1R- 488

REPORTS

DATE:

6-10-10

Texerra

505 N Big Spring, Suite 404 Midland, Texas 79701
Tel: 432-634-9257 E-mail: lpg@texerra.com

June 10th, 2010

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

RE: **Corrective Action Plan Amendments – Preliminary Report**
Vanguard Natural Resources LLC
ABO F-31 SWD UL F Sec 31 T 16S R 37E
NMOCD Case Number: 1R 488

Sent via E-mail & U.S. Certified Mail w/ Return Receipt 7007 0710 0003 0305 3866

Dear Mr. Hansen:

We have completed the investigative field work specified in the Corrective Action Plan Amendments of February 2nd, 2010 for this location. The results of this work entailed evaluating soils from four soil borings and installing two monitor wells (Figure 1), and are summarized below:

Residual Soil Chloride and Petroleum Hydrocarbon Concentrations

Referring to the *attached* soil boring logs, please note the following:

- Residual soil chloride concentrations from an up-gradient soil boring (SB-11) declined from approximately 1,500 ppm to less than 250 ppm at the limit of drilling, 90 ft bgs. Residual soil hydrocarbon concentrations were negligible (< 2.5 ppm throughout) as measured by a field PID meter.
- Residual soil chloride concentrations from a down-gradient soil boring (SB-12) were less than 250 ppm throughout the depth of drilling, 90 ft bgs. Residual soil hydrocarbon concentrations were also negligible throughout this soil bore (< 3.0 ppm throughout) as measured by a field PID meter.
- Residual soil chloride concentrations from a monitor well bore advanced near the former SWD well (MW-1) declined from approximately 1,200 ppm near the surface to less than 250 ppm at the limit of drilling of 90 ft bgs. Residual soil hydrocarbon concentrations were moderately elevated in the midrange of the soil bore, indicating a value of approximately 54 ppm as measured by a field PID meter and corroborated by laboratory analysis. However, residual hydrocarbon concentrations dropped below 10 ppm at 60 ft bgs and remained below 5 ppm at 80 and 90 ft bgs.
- Residual soil chloride concentrations from a monitor well bore down-gradient of the site (MW-2) were less than 200 ppm throughout the limit of drilling at 90 ft bgs. Residual soil hydrocarbon concentrations were negligible (< 2.5 ppm throughout) as measured by a field PID meter.

ABO F-31 SWD

Groundwater Chloride and Petroleum Hydrocarbon Concentrations

Referring to the *attached* laboratory reports, please note the following:

- Petroleum hydrocarbon concentrations were below the limit of laboratory detection in both monitor wells on both sampling dates (April 26th and May 28th, 2010).
- Groundwater chloride concentrations were low (< 155 ppm on both sampling dates) in the monitor well near the former SWD well, MW-1, but were elevated (1,200 ppm on April 26th and 1,540 ppm on May 28th) in the down-gradient monitor well, MW-2.

Analysis of Results and Recommendations

The low levels of chlorides and the absence of petroleum hydrocarbons in groundwater near the former SWD well (MW-1) indicate that the former SWD well is not a significant source of these contaminants and does not pose a threat to groundwater quality.

The elevated levels of chloride found in the down-gradient monitor well apparently comes from an up-gradient source. We therefore suggest and propose to NMOCD that an up-gradient monitor well be installed to determine if the source of these chlorides is from the ABO F-31 site itself or if it may be from an up-gradient source (perhaps an old drilling pit to the northwest of the former ABO F-31 facility).

We respectfully submit this report for your review and consideration.

