1R - 426-99

WORKPLANS

Date:
12-22-10

Hansen, Edward J., EMNRD

From: Katie Jones [kjones@riceswd.com]
Sent: Wednesday, February 02, 2011 9:56 AM
To: Hansen, Edward J., EMNRD
Cc: Hack Conder; lpg@texerra.com
Subject: BD O-23 vent (1R426-99) CAP Addendum
Attachments: BD O-23 vent (1R426-99) SB-8 log.pdf; BD O-23 vent LAB 1.13.11.pdf; BD O-23 vent (1R426-99) SB-8 photos.pdf; BD O-23 vent (1R426-99) MW-1R installation photos.pdf; BD O-23 vent (1R426-99) Proposed Liner.jpg; BD O-23 vent (1R426-99) Chloride Mass - Table 1 01.31.11.xls

Mr. Hansen,

This email is an Addendum to the BD O-23 vent site (1R426-99) Corrective Action Plan (CAP), submitted to the NMOCD on December 22, 2010. In an email dated January 11, 2011, NMOCD requested ROC determine the extent of the release to the north of SB-2. On January 13, 2011, SB-8 was drilled approximately 15 ft north of SB-2 and MW-1 was replaced with MW-1R, a 4 inch well. MW-1 was plugged on January 21, 2011 using a cement grout with 1-3% bentonite and a 3 ft cap of cement. Based on the findings in SB-8, ROC requests the following as an Addendum to the CAP. SB-8 log, lab results, photos, a new plat showing the proposed liner location, and a new table showing chloride mass calculations are attached. If you need any further information, please let me or Hack Conder know.

Page 1, paragraphs 2 and 3: text in blue lettering, below, will be added to the paragraph. Red lettering marked with a strike-through will be deleted.

"Groundwater chloride concentrations were found on October 13th to measure 4,400 mg/l from (a more recently installed) up-gradient monitor well (MW-2) and to measure 7,000 mg/l from the original near-source/down-gradient monitor well (MW-1) on the same date. Monitor well locations are shown in Figure 2 and groundwater laboratory data are given in Figures 3 & 4. It is apparent that although the up-gradient groundwater quality is impaired before it moves across the location it has also been affected by the downward migration of residual soil chlorides from the site. This is supported by the elevated levels of residual soil chlorides measured across the site during a soils evaluation conducted on February 23rd and March 17th, 2010 and January 13th, 2011 (Figure 5). We estimate the residual mass of contributed chlorides to be approximately ~~7,340~~7,733 lbs from the bottom 10 ft interval of the unsaturated zone and approximately ~~995~~1,160 lbs in the affected groundwater beneath the site, based on the attached chloride mass calculations (Table 1).

Texerra recommends and proposes the following Corrective Action Plan to protect groundwater and to move this project toward "remediation termination" status:

1) Remove the upper (approximately) four feet of chloride impacted soils across the area affected by past operations of the BD O-23 junction box (approximately ~~57~~70x84 ft with the southeast corner cut off to remain a safe distance away from a petroleum pipeline) and dispose of these in an NMOCD approved facility.

2) Install and properly seat a 20-mil plastic infiltration barrier at this depth encompassing the area impacted by the former junction box (as shown in Figure 6), and backfill with clean fill dirt with a chloride concentration below 500 mg/kg and a PID (field) reading below 100 ppm.

3) Prepare the surface soils over and surrounding the site and seed to a native vegetation mix.

4) Install a 4-inch diameter near-source "pumping well" and withdraw a volume of groundwater sufficient to remove the total estimated contributed chloride mass of ~~8,334~~8,893 lbs (Table 1). Removed

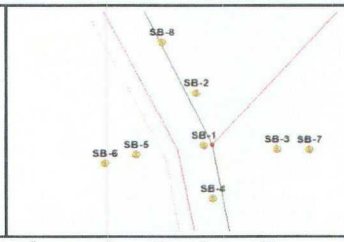
groundwater will be utilized for pipeline and well maintenance and possibly treated and used to promote vegetation. The Office of the State Engineer (OSE) will be pre-notified of this pumping activity."

Page 2, paragraphs 3: text in blue lettering, below, will be added to the paragraph. Red lettering marked with a strike-through will be deleted.

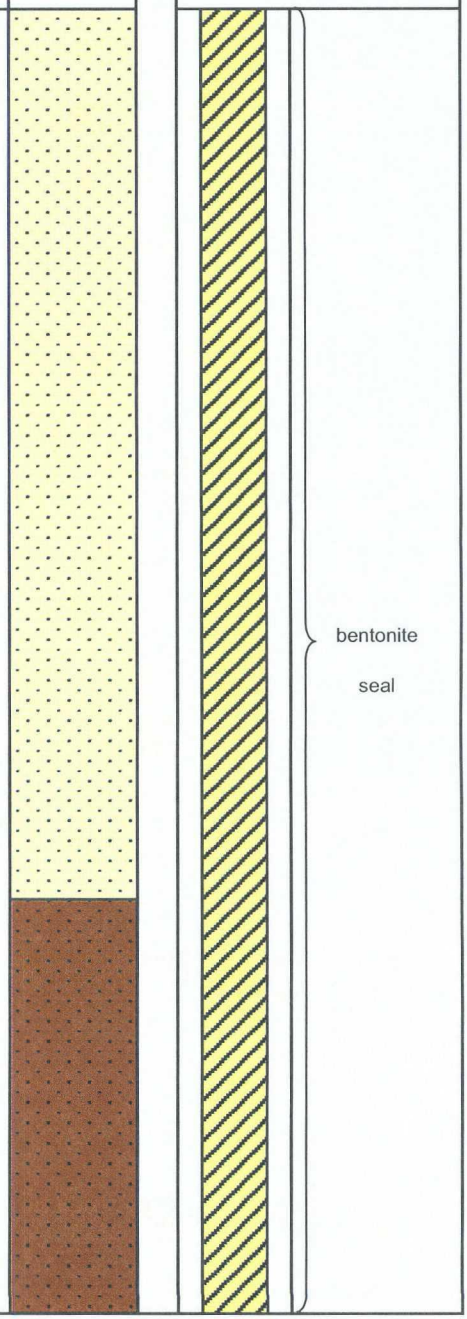
"Upon the removal of the ~~8,334~~8,893 lbs of chloride and approximately ~~3,7804~~,033 barrels of groundwater we anticipate submitting to NMOCD a final remediation progress report and request for project termination."

