1R - 219

GENERAL CORRESPONDENCE

YEAR(S):

2000 → 1994

RICE *Operating Company*

From the desk of:
Carolyn Doran Haynes

3-17-00

Bill Olson:

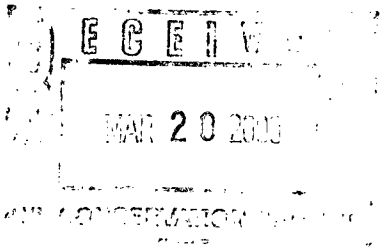
It appears we are finally getting the oil! Bob Allen's team has been a big part of agressively going after it.

I would like to comment about MW-3. This is a very deep well (155') and also has large casing (4"). Before sampling, we are now using a pump to purge the required casing volume. In the past, I can't confirm that this was accomplished, and the analytical results maybe a testimony to that (upon comparison from years past.) This year, I will also be researching techniques to recover Cl without wasting precious water. We (Bob Allen + I) will review any protocol (before implementing) with you for your input + guidance. Thanks so much!

Carolyn Haynes

RICE *Operating Company*

122 West Taylor • Hobbs, New Mexico 88240
Phone: (505)393-9174 • Fax: (505) 397-1471



CERTIFIED MAIL
RETURN RECEIPT NO. Z 577 009 727

March 17, 2000

Mr. William C. Olson
NM Energy, Minerals, and Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
2040 S. Pacheco
Santa Fe, NM 87505

RE: 1999 MONITOR WELL REPORT
GROUNDWATER REMEDIATION/MONITORING
PIPELINE LEAK, WEST COUNTY ROAD SITE
HOBBS SWD SYSTEM
SW/4 NW/4 JCT. N-6, SEC 5,6, T19S, R38E, LEA COUNTY, NEW MEXICO

Dear Mr. Olson:

Rice Operating Company (ROC) appreciates this opportunity to submit the 1999 Monitor Well Report for the Hobbs Salt Water Disposal System Junction N-6 Release Site in the SW/4 NW/4 of Sections 5, 6, T19S, R38E, Lea County, NM. This monitoring site is situated just south of the intersection of Highway 62-180 and the South Loop of the Hobbs West County Road by-pass.

The 1999 quarterly monitoring events for the seven monitor wells were scheduled and conducted by Safety and Environmental Solutions, Inc. (SES) of Hobbs. Analytical results were conducted by Cardinal Larboratories of Hobbs. The 1999 MW Report was compiled by SES.

ROC has contracted with SES for Year 2000 monitor well sampling and SES will schedule all major events with a 48-hour advance notice to the NMOCD. All sampling activities will be conducted pursuant to NMOCD guidelines.

ROC has actively worked toward recovering the phase-separated hydrocarbon (PSH) at the Recovery Well MW-1. The high-volume submersible pump was removed March 13, 1999 because PSH recovery was negligible compared to the water volume pumped (and disposed.) Manual bailing of the PSH did not realize distinct improvement in reducing the PSH layer, so a

skimmer-type pump was installed in September 1999. This pumping program is monitored weekly to optimize PSH recovery, and it appears the PSH layer is now shrinking. The Recovery Well MW-1 oil-recovery cumulative results are summarized in the attached table. The monitor wells water-elevation and analytical cumulative results are also attached.

All recovered fluids from the skimmer pump operation and the monitor well sampling events are discharged into the into the Hobbs SWD System pipeline for disposal.

ROC is the service provider (operator) for the Hobbs Salt Water Disposal System and has no ownership of any portion of pipeline, well or facility. The Hobbs SWD System is owned by a consortium of oil producers, System Partners, who provide all operating capital on a percentage ownership/usage basis.

Thank you for your consideration concerning this yearly summary of groundwater monitoring information. If you have any questions or if I can be of any service, please don't hesitate to call.

RICE OPERATING COMPANY

Carolyn Doran Haynes

Carolyn Doran Haynes
Operations Engineer

Enclosure: 1999 Year Report
Summary Tables

Cc: file, Ms. Donna Williams,
NMOCD, District I Office
1625 N. French Drive
Hobbs, NM 88240

QUARTERLY SUMMARY OF RECOVERY SYSTEM OPERATIONS

WATER AND CRUDE OIL RECOVERY VOLUMES

WEST COUNTY ROAD SPILL SITE, HOBBS SWD SYSTEM

Groundwater Recovery Operations				Crude Oil Recovery Operations		
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Volume Recovered (gal)	Cumulative Volume (gal)	Description
JAN 1996	0	0	0.0	0.00	0.00	No recovery operations
FEB 1996	0	0	0.0	0.00	0.00	pending regulatory approval &
MAR 1996	0	0	0.0	0.00	0.00	facility installation
1ST QTR	**0**	**0**	**0.0**	**0.00**	**0.00**	
APR 1996	0	0	0.0	30.75	30.75	
MAY 1996	0	0	0.0	7.85	38.60	
JUN 1996	19	19,140	1.1	2.38	40.98	Groundwater Monitoring Event
2ND QTR	**19**	**19,140**	**0.4**	**40.98**	**40.98**	
JUL 1996	0	0	0.0	6.50	47.48	
AUG 1996	0	0	0.0	3.27	50.75	Groundwater Monitoring Event
SEP 1996	0	0	0.0	3.75	54.50	
3RD QTR	**0**	**0**	**0.0**	**13.52**	**54.50**	
OCT 1996	0	0	0.0	5.00	59.50	
NOV 1996	528	262,080	6.1	1.70	61.20	Groundwater Monitoring Event
DEC 1996	720	561,600	13.0	3.00	64.20	
4TH QTR	**1,248**	**823,680**	**6.4**	**9.70**	**64.20**	
1996 TOTALS	**1,267**	**842,820**	**1.7**	**64.20**	**64.20**	
JAN 1997	744	580,320	13.0	3.10	67.30	
FEB 1997	672	485,280	13.0	2.80	70.10	
MAR 1997	744	426,240	9.5	2.60	72.70	
1ST QTR	**2,160**	**1,491,840**	**11.8**	**8.50**	**72.70**	
APR 1997	0	0	0.0	2.25	74.95	Groundwater Monitoring Event
MAY 1997	408	325,440	7.3	4.45	79.40	
JUN 1997	672	524,160	12.1	2.80	82.20	
2ND QTR	**1,080**	**849,600**	**6.5**	**9.50**	**82.20**	
JUL 1997	600	465,120	10.4	2.50	84.70	Groundwater Monitoring Event
AUG 1997	744	580,320	13.0	2.10	86.80	
SEP 1997	720	561,600	13.0	3.00	89.80	
3RD QTR	**2,064**	**1,607,040**	**12.1**	**7.60**	**89.80**	
OCT 1997	744	580,320	13.0	3.10	92.90	
NOV 1997	720	541,440	12.5	3.00	95.90	
DEC 1997	48	34,560	0.0	3.70	99.60	Groundwater Monitoring Event
4TH QTR	**1,512**	**1,156,320**	**8.5**	**9.80**	**99.60**	
1997 TOTALS	**6,816**	**5,104,800**	**9.7**	**35.40**	**99.60**	Total Crude oil recovered from Apr 96 to Dec 97

WEST COUNTY ROAD SPILL SITE, HOBBS SWD SYSTEM						
Groundwater Recovery Operations				Crude Oil Recovery Operations		
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Volume Recovered (gal)	Cumulative Volume (gal)	Description
JAN 1998	0	0	0.0	4.75	104.35	
FEB 1998	240	144,000	3.6	3.25	707.60	Groundwater Monitoring Event
MAR 1998	744	446,400	10.0	3.10	110.70	
1ST QTR	**984**	**590,400**	**4.5**	**11.10**	**110.70**	
APR 1998	696	167,040	0.0	2.90	113.60	
MAY 1998	744	178,560	4.0	3.10	116.70	
JUN 1998	740	172,800	4.0	3.00	119.70	
2ND QTR	**2,180**	**518,400**	**2.7**	**9.00**	**119.70**	
JUL 1998	576	138,240	4.0	2.40	122.10	
AUG 1998	0	0	0.0	19.50	141.60	Groundwater Monitoring Event
SEP 1998	0	0	0.0	4.63	146.23	
3RD QTR	**576**	**138,240**	**1.3**	**26.53**	**146.23**	
OCT 1998	0	0	0.0	8.26	154.49	
NOV 1998	0	0	0.0	11.63	166.12	
DEC 1998	0	0	0.0	10.63	176.75	Groundwater Monitoring Event
4TH QTR	**0**	**0**	**0.0**	**30.52**	**176.75**	
1998 TOTALS	**3,740**	**1,247,040**	**2.1**	**77.15**	**176.75**	Total Crude oil recovered from Apr 96 to Dec 98
JAN 1999	610.5	127,153	2.5	3.10	179.85	
FEB 1999	672	68,554	1.8	2.80	182.65	
MAR 1999	292.4	6,418	0.4	0.60	183.25	Pulled pump March 13
1ST QTR	**1,575**	**202,125**	**1.6**	**6.50**	**183.25**	
APR 1999	0	73	0.0	16.56	199.81	Recovered w/ manual bailer
MAY 1999	0	41	0.0	10.55	210.36	Recovered w/ manual bailer
JUN 1999	0	0	0.0	0.00	210.36	
2ND QTR	**0**	**114**	**0.0**	**27.11**	**210.36**	
JUL 1999	0	0	0.0	0.00	210.36	
AUG 1999	0	0	0.0	19.50	229.86	Recovered w/ manual bailer
SEP 1999	0	0	0.0	0.00	229.86	
3RD QTR	**0**	**0**	**0.0**	**19.50**	**229.86**	
OCT 1999	116.5	75	0.0	32.00	261.86	Installed skimmer-type pump
NOV 1999	112	151	0.0	60.00	321.86	
DEC 1999	58.5	19	0.0	15.00	336.86	
4TH QTR	**287**	**245**	**0.0**	**107.00**	**336.86**	
1999 TOTALS	**1,862**	**202,484**	**0.4**	**160.11**	**336.86**	Total Crude oil recovered from Apr 96 to Dec 99

SUMMARY OF 1996, 1997, 1998, 1999 RECOVERED VOLUMES

WEST COUNTY ROAD SPILL SITE, HOBBS SWD SYSTEM

Groundwater Recovery Operations				Crude Oil Recovery Operations		
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Volume Recovered (gal)	Cumulative Volume (gal)	Description
1996 TOTALS	1,267	842,820	1.7	64.20	64.20	Total Crude oil recovered from Apr 96 to Dec 96
1997 TOTALS	6,816	5,104,800	9.7	35.40	99.60	Total Crude oil recovered from Apr 96 to Dec 97
1998 TOTALS	3,740	1,247,040	2.1	77.15	176.75	Total Crude oil recovered from Apr 96 to Dec 98
1999 TOTALS	1,862	202,484	0.4	160.11	336.86	Total Crude oil recovered from Apr 96 to Dec 99
4-YEAR TOTAL	**13,685**	**7,397,144**		**336.86**	**336.86**	Total Crude Oil recovered from April 1996 to December 1999

SUMMARY OF GROUNDWATER MEASUREMENTS by QUARTER

WEST COUNTY ROAD SPILL SITE, HOBBS SWD SYSTEM

Well	Date Gauged	Depth to Water	Water Elevation	Casing Elevation	Surface Elevation	LNAPL Thickness
IWW	07/26/95	35.75	62.26	98.01	97.8	0.00
IWW	06/24/96	35.50	62.51	98.01	97.8	0.00
IWW	08/02/96	35.60	62.41	98.01	97.8	0.00
IWW	11/22/96	37.00	61.01	98.01	97.8	0.00
IWW	07/02/97	37.00	61.01	98.01	97.8	0.00
IWW	08/07/97	37.78	60.23	98.01	97.8	0.00
IWW	12/06/97	37.51	60.50	98.01	97.8	0.00
IWW	02/14/98	37.14	60.90	98.04	97.8	0.00
IWW	04/07/99	38.06	60.11	98.17	97.8	0.00
IWW	06/28/99	38.18	59.99	98.17	97.8	0.00
IWW	09/17/99	38.23	59.94	98.17	97.8	0.00
IWW	12/13/99	38.44	59.73	98.17	97.8	0.00
MW-1	07/26/95	42.09	57.91	100.00	97.3	N/A
MW-1	06/24/96	40.73	59.27	100.00	97.3	N/A
MW-1	08/07/97	39.00	62.50	100.00	97.3	1.83
MW-1	02/14/98	39.26	60.86	100.00	97.3	0.15
MW-1	10/26/98	40.50	60.05	100.00	97.3	0.67
MW-1	04/07/99	42.17	57.83	100.00	97.3	
MW-1	06/28/99	44.67	55.33	100.00	97.3	
MW-1	09/17/99	free	product		free	product
MW-1	12/13/99	free	product		free	product
MW-2	07/26/95	37.45	60.46	97.91	98.5	0.00
MW-2	06/18/96	35.16	62.75	97.91	98.5	0.00
MW-2	06/24/96	35.24	62.67	97.91	98.5	0.00
MW-2	08/02/96	35.30	62.61	97.91	98.5	0.00
MW-2	11/22/96	37.00	60.91	97.91	98.5	0.00
MW-2	07/02/97	36.70	61.21	97.91	98.5	0.00
MW-2	08/07/97	37.80	60.11	97.91	98.5	0.00
MW-2	12/06/97	37.32	60.59	97.91	98.5	0.00
MW-2	02/14/98	37.70	60.24	97.94	98.5	0.00
MW-2	04/07/99	37.83	60.06	97.89	98.5	0.00
MW-2	06/28/99	37.92	59.97	97.89	98.5	0.00
MW-2	09/17/99	38.00	59.89	97.89	98.5	0.00
MW-2	12/13/99	38.15	59.74	97.89	98.5	0.00
MW-3	07/26/95	34.97	62.57	97.54	98.1	0.00
MW-3	06/24/96	35.54	62.00	97.54	98.1	0.00
MW-3	08/02/96	36.60	60.94	97.54	98.1	0.00
MW-3	11/22/96	35.70	61.84	97.54	98.1	0.00
MW-3	07/02/97	36.20	61.34	97.54	98.1	0.00
MW-3	08/07/97	36.80	60.74	97.54	98.1	0.00
MW-3	12/06/97	36.80	60.74	97.54	98.1	0.00
MW-3	02/14/98	36.88	60.77	97.65	98.1	0.00
MW-3	04/07/99	38.52	59.13	97.65	98.1	0.00
MW-3	06/28/99	38.60	59.05	97.65	98.1	0.00
MW-3	09/17/99	38.58	59.07	97.65	98.1	0.00
MW-3	12/13/99	38.75	58.90	97.65	98.1	0.00

Well	Date Gauged	Depth to Water	Water Elevation	Casing Elevation	Surface Elevation	LNAPL Thickness
MW-4	07/26/95	37.40	62.95	100.35	100.8	0.00
MW-4	06/24/96	37.20	63.15	100.35	100.8	0.00
MW-4	08/02/96	35.80	64.55	100.35	100.8	0.00
MW-4	11/22/96	38.25	62.10	100.35	100.8	0.00
MW-4	07/02/97	38.30	62.05	100.35	97.4	0.00
MW-4	08/07/97	37.50	62.85	100.35	97.4	0.00
MW-4	12/06/97	39.30	61.05	100.35	97.4	0.00
MW-4	02/14/98	No data		99.93	97.4	0.00
MW-4	04/07/99	40.01	60.25	100.26	97.4	0.00
MW-4	06/28/99	40.80	59.46	100.26	97.4	0.00
MW-4	09/17/99	40.16	60.10	100.26	97.4	0.00
MW-4	12/13/99	40.35	59.91	100.26	97.4	0.00
MW-5	07/26/95	33.91	62.25	96.16	96.0	0.00
MW-5	06/18/96	33.61	62.55	96.16	96.0	0.00
MW-5	06/24/96	33.72	62.44	96.16	96.0	0.00
MW-5	08/02/96	33.58	62.58	96.16	96.0	0.00
MW-5	11/22/96	34.60	61.56	96.16	96.0	0.00
MW-5	07/02/97	34.97	61.19	96.16	96.0	0.00
MW-5	08/07/97	35.70	60.46	96.16	96.0	0.00
MW-5	12/06/97	35.76	60.40	96.16	96.0	0.00
MW-5	02/14/98	35.30	60.91	96.21	96.0	0.00
MW-5	04/07/99	36.28	60.17	96.45	96.0	0.00
MW-5	06/28/99	36.40	60.05	96.45	96.0	0.00
MW-5	09/17/99	36.49	59.96	96.45	96.0	0.00
MW-5	12/13/99	36.64	59.81	96.45	96.0	0.00
MW-6	07/26/95	35.69	62.83	98.52	98.8	0.00
MW-6	06/18/96	35.56	62.96	98.52	98.8	0.00
MW-6	06/24/96	35.68	62.84	98.52	98.8	0.00
MW-6	08/02/96	35.68	62.84	98.52	98.8	0.00
MW-6	11/22/96	37.29	61.23	98.52	98.8	0.00
MW-6	07/02/97	37.10	61.42	98.52	98.8	0.00
MW-6	08/07/97	38.20	60.32	98.52	98.8	0.00
MW-6	12/06/97	37.74	60.78	98.52	98.8	0.00
MW-6	02/14/98	No data		98.53	98.8	0.00
MW-6	04/07/99	38.27	60.17	98.44	98.8	0.00
MW-6	06/28/99	38.37	60.07	98.44	98.8	0.00
MW-6	09/17/99	38.45	59.99	98.44	98.8	0.00
MW-6	12/13/99	38.62	59.82	98.44	98.8	0.00
MW-7	07/26/95	37.92	60.57	98.49	98.8	0.00
MW-7	06/24/96	35.76	62.73	98.49	98.8	0.00
MW-7	08/02/96	36.10	62.39	98.49	98.8	0.00
MW-7	11/22/96	36.84	61.65	98.49	98.8	0.00
MW-7	07/02/97	37.38	61.11	98.49	98.8	0.00
MW-7	08/07/97	37.30	61.19	98.49	98.8	0.00
MW-7	12/06/97	37.81	60.68	98.49	98.8	0.00
MW-7	02/14/98	No data		98.53	98.8	0.00
MW-7	04/07/99	38.40	60.04	98.44	98.8	0.00
MW-7	06/28/99	38.46	59.98	98.44	98.8	0.00
MW-7	09/17/99	38.56	59.88	98.44	98.8	0.00
MW-7	12/13/99	38.73	59.71	98.44	98.8	0.00

SUMMARY OF WATER SAMPLE ANALYTICAL RESULTS 1995 - 1999
WEST COUNTY ROAD SPILL SITE, HOBBS SWD SYSTEM

Well Name	Date Sampled	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)	Total BTEX (ppm)	TDS (mg/l)	Chloride (mg/l)
NMWQCC Standards		0.010	0.750	0.750	0.620	N/A	1,000	250
MW-1	07/24/95	**2.8710**	<0.0200	0.0120	0.2710	3.1540	**25,106**	**14,091**
MW-1	07/24/95	N/A	N/A	N/A	N/A	N/A	**4,374**	
MW-1 (SPL)	02/18/98	**3.4000**	0.5700	**0.9600**	**0.7400**	5.6700	493	100
MW-1 (SPL)	12/12/98						840	43
MW-1	04/07/99	**2.8500**	**1.3300**	**2.5200**	**2.5500**	9.2500	**1820**	**1286**
MW-2	07/21/95	**0.0470**	0.0120	0.0330	<0.0010	0.0920	N/A	132
MW-2	06/19/96	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	649	96
MW-2	08/12/96	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	N/A	N/A
MW-2	11/25/96	0.0019	0.0012	0.0018	<0.0030	0.0049	443	44
MW-2	04/03/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	497	50
MW-2	07/02/97	0.0060	0.0070	0.0030	0.0110	0.0270	399	44
MW-2	12/06/97	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	414	40
MW-2 (SPL)	12/06/97	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	N/A	N/A
MW-2 (SPL)	02/18/98	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	455	36
MW-2	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	457	45
MW-2	12/12/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	422	47
MW-2	04/06/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	464	40
MW-2	06/28/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	426	44
MW-2	09/17/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	528	45
MW-2	12/14/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	596	41
MW-3 - S	07/21/95	0.0020	<0.0010	<0.0010	<0.0030	0.0020	N/A	**256**
MW-3	07/21/95	**0.0440**	0.0610	0.0480	0.0420	0.1950	N/A	N/A
MW-3	06/19/96	**0.1320**	<0.0010	<0.0010	<0.0010	0.1320	**2,684**	160
MW-3	11/25/96	**1.1700**	0.0011	0.0047	0.0150	1.1908	**13,890**	**6,850**
MW-3	04/03/97	**0.2920**	<0.0010	0.0010	0.0050	0.2980	**7764**	**3249**
MW-3	07/02/97	0.0020	<0.0010	<0.0010	<0.0030	0.0020	**3065**	**1290**
MW-3	12/06/97	**0.0120**	<0.0020	<0.0020	<0.0060	0.0120	**4610**	**1450**
MW-3 (SPL)	12/06/97	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	N/A	N/A

Well Name	Date Sampled	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)	Total BTEX (ppm)	TDS (mg/l)	Chloride (mg/l)
NMWQCC Standards		0.010	0.750	0.750	0.620	N/A	1,000	250
MW-3 (SPL)	02/18/98	0.0016	<0.0010	<0.0010	<0.0010	0.0016	**2,967**	**1,700**
MW-3	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	**3,980**	**1,672**
MW-3	12/12/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	**1,498**	**614**
MW-3	04/07/99	**0.9530**	0.0020	0.0040	<0.0060	N/A	**20,470**	**11,770**
MW-3	06/28/99	**0.6730**	<0.0020	0.0020	<0.0060	N/A	**15,660**	**8,567**
MW-3	09/17/99	**0.7150**	<0.0020	<0.0020	<0.0060	N/A	**17,730**	**8,922**
MW-3	12/14/99	**0.7610**	<0.0020	0.0030	<0.0060	N/A	**18,120**	**9,093**
MW-4	08/10/95	<0.0010	<0.0010	<0.0010	0.0670	0.0670	N/A	**332**
MW-4	06/19/96	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	**1,114**	**312**
MW-4	11/25/96	0.0029	0.0011	0.0019	<0.0030	0.0059	953	240
MW-4	04/03/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	877	196
MW-4	07/02/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	788	206
MW-4	12/06/97	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	974	**264**
MW-4	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	**1,152**	**294**
MW-4	12/12/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	**910**	**344**
MW-4	04/07/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	**1,088**	**297**
MW-4	06/28/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	**1,080**	**279**
MW-4	09/17/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	**1,187**	**300**
MW-4	12/14/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	**1,260**	**372**
MW-5	07/24/95	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	**1,481**	106
MW-5	06/19/96	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	506	44
MW-5	11/25/96	0.0012	0.0012	0.0016	<0.0030	0.0040	506	70
MW-5	04/03/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	509	50
MW-5	07/02/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	458	50
MW-5	12/06/97	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	506	52
MW-5 (SPL)	12/06/97	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	N/A	N/A
MW-5 (SPL)	02/18/98	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	426	44
MW-5	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	505	42
MW-5	12/12/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	421	47
MW-5	04/07/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	491	40

Well Name	Date Sampled	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)	Total BTEX (ppm)	TDS (mg/l)	Chloride (mg/l)
NMWQCC Standards		0.010	0.750	0.750	0.620	N/A	1,000	250
MW-5	06/28/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	449	44
MW-5	09/17/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	484	49
MW-5	12/14/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	596	45
MW-6	07/21/95	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	N/A	96
MW-6	06/19/96	**0.0230**	<0.0010	<0.0010	<0.0030	0.0230	524	48
MW-6	11/25/96	**0.0160**	0.0013	0.0023	0.0047	0.0243	477	38
MW-6	04/03/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	404	80
MW-6	07/02/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	419	38
MW-6	12/06/97	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	445	28
MW-6 (SPL)	12/06/97	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	N/A	N/A
MW-6	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	225	20
MW-6	12/12/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	363	20
MW-6	04/06/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	436	20
MW-6	06/28/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	378	28
MW-6	09/17/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	428	24
MW-6	12/13/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	576	24
MW-7	07/24/95	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	**3,218**	**382**
MW-7	06/19/96	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	**1,127**	**359**
MW-7	11/25/96	0.0011	<0.0010	<0.0010	<0.0030	<0.0030	**1,090**	**334**
MW-7	04/03/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	**1166**	**344**
MW-7	07/02/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	**1092**	**264**
MW-7	12/06/97	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	806	188
MW-7 (SPL)	12/06/97	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	N/A	N/A
MW-7	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	802	212
MW-7	12/12/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	853	**262**
MW-7	04/06/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	**1000**	245
MW-7	06/28/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	938	**255**
MW-7	09/17/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	**1685**	**255**
MW-7	12/13/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	996	**258**
WHW	08/16/96	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	473	32

Well Name	Date Sampled	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)	Total BTEX (ppm)	TDS (mg/l)	Chloride (mg/l)
NMWQCC Standards		0.010	0.750	0.750	0.620	N/A	1,000	250
WHW	N/A	N/A	N/A	N/A	N/A	N/A	898	68
CMW	08/16/96	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	448	68
CMW	N/A	N/A	N/A	N/A	N/A	N/A	490	52
GHW	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	722	76
GHW	12/12/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	703	78
IWW	07/24/95	**0.7770**	<0.0200	<0.0200	0.0300	0.8070	**13,889**	**7,178**
IWW	06/19/96	**0.0320**	<0.0010	<0.0010	<0.0030	0.0320	**1,817**	**828**
IWW	11/25/96	**0.6550**	<0.0010	0.0026	<0.0030	0.6576	**10,147**	**5,300**
IWW	04/03/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	**1468**	**760**
IWW	07/02/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	663	200
IWW	12/06/97	<0.0020	0.0060	<0.0020	0.0060	0.0120	931	**328**
IWW (SPL)	12/06/97	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	N/A	N/A
IWW (SPL)	02/18/98	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	491	67
IWW	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	491	67
IWW	12/12/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	369	74
IWW	04/06/99	0.0630	<0.0020	<0.0020	<0.0060	<0.0060	**3310**	**2275**
IWW	06/28/99	0.0130	<0.0020	<0.0020	<0.0060	<0.0060	**2780**	**1893**
IWW	09/17/99	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	626	166
IWW	12/13/99	0.0040	<0.0020	<0.0020	<0.0060	<0.0060	**1260**	**505**
MW-1	07/24/95	**2.8710**	<0.0200	0.0120	0.2710	3.1540	**25,106**	**14,091**
MW-1	07/24/95	N/A	N/A	N/A	N/A	N/A	**4,374**	
MW-1 (SPL)	02/18/98	**3.4000**	0.5700	**0.9600**	**0.7400**	5.6700	493	100
MW-1 (SPL)	12/12/98						840	43
MW-1	04/07/99	**2.8500**	**1.3300**	**2.5200**	**2.5500**	9.2500	**1820**	**1286**

Analysis was performed by Cardinal Laboratories in Hobbs, New Mexico.

Samples labeled (SPL) analyzed by Southern Petroleum Laboratories, Houston, Texas.

Benzene, toluene, eythlbenzene, and xylene (BTEX), total dissolved solids (TDS), and chloride analyses were conducted using EPA Methods 8020, 160.1, and 352.3, respectively.

Results presented in bold print exceed NMWQCC human health standards for ground water.

All results are reported in milligrams per liter (mg/l), parts per million (ppm).

RICE *Operating Company*
122 West Taylor • Hobbs, NM 88240
Phone: (505) 393-9174 • Fax: (505) 397-1471

April 12, 1999

Mr. William C. Olson
New Mexico Oil Conservation Division
2040 South Pacheco
Santa Fe, New Mexico 87505

RE: Groundwater Monitoring
Pipeline Leak, West County Road Site, Hobbs SWD System
SW/4, NW/4 of Section 5, T19S, R38E, NMPM, Lea County, Hobbs, NM

Dear Mr. Olson:

Rice Operating Company (ROC) has been conducting groundwater monitoring and hydrocarbon contamination recovery at the above-referenced site since early 1996. The summary of activities and results that is compiled in this report will bring the project record up to date.

Field Operations

Recovery well MW-1, monitor wells MW-2, MW-3, MW 4, MW5, MW6, MW7, and the inactive water well at the site (IWW) have been gauged, developed, and sampled at various times throughout the last three years. The sampling events were performed by Mr. Jerry Brian with Quest Personnel Inc., and Mr. F. Wesley Root, formerly of Rice Operating Company. Recovery Well MW-1 was also pumped and bailed throughout the years to recover phase-separated hydrocarbons. Volumes are summarized in Appendix A.

Sampling and Analytical Procedures

Prior to development and sampling the monitor wells were in most instances gauged to obtain water level measurements. These water level measurements were assessed as elevation levels and are summarized in Appendix B. The wells were surge-bailed to remove any fine granulated materials and then purged by manual bailing prior to collecting groundwater samples for laboratory analysis.

After purging, a water sample was obtained and placed into a one-liter glass jar and into two 40-milliliter sample vials with zero headspace, labeled for sample identification, sealed with QA/QC seals, and preserved at 4° C in accordance with EPA Method 600/4-82-029. A chain-of-custody documenting the sample collection times and delivery time to the laboratory was completed. The samples were transported to Cardinal Laboratories in Hobbs, New Mexico or shipped to SPL in Houston, TX for analysis. The samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX), total dissolved solids (TDS), and chloride using EPA Methods SW 846-

8260, 600/4-79-02-160.1, and 600/4-79-02-325.3, respectively. Analytical summary for each year and copies of laboratory results accompanied by chain of custody are in Appendix C.

Analytical Results

Analytical results from the water samples recorded BTEX levels below NMWQCC Standard limits for wells MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, the inactive water well IWW, and the Gray House Well, GHW. The recovery well, MW-1, was found to have phase-separated hydrocarbons on the fluid column.

