1R - 426-37

REPORTS

DATE:

4-1-08

BD Jct N-29

IR426-37

CLOSURE

4-1-08

RICE OPERATING COMPANY

JUNCTION BOX CLOSURE REPORT

BOX LOCATION

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	BOX DIMENSIONS - FEET		
							Length	Width	Depth
BD	jct. N-29	N	29	21S	37E	Lea	no box--jct. eliminated		

LAND TYPE: BLM _____ STATE _____ FEE LANDOWNER Tom Kennaan OTHER _____

Depth to Groundwater 89 feet NMOCD SITE ASSESSMENT RANKING SCORE: 10

Date Started 10/7/2002 Date Completed 12/27/2002 NMOCD Witness YES

Soil Excavated 4000 cubic yards Excavation Length 165 Width 60 Depth 18-40 feet

Soil Disposed 84 cubic yards Offsite Facility Sundance Location Eunice, New Mexico

General Description of Remedial Action:

For a summary of the junction box remediation & excavation activities, refer to the previously-submitted Junction Box Disclosure Report (2002). Groundwater at this site has been monitored on a quarterly basis by the sampling of 2 monitoring wells at the site.

A Closure Report by R.T. Hicks Consultants requesting closure of this junction box site was submitted to OCD on February 14, 2007 and is included with this form.

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REPORT ASSEMBLED BY Kristin Farris Pope SIGNATURE Kristin Farris Pope

DATE 4/10/2007 TITLE Project Scientist

R. T. HICKS CONSULTANTS, LTD.
901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

February 14, 2007

Wayne Price
Bureau Chief
NMOCD Environmental Bureau
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
Via E-mail

RE: Jct. N-29, T21S, R37E, Section 29, Unit N; NMOCD Case # 1R0426-37

Dear Mr. Price,

On behalf of Rice Operating Company, R.T. Hicks Consultants, Ltd. is pleased to submit a Closure Report for the above-referenced site. The data presented in this report allow us to conclude that ground water has not been impacted by any releases from the N-29 site and we are requesting that the file for this site be closed.

If you have any questions or concerns, please do not hesitate to contact us.

Sincerely,
R.T. Hicks Consultants, Ltd.

Katie Lee

Katie Lee
Staff Scientist

Copy: Hobbs NMOCD office;
Rice Operating Company

January 24, 2007

Closure Report: Junction N-29

R.T. Hicks Consultants, Ltd.

901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

January 24, 2007

Closure Report: Junction N-29

T21S-R37E-sec 29-unit N

NMOCD case #: 1RO426-37

prepared for:

Rice Operating Company
122 West Taylor
Hobbs, NM 88240

R.T. Hicks Consultants, Ltd.

901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

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Quality Assurance Protocols

1.0 EXECUTIVE SUMMARY

The N-29 junction box site is located about 2 miles northwest of the intersection of State Routes 8/176 and Highway 207, near Eunice, New Mexico, in Section 29, 21S, 37E Unit N. In 2002, Rice Operating Company (ROC) began delineation and excavation activities as part of the junction box upgrade program. In early 2003, a Disclosure Report was submitted by ROC to the NMOCD. In July of 2003 R.T. Hicks Consultants, Ltd., submitted a letter proposing a scope of work designed to identify and mitigate any threat to human health or the environment at Junction N-29.

This report incorporates the findings of previous investigations, details the remedy that has been employed at the site to date, and presents current analytical data collected at the site. The site remedy included the excavation of chloride-impacted soil to a depth of 40 ft. below ground surface (bgs), followed by introduction of imported backfull and a compacted clay liner installed at 20 ft. bgs. Contouring of the ground surface to shed rain water and re-seeding of the area completed the site remedy. Deep and shallow monitoring wells have been installed down-gradient from the site and sampling there indicates that ground water in the area has not been impacted by releases at Junction N-29. We therefore conclude, as presented in Section 6.0 of this report, that this site file is ready for closure.

This report incorporates the required elements for both Stage 1 and Stage 2 Abatement Plans; however, because there is no evidence of ground water impairment due to the N-29 junction box site, we ask that NMOCD consider this report a request for closure of this file.

2.0 CHRONOLOGY OF EVENTS

Summer, 2002	During a junction box upgrade, Rice Operating Company (ROC) begin delineation and excavation activities at N-29.
October–December, 2002	ROC excavates chloride and TPH-impacted soil to a depth of 40 feet below ground surface (bgs). Imported backfill, placed in the deep excavation from 40 feet to 20 feet bgs, is overlain by compacted clay liner and additional backfill to ground surface to create a vadose zone remedy. The ground surface is graded to drain rainwater away from the area above the cap. The surface is then reseeded.
January 2, 2003	ROC submits a Disclosure Report detailing the vadose zone closure in 2002.
July 29, 2003	Hicks Consultants, Inc., submits a workplan proposing examination of the regional hydrogeology and the installation of one deep and one shallow well down-gradient from the site to determine if the release caused impairment of ground water quality.
August 21, 2003	NMOCD approves the 2003 workplan
2003–2005	The surface landowner prevents access to the site to implement the approved workplan. In the spring of 2005, the landowner grants site access.
May 13, 2005	A deep monitoring well and a shallow monitoring well are installed down-gradient from the release site.
July 5, 2005	NMOCD requests a Rule 19 Abatement Plan for the site.
July 6, 2005	Hicks Consultants requests an extension to submit an Abatement Plan under Rule 19 for this site.

February 10, 2006	Hicks Consultants submits a Final Report and requests exclusion from Rule 19 and closure of the site file.
March 30, 2006	NMOCD requests a comprehensive closure report.
August 2005–present	Quarterly ground water sampling takes place at the monitoring wells down-gradient from the site.

3.0 BACKGROUND

3.1 SITE LOCATION AND LAND USE

The N-29 junction box site is located about 2 miles northwest of the intersection of State Routes 8 and Highway 207, near Eunice, New Mexico, in Section 29, 21S, 37E Unit N. Plate 1 shows the location of the site.

Land in the site area is primarily utilized for oil and gas production and cattle ranching. The subsurface mineral owner is the BLM, the surface fee landowner is Tom Kennaan. Plate 2 is an aerial photograph of the area showing this land use and the access road from Highway 8.

3.2 SUMMARY OF PREVIOUS WORK

Initial sampling activities that delineated a zone of impact associated with the N-29 junction box area began in 2002, as part of ROC's junction box upgrade program.

ROC drilled a soil boring and conducted soil sampling within the upper vadose zone during excavation activities between October 7, 2002, and December 27, 2002. Soil samples were analyzed for chlorides in the field using field-adapted Method 9253 (QP-03). Appendix A presents the 2002 Disclosure Report that includes the boring log and field analyses, details and manifests of soil excavation, and soil field tests. Sidewall and bottom samples were sent to the laboratory for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Method 8021B, gas and diesel range organics (GRO/DRO) using EPA Method 8015M, and chlorides to confirm the completion of excavation activities. Results of the excavation sampling are listed in Table 1, below.

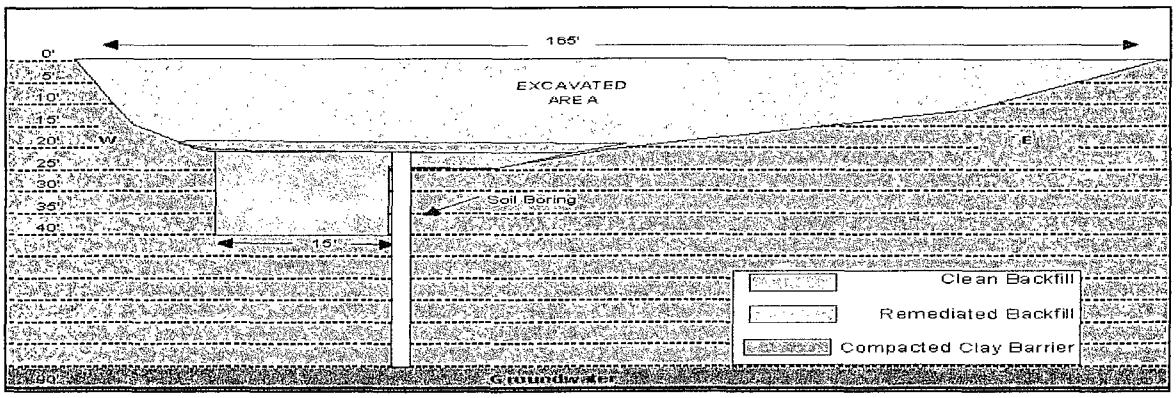
Table 1: Soil Sample Results After Excavation

Sample Location	BTEX	GRO	DRO	Chloride
	(mg/kg)			
Sidewalls	<0.025	<10	<10	5140
Bottom	<0.025	<10	<10	478

Most of the hydrocarbon-impacted soil that was excavated to a depth of 40 feet below ground surface was bio-remediated (landfarmed) on-site. Approximately 84 cubic yards of hydrocarbon-impacted soil was transported to the Sundance/Parabo facility east of Eunice.

Imported backfill placed in the deep excavation from 40 feet to 20 feet bgs was overlain by a compacted clay liner and additional backfill to ground surface to create a vadose zone remedy. The ground surface was graded to drain rainwater away from the area above the cap. The surface was then reseeded. Figure 1 presents a schematic of the excavation, backfill and clay layer installed at the site.

Figure 1: Profile View of Impact Area



The Disclosure Report detailing all of the above-referenced work was completed on December 27, 2002, and forwarded to the NMOCD in early 2003. The work completed in 2002 concluded the vadose zone remedy for the site.

4.0 GEOLOGY AND HYDROGEOLOGY

4.1 REGIONAL AND LOCAL HYDROGEOLOGY

The Ogallala Formation is present throughout much of the area surrounding the site and is underlain by the Dockum Group redbeds. Along Monument Draw, east of the site, erosion has stripped the Ogallala, and deposition of alluvium over the redbeds has created a separate aquifer that is hydraulically connected to the Ogallala in many locations (see Nicholsen and Clebsch, 1961). The Ogallala Formation underlies the City of Eunice and the site area.

Plate 3 is the ground water map of southern Lea County (Nicholsen and Clebsch, 1961). This plate shows the water table elevation mimics the redbed elevation. At the N-29 junction box site, ground water flows southeast, toward Monument Draw.

Plate 4 presents a ground water map derived from 2005 ground water measurements at the N-29 junction box site and 2003 measurements from four wells at the ChevronTexaco site (CDU Tract 19, IRP-223) to the northeast of N-29. Appendix B presents a potentiometric surface map from a 2004 Chevron-sponsored report on the CDU Tract 19 site that confirms the south-southeast ground water flow direction. The deep and shallow monitoring wells installed to the southeast of the old junction box are down-gradient from any releases there. NMOCD files show no new ground water data for the Chevron Texaco site; however, we believe the potentiometric surface map presented in Plate 4 is nonetheless reliable.

From the data of Nicholsen and Clebsch (1961), presented in Plate 4 of this report, one can estimate the saturated thickness of the alluvium in our area of interest at about 35 feet (10.5 meters). The lithologic logs of the on-site monitoring wells (Appendix C) show a saturated thickness of 31 feet with the saturated zone dominated by silt-like sand and clay-like sand. Hydraulic conductivity values for silt-like sand and clay-like sand are presented in Table 2.2 of Freeze and Cherry (1979) and are estimated between 0.665 and 1.33 ft/day. A specific yield (porosity) of 0.23 for the Ogallala aquifer near the site area is based on limited published information (Hart & McAda, 1985). Data from Nicholsen and Clebsh show a regional hydraulic gradient of about 0.0047.

Using these values yields an average linear velocity of between 4.9 and 9.9 feet per year. Table 2, below, presents the parameters and calculations employed. Because our monitoring wells are located about 66-feet down-gradient from the former junction box, the wells will not intercept molecules that were released from the site 6.6 years ago, as calculated using the fastest average linear velocity

(13.2 years ago, if the slower velocity is used in the calculation). The monitoring wells would be ineffective in detecting a past chloride release if releases ceased before 1999 (or, using the slower velocity, before 1992) and natural attenuation removed all evidence of such a release. As chloride-impacted soil was excavated in 2002, this is highly unlikely.

Table 2: Ground Water Flow Velocity Calculations

Parameter	Low Estimate	High Estimate
Hydraulic conductivity k (ft./day)	0.665	1.33
dh/dl (hydraulic gradient)	0.00473	
Q = k • dh/dl	0.0031	0.0063
Specific yield = porosity	0.23	
Average linear velocity = Q/porosity (ft./day)	0.014	0.027
Average linear velocity (ft./year)	4.992	9.983
Transport time from release to well (years)	13.2	6.6

Further discussion of the regional and localhydrogeology is presented in our February, 2006, report, previously submitted (see Appendix E).

Surface water in the area is ephemeral and flows in Monument Draw occur only after large precipitation events. We found no evidence to suggest that the release from the junction box affected Monument Draw or any watercourse in any manner. Therefore, this document does not provide information on surface water hydrogeology.

4.2 2005 & 2006 GROUND WATER MONITORING

Monitoring wells N-29 MW-Deep and N-29 MW-Shallow were installed in May, 2005, approximately 66 feet to the southeast (down-gradient) of the excavated area in accordance to the NMOCD-approved Investigation and Characterization workplan (Appendix E). The inset in Plate 6 shows the location of the wells relative to the vadose zone remedy excavation. Subsequent sampling of N-29 MW-Deep and N-29 MW-Shallow in August and October of 2005 as well as in January, April and July of 2006 confirmed that ground water does not exhibit concentrations of BTEX, chloride, or TDS levels above WQCC standards. BTEX concentrations were below the laboratory detection limit of 0.01 mg/L. Tables 3 and 4 and Figures 2 and 3 present the TDS and chloride concentrations at the existing down gradient monitoring wells. Copies of the laboratory analytical report, the chain of custody form for the most recent ground water sampling event, and a table presenting 2005 and 2006 sampling events are included in Appendix D. The Annual Ground Water Monitoring Report for 2006

(along with other previously submitted reports) is presented in Appendix E.
All relevant correspondence concerning this site may be found in Appendix F.

Table 3. MW-1 (Deep) TDS & Chloride Concentrations

Depth To Water (ft.)	Sample Date	Chloride (mg/L)	TDS
89.20	8/30/05	80.2	764
—	10/18/05	82.8	766
89.10	1/17/06	62.2	420
89.94	4/17/06	79.2	584
88.20	7/12/06	63.4	552
88.90	10/5/06	54.5	520

Total depth of well is 118.2 feet.

Figure 2: N-29 Ground Water Quality at MW-1

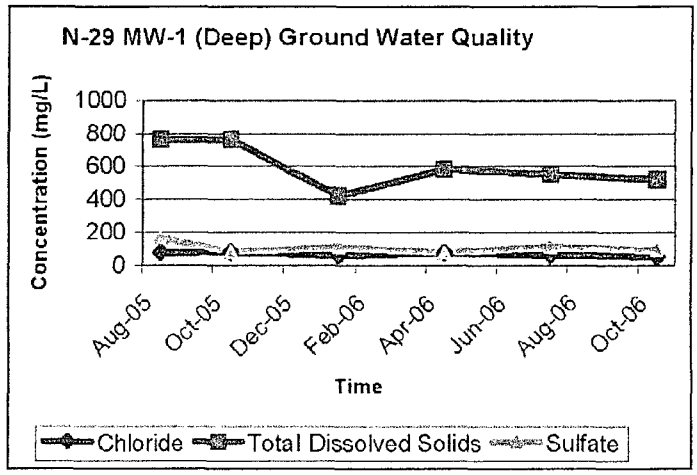
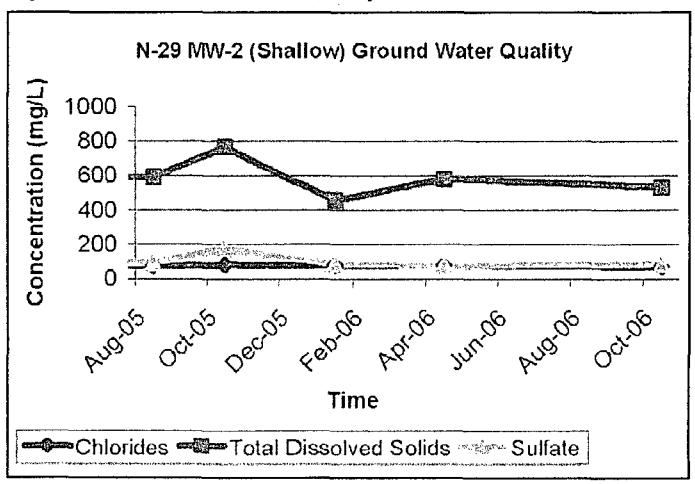


Table 4: MW-2 (Shallow) TDS & Chloride Concentrations

Depth To Water (ft.)	Sample Date	Chloride (mg/L)	TDS
89.50	8/30/05	73.1	590
89.90	10/18/05	82.8	766
89.30	1/17/06	78.8	454
89.42	4/17/06	79.2	584
89.17	7/12/06	89.2	566
89.11	10/5/06	70.1	534

Total depth of well is 104.1 feet.

Figure 3: N-29 Ground Water Quality at MW-2



5.0 QUALITY ASSURANCE PROTOCOLS EMPLOYED

Sampling and analytical procedures were performed in accordance with Title 20 NMAC 6.3107.B and Section 103 of the Water Quality Standards for Interstate and Intrastate Streams in New Mexico (20 NMAC 6.1). Specific quality procedures for obtaining ground water samples are included in Appendix G.

6.0 CONCLUSIONS AND RECOMMENDATIONS

From the information gathered and presented in this report, we conclude the following:

1) The vadose zone remedy is complete.

2) The monitoring well cluster (deep and shallow monitoring wells installed down-gradient from the former junction box) is located and constructed in a manner that would detect any impairment to ground water that may have been caused by the N-29 junction box.

3) Past releases from Junction N-29 did not introduce a sufficient mass of chloride or other constituent to cause impairment of ground water quality.

4) Ground water monitoring of the deep and shallow monitoring wells at the site indicates that water in these wells has levels of BTEX, chloride and TDS that are below WQCC standards.

Based on the above conclusions, we recommend the following:

1) The NMOCD withdraw this site from Rule 19 because the site does not meet Rule 19 criteria. The past release dose at this site does not pose a threat to fresh water, public health, or the environment.

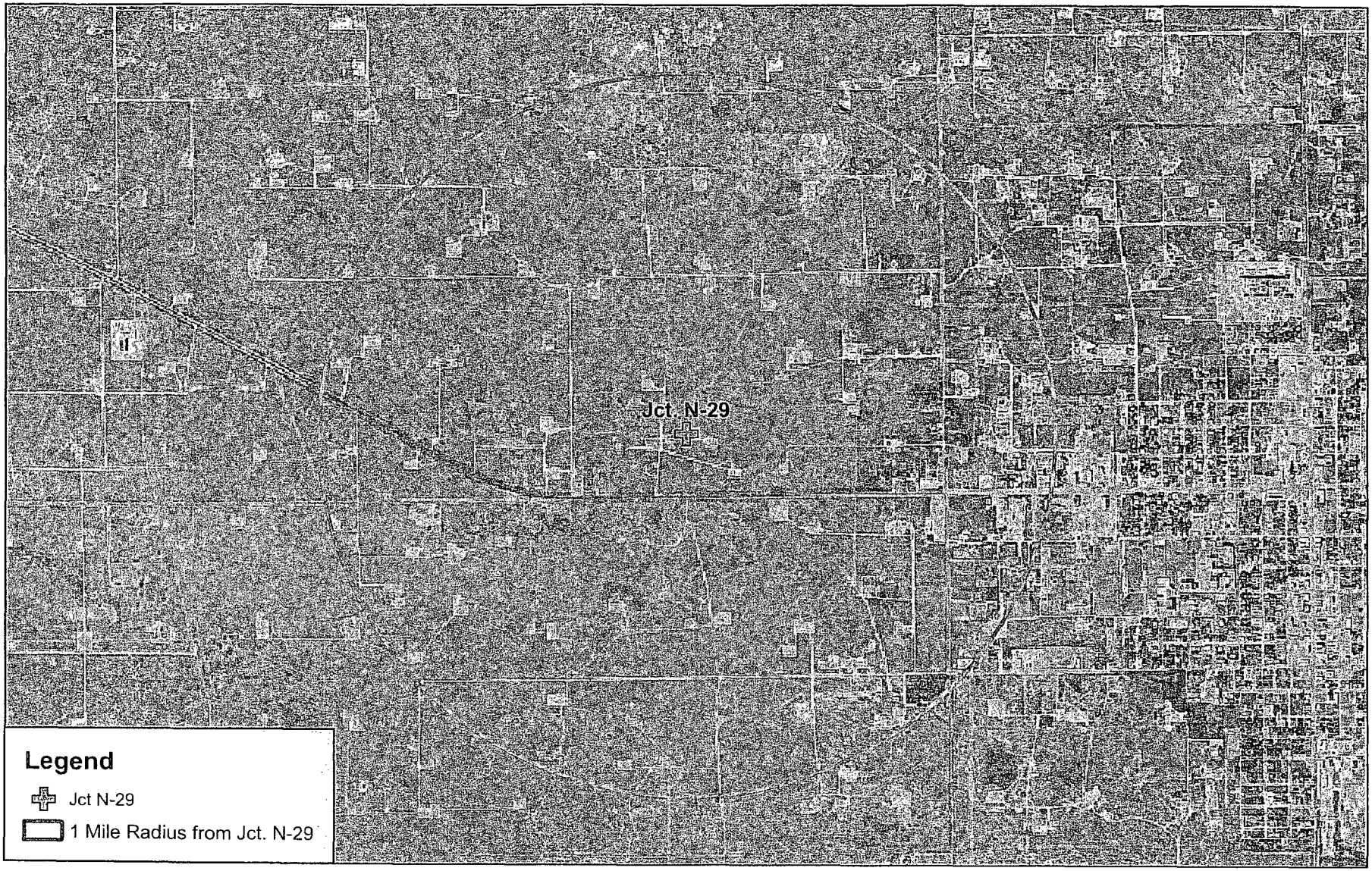
2) The two monitoring wells be plugged and abandoned.

3) The regulatory file be closed.

Plates

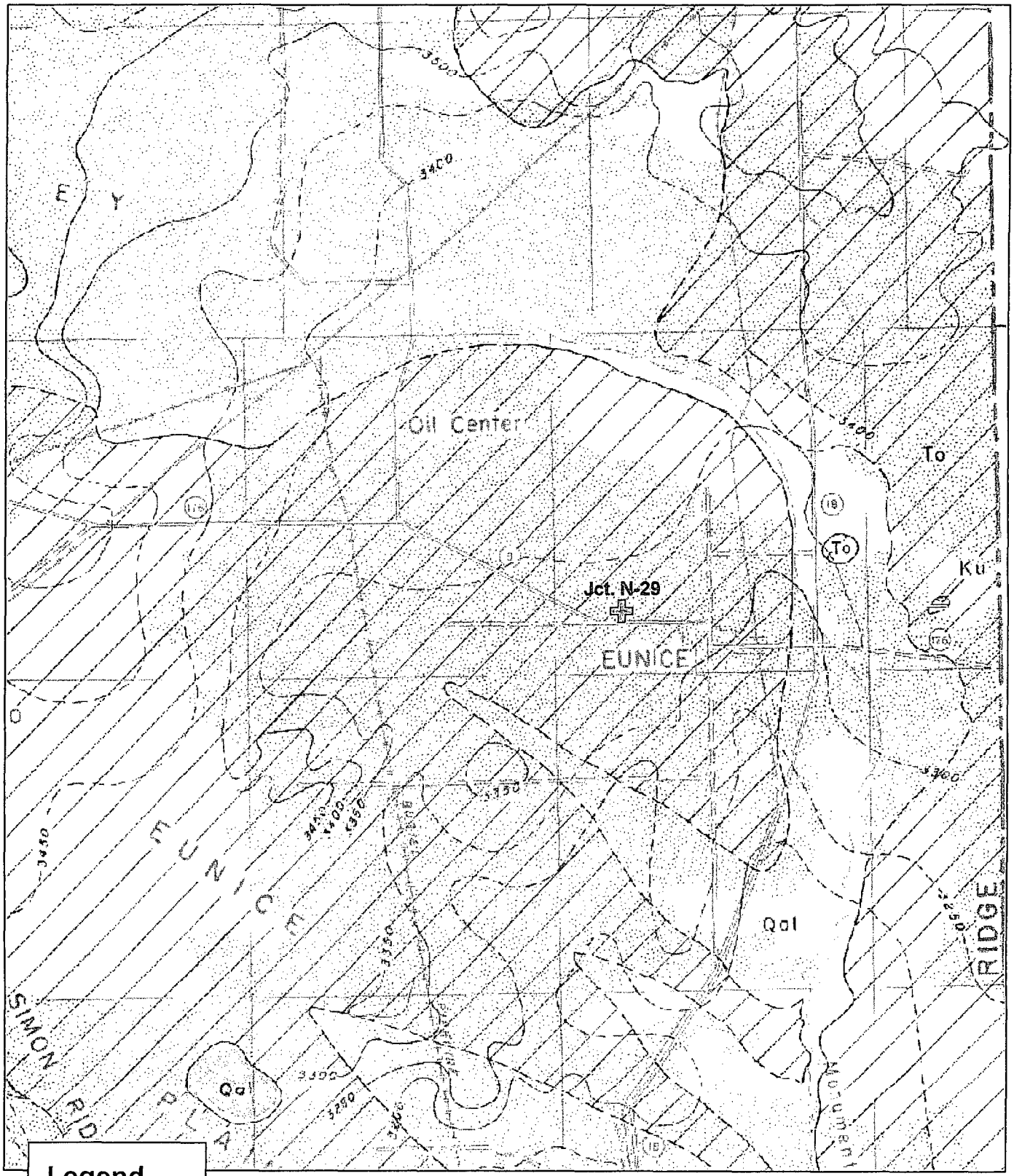
Plates 1–4

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

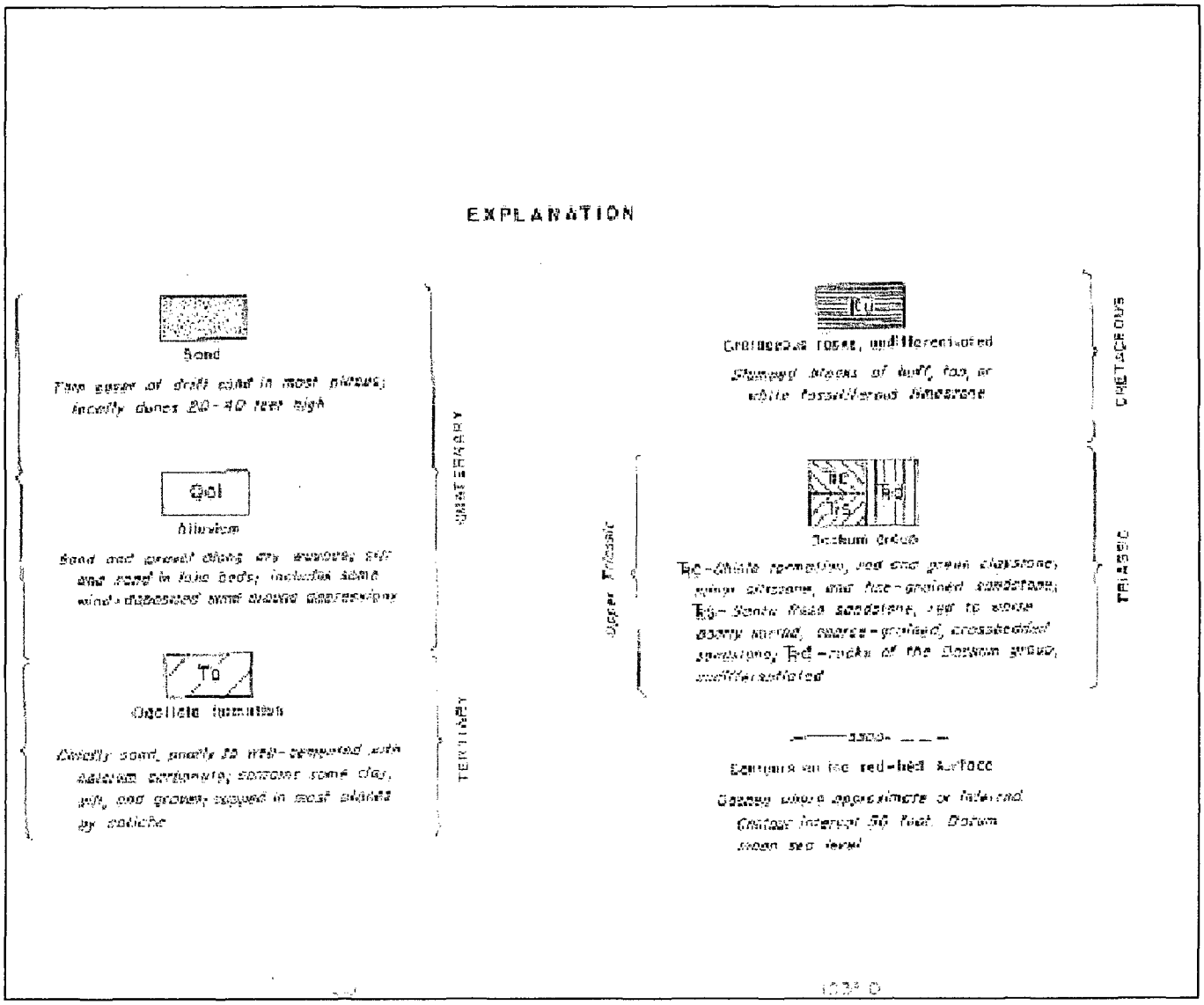


R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

2004 Aerial Photograph of Surrounds	Plate 2
ROC: Jct. N-29 (NMOCD #: 1R0426-37)	January 2007

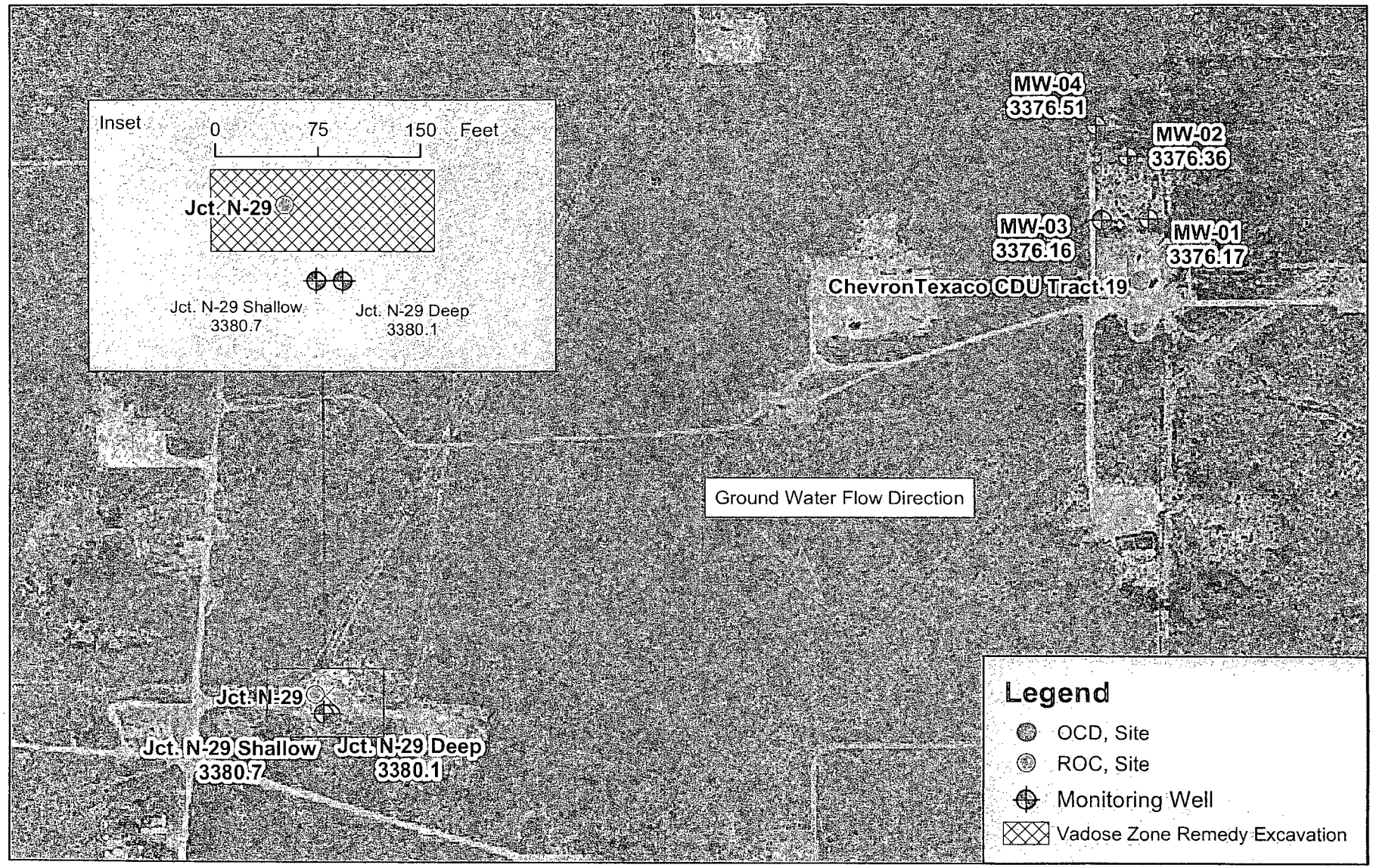


R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Local Geologic Map (Nicholson & Clebsch, 1961)	Plate 3
	ROC: Jct. N-29 (NMOCD #: 1R0426-37)	January 2007



Legend to Nicholson & Clebsch (1961) Geologic Map

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Supplemental Legend to Geologic Map	Plate 3 Supplemental
	ROC: Jct. N-29 (NMOCD #: 1R0426-37)	January 2007



Source Map: USGS 7.5' Quad; Eunice

0 500 1,000 2,000 Feet

N

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	2005 Ground Water Elevations (fmsl)	Plate 4
	ROC: Jct. N-29 (NMOCD #: 1R0426-37)	January 2007

Appendix A

Disclosure Report

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

RICE OPERATING COMPANY
JUNCTION BOX DISCLOSURE REPORT

BOX LOCATION

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	BOX DIMENSIONS - FEET		
							Length	Width	Depth
BD	N-29	N	29	21S	37E	LEA	not	built	yet

LAND TYPE: BLM _____ STATE _____ FEE LANDOWNER TOM KENNAAN OTHER _____

Depth to Groundwater 90 feet NMOCD SITE ASSESSMENT RANKING SCORE: 10

Date Started 10/7/2002 Date Completed 12/27/2002 OCD Witness YES

Soil Excavated 4000 cubic yards Excavation Length 165 Width 55 Depth 18" feet

Soil Disposed 84 cubic yards Offsite Facility Sundance Location Eunice, New Mexico

FINAL ANALYTICAL RESULTS: Sample Date 12/30/2002 Sample Depth 20'

Procure 5-point composite sample of bottom and 4-point composite sample of sidewalls. TPH, BTEX and Chloride laboratory test results completed by using an approved lab and testing procedures pursuant to NMOCD guidelines.

Sample Location	Benzene mg/kg	Toluene mg/kg	Ethyl Benzene mg/kg	Total Xylenes mg/kg	GRO mg/kg	DRO mg/kg	Chlorides mg/kg
SIDEWALLS	<0.025	<0.025	<0.025	<0.025	<10	<10	5140
BOTTOM	<0.025	<0.025	<0.025	<0.025	<10	<10	478

General Description of Remedial Action: Delineation of this site found high TPH and chloride impact under the junction box site to 40' bgs. Results from a soil boring under the box site indicated the TPH stopped before reaching groundwater but the chlorides continue to groundwater. In order to place the boring machine close to the impact, the excavation was backfilled to 20'bgs with clean soil. An anomalous high chloride spot was found on the north wall of 12,000 ppm chlorides. Field chloride tests were run on samples taken around this spot with results ranging from 105 ppm to 2700 ppm chlorides. The results are enclosed. A poly liner will be installed above the impacted soil at 6' bgs. A compacted clay liner was installed @ 20' and tested. The excavation was backfilled with soil remediated on-site and contoured to the surrounding terrain. The backfill was packed in 5' lifts and a composite sample was taken from each lift and analyzed by a certified lab. A monitor well will be installed and sampled to monitor the ground water constituents. An annual report with the sampling results will be sent to the NMOCD. The site will be reseeded and a water proof junction box will be installed north of the remediated area.