Thank you.

Katie Jones
Environmental Project Coordinator
RICE *Operating Company*

Logger:	Jordan Woodfin		RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC
Driller:	Harrison & Cooper, Inc.		
Drilling Method:	Air rotary		**Project Name:** BD O-23 vent **Well ID:** SB-8
Start Date:	1/13/2011		
End Date:	1/13/2011		**Project Consultant:** Texerra
Comments: Located 37 ft north of the former junction box site.			**Location:** UL/O sec. 23 T21S R37E
DRAFTED BY: L.Weinheimer			**Lat:** 32°27'36.309"N **County**: LEA
TD = 40 ft	GW = 45 ft		**Long:** 103°7'52.279"W **State**: NM

Depth (feet)	chloride field tests	LAB	PID	Description
				Tan very fine sand with small caliche fragments
5 ft	1,750		0.1	
10 ft	1,765	Cl- 704	0.0	
		GRO <10		
		DRO <10		
15 ft	1,693		0.0	
20 ft	1,010		0.0	
25 ft	1,367		0.0	
30 ft	845		0.0	
				Brownish red very fine silty sand
35 ft	453		0.0	
40 ft	289	Cl- 416	0.0	
		GRO <10		
		DRO <10		



Soil Chloride Calculator
Estimated Mass of Contributed, Residual Chloride
from unsaturated zone soil and saturated zone groundwater

Site:	**BD O-23 Vent**
This estimate prepared by:	L. Peter Galusky, Jr.
Date:	1/31/2011

Model Inputs

			Notes
length of affected area (ft)		70	measured/estimated
width of affected area (ft)		85	measured/estimated
depth to water table (ft)		40	measured
unsat zone affected depth (ft)		10	bottom 10 ft of unsat zone
sat zone affected thickness (ft)		10	prescribed by NMOCD
unsat zone avg Cl- conc of affected soil (ppm)		1,631	measured/estimated
unsat zone est. natural background Cl- conc (ppm)		141	lowest reading found
unsat zone mass density (lbs/cu yd)		3,000	estimated
Cl- conc of affected groundwater (ppm)		7,000	measured
Cl- conc of up-gradient groundwater (ppm)		4,400	measured
sat zone mass density (lbs/cu yd)		3,000	estimated
Cl- conc of recovery well (ppm)	MW-1	7,000	measured/estimated
avg daily pumping rate of recover well (gpm)		0.5	anticipated

Intermediate (calculated) Parameters

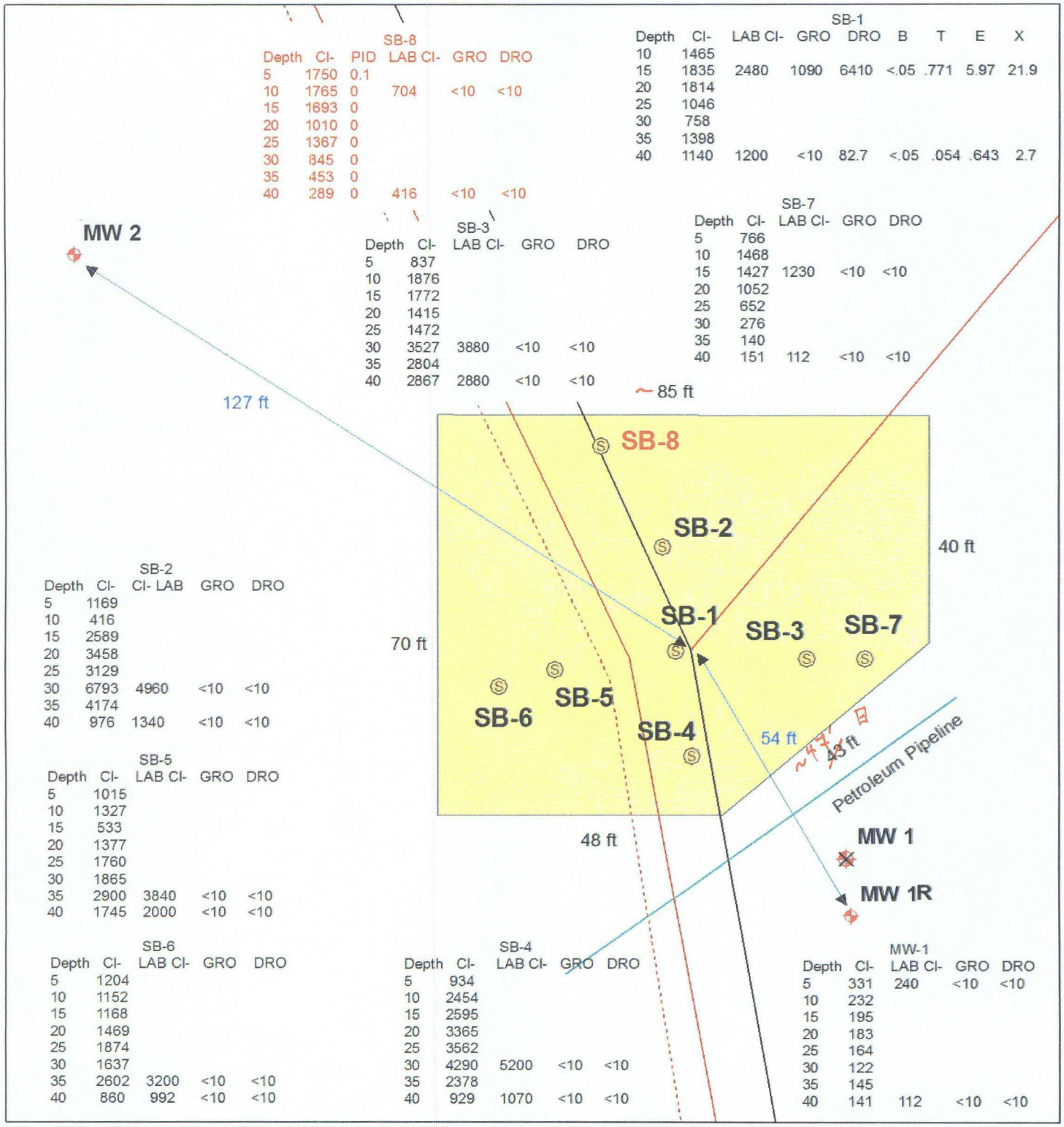
affected area (sq ft)	4,671	calculated
unsat zone Cl- conc attributed to source (ppm)	1,490	calculated
unsat zone volume of affected soil (cu yds)	1,730	calculated
unsat zone total mass of affected soils (lbs)	5,189,722	calculated
unsat zone mass of contributed residual soil chloride (lbs)	7,733	calculated
volume of affected groundwater (cu ft)	59,500	calculated
mass of affected groundwater (lbs)	446,250	calculated
mass of contributed Cl- in affected groundwater	1,160	calculated
avg daily pumping rate of recovery well (bbls/day)	17.1	calculated
Cl- conc of recovery well (lbs/bbl)	2.2	calculated