TDS and Chloride analysis of the water samples obtained from the wells recorded concentrations below the New Mexico Water Quality Control Commission human health standards for groundwater (TDS < 1,000 ppm; Chloride < 250 ppm) at MW-1, MW-2, MW-5, MW-6, IWW, and GHW.

Planned Activities for 1999

Sampling events will be accomplished approximately quarterly for the 1999 year. The first sampling event of 1999 occurred April 6 and 7 and was conducted by Safety and Environmental Solutions of Hobbs, NM. Ms. Donna Williams of the OCD witnessed the event. Cardinal Laboratory of Hobbs, NM received the properly preserved samples for analysis of BTEX, TDS, major anions and cations, pH and specific gravity.

The remaining sampling events are scheduled for June, September, and December 1999. Each sampling event will be summarized and included in the annual report to be submitted to the OCD in March 2000.

The recovery well, MW-1 will be routinely monitored for phase-separated hydrocarbons. These hydrocarbons will be manually bailed from the well and the volume recorded. It may become necessary to install a skimming-type pump in order to accomplish this hydrocarbon recovery more quickly. All water and hydrocarbon volumes recovered will be recorded and the fluid will be discharged into the RICE pipeline and disposed through the Hobbs SWD System, as stated in the Phase III Cleanup Implementation Plan approved by the OCD.

Please contact me at (505) 393-9174, fax (505) 397-1471 if you have any questions.

Sincerely,

Carolyn Doran Haynes

Carolyn Doran Haynes
Operations Engineer

Attachments: Appendices A, B, C
Cc: Donna Williams, NMOCD Hobbs Office, 1625 N. French Dr., Hobbs, NM 88240
File

APPENDIX A

QUARTERLY SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER AND CRUDE OIL RECOVERY VOLUMES
WEST COUNTY ROAD SPILL SITE, HOBBS SWD SYSTEM

Groundwater Recovery Operations				Crude Oil Recovery Operations		
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Volume Recovered (gal)	Cumulative Volume (gal)	Description
JAN 1996	0	0	0.0	0.00	0.00	No recovery operations
FEB 1996	0	0	0.0	0.00	0.00	pending regulatory approval &
MAR 1996	0	0	0.0	0.00	0.00	facility installation
1ST QTR	**0**	**0**	**0.0**	**0.00**	**0.00**	
APR 1996	0	0	0.0	30.75	30.75	
MAY 1996	0	0	0.0	7.85	38.60	
JUN 1996	19	19,140	1.1	2.38	40.98	Groundwater Monitoring Event
2ND QTR	**19**	**19,140**	**0.4**	**40.98**	**40.98**	
JUL 1996	0	0	0.0	6.50	47.48	
AUG 1996	0	0	0.0	3.27	50.75	Groundwater Monitoring Event
SEP 1996	0	0	0.0	3.75	54.50	
3RD QTR	**0**	**0**	**0.0**	**13.52**	**54.50**	
OCT 1996	0	0	0.0	5.00	59.50	
NOV 1996	528	262,080	6.1	1.70	61.20	Groundwater Monitoring Event
DEC 1996	720	561,600	13.0	3.00	64.20	
4TH QTR	**1,248**	**823,680**	**6.4**	**9.70**	**64.20**	
1996 TOTALS	**1,267**	**842,820**	**1.7**	**64.20**	**64.20**	
JAN 1997	744	580,320	13.0	3.10	67.30	
FEB 1997	672	485,280	13.0	2.80	70.10	
MAR 1997	744	426,240	9.5	2.60	72.70	
1ST QTR	**2,160**	**1,491,840**	**11.8**	**8.50**	**72.70**	
APR 1997	0	0	0.0	2.25	74.95	Groundwater Monitoring Event
MAY 1997	408	325,440	7.3	4.45	79.40	
JUN 1997	672	524,160	12.1	2.80	82.20	
2ND QTR	**1,080**	**849,600**	**6.5**	**9.50**	**82.20**	
JUL 1997	600	465,120	10.4	2.50	84.70	Groundwater Monitoring Event
AUG 1997	744	580,320	13.0	2.10	86.80	
SEP 1997	720	561,600	13.0	3.00	89.80	
3RD QTR	**2,064**	**1,607,040**	**12.1**	**7.60**	**89.80**	
OCT 1997	744	580,320	13.0	3.10	92.90	
NOV 1997	720	541,440	12.5	3.00	95.90	
DEC 1997	48	34,560	0.0	3.70	99.60	Groundwater Monitoring Event
4TH QTR	**1,512**	**1,156,320**	**8.5**	**9.80**	**99.60**	
1997 TOTALS	**6,816**	**5,104,800**	**9.7**	**35.40**	**99.60**	Total Crude oil recovered from Apr 96 to Dec 97

QUARTERLY SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER AND CRUDE OIL RECOVERY VOLUMES
WEST COUNTY ROAD SPILL SITE, HOBBS SWD SYSTEM

Groundwater Recovery Operations				Crude Oil Recovery Operations		
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Volume Recovered (gal)	Cumulative Volume (gal)	Description
JAN 1998	0	0	0.0	4.75	104.35	
FEB 1998	240	144,000	3.6	3.25	707.60	Groundwater Monitoring Event
MAR 1998	744	446,400	10.0	3.10	110.70	
1ST QTR	**984**	**590,400**	**4.5**	**11.10**	**110.70**	
APR 1998	696	167,040	0.0	2.90	113.60	
MAY 1998	744	178,560	4.0	3.10	116.70	
JUN 1998	740	172,800	4.0	3.00	119.70	
2ND QTR	**2,180**	**518,400**	**2.7**	**9.00**	**119.70**	
JUL 1998	576	138,240	4.0	2.40	122.10	
AUG 1998	0	0	0.0	19.50	141.60	Groundwater Monitoring Event
SEP 1998	0	0	0.0	4.63	146.23	
3RD QTR	**576**	**138,240**	**1.3**	**26.53**	**146.23**	
OCT 1998	0	0	0.0	8.26	154.49	
NOV 1998	0	0	0.0	11.63	166.12	
DEC 1998	0	0	0.0	10.63	176.75	Groundwater Monitoring Event
4TH QTR	**0**	**0**	**0.0**	**30.52**	**176.75**	
1998 TOTALS	**3,740**	**1,247,040**	**2.1**	**77.15**	**176.75**	Total Crude oil recovered from Apr 96 to Dec 98

SUMMARY OF 1996, 1997, 1998 RECOVERED VOLUMES
WEST COUNTY ROAD SPILL SITE, HOBBS SWD SYSTEM

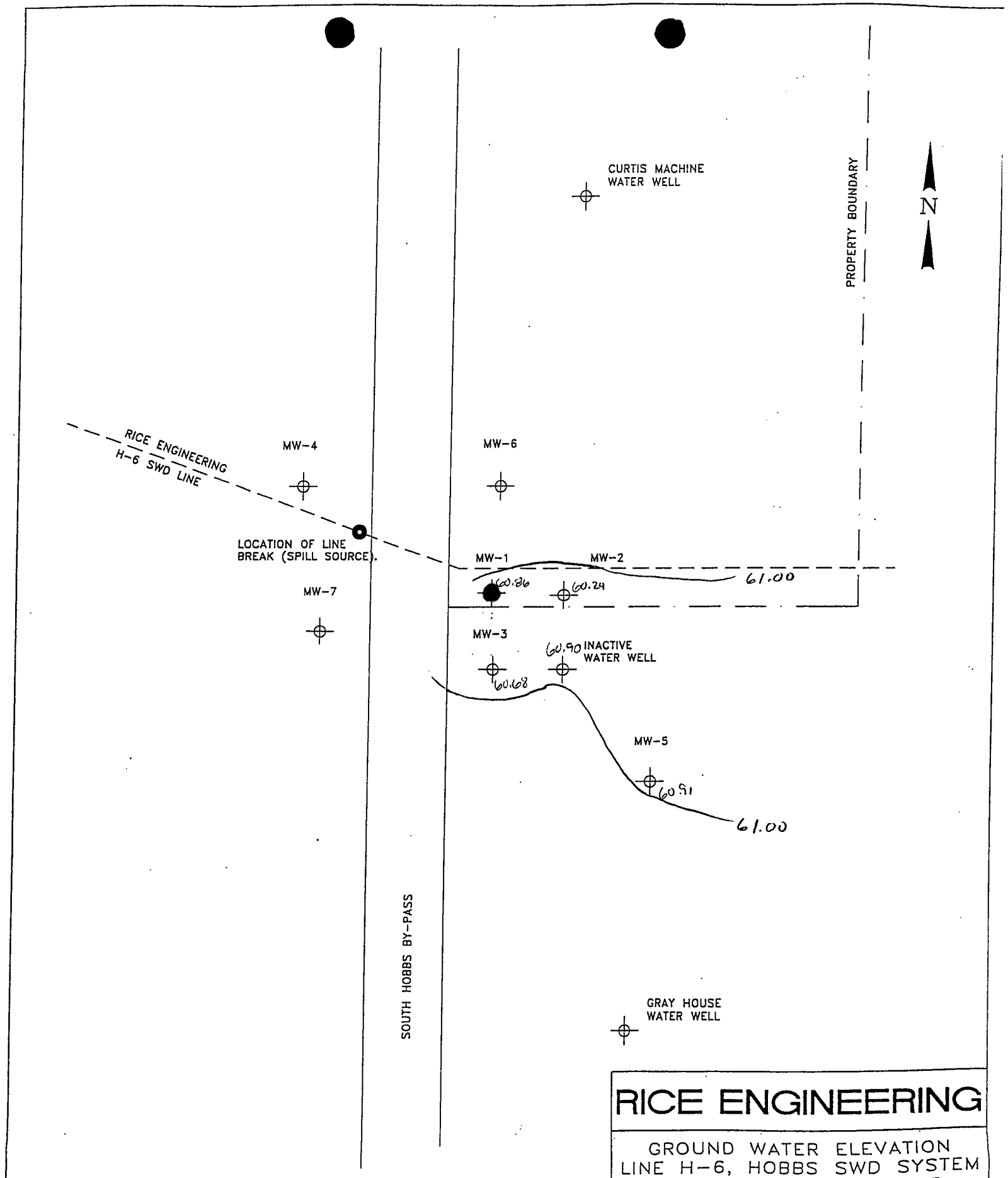
Groundwater Recovery Operations				Crude Oil Recovery Operations		
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Volume Recovered (gal)	Cumulative Volume (gal)	Description
1996 TOTALS	**1,267**	**842,820**	**1.7**	**64.20**	**64.20**	Total Crude oil recovered from Apr 96 to Dec 96
1997 TOTALS	**6,816**	**5,104,800**	**9.7**	**35.40**	**99.60**	Total Crude oil recovered from Apr 96 to Dec 97
1998 TOTALS	**3,740**	**1,247,040**	**2.1**	**77.15**	**176.75**	Total Crude oil recovered from Apr 96 to Dec 98
3-YEAR TOTAL	**11,823**	**7,194,660**		**176.75**	**176.75**	

APPENDIX B

SUMMARY OF GROUNDWATER MEASUREMENTS by QUARTER
WEST COUNTY ROAD SPILL SITE, HOBBS SWD SYSTEM

Well Name	Date Gauged	Depth to Water	Water Elevation	Casing Elevation	Surface Elevation	LNAPL Thickness
IWW	07/26/95	35.75	62.26	98.01	97.8	0.00
MW-1	07/26/95	42.09	57.91	100.00	97.3	N/A
MW-2	07/26/95	37.45	60.46	97.91	98.5	0.00
MW-3	07/26/95	34.97	62.57	97.54	98.1	0.00
MW-4	07/26/95	37.40	62.95	100.35	100.8	0.00
MW-5	07/26/95	33.91	62.25	96.16	96.0	0.00
MW-6	07/26/95	35.69	62.83	98.52	98.8	0.00
MW-7	07/26/95	37.92	60.57	98.49	98.8	0.00
MW-2	06/18/96	35.16	62.75	97.91	98.5	0.00
MW-5	06/18/96	33.61	62.55	96.16	96.0	0.00
MW-6	06/18/96	35.56	62.96	98.52	98.8	0.00
IWW	06/24/96	35.50	62.51	98.01	97.8	0.00
MW-1	06/24/96	40.73	59.27	100.00	97.3	N/A
MW-2	06/24/96	35.24	62.67	97.91	98.5	0.00
MW-3	06/24/96	35.54	62.00	97.54	98.1	0.00
MW-4	06/24/96	37.20	63.15	100.35	100.8	0.00
MW-5	06/24/96	33.72	62.44	96.16	96.0	0.00
MW-6	06/24/96	35.68	62.84	98.52	98.8	0.00
MW-7	06/24/96	35.76	62.73	98.49	98.8	0.00
IWW	08/02/96	35.60	62.41	98.01	97.8	0.00
MW-2	08/02/96	35.30	62.61	97.91	98.5	0.00
MW-3	08/02/96	36.60	60.94	97.54	98.1	0.00
MW-4	08/02/96	35.80	64.55	100.35	100.8	0.00
MW-5	08/02/96	33.58	62.58	96.16	96.0	0.00
MW-6	08/02/96	35.68	62.84	98.52	98.8	0.00
MW-7	08/02/96	36.10	62.39	98.49	98.8	0.00
IWW	11/22/96	37.00	61.01	98.01	97.8	0.00
MW-2	11/22/96	37.00	60.91	97.91	98.5	0.00
MW-3	11/22/96	35.70	61.84	97.54	98.1	0.00
MW-4	11/22/96	38.25	62.10	100.35	100.8	0.00
MW-5	11/22/96	34.60	61.56	96.16	96.0	0.00
MW-6	11/22/96	37.29	61.23	98.52	98.8	0.00
MW-7	11/22/96	36.84	61.65	98.49	98.8	0.00

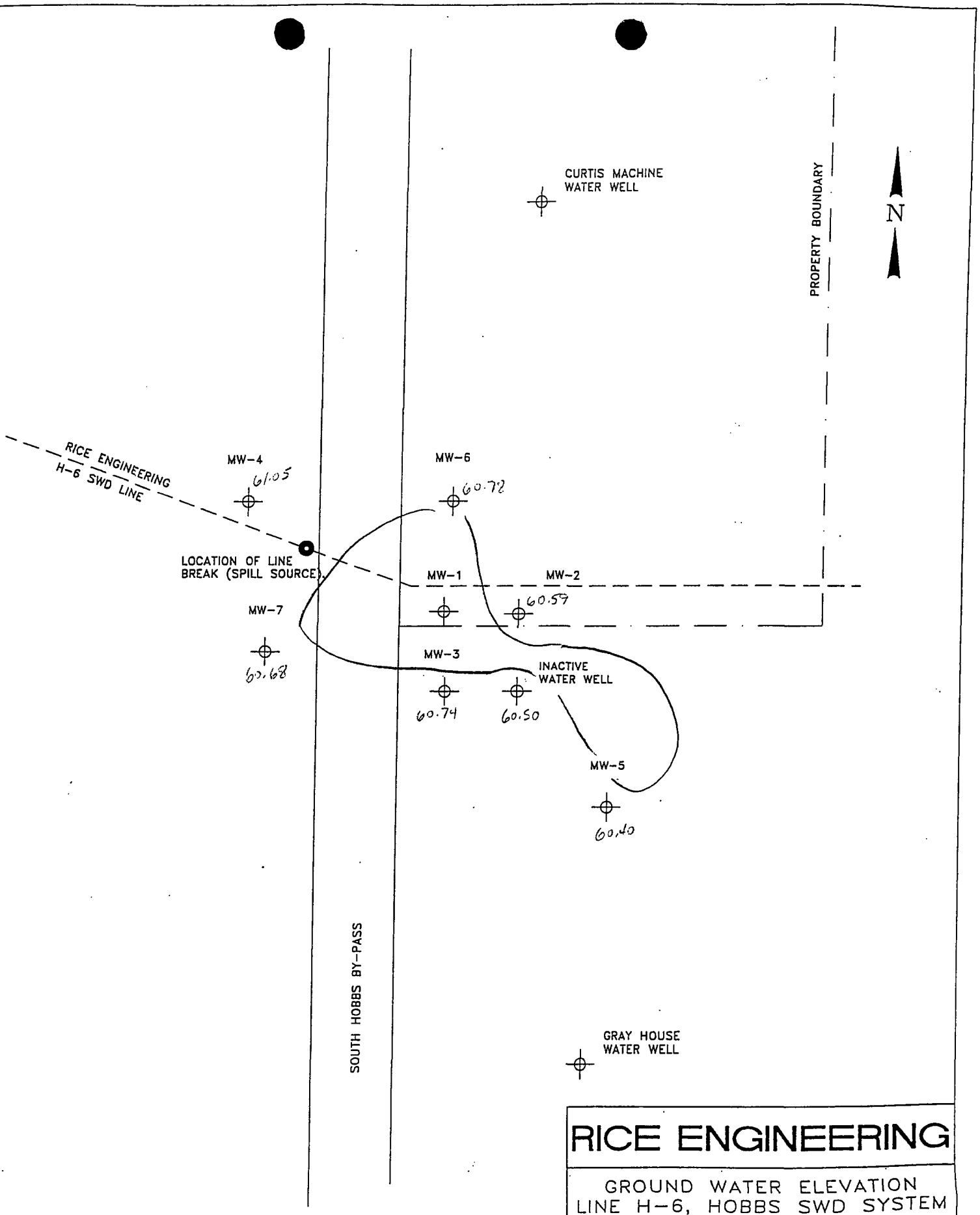
Well Name	Date Gauged	Depth to Water	Water Elevation	Casing Elevation	Surface Elevation	LNAPL Thickness
IWW	07/02/97	37.00	61.01	98.01	97.8	0.00
MW-2	07/02/97	36.70	61.21	97.91	98.5	0.00
MW-3	07/02/97	36.20	61.34	97.54	98.1	0.00
MW-4	07/02/97	38.30	62.05	100.35	97.4	0.00
MW-5	07/02/97	34.97	61.19	96.16	96.0	0.00
MW-6	07/02/97	37.10	61.42	98.52	98.8	0.00
MW-7	07/02/97	37.38	61.11	98.49	98.8	0.00
IWW	08/07/97	37.78	60.23	98.01	97.8	0.00
MW-1	08/07/97	39.00	62.50	100.00	97.3	1.83
MW-2	08/07/97	37.80	60.11	97.91	98.5	0.00
MW-3	08/07/97	36.80	60.74	97.54	98.1	0.00
MW-4	08/07/97	37.50	62.85	100.35	97.4	0.00
MW-5	08/07/97	35.70	60.46	96.16	96.0	0.00
MW-6	08/07/97	38.20	60.32	98.52	98.8	0.00
MW-7	08/07/97	37.30	61.19	98.49	98.8	0.00
IWW	12/06/97	37.51	60.50	98.01	97.8	0.00
MW-2	12/06/97	37.32	60.59	97.91	98.5	0.00
MW-3	12/06/97	36.80	60.74	97.54	98.1	0.00
MW-4	12/06/97	39.30	61.05	100.35	97.4	0.00
MW-5	12/06/97	35.76	60.40	96.16	96.0	0.00
MW-6	12/06/97	37.74	60.78	98.52	98.8	0.00
MW-7	12/06/97	37.81	60.68	98.49	98.8	0.00
IWW	02/14/98	37.14	60.90	98.04	97.8	0.00
MW-1	02/14/98	39.26	60.86	100.00	97.3	0.15
MW-2	02/14/98	37.70	60.24	97.94	98.5	0.00
MW-3	02/14/98	36.88	60.68	97.56	98.1	0.00
MW-4	02/14/98	No data		99.93	97.4	0.00
MW-5	02/14/98	35.30	60.91	96.21	96.0	0.00
MW-6	02/14/98	No data		98.53	98.8	0.00
MW-7	02/14/98	No data		98.53	98.8	0.00
MW-1	10/26/98	40.50	60.05	100.00	97.3	0.67



RICE ENGINEERING

GROUND WATER ELEVATION
LINE H-6, HOBBS SWD SYSTEM
SEC 5 & 6, T19S, R38E
LEA Co., NEW MEXICO

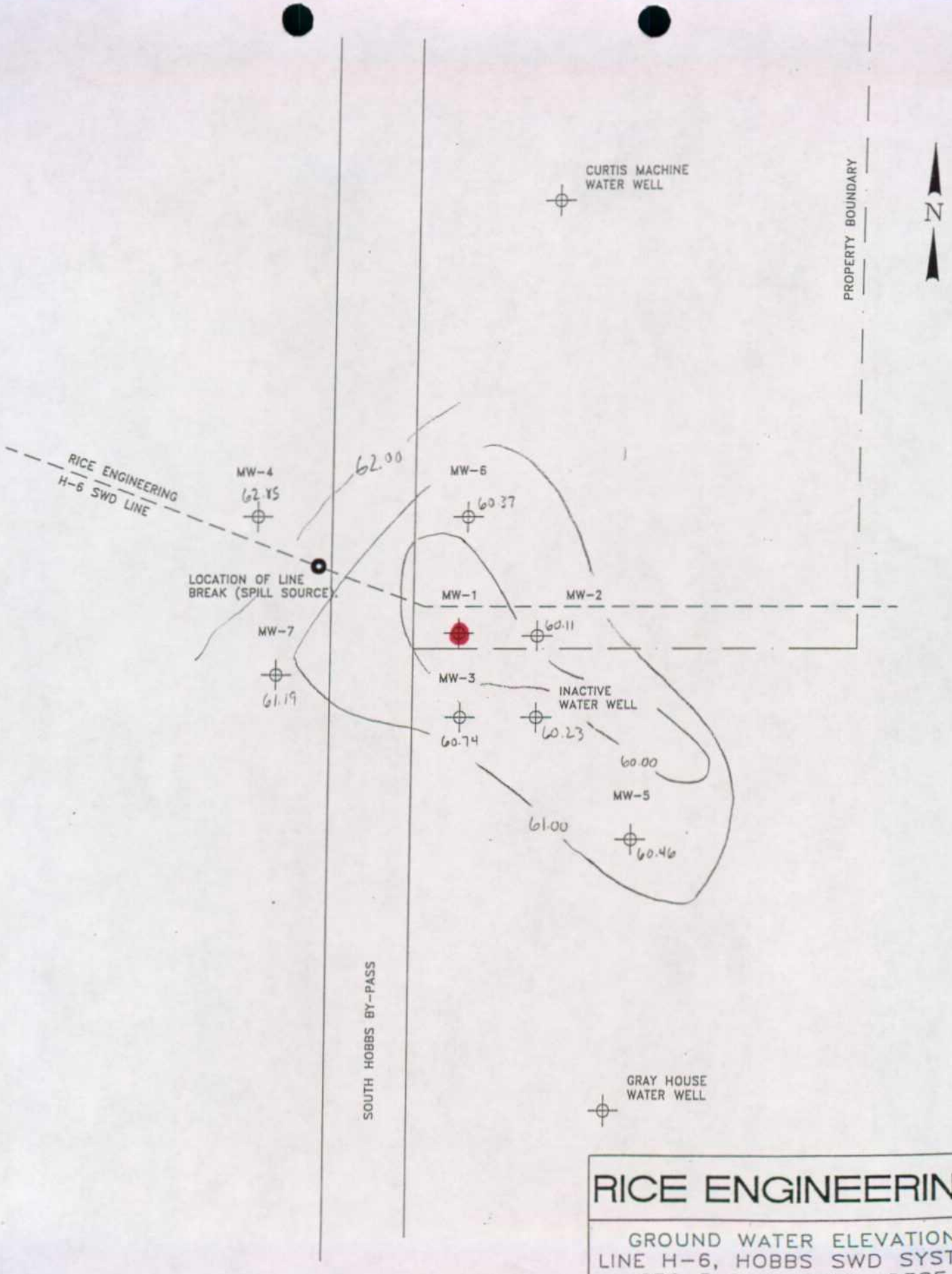
DATE: 2-14-98	DRAWN M.F.G.	REV. DATE	DIV
SCALE: 1" = 200'		JOB #	
SHEET		FILE:	



RICE ENGINEERING

GROUND WATER ELEVATION
LINE H-6, HOBBS SWD SYSTEM
SEC 5 & 6, T19S, R38E
LEA Co., NEW MEXICO

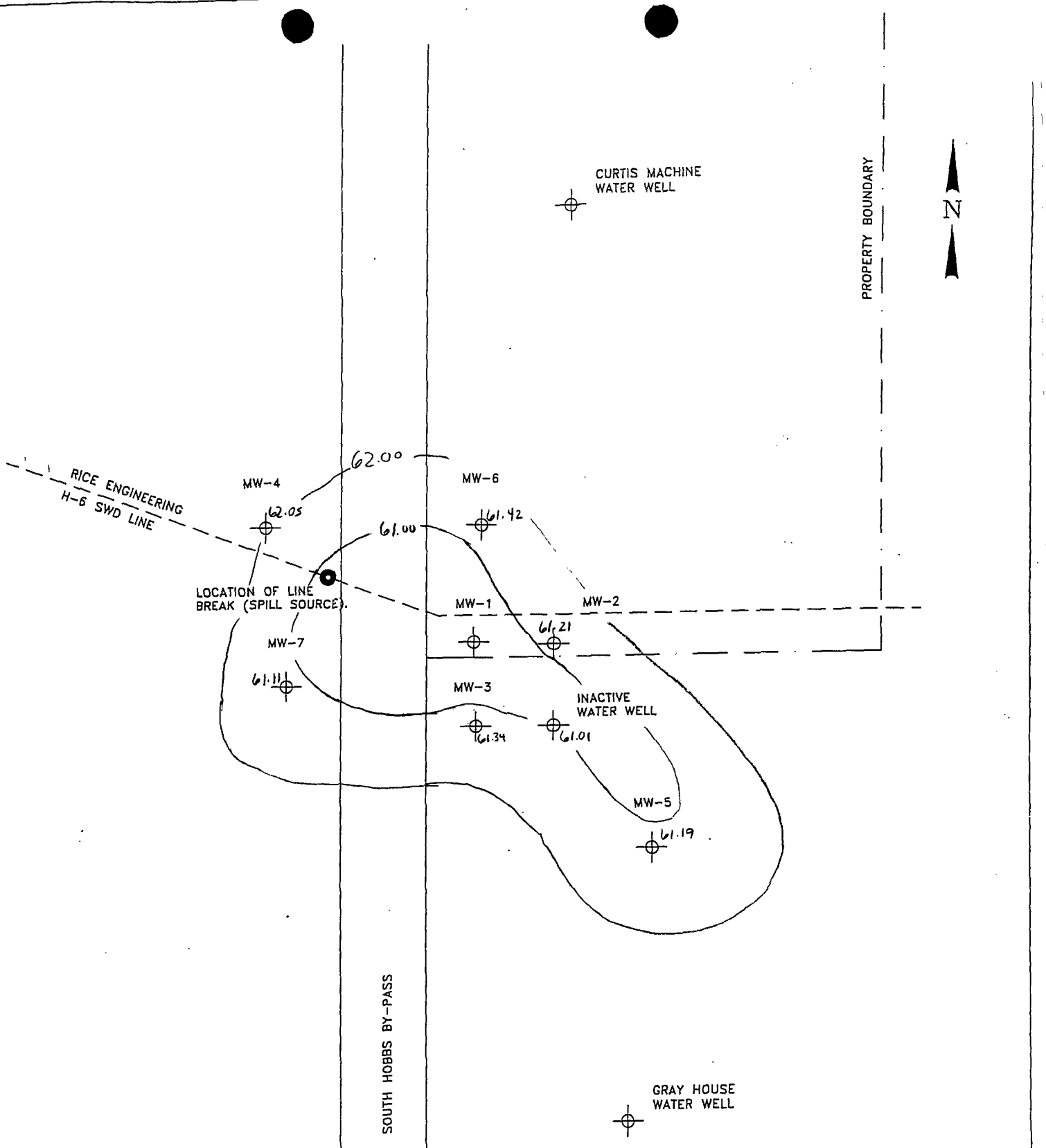
DATE: 12-6-97	DRAWN M.F.G.	REV. DATE	DIV
SCALE: 1" = 200'		JOB #	
SHEET		FILE:	



RICE ENGINEERING

GROUND WATER ELEVATION
LINE H-6, HOBBS SWD SYSTEM
SEC 5 & 6, T19S, R38E
LEA Co., NEW MEXICO

DATE: 6-7-97	DRAWN M.F.G.	REV. DATE	DIV
SCALE: 1" = 200'		JOB #	
SHEET		FILE:	

