1R - 427-62

REPORTS

DATE:

12-12-08

TETRA TECH

CERTIFIED MAIL
RETURN RECEIPT NO. 7006 3450 0001 6909 4655

December 12, 2008
Mr. Wayne Price
New Mexico Energy, Minerals, & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87505

Re: Termination Request Report, Rice Operating Company, Eunice Monument Eumont (EME) Saltwater Disposal System (SWD) A-2 Release, Unit A, Section 2, T-20-S, R-36-E, Lea County, New Mexico, NMOCD CASE #1R0427-62

Dear Mr. Price:

Tetra Tech (formerly Highlander Environmental Corp.) submits the following Termination Request Report for the Rice Operating Company (ROC), A-2 Release, located in the Eunice Monument Eumont (EME) Salt Water Disposal System. The Site is shown on Figure 1 and Figure 2.

Background

On August 26, 2003, a release was discovered 1,055 feet west of the A-2 Junction. According to the form C-141 (Initial) filed with the NMOCD, the release was due to a crack on a 6-inch asbestos/concrete line. An estimated 15 barrels of produced water was released. Regional groundwater information indicated that the depth to groundwater is approximately 50-90 feet below ground surface (bgs).

Initial soil sampling performed in April 2004, indicated residual subsurface chloride impact. On January 2, 2004, a hollow stem auger unit was utilized to conduct one soil boring at the leak source area at the site. Chloride concentrations did not decline with depth, and the site was disclosed to the OCD as a site with potential groundwater impact on January 14, 2004. The soil boring was backfilled with bentonite and drill cuttings.

On July 21, 2006, ROC submitted an ICP to Mr. Wayne Price of the NMOCD-Santa Fe office for review. Mr. Price approved the ICP in a letter dated August 9, 2006.

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

Between October 10 and October 20, 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 area. Visual measurements of the site indicated the release area was approximately 25 feet by 25 feet. Soil samples were collected every 5 feet utilizing a split spoon sampler and field screened for chlorides. Selected samples were placed in laboratory supplied containers and delivered under chain-of-custody control for chloride analysis by EPA method 300.0. Analytical results indicated the subsurface soils in monitor well MW-1 exhibited only slightly elevated chlorides primarily confined to near surface. The monitor wells had soil concentrations of greater than 250 mg/kg at the saturated zone approximately 40 feet bgs indicating an impact from the regional groundwater.

The initial groundwater sampling (November 1, 2006) for the three monitor wells showed elevated chloride levels ranging from 2,950 mg/L in MW-2 (downgradient) to 4,250 mg/L in MW-3 (upgradient). In addition, TDS ranged from 4,990 mg/L in MW-2 to 7,680 mg/L in MW-3. The BTEX concentrations were below reporting limits for each of the monitor wells. In comparing the chloride concentration analysis data with other water quality in the area, specifically the ROC EME D-1 (AP-67) which is directly downgradient of the Climax Chemical Plant Site, it appears the chloride concentrations at the site are consistent with regional groundwater in the area. The EME D-1 data indicates the background chloride concentrations range from 7,910 mg/L to 12,900 mg/L in areas outside the initial release area.

On May 22, 2007, ROC submitted a Corrective Action Plan (CAP) for the site to Mr. Wayne Price of the NMOCD-Santa Fe office for review. The CAP proposed preparation and revegetation of the surface soils in order to provide an infiltration barrier. Based on a visual inspection and subsurface drilling, the area of the release to be revegetated is approximately 25 feet by 25 feet. Mr. Price approved the CAP in a meeting with ROC and Tetra Tech on July 18, 2007, with the exception that the clay liner be installed at a depth of 4 feet bgs instead of the proposed 3 feet bgs.

Between October 11 and October 29, 2007, ROC oversaw the excavation and removal of the overburden around the source release area. An area measuring 25 feet by 25 feet by 5 feet deep was excavated with approximately 96 cubic yards of soil transported offsite for disposal at the Sundance disposal facility in Eunice, New Mexico. The remaining excavated soils were blended with clean soil and tested for chlorides. The laboratory sample result indicated the chloride levels were 880 mg/kg, which is conducive for growing native grasses. Prior to backfilling of the excavation, a one foot thick clay layer was placed in the bottom of the excavation and compacted. The density of the compacted clay measured 94.9%. Upon completion of the compaction, the blended soils were placed back within the excavation and brought up to grade. On November 6, 2007, the entire disturbed area (approximately 9,000 square feet) was reseeded with native vegetation and is currently monitored for growth. Photographs of current conditions as of August 14, 2008 are included in Appendix C.

Monitor Well Sample Results

The chloride concentrations for the three monitor wells have been elevated since the wells were installed in October 2006. The wells have ranged from a low of 2,200 mg/L in downgradient MW-2 in May 2008 to 8,750 mg/L in upgradient MW-3 in February 2007. The chloride concentrations for the three wells have remained relatively stable since installation. The water quality shows background levels throughout the site with some upgradient groundwater degradation in MW-3. In comparing the chloride concentration analysis data with other water quality in the area, specifically the ROC EME D-1, it appears the chloride concentrations at the site are consistent with regional groundwater degradation in the area. The EME D-1 data indicates chloride concentrations ranging from 7,910 mg/L to 12,900 mg/L in areas outside the initial release area. Copies of the analytical tables for both the EME A-2 and EME D-1 are included as Appendix A and B, respectively.

Since installation in October 2006, there have been no BTEX constituents detected at or above reporting limits for any of the monitor wells at the EME A-2. Cumulative analytical data is summarized in the tables located in Appendix A.

Regional and Local Groundwater Gradient

Groundwater gradient maps were constructed for both the EME A-2 and EME D-1 sites. Based on the collected data it appears the groundwater gradient for the EME A-2 is to the south, while the groundwater gradient for the EME D-1 is to the south to southeast. This is consistent with previous groundwater gradient maps for the two sites. Regionally, the groundwater gradient is to the south to southeast. Figures 3, 4, and 5 present the groundwater gradients for the two sites and the regional area.

Possible Source of Regional Groundwater Quality Degradation

The former Climax Chemical Company site is located approximately 2,500 feet north (upgradient) of the A-2 release site. The site was a chemical facility that produced industrial organic chemicals for the agricultural industry and placed hydrochloric acid in onsite landfarms from approximately 1987 until about 1991 with groundwater impact noted from activities at the facility. The facility has been of business since 1993. The site is listed as a New Mexico Superfund site which has been placed on RCRA. No further information on the site is available.

The EME A-2 site has groundwater degradation of chlorides in both the up, source and downgradient monitor wells. Due to the down gradient location from the former Climax Chemical plant, and the known groundwater impacts from the plant, it is possible the degradation source is the former chemical plant.

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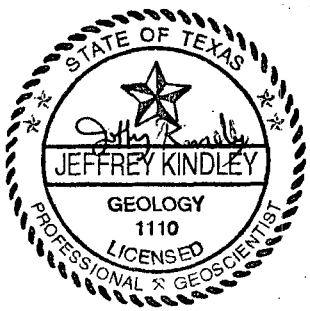
Conclusions

1. Since the installation of the monitor wells in October 2006, no BTEX constituents have been detected at or above the New Mexico Water Quality Control Commission (WQCC) standards.

2. Chloride concentrations for the three monitor wells have remained elevated since installation of the wells in October 2006. The wells have ranged from a low of 2,200 mg/L in downgradient MW-2 in May 2008 to 8,750 mg/L in upgradient MW-3 in February 2007. The water quality shows background levels throughout the site with some upgradient groundwater degradation in MW-3. In comparing the chloride concentration analysis data with other water quality in the area, specifically the ROC EME D-1 (AP-67), which is directly downgradient of the Climax Chemical Plant Site, it appears the chloride concentrations at the site are consistent with regional groundwater degradation in the area. The EME D-1 data indicates the background chloride concentrations range from 7,910 mg/L to 12,900 mg/L in areas outside the initial release area.

Since this site exhibits chloride concentrations consistent with water quality throughout the area and due to its location 2,500 feet down gradient of a possible source area (Climax Chemical), ROC requests that the NMOCD consider termination of this Site. If you require any additional information or have any questions or comments concerning the assessment/closure report, please call at (432) 682-4559.



