

MONITORING REPORTS

DATE: 2004 - 1999



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

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

March 16, 2004

remediacon@yahoo.com

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:

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

Mr. Stephen Weathers March 16, 2004 Page 3

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 concentrationtime 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.

Mr. Stephen Weathers March 16, 2004 Page 4

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

Mechael H. Stewart

Michael H. Stewart, PE Principal Engineer

MHS/tbm

attachments

TABLES

Table 1 - Summary of Hobbs Booster Station Well Construction Information

	Top of					Top of			
-	Casing	Total Well	Screen	Gravel		Casing	Total Well	Screen	Gravel
Well	Elevation	Depth	Interval	Interval	Well	Elevation	Depth	Interval	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	09	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	H-W-T	3,622.30	51	36-51	34-51
MW-9	3,625.21	63	43-63	40-63	I-W-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	09	45-60	42-60
MW-17	3,623.94	99	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	09	45-60	43-45
MW-19	3,624.12	68	43-63	40-65	TW-S	3,628.77	09	45-60	43-45
MW-19D	3,623.79	83	71-76	69-76	RW-1	3624.52	09	35-60	32-60
MW-20	3,621.49	59	59-44	59-42					
Notes All in	All units in feet								

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

3,579.96 3,579.64 3,579.96 3,579.64 3,581.95 3,581.90 3,581.67 3,581.64 3,581.57 3,581.67 3,581.64 3,581.57 3,581.36 3,579.00 3,578.96 3,578.82 3,579.00 3,578.96 3,578.82 3,580.58 3,580.59 3,580.27 3,582.45 3,582.38 3,577.31 3,582.45 3,577.46 3,577.31 3,577.46 3,577.45 3,577.35 3,577.46 3,577.46 3,577.35 3,579.28 3,577.46 3,577.35 3,579.28 3,577.46 3,577.35 3,570.41 3,577.35 3,579.33 3,579.53 3,579.53 3,579.36 3,579.53 3,574.43 3,574.43 3,574.66 3,574.53 3,574.43 3,574.66 3,574.53 3,574.43 3,573.97 3,574.53 3,574.43 3,573.97 3,574.53 3,574.43 3,573.97 3,574.53 3,574.43 3,573.97 3,574.53 3,574.43	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
3,580.50 3,579.66 3,577.24 3,577.24 3,577.24 3,577.24 3,577.66 3,577.66 3,577.66 3,577.66 3,577.66 3,577.66 3,577.66 3,577.66 3,577.66 3,577.66 3,577.66 3,577.24 3,577.67 3,577.67 3,577.67 3,577.67 3,577.67 3,577.66 3,577.66 3,577.67 <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>1</th><th></th></td<>																1	
3.582.06 3.581.05 3.581.06 3.581.67 3.581.67 3.580.16 3.570.76 3.570.46 3.582.05 3.581.64 3.581.57 3.581.61 3.580.65 3.580.65 3.580.65 3.580.06 3.570.77 3.577.97 3.577.94 3.571.05 3.577.92 3.581.57 3.581.54 3.580.25 3.580.05 3.577.97 3.577.94 3.577.62 3.577.61 3.577.97 3.577.62 3.577.61<	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
3.582.25 3.581.68 3.581.57 3.581.11 3.580.77 3.577.63 3.577.63 5.579.76 3.577.24 5.579.76 3.577.24 5.579.76 3.577.24 5.579.46 3.579.95 3.579.27 3.577.81 3.577.80 3.577.80 3.577.63 5.577.63 5.577.63 5.577.63 5.577.63 5.577.94 5.577.63 5.577.71 5.577.63 5.577.63 5.577.71 5.577.71 5.577.63 5.577.71 5.577.71 5.577.71 5.577.71 5.577.63 5.577.71 5.577.71 5.577.63 5.577.71 5.577.63 5.577.71 5.577.71 5.577.63 5.577.71 5.577.71 5.577.71 5.577.63 5.577.71 5.577.71 5.577.63 5.577.71 5.577.71 5.577.63 5.577.71 5.577.71 5.577.63 5.577.71 5.577.51 5.57	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
3,579.95 3,579.01 3,579.00 3,578.06 3,577.06 3,577.06 3,577.06 3,577.06 3,577.06 3,577.06 3,577.06 3,577.06 3,577.06 3,577.06 3,577.06 3,577.06 3,577.06 3,577.06 3,579.06 3,577.06 <td< th=""><th>MW-3</th><th>3,582.25</th><th>3,581.68</th><th>3,582.05</th><th>3,581.64</th><th>3,581.57</th><th>3,581.36</th><th>3,581.11</th><th>3,580.97</th><th>3,580.48</th><th>3,580.29</th><th>3,580.11</th><th>3,580.52</th><th>3,580.06</th><th>3,579.79</th><th>3,579.46</th><th>3,579.08</th></td<>	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
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	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
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	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
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	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
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	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
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	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
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	MW-9		3,577.62	3,577.51	3,577.46		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
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	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
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	MW-11		3,577.90	3,578.00	3,577.66		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
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	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
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	MW-13				3,576.41		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
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	MW-14				3,577.51		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
3,581.50 3,581.21 3,580.76 3,580.28 3,579.96 3,579.96 3,579.62 3,579.26 3,579.26 3,579.26 3,579.26 3,573.15 3 3,575.36 3,575.26 3,575.15 3,574.89 3,574.24 3,574.07 3,573.90 3,573.16 3,573.42 3,573.42 3,573.42 3,573.42 3,573.42 3,573.42 3,573.42 3,572.42 3,572.42 3 3,574.66 3,574.21 3,573.56 3,573.28 3,572.42 3,572.42 3,572.42 3,572.42 3,572.42 3,571.76 3,571.78 3 3,573.67 3,573.35 3,573.36 3,572.58 3,572.49 3,571.76 3,571.78 3 3,573.88 3,573.55 3,572.50 3,572.58 3,572.28 3,571.56 3,571.56 3 3,573.88 3,573.55 3,572.56 3,572.58 3,572.88 3,571.56 3,572.44 3 3,572.56 3,573.32 3,572.56 3,572.28 3,571.56 3,571.56 1 1 3,572.56 3,572.59 3,572.28 3,572.82 3,572.44 3,572.82	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
3,575.36 3,575.26 3,575.15 3,574.89 3,574.24 3,574.09 3,573.90 3,573.85 3,573.44 3,573.42 2 3,574.66 3,574.21 3,573.56 3,573.56 3,573.22 3,573.15 3,572.76 3,572.42 3 3,574.66 3,574.21 3,573.56 3,573.56 3,573.22 3,573.15 3,572.76 3,572.42 3 3,573.79 3,573.28 3,573.28 3,572.78 3,572.12 3,571.78 3 3,573.88 3,573.55 3,572.59 3,572.58 3,572.28 3,572.18 3,571.92 3,571.66 3 3,573.86 3,573.32 3,572.56 3,572.58 3,572.28 3,571.92 3,571.56 3 3,573.66 3,573.32 3,572.36 3,572.38 3,572.82 3,572.44 3 3,573.46 3,573.32 3,573.32 3,572.82 3,572.42 3,571.92 3 3,573.46 3,573.32 3,572.36 3,572.28 3,571.92 3,572.44 3 3,573.46 3,573.46 3,573.32 3,573.28 3,572.48 3,572.44 <td>MW-16</td> <td></td> <td></td> <td></td> <td>3,581.50</td> <td></td> <td>3,581.21</td> <td>3,580.96</td> <td>3,580.79</td> <td>3,580.28</td> <td>3,580.14</td> <td>3,579.96</td> <td>3,580.43</td> <td>3,579.93</td> <td>3,579.62</td> <td>3,579.29</td> <td>3,578.90</td>	MW-16				3,581.50		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
3,574.65 3,574.43 3,574.21 3,573.56 3,573.22 3,573.42 3,573.15 3,572.76 3,572.42 3,573.97 3,573.37 3,573.35 3,573.32 3,572.58 3,572.49 3,572.12 3,571.78 3,573.97 3,573.37 3,573.32 3,572.59 3,572.78 3,572.12 3,571.78 3,573.97 3,573.32 3,572.59 3,572.58 3,572.28 3,571.32 3,573.97 3,573.32 3,572.51 3,572.59 3,572.28 3,571.92 3,572.56 3,572.32 3,572.36 3,572.38 3,571.92 3,571.56 3,573.46 3,572.32 3,573.32 3,573.32 3,572.82 3,572.82 3,572.44	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
3,573.97 3,573.78 3,573.32 3,572.90 3,572.58 3,572.78 3,572.12 3,571.78 1<	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
3,572.51 3,572.59 3,572.28 3,571.92 3,571.52 3,573.46 3,573.46 3,573.62 3,572.82 3,572.44	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
3,573.46 3,573.32 3,573.28 3,572.82 3,572.44 3,572.62 3,572.08 3,572.08 3,572.08 3,572.78	MW-20								1		3,572.51	3,572.36	3,572.59	3,572.28	3,571.92	3,571.56	3,571.15
3,572.08 3,571.78	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

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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	e feet	· · · · · · · · · · · · · · · · · · ·	•		· · · · · · · · · · · · · · · · · · ·	·	

Table 3 - Corrected Groundwater Elevations for the Product Characterization Wells

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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

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* 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

Well	Benzene	Toluene	Ethylbenzene	Xylenes
<u>MW-14</u>	< 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	•	•	

Initial Results from the December 30, 2003 Sampling Episoce

January 14 and 27, 2004 Resampling Results

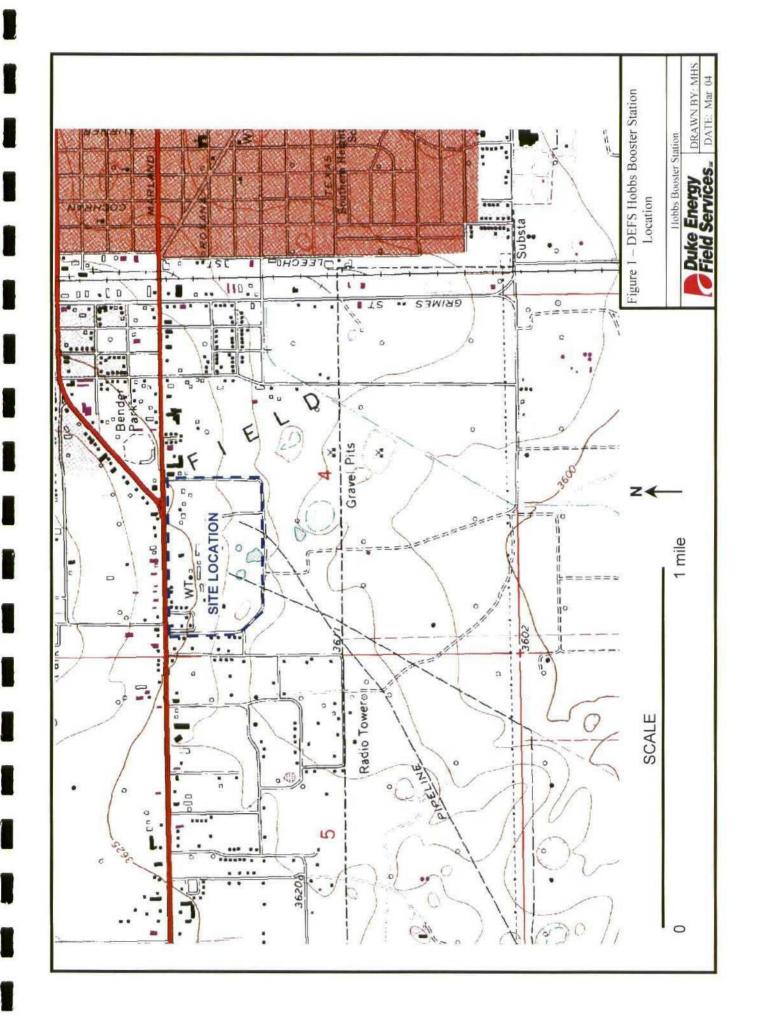
Well/Date	Benzene	Toluene	Ethylbenzene	Xylenes
MW-19D				
1/14/2004	0.030	< 0.001	< 0.001	0.00100
1/27/2004	< 0.005	< 0.005	< 0.005	< 0.005
MW-22				
1/14/2004	0.001	< 0.001	0.00011	0.00240
Units are mg/l		•	······	

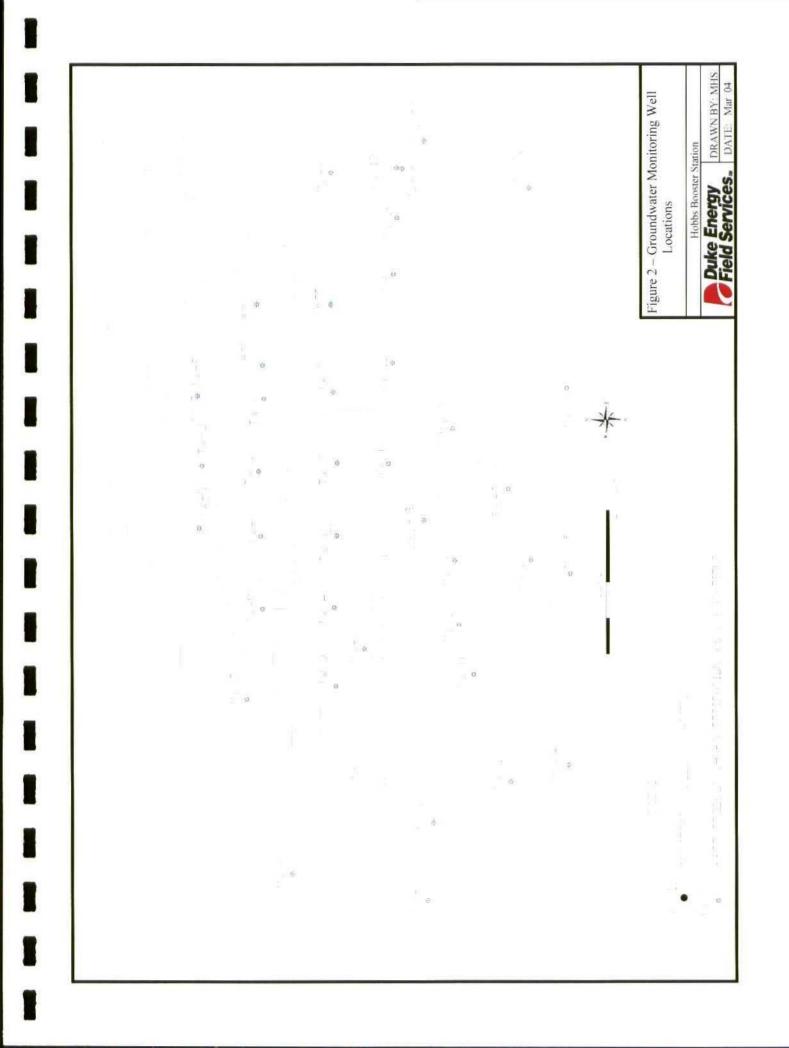
Table 6 - Summary of Dissolved Benzene Concentrations from the Historic Groundwater Monitoring Episodes

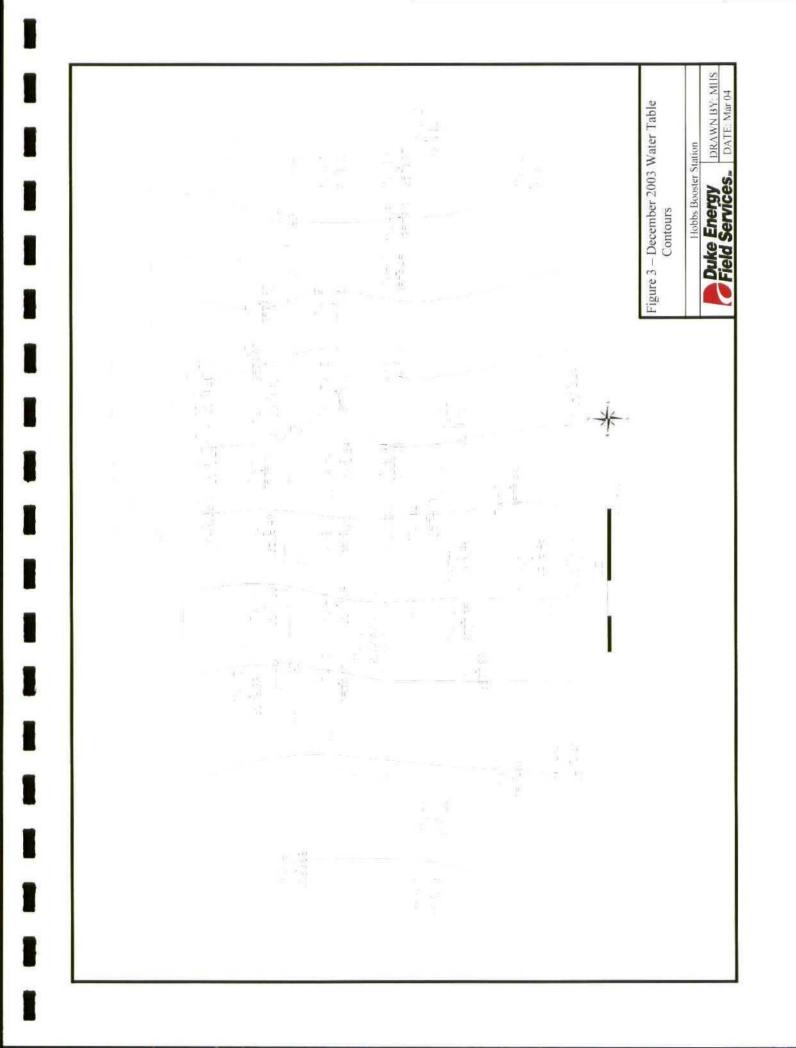
Benzene		5/11/00	7/8/99 5/11/00 8/22/00 10/31/00	10/31/00	2/5/01	5/15/01	8/9/01	10/19/01 3/13/02	3/13/02	6/3/02	9/24/02	12/10/02	3/19/03	6/23/03	9/17/03	9/24/02 12/10/02 3/19/03 6/23/03 9/17/03 12/30/03	1/14/04 1/27/04
MW-1	0.232	0.191	0.181	0.197	0.570	LNAPL	LNAPL	0.144	LNAPL	LNAPL				LNAPL			
MW-2	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				LNAPL			
MW-9		0.702	LNAPL	LNAPL	LNAPL	LNAPL LNAPL LNAPL	LNAPL	LNAPL LNAPL LNAPL	LNAPL	LNAPL				LNAPL			
MW-10		LNAPL	LNAPL LNAPL	0.535	LNAPL	LNAPL	LNAPL	1.13	LNAPL 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/<	<0.001	
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	i) All ui	1) All units mg/l															

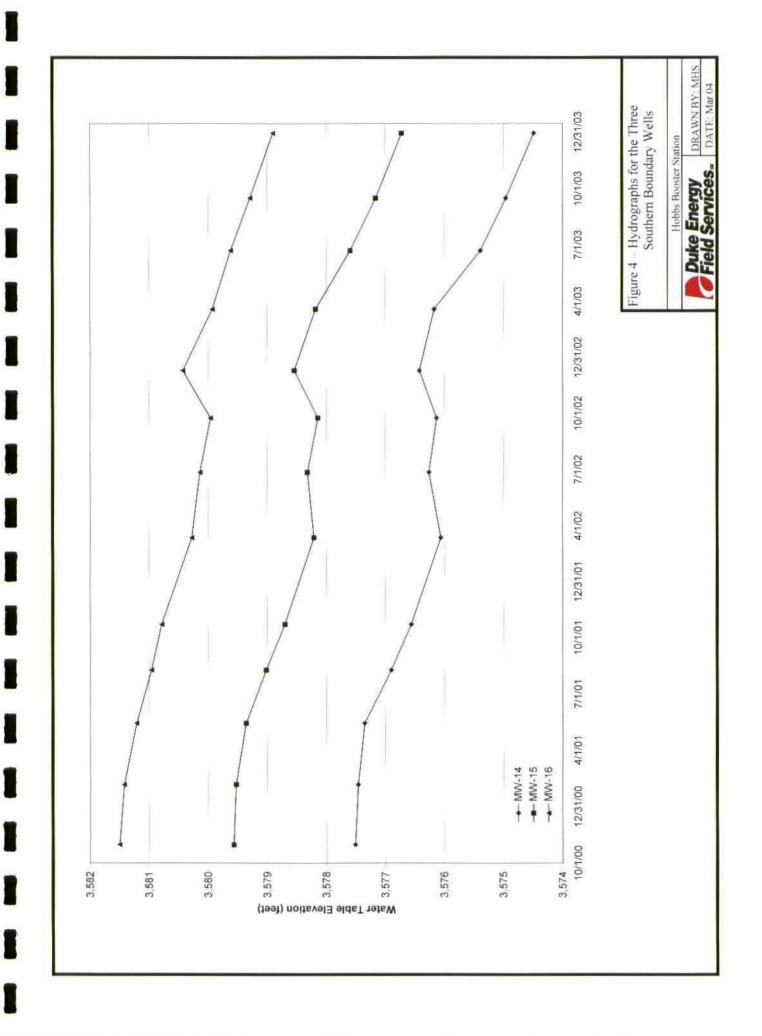
1) All units mg/l 2) Wells MW-4, MW-11, MW-12 and MW-13 have contained LNAPLs during each sampling episode and have never been tested for dissolved-phase hydrocarbons in the groundwater. 3) NS well MW-22 was not resampled on January 24, 2004 4) A blank cell indicates that the well was not sampled.

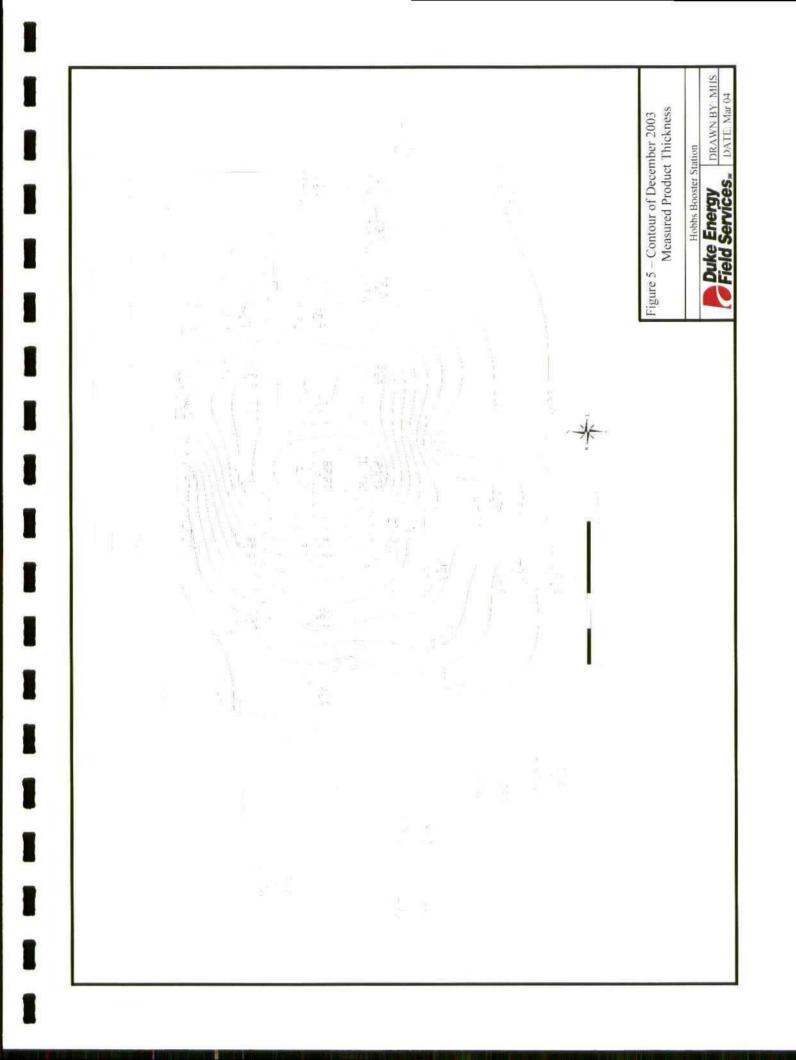
FIGURES

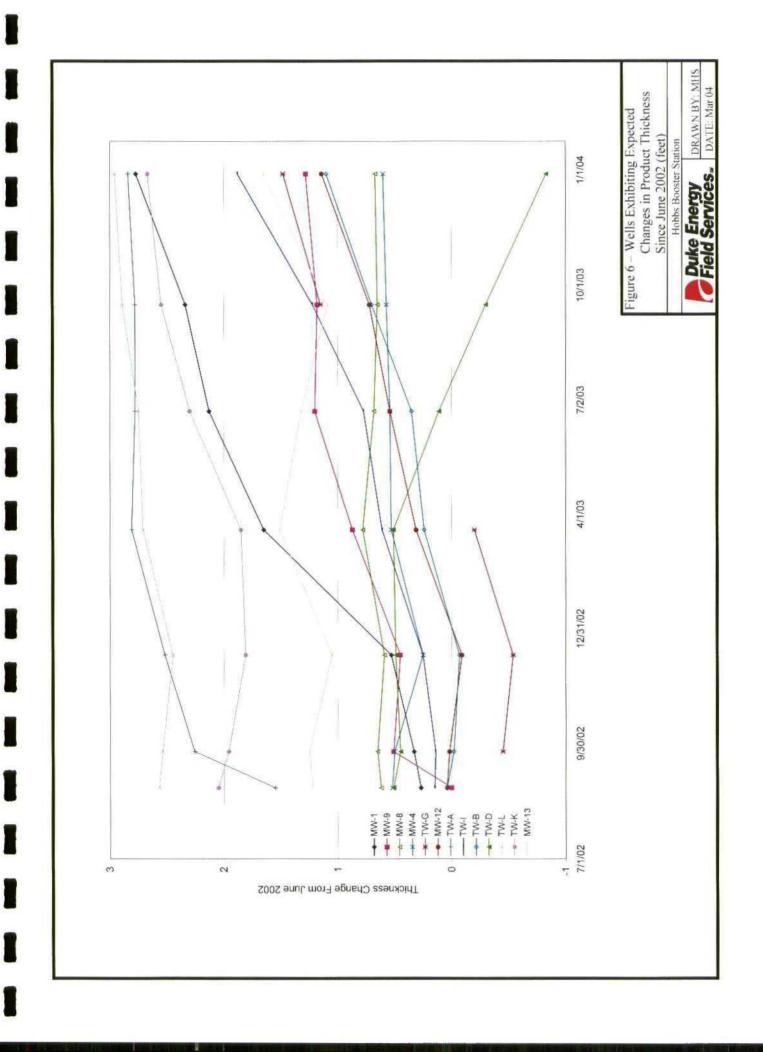


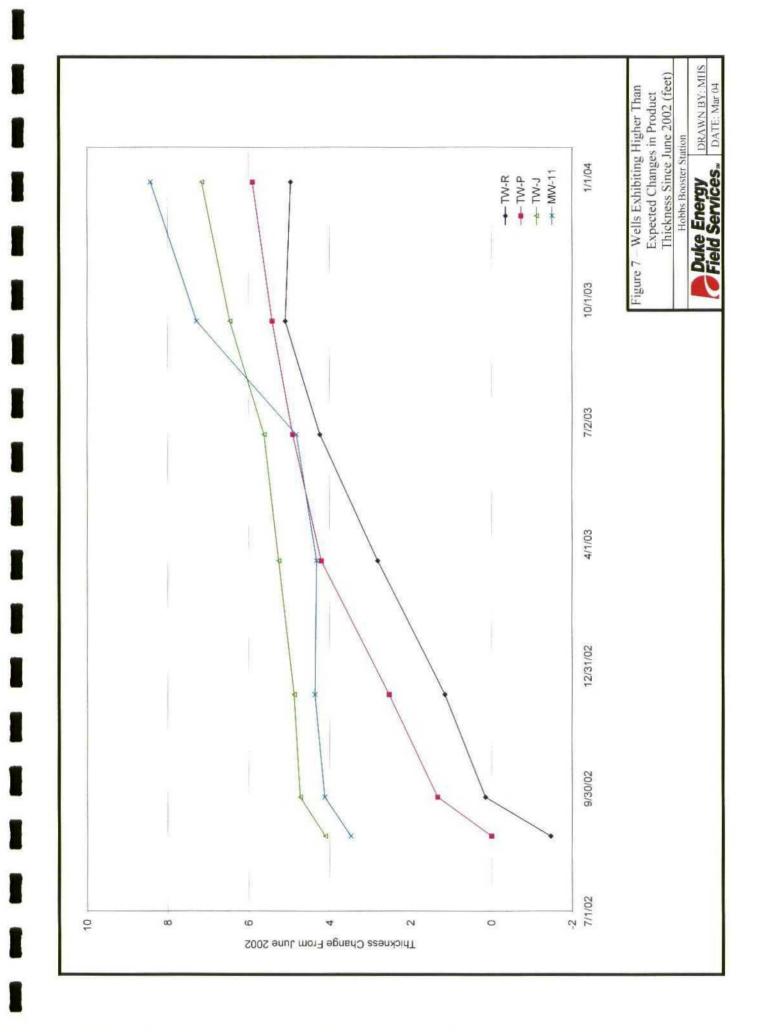


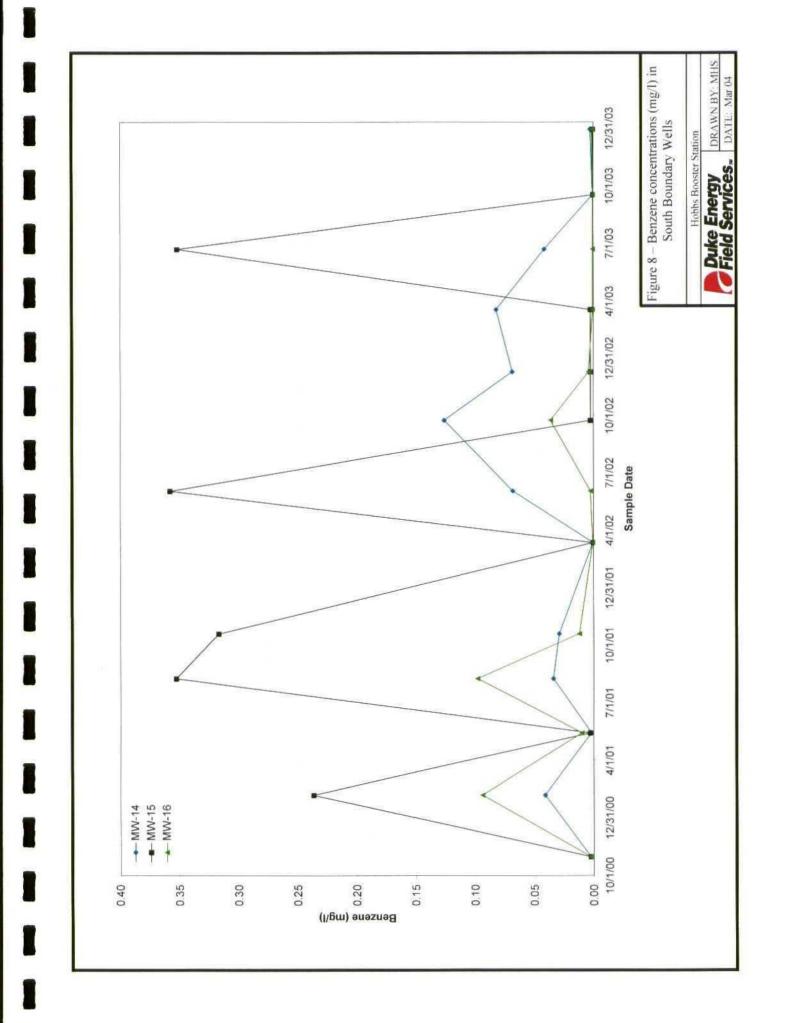












ANALYTICAL LABORATORY REPORT

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Mon Jan 5 15:15:07 2004

Page 2 of 2

Report Date: January 5, 2004

Work Order: 4010206 Duke Energy Field Services

Page Number: 2 of 2 Hobbs Booster Station

Summary Report

		Summary	Report		
Mike Stewart				Report Date:	anuary 5, 2004
Remediacon Inc.				*	······
P.O. Box 302				Work Order: 4	010206
Evergreen, CO 80-	137			ан сан сан сан сан сан сан сан сан сан с	
Project Location: Project Name:	Hobbs Booster Station Duke Energy Field Ser	vices	((
			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	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	
	Benzene	Toluene	Ethylbenzene	Xylene (isomers)
ample - Field Code	(mg/L)	(mg/L)	(mg/L)	$(m_{\rm E}/L)$
4239 - MW-19D	0.0338	<0.00100	<0.00100	0.00140
4240 - MW-19	<0.00100	<0.00100	<0.00100	0.00160
4241 - MW-22	0.0249	<0.00100	0.00100	<0.00100
4242 - MW-21	<0.00100	<0.00100	<0.00100	<0.00100
4243 - MW-20	<0.00100	<0.00100	<0.00100	<0.00100
4244 - MW-14	ా <0.00500	<0.00500	0.0137	<0.00500
4245 - MW-15 👘 👘	<0.00100	<0.00100	0.0615	0.00100
4246 - MW-16 /	0.00130	<0.00100	<0.00100	<0.00100
4247 - Duplicate	<0.00100	<0.00100	0.0613	0.00120
4248 - Trip Blank	<0.00100	<0.00100	<0.00100	0.00110

01/21/2004 13:06 806/941298

TRACEANALYSIS

PAGE 01

Report Date: January 20, 2004

Work Order: 4011603 Duke Energy Field Services

Page Number: 1 of 1 Hobbs Booster Station

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

$\frac{\text{Sample}}{25138}$	Description	Matrix	Date <u>Taken</u>	Time Taken	${f Date} {f Received}$
25139	MW-22 (0401141455) MW-190 (0401141600)	water	2004-01-14	14:55	2004-01-16
	10100-100 (0401141600)	water	2004-01-14	16:00	2004-01-16

			BTEX	<u> </u>
Sample - Field Code	Benzene	Toluene	Ethylbenzene	Xylene (isomers)
25138 - MW-22 (0401141455)	(mg/l _r)	(m#/L)	(mg/L)	(nig/L)
25139 - MW-190 (0401141600)	< 0.00100	< 0.00100	0.00110	0.00240
(0+01141000)	0.0303	<0.00100	<0.00100	0.00100

Report Date: February 9, 2004

Work Order: 4020428 Duke Energy Field Services

Page Number: 2 of 2 Hobbs Booster Station

Summary Report

Mike Stewart Remediacon In P.O. Box 302	10							
P.O. Box 302	1C				Report Date: .	February 9, 2004		
						·		
	00.007			Work Order: 4020428				
Evergreen, CC) 80 1 37							
Project Locati	on: Hobbs Boost	er Station						
Project Name	Duke Energy	/ Field Services		يلامر				
				Date	Time	Date		
Sample	Description		Matrix	Taken	Taken	Received		
26709	(MW-19d)040	130 1650	water	2004-01-27	16:50	2001-02-0-		
	- · ·	Benzene	Toluen		benzene	Xylene (isomers		
Sample - Field	Code 19d)040130 1650	(mg/L) <0.00500	(m.z/L) <0:0050		.00500	(mg/L) <0.00500		

TraceAnalysis, Inc. • 6701 Aberdeen Ave., Suite 9 • Lubbock, TX 79424-1515 • (806) 794-1296



November 12, 2002

Mr. Jack Ford New Mexico Oil Conservation Division 1220 S. St. Francis Dr. Santa Fe, NM 87505 P.O. Box 5493 Denver, Colorado 80217 370 17th Street, Suite 900 Denver, Colorado 80202 Direct: 303-595-3331 Fax: 303-893-8902

RECEIVED

NOV 1 8 2002 Environmental Bureau Oil Conservation Division

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

Wuhl H. then For

Stephen Weathers Environmental Specialist

Enclosure

cc: Larry Johnson, OCD Hobbs District Environmental Files

Remediacon Incorporated

Geological and Engineering Services remediacon@yahoo.com

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).

Mr. Stephen Weathers November 12, 2002 Page 2

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.

Mr. Stephen Weathers November 12, 2002 Page 3

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

Mech H. there

Michael H. Stewart, P.E. Principal Engineer

MHS/tbm

attachments

TABLEŠ

	Ground	Top Of Casing	Total Well	Well	Screen	Gravel
Well	Elevation	Élevation	Depth	Diameter	Interval	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

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Table 1 – Summary of Hobbs Booster Station Well Construction Information

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)

Table 2 – Hobbs Booster Station Groundwater Monitoring Program

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.

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				Corrected
*** * **	Depth To	Depth To	Product	Groundwater
Well	Water	Product	Thickness	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

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

All units in feet

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See text for corrected elevation formula

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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

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Table 4 – Summary of Measured Product Thicknesses

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

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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

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

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

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

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

All units are mg/l

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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
	<.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	ŇМ	NM	< 0.001	< 0.005

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

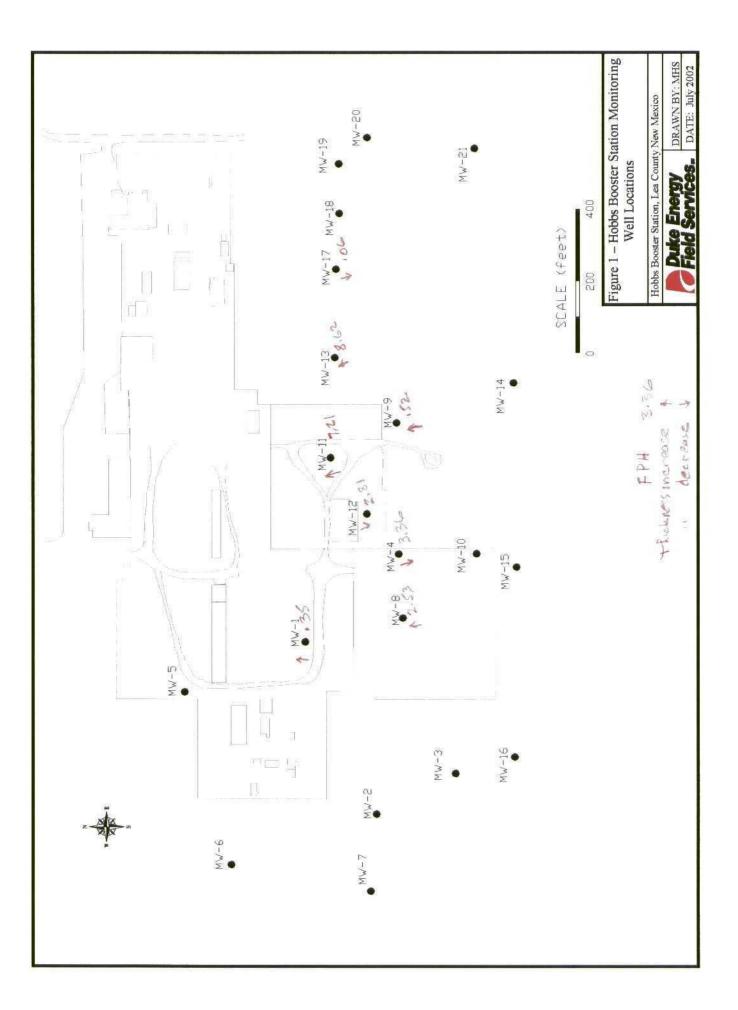
All units are mg/l

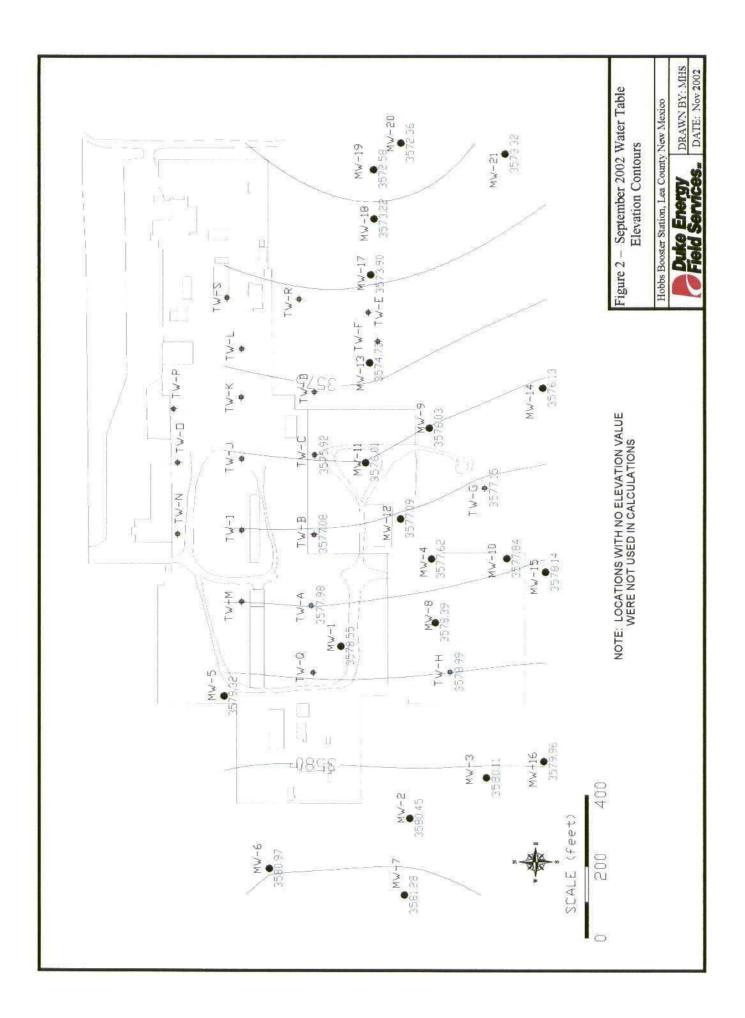
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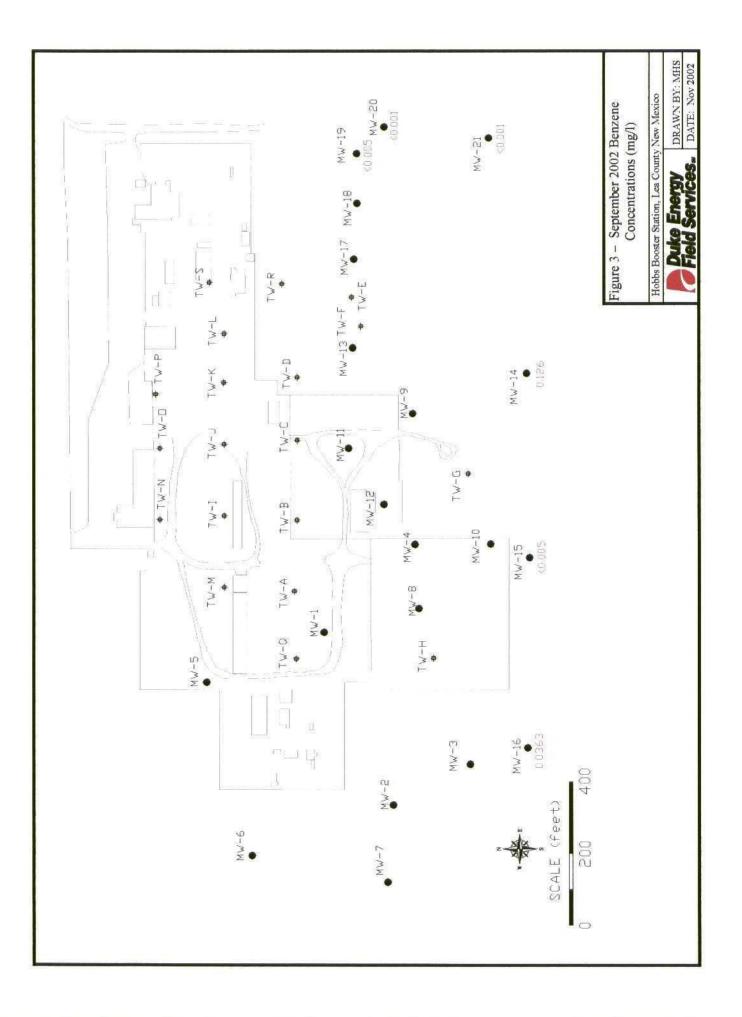
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FIGURES

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ATTACHMENTS

HOBBS BOOSTER STATION SEPTEMBER 2002

WELL PURGING FORMS

	CLIENT:	Duke Energy Field Services				WELL ID: MW-14						
SI	TE NAME:	Hobbs Booster				DATE:	9/24/2002					
PRO	JECT NO.	F-105				SAMPLER:	D. Littlejohn					
PURGING	METHOD:	ļ	🗹 Hand Bai	led 🗌 Pu	mp [,] If Pu	np, Type:	·					
SAMPLING METHOD: I Disposable Bailer I Direct from Discharge Hose I Other:												
DESCRIB	E EQUIPMI	ENT DECO	NTAMINATI	ON METHO	DD BEFO	RE SAMP	LING THE WELL:					
☑ Gloves	s 🗹 Alcono	x 🗹 Distill	ed Water Ri	nse 🗆 C	Other:							
DISPOSA	L METHOD		E WATER:	Surface	Discharg	je 🗌 Dru	ms 🖸 Disposal Facility					
			64.15 45.29		1							
HEIGHT (OF WATER	COLUMN:	18.86			9.2	Minimum Gallons to					
WELL DIA	METER:	2.0	Inch				purge 3 well volumes (Water Column Height x 0.49)					
TIME	VOLUME PURGED		COND. m S/cm	pН	DO ma/l	Turb	PHYSICAL APPEARANCE AND REMARKS					
7:54	0.0		-	-	mg/L -	-	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%					
							· · · · · · · · · · · · · · · · · · ·					
							······································					
		1										
0:26	:Total Time	ə (hr:min)	11	:Total Vol	(gal)	0.42	:Flow Rate (gal/min)					
SAMP	LE NO.:	Collected S	Sample No.:	020924	0826							
ANAL	YSES:	BTEX (802	1-B)									
COM	IENTS:											

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SITE NAME: Hobbs Booster DATE: 9/23/2002 PROJECT NO. F-105 SAMPLER: D. Littlejohn PURGING METHOD: Image: Hand Bailed Image: Pump If Pump, Type: Image: Disposable Bailer Image: Power Pump, Type: SAMPLING METHOD: Image: Disposable Bailer Image: Disposable Bailer Image: Power Pump, Type: Image: Disposable Bailer Image: Power Pump, Type: DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL: Image: Disposable Pump, Type: Image: Pump If Pump, Type: Image: Pump, Type: Image: Pump If Pump, Type: Image: Pump, Type: DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL: Image: Pump, Type: Image: Pump If Pump, Type: Image: Pump, Type: Image: Pump If Pump, Type: Pump, Type: Image: Pump, Type: Image: Pump If Pump, Type: Pump, Type: <td< th=""></td<>
PURGING METHOD: Image: Hand Bailed Pump If Pump, Type: SAMPLING METHOD: Image: Disposable Bailer Direct from Discharge Hose Other: DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL: Image: Disposal Pacific Point Po
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 B.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)
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 B.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)
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 B.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)
☑ 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 B.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)
DISPOSAL METHOD OF PURGE WATER: □ Surface Discharge □ Drums ☑ Disposal Facility TOTAL DEPTH OF WELL: 58.44 Feet
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 Well Inch Diameter (Water Column Height x 0.49)
DEPTH TO WATER: 41.25 Feet HEIGHT OF WATER COLUMN: 17.19 Feet WELL DIAMETER: 2.0 Inch Well 100 (Water Column Height x 0.49)
HEIGHT OF WATER COLUMN: 17.19 Feet 8.4 Minimum Gallons to WELL DIAMETER: 2.0 Inch purge 3 well volumes (Water Column Height x 0.49)
(Water Column Height x 0.49)
PURGED °C mg/L 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.

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	CLIENT:	Duke E	nergy Field S	ervices	-	WELL ID:	. <u>MW-16</u>
S		F	Hobbs Booster			DATE	9/23/2002
PRC	JECT NO.		F-105			SAMPLER:	D. Littlejohn
PURGING	METHOD:	i	Hand Bai	led 🗆 Pu	mplfPu	np, Type:	
SAMPLIN) :	🖸 Disposab	le Bailer	Direct 1	rom Disch	arge Hose 🛛 Other:
DESCRIB	BE EQUIPMI	ENT DECO	NTAMINATI	ON METHO	OD BEFO	RE SAMP	LING THE WELL:
✓ Glove	s 🗹 Alcono	x 🗹 Distill	ed Water Ri	nse 🗆 C	Other:		
DISPOSA			E WATER:	Surface	Discharg	je 🗆 Dru	ms 🗹 Disposal Facility
TOTAL D		VELL:	56.11	Feet			
DEPTH T	O WATER:		41.91	Feet		7.0	Minimum Callena to
	AMETER:		14.20 Inch	reet		7.0	_Minimum Gallons to purge 3 well volumes
r			•	······			(Water Column Height x 0.49)
TIME	VOLUME PURGED		COND. m S/cm	pН	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%
					<u>ہ</u>		
				·			
	ļ	L		L			
0:21	:Total Time	e (hr:min)	9	:Total Vol	(gal)	0.43	:Flow Rate (gal/min)
SAMP	LE NO.:	Collected S	Sample No.:	020923	1725		
ANAL	YSES:	BTEX (802	1-B)		•		•
COM	MENTS:	pH Meter M	Alfunctionin	g.			

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	CLIENT:	Duke E	nergy Field S	ervices		WELL ID:	MW-19
SI	TE NAME:	F	Hobbs Booster D		DATE:	9/24/2002	
PRO	JECT NO.		F-105	F-105 SAMPLER:		D. Littlejohn	
PURGING	METHOD		Hand Bai	led 🗌 Pu	mp If Pur	mp, Type:	
SAMPLIN	G METHOD	D :	🗹 Disposab	le Bailer	Direct f	rom Discha	arge Hose 🛛 Other:
DESCRIB	E EQUIPM	ENT DECO	NTAMINATI	ON METHO	DD BEFO	RE SAMPI	LING THE WELL:
Gloves	s 🗹 Alcono	x 🗹 Distill	ed Water Ri	nse 🗌 C	Other:		n
DISPOSA	L METHOD	OF PURG	E WATER:	Surface	Discharg	je 🗆 Drui	ms 🗵 Disposal Facility
			<u>65.07</u> 51.54		o		
HEIGHT C	OF WATER	COLUMN:	13.53			6.6	Minimum Gallons to
WELL DIA	METER:	2.0	Inch				purge 3 well volumes (Water Column Height x 0.49)
TIME	VOLUME PURGED		COND. <i>m</i> S/cm	pН	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		
						_	
0:28	:Total Time	e (hr:min)	7	:Total Vol	(gal)	0.25	:Flow Rate (gal/min)
SAMPI	LE NO.:	Collected S	Sample No.:	020924	1027		
ANAL	YSES:	BTEX (802	1-B)				
COMM	IENTS:	pH Meter N	lalfunctionin	g.			

	CLIENT:	Duke E	nergy Field S	ervices		WELL ID:	MW-20
SIT		F	lobbs Booster	•		DATE:	9/24/2002
PROJ	JECT NO.	F-105				SAMPLER:	D. Littlejohn
PURGING	METHOD:		☑ Hand Bai	led 🗆 Pu	mp If Pur	np, Type:	
SAMPLING		D:	☑ Disposab	le Bailer 🛛	∃ ₀Direct f	rom Discha	arge Hose 🛛 Other:
DESCRIBE	EQUIPM	ENT DECO	NTAMINATI	ON METHO	DD BEFO	RE SAMPI	LING THE WELL:
☑ Gloves		x 🗹 Distill	ed Water Ri	nse 🗆 C	Other:	<u> </u>	
DISPOSAL		OF PURGI	E WATER:	Surface	Discharg	e 🗆 Drui	ms 🗵 Disposal Facility
TOTAL DE		VELL:	61.00	Feet			
HEIGHT O	F WATER	COLUMN:	49.13 11.87	Feet		5.8	Minimum Gallons to
WELL DIAN	METER:	2.0	Inch		·		purge 3 well volumes
	VOLUME	TEMP.	COND.		DO		(Water Column Height x 0.49) PHYSICAL APPEARANCE AND
TIME	PURGED	⊃°	<i>m</i> S/cm	рН	mg/L_	Turb	REMARKS
10:50	0.0			-	-		Begin Hand Bailing
10:57	3.5	<u>19.8</u>	1.92	5.87	2.74	999	Sal = 0.09%
11:05	7.0	<u>19.7</u>	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		
				-		······	
0:24	:Total Time	ə (hr:min)	8.5	:Total Vol	(gal)	0.35	:Flow Rate (gal/min)
SAMPL	E NO.:	Collected S	ample No.:	020924	1125		
ANALY	YSES:	BTEX (802	1-B)				
COMM	ENTS:	pH Meter M	alfunctionin	g.			

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	CLIENT:	Duke E	nergy Field S	ervices	-	WELL ID:	MW-21
SI	ITE NAME:	F	lobbs Booste	r	-	DATE:	9/24/2002
PRC	JECT NO.		F-105		. 8	SAMPLER:	D. Littlejohn
PURGING	METHOD	:	☑ Hand Bai	led 🗌 Pu	mp If Pu	np, Type:	
SAMPLIN	G METHO	D :	🗹 Disposab	le Bailer	Direct 1	from Disch	arge Hose 🛛 Other:
DESCRIB	E EQUIPM	ENT DECO	NTAMINATI	ON METHO	OD BEFO	RE SAMP	LING THE WELL:
Glove:	s 🗹 Alcond	x 🗹 Distill	ed Water Ri	nse 🗆 C	Other:		
DISPOSA		OF PURG	E WATER:	Surface	Discharg	je 🗌 Drui	ms 🗹 Disposal Facility
			62.94				
	O WATER: OF WATER		50.93 12.01		¢	5.9	Minimum Gallons to
		2.0					purge 3 well volumes
[TEMP.	COND.		DO		(Water Column Height x 0.49) PHYSICAL APPEARANCE AND
TIME	PURGED		<i>m</i> S/cm	pН	mg/L	Turb	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		
-							
0:25	:Total Tim	e (hr:min)	7	:Total Vol	(gal)	0.28	:Flow Rate (gal/min)
SAMP	LE NO.:	Collected S	ample No.:	020924	0928		
ANAL	YSES:	BTEX (802	1- B)				
COM	MENTS:	pH Meter M	alfunctionin	g			

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HOBBS BOOSTER STATION SEPTEMBER 2002 ANALYTICAL LABORATORY REPORT

TraceAnalysis, Inc.

Dale Littlejohn

Report Date: October 7, 2002Order Number: A02092507 CC # V-103 Duke Energy Field services Page Number: 1 of 1 Hobbs Booster

Summary Report

Report Date:

October 7, 2002

Order ID Number: A02092507

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

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

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	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									
	Benzene	Toluene	Ethylbenzene	M,P,O-Xylene	Total BTEX					
Sample - Field Code	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)					
208733 - Rinsate	< 0.001	< 0.001	<0.001	< 0.001	< 0.001					
208734 - MW-16	0.0363	<0.005	č<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.

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6701 Aberdeen Avenue, Suite 9 155 McCutcheon, Suite H

Lubbock, Texas 79424 El Paso. Texas 79932 E-Mail: lab@traceanalvsis.com

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FAX 806 • 794 • 1298 FAX 915 • 585 • 4944

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.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	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(cs) 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.

This report consists of a total of 12 pages and shall not be reproduced except in its entircty including the chain of custody (COC), without written approval of TraceAnalysis, Inc.

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: Analysis:	208733 BTEX	G - Rinsate 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	Dil	ution	RDL
Benzene			<0.001	mg/L		1	0.001
Toluene		•	<0.001	mg/L		1	0.001
Ethylbenze	ne	•	<0.001	mg/L		1	0.001
M,P.O-Xyle	ene	•	<0.001	mg/L		1 .	0.001
Total BTE	x	· · · · · · · · · · · · · · · · · · ·	<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: Analyst:	BTEX CG	Analytical Method: Preparation Method	S 8021B S 5030B	QC Batch: Prep Batch:	QC23776 PB22245	Date Analyzed: Date Prepared:	9/25/02 9/25/02
Param		Flag	Result	Units	Dil	ution	RDL
Benzene			0.0363	mg/L		5	0.001
Toluene			<0.005	mg/L		5	0.001
Ethylbenze	ene		<0.005	mg/L		5	0.001
M,P,O-Xyl	ene		<0.005	mg/L		5	0.001
Total BTE	X		0.0363	mg/L		5	0.001

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	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: Analysis: Analyst:	208735 BTEX CG	- MW-15 Analytical Method: Preparation Method:	S 8021B S 5030B	QC Batch: Prep Batch:	QC23942 PB22371	Date Analyzed: Date Prepared:	10/3/02 10/3/02
Param		Flag	Result	Units	Dil	ution	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
Ethylbenzer	ne		<0.005	mg/L		10	0.001
M,P,O-Xyle	ene		< 0.005	mg/L		10	0.001
Total BTE	x		<0.010	mg/L		10	0.001

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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			Result	Units	Di	lution	RDL	
Benzene			0.126	mg/L		20	0.001	
Toluene			<0.020	mg∕L		20	0.001	
Ethylbenze			0.001					
	I,P,O-Xylene		< 0.020	mg/L		20	0.001	
Total BTE	X		0.126	mg/L		20	0.001	
					~	_		
0	121		TT	151) (1	Spike	Percent	Recovery	
Surrogate	Flag	Result	Units	Dilution	Amount	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:		- MW-21	(1 0001 D	00.0.41	0.000550		0 /05 /00	
Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23778	Date Analyzed:	9/25/02	
Analyst:	CG	Preparation Method	l: S 5030B	Prep Batch:	PB22246	Date Prepared:	9/25/02	
Param		Flag	Result	Units	Di	lution	RDI	
Benzene			<0.001	mg/L		1	0.001	
Toluene			<0.001	mg/L		1	0.001	
Ethylbenze			<0.001	mg/L		1	0.001	
M,P,O-Xyl			<0.001	mg/L		1	0.00	
Total BTE	X		< 0.001	mg/L		1	0.001	
				0				
					Spike	Percent	Recover	

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:	20873	8 - MW-19					
Analysis:	BTEX	Analytical Met	thod: S 8021B	QC Batch:	QC23801	Date Analyzed:	9/26/02
Analyst:	CG	Preparation M	ethod: S 5030B	Prep Batch:	PB22261	Date Prepared:	9/26/02
Param		Flag	Result	Units	Di	lution	RDL
Benzene			<0.005	mg/L		5	0.001
Toluene			< 0.005	mg/L		5	0.001
Ethylbenze	ne		<0.005	mg/L		5	0.001
M,P,O-Xyl	ene		< 0.005	mg/L		5	0.001
Total BTE	х		<0.005	mg/L		5	0.001

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				0	Spike	Percent	Recovery
Surrogate	\mathbf{Flag}	Result	Units	Dilution	Amount	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: Analyst:	$\begin{array}{c} \operatorname{BTEX} \\ \operatorname{CG} \end{array}$	Analytical Method: Preparation Method	S 8021B : S 5030B	QC Batch: Prep Batch:	QC23778 PB22246	Date Analyzed: Date Prepared:	9/25/02 9/25/02
Param		Flag	Result	Units	Dil	ution	RDL
Benzene			< 0.001	mg/L	1		0.001
foluenc			<0.001	mg/L		1	0.001
Ethylbenze	ne		<0.001	mg/L		1	0.001
M,P,O-Xyle	ene		<0.001	mg/L		1	0.001
Total BTE	X		<0.001	ng/L		1	0.001
					C- 3	Descent	Decourant
Provente	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Surrogate TFT	гад	0.0963	mg/L	1	0.10	<u>96</u>	70 - 130
4-BFB		0.0848	mg/L	1	0.10	85	70 - 130
Sample: Analysis:	208740 BTEX	- Dup-1 Analytical Method:	S 8021B	° QC Batch:	QC23909	Date Analyzed:	10/2/02
Analysis. Analyst:	CG	Preparation Method		Prep Batch:	PB22345	Date Prepared:	10/2/02
Param		Flag	Result	Units	Di	lution	RDL
and a second sec			< 0.005	mg/L		5	0.001
and a second sec				ma / I		5	0.001
MTBE Benzene			< 0.005	mg/L			
MTBE Benzene Toluene			< 0.005	mg/L		5	0.001
MTBE Benzene Toluene Ethylbenze			<0.005 <0.005	mg/L mg/L		5 5	0.001 0.001
MTBE Benzene Toluene Ethylbenze M,P,O-Xyl	ene		<0.005 <0.005 <0.005	mg/L mg/L mg/L		5 5 5	0.001 0.001 0.001
MTBE Benzene Toluene Ethylbenze	ene		<0.005 <0.005	mg/L mg/L		5 5	0.001 0.001 0.001
MTBE Benzene Toluene Ethylbenze M,P,O-Xyl	ene		<0.005 <0.005 <0.005	mg/L mg/L mg/L	Spike	5 5 5	0.001 0.001 0.001 0.001
MTBE Benzene Toluene Ethylbenze M,P,O-Xyl Total BTE	ene X	Result	<0.005 <0.005 <0.005 <0.005	mg/L mg/L mg/L	Spike Amount	5 5 5 5	0.001 0.001 0.001 0.001 Recovery Limits
MTBE Benzene Toluene Ethylbenze M,P,O-Xyl	ene	Result	<0.005 <0.005 <0.005	mg/L mg/L mg/L mg/L		5 5 5 5 Percent	0.001 0.001 0.001 0.001 Recovery

Order Number: A02092507 Duke Energy Field services

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	0	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
Toluenc		< 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
$\overline{\mathrm{T}\mathrm{F}\mathrm{T}}$		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
Toluenc		< 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

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

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Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits		
TFT		0.0993	mg/L	1	0.10	99	70 - 130		
<u>4-BFB</u>		0.0957	mg/L	1	0.10	96	70 - 130		
Method I	Blank	QCBatch:	QC23909						
Param		Flag		Results	Unit	S	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	e			<0.001	mg/I		0.001		
Total BTEX			Autor	<0.001	mg/1	L	0.001		
Surrogate	Flag	Result	Units	o	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 3	Blank	QCBatch:	QC23942						
Param		Flag		Results	Unit	-u	Reporting Limit		
MTBE		1 108		<0.001	mg/		0.001		
Benzene				<0.001	mg/		0.001		
Toluenc				<0.001	mg/		0.001		
Ethylbenzene	2			<0.001	mg/		0.001		
M,P,O-Xylen				<0.001	mg/		0.001		
Total BTEX	10			<0.001	mg/		0.001		
THE DIDA				~0.001		<u> </u>	0.001		

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	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

Laborato	ry Contro	l Spikes	Q	CBatch:	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
									Conti	nued

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Param	LCS Result	\mathbf{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.

	LCS	LCSD			Spike	LCS	LCSD	Recovery
Surrogate	Result	Result	Units	Dilution	Amount	% Rec	% Rec	Limits
TFT	0.102	0.0801	mg/L	1	0.10	102	80	70 - 130
<u>4-BFB</u>	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		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

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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-Xylenc	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.