Estimated Contributed Cl- Mass and Equivalent Pumping Volume & Time

Max potential chlorides from unsaturated zone (soils)	7,733	calculated
Maximum potential chlorides from affected groundwater	1,160	calculated
Total mass of contributed chlorides (lbs)	**8,893**	**calculated**
# bbls to remove contributed Cl- from unsat zone	4,033	calculated
days pumping required to remove contributed Cl-	**235**	**calculated**

Note: It is assumed that only the lower 10 ft of soils in the affected unsaturated zone will potentially contribute chlorides to groundwater following the installation of an infiltration barrier. Therefore, in estimating the mass of contributed chlorides from the unsaturated zone only the lower ten feet were considered in the calculations.

Proposed liner



SB-8

Depth	Cl-	PID	LAB Cl-	GRO	DRO
5	1750	0.1			
10	1765	0	704	<10	<10
15	1693	0			
20	1010	0			
25	1367	0			
30	845	0			
35	453	0			
40	289	0	416	<10	<10

SB-1

Depth	Cl-	LAB Cl-	GRO	DRO	B	T	E	X
10	1465							
15	1835	2480	1090	6410	<.05	.771	5.97	21.9
20	1814							
25	1046							
30	758							
35	1398							
40	1140	1200	<10	82.7	<.05	.054	.643	2.7

SB-3

Depth	Cl-	LAB Cl-	GRO	DRO
5	837			
10	1876			
15	1772			
20	1415			
25	1472			
30	3527	3880	<10	<10
35	2804			
40	2867	2880	<10	<10

SB-7

Depth	Cl-	LAB Cl-	GRO	DRO
5	766			
10	1468			
15	1427	1230	<10	<10
20	1052			
25	652			
30	276			
35	140			
40	151	112	<10	<10

SB-2

Depth	Cl-	Cl- LAB	GRO	DRO
5	1169			
10	416			
15	2589			
20	3458			
25	3129			
30	6793	4960	<10	<10
35	4174			
40	976	1340	<10	<10

SB-5

Depth	Cl-	LAB Cl-	GRO	DRO
5	1015			
10	1327			
15	533			
20	1377			
25	1760			
30	1865			
35	2900	3840	<10	<10
40	1745	2000	<10	<10

SB-6

Depth	Cl-	LAB Cl-	GRO	DRO
5	1204			
10	1152			
15	1168			
20	1469			
25	1874			
30	1637			
35	2602	3200	<10	<10
40	860	992	<10	<10

SB-4

Depth	Cl-	LAB Cl-	GRO	DRO
5	934			
10	2454			
15	2595			
20	3365			
25	3562			
30	4290	5200	<10	<10
35	2378			
40	929	1070	<10	<10

MW-1

Depth	Cl-	LAB Cl-	GRO	DRO
5	331	240	<10	<10
10	232			
15	195			
20	183			
25	164			
30	122			
35	145			
40	141	112	<10	<10

RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC — RECS

BD O-23 vent

Legals: UL/O sec. 23
T21S R37E

Case #: 1R426-99

N W E S

0 10 20 40 Feet

Drawing date: 10-22-10
Drafted by: L. Weinheimer

CARDINAL Laboratories

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

January 20, 2011

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: BD O-23 VENT

Enclosed are the results of analyses for samples received by the laboratory on 01/14/11 8:07.