Respectfully Submitted,
Tetra Tech

Jeff Kindley, P.G.
Senior Project Manager

cc: ROC, Edward Hansen – NMOCD
Enclosures: Figures, Tables, Laboratory Analysis

FIGURES

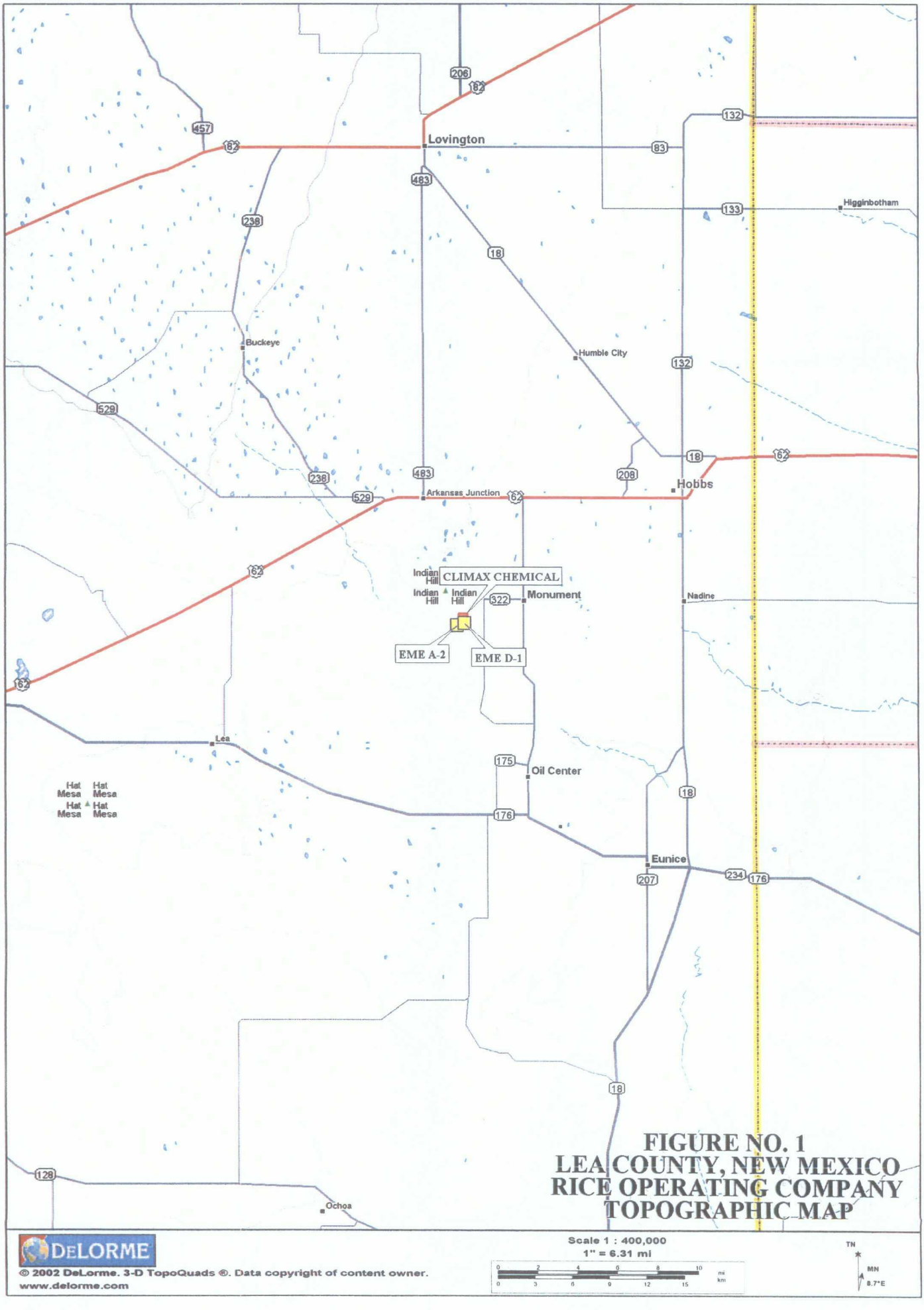


FIGURE NO. 1
LEA COUNTY, NEW MEXICO
RICE OPERATING COMPANY
TOPOGRAPHIC MAP

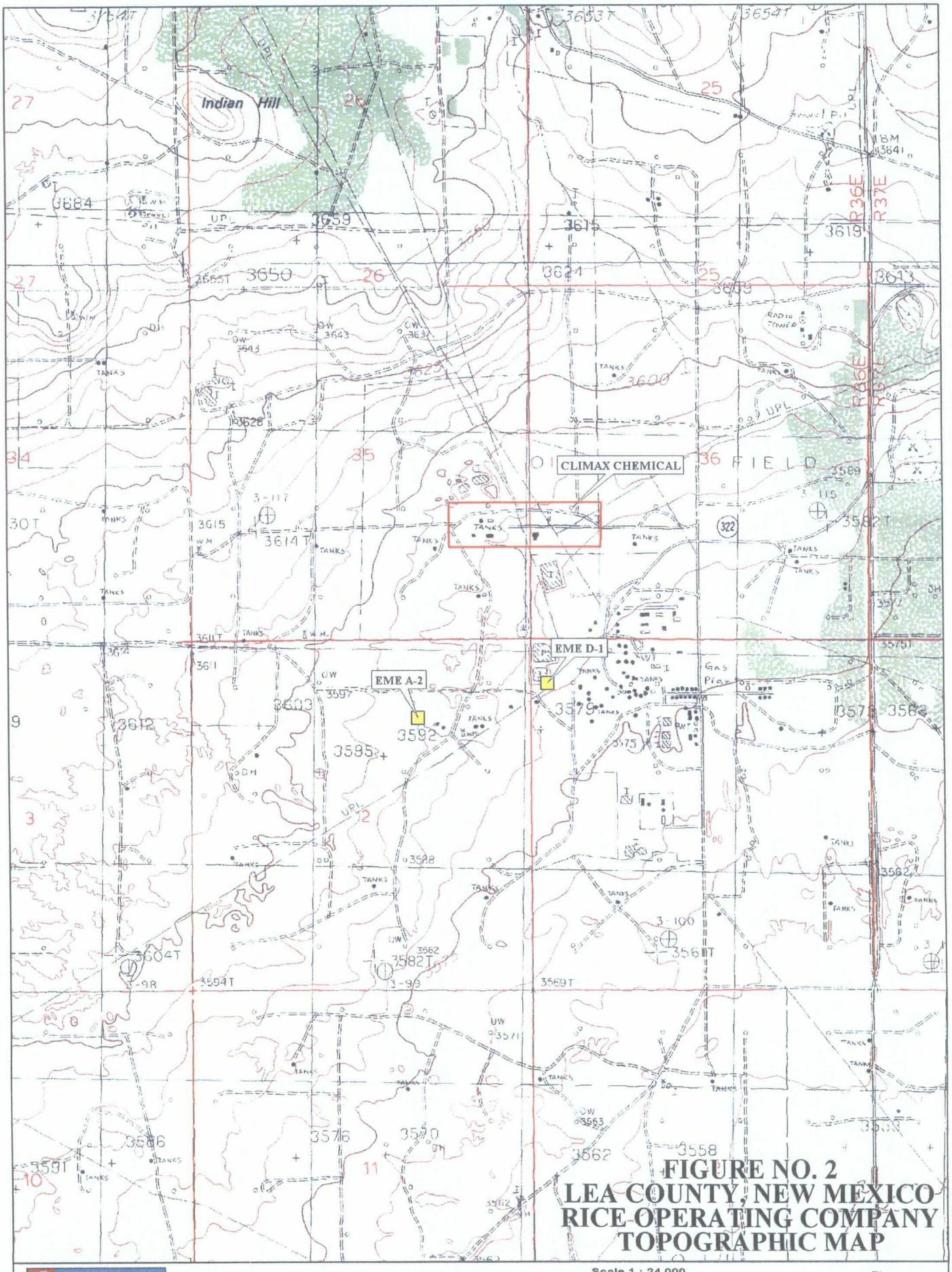
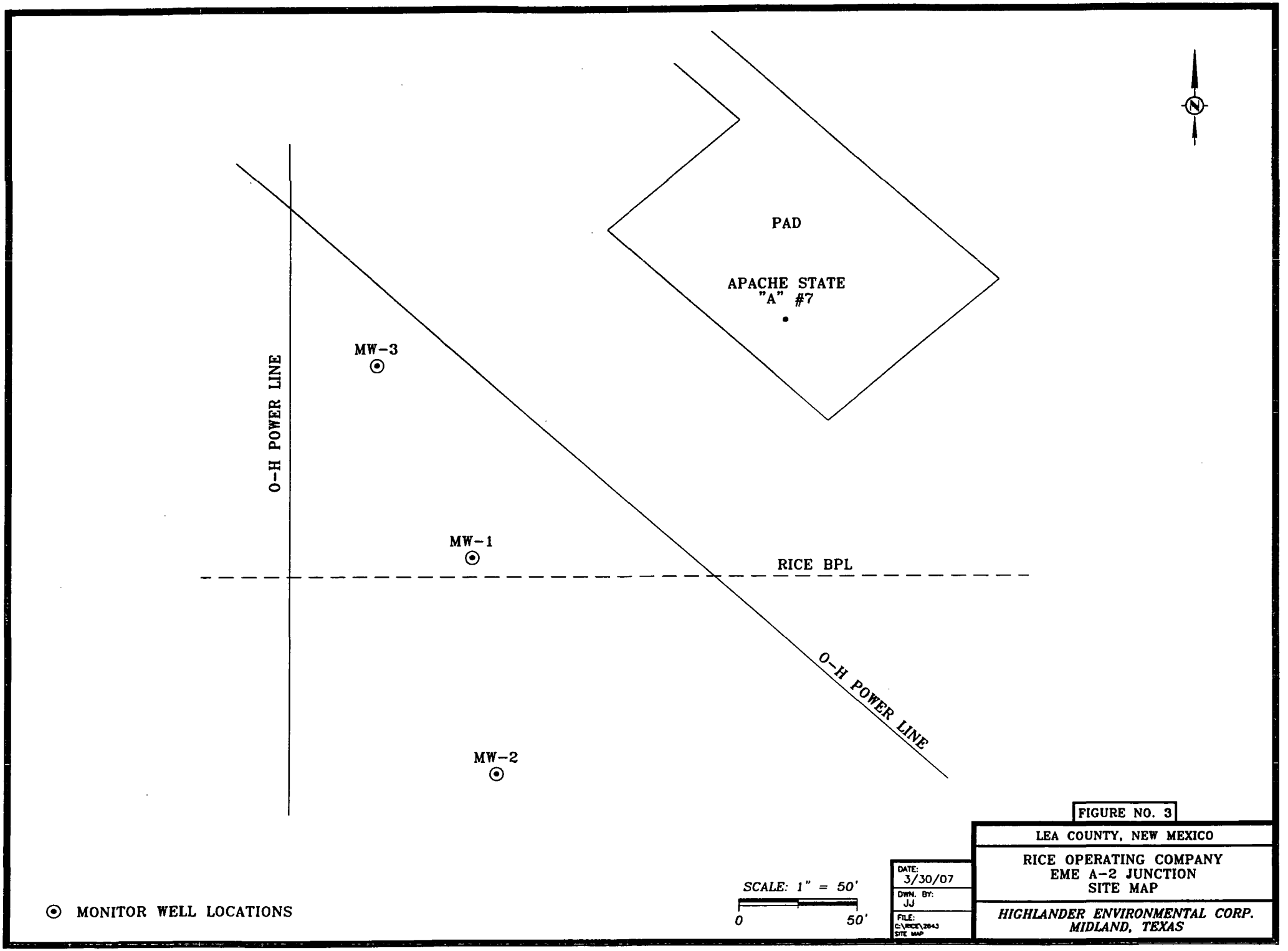