* A 15' X 15' area was excavated to 40' bgs (see enclosed figures)

TPH/CHLORIDE FIELD TESTS

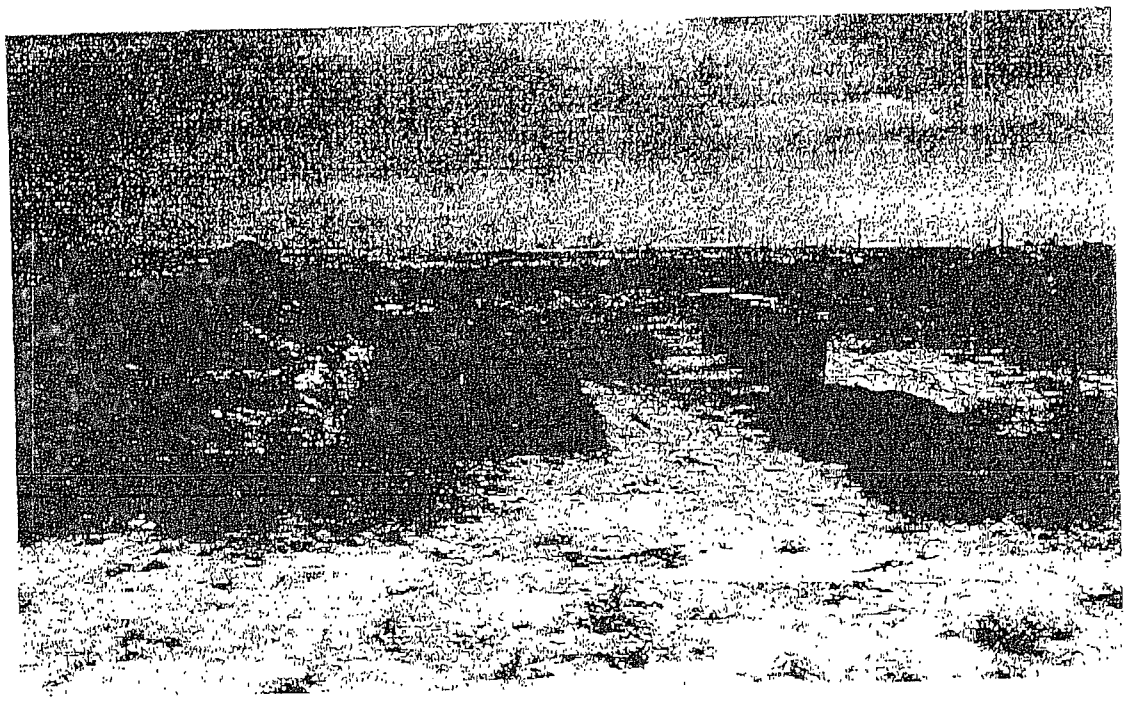
LOCATION	Depth	TPH	mg/kg
SIDEWALLS	17'	N/A	4889
BOTTOM	20'	N/A	599
Remediated Soil	comp	211	1080
Surface	0'	N/A	487
15' Lift	5'	192	762
10' Lift	10'	206	886
5' Lift	15'	341	993

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

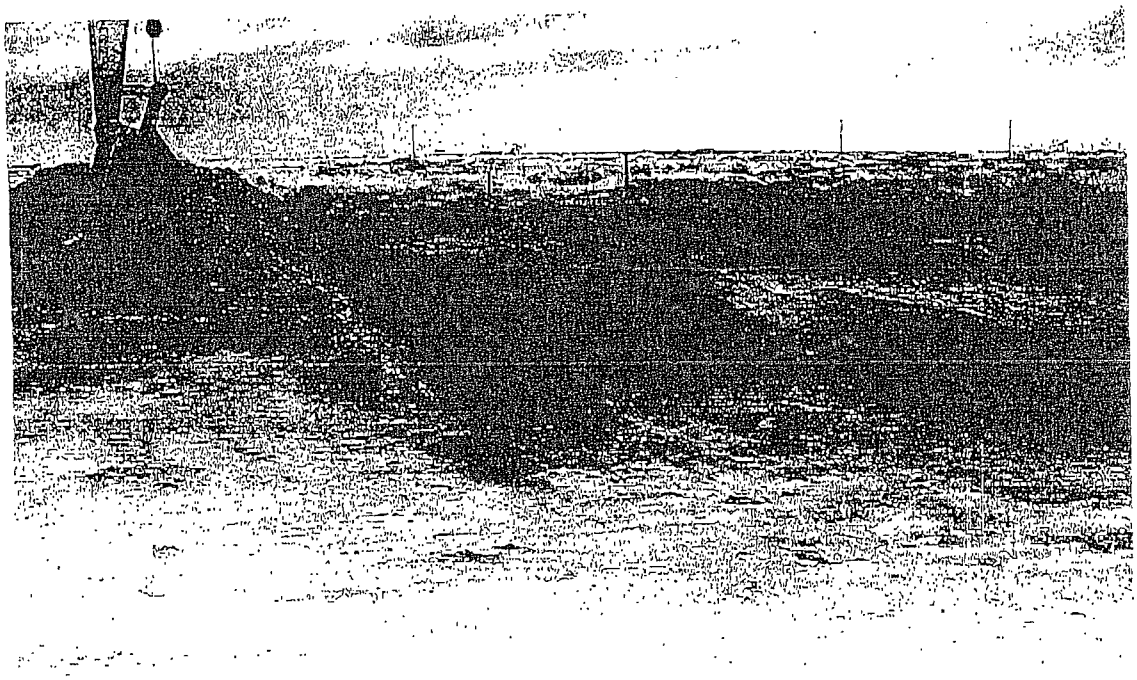
DATE January 2, 2003 PRINTED NAME D. E. Anderson

SIGNATURE _____ TITLE Project Leader - Environmental

BD jct. N-29

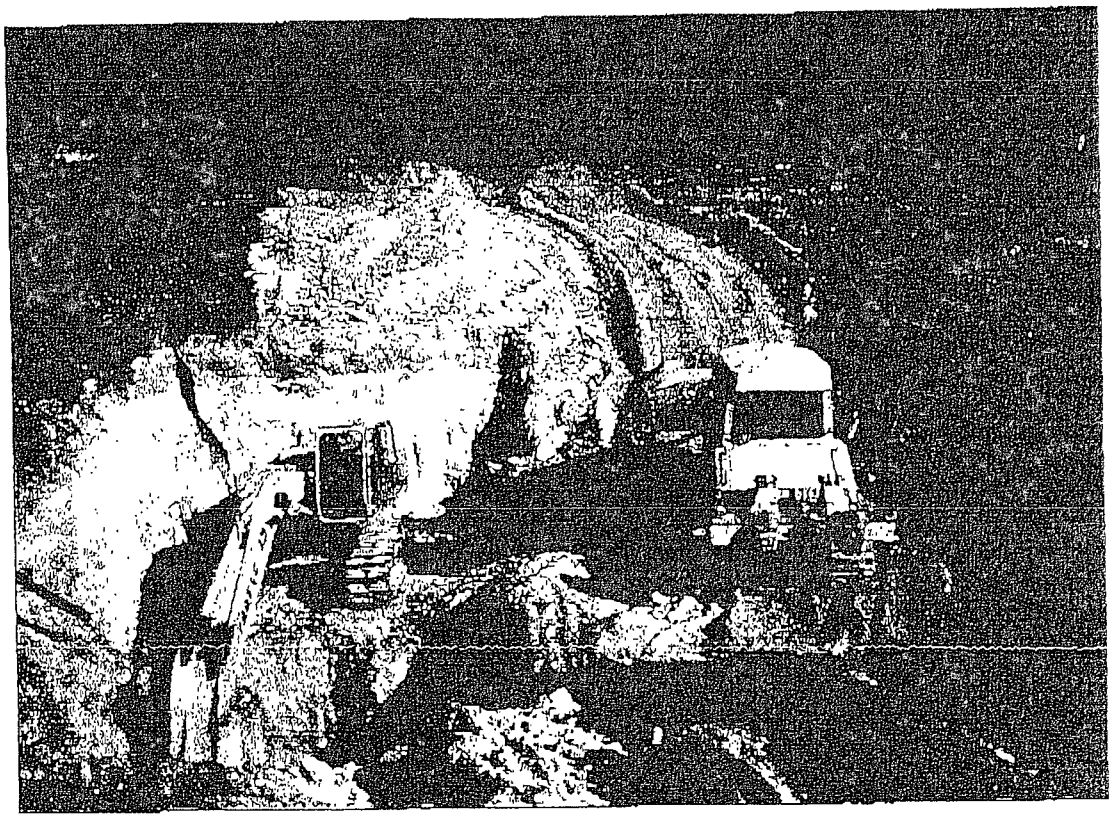


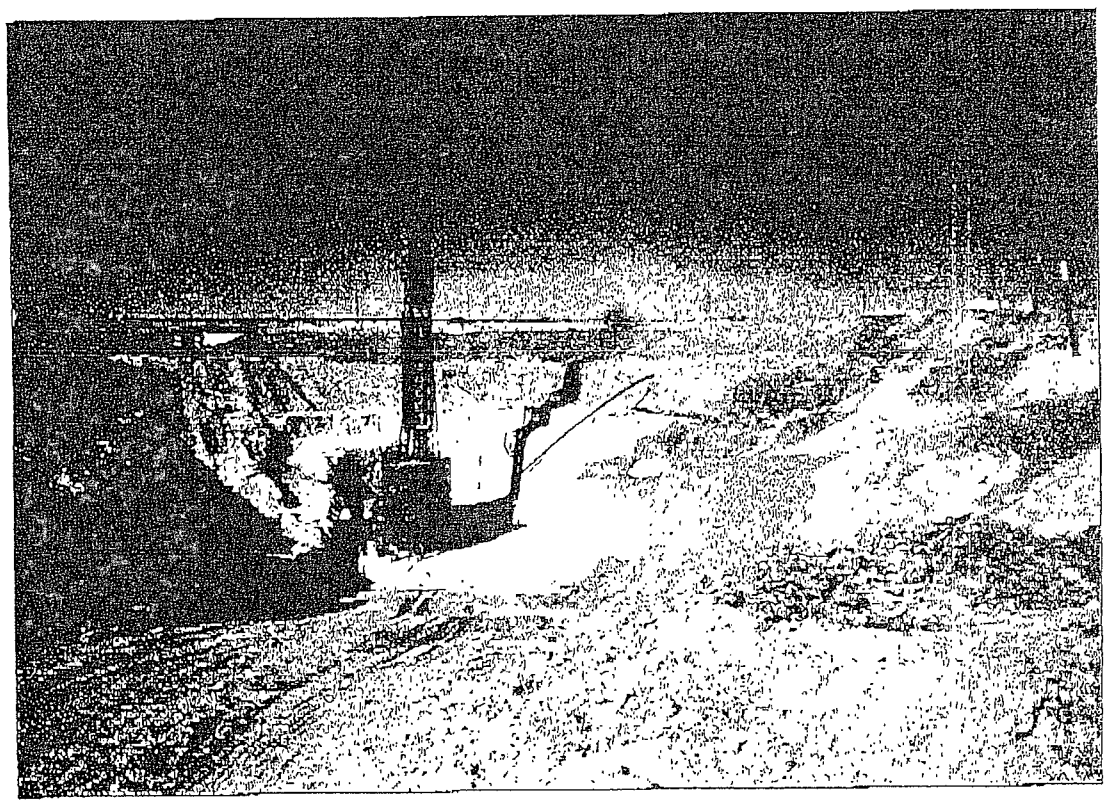
NORM excavation



Impact Excavation

BD jct. N-29

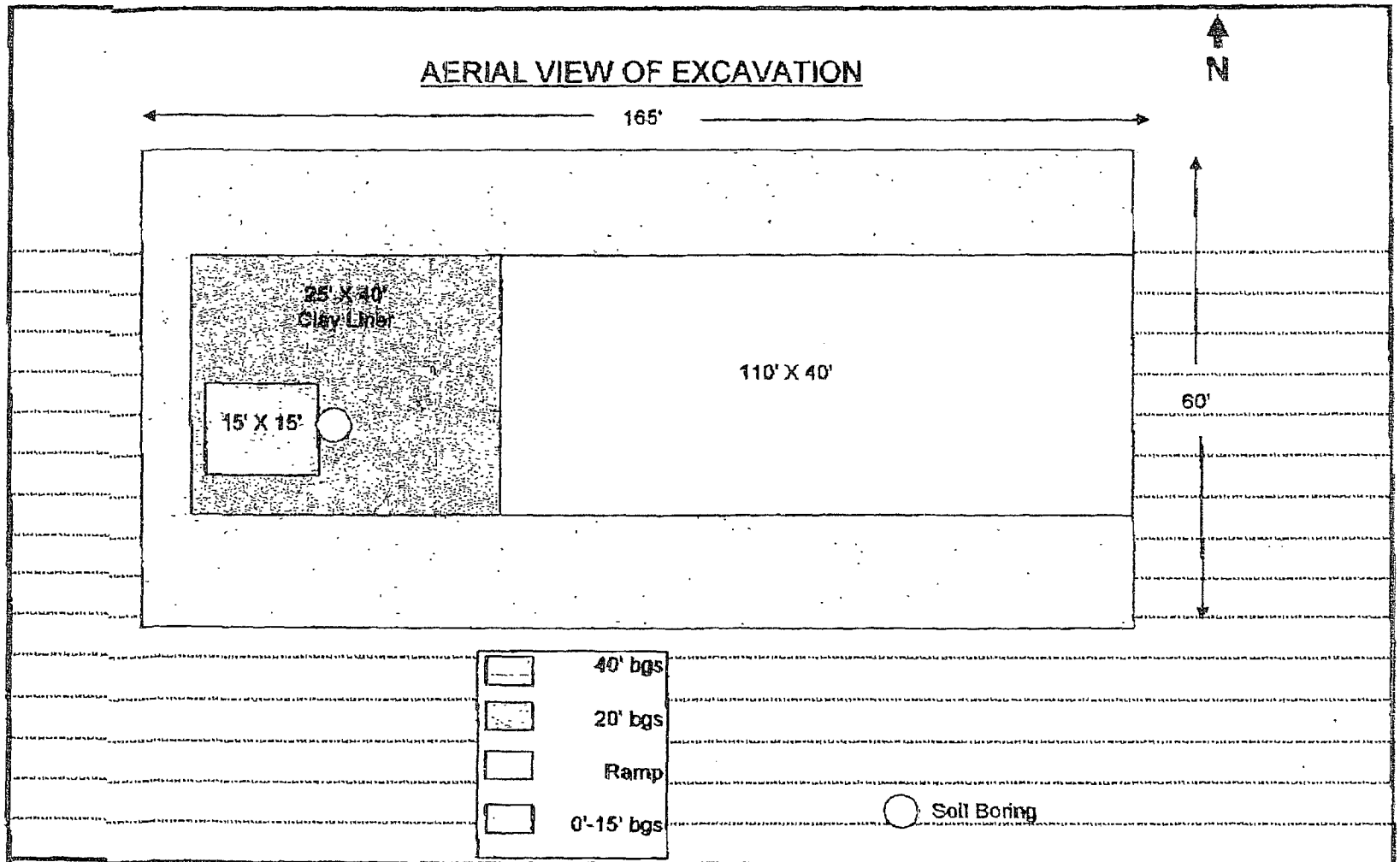




Soil Bore

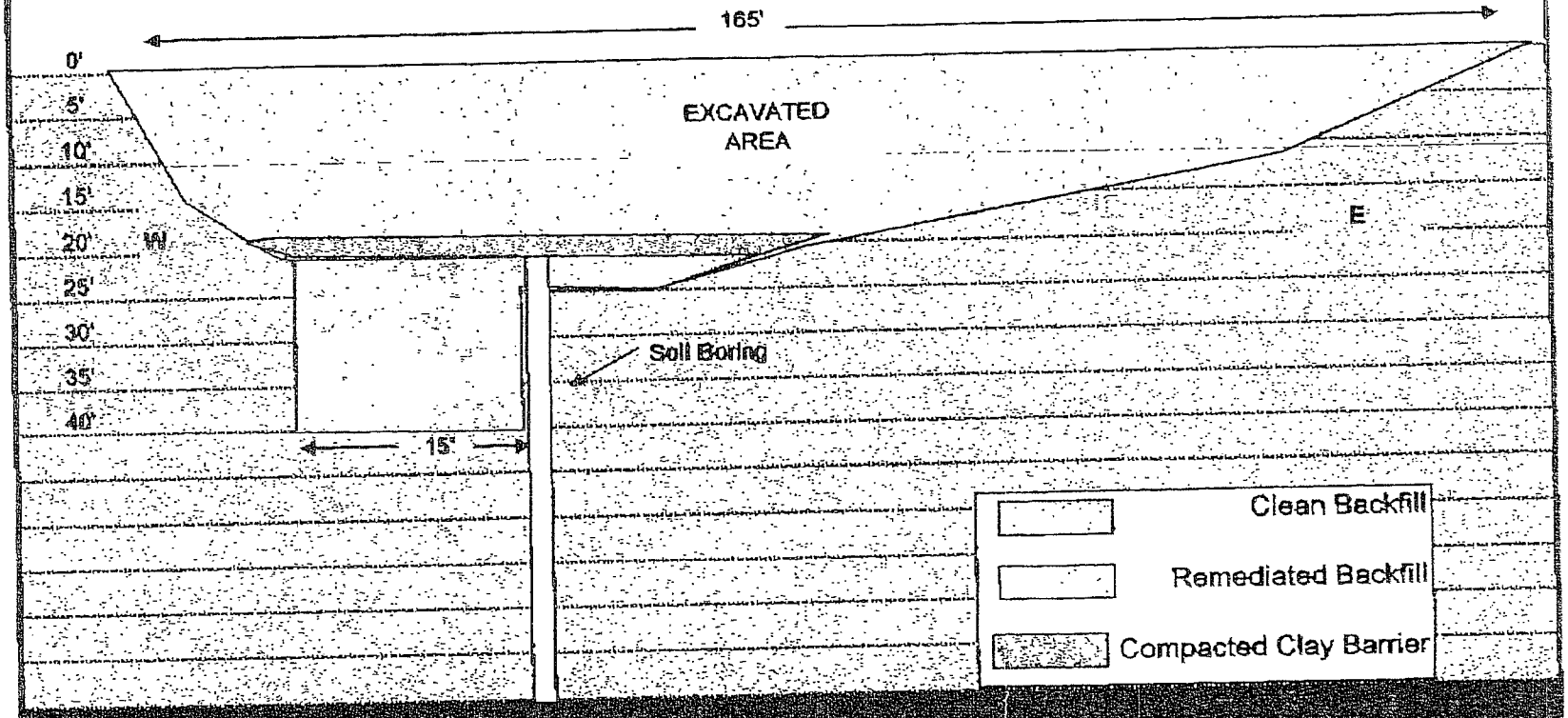
DRILLING LOG	Site Name/Location					Logged by: A. Escobar
RICE Operating Company 122 West Taylor Hobbs, New Mexico 88240 Phone: (505) 393-9174 Fax (505) 397-1471	Jct N-20 29-T21S-R37E BD SWD System Lea County, NM	Well No.: MW1 Mud Depth: 90' Casing Length: Screen Length:	Date Drilled: 11/2/00 Boring Depth: 90' Boring Diameter: 4.75" Drilling Method: Air Rotary	Driller: Eades Well Material: Casing Size: Slot Size: N/A		Construction: Backfill with bentonite and cuttings.

DEPTH	SUBSURFACE LITHOLOGY	SAMPLE TYPE	Chlorides Field	TEST (ppm) Lab	mg/kg TPH		Boring
0	Ground surface						
	Topsoil						
	Caliche						
10						excavation	
20	BORING RIG PLACEMENT						Boring Start
					Lab	Soil Boring PID	Clean Backfill
30	tan sand w/caliche	Grab		142	<10	361	
		Grab		5000	<10	366	
40	moist	Grab	3626	4160	<10	245	Cuttings
	brown sand	Grab			<10	148	
50		Grab	3245	3630	<10	139	
	sand w/caliche rocks	Grab			47	320	
60		Grab	2696	3190	12	223	
	brown sand	Grab			<10	197	
70		Grab	2899	3010	12	61	
		Grab			19	181	
80		Grab	3899	4430	21	92	
	sandstone sand & sandstone	Grab	3234	3460	<10	127	
90	sand - wet	Grab	570	576	<10	2	



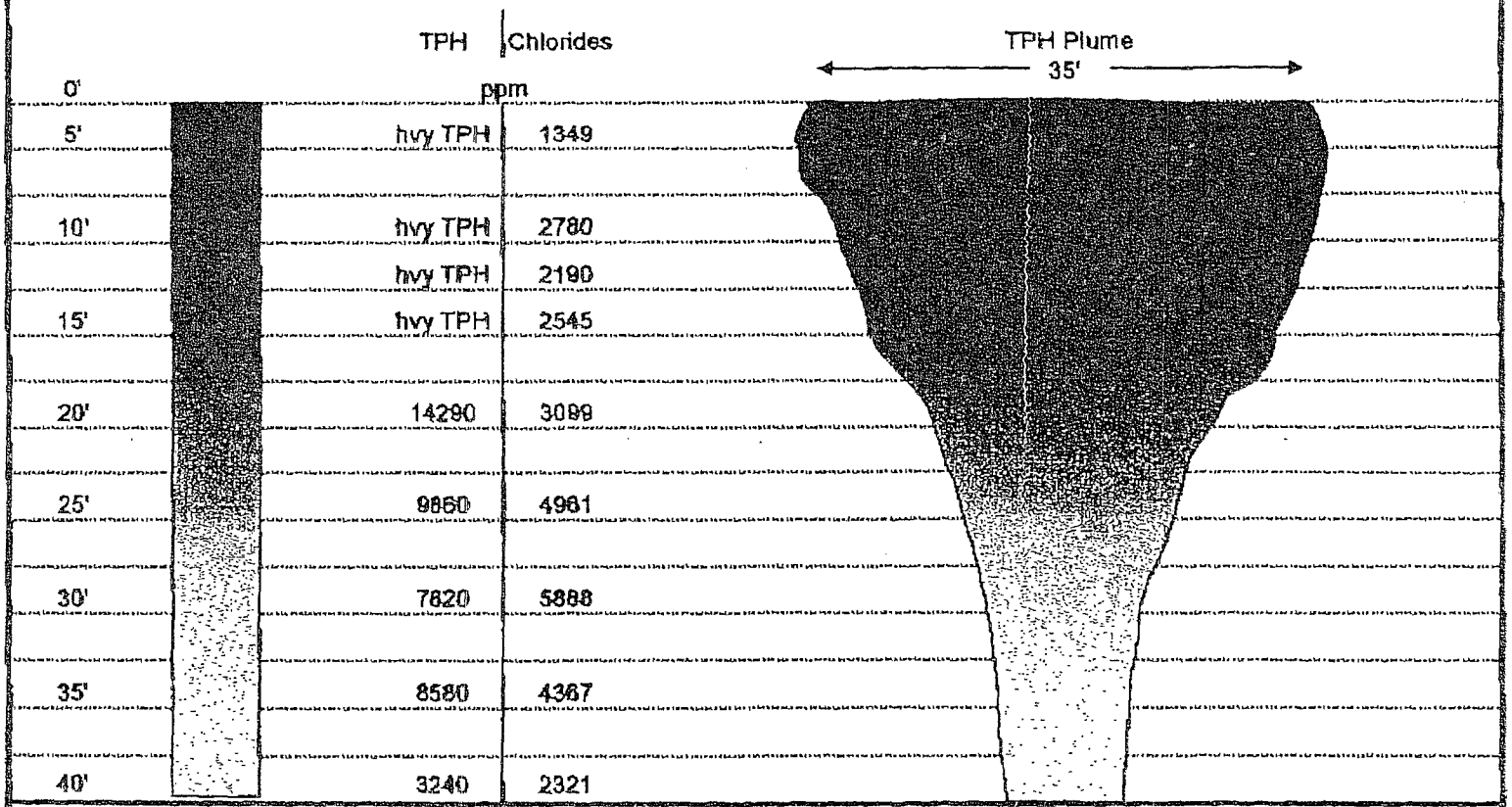
RICE OPERATING COMPANY 122 W. Taylor Hobbs, NM 88240	12/31/2002 SITE MAP **Jct. N-29**	BD SWD SYSTEM Unit Letter N, Sec 29, T21S, R37E Lea County, NM

PROFILE VIEW OF IMPACT AREA



RICE OPERATING COMPANY 122 W. Taylor Hobbs, NM 88240	12/31/2002 SITE MAP Jct. N-29	BD SWD SYSTEM Unit Letter N, Sec 29, T21S, R37E Lea County, NM

VERTICAL DELINEATION FIELD TESTS



RICE OPERATING COMPANY 122 W. Taylor Hobbs, NM 88240	12/31/2002 SITE MAP Jct. N-29	BD SWD SYSTEM Unit Letter N, Sec 29, T21S, R37E Lea County, NM

Appendix B

Potentiometric Surface Maps

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

ChevronTexaco
Additional Site Investigation
CDU Tract 19
Lea County, New Mexico

July 15, 2003

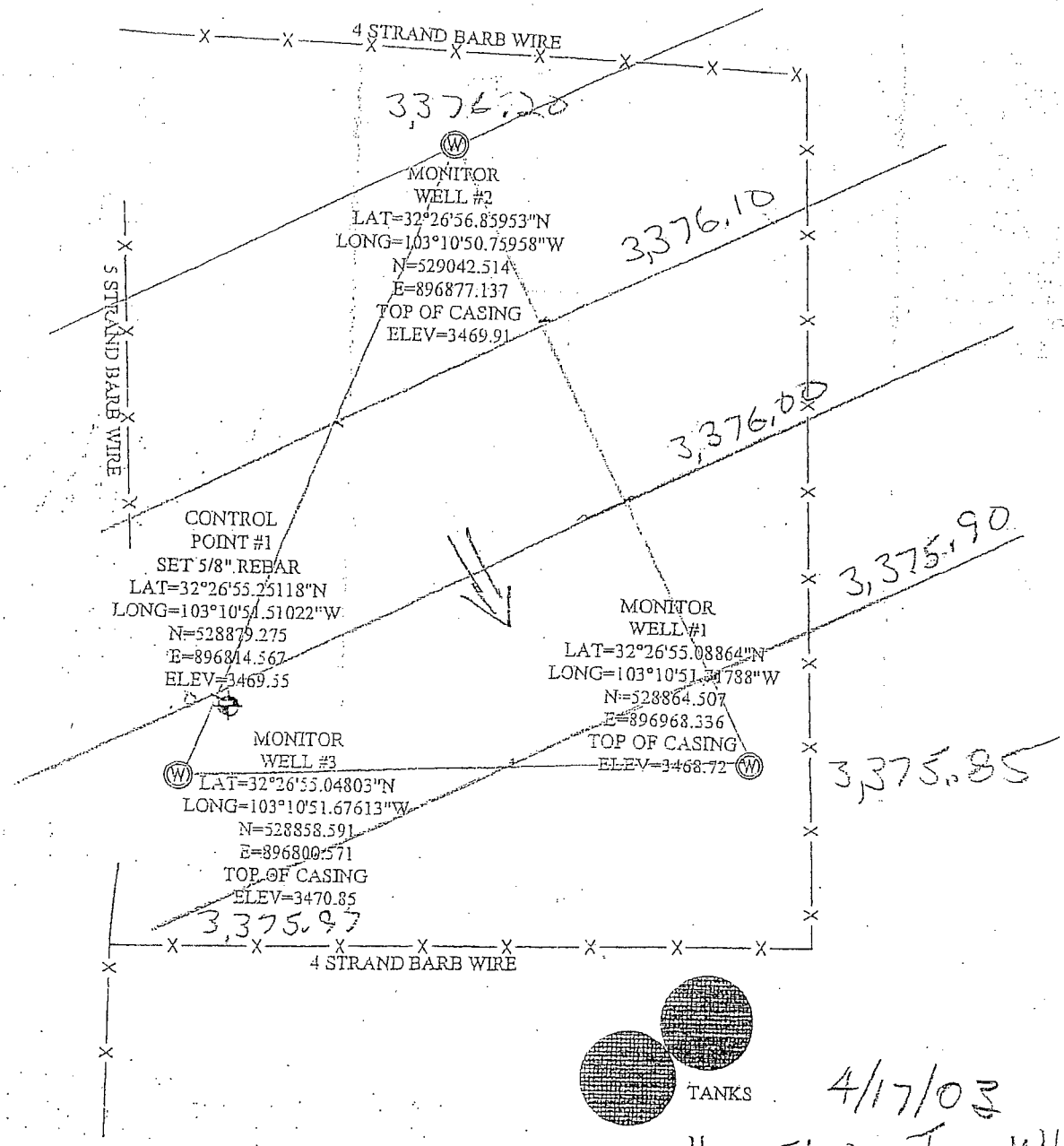
Prepared for:

ChevronTexaco
P.O. Box 1949
Eunice, New Mexico 88231

By:

Safety & Environmental Solutions, Inc.
703 E. Clinton, Suite 102
Hobbs, New Mexico 88240
(505) 397-0510

original



4/17/03

well	Elev	Tw	WL Elev.
mw-1	3468.72	92.87	3,375.85
mw-2	3469.91	93.71	3,376.20
mw-3	3470.85	94.88	3,375.97

DANIEL R. MUTH
NEW MEXICO
13239
4/30/02
REGISTERED PROFESSIONAL SURVEYOR

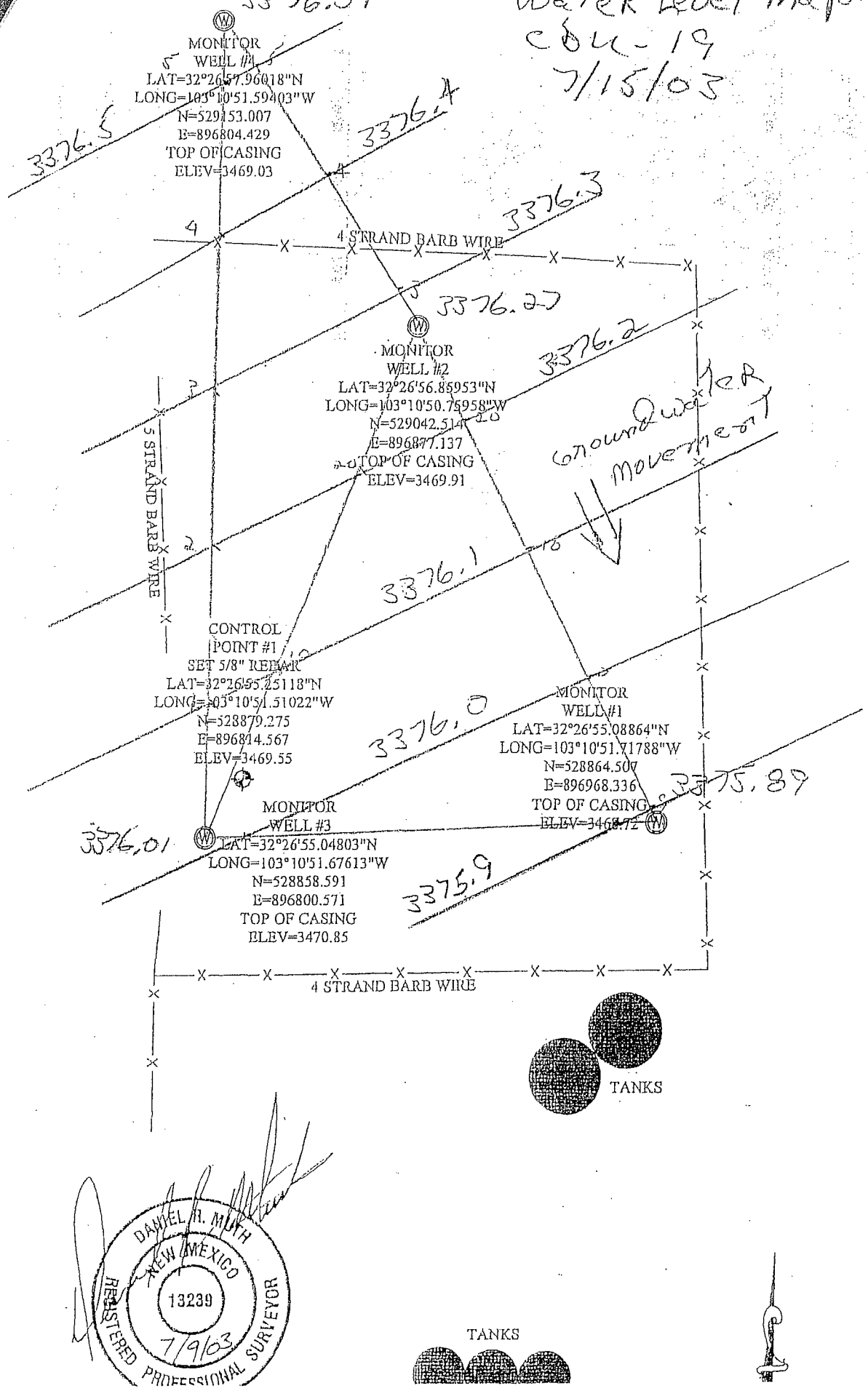
TANKS

NORTH

CBU Tract 19 Date 4/17/03

S OF BEARING:
POSITIONS WERE OBSERVED USING GLOBAL POSITIONING

SCALE 1" = 50'


Water Level Map-
COC-19
7/15/03
3376.54
MONITOR
WELL #1
LAT=32°26'57.96018"N
LONG=103°10'51.59403"W
N=529153.007
E=896804.429
TOP OF CASING
ELEV=3469.03
3376.5
3376.4
3376.3
4 STRAND BARB WIRE
3376.27
MONITOR
WELL #2
LAT=32°26'56.85953"N
LONG=103°10'50.75958"W
N=529042.514
E=896877.137
TOP OF CASING
ELEV=3469.91
3376.2
Groundwater
Movement
5 STRAND BARB WIRE
3376.1
CONTROL
POINT #1
SET 5/8" REBAR
LAT=32°26'55.25118"N
LONG=103°10'51.51022"W
N=528879.275
E=896814.567
ELEV=3469.55
3376.0
MONITOR
WELL #1
LAT=32°26'55.08864"N
LONG=103°10'51.71788"W
N=528864.500
E=896968.336
TOP OF CASING
ELEV=3468.72
3375.89
3376.01
MONITOR
WELL #3
LAT=32°26'55.04803"N
LONG=103°10'51.67613"W
N=528858.591
E=896800.571
TOP OF CASING
ELEV=3470.85
3375.9
4 STRAND BARB WIRE
TANKS
DANIEL R. MUTH
NEW MEXICO
13239
7/9/03
REGISTERED PROFESSIONAL SURVEYOR
TANKS

Appendix C

Lithologic Logs

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

Borehole/Well Log

Facility Name:	Jct N-29 BD; Rice Operating Co.	UTM/Geographic/State Plane:	UTM
Address:	3 miles west of Eunice	X:	670447.6
City, State:	Eunice, NM	Y:	3591382.9
County:	Lea	Z:	3464 ft msl
Driller:	Atkins Engineering Associates Inc.	Datum:	NAD 83
Auger Type:	4.25 Hollow Stem	Borehole ID:	B-29 BD
Auger Dia.:	8"	Well ID:	Jct N-29 BD-shallow
Drill Date:	08/11/2005	Total Depth:	100

DEPTH	W.L.	Lithology	Soil Description	Sample/ Blow Counts	PID ppm	Well Construction	Well Description
5							4"x4"x5' Well Cover
0			SM: Silty fine sand, loose, reddish tan, dry				2'x2'x4" Concrete Pad
-5			SC: Sandy clay, loose, red, damp				
-10			SM: Silty sand w/ caliche, loose, red and white,				
-15			SM: Silty fine sand, loose, red, dry				
-20							
-25			SM: Silty fine sand w/ broken sandstone, loose, tan & white, dry				
-30							
-35							
-40							
-45			SS: Cemented sandstone, firm, light tan, dry				
-50							2" PVC Casing
-55							
-60			SM: Silty sand, loose, tan, dry				
-65							Bentonite Grout
-70							
-75							
-80			SS: Sandstone, hard, light tan, dry				
-85	▼		SM: Silty sand, soft, reddish tan, wet				Bentonite Seal
-90							Screen
-95							Sand
-100							

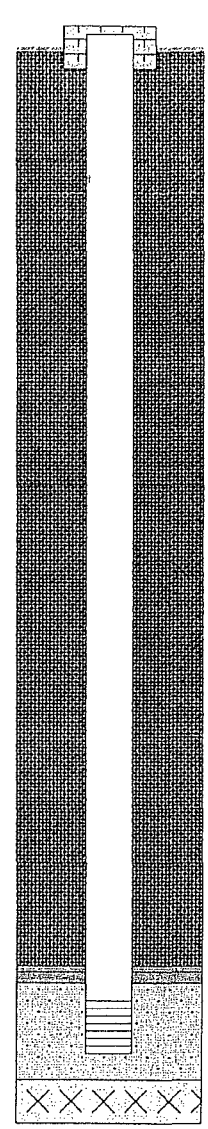
R.T. Hicks Consultants, Ltd

901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505-266-5004 Fax: 505-266-0745

Borehole/Well Log

Facility Name:	Jct N-29 BD; Rice Operating Co.	UTM/Geographic/State Plane:	UTM
Address:	3 miles west of Eunice	X:	670453.6
City, State:	Eunice, NM	Y:	3591382.9
County:	Lea	Z:	3464 ft msl
Driller:	Atkins Engineering Associates Inc.	Datum:	NAD 83
Auger Type:	4.25 Hollow Stem	Borehole ID:	B-29 BD
Auger Dia.:	8"	Well ID:	Jct N-29 BD-deep
Drill Date:	07/20/05	Total Depth:	125

DEPTH	W.L.	Lithology	Soil Description	Sample/ Blow Counts	PID ppm	Well Construction	Well Description
5							
0			SM: Silty, fine sand, loose, reddish tan, dry				
-5			SC: Sandy clay, loose, red, damp				
-10			SM: Silty sand w/caliche, loose, red and white, damp				
-15			SM: Silty fine sand, loose, reddish tan, dry				
-20							
-25			SM: Silt fine sand w/broken sandstone, loose, tan, white, dry				
-30							
-35							
-40							
-45			SS: Cemented Sandstone, firm, light tan, dry				
-50							
-55							
-60			SM: Silty fine sand, loose, tan, dry				
-65							
-70							
-75							
-80			SS: Sandstone, hard, light tan, dry				
-85	▼		SM: Silty Sand, soft, reddish tan, wet				
-90							
-95							
-100			SM: Silty sand, soft, tan, wet				
-105							
-110							
-115			SC: Clayey sand, soft, reddish tan, wet				
-120			CL: Clay, stiff, red, moist				
-125							



4"x4"x5' Well Cover
2'x2'x4" Concrete Pad

2" PVC Casing

Bentonite Grout

Bentonite Seal

Screen

Sand

Cuttings and silica

R.T. Hicks Consultants, Ltd

901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505-266-5004 Fax: 505-266-0745

Appendix D

Chemical Analyses

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

ENVIRONMENTAL LAB OF
[illegible]

Analytical Report

Prepared for:

Kristin Farris-Pope

Rice Operating Co.

