs Booster Station.

3.0 Site Background

The Hobbs Booster Station is located approximately one mile west of the city limits in Hobbs, New Mexico at 1625 West Marland Boulevard. The facility occupies the north half of section 4, township 19 south, and range 38 east (approximately 620 acres), with the exception of approximately 16 acres of the property in the northwest corner of the section which was deeded to Jones Brothers Construction and the City of Hobbs in the 1970s. The facility was initially built as a gasoline plant in the 1930s. The facility operated as a lean oil plant from the 1950s to 1970s. The plant switched to cryogenic operations in the early 1970s and continued that operation until 1976. Between 1976 and the 1980s the facility operated as a gas compressor (booster) station. Most of the plant was decommissioned in 1986. From 1986 to the present, the facility has operated as a natural gas liquid gathering station.

Some of the on site structures include:

- Office building
- Warehouse building
- Other smaller buildings and storage sheds
- Aboveground storage tanks (ASTs) containing condensate, slop oil, produced water, antifreeze, methanol, and lube oil.
- Subsurface gas, crude oil, and water lines
- Gas scrubber/separator units
- Gas flare
- Numerous structures, foundations, and equipment that are not in service, or are vacant, are also present.

The facility is zoned as industrial property and is adjacent to commercial properties along the north, west and east sides. The facility is bordered on the north by State Highway 62/180. Harbison Fisher Sales Company borders the site at the northwest corner and Key Energy Services abuts the plant on the west side. The transportation office and facility of Phillips Petroleum Company occupies the northeast corner of the property. To the south is undeveloped property used primarily for oil and gas production and pastureland. Approximately five gas wells owned by Oxy USA Inc. (Oxy) are located within the property boundaries. Another OXY gas well is located near the south property boundary of the plant.

The nearest residence to the site is located along Texaco Street approximately 400 feet west of the western boundary of the site property.

4.0 Procedures

Drilling operations were conducted by Diversified Water Well Drilling using an air-rotary drilling rig. Soil cuttings were collected and field-screened using a Hnu Model GP 101 photoionization detector (PID). Soil cutting samples were placed in plastic ziplock bags and allowed to reach ambient temperature (85° F or above). Field PID measurements of the headspace were then recorded on the lithologic logs (Appendix A).

The five monitoring wells were constructed of 2-inch diameter schedule 40 PVC well casing and 20 feet of 0.020-inch slotted well screen. Approximately 5 feet of well screen was installed above the water table leaving approximately 15 feet of well screen below the water table. The screened portion of each monitoring well was surrounded with a filterpack consisting of 12/20 Brady sand, which extended to approximately 2 to 3 feet above the top of the screen. The filterpack was capped with approximately bentonite up to approximately 10 feet below ground surface. The remaining 10 feet of annular space in each monitoring well was sealed using a grout composed of portland cement with a 5 percent bentonite mixture, emplaced from the top of the bentonite plug to ground surface. A 2-foot by 2-foot concrete pad was constructed at the surface and the top of casing protected with an above ground, locked steel well cover. Recovery well RW-1 was completed similar to the monitoring wells with the following exceptions: 4-inch diameter PVC well casing and screen was used, 25 feet of well screen was installed, and a larger concrete pad was constructed to accommodate the free product recovery system. The monitoring well construction diagrams are provided in Appendix A.

The monitoring well locations and elevations were surveyed by John West Engineering of Hobbs, New Mexico, using the facilities' existing grid systems. Ground surface elevations and top- of-well casing elevations were determined within 0.01 feet relative to mean sea level. A copy of the survey plat is included in Appendix B.

The monitoring wells were gauged for depth to groundwater using a Solinst Model 101 electronic water indicator. If light non-aqueous phase liquids (LNAPL) were present in the well, a Heron Model H.01L oil/water interface probe was used to measure product thickness.

Immediately prior to collecting groundwater samples, each monitoring well was purged using a decontaminated 2-inch diameter submersible pump. Groundwater parameters, including pH, conductivity, temperature, turbidity, and dissolved oxygen (DO) were measured during purging using a Horiba Model U10 multiparameter meter and Hanna Model 9143 DO meter. A total of 165 gallons of water was purged from monitoring wells MW-1, MW-2, MW-3, MW-5, MW-6, MW-7, MW-8 and MW-9 during the May 11, 2000 sampling event. Monitoring wells MW-4, MW10, and MW-11 were not sampled due to the presence of LNAPL.

Groundwater samples were obtained using a new, decontaminated, disposable bailer for each well after purging. The water samples were transferred into airtight, septum-sealed, 40-milliliter glass VOA sample vials with zero headspace for analysis of total BTEX (EPA Method 8021B). For each set of samples, chain of custody forms documenting sample identification numbers, collection times, and delivery times to the laboratory were completed. All water samples were placed in an ice-filled cooler immediately after collection and transported to Trace Analysis, Inc. in Lubbock, Texas.

5.0 Hydrogeology

The site is located along the southernmost extent of what is known as the Llano Estacado (caprock). According to published information (Nicholson and Clebsch, 1961 and Barnes, 1976), the Hobbs Booster Station is underlain by the late Tertiary Age Ogallala Formation that is composed of calcareous sands, silts, clays, and gravels. The near surface Ogallala sediments are often calcified (indurate with cemented calcium carbonate). The presence of caliche generally decreases with depth becoming negligible at depths greater than 35 to 50 feet below the surface. The thickness of the Ogallala Formation varies locally as a result of significant paleo-topography at the top of the underlying Triassic Dockum Group. Based on the depth of area water wells, the thickness of the Ogallala Formation varies from approximately 35 to 100 feet. Cretaceous Age rocks in the region have been removed by pre-Tertiary erosion; consequently the Ogallala Formation rests unconformably on the Triassic Dockum Group. The uppermost unit of the Dockum Group is the Chinle Formation that primarily consists of micaceous red clay and shale, but also contains thin interbeds of fine-grained sandstone and siltstone. The red clays and shale of the Chinle Formation act as an aquitard beneath the water-bearing colluvial deposits, and therefore, limit the amount of recharge to the underlying Dockum Group. The thickness of the Dockum Group in southern Lea County varies from 0 to 1,270 feet thick (Nicholson and Clebsch, 1961). A geologic map is depicted Figure 1. Also, a topographic map of the site and adjoining areas is shown in Figure 2. A generalized description of the surface and shallow subsurface geologic formations is summarized in the stratigraphic chart below.

Map Symbol	Formation Name	Description
Qal	Quaternary alluvium	Floodplain, pediment, and low terrace deposits
Qs	Quaternary windblown sand	Windblown sand and silt cover sand
Qp	Quaternary playa deposits	Clay, silt, and sand deposits in shallow depressions
Qsgc	Quaternary colluvial deposits	Sand, silt, and gravel deposited by slopewash, and talus from the Ogallala
Qcs	Quaternary windblown cover sand	Fine- to medium-grained quartz, silty, calcareous windblown cover sand
To	Tertiary Ogallala Formation	Fluviatile sand, silt, clay, and gravel capped by caliche
T_R^c	Triassic Chinle Formation	Micaceous claystone interbedded with thin beds of fine-grained sandstone
T_R^d	Triassic Dockum Group	Shale, sandstone, siltstone, limestone, and gravel (mostly thin bedded micaceous shale

Potable groundwater used in southern Lea County is derived primarily from the Ogallala Formation and the Quaternary alluvium. Water-bearing zones within the Triassic Dockum Group in a few scattered areas within southern Lea County have provided lower yields of potable groundwater. In the site area, no potable water is known to be derived below the Triassic Dockum Group. Water from the Ogallala and alluvium aquifers in southern Lea County is used for irrigation, stock, domestic, industrial, and public supply purposes.

The regional gradient of the Ogallala aquifer in the site area generally flows toward the southeast. Based on data provided by the State Engineer Office, the hydraulic gradient varies from approximately 0.002 to 0.1 feet/feet. Recharge to the Ogallala aquifer occurs primarily by infiltration of precipitation at a rate of one quarter to one half inch of water per year due to the characteristically arid climate of southern Lea County (Nicholson and Clebsch, 1961). Hydraulic conductivity values are estimated between 26 and 50 feet per day, and specific yields of 0.23 for the Ogallala aquifer near the site area based on limited published information (McAda, 1984). However, pump testing of the aquifer would be necessary to determine actual values on site.

The lithology of the subsurface soils in monitoring wells MW-7 through MW-11 was similar. Generally, the unsaturated zone is composed of a hard, weathered and fractured, light gray caliche layer to a depth of approximately 17 to 20 feet. A hard pale brown siliceous sandstone stringer (approximately 2 feet thick) occurred at approximately 20 to 22 feet. Below the sandstone unit, an approximately 35 to 40-foot thick light brownish gray, very fine-grained calcareous sand was present. This unit changed gradationally with depth to a fine-grained noncalcareous sand. Thin stringers of siliceous sandstone were present at various depths in the borings. Groundwater was encountered in the light brown, fine-grained sand unit at depths ranging from 36 to 48 feet below ground surface. A more detailed description of the subsurface soils is provided on the lithologic logs in Appendix A.

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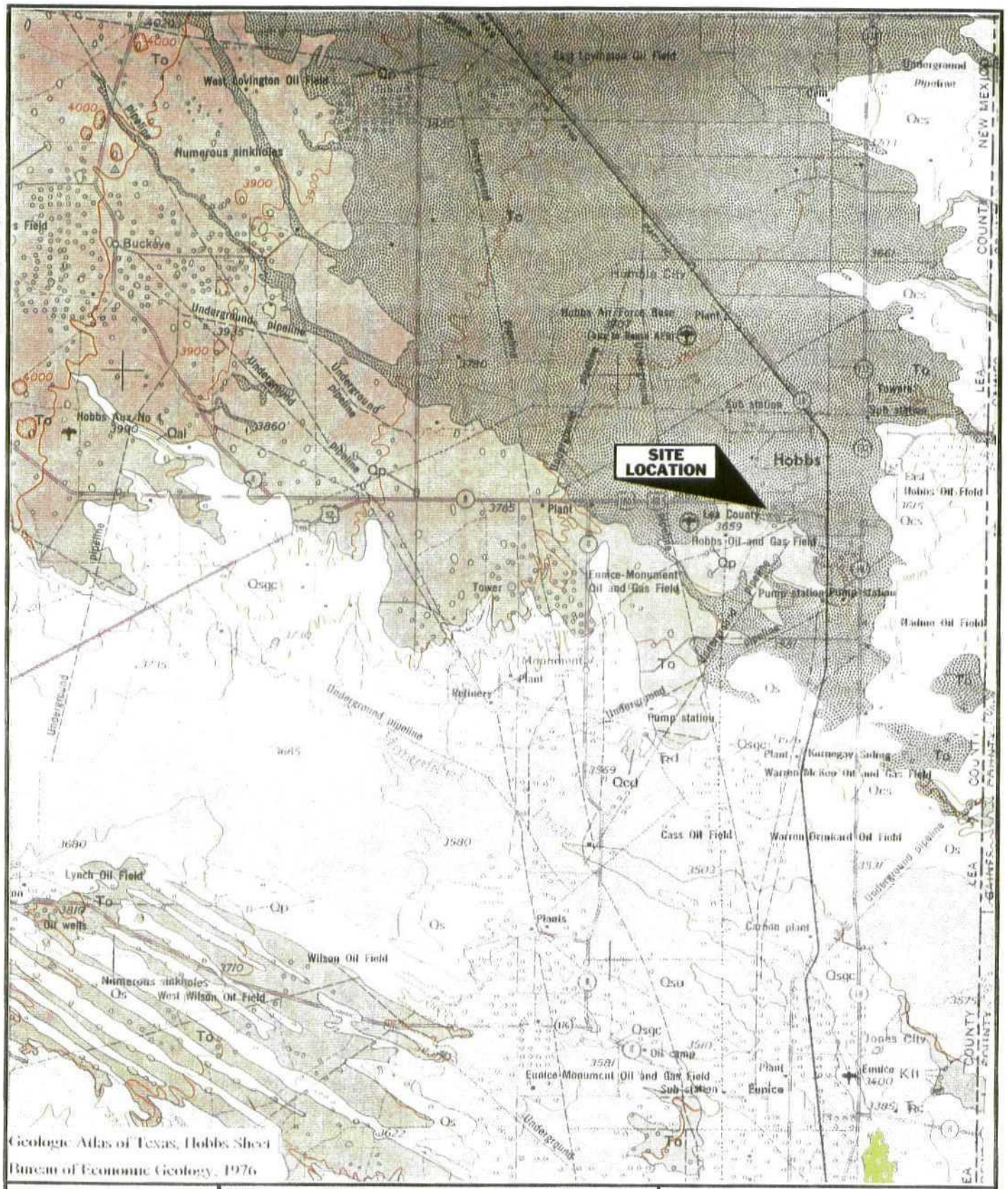

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DATE:	05/25/00	REV. NO.:	1
AUTHOR:	GJV	DRN BY:	GJV
CK'D BY:	DTL	SCALE:	1 in = 4 mi

FIGURE 1
GEOLOGIC MAP

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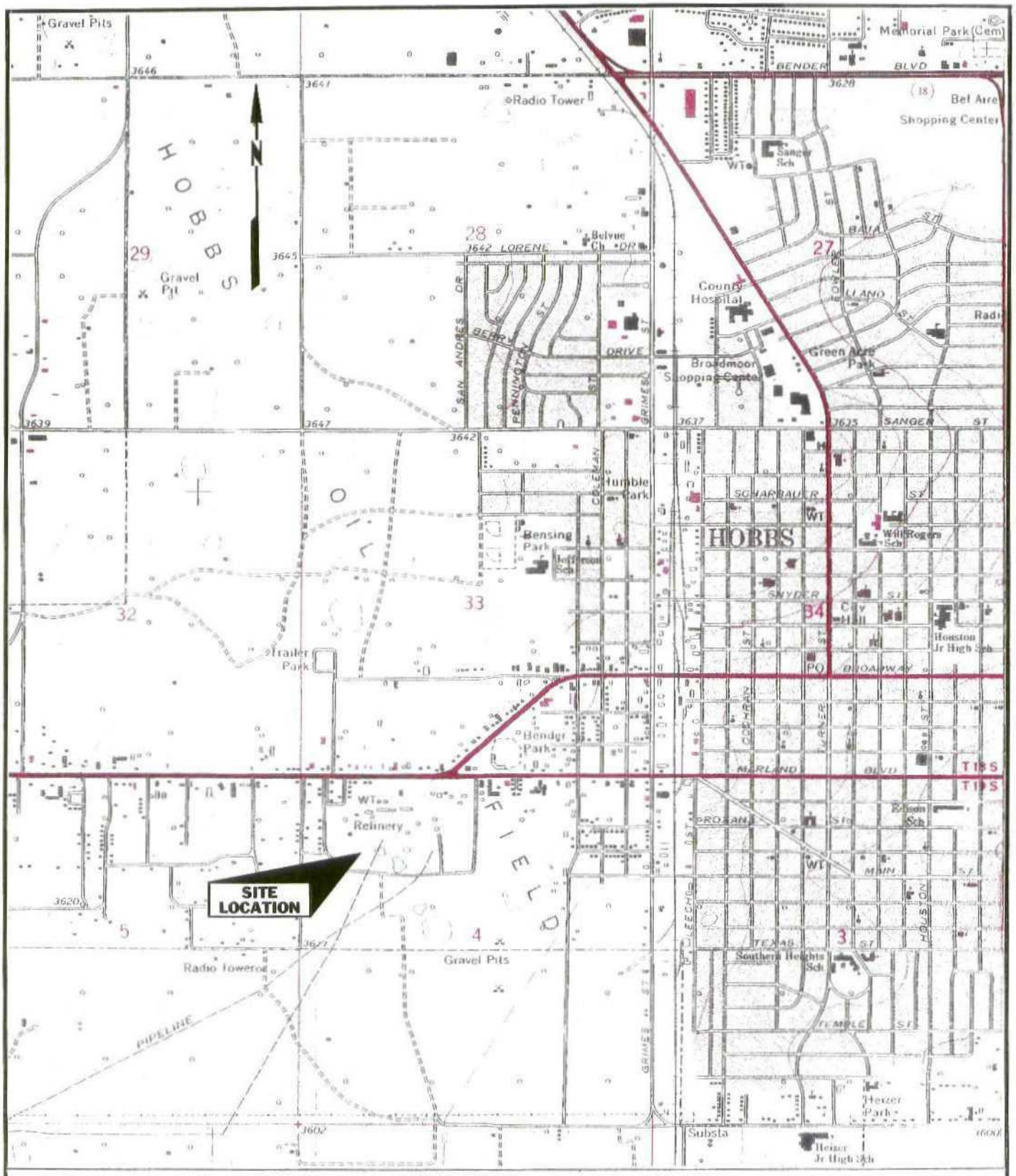


Hobbs West, Lea County, New Mexico USGS Topographic Quadrangle, 1969 (Photorevised 1979)

SITE:	HOBBS BOOSTER STATION		
DATE:	05/25/00	REV. NO.:	1
AUTHOR:	GJV	DRN BY:	GJV
CK'D BY:	DTL	SCALE:	1 in = 2,000 ft

FIGURE 2
TOPOGRAPHIC MAP

6.0 Groundwater Elevations, Hydraulic Gradient and Flow Direction

Based on the most recent gauging data collected by TRW on May 11, 2000, the groundwater conditions at the Hobbs Booster Station are characterized below.

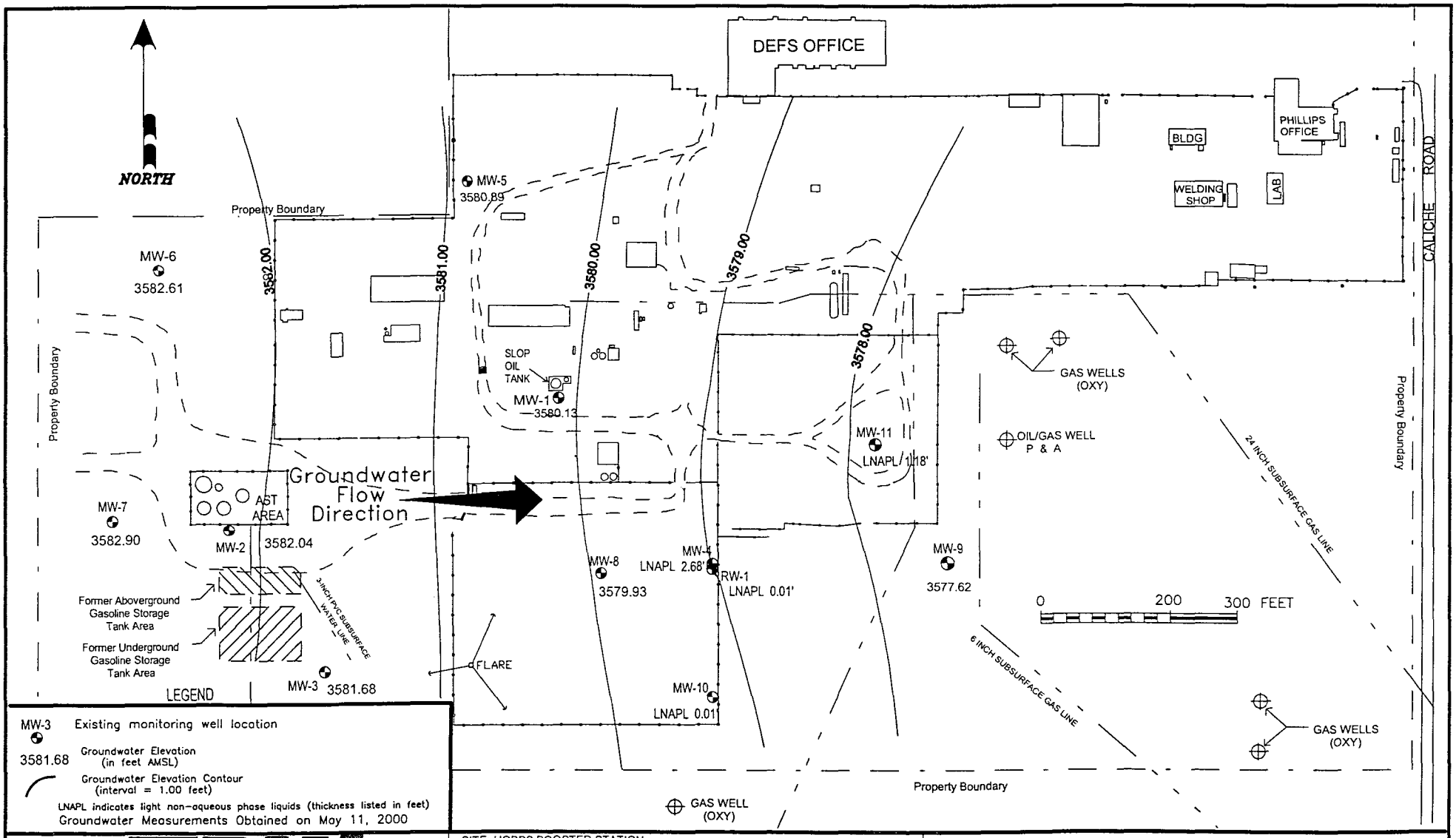
- The depth to the water table varies from approximately 36 feet below ground surface on the east side of the site (MW-7) to approximately 48 feet on the west side (MW-11).
- The hydraulic gradient is approximately 0.004 feet/foot
- The direction of groundwater flow is to the east

A groundwater elevation map depicting the water table elevation and direction of groundwater flow using the gauging data obtained during the May 11, 2000 sampling events is presented in Figure 3. Historical groundwater elevations and depth to water measurements are summarized in Table 1 below.

Table 1
Summary of Groundwater Level Measurements
Hobbs Booster Station

Monitoring Well	Date Gauged	Ground Surface Elevation (feet AMSL)	Top of Casing Elevation (feet AMSL)	Depth to Groundwater (feet AMSL)	Depth to LNAPL (feet AMSL)	LNAPL Thickness (feet)	Corrected Groundwater Elevation (feet AMSL)
MW-1	07/08/99	3623.60	3626.06	45.56	ND	0.00	3580.50
	05/11/00	3623.60	3626.06	45.93	ND	0.00	3580.13
MW-2	07/08/99	3620.65	3623.14	40.51	ND	0.00	3582.63
	05/11/00	3620.65	3623.14	41.10	ND	0.00	3582.04
MW-3	07/08/99	3620.08	3623.01	40.76	ND	0.00	3582.25
	05/11/00	3620.08	3623.01	41.33	ND	0.00	3581.68
MW-4	07/08/99	3621.66	3624.29	46.86	43.60	3.26	3579.64
	05/11/00	3621.66	3624.29	47.09	44.41	2.68	3579.02
MW-5	07/08/99	3626.30	3629.16	48.15	ND	0.00	3581.01
	05/11/00	3626.30	3629.16	48.27	ND	0.00	3580.89
MW-6	07/08/99	3624.14	3626.93	43.95	ND	0.00	3582.98
	05/11/00	3624.14	3626.93	44.32	ND	0.00	3582.61
MW-7	05/11/00	3618.93	3621.40	38.50	ND	0.00	3582.90
MW-8	05/11/00	3620.84	3623.62	43.69	ND	0.00	3579.93
MW-9	05/11/00	3622.60	3625.21	47.59	ND	0.00	3577.62
MW-10	05/11/00	3618.30	3621.07	41.65	41.64	0.01	3579.43
MW-11	05/11/00	3623.05	3625.88	48.94	47.76	1.18	3577.74
RW-1	05/11/00	3621.53	3624.52	45.06	45.05	0.01	3579.47

LNAPL = Light Non-Aqueous Phase Liquid
AMSL = Above Mean Sea Level
ND = Not Detected
Corrected Groundwater Elevation = Casing Elevation - Depth to Groundwater + (LNAPL Thickness x Specific Gravity of LNAPL)
Specific Gravity of LNAPL (MW-4) = 0.6773
Groundwater flow is to the east-southeast.



SITE: HOBBS BOOSTER STATION	
DATE: 05/11/2000	REV. NO.: 2
AUTHOR: GJV	DRN BY: GJV
CK'D BY: DTL	SCALE: 1 INCH = 215 FEET

FIGURE 3
GROUNDWATER ELEVATION MAP

7.0 Distribution of Hydrocarbons in Groundwater

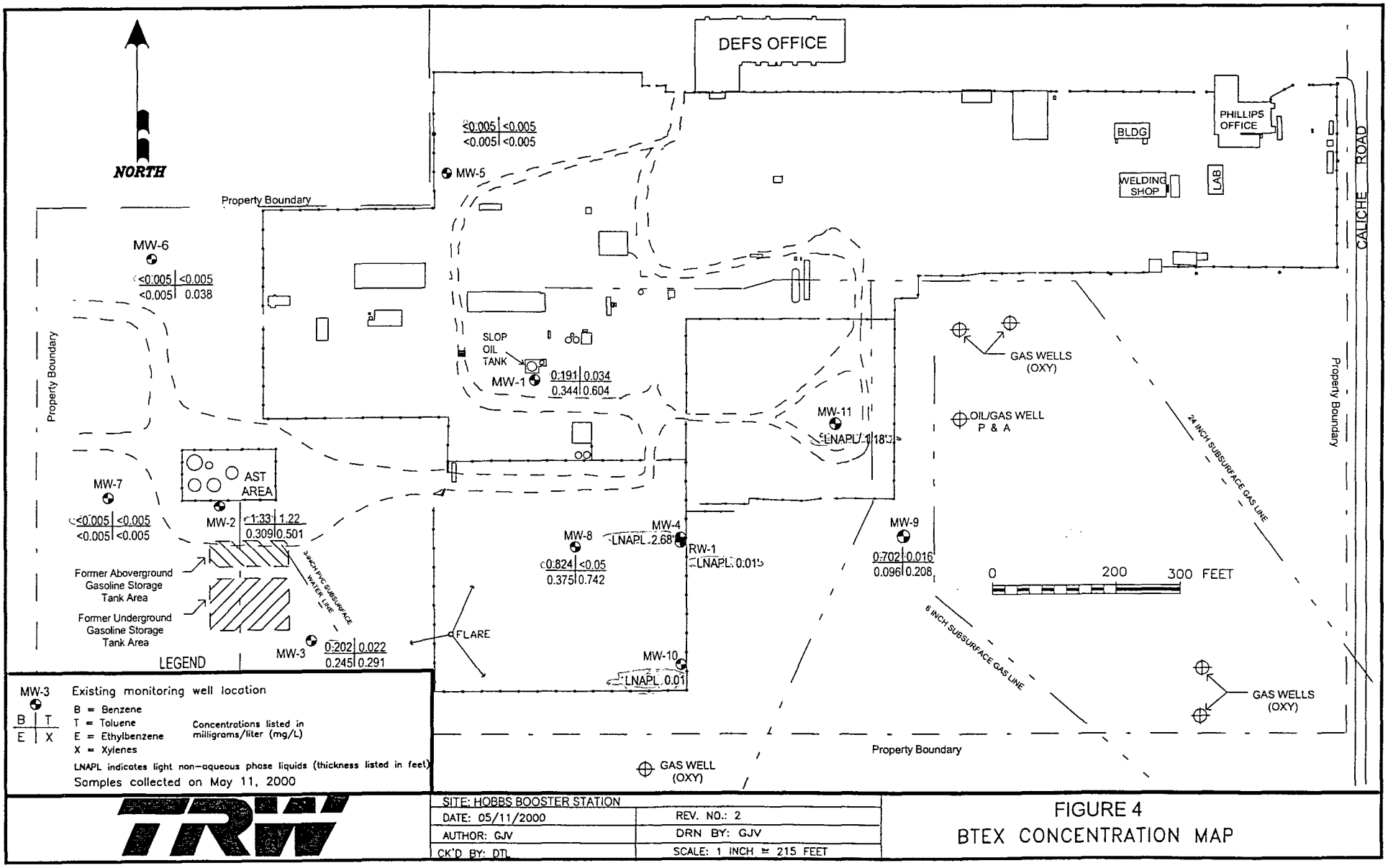
A historical listing of BTEX concentrations obtained from the on site monitoring wells is summarized in Table 2. A hydrocarbon concentration map depicting the BTEX concentrations for May 11, 2000 sampling event is presented in Figure 4. Laboratory analytical reports and chain-of-custody documentation for the groundwater sampling operations are provided in Appendix D. Based on the most recent analytical data, the distribution of hydrocarbons at the Hobbs Booster Station is described below.

- Benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations in monitoring wells MW-5, MW-6, and MW-7 remain well below New Mexico Water Quality Control Commission (WQCC) standards.
- Benzene levels in monitoring well MW-1 (0.191 mg/L), MW-2 (1.33 mg/L), MW-3 (0.202 mg/L), MW-8 (0.824 mg/L), and MW-9 (0.702 mg/L) are above the WQCC standard of 0.010 mg/L.
- The toluene concentration in MW-2 (1.22 mg/L) exceeds the WQCC standard of 0.75 mg/L.
- The xylene concentration in MW-8 (0.742 mg/L) exceeds the WQCC standard of 0.62 mg/L.

Table 2
Summary of BTEX Concentrations in Groundwater
Hobbs Booster Station

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-1	06/17/99	**0.232**	0.029	0.168	0.229
	05/11/00	**0.191**	0.034	0.344	0.604
MW-2	06/17/99	**0.934**	**0.993**	0.192	0.359
	05/11/00	**1.33**	**1.22**	0.309	0.501
MW-3	06/17/99	**0.262**	0.029	0.222	0.287
	05/11/00	**0.202**	0.022	0.245	0.291
MW-4	06/17/99	LNAPL	LNAPL	LNAPL	LNAPL
	05/11/00	LNAPL	LNAPL	LNAPL	LNAPL
MW-5	06/17/99	< 0.005	< 0.005	< 0.005	< 0.005
	05/11/00	< 0.005	< 0.005	< 0.005	< 0.005
MW-6	06/18/99	< 0.005	< 0.005	< 0.005	< 0.005
	05/11/00	< 0.005	< 0.005	< 0.005	0.038
MW-7	05/11/00	< 0.005	< 0.005	< 0.005	< 0.005
MW-8	05/11/00	**0.824**	< 0.05	0.375	**0.742**
MW-9	05/11/00	**0.702**	0.016	0.096	0.208
MW-10	05/11/00	LNAPL	LNAPL	LNAPL	LNAPL
MW-11	05/11/00	LNAPL	LNAPL	LNAPL	LNAPL
WQCC Standards		0.010	0.75	0.75	0.62

Analyses performed by Trace Analysis, Inc., Lubbock, Texas.
All samples analyzed for BTEX using EPA Method 8021B.
Values listed in **boldface** type indicate concentrations exceed New Mexico Water Quality Control Commission (WQCC) standards.
LNAPL - No sample analyzed due to presence of Light Non-Aqueous Phase Liquid.