FIGURE NO. 2
LEA COUNTY, NEW MEXICO
RICE OPERATING COMPANY
TOPOGRAPHIC MAP



⊙ MONITOR WELL LOCATIONS

FIGURE NO. 3

LEA COUNTY, NEW MEXICO

RICE OPERATING COMPANY
EME A-2 JUNCTION
SITE MAP

HIGHLANDER ENVIRONMENTAL CORP.
MIDLAND, TEXAS

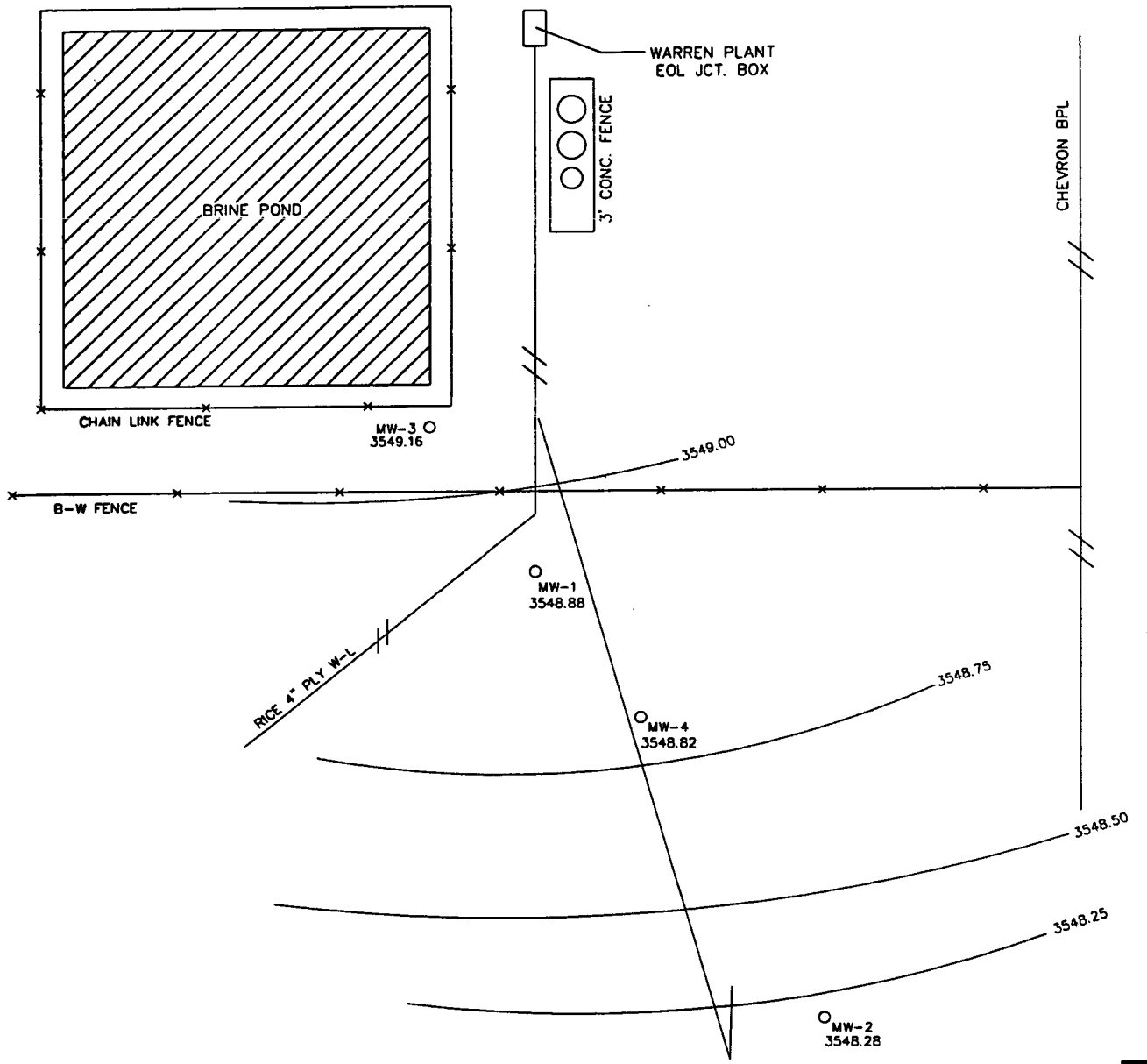


FIGURE NO. 4

LEA COUNTY, NEW MEXICO

RICE OPERATING COMPANY
EME JCT. D-1
GROUNDWATER GRADIENT MAP

DATE: 7/25/08