122 W. Taylor

Hobbs, NM 88240

Project: BD Jct. N-29

Project Number: None Given

Location: T21S-R37E-Sec.29N, Lea County, NM

Lab Order Number: 6J10003

Report Date: 10/23/06

Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Monitor Well #1- Deep	6J10003-01	Water	10/05/06 13:40	10-09-2006 17:20
Monitor Well #1- Shallow	6J10003-02	Water	10/05/06 14:35	10-09-2006 17:20

12600 West I-20 East - Odessa, Texas 79705 - (432) 563-1800 - Fax (432) 563-1713

Rice Operating Co.
122 W. Taylor
Hobbs NM, 88240

Project: BD Jct. N-29
Project Number: None Given
Project Manager: Kristin Farris-Pope

Fax: (505) 397-1471

Organics by GC

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Monitor Well #1- Deep (6J10003-01) Water									
Benzene	ND	0.00100	mg/L	1	EJ61407	10/14/06	10/15/06	EPA 8021B	
Toluene	ND	0.00100	"	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	"	
Xylene (p/m)	ND	0.00100	"	"	"	"	"	"	
Xylene (o)	ND	0.00100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*81.5 %*		*80-120*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*82.8 %*		*80-120*	"	"	"	"	
Monitor Well #1- Shallow (6J10003-02) Water									
Benzene	ND	0.00100	mg/L	1	EJ61407	10/14/06	10/15/06	EPA 8021B	
Toluene	ND	0.00100	"	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	"	
Xylene (p/m)	ND	0.00100	"	"	"	"	"	"	
Xylene (o)	ND	0.00100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*81.0 %*		*80-120*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*87.5 %*		*80-120*	"	"	"	"	

Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	

General Chemistry Parameters by EPA / Standard Methods

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Monitor Well #1- Deep (6J10003-01) Water									
Total Alkalinity	**240**	2.00	mg/L	1	EJ61011	10/10/06	10/10/06	EPA 310.1M	
Chloride	**54.5**	5.00	"	10	EJ61103	10/10/06	10/10/06	EPA 300.0	
Total Dissolved Solids	**520**	10.0	"	1	EJ61016	10/10/06	10/11/06	EPA 160.1	
Sulfate	**92.7**	5.00	"	10	EJ61103	10/10/06	10/10/06	EPA 300.0	
Monitor Well #1- Shallow (6J10003-02) Water									
Total Alkalinity	**216**	2.00	mg/L	1	EJ61011	10/10/06	10/10/06	EPA 310.1M	
Chloride	**70.1**	5.00	"	10	EJ61103	10/10/06	10/10/06	EPA 300.0	
Total Dissolved Solids	**534**	10.0	"	1	EJ61016	10/10/06	10/11/06	EPA 160.1	
Sulfate	**87.2**	5.00	"	10	EJ61103	10/10/06	10/10/06	EPA 300.0	

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Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	

Total Metals by EPA / Standard Methods

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Monitor Well #1- Deep (6J10003-01) Water									
Calcium	**28.7**	0.810	mg/L	10	EJ61107	10/11/06	10/11/06	EPA 6010B	
Magnesium	**17.1**	0.360	"	"	"	"	"	"	
Potassium	**10.8**	0.600	"	"	"	"	"	"	
Sodium	**102**	2.15	"	50	"	"	"	"	
Monitor Well #1- Shallow (6J10003-02) Water									
Calcium	**45.0**	0.810	mg/L	10	EJ61107	10/11/06	10/11/06	EPA 6010B	
Magnesium	**24.1**	0.360	"	"	"	"	"	"	
Potassium	**4.95**	0.600	"	"	"	"	"	"	
Sodium	**84.3**	0.430	"	"	"	"	"	"	

12600 West I-20 East - Odessa, Texas 79705 - (432) 563-1800 - Fax (432) 563-1713

Rice Operating Co.
122 W. Taylor
Hobbs NM, 88240

Project: BD Jct. N-29
Project Number: None Given
Project Manager: Kristin Farris-Pope

Fax: (505) 397-1471

Organics by GC - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EJ61407 - EPA 5030C (GC)										
Blank (EJ61407-BLK1)				Prepared: 10/14/06 Analyzed: 10/15/06						
Benzene	ND	0.00100	mg/L							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00100	"							
Xylene (o)	ND	0.00100	"							
Surrogate: a,a,a-Trifluorotoluene	*33.5*		*ug/l*	*40.0*		*83.8*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*35.0*		*"*	*40.0*		*87.5*	*80-120*			
LCS (EJ61407-BS1)				Prepared: 10/14/06 Analyzed: 10/15/06						
Benzene	0.0451	0.00100	mg/L	0.0500		90.2	80-120			
Toluene	0.0430	0.00100	"	0.0500		86.0	80-120			
Ethylbenzene	*0.0513*	*0.00100*	"	*0.0500*		*103*	80-120			
Xylene (p/m)	0.0929	0.00100	"	0.100		92.9	80-120			
Xylene (o)	0.0423	0.00100	"	0.0500		84.6	80-120			
Surrogate: a,a,a-Trifluorotoluene	*34.4*		*ug/l*	*40.0*		*86.0*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*43.8*		*"*	*40.0*		*110*	*80-120*			
Calibration Check (EJ61407-CCV1)				Prepared: 10/14/06 Analyzed: 10/17/06						
Benzene	49.9		ug/l	50.0		99.8	80-120			
Toluene	43.1		"	50.0		86.2	80-120			
Ethylbenzene	42.0		"	50.0		84.0	80-120			
Xylene (p/m)	83.7		"	100		83.7	80-120			
Xylene (o)	41.2		"	50.0		82.4	80-120			
Surrogate: a,a,a-Trifluorotoluene	*36.1*		*"*	*40.0*		*90.2*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*34.3*		*"*	*40.0*		*85.8*	*80-120*			
Matrix Spike (EJ61407-MS1)	**Source: 6J12015-01**			Prepared: 10/14/06 Analyzed: 10/17/06						
Benzene	0.0501	0.00100	mg/L	0.0500	ND	100	80-120			
Toluene	0.0440	0.00100	"	0.0500	ND	88.0	80-120			
Ethylbenzene	0.0416	0.00100	"	0.0500	ND	83.2	80-120			
Xylene (p/m)	0.0914	0.00100	"	0.100	ND	91.4	80-120			
Xylene (o)	0.0427	0.00100	"	0.0500	ND	85.4	80-120			
Surrogate: a,a,a-Trifluorotoluene	*35.5*		*ug/l*	*40.0*		*88.8*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*40.2*		*"*	*40.0*		*100*	*80-120*			

Organics by GC - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EJ61407 - EPA 5030C (GC)										
Matrix Spike Dup (EJ61407-MSD1)	**Source: 6J12015-01**			Prepared: 10/14/06 Analyzed: 10/17/06						
Benzene	0.0502	0.00100	mg/L	0.0500	ND	100	80-120	0.00	20	
Toluene	0.0442	0.00100	"	0.0500	ND	88.4	80-120	0.454	20	
Ethylbenzene	0.0412	0.00100	"	0.0500	ND	82.4	80-120	0.966	20	
Xylene (p/m)	0.0913	0.00100	"	0.100	ND	91.3	80-120	0.109	20	
Xylene (o)	0.0437	0.00100	"	0.0500	ND	87.4	80-120	2.31	20	
Surrogate: a,a,a-Trifluorotoluene	*35.4*		*ug/l*	*40.0*		*88.5*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*41.0*		*"*	*40.0*		*102*	*80-120*			

Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EJ61011 - General Preparation (WetChem)										
Blank (EJ61011-BLK1)				Prepared & Analyzed: 10/10/06						
Total Alkalinity	ND	2.00	mg/L							
LCS (EJ61011-BS1)				Prepared & Analyzed: 10/10/06						
Total Alkalinity	190	2.00	mg/L	200		95.0	85-115			
Duplicate (EJ61011-DUP1)	**Source: 6J09002-01**			Prepared & Analyzed: 10/10/06						
Total Alkalinity	248	2.00	mg/L		244			1.63	20	
Reference (EJ61011-SRM1)				Prepared & Analyzed: 10/10/06						
Total Alkalinity	250		mg/L	250		100	90-110			
Batch EJ61016 - Filtration Preparation										
Blank (EJ61016-BLK1)				Prepared: 10/10/06 Analyzed: 10/11/06						
Total Dissolved Solids	ND	10.0	mg/L							
Duplicate (EJ61016-DUP1)	**Source: 6J09002-01**			Prepared: 10/10/06 Analyzed: 10/11/06						
Total Dissolved Solids	1570	10.0	mg/L		1590			1.27	5	
Duplicate (EJ61016-DUP2)	**Source: 6J10002-03**			Prepared: 10/10/06 Analyzed: 10/11/06						
Total Dissolved Solids	3910	10.0	mg/L		3900			0.256	5	
Batch EJ61103 - General Preparation (WetChem)										
Blank (EJ61103-BLK1)				Prepared & Analyzed: 10/10/06						
Sulfate	ND	0.500	mg/L							
Chloride	ND	0.500	"							

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EJ61103 - General Preparation (WetChem)										
LCS (EJ61103-BS1)				Prepared & Analyzed: 10/10/06						
Chloride	10.8	0.500	mg/L	10.0		108	80-120			
Sulfate	10.3	0.500	"	10.0		103	80-120			
Calibration Check (EJ61103-CCV1)				Prepared & Analyzed: 10/10/06						
Chloride	10.5		mg/L	10.0		105	80-120			
Sulfate	10.2		"	10.0		102	80-120			
Duplicate (EJ61103-DUP1)	**Source: 6J10001-01**			Prepared & Analyzed: 10/10/06						
Sulfate	324	12.5	mg/L		315			2.82	20	
Chloride	506	12.5	"		494			2.40	20	
Duplicate (EJ61103-DUP2)	**Source: 6J10003-02**			Prepared & Analyzed: 10/10/06						
Sulfate	88.3	5.00	mg/L		87.2			1.25	20	
Chloride	69.2	5.00	"		70.1			1.29	20	
Matrix Spike (EJ61103-MS1)	**Source: 6J10001-01**			Prepared & Analyzed: 10/10/06						
Chloride	773	12.5	mg/L	250	494	112	80-120			
Sulfate	541	12.5	"	250	315	90.4	80-120			
Matrix Spike (EJ61103-MS2)	**Source: 6J10003-02**			Prepared & Analyzed: 10/10/06						
Chloride	185	5.00	mg/L	100	70.1	115	80-120			
Sulfate	182	5.00	"	100	87.2	94.8	80-120			

Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	

Total Metals by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EJ61107 - 6010B/No Digestion										
Blank (EJ61107-BLK1)				Prepared & Analyzed: 10/11/06						
Calcium	ND	0.0810	mg/L							
Magnesium	ND	0.0360	"							
Potassium	ND	0.0600	"							
Sodium	ND	0.0430	"							
Calibration Check (EJ61107-CCV1)				Prepared & Analyzed: 10/11/06						
Calcium	2.01		mg/L	2.00		100	85-115			
Magnesium	2.17		"	2.00		108	85-115			
Potassium	1.78		"	2.00		89.0	85-115			
Sodium	1.77		"	2.00		88.5	85-115			
Duplicate (EJ61107-DUP1)	**Source: 6J09002-01**			Prepared & Analyzed: 10/11/06						
Calcium	214	4.05	mg/L		213			0.468	20	
Magnesium	82.1	1.80	"		84.4			2.76	20	
Potassium	10.8	0.600	"		10.4			3.77	20	
Sodium	90.4	2.15	"		90.0			0.443	20	

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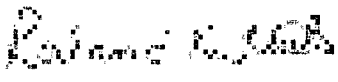
Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Report Approved By:  Date: 10/23/2006

Raland K. Tuttle, Lab Manager
Celey D. Keene, Lab Director, Org. Tech Director
Peggy Allen, QA Officer
Jeanne Mc Murrey, Inorg. Tech Director
LaTasha Cornish, Chemist
Sandra Sanchez, Lab Tech.

Environmental Lab of Texas

12600 West I-20 East
Odessa, Texas 79765
Phone: 432-563-1800
Fax: 432-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Kristin Farris Pope kpope@riceswd.com
Company Name: RICE Operating Company
Company Address: 122 W. Taylor Street
City/State/Zip: Hobbs, New Mexico 88240
Telephone No: (505) 393-9174 Fax No: (505) 397-1471
Sampler Signature: Rozanne Johnson (505) 631-9310
Email: rozanne@valornet.com

Project Name: BD Junction N-29
Project Number:
Project Loc: T21S-R37E-Sec29N, Lea County NM
PO Number:

LAB # (lab use only)	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	Preservative: HNO_3	Preservative: HCl (2) 40 ml glass vials	Preservative: NaOH	Preservative: H_2SO_4	Preservative: None (1) 1 Liter HDPE	Preservative: Other (Specify)	Matrix: Water	Matrix: Sludge	Matrix: Soil	Matrix: Other (specify):	Analyze For: TPH: 418.1 8015M 1005	Cations (Ca, Mg, Na, K)	Anions (Cl, SO_4, CO_3, HCO3)	SAR / ESP / CEC	Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles	Semivolatiles	BTEX 8021B/5030	RCI	N.O.R.M.	Total Dissolved Solids				RUSH TAT (Pre-Schedule)	Standard TAT
01	Monitor Well #1~ Deep	10/5/2006	13:40	3	X		2			1		X					X	X					X			X					X
02	Monitor Well #2 ~ Shallow	10/5/2006	14:35	3	X		2			1		X					X	X					X			X					X

TCLP:
TOTAL: X

Special Instructions:
PLEASE Email RESULTS TO: kpope@riceswd.com; mfranks@riceswd.com
rozanne@valornet.com

Sample Containers Intact? Y N
Labels on container? Y N
Custody Seals: Containers Coolers
Temperature Upon Receipt: 3.5 C

Laboratory Comments:

Relinquished by:	Date	Time	Received by:	Date	Time
Rozanne Johnson	10-9-06	12:45		10/9/06	12:46
Relinquished by:	Date	Time	Received by ELOT:	Date	Time
	10/9/06	17:20		10-09-06	1720

Environmental Lab of Texas

Variance/ Corrective Action Report- Sample Log-In

ient: Rice Op.

ate/ Time: 10/9/08 17:20

ab ID # : 610003

itials: DK

Sample Receipt Checklist

					Client Initials
1	Temperature of container/ cooler?	Yes	No	3.5 °C	
2	Shipping container in good condition?	Yes	No		
3	Custody Seals intact on shipping container/ cooler?	Yes	No	Not Present	
4	Custody Seals intact on sample bottles/ container?	Yes	No	Not Present	
5	Chain of Custody present?	Yes	No		
6	Sample instructions complete of Chain of Custody?	Yes	No		
7	Chain of Custody signed when relinquished/ received?	Yes	No		
8	Chain of Custody agrees with sample label(s)?	Yes	No	ID written on Cont./ Lid	
9	Container label(s) legible and intact?	Yes	No	Not Applicable	
10	Sample matrix/ properties agree with Chain of Custody?	Yes	No		
11	Containers supplied by ELOT?	Yes	No		
12	Samples in proper container/ bottle?	Yes	No	See Below	
13	Samples properly preserved?	Yes	No	See Below	
14	Sample bottles intact?	Yes	No		
15	Preservations documented on Chain of Custody?	Yes	No		
16	Containers documented on Chain of Custody?	Yes	No		
17	Sufficient sample amount for indicated test(s)?	Yes	No	See Below	
18	All samples received within sufficient hold time?	Yes	No	See Below	
19	VOC samples have zero headspace?	Yes	No	Not Applicable	

Variance Documentation

Contact: _____ Contacted by: _____ Date/ Time: _____

Regarding: _____

Corrective Action Taken: _____

Check all that Apply:

- ☐ See attached e-mail/ fax
- ☐ Client understands and would like to proceed with analysis
- ☐ Cooling process had begun shortly after sampling event

ENVIRONMENTAL LAB OF
[illegible]

Analytical Report

Prepared for:

Kristin Farris-Pope

Rice Operating Co.

122 W. Taylor

Hobbs, NM 88240

Project: BD Jct. N-29

Project Number: None Given

Location: Lea County

Lab Order Number: 6D20005

Report Date: 05/01/06

Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	**Reported:**
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	05/01/06 11:42

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Monitor Well #1- Deep	6D20005-01	Water	04/17/06 14:10	04/20/06 15:05
Monitor Well #2- Shallow	6D20005-02	Water	04/17/06 15:25	04/20/06 15:05

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Organics by GC

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Monitor Well #1- Deep (6D20005-01) Water									
Benzene	ND	0.00100	mg/L	1	ED62105	04/21/06	04/21/06	EPA 8021B	
Toluene	ND	0.00100	"	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	"	
Xylene (p/m)	ND	0.00100	"	"	"	"	"	"	
Xylene (o)	ND	0.00100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*97.0 %*	*80-120*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*102 %*	*80-120*		"	"	"	"	
Monitor Well #2- Shallow (6D20005-02) Water									
Benzene	ND	0.00100	mg/L	1	ED62105	04/21/06	04/21/06	EPA 8021B	
Toluene	ND	0.00100	"	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	"	
Xylene (p/m)	ND	0.00100	"	"	"	"	"	"	
Xylene (o)	ND	0.00100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*95.0 %*	*80-120*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*100 %*	*80-120*		"	"	"	"	

Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	**Reported:**
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	05/01/06 11:42

General Chemistry Parameters by EPA / Standard Methods

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Monitor Well #1- Deep (6D20005-01) Water									
Total Alkalinity	**198**	2.00	mg/L	1	ED62402	04/25/06	04/25/06	EPA 310.1M	
Chloride	**55.9**	5.00	"	10	ED62120	04/24/06	04/24/06	EPA 300.0	
Total Dissolved Solids	**502**	5.00	"	1	ED62405	04/20/06	04/21/06	EPA 160.1	
Sulfate	**86.4**	5.00	"	10	ED62120	04/24/06	04/24/06	EPA 300.0	
Monitor Well #2- Shallow (6D20005-02) Water									
Total Alkalinity	**188**	2.00	mg/L	1	ED62402	04/25/06	04/25/06	EPA 310.1M	
Chloride	**79.2**	5.00	"	10	ED62120	04/24/06	04/24/06	EPA 300.0	
Total Dissolved Solids	**584**	5.00	"	1	ED62405	04/20/06	04/21/06	EPA 160.1	
Sulfate	**80.4**	5.00	"	10	ED62120	04/24/06	04/24/06	EPA 300.0	

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Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	**Reported:**
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	05/01/06 11:42

Total Metals by EPA / Standard Methods

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Monitor Well #1- Deep (6D20005-01) Water									
Calcium	**28.8**	0.100	mg/L	10	ED62106	04/21/06	04/21/06	EPA 6010B	
Magnesium	**13.4**	0.0100	"	"	"	"	"	"	
Potassium	**10.0**	0.500	"	"	"	"	"	"	
Sodium	**122**	0.500	"	50	"	"	"	"	
Monitor Well #2- Shallow (6D20005-02) Water									
Calcium	**49.9**	0.100	mg/L	10	ED62106	04/21/06	04/21/06	EPA 6010B	
Magnesium	**24.2**	0.0100	"	"	"	"	"	"	
Potassium	**5.20**	0.500	"	"	"	"	"	"	
Sodium	**80.1**	0.500	"	50	"	"	"	"	

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Organics by GC - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch ED62105 - EPA 5030C (GC)										
Blank (ED62105-BLK1)				Prepared & Analyzed: 04/21/06						
Benzene	ND	0.00100	mg/L							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00100	"							
Xylene (o)	ND	0.00100	"							
Surrogate: a,a,a-Trifluorotoluene	*42.2*		*ug/l*	*40.0*		*106*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*44.5*		*"*	*40.0*		*111*	*80-120*			
LCS (ED62105-BS1)				Prepared & Analyzed: 04/21/06						
Benzene	0.0477	0.00100	mg/L	0.0500		95.4	80-120			
Toluene	0.0506	0.00100	"	0.0500		101	80-120			
Ethylbenzene	0.0523	0.00100	"	0.0500		105	80-120			
Xylene (p/m)	0.117	0.00100	"	0.100		117	80-120			
Xylene (o)	0.0580	0.00100	"	0.0500		116	80-120			
Surrogate: a,a,a-Trifluorotoluene	*37.5*		*ug/l*	*40.0*		*93.8*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*41.1*		*"*	*40.0*		*103*	*80-120*			
Calibration Check (ED62105-CCV1)				Prepared: 04/21/06 Analyzed: 04/23/06						
Benzene	54.3		ug/l	50.0		109	80-120			
Toluene	53.4		"	50.0		107	80-120			
Ethylbenzene	57.0		"	50.0		114	80-120			
Xylene (p/m)	115		"	100		115	80-120			
Xylene (o)	56.7		"	50.0		113	80-120			
Surrogate: a,a,a-Trifluorotoluene	*34.8*		*"*	*40.0*		*87.0*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*37.6*		*"*	*40.0*		*94.0*	*80-120*			
Matrix Spike (ED62105-MS1)	**Source: 6D17002-02**			Prepared & Analyzed: 04/21/06						
Benzene	0.0508	0.00100	mg/L	0.0500	ND	102	80-120			
Toluene	0.0537	0.00100	"	0.0500	ND	107	80-120			
Ethylbenzene	0.0579	0.00100	"	0.0500	ND	116	80-120			
Xylene (p/m)	0.120	0.00100	"	0.100	ND	120	80-120			
Xylene (o)	0.0581	0.00100	"	0.0500	ND	116	80-120			
Surrogate: a,a,a-Trifluorotoluene	*41.9*		*ug/l*	*40.0*		*105*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*47.3*		*"*	*40.0*		*118*	*80-120*			

Organics by GC - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch ED62105 - EPA 5030C (GC)										
Matrix Spike Dup (ED62105-MSD1)	**Source: 6D17002-02**			Prepared & Analyzed: 04/21/06						
Benzene	0.0514	0.00100	mg/L	0.0500	ND	103	80-120	0.976	20	
Toluene	0.0540	0.00100	"	0.0500	ND	108	80-120	0.930	20	
Ethylbenzene	0.0567	0.00100	"	0.0500	ND	113	80-120	2.62	20	
Xylene (p/m)	0.119	0.00100	"	0.100	ND	119	80-120	0.837	20	
Xylene (o)	0.0596	0.00100	"	0.0500	ND	119	80-120	2.55	20	
Surrogate: a,a,a-Trifluorotoluene	*39.2*		*ug/l*	*40.0*		*98.0*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*45.9*		"	*40.0*		*115*	*80-120*			

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch ED62120 - General Preparation (WetChem)										
Blank (ED62120-BLK1)				Prepared & Analyzed: 04/24/06						
Sulfate	ND	0.500	mg/L							
Chloride	ND	0.500	"							
LCS (ED62120-BS1)				Prepared & Analyzed: 04/24/06						
Sulfate	8.76		mg/L	10.0		87.6	80-120			
Chloride	9.01		"	10.0		90.1	80-120			
Calibration Check (ED62120-CCV1)				Prepared & Analyzed: 04/24/06						
Sulfate	9.38		mg/L	10.0		93.8	80-120			
Chloride	9.40		"	10.0		94.0	80-120			
Duplicate (ED62120-DUP1)	**Source: 6D20005-01**			Prepared & Analyzed: 04/24/06						
Sulfate	86.7	5.00	mg/L		86.4			0.347	20	
Chloride	56.7	5.00	"		55.9			1.42	20	
Batch ED62402 - General Preparation (WetChem)										
Blank (ED62402-BLK1)				Prepared & Analyzed: 04/25/06						
Total Alkalinity	ND	2.00	mg/L							
LCS (ED62402-BS1)				Prepared & Analyzed: 04/25/06						
Bicarbonate Alkalinity	214	2.00	mg/L	200		107	85-115			
Duplicate (ED62402-DUP1)	**Source: 6D20005-01**			Prepared & Analyzed: 04/25/06						
Total Alkalinity	197	2.00	mg/L		198			0.506	20	
Reference (ED62402-SRM1)				Prepared & Analyzed: 04/25/06						
Total Alkalinity	97.0		mg/L	100		97.0	90-110			

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch ED62405 - Filtration Preparation										
Blank (ED62405-BLK1)				Prepared: 04/20/06 Analyzed: 04/21/06						
Total Dissolved Solids	ND	5.00	mg/L							
Duplicate (ED62405-DUP1)		**Source: 6D20006-01**		Prepared: 04/20/06 Analyzed: 04/21/06						
Total Dissolved Solids	2390	5.00	mg/L		2290			4.27	5	

Total Metals by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch ED62106 - 6010B/No Digestion										
Blank (ED62106-BLK1)				Prepared & Analyzed: 04/21/06						
Calcium	ND	0.0100	mg/L							
Magnesium	ND	0.00100	"							
Potassium	ND	0.0500	"							
Sodium	ND	0.0100	"							
Calibration Check (ED62106-CCV1)				Prepared & Analyzed: 04/21/06						
Calcium	1.98		mg/L	2.00		99.0	85-115			
Magnesium	2.10		"	2.00		105	85-115			
Potassium	2.06		"	2.00		103	85-115			
Sodium	2.06		"	2.00		103	85-115			
Duplicate (ED62106-DUP1)	**Source: 6D20005-01**			Prepared & Analyzed: 04/21/06						
Calcium	25.1	0.100	mg/L		28.8			13.7	20	
Magnesium	15.9	0.0100	"		13.4			17.1	20	
Potassium	8.87	0.500	"		10.0			12.0	20	
Sodium	122	0.500	"		122			0.00	20	

Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	**Reported:**
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	05/01/06 11:42

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Report Approved By: _____ Date: 5/1/2006

Raland K. Tuttle, Lab Manager
Celey D. Keene, Lab Director, Org. Tech Director
Peggy Allen, QA Officer
Jeanne Mc Murrey, Inorg. Tech Director
LaTasha Cornish, Chemist
Sandra Sanchez, Lab Tech.

Environmental Lab of Texas

12600 West I-20 East
Odessa, Texas 79765

Phone: 432-563-1800
Fax: 432-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Kristin Farris Pope kpope@riceswd.com

Company Name: RICE Operating Company

Company Address: 122 W. Taylor Street

City/State/Zip: Hobbs, New Mexico 88240

Telephone No: (505) 393-9174

Fax No: (505) 397-1471

Sampler Signature: Rozanne Johnson (505) 631-9310

Email: rozanne@valornet.com

Project Name: BD Jct. N-29

Project #:

Project Loc: Lea County

PO #:

Analyze For: TCLP: / TOTAL: X (BTEX 8021B/5030)

LAB # (lab use only)	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	HNO_3	HCl (2) 40 ml glass vials	NaOH	H_2SO_4	None (1) 1 Liter HDPE	Other (Specify)	Matrix: Water	Sludge	Soil	Other (specify):	TPH: 418.1 8015M 1005 1006	Cations (Ca, Mg, Na, K)	Anions (Cl, SO4, CO3, HCO3)	SAR / ESP / CEC	Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles	Semivolatiles	BTEX 8021B/5030	RCI	N.O.R.M.	Total Dissolved Solids				RUSH TAT (Pre-Schedule)	Standard TAT
-01	Monitor Well #1 - Deep	4/17/2006	14:10	3	X		2			1		X					X	X					X			X					X
-02	Monitor Well #2 - Shallow	4/17/2006	15:25	3	X		2			1		X					X	X					X			X					X

Special Instructions:

PLEASE Email RESULTS TO: kpope@riceswd.com & mfranks@riceswd.com

Sample Containers Intact? Y N
Labels on container? Y N
Custody Seals: Containers / Cooler
Temperature Upon Receipt:

Laboratory Comments: 2.5

Relinquished by:	Date	Time	Received by:	Date	Time
Rozanne Johnson	4/20/06	15:05			
Relinquished by:	Date	Time	Received by ELOT:	4/20/06	15:05

Environmental Lab of Texas
Variance / Corrective Action Report – Sample Log-In

Client: Rice Op.

Date/Time: 4/20/00 15:05

Order #: 160020005

Initials: CK

Sample Receipt Checklist

Temperature of container/cooler?	Yes	No	2.5 C
Shipping container/cooler in good condition?	Yes	No	
Custody Seals intact on shipping container/cooler?	Yes	No	Not present
Custody Seals intact on sample bottles?	Yes	No	Not present
Chain of custody present?	Yes	No	
Sample Instructions complete on Chain of Custody?	Yes	No	
Chain of Custody signed when relinquished and received?	Yes	No	
Chain of custody agrees with sample label(s)	Yes	No	
Container labels legible and intact?	Yes	No	
Sample Matrix and properties same as on chain of custody?	Yes	No	
Samples in proper container/bottle?	Yes	No	
Samples properly preserved?	Yes	No	
Sample bottles intact?	Yes	No	
Preservations documented on Chain of Custody?	Yes	No	
Containers documented on Chain of Custody?	Yes	No	
Sufficient sample amount for indicated test?	Yes	No	
All samples received within sufficient hold time?	Yes	No	
VOC samples have zero headspace?	Yes	No	Not Applicable

Other observations:

_____

_____

_____

Variance Documentation:

Contact Person: _____ Date/Time: _____ Contacted by: _____

Regarding:

_____

_____

_____

Corrective Action Taken:

_____

_____

_____

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_____

_____

_____

_____

TRACEANALYSIS, INC.

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

Analytical and Quality Control Report

Kristen Farris-Pope
Rice Operating Company
122 W Taylor Street
Hobbs, NM, 88240

Report Date: July 21, 2006

Work Order: 6071304

Project Location: Lea County,NM
Project Name: BD Junction N-29
Project Number: BD Junction N-29

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
94976	Monitor Well-1 Deep	water	2006-07-12	09:30	2006-07-12
94977	Monitor Well-2 Shallow	water	2006-07-12	11:20	2006-07-12

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 94976 - Monitor Well-1 Deep

Analysis:	Alkalinity	Analytical Method:	SM 2320B	Prep Method:	N/A
QC Batch:	28009	Date Analyzed:	2006-07-14	Analyzed By:	LJ
Prep Batch:	24539	Sample Preparation:	2006-07-14	Prepared By:	LJ

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1	1.00
Bicarbonate Alkalinity		**232**	mg/L as CaCo3	1	4.00
Total Alkalinity		**232**	mg/L as CaCo3	1	4.00

Sample: 94976 - Monitor Well-1 Deep

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	27996	Date Analyzed:	2006-07-13	Analyzed By:	KB
Prep Batch:	24529	Sample Preparation:	2006-07-13	Prepared By:	KB

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0998	mg/L	1	0.100	100	66.2 - 127.7
4-Bromofluorobenzene (4-BFB)		0.0864	mg/L	1	0.100	86	70.6 - 129.2

Sample: 94976 - Monitor Well-1 Deep

Analysis:	Cations	Analytical Method:	S 6010B	Prep Method:	S 3005A
QC Batch:	28124	Date Analyzed:	2006-07-18	Analyzed By:	TP
Prep Batch:	24582	Sample Preparation:	2006-07-17	Prepared By:	TS

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		**34.2**	mg/L	1	0.500
Dissolved Potassium		**13.8**	mg/L	1	1.00
Dissolved Magnesium		**18.8**	mg/L	1	1.00
Dissolved Sodium		**128**	mg/L	10	1.00

Sample: 94976 - Monitor Well-1 Deep

Analysis:	Ion Chromatography	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	28175	Date Analyzed:	2006-07-19	Analyzed By:	WB
Prep Batch:	24650	Sample Preparation:	2007-07-19	Prepared By:	WB

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		**63.4**	mg/L	5	0.500
Sulfate		**113**	mg/L	5	0.500

Sample: 94976 - Monitor Well-1 Deep

Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	28155	Date Analyzed:	2006-07-19	Analyzed By:	WB
Prep Batch:	24648	Sample Preparation:	2006-07-18	Prepared By:	WB

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		**552.0**	mg/L	2	10.00

Sample: 94977 - Monitor Well-2 Shallow

Analysis:	Alkalinity	Analytical Method:	SM 2320B	Prep Method:	N/A
QC Batch:	28009	Date Analyzed:	2006-07-14	Analyzed By:	LJ
Prep Batch:	24539	Sample Preparation:	2006-07-14	Prepared By:	LJ

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1	1.00
Bicarbonate Alkalinity		**200**	mg/L as CaCo3	1	4.00
Total Alkalinity		**200**	mg/L as CaCo3	1	4.00

Sample: 94977 - Monitor Well-2 Shallow

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	27996	Date Analyzed:	2006-07-13	Analyzed By:	KB
Prep Batch:	24529	Sample Preparation:	2006-07-13	Prepared By:	KB

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.100	mg/L	1	0.100	100	66.2 - 127.7
4-Bromofluorobenzene (4-BFB)		0.0860	mg/L	1	0.100	86	70.6 - 129.2

Sample: 94977 - Monitor Well-2 Shallow

Analysis:	Cations	Analytical Method:	S 6010B	Prep Method:	S 3005A
QC Batch:	28124	Date Analyzed:	2006-07-18	Analyzed By:	TP
Prep Batch:	24582	Sample Preparation:	2006-07-17	Prepared By:	TS

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		**58.6**	mg/L	1	0.500
Dissolved Potassium		**6.76**	mg/L	1	1.00
Dissolved Magnesium		**28.1**	mg/L	1	1.00
Dissolved Sodium		**82.4**	mg/L	1	1.00

Sample: 94977 - Monitor Well-2 Shallow

Analysis:	Ion Chromatography	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	28175	Date Analyzed:	2006-07-19	Analyzed By:	WB
Prep Batch:	24650	Sample Preparation:	2007-07-19	Prepared By:	WB

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		**89.2**	mg/L	5	0.500
Sulfate		**118**	mg/L	5	0.500

Sample: 94977 - Monitor Well-2 Shallow

Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	28155	Date Analyzed:	2006-07-19	Analyzed By:	WB
Prep Batch:	24648	Sample Preparation:	2006-07-18	Prepared By:	WB

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		**566.0**	mg/L	2	10.00

Method Blank (1) QC Batch: 27996

QC Batch:	27996	Date Analyzed:	2006-07-13	Analyzed By:	KB
Prep Batch:	24529	QC Preparation:	2006-07-13	Prepared By:	KB

Parameter	Flag	MDL Result	Units	RL
Benzene		<0.000255	mg/L	0.001
Toluene		<0.000210	mg/L	0.001
Ethylbenzene		<0.000317	mg/L	0.001
Xylene		<0.000603	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.101	mg/L	1	0.100	101	76.1 - 117

continued ...

method blank continued . . .

