1R - 425-83

WORKPLANS

Date:

2-15-13

L. Peter Galusky, Jr. Ph.D., P.G.
Texerra LLC

20055 Laredo Ln Monument, CO 80132
E-mail: lpg@texerra.com, Tel: 719-339-6791

February 15th, 2013

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

RECEIVED
FEB 19 2013
Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, NM 87505

RE: **INVESTIGATION & CHARACTERIZATION PLAN (ICP)**
Rice Operating Company – Vacuum SWD System
Vacuum Jct. A-36: UL A, Sec. 36, T17S, R34E
NMOCD Case Number: 1R424-83

Sent via Certified U.S. Mail w/ Return Receipt No. 7011 0110 0002 5197 1365

Mr. Hansen:

RICE Operating Company (ROC) has retained Texerra to address potential environmental concerns at the above-referenced site in the Abandoned Vacuum Salt Water Disposal (SWD) system. ROC is the service provider (agent) for the Vacuum 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/usage basis. Environmental projects of this nature require System Party AFE approval prior to work commencing at the site. In general, project funding is not forthcoming until NMOCD approves the work plan. Therefore, your timely review of this submission is greatly appreciated.

For all such environmental projects, ROC will choose the 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 generally have three submissions:

1. This Investigation and Characterization Plan (ICP) is proposed for gathering data 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), if warranted.
3. Finally, after implementing the remedy, a Termination Request with final documentation will be submitted.

Background and Previous Work

This site is located approximately ¼ mile SSE of Buckeye, New Mexico in UL A, Sec. 36, T17S, R34E as shown on the Site Location Map (Appendix). NM OSE records indicate that groundwater will likely be encountered at a depth of approximately 85 +/- feet.

In 2009, ROC initiated work on the former Vacuum A-36 junction box as part of the system abandonment. The former junction box and surrounding soil was removed from an excavation of approximately dimensions 10 ft by 10 ft by 12 ft deep. Soils samples were field analyzed at regular intervals for chloride and hydrocarbon. The 12 ft sample from the source and 5 ft west, east, north and south of the source were analyzed by a commercial laboratory. Residual soil hydrocarbons were below detectable limits for all these samples. However, elevated residual soil chlorides (ranging from 672 to 3,200 mg/kg) were found in these bottom samples.

The excavated soil was blended onsite (testing 47.7 mg/kg TPH and 2;200 mg/kg chloride) and returned to the excavation. A 1 ft thick compacted clay barrier was installed from 4 to 5 ft bgs. Clean, imported soil was installed above the clay barrier and the surface was returned to the natural contour and seeded. NMOCD was notified of potential groundwater impact on March 12, 2010 and a Junction Box Disclosure Report (Appendix) was submitted with all the 2009 junction box closures and disclosures.

ROC proposes additional investigative and characterization work at the site to determine if there is potential for groundwater degradation from residual chlorides at the site.

Proposed Work Elements

1. Conduct vertical and lateral delineation of residual soil chlorides and hydrocarbons from samples taken using a drill rig, hand auger, and/or backhoe.
    a. Vertical sampling will be conducted until the following criteria are met in the field.
        i. Three samples in which the chloride concentration decreases and the third sample has a chloride concentration of $\leq$ 250 ppm; and,
        ii. Three samples in which PID readings decrease and the third sample has a PID reading of $\leq$ 100 ppm; or,
        iii. The sampling reaches the capillary fringe.
    b. Lateral sampling will be conducted until the following criteria are met in the field.
        i. A decrease is observed in chloride concentrations between lateral bores at similar depths; and,
        ii. A chloride concentration of $\leq$ 250 ppm is observed in a lateral surface sample; or,
        iii. Safety concerns impede further lateral delineation.
2. If warranted, install a monitor well to provide direct measurement of the potential groundwater impact at the site. Additional monitoring wells may be required to fully delineate groundwater quality. (All monitor wells will be installed by EPA, NMOCD, and industry standards.)
3. Evaluate the risk of groundwater impact based on the information obtained.

If the evaluation demonstrates that residual constituents pose no threat to ground water quality, then only a surface restoration plan will be proposed to OCD. If this work indicates that there is a present

or future risk of impacting groundwater quality from past operations at this location, then a corrective action plan (CAP) will be developed and proposed to OCD.