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 Hydorcarbons

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

Cardinal Laboratories is accreditated through 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 524.4	Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene
Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Rice Operating Company
Hack Conder
112 W. Taylor
Hobbs NM, 88240
Fax To: (575) 397-1471

Received:	01/14/2011	Sampling Date:	01/13/2011
Reported:	01/20/2011	Sampling Type:	Soil
Project Name:	BD O-23 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 8 @ 10 FT. (H100098-01)

Chloride, SM4500Cl-B mg/kg **Analyzed By: HM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**704**	16.0	01/17/2011	ND	432	108	400	3.77	

TPH 8015M mg/kg **Analyzed By: AB**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/15/2011	ND	193	96.3	200	11.3	
DRO >C10-C28	<10.0	10.0	01/15/2011	ND	159	79.7	200	0.992	

Surrogate: 1-Chlorooctane	*102 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*109 %*	*70-130*

Sample ID: SB 8 @ 40 FT. (H100098-02)

Chloride, SM4500Cl-B mg/kg **Analyzed By: HM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**416**	16.0	01/17/2011	ND	432	108	400	3.77	

TPH 8015M mg/kg **Analyzed By: AB**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/15/2011	ND	193	96.3	200	11.3	
DRO >C10-C28	<10.0	10.0	01/15/2011	ND	159	79.7	200	0.992	

Surrogate: 1-Chlorooctane	*87.1 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*92.6 %*	*70-130*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

CARDINAL LABORATORIES

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 #: 575-393-9174 **Fax #:** 575-397-1471	**Address:**
Project #: **Project Owner:**	**City:**
Project Name: BD O-23 Vent	**State:** **Zip:**
Project Location: BD O-23 Vent	**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	TPH 8015 M Extended Thru C40						
H10009B-1	SB 8 @ 10ft		1			✓					✓		1/13/11	310	✓	✓										
2	SB 8 2 40ft		1			✓					✓		1/13/11	330	✓	✓										

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:** 1/14/11 **Time:** 7:30	**Received By:**	**Phone Result:** ☐ Yes ☑ No **Add'l Phone #:**
Relinquished By:	**Date:** 1/14/11 **Time:** 8:07	**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; jwoodfin@riceswd.com; Lweinheimer@riceswd.com kjones@riceswd.com

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

NEED SAMPLES BACK, PLEASE

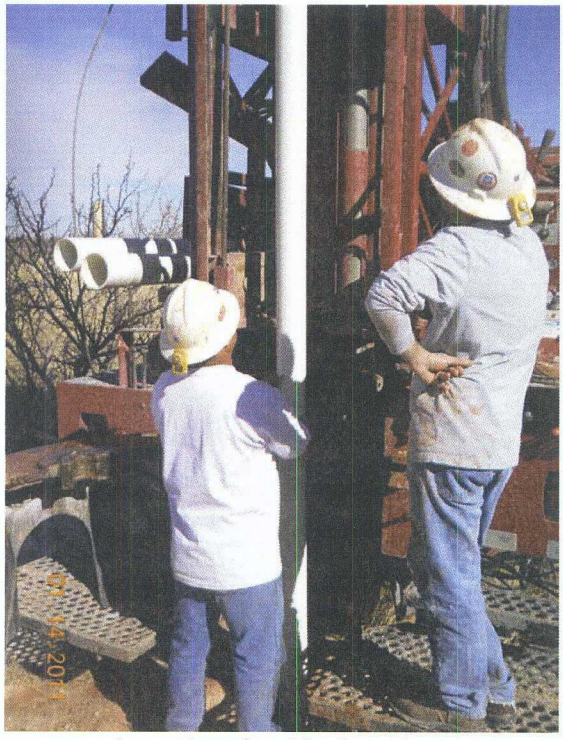
SA 26

BD O-23 vent (1R426-99)

MW-1R Installation

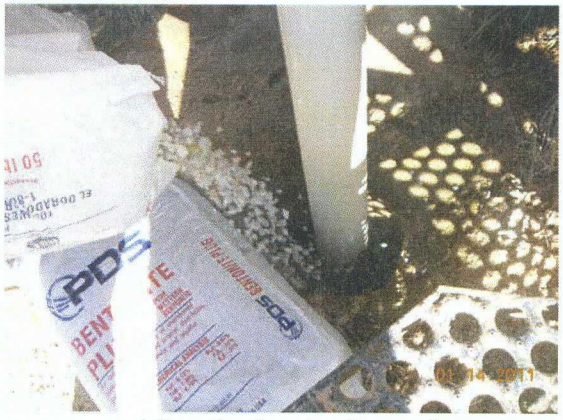
drilling MW-1

continued drilling with mud rotary



inserting the 4 inch casing

adding the sand pack



adding the bentonite seal

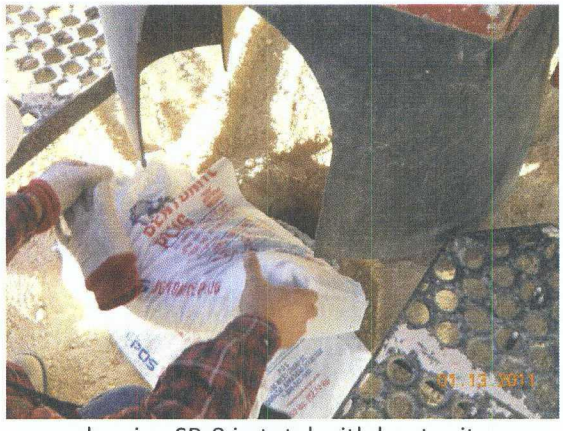
concreting in the riser

MW-1R complete

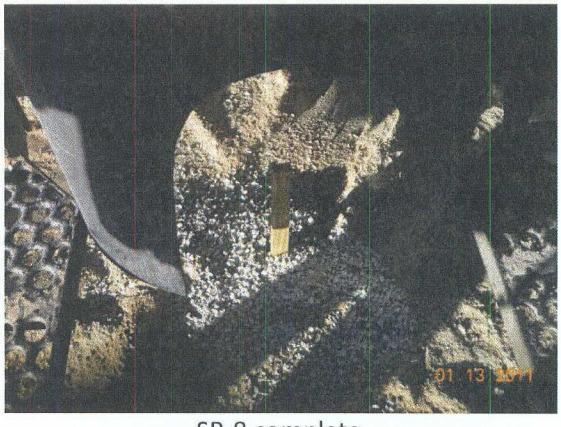
BD O-23 vent (1R426-99)