DWN. BY: RC
FILE: C:\RICE\2643 EME D-1

TETRA TECH, INC.
MIDLAND, TEXAS

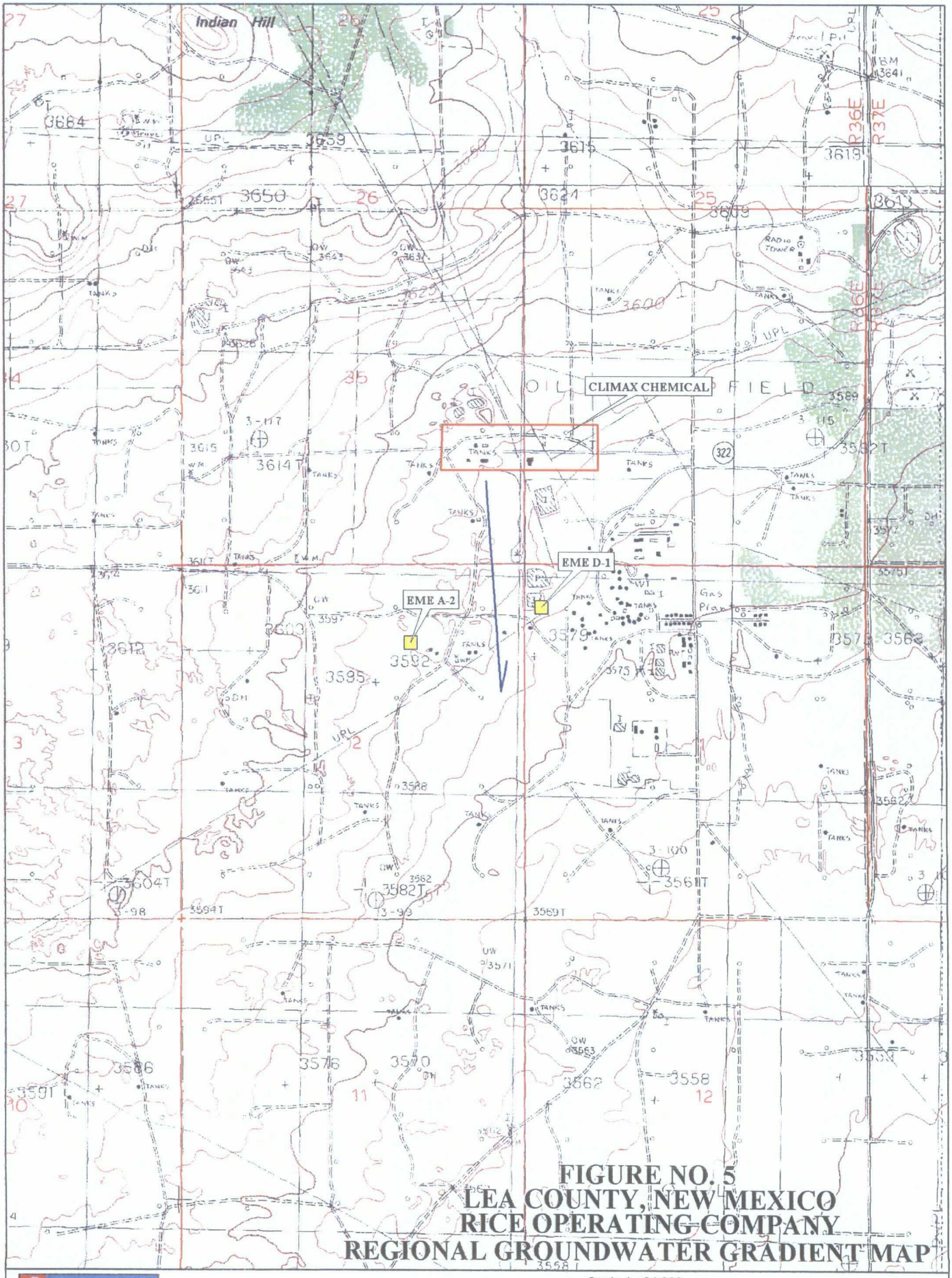
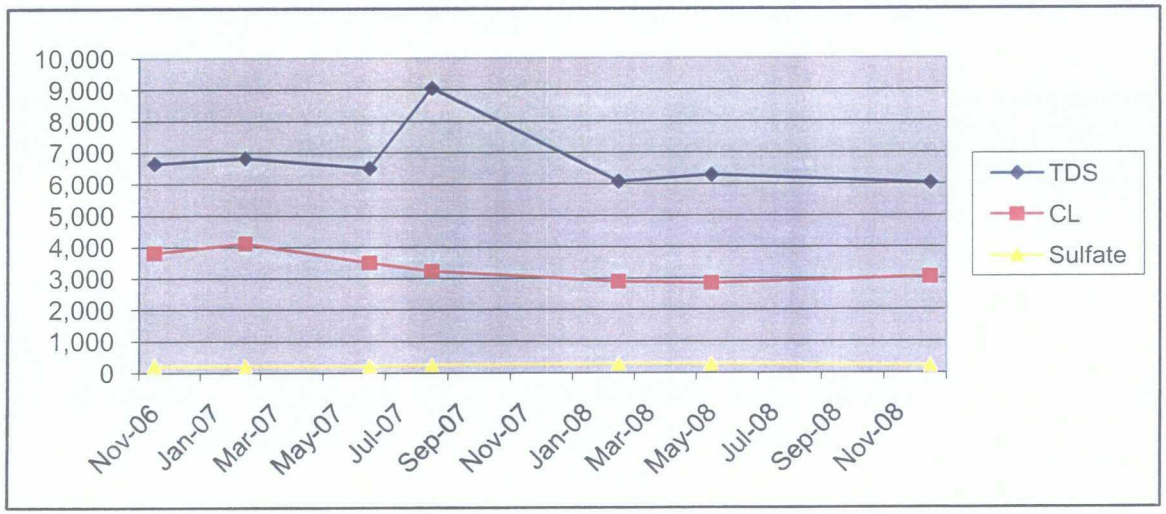


FIGURE NO. 5
LEA COUNTY, NEW MEXICO
RICE OPERATING COMPANY
REGIONAL GROUNDWATER GRADIENT MAP

APPENDIX A
EME A-2 TABLES

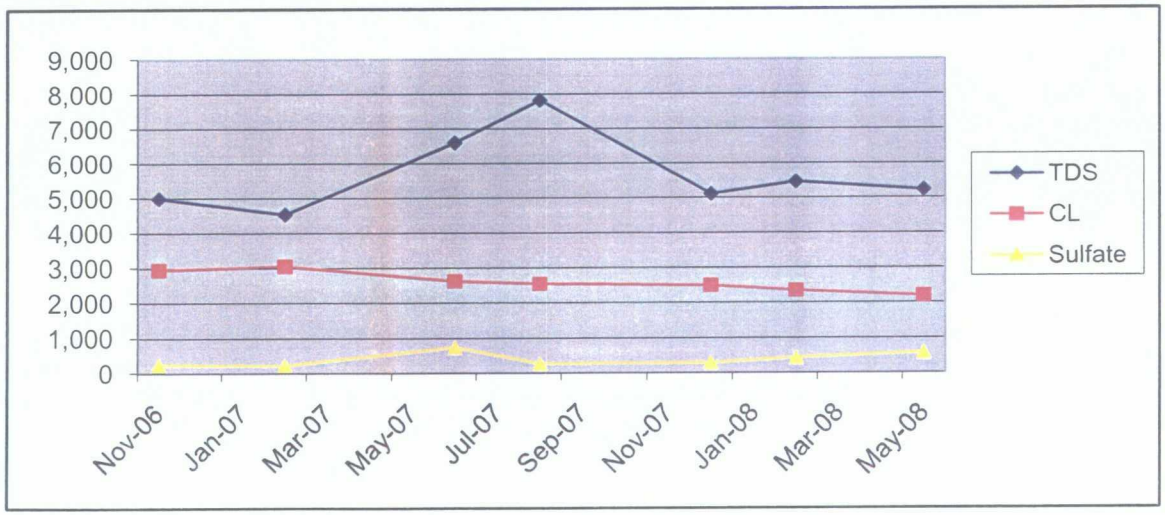
Rice Engineering Operating
EME Jct. A-2
Lea County, New Mexico