SITE: HOBBS BOOSTER STATION	
DATE: 05/11/2000	REV. NO.: 2
AUTHOR: GJV	DRN BY: GJV
CK'D BY: DTL	SCALE: 1 INCH = 215 FEET

FIGURE 4
BTEX CONCENTRATION MAP

8.0 Remediation System Performance

The remediation system at the Hobbs Booster Station consists of one Xitech pneumatic product recovery system that was installed in recovery well RW-1 on May 10, 2000. As of May 31, 2000, a total of approximately 2.5 gallons of LNAPL (condensate) have been removed from RW-1.

9.0 Conclusions

Conclusions relevant to groundwater conditions and the remediation performance at the Hobbs Booster Station are presented below.

- Benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations in monitoring wells MW-5, MW-6, and MW-7 remain well below New Mexico Water Quality Control Commission (WQCC) standards.
- Benzene levels in monitoring well MW-1 (0.191 mg/L), MW-2 (1.33 mg/L), MW-3 (0.202 mg/L), MW-8 (0.824 mg/L), and MW-9 (0.702 mg/L) are above the WQCC standard of 0.010 mg/L.
- The toluene concentration in MW-2 (1.22 mg/L) exceeds the WQCC standard of 0.75 mg/L.
- The xylene concentration in MW-8 (0.742 mg/L) exceeds the WQCC standard of 0.62 mg/L.
- As of May 31, 2000, a total of approximately 2.5 gallons of LNAPL (condensate) have been removed by the product recovery system installed at recovery well RW-1.

10.0 Recommendations

The following recommendations are proposed for the remediation system and monitoring operations at the Hobbs Booster Station.

- Continue LNAPL recovery operations since the present system has been effective in recovering LNAPL from RW-1.
- Install a passive bailer or absorbent sock in monitoring well MW-10 and MW-11 to recover LNAPL.
- Perform more extensive assessment of site using historical aerial photographs, inventory of area water wells, and identification of subsurface pipelines.
- Complete delineation of the hydrocarbon plume with the installation and sampling of additional downgradient and crossgradient monitoring wells.
- Continue the groundwater monitoring program on a quarterly basis until the fourth quarter this year. The next sampling event is scheduled during the third quarter of 2000.

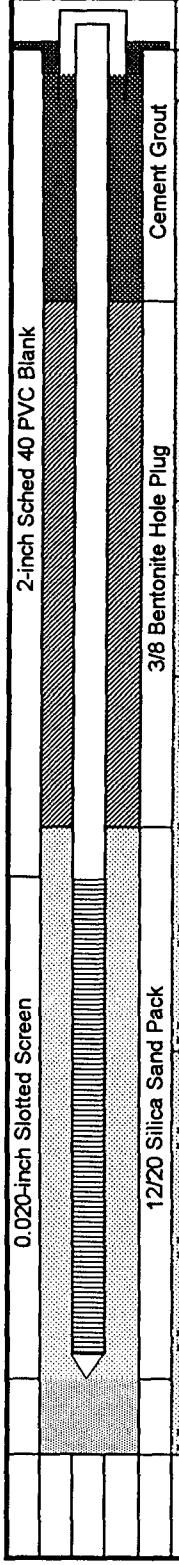
Appendix A

Lithologic Logs and Well Construction Diagrams

LITHOLOGIC LOG (MONITORING WELL)

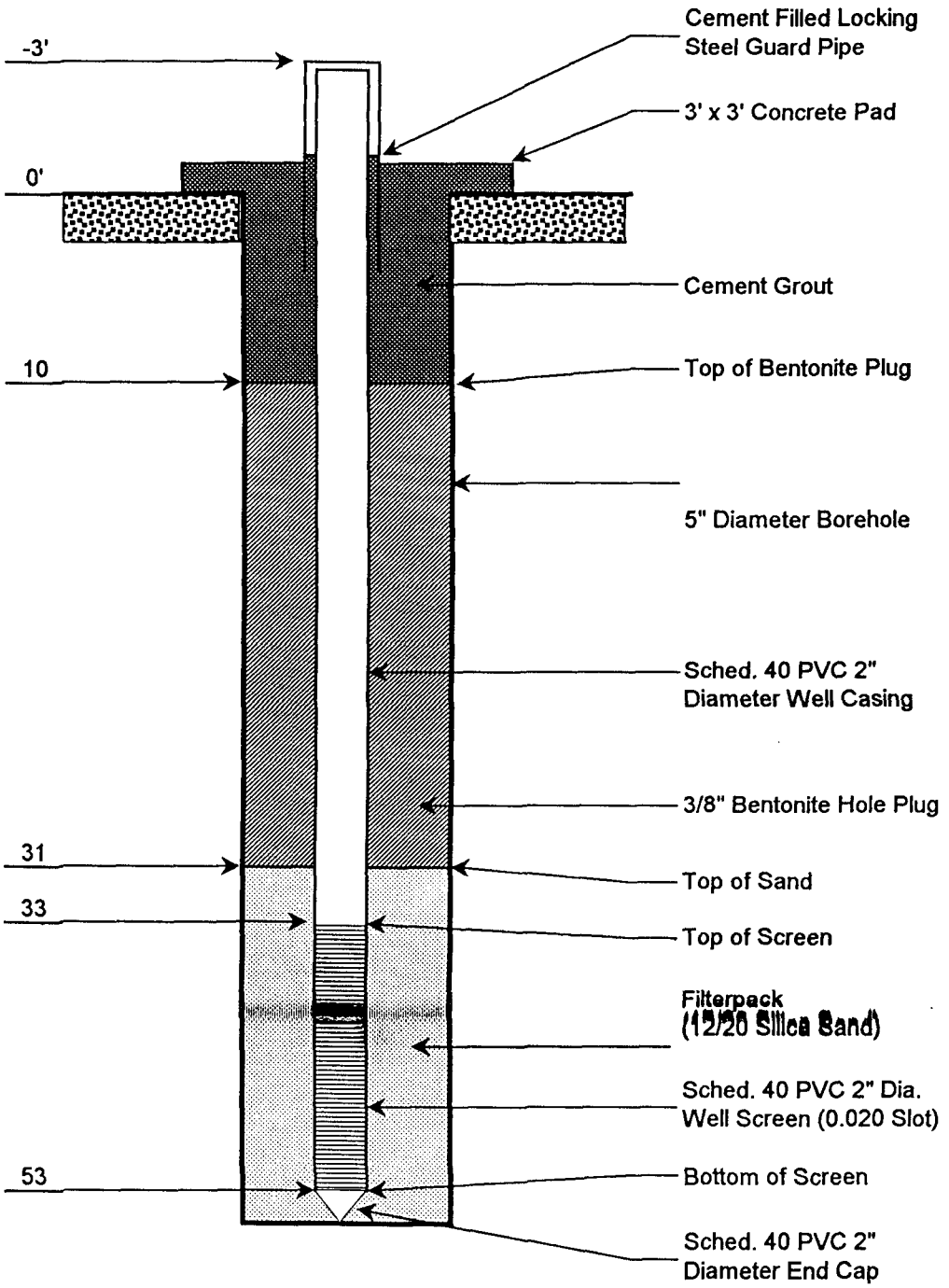
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW - 7	TOTAL DEPTH:	53 Feet
SITE ID:	Hobbs Booster Station	CLIENT:	DEFS/GPM Gas Corp.
SURFACE ELEVATION:	3618.78	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	05/08/00	FIELD REP.:	J. Fergerson
COMPLETION DATE:	05/08/00	FILE NAME:	/GPM/HOBBS\logs.xls
COMMENTS:	215 feet due west of MW-2 and approximately 15 feet north.		



LITH.	USCS	Sample Depth	Time	Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
	CL	0	0900	Surface	0		Silty clay, dk brown, moist, no odor.
		5	0905	Cuttings	0	5	Caliche, white-tan, weathered-dense, no odor, with vf grain sand in matrix.
	CAL /SM	10	0912	Cuttings	0	10	
		15	0919	Cuttings	0	15	
	SM/SS	20	0931	Cuttings	0	20	Sand, vf grain, white-yellow-lt brown, no odor, unconsol, interbedded with mod-well cemented sandstone and weathered caliche.
	SW						Sand, vf grain, tan-lt brown, sl moist, no odor, unconsol, interbedded with mod-well cemented sandstone.
		25	0941	Cuttings	0	25	
	SW	30	0949	Cuttings	0	30	Sand, vf grain, tan-lt brown, sl moist, no odor, unconsol, interbedded with well cemented sandstone.
		35	0956	Cuttings	0	35	
							Groundwater Encountered @ 38 Feet
		40	1004	Cuttings	0	40	
	SW					45	Sand, vf grain, tan-lt brown, sl moist, no odor, unconsol, interbedded with well cemented sandstone.
						50	
							Bottom of well @ 53 feet
						55	
							TD @ 56 feet
						60	

MONITORING WELL CONSTRUCTION DIAGRAM (MW-7)

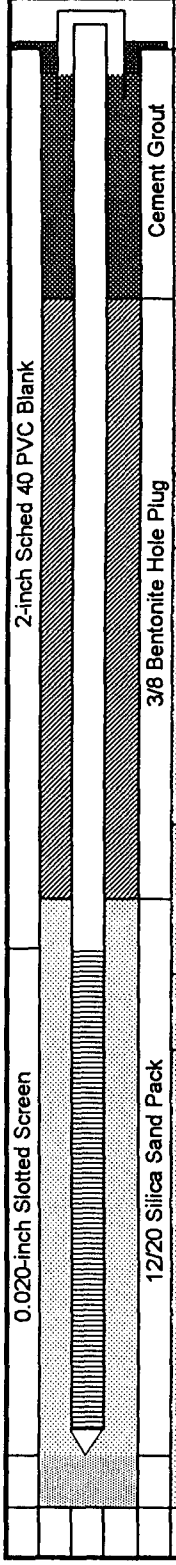


TRW Energy & Environmental Systems	SITE: Hobbs Booster Station		**MW-7 Monitoring Well Construction Diagram**
	DATE: 05/08/00	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: GJV	
	CK'D BY: DTL	FILE: Well Bore Diagram	

LITHOLOGIC LOG (MONITORING WELL)

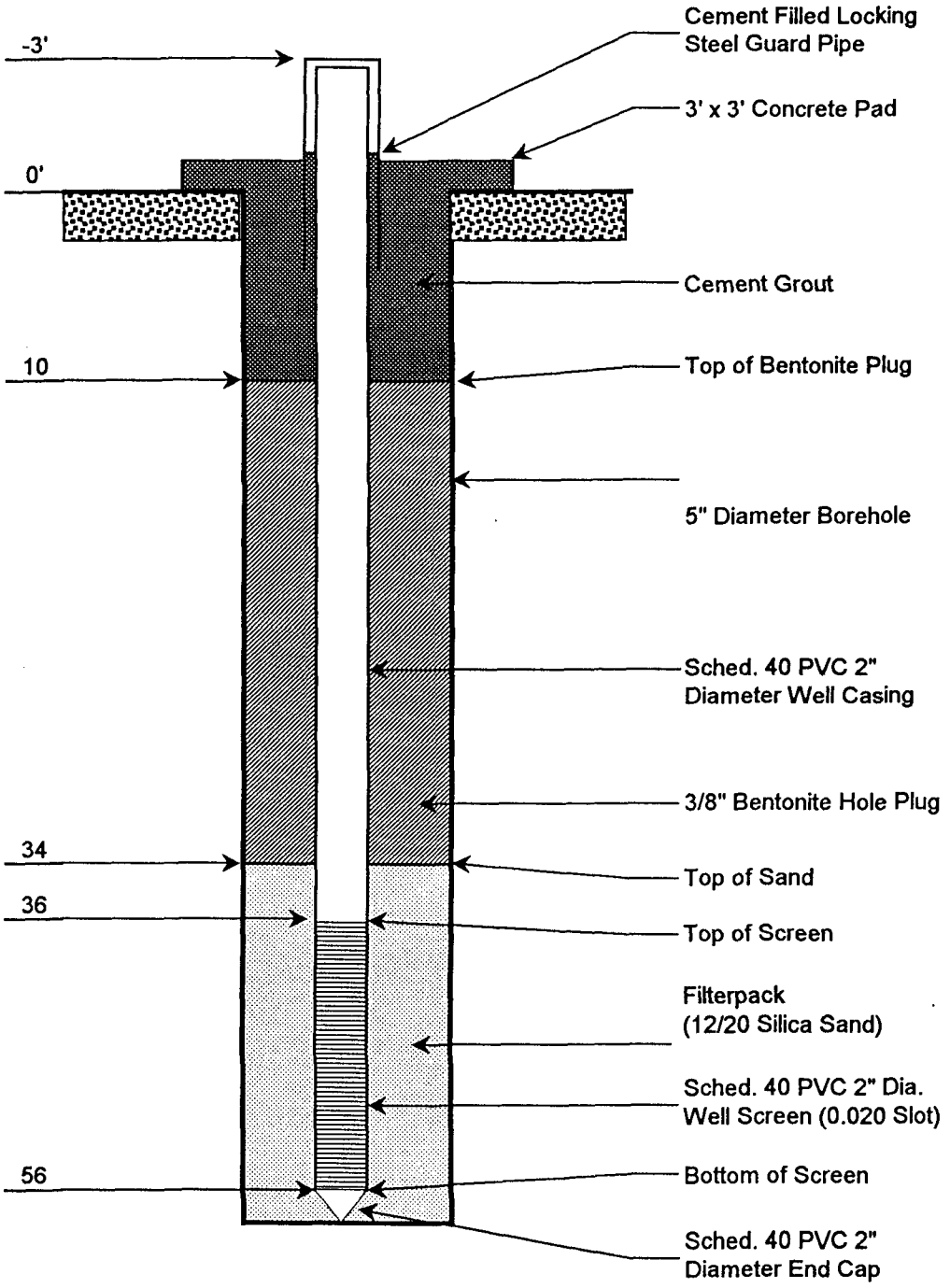
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW - 8	TOTAL DEPTH:	56 Feet
SITE ID:	Hobbs Booster Station	CLIENT:	DEFS/GPM Gas Corp.
SURFACE ELEVATION:	3620.61	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	05/08/00	FIELD REP.:	J. Fergerson
COMPLETION DATE:	05/08/00	FILE NAME:	/GPM/HOBBS\logs.xls
COMMENTS:	187 feet west of east fenceline and 242 feet north of south fenceline.		



LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
		0	1027	Surface	0		Caliche, white-yellow-tan, weathered-dense, no odor, with vf grain sand in matrix.
		5	1033	Cuttings	0	5	
	CAL /SM	10	1039	Cuttings	0	10	
		15	1046	Cuttings	0	15	
	CAL/S S	20	1053	Cuttings	0.8 0	20	Caliche, white-yellow-tan, weathered-dense, sl odor, with sl gray staining in matrix and interbedded with mod-well cemented sandstone.
	SW	25	1101	Cuttings	0	25	Sand, vf grain, tan-lt brown, no odor, unconsol, interbedded with mod-well cemented sandstone.
		30	1110	Cuttings	1.1	30	
	SW	35	1112	Cuttings	1.3	35	Sand, vf grain, tan-lt brown, sl odor, unconsol, interbedded with well cemented sandstone.
	SW	40	1120	Cuttings	108.8	40	Sand, vf grain, tan-lt brown, good odor, v moist, unconsol, interbedded with well cemented sandstone. Groundwater @ 41 feet
	SW					45	Sand, vf grain, tan-lt brown-gray, v moist, strong odor, unconsol with gray staining in matrix and interbedded with well cemented sandstone.
						50	
						55	
							Bottom of well @ 56 feet TD @ 58 feet
						60	

MONITORING WELL CONSTRUCTION DIAGRAM (MW-8)

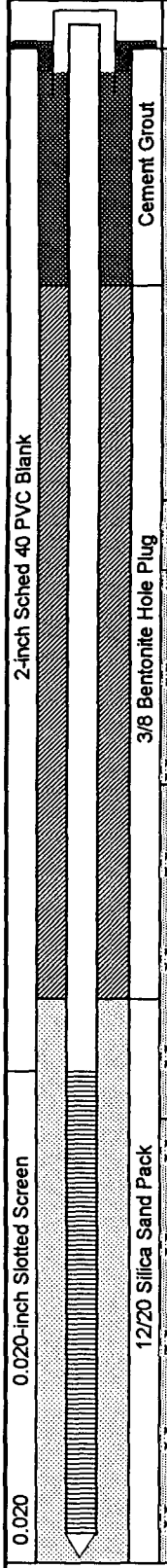


TRW Energy & Environmental Systems	SITE: Hobbs Booster Station		**MW-8 Monitoring Well Construction Diagram**
	DATE: 05/08/00	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: GJV	
	CK'D BY: DTL	FILE: Well Bore Diagram	

LITHOLOGIC LOG (MONITORING WELL)

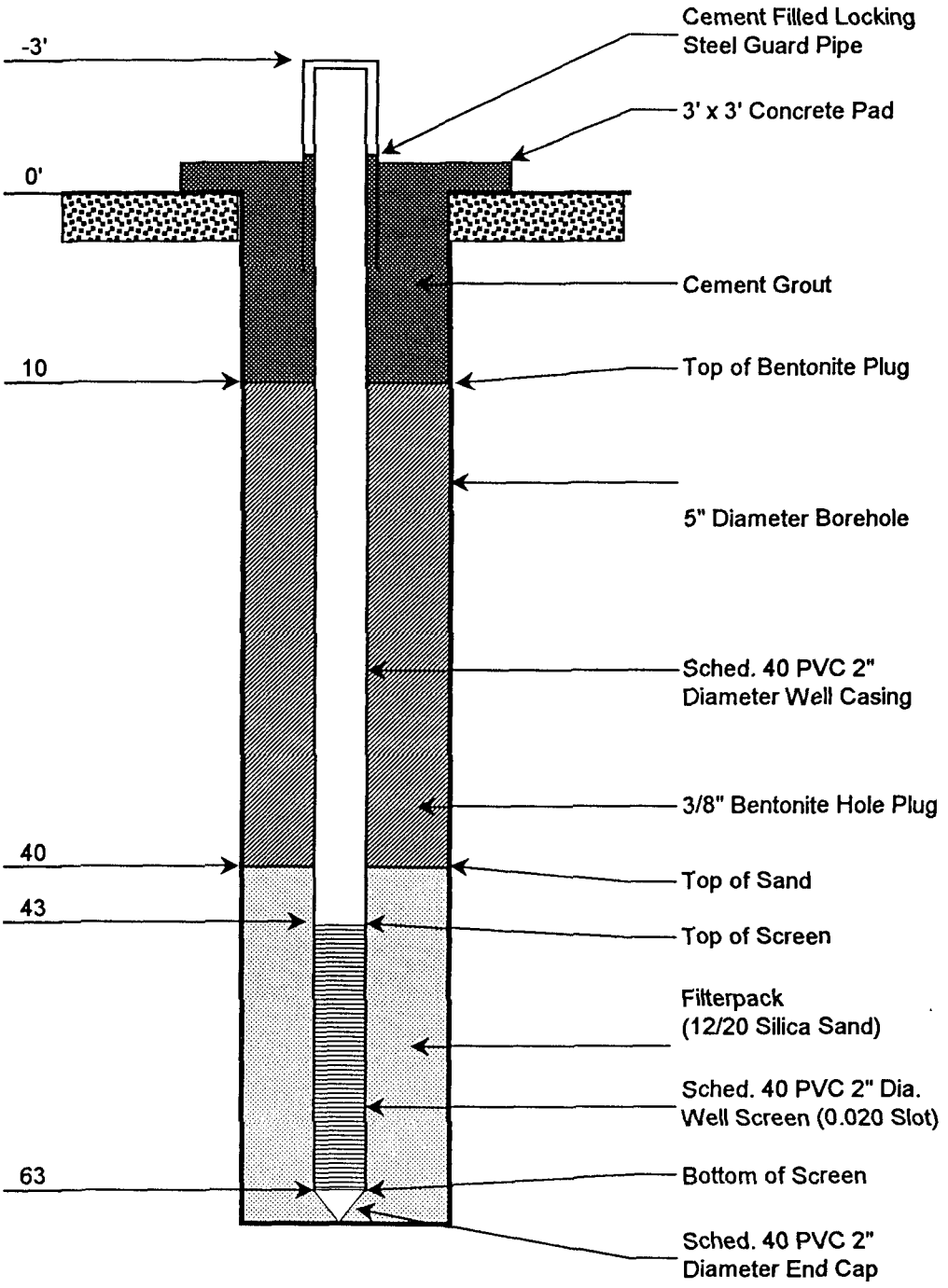
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW -9	TOTAL DEPTH:	63 Feet
SITE ID:	Hobbs Booster Station	CLIENT:	DEFS/GPM Gas Corp.
SURFACE ELEVATION:	3622.40	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	05/09/00	FIELD REP.:	J. Fergerson
COMPLETION DATE:	05/09/00	FILE NAME:	/GPM/HOBBS\logs.xls
COMMENTS:	45 feet west of east fence line and 44 feet north of south fenceline		



LITH.	USCS	Sample Depth	Time	Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
		0	1440	Surface	0		Caliche, white-yellow-tan, weathered-dense, no odor, with vf grain sand in matrix.
		5	1448	Cuttings	0	5	
	CAL/SM	10	1454	Cuttings	4.1	10	
		15	1501	Cuttings	0	15	
	CAL/SS	20	1510	Cuttings	0.6	20	Caliche, white-yellow-tan, weathered-dense, sl odor, with staining in matrix and interbedded with mod-well cemented sandstone.
		25	1522	Cuttings	0.9	25	Sand, vf grain, white-tan-lt brown, sl odor, unconsol, interbedde with mod-well cemented sandstone.
	SW	30	1532	Cuttings	1.4	30	
		35	1540	Cuttings	3.3	35	Sand, vf grain, tan-lt brown, sl odor, unconsol, interbedded with well cemented sandstone.
	SW	40	1553	Cuttings	2.8	40	
		45	1605	Cuttings	203.9	45	
		48	1611	Cuttings	239.3		Sand, vf grain, tan-lt brown, good odor, unconsol, interbedded with well cemented sandstone. Groundwater encountered @ 48 feet
	SW					50	
						55	
						60	
	SW						Sand, vf grain, tan-lt brown, good odor, unconsol, interbedded with well cemented sandstone. TD @ 63 feet

MONITORING WELL CONSTRUCTION DIAGRAM (MW-9)

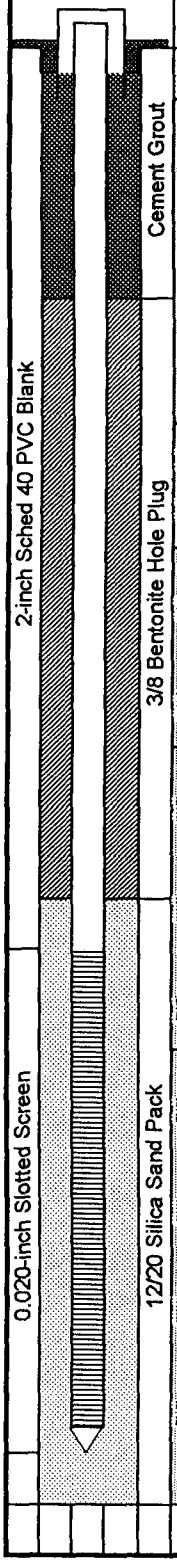


TRW Energy & Environmental Systems	SITE: Hobbs Booster Station		**MW-9 Monitoring Well Construction Diagram**
	DATE: 05/09/00	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: GJV	
	CK'D BY: DTL	FILE: Well Bore Diagram	

LITHOLOGIC LOG (MONITORING WELL)

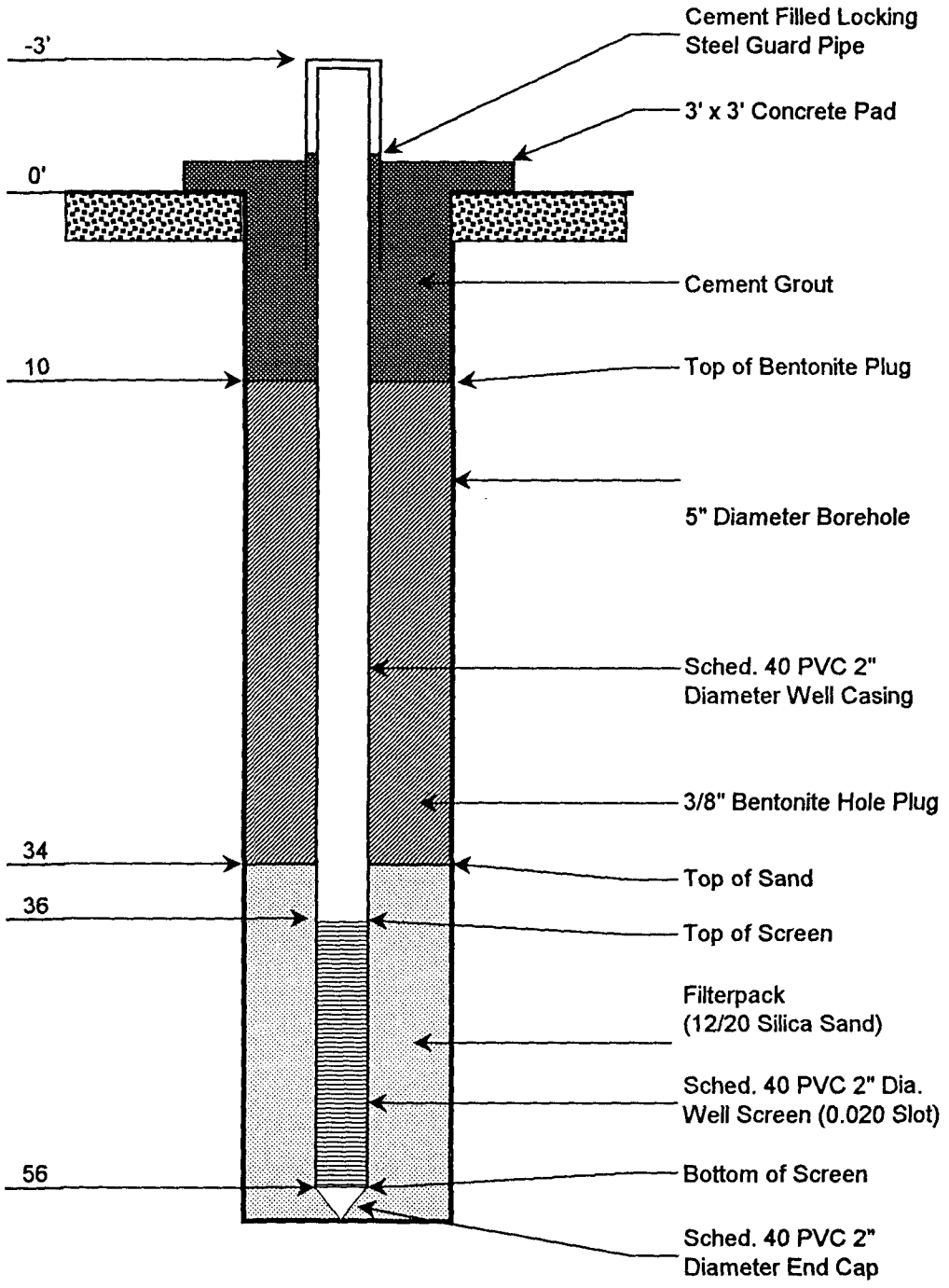
TRW
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW - 10	TOTAL DEPTH:	58 Feet
SITE ID:	Hobbs Booster Station	CLIENT:	DEFS/GPM Gas Corp.
SURFACE ELEVATION:	3618.30	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	05/08/00	FIELD REP.:	J. Fergerson
COMPLETION DATE:	05/08/00	FILE NAME:	/GPM/HOBBS\logs.xls
COMMENTS:	9 feet west of east fenceline and 40 feet north of south fenceline.		



LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
	CL	0	1415	Surface	0		Silty clay, dk brown, sl moist, no odor.
	CAL/SM	5	1422	Cuttings	0	5	Caliche, white-yellow-tan, weathered-dense, no odor, with vf grain sand in matrix.
		10	1427	Cuttings	0	10	
		15	1434	Cuttings	0	15	
	CAL/SS	20	1442	Cuttings	0	20	Caliche, white-yellow-tan, weathered-dense, sl odor, with sl gray staining in matrix and interbedded with mod-well cemented sandstone.
	SW	25	1453	Cuttings	0	25	Sand, vf grain, tan-lt brown, no odor, unconsol, interbedded with mod-well cemented sandstone.
		30	1506	Cuttings	0	30	Sand, vf grain, tan-lt brown, sl odor, unconsol, interbedded with well cemented sandstone.
	SW	35	1515	Cuttings	0	35	
		38		Cuttings	9.1		
		40	1527	Cuttings	120.5	40	Groundwater @ 41 feet
	SW					45	Sand, vf grain, tan-lt brown-dk gray, v moist, strong odor, unconsol with dk gray staining in matrix and interbedded with well cemented sandstone.
						50	
						55	
							Bottom of well @ 56 feet
							TD @ 58 feet
						60	

MONITORING WELL CONSTRUCTION DIAGRAM (MW-10)

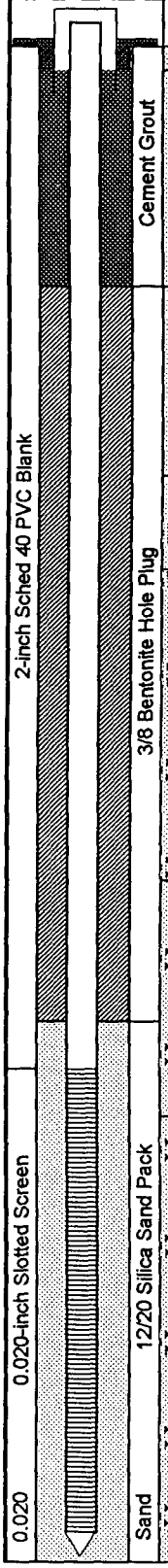


TRW Energy & Environmental Systems	SITE: Hobbs Booster Station		**MW-10 Monitoring Well Construction Diagram**
	DATE: 05/08/00	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: GJV	
	CK'D BY: DTL	FILE: Well Bore Diagram	

LITHOLOGIC LOG (MONITORING WELL)

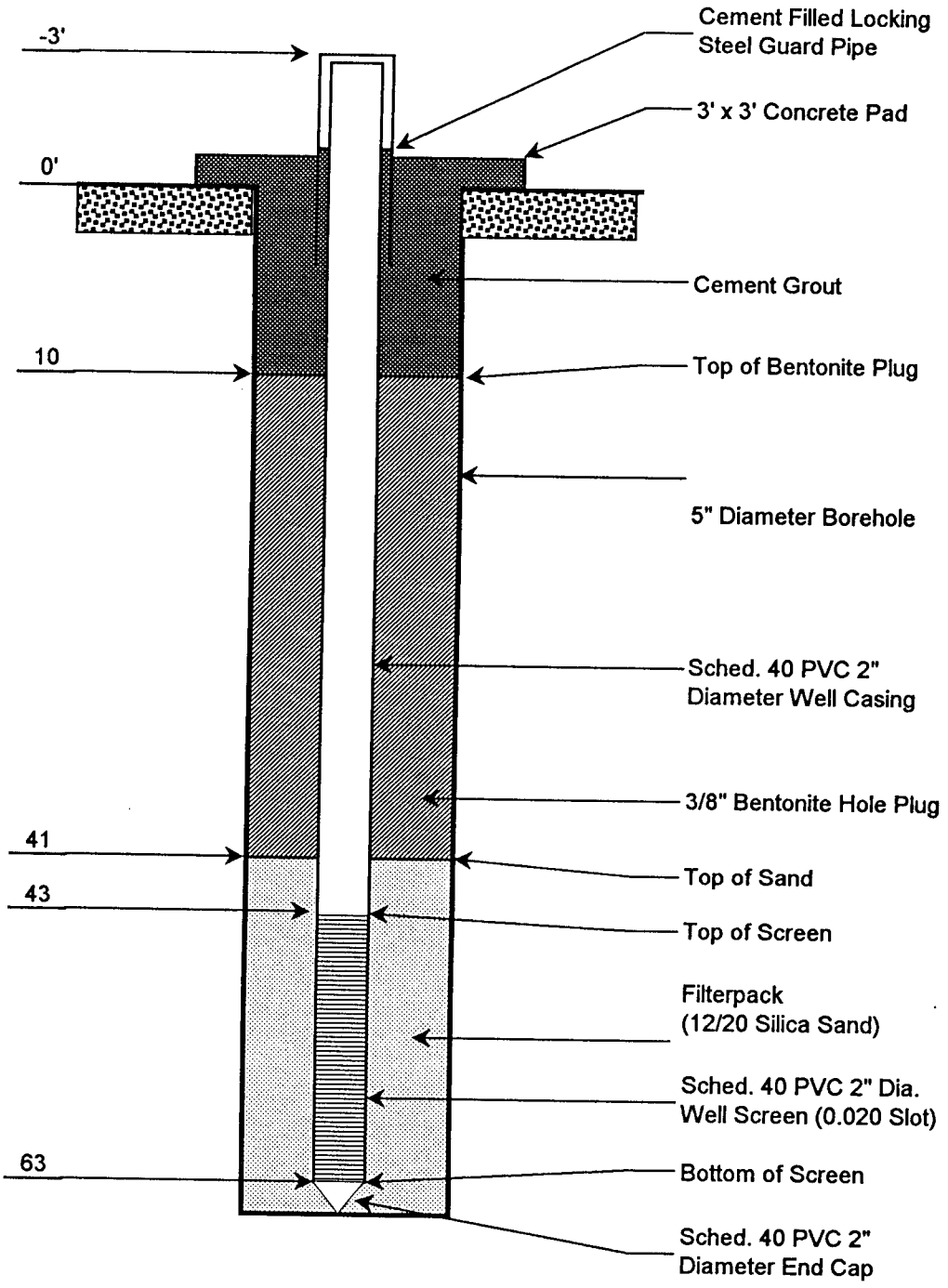
TRW
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW -11	TOTAL DEPTH:	63 Feet
SITE ID:	Hobbs Booster Station	CLIENT:	DEFS/GPM Gas Corp.
SURFACE ELEVATION:	3622.99	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	05/09/00	FIELD REP.:	J. Fergerson
COMPLETION DATE:	05/09/00	FILE NAME:	/GPM/HOBBS\logs.xls
COMMENTS:	138 feet west of east fence line and 135 feet north of south fenceline.		