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
4-Bromofluorobenzene (4-BFB)		0.0888	mg/L	1	0.100	89	58.5 - 118

Method Blank (1) QC Batch: 28009

QC Batch: 28009 Date Analyzed: 2006-07-14 Analyzed By: LJ
Prep Batch: 24539 QC Preparation: 2006-07-14 Prepared By: LJ

Parameter	Flag	MDL Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1
Bicarbonate Alkalinity		<4.00	mg/L as CaCo3	4
Total Alkalinity		<4.00	mg/L as CaCo3	4

Method Blank (1) QC Batch: 28124

QC Batch: 28124 Date Analyzed: 2006-07-18 Analyzed By: TP
Prep Batch: 24582 QC Preparation: 2006-07-17 Prepared By: TS

Parameter	Flag	MDL Result	Units	RL
Dissolved Calcium		<0.0950	mg/L	0.5
Dissolved Potassium		0.612	mg/L	1
Dissolved Magnesium		<0.704	mg/L	1
Dissolved Sodium		0.709	mg/L	1

Method Blank (1) QC Batch: 28155

QC Batch: 28155 Date Analyzed: 2006-07-19 Analyzed By: WB
Prep Batch: 24648 QC Preparation: 2006-07-18 Prepared By: WB

Parameter	Flag	MDL Result	Units	RL
Total Dissolved Solids		<5.000	mg/L	10

Method Blank (1) QC Batch: 28175

QC Batch: 28175 Date Analyzed: 2006-07-19 Analyzed By: WB
Prep Batch: 24650 QC Preparation: 2006-07-19 Prepared By: WB

Parameter	Flag	MDL Result	Units	RL
Chloride		<0.0181	mg/L	0.5
Sulfate		<0.0485	mg/L	0.5

Duplicates (1)

QC Batch: 28009 | Date Analyzed: 2006-07-14 | Analyzed By: LJ
Prep Batch: 24539 | QC Preparation: 2006-07-14 | Prepared By: LJ

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Hydroxide Alkalinity	<1.00	<1.00	mg/L as CaCo3	1	0	20
Carbonate Alkalinity	<1.00	<1.00	mg/L as CaCo3	1	0	20
Bicarbonate Alkalinity	252	256	mg/L as CaCo3	1	2	12.6
Total Alkalinity	252	256	mg/L as CaCo3	1	2	11.5

Duplicates (1)

QC Batch: 28155 | Date Analyzed: 2006-07-19 | Analyzed By: WB
Prep Batch: 24648 | QC Preparation: 2006-07-18 | Prepared By: WB

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids	554.0	552.0	mg/L	2	0	17.2

Laboratory Control Spike (LCS-1)

QC Batch: 27996 | Date Analyzed: 2006-07-13 | Analyzed By: KB
Prep Batch: 24529 | QC Preparation: 2006-07-13 | Prepared By: KB

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.106	0.104	mg/L	1	0.100	<0.000255	106	2	80.8 - 112	20
Toluene	0.105	0.103	mg/L	1	0.100	<0.000210	105	2	78 - 114	20
Ethylbenzene	0.106	0.104	mg/L	1	0.100	<0.000317	106	2	78.6 - 116	20
Xylene	0.319	0.315	mg/L	1	0.300	<0.000603	106	1	83.2 - 112	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.104	0.102	mg/L	1	0.100	104	102	79.9 - 117
4-Bromofluorobenzene (4-BFB)	0.0981	0.0979	mg/L	1	0.100	98	98	79 - 123

Laboratory Control Spike (LCS-1)

QC Batch: 28124 | Date Analyzed: 2006-07-18 | Analyzed By: TP
Prep Batch: 24582 | QC Preparation: 2006-07-17 | Prepared By: TS

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Dissolved Calcium	50.0	49.6	mg/L	1	50.0	<0.0950	100	1	85 - 115	20
Dissolved Potassium	50.3	50.3	mg/L	1	50.0	<0.377	101	0	85 - 113	20
Dissolved Magnesium	50.6	49.4	mg/L	1	50.0	<0.704	101	2	85 - 113	20

continued . . .

control spikes continued ...

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Dissolved Sodium	49.2	49.5	mg/L	1	50.0	<0.261	98	1	85 - 111	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 28175 | Date Analyzed: 2006-07-19 | Analyzed By: WB
Prep Batch: 24650 | QC Preparation: 2006-07-19 | Prepared By: WB

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Chloride	11.9	11.9	mg/L	1	12.5	<0.0181	96	0	90 - 110	20
Sulfate	12.3	12.5	mg/L	1	12.5	<0.0485	98	2	90 - 110	20

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

Matrix Spike (MS-1) Spiked Sample: 94963

QC Batch: 27996 | Date Analyzed: 2006-07-13 | Analyzed By: KB
Prep Batch: 24529 | QC Preparation: 2006-07-13 | Prepared By: KB

Param		MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	[1]	0.114	NA	mg/L	1	0.100	<0.000255	114	200	70.9 - 126	20
Toluene	[2]	0.113	NA	mg/L	1	0.100	<0.000210	113	200	70.8 - 125	20
Ethylbenzene	[3]	0.114	NA	mg/L	1	0.100	<0.000317	114	200	74.8 - 125	20
Xylene	[4]	0.342	NA	mg/L	1	0.300	<0.000603	114	200	75.7 - 126	20

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

Surrogate		MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	[5]	0.102	NA	mg/L	1	0.1	102	0	73.6 - 121
4-Bromofluorobenzene (4-BFB)	[6]	0.0970	NA	mg/L	1	0.1	97	0	81.8 - 114

Matrix Spike (MS-1) Spiked Sample: 94963

QC Batch: 28124 | Date Analyzed: 2006-07-18 | Analyzed By: TP
Prep Batch: 24582 | QC Preparation: 2006-07-17 | Prepared By: TS

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Dissolved Calcium	223	231	mg/L	1	50.0	175	96	4	68.4 - 138	20

continued ...

[1] RPD is out of range because a matrix spike duplicate was not prepared.
[2] RPD is out of range because a matrix spike duplicate was not prepared.
[3] RPD is out of range because a matrix spike duplicate was not prepared.
[4] RPD is out of range because a matrix spike duplicate was not prepared.
[5] RPD is out of range because a matrix spike duplicate was not prepared.
[6] RPD is out of range because a matrix spike duplicate was not prepared.

matrix spikes continued . . .

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Dissolved Potassium	63.7	64.8	mg/L	1	50.0	13.4	101	2	82 - 129	20
Dissolved Magnesium	121	119	mg/L	1	50.0	69.4	103	2	61.2 - 135	20
Dissolved Sodium	377	386	mg/L	1	50.0	330	94	2	81.8 - 125	20

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

Matrix Spike (MS-1) Spiked Sample: 94977

QC Batch: 28175 Date Analyzed: 2006-07-19 Analyzed By: WB
Prep Batch: 24650 QC Preparation: 2006-07-19 Prepared By: WB

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Chloride	218	219	mg/L	10	12.5	85.9	106	0	25.4 - 171	20
Sulfate	232	233	mg/L	10	12.5	107	100	0	0 - 677	20

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

Standard (ICV-1)

QC Batch: 27996 Date Analyzed: 2006-07-13 Analyzed By: KB

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.106	106	85 - 115	2006-07-13
Toluene		mg/L	0.100	0.106	106	85 - 115	2006-07-13
Ethylbenzene		mg/L	0.100	0.107	107	85 - 115	2006-07-13
Xylene		mg/L	0.300	0.318	106	85 - 115	2006-07-13

Standard (CCV-1)

QC Batch: 27996 Date Analyzed: 2006-07-13 Analyzed By: KB

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.106	106	85 - 115	2006-07-13
Toluene		mg/L	0.100	0.105	105	85 - 115	2006-07-13
Ethylbenzene		mg/L	0.100	0.108	108	85 - 115	2006-07-13
Xylene		mg/L	0.300	0.320	107	85 - 115	2006-07-13

Standard (ICV-1)

QC Batch: 28009 Date Analyzed: 2006-07-14 Analyzed By: LJ

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Alkalinity		mg/L as CaCo3	250	260	104	90 - 110	2006-07-14

Standard (CCV-1)

QC Batch: 28009 Date Analyzed: 2006-07-14 Analyzed By: LJ

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Alkalinity		mg/L as CaCo3	250	256	102	90 - 110	2006-07-14

Standard (ICV-1)

QC Batch: 28124 Date Analyzed: 2006-07-18 Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	50.0	49.2	98	90 - 110	2006-07-18
Dissolved Potassium		mg/L	50.0	51.9	104	90 - 110	2006-07-18
Dissolved Magnesium		mg/L	50.0	48.8	98	90 - 110	2006-07-18
Dissolved Sodium		mg/L	50.0	51.8	104	90 - 110	2006-07-18

Standard (CCV-1)

QC Batch: 28124 Date Analyzed: 2006-07-18 Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	50.0	51.4	103	90 - 110	2006-07-18
Dissolved Potassium		mg/L	50.0	52.1	104	90 - 110	2006-07-18
Dissolved Magnesium		mg/L	50.0	51.5	103	90 - 110	2006-07-18
Dissolved Sodium		mg/L	50.0	51.9	104	90 - 110	2006-07-18

Standard (ICV-1)

QC Batch: 28155 Date Analyzed: 2006-07-19 Analyzed By: WB

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1036	104	90 - 110	2006-07-19

Standard (CCV-1)

QC Batch: 28155 Date Analyzed: 2006-07-19 Analyzed By: WB

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1040	104	90 - 110	2006-07-19

Standard (ICV-1)

QC Batch: 28175 Date Analyzed: 2006-07-19 Analyzed By: WB

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	12.0	96	90 - 110	2006-07-19
Sulfate		mg/L	12.5	12.4	99	90 - 110	2006-07-19

Standard (CCV-1)

QC Batch: 28175 Date Analyzed: 2006-07-19 Analyzed By: WB

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	12.0	96	90 - 110	2006-07-19
Sulfate		mg/L	12.5	12.4	99	90 - 110	2006-07-19

6701 Aberdeen Ave, Ste 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

TraceAnalysis, Inc.

155 McCutcheon Way, Suite H
El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # 6071304

Company Name: RICE Operating Company	Phone #: (505)393-9174
Address: (Street, City, Zip) 122 W Taylor Street - Hobbs, New Mexico 88240	Fax #: (505) 397-1471
Contact Person: Kristin Farris - Pope, Project Scientist	kpope@riceswd.com
Invoice to: (If different from above)	
Project #: None Given	Project Name: BD Junction N-29
Project Location: Lea County - New Mexico	Sampler Signature: Rozanne Johnson (505)631-9310 rozanne@valornet.com

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL	HNO_3	$NaHSO_4$	H_2SO_4	ICE	NONE	SAMPLING: DATE 2006	TIME
94976	Monitor Well #1-Deep	2	40 ml	X				X				X		7-12	9:30
	Monitor Well #1-Deep	1	1L	X								X		7-12	9:30
77	Monitor Well #2-Shallow	2	40 ml	X				X				X		7-12	11:20
	Monitor Well #2-Shallow	1	1L	X								X		7-12	11:20

ANALYSIS REQUEST
(Circle or Specify Method No.)

MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005 / TX1005 Extended (C35)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Moisture Content	Cations (Ca, Mg, Na, K)	Anions (Cl, SSSSO4, CO3, HCO3)	Total Dissolved Solids		Turn Around Time if different from standard	Hold
	X																				
																X	X	X			
	X																				
																X	X	X			

Relinquished by: Rozanne Johnson	Date: 7-12-06	Time: 2:15pm
Relinquished by:	Date:	Time:
Relinquished by:	Date:	Time:

Received by:	Date:	Time:
Received by:	Date:	Time:
Received at Laboratory by: Stacy Allonso	Date: 7-12-06	Time: 2:15PM

LAB USE ONLY
Intact Y / N
Headspace Y / N
Temp °
Log-in Review

REMARKS:
☐ check if special reporting limits needed

Carrier # Caliyah

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of COC

ENVIRONMENTAL LAB OF
[illegible]

Analytical Report

Prepared for:

Kristin Farris-Pope

Rice Operating Co.

122 W. Taylor

Hobbs, NM 88240

Project: BD Jct. N-29

Project Number: None Given

Location: Lea County

Lab Order Number: 6A19008

Report Date: 01/30/06

Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	**Reported:**
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	01/30/06 09:33

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Monitor Well #1	6A19008-01	Water	01/17/06 11:00	01/19/06 11:10
Monitor Well #2- Shallow	6A19008-02	Water	01/17/06 09:35	01/19/06 11:10

12600 West I-20 East - Odessa, Texas 79705 - (432) 563-1800 - Fax (432) 563-1713

Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	**Reported:**
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	01/30/06 09:33

Organics by GC

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Monitor Well #1 (6A19008-01) Water									
Benzene	ND	0.00100	mg/L	1	EA62304	01/23/06	01/24/06	EPA 8021B	
Toluene	ND	0.00100	"	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	"	
Xylene (p/m)	ND	0.00100	"	"	"	"	"	"	
Xylene (o)	ND	0.00100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*89.5 %*	*80-120*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*85.8 %*	*80-120*		"	"	"	"	
Monitor Well #2- Shallow (6A19008-02) Water									
Benzene	ND	0.00100	mg/L	1	EA62304	01/23/06	01/24/06	EPA 8021B	
Toluene	ND	0.00100	"	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	"	
Xylene (p/m)	ND	0.00100	"	"	"	"	"	"	
Xylene (o)	ND	0.00100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*90.5 %*	*80-120*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*83.0 %*	*80-120*		"	"	"	"	

12600 West I-20 East - Odessa, Texas 79705 - (432) 563-1800 - Fax (432) 563-1713

Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	**Reported:**
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	01/30/06 09:33

General Chemistry Parameters by EPA / Standard Methods

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Monitor Well #1 (6A19008-01) Water									
Total Alkalinity	**204**	2.00	mg/L	1	EA62406	01/26/06	01/26/06	EPA 310.1M	
Chloride	**62.2**	5.00	"	10	EA62018	01/20/06	01/20/06	EPA 300.0	
Total Dissolved Solids	**420**	5.00	"	1	EA62307	01/19/06	01/20/06	EPA 160.1	
Sulfate	**111**	5.00	"	10	EA62018	01/20/06	01/20/06	EPA 300.0	
Monitor Well #2- Shallow (6A19008-02) Water									
Total Alkalinity	**187**	2.00	mg/L	1	EA62406	01/26/06	01/26/06	EPA 310.1M	
Chloride	**78.8**	5.00	"	10	EA62018	01/20/06	01/20/06	EPA 300.0	
Total Dissolved Solids	**454**	5.00	"	1	EA62307	01/19/06	01/20/06	EPA 160.1	
Sulfate	**86.3**	5.00	"	10	EA62018	01/20/06	01/20/06	EPA 300.0	

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Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	**Reported:**
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	01/30/06 09:33

Total Metals by EPA / Standard Methods

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Monitor Well #1 (6A19008-01) Water									
Calcium	**30.3**	0.100	mg/L	10	EA62615	01/26/06	01/26/06	EPA 6010B	
Magnesium	**18.0**	0.0100	"	"	"	"	"	"	
Potassium	**9.30**	0.500	"	"	"	"	"	"	
Sodium	**116**	0.500	"	50	"	"	"	"	
Monitor Well #2- Shallow (6A19008-02) Water									
Calcium	**53.2**	0.100	mg/L	10	EA62615	01/26/06	01/26/06	EPA 6010B	
Magnesium	**24.1**	0.0100	"	"	"	"	"	"	
Potassium	**4.64**	0.500	"	"	"	"	"	"	
Sodium	**71.8**	0.100	"	"	"	"	"	"	

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Organics by GC - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EA62304 - EPA 5030C (GC)										
Blank (EA62304-BLK1)				Prepared & Analyzed: 01/23/06						
Benzene	ND	0.00100	mg/L							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00100	"							
Xylene (o)	ND	0.00100	"							
Surrogate: a,a,a-Trifluorotoluene	*37.5*		*ug/l*	*40.0*		*93.8*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*32.6*		"	*40.0*		*81.5*	*80-120*			
LCS (EA62304-BS1)				Prepared & Analyzed: 01/23/06						
Benzene	0.0461	0.00100	mg/L	0.0500		92.2	80-120			
Toluene	0.0462	0.00100	"	0.0500		92.4	80-120			
Ethylbenzene	0.0427	0.00100	"	0.0500		85.4	80-120			
Xylene (p/m)	0.0846	0.00100	"	0.100		84.6	80-120			
Xylene (o)	0.0451	0.00100	"	0.0500		90.2	80-120			
Surrogate: a,a,a-Trifluorotoluene	*38.5*		*ug/l*	*40.0*		*96.2*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*37.9*		"	*40.0*		*94.8*	*80-120*			
Calibration Check (EA62304-CCV1)				Prepared & Analyzed: 01/23/06						
Benzene	44.4		ug/l	50.0		88.8	80-120			
Toluene	45.2		"	50.0		90.4	80-120			
Ethylbenzene	42.5		"	50.0		85.0	80-120			
Xylene (p/m)	83.1		"	100		83.1	80-120			
Xylene (o)	44.5		"	50.0		89.0	80-120			
Surrogate: a,a,a-Trifluorotoluene	*35.8*		"	*40.0*		*89.5*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*35.5*		"	*40.0*		*88.8*	*80-120*			
Matrix Spike (EA62304-MS1)	**Source: 6A20019-01**			Prepared & Analyzed: 01/23/06						
Benzene	0.0455	0.00100	mg/L	0.0500	ND	91.0	80-120			
Toluene	0.0452	0.00100	"	0.0500	ND	90.4	80-120			
Ethylbenzene	0.0417	0.00100	"	0.0500	ND	83.4	80-120			
Xylene (p/m)	0.0829	0.00100	"	0.100	ND	82.9	80-120			
Xylene (o)	0.0445	0.00100	"	0.0500	ND	89.0	80-120			
Surrogate: a,a,a-Trifluorotoluene	*38.2*		*ug/l*	*40.0*		*95.5*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*36.2*		"	*40.0*		*90.5*	*80-120*			

Organics by GC - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EA62304 - EPA 5030C (GC)										
Matrix Spike Dup (EA62304-MSD1)	**Source: 6A20019-01**			Prepared & Analyzed: 01/23/06						
Benzene	0.0427	0.00100	mg/L	0.0500	ND	85.4	80-120	6.35	20	
Toluene	0.0428	0.00100	"	0.0500	ND	85.6	80-120	5.45	20	
Ethylbenzene	0.0404	0.00100	"	0.0500	ND	80.8	80-120	3.17	20	
Xylene (p/m)	0.0802	0.00100	"	0.100	ND	80.2	80-120	3.31	20	
Xylene (o)	0.0427	0.00100	"	0.0500	ND	85.4	80-120	4.13	20	
Surrogate: a,a,a-Trifluorotoluene	*37.2*		*ug/l*	*40.0*		*93.0*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*35.4*		"	*40.0*		*88.5*	*80-120*			

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EA62018 - General Preparation (WetChem)										
Blank (EA62018-BLK1)				Prepared & Analyzed: 01/20/06						
Sulfate	ND	0.500	mg/L							
Chloride	ND	0.500	"							
LCS (EA62018-BS1)				Prepared & Analyzed: 01/20/06						
Chloride	8.74		mg/L	10.0		87.4	80-120			
Sulfate	9.62		"	10.0		96.2	80-120			
Calibration Check (EA62018-CCV1)				Prepared & Analyzed: 01/20/06						
Sulfate	9.77		mg/L	10.0		97.7	80-120			
Chloride	8.88		"	10.0		88.8	80-120			
Duplicate (EA62018-DUP1)	**Source: 6A19008-01**			Prepared & Analyzed: 01/20/06						
Sulfate	110	5.00	mg/L		111			0.905	20	
Chloride	61.5	5.00	"		62.2			1.13	20	
Batch EA62307 - General Preparation (WetChem)										
Blank (EA62307-BLK1)				Prepared: 01/19/06 Analyzed: 01/20/06						
Total Dissolved Solids	ND	5.00	mg/L							
Duplicate (EA62307-DUP1)	**Source: 6A19005-01**			Prepared: 01/19/06 Analyzed: 01/20/06						
Total Dissolved Solids	2400	5.00	mg/L		2480			3.28	5	
Batch EA62406 - General Preparation (WetChem)										
Blank (EA62406-BLK1)				Prepared & Analyzed: 01/26/06						
Total Alkalinity	ND	2.00	mg/L							

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EA62406 - General Preparation (WetChem)										
LCS (EA62406-BS1)				Prepared & Analyzed: 01/26/06						
Bicarbonate Alkalinity	220		mg/L	200		110	85-115			
Duplicate (EA62406-DUP1)		**Source: 6A19005-01**		Prepared & Analyzed: 01/26/06						
Total Alkalinity	258	2.00	mg/L		256			0.778	20	
Reference (EA62406-SRM1)				Prepared & Analyzed: 01/26/06						
Total Alkalinity	97.0		mg/L	100		97.0	90-110			

Total Metals by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EA62615 - 6010B/No Digestion										
Blank (EA62615-BLK1)				Prepared & Analyzed: 01/26/06						
Calcium	ND	0.0100	mg/L							
Magnesium	ND	0.00100	"							
Potassium	ND	0.0500	"							
Sodium	ND	0.0100	"							
Calibration Check (EA62615-CCV1)				Prepared & Analyzed: 01/26/06						
Calcium	2.12		mg/L	2.00		106	85-115			
Magnesium	1.99		"	2.00		99.5	85-115			
Potassium	1.88		"	2.00		94.0	85-115			
Sodium	1.94		"	2.00		97.0	85-115			
Duplicate (EA62615-DUP1)	**Source: 6A19005-01**			Prepared & Analyzed: 01/26/06						
Calcium	224	0.500	mg/L		222			0.897	20	
Magnesium	115	0.0500	"		120			4.26	20	
Potassium	14.6	0.500	"		15.2			4.03	20	
Sodium	306	0.500	"		313			2.26	20	

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Report Approved By: _____ Date: 1/30/2006

Raland K. Tuttle, Lab Manager
Celey D. Keene, Lab Director, Org. Tech Director
Peggy Allen, QA Officer
Jeanne Mc Murrey, Inorg. Tech Director
LaTasha Cornish, Chemist
Sandra Sanchez, Lab Tech.

Environmental Lab of Texas

12600 West I-20 East
Odessa, Texas 79765
Phone: 432-563-1800
Fax: 432-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Kristin Farris Pope kpriceswd@valornet.com
Company Name: RICE Operating Company
Company Address: 122 W. Taylor Street
City/State/Zip: Hobbs, New Mexico 88240
Telephone No: (505) 393-9174 Fax No: (505) 397-1471
Sampler Signature: Rozanne Johnson (505) 631-9310
Email: rozanne@valornet.com

Project Name: BD Jct N-29
Project #:
Project Loc: Lea County
PO #:

LAB # (lab use only)	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	Preservative: HNO_3	Preservative: HCl (2) 40 ml glass vials	Preservative: NaOH	Preservative: H_2SO_4	Preservative: None (1) 1 Liter HDPE	Preservative: Other (Specify)	Matrix: Water	Matrix: Sludge	Matrix: Soil	Matrix: Other (specify):	Analyze For: TPH: 418.1 8015M 1005 1006	Cations (Ca, Mg, Na, K)	Anions (Cl, SO4, CO3, HCO3)	SAR / ESP / CEC	Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles	Semivolatiles	BTEX 8021B/5030 (TCLP: / TOTAL: X)	RCI	N.O.R.M.	Total Dissolved Solids				RUSH TAT (Pre-Schedule)	Standard TAT
01	Monitor Well #1-Deep	1/17/2006	11:00	3	X		2			1		X					X	X					X			X					X
02	Monitor Well #2-Shallow	1/17/2006	9:35	3	X		2			1		X					X	X					X			X					X

Special Instructions:
PLEASE Email RESULTS TO: kpriceswd@valornet.com & mfranks@riceswd.com

Sample Containers Intact? Y N
Labels on container? Y N
Custody Seals: Containers / cooler
Temperature Upon Receipt: -2.0

Laboratory Comments:

Relinquished by:	Date	Time	Received by:	Date	Time
Rozanne Johnson	1/19/2006	6:51	James Johnson	1/19/2006	6:52
James Johnson	1/19/2006	11:10	Received by ELOT: Cerin Lees	1/19/06	11:10

Environmental Lab of Texas
Variance / Corrective Action Report – Sample Log-In

Client: Fire Dp.

Date/Time: 1/19/06 11:10

Order #: 6A19008

Initials: CK

Sample Receipt Checklist

Temperature of container/cooler?	Yes	No	-2.0 C
Shipping container/cooler in good condition?	Yes	No	
Custody Seals intact on shipping container/cooler?	Yes	No	Not present
Custody Seals intact on sample bottles?	Yes	No	Not present
Chain of custody present?	Yes	No	
Sample Instructions complete on Chain of Custody?	Yes	No	
Chain of Custody signed when relinquished and received?	Yes	No	
Chain of custody agrees with sample label(s)	Yes	No	
Container labels legible and intact?	Yes	No	
Sample Matrix and properties same as on chain of custody?	Yes	No	
Samples in proper container/bottle?	Yes	No	
Samples properly preserved?	Yes	No	
Sample bottles intact?	Yes	No	
Preservations documented on Chain of Custody?	Yes	No	
Containers documented on Chain of Custody?	Yes	No	
Sufficient sample amount for indicated test?	Yes	No	
All samples received within sufficient hold time?	Yes	No	
VOC samples have zero headspace?	Yes	No	Not Applicable

Other observations:

Samples not frozen

Variance Documentation:

Contact Person: - ______ Date/Time: ______ Contacted by: ______

Regarding:

Corrective Action Taken:

Appendix E

Previous Reports

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

R. T. HICKS CONSULTANTS, LTD.

219 Central Avenue NW Suite 266 Albuquerque, NM 87102 505.266.5004 Fax: 505.246.1818

July 29, 2003

Mr. Wayne Price
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: N-29 Junction Box, Section 29, 21S, 37E Unit N

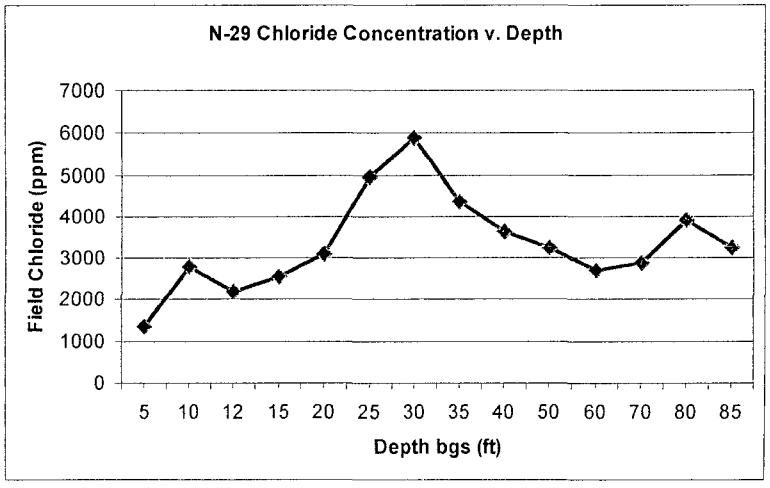
Dear Mr. Price

Rice Operating Company retained Hicks Consultants to address potential environmental concerns at the above referenced site. This submission proposes a scope of work that we believe will best mitigate any threat to human health and the environment and lead to closure of the regulatory file for this site.

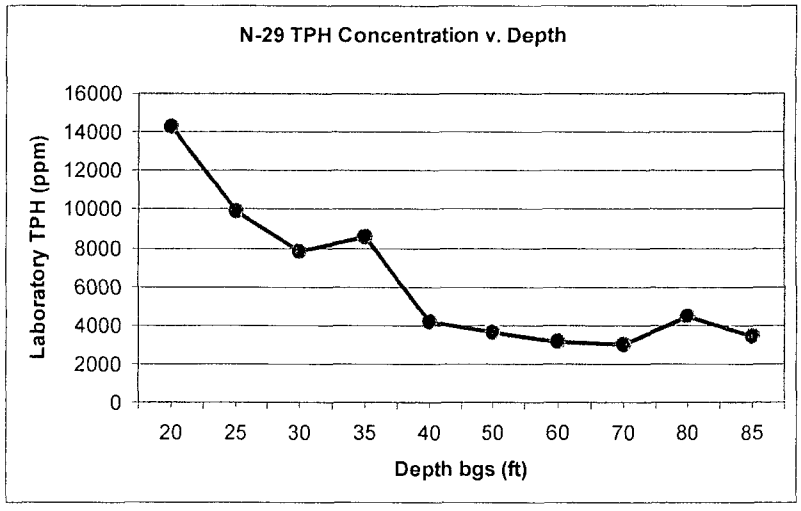
Background

The N-29 Junction Box Site is located about 2 miles northwest of the intersection of State Routes 8/176 and Loop 18, near Eunice, New Mexico. Plate 1 shows the location of the site.

Rice Operating Company (ROC) prepared a Release Notification report and a Disclosure Report that summarizes activities to date. The Disclosure Report, which is part of the 2002 submission to NMOCD, is dated January 2, 2003. The soil borings show relatively constant chloride and TPH concentrations from near surface to a depth of 85 feet (ground water). As Figure 1 shows, consistent chloride concentrations suggest that the release created saturated conditions in the vadose zone. Saturated conditions distribute chloride relatively evenly throughout the vadose zone. Unsaturated flow conditions create different chloride distributions in the vadose zone.



TPH decreases from 14,000 ppm at 20 feet below grade to about 4000 ppm at 40 feet (Figure 2), a 75% decrease. Because the release consisted of produced water from oil wells, laboratory analysis of soil samples detected volatile hydrocarbons in only one sample (less than 0.1 ppm of toluene and xylene). Volatile hydrocarbons are not commonly associated with crude oil as they are with refined products or water produced from natural gas wells. Regulated hydrocarbon constituents may not be present in ground water.



The soil boring data suggests potential ground water impairment by chloride. We propose installation of a ground water monitoring well, reclamation of the surface to its original productive capacity, and evaluation of the threat to ground water quality posed by the residual chloride and any hydrocarbon mass in the vadose zone.

1. Evaluate Chloride and BTEX Flux from the Vadose Zone to Ground Water

We propose to employ HYDRUS1D and a simple ground water mixing model to evaluate the potential of residual chloride and hydrocarbon mass in the vadose zone to materially impair ground water quality at the site. We will employ predictions of the migration of chloride ion and the detected regulated hydrocarbons from the vadose zone to ground water in our selection of an appropriate remedy for the land surface and underlying vadose zone. This simulation is the "no action" alternative, which predicts chloride and hydrocarbon flux to ground water in the absence of any engineered remedy by ROC.

For the no action scenario, we will employ the input parameters to HYDRUS and the mixing model outlined in Table 1. We will assume that vegetation is not present over the release site (no evapotranspiration) and an aquifer thickness of 10 feet. If this simulation does not return results that are consistent with the ground water data from the proposed monitoring well (see below), we will increase the aquifer thickness in the mixing model to the total thickness measured in the proposed monitoring well. At other sites, we have found that chloride is distributed throughout the thickness of the aquifer and using the entire aquifer thickness returns HYDRUS predictions that fit the field data. Employing the entire thickness of the aquifer in the mixing model calculations may be required for the N-29 site.

Table 1: Input Parameters for Simulation Modeling

Input Parameter	Source
Vadose Zone Thickness	Proposed monitoring well (See also attached boring log)
Vadose Zone Texture	Proposed monitoring well
Dispersion Length	Professional judgment
Soil Moisture	Field Measurements from monitoring well boring and simulations with HYDRUS 1D
Vadose Zone Chloride Load	ROC Data from Disclosure Report
Length of release perpendicular to ground	Field Measurements
Climate	Pearl, NM station (Hobbs)
Background Chloride in Ground Water	Samples from nearby water supply wells
Ground Water Flux	Calculated from regional hydraulic data and data from nearby wells
Aquifer Thickness	Nicholson and Clebsch (1960), SEO data, measurements from proposed monitoring well, and an arbitrary value of 10 feet.

2. Collection and Evaluation of Data for Simulation Modeling

The HYDRUS1D and mixing model simulation requires input of 10 parameters. As Table 1 shows, we must collect site specific data for several of these parameters, some data are available from previous ROC work at the site, and other data are available from public sources. Although our previous work with the American Petroleum Institute showed that soil moisture values did not strongly influence the ability of the model to predict chloride migration from the vadose zone to ground water, we plan collect soil moisture data from this site for model input.

We propose a field program to collect other important site-specific data for model input. First we will measure the depth to ground water at nearby windmills and supply wells to determine the hydraulic gradient (Plate 1). To establish background chloride concentrations in ground water, we propose to sample one of the active supply well located in Sections 29 and 30 (Plate 1) and any background monitoring well that exists at the nearby Chevron Tank Battery site (See Plate 1).

We will drill a monitoring well about 100 feet down gradient from the former junction box, at the edge of the existing pad. We will drill this well to the top of the red bed (bottom of the Ogallala). We will place one 5-foot screen at the base of the Ogallala. In this same borehole, we will install a second 2-inch casing with 15 feet of screen at the top of the water table. We will drill, complete, develop and sample these wells in a manner that is consistent with the industry standards (e.g. ASTM, EPA). If possible, we will install

bentonite pellets to isolate the two screened intervals. To assure that the well boring does not create any communication between the two sampling screens, we will employ low-flow pump and micro-purge techniques for sampling. This project-proven sampling strategy also reduces the volume of "purge water".