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
1	43.74	54.18	1.70	6	11/01/06	3,820	6,650	<0.001	<0.001	<0.001	<0.001	225	Clear no odor
1	43.76	54.16	1.70	6	02/13/07	4,120	6,830	<0.001	<0.001	<0.001	<0.001	222	Clear no odor
1	43.81	54.16	1.70	6	06/08/07	3,510	6,510	<0.001	<0.001	<0.001	<0.001	225	Clear no odor
1	44.09	54.16	1.60	6	08/21/07	3,239	9,045	<0.004	<0.004	<0.004	<0.012	249	Clear no odor
1	44.31	54.16	1.60	6	12/04/08	3,050	6,033	<0.001	<0.001	<0.001	<0.003	235	Clear no odor
1	44.38	54.12	1.60	6	02/13/08	2,900	6,080	<0.002	<0.002	<0.002	<0.006	289	Clear no odor
1	44.56	54.12	1.50	6	05/20/08	2,850	6,290	<0.002	<0.002	<0.002	<0.006	285	Clear no odor



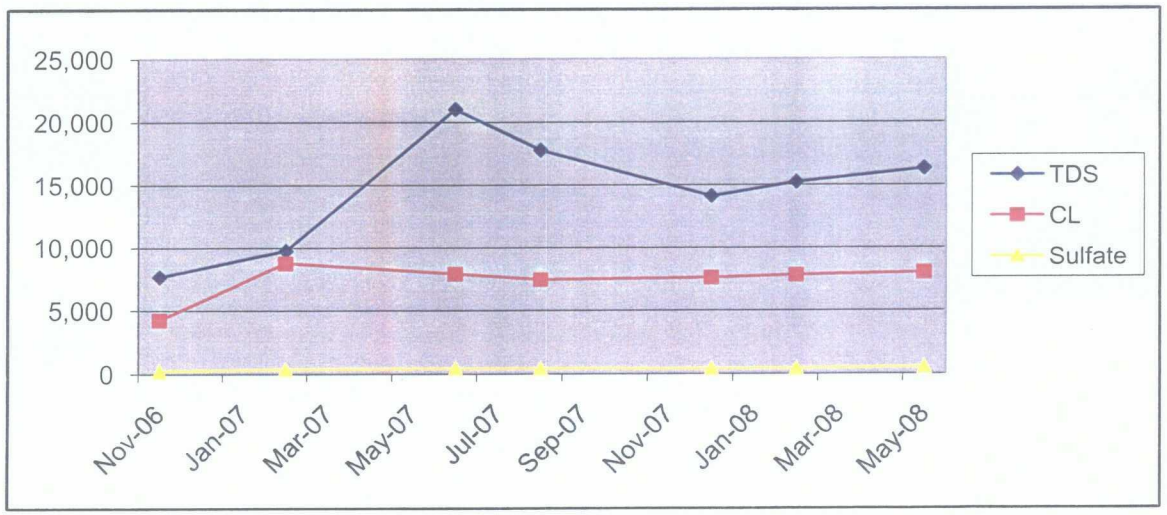
Rice Engineering Operating
EME Jct. A-2
Lea County, New Mexico

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
2	43.08	54.34	1.80	6	11/01/06	2,950	4,990	<0.001	<0.001	<0.001	<0.001	241	Clear no odor
2	43.07	54.30	1.80	6	02/13/07	3,060	4,540	<0.001	<0.001	<0.001	<0.001	226	Clear no odor
2	43.14	54.30	1.80	6	06/08/07	2,630	6,600	<0.001	<0.001	<0.001	<0.001	740	Clear no odor
2	43.43	54.30	1.70	6	08/21/07	2,549	7,819	<0.004	<0.004	<0.004	<0.012	268	Clear no odor
2	43.62	54.30	1.70	6	12/04/07	2,500	5,111	<0.001	<0.001	<0.001	<0.003	292	Clear no odor
2	43.73	54.30	1.70	6	02/13/08	2,350	5,460	<0.002	<0.002	<0.002	<0.006	437	Clear no odor
2	43.88	54.30	1.70	6	05/20/08	2,200	5,230	<0.002	<0.002	<0.002	<0.006	575	Clear no odor



Rice Engineering Operating
EME Jct. A-2
Lea County, New Mexico

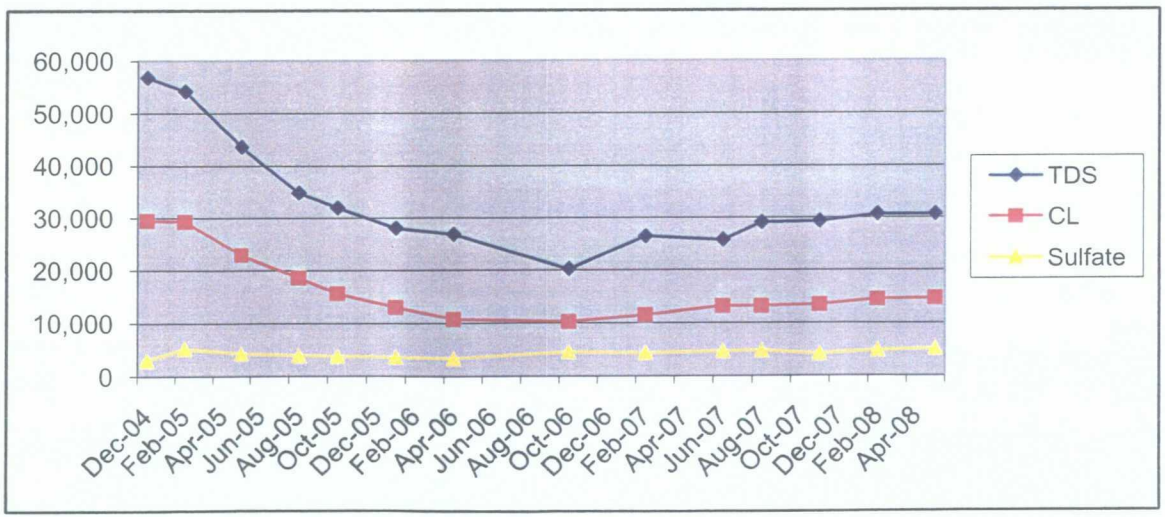
MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
3	42.34	55.14	2.00	8	11/01/06	4,250	7,680	<0.001	<0.001	<0.001	<0.001	232	Clear no odor
3	42.35	55.14	2.00	8	02/13/07	8,750	9,740	<0.001	<0.001	<0.001	<0.001	376	Clear no odor
3	42.40	55.14	2.00	8	06/08/07	7,900	21,000	<0.001	<0.001	<0.001	<0.001	450	Clear no odor
3	42.66	55.14	2.00	8	08/21/07	7,448	17,755	<0.004	<0.004	<0.004	<0.012	432	Clear no odor
3	42.89	55.14	2.00	8	12/04/07	7,600	14,088	<0.001	<0.001	<0.001	<0.003	411	Clear no odor
3	42.98	55.14	2.00	8	02/13/08	7,800	15,200	<0.002	<0.002	<0.002	<0.006	437	Clear no odor
3	43.13	54.93	2.00	8	05/20/08	8,000	16,300	<0.002	<0.002	<0.002	<0.006	541	Clear no odor



