1R-425-88

WORKPLANS

Date: 10-26-10

P.O. Box 5630 Hobbs, NM 88241 Phone 575.393.4411 Fax 575.393.0293 RECEIVED OCD

2010 OCT 27 P 1:19

CERTIFIED MAIL RETURN RECIEPT NO. 7009 1680 0001 6619 6330

October 26th, 2010

Mr. Edward Hansen

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

RE: INVESTIGATION & CHARACTERIZATION PLAN Rice Operating Company – Vacuum SWD System Vacuum D-31 EOL (1R425-88): UL/D, Sec. 31, T17S, R35E

Mr. Hansen:

1.11

RICE Operating Company (ROC) has retained Rice Environmental Consulting and Safety (RECS) to address potential environmental concerns at the above-referenced site in the abandoned Vacuum Salt Water Disposal (SWD) system. ROC is the service provider (agent) for the Vacuum SWD System and has no ownership of any portion of the pipeline, well, or facility. The system is owned by a consortium of oil producers, System Parties, who provide all operating capital on a percentage/usage basis. Environmental projects of this nature require System Party AFE approval prior to work commencing at the site. In general, project funding is not forthcoming until NMOCD approves the work plan. Therefore, your timely review of this submission is greatly appreciated.

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

- Protects public health,
- Provides the greatest net environmental benefit,
- Complies with NMOCD Rules, and
- Is supported by good science.

Each site shall generally have three submissions:

- 1. This <u>Investigation and Characterization Plan</u> (ICP) is proposed for gathering data and site characterization and assessment.
- 2. Upon evaluating the data and results from the ICP, a recommended remedy will be submitted in a <u>Corrective Action Plan</u> (CAP) if warranted.
- 3. Finally, after implementing the remedy, a <u>Termination Request</u> with final documentation will be submitted.

Background and Previous Work

This site is located approximately 0.3 miles south of Buckeye, New Mexico in UL/D, Sec. 31, T17S, R35E as shown on the Site Location Map (Figure 1). NM OSE records indicate that groundwater will likely be encountered at a depth of approximately 117 +/-feet.

In 2009, ROC initiated work on the former Vacuum D-31 EOL junction as part of the system abandonment. The site was delineated using a backhoe to form an excavation with dimensions 30x25x12-ft deep and soil samples were screened at regular intervals for both hydrocarbons and chlorides. A 4-wall, bottom, and blended backfill composite sample was collected from the excavation for laboratory verification. Laboratory results yielded negligible concentrations of gasoline range organics (GRO) and diesel range organics (DRO) in all samples. Chloride concentrations were confirmed at 672 mg/kg in the 4-wall composite, 1,200 mg/kg in the bottom composite, and 720 mg/kg in the blended backfill composite. The blended excavated soil (blended backfill composite) was returned to the excavation 5 feet below ground surface (bgs). A 5 foot deep shelf was excavated 5 feet in each direction in preparation for a clay barrier. At 5 ft below ground surface (bgs), a 40x35 ft clay barrier was installed with a compaction test performed on May 21, 2009. The remaining blended excavated soil was blended with clean, imported soil and placed over the clay barrier. Laboratory analysis of the blended backfill II composite confirmed a chloride concentration of 256 mg/kg. The area was contoured to the surrounding landscape, seeded, and an identification plate was placed on the surface of the site to mark its location for future environmental considerations. NMOCD was notified of potential groundwater impact on March 12, 2009 and a junction box disclosure report (Appendix A) was submitted to NMOCD with all the 2009 junction box closures and disclosures.

To further investigate depth of chloride presence, one soil bore (SB-1) was initiated on June 19, 2009 at 3 feet south-east of the former junction box. The boring was advanced to 80 feet bgs with soil samples collected every 5 feet and field tested for organic vapors and chlorides. Field chloride titrations yielded concentrations that decreased with depth, which was confirmed by laboratory analysis of the 35 foot (1,500 mg/kg) and the 80 foot (272 mg/kg) samples. TPH (GRO and DRO) concentrations were negligible in both samples. The entire borehole was plugged with bentonite to the ground surface.

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

Proposed Work Elements

1. Using site specific data, a conservative chloride migration model will be used to determent if unsaturated chloride transport through the vadose zone would cause the underlying groundwater to exceed 250 mg/L in the future.

- 2. A visual inspection of the site will be conducted to determine if soil restoration is required to promote re-vegetation of the ground surface. Depending on the findings, the appropriate steps will be taken to re-vegetate the site. Vegetation acts as a 'natural infiltration barrier' because plants capture water through their roots, reducing the volume of water infiltrating below the root zone.
- 3. Collect regional hydrogeologic data to verify depth to groundwater in the area of this site. A one-half mile water well inventory will be performed. The water well inventory will include a review of water well records listed on the New Mexico State Engineer Office and United States Geological Survey (USGS) websites.

If site specific modeling shows no threat to groundwater from residual chlorides and surface restoration work has been completed, then a Termination Request will be submitted to NMOCD. However, if site specific modeling shows impact to groundwater from residual chlorides, a CAP will be developed to address these concerns.

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

Sincerely,

JC.W.