3. Design Remedy and Submit Report

ROC has completed the repair of the pipeline junction at the site. We do not anticipate additional releases of produced water. Our modeling of the "no action alternative" (Task 1) may show that the residual chloride mass in the vadose zone poses a threat to ground water quality. If such a threat does exist, we will use the HYDRUS-1D model predictions to develop a remedy for the vadose zone. If necessary, we will simulate:

1. excavation, disposal and replacement of clean soil to remove the chloride mass,

2. installation of a low permeability barrier to minimize natural infiltration,

3. surface grading and seeding to eliminate any ponding of precipitation and promote evapotranspiration, thereby minimizing natural infiltration, and

4. a combination of the above potential remedies.

We will select the vadose zone remedy that offers the greatest environmental benefit while causing the least environmental damage.

If the monitoring data demonstrate that a site release caused impairment of water quality, we will use the ground water mixing model or a suitable alternative to assist in the design of a ground water remedy. It is possible, that the background chloride concentrations in ground water measured in the nearby wells is equal to or higher than the chloride concentration in the proposed down gradient monitoring well. Such data would strongly suggest that the N-29 site has not caused any material impairment of ground water quality. If we find no evidence of impairment of water quality due to past activities, we will not prepare a ground water remedy. If data suggest that the N-29 site has contributed chloride to ground water and caused ground water impairment, we will examine the following alternatives:

1. Natural restoration due to dilution and dispersion,

2. Pump and dispose to restore the saturated zone,

3. Pump and treat to restore the saturated zone,

4. Because of the location of the site, institutional controls negotiated with the landowner may provide an effective remedy. Such controls may be restriction of water use to livestock until natural restoration returns the water quality to state

standards, a provision for alternative supply well design, or a provision for well head treatment to mitigate any damage to the water resource.

We plan to commence data collection for the HYDRUS1D simulations described above in August. Your approval to move forward with this work plan will facilitate our access to nearby windmills and speed the implementation of a surface remedy.

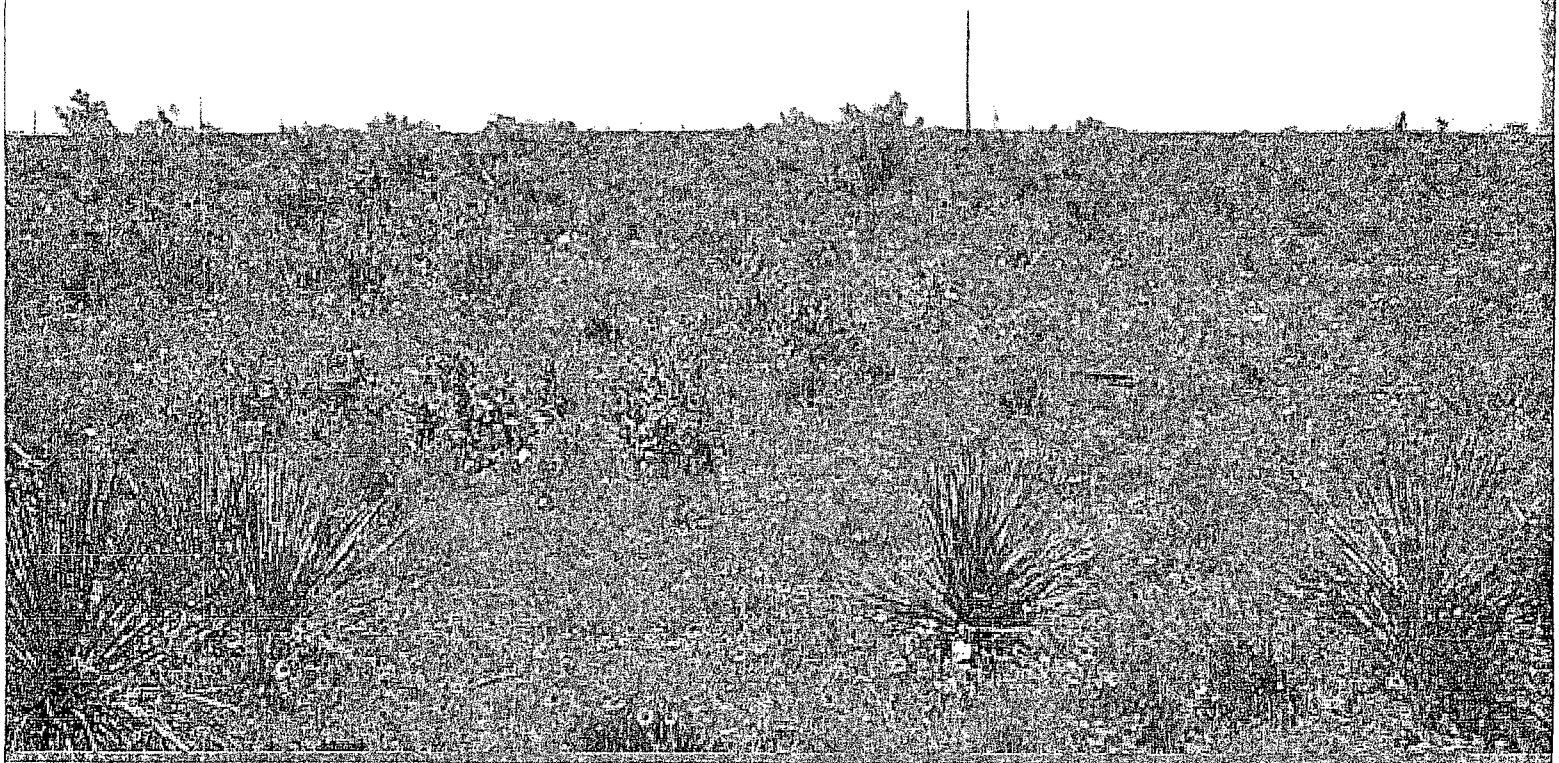
Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

Copy:
Rice Operating Company

February 2006

Final Report



Junction N-29

R.T. Hicks Consultants, Ltd.

901 Rio Grande Blvd. NW, Suite F-142, Albuquerque, NM 87104

February 10, 2006

Final Report
Junction N-29

Prepared for:

Rice Operating Company
122 West Taylor
Hobbs, NM 88240

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142, Albuquerque, NM 87104

1.0 EXECUTIVE SUMMARY

The N-29 Junction Box Site is located about 2 miles northwest of the intersection of State Routes 8/176 and Loop 18, near Eunice, New Mexico in Section 29, 21S, 37E Unit N. In 2002, ROC began delineation and excavation activities as part of the Junction Box Upgrade Program. In early 2003, a Disclosure Report was submitted by ROC to the NMOCD. In July of 2003 R.T. Hicks Consultants, Ltd. submitted a letter proposing a scope of work designed to identify and mitigate any threat to human health or the environment at Jct. N-29.

This report incorporates the preliminary findings from previous investigations, details the remedy that has been employed there to date, presents current analytical data collected at the site. Deep and shallow monitoring wells have been installed down-gradient from the site and sampling there indicates that ground water in the area has not been impacted by past releases at Jct. N-29. As presented in Section 5.0, we therefore conclude that this site file is ready for closure. Section 3.0 of this report describes the previous work employed. Quality assurance protocols are included in section 5.0.

This report incorporates the required elements for both Stage 1 and 2 Abatement Plans. However, because no evidence of ground water impairment due to the release we ask that NMOCD consider this report a file closure request.

2.0 CHRONOLOGY OF EVENTS

Summer, 2002	During a Junction Box upgrade, ROC discovers that releases from the Junction introduced produced water to the subsurface
October-December 2002	ROC excavates chloride and TPH-impacted soil to a depth of 40 feet below ground surface (bgs). Imported backfill placed in the deep excavation from 40 feet to 20 feet bgs is overlain by compacted clay liner and additional backfill to ground surface to create a vadose zone remedy. The ground surface is graded to drain rainwater away from the area above the cap. The surface is then reseeded.
January 2, 2003	Rice Operating Company submits a Disclosure Report detailing the vadose zone closure in 2002.
July 29, 2003	Hicks Consultants submits a workplan proposing examination of the regional hydrogeology and installation of a deep and shallow well down-gradient from the site to determine if the past release caused impairment of ground water quality.
August 21, 2003	NMOCD approves the 2003 workplan
2003-2005	The surface landowner prevents access to the site to implement the approved workplan. In Spring 2005, the landowner grants site access.
May 13, 2005	A deep monitoring well and a shallow monitoring well is installed down-gradient from the release site.
August 2005- present	Quarterly ground water sampling at the monitoring wells down-gradient from the site.

3.0 BACKGROUND

3.1 SITE LOCATION AND LAND USE

The N-29 Junction Box Site is located about 2 miles northwest of the intersection of State Routes 8 and Highway 207, near Eunice, New Mexico in Section 29, 21S, 37E Unit N. Plate 1 shows the location of the site.

Land in the site area is primarily utilized for oil and gas production and cattle ranching. The subsurface mineral owner is the BLM, the surface fee landowner is Tom Kennaan. Plate 2 is an aerial photograph of the area showing this land use and the access road from Highway 8.

3.2 SUMMARY OF PREVIOUS WORK

Initial sampling activities that delineated a zone of impact associated the N-29 junction box area began in 2002, as part of ROC's junction box upgrade program.

ROC drilled a soil boring and conducted soil sampling within upper vadose zone during excavation activities between October 7, 2002 and December 27, 2002. Soil samples were analyzed in the field for chlorides using field-adapted Method 9253 (QP-03). Appendix A presents the 2002 Disclosure Report that gives the boring log and field analyses, details of soil excavation and soil field tests. Sidewall and bottom samples were sent to the laboratory for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX) using EPA Method 8021B, gas and diesel range organics (GRO/DRO) using EPA Method 8015M, and chlorides to confirm the completion of excavation activities. Results of the excavation sampling are listed in the Table 1.

Table 1: Soil Sample Results After Excavation

Sample Location	BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	Chlorides (mg/kg)
Sidewalls	<0.025	<10	<10	5140
Bottom	<0.025	<10	<10	478

Most of the hydrocarbon-impacted soil that was excavated to a depth of 40 feet below ground surface was bio-remediated (landfarmed) on site. Approximately 84 cubic yards of hydrocarbon-impacted soil was transported to the Sundance/Parabo facility east of Eunice.

Imported backfill placed in the deep excavation from 40 feet to 20 feet bgs was overlain by a compacted clay liner and additional backfill to ground surface to create a vadose zone remedy. The ground surface was graded to drain rainwater away from the area above the cap. The surface was then reseeded. The disclosure report detailing all of the above-referenced work was completed on

December 27, 2002 and forwarded to the NMOCD in early 2003. The work completed in 2002 completed the vadose zone remedy for the site.

4.0 GEOLOGY AND HYDROGEOLOGY

4.1 REGIONAL AND LOCAL HYDROGEOLOGY

Plate 3 presents a geologic map of southern Lea County. This map shows the Ogallala Formation is present throughout much of the area and is underlain by the Dockum Group redbeds. Along Monument Draw, east of the site, erosion has stripped the Ogallala and deposition of alluvium over the redbeds has created a separate aquifer that is hydraulically connected to the Ogallala in many locations (see Nicholsen and Clebsch, 1961).

Plate 4 displays the portion of the geologic map of southern Lea County southeast of Eunice, New Mexico from Nicholsen and Clebsch (1961). The Ogallala Formation underlies the City of Eunice, the site area and the eastern boundary of Plate 4. Quaternary erosion and deposition removed the Ogallala and deposited alluvium within the central part of Plate 4, which effectively outlines the active channel of Monument Draw. The N-29 junction box is plotted on Plate 4.

Plate 4 also shows the elevation of the top of the red bed surface. The Dockum Group red beds are an aquiclude below the Ogallala and alluvial aquifers. East of the N-29 Junction Box, the red bed elevation contours define a paleo-valley just west of and sub-parallel to Monument Draw. The elevation of the red bed surface influences ground water flow. Ground water is generally directed toward the axis of this subsurface feature

Plate 5 is the ground water map of southern Lea County (Nicholsen and Clebsch, 1961) covering the same area as Plate 4. This plate shows that the water table elevation mimics the red-bed elevation. At the N-29 junction box site, ground water flows southeast, toward Monument Draw.

Plate 6 presents a ground water map derived from 2005 ground water measurements at the N-29 junction box site and 2003 measurements from four wells at the ChevronTexaco site (CDU Tract 19, IRP-223) to the northeast of N-29. Appendix B presents a potentiometric surface map from a 2004 Chevron-sponsored report on the CDU Tract 19 site that confirms the south-southeast ground water flow direction. The deep and shallow Monitoring wells installed to the southeast of the old junction box are down gradient from any releases there.

From the data of Nicholsen and Clebsch (1961) presented in Plates 4 and 5 of this report one can estimate the saturated thickness of the alluvium in our area of interest as about 35 feet (10.5 meters). The lithologic logs of the on-site monitoring wells (Appendix C) show a saturated thickness of 31 feet with the saturated zone dominated by silty sand and clayey sand. Hydraulic conductivity values for silty sand and clayey sand are presented in Table 2.2 of

Freeze and Cherry (1979) and are estimated between 0.665 and 1.33 ft/day. A specific yield (porosity) of 0.23 for the Ogallala aquifer near the site area is based on limited published information (Hart & McAda, 1985). Data from Nicholsen and Clebsh show a regional hydraulic gradient of about 0.0047.

Using these values yields an average linear velocity of between 4.9 and 9.9-feet per year. The table below presents the parameters and calculations employed. Because our monitoring wells are located about 66-feet down gradient from the former junction box, the wells will *not* intercept molecules that were released from the site 6.6 years ago, if we use the fastest average linear velocity, or 13.2 years ago if the slower velocity is employed in the calculation. The monitoring wells would be ineffective in detecting a past chloride release if releases ceased before 1999 or, using the slower velocity, before 1992 *and* natural attenuation removed all evidence of such a release. As chloride impacted soil was excavated in 2002, this is highly unlikely.

Table 2. Ground Water Flow Velocity Calculations

Parameter	Low Estimate	High Estimate
Hydraulic Conductivity k (ft/day)	0.665	1.33
dh/dl (hydraulic gradient)	0.00473	
Q = k* dh/dl	0.0031	0.0063
Specific yield = porosity	0.23	
Average linear velocity = Q/porosity (ft/day)	0.014	0.027
Average linear velocity (ft/year)	***4.992***	***9.983***
Transport Time from Release to Well (years)	13.2	6.6

We conclude that the monitoring well cluster is located and constructed in a manner that would detect any past releases from Junction Box N-29. We conclude that any past releases from Junction Box N-29 did not introduce a sufficient mass of chloride or other constituent to cause impairment of ground water quality.

An inventory of water supply wells obtained from state (NMOSE) and federal (USGS) databases is shown in Plate 7. Field reconnaissance has confirmed that there are more wells in the area than appear in the databases used for this map.

Surface water in the area is ephemeral and flows in Monument Draw occur only after large precipitation events. We found no evidence to suggest that the release from the junction box affected Monument Draw or any watercourse in any manner. Therefore, this document does not provide information on surface water hydrogeology.

4.2 2005 Ground Water Monitoring

Monitoring wells N-29 MW-Deep and N-29 MW-Shallow were installed approximately 66 feet to the southeast (down gradient) of the excavated area. The inset in Plate 6 shows the location of the wells relative to the vadose zone remedy excavation. Subsequent sampling of N-29 MW-Deep and N-29 MW-Shallow in August and October of 2005 confirmed that ground water was not impacted with BTEX, chloride, or TDS levels above WQCC standards. BTEX concentrations were below laboratory detection limit of 0.01 µg/L. Copies of the laboratory analytical report and chain of custody form for the most recent ground water sampling event are included in Appendix C. See Table 3 (attached) for the results of the two sampling events.

5.0 CONCLUSIONS AND RECOMMENDATIONS

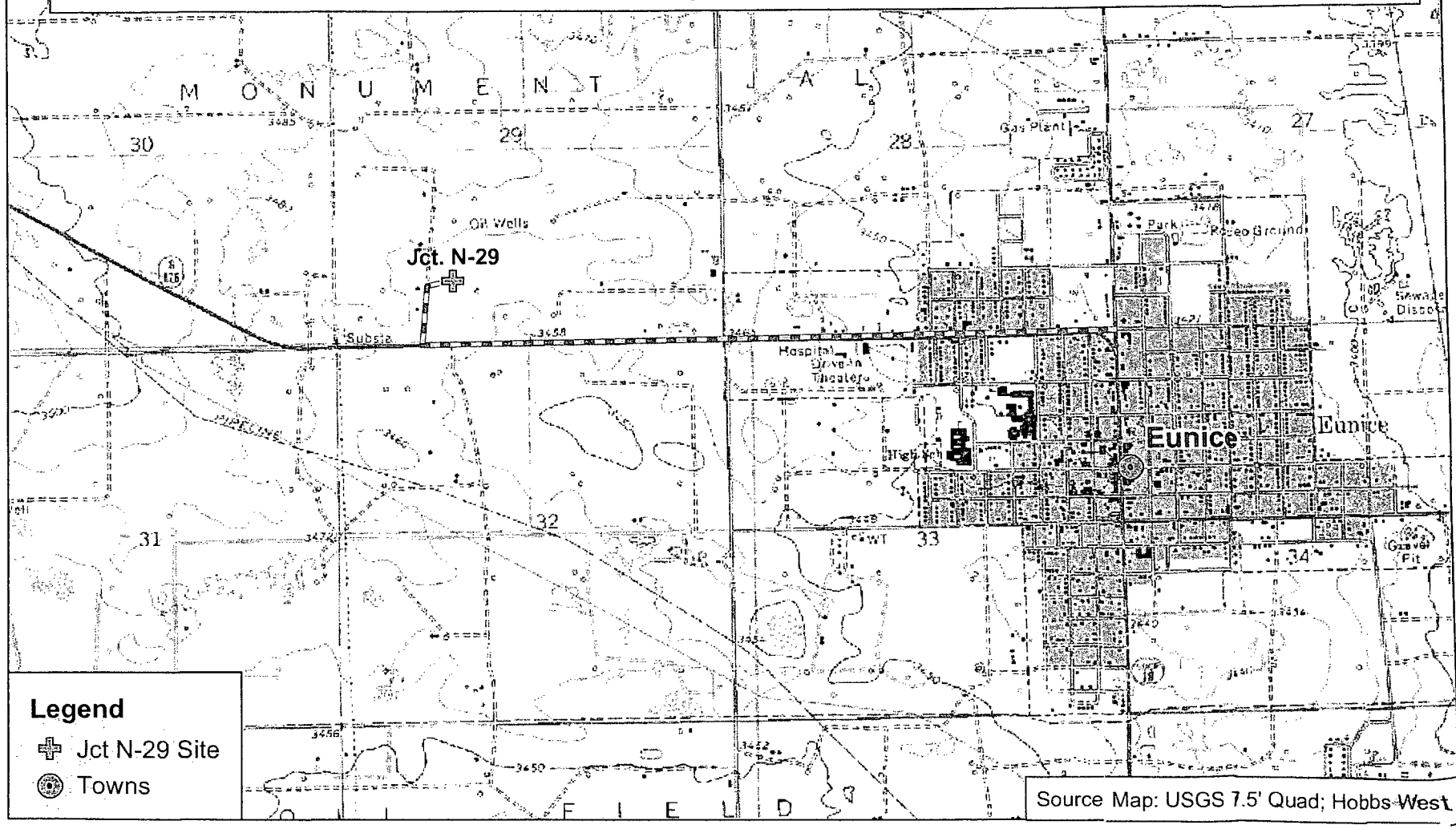
- The Vadose Zone remedy is complete.
- Deep and Shallow Monitoring Wells installed down gradient from the former junction box would detect any impairment to ground water that may have been caused by past releases from the N-29 Junction.
- Ground water monitoring of the Deep and Shallow Monitoring Wells at the site indicates that water in these wells has levels of BTEX, Chloride and TDS that are below WQCC standards
- We recommend that NMOCD withdraw this site from Rule 19 because the past release dose not pose a threat to fresh water, public health or the environment.
- We recommend plugging and abandonment of the two monitoring wells and closure of the regulatory file.

6.0 QUALITY ASSURANCE / QUALITY CONTROL

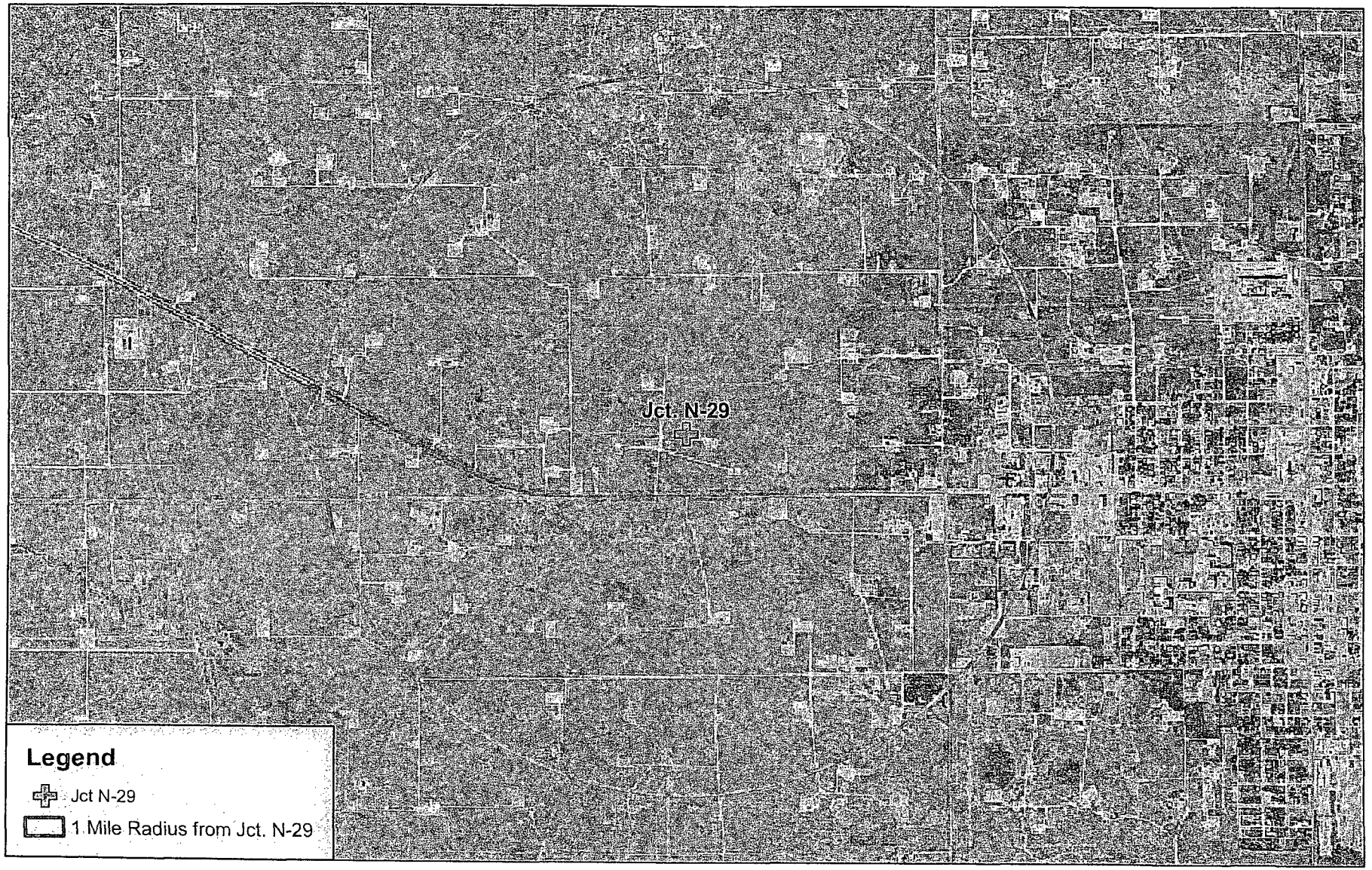
Sampling and analytical procedures were performed in accordance with Title 20 NMAC 6.3107.B and Section 103 of the Water Quality Standards for Interstate and Intrastate Streams in New Mexico (20 NMAC 6.1). Specific quality procedures for obtaining ground water samples are included in Appendix D.

PLATES & TABLES

Directions to site: From the intersection of Highway 207 and Highway 8 in Eunice, proceed west on Highway 8 for 1.8 miles. Turn north on an unnamed dirt road. Proceed north for 850 feet. Then turn east on an unnamed dirt road. Proceed east for 340 feet. Jct N-29 is north of the road. The two monitoring wells are southeast of the junction box, south of the dirt road.



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Site Map	Plate 1
	ROC: Jct. N-29 (NMOCD #: 1R0426-37)	January 2008



R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

2004 Aerial Photograph of Surrounds

Plate 2

ROC: Jct. N-29 (NMOCD #: 1R0426-37)

January 2006

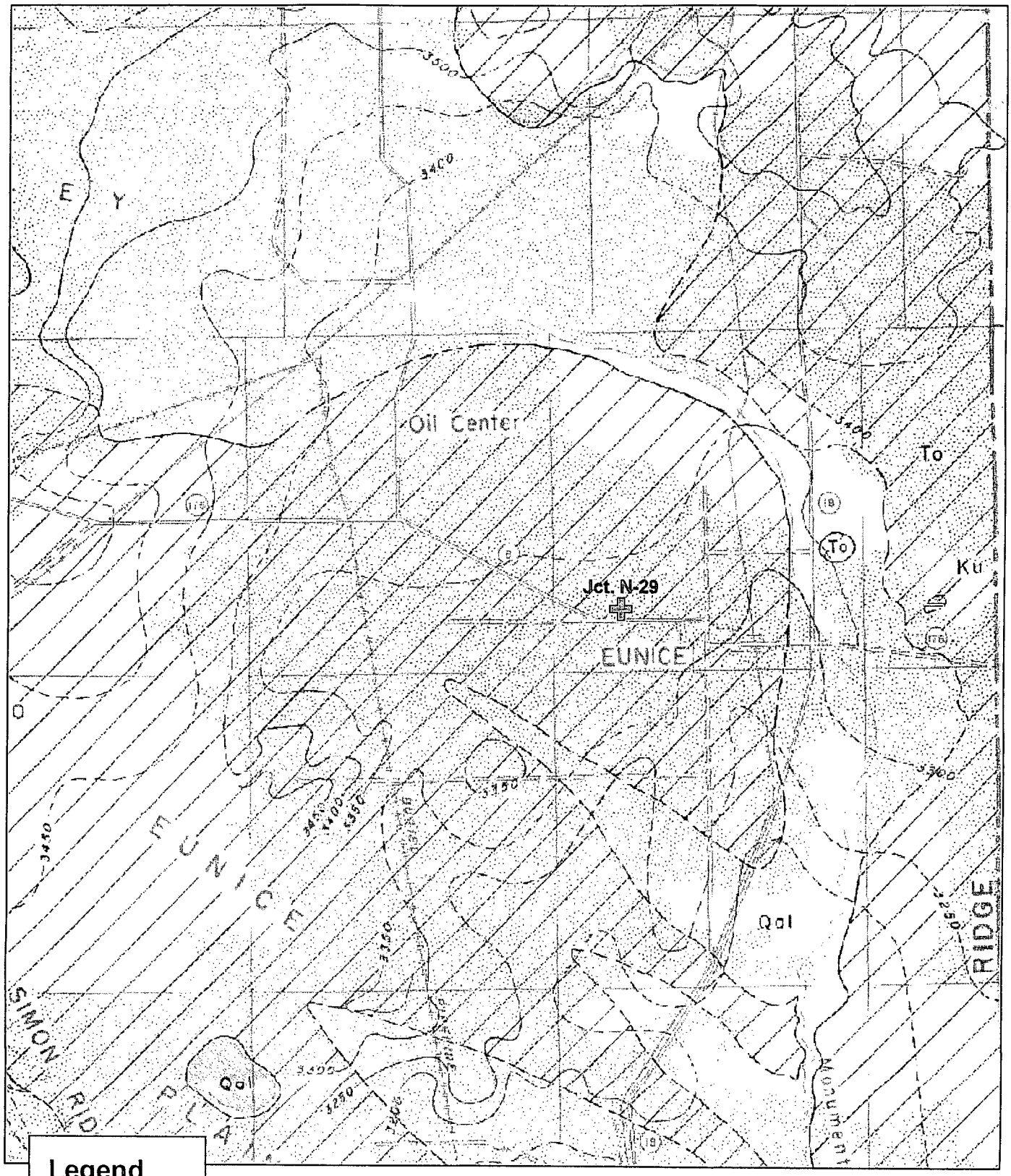
N

Legend

Map_Unit, Description

- Kl, Lower Cretaceous, undivided
- Pat, Permian-Tansill or Yates Formation
- Pqm, Paleozoic-Quartermaster Formation
- Pr, Paleozoic-Ruster Formation
- Qa, Quaternary Alluvium
- T(r)s, Triassic-Santa Rosa Formation
- Qe, Quaternary Eolian Deposits
- Qe/Qp, Quaternary Eolian Piedmont Deposits
- Qoa, Quaternary-Older Alluvial Deposits
- To, Tertiary Ogallala Formation
- Qp, Quaternary Piedomon Alluvial Deposits
- Qpl, Quaternary Lacustrine and Playa Deposits
- T(r)cu, Triassic-Upper Chinle

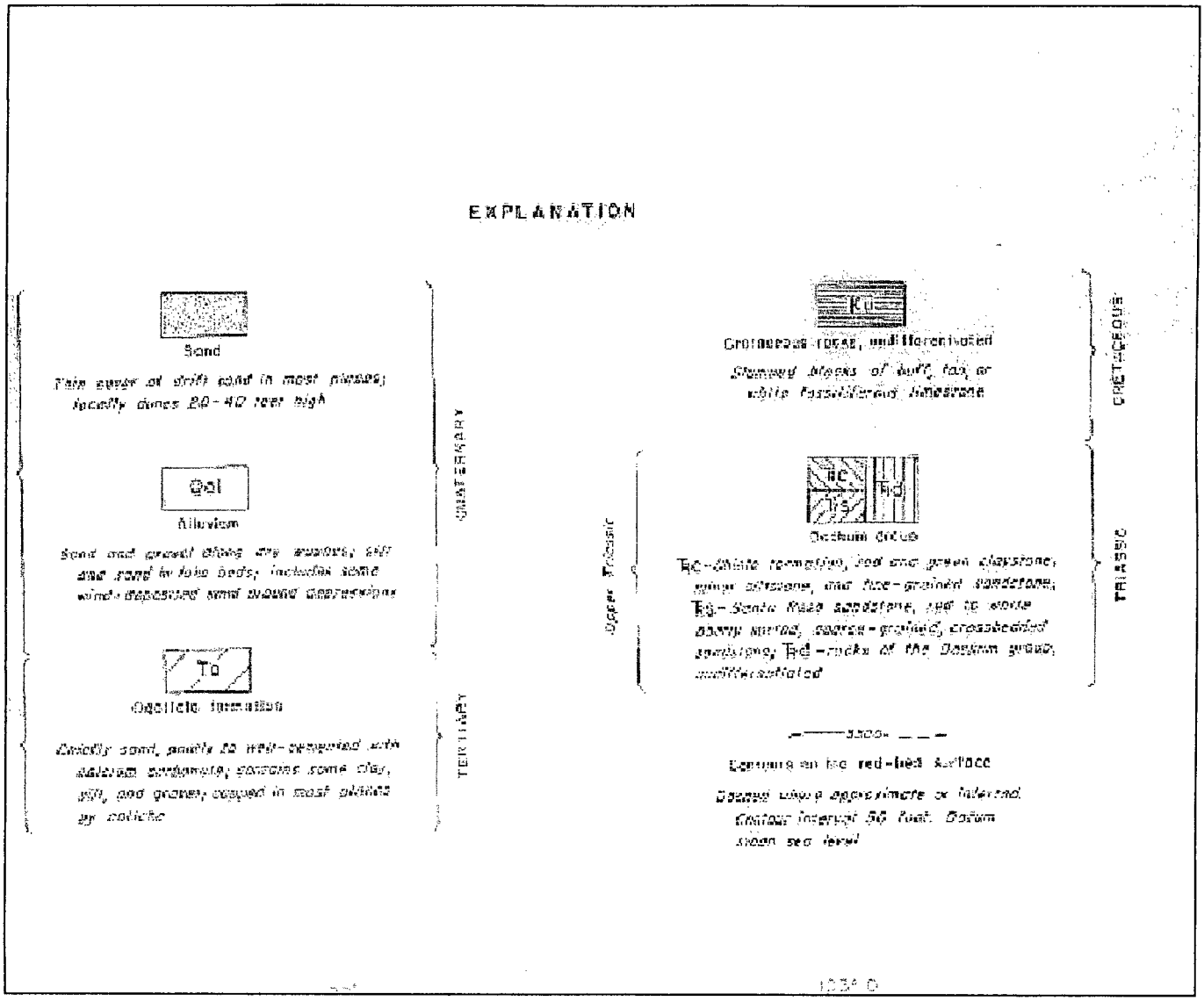
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Regional Geologic Map (USGS Open File Report OF-97-52)	Plate 3
	ROC: Jct. N-29 (NMOCD #: 1R0426-37)	January 2006



Legend

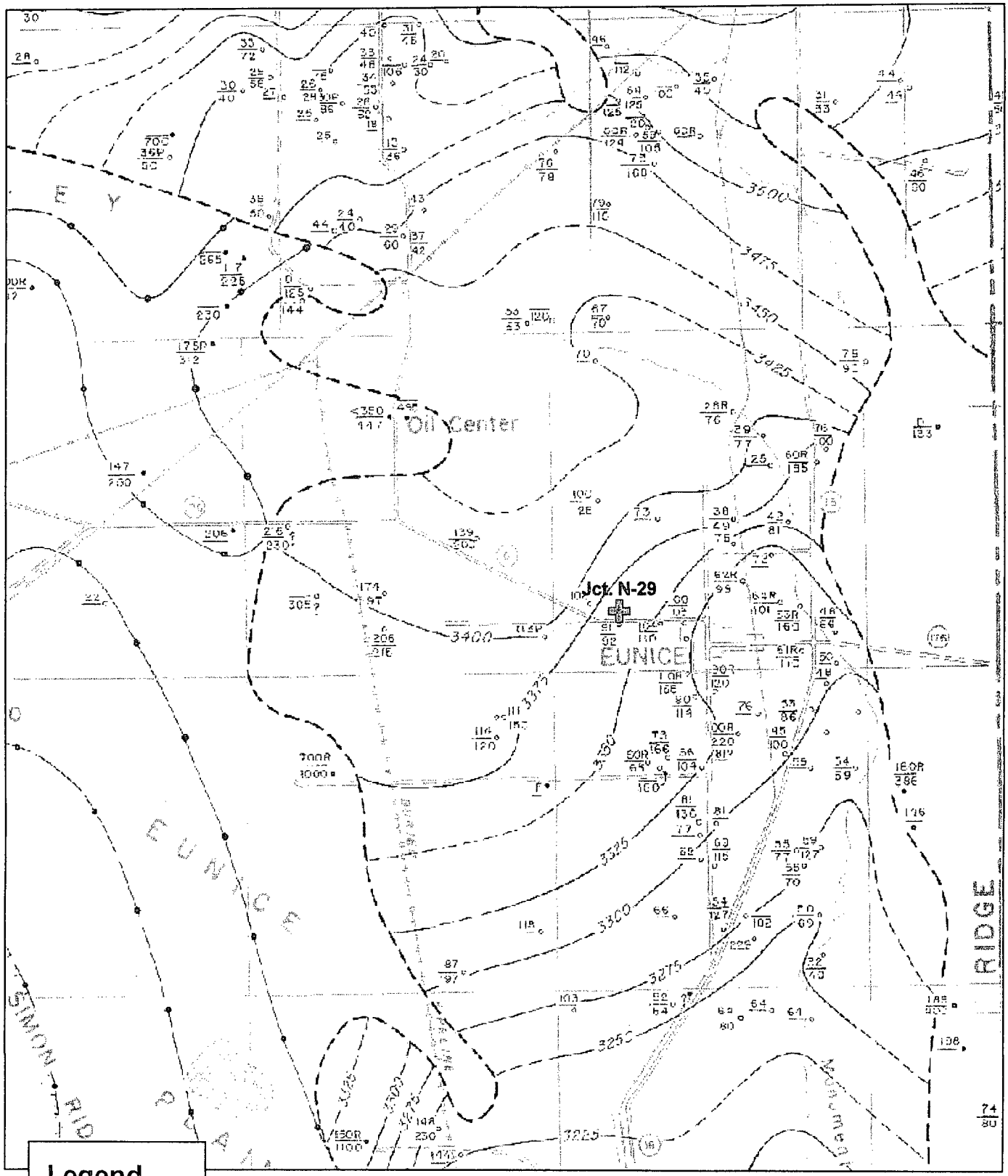
⊕ N-29 Site

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Local Geologic Map (Nicholson & Clebsch, 1961)	Plate 4
	ROC: Jct. N-29 (NMOCD #: 1R0426-37)	January 2006