LITH.	USCS	Sample Depth	Time	Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
	CL	0	1130	Surface	0		Silty clay, dk brown, sl moist, no odor.
	CAL/S M	5	1135	Cuttings	0	5	Caliche, white-yellow-tan, weathered-dense, no odor, with vf grain sand in matrix.
		10	1139	Cuttings	123.2	10	
	CAL/S M	15	1144	Cuttings	0	15	Caliche, white-yellow-tan, weathered-dense, good odor, with vf grain sand in matrix.
	CAL/S S	20	1150	Cuttings	12.4	20	Caliche, white-yellow-tan, weathered-dense, sl odor, with staining in matrix and interbedded with mod-well cemented sandstone.
	SW	25	1158	Cuttings	22.1	25	Sand, vf grain, white-tan-lt brown, sl odor, unconsol, interbedde with mod-well cemented sandstone.
		30	1207	Cuttings	69.6	30	
		35	1214	Cuttings	132.3	35	
	SW	40	1223	Cuttings	41.2	40	Sand, vf grain, white-tan-lt brown, sl moist, sl odor, unconsol, interbedded with well cemented sandstone.
		45	1231	Cuttings	77.1	45	Sand, vf grain, tan-lt brown, good odor, unconsol, interbedded with well cemented sandstone.
		47	1240	Cuttings	115.0		Groundwater Encountered @ 47 Feet
	SW					50	
						55	
						60	
	SW						Sand, vf grain, tan-lt brown, wet, good odor, unconsol, interbedded with well cemented sandstone.
							TD @ 63 Feet

MONITORING WELL CONSTRUCTION DIAGRAM (MW-11)

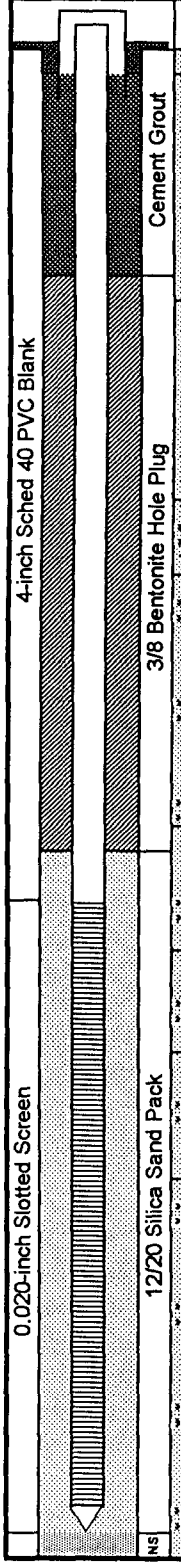


TRW Energy & Environmental Systems	SITE: Hobbs Booster Station		**MW-11 Monitoring Well Construction Diagram**
	DATE: 05/09/00	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: GJV	
	CK'D BY: DTL	FILE: Well Bore Diagram	

LITHOLOGIC LOG (RECOVERY WELL, RW-1)

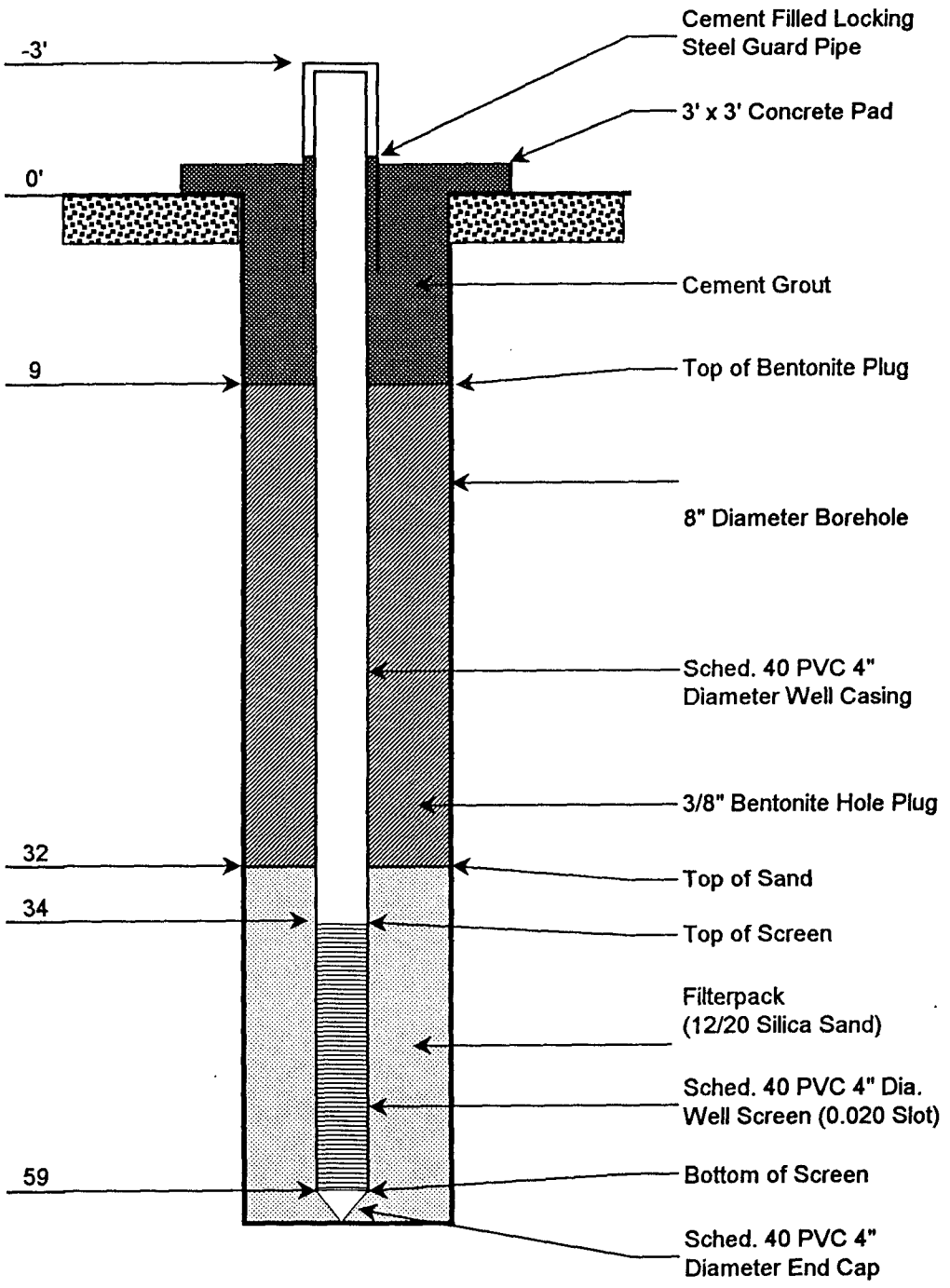
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	RW-1	TOTAL DEPTH:	59 Feet
SITE ID:	Hobbs Booster Station	CLIENT:	DEFS/GPM Gas Corp.
SURFACE ELEVATION:	3621.40	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	05/08/00	FIELD REP.:	J. Fergerson
COMPLETION DATE:	05/09/00	FILE NAME:	/GPM/HOBBS\logs.xls
COMMENTS:	10 feet south of MW-4		



LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
	CL	0	1615	Surface	0		Silty clay, dk brown, sl moist, no odor.
	CAL/SM	5	1621	Cuttings	0	5	Caliche, white-yellow-tan, weathered-dense, no odor, with vf grain sand in matrix.
		10	1626	Cuttings	2.8	10	
	CAL/SM	15	1632	Cuttings	3.1	15	Caliche, white-yellow-tan, weathered-dense, sl odor, with vf grain sand in matrix.
	CAL/SS	20	1637	Cuttings	3.9	20	Caliche, white-yellow-tan, weathered-dense, sl odor, interbedded with mod-well cemented sandstone.
	SW	25	1644	Cuttings	3.7	25	Sand, vf grain, tan-lt brown, sl odor, unconsol, interbedded with mod-well cemented sandstone.
		30	1650	Cuttings	0.5	30	
	SW	35	1702	Cuttings	8.8	35	Sand, vf grain, tan-lt brown, sl odor, unconsol, interbedded with well cemented sandstone.
	SW						Sand, vf grain, tan-lt brown, strong odor, v moist, unconsol, interbedded with well cemented sandstone.
	SW	40	1715	Cuttings	142.6	40	Sand, vf grain, tan-lt brown, strong odor, v moist, unconsol, interbedded with well cemented sandstone. Groundwater @ 42 Feet
	SW	45		Cuttings	320.6	45	Sand, vf grain, tan-lt brown, strong odor, wet, unconsol, interbedded with well cemented sandstone.
						50	
						55	
						60	TD @ 60 Feet

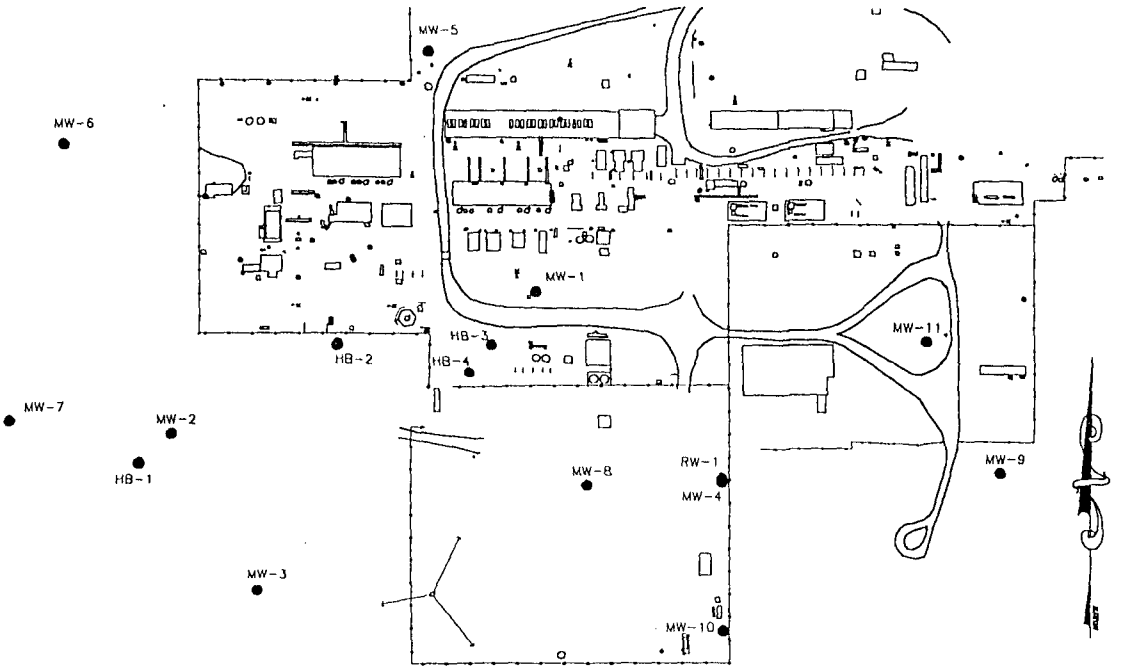
RECOVERY WELL CONSTRUCTION DIAGRAM (RW-1)



TRW Energy & Environmental Systems	SITE: Hobbs Booster Station		**RW-1 Recovery Well Construction Diagram**
	DATE: 05/09/00	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: GJV	
	CK'D BY: DTL	FILE: Well Bore Diagram	

Appendix B

Survey Plat of Hobbs Booster Station



MONITOR WELLS & BORE HOLES	PLANT COORDINATES X	Y	NAVD 88 ELEVATIONS IN FEET
MW-1	E-12+44.9	S-7+43.2	NATURAL GROUND: 3623.43
			ALUM. CAP IN CONCRETE: 3623.60
			TOP 2" PVC CASING: 3626.06
MW-2	E-7+62.6	S-9+35.9	NATURAL GROUND: 3620.52
			ALUM. CAP IN CONCRETE: 3620.65
			TOP 2" PVC CASING: 3623.14
MW-3	E-8+76.5	S-11+50.0	NATURAL GROUND: 3619.81
			ALUM. CAP IN CONCRETE: 3620.08
			TOP 2" PVC CASING: 3623.01
MW-4	E-14+80.1	S-9+96.2	NATURAL GROUND: 3621.51
			ALUM. CAP IN CONCRETE: 3621.66
			TOP 2" PVC CASING: 3624.29
MW-5	E-11+05.0	S-4+16.5	NATURAL GROUND: 3626.12
			ALUM. CAP IN CONCRETE: 3626.30
			TOP 2" PVC CASING: 3629.16
MW-6	E-6+21.0	S-5+43.0	NATURAL GROUND: 3623.87
			ALUM. CAP IN CONCRETE: 3624.14
			TOP 2" PVC CASING: 3626.93
MW-7	E-5+47.2	S-9+20.5	NATURAL GROUND: 3618.78
			ALUM. CAP IN CONCRETE: 3618.93
			TOP 2" PVC CASING: 3621.40
MW-8	E-13+11.2	S-10+07.3	NATURAL GROUND: 3620.61
			ALUM. CAP IN CONCRETE: 3620.84
			TOP 2" PVC CASING: 3623.62
MW-9	E-18+57.2	S-9+90.4	NATURAL GROUND: 3622.40
			ALUM. CAP IN CONCRETE: 3622.60
			TOP 2" PVC CASING: 3625.21
MW-10	E-14+91.2	S-12+06.9	NATURAL GROUND: 3618.30
			ALUM. CAP IN CONCRETE: 3618.30
			TOP 2" PVC CASING: 3621.07
MW-11	E-17+60.0	S-8+11.6	NATURAL GROUND: 3622.99
			ALUM. CAP IN CONCRETE: 3623.05
			TOP 2" PVC CASING: 3625.88
RW-1	E-14+89.5	S-10+03.6	NATURAL GROUND: 3621.40
			ALUM. CAP IN CONCRETE: 3621.53
			TOP 4" PVC CASING: 3624.52
HB-1	E-9+75.5	S-7+19.7	NATURAL GROUND: 3619.08
HB-2	E-9+82.4	S-8+14.7	NATURAL GROUND: 3619.22
HB-3	E-11+86.3	S-8+14.7	NATURAL GROUND: 3622.32
HB-4	E-11+56.6	S-8+52.4	NATURAL GROUND: 3621.61

200 0 200 400 FEET

Scale:1"=200'

I HEREBY CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MININUM STANDARDS FOR SURVEYING IN NEW MEXICO.

GARY G. EIDSON NEW MEXICO

5/26/2000

RONALD J. EIDSON, N.M. P.S. No. 3239
GARY G. EIDSON N.M. P.S. No. 12641

JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, NEW MEXICO - 505-393-3117

GPM GAS CORPORATION NM REGION

LOCAL HORIZONTAL AND VERTICAL COORDINATE
LOCATION OF MONITOR WELLS AND BORE HOLES AT THE
HOBBS BOOSTER STATION
SECTION 4, TOWNSHIP 19 SOUTH,
RANGE 38 EAST, N.M.P.M.,
LEA COUNTY, NEW MEXICO

Revised: 05/26/2000 CDG WO#00110648

Survey Date: 6/23/99		Sheet 1 of 1 Sheets	
W.O. Number: 99-11-0540		Drawn By:D.McCARLEY	
Date: 6/24/99	GPM	GPMC0540	Scale:1"=200'

Appendix C

Water Well Inventory

SNNUM	BASIN	FILNUM	FILSUF	REFBSN	REFNUM	REFSUF	SUBFILE	PRIMM	PRIDD	PRIYY	STATUS	USE	SOURCE	TOWN	RANGE	SECTION	QUARTER	LNTOWN	LNRANGE	LNSEC	CARDATE	BLOCK	METER	NAME	FILEACRES	ACFTSURV	RATE	ENTER
07	L	07758						09	12	1977	PMT	DOM		19S	38E	03	421	19S	38E	03	0977	65		ELLIOTT DONALD	0.00	3.00	0	
07	L	02797						03	03	1955	PMT	DOM		19S	38E	03	430	19S	38E	03	0764	65		CASTLE AVE CHURCH	0.00	3.00	0	
07	L	06390						10	10	1968	PMT	DOM		19S	38E	03	430	19S	38E	03	1068	65		LATHRAM DOUGLAS M	0.00	3.00	0	
07	L	03714						10	25	1957	PMT	DOM		19S	38E	03	434	19S	38E	03	0964	65		STANBRO DAVID	0.00	3.00	0	
07	L	03806						03	10	1958	PMT	DOM		19S	38E	03	434	19S	38E	03	0964	65		FREEMAN SAMUEL C	0.00	3.00	0	
07	L	01016						06	15	1950	PMT	DOM		19S	38E	03	440	19S	38E	03	0564	65		HENEGAR P A	0.00	3.00	0	
07	L	05642						05	25	1965	PMT	DOM		19S	38E	03	440	19S	38E	03	0765	65		JR SMITH MR FRANK	0.00	3.00	0	
07	L	06578	L					08	22	1969	PMT	DOM		19S	38E	03	440	19S	38E	03	0771	65		PRITCHARD EZRA	0.00	0.00	0	
07	L	02868						05	12	1955	PMT	DWD		19S	38E	03	441	19S	38E	03	0864	65		M & J DRILLING CO	0.00	0.00	0	
07	L	01593						10	15	1952	PMT	DOM		19S	38E	03	442	19S	38E	03	0864	65		MCANALLY JESS J	0.00	3.00	0	
07	L	03330						10	16	1956	PMT	DOM		19S	38E	03	443	19S	38E	03	0864	65		HALL RALPH	0.00	3.00	0	
07	L	07297						11	27	1974	PMT	DOM		19S	38E	03	4430	19S	38E	03		65		THOMASSON RONALD M	0.00	3.00	0	
07	L	01579						09	29	1952	PMT	DOM		19S	38E	03	444	19S	38E	03	0864	65		WILLIAMS KENNETH E	0.00	3.00	0	
07	L	01626						10	27	1952	PMT	DOM		19S	38E	03	444	19S	38E	03	0864	65		WALTON JOSEPH O	0.00	3.00	0	
07	L	02570						06	03	1954	PMT	DOM		19S	38E	03	444	19S	38E	03	0764	65		JR BARROW DAVE	0.00	3.00	0	
07	L	01105						04	19	1951	PMT	DOM		19S	38E	04	003	19S	38E	04	0364	65		SIMEN E W	0.00	3.00	0	
07	L	07540						04	27	1976	PMT	CPS		19S	38E	04	1110	19S	38E	04		65		PHILLIPS PETROLEUM	0.00	0.00	0	
07	L	00227						11	16	1946	LIC	FPP		19S	38E	04	112	19S	38E	04	0364	65		PHILLIPS PETRO CO	0.00	56.00	56	
07	L	08317						07	23	1980	PMT	DIC		19S	38E	04	113	19S	38E	04	0780	65		A-WELDERS & SUPPLY	0.00	3.00	0	
07	L	00229						11	16	1946	LIC	FPP		19S	38E	04	113	19S	38E	04	0364	65		PHILLIPS PETRO CO	0.00	56.00	56	
07	L	00228						11	16	1946	LIC	FPP		19S	38E	04	121	19S	38E	04	0364	65		PHILLIPS PETRO CO	0.00	56.00	56	
07	L	00230						11	16	1946	LIC	FPP		19S	38E	04	122	19S	38E	04	0364	65		PHILLIPS PETRO CO	0.00	56.00	56	
07	L	00231						11	16	1946	LIC	FPP		19S	38E	04	123	19S	38E	04	0364	65		PHILLIPS PETRO CO	0.00	56.00	56	
07	L	00241						01	22	1947	PMT	NDT		19S	38E	04	210	19S	38E	04	0364	65		ROGERS GOMER G	0.00	0.00	0	
07	L	07521						08	27	1976	PMT	CPS		19S	38E	04	2130	19S	38E	04		65		PHILLIPS PETROLEUM	0.00	0.00	0	
07	L	01592						10	15	1952	PMT	DOM		19S	38E	04	221	19S	38E	04	0664	65		MCANALLY JESS J	0.00	3.00	0	

New Mexico Office of the State Engineer
Well Reports and Downloads

Township: 19S Range: 38E Sections: 3,4,9,10

NAD27 X: Y: Zone: Search Radius:

County: LE Basin: L Number: Suffix:

Owner Name: (First) (Last) ○ Non-Domestic ○ Domestic ◉ All

Well Data Report | Avg Depth to Water Report | Water Column Report | Clear Form | Exit | Help

WELL DATA REPORT 05/12/2000

DB	File Nbr	Use (acre ft per annum)	Diversion	Owner	Well Number	Tws	Rng	Sec	q	q	q	Zone
					(quarters are biggest to smallest)							
L	01016	DOM	3	P.A. HENEGAR	L 01016 APPRO	19S	38E	03	4	4		
L	01104	DOM	3	W. E. GRANATH	L 01104	19S	38E	04	2	3	4	
L	01172	DOM	3	A.M. HOFFMAN	L 01172 APPRO	19S	38E	03	3	2		
L	01292	DOM	3	DUDLEY C. THORP	L 01292 APPRO	19S	38E	10	1	4	3	
L	01345	DOM	3	LAURA AND AUDRIE PARRETT	L 01345 APPRO	19S	38E	04				
L	01397	DOM	3	HORA CE MARTIN	L 01397 APPRO	19S	38E	03	3	4	4	
					L 01397 CPPU	19S	38E	03	3	4	4	
L	01518	DOM	3	C.R. TATE	L 01518 APPRO	19S	38E	03				
L	01626	DOM		JOSEPH O. WALTON	L 01626 APPRO	19S	38E	03	4	4	4	
L	02320	DOM	3	KENNETH E. WILLIAMS	L 02320 APPRO	19S	38E	03	3	3	3	
L	02411	DOM	3	STANOLIND OIL AND GAS COMPANY	L 02411 APPRO	19S	38E	09	2	2		
L	02536	PRO	3	GACKLE DRILLING CO.	L 02536 APPRO	19S	38E	04	2	3		
L	02570	DOM	3	DAVE JR. BARROW	L 02570 APPRO	19S	38E	03	4	4	4	
L	02640	PRO	3	GACKLE DRILLING COMPANY	L 02640 APPRO	19S	38E	10	3	1		
L	02797	DOM	3	CASTLE AVENUE BAPTIST CHURCH	L 02797 APPRO	19S	38E	03	4	3		
L	02800	DOM	3	CURTIS V. MYERS	L 02800 APPRO	19S	38E	04	4	4	4	
L	02868	PRO	3	M. & J. DRILLING CO.	L 02868 APPRO	19S	38E	03	4	4	1	
L	02982	DOM	3	HENRY EASTON	L 02982 APPRO	19S	38E	04	2	4	3	
L	03084	DOM	3	RALPH L. HENDRICKSON	L 03084 APPRO	19S	38E	03				
L	03330	DOM	3	RALPH HALL	L 03330 APPRO	19S	38E	03	4	4	3	
L	03342	DOM	3	B. L. THORP	L 03342 APPRO	19S	38E	10	2	1	2	
					L 03342 CLW	19S	38E	10	2	1	2	
L	03416	DOM		W.H. REDINGER	L 03416 APPRO EXP	19S	38E	03	3	3	4	
L	03714	COM	3	DAVID STANBRO	L 03714 APPRO	19S	38E	03	4	3	4	
L	03808	DOM	3	SAMUEL C. FREEMAN	L 03808 APPRO	19S	38E	03	4	3	4	
L	04181	DOM	3	N. E. WILLIAMS	L 04181 APPRO	19S	38E	03	3	4		
L	04316	DOM	3	N E WILLIAMS	L 04316 APPRO	19S	38E	03	4	3		

L	04317		DOM	3	N. E. WILLIAMS	L	04317	APPRO	19S	38E	03	3 4
L	04635		DOM	3	GEORGE DAVIS	L	04635	APPRO	19S	38E	03	1 2 2
L	05153		DOM		JAMES A. HARRINGTON	L	05153	EXP	19S	38E	03	3
L	05339	(5)	STK		EXXON CORPORATION	L	05339	(5)	19S	38E	04	4 3 1
L	05642		DOM		FRANK JR. MR. & MRS. SMITH	L	05642	EXP	19S	38E	03	4 4
L	05707		DOM	3	PAUL WALLACH	L	05707		19S	38E	04	4 2
L	05830		DOM		SANDY GLANTON	L	05830	EXP	19S	38E	03	2 3 3
L	05936		DOM		JAMES A. WILLIAMS	L	05936	EXP	19S	38E	03	2 4 4
L	06097		DOM	3	LEO GREENWOOD	L	06097		19S	38E	04	2 4
L	06192		DOM	3	TONY BISWELL	L	06192		19S	38E	03	3 2
L	06373		DOM		ROBERT A. TURNER	L	06373	EXP	19S	38E	03	3 2 1
L	06390		DOM		DOUGLAS M. LATHRAM	L	06390	EXP	19S	38E	03	4 3
L	06454		DOM		MRS. WILL N. TERRY	L	06454	EXP	19S	38E	10	4 3
L	06517		DOM		GLENN DRAGOO	L	06517	EXP	19S	38E	09	2 2 2
L	06578		DOM		EZRA MACK RITCHARD	L	06578	EXP	19S	38E	03	4 4
L	06669		DOM		C. D. CLINE	L	06669	EXP	19S	38E	03	3 4 3
L	06902		DOM	3	RICHARD M. JOHNSON	L	06902		19S	38E	03	3 1
L	06941		DOM		RICHARD JOHNSON	L	06941	EXP	19S	38E	03	3 1
L	07176		DOM	3	CHARLIE L. PREAS	L	07176		19S	38E	03	3
L	07238		DOM	3	B.L. THORP	L	07238		19S	38E	10	2 1 2
L	07242		DOM	3	AMOCO PRODUCTION CO.	L	07242		19S	38E	09	2 1
						L	07242	CLW	19S	38E	09	2 2 2
L	07297		DOM	3	RONALD MRS. THOMASSON	L	07297		19S	38E	03	4 4 3
L	07521		DOM	3	PHILLIPS PETROLEUM COMPANY	L	07521		19S	38E	04	2 1 3
L	07522		OBS	3	PHILLIPS PETROLEUM COMPANY	L	07522		19S	38E	03	1 1 4
L	07540		OBS		PHILLIS PETEROLEUM COMPANY	L	07540	EXP	19S	38E	04	1 1 1
L	07661		DOM	3	ARTHUR M. HOFFMAN	L	07661		19S	38E	03	3 2
L	08158		DOM	3	C. D. CLINE	L	08158		19S	38E	04	2 4 4
L	08167		SAN	3	BABER WELL SERVICING CO.	L	08167		19S	38E	10	1 1 2
L	08200		PRO		AMOCO PRODUCTION COMPANY	L	08200	EXP	19S	38E	04	4 4
L	08317		SAN	3	A-WELDERS & SUPPLY	L	08317		19S	38E	04	1 1 1
L	08375		DOM	3	ALVIN L. TRUSTY	L	08375		19S	38E	10	2 4 3
L	09077		STK	3	WESTERN OIL PRODUCTION	L	09077		19S	38E	04	4 3 2
L	09286		PRO		AMOCO PRODUCTION COMPANY	L	09286	EXP	19S	38E	10	3 4 4
L	09287		PRO		AMOCO PRODUCTION COMPANY	L	09287	EXP	19S	38E	09	2 3 3
L	09288		PRO		AMOCO PRODUCTION COMPANY	L	09288	EXP	19S	38E	04	4 4 3
L	09839		DOM	3	E. W. PERKINS	L	09839		19S	38E	03	3 1 3