Lara Weinheimer Project Scientist RECS (575) 441-0431

Attachments:

Figures – Site location map Appendix A – Junction Box Disclosure Report Appendix B – Quality Procedures



Figures

RICE Environmental Consulting and Safety (RECS) P.O. Box 5630 Hobbs, NM 88241 Phone 575.393.4411 Fax 575.393.0293

Site Location





Vacuum D-31 EOL

Legals: UL/D sec. 31 T17S R35E NMOCD Case #: 1R425-88

0	500	1,000	2,000
\square		- I I	Feet
Drawing di Revision d	ate: late:		

FIGURE 1

Appendix A Junction Box Disclosure Report

RICE Environmental Consulting and Safety (RECS) P.O. Box 5630 Hobbs, NM 88241 Phone 575.393.4411 Fax 575.393.0293

RICE OPERATING COMPANY JUNCTION BOX DISCLOSURE' REPORT

				BOXL	OCATION				
SWD SYSTEM J	UNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNT	Y BOX DIME	NSIONS' FEET	
Vacuum	D-31 EOL	D	31	17S'	35E	Lea	Lengin	iminated	Depth
LAND TYPE; BL	M ST	ATE X	FEE LAN		······································		OTHER		
Depth to Ground	water1	<u>117 te</u>	et		NMQĈĐ	SITE ASSI	SSMENT RANKING S	CORE:2	0
Date Started	2/18/20	09	Date Cor	npleted	6/8/200	9	OCD Witness	no	
Soil Excavated	333.3	_cubic yards	s Exc	avation Ler	igth	30	Width 25	Depth 12	feet
Soil Disposed	84	_cubic yard:	s Off	site Facility	Ś	undance	Location	Euñice, N	IM
INAL ANALYTIC	CALRES	ULTS:	Sample	Date	4/6/2009 5/20/200	, 4/15/2009 9, 6/19/200	Sample De	pth 12.ft. 35	5 ft. 80 fl
Procure 5-point compo PH and Chloride labo	site sample o ratory test re- procedures p	of bottom a sults comp ursuant to	nd 4-point leted by us NMOCD g	composite : sing an appr uldelines.	sample of si oved lab an	dèwalls. d lesting	CHLORIDE FI	eld tests	~
Sample:	PID (field)	GRC mg/k	D - C	DRO mg/kg	Chlori ma/	des kg	LOCATION	DEPTH	mg/k
4-WALL COMP.	0:5	<10;	0	<10.0	67:	2	4-WALL COMP	in/a	568
BOTTOM COMP.	2.3	<10.	0,	<10.0	1,20	0	BOTTOM COMP.	.12	957
BLENDED BACKFILL COMP	2.0	<10	0	<10.0	-72	3	BLENDED BACKFILL	:n/a	722
LENDED BACKFILL II COM	P 0.9				25	\$:	BLENDED BACKFILL II COMP:	n/ā	303
SB #1 @ 35		أناً <10.	0	<10.0 r	1,50	0 ^{0,}	BACKGROUND	6"	194
'SB #1(@:80)	: Rate	<10.	0	<10,0	27	2'		15'	.86
4 mg 11	h anna a'						1	20'	. 87
eneral Description	of Remédial	Action: T	his junction	n was addres	sed during th	ne .		25	84
cuum SWD System At	andonment.	An investiga	lion was co	onducted at th	ne former jur	ction		30.	1,39
ox site using a backhoe	to collect soil	samples at	regular inte	rvals creating	g a 30x25x12	?'ft		35'	1.4
cavation. Chloride field	Liests perform	ied on each	sample yie	Ided elevated	t concentrati	ons:	· · · · ·	40	1.3
rganic vapors; measure	d using a PID	yielded low	concentra	tions. Repre	sentative cor	nposite.	Soil Bore 3 ft. south	45'	99
moles were sent to a c	ommercial lat	noratory for :	analysis of	chloride and	TPH which	confirmed	east of the former	501	1 1.11

elevated chloride concentrations and low concentrations of TPH. The blended excavated soil was returned to the excavation 5 It below ground surface (BGS), A 5-ft-deep shelf was excavated 5 ft in every direction. At 5-4 ft BGS, a 1-ft thick clay barrier was installed with a compaction test performed on 5/21/2009., The remaining backfill was blended on site with clean imported soil and returned to ground surface and contoured to the surrounding area. On 6/8/2009, the site was seeded with a blend of native vegetation and is expected to return to a productive capacity at a normal rate. To further investigate depth of chloride presence, a soll

. . .

COMP	n/ă	303
BACKGROUND	6"	194
	15	861
	20'	871
	25	844
	30.	1,393
;	35'	1.412
Allen Jan Pro	. 40	1,338
Soil Bore 3 ft. south	45'	997
junction box	50'	1,101
	55'	779
	60'	525
	65'	531
	70'	510
	75	425
	80	300

bore was initiated on 6/19/2009 at 3 ft SE of the former junction box site.. The boring was advanced to a depth of 80 ft BGS with soil samples collected every 5 ft and field tested for chloride and organic vapors. Lab analysis of the 35 and 80 ft samples yielded chloride concentrations that decreased with depth and low concentrations of organics. The entire bore hole was plugged with bentonite to the ground surface. NMOCD was notified of potential groundwater impact on 3/12/09,

ADDITIONAL EVALUATION IS HIGH PRIORITY

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

1-HE	EREBY CERTIFY TI	AT THE INFORM	IATION ABOVE	S TRUE AND CO	MPLETE TO	THE BES	TOFMY
		K	NOWLEDGE AN	D BELIEF	1		
	Jordan Woodfin		Jordan	Wood	- cc	MPANY_	RICE OPERATING COMPANY
REPORT ASSEMBLED BY	arry Bruce Baker Jr.	INITIAL &	BB	······	Y		
PROJECT LEADER	Larry Bruce Baker Jr.		lany Be	uce Baker	pr.	DATE_	4-1-10

PROJECT LEADER Lany Bruce Baker Jr. SIGNATURE Jany Bruce Haker Jr. This site is a "DISCLOSURE." It will be placed on a prioritized list of similar sites for further consideration.