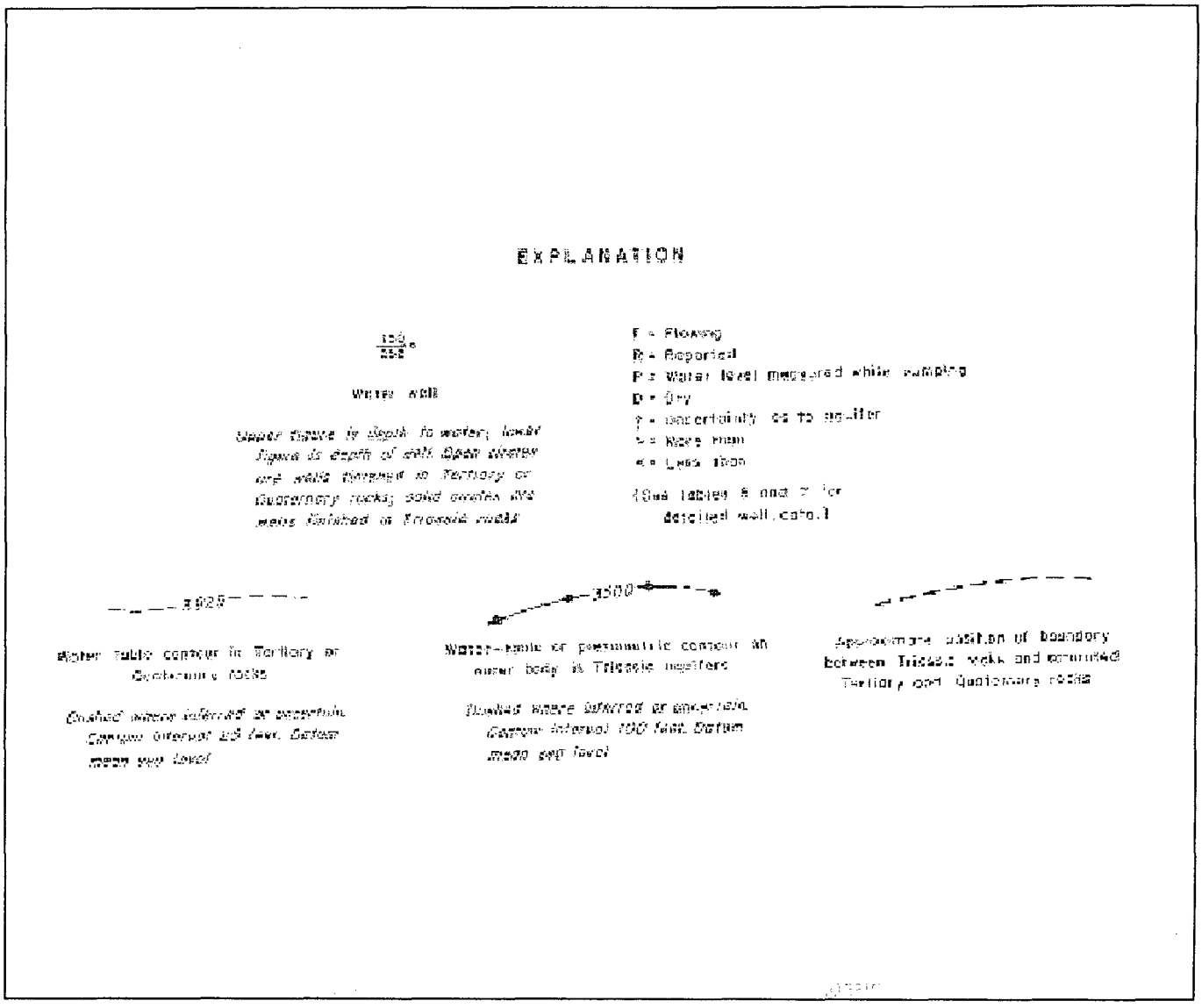


Legend to Nicholson & Clebsch (1961) Geologic Map

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Supplemental Legend to Geologic Map	Plate 4 Supplemental
	ROC: Jct. N-29 (NMOCD #: 1R0426-37)	January 2006

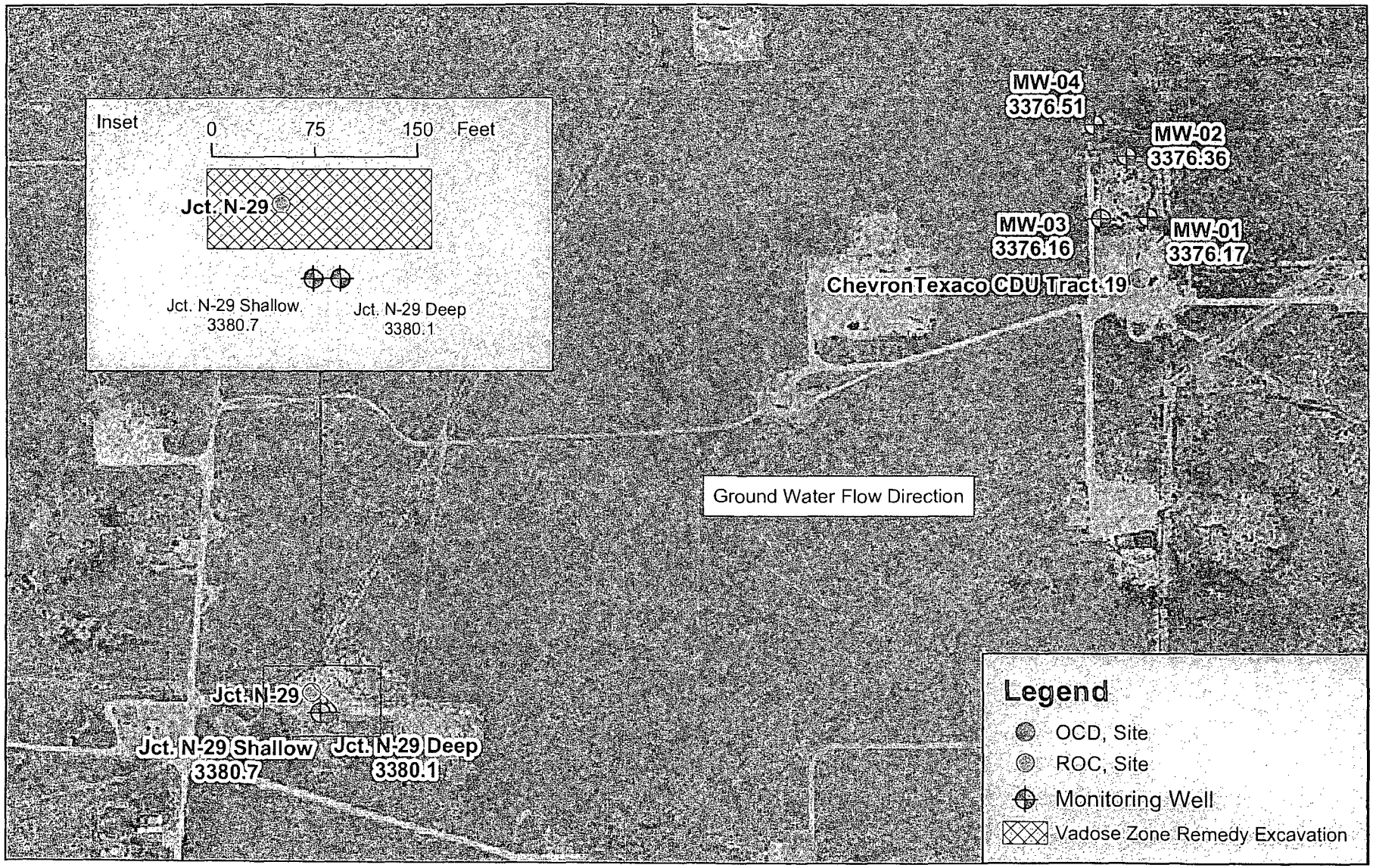


R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Local Ground Water Map (Nicholson & Clebsch, 1961)	Plate 5
	ROC: Jct. N-29 (NMOCD #: 1R0426-37)	January 2006



Legend to Nicholson & Clebsch (1961) Ground Water Map

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Supplemental Legend to Ground Water Map	Plate 5 Supplemental
	ROC: Jct. N-29 (NMOCD #: 1R0426-37)	January 2006

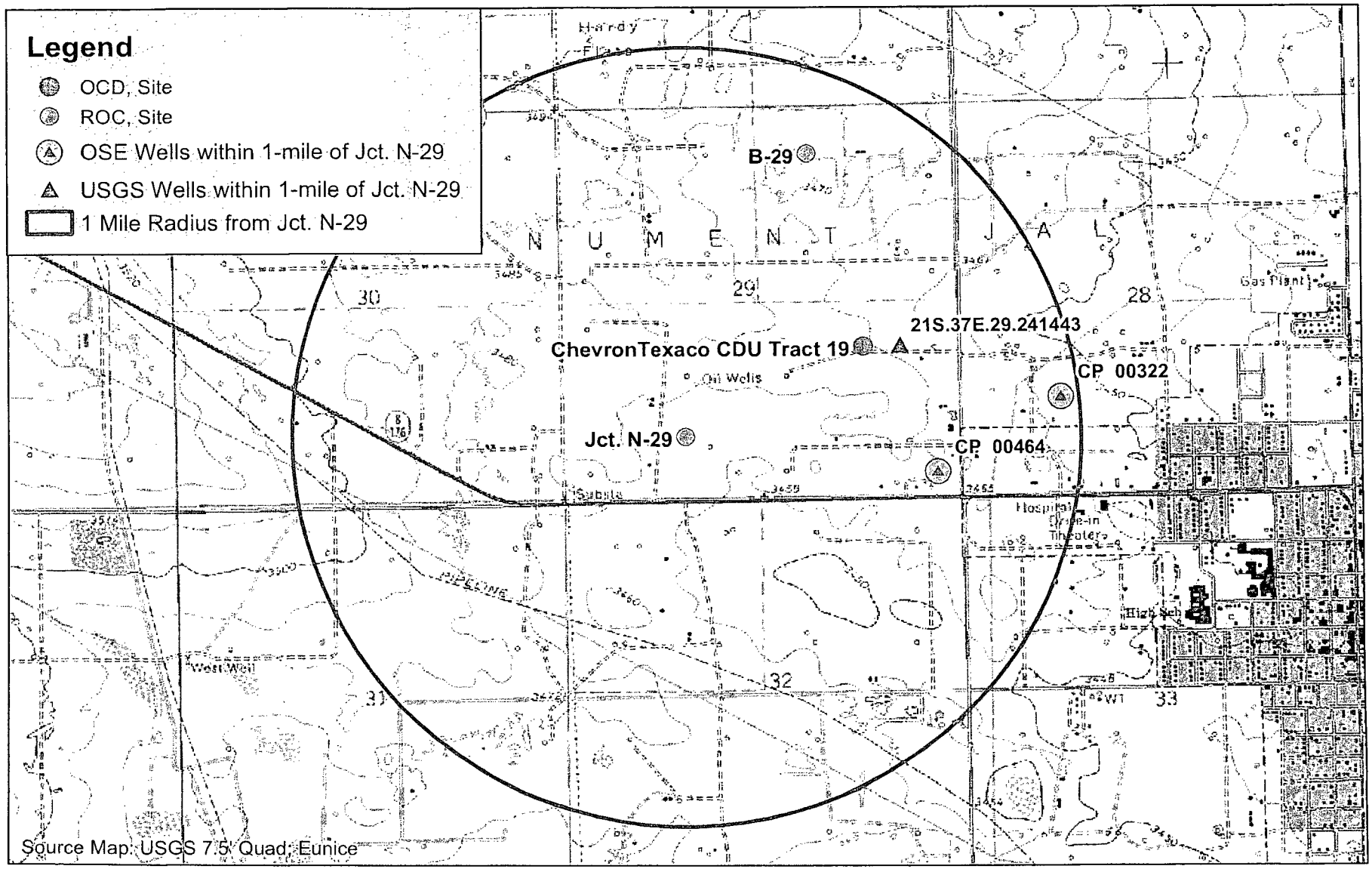


Source Map: USGS 7.5' Quad; Eunice

0 500 1,000 2,000 Feet

N

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Ground Water Elevations (fmsl)	Plate 6
	ROC: Jct. N-29 (NMOCD #: 1R0426-37)	January 2006



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Wells within 1-Mile of Jct. N-29	Plate 7
	ROC: Jct. N-29 (NMOCD #: 1R0426-37)	January 2006

Table 3:
Ground Water Chemistry

Well Name	Date	Benzene(ug/L)	Toluene(ug/L)	Ethyl Benz(ug/L)	Total Xylenes(ug/L)	Chloride(mg/L)	TDS(mg/L)
Jct. N-29 Deep	08/30/05	<1	<1	<1	<1	80.2	764
	10/18/05	<1	<1	<1	<1	82.8	766
	01/17/06	<1	<1	<1	<1	62.2	420
Jct. N-29 Shallow	08/30/05	<1	<1	<1	<1	73.1	590
	10/18/05	<1	<1	<1	<1	80.3	568
	01/17/06	<1	<1	<1	<1	78.8	454
WQCC Standards		*10*	*750*	*750*	*620*	*250*	*1000*

Well Name	Date	Sulfate(mg/L)	Sodium(mg/L)	Calcium(mg/L)	Magnesium(mg/L)	Potassium(mg/L)	CaCO3(mg/L)
Jct. N-29 Deep	08/30/05	170	168	56	29.8	11	218
	10/18/05	86.3	135	43.2	24	10.9	230
	01/17/06	111	116	30.3	18	9.3	204
Jct. N-29 Shallow	08/30/05	91.9	116	36.8	10	6.67	210
	10/18/05	179	84.6	51.8	18.7	5.38	206
	01/17/06	86.3	71.8	53.2	24.1	4.64	187
WQCC Standards		*600*	--	--	--	--	--

APPENDIX A

RICE OPERATING COMPANY
JUNCTION BOX DISCLOSURE REPORT

BOX LOCATION

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	BOX DIMENSIONS - FEET		
							Length	Width	Depth
BD	N-29	N	29	21S	37E	LEA	not	built	yet

LAND TYPE: BLM _____ STATE _____ FEE LANDOWNER TOM KENNAAN OTHER _____

Depth to Groundwater 90 feet NMOCD SITE ASSESSMENT RANKING SCORE: 10

Date Started 10/7/2002 Date Completed 12/27/2002 OCD Witness YES

Soil Excavated 4000 cubic yards Excavation Length 165 Width 55 Depth 18" feet

Soil Disposed 84 cubic yards Offsite Facility Sundance Location Eunice, New Mexico

FINAL ANALYTICAL RESULTS: Sample Date 12/30/2002 Sample Depth 20'

Procure 5-point composite sample of bottom and 4-point composite sample of sidewalls. TPH, BTEX and Chloride laboratory test results completed by using an approved lab and testing procedures pursuant to NMOCD guidelines.

Sample Location	Benzene mg/kg	Toluene mg/kg	Ethyl Benzene mg/kg	Total Xylenes mg/kg	GRO mg/kg	DRO mg/kg	Chlorides mg/kg
SIDEWALLS	<0.025	<0.025	<0.025	<0.025	<10	<10	5140
BOTTOM	<0.025	<0.025	<0.025	<0.025	<10	<10	478

General Description of Remedial Action: Delineation of this site found high TPH and chloride impact under the junction box site to 40' bgs. Results from a soil boring under the box site indicated the TPH stopped before reaching groundwater but the chlorides continue to groundwater. In order to place the boring machine close to the impact, the excavation was backfilled to 20'bgs with clean soil. An anomalous high chloride spot was found on the north wall of 12,000 ppm chlorides. Field chloride tests were run on samples taken around this spot with results ranging from 105 ppm to 2700 ppm chlorides. The results are enclosed. A poly liner will be installed above the impacted soil at 6' bgs. A compacted clay liner was installed @ 20' and tested. The excavation was backfilled with soil remediated on-site and contoured to the surrounding terrain. The backfill was packed in 5' lifts and a composite sample was taken from each lift and analyzed by a certified lab. A monitor well will be installed and sampled to monitor the ground water constituents. An annual report with the sampling results will be sent to the NMOCD. The site will be reseeded and a water proof junction box will be installed north of the remediated area.

* A 15' X 15' area was excavated to 40' bgs (see enclosed figures)

TPH/CHLORIDE FIELD TESTS

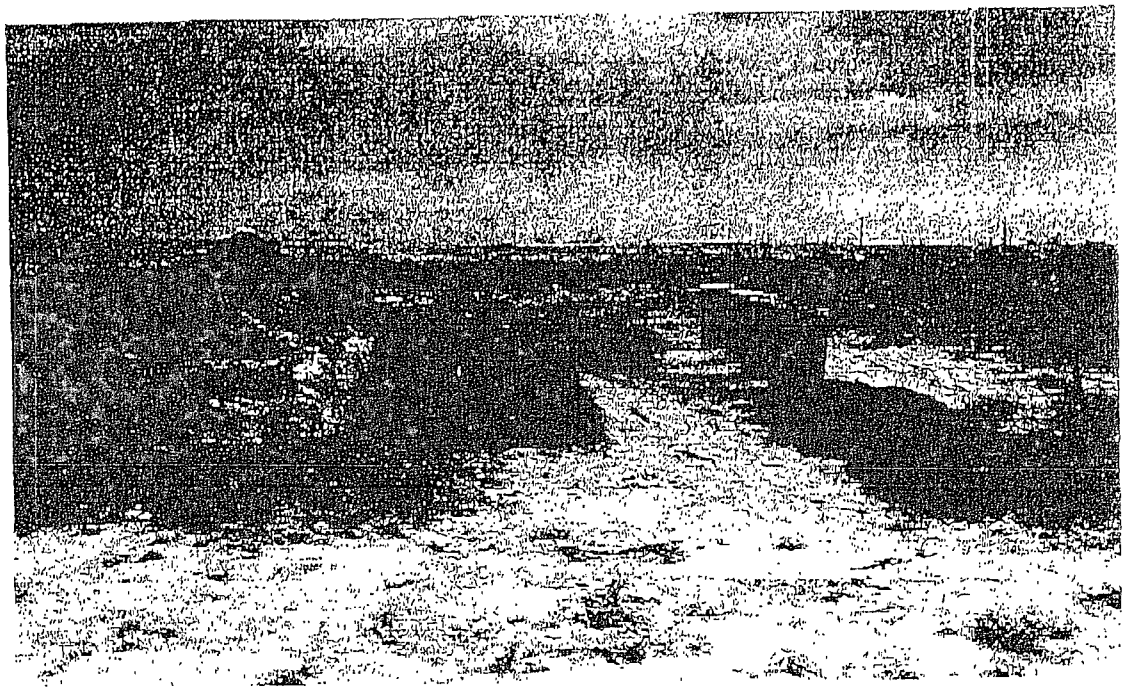
LOCATION	Depth	TPH	mg/kg
SIDEWALLS	17'	N/A	4889
BOTTOM	20'	N/A	599
Remediated Soil	comp	211	1080
Surface	0'	N/A	487
15' Lift	5'	192	762
10' Lift	10'	206	886
5' Lift	15'	341	993

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

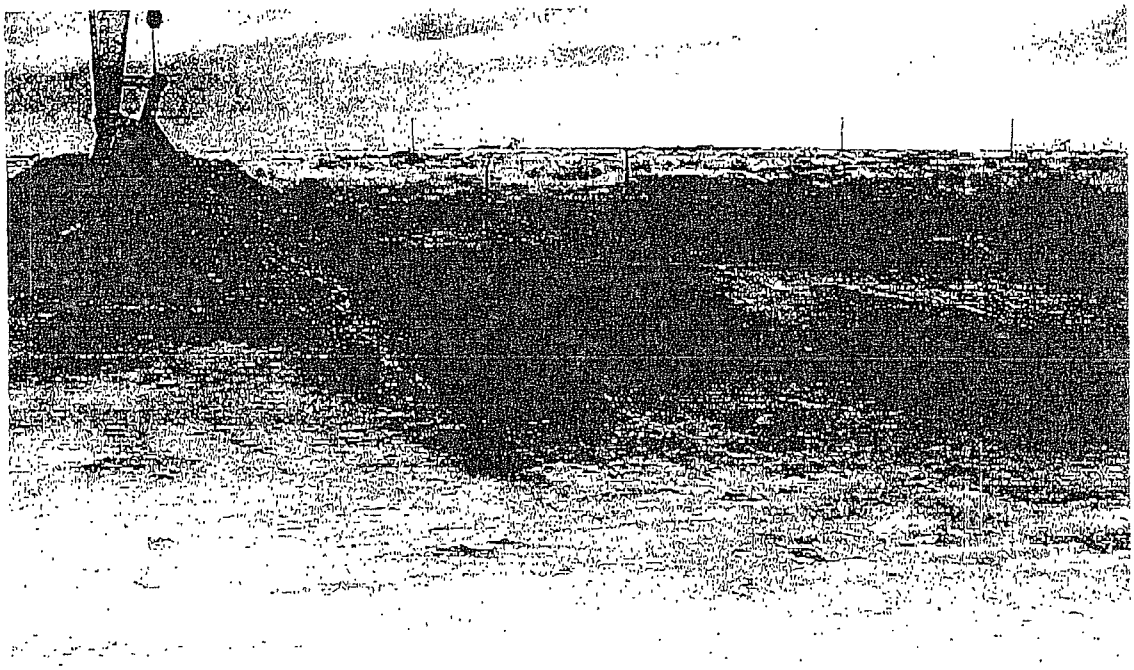
DATE January 2, 2003 PRINTED NAME D. E. Anderson

SIGNATURE _____ TITLE Project Leader - Environmental

BD jct. N-29

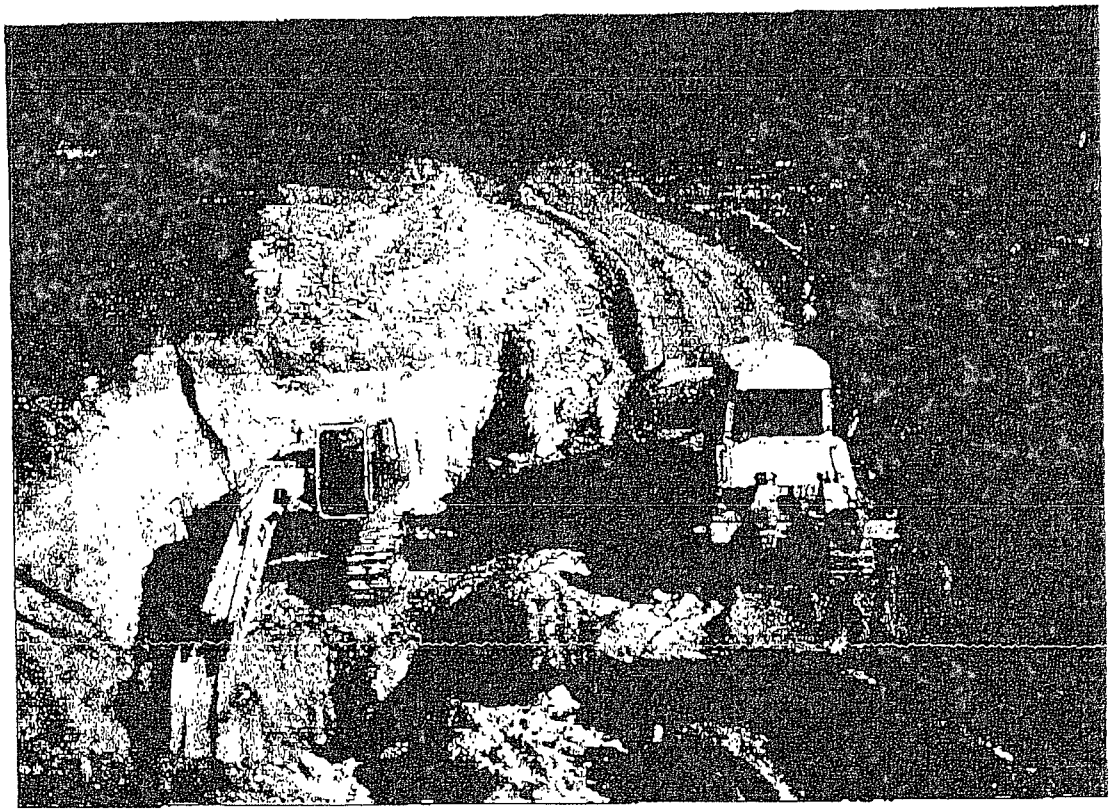


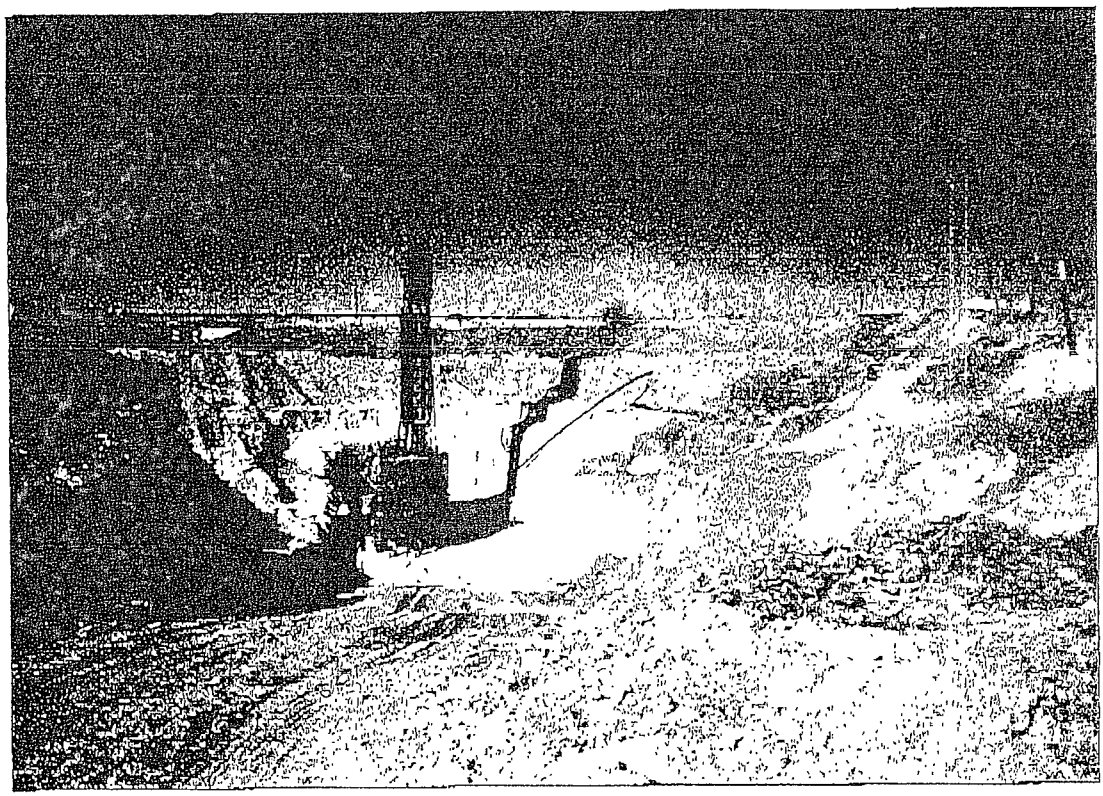
NORM excavation



Impact Excavation

BD jct. N-29

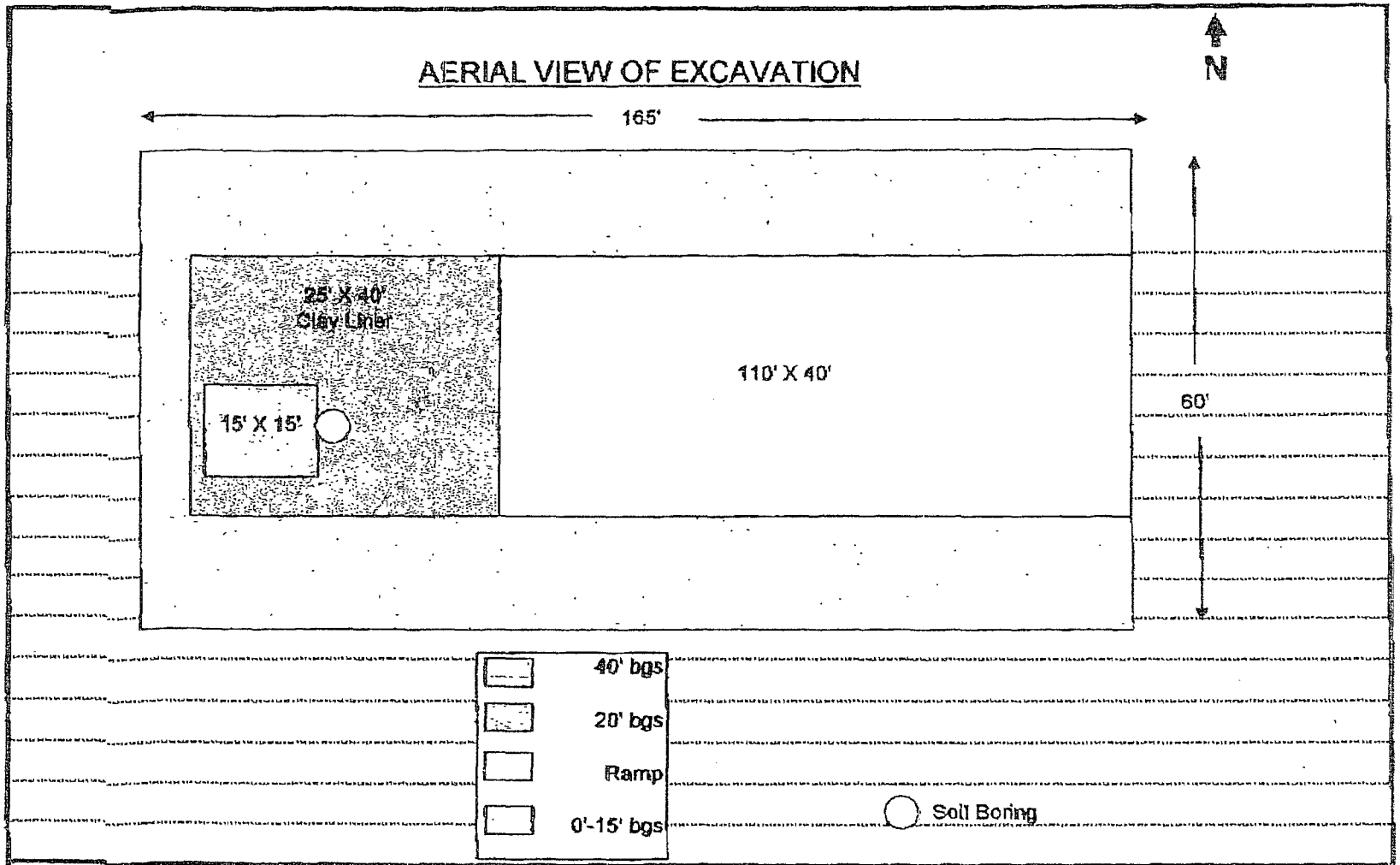




Soil Bore

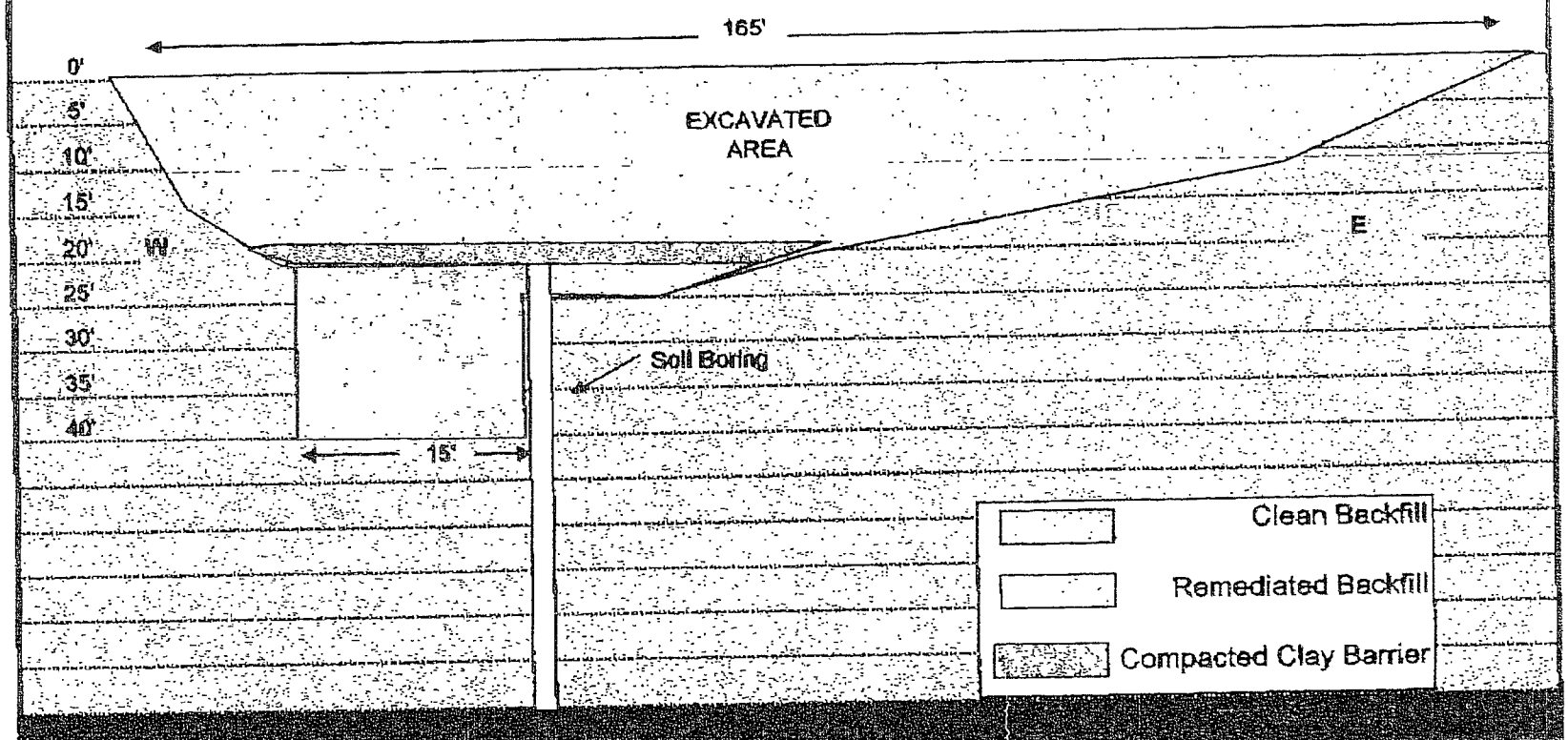
DRILLING LOG	Site Name/Location					Logged by: A.Eades
RICE Operating Company 122 West Taylor Hobbs, New Mexico 88240 Phone: (505) 393-9174 Fax: (505) 397-1471	Jct N-29 29-T21S-R37E BD SWD System Lea County, NM	Well No.: MW1	Date Drilled: 11/7/00	Driller: Eades		Construction: Backfill with bentonite and cuttings.
		Mud Depth: 90'	Boring Depth: 90'	Well Material:		
		Casing Length:	Boring Diameter: 4.75"	Casing Dia:		
		Screen Length:	Drilling Method: Air Rotary	Box Size: N/A		