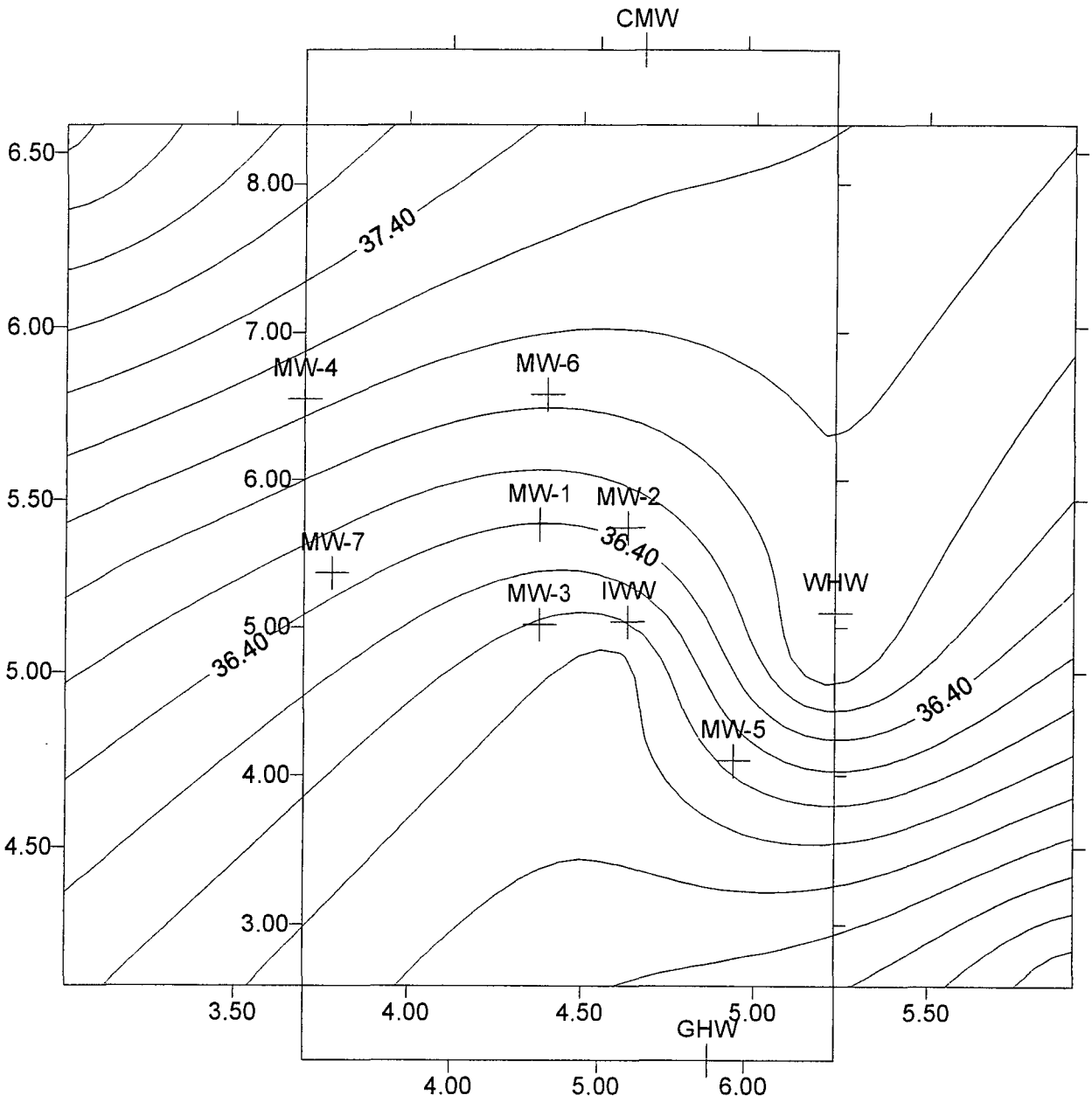


RICE ENGINEERING

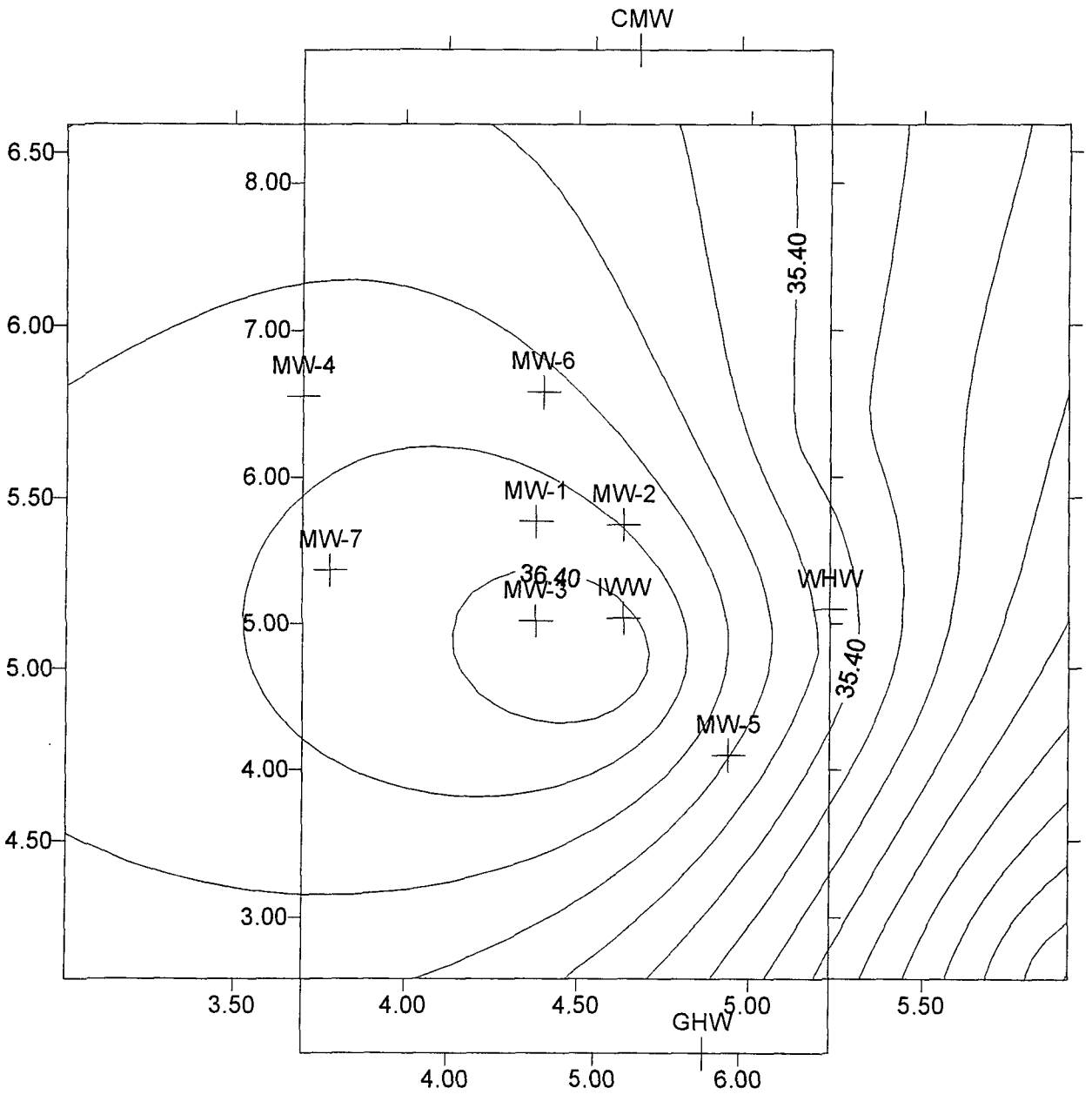
GROUND WATER ELEVATION
LINE H-6, HOBBS SWD SYSTEM
SEC 5 & 6, T19S, R38E
LEA Co., NEW MEXICO

DATE: 7-2-97	DRAWN M.F.G.	REV. DATE	DIV
SCALE: 1" = 200'		JOB #	
SHEET		FILE:	

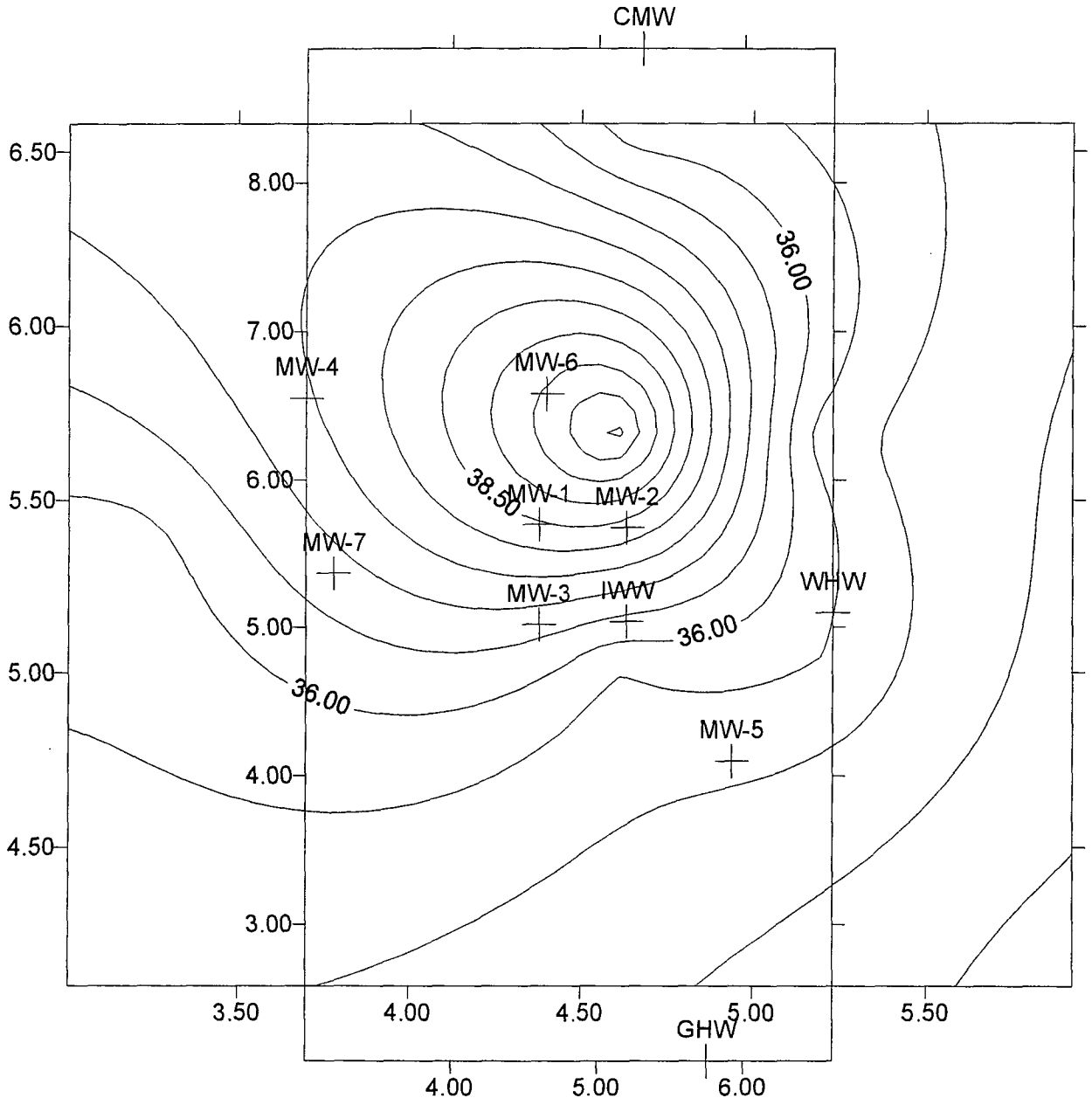
11-22-96


CMW
GHW
WHW
IWW
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
37.40
36.40
36.40
36.40
8.00
7.00
6.00
5.00
4.00
3.00
6.50
6.00
5.50
5.00
4.50
3.50
4.00
4.50
5.00
5.50
4.00
5.00
6.00

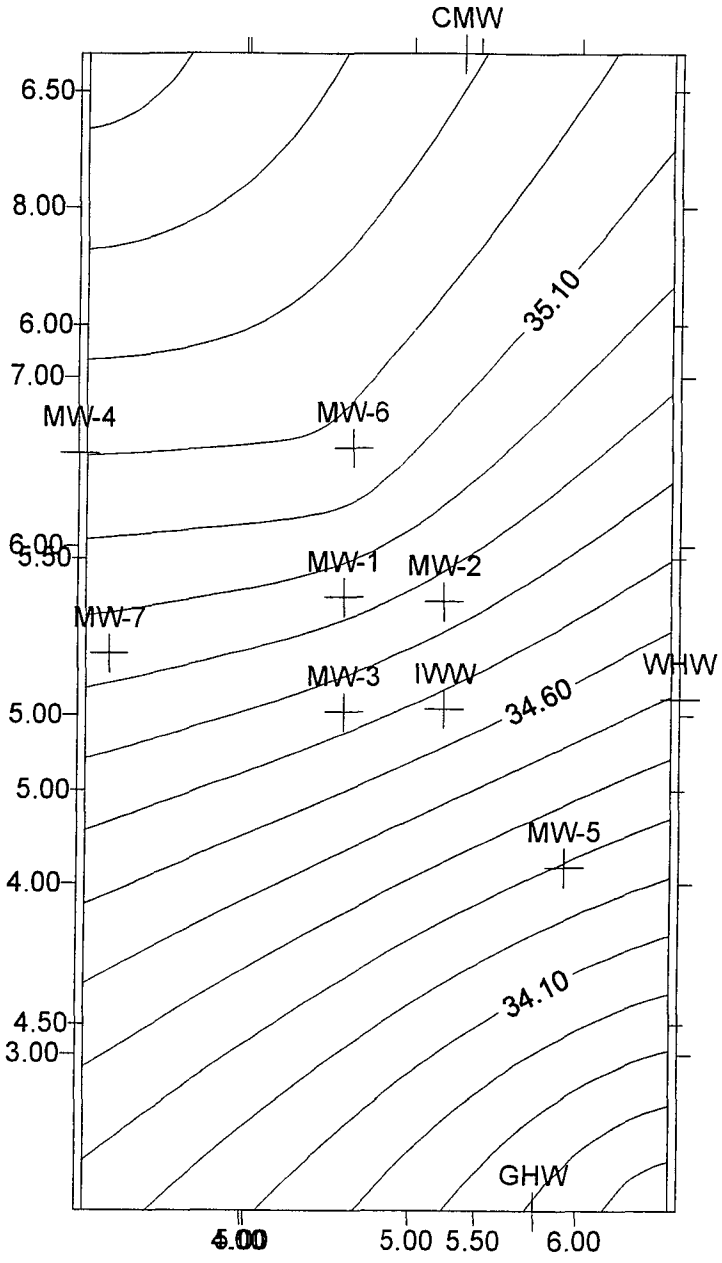
8-2-96


CMW
6.50
8.00
6.00
7.00
MW-4
MW-6
6.00
5.50
MW-1
MW-2
MW-7
36.40
MW-3
IWW
WHW
5.00
5.00
35.40
35.40
MW-5
4.00
4.50
3.00
3.50
4.00
4.50
5.00
5.50
GHW
4.00
5.00
6.00

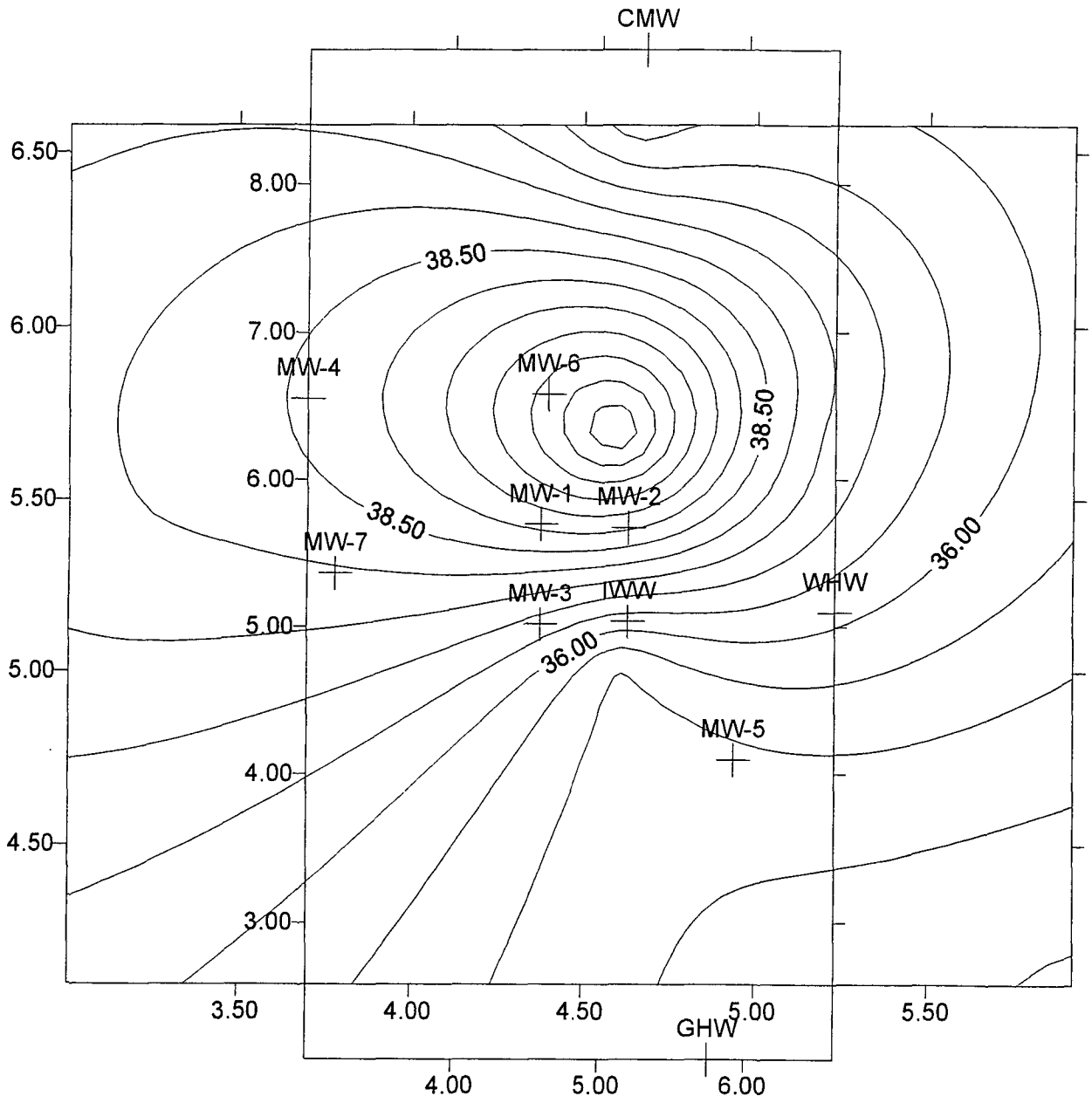
6-24-96


CMW
6.50
8.00
6.00
7.00
MW-4
MW-6
6.00
5.50
38.50
MW-1
MW-2
MW-7
MW-3
IWW
WHW
5.00
36.00
5.00
36.00
MW-5
4.00
4.50
3.00
3.50
4.00
4.50
5.00
5.50
GHW
4.00
5.00
6.00

6-18-96


CMW
6.50
8.00
6.00
7.00
MW-4
MW-6
35.10
6.00
5.50
MW-1
MW-2
MW-7
MW-3
IWW
WHW
34.60
5.00
5.00
MW-5
4.00
34.10
4.50
3.00
GHW
5.00
5.50
6.00

7-26-95


CMW
6.50
8.00
38.50
6.00
7.00
MW-4
MW-6
38.50
6.00
MW-1
MW-2
5.50
38.50
MW-7
36.00
MW-3
IWW
WHW
5.00
36.00
5.00
MW-5
4.00
4.50
3.00
3.50
4.00
4.50
5.00
5.50
GHW
4.00
5.00
6.00

APPENDIX C

SUMMARY OF WATER SAMPLE ANALYTICAL RESULTS 1998
WEST COUNTY ROAD SPILL SITE, HOBBS SWD SYSTEM

Well Name	Date Sampled	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)	Total BTEX (ppm)	TDS (mg/l)	Chloride (mg/l)
NMWQCC	Standards	0.010	0.750	0.750	0.620	N/A	1,000	250
MW-1 (SPL)	02/18/98	**3.4000**	0.5700	**0.9600**	**0.7400**	5.6700	493	100
MW-1 (SPL)	12/12/98						840	43
MW-2 (SPL)	02/18/98	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	455	36
MW-2	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	457	45
MW-2	12/12/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	422	47
MW-3 (SPL)	02/18/98	0.0016	<0.0010	<0.0010	<0.0010	0.0016	**2,967**	**1,700**
MW-3	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	**3,980**	**1,672**
MW-3	12/12/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	**1,498**	**614**
MW-4	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	**1,152**	**294**
MW-4	12/12/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	**910**	**344**
MW-5 (SPL)	02/18/98	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	426	44
MW-5	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	505	42
MW-5	12/12/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	421	47
MW-6	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	225	20
MW-6	12/12/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	363	20
MW-7	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	802	212
MW-7	12/12/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	853	262
IWW (SPL)	02/18/98	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	491	67
IWW	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	491	67
IWW	12/12/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	369	74
GHW	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	722	76
GHW	12/12/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	703	78

Analysis was performed by Cardinal Laboratories in Hobbs, New Mexico.

Samples labeled (SPL) analyzed by Southern Petroleum Laboratories, Houston, Texas.

Benzene, toluene, eythlbenzene, and xylene (BTEX); total dissolved solids (TDS); and chloride analyses were conducted using EPA Methods 8020, 160.1, and 352.3, respectively.

Results presented in bold print exceed NMWQCC human health standards for ground water.

All results are reported in milligrams per liter (mg/l); parts per million (ppm).

SUMMARY OF WATER SAMPLE ANALYTICAL RESULTS 1997
WEST COUNTY ROAD SPILL SITE, HOBBS SWD SYSTEM

Well Name	Date Sampled	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)	Total BTEX (ppm)	TDS (mg/l)	Chloride (mg/l)
NMWQCC	Standards	0.010	0.750	0.750	0.620	N/A	1,000	250
MW-2	04/03/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	497	50
MW-2	07/02/97	0.0060	0.0070	0.0030	0.0110	0.0270	399	44
MW-2	12/06/97	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	414	40
MW-2 (SPL)	12/06/97	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	N/A	N/A
MW-3	04/03/97	**0.2920**	<0.0010	0.0010	0.0050	0.2980	**7764**	**3249**
MW-3	07/02/97	0.0020	<0.0010	<0.0010	<0.0030	0.0020	**3065**	**1290**
MW-3	12/06/97	**0.0120**	<0.0020	<0.0020	<0.0060	0.0120	**4610**	**1450**
MW-3 (SPL)	12/06/97	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	N/A	N/A
MW-4	04/03/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	877	196
MW-4	07/02/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	788	206
MW-4	12/06/97	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	974	**264**
MW-5	04/03/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	509	50
MW-5	07/02/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	458	50
MW-5	12/06/97	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	506	52
MW-5 (SPL)	12/06/97	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	N/A	N/A
MW-6	04/03/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	404	80
MW-6	07/02/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	419	38
MW-6	12/06/97	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	445	28
MW-6 (SPL)	12/06/97	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	N/A	N/A
MW-7	04/03/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	**1166**	**344**
MW-7	07/02/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	**1092**	**264**
MW-7	12/06/97	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	806	188
MW-7 (SPL)	12/06/97	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	N/A	N/A
IWW	04/03/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	**1468**	**760**
IWW	07/02/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	663	200
IWW	12/06/97	<0.0020	0.0060	<0.0020	0.0060	0.0120	931	**328**
IWW (SPL)	12/06/97	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	N/A	N/A

Analysis was performed by Cardinal Laboratories in Hobbs, New Mexico.

Samples labeled (SPL) analyzed by Southern Petroleum Laboratories, Houston, Texas.

Benzene, toluene, eythlbenzene, and xylene (BTEX); total dissolved solids (TDS); and chloride analyses were conducted using EPA Methods 8020, 160.1, and 352.3, respectively.

Results presented in bold print exceed NMWQCC human health standards for ground water.

All results are reported in milligrams per liter (mg/l); parts per million (ppm).

SUMMARY OF WATER SAMPLE ANALYTICAL RESULTS 1995 & 1996
WEST COUNTY ROAD SPILL SITE, HOBBS SWD SYSTEM

Well Name	Date Sampled	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)	Total BTEX (ppm)	TDS (mg/l)	Chloride (mg/l)
NMWQCC Standards		0.010	0.750	0.750	0.620	N/A	1,000	250
MW-1	07/24/95	**2.8710**	<0.0200	0.0120	0.2710	3.1540	**25,106**	**14,091**
MW-1	07/24/95	N/A	N/A	N/A	N/A	N/A	**4,374**	
MW-2	07/21/95	**0.0470**	0.0120	0.0330	<0.0010	0.0920	N/A	132
MW-2	06/19/96	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	649	96
MW-2	08/12/96	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	N/A	N/A
MW-2	11/25/96	0.0019	0.0012	0.0018	<0.0030	0.0049	443	44
MW-3 (S)	07/21/95	0.0020	<0.0010	<0.0010	<0.0030	0.0020	N/A	**256**
MW-3	07/21/95	**0.0440**	0.0610	0.0480	0.0420	0.1950	N/A	N/A
MW-3	06/19/96	**0.1320**	<0.0010	<0.0010	<0.0010	0.1320	**2,684**	160
MW-3	11/25/96	**1.1700**	0.0011	0.0047	0.0150	1.1908	**13,890**	**6,850**
MW-4	08/10/95	<0.0010	<0.0010	<0.0010	0.0670	0.0670	N/A	**332**
MW-4	06/19/96	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	**1,114**	**312**
MW-4	11/25/96	0.0029	0.0011	0.0019	<0.0030	0.0059	953	240
MW-5	07/24/95	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	**1,481**	106
MW-5	06/19/96	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	506	44
MW-5	11/25/96	0.0012	0.0012	0.0016	<0.0030	0.0040	506	70
MW-6	07/21/95	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	N/A	96
MW-6	06/19/96	**0.0230**	<0.0010	<0.0010	<0.0030	0.0230	524	48
MW-6	11/25/96	**0.0160**	0.0013	0.0023	0.0047	0.0243	477	38
MW-7	07/24/95	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	**3,218**	**382**
MW-7	06/19/96	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	**1,127**	**359**
MW-7	11/25/96	0.0011	<0.0010	<0.0010	<0.0030	<0.0030	**1,090**	**334**
IWW	07/24/95	**0.7770**	<0.0200	<0.0200	0.0300	0.8070	**13,889**	**7,178**
IWW	06/19/96	**0.0320**	<0.0010	<0.0010	<0.0030	0.0320	**1,817**	**828**
IWW	11/25/96	**0.6550**	<0.0010	0.0026	<0.0030	0.6576	**10,147**	**5,300**
CMW	N/A	N/A	N/A	N/A	N/A	N/A	490	52
CMW	08/16/96	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	448	68
WHW	N/A	N/A	N/A	N/A	N/A	N/A	898	68
WHW	08/16/96	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	473	32

Analysis was performed by Cardinal Laboratories in Hobbs, New Mexico.

Benzene, toluene, eythlbenzene, and xylene (BTEX); total dissolved solids (TDS); and chloride analyses were conducted using EPA Methods 8020, 160.1, and 352.3, respectively.

Results presented in bold print exceed NMWQCC human health standards for ground water.

MW-3 (S) = shallow sample from monitor well 3;IWW = Inactive on-site well; WHW = Wilson house water well; CMW = Curtis machine shop water well.

All results are reported in milligrams per liter (mg/l); parts per million (ppm).

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: F. WESLEY ROOT
122 W. TAYLOR
HOBBS, NM 22840
FAX TO: (505) 397-1471

Receiving Date: 12/14/98
Reporting Date: 12/16/98
Project Number: NOT GIVEN
Project Name: NOT GIVEN
Project Location: NOT GIVEN

Sampling Date: 12/12/98
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: AH

LAB NUMBER	SAMPLE ID	Cl (mg/L)	pH (s.u.)	TDS (mg/L)
ANALYSIS DATE		12/15/98	12/15/98	12/15/98
H3961-1	MW-6	20	7.18	363
H3961-2	MW-4	344	7.27	910
H3961-3	MW-7	262	7.39	853
H3961-4	IWW	74	7.64	369
H3961-5	MW-5	47	7.59	421
H3961-6	MW-2	47	7.52	422
H3961-7	MW-3	614	7.36	1498
H3961-8	GRAY WELL	78	7.29	703
H3961-9	MW-1	43	7.68	840
Quality Control		1301	7.09	NR
True Value QC		1319	7.00	NR
% Recovery		98.6	101	NR
Relative Percent Difference		0.2	1.4	1.2

METHODS:	EPA 600/4-79-020	4500 Cl B*	150.1	160.1

*Standard Method

Chemist

Date 12/16/98

H3961-2.XLS

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: F. WESLEY ROOT
122 W. TAYLOR
HOBBS, NM 22840
FAX TO: (505) 397-1471

Receiving Date: 12/14/98
Reporting Date: 12/16/98
Project Number: NOT GIVEN
Project Name: NOT GIVEN
Project Location: NOT GIVEN

Sampling Date: 12/12/98
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC/AH

LAB NO.	SAMPLE ID	BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL BENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)
ANALYSIS DATE		12/14/98	12/14/98	12/14/98	12/14/98
H3961-1	MW-6	<0.002	<0.002	<0.002	<0.006
H3961-2	MW-4	<0.002	<0.002	<0.002	<0.006
H3961-3	MW-7	<0.002	<0.002	<0.002	<0.006
H3961-4	IWW	<0.002	<0.002	<0.002	<0.006
H3961-5	MW-5	<0.002	<0.002	<0.002	<0.006
H3961-6	MW-2	<0.002	<0.002	<0.002	<0.006
H3961-7	MW-3	<0.002	<0.002	<0.002	<0.006
H3961-8	GRAY WELL	<0.002	<0.002	<0.002	<0.006
Quality Control		0.096	0.097	0.094	0.288
True Value QC		0.100	0.100	0.100	0.300
% Recovery		95.5	97.4	94.4	95.8
Relative Percent Difference		1.1	0.1	6.1	4.4

METHOD: EPA SW 846-8260

Chemist

12/16/98
Date

H3961-1.XLS

CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 (915) 673-7001 Fax (915) 673-7020
101 East Marland, Hobbs, NM 88240 (505) 393-2326 Fax (505) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

Company Name: Rice Operating Company	BILL TO PO #: N/A
Project Manager: F. Wesley Root	Company: ROC
Address: 122 West Taylor	Attn: F. Wesley Root
City: Hobbs State: NM Zip: 88240	Address: 122 W. Taylor
Phone #: 505-393-9174	City: Hobbs
Fax #: 505-397-1471	State: NM Zip: 88240
Project #: Project Owner:	Phone #: 505-393-9174
Project Name:	Fax #: 505-397-1471
Project Location:	

FOR LAB USE ONLY LAB I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	PRES.: ACID:	ICE / COOL	OTHER:	SAMPLING: DATE	TIME	ANALYSIS REQUEST: BTEX	pH	Chloride	TDS
H8961-1	MW-6	G	4	✓							✓		12-12-98	10:45	✓	✓	✓	✓
-2	MW-4	G	4	✓							✓		12-12-98	11:15	✓	✓	✓	✓
-3	MW-7	G	4	✓							✓		12-12-98	11:30	✓	✓	✓	✓
-4	IWW	G	4	✓							✓		12-12-98	12:45	✓	✓	✓	✓
-5	MW-5	G	4	✓							✓		12-12-98	12:00	✓	✓	✓	✓
-6	MW-2	G	4	✓							✓		12-12-98	12:15	✓	✓	✓	✓
-7	MW-3	G	4	✓							✓		12-12-98	14:00	✓	✓	✓	✓
-8	GRAY WELL	G	4	✓							✓		12-14-98	12:00	✓	✓	✓	✓
-9	MW-1	G	2	✓							✓		12-14-98	12:30		✓	✓	✓

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Terms and Conditions: Interest will be charged on all accounts more than 30 days past due at the rate of 24% per annum from the original date of invoice, and all costs of collections, including attorney's fees.

