1R - 427-236

WORKPLANS

DATE:
10-9-09

IR427-236

ARCADIS

Infrastructure, buildings, environment, communications

ARCADIS U.S., Inc.
1004 N. Big Spring Street
Suite 300
Midland Texas 79701
Tel 432.687.5400
Fax 432.687.5401
www.arcadis-us.com

Ed Hansen
New Mexico Oil Conservation Division
1220 So. Saint Francis Drive
Santa Fe, New Mexico 87505

Certified Mail Receipt No. 7002 2410 0001 5813 3685

Subject:
Investigation and Characterization Plan
Eunice Monument Eumont (EME) Junction H-20
T20S, R37E, Section 20, Unit H, Monument, Lea County, New Mexico

Date:
October 9, 2009

Contact:
Sharon Hall

Phone:
432 687-5400

Email:
shall@arcadis-us.com

Dear Mr. Hansen,

RICE Operating Company (ROC) has retained ARCADIS U.S., Inc. to address potential environmental concerns at the above-referenced site. ROC is the service provider (agent) for the Eunice Monument Eumont (EME) SWD System and has no ownership of any portion of the pipeline, well, or facility. The System is owned by a consortium of oil producers, System Parties, who provide all operating capital on a percentage ownership/usage basis. Environmental projects of this magnitude require System Parties AFE approval and work begins as funds are received. 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).

3. Finally, after implementing the remedy, a closure report with final documentation will be submitted.

On behalf of ROC, ARCADIS respectfully submits this ICP for the above-referenced site.

SITE HISTORY AND BACKGROUND

The site is located south of the town of Monument, New Mexico (Figure 1). Elevated chlorides in this area have been reported since as early as 1952 (Ground-Water Report 6, Geology and Ground-Water conditions in Southern Lea County, Alexander Nicholson, Jr. and Alfred Clebsch, Jr.). The expected depth to groundwater at this site is approximately 23 feet below ground surface.

The junction box was eliminated and the site by-passed with a poly line (Figure 2). Initial delineation began on March 1, 2002 and was completed on March 7, 2002. A backhoe was used to collect soil samples to a depth of 15 feet below ground surface (bgs) at the removed junction box location. Additional samples were collected at a depth of 11 feet bgs from excavations 10 feet south, east and west and 15 and 20 feet north of the junction box location. Soil samples were analyzed in the field for chlorides using field-adapted Method 9253 and screened in the field using a photoionization detector (PID).

A backhoe was used to excavate soils around the former junction box creating an excavation measuring 30 feet by 20 feet by 11 feet deep. A four wall composite sample was collected at a depth of 10 feet bgs from each of the four walls and five-point composite sample was collected from the bottom at 11 feet bgs of the excavation and submitted to Environmental Lab of Texas for benzene, toluene, ethylbenzene and xylenes (BTEX), gasoline range organics (GRO), diesel range organics (DRO) and chloride analysis. BTEX, GRO and DRO were not detected in the samples. Chlorides were detected in both the samples submitted to the lab and the samples analyzed in the field at concentrations less than 250 milligrams per kilogram (mg/kg).

Field chloride analysis was performed on samples excavated from the former junction box location and the delineation excavations north, south east and west of the former junction box location. Elevated chlorides were detected in samples collected from the former junction box location. Chlorides were detected at a concentration of 700 mg/kg in the delineation excavation 15 feet north of the former junction box locations. Chloride concentrations in excess of 250 mg/kg were not detected in any of the other horizontal delineation samples. Based on the results of the soil sampling analytical results, elevated chloride concentrations are present at the subject site.

A one-foot thick compacted clay barrier was installed to inhibit downward chloride migration. Blended soils were used to backfill the excavation to ground surface and to contour the surrounding area.

A sample of the blended backfill material was analyzed in the field for chlorides. The remediated (blended) composite sample concentration was 250 mg/kg.

ROC disclosed potential groundwater impact at the site to NMOCD via e-mail on April 15, 2002. A disclosure report was submitted to NMOCD with all of the ROC 2002 Junction Box Reports in March 2003 per the ROC Junction Box Upgrade Work plan. The source of this potential impact is historical and has been removed.