Page 1 of 2

Vacuum D-31 EOL Unit D, Section 31, T17S, R35E







Delineation trench being excavated



Drilling Soil Bore #1

6/19/2009

plugging Soil Bore #1 with bentonite

6/19/2009

Page 2 of 2

	Logger:		Lara Weinheimer	Client:		Well ID:
	Driller:		Harrison & Cooper, Inc. Drilling	RICE Operating (Company	
Drilli	ng Method:		Air rotary	Project Name:		
	Start Date:		6-19-09	Vacuum D-3	1 EOL	
	End Date:		6-19-09	Location:		CP 1
Comm	nents:			Vacuum SWD	System	3D - 1
	Located: 3	ft SE c	of the former junction box site	Vacuum SVD	System	
				unit 'D' Sec.31 T1	7S, R35E	
	TD = 80 ft		GW = ~117 ft	Lea County	NM	
Depth feet)	chloride field tests	PID	Description	Lithology	Sc	il Bore
			10 - 15 ft		Con	struction
15	0.01		VERY FINE TO FINE SAND, ROCKY			
15	861	0	light brown, caliche, chert, sandstone, dry			
20	871	0				
25	044					
25	044		15 - 45 ft			
			light brown, dry			
30	1393					
35	1412					
LAB	1500	GRO < 10	n news			
		DRO < 10	AGUS			
40	1338					
45	997					
						bentonite
FO	1101	_	45 - 55 ft			seal
50	1101		VERY FINE TO FINE SAND			
			light brown, slightly moist			
55	779		and the second second			
			55 - 60 ft			
60	525		VERY FINE TO FINE SAND, QUARTIZE			
00	020		regulari-brown, moist			
			60 - 70 ft			
65	531		VERY FINE TO FINE SAND			
			reddish-brown, moist			
70	510					
			70 - 75 ft			
75	105		VERY FINE TO FINE SAND			
15	425		reddish-brown, slightly moist			
			VERY FINE TO FINE SAND			
80	300	_	reddish-brown, moist			/
LAB	272	GRO < to		<u> </u>	VIIIA	
		0RO = 10				



ANALYTICÁL RESULTS FOR RICE OPERATING COMPANY ATTN: HACK CONDER 122 W. TAYLOR HOBBS, NM 88240 FAX TO: (575) 397-1471

Receiving Date: 06/23/09 Reporting Date: 11/09/09** Project Owner: NOT GIVEN Project Name: VACUUM D-31 EOL** Project Location: VACUUM D-31 EOL**

Sampling Date: 06/19/09 Sample Type: SOIL Sample Condition: COOL & INTACT Sample Received By: HM Analyzed By: AB/HM

LAB NUMBER SAMPLE ID (mg/kg) (mg/kg) (mg/kg) ANALYSIS DATE 08/24/09 06/24/09 06/23/09 H17687-1 SB #1 @ 35' <10.0 <10.0 1,500 H17687-2 SB #1 @ 80' <10.0 <10.0 272 Quality Control 590 600 490 True Value QC 500 500 500 % Recovery 118 120 98.0 Relative Percent Difference 1.6 1.0 2.0		GRO (Ce-Cu)	DRO (>C ₁₀ -C ₂₈)	CI*
ANALYSIS DATE 06/24/09 06/24/09 06/23/09 H17687-1 SB #1 @ 35' <10.0 <10.0 1,500 H17687-2 SB #1 @ 80' <10.0 <10.0 272 Quality Control 590 600 490 True Value QC 500 500 500 % Recovery 118 120 98.0 Relative Percent Difference 1.6 1.0 2.0	LAB NUMBER SAMPLE ID	(mg/kg)	(mg/kg)	(mg/kg)
H17687-1 SB #1 @ 35' <10.0	ANALYSIS DATE	06/24/09	06/24/09	06/23/09
H17687-2 SB #1 @ 80' <10.0 <10.0 272 Quality Control 590 600 490 True Value QC 500 500 500 % Recovery 118 120 98.0 Relative Percent Difference 1.6 1.0 2.0	H17687-1 SB #1 @ 35	<10.0	<10.0	1,500
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Quality Control 590 600 490 True Value QC 500 500 500 % Recovery 118 120 98.0 Relative Percent Difference 1.6 1.0 2.0		андан на н		
True Value QC 500 500 500 % Recovery 118 120 98.0 Relative Percent Difference 1.6 1.0 2.0	Quality Control	590	600	490
% Recovery 118 120 98.0 Relative Percent Difference 1.6 1.0 2.0	True Value QC	500	500	500
Relative Percent Difference 1.6 1.0 2.0	% Recovery	118	120	98.0
	Relative Percent Difference	1.8	1.0	2.0

METHODS: TPH GRO & DRO: EPA SW-846 8015 M; CI: Std. Methods 4500-CIB *Analyses performed on 1:4 witv aqueous extracts. Reported on wet weight. **Revised Report