APPENDIX B
EME D-1 TABLES

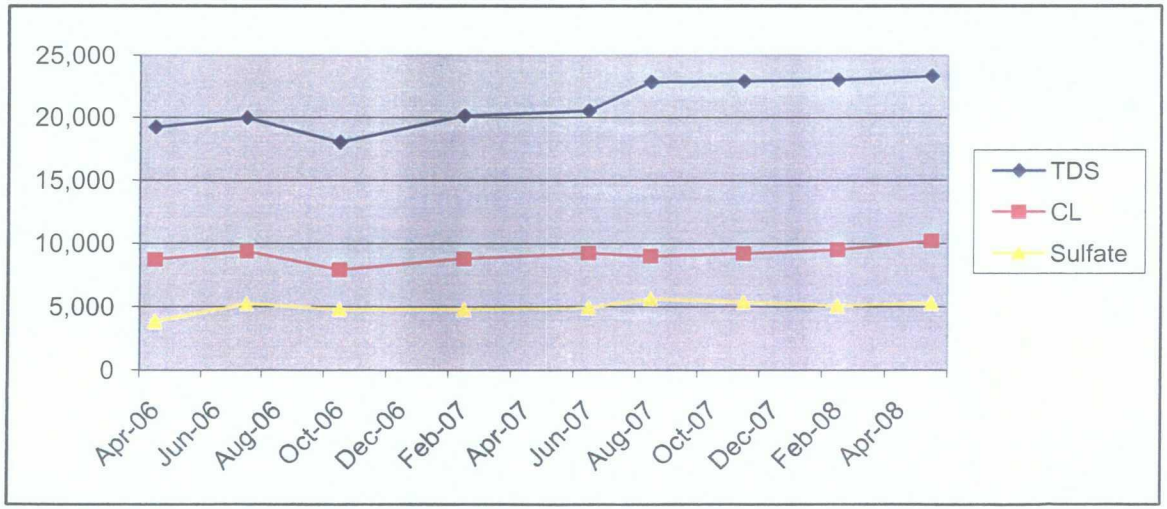
Rice Engineering Operating
EME Jct. D-1 Leak
Lea County, New Mexico

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
1	37.20	42.50		2.70	12/21/04	29,400	56,800	<0.001	<0.001	<0.001	<0.001	3,000	Tan & Silty
1	36.20	42.65		8.00	02/09/05	29,200	54,200	<0.001	<0.001	<0.001	<0.001	5,220	
1					05/03/05	22,900	43,600	<0.001	<0.001	<0.001	<0.001	4,270	
1					08/13/05	18,600	34,800	<0.001	<0.001	<0.001	<0.001	3,900	
1	34.70	42.65	1.30	5.00	10/19/05	15,600	31,900	<0.001	<0.001	<0.001	<0.001	3,810	
1	34.95	42.95	1.20	4.50	01/18/06	13,000	28,000	<0.001	<0.001	<0.001	<0.001	3,580	
1	35.54	42.65	1.10	10.00	04/19/06	10,700	26,800	<0.001	<0.001	<0.001	<0.001	3,320	
1	36.57	42.65	1.00	5.00	10/10/06	10,200	20,200	<0.001	<0.001	<0.001	<0.001	4,570	Silt
1	36.99	42.59	0.90	5.00	02/27/07	11,400	26,400	<0.001	<0.001	<0.001	<0.001	4,360	Silt to clear
1	37.36	42.59	0.80	5.00	06/04/07	13,100	25,700	<0.001	<0.001	<0.001	<0.001	4,650	Silt to clear
1	37.71	42.59	0.80	4.00	08/20/07	13,096	29,024	<0.002	<0.002	<0.002	<0.006	4,780	Silt to clear
1	38.03	42.59	0.70	4.00	11/06/07	13,400	29,255	<0.001	<0.001	<0.001	<0.003	4,180	Silt to clear
1	38.38	42.60	0.70	4.00	02/12/08	14,400	30,600	<0.001	<0.001	<0.001	<0.003	4,810	Silt to clear
1	38.89	42.60	0.60	4.00	05/19/08	14,600	30,600	<0.002	<0.002	<0.002	<0.006	5,130	Silt to clear



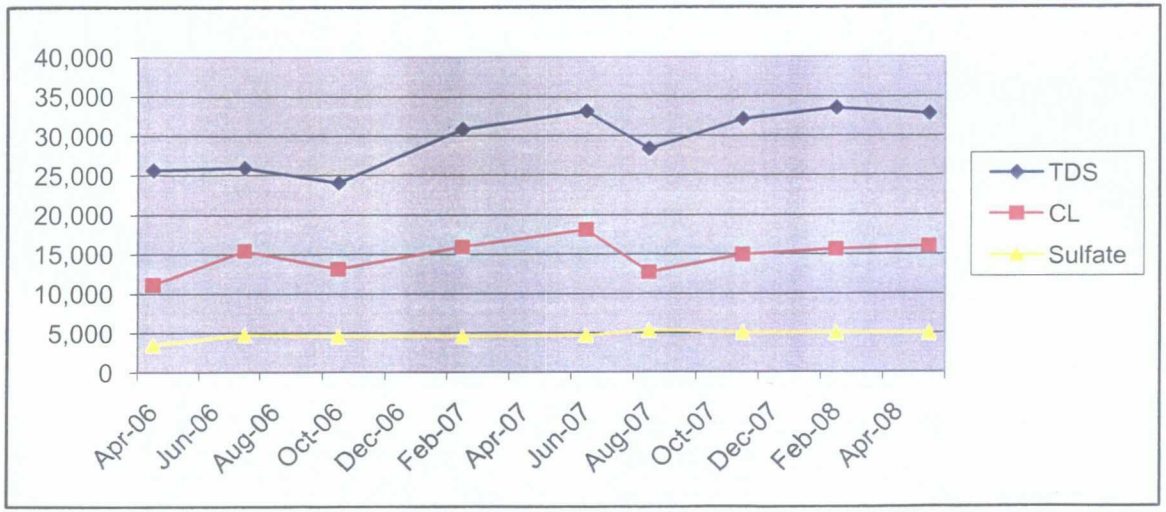
Rice Engineering Operating
EME Jct. D-1 Leak
Lea County, New Mexico

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
2	33.89	46.00	1.90	10	04/19/06	8,730	19,200	<0.001	<0.001	<0.001	<0.001	3,840	
2	34.65	46.00	1.80	10	07/18/06	9,390	19,950	<0.001	<0.001	<0.001	<0.001	5,240	Clear no odor
2	34.87	46.00	1.80	10	10/10/06	7,910	18,000	<0.001	<0.001	<0.001	<0.001	4,790	Silt to clear
2	35.38	47.18	1.90	8	02/27/07	8,780	20,100	<0.001	<0.001	<0.001	<0.001	4,780	Clear no odor
2	35.87	47.18	1.80	8	06/04/07	9,230	20,500	<0.001	<0.001	<0.001	<0.001	4,910	Silt to clear
2	36.19	47.18	1.80	8	08/20/07	8,997	22,820	<0.002	<0.002	<0.002	<0.006	5,610	Clear no odor
2	36.48	47.18	1.70	8	11/06/07	9,200	22,905	<0.001	<0.001	<0.001	<0.003	5,350	Clear no odor
2	36.85	47.20	1.70	8	02/12/08	9,500	23,000	<0.001	<0.001	<0.001	<0.003	5,050	Silt to clear
2	37.34	47.20	1.60	8	05/19/08	10,200	23,300	<0.002	<0.002	<0.002	<0.006	5,280	Silt to clear
2													