INVESTIGATION AND CHARACTERIZATION PLAN

As discussed above, existing site data suggest a potential for impairment of ground water 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

Chloride impacted regional groundwater has been reported in this area near the towns of Eunice and Monument since as early as 1952 (Groundwater Report 6, Geology and Ground-Water Conditions in Southern Lea County , New Mexico, Nicholson and Clebsch, United States Geological Survey).

A one-half mile water well inventory will be performed. The water well inventory will include a review of water well records listed on the New Mexico State Engineer Office and United States Geological Survey (USGS) websites and windmills indicated on applicable USGS topographic maps

Task 2- Evaluate Concentrations of Constituents of Concern in Soil and Groundwater

One soil boring will be drilled at the site near the former junction box location. Soil samples will be collected at regular intervals no greater than five feet, screened in the field using a photo ionization detector (PID) and field tested for chlorides. Soil lithology and the presence of any observed staining or odor will be recorded. Representative select samples will be submitted to a laboratory for laboratory analysis as confirmation of the field sampling.

The soil boring will be drilled to a depth where chloride concentrations do not exceed 250 mg/kg (minimum depth of 15 feet bgs) or to groundwater, whichever is shallower. If warranted, a monitoring well will be installed to provide a direct measurement of potential groundwater impact. Additional soil borings will be used to delineate the lateral and vertical extent of impacts to soil. Soil samples will be collected at regular intervals no greater than five feet, screened in the field using a photo ionization detector (PID) and field tested for chlorides. Soil lithology and the presence of any observed staining or odor will be recorded. Representative select samples will be submitted to a laboratory for laboratory analysis as confirmation of the field sampling.

The monitor well will be constructed, developed and sampled in accordance with Environmental Protection Agency and NMOCD standards. A groundwater sample will be collected and submitted for laboratory analysis for chlorides.

Task 3 Evaluate Potential Flux from the Vadose Zone to Ground Water

The information from Task 1 and Task 2 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 surface restoration plan protective of groundwater 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.

A report that details the investigation activities and results will be submitted to the NMOCD. The report will include recommendations for further action (CAP) if necessary or for closure of the site.

Very truly yours,

ARCADIS U.S, Inc.