	LCS	LCSD			Spike	LCS	LCSD	Recovery
Surrogate	Result_	Result	Units	Dilution	Amount	% Rec	% Rec	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
Ethylbonzene	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	00	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	Spik e 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

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	(1)	l

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
Benzenc		mg/L	0.10	0.0924	92	85 - 115	9/25/02
Toluenc		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	<u></u>	mg/L	0.30	0.263	88	85 - 115	9/25/02

CCV (2) QCBatch: QC23776

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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Datc Analyzed
MTBE		mg/L	0.10	0.0952	95	85 - 115	9/25/02
Benzenc		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

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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
Ethylbenzonc		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)	QCBa	tch: QC23	778				
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

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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:

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QC23778

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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

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CCV(1)	QCBatch:	QC23801
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			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
MTBE		mg/L	0.10	0.0976	98	85 - 115	9/26/02
Benzeno		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-Xylenc		mg/L	0.30	0.286	95	85 - 115	9/26/02

CCV(2)	QCBa	tch: QC23	801				
			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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

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ICV (1)

QCBatch: QC23801

			CCVs True	CCVs° Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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

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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		
Bonzene		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
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			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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)				
			CCVs True	\mathbf{CCVs} ° Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
MTBE	1 145	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:

tch: 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:

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Report Date: Oct CC # V-103	ober 7, 2002		Order M Duke E	Page Number: 12 of 12 Hobbs Booster				
Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Rocovery	Percent Recovery Limits	Date Analyzod	
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	

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

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Remediacon Incorporated

Geological and Engineering Services remediacon@yahoo.com

September 5, 2002

Mr. Stephen Weathers Duke Energy Field Services, LP 370 17th Street, Suite 900 Denver, CO 80202 PO Box 302, Evergreen, Colorado 80437 Telephone: 303.674.4370 Facsimile: 617.507.6178

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SFP 0 9 2002 Environmental Bureau Oil Conservation Division

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

Mechael H. Stewart

Michael H. Stewart, P.E. Principal Engineer

MHS/tbm

attachments

TABLES

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[Ground	Top Of Casing	Total Well	Well	Screen	Gravel
Well	Elevation	Elevation	Depth	Diameter	Interval	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 1 – Summary of Hobbs Booster Station Well Construction Information

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

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MW-1 MW-2 MW-3					11/1/2/2	10/01/0	8/9/01	10/23/01	3/13/02	6/27/02
MW-1 MW-2 MW-3										
MW-2 MW-3	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-3	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
	3,582.25	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
9-MM	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
8-MM	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
6-MM	MN	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	MN	3,578.58	3,578.58	3,578.18	3,578.18	3,577.96	3,577.73	3,577.53
MW-13	NM	MN	WN	3,576.41	3,576.32	3,576.29	3,575.86	3,575.81	3,575.40	3,575.23
MW-14	NM	MN	MN	3,577.51	3,577.46	3,577.35	3,576.90	3,576.56	3,576.06	3,576.26
MW-15	NM	MN	MN	3,579.57	3,579.53	3,579.36	3,579.02	3,578.70	3,578.21	3,578.32
MW-16	NM	NN	MN	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	MN	3,575.36	3,575.26	3,575.15	3,574.89	3,574.68	3,574.24	3,574.07
MW-18	MN	MN	MN	3,574.66	3,574.53	3,574.43	3,574.21	3,573.98	3,573.56	3,573.38
MW-19	MN	MN	MN	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	MN	NM	MN	NM	MN	MN	MN	3,572.51
MW-21	MN	MN	MN	MN	MN	NM	MN	MN	MN	3,573.46

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		8/22/00	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
6-WW	NM				0.01		0.00	0.01	0.15	Sheen
MW-10		0.01	0.00	0.00	0.02	0.02		0.01	0.02	
MW-11		1.18	4.10	4.45	5.42	5.47	5.97	6.26	L	3.09
MW-12	MN	MN	MN	0.08	1.05	0.96	2.04	1.71	2.79	2.79
MW-13		MN	MN	0.17	0.76	0.84	5.22	5.69	7.62	7.37
MW-17	NM	MN	MN	0.01	0.02	0.01	0.03		0.03	Sheen
MW-18	MN	MN	MN					0.01	Sheen	
Matan All	1 to fact									

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

	66/8/L	5/11/00	8/22/00	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	MN		0.00	0.00	0.00	0.27	0.40	0.06	0.72	1.88
6-WM	MN				0.01		0.00	0.01	0.15	Sheen
MW-10	MN	0.01	0.00	0.00	0.02	0.02		0.01	0.02	
MW-11	MN	1.18	4.10	4.45	5.42	5.47	5.97	6.26	7	3.09
MW-12	MN	MN	MN	0.08	1.05	0.96	2.04	1.71	2.79	2.79
MW-13	MN	MN	MN	0.17	0.76	0.84	5.22	5.69	7.62	7.37
MW-17	MN	MN	MN	0.01	0.02	0.01	0.03		0.03	Sheen
MW-18	MN	MN	NM					0.01	Sheen	

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

 MW-18
 NM
 NM
 NM
 NM
 NM
 NM
 NM
 NM
 Notes:
 All units in feet
 NM
 N

	7/8/99	5/11/00	8/22/00	10/31/00	2/5/01	5/15/2001	8/9/2001	10/19/2001	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	MN	MN	MN	<.005	0.237	0.003	0.353	0.317	<0.001	0.358
MW-16	MN	MN	MN	<.005	0.094	0.01	860.0	0.012	<0.001	<0.005
MW-18	MN	MN	MN	<.005	<.005	0.004	0.007	0.036	<0.001	LNAPL
MW-19	NM	NM	MN	<.005	<.005	0.001	<.005	0.035	<0.001	<0.001
MW-20	NM	NM	MN	NM	NM	NM	NM	NM	NM	<0.002
MW-21	MN	MN	MN	MN	NM	MN	MN	MN	MN	<0.001

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

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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

	Inside Area of	
Well	Free Phase Hydrocarbons	Proposed Monitoring Frequency
<u>MW-1</u>	Boundary	None (FPH present)
<u>MW-2</u>	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

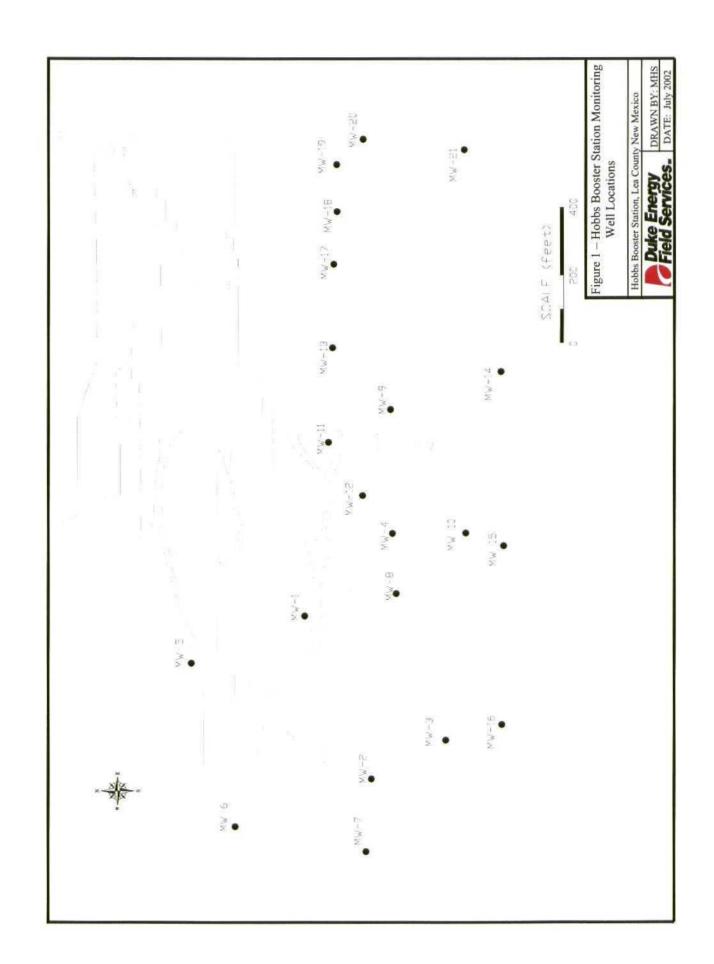
Table 5 – Proposed Groundwater Monitoring Program

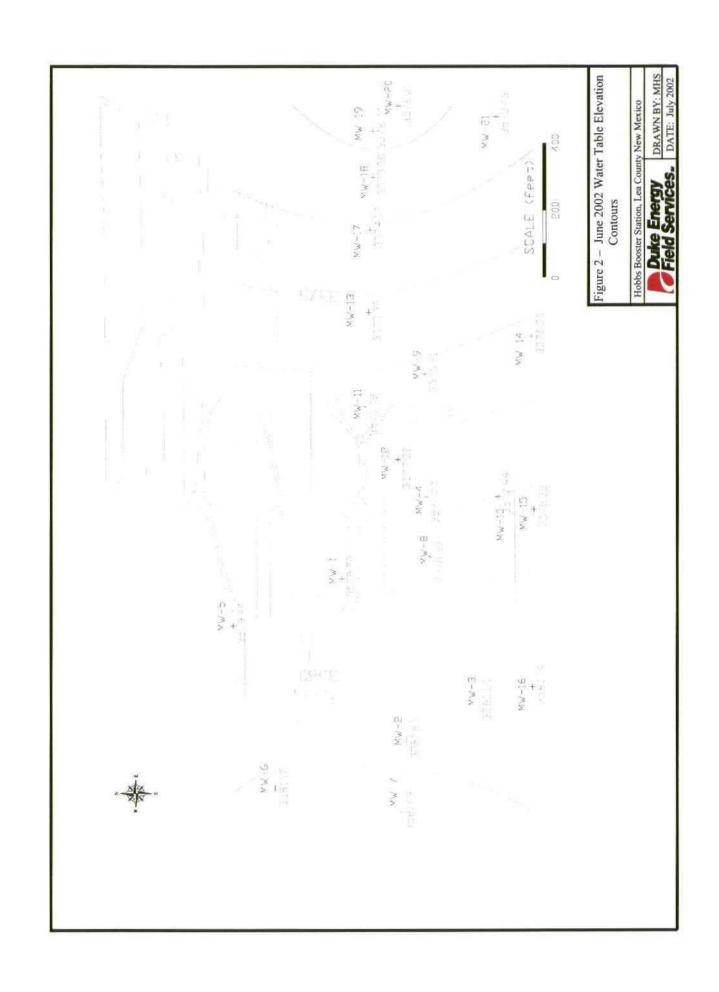
FPH: Free phase hydrocarbons

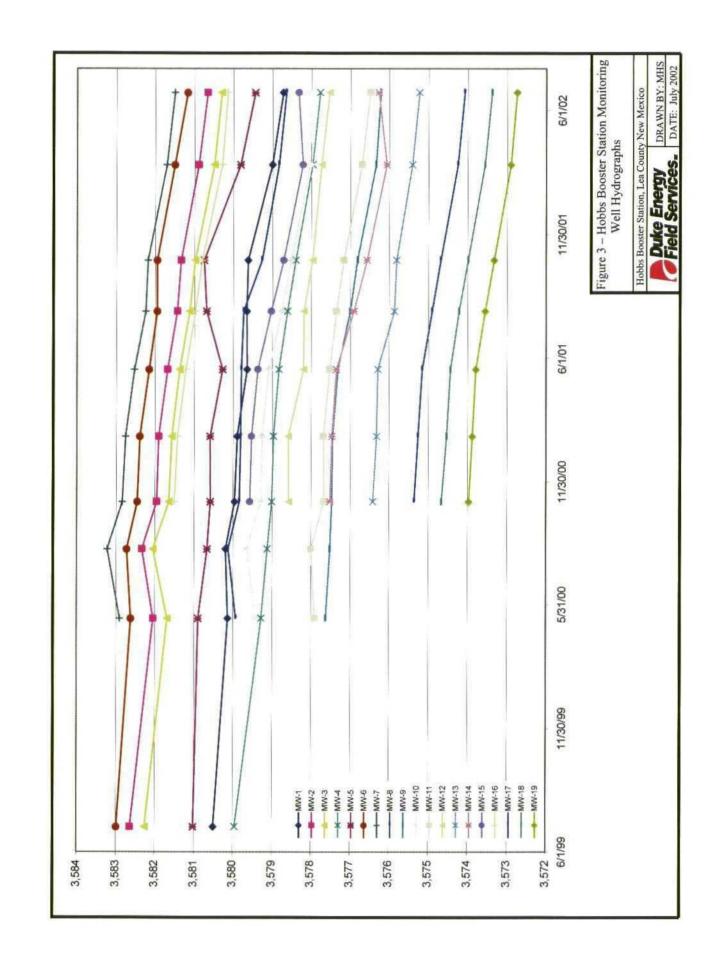
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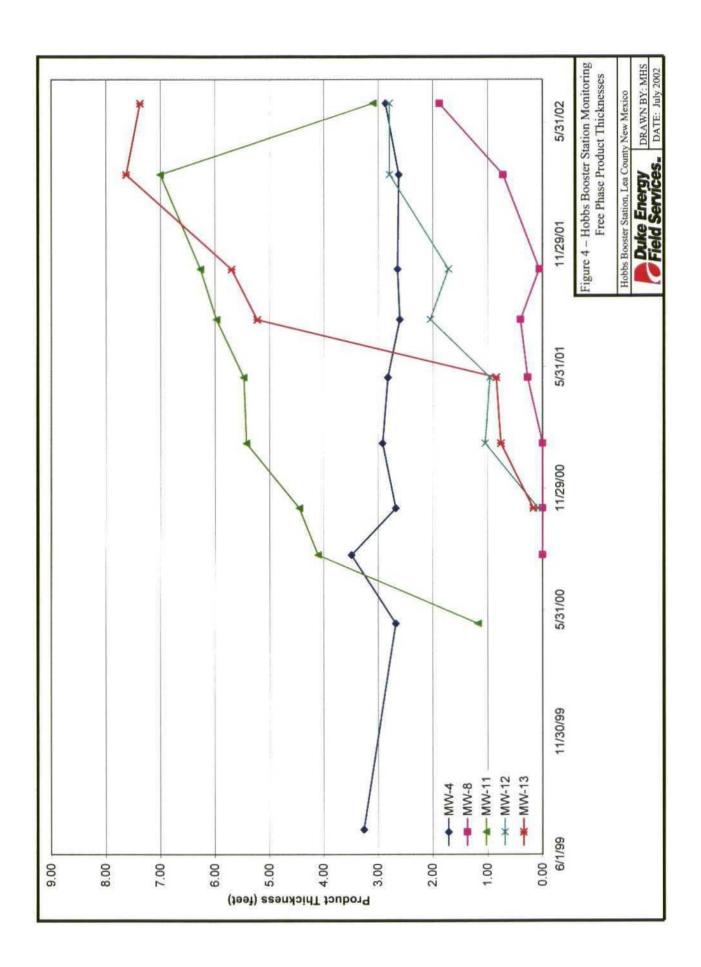


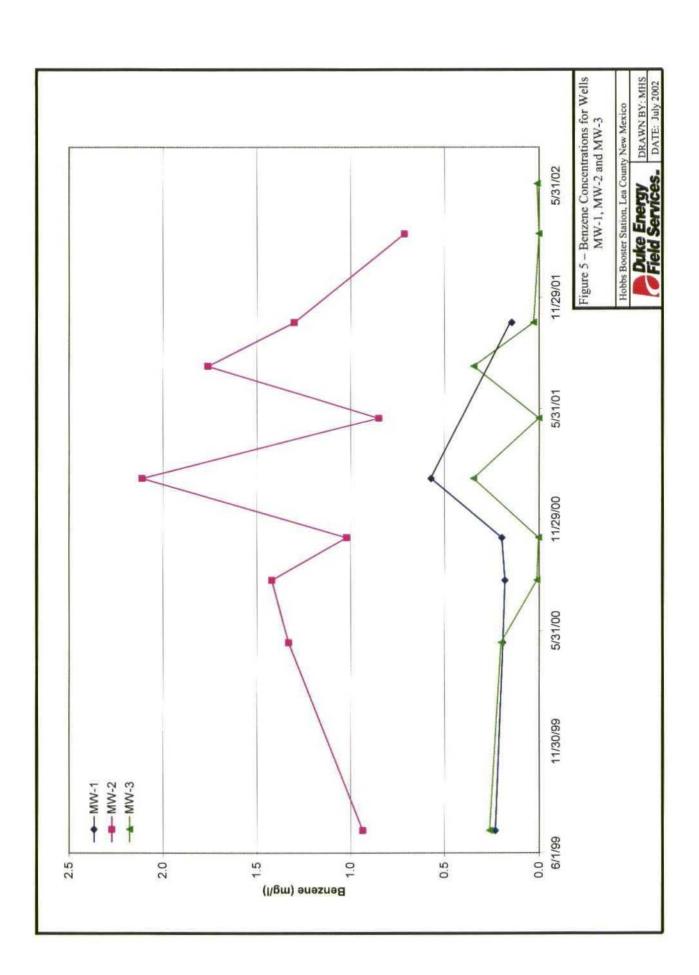
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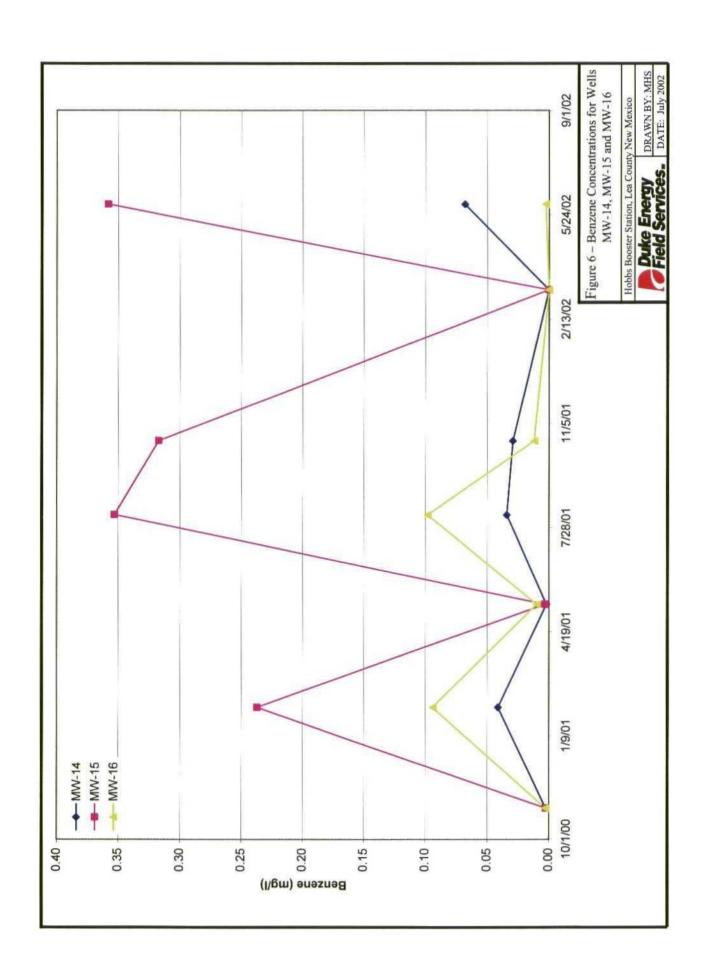


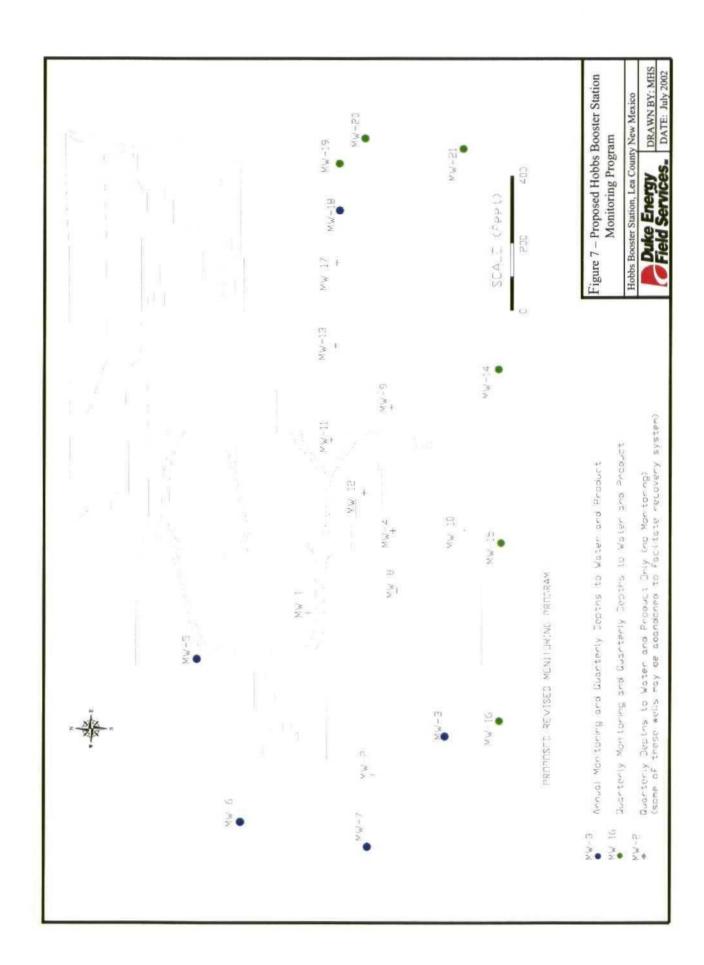












Remediacon Incorporated

Geological and Engineering Services remediacon@yahoo.com

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

September 4, 2002

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

SEP 0 9 2002 Environmental Bureau Oil Conservation Division

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 freephase hydrocarbon thickness in wells MW-8, MW-11, MW-12 and MW-13 as shown by the following table (all units in feet): Mr. Stephen Weathers September 4, 2002 Page 2

	Change in Measured Depth To Free Product	Change in Free Product Thickness
Well	(feet) ¹	(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.

Mr. Stephen Weathers September 4, 2002 Page 3

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 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.

Mr. Stephen Weathers September 4, 2002 Page 4

CONCLUSIONS

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

- 1. Measurable free product is present under approximately 14 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

Mechael H. Stewart

Michael H. Stewart, P.E. Principal Engineer

MHS/tbm

attachments



	Ground	Top Of Casing	Total Well	Well	Screen	Gravel
Well	Elevation	Elevation	Depth	Diameter		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 1 – Summary of Hobbs Booster Station Well Construction Information

	7/8/99	5/11/00	8/22/00	10/31/00	2/5/01	5/15/01	8/9/01	10/23/01	8/9/01 10/23/01 3/13/02	6/27/02
MW-I						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	MN		0.00	0.00	0.00	0.27	0.40	0.06	0.72	1.88
9-WM	MN				0.01		0.00	0.01	0.15	Sheen
MW-10	MN	0.01	0.00	0.00	0.02	0.02		0.01	0.02	
MW-11	MN	1.18	4.10	4.45	5.42	5.47	5.97	6.26	7	3.09
MW-12	MN	MN	MN	0.08	1.05	0.96	2.04	1.71	2.79	2.79
MW-13	MN	MN	MN	0.17	0.76	0.84	5.22	5.69	7.62	7.37
MW-17	MN	MN	MN	0.01	0.02	0.01	0.03		0.03	Sheen
MW-18	MN	MN	MN					0.01	Sheen	

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

MW-18 Notes: All

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

				Hydrated
	Total	Slotted	Sand	Bentonite Chip
Well	Depth	Interval	Interval	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

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

NOTES:

1. All units are feet

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

Well	Depth	PID
A	8-10	78.9
A A A A A	13-15	322
Α	22-24	317
A	30-32	208
A	38-40	161
A	45-47	328
В	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 C 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
		·····
0	8-10	0.0
0	45-47	0.0
0	48.0	Moderate HC odor
P	3-5	0.0
Р	8-10	0.0
<u> </u>	45-47	162
Q	3-5	0.0
Q Q 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
<u>S</u> S	3-5	0.0
	8-10	0.0
	45-47	0.0
S	60	Slight HC odor

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

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

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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
<u>SG-60</u>	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

	Measured	Calculated
	Thickness in	Actual
Location	Wells	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

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

All units in feet

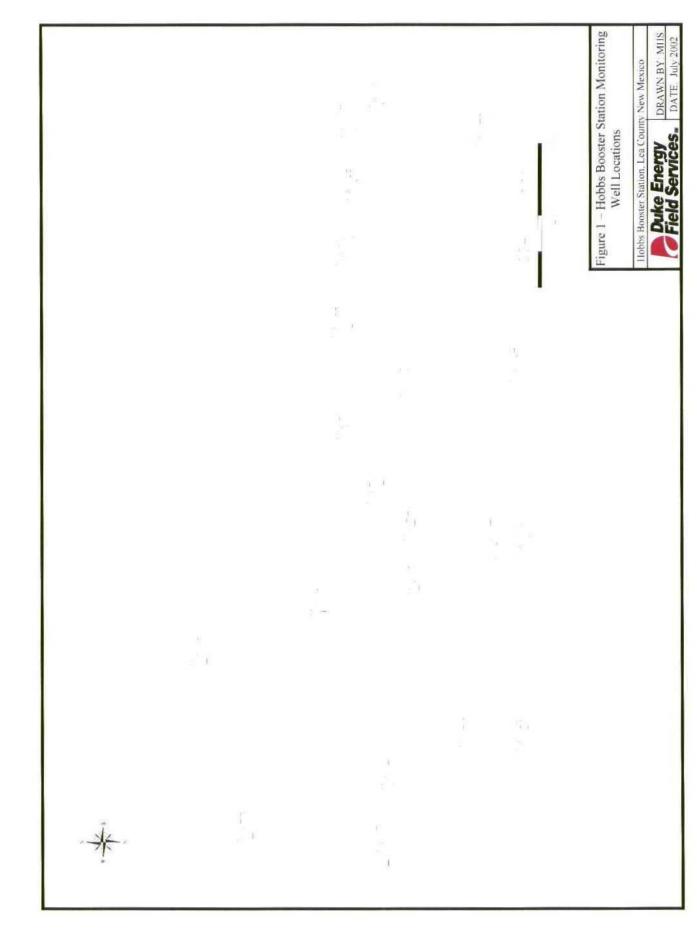
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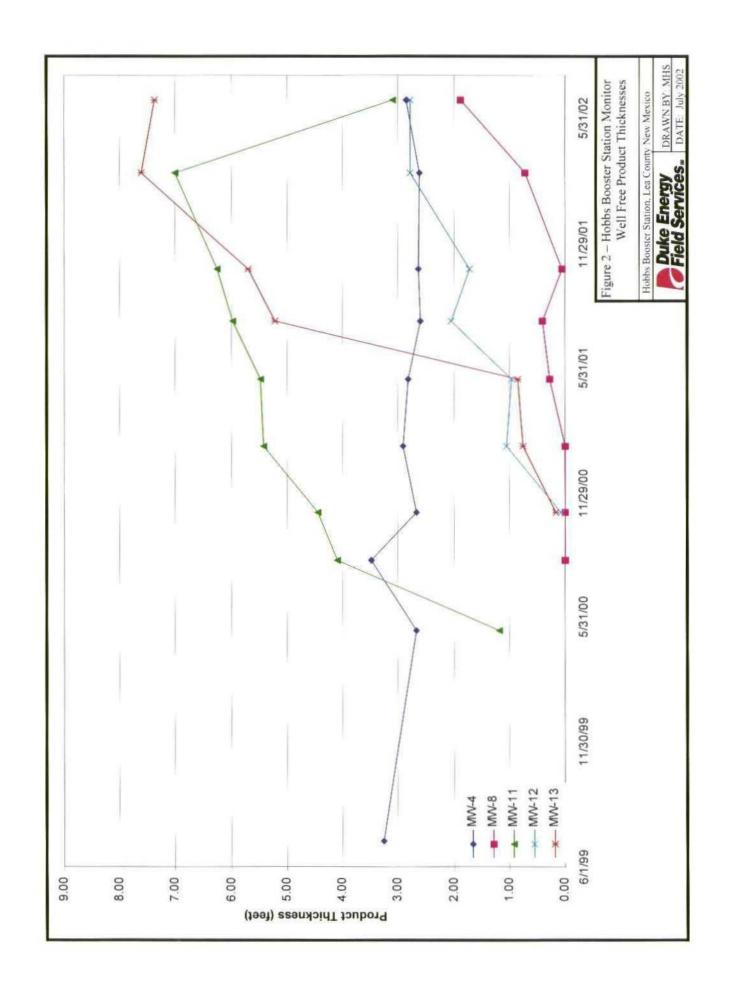
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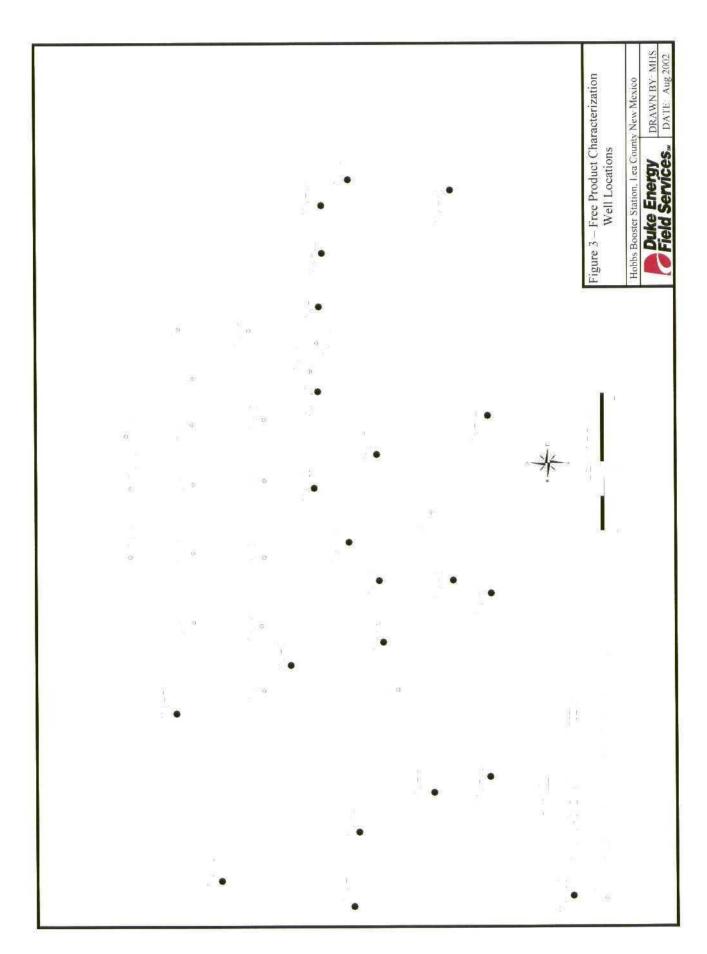
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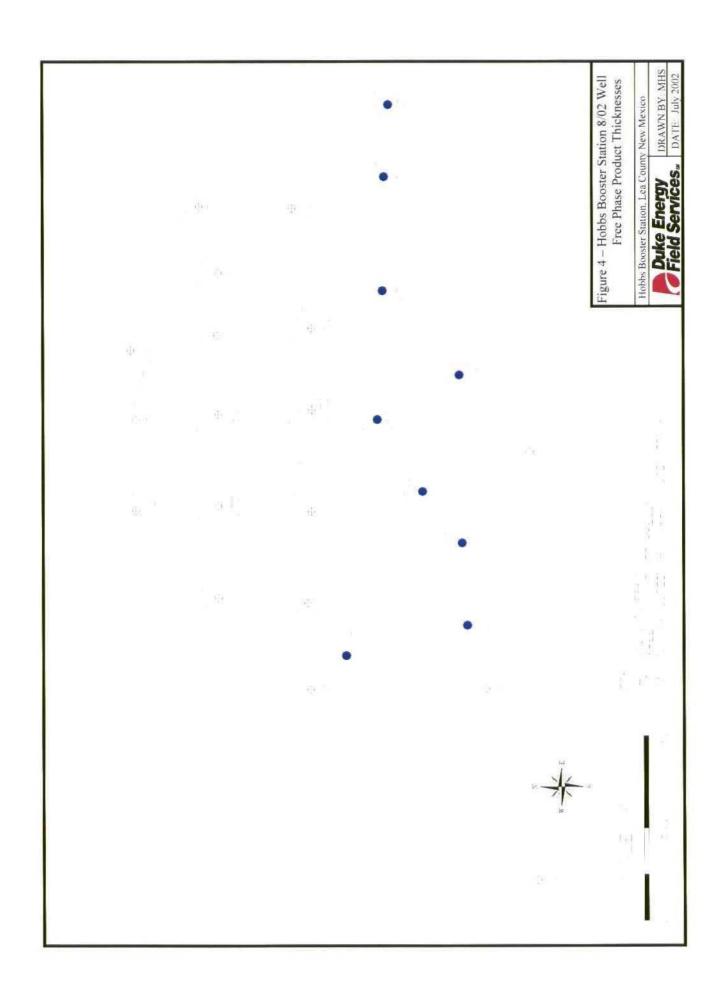
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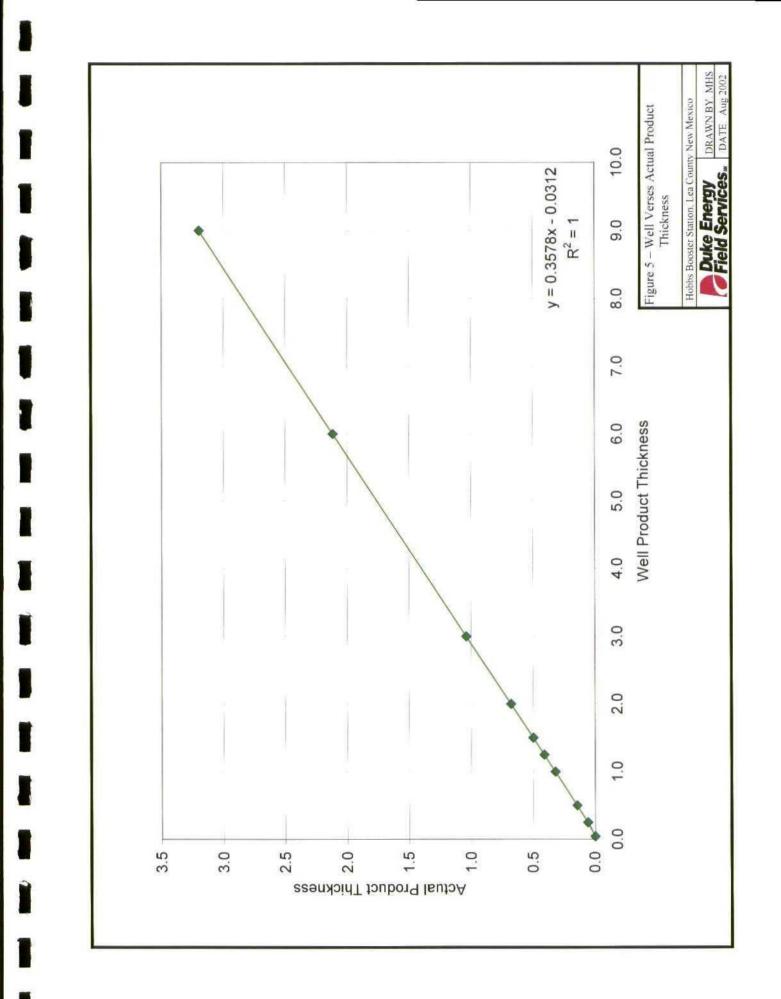
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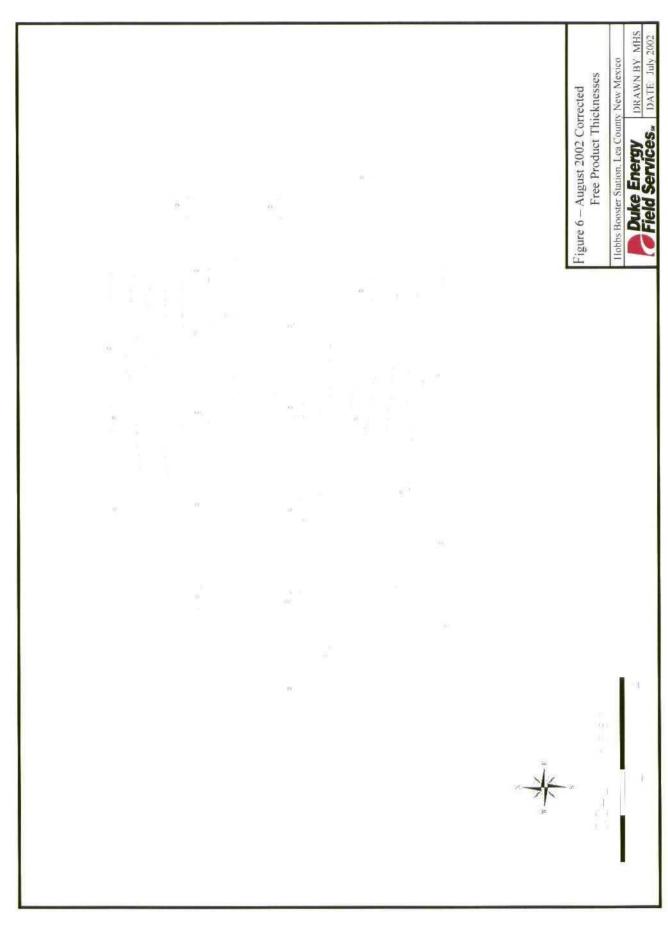


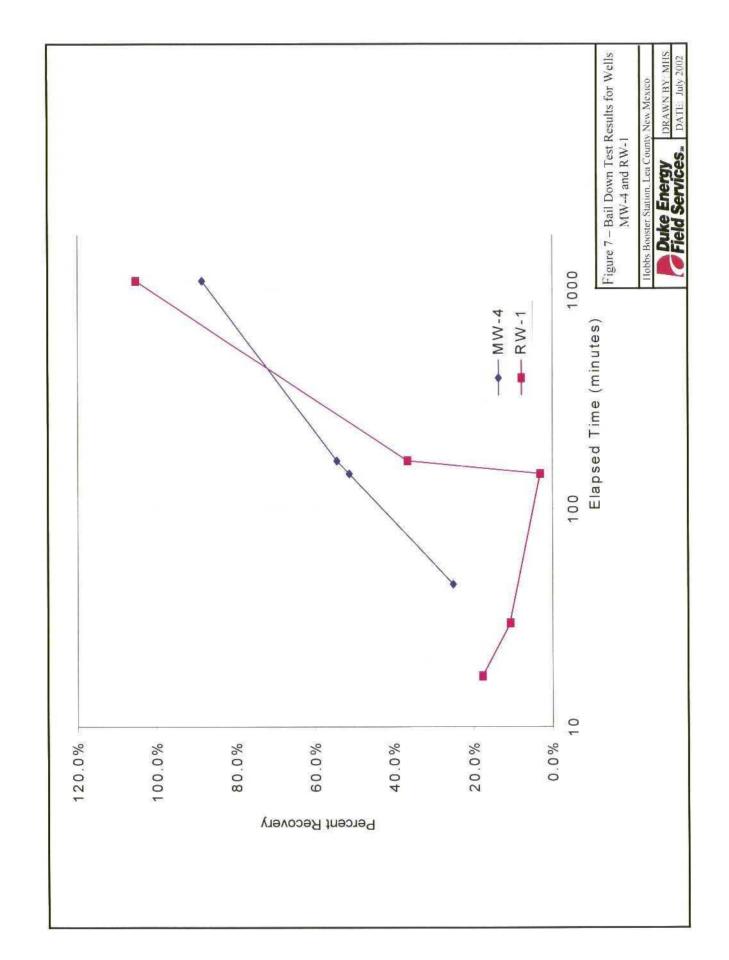


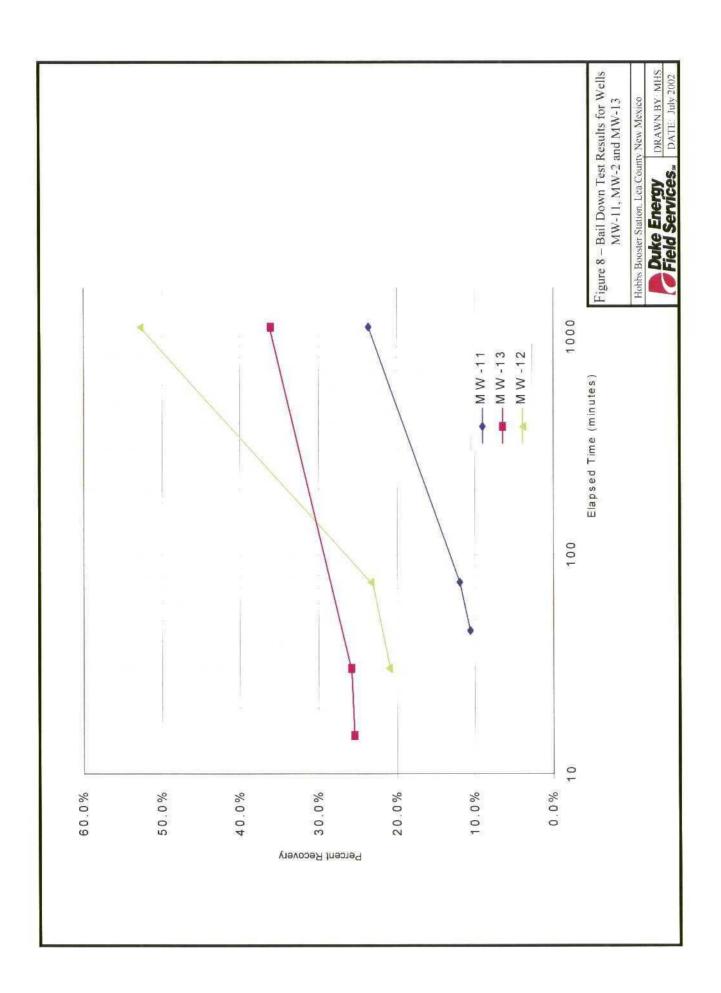












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April 4, 2002

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.

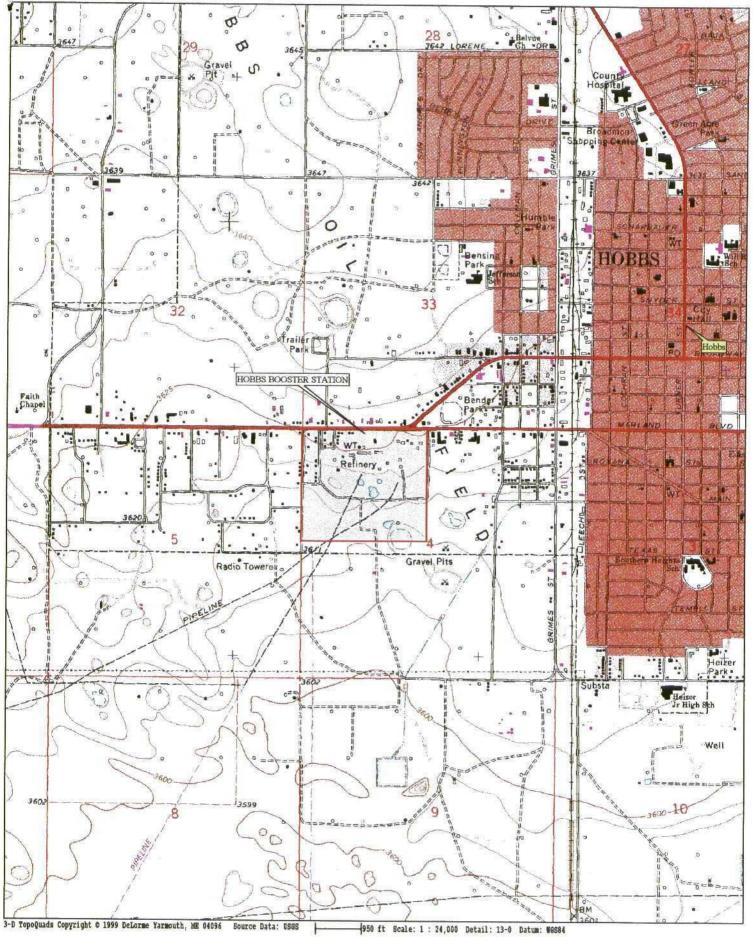
Depth to groundwater in the site area occurs at 36 to 48 feet below ground surface across the site. The direction of groundwater flow is to the southeast with a hydraulic gradient of approximately 0.004 feet/foot, which is consistent with determinations made from previous gauging events. The water table 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



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

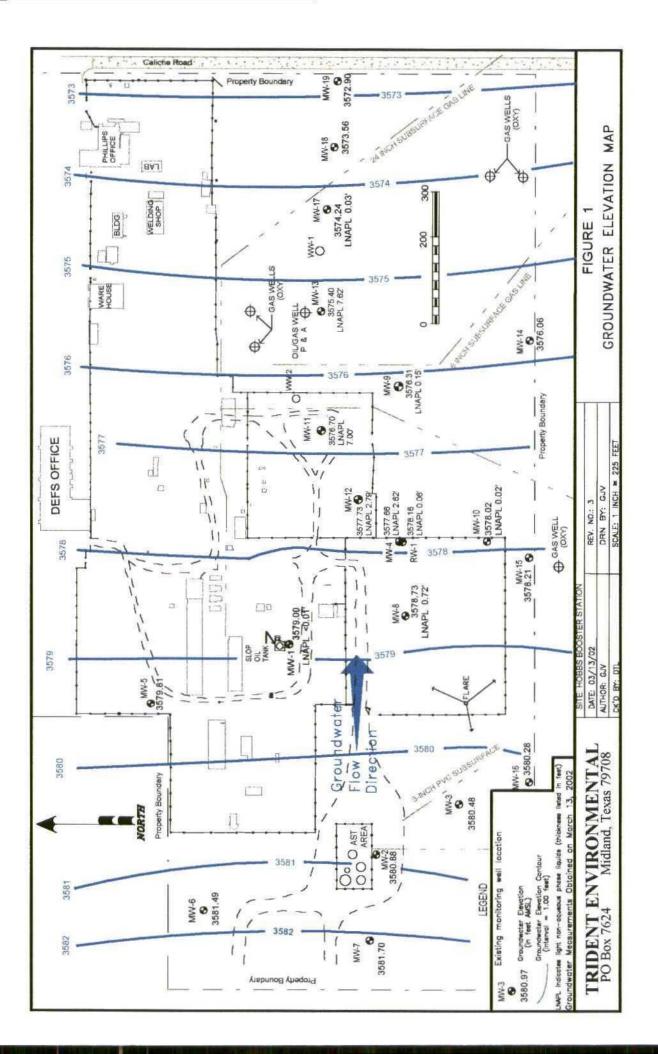




Table 1Summary of Groundwater ElevationsMeasurements Obtained on March 13, 2002						
Monitoring Well	Ground Surface Elevation (Feet)	Top of Casing Elevation (Feet)	Depth to Groundwater (Feet)	Depth to LNAPL (Feet)	LNAPL Thickness (Feet)	Corrected Groundwater Elevation (Feet)
MW-1	3623.60	3626.06	47.06	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.

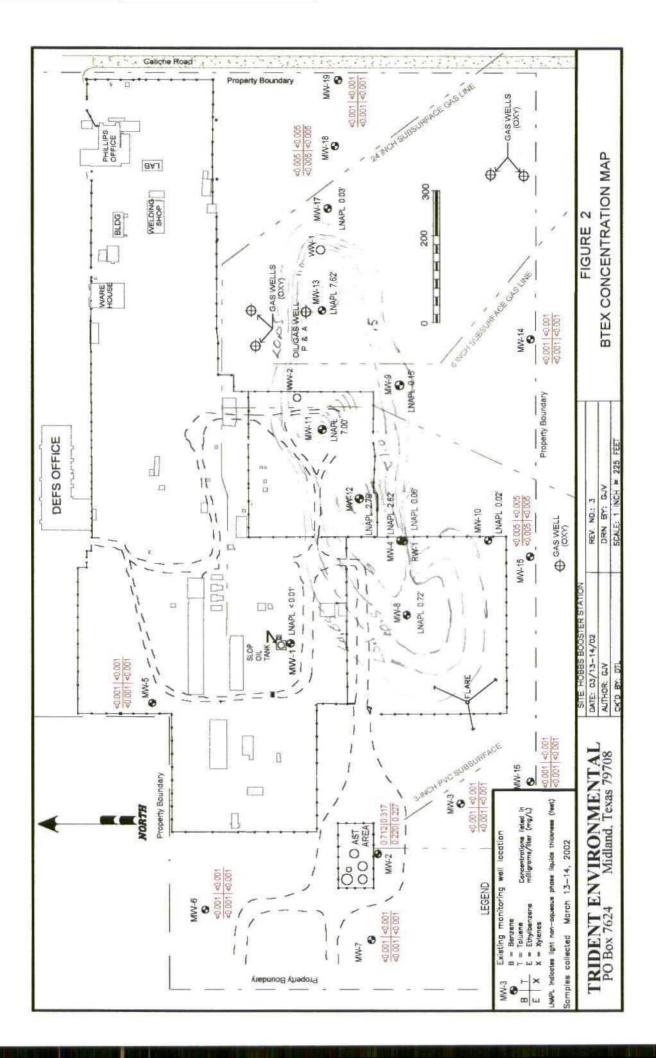


Table 2 Summary of BTEX Concentrations						
Grow		•	centrations n March 13-14, 20	102		
Monitoring	Benzene	Toluene	Ethylbenzene	Xylenes		
Well	(mg/L)	(mg/L)	(mg/L)	(mg/L)		
MW-2	0.712	0.317	0.220	0.227		
MW-3	< 0.001	0.006	< 0.001	0.008		
MW-5	< 0.001	< 0.001	< 0.001	< 0.001		
MW-6	< 0.001	< 0.001	< 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	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. Man Duti

Gilbert J. Van Deventer, REM Project Manager

Attachments

ATTACHMENTS

ATTACHMENT A

SUMMARY OF HISTORICAL BTEX CONCENTRATIONS

		Tabl	e 3	<u> </u>	······································
	Sum	mary of BTEX (Concentrations in	Groundwater	
			Booster Station		
Monitoring	Sampling	Benzene	Toluene	Ethylbenzene	Xylenes
Well	Date	(mg/L)	(mg/L)	(mg/L)	(mg/L)
	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-1	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
	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-2	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
	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-3	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
	06/17/99	< 0.005	< 0.001	< 0.001	< 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-5	02/05/01	< 0.005	< 0.005	< 0.005	< 0.005
	05/15/01	< 0.003	< 0.003	< 0.003	< 0.003
	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
	06/18/99	< 0.001	< 0.001	< 0.005	< 0.001
	05/11/00	< 0.005	< 0.005	< 0.005	0.038
	08/22/00	< 0.005	0.003	< 0.005	0.038
	10/31/00	< 0.005	< 0.008	< 0.005	< 0.007
MW-6	02/05/01	< 0.005	< 0.003	< 0.005	< 0.003
141 44 -0	02/03/01	< 0.003		< 0.003	
	03/13/01 08/09/01	< 0.001	< 0.001		< 0.001
	10/10/01		< 0.001	< 0.001	< 0.001
		< 0.001	< 0.001	< 0.001	< 0.001
VOCC Store	03/13/02	< 0.001	< 0.001	< 0.001	< 0.001
VQCC Stand	iards	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.

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~		e 3 (Continued)	C	
Sum			Groundwater	
Sampling	Benzene	Toluene	Ethylbenzene	Xylenes
Date	(mg/L)	(mg/L)	(mg/L)	(mg/L)
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
		< 0.001		< 0.001
				< 0.001
				< 0.001
				< 0.001
				0.742
				LNAPL
				LNAPL
				0.286
				0.340
				0.449
				LNAPL
				LNAPL
			The second se	0.208
				LNAPL
		, , , , , , , , , , , , , , , , , , , ,	1	LNAPL
				1 .28 LNAPL
				LNAPL
				LNAPL
				2.38
				<u>LNAPL</u> < 0.005
				< 0.005
				< 0.001
1				< 0.005
				< 0.001
				< 0.001
1			1	< 0.005
				< 0.005
				< 0.001
				< 0.005
				< 0.020
03/13/02 lards	<u>< 0.005</u> 0.010	<u>< 0.005</u> 0.75	<u>< 0.005</u> 0.75	<u>< 0.005</u> 0.62
	Sampling Date 05/11/00 08/22/00 10/31/00	Summary of BTEX (Hobbs Sampling Date Benzene (mg/L) 05/11/00 < 0.005	Summary of BTEX Concentrations in Hobbs Booster StationSampling DateBenzene (mg/L)Toluene (mg/L) $05/11/00$ < 0.005	Summary of BTEX Concentrations in Groundwater Hobbs Booster StationSampling DateBenzene (mg/L)Toluene (mg/L)Ethylbenzene (mg/L)05/11/00< 0.005

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						
			Booster Station				
Monitoring	Sampling	Benzene	Toluene	Ethylbenzene	Xylenes		
Well	Date	(mg/L)	(mg/L)	(mg/L)	(mg/L)		
	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005		
	02/05/01	0.094	< 0.005	< 0.005	< 0.005		
MW-16	05/15/01	0.01	0.004	0.003	0.004		
141 44 - 10	08/09/01	0.098	< 0.005	< 0.005	< 0.005		
ł	10/10/01	0.012	< 0.001	0.007	0.002		
	03/13/02	< 0.001	< 0.001	< 0.001	< 0.001		
	10/31/00	LNAPL	LNAPL	LNAPL	LNAPL		
	02/05/01	LNAPL	LNAPL	LNAPL	LNAPL		
MW-17	05/15/01	LNAPL	LNAPL	LNAPL	LNAPL		
101 00 -1 /	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		
	10/31/00	< 0.005	< 0.005	0.017	0.143		
	02/05/01	< 0.005	< 0.005	< 0.005	< 0.005		
MW-18	05/15/01	0.004	0.003	0.02	0.009		
IVI VV - 1 O	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		
	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005		
	02/05/01	< 0.005	< 0.005	< 0.005	< 0.005		
MW-19	05/15/01	0.001	< 0.001	< 0.001	< 0.001		
IVI VV - 19	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 Stand	ards	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

Hobbs Booster

Page Number: 1 of 3

6701 Aberdeen Ave., Suite 9

Summary Report

Report Date:

March 25. 2002

Order ID Number: A02031416

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

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	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						
	Benzene	Toluene	Ethylbenzene	M.P.O-Xylene	Total BTEX		
Sample - Field Code	(ppm)	(ppm)	(ppm)	(ppm)	(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	0.0024	0.0024		
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	I	0.56	mg/L
Nitrate-N		8.30	$\mathrm{mg/L}$
Sulfate	2	360	mg/L
Total Iron		<0.050	mg/L
Total Manganese		<0.025	mg/L

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

TraceAnalysis, Inc.

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

¹Sample was received out of hold time. Ferrons iron should be ran in the field. Sample was tested the day it was received.

²Sulfate 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.

Report Date: March 25. 2002 Order Number: A02031416 Page Number: 2 of 3 CC # V-103 **Duke Energy Field services** Hobbs Booster Sample: 192805 - MW-7 Param Result Units Flag ferrous iron 0.56 mg/LNitrate-N 6.74mg/LSulfate 142mg/L Total Iron < 0.050mg/L**Total Manganese** < 0.025mg/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	$\mathrm{mg/L}$

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	- 1	0.56	mg/L
Nitrate-N		2.80	$\mathrm{mg/L}$
Sulfate		106	mg/L
Total Iron		0.348	mg/L
Total Manganese		0.203	$\mathrm{mg/L}$

Sample: 192809 - MW-3

Param	Flag	Result	Units
ferrous iron	8	0.56	ng/L
Nitrate-N		2.60	$\mathrm{mg/L}$
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.

⁴Sample was received out of hold time. Ferrous iron should be ran in the field. Sample was tested the day it was received.

 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.

*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.

⁵Sulfate 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.

TraceAnalysis, Inc.	6701 Aberdeen Ave., Suite 9	Lubbock, TX 79424-1515	(806) 794-1296
Report Date: March 25	. 2002Order Number: A02031416		Page Number: 3 of 3
CC # V-103	Duke Energy Field services		Hobbs Booster
Sample: 192810 -	MW-14	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
Param	${f Flag}$	Result	Units
ferrous iron	<u>n</u>	0.56	mg/L
Nitrate-N		<1.00	$\mathrm{mg/L}$

31.9

0.334

0.0592

mg/L mg/L

 $\mathrm{mg/L}$

4

Sulfate

Total Iron

Total Manganese

⁹Sample 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.

Report Date: March 20, 2002Order Number: A02031512CC # V-103Duke Energy Field services

Page Number: 1 of 2 Hobbs Booster

Summary Report

 Gil Van Deventer
 Report Date:
 March 20, 2002

 Trident Environmental
 P.O. Box 7624
 Order ID Number:
 A02031512

 Project Number:
 CC # V-103
 Order ID Number:
 A02031512

 Project Name:
 Duke Energy Field services
 Froject Location:
 Hobbs Booster

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	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						
	Benzene	Toluene	Ethylbenzene	M,P,O-Xylene	Total BTEX		
Sample - Field Code	(ppm)	(ppm)	(ppm)	(ppm)	(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	\mathbf{Units}
ferrous iron	1	0.56	mg/L
Nitrate-N		<1.00	m mg/L
Sulfate	2	<2.00	m mg/L
Total Iron		7.91	m 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	$\mathrm{mg/L}$
		<i>a i</i>	7 1

Continued on next page ...

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

²Sulfate 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.

³Sample 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 Ave., Suite 9	Lubbock, TX 79424-1515	(806) 794-1296
Report Date: March 20 CC # V-103 Sample 192974 continue	, 2002Order Number: A02031512 Duke Energy Field services	18	Page Number: 2 of 2 Hobbs Booster
Param	Flag	Result	Units
Sulfate		30.5	mg/L
Total Iron		2.13	mg/L
		0.202	mg/L

Sample: 192975 - MW-18

Param	Flag	Result	Units
ferrous iron	4	0.56	mg/L
Nitrate-N		<1.00	$\mathrm{mg/L}$
Sulfate		14.9	m mg/L
Total Iron		< 0.050	m mg/L
Total Manganese		0.110	mg/L

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

6701 Aberdeen Avenue, Suite 9 155 McCutcheon, Suite H

800•378•1296 Lubbock, Texas 79424 El Paso, Texas 79932 888•588•3443

806 • 794 • 1296 FAX 806 • 794 • 1298 915•585•3443

E-Mail: lab@traceanalysis.com

FAX 915•585•4944

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.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	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
1929 76	Duplicate	Water	3/13/02	17:40	3/15/02
192977	Rinsate	Water	3/13/02	17:00	3/15/02

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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.

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Dr. Blair Leftwich, Director

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Analytical Report

Sample: Analysis: Analyst:	192973 BTEX CG	3 - MW-15 Analytical Method: Preparation Method	S 8021B : S 5030B	QC Batch: Prep Batch:	QC18928 PB18328	Date Analyzed: Date Prepared:	3/19/02 3/19/02
Param		Flag	Result	Units	Dil	ution	RDL
Benzene			< 0.005	mg/L		5	0.001
Toluene			< 0.005	mg/L		5	0.001
Ethylbenzer	ne		0.0376	mg/L		5	0.001
M,P,O-Xyle	ne		<0.005	mg/L		5	0.001
Total BTE	ζ	• • • •	0.0376	mg/L		5	0.001
					Spiles	Doroont	Descuert

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	\mathbf{Amount}	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: Analyst:	Ferrous Iron JSW	Analytical Method: Preparation Method:		QC Batch: Prep Batch:	•	Date Analyzed: Date Prepared:	$3/15/02 \ 3/15/02$
Param	Fla	g Result	Units	D	ilution		RDL
ferrous iron	1	0.56	mg/L		1		0.01

Sample: 192973 - MW-15

Analysis:	Ion Chromatogray	ohy (IC)	Analytical Method:	E 300.	0 QC Batch:	QC18897 Date Analyzed: 3/15/02
Analyst:	JS	ĺ ĺ	Preparation Method:	N/A	Prep Batch:	PB18300 Date Prepared: 3/15/02
Param	Flag	Result	Units	Dilut	ion	RDL
Nitrate-N		<1.00	mg/L	5		0.20
	0		-,			

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Sample: 192973 - MW-15

Sulfate

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Analysis: Analyst:	Total Metals RR	Analytical Preparatic	Method: on Method:	S 6010B S 3010A	QC Batch: Prep Batch:	QC18933 PB18278	Date Analyzed: Date Prepared:	$3/19/02 \ 3/18/02$
Param		Flag	Resul	t	Units	Dilution		RDL
Total Iron			7.9		mg/L	1		0.05
Total Mang	ganese		0.236	3	mg/L	1		0.02

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

mg/L

²Sulfate 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.

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Report Date: March 20,	2002
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Sample: Analysis: Analyst:		- MW-2 Analytical Method Preparation Metho		QC Batch: Prep Batch:	QC18899 PB18302	Date Analyzed: Date Prepared:	3/18/02 3/18/02
Param		Flag	Result	Units	Diluti	on	RDL
Benzene			0.712	mg/L	10		0.001
Toluene			0.317	mg/L	10		0.001
Ethylbenzer	ne		0.220	mg/L	10		0.001
M,P,O-Xyle	ene		0.227	mg/L	10		0.001
Total BTE	X		1.476	mg/L	10		0.001
					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TFT 4-BFB		0.095 0.094	mg/L mg/L	10 10	0.10 0.10	95 94	70 - 130 70 - 130
Sample: Analysis: Analyst:	192974 - Ferrous Iron JSW			IR-1 QC Batch Prep Bate	•	Date Analyzed: Date Prepared:	$3/15/02 \ 3/15/02$
Param	F	lag Res		Units	Dilution		RDL
ferrous iron	······	3 0	.56	mg/L	1		0.01
Samala							
Analysis:	192974 - Ion Chromat JS	tography (IC) Anal	lytical Method paration Metho	-	-	8897 Date Analyze 3300 Date Prepare	• •
Analysis: Analyst:	Ion Chromat JS	tography (IC) Anal	•	-	-		• •
Analysis: Analyst: Param	Ion Chromat	tography (IC) Anal Prep	paration Metho	od: N/A Prep	-		d: 3/15/02
Analysis: Analyst: Param Nitrate-N	Ion Chromat JS	tography (IC) Anal Prep Result	earation Metho Units	d: N/A Prep Dilution	-		d: 3/15/02 RDL 0.20
Sample: Analysis: Analyst: Param Nitrate-N Sulfate Sample: Analysis:	Ion Chromat JS Flag 192974 - Total Metals	tography (IC) Anal Prep Result <1.00 30.5 MW-2 Analytical Met	Units Units mg/L mg/L	od: N/A Prep Dilution 5 5 0B QC Batch:	QC18933	3300 Date Prepare	d: 3/15/02 RDL 0.20 0.50 3/19/02
Analysis: Analyst: Param Nitrate-N Sulfate Sample: Analysis: Analyst:	Ion Chromat JS Flag 192974 -	tography (IC) Anal Prep Result <1.00 30.5 MW-2 Analytical Met Preparation Me	Units Units mg/L mg/L	od: N/A Prep Dilution 5 5 0B QC Batch: 0A Prep Batch	QC18933 n: PB18278	3300 Date Prepare Date Analyzed: Date Prepared:	d: 3/15/02 <u>RDL</u> 0.20 0.50 3/19/02 3/18/02
Analysis: Analyst: Param Nitrate-N Sulfate Sample: Analysis: Analyst: Param	Ion Chromat JS Flag 192974 - Total Metals	tography (IC) Anal Prep Result <1.00 30.5 MW-2 Analytical Met	Units Units mg/L mg/L chod: S 6010 ethod: S 3010 Result	od: N/A Prep Dilution 5 5 0B QC Batch: 0A Prep Batch Units	QC18933 n: PB18278 Dilution	3300 Date Prepare Date Analyzed: Date Prepared:	d: 3/15/02 <u>RDL</u> 0.20 0.50 3/19/02 3/18/02 RDL
Analysis: Analyst: Param Nitrate-N Sulfate Sample: Analysis:	Ion Chromat JS Flag 192974 - Total Metals RR	tography (IC) Anal Prep Result <1.00 30.5 MW-2 Analytical Met Preparation Me	Units Units mg/L mg/L	od: N/A Prep Dilution 5 5 0B QC Batch: 0A Prep Batch	QC18933 n: PB18278	3300 Date Prepare Date Analyzed: Date Prepared:	d: 3/15/02 <u>RDL</u> 0.20 0.50 3/19/02 3/18/02

Sample:	192975	- MW-18					
Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18899	Date Analyzed	l: 3/18/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB18302	Date Prepared	: 3/18/02
Param		Flag	Result	Units	Dil	ution	RDL
Benzene		<	< 0.005	mg/L	* *	5	0.001
Toluene		<	<0.005	mg/L		5	0.001
							Continued

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

Order Number: A02031512 Duke Energy Field services

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

					Spike	Percent	Recovery
Surrogate	Flag	Result	\mathbf{Units}	Dilution	Amount	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

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Analysis: Analyst:	Ferrous Iron JSW	Analytical Method: Preparation Method:		QC Batch: Prep Batch:	QC18887 PB18292	Date Analyzed: Date Prepared:	$3/15/02 \ 3/15/02$
Param	Fla	g Result	Units	D	ilution		RDL
ferrous iron	4	0.56	mg/L		1		0.01

Sample: 192975 - MW-18

Analysis:	Ion Chromatography (IC) Analytical Method:	E 300.0	0 QC Batch:	QC18897 Date Analyzed: 3/15/02
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB18300 Date Prepared: 3/15/02

Param	\mathbf{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: Analyst:	Total Metals RR	Analytical Preparatio	Method: n Method:	S 6010B S 3010A	QC Batch: Prep Batch:	QC18933 PB18278	Date Analyzed: Date Prepared:	3/19/02 3/18/02
Param		Flag	Resu	lt	Units	Dilutio	n	RDL
Total Iron			< 0.05	0	mg/L	1	<u></u>	0.05
<u>Total Mang</u>	ganese		0.11	0	mg/L	1		0.02

Sample: 192976 - Duplicate

Analysis: Analyst:	BTEX CG	Analytical Method: Preparation Method	S 8021B : S 5030B	QC Batch: Prep Batch:	QC18899 PB18302	Date Analyzed: Date Prepared:	$3/18/02 \ 3/18/02$
Param		Flag	Result	Units	Dil	ution	RDL
Benzene			0.732	mg/L		5	0.001
Toluene			0.341	mg/L		5	0.001
Ethylbenze	ne		0.241	mg/L		5	0.001
M,P,O-Xyle	ene		0.252	mg/L		5	0.001
Total BTE	X		1.566	mg/L		5	0.001

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

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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

5	TEX G	Analytical Method: Preparation Method:	S 8021B S 5030B	QC Batch: Prep Batch:	QC18899 PB18302	Date Analyzed: Date Prepared:	$3/18/02 \\ 3/18/02$
j	-	•		•			. ,
Param		Flag	Result	Units	Dil	ution	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
					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
$\overline{\mathrm{TFT}}$	-	0.087	ng/L	5	0.10	87	70 - 130
4-BFB		0.089	mg/L	5	0.10	89	70 - 130

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Quality Control Report Method Blank

Method I	Blank	QCBatch:	QC1888	7			
							Reporting
Param		Flag		Results	Units		Limit
ferrous iron				0.56	mg/I	J	0.01
Method H	Blank	QCBatch:	QC1889	7			
Param		Flag		Results	Units		Reporting Limit
Nitrate-N				<0.2	mg/L		0.20
Sulfate				<2.0	mg/L		0.50
Method F	Blank	QCBatch:	QC1889	9			Poporting
Param		Flag		Results	Unit	s	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/I		0.001
Total BTEX				<0.001	mg/I		0.001
Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT 4-BFB		0.096 0.093	mg/L	1 1	$\begin{array}{c} 0.10\\ 0.10\end{array}$	96 93	70 - 130 70 - 130
Method B	Blank	QCBatch:	mg/L QC18928		0.10		Reporting
Param		Flag		Results	Units	3	Limit
Benzene		<u> </u>		<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	<u> </u>		<u> </u>	<0.001	mg/L	J 	0.001
Surrogate	Flag	Result	Units mg/L	Dilution 1	Spike Amount 0.10	Percent Recovery 92	Recovery Limits 70 - 130
4-BFB		0.0925	mg/L	1	0.10	92 92	70 - 130

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RPD

Limit

20 20

20

20

90 - 110

90 - 110

Method Blank	QCBatch:	QC18933			
					Reporting
Param	Flag		Results	Units	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

Laborat	Laboratory Control Spikes			QCBatch:	QC1889	97			
	LCS	LCSD			Spike Amount	Matrix			% Rec
Param	Result	Result	Units	Dil.	Added	Result	% Rec	RPD	Limit
Chloride	11.92	11.94	mg/L	1	12.50	<2.0	95	0	90 - 110
Fluoride	2.29	2.30	mg/L	1	2.50	< 0.2	91	0	90 - 110

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

mg/L

mg/L

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Laboratory Control Spikes

2.35

12.29

2.33

12.41

Nitrate-N

Sulfate

QCBatch: QC18899

2.50

12.50

94

98

< 0.2

<2.0

0

0

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

QC18928 QCBatch:

Spike										
	LCS	LCSD			Amount	Matrix			$\% \ Rec$	RPD
Param	Result	Result	Units	Dil.	Added	Result	$\% \ \mathrm{Rec}$	RPD	Limit	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.

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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

QC18933

Laboratory Control Spikes

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.

QCBatch:

Quality Control Report Matrix Spikes and Duplicate Spikes

Matrix	Spikes	QCBa

atch: QC18897

					Spike					
	MS	MSD			Amount	Matrix			$\% { m Rec}$	RPD
Param	Result	Result	Units	Dil.	Added	Result	$\% { m Rec}$	RPD	Limit	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

					Spike					
	MS	MSD			Amount	Matrix			$\% { m Rec}$	RPD
Param	Result	Result	Units	Dil.	Added	Result	$\% { m Rec}$	RPD	Limit	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

⁹Matrix spike recovery low due to matrix problems. LCS demonstrates process under control.

⁵The *10 dilution was used for the matrix spikes, but the *5 dilution was reported.

⁶The *10 dilution was used for the matrix spikes, but the *5 dilution was reported

⁷The *10 dilution was used for the matrix spikes, but the *5 dilution was reported. The correct %Rec = 99.

⁸The *10 dilution was used for the matrix spikes, but the *5 dilution was reported. The correct %Rec = 97.

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Order Number: A02031512 Duke Energy Field services Page Number: 9 of 11 Hobbs Booster

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

		CCVs	\mathbf{CCVs}	CCVs	Percent		
			True	Found	Percent	Recovery	Date
Param	Flag	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	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

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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

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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

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Continued							
			CCVs	\mathbf{CCVs}	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	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

			CCVs	CCVs	CCVs	$\mathbf{Percent}$	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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

			\mathbf{CCVs}	CCVs	CCVs	Percent		
			True	Found	Percent	Recovery	Date	
Param	Flag	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	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

			\mathbf{CCVs}	CCVs	\mathbf{CCVs}	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	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

			CCVs	\mathbf{CCVs}	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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

Report Date: Marc CC # V-103	h 20, 2002			mber: A0203 ergy Field serv		-	nber: 11 of 11 Iobbs Booster
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			CCVs	CCVs	CCVs	Percent	
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Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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

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

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MAR 2 5 2002

Environmental Bureau Oil Conservation Division

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:

March 22, 2002

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 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 ¹/₄ 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 $2\frac{1}{2}$ 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.

Mr. Stephen Weathers March 22, 2002 Page 9

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.