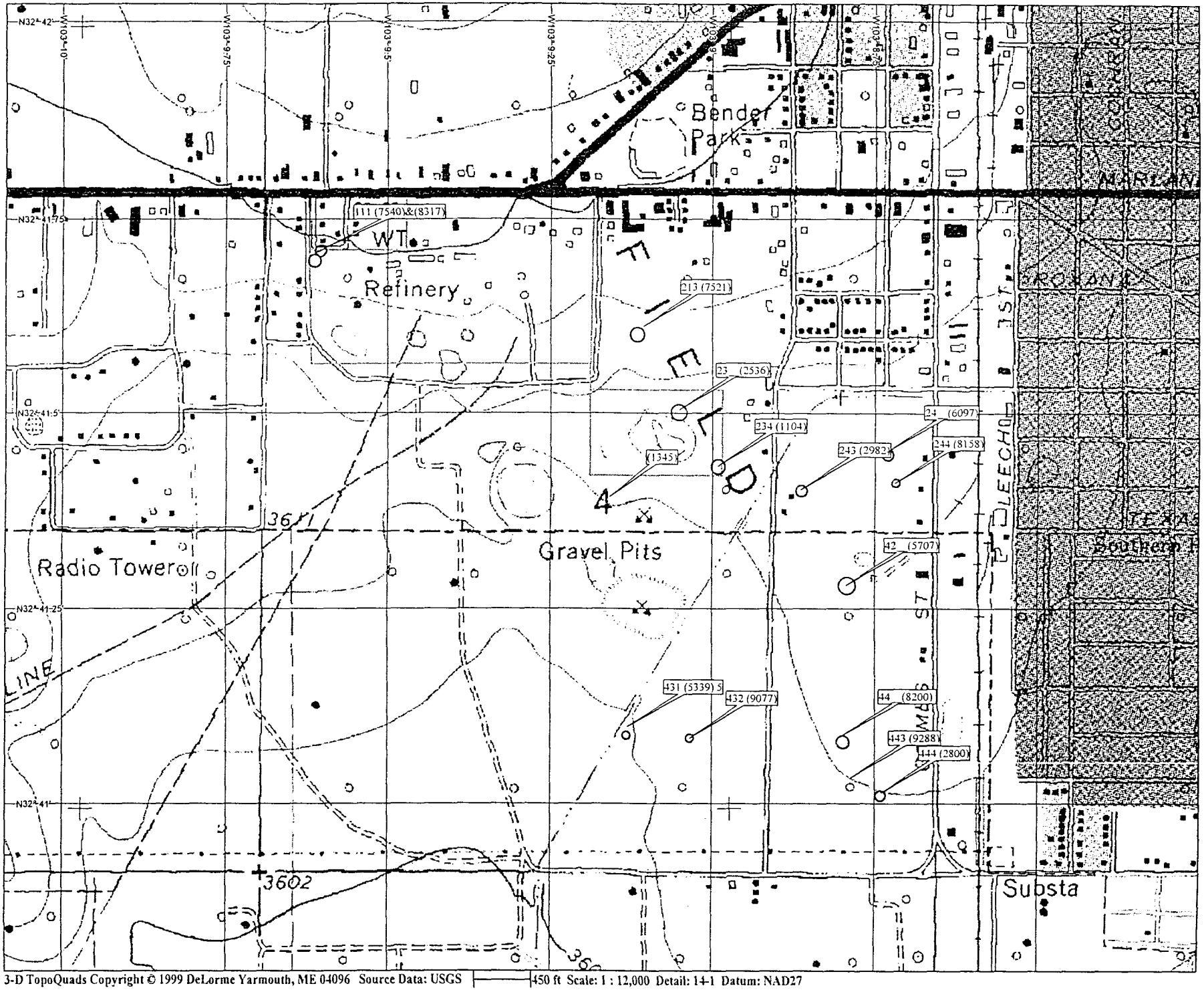
Record Count: 64

WATER COLUMN REPORT 05/12/2000

(quarters are biggest to smallest)

Well Number	Tws	Rng	Sec	q	q	q	Zone	X	Y	Depth Well	Depth Water	Water Column
L 01518 APPRO	19S	38E	03							110	53	57
L 03084 APPRO	19S	38E	03							95	40	55
L 07522	19S	38E	03	1	1	4				350		
L 04635 APPRO	19S	38E	03	1	2	2				100	44	56
L 07176	19S	38E	03	3						100	52	48
L 06902	19S	38E	03	3	1					150	53	97
L 09839	19S	38E	03	3	1	3				150	60	90
L 07661	19S	38E	03	3	2					150	65	85
L 06192	19S	38E	03	3	2					125	60	65
L 01172 APPRO	19S	38E	03	3	2					110	40	70
L 02320 APPRO	19S	38E	03	3	3	3				65	40	25
L 04181 APPRO	19S	38E	03	3	4					75	48	27
L 04317 APPRO	19S	38E	03	3	4					72	50	22
L 01397 APPRO	19S	38E	03	3	4	4				80	50	30
L 01397 CPPU	19S	38E	03	3	4	4				90	48	42
L 02797 APPRO	19S	38E	03	4	3					100	50	50
L 04316 APPRO	19S	38E	03	4	3					72	49	23
L 03714 APPRO	19S	38E	03	4	3	4				85	40	45
L 03808 APPRO	19S	38E	03	4	3	4				100	40	60
L 01016 APPRO	19S	38E	03	4	4					76		
L 02868 APPRO	19S	38E	03	4	4	1				103	42	61
L 03330 APPRO	19S	38E	03	4	4	3				100	40	60
L 07297	19S	38E	03	4	4	3				150	45	105
L 02570 APPRO	19S	38E	03	4	4	4				80	45	35
L 01345 APPRO	19S	38E	04							76	56	20
L 08317	19S	38E	04	1	1	1				150	50	100
L 07521	19S	38E	04	2	1	3				300		
L 02536 APPRO	19S	38E	04	2	3					96	42	54
L 01104	19S	38E	04	2	3	4				60	33	27
L 06097	19S	38E	04	2	4					100	65	35
L 02982 APPRO	19S	38E	04	2	4	3				100	35	65
L 08158	19S	38E	04	2	4	4				130	44	86
L 05707	19S	38E	04	4	2					121	50	71
L 09077	19S	38E	04	4	3	2				144	95	49
L 02800 APPRO	19S	38E	04	4	4	4				85	40	45
L 07242	19S	38E	09	2	1					130	60	70
L 02411 APPRO	19S	38E	09	2	2					92	44	48
L 07242 CLW	19S	38E	09	2	2	2				141	65	76
L 08167	19S	38E	10	1	1	2				130	38	92
L 01292 APPRO	19S	38E	10	1	4	3				80	5	75
L 03342 CLW	19S	38E	10	2	1	2				150	62	88
L 03342 APPRO	19S	38E	10	2	1	2				100	42	58
L 07238	19S	38E	10	2	1	2				120	48	72
L 08375	19S	38E	10	2	4	3				150	84	66
L 02640 APPRO	19S	38E	10	3	1					95	50	45

Record Count: 45


Bender Park
WT
Refinery
Gravel Pits
Radio Tower
Substa
111 (7540)&(8317)
213 (7521)
23 (2536)
234 (1104)
(1345)
24 (6097)
243 (29825)
244 (8158)
42 (5707)
431 (5339) 5
432 (9077)
44 (8200)
443 (9288)
444 (2800)
3602
N32°42'
N32°41'75"
N32°41'5"
N32°41'25"
N32°41'
W103°10'
W103°9'75"
W103°9'5"
W103°9'25"
W103°9'
W103°8'75"
W103°8'5"
3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS
450 ft Scale: 1 : 12,000 Detail: 14-1 Datum: NAD27

Appendix D

Laboratory Analytical Reports and Chain-of-Custody Documentation

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Gil Van Deventer
TRW
415 West Wall Suite 1818
Midland, TX 79701

Report Date: 5/24/00

Project Number: GPM Gas Corp
Project Name: P/G494/3AC
Project Location: Hobbs Booster Station

Order ID Number: A00051302

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to TraceAnalysis, Inc. for analysis:

Sample Number	Sample Description	Matrix	Date Taken	Time Taken	Date Received
146084	MW-7 (0005110930)	Water	5/11/00	9:30	5/13/00
146085	MW-6 (0005111030)	Water	5/11/00	10:30	5/13/00
146086	MW-5 (0005111125)	Water	5/11/00	11:25	5/13/00
146087	MW-1 (0005111210)	Water	5/11/00	12:10	5/13/00
146088	MW-3 (0005111300)	Water	5/11/00	13:00	5/13/00
146089	MW-2 (0005111350)	Water	5/11/00	13:50	5/13/00
146090	MW-8 (0005111450)	Water	5/11/00	14:50	5/13/00
146091	Duplicate (00511520)	Water	5/11/00	15:20	5/13/00
146092	MW-9 (0005111610)	Water	5/11/00	16:10	5/13/00
146093	Trip Blank (729A & 729B)	Water	5/11/00	-	5/13/00

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 9 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical Results Report

Sample Number: 146084
Description: MW-7 (0005110930)

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	<0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02318	QC02723	0.001
Toluene	<0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02318	QC02723	0.001
Ethylbenzene	<0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02318	QC02723	0.001
M,P,O-Xylene	<0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02318	QC02723	0.001
Total BTEX	<0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02318	QC02723	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.564	5	0.1	113	72 - 128	RC	PB02318	QC02723
4-BFB	0.592	5	0.1	118	72 - 128	RC	PB02318	QC02723

Sample Number: 146085
Description: MW-6 (0005111030)

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	<0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02318	QC02723	0.001
Toluene	<0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02318	QC02723	0.001
Ethylbenzene	<0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02318	QC02723	0.001
M,P,O-Xylene	0.038	5	S 8021B	5/18/00	5/18/00	RC	PB02318	QC02723	0.001
Total BTEX	0.038	5	S 8021B	5/18/00	5/18/00	RC	PB02318	QC02723	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.553	5	0.1	111	72 - 128	RC	PB02318	QC02723
4-BFB	0.576	5	0.1	115	72 - 128	RC	PB02318	QC02723

Sample Number: 146086
Description: MW-5 (0005111125)

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	<0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02317	QC02721	0.001
Toluene	<0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02317	QC02721	0.001
Ethylbenzene	<0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02317	QC02721	0.001
M,P,O-Xylene	<0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02317	QC02721	0.001
Total BTEX	<0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02317	QC02721	0.001

* Test Comments - Elevated reporting limits due to silt in the matrix.

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.478	1	0.1	96	72 - 128	RC	PB02317	QC02721
4-BFB	0.491	1	0.1	98	72 - 128	RC	PB02317	QC02721

Sample Number: 146087
Description: MW-1 (0005111210)

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	0.191	5	S 8021B	5/23/00	5/23/00	RC	PB02380	QC02792	0.001
Toluene	0.034	5	S 8021B	5/23/00	5/23/00	RC	PB02380	QC02792	0.001
Ethylbenzene	0.344	5	S 8021B	5/23/00	5/23/00	RC	PB02380	QC02792	0.001
M,P,O-Xylene	0.604	5	S 8021B	5/23/00	5/23/00	RC	PB02380	QC02792	0.001
Total BTEX	1.17	5	S 8021B	5/23/00	5/23/00	RC	PB02380	QC02792	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.431	5	0.1	86	72 - 128	RC	PB02380	QC02792
4-BFB	0.462	5	0.1	92	72 - 128	RC	PB02380	QC02792

Sample Number: 146088
Description: MW-3 (0005111300)

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	0.202	5	S 8021B	5/23/00	5/23/00	RC	PB02380	QC02792	0.001
Toluene	0.022	5	S 8021B	5/23/00	5/23/00	RC	PB02380	QC02792	0.001
Ethylbenzene	0.245	5	S 8021B	5/23/00	5/23/00	RC	PB02380	QC02792	0.001
M,P,O-Xylene	0.291	5	S 8021B	5/23/00	5/23/00	RC	PB02380	QC02792	0.001
Total BTEX	0.76	5	S 8021B	5/23/00	5/23/00	RC	PB02380	QC02792	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.428	5	0.1	86	72 - 128	RC	PB02380	QC02792
4-BFB	0.43	5	0.1	86	72 - 128	RC	PB02380	QC02792

Sample Number: 146089
Description: MW-2 (0005111350)

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	1.33	10	S 8021B	5/18/00	5/18/00	RC	PB02317	QC02721	0.001
Toluene	1.22	10	S 8021B	5/18/00	5/18/00	RC	PB02317	QC02721	0.001
Ethylbenzene	0.309	10	S 8021B	5/18/00	5/18/00	RC	PB02317	QC02721	0.001
M,P,O-Xylene	0.501	10	S 8021B	5/18/00	5/18/00	RC	PB02317	QC02721	0.001
Total BTEX	3.36	10	S 8021B	5/18/00	5/18/00	RC	PB02317	QC02721	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.976	1	0.1	98	72 - 128	RC	PB02317	QC02721
4-BFB	1.01	1	0.1	101	72 - 128	RC	PB02317	QC02721

Sample Number: 146090
Description: MW-8 (0005111450)

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	0.824	50	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001
Toluene	<0.05	50	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001
Ethylbenzene	0.375	50	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001
M,P,O-Xylene	0.742	50	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001

Total BTEX	1.94	50	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	4.17	50	0.1	83	72 - 128	RC	PB02362	QC02769
4-BFB	4.45	50	0.1	89	72 - 128	RC	PB02362	QC02769

Sample Number: 146091
Description: Duplicate (00511520)

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	1.03	200	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001
Toluene	<0.2	200	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001
Ethylbenzene	0.433	200	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001
M,P,O-Xylene	0.816	200	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001
Total BTEX	2.28	200	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	17.1	200	0.1	86	72 - 128	RC	PB02362	QC02769
4-BFB	17.8	200	0.1	89	72 - 128	RC	PB02362	QC02769

Sample Number: 146092
Description: MW-9 (0005111610)

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	0.702	10	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001
Toluene	0.016	10	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001
Ethylbenzene	0.096	10	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001
M,P,O-Xylene	0.208	10	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001
Total BTEX	1.02	10	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.805	10	0.1	81	72 - 128	RC	PB02362	QC02769
4-BFB	0.931	10	0.1	93	72 - 128	RC	PB02362	QC02769

Sample Number: 146093
Description: Trip Blank (729A & 729B)

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	<0.001	1	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001
Toluene	<0.001	1	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001
Ethylbenzene	<0.001	1	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001
M,P,O-Xylene	<0.001	1	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001
Total BTEX	<0.001	1	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.081	1	0.1	81	72 - 128	RC	PB02362	QC02769
4-BFB	0.082	1	0.1	82	72 - 128	RC	PB02362	QC02769

Quality Control Report
Method Blanks

Param	Flag	Blank Result	Reporting Limit	Date Analyzed	Prep Batch #	QC Batch #
Benzene (mg/L)		<0.001	0.001	5/18/00	PB02317	QC02721
Toluene (mg/L)		<0.001	0.001	5/18/00	PB02317	QC02721
Ethylbenzene (mg/L)		<0.001	0.001	5/18/00	PB02317	QC02721
M,P,O-Xylene (mg/L)		<0.001	0.001	5/18/00	PB02317	QC02721
Total BTEX (mg/L)		<0.001	0.001	5/18/00	PB02317	QC02721
Surrogate		Result	Spike Amount	% Rec.	% Rec. Limit	QC Batch #
TFT (mg/L)		0.088	0.1	88	72 - 128	QC02721
4-BFB (mg/L)		0.091	0.1	91	72 - 128	QC02721
Benzene (mg/L)		<0.001	0.001	5/18/00	PB02318	QC02723
Toluene (mg/L)		<0.001	0.001	5/18/00	PB02318	QC02723
Ethylbenzene (mg/L)		<0.001	0.001	5/18/00	PB02318	QC02723
M,P,O-Xylene (mg/L)		<0.001	0.001	5/18/00	PB02318	QC02723
Total BTEX (mg/L)		<0.001	0.001	5/18/00	PB02318	QC02723
Surrogate		Result	Spike Amount	% Rec.	% Rec. Limit	QC Batch #
TFT (mg/L)		0.098	0.1	98	72 - 128	QC02723
4-BFB (mg/L)		0.088	0.1	88	72 - 128	QC02723
Benzene (mg/L)		<0.001	0.001	5/22/00	PB02362	QC02769
Toluene (mg/L)		<0.001	0.001	5/22/00	PB02362	QC02769
Ethylbenzene (mg/L)		<0.001	0.001	5/22/00	PB02362	QC02769
M,P,O-Xylene (mg/L)		<0.001	0.001	5/22/00	PB02362	QC02769
Total BTEX (mg/L)		<0.001	0.001	5/22/00	PB02362	QC02769
Surrogate		Result	Spike Amount	% Rec.	% Rec. Limit	QC Batch #
TFT (mg/L)		0.093	0.1	93	72 - 128	QC02769
4-BFB (mg/L)		0.097	0.1	97	72 - 128	QC02769
Benzene (mg/L)		<0.001	0.001	5/23/00	PB02380	QC02792
Toluene (mg/L)		<0.001	0.001	5/23/00	PB02380	QC02792
Ethylbenzene (mg/L)		<0.001	0.001	5/23/00	PB02380	QC02792
M,P,O-Xylene (mg/L)		<0.001	0.001	5/23/00	PB02380	QC02792
Total BTEX (mg/L)		<0.001	0.001	5/23/00	PB02380	QC02792
Surrogate		Result	Spike Amount	% Rec.	% Rec. Limit	QC Batch #
TFT (mg/L)		0.09	0.1	90	72 - 128	QC02792
4-BFB (mg/L)		0.087	0.1	87	72 - 128	QC02792

Quality Control Report
Lab Control Spikes and Duplicate Spike

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCS	MTBE (mg/L)	<0.001	1	0.1	0.105	105		80 - 120	-	QC02721
LCS	Benzene (mg/L)	<0.001	1	0.1	0.101	101		80 - 120	-	QC02721
LCS	Toluene (mg/L)	<0.001	1	0.1	0.102	102		80 - 120	-	QC02721
LCS	Ethylbenzene (mg/L)	<0.001	1	0.1	0.097	97		80 - 120	-	QC02721
LCS	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.286	95		80 - 120	-	QC02721

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCS	TFT (mg/L)	1	0.1	0.098	98	72 - 128	QC02721
LCS	4-BFB (mg/L)	1	0.1	0.101	101	72 - 128	QC02721

LCSD	MTBE (mg/L)	<0.001	1	0.1	0.1	100	5	-	0 - 20	QC02721
LCSD	Benzene (mg/L)	<0.001	1	0.1	0.098	98	3	-	0 - 20	QC02721
LCSD	Toluene (mg/L)	<0.001	1	0.1	0.098	98	4	-	0 - 20	QC02721
LCSD	Ethylbenzene (mg/L)	<0.001	1	0.1	0.094	94	3	-	0 - 20	QC02721
LCSD	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.277	92	3	-	0 - 20	QC02721

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCSD	TFT (mg/L)	1	0.1	0.096	96	72 - 128	QC02721
LCSD	4-BFB (mg/L)	1	0.1	0.098	98	72 - 128	QC02721

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCS	MTBE (mg/L)	<0.001	1	0.1	0.083	83		80 - 120	-	QC02723
LCS	Benzene (mg/L)	<0.001	1	0.1	0.096	96		80 - 120	-	QC02723
LCS	Toluene (mg/L)	<0.001	1	0.1	0.09	90		80 - 120	-	QC02723
LCS	Ethylbenzene (mg/L)	<0.001	1	0.1	0.091	91		80 - 120	-	QC02723
LCS	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.274	91		80 - 120	-	QC02723

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCS	TFT (mg/L)	1	0.1	0.082	82	72 - 128	QC02723
LCS	4-BFB (mg/L)	1	0.1	0.082	82	72 - 128	QC02723

LCSD	MTBE (mg/L)	<0.001	1	0.1	0.087	87	5	-	0 - 20	QC02723
LCSD	Benzene (mg/L)	<0.001	1	0.1	0.092	92	4	-	0 - 20	QC02723
LCSD	Toluene (mg/L)	<0.001	1	0.1	0.086	86	5	-	0 - 20	QC02723
LCSD	Ethylbenzene (mg/L)	<0.001	1	0.1	0.086	86	6	-	0 - 20	QC02723
LCSD	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.259	86	6	-	0 - 20	QC02723

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCSD	TFT (mg/L)	1	0.1	0.086	86	72 - 128	QC02723
LCSD	4-BFB (mg/L)	1	0.1	0.086	86	72 - 128	QC02723

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCS	MTBE (mg/L)	<0.001	1	0.1	0.093	93		80 - 120	-	QC02769
LCS	Benzene (mg/L)	<0.001	1	0.1	0.095	95		80 - 120	-	QC02769
LCS	Toluene (mg/L)	<0.001	1	0.1	0.1	100		80 - 120	-	QC02769
LCS	Ethylbenzene (mg/L)	<0.001	1	0.1	0.098	98		80 - 120	-	QC02769
LCS	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.303	101		80 - 120	-	QC02769

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCS	TFT (mg/L)	1	0.1	0.09	90	72 - 128	QC02769
LCS	4-BFB (mg/L)	1	0.1	0.096	96	72 - 128	QC02769

LCSD	MTBE (mg/L)	<0.001	1	0.1	0.098	98	5	-	0 - 20	QC02769
LCSD	Benzene (mg/L)	<0.001	1	0.1	0.098	98	3	-	0 - 20	QC02769
LCSD	Toluene (mg/L)	<0.001	1	0.1	0.102	102	2	-	0 - 20	QC02769
LCSD	Ethylbenzene (mg/L)	<0.001	1	0.1	0.101	101	3	-	0 - 20	QC02769
LCSD	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.312	104	3	-	0 - 20	QC02769

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCSD	TFT (mg/L)	1	0.1	0.088	88	72 - 128	QC02769
LCSD	4-BFB (mg/L)	1	0.1	0.096	96	72 - 128	QC02769

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCS	MTBE (mg/L)	<0.001	1	0.1	0.092	92		80 - 120	-	QC02792
LCS	Benzene (mg/L)	<0.001	1	0.1	0.093	93		80 - 120	-	QC02792
LCS	Toluene (mg/L)	<0.001	1	0.1	0.098	98		80 - 120	-	QC02792
LCS	Ethylbenzene (mg/L)	<0.001	1	0.1	0.096	96		80 - 120	-	QC02792
LCS	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.298	99		80 - 120	-	QC02792

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCS	TFT (mg/L)	1	0.1	0.089	89	72 - 128	QC02792
LCS	4-BFB (mg/L)	1	0.1	0.087	87	72 - 128	QC02792

LCSD	MTBE (mg/L)	<0.001	1	0.1	0.092	92	0	-	0 - 20	QC02792
LCSD	Benzene (mg/L)	<0.001	1	0.1	0.094	94	1	-	0 - 20	QC02792
LCSD	Toluene (mg/L)	<0.001	1	0.1	0.099	99	1	-	0 - 20	QC02792
LCSD	Ethylbenzene (mg/L)	<0.001	1	0.1	0.097	97	1	-	0 - 20	QC02792
LCSD	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.304	101	2	-	0 - 20	QC02792

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCSD	TFT (mg/L)	1	0.1	0.089	89	72 - 128	QC02792
LCSD	4-BFB (mg/L)	1	0.1	0.087	87	72 - 128	QC02792

Quality Control Report
Continuing Calibration Verification Standard

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	Benzene (mg/L)		0.1	0.1	100	80 - 120	5/18/00	QC02721
ICV	Toluene (mg/L)		0.1	0.101	101	80 - 120	5/18/00	QC02721
ICV	Ethylbenzene (mg/L)		0.1	0.097	97	80 - 120	5/18/00	QC02721
ICV	M,P,O-Xylene (mg/L)		0.3	0.284	95	80 - 120	5/18/00	QC02721
CCV 1	Benzene (mg/L)		0.1	0.099	99	80 - 120	5/18/00	QC02721
CCV 1	Toluene (mg/L)		0.1	0.1	100	80 - 120	5/18/00	QC02721
CCV 1	Ethylbenzene (mg/L)		0.1	0.096	96	80 - 120	5/18/00	QC02721
CCV 1	M,P,O-Xylene (mg/L)		0.3	0.282	94	80 - 120	5/18/00	QC02721
CCV 2	Benzene (mg/L)		0.1	0.099	99	80 - 120	5/18/00	QC02721
CCV 2	Toluene (mg/L)		0.1	0.101	101	80 - 120	5/18/00	QC02721
CCV 2	Ethylbenzene (mg/L)		0.1	0.096	96	80 - 120	5/18/00	QC02721
CCV 2	M,P,O-Xylene (mg/L)		0.3	0.282	94	80 - 120	5/18/00	QC02721

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	Benzene (mg/L)		0.1	0.091	91	80 - 120	5/18/00	QC02723
ICV	Toluene (mg/L)		0.1	0.093	93	80 - 120	5/18/00	QC02723
ICV	Ethylbenzene (mg/L)		0.1	0.094	94	80 - 120	5/18/00	QC02723
ICV	M,P,O-Xylene (mg/L)		0.3	0.284	95	80 - 120	5/18/00	QC02723
CCV 1	Benzene (mg/L)		0.1	0.082	82	80 - 120	5/18/00	QC02723
CCV 1	Toluene (mg/L)		0.1	0.081	81	80 - 120	5/18/00	QC02723
CCV 1	Ethylbenzene (mg/L)		0.1	0.08	80	80 - 120	5/18/00	QC02723
CCV 1	M,P,O-Xylene (mg/L)		0.3	0.241	80	80 - 120	5/18/00	QC02723
CCV 2	Benzene (mg/L)		0.1	0.106	106	80 - 120	5/18/00	QC02723
CCV 2	Toluene (mg/L)		0.1	0.106	106	80 - 120	5/18/00	QC02723
CCV 2	Ethylbenzene (mg/L)		0.1	0.098	98	80 - 120	5/18/00	QC02723
CCV 2	M,P,O-Xylene (mg/L)		0.3	0.312	104	80 - 120	5/18/00	QC02723

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	Benzene (mg/L)		0.1	0.094	94	80 - 120	5/22/00	QC02769
ICV	Toluene (mg/L)		0.1	0.099	99	80 - 120	5/22/00	QC02769
ICV	Ethylbenzene (mg/L)		0.1	0.1	100	80 - 120	5/22/00	QC02769
ICV	M,P,O-Xylene (mg/L)		0.3	0.308	103	80 - 120	5/22/00	QC02769
CCV 1	Benzene (mg/L)		0.1	0.094	94	80 - 120	5/22/00	QC02769
CCV 1	Toluene (mg/L)		0.1	0.097	97	80 - 120	5/22/00	QC02769
CCV 1	Ethylbenzene (mg/L)		0.1	0.097	97	80 - 120	5/22/00	QC02769
CCV 1	M,P,O-Xylene (mg/L)		0.3	0.299	100	80 - 120	5/22/00	QC02769
CCV 2	Benzene (mg/L)		0.1	0.094	94	80 - 120	5/22/00	QC02769

Quality Control Report
Continuing Calibration Verification Standard

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
CCV 2	Toluene (mg/L)		0.1	0.099	99	80 - 120	5/22/00	QC02769
CCV 2	Ethylbenzene (mg/L)		0.1	0.098	98	80 - 120	5/22/00	QC02769
CCV 2	M,P,O-Xylene (mg/L)		0.3	0.304	101	80 - 120	5/22/00	QC02769

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	Benzene (mg/L)		0.1	0.094	94	80 - 120	5/23/00	QC02792
ICV	Toluene (mg/L)		0.1	0.099	99	80 - 120	5/23/00	QC02792
ICV	Ethylbenzene (mg/L)		0.1	0.098	98	80 - 120	5/23/00	QC02792
ICV	M,P,O-Xylene (mg/L)		0.3	0.308	103	80 - 120	5/23/00	QC02792
CCV 1	Benzene (mg/L)		0.1	0.092	92	80 - 120	5/23/00	QC02792
CCV 1	Toluene (mg/L)		0.1	0.097	97	80 - 120	5/23/00	QC02792
CCV 1	Ethylbenzene (mg/L)		0.1	0.093	93	80 - 120	5/23/00	QC02792
CCV 1	M,P,O-Xylene (mg/L)		0.3	0.292	97	80 - 120	5/23/00	QC02792
CCV 2	Benzene (mg/L)		0.1	0.092	92	80 - 120	5/23/00	QC02792
CCV 2	Toluene (mg/L)		0.1	0.096	96	80 - 120	5/23/00	QC02792
CCV 2	Ethylbenzene (mg/L)		0.1	0.094	94	80 - 120	5/23/00	QC02792
CCV 2	M,P,O-Xylene (mg/L)		0.3	0.291	97	80 - 120	5/23/00	QC02792

#000513

TRW Inc.
Energy & Environmental Systems
415 West Wall St. Suite. 1818
Midland, Texas 79701
(915) 682-0008
FAX: (915) 682-0028

№ 13507

Chain of Custody

Date 5/12/00 Page 1 of 1

Lab Name: TRACE ANALYSIS, INC
Address: 6701 Aberdeen
Lubbock, Tx 79424
Telephone: (800) 378-1296

Samplers (SIGNATURES)

John Ferguson

Analysis Request

Sample Identification	Matrix	Date	Time	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	Total Metals	TCLP Metals									Number of Containers
MW-7 (000511 0930)	Water	5/11/00	0930	√												1460	84									3
MW-6 (000511 1030)	Water	5/11/00	1030	√													85									3
MW-5 (000511 1125)	Water	5/11/00	1125	√													86									3
MW-1 (000511 1210)	Water	5/11/00	1210	√													87									3
MW-3 (000511 1300)	Water	5/11/00	1300	√													88									3
MW-2 (000511 1350)	Water	5/11/00	1350	√													89									3
MW-8 (000511 1450)	Water	5/11/00	1450	√													90									3
Duplicate (000511 1520)	Water	5/11/00	1520	√													91									3
MW-9 (000511 1610)	Water	5/11/00	1610	√													92									3
Trip Blank (7291 + 729B)	Water			√													93									2

Project Information	Sample Receipt
Project Name: GPM Gas Corp	Total Containers:
Project Location: Hobbs Booster Station	COC Seals:
Project Manager: Gil Van Deventer	Rec'd Good Cond/Cold:
Cost Center No.: P/6494/3AC	Conforms to Records:
Shipping ID No.:	Lab No.:
P O No.:	

Special Instructions/Comments: Invoice Direct to GPM
Attn: Mel Driver
Need Result by 5/26/00