Drilling SB-8

drilling SB-8, facing north



plugging SB-8 in total with bentonite



SB-8 complete

Texerra

75 Wuthering Hts Drive Colorado Springs, CO 80921
Tel: 719-339-6791 E-mail: lpg@texerra.com

December 22nd, 2010

Mr. Edward Hansen
New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87504

RE: Corrective Action Plan (CAP)
Rice Operating Company – BD SWD System
BD O-23 Junction Box (Vent) UL O, Sect 23, Township 21S, Range 37E
NMOCD Case Number 1R426-99

Sent via Email and U.S. Certified Mail Return Receipt No. 7008 1140 0001 3068 8715

Mr. Hansen,

This report presents the results of additional groundwater sampling and analysis as specified in the Notification of Groundwater Impact for the BD O-23 Jct site (location given in Figure 1), submitted to NMOCD on September 13th of this year, and proposes a Corrective Action Plan (CAP) to restore the ground surface at the site and to protect groundwater quality.

Groundwater chloride concentrations were found on October 13th to measure 4,400 mg/l from (a more recently installed) up-gradient monitor well (MW-2) and to measure 7,000 mg/l from the original near-source/down-gradient monitor well (MW-1) on the same date. Monitor well locations are shown in Figure 2 and groundwater laboratory data are given in Figures 3 & 4. It is apparent that although the up-gradient groundwater quality is impaired before it moves across the location it has also been affected by the downward migration of residual soil chlorides from the site. This is supported by the elevated levels of residual soil chlorides measured across the site during a soils evaluation conducted on February 23rd and March 17th, 2010 (Figure 5). We estimate the residual mass of contributed chlorides to be approximately 7,340 lbs from the bottom 10 ft interval of the unsaturated zone and approximately 995 lbs in the affected groundwater beneath the site, based on the attached chloride mass calculations (Table 1).

Texerra recommends and proposes the following **Corrective Action Plan** to protect groundwater and to move this project toward "remediation termination" status:

1) Remove the upper (approximately) four feet of chloride impacted soils across the area affected by past operations of the BD O-23 junction box (approximately 57x84 ft with the southeast corner cut off to remain a safe distance away from a petroleum pipeline) and dispose of these in an NMOCD approved facility.
2) Install and properly seat a 20-mil plastic infiltration barrier at this depth encompassing the area impacted by the former junction box (as shown in Figure 6), and backfill with clean fill dirt with a chloride concentration below 500 mg/kg and a PID (field) reading below 100 ppm.
3) Prepare the surface soils over and surrounding the site and seed to a native vegetation mix.

4) Install a 4-inch diameter near-source "pumping well" and withdraw a volume of groundwater sufficient to remove the total estimated contributed chloride mass of 8,334 lbs (Table 1). Removed groundwater will be utilized for pipeline and well maintenence and possibly treated and used to promote vegetation. The Office of the State Engineer (OSE) will be pre-notified of this pumping activity.

The re-establishment of natural vegetation will remove most precipitation through evapotranspiration and the installation of the synthetic liner installed below the root zone will virtually stop the downward migration of water that the plants are unable to capture during wet periods. The net effect of this "evaporation/infiltration barrier" will be to first diminish and then to eventually stop the downward migration of residual soil chlorides into the groundwater. Taken together, these measures will protect groundwater quality beneath and down-gradient from the subject location.

We will sample groundwater on a quarterly basis from the up-gradient monitor well and the (to be constructed) near-source pumping well, and analyze this in the laboratory for chlorides, sulfate, TDS and BTEX. We will additionally measure the volume of groundwater removed from the pumping well over time and monitor chlorides in this water using field titration methods on a more frequent basis.

Upon the removal of the 8,334 lbs of chloride and approximately 3,780 barrels of groundwater we anticipate submitting to NMOCD a final remediation progress report and request for project termination.

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

Please do not hesitate to contact either myself or Rice Operating Company if you have any questions or need additional information.

Sincerely,

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

Attachments: Figures and Tables
Copy: Rice Operating Company

Figure 1 – BD O-23 Jct (vent) location.