Mr. Stephen Weathers March 22, 2002 Page 10

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-GenTM 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 $\frac{1}{2}$ 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,

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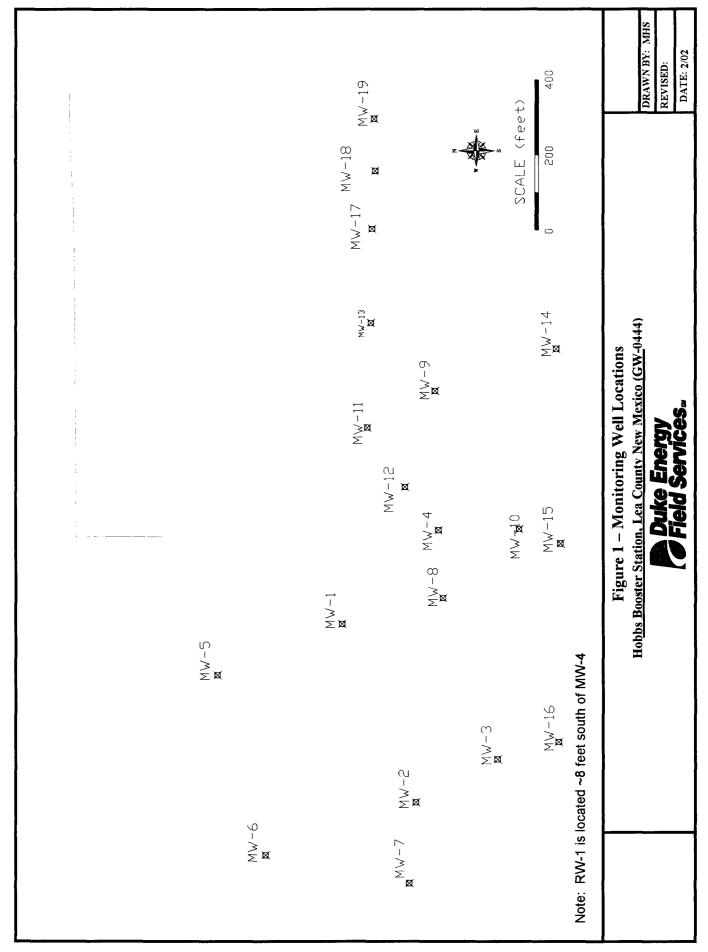
Michael H. Stewart, PE, CPG

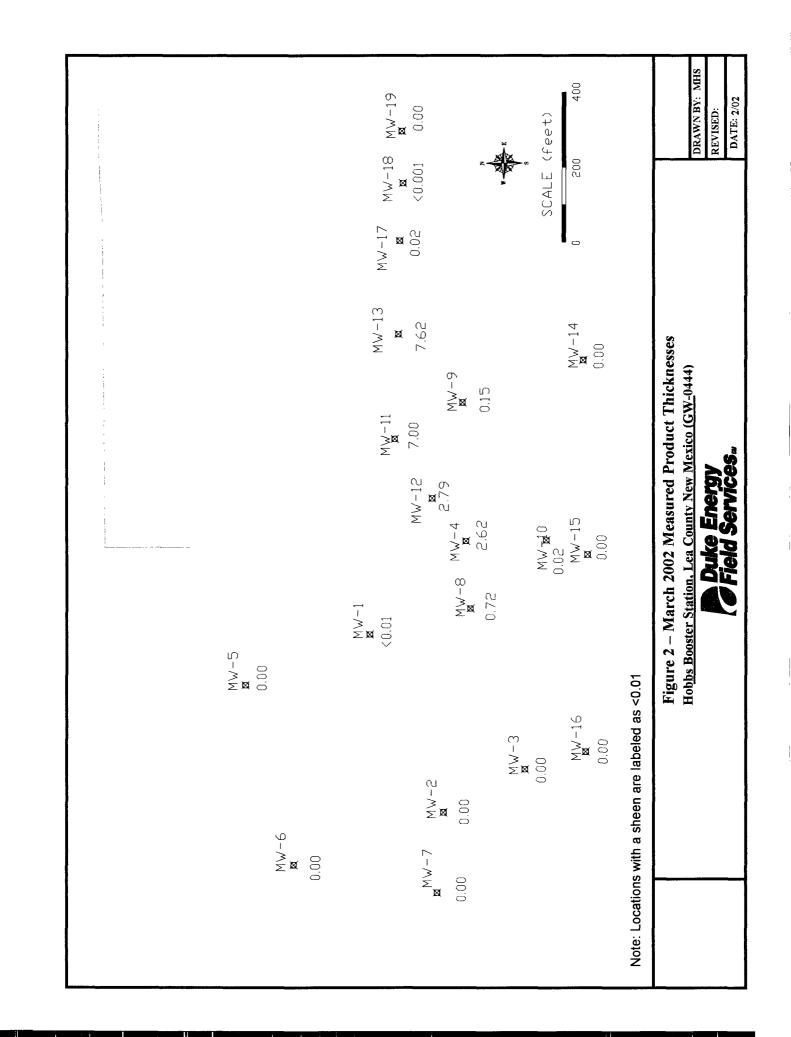
TABLES

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Well	Elevation	Elevation	Diameter	Depth	Screen	Sand Pack
	(feet)	(feet)	(inches)	(feet)	(feet)	(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

Table 1 – Monitoring Well Construction Information

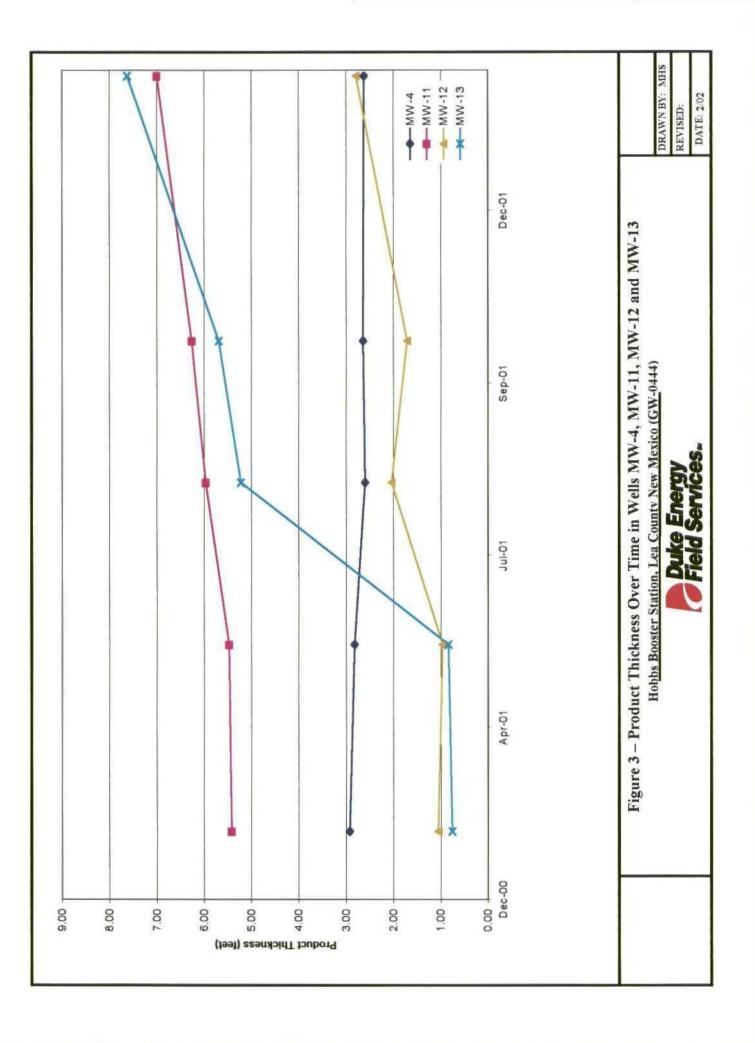
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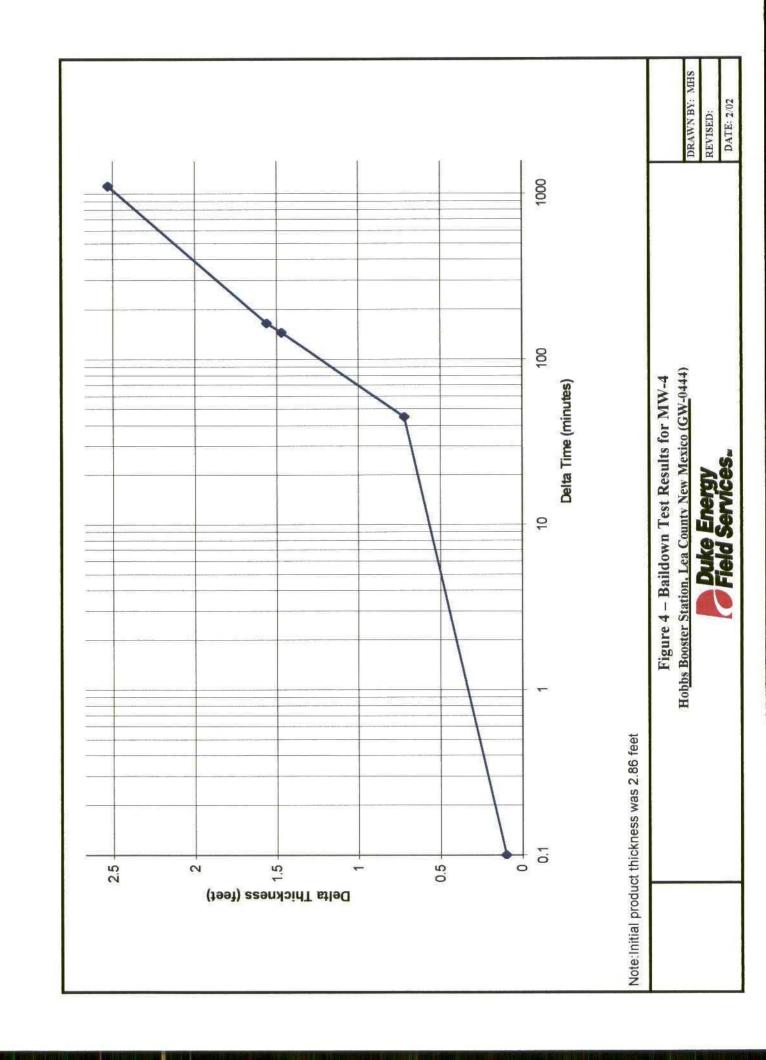


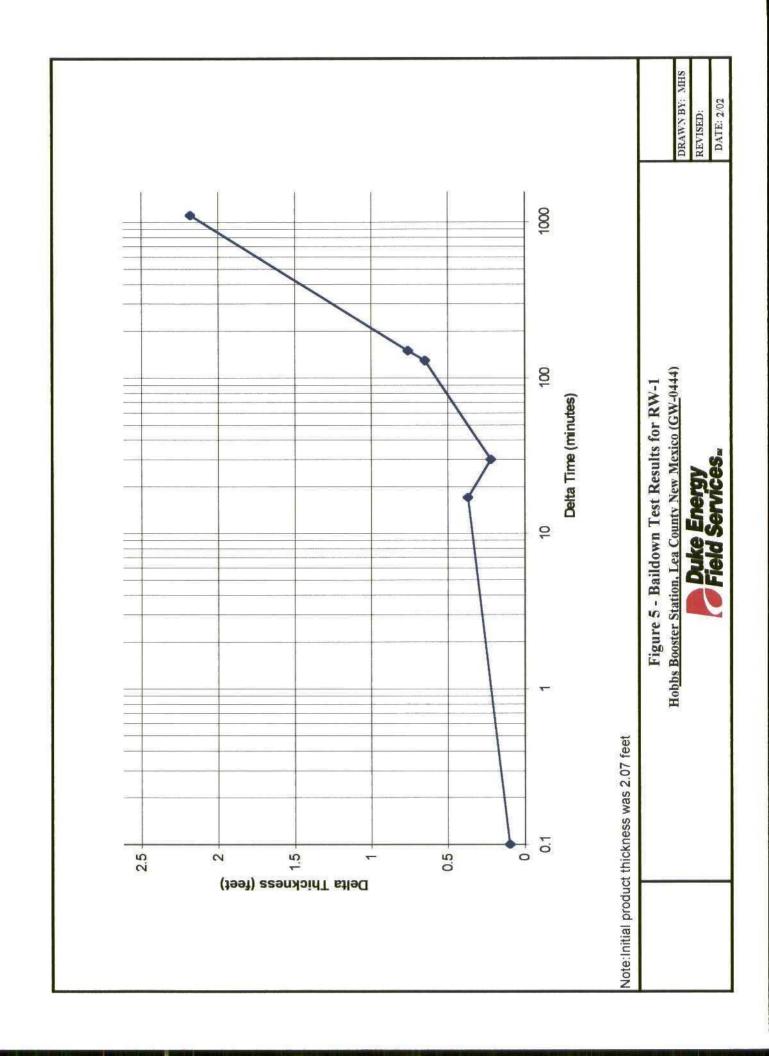


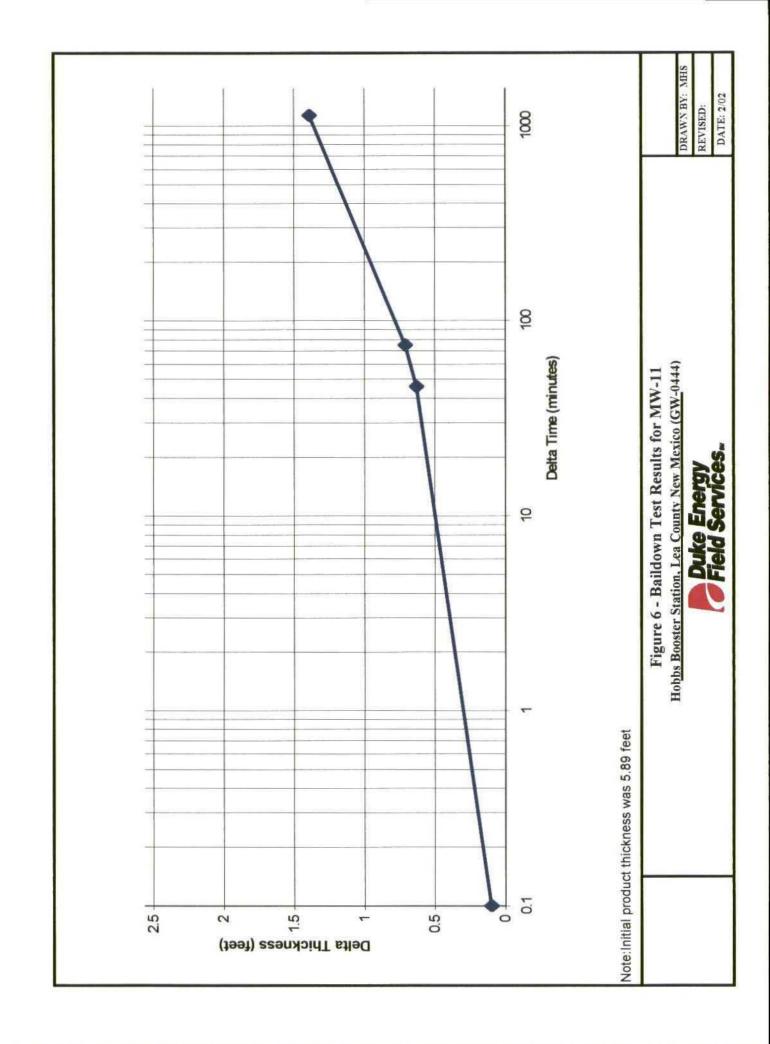
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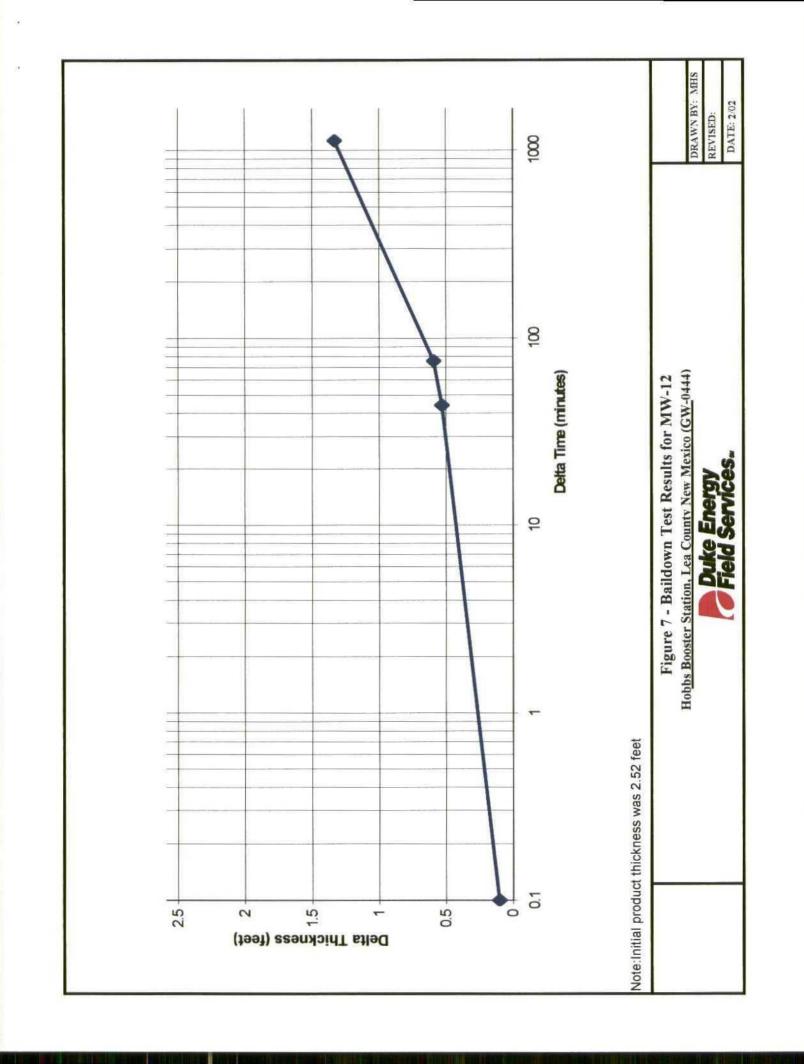
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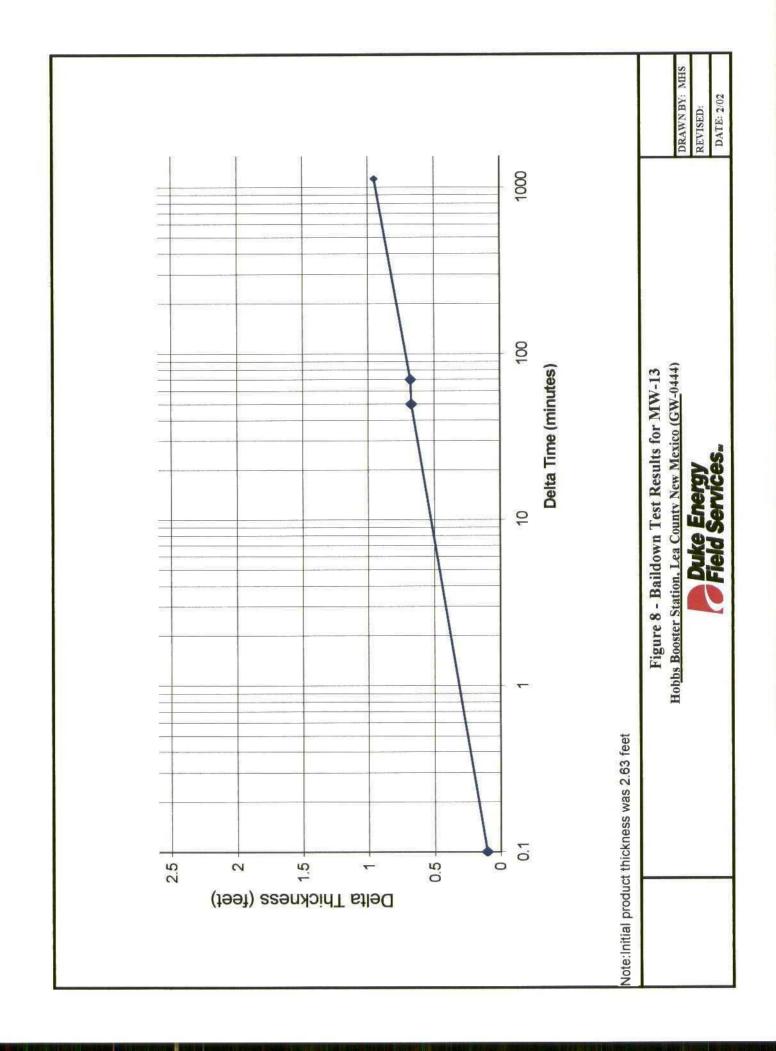


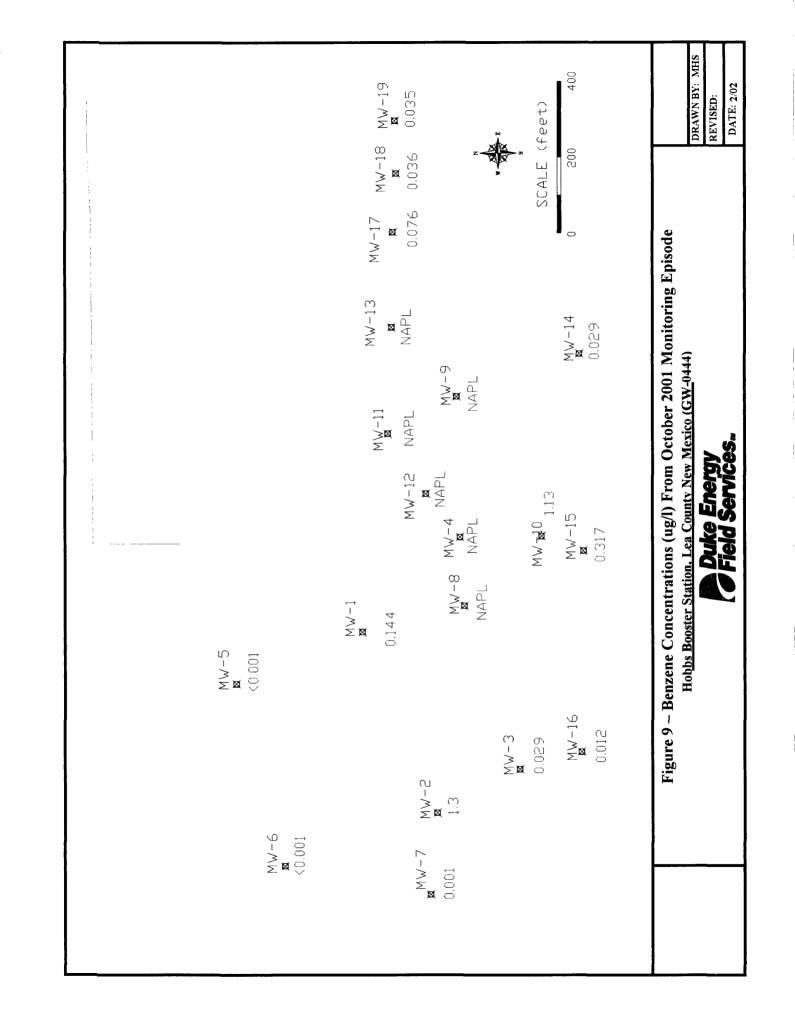


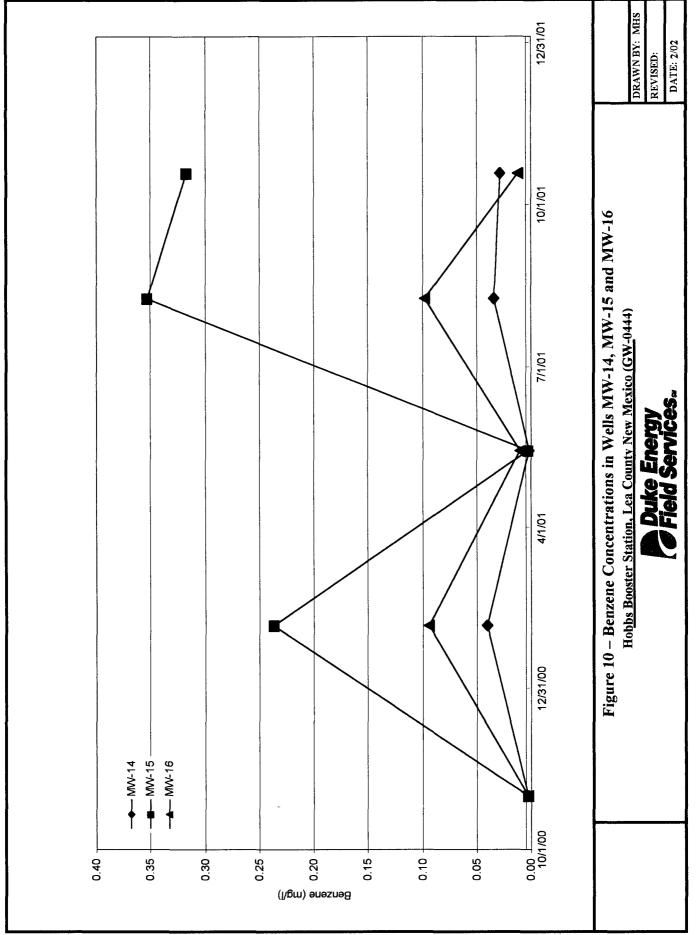


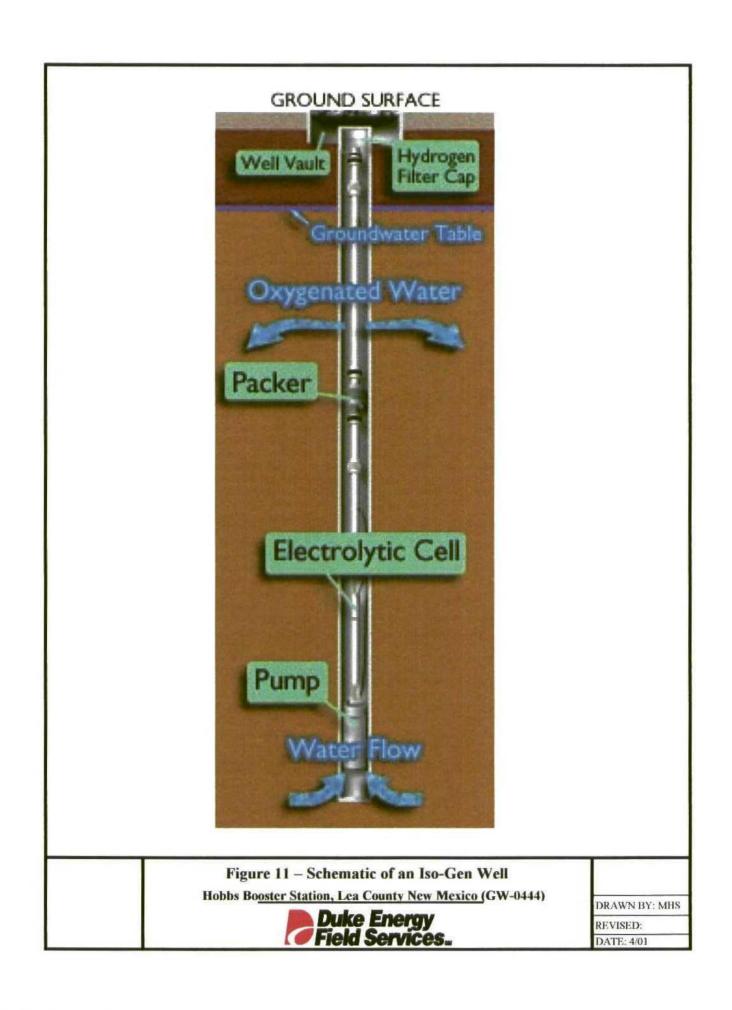


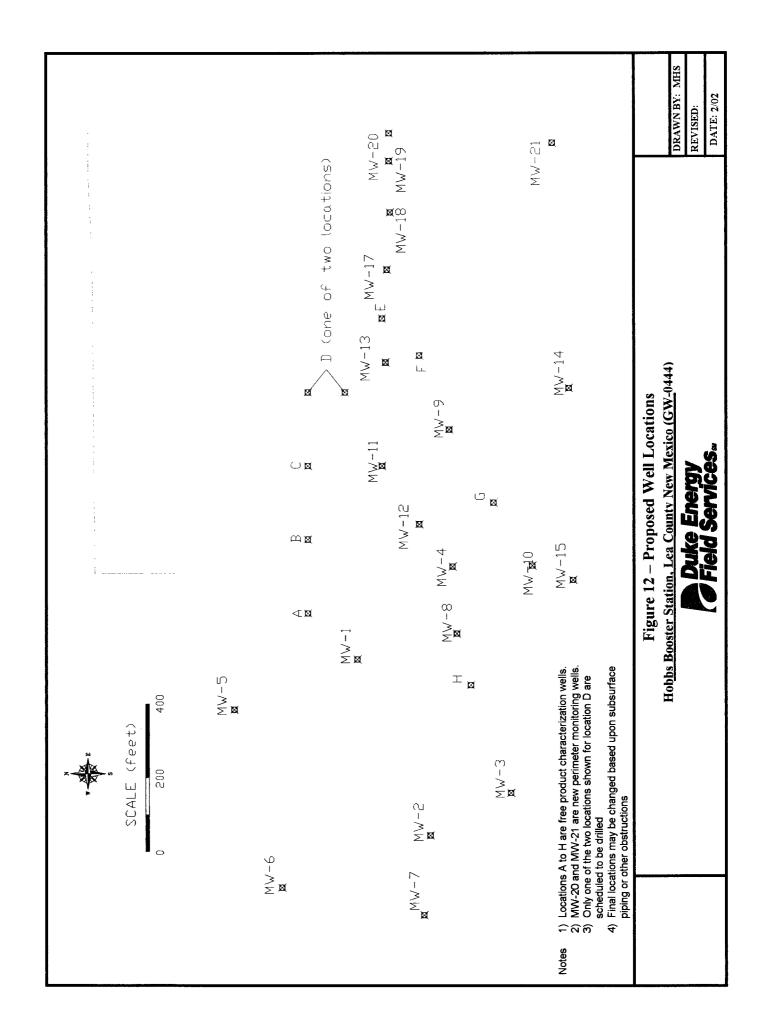


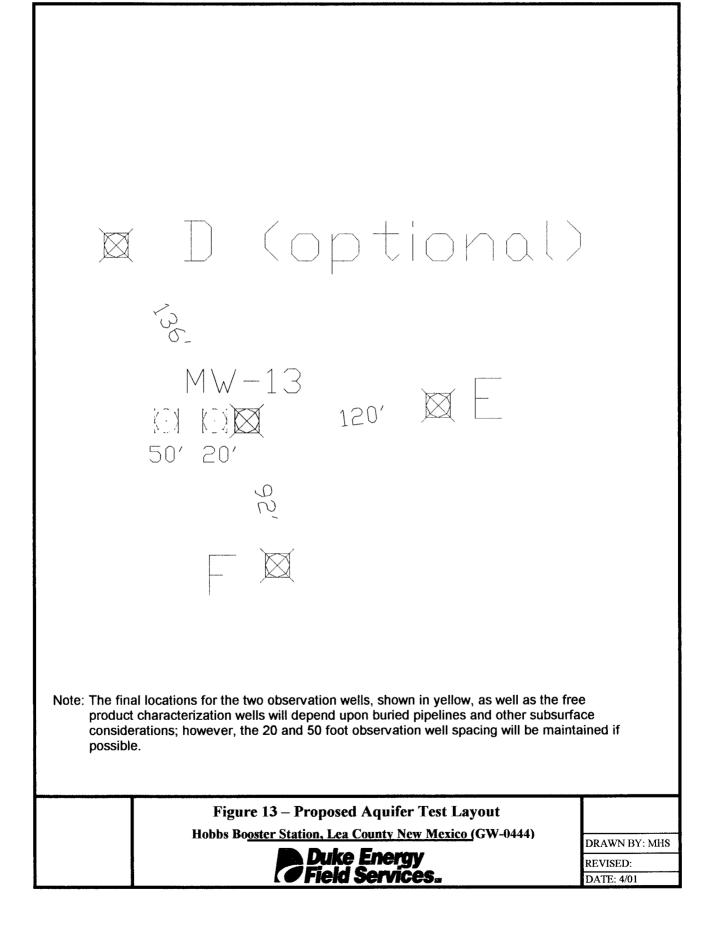










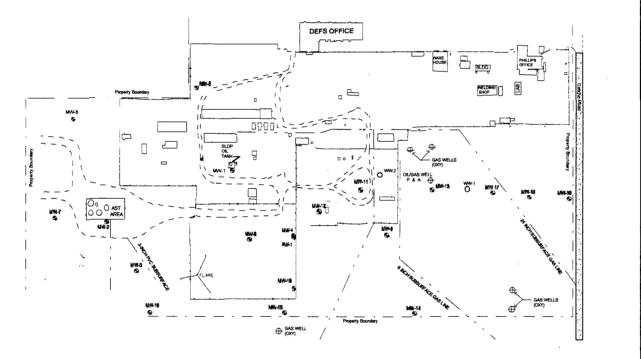


2001 ANNUAL GROUNDWATER MONITORING AND REMEDIATION PERFORMANCE REPORT HOBBS BOOSTER STATION LEA COUNTY, NEW MEXICO

FEBRUARY 5, 2002

Prepared For:

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

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2-5-02

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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 (NO₃), sulfate (SO₄), ferric iron (Fe³⁺), ferrous iron (Fe²⁺), 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).



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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.



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N (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
	02/05/01	Pump	12	Disposable bailer
MW-2	05/15/01	Pump	12	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
	10/10/01	Pump	9 12	Disposable bailer
	02/05/01	Pump		Disposable bailer
MW-3	05/15/01	Pump	12	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
	10/10/01	Pump	9	Disposable bailer
	02/05/01	Pump	12	Disposable bailer
MW-5	05/15/01	Pump	12	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
	10/10/01	Pump	9	Disposable bailer
	02/05/01	Pump	9	Disposable bailer
MW-6	05/15/01	Pump	9	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
	10/10/01	Pump	9	Disposable bailer
	02/05/01	Pump	15	Disposable bailer
MW-7	05/15/01	Pump	12	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
	10/10/01	Pump	9	Disposable bailer
	02/05/01	_	12	Disposable bailer
MW-8	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
	02/05/01	Pump	12	Disposable bailer
MW-14	05/15/01	Pump	9	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
	10/10/01	Pump	9	Disposable bailer
	02/05/01	Pump	12	Disposable bailer
MW-15	05/15/01	Pump	12	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
	10/10/01	Pump	12	Disposable bailer
	02/05/01	Pump	12	Disposable bailer
MW-16	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
	02/05/01	Pump	12	Disposable bailer
MW-18	05/15/01	Pump	25	Disposable bailer
	08/09/01	Pump	18	Disposable bailer
	10/10/01	Bailer	24	Disposable bailer
	02/05/01	Pump	12	Disposable bailer
MW-19	05/15/01	Pump	12	Disposable bailer
	08/09/01	Pump	12	Disposable bailer
	10/10/01	Pump	9	Disposable bailer

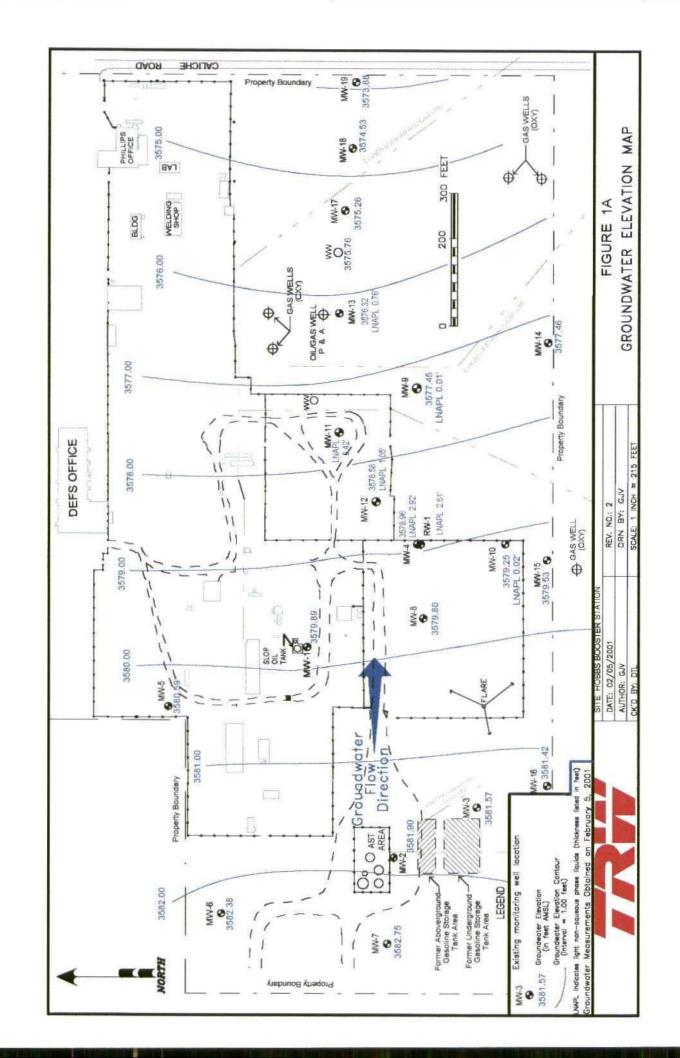


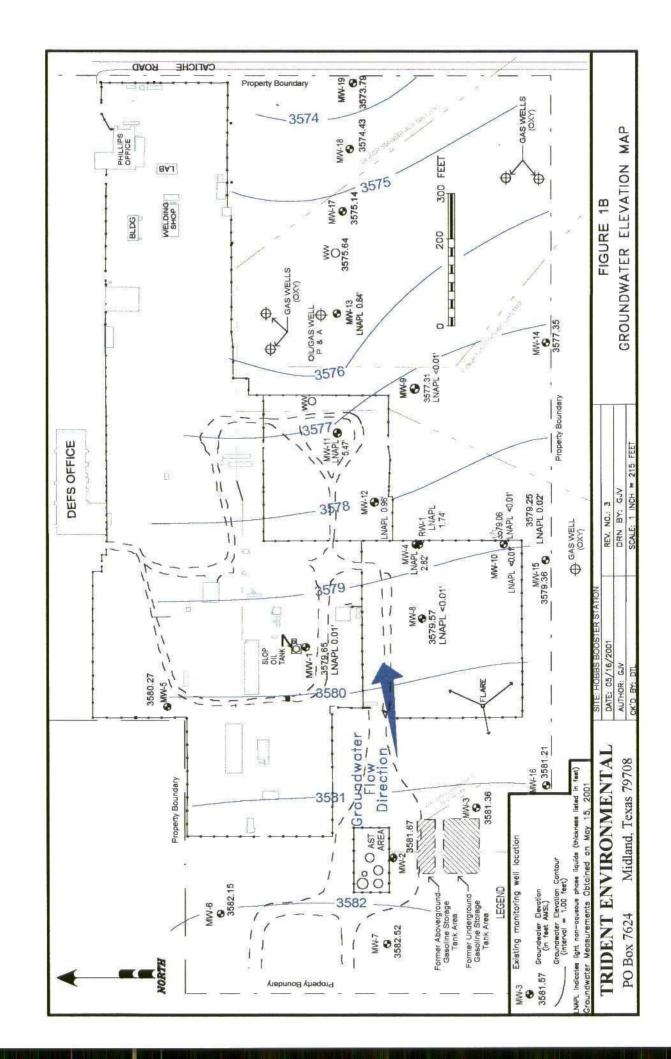
5.0 Groundwater Elevations, Hydraulic Gradient and Flow Direction

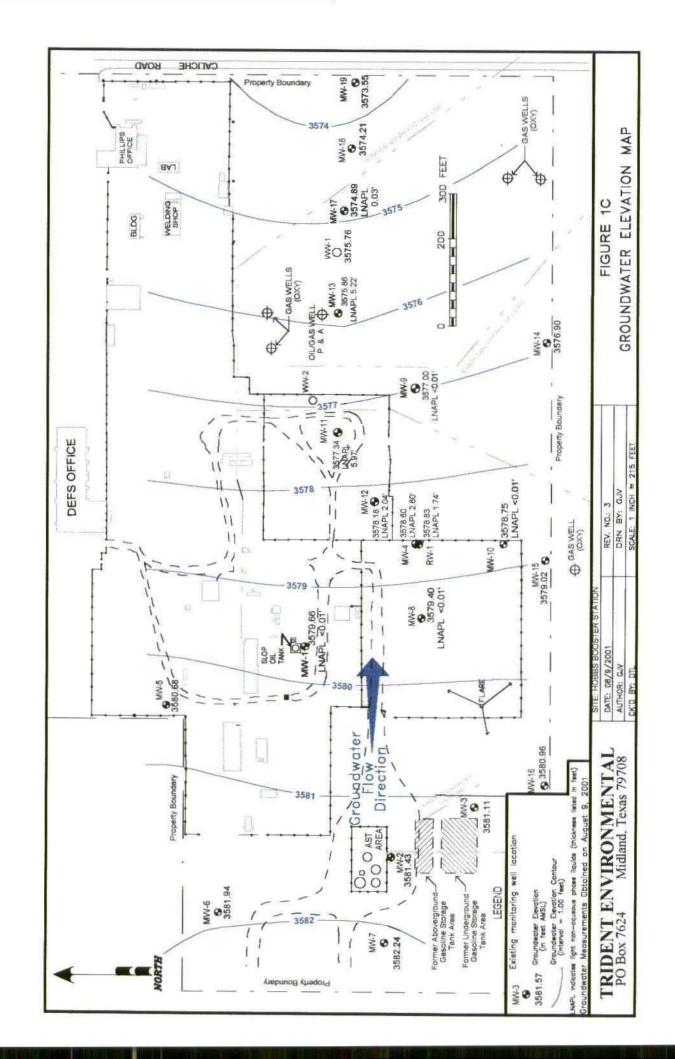
Based on the most recent gauging data collected by Trident on December 9, 2001, the groundwater conditions at the Hobbs Booster Station are characterized below.

- 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.







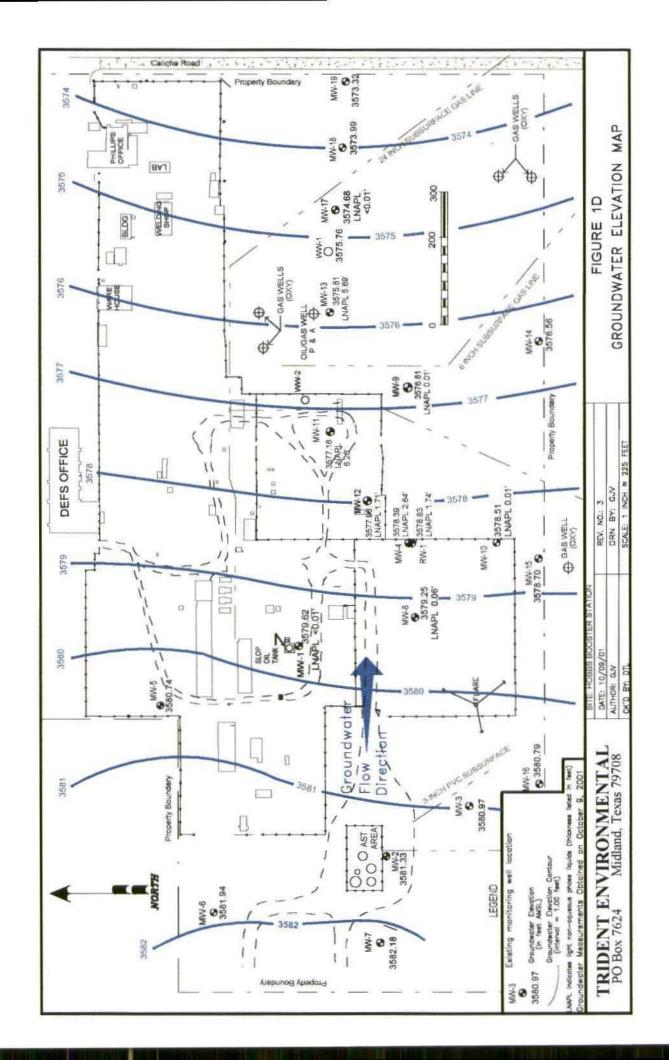


	Table 2 Summary of Groundwater Level Measurements								
			y of Groundwa	ter Level Meas	urements		Composted		
		Ground	Terreford	Denth	Denth to		Corrected		
	D.	Surface	Top of Casing	Depth to	Depth to	LNAPL	Groundwater		
Monitoring	Date	Elevation	Elevation	Groundwater	LNAPL	Thickness	Elevation		
Well	Gauged	(feet AMSL)	(feet AMSL)	(feet AMSL)	(feet AMSL)	<u>````</u>	(feet AMSL)		
	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		
MW-1	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		
	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		
MW-2	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		
	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		
MW-3	10/31/00	3620.08	3623.01	41.37	ND	0.00	3581.64		
1.1.1.1	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		
	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		
MW-4	10/31/00	3621.66	3624.29	47.36	44.68	2.68	3579.00		
1,2,1,	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		
	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		
MW-5	10/31/00	3626.30	3629.16	48.58	ND	0.00	3580.58		
10100 5	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		
	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		
MW-6	10/31/00	3624.14	3626.93	44.48	ND	0.00	3582.45		
TAT AA -O	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

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Table 2 (Continued) Summary of Groundwater Level Measurements								
		Surface	Top of Casing	Depth to	Depth to	LNAPL	Groundwater	
Monitoring	Date	Elevation	Elevation	Groundwater	LNAPL	Thickness	Elevation	
Well	Gauged	(feet AMSL)	(feet AMSL)	(feet AMSL)	(feet AMSL)	(feet)	(feet AMSL)	
	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-7	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	
	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	
MW-8	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	
	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	
MW-9	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	
	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	
10110	10/31/00	3618.30	3621.07	41.79	41.79	<0.01	3579.28	
MW-10	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	
	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	
MW-11	10/31/00	3623.05	3625.88	51.85	47.40	4.45	3577.66	
WIW-11	02/05/01	3623.05	3625.88	52.62	47.20	5.42	3577.69	
	05/15/01 08/09/01	3623.05	3625.88	52.83	47.36	5.47	3577.52	
		3623.05	3625.88	53.41	47.44	5.97	3577.34	
	10/09/01 10/31/00	<u>3623.05</u> 3623.95	3625.88 3626.60	53.83 48.09	47.57	6.26	3577.16 3578.58	
	02/05/01	3623.95	3626.60		48.01	0.08		
MW-12	02/03/01	3623.95	3626.60	48.88 49.20	47.83 48.24	1.05 0.96	3578.58 3578.18	
101 00 - 12	08/09/01	3623.95	3626.60	50.09	48.05	2.04	3578.18	
	10/09/01	3623.95	3626.60	50.09	48.03	1.71	3577.96	
	10/31/00	3623.53	3626.30	50.04	48.33	0.17	3576.41	
MW-13	02/05/01	3623.53	3626.30	50.60	49.80	0.76	3576.32	
	05/15/01	3623.53	3626.30	50.00	49.84	0.78	3576.29	
	08/09/01	3623.53	3626.30	54.70	49.80	5.22	3575.86	
	10/09/01	3623.53	3626.30	55.14	49.48	5.69	3575.80	
	10/31/00	3618.76	3621.42	43.91	49.45 ND	0.00	3577.51	
	02/05/01	3618.76	3621.42	43.91	ND	0.00	3577.46	
MW-14	05/15/01	3618.76	3621.42	44.07	ND	0.00	3577.35	
141 14 - 17	08/09/01	3618.76	3621.42	44.07	ND 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										
Ground Correc										
		Surface	Top of Casing	Depth to	Depth to	LNAPL	Groundwater			
Monitoring	Date	Elevation	Elevation	Groundwater	LNAPL	Thickness	Elevation			
Well	Gauged	(feet AMSL)	(feet AMSL)	(feet AMSL)	(feet AMSL)	(feet)	(feet AMSL)			
	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			
MW-15	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			
	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			
MW-16	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			
	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			
MW-17	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			
	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			
MW-18	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			
	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			
MW-19	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			
	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			
RW-1	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			

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

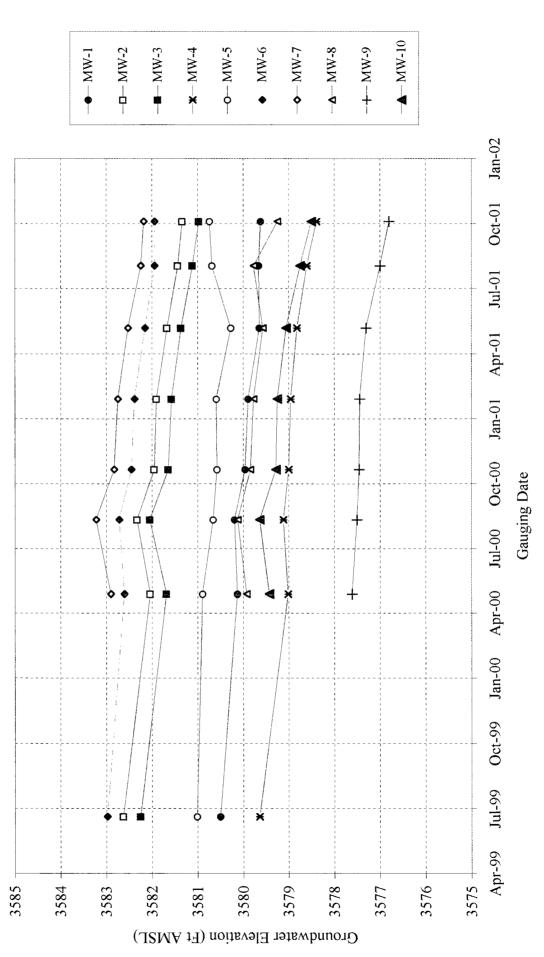
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Hobbs Booster Station

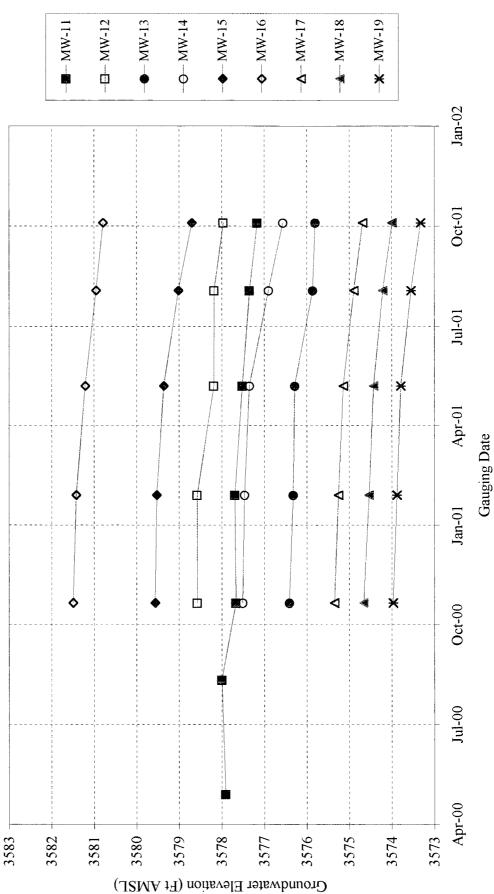




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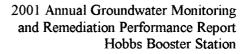
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6.0 Distribution of Hydrocarbons in Groundwater

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.



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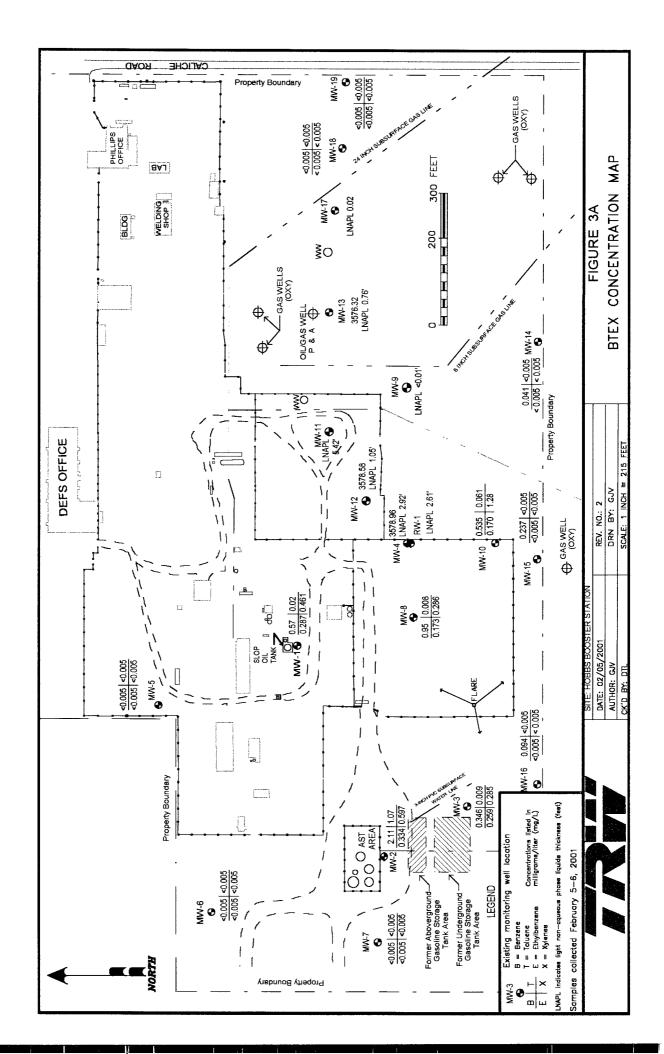
		Hobbs	Booster Station		
Monitoring	Sampling	Benzene	Toluene	Ethylbenzene	Xylenes
Well	Date	(mg/L)	(mg/L)	(mg/L)	(mg/L)
	06/17/99	0.232	0.029	0.168	0.229
	05/11/00	0.191	0.034	0.344	0.604
	08/22/00	0.181	0.035	0.273	0.450
	10/31/00	0.197	0.028	0.285	0.466
MW-1	02/05/01	0.57	0.020	0.287	0.461
	05/15/01	LNAPL	LNAPL	LNAPL	LNAPL
	08/09/01	LNAPL	LNAPL	LNAPL	LNAPL
1	10/11/01	0.144	< 0.020	0.236	0.120
	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-2	02/05/01	2.11	1.07	0.334	0.597
	05/15/01	0.848	0.488	0.334	0.397 0.772
	08/09/01	1.76	0.488	0.390	0.452
ĺ	10/10/01	1.30	0.246	0.233	0.432
	06/17/99	0.262	0.029	0.222	0.243
	05/11/00	0.202	0.029	0.222	0.287
	08/22/00	0.011	0.022	0.243	0.291
MW-3	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
	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
MW-5	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
	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
MW-6	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
111 11 10	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
	05/11/00	< 0.005	< 0.005	< 0.005	< 0.005
ļ	08/22/00	< 0.005	0.008	< 0.005	0.008
l	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
MW-7	02/05/01	< 0.005	< 0.005	< 0.005	< 0.005
1	05/15/01	< 0.001	< 0.001	< 0.001	< 0.001
1	08/09/01	< 0.001	< 0.001	< 0.001	< 0.001
	10/10/01	< 0.001	< 0.001	< 0.001	< 0.001
/QCC Standa		0.010	0.75	0.75	0.62
			ting EPA Method 8021B.		0.02

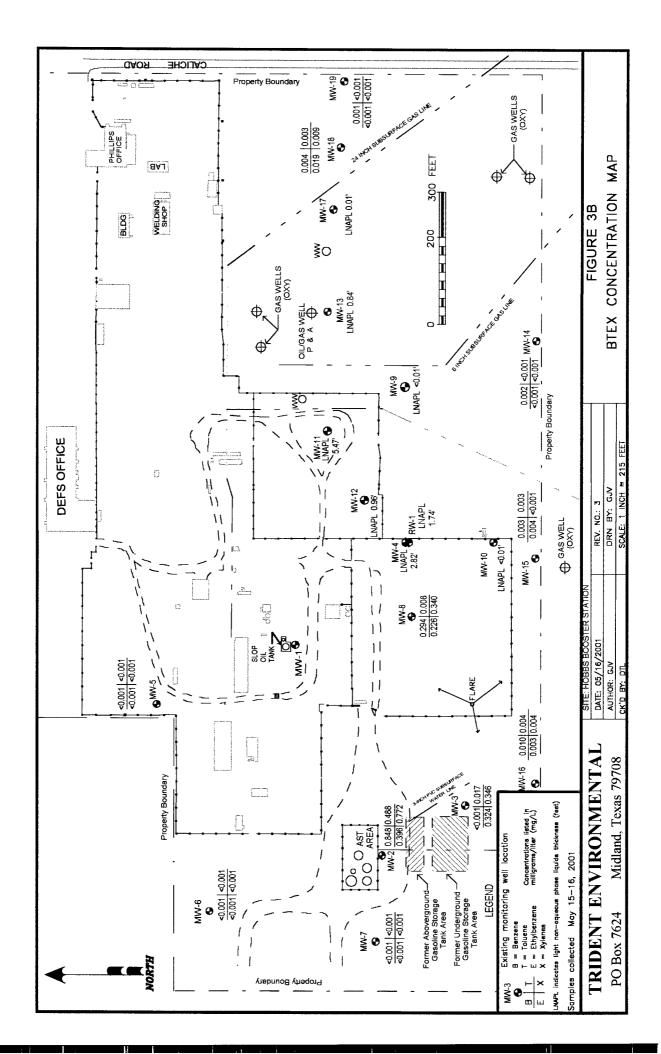


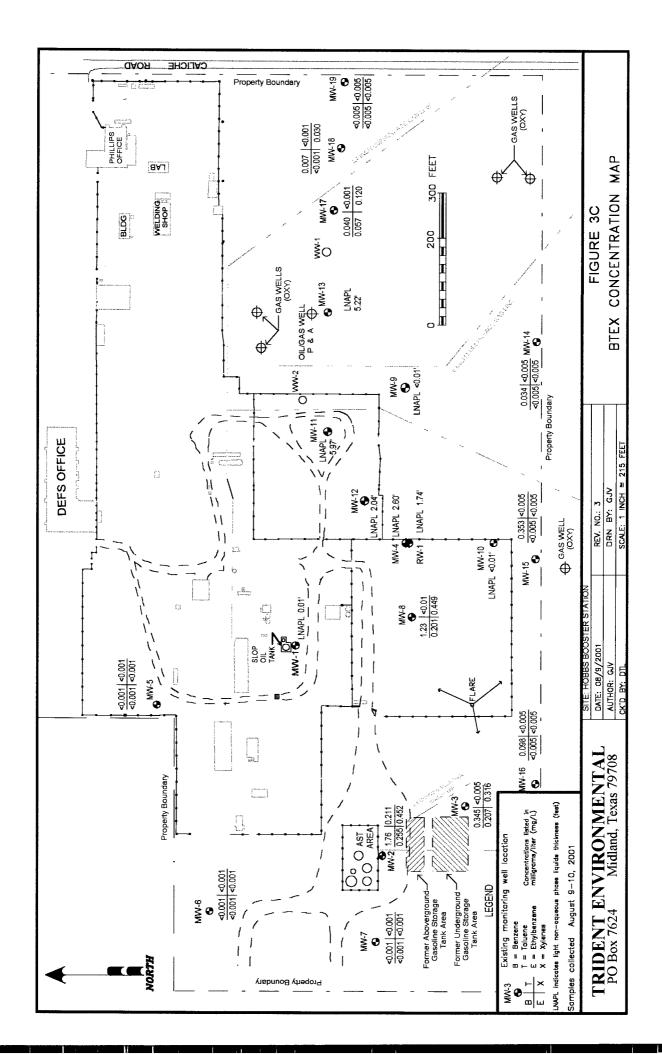
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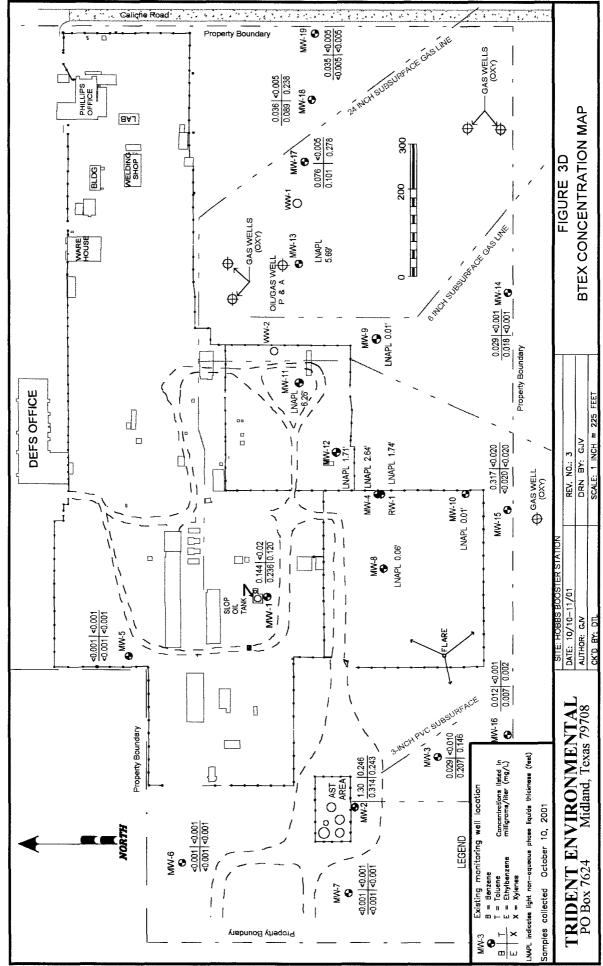
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	~		le 3 (Continued)	— • ·	
			Concentrations in		
Monitoring	Sampling	Benzene	Toluene	Ethylbenzene	Xylenes
Well	Date	(mg/L)	(mg/L)	(mg/L)	(mg/L)
	05/11/00	0.824	< 0.05	0.375	0.742
	08/22/00	LNAPL	LNAPL	LNAPL	LNAPL
	10/31/00	LNAPL	LNAPL	LNAPL	LNAPL
MW-8	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
	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-9	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
	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
MW-10	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
	10/31/00	< 0.005	< 0.005	0.007	< 0.005
MW-14	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
	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
	02/05/01	0.237	< 0.005	< 0.005	< 0.005
MW-15	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
	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
	02/05/01	0.094	< 0.005	< 0.005	< 0.005
MW-16	05/15/01	0.01	0.004	0.003	0.004
1	08/09/01	0.098	< 0.005	< 0.005	< 0.005
1	10/10/01	0.012	< 0.001	0.007	0.002
	10/31/00	LNAPL	LNAPL	LNAPL	LNAPL
	02/05/01	LNAPL	LNAPL	LNAPL	LNAPL
MW-17	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
	10/31/00	< 0.005	< 0.005	0.017	0.143
1	02/05/01	< 0.005	< 0.005	< 0.005	< 0.005
MW-18	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
	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
	02/05/01	< 0.005	< 0.005	< 0.005	< 0.005
MW-19	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
/QCC Standa		0.010	0.75	0.75	0.62
	44 W417	0.010	0.10	1 0.75	0.04





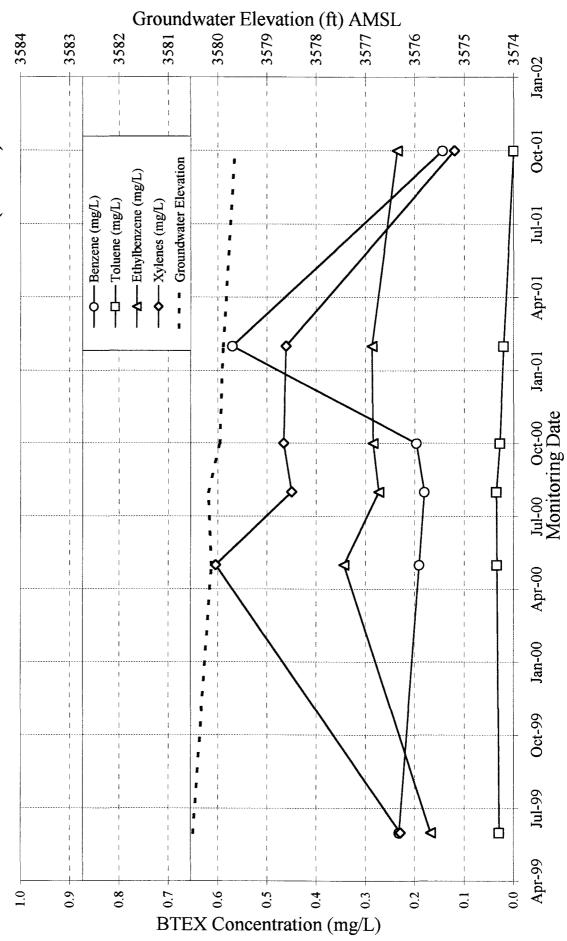




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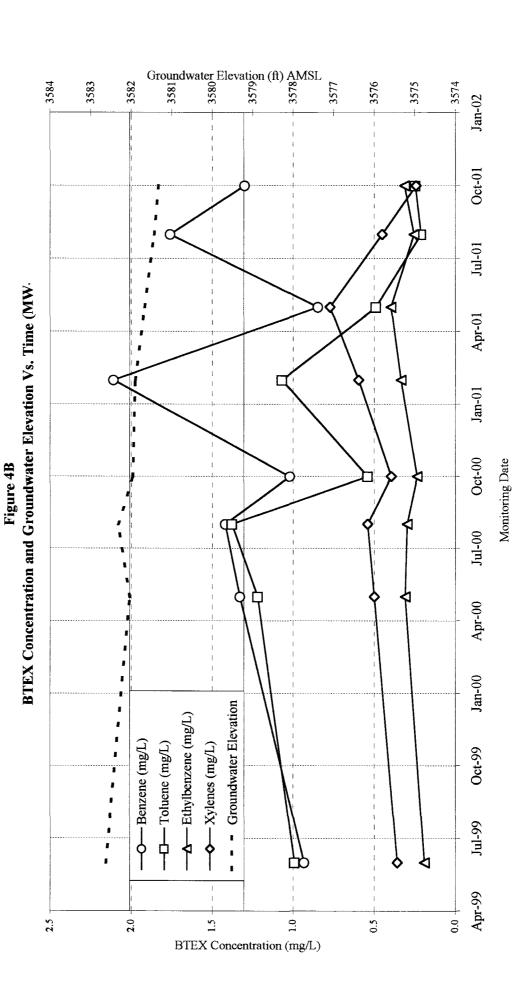
Hobbs Booster Station



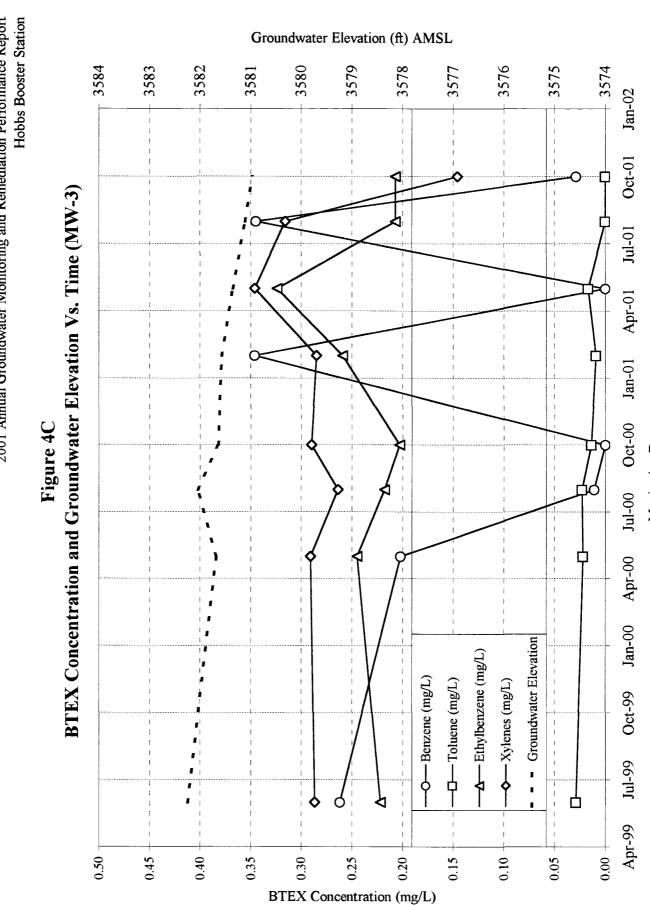


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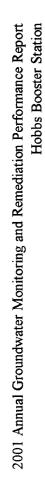
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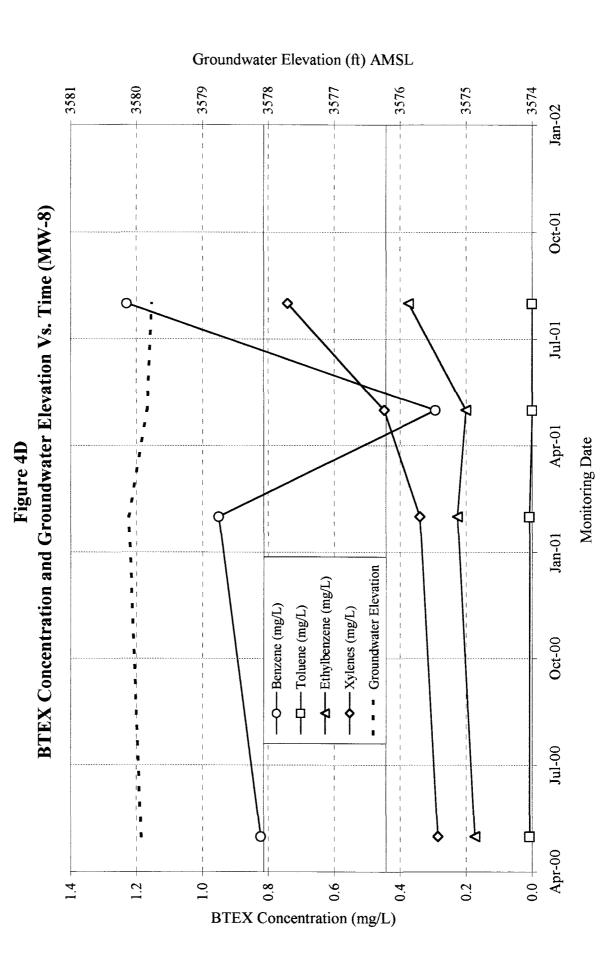


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Monitoring Date

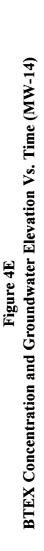


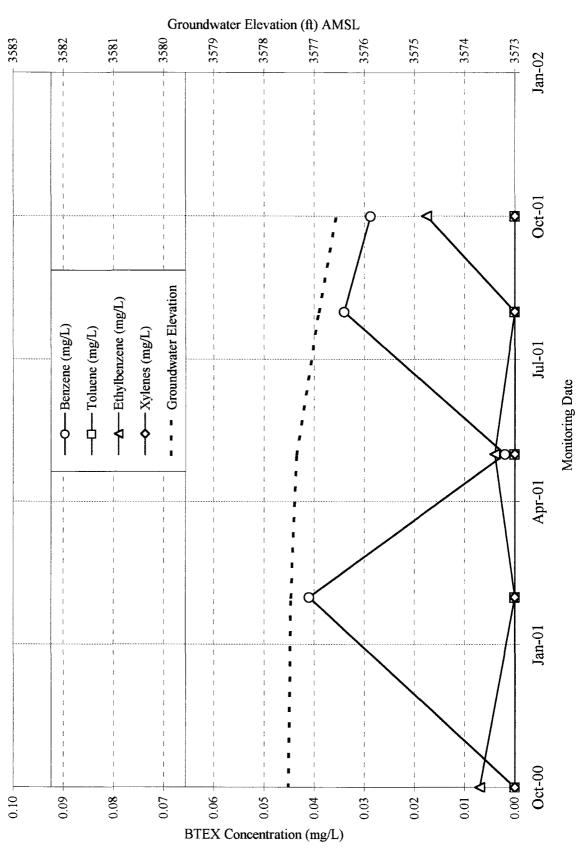


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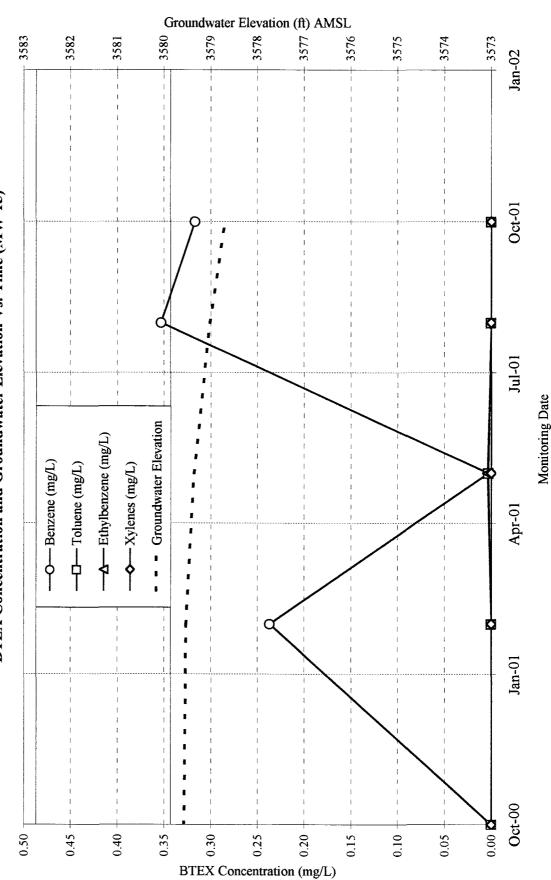




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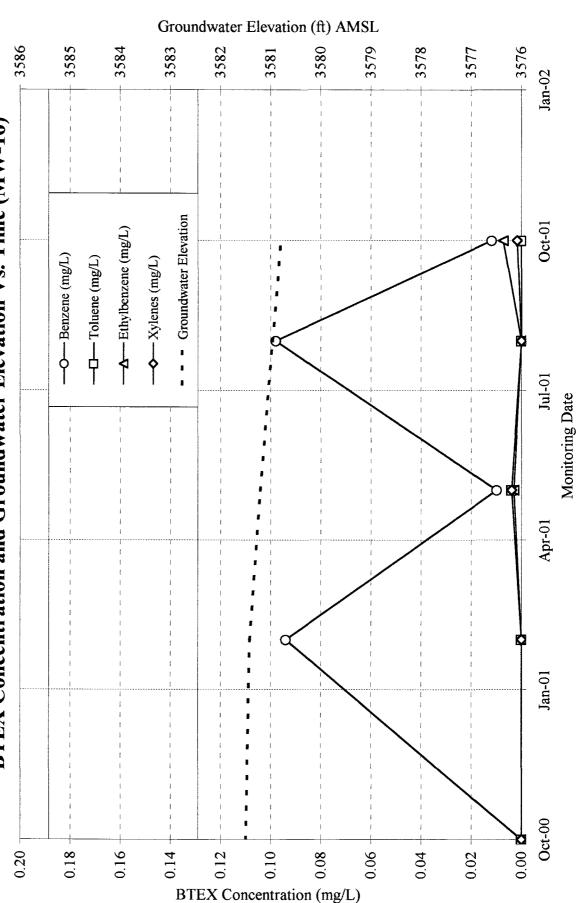
Figure 4F BTEX Concentration and Groundwater Elevation Vs. Time (MW-15)



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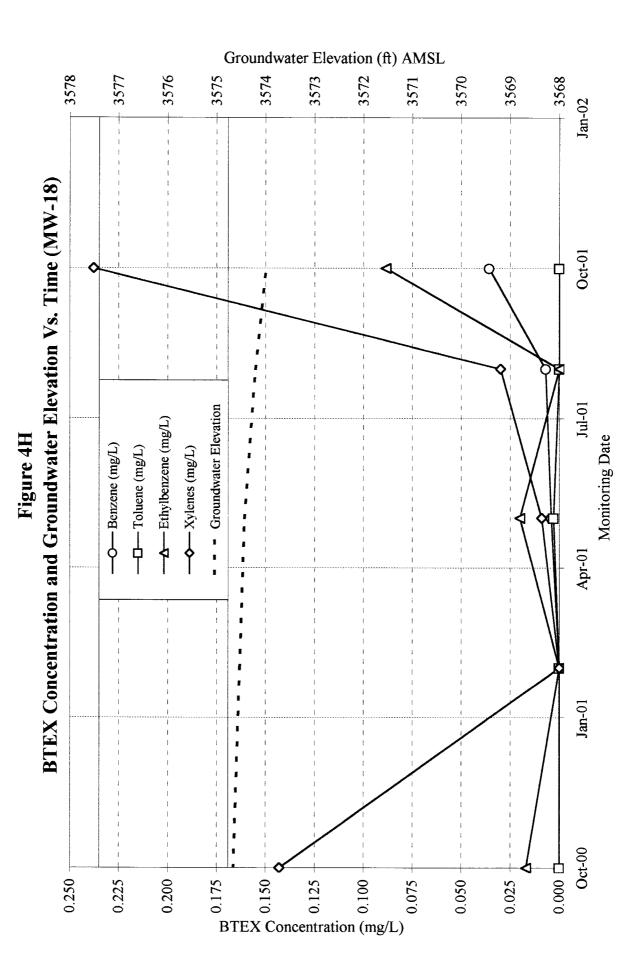




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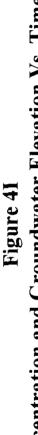
Hobbs Booster Station



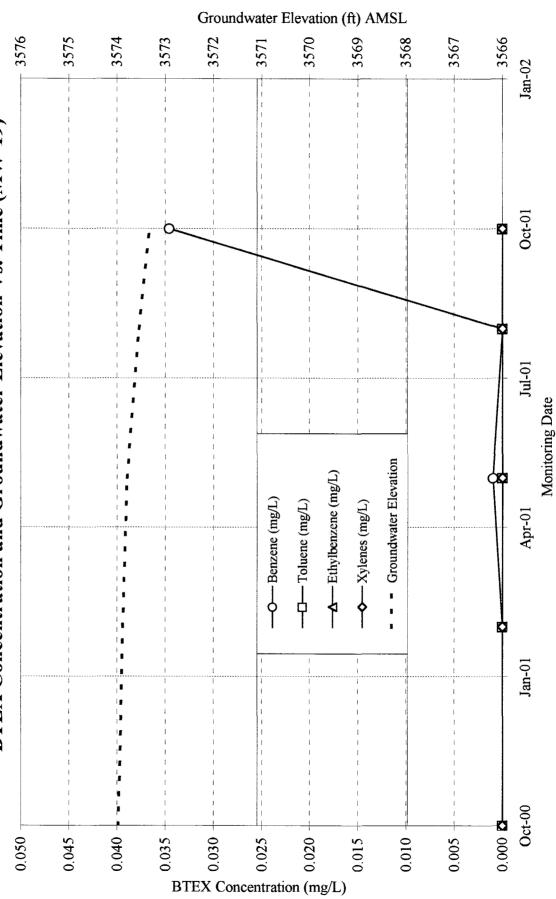
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7.0 **Remediation System Performance**

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.