Thank you for your time and consideration on this project. Please call Hack Conder at (575) 393-9174 or myself if you have any questions or wish to discuss this project.

Sincerely,

L. Peter Galusky, Jr. Ph.D., P.G.

Copy: Rice Operating Company

Attachments: Appendix

APPENDIX

- ✓ **Site Location Map**

- ✓ **Project Disclosure**

  - **Junction Box Disclosure Report**
  - **Photographs**
  - **Laboratory Report**
  - **PID Sheet**
  - **Excavation Cross Section w/ Clay Barrier**
  - **Engineer's Clay Barrier Soil Density Report**
  - **Soil Chloride vs Depth**

RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

Vacuum Jct. A-36

Unit A, Section 36, T17S, R34E

NMOCD Case #: 1R425-83

Figure 1

N W E S

0 300 600 1,200 Feet

Drawing date: 2-8-13

RICE OPERATING COMPANY
JUNCTION BOX DISCLOSURE* REPORT

BOX LOCATION

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	BOX DIMENSIONS - FEET		
							Length	Width	Depth
Vacuum	Jct. A-36	A	36	17S	34E	Lea	eliminated		

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

Depth to Groundwater 85 feet NMOCD SITE ASSESSMENT RANKING SCORE: 10

Date Started 5/5/2009 Date Completed 5/29/2009 OCD Witness no

Soil Excavated 44.4 cubic yards Excavation Length 10 Width 10 Depth 12 feet

Soil Disposed 48 cubic yards Offsite Facility Sundance Location Eunice, NM

FINAL ANALYTICAL RESULTS:

Sample Date 5/8/2009 **Sample Depth** 12 ft

TPH and Chloride laboratory test results completed by using an approved lab and testing procedures pursuant to NMOCD guidelines.

Sample Location	PID (field) ppm	GRO mg/kg	DRO mg/kg	Chloride mg/kg
SOURCE 12' GRAB	0.0	<10.0	<10.0	1,390
5 ft WEST 12' GRAB	1.5	<10.0	<10.0	1,580
5 ft EAST 12' GRAB	0.4	<10.0	<10.0	1,410
5 ft NORTH 12' GRAB	1.4	<10.0	<10.0	3,200
5 ft SOUTH 12' GRAB	0.0	<10.0	<10.0	672
BLENDED BACKFILL	5.4	<10.0	47.7	2,200

CHLORIDE FIELD TESTS

LOCATION	DEPTH	mg/kg
source	12'	1,623
5 ft west	12'	1,579
5 ft east	12'	1,300
5 ft north	12'	2,879
5 ft south	12'	598
blended backfill	n/a	1,987
background	6"	196
vertical delineation trench at the junction (source)	3'	478
	4'	358
	5'	261
	6'	288
	7'	440
	8'	299
	9'	399
	10'	616
	11'	647
	12'	690

General Description of Remedial Action: This junction box was addressed during the Vacuum SWD System Abandonment. An investigation was conducted at the former junction box site using a backhoe to collect soil samples at regular intervals producing a 10x10x12-ft deep excavation. Chloride field tests were performed on each sample which yielded elevated concentrations. Organic vapors, measured using a PID, yielded low concentrations. The excavated soil was blended on site and a representative composite sample was collected from the blended backfill. The blended backfill composite sample and the deepest sample, 12 ft BGS, from the North, South, East, and West verticals were sent to a commercial laboratory for analysis of chloride and TPH. Laboratory analysis confirmed elevated concentrations of chloride and low concentrations of TPH. The blended backfill was returned to the excavation up to 5 ft below ground surface (BGS). At 5-4 ft BGS, a 1-ft thick clay barrier was installed and a compaction test was performed on 5/29/2009. The remaining fill was returned to the excavation to ground surface and contoured to the surrounding area. On 5/29/2009, 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 3/12/2010.

