1R - 423-07

WORKPLANS

DATE:
10-1-09

TETRA TECH

INVESTIGATION & CHARACTERIZATION WORK PLAN FOR RICE OPERATING COMPANY JUSTIS JCT. E-26

LOCATED AT UNIT "E", SEC. 26, T24S, R37E LEA COUNTY, NEW MEXICO NMOCD #1R0423-07

Prepared for:

RICE OPERATING COMPANY
12 W. Taylor Street
Hobbs, NM 88240

Prepared by:

Tetra Tech
1910 N. Big Spring St.
Midland, Texas 79705
(432) 682-4559
Fax (432) 682-3946

Tetra Tech Project No. 114-6400254
October 1, 2009

complex world CLEAR SOLUTIONS™

TETRA TECH

CERTIFIED MAIL
RETURN RECIEPT NO. 7006 0100 0001 2434 0022

October 1, 2009

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

RE: **INVESTIGATION & CHARACTERIZATION WORK PLAN**
JUSTIS JCT. E-26
UNIT "E", SEC. 26, T24S, R37E
LEA COUNTY, NEW MEXICO
NMOCD #1R0423-07

Mr. Hansen:

RICE Operating Company (ROC) has retained Tetra Tech, Inc. (Tetra Tech) to address potential environmental concerns at the Justis SWD System Jct. E-26 site. ROC is the service provider (agent) for the Justis SWD System and has no ownership of any portion of the pipeline, well or facility. The Justis SWD system is owned by a consortium of oil producers, System Parties, who provide all operating capital on a percentage ownership/usage basis. In general, project funding is not forthcoming until NMOCD approves the work plan. Therefore, your timely review of this submission is requested.

For all environmental projects, ROC will choose a path forward that:

- protects public health,
- provides the greatest net environmental benefit,
- complies with NMOCD Rules, and
- is supported by good science.

Each site shall have three submissions or a combination of:

1. This **Investigation and Characterization Plan** (ICP) is a proposal for data gathering and site characterization and assessment.

2. Upon evaluating the data and results from the ICP, a recommended remedy will be submitted in a **Corrective Action Plan** (CAP).

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

3. Finally, after implementing the remedy, a **Closure Report** with final documentation will be submitted.

BACKGROUND & PREVIOUS WORK

As part of the ROC Junction Box Upgrade Workplan, starting on June 27, 2003, the junction box was removed and a new, watertight junction box was installed 25 feet south of the former junction box. The former junction box site was excavated to a depth of 12 feet deep with a backhoe. PID readings and chloride field tests were conducted at regular intervals. Based on the field PID readings and the chloride field tests, both the TPH and chlorides did not exhibit a decrease with depth. In order to determine the vertical extent of hydrocarbon and chloride impacts, on March 18, 2004, a soil boring was drilled in the former junction box to a depth of 67 feet below ground surface (bgs). Analytical results from the drilling indicate the TPH concentrations decreased with depth, while the chloride concentrations did not exhibit a significant decline with depth. The chloride concentration was 587 milligrams per kilogram (mg/Kg) at 67 feet bgs. Upon completion of the drilling, the soil boring was backfilled with bentonite to ground surface. No water wells were located within Section 26 which contains the site. However, there is one water well in adjacent Section 27, which reportedly has groundwater at 41 feet bgs. In adjacent Section 23, one water well reportedly has a depth to groundwater of 94 feet bgs, while Section 25 has two wells at 89 and 90 feet bgs, respectively.

Upon completion of the excavation, the site was backfilled with clean imported soils and brought up to surface grade. In March 2004, ROC submitted a Junction Box Disclosure Report to the NMOCD. A copy of the Junction Box Disclosure Report is included in Appendix A. A copy of the laboratory analysis is presented in Appendix B. A copy of the boring log is included in Appendix C.

INVESTIGATION & CHARACTERIZATION PLAN

As discussed above, existing site data suggest a potential for impairment of groundwater quality. Therefore the work elements described below are designed to assist ROC in selecting an appropriate vadose zone remedy and, if necessary, a groundwater remedy.