<i>•</i>				•	Table 4							
			P	roduct R								
				Hobbs H								
Date		Product Recovered (gallons)										
Daic	RW-1	MW-1	MW-4	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	(gallons)		
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 recover							·					
RW-1 (4-inch d				rt Skimmer (P	roduct Reco	very System)						
MW-1 (2-inch d	hameter we	II): Passive ba	ailer									

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 (NO₃), sulfate (SO₄), ferric iron (Fe³⁺), ferrous iron (Fe²⁺), 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

	CLIENT:	Duke E	nergy Field S	ervices	_	WELL ID	MW-1
S	TE NAME:	Hobb	s Booster Sta	ation	-	DATE	5/16/01
PRC	JECT NO.		V-103		. 8	SAMPLER	Fergerson
							Whaler Super Purger submersible pump
DESCRIE	E EQUIPM	ENT DECO	NTAMINAT	ION METH	OD BEFO	ORE SAME	PLING THE WELL:
Glove	s 🗹 Alcond	ox 🗹 Disti	lled Water F	Rinse 🔲 🤅	Other:		
DISPOSA					e Dischar	ge 🗌 Dri	ims Disposal Facility
DEPTH T HEIGHT	EPTH OF V O WATER: OF WATER AMETER:	COLUMN:	53.00 46.42 6.58 Inch	Feet		3.2	_Minimum Gallons to purge 3 well volumes
TIME	VOLUME PURGED		COND. mS/cm	pН	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
COMMEN	NTS:	Not sample	d due to pre	esence of L	NAPL (<	0.01 ft) aft	er pump was removed from well.
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	CLIENT:	Duke E	nergy Field S	ervices		WELL ID	MW-2
SI	TE NAME:	Hobb	s Booster Sta	ation	_	DATE	5/16/01
PRC	JECT NO.		V-103			SAMPLER:	Fergerson
SAMPLIN		D:	🗹 Disposab	le Bailer] Direct	from Disch	Whaler Super Purger submersible pump narge Hose Other:
DISPOSA) of Purg	E WATER:	Surface			ıms
DEPTH T HEIGHT (O WATER: OF WATER AMETER:	COLUMN: 2.0		Feet		5.6	_Minimum Gallons to purge 3 well volumes
TIME	VOLUME PURGED		COND. <i>m</i> S/cm	pН	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
						., . ···.	
·							
							l
COMMEN	ITS:						

N. 1

	CLIENT:	Duke E	nergy Field S	ervices	_	WELL ID	. <u>MW-3</u>
S		Hobb	s Booster Sta	ation	_	DATE	5/16/01
PRC	JECT NO.		V-103		_ 5	SAMPLER	:Fergerson
SAMPLIN DESCRIE	G METHO	D: ENT DECC	🗹 Disposab	ole Bailer [ION METH		from Discł	Whaler Super Purger submersible pump narge Hose
DISPOSA		OF PURG	E WATER:	Surface	e Dischar	ge 🗌 Dru	ums ☑Disposal Facility
DEPTH T HEIGHT (O WATER:	COLUMN:	53.00 41.65 11.35 Inch	Feet		5.6	_Minimum Gallons to purge 3 well volumes
TIME	VOLUME PURGED		COND. <i>m</i> S/cm	рН	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
		· · · · · · · · · · · · · · · · · · ·					
COMMEN	ITS:	Collected S	ample for B	TEX 8021	B (Two 40	-ml VOA c	containers).

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S	TE NAME:	Hobb	os Booster Sta	ation	-	DATE	:5/15/01
PRC	JECT NO.		V-103		- 5	SAMPLER	: Fergerson
PURGING		:	Hand Ba	iled 🗹 Pu	ump If Pu	mp, Type:	Whaler Super Purger submersible pur
SAMPLIN		D:	✓ Disposab	le Bailer	Direct	from Discl	harge Hose 🔲 Other:
DESCRIE		ENT DECC				DRE SAMI	PLING THE WELL:
Glove	s 🗹 Alcond	ox 🗹 Disti	illed Water F	Rinse 🔲	Other:		
DISPOSA		OF PURG	E WATER:	Surfac	e Discharç	ge 🗌 Dru	ums Disposal Facility
TOTAL D	EPTH OF V	VELL:	57.00	Feet			
DEPTH T	O WATER:		<u>48.89</u> 8.11			4.0	Minimum Gallons to purge 3 well volum
	AMETER:			reel		4.0	
TIME	VOLUME		COND. mS/cm	рН	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMAR
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
- 10 - 10 - 10 - 11						n	Placed sample in two 40-ml VOAs
	ITS:						

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ļ	CLIENT:	Duke E	nergy Field S	ervices	-	WELL ID:	MW-6
S	TE NAME:	Hobb	s Booster Sta	ation	_	DATE	5/15/01
PRC	JECT NO.		V-103			SAMPLER:	Fergerson
PURGING	G METHOD	:	🗌 Hand Bai	led 🔽 Pu	imp_lf_Pu	mp, Type:	Whaler Super Purger submersible pump
SAMPLIN	IG METHO	D :	🗹 Disposab	le Bailer [Direct	from Disch	narge Hose 🔲 Other:
DESCRIE	BE EQUIPM	ENT DECC	NTAMINAT	ION METH	IOD BEFC	DRE SAMF	PLING THE WELL:
Glove	es 🗹 Alcono	ox 🗹 Disti	lled Water F	Rinse 🔲	Other:		
ŀ					e Discharç	je 🗌 Dru	ims Disposal Facility
DEPTH T HEIGHT	O WATER:	COLUMN:	53.00 44.78 8.22 Inch	Feet		4.0	_Minimum Gallons to purge 3 well volumes
TIME	VOLUME PURGED		COND. mS/cm	pН	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
·							
•				····			
COMMEN	NTS:				· · · · · · · · · ·		
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	CLIENT:	Duke E	nergy Field S	ervices			MW-7
SI		Hobb	s Booster Sta	ation		DATE	5/15/01
PRC	JECT NO.	8- 55 -56 m	V-103		. 8	SAMPLER	Fergerson
SAMPLIN	IG METHO	D:	🗹 Disposab	le Bailer [Direct	from Disch	Whaler Super Purger submersible pump harge Hose
DISPOSA) of Purg		Surface			ims Disposal Facility
DEPTH T HEIGHT (O WATER: OF WATER AMETER:	COLUMN: 2.0	38.88 14.12 Inch	Feet		6.9	_Minimum Gallons to purge 3 well volumes
TIME	VOLUME PURGED		COND. <i>m</i> S/cm	pН	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
·							
,							+
							1
COMMEN							
			<u> </u>				

6	-		nergy Field S		-		. MW-14
					-		
PRC	DJECT NO.	······	V-103	····	. 3	AMPLER	E Fergerson
			Hand Bai	ied II Pu	imn lf Du	mn Tyne	:
							harge Hose Other:
							PLING THE WELL:
	s 🗹 Alcond						
01000			Neu VValei M		other.		
DISPOSA		OF PURG	E WATER:	Surface	e Discharç	ge 🗌 Dru	ums 🗹 Disposal Facility
TOTAL D	EPTH OF V	VELL:	63.00	Feet			
	O WATER: OF WATER		44.07			9-3	Minimum Gallons to purge 3 well volume
	AMETER:		and the second se	1 001			
TIME	VOLUME	TEMP.	COND.		DO		
TIME	PURGED	° C / °F	<i>m</i> S/cm	pH	mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
<u>1741</u>	0	-	-		-	-	Pump turned on.
<u>1747</u>	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
		······					
COMMEN	NTS:						

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			nergy Field S os Booster Sta				MW-15 5/16/01
	-		V-103		•		Fergerson
r i i i i	JECTINO.		<u>v-105</u>		. `		reigeison
PURGING			Hand Bai	iled 🗹 Pເ	ımp lf Pu	imp, Type:	Whaler Super Purger submersible pur
SAMPLIN		D :	🗸 Disposab	le Bailer [Direct	from Disch	arge Hose 🔲 Other:
DESCRIE		ENT DECO	NTAMINAT	ION METH	OD BEFO	DRE SAMF	LING THE WELL:
Glove	s 🗹 Alcond	x 🗹 Disti	lled Water F	Rinse 🔲	Other:		
					Dischar		ms Disposal Facility
					DISCHAR		
TOTAL D DEPTH T	EPTH OF V O WATER:	VELL:	<u>58.00</u> 40.03	Feet			
			17.97			8.8	Minimum Gallons to purge 3 well volum
WELL DI	AMETER:	2.0	incn				
TIME	VOLUME PURGED		COND. mS/cm	рН	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARK
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 we
							Placed duplicate sample in two 40-ml VOAs
	ļ						

	CLIENT:	Duke E	nergy Field S	ervices	-	WELL ID:	MW-16
SI	SITE NAME: Hobbs Booster Station				_	DATE:	5/16/01
PRC	PROJECT NO. V-103					SAMPLER:	Fergerson
							Whaler Super Purger submersible pump
							narge Hose 🔲 Other:
DESCRIB	E EQUIPM	ENT DECO	NTAMINAT	ION METH	IOD BEFC	ORE SAMP	PLING THE WELL:
Glove	s 🗹 Alcond	Disti	lled Water F	Rinse 🔲	Other:		
DISPOSA) of Purg	E WATER:	Surface	e Discharç	ge 🗌 Dru	Ims IDisposal Facility
DEPTH T HEIGHT (O WATER: OF WATER AMETER:	COLUMN: 2.0	55.00 40.66 14.34 Inch	Feet		7.0	_Minimum Gallons to purge 3 well volumes
TIME	VOLUME PURGED		COND. mS/cm	рН	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	-	<u> </u>	
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
COMMEN	ITS:			· · · · · · · · · · · · · · · · · · ·			

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	CLIENT:	Duke E	nergy Field S	ervices	-	WELL ID	: MW-18
SI	SITE NAME: Hobbs Booster Station				-	DATE	:5/15/01
PRC	PROJECT NO V-103					SAMPLER	:Fergerson
PURGING		:	Hand Bai	iled 🗹 Pu	imp If Pu	mp, Type	Whaler Super Purger submersible pump
SAMPLIN		D :	🗹 Disposab	le Bailer [Direct	from Disc	harge Hose 🔲 Other:
DESCRIB	EEQUIPM	ENT DECC	NTAMINAT	ION METH	IOD BEFO	DRE SAM	PLING THE WELL:
Glove	s 🗹 Alcond	ox 🗹 Disti	lled Water F	Rinse 🔲	Other:		
DISPOSA) of purg	E WATER:	Surface	e Dischar	ge 🗌 Dru	ums IDisposal Facility
TOTAL D	EPTH OF V O WATER:	VELL:	63.00 49.87	Feet			
HEIGHT	OF WATER	COLUMN:	13.13			25.7	_Minimum Gallons to purge 3 well volumes
WELL DI	METER:	4.0	Inch				
TIME	VOLUME PURGED		COND. <i>m</i> S/cm	рН	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
				• 			
ļ							
						·	
COMMEN	ITS:	Pump & ho	se had prod	uct when re	emoved f	rom well, I	nowever, 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.

	CLIENT:	Duke E	nergy Field S	ervices		WELL ID:	. <u>MW-19</u>
S	SITE NAME: Hobbs Booster Station					DATE	5/15/01
PRC	PROJECT NO V-103					SAMPLER	Fergerson
SAMPLIN DESCRIE	IG METHOI BE EQUIPM	D: ENT DECC	☑ Disposab NTAMINAT	ole Bailer [ION METH	Direct	from Disch DRE SAMF	Whaler Super Purger submersible pump narge Hose Other: PLING THE WELL:
Glove	s 🗹 Alcono	ox 🗹 Disti	lled Water F	Rinse 🔲	Other:		· · · · · · · · · · · · · · · · · · ·
DISPOSA) of Purg	E WATER:	Surface	e Dischar	ge 🗌 Dru	ums Disposal Facility
DEPTH T HEIGHT (O WATER: OF WATER AMETER:	COLUMN: 2.0	13.67 Inch	Feet		6.7	_Minimum Gallons to purge 3 well volumes
TIME	VOLUME PURGED		COND. <i>m</i> S/cm	pН	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
							[
COMMEN	NTS:			•	•	ана на _/ , а , , , , , , , , , , , , , , , , , 	· · · · · · · · · · · · · · · · · · ·
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SI	TE NAME:	Hobbs Booster Station			DATE:		:8/10/01
PRC	JECT NO.		V-103				: Fergerson / Littlejohn
PURGING	G METHOD:		I Hand Bai	iled 🗹 Pu	ımp lf Pu	mp, Type:	Whaler Super Purger submersible pu
							harge Hose 🔲 Other:
			-				PLING THE WELL:
Glove	s 🗹 Alcono	x 🗹 Disti	lled Water R	Rinse 🔲	Other:		
DISPOSA		OF PURG	E WATER:	Surface	e Discharç	je 🗌 Dru	ums 🗹 Disposal Facility
			53.00	Feet		,	
DEPTH T	O WATER:		<u>41.71</u> 11.29	Feet		5.5	Minimum Gallons to purge 3 well volum
	METER:			1 001	-		
TIME	VOLUME PURGED		COND. <i>m</i> S/cm	pН	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMAR
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
				<u> </u>			Placed sample in two 40-ml VOAs
<u> </u>							
	 ITS:		· · · · · · · · · · · · · · · · · · ·	•			••••••••••••••••••••••••••••••••••••••
COMMEN							

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	CLIENT:	Duke Er	ergy Field S	Services		WELL ID:	MW-3
SI	SITE NAME: Hobbs Booster Station					DATE:	8/10/01
PROJECT NO. V-103							Fergerson / Littlejohn
PURGING			□ Hand Bai	iled 🔽 Pu	imn lf Pu	mn Type:	Whaler Super Purger submersible pump
							arge Hose Other:
			-				
			lled Water F		Juner		
DISPOSA		OF PURG	E WATER:	Surface	e Discharç	ge 🗌 Dru	ms IDisposal Facility
DEPTH T HEIGHT (O WATER:		53.00 41.90 11.10 Inch	Feet		5.4	_Minimum Gallons to purge 3 well volumes
TIME	VOLUME PURGED		COND. <i>m</i> S/cm	pН	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
						· · · · · · · · · · · · · · · · · · ·	
,							
				:			
	NTS:	Collected S	Sample for B	TEX 8021E	3 (Two 40	-ml VOA o	containers).

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SI	CLIENT:	E NAME: Hobbs Booster Station			-		MW-5 8/9/01
			V-103				Fergerson / Littlejohn
	-				-		
PURGING		:	Hand Bai	iled 🗹 Pu	imp If Pu	mp, Type:	Whaler Super Purger submersible pur
SAMPLIN		D:	🗸 Disposab	le Bailer [Direct	from Disch	arge Hose 🔲 Other:
DESCRIE		ENT DECC	NTAMINAT	ION METH		DRE SAMF	LING THE WELL:
Glove	s 🗹 Alcond	x 🗹 Disti	lled Water F	Rinse 🔲	Other:		
DISPOSA			E WATER:	Surface	e Dischar	ae 🗌 Dru	ms Disposal Facility
			57.00			. —	
DEPTH T	O WATER:		48.48	Feet			
	OF WATER		8.52	Feet		4.2	Minimum Gallons to purge 3 well volum
	-						F
TIME	VOLUME PURGED		COND. <i>m</i> S/cm	pН	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMAR
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
COMMEN	NTS:	······································	<u></u>				······································

SI	TE NAME:	Hobb	s Booster St	ation		DATE	:8/9/01
	•		V-103		- 5		: Fergerson / Littlejohn
	-		·····		-		
PURGING		:	🗌 Hand Bai	led 🗹 Pu	ump If Pu	mp, Type:	Whaler Super Purger submersible pum
SAMPLIN		D:	🗹 Disposab	le Bailer [Direct	from Discl	harge Hose 🔲 Other:
DESCRIB		ENT DECC	NTAMINAT	ION METH	IOD BEFO	ORE SAM	PLING THE WELL:
Glove	s 🗹 Alcond	x 🗹 Disti	lled Water F	Rinse 🔲	Other:		
DISPOSA		OF PURG	E WATER:	Surface	e Discharç	ge 🗌 Dri	ums Disposal Facility
TOTAL D	EPTH OF V	VELL:	53.00	Feet			
DEPTH T	O WATER:		44.99	Feet		• •	
	AMETER:		8.01 Inch	reet		3.9	_Minimum Gallons to purge 3 well volume
	VOLUME	TEMP.	COND.	· · · · ·	DO		· · · · · · · · · · · · · · · · · · ·
TIME	PURGED		<i>m</i> S/cm	pH	mg/L	Turb	PHYSICAL APPEARANCE AND REMARK
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
				,			

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S	ITE NAME:	Hobb	s Booster St	ation		DATE:	8/9/01
	JECT NO.						Fergerson / Littlejohn
PURGIN	G METHOD:	:	Hand Bai	iled 🗹 Pu	imp If Pu	mp, Type:	Whaler Super Purger submersible pun
SAMPLIN		D :	🗸 Disposab	le Bailer [Direct	from Disch	arge Hose 🔲 Other:
DESCRIE		ENT DECO	NTAMINAT	ION METH	OD BEFO	ORE SAMP	LING THE WELL:
Glove	s 🗹 Alcond	ox 🗹 Disti	lled Water F	Rinse 🔲	Other:		
DISPOSA		OF PURG	E WATER:	Surface	e Discharo	ie 🗌 Dru	ms Disposal Facility
						,	
DEPTH T	EPTH OF V O WATER:		39.16	Feet			
	OF WATER AMETER:			Feet		6.8	Minimum Gallons to purge 3 well volum
TIME	VOLUME		COND. mS/cm	pН	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARI
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

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S	-		s Booster St		-		MW-8 8/10/01
	-		V-103	<u>u</u>	•		Fergerson / Littlejohn
FRU	JECTINO.	<u>-</u> <u>.</u>	V-103		. `		
PURGING		:	🗌 Hand Bai	led 🗹 Pເ	imp If Pu	mp, Type:	Whaler Super Purger submersible pun
SAMPLIN		D:	🗹 Disposab	le Bailer [Direct	from Disch	arge Hose 🔲 Other:
DESCRIE		ENT DECO	NTAMINAT	ION METH		DRE SAMF	PLING THE WELL:
Glove	s 🗹 Alcond	x 🗹 Disti	lled Water F	Rinse 🔲	Other:		
DISPOSA		OF PURG	E WATER:	Surface	e Discharç	ge 🗌 Dru	ms IDisposal Facility
DEPTH T HEIGHT	O WATER:	COLUMN:	56.00 44.22 11.78 Inch	Feet		5.8	_Minimum Gallons to purge 3 well volum
TIME	VOLUME PURGED		COND. <i>m</i> S/cm	pН	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARK
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
						····	
	ļ					·····	
COMMEN	NTS:						

	CLIENT:	Duke Er	ergy Field S	Services		WELL ID:	MW-10
SI		Hobb	s Booster St	ation		DATE:	8/10/01
PRC	JECT NO.		V-103				Fergerson / Littlejohn
		_					
							Whaler Super Purger submersible pump
			-				arge Hose Other:
							PLING THE WELL:
Glove	s 🗹 Alcond	ox 🗹 Disti	lled Water F	Rinse 🔲 🤅	Other:		
DISPOSA		O OF PURG	E WATER:	Surface	e Dischar	ge 🔲 Dru	ms
	EPTH OF V		56.00				
_			42.32			6.7	Minimum Gallons to purge 3 well volumes
WELL DI	AMETER:	2.0	Inch				-
	VOLUME		COND.	pН	DO	Turb	PHYSICAL APPEARANCE AND REMARKS
	PURGED		<i>m</i> S/cm		mg/L		_
1117	0	-	-	-	_	-	Pump turned on.
	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
I							Placed sample in two 40-ml VOAs
			· · ·				
_ 							
							l
COMMEN	NTS:			·			

	-		ergy Field S		-		MW-14
	-		s Booster St	ation	•		8/10/01
PRC	JECT NO.		V-103	<u> </u>	. 8	SAMPLER	Fergerson / Littlejohn
						T) Alfactory Queen Duran a submany initia
							Whaler Super Purger submersible pum
			-				arge Hose Other:
						DRE SAMF	PLING THE WELL:
Glove	s 🗹 Alcond	ox ⊻ Disti	lled Water F	Rinse 🔟	Other:		
DISPOSA		OF PURG	E WATER:	Surface	e Dischar	ge 🗌 Dru	ms Disposal Facility
TOTAL D		VELL:	63.00	Feet			
DEPTH T	O WATER:		44.52 18.48	Feet		9.0	Minimum Gallons to purge 3 well volume
	AMETER:					5.0	
TIME	VOLUME	TEMP.	COND.		DO	Turb	PHYSICAL APPEARANCE AND REMARK
	PURGED	° C / °F	<i>m</i> S/cm	рН 	mg/L	Turb	PHISICAL APPEARANCE AND REMARK
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
	the second s						

	-		ergy Field S		-		MW-15
	-		s Booster St		-		8/10/01
PRC	JECT NO.		V-103	·	. s	SAMPLER	Fergerson / Littlejohn
							Whaler Super Purger submersible pum
							PLING THE WELL:
			lled Water F				
					-		
DISPOSA	L METHOD	OF PURG	E WATER:	Surface	e Discharg	je 🗌 Dri	ıms
DEPTH T HEIGHT	O WATER:	COLUMN:	58.00 40.37 17.63 Inch	Feet		8.6	_Minimum Gallons to purge 3 well volume
TIME	VOLUME PURGED	TEMP. °C / °F	COND. mS/cm	pН	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARK
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
						<u>.</u>	Placed sample in two 40-ml VOAs

	CLIENT:	Duke Er	ergy Field S	Services		WELL ID:	MW-16
SI		Hobb	s Booster St	ation		DATE	8/10/01
PRC	JECT NO.		<u>V-103</u>		SAMPLER:		Fergerson / Littlejohn
DURCING					imp. If Du		Whaler Super Purger submersible pump
							narge Hose 🔲 Other:
						JRE SAMI	PLING THE WELL:
Giove		DX 🗹 DISti	lled Water F	(inse 🔟 🤅	Otner:		
DISPOSA		OF PURG	E WATER:	Surface	e Dischar	ge 🗌 Dri	ıms
TOTAL D	EPTH OF V	VELL:	55.00	Feet			
DEPTH T	O WATER:		40.91 14.09	Feet		6.9	Minimum Gallons to purge 3 well volumes
	AMETER:			I CEL		0.9	Minimum Galions to purge 5 weil volumes
۱ ۲	VOLUME	TEMP.	COND.		DO		Τ
TIME	PURGED		<i>m</i> S/cm	pH	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
COMMEN	ITS:	··· ···					

	CLIENT:	Duke Er	ergy Field S	Services	-	WELL ID	: MW-17
SI		Hobb	s Booster St	ation	-	DATE	:8/10/01
PRC	JECT NO.		V-103		. 8	SAMPLER	: Fergerson / Littlejohn
SAMPLIN	g metho	D :	🗹 Disposab	le Bailer [Direct	from Disc	Whaler Super Purger submersible pump
			lled Water F			JRE SAIVII	PLING THE WELL:
DISPOSA TOTAL D DEPTH T) of Purg VELL:	E WATER: 62.00 49.07				ums Disposal Facility Minimum Gallons to purge 3 well volumes
	METER:						
TIME	VOLUME PURGED	TEMP. °C / °F	COND. <i>m</i> S/cm	pН	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							
ļ							
COMMEN	ITS:	Installed hy	/drophobic(c	il absorber	nt) sock in	to well	

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	CLIENT:	Duke Er	nergy Field S	Services	-	WELL ID	. <u>MW-18</u>
SI		Hobb	s Booster St	ation	-	DATE	8/10/01
PRC	JECT NO.		<u>V-</u> 103			SAMPLER	: Fergerson / Littlejohn
PURGING	METHOD	:	🗌 Hand Bai	led 🗹 Pu	ımp lf Pu	mp, Type:	Whaler Super Purger submersible pump
SAMPLIN	G METHO	D :	🗹 Disposab	le Bailer [Direct	from Discl	narge Hose 🔲 Other:
DESCRIB	E EQUIPM	ENT DECO	NTAMINAT	ION METH	IOD BEFC	ORE SAM	PLING THE WELL:
Glove	s 🗹 Alcond	ox 🗹 Disti	lled Water F	Rinse 🔲	Other:		
DISPOSA		OF PURG	E WATER:	Surface	e Discharç	ge 🗌 Dru	ums IDisposal Facility
DEPTH T HEIGHT (O WATER: DF WATER		50.09 12.91	Feet Feet Feet		25.3	_Minimum Gallons to purge 3 well volumes
TIME	VOLUME PURGED		COND. <i>m</i> S/cm	pН	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
		······					
COMMEN	ITS:	Installed hy	/drophobic(o	il absorber	nt) sock in	to well	

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c	ITE NAME:						MW-19 8/10/01
PRC	DJECT NO.		V-103			SAMPLER:	Fergerson / Littlejohn
						-	14/6-14 - O O
							Whaler Super Purger submersible pur
							arge Hose 🔲 Other:
						DRE SAMP	PLING THE WELL:
Glove	s 🗹 Alcond	ox 🗹 Disti	lled Water F	Rinse 📋 🤅	Other:		
DISPOSA		OF PURG	E WATER:	Surface	e Discharç	je 🗌 Dru	ms
	EPTH OF V	VELL	64 00	Feet			
	EPTH OF V O WATER:			Feet			
	OF WATER AMETER:			Feet	-	6.6	Minimum Gallons to purge 3 well volum
							• · · · · · · · · · · · · · · · · · · ·
TIME	VOLUME PURGED		COND. <i>m</i> S/cm	рН	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARK
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
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	CLIENT:	Duke En	ergy Field S	Services		WELL ID	MW-1
SI	TE NAME:	Hobb	s Booster St	ation		DATE	10/11/01
PRC	JECT NO.		V-103		. 8	SAMPLER	Fergerson / Littlejohn
PURGING		:	☑ Hand Ba	iled 🗌 Pu	ımp If Pu	mp, Type :	
SAMPLIN		D:	🗸 Disposat	le Bailer	Direct	from Discł	narge Hose
DESCRIE		ENT DECO	NTAMINAT	ION METH	OD BEFC		PLING THE WELL:
Glove	s 🗹 Alcono	ox 🗹 Disti	lled Water F	Rinse 🔲 🤇	Other:		
DISPOSA		OF PURG	E WATER:	Surface	e Discharç	ge 🗌 Dru	ıms
DEPTH T HEIGHT (O WATER:	COLUMN:	53.00 46.44 6.56 Inch	Feet		3.2	_Minimum Gallons to purge 3 well volumes
TIME	VOLUME PURGED		COND. <i>m</i> S/cm	pН	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
ļ							
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				l		· · ·	l
COMMEN	NTS:	Re-installed	d passive ba	ailer into we	ell after sa	mpling.	

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S	ITE NAME:	Hobb	s Booster St	ation		WELL ID: DATE:	10/10/01
	•		V-103		-		Fergerson / Littlejohn
		······································			-		
PURGING		:	Hand Bai	iled 🗹 Pu	imp If Pu	mp, Type:	Whaler Super Purger submersible pum
SAMPLIN		D:	🗌 Disposat	le Bailer [Direct	from Disch	arge Hose
DESCRIE		ENT DECO	NTAMINAT	ION METH	IOD BEFC	ORE SAMP	LING THE WELL:
Glove	es 🗹 Alcono	ox 🗹 Disti	lled Water F	Rinse 🔲	Other:		
DISPOSA) of Purg	E WATER:	Surface	e Discharç	ge 🗌 Dru	ms 🗹 Disposal Facility
DEPTH T HEIGHT	EPTH OF V O WATER: OF WATER AMETER:	COLUMN:	41.81 11.19	Feet Feet Feet		5.5	_Minimum Gallons to purge 3 well volum
TIME	VOLUME PURGED		COND. <i>m</i> S/cm	рН	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARK
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
<u> </u>							
			L	I			l
COMME	NTS:					<u></u>	

	CLIENT:	Duke Er	ergy Field S	Services	_	WELL ID:	MW-3
S		Hobb	s Booster St	ation	_	DATE	10/10/01
PRC	JECT NO.		V-103	· · · · · · · · · · · · · · · · · · ·	_ 8	SAMPLER	Fergerson / Littlejohn
SAMPLIN	IG METHO	D:	🗹 Disposat	le Bailer [Direct	from Discł	Whaler Super Purger submersible pump harge Hose Other:
							PLING THE WELL:
Glove	s ✓ Alcono	ox 🗹 Disti	lled Water F	Rinse 🛄	Other:		
DISPOSA		OF PURG	E WATER:	Surface	e Discharç	ge 🗌 Dri	ims
DEPTH T HEIGHT (EPTH OF V O WATER: OF WATER AMETER:		42.04 10.96	Feet Feet Feet		5.4	_Minimum Gallons to purge 3 well volumes
TIME	VOLUME PURGED		COND. <i>m</i> S/cm	pН	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		- 14					Collected duplicate sample
							Placed duplicate sample in two 40-ml VOAs
COMMEN	NTS:	Collected S	Sample for E	TEX 8021	B (Two 40	-ml VOA c	containers).

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	CLIENT:	Duke Er	ergy Field S	Services		WELL ID:	MW-5
SI	TE NAME:	Hobb	s Booster St	ation	-	DATE:	10/10/01
PRC	JECT NO.		V-103		. 8	SAMPLER:	Fergerson / Littlejohn
			_	_			
							Whaler Super Purger submersible pump
			-				arge Hose 🔲 Other:
							PLING THE WELL:
Glove	s 🗹 Alcond	ox 🗹 Disti	lled Water F	Rinse 🔲 🤅	Other:		
DISPOSA		OF PURG	E WATER:	Surface	e Discharç	ge 🔲 Dru	ms Disposal Facility
				Feet			
	O WATER: OF WATER			Feet Feet		4.2	Minimum Gallons to purge 3 well volumes
WELL DI	AMETER:	2.0	Inch				-
TIME	VOLUME		COND.	pН	DO	Turb	PHYSICAL APPEARANCE AND REMARKS
<u> </u>	PURGED		<i>m</i> S/cm		mg/L		
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
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							<u> </u>
COMMEN	NTS:		- 				

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	CLIENT:	Duke Er	ergy Field S	Services		WELL ID:	MW-6		
SI	TE NAME:	Hobb	s Booster St	ation		DATE	10/10/01		
PRC	JECT NO.		V-103			SAMPLER:	Fergerson / Littlejohn		
PURGINO		:	🗌 Hand Bai	iled 🗹 Pu	imp If Pu	imp, Type:	Whaler Super Purger submersible pump		
SAMPLIN		D:	🗹 Disposab	le Bailer	Direct	from Disch	arge Hose 🔲 Other:		
DESCRIE		ENT DECO	NTAMINAT	ION METH	OD BEFO	ORE SAMP	PLING THE WELL:		
Glove	s 🗹 Alcono	ox 🗹 Disti	lled Water F	Rinse 🔲 🤉	Other:				
DISPOSA		OF PURG	E WATER:	Surface	e Discharç	ge 🗌 Dru	ms Disposal Facility		
		VELL:	53.00	Feet					
	O WATER: OF WATER			Feet Feet		3.9	Minimum Gallons to purge 3 well volumes		
WELL DI	AMETER:	2.0	Inch						
TIME	VOLUME	TEMP.	COND.	pН	DO	Turb	PHYSICAL APPEARANCE AND REMARKS		
	PURGED	° C / ° F	<i>m</i> S/cm		mg/L				
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		
,									
COMMEN	ITS:				····				

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SI	TE NAME:	Hobb	s Booster Si	tation		DATE:	10/10/01
	•		V-103				Fergerson / Littlejohn
							Whaler Super Purger submersible pur
							PLING THE WELL:
			lled Water F				
					•	ne 🗆 Dru	ms Disposal Facility
TOTAL D DEPTH T HEIGHT (EPTH OF V O WATER:	VELL: COLUMN:	53.00 39.22 13.78	Feet Feet			Minimum Gallons to purge 3 well volum
TIME	VOLUME PURGED	TEMP.	COND. <i>m</i> S/cm	рН	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMAR
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

S	ITE NAME:	Hobb	s Booster Si	tation			MW-10 10/10/01
	DJECT NO.						Fergerson / Littlejohn
				·			
PURGIN			🗌 Hand Ba	iled 🗹 Pu	imp If Pu	mp, Type:	Whaler Super Purger submersible pur
SAMPLIN		D :	🗹 Disposat	ole Bailer [Direct	from Disch	arge Hose 🔲 Other:
DESCRIE		ENT DECO	NTAMINAT	ION METH	OD BEFC	ORE SAMP	LING THE WELL:
Glove	es 🗹 Alcond	ox 🗹 Disti	lled Water F	Rinse 🔲	Other:		
DISPOSA	AL METHOD	OF PURG	E WATER:	Surface	e Discharç	je 🗌 Dru	ms Disposal Facility
	EPTH OF V	VELL:	56.00	Feet			
DEPTH T	O WATER: OF WATER		42.57	Feet		6 6	Minimum Gallons to purge 3 well volum
	AMETER:			- reel	•	0.0	
	VOLUME	TEMP.	COND.		DO		
TIME	PURGED	° C / °F	<i>m</i> S/cm	рН	mg/L	Turb	PHYSICAL APPEARANCE AND REMAR
	0	-	-	-		-	Turned pump on
1429	3	19.8	3100	8.05	3.44	138	
1438	6	19.7	3110	8.14	3.21	284	
	9	19.8	3080	8.15	3.23	314	
1455							Collected sample
							Placed sample in two 40-ml VOAs
						- #	
			- 				
						<u> </u>	
		· · · · · · · · · · · · · · · · · · ·		L			
COMME	NTS:			·····			

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ci	CLIENT:		s Booster S		-		MW-14
	-				-		<u> </u>
PRO	JECT NO.		V-103		- 8	SAMPLER:	Fergerson / Littlejohn
PURGING			🗌 Hand Ba	iled 🔽 Pu	ımp lf Pu	mp, Type:	Whaler Super Purger submersible pump
							arge Hose Other:
			-				
Glove	s 🗹 Alcond	x 🗹 Disti	lled Water F	Rinse 🔲	Other:		
					•		
DISPOSA	L METHOD	OF PURG	E WATER:	Surface	e Discharç	je 🗌 Dru	ms 🗹 Disposal Facility
				Feet			
	O WATER: OF WATER		<u>44.86</u> 18.14	Feet Feet		8.9	Minimum Gallons to purge 3 well volumes
	METER:			-	•		
	VOLUME	TEMP.	COND.	mLl	DO		PHYSICAL APPEARANCE AND REMARKS
TIME	PURGED	° C / ° F	<i>m</i> S/cm	рН	mg/L	Turb	
1525	0	-	-	-	-		Turned pump on
1531	3	22.0	2130	7.74	2.40	228	
1 <u>537</u>	6	21.5	2040	7.82	2.54	81	
1542	9	21.5	2010	7.79	2.23	42	
1 <u>550</u>							Collected sample
			·····				Placed sample in two 40-ml VOAs
····							
COMMEN		·····	l	<u>ــــــــــــــــــــــــــــــــــــ</u>	L		1

	CLIENT:	Duke Er	ergy Field S	Services		WELL ID:	MW-15
SI	TE NAME:	Hobb	s Booster St	ation		DATE:	10/10/01
PRC	JECT NO.	·····	V-103		. 8	SAMPLER:	Fergerson / Littlejohn
SAMPLIN DESCRIE	IG METHOE BE EQUIPM es ☑ Alcond	D: ENT DECC Dx I Disti	☑ Disposab NTAMINAT Iled Water F	le Bailer [ION METH Rinse 🔲 (Direct	from Disch DRE SAMF	Whaler Super Purger submersible pump harge Hose □ Other: PLING THE WELL: Imms ✓Disposal Facility
TOTAL D DEPTH T HEIGHT	EPTH OF V O WATER: OF WATER AMETER:	VELL: COLUMN: 2.0	58.00 40.69 17.31	Feet Feet Feet	- Dischary	-	_Minimum Gallons to purge 3 well volumes
TIME	VOLUME PURGED		COND. mS/cm	pН	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
				-			
COMMEN	NTS:	·····					

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C:/FORMS/SAMPLING DATA FORM

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PROJEC PURGING M SAMPLING M DESCRIBE E I Gloves I): ENT DECO x ☑ Distii OF PURG /ELL:	☑ Disposab NTAMINATI lled Water R E WATER:	led	imp If Pu Direct OD BEFC	SAMPLER mp, Type: from Discl DRE SAMI	: <u>10/10/01</u> : <u>Fergerson / Littlejohn</u> <u>Whaler Super Purger submersible pump</u> harge Hose Other: PLING THE WELL:
PURGING M SAMPLING M DESCRIBE E DISPOSAL M DISPOSAL M DEPTH TO V HEIGHT OF	METHOD: METHOD EQUIPME Alcono METHOD PTH OF W WATER: WATER): ENT DECO x ☑ Distil OF PURG /ELL:	☐ Hand Bai ☑ Disposab NTAMINATI Iled Water R E WATER:	led	Imp If Pu Direct	mp, Type: from Discl DRE SAMI	Whaler Super Purger submersible pump
SAMPLING N DESCRIBE E DISPOSAL N TOTAL DEP DEPTH TO V HEIGHT OF	METHOD EQUIPME Alcono METHOD PTH OF W WATER:): ENT DECO X I Distil OF PURG /ELL:	☑ Disposab NTAMINATI lled Water R E WATER:	le Bailer [ON METH linse 🔲 (Direct	from Discl DRE SAMI	harge Hose 🔲 Other:
FOTAL DEP ⁻ DEPTH TO V HEIGHT OF	TH OF W WATER: WATER	/ELL:		Surface			
DEPTH TO V HEIGHT OF	WATER: WATER		55 00		e Discharg	ge 🗌 Dru	ums <a>Disposal Facility
	IETER: _		41.08 13.92	Feet Feet Feet		6.8	_Minimum Gallons to purge 3 well volumes
	OLUME	TEMP. °C / °F	COND. <i>m</i> S/cm	pН	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
				<u></u>			

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2		Hobb	s Booster S	ation	. .		: 10/10/01
	-				-		
PRC	JECT NO.	<u> </u>	V-103		- *	SAMPLER	: Fergerson / Littlejohn
PURGING		:	✓ Hand Ba	iled 🗌 Pu	ımp lf Pu	mp, Type:	·
SAMPLIN		D:	🗹 Disposat	ole Bailer [Direct	from Disc	harge Hose 🔲 Other:
DESCRIB		ENT DECC	NTAMINAT	ION METH		DRE SAM	PLING THE WELL:
Giove	s 🗹 Alcond	ox 	lled Water F	Rinse 🔲	Other:		
DISPOSA		OF PURG	E WATER:	Surface	e Discharç	ge 🗌 Dri	ums Disposal Facility
DEPTH T HEIGHT (EPTH OF V O WATER: OF WATER AMETER:		49.26 12.74	Feet Feet Feet		24.9	_Minimum Gallons to purge 3 well volun
TIME	VOLUME PURGED		COND. <i>m</i> S/cm	рН	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMAR
	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
]]						.1
COMMEN	JTC.	Doonvorod	20 ml from	sock prior	to nuraina	Installed	new hydrophobic(oil absorbent) sock

C:/FORMS/SAMPLING DATA FORM

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s	ITE NAME:	Hobb	s Booster St	ation	_	DATE:	10/10/01
PRO	DJECT NO.		V-103		_ 5		Fergerson / Littlejohn
PURGIN		:	✓ Hand Ba	iled 🗌 Pu	ump If Pu	mp, Type:	
							narge Hose Other:
	es 🗹 Alcond						
					-		
DISPOS	AL METHOD) of Purg	E WATER:	Surfac	e Discharg	ge [] Dru	Ims Disposal Facility
	EPTH OF V			Feet			
	TO WATER: OF WATER			Feet Feet		24.8	Minimum Gallons to purge 3 well volum
WELL D	AMETER:	4.0	Inch	-	-		
TIME	VOLUME		COND.	рН	DO	Turb	PHYSICAL APPEARANCE AND REMAR
	PURGED	°C / °F	<i>m</i> S/cm		mg/L		
	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
COMME	NTS:	No recover	y from hydro	ophobic(oil	absorben	t) sock prid	or to purging. Re-installed sock into well
after sam	pling.						

	CLIENT:	Duke Er	nergy Field S	Services		WELL ID	: MW-19
SI	TE NAME:	Hobb	s Booster St	ation		DATE	:10/10/01
PRC	JECT NO.		V-103		. 8	SAMPLER	: Fergerson / Littlejohn
SAMPLIN DESCRIB I Glove DISPOSA TOTAL D DEPTH T	G METHOE E EQUIPMI s ☑ Alconc	D: ENT DECO DX I Disti D OF PURG VELL:	✓ Disposate NTAMINAT Iled Water F E WATER: 64.00 50.80	ole Bailer [ION METH Rinse 🔲 (Imp If Pu Direct OD BEFC Other:	mp, Type: from Discł DRE SAMF	Minimum Gallons to purge 3 well volumes
WELL DI		2.0		Г	DO		
TIME	PURGED		m S/cm	рН	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
							
COMMEN	ITS:				 ,		
			- * *				

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C:/FORMS/SAMPLING DATA FORM

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Appendix B

D

Laboratory Analytical Reports and Chain-of-Custody Documentation



155 McCutcheon, Suite H

Lubbock, Iexas 79424 800•378•1296 El Paso, Texas 79932 888•588•3443 E-Mail: lab@traceanalysis.com

16 806•794•1296 FA 3 915•585•3443 FA

443 FAX 915•585•4944

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/6494/3CProject Name:Duke Energy Field ServicesProject Location:Hobbs Booster

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

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	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.

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 Report

Sample: 164689 - MW-2

Analysis: Analyst:	BTEX JW	Analytical Method: Preparation Method:	S 8021B E 5030B	QC Batch: Prep Batch:	QC09012 PB07764	Date Analyzed: Date Prepared:	2/12/01 2/12/01
Param		Flag	Result	Units	Dilu	tion	RDL
Benzene			2.11	mg/L	5		0.001
Toluene			1.07	mg/L	5		0.001
Ethylbenze	ne		0.334	mg/L	5		0.001
M,P,O-Xyle	ene		0.597	mg/L	. 5		0.001
\underline{T} otal BTE	X		4.11	mg/L	5	i	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
$\overline{\mathrm{T}}\overline{\mathrm{FT}}$		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: Analyst:	BTEX JW	Analytical Method: Preparation Method	S 8021B : E 5030B	QC Batch: Prep Batch:	QC09012 PB07764	Date Analyzed: Date Prepared:	2/12/01 2/12/01
Param		Flag	Result	Units	Dilu	tion	RDL
Benzene			2.07	mg/L	5)	0.001
Toluene			1.02	mg/L	5)	0.001
Ethylbenze	ne		0.32	mg/L	5	i	0.001
M,P,O-Xyle	ene		0.577	mg/L	5)	0.001
Total BTE	x		3.98	mg/L	5	j	0.001

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
$\overline{\mathrm{T}}\mathrm{F}\mathrm{T}$	· · · · · · · · · · · · · · · · · · ·	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

v	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	Dilu	tion	RDL
Benzene			0.95	mg/L	ţ	5	0.001
Toluene			0.008	m mg/L	Ę	5	0.001
Ethylbenzene	e		0.173	m mg/L	Ę	5	0.001
M,P,O-Xylen	ie		0.286	mg/L		5	0.001
Total BTEX			1.42	mg/L	Ę	5	0.001
						,	
					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TFT		0.474	mg/L	1	0.10	94	72 - 128

Continued ...

Report Date: February 15, 2001 P/6494/3C				Order Number: A01020912 Duke Energy Field Services			Page Number: 3 of 11 Hobbs Booster		
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:	$_{\rm JW}$	Preparation Method:	E 5030B	Prep Batch:	PB07764	Date Prepared:	2/12/01
Param		Flag	Result	Units	Dilu	ition	RDL
Benzene			0.037	mg/L		1	0.001
Toluene			< 0.001	mg/L		L	0.001
Ethylbenze	ne		0.004	mg/L	-	1	0.001
M,P,O-Xyl	ene		< 0.001	mg/L		1	0.001
Total BTE	X		0.041	mg/L		l	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	$\mathrm{mg/L}$	1	0.10	93	72 - 128

Sample: 164693 - Trip Blank 969A &B

Analysis: Analyst:	BTEX JW	Analytical Method: Preparation Method:	S 8021B E 5030B	QC Batch: Prep Batch:	QC09012 PB07764	Date Analyzed: Date Prepared:	2/12/01 2/12/01
Param		Flag	Result	Units	Dil	ution	RDL
Benzene			< 0.005	mg/L		5	0.001
Toluene			<0.005	mg/L		5	0.001
Ethylbenze	ne		< 0.005	mg/L		5	0.001
M,P,O-Xyle	ene		< 0.005	mg/L		5	0.001
Total BTE	Х		<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: Analysis: Analyst:	164694 BTEX JW	- MW-5 Analytical Method: Preparation Method:	S 8021B E 5030B	QC Batch: Prep Batch:	QC09012 PB07764	Date Analyzed: Date Prepared:	2/12/01 2/12/01
Param		Flag	Result	Units	Dilu	ition	RDL
Benzene			< 0.005	mg/L	Ę	5	0.001
Toluene			<0.005	mg/L		5	0.001
Ethylbenzer	ne		< 0.005	mg/L	ł	5	0.001
M,P,O-Xyle	ne		< 0.005	mg/L	ţ	õ	0.001
Total BTEX	K		<0.005	mg/L		5	0.001

Report Date: February 15, 2001 P/6494/3C				der Number: A01 ke Energy Field S	Page Number: 4 of 11 Hobbs Booster		
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		0.422			0.10	84	72 - 128

Sample: 164695 - MW-6

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Analysis: Analyst:	BTEX JW	Analytical Method: Preparation Method	S 8021B E 5030B	QC Batch: Prep Batch:	QC09012 PB07764	Date Analyzed: Date Prepared:	2/12/01 2/12/01
Param		Flag	Result	Units	Dilu	ition	RDL
Benzene			< 0.005	mg/L	,	5	0.001
Toluene			< 0.005	mg/L		5	0.001
Ethylbenze	ne		< 0.005	mg/L		5	0.001
M,P,O-Xyl	ene		<0.005	mg/L		5	0.001
Total BTE	X		< 0.005	mg/L		5	0.001

					Spike	Percent	Recovery
Surrogate	Flag	\mathbf{Result}	Units	Dilution	Amount	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: Analyst:	BTEX JW	Analytical Method: Preparation Method:	S 8021B E 5030B	QC Batch: Prep Batch:	QC09012 PB07764	Date Analyzed: Date Prepared:	2/12/01 2/12/01
Param		Flag	Result	Units	Dilu	ition	RDL
Benzene			< 0.005	mg/L		5	0.001
Toluene			< 0.005	mg/L		5	0.001
Ethylbenze	ne		< 0.005	mg/L		5	0.001
M,P,O-Xyle	ene		< 0.005	mg/L		5	0.001
Total BTE	X		<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	$\mathrm{mg/L}$	1	0.10	80	72 - 128

Sample: 164697 - MW-19

Analysis: Analyst:	BTEX JW	Analytical Method: Preparation Method:	S 8021B E 5030B	QC Batch: Prep Batch:	QC09014 PB07765	Date Analyzed: Date Prepared:	$\frac{2}{12}$
Param		Flag	Result	Units	Dilu	ition	RDL
Benzene		· · · · · · · · · · · · · · · · · · ·	< 0.005	mg/L		5	0.001
Toluene			< 0.005	mg/L		5	0.001
Ethylbenze	ene		< 0.005	mg/L		5	0.001
M,P,O-Xyl	ene		< 0.005	mg/L		5	0.001
Total BTE	Х		<0.005	$\mathrm{mg/L}$		5	0.001

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Report Date: February 15, 2001 Order Number: A01020912 Page Number: 5 of 11 P/6494/3C Duke Energy Field Services Hobbs Booster Spike Percent Recovery Surrogate Flag Result Units Dilution Amount Limits Recovery TFT 0.458mg/L 1 0.10 91 72 - 128 4-BFB 0.4161 83 mg/L0.1072 - 128

Sample: 164698 - MW-14

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09014	Date Analyzed:	2/12/01
Analyst:	$_{\rm JW}$	Preparation Method:	E 5030B	Prep Batch:	PB07765	Date Prepared:	2/12/01
Param		Flag	Result	Units	Dil	ution	RDL
Benzene			0.041	mg/L	•	5	0.001
Toluene			< 0.005	mg/L		5	0.001
Ethylbenze	ene		<0.005	mg/L		5	0.001
M,P,O-Xyl	ene		< 0.005	mg/L		5	0.001
Total BTE	X		0.041	mg/L		5	0.001

					Spike	Percent	Recovery
Surrogate	Flag	\mathbf{Result}	Units	Dilution	Amount	Recovery	\mathbf{Limits}
$\overline{\mathrm{TFT}}$		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: Analyst:	BTEX JW	Analytical Method: Preparation Method:	S 8021B E 5030B	QC Batch: Prep Batch:	QC09014 PB07765	Date Analyzed: Date Prepared:	2/12/01 2/12/01
Param		Flag	Result	Units	Dil	ution	RDL
Benzene			0.094	mg/L		5	0.001
Toluene			< 0.005	mg/L		5	0.001
Ethylbenze	ne		< 0.005	mg/L		5	0.001
M,P,O-Xyl	ene		< 0.005	mg/L		5	0.001
Total BTE	X		0.094	$\mathrm{mg/L}$		5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
$\overline{\mathrm{TFT}}$		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	Dilu	ition	RDL
Benzene			0.237	mg/L		5	0.001
Toluene		•	< 0.005	mg/L		5	0.001
Ethylbenze	ne	•	< 0.005	m mg/L		5	0.001
M,P,O-Xyl	ene	•	<0.005	mg/L		5	0.001
Total BTE	X		0.237	$\mathrm{mg/L}$		5	0.001

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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	$\mathrm{mg/L}$	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	Dilt	ution	RDL
Benzene	<u> </u>		< 0.005	mg/L		5	0.001
Toluene			< 0.005	mg/L		5	0.001
Ethylbenze	ene		< 0.005	$\mathrm{mg/L}$		5	0.001
M,P,O-Xyl	ene		< 0.005	mg/L		5	0.001
Total BTE	X		<0.005	mg/L		5	0.001

					\mathbf{Spike}	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TFT		0.466	mg/L	1	0.10	93	72 - 128
4-BFB		0.433	$\mathrm{mg/L}$	1	0.10	86	72 - 128

Sample: 164702 - MW-3

Analysis: BTEX Analyst: JW		Analytical Method: Preparation Method:	S 8021B E 5030B	QC Batch: Prep Batch:	QC09014 PB07765	Date Analyzed: Date Prepared:	2/12/01 2/12/01
Param		Flag	Result	Units	Dilu	tion	RDL
Benzene			0.346	mg/L	Ē)	0.001
Toluene			0.009	mg/L	5	j	0.001
Ethylbenze	ne		0.259	mg/L	5	<u>,</u>	0.001
M,P,O-Xyle	ene		0.285	mg/L	Ę	ò	0.001
Total BTE	x		0.899	$\mathrm{mg/L}$	Ę	j	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 Analyst: JW		Analytical Method: Preparation Method:	S 8021B E 5030B	QC Batch: Prep Batch:	QC09014 PB07765	Date Analyzed: Date Prepared:	2/12/01 2/12/01
Param		Flag F	lesult	Units	, Dilu	tion	RDL
Benzene		······	0.57	mg/L	Ę,)	0.001
Toluene			0.02	mg/L	Ę)	0.001
Ethylbenze	ne		0.287	mg/L	5	ò	0.001
M,P,O-Xyl	ene		0.461	mg/L	Ę)	0.001
Total BTEX			1.34	mg/L	5	j	0.001

Report Date: February 15, 2001 P/6494/3C				ler Number: A01 æ Energy Field S	Page Number: 7 of 11 Hobbs Booster		
Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT 4-BFB		$\begin{array}{c} 0.476 \\ 0.528 \end{array}$	mg/L mg/L	1 1	0.10 0.10	95 105	72 - 128 72 - 128

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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

				\mathbf{Spike}	Percent	Recovery
Surrogate	\mathbf{Flag}	\mathbf{Result}	Units	Amount	Recovery	Limit
TFT		0.098	mg/L	0.10	98	72 - 128
4-BFB		0.091	m 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

				Spike	Percent	Recovery
Surrogate	Flag	\mathbf{Result}	Units	Amount	Recovery	\mathbf{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

					Spike					
		Sample			Amount	Matrix	%		% Rec.	RPD
Param	Flag	\mathbf{Result}	Units	Dil.	Added	\mathbf{Result}	Rec.	RPD	\mathbf{Limit}	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

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Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT 4-BFB		0.096 0.1	m mg/L m mg/L	1 1	0.10 0.10	96 100	72 - 128 72 - 128

LCSD QC Batch: QC09012

					Spike					
		Sample			Amount	Matrix	%		% Rec.	RPD
Param	Flag	\mathbf{Result}	Units	Dil.	Added	\mathbf{Result}	Rec.	RPD	\mathbf{Limit}	Limit
MTBE		0.111	mg/L	1	0.10	< 0.001	111	2	80 - 120	20
Benzene		0.101	$\mathrm{mg/L}$	1	0.10	< 0.001	101	2	80 - 120	20
Toluene		0.103	$\mathrm{mg/L}$	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

					Spike	%	% Rec.
Surrogate	\mathbf{Flag}	\mathbf{Result}	Units	Dil.	Amount	Rec.	\mathbf{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	$\begin{array}{c} \mathbf{Sample} \\ \mathbf{Result} \end{array}$	Units	Dil.	Spike Amount Added	${f Matrix}\ {f Result}$	% 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

					Spike					
		Sample			Amount	Matrix	%		% Rec.	RPD
Param	\mathbf{Flag}	Result	Units	Dil.	Added	Result	Rec.	RPD	\mathbf{Limit}	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

Report Date: February 15, 2001 P/6494/3C				mber: A0102 ergy Field Ser	Page Number: 10 of 11 Hobbs Booster		
Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.099	mg/L	1	0.10	99	72 - 128
4-BFB	4-BFB 0.1			1	0.10	100	72 - 128

Quality Control Report Continuing Calibration Verification Standards

CCV (1) QC Batch: QC09012

			CCVs	CCVs	CCVs	Percent	
			\mathbf{True}	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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	8	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

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	\mathbf{Flag}	Units	Conc.	Conc.	Recovery	Limits	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 ...

Report Date:	February	15,	2001
P/6494/3C			

Order Number: A01020912 Duke Energy Field Services

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			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
MTBE		mg/L	0.10	0.094	94	85 - 115	2/12/01
Benzene		$\mathrm{mg/L}$	0.10	0.103	103	85 - 115	2/12/01
Toluene		mg/L	0.10	0.105	105	85 - 115	2/12/01
Ethylbenzene		$\mathrm{mg/L}$	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

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	\mathbf{Flag}	Units	Conc.	Conc.	Recovery	Limits	Analyzed
MTBE		mg/L	0.10	0.099	99	85 - 115	2/12/01
Benzene		m 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

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	\mathbf{Flag}	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	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

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	ا ah Name، 10 ۵ د ت	6701 Lubbo	Telephone: \$00 - 31	Samplers (SIGNATURES)	Sample kentification	11W-5/0102051255)	(04 CI 20 20 10) - MM	1-7 (0102 cv 1430)	4W-19 (010205 1550)	MW-14 (010205 16.30)	MW-16 (010205 1726)	MW-15 (010206 0930)	<u>/-i8 (010206 1125)</u>	MW-3 (0102061400)	MW-1 (010206 (500)		Project Name: Du KC ENERSY F	Project Location: Hobbs Boosfer Station	Project Manager. Gil Van Deventer	Cost Center No.: P/C 4 94/3AC	Shipping ID No.:	P O No.:	Special Instructions/Comments:	CHICCLUD	Atta: JICVE WEUTWEN

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	TRACE	6701 A Lubboo	(SIGNATURES)		(000			ink 769ABB			Project Information	DUKE ENERSY Field	Project Location: Hobbs Booster Station	Project Manager: Gil Van Deventer	PIG494 13A C	• •	Comments:	irect to Duke	Steve Weathers
	Lab Name:	Address: Telephone:	Samplers (SIGNATURES)	MW-7 / AI MO AL ICEA	Duplicate (010206000	MW-81010206	Rinsate	BI	-			Project Name: DU	Project Location: H_c	Project Manager: G	Cost Center No.: ρ	Shipping ID No.: P O No.:	Special Instructions/Comments:		Atr: Ste

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(806) 794-1296

Report Date: May 24, 2001 Order Number: A01051812 Duke Energy Field Services V-103

Summary Report

Report Date: May 24, 2001

Order ID Number: A01051812

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

Project Number:Duke Energy Field ServicesProject Name:V-103Project Location:Hobbs Booster

			Date	\mathbf{Time}	Date
Sample	Description	Matrix	Taken	Taken	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		
	Benzene	Toluene	Ethylbenzene	M,P,O-Xylene	Total BTEX
Sample - Field Code	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(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

Lubbock, Texas 79424 800 • 378 • 1296 806 • 794 • 1296 FAX 806 • 794 • 1298 6701 Aberdeen Avenue, Suite 9

155 McCutcheon, Suite H

El Paso, Texas 79932 888 • 588 • 3443 E-Mail: lab@traceanalysis.com 915 • 585 • 3443

FAX 915•585•4944

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.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	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: Analysis: Analyst:	1 71433 BTEX JW	3 - MW-6 Analytical Method: Preparation Method:	S 8021B E 5030B	QC Batch: Prep Batch:	QC11377 PB09731	Date Analyzed: Date Prepared:	5/21/01 5/21/01
Param		Flag	Result	Units	Dil	ution	RDL
Benzene		······	< 0.001	mg/L		1	0.001
Toluene			<0.001	$\mathrm{mg/L}$		1	0.001
Ethylbenzer	ne		< 0.001	mg/L		1	0.001
M,P,O-Xyle	ene		< 0.001	mg/L		1	0.001
Total BTEX	ζ		< 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
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Analysis: Analyst:	BTEX JW	Analytical Method: Preparation Method		QC Batch: Prep Batch:	QC11377 PB09731	Date Analyzed: Date Prepared:	5/21/01 5/21/01
Param		Flag	Result	Units	Dil	ution	RDL
Benzene			< 0.001	mg/L	· · · · · · · · · · · · · · · · · · ·	1	0.001
Toluene			< 0.001	mg/L		1	0.001
Ethylbenze	ene		< 0.001	mg/L		1	0.001
M,P,O-Xyl	ene		< 0.001	mg/L		1	0.001
Total BTE	X		< 0.001	mg/L		1	0.001

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	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

Analyst: JW	Analytical Metho Preparation Metho		QC Batch: Prep Batch:	QC11377 PB09731	Date Analyzed: Date Prepared:	5/21/01 5/21/01
Param	Flag	Result	Units	Dil	ution	RDL
Benzene	<u>,</u>	< 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 ...

Result Result 0.0967 0.092 - MW-19 Analytical Methor Preparation Met	Units Units mg/L mg/L	Dilution Dilution 1 1	Spike Amount Spike Amount 0.10 0.10	Percent Recovery Percent Recovery 96 92	Recover Limits Recover Limits
0.0967 0.092 - MW-19 Analytical Metho	mg/L	1	Amount 0.10	Recovery 96	
0.0967 0.092 - MW-19 Analytical Metho	mg/L	1	0.10	96	Linnes
0.092 - MW-19 Analytical Metho					72 - 128
- MW-19 Analytical Meth	mg/L	1	0.10	92	72 - 128 72 - 128
Analytical Meth					12 - 120
Preparation Met		QC Batch:	QC11377	Date Analyzed:	5/21/0
	hod: E 5030B	Prep Batch:	PB09731	Date Prepared:	5/21/0
Flag	Result	Units	Dil	ution	RD1 0.00
					0.00
					0.00
					0.00
					0.00
	0.0011	mg/ 1/		1	
	TT */		Spike	Percent	Recover
					Limits
	mg/L mg/L		0.10	1011	72 - 128
- MW-18		1	0.10	95	72 - 128
- MW-18 Analytical Metho Preparation Met	od: S 8021B	1 QC Batch: Prep Batch:	0.10 QC11377 PB09731		72 - 128 5/21/0 5/21/0
Analytical Metho	od: S 8021B hod: E 5030B Result	QC Batch: Prep Batch: Units	QC11377 PB09731 Dilt	95 Date Analyzed: Date Prepared: ution	5/21/0 5/21/0 RDI
Analytical Methor Preparation Met	od: S 8021B hod: E 5030B Result 0.004	QC Batch: Prep Batch: Units mg/L	QC11377 PB09731 Dilt	95 Date Analyzed: Date Prepared: ution 1	5/21/0 5/21/0 RD1 0.00
Analytical Methor Preparation Met	bd: S 8021B hod: E 5030B Result 0.004 0.0029	QC Batch: Prep Batch: Units mg/L mg/L	QC11377 PB09731 Dilt	95 Date Analyzed: Date Prepared: ution 1 1	5/21/0 5/21/0 RD1 0.00 0.00
Analytical Methor Preparation Met	bd: S 8021B hod: E 5030B Result 0.004 0.0029 0.0193	QC Batch: Prep Batch: Units mg/L mg/L mg/L	QC11377 PB09731 Dilt	95 Date Analyzed: Date Prepared: ution 1 1 1	5/21/0 5/21/0 RDI 0.00 0.00 0.00
Analytical Methor Preparation Met	bd: S 8021B hod: E 5030B Result 0.004 0.0029 0.0193 0.0085	QC Batch: Prep Batch: Units mg/L mg/L mg/L mg/L	QC11377 PB09731 Dil	95 Date Analyzed: Date Prepared: ution 1 1 1 1	5/21/0 5/21/0 RDI 0.00 0.00 0.00 0.00
Analytical Methor Preparation Met	bd: S 8021B hod: E 5030B Result 0.004 0.0029 0.0193	QC Batch: Prep Batch: Units mg/L mg/L mg/L	QC11377 PB09731 Dil	95 Date Analyzed: Date Prepared: ution 1 1 1	5/21/0 5/21/0 RDI 0.00 0.00 0.00
Analytical Metho Preparation Met Flag	bd: S 8021B hod: E 5030B Result 0.004 0.0029 0.0193 0.0085 0.0347	QC Batch: Prep Batch: Units mg/L mg/L mg/L mg/L	QC11377 PB09731 Dil	95 Date Analyzed: Date Prepared: ution 1 1 1 1	5/21/0 5/21/0 RDI 0.00 0.00 0.00 0.00
Analytical Methor Preparation Met	bd: S 8021B hod: E 5030B Result 0.004 0.0029 0.0193 0.0085	QC Batch: Prep Batch: Units mg/L mg/L mg/L mg/L mg/L	QC11377 PB09731 Dilt	95 Date Analyzed: Date Prepared: ution 1 1 1 1 1 1 Percent	5/21/0 5/21/0 RD1 0.00 0.00 0.00 0.00 0.00 Recover
	Result 0.1 0.0957	0.1 mg/L	<0.001	<0.001	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$

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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: Analyst:	BTEX JW	Analytical Method: Preparation Method		QC Batch: Prep Batch:	QC11377 PB09731	Date Analyzed: Date Prepared:	5/21/01 5/21/01
Param		Flag	Result	Units	Dilu	ition	RDL
Benzene		······································	0.0101	mg/L	· · · · · · · · · · · · · · · · · · ·	1	0.001
Toluene			0.0038	mg/L		1	0.001
Ethylbenze	ene		0.0033	m mg/L		1	0.001
M.P,O-Xyl	ene		0.0044	mg/L		1	0.001
Total BTE	Х		0.0216	mg/L		1	0.001

					Spike	Percent	Recovery
Surrogate	Flag	Result	\mathbf{Units}	Dilution	Amount	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

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Analysis: Analyst:	BTEX JW	Analytical Method: Preparation Method	S 8021B : E 5030B	QC Batch: Prep Batch:	QC11377 PB09731	Date Analyzed: Date Prepared:	5/21/01 5/21/01
Param		Flag	Result	Units	Dil	ution	RDL
Benzene			<0.001	mg/L		1	0.001
Toluene			0.0171	mg/L		1	0.001
Ethylbenze	ene		0.324	mg/L		1	0.001
M,P,O-Xyl	ene		0.346	mg/L		1	0.001
Total BTE	X		0.6871	mg/L		1	0.001

					\mathbf{Spike}	Percent	Recovery
Surrogate	\mathbf{Flag}	Result	Units	Dilution	Amount	Recovery	Limits
TFT	<u></u>	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:	$_{ m JW}$	Preparation Method:	E 5030B	Prep Batch:	PB09731	Date Prepared:	5/21/01
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Continued Param	Sample: 171441 Ana Flag	lysis: BTEX Result	Units	Dilution	RDL
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

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	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
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Analysis: Analyst:	BTEX JW	Analytical Method: Preparation Method	S 8021B : E 5030B	QC Batch: Prep Batch:	QC11377 PB09731	Date Analyzed: Date Prepared:	$5/21/01 \\ 5/21/01$
Param		Flag	Result	Units	Dilı	ition	RDL
Benzene			0.848	mg/L		1	0.001
Toluene			0.488	mg/L		1	0.001
Ethylbenze	ne		0.396	mg/L		1	0.001
M,P,O-Xyl	ene		0.772	mg/L		1	0.001
Total BTE	Х		2.5	mg/L		1	0.001

Surrogate	\mathbf{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		\mathbf{Flag}	Result	Units	Dih	ition	RDL
Benzene			0.0104	mg/L		1	0.001
Toluene			0.0041	mg/L		1	0.001
Ethylbenzer	ne		0.0035	mg/L		1	0.001
M,P,O-Xyle	ene		0.0039	mg/L		1	0.001
Total BTE	X		0.0219	mg/L		1	0.001
					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TFT		0.112	mg/L	1	0.10	112	72 - 128
4-BFB		0.112	m mg/L	1	0.10	112	72 - 128

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Sample:	171444	- MW-8					
Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11377	Date Analyzed:	5/21/01
Analyst:	JW	Preparation Method	i: E 5030B	Prep Batch:	PB09731	Date Prepared:	5/21/01
Param		Flag	Result	Units	Dil	ution	RDL
Benzene			0.294	mg/L		1	0.001
Toluene			0.0083	m mg/L		1	0.001
Ethylbenze			0.226	m mg/L		1	0.001
M,P,O-Xyle			0.34	m mg/L		1	0.001
Total BTE	X		0.868	mg/L		1	0.001
					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TFT	1 105	0.103	mg/L	1	0.10	103	72 - 128
4-BFB	1	0.137	mg/L	1	0.10	137	72 - 128
Sample:		- Rinsate	C 0001D		0.011074		r (01 /0:
Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11374	Date Analyzed:	5/21/01
Analyst:	JW	Preparation Method	l: E 5030B	Prep Batch:	PB09729	Date Prepared:	5/21/03
Param		Flag	Result	Units	Di	lution	RDI
Benzene			< 0.001	mg/L		1	0.00
Toluene			< 0.001	mg/L		1	0.003
Ethylbenzei			< 0.001	m mg/L		1	0.00
M,P,O-Xyle			< 0.001	m mg/L		1	0.00
Total BTEX	X		<0.001	mg/L		1	0.001
					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	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 BTEX	- Trip Blank Analytical Method:	S 8021B	QC Batch:	QC11374 PB09729	Date Analyzed: Date Prepared:	5/21/03 5/21/03
-	JW	Preparation Method	l: E 5030B	Prep Batch:	F D09729	1	
Analyst: Param		Preparation Methoo Flag	Result	Units		lution	
Analyst: Param Benzene		-	Result <0.001	Units mg/L		lution 1	0.00
Analyst: Param Benzene Toluene	JW	-	Result <0.001 <0.001	Units mg/L mg/L		lution 1 1	0.00
Analyst: Param Benzene Foluene Ethylbenzer	JW	-	Result <0.001 <0.001 <0.001	Units mg/L mg/L mg/L		lution 1 1 1	0.001 0.001 0.001
Analyst: Param Benzene Foluene Ethylbenzen M,P,O-Xyle	JW ne ene	-	Result <0.001 <0.001 <0.001 <0.001	Units mg/L mg/L mg/L mg/L		lution 1 1 1 1	0.001 0.001 0.001 0.001
Analyst: Param Benzene Foluene Ethylbenzen M,P,O-Xyle	JW ne ene	-	Result <0.001 <0.001 <0.001	Units mg/L mg/L mg/L		lution 1 1 1	0.00 0.00 0.00 0.00
Analyst: Param Benzene Toluene Ethylbenzer M,P,O-Xyle Total BTEX	JW ne me K	Flag	Result <0.001 <0.001 <0.001 <0.001 <0.001	Units mg/L mg/L mg/L mg/L mg/L	Dil	lution 1 1 1 1 1 1 Percent	0.003 0.003 0.003 0.003 0.003
Analyst: Param Benzene Toluene Ethylbenzen M,P,O-Xyle Total BTEX	JW ne ene	Flag Result	Result <0.001 <0.001 <0.001 <0.001 <0.001	Units mg/L mg/L mg/L mg/L Dilution	Dil Spike Amount	lution 1 1 1 1 1 1 Percent Recovery	RDL 0.001 0.001 0.001 0.001 0.001 Recovery Limits
Analysis: Analyst: Param Benzene Toluene Ethylbenzen M,P,O-Xyle Total BTE2 Surrogate TFT 4-BFB	JW ne me K	Flag	Result <0.001 <0.001 <0.001 <0.001 <0.001	Units mg/L mg/L mg/L mg/L mg/L	Dil	lution 1 1 1 1 1 1 Percent	0.001 0.001 0.001 0.001 0.001

¹SURROGATE 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	m mg/L	0.001
Total BTEX		< 0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	<u>y</u>	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
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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

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	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.