Con. Chemisi

11/09/07 Date

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

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

Receiving Date: 04/06/09 Reporting Date: 04/08/09 Project Number: NOT GIVEN Project Name: VACUUM JCT D-31 EQL Project Location: VACUUM JCT D-31 EQL

Sampling Date: 04/06/09 Sample Type: SOIL Sample Condition: COOL & INTACT Sample Received By: ML Analyzed By: AB/TR

GRO DRO (C₆-C₁₀) (>C₁₀-C₂₈) CI* (mg/kg) (mg/kg) (mg/kg)

LAB NUMBER SAMPLE ID

ANALYSIS DATE	04/07/09	04/07/09	04/07/09
H17200-1 5PT BTM COMP	<10,0	<10.0	1,200
H17200-2 4 WALL COMP	<10.0	<10.0	672
	/		
		1	
Quality Control	547	542	500
True Value QC	500	500	. 500
% Recovery	109	.108	100
Relative Percent Difference	3.5	3.5	< 0.1

METHODS: TPH GRO & DRO: EPA SW-846 8015 M; CI: Std. Methods 4500-CIB *Analyses performed on 1:4 w:v aqueous extracts.

H17200 TCL RICE

PLEASE NOTE: Liability and Damages. Cardina's liability and client's exclusive remady for any client arbitic, whether based in contract or tort. shall be limited to the amount paid by client for analyses. All damps including those for negligence and any other cause wheteore shall be deened waved indees made in writing and received by Cardinal within thirty (30) days after combinition of the applicable service. In no event shall Cardinal de liable for incidental or consequential damages including, without limitation, business interruptions, loss of deer or loss of more incidented by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claums has done stated, reacting or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written addreval of Cardinal Laboratories.

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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RICE OPERATING COMPANY

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

Check Model Number:



Model: PGM 7300 Serial No Model: PGM 7300 Serial No Model: PGM 7300 Serial No

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

GAS COMPOSITION: ISOBUTYLENE 100PPM / AIR: BALANCE.

LOTNO: 08-3425	EXPIRATION DATE: 8-29-09
FILL DATE: Z 29.08	METER READING ACCURACY: (DO

ACCURACY : +/- 2%

SYSTEM	JUNCTION	UNIT	SECTION	TOWN SHIP	RANGE
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I verify that I have calibrated the above instrument in accordance to the manufacture operation manual.

ada Wood SIGNATUE:

DATE: 4-11-04





PHONE (575) 393-2326 . 101 E. MARLAND . HOBBS, NM 68240

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

Receiving Date: 04/15/09 Reporting Date: 04/17/09 Project Number: NOT GIVEN Project Name: VACUUM JCT D-31 EQL Project Location: VACUUM JCT D-31 EQL Sampling Date: 04/15/09 Sample Type: SOIL Sample Condition: COOL & INTACT Sample Received By: ML Analyzed By: AB/HM

GRO DRO

13.9

		(C6-C10) (≥C ₃₀ -C ₂₈)	Cl
LAB NUMBE	R SAMPLE ID	(mg/kg)	(mg/kg)	(mg/kg)
ANALYSIS D	ATE	04/17/09	04/17/09	04/16/09
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	***************************************			e open analysis providence of the data of the
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Trúe Value C	¢,	500	500	5,00
% Recovery		108	108	100

METHODS: TPH GRO & DRO: EPA SW-846 8015 M; CI': Std. Methods 4500-CI'B *Analysis performed on a 1:4 w:v aqueous extract.

Chemist

Relative Percent Difference

COM-

< 0.1

10.5

H17243 TCL RICE

PLEASE NOTE: Lisbility and Dimages. Cardinat's lisbility and client's exclusive femedy (or any claim ansing, whether based in contrast or toit, shall be limited to the amount paid by client for analyses. All craims, including base for negligence and any other cause whatsoever shall be deemed waved by loss made in writing and received by Cardinat within think (30) days after completion of the applicable service. In the what shall be installed to the performance of services fractures including, whether based in contrast or toit, shall be limited to the amount paid by client for analyses. All craims, including base for negligence and any other cause whatsoever shall be deemed waved by blacks, inducting in writing and received by Cardinat within think (30) days after completion of the applicable service. In the what single control by the contrast or solvices fractures by Cardinat, regardless of whether based upon any of the above-stated reasons or difference on the low of the above-stated reasons or difference on the contrast or shall not be reproduced except in full with writen approval of Cardinat Laboratories.

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101 East Marland, Höbbs, NM 88240 (575) 993-2326 Fax (575) 393-2476			- the state of the		,	Pageof		ş
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city: L-(0(3(35) state:///// zip:	88240	Vttn:						
Phone #: 393-91.7C/ Fax #:		vddress:	station of the second				a	
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RICE OPERATING COMPANY

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

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Check Model Number;

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Serial No: 590-000183. Model: PGM 7300 Model: PGM 7300 Serial No: 590-000508: Model: PGM 7300 Serial No: 590-000504

Model: PGM 7600 Model: PGM 7600 Model: PGM 7600

1.4

Serial No: 110-023920

Serial No: 110-013744 Serial No: 110-013676

GAS COMPOSITION: ISOBETYLENE 1000PPM / AIR: BALANCE	
LOT NO. 08-3425 EXPIRATION DATE 8-29-09	
FILL DATE: Z-Z9-08 METER READING ACCURACY: 100	
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I verify that I have calibrated the above instrument in accordance to the manufacture operation manual.