Sincerely,

L. Peter Galusky, Jr. Ph.D.
Principal

Copy: Britt Pence, Vanguard Natural Resources LLC

Attachments: Soil boring logs, laboratory results

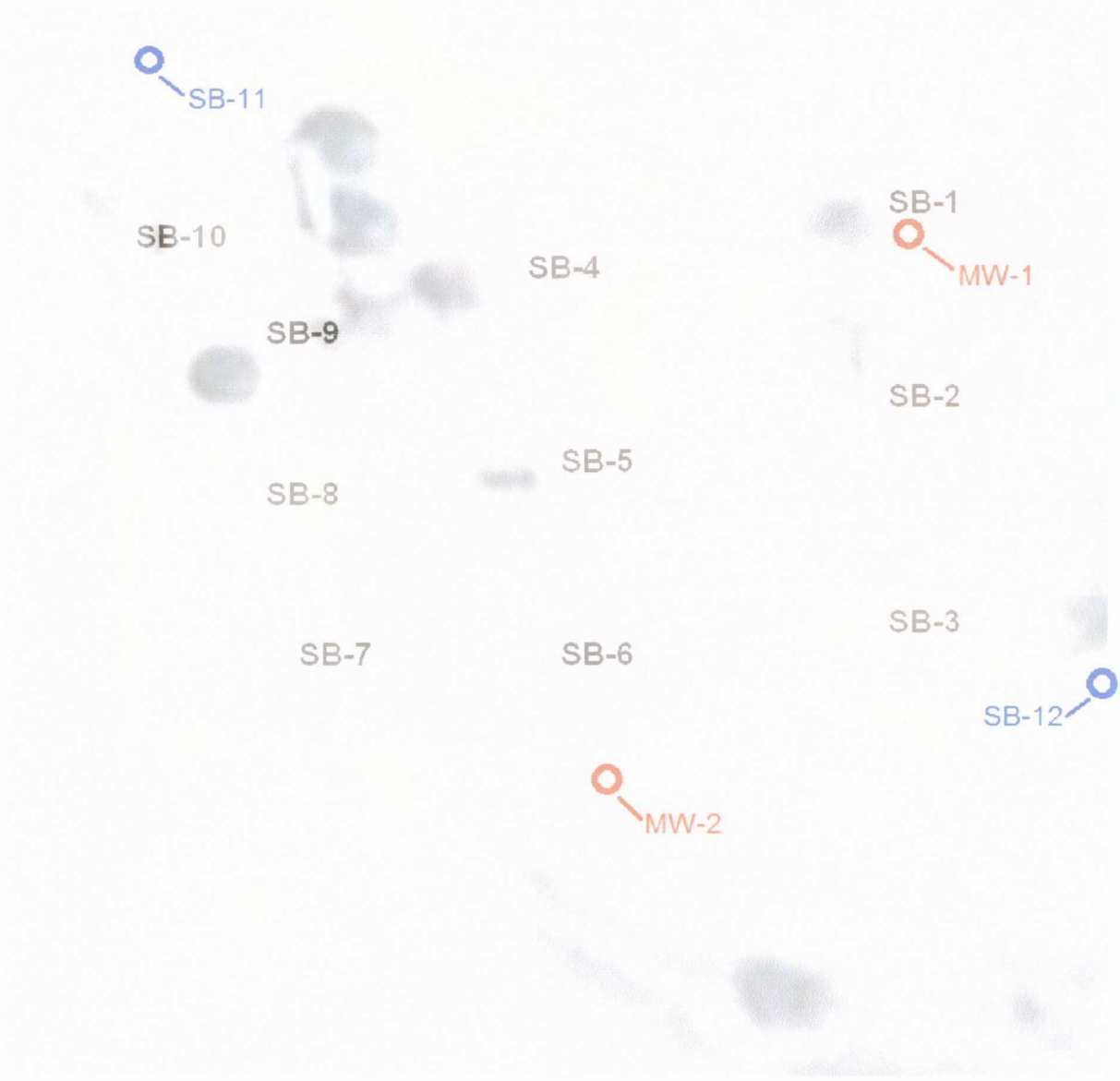

Figure 1 –New monitor well locations (**red circles**) and soil boring locations (**blue circles**) referred to in this report.

Vmail
Alumni e-mail for life

L. Peter Galusky Jr. <lpgalusky@alumni.virginia.edu>

NMOCD Case No. 1R 488. Vanguard Natural Resources. ABO F-31 Preliminary CAP Report.

Hansen, Edward J., EMNRD <edwardj.hansen@state.nm.us> **Tue, Jun 22, 2010 at 3:26 PM**

To: "L Peter Galusky Jr @ Texerra" <lpg.texerra@gmail.com>

Pete,

I received a hard copy of the report, but could you also send a hard copy of the lab results and logs– thanks.

Edward J.

✓ EJHansen.

Pete G. 6/23/10

From: lpgalusky@alumni.virginia.edu [mailto:lpgalusky@alumni.virginia.edu] **On Behalf Of** L Peter Galusky Jr @ Texerra
Sent: Monday, June 14, 2010 9:30 AM
To: Hansen, Edward J., EMNRD
Subject: Re: NMOCD Case No. 1R 488. Vanguard Natural Resources. ABO F-31 Preliminary CAP Report.

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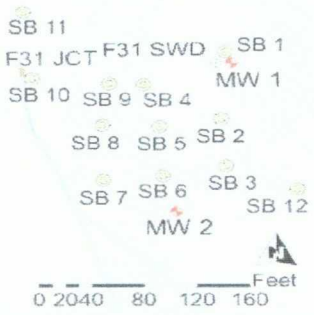
RECEIVED OCD
2010 JUN 25 P 12:46

Logger:	Lara Weinheimer
Driller:	Harrison & Cooper, Inc. Drilling
Consultant:	Texerra
Drilling Method:	Air rotary
Start Date:	4/19/2010
End Date:	4/19/2010

Comments: All sampled from cuttings. Located 154 feet WNW of the SWD well.
TD = 90 ft GW = 94 ft