ADDITIONAL EVALUATION IS *MEDIUM* PRIORITY

enclosures: photos, lab results, PID (field) results, cross-section, compaction test, chloride curve

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

SITE SUPERVISOR Jordan Woodfin SIGNATURE Jordan Woodfin COMPANY RICE OPERATING COMPANY

REPORT ASSEMBLED BY Katie Jones INITIAL KJ

PROJECT LEADER Larry Bruce Baker Jr. SIGNATURE Larry Bruce Baker Jr. DATE 3-19-10

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

Vacuum Jct. A-36

Unit A, Section 36, T17S, R34E

collecting a soil sample, facing west 5/5/2009

final excavation, facing north 5/8/2009

clay compaction test, facing southeast 5/29/2009

seeding the backfilled site, facing south 5/29/2009

CARDINAL LABORATORIES

PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: JORDAN WOODFIN
122 W. TAYLOR
HOBBS, NM 88240

Receiving Date: 05/08/09
Reporting Date: 05/12/09
Project Number: NOT GIVEN
Project Name: VACUUM JCT A-36
Project Location: VACUUM JCT A-36

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Sampling Date: 05/08/09
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: AB/TR

LAB NUMBER	SAMPLE ID	GRO (C_6-C_{10}) (mg/kg)	DRO (>C_{10}-C_{28}) (mg/kg)	Cl* (mg/kg)
ANALYSIS DATE		05/11/09	05/11/09	05/12/09
H17396-1	SOURCE GRAB @ 12FT	<10.0	<10.0	1,390
H17396-2	5FT WEST 12FT GRAB	<10.0	<10.0	1,580
H17396-3	5FT EAST 12FT GRAB	<10.0	<10.0	1,410
H17396-4	5FT NORTH 12FT GRAB	<10.0	<10.0	3,200
H17396-5	5FT SOUTH 12FT GRAB	<10.0	<10.0	672
H17396-6	BLENDED BACKFILL	<10.0	47.7	2,200
Quality Control		517	432	500
True Value QC		500	500	500
% Recovery		103	86.4	100
Relative Percent Difference		3.0	5.1	< 0.1

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

05/13/09
Date

H17396 TCL RICE

CARDINAL LABORATORIES

101 East Marland, Hobbs, NM 88240
(575) 393-2326 Fax (575) 393-2476

Page____ of____

Company Name:	LE OPERATING
Project Manager:	JORDAN WOODFIN
Address:	122 W. TAYLOR
City:	HOBBS State NM Zip: 88240
Phone #:	393-9174 Fax #:
Project #:	Project Owner:
Project Name:	Vacuum Jct A-36
Project Location:	VACUUM JCT A-36
Sampler Name:	

BILL TO

P.O. #:	
Company:	
Attn:	
Address:	
City:	
State:	Zip:
Phone #:	
Fax #:	

ANALYSIS REQUEST

Cl - | TPH 8015M

COPY

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	Cl -	TPH 8015M
H17396-1	Source Grab @ 12ft	G	1			X					X		5-8-09	1:15p	X	X
-2	5ft West 12ft Grab	G	1			X					X		5-8-09	12:59p	X	X
-3	5ft EAST 12ft Grab	G	1			X					X		5-8-09	1:05p	X	X
-4	5ft North 12ft Grab	G	1			X					X		5-8-09	12:53p	X	X
-5	5ft South 12ft Grab	G	1			X					X		5-8-09	1:10p	X	X
-6	Blended Backfill	C	1			X					X		5-8-09	1:45p	X	X

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.

Sampler Relinquished: Jordan Woodfin	Date: 5-8-09 Time: 4:41	Received By: Misty LaBeaut	
Relinquished By:	Date: Time:	Received By:	
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Temp.	Sample Condition: Cool Yes / No; Intact Yes / No	CHECKED BY: (Initials) MCB

Phone Result: ☐ No Add'l Phone #:
Fax Result: ☐ No Add'l Fax #:

REMARKS:
Email Results to
BBAKER@RICE.SWD
cc JPURVIS@RICE.SWD
cc JWOODFIN@RICE.SWD

† Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476.

RICE OPERATING COMPANY

122 West Tayor Hobbs, NM 88240
PHONE: (575) 393-9174 FAX: (575) 397-1471
PID METER CALIBRATION & FIELD REPORT FORM

Check Model Number:

	Model: PGM 7300	Serial No: 590-000183			Model: PGM 7600	Serial No: 110-023920
	Model: PGM 7300	Serial No: 590-000508			Model: PGM 7600	Serial No: 110-013744
✓	Model: PGM 7300	Serial No: 590-000504			Model: PGM 7600	Serial No: 110-013676