DEPTH	SUBSURFACE LITHOLOGY	SAMPLE TYPE	Chlorides (ppm) Field	Lab	TEST mg/kg TPH		Boring
0	Ground surface						
	Topsoil						
	Caliche						
10						excavation	
20	BORING RIG PLACEMENT						Boring Start
					Lab	Soil Boring PID	Clean Backfill
30	tan sand w/caliche	Grab		142	<10	361	
		Grab		5000	<10	366	
40	moist	Grab	3626	4160	<10	245	Cuttings
	brown sand	Grab			<10	148	
50		Grab	3245	3630	<10	139	
	sand w/caliche rocks	Grab			47	320	
60		Grab	2696	3190	12	223	
	brown sand	Grab			<10	137	
70		Grab	2699	3010	12	61	
		Grab			19	181	
80		Grab	3899	4430	21	92	
	sandstone sand & sandstone	Grab	3234	3460	<10	127	
90	sand - wet	Grab	570	576	<10	2	



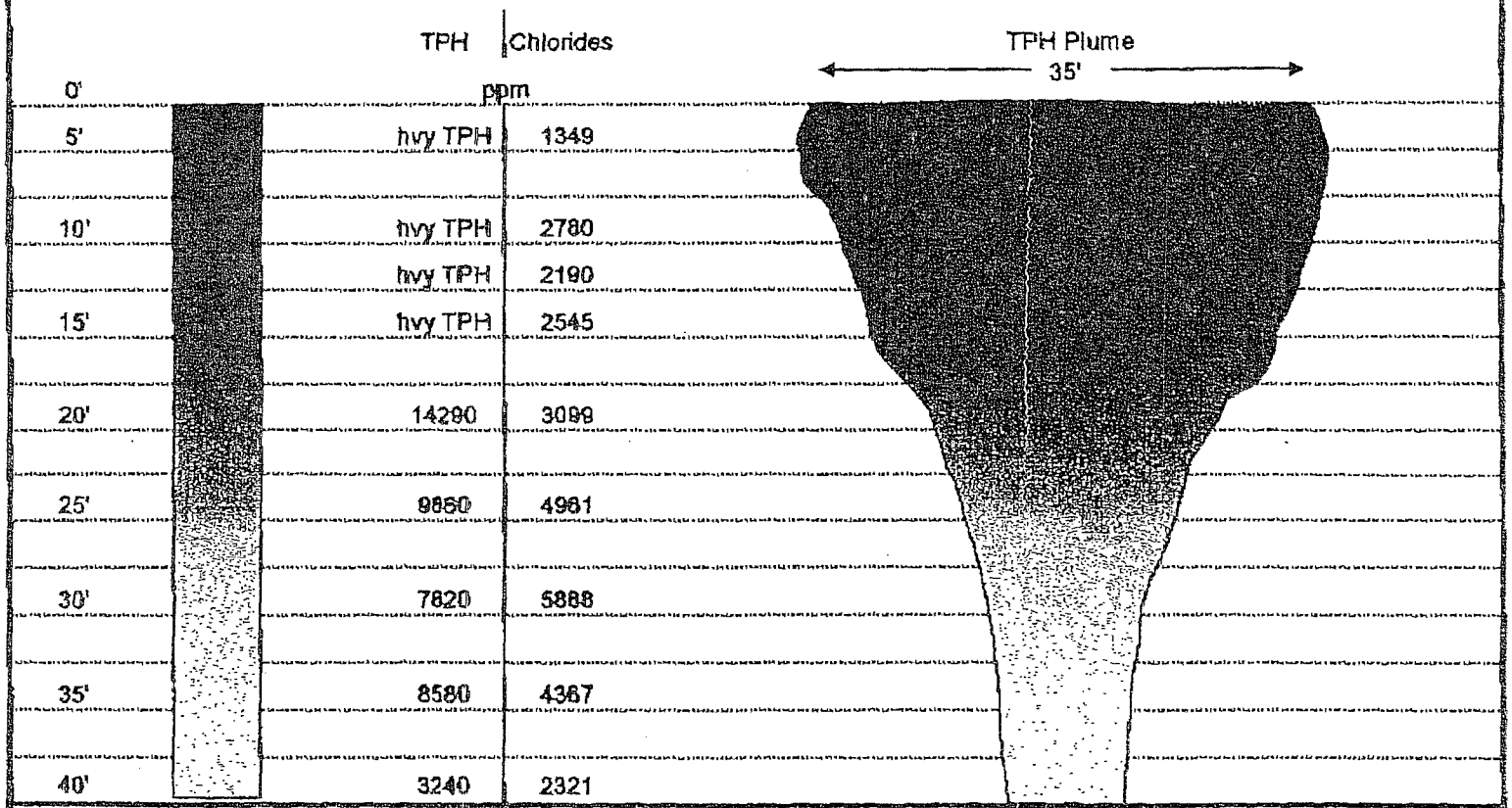
RICE OPERATING COMPANY 122 W. Taylor Hobbs, NM 88240	12/31/2002 SITE MAP **Jct. N-29**	BD SWD SYSTEM Unit Letter N, Sec 29, T21S, R37E Lea County, NM

PROFILE VIEW OF IMPACT AREA



RICE OPERATING COMPANY 122 W. Taylor Hobbs, NM 88240	12/31/2002 SITE MAP Jct. N-29	BD SWD SYSTEM Unit Letter N, Sec 29, T21S, R37E Lea County, NM

VERTICAL DELINEATION FIELD TESTS

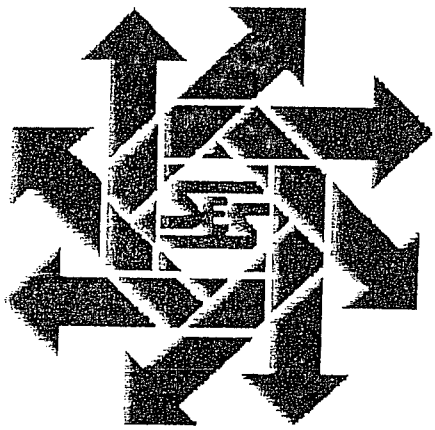


RICE OPERATING COMPANY 122 W. Taylor Hobbs, NM 88240	12/31/2002 SITE MAP Jct. N-29	BD SWD SYSTEM Unit Letter N, Sec 29, T21S, R37E Lea County, NM

APPENDIX B

ChevronTexaco
Additional Site Investigation
CDU Tract 19
Lea County, New Mexico

July 15, 2003

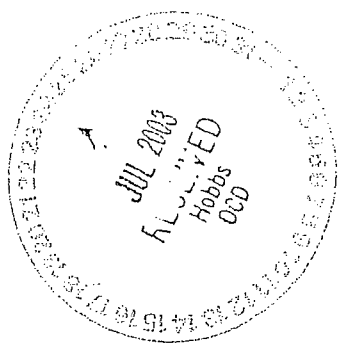


Prepared for:

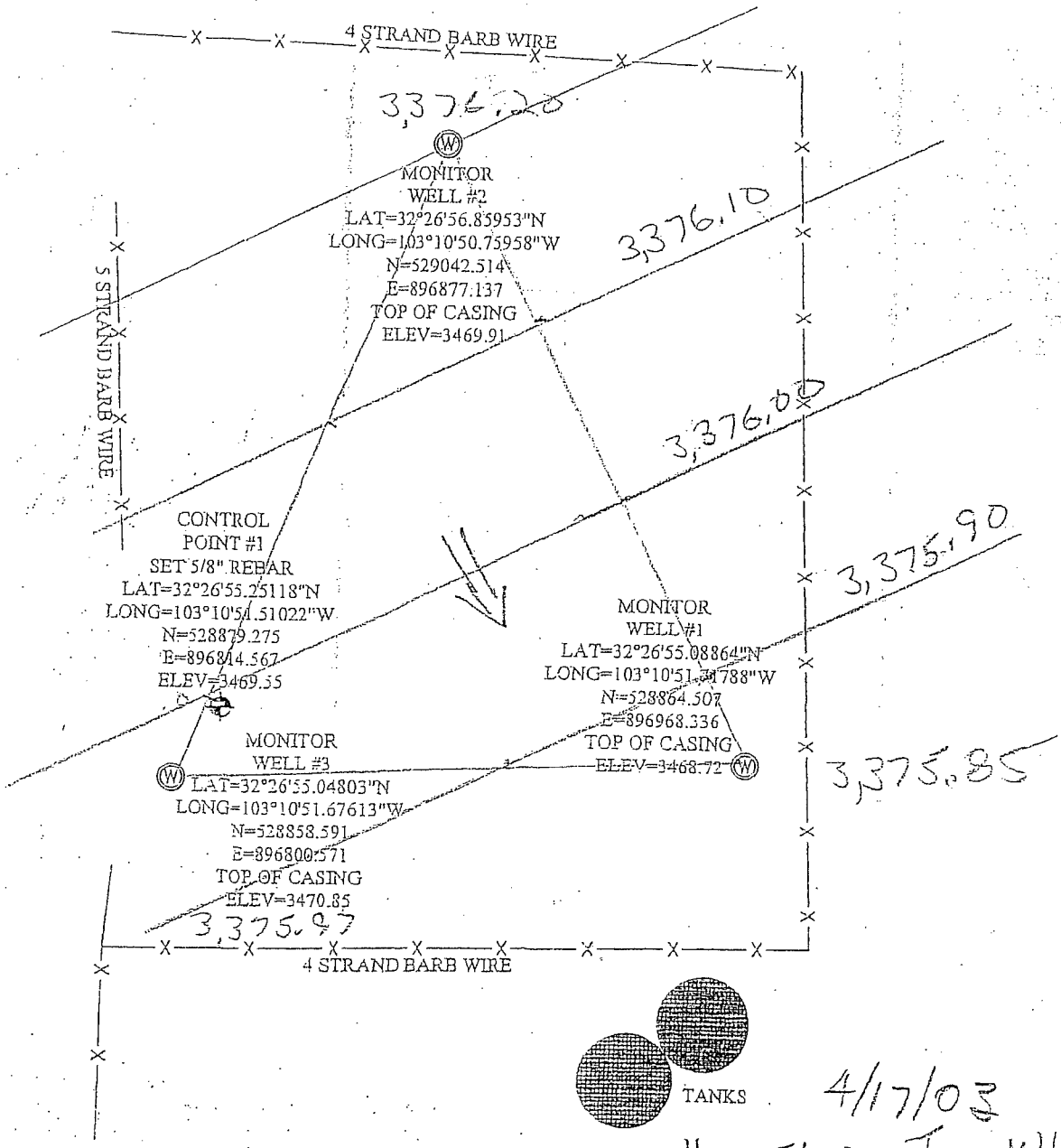
ChevronTexaco
P.O. Box 1949
Eunice, New Mexico 88231

By:

Safety & Environmental Solutions, Inc.
703 E. Clinton, Suite 102
Hobbs, New Mexico 88240
(505) 397-0510



Original



4/17/03

Well	Elev	Tw	WL Elev.
mw-1	3468.72	92.87	3,375.85
mw-2	3469.91	93.71	3,376.20
mw-3	3470.85	94.88	3,375.97

DANIEL R. HUTAF
NEW MEXICO
13239
4/30/02
REGISTERED PROFESSIONAL SURVEYOR

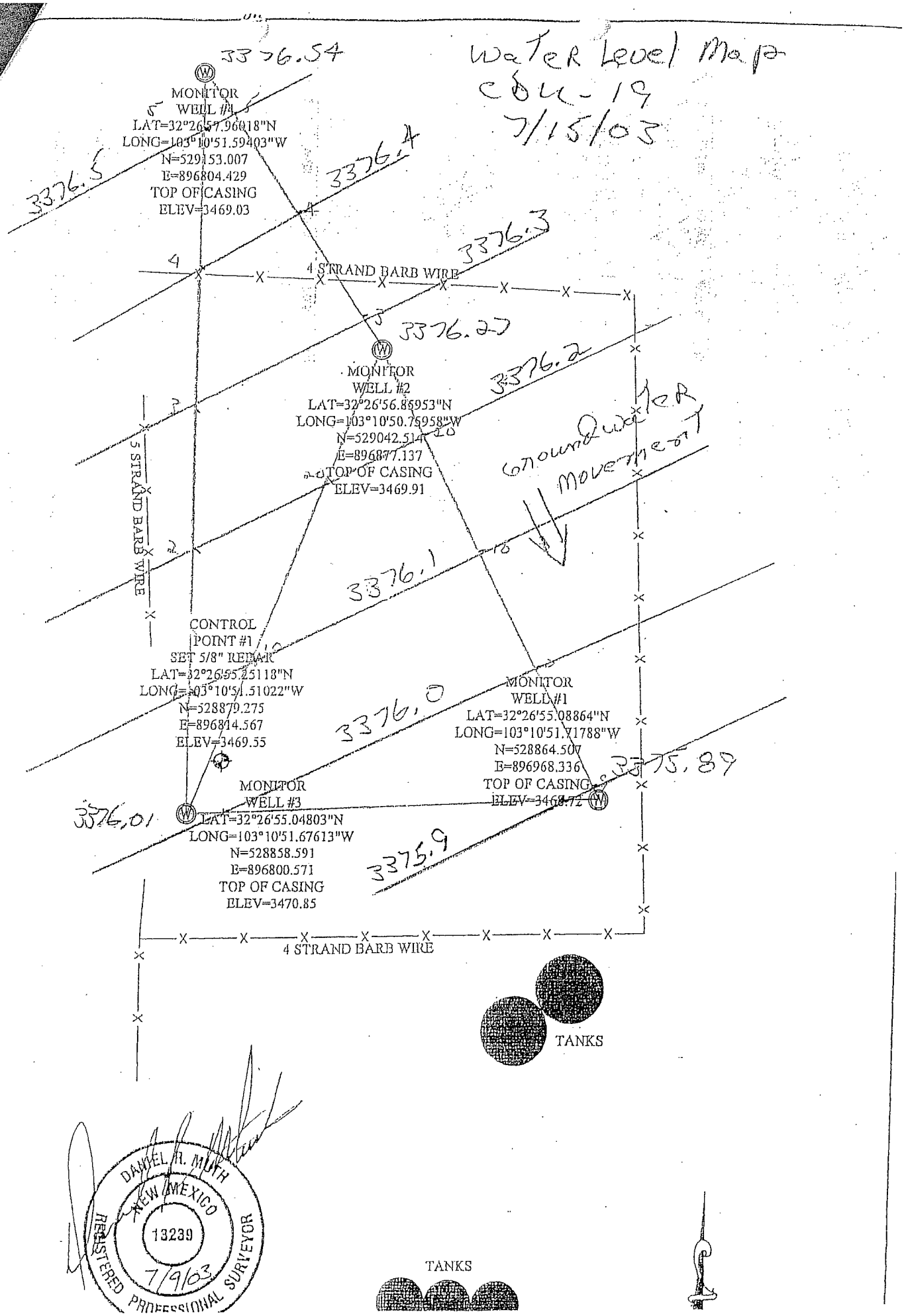
TANKS

HURON

Blue Tract 19 Date 4/17/03

S OF BEARING:
POSITIONS WERE OBSERVED USING GLOBAL POSITIONING

SCALE 1" = 50'


Water Level Map
CCU-19
7/15/03
3376.54
MONITOR
WELL #4
LAT=32°26'57.96018"N
LONG=103°10'51.59403"W
N=529153.007
E=896804.429
TOP OF CASING
ELEV=3469.03
3376.5
3376.4
3376.3
4 STRAND BARB WIRE
3376.27
MONITOR
WELL #2
LAT=32°26'56.85953"N
LONG=103°10'50.75958"W
N=529042.514
E=896877.137
TOP OF CASING
ELEV=3469.91
3376.2
Groundwater
Movement
5 STRAND BARB WIRE
3376.1
CONTROL
POINT #1
SET 5/8" REBAR
LAT=32°26'55.25118"N
LONG=103°10'51.51022"W
N=528879.275
E=896814.567
ELEV=3469.55
3376.0
MONITOR
WELL #1
LAT=32°26'55.08864"N
LONG=103°10'51.71788"W
N=528864.507
E=896968.336
TOP OF CASING
ELEV=3468.72
3375.89
MONITOR
WELL #3
LAT=32°26'55.04803"N
LONG=103°10'51.67613"W
N=528858.591
E=896800.571
TOP OF CASING
ELEV=3470.85
3376.01
3375.9
4 STRAND BARB WIRE
TANKS
DANIEL R. MUTH
NEW MEXICO
13239
REGISTERED PROFESSIONAL SURVEYOR
7/9/03
TANKS

APPENDIX C

Soil Borings and Monitoring Wells

From May 11, to May 13, 2005, Andrew Parker of Hicks Consultants mobilized to the Site to provide soil boring and monitoring well installation oversight. Using a hollow-stem auger drilling rig operated by Atkins Engineering of Roswell, New Mexico, three soil borings were installed down gradient from the N-29 junction box. Split-spoon samples were recovered at 5-foot intervals to characterize lithology.

However, borehole collapse resulted in backfilling two of the three soil borings with soil cuttings and bentonite. The third soil boring was completed as a ground water monitoring well (Jct. N-29 Shallow) by installing 2-inch PVC casing, to a total depth of 104-feet. The completion included a 15-foot long section of 0.01-inch slotted screen that was covered by an 8/16 size sand filter, topped with two to three feet of bentonite chips, and grout to the surface. The top of the casing is protected by an above ground monument box set in a 2-foot by 2-foot cement pad.

On August 11, 2005, Eades Drilling of Hobbs, New Mexico, mobilized to the site to install an additional borehole located down gradient of the N-29 junction box. The soil boring was completed as a ground water monitoring well (Jct. N-29 Deep) by installing 2-inch PVC casing, to a total depth of 118-feet. The completion included a 5-foot long section of 0.01-inch slotted screen that was covered by an 8/16 size sand filter, topped with two to three feet of bentonite chips, and grout to the surface. The top of the casing is protected by an above ground monument box set in a 2-foot by 2-foot cement pad.

Below are the Borehole/Well Logs for monitoring wells Jct. N-29 Shallow and Jct. N-29 Deep.

Borehole/Well Log

Facility Name:	Jct N-29 BD; Rice Operating Co.	UTM/Geographic/State Plane:	UTM
Address:	3 miles west of Eunice	X:	670447.6
City, State:	Eunice, NM	Y:	3591382.9
County:	Lea	Z:	3464 ft msl
Driller:	Atkins Engineering Associates Inc.	Datum:	NAD 83
Auger Type:	4.25 Hollow Stem	Borehole ID:	B-29 BD
Auger Dia.:	8"	Well ID:	Jct N-29 BD-shallow
Drill Date:	08/11/2005	Total Depth:	100

DEPTH	W.L.	Lithology	Soil Description	Sample/ Blow Counts	PID ppm	Well Construction	Well Description
5 to -100	▼ at -85		SM: Silty fine sand, loose, reddish tan, dry SC: Sandy clay, loose, red, damp SM: Silty sand w/ caliche, loose, red and white, SM: Silty fine sand, loose, red, dry SM: Silty fine sand w/ broken sandstone, loose, tan & white, dry SS: Cemented sandstone, firm, light tan, dry SM: Silty sand, loose, tan, dry SS: Sandstone, hard, light tan, dry SM: Silty sand, soft, reddish tan, wet				4"x4"x5' Well Cover 2'x2'x4" Concrete Pad 2" PVC Casing Bentonite Grout Bentonite Seal Screen Sand

R.T. Hicks Consultants, Ltd

901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505-266-5004 Fax: 505-266-0745

rehole/Well Log

Facility Name:	Jct N-29 BD; Rice Operating Co.	UTM/Geographic/State Plane:	UTM
Address:	3 miles west of Eunice	X:	670453.6
City, State:	Eunice, NM	Y:	3591382.9
County:	Lea	Z:	3464 ft msl
Driller:	Atkins Engineering Associates Inc.	Datum:	NAD 83
Auger Type:	4.25 Hollow Stem	Borehole ID:	B-29 BD
Auger Dia.:	8"	Well ID:	Jct N-29 BD-deep
Drill Date:	07/20/05	Total Depth:	125

DEPTH	W.L.	Lithology	Soil Description	Sample/ Blow Counts	PID ppm	Well Construction	Well Description
5							4"x4"x5' Well Cover
0			SM: Silty, fine sand, loose, reddish tan, dry				2'x2'x4" Concrete Pad
-5			SC: Sandy clay, loose, red, damp				
-10			SM: Silty sand w/caliche, loose, red and white, damp				
-15			SM: Silty fine sand, loose, reddish tan, dry				
-20			SM: Silt fine sand w/broken sandstone, loose, tan, white, dry				
-25							
-30							
-35							
-40							
-45			SS: Cemented Sandstone, firm, light tan, dry				
-50							
-55							
-60			SM: Silty fine sand, loose, tan, dry				2" PVC Casing
-65							
-70							
-75							Bentonite Grout
-80			SS: Sandstone, hard, light tan, dry				
-85	▼		SM: Silty Sand, soft, reddish tan, wet				
-90							
-95							
-100			SM: Silty sand, soft, tan, wet				
-105							
-110							Bentonite Seal
-115			SC: Clayey sand, soft, reddish tan, wet				Screen
-120			CL: Clay, stiff, red, moist				Sand
-125							Cuttings and silica

R.T. Hicks Consultants, Ltd

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Ph: 505-266-5004 Fax: 505-266-0745

ENVIRONMENTAL LAB OF
[illegible] - Odessa, Texas 79765

Analytical Report

Prepared for:

Kristin Farris-Pope

Rice Operating Co.

122 W. Taylor

Hobbs, NM 88240

Project: BD Jct. N-29

Project Number: None Given

Location: Lea County

Lab Order Number: 5J20006

Report Date: 10/26/05

Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	**Reported:**
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	10/26/05 17:01

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Monitor Well #1- Deep	5J20006-01	Water	10/18/05 09:30	10/20/05 09:30
Monitor Well #2- Shallow	5J20006-02	Water	10/18/05 10:00	10/20/05 09:30

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Organics by GC

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Monitor Well #1- Deep (5J20006-01) Water									
Benzene	**ND**	0.00100	mg/L	1	EJ52011	10/20/05	10/20/05	EPA 8021B	
Toluene	ND	0.00100	"	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	"	
Xylene (p/m)	ND	0.00100	"	"	"	"	"	"	
Xylene (o)	ND	0.00100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*91.0 %*	*80-120*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*82.8 %*	*80-120*		"	"	"	"	
Monitor Well #2- Shallow (5J20006-02) Water									
Benzene	ND	0.00100	mg/L	1	EJ52011	10/20/05	10/20/05	EPA 8021B	
Toluene	ND	0.00100	"	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	"	
Xylene (p/m)	ND	0.00100	"	"	"	"	"	"	
Xylene (o)	ND	0.00100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*90.0 %*	*80-120*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*87.2 %*	*80-120*		"	"	"	"	

Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	**Reported:**
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	10/26/05 17:01

General Chemistry Parameters by EPA / Standard Methods

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Monitor Well #1- Deep (5J20006-01) Water									
Total Alkalinity	**230**	2.00	mg/L	1	EJ52114	10/21/05	10/21/05	EPA 310.2M	
Chloride	**82.8**	5.00	"	10	EJ52108	10/20/05	10/21/05	EPA 300.0	
Total Dissolved Solids	**766**	5.00	"	1	EJ52403	10/20/05	10/21/05	EPA 160.1	
Sulfate	**86.3**	5.00	"	10	EJ52108	10/20/05	10/21/05	EPA 300.0	
Monitor Well #2- Shallow (5J20006-02) Water									
Total Alkalinity	**206**	2.00	mg/L	1	EJ52114	10/21/05	10/21/05	EPA 310.2M	
Chloride	**80.3**	5.00	"	10	EJ52108	10/20/05	10/21/05	EPA 300.0	
Total Dissolved Solids	**568**	5.00	"	1	EJ52403	10/20/05	10/21/05	EPA 160.1	
Sulfate	**179**	5.00	"	10	EJ52108	10/20/05	10/21/05	EPA 300.0	

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Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	**Reported:**
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	10/26/05 17:01

Total Metals by EPA / Standard Methods

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Monitor Well #1- Deep (5J20006-01) Water									
Calcium	**43.2**	0.100	mg/L	10	EJ52111	10/21/05	10/21/05	EPA 6010B	
Magnesium	**24.0**	0.0100	"	"	"	"	"	"	
Potassium	**10.9**	0.500	"	"	"	"	"	"	
Sodium	**135**	0.500	"	50	"	"	"	"	
Monitor Well #2- Shallow (5J20006-02) Water									
Calcium	**51.8**	0.100	mg/L	10	EJ52111	10/21/05	10/21/05	EPA 6010B	
Magnesium	**18.7**	0.0100	"	"	"	"	"	"	
Potassium	**5.38**	0.500	"	"	"	"	"	"	
Sodium	**84.6**	0.500	"	50	"	"	"	"	

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Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	**Reported:**
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	10/26/05 17:01

Organics by GC - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EJ52011 - EPA 5030C (GC)										
Blank (EJ52011-BLK1)				Prepared & Analyzed: 10/20/05						
Benzene	ND	0.00100	mg/L							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00100	"							
Xylene (o)	ND	0.00100	"							
Surrogate: a,a,a-Trifluorotoluene	*38.1*		*ug/l*	*40.0*		*95.2*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*35.4*		"	*40.0*		*88.5*	*80-120*			
LCS (EJ52011-BS1)				Prepared & Analyzed: 10/20/05						
Benzene	0.0402	0.00100	mg/L	0.0500		80.4	80-120			
Toluene	0.0490	0.00100	"	0.0500		98.0	80-120			
Ethylbenzene	0.0592	0.00100	"	0.0500		118	80-120			
Xylene (p/m)	0.115	0.00100	"	0.100		115	80-120			
Xylene (o)	0.0584	0.00100	"	0.0500		117	80-120			
Surrogate: a,a,a-Trifluorotoluene	*37.3*		*ug/l*	*40.0*		*93.2*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*39.9*		"	*40.0*		*99.8*	*80-120*			
Calibration Check (EJ52011-CCV1)				Prepared: 10/20/05 Analyzed: 10/24/05						
Benzene	0.0598		mg/L	0.0500		120	80-120			
Toluene	0.0593		"	0.0500		119	80-120			
Ethylbenzene	0.0586		"	0.0500		117	80-120			
Xylene (p/m)	0.113		"	0.100		113	80-120			
Xylene (o)	0.0584		"	0.0500		117	80-120			
Surrogate: a,a,a-Trifluorotoluene	*45.9*		*ug/l*	*40.0*		*115*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*40.0*		"	*40.0*		*100*	*80-120*			
Matrix Spike (EJ52011-MS1)	**Source: 5J20030-02**			Prepared: 10/20/05 Analyzed: 10/24/05						
Benzene	0.0578	0.00100	mg/L	0.0500	ND	116	80-120			
Toluene	0.0568	0.00100	"	0.0500	ND	114	80-120			
Ethylbenzene	0.0584	0.00100	"	0.0500	ND	117	80-120			
Xylene (p/m)	0.109	0.00100	"	0.100	ND	109	80-120			
Xylene (o)	0.0571	0.00100	"	0.0500	ND	114	80-120			
Surrogate: a,a,a-Trifluorotoluene	*41.9*		*ug/l*	*40.0*		*105*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*34.8*		"	*40.0*		*87.0*	*80-120*			

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Organics by GC - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EJ52011 - EPA 5030C (GC)										
Matrix Spike Dup (EJ52011-MSD1)	**Source: 5J20030-02**			Prepared: 10/20/05 Analyzed: 10/24/05						
Benzene	0.0591	0.00100	mg/L	0.0500	ND	118	80-120	1.71	20	
Toluene	0.0599	0.00100	"	0.0500	ND	120	80-120	5.13	20	
Ethylbenzene	0.0597	0.00100	"	0.0500	ND	119	80-120	1.69	20	
Xylene (p/m)	0.119	0.00100	"	0.100	ND	119	80-120	8.77	20	
Xylene (o)	0.0596	0.00100	"	0.0500	ND	119	80-120	4.29	20	
Surrogate: a,a,a-Trifluorotoluene	*43.8*		*ug/l*	*40.0*		*110*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*40.7*		*"*	*40.0*		*102*	*80-120*			

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EJ52108 - General Preparation (WetChem)										
Blank (EJ52108-BLK1)				Prepared: 10/20/05 Analyzed: 10/21/05						
Chloride	ND	0.500	mg/L							
Sulfate	ND	0.500	"							
LCS (EJ52108-BS1)				Prepared: 10/20/05 Analyzed: 10/21/05						
Chloride	8.69		mg/L	10.0		86.9	80-120			
Sulfate	8.90		"	10.0		89.0	80-120			
Calibration Check (EJ52108-CCV1)				Prepared: 10/20/05 Analyzed: 10/21/05						
Chloride	8.88		mg/L	10.0		88.8	80-120			
Sulfate	9.33		"	10.0		93.3	80-120			
Duplicate (EJ52108-DUP1)	**Source: 5J20004-01**			Prepared: 10/20/05 Analyzed: 10/21/05						
Chloride	1010	25.0	mg/L		1000			0.995	20	
Sulfate	1750	25.0	"		1750			0.00	20	
Batch EJ52114 - General Preparation (WetChem)										
Blank (EJ52114-BLK1)				Prepared & Analyzed: 10/21/05						
Total Alkalinity	ND	2.00	mg/L							
Duplicate (EJ52114-DUP1)	**Source: 5J20006-01**			Prepared & Analyzed: 10/21/05						
Total Alkalinity	229	2.00	mg/L		230			0.436	20	
Reference (EJ52114-SRM1)				Prepared & Analyzed: 10/21/05						
Bicarbonate Alkalinity	229		mg/L	200		114	80-120			

Rice Operating Co.	Project: BD Jct. N-29	Fax: (505) 397-1471
122 W. Taylor	Project Number: None Given	**Reported:**
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	10/26/05 17:01

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EJ52403 - General Preparation (WetChem)										
Blank (EJ52403-BLK1)				Prepared: 10/20/05 Analyzed: 10/21/05						
Total Dissolved Solids	ND	5.00	mg/L							
Duplicate (EJ52403-DUP1)	**Source: 5J20006-01**			Prepared: 10/20/05 Analyzed: 10/21/05						
Total Dissolved Solids	732	5.00	mg/L		766			4.54	5	

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Total Metals by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EJ52111 - 6010B/No Digestion										
Blank (EJ52111-BLK1)				Prepared & Analyzed: 10/21/05						
Calcium	ND	0.0100	mg/L							
Magnesium	ND	0.00100	"							
Potassium	ND	0.0500	"							
Sodium	ND	0.0100	"							
Calibration Check (EJ52111-CCV1)				Prepared & Analyzed: 10/21/05						
Calcium	1.94		mg/L	2.00		97.0	85-115			
Magnesium	2.11		"	2.00		106	85-115			
Potassium	1.86		"	2.00		93.0	85-115			
Sodium	1.89		"	2.00		94.5	85-115			
Duplicate (EJ52111-DUP1)	**Source: 5J20006-01**			Prepared & Analyzed: 10/21/05						
Calcium	43.0	0.100	mg/L		43.2			0.464	20	
Magnesium	23.8	0.0100	"		24.0			0.837	20	
Potassium	11.0	0.500	"		10.9			0.913	20	
Sodium	136	0.500	"		135			0.738	20	

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Report Approved By: _____ Date: 10/26/2005

Raland K. Tuttle, Lab Manager
Celey D. Keene, Lab Director, Org. Tech Director
Peggy Allen, QA Officer
Jeanne Mc Murrey, Inorg. Tech Director
James L. Hawkins, Chemist/Geologist
Sandra Sanchez, Lab Tech.

Environmental Lab of Texas I, Ltd.

12600 West I-20 East
Odessa, Texas 79763

Phone: ~~915~~ 432-563-1800
Fax: ~~915~~ 432-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Kristin Farris Pope Kpriceswd@valornet.com

Company Name: RICE Operating Company

Company Address: 122 W. Taylor Street

City/State/Zip: Hobbs, New Mexico 88240

Telephone No: 505) 393-9174

Fax No: (505) 397-1471

Sampler Signature: [signature] rozanne@valornet.com Rozanne Johnson (505) 631-9310

Project Name: BD Jct. N-29

Project #:

Project Loc: Lea County

PO #:

Analyze For: TCLP: / TOTAL: X (BTEX)

LAB # (lab use only) 552006	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Ice	HNO_3	HCl	NaOH	H_2SO_4	None	Other (Specify)	Water	Sludge	Soil	Other (specify):	TPH: 418.1 8015M 1005 1006	Cations (Ca, Mg, Na, K)	Anions (Cl, SO4, CO3, HCO3)	SAR / ESP / CEC	Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles	Semivolatiles	BTEX 8021B/5030	RCI	N.O.R.M.	Total Gamma	Total Dissolved Solids		RUSH TAT (Pre-Schedule)	Standard TAT
01	Monitor Well # 1-Deep	10/18/05	9:30	3	X		X					X					X	X					X				X			X
02	Monitor Well # 2-Shallow	10/18/05	10:00	3	X		X					X					X	X					X				X			X

Special Instructions:

Relinquished by:	Date	Time	Received by:	Date	Time
[signature]	10/19/05	16:25	James Johnson	10/19/05	16:20

Relinquished by:	Date	Time	Received by ELOT:	Date	Time
James Johnson	10/20/05	9:30	Carrie Kelly	10/20/05	9:30

Sample Containers Intact? (Y) N
Temperature Upon Receipt: 1.0
Laboratory Comments: 1 L-poly 2-VOA seals/labels

Environmental Lab of Texas
Variance / Corrective Action Report – Sample Log-In

Client: RRR

Date/Time: 10/20/05 9:30

Order #: 5J20006

Initials: CK

Sample Receipt Checklist

Temperature of container/cooler?	Yes	No	1.0 C
Shipping container/cooler in good condition?	Yes	No	
Custody Seals intact on shipping container/cooler?	Yes	No	Not present
Custody Seals intact on sample bottles?	Yes	No	Not present
Chain of custody present?	Yes	No	
Sample Instructions complete on Chain of Custody?	Yes	No	
Chain of Custody signed when relinquished and received?	Yes	No	
Chain of custody agrees with sample label(s)	Yes	No	
Container labels legible and intact?	Yes	No	
Sample Matrix and properties same as on chain of custody?	Yes	No	
Samples in proper container/bottle?	Yes	No	
Samples properly preserved?	Yes	No	
Sample bottles intact?	Yes	No	
Preservations documented on Chain of Custody?	Yes	No	
Containers documented on Chain of Custody?	Yes	No	
Sufficient sample amount for indicated test?	Yes	No	
All samples received within sufficient hold time?	Yes	No	
VOC samples have zero headspace?	Yes	No	Not Applicable

Other observations:

_____

_____

_____

Variance Documentation:

Contact Person: - _____ Date/Time: _____ Contacted by: _____

Regarding:

_____

_____

_____

Corrective Action Taken:

_____

_____

_____

_____

_____

_____

_____

_____

APPENDIX D

Rice Operating Company

Quality Procedure-05
Procedure for Obtaining Water Samples (Cased Wells) Using One Liter Bailer

1.0 Purpose
This procedure outlines the methods to be employed in obtaining water samples from cased monitoring wells.

2.0 Scope
This procedure shall be used for developed, cased water monitoring wells. It is not to be used for standing water samples such as ponds or streams.

3.0 Preliminary

3.1 Obtain sterile sampling containers from the testing laboratory designated to conduct analyses of the water. The shipment should include a Certificate of Compliance from the manufacturer of the collection bottle or vial and a Serial Number for the lot of containers. Retain this Certificate for future documentation purposes.

3.2 The following table shall be used to select the appropriate sampling container, preservative method and holding times for the various elements and compounds to be analyzed.