RICE OPERATING COMPANY ROC SINCE 1955

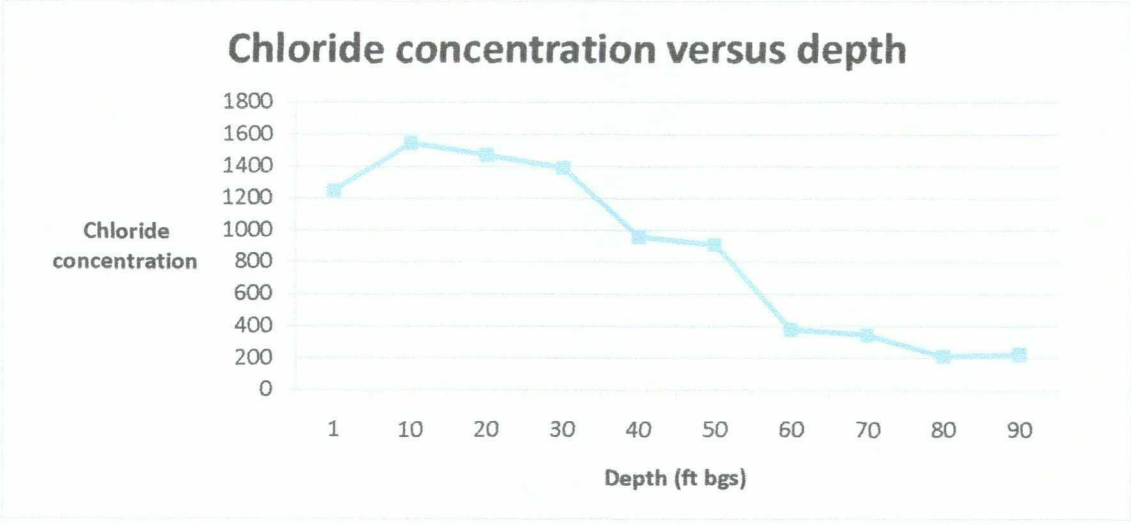
Project Name: Abo F-31 SWD **Well ID:** SB-11
Location: UL/F, Sec. 31, T16S, R37E
Lat: 32°52'46.89897" N **County:** Lea
Long: 103°17'28.38703" W **State:** NM

Depth (feet)	chloride field tests (ppm)	LAB	PID	Description
1	1,247		0	0 - 10 ft VERY FINE TO FINE SAND; CALICHE brown, dry, no odor
10	1,544	Cl 1,540	0	
20	1,470		0.2	10 - 20 ft VERY FINE TO FINE SAND light brown, dry, no odor
30	1,392		1.1	
40	957		1.9	20 - 90 ft VERY FINE TO FINE SAND light brown, dry, no odor
50	909		1.7	
60	378		2.0	
70	343		0.5	

Lithology

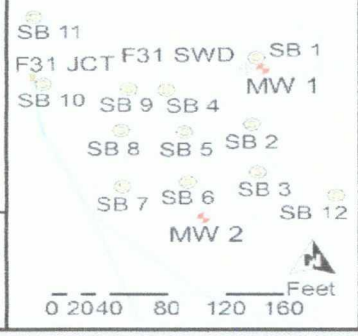
Bore Construction: bentonite seal

Depth (feet)	chloride field tests (ppm)	LAB	PID	Description	Lithology	Bore Construction
				slightly moist		bentonite seal
80	211		0.7			
90	227	Cl 128	1.2			



Logger:	Lara Weinheimer
Driller:	Harrison & Cooper, Inc. Drilling
Consultant:	Texerra
Drilling Method:	Air rotary
Start Date:	4/19/2010
End Date:	4/19/2010

Comments: All sampled from cuttings. Located 134 feet SSE of the SWD well.
TD = 90 ft GW = 94 ft



RICE OPERATING COMPANY ROC SINCE 1955

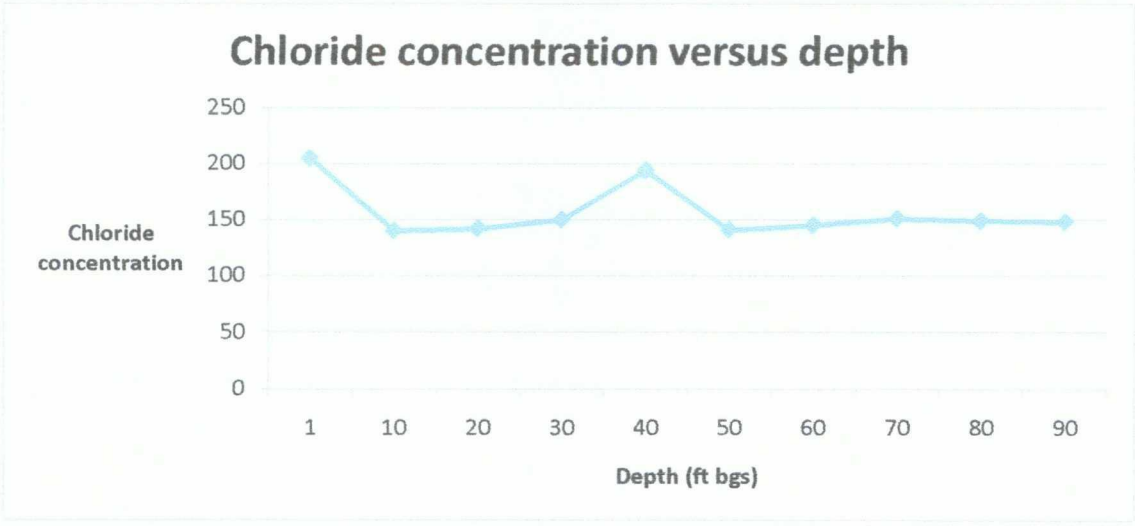
Project Name: Abo F-31 SWD **Well ID:** SB-12
Location: UL/F, Sec. 31, T16S, R37E
Lat: 32°52'45.23075" N **County:** Lea
Long: 103°17'25.95227" W **State:** NM