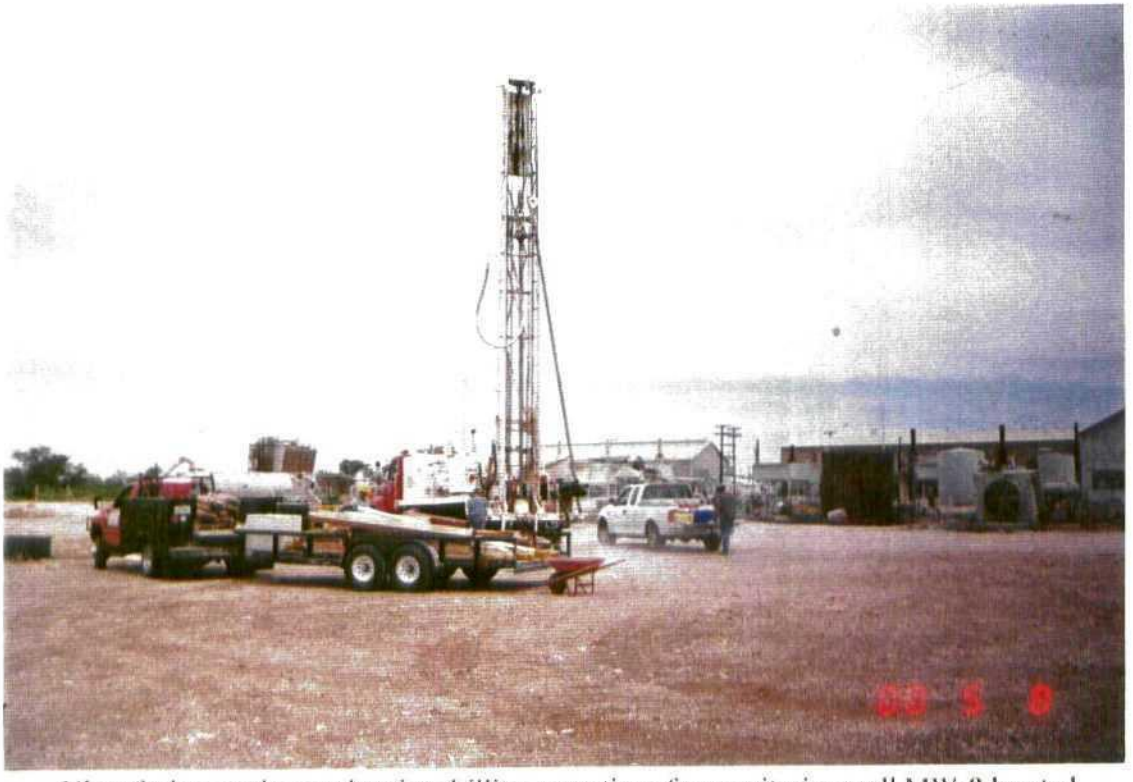
Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
John Ferguson 1640	Helen Shelton 6:30 PM	
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
John Ferguson 5/12/00	HELEN SHELTON 5/12/00	
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
TRW Inc	TRACE ANALYSIS	
(Company)	(Company)	(Company)
Received By: (1)	**Received By: (2)**	**Received By: (3)**
Helen Shelton 1640	4 0	Vicki Heasley
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
HELEN SHELTON 5/12/00		Vicki Heasley 9:00 AM
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
TRACE ANALYSIS		TRACE Analysis 5-13-00
(Company)	(Company)	(Company) 5/23/00

Distribution: White, Canary-Laboratory / Pink-TRW

Appendix E

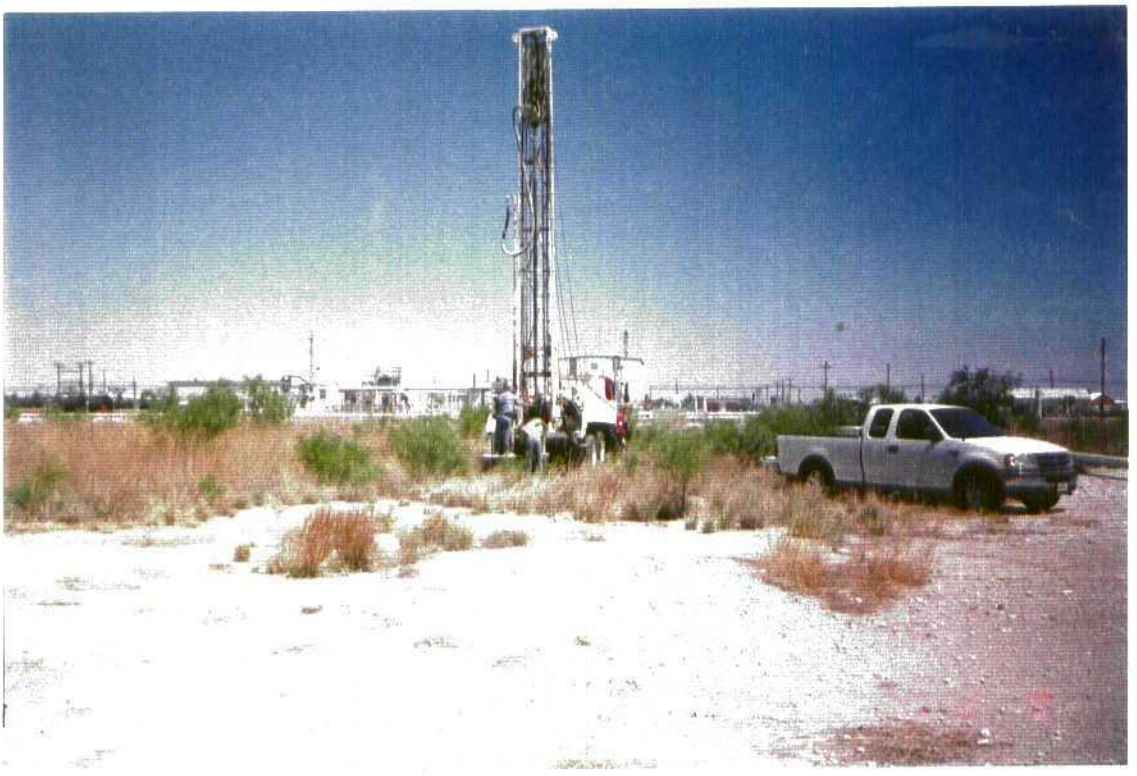
Photodocumentation

View facing west showing drilling operations at upgradient monitoring well MW-7.



View facing northwest showing drilling operations for monitoring well MW-8 located approximately 180 feet upgradient (west) of monitoring well MW-4 and recovery well RW-1.

View facing northwest showing installation of monitoring well MW-9 located approximately 360 feet downgradient (east) of monitoring well MW-4 and recovery well RW-1.



View facing north showing drilling operations at monitoring well MW-11 located approximately 650 feet downgradient (east) of monitoring well MW-1.

View facing northwest showing installation of recovery well RW-1 located adjacent (south) to monitoring well MW-4.

View facing north showing Xitech product recovery system installed at recovery well RW-1.

GPM GAS CORPORATION
SUBSURFACE SOIL AND GROUNDWATER INVESTIGATION
HOBBS BOOSTER STATION
LEA COUNTY, NEW MEXICO

JULY 28, 1999

Prepared For:

GPM Gas Corporation
New Mexico Region
P. O. Box 50020
Midland, Texas 79710

TRW

TRW Systems & Information Technology Group 415 West Wall Street, Suite 1818
Midland, TX 79701

July 28, 1999

Mr. Mel Driver
GPM Gas Corporation
New Mexico Region
P. O. Box 50020
Midland, Texas 79710-0020

RE: SUBSURFACE SOIL AND GROUNDWATER INVESTIGATION
HOBBS BOOSTER STATION, LEA COUNTY, NEW MEXICO

Dear Mr. Driver:

TRW Inc. – Energy & Environmental Systems (TRW) has completed the installation and sampling of six monitoring wells at the Hobbs Booster Station. The investigation was conducted to address concerns of potential releases of petroleum hydrocarbons to the subsurface at 2 locations within the facility, in particular, the slop oil tank and heater treater areas. The concerns were raised by Mr. Jack Ford and Mr. Wayne Price of the New Mexico Oil Conservation Division (OCD) during an on site inspection of observed practices related to the renewal of the discharge plan.

Procedures

Soil Sampling Methods

Drilling and sampling operations for the six monitoring wells were conducted by Diversified Water Well Drilling using an air-rotary drilling rig. Soil samples were collected with a split-spoon sampling tool at 5-foot intervals from 5 feet below ground surface to the top of the water table (approximately 40 feet below ground surface). Each soil sample was field-screened (headspace analysis) using a MiniRAE Model PGM-76IS photoionization detector (PID). Field PID measurements were used to determine the presence of actionable soils (PID reading greater than 100 ppm) as defined in the OCD) "Guidelines for Remediation of Leaks, Spills and Releases" (August 13, 1993). In each borehole, the soil sample that registered the highest PID reading, and/or samples with PID readings above 100 ppm, and the sample immediately above the groundwater table were submitted to Trace Analysis, Inc. of Lubbock, Texas, for analysis. Surface soil samples from 2 of the monitoring wells and at 4 locations downslope from the areas of concern were also submitted for analysis. Soil samples were analyzed at the laboratory for total petroleum hydrocarbons (TPH) using Environmental Protection Agency (EPA) Method 418.1 and benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8021B. Soil samples were placed in 125-milliliter (4-ounce) glass jars with teflon-lined lids sealed with quality assurance/quality control (QA/QC) seals, and preserved at 4°C with zero headspace according to EPA requirements (EPA 600/4-82-029). A chain-of-custody (COC) form documenting sample identification numbers, collection times, and delivery times to the laboratory was completed for each set of samples.

Monitoring Well Construction Methods

The monitoring wells were constructed of 2-inch diameter schedule 40 PVC well casing and 20 feet of 0.020-inch slotted well screen. Approximately 4 to 8 feet of well screen was installed above the water table leaving approximately 12 to 16 feet of well screen below the water table. The screened portion of each monitoring well was surrounded with a filterpack consisting of 8/16

Brady sand that was capped with approximately 20 to 24 feet of bentonite. The remaining 10 feet of annular space in each monitoring well was sealed using a grout composed of portland cement with a 5 percent bentonite mixture, emplaced from the top of the bentonite plug to ground surface. A 2-foot by 2-foot concrete pad was constructed at the surface and the top of casing protected with an above ground, locked steel well cover. The monitoring well construction diagrams are provided in Attachment A. The monitoring well and soil borings locations and elevations were surveyed by John West Engineering of Hobbs, New Mexico. A copy of the survey plat is included in Attachment B.

Groundwater Sampling Methods

The monitoring wells were gauged for depth to groundwater using a Solinst Model 101 electronic water indicator. If light non-aqueous phase liquids (LNAPL, condensate) was present in the well, a Heron Model H.01L oil/water interface probe was used to measure product thickness.

Immediately prior to collecting groundwater samples, each monitoring well was purged using a decontaminated 2-inch diameter submersible pump. A total of approximately 165 gallons was purged from all the on-site monitoring wells. Field parameters, including pH, conductivity, temperature, and dissolved oxygen were measured during purging, and groundwater samples collected after these parameters stabilized.

Water samples collected from monitoring wells MW-1, MW-2, MW-3, MW-5, and MW-6 for laboratory analysis were transferred into air-tight, septum-sealed, 40-milliliter glass VOA sample vials with zero headspace for analysis of total BTEX (EPA Method 8021B). Monitoring well MW-4 was not sampled due to the presence of LNAPL. For each set of samples, chain of custody forms documenting sample identification numbers, collection times, and delivery times to the laboratory were completed. All water samples were placed in an ice-filled cooler immediately after collection and transported to Trace Analysis, Inc. in Lubbock, Texas.

Local Geology

The lithology of the subsurface soils in monitoring wells MW-1 through MW-6 was similar. Generally, the unsaturated zone is composed of a hard, weathered and fractured, light gray caliche layer to a depth of approximately 7 to 18 feet. A hard pale brown siliceous sandstone stringer (approximately 2 feet thick) occurred at approximately 16 to 18 feet. Below the sandstone unit, an approximately 10 to 25-foot thick light brownish gray, very fine-grained calcareous sand was present. This unit changed gradationally with depth to a fine-grained noncalcareous sand. Thin stringers of siliceous sandstone were present at various depths in the borings. Groundwater was encountered in the light brown, fine-grained sand unit at depths ranging from 37 to 43 feet below ground surface. The groundwater encountered at the site is that of the Ogallala Formation. A detailed description of the subsurface soils is provided on the lithologic logs in Attachment A.

Soil Sample Analytical Results

During soil sampling operations, PID readings (Attachment A) ranged from 0 ppm in various intervals of all borings to 154 ppm in the 40 to 41-foot interval of MW-2. Soil sample analytical results are summarized in Table 1. Laboratory analytical reports and the COC documentation are provided in Attachment C.

Laboratory analyzed BTEX concentrations were below the laboratory detection limit of 0.050 mg/kg, with the exception of minor concentrations of toluene, ethylbenzene, and xylene detected in monitoring well MW-1 and surface samples HB-3 and HB-4.

Based on a Category I ranking for the site (> 19 points), none of the samples exceeded the OCD recommended action level of 10 ppm for benzene or 50 ppm for BTEX. The 100 ppm standard for TPH was exceeded in the surface samples of MW-1 (49,000 mg/kg), MW-5 (638 mg/kg), HB-3 (37,500 mg/kg), and HB-4 (69,300 mg/kg). Only one subsurface sample, 42-foot depth in MW-1 (254 mg/kg), exceeded the TPH standard, however this sample was collected in the saturated zone of the monitoring well.

Table 1
Summary of BTEX and TPH Concentrations in Soil Borings
GPM Hobbs Booster Station

Monitoring Well	Sample Depth (feet)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	TPH (mg/kg)
MW-1	Surface	< 0.050	0.052	0.074	0.488	**49,700**
	42	< 0.050	< 0.050	< 0.050	< 0.050	**254**
MW-2	15	< 0.050	< 0.050	< 0.050	< 0.050	< 10
	40	< 0.050	< 0.050	< 0.050	< 0.050	13
MW-3	40	< 0.050	< 0.050	< 0.050	< 0.050	< 10
MW-4	40	< 0.050	< 0.050	< 0.050	< 0.050	73
MW-5	Surface	< 0.050	< 0.050	< 0.050	< 0.050	**638**
	40	< 0.050	< 0.050	< 0.050	< 0.050	< 10
MW-6	40	< 0.050	< 0.050	< 0.050	< 0.050	< 10
HB-1	Surface	< 0.050	< 0.050	< 0.050	< 0.050	**559**
HB-2	Surface	< 0.050	< 0.050	< 0.050	< 0.050	< 10
HB-3	Surface	< 0.050	0.104	0.286	2.610	**37,500**
HB-4	Surface	< 0.050	< 0.050	< 0.050	0.346	**69,300**

Analyses performed by Trace Analysis, Inc., Lubbock, Texas.
All samples analyzed for BTEX using EPA Method 8021B.
Values in boldface type indicate concentrations exceed remediation action levels as specified by the NMOCD in Guidelines For Remediation of Leaks, Spills and Releases (August 13, 1993) for sites with a NMOCD ranking score greater than 19 points

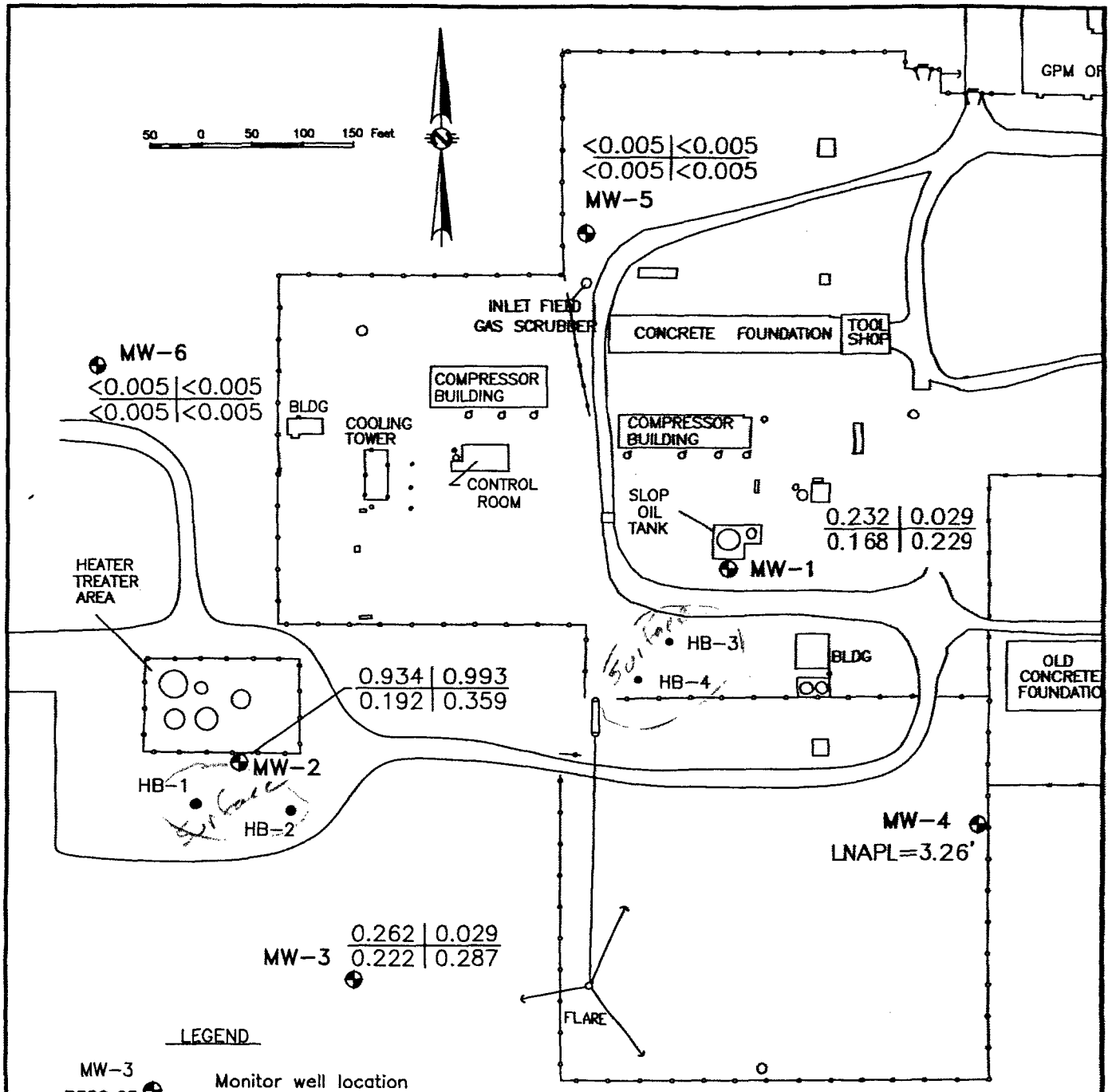
Groundwater Analytical Results

Groundwater sample analytical results for the June 17, 1999 sampling event are presented in Table 2. The New Mexico Water Control Commission (WQCC) standards are presented for comparison. Those constituents that recorded concentrations above the WQCC standards are highlighted in boldface type. The BTEX concentrations in groundwater are depicted graphically in Figure 1. During this sampling event, the groundwater samples obtained from upgradient monitoring wells MW-5 and MW-6 had BTEX concentrations below the laboratory detection limit of 0.005 mg/l. The WQCC standard of 0.010 mg/L for benzene was exceeded in MW-1 (0.232 mg/L), MW-2 (0.934 mg/L), and MW-3 (0.262 mg/L). The WQCC standard of 0.75 mg/L for toluene was exceeded in MW-2 (0.993 mg/L). All other BTEX constituents for the sampled monitoring wells were below WQCC standards. Samples were not collected from MW-4 due to the presence of LNAPL (condensate).

Table 2
Summary of BTEX Concentrations in Groundwater
Monument Booster Station

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-1	06/17/99	**0.232**	0.029	0.168	0.229
MW-2	06/17/99	**0.934**	**0.993**	0.192	0.359
MW-3	06/17/99	**0.262**	0.029	0.222	0.287
MW-4	06/17/99	LNAPL	LNAPL	LNAPL	LNAPL
MW-5	06/17/99	< 0.005	< 0.005	< 0.005	< 0.005
MW-6	06/18/99	< 0.005	< 0.005	< 0.005	< 0.005
WQCC Standards		0.010	0.75	0.75	0.62

Analyses performed by Trace Analysis, Inc., Lubbock, Texas.
All samples analyzed for BTEX using EPA Method 8021B.
Values listed in **boldface** type indicate concentrations exceed New Mexico Water Quality Control Commission (WQCC) standards.
LNAPL - No sample analyzed due to presence of Light Non-Aqueous Phase Liquid.



LEGEND

MW-3
3582.25 — Monitor well location
Groundwater elevation

B | T
E | X

B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes

HB-1 — Surface sample location

Samples collected June 17–18, 1999
LNAPL indicates light non-aqueous phase liquids (thickness listed in feet)
Concentrations listed in milligrams/liter (mg/L)

CLIENT: GPM–HOBBS BOOSTER STA.	
DATE: 06/18/99	REV. NO.: 1
AUTHOR: GJV	DRN BY: DLopez
CK'D BY: DTL	SCALE: 1"= 150'

FIGURE 1
BTEX CONCENTRATION IN GROUNDWATER

TRW\hobbs\btex061899

Groundwater Gradient

Depth to groundwater occurs at approximately 38 to 43 feet below ground surface at the site. Groundwater elevations for the June 17, 1999 sampling event are summarized in Table 3. A groundwater gradient map indicating the direction of groundwater flow is illustrated in Figure 2. The groundwater gradient direction is to the east with a hydraulic gradient of approximately 0.004 ft/ft.

Table 3
Summary of Groundwater Level Measurements
GPM Hobbs Booster Station

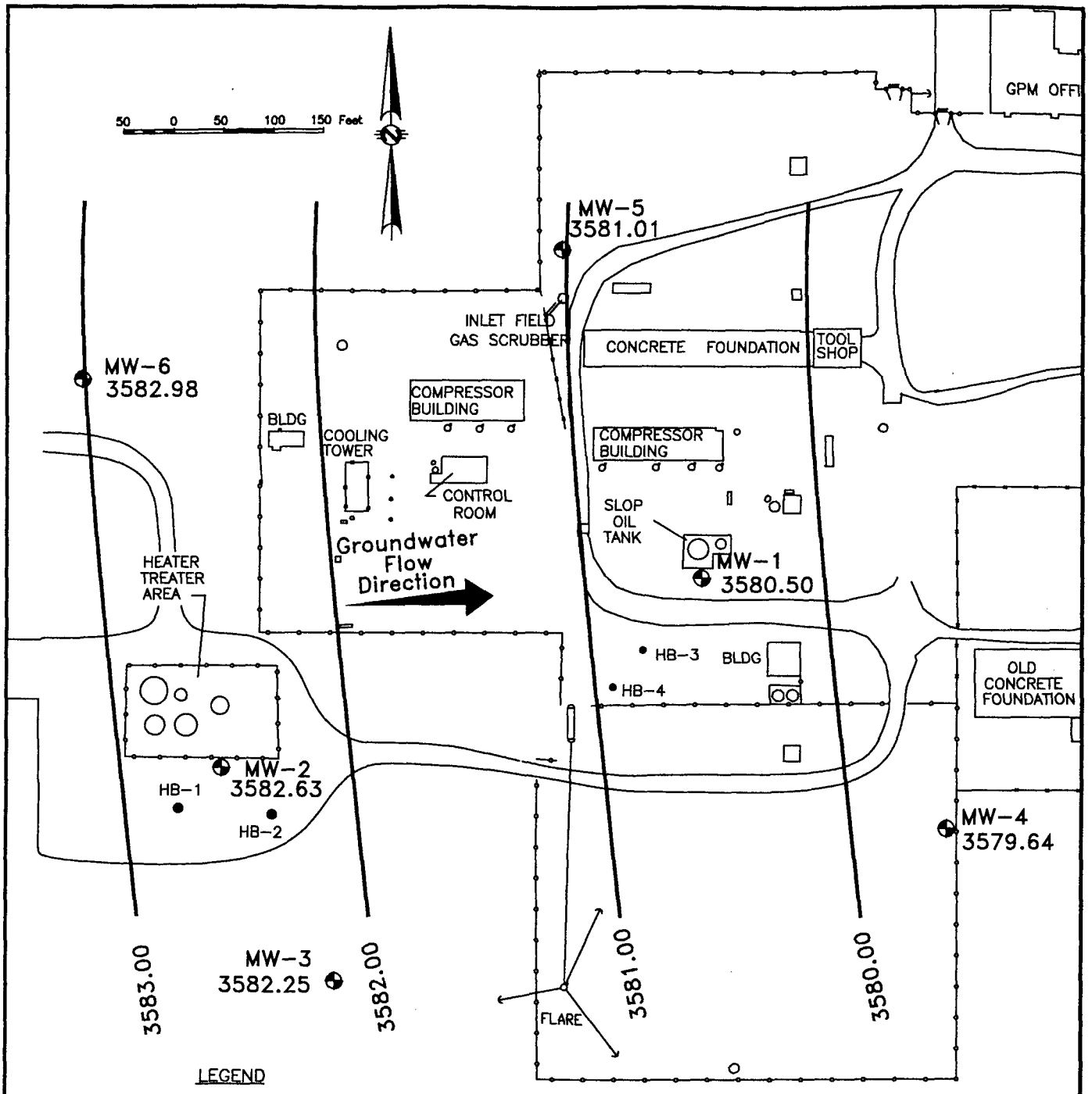
Monitoring Well	Date Gauged	Ground Surface Elevation (feet AMSL)	Top of Casing Elevation (feet AMSL)	Depth to Groundwater (feet AMSL)	Depth to LNAPL (feet AMSL)	LNAPL Thickness (feet)	Corrected Groundwater Elevation (feet AMSL)
0	07/08/99	3623.60	3626.06	45.56	ND	0.00	3580.50
MW-2	07/08/99	3620.65	3623.14	40.51	ND	0.00	3582.63
MW-3	07/08/99	3620.08	3623.01	40.76	ND	0.00	3582.25
MW-4	07/08/99	3621.66	3624.29	46.86	43.60	3.26	3579.64
MW-5	07/08/99	3626.30	3629.16	48.15	ND	0.00	3581.01
MW-6	07/08/99	3624.14	3626.93	43.95	ND	0.00	3582.98

LNAPL = Light Non-Aqueous Phase Liquid
AMSL = Above Mean Sea Level
ND = Not Detected
Corrected Groundwater Elevation = Casing Elevation - Depth to Groundwater + (LNAPL Thickness x Specific Gravity of LNAPL)
Specific Gravity of LNAPL = 0.6773
Groundwater flow is to the east with a gradient of approximately 0.004 ft/ft.

Conclusions

The results of this subsurface soil and groundwater investigation at the Hobbs Booster Station are summarized as follows:

- The WQCC standard of 0.010 mg/L for benzene in groundwater was exceeded in MW-1, MW-2, and MW-3.
- The WQCC standard of 0.75 mg/L for toluene in groundwater was exceeded in MW-2.
- Approximately 3.26 feet of LNAPL (condensate) was observed in monitoring well MW-4.
- The OCD recommended action level of 100 ppm for TPH in soil was exceeded in surface samples collected from MW-1, MW-5, HB-3, and HB-4.



LEGEND

MW-3 3582.25 — Monitor well location, Groundwater elevation

3583.00 — Ground water elevation contour (interval = 1.00 feet)

HB-1 — Surface sample location

Measurements obtained on June 18, 1999 .
Water table elevations are in feet AMSL

TRW	CLIENT: GPM–HOBBS BOOSTER STA.	
	DATE: 06/18/99	REV. NO.: 1
	AUTHOR: GJV	DRN BY: DLopez
	CK'D BY: DTL	SCALE: 1"= 150'

FIGURE 2
GROUNDWATER
ELEVATION MAP

TRW\hobbs\grw061899

Recommendations

Remediation of the TPH in the shallow soil around the identified areas of impact (slop oil tank and heater treater) should be relatively straightforward by employing one of the three options listed below.

- Excavate soil and landfarm on site
- Excavate soil and transport to an OCD-approved landfill/treatment facility
- Mix and till in place and enhance in situ biodegradation using a product, such as Micro-Blaze™

Before remedial action of the groundwater can be addressed, further horizontal delineation is recommended in the downgradient (east) and cross-gradient (south) directions. Also, the release source of condensate that was observed in monitoring well MW-4 should be investigated further.

Sincerely,

Gilbert J. Van Deventer, REM

Attachments

cc: Tony Canfield, GPM - Oil Center, NM
Jack Ford, OCD - Santa Fe, NM
Bill Olson, OCD - Santa Fe, NM
Donna Williams, OCD - Hobbs, NM

ATTACHMENTS

ATTACHMENT A

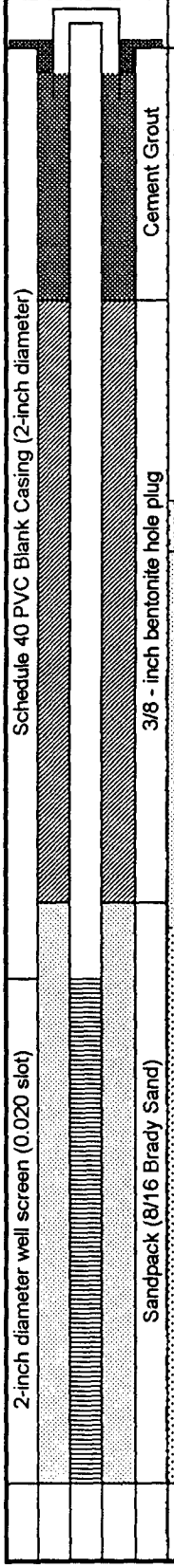
LITHOLOGIC LOGS AND

MONITORING WELL CONSTRUCTION DIAGRAMS

LITHOLOGIC LOG (MONITORING WELL)

TRW
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW - 1	TOTAL DEPTH:	57 Feet
SITE ID:	GPM - Hobbs Booster Station	CLIENT:	GPM Gas Corp.
SURFACE ELEVATION:	3623.60	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	06/15/99	FIELD REP.:	GJV
COMPLETION DATE:	06/15/99	FILE NAME:	/GPM/Hobbs/Hobbs-Logs.xls
COMMENTS:	Located adjacent to south side of berm surrounding slop oil tank.		

