1R-425-66

WORKPLANS

Date:
9-14-10

Hansen, Edward J., EMNRD

From: Katie Jones [kjones@riceswd.com]
Sent: Friday, April 01, 2011 3:07 PM
To: Hansen, Edward J., EMNRD
Cc: Hack Conder; Katie Lee
Subject: Vacuum L-26 vent (1R425-66) CAP Addendum
Attachments: Vacuum L-26 vent (1R425-66) Proposed Liner.jpg; Vacuum L-26 vent (1R425-66) IC Report and CAP 9.14.10.pdf

Mr. Hansen,

This email is an Addendum to the Vacuum L-26 vent site (1R425-66) Initial Characterization Report and Corrective Action Plan (CAP), submitted to the NMOCD on September 14, 2010. Page 3, section: Recommendations, paragraphs 1-3: text in blue lettering, below, will replace text in red lettering, below. A new plat showing the proposed liner dimensions and the previously submitted Initial Characterization Report and CAP are attached. If you need any further information, please let me or Hack know.

"A monitoring well (MW-1) was installed approximately 50 feet down gradient of this site on November 15, 2010. Groundwater samples collected from this monitoring well tested 940 mg/L and 960 mg/L Cl^- on November 22, 2010 and February 16, 2011, respectively. ROC proposes to install additional monitoring wells to further delineate groundwater quality at this site.

To further protect groundwater from potential chloride migration, ROC proposes to excavate soil with a 64x63-ft area to a depth of approximately 5 to 4-ft below ground surface (bgs) and properly seat a 20 mil, reinforced polyethylene liner in the base of the excavation. Backfill soils will not exceed a chloride concentration of 500 mg/kg and a PID (field) ready of 100 ppm. Excavated soil will be evaluated for use as backfill and any soil requiring disposal will be properly disposed of at a NMOCD approved facility. The site will then be seeded with native seed mixes and soil amendments will be added as necessary to encourage re-vegetation. As plants capture water through their roots, they reduce the volume of water infiltrating below the root zone and create a natural "infiltration barrier" that will remain in place after the buried synthetic liner degrades. Both the synthetic liner and vegetation help protect ground water as the decreased flux of water through the subsurface slows the transportation rate of residual chloride in the subsurface, allowing dilution and dispersion to decrease possible adverse impact to ground water.

Once these activities are completed and ROC has obtained three quarters of monitoring well sampling data on the additional wells, we will submit a CAP Report on the findings regarding groundwater quality and a summary of the corrective actions."

"We propose installing a monitoring well approximately 50 feet down gradient from the site to evaluate possible ground water impact due to historic, intermittent releases from the former junction box.

We recommend surface restoration at the site, including removal of large rocks and seeding the area with native seed mixes and soil amendments as necessary to encourage re-vegetation. As plants capture water through their roots, they reduce the volume of water infiltrating below the root zone and create a natural "infiltration barrier" that will remain in place after the buried geosynthetic liner degrades. Both the synthetic liner already in place and vegetation help protect ground water as the decreased flux of water through the subsurface slows the transportation rate of residual chloride in the subsurface, allowing dilution and dispersion to decrease possible adverse impact to ground water.

Once these activities are completed and documented, we will submit a report on findings regarding ground water quality down gradient from the site."

Thank you.

Katie Jones
Environmental Project Coordinator
RICE *Operating Company*

Proposed liner

SB-1

Depth	Cl-	PID	LAB Cl-	GRO	DRO	B	T	E	X
15	442	52.7							
20	2168	6.8							
25	2279	0.7							
30	3541	7.7	4320	<10	<50.4	<0.05	<0.05	<0.05	<0.3
35	2695	3							
40	2487	1.4							
45	2351	1.6							
50	2399	1.2							
55	1214	1.6							
60	534	0.8	528	<10	<10	<0.05	<0.05	<0.05	<0.3

SB-2

Depth	Cl-	PID	LAB Cl-	GRO	DRO	B	T	E	X
5	3301	0.7	3400	<10	<10	<0.05	<0.05	<0.05	<0.3
10	1614	0.7							
15	311	1							
20	229	1.6	192	<10	<10	<0.05	<0.05	<0.05	<0.3

SB-3

Depth	Cl-	PID	LAB Cl-	GRO	DRO	B	T	E	X
5	243	1.2							
10	399	0.7							
15	564	0.6	320	<10	<10	<0.05	<0.05	<0.05	<0.3
20	662	2.5	704	<10	<10	<0.05	<0.05	<0.05	<0.3

SB-4

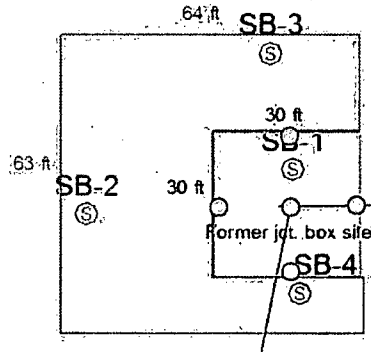
Depth	Cl-	PID	LAB Cl-	GRO	DRO	B	T	E	X
5	373	4.6							
10	845	1.4							
15	909	1.4							
20	2583	0.9							
25	2999	0.9	2880	<10	<10	<0.05	<0.05	<0.05	<0.3
30	2970	0.5							
35	1554	0.3							
40	1461	0.4	1540	<10	<10	<0.05	<0.05	<0.05	<0.3

15' North

Depth	Cl-	PID
1	200	4.2
2	663	7.1
3	751	2.9
4	870	2.6
5	1255	1.4
6	2736	0.8
7	1614	0.9
8	2957	1.4
9	2704	2.4
10	1610	4.2
11	2148	3.1
12	1148	2.9

15' East

Depth	Cl-	PID
1	253	47
2	331	68.4
3	302	65
4	344	253
5	279	645
6	331	725
7	249	907
8	231	1274
9	404	950
10	219	1188
11	326	1088
12	396	829



Source Trench

Depth	Cl-	PID
2	989	0.6
3	483	38.6
4	366	238
5	432	349
6	466	449
7	1211	203
8	2634	37.3
9	1779	295
10	845	662
11	2814	360
12	4089	210

MW-1

Depth	Cl-	PID	LAB Cl-	GRO	DRO
5	342	3.1			
10	1041	1.9	1390	<10	<10
15	727	2.3			
20	523	2.1			
25	909	2.3			
30	645	4			
35	346	2.9			
40	313	3.1			
45	262	2.5			
50	141	3.1			
55	120	2.5	80	<10	<10

15' West

Depth	Cl-	PID
1	3656	7.5
2	3738	11.2
4	3437	33.2
5	2986	25.9
6	3804	2.6
7	3524	0
8	4211	0
9	4291	0
10	5690	0
11	4592	0
12	5297	0.2

15' South

Depth	Cl-	PID
1	1005	1.7
3	2926	0.2
4	2474	0
5	1656	0
6	1950	0
7	2967	125
8	996	191
9	847	355
10	1009	278

4 wall composite

Cl-	GRO	DRO
3000	88.5	869

Bottom composite

Cl-	GRO	DRO
1140	<10	214

○ Backhoe delineation trenches

□ Geo-synthetic liner

RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC

RECS

Vacuum L-26 vent

Legals: UL/L sec. 26
T17S R35E

Case #: 1R425-66

N W E S

0 15 30 60 Feet

Drawing date: 2-16-11
Drafted by: L. Weinheimer

R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266.0745

RECEIVED OCD

2010 SEP 16 A 11:45

September 14, 2010

Mr. Edward J. Hansen
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: **Vacuum L-26 Vent Site: T-17-S, R-35-E, Section 26, Unit L,**
Initial Characterization Report and Corrective Action Plan
NMOCD Case #: 1R425-66

Mr. Hansen:

On behalf of Rice Operating Company (ROC), R.T. Hicks Consultants, Ltd. is submitting this Initial Characterization Report (ICR) and Corrective Action Plan (CAP) for the Vacuum SWD L-26 Vent Site regulatory file. The investigation conducted followed our September 30, 2009 Investigation Characterization Plan.

Background
The Vacuum L-26 Vent site is located east of Buckeye in Lea County at T-17-S, R-35-E, Section 26, in Unit L. The pipeline and original equipment were abandoned prior to 2002. The September 2009 Investigation Characterization Plan (ICP), approved by the NMOCD on January 28, 2010 is provided as Attachment A to this letter. The ICP includes background information and a site vicinity map for this and one other nearby ROC site.