Depth (feet)	chloride field tests (ppm)	LAB	PID	Description
				0 - 1 ft
				VERY FINE TO FINE SAND; CALICHE
1	205	Cl^- 48	1.1	brown, dry, no odor
				1 - 90 ft
10	140		2.7	VERY FINE TO FINE SAND
				light brown, slightly moist, no odor
20	142		0.8	
30	150		0.7	
40	194		0.8	
50	141		0.7	
60	145		0.6	

Lithology

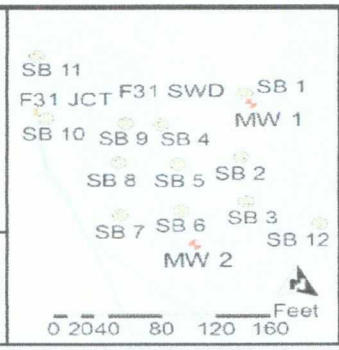
Bore Construction: bentonite seal

Depth (feet)	chloride field tests (ppm)	LAB	PID	Description	Lithology	Bore Construction
70	151		0.7			
80	149		1.0			bentonite seal
90	148	Cl⁻ 48	0.4			



Logger:	Lara Weinheimer
Driller:	Harrison & Cooper, Inc. Drilling
Consultant:	Texerra
Drilling Method:	Air rotary
Start Date:	4/19/2010
End Date:	4/19/2010

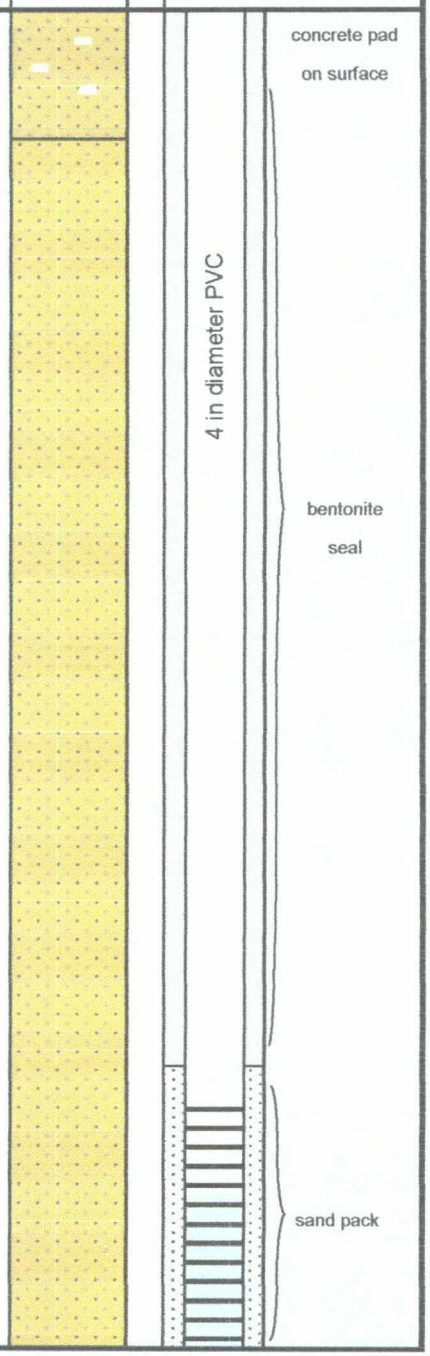
Comments:
All samples from cuttings.
Located 11 feet E of the SWD well.
TD = 108 ft GW = 94 ft

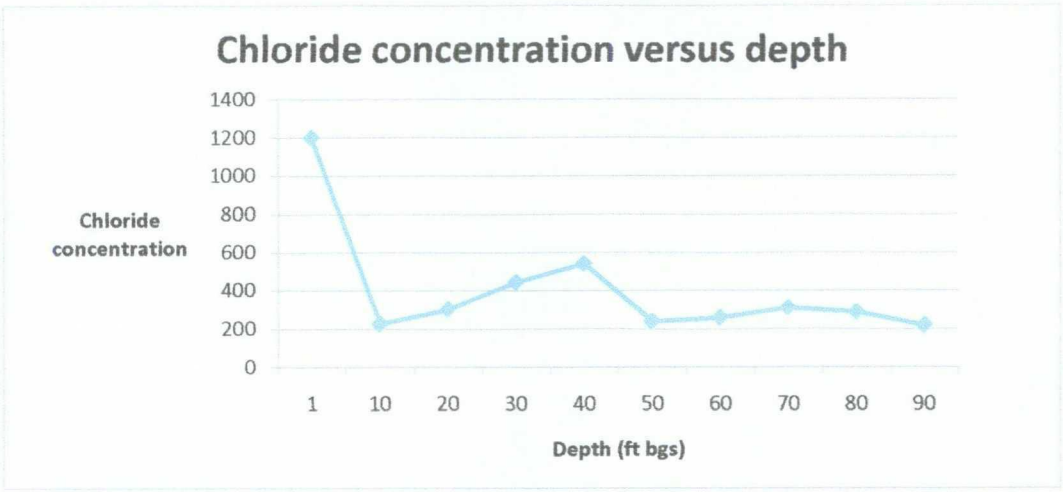


RICE OPERATING COMPANY
ROC
SINCE 1955

Project Name: Abo F-31 SWD **Well ID:** MW-1
Location: UL/F, Sec. 31, T16S, R37E
Lat: 32°52'46.40953" N **County:** LEA
Long: 103°17'26.53370" W **State:** NM