Sharon E. Hall

Sharon E. Hall
Associate Vice President

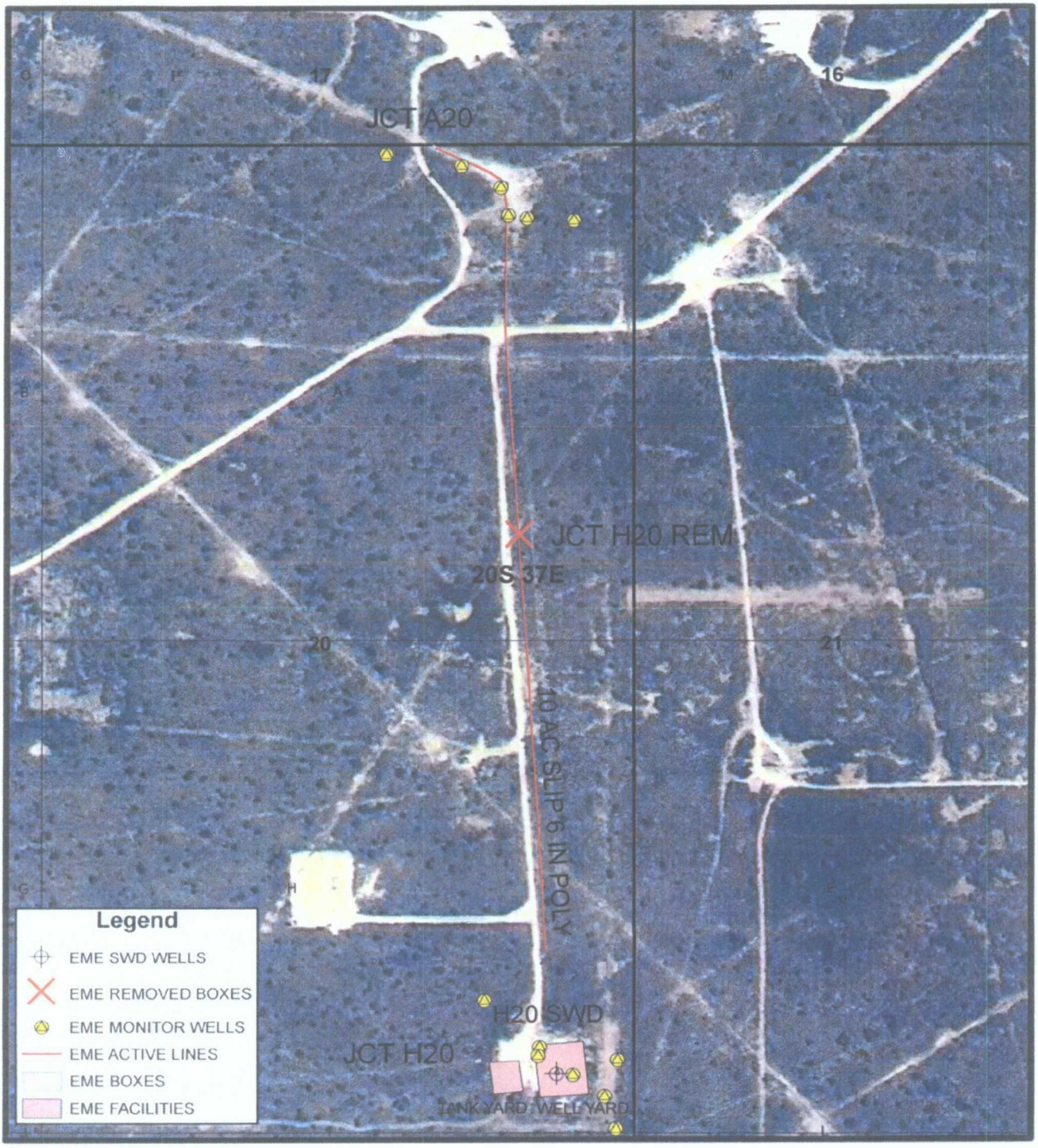
Copies:
Hack Conder- Rice Operating Company

Attachment:

Figures 1 and 2

Disclosure report with field sampling results

EME H-20 AREA



0 140 280 560 840 1,120 Feet

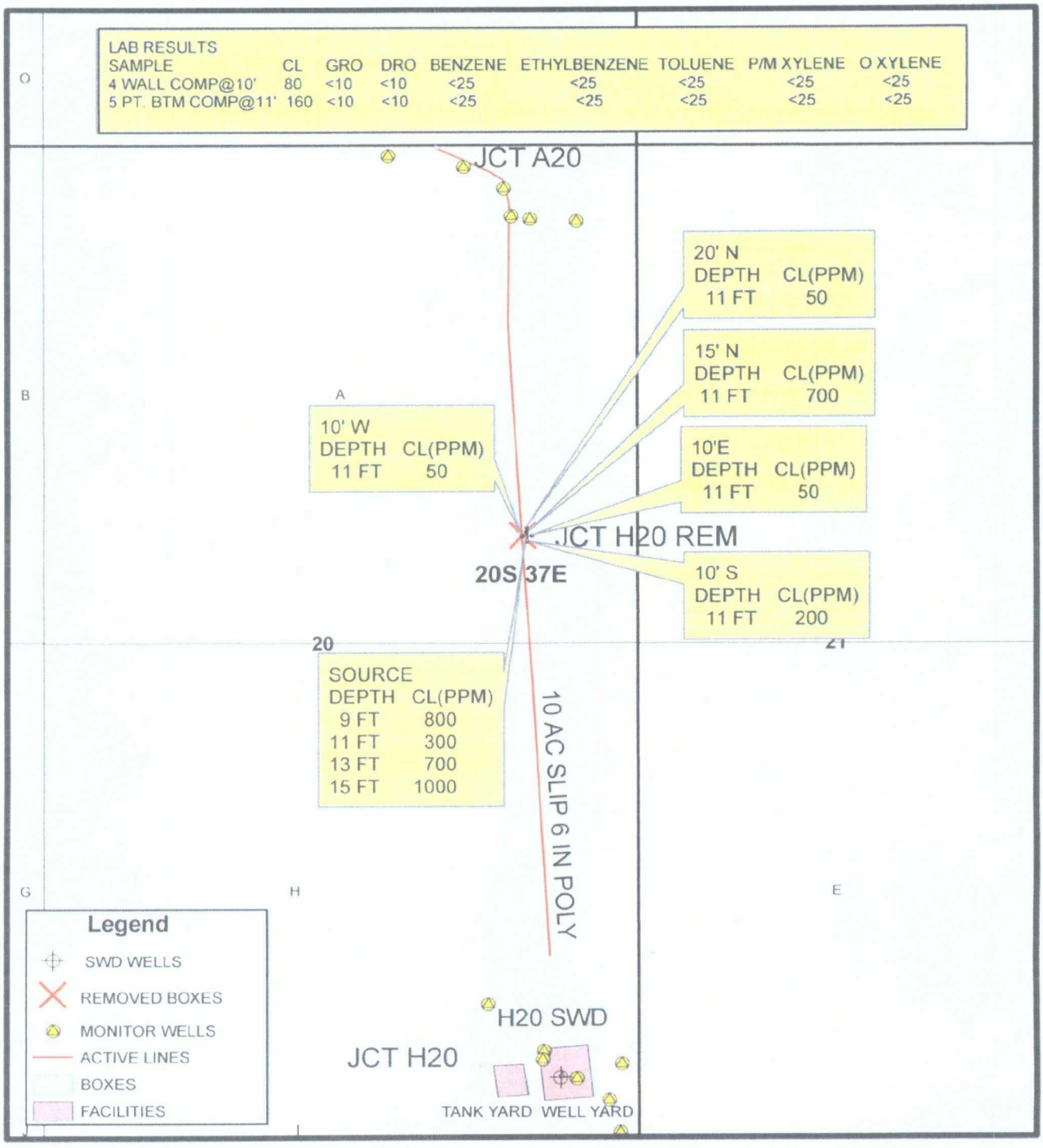
N

RICE OPERATING COMPANY ROC SINCE 1955

EUNICE-MONUMENT-EUMONT (EME) JCT H-20
SECTION 20 T-20-S R-37-E LEA COUNTY, NM
JUNCTION BOX DELINEATION

CASE NO.:
DRAWING DATE: 10/5/2009
PREPARED BY: TG

EME H-20 AREA



0 140 280 560 840 1,120 Feet

N

RICE OPERATING COMPANY ROC SINCE 1955

EUNICE-MONUMENT-EUMONT (EME) JCT H-20
SECTION 20 T-20-S R-37-E LEA COUNTY, NM
JUNCTION BOX DELINEATION

CASE NO.:
DRAWING DATE: 10/5/2009
PREPARED BY: TG

RICE OPERATING COMPANY
JUNCTION BOX DISCLOSURE REPORT

BOX LOCATION

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	BOX DIMENSIONS - FEET		
							Length	Width	Depth
EME	H-20	H	20	20S	37E	LEA			

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

Depth to Groundwater < 50 feet NMOCD SITE ASSESSMENT RANKING SCORE: 20

Date Started 03/01/2002 Date Completed 03/07/2002 OCD Witness NO

Soil Excavated 120 cubic yards Excavation Length 30 Width 20 Depth 11' feet

Soil Disposed 0 cubic yards Offsite Facility _____ Location _____

ANALYTICAL RESULTS:

Sample Date 03/07/2002 **Sample Depth** 11'

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	80
BOTTOM	<0.025	<0.025	<0.025	<0.025	<10	<10	160

General Description of Remedial Action: Delineated vertical and lateral extent.

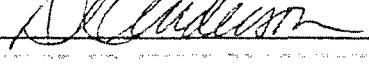
Vertical delineation found chlorides of 1000 ppm and TPH of 13 ppm @ 15' bgs. Vertical delineation is incomplete. Lateral delineation found chlorides of 100 ppm or less @ 11' bgs in all four directions. A compacted clay barrier was installed. The excavated soil was blended to 250 ppm chlorides and used as backfill. This site is no longer a junction and no box is required.