- Jorden Wordy SIGNATUE/

DATE: 4-15-29





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

ANALYTICAL RESULTS FOR **RICE OPERATING COMPANY** ATTN: JORDAN WOODEIN 122 WEST TAYLOR **HOBBS, NM 88240** FAX TO: (575) 397-1471

Receiving Date: 05/19/08 Reporting Date: 05/20/09 Project Number: NOT GIVEN Project Name: VACUUM JCT D-31 EOL Project Location: VACUUM JCT D-31 EOL

Analysis Date: 05/20/09 Sampling Date: 05/19/09 Sample Type: SOIL. Sample Condition: COOL&, INTACT Sample Received By: ML Analyzed By: AB

CI

LAB NO: SAMPLE ID (mg/kg)

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METHOD: Standard Methods

4500-CI'B

Note: Analysis performed on a 1:4 wiv aqueous extract.

Chemist

Orlanling

Date

H17457 RICE

PLEASE NOTE: Liability and Damages. Cardinal's liability and client staxousive remedy for any claim arising; whether based in contract or tori, shall be limited to the amount/paul 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 the went shall Cardinal be lease for incluented or consequential damages, including, without limitation, business interruptions, toss of use, or loss of profits inclured by client, its subsidiaries antitations 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 the base of the tothe complete classes that the damages including and an applicable so 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 but with written approval of Cardinal Laboratories.

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST							101 J			WPLING.	168		TIME	201 3000 X X						auar ajud by the allent with the first state of the second state o	auritäetkant voikettiaet [Phionie Result: []-Yest[]400] [Add4Pfkone #t	Fax Result. C. Yes. E 446. Rud' Fax #: Remarks:	outer a cutto to:	BARCER & CEESUD CON	CC JANKY SC TO		7 CUST
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ARDINAL LABORATORIES 101 East Marland, Hobbs, NM 88240 2 (605), 353-2326 FAX (505) 353:2476 (ame: 20106 0 758AT7.Alb		NJJO OOKNAW MOO DE (N	122. W. TAYLOR	0.8.85 State: MM 210: 2	393-9174 Fax#:	Project Owner	10: Vacuum Jet D.3/ 6	ation: VACUUM Jct 0-31 2	me: Joicpan Wantern		28 4wo(3	Sample L.D.	1497.14	1.1 Steuded Backfull IL C	set			รม จางกันร์ แมนการแรงมายรายราย รายแมนแม่มา มามาและมายระบบ แล้วระบบร์การและเหรี่ยวิทยามารายรูญและได้ สาวเปลามา		ability and Dáma gas. Caudhala thailty and Efford's credents's rectarts for any definit Welduting there has no gatherites and any other causes yranding the deemed in Lande Chydand he statis, but frequential as concerpanenta damages, including which in	otre altstrag uit ut or indicates to the pollomenatics of sectors of accounts by Constraint in 2018 BV: TREES	N: Non-N. Time 11. az	et a saver referred a saver a s	1000	I By: (Circle One)	UPS Bus - Other:	final cannot acceptiverbal changes. Please fax v
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RICE OPERATING COMPANY

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

Check Model Number:

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 Model: PGM 7300
 Serial No: 590-000183

 Model: PGM 7300
 Serial No: 590-000508

 Model: PGM 7300
 Serial No: 590-000504

83 08 04 Model: PGM 7600 Model: PGM 7600 Model: PGM 7600 Serial No: 110-023920 Serial No: 110-013744 Serial No: 110-013676

GAS COMPOSITION: ISOBUTYLENE 100PPM / AIR: BALANCE

LOT NO : 083425 EXPIRATION DATE: 8-29-09
EILL DATE:2-29-08 METER READING ACCURACY: 100

ACCÜRACY : +/- 2%

SYSTEM	JUNCTION	UNIT	SECTION	TOWN SHIP	RANGE
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I verify that I have calibrated the above instrument in accordance to the manufacture operation manual.

) ndan Woodf SIGNATUE

DATE: 5-19-09

Vacuum D-31 EOL Unit 'D' Sec. 31, T17S, R35E

Excavation Cross-Section

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	LABORATORY TES PETTIGREW & ASS 1410 N. GRI HOBES NM 1 (575) 393-90	J REPORT OCIATES, P.A. MES 18240 127	DEMA WILLETAM	Assino Ris P. HICKS, P.E./L.S.J. M. HICKS, TIL, P.E./L.S.
To:,	Rice Öperating Company Attn: Hack Conder 122 W. Taylor	Material: Çoop	er Red Clay	
	Hobbs, NM 88240	Test Method:	ASTM: D 2922	
Project:	General Information Project No. 2008,1069			
Date of Test:	-April-10, 2000 1 sipe 5/21/09 EV	Depth:	See Below	
		Depth of Probe:	12 [#]	
Test No.	Location	Dry Density % Max % 1	Noisture	
SG 13	Vácutim Jct. D/31 EOL - 10 W. & 10 N. of SE Corner of Pit	90.7	16.9	5 Below Surface

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Control Density:	100.4 ASTM: D 698
Required Compactio	n: 90 - 95%
Lab No.:	09 3200-3201
Copies To:	Rice Operating

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Optimum Moisture: 21.6%

Densometer ID: 815 PETTIGREW & ASSOCIATES

BY: <u>Quicem Plact</u> BY: <u>Conse</u> Ρ.E.

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CHLORIDE CONCENTRATION CURVE

RICE Operating Company.