GAS COMPOSITION: ISOBUTYLENE 100PPM / AIR: BALANCE

LOT NO: 08-3425	EXPIRATION DATE: 8-29-09
FILL DATE: 2-29-08	METER READING ACCURACY: 100

ACCURACY : +/- 2%

SYSTEM	JUNCTION	UNIT	SECTION	TOWN SHIP	RANGE
Vacuum	A-36	A	36	17S	34E

5ft South

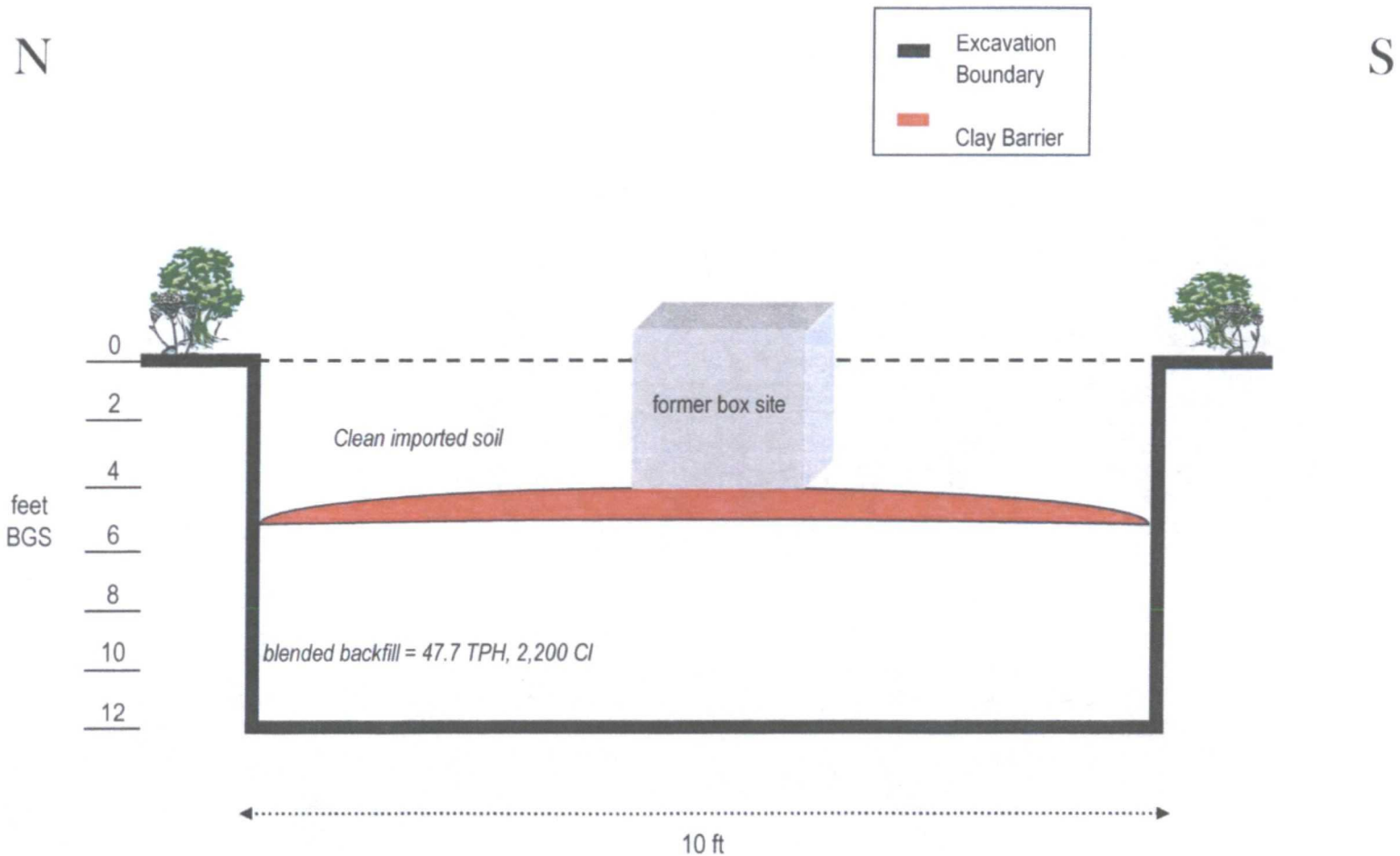
SAMPLE ID	PID	SAMPLE ID	PID
1'	5.5	Backfill	5.4
2'	2.4		
3'	19	[illegible]	
4'	21.3	5ft North 12ft grab	1.4
5'	17.1	5ft South 12ft grab	0
6'	8.5	5ft East 12ft grab	0.4
7'	14.3	5ft West 12ft grab	1.5
8'	7.6	Source grab at 12ft	0
9'	4.5		
10'	1.3		
11'	1.3		
12'	0.7		

I verify that I have calibrated the above instrument in accordance to the manufacture operation manual.