CHLORIDE FIELD TESTS

LOCATION	DEPTH	mg/kg
SIDEWALLS	10'	100
BOTTOM	11'	200
Vertical Trench	9'	800
	11'	300
	13'	700
	15'	1000
10' E	11'	50
10' S	11'	100
10' W	11'	100
20' N	11'	50

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

DATE April 15, 2002 PRINTED NAME D. E. Anderson

SIGNATURE  TITLE Project Leader - Environmental

ANALYTICAL REPORT

Prepared for:

ROB ELAM
RE ENVIRONMENTAL
P.O. BOX 13418
ODESSA, TX 79768

Project: Rice A-20

Order#: G0202776

Report Date: 03/13/2002

Certificates
US EPA Laboratory Code TX00158

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

RE ENVIRONMENTAL
P.O. BOX 13418
ODESSA, TX 79768
366-0804

Order#: G0202776
Project:
Project Name: Rice
Location: H-20

The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas.

ICE

Lab ID:	Sample :	Matrix:	Date / Time Collected	Date / Time Received	Container	Preservative
0202776-01	4pt Wall Comp. @10'	SOIL	03/07/2002 15:00	03/08/2002 15:35	4 oz Glass	n/a
	Lab Testing:	Rejected: No		Temp: 4C		
	8015M TPH GRO/DRO					
	8021B/5030 BTEX					
	Chloride					
0202776-02	5pt Bottom Comp @11'	SOIL	03/08/2002 13:00	03/08/2002 15:35	4 oz Glass	n/a
	Lab Testing:	Rejected: No		Temp: 4C		
	8015M TPH GRO/DRO					
	8021B/5030 BTEX					
	Chloride					

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

ROB ELAM
RE ENVIRONMENTAL
P.O. BOX 13418
ODESSA, TX 79768

Order#: G0202776
Project:
Project Name: Rice
Location: H-20

Lab ID: 0202776-01
Sample ID: 4pt Wall Comp. @10'

8015M TPH GRO/DRO

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		03/11/2002	1	1	CK	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C28	<10.0	10.0
Total C6-C28	<10.0	10.0

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0000830-02		03/13/2002 21:33	1	1	CK	8021B

Parameter	Result µg/kg	RL
Benzene	<25.0	25.0
Ethylbenzene	<25.0	25.0
Toluene	<25.0	25.0
p/m-Xylene	<25.0	25.0
o-Xylene	<25.0	25.0

Lab ID: 0202776-02
Sample ID: 5pt Bottom Comp @11'

8015M TPH GRO/DRO

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		03/11/2002	1	1	CK	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C28	<10.0	10.0
Total C6-C28	<10.0	10.0

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

ROB ELAM	Order#: G0202776
RE ENVIRONMENTAL	Project:
P.O. BOX 13418	Project Name: Rice
ODESSA, TX 79768	Location: H-20

Lab ID: 0202776-02
Sample ID: 5pt Bottom Comp @11'

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0000830-02		03/13/2002 21:54	1	1	CK	8021B

Parameter	Result µg/kg	RL
Benzene	<25.0	25.0
Ethylbenzene	<25.0	25.0
Toluene	<25.0	25.0
p/m-Xylene	<25.0	25.0
o-Xylene	<25.0	25.0

Approval: Raland K Tuttle 3-14-02
Raland K. Tuttle, Lab Director, QA Officer — Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Irene Perry, QA Assistant
Sandra Biezugbe, Lab Tech.
Curt Cowdrey, Lab Tech.
Sara Molina, Lab Tech.

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

ROB ELAM	Order#: G0202776
RE ENVIRONMENTAL	Project:
P.O. BOX 13418	Project Name: Rice
ODESSA, TX 79768	Location: H-20

Lab ID: 0202776-01
Sample ID: 4pt Wall Comp. @10'

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	80.0	mg/kg	1	10	9253	03/11/2002	SB

Lab ID: 0202776-02
Sample ID: 5pt Bottom Comp @11'

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	160	mg/kg	1	10	9253	03/11/2002	SB

Approval: 3-14-02
Raland K. Tuttle, Lab Director, QA Officer Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Irene Perry, QA Assistant
Sandra Biezugbe, Lab Tech.
Curt Cowdrey, Lab Tech.
Sara Molina, Lab Tech.