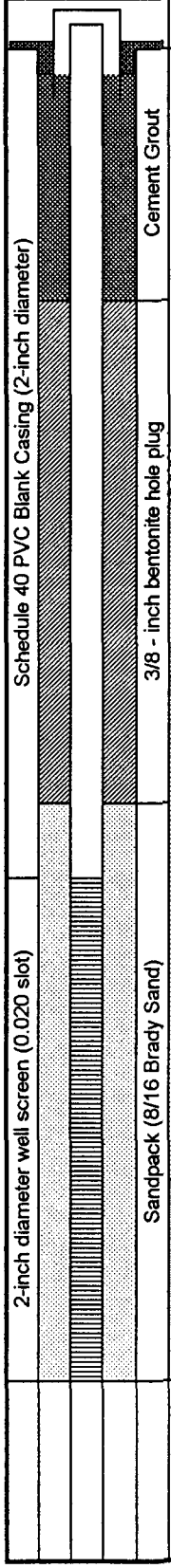


LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
		0	0920	Surface	1.7		
		5	0945	Cuttings	0	5	Caliche, light gray, indurated
	CAL	10	0955	Split Spoon	5.8	10	Caliche, light brownish gray, hard
		15	1000	Split Spoon	5.0	15	Caliche, light brownish gray, hard
	SS	20	1005	Cuttings	0	20	Sandstone (siliceous), pale brown, very hard stringer
							Light brownish gray, very fine-grained calcareous sand
		25	1010	Cuttings	0	25	Light brownish gray, very fine-grained calcareous sand, with very hard siliceous sandstone stringers
	SM/SS	30	1015	Cuttings	0	30	Light brownish gray, very fine-grained calcareous sand, with very hard siliceous sandstone stringers
		35	1020	Split Spoon	0	35	
							Light brown, fine-grained sand, poor to moderate sorting, subangular
		40	1050	Split Spoon	0	40	
		42	1100	Cuttings	95		Driller noted slight odor at approx. 41 feet
							Groundwater encountered at approx. 43 feet
	SW					45	Light brown, fine-grained sand, poor to moderate sorting, subangular
						50	Light brown, fine-grained sand, poor to moderate sorting, subangular
						55	Light brown, fine-grained sand, poor to moderate sorting, subangular
							Bottom of boring at 57 feet below ground surface
						60	

LITHOLOGIC LOG (MONITORING WELL)

TRW
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW - 2	TOTAL DEPTH:	53 Feet
SITE ID:	GPM - Hobbs Booster Station	CLIENT:	GPM Gas Corp.
SURFACE ELEVATION:	3623.14	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	06/15/99	FIELD REP.:	GJV
COMPLETION DATE:	06/15/99	FILE NAME:	/GPM/HOBBS\logs.xls
COMMENTS:	Located adjacent to south side of fence surrounding the heater treater area		

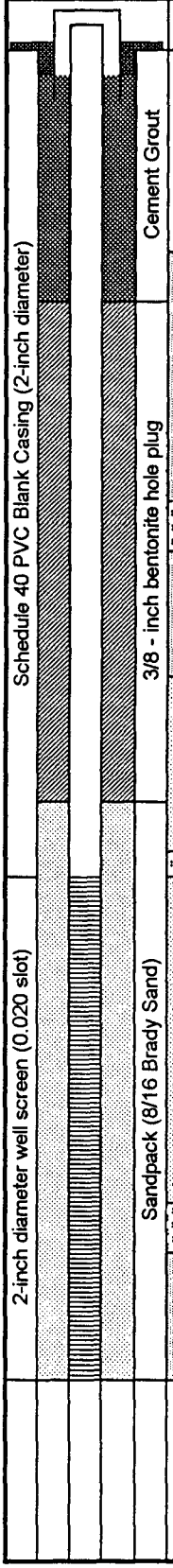


LITH.	USCS	Sample Depth	Time	Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
		0	1130	Surface	0		Caliche, light gray, very hard
		5	1140	Cuttings	23.8	5	Caliche, light gray, very hard
	CAL	10	1145	Split Spoon	5	10	Caliche, light gray, with minor amounts of very fine-grained sand, hard
		15	1155	Split Spoon	32.7	15	
	SS						Sandstone, pale brown, hard
	SM	20	1210	Split Spoon	2.3	20	Light brownish gray, very fine-grained calcareous sand, with very hard siliceous sandstone stringers
		25	1215	Split Spoon	1.3	25	
							Light brown, fine-grained calcareous sand
		30	1220	Split Spoon	1.5	30	Light brown, fine-grained calcareous sand
	SM	35	1240	Split Spoon	59.7	35	Light brown, fine-grained calcareous sand, with very hard siliceous sandstone stringers, slight hydrocarbon odor
							Groundwater encountered at approx. 38 feet
		40	1252	Split Spoon	154	40	Light brown, fine-grained calcareous sand, with very hard siliceous sandstone stringers, slight hydrocarbon odor
						45	
	SW						Light brownish gray, fine-grained sand, moderate hydrocarbon ododr
						50	Light brownish gray, fine-grained sand, moderate hydrocarbon ododr
							Bottom of boring at 53 feet below ground surface
						55	
						60	

LITHOLOGIC LOG (MONITORING WELL)

TRW
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW - 3	TOTAL DEPTH:	53 Feet
SITE ID:	GPM - Hobbs Booster Station	CLIENT:	GPM Gas Corp.
SURFACE ELEVATION:	3623.01	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	06/15/99	FIELD REP.:	GJV
COMPLETION DATE:	06/16/99	FILE NAME:	/GPM/HOBBS\logs.xls
COMMENTS:	Located approximately 250 feet southeast of heater treater area		

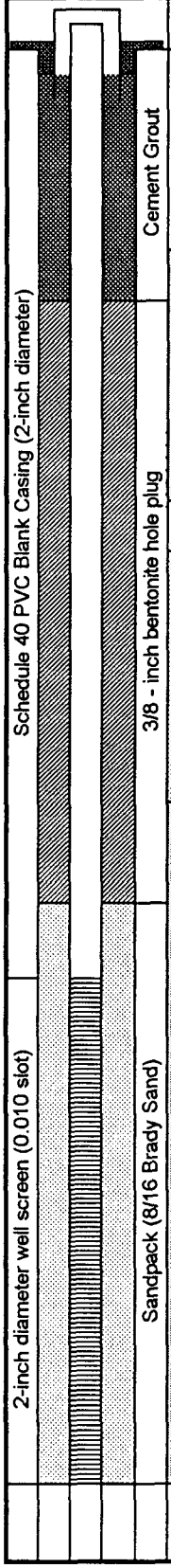


LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
		0	1610	Surface	0		Caliche, light gray, very hard
	CAL	5	1630	Cuttings	0	5	Caliche, light gray, very hard
		10	1640	Split Spoon	0	10	Caliche, light gray, with minor amounts of very fine-grained sand, hard
	CAL /SM	15	1645	Split Spoon	0	15	
	SS	20	1700	Split Spoon	0	20	Sandstone (siliceous), pale brown, hard
	CAL /SM	25	1710	Split Spoon	0	25	Caliche, light gray, with minor amounts of very fine-grained sand, less indurated
	SM	30	1717	Split Spoon	0	30	Light brown, very fine-grained calcareous sand
	SS						Sandstone (siliceous), pale brown, hard
	SM	35	1725	Split Spoon	0	35	Light brown, fine-grained calcareous sand
		40	1735	Split Spoon	91	40	Groundwater encountered at approx. 37 feet Light brown, fine-grained calcareous sand slight hydrocarbon odor
						45	Light brown, fine-grained calcareous sand
	SS						Sandstone (siliceous), pale brown, hard
	SW					50	Light brownish gray, fine-grained sand
						55	Bottom of boring at 53 feet below ground surface
						60	

LITHOLOGIC LOG (MONITORING WELL)

TRW
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW - 4	TOTAL DEPTH:	57 Feet
SITE ID:	GPM - Hobbs Booster Station	CLIENT:	GPM Gas Corp.
SURFACE ELEVATION:	3624.29	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	06/16/99	FIELD REP.:	GJV
COMPLETION DATE:	06/16/99	FILE NAME:	/GPM/HOBBS\logs.xls
COMMENTS:	Located approx. 350 southeast of slop oil tank area and adjacent to fence line.		

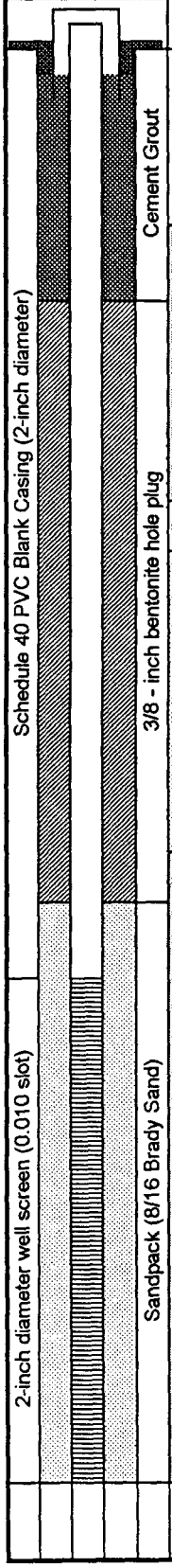


LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
		0	1015	Surface	0		Caliche, light gray, very hard
	CAL	5	1025	Cuttings	0	5	Caliche, light gray, very hard
		10	1040	Cuttings	0	10	Caliche, light gray, with minor amounts of very fine-grained sand, hard
	CAL /SM	15	1050	Split Spoon	0	15	
	SS	20	1055	Split Spoon	0	20	Sandstone (siliceous), pale brown, hard
	SM	25	1105	Split Spoon	0	25	Light brownish gray, very fine-grained calcareous sand
		30	1110	Split Spoon	0	30	Light brownish gray, very fine-grained calcareous sand
		35	1120	Split Spoon	0	35	Light brown, fine-grained sand
	SW	40	1130	Split Spoon	9.1	40	Light brown, fine-grained sand, slight hydrocarbon odor
							Groundwater encountered at approx. 42 feet
						45	Light brown, fine-grained sand, strong hydrocarbon odor
						50	Light brown, fine-grained sand, strong hydrocarbon odor
						55	Light brown, fine-grained sand, strong hydrocarbon odor
							Bottom of boring at 57 feet below ground surface
						60	

LITHOLOGIC LOG (MONITORING WELL)

TRW
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW - 5	TOTAL DEPTH:	57 Feet
SITE ID:	GPM - Hobbs Booster Station	CLIENT:	GPM Gas Corp.
SURFACE ELEVATION:	3623.87	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	06/16/99	FIELD REP.:	GJV
COMPLETION DATE:	06/16/99	FILE NAME:	/GPM/HOBBS\logs.xls
COMMENTS:	Located approx. 350 northwest of slop oil tank area (40 feet north of scrubber).		

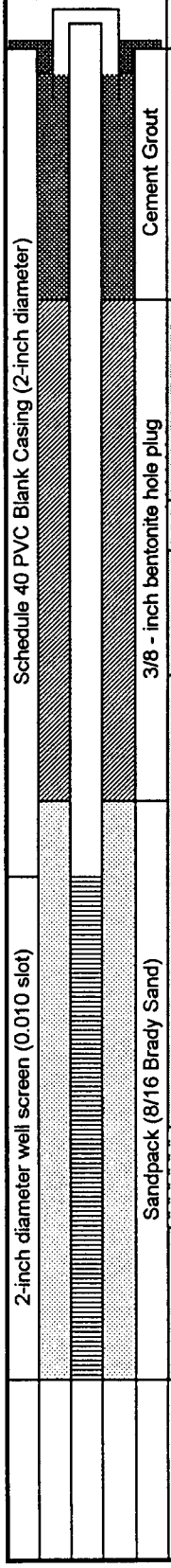


LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
		0	1440	Surface	22.5		Caliche, light gray, very hard
	CAL	5	1455	Cuttings	0	5	Caliche, light gray, very hard
		10	1500	Split Spoon	0	10	Caliche, light gray, with minor amounts of very fine-grained sand, hard
	CAL /SM	15	1510	Split Spoon	0	15	
	SS	20	1515	Split Spoon	0	20	Sandstone (siliceous), pale brown, hard
							Light brownish gray, very fine-grained calcareous sand
	SM	25	1540	Split Spoon	0	25	Light brownish gray, very fine-grained calcareous sand
		30	1550	Split Spoon	0	30	Light brownish gray, very fine-grained calcareous sand
		35	1555	Split Spoon	0	35	Light brown, fine-grained sand
		40	1605	Split Spoon	0	40	Light brown, fine-grained sand
	SW					45	Groundwater encountered at approx. 45 feet
						50	Light brown, fine-grained sand
						55	Light brown, fine-grained sand
							Bottom of boring at 57 feet below ground surface
						60	

LITHOLOGIC LOG (MONITORING WELL)

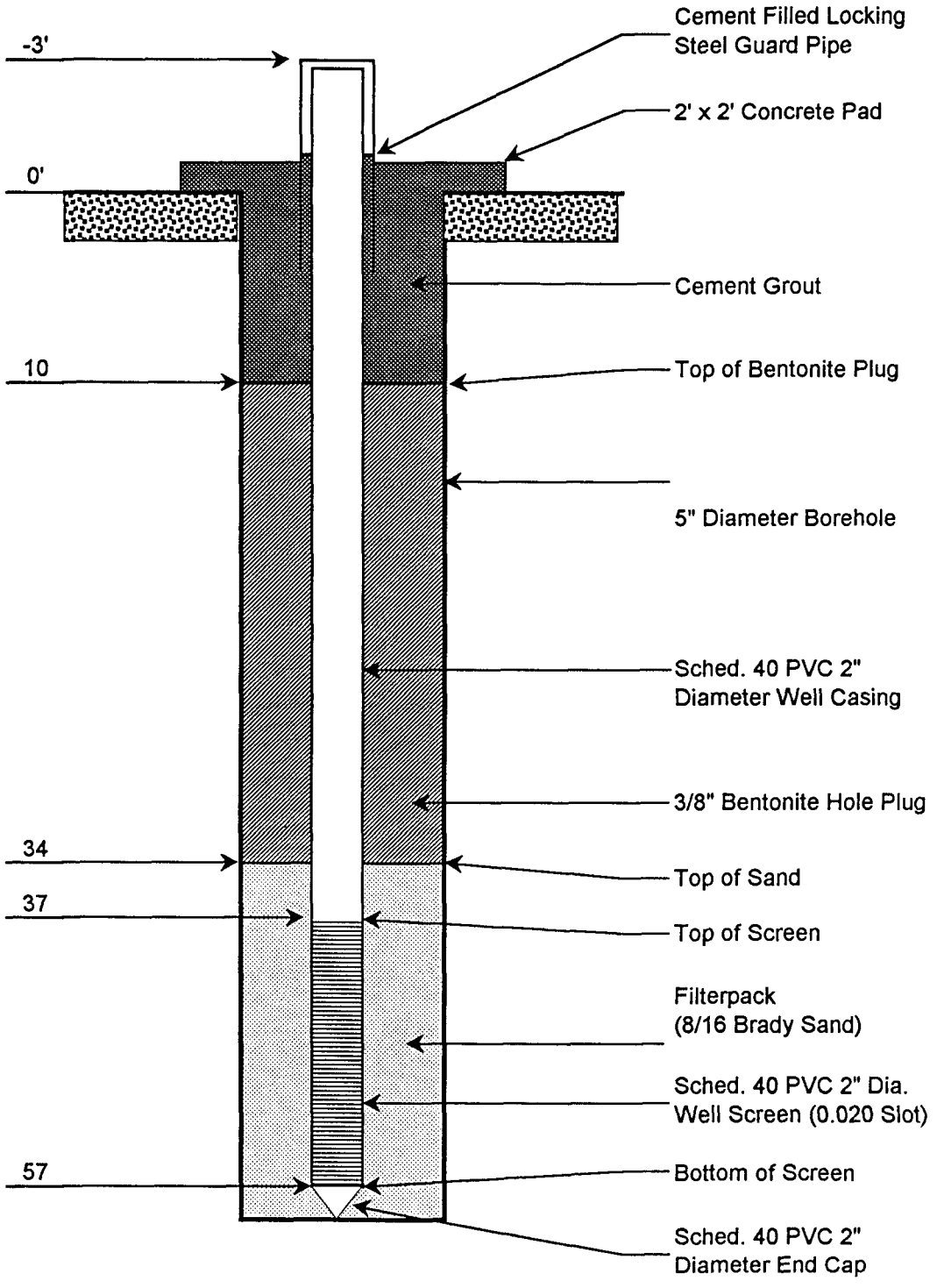
415 WEST WALL
SUITE 1818
MIDLAND, TEXAS 79701

MONITOR WELL NO.:	MW - 6	TOTAL DEPTH:	53 Feet
SITE ID:	GPM - Hobbs Booster Station	CLIENT:	GPM Gas Corp.
SURFACE ELEVATION:	3624.14	COUNTY:	Lea
CONTRACTOR:	Diversified Water Well Drilling	STATE:	New Mexico
DRILLING METHOD:	Air Rotary	LOCATION:	NW 1/4 Sec. 4, T19S, R38E
START DATE:	06/16/99	FIELD REP.:	GJV
COMPLETION DATE:	06/17/99	FILE NAME:	/GPM/HOBBS\logs.xls
COMMENTS:	Located ~ 420 ft northwest of heater treater area (~ 140 ft north of Altura gas well).		



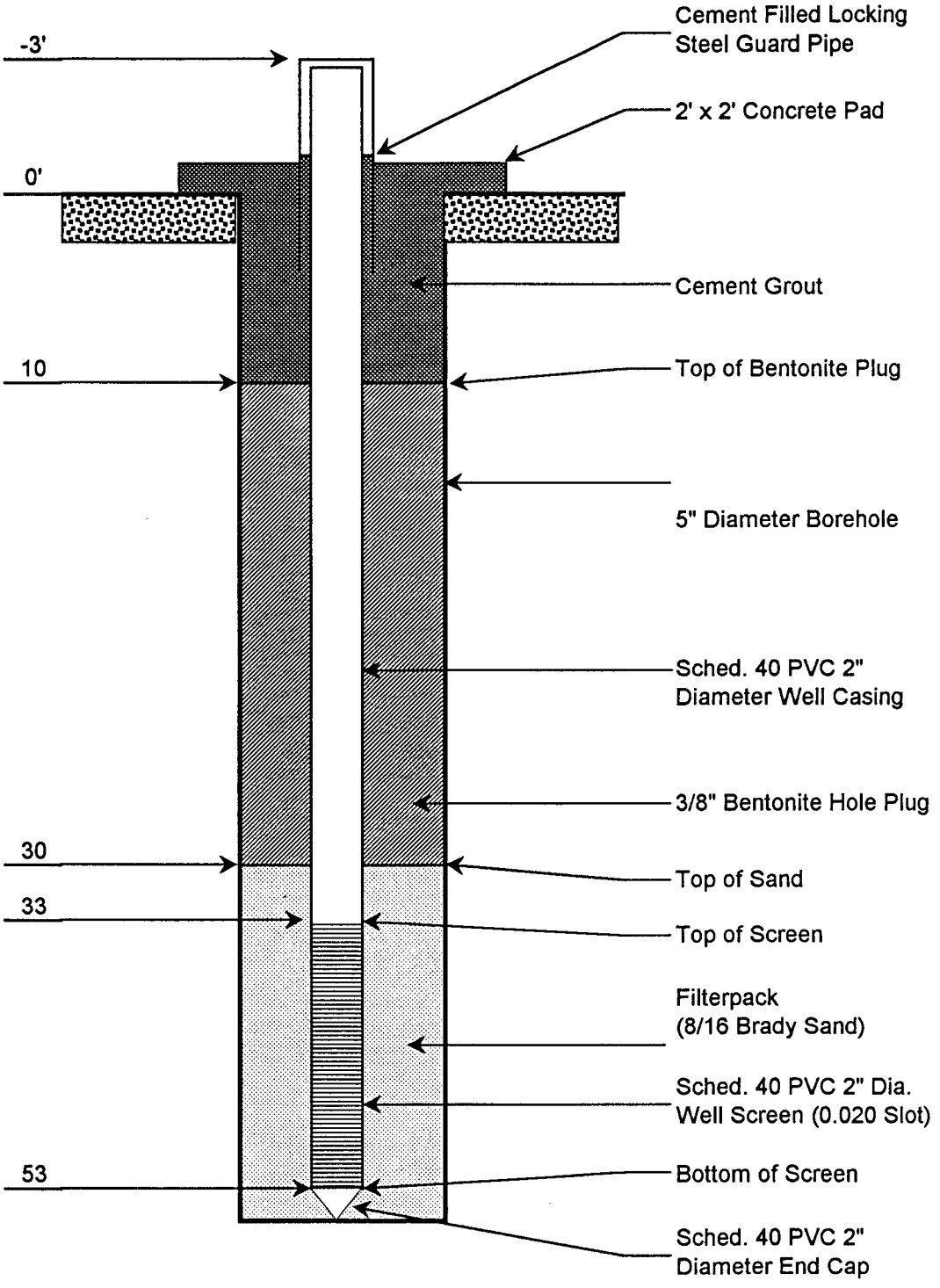
LITH.	USCS	Sample Depth	Sample Time	Sample Type	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
		0	1725	Surface	0		
	CAL	5	1730	Cuttings	0	5	Caliche, grayish orange pink, very hard
		10	1747	Split Spoon	0	10	
	CAL /SM	15	1755	Split Spoon	0	15	Caliche, light gray, with minor amounts of very fine-grained sand, hard
	SS	20	1805 6-15-99	Split Spoon	0	20	Sandstone (siliceous), pale brown, hard
	SM						Light brownish gray, very fine-grained calcareous sand
		25	0800 6-16-99	Split Spoon	0	25	Light brown, fine-grained sand
		30	0805	Split Spoon	0	30	Light brown, fine-grained sand
	SW	35	0812	Split Spoon	0	35	Light brown, fine-grained sand
							Groundwater encountered at approx. 38 feet
		40	0820	Split Spoon	91	40	Light brown, fine-grained sand
	SS					45	Sandstone (siliceous), pale brown, hard
	SW					50	Light brown, fine-grained sand
							Bottom of boring at 53 feet below ground surface
						55	
						60	

MONITORING WELL CONSTRUCTION DIAGRAM (MW-1)



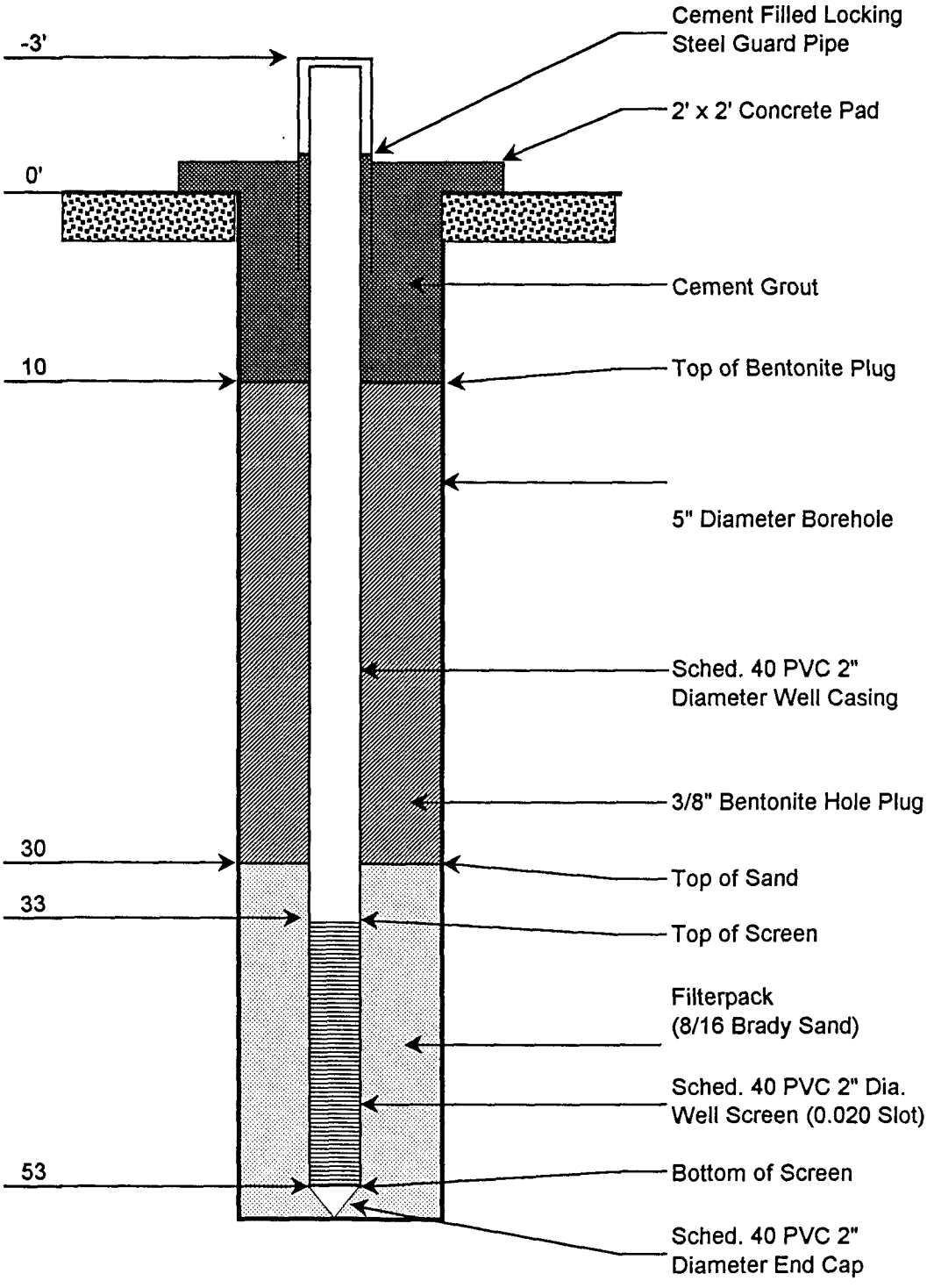
TRW Energy & Environmental Systems	SITE: GPM - Hobbs Booster Station		**MW-1 Monitoring Well Construction Diagram**
	DATE: 06/15/99	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: GJV	
	CK'D BY: DTL	FILE: Well Bore Diagram	

MONITORING WELL CONSTRUCTION DIAGRAM (MW-2)



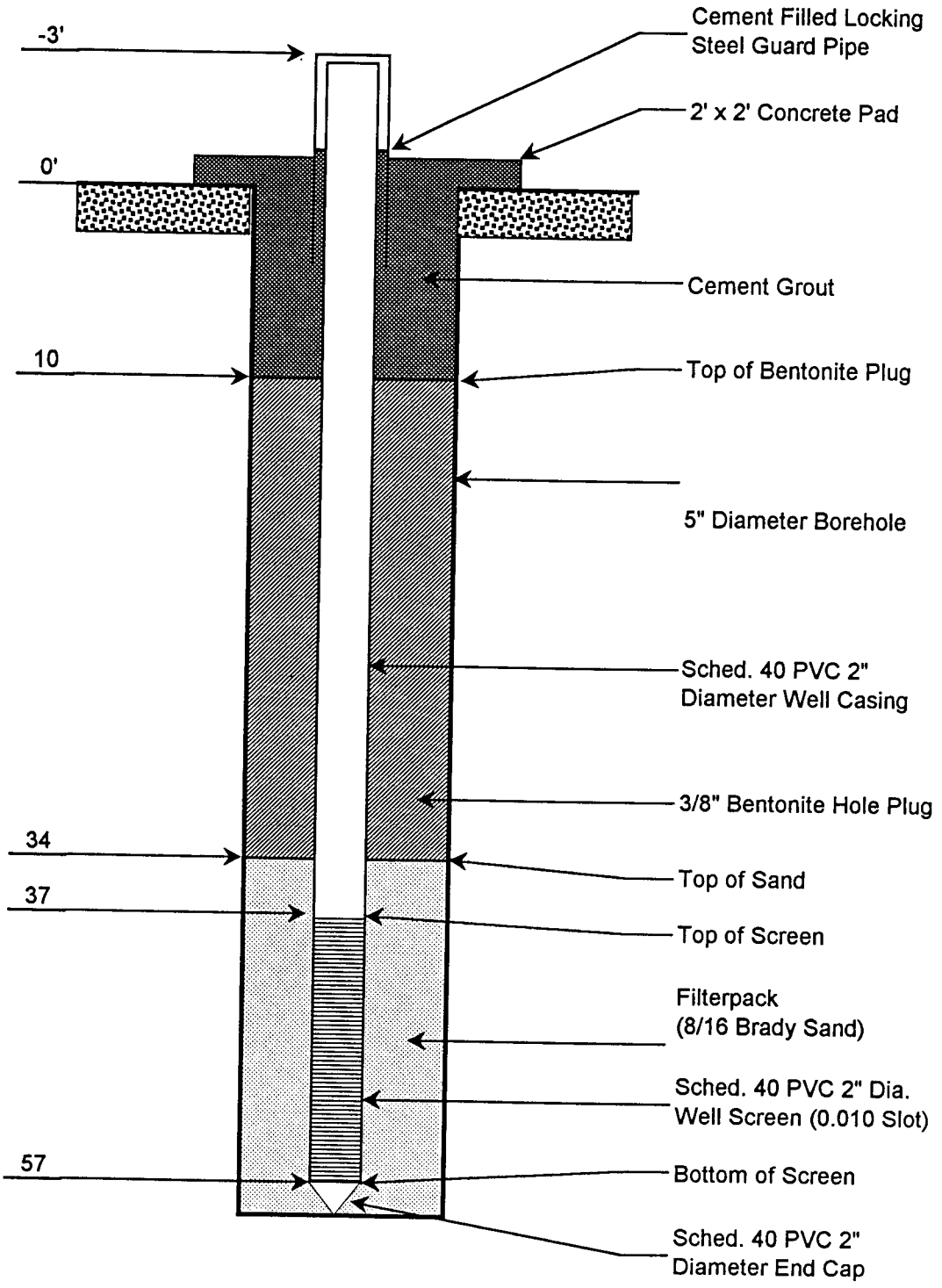
TRW Energy & Environmental Systems	SITE: GPM - Hobbs Booster Station		**MW-2 Monitoring Well Construction Diagram**
	DATE: 06/15/99	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: GJV	
	CK'D BY: DTL	FILE: Well Bore Diagram	

MONITORING WELL CONSTRUCTION DIAGRAM (MW-3)