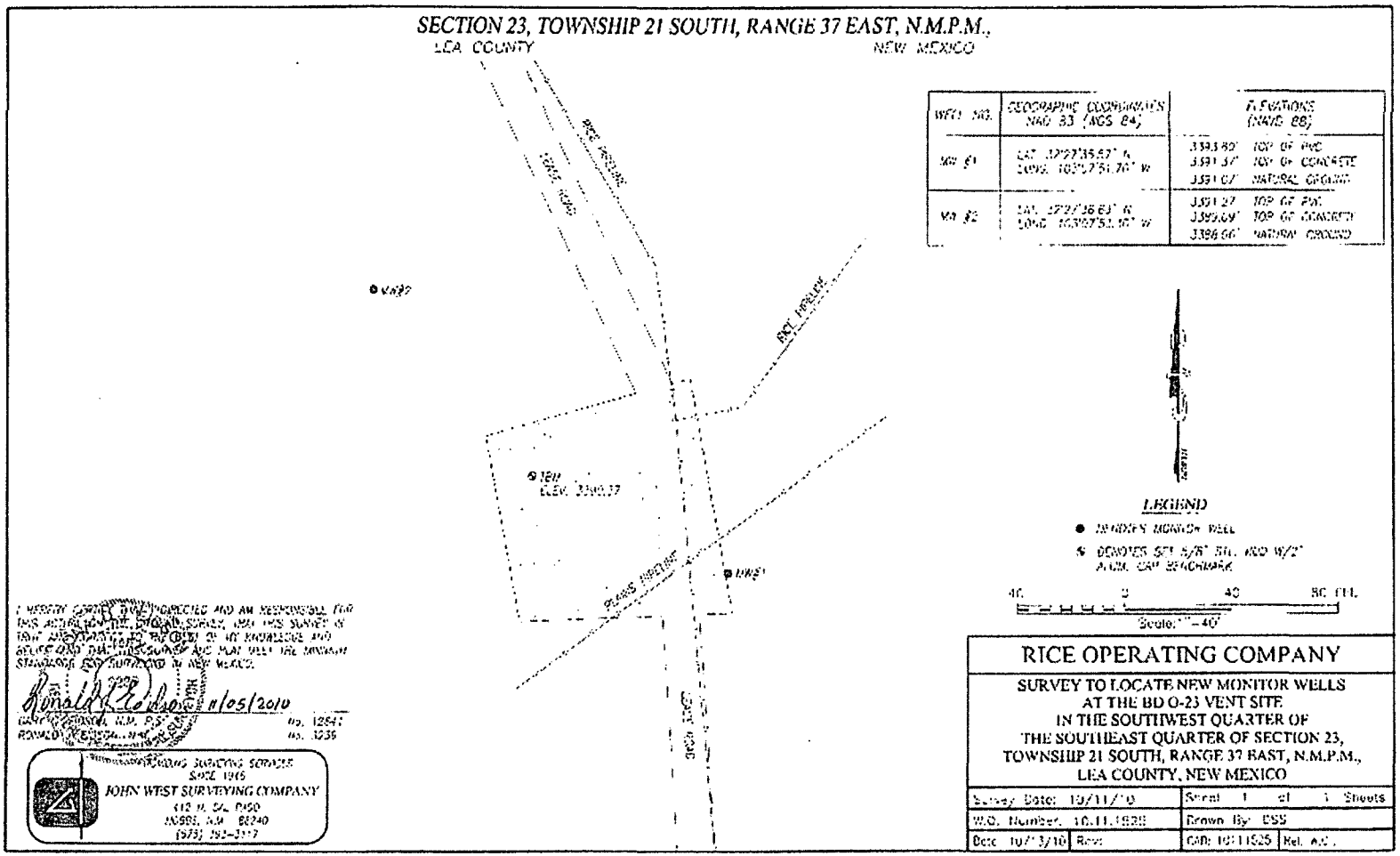


Figure 2 – BD O-23 Vent surveyed monitor well locations.

CARDINAL Laboratories

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

Analytical Results For:

Rice Operating Company
Hack Conder
112 W. Taylor
Hobbs NM, 88240
Fax To: (575) 397-1471

Received:	10/14/2010	Sampling Date:	10/13/2010
Reported:	10/20/2010	Sampling Type:	Water
Project Name:	BD O-23 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T21S R37E SEC23 O-LEA CTY., NM		

Sample ID: MONITOR WELL #2 (H021056-02)

BTEX 8021B — mg/L — Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	10/19/2010	ND	0.051	101	0.0500		
Toluene*	<0.001	0.001	10/19/2010	ND	0.050	100	0.0500		
Ethylbenzene*	<0.001	0.001	10/19/2010	ND	0.052	104	0.0500		
Total Xylenes*	<0.003	0.003	10/19/2010	0.003	0.150	99.9	0.150		

Surrogate: 4-Bromofluorobenzene (PH — *102 %* — *80-120*

Chloride, SM4500Cl-B — mg/L — Analyzed By: HM

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	4400	4.00	10/18/2010	ND	108	108	100	3.77	

Sulfate 375.4 — mg/L — Analyzed By: HM

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate	243	10.0	10/19/2010	ND	38.9	97.2	40.0	5.36	

TDS 160.1 — mg/L — Analyzed By: HM

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS	7300	5.00	10/15/2010	ND				1.40	

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*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

Figure 3 – Up-gradient monitor well (MW-2) laboratory results, as sampled on 10.13.10.

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

Analytical Results For:

Rice Operating Company
Hack Conder
112 W. Taylor
Hobbs NM, 88240
Fax To: (575) 397-1471

Received:	10/14/2010	Sampling Date:	10/13/2010
Reported:	10/20/2010	Sampling Type:	Water
Project Name:	BD O-23 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T21S R37E SEC23 O-LEA CTY., NM		

Sample ID: MONITOR WELL #1 (H021056-01)

BTEX 8021B mg/L Analyzed By: cms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	10/19/2010	ND	0.051	101	0.0500		
Toluene*	<0.001	0.001	10/19/2010	ND	0.050	100	0.0500		
Ethylbenzene*	<0.001	0.001	10/19/2010	ND	0.052	104	0.0500		
Total Xylenes*	<0.003	0.003	10/19/2010	0.003	0.150	99.9	0.150		
Surrogate: 4-Bromofluorobenzene (PIL	*103 %*	*80-120*							