Vacuum D-31 EOL Unit'D', Sec. 31, T17S, R35E

SOIL BORING samples at 3 ft southeast of the junction (source).

ppm	61	71	44	393	112	338	97.	101	79	25	31	10	25	00
0) [CI]	8	8	8	.	1		6		2	2	5	2.	4	С,
Depth bgs (f	15	20	.25	30	35	40	45	50°	55.	60	65	70	75	80





Appendix B Quality Procedures

RICE Environmental Consulting and Safety (RECS) P.O. Box 5630 Hobbs, NM 88241 Phone 575.393.4411 Fax 575.393.0293

Quality Procedures

Table of Contents

- QP-1 Soil Samples for Transportation to a Laboratory
- QP-2 Chloride Titration Using 0.282 Normal Silver Nitrate Solution
- QP-3 Development of Cased Water-Monitoring Wells
- QP-4 Sampling of Cased Water-Monitoring Well
- QP-5 Composite Sampling of Excavation Sidewalls and Bottoms for TPH and Chloride Analysis
- QP-6 Sampling and Testing Protocol for VOC in soil
- QP-7 Composite Sampling of Excavation Sidewalls and Bottoms for BTEX
- QP-8 Procedure for Plugging and Abandonment of Cased Water-Monitoring wells

Quality Procedure Soil Samples for Transportation to a Laboratory

1.0 Purpose

This procedure outlines the methods to be employed when obtaining soil samples to be taken to a laboratory for analysis.

2.0 Scope

This procedure is to be used when collecting soil samples intended for ultimate transfer to a testing laboratory.

3.0 Preliminary

- 3.1 Obtain sterile sampling containers from the testing laboratory designated to conduct analyses of the soil.
- 3.2 If collecting TPH, BTEX, RCRA 8 metals, cation /anions or O&G, the sample jar may be a clear 4 oz. container with Teflon lid. If collecting PAH's, use an amber 4 oz. container.

4.0 Chain of Custody

- 4.1 Prepare a Sample Plan. The plan will list the number, location and designation of each planned sample and the individual tests to be performed on the sample. The sampler will check the list against the available inventory of appropriate sample collection bottles to insure against shortage.
- 4.2 Transfer the data to the Laboratory Chain of Custody Form. Complete all sections of the form except those that relate to the time of delivery of the samples to the laboratory.
- 4.3 Pre-label the sample collection jars. Include all requested information except time of collection. (Use a fine point Sharpie to insure that the ink remains on the label.) Affix the labels to the jars.

5.0 Sampling Procedure

- 5.1 Do not touch the soil with your bare hands. Use new nitrile gloves to help minimize any contamination.
- 5.2 Go to the sampling point with the sample container. If not analyzing for ions or metals, use a trowel to obtain the soil.

- 5.3 Pack the soil tightly into the container leaving the top slightly domed. Screw the lid down tightly. Enter the time of collection onto the sample collection jar label.
- 5.4 Place the sample directly on ice for transport to the laboratory if required.
- 5.5 Complete the Chain of Custody form to include the collection times for each sample. Deliver all samples to the laboratory.

6.0 Documentation

- 6.1 The testing laboratory shall provide the following minimum information:
 - a. Project and sample name.
 - b. Signed copy of the original Chain of Custody Form including the time the sample was received by the lab.
 - c. Results of the requested analyses
 - d. Test Methods employed
 - e. Quality Control methods and results

QUALITY PROCEDURE Chloride Titration Using 0.282 Normal Silver Nitrate Solution

1.0 Purpose

This procedure is to be used to determine the concentration of chloride in soil.

2.0 Scope

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This procedure is to be used as the standard field measurement for soil chloride concentrations.

3.0 Sample Collection and Preparation

- 3.1 Collect at least 80 grams of soil from the sample collection point. Take care to insure that the sample is representative of the general background to include visible concentrations of hydrocarbons and soil types. If necessary, prepare a composite sample for soils obtained at several points in the sample area. Take care to insure that no loose vegetation, rocks or liquids are included in the sample(s).
- 3.2 The soil sample(s) shall be immediately inserted into a one-quart or larger polyethylene freezer bag. Care should be taken to insure that no cross-contamination occurs between the soil sample and the collection tools or sample processing equipment.
- 3.3 The sealed sample bag should be massaged to break up any clods.

4.0 Sample Preparation

- 4.1 Tare a clean glass vial having a minimum 40 ml capacity. Add at least 10 grams of the soil sample and record the weight.
- 4.2 Add at least 20 grams of reverse osmosis water to the soil sample and shake well.
- 4.3 Allow the sample to set for a period of 5 minutes or until the separation of soil and water.

5.0 Titration Procedure

- 5.1 Using a graduated pipette, remove 10 ml extract and dispense into a clean plastic cup.
- 5.2 Add 2-3 drops potassium chromate (K_2CrO_4) to mixture if necessary.

- 5.3 Using a 1 ml pipette, carefully add .282 normal silver nitrate (one drop at a time) to the sample while constantly agitating it. Stop adding silver nitrate when the solution begins to change from yellow to red. Be consistent with endpoint recognition.
- 5.4 Record the ml of silver nitrate used.

6.0 Calculation

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To obtain the chloride concentration, insert measured data into the following formula:

<u>.282 X 35,450 X ml AgNO₃</u>	Х	grams of water in mixture
ml water extract		grams of soil in mixture

Using Step 5.0, determine the chloride concentration of the RO water used to mix with the soil sample. Record this concentration and subtract it from the formula results to find the net chloride in the soil sample.

