1R - 459

WORKPLANS

DATE:
12-12-08

TETRA TECH

RECEIVED
2008 DEC 29 PM 1 06

CERTIFIED MAIL
RETURN RECEIPT NO. 7006 3450 0001 6909 4648

December 12, 2008

Mr. Edward J. Hansen
New Mexico Energy, Minerals, & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87505

Re: Proposed Recovery of Produced Water from Monitor Well MW-1, Rice Operating Company, K-4 Release, BD SWD System, Unit K, Section 4, T-22-S, R-37-E, Lea County, New Mexico, NMOCD CASE #1R0459

Dear Mr. Hansen:

Rice Operating Company (ROC) submits the following proposed Recovery of Produced Water from Monitor Well MW-1, K-4 Release, located in the BD Salt Water Disposal System.

Background

On February 25, 2004, a leak was discovered 34 feet east of the K-4 junction box. According to the form C-141 (Initial) filed with the NMOCD, the spill was due to the rupture of a 4-inch PVC line. An estimated 1,040 barrels of produced water was discharged with 1,000 barrels of fluid recovered. Regional groundwater information indicates that the depth to groundwater is approximately 90 to 100 feet below ground surface (bgs).

Initial soil sampling performed in April 2004, indicated a residual subsurface chloride impact. On July 14, 2004, a hollow-stem auger unit was utilized to drill one soil boring at the release source area at the site. The soil boring was advanced to a depth of 80 feet bgs. Field chloride analysis was performed on soil samples at five foot increments. Results of field chloride testing and laboratory analysis indicated that chloride impacts extend to a depth of greater than 80 feet bgs. The soil boring was backfilled with bentonite and drill cuttings.

Tetra Tech
1910 North Big Spring, Midland, TX 79705
Tel 432.682.4559 Fax 432.682.3946 www.tetratech.com

Between October 12 and October 19, 2006, Highlander personnel were onsite to oversee the installation of three monitor wells (MW-1 through MW-3) within, up and down gradient of the release source area. The wells were drilled to a maximum depth ranging from 92 to 95 feet bgs. The wells were completed with 0.020 slotted 2 inch PVC screen placed 15 feet below and 5 feet above the water table to EPA and industry standards. The wells were completed with monument style risers.

During drilling activities, soil samples were collected every 10 feet for monitor well MW-1 and 5 feet for monitor wells MW-2 and MW-3. Soil samples were field screened for chlorides with a field sampling kit. Specific samples were collected and submitted for laboratory analysis of chlorides utilizing EPA Method 300.0. Laboratory analytical results indicated the entire soil column for MW-1 was impacted with chlorides greater than 250 mg/kg. Monitor well MW-2 and MW-3 had soil concentrations of less than 25 mg/kg at the vadose zone located at approximately 80 feet bgs. Groundwater was found to be impacted with chlorides only in monitor well MW-1.

On April 23, 2007, Highlander submitted a Corrective Action Plan (CAP) for the site. The CAP addresses elevated levels of chlorides within the soils and included placement of a barrier approximately 68 feet by 120 feet wide at three feet below ground surface (bgs). Upon completion of the barrier, the excavation will be backfilled with soils that will support vegetation. The disturbed area will be reseeded with a blend of native vegetation and monitored for growth. As of this report, the CAP has not been approved by the NMOCD.

During a meeting between Rice, Highlander, and the NMOCD on July 18, 2007, it was decided to replace the 2 inch monitor well at MW-1 with a 4 inch monitor well in order to increase volume of recovery of chlorides within that well. Also, it was discussed that the soil barrier would be placed at four feet bgs instead of three feet bgs. On August 7, 2007, monitor well MW-1was redrilled and reinstalled as a 4 inch well.

A pump test was performed on monitor well MW-1 on November 29, 2007. Results indicate the well was able to sustain 3 gallons per minute (gpm) for 40 minutes without pumping dry. Groundwater analytical results show the concentrations of chlorides dropped by approximately 300 mg/L (from 1,040 mg/L on November 13, 2006 to 736 mg/L on October 31, 2007). Monitor well MW-1 is the only well at the site with elevated chlorides. The most recent sampling on November 13, 2008 showed the chloride concentration in MW-1 has declined to 570 mg/L.