Task 1 Collect Regional Hydrogeologic Data

A water well inventory will be performed to encompass a ½ mile radius around the former junction box site. The inventory will include a review of water well records on the New Mexico Office of the State Engineer W.A.T.E.R.S. database and United States Geologic Survey (USGS) website. Any water wells denoted on the USGS 7.5 minute topographic quadrangle map within the search radius will be inspected. If viable wells are located, they will be evaluated for the possible incorporation of water level measurements and groundwater monitoring.

TETRA TECH

Task 2 Evaluate Concentrations of Constituents of Concern in Soil (and Ground Water)

Tetra Tech proposes to conduct soil borings at the former junction box site for further evaluation. The soil borings will be placed appropriately to evaluate subsurface chloride/TPH impacts for vertical and horizontal delineation. The soil boring samples will be field screened for chloride and TPH concentrations. If warranted, a monitoring well will be installed to provide a direct measurement of potential groundwater impact.

If a monitoring well is installed, it will be constructed according to EPA and industry standards and developed either by bailing with a rig or hand bailer, or pumping with an electric submersible pump to remove fine grained sediment disturbed during drilling and to ensure collection of representative groundwater samples.

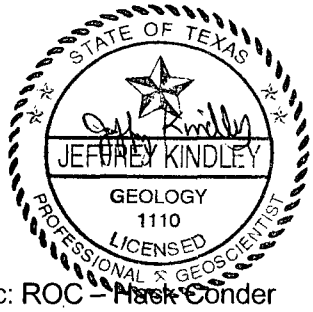
If a monitoring well is completed, it will be properly purged and sampled with a clean, dedicated, polyethylene bailer and disposable line. Groundwater samples will be submitted to a laboratory for analysis of Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) by method EPA 8021B, and chloride by method 4500-Cl-B.

Task 3 Evaluate Flux from the Vadose Zone to Ground Water

As part of the ICP, the residual impact to vadose zone soils will be evaluated to determine what, if any remediation/isolation techniques will be required at the site.

The information gathered from tasks 1-3 will be evaluated and utilized to design a groundwater remedy, if needed. The groundwater remedy that offers the greatest environmental benefit while causing the least environmental impairment will be selected. If the evaluation demonstrates that residual constituents pose no threat to groundwater quality, only a vadose zone remedy will be proposed. Such recommendations and findings will be presented to NMOCD in a subsequent Corrective Action Plan (CAP). When evaluating any proposed remedy or investigative work, ROC will confirm that there is a reasonable relationship between the benefits created by the proposed remedy or assessment and the economic and social costs.

Should you have any questions, please contact me at (432) 682-4559. Your prompt review of this submission is appreciated. Thank you for your attention to this matter.



Tetra Tech, Inc.