Sampler Relinquished: J. Brison	Date: 12/14/98 Time: 1:00 PM	Received By: F. Wesley Root	Phone Result ☐ Yes ☐ No Additional Fax #:
Relinquished By: F. Wesley Root	Date: 12/14/98 Time: 2:15	Received By: (Lab Staff) Burgess A. Cook	Fax Result: ☐ Yes ☐ No
Delivered By: (Circle One) Sampler - UPS - Bus - Other:		Sample Condition Cool: ☒ Yes ☐ No Intact: ☒ Yes ☐ No	CHECKED BY: (Initials)

REMARKS:

† Cardinal cannot accept verbal changes. Please fax written changes to 915-673-7020.

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: F. WESLEY ROOT
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (505) 397-1471

Receiving Date: 08/17/98
Reporting Date: 08/18/98
Project Number: NOT GIVEN
Project Name: WEST COUNTY ROAD
Project Location: HOBBS SWD SYSTEM, LEA CO. NM

Sampling Date: 08/16/98
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: AH
Analyzed By: BC

LAB NO.	SAMPLE ID	BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL BENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)
ANALYSIS DATE		08/17/98	08/17/98	08/17/98	08/17/98
H3794-1	MW-7	<0.002	<0.002	<0.002	<0.006
H3794-2	MW-4	<0.002	<0.002	<0.002	<0.006
H3794-3	MW-6	<0.002	<0.002	<0.002	<0.006
H3794-4	MW-5	<0.002	<0.002	<0.002	<0.006
H3794-5	MW-2	<0.002	<0.002	<0.002	<0.006
H3794-6	MW-3	<0.002	<0.002	<0.002	<0.006
H3794-7	IWW	<0.002	<0.002	<0.002	<0.006
H3794-8	GRAY WELL	<0.002	<0.002	<0.002	<0.006
Quality Control		0.092	0.090	0.088	0.270
True Value QC		0.100	0.100	0.100	0.300
% Recovery		91.5	90.4	88.4	90.1
Relative Percent Difference		8.5	8.1	5.6	5.1

METHOD: EPA SW 846-8260

Chemist

8/18/98
Date

RECEIVED
AUG 21 1998
RICE OPERATING
HOBBS, NM

H3794-1.XLS

CARDINAL LABORATORIES, INC.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240
(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

Page____ of ____

Company Name: Rice Operating Company	BILL TO PO #:
Project Manager: F. Wesley Root	Company: ROC
Address: 122 West Taylor	Attn: F. Wesley Root
City: Hobbs State: NM Zip: 88240	Address: 122 W. Taylor
Phone #: 505-393-9174	City: Hobbs
Fax #: 505-397-1471	State: NM Zip: 88240
Project #: Project Owner: Hobbs SWD System	Phone #: 505-393-9174
Project Name: West County Road	Fax #: 505-397-1471
Project Location: Hobbs SWD System, Lea Co. NM	

FOR LAB USE ONLY LAB I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	PRES.: ACID:	ICE / COOL	OTHER:	SAMPLING: DATE	TIME	BTEX	TDS	Chloride
H3794-1	MW-7	G	3	V									8-16-98	14:30	V	V	V
-2	MW-4	G	3	V									8-16-98	14:45	V	V	V
-3	MW-6	G	3	V									8-16-98	15:15	V	V	V
-4	MW-5	G	3	V									8-16-98	15:30	V	V	V
-5	MW-2	G	3	V									8-16-98	15:45	V	V	V
-6	MW-3	G	3	V									8-16-98	16:10	V	V	V
-7	IWW	G	3	V									8-16-98	16:30	V	V	V
-8	GRAG WELL	G	3	V									8-16-98	16:50	V	V	V

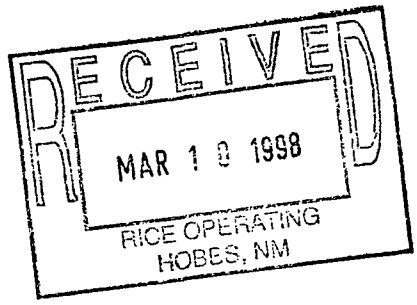
ANALYSIS REQUEST

Sampler Relinquished: [signature]	Date: 8/16/98 Time: 18:00	Received By: [signature]	Phone Result ☐ Yes ☐ No Additional Fax #:
Relinquished By: F. Wesley Root	Date: 8/17/98 Time: 9:45	Received By: (Lab Staff) [signature]	Fax Result: ☐ Yes ☐ No REMARKS:
Delivered By: (Circle One) Sampler - UPS - Bus - Other:		Sample Condition Cool: ☒ Yes ☐ No Intact: ☒ Yes ☐ No	CHECKED BY: (Initials)

† Cardinal cannot accept verbal changes. Please fax written changes to 915-673-7020.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

March 4, 1998



Mr. F. Wesley Root
RICE OPERATING COMPANY
122 West Taylor
Hobbs, NM 88240

The following report contains analytical results for the sample(s) received at Southern Petroleum Laboratories (SPL) on February 18, 1998. The sample(s) was assigned to Certificate of Analysis No.(s) 9802849 and analyzed for all parameters as listed on the chain of custody.

The pH, Carbonate, and Bicarbonate parameters were received out of holding time. The analyses were still performed by the laboratory.

Any data flag or quality control exception associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s).

If you have any questions or comments pertaining to this data report, please do not hesitate to contact me. Please reference the above Certificate of Analysis No. during any inquiries.

Again, SPL is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.

Southern Petroleum Laboratories

Electa Brown
Client Services Representative

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Southern Petroleum Laboratories, Inc.

Certificate of Analysis Number: 98-02-849

Approved for Release by:

Electa Brown, Client Services Representative — Date 3/5/98

Greg Grandits
Laboratory Director

Idelis Williams
Quality Assurance Officer

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No.
9802849-01

Client: Rice Operating Company
122 West Taylor
Hobbs, NM 88240

P.O. #:

Attn: F. Wesley Root
DATE: 3/4/98

PROJECT: Hobbs SWD System
PROJECT NO:
SITE: Lea Co, NM
MATRIX: Water
SAMPLED BY: Rice Operating Co.
DATE SAMPLED: 2/14/1998 16:25:00 P
SAMPLE ID: MW-5
DATE RECEIVED: 2/18/98

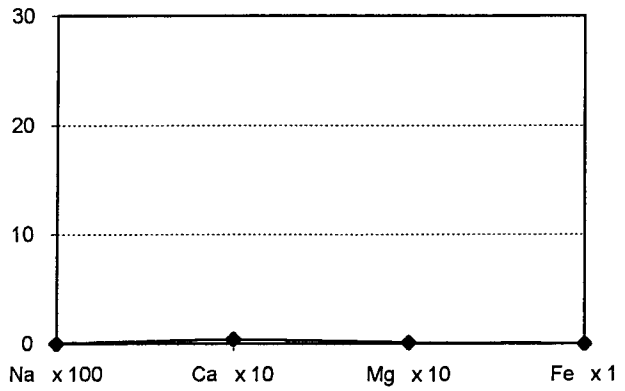
ANALYTICAL DATA

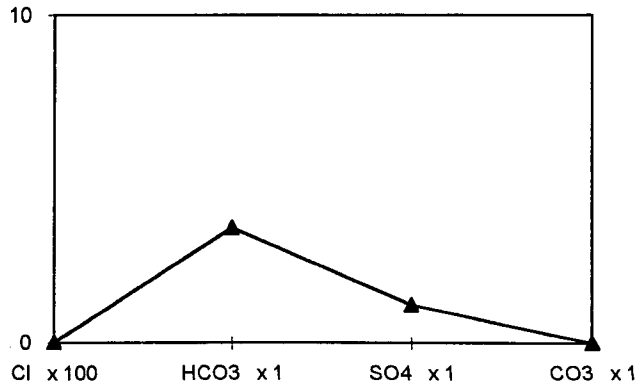
ION	mg/L	meq/L
Sodium, Na (Calc.)	16.5409	0.72
Calcium, Ca	81	4.04
Magnesium, Mg	14	1.15
Chloride, Cl	44	1.24
Bicarbonate, CaCO	214	3.51
Sulfate SO4	56	1.17
Carbonate, CaCO3	0	0.00
Iron, Fe(Total)	0	0.00
Barium, Ba	0.1	0.00

WET CHEMISTRY	RESULT
Total Dissolved Solids (calc.) mg/L	425.641
Specific Gravity 60/60 deg. F.	1.0070
Resistivity (Mohm-cm) 75 deg. F.	1.4460
pH pH units	7.74

MINERAL ANALYSIS PATTERN

(Number Below Ion Name meq/liter/Scale Unit)





HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9802849-01

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 03/03/98

PROJECT: Hobbs SWD System
SITE: Lea Co, NM
SAMPLED BY: Rice Operating Co
SAMPLE ID: MW-5

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 02/14/98 16:25:00
DATE RECEIVED: 02/18/98

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1.0 P	µg/L
TOLUENE	ND	1.0 P	µg/L
ETHYLBENZENE	ND	1.0 P	µg/L
TOTAL XYLENE	ND	1.0 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	97		
4-Bromofluorobenzene	100		
Method 8020A ***			
Analyzed by: VHZ			
Date: 02/18/98			
Barium, Total	0.10	0.05	mg/L
Method 6010B ***			
Analyzed by: PS			
Date: 02/19/98 08:10:00			
Calcium, Total	81	1	mg/L
Method 6010B ***			
Analyzed by: PS			
Date: 02/19/98 08:10:00			
Iron, Total	ND	0.2	mg/L
Method 6010B ***			
Analyzed by: PS			
Date: 02/19/98 08:10:00			

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9802849-01

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 03/03/98

PROJECT: Hobbs SWD System
SITE: Lea Co, NM
SAMPLED BY: Rice Operating Co
SAMPLE ID: MW-5

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 02/14/98 16:25:00
DATE RECEIVED: 02/18/98

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total Method 6010B *** Analyzed by: PS Date: 02/19/98 08:10:00	ND	20	mg/L
Magnesium, Total Method 6010B *** Analyzed by: PS Date: 02/19/98 08:10:00	14	1	mg/L
Acid Digestion-Aqueous, ICP Method 3010A *** Analyzed by: EE Date: 02/19/98 07:40:00	02/19/98		
Chloride Method 325.3 * Analyzed by: TV Date: 02/25/98 11:00:00	44	2	mg/L
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 02/19/98 10:22:00	ND	1	mg/L
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 02/19/98 10:22:00	214	1	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9802849-01

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 03/03/98

PROJECT: Hobbs SWD System
SITE: Lea Co, NM
SAMPLED BY: Rice Operating Co
SAMPLE ID: MW-5

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 02/14/98 16:25:00
DATE RECEIVED: 02/18/98

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total Method CALCULATION Analyzed by: DAM Date: 03/03/98 10:00:00	16	1	mg/L
pH Method 150.1 * Analyzed by: JS Date: 02/19/98 10:22:00	7.74		pH units
Resistivity Method 120.1 * Analyzed by: JS Date: 02/19/98 15:30:00	1.446	0.001	Mohms-cm
Sulfate Method 375.4 * Analyzed by: EM Date: 02/27/98 09:15:00	56	25	mg/L
Specific Gravity ASTM D1429 Analyzed by: KS Date: 02/24/98 17:00:00	1.007		g/cm3
Total Dissolved Solids Method CALCULATION Analyzed by: DAM Date: 03/03/98 10:00:00	426	1	mg/L

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. 9802849-02

Client: Rice Operating Company
122 West Taylor
Hobbs, NM 88240

P.O. #:

Attn: F. Wesley Root
DATE: 3/4/98

PROJECT: Hobbs SWD System
PROJECT NO:
SITE: Lea Co, NM
MATRIX: Water
SAMPLED BY: Rice Operating Co.
DATE SAMPLED: 2/14/1998 16:15:00 P
SAMPLE ID: MW-3
DATE RECEIVED: 2/18/98

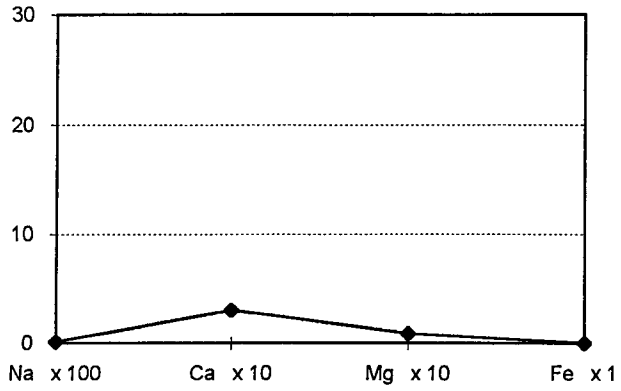
ANALYTICAL DATA

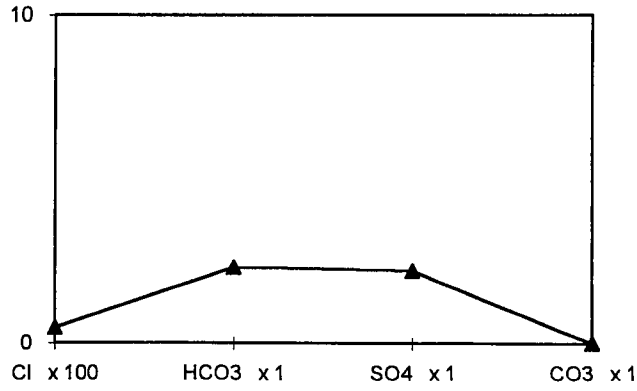
ION	mg/L	meq/L
Sodium, Na (Calc.)	299.966	13.05
Calcium, Ca	607	30.29
Magnesium, Mg	111	9.13
Chloride, Cl	1700	47.95
Bicarbonate, CaCO	141	2.31
Sulfate SO4	107	2.23
Carbonate, CaCO3	0	0.00
Iron, Fe(Total)	0.7	0.03
Barium, Ba	0.2	0.00

WET CHEMISTRY	RESULT
Total Dissolved Solids (calc.) mg/L	2966.87
Specific Gravity 60/60 deg. F.	1.0140
Resistivity (Mohm-cm) 75 deg. F.	0.2060
pH pH units	7.40

MINERAL ANALYSIS PATTERN

(Number Below Ion Name meq/liter/Scale Unit)





HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9802849-02

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 03/03/98

PROJECT: Hobbs SWD System
SITE: Lea Co, NM
SAMPLED BY: Rice Operating Co
SAMPLE ID: MW-3

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 02/14/98 16:15:00
DATE RECEIVED: 02/18/98

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	1.6	1.0 P	µg/L
TOLUENE	ND	1.0 P	µg/L
ETHYLBENZENE	ND	1.0 P	µg/L
TOTAL XYLENE	ND	1.0 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	1.6		µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	97		
4-Bromofluorobenzene	97		
Method 8020A ***			
Analyzed by: VHZ			
Date: 02/18/98			
Barium, Total	0.20	0.05	mg/L
Method 6010B ***			
Analyzed by: PS			
Date: 02/19/98 08:10:00			
Calcium, Total	607	1	mg/L
Method 6010B ***			
Analyzed by: PS			
Date: 02/19/98 08:10:00			
Iron, Total	0.7	0.2	mg/L
Method 6010B ***			
Analyzed by: PS			
Date: 02/19/98 08:10:00			

(P) - Practical Quantitation Limit ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9802849-02

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 03/03/98

PROJECT: Hobbs SWD System
SITE: Lea Co, NM
SAMPLED BY: Rice Operating Co
SAMPLE ID: MW-3

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 02/14/98 16:15:00
DATE RECEIVED: 02/18/98

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Potassium, Total Method 6010B *** Analyzed by: PS Date: 02/19/98 08:10:00	ND	20	mg/L
Magnesium, Total Method 6010B *** Analyzed by: PS Date: 02/19/98 08:10:00	111	1	mg/L
Acid Digestion-Aqueous, ICP Method 3010A *** Analyzed by: EE Date: 02/19/98 07:40:00	02/19/98		
Chloride Method 325.3 * Analyzed by: TV Date: 02/25/98 11:00:00	1700	50	mg/L
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 02/19/98 10:22:00	ND	1	mg/L
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 02/19/98 10:22:00	141	1	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9802849-02

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 03/03/98

PROJECT: Hobbs SWD System
SITE: Lea Co, NM
SAMPLED BY: Rice Operating Co
SAMPLE ID: MW-3

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 02/14/98 16:15:00
DATE RECEIVED: 02/18/98

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total Method CALCULATION Analyzed by: DAM Date: 03/03/98 10:00:00	300	1	mg/L
pH Method 150.1 * Analyzed by: JS Date: 02/19/98 10:22:00	7.40		pH units
Resistivity Method 120.1 * Analyzed by: JS Date: 02/19/98 15:30:00	0.206	0.001	Mohms-cm
Sulfate Method 375.4 * Analyzed by: EM Date: 02/27/98 09:15:00	107	25	mg/L
Specific Gravity ASTM D1429 Analyzed by: KS Date: 02/24/98 17:00:00	1.014		g/cm3
Total Dissolved Solids Method CALCULATION Analyzed by: DAM Date: 03/03/98 10:00:00	2967	1	mg/L

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

Certificate of Analysis No.
9802849-03

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Client: Rice Operating Company
122 West Taylor
Hobbs, NM 88240

P.O. #:
Attn: F. Wesley Root
DATE: 3/4/98

PROJECT: Hobbs SWD System
PROJECT NO:
SITE: Lea Co, NM
MATRIX: Water
SAMPLED BY: Rice Operating Co.
DATE SAMPLED: 2/14/1998 16:35:00 P
SAMPLE ID: MW-1
DATE RECEIVED: 2/18/98

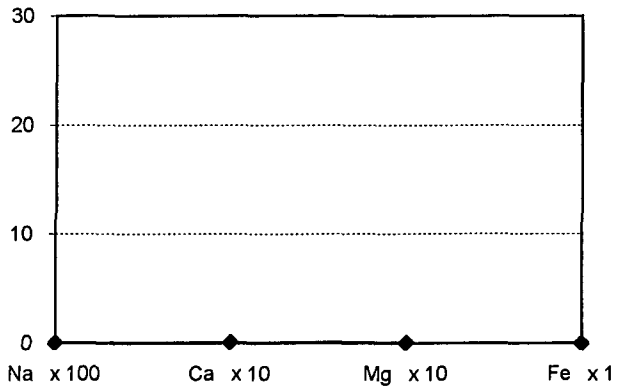
ANALYTICAL DATA

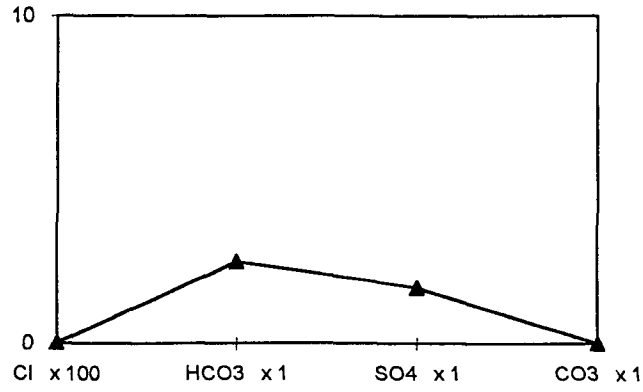
ION	mg/L	meq/L
Sodium, Na (Calc.)	98.2628	4.27
Calcium, Ca	24	1.20
Magnesium, Mg	9	0.74
Chloride, Cl	100	2.82
Bicarbonate, CaCO	151	2.47
Sulfate SO4	81	1.69
Carbonate, CaCO3	0	0.00
Iron, Fe(Total)	0	0.00
Barium, Ba	0.19	0.00

WET CHEMISTRY	RESULT
Total Dissolved Solids (calc.) mg/L	493.453
Specific Gravity 60/60 deg. F.	1.0140
Resistivity (Mohm-cm) 75 deg. F.	1.1230
pH pH units	7.88

MINERAL ANALYSIS PATTERN

(Number Below Ion Name meq/liter/Scale Unit)





HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9802849-03

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 03/03/98

PROJECT: Hobbs SWD System
SITE: Lea Co, NM
SAMPLED BY: Rice Operating Co
SAMPLE ID: MW-1

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 02/14/98 16:35:00
DATE RECEIVED: 02/18/98

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	3400	10 P	µg/L
TOLUENE	570	10 P	µg/L
ETHYLBENZENE	960	10 P	µg/L
TOTAL XYLENE	740	10 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	5670		µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	113		
4-Bromofluorobenzene	117		
Method 8020A ***			
Analyzed by: VHZ			
Date: 02/18/98			
Barium, Total	0.19	0.05	mg/L
Method 6010B ***			
Analyzed by: PS			
Date: 02/19/98 08:10:00			
Calcium, Total	24	1	mg/L
Method 6010B ***			
Analyzed by: PS			
Date: 02/19/98 08:10:00			
Iron, Total	ND	0.2	mg/L
Method 6010B ***			
Analyzed by: PS			
Date: 02/19/98 08:10:00			
Potassium, Total	30	20	mg/L
Method 6010B ***			
Analyzed by: PS			
Date: 02/19/98 08:10:00			

(P) - Practical Quantitation Limit ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.
QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9802849-03

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 03/03/98

PROJECT: Hobbs SWD System
SITE: Lea Co, NM
SAMPLED BY: Rice Operating Co
SAMPLE ID: MW-1

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 02/14/98 16:35:00
DATE RECEIVED: 02/18/98

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Magnesium, Total Method 6010B *** Analyzed by: PS Date: 02/19/98 08:10:00	9	1	mg/L
Acid Digestion-Aqueous, ICP Method 3010A *** Analyzed by: EE Date: 02/19/98 07:40:00	02/19/98		
Chloride Method 325.3 * Analyzed by: TV Date: 02/25/98 11:00:00	100	5	mg/L
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 02/19/98 10:22:00	ND	1	mg/L
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 02/19/98 10:22:00	151	1	mg/L
Sodium, Total Method CALCULATION Analyzed by: DAM Date: 03/03/98 10:00:00	98	1	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9802849-03

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 03/03/98

PROJECT: Hobbs SWD System
SITE: Lea Co, NM
SAMPLED BY: Rice Operating Co
SAMPLE ID: MW-1

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 02/14/98 16:35:00
DATE RECEIVED: 02/18/98

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
pH Method 150.1 * Analyzed by: JS Date: 02/19/98 10:22:00	7.88		pH units
Resistivity Method 120.1 * Analyzed by: JS Date: 02/19/98 15:30:00	1.123	0.001	Mohms-cm
Sulfate Method 375.4 * Analyzed by: EM Date: 02/27/98 09:15:00	81	25	mg/L
Specific Gravity ASTM D1429 Analyzed by: KS Date: 02/24/98 17:00:00	1.014		g/cm3
Total Dissolved Solids Method CALCULATION Analyzed by: DAM Date: 03/03/98 10:00:00	493	1	mg/L

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9802849-04

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 03/04/98

PROJECT: Hobbs SWD System
SITE: Lea Co, NM
SAMPLED BY: Rice Operating Co
SAMPLE ID: MW-2

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 02/14/98 17:15:00
DATE RECEIVED: 02/18/98

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1.0 P	µg/L
TOLUENE	ND	1.0 P	µg/L
ETHYLBENZENE	ND	1.0 P	µg/L
TOTAL XYLENE	ND	1.0 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	97		
4-Bromofluorobenzene	97		
Method 8020A ***			
Analyzed by: VHZ			
Date: 02/19/98			
Chloride	36	1	mg/L
Method 325.3 *			
Analyzed by: TV			
Date: 02/25/98 11:00:00			
Total Dissolved Solids	455	1	mg/L
Method 160.1 *			
Analyzed by: KS			
Date: 02/19/98 09:00:00			

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9802849-05

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 03/03/98

PROJECT: Hobbs SWD System
SITE: Lea Co, NM
SAMPLED BY: Rice Operating Co
SAMPLE ID: IWW

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 02/14/98 17:20:00
DATE RECEIVED: 02/18/98

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1.0 P	µg/L
TOLUENE	ND	1.0 P	µg/L
ETHYLBENZENE	ND	1.0 P	µg/L
TOTAL XYLENE	ND	1.0 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L
Surrogate	**% Recovery**		
1,4-Difluorobenzene	97		
4-Bromofluorobenzene	97		
Method 8020A ***			
Analyzed by: VHZ			
Date: 02/19/98			
Chloride	67	1	mg/L
Method 325.3 *			
Analyzed by: TV			
Date: 02/25/98 11:00:00			
Total Dissolved Solids	491	1	mg/L
Method 160.1 *			
Analyzed by: KS			
Date: 02/19/98 09:00:00			

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

QUALITY CONTROL

DOCUMENTATION

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL BATCH QUALITY CONTROL REPORT **

METHOD 8020

Batch Id: HP_U980218101200

Units: µg/L

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Benzene	ND	50	51	102	61 - 119
Toluene	ND	50	53	106	65 - 125
EthylBenzene	ND	50	53	106	70 - 118
O Xylene	ND	50	52	104	72 - 117
M & P Xylene	ND	100	110	110	72 - 116

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
BENZENE	ND	20	19	95.0	20	100	5.13	21	32 - 164
TOLUENE	ND	20	18	90.0	20	100	10.5	20	38 - 159
ETHYLBENZENE	ND	20	19	95.0	20	100	5.13	19	52 - 142
O XYLENE	ND	20	18	90.0	19	95.0	5.41	18	53 - 143
M & P XYLENE	ND	40	39	97.5	41	102	4.51	17	53 - 144

Analyst: VHZ
Sequence Date: 02/18/98
SPL ID of sample spiked: 9802628-04A
Sample File ID: U_B3069.TX0
Method Blank File ID:
Blank Spike File ID: U_B3064.TX0
Matrix Spike File ID: U_B3066.TX0
Matrix Spike Duplicate File ID: U_B3067.TX0

* = Values outside QC Range due to Matrix Interference (except RPD)
« = Data outside Method Specification limits.
NC = Not Calculated (Sample exceeds spike by factor of 4 or more)
ND = Not Detected/Below Detection Limit
% Recovery = [(<1> - <2>) / <3>] x 100
LCS % Recovery = (<1> / <3>) x 100
Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100
(**) = Source: SPL-Houston Historical Data (1st Q '97)
(***) = Source: SPL-Houston Historical Data (1st Q '97)

SAMPLES IN BATCH(SPL ID): 9802628-06A 9802849-01A 9802849-02A 9802849-03A 9802628-04A 9802628-01A 9802820-01A 9802628-05A

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL BATCH QUALITY CONTROL REPORT **

METHOD 8020

Batch Id: HP_U980218220700

Units: µg/L

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Benzene	ND	50.0	40	80.0	61 - 119
Toluene	ND	50.0	41	82.0	65 - 125
EthylBenzene	ND	50.0	41	82.0	70 - 118
O Xylene	ND	50.0	41	82.0	72 - 117
M & P Xylene	ND	100.0	83	83.0	72 - 116

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
BENZENE	ND	20	20	100	19	95.0	5.13	21	32 - 164
TOLUENE	ND	20	20	100	18	90.0	10.5	20	38 - 159
ETHYLBENZENE	ND	20	20	100	18	90.0	10.5	19	52 - 142
O XYLENE	ND	20	20	100	18	90.0	10.5	18	53 - 143
M & P XYLENE	ND	40	38	95.0	33	82.5	14.1	17	53 - 144

Analyst: VHZ
Sequence Date: 02/18/98
SPL ID of sample spiked: 9802833-06A
Sample File ID: U_B3097.TX0
Method Blank File ID:
Blank Spike File ID: U_B3094.TX0
Matrix Spike File ID: U_B3095.TX0
Matrix Spike Duplicate File ID: U_B3096.TX0

* = Values outside QC Range due to Matrix Interference (except RPD)
« = Data outside Method Specification limits.
NC = Not Calculated (Sample exceeds spike by factor of 4 or more)
ND = Not Detected/Below Detection Limit
% Recovery = [(<1> - <2>) / <3>] x 100
LCS % Recovery = (<1> / <3>) x 100
Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100
(**) = Source: SPL-Houston Historical Data (1st Q '97)
(***) = Source: SPL-Houston Historical Data (1st Q '97)

SAMPLES IN BATCH(SPL ID):

9802833-02A 9802833-03A 9802833-04A 9802833-05A
9802751-04A 9802718-04A 9802718-02A 9802718-03A
9802396-01A 9802803-01A 9802833-06A 9802849-04A
9802849-05A 9802833-01A

ICP Spec* scopy Method 6010 Quality Control Report

Matrix: Water Units: mg/L Analyst: PS

Date:021998 Time:0810 File Name: 21998C10 Checked:

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

2/20/98

Laboratory Control Sample

Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit
Silver						
Aluminum						
Arsenic						
Barium	ND	2.00	1.97	98	1.60	2.40
Beryllium						
Calcium	ND	20.00	19.87	99	16.00	24.00
Cadmium						
Cobalt						
Chromium						
Copper						
Iron	ND	2.00	1.99	99	1.60	2.40
Potassium	ND	20.00	20.81	104	16.00	24.00
Magnesium	ND	20.00	20.54	103	16.00	24.00
Manganese						
Sodium						
Nickel						
Lead						
Antimony						
Selenium						
Thallium						
Vanadium						
Zinc						