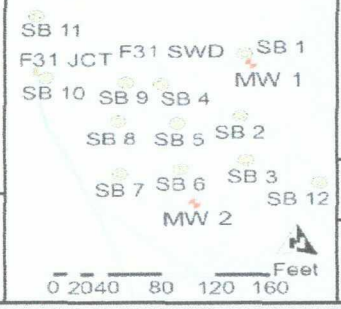
Depth (feet)	chloride field tests (ppm)	LAB	PID	Description
				0 - 1 ft
				VERY FINE TO FINE SAND; CALICHE
1	1,201	Cl 1,310	1.2	brown, dry, no odor
10	225		5.7	1 - 90 ft
20	302		9	VERY FINE TO FINE SAND
				light brown, dry, no odor
30	442		12.3	
B <0.025	E <0.050	GRO	<10.0	
T <0.050	X <0.300	DRO	1,230	
40	540		4.7	
50	237		53.7	
B <0.025	E <0.050	GRO	<10.0	
T <0.050	X <0.300	DRO	1,500	
60	258	Cl 128	30.0	
B <0.025	E = 0.083	GRO	<10.0	
T <0.050	X = 0.531	DRO	924	
70	308		6.5	
80	286		4.9	
90	218	Cl 128	1.9	slightly moist
100				




Chloride concentration versus depth
Chloride concentration
1400
1200
1000
800
600
400
200
0
1
10
20
30
40
50
60
70
80
90
Depth (ft bgs)

Logger:	Lara Weinheimer
Driller:	Harrison & Cooper, Inc. Drilling
Consultant:	Texerra
Drilling Method:	Air rotary
Start Date:	4/19/2010
End Date:	4/19/2010

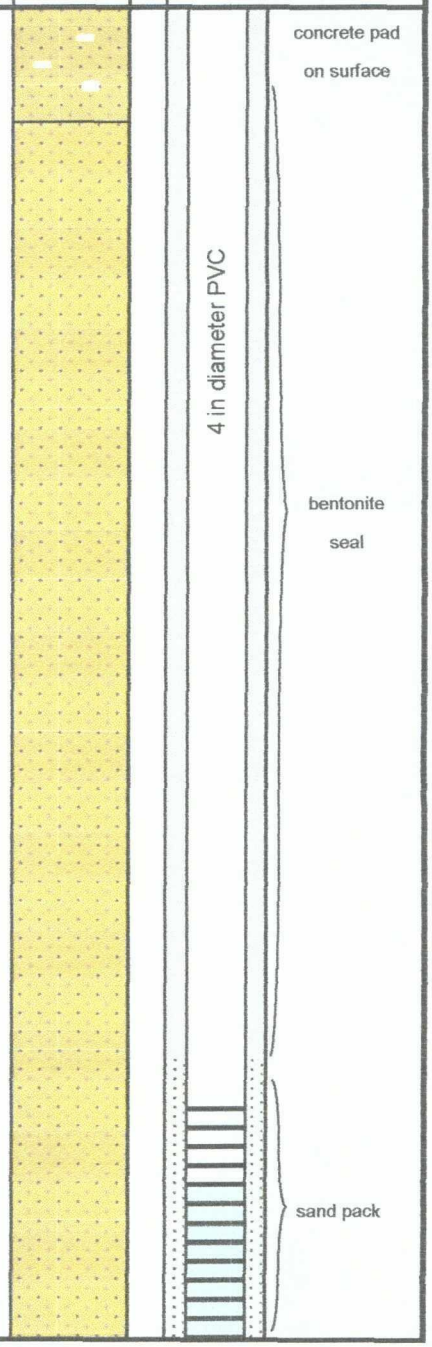
Comments: All samples from cuttings. Located 142 feet SSW of the SWD well.
TD = 108 ft GW = 94 ft