Based upon the reductions shown to date and limited groundwater impact, ROC proposes to periodically pump MW-1 for 4 to 6 hours, 1 to 2 times per quarter and monitor the site for continued reduction of chlorides. The water appears suitable for surface discharge. If conditions deteriorate, the site will be reevaluated.

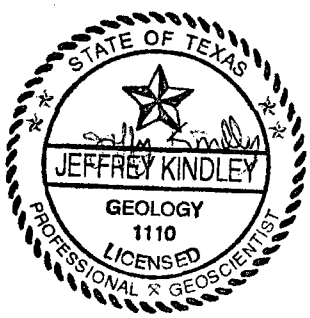
TETRA TECH

If you have any questions or comments, please feel free to contact either myself or Tim Reed at (432) 682-4559.

Respectfully Submitted,
Tetra Tech

Jeffrey Kindley, P.G.
Senior Project Manager

cc: ROC, Edward Hansen – NMOCD
Enclosures: Figures, Chloride Concentration Tables



FIGURES

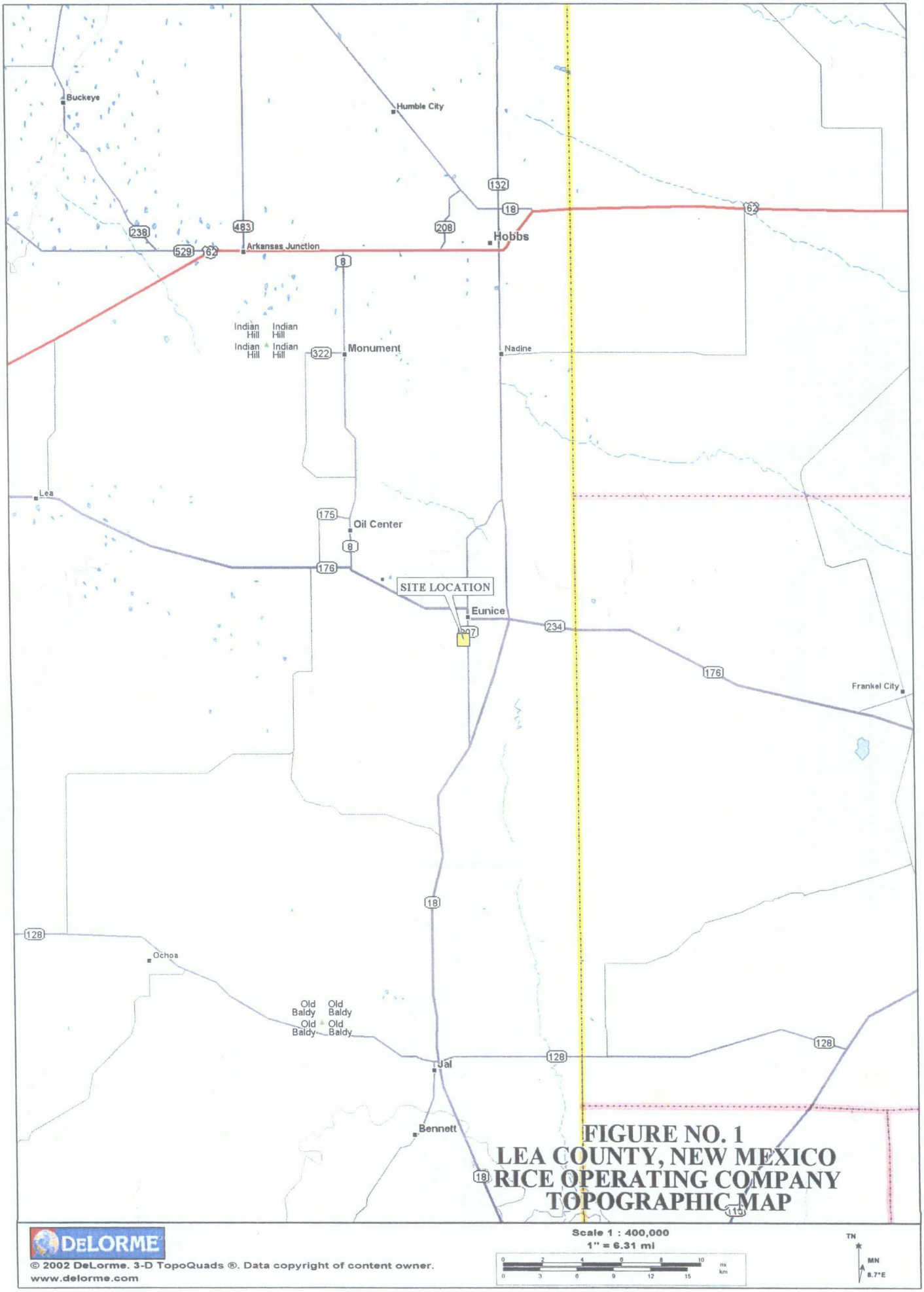


FIGURE NO. 1
LEA COUNTY, NEW MEXICO
RICE OPERATING COMPANY
TOPOGRAPHIC MAP

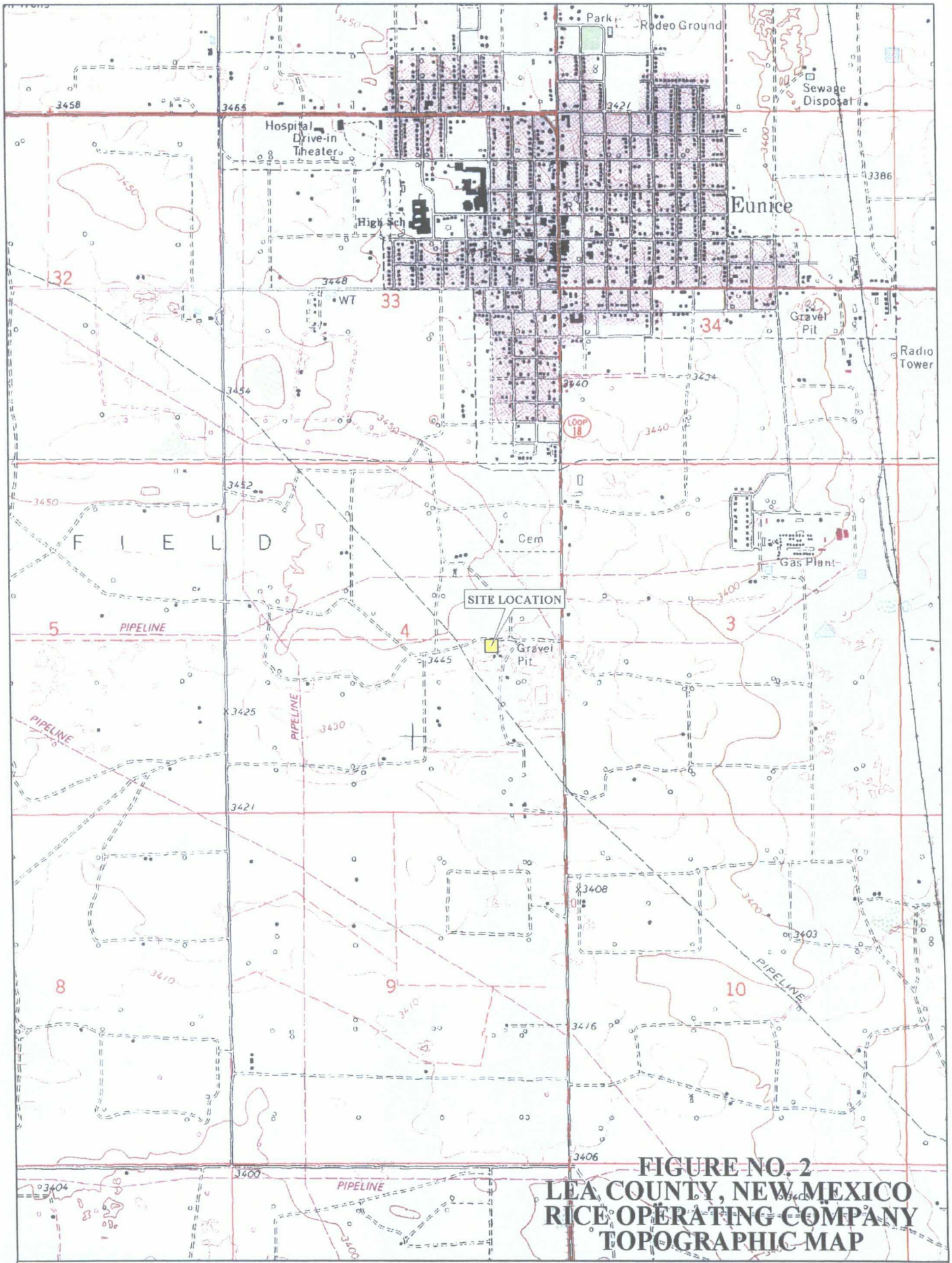


FIGURE NO. 2
LEA COUNTY, NEW MEXICO
RICE OPERATING COMPANY
TOPOGRAPHIC MAP

DeLORME

www.delorme.com

Scale 1 : 24,000
1" = 2000 ft

0 800 1200 1800 2400 3000 ft
0 200 400 600 800 1000 m