Work Orders in Batch

Work Order	Fractions
98-02-849	01B-03B

Matrix Spike - Spike Duplicate Results

Work Order Spiked: 9802849-01B

Element	Sample Result	Spike Added	Matrix Spike Result	Matrix Spike Recovery	Matrix Spike Duplicate Result	Matrix Spike Duplicate Recovery	QC Limits % Recovery		Spike RPD %	QC Limits %
Silver										
Aluminum										
Arsenic										
Barium	0.1011	10.0	9.936	98.3	10.24	101.4	80	120	3.0	20.0
Beryllium										
Calcium	81.1	100.0	179.4	98.3	184.7	103.6	80	120	5.3	20.0
Cadmium										
Cobalt										
Chromium										
Copper										
Iron	0.0269	10.0	9.932	99.1	10.26	102.3	80	120	3.3	20.0
Potassium	7.351	100.0	102.4	95.0	112.8	105.4	80	120	10.4	20.0
Magnesium	13.86	100.0	117.1	103.2	120.8	106.9	80	120	3.5	20.0
Manganese										
Sodium										
Nickel										
Lead										
Antimony										
Selenium										
Thallium										
Vanadium										
Zinc										

Elements Bench Spiked:ALL 10X DILUTION

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 02/26/98
Analyzed on: 02/25/98
Analyst: TV

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Chloride
Method 325.3 *

SPL Sample ID Number	Blank Value MG/L	LCS Concentration MG/L	Measured Concentration MG/L	% Recovery	QC Limits Recovery
LCS	ND	170.0	169.27	99.6	94 - 106

-9802B45

Samples in batch:

9802849-01C	9802849-02C	9802849-03C	9802849-04B
9802849-05B	9802887-06E	9802888-01H	9802888-06H
9802888-07H	9802889-08E	9802890-13E	9802890-14E
9802908-11H	9802908-12H	9802A08-07A	9802A10-01F
9802A69-09F			

COMMENTS:

LCS=SPL ID#94453182-12

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 02/26/98
Analyzed on: 02/25/98
Analyst: TV

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Chloride
Method 325.3 *

SPL Sample ID Number	Method Blank MG/L	Sample Result MG/L	Spike Added MG/L	Matrix Spike Result MG/L	Matrix Spike Recovery %	Matrix Spike Duplicate Result MG/L	Matrix Spike Duplicate Recovery %	RPD (%)	QC LIMITS (Advisory) RPD Max	QC LIMITS (Advisory) % REC
9802849-02C	ND	33.15	50.0	82.95	99.6	83.13	100	0.4	5	92 -109

-9802B44

Samples in batch:

9802849-01C	9802849-02C	9802849-03C	9802849-04B
9802849-05B	9802888-01H	9802888-06H	9802888-07H

COMMENTS:

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 02/19/98
Analyzed on: 02/19/98
Analyst: JS

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

Carbonate, as CaCO3
Method SM 4500-CO2D **

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration mg/L	Duplicate Sample mg/L	RPD	RPD Max.
9802849-01C	ND	ND	0	5

-9802898

Samples in batch:

9802849-01C 9802849-02C 9802849-03C

COMMENTS:

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 02/19/98
Analyzed on: 02/19/98
Analyst: JS

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

Bicarbonate, as CaCO3
Method SM 4500-CO2D **

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration mg/L	Duplicate Sample mg/L	RPD	RPD Max.
9802849-01C	214	215	0.5	5

-9802899

Samples in batch:

9802849-01C 9802849-02C 9802849-03C

COMMENTS:

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 02/19/98
Analyzed on: 02/19/98
Analyst: JS

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

pH
Method 150.1 *

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration pH units	Duplicate Sample pH units	RPD	RPD Max.
9802849-01C	7.74	7.72	0.3	1.0

-9802894

Samples in batch:

9802834-03A 9802849-01C 9802849-02C 9802849-03C

COMMENTS:

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 02/19/98
Analyzed on: 02/19/98
Analyst: JS

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Resistivity
Method 120.1 *

SPL Sample ID Number	Blank Value Mohms-cm	LCS Concentration Mohms-cm	Measured Concentration Mohms-cm	% Recovery	QC Limits Recovery
LCS	ND	1408.8	1409.2	100	90 - 110

-9802893

Samples in batch:

9802849-01C 9802849-02C 9802849-03C

COMMENTS:

LCS ID#: 94453170-21

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 02/19/98
Analyzed on: 02/19/98
Analyst: JS

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

Resistivity
Method 120.1 *

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration Mohms-cm	Duplicate Sample Mohms-cm	RPD	RPD Max.
9802849-01C	1.446	1.446	0	1.0

-9802892

Samples in batch:

9802849-01C 9802849-02C 9802849-03C

COMMENTS:

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 02/27/98
Analyzed on: 02/27/98
Analyst: EM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Sulfate
Method 375.4 *

SPL Sample ID Number	Blank Value mg/L	LCS Concentration mg/L	Measured Concentration mg/L	% Recovery	QC Limits Recovery
LCS	ND	8.48	7.45	87.9	82 - 111

-9802B93

Samples in batch:

9802849-01C	9802849-02C	9802849-03C	9802887-06E
9802888-01G	9802888-06G	9802888-07G	9802889-08E
9802890-13E	9802890-14E	9802908-11G	9802908-12G

COMMENTS:

SPL LCS#: 94453182-12

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 02/27/98
Analyzed on: 02/27/98
Analyst: EM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Sulfate
Method 375.4 *

SPL Sample ID Number	Method Blank mg/L	Sample Result mg/L	Spike Added mg/L	Matrix Spike Result mg/L	Matrix Spike Recovery %	Matrix Spike Duplicate Result mg/L	Matrix Spike Duplicate Recovery %	RPD (%)	QC LIMITS (Advisory) RPD Max	QC LIMITS (Advisory) % REC
9802887-06E	ND	10.62	10.00	19.02	84.0	19.51	88.9	5.7	9.5	84 -120

-9802B92

Samples in batch:

9802849-01C 9802887-06E 9802888-01G 9802888-06G
9802888-07G 9802889-08E 9802890-13E 9802890-14E
9802908-11G 9802908-12G

COMMENTS:

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 02/27/98
Analyzed on: 02/27/98
Analyst: EM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Sulfate
Method 375.4 *

SPL Sample ID Number	Method Blank mg/L	Sample Result mg/L	Spike Added mg/L	Matrix Spike Result mg/L	Matrix Spike Recovery %	Matrix Spike Duplicate Result mg/L	Matrix Spike Duplicate Recovery %	RPD (%)	QC LIMITS (Advisory) RPD Max	QC LIMITS (Advisory) % REC
9802849-02C	ND	4.28	10.00	14.13	98.5	14.54	103	4.5	9.5	84 -120

-9802B94

Samples in batch:

9802849-02C 9802849-03C

COMMENTS:

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 02/25/98
Analyzed on: 02/24/98
Analyst: KS

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

Specific Gravity
ASTM D1429

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration g/cm3	Duplicate Sample g/cm3	RPD	RPD Max.
9802849-01C	1.007	1.009	0.2	1.0

-9802A72

Samples in batch:

9802849-01C 9802849-02C 9802849-03C

COMMENTS:

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 02/20/98
Analyzed on: 02/19/98
Analyst: ET

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

Total Dissolved Solids
Method 160.1 *

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration mg/L	Duplicate Sample mg/L	RPD	RPD Max.
9802832-01D	1710	1780	4.0	5

-9802925

Samples in batch:

9802832-01D	9802832-02D	9802832-03D	9802836-01D
9802836-02D	9802836-03D	9802849-04B	9802849-05B
9802863-01H	9802884-03C		

COMMENTS:

CHAIN OF CUSTODY

AND

SAMPLE RECEIPT CHECKLIST

9802849

CHAIN OF CUSTODY RECORD NO. _____ **Date:** _____ **Page** ____ **of** ____

SITE ADDRESS: West County Road
Hobbs SWD System, Lea Co. NM

WIC #: _____

CONSULTANT NAME & ADDRESS: Rice Operarting Company
122 W. Taylor, Hobbs, NM 88240

CONSULTANT CONTACT: _____

PHONE: 505-393-9174 FAX: 505-397-1471

SAMPLED BY: Q. Brian

CHECK ONE BOX ONLY CT/DT

- QUARTERLY MONITORING (X) 5401
- SITE INVESTIGATION ( ) 5441
- SOIL FOR DISPOSAL ( ) 5442
- WATER FOR DISPOSAL ( ) 5443
- AIR SAMPLER - SYS 0-48 ( ) 5462
- WATER SAMPLE - SYS 0-48 ( ) 5463
- OTHER _____ ( )

SAMPLE I.D	DATE	TIME	COMP	GRAB	MATRIX: H2O	SOIL	AIR	SLUDGE	OTHER	METHOD PRESERVED: HCl	HNO3	H2SO4	NONE	OTHER	NO OF CONTAINERS	CONTAINER SIZE	BTEX 602 ☐ WITH MTBE ☐	BTEX/GAS HYDROCARBONS PD/FID ☐ WITH MTBE ☐	VOL 624/PPL ☐ 8240TAL ☐ NBS (+19) ☐	PNA/PAH 8310 ☐ 8100 ☐ 610 ☐	SEMI-VOL 625/PPL ☐ 8270TAL ☐ NBS (+25) ☐	TPH/R 418.1 ☐ SM503 ☐ ☐ ☐	TPH/GC 8015 Mod GAS ☐ 8015 Mod DIESEL ☐	TCLP METALS ☐ VOL ☐ SEMI-VOL ☐ PEST ☐ HERB ☐	EP TOX METALS ☐ PESTICIDES ☐ HERBICIDES ☐	REACTIVITY ☐ CORROSIVITY ☐ IGNITABILITY ☐	OTHER: Total Dissolved Solids	Mineral Pattern *	Chlorides	REMARKS
MW-5	2-14-98	16:25		V	V									ICE	2	40ml	X													
MW-5	2-14-98	16:25		V	V									ICE	2	Lt												X		
MW-3	2-14-98	16:15		V	V									ICE	2	40ml	X													
MW-3	2-14-98	16:15		V	V									ICE	2	Lt												X		
MW-1	2-14-98	16:35		V	V									ICE	1	40ml	X													
MW-1	2-14-98	16:35		V	V									ICE	2	Lt												X		
MW-2	2-14-98	17:15		V	V									ICE	2	40ml	X													
MW-2	2-14-98	17:15		V	V									ICE	1	Lt												X		X
IWW	2-14-98	17:20		V	V									ICE	2	40ml	X													
[redacted]	2-14-98	17:20		V	V									ICE	1	Lt												X		X

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Q. Brian	2/16/98	17:15	F. Wesley Root	2-16-98	17:15
F. Wesley Root	2-17-98	16:00	[signature]	2-18-98	1000
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

BILL NO.: UPS: 1ZE04 62E0 1000 0912 2 of 2

LABORATORY: SPL - Houston

CONTACT: Electa Brown PHONE: _____ FAX: _____

TURN AROUND TIME (CHECK ONE)

7 DAYS ☐ 14 DAYS XX (NORMAL)

48 HOURS ☐ OTHER ☐ _____

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN OF CUSTODY WITH INVOICE AND RESULTS

DISTRIBUTION: PINK Sampling Coordinator - WHITE & YELLOW Accompanies Shipment - WHITE Returned with Report

Carbonate, Bicarbonate, pH, Resistivity, Sulfate, Specific Gravity

* Mineral Pattern - Barium, Calcium, Iron, Potassium, Magnesium, Sodium, Chloride, TDS

SPL Houston Environmental Laboratory

Sample Login Checklist

Date:	Time:
2-18-98	1000

SPL Sample ID:
9802849

			Yes	No
1	Chain-of-Custody (COC) form is present.		✓	
2	COC is properly completed.		✓	
3	If no, Non-Conformance Worksheet has been completed.			
4	Custody seals are present on the shipping container.		✓	
5	If yes, custody seals are intact.		✓	
6	All samples are tagged or labeled.		✓	
7	If no, Non-Conformance Worksheet has been completed.			
8	Sample containers arrived intact		✓	
9	Temperature of samples upon arrival:		2° C	
10	Method of sample delivery to SPL:	SPL Delivery		
		Client Delivery		
		FedEx Delivery (airbill #)		
		Other: UPS	1Z E04 626 01 1000 0912	
11	Method of sample disposal:	SPL Disposal	✓	
		HOLD		
		Return to Client		

Name:	Date:
[signature]	2/18/98

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: F. WESLEY ROOT
122 W.TAYLOR
HOBBS, NM 88240
FAX TO: 505-397-1471

Receiving Date: 12/08/97
Reporting Date: 12/11/97
Project Number: NOT GIVEN
Project Name: WEST CO. RD.
Project Location: HOBBS SYSTEM, LEA CO. NM

Sampling Date: 12/06/97
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: AH

LAB NUMBER	SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE		12/09/97	12/09/97	12/09/97	12/09/97
H3357-1	MW-4	<0.002	<0.002	<0.002	<0.006
H3357-2	MW-7	<0.002	<0.002	<0.002	<0.006
H3357-3	MW-6	<0.002	<0.002	<0.002	<0.006
H3357-4	MW-5	<0.002	<0.002	<0.002	<0.006
H3357-5	MW-3	0.012	<0.002	<0.002	<0.006
H3357-6	MW-2	<0.002	<0.002	<0.002	<0.006
H3357-7	IWW	<0.002	0.006	<0.002	0.006
Quality Control		0.104	0.096	0.093	0.288
True Value QC		0.100	0.100	0.100	0.300
% Accuracy		104	95.8	93.1	96.0
Relative Percent Difference		4.8	3.9	0.3	0.7

METHOD: EPA SW 846-8260, gc/ms

RECEIVED
DEC 13 1997
RICE OPERATING
HOBBS, NM

Chemist

12/11/97
Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: F. WESLEY ROOT
122 W.TAYLOR
HOBBS, NM 88240
FAX TO: 505-397-1471

Receiving Date: 12/08/97
Reporting Date: 12/11/97
Project Number: NOT GIVEN
Project Name: WEST CO. RD.
Project Location: HOBBS SYSTEM, LEA CO. NM

Sampling Date: 12/06/97
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: AH

LAB NUMBER	SAMPLE ID	TDS (mg/L)	Cl (mg/L)
ANALYSIS DATE:		12/09/97	12/09/97
H3357-1	MW-4	974	264
H3357-2	MW-7	806	188
H3357-3	MW-6	445	28
H3357-4	MW-5	506	52
H3357-5	MW-3	4610	1450
H3357-6	MW-2	414	40
H3357-7	IWW	931	328
Quality Control		NR	500
True Value QC		NR	500
% Recovery		NR	100
Relative Percent Difference		0.3	4.0

METHODS: EPA 600/4-79-02	160.1	325.3

RECEIVED
DEC 13 1997
RICE OPERATING
HOBBS, NM

Chemist

12/11/97
Date

H3357.XLS

CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240
(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

Company Name: Rice Operating Company		**BILL TO**	PO #:
Project Manager: F. Wesley Root		Company: ROC	
Address: 122 West Taylor		Attn: F. Wesley Root	
City: Hobbs	State: NM Zip: 88240	Address: 122 W. Taylor	
Phone #: 505-393-9174		City: Hobbs	
Fax #: 505-397-1471		State: NM	Zip: 88240
Project #:	Project Owner: Hobbs System	Phone #: 505-393-9174	
Project Name: West Co. Rd.		Fax #: 505-397-1471	
Project Location: Hobbs System, Lea Co. NM			

FOR LAB USE ONLY LAB I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	PRES.: ACID:	ICE / COOL	OTHER:	SAMPLING: DATE	TIME	ANALYSIS REQUEST: BTEX	TDS, ~~Chloride~~	Chloride
	MW-4	G	2	✓							✓		12-6-97	12:10	✓	✓	✓
	MW-7	G	2	✓							✓		12-6-97	12:35	✓	✓	✓
	MW-6	G	2	✓							✓		12-6-97	14:30	✓	✓	✓
	MW-5	G	2	✓							✓		12-6-97	14:40	✓	✓	✓
	MW-3	G	2	✓							✓		12-6-97	14:50	✓	✓	✓
	MW-2	G	2	✓							✓		12-6-97	15:10	✓	✓	✓
	IWW	G	2	✓							✓		12-6-97	16:20	✓	✓	✓

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequental damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Terms and Conditions: Interest will be charged on all accounts more than 30 days past due at the rate of 24% per annum from the original date of invoice, and all costs of collections, including attorney's fees.

Sampler Relinquished: A. Brown (signature)	Date: 12/8/97 Time: 15:00	Received By:	Phone Result ☐ Yes ☐ No Additional Fax #: Fax Result: ☐ Yes ☐ No
Relinquished By:	Date: 12/8/97 Time: 3:00 PM	Received By: (Lab Staff) (signature)	REMARKS:
Delivered By: (Circle One) Sampler - UPS - Bus - Other:		Sample Condition: Cool ☒ Yes ☐ No; Intact ☒ Yes ☐ No — CHECKED BY: (Initials)	

† Cardinal cannot accept verbal changes. Please fax written changes to 915-673-7020.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

December 19, 1997

Mr. F. Wesley Root
RICE OPERATING COMPANY
122 West Taylor
Hobbs, NM 88240

The following report contains analytical results for samples received at Southern Petroleum Laboratories (SPL) on December 10, 1997. The samples were assigned to Certificate of Analysis No.(s) 9712600 and analyzed for all parameters as listed on the chain of custody.

Any data flag or quality control exception associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s).

If you have any questions or comments pertaining to this data report, please do not hesitate to contact me. Please reference the above Certificate of Analysis No. during any inquiries.

Again, SPL is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.

Southern Petroleum Laboratories

Electa Brown
Client Services Representative

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Southern Petroleum Laboratories, Inc.

Certificate of Analysis Number: 97-12-600

Approved for Release by:

Electa Brown, Client Services Representative — Date: 12/19/97

Greg Grandits
Laboratory Director

Idelis Williams
Quality Assurance Officer

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

****SUMMARY REPORT*****

12/19/97

Company: Rice Operating Company
Site: West Co Road Lea Co, NM
Project No:
Project: Hobbs SWD System

ANALYTICAL DATA
NOTE: ND - Not Detected

SPL ID MATRIX	CLIENT ID DATE SAMPLED	BENZENE PQL	TOLUENE PQL	ETHYLBENZ. PQL	XYLENE PQL	TPH-IR	TPH-GC	LEAD	MTBE
9712600-01 WATER	MW-7 12/06/97 12:35:00	ND 1.0µg/L	ND 1.0µg/L	ND 1.0µg/L	ND 1.0µg/L				
9712600-02 WATER	MW-6 12/06/97 14:30:00	ND 1.0µg/L	ND 1.0µg/L	ND 1.0µg/L	ND 1.0µg/L				
9712600-03 WATER	MW-5 12/06/97 14:40:00	ND 1.0µg/L	ND 1.0µg/L	ND 1.0µg/L	ND 1.0µg/L				
9712600-04 WATER	MW-3 12/06/97 14:50:00	ND 1.0µg/L	ND 1.0µg/L	ND 1.0µg/L	ND 1.0µg/L				
9712600-05 WATER	MW-2 12/06/97 15:10:00	ND 1.0µg/L	ND 1.0µg/L	ND 1.0µg/L	ND 1.0µg/L				
9712600-06 WATER	IWW 12/06/97 16:20:00	ND 1.0µg/L	ND 1.0µg/L	ND 1.0µg/L	ND 1.0µg/L				
9712600-07 WATER	MW-3 12/06/97	ND 1.0µg/L	ND 1.0µg/L	ND 1.0µg/L	ND 1.0µg/L				

BTEX - Method 8020A ***

Elicia Brown

SPL, Inc., - Project Manager

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9712600-01

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 12/19/97

PROJECT: Hobbs SWD System
SITE: West Co Road Lea Co, NM
SAMPLED BY: Rice Operating
SAMPLE ID: MW-7

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 12/06/97 12:35:00
DATE RECEIVED: 12/10/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1.0 P	µg/L
TOLUENE	ND	1.0 P	µg/L
ETHYLBENZENE	ND	1.0 P	µg/L
TOTAL XYLENE	ND	1.0 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	100
4-Bromofluorobenzene	97

Method 8020A ***
Analyzed by: VHZ
Date: 12/12/97

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9712600-02

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 12/19/97

PROJECT: Hobbs SWD System
SITE: West Co Road Lea Co, NM
SAMPLED BY: Rice Operating
SAMPLE ID: MW-6

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 12/06/97 14:30:00
DATE RECEIVED: 12/10/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1.0 P	µg/L
TOLUENE	ND	1.0 P	µg/L
ETHYLBENZENE	ND	1.0 P	µg/L
TOTAL XYLENE	ND	1.0 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	93
4-Bromofluorobenzene	100

Method 8020A ***
Analyzed by: VHZ
Date: 12/12/97

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9712600-03

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 12/19/97

PROJECT: Hobbs SWD System
SITE: West Co Road Lea Co, NM
SAMPLED BY: Rice Operating
SAMPLE ID: MW-5

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 12/06/97 14:40:00
DATE RECEIVED: 12/10/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1.0 P	µg/L
TOLUENE	ND	1.0 P	µg/L
ETHYLBENZENE	ND	1.0 P	µg/L
TOTAL XYLENE	ND	1.0 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	93
4-Bromofluorobenzene	100

Method 8020A ***
Analyzed by: VHZ
Date: 12/12/97

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9712600-04

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 12/19/97

PROJECT: Hobbs SWD System
SITE: West Co Road Lea Co, NM
SAMPLED BY: Rice Operating
SAMPLE ID: MW-3

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 12/06/97 14:50:00
DATE RECEIVED: 12/10/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1.0 P	µg/L
TOLUENE	ND	1.0 P	µg/L
ETHYLBENZENE	ND	1.0 P	µg/L
TOTAL XYLENE	ND	1.0 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	93
4-Bromofluorobenzene	97

Method 8020A ***
Analyzed by: VHZ
Date: 12/12/97

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9712600-05

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 12/19/97

PROJECT: Hobbs SWD System
SITE: West Co Road Lea Co, NM
SAMPLED BY: Rice Operating
SAMPLE ID: MW-2

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 12/06/97 15:10:00
DATE RECEIVED: 12/10/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1.0 P	µg/L
TOLUENE	ND	1.0 P	µg/L
ETHYLBENZENE	ND	1.0 P	µg/L
TOTAL XYLENE	ND	1.0 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	97
4-Bromofluorobenzene	97

Method 8020A ***
Analyzed by: VHZ
Date: 12/12/97

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9712600-06

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 12/19/97

PROJECT: Hobbs SWD System
SITE: West Co Road Lea Co, NM
SAMPLED BY: Rice Operating
SAMPLE ID: IWW

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 12/06/97 16:20:00
DATE RECEIVED: 12/10/97

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1.0 P	µg/L
TOLUENE	ND	1.0 P	µg/L
ETHYLBENZENE	ND	1.0 P	µg/L
TOTAL XYLENE	ND	1.0 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	100
4-Bromofluorobenzene	100

Method 8020A ***
Analyzed by: VHZ
Date: 12/12/97

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

SPL, Inc., - Project Manager

QUALITY CONTROL

DOCUMENTATION

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

SPL BATCH QUALITY CONTROL REPORT **
METHOD 8020/602

Matrix: Aqueous
Units: µg/L

Batch Id: VARD971212120700

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result <1>	Blank Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Benzene	ND	50	53	106	61 - 119
Toluene	ND	50	55	110	65 - 125
EthylBenzene	ND	50	53	106	70 - 118
O Xylene	ND	50	52	104	72 - 117
M & P Xylene	ND	100	110	110	72 - 116

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike Result <1>	Matrix Spike Recovery <4>	Matrix Spike Duplicate Result <1>	Matrix Spike Duplicate Recovery <5>	MS/MSD Relative % Difference	QC Limits(***) (Advisory) RPD Max.	QC Limits(***) (Advisory) Recovery Range
BENZENE	ND	20	19	95.0	17	85.0	11.1	21	32 - 164
TOLUENE	ND	20	19	95.0	18	90.0	5.41	20	38 - 159
ETHYLBENZENE	ND	20	19	95.0	18	90.0	5.41	19	52 - 142
O XYLENE	ND	20	19	95.0	18	90.0	5.41	18	53 - 143
M & P XYLENE	ND	40	38	95.0	36	90.0	5.41	17	53 - 144

Analyst: VHZ
Sequence Date: 12/13/97
SPL ID of sample spiked: 9712274-06A
Sample File ID: D_L7332.TX0
Method Blank File ID:
Blank Spike File ID: D_L7374.TX0
Matrix Spike File ID: D_L7329.TX0
Matrix Spike Duplicate File ID: D_L7330.TX0

* = Values Outside QC Range. « = Data outside Method Specification limits.
NC = Not Calculated (Sample exceeds spike by factor of 4 or more)
ND = Not Detected/Below Detection Limit
% Recovery = [(<1> - <2>) / <3>] x 100
LCS % Recovery = (<1> / <3>) x 100
Relative Percent Difference = |(<4> - <5> | / [(<4> + <5>) x 0.5] x 100
(**) = Source: SPL-Houston Historical Data (1st Q '97)
(***) = Source: SPL-Houston Historical Data (1st Q '97)

SAMPLES IN BATCH(SPL ID):

9712600-04A 9712600-05A 9712600-06A 9712600-07A
9712274-01A 9712274-02A 9712274-07A 9712334-01A
9712334-03A 9712336-02A 9712336-04A 9712336-01A
9712336-05A 9712336-03A 9712405-01A 9712405-03A
9712274-06A 9712600-01A 9712600-02A 9712600-03A

CHAIN OF CUSTODY

AND

SAMPLE RECEIPT CHECKLIST

9712600

CHAIN OF CUSTODY RECORD NO. _____

Date: 12-6-97
Page 1 of 1

SITE ADDRESS: West Co. Road
Hobbs SWD System, Lea Co, NM

WIC #:

CONSULTANT NAME & ADDRESS: Rice Operating Company
122 West Taylor, Hobbs, NM 88240

CONSULTANT CONTACT: F. Wesley Root

PHONE: 505-393-9174 FAX: 505-397-1471

SAMPLED BY: J. Brian

CHECK ONE BOX ONLY CT/DT

- QUARTERLY MONITORING [X] 5481
- SITE INVESTIGATION [ ] 5441
- SOIL FOR DISPOSAL [ ] 5442
- WATER FOR DISPOSAL [ ] 5443
- AIR SAMPLER - SYS O+M [ ] 5462
- WATER SAMPLE - SYS O+M [ ] 5463
- OTHER _____ [ ]

SAMPLE ID	DATE	TIME	COMP	GRAB	MATRIX: H2O	SOIL	AIR	SLUDGE	OTHER	METHOD PRESERVED: HCl	HNO3	H2SO4	NONE	OTHER: ICE	NO OF CONTAINERS	CONTAINER SIZE	BTEX 602 WITH MTBE	BTEX 602	BTEX/GAS HYDROCARBONS PID/FID WITH MTBE	VOL 624/PPL	EXTOTAL	NBS (+15)	PNA/PAH 8310	9100	810	SEMI-VOL 625/PPL	EXTOTAL	NBS (+25)	TPH/MR 418.1	SMOD	TPH/GC 8015 Mod GAS	8015 Mod DIESEL	TCLP METALS	VOL	SEMI-VOL	PEST	HERB	EP TOX METALS	PESTICIDES	HERBICIDES	REACTIVITY	CORROSIVITY	IGNITABILITY	OTHER	REMARKS
MW-7	12-6-97	12:33		V	V								V	V	1	40mL	V																												
MW-6	12-6-97	14:30		V	V								V	V	1	40mL	V																												
MW-5	12-6-97	14:40		V	V								V	V	1	40mL	V																												
MW-3	12-6-97	14:50		V	V								V	V	1	40mL	V																												
MW-2	12-6-97	15:10		V	V								V	V	1	40mL	V																												
IWW	12-6-97	16:20		V	V								V	V	1	40mL	V																												

RUSH

19°C

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
J. Brian	12/8/97	17:30		12/10/97	1000
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

BILL NO: _____

LABORATORY: _____

CONTACT: _____ PHONE: _____ FAX: _____

TURN AROUND TIME (CHECK ONE)

7 DAYS ☐ 14 DAYS ☐ (NORMAL)

48 HOURS ☐ OTHER ☐ _____

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN OF CUSTODY WITH INVOICE AND RESULTS

SPL Houston Environmental Laboratory

Sample Login Checklist

Date:	Time:
12/10/97	1100

SPL Sample ID:
9712600

			Yes	No
1	Chain-of-Custody (COC) form is present.		✓	
2	COC is properly completed.		✓	
3	If no, Non-Conformance Worksheet has been completed.			
4	Custody seals are present on the shipping container.		✓	
5	If yes, custody seals are intact.		✓	
6	All samples are tagged or labeled.		✓	
7	If no, Non-Conformance Worksheet has been completed.			
8	Sample containers arrived intact		✓	
9	Temperature of samples upon arrival:		19° C	
10	Method of sample delivery to SPL:	SPL Delivery		
		Client Delivery		
		FedEx Delivery (airbill #)	328360 7585	
		Other:		
11	Method of sample disposal:	SPL Disposal	✓	
		HOLD		
		Return to Client		

Name:	Date:
[signature]	12/10/97

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: WES ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 07/02/97
Reporting Date: 07/08/97
Project Number: 129
Project Name: SPILL SITE
Project Location: W. COUNTY RD., HOBBS, NM

Sampling Date: 07/02/97
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC/AH

LAB NUMBER	SAMPLE ID	TDS (mg/L)	Cl (mg/L)	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE:		07/08/97	07/03/97	07/03/97	07/03/97	07/03/97	07/03/97
H3037-1	MW-2	399	44	0.006	0.007	0.003	0.011
H3037-2	MW-3	3065	1290	0.002	<0.001	<0.001	<0.003
H3037-3	MW-4	788	206	<0.001	<0.001	<0.001	<0.003
H3037-4	MW-5	458	50	<0.001	<0.001	<0.001	<0.003
H3037-5	MW-6	419	38	<0.001	<0.001	<0.001	<0.003
H3037-6	MW-7	1092	264	<0.001	<0.001	<0.001	<0.003
H3037-7	IAW	663	200	<0.001	<0.001	<0.001	<0.003
Quality Control		NR	200	0.087	0.086	0.088	0.264
True Value QC		NR	200	0.100	0.100	0.100	0.300
% Accuracy		NR	100	87	86	88	88
Relative Percent Difference		NR	0	4.4	0.9	0.9	2.4

METHODS: TDS- EPA 600/4-79-020, 160.1; Cl-EPA 600/4-79-020, 325.3 BTEX-EPA SW-846-8020

Burgess J. A. Cooke. Ph. D.