Field Program
ROC conducted an excavation and sampling program in 2008. As shown on the December 2, 2008 Junction Box Disclosure Report (included in Attachment A), soil samples were collected at regular intervals within a 30x30x12-ft deep excavation. Plate 1A presents the results of soil samples field tested for chloride and hydrocarbons, as well as the results for confirmation samples sent to the laboratory. Evidence of chloride levels above 1,000 mg/kg in soil was found at the source and to the north, south, and west of the source. Field screening for hydrocarbons showed photo-ionic detector (PID) readings above 100 ppm at the source, 5-feet north, 15-feet east, and 15-feet south of the source. Excavated soil was blended on-site and returned to the excavation up to 4 feet below ground surface (bgs). At 4 feet bgs a geosynthetic liner was installed across the 30x30-foot excavation with 6" of blow sand above and below it. The excavation was backfilled with remaining soil on site and contoured to match the surrounding area.

In May of 2010, Hicks Consultants supervised a deep soil sampling program to characterize possible hydrocarbon and chloride impact due to past activities. Plate 1B presents soil boring locations as well as the results of field tests for chloride and hydrocarbons and laboratory verification results. Soil boring No. 1 (SB-1) was

drilled adjacent to the north side of the former junction box to evaluate the deep soil directly below the former ROC equipment and reached a total depth of 60 feet bgs. Soil borings 2 and 3 reached 20 feet bgs and were located to the west and north of the source, respectively. Soil boring 4 was located to the south of the source and extended to 40 feet bgs.

In SB-1 chloride over 1,000 mg/kg was observed from 20-55 feet bgs. The highest chloride reading was 4,320 mg/kg (by laboratory verification) at 30 feet bgs, chloride declined from 50-60 feet bgs, with a chloride level of 528 mg/kg at 60 feet bgs. The depth to water at the site is estimated to be 68 feet bgs. SB-2, located 45 feet west of the former junction box, showed chloride above 1,000 mg/kg at 5 and 10 feet, but chloride declined to 192 mg/kg at 20 feet bgs. SB-3 was located 25' north of the former junction box, showed chloride levels from 243 – 704 mg/kg. SB-4, located 25' south of the former junction box showed chloride levels above 1,000 mg/kg from 20-40 feet bgs, with decline to 1,540 mg/kg at 40 feet bgs. The results of this investigation show evidence of a release of chloride that may have reached ground water, with the majority of chloride mass observed at the former junction box location and to the south of it. The 30x30 foot geosynthetic liner installed 4 feet bgs over the former junction box will slow the transport of chloride through the vadose zone toward ground water.

The highest photo-ionic detector (PID) reading encountered in the soil boring investigation was 52.7 at 15 feet bgs in SB-1. All other PID readings in soil boring samples were below 10. Laboratory verification found Benzene, Toluene, Ethyl benzene and Xylenes below detection limits in every soil sample submitted. Attachment B provides a soil lithology log including the field hydrocarbon and chloride screening data. Attachment C provides the laboratory report and chain of custody for verification of the May 10, 2010 field data.

Recommendations

We propose installing a monitoring well approximately 50 feet down gradient from the site to evaluate possible ground water impact due to historic, intermittent releases from the former junction box.

We recommend surface restoration at the site, including removal of large rocks and seeding the area with native seed mixes and soil amendments as necessary to encourage re-vegetation. As plants capture water through their roots, they reduce the volume of water infiltrating below the root zone and create a natural "infiltration barrier" that will remain in place after the buried geosynthetic liner degrades. Both the synthetic liner already in place and vegetation help protect ground water as the decreased flux of water through the subsurface slows the transportation rate of residual chloride in the subsurface, allowing dilution and dispersion to decrease possible adverse impact to ground water.

Once these activities are completed and documented, we will submit a report on findings regarding ground water quality down gradient from the site.

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

Please contact Hack Conder of ROC at 575-393-9174 if you have any questions concerning this submission. Thank you for your time and consideration.

Sincerely,
R.T Hicks Consultants, Ltd.

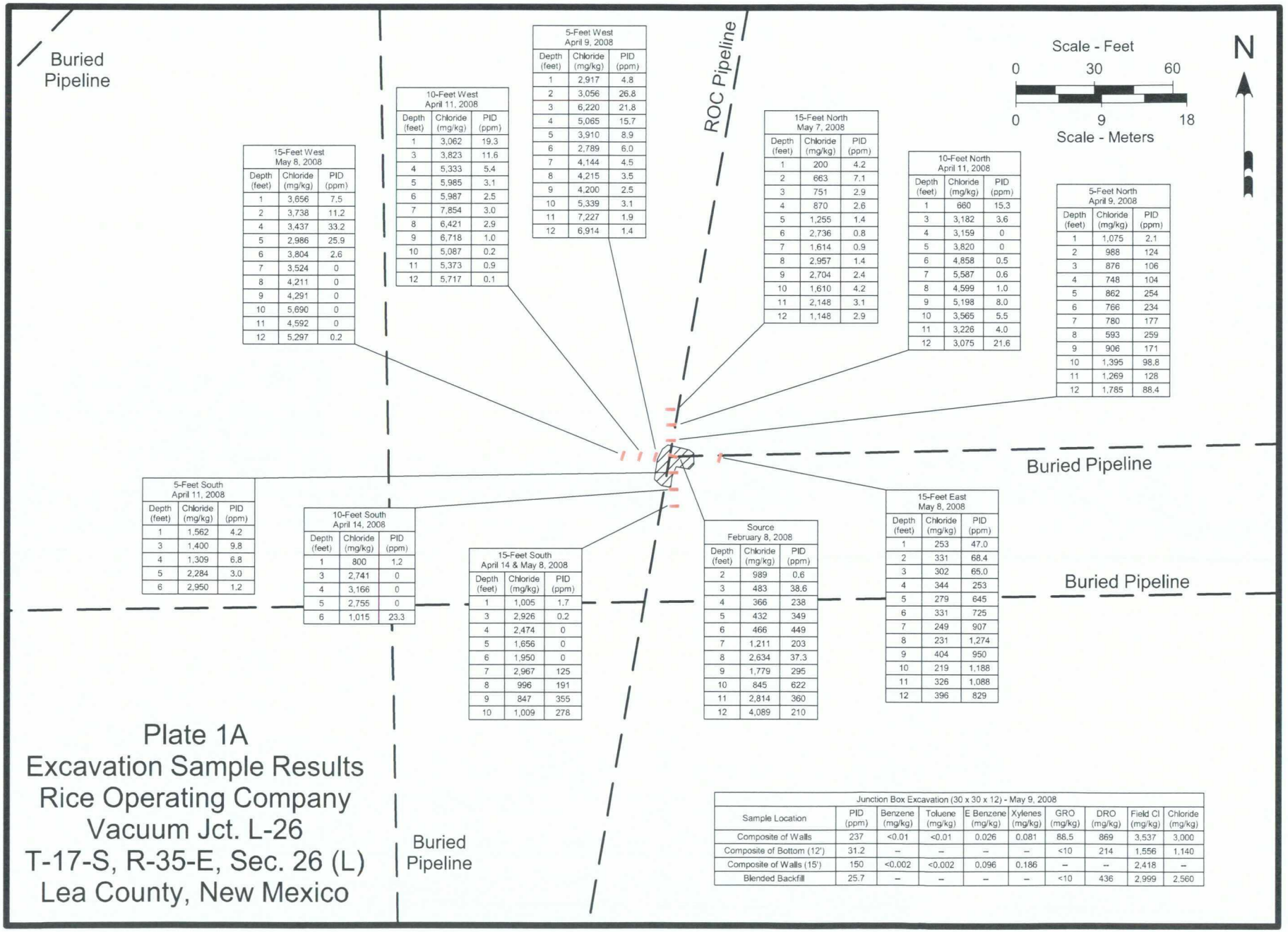
Katie Lee

Katie Lee
Project Scientist

Copy: Hack Conder, ROC

Plates

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



15-Feet West
May 8, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
1	3,656	7.5
2	3,738	11.2
4	3,437	33.2
5	2,986	25.9
6	3,804	2.6
7	3,524	0
8	4,211	0
9	4,291	0
10	5,690	0
11	4,592	0
12	5,297	0.2

10-Feet West
April 11, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
1	3,062	19.3
3	3,823	11.6
4	5,333	5.4
5	5,985	3.1
6	5,987	2.5
7	7,854	3.0
8	6,421	2.9
9	6,718	1.0
10	5,087	0.2
11	5,373	0.9
12	5,717	0.1

5-Feet West
April 9, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
1	2,917	4.8
2	3,056	26.8
3	6,220	21.8
4	5,065	15.7
5	3,910	8.9
6	2,789	6.0
7	4,144	4.5
8	4,215	3.5
9	4,200	2.5
10	5,339	3.1
11	7,227	1.9
12	6,914	1.4