TN
MN
8.7°E

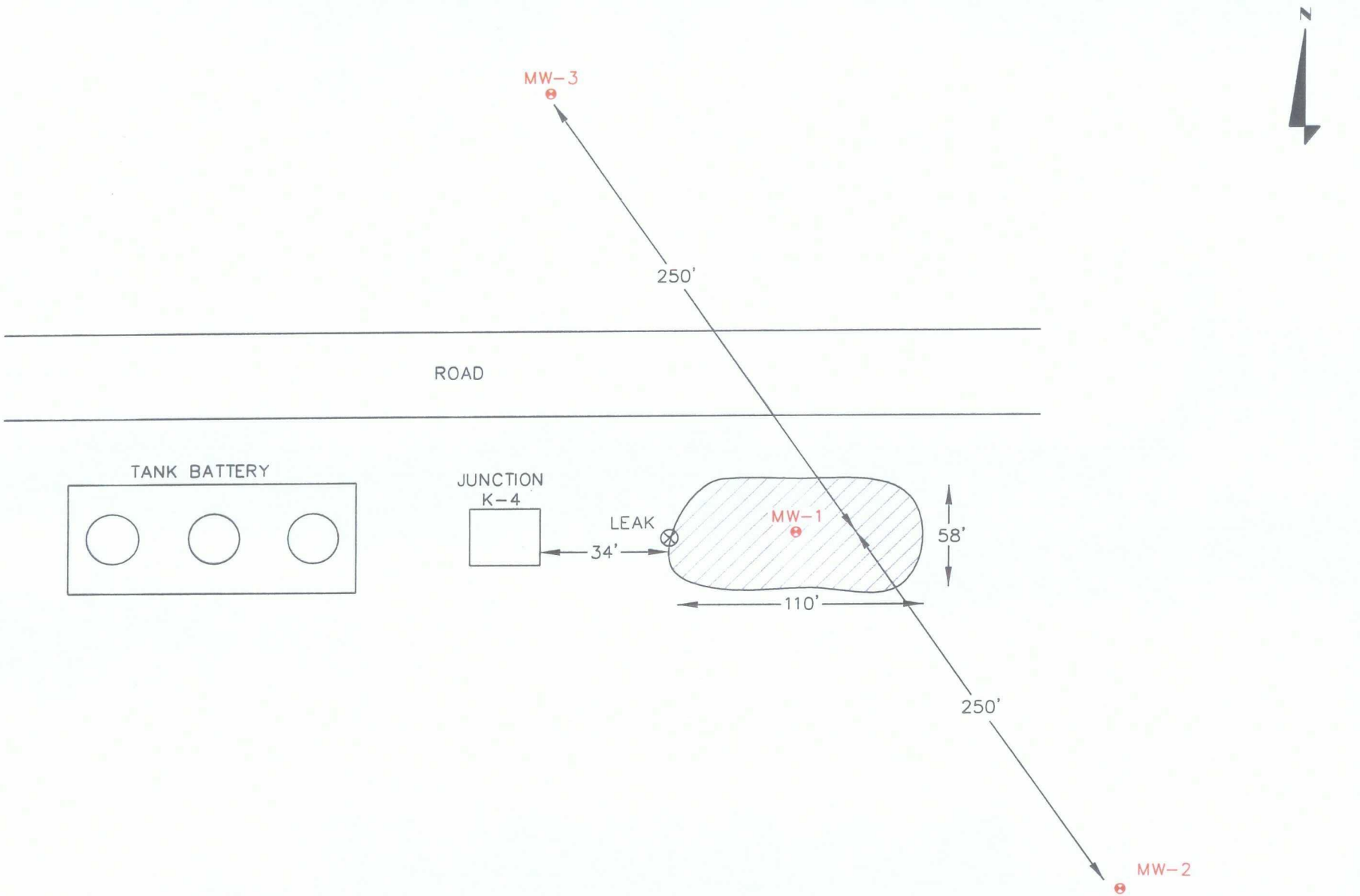


FIGURE NO. 3

LEA COUNTY, NEW MEXICO

RICE OPERATING COMPANY

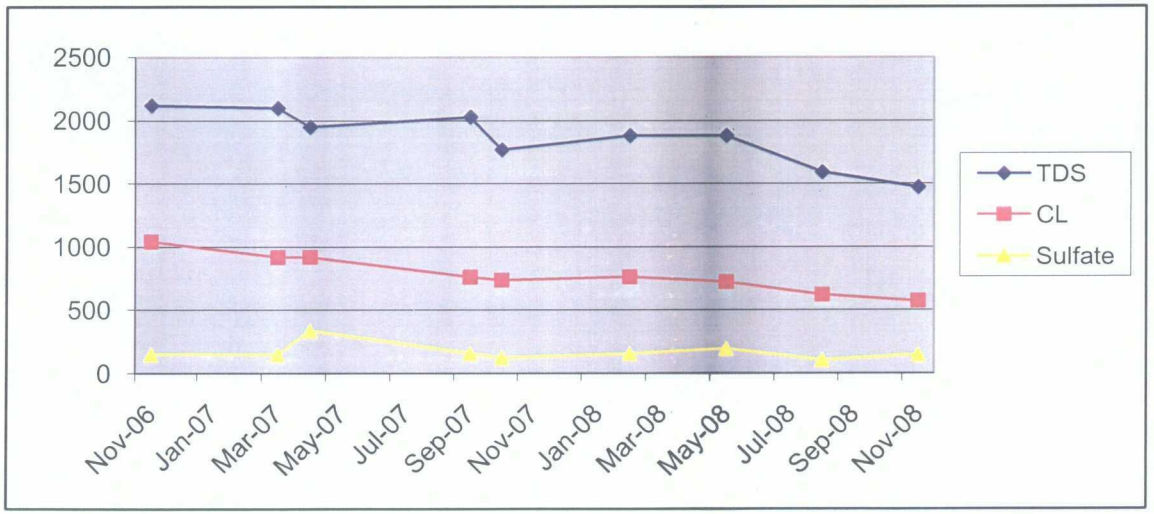
BD K-4 JUNCTION

HIGHLANDER ENVIRONMENTAL CORP.
MIDLAND, TEXAS

TABLES

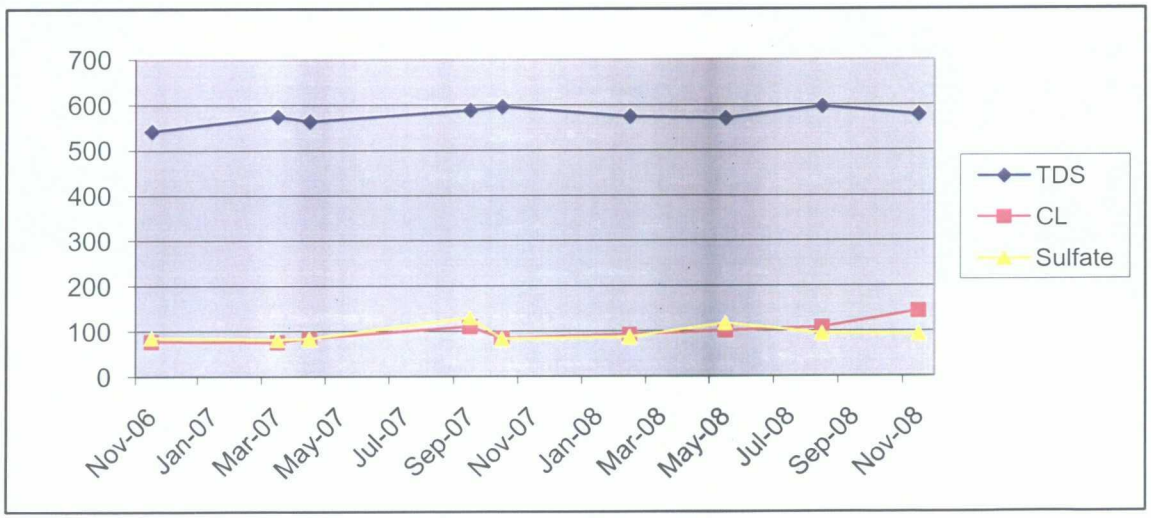
Rice Engineering Operating
BD K-4
Lea County, New Mexico