7/8/97
Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page ___ of

Company Name: E-TECH SERVICES	BILL TO / PO #:
Project Manager:	Company: RICE ENG.
Address: P.O. Box 51151	Attn: Wes Root
City: Midland State: TX Zip: 79710-1151	Address:
Phone #: (915) 550-4913	City: HOBBS
Fax #: (915) 550-4913	State: N.M. Zip:
Project #: 129	Phone #:
Project Name: Spill Site	Fax #:
Project Location: West County Road, Hobbs	

LAB I.D. #	Sample I.D.	COMP(C) OR GRAB(G)	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	PRESERVATION: ACID:	ICE / COOL	OTHER:	SAMPLING: DATE	TIME	ANALYSIS REQUEST: BTEX	TDS	Chlorides
H3037-1	MW-2	G	4	✓							✓		7-2-97	3:15	✓	✓	✓
-2	MW-3	G	4	✓							✓		7-2-97	3:30	✓	✓	✓
-3	MW-4	G	4	✓							✓		7-2-97	11:20	✓	✓	✓
-4	MW-5	G	4	✓							✓		7-2-97	2:35	✓	✓	✓
-5	MW-6	G	4	✓							✓		7-2-97	11:50	✓	✓	✓
-6	MW-7	G	4	✓							✓		7-2-97	11:00	✓	✓	✓
-7	~~TRIP~~ TAW	G	4	✓							✓		7-27	3:00	✓	✓	✓

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.

Sampler Relinquished: Bill D. Smith	Date: 7-2-97 Time: 7:00	Received By:	Phone Result ☐ Yes ☐ No Additional Fax #: Fax Results: ☐ Yes ☐ No REMARKS:
Relinquished By:	Date: 7/2/97 Time: 7:00 PM	Received By: (Lab Staff) Burgess J. Cooke	
Delivered By: (Circle One) UPS - Fed Ex - Bus - Other:		Sample Condition Cool: ☐ Yes ☐ No Intact: ☐ Yes ☐ No	CHECKED BY: (Initials)

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: WES ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 04/03/97
Reporting Date: 04/07/97
Project Number: 129
Project Name: HOBBS SPILL SITE, LINE H-6 (E-TECH)
Project Location: HOBBS, NM

Sampling Date: 04/03/97
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: AH
Analyzed By: BC

LAB NUMBER	SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE		04/05/97	04/05/97	04/05/97	04/05/97
H2896-1	MW-2	<0.001	<0.001	<0.001	<0.003
H2896-2	MW-3	0.292	<0.001	0.001	0.005
H2896-3	MW-4	<0.001	<0.001	<0.001	<0.003
H2896-4	MW-5	<0.001	<0.001	<0.001	<0.003
H2896-5	MW-6	<0.001	<0.001	<0.001	<0.003
H2896-6	MW-7	<0.001	<0.001	<0.001	<0.003
H2896-7	WW	<0.001	<0.001	<0.001	<0.003
Quality Control		0.107	0.105	0.110	0.331
True Value QC		0.100	0.100	0.100	0.300
% Accuracy		107	105	110	110
Relative Percent Difference		3.2	4.4	4.1	5.7

METHOD: EPA SW 846-8260

Chemist

4/7/97
Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: WES ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 04/03/97
Reporting Date: 04/09/97
Project Number: 129
Project Name: HOBBS SPILL SITE, LINE H-6 (E-TECH)
Project Location: HOBBS, NM

Sampling Date: 04/03/97
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: AH
Analyzed By: AH/BC

LAB NUMBER	SAMPLE ID	Na (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Conductivity (umhos/cm)	T-Alkalinity (mgCaCO3/L)
ANALYSIS DATE:		04/09/97	04/04/97	04/04/97	04/04/97	04/04/97	04/04/97
H2896-1	MW-2	165	78	18	2.4	904	268
H2896-2	MW-3	1692	115	263	19.0	11200	184
H2896-3	MW-4	76	117	29	1.9	1354	208
H2896-4	MW-5	66	74	21	2.5	872	236
H2896-5	MW-6	82	70	20	1.3	779	232
H2896-6	MW-7	327	70	17	3.8	2199	308
H2896-7	WW	552	61	23	9.0	3230	232
Quality Control		NR	NR	NR	NR	1413	NR
True Value QC		NR	NR	NR	NR	1413	NR
% Recovery		NR	NR	NR	NR	100	NR
Relative Percent Difference		NR	NR	NR	NR	0	NR
METHODS:			SM3500-Ca-D	3500-Mg E	8049	120.1	310.1

LAB NUMBER	SAMPLE ID	Cl⁻ (mg/L)	SO4 (mg/L)	CO3 (mg/L)	HCO3 (mg/L)	pH (s.u.)	TDS (mg/L)
ANALYSIS DATE:		04/04/97	04/04/97	04/04/97	04/04/97	04/04/97	04/04/97
H2896-1	MW-2	50	110	0	327	7.40	497
H2896-2	MW-3	3249	300	0	224	7.14	7764
H2896-3	MW-4	196	92	0	254	7.18	877
H2896-4	MW-5	50	103	0	288	7.73	509
H2896-5	MW-6	80	88	0	283	7.19	404
H2896-6	MW-7	344	162	0	376	7.84	1166
H2896-7	WW	760	150	0	283	7.38	1468
Quality Control		480	105	NR	NR	7.00	NR
True Value QC		500	100	NR	NR	7.00	NR
% Recovery		96.0	105	NR	NR	100	NR
Relative Percent Difference		0	4.8	NR	NR	0	0.2
METHODS:		SM4500-Cl-B	375.4	310.1	310.1	150.1	160.1

Gayle A. Potter, Chemist

04/10/97
Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page ___ of ___

Company Name:	E-TECH SERVICES
Project Manager:	BILL D. SMITH
Address:	P.O. BOX 51151
City:	Midland State: TX Zip: 79710
Phone #:	(915) 550-4913
Fax #:	(915) 550-4913
Project #:	129
Project Name:	HOBBS SPILL SITE, LINE H-6
Project Location:	HOBBS N.M.

BILL TO PO #:

Company:	RICE Engineering
Attn:	Wes Root
Address:	
City:	HOBBS
State:	N.M. Zip:
Phone #:	
Fax #:	

LAB I.D. #	Sample I.D.	COMP(C) OR GRAB(G)	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	PRESERVATION: ACID:	ICE / COOL	OTHER:	SAMPLING: DATE	TIME	ANALYSIS REQUEST: BTEX	TDS	Major Cations/Anions
	MW-2	G	4	✓							✓		4-3-97	1345	✓	✓	✓
	MW-3	G	4	✓							✓		4-3-97	1030	✓	✓	✓
	MW-4	G	4	✓							✓		4-3-97	1150	✓	✓	✓
	MW-5	G	4	✓							✓		4-3-97	1215	✓	✓	✓
	MW-6	G	4	✓							✓		4-3-97	1310	✓	✓	✓
	MW-7	G	4	✓							✓		4-3-97	1130	✓	✓	✓
	WW	G	4	✓							✓		4-3-97	1245	✓	✓	✓

Sampler Relinquished:	Date: 4-3-97	Received By:	Phone Result ☐ Yes ☐ No Additional Fax #:
Bill D. Smith	Time:		Fax Results: ☐ Yes ☐ No
Relinquished By:	Date: 4-3-97	Received By: (Lab Staff)	REMARKS: Result to Wes Root @ RICE Engineering
	Time: 4:35	Amy Hill	
Delivered By: (Circle One)	Sample Condition: Cool ☑ Yes ☐ No / Intact ☑ Yes ☐ No	CHECKED BY: (Initials)	
UPS - Fed Ex - Bus - Other:			

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401
PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
RICE ENGINEERING & OPERATING
ATTN: WESLEY ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 11/25/96
Reporting Date: 12/02/96
Project Number: NOT GIVEN
Project Name:SPILL SITE, LINE H6/E-TECH SERVICE
Project Location: HOBBS, NM

Sampling Date: 11/25/96
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC

LAB NUMBER	SAMPLE ID	BENZENE (ppb)	TOLUENE (ppb)	ETHYL BENZENE (ppb)	TOTAL XYLENES (ppb)
ANALYSIS DATE		11/26/96	11/26/96	11/26/96	11/26/96
H2716-1	MW-2	1.9	1.2	1.8	<3
H2716-2	MW-3	1170	1.1	4.7	15
H2716-3	MW-4	2.9	1.1	1.9	<3
H2716-4	MW-5	1.2	1.2	1.6	<3
H2716-5	MW-6	16.1	1.3	2.3	4.7
H2716-6	IWW	655	<1	2.6	<3
H2716-7	MW-7	1.1	<1	<1	<3
Quality Control		94.8	89.3	90.3	270
True Value QC		100	100	100	300
% Accuracy		94.8	89.3	90.3	90.0
Relative Percent Difference		5.0	1.5	1.6	2.2

METHOD: EPA SW 846-8020, 5030, Gas Chromatography

Burgess J. A. Cooke, Ph. D.

12/2/96
Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401
PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
RICE ENGINEERING & OPERATING
ATTN: WESLEY ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 11/25/96
Reporting Date: 12/06/96
Project Number: NOT GIVEN
Project Name: SPILL SITE, LINE H6/E-TECH SERV.
Project Location: HOBBS, NM

Sampling Date: 11/25/96
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC/WL

LAB NUMBER	SAMPLE ID	Na ppm	Ca ppm	Mg ppm	K ppm	Cl ppm	SO4 ppm	CO3 ppm	HCO3 ppm
ANALYSIS DATE:		12/6/96	12/2/96	12/2/96	11/27/96	11/26/96	11/27/96	12/6/96	12/6/96
H2716-1	MW-2	23.6	71.6	25.5	3.90	44.0	88.1	0	229
H2716-2	MW-3	3761	642	215	47.8	6850	760	0	366
H2716-3	MW-4	48.3	146	41.8	1.89	240	97.7	0	251
H2716-4	MW-5	1.5	81.6	39.9	1.25	70.0	97.9	0	212
H2716-5	MW-6	12.2	89.6	25.3	1.25	38.0	98.8	0	244
H2716-6	IWW	3310	216	114	49.0	5300	395	0	503
H2716-7	MW-7	181	109	36.5	3.74	334	148	0	242
Quality Control		NR	NR	NR	NR	205	52.4	NR	NR
True Value QC		NR	NR	NR	NR	200	50.0	NR	NR
% Accuracy		NR	NR	NR	NR	102	105	NR	NR
Relative Percent Difference		NR	1.1	2.0	NR	1.0	0.3	NR	NR
METHODS: EPA 600/4-79-02						352.3	375.4		
Std. Methods		3111B	3111B	3111B	3111B			2320B	2320B

Wei Li

Wei Li, Chemist

12-6-96

Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2[illegible]BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401
PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
RICE ENGINEERING & OPERATING
ATTN: WESLEY ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 11/25/96
Reporting Date: 12/02/96
Project Number: NOT GIVEN
Project Name:SPILL SITE, LINE H6/E-TECH SERVICE
Project Location: HOBBS, NM

Analysis Date: 11/26/96
Sampling Date: 11/25/96
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC

LAB NUMBER	SAMPLE ID		TDS (mg/L)
H2716-1	MW-2		443
H2716-2	MW-3		13890
H2716-3	MW-4		953
H2716-4	MW-5		506
H2716-5	MW-6		477
H2716-6	IWW		10147
H2716-7	MW-7		1090
Quality Control			NR
True Value QC			NR
% Accuracy			NR
Relative Percent Difference			1.7

METHOD: EPA 600/4-79-020, 160.1

Chemist

12/2/96
Date

ARDINAL LABORATORIES
PHONE: (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

Chain of Custody Record

Project I.D. SPILL SITE, LINE H-6, #129
Project Location HOBBS, N.M.
Sampled By BILL D. SMITH
Client Name E-TECH SERVICES / RICE ENG-
Address P.O. BOX 51151, Midland TX 79710
Telephone (915) 520-9893

SEND REPORT TO:
F. WESLEY ROOT
RICE ENG

H2716-1,2,3,4,5,6,7

Sample Number	Date	Time	Composite	Grab	Sample Location	Number of Containers	BTEX	TDS	Major Cations / Anions				Remarks (Type sample, preservation, etc.)
1	11-25	1445		✓	MW-2	3	✓	✓	✓				intact / cool GWater
2	11-25	1345		✓	MW-3	3	✓	✓	✓				↓
3	11-25	1045		✓	MW-4	3	✓	✓	✓				↓
4	11-25	1200		✓	MW-5	3	✓	✓	✓				↓
5	11-25	1245		✓	MW-6	3	✓	✓	✓				↓
6	11-25	1530		✓	F.W.W.	3	✓	✓	✓				↓
7	11-25	1130		✓	MW-7	3	✓	✓	✓				↓

Released by: (Signature)	Date	Time	Received by: (Signature)	Remarks:	Shipped/Delivered
Bill D. Smith	11-29-9?	1900	[signature]		
Released by: (Signature)	Date	Time	Received by: (Signature)		

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

ANALYTICAL RESULTS FOR
RICE ENGINEERING CORP
ATTN: GLYNN PARKER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 08/12/96
Reporting Date: 08/14/96
Project Number: NOT GIVEN
Project Name: HOBBS SPILL SITE
Project Location: SEC. 5 T.195 R.38E, LEA CO., NM

Sampling Date: 08/12/96
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC

LAB NUMBER SAMPLE ID	BENZENE (ppb)	TOLUENE (ppb)	ETHYLBENZEN (ppb)	TOTAL XYLENES (ppb)
ANALYSIS DATE	8/13/96	8/13/96	8/13/96	8/13/96
H2602-1 MW#2	<1	<1	<1	<1
Quality Control	100.3	93.4	89.8	273
True Value QC	88.2	85.8	83.4	254
% Accuracy	114	109	108	107
Relative Percent Difference	0.5	0.8	1.0	0.4

METHOD: EPA SW 846-8020, 5030, Gas Chromatography

Burgess J. A. Cooke, Ph. D.

8/14/96
Date

Environmental Analytical Services

H2602-1

ARDINAL LABORATORIES

118 S. Commercial Ave.
Farmington, NM 87401
505-326-4669
FAX 505-326-4535

101 E. Marland
Hobbs, NM 88240
505-393-2326
FAX 505-393-2476

Chain of Custody Record

Project I.D. HOBBS Spill Site
Project Location Sec 5 T 19S R 38E Lea Co NM
Sampled By Glynn Parker
Client Name Rice Eng. CORP.
Address 122 W. Taylor - Hobbs N.M. 88240
Telephone (505) 393-9174 Fax (505) 397-1471

Sample Number	Date	Time	Composite	Grab	Sample Location	Number of Containers	Analysis Required: BTEX	Remarks (Type sample, preservation, etc.)
1	8/12/96	1100			MW #2	2	X	

Released by: (Signature)	Date	Time	Received by: (Signature)
Glynn Parker	8/13/96	1113hrs	B. Cook
Released by: (Signature)	Date	Time	Received by: (Signature)

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for the analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401
PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
E-TECH SERVICE
ATTN: BILL D. SMITH
P.O. BOX 51151
MIDLAND, TX 79710
FAX TO: RICE ENGINEERING, HOBBS, NM.

Receiving Date: 06/19/96
Reporting Date: 06/29/96
Project Number: #129
Project Name: Hobbs Spil Site
Project Location: Hobbs, NM

Sample Date: 06/19/96
Sample Type: Water
Sample Condition: Glass, Intact
Sample Received By: BC
Analyzed By: BC

LAB NUMBER SAMPLE ID H2562-1-7		BENZENE (ppb)	TOLUENE (ppb)	ETHYL BENZENE (ppb)	TOTAL XYLENES (ppb)
ANALYSIS DATE		6/20/96	6/20/96	6/20/96	6/20/96
H2562-1	MW-6	23	<1	<1	<3
H2562-2	MW-5	<1	<1	<1	<3
H2562-3	MW-2	<1	<1	<1	>3
H2562-4	MW-3	132	<1	<1	<1
H2562-5	WW	32	<1	<1	<3
H2562-6	MW-4	<1	<1	<1	<3
H2562-7	MW-7	<1	<1	<1	<3
Quality Control		100	93	86	283
True Value QC		95	86	87	252
% Accuracy		105	108	98	113
Relative Percent Difference		8.6	4.3	4.1	1.1

METHOD: EPA SW 846-8020, 5030, Gas Chromatography

Chemist

7/11/96
Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401
PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
E-TECH SERVICE
ATTN: BILL D. SMITH
P.O. BOX 51151
MIDLAND, TX 79710
FAX TO: RICE ENGINEERING, HOBBS, NM.

Receiving Date: 06/19/96
Reporting Date: 06/29/96
Project Number: #129
Project Name: Hobbs Spill Site
Project Location: Hobbs, NM

Analysis Date: 06/28/96
Sample Date: 06/19/96
Sample Type: Water
Sample Condition: Glass, Intact
Sample Received By: BC
Analyzed By: BC

LAB NUMBER	SAMPLE ID	TDS (mg/L)
H2562-1	MW-6	524
H2562-2	MW-5	506
H2562-3	MW-2	649
H2562-4	MW-3	2684
H2562-5	WW	1817
H2562-6	MW-4	1114
H2562-7	MW-7	1130
Quality Control	MW-7D	1127
True Value QC		1130
% Accuracy		99
Relative Percent Difference		N/A

METHOD: EPA 600/4-79-020, 160.1

Chemist

06/29/96
Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401
PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
E-TECH SERVICE
ATTN: BILL D. SMITH
P.O. BOX 51151
MIDLAND, TX 79710
FAX TO: RICE ENGINEERING, HOBBS, NM.

Receiving Date: 06/19/96
Reporting Date: 06/29/96
Project Number: #129
Project Name: Hobbs Spill Site
Project Location: Hobbs, NM

Sample Date: 06/19/96
Sample Type: Water
Sample Condition: Glass, Intact
Sample Received By: BC
Analyzed By: WL & GP

LAB NUMBER H2562	SAMPLE ID	Na ppm	Ca ppm	Mg ppm	K ppm	Cl ppm	SO4 ppm	CO3 ppm	HCO3 ppm
ANALYSIS DATE:		6/28/96	6/28/96	6/28/96	6/28/96	6/28/96	6/28/96	6/28/96	6/28/96
H2562-1	MW-6	40	87	16	3	48	81	0	288
H2562-2	MW-5	45	79	15	3	44	76	0	264
H2562-3	MW-2	74	85	20	6	96	66	0	273
H2562-4	MW-3	544	160	41	15	1004	120	0	273
H2562-5	WW	466	80	24	6	828	75	0	190
H2562-6	MW-4	160	119	25	5	312	72	0	239
H2562-7	MW-7	254	84	17	7	359	105	0	283
Quality Control		0.95	2.09	0.499	4.95	499	101	105	97
True Value QC		1	2	0.5	5	500	100	100	100
% Accuracy		95	104	99	99	99	101	105	97
Relative Percent Difference		1.5	1.2	1.3	5.2	0.1	0.1	4.8	3
METHODS: EPA 600/4-79-02						352.3	375.4		
Std. Methods		3111B	3111B	3111B	3111B			2320B	2320B

Wei Li
Wei Li, Chemist

7-11-96
Date

#H-2562 #H-2562

ARDINAL LABORATORIES
PHONE: (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

Chain of Custody Record

Project I.D. #129 (#H-2562)
Project Location Hobbs Spill Site
Sampled By Bill D. Smith
Client Name E-Tech Service
Address P.O. Box 51151, Midland TX 79710
Telephone (915) 520-7010

Sample Number	Date	Time	Composite	Grab	Sample Location	Number of Containers	BTEX	TDS	Major Cation/Anion					Remarks (Type sample, preservation, etc.)
1	6-18	1630		X	MW-6	4	✓	✓	✓					
2	6-18	1645		X	MW-5	4	✓	✓	✓					
3	6-18	1700		X	MW-2	4	✓	✓	✓					
4	6-19	1415		X	MW-3	4	✓	✓	✓					
5	6-19	1500		X	W.W.	4	✓	✓	✓					
6	6-19	1710		X	MW-4	4	✓	✓	✓					
7	6-19	1730		X	MW-7	4	✓	✓	✓					

Released by: (Signature)	Date	Time	Received by: (Signature)	Remarks:	Shipped/Delivered
Bill D. Smith	6-19	1545	~~Bill~~	FAX results to Rice Eng. Attn. Wes Root ~~But Bill to E-Tech~~	
Released by: (Signature)	6/19	4:11 PM	[illegible] - G.J. Parker		

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

January 29, 1996

CERTIFIED MAIL
RETURN RECEIPT NO. Z-765-962-544

Mr. Dave Abbott
Division Engineer
Rice Engineering Corporation
122 West Taylor
Hobbs, New Mexico 88240

RE: GROUND WATER REMEDIATION PLAN
RICE ENGINEERING PRODUCED WATER GATHERING LINE
LEA COUNTY, NEW MEXICO

Dear Mr. Abbott:

The New Mexico Oil Conservation Division (OCD) has completed a review of Rice Engineering Corporation's (REC) December 22, 1995 "GROUNDWATER CONTAMINATION, RICE ENGINEERING PRODUCED WATER GATHERING PIPELINE, LEA COUNTY, NEW MEXICO" which was received by the OCD on January 10, 1996. This document contains REC's remedial action plan for remediation of ground water contamination related to a leak from an REC produced water gathering line in Unit E of Section 5, T19S, R38E NMPM Lea County, New Mexico.

The remedial action plan, as contained in the above referenced document, is approved with the following conditions:

1. Ground water from the monitor wells will be sampled and analyzed on a quarterly basis for concentrations of benzene, toluene, ethylbenzene, xylene (BTEX), total dissolved solids (TDS) and major cations and anions using EPA approved methods.

   NOTE: Since there is no New Mexico Water Quality Control Commission (WQCC) ground water standard for total petroleum hydrocarbons (TPH), the OCD does not require that REC sample and analyze ground water for TPH.

2. Target ground water cleanup levels for the site will be all applicable WQCC ground water standards related to the materials spilled including, but not limited to, those for BTEX, TDS, chloride and polynuclear aromatic hydrocarbons.

3. The quarterly reports will be submitted to the OCD by January 1, April 1, July 1 and October 1 of each respective year with the first report due on April 1, 1996. The reports will contain:

   a. A description of all remediation and monitoring activities which occurred during the period, conclusions and recommendations.

   b. A summary of the laboratory analytic results of water quality sampling of the monitor wells. The results for each monitor well will be presented in tabular form and will show past and present sampling results.

   c. A quarterly water table elevation map using the water table elevation of the ground water in all monitor wells.

   d. The volume of fluids recovered from each recovery well during the quarter and the cumulative volume recovered to date.

4. REC will notify the OCD at least one week in advance of all scheduled activities such that the OCD has the opportunity to witness the events and/or split samples.

5. All original documents submitted for approval will be submitted to the OCD Santa Fe Office with copies provided to the OCD Hobbs District Office.

Please be advised that OCD approval does not relieve REC of liability should contamination exist which is outside the scope of work plan, or if the proposed remedial action plan fails to the adequately remediate contamination at the site. In addition, OCD approval does not relieve REC of responsibility for compliance with any other federal, state or local laws and/or regulations.

If you have any questions, please call me at (505) 827-7154.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

Z 765 962 544

Receipt for Certified Mail

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to	
Street and No.	
P.O., State and ZIP Code	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing *to Whom & Date Delivered*	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form **3800**, March 1993

Fold at line over top of envelope to the right of the return address

RICE Engineering Corporation
122 WEST TAYLOR TELEPHONE (505) 393-9174
HOBBS, NEW MEXICO 88240

December 22, 1995

State of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87504

ATTENTION: BILL OLSON

RE: GROUNDWATER CONTAMINATION
RICE ENGINEERING PRODUCED WATER
GATHERING PIPELINE
LEA COUNTY, NEW MEXICO

Dear Mr. Olson:

Enclosed is the work plan for Phase III Cleanup of the above referenced Groundwater Impact area. This area is located on the western edge of Section 5, T19S, R38E, NMPM, Lea County.

If there are any questions or additional information needed, please contact us at this office.

Sincerely,

RICE ENGINEERING CORPORATION

Dave Abbott
Division Engineer

DA/pf

Enclosures

bcc: LBG - REC - Midland
GB
Jerry Sexton - NMOCD - Hobbs
Wayne Price - NMOCD - Hobbs
Wes Root - ESCI - Hobbs
File

RICE Engineering Corporation

122 WEST TAYLOR TELEPHONE (505) 393-9174

HOBBS, NEW MEXICO 88240

PHASE III - CLEANUP IMPLEMENTATION

1) The cleanup of the aquifer is at this time proposed to be performed utilizing Monitor Well #1 and the existing domestic well as recovery wells.

   This is proposed to minimize the drainage by these wells of unimpacted water to as high a degree as possible. The New Mexico State Engineers Office will be contacted for approval of the expected total water production volumes.

2) The impacted water from the cleanup producing wells will be sampled biweekly for a (2) two month period and then monthly and quarterly depending on the change pattern. The impacted waters are planned to be discharged into the pipeline from which the spill originated and disposed in (2) two Rice Engineering operated Hobbs Salt Water Disposal System oil and gas produced water Class II permitted disposal wells. These wells inject those waters into the San Andres from 4,200' to 5,500'. The producing wells will be produced at Rates to effect proper draw down and/or to yield total water volumes that the SWD System can accept.

   The water samples will be analyzed during the cleanup phase for chlorides, total petroleum hydrocarbons and total dissolved solids. Target levels to be reached for these impacted levels will be < 100 ppm TPH, < 250 ppm chlorides and < 1500 ppm TDS. Upon indication that impacted waters have been removed, samples will be analyzed according to the New Mexico Water Quality Control Commission Ground Water Standards as necessary to confirm cleanup has progressed to the needed levels. Any laboratory performing analysis of samples will be certified and instructed to conduct such tests according to applicable standards for analytical methods. From time to time, second confirmation analysis will be performed by the same or other laboratories.

3) It is planned that the impacted overlying rock and aquifer sands will not be removed. The monitor wells will be sampled as long as necessary or at least a one year period after the impacted waters are removed from the aquifer resulting in acceptable levels. This monitoring will give evidence if further downward migration has resulted. It is expected that with the small rainfall amounts in this area and the fairly impermeable shallow rock and caliche layer that no downward leaching would occur.

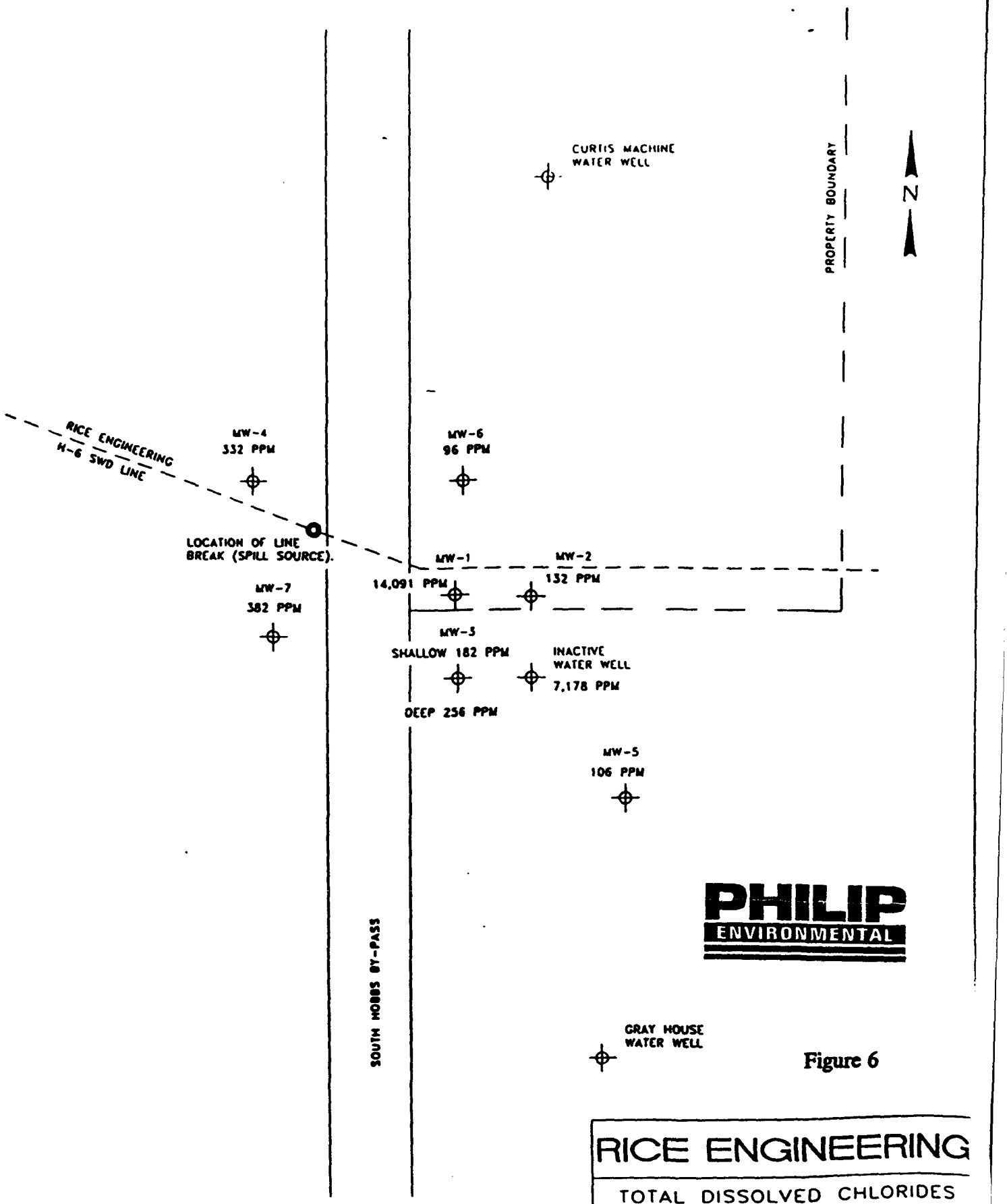
4) During the development and production periods of all wells and facilities, all personnel will be equipped with proper safety equipment. Upon starting of phase III, where exposure to the general public is determined possibly due to detected high levels of hazardous gas discharge, monitoring and alarm equipment will be installed and utilized.