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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

					Spike					
	LCS	LCSD			Amount	Matrix			% Rec	RPD
Param	Result	Result	Units	Dil.	Added	Result	$\% \mathrm{Rec}$	RPD	Limit	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.

_	LCS	LCSD			Spike	LCS	LCSD	Recovery
Surrogate	Result	\mathbf{Result}	Units	Dilution	Amount	% Rec	% Rec	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

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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		m mg/L	0.30	0.267	89	85 - 115	5/21/01

ICV (1) QCBatch: QC11374

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			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date	
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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)

N.

QCBatch: QC11377

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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

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TRIC	Lab Name:	Address: Telephone:	Samplerg (SIGNATURES)	Sample	Duplicate	MW-8	Riviate	Tim Nack							Project Name:	Project Location:	Project Manager:	Cost Center No.:	Shipping ID No.:	Bill to (see below):	Special Instructions/Comments:	Duke Energy F	P. O. Box 5493	

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TraceAnalysis, Inc.

CC # V-103

Report Date: August 15, 2001Order Number: A01081409 Duke Energy Field services Page Number: 1 of 1 Hobbs Booster

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

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	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	······································	
	Benzene	Toluene	Ethylbenzene	M,P,O-Xylene	Total BTEX
Sample - Field Code	(ppm)	(ppm)	(ppm)	(ppm)	(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

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

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-103Project Name:Duke Energy Field servicesProject Location:Hobbs Booster

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

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	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: Analyst:	BTEX CG	Analytical Method Preparation Metho		QC Batch: Prep Batch:	QC13346 PB11391	Date Analyzed: Date Prepared:	8/14/01 8/14/01
Param		Flag	Result	Units	Dil	ution	RDL
Benzene		· · · · · · · · · · · · · · · · · · ·	< 0.001	mg/L		1	0.001
Toluene			< 0.001	mg/L		1	0.001
Ethylbenze	ene		< 0.001	mg/L	,	1	0.001
M,P,O-Xyl	ene		< 0.001	mg/L		1	0.001
Total BTE	x		<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: Analyst:	BTEX CG	Analytical Method: Preparation Method	S 8021B E 5030B	QC Batch: Prep Batch:	QC13346 PB11391	Date Analyzed: Date Prepared:	8/14/01 8/14/01
Param		Flag	Result	Units	Dilt	ition	RDL
Benzene			< 0.001	mg/L		1	0.001
Toluene			< 0.001	mg/L		1	0.001
Ethylbenze	ene		< 0.001	mg/L		1	0.001
M,P,O-Xyl	ene		< 0.001	mg/L		1	0.001
Total BTE	Х		< 0.001	mg/L		1	0.001

					Spike	$\mathbf{Percent}$	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	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: Analysis: Analyst:	177051 BTEX CG	- MW-5 Analytical Method: Preparation Method:	S 8021B : E 5030B	QC Batch: Prep Batch:	QC13346 PB11391	Date Analyzed: Date Prepared:	8/14/01 8/14/01
Param		Flag	Result	Units	Dilı	ition	RDL
Benzene			< 0.001	mg/L		1	0.001
Toluene			< 0.001	m mg/L		1	0.001
Ethylbenzer	ne		< 0.001	mg/L		1	0.001
M,P,O-Xyle	ene		< 0.001	mg/L		1	0.001
Total BTEX	ζ		<0.001	mg/L		1	0.001

¹Poor surrogate recovery due to lack of mixing.

²Poor surrogate recovery due to lack of mixing.

³Poor surrogate recovery due to matrix difficulties.

Report Date: August 15, 2001 CC # V-103

Order Number: A01081409 Duke Energy Field services

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	, Dilu	tion	RDL
Benzene	********		0.004	mg/L]		0.001
Toluene			< 0.001	mg/L	1	L	0.001
Ethylbenze	ne		< 0.001	mg/L]	L	0.001
M,P,O-Xyle	ene		< 0.001	mg/L	1	L	0.001
Total BTE	X		0.004	mg/L	[0.001
		- 1	TT 1.		Spike	Percent	Recovery

Surrogate	Flag	Result	Units	Dilution	Amount	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: Analysis: Analyst:	T77053 BTEX CG	3 - MW-15 Analytical Method: Preparation Method:	S 8021B E 5030B	QC Batch: Prep Batch:	QC13346 PB11391	Date Analyzed: Date Prepared:	8/14/01 8/14/01
Param		Flag	Result	Units	\mathbf{Dil}	ution	RDL
Benzene			0.353	mg/L		5	0.001
Toluene			< 0.005	mg/L		5	0.001
Ethylbenze	ne		<0.005	mg/L		5	0.001
M,P,O-Xyl	ene		<0.005	mg/L		5	0.001
Total BTE			0.353	mg/L		5	0.001

					Spike	Percent	Recovery
Surrogate	Flag	\mathbf{Result}	\mathbf{Units}	Dilution	Amount	Recovery	Limits
\mathbf{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: Analyst:	BTEX CG	Analytical Method: Preparation Method:	S 8021B E 5030B	QC Batch: Prep Batch:	QC13346 PB11391	Date Analyzed Date Prepared	, ,
Param		Flag	Result	Units	Dil	ution	RDL
Benzene	, .		0.034	mg/L		5	0.001
Toluene			< 0.005	mg/L		5	0.001
Ethylbenze	ene		< 0.005	mg/L		5	0.001
	1. A. B.	A 17 797 1991 A A A A A A A A A A A A A A A A A					Continued

⁴Poor surrogate recovery due to matrix difficulties.

⁵Poor surrogate recovery due to lack of mixing.

⁶Poor surrogate recovery due to lack of mixing.

Report Date: August 15, 2001 CC # V-103

Order Number: A01081409 Duke Energy Field services

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: Analyst:	BTEX CG	Analytical Method: Preparation Method		QC Batch: Prep Batch:	QC13346 PB11391	Date Analyzed: Date Prepared:	8/14/01 8/14/01
Param		Flag	Result	Units	Dil	ution	RDL
Benzene	· · · · · · · · · · · · · · · · · · ·		0.098	mg/L		5	0.001
Toluene			< 0.005	mg/L		5	0.001
Ethylbenze	ene		< 0.005	mg/L		5	0.001
M,P,O-Xyl	ene		< 0.005	mg/L		5	0.001
Total BTE	Х		0.098	mg/L		5	0.001

					Spike	Percent	Recovery
Surrogate	Flag	\mathbf{Result}	\mathbf{Units}	Dilution	Amount	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: Analyst:	BTEX CG	Analytical Method: Preparation Method	S 8021B : E 5030B	QC Batch: Prep Batch:	QC13346 PB11391	Date Analyzed: Date Prepared:	8/14/01 8/14/01
Param		Flag	Result	Units	Dil	ution	RDL
Benzene		······································	0.345	mg/L		5	0.001
Toluene			< 0.005	mg/L		5	0.001
Ethylbenze	ene		0.207	mg/L		5	0.001
M,P,O-Xyl	ene		0.316	mg/L		5	0.001
Total BTE	X		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:	17705'	7 - 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
						Con	ntinued

Report Date: August 15, 2001 CC # V-103

Order Number: A01081409 Duke Energy Field services

Continued Param	Sample: 177057 Ana Flag	lysis: BTEX Result	Units	Dilution	RDL
Param	Flag	Result	\mathbf{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

Companya ta	171	Descrit	TToita	Dilution	Spike	Percent Recovery	Recovery Limits
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Linns
$\overline{\mathrm{TFT}}$		0.518	mg/L	5	0.10	103	72 - 128
4-BFB		0.453	$\mathrm{mg/L}$	5	0.10	90	72 - 128

Sample: Analysis: Analyst:	BTEX CG	8 - Duplicate Analytical Method: Preparation Method:	S 8021B E 5030B	QC Batch: Prep Batch:	QC13346 PB11391	Date Analyzed: Date Prepared:	8/14/01 8/14/01
Param		Flag	Result	Units	Dil	ution	RDL
Benzene			1.72	mg/L		5	0.001
Toluene			0.205	mg/L		5	0.001
Ethylbenze	ne		0.25	mg/L		5	0.001
M,P,O-Xyle	ene		0.43	mg/L		5	0.001
Total BTE	Х		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: Analysis: Analyst:	177059 BTEX CG	- MW-8 Analytical Method: Preparation Method		QC Batch: Prep Batch:	QC13346 PB11391	Date Analyzed: Date Prepared:	8/14/01 8/14/01
Param		Flag	Result	Units	Dilu	tion	RDL
Benzene			1.23	mg/L	1	0	0.001
Toluene			< 0.01	mg/L	1	0	0.001
Ethylbenzer	ne		0.201	mg/L	1	0	0.001
M,P,O-Xyle	ene		0.449	mg/L	1	0	0.001
Total BTEX	X		1.88	mg/L	1	0	0.001
					Spike	Percent	Recovery
Surrogate	Flag	\mathbf{Result}	Units	Dilution	Amount	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

Report Date: August 15, 2001 CC # V-103 Order Number: A01081409 Duke Energy Field services

Sample:	177060	- MW-10					
Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13346	Date Analyzed:	8/14/01
Analyst:	CG	Preparation Method	l: E 5030B	Prep Batch:	PB11391	Date Prepared:	8/14/01
Param		Flag	Result	Units	Dil	ution	RDL
Benzene			0.85	mg/L		5	0.001
Toluene			0.202	mg/L		5	0.001
Ethylbenzei	ne		0.148	mg/L		5	0.001
M,P,O-Xyle			0.3	8, mg/L		5	0.001
Total BTE			1.5	mg/L		5	0.001
					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	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: Analysis: Analyst:	177061 BTEX CG	- Rinsate Analytical Method: Preparation Method	S 8021B : E 5030B	QC Batch: Prep Batch:	QC13346 PB11391	Date Analyzed: Date Prepared:	8/14/01 8/14/01
Param		Flag	Result	Units	Di	lution	RDL
Benzene	. ,		0.004	mg/L		1	0.001
Toluene			< 0.001	mg/L		1	0.001
Ethylbenzer	ne		< 0.001	mg/L		1	0.001
M,P,O-Xyle	ene		< 0.001	mg/L		1	0.001
Total BTEX	X		0.004	mg/L		1	0.001
					0.11	Deveed	D
Cumpo moto	Eler	Descript	Units	Dilution	Spike	Percent	Recovery Limits
Surrogate	Flag	Result			Amount	Recovery	
TFT	8	0.0622	mg/L	1	0.10	62	72 - 128
4-BFB		0.044	mg/L	1	0.10	44	72 - 128
Sample: Analysis:	177062 BTEX	- MW-18 Analytical Method:	S 8021B	QC Batch:	QC13346	Date Analyzed:	8/14/01
Analyst:	CG	Preparation Method		Prep Batch:	PB11391	Date Prepared:	8/14/01
Param		Flag	Result	Units	Dil	ution	RDL
Benzene			0.007	mg/L		1	0.001
Toluene			< 0.001	mg/L		1	0.001
Ethylbenzer	ne		< 0.001	mg/L		1	0.001
M,P,O-Xyle			0.030	mg/L		1	0.001
Total BTEX			0.036	mg/L		1	0.001
					Q '1		D
		Dervit	Units	Dilution	Spike	Percent	Recovery
C	ייד		1 10110	1 11 11 10 10 10	Amount	Recovery	Limits
Surrogate	Flag	Result					
Surrogate TFT 4-BFB	Flag	0.0729 0.0583	mg/L mg/L	1 1	0.10 0.10	73 58	72 - 128 72 - 128

⁷Poor surrogate recovery due to lack of mixing. ⁸Poor surrogate recovery due to lack of mixing.

Report Date: August 15, 2001 CC # V-103		Order Number: A01081409 Duke Energy Field services			Page Number: 7 of 9 Hobbs Booster		
Sample:	17706	3 - 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

Analyst: CG	Preparation N	tetuod: E 2020B	Prep Datch:	LDI1291 D	ate Frepared:	8/14/01
Param	Flag	Result	Units	Dilution	n	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

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⁹Poor surrogate recovery due to lack of mixing. ¹⁰Poor surrogate recovery due to lack of mixing.

Quality Control Report Method Blank

Method Blank

QCBatch: QC13346

Param	Flag	Results	Units	Reporting Limit
Benzene	1 1008	<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

					Spike	Percent	Recovery
Surrogate	Flag	\mathbf{Result}	Units	Dilution	Amount	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	$\begin{array}{c} \mathrm{LCS} \\ \mathrm{Result} \end{array}$	$\begin{array}{c} \mathrm{LCSD} \\ \mathrm{Result} \end{array}$	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

\mathbf{CCV}	(1)	QCBatch:	QC13346
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			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
MTBE	<u> </u>	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
	······································						Cartingal

Continued ...

Report Date:	August	15,	2001
CC # V-103			

Order Number: A01081409 Duke Energy Field services

 $\dots Continued$

Commuta			CCVs	CCVs	$\rm CCVs$	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	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	1.100.10 0.11.1 1 1	mg/L	0.30	0.262	87	85 - 115	8/14/01

ICV (1) QCBatch: QC13346

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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

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Chain of Custody V-103-8/01

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

TRIDENT ENVIRONMENTAL

V-103-8/01 Chain of Custody		SIE		nber of Co		8	K		6	r 			Relinquished By: (3) (Company)		(Printed Name)	ure)	(Date) (Time)	Received By: (2)+(compary) //	1 RUCETINALYSIS,	(Phinted Marriel, Hersel,	10) IChi De	10.41-8(april)	Copy signed original form for Trident Environmental records
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ronmental 24 cas 79708 808 27 (Fax)		ə	, Jisoqri	ple Type:		8/10/01 1050 6	11 1140 6	11 1155 6	11 1620 G	-) 02F1 11			Sample Receipt	Total Containers:	COC Seals:	Rec'd Good Cond/Cold:	Conforms to Records:	Lab No.:		Please send invoice direct to client:	Attention: Steve Weathers	P. O. Box 5493, Denver, Colorado 80217	shripped shery
Trident EnvironmentalP.O. Box 7624P.O. Box 7624Midland, Texas 79708ENVIRONMENTAL(915) 682-0727 (Fax)	Lab Name: Trace Analysis, Inc.		Telephone: (800) 378-1296	Samplers (SIGNATURES)	Sample Identification Matrix	7059 Woter		Rinsate 61 11	mw-18 62 11	mw-17 63 11			Project Information	Project Name: Duke Energy Field Services Total Containers:	n: Hobbs Booster	Gil Van Deventer	V-103	Shipping ID No.:	Bill to (see below):	s/Comments:	Duke Energy Field Services, Attention: Steve Weathers	P. O. Box 5493,	6

HULURITC

Gil Van Deventer Trident Environmental Lubbock, TX 79424-1515

(806) 794-1296

Report Date: October 18, 2001Order Number: A01101513CC # V-103Duke Energy Field services

Page Number: 1 of 1 Hobbs Booster

Summary Report

Report Date:

October 18, 2001

Order ID Number: A01101513

P.O. Box 7624 Midland, Tx. 79708

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

			Date	\mathbf{Time}	Date
Sample	Description	Matrix	Taken	Taken	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		
	Benzene	Toluene	Ethylbenzene	M,P,O-Xylene	Total BTEX
Sample - Field Code	(ppm)	(ppm)	(ppm)	(ppm)	(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



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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.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	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.

This report consists of a total of 13 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: Analysis: Analyst:	18180 BTEX CG	0 - MW-5 Analytical Method: Preparation Method:	S 8021B N/A	QC Batch: Prep Batch:	QC14862 PB12639	Date Analyzed: Date Prepared:	10/15/01 10/15/01
Param		Flag	Result	Units	D	ilution	RDL
Benzene			< 0.001	mg/L		1	0.001
Toluene			<0.001	mg/L		1	0.001
Ethylbenze	ne		< 0.001	mg/L		1	0.001
M,P,O-Xyle	ene		< 0.001	mg/L		1	0.001
Total BTE		·····	< 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: Analyst:	BTEX CG	Analytical Method: Preparation Method:	S 8021B N/A	QC Batch: Prep Batch:	QC14862 PB12639	Date Analyzed: Date Prepared:	10/15/01 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	
Ethylbenze	ne		<0.001	mg/L		1	0.001	
M,P,O-Xyl	ene		< 0.001	mg/L		1	0.001	
Total BTE	X		< 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	2 - MW-7					
Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14862 Date	e Analyzed:	10/15/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB12639 Date	e Prepared:	10/15/01
Param		Flag	Result	Units	Dilution	L	RDL
Benzene			< 0.001	mg/L	1		0.001
Toluene			< 0.001	mg/L	1		0.001
Ethylbenzer	ne		< 0.001	mg/L	1		0.001
M,P,O-Xyle	ene		< 0.001	mg/L	- 1		0.001
Total BTE	K		< 0.001	mg/L	1		0.001

Continued ...

Report Date: October 18, 2001				er Number: A01	Page Number: 3 of 13		
CC # V-103				e Energy Field s	Hobbs Booster		
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: Analyst:	BTEX CG	Analytical Method: Preparation Method	S 8021B : N/A	QC Batch: Prep Batch:	QC14949 PB12713	Date Analyzed: Date Prepared:	10/17/01 10/17/01
Param Flag		Flag	Result		Di	Dilution	
Benzene			0.0346	mg/L	5		0.001
Toluene			< 0.005	mg/L		5	0.001
Ethylbenze	ene		< 0.005	mg/L		5	0.001
M,P,O-Xyl			< 0.005	mg/L		5	0.001
Total BTE	x		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: Analyst:	BTEX CG	Analytical Method: Preparation Method	S 8021B : N/A	QC Batch: Prep Batch:	QC14922 PB12687	Date Analyzed: Date Prepared:	10/16/01 10/16/01
Param		Flag	Result	Units	Dil	ution	RDL
Benzene			0.0359	mg/L		5	0.001
Toluene			<0.005	mg/L		5	0.001
Ethylbenze	ene		0.0885	mg/L		5	0.001
M,P,O-Xyl	ene		0.238	mg/L		5	0.001
Total BTE	X		0.3624	mg/L		5	0.001

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	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

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Analysis: Analyst:	BTEX CG	Analytical Metho Preparation Meth		QC Batch: Prep Batch:	QC14949 PB12713	Date Analyzed: Date Prepared:	10/17/01 10/17/01
Param		Flag	Result	Units	Di	lution	RDL
Benzene			0.076	mg/L		5	0.001
Toluene			< 0.005	mg/L		5	0.001
Ethylbenze	ne	· · · · · · · · · · · · · · · · · · ·	0.101	mg/L		5	0.001

Continued ...

Report Date: October 18, 2001 CC # V-103			Number: A0110 Energy Field serv	Page Number: 4 of 13 Hobbs Booster			
Continu	ed Sample	: 181805 Analysis:	BTEX				
Param		Flag	Result	Units	D	ilution	RDI
M,P,O-Xyle	ene		0.278	mg/L		5	0.00
Total BTEX	<u>x</u>		0.455	mg/L	· .· · · · · · · · · · · · · · · · · ·	5	0.00
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		72 - 128
Sample:	181806	- MW-15					
Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14862	Date Analyzed:	10/15/0
Analyst:	CG	Preparation Method	l: N/A	Prep Batch:	PB12639	Date Prepared:	10/15/0
Param		Flag	Result	Units	D	ilution	RDI
Benzene			0.317	mg/L		20	0.00
Foluene			<0.020	mg/L		20	0.00
Ethylbenzer			<0.020	mg/L		20	0.00
M,P,O-Xyle			<0.020	mg/L		20	0.00
Total BTEX	K	· · · · · · · · · · · · · · · · · · ·	0.317	mg/L		20	0.00
					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	Flag	2.27	mg/L	20	Amount 0.10	Recovery 114	72 - 128
TFT	Flag				Amount	Recovery	Limits
Surrogate TFT 4-BFB		2.27 1.73	mg/L	20	Amount 0.10	Recovery 114	Limits 72 - 128
FFT 4-BFB Sample:	181807	2.27 1.73 - MW-10	mg/L mg/L	20 20	Amount 0.10 0.10	Recovery 114 86	Limits 72 - 128 72 - 128
TFT 4-BFB Sample: Analysis:	181807 BTEX	2.27 1.73 - MW-10 Analytical Method:	mg/L mg/L S 8021B	20 20 QC Batch:	Amount 0.10 0.10 QC14862	Recovery 114 86 Date Analyzed:	Limits 72 - 128 72 - 128 10/15/01
FFT 4-BFB Sample: Analysis:	181807	2.27 1.73 - MW-10	mg/L mg/L S 8021B	20 20	Amount 0.10 0.10	Recovery 114 86	Limits 72 - 128 72 - 128 10/15/01
FFT 4-BFB Sample: Analysis: Analyst: Param	181807 BTEX	2.27 1.73 - MW-10 Analytical Method:	mg/L mg/L S 8021B I: N/A Result	20 20 QC Batch:	Amount 0.10 0.10 QC14862 PB12639	Recovery 114 86 Date Analyzed: Date Prepared: lution	Limits 72 - 128 72 - 128 10/15/0 10/15/0 RDI
FFT 4-BFB Analysis: Analyst: Param 3enzene	181807 BTEX	2.27 1.73 - MW-10 Analytical Method: Preparation Method:	mg/L mg/L S 8021B I: N/A Result 1.13	20 20 QC Batch: Prep Batch: Units mg/L	Amount 0.10 0.10 QC14862 PB12639	Recovery 114 86 Date Analyzed: Date Prepared: lution 50	Limits 72 - 128 72 - 128 10/15/0 10/15/0 RDI 0.00
FFT 4-BFB Analysis: Analyst: Param Benzene Foluene	181807 BTEX CG	2.27 1.73 - MW-10 Analytical Method: Preparation Method:	mg/L mg/L S 8021B I: N/A Result 1.13 0.85	20 20 QC Batch: Prep Batch: Units mg/L mg/L	Amount 0.10 0.10 QC14862 PB12639	Recovery 114 86 Date Analyzed: Date Prepared: lution 50 50	Limits 72 - 128 72 - 128 10/15/0 10/15/0 RDI 0.00 0.00
FFT 4-BFB Analysis: Analyst: Param Benzene Foluene Ethylbenzen	181807 BTEX CG	2.27 1.73 - MW-10 Analytical Method: Preparation Method:	mg/L mg/L S 8021B I: N/A Result 1.13 0.85 0.889	20 20 QC Batch: Prep Batch: Units mg/L mg/L mg/L	Amount 0.10 0.10 QC14862 PB12639	Recovery 114 86 Date Analyzed: Date Prepared: lution 50 50 50 50	Limits 72 - 128 72 - 128 10/15/0 10/15/0 RDI 0.00 0.00 0.00
FFT 4-BFB Analysis: Analyst: Param Benzene Foluene Ethylbenzen M,P,O-Xyle	181807 BTEX CG ne	2.27 1.73 - MW-10 Analytical Method: Preparation Method:	mg/L mg/L S 8021B I: N/A Result 1.13 0.85 0.889 2.38	20 20 QC Batch: Prep Batch: Units mg/L mg/L mg/L mg/L	Amount 0.10 0.10 QC14862 PB12639	Recovery 114 86 Date Analyzed: Date Prepared: lution 50 50 50 50 50 50	Limits 72 - 128 72 - 128 10/15/0 10/15/0 RDI 0.00 0.00 0.00 0.00
TFT	181807 BTEX CG ne	2.27 1.73 - MW-10 Analytical Method: Preparation Method:	mg/L mg/L S 8021B I: N/A Result 1.13 0.85 0.889	20 20 QC Batch: Prep Batch: Units mg/L mg/L mg/L	Amount 0.10 0.10 QC14862 PB12639	Recovery 114 86 Date Analyzed: Date Prepared: lution 50 50 50 50	Limits 72 - 128 72 - 128 10/15/0 10/15/0 RDI 0.00 0.00 0.00 0.00
FFT 4-BFB 5ample: Analysis: Analyst: Param Benzene Foluene Ethylbenzen M,P,O-Xyle Fotal BTEX	181807 BTEX CG ne	2.27 1.73 - MW-10 Analytical Method: Preparation Method Flag	mg/L mg/L S 8021B I: N/A Result 1.13 0.85 0.889 2.38 5.249	20 20 QC Batch: Prep Batch: Units mg/L mg/L mg/L mg/L	Amount 0.10 0.10 QC14862 PB12639 Di Spike	Recovery 114 86 Date Analyzed: Date Prepared: lution 50 50 50 50 50 50 Percent	Limits 72 - 128 72 - 128 10/15/0 10/15/0 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0
FFT 4-BFB 5ample: Analysis: Analyst: Param Benzene Foluene Ethylbenzen M,P,O-Xyle Fotal BTEX	181807 BTEX CG ne	2.27 1.73 - MW-10 Analytical Method: Preparation Method Flag Result	mg/L mg/L S 8021B I: N/A Result 1.13 0.85 0.889 2.38 5.249 Units	20 20 QC Batch: Prep Batch: Units mg/L mg/L mg/L mg/L mg/L Dilution	Amount 0.10 0.10 QC14862 PB12639 Di Di	Recovery 114 86 Date Analyzed: Date Prepared: lution 50 50 50 50 50 50 50 Percent Recovery	Limits 72 - 128 72 - 128 10/15/0 10/15/0 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0
FFT I-BFB Sample: Analysis: Analysis: Analyst: Param Benzene Coluene Ethylbenzen M,P,O-Xyle Cotal BTEX Surrogate FFT	181807 BTEX CG ne	2.27 1.73 - MW-10 Analytical Method: Preparation Method: Flag Result 5.62	mg/L mg/L S 8021B I: N/A Result 1.13 0.85 0.889 2.38 5.249 Units mg/L	20 20 QC Batch: Prep Batch: Units mg/L mg/L mg/L mg/L mg/L Dilution 50	Amount 0.10 0.10 QC14862 PB12639 Di Di Spike Amount 0.10	Recovery 114 86 Date Analyzed: Date Prepared: lution 50 50 50 50 50 50 50 50 112	Limits 72 - 128 72 - 128 72 - 128 10/15/01 10/15/01 0.00100000000
FFT 4-BFB Analysis: Analysis: Param Benzene Foluene Ethylbenzen M,P,O-Xyle	181807 BTEX CG ne	2.27 1.73 - MW-10 Analytical Method: Preparation Method Flag Result	mg/L mg/L S 8021B I: N/A Result 1.13 0.85 0.889 2.38 5.249 Units	20 20 QC Batch: Prep Batch: Units mg/L mg/L mg/L mg/L mg/L Dilution	Amount 0.10 0.10 QC14862 PB12639 Di Di	Recovery 114 86 Date Analyzed: Date Prepared: lution 50 50 50 50 50 50 50 Percent Recovery	Limits 72 - 128 72 - 128 10/15/0 10/15/0 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0
FFT 4-BFB 5	181807 BTEX CG ne X	2.27 1.73 - MW-10 Analytical Method: Preparation Method Flag Result 5.62 4.36	mg/L mg/L S 8021B I: N/A Result 1.13 0.85 0.889 2.38 5.249 Units mg/L	20 20 QC Batch: Prep Batch: Units mg/L mg/L mg/L mg/L mg/L Dilution 50	Amount 0.10 0.10 QC14862 PB12639 Di Di Spike Amount 0.10	Recovery 114 86 Date Analyzed: Date Prepared: lution 50 50 50 50 50 50 50 50 112	Limits 72 - 128 72 - 128 10/15/0 10/15/0 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0
FFT 4-BFB 5	181807 BTEX CG ne S Flag 181808	2.27 1.73 - MW-10 Analytical Method: Preparation Method Flag Result 5.62 4.36 - MW-14	mg/L mg/L S 8021B S 8021B N/A Result 1.13 0.85 0.889 2.38 5.249 Units mg/L mg/L	20 20 QC Batch: Prep Batch: Units mg/L mg/L mg/L mg/L Dilution 50 50	Amount 0.10 0.10 QC14862 PB12639 Di Di Spike Amount 0.10 0.10	Recovery 114 86 Date Analyzed: Date Prepared: hution 50 50 50 50 50 50 50 50 50 50	Limits 72 - 128 72 - 128 72 - 128 10/15/0 10/15/0 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0
FFT 4-BFB 5	181807 BTEX CG ne X	2.27 1.73 - MW-10 Analytical Method: Preparation Method Flag Result 5.62 4.36	mg/L mg/L S 8021B S 8021B N/A Result 1.13 0.85 0.889 2.38 5.249 Units mg/L mg/L S 8021B	20 20 QC Batch: Prep Batch: Units mg/L mg/L mg/L mg/L mg/L Dilution 50	Amount 0.10 0.10 QC14862 PB12639 Di Di Spike Amount 0.10	Recovery 114 86 Date Analyzed: Date Prepared: lution 50 50 50 50 50 50 50 50 112	Limits 72 - 128 72 - 128 10/15/0 10/15/0 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0

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Report Date: October 18, 2001Order Number: A01CC # V-103Duke Energy Field s				0· ·····			
Continued	l Sample	e: 181808 Analy	sis: BTEX		<u></u>		<u> </u>
Param		Flag	Result	Units	D	ilution	RDL
Param		Flag	Result	Units	D	ilution	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-Xylen			< 0.001	mg/L		1	0.001
Total BTEX			0.0464	mg/L		1	0.001
Surrogate TFT 4-BFB	Flag	Result 0.104 0.0755	Units mg/L mg/L	Dilution 1 1	Spike Amount 0.10 0.10	Percent Recovery 104 76	Recovery Limits 72 - 128 72 - 128
	181809 BTEX CG	– MW-16 Analytical Meth Preparation Me		QC Batch: Prep Batch:	QC14868 PB12643	Date Analyzed: Date Prepared:	10/15/01 10/15/01
Param		Flag	Result	Units	Di	ilution	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
IDO Valor	-		0.0017	mg/T		1	0.001

mg/L

mg/L

Dilution

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Percent

Recovery

Spike

Amount

0.001

0.001

Recovery

Limits 72 - 128 72 - 128

\mathbf{TFT}	1	0.0445	mg/L	1	0.10	44	
4-BFB	2	0.0584	mg/L	1	0.10	58	

0.0017

0.0208

Units

181810 - MW-3 Sample:

Flag

Result

M,P,O-Xylene

Total BTEX

Surrogate

Analysis: Analyst:	BTEX CG	Analytical Method: Preparation Method:	S 8021B N/A	QC Batch: Prep Batch:	QC14868 PB12643	Date Analyzed: Date Prepared:	10/15/01 10/15/01
Param		Flag	Result	Units	Di	lution	RDL
Benzene			0.0293	mg/L		10	0.001
Toluene			<0.010	mg/L		10	0.001
Ethylbenze	ne		0.207	mg/L		10	0.001
M,P,O-Xyle			0.146	mg/L		10	0.001
Total BTE	x		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

¹Low surrogate due to prep error. QC show method to be in control. ²Low surrogate due to prep error, QC showed method to be in control

	Report Date: October 18, 2001 CC # V-103			Number: A0110 Energy Field serv		Page Number: 6 of 13 Hobbs Booster		
Sample:	181811	- MW-2						
Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC14868	Date Analyzed:	10/15/01	
Analyst:	CG	Preparation Method:		Prep Batch:	PB12643	Date Prepared:	10/15/01	
Param		Flag	Result	Units	D	ilution	RDL	
Benzene			1.30	mg/L		20	0.001	
Toluene			0.246	mg/L		20	0.001	
Ethylbenzer	ne		0.314	m mg/L		20	0.001	
M,P,O-Xyle			0.243	mg/L		20	0.001	
Total BTE	<u> </u>	· · · · · · · · · · · · · · · · · · ·	2.103	mg/L	· · · ·	20	0.001	
					Spike	Percent	Recovery	
Surrogate	Flag	Result	Units	Dilution	Amount	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	D	Dilution	RDL	
Benzene			0.907	mg/L		50	0.001	
Foluene		· ·	< 0.050	mg/L		50	0.001	
Ethylbenzer			0.385	mg/L		50	0.001	
M,P,O-Xyle			0.051 1.343	mg/L		50 50	0.001 0.001	
Total BTEX	<u> </u>	8-8 - Alder - Hannes Hannes - 1 - 1 - 7 - 7 - 7	1.343	mg/L			0.001	
		D	* * •.		Spike	Percent	Recovery	
Surrogate	Flag	1000 0110	Units	Dilution	Amount	Recovery	Limits	
TFT A DED			mg/L	50	0.10	99	72 - 128	
L-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	D	Dilution	RDL	
Benzene			0.144	mg/L		20	0.001	
Foluene		·	< 0.020	mg/L		20	0.001	
Ethylbenzer			0.236	mg/L		20	0.001	
M,P,O-Xyle			0.120	mg/L		20	0.001	
Total BTEX	<u> </u>		0.5	mg/L		20	0.001	
					Spike	Percent	Recovery	
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits	

					Spike	Percent	Recovery
Surrogate	Flag	Result	\mathbf{Units}	Dilution	Amount	Recovery	Limits
TFT		1.93	mg/L	20	0.10	96	72 - 128
4-BFB		1.78	$\mathrm{mg/L}$	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	l: N/A	Prep Batch:	PB12643	Date Prepared:	10/15/01
Param		Flag	Result	Units	D	vilution	RDI
Benzene			0.0293	mg/L		10	0.001
Toluene			< 0.010	mg/L		10	0.001
Ethylbenzer	ne		0.207	mg/L		10	0.001
M,P,O-Xyle			0.146	8, mg/L		10	0.001
Total BTE			0.3823	mg/L		10	0.001
a ,					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TFT		0.977	mg/L	10	0.10	98	72 - 128
4-BFB		0.886	mg/L	10	0.10		72 - 128
Sample: Analysis: Analyst:	181815 BTEX CG	- Rinsate Analytical Method: Preparation Method	,	QC Batch: Prep Batch:	QC14868 PB12643	Date Analyzed: Date Prepared:	10/15/01 10/15/01
Param	·····	Flag	Result	Units	D	ilution	RDL
Benzene			< 0.005	mg/L		5	0.001
Toluene			< 0.005	mg/L		5	0.001
Ethylbenzer			< 0.005	mg/L		5	0.001
M,P,O-Xyle			< 0.005	$\mathrm{mg/L}$		5	0.001
Total BTE	<u>x</u>		< 0.005	mg/L		5	0.001
					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	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: Analysis: Analyst:	181816 BTEX CG	- Field Blank Analytical Method: Preparation Method	S 8021B : N/A	QC Batch: Prep Batch:	QC14868 PB12643	Date Analyzed: Date Prepared:	10/15/0 10/15/0
Param		Flag	Result	Units	D	ilution	RDI
Benzene			< 0.005	mg/L		5	0.001
Toluene			< 0.005	mg/L		5	0.001
Ethylbenzer			< 0.005	m mg/L		5	0.001
M,P,O-Xyle			< 0.005	mg/L		5	0.001
Total BTEX	<		<0.005	mg/L	· · · ·	5	0.001
					Spike	Percent	Recovery
Q	1001	D 14	TT •/	D:1	-		T 2
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Surrogate TFT 4-BFB	Flag	Result 0.443 0.400	Units mg/L mg/L	Dilution 5 5	-		Limits 72 - 128 72 - 128

³Low surrogate due to prep error, QC showed method to be in control.

Report Date: October 18, 2001 CC # V-103 Order Number: A01101513 Duke Energy Field services

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 Recoverv	Recovery Limits
TFT	riag	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:

atch: 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	

Report Date: October 18 CC # V-103	0	Number: A01101 Energy Field serv	Page Number: 9 of 13 Hobbs Booster		
Method Blank	QCBatch:	QC14949			
					Reporting
Param	Flag	Results		Units	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

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	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	$\begin{array}{c} { m LCSD} \\ { m Result} \end{array}$	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

					Spike					
	LCS	LCSD			Amount	Matrix			% Rec	RPD
Param	Result	Result	Units	Dil.	Added	Result	% Rec	RPD	Limit	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

Param	Result	Result	Units	Dil.	Added	Result	$\% { m Rec}$	RPD	Limit	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	LĊSD % 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.	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	$\begin{array}{c} { m LCSD} \\ { m Result} \end{array}$	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

\mathbf{CCV}	(1)
	<u>\</u> -/

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

Report Date: October 18, 2001 CC # V-103			÷	Number: A011 Inergy Field se	Page Number: 11 of 13 Hobbs Booster		
Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE	<u></u>	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
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)	QCBa	tch: QC14	868				
Domony	Flee	11-:44	CCVs True	CCVs Found	CCVs Percent	Percent Recovery Limits	Date Analyzed
Param MTBE	Flag	Units	<u>Conc.</u> 0.10	<u> </u>	Recovery 101	<u>85 - 115</u>	10/15/01
		mg/L				• • •	
Benzene		m 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

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			$\begin{array}{c} \mathrm{CCVs} \\ \mathrm{True} \end{array}$	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	Analyzed
MTBE		mg/L	0.10	0.105	105	85 - 115	10/15/01
							Continued

Report Date: October 18, 2001 CC # V-103 Continued				Number: A011 Snergy Field se	Page Number: 12 of 13 Hobbs Booster		
			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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)	QCBa	tch: QC14	1922				
Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE	1 105	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)

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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

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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recoverv	Percent Recovery Limits	Date Analvzed
MTBE		mg/L	0.10	0.112	112	85 - 115	10/17/01
							Continued

Report Date: October 18, 2001 CC # V-103 Continued				Number: A011 Energy Field se	Page Number: 13 of 13 Hobbs Booster		
			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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:	QC149	949				
D		TT 4.	CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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

Trident Environmental ParticipationFrident Environmental B,O. Box 7624 B,O. Box 7624 B,O. Box 7624 B,O. Box 7624 B,O. Box 7624 B,O. Box 7624 B,O. Box 7624 B,D. B.C. 0727 (Fax)Frident Environmental B,O. Box 7624 B,D. B.C. 0727 (Fax) B,D. B.C. 0721 (Fax) B,D. B,D. 1040 (Fac) 0.011 (FSS) B,D. 1040 (Fac) 0.010 (Fac) 111 (FSS) B,D. 1040 (Fac) 0.010 (Fac) 0.010 (Fac) 111 (FSS) B,D. 1040 (Fac) 0.010 (Fac) 0.010 (Fac) 111 (FSS) B,D. 1040 (Fac) 0.010 (V-103-10-01-1 Chain of Custody	Analysis Request				0112C 0112C 0112C 0112C 0112C 0112C 0112C 0112C 0112C 0112C 0112C	D, C- 5PA 5 (EPA 5 (EPA 5 2 PA 4 7 PA 4 7 7 7 7 7 7 7 7 100 7 7 7 7 100 7 7 7 7	липре оста и оста и и и и и и и и и и и и и и и и и и и		2	2		2						Relinquished By: Relinquished By: Relinquished By: (1) (Company) (2) (Company)	invironmental	ne)	Signature) (Signature) (Signature)	(Time) (Date) (Time)	Received By: Received By: Received By: (1) (Company) (2) (Company) A	 ht: (Printed Name) (Printed Name) (Printed Name) (Printed Name) (Printed Name)	30217 (Signature) (Signature) (Signature) (Signature) ((Signature)) ((C) (Signature)) (C)	(Date) (Time) (Time) (Date)
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ANNUAL GROUNDWATER MONITORING, REMEDIATION AND INVESTIGATION REPORT HOBBS BOOSTER STATION LEA COUNTY, NEW MEXICO

Prepared For:

DECEMBER 12, 2000

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



Annual Groundwater Monitoring, **Remediation**, and Investigation Report **Hobbs Booster Station** Lea County, New Mexico

Prepared by:

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SUBMITTED BY:

DATE:

1/3/01

1/3/01

Gilbert J. Van Deventer, REM Project Manager

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Dale T. Littlejohn Quality Assurance Officer

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TABLES

Table 1	Summary of Groundwater Elevations
Table 2	Summary of Dissolved BTEX Concentrations

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APPENDICES

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Appendix A	Lithologic Logs and Well Construction Diagrams
Appendix B	Survey Plat of Hobbs Booster Station
Appendix C	Laboratory Analytical Reports and Chain-of-Custody Documentation

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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.

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- 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.



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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.

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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- ofwell 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-16, 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	Sample	Purge	Purge	Sampling Method							
Well No.	Date	Method	Volume								
MW-1	08/22/00	Pump	10	Disposable bailer							
101 00 - 1	10/31/00	Pump	15	Disposable bailer							
MW-2	08/22/00	Bailer	14	Disposable bailer							
101 00 -2	10/31/00	Bailer	15	Disposable bailer							
MW-3	08/22/00	Pump	10	Disposable bailer							
1 1 1	10/31/00	Pump	15	Disposable bailer							
MW-5 08/22/00 Pump 12 Disposable bailer											
101 00 - 3	10/31/00	Pump	15	Disposable bailer							
MW-6	08/22/00	Pump	10	Disposable bailer							
141 44 -0	10/31/00	Pump	15	Disposable bailer							
MW-7	08/22/00	Pump	10	Disposable bailer							
101 00 - 7	10/31/00	Pump	15	Disposable bailer							
MW-10	10/31/00	Bailer	8	Disposable bailer							
MW-14	10/31/00	Pump		Disposable bailer							
MW-15	10/31/00	Pump	30	Disposable bailer							
<u>MW-16</u>	10/31/00	Pump	35	Disposable bailer							
<u>MW-18</u>	10/31/00	Pump	50	Disposable bailer							
MW-19	10/31/00	Pump	25	Disposable bailer							
Monitoring wel		• •		-13, and MW-17							

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

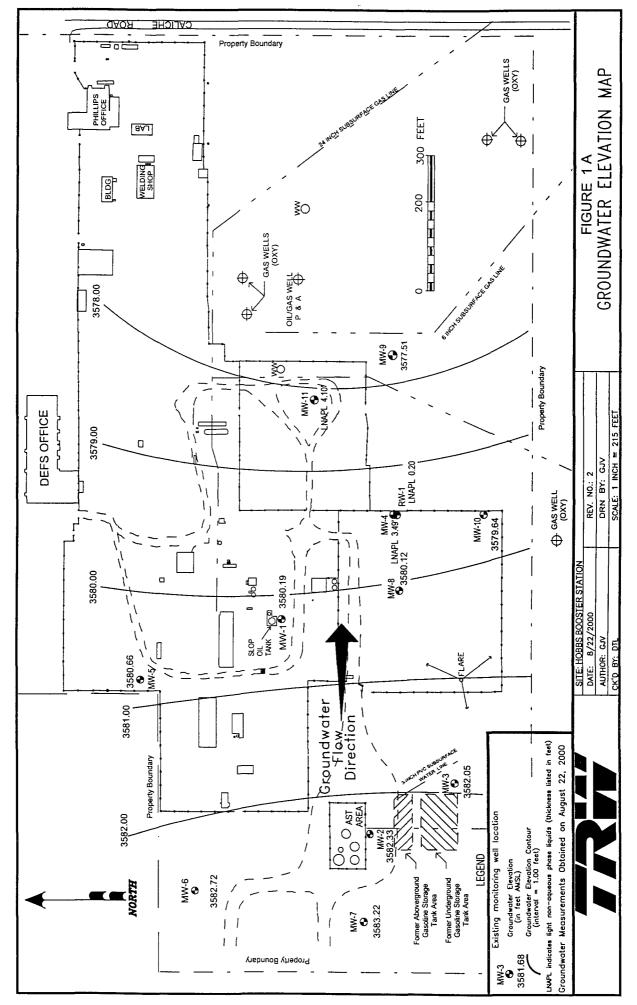
Groundwater elevation maps depicting the water table elevation and direction of groundwater flow using the gauging data obtained during the August 22, 2000 and October 31, 2000 monitoring events are presented in Figure 1A and 1B, respectively. Historical groundwater elevations and depth to water measurements are summarized in Table 1 and depicted graphically in Figure 2.

7.0 Distribution of Hydrocarbons in Groundwater

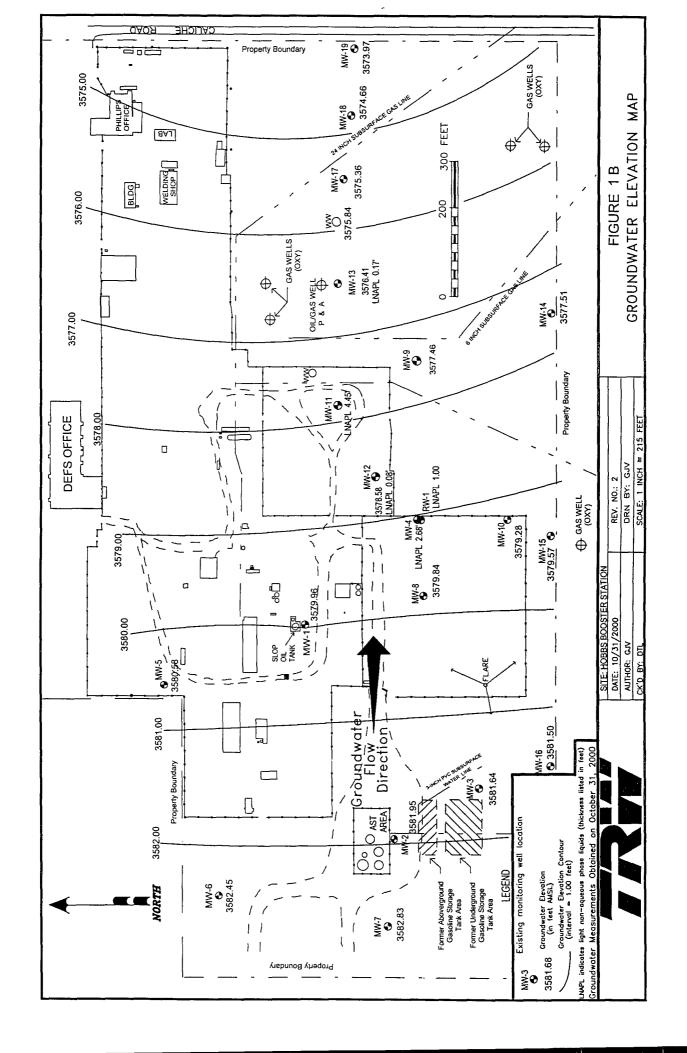
A historical listing of BTEX concentrations obtained from the on site monitoring wells is summarized in Table 2. Hydrocarbon concentration maps depicting the BTEX concentrations for the Saugust 22, 2000 and October 31, 2000 sampling events are presented in Figures 3A and 3B, respectively. Laboratory 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.

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Annual Groundwater Monitoring, Remediation, and Investigation Report Hobbs Booster Station

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		-		ole 1			
			of Groundwa	ter Level Meas	urements		
		Ground	T (C)			1	Corrected
		Surface	Top of Casing	Depth to	Depth to	LNAPL	Groundwate
Monitoring			Elevation (feet	Groundwater	LNAPL (feet	Thickness	Elevation
Well	Date Gauged	AMSL)	AMSL)	(feet AMSL)	AMSL)	<u>(feet)</u>	(feet AMSL
	07/08/99	3623.60	3626.06	45.56	ND	0.00	3580.50
MW-1	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
	07/08/99	3620.65	3623.14	40.51	ND	0.00	3582.63
MW-2	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
	07/08/99	3620.08	3623.01	40.76	ND	0.00	3582.25
MW-3	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
	07/08/99	3621.66	3624.29	46.86	43.60	3.26	3579.64
MW-4	05/11/00	3621.66	3624.29	47.09	44.41	2.68	3579.02
141 444	08/22/00	3621.66	3624.29	47.87	44.38	3.49	3579.12
	10/31/00		3624.29	47.36	44.68	2.68	3579.00
	07/08/99	3626.30	3629.16	48.15	ND	0.00	3581.01
MW 5	05/11/00	3626.30	3629.16	48.27	ND	0.00	3580.89
MW-5	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
	07/08/99	3624.14	3626.93	43.95	ND	0.00	3582.98
1.612.7	05/11/00	3624.14	3626.93	44.32	ND	0.00	3582.61
MW-6	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
	05/11/00	3618.93	3621.40	38.50	ND	0.00	3582.90
MW-7	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
	05/11/00	3620.84	3623.62	43.69	ND	0.00	3579.93
MW-8	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
	05/11/00	3622.60	3625.21	47.59	ND	0.00	3577.62
MW-9	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
	05/11/00	3618.30	3621.07	41.65	41.64	0.01	3579.43
MW-10	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
	05/11/00	3623.05	3625.88	48.94	47.76	1.18	3577.91
MW-11	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	49.80 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			<0.00	
MW-17 MW-18	10/31/00		<u>3623.94</u> 3624.30	48.59	48.58	<0.01	3575.36
MW-18 MW-19		3621.96		49.64	49.64		3574.66
IVI W - 19	10/31/00	3621.42	3624.12	50.15	ND 45.05	0.00	3573.97
DW	05/11/00	3621.53	3624.52	46.00	45.05	0.95	3579.16
RW-1	08/22/00	3621.53	3624.52	45.20	45.00	0.20	3579.47
	10/31/00	3621.53	3624.52	46.00 , ND = Not Detected	45.00	1.00	3579.2

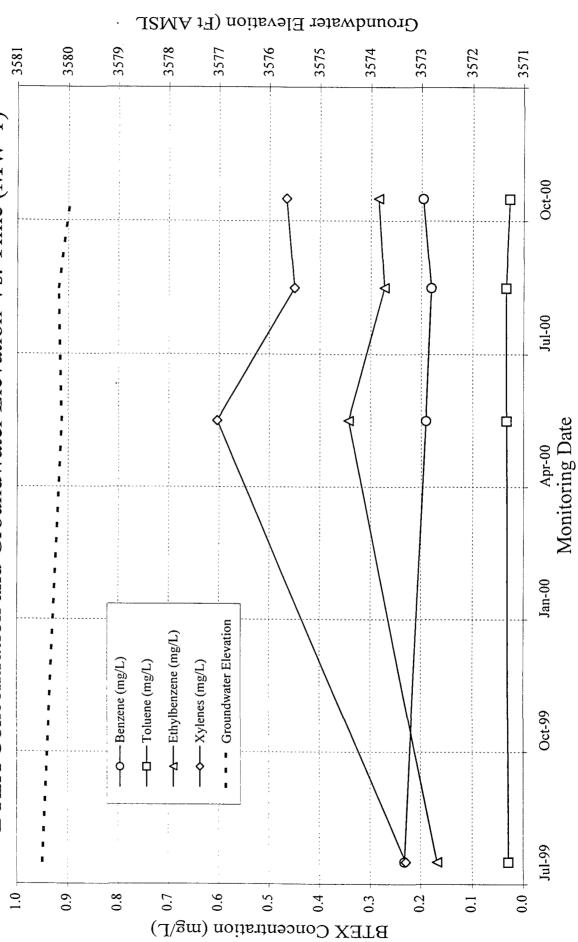
Corrected Groundwater Elevation = Casing Elevation - Depth to Groundwater + (LNAPL Thickness x Specific Gravity of LNAPL)

Specific Gravity of LNAPL (MW-4) = 0.7740; Specific Gravity of LNAPL (MW-11) = 0.8165

2000 Annual Groundwater Monitoring, Remediation, and Investigation Report Hobbs Booster Station

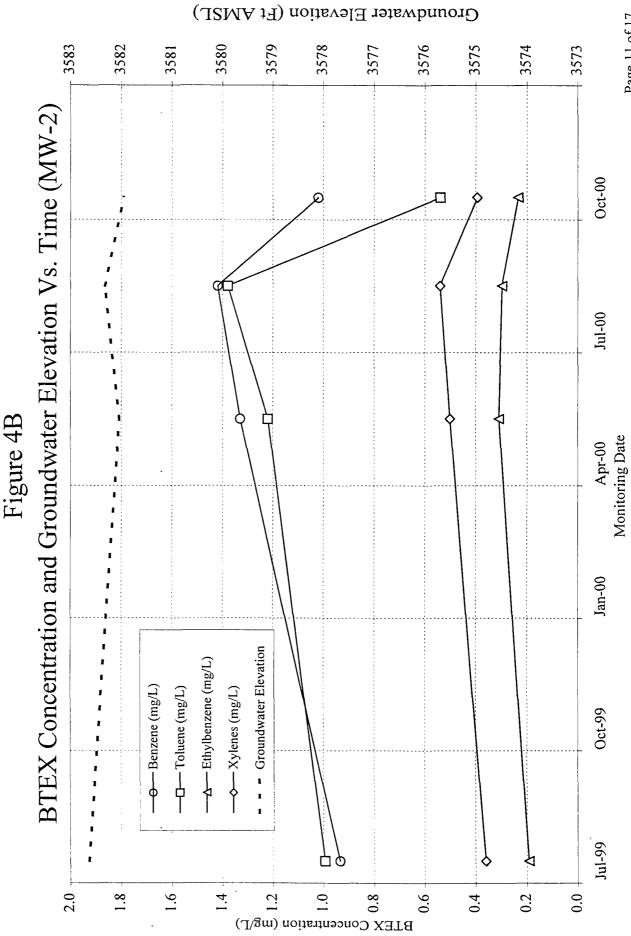




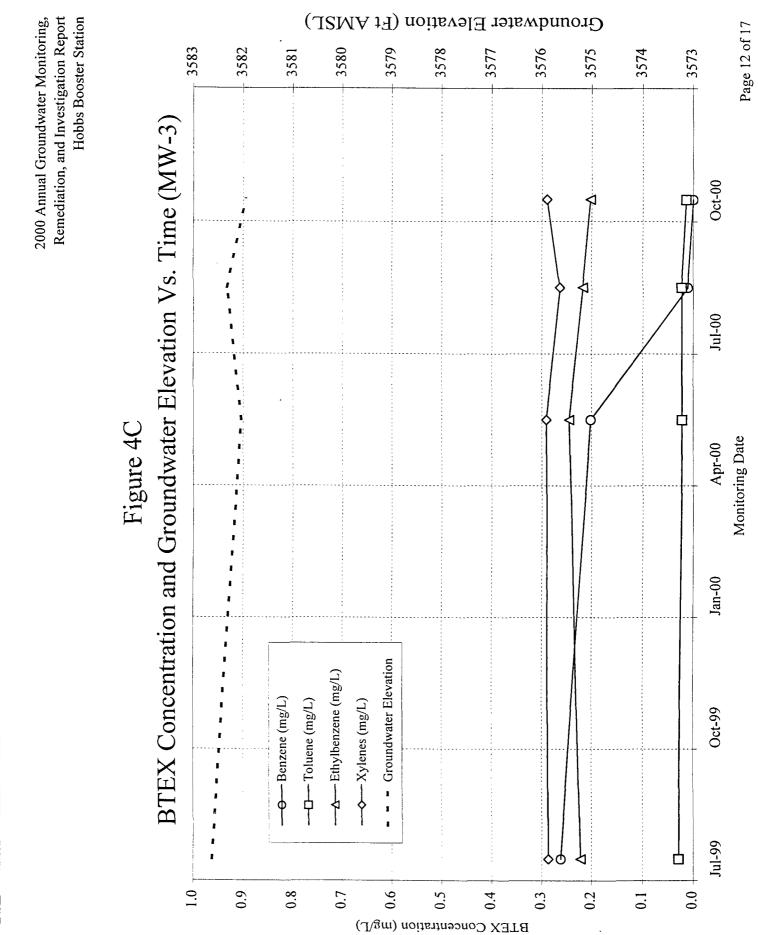


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Remediation, and Investigation Report 2000 Annual Groundwater Monitoring, Hobbs Booster Station



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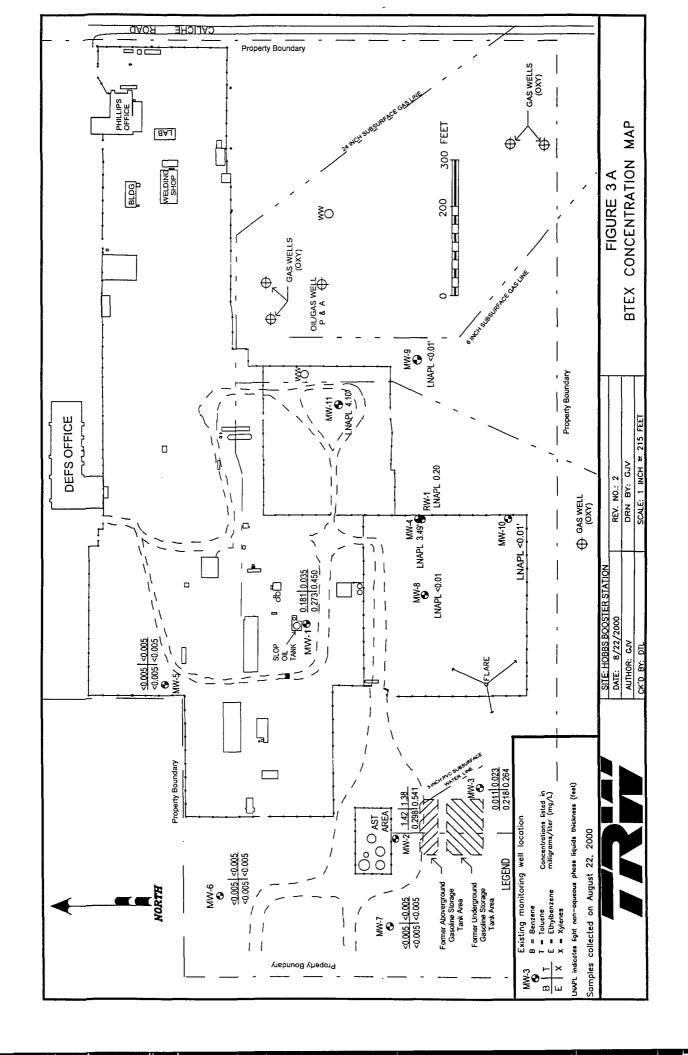
	Sun	umary of BTEX (Table 2 Concentrations in (Groundwater	
	Sun		s Booster Station	51 ound water	
Monitoring	Sampling	Benzene	Toluene	Ethylbenzene	Xylenes
Well	Date	(mg/L)	(mg/L)	(mg/L)	(mg/L)
	06/17/99	0.232	0.029	0.168	0.229
	05/11/00	0.191	0.034	0.344	0.604
MW-1	08/22/00	0.181	0.035	0.273	0.450
	10/31/00	0.197	0.028	0.285	0.466
	06/17/99	0.934	0.993	0.192	0.359
	05/11/00	1.33	1.22	0.309	0.501
MW-2	08/22/00	1.42	1.38	0.298	0.541
	10/31/00	1.02	0.539	0.235	0.394
	06/17/99	0.262	0.029	0.222	0.287
	05/11/00	0.202	0.022	0.245	0.291
MW-3	08/22/00	0.011	0.023	0.218	0.264
	10/31/00	< 0.005	0.014	0.213	0.290
	06/17/99	LNAPL	LNAPL	LNAPL	LNAPL
	05/11/00	LNAPL	LNAPL	LNAPL	LNAPL
MW-4	08/22/00	LNAPL	LNAPL	LNAPL	LNAPL
ļ	10/31/00	LNAPL	LNAPL	LNAPL	LNAPL
	06/17/99	< 0.005	< 0.005	< 0.005	< 0.005
	05/11/00	< 0.005	< 0.005	< 0.005	< 0.005
MW-5	08/22/00	< 0.005	< 0.005	< 0.005	< 0.005
	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
	06/18/99	< 0.005	< 0.005	< 0.005	< 0.005
	05/11/00	< 0.005	< 0.005	< 0.005	0.003
MW-6	08/22/00	< 0.005	0.003	< 0.005	0.038
	10/31/00	< 0.005	< 0.005	< 0.005	< 0.005
	05/11/00	< 0.005	< 0.005	< 0.005	< 0.005
MW-7	08/22/00	< 0.005	0.003	< 0.005	0.005
141 44 - /	10/31/00	< 0.005	< 0.005	< 0.003	< 0.005
	05/11/00	0.824	< 0.005	0.375	<u>< 0.005</u> 0.742
MW-8	03/11/00 08/22/00	U.824 LNAPL			U.742 LNAPL
TAT 44 -0	10/31/00	LNAPL LNAPL	LNAPL LNAPL	LNAPL LNAPL	LNAPL
	05/11/00	0.702			
MW-9			0.016	0.096	0.208 LNAPL
101 00 -9	08/22/00 10/31/00	LNAPL LNAPL	LNAPL	LNAPL	LNAPL LNAPL
			LNAPL	LNAPL	
MW-10	05/11/00	LNAPL	LNAPL	LNAPL	LNAPL
1VI VV-1U	08/22/00 10/31/00	LNAPL 0.535	LNAPL	LNAPL	LNAPL
			0.061	0.17	1.28
MW-11	05/11/00	LNAPL		LNAPL	LNAPL
1V1 VV - 1 1	08/22/00	LNAPL	LNAPL	LNAPL	LNAPL
MW 14	10/31/00	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 Standa		0.010 s, Inc., Lubbock, Texa	0.75	0.75	0.62

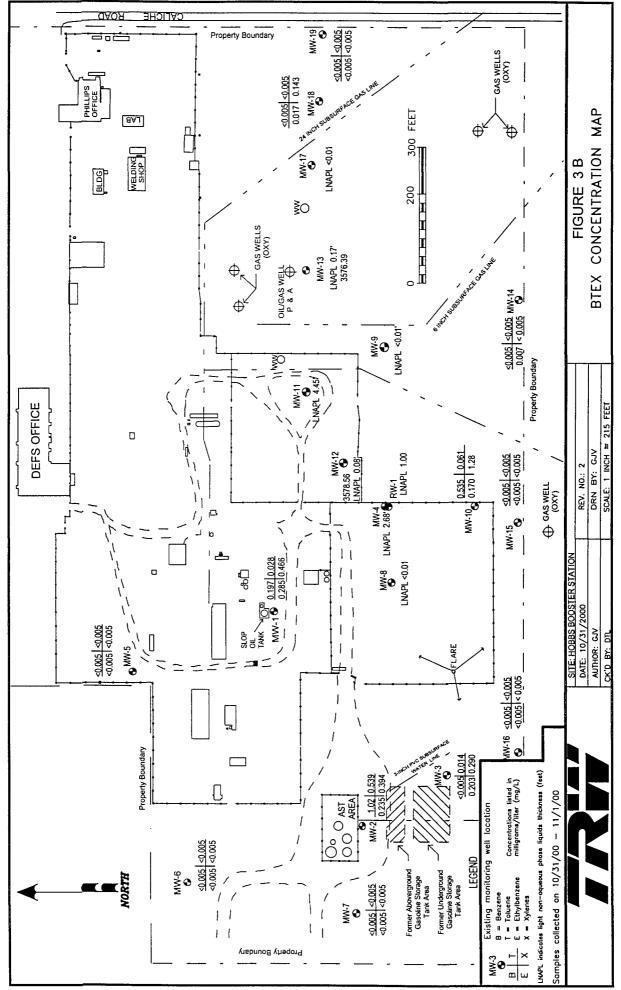
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Analyses performed by Trace Analysis, Inc., Lubbock, Texas.

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.









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.

		Pro	Ta duct Rec	ble 3 overy Vo	lumes						
Date		Prod	uct Recov	vered (gal	lons)		Cumulative Product				
Date	RW-1	MW-4	MW-8	MW-9	MW-10	MW-11	Recovered (gallons)				
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 V	volume of	Product 1	Recovered	I 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: Hydr MW-11: Passi	ophobic (oil :	adsorbent) soo									



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.