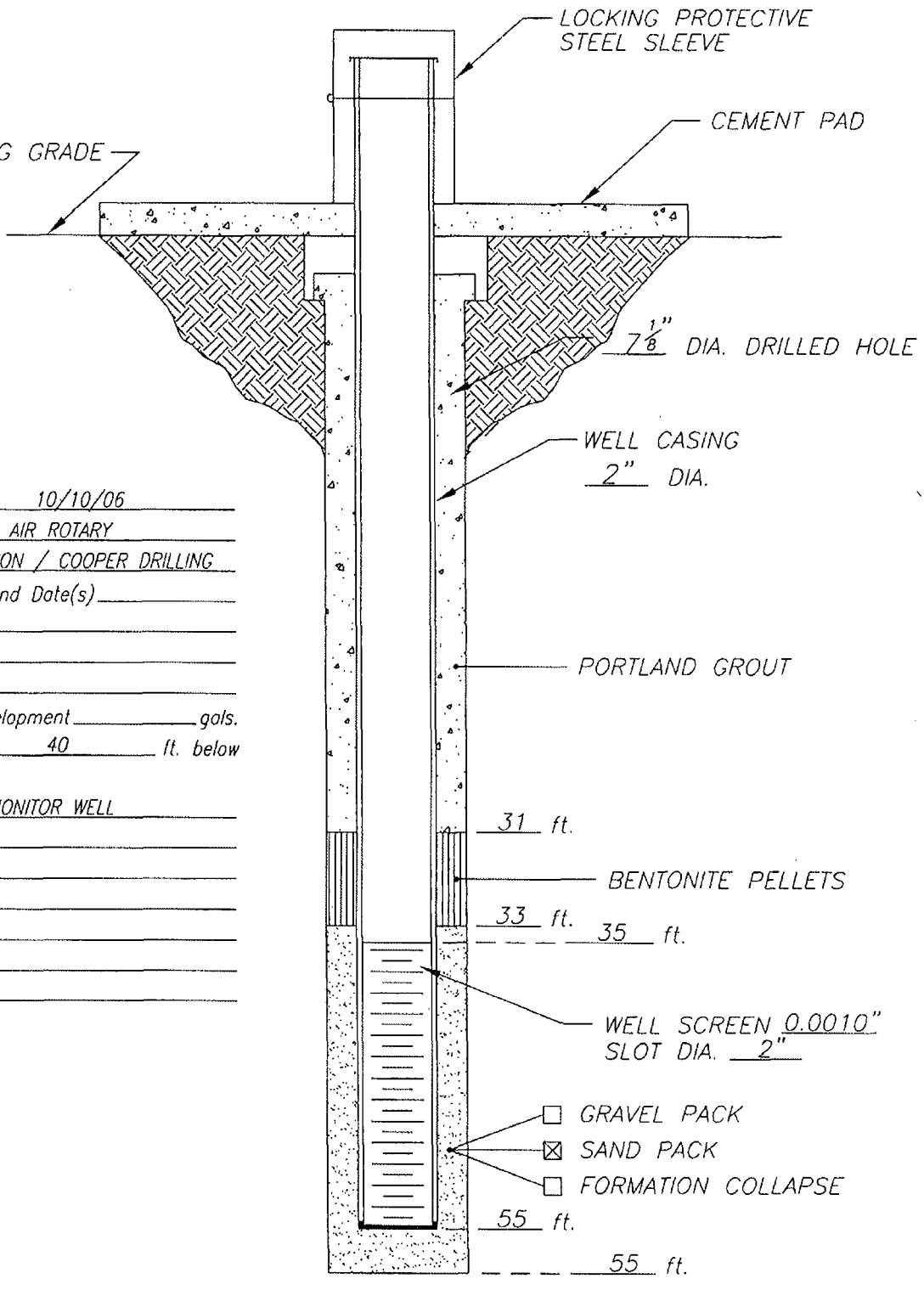
Rice Engineering Operating
EME Jct. D-1 Leak
Lea County, New Mexico

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
3	37.55	47.95	1.70	10	04/19/06	11,100	25,600	<0.001	<0.001	<0.001	<0.001	3,480	
3	38.24	47.95	1.60	10	07/18/06	15,400	25,900	<0.001	<0.001	<0.001	<0.001	4,770	Clear no odor
3	38.59	47.95	1.50	10	10/10/06	13,100	24,000	<0.001	<0.001	<0.001	<0.001	4,570	Clear no odor
3	39.00	47.93	1.40	6	02/27/07	15,900	30,800	<0.001	<0.001	<0.001	<0.001	4,570	Clear no odor
3	39.47	47.93	1.40	6	06/04/07	18,100	33,100	<0.001	<0.001	<0.001	<0.001	4,670	Silt to clear
3	39.81	47.93	1.30	6	08/20/07	12,696	28,292	<0.002	<0.002	<0.002	<0.006	5,300	Clear
3	39.99	47.93	1.30	6	11/06/07	14,900	32,095	<0.001	<0.001	<0.001	<0.003	5,001	Silt to clear
3	40.35	47.95	1.20	6	02/12/08	15,600	33,500	<0.001	<0.001	<0.001	<0.003	4,970	Silt to clear
3	40.68	47.95	1.20	6	05/19/08	16,000	32,800	<0.002	<0.002	<0.002	<0.006	4,970	Silt to clear
3													



APPENDIX C
PHOTOGRAPHS

WELL CONSTRUCTION LOG



Installation Date(s) 10/10/06
Drilling Method AIR ROTARY
Drilling Contractor HARRISON / COOPER DRILLING
Development Technique(s) and Date(s) _____

Water Removed During Development _____ gals.
Static Depth to Water 40 ft. below Ground Level
Well Purpose MONITOR WELL

Remarks _____

DATE: 11/9/06 *Highlander Environmental*	CLIENT: *RICE OPERATING* PROJECT: *EME A-2* LOCATION: *LEA COUNTY, NEW MEXICO*	WELL NO. MW-1

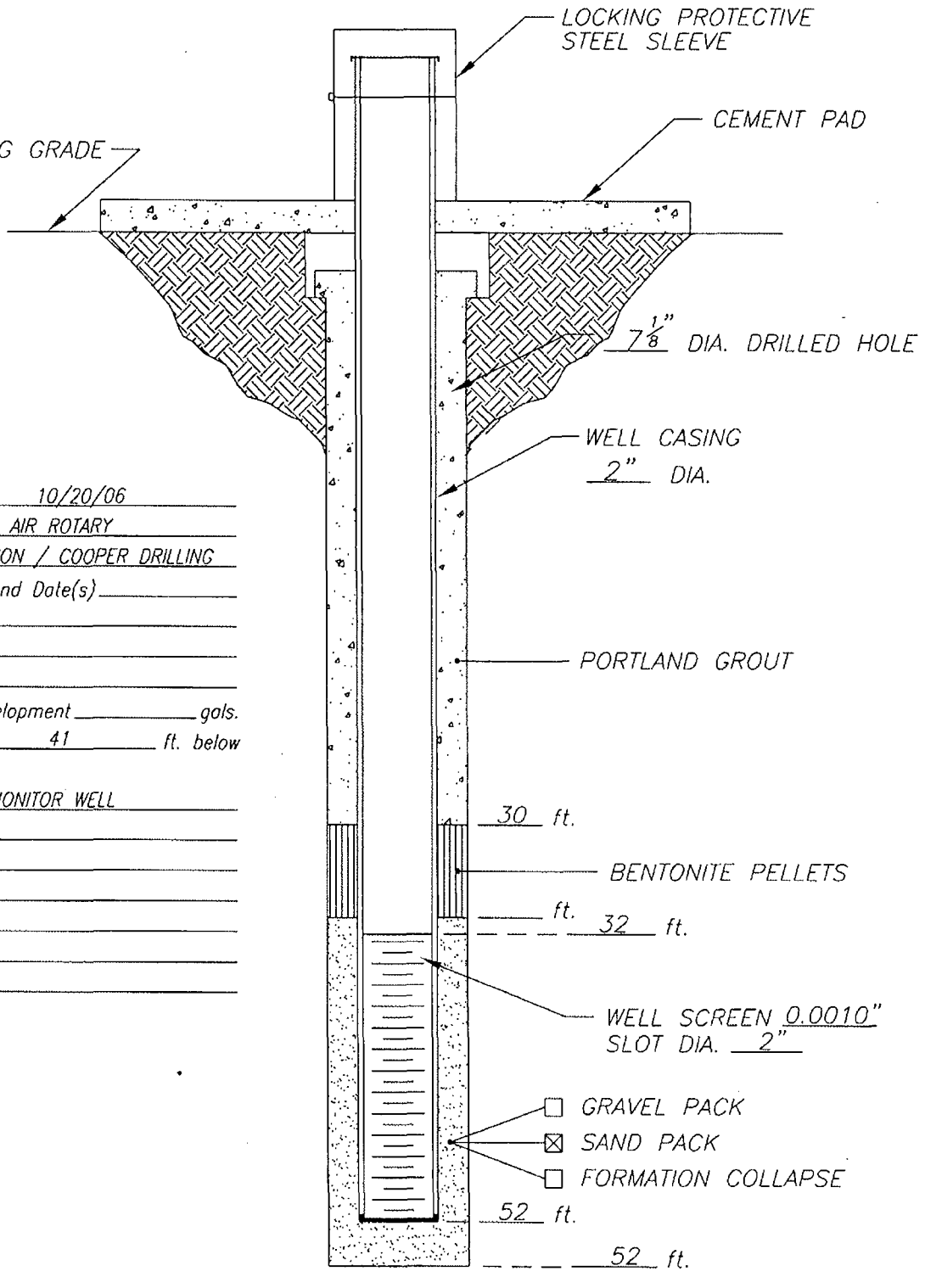
SAMPLE LOG

Boring/Well MW-1
Project Number: 2643
Client: Rice Engineering
Site Location: EME A-2
Location: Lea County, New Mexico
Total Depth 55
Date Installed: 10/10/06