Jeffrey Kindley, P.G.
Senior Environmental Geologist

cc: ROC – Hack Conder
NMOCD – Larry Johnson

enclosures: photos, disclosure report, laboratory analysis

FIGURES

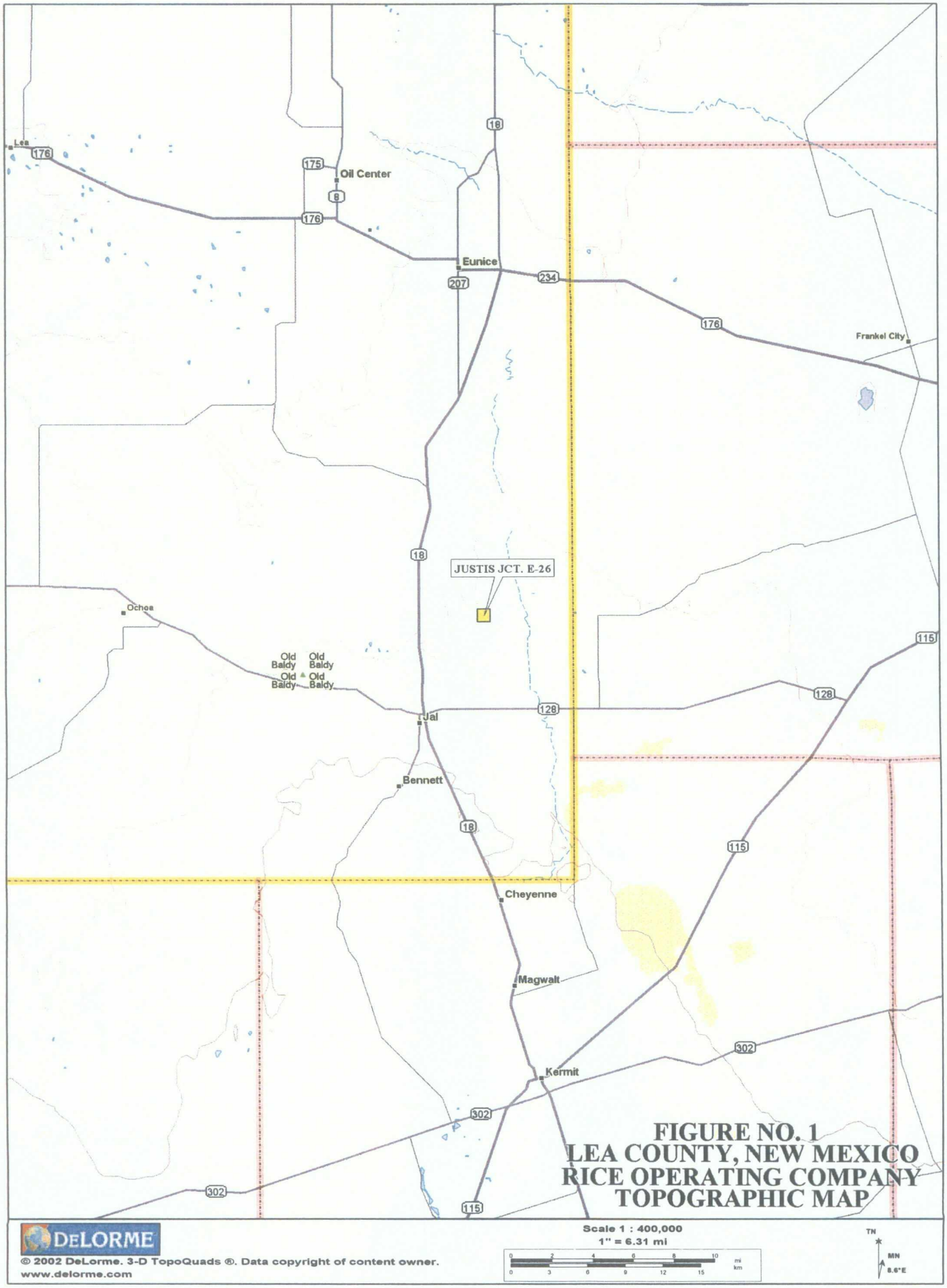


FIGURE NO. 1
LEA COUNTY, NEW MEXICO
RICE OPERATING COMPANY
TOPOGRAPHIC MAP

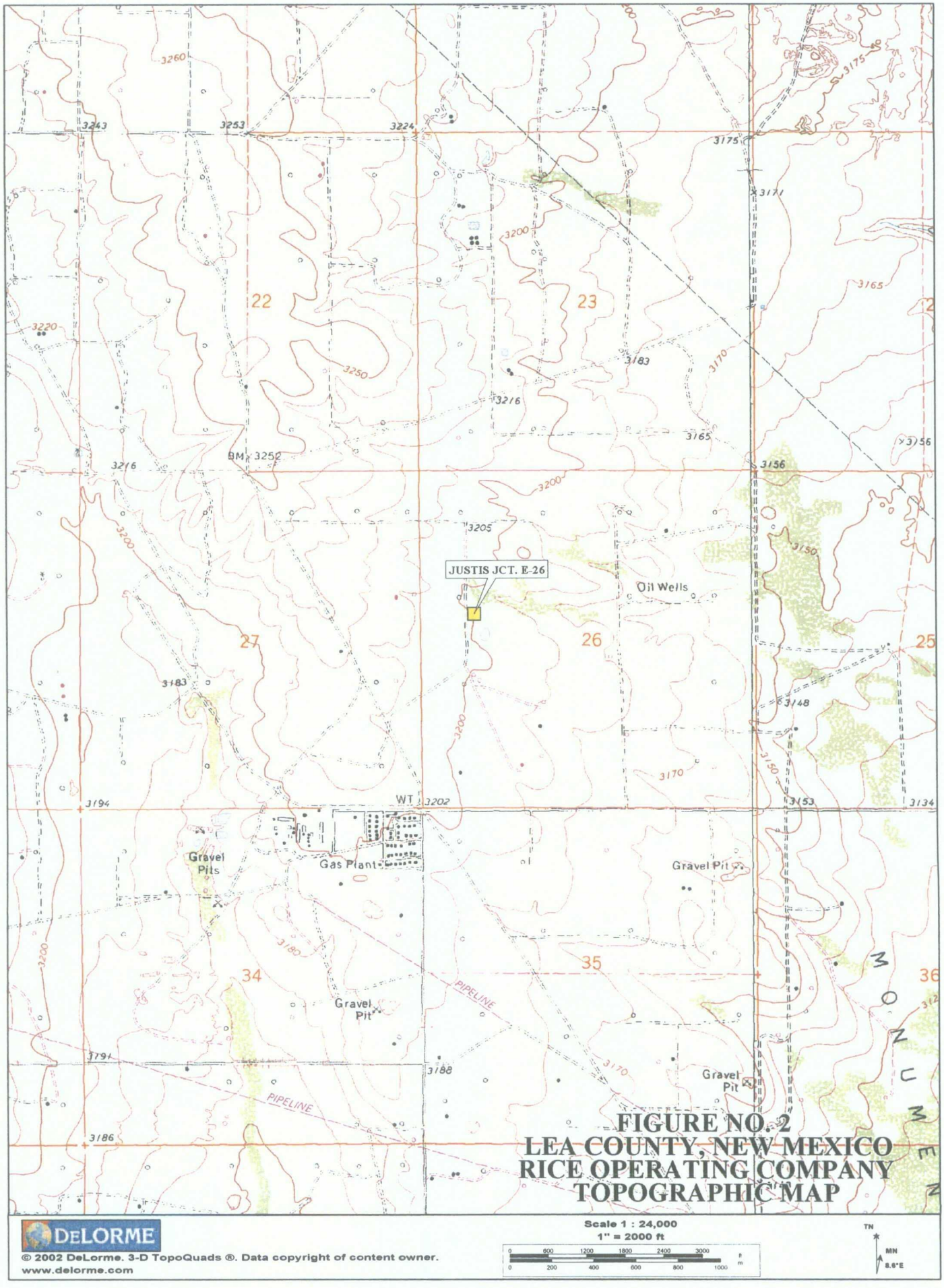
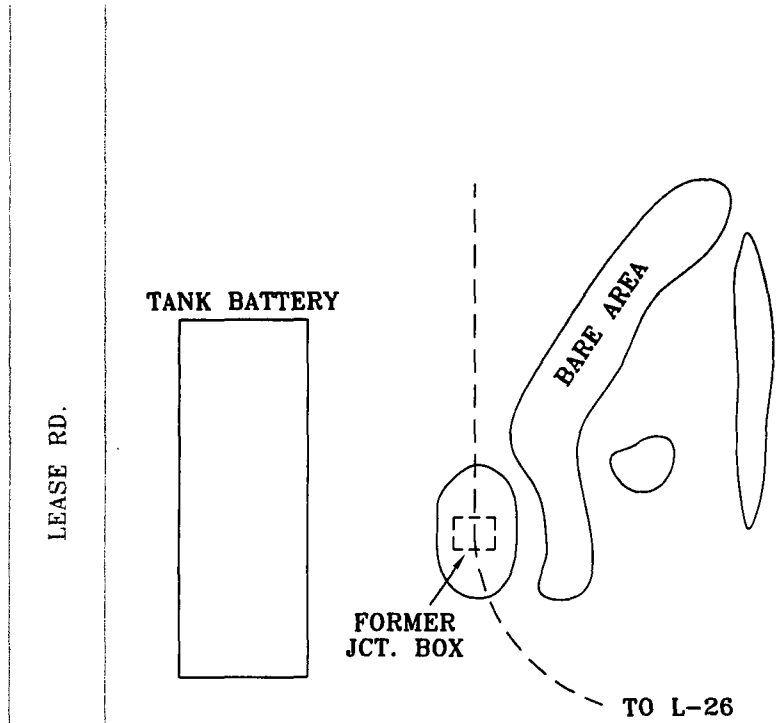