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Appendix A

Lithologic Logs and Well Construction Diagrams

	415 WI SUI	TE 1	WALL	01		MONI SURFAC DRIL	TOR WE CE ELEN CONTR LING M STAR PLETIOI	ELL NO.: SITE ID: /ATION: ACTOR: ETHOD: T DATE: N DATE:	MW-12 Hobbs E 3623.95 Diversifi Air Rota 10/23/00 10/24/00	ed Water \ ry	COUNTY: Lea Well Drilling STATE: New Mexico LOCATION: NW 1/4 Sec. 4, T19S, R3 FIELD REP.: J. Fergerson FILE NAME:
		<u></u>		·					Approxir		' south & 166' west of MW-11.
			<u>LIT</u> ⊢	1. L	USCS ML	Depth	Sample Time 1348	Туре	PID		LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRA SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURE Clayey silt, dk brown, v moist, no hydrocarbon odor, w frac caliche in matrix.
		Cement Grout			CAL	4-5	1354	Cuttings	2.0	5	Caliche, v pale orange-gravish orange, no hydrocarbon odor, weathered, w/dense layers interbedded.
						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.
C Blank					CAL/ SS	14-15	1401	Cuttings	0.0	15	
ed 40 PVC		Plug				19-20	1403	Cuttings	2.0	20	
4 Inch Sched		Bentonite Hole				24-25	1410	Cuttings	0.0	25	Sand, grayish orange pink-v pale orange, vf grain, unconsol, hydrocarbon odor, w/mod-well cemented vf grain sand & sandstone interbeds.
		3/8				29-30	1413	Cuttings	0.0		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	
))) S	w/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.
PVC Screen		Sand Pack				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 a sandstone interbeds. Groundwater Encountered @ 45 Feet
4 Inch U.UIU Slotted PVC		12/20 Silica S								50	
4 INCI										55	

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		1	MONITO	RING WE	ELL NO:		MW-12	TOTAL DEF	PTH:	65 Feet
	LITH.	USCS	Depth	Sample Time	Туре	PID	DEPTH	LITHOLOGIC DESCRIPTION	<u>N: LITHOL</u> G, CONSO	OGY, COLOR, GRA L., DIST. FEATURE
Vatural Vatural Sand 12/20		sw/ss						Sand, grayish orange pink-It I good hydrocarbon odor, w/mo and sandstone interbeds.	prown, vf gr	ain, unconsol, wet,
Sand							65	TD	2) 65 Feet	
							70	i		
							75			
							80			
							85			
							90			
							95			
							100			
							105			
							110			
							105			
									·	

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						LI	THOL	OGIC I	_0G ((MONI	TORING WELL)
N	415 5	WE	ST V	WALL	,	SURFA DRII	CE ELE CONTR LING M STAR PLETIOI	ETHOD: T DATE: N DATE:	Hobbs 3623.5 Diversi Air Rot 10/24/0 10/24/0	Booster S 3 fied Wate ary 00 00	TOTAL DEPTH: 69 Feet CLIENT: Duke Energy Field Services COUNTY: Lea Pr Well Drilling Pr Well Drilling COUNTY: Lea LOCATION: NW 1/4 Sec. 4, T19S, R38 FIELD REP.: FILE NAME: 92' east & 170' north of MW-9.
					1	r	Sample			TDEPTH	ILITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN
62222				LITH.	USCS	Depth	Time 1103	Туре	PID		SIZE, SORTING, ROUNDING, CONSOL., DIST, FEATURES Clayey silt, dk brown, v moist, no hydrocarbon odor, w frac
					ML		1100				caliche in matrix.
			Cement Grout		CAL	4-5	1123	Cuttings	23.2	5	Caliche, v pale orange-grayish orange, sl hydrocarbon odor, weathered, w/ dense layers interbedded.
						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.
k					CAL/ SS	14-15	1133	Cuttings	0.1	15	
D PVC Blank			Plug			19-20	1136	Cuttings	0.8	20	
4 Inch Sched 40 PVC			Bentonite Hole	*****		24-25	1203	Cuttings	0.1		Sand, grayish orange pink-v pale orange, vf grain, unconsol, no hydrocarbon odor, w/mod-well cemented vf grain sand & sandstone interbeds.
			3/8			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.
					sw/ss	39-40	1215	Cuttings	0.1	40	
sen			Sand Pack			44-45	1219	Cuttings	8.9		Sand, grayish orange pink-lt brown, vf grain, unconsol, moist, sl hydrocarbon odor, w/mod-well cemented vf grain sand and sandstone interbeds.
4 Inch 0.010 Slotted Screen			12/20 Silica Sa			49-50	1223	Cuttings	56.3		Groundwater Encountered @ 49 Feet Sand, light brown, vf grain, unsonsol, wet, good hydrocarbon odor, w/mod-well cemented vf grain sand and sandstone interbeds.
4 Inch 0.0										55	
			, , ,							60	

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		ΜΟΝΙΤΟ	RING W	ELL NO:		MW-1	
LITH.	USCS	Depth	Sample Time	Туре	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAI SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
Mana Screen Screen	sw/ss					65	Sand, light brown, vf grain, unsonsol, wet, good hydrocarbon odor, w/mod-well cemented vf grain sand and sandstone interbeds. TD @ 69 Feet
·						70 75 80 80 90 90 95 95 100 105 105	

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	15 WE	ľE 1	WALL	,	SURFA	CE ELEV CONTR LING M STAR PLETIOI COM	ETHOD: T DATE: N DATE: MENTS:	Hobbs 3618.7 Diversit Air Rota 10/24/0 10/24/0	Booster S 6 Fied Water ary 10 10 mately 12	TOTAL DEPTH: 66 Feet CLIENT: Duke Energy Field Se COUNTY: Lea Well Drilling LOCATION: NW 1/4 Sec. 4, T19S FIELD REP.: FILE NAME: 5' east & 324' south of MW-9 LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, C			
		 		USCS	Depth	Sample Time 1510	Туре	PID		SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURE Clayey silt, dk brown, v moist, no hydrocarbon odor, w frac			
		Cement Grout		ML CAL	4-5	1515	Cuttings	0.1	5	caliche in matrix. Caliche, v pale orange-grayish orange, no hydrocarbon odor, weathered, w/ dense layers interbedded.			
					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			
Blank				CAL/ SS	14-15	1520	Cuttings	0.4	15	sandstone interbeds.			
Sched 40 PVC E		Hole Plug			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.			
2 Inch Sche		3/8 Bentonite F			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				
				sw/ss	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.			
Screen		I Sand Pack			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			
2 Inch 0.010 Slotted Screen		12/20 Silica			49-50	1555	Cuttings	0.6	50	Sand, light brown, vf grain, unsonsol, wet, no hydrocarbon od w/mod-well cemented vf grain sand and sandstone interbeds.			
2 Inch									55				

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		l	ΜΟΝΙΤΟ	RING WE	ELL NO:		MW-14	<u>4</u> T	OTAL DEPTH:	66 Feet
	LITH.	uscs	Depth	Sample Time	Туре	PID	DEPTH	LITHOLOGIC DES	SCRIPTION: LITI ROUNDING, COI	HOLOGY, COLOR, GRAI
al Screen		sw/ss						Sand, light brown,	vf grain, unsonsol	, wet, moderate hydrocart sand and sandstone
Sand							65		TD @ 66 F	: oot
	<u></u>	<u>d</u>		L		L				
							70			
							70			
		•					75			
							80			
							85			
							90			
							95			
							100			
							105			
							110			
							105			

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Screen 2 Inch Sched 40 PVC Blank Immunitie 30 Bentonite Hole Plug Cement Grout		USCS ML CAL CAL/ SS	Depth 4-5 9-10 14-15 19-20	Sample Time 0920 0935 0944 0950	Type Cuttings Cuttings Cuttings	3.9	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAI SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES Clayey silt, dk brown, sl moist, no hydrocarbon odor, w frac caliche in matrix. Caliche, v pale orange, no hydrocarbon odor, weathered, with dense layers interbedded. Caliche, v pale orange, slight hydrocarbon odor, weathered, with dense layers and mod-well cemented vf grain sand and sandstone interbeds.
Screen 2 Inch Sched 40 PVC Blank Immunitie 38 Bentonite Hole Plug Cement		CAL/	9-10 14-15	0944 0950	Cuttings	3.9	10	dense layers interbedded. Caliche, v pale orange, slight hydrocarbon odor, weathered, wi dense layers and mod-well cemented vf grain sand and
Screen 2 Inch Sched 40 PVC Screen 38 Bentonite Hole Plug			14-15	0950	Cuttings			dense layers and mod-well cemented vf grain sand and
Screen 2 Inch Sched 40 Inch Sched 40 3/3 Bentonite Hole Sand Pack 3/3 Bentonite Hole						1.2	15	
Screen			19-20	0952	Cuttinas		<u> </u>	4
Screen	******					0.6	20	Sand, grayish orange pink-v pale orange, vf grain, unconsol, n hydrocarbon odor, withmod-well cemented vf grain sand and sandstone interbeds.
Scre			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 gra sand and sandstone interbeds.
Scre			29-30	1003	Cuttings	0.6	30	Sand, light-med gray-pale yellowish brown, vf grain, unconsol, hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds.
Scre		014//00	34-35	1005	Cuttings	0.4	35	
Sea Sa		SW/SS	39-40	1012	Cuttings	47.0	40	Sand, It-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
2/20 Slit			44-45	1018	Cuttings	2.2	45	
Z Inch 0.010 Slotted							50	Sand, It gray-pale yellowish brown, vf grain, unconsol, sl hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds.
	****						55	TD @ 59 Feet

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MI	S	UTT	E 18	VALL B18 CAS 797	01		SURFAC	CE ELEV CONTR LING M STAR PLETIOI COM	VATION: ACTOR: ETHOD: T DATE: N DATE: MENTS:	Hobbs 3619.1 Diversi Air Rot 10/25/0	Booster S 0 fied Wate ary 00 00 imately 37	COUNTY: Lea r Well Drilling STATE: New Mexico LOCATION: NW 1/4 Sec. 4, T19S, R38 FIELD REP.: J. Fergerson FILE NAME: 7' east & 174' south of MW-3
					1.	uscs	Depth	Sample Time 1225	Туре	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAI SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES Clayey silt, dk brown, v moist, no hydrocarbon odor, w frac cali
			Cement Grout			ML CAL	4-5	1241	Cuttings	0.0	5	in matrix. Caliche, v pale orange-grayish orange, no hydrocarbon odor, weathered, with dense layers interbedded.
k							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
d 40 PVC Blank			e Plug			CAL/ SS	14-15	1252	Cuttings	0.0	15	
2 Inch Sched 40 PVC			Bentonite Hole				19-20	1257	Cuttings	0.0	_20	Sand, grayish orange pink-v pale orange, vf grain, unconsol, n hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds.
			3/8 Be				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, mois no hydrocarbon odor, with mod-well cemented vf grain sand an Isandstone interbeds.
C Screen			nd Pack		Single Si	sw/ss	39-40	1327	Cuttings	20.0	40	Groundwater Encountered @ 38 Feet Sand, light brown-pale yellowish brown, vf grain, unconsol, moi no hydrocarbon odor, with mod-well cemented vf grain sand interbeds.
Slotted PVC) Silica Sand					-			45	
2 Inch 0.010			12/20									
51											50	
Natural	₽		Sand Sand								55	
ž			S I				I				60	TD @ 58 Feet

	SUL	ГЕ 1	WALL 818 XAS 79701	DRILLING METHOD: Air Rotary LOCATION: NW 79701 START DATE: 10/25/00 FIELD REP.: J. Fe COMPLETION DATE: 10/26/00 FILE NAME:									
		0000	LITH.	USCS	Depth	Sample Time 0930	Туре	PID	DEPTH	SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES Clayey silt, dk brown, v moist, no hydrocarbon odor, with fracture			
		ement Grout		ML	4-5	0950	Cuttings	0.0	5	caliche in matrix. Caliche, v pale orange, no hydrocarbon odor, weathered, w/den layers and mod cemented vf grain sand interbeds.			
		0		CAL/ SS	9-10	0955	Cuttings	0.0	10				
C Blank					14-15	0958	Cuttings	0.0	15				
4 Inch Sched 40 PVC Blank		Hole Plug			19-20	1002	Cuttings	0.3	20	Sand, v pale orange, vf grain, unconsol, no hydrocarbon odor,w mod-well cemented vf grain sand and sandstone interbeds.			
4 Inch Sc		Bentonite			24-25	1016	Cuttings	0.3	25	Sand, grayish orange pink-lt brown, ∨f grain, unconsol, no hydrocarbon odor, with mod-well cemented ∨f grain sand interbeds.			
					29-30	1019	Cuttings	0.3	30				
					34-35	1022	Cuttings	0.3	35	Sand, grayish orange pink-It brown, vf grain, unconsol, no hydrocarbon odor, w/mod-well cemented vf grain sand and sandstone interbeds.			
				sw/ss	39-40	1025	Cuttings	0.2	40				
creen		Sand Pack			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 grair sand and sandstone interbeds. Groundwater Encountered @ 46 Feet			
Inch 0.010 Slotted Screen		12/20 Silica Sa			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.			
4 Inch 0		•-						•	55				

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			MONITO	RING WE	ELL NO:		MW-17	7 <u> </u>	OTAL DEPTI	H:	66 Feet
	LITH.	USCS	Depth	Sample Time	T	PID	DEPTH	LITHOLOGIC DES	CRIPTION:	LITHOLO	GY, COLOR, GRAI
•		0505	Depin	, ime	Туре	PID		SIZE, SORTING, F Sand, pale yellowis			
								wet, strong hydroca	rbon odor, w	ith mod-we	Il cemented vf grain
		sw/ss						sand interbeds.			
Sand							65				
²									TD @	66 Feet	
							70				
							75				
							80				
							85				
							90				
							95				
							100				
]				
							105				
							110				
							105				

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5	WES	E 18	VALL	7	SURFA DRIL	CE ELE CONTR LING M STAR PLETIOI	VATION: ACTOR: ETHOD: T DATE: N DATE:	Hobbs 3621.9 Diversi Air Rot 10/26/0 10/26/0	Booster S 6 fied Wate ary 00 00	TOTAL DEPTH: 68 Feet CLIENT: Duke Energy Field Service COUNTY: Lea r Well Drilling FIELD REP.: New Mexico LOCATION: NW 1/4 Sec. 4, T19S, R33 FIELD REP.: J. Fergerson FILE NAME: 2' east and 4' south of MW-17
	7]		LITH.	USCS	Depth	Sample Time	Туре	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRA SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURE
				ML		1350				Clayey silt, dk brown, v moist, no hydrocarbon odor, with fractu caliche in matrix.
		Cement Grout		CAL	4-5	1401	Cuttings	0.2	5	Caliche, v pale orange-v light gray, no hydrocarbon odor, weathered, with dense layers interbeds.
		0			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.
blank				CAL/ SS	14-15	1410	Cuttings	0.2	15	
		e Hole Plug			19-20	1413	Cuttings	0.5	20	Sand, v pale orange, vf grain, unconsol, no hydrocarbon odor, with mod cemented vf grain sand interbeds.
		3/8 Bentonite			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.
		1111 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			29-30	1423	Cuttings	0.2	30	
			*****		34-35	1425	Cuttings	0.4	35	
		و و و ووور و در د		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.
		Sand Pack			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 grai sand and sandstone interbeds.
		12/20 Silica			49-50	1436	Cuttings	23.4	50	Groundwater Encountered @ 48 Feet
		1			54-55	1439	Cuttings	9.0	55	

		i	MONITO	RING WE	ELL NO:	•	MW-1	8	TOTAL DEPT	H:	68 Feet
	LITH.	USCS	Depth	Sample Time	Туре	PID	DEPTH	LITHOLOGIC DE SIZE, SORTING,	SCRIPTION: ROUNDING,	LITHOLO	GY, COLOR, GRAI , DIST. FEATURES
4 Inch								Sand, grayish ora	nge pink-grayi	ish orange,	vf grain, unconsol, ell cemented vf grair
12/20 Silica								sand and sandsto	one interbeds.		ai cemented vi gran
2		sw/ss					65				
Sand											
So at									TD @	68 Feet	
							70				
							75				
							80				
							85				
							90				
							95				
							100				
							105				
							110				
							105				

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ML 1650 Clayey silt, dk brown, v moist, no hydrocarbon odor, with fractucaliche, mod orange pink-v pale orange, no hydrocarbon odor, with fractucaliche, mod orange pink-v pale orange, no hydrocarbon odor, weathered, with dense layers and mod-well cemented vf grain sand interbeds. Veg 9-10 1703 Cuttings 0.0 5 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. CAL/SS 14-15 1705 Cuttings 0.5 15 Bodd 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. Bodd 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. Bodd 24-25 1716 Cuttings 0.0 30 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 Sand, mod orange pink-v pale orange, vf grain, unconsol, no hydrocarbon odor, with mod-well cemented vf grai	м	S	UTT	E 1	WALL 818 XAS 79701	,	MONIT SURFAC (DRIL	FOR WE CONTR LING M STAR PLETIOI	ELL NO.: SITE ID: /ATION: ACTOR: ETHOD: T DATE: N DATE:	MW-1 Hobbs 3621.4 Divers Air Ro 10/26/ 10/27/	9 Booster 42 ified Wate tary 00 00	TORING WELL) TOTAL DEPTH: 68 Feet Station CLIENT: Duke Energy Field Services COUNTY: Lea ar Well Drilling STATE: New Mexico LOCATION: NW 1/4 Sec. 4, T19S, R38E FIELD REP: J. Fergerson FILE NAME: 40' east and 8' north of MW-18
Yet caliche in matrix CAL 4-5 1701 Cuttings 0.0 5 Supervised Galiche, value orange, pick-v pale orange, no hydrocarbon odor, weathered, with dense layers and mod-well cemented vf grain sand interbeds. Participation 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. CAL/SS 14-15 1705 Cuttings 0.5 15 Participation 19-20 1708 Cuttings 0.0 20 hydrocarbon odor, with mod-well cemented vf grain sand interbeds. Participation 19-20 1708 Cuttings 0.0 20 hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds. Participation 24-25 1716 Cuttings 0.0 25 hydrocarbon odor, with mod-well cemented vf grain sand interbeds. Store 28-30 1718 Cuttings 0.0 30 30 Sand, mod orange pink-v pale orange, vf grain, unconsol, no hydrocarbon odor, with mod-well cemented vf grain sinterbeds. Store 28-30 1718 Cuttings 0.0 30 30				2223	LITH.	USCS	Depth			PID	DEPTH	SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
Yet CAL 4-5 1701 Cuttings 0.0 5 Yet CAL 4-5 1701 Cuttings 0.0 5 Sand Galache, 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, volte orange-pinkish gray, no hydrocarbon odor, weathered, with mod-well cemented vf grain sand interbeds. Brid 9-10 1705 Cuttings 0.5 15 Sand, mod-orange pink-v pale orange, vf grain, unconsol, no hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds. Sand, mod-orange pink-v pale orange, vf grain, unconsol, no hydrocarbon odor, with mod-well cemented vf grain sand interbeds. 9 19-20 1708 Cuttings 0.0 25 9 19-20 1716 Cuttings 0.0 25 9 24-25 1716 Cuttings 0.0 25 9 34-35 1720 Cuttings 0.0 30 9 34-35 1720 Cuttings 0.2 40 9 39-40 1721 Cuttings 0.2						ML		1650				
Yet 24-25 1705 Cuttings 0.0 10 weathered, with mod-well cemented vf grain sand interbeds. Non-openet of the second secon				Cement Grout		CAL	4-5	1701	Cuttings	0.0	5	weathered, with dense layers and mod-well cemented vf grain
Yeigo Od Op Deutys 14-15 1705 Cuttings 0.5 15 Image: Dod Op Deutys 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. Image: Dod Op Deutys 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. Image: Dod Op Deutys 29-30 1718 Cuttings 0.0 30 Image: Dod Op Deutys 29-30 1718 Cuttings 0.0 30 Image: Dod Op Deutys 34-35 1720 Cuttings 2.1 35 Image: Dod Op Deutys 39-40 1721 Cuttings 0.2 40 Image: Dod Op Deutys 39-40 1721 Cuttings 0.2 40 Image: Dod Op Deutys 39-40 1721 Cuttings 0.2 40 Image: Dod Op Deutys 39-40 1721 Cuttings 0.2 40 Image: Dod Op Deutys 39-40 1721 Cuttings 0.2 40							9-10	1703	Cuttings	0.0	10	
Code of party 19-20 1708 Cuttings 0.0 20	ank					CAL/SS	14-15	1705	Cuttings	0.5	15	
90/500 90/7	40 PVC			Plug			19-20	1708	Cuttings	0.0	20	hydrocarbon odor, with mod-well cemented vf grain sand and
80 29-30 1718 Cuttings 0.0 30 34-35 1720 Cuttings 2.1 35 moist, no hydrocarbon odor, with mod-well cemented vf grain s interbeds. SW/SS 39-40 1721 Cuttings 0.2 40 44-45 1725 Cuttings 0.2 45 moist, no hydrocarbon odor, with mod-well cemented vf grain s interbeds.				음			24-25	1716	Cuttings	0.0	25	hydrocarbon odor, with mod-well cemented vf grain sand
34-35 1720 Cuttings 2.1 35 moist, no hydrocarbon odor, with mod-well cemented vf grain s interbeds. SW/SS 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							29-30	1718	Cuttings	0.0	30	
44-45 1725 Cuttings 0.2 40 Sand, mod orange pink-grayish orange, vf grain, unconsol, v moist, no hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbads							34-35	1720	Cuttings	2.1	35	moist, no hydrocarbon odor, with mod-well cemented vf grain sa
44-45 1725 Cuttings 0.2 45 moist, no hydrocarbon odor, with mod-well cemented vf grain						sw/ss	39-40	1721	Cuttings	0.2	40	
49-50 1731 Cuttings 0 50 SUBJUC VIEW STREET	een			Pack			44-45	1725	Cuttings	0.2	45	moist, no hydrocarbon odor, with mod-well cemented vf grain sand and sandstone interbeds.
Solution State 1732 Cuttings 0.2 55	3 Slotted Scn			Silica Sand			49-50	1731	Cuttings	0	50	Groundwater Encountered @ 48 Feet
	2 Inch 0.01(12/21			54-55	1732	Cuttings	0.2	55	
	-											

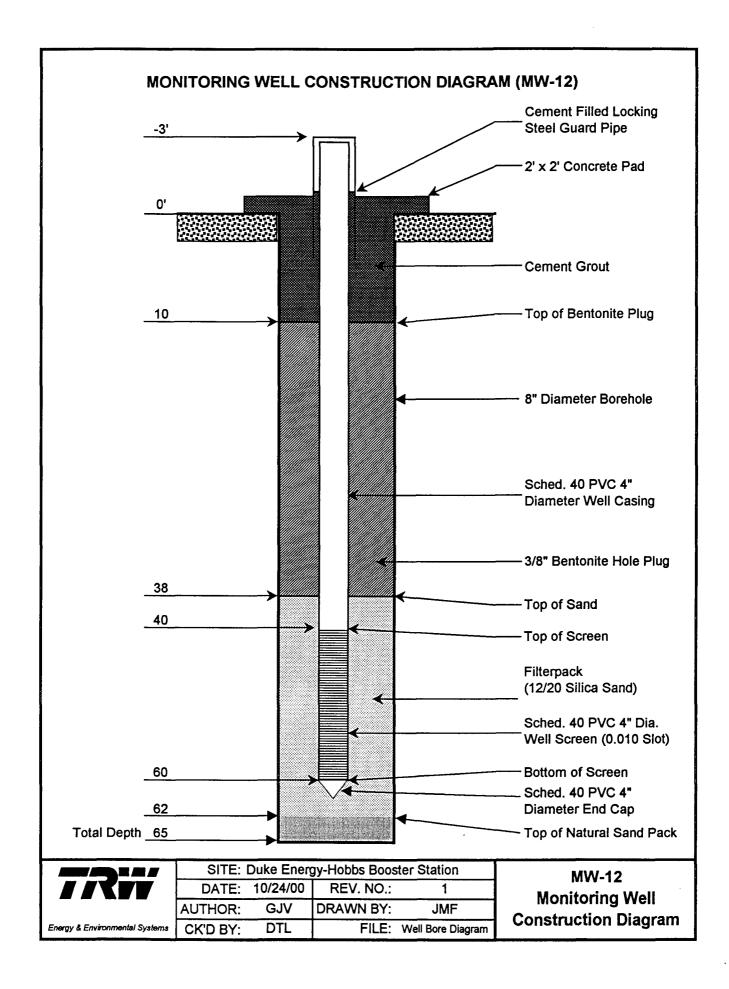
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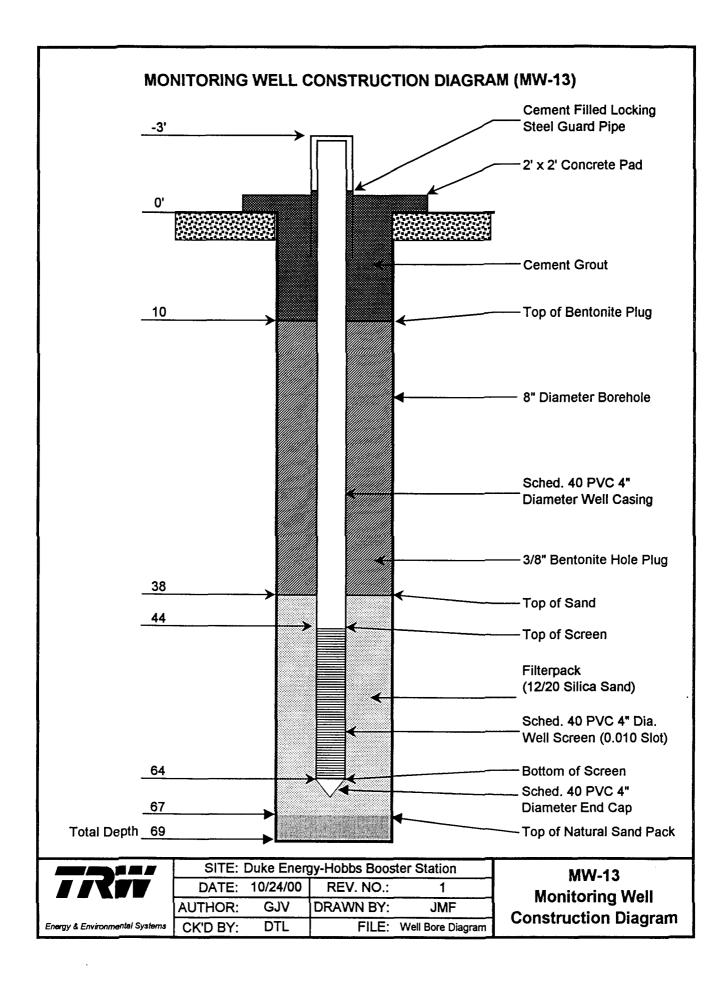
		М	ONITOF	RING WE	ELL NO:		MW-1	9 TOTAL DEP	гн:	68 Feet
	LITH.	USCS	Depth	Sample Time	Туре	PID	DEPTH	LITHOLOGIC DESCRIPTION SIZE, SORTING, ROUNDING	: LITHOLOG	GY, COLOR, GRAI
ral 2 Inch	*****	sw/ss					65	Sand, mod orange pink-grayisł moist, no hydrocarbon odor, wi sand and sandstone interbeds.	n orange, vf g th mod-well d	rain, unconsol, v
Sand								TD	2) 68 Feet	
							70			
							75			
							80			
							85			
							90			
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		4 2 2								
		2					100			
						:				
							105			
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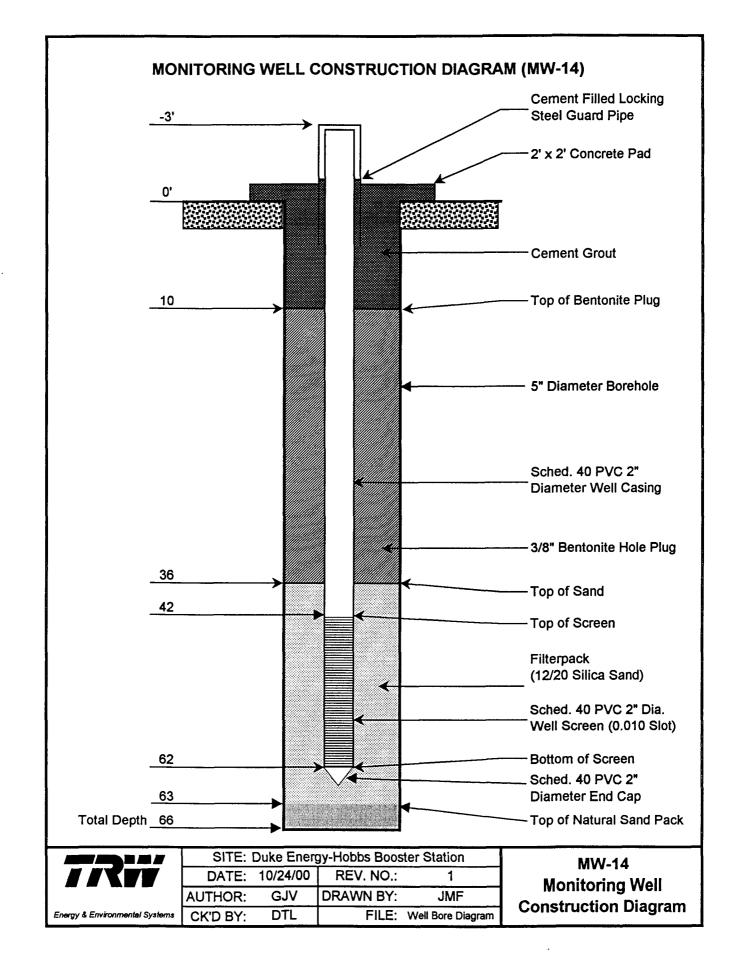
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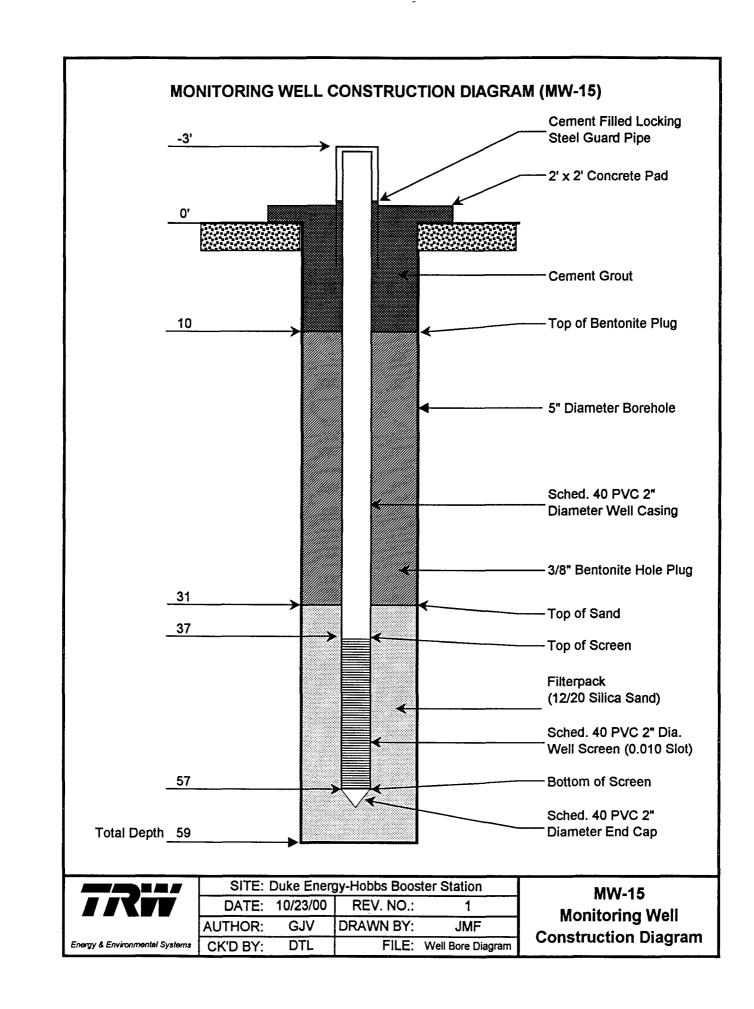
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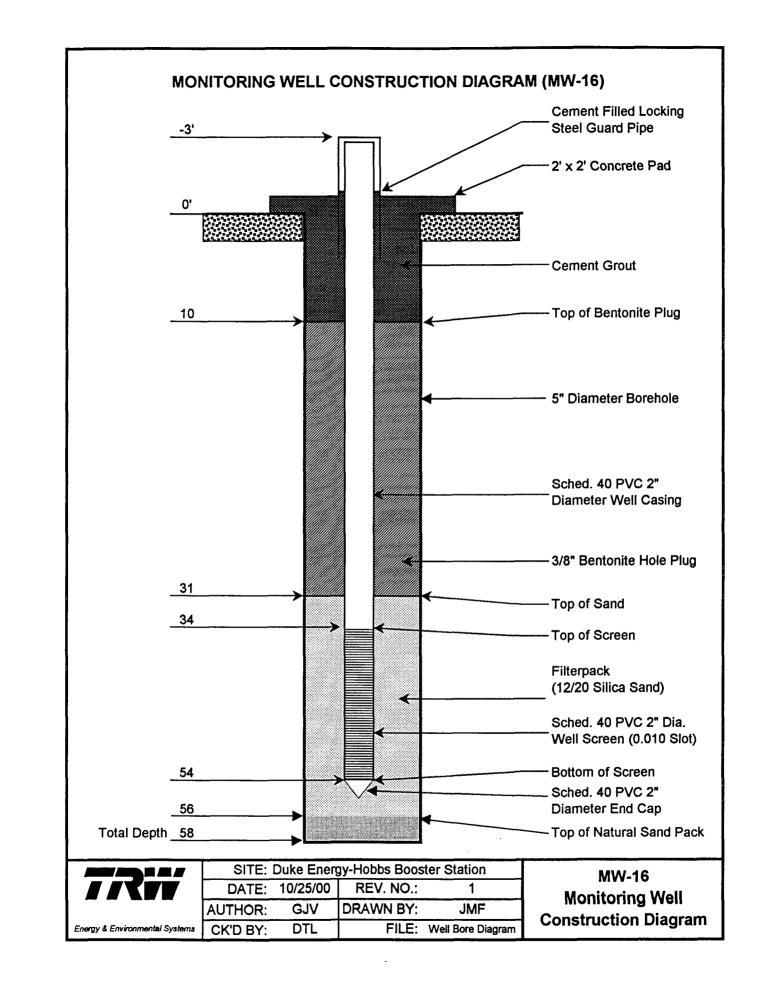


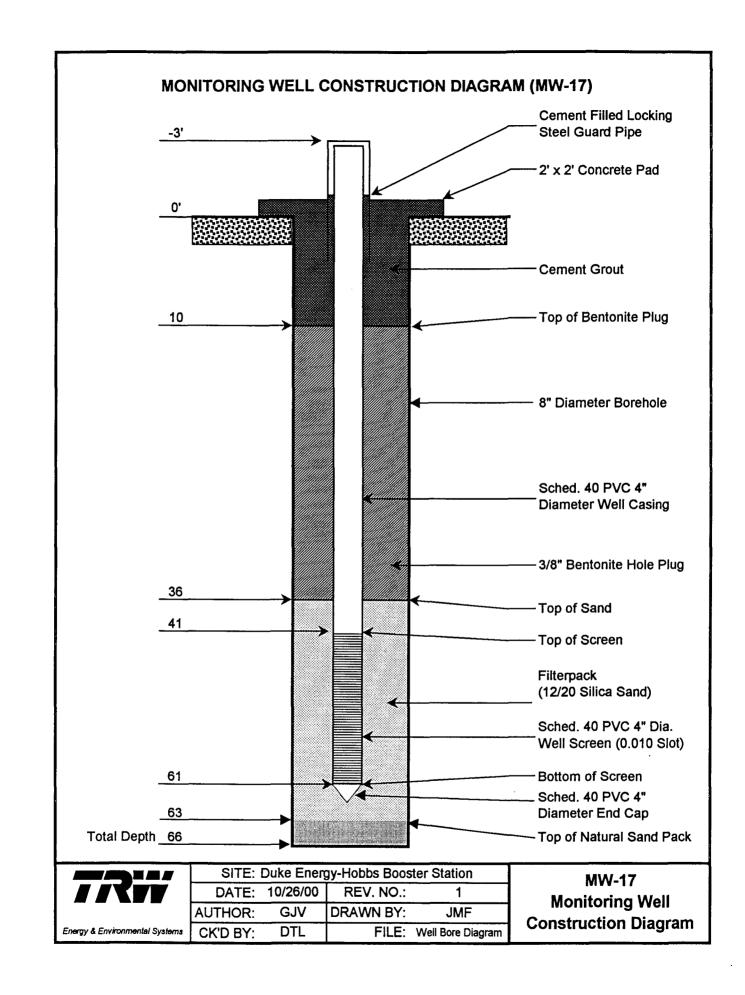


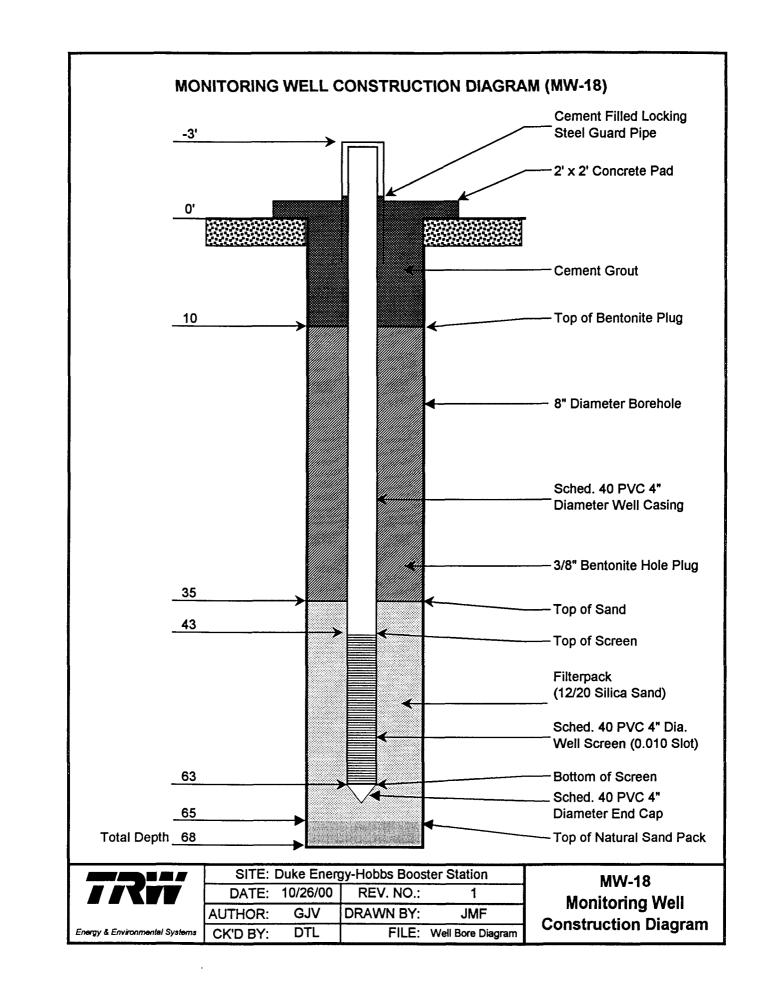


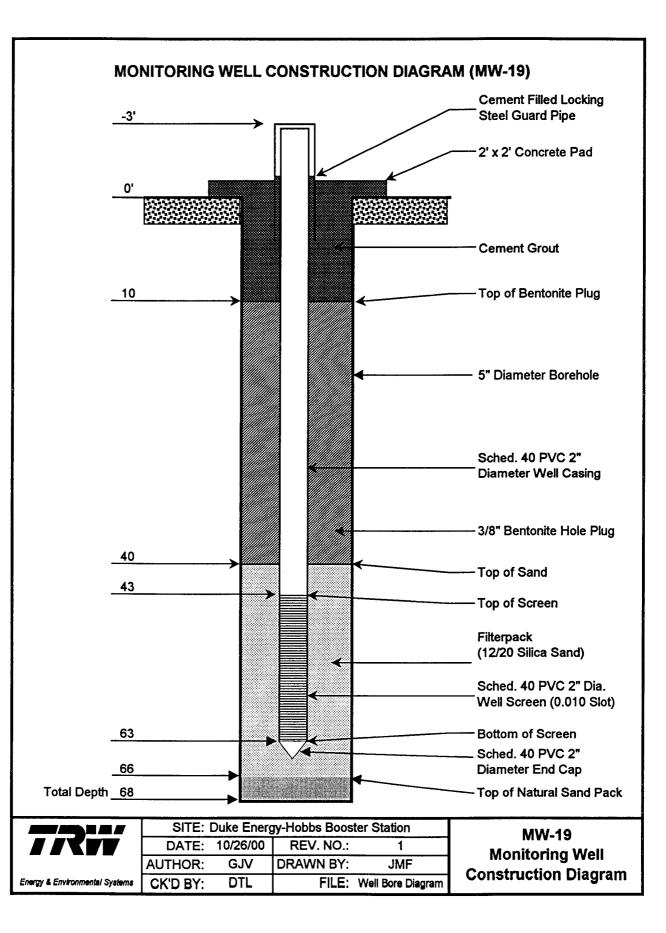


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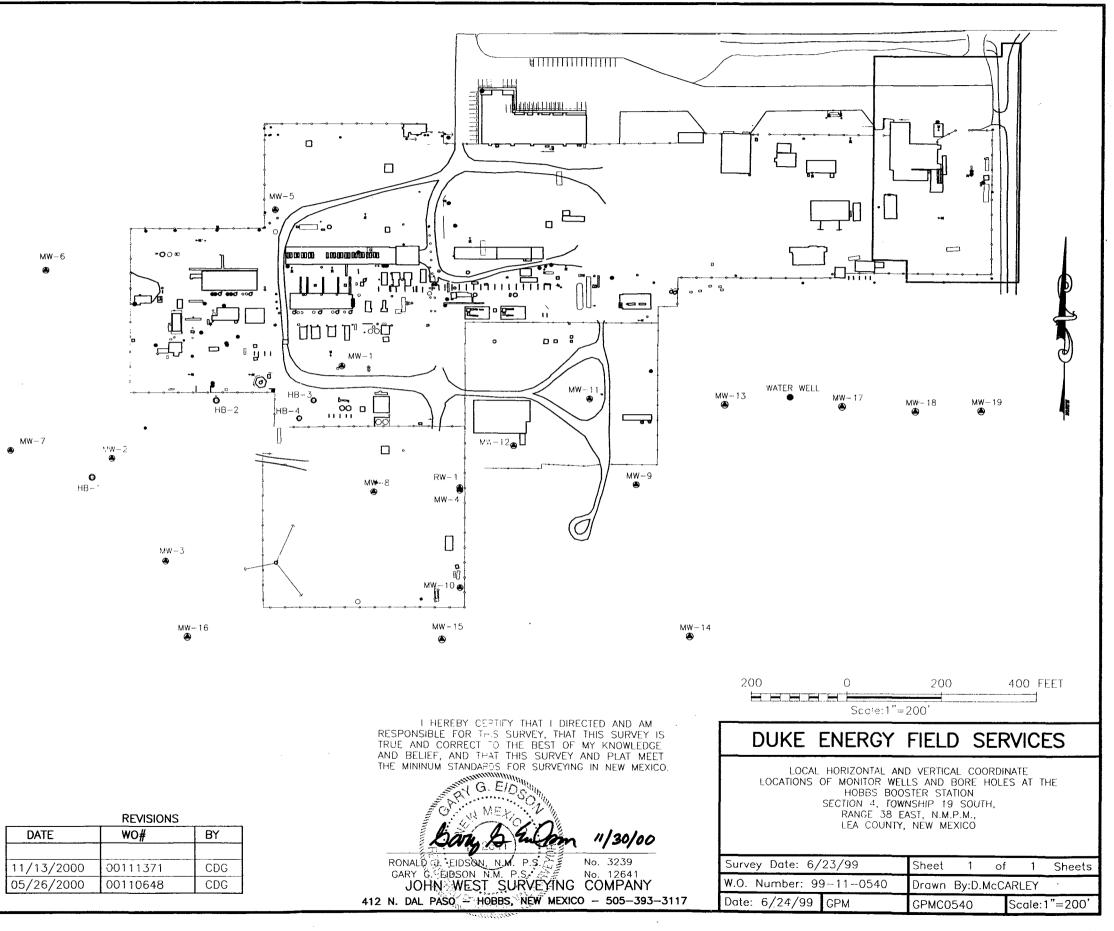




Appendix **B**

Survey Plat of Hobbs Booster Station

MONITOR WELLS	PLANT CO	ORDINATES	NAVD 88 ELEVATIONS IN FEET
MW-1	E-12+44.9	S-7+43.2	NATURAL GROUND: 3623.43
MW-1	E-12+44.9	5-7+43.2	ALUM. CAP IN CONCRETE: 3623.60
			TOP 2" PVC CASING: 3626.06
MW-2	E-7+62.6	C 0 1 75 0	NATURAL GROUND: 3620.52
MW-2	E-7+02.0	S-9+35.9	ALUM. CAP IN CONCRETE: 3620.65
			TOP 2" PVC CASING: 3623.14
	5.0.705		
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
· ·		1	ALUM. CAP IN CONCRETE: 3624.14
			TOP 2" PVC CASING: 3626.93
	E-5+47.2	S-9+20.5	NATURAL GROUND: 3618.78
		-	ALUM, CAP IN CONCRETE: 3618.93
	1	1	TOP 2" PVC CASING: 3621.40
MW-8	E-13+11.2	S-10+07.3	NATURAL GROUND: 3620.61
	1	1	ALUM. CAP IN CONCRETE: 3620.84
			TOP 2" PVC CASING: 3623.62
	E-18+57.2	S-9+90.4	NATURAL GROUND: 3622.40
14114-5	L 10757.2	3-3+30.4	ALUM. CAP IN CONCRETE: 3622.60
			TOP 2" PVC CASING: 3625.21
		6 10 00 0	
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
		L	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
MW14	E-19+69.6	S-13+07.2	NATURAL GROUND: 3618.76
			BRASS CAP IN CONCRETE: 3618.87
			TOP 2" PVC CASING: 3621.42
MW15	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	5-8+26.6	NATURAL GROUND: 3621.36
NIT 17	L 22.107.0	3-0+20.0	BRASS CAP IN CONCRETE: 3621.62
		ł	TOP 4" PVC CASING: 3623.94
1.11k/ 1.D	F-24142 0	C. 9. 15 0	NATURAL GROUND: 3621.96
MW-18	E-24+42.8	\$8+35.9	
		 	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
		1	
HB-3	E-11+86.3	S-8+14.7	NATURAL GROUND: 3622.32
		1	
	+	+	
HB-4	E-11+56.6	S-8+52.4	NATURAL GROUND: 3621.61
110 T	1		151101VL 0100ND. 5021.01
	+		······································
		+	·····
	1	1	
	E-2177.56	S-8+06.8	TOP OF WELL: 3622.91



	REVISIONS						
DATE	WO#	BY					
11/13/2000	00111371	CDG					
05/26/2000	00110648	CDG					

Appendix C

Laboratory Analytical Reports and Chain-of-Custody Documentation

6701 Aberdeen Avenue, Suite 9 4725 Ripley Avenue, Suite A Lubbock, Texas 79424 800 • 378 • 1296 El Paso, Texas 79922 888 • 588 • 3443 E-Mail: lab@traceanalysis.com

800•378•1296 806•794•1296 888•588•3443 915•585•3443 raceanalysis.com

1296 FAX 806 • 794 • 1298 3443 FAX 915 • 585 • 4944

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/6494/3BCProject Name:Duke Energy Field ServicesProject Location:Hobbs Booster

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

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	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.

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 and Quality Control Report

Sample: 158168 - MW-19 (0010311315)

Analysis: Analyst:	BTEX RC	Analytical Method: Preparation Method	S 8021B : 5035	QC Batch: Prep Batch:	QC06532 PB05696	Date Analyzed: Date Prepared:	11/13/00 11/13/00
Param		Flag	Result	Units	Di	lution	RDL
Benzene			<0.005	mg/L		5	0.001
Toluene			<0.005	mg/L		5	0.001
Ethylbenze	ene		<0.005	mg/L		5	0.001
M,P,O-Xyl	ene		<0.005	mg/L		5	0.001
<u>Total BTE</u>	X		< 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: Analyst:	BTEX RC	Analytical Method: Preparation Method	S 802ÍB : 5035	QC Batch: Prep Batch:	QC06532 PB05696	Date Analyzed: Date Prepared:	11/13/00 11/13/00
Param		Flag	Result	Units	Di	lution	RDL
Benzene			<0.005	mg/L		5	0.001
Toluene			<0.005	mg/L		5	0.001
Ethylbenze	ene		0.007	mg/L		5	0.001
M,P,O-Xyl	ene		<0.005	mg/L		5	0.001
Total BTE	X		0.007	mg/L		5	0.001

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	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: Analyst:	BTEX RC	Analytical Method: Preparation Method		QC Batch: Prep Batch:	QC06532 PB05696	Date Analyzed: Date Prepared:	11/13/00 11/13/00
Param		Flag	Result	Units	Di	lution	RDL
Benzene			<0.005	mg/L		5	0.001
Toluene			<0.005	mg/L		5	0.001
Ethylbenze	ne		<0.005	mg/L		5	0.001
M,P,O-Xyl	ene		<0.005	mg/L		5	0.001
Total BTE	X		<0.005	mg/L		5	0.001

Report Date: November 14, 2000 P/6494/3BC			Order Number: A00110616 Duke Energy Field Services			Page Number: 3 of 9 Hobbs Booster		
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: Analysis: Analyst:	158171 BTEX RC	- MW-7 (00103 Analytical Method: Preparation Method	S 8021B	QC Batch: Prep Batch:	QC06532 PB05696	Date Analyzed: Date Prepared:	11/13/00 11/13/00
Param		Flag	Result	Units	Di	lution	RDL
Benzene			<0.005	mg/L		5	0.001
Toluene			<0.005	mg/L		5	0.001
Ethylbenze	ne		<0.005	mg/L		5	0.001
M,P,O-Xyle	ene		<0.005	mg/L		5	0.001
Total BTE	X	<u> </u>	<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: Analyst:	BTEX RC	Analytical Method: Preparation Method	S 8021B : 5035	QC Batch: Prep Batch:	QC06532 PB05696	Date Analyzed: Date Prepared:	11/13/00 11/13/00
Param		Flag	Result	Units	Di	lution	RDL
Benzene			<0.005	mg/L		5	0.001
Toluene			<0.005	mg/L		5	0.001
Ethylbenze	ene		<0.005	mg/L		5	0.001
M,P,O-Xył	ene		<0.005	mg/L		5	0.001
Total BTE	X		<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: Analyst:	BTEX RC	Analytical Method Preparation Metho		QC Batch: Prep Batch:	QC06532 PB05696	Date Analyzed: Date Prepared:	11/13/00 11/13/00
Param		Flag	Result	Units	Di	lution	RDL
Benzene			<0.005	mg/L		5	0.001
Toluene			< 0.005	mg/L		5	0.001
Ethylbenze	ene		<0.005	mg/L		5	100.0

Continued ...

			Duke	Energy Field Se	ervices	Но	obbs Booste
Continue	d Sample	:: 158173 Analysi	s: BTEX				
Param	•	Flag	Result	Units	'n	lution	RDI
M,P,O-Xyler			<0.005	mg/L			
Total BTEX			<0.005			5	0.001
			<0.000	mg/L		5	0.001
					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TFT		0.535	mg/L	1	0.10	107	72 - 128
4-BFB	<u></u>	0.512	mg/L	1	0.10	102	72 - 128
Analysis:	158174 BTEX RC	- MW-15 (001 Analytical Metho Preparation Meth	d: S 8021B	QC Batch: Prep Batch:	QC06532 PB05696	Date Analyzed: Date Prepared:	11/13/00 11/13/00
Param		Flag	Result	Units	D:	- 	יחת
Benzene		I 105			D1	lution	RDL
Toluene			< 0.005	mg/L		5	0.001
			< 0.005	mg/L		5	0.00
Ethylbenzene			< 0.005	mg/L		5	0.00
M,P,O-Xyler			<0.005	mg/L		5	0.001
Total BTEX	<u></u>	·····	<0.005	mg/L		5	0.001
Surrogate TFT	Flag	Result 0.531	Units mg/L	Dilution 1	Spike Amount 0.10	Percent Recovery 106	Recovery Limits 72 - 128
4-BFB		0.521	mg/L	1	0.10	104	72 - 128
-		- MW-1 (0011		OC Patala	0.0005 89		11/19/00
Analysis:	158175 BTEX RC	- MW-1 (0011 Analytical Metho Preparation Meth	d: S 8021B	QC Batch: Prep Batch:	QC06532 PB05696	Date Analyzed: Date Prepared:	
Analysis: Analyst: Param	BTEX	Analytical Metho	d: S 8021B 10d: 5035 Result	Prep Batch: Units	PB05696	Date Prepared: ution	11/13/00 RDI
Analysis: Analyst: Param Benzene	BTEX	Analytical Metho Preparation Meth	d: S 8021B nod: 5035 Result 0.197	Prep Batch: Units mg/L	PB05696	Date Prepared: ution 5	11/13/00 RDI 0.002
Analysis: Analyst: Param Benzene Toluene	BTEX RC	Analytical Metho Preparation Meth	d: S 8021B nod: 5035 Result 0.197 0.028	Prep Batch: Units mg/L mg/L	PB05696	Date Prepared: ution 5 5	11/13/00 RDI 0.00 0.00
Analysis: Analyst: Param Benzene Toluene Ethylbenzene	BTEX RC	Analytical Metho Preparation Meth	d: S 8021B nod: 5035 Result 0.197 0.028 0.285	Prep Batch: Units mg/L mg/L mg/L	PB05696	Date Prepared: ution 5 5 5	11/13/00 RDI 0.000 0.000 0.000
Analysis: Analyst: Param Benzene Toluene Ethylbenzen M,P,O-Xyler	BTEX RC e ne	Analytical Metho Preparation Meth	d: S 8021B nod: 5035 Result 0.197 0.028 0.285 0.466	Prep Batch: Units mg/L mg/L mg/L mg/L	PB05696	Date Prepared: ution 5 5 5 5 5 5	11/13/00
Analysis: Analyst: Param Benzene Toluene Ethylbenzen M,P,O-Xyler	BTEX RC e ne	Analytical Metho Preparation Meth	d: S 8021B nod: 5035 Result 0.197 0.028 0.285	Prep Batch: Units mg/L mg/L mg/L	PB05696	Date Prepared: ution 5 5 5	11/13/00
Analysis: Analyst: Param Benzene Toluene Ethylbenzen M,P,O-Xyler	BTEX RC e ne	Analytical Metho Preparation Meth	d: S 8021B nod: 5035 Result 0.197 0.028 0.285 0.466	Prep Batch: Units mg/L mg/L mg/L mg/L	PB05696 Dil	Date Prepared: ution 5 5 5 5 5 5	11/13/00 RDI 0.00 0.00 0.00 0.00 0.00
Analysis: Analyst: Param Benzene Toluene Ethylbenzene M,P,O-Xyler Total BTEX	BTEX RC e ne	Analytical Metho Preparation Meth	d: S 8021B nod: 5035 Result 0.197 0.028 0.285 0.466	Prep Batch: Units mg/L mg/L mg/L mg/L	PB05696	Date Prepared: ution 5 5 5 5 5 5	11/13/00 11/13/00 RDI 0.00 0.00 0.00 0.00 0.00 Recovery Limits
Analysis: Analyst: Param Benzene Toluene Ethylbenzene M,P,O-Xyler Total BTEX Surrogate	BTEX RC e ne	Analytical Metho Preparation Meth Flag	d: S 8021B nod: 5035 Result 0.197 0.028 0.285 0.466 0.976 Units	Prep Batch: Units mg/L mg/L mg/L mg/L mg/L	PB05696 Dil	Date Prepared: ution 5 5 5 5 5 5 9 Percent	Recovery
Analysis: Analyst: Param Benzene Toluene Ethylbenzene M,P,O-Xyler Total BTEX Surrogate TFT	BTEX RC e ne	Analytical Metho Preparation Meth Flag Result	d: S 8021B nod: 5035 Result 0.197 0.028 0.285 0.466 0.976	Prep Batch: Units mg/L mg/L mg/L mg/L Dilution	PB05696 Dil Spike Amount	Date Prepared: ution 5 5 5 5 5 Percent Recovery	11/13/00 RDI 0.000 0.000 0.000 0.000 0.000 Recovery Limits
Analysis: Analyst: Param Benzene Toluene Ethylbenzene M,P,O-Xyler Total BTEX Surrogate TFT 4-BFB	BTEX RC e ne Flag	Analytical Metho Preparation Meth Flag Result 0.557 0.515	d: S 8021B nod: 5035 Result 0.197 0.028 0.285 0.466 0.976 Units mg/L mg/L	Prep Batch: Units mg/L mg/L mg/L mg/L Dilution	PB05696 Dil Spike Amount 0.10	Date Prepared: ution 5 5 5 5 5 Percent Recovery 111	RECOVER Limits 72 - 128
Analysis: Analyst: Param Benzene Toluene Ethylbenzene M,P,O-Xyler Total BTEX Surrogate TFT	BTEX RC e ne Flag	Analytical Metho Preparation Meth Flag Result 0.557	d: S 8021B nod: 5035 Result 0.197 0.028 0.285 0.466 0.976 Units mg/L mg/L	Prep Batch: Units mg/L mg/L mg/L mg/L Dilution	PB05696 Dil Spike Amount 0.10	Date Prepared: ution 5 5 5 5 5 Percent Recovery 111	RD1 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.

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Report Date: November 14, 2000 P/6494/3BC			Order Number: A00110616 Duke Energy Field Services				Page Number: 5 of 9 Hobbs Booster	
Param		Flag	Result Units Dilution			ution	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	Percer Recove		
TFT		0.555	mg/L	1	0.10	111	72 - 128	
4-BFB		0.509	mg/L	1	0.10	101	72 - 128	

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Sample: 158177 - Duplicate (0011011230)

Analysis: Analyst:	BTEX RC	Analytical Method: Preparation Method		QC Batch: Prep Batch:	QC06532 PB05696	Date Analyzed: Date Prepared:	11/13/00 11/13/00
Param		Flag	Result	Units	Di	lution	RDL
Benzene			1.07	mg/L		5	0.001
Toluene			0.604	mg/L		5	0.001
Ethylbenze	ene		0.233	mg/L		5	0.001
M,P,O-Xyl	ene		0.402	mg/L		5	0.001
Total BTE	Х		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: Analyst:	BTEX RC	Analytical Method Preparation Metho		QC Batch: Prep Batch:	QC06532 PB05696	Date Analyzed: Date Prepared:	11/13/00 11/13/00
Param		Flag	Result	Units	Di	lution	RDL
Benzene			1.02	mg/L		5	0.001
Toluene			0.539	mg/L		5	0.001
Ethylbenze	ene		0.235	mg/L		5	0.001
M,P,O-Xyl	lene		0.394	mg/L		5	0.001
Total BTE	X		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

Report	Date:	November	14,	2000
P/6494	/3BC			

Order Number: A00110616 Duke Energy Field Services

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Sample: Analysis: Analyst:	158179 BTEX RC	- Rinsate (00110 Analytical Method: Preparation Method:	S 8021B	QC Batch: Prep Batch:	QC06532 PB05696	Date Analyzed: Date Prepared:	11/13/00 11/13/00
Param		Flag	Result	Units	Di	lution	RDL
Benzene			< 0.005	mg/L		5	0.001
Toluene			<0.005	mg/L		5	0.001
Ethylbenze	ne		<0.005	mg/L		5	0.001
M,P,O-Xyle	ene		<0.005	mg/L		5	0.001
Total BTE	X		<0.005	mg/L		5	0.001

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TFT		0.53	mg/L	1	0.10	106	72 - 128
<u>4-BFB</u>		0.513	mg/L	1	0.10	102	72 - 128

Sample: 158180 - MW-10 (0011011530)

Analysis: Analyst:	BTEX RC	Analytical Method: Preparation Method	S 8021B : 5035	QC Batch: Prep Batch:	QC06532 PB05696	Date Analyzed: Date Prepared:	11/13/00 11/13/00
Param		Flag	Result	Units	Dil	RDL	
Benzene			0.535	mg/L		50	0.001
Toluene			0.061	mg/L		50	0.001
Ethylbenze	ene		0.17	mg/L		50	0.001
M,P,O-Xyl	lene		1.28	mg/L		50	0.001
Total BTE	X		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: Analyst:	BTEX RC	Analytical Method: Preparation Method:	S 8021B 5035	QC Batch: Prep Batch:	QC06532 PB05696	Date Analyzed: Date Prepared:	11/13/00 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
Ethylbenze	ene		0.017	mg/L		5	0.001
M,P,O-Xyl	ene		0.143	mg/L		5	0.001
Total BTE	Χ		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

Report Date: November 14, 2000 P/6494/3BC				r Number: A001 Energy Field Se		Page Number: 7 of 9 Hobbs Booster		
Surrogate Flag		Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits	
4-BFB		0.492	mg/L	1	0.10	98	72 - 128	
Analysis:	158182 BTEX RC	- Trip Blank Analytical Method: Preparation Method	S 8021B : 5035	QC Batch: Prep Batch:	QC06532 PB05696	Date Analyzed: Date Prepared:	11/13/00 11/13/00	
Param		Flag	Result	Units	Di	lution	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-Xylen	е		<0.001	mg/L	•.	1	0.001	
Total BTEX			<0.001	mg/L		1	0.001	
6	ri -			201	Spike	Percent	Recovery	
Surrogate			Units	Dilution	Amount	Recovery	Limits	
TFT		0.109	mg/L	1	0.10	109	72 - 128	

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Quality Control Report Method Blank

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0.10

102

72 - 128

0.102

mg/L

4-BFB

Sample: Me	thod Blank	QCBatch	QC06532			
Param	F	lag	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
Surrogata	Flag	Result	Units	Spike	Percent	Recovery Limit
Surrogate TFT	1 lag			Amount	Recovery	72 - 128
4-BFB		0.11 0.106	mg/L mg/L	0.10 0.10	110 106	72 - 128 72 - 128

Quality Control Report Lab Control Spikes and Duplicate Spikes

Order Number: A00110616 Duke Energy Field Services

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Sample: LCS

QC	Batch:	QC06532
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				Spike					
	Sample			Amount	Matrix	%		% Rec.	RPD
Flag	Result	Units	Dil.	Added	Result	Rec.	RPD	Limit	Limit
	0.103	mg/L	1	0.10	< 0.001	103		80 - 120	20
	0.102	mg/L	1	0.10	< 0.001	102		80 - 120	20
	0.099	mg/L	1	0.10	< 0.001	99		80 - 120	20
	0.096	mg/L	1	0.10	< 0.001	96		80 - 120	20
	0.266	mg/L	1	0.30	< 0.001	88		80 - 120	20
	Flag	Flag Result 0.103 0.102 0.099 0.096	Flag Result Units 0.103 mg/L 0.102 mg/L 0.099 mg/L 0.096 mg/L	Flag Result Units Dil. 0.103 mg/L 1 0.102 mg/L 1 0.099 mg/L 1 0.096 mg/L 1	Sample Amount Flag Result Units Dil. Added 0.103 mg/L 1 0.10 0.102 mg/L 1 0.10 0.099 mg/L 1 0.10 0.096 mg/L 1 0.10	Sample Amount Matrix Flag Result Units Dil. Added Result 0.103 mg/L 1 0.10 <0.001	Sample Amount Matrix % Flag Result Units Dil. Added Result Rec. 0.103 mg/L 1 0.10 <0.001	Sample Amount Matrix % Flag Result Units Dil. Added Result Rec. RPD 0.103 mg/L 1 0.10 <0.001	Sample Amount Matrix % % Rec. Flag Result Units Dil. Added Result Rec. RPD Limit 0.103 mg/L 1 0.10 <0.001

_					Spike	%	% Rec.
Surrogate	Flag	Result	Units	Dil.	Amount	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

0.097

					Spike					
		Sample			Amount	Matrix	%		% Rec.	RPD
Param	Flag	Result	Units	Dil.	Added	Result	Rec.	RPD	Limit	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	00	80 - 120	20
							Spike		%	% Rec.
Surrogate	Flag	Res	ult	Units	Dil	l.	Amount	R	lec.	Limit
TFT		0.1	01	mg/L	1		0.10	1	.01	72 - 128

Quality Control Report Continuing Calibration Verification Standards

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0.10

97

72 - 128

mg/L

Sample: CCV (1)

4-BFB

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

Order Number: A00110616 Duke Energy Field Services

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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

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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

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Lau	Ac	Tele	Samplers (SIGNATURES)	K	C/ San	11W-19 (0	MW-14 (1	1N-5 61	MW-7 LC	MW-L LC	114-16 (1	411V-15 (1	111-1 (1	M.3 (1	Junlice to		Project Name:	Project Location:	Project Manager: 6	Cost Center No	Shipping ID No.:	P O No.:	Special Instruct	Dulie Ene	PO Box	

Chain of Custody Nº 13564

Harrourd

Energy & Environmental Systems 415 West Wall St. Suite. 1818 Midland, Texas 79701 (915) 682-0008 FAX: (915) 682-0028 TRW Inc.

TRW Inc. Energy & Environment 415 West Wall St. Suit Midland, Texas 79701	TRW Inc. Energy & Environmental Systems 415 West Wall St. Suite. 1818 Midland, Texas 79701										• *				° Z	13	565	
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Project Information	Sample Receipt		telinquis	Relinquished By:			(1)	Relinqui	Relinquished By			(2)		Relinquished By:	d By:		Ĭ	(3)
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6701 Aberdeen Avenue, Suite 9 4725 Ripley Avenue, Suite A

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FAX 915•585•4944

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.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	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

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Analytical and Quality Control Report

Analysis: Analyst:	BTEX RC	Analytical Method: Preparation Method	S 8021B : 5035	QC Batch: Prep Batch:	QC04582 PB03988	Date Analyzed: Date Prepared:	8/30/00 8/30/00
Param		Flag	Result	Units	Di	lution	RDI
Benzene			< 0.005	mg/L		5	0.001
Toluene			0.008	mg/L		5	0.001
Ethylbenzei			<0.005	mg/L		5	0.001
M,P,O-Xyle			0.008	mg/L		5	0.001
Total BTE	<		0.016	mg/L		5	0.001
Currogata	Flor	Dervit	¥T ',		Spike	Percent	Recovery
Surrogate TFT	Flag	Result 0.456	Units	Dilution	Amount	Recovery	Limits
4-BFB			mg/L mg/L	1 1	0.10 0.10	91 107	72 - 128 72 - 128
Sample: Analysis: Analyst:	1 52197 BTEX RC	- MW-6 Analytical Method: Preparation Method	S 8021B : 5035	QC Batch: Prep Batch:	QC04582 PB03988	Date Analyzed: Date Prepared:	8/30/00 8/30/00
Param		Flag	Result	Units	Di	lution	RDI
Benzene			<0.005	mg/L		5	0.001
Toluene			0.008	mg/L		5	0.001
Ethylbenzer			<0.005	mg/L		5	0.00
M,P,O-Xyle Total BTEX			0.007 0.014	mg/L mg/L		5 5	0.001 0.001
					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TFT			mg/L	1	0.10	75	72 - 128
4-BFB			mg/L	1	0.10	95	72 - 128
Sample: Analysis: Analyst:	1 52198 BTEX RC	- MW-5 Analytical Method: Preparation Method	S 8021B : 5035	QC Batch: Prep Batch:	QC04582 PB03988	Date Analyzed: Date Prepared:	8/30/00 8/30/00
Param		Flag	Result	Units	Di	lution	RDI
Benzene			<0.005	mg/L		5	0.00
Toluene			<0.005	mg/L		5	0.00
Ethylbenzei			<0.005	mg/L		5	0.00
M,P,O-Xyle			<0.005	mg/L		5	0.00
Total BTEX	ζ		<0.005	mg/L		5	0.00

P/6494/3A	-	er 5, 2000		r Number: A0008 Energy Field Se			mber: 3 of obbs Boost
Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recover Limits
TFT		0.459	mg/L	1	0.10	91	72 - 12
<u>4-BFB</u>		0.54	mg/L	1	0.10	108	72 - 12
C I	1 = 01 00						
Sample:		- MW-2					
Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC04582	Date Analyzed:	8/30/0
Analyst:	RC	Preparation Method	l: 5035	Prep Batch:	PB03988	Date Prepared:	8/30/0
Param	<u></u>	Flag	Result	Units	Dil	ution	RD
Benzene			1.42	mg/L		5	0.00
Toluene			1.38	mg/L		5	0.00
Ethylbenze			0.298	mg/L		5	0.00
M,P,O-Xyle			0.541	mg/L		5	0.00
Total BTE	X		3.64	mg/L		5	0.00
Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recover Limits
TFT		0.533	mg/L	1	0.10	106	72 - 12
4-BFB		0.549	mg/L	1	0.10	109	72 - 12
-	152200 - BTEX		S 8021B	QC Batch	QC04582	Date Analyzed	8/30/0
Analysis:		- MW-1 Analytical Method: Preparation Method	S 8021B : 5035	QC Batch: Prep Batch:	QC04582 PB03988	Date Analyzed: Date Prepared:	
Analysis: Analyst: Param	BTEX	Analytical Method:	: 5035 Result	Prep Batch: Units	PB03988	Date Prepared: ution	8/30/(RL
Analysis: Analyst: Param Benzene	BTEX	Analytical Method: Preparation Method	: 5035 Result 0.181	Prep Batch: Units mg/L	PB03988	Date Prepared: ution 5	8/30/(RL 0.0
Analysis: Analyst: Param Benzene Toluene	BTEX RC	Analytical Method: Preparation Method	: 5035 Result 0.181 0.035	Prep Batch: Units mg/L mg/L	PB03988	Date Prepared: ution 5 5	8/30/(RD 0.0(0.0(
Analysis: Analyst: Param Benzene Toluene Ethylbenze:	BTEX RC	Analytical Method: Preparation Method	E: 5035 Result 0.181 0.035 0.273	Prep Batch: Units mg/L mg/L mg/L	PB03988	Date Prepared: ution 5 5 5	8/30/6 RD 0.00 0.00 0.00
Analysis: Analyst: Param Benzene Toluene Ethylbenze M,P,O-Xyle	BTEX RC ne ene	Analytical Method: Preparation Method	E: 5035 Result 0.181 0.035 0.273 0.45 0.45	Prep Batch: Units mg/L mg/L mg/L mg/L	PB03988	Date Prepared: ution 5 5 5 5 5	8/30/(RL 0.0(0.0(0.0(0.0(
Analysis: Analyst: Param Benzene Toluene Ethylbenze M,P,O-Xyle	BTEX RC ne ene	Analytical Method: Preparation Method	E: 5035 Result 0.181 0.035 0.273	Prep Batch: Units mg/L mg/L mg/L	PB03988	Date Prepared: ution 5 5 5	8/30/6 RD 0.00 0.00 0.00 0.00
Analysis: Analyst: Param Benzene Toluene Ethylbenze M,P,O-Xyle Total BTE	BTEX RC ne ene X	Analytical Method: Preparation Method Flag	: 5035 Result 0.181 0.035 0.273 0.45 0.938	Prep Batch: Units mg/L mg/L mg/L mg/L	PB03988 Dil	Date Prepared: ution 5 5 5 5 5 Percent	8/30/(<u>RD</u> 0.00 0.00 0.00 0.00 0.00 Recover
Analysis: Analyst: Param Benzene Toluene Ethylbenze M,P,O-Xyle Total BTE2 Surrogate	BTEX RC ne ene	Analytical Method: Preparation Method Flag Result	: 5035 <u>Result</u> 0.181 0.035 0.273 0.45 0.938 Units	Prep Batch: Units mg/L mg/L mg/L mg/L mg/L	PB03988 Dil Spike Amount	Date Prepared: ution 5 5 5 5 5 Percent Recovery	8/30/0 8/30/0 RD 0.00 0.00 0.00 0.00 0.00 0.00 Recover Limits
Analysis: Analyst: Param Benzene Toluene Ethylbenze M,P,O-Xyle Total BTE Surrogate TFT	BTEX RC ne ene X	Analytical Method: Preparation Method Flag Result 0.478	E: 5035 Result 0.181 0.035 0.273 0.45 0.938 Units mg/L	Prep Batch: Units mg/L mg/L mg/L mg/L Dilution	PB03988 Dil Spike Amount 0.10	Date Prepared: ution 5 5 5 5 5 5 5 7 9 7 95	8/30/(RD 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Recover Limits 72 - 12
Sample: Analysis: Analyst: Param Benzene Toluene Ethylbenze M,P,O-Xyle Total BTE Surrogate TFT 4-BFB	BTEX RC ne ene X	Analytical Method: Preparation Method Flag Result	: 5035 <u>Result</u> 0.181 0.035 0.273 0.45 0.938 Units	Prep Batch: Units mg/L mg/L mg/L mg/L mg/L	PB03988 Dil Spike Amount	Date Prepared: ution 5 5 5 5 5 Percent Recovery	8/30/ R: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.
Analysis: Analyst: Param Benzene Toluene Ethylbenze: M,P,O-Xyle Total BTE2 Surrogate TFT 4-BFB	BTEX RC ne ene X Flag	Analytical Method: Preparation Method Flag Result 0.478 0.52	E: 5035 Result 0.181 0.035 0.273 0.45 0.938 Units mg/L	Prep Batch: Units mg/L mg/L mg/L mg/L Dilution	PB03988 Dil Spike Amount 0.10	Date Prepared: ution 5 5 5 5 5 5 5 7 9 7 95	8/30/4 RI 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.
Analysis: Analyst: Param Benzene Toluene Ethylbenze: M,P,O-Xyle Total BTE2 Surrogate TFT 4-BFB Sample:	BTEX RC ne ene X Flag 152201 -	Analytical Method: Preparation Method Flag Result 0.478 0.52 - MW-3	: 5035 Result 0.181 0.035 0.273 0.45 0.938 Units mg/L mg/L	Prep Batch: Units mg/L mg/L mg/L mg/L Dilution 1 1	PB03988 Dil Spike Amount 0.10 0.10	Date Prepared: ution 5 5 5 5 5 Percent Recovery 95 104	8/30/4 <u>RI</u> 0.00 0.00 0.00 0.00 0.00 Recove Limit: 72 - 12 72 - 12 72 - 12
Analysis: Analysis: Param Benzene Toluene Ethylbenze M,P,O-Xyle Total BTE Surrogate TFT 4-BFB Sample: Analysis:	BTEX RC ne ene X Flag	Analytical Method: Preparation Method Flag Result 0.478 0.52	: 5035 Result 0.181 0.035 0.273 0.45 0.938 Units mg/L mg/L S 8021B	Prep Batch: Units mg/L mg/L mg/L mg/L Dilution	PB03988 Dil Spike Amount 0.10	Date Prepared: ution 5 5 5 5 5 5 5 7 9 7 95	8/30/(RE 0.00 0.00 0.00 0.00 0.00 Recover Limits 72 - 12 72 - 12 8/30/0
Analysis: Analysis: Param Benzene Toluene Ethylbenze M,P,O-Xyle Total BTE Surrogate TFT 4-BFB Sample: Analysis: Analysis:	BTEX RC ne ene X Flag 152201 - BTEX	Analytical Method: Preparation Method Flag Result 0.478 0.52 - MW-3 Analytical Method:	: 5035 Result 0.181 0.035 0.273 0.45 0.938 Units mg/L mg/L S 8021B	Prep Batch: Units mg/L mg/L mg/L mg/L Dilution 1 1 2 2 2 2 2 2 2 2 3 2 2 3 2 3 2 3 2 3	PB03988 Dil Spike Amount 0.10 0.10 QC04583 PB03988	Date Prepared: ution 5 5 5 5 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7	8/30/(RD 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 8/30/0 8/30/0 8/30/0
Analysis: Analysis: Param Benzene Toluene Ethylbenze: M,P,O-Xyle Total BTE2 Surrogate TFT 4-BFB Sample: Analysis: Analysis: Param	BTEX RC ne ene X Flag 152201 - BTEX	Analytical Method: Preparation Method Flag Result 0.478 0.52 - MW-3 Analytical Method: Preparation Method	: 5035 Result 0.181 0.035 0.273 0.45 0.938 Units mg/L mg/L S 8021B : 5035	Prep Batch: Units mg/L mg/L mg/L mg/L Dilution 1 1 2 QC Batch: Prep Batch: Units	PB03988 Dil Spike Amount 0.10 0.10 QC04583 PB03988 Dil	Date Prepared: ution 5 5 5 5 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7	8/30/0 RD 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 8/30/0 8/30/0 8/30/0 RD
Analysis: Analyst: Param Benzene Toluene Ethylbenze M,P,O-Xyle Total BTE Surrogate TFT	BTEX RC ne ene X Flag 152201 - BTEX	Analytical Method: Preparation Method Flag Result 0.478 0.52 - MW-3 Analytical Method: Preparation Method	: 5035 Result 0.181 0.035 0.273 0.45 0.938 Units mg/L mg/L S 8021B : 5035 Result 0.011	Prep Batch: Units mg/L mg/L mg/L mg/L Dilution 1 1 2 QC Batch: Prep Batch: Units mg/L	PB03988 Dil Spike Amount 0.10 0.10 0.10 QC04583 PB03988 Dih	Date Prepared: ution 5 5 5 5 5 5 7 7 7 8 7 95 104 Date Analyzed: Date Prepared: 101 105	8/30/0 RD 0.00 0.00 0.00 0.00 0.00 0.00 Recover Limits 72 - 12 72 - 12 72 - 12 8/30/0 8/30/0 RD 0.00 0.
Analysis: Analysis: Param Benzene Toluene Ethylbenze: M,P,O-Xyle Total BTE2 Surrogate TFT 4-BFB Sample: Analysis: Analysis: Analyst: Param Benzene Toluene	BTEX RC ne ene X Flag 152201 - BTEX RC	Analytical Method: Preparation Method Flag Result 0.478 0.52 - MW-3 Analytical Method: Preparation Method	: 5035 Result 0.181 0.035 0.273 0.45 0.938 Units mg/L mg/L S 8021B : 5035 Result 0.011 0.023	Prep Batch: Units mg/L mg/L mg/L mg/L Dilution 1 1 1 QC Batch: Prep Batch: Units mg/L mg/L	PB03988 Dil Spike Amount 0.10 0.10 QC04583 PB03988 Dilu	Date Prepared: ution 5 5 5 5 5 7 Percent Recovery 95 104 Date Analyzed: Date Prepared: ution 5 5	8/30/0 RD 0.00 0.00 0.00 0.00 0.00 0.00 Recover Limits 72 - 12 72 - 12 72 - 12 8/30/0 8/30/0 RD 0.00 0.
Analysis: Analysis: Param Benzene Toluene Ethylbenze: M,P,O-Xyle Total BTE2 Surrogate TFT 4-BFB Sample: Analysis: Analyst: Param Benzene	BTEX RC ne ene X Flag 152201 BTEX RC	Analytical Method: Preparation Method Flag Result 0.478 0.52 - MW-3 Analytical Method: Preparation Method	: 5035 Result 0.181 0.035 0.273 0.45 0.938 Units mg/L mg/L S 8021B : 5035 Result 0.011	Prep Batch: Units mg/L mg/L mg/L mg/L Dilution 1 1 2 QC Batch: Prep Batch: Units mg/L	PB03988 Dil Spike Amount 0.10 0.10 QC04583 PB03988 Dilu	Date Prepared: ution 5 5 5 5 5 5 7 7 7 8 7 95 104 Date Analyzed: Date Prepared: 101 5	8/30/0 RD 0.00 0.00 0.00 0.00 0.00 0.00 Recover Limits 72 - 12 72 - 12 72 - 12 8/30/0 8/30/0 RD 0.00 0.