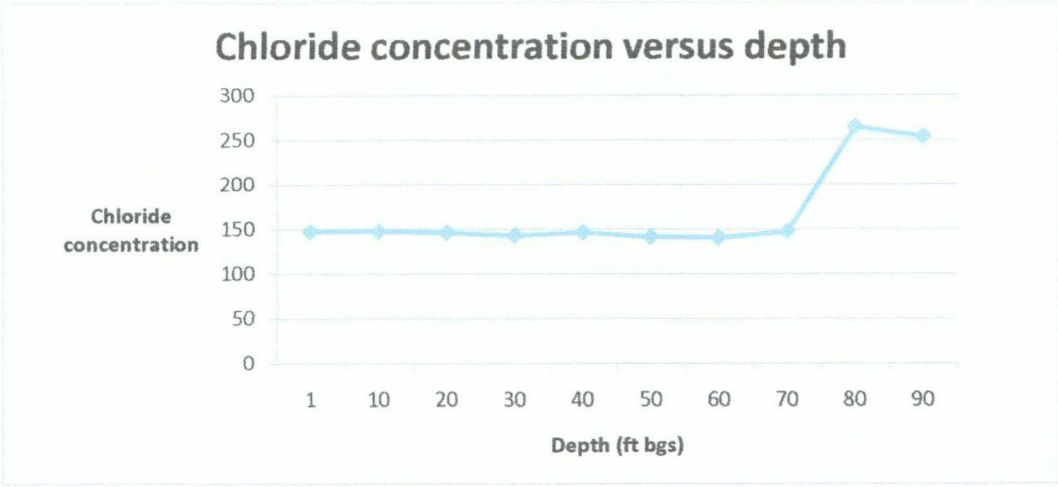


RICE OPERATING COMPANY ROC SINCE 1955

Project Name: Abo F-31 SWD **Well ID:** MW-2
Location: UL/F, Sec. 31, T16S, R37E
Lat: 32°52'45.03277" N **County:** LEA
Long: 103°17'27.03316" W **State:** NM

Depth (feet)	chloride field tests (ppm)	LAB	PID	Description
				0 - 1 ft
				VERY FINE TO FINE SAND; CALICHE
1	147		0.9	dark brown, moist, no odor
10	147	Cl 32	1.2	
				1 -30 ft
				VERY FINE TO FINE SAND
20	146		0.5	light brown, dry, no odor
30	143		1.1	
40	146		0.8	
				30 - 60 ft
				VERY FINE TO FINE SAND
50	141		0.6	light reddish brown, dry, no odor
60	141		1.0	
70	147		0.6	60 -90 ft
				VERY FINE TO FINE SAND
				light brown, slightly, no odor
80	265	Cl 208	0.4	
90	254	Cl 160	0.2	
100				




Chloride concentration versus depth
Chloride concentration
300
250
200
150
100
50
0
1
10
20
30
40
50
60
70
80
90
Depth (ft bgs)

CARDINAL LABORATORIES

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

April 29, 2010

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

Re: ABO F-31 SWD (Revised Report)

Enclosed are the results of analyses for sample number H19706, received by the laboratory on 04/20/10 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: 7 (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 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 04/20/10
Reporting Date: 04/21/10
Project Owner: NOT GIVEN
Project Name: ABO F-31 SWD
Project Location: ABO F-31 SWD

Analysis Date: 04/20/10
Sampling Date: 04/19/10
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: JH
Analyzed By: SJ

LAB NO.	SAMPLE ID	Cl^- (mg/kg)
H19706-1	SB-11 @ 10'	1,540
H19706-2	SB-11 @ 90'	128
H19706-3	MW-1 @ 1'	1,310
H19706-6	MW-1 @ 60'	128
H19706-7	MW-1 @ 90'	128
H19706-8	SB-12 @ 1'	48
H19706-9	SB-12 @ 90'	48
H19706-10	MW-2 @ 10'	32
H19706-11	MW-2 @ 80'	208
H19706-12	MW-2 @ 90'	160
Quality Control		500
True Value QC		500
% Recovery		100
Relative Percent Difference		< 0.1

METHOD: Standard Methods	4500-Cl B

Note: Analyses performed on 1:4 w:v aqueous extracts.
Not accredited for Chloride.

Chemist

04/21/10
Date

H19706 Rice

CARDINAL LABORATORIES

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

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

Receiving Date: 04/20/10
Reporting Date:04/22/10
Project Number: NOT GIVEN
Project Name: ABO F-31 SWD
Project Location: ABO F-31 SWD

Sampling Date: 04/19/10
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: JH
Analyzed By: AB

LAB NUMBER	SAMPLE ID	GRO (C_6-C_{10}) (mg/kg)	DRO (>C_{10}-C_{28}) (mg/kg)
ANALYSIS DATE		04/22/10	04/22/10
H19706-4	MW-1 @ 30'	<10.0	1,230
H19706-5	MW-1 @ 50'	<10.0	1,500
Quality Control		524	533
True Value QC		500	500
% Recovery		105	107
Relative Percent Difference		2.5	0.6

METHODS: TPH GRO & DRO: EPA SW-846 8015 M. Reported on wet weight.
Not accredited for GRO/DRO.

Chemist

04/29/10
Date

H19706 T RICE

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

Receiving Date: 04/20/10
Reporting Date: 04/29/10
Project Number: NOT GIVEN
Project Name: ABO F-31 SWD
Project Location: ABO F-31 SWD

Sampling Date: 04/19/10
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: JH
Analyzed By: AB

LAB NUMBER	SAMPLE ID	GRO (C_6-C_{10}) (mg/kg)	DRO (>C_{10}-C_{28}) (mg/kg)
ANALYSIS DATE		04/29/10	04/29/10
H19706-6	MW-1 @ 60'	<10.0	924
Quality Control		595	598
True Value QC		500	500
% Recovery		119	120
Relative Percent Difference		0.2	1.6

METHODS: TPH GRO & DRO: EPA SW-846 8015 M. Reported on wet weight.
Not accredited for GRO/DRO.