15-Feet North
May 7, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
1	200	4.2
2	663	7.1
3	751	2.9
4	870	2.6
5	1,255	1.4
6	2,736	0.8
7	1,614	0.9
8	2,957	1.4
9	2,704	2.4
10	1,610	4.2
11	2,148	3.1
12	1,148	2.9

10-Feet North
April 11, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
1	660	15.3
3	3,182	3.6
4	3,159	0
5	3,820	0
6	4,858	0.5
7	5,587	0.6
8	4,599	1.0
9	5,198	8.0
10	3,565	5.5
11	3,226	4.0
12	3,075	21.6

5-Feet North
April 9, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
1	1,075	2.1
2	988	124
3	876	106
4	748	104
5	862	254
6	766	234
7	780	177
8	593	259
9	906	171
10	1,395	98.8
11	1,269	128
12	1,785	88.4

5-Feet South
April 11, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
1	1,562	4.2
3	1,400	9.8
4	1,309	6.8
5	2,284	3.0
6	2,950	1.2

10-Feet South
April 14, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
1	800	1.2
3	2,741	0
4	3,166	0
5	2,755	0
6	1,015	23.3

15-Feet South
April 14 & May 8, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
1	1,005	1.7
3	2,926	0.2
4	2,474	0
5	1,656	0
6	1,950	0
7	2,967	125
8	996	191
9	847	355
10	1,009	278

Source
February 8, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
2	989	0.6
3	483	38.6
4	366	238
5	432	349
6	466	449
7	1,211	203
8	2,634	37.3
9	1,779	295
10	845	622
11	2,814	360
12	4,089	210

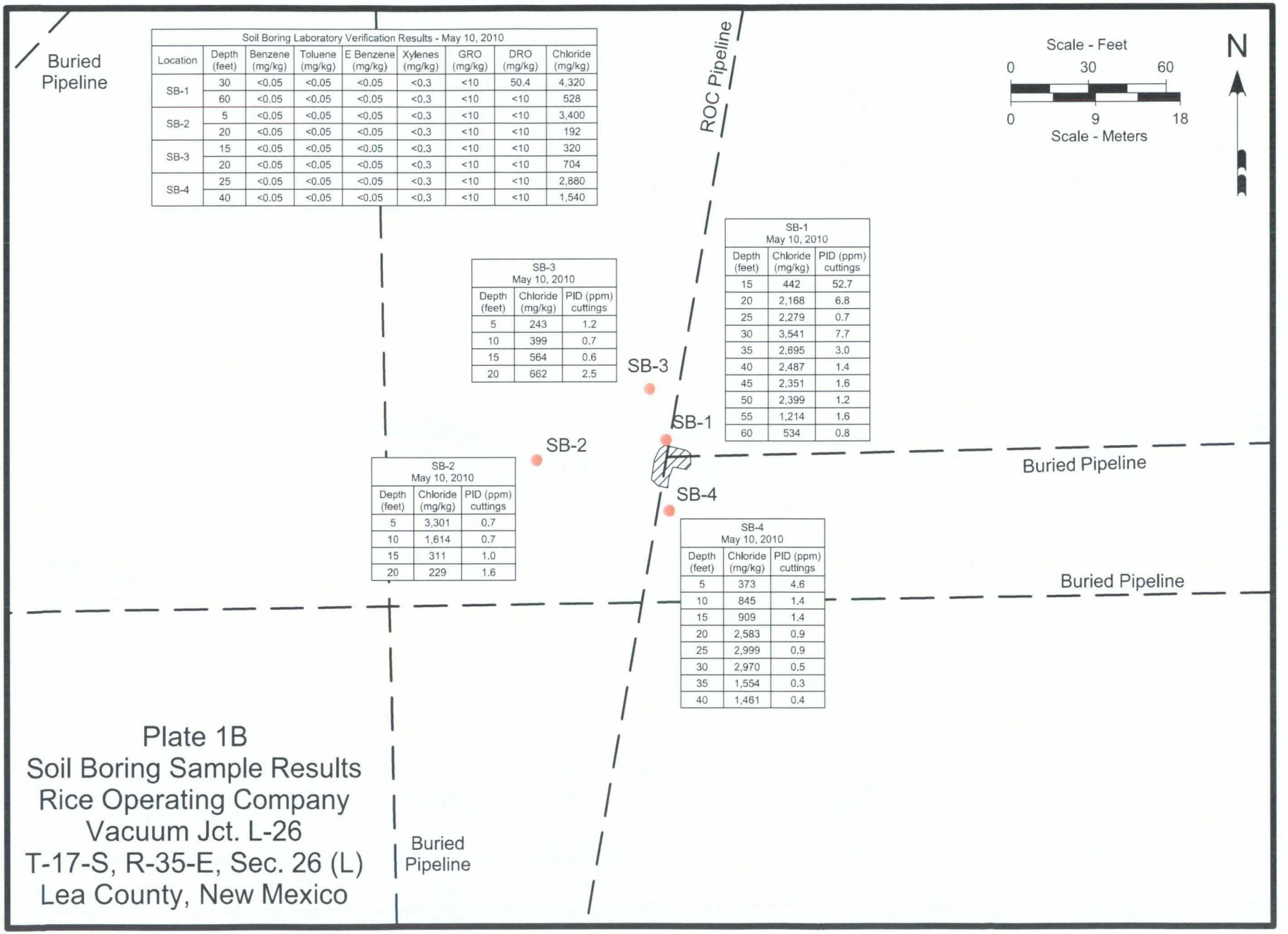
15-Feet East
May 8, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
1	253	47.0
2	331	68.4
3	302	65.0
4	344	253
5	279	645
6	331	725
7	249	907
8	231	1,274
9	404	950
10	219	1,188
11	326	1,088
12	396	829

Plate 1A
Excavation Sample Results
Rice Operating Company
Vacuum Jct. L-26
T-17-S, R-35-E, Sec. 26 (L)
Lea County, New Mexico

Junction Box Excavation (30 x 30 x 12) - May 9, 2008

Sample Location	PID (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	E Benzene (mg/kg)	Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	Field Cl (mg/kg)	Chloride (mg/kg)
Composite of Walls	237	<0.01	<0.01	0.026	0.081	88.5	869	3,537	3,000
Composite of Bottom (12')	31.2	–	–	–	–	<10	214	1,556	1,140
Composite of Walls (15')	150	<0.002	<0.002	0.096	0.186	–	–	2,418	–
Blended Backfill	25.7	–	–	–	–	<10	436	2,999	2,560



Soil Boring Laboratory Verification Results - May 10, 2010								
Location	Depth (feet)	Benzene (mg/kg)	Toluene (mg/kg)	E Benzene (mg/kg)	Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	Chloride (mg/kg)
SB-1	30	<0.05	<0.05	<0.05	<0.3	<10	50.4	4,320
	60	<0.05	<0.05	<0.05	<0.3	<10	<10	528
SB-2	5	<0.05	<0.05	<0.05	<0.3	<10	<10	3,400
	20	<0.05	<0.05	<0.05	<0.3	<10	<10	192
SB-3	15	<0.05	<0.05	<0.05	<0.3	<10	<10	320
	20	<0.05	<0.05	<0.05	<0.3	<10	<10	704
SB-4	25	<0.05	<0.05	<0.05	<0.3	<10	<10	2,880
	40	<0.05	<0.05	<0.05	<0.3	<10	<10	1,540

SB-1 May 10, 2010		
Depth (feet)	Chloride (mg/kg)	PID (ppm) cuttings
15	442	52.7
20	2,168	6.8
25	2,279	0.7
30	3,541	7.7
35	2,695	3.0
40	2,487	1.4
45	2,351	1.6
50	2,399	1.2
55	1,214	1.6
60	534	0.8

SB-3 May 10, 2010		
Depth (feet)	Chloride (mg/kg)	PID (ppm) cuttings
5	243	1.2
10	399	0.7
15	564	0.6
20	662	2.5

SB-2 May 10, 2010		
Depth (feet)	Chloride (mg/kg)	PID (ppm) cuttings
5	3,301	0.7
10	1,614	0.7
15	311	1.0
20	229	1.6

SB-4 May 10, 2010		
Depth (feet)	Chloride (mg/kg)	PID (ppm) cuttings
5	373	4.6
10	845	1.4
15	909	1.4
20	2,583	0.9
25	2,999	0.9
30	2,970	0.5
35	1,554	0.3
40	1,461	0.4

Plate 1B
Soil Boring Sample Results
Rice Operating Company
Vacuum Jct. L-26
T-17-S, R-35-E, Sec. 26 (L)
Lea County, New Mexico