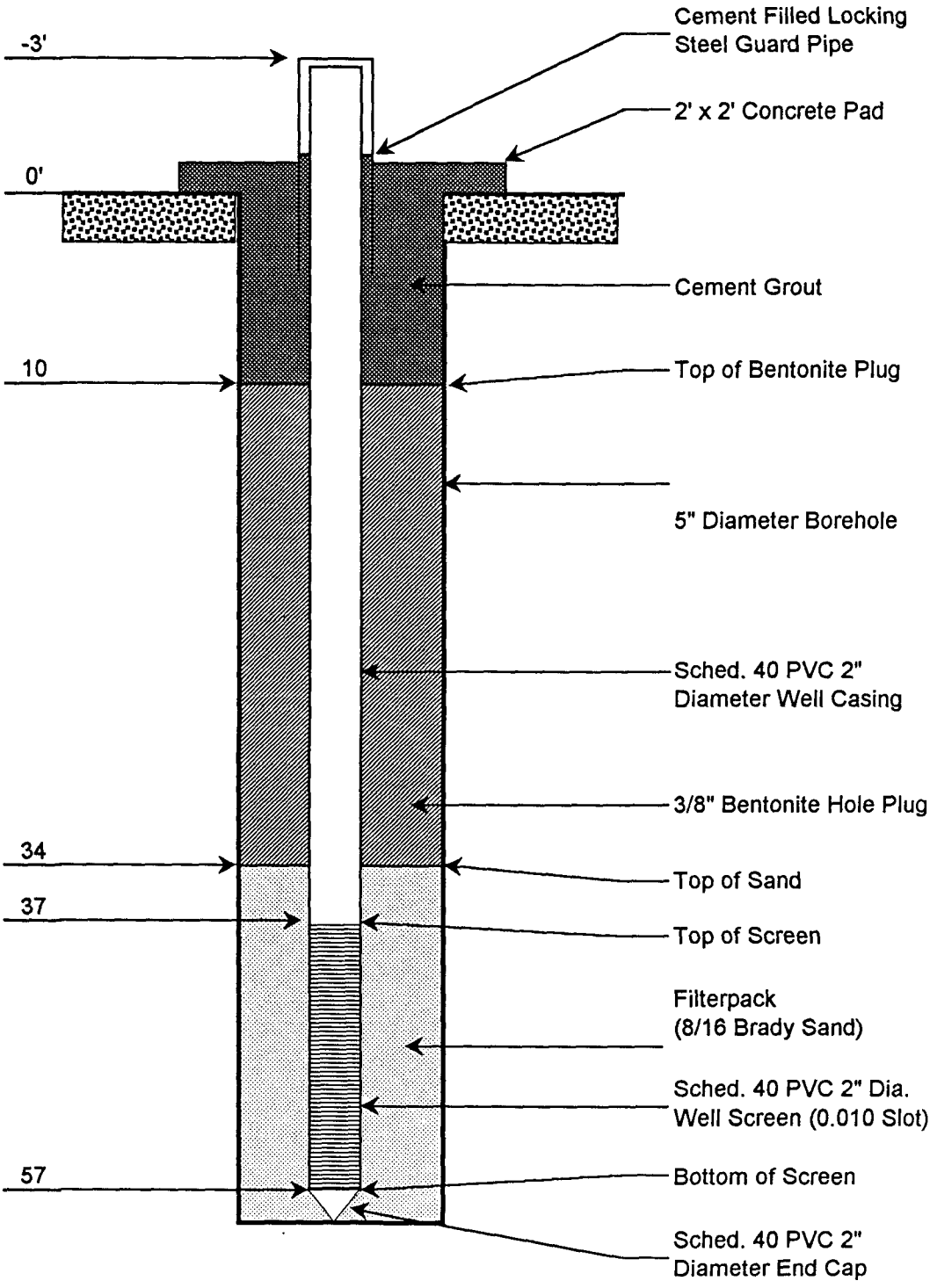
TRW Energy & Environmental Systems	SITE: GPM - Hobbs Booster Station		**MW-3 Monitoring Well Construction Diagram**
	DATE: 06/15/99	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: GJV	
	CK'D BY: DTL	FILE: Well Bore Diagram	

MONITORING WELL CONSTRUCTION DIAGRAM (MW-4)



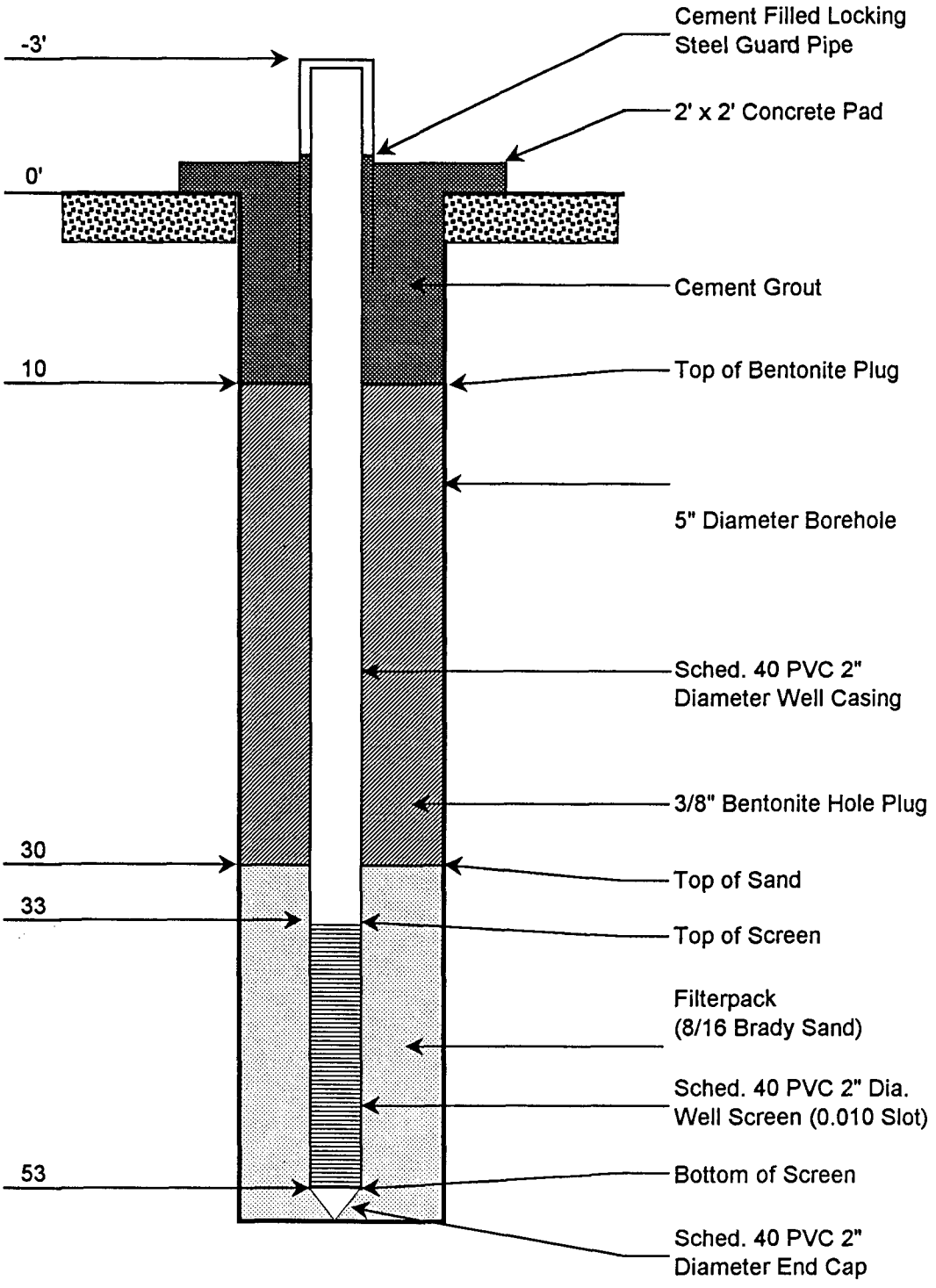
TRW Energy & Environmental Systems	SITE: GPM - Hobbs Booster Station		**MW-4 Monitoring Well Construction Diagram**
	DATE: 06/16/99	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: GJV	
	CK'D BY: DTL	FILE: Well Bore Diagram	

MONITORING WELL CONSTRUCTION DIAGRAM (MW-5)



TRW Energy & Environmental Systems	SITE: GPM - Hobbs Booster Station		**MW-5 Monitoring Well Construction Diagram**
	DATE: 06/16/99	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: GJV	
	CK'D BY: DTL	FILE: Well Bore Diagram	

MONITORING WELL CONSTRUCTION DIAGRAM (MW-6)

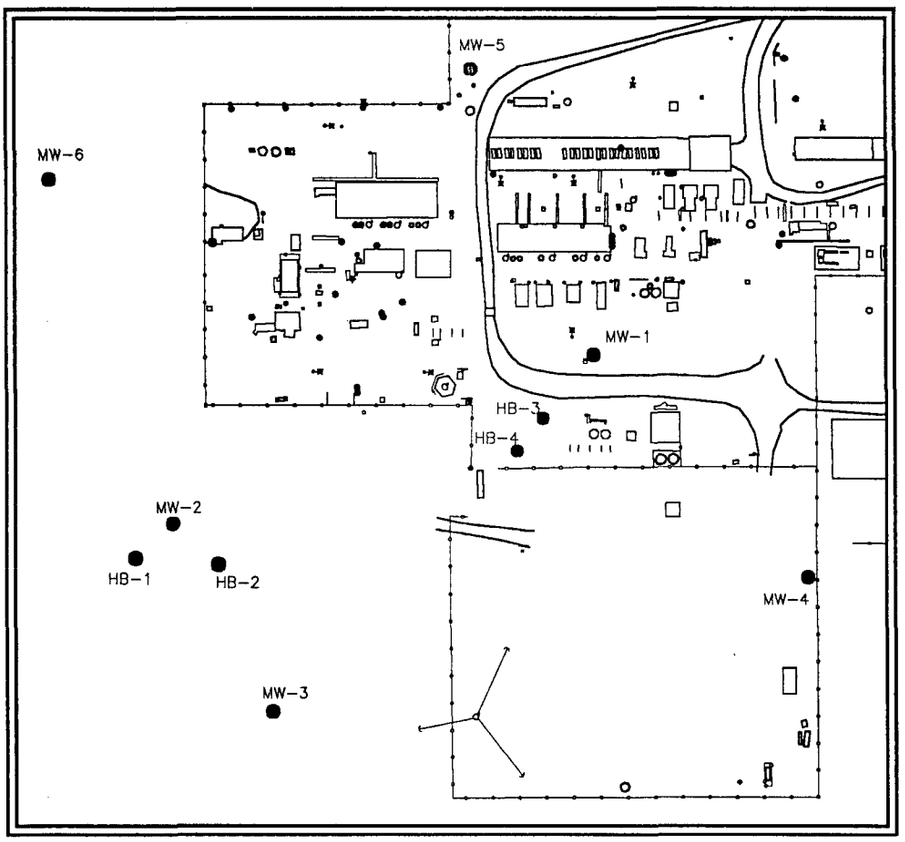


TRW Energy & Environmental Systems	SITE: GPM - Hobbs Booster Station		**MW-6 Monitoring Well Construction Diagram**
	DATE: 06/17/99	REV. NO.: 1	
	AUTHOR: GJV	DRAWN BY: GJV	
	CK'D BY: DTL	FILE: Well Bore Diagram	

ATTACHMENT B

SURVEY PLAT OF

GPM HOBBS BOOSTER STATION



MONITOR WELLS & BORE HOLES	PLANT COORDINATES X	Y	NAVD 88 ELEVATIONS IN FEET
MW-1	E-12+44.9	S-7+43.2	NATURAL GROUND: 3623.43
			ALUM. CAP IN CONCRETE: 3623.60
			TOP 2" PVC CASING: 3626.06
MW-2	E-7+62.6	S-9+35.9	NATURAL GROUND: 3620.52
			ALUM. CAP IN CONCRETE: 3620.65
			TOP 2" PVC CASING: 3623.14
MW-3	E-8+76.5	S-11+50.0	NATURAL GROUND: 3619.81
			ALUM. CAP IN CONCRETE: 3620.08
			TOP 2" PVC CASING: 3623.01
MW-4	E-14+90.1	S-9+96.2	NATURAL GROUND: 3621.51
			ALUM. CAP IN CONCRETE: 3621.66
			TOP 2" PVC CASING: 3624.29
MW-5	E-11+05.0	S-4+16.5	NATURAL GROUND: 3626.12
			ALUM. CAP IN CONCRETE: 3626.30
			TOP 2" PVC CASING: 3629.16
MW-6	E-6+21.0	S-5+43.0	NATURAL GROUND: 3623.87
			ALUM. CAP IN CONCRETE: 3624.14
			TOP 2" PVC CASING: 3626.93
HB-1	E-7+19.7	S-9+75.5	NATURAL GROUND: 3619.08
HB-2	E-8+14.7	S-9+82.4	NATURAL GROUND: 3619.22
HB-3	E-11+86.3	S-8+14.7	NATURAL GROUND: 3622.32
HB-4	E-11+56.6	S-8+52.4	NATURAL GROUND: 3621.61

200 0 200 400 FEET

Scale:1" =200'

I HEREBY CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

GARY G. EIDSON NEW MEXICO 12641 REGISTERED PROFESSIONAL SURVEYOR

6/30/99

RONALD J. EIDSON, N.M. P.S. No. 3239
GARY L. EIDSON N.M. P.S. No. 12641

JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, NEW MEXICO – 505-393-3117

GPM GAS CORPORATION NM REGION

LOCAL HORIZONTAL AND VERTICAL COORDINATE
LOCATIONS OF MONITOR WELLS AND BORE HOLES AT THE
HOBBS BOOSTER STATION
SECTION 4,TOWNSHIP 19 SOUTH,
RANGE 38 EAST, N.M.P.M.,
LEA COUNTY, NEW MEXICO

Revised: 6/22/99

Survey Date: 6/23/99		Sheet 1 of 1 Sheets	
W.O. Number: 99-11-0540		Drawn By:D.McCARLEY	
Date: 6/24/99	GPM	GPMC0540	Scale:1" =200'

ATTACHMENT C

LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Gil Van Deventer
TRW
415 West Wall Suite 1818
Midland, TX 79701

Report Date: 8/2/99

Project Number: P/2398/8.1C
Project Name: GPM Gas Corp.
Project Location: Hobbs Station

Order ID Number: 99061911

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to TraceAnalysis, Inc. for analysis:

Sample Number	Sample Description	Matrix	Date Taken	Time Taken	Date Received
126874	MW-1 (Surface)	Soil	6/15/99	9:20	6/19/99
126875	MW-2 (42')	Soil	6/15/99	11:00	6/19/99
126876	MW-2 (15')	Soil	6/15/99	11:55	6/19/99
126877	MW-2 (40')	Soil	6/15/99	13:52	6/19/99
126878	MW-3 (40')	Soil	6/15/99	17:35	6/19/99
126879	MW-4 (40')	Soil	6/16/99	11:40	6/19/99
126880	MW-5 (Surface)	Soil	6/16/99	14:40	6/19/99
126881	MW-5 (40')	Soil	6/16/99	16:05	6/19/99
126882	MW-6 (40')	Soil	6/17/99	8:20	6/19/99
126883	HB-1 (Surface)	Soil	6/16/99	9:10	6/19/99
126884	HB-2 (Surface)	Soil	6/16/99	9:20	6/19/99
126885	HB-3 (Surface)	Soil	6/16/99	10:00	6/19/99
126886	HB-4 (Surface)	Soil	6/16/99	10:10	6/19/99

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 11 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical Results Report

Sample Number: 126874
Description: MW-1 (Surface)

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
MTBE (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Benzene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Toluene (mg/Kg)		0.052	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Ethylbenzene (mg/Kg)		0.074	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
M,P,O-Xylene (mg/Kg)		0.488	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Total BTEX (mg/Kg)		0.614	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/Kg)	5.45	50	0.1	109	72 - 128	RC	PB01216	QC01508
4-BFB (mg/Kg)	5.49	50	0.1	110	72 - 128	RC	PB01216	QC01508

TRPHC (mg/Kg)		49700	1	E 418.1	6/23/99	6/24/99	MF	PB01233	QC01527	10

Sample Number: 126875
Description: MW-2 (42')

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
MTBE (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Benzene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Toluene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Ethylbenzene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
M,P,O-Xylene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Total BTEX (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/Kg)	5.43	50	0.1	109	72 - 128	RC	PB01216	QC01508
4-BFB (mg/Kg)	5.28	50	0.1	106	72 - 128	RC	PB01216	QC01508

TRPHC (mg/Kg)		254	1	E 418.1	6/23/99	6/24/99	MF	PB01233	QC01527	10

Sample Number: 126876
Description: MW-2 (15')

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
MTBE (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Benzene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Toluene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Ethylbenzene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
M,P,O-Xylene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Total BTEX (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/Kg)	5.15	50	0.1	103	72 - 128	RC	PB01216	QC01508
4-BFB (mg/Kg)	5.16	50	0.1	103	72 - 128	RC	PB01216	QC01508

TRPHC (mg/Kg)		<10.0	1	E 418.1	6/23/99	6/24/99	MF	PB01233	QC01527	10

Sample Number: 126877
Description: MW-2 (40')

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
MTBE (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Benzene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Toluene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Ethylbenzene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
M,P,O-Xylene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Total BTEX (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/Kg)	5.33	50	0.1	107	72 - 128	RC	PB01216	QC01508
4-BFB (mg/Kg)	5.18	50	0.1	104	72 - 128	RC	PB01216	QC01508

TRPHC (mg/Kg)		12.8	1	E 418.1	6/23/99	6/24/99	MF	PB01233	QC01527	10

Sample Number: 126878
Description: MW-3 (40')

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
MTBE (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Benzene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Toluene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Ethylbenzene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
M,P,O-Xylene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Total BTEX (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/Kg)	4.96	50	0.1	99	72 - 128	RC	PB01216	QC01508
4-BFB (mg/Kg)	4.86	50	0.1	97	72 - 128	RC	PB01216	QC01508

TRPHC (mg/Kg)		<10.0	1	E 418.1	6/23/99	6/24/99	MF	PB01233	QC01527	10

Sample Number: 126879
Description: MW-4 (40')

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
MTBE (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Benzene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Toluene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Ethylbenzene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
M,P,O-Xylene (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001
Total BTEX (mg/Kg)		<0.05	50	S 8021B	6/22/99	6/22/99	RC	PB01216	QC01508	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/Kg)	5.21	50	0.1	104	72 - 128	RC	PB01216	QC01508
4-BFB (mg/Kg)	4.91	50	0.1	98	72 - 128	RC	PB01216	QC01508

TRPHC (mg/Kg)		73.1	1	E 418.1	6/23/99	6/24/99	MF	PB01233	QC01527	10

Sample Number: 126880
Description: MW-5 (Surface)

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
MTBE (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Benzene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Toluene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Ethylbenzene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
M,P,O-Xylene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Total BTEX (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/Kg)	5.18	50	0.1	104	72 - 128	RC	PB01300	QC01622
4-BFB (mg/Kg)	5.17	50	0.1	103	72 - 128	RC	PB01300	QC01622

TRPHC (mg/Kg)		638	1	E 418.1	6/23/99	6/24/99	MF	PB01233	QC01527	10

Sample Number: 126881
Description: MW-5 (40')

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
MTBE (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Benzene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Toluene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Ethylbenzene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
M,P,O-Xylene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Total BTEX (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/Kg)	5.27	50	0.1	105	72 - 128	RC	PB01300	QC01622
4-BFB (mg/Kg)	4.99	50	0.1	100	72 - 128	RC	PB01300	QC01622

TRPHC (mg/Kg)		<10.0	1	E 418.1	6/23/99	6/24/99	MF	PB01233	QC01527	10

Sample Number: 126882
Description: MW-6 (40')

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
MTBE (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Benzene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Toluene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Ethylbenzene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
M,P,O-Xylene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Total BTEX (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/Kg)	5.34	50	0.1	107	72 - 128	RC	PB01300	QC01622
4-BFB (mg/Kg)	5.02	50	0.1	100	72 - 128	RC	PB01300	QC01622

TRPHC (mg/Kg)		<10.0	1	E 418.1	6/23/99	6/24/99	MF	PB01233	QC01527	10

Sample Number: 126883
Description: HB-1 (Surface)

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
MTBE (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Benzene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Toluene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Ethylbenzene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
M,P,O-Xylene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Total BTEX (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/Kg)	5.19	50	0.1	104	72 - 128	RC	PB01300	QC01622
4-BFB (mg/Kg)	4.99	50	0.1	100	72 - 128	RC	PB01300	QC01622

TRPHC (mg/Kg)		559	1	E 418.1	6/23/99	6/24/99	MF	PB01233	QC01527	10

Sample Number: 126884
Description: HB-2 (Surface)

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
MTBE (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Benzene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Toluene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Ethylbenzene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
M,P,O-Xylene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Total BTEX (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/Kg)	5.41	50	0.1	108	72 - 128	RC	PB01300	QC01622
4-BFB (mg/Kg)	5.16	50	0.1	103	72 - 128	RC	PB01300	QC01622

TRPHC (mg/Kg)		<10.0	1	E 418.1	6/23/99	6/24/99	MF	PB01233	QC01529	10

Sample Number: 126885
Description: HB-3 (Surface)

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
MTBE (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Benzene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Toluene (mg/Kg)		0.104	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Ethylbenzene (mg/Kg)		0.286	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
M,P,O-Xylene (mg/Kg)		2.61	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Total BTEX (mg/Kg)		3.00	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/Kg)	5.65	50	0.1	113	72 - 128	RC	PB01300	QC01622
4-BFB (mg/Kg)	6.26	50	0.1	125	72 - 128	RC	PB01300	QC01622

TRPHC (mg/Kg)		37500	1	E 418.1	6/23/99	6/24/99	MF	PB01233	QC01529	10

Sample Number: 126886
Description: HB-4 (Surface)

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
MTBE (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Benzene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Toluene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Ethylbenzene (mg/Kg)		<0.05	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
M,P,O-Xylene (mg/Kg)		0.346	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001
Total BTEX (mg/Kg)		0.346	50	S 8021B	6/30/99	6/30/99	RC	PB01300	QC01622	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/Kg)	5.35	50	0.1	107	72 - 128	RC	PB01300	QC01622
4-BFB (mg/Kg)	4.91	50	0.1	98	72 - 128	RC	PB01300	QC01622

TRPHC (mg/Kg)		69300	1	E 418.1	6/23/99	6/24/99	MF	PB01233	QC01529	10

Quality Control Report
Method Blanks

Param	Flag	Blank Result	Reporting Limit	Date Analyzed	Prep Batch #	QC Batch #
MTBE (mg/Kg)		<0.050	0.001	6/22/99	PB01216	QC01508
Benzene (mg/Kg)		<0.050	0.001	6/22/99	PB01216	QC01508
Toluene (mg/Kg)		<0.050	0.001	6/22/99	PB01216	QC01508
Ethylbenzene (mg/Kg)		<0.050	0.001	6/22/99	PB01216	QC01508
M,P,O-Xylene (mg/Kg)		<0.050	0.001	6/22/99	PB01216	QC01508
Total BTEX (mg/Kg)		<0.050	0.001	6/22/99	PB01216	QC01508
MTBE (mg/Kg)		<0.050	0.001	6/30/99	PB01300	QC01622
Benzene (mg/Kg)		<0.050	0.001	6/30/99	PB01300	QC01622
Toluene (mg/Kg)		<0.050	0.001	6/30/99	PB01300	QC01622
Ethylbenzene (mg/Kg)		<0.050	0.001	6/30/99	PB01300	QC01622
M,P,O-Xylene (mg/Kg)		<0.050	0.001	6/30/99	PB01300	QC01622
Total BTEX (mg/Kg)		<0.050	0.001	6/30/99	PB01300	QC01622

Surrogate	Result	Spike Amount	% Rec.	% Rec. Limit	QC Batch #
TFT (mg/Kg)	4.84	0.1	97	72 - 128	QC01622
4-BFB (mg/Kg)	4.87	0.1	97	72 - 128	QC01622

Param	Flag	Blank Result	Reporting Limit	Date Analyzed	Prep Batch #	QC Batch #
TRPHC (mg/Kg)		<10.0	10	6/24/99	PB01233	QC01527
TRPHC (mg/Kg)		<10.0	10	6/24/99	PB01233	QC01529

Quality Control Report
Matrix Spike and Matrix Duplicate Spike

Standard	Param	Sample Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
MS	TRPHC (mg/Kg)	<10.0	1	250	244	98		70 - 130	0 - 20	QC01527
MSD	TRPHC (mg/Kg)	<10.0	1	250	242	97	1	70 - 130	0 - 20	QC01527

Standard	Param	Sample Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
MS	TRPHC (mg/Kg)	<10.0	1	250	251	100		70 - 130	0 - 20	QC01529
MSD	TRPHC (mg/Kg)	<10.0	1	250	279	112	11	70 - 130	0 - 20	QC01529

Standard	Param	Sample Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
MS	MTBE (mg/Kg)	<0.05	1	5	5.11	102		80 - 120	0 - 20	QC01622
MS	Benzene (mg/Kg)	<0.05	1	5	4.91	98		80 - 120	0 - 20	QC01622
MS	Toluene (mg/Kg)	<0.05	1	5	4.84	97		80 - 120	0 - 20	QC01622
MS	Ethylbenzene (mg/Kg)	<0.05	1	5	4.81	96		80 - 120	0 - 20	QC01622
MS	M,P,O-Xylene (mg/Kg)	<0.05	1	15	14.1	94		80 - 120	0 - 20	QC01622

Standard	Surrogate	Result	Dil.	Spike Amount	Analyst	% Rec.	% Rec. Limit	Prep Batch #	QC Batch #
MS	TFT (mg/Kg)	5.14	50	0.1	RC	103	72 - 128	PB01300	QC01622
MS	4-BFB (mg/Kg)	5.28	50	0.1	RC	106	72 - 128	PB01300	QC01622

Standard	Param	Sample Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
MSD	MTBE (mg/Kg)	<0.05	1	5	5.12	102	0	80 - 120	0 - 20	QC01622
MSD	Benzene (mg/Kg)	<0.05	1	5	5.00	100	2	80 - 120	0 - 20	QC01622
MSD	Toluene (mg/Kg)	<0.05	1	5	4.98	100	3	80 - 120	0 - 20	QC01622
MSD	Ethylbenzene (mg/Kg)	<0.05	1	5	4.90	98	2	80 - 120	0 - 20	QC01622
MSD	M,P,O-Xylene (mg/Kg)	<0.05	1	15	14.4	96	2	80 - 120	0 - 20	QC01622

Standard	Surrogate	Result	Dil.	Spike Amount	Analyst	% Rec.	% Rec. Limit	Prep Batch #	QC Batch #
MSD	TFT (mg/Kg)	5.18	50	0.1	RC	104	72 - 128	PB01300	QC01622
MSD	4-BFB (mg/Kg)	5.25	50	0.1	RC	104	72 - 128	PB01300	QC01622

Quality Control Report
Lab Control Spikes and Duplicate Spike

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCS	MTBE (mg/Kg)	<0.050	1	5	5.28	106		80 - 120	0 - 20	QC01508
LCS	Benzene (mg/Kg)	<0.050	1	5	5.23	105		80 - 120	0 - 20	QC01508
LCS	Toluene (mg/Kg)	<0.050	1	5	5.03	101		80 - 120	0 - 20	QC01508
LCS	Ethylbenzene (mg/Kg)	<0.050	1	5	4.88	98		80 - 120	0 - 20	QC01508
LCS	M,P,O-Xylene (mg/Kg)	<0.050	1	15	14.8	99		80 - 120	0 - 20	QC01508

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCS	TFT (mg/Kg)	1	5	5.26	104	72 - 128	QC01508
LCS	4-BFB (mg/Kg)	1	5	5.36	106	72 - 128	QC01508

LCSD	MTBE (mg/Kg)	<0.050	1	5	5.03	101	5	80 - 120	0 - 20	QC01508
LCSD	Benzene (mg/Kg)	<0.050	1	5	5.20	104	1	80 - 120	0 - 20	QC01508
LCSD	Toluene (mg/Kg)	<0.050	1	5	5.02	100	0	80 - 120	0 - 20	QC01508
LCSD	Ethylbenzene (mg/Kg)	<0.050	1	5	4.88	98	0	80 - 120	0 - 20	QC01508
LCSD	M,P,O-Xylene (mg/Kg)	<0.050	1	15	14.7	98	1	80 - 120	0 - 20	QC01508

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCSD	TFT (mg/Kg)	1	5	5.23	104	72 - 128	QC01508
LCSD	4-BFB (mg/Kg)	1	5	5.36	106	72 - 128	QC01508

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCS	MTBE (mg/Kg)	<0.050	50	5	2.16	43		80 - 120	0 - 20	QC01622
LCS	Benzene (mg/Kg)	<0.050	50	5	2.05	41		80 - 120	0 - 20	QC01622
LCS	Toluene (mg/Kg)	<0.050	50	5	2	40		80 - 120	0 - 20	QC01622
LCS	Ethylbenzene (mg/Kg)	<0.050	50	5	1.98	40		80 - 120	0 - 20	QC01622
LCS	M,P,O-Xylene (mg/Kg)	<0.050	50	15	5.6	37		80 - 120	0 - 20	QC01622

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCS	TFT (mg/Kg)	50	0.1	3.17	100	72 - 128	QC01622
LCS	4-BFB (mg/Kg)	50	0.1	3.1	100	72 - 128	QC01622

LCSD	MTBE (mg/Kg)	<0.050	50	5	3.58	1	49	80 - 120	0 - 20	QC01622
LCSD	Benzene (mg/Kg)	<0.050	50	5	3.48	1	52	80 - 120	0 - 20	QC01622
LCSD	Toluene (mg/Kg)	<0.050	50	5	3.42	1	52	80 - 120	0 - 20	QC01622
LCSD	Ethylbenzene (mg/Kg)	<0.050	50	5	3.39	1	53	80 - 120	0 - 20	QC01622
LCSD	M,P,O-Xylene (mg/Kg)	<0.050	50	15	9.72	1	54	80 - 120	0 - 20	QC01622

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCSD	TFT (mg/Kg)	50	0.1	4.82	96	72 - 128	QC01622
LCSD	4-BFB (mg/Kg)	50	0.1	4.74	95	72 - 128	QC01622

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCS	TRPHC (mg/Kg)	<10.0	1	250	230	92		70 - 130	0 - 20	QC01527
LCSD	TRPHC (mg/Kg)	<10.0	1	250	250	100	8	70 - 130	0 - 20	QC01527

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCS	TRPHC (mg/Kg)	<10.0	1	250	230	92		70 - 130	0 - 20	QC01529
LCSD	TRPHC (mg/Kg)	<10.0	1	250	250	100	8	70 - 130	0 - 20	QC01529

Quality Control Report
Continuing Calibration Verification Standard

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	MTBE (mg/Kg)		0.1	0.101	101	80 - 120	6/22/99	QC01508
ICV	Benzene (mg/Kg)		0.1	0.108	108	80 - 120	6/22/99	QC01508
ICV	Toluene (mg/Kg)		0.1	0.107	107	80 - 120	6/22/99	QC01508
ICV	Ethylbenzene (mg/Kg)		0.1	0.107	107	80 - 120	6/22/99	QC01508
ICV	M,P,O-Xylene (mg/Kg)		0.3	0.32	107	80 - 120	6/22/99	QC01508
CCV (1	MTBE (mg/Kg)		0.1	0.102	102	80 - 120	6/22/99	QC01508
CCV (1	Benzene (mg/Kg)		0.1	0.099	99	80 - 120	6/22/99	QC01508
CCV (1	Toluene (mg/Kg)		0.1	0.098	98	80 - 120	6/22/99	QC01508
CCV (1	Ethylbenzene (mg/Kg)		0.1	0.098	98	80 - 120	6/22/99	QC01508
CCV (1	M,P,O-Xylene (mg/Kg)		0.3	0.29	97	80 - 120	6/22/99	QC01508