Chemist

04/29/10
Date

H19706-6 T RICE

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: 04/20/10
Reporting Date: 04/29/10*
Project Number: NOT GIVEN
Project Name: ABO F-31 SWD
Project Location: ABO F-31 SWD

Sampling Date: 04/19/10
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: JH
Analyzed By: ZL

LAB NUMBE SAMPLE ID	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL BENZENE (mg/kg)	TOTAL XYLENES (mg/kg)
ANALYSIS DATE	04/20/10	04/20/10	04/20/10	04/20/10
H19706-4 MW-1 @ 30'	<0.025	<0.050	<0.050	<0.300
H19706-5 MW-1 @ 50'	<0.025	<0.050	<0.050	<0.300
H19706-6* MW-1 @ 60'	<0.025	<0.050	0.083	0.531
Quality Control	0.047	0.050	0.049	0.145
True Value QC	0.050	0.050	0.050	0.150
% Recovery	94.0	100	98.0	96.7
Relative Percent Difference	1.1	3.6	6.7	8.6

METHOD: EPA SW-846 8021B

TEXAS NELAP CERTIFICATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES. Reported on wet weight.
* This sample was added and analyzed on 04/28/10. Revised Report.

Chemist

04/29/10
Date

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 #: 393-9174 Fax #: 397-1471	Address:
Project #: Project Owner:	City:
Project Name: Abo F-31 SWD	State: Zip:
Project Location: Abo F-031 SWD	Phone #:
Sampler Name: L. Weinheimer	Fax #:

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV: ACID/BASE	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions							
H19706-1	SB-11 @ 10'		1			✓					✓		4/19/10	08:16	✓											
-2	SB-11 @ 90'		1			✓					✓		4/19/10	09:03	✓											
3	MW-1 @ 1'		1			✓					✓		4/19/10	09:34	✓											
4	MW-1 @ 30'		1			✓					✓		4/19/10	09:50		✓	✓									
5	MW-1 @ 50'		1			✓					✓		4/19/10	10:07	✓	✓	✓		added as per Lora*							
6	MW-1 @ 60'		1			✓					✓		4/19/10	10:15												
7	MW-1 @ 90'		1			✓					✓		4/19/10	10:33	✓											
8	SB-12 @ 1'		1			✓					✓		4/19/10	12:17	✓											
9	SB-12 @ 90'		1			✓					✓		4/19/10	01:04	✓											
10	Mw-2 @ 10'		1			✓					✓		4/19/10	01:51	✓											

Relinquished By: L. Weinheimer	Date: 4-20-10 Time: 7:00	Received By:	Phone Result: ☐ Yes ☑ No Add'l Phone #:
Relinquished By:	Date: 4/20/10 Time: 8:00	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; jpurvis@riceswd.com; Lweinheimer@riceswd.com *Chloride added 4/23/10 ch BTEX, TPH added as per Lora 4/26/10 ch

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

#26

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: Abo F-31 SWD	State: Zip:
Project Location: Abo F-31 SWD	Phone #:
Sampler Name: L. Weinheimer	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					
H19706-11	MW-2 @ 80'		1			✓					✓		4/19/10	02:34	✓									
12	MW-2 @ 90'		1			✓					✓		4/19/10	02:39	✓									

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: L. Weinheimer	Date: 4-19-10 Time: 9:00	Received By:	Phone Result: ☐ Yes ☑ No Add'l Phone #:
Relinquished By:	Date: 4/20/10 Time: 8:00	Received By: Yodi 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; jpurvis@riceswd.com; Lweinheimer@riceswd.com

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

#26

CARDINAL LABORATORIES

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

May 5, 2010

Hack Conder
Vanguard
112 West Taylor
Hobbs, NM 88240

Re: Vanguard Abo F-31

Enclosed are the results of analyses for sample number H19768, received by the laboratory on 04/28/10 at 10:35 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: 4 (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
VANGUARD
ATTN: HACK CONDER
112 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 04/28/10
Reporting Date: 04/30/10
Project Number: NOT GIVEN
Project Name: VANGUARD ABO F-31
Project Location: T16S-R37E-SEC31 UNIT F~ LEA CO., NM

Sampling Date: 04/26/10
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: JH
Analyzed By: ZL

LAB NUMBE SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE	04/30/10	04/30/10	04/30/10	04/30/10
H19768-1 MONITOR WELL #1	<0.001	<0.001	<0.001	<0.003
H19768-2 MONITOR WELL #2	<0.001	<0.001	<0.001	<0.003
Quality Control	0.053	0.052	0.049	0.154
True Value QC	0.050	0.050	0.050	0.150
% Recovery	106	104	98.0	103
Relative Percent Difference	2.2	<1.0	2.4	3.1

METHOD: EPA SW-846 8021B

TEXAS NELAP CERTIFICATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.

Chemist

05/05/10
Date

H19768WD PICE

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
VANGUARD
ATTN: HACK CONDER
112 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 04/28/10
Reporting Date: 05/04/10
Project Number: NOT GIVEN
Project Name: VANGUARD ABO F-31
Project Location: T16S R37E SEC31 UNIT F LEA COUNTY-NM

Sampling Date: 04/26/10
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By:. JH
Analyzed By: HM

LAB NO.	SAMPLE ID	Cl^- (mg/L)	SO_4 (mg/L)	TDS (mg/L)
Analysis Date:		04/29/10	05/03/10	04/28/10
H19768-1	MONITOR WELL #1	108	40.2	482
H19768-2	MONITOR WELL #2	1,200	139	2,770
Quality Control		490	43.5	NR
True Value QC		500	40.0	NR
% Recovery		98.0	109	NR
Relative Percent Difference		2.0	2.5	11.9
METHOD: Standard Methods, EPA		4500-Cl B	375.4	160.1

Not accredited for Chloride, Sulfate and TDS.