Attachment A

Jan 2010 OCD Approval
Sept 2009 ICP
Dec 2008 Jct Box Disclosure Report

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

Katie Lee

From: Katie Jones [kjones@riceswd.com]
Sent: Thursday, January 28, 2010 3:12 PM
To: Katie Lee
Subject: FW: ICP Approval for Rice Vacuum L-26 vent (1R425-66)

From: Hansen, Edward J., EMNRD [mailto:edwardj.hansen@state.nm.us]
Sent: Thursday, January 28, 2010 8:16 AM
To: Hack Conder
Cc: Leking, Geoffrey R, EMNRD; Katie Jones
Subject: ICP Approval for Rice Vacuum L-34 vent (1R425-66)

Dear Mr. Conder:

The New Mexico Oil Conservation Division (OCD) has reviewed the submitted Investigation Characterization Plans (ICP), dated September 30, 2009, for the above-referenced site. The OCD hereby conditionally approves the following ICP for the Rice Operating Company (ROC) site:

> Rice Vacuum L-26 vent submitted by R. T. Hicks on 10/2/2009 #1R425-66
>
> ROC must delineate the extent of the impact at the site for chloride to 250 mg/Kg or less; TPH to 100 ppm or less (using a PID); benzene to 10 mg/Kg or less; and BTEX to 50 mg/Kg or less.
>
> If groundwater (including the capillary fringe) is encountered, then ROC must install at least one monitoring well. (Additional monitoring wells may be required if any WQCC standard is exceeded.) The groundwater must be analyzed for chloride, sulfate and TDS (and BTEX if warranted).

Also, please be advised that OCD approval of this plan does not relieve the owner/operator of responsibility should operations pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the owner/operator of responsibility for compliance with any OCD, federal, state, or local laws and/or regulations.

If you have questions regarding this matter, please contact me at 505-476-3489.

Edward J. Hansen
Hydrologist
Environmental Bureau

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

September 30, 2009

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

RE: Investigation Characterization Plan
Vacuum Salt Water Disposal System: F-25 EOL, L-26 Vent
NMOCD Case #s: Not Yet Assigned
T17S, R35E, Section 25 and 26

Dear Mr. Hansen:

On behalf of Rice Operating Company (ROC), R.T. Hicks Consultants, Ltd. is pleased to submit this Investigation Characterization Plan (ICP) for the above- referenced sites within the Vacuum Salt Water Disposal System. Plate 1 is a map showing the sites relative to major roads in the area, nearby ROC sites and nearby USGS monitoring wells. GPS coordinates for the site are approximately: N32° 48.479, W103° 24.917 (F-25 EOL) and N32° 48.199, W103° 25.945 (L-26).

Background and Previous Work
Both sites were initially assessed as part of Vacuum System abandonment. At F-25 EOL, the former junction box was removed along with 40 cubic yards of soil which was disposed of at a NMOCD-approved facility. Three sampling trenches were advanced to 12' below ground surface (bgs) to characterize impact (at the source, 5 ft north and 5 ft west of the former junction box). The site was graded with blended material.

At L-26 Vent, site work included:
- Excavation to 30L x 30W x 12D feet,
- Backfilling with blended soil,
- A geosynthetic liner was installed over a cushioning layer of blow sand and
- The remainder of the excavation was backfilled with blended dirt to the surface.

In both cases, the surface was contoured to the surrounding area and an identification plate was placed at the site to mark the location of the former junction box. The initial disclosure reports for these sites are attached.

Proposed Work Elements
The following work elements are either complete or proposed to characterize this site sufficiently to develop an appropriate path forward:

1. ROC has identified and documented the location of all current and historic equipment and pipelines associated with the site.
2. ROC has conducted initial trench sampling adjacent to the former junction boxes.
3. ROC and Hicks Consultants will conduct vertical and lateral delineation of soil chlorides.

4. If warranted, we will install one monitor well to evaluate possible ground water impact. Plate 2 presents a potentiometric surface map for the site area.

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

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

1. Protects public health.
2. Provides the greatest net environmental benefit.
3. Complies with NMOCD Rules.
4. Is supported by good science.

Each site shall have three submissions or a combination of:

1. This Investigation and Characterization Plan (ICP), which is a proposal for data gathering, and site characterization and assessment (this submission).
2. Upon evaluation of 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 Termination Request with final documentation will be submitted.

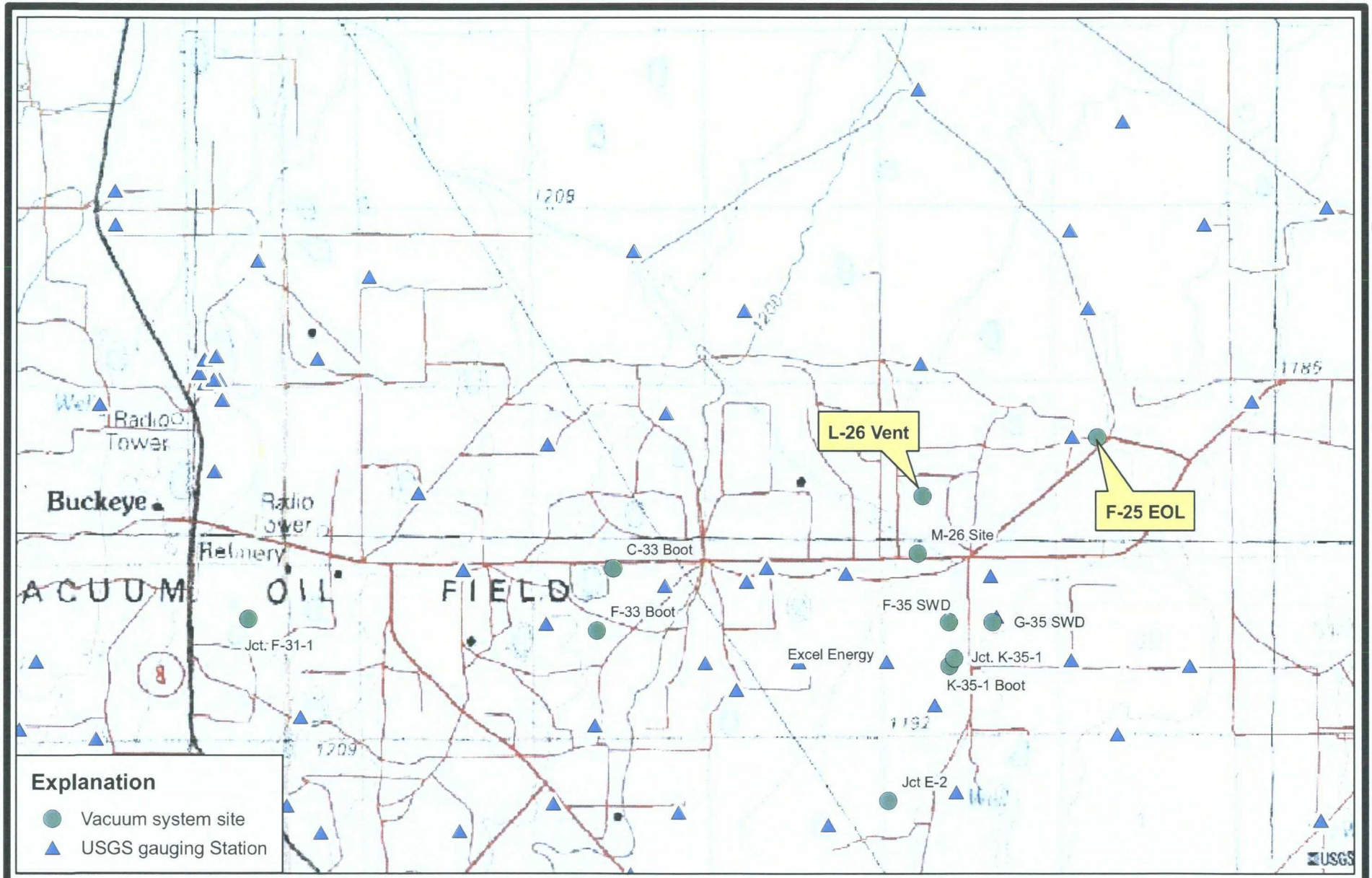
If you have any questions or comments regarding this ICP, please feel free to contact me or Hack Conder of Rice Operating Company.

Sincerely,
R.T. Hicks Consultants, Ltd.