Record all results on the delineation form.

Quality Procedure Development of Cased Water-Monitoring Wells

1.0 Purpose

This procedure outlines the methods to be employed to develop cased monitoring wells.

2.0 Scope

This procedure shall be used for developed, cased water monitoring wells. It is not to be used for standing water samples such as ponds or streams.

3.0 Sample Collection and Preparation

- 3.1 Prior to development, the static water level and height of the water column within the well casing will be measured with the use of an electric D.C. probe.
- 3.2 All measurements will be recorded within a field log notebook.
- 3.3 All equipment used to measure the static water level will be decontaminated after each use by means of Liquinox, a phosphate free laboratory detergent, and water to reduce the possibility of crosscontamination. The volume of water in each well casing will be calculated.

4.0 Purging

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- 4.1 Wells will be purged by using a 2" decontaminated submersible pump or dedicated one liter Teflon bailer. Wells should be purged until the pH and conductivity are stabilized and the turbidity has been reduced to the greatest extent possible.
- 4.2 If a submersible is used the pump will be decontaminated prior to use by scrubbing the outside surface of tubing and wiring with a Liquinox water mixture, pumping a Liquinox-water mixture through the pump, and a final flush with fresh water.

5.0 Water Disposal

5.1 All purge and decontamination water will be temporarily stored within a portable tank to be later disposed of in an appropriate manner.

6.0 Records

6.1 Rice Environmental Consulting and Safety will record the amount of water removed from the well during development procedures. The purge volume will be reported to the appropriate regulatory authority when filing the closure report.

Quality Procedure Sampling of Cased Water-Monitoring Well

1.0 Purpose

This procedure outlines the methods to be employed in obtaining water samples from cased monitoring wells.

2.0 Scope

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This procedure shall be used for developed, cased water monitoring wells. It is not to be used for standing water samples such as ponds or streams.

3.0 Preliminary

- 3.1 Obtain sterile sampling containers from the testing laboratory designated to conduct analyses of the water.
- 3.2 The following table shall be used to select the appropriate sampling container, preservative method and holding times for the various elements and compounds to be analyzed.

Compound to be Analyzed	Sample Container Size	Sample Container Description	Cap Requirements	Preservative	Maximum Hold Time
BTEX	40 ml	VOA Container	Teflon Lined	HCL	14 days
TPH (8015 Extended)	40 ounces	(2) 40ml VOA vials	Teflon Lined	HCL and Ice	14 days
PAH	1 liter	amber glass	Teflon Lined	Ice	7 days
Cation/Anion	1 liter	HD polyethylene	Any Plastic	None	48 Hrs
Metals	1 liter	HD polyethylene	Any Plastic	Ice/HNO ₃	28 Days
TDS	300 ml	clear glass or 250 ml HD polyethylene	Any Plastic	Ice	7 Days
Cl-	500 ml	HD polyethylene	Any Plastic	None	28 Days

4.0 Chain of Custody

- 4.1 Prepare a Sample Plan. The plan will list the well identification and the individual tests to be performed at that location. The sampler will check the list against the available inventory of appropriate sample collection bottles to insure against shortage.
- 4.2 Transfer the data to the Laboratory Chain of Custody Form. Complete all sections of the form except those that relate to the time of delivery of the samples to the laboratory.
- 4.3 Pre-label the sample collection jars. Include all requested information except time of collection. (Use a fine point Sharpie to insure that the ink remains on the label). Affix the labels to the jars.

5.0 Bailing Procedure

5.1 Identify the well from the sites schematics. Place pre-labeled jar(s) next to the well. Remove the plastic cap from the well bore by first lifting the metal lever and then unscrewing the entire assembly.

5.2 Using a dedicated one liter Teflon bailer or submersible pump, purge a minimum of three well volumes. Place the water in storage container for transport to a ROC disposal facility.

5.3 If using a bailer, take care to insure that the bailing device and string does not become cross-contaminated. A clean pair of nitrile gloves should be used when handling either the retrieval string or bailer. The retrieval string should not be allowed to come into contact with the ground.

6.0 Sampling Procedure

- 6.1 Once the well has been bailed in accordance with 5.2 of this procedure, a sample may be decanted into the appropriate sample collection jar directly from the bailer or submersible pump.
- 6.2 Note the time of collection on the sample jar with a fine Sharpie.
- 6.3 Place the sample directly on ice for transport to the laboratory. The preceding table shows the maximum hold times between collection and testing for the various analyses.

6.4 Complete the Chain of Custody form to include the collection times for each sample. Deliver all samples to the laboratory.

7.0 Documentation

- 7.1 The testing laboratory shall provide the following minimum information:
 - A. Project and sample name.
 - B. Signed copy of the original Chain of Custody Form including the time the sample was received by the lab.
 - C. Results of the requested analyses
 - D. Test Methods employed
 - E. Quality Control methods and results

Calculation for Determining the Minimum Bailing Volume for Monitor Wells Formula V= (πr²h) 2" well [V/231=gal] X 3 = Purge Volume

V=Volume
π=pi
r=inside radius of the well bore
h=maximum height of well bore in water table

Example:

π	r^2	h(in)	V(cu.in)	V(gal)	X 3 Volumes	Actual
3.1416	1	180	565.488	2.448	7.34 gal	>10 gal

Quality Procedure Composite Sampling of Excavation Sidewalls and Bottoms For TPH and Chloride Analysis

1.0 Purpose

This procedure outlines the methods to be employed when obtaining final composite soil samples for TPH and Chloride analysis.