Chloride, SM4500Cl-B mg/L Analyzed By: HM

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	7000	4.00	10/18/2010	ND	108	108	100	3.77	

Sulfate 375.4 mg/L Analyzed By: HM

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate	409	10.0	10/19/2010	ND	38.9	97.2	40.0	5.36	

TDS 160.1 mg/L Analyzed By: HM

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS	12200	5.00	10/15/2010	ND				1.40	

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*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

Figure 4 – Down-gradient monitor well (MW-1) laboratory results, as sampled on 10.13.10

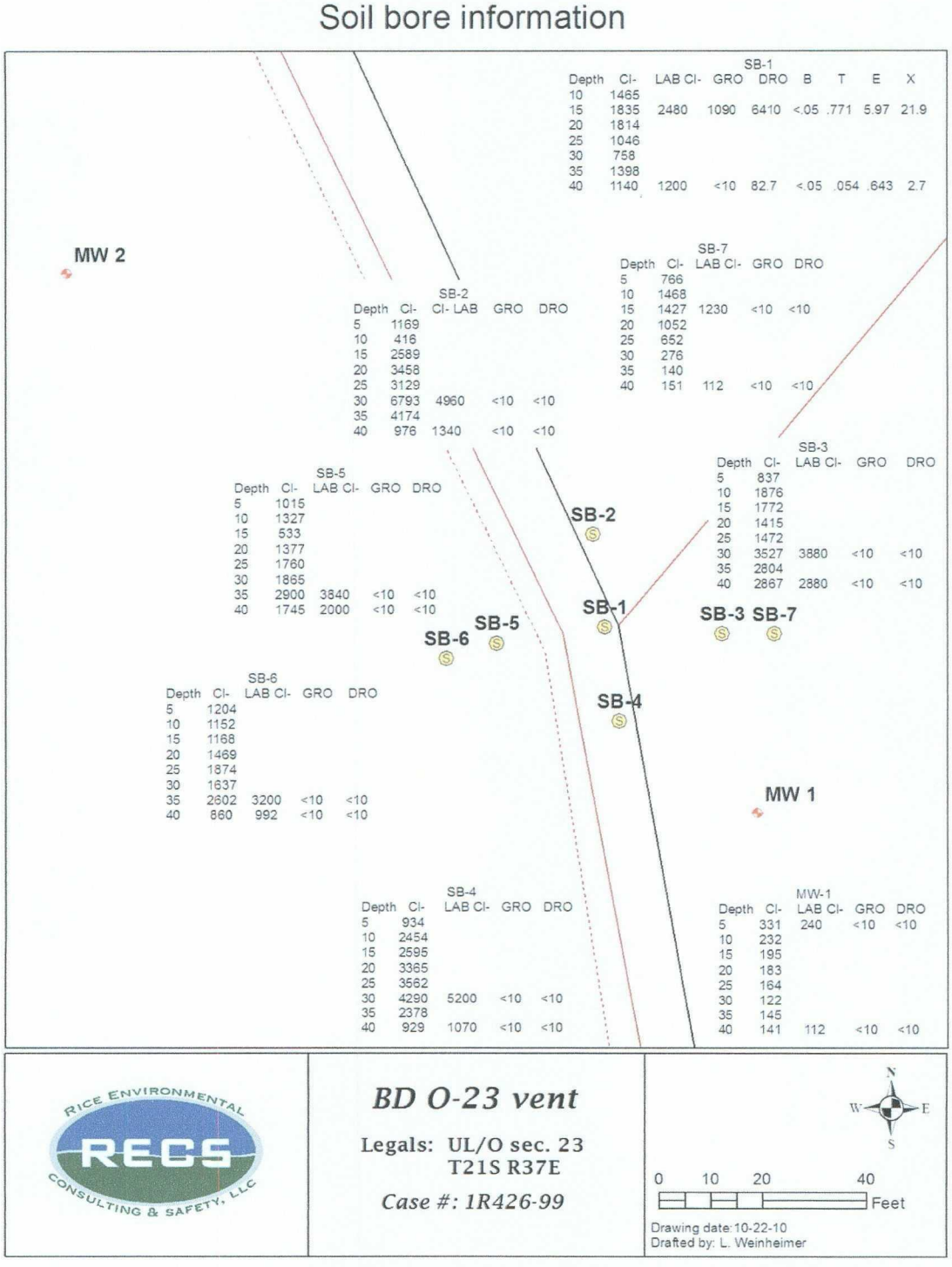

Figure 5 – Soil chloride concentrations as measured in the field (and confirmed in the laboratory) on February 23rd and March 17th, 2010.

Table 1 – BD O-23 Vent residual chloride mass calculations.

Soil Chloride Calculator
Estimated Mass of Contributed, Residual Chloride
from unsaturated zone soil and saturated zone groundwater

Site:	**BD O-23 Vent**
This estimate prepared by:	L. Peter Galusky, Jr.
Date:	12/14/2010

Model Inputs			Notes
length of affected area (ft)		60	measured/estimated
width of affected area (ft)		85	measured/estimated
depth to water table (ft)		40	measured
unsat zone affected depth (ft)		10	bottom 10 ft of unsat zone
sat zone affected thickness (ft)		10	prescribed by NMOCD
unsat zone avg Cl- conc of affected soil (ppm)		1,791	measured/estimated
unsat zone est. natural background Cl- conc (ppm)		141	lowest reading found
unsat zone mass density (lbs/cu yd)		3,000	estimated
Cl- conc of affected groundwater (ppm)		7,000	measured
Cl- conc of up-gradient groundwater (ppm)		4,400	measured
sat zone mass density (lbs/cu yd)		3,000	estimated
Cl- conc of recovery well (ppm)	MW-1	7,000	measured/estimated
avg daily pumping rate of recover well (gpm)		0.5	anticipated