Chemist

05/05/10
Date

H19768 RICE

101 East Marland - Hobbs, New Mexico 88240
Tel (575) 393-2326
Fax (575) 393-2476

Cardinal Laboratories, Inc.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # _____

Company Name: Vanguard	BILL TO Company: Arc Environmental C/O Rozanne Johnson PO#
Project Manager: Hack Conder	Address: (Street, City, Zip) P. O. Box 1772 ~ Lovington, New Mexico 88260
Address: (Street, City, Zip) 122 W. Taylor Street~Hobbs, New Mexico 88240	Phone#: (575)631-9310 Fax#:
Phone #: (575) 393-9174	Fax #: (575) 397-1471
Project #:	Project Name: Vanguard Abo F-31
Project Location: T16S R37E Sec31 UnitF Lea County -New Mexico	Sampler Signature: Rozanne Johnson (575)631-9310 rozanne@valornet.com

LAB # (LAB USE ONLY)	FIELD CODE	(G)rab or (C)omp	# CONTAINERS	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL (4-40ml VOA)	HNO_3	NaHSO4	H_2SO_4	ICE	NONE	SAMPLING: DATE (2010)	TIME
H19768-1	Monitor Well #1	G	3	X				X				X		4-26	
2	Monitor Well #2	G	3	X				X				X		4-26	

ANALYSIS REQUEST
(Circle or Specify Method No.)

MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	Metals	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Moisture Content	Cations (Ca, Mg, Na, K)	Anions (Cl, SO4, CO3, HCO3)	Sulfates	Total Dissolved Solids	Chlorides 300.1	Turn Around Time ~ 24 Hours
	X																	X	X	X	
	X																	X	X	X	

Relinquished by: Rozanne Johnson	Date: 4-28-10	Time: 10:35	Received by:
Relinquished by:	Date:	Time:	Received By: (Laboratory Staff) Jodi Henson
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Sample Condition: Cool: Yes / No; Intact: Yes / No	CHECKED BY: (Initials)	

Date: 4-28-10 Time: 10:36
Date: 4/28/10 Time: 10:35

Phone Results: Yes / No
Fax Results: Yes / No Additional Fax Number:

REMARKS:

Email Results to: rozanne@valornet.com
hconder@riceswd.com
klones@riceswd.com

#26

CARDINAL LABORATORIES

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

June 4, 2010

Hack Conder
Vanguard
112 West Taylor
Hobbs, NM 88240

Re: ABO F-31 SWD

Enclosed are the results of analyses for sample number H20007, received by the laboratory on 06/01/10 at 10:04 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
VANGUARD
ATTN: HACK CONDER
112 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 06/01/10
Reporting Date: 06/03/10
Project Number: NOT GIVEN
Project Name: ABO F-31 SWD
Project Location: T16S R37E SEC 31 F

Sampling Date: 05/28/10
Sample Type: WATER
Sample Condition: COOL & INTACT @ 4°C
Sample Received By: HM
Analyzed By: HM

LAB NO.	SAMPLE ID	Cl^- (mg/L)	SO_4 (mg/L)	TDS (mg/L)
Analysis Date:		06/03/10	06/02/10	06/02/10
H20007-1	MONITOR WELL #1	152	92.6	549
H20007-2	MONITOR WELL #2	1,540	115	4,080
Quality Control		500	40.8	NR
True Value QC		500	40.0	NR
% Recovery		100	102	NR
Relative Percent Difference		< 0.1	3.6	6.6
METHOD: Standard Methods, EPA		4500-ClB	375.4	160.1

Not accredited for Chloride, Sulfate and TDS.

Chemist

Date

H20007 VANGUARD

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: Vanguard	**BILL TO**
Project Manager: Hank Conder	P.O. #:
Address: 112 W. Taylor Street	Company: Arc Env.
City: Hobbs State: NM Zip: 88240	Attn:
Phone #: (575)393-9174 Fax #: (575)393-1471	Address: P.O. Box 1772
Project #: Project Owner:	City: Lovington
Project Name: ABS F-31 SWD	State: NM Zip: 88260
Project Location: T16S R37E Sec 31 E	Phone #: (575)631-9310
Sampler Name: Roxanne Johnson	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	Total Dissolved Solids	Benzene
H26001-1	Monitor Well #1	G	1	X							X		5-28	9:10	X	X	X
-2	Monitor Well #2	G	1	X							X		5-28	11:20	X	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 claims 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:	Date: 06/01/2010	Received By:	Phone Result: ☐ Yes ☐ No Add'l Phone #:
	Time: 10:04		Fax Result: ☐ Yes ☐ No Add'l Fax #:
Relinquished By:	Date:	Received By:	REMARKS: email to: roxanne@valornet.com kconder@nmsud.com kjones@nmsud.com
	Time:		

Delivered By: (Circle One)
Sampler - UPS - Bus - Other:

Sample Condition		CHECKED BY: (Initials)
Cool	Intact	
☐ Yes ☐ No	☑ Yes ☐ No	

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

TR26