SIGNATURE: Jordan Woodfin DATE: 5-8-09

Vacuum Jct. A-36
Unit 'A', Sec. 36, T17S, R34E

Excavation Cross-Section



LABORATORY TEST REPORT
PETTIGREW & ASSOCIATES, P.A.
1110 N. GRIMES
HOBBS, NM 88240
(575) 393-9827

AASHTO R18
DEBRA P. HICKS, P.E./L.S.I.
WILLIAM M. HICKS, III, P.E./P.S.

To: Rice Operating Company
Attn: Bruce
122 W. Taylor
Hobbs, NM 88240

Material: Cooper Red Clay

Test Method: ASTM: D 2922

Project: General Information
Project No. 2008.1069

Date of Test: May 29, 2009

Depth: See Below

Depth of Probe: 12"

Test No.	Location	Dry Density % Max	% Moisture	Depth
SG 15	Vacuum JCT A/36 - 6' W. & 5' N. of SE Corner of Pit	90.0	11.9	3' Below Surface

COPY

Control Density: 100.4
ASTM: D 698

Optimum Moisture: 21.6%

Required Compaction: 90 - 95%

Densometer ID: 815

Lab No.: 09 3344-3345

Copies To: Rice Operating

PETTIGREW & ASSOCIATES

BY: Eric M Hart

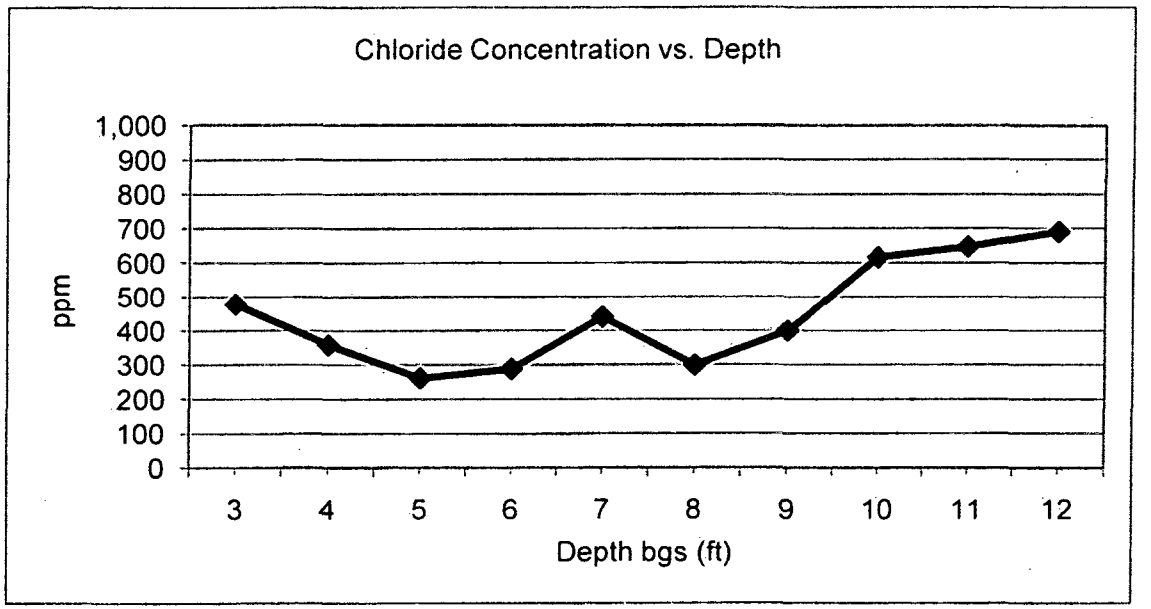
BY: _____ P.E.

Vacuum Jct. A-36

Unit 'A', Sec. 36, T17S, R34E

Backhoe samples at the junction (source)

Depth bgs (ft)	[Cl⁻] ppm
3	478
4	358
5	261
6	288
7	440
8	299
9	399
10	616
11	647
12	690



Groundwater = 85 ft