FIGURE NO. 2
LEA COUNTY, NEW MEXICO
RICE OPERATING COMPANY
TOPOGRAPHIC MAP



NOT TO SCALE

FIGURE NO. 3

LEA COUNTY, NEW MEXICO

RICE OPERATING COMPANY
JUSTIS JCT. E-26
SITE MAP

DATE: 8/27/09
DWN. BY: JJ
FILE: H:\RICE\6400254 SITE MAP

TETRA TECH, INC.
MIDLAND, TEXAS

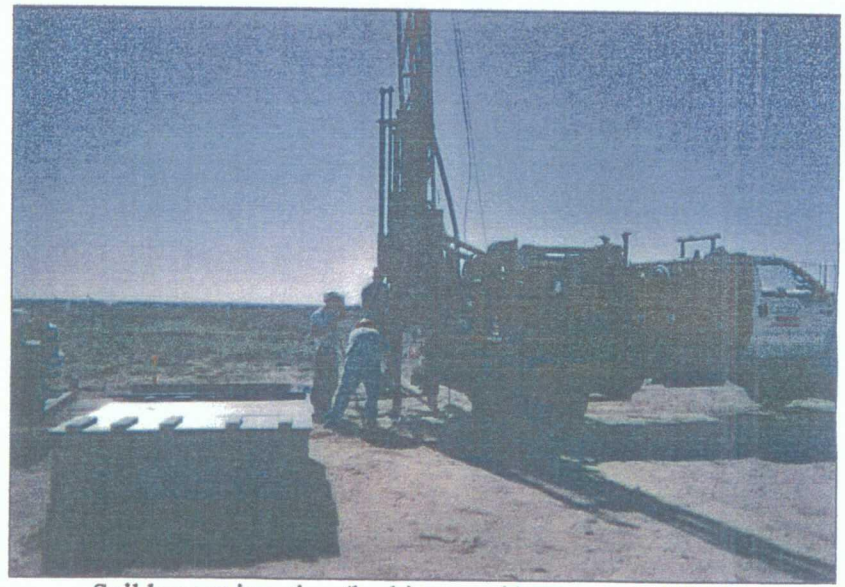
PHOTOGRAPHS

Justis jct. E-26

Junction box before NORM decon. (looking north) 4/26/2002

After new plumbing 6/28/2002

Box construction after vertical delineation trench 9/5/2003



Soil bore at junction (looking south) 3/18/2004

APPENDIX A
JUNCTION BOX DISCLOSURE REPORT

RICE OPERATING COMPANY
JUNCTION BOX DISCLOSURE* REPORT

BOX LOCATION

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	BOX DIMENSIONS - FEET		
							Length	Width	Depth
Eunice Monument Eumont (EME)	Jct. C-8 vent	C	8	20S	37E	Lea	moved 50 ft north		