Intermediate (calculated) Parameters		
affected area (sq ft)	4,004	calculated
unsat zone Cl- conc attributed to source (ppm)	1,650	calculated
unsat zone volume of affected soil (cu yds)	1,483	calculated
unsat zone total mass of affected soils (lbs)	4,448,333	calculated
unsat zone mass of contributed residual soil chloride (lbs)	7,340	calculated
volume of affected groundwater (cu ft)	51,000	calculated
mass of affected groundwater (lbs)	382,500	calculated
mass of contributed Cl- in affected groundwater	995	calculated
avg daily pumping rate of recovery well (bbls/day)	17.1	calculated
Cl- conc of recovery well (lbs/bbl)	2.2	calculated

Estimated Contributed Cl- Mass and Equivalent Pumping Volume & Time		
Max potential chlorides from unsaturated zone (soils)	7,340	calculated
Maximum potential chlorides from affected groundwater	995	calculated
Total mass of contributed chlorides (lbs)	**8,334**	**calculated**
# bbls to remove contributed Cl- from unsat zone	3,780	calculated
days pumping required to remove contributed Cl-	**220**	**calculated**

Note: It is assumed that only the lower 10 ft of soils in the affected unsaturated zone will potentially contribute chlorides to groundwater following the installation of an infiltration barrier. Therefore, in estimating the mass of contributed chlorides from the unsaturated zone only the lower ten feet were considered in the calculations.

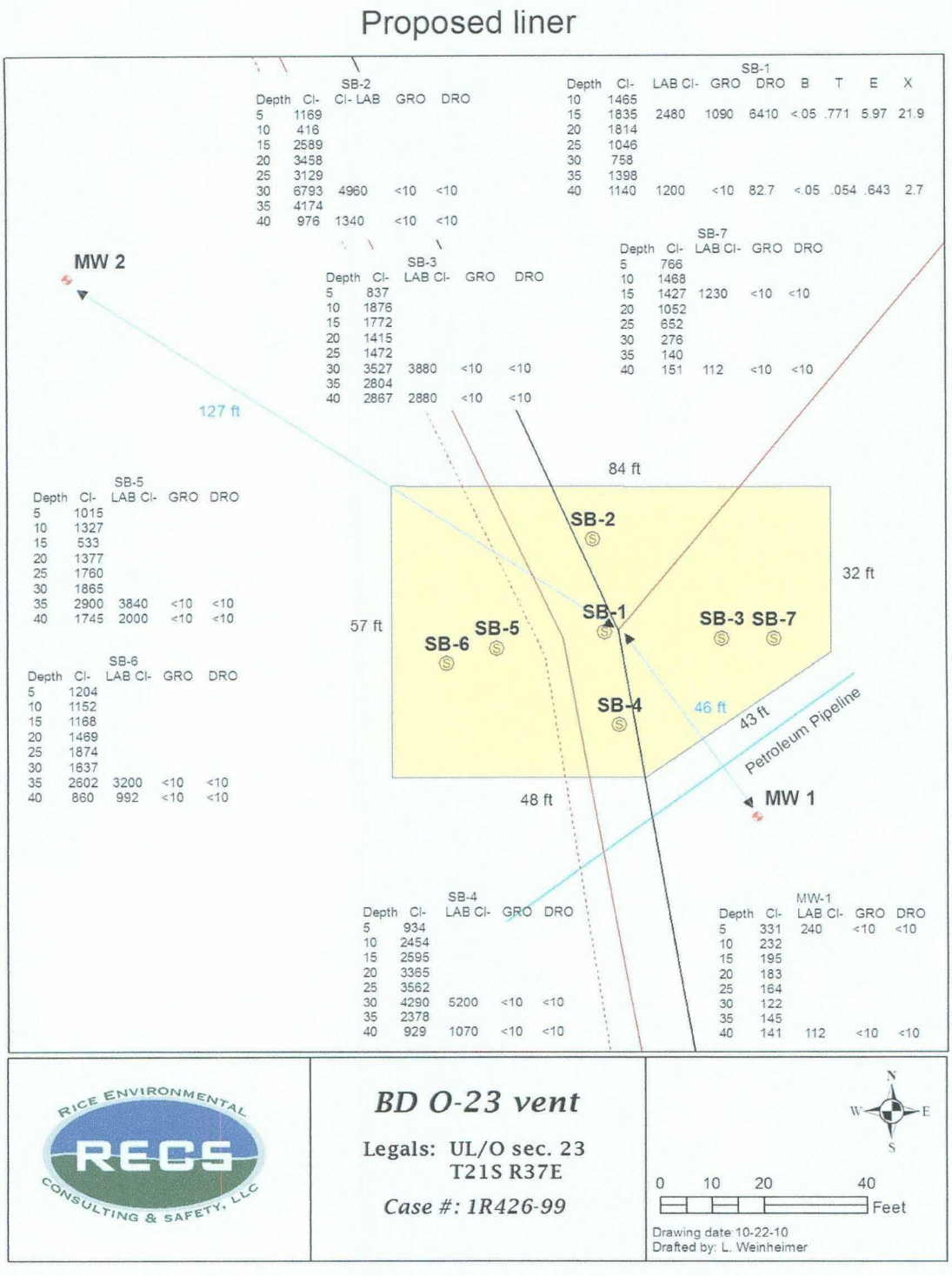

Figure 6 – Schematic diagram of proposed sub-surface soil liner (yellow shaded area) superimposed over soil boring data map (Figure 5).