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	MTBE (mg/Kg)		0.1	0.096	96	80 - 120	6/30/99	QC01622
ICV	Benzene (mg/Kg)		0.1	0.097	97	80 - 120	6/30/99	QC01622
ICV	Toluene (mg/Kg)		0.1	0.096	96	80 - 120	6/30/99	QC01622
ICV	Ethylbenzene (mg/Kg)		0.1	0.095	95	80 - 120	6/30/99	QC01622
ICV	M,P,O-Xylene (mg/Kg)		0.3	0.274	91	80 - 120	6/30/99	QC01622
CCV (1	MTBE (mg/Kg)		0.1	0.086	86	80 - 120	6/30/99	QC01622
CCV (1	Benzene (mg/Kg)		0.1	0.090	90	80 - 120	6/30/99	QC01622
CCV (1	Toluene (mg/Kg)		0.1	0.098	98	80 - 120	6/30/99	QC01622
CCV (1	Ethylbenzene (mg/Kg)		0.1	0.095	95	80 - 120	6/30/99	QC01622
CCV (1	M,P,O-Xylene (mg/Kg)		0.3	0.285	95	80 - 120	6/30/99	QC01622
CCV (2	MTBE (mg/Kg)		0.1	0.080	80	80 - 120	6/30/99	QC01622
CCV (2	Benzene (mg/Kg)		0.1	0.084	84	80 - 120	6/30/99	QC01622
CCV (2	Toluene (mg/Kg)		0.1	0.088	88	80 - 120	6/30/99	QC01622
CCV (2	Ethylbenzene (mg/Kg)		0.1	0.086	86	80 - 120	6/30/99	QC01622
CCV (2	M,P,O-Xylene (mg/Kg)		0.3	0.268	89	80 - 120	6/30/99	QC01622
CCV (3	MTBE (mg/Kg)		0.1	0.086	86	80 - 120	6/30/99	QC01622
CCV (3	Benzene (mg/Kg)		0.1	0.098	98	80 - 120	6/30/99	QC01622
CCV (3	Toluene (mg/Kg)		0.1	0.096	96	80 - 120	6/30/99	QC01622
CCV (3	Ethylbenzene (mg/Kg)		0.1	0.093	93	80 - 120	6/30/99	QC01622
CCV (3	M,P,O-Xylene (mg/Kg)		0.3	0.264	88	80 - 120	6/30/99	QC01622

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	TRPHC (mg/Kg)		100	107	107	70 - 130	6/24/99	QC01527
CCV (1	TRPHC (mg/Kg)		100	104	104	70 - 130	6/24/99	QC01527
CCV (2	TRPHC (mg/Kg)		100	105	105	70 - 130	6/24/99	QC01527

Quality Control Report
Continuing Calibration Verification Standard

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
CCV (3	TRPHC (mg/Kg)		100	105	105	70 - 130	6/24/99	QC01527

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	TRPHC (mg/Kg)		100	107	107	70 - 130	6/24/99	QC01529
CCV (1	TRPHC (mg/Kg)		100	104	104	70 - 130	6/24/99	QC01529
CCV (2	TRPHC (mg/Kg)		100	105	105	70 - 130	6/24/99	QC01529
CCV (3	TRPHC (mg/Kg)		100	105	105	70 - 130	6/24/99	QC01529

TRW Inc.
Energy & Environmental Systems
415 West Wall St. Suite. 1818
Midland, Texas 79701
(915) 682-0008
FAX: (915) 682-0028

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Chain of Custody

Date 6-18-99 Page 2 of 2

Lab Name: Trace Analysis Inc
Address: 6701 Aberdeen Ave, Ste 9
Lubbock, Tx 79424
Telephone: 806/794-1296

Samplers (SIGNATURES)

Analysis Request

Sample Identification	Matrix	Date	Time	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	Total Metals	TCLP Metals							Number of Containers
HB-1 (Surface)	Soil	6-16-99	0910	✓					✓				12	68	83									1
HB-2 (Surface)	Soil	6-16-99	0920	✓					✓						84									1
HB-3 (Surface)	Soil	6-16-99	1000	✓					✓						85									1
HB-4 (Surface	Soil	6-16-99	1010	✓					✓						86									1

Project Information	Sample Receipt
Project Name: GPM Gas Corp	Total Containers:
Project Location: Hobbs Station	COC Seals:
Project Manager: G.I Van Deventer	Rec'd Good Cond/Cold:
Cost Center No.: P/2398/8.1C	Conforms to Records:
Shipping ID No.: 902-167-328-7 TNMEO	Lab No.:
P O No.:	

Special Instructions/Comments: Invoice to GPM (Mel Driver)

Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
(Signature) (Time) 1500	(Signature) (Time)	(Signature) (Time)
(Printed Name) (Date) G.I Van Deventer 6-18-99	(Printed Name) (Date)	(Printed Name) (Date)
(Company) TRW Inc.	(Company)	(Company)
Received By: (1)	**Received By: (2)**	**Received By: (3)**
(Signature) (Time)	(Signature) (Time)	(Signature) (Time) 10:00AM
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date) 6/19/99
(Company)	(Company)	(Company)

Distribution: White, Canary-Laboratory / Pink-TRW

TRW Inc.
Energy & Environmental Systems
415 West Wall St. Suite. 1818
Midland, Texas 79701
(915) 682-0008
FAX: (915) 682-0028

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Chain of Custody

Date 6-18-99 Page 1 of 2

Lab Name: Trace Analysis Inc
Address: 6701 Aberdeen Ste 9
Lubbock, Tx 79424
Telephone: 800/ 794 1296

Samplers (SIGNATURES)

Analysis Request

Sample Identification	Matrix	Date	Time	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	Total Metals	TCLP Metals	Number of Containers
MW-1 (Surface)	Soil	6-15-99	0920	✓					✓					1	26	87	4	1
MW-1 (42')	Soil	6-15-99	1100	✓					✓							75		1
MW-2 (15')	Soil	6-15-99	1155	✓					✓							76		1
MW-2 (40')	Soil	6-15-99	1252	✓					✓							77		1
MW-3 (40')	Soil	6-15-99	1735	✓					✓							78		1
MW-4 (40')	Soil	6-16-99	1140	✓					✓							79		1
MW-5 (Surface)	Soil	6-16-99	1440	✓					✓							80		1
MW-5 (40')	Soil	6-16-99	1605	✓					✓							81		1
MW-6 (40')	Soil	6-17-99	0820	✓					✓							82		1

Project Information

Project Name: GPM Gas Corp
Project Location: Hobbs Station
Project Manager: Gil Van Deventer
Cost Center No.: P/2398/81C
Shipping ID No.: 902-161-3287 TNM20
P O No.:

Sample Receipt

Total Containers:
COC Seals:
Rec'd Good Cond/Cold:
Conforms to Records:
Lab No.:

Special Instructions/Comments: Invoice to GPM (Mel Driver)

Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
(Signature) (Time) 1500	(Signature) (Time)	(Signature) (Time)
(Printed Name) (Date) Gil Van Deventer 6/18/99	(Printed Name) (Date)	(Printed Name) (Date)
(Company) TRW Inc.	(Company)	(Company)
Received By: (1)	**Received By: (2)**	**Received By: (3)**
(Signature) (Time)	(Signature) (Time)	(Signature) (Time) 10:00AM
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date) 6/19/99
(Company)	(Company)	(Company) Trace Analysis

Distribution: White, Canary-Laboratory / Pink-TRW

BHS # 902-117-3287

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Gil Van Deventer
TRW
415 West Wall Suite 1818
Midland, TX 79701

Report Date: 6/23/99

Project Number: P/2398/8.1C
Project Name: GPM Gas Corp.
Project Location: Hobbs Station

Order ID Number: 99061910

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to TraceAnalysis, Inc. for analysis:

Sample Number	Sample Description	Matrix	Date Taken	Time Taken	Date Received
126865	MW 5	Water	6/17/99	11:30	6/19/99
126866	MW 3	Water	6/17/99	13:00	6/19/99
126867	MW 1	Water	6/17/99	15:05	6/19/99
126868	MW 2	Water	6/17/99	16:20	6/19/99
126870	MW 6	Water	6/18/99	13:00	6/19/99
126871	Duplicate	Water	6/17/99	12:00	6/19/99
126872	Rinsate	Water	6/18/99	11:50	6/19/99
126873	Trip Blank 603A	Water	6/17/99	-	6/19/99

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 5 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical Results Report

Sample Number: 126865
Description: MW 5

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		<0.005	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Toluene (mg/L)		<0.005	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Ethylbenzene (mg/L)		<0.005	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
M,P,O-Xylene (mg/L)		<0.005	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Total BTEX (mg/L)		<0.005	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.542	5	0.1	108	72 - 128	SO	PB01197	QC01478
4-BFB (mg/L)	0.492	5	0.1	98	72 - 128	SO	PB01197	QC01478

Sample Number: 126866
Description: MW 3

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		0.262	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Toluene (mg/L)		0.029	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Ethylbenzene (mg/L)		0.222	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
M,P,O-Xylene (mg/L)		0.287	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Total BTEX (mg/L)		0.800	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.525	5	0.1	105	72 - 128	SO	PB01197	QC01478
4-BFB (mg/L)	0.55	5	0.1	110	72 - 128	SO	PB01197	QC01478

Sample Number: 126867
Description: MW 1

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		0.232	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Toluene (mg/L)		0.029	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Ethylbenzene (mg/L)		0.168	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
M,P,O-Xylene (mg/L)		0.229	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Total BTEX (mg/L)		0.658	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.513	5	0.1	102	72 - 128	SO	PB01197	QC01478
4-BFB (mg/L)	0.58	5	0.1	116	72 - 128	SO	PB01197	QC01478

Sample Number: 126868
Description: MW 2

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		0.934	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001

Toluene (mg/L)	0.993	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Ethylbenzene (mg/L)	0.192	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
M,P,O-Xylene (mg/L)	0.359	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Total BTEX (mg/L)	2.48	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.499	5	0.1	100	72 - 128	SO	PB01197	QC01478
4-BFB (mg/L)	0.517	5	0.1	103	72 - 128	SO	PB01197	QC01478

Sample Number: 126870
Description: MW 6

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		<0.005	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Toluene (mg/L)		<0.005	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Ethylbenzene (mg/L)		<0.005	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
M,P,O-Xylene (mg/L)		<0.005	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Total BTEX (mg/L)		<0.005	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.532	5	0.1	106	72 - 128	SO	PB01197	QC01478
4-BFB (mg/L)	0.486	5	0.1	97	72 - 128	SO	PB01197	QC01478

Sample Number: 126871
Description: Duplicate

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		1.01	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Toluene (mg/L)		1.09	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Ethylbenzene (mg/L)		0.21	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
M,P,O-Xylene (mg/L)		0.394	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Total BTEX (mg/L)		2.7	5	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.514	5	0.1	102	72 - 128	SO	PB01197	QC01478
4-BFB (mg/L)	0.546	5	0.1	109	72 - 128	SO	PB01197	QC01478

Sample Number: 126872
Description: Rinsate

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		0.008	1	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Toluene (mg/L)		<0.001	1	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Ethylbenzene (mg/L)		<0.001	1	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
M,P,O-Xylene (mg/L)		<0.001	1	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Total BTEX (mg/L)		0.008	1	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.090	1	0.1	90	72 - 128	SO	PB01197	QC01478
4-BFB (mg/L)	0.079	1	0.1	79	72 - 128	SO	PB01197	QC01478

Sample Number: 126873
Description: Trip Blank 603A

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		<0.001	1	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Toluene (mg/L)		<0.001	1	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Ethylbenzene (mg/L)		<0.001	1	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
M,P,O-Xylene (mg/L)		<0.001	1	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001
Total BTEX (mg/L)		<0.001	1	S 8021B	6/21/99	6/18/99	SO	PB01197	QC01478	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.108	1	0.1	108	72 - 128	SO	PB01197	QC01478
4-BFB (mg/L)	0.091	1	0.1	91	72 - 128	SO	PB01197	QC01478

Quality Control Report
Method Blanks

Param	Flag	Blank Result	Reporting Limit	Date Analyzed	Prep Batch #	QC Batch #
Benzene (mg/L)		<0.001	0.001	6/18/99	PB01197	QC01478
Toluene (mg/L)		<0.001	0.001	6/18/99	PB01197	QC01478
Ethylbenzene (mg/L)		<0.001	0.001	6/18/99	PB01197	QC01478
M,P,O-Xylene (mg/L)		<0.001	0.001	6/18/99	PB01197	QC01478
Total BTEX (mg/L)		<0.001	0.001	6/18/99	PB01197	QC01478

Quality Control Report
Lab Control Spikes and Duplicate Spike

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCS	Benzene (mg/L)	<0.001	1	0.1	0.102	102		80 - 120	0 - 20	QC01478
LCS	Toluene (mg/L)	<0.001	1	0.1	0.098	98		80 - 120	0 - 20	QC01478
LCS	Ethylbenzene (mg/L)	<0.001	1	0.1	0.096	96		80 - 120	0 - 20	QC01478
LCS	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.286	95		80 - 120	0 - 20	QC01478

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCS	TFT (mg/L)	1	0.1	0.103	103	72 - 128	QC01478
LCS	4-BFB (mg/L)	1	0.1	0.104	104	72 - 128	QC01478

LCSD	Benzene (mg/L)	<0.001	1	0.1	0.104	104	2	80 - 120	0 - 20	QC01478
LCSD	Toluene (mg/L)	<0.001	1	0.1	0.101	101	3	80 - 120	0 - 20	QC01478
LCSD	Ethylbenzene (mg/L)	<0.001	1	0.1	0.099	99	3	80 - 120	0 - 20	QC01478
LCSD	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.296	99	3	80 - 120	0 - 20	QC01478

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCSD	TFT (mg/L)	1	0.1	0.107	107	72 - 128	QC01478
LCSD	4-BFB (mg/L)	1	0.1	0.108	108	72 - 128	QC01478

Quality Control Report
Continuing Calibration Verification Standard

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	Benzene (mg/L)		0.1	0.106	106	80 - 120	6/18/99	QC01478
ICV	Toluene (mg/L)		0.1	0.103	103	80 - 120	6/18/99	QC01478
ICV	Ethylbenzene (mg/L)		0.1	0.101	101	80 - 120	6/18/99	QC01478
ICV	M,P,O-Xylene (mg/L)		0.3	0.305	102	80 - 120	6/18/99	QC01478
CCV (1	Benzene (mg/L)		0.1	0.105	105	80 - 120	6/18/99	QC01478
CCV (1	Toluene (mg/L)		0.1	0.100	100	80 - 120	6/18/99	QC01478
CCV (1	Ethylbenzene (mg/L)		0.1	0.097	97	80 - 120	6/18/99	QC01478
CCV (1	M,P,O-Xylene (mg/L)		0.3	0.293	98	80 - 120	6/18/99	QC01478

TRW Inc.
Energy & Environmental Systems
415 West Wall St. Suite. 1818
Midland, Texas 79701
(915) 682-0008
FAX: (915) 682-0028

99061910

No 13424

Chain of Custody

Date 6/18-99 Page 1 of 1

Lab Name: Trace Analysis Inc
Address: 6701 Aberdeen Av., Ste 9
Lubbock, Tx 79424
Telephone: 806/794-1296

Samplers (SIGNATURES): Gil Van Deventer

Analysis Request

Sample Identification	Matrix	Date	Time	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	Total Metals	TCLP Metals	Fingerprint Report by Cardinal Chain	Specific gravity per API 42/28				Number of Containers
MW-5	Water	6-17-99	1130	√						12	86	5											2
MW-3	Water	6-17-99	1300	√							66												2
MW-1	Water	6-17-99	1505	√							67												2
MW-2	Water	6-17-99	1620	√							68												2
MW-4 Product	~~Water~~	6-17-99	1800	*	←NO BTEX						69							√	√				4 ~~2~~
MW-6	Water	6-18-99	1300	√							70												2
Duplicate	Water	6-17-99	1200	√							71												2
Rinsate	Water	6-18-99	1150	√							72												2
Trip Blank 603A/13	Water			√							73												2

Project Information		Sample Receipt	
Project Name:	GPM Gas Corp	Total Containers:	
Project Location:	Hobbs Station	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	
Cost Center No.:	P/2398/8.1C	Conforms to Records:	
Shipping ID No.:	902-167-328 TNM&O	Lab No.:	
P O No.:			

Special Instructions/Comments: Invoice direct to GPM (Mel Driver)
* Need results by 6-24-99 (morning)

Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
Gil Van Deventer 1500 (Signature) (Time)	(Signature) (Time)	(Signature) (Time)
Gil Van Deventer 6/18/99 (Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
(Company)	(Company)	(Company)
Received By: (1)	**Received By: (2)**	**Received By: (3)**
(Signature) (Time)	(Signature) (Time)	(Signature) 1010 AM (Time)
(Printed Name) (Date)	(Printed Name) (Date)	Marc Sviatge 06/19/99 (Printed Name) (Date)
(Company)	(Company)	(Company) TRACE ANALYSIS 6/19

Distribution: White, Canary-Laboratory / Pink-TRW

RH #902-167-328 TNM&O

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

ANALYTICAL RESULTS FOR
TRW INC.
415 West Wall St. Suite 1818
Midland, TX 79701
Attn: Gil Van Deventer

July 8, 1999
Receiving Date: 06/19/99
Sample Type: Water
Project No: N/A
Project Location: Hobbs Station

Sampling Date: 6/17/99
Sample Condition: Intact & Cool
Sample Received by: MS
Project Name: GPM Gas Corp.

TA#	FIELD CODE	SPECIFIC GRAVITY (mg/L)
T126869	MW-4	0.6773
ICV		---
CCV		---
REPORTING LIMIT		---
RPD		0
% Extraction Accuracy		---
% Instrument Accuracy		---
PREP DATE		7/8/99
ANALYSIS DATE		7/8/99

CHEMIST: JS
METHODS: ASTM D854-92

Director, Dr. Blair Leftwich

7-8-99
Date

TRACE ANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

ANALYTICAL RESULTS FOR
TRW INC.
Attention: Gil Van Deventer
415 West Wall, Suite 1818
Midland, TX 79700

June 28, 1999
Receiving Date: 06/19/99
Sample Type: Water
Charge Code No: P/2398/8.1C
Project Location: Hobbs Station
COC# 13424

Prep Date: 06/21/99
Analysis Date: 06/21/99
Sampling Date: 06/17/99
Sample Condition: I & C
Sample Received by: VW
Project: GPM -Gas Corp.

TA#: T126869
FIELD CODE: MW-4

FINGERPRINT

Sample 126869 has compounds predominantly in the region of C6-C10. Fingerprint is similar to condensate.

RANGE	CONCENTRACTION (mg/L)
C6-C8	396,087
>C8-C10	45,655
>C10-C12	3,881
>C12-C16	5,013
	450,636 *

***Note: Remaining hydrocarbons may be <C6.**

CV Avg.: 499
EA: 92
IA: 100
RPD: 2

CHEMIST: MF
METHOD: TX 1005

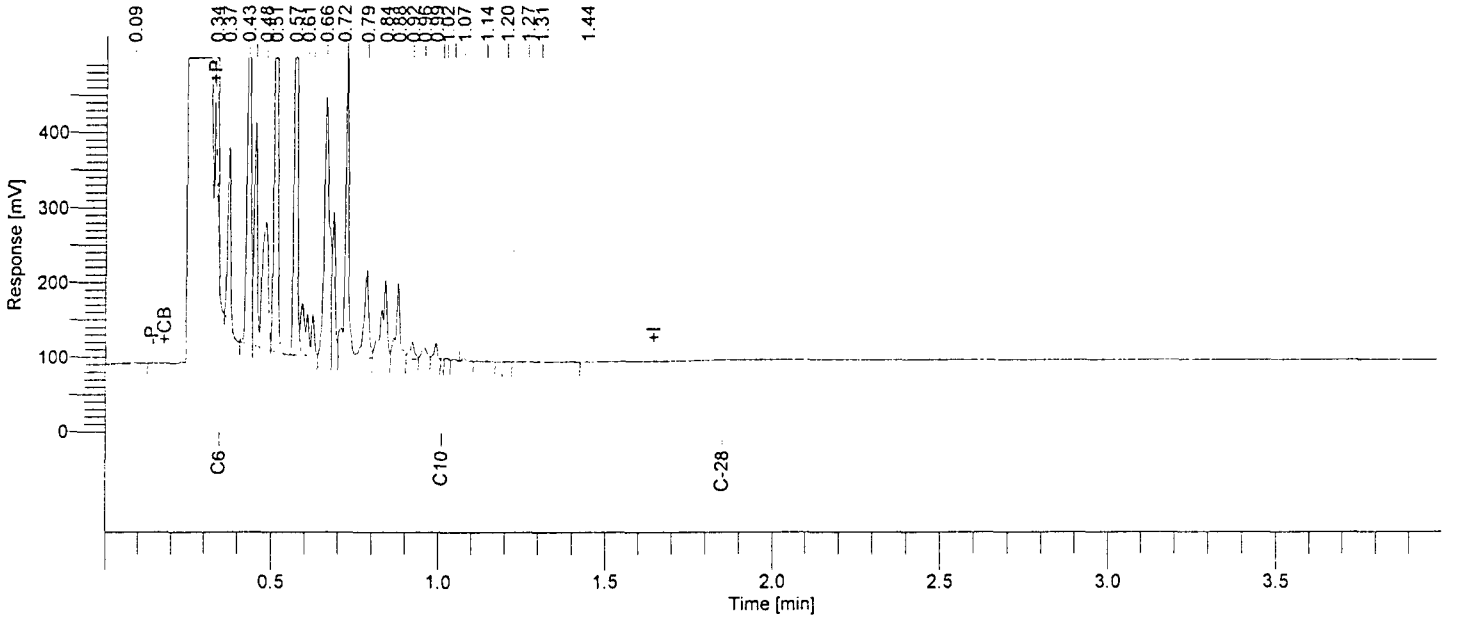
Director, Dr. Blair Leftwich

6-28-99
Date

Software Version	: 6.1.0.2:G07	Date	: 02/09/99 01:32:55 PM
Operator	: TurboChrom	Sample Name	: condensate*100
Sample Number	: 006	Study	: TPH
utoSampler	: BUILT-IN	Rack/Vial	: 0/6
nstrument Name	: GC6	Channel	: A
Instrument Serial #	: None	A/D mV Range	: 1000
Delay Time	: 0.00 min	End Time	: 3.98 min
Sampling Rate	: 25.0000 pts/s		
Volume Injected	: 1.000000 ul	Area Reject	: 0.000000
Sample Amount	: 1.0000	Dilution Factor	: 100.00
Data Acquisition Time	: 02/09/99 12:56:56 PM	Cycle	: 6

Raw Data File : T:\Data\GC6\BN6A006.raw
Inst Method : D:\Method\TPHEZ from T:\Data\GC6\BN6A006.raw
Proc Method : T:\Method\TPHEZ.mth
Calib Method : T:\Method\TPHEZ.mth
Sequence File : D:\Sequence\BN6A.seq

condensate Standard
1:100 dilution



TX1005

Analytical Method: TX1005
Reporting Units: mg/L
Matrix: water

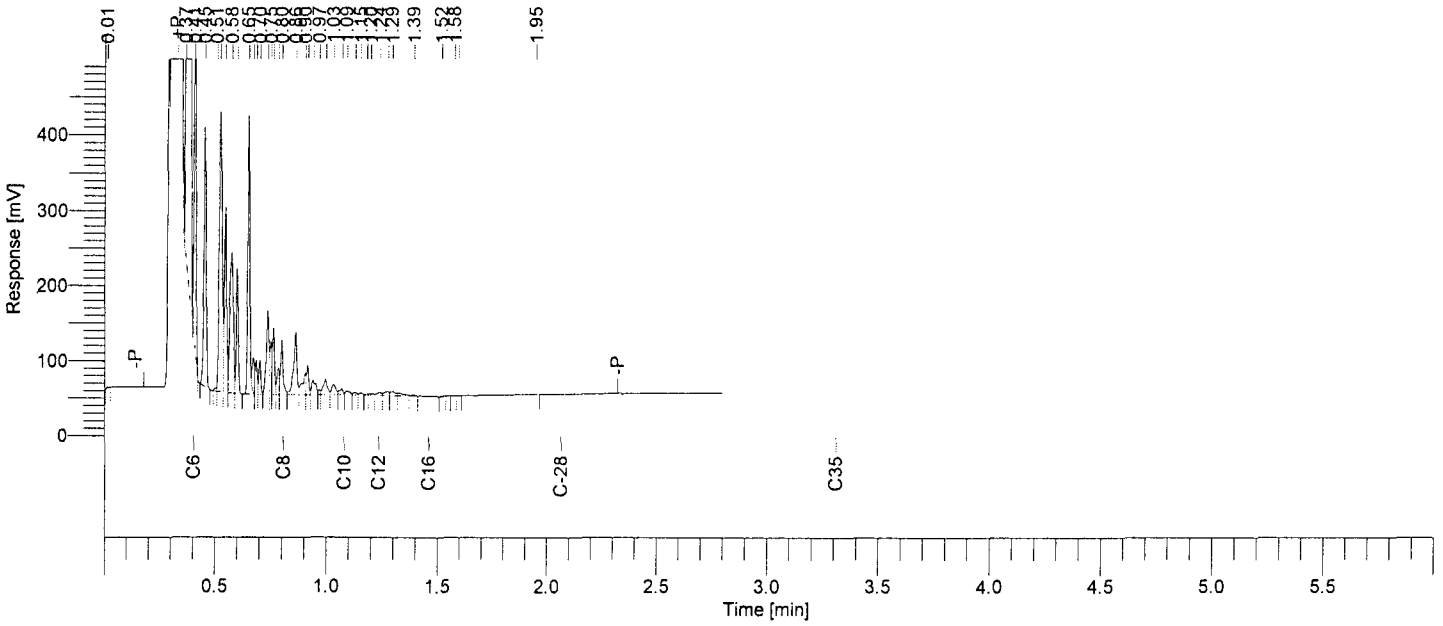
Component Name	Adjusted Amount	Raw Amount	Area [µV·s]
	0.7	0.0	6734.70
C6	19.6	0.2	196348.17
TPH AS GASOLINE	715912.4	7159.1	3225289.75
TPH AS DIESEL	3679.8	36.8	12858.45
			3441231.08

Report stored in ASCII file: .TX0

Software Version	: 6.1.0.2:G07	Date	: 06/25/99 09:59:51 AM
Operator	: TurboChrom	Sample Name	: 126869
Sample Number	: 040	Study	: QC01470
AutoSampler	: BUILT-IN	Rack/Vial	: 0/37
Instrument Name	: GC6	Channel	: A
Instrument Serial #	: None	A/D mV Range	: 1000
Delay Time	: 0.00 min	End Time	: 2.80 min
Sampling Rate	: 25.0000 pts/s		
Volume Injected	: 1.000000 ul	Area Reject	: 0.000000
Sample Amount	: 1.0000	Dilution Factor	: 100.00
Data Acquisition Time	: 06/21/99 05:05:38 PM	Cycle	: 40

Raw Data File : D:\Data\GC6\GP6A040.raw
Inst Method : T:\Method\TPHEZ from D:\Data\GC6\GP6A040.raw
Proc Method : T:\Method\TX1006AL.mth
Calib Method : T:\Method\TX1006AL.mth
Sequence File : D:\Sequence\GP6A.seq

MW-4 Product
1:100 dilution



TX1005

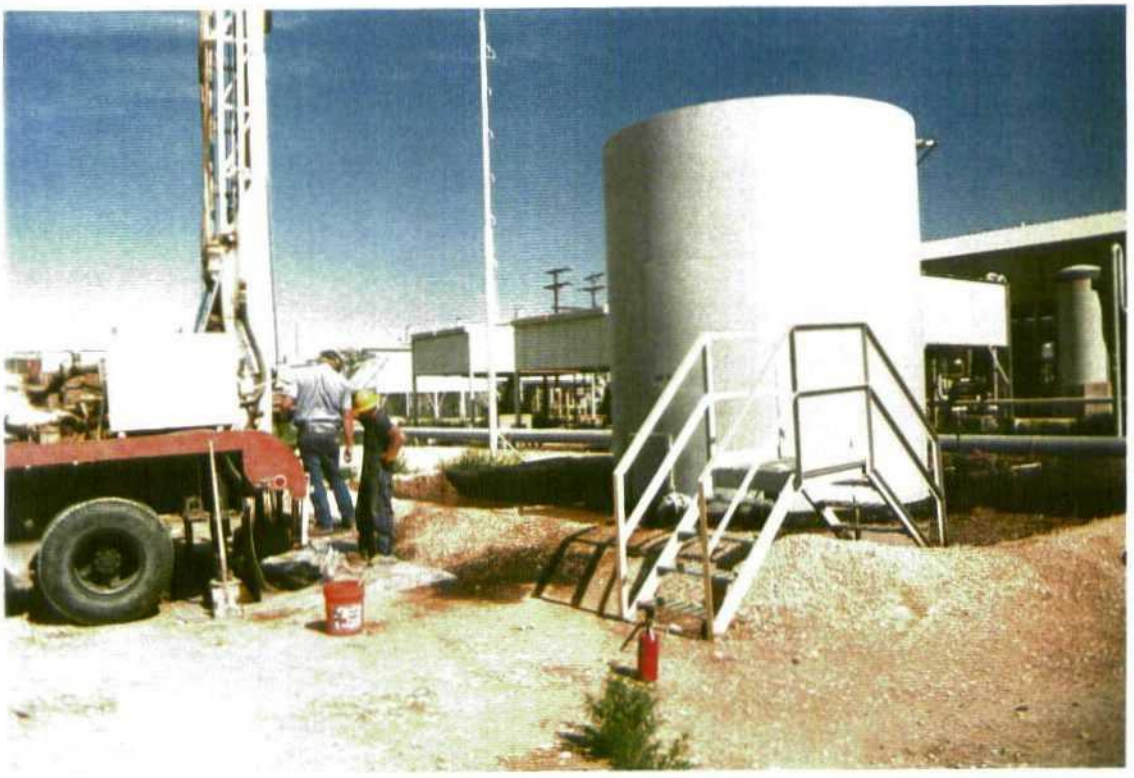
Analytical Method: TX1005
Reporting Units: mg/L
Matrix: water

Component Name	Adjusted Amount	Raw Amount	Area [µV·s]
>C6-C8 AL	396087.0	3960.9	2011637.62
>C8-C10 AL	45655.2	456.6	231872.60
>C10-C12 AL	3880.9	38.8	19709.98
>C12-16 AL	5012.7	50.1	25458.33
>C16-35 AL	622.3	6.2	3160.37
			2291838.90

Report stored in ASCII file: .TX0

ATTACHMENT D

PHOTODOCUMENTATION



View facing northwest showing drilling operations at MW-1
located adjacent to south side of berm surrrounding slop oil tank

View of tanks at heater treater area (facing northwest).
Completed monitoring well MW-2 (lower left corner) located adjacent to south side of fence.

View facing southeast showing drilling operations at MW-3 (background, center) located approximately 250 south of MW-2 (foreground, center).

View facing northeast showing split-spoon sampling operations at monitoring well MW-5 located approximately 350 feet northwest of slop oil tank and 40 feet north of inlet gas scrubber.

View facing southeast showing drilling operations at MW-6 (foreground) located approximately 420 northwest of heater treater area (background, right center).