Prepared by:

RICE ENGINEERING CORPORATION

Dave Abbott
Division Engineer

DA/pf



PHILIP ENVIRONMENTAL

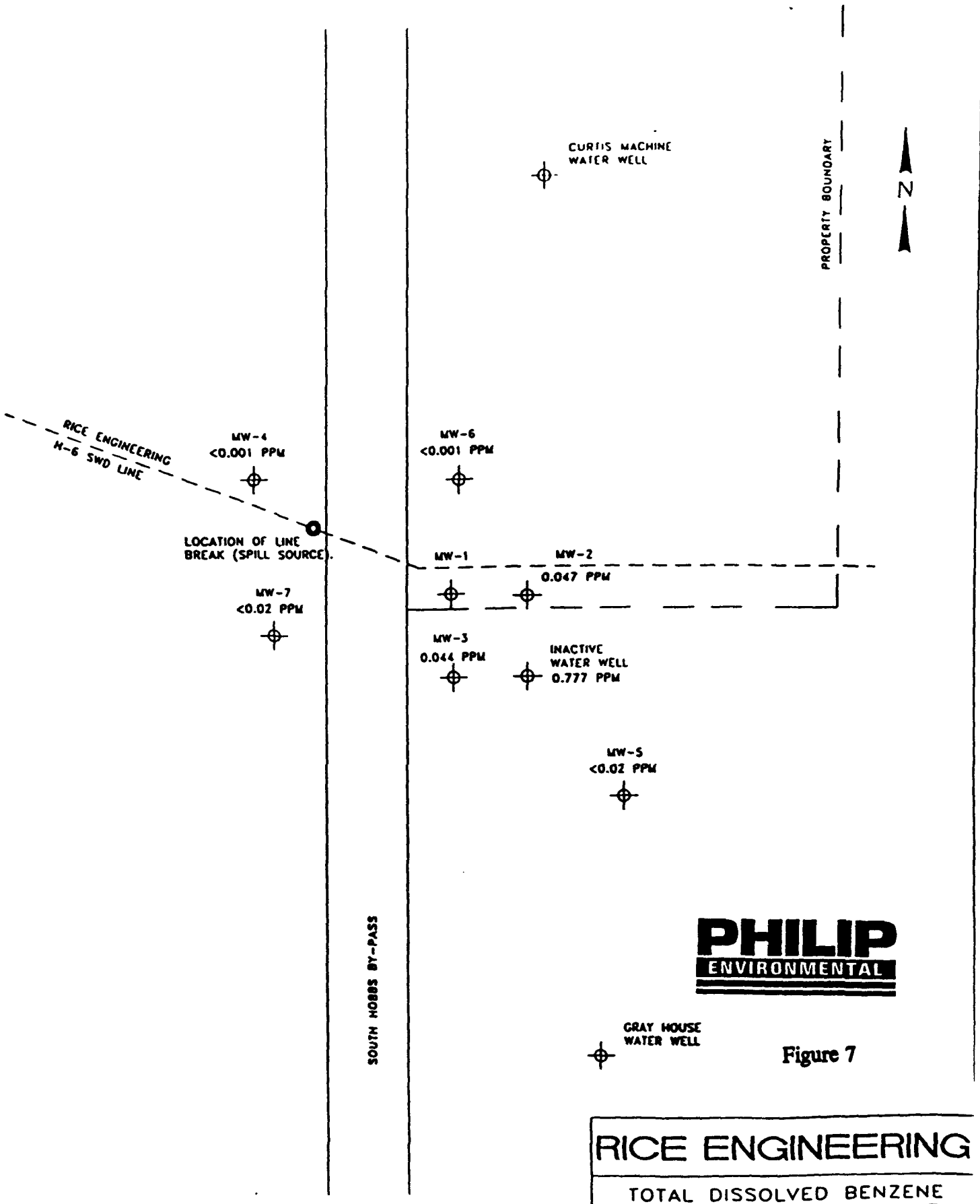
Figure 6

RICE ENGINEERING

TOTAL DISSOLVED CHLORIDES
LINE H-6, HOBBS SWD SYSTEM
SEC 5 & 6, T19S, R38E
LEA Co., NEW MEXICO

DATE: 7-27-95	DRAWN M.S.G.	REV. DATE	DIV
SCALE: 1" = 200'		JOB # 129	
SHEET 3 OF 4		FILE:	

ENVIRONMENTAL SPILL CONTROL, Inc.



PHILIP ENVIRONMENTAL

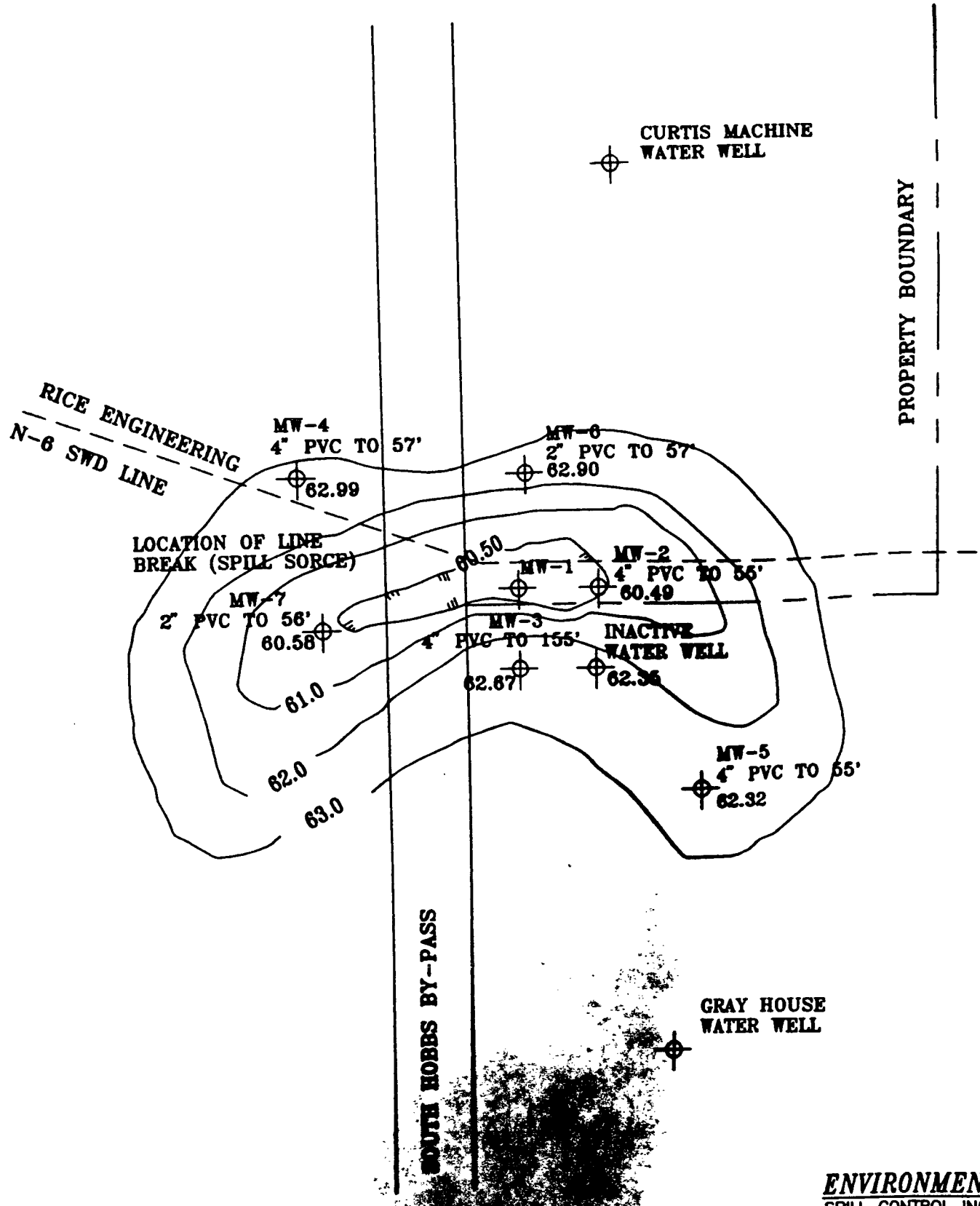
Figure 7

RICE ENGINEERING

TOTAL DISSOLVED BENZENE
LINE H-6, HOBBS SWD SYSTEM
SEC 5 & 6, T19S, R38E
LEA Co., NEW MEXICO

DATE: 7-27-95	DRAWN M.F.C.	REV. DATE	DIV
SCALE: 1" = 200'		JOB # 129	
SHEET 4 OF 4		FILE:	

ENVIRONMENTAL SPILL CONTROL, Inc.



ENVIRONMENTAL
SPILL CONTROL INC.
Phone (505) 392-6167
Fax (505) 397-5085

PHILIP ENVIRONMENTAL

GROUNDWATER [illegible] MAP
LINE N-6, [illegible]
SEC 5 [illegible]
LEA C[illegible]

Project:	DWN:	Revision:
Figure: 8	CHKD:	Date: 9/19/95

NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 S. Pacheco
Santa Fe, New Mexico 87505

October 23, 1995

CERTIFIED MAIL
RETURN RECEIPT NO. Z-765-962-430

Mr. Dave Abbott
Division Engineer
Rice Engineering Corporation
122 West Taylor
Hobbs, New Mexico 88240

RE: GROUND WATER CONTAMINATION
RICE ENGINEERING PRODUCED WATER GATHERING LINE
LEA COUNTY, NEW MEXICO

Dear Mr. Abbott:

The New Mexico Oil Conservation Division (OCD) has completed a review of Rice Engineering Corporation's (REC) undated "PHASE II ENVIRONMENTAL INVESTIGATION, RICE ENGINEERING, SOUTH HOBBS BY-PASS SALTWATER PIPELINE LEAK" which was received by the OCD on September 25, 1995. This document contains the results of REC's investigation of the extent of contamination related to a leak from an REC produced water gathering line in Unit E of Section 5, T19S, R38E NMPM Lea County, New Mexico.

The above referenced investigation report is satisfactory. Based upon a review of the above referenced document, the OCD requests that REC submit a remedial action plan to the OCD by December 22, 1995. The remedial action plan will contain:

1. A work plan for containing and remediating contaminated ground water.

2. A ground water monitoring plan.

3. An implementation schedule.

If you have any questions, please contact me at (505) 827-7154.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price, OCD Hobbs Office

Z 765 962 430

Receipt for Certified Mail

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to	
Street and No.	
P.O., State and ZIP Code	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form **3800**, March 1993

Fold at line over top of envelope to the right of the return address

Bill Olson

From: Wayne Price
To: Roger Anderson
Cc: Bill Olson; Wayne Price; Jerry Sexton
Subject: Amaco-Rice Engr. west ct. rd.-Hearing
Date: Friday, September 22, 1995 3:18PM
Priority: High

Dear Roger,

Amoco's attroney Lynn Eortka indicated he was going to subpoena me for a hearing on Thursday Sept. 28. After discussing this issue with him it appears that Amoco and Bravo are at odds on the Rice Engr. Line leak on west county rd. It appears that the way the contract is written if any lawsuits are lodged against the parterns, then somehow the contract allows certain partners to be left out depending on the volumes and quantities of material they ship down the line.

The questions they are going to ask are related to the legal aspect of wheather NMOCD is actually sueing or if we are seeking voluntary complaince.

Therefore I recommend that either you, Bill Olson or even one of our attroneys be there. Mr. Eortka didn't mind who, just as long as this person has a good working knowledge of how the NMOCD proceeds in these type of cases.

Please let me know.

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☑ Telephone ☐ Personal	Time 0930	Date 9/18/95

Originating Party	Other Parties
Aubrey Kenyon - citizen	Bill Olson - Envir. Bureau

Subject

Rice Engineering - Hobbs South Bypass contamination

Discussion

Briefed him on status of case
He owns land on which contamination occurred (east side of bypass)
He requested to be copied on all correspondence

Aubrey Kenyon
P.O. Box 476
Hobbs, NM 88240

Conclusions or Agreements

OCD will send him copies of all future correspondence

Distribution

Jerry Sexton, Wayne Price } OCD Hobbs
file

Signed Bill Olson

OIL CONSERVATION DIVISION
RECEIVED
'95 SEP 22 AM 8 52

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal	Time 9:10 AM	Date 9/18/95

Originating Party	Other Parties
AUBREY KENYON	

Subject: RICE ENGR. LINE LEAK - W of ROAD

Discussion: MR. KENYON IS PROPERTY OWNER IN AREA REQUESTED INFO ON FINAL REPORT.

Conclusions or Agreements

FINAL REPORT DUE SEPT 30 1995 ADVISED MR. KENYON HE IS WELCOME TO REVIEW & COPY OUR FILES ALL PUBLIC RECORD.

Distribution cc: JERRY SEXTON
BILL OLSON

Signed

Bill Olson

From: Wayne Price
To: Bill Olson
Cc: Wayne Price; Jerry Sexton
Subject: Rice Engr. w.cty.rd. phase II Invest.
Date: Wednesday, July 19, 1995 11:29AM
Priority: High

Dear Bill,

This is a progress report for your review.

Rice has drilled a shallow MW#3 due south approx. 100-150' from the initial well TD of this well is at approx. 45-50'. They drilled in this direction because of the electromagnetic survey ran which indicates there is a possible plume in this direction.

The initial results indicate this well to be clean. Rice has requested to deepen this well to extend down into the aquifer to determine if the contamination is deeper.

Their consultant Sharon Hall with Phillip is suppose to contact you to discuss this with you.

I have reviewed their work plan and this approach appears to be consistant with the plan.

The orginal well MW#1 has approx. 10 ' of product on top of the water table. This measurement was made during or right after dynamic pumping conditions.

Telephone call Olson to Price. @ approx. 11:15 am

Bill per our telephone conversation, I am going to relay the message that on all the other wells that both hydrocarbons and salt water contamination should be screened to determine if any contamination is present at various levels.

OIL CONSERVATION DIVISION
2040 S. Pacheco
Santa Fe, New Mexico 87505

July 19, 1995

CERTIFIED MAIL
RETURN RECEIPT NO. Z-765-962-376

Mr. Dave Abbott
Division Engineer
Rice Engineering Corporation
122 West Taylor
Hobbs, New Mexico 88240

RE: GROUND WATER CONTAMINATION
RICE ENGINEERING PRODUCED WATER GATHERING LINE
LEA COUNTY, NEW MEXICO

Dear Mr. Abbott:

The New Mexico Oil Conservation Division (OCD) is in receipt of Rice Engineering Corporation's (REC) June 5, 1995 correspondence requesting a 90 day extension of the timetable for submission of a ground water investigation report related to a leak from an REC produced water gathering line in the SW/4, NW/4 of Section 5, T19S, R38E NMPM Lea County, New Mexico.

Your request for an extension of the time schedule to submit an investigation report on the extent of ground water contamination at the above referenced site is granted. REC will submit the investigation report to the OCD by September 30, 1995.

If you have any questions, please contact me at (505) 827-7154.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price, OCD Hobbs Office

Z 765 962 376

Receipt for Certified Mail

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to	
Street and No.	
P.O., State and ZIP Code	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form **3800**, March 1993

Fold at line over top of envelope to the right of the return address

cc: J SEETON
BILL OLSON
NMOCD

OIL CONSERVATION DIVISION
RECEIVED
'95 JUL 11 AM 8 52

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal	Time 9:51 AM	Date 7-13-95
Originating Party		**Other Parties**
DAVE ABBOTT - RICE ENGR.		

Subject WEST CO. ROAD PROJECT -

Discussion NOTIFIED THEY ARE GOING TO START PHASE II OF GROUNDWATER INVESTIGATION WILL DRILL 8 MW'S - STARTING 7/17/95

Conclusions or Agreements

Distribution

Signed

RICE Engineering Corporation

122 WEST TAYLOR TELEPHONE (505) 393-9174

HOBBS, NEW MEXICO 88240

June 5, 1995

Attn: Mr. Bill Olson
New Mexico Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

Dear Mr. Olson;

Our spill site phase II investigation of the plume of contamination, has not yet began due to surface owners issues that will not allow access on their properties. It is our position, at this time, to petition the Oil Conservation Division for a 90 day extension that will allow time for resolution of the issues with the surface owners. This extension would also allow ample time for the phase II completion and a completed Hydrological study. If you should have any further questions, please contact this office at your earliest convenience.

Sincerely,

Dave Abbott
Division Engineer

DA/lr

cc: LBG
JW Neal
Sharon Hall
File

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

March 8, 1995

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-242-217

Mr. Jerry D. Hillard
Division Manager
Rice Engineering Corporation
122 West Taylor
Hobbs, New Mexico 88240

RE: GROUND WATER CONTAMINATION INVESTIGATION WORK PLAN
RICE ENGINEERING PRODUCED WATER GATHERING LINE
LEA COUNTY, NEW MEXICO

Dear Mr. Hillard:

The New Mexico Oil Conservation Division (OCD) has completed a review of Rice Engineering Corporation's (REC) January 13, 1995 "GROUNDWATER IMPACT, RICE ENGINEERING PRODUCED WATER GATHERING PIPELINE, LEA COUNTY, NEW MEXICO". This document contains REC's work plan for investigating the extent of ground water contamination related to a leak from a REC produced water gathering line in the SW/4, NW/4 of Section 5, T19S, R38E NMPM Lea County, New Mexico.

The above work plan is approved with the following conditions:

1. All monitor wells will be constructed as set out below:

   a. If the well is to be screened across the water table interface, a minimum of 15 feet of well screen will be installed with at least 10 feet of well screen below the water table and 5 feet of well screen above the water table.

   b. An appropriately sized gravel pack will be set around the well screen from the bottom of the hole to 2-3 feet above the top of the well screen.

   c. A 2-3 foot bentonite plug will be placed above the gravel pack.

d. The remainder of the hole will be sealed with cement containing 3-5 % bentonite.

2. REC will develop each well upon completion using EPA approved procedures.

3. REC will sample ground water from all monitor wells. Ground water from these monitor wells will be sampled and analyzed for concentrations of benzene, toluene, ethylbenzene, xylene (BTEX), major cations and anions, heavy metals and polynuclear aromatic hydrocarbons using EPA approved methods.

NOTE: The OCD will not require REC to analyze ground water samples for heavy metals and PAH's, if, REC can provide the OCD with an analysis of the produced water from this line showing that these constituents do not exceed New Mexico Water Quality Control Commission ground water standards.

4. REC will submit a report on the investigation to the OCD by June 30, 1995. The report will contain:

a. A description of all activities which occurred during the investigation, conclusions and recommendations.

b. A summary of the laboratory analytic results of water quality sampling of the monitor wells.

c. A water table elevation map using the water table elevation of the ground water in all monitor wells.

d. A geologic log and as built well completion diagram for each well.

5. REC will notify the OCD at least one week in advance of all scheduled activities such that the OCD has the opportunity to witness the events and or split samples.

6. All original documents submitted for approval will be submitted to the OCD Santa Fe Office with copies provided to the OCD Hobbs District Office.

Please be advised that OCD approval does not relieve REC of liability should the investigation activities determine that contamination exists which is beyond the scope of the work plan or

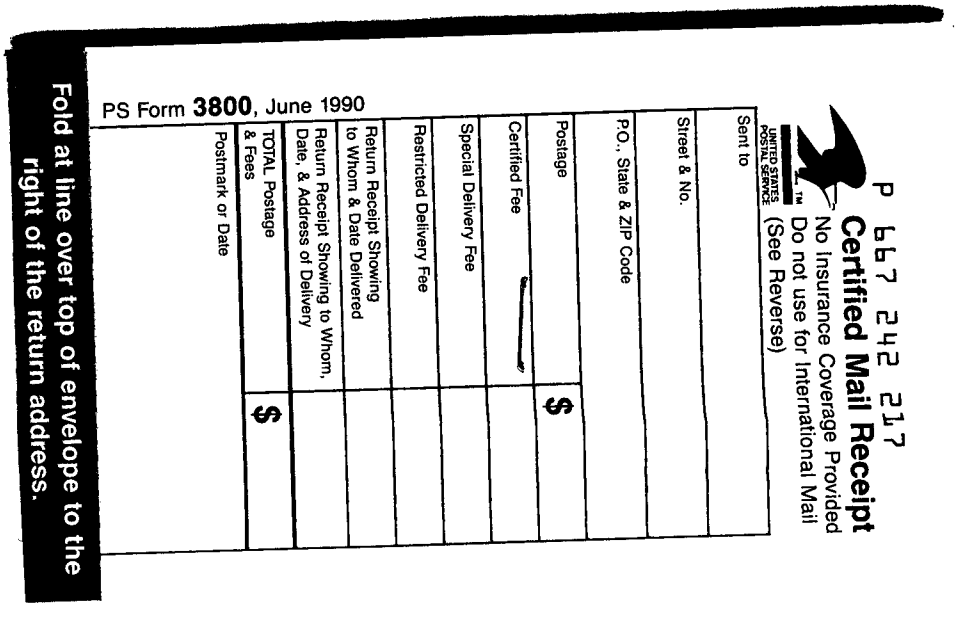
if the activities fail to adequately determine the extent of contamination related to REC's activities. In addition, OCD approval does not relieve REC of responsibility for compliance with any other federal, state or local laws and/or regulations.

If you have any questions, please call me at (505) 827-7154.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price , OCD Hobbs Office



Bill Olson

From: Jerry Sexton
Date sent: Mon, Mar 6, 1995 2:57PM
To: Bill Olson
Subject: Registered: Jerry Sexton

Your message
To: Jerry Sexton
Subject: Rice Engineering Investigation Work Plan
Date: Mon, Mar 6, 1995 2:33PM
was accessed on
Date: Mon, Mar 6, 1995 2:57PM

Bill Olson

From: Wayne Price
To: Bill Olson
Cc: Wayne Price
Subject: Rice Engineering Work Plan
Date: Mon, Mar 6, 1995 3:55PM
Priority: High

Dear Bill,

Jerry Sexton and I have reviewed the work plan and find it satisfactory.

POST-kwik® PK100R-3 **REPLY MESSAGE**

FORM NO. PK100R-3 LOT 65601
AVAILABLE FROM
BUSINESS ENVELOPE MANUFACTURERS, INC.
DEER PARK, N.Y. 11729
800-645-5235 NY (516) 667-8500

TO
BILL OLSON
2040 S. PACHECO ST.
SANTA FE, NM 87505

RICE ENGINEERING CORPORATION
122 WEST TAYLOR STREET
HOBBS, NEW MEXICO 88240
(505) 393-9174

SUBJECT: LETTER - GROUNDWATER IMPACT

DATE: 1/26/95

FOLD ◀

ENCLOSED IS A COPY OF THE LETTER WE MAILED TO YOU ON JANUARY 13, 1995 CONCERNING SITE ASSESSMENT OF GROUNDWATER IMPACT AREA.

PLEASE REPLY TO ▶

SIGNED: Jerry Hilland

RECEIVED
JAN 31 1995
OIL CONSERVATION DIV.
SANTA FE

DATE:

SIGNED:

DETACH YELLOW COPY — SEND WHITE AND PINK COPIES WITH CARBONS INTACT

ITEM NO. PK100R-3
AVAILABLE FROM BUSINESS ENVELOPE MANUFACTURERS, INC · DEER PARK, N.Y. · ANAHEIM, CALIF.

THIS COPY FOR PERSON ADDRESSED

RICE Engineering Corporation
122 WEST TAYLOR TELEPHONE (505) 393-9174
HOBBS, NEW MEXICO 88240

January 13, 1995

State of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87504

Attention: Roger C. Anderson

Re: Groundwater Impact
Rice Engineering Produced Water
Gathering Pipeline
Lea County, New Mexico

Dear Mr. Anderson:

Enclosed is the work plan for Site Assessment of the above referenced Groundwater Impact area. This area is located on the western edge of Section 5, T19S, R38E, NMPM, Lea County.

If there are any questions or additional information needed, please contact us at this office.

Yours very truly,

RICE ENGINEERING CORPORATION

Jerry Hillard
Division Manager

Enclosures

HOBBS SWD SYSTEM
SPILLSITE INVESTIGATION PLAN
SECTION 5 & 6, TOWNSHIP 19 SOUTH, RANGE 38 EAST
LEA COUNTY, NEW MEXICO

PHASE I - DISCOVERY AND DETERMINATION OF GROUNDWATER IMPACT

A leak was discovered April 29, 1994 on a buried produced water line, South of the Carlsbad Highway on West County Road, approximately 1/2 mile south of Walker Machine Shop. The line is an eight (8) inch poly line, buried at a depth of 2.5 feet at the bottom of the west borrow ditch, which runs under West County Road from the West to the East. The leak was located and repaired on the west side of the road. The impact from the leak was mostly on the east side of the road due to the drainage of the conduit installed in an eastward down slope. The leak appears to have been caused by heavy equipment when the borrow ditches were being excavated for storm water control.

A. Oral Notification of the Oil Conservation Division (OCD) 4-29-94 and written notice 5-3-94.

The OCD advised that samples should be taken on the impacted soil removed from the ditchline to make the repair. The soil was spread out along the ditchline, fertilized, watered and allowed to set for 6 days. A composite sample was taken and analyzed, showing TPH of 7,721 ppm and chlorides of 680 ppm. (Sample results indicated on attachment 1)

Two additional samples were taken following this analysis. One at the ditch bottom and the other approximately half-way down one ditch wall. These samples did have a hydrocarbon odor. The lab analyses showed TPH of 17,817 ppm bottom, 16,665 ppm wall, chlorides of 160 ppm bottom and 3,278 ppm wall. The OCD indicated they felt at this point there was a high possibility of deep chloride penetration. (Sample results indicated on attachment 1)

B. Per recommendation from the OCD, a bore hole was drilled to 40 feet from ground level using an auger rig to determine the extent of impacted area of the site. The bore hole was located next to the pipeline in the ditch bottom. The boring indicated moderate presence of hydrocarbons down to the 40 foot level and a shallow water groundwater zone was indicated by some moisture in the cuttings. This bore hole was plugged with cement and the ditchline backfilled.

C. In further consideration of the recommendation of the OCD, a monitor well was drilled using an air rig, 15 feet to the southeast of the first bore hole. (Well no. 1 on attached plat) A

4 3/4 inch hole was drilled to a total depth of 65 feet. At the top of the hole immediately under the cover soil unconsolidated rock materials were encountered down to around 10 feet. Sand and caliche was then drilled down to 35 feet where a hard sandstone layer was encountered. This layer extended about 6 feet upon which groundwater was incurred immediately below. Hydrogen sulfide was encountered at this point requiring proper safety equipment. Representatives from the OCD were present during drilling and took samples along with Environment Spill Control Incorporated.

The decision was made to ream out the hole to 6 1/2 inches in order to set 4 1/2 inch flush joint casing, which would allow for the installation of a downhole pump to test the water. The hole was reamed to 65 feet, casing set with 10 feet of screened slotted tailpipe in the water and 5 feet out. The bottom of the casing is at 55 feet, leaving 10 feet of rathole. Water level was gauged afterward standing at 37 feet, apparent fluid head of the Aquifer.

D. The State Engineer was consulted as to the designation of the groundwater. We were informed that this would be the expected top of the Ogallala Aquifer.

PHASE II - IMPACTED AREA ASSESSMENT

Currently, the information as to the extent of area coverage and depth of impact is from only two sources, the spillsite monitor well and a currently unused domestic water well 163 feet to the Southeast of the site monitor well. A sample taken from the one monitor well show TPH of 3.8 ppm, chlorides of 17,495 ppm and Total Dissolved Solids (TDS) of 36,200 ppm. A sample from the domestic well to the Southeast has a TPH of 1.4 ppm, chlorides of 4,879 ppm and TDS of 10,446. One other sampled domestic well, approximately 450 feet east, had TPH of 0.3 ppm, chlorides of 36 ppm and TDS of 440 ppm. (See Attachment no. 2 for all water analyses) Known hydrology and geology of the Ogallala aquifer of this area indicates a reservoir fluid movement to the southeast direction and a probable total thickness of the sand of around 150'. It is felt that the direction of search for the impacted area extent should concentrate mostly in this direction.

It is being considered to perform an Electromagnetis Survey of the area to help define the suspected direction and extent of impacted waters. If this survey is utilized, the below investigation well plan could be changed. The objective of wells at that point would be to confirm the areal extent of impact indicated by the Electromagnetic Survey. If this extent is confirmed, then subsequent well drilling would need to be only for contaminant removal and monitoring.

It is planned, at this time, to start the impacted area assessment by drilling the following monitor and/or test wells.