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
1	85.02	93.63	1.40	5	11/13/06	1040	2120	<0.001	<0.001	<0.001	<0.001	152	Clear no odor
1	84.99	93.62	1.40	6	03/08/07	916	2100	<0.001	<0.001	<0.001	<0.001	148	Clear no odor
1	84.96	93.62	1.40	6	04/23/07	917	1950	<0.001	<0.001	<0.001	<0.001	339	Clear no odor
1	86.06	97.70	7.60	6	09/14/07	760	2028	<0.001	<0.001	<0.001	<0.003	159	Clear no odor
1	86.06	97.70	7.60	20	10/31/07	736	1770	<0.002	<0.002	<0.002	<0.006	124	Clear no odor
1	85.93	98.60	8.20	30	02/15/08	760	1880	<0.002	<0.002	<0.002	<0.006	157	Clear no odor
1	85.73	98.60	8.40	30	05/05/08	720	1880	<0.002	<0.002	<0.002	<0.006	195	Clear no odor
1	85.81	98.60	8.30	30	08/11/08	620	1590	<0.001	<0.001	<0.001	<0.003	106	Clear no odor
1	85.65	98.60	8.40	30	11/13/08	570	1470	<0.001	<0.001	<0.001	<0.003	148	Clear no odor



Rice Engineering Operating
BD K-4
Lea County, New Mexico

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
2	83.35	94.10	1.70	7	11/13/06	77	542	<0.001	<0.001	<0.001	<0.001	85	Clear no odor
2	83.28	94.08	1.70	7	03/08/07	75.3	574	<0.001	<0.001	<0.001	<0.001	80.8	Clear no odor
2	83.25	94.08	1.70	7	04/23/07	83.5	564	<0.001	<0.001	<0.001	<0.001	83	Clear no odor
2	83.12	94.08	1.80	7	09/14/07	110	588	<0.001	<0.001	<0.001	<0.003	130	Clear no odor
2	83.11	94.08	1.80	6	10/31/07	84	596	<0.002	<0.002	<0.002	<0.002	82.7	Clear no odor
2	82.97	94.05	1.80	6	02/15/08	92	574	<0.002	<0.002	<0.002	<0.006	86.6	Clear no odor
2	82.81	94.05	1.80	6	05/05/08	100	570	<0.002	<0.002	<0.002	<0.006	117	Clear no odor
2	82.86	94.05	1.80	6	08/11/08	108	596	<0.001	<0.001	<0.001	<0.003	94	Clear no odor
2	82.75	94.05	1.80	6	11/13/08	144	578	<0.001	<0.001	<0.001	<0.003	93.7	Clear no odor



Rice Engineering Operating
BD K-4
Lea County, New Mexico

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
3	86.45	94.60	1.30	5	11/13/06	148	622	<0.001	<0.001	<0.001	<0.001	97.6	Clear no odor
3	86.41	94.50	1.30	5	03/08/07	199	678	<0.001	<0.001	<0.001	<0.001	103	Clear no odor
3	86.35	94.50	1.30	6	04/23/07	145	674	<0.001	<0.001	<0.001	<0.001	92.1	Clear no odor
3	86.23	94.50	1.30	6	09/14/07	170	710	<0.001	<0.001	<0.001	<0.001	151	Clear no odor
3	86.19	94.50	1.30	6	10/31/07	156	689	<0.001	<0.001	<0.001	<0.001	106	Clear no odor
3	86.09	94.35	1.30	6	02/15/08	160	668	<0.002	<0.002	<0.002	<0.006	110	Clear no odor
3	85.89	94.35	1.40	6	05/05/08	160	710	<0.002	<0.002	<0.002	<0.006	166	Clear no odor
3	85.94	94.35	1.30	6	08/11/08	172	691	<0.001	<0.001	<0.001	<0.003	117	Clear no odor
3	85.84	94.35	1.40	6	11/13/08	168	711	<0.001	<0.001	<0.001	<0.003	124	Clear no odor