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<i>Continu</i> Param	ed Sample	: 152201 Analysi Flag	s: BTEX	TT	D.1		
Total BTEX	×	Tag	Result	Units	Dil	ution	RDI
	<u>`</u>		0.516	mg/L		5	0.00
-					Spike	Percent	Recover
Surrogate	Flag	Result	Units	Dilution	Amount	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 Metho	od: S 8021B	QC Batch:	QC04583	Date Analyzed:	8/30/0
Analyst:	RC	Preparation Met	hod: 5035	Prep Batch:	PB03988	Date Prepared:	8/30/0
Param		Flag	Result	Units	Dil	ution	RD
Benzene			<0.001	mg/L		1	0.00
Toluene			<0.001	mg/L		1	0.00
Ethylbenzer			<0.001	mg/L		1	0.00
M,P,O-Xyle			0.002	mg/L		1	0.00
Total BTEX	ί.		0.002	mg/L		1	0.00
Surrogata		Popult	Thite	Dilution	Spike	Percent	
	Flag	Result	Units	Dilution	Amount	Recovery	Limits
TFT		0.087	mg/L	1	Amount 0.10	Recovery 87	Limits 72 - 128
Surrogate TFT 4-BFB					Amount	Recovery	Recover: Limits 72 - 128 72 - 128
TFT 4-BFB	Flag	0.087 0.104	mg/L	1	Amount 0.10	Recovery 87	Limits 72 - 128
TFT 4-BFB Sample:	Flag 152203	0.087 0.104 - Duplicate	mg/L mg/L	1 1	Amount 0.10 0.10	Recovery 87 104	Limits 72 - 128 72 - 128
TFT 4-BFB Sample: Analysis:	Flag 152203 BTEX	0.087 0.104 - Duplicate Analytical Metho	mg/L mg/L od: S 8021B	1 1 QC Batch:	Amount 0.10 0.10 QC04583	Recovery 87 104 Date Analyzed:	Limits 72 - 128 72 - 128 8/30/0
TFT 4-BFB Sample: Analysis:	Flag 152203	0.087 0.104 - Duplicate	mg/L mg/L od: S 8021B	1 1	Amount 0.10 0.10	Recovery 87 104	Limits 72 - 128 72 - 128 8/30/0
TFT 4-BFB Sample: Analysis: Analyst: Param	Flag 152203 BTEX	0.087 0.104 - Duplicate Analytical Metho	mg/L mg/L od: S 8021B hod: 5035 Result	1 1 QC Batch: Prep Batch: Units	Amount 0.10 0.10 QC04583 PB03988 Dilu	Recovery 87 104 Date Analyzed: Date Prepared: ation	Limits 72 - 128 72 - 128 8/30/0 8/30/0 RD
TFT 4-BFB Sample: Analysis: Analyst: Param Benzene	Flag 152203 BTEX	0.087 0.104 - Duplicate Analytical Metho Preparation Metho	mg/L mg/L bd: S 8021B hod: 5035 Result 0.008	1 1 QC Batch: Prep Batch: Units mg/L	Amount 0.10 0.10 QC04583 PB03988 Dilt	Recovery 87 104 Date Analyzed: Date Prepared: ation 5	Limits 72 - 128 72 - 128 8/30/0 8/30/0 RD 0.00
TFT 4-BFB Analysis: Analyst: Param Benzene Toluene	Flag 152203 BTEX RC	0.087 0.104 - Duplicate Analytical Metho Preparation Metho	mg/L mg/L bd: S 8021B hod: 5035 <u>Result</u> 0.008 0.017	1 1 QC Batch: Prep Batch: Units mg/L mg/L	Amount 0.10 0.10 QC04583 PB03988 Dilu	Recovery 87 104 Date Analyzed: Date Prepared: ation 5 5	Limits 72 - 128 72 - 128 8/30/0 8/30/0 RD 0.00 0.00
TFT 4-BFB Analysis: Analyst: Param Benzene Toluene Ethylbenzer	Flag 152203 BTEX RC	0.087 0.104 - Duplicate Analytical Metho Preparation Metho	mg/L mg/L bd: S 8021B hod: 5035 Result 0.008 0.017 0.173	l l QC Batch: Prep Batch: Units mg/L mg/L mg/L	Amount 0.10 0.10 QC04583 PB03988 Dilt	Recovery 87 104 Date Analyzed: Date Prepared: 1tion 5 5 5 5	Limits 72 - 128 72 - 128 8/30/0 8/30/0 RD 0.00 0.00 0.00
TFT 4-BFB Analysis: Analyst: Param Benzene Toluene Ethylbenzer M,P,O-Xyle	Flag 152203 BTEX RC	0.087 0.104 - Duplicate Analytical Metho Preparation Metho	mg/L mg/L bd: S 8021B hod: 5035 Result 0.008 0.017 0.173 0.183	1 1 QC Batch: Prep Batch: Units mg/L mg/L mg/L mg/L	Amount 0.10 0.10 QC04583 PB03988 Dilt	Recovery 87 104 Date Analyzed: Date Prepared: 1tion 5 5 5 5 5	Limits 72 - 122 72 - 122 8/30/0 8/30/0 RD 0.00 0.00 0.00 0.00
TFT	Flag 152203 BTEX RC	0.087 0.104 - Duplicate Analytical Metho Preparation Metho	mg/L mg/L bd: S 8021B hod: 5035 Result 0.008 0.017 0.173	l l QC Batch: Prep Batch: Units mg/L mg/L mg/L	Amount 0.10 0.10 QC04583 PB03988 Dilt	Recovery 87 104 Date Analyzed: Date Prepared: 1tion 5 5 5 5	Limits 72 - 128
TFT 4-BFB Sample: Analysis: Analyst: Param Benzene Toluene Ethylbenzer M,P,O-Xyle	Flag 152203 BTEX RC	0.087 0.104 - Duplicate Analytical Metho Preparation Methor Flag	mg/L mg/L bd: S 8021B hod: 5035 Result 0.008 0.017 0.173 0.183 0.381	1 1 QC Batch: Prep Batch: Units mg/L mg/L mg/L mg/L	Amount 0.10 0.10 QC04583 PB03988 Dilt	Recovery 87 104 Date Analyzed: Date Prepared: 1tion 5 5 5 5 5	Limits 72 - 128 72 - 128 8/30/0 8/30/0 RD 0.00 0.00 0.00 0.00 0.00
TFT 4-BFB Sample: Analysis: Analyst: Param Benzene Toluene Ethylbenzer M,P,O-Xyle	Flag 152203 BTEX RC	0.087 0.104 - Duplicate Analytical Metho Preparation Methor Flag Result	mg/L mg/L bd: S 8021B hod: 5035 Result 0.008 0.017 0.173 0.183	1 1 QC Batch: Prep Batch: Units mg/L mg/L mg/L mg/L	Amount 0.10 0.10 QC04583 PB03988 Dilt	Recovery 87 104 Date Analyzed: Date Prepared: ation 5 5 5 5 5 5	Limits 72 - 128 72 - 128 8/30/0 8/30/0 RD 0.00 0.00 0.00 0.00
TFT 4-BFB Analysis: Analyst: Param Benzene Toluene Ethylbenzer M,P,O-Xyle Total BTEX	Flag 152203 BTEX RC	0.087 0.104 - Duplicate Analytical Metho Preparation Methor Flag	mg/L mg/L bd: S 8021B hod: 5035 Result 0.008 0.017 0.173 0.183 0.381 Units	1 1 QC Batch: Prep Batch: Units mg/L mg/L mg/L mg/L	Amount 0.10 0.10 QC04583 PB03988 Dilt	Recovery 87 104 Date Analyzed: Date Prepared: ntion 5 5 5 5 5 5 5 5 5 5	Limits 72 - 128 72 - 128 8/30/0 8/30/0 RD 0.00 0.00 0.00 0.00 0.00 0.00 0.00
TFT 4-BFB Analysis: Analyst: Param Benzene Toluene Ethylbenzer M,P,O-Xyle Total BTEX	Flag 152203 BTEX RC	0.087 0.104 - Duplicate Analytical Metho Preparation Methor Flag Result	mg/L mg/L bd: S 8021B hod: 5035 Result 0.008 0.017 0.173 0.183 0.381	l l QC Batch: Prep Batch: Units mg/L mg/L mg/L mg/L mg/L mg/L	Amount 0.10 0.10 QC04583 PB03988 Dih	Recovery 87 104 Date Analyzed: Date Prepared: 1tion 5 5 5 5 5 5 5 5 5 5 5 5 5	Limits 72 - 122 72 - 122 8/30/0 8/30/0 RD 0.00 0.00 0.00 0.00 0.00 0.00 0.00

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Report Date: Septer P/6494/3AC	nber 5, 2000		Number: A0008251 Energy Field Servic		Page Number: 5 of 8 Hobbs Booster
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 B	lank QCBa	tch: 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

				Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Amount	Recovery	Limit
$\overline{\mathrm{T}\mathrm{F}\mathrm{T}}$		0.071	mg/L	0.10	72	72 - 128
4-BFB		0.082	mg/L	0.10	82	72 - 128

Sample: Method Blank

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

Sample: LCS

Quality Control Report Lab Control Spikes and Duplicate Spikes

Sample: LCS		QC Batcl	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

					Spike					
		Sample			Amount	Matrix	%		% Rec.	RPD
Param	Flag	Result	Units	Dil.	Added	Result	Rec.	RPD	Limit	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	<u> </u>	0.084	mg/L	1	0.10	84	72 - 128
4-BFB		0.097	mg/L	1	0.10	97	72 - 128

Sample: LCS

					Spike					
		Sample			Amount	Matrix	%		% Rec.	RPD
Param	Flag	Result	Units	Dil.	Added	Result	Rec.	RPD	Limit	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

Report Date: September 5, 2000 P/6494/3AC				Number: A000 nergy Field Se	-	Page Number: 7 of 8 Hobbs Booster		
Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit	
TFT 4-BFB		0.089 0.103	mg/L mg/L	1 1	0.10 0.10	89 103	72 - 128 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

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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)

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

Order Number: A00082515 Duke Energy Field Services

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Sample: ICV	(1)	QC Batch:	QC04582
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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	0.1	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) Q

QC Batch: QC04583

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	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)

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

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Chain of Custody

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Groundwater Investigation Hobbs Booster Station Lea County, New Mexico

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7/17/00

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APPENDICES

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Appendix A	Lithologic Logs and Well Construction Diagrams
Appendix B	Survey Plat of Hobbs Booster Station
Appendix C	Water Well Inventory
Appendix D	Laboratory Analytical Reports and Chain-of-Custody Documentation
Appendix E	Photodocumentation



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 δ 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.



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2.0	Chronol	ogy of	Events
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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.

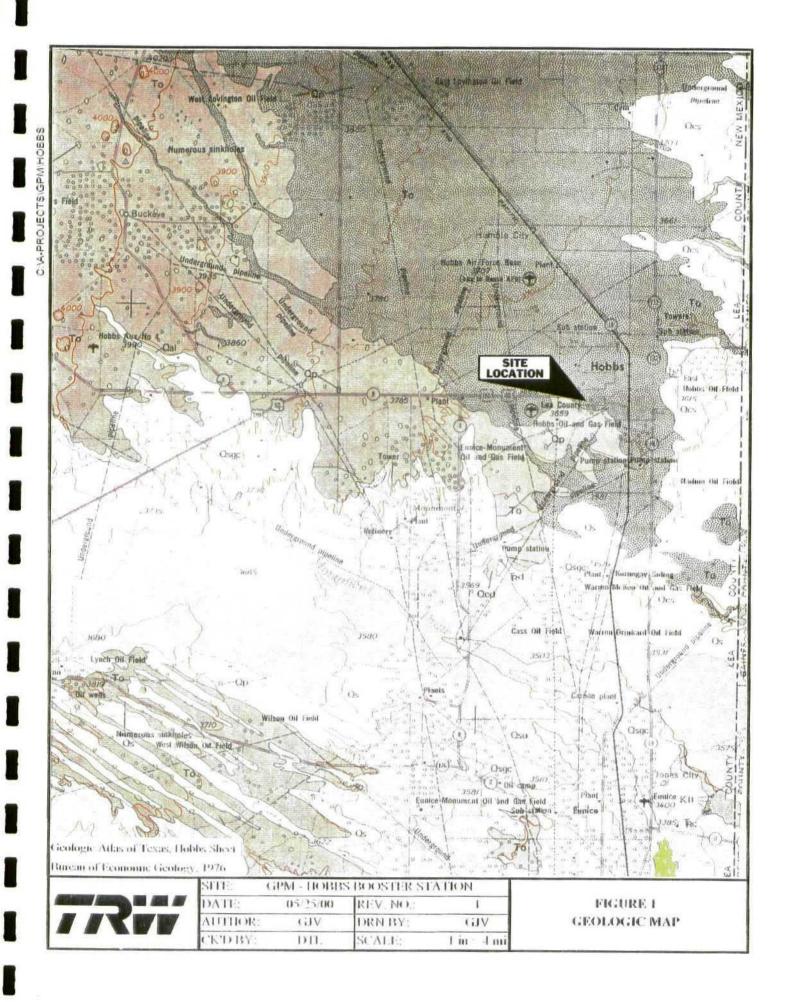
Map Symbol	Formation Name	Description
Qal	Quaternary alluvium	Floodplain, pediment, and low terrace deposits
Qs	Quaternary windblown sand	Windblown sand and silt cover sand
Qp	Quaternary playa deposits	Clay, silt, and sand deposits in shallow depressions
Qsgc	Quaternary colluvial deposits	Sand, silt, 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
То	Tertiary Ogallala Formation	Fluviatile sand, silt, clay, and gravel capped by caliche
T _R °	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

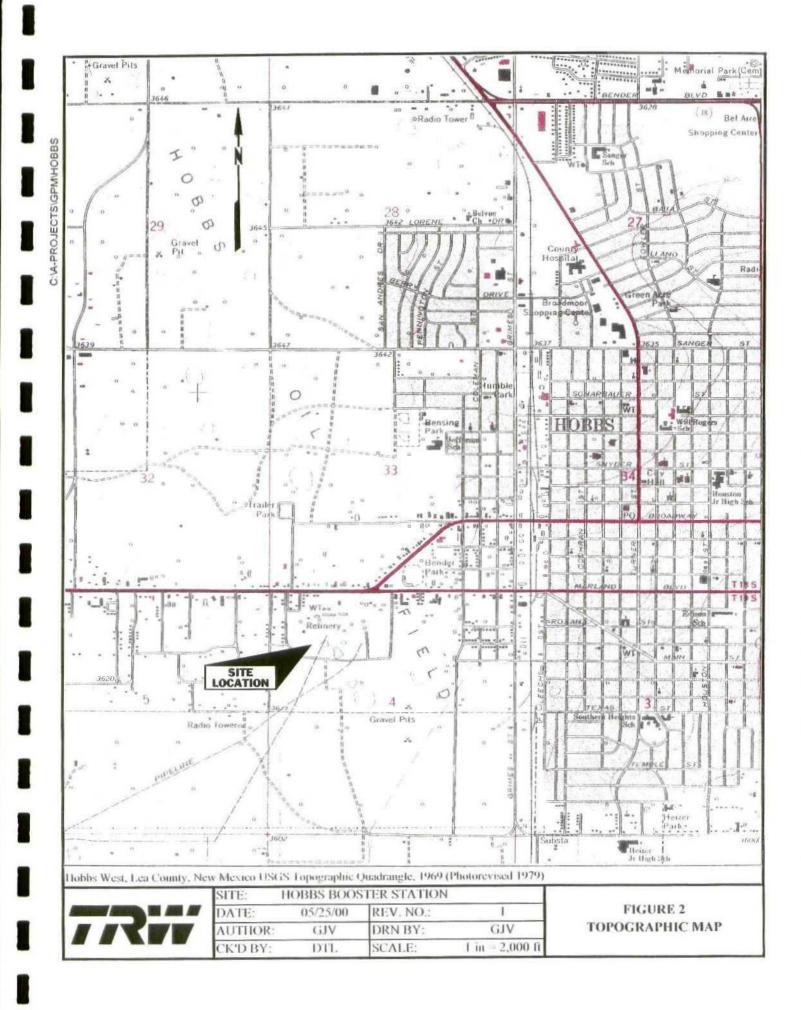
Potable groundwater used in southern Lea County is derived primarily from the Ogallala Formation and the Quaternary alluvium. Water-bearing zones within the Triassic Dockum Group in a few scattered areas within southern Lea County have provided lower yields of potable groundwater. In the site area, no 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.







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.

			Tal	ole 1									
		Summary	y of Groundwa	ter Level Measu	irements								
	Hobbs Booster Station												
Monitoring	Date	Ground Surface Elevation	Top of Casing Elevation	Depth to Groundwater	Depth to LNAPL (feet	LNAPL Thickness	Corrected Groundwater Elevation						
Well	_Gauged_	(feet AMSL)		(feet AMSL)	AMSL)	(feet)	(feet AMSL)						
MW-1	07/08/99 05/11/00	3623.60 3623.60	3626.06 3626.06	45.56 45.93	ND ND	0.00 0.00	3580.50 3580.13						
MW-2	07/08/99 05/11/00	3620.65 3620.65	3623.14 3623.14	40.51 41.10	ND ND	0.00	3582.63 3582.04						
MW-3	07/08/99 05/11/00	3620.08 3620.08	3623.01 3623.01	40.76 41.33	ND ND	0.00 0.00	3582.25 3581.68						
MW-4	07/08/99 05/11/00	3621.66 3621.66	3624.29 3624.29	46.86 47.09	43.60 44.41	3.26 2.68	3579.64 3579.02						
MW-5	07/08/99 05/11/00	3626.30 3626.30	3629.16 3629.16	48.15 48.27	ND ND	0.00 0.00	3581.01 3580.89						
MW-6	07/08/99 05/11/00	3624.14 3624.14	3626.93 3626.93	43.95 44.32	ND ND	0.00 0.00	3582.98 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						
<u>RW-1</u>	05/11/00	3621.53	3624.52	45.06	45.05	0.01	3579.47						

LNAPL = Light Non-Aqueous Phase Liquid

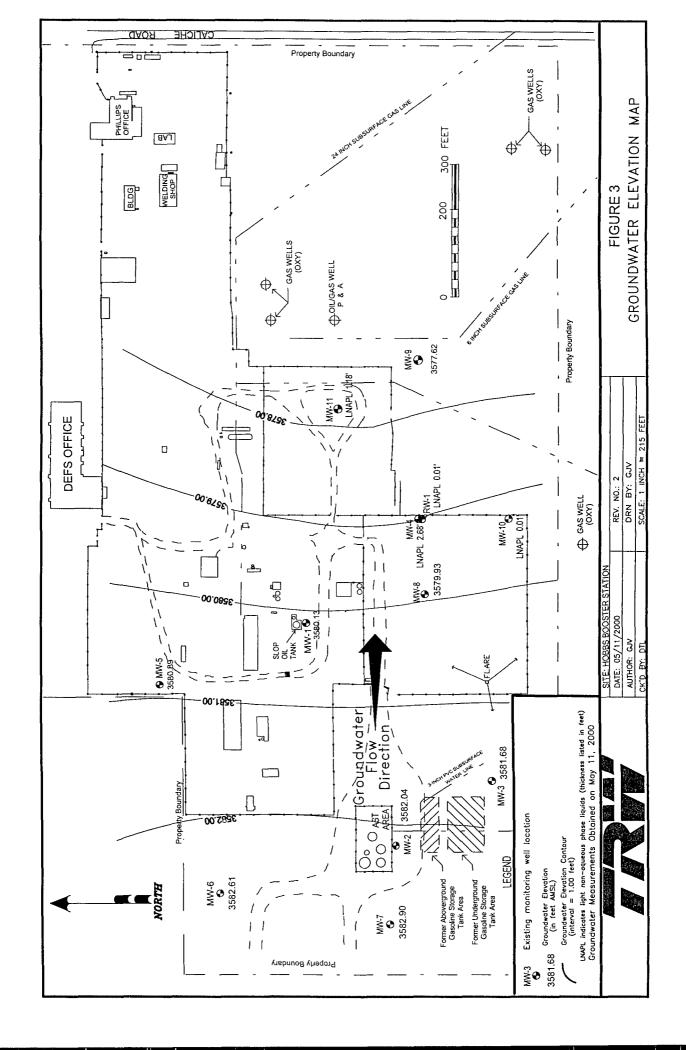
AMSL = Above Mean Sea Level

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.





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.

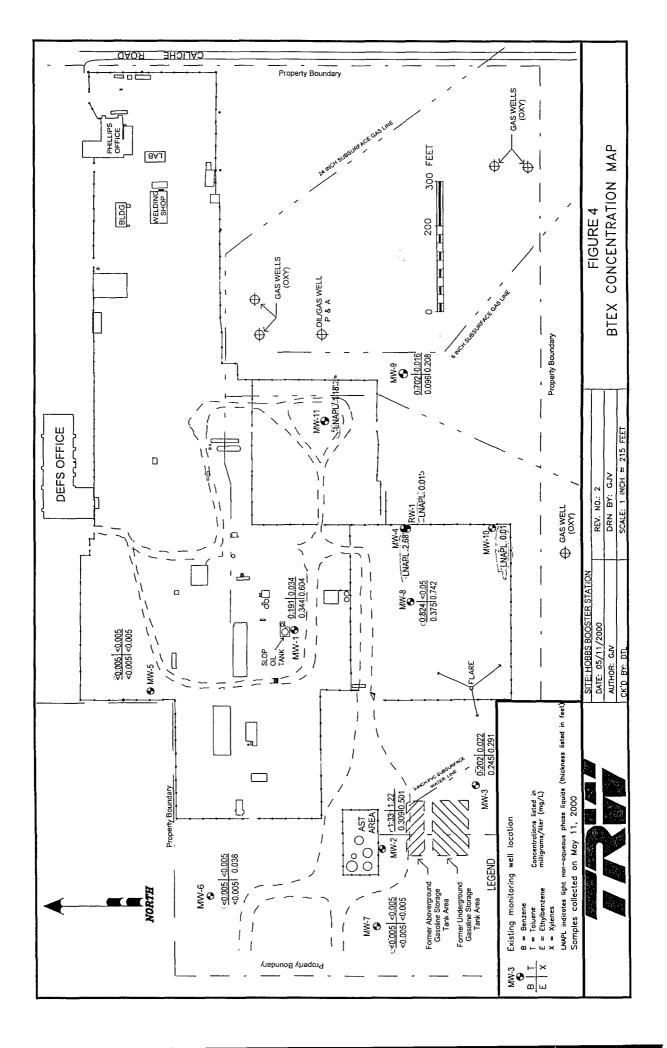
			Table 2		
	Sum	mary of BTEX C	Concentrations in	Groundwater	
······		<u> </u>	Booster Station		r
Monitoring	Sampling	Benzene	Toluene	Ethylbenzene	Xylenes
Well	Date	(mg/L)	(mg/L)	(mg/L)	(mg/L)
MW-1	06/17/99	0.232	0.029	0.168	0.229
IVI W - I	05/11/00	0.191	0.034	0.344	0.604
MW-2	06/17/99	0.934	0.993	0.192	0.359
M W-2	05/11/00	1.33	1.22	0.309	0.501
	06/17/99	0.262	0.029	0.222	0.287
MW-3	05/11/00	0.202	0.022	0.245	0.291
	06/17/99	LNAPL	LNAPL	LNAPL	LNAPL
MW-4	05/11/00	LNAPL	LNAPL	LNAPL	LNAPL
MW-5	06/17/99	< 0.005	< 0.005	< 0.005	< 0.005
IVI W-5	05/11/00	< 0.005	< 0.005	< 0.005	< 0.005
MW-6	06/18/99	< 0.005	< 0.005	< 0.005	< 0.005
IVI W-0	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 Standa	ards	0.010	0.75	0.75	0.62

• The xylene concentration in MW-8 (0.742 mg/L) exceeds the WQCC standard of 0.62 mg/L.

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.





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.

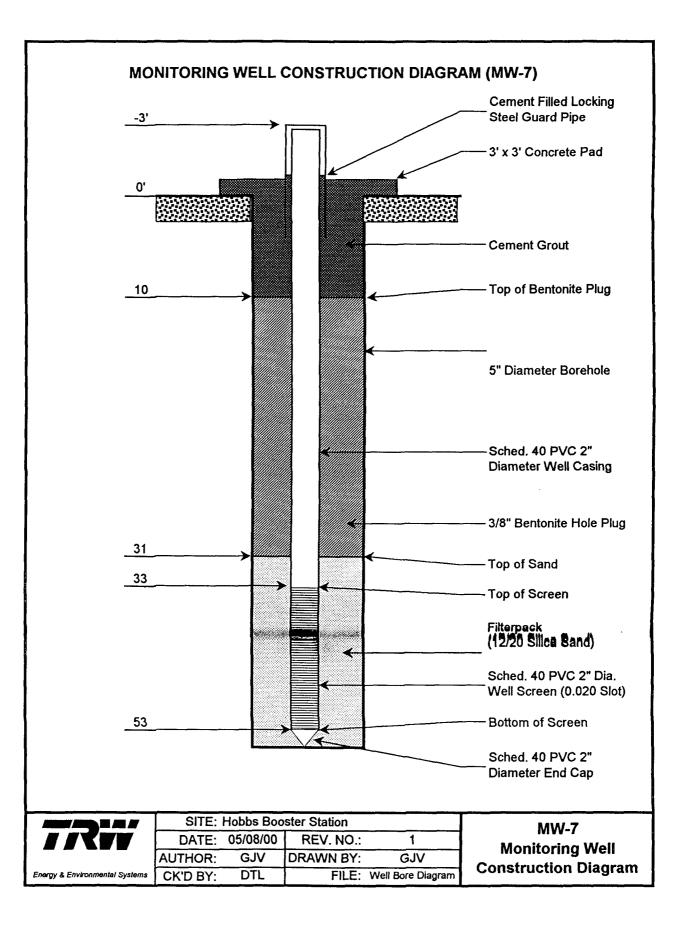
Appendix A

Lithologic Logs and Well Construction Diagrams

415 WEST WALL SUITE 1818 MIDLAND, TEXAS 79701					SURFA	CE ELEN CONTRA LING MI STAR	/ATION:	Hobbs B 3618.78 Diversifi Air Rota 05/08/00	ed Water ' ry)	ation TOTAL DEPTH: 53 Feet ation CLIENT: DEFS/GPM Gas Corp. COUNTY: Lea Well Drilling STATE: New Mexico LOCATION: NW 1/4 Sec. 4, T19S, R FIELD REP.: J. Fergerson FILE NAME: /GPM/HOBBSVogs.xls
		-			·		MENTS:		due west	of MW-2 and approximately 15 feet north.
			LITH.	USCS	Depth 0	Time 0900	Type Surface	PID 0		SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATUR Silty clay, dk brown, moist, no odor.
	Perment Grout			CL	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	
ed 40 PVC Blank	Diug	Ra			15	0919	Cuttings	0	15	
	Hold			SM/SS	20	0931	Cuttings	0	20	Sand, vf grain, white-yellow-It brown, no odor, unconsol, interbedded with mod-well cemented sandstone and weathered caliche. Sand, vf grain, tan-It brown, sl moist, no odor, unconsol,
	3/8 Bentonite		33355	sw	25	0941	Cuttings	0	25	Sand, vf grain, tan-it brown, si moist, no odor, unconsol, Sand, vf grain, tan-it brown, si moist, no odor, unconsol,
			565555 5655555	0.14	30	0949	Cuttings	0	30	interbedded with well cemented sandstone.
			386666	SW	35	0956	Cuttings	0	35	
	Sand Pack		<u></u>		40	1004	Cuttings	0	40	Groundwater Encountered @ 38 Feet
	12/20 Silica San			sw					45	Sand, vf grain, tan-It brown, sl moist, no odor, unconsol, interbedded with well cemented sandstone. Bottom of well @ 53 feet TD @ 56 feet

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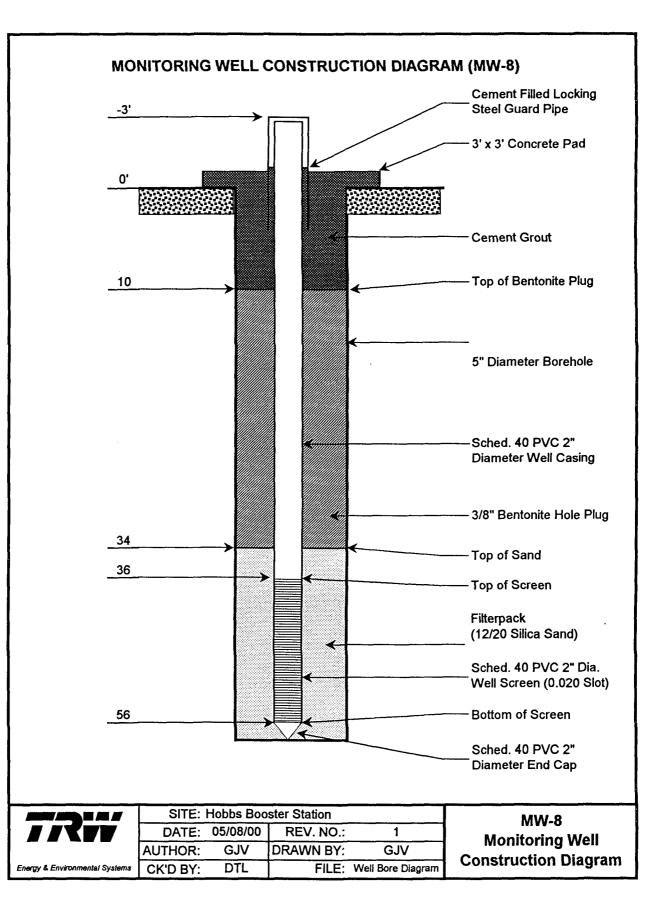


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The second se				;,;,;;;;;;;;;;;;;	377	35	1112	Cuttings	1.3	35	
The second se											Sand vf.grain tan It brown good odor v moiet upconsol
Source Sand, vf grain, tan-It brown-gray, v moist, strong odor, unconsol with gray staining in matrix and interbedded with well cemented sandstone. Source 45 Source 50 Source 50 Source 55 Bottom of well @ 56 feet					sw	40	1120	0	109 9	- 20	interbedded with well cemented sandstone.
Image: Solution of well @ 56 feet	₋∭≣		¥			-0	1120	Cuttings	100.0	+0	Sand, vf grain, tan-lt brown-gray, v moist, strong odor,
Image: Solution of well @ 56 feet			d Pa								
Image: Solution of well @ 56 feet										45	
Bottom of well @ 56 feet											
Bottom of well @ 56 feet			20 S								
Bottom of well @ 56 feet					sw					50	
Bottom of well @ 56 feet											
Bottom of well @ 56 feet											
]		******						55	
TD @ 58 feet	-	/	_								Bottom of well @ 56 feet
											TD @ 58 feet

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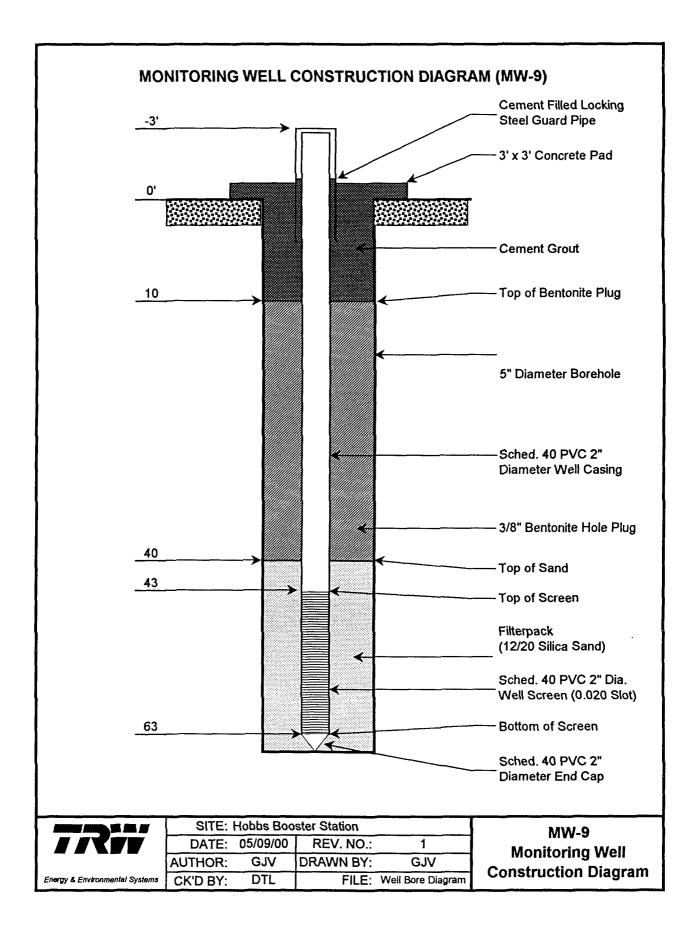
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MIC	SU	VEST	WALL 1818 2XAS 75	9701		SURFA	CE ELEN CONTRA LING MI STAR ⁻ PLETION	ATION: ACTOR: ETHOD: F DATE: N DATE:	Hobbs E 3622.40 Diversifi Air Rota 05/09/00 05/09/00	ed Water ' ry)	TOTAL DEPTH: 63 Feet ation CLIENT: DEFS/GPM Gas Corp. COUNTY: Lea Well Drilling STATE: New Mexico LOCATION: NW 1/4 Sec. 4, T19S, R FIELD REP.: J. Fergerson FILE NAME: /GPM/HOBBSVogs.xis st fence line and 44 feet north of south fenceline
	Π]	LIT	н. Ц	JSCS	Depth	Sample Time	Туре	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GR SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATUR
						0	1440	Surface	0		Caliche, white-yellow-tan, weathered-dense, no odor, with vf grain sand in matrix.
		Cement Grout				5	1448	Cuttings	0	5	
					XAL/S M	10	1454	Cuttings	4.1	10	
Blank						15	1501	Cuttings	0	15	
ed 40 PVC B		Plud			SAL/S	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.
2-Inch Sched 40 PVC		entonite Hole Pluc			sw	25	1522	Cuttings	0.9	25	Sand, vf grain, white-tan-it brown, sl odor, unconsol, interbedde with mod-well cemented sandstone.
		3/8 Br				30	1532	Cuttings	1.4		Sand, vf grain, tan-It brown, sl odor, unconsol, interbedded with well cemented sandstone.
						35	1540	Cuttings	3.3	35	
					sw	40	1553	Cuttings	2.8	40	
-						45	1605	Cuttings	203.9		
creen		Silica Sand Pack				48	1611	Cuttings	239.3		Sand, vf grain, tan-It brown, good odor, unconsol, interbedded with well cemented sandstone. Groundwater encountered @ 48 feet
		a San								-50	
U.UZU-INCN Slotted Screen		12/20 Silic			sw					55	
ō				****							
0.020					sw		;			60	Sand, vf grain, tan-lt brown, good odor, unconsol, interbedded with well cemented sandstone. TD @ 63 feet

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	E 1	WALL 818	USCS CL	DRIL	CE ELEN CONTR LING M STAR PLETION COM	VATION: ACTOR: ETHOD: T DATE: N DATE:	3618.30 Diversifi Air Rota 05/08/00	ed Water	COUNTY: Lea Well Drilling STATE: New Mexico
		818 XAS 79701	1	DRIL	CONTR LING M STAR PLETION COM	ACTOR: ETHOD: T DATE: N DATE:	Diversifi Air Rota 05/08/00	ed Water	Well Drilling STATE: New Mexico
	TE	XAS 79701	1	СОМ	STAR PLETION COM	T DATE: N DATE:	05/08/00		LOCATION: NW 1/4 Sec. 4, T19S, R
			1	<u> </u>	COM)	FIELD REP.: J. Fergerson
			1	Depth					FILE NAME: /GPM/HOBBS\logs.xls fenceline and 40 feet north of south fenceline.
			1	Depth					LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GR.
			CL		Sample Time	Туре	PID	DEPTH	SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATUR
				0	1415	Surface	0	ļ	Silty clay, dk brown, sl moist, no odor.
									Caliche, white-yellow-tan, weathered-dense, no odor, with vf
	Cemer			5	1422	Cuttings	0	5	grain sand in matrix.
	ຍ								
			CAL/S						
			М	10	1427	Cuttings	0	10	
									4
				15	1434	Cuttings	о	15	
									Caliche, white-yellow-tan, weathered-dense, sl odor, with sl gray staining in matrix and interbedded with mod-well
	Plug	ĺŤ <u></u> ŧŤ _Ŧ Ť _Ŧ	CAL/S S						cemented sandstone.
		-		20	1442	Cuttings	o	20	
	e Hole								Sand, vf grain, tan-lt brown, no odor, unconsol, interbedded with mod-well cemented sandstone.
	Bentonite								
			sw	25	1453	Cuttings	0	25	
	8								
									Sand, vf grain, tan-lt brown, sl odor, unconsol, interbedded
				30	1506	Cuttings	0	30	with well cemented sandstone.
		\$. \$. \$.\$.\$.\$.\$.						 	
	ĺ								
	-		sw	35	1515	Cuttings	0	35	
									· · ·
				38		Cuttings	9.1		
	ļ			40	1527	Cuttings	120.5	40	Groundwater @ 41 feet Sand, vf grain, tan-tt brown-dk gray, v moist, strong odor,
	뇡								unconsol with dk gray staining in matrix and interbedded
	ц. 1								with well cemented sandstone.
	Sand							45	
۲ انتخا ب ا	g		sw						
	12/20	;;;;;;;;;;;;;	300					50	
	ļ	*****						55	Bottom of well @ 56 feet
1 1									_
+									TD @ 58 feet

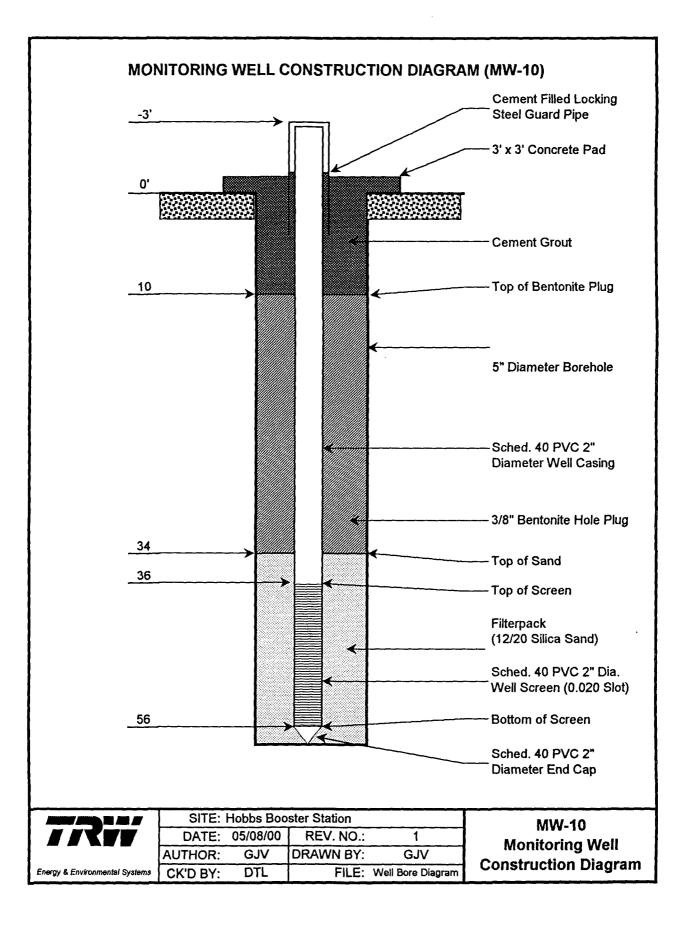
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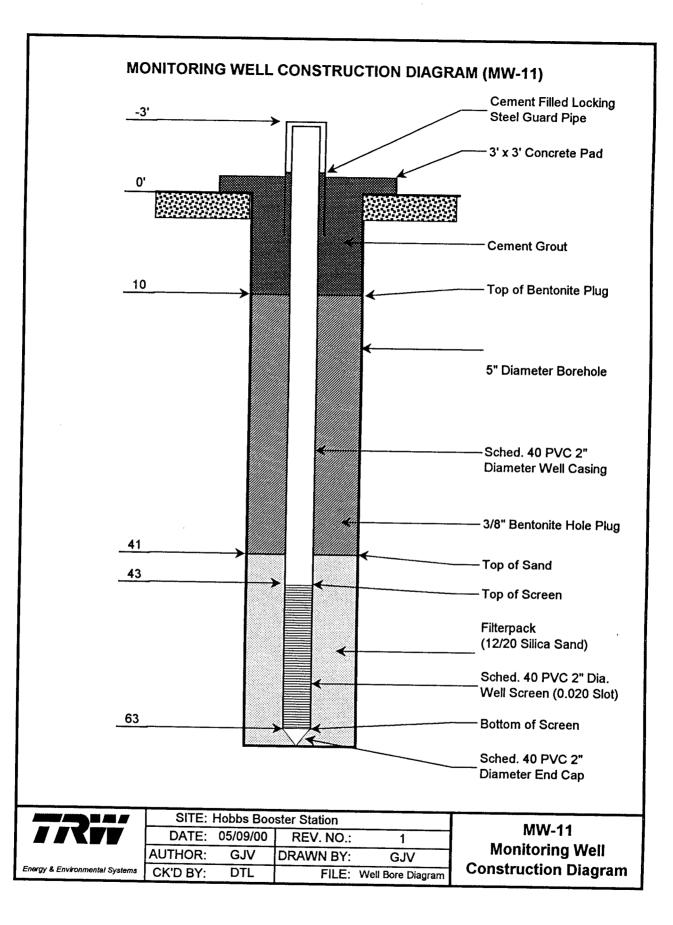
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					7		TOR WE	ELL NO.:	MW -11		ORING WELL) TOTAL DEPTH: 63 Feet
		7	Ľ				1	SITE ID: /ATION:	Hobbs E	Booster Sta	ation CLIENT: DEFS/GPM Gas Corp. COUNTY: Lea
		WES					CONTR	ACTOR:	Diversifi	ed Water	Well Drilling STATE: New Mexico
	-	UITE				DRIL		ETHOD:			LOCATION: NW 1/4 Sec. 4, T195, R
M	IDLA	ND, I	E E	CAS 79701		сом		T DATE: N DATE:			FIELD REP.: J. Fergerson FILE NAME: /GPM/HOBBSVogs.xls
							COM	MENTS:	138 feet	west of ea	ast fence line and 135 feet north of south fenceline.
			Т				Sample			DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GR
-			-		USCS	Depth 0	Time 1130	Type Surface	PID 0	 	SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATUR Silty clay, dk brown, sl moist, no odor.
					<u> </u>	-			-		Caliche, white-yellow-tan, weathered-dense, no odor, with vf
			Erou Crou			i I	[grain sand in matrix.
		0000000	N		CAL/S	5	1135	Cuttings	0	5	
			Cement		M	ĺ	ļ	{			
			อิ			l	ļ				
				<u></u>		4.0		0.44	400 -		1
			-		┟───┤	10	1139	Cuttings	123.2	10	Caliche, white-yellow-tan, weathered-dense, good odor, with
				<u></u> _							ví grain sand in matrix.
					CAL/S		1				4
					M	15	1144	Cuttings	0	15	
¥										J	4
Slan											
S					CAL/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
d Q				1.	s	20		Cullings	16.1		sandstone.
2-inch Sched 40 PVC Blank		1	2	液液液							Sand, vf grain, white-tan-It brown, sl odor, unconsol,
Sch			Hole Flug]			}	interbedde with mod-well cemented sandstone.
C-			Î 0			25	1158	Cuttings	22.1	25	
2-ir				444444			l			 	
			pentontte		sw						
			ŝ		300	30	1207	Cuttings	69.6	- 30	
				444444				J J.			
			1000								
						05	1011		400.0		
				<u></u>		35	1214	Cuttings	132.3	35	Sand, vf grain, white-tan-lt brown, sl moist, sl odor, unconsol
			1000								Interbedded with well cemented sandstone.
				******							· ·
					sw	40	1223	Cuttings	41.2	40	
			-								
											
1						45	1231	Cuttings	77.1	- 45	Sand, vf grain, tan-lt brown, good odor, unconsol,
											interbedded with well cemented sandstone.
e			g	3333333		47	1240	Cuttings	115.0		Groundwater Encountered @ 47 Feet
Scr			ġ								
fed			8.	******						50	4
틿											1
0.020-inch Slotted Screen			12/20 Silica Sand Pack		SW	i					
Į			2	*****						55	
ö											
			No. of the local sector of								
				44444			i i				
										60	Sand of grain tan it brown wat good adar upgenesi
0.020				555555	sw						Sand, vf grain, tan-lt brown, wet, good odor, unconsol, interbedded with well cemented sandstone.
0	57	6	0 []							·	TD @ 63 Feet

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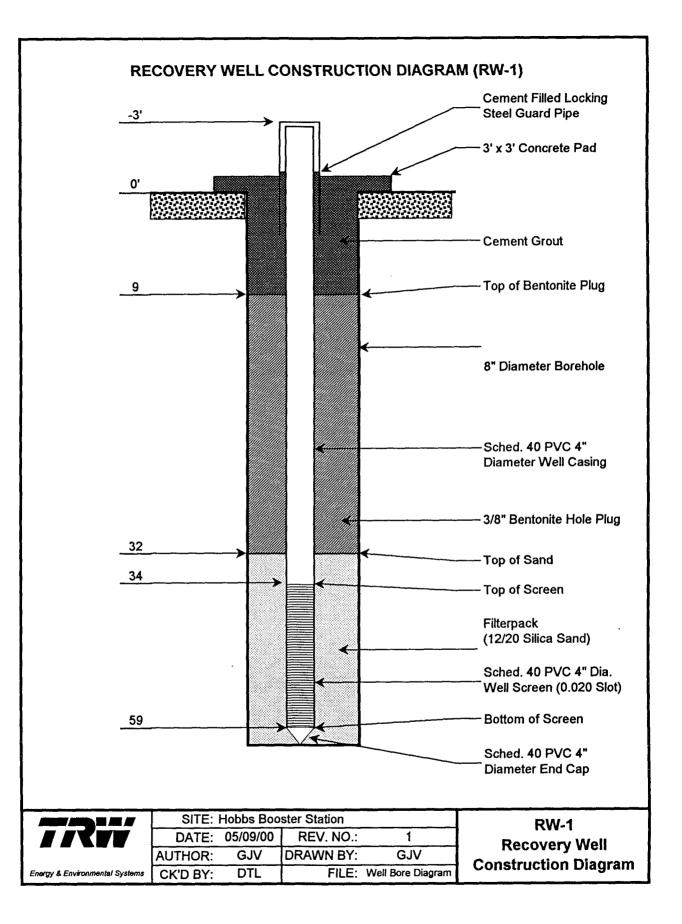


				,	LITH	IOLOC	GIC LC)G (RE	COVE	RY WELL, RW-1)
	415 W SUI	EST TE 1			SURFA	CE ELEN CONTRA LING MI STAR PLETION	/ATION: ACTOR: ETHOD: T DATE: N DATE:	Hobbs B 3621.40 Diversifi Air Rota 05/08/00 05/09/00	ed Water ly)	COUNTY: Lea Nell Drilling LOCATION: NW 1/4 Sec. 4, T19S, R38 FIELD REP.: J. Fergerson FILE NAME: /GPM/HOBBSVogs.xls
 Г				1		Sample			DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAI
			LITH.	USCS CL	Depth 0	Time 1615	Type Surface	PID 0		SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURE: Silty clay, dk brown, sl moist, no odor.
		Cement Grout		CAL/SM	5	1621	Cuttings		5	Caliche, white-yellow-tan, weathered-dense, no odor, with vf grain sand in matrix.
PVC Blank				CAL/SM	15	1632	Cuttings		10	Caliche, white-yellow-tan, weathered-dense, sl odor, with vf grain sand in matrix.
4-inch Sched 40 PV		nite Hole Plug		CAL/SS	20	1637	Cuttings		20	Caliche, white-yellow-tan, weathered-dense, sl odor, interbedded with mod-well cemented sandstone.
4-ir		3/8 Bentonite		sw	25	1644	Cuttings	3.7	25	Sand, vf grain, tan-It brown, sl odor, unconsol, interbedded with mod-well cemented sandstone.
					30	1650	Cuttings	0.5	30	Sand, vf grain, tan-lt brown, sl odor, unconsol, interbedded
				sw	35	1702	Cuttings	8.8		with well cemented sandstone. Sand, vf grain, tan-lt brown, strong odor, v moist, unconsol,
			1466666	SW	40	1715	Cuttings	142.6	40	interbedded with well cemented sandstone. Sand, vf grain, tan-lt brown, strong odor, v moist, unconsol,
ted Screen		a Sand Pack		sw	45		Cuttings	320.6	45	interbedded with well cemented sandstone. Groundwater @ 42 Feet
0.020-inch Slotted				SW					50	Sand, vf grain, tan-It brown, strong odor, wet, unconsol, interbedded with well cemented sandstone. TD @ 60 Feet

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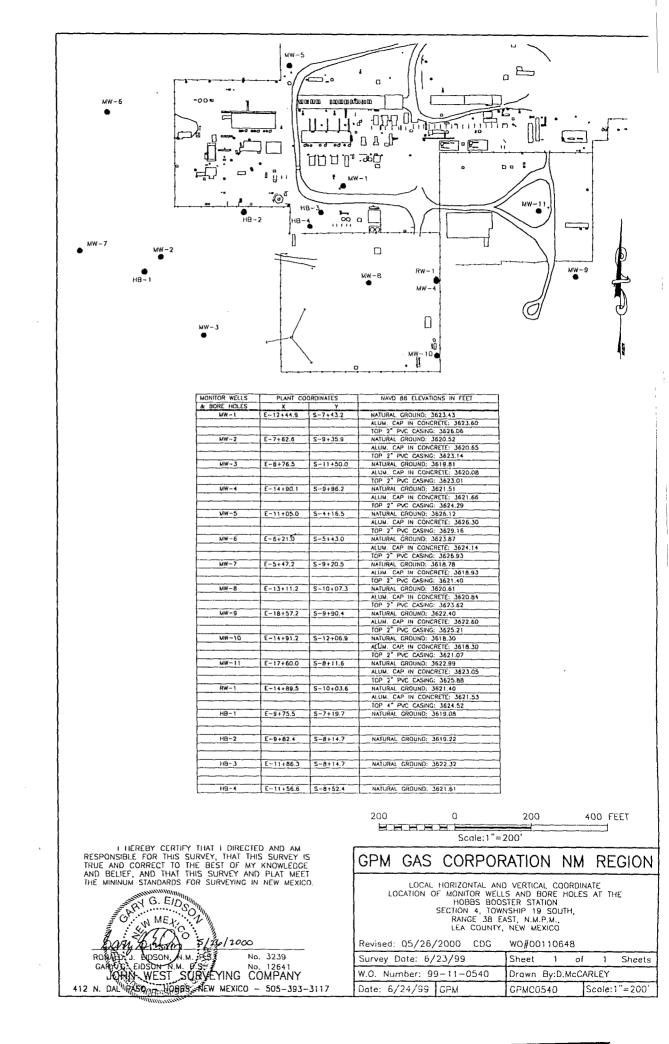
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Appendix **B**

Survey Plat of Hobbs Booster Station



Appendix C

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Water Well Inventory

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0.00 56.00 56	railLifs FEIND CO	382 04 0324 65	122 195 172 195	195 36E 04	11 16 1946 LIC FPP	2 07 L 00230
0.00 56.00 56	PHILLIPS PETRO CO	38E 04 0354 65	121 195	175 38E 04	11 16 1946 LIC PPP	07
0.00	PHILLIPS PETRO CO	38E 04 0364 65	113 195	195 38E 04	11 15 1946 LIC FFP	07 L 00229
0.00 3.00 0	A-WELDERS & SUPFLY	38E 04 0780 65	115 175	195 JEE 04	<u>0) 23 1780 Phi Dic</u>	07 E 0801/
0.00 51.00 53	PHILLIPS PETRO CO	38E 04 0344 65	112 195	195 JEE 04	11 14 1946 LIC PPP	07 L 00227
0.00 0.00 0	PHILLIPS PETROLEUM	JBE 04 65	1110 195	195 38E 04	04 27 1976 PMT CPS	97 L 07540
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0.00 3.00	JR BARRON DAVE	03 0764 65	1	38£	PAT	07 L 02570
5.00 0		1 60	444 195	195 38E 03	ANY TAXABLE IN THE PART OF A STATE OF A	07 L - 01626
0.00 3.00 0	WILLIAMS KERNEIN E	. JAE 03 0654 65	561 111	195 38E 03	09 29 1952 PAI DUN	07 L 01279
3.00	THOMASSON RONALD N		4430 195	网络小白小鸡	400 I.N. 1161 I.S. 11	07 L 07297
3.00 0	HALL RALPH	J8E - 0). 0E54 65	443 195	195 38E 03	NOV TRADE STATES IN THE STATES AND A STATE	07 L 03330
0.00 3.00 d	NCANALLY JESS J	38E 03 0464 65	561 745	195 Jae 03	10 15 1952 PAT UUA	07 T 01593
0.00 0.00 0	N L J DRILLING CO	38E 03 0864 63	MI 195	195 JEE 03	05 12 1955 PMT 000	07 L 02863
0.00 0.00 0	PRITCHARD EIRA	38E 03 0771 65	440 195	195 38E 03	08 22 1969 PMT DOM	07 E06578 L
0.00 3.00 0		38E US U/65 65	440 195	195 38 03	No. 25 1965 PM DOM: 00 00 00 00 00 00 00 00 00 00 00 00 00	J L 05642
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	ELLIDIT DOWALD	38E 03 0977 65	4ZI 195	195 38E 03	HUO 1K4 1771 21 40	17 L 07758
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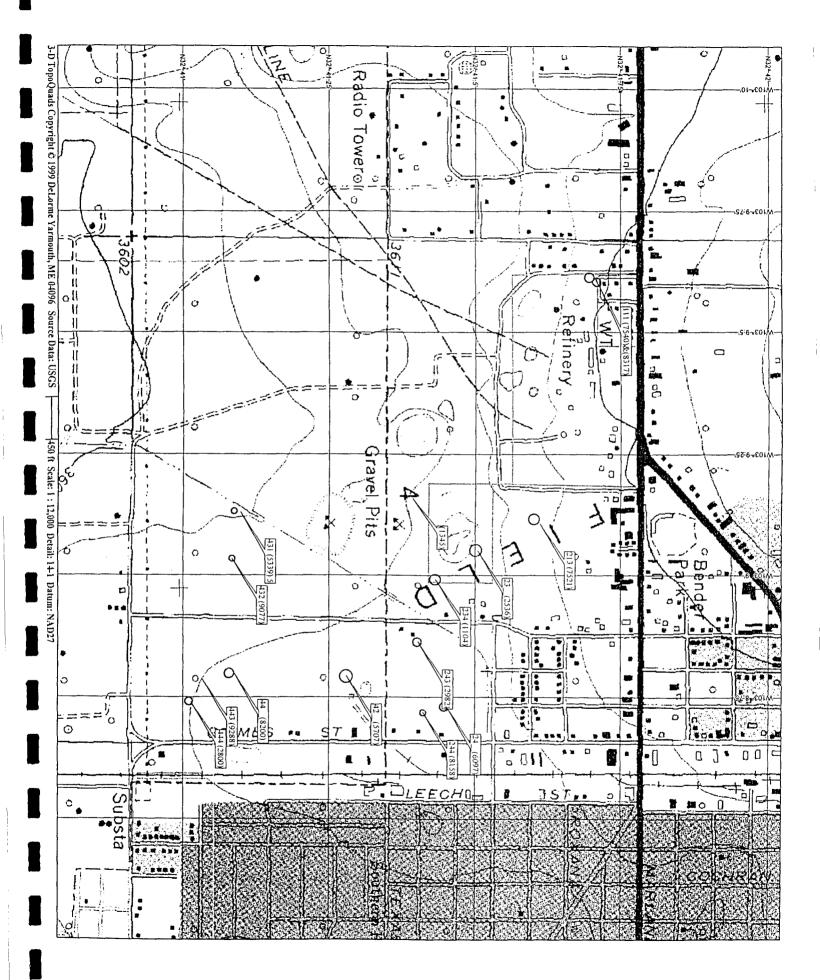
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Appendix D

Laboratory Analytical Reports and Chain-of-Custody Documentation

6701 Aberdeen Avenue, Suite 9 4725 Ripley Avenue, Suite A

Lubbock, Texas 79424 800 • 378 • 1296 El Paso, Texas 79922 E-Mail: lab@traceanalysis.com

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888 • 588 • 3443

806 • 794 • 1296 FAX 806 • 794 • 1298 915 • 585 • 3443 FAX 915 • 585 • 4944

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

I

Analytical Results Report

Sample Number:	146084
Description:	MW-7 (0005110930)

Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
<0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02318	QC02723	0.001
<0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02318	QC02723	0.001
<0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02318	QC02723	0.001
<0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02318	QC02723	0.001
< 0.005	5	S 8021B	5/18/00	5/18/00	RC	PB02318	QC02723	0.001
Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #	
0.564	5	0.1	113	72 - 128	RC	PB02318	QC02723	
0.592	5	0.1	118	72 - 128	RC	PB02318	QC02723	
	<0.005 <0.005 <0.005 <0.005 <0.005 <0.005 Result 0.564	<0.005 5 <0.005 5 <0.005 5 <0.005 5 <0.005 5 Result Dilution 0.564 5	Result Dilution Method <0.005	Result Dilution Method Prepared <0.005	Result Dilution Method Prepared Analyzed <0.005	Result Dilution Method Prepared Analyzed Analyst <0.005	Result Dilution Method Prepared Analyzed Analyst Batch # <0.005	Result Dilution Method Prepared Analyzed Analyst Batch # Batch # <0.005

Sample Number: Description:

146085 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 sil	t in the ma	trix.						
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	

Report Date: 5/24/00

GPM Gas Corp

Order ID Number: A00051302 P/G494/3AC

Page Number: 3 of 9 Hobbs Booster Station

Sample Number: 146087 Description: MW-1 (0005

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 Dilutio	Analytical n 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
		Spike	%	% Rec.		Prep	QC	
Surrogate (mg/L)	Result Dilution		Rec.	Limit	Analyst	Batch #	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	2 (0005111350)								
Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)	<u></u>								
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) TFT 4-BFB	Result 0.976 1.01	Dilution 1 I	Spike Amount 0.1 0.1	% Rec. 98 101	% Rec. Limit 72 - 128 72 - 128	Analyst RC RC	Prep Batch # PB02317 PB02317	QC Batch # QC02721 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

Report Date: 5/24/00 GPM Gas Corp	Order ID N P/G494/3A		-	Number: s Booster S				
Total BTEX	1.94 50	S 8021B	5/22/00	5/22/00	RC	PB02362	QC02769	0.001
Surrogate (mg/L) TFT 4-BFB	Result Dilution 4.17 50 4.45 50	Spike Amount 0.1 0.1	% Rec. 83 89	% Rec. Limit 72 - 128 72 - 128	Analyst RC RC	Prep Batch # PB02362 PB02362	QC Batch # QC02769 QC02769	

Sample Number: 146091 Description: Duplica

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: 146

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	. بورS 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
		Dilation		Tiepareu	Analyzed				
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
			Spike	%	% Rec.		Prep	QC	
Surrogate (mg/L)	Result	Dilution	Amount	Rec.	Limit	Analyst	Batch #	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	

Order ID Number: A00051302 P/G494/3AC

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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
			Spike	%	% Rec.	QC
Surrogate		Result	Amount	Rec.	Limit	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
			Spike	%	% Rec.	QC
Surrogate		Result	Amount	Rec.	Limit	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
<u> </u>		- ·	Spike	%	% Rec.	QC
Surrogate		Result	Amount	Rec.	Limit	Batch #
TFT (mg/L)		0.093	0.1	93 97	72 - 128 72 - 128	QC02769 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
			Spike	%	% Rec.	QC
Surrogate		Result	Amount	Rec.	Limit	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

р	aram	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec. 1	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCS N	1TBE (mg/L)	< 0.001	1	0.1	0.105	105		80 - 120	-	QC02721
LCS B	enzene (mg/L)	< 0.001	1	0.1	0.101	101		80 - 120	-	QC02721
LCS T	oluene (mg/L)	<0.001	1	0.1	0.102	102		80 - 120	-	QC02721
LCS E	thylbenzene (mg/L)	<0.001	1	0.1	0.097	97		80 - 120	-	QC02721
LCS M	1,P,O-Xylene (mg/L)	< 0.001	1	0.3	0.286	95		80 - 120	-	QC02721
Standard LCS - LCS	Surrogate TFT (mg/L) 4-BFB (mg/L)		Dil. 1 1	Spike Amount 0.1 0.1	Result 0.098 0.101	% Rec. 98 101		% Rec. Limit 72 - 128 72 - 128		QC Batch # QC02721 QC02721
LCSD N	ATBE (mg/L)	<0.001	1	0.1	0.1	100	5	-	0 - 20	QC02721
LCSD B	Benzene (mg/L)	<0.001	1	0.1	0.098	98	3	-	0 - 20	QC02721
LCSD T	`oluene (mg/L)	<0.001	1	0.1	0.098	98	4	-	0 - 20	QC02721
LCSD E	Cthylbenzene (mg/L)	< 0.001	1	0.1	0.094	94	3	-	0 - 20	QC02721
LCSD N	A,P,O-Xylene (mg/L)	<0.001	1	0.3	0.277	92	3	-	0 - 20	QC02721
Standard LCSD LCSD	Surrogate TFT (mg/L) 4-BFB (mg/L)		Dil. 1 1	Spike Amount 0.1 0.1	Result 0.096 0.098	% Rec. 96 98		% Rec. Limit 72 - 128 72 - 128		QC Batch # QC02721 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
Standar LCS LCS	rd Surrogate TFT (mg/L) 4-BFB (mg/L)		Dil. 1 1	Spike Amount 0.1 0.1	Result 0.082 0.082	% Rec. 82 82		% Rec. Limit 72 - 128 72 - 128		QC Batch # QC02723 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		< 0.001	1	0.3	0.259	86	6	-	0 - 20	QC02723
Standar LCSD LCSD			Dil. 1 1	Spike Amount 0.1 0.1	Result 0.086 0.086	% Rec. 86 86		% Rec. Limit 72 - 128 72 - 128		QC Batch # QC02723 QC02723

Report	Date: 5/24/00	Order ID N	lumber	: A000513	302			Pa	ge Numb	er: 7 of 9
GPM (Gas Corp	P/G494/37	AC					Hol	bbs Boos	ter Station
	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	-	QC0276
LCS	Benzene (mg/L)	< 0.001	1	0.1	0.095	95		80 - 120	-	QC0276
LCS	Toluene (mg/L)	< 0.001	1	0.1	0.1	100		80 - 120	-	QC0276
LCS	Ethylbenzene (mg/L)	< 0.001	1	0.1	0.098	98		80 - 120	-	QC0276
LCS	M,P,O-Xylene (mg/L)	< 0.001	1	0.3	0.303	101		80 - 120	-	QC0276
				Spike		%		% Rec.		QC
Standar	0		Dil.	Amount	Result	Rec		Limit		Batch #
LCS	TFT (mg/L)		1	0.1	0.09	90		72 - 128		QC0276
LCS	4-BFB (mg/L)		1	0.1	0.096	96		72 - 128		QC0276
LCSD	MTBE (mg/L)	<0.001	1	0.1	0.098	98	5	-	0 - 20	QC0276
lCSD	Benzene (mg/L)	< 0.001	1	0.1	0.098	98	3	-	0 - 20	QC0276
LCSD	Toluene (mg/L)	< 0.001	1	0.1	0.102	102	2	-	0 - 20	QC0276
LCSD	Ethylbenzene (mg/L)	< 0.001	1	0.1	0.101	101	3	-	0 - 20	QC0276
LCSD		< 0.001	1	0.3	0.312	104	3	-	0 - 20	QC0276
				Spike		%		% Rec.		QC
Standar	-		Dil.	Amount	Result	Rec		Limit		Batch #
LCSD LCSD	TFT (mg/L) 4-BFB (mg/L)		1	0.1 0.1	0.088 0.096	88 96		72 - 128 72 - 128		QC0276 QC0276
				Spike	Matrix			<u> </u>		
		Blank		Amount	Spike	%		% Rec.	RPD	QC
	Param	Result	Dil.	Added	Result	Rec.	RPD	Limit	Limit	Batch #
LCS	MTBE (mg/L)	< 0.001	1	0.1	0.092	92		80 - 120	-	QC0279
LCS	Benzene (mg/L)	<0.001	1	0.1	0.093	93		80 - 120	-	QC0279
LCS	Toluene (mg/L)	< 0.001	1	0.1	0.098	98		80 - 120	-	QC0279
				0.1	0.096	96		80 - 120	-	QC0279
LCS	Ethylbenzene (mg/L)	< 0.001	1	0.1	0.070					
LCS	Ethylbenzene (mg/L) M,P,O-Xylene (mg/L)	<0.001 <0.001	1 1	0.3	0.298	99		80 - 120	-	QC0279
LCS LCS	M,P,O-Xylene (mg/L)		1		0.298	99 %		% Rec.	-	QC
LCS LCS Standar	M,P,O-Xylene (mg/L) d Surrogate		1 Dil.	0.3 Spike Amount	0.298 Result	% Rec		% Rec. Limit	-	QC Batch #
LCS LCS Standar LCS	M,P,O-Xylene (mg/L) d Surrogate TFT (mg/L)		1 Dil. 1	0.3 Spike Amount 0.1	0.298 Result 0.089	% Rec 89		% Rec. Limit 72 - 128	-	Batch # QC0279
LCS LCS Standar LCS	M,P,O-Xylene (mg/L) d Surrogate		1 Dil.	0.3 Spike Amount	0.298 Result	% Rec		% Rec. Limit	-	QC Batch # QC0279
LCS LCS Standar LCS LCS	M,P,O-Xylene (mg/L) d Surrogate TFT (mg/L)		1 Dil. 1	0.3 Spike Amount 0.1	0.298 Result 0.089	% Rec 89	0	% Rec. Limit 72 - 128	- 0 - 20	QC Batch # QC0279 QC0279
LCS LCS Standar LCS LCS LCSD	M,P,O-Xylene (mg/L) d Surrogate TFT (mg/L) 4-BFB (mg/L)	<0.001	1 Dil. 1 1	0.3 Spike Amount 0.1 0.1	0.298 Result 0.089 0.087	% Rec 89 87		% Rec. Limit 72 - 128		QC Batch # QC0279 QC0279 QC0279
LCS LCS Standar LCS LCS LCSD LCSD	M,P,O-Xylene (mg/L) d Surrogate TFT (mg/L) 4-BFB (mg/L) MTBE (mg/L)	<0.001 <0.001	1 Dil. 1 1	0.3 Spike Amount 0.1 0.1	0.298 Result 0.089 0.087 0.092	% Rec 89 87 92	0	% Rec. Limit 72 - 128	0 - 20	QC Batch #
LCS LCS Standar LCS LCS LCSD LCSD LCSD	M,P,O-Xylene (mg/L) d Surrogate TFT (mg/L) 4-BFB (mg/L) MTBE (mg/L) Benzene (mg/L) Toluene (mg/L)	<0.001 <0.001 <0.001	1 Dil. 1 1 1	0.3 Spike Amount 0.1 0.1 0.1	0.298 Result 0.089 0.087 0.092 0.094	% Rec 89 87 92 94	0 1	% Rec. Limit 72 - 128	0 - 20 0 - 20	QC Batch # QC0279 QC0279 QC0279 QC0279 QC0279
LCS LCS Standar LCS LCS LCSD LCSD LCSD	M,P,O-Xylene (mg/L) d Surrogate TFT (mg/L) 4-BFB (mg/L) MTBE (mg/L) Benzene (mg/L) Toluene (mg/L)	<0.001 <0.001 <0.001 <0.001	1 Dil. 1 1 1 1 1	0.3 Spike Amount 0.1 0.1 0.1 0.1	0.298 Result 0.089 0.087 0.092 0.094 0.099	% Rec 89 87 92 94 99	0 1 1	% Rec. Limit 72 - 128	0 - 20 0 - 20 0 - 20	QC Batch # QC0279 QC0279 QC0279 QC0279 QC0279 QC0279
LCS LCS Standar LCS LCSD LCSD LCSD LCSD LCSD	M,P,O-Xylene (mg/L) d Surrogate TFT (mg/L) 4-BFB (mg/L) MTBE (mg/L) Benzene (mg/L) Toluene (mg/L) Ethylbenzene (mg/L) M,P,O-Xylene (mg/L)	<0.001 <0.001 <0.001 <0.001 <0.001	1 Dil. 1 1 1 1 1 1	0.3 Spike Amount 0.1 0.1 0.1 0.1 0.1	0.298 Result 0.089 0.087 0.092 0.094 0.099 0.097 0.304	% Rec 89 87 92 94 99 97	0 1 1 1	% Rec. Limit 72 - 128	0 - 20 0 - 20 0 - 20 0 - 20 0 - 20	QC Batch # QC0279 QC0279 QC0279 QC0279 QC0279 QC0279 QC0279 QC0279 QC0279
LCS LCS Standar LCS LCSD LCSD LCSD LCSD LCSD Standar	M,P,O-Xylene (mg/L) d Surrogate TFT (mg/L) 4-BFB (mg/L) MTBE (mg/L) Benzene (mg/L) Toluene (mg/L) Ethylbenzene (mg/L) M,P,O-Xylene (mg/L) d Surrogate	<0.001 <0.001 <0.001 <0.001 <0.001	1 Dil. 1 1 1 1 1 1 1 1 1 0 1.	0.3 Spike Amount 0.1 0.1 0.1 0.1 0.1 0.1 0.3 Spike Amount	0.298 Result 0.089 0.087 0.092 0.094 0.099 0.097 0.304 Result	% Rec 89 87 92 94 99 97 101 % Rec	0 1 1 2	% Rec. Limit 72 - 128 72 - 128 - - - - - % Rec. Limit	0 - 20 0 - 20 0 - 20 0 - 20 0 - 20	QC Batch # QC0279 QC0279 QC0279 QC0279 QC0279 QC0279 QC0279 QC0279 QC0279 QC0279
LCS LCS Standar LCS LCSD LCSD LCSD LCSD LCSD	M,P,O-Xylene (mg/L) d Surrogate TFT (mg/L) 4-BFB (mg/L) MTBE (mg/L) Benzene (mg/L) Toluene (mg/L) Ethylbenzene (mg/L) M,P,O-Xylene (mg/L)	<0.001 <0.001 <0.001 <0.001 <0.001	1 Dil. 1 1 1 1 1 1	0.3 Spike Amount 0.1 0.1 0.1 0.1 0.1 0.1 0.3 Spike	0.298 Result 0.089 0.087 0.092 0.094 0.099 0.097 0.304	% Rec 89 87 92 94 99 97 101 %	0 1 1 2	% Rec. Limit 72 - 128 72 - 128 - - - - - - - - - - - - % Rec.	0 - 20 0 - 20 0 - 20 0 - 20 0 - 20	QC Batch # QC0279 QC0279 QC0279 QC0279 QC0279 QC0279 QC0279 QC0279 QC0279

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 I	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 I	Ethylbenzene (mg/L)		0.1	0.08	80	80 - 120	5/18/00	QC02723
CCV I	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)	<u> </u>	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 I	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
			0.1				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 I	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

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Energy & Environment: 415 West Wall St. Suit Midland, Texas 79701	Energy & Environmental Systems 415 West Wall St. Suite. 1818 Midland, Texas 79701								٥١ Z	13507]
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Sàmple Identification Matrix	Date Time		NOC HVd		סצכ						IDAL
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MW-6 (000511 1030) Water	- S/11/00 1030	1						5		3	
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(0005111350)	~ 5/11/00 1350	.7						× 4		3	
	Slidon 1450	~_						0		m	~
Doplicate (Das 11 1520) Water		2						1/0/		m	
	Slilloo 1610	7						60		3	
Trip Blank (729A+779A) Water		5						1		7	
Project Information	Sample Receipt	-	Relinquished By:	(1)	Relinquished By	By: I ^ 0.		(2) Rel	Relinquished By:	(3)	
Project Name: 6PM Gas Corp	Total Containers:		White ar	1640	Helling	ON LUT	19	~ ~			
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Cost Center No.: P/L444/3 #C	Conforms to Records:		(Company)		(Company)			<u>e</u>	(Company)		
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Appendix E

Photodocumentation

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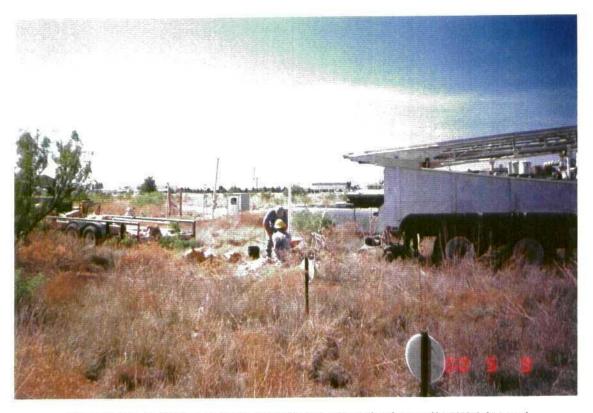
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View facing west showing drilling operations at upgradient monitoring well MW-7.