LAND TYPE: BLM X STATE ___ FEE LANDOWNER _____ OTHER _____

Depth to Groundwater 40 feet NMOCD SITE ASSESSMENT RANKING SCORE: 20

Date Started 8/17/2006 Date Completed 10/17/2006 OCD Witness no

Soil Excavated 400.0 cubic yards Excavation Length 30 Width 30 Depth 12 feet

Soil Disposed 0 cubic yards Offsite Facility n/a Location n/a

FINAL ANALYTICAL RESULTS: **Sample Date** 9/26/2006 Sample Depth 12 ft

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
4-WALL COMP.	PID = 6.2 (field reading)				<10.0	21.9	64
BOTTOM COMP.	<0.005	<0.005	<0.005	<0.015	<10.0	325	576
BACKFILL	PID = 38.1 (field reading)				<10.0	269	352

General Description of Remedial Action: This junction was addressed under the pipeline replacement/upgrade program. A new, watertight junction box was installed 50 ft north of the former. After the former box was removed, an investigation was conducted using a backhoe to collect soil samples at regular intervals producing a 30x30x12-ft-deep hole. Each sample was field tested for chloride concentrations and orgainc vapors. Representative composite samples were collected from the excavation bottom, walls, and excavated soil for laboratory confirmation of chloride, TPH, and BTEX concentrations. The excavated soil was then blended on-site and returned to the excavation up to the ground surface. Clean, imported soil was used to top cap the location. On 10/25/2008, the site was seeded with a blend of native vegetation and is expected to return to a productive capacity at a normal rate. NMOCD was notified of potential groundwater impact on 7/31/2008.

ADDITIONAL EVALUATION IS HIGH PRIORITY

enclosures: photos, lab results, BTEX comparison table, chloride curve

CHLORIDE FIELD TESTS

LOCATION	DEPTH	mg/kg
4-wall comp.	n/a	374
bottom comp.	12'	594
backfill comp.	n/a	555
vertical delineation trench 15 ft south of the junction (source)	1'	404
	2'	401
	3'	336
	4'	433
	5'	422
	6'	466
	7'	566
	8'	472
	9'	392
	10'	407
	11'	523
	12'	800

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

SITE SUPERVISOR Noel Carmona SIGNATURE _____ COMPANY RICE OPERATING COMPANY

REPORT ASSEMBLED BY Katie Jones INITIAL KJ

PROJECT LEADER Larry Bruce Baker Jr. SIGNATURE Larry Bruce Baker Jr. DATE 9-11-08

*This site is a "DISCLOSURE." It will be placed on a prioritized list of similar sites for further consideration.

APPENDIX B
LABORATORY ANALYTICAL

CARDINAL LABORATORIES

PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: ROY R. RASCON
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (505) 397-1471

COPY

Receiving Date: 09/27/06
Reporting Date: 09/28/06
Project Number: NOT GIVEN
Project Name: EME VENT C-8
Project Location: NOT GIVEN

Sampling Date: 09/26/06
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: HM
Analyzed By: BC/HM

LAB NUMBER	SAMPLE ID	GRO (C_6-C_{10}) (mg/Kg)	DRO (>C_{10}-C_{28}) (mg/Kg)	Cl* (mg/Kg)
ANALYSIS DATE		09/26/06	09/26/06	09/27/06
H11578-2	BTTM FIELD COMP @ 12'	<10.0	325	576
H11578-3	BACKFILL COMP	<10.0	269	352
H11578-4	4 WALL COMP 30x30	<10.0	21.9	64
Quality Control		780	784	490
True Value QC		800	800	500
% Recovery		97.5	98.0	98.0
Relative Percent Difference		2.2	0.6	0.0

METHODS: TPH GRO & DRO: EPA SW-846 8015 M; Cl: Std. Methods 4500-Cl B
*Analyses performed on 1:4 w:v aqueous extracts.