Katie Lee

Katie Lee
Project Scientist

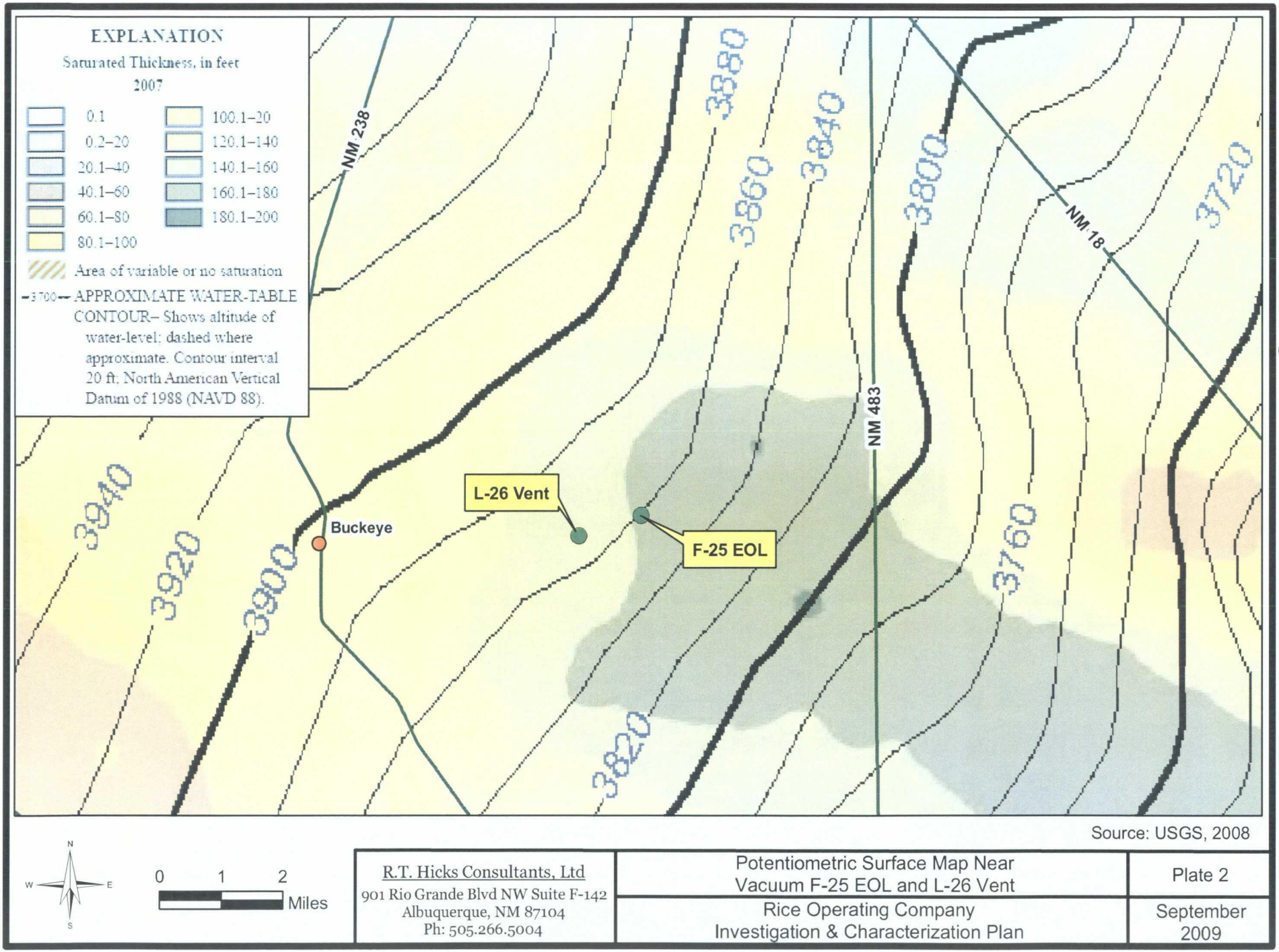
Copy: Rice Operating Company



S:/PROJECTS/ROC/VACUUM_F25_EOL/PLATESICP/LOCATION.MXD

9/18/2009

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Location of Vacuum F-25 EOL & L-26 Vent Relative to ROC Sites and USGS Gauging Stations	Plate 1
	Rice Operating Company Investigation & Characterization Plan	September 2009



Source: USGS, 2008

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Potentiometric Surface Map Near Vacuum F-25 EOL and L-26 Vent	Plate 2
	Rice Operating Company Investigation & Characterization Plan	September 2009

S:/PROJECTS/ROC/VACUUM_F25_EOL/PLATESICP/USGS_POT.MXD

9/18/2009

RICE OPERATING COMPANY
JUNCTION BOX DISCLOSURE* REPORT

BOX LOCATION

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	BOX DIMENSIONS - FEET		
							Length	Width	Depth
Vacuum	vent L-26	L	26	17S	35E	Lea	no box; system abandonment		

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

Depth to Groundwater 68 feet NMOCD SITE ASSESSMENT RANKING SCORE: 10

Date Started 2/7/2008 Date Completed 5/21/2008 OCD Witness no

Soil Excavated 400 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 5/9/2008 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.	<0.010	<0.010	0.026	0.081	88.5	869	3,000
BOTTOM COMP.	PID = 31.2 (field reading)				<10.0	214	1,140
BACKFILL COMP.	PID = 25.7 (field reading)				<10.0	436	2,560

General Description of Remedial Action: This junction was eliminated during the Vacuum SWD system abandonment. After the former junction box was removed, an investigation was conducted using a backhoe to collect soil samples at regular intervals producing a 30x30x12-ft deep excavation. Chloride field tests were performed on each sample, which yielded elevated concentrations that did not relent with depth. Organic vapors were measured using a PID. Representative composite samples were sent to a commercial laboratory for analysis of chloride, TPH, and BTEX. The excavated soil was blended on-site and returned to the excavation up to 4 ft below ground surface (BGS). At 4 ft BGS, a geosynthetic liner was installed with 6 inches of clean, imported soil above and below the liner to serve as padding. The remaining fill was returned to the excavation to ground surface and contoured to the surrounding area. An identification plate was place on the surface at the former junction site to mark the presence of the geosynthetic liner below. NMOCD was notified of potential groundwater on 12/1/2008.

ADDITIONAL EVALUATION IS MEDIUM PRIORITY

enclosures: photos, lab results, PID field screenings, cross-section, BTEX study, chloride curve

CHLORIDE FIELD TESTS

LOCATION	DEPTH	mg/kg
background	6"	107
4-wall comp.	n/a	3,537
bottom comp.	12'	1,556
backfill comp	n/a	2,999
vertical delineation trench at 5 ft north of the junction (source)	1'	1,075
	2'	988
	3'	876
	4'	748
	5'	862
	6'	766
	7'	780
	8'	593
	9'	906
	10'	1,395
	11'	1,269
	12'	1,785

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

SITE SUPERVISOR Roy Rascon SIGNATURE not available COMPANY RICE OPERATING COMPANY

REPORT ASSEMBLED BY Katie Jones INITIAL KJ

PROJECT LEADER Larry Bruce Baker Jr. SIGNATURE Larry Bruce Baker Jr DATE 12-2-08

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

Attachment B

Lithology Logs

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

Logger:	Dale Littlejohn
Driller:	Harrison & Cooper
Consultant:	R.T. Hicks
Drilling Method	Air Rotary
Start Date:	5/10/2010
End Date:	5/10/2010

RICE OPERATING COMPANY ROC SINCE 1955

Project Name: Vacuum Jct L-26 **Well ID:** SB #1

Location: UL/ L Sec 26 T17S R35E

Lat:N 32* 48' 12.399" **County:** Lea

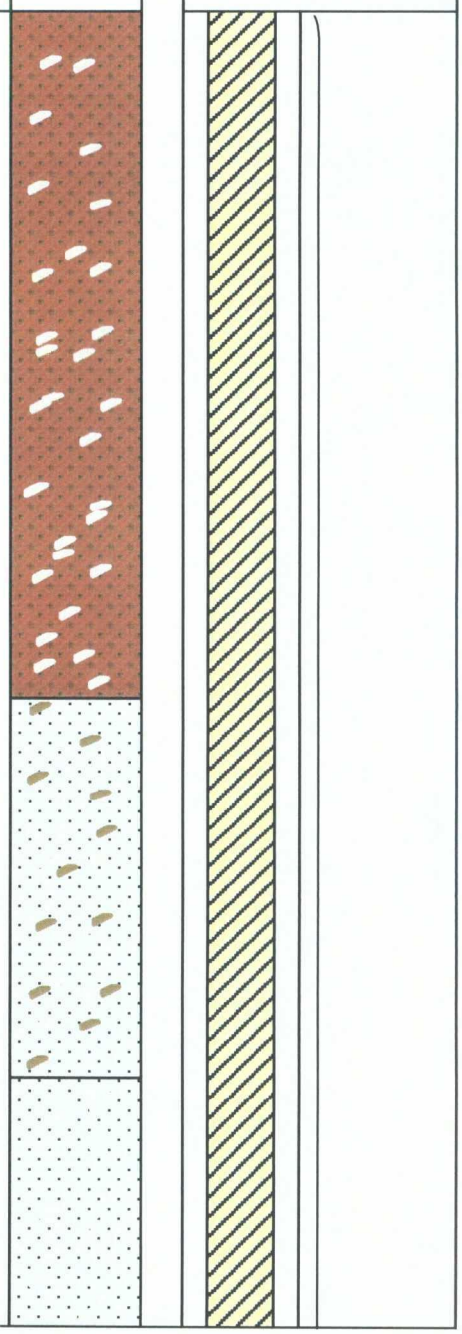
Long:W103* 25' 58.325" **State:** NM

Comments: All samples from cuttings. Located at source of the former junction box.