RL = Reporting Limit N/A = Not Applicable

ENVIRONMENTAL LAB OF TEXAS I, LTD. 12600 West I-20 East, Odessa, TX 79765 Ph: 915-563-1800

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

8015M TPH GRO/DRO

Order#: G0202776

BLANK	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Total C6-C28-mg/kg	0000838-02			<10.0		
MS	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Total C6-C28-mg/kg	0202763-04	17.7	952	857	88.2%	
MSD	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Total C6-C28-mg/kg	0202763-04	17.7	952	1150	118.9%	29.2%
SRM	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Total C6-C28-mg/kg	0000838-05		1000	1023	102.3%	0.%

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

8021B/5030 BTEX

Order#: G0202776

BLANK	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-µg/kg	0000830-02			<25.0		
Ethylbenzene-µg/kg	0000830-02			<25.0		
Toluene-µg/kg	0000830-02			<25.0		
p/m-Xylene-µg/kg	0000830-02			<25.0		
o-Xylene-µg/kg	0000830-02			<25.0		
MS	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-µg/kg	0202753-01	0	100	111	111.%	
Ethylbenzene-µg/kg	0202753-01	0	100	114	114.%	
Toluene-µg/kg	0202753-01	0	100	113	113.%	
p/m-Xylene-µg/kg	0202753-01	0	200	230	115.%	
o-Xylene-µg/kg	0202753-01	0	100	113	113.%	
MSD	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-µg/kg	0202753-01	0	100	108	108.%	2.7%
Ethylbenzene-µg/kg	0202753-01	0	100	110	110.%	3.6%
Toluene-µg/kg	0202753-01	0	100	110	110.%	2.7%
p/m-Xylene-µg/kg	0202753-01	0	200	225	112.5%	2.2%
o-Xylene-µg/kg	0202753-01	0	100	109	109.%	3.6%
SRM	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-µg/kg	0000830-05		100	111	111.%	0.%
Ethylbenzene-µg/kg	0000830-05		100	113	113.%	0.%
Toluene-µg/kg	0000830-05		100	113	113.%	0.%
p/m-Xylene-µg/kg	0000830-05		200	228	114.%	0.%
o-Xylene-µg/kg	0000830-05		100	113	113.%	0.%

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

Test Parameters

Order#: G0202776

BLANK	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg	0000815-01			<5.00		
CONTROL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg	0000815-02		5000	5050	101.%	
MS	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg	0202753-01	742	625	1370	100.5%	
MSD	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg	0202753-01	742	625	1380	102.1%	0.7%

Environmental Lab of Texas, Inc.

12600 West I-20 East
Odessa, Texas 79763
Phone: 915-563-1800
Fax: 915-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Derek Robinson
Company Name: RE Environmental
Company Address:
City/State/Zip:
Telephone No:
Fax No:
Sampler Signature:

Project Name: Rice
Project #:
Project Loc: H-20
PO #:

LAB # (lab use only)	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	Preservative: HNO_3	Preservative: HCl	Preservative: NaOH	Preservative: H_2SO_4	Preservative: None	Preservative: Other (Specify)	Matrix: Water	Matrix: Sludge	Matrix: Soil	Matrix: Other (specify)	Analyze For: TCLP:	Analyze For: TOTAL: TDS / SAR / EC	TPH 418.1	TPH TX 1005/1006	TPH 8015M GRO/DRO	Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles	Semivolatiles	BTEX 8021B/5030	RUSH TAT (Pre-Schedule)	Standard TAT
8726-01	4pt Wall Comp. @10'	3-7-02	3:00pm	1	X									X			X			X				X		
-02	5pt Bottom Comp @11'	3-8-02	1:00pm	1	X									X			X			X				X		

Special Instructions:
Fax Results to Donnie Anderson & Derek Robinson

Relinquished by:	Date	Time	Received by:	Date	Time
	3-8-02	3:30pm			
Relinquished by:	Date	Time	Received by ELOT:	Date	Time
			Kay Blodgett	3-8-02	15:35

Sample Containers Intact? Y N
Temperature Upon Receipt:
Laboratory Comments:
4°C