Chemist

9/28/06
Date

H11578A

CARDINAL LABORATORIES

PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: ROY R. RASCON
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (505) 397-1471

COPY

Receiving Date: 09/27/06
Reporting Date: 09/28/06
Project Number: NOT GIVEN
Project Name: EME VENT C-8
Project Location: NOT GIVEN

Sampling Date: 09/26/06
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: HM
Analyzed By: BC

LAB NO.	SAMPLE ID	BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL BENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)
ANALYSIS DATE		09/27/06	09/27/06	09/27/06	09/27/06
H11578-1	COMPOSITE, BTTM #1-#5	<0.005	<0.005	<0.005	<0.015
H11578-2	BTTM FIELD COMP @ 12'	<0.005	<0.005	<0.005	<0.015
Quality Control		0.105	0.104	0.105	0.305
True Value QC		0.100	0.100	0.100	0.300
% Recovery		105	104	105	102
Relative Percent Difference		4.5	1.4	0.6	1.5

METHOD: EPA SW-846 8260

Chemist

9/28/06
Date

COPY

CARDINAL LABORATORIES, INC.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

2111 Beechwood, Abilene, TX 79603 (325) 673-7001 Fax (325) 673-7020
101 East Marland, Hobbs, NM 88240 (505) 393-2326 Fax (505) 393-2476

Page ____ of ____

Company Name: RICE OPER. Co.	BILL TO
Project Manager: Ray R. Rascon	P.O. #:
Address: 122 W. TAYLOR	Company:
City: Hobbs, State: NM Zip: 88240	Attn:
Phone #: 393-9174 Fax #: 397-1471	Address:
Project #: EME Vent C-8 Project Owner:	City:
Project Name: —	State: Zip:
Project Location: —	Phone #:
Sampler Name: X	Fax #:

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	TPH 8015 M	Cl-	BTEX
H11528-1	BTM #1	G	1			✓					✓		9-26-06	300 P			✓
	BTM #2	G	1			✓					✓						
	BTM #3	G	1			✓					✓						
	BTM #4	G	1			✓					✓						
	BTM #5	G	1			✓					✓						
-2	BTM Field Comp @12'	C	1			✓					✓			✓	✓	✓	✓
-3	BACKFILL COMP	C	1			✓					✓			200 P	✓	✓	
-4	4 WALL COMP 30X30	C	1			✓					✓			1200 P	✓	✓	

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

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

Sampler Relinquished: X	Date: X 9-27-06	Received By:	Phone Result: ☐ Yes ☐ No
	Time: X 10:24 A.M.		Fax Result: ☐ Yes ☐ No
Relinquished By:	Date: 09-27-06	Received By: (Lab Staff)	REMARKS: BTM #1-5 Composite IN Lab & Run BTEX
	Time: 10:24		
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Sample Condition: Temp. °C / Intact? ☑ Yes ☐ No	Checked By: (Initials)	

† Cardinal cannot accept verbal changes. Please fax written changes to (325) 673-7020.

2008 BTEX Study

Revised Junction Box Upgrade Plan (2003)

System:	EME	Date:	9/26/2006	Laboratory:	Cardinal
Site:	Jct. C-8 vent	Sampler:	Noel Carmona		Laboratories

Location	Component	PID reading (ppm)	FIELD COMPOSITE (mg/kg)			
			Benzene	Toluene	Ethyl Benzene	Total Xylenes
bottom composite at 12 ft BGS	1	0.1	<0.005	<0.005	<0.005	<0.015
	2	3.2				
	3	235.0				
	4	33.5				
	5	18.2				
			LAB COMPOSITE (mg/kg)			
			<0.005	<0.005	<0.005	<0.015