Compound to be Analyzed	Sample Container Size	Sample Container Description	Cap Requirements	Preservative	Maximum Hold Time
BTEX	40 ml	VOA Contianer	Teflon Lined	HCl	7 days
TPH	1 liter	clear glass	Teflon Lined	HCl	28 days
PAH	1 liter	amber glass	Teflon Lined	Ice	7 days
Cation/Anion	1 liter	clear glass	Teflon Lined	None	28 Hrs
Metals	1 liter	HD polyethylene	Any Plastic	Ice/HNO_3	28 days
TDS	300 ml	clear glass	Any Plastic	Ice	7 days

4.0 Chain of Custody

4.1 Prepare a Sample Plan. The plan will list the well identification and the individual tests to be performed at that location. The sampler will check the list against the available inventory of appropriate sample collection bottles to insure against shortage.

4.2 Transfer the data to the Laboratory Chain of Custody Form. Complete all sections of the form except those that relate to the time of delivery of the samples to the laboratory.

4.3 Pre-label the sample collection jars. Include all requested information except time of collection. (Use a fine point Sharpie to insure that the ink remains on the label). Affix the labels to the jars.

5.0 Bailing Procedure

5.1 Identify the well from the sites schematics. Place pre-labeled jar(s) next to the well. Remove the plastic cap from the well bore by first lifting the metal lever and then unscrewing the entire assembly.

5.2 Using a dedicated one liter Teflon bailer, purge a minimum of three well volumes. Place the water in storage container for transport to a ROC disposal facility.

5.3 Take care to insure that the bailing device and string do not become cross-contaminated. A clean pair of robber gloves should be used when handling either the retrieval string or bailer. The retrieval string should not be allowed to come into contact with the ground.

6.0 Sampling Procedure

6.1 Once the well has been bailed in accordance with 5.2 of this procedure, a sample may be decanted into the appropriate sample collection jar directly from the bailer. The collection jar should be filled to the brim. Once the jar is sealed, turn the jar over to detect any bubbles that may be present. Add additional water to remove all bubbles from the sample container.

6.2 Note the time of collection on the sample jar with a fine Sharpie.

6.3 Place the sample directly on ice for transport to the laboratory. The preceding table shows the maximum hold times between collection and testing for the various analyses.

6.4 Complete the Chain of Custody form to include the collection times for each sample. Deliver all samples to the laboratory.

7.0 Documentation

7.1 The testing laboratory shall provide the following minimum information:

A. Project and sample name.
B. Signed copy of the original Chain of Custody Form including the time the sample was received by the lab.
C. Results of the requested analyses
D. Test Methods employed
E. Quality Control methods and results

Calculation for Determining the Minimum Bailing Volume for Monitor Wells

Formula $V = (\pi r^2 h)$

2" well [V/0.231=gallon] X 3 = Purge Volume

V = Volume
π = pi
r = inside radius of the well bore
h = maximum height of well bore in water table

Example:

π	r^2	h (in)	V (cu.in)	V (gal)	x 3 Volumes	Actual
3.1416	1	180	565.488	2.448	7.34 gal	> 10 gal

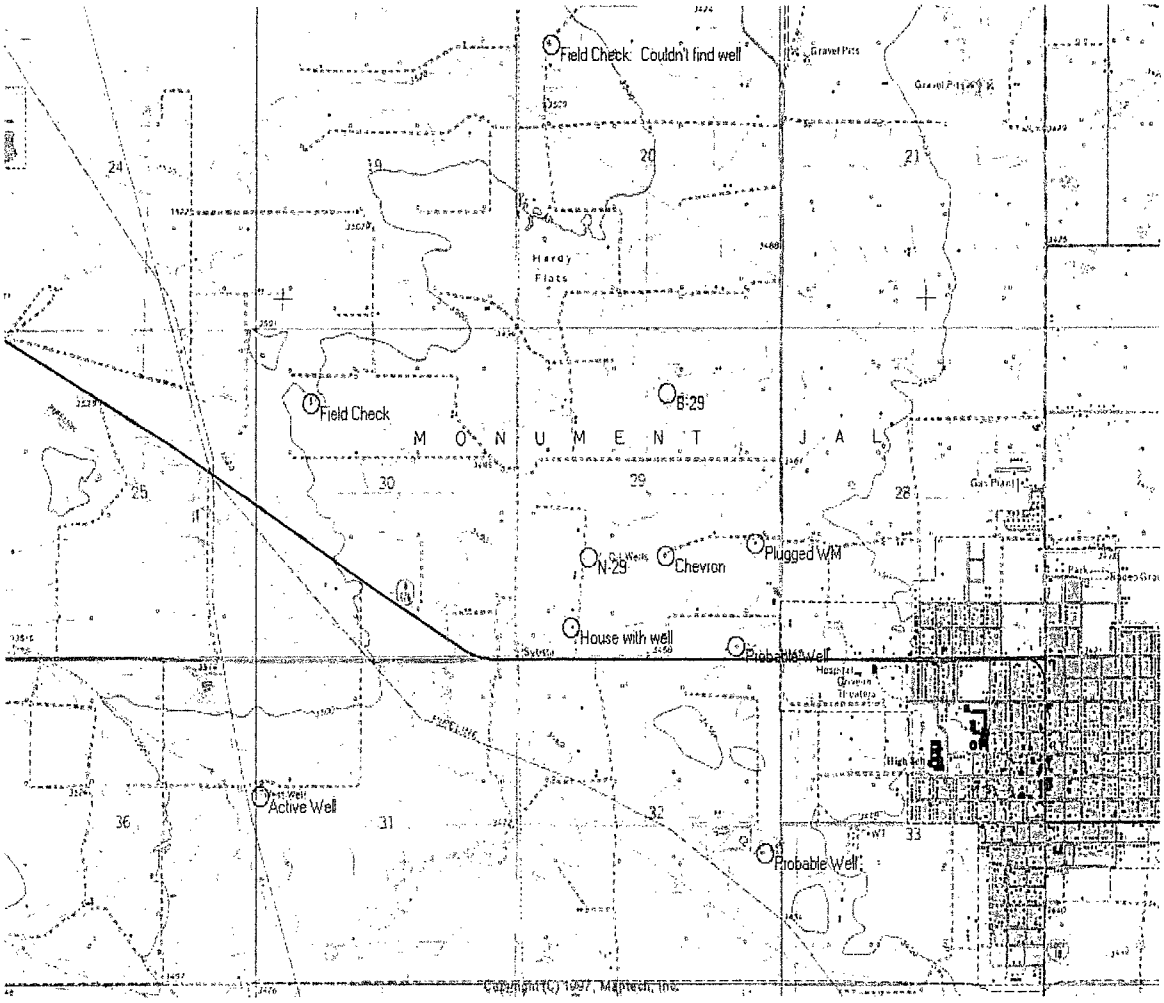


Plate 1: Location Map Showing Nearby Water Wells

DRILLING LOG	Site Name/Location				Logged by: A.Eades
RICE *Operarting Company* 122 West Taylor Hobbs, New Mexico 88240 Phone: (505) 393-9174 Fax: (505) 397-1471	**Jct N-29** **29-T21S-R37E** **BD** **SWD System** **Lea County, NM**	Well No. MW1	Date Drilled: 11/22/02	Driller: Eades	Construction: Backfill with bentonite and cuttings.
		Well Depth: 90'	Boring Depth:53'	Well Material:	
		Casing Length:	Boring Diameter: 4.75"	Casing Size:	
		Screen Length:	Drilling Method: Air Rotary	Slot Size: N/A	

DEPTH	SUBSURFACE LITHOLOGY	SAMPLE	Chlorides	TEST (ppm)	mg/kg		Boring
0	Ground surface	TYPE	Field	Lab	TPH		
	Topsoil						
	Caliche						
10						excavation	
20	BORING RIG PLACEMENT						Boring Start
						Soil Boring PID	Clean Backfill
					Lab		
30	tan sand w/caliche	Grab		142	<10	361	
		Grab		5000	<10	366	
40	moist	Grab	3626	4160	<10	245	Cuttings
	brown sand	Grab			<10	148	
50		Grab	3245	3630	<10	139	
	sand w/caliche rocks	Grab			47	320	
60		Grab	2696	3190	12	223	
	brown sand	Grab			<10	137	
70		Grab	2899	3010	12	61	
		Grab			19	181	
80		Grab	3899	4430	21	92	Bentonite
	sandstone						
	sand & sandstone	Grab	3234	3460	<10	127	
90	sand - wet	Grab	570	576	<10	2	

R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

February 5, 2007

Wayne Price
Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, NM 87505

RE: 2006 Annual Ground Water Monitoring Report
Jct. N-29, Sec 29, T21S, R37E, Unit "N"
NMOCD Case #: 1R0426-37

Dear Mr. Wayne Price:

R.T. Hicks Consultants, Ltd is pleased to submit the 2006 Annual Ground Water Monitoring Report for the Jct. N-29 site located in the BD Salt Water Disposal System (SWD). This report consists of the following sections:

1. A table summarizing all laboratory results, depth to ground water and other pertinent data associated with ground water sampling at the site, including this past year.
2. Graphs showing chemical concentration vs. time for chloride, TDS, and sulfate.
3. Laboratory and field data sheets associated with the routine sampling for 2006.

The Final Closure Report will be submitted to NMOCD by February 26, 2007.

Thank you for your consideration of this annual summary information. If you have any questions, please contact us at 505-266-5004, or Kristin Farris Pope at ROC, 505-393-9174.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

Copy: Hobbs NMOCD office; Rice Operating Company

Jct. N-29

Table 1: chemistry over time

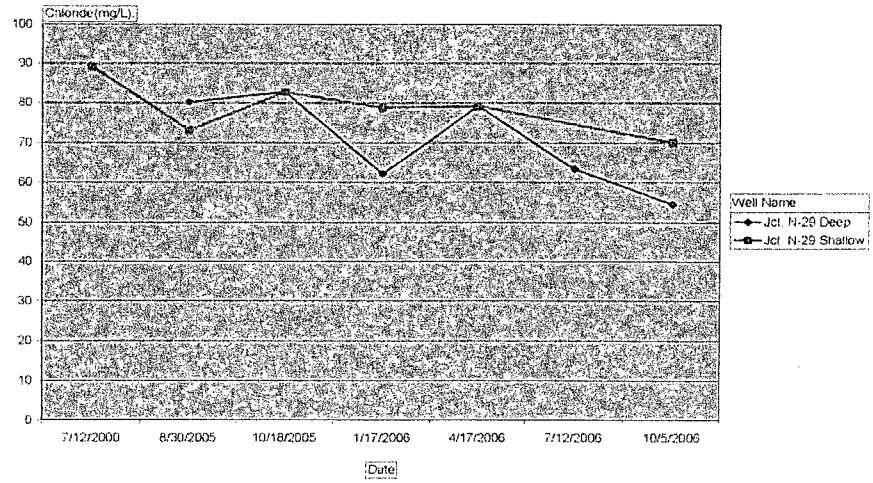
Well Name	*Date*	*DTW (ft)*	*Chloride (mg/L)*	*Sulfate (mg/L)*	*TDS (mg/L)*	*Benzene (ug/L)*	*Toluene (ug/L)*	*EthylBenzene (ug/L)*	*Total Xylenes (ug/L)*	*Comments*
Jct. N-29 Deep	8/30/2005	89.20	80.2	170	764	<0.001	<0.001	<0.001	<0.001	
Jct. N-29 Deep	10/18/2005	XXX	82.8	86.3	766	<0.001	<0.001	<0.001	<0.001	
Jct. N-29 Deep	1/17/2006	89.10	62.2	111	420	<0.001	<0.001	<0.001	<0.001	
Jct. N-29 Deep	4/17/2006	89.94	79.2	80.4	584	<0.001	<0.001	<0.001	<0.001	
Jct. N-29 Deep	7/12/2006	88.20	63.4	113	552	<0.001	<0.001	<0.001	<0.001	
Jct. N-29 Deep	10/5/2006	88.90	54.5	92.7	520	<0.001	<0.001	<0.001	<0.001	Clear with no odor

Well Name	*Date*	*DTW (ft)*	*Chloride (mg/L)*	*Sulfate (mg/L)*	*TDS (mg/L)*	*Benzene (ug/L)*	*Toluene (ug/L)*	*EthylBenzene (ug/L)*	*Total Xylenes (ug/L)*	*Comments*
Jct. N-29 Shallow	7/12/2000	89.17	89.2	118	566	<0.001	<0.001	<0.001	<0.001	
Jct. N-29 Shallow	8/30/2005	89.50	73.1	91.9	590	<0.001	<0.001	<0.001	<0.001	
Jct. N-29 Shallow	10/18/2005	89.90	82.8	179	766	<0.001	<0.001	<0.001	<0.001	
Jct. N-29 Shallow	1/17/2006	89.30	78.8	86.3	454	<0.001	<0.001	<0.001	<0.001	
Jct. N-29 Shallow	4/17/2006	89.42	79.2	80.4	584	<0.001	<0.001	<0.001	<0.001	
Jct. N-29 Shallow	10/5/2006	89.11	70.1	87.2	534	<0.001	<0.001	<0.001	<0.001	Clear with no odor

Ground Water Quality at Jct N-29

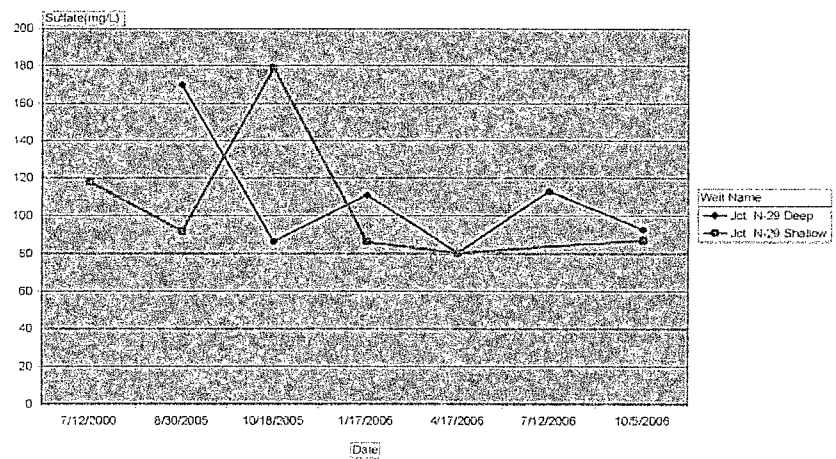
Site Name: Jct N-29

Chloride Over Time



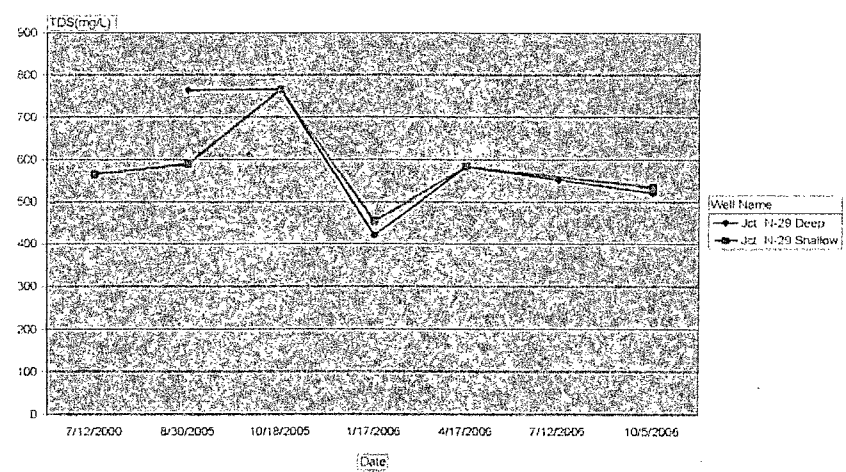
Site Name: Jct N-29

Sulfate Over Time



Site Name: Jct N-29

TDS Over Time



Appendix F

Relevant Correspondence

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

----- Original Message -----
From: "Carolyn Doran Haynes" <cdhriceswd@leaco.net>
To: "'Price, Wayne'" <WPrice@state.nm.us>
Cc: "'Kristin Farris'" <enviro@leaco.net>
Sent: Thursday, December 02, 2004 2:28 PM
Subject: FW: BD N-29 N-29-T21s-R37e

> Wayne,
>
> This site has been locked-up in the Kennann/Flap Sims lawsuit. The AFE
> was
> approved just after OCD's approval of the workplan, but nothing has been
> done at the site as the landowner refused ROC access to do the work and
> would not sign a monitor well agreement. The lawsuit on the Kennann ranch
> is VERY NEAR settlement finalization. As soon as it is final, RT Hicks
> will
> implement the workplan that was approved. I expect it to be in January as
> Rice is collecting the settlement money NOW. I also believe that the
> Kennanns will agree to the monitor well agreement then.
>
> Carolyn
>
> -----Original Message-----
> From: Rice Operating [mailto:riceswd@leaco.net]
> Sent: Thursday, December 02, 2004 1:43 PM
> To: Haynes, Carolyn Doran
> Subject: Fw: BD N-29 N-29-T21s-R37e
>
> ----- Original Message -----
> From: "Price, Wayne" <WPrice@state.nm.us>
> To: "Carolyn Doran Haynes (E-mail)" <riceswd@leaco.net>; "Kristin Farris
> Pope (E-mail)" <enviro@leaco.net>
> Sent: Thursday, December 02, 2004 11:29 AM
> Subject: BD N-29 N-29-T21s-R37e
>
>
>> Please provide an up-date on this site. OCD does not have a record
>> showing

>> the Monitor well results. Please provide within 10 days.
>>
>> Sincerely:
>>
>> Wayne Price
>> New Mexico Oil Conservation Division
>> 1220 S. Saint Francis Drive
>> Santa Fe, NM 87505
>> 505-476-3487
>> fax: 505-476-3462
>> E-mail: WPRICE@state.nm.us
>>
>>
>> Confidentiality Notice: This e-mail,including all attachments is for the
>> sole use of the intended recipient(s) and may contain confidential and
>> privileged information. Any unauthorized review,use,disclosure or
>> distribution is prohibited unless specifically provided under the New
>> Mexico Inspection of Public Records Act. If you are not the intended
>> recipient, please contact the sender and destroy all copies of this
>> message. -- This email has been scanned by the MessageLabs Email
>> Security
>
>> System.
>>
>
>
>

From: Randall Hicks [R@rthicksconsult.com]
Sent: Tuesday, August 19, 2003 2:39 PM
To: 'Price, Wayne'
Cc: 'riceswd'
Subject: N-29 Workplan
Wayne

This plan should have been delivered to you about two weeks ago with the B-29 Plan.

We would like to get going on this work, your comments/approval is greatly appreciated.

Randy

R. T. HICKS CONSULTANTS, LTD.

219 Central Avenue NW Suite 266 Albuquerque, NM 87102 505.266.5004 Fax: 505.246.1818

July 29, 2003

Mr. Wayne Price
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: N-29 Junction Box, Section 29, 21S, 37E Unit N

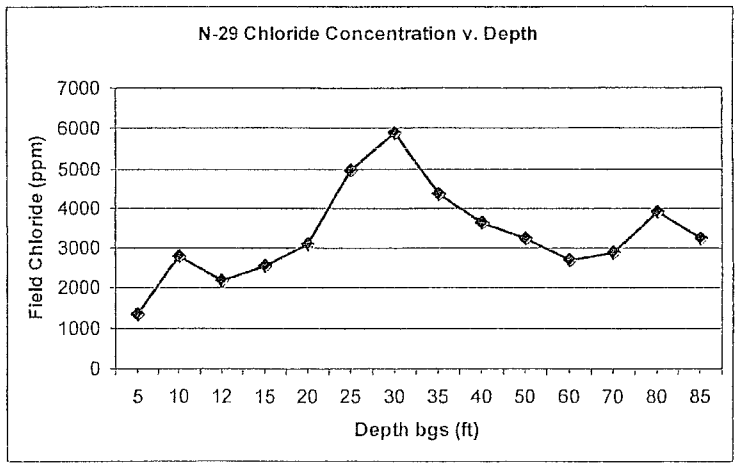
Dear Mr. Price

Rice Operating Company retained Hicks Consultants to address potential environmental concerns at the above referenced site. This submission proposes a scope of work that we believe will best mitigate any threat to human health and the environment and lead to closure of the regulatory file for this site.

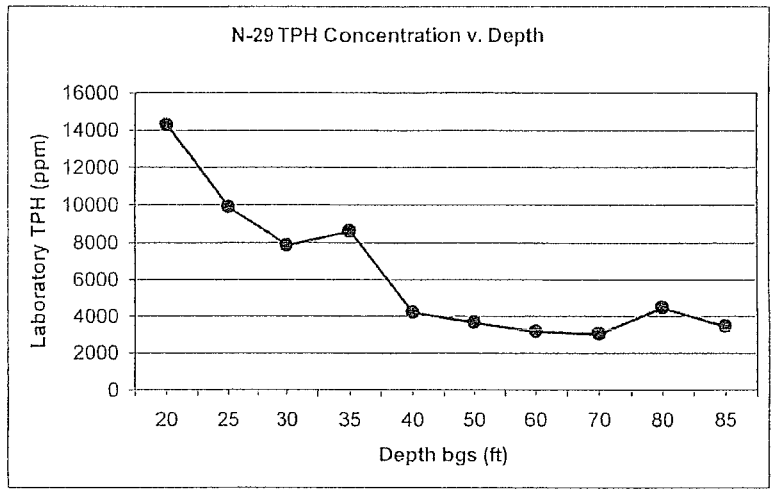
Background

The N-29 Junction Box Site is located about 2 miles northwest of the intersection of State Routes 8/176 and Loop 18, near Eunice, New Mexico. Plate 1 shows the location of the site.

Rice Operating Company (ROC) prepared a Release Notification report and a Disclosure Report that summarizes activities to date. The Disclosure Report, which is part of the 2002 submission to NMOCD, is dated January 2, 2003. The soil borings show relatively constant chloride and TPH concentrations from near surface to a depth of 85 feet (ground water). As Figure 1 shows, consistent chloride concentrations suggest that the release created saturated conditions in the vadose zone. Saturated conditions distribute chloride relatively evenly throughout the vadose zone. Unsaturated flow conditions create different chloride distributions in the vadose zone.



TPH decreases from 14,000 ppm at 20 feet below grade to about 4000 ppm at 40 feet (Figure 2), a 75% decrease. Because the release consisted of produced water from oil wells, laboratory analysis of soil samples detected volatile hydrocarbons in only one sample (less than 0.1 ppm of toluene and xylene). Volatile hydrocarbons are not commonly associated with crude oil as they are with refined products or water produced from natural gas wells. Regulated hydrocarbon constituents may not be present in ground water.



The soil boring data suggests potential ground water impairment by chloride. We propose installation of a ground water monitoring well, reclamation of the surface to its original productive capacity, and evaluation of the threat to ground water quality posed by the residual chloride and any hydrocarbon mass in the vadose zone.

1. Evaluate Chloride and BTEX Flux from the Vadose Zone to Ground Water

We propose to employ HYDRUS1D and a simple ground water mixing model to evaluate the potential of residual chloride and hydrocarbon mass in the vadose zone to materially impair ground water quality at the site. We will employ predictions of the migration of chloride ion and the detected regulated hydrocarbons from the vadose zone to ground water in our selection of an appropriate remedy for the land surface and underlying vadose zone. This simulation is the "no action" alternative, which predicts chloride and hydrocarbon flux to ground water in the absence of any engineered remedy by ROC.

For the no action scenario, we will employ the input parameters to HYDRUS and the mixing model outlined in Table 1. We will assume that vegetation is not present over the release site (no evapotranspiration) and an aquifer thickness of 10 feet. If this simulation does not return results that are consistent with the ground water data from the proposed monitoring well (see below), we will increase the aquifer thickness in the mixing model to the total thickness measured in the proposed monitoring well. At other sites, we have found that chloride is distributed throughout the thickness of the aquifer and using the entire aquifer thickness returns HYDRUS predictions that fit the field data. Employing the entire thickness of the aquifer in the mixing model calculations may be required for the N-29 site.

Table 1: Input Parameters for Simulation Modeling

Input Parameter	Source
Vadose Zone Thickness	Proposed monitoring well (See also attached boring log)
Vadose Zone Texture	Proposed monitoring well
Dispersion Length	Professional judgment
Soil Moisture	Field Measurements from monitoring well boring and simulations with HYDRUS 1D
Vadose Zone Chloride Load	ROC Data from Disclosure Report
Length of release perpendicular to ground	Field Measurements
Climate	Pearl, NM station (Hobbs)
Background Chloride in Ground Water	Samples from nearby water supply wells
Ground Water Flux	Calculated from regional hydraulic data and data from nearby wells
Aquifer Thickness	Nicholson and Clebsch (1960), SEO data, measurements from proposed monitoring well, and an arbitrary value of 10 feet.

2. Collection and Evaluation of Data for Simulation Modeling

The HYDRUS1D and mixing model simulation requires input of 10 parameters. As Table 1 shows, we must collect site specific data for several of these parameters, some data are available from previous ROC work at the site, and other data are available from public sources. Although our previous work with the American Petroleum Institute showed that soil moisture values did not strongly influence the ability of the model to predict chloride migration from the vadose zone to ground water, we plan collect soil moisture data from this site for model input.

We propose a field program to collect other important site-specific data for model input. First we will measure the depth to ground water at nearby windmills and supply wells to determine the hydraulic gradient (Plate 1). To establish background chloride concentrations in ground water, we propose to sample one of the active supply well located in Sections 29 and 30 (Plate 1) and any background monitoring well that exists at the nearby Chevron Tank Battery site (See Plate 1).

We will drill a monitoring well about 100 feet down gradient from the former junction box, at the edge of the existing pad. We will drill this well to the top of the red bed (bottom of the Ogallala). We will place one 5-foot screen at the base of the Ogallala. In this same borehole, we will install a second 2-inch casing with 15 feet of screen at the top of the water table. We will drill, complete, develop and sample these wells in a manner that is consistent with the industry standards (e.g. ASTM, EPA). If possible, we will install

bentonite pellets to isolate the two screened intervals. To assure that the well boring does not create any communication between the two sampling screens, we will employ low-flow pump and micro-purge techniques for sampling. This project-proven sampling strategy also reduces the volume of "purge water".

3. Design Remedy and Submit Report

ROC has completed the repair of the pipeline junction at the site. We do not anticipate additional releases of produced water. Our modeling of the "no action alternative" (Task 1) may show that the residual chloride mass in the vadose zone poses a threat to ground water quality. If such a threat does exist, we will use the HYDRUS-1D model predictions to develop a remedy for the vadose zone. If necessary, we will simulate:

1. excavation, disposal and replacement of clean soil to remove the chloride mass,

2. installation of a low permeability barrier to minimize natural infiltration,

3. surface grading and seeding to eliminate any ponding of precipitation and promote evapotranspiration, thereby minimizing natural infiltration, and

4. a combination of the above potential remedies.

We will select the vadose zone remedy that offers the greatest environmental benefit while causing the least environmental damage.

If the monitoring data demonstrate that a site release caused impairment of water quality, we will use the ground water mixing model or a suitable alternative to assist in the design of a ground water remedy. It is possible, that the background chloride concentrations in ground water measured in the nearby wells is equal to or higher than the chloride concentration in the proposed down gradient monitoring well. Such data would strongly suggest that the N-29 site has not caused any material impairment of ground water quality. If we find no evidence of impairment of water quality due to past activities, we will not prepare a ground water remedy. If data suggest that the N-29 site has contributed chloride to ground water and caused ground water impairment, we will examine the following alternatives:

1. Natural restoration due to dilution and dispersion,

2. Pump and dispose to restore the saturated zone,

3. Pump and treat to restore the saturated zone,

4. Because of the location of the site, institutional controls negotiated with the landowner may provide an effective remedy. Such controls may be restriction of water use to livestock until natural restoration returns the water quality to state

standards, a provision for alternative supply well design, or a provision for well head treatment to mitigate any damage to the water resource.

We plan to commence data collection for the HYDRUS1D simulations described above in August. Your approval to move forward with this work plan will facilitate our access to nearby windmills and speed the implementation of a surface remedy.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks

Validity unknown

Digitally signed by Randall T. Hicks
DN: cn=Randall T. Hicks, c=US
Date: 2003.03.19 13:34:51 -07'00'

Randall T. Hicks
Principal

Copy:
Rice Operating Company

R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

July 6, 2005

Mr. Daniel Sanchez
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: N-29 Junction Box, Section 29, 21S, 37E Unit N

Dear Mr. Sanchez

In your letter of July 5, 2005, NMOCD required Rice Operating Company (ROC) to submit an abatement plan for the above-referenced site on or before July 15, 2005. We respectfully request NMOCD grant an extension for this submission. On August 19, 2003, we submitted an investigative characterization plan to Wayne Price on behalf of ROC. Although Mr. Price rapidly approved the plan, issues involving the landowner restricted our access to the site until earlier this year. In June, we installed a boring which collapsed before we could complete the monitoring well. We are scheduling a rig to complete the project before the end of July.

As stated in the August 2003 plan, we believe the release from the site created saturated conditions in the vadose zone and this condition can result in localized impairment of ground water. We ask that NMOCD allow us to complete the monitoring well cluster proposed in our 2003 plan, perform two quarters of monitoring, and then report the results to NMOCD with our recommendations for further action. We would like to fully develop the proposed well cluster by over pumping, and collect the first quarterly samples in August. The results from the second quarterly event (November) would be returned from the laboratory in December, allowing us to respond to NMOCD with a data-driven plan for further action in January of 2006. Thank you for consideration of this request.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall Hicks
Principal

Copy: Kristin Pope, Rice Operating Company

R. T. HICKS CONSULTANTS, LTD.
901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

February 10, 2006

Wayne Price
Bureau Chief
NMOCD Environmental Bureau
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
Via E-mail

RE: Jct. N-29, T21S, R37E, Section 29, Unit N; NMOCD Case # 1R0426-37

Dear Mr. Price,

On behalf of Rice Operating Company, R.T. Hicks Consultants, Ltd. is pleased to submit the following report for the above-referenced site. The data presented in this report allow us to conclude that ground water has not been impacted by any releases from the N-29 site and we are requesting that the file for this site be closed without inclusion in Rule 19.

CD copies of this report follow FedEx. If you have any questions or concerns, please do not hesitate to contact us. Please note that we have included all of the information generally required in a Stage 1 Abatement Plan.

Sincerely,
R.T. Hicks Consultants, Ltd.

Katie Lee

Katie Lee
Staff Scientist

Copy: Hobbs NMOCD office;
Rice Operating Company

From: Gil Van Deventer [gil@rthicksconsult.com]
Sent: Friday, March 24, 2006 2:26 PM
To: Wayne Price
Cc: Katie Lee; Andrew Parker; Carolyn Haynes; Randall T. Hicks; Daniel Sanchez; Kristin Farris Pope
Subject: N-29 Junction Box Site - 2005 Annual Monitoring Report
Wayne & others:

Attached please find the *short* version (lab reports not included) of the report referenced below. The complete report on compact disk will be sent U S Priority Mail today.

CERTIFIED MAIL
RETURN RECIEPT NO. 7099 3400 0017 1737 2343

March 22, 2006

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

RE: 2005 ANNUAL MONITORING REPORT
BLINEBRY-DRINKARD (BD) SALTER WATER DISPOSAL (SWQD) SYSTEM
N-29 JUNCTION BOX SITE
T22S-R37E-SECTION 29, UNIT LETTER N
NMOCD CASE #: NOT ASSIGNED

Mr. Price:

R. T. Hicks Consultants, Ltd. takes this opportunity to submit the 2005 Annual Monitoring Well Report for the N-29 Junction Box site located in the BD SWD System. The groundwater quality at this site, for each constituent of concern, has been below the Water Quality Control Commission (WQCC) standards during each of three groundwater sampling events. The initial groundwater sampling event occurred on August 30, 2005. Based on the findings as presented in a report submitted to the NMOCD on February 10, 2006, there is no evidence of ground water impairment due to the release, therefore closure of the regulatory file has been requested.

ROC is the service provider (operator) for the BD SWD System and has no ownership of any portion of pipeline, well, or facility. The BD 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 annual summary of groundwater monitoring information. If you have any questions, do not hesitate to contact me at (423) 638-8740 or Kristin Farris Pope at (505) 393-9174.

Sincerely,

Gilbert J. Van Deventer, REM, PG, NMCS
R. T. Hicks Consultants Ltd.

Gilbert J. Van Deventer

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Appendix G

Quality Assurance Protocols

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Rice Operating Company

Quality Procedure-05
Procedure for Obtaining Water Samples (Cased Wells) Using One Liter Bailer

1.0 Purpose
This procedure outlines the methods to be employed in obtaining water samples from cased monitoring wells.

2.0 Scope
This procedure shall be used for developed, cased water monitoring wells. It is not to be used for standing water samples such as ponds or streams.

3.0 Preliminary

3.1 Obtain sterile sampling containers from the testing laboratory designated to conduct analyses of the water. The shipment should include a Certificate of Compliance from the manufacturer of the collection bottle or vial and a Serial Number for the lot of containers. Retain this Certificate for future documentation purposes.

3.2 The following table shall be used to select the appropriate sampling container, preservative method and holding times for the various elements and compounds to be analyzed.

Compound to be Analyzed	Sample Container Size	Sample Container Description	Cap Requirements	Preservative	Maximum Hold Time
BTEX	40 ml	VOA Contianer	Teflon Lined	HCl	7 days
TPH	1 liter	clear glass	Teflon Lined	HCl	28 days
PAH	1 liter	amber glass	Teflon Lined	Ice	7 days
Cation/Anion	1 liter	clear glass	Teflon Lined	None	28 Hrs
Metals	1 liter	HD polyethylene	Any Plastic	Ice/HNO_3	28 days
TDS	300 ml	clear glass	Any Plastic	Ice	7 days

4.0 Chain of Custody

4.1 Prepare a Sample Plan. The plan will list the well identification and the individual tests to be performed at that location. The sampler will check the list against the available inventory of appropriate sample collection bottles to insure against shortage.

4.2 Transfer the data to the Laboratory Chain of Custody Form. Complete all sections of the form except those that relate to the time of delivery of the samples to the laboratory.

4.3 Pre-label the sample collection jars. Include all requested information except time of collection. (Use a fine point Sharpie to insure that the ink remains on the label). Affix the labels to the jars.

5.0 Bailing Procedure

5.1 Identify the well from the sites schematics. Place pre-labeled jar(s) next to the well. Remove the plastic cap from the well bore by first lifting the metal lever and then unscrewing the entire assembly.

5.2 Using a dedicated one liter Teflon bailer, purge a minimum of three well volumes. Place the water in storage container for transport to a ROC disposal facility.

5.3 Take care to insure that the bailing device and string do not become cross-contaminated. A clean pair of robber gloves should be used when handling either the retrieval string or bailer. The retrieval string should not be allowed to come into contact with the ground.

6.0 Sampling Procedure

6.1 Once the well has been bailed in accordance with 5.2 of this procedure, a sample may be decanted into the appropriate sample collection jar directly from the bailer. The collection jar should be filled to the brim. Once the jar is sealed, turn the jar over to detect any bubbles that may be present. Add additional water to remove all bubbles from the sample container.

6.2 Note the time of collection on the sample jar with a fine Sharpie.

6.3 Place the sample directly on ice for transport to the laboratory. The preceding table shows the maximum hold times between collection and testing for the various analyses.

6.4 Complete the Chain of Custody form to include the collection times for each sample. Deliver all samples to the laboratory.

7.0 Documentation

7.1 The testing laboratory shall provide the following minimum information:

A. Project and sample name.
B. Signed copy of the original Chain of Custody Form including the time the sample was received by the lab.
C. Results of the requested analyses
D. Test Methods employed
E. Quality Control methods and results

Calculation for Determining the Minimum Bailing Volume for Monitor Wells

Formula $V = (\pi r^2 h)$

2" well [V/0.231=gallon] X 3 = Purge Volume

V = Volume
π = pi
r = inside radius of the well bore
h = maximum height of well bore in water table

Example:

π	r^2	h (in)	V (cu.in)	V (gal)	x 3 Volumes	Actual
3.1416	1	180	565.488	2.448	7.34 gal	> 10 gal