Drafted by: Jordan Woodfin

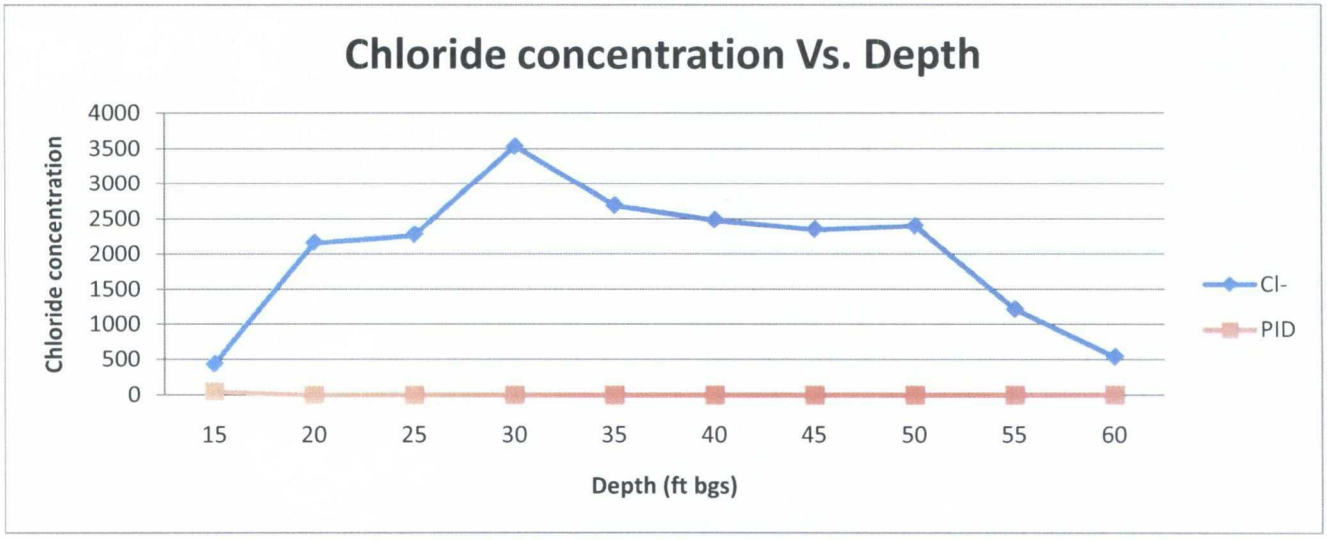
TD = 60 ft Estimated depth to GW = 68 ft

Depth (feet)	chloride field tests	LAB	PID	Description
				0ft-12ft CALICHE (BACKFILL) silt, grayish-brown
				12ft-18ft
15 ft	442		52.7	CALICHE,QUARTZITE, SANDSTONE gray with hard brown quartzite, and gray sandstone
				18ft-25ft
20 ft	2168		6.8	SAND AND CALICHE grayish white, fine to medium grain, poorly sorted, angular sand



Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
25 ft	2279		0.7			
				25ft-52ft		
30 ft	3541		7.7			
		GRO	<10			
		DRO	50.4			bentonite seal
				SAND		
35 ft	2695		3			
				brown, medium grain, well sorted, sub angular, becoming sub rounded with depth		
40 ft	2487		1.4			
45 ft	2351		1.6			

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
50 ft	2399		1.2			
55 ft	1214		1.6			
				52ft- 65ft		
				SAND		
60 ft	534	Cl- 528	0.8			
	B = 050	GRO <10		brown, medium to coarse grain, moderately sorted, sub-rounded		
	T = 050	DRO <10				
	E = 050					
	X = 300					



Logger:	Dale Littlejohn
Driller:	Harrison & Cooper
Consultant:	R.T. Hicks
Drilling Method	Air Rotary
Start Date:	5/10/2010
End Date:	5/10/2010

RICE OPERATING COMPANY ROC SINCE 1955

Project Name: Vacuum Jct L-26 **Well ID:** SB #2

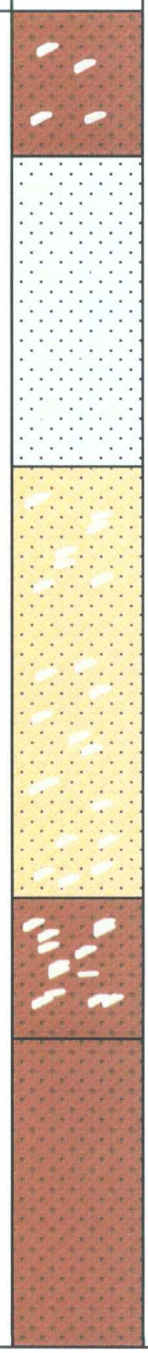
Location: UL/L Sec 26 T17S R35E
Lat: N32* 48' 12.313" **County:** Lea
Long: W103*25' 58.839" **State:** NM

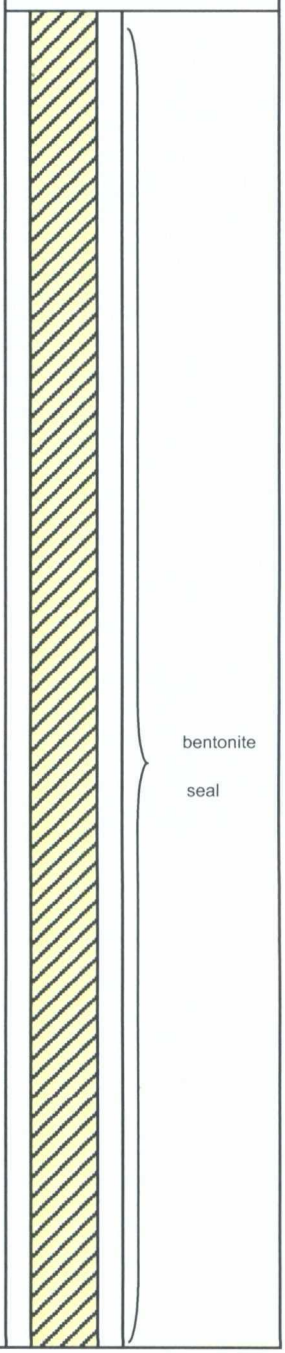
Comments: All samples from cuttings. Located 45' West of the former junction box.