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 (cast) 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.



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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





July 28, 1999

TRW Systems & Information 415 West Wall Street, Suite 1818 **Technology Group**

Midland, TX 79701

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 splitspoon 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 2inch 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	· · · · · · · · · · · · · · · · · · ·		
	S	ummary of BTEX	and TPH Co	ncentrations in Soil	Borings	
		GP	M Hobbs Boos	ster 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
1111-1	42	< 0.050	< 0.050	< 0.050	< 0.050	254
MW-2	15	< 0.050	< 0.050	< 0.050	< 0.050	< 10
101 00 -2	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
101 00 - 5	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
	-	alysis, Inc., Lubbock, Texa using EPA Method 8021B.				

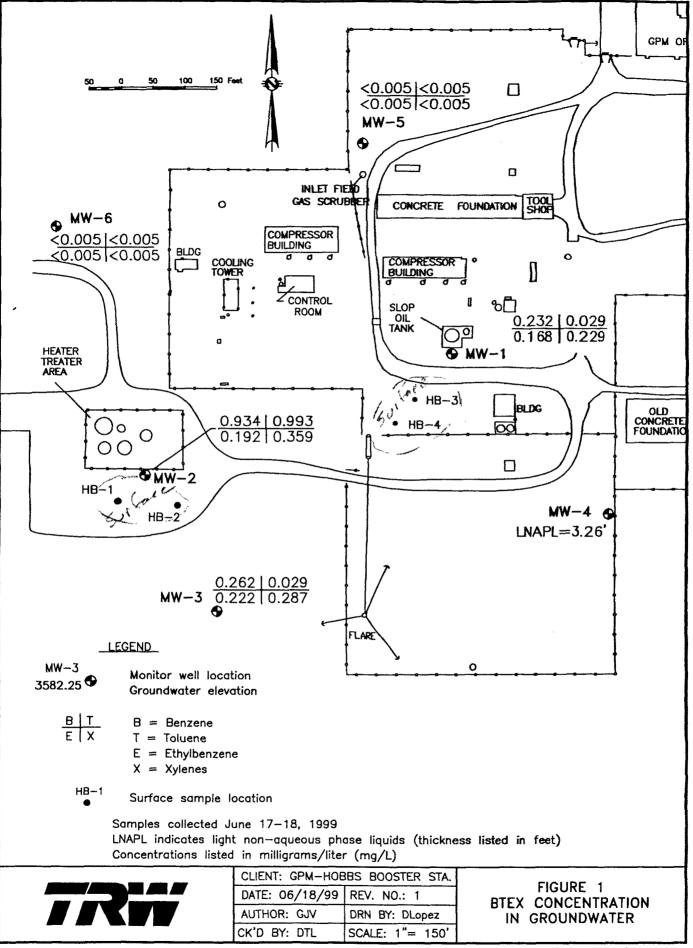
Values in boldface type indicate concentrations exceed remediation action levels as specified by the NMOCD in Guidelines For Remediation of Leaks, Spills and Releases (August 13, 1993) for sites with a NMOCD ranking score greater than 19 points

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		
	Sun	imary of BTEX	Concentrations	s in Groundwater	
		Monur	nent Booster Sta	ation	
Monitoring	Sampling	Benzene	Toluene	Ethylbenzene	Xylenes
Well	Date	(mg/L)	(mg/L)	(mg/L)	(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 S	tandards	0.010	0.75	0.75	0.62
WQCC S Analyses perfor All samples ana	tandards med by Trace Ana lyzed for BTEX u	0.010 alysis, Inc., Lubbock, T ising EPA Method 802	0.75 exas. 1B.		0.62

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



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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.

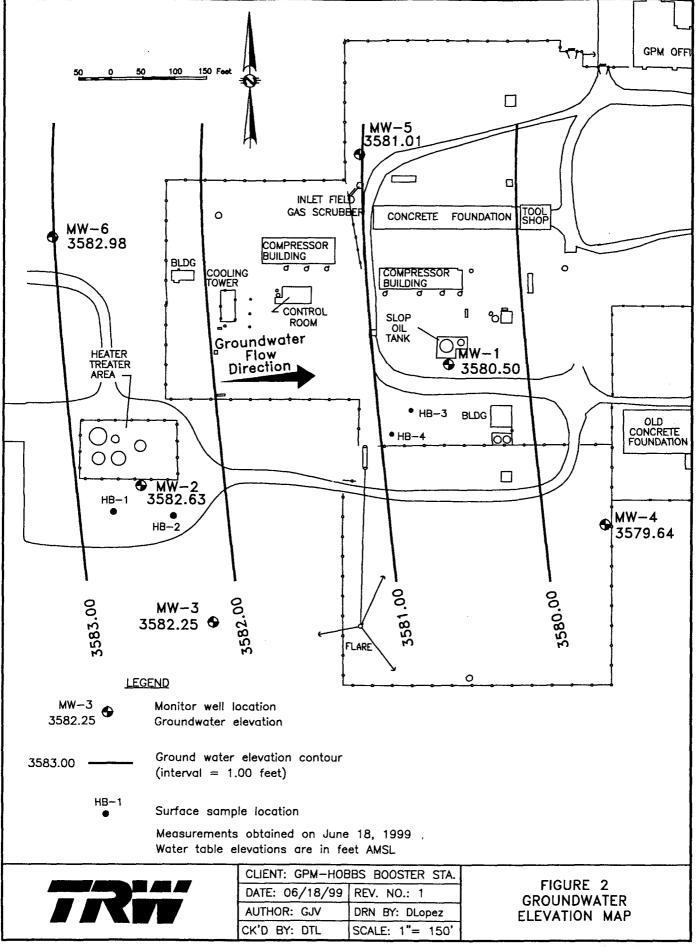
			Ta	ble 3			
		Summar	y of Groundwa	ter Level Meas	urements		
			GPM Hobbs	Booster Station			
		Ground					Corrected
		Surface	Top of Casing	Depth to	Depth to	LNAPL	Groundwater
Monitoring	Date	Elevation	Elevation	Groundwater	LNAPL	Thickness	Elevation
Well	Gauged	(feet AMSL)	(feet AMSL)	(feet AMSL)	(feet AMSL)	(feet)	(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 No	n-Aqueous Phase I	.iquid			•	·····	
AMSL = Above Me	an Sea Level						
ND = Not Detected							
		asing Elevation - Dep	pth to Groundwater +	(LNAPL Thickness x	Specific Gravity of I	NAPL)	
Specific Gravity of I	LNAPL = 0.6773						

Groundwater flow is to the east with a gradient of approximately 0.004 fl/fl.

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.



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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, Tay Dave

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

N.

						HOL	OGIC I	_OG (MONIT	ORING WELL)
		TE 1		,	MONI ^T SURFAC DRIL	TOR WE CE ELEV CONTR LING M STAR PLETIOI	ELL NO.: SITE ID: /ATION: ACTOR: ETHOD: T DATE: N DATE:	MW - 1 GPM - H 3623.60 Diversifie Air Rotai 06/ 06/	lobbs Boo ed Water 15/99 15/99	TOTAL DEPTH: 57 Feet ster Station CLIENT: GPM Gas Corp. COUNTY: Lea Well Drilling STATE: New Mexico LOCATION: NW 1/4 Sec. 4, T19S, R38E FIELD REP.: GJV FILE NAME: /GPM/Hobbs/Hobbs-Logs.xls to south side of berm surrounding slop oil tank.
			LITH.	USCS	Depth	Sample Time	Туре	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
		Cement Grout			5	0920 0945	Surface Cuttings	0	5	Caliche, light gray, indurated
diameter)		ŏ		CAL	10	0955	Split Spoon	5.8	10	Caliche, light brownish gray, hard
Casing (2-inch		plug			15	1000	Split Spoon	5.0	15	Caliche, light brownish gray, hard
Blank (hole		SS	20	1005	Cuttings	0	20	Sandstone (siliceous), pale brown, very hard stringer
Schedule 40 PVC BI		3/8 - inch bentonite		SM/SS	25	1010	Cuttings	0	25	Light brownish gray, very fine-grained calcareous sand Light brownish gray, very fine-grained calcareous sand, with very hard siliceous sandstone stringers
					30 35	1015 1020	Cuttings Split	0	30	Light brownish gray, very fine-grained calcareous sand, with very hard siliceous sandstone stringers
							Spoon			Light brown, fine-grained sand, poor to moderate sorting, subangular
न्न					40	1050	Split Spoon	0	40	Driller noted slight odor at approx. 41 feet
screen (0.020 slot)		Brady Sand)			42	1100	Cuttings	95		Groundwater encountered at approx. 43 feet
		Sandpack (8/16 Br		sw					45	Light brown, fine-grained sand, poor to moderate sorting, subangular Light brown, fine-grained sand, poor to moderate sorting,
2-inch diameter well		Sai							55	Light brown, fine-grained sand, poor to moderate sorting, subangular
									60	Bottom of boring at 57 feet below ground surface

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LITHOLOGIC LOG (MONITORING WELL)



							L .I (HOL	OGICI	LOG (DNITORING WEI	LL)	
				?		,				GPM - F	bs Booster Station	TOTAL DEPTH: 53 Feet CLIENT: GPM Gas Corp.	
'	415 WEST WALL COL							CE ELE\ CONTR	ATION:	3623.14 Diversifi	Water Well Drilling	COUNTY: Lea STATE: New Mexico	
	SUITE 1818 MIDLAND, TEXAS 79701						DRIL	LING M	ETHOD:	Air Rotary LOCATION: NW 1/4 Sec. 4, T19S, R3 06/15/99 FIELD REP.: GJV			
	m di	JAIN.	D, 1	L Eve	CAS / 9701		сом	PLETION	N DATE:	06/	06/15/99 FILE NAME: /GPM/HOBBSVogs.xls		
								COM	MENTS:	Located	acent to south side of fer	nce surrounding the heater treater area	
			7	-1				Sample				SCRIPTION: LITHOLOGY, COLOR, GRAIN	
100000			300 300			USCS	Depth 0	Time 1130	Type Surface	PID 0	Caliche, light gray	, ROUNDING, CONSOL., DIST. FEATURES	
				Groc			_						
				te			5	1140	Cuttings	23.8	5 Caliche, light gray	y, very hard	
				Cement	-4			1					
ater)						CAL			Split				
ian.				{			10	1145	Spoon	5	10 Caliche, light gray very fine-grained	y, with minor amounts of sand_hard	
Ę													
(2-ir									Calit				
Casing (2-inch diameter)				ς.			15	1155	Split Spoon	32.7	15		
k Ca				la plug		SS					Sandstone, pale l	brown, hard	
Schedule 40 PVC Blank				te hole					Solit		Light brownish gr	ay, very fine-grained calcareous sand,	
Š				inch bentonite			20	1210	Split Spoon	2.3	20 with very hard sili	iceous sandstone stringers	
40				a 4		SM							
				Ë					Calife				
Sch				3/8			25	1215	Split Spoon	1.3	25	grained calcareous sand	
				_			30	1220	Split Spoon	1.5	30 Light brown, fine-	-grained calcareous sand	
					- <u></u>								
						SM	35	1240	Split Spoon	59.7		grained calcareous sand, with very hard ne stringers, slight hydrocarbon odor	
(j				ਦ	مند مدر مدر مدر مدر مدر مدر مدر مدر								
20 s				Sand)							Groundwater enc	countered at approx. 38 feet	
0.0				Brady	<u></u>		40	1252	Split Spoon	154		grained calcareous sand, with very hard	
reer				(8/16 E							siliceous sandsto	ne stringers, slight hydrocarbon odor	
2-inch diameter well screen (0.020 slot)				Sandpack							45		
amet				San				I.			Light brownish gr	ay, fine-grained sand, moderate dr	
ц Ч													
2 Ļ						SW						ay, fine-grained sand, moderate	
											hydrocarbon odoo	ar	
\vdash		Į		_							Bottom of boring	at 53 feet below ground surface	
											55	at our fore poloning round our rado	
											60		

							•					
					LI	FHOL	OGIC I	_OG (MONIT	ORING WELL)		
	IS WES	E 18		1	SURFA DRII	CE ELE CONTR LING M STAR PLETION	ATION: ACTOR: ETHOD: T DATE: N DATE:	GPM - H 3623.01 Diversifi Air Rota 06/ 06/	ed Water V ry 15/99 16/99	TOTAL DEPTH: 53 Feet ster Station CLIENT: GPM Gas Corp. COUNTY: Lea New Mexico LOCATION: NW 1/4 Sec. 4, T19S, R38E FIELD REP.: GJV FILE NAME: /GPM/HOBBS\logs.xls ttely 250 feet southeast of heater treater area		
		-1				Sample		Localed		LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN		
		131361		USCS	Depth 0	Time 1610	Type Surface	PID 0		SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES Caliche, light gray, very hard		
		Cement Grout		CAL	5	1630	Cuttings	0	5	Caliche, light gray, very hard		
(2-inch diameter)					10	1640	Split Spoon	0	10	Caliche, light gray, with minor amounts of very fine-grained sand, hard		
Blank Casing (2-inc		hole plug		CAL /SM	15	1645	Split Spoon	0	15			
C Blar				SS	20	1700	Split	0	20	Sandstone (siliceous), pale brown, hard		
Schedule 40 PVC		- inch bentonite		CAL /SM	20	1700	Spoon	U		Caliche, light gray, with minor amounts of very fine-grained sand, less indurated		
Sche		3/8 -			25	1710	Split Spoon	0	25	Light brown, very fine-grained calcareous sand		
			<pre></pre>	SM	30	1717	Split Spoon	0	30	Light brown, very fine-grained calcareous sand		
			SARA SS			Split			Sandstone (siliceous), pale brown, hard Light brown, fine-grained calcareous sand			
slot)		8/16 Brady Sand)			35	1725	Spoon	0	35	Groundwater encountered at approx. 37 feet. ²		
2-inch diameter well screen (0.020 slot)			Brady S	Brady S	S I		SM	40	1735	Split Spoon	91	
		Sandpack							45	Light brown, fine-grained calcareous sand		
diamet		San		SS						Sandstone (siliceous), pale brown, hard		
2-inch		1100000 - 10000 - 10000 - 10000 - 100000 - 1000000 - 100000000		sw					50	Light brownish gray, fine-grained sand		
									55	Bottom of boring at 53 feet below ground surface		
									60			
		1					L		1. 00			

LITHOLOGIC LOG (MONITORING WELL)



MONITOR WELL NO.: MW - 4 SITE ID: GPM - Hobbs Booster Station SURFACE ELEVATION: 3624.29 CONTRACTOR: Diversified Water Well Drilling DRILLING METHOD: Air Rotary START DATE: COMPLETION DATE:

TOTAL DEPTH: 57 Feet LOCATION: NW 1/4 Sec. 4, T19S, R38E 06/16/99 FIELD REP .: GJV FILE NAME: /GPM/HOBBSVogs.xls 06/16/99 COMMENTS: Located approx. 350 southeast of slop oil tank area and adjacent to fence line.

CLIENT: GPM Gas Corp. COUNTY: Lea STATE: New Mexico

							COM	MENTS: -	Located	approx. 35	50 southeast of slop oil tank area and adjacent to fence line.
		_					Sample	T		DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN
den a	J 🗆	٦ L		LITH.	USCS	Depth	Time	Туре	PID		SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
				<u> </u>		0	1015	Surface	0		Caliche, light gray, very hard
			Grout	محمد محمد محمد رحمد رحمد رحمد						<u> </u>	
			ũ		CAL	5	1025	Cuttings	0	5	Caliche, light gray, very hard
			lent								
			Cement								
						10	1040	Cuttings	0	10	Caliche, light gray, with minor amounts of very fine-grained sand, hard
Ē							1040	outungo	Ū		vory mile-gramed same, mare
Ê											
dia				╧╧╧╧╧╧	CAL						
뒫					/SM	15	1050	Split	0	15	
5				التحديث تحد		15	1050	Spoon	U	15	
g											
asi			Bnld								
¥					ss	20	1055	Split	0	<u> </u>	Sandstone (siliceous), pale brown, hard
Bar			bentonite hole			20	1000	Spoon	U	20	Light brownish gray, very fine-grained calcareous sand
2			orit								Light brownish gray, very nile granica calcal cous sand
d l			ent	حد عد مد حد خد							
¥			۹ بر			25	1105	Split	0		Light brownish error way free arginal colorroous and
P			inch	علم علم علم علم علم علم	SM	25	1105	Spoon	U	25	Light brownish gray, very fine-grained calcareous sand
Schedule 40 PVC Blank Casing (2-inch diameter)			3/8 -								
S			~								
						30	1110	Split	0	30	
						30	1110	Spoon	U	30	Light brown, fine-grained sand
											Light brown, nito grained band
						35	1120	Split	•		Links Lanuar Free mained and
						35	1120	Spoon	0	35	Light brown, fine-grained sand
						. 1					
						40	1120	Split	0.4		
÷						40	1130	Spoon	9.1	40	Light brown, fine-grained sand, slight hydrocarbon odor
) slot)			Sand)					·			Groundwater encountered at approx. 42 feet 🤉
g			S Z		4						
e			rad		sw						
99			9 8		l					45	Light brown, fine-grained sand, strong hydrocarbon odor
ន្ល			(8/								
le l			Š								
Er.			g								Light because free surgices depend of the problem by dependence of the
Ē			Sandpack (8/16 Brady		ĺ					50	Light brown, fine-grained sand, strong hydrocarbon odor
dia			-/		ļ						
2-inch diameter well screen (0.010											
2											
										55	Light brown, fine-grained sand, strong hydrocarbon odor
				a one of the second							Bottom of boring at 57 feet below ground surface
									_	60	

						L17		OGIC. I	_OG (I		ORING WELL)	
м	:	SUIT	Έ18	VALL 518 KAS 79701	,	MONI SURFA DRIL	TOR WE CE ELEV CONTR LING M STAR PLETIOI	ELL NO.: SITE ID: /ATION: ACTOR: ETHOD: T DATE: N DATE:	MW - 5TOTAL DEPTH:57 FeetGPM - Hobbs Booster StationCLIENT:GPM Gas Corp.3623.87COUNTY:LeaDiversified Water Well DrillingSTATE:New MexicoAir RotaryLOCATION:NW 1/4 Sec. 4, T19S, R38E06/16/99FIELD REP.:GJV			
		-			USCS	Denth	Sample	Tuno	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN	
					0505	Depth 0	Time 1440	Type Surface	22.5		SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES Caliche, light gray, very hard	
			Cement Grout		CAL	5	1455	Cuttings	0	5	Caliche, light gray, very hard	
ameter)					CAL	10	1500	Split Spoon	0	10	Caliche, light gray, with minor amounts of very fine-grained sand, hard	
sing (2-inch di			9		/SM	15	1510	Split . Spoon	0	15		
lank Ca:			hole plug		SS	20	1515	Split Spoon	0	20	Sandstone (siliceous), pale brown, hard	
Schedule 40 PVC Blank Casing (2-inch diameter)			3/8 - inch bentonite		SМ	25	1540	Split Spoon	0	25	Light brownish gray, very fine-grained calcareous sand 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	
110 slot)			Sand)			40	1605	Split Spoon	0	40	Light brown, fine-grained sand	
l screen (0.0			Sandpack (8/16 Brady Sand)		sw					45	Groundwater encountered at approx. 45 feet	
2-inch diameter well screen (0.010 slot)			Sandpack							50	Light brown, fine-grained sand	
2-inc										55	Light brown, fine-grained sand	
				<u>, est pape 18 de 1 - 193 - 193 - 193</u>						60	Bottom of boring at 57 feet below ground surface	

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Schedule 40 PVC Blank Casing (2-inch diameter)

2-inch diameter well screen (0.010 slot)

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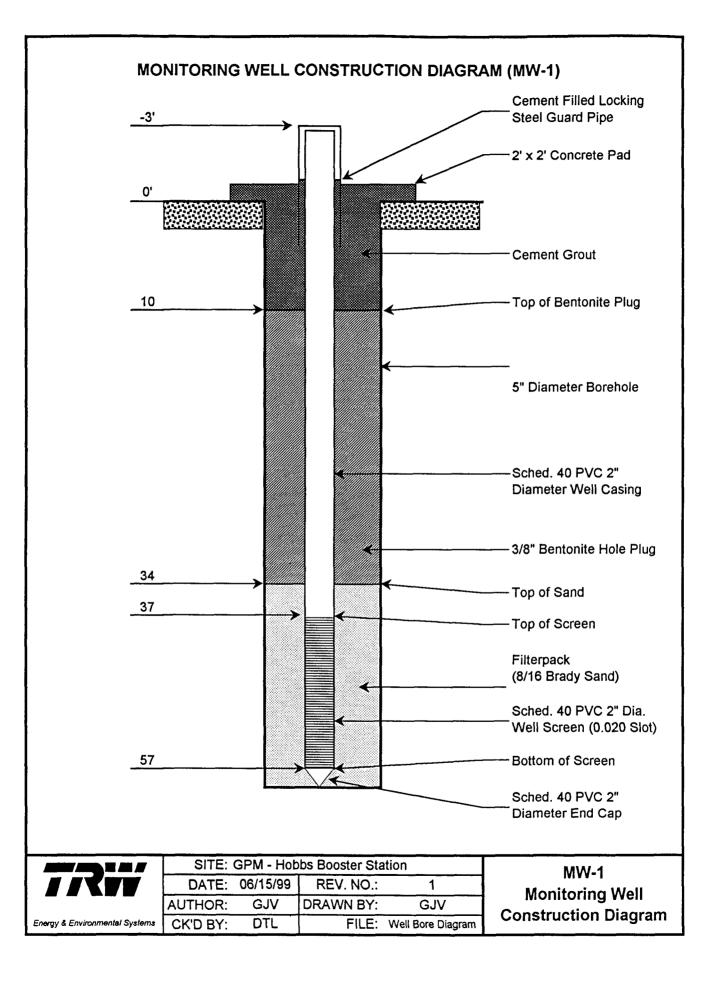
					Lľ	THOLO	DGIC I	LOG (I	MONIT	ORING WELL)
:	SUIT	E 18	VALL 118 KAS 79701		SURFA DRII	CE ELEV CONTR/ LLING ME START	ATION: ATION: ACTOR: ETHOD: DATE: I DATE:	GPM - H 3624.14 Diversifie Air Rotar 06/1 06/1	ed Water V Y 16/99 17/99	TOTAL DEPTH: 53 Feet ster Station CLIENT: GPM Gas Corp. COUNTY: Lea Lea Vell Drilling STATE: LOCATION: NWW 1/4 Sec. 4, T19S, R38E FIELD REP.: GJV FILE NAME: /GPM/HOBBSVogs.xls orthwest of heater treater area (~ 140 ft north of Altura gas well).
	71		LITH.	USCS	Depth	Sample Time	Туре	PID	DEPTH	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. FEATURES
		Cement Grout		CAL	5	1725 1730 1747	Surface Cuttings Split	0	5	Caliche, grayish orange pink, very hard
		hole plug		CAL /SM	15	1755	Spoon Split Spoon	0	15	Caliche, light gray, with minor amounts of very fine-grained sand, hard
		inch bentonite h		SS	20	1805 6-15-99	Split Spoon	o	20	Sandstone (siliceous), pale brown, hard
		3/8 - incł		SM	25	0800 6-16-99	Split Spoon	0	25	Light brownish gray, very fine-grained calcareous sand Light brown, fine-grained sand
					30	0805	Split Spoon	0	30	Light brown, fine-grained sand
		(p		sw	35	0812	Split Spoori	0	35	Light brown, fine-grained sand
		Sandpack (8/16 Brady Sand)			40	0820	Split Spoon	91	40	Groundwater encountered at approx. 38 feet
		Sandpack	> > <td>SS</td> <td></td> <td></td> <td></td> <td></td> <td>45</td> <td>Sandstone (siliceous), pale brown, hard</td>	SS					45	Sandstone (siliceous), pale brown, hard
				sw					50	Light brown, fine-grained sand
									55 60	Bottom of boring at 53 feet below ground surface

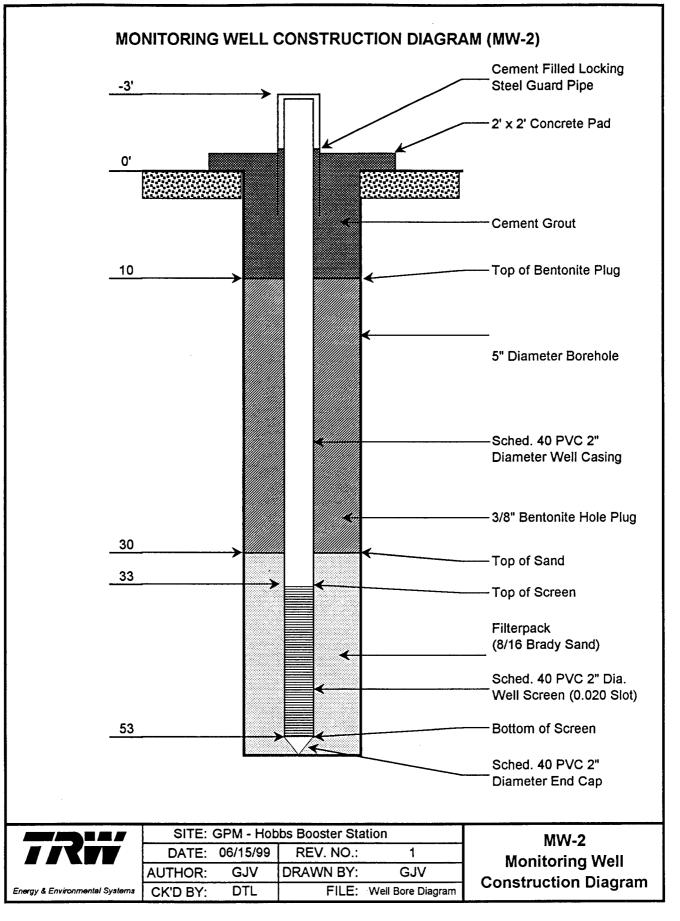
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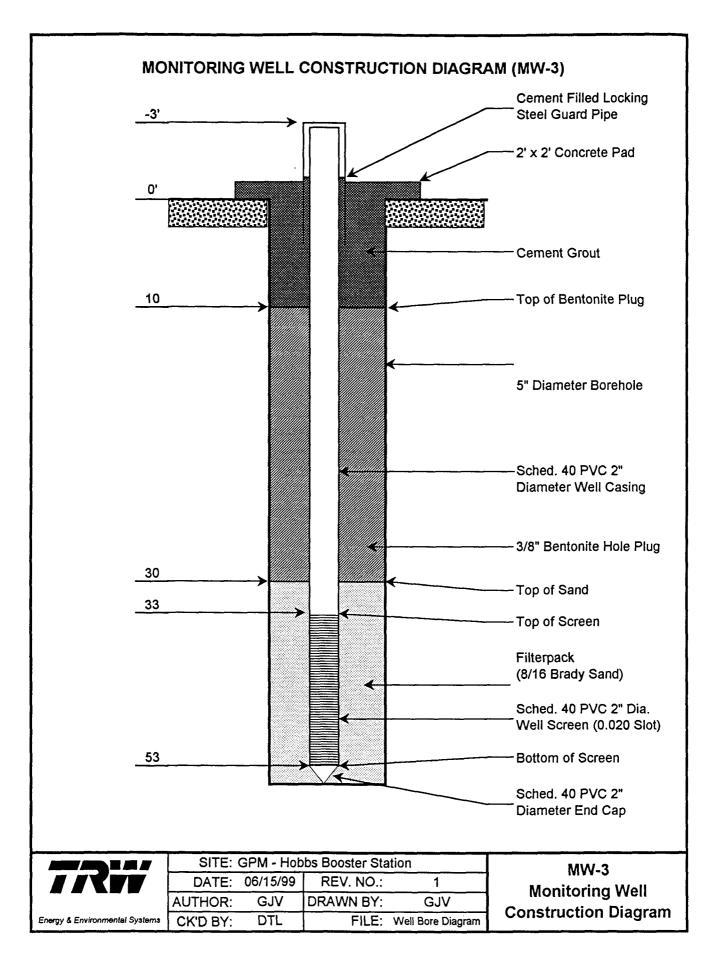
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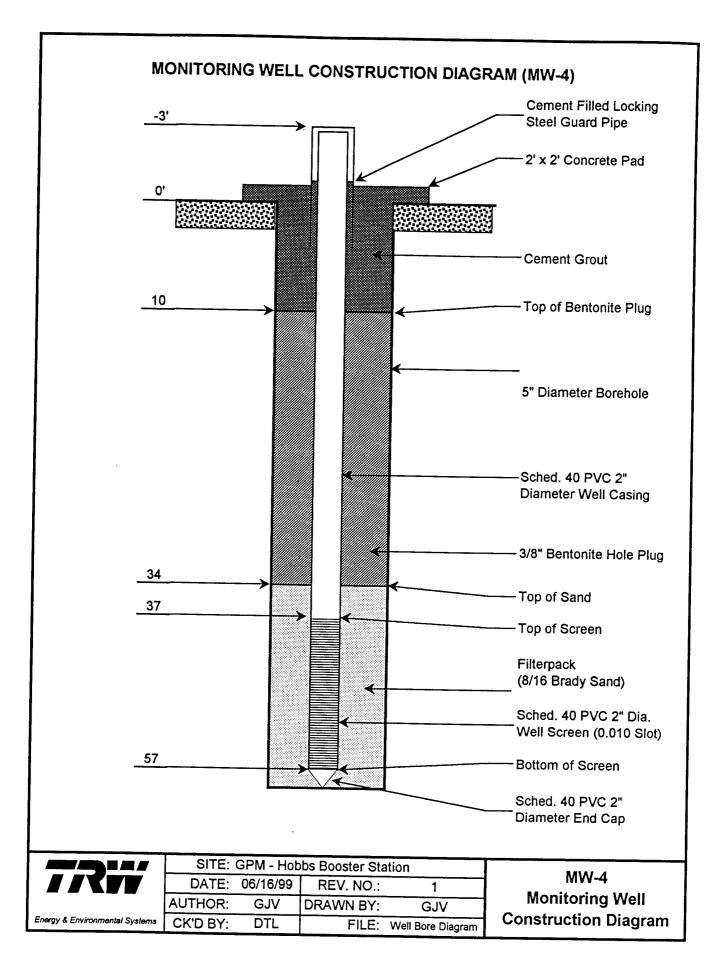
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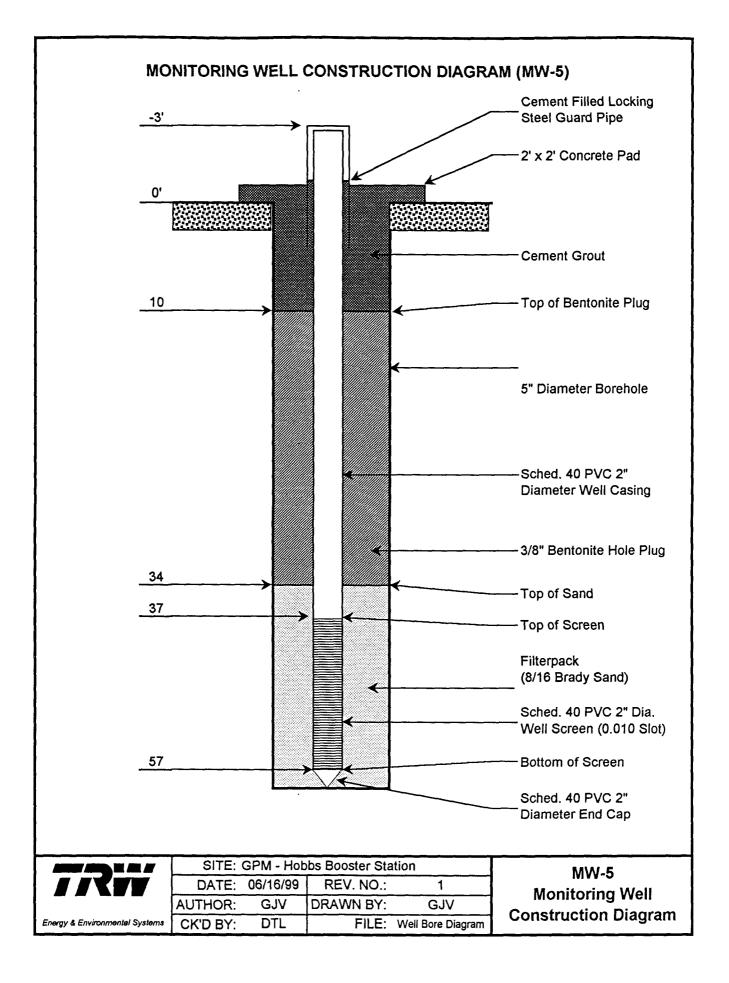


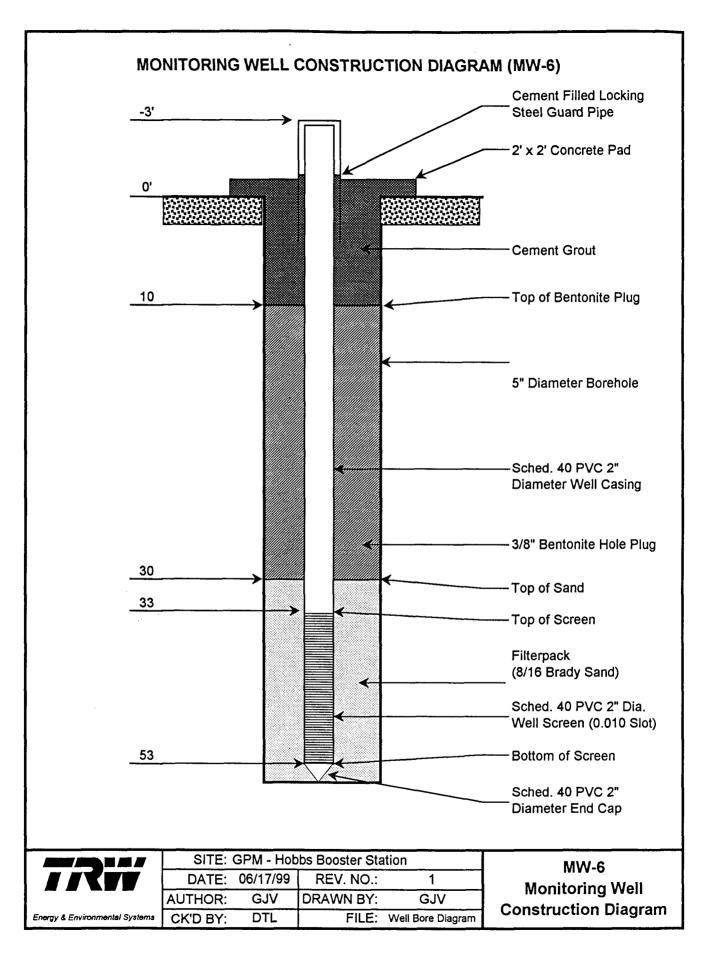
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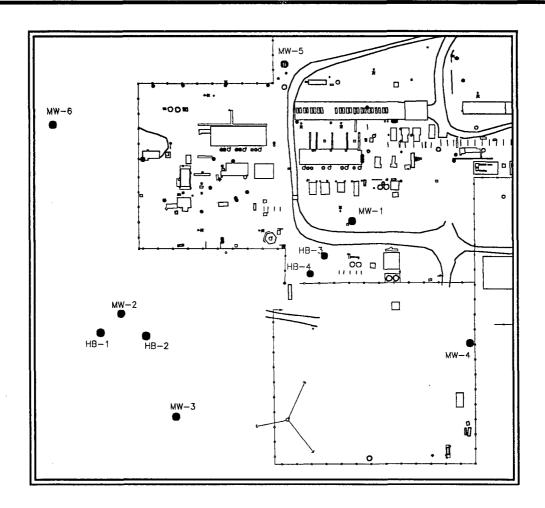




ATTACHMENT B

SURVEY PLAT OF

GPM HOBBS BOOSTER STATION



ONITOR WELLS	PLANT CC	ORDINATES	NAVD 88 ELEVATIONS IN FEET
BORE HOLES	X	Y	
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
	1		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
	1.		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

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. G. EIDSO 6/30/99 ROMER J. EDGON N.M. TO No. 3239 GARY & EDGON N.M. C. 12641 JOHN WEST SHEETING COMPANY N. DAL PAGEOFESSION NEW MEXICO - 505-393 RON 412 N. DAL NEW MEXICO - 505-393-3117

Scale:1"=200'

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GPM GAS CORPORATION NM REGION

200

400 FEET

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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

200

Survey Date: 6/23/	99 Sheet	1	of	1	Sheets
W.O. Number: 99-1	1–0540 Drawn	By:D.	McCAF	RLEY	
Date: 6/24/99 GP	M GPMC	0540	S	cale:	1"=200'

ATTACHMENT C

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LABORATORY ANALYTICAL REPORTS AND

CHAIN-OF-CUSTODY DOCUMENTATION



6701 Aberdeen Avenue, Suite 9 4725 Ripley Avenue, Suite A Lubbock, Texas 79424 800 • 378 • 1296 El Paso, Texas 79922 888 • 588 • 3443 E-Mail: lab@traceanalysis.com

378 • 1296 806 • 794 • 1296 588 • 3443 915 • 585 • 3443 alvsis.com

•1296 FAX 806 • 794 • 1298 •3443 FAX 915 • 585 • 4944

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.	Order ID Number:	99061911
Project Location:	Hobbs Station		

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:126874Description: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
		Doguit		Spike	%	% Rec.	A a la a	Prep	QC	
Surrogate			Dilution	Amount	Rec.	Limit	Analyst	Batch #	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
				Spike	%	% Rec.		Prep	QC	
Surrogate			Dilution	Amount	Rec.	Limit	Analyst	Batch #	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
				Spike	%	% Rec.		Prep	QC	
Surrogate		Result	Dilution	Amount	Rec.	Limit	Analyst	Batch #	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:

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126878

Order ID Number: 99061911 GPM Gas Corp.

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 TFT (mg/Kg) 4-BFB (mg/Kg)		Result 5.33 5.18	Dilution 50 50	Spike Amount 0.1 0.1	% Rec. 107 104	% Rec. Limit 72 - 128 72 - 128	Analyst RC RC	Prep Batch # PB01216 PB01216	QC Batch # QC01508 QC01508	
TRPHC (mg/Kg)		12.8	1	E 418.1	6/23/99	6/24/99	MF	PB01233	QC01527	10

Sample Rumber. 120070										
Description: MW-3 (40')			Analytical	Date	Date		Prep	QC	
D	Ela a	Desult	Dilution				A	•	•	זרות
Param	Flag	Result	Dilution	Method	Prepared	Analyzed	Analyst	Batch #	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
				Spike	%	% Rec.		Prep	QC	
Surrogate		Result	Dilution	Amount	Rec.	Limit	Analyst	Batch #	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 TFT (mg/Kg) 4-BFB (mg/Kg)		Result 5.21 4.91	Dilution 50 50	Spike Amount 0.1 0.1	% Rec. 104 98	% Rec. Limit 72 - 128 72 - 128	Analyst RC RC	Prep Batch # PB01216 PB01216	QC Batch # QC01508 OC01508	
TRPHC (mg/Kg)		73.1	1	E 418.1	6/23/99	6/24/99	MF	PB01233	QC01503	10

Report Date: 8/2/99

P/2398/8.1C

Order ID Number: 99061911 GPM Gas Corp.

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')

•				Analytical	Date	Date		Prep	QC	
Param	Flag	Result	Dilution	Method	Prepared	Analyzed	Analyst	Batch #	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
				Spike	%	% Rec.		Prep	QC	
Surrogate		Result	Dilution	Amount	Rec.	Limit	Analyst	Batch #	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	OC01622	
4-BFB (mg/Kg)		5.02	50	0.1	100	72 - 128	RC	PB01300		
TRPHC (mg/Kg)		<10.0	1	E 418.1	6/23/99	6/24/99	MF	PB01233	QC01527	10

Report Date: 8/2/99

P/2398/8.1C

Order ID Number: 99061911 GPM Gas Corp.

Sample Number: 126883 HB-1 (Surface) Description:

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 TFT (mg/Kg) 4-BFB (mg/Kg)		Result 5.19 4.99	Dilution 50 50	Spike Amount 0.1 0.1	% Rec. 104 100	% Rec. Limit 72 - 128 72 - 128	Analyst RC RC	Prep Batch # PB01300 PB01300	QC Batch # QC01622 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)

				Analytical	Date	Date		Prep	QC	
Param	Flag	Result	Dilution	Method	Prepared	Analyzed	Analyst	Batch #	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
				Spike	%	% Rec.		Prep	QC	
Surrogate		Result	Dilution	Amount	Rec.	Limit	Analyst	Batch #	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

126885 Sample Number:

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
		Degult		Spike	%	% Rec.		Prep	QC	
Surrogate		Result	Diration	Amount	Rec.	Limit	Analyst	Batch #	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

Report Date: 8/2/99

P/2398/8.1C

Order ID Number: 99061911 GPM Gas Corp.

Sample Number:126886Description: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 TFT (mg/Kg) 4-BFB (mg/Kg)		Result 5.35 4.91	Dilution 50 50	Spike Amount 0.1 0.1	% Rec. 107 98	% Rec. Limit 72 - 128 72 - 128	Analyst RC RC	Prep Batch # PB01300 PB01300	QC Batch # QC01622 QC01622	
TRPHC (mg/Kg)		69300	I	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 TFT (mg/Kg) 4-BFB (mg/Kg)		Result 4.84 4.87	Spike Amount 0.1 0.1	% Rec. 97 97	% Rec. Limit 72 - 128 72 - 128	QC Batch # QC01622 QC01622
		Blank	Reporting	Date	Prep	QC
Param	Flag	Result	Limit	Analyzed	Batch #	Batch #
TRPHC (mg/Kg)		<10.0	10	6/24/99	PB01233	QC01527
TRPHC (mg/Kg)		<10.0	10	6/24/99	PB01233	QC01529

Standard

MS

MS

MSD

MSD

MSD

MSD

MSD

MSD

MSD

Standard

Surrogate

Surrogate

TFT (mg/Kg)

4-BFB (mg/Kg)

TFT (mg/Kg)

4-BFB (mg/Kg)

MTBE (mg/Kg)

Benzene (mg/Kg)

Toluene (mg/Kg)

Ethylbenzene (mg/Kg)

M,P,O-Xylene (mg/Kg)

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	l	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

Spike

Amount

0.1

0.1

5

5

5

5

15

Spike

Amount

0.1

0.1

Result Dil.

50

1

1

1

1

1

Result Dil.

5.25 50

5.18 50

5.14 50

5.28

< 0.05

< 0.05

< 0.05

< 0.05

< 0.05

%

Rec.

103

106

102

100

100

98

96

%

Rec.

104

104

0

2

3

2

2

Analyst

RC

RC

5.12

5.00

4.98

4.90

14.4

Analyst

RC

RC

% Rec.

Limit

72 - 128

72 - 128

80 - 120

80 - 120

80 - 120

80 - 120

80 - 120

% Rec.

Limit

72 - 128

72 - 128

Prep

Batch #

PB01300

PB01300

0 - 20

0 - 20

0 - 20

0 - 20

0 - 20

Prep

Batch #

PB01300

PB01300 QC01622

QC

Batch #

QC01622

QC01622

QC01622

QC01622

QC01622

QC01622

QC01622

QC

Batch #

QC01622

Quality Control Report Lab Control Spikes and Duplicate Spike

		~ ''					
D 11	Amount	Spike	%		% Rec.	RPD	QC
Dil.	Added	Result	Rec.	RPD	Limit	Limit	Batch #
1	5	5.28	106		80 - 120	0 - 20	QC01508
1	5	5.23	105		80 - 120	0 - 20	QC01508
1	5	5.03	101		80 - 120	0 - 20	QC01508
1	5	4.88	98		80 - 120	0 - 20	QC01508
1	15	14.8	99		80 - 120	0 - 20	QC01508
Dil. 1 1	Spike Amount 5 5	Result 5.26 5.36	% Rec. 104 106		% Rec. Limit 72 - 128 72 - 128		QC Batch # QC01508 QC01508
1	5	5.03	101	5	80 - 120	0 - 20	QC01508
	5	5.20	104	1	80 - 120	0 - 20	QC01508
1	5	5.02	100	0	80 - 120	0 - 20	QC01508
1	5	4.88	98	0	80 - 120	0 - 20	QC01508
1	15	14.7	98	1	80 - 120	0 - 20	QC01508
Dil. 1 1	Spike Amount 5 5	Result 5.23 5.36	% Rec. 104 106		% Rec. Limit 72 - 128 72 - 128		QC Batch # QC01508 QC01508
) 1) 1) 1) 1) 1) 1) 1) 1) 1) 1	Dil. Added 1 5	Dil. Added Result 0 1 5 5.28 0 1 5 5.23 0 1 5 5.23 0 1 5 5.03 0 1 5 4.88 0 1 15 14.8 Spike Dil. Amount Result 1 5 5.26 1 1 5 5.26 1 1 5 5.20 1 1 5 5.02 1 1 5 5.02 1 1 5 4.88 1 1 15 14.7 Spike Dil. Amount Result 1 5 5.23	Dil. Added Result Rec. 0 1 5 5.28 106 0 1 5 5.23 105 0 1 5 5.03 101 0 1 5 4.88 98 0 1 15 14.8 99 Spike % Mount Result Rec. 1 5 5.26 104 1 1 5 5.20 104 1 1 5 5.02 100 1 1 5 5.02 100 1 1 5 5.02 100 1 1 5 4.88 98 1 1 5 14.7 98 % Dil. Amount Result Rec. 1 1 5 5.23 104 104	Dil.AddedResultRec.RPD015 5.28 106 015 5.23 105 015 5.03 101 015 4.88 98 0115 14.8 99 Spike%Dil.AmountResultRec.15 5.26 104 15 5.20 104 15 5.02 100 015 5.02 100 015 4.88 98 0115 14.7 98 115 14.7 98 1 Spike% M_{011} ResultRec.15 5.23 104	Dil.AddedResultRec.RPDLimit15 5.28 106 $80 - 120$ 15 5.23 105 $80 - 120$ 15 5.03 101 $80 - 120$ 15 4.88 98 $80 - 120$ 15 4.88 98 $80 - 120$ 115 14.8 99 $80 - 120$ 0115 14.8 99 $80 - 120$ Spike%% Rec.Limit15 5.26 104 $72 - 128$ 15 5.03 101 5 $80 - 120$ 015 5.02 104 115 5.02 100 0 $80 - 120$ 15 4.88 98 0 $80 - 120$ 115 14.7 98 1 $80 - 120$ 1 5 5.23 104 $72 - 128$	Dil.AddedResultRec.RPDLimitLimit015 5.28 106 $80 - 120$ $0 - 20$ 015 5.23 105 $80 - 120$ $0 - 20$ 015 5.03 101 $80 - 120$ $0 - 20$ 015 4.88 98 $80 - 120$ $0 - 20$ 015 4.88 98 $80 - 120$ $0 - 20$ 0115 14.8 99 $80 - 120$ $0 - 20$ 0115 14.8 99 $80 - 120$ $0 - 20$ 015 5.26 104 $72 - 128$ 15 5.26 104 $72 - 128$ 015 5.02 104 1 $80 - 120$ 015 5.02 104 1 $80 - 120$ $0 - 20$ 15 5.02 100 0 $80 - 120$ $0 - 20$ 15 4.88 98 0 $80 - 120$ $0 - 20$ 115 14.7 98 1 $80 - 120$ $0 - 20$ 115 14.7 98 1 $80 - 120$ $0 - 20$ 1 5 5.23 104 $72 - 128$

				Spike	Matrix	. (0 (D		0.0
	Description	Blank	D'I	Amount	Spike	%	000	% Rec.	RPD	QC
	Param	Result	Dil.	Added	Result	Rec.	RPD	Limit	Limit	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
Standar LCS LCS	d Surrogate TFT (mg/Kg) 4-BFB (mg/Kg)		Dil. 50 50	Spike Amount 0.1 0.1	Result 3.17 3.1	% Rec 100 100)	% Rec. Limit 72 - 128 72 - 128		QC Batch # QC01622 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
Standar LCSD LCSD	d Surrogate TFT (mg/Kg) 4-BFB (mg/Kg)		Dil. 50 50	Spike Amount 0.1 0.1	Result 4.82 4.74	% Rec 96 95		% Rec. Limit 72 - 128 72 - 128		QC Batch # QC01622 QC01622

Report P/2398			Order ID Number: 99061911 GPM Gas Corp.						Page Number: 9 of Hobbs Stati				
	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

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Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	MTBE (mg/Kg)	8	0.1	0.101	101	80 - 120	6/22/99	QC01508
ICV	Benzene (mg/Kg)		0.1	0.108	101	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 80 - 120	6/22/99	QC01508
ICV	M,P,O-Xylene (mg/Kg)		0.3	0.32	107	80 - 120	6/22/99	QC01508
			0.1	0.102				-
	MTBE (mg/Kg)		0.1		102 99	80 - 120	6/22/99	QC01508
-	Benzene (mg/Kg)			0.099		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
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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

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TRW Inc. Energy & E 415 West V Midland, Te (915) 682-0 FAX: (915)

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

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lame: Trace A	6.701 Lubbut 804/1	ATURES) L. P.U.	Sample Identification	(Surfice)	(42.)	(15)	(40.)	(40')	(40-)	(Sur (ne)	(+42-)	(- ش+)		Project Information	GPM GAU LUP	Hobbs Station	22	P/2398	Shipping ID No.: 90 2 -161-328-7		Special Instructions/Comments: 1, いしていたい			
Lab Name:	Address: Telephone:	Samplers (SIGNATURES)	Samp) 1- MM	M-I I-ML	1	M.W-2	MM-3	H-MW	5-MW	S-MM	MW-6			Project Name:	Project Location:	Project Manager: G; V	Cost Center No.:	hipping ID No.:	P O No.:	pecial Instructio			



6701 Aberdeen Avenue, Suite 9 4725 Ripley Avenue, Suite A

Lubbock, Texas 79424 800 • 378 • 1296 888•588•3443 El Paso, Texas 79922 E-Mail: lab@traceanalysis.com 806 • 794 • 1296 FAX 806 • 794 • 1298 915 • 585 • 3443

FAX 915•585•4944

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.	Order ID Number:	99061910
Project Location:	Hobbs Station		

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 TFT (mg/L)		Result 0.542	Dilution 5	Spike Amount 0.1	% Rec. 108	% Rec. Limit 72 - 128	Analyst SO	Prep Batch # PB01197	QC Batch # QC01478	
4-BFB (mg/L)		0.492	5	0.1	98	72 - 128	SO	PB01197	QC01478	

Sample Number: 126866 Description: MW 3

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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 TFT (mg/L) 4-BFB (mg/L)		Result 0.525 0.55	Dilution 5 5	Spike Amount 0.1 0.1	% Rec. 105 110	% Rec. Limit 72 - 128 72 - 128	Analyst SO SO	Prep Batch # PB01197 PB01197	QC Batch # QC01478 QC01478	

Sample Number: 126867

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Description:	MW
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•				Analytical	Date	Date		Prep	QC	
Param	Flag	Result	Dilution	Method	Prepared	Analyzed	Analyst	Batch #	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
				Spike	%	% Rec.		Prep	QC	
Surrogate		Result	Dilution	Amount	Rec.	Limit	Analyst	Batch #	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	141 44 2	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

Report Date: 6/23/99 P/2398/8.1C											
Toluene (mg/L)		5 S 8021B	6/21/99	6/18/99	SO	PB01197	Hobbs S 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 TFT (mg/L) 4-BFB (mg/L)		Spike lution Amount 5 0.1 5 0.1	% Rec. 100 103	% Rec. Limit 72 - 128 72 - 128	Analyst SO SO	Prep Batch # PB01197 PB01197	QC Batch # QC01478 QC01478				

Sample Number:126870Description: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 TFT (mg/L) 4-BFB (mg/L)		Result 0.532 0.486	Dilution 5 5	Spike Amount 0.1 0.1	% Rec. 106 97	% Rec. Limit 72 - 128 72 - 128	Analyst SO SO	Prep Batch # PB01197 PB01197	QC Batch # QC01478 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 TFT (mg/L) 4-BFB (mg/L)	Result 0.514 0.546	Dilution 5 5	Spike Amount 0.1 0.1	% Rec. 102 109	% Rec. Limit 72 - 128 72 - 128	Analyst SO SO	Prep Batch # PB01197 PB01197	QC Batch # QC01478 QC01478	

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Sample Number: 126872

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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

Report Date: 6/23/99 P/2398/8.1C	Order ID Number: GPM Gas Corp.	99061910		Page	Number: 4 of 5 Hobbs Station
Surrogate TFT (mg/L) 4-BFB (mg/L)	Spi Result Dilution Amo 0.090 1 0. 0.079 1 0.	ount Rec. Lim 1 90 72 - 1	it Analyst 28 SO		QC Batch # QC01478 QC01478

126873 Sample Number: 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 TFT (mg/L) 4-BFB (mg/L)		Result 0.108 0.091	Dilution 1 1	Spike Amount 0.1 0.1	% Rec. 108 91	% Rec. Limit 72 - 128 72 - 128	Analyst SO SO	Prep Batch # PB01197 PB01197	QC Batch # QC01478 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

	Blank		Spike Amount	Matrix Spike	%		% Rec.	RPD	QC
Param	Result	Dil.	Added	Result	Rec.	RPD	Limit	Limit	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 LCS TFT (mg/L) LCS 4-BFB (mg/L)		Dil. 1 1	Spike Amount 0.1 0.1	Result 0.103 0.104	% Rec. 103 104		% Rec. Limit 72 - 128 72 - 128		QC Batch # QC01478 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 LCSD TFT (mg/L) LCSD 4-BFB (mg/L)		Dil. 1 1	Spike Amount 0.1 0.1	Result 0.107 0.108	% Rec. 107 108		% Rec. Limit 72 - 128 72 - 128		QC Batch # QC01478 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

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Chain of Custody

Nº 13424

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X-Need results by 6-24-99 (morning)	24.99	(morni)			(Printed Name)			(Date)	(Printed Name)			e	(Date) (Pri	(Printed Name)	(0		/ (Date)	(e)
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4725 Ripley Avenue, Suite A

Lubbock, Texas 79424 800=378=1296 El Paso, Texas 79922 888=588=3443 E-Mail: lab@traceanalysis.com 806•794•1296 FA 915•585•3443 FA

FAX 915•585•4944

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 % Extraction Accuracy % Instrument Accuracy		0
PREP DATE ANALYSIS DATE		7/8/99 7/8/99

CHEMIST: JS METHODS: ASTM D854-92

7-8-99

Director, Dr. Blair Leftwich

Date



6701 Aberdeen Avenue, Suite 9 4725 Ripley Avenue, Suite A Lubbock, Texas 79424 800 • 378 • 1296 El Paso, Texas 79922 888 • 588 • 3443 E-Mail: lab@traceanalysis.com 806•794•1296 FAX 915•585•3443 FAX

 Pactor
 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

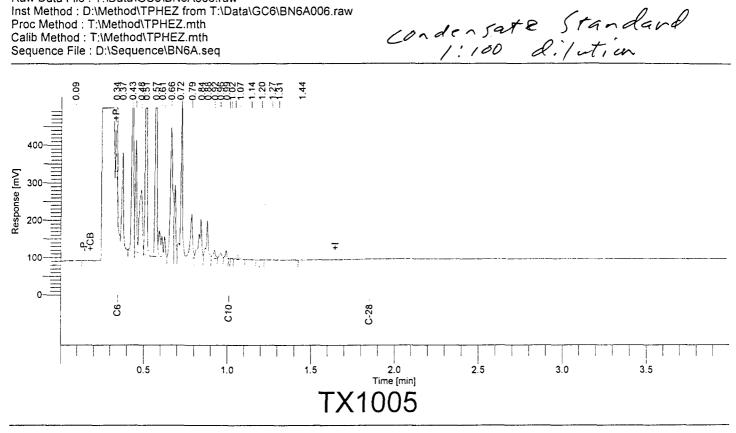
6-28-99

Date

Software Version	:	6.1.0.2:G07	٤
Operator	:	TurboChrom	S
Sample Number	:	006	S
utoSampler	:	BUILT-IN	F
instrument Name	:	GC6	C
Instrument Serial #	:	None	A
Delay Time	:	0.00 min	E
Sampling Rate	:	25.0000 pts/s	
Volume Injected	:	1.000000 ul	A
Sample Amount	:	1.0000	D
Data Acquisition Time	:	02/09/99 12:56:56 PM	С

Date Sample Name Study Rack/Vial Channel A/D mV Range End Time	•••••••••••••••••••••••••••••••••••••••	02/09/99 01:32:55 PM <u>condensate*100</u> TPH 0/6 A 1000 3.98 min
Area Reject Dilution Factor Cycle		0.000000 100.00 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



Analytical Method: TX1005 Reporting Units: mg/L Matrix: water

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Component Name	Adjusted Amount	Raw Amount	Area [µV·s]
C6 TPH AS GASOLINE TPH AS DIESEL	0.7 19.6 715912.4 3679.8	0.0 0.2 7159.1 36.8	6734.70 196348.17 3225289.75 12858.45
			3441231.08

Report stored in ASCII file: .TX0

Software Version : 6	0.1.0.2:G07	Date	: 06/25/99 09:59:51	AM
	urboChrom	Sample Name		,
Sample Number : 0	40		: QC01470	
	BUILT-IN	Rack/Vial	: 0/37	
Instrument Name : G	SC6	Channel	: A	
Instrument Serial # : N	lone	A/D mV Range	: 1000	
).00 min	End Time	: 2.80 min	
Sampling Rate : 2	5.0000 pts/s			
Volume Injected : 1	.000000 ul	Area Reject	: 0.000000	
	.0000	Dilution Factor	: 100.00	
Data Acquisition Time : 0	6/21/99 05:05:38 PM	Cycle	: 40	
Raw Data File : D:\Data\G(Inst Method : T:\Method\TF Proc Method : T:\Method\T Calib Method : T:\Method\T Sequence File : D:\Sequer	PHEZ from D:\Data\GC6\GP6A040.raw IX1006AL.mth TX1006AL.mth		n w-4 1:100 d.	Product Intion

-1.95 =0.01 400 Gesponse [m/] 200-200-100 Q. Til. = 0-C16-C-28--C10-C12 -C35 --C6ő 3.0 Time [min] 0.5 1.0 1.5 2.0 2.5 3.5 4.0 4.5 5.0 5.5 TX1005

Analytical Method: TX1005 Reporting Units: mg/L Matrix: water

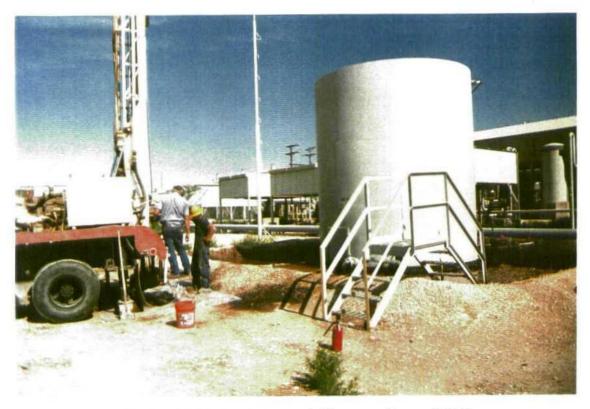
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Report stored in ASCII file: .TX0

ATTACHMENT D

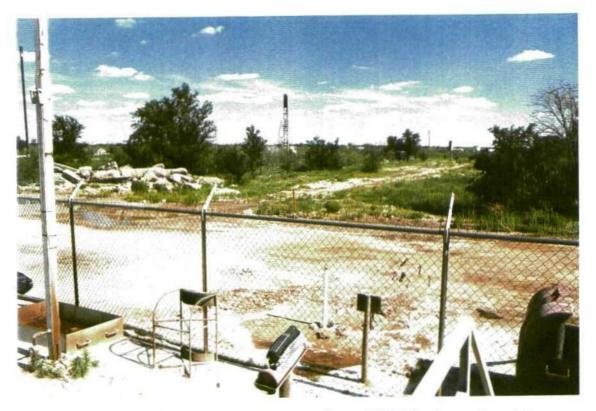
PHOTODOCUMENTATION



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).