A) A well 100' to the east of Well no. 1 (plat well no. 2)

This well will be located 7' to 10' to the south of the direct easterly line due to back cover of the pipeline.

B) A well 100' to the south of Well no. 1 (plat well no. 3)

C) A well 175' to the west northwest of Well no. 1 This well will be located adjacent to the pipeline. (plat well no. 4)

D) A well 100' to the southeast of the existing domestic well that is 163' southeast of Well no. 1 (plat well no. 5)

E) a well 100' to the north of well no. 1 (Plat well no. 6)

Each well will be specifically drilled to a depth which indicates elevated levels of TPH and chlorides concentrations, then the well will be drilled 15 ft. deeper. The well will be drilled until elevated levels are reached or the well is at the bottom of the aquifer which is estimated to be 250 ft. in this particular area. If impacted waters are encountered in any well, additional wells will be drilled to define the extent of impact.

It is understood that past experience with impacted fluids entry of this type into the Ogallala has indicated the more dense waters move downward to the lower level of the aquifer. Rice has been informed that in some cases, though, there is an interval in the sand formation which effectively separates the sand into two or more layers.

ATTACHMENT 1

Soil and Well Cuttings Analysis

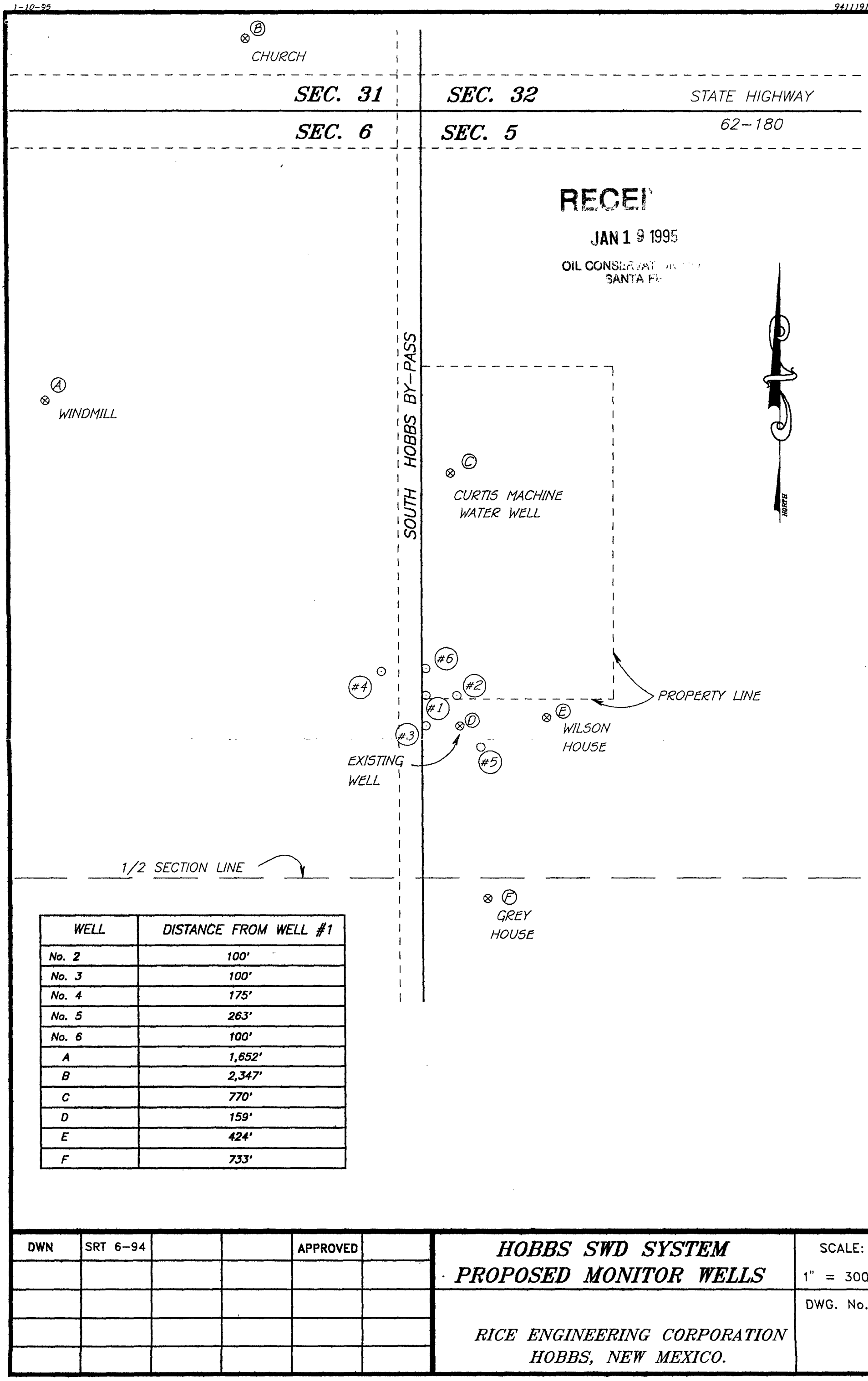
Date	Source	TRPHC ppm	CHLORIDES ppm
5/11/94	Ditch Cuttings	7,721	680
5/16/94	Ditch Bottom	17,817	160
5/16/94	Ditch Wall	16,665	3,278
5/18/94	Borehole-39' deep		2,359
	40' deep		2,479
5/23/94	Test Well-		
	Surface	2,610	
	10'	5,360	
	20'	14,400	
	30'	9,720	
	40'	4,870	
	50'	2,200	
5/23/94	West Side Road Auger Hole-8' deep	11,000	

ATTACHMENT 2

Water Analysis

Date	Source	TRPHC ppm	Chlorides ppm	TDS ppm
5/31/94	Well #1	3.8	17,494	36,200
6/1/94	Well A	2.8	68	898
6/1/94	Well B	0.1	204	1,026
6/1/94	Well C	0.3	52	490
5/31/94	Well D	1.4	4,878	10,446
5/31/94	Well E	0.3	36	440
6/7/94	Well F	<1	40	421

1-10-95 94111916



RECEI

JAN 1 9 1995

OIL CONSERVAT
SANTA F

WELL	DISTANCE FROM WELL #1
No. 2	100'
No. 3	100'
No. 4	175'
No. 5	263'
No. 6	100'
A	1,652'
B	2,347'
C	770'
D	159'
E	424'
F	733'

DWN	SRT 6-94			APPROVED	

HOBBS SWD SYSTEM
PROPOSED MONITOR WELLS

RICE ENGINEERING CORPORATION
HOBBS, NEW MEXICO.

SCALE: 1" = 300'

DWG. No.

1-10-95

94111916

Ⓑ CHURCH

SEC. 31 | SEC. 32 | STATE HIGHWAY 62-180

SEC. 6 | SEC. 5

SOUTH HOBBS BY-PASS

Ⓐ WINDMILL

Ⓒ CURTIS MACHINE WATER WELL

NORTH

#6 #4 #2 #1 #3 #5

PROPERTY LINE

Ⓔ WILSON HOUSE

Ⓓ EXISTING WELL

1/2 SECTION LINE

Ⓕ GREY HOUSE

WELL	DISTANCE FROM WELL #1
No. 2	100'
No. 3	100'
No. 4	175'
No. 5	263'
No. 6	100'
A	1,652'
B	2,347'
C	770'
D	159'
E	424'
F	733'

DWN	SRT 6-94			APPROVED	

HOBBS SWD SYSTEM
PROPOSED MONITOR WELLS

SCALE: 1" = 300'

DWG. No.

RICE ENGINEERING CORPORATION
HOBBS, NEW MEXICO.

RICE Engineering Corporation
122 WEST TAYLOR TELEPHONE (505) 393-9174
HOBBS, NEW MEXICO 88240

November 11, 1994

State of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87504

Attention: Roger C. Anderson

Re: Groundwater Impact
Rice Engineering Produced Water
Gathering Line
Lea County, New Mexico

Dear Mr. Anderson:

As we discussed on November 3, 1994, we need to request an extension for time to submit the work plan. We, therefore, request that an extension be granted to allow the plan to be submitted on or before January 13, 1995.

If there are any questions, please contact me at this office.

Yours very truly,

RICE ENGINEERING CORPORATION

Jerry D. Hillard
Division Manager

JDH/cp

Gave verbal O/L approval at 11/3/94 meeting between OCD and Rice.

OCD/Rice Engineering Meeting 11/3/94 1445 hrs

participants - Bill Olson - OCD Envir. Bureau
Bill LeMay - " Director
Roger Anderson - " Envir. Bureau
Dave Davis - " " "
Jerry Hillard - Rice Engineering
Jim Hoss - " "
Raul Carroll - OCD Legal

J.H. Intro

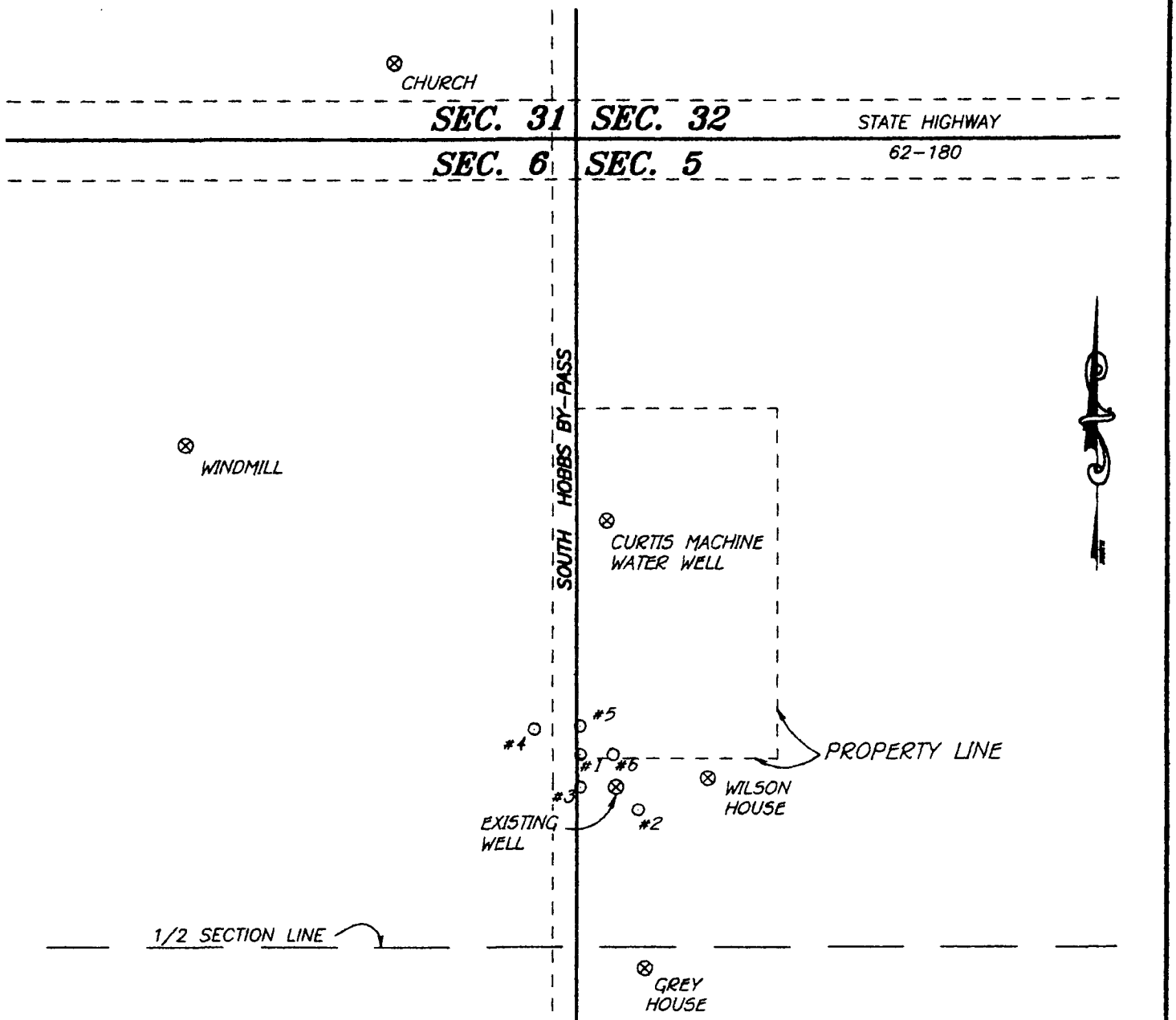
Hillard - Leak discovered 4/29/94
handout map of site (handout #1)
Leak on Hobbs south bypass
Highway work in 1988
Injectate - Line runs under road
" " was lowered for road construction
Borrow pit was located over line
During borrow pit operations line was apparently nicked
Conduit was used on road crossing
Damp area discovered in 4/29
Reported to Jerry Sexton
Excavated line found leak
Extensive contamination found
Drilled monitor wells - evidence of contam. with depth
- approx. 65' deep
- sampled well - contaminated
17,000 Cl-

* - sampled existing wells in area for TDS, Cl^-, TPH
  - existing well at 10,000 ppm TDS
  - other wells appear clean
  - no samples for BTEX

- Contacted county, since they caused leak
- County said not responsible
- Prepared complaint against county

- Will submit work plan on invest. by 1/13/95

1445 hardcopy 11/3/94 OCD/Rice meeting #1



WELL	DISTANCE FROM WELL #1
No. 2	263'
No. 3	100'
No. 4	175'
No. 5	100'
No. 6	163'
Church	2,347'
Windmill	1,652'
Existing Well	159'
Wilson House	424'
Grey House	733'
Curtis Machine Water Well	770'

DWN	SRT 6-94			APPROVED		HOBBS SWD SYSTEM PROPOSED MONITOR WELLS	SCALE: 1" = 500'
							DWG. No.
						RICE ENGINEERING CORPORATION HOBBS, NEW MEXICO.	

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

July 22, 1994

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

CERTIFIED MAIL
RETURN RECEIPT NO. P-111-334-148

Mr. Jerry D. Hillard
Division Manager
Rice Engineering Corporation
122 West Taylor
Hobbs, New Mexico 88240

RE: GROUND WATER CONTAMINATION
RICE ENGINEERING PRODUCED WATER GATHERING LINE
LEA COUNTY, NEW MEXICO

Dear Mr. Hillard:

The New Mexico Oil Conservation Division (OCD) is in receipt of Rice Engineering Corporation's (REC) July 15, 1994 "GROUNDWATER IMPACT RICE ENGINEERING PRODUCED WATER GATHERING LINE, LEA COUNTY, NEW MEXICO". This document requests a 90 day extension of the timetable for submission of a work plan for investigating the extent of ground water contamination related to a leak from a REC produced water gathering line in the SW/4, NW/4 of Section 5, T19S, R38E NMPM Lea County, New Mexico.

Your request for an extension of the time schedule to submit a work plan for investigation of the extent of ground water contamination at the above referenced site is granted. REC will submit the work plan by November 1, 1994.

If you have any questions, please contact me at (505) 827-5812.

Sincerely,

Roger C. Anderson
Bureau Chief

xc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price, OCD Hobbs Office

RICE Engineering Corporation
122 WEST TAYLOR TELEPHONE (505) 393-9174
HOBBS, NEW MEXICO 88240

July 15, 1994

State Of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87504
Attn: Roger C. Anderson

Re: Groundwater Impact
Rice Engineering Produced Water Gathering Line
Lea County, New Mexico

Dear Mr. Anderson:

In your letter of May 31, 1994, you stated that the OCD requested that Rice would submit a work plan by August 1, 1994. Due to settlement of issues related to this incident, Rice Engineering respectfully requests that a 90 day extension be granted to the time which the plan is desired to be submitted.

If there are any questions, please contact me at this office.

Yours very truly,

RICE ENGINEERING CORPORATION

Jerry Hillard
Division Manager

cc: Jerry Sexton, OCD Hobbs District Supervisor

Wayne Price, OCD Hobbs Office

...CONSERVATION DIVISION

'1 8 50

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☐ Telephone ☒ Personal	Time ≈ 11:30 am	Date 6/16/94

Originating Party	Other Parties
JERRY HILLARD - RICE ENGR-	

Subject RICE LINE LEAK - Wt ct Rd (HOBBS NM) 1/4 S of US 180

Discussion MR. HILLARD GAVE ME A copy of DIARY of Activities

ATTACHED!

Conclusions or Agreements I will forward to BILL OLSON / ROGER ANDERSON
SANTA Fe

Distribution
cc: ROGER ANDERSON
JERRY SEXTON
Bill Olson

Signed

DIARY of ACTIVITIES
West County Road Spill
Hobbs Salt Water Disposal System

4/29/94 At around 3:00 pm, I was called by Billy Walker, Area Foreman to come to a spill site on the south part of the West County road near Curtis Machine Shop. Upon arrival, I was shown two dug holes exposing the 8 inch pipeline crossing the roadway, one at the west end of the conduit and one on the borrow ditch wall. The hole at the conduit end showed no leakage while the one in the ditch exposed the conduit which had holes on it's wall allowing water to escape. This excavation was at the point where the surface detection of spill was at. There had been no digging on the east side of the roadway at this point. It was suspected that a leak in the internal plastic pipeline could exist inside the underroad conduit. It was decided to begin search on the east side for water escape from the conduit. Water escape from the east end of the conduit was found. Water was diverted away from this pipeline to allow the repair. The OCD and the City Environmental Department was notified about the leak.

4/30/94 The pipeline was dug out far enough on the east end to allow the cutting and removal of the crossing pipe from the conduit. Upon removal, it was detected that a cut or nick of the top part of the pipe had been made on the western portion. Upon measuring the cut distance from the pipe segment removed, it was determined that the cut would have been located at the bottom of the west ditch. Digging here showed that the conduit had been damaged and severe corrosion had resulted from water loss. Part of the damaged conduit was removed and replaced being topped with a concrete blanket to prevent recurring damage. The repaired internal plastic pipe was attempted to be inserted back through the conduit but stopped, indicating partial collapse near the east end which was still covered.

5/1/94 The conduit was uncovered on the eastern side of the crossing after which 15 feet was removed and the 8 inch plastic pipe reinserted and connected. The line was placed back in service with the wet ditch cuttings left at the surface.

5/2/94 Jerry Sexton of the OCD was contacted and taken out to the spillsite to question as what options were considered about disposal or cleanup. Mr. Sexton advised we should test the soil for hydrocarbon and salt content. He also contacted Wayne Price for his opinion. Mr. Price also came to the location saying we should initially spread the material and test after a short period of reclamation. He said his concern was mainly that there had been downward migration of the contaminate liquids and if the levels on the ditch cuttings were at unacceptable levels, samples should be gathered of the ditch bottom.

5/3/94 I was able to contact Mr. Curtis, owner and operator of the machine shop to the north of the spill site and on whose lot the spill occurred on the east side of the road. We asked Mr. Curtis for permission to spread the ditch cutting out to the north of the pipeline for reclamation procedures. He had no objection as he at the

time had no plans for usage of this segment of the property. Contact was made with Dirtworks for them to begin the spreading and treatment of the soils on the next day.

5/4/94 Dirtworks spread the contaminated soil and rock cuttings out to the north.

5/5/94 Dirtworks sprayed the site with fertilizer and water.

5/11/94 A composite sample was taken of the removed and spread ditch cuttings. The composite was conducted by dividing the area into 10 foot on each side squares and taking one sample from each, then combining and mixing the composite. The sample was taken to Cardinal Laboratories.

5/13/94 The results of the analysis were receved showing that the aggregate sample had a total petroleum hydrocarbon (TPH) content of 7,721 ppm and Chlorides of 680 ppm. This is considered to be an excessive level. Mr. Price was contacted and he advised that guidelines would call for a sample of the lower level solids at the ditch bottom.

5/16/94 Samples were taken from the ditch bottom by removing the sand pad and pipe cover next to the pipeline at a point estimated to be near the end of the origonal conduit. Upon digging a depth of around 6 inches, clean appearing caliche was found. Mr. Price was contacted and came to the site. A sample was also taken from the ditch wall at a point about 3 feet down on the north side. The sample was taken at a point where non rocky solids could be found. Both of the samples had no appearance of contamination as would be given if they had been in contact with produced water, i.e. the black or gray color due to hydrocarbon or Iron Sulfide. However, both samples gave hydrocarbon odors.

5/17/94 Received analysis of the two samples. The bottom was 17,817 TPH and 160 chlorides and the side was 16,665 TPH and 3278 chlorides. Cardinal laboratories stated this analysis did not represent aromatics and light fractions. Our reasoning was that the soil should have had appearance of hydrocarbon presence at this level. We took two more samples to another laboratory and receved similar analysis. We advised the OCD of the results. Mr. Price advised us that the next step should be to bore a hole at the spill point to assess depth of contamination.

5/18/94 Abbott Bros. Rat Hole service was contacted to drill a test hole at the site. The hole bored was approximately 5 ft. west of the ditch bottom sample site. The cuttings from the beginning point to the total depth of 40 ft below ground level showed a dark color indicating iron sulfide presence. All cuttings had strong hydrocarbon odor. Samples taken at the bottom of the hole gave a chloride content of 2479 ppm. No analysis of hydrocarbon content was performed. Water content was seen at one point approximately 36 ft. in depth.

5/20/94 The 40 ft. test borehole was plugged with a 2 yd mixture of 19 sx. type II cement, 800# sand and 222 gal water. The cement level drifted down approximately one foot. The ditch cuttings were placed back in the ditchline.

5/23/94 Environmental Spill Control rigged up Auger-Air to drill a well into the Ogallalla for test and monitoring purposes. The well is located approximately 15 ft southeast of the 40 ft borehole next to the pipeline. Samples were taken each 10 ft below the surface and analyzed for hydrocarbons. The first point where the appearance of iron sulfide was found was at 15 ft and remained to total depth. Water was encountered at 41 ft. The well was drilled to 65 ft with a 4 3/4 in. bit. The hydrocarbons were as follows:

Depth	TPH
10'	5,360
20'	14,400
30'	9,720
40'	4,870
50'	2,200

5/24/94 It was decided that the hole should be reamed to 6 1/4 in diameter to allow pumping of the water zone for a period before a sample would be taken. The hole was reamed this day and 4 1/2 in PVC casing set at 55 ft. The casing had 15 ft slotted and screened interval set so that 5 ft is above the Ogallalla top at 41 ft. The casing was set with gravel pack to cover the screened interval, bentonite interval above gravel and then cement grout to the surface. The static fluid level inside the casing was 37 ft from surface.

5/25/94 The base at the surface and the casing cap were installed this day.

5/26/94 Materials and equipment for the downhole pump assembly was accumulated

5/27/94 The pump and tubing was installed. Power supply was set up to use a generator for the temporary use. The water was produced into a rental tank and transported by truck to the System Disposal well E-15. Approval for test production of the well was given by the OCD. Samples of water were taken from the domestic water well at the Wilson residence approximately 450 ft east and an unused well on the Kenyon lot about 163 ft southeast of the test well.

5/28/94 Continued pumping of the test well.

5/29/94 Continued pumping of the test well.

5/30/94 Shut the pump down to allow for the required 24 hr static period before testing. 1665 bbls water was produced.

5/31/94 Took sample of water from the test well. A meeting of the Hobbs SWD System partners was conducted this morning. The parties were advised of the events up until that time and questioned for suggestion and approval to continue with needed steps. We were instructed to draft a plan to be submitted to the OCD for the site reclamation. The plan was to be directed to the System parties for their review before submitting it to the OCD. After this plan is prepared, an AFE is then to be prepared and sent out to the System partners. They will evaluate the question of whether to attempt to resolve the County to assume liability for the situation and be responsible for all expenditures. We were to begin filing of the Claim toward the County due to the elapsed time ruling and then be directed to continue pursuit of the claim upon receipt of the response of the AFE. We were also directed to check all similar road crossings in the Hobbs SWD System for potential problems like that in this situation. Analysis of the waters from the other domestic wells was received aftr the meeting adjourned. The well 450 ft east had 0.3 ppm TPH , 36 ppm Chlorides, and 440 ppm TDS while the well 163 ft southeast had 1.4 ppm TPH, 4,879 ppm Chlorides and 10,446 ppm TDS.

6/1/94 Samples were taken from three other wells to the north of the test well. One is at the Curtis Machine Shop approximately 500 ft north northeast, another at a church building north of Highway 62-180 and a windmill estimated to be over 2000 ft west

6/2/94 The analysis of the water from the test well at yhe spill sitewas received: 3.8 TPH,17,495 Chlorides and 36,200 TDS.

6/6/94 Analysis of the waters from the other three wells was received.

	TPH	Chlorides	TDS
Church	0.1	204	1026
Curtis Machine	0.3	52	490
Windmill	2.8	68	633

6/7/94 Contact was made with the landowner to the south of the lot where the contaminated unused domestic well is located. Authority to obtain a sample was obtained. Minutes of the Meeting and the Draft Site Plan were sent out to the System partners along with water disposal volumes for the times around the creation of the leak and recent times before the discovery of the leak and after its repair. it was stated in the minutes that information had been provided that the work apparently responsible for the leak was performed by the County Road Department personnell between September 13 to 26 of 1988.

6/8/94 Analysis of the water from the above well was received. Less than 1.0 TPH, 88 ppm Chlorides and 898 ppm TDS. Jerry Hillard met with Clifford Gladewell of O' Neal and Associates who was investigating the situation for the State Highway Department. He said his objective was to determine if the State or the State's

contractor could be responsible for the situation. A copy of the Draft Site Reclamation and Cleanup plan was taken to Jerry Sexton of the OCD.

6/10/94 Rice Engineering was contacted today by Aubrey Kenyon, owner of the surface south of the pipeline crossing on the east side of the roadway. Mr. Kenyon states he considers that the lot must be purchased by the System or he will take legal action for damages. He informed us that he was not able to sell the property in the past due to the contaminated water.

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

May 31, 1994

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

CERTIFIED MAIL
RETURN RECEIPT NO. P-111-334-119

Mr. Jerry D. Hillard
Division Manager
Rice Engineering Corporation
122 West Taylor
Hobbs, New Mexico 88240

RE: GROUND WATER CONTAMINATION
RICE ENGINNERING PRODUCED WATER GATHERING LINE
LEA COUNTY, NEW MEXICO

Dear Mr. Hillard:

The New Mexico Oil Conservation Division (OCD) is in receipt of Rice Engineering Corporation's (REC) May 26, 1994 "NOTIFICATION OF PRODUCED WATER CONTAMINATION". This document contains notification of ground water contamination related to a leak from a REC produced water gathering line in the SW/4, NW/4 of Section 5, T19S, R38E NMPM Lea County, New Mexico.

Although this document states REC's intent to submit a work plan for identifying the extent of ground water contamination at the site, no date for submission of the work plan was provided. Therefore, the OCD requests that REC submit the above referenced work plan to OCD by August 1, 1994.

If you have any questions, please contact me at (505) 827-5812.

Sincerely,

Roger C. Anderson
Bureau Chief

xc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price, OCD Hobbs Office

P 111 334 119

Receipt for Certified Mail

UNITED STATES POSTAL SERVICE

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

Sent to	
Street and No.	
P.O., State and ZIP Code	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form 3800, June 1991

Fold at line over top of envelope to the right of the return address

RICE Engineering Corporation
122 WEST TAYLOR TELEPHONE (505) 393-9174
HOBBS, NEW MEXICO 88240

May 26, 1994

Mr. William J. Lemay
State of New Mexico
Oil Conservation Division
P. O. Box 2088
Santa Fe, NM 87501

Re: Notification of Produced Water Contamination

Dear Mr. Lemay:

Please accept this letter as notice of groundwater contamination due to accidental cutting of a produced water gathering line in the SW/4 of the NW/4 of Section 5, Township 19 South, Range 38 East in the Lea County, New Mexico.

As of this date, we have drilled a monitor well to a total depth of 65 feet that encountered groundwater at 41 feet. Field laboratory analysis of this groundwater indicated contamination while the monitor well was drilled. Our plan is to test the well and have a laboratory analysis of the water recovered during the initial well testing.

Currently we are in the process of identifying all surface owners and will contact them and notify them of the situation.

We are currently drafting a plan to identify the extent of the plume of contamination along with recommendations for remediation of the site to be submitted for approval at a later date. At the time, however, there is question as to who is the responsible party for costs associated with this project. No execution of the plans for spill site identification or reclamation will be performed until determination of the party responsible for expenses involved. If you have any questions, please contact me at (505) 393-9174.

Yours very truly,

RICE ENGINEERING CORPORATION

Jerry D. Hillard
Division Manager

cc: LBG
DA
TM

JDH/cp

RICE Engineering Corporation
122 WEST TAYLOR TELEPHONE (505) 393-9174
HOBBS, NEW MEXICO 88240

May 26, 1994

Mr. William J. Lemay
State of New Mexico
Oil Conservation Division
P. O. Box 2088
Santa Fe, NM 87501

Re: Notification of Produced Water Contamination

Dear Mr. Lemay:

Please accept this letter as notice of groundwater contamination due to accidental cutting of a produced water gathering line in the SW/4 of the NW/4 of Section 5, Township 19 South, Range 38 East in the Lea County, New Mexico.

As of this date, we have drilled a monitor well to a total depth of 65 feet that encountered groundwater at 41 feet. Field laboratory analysis of this groundwater indicated contamination while the monitor well was drilled. Our plan is to test the well and have a laboratory analysis of the water recovered during the initial well testing.

Currently we are in the process of identifying all surface owners and will contact them and notify them of the situation.

We are currently drafting a plan to identify the extent of the plume of contamination along with recommendations for remediation of the site to be submitted for approval at a later date. At the time, however, there is question as to who is the responsible party for costs associated with this project. No execution of the plans for spill site identification or reclamation will be performed until determination of the party responsible for expenses involved. If you have any questions, please contact me at (505) 393-9174.

Yours very truly,

RICE ENGINEERING CORPORATION

Jerry D. Hillard
Division Manager

cc: LBG
DA
TM

JDH/cp