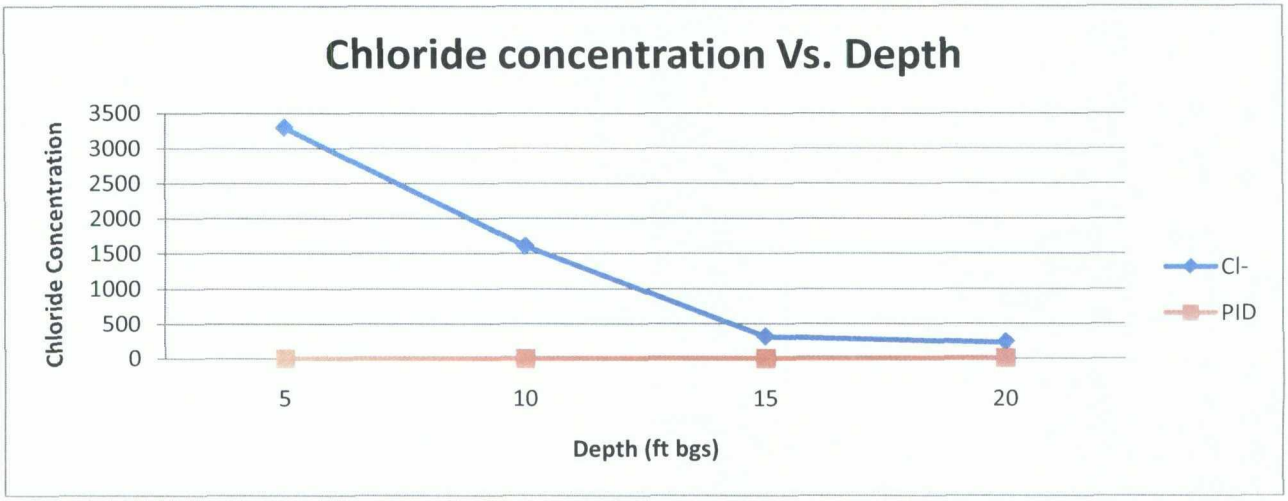
Drafted by: Jordan Woodfin

TD = 20 ft Estimated depth to GW = 68ft

Depth (feet)	chloride field tests	LAB	PID	Description
				0ft-3ft
				SILT & SOME CALICHE
				dark brown
				3ft-8ft
5 ft	3301	CL- 3400	0.7	CALICHE
	B = 050	GRO <10		
	T = 050	DRO <10		
	E = 050			white to light gray
	X = 300			
				8ft-16ft
10 ft	1614		0.7	
				CALICHE & SILTY SAND
15 ft	311		1	interbedded grayish-brown silty sand
				16ft-18ft
				QUARTZITE & CALICHE
				brown, fine crystalline with interbedded silt
				18ft-20ft
20 ft	229	CL- 192	1.6	SAND & SANDSTONE
	B = 050	GRO <10		
	T = 050	DRO <10		silt interbedded with quartzite and sandstone (hard drilling)
	E = 050			
	X = 300			






Chloride concentration Vs. Depth
Chloride Concentration
3500
3000
2500
2000
1500
1000
500
0
5
10
15
20
Depth (ft bgs)
Cl-
PID

Logger:	Dale Littlejohn
Driller:	Harrison & Cooper
Consultant:	R.T. Hicks
Drilling Method	Air Rotary
Start Date:	5/10/2010
End Date:	5/10/2010

RICE OPERATING COMPANY ROC SINCE 1955

Project Name: Vacuum Jct L-26 **Well ID:** SB #3

Location: UL/L Sec 26 T17S R35E

Lat: N 32* 48.12.643" **County:** Lea

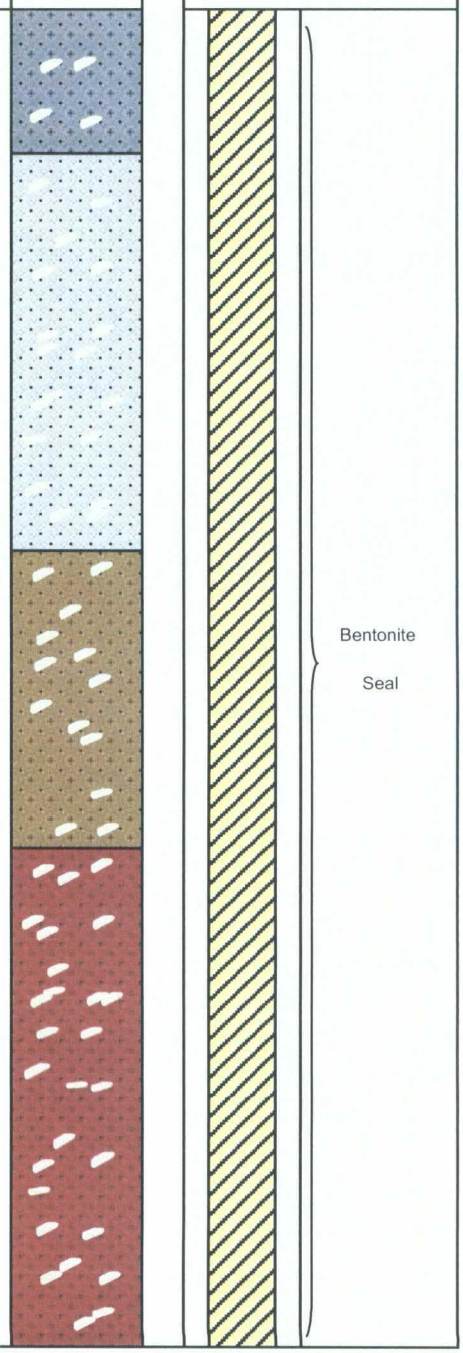
Long: W103* 35' 58.385" **State:** NM

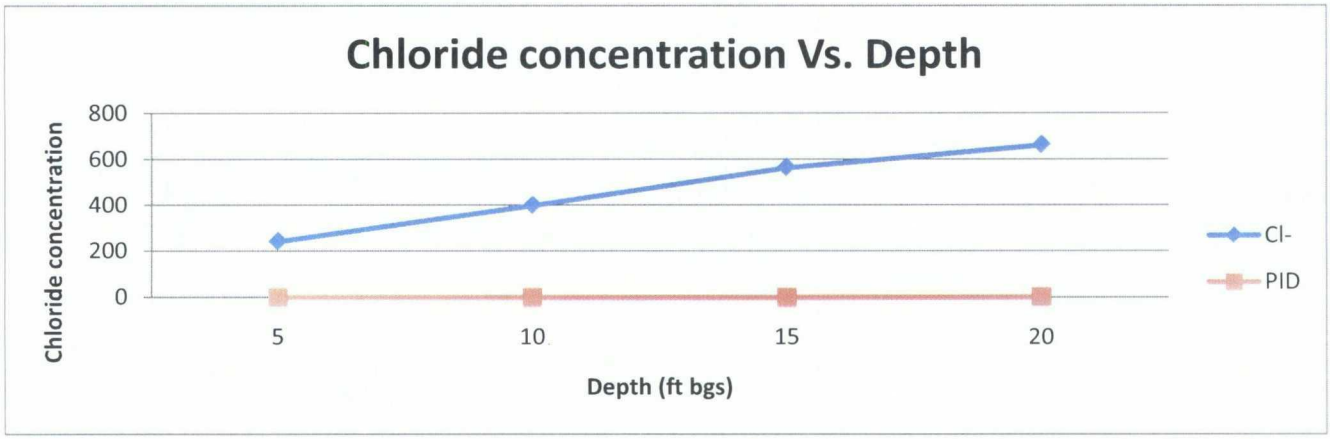
Comments: All samples from cuttings. Located 25' north of the former junction box location

Drafted by: Jordan Woodfin

TD = 20ft Estimated depth to GW = 68 ft

Depth (feet)	chloride field tests	LAB	PID	Description
				0ft-1ft CLAY & CALICHE silty clay, gray to dark gray
				1ft-9ft CALICHE gray with interbedded brown silt
5 ft	243		1.2	
10 ft	399		0.7	9ft-15ft CALICHE brown silt with some quartz
15 ft	564	CL: 320	0.6	
	B = 050	GRO <10		15ft-20ft SILT, SOME CALCIHE, QUARTZITE light reddish-brownwith some caliche and thin bedded quartzite
	T = 050	DRO <10		
	B = 050			
	X = 300			
20 ft	662	CL: 704	2.5	
	B = 050	GRO <10		
	T = 050	DRO <10		
	B = 050			
	X = 300			




Chloride concentration Vs. Depth
Chloride concentration
800
600
400
200
0
5
10
15
20
Depth (ft bgs)
Cl-
PID

Logger:	Dale Littlejohn
Driller:	Harrison & Cooper
Consultant:	R.T. Hicks
Drilling Method	Air Rotary
Start Date:	5/10/2010
End Date:	5/10/2010

RICE OPERATING COMPANY ROC SINCE 1955

Project Name: Vacuum Jct L-26 **Well ID:** SB #4

Location: UL/L Sec 26 T17S R35E

Lat: N 32* 48' 12.132" **County:** Lea

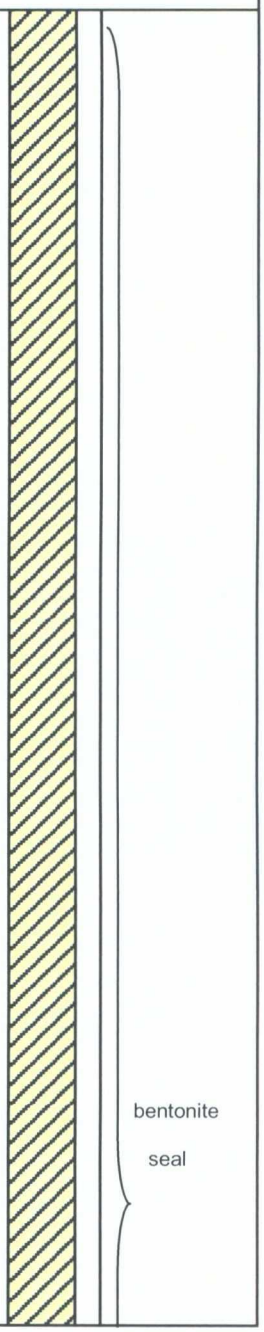
Long: W. 103* 25' 58.31" **State:** NM

Comments: All samples from cuttings. Located 25' south of the former junction box.