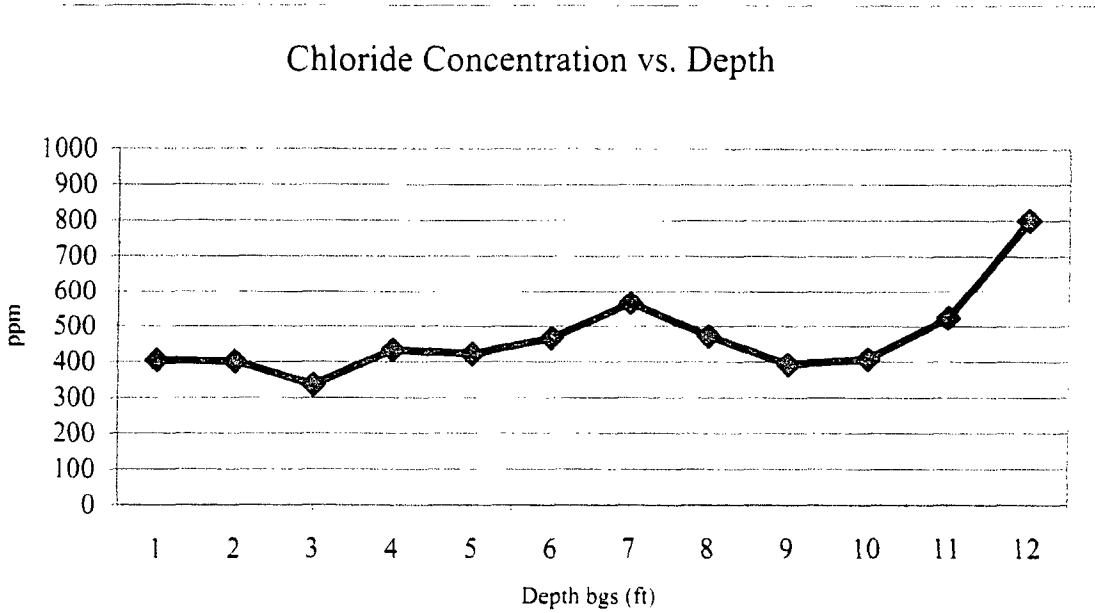
Field PID tests <100 ppm are considered final for BTEX. If PID is >100 ppm, the components of the BTEX composite sample will be collected individually and will be composited under laboratory conditions to prevent excessive volatilization. A 15-box, 30-sample study will be made to compare field-compositing with lab-compositing BTEX samples. Composite components are collected in a skewed 'W' pattern.

EME Jct. C-8 vent

unit 'C', Sec. 8, T20S, R37E

Backhoe samples at 15 ft south of the junction (source)

Depth bgs (ft)	[Cl⁻] ppm
1	404
2	401
3	336
4	433
5	422
6	466
7	566
8	472
9	392
10	407
11	523
12	800



Groundwater = 40 ft

APPENDIX C
SOIL BORING LOG

LOG OF BORING
K. Farris
RICE Operating Company

Logger:	Israel Juarez; Mort Bates	**Client:**	**Well ID:**
Driller:	Atkins Engineering Associates, Inc.	RICE Operating Company	
Drilling Method:	Hollow Stem Auger	**Project Name:**	
Start Date:	3/18/2004	jct. E-26	SB-1
End Date:	3/18/2004	**Location:**	
Notes: TD = 67 ft Groundwater = 67 ft		Justis SWD System Sec. 26, T24S, R37E Lea County, NM	

Depth (feet)	Split Spoon chloride	Split Spoon PID	Description	Lithology	Additional Notes
0.0			0-2 ft Silty Sand w/Broken Caliche: loose, brown, dry		
2.0					
			2-4 ft Caliche: loose, light tan, damp		
4.0					
6.0			4-23 ft Silty Sand w/Caliche: loose, light tan, damp		
8.0					
10.0					
12.0					
14.0					
	870	50.6			
16.0					
18.0					
20.0	999	43.1			
22.0					
24.0					
	696	21.7			
26.0					
28.0					Backfilled with drill cuttings
30.0	344	23.1			
32.0					
34.0					
	380	44.8			
36.0	278	19.7			
	460	18.7			
38.0					
40.0					
42.0	514	25.6	23-62 ft Silty Sand, loose, brown, damp		
44.0					
46.0					
	586	32.8			
48.0					
50.0					
52.0	540	35.8			
54.0					
56.0					
	335	34.3		57-67 ft hydrated bentonite plug	
58.0					
60.0					
62.0	469	74.5			
64.0			62-67 ft Poorly-graded Sand: loose, brown, damp		
66.0					
67.0	587	68.3			lab = 925 ppm Cl