DEPTH (in feet)	OVM	CHLORIDES (in mg/Kg)	SAMPLE DESCRIPTION
3-5	0	260	Tan/buff calcareous fine grain sand
8-10	0	355	Tan/red calcareous fine grain sand
13-15	0	436	Tan/buff calcareous fine grain sand
18-20	0	347	Tan/buff calcareous fine grain sand
23-25	0	176	Tan/red calcareous fine grain sand
28-30	0	227	Tan/red calcareous fine grain sand
33-35	0	435	Tan/red calcareous fine grain sand
38-40	1	308	Tan/brown clayey fine grain sand
43-45	0	348	Tan/brown sandy clay
48-50	0	712	Tan/brown clayey fine grain sand
53-55	0	843	Red fine grain sandy clay

Boring completed at 55 feet bgs Groundwater encountered at 40 feet

WELL CONSTRUCTION LOG



Installation Date(s) 10/20/06
Drilling Method AIR ROTARY
Drilling Contractor HARRISON / COOPER DRILLING
Development Technique(s) and Date(s) _____

Water Removed During Development _____ gals.
Static Depth to Water 41 ft. below Ground Level
Well Purpose MONITOR WELL

Remarks _____

DATE: 11/9/06 *Highlander Environmental*	CLIENT: *RICE OPERATING* PROJECT: *EME A-2* LOCATION: *LEA COUNTY, NEW MEXICO*	WELL NO. MW-2

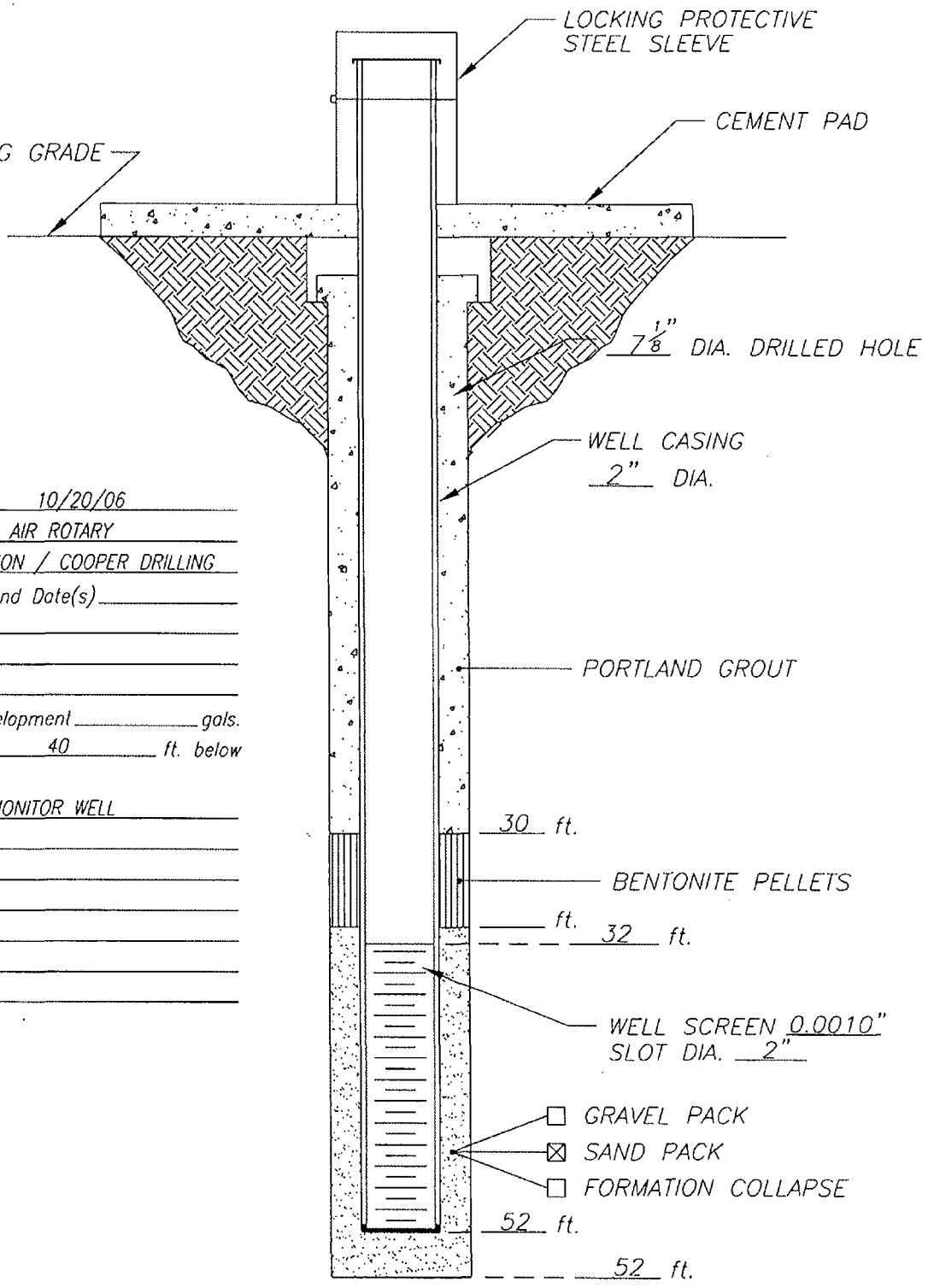
SAMPLE LOG

Boring/Well: MW-2
Project Number: 2643
Client: Rice Engineering
Site Location: EME A-2
Location: Lea County, New Mexico
Total Depth 52
Date Installed: 10/20/06

DEPTH (in feet)	OVM	CHLORIDES (in mg/Kg)	SAMPLE DESCRIPTION
3-5	0	117	Buff fine grain calcareous sand
8-10	0	89	Buff fine grain calcareous sand with limestone intermixed
23-25	0	283	Tan fine grain calcareous sand
28-30	0	251	Tan fine grain calcareous sand
33-35	0	167	Tan fine grain calcareous sand with limestone intermixed
38-40	0	224	Tan fine grain calcareous sand
43-45	0	--	Tan/brown sandy clay
48-50	0	--	Tan fine grain sandy clay (wet)
53-55	0	843	Red fine grain sandy clay becoming red clay

Boring completed at 52 feet bgs Groundwater encountered at 41 feet

WELL CONSTRUCTION LOG



Installation Date(s) 10/20/06
Drilling Method AIR ROTARY
Drilling Contractor HARRISON / COOPER DRILLING
Development Technique(s) and Date(s) _____

Water Removed During Development _____ gals.
Static Depth to Water 40 ft. below Ground Level
Well Purpose MONITOR WELL

Remarks _____

DATE: 11/9/06 *Highlander Environmental*	CLIENT: *RICE OPERATING* PROJECT: *EME A-2* LOCATION: *LEA COUNTY, NEW MEXICO*	WELL NO. MW-3

SAMPLE LOG

Boring/Well: MW-3
Project Number: 2643
Client: Rice Engineering
Site Location: EME A-2
Location: Lea County, New Mexico
Total Depth 52
Date Installed: 10/20/06

DEPTH (in feet)	OVM	CHLORIDES (in mg/Kg)	SAMPLE DESCRIPTION
3-5	1	553	Buff tan fine grain sandy limestone
8-10	2	449	Tan fine grain calcareous sand
13-15	0	965	Buff fine grain sandy limestone
18-20	1	545	Tan fine grain calcareous sand
23-25	1	253	Tan fine grain calcareous sand
28-30	3	240	Tan fine grain calcareous sand
33-35	2	282	Tan fine grain calcareous sand with clay intermixed
38-40	4	335	Tan clay with small amounts of sand
43-45	0	--	Tan fine grain sandy clay (wet)
48-50	0	--	Tan fine grain sandy clay (wet)

Boring completed at 52 feet bgs Groundwater encountered at 40 feet