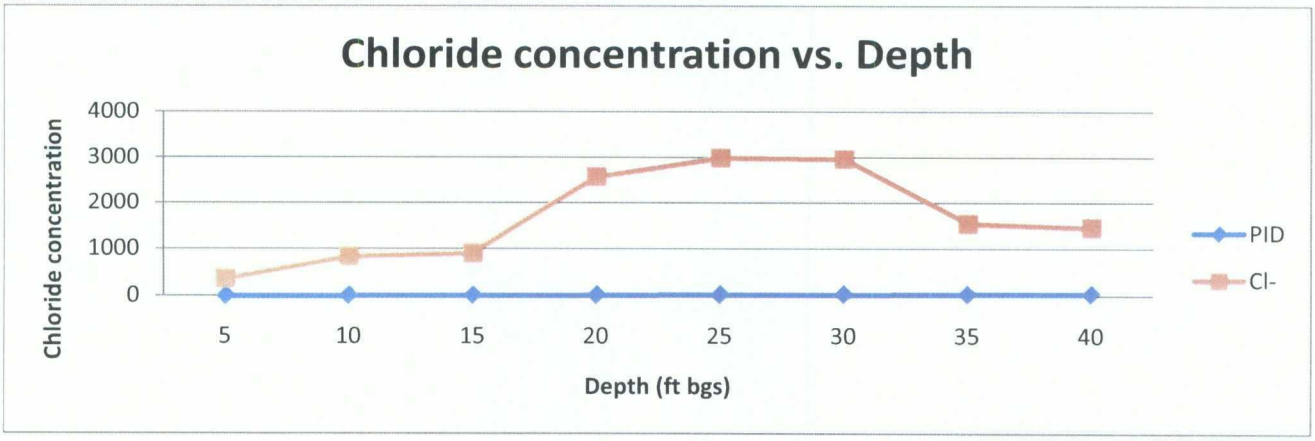
Drafted by: Jordan Woodfin

TD = 40 ft Estimated depth to GW = 68 ft

Depth (feet)	chloride field tests	LAB	PID	Description
				0ft-2ft
				CALICHE & SILT
				dark brown, with some caliche
5 ft	373		4.6	2ft-25ft
10 ft	845		1.4	CALICHE
15 ft	909		1.4	white to light gray interbedded light brown silt and dark brown quartzite
20 ft	2583		0.9	



Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
25 ft	2999	Cl- 2880	0.9			
	B = 050	GRO <10				
	T = 050	DRO <10				
	E = 050					
	X = 300			25ft-40ft		
30 ft	2970		0.5			
				SAND		
				brown, fine to medium grain, well sorted, angular to sub angular		
35 ft	1554		0.3			
40 ft	1461	Cl- 1540	0.4			
	B = 050	GRO <10				
	T = 050	DRO <10				
	E = 050					
	X = 300					



Attachment C

Laboratory Results

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

CARDINAL LABORATORIES

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

May 18, 2010

Hack Conder
Rice Operating Company
112 West Taylor
Hobbs, NM 88240

Re: Vacuum Jct L-26

Enclosed are the results of analyses for sample number H19865, received by the laboratory on 05/11/10 at 8:00 am.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method SW-846 8260	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method TX 1005	Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Cardinal Laboratories is accredited though the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.2	Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

Total Number of Pages of Report: 3 (includes Chain of Custody)

Sincerely,

Celey D. Keene
Laboratory Director

This report conforms with NELAP requirements.

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
112 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 05/11/10
Reporting Date: 05/17/10
Project Owner: NOT GIVEN
Project Name: VACUUM JCT L-26
Project Location: VACUUM JCT L-26

Sampling Date: 05/10/10
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: JH
Analyzed By: AB/ZL/HM

LAB NO.	SAMPLE ID	GRO (C_6-C_{10}) (mg/kg)	DRO (>C_{10}-C_{28}) (mg/kg)	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL BENZENE (mg/kg)	TOTAL XYLENES (mg/kg)	Cl* (mg/kg)
ANALYSIS DATE:		05/14/10	05/14/10	05/12/10	05/12/10	05/12/10	05/12/10	05/11/10
H19865-1	SB#1 @ 30FT	<10.0	50.4	<0.050	<0.050	<0.050	<0.300	4,320
H19865-2	SB#1 @ 60FT	<10.0	<10.0	<0.050	<0.050	<0.050	<0.300	528
H19865-3	SB#2 @ 5FT	<10.0	<10.0	<0.050	<0.050	<0.050	<0.300	3,400
H19865-4	SB#2 @ 20FT	<10.0	<10.0	<0.050	<0.050	<0.050	<0.300	192
H19865-5	SB#3 @ 15FT	<10.0	<10.0	<0.050	<0.050	<0.050	<0.300	320
H19865-6	SB#3 @ 20FT	<10.0	<10.0	<0.050	<0.050	<0.050	<0.300	704
H19865-7	SB#4 @ 25FT	<10.0	<10.0	<0.050	<0.050	<0.050	<0.300	2,880
H19865-8	SB#4 @ 40FT	<10.0	<10.0	<0.050	<0.050	<0.050	<0.300	1,540
Quality Control		475	452	0.020	0.021	0.021	0.057	500
True Value QC		500	500	0.020	0.020	0.020	0.060	500
% Recovery		95.0	90.4	100	105	105	95.0	100
Relative Percent Difference		1.1	9.0	3.6	1.1	<1.0	<1.0	< 0.1

METHODS: TPH GRO & DRO - EPA SW-846 8015 M; BTEX - SW-846 8021B; Cl-: Std. Methods 4500-Cl-B
*Analyses performed on 1:4 w:v aqueous extracts. Reported on wet weight.
TEXAS NELAP ACCREDITATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES. Not accredited for GRO/DRO and Chloride.

Lab Director

05/18/10
Date

H19865 TBCL RICE

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

CARDINAL LABORATORIES

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name:	Rice Operating Company	**BILL TO**	
Project Manager:	Hack Conder	P.O. #:	
Address:	122 West Taylor	Company:	
City:	Hobbs	State: NM Zip: 88240	Attn:
Phone #:	393-9174	Fax #: 397-1471	Address:
Project #:		Project Owner:	City:
Project Name:	Vacuum Jct L-26		State: Zip:
Project Location:	Vacuum Jct L-26		Phone #:
Sampler Name:	Jordan Woodfin		Fax #:

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST										
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	ACID/BASE:	ICE / COOL	OTHER:	DATE	TIME	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions							
H19865-1	SB#1 @ 30 ft	G	1			✓					✓		5/10/10	8:32 a	✓	✓	✓								
2	SB# 1 @ 60 ft	G	1			✓					✓		5/10/10	8:50 a	✓	✓	✓								
3	SB# 2 @ 5ft	G	1			✓					✓		5/10/10	9:11 a	✓	✓	✓								
4	SB #2 @ 20ft	G	1			✓					✓		5/10/10	9:23 a	✓	✓	✓								
5	SB#3 @ 15ft	G	1			✓					✓		5/10/10	9:55 a	✓	✓	✓								
6	SB #3 @ 25ft	G	1			✓					✓		5/10/10	10:01 a	✓	✓	✓								
7	SB #4 @ 25ft	G	1			✓					✓		5/10/10	11:06 a	✓	✓	✓								
8	SB #4 @ 40ft	G	1			✓					✓		5/10/10	11:31 a	✓	✓	✓								

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.

Relinquished By: Jordan Woodfin	Date: 5/11/10 Time: 7:00	Received By:	Phone Result: ☐ Yes ☑ No Add'l Phone #:
Relinquished By:	Date: 5/11/10 Time: 9:00	Received By: Jodi Henson	Fax Result: ☐ Yes ☑ No Add'l Fax #:
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Sample Condition Cool: ☑ Yes ☐ No Intact: ☑ Yes ☐ No	CHECKED BY: (Initials)	REMARKS: email results Hconder@riceswd.com; Kjones@riceswd.com Jwoodfin@riceswd.com

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476

#26

NEED SAMPLES BACK, PLEASE