2.0 Scope

This procedure is to be used in conjunction with *Quality Procedure – 02:* Soil Samples for Transportation to a Laboratory and will be inserted at subparagraph 5.2 of Section 5.0: Sampling Procedure.

3.0 Sampling Procedure

Follow *Quality Procedure – 02: Soil Samples for Transportation to a Laboratory* for all Sections and subparagraphs until subparagraph 5.2 of Section 5.0: Sampling Procedure. Instead of 5.2 instructions, perform the composite sample collection procedure as follows:

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- 3.1 Go to the excavation with a new plastic baggie. If not analyzing for ions or metals, use a trowel to obtain the soil. If the excavation is deeper than 6' BGS, do not enter the pit, but use a backhoe to assist in procurement of the sample. (If a backhoe is used, the backhoe will obtain an amount of soil from each composite point; bring the purchase to the surface staging area where a sample-portion of soil will be extracted from the backhoe purchase. The remainder of the backhoe purchase will be staged on the surface with other staged soils.)
- 3.2 Sidewall samples
 - 3.2.1 On each sidewall, procure a 5oz sample from each of five distinct points on the sidewall with distinct points resembling the "W" pattern:



- 3.2.2 Thoroughly blend these five samples in a labeled baggie.
- 3.2.3 Repeat steps 3.2.1 through 3.2.4 for each remaining sidewall.
- 3.2.4 From each labeled baggie, procure a 5 oz portion and pour into a baggie labeled "Sidewall Composite". Blend this soil mixture completely.
- 3.2.5 Obtain proper laboratory sample container for "Sidewall Composite" and continue with subparagraph 5.3 of QP 01.

3.3 Bottom Sample

- 3.3.1 From bottom of excavation, procure a 5oz sample from each of five distinct points with distinct points resembling the "W" pattern as illustrated above.
- 3.3.2 Thoroughly blend these five samples in a clean baggie.
- 3.2.3 Obtain proper laboratory sample container for "Bottom Composite" and continue with subparagraph 5.3 of QP 01.

QUALITY PROCEDURE Sampling and Testing Protocol for VOC in Soil

1.0 Purpose

This procedure is to be used to determine the concentrations of Volatile Organic Compounds in soils.

2.0 Scope

This procedure is to be used as the standard field measurement for soil VOC concentrations. It is not to be used as a substitute for full spectrographic speciation of organic compounds.

3.0 Procedure

- 3.1 Sample Collection and Preparation
 - 3.1.1 Collect at least 500 g. of soil from the sample collection point. Take care to insure that the sample is representative of the general background to include visible concentrations of hydrocarbons and soil types. If necessary, prepare a composite sample of soils obtained at several points in the sample area. Take care to insure that no loose vegetation, rocks or liquids are included in the sample(s).
 - 3.1.2 The soil sample(s) shall be immediately inserted into a one-quart or larger polyethylene freezer bag and sealed. When sealed, the bag should contain a nearly equal space between the soil sample and trapped air. Record the sample name and the time that the sample was collected on the Field Analytical Report Form.
 - 3.1.3 The sealed samples shall be allowed to set for a minimum of five minutes at a temperature of between 10-15 Celsius, (59-77⁰F). The sample temperatures may be adjusted by cooling the sample in ice, or by heating the sample within a generally controlled environment such as the inside of a vehicle. The samples should not be placed directly on heated surfaces or placed in direct heat sources such as lamps or heater vents.
 - 3.1.4 The sealed sample bag should be massaged to break up any clods, and to provide the soil sample with as much exposed surface area as practically possible.

- 3.2.1 The instrument to be used in conducting VOC concentration testing shall be a RAE Systems Photoionization device. (Device will be identified on VOC Field Test Report Form.) Prior to use, the instrument shall be zeroed-out in accordance with the appropriate maintenance and calibration procedure outlined in the instrument operation manual. The PID device will be calibrated each day it's used.
- 3.2.2 Carefully open one end of the collection bag and insert the probe tip into the bag taking care that the probe tip not touch the soil sample or the sidewalls of the bag.
- 3.2.3 Set the instrument to retain the highest result reading value. Record the reading onto the Field Test Report Form.
- 3.2.4 If the instrument provides a reading exceeding 100 ppm, proceed to QP-7. If the reading is 100 ppm or less, NMOCD BTEX guideline has been met and no further testing for BTEX is necessary. File the Field Test Report Form in the project file.

4.0 Clean-up

After testing, the soil samples shall be returned to the sampling location, and the bags collected for off-site disposal. IN NO CASE SHALL THE SAME BAG BE USED TWICE. EACH SAMPLE CONTAINER MUST BE DISCARDED AFTER EACH USE.

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Quality Procedure Composite Sampling of Excavation Sidewalls and Bottoms For BTEX

1.0 Purpose

This procedure outlines the methods to be employed when obtaining final composite soil samples for BTEX analysis.

2.0 Scope

This procedure is to be used when collecting soil samples intended for ultimate transfer to a testing laboratory for BTEX analysis. This procedure is to be used only when the PID field-test results for OVM exceeds 100 ppm.

3.0 Preliminary

3.1 Obtain sterile, clear, 2 oz. glass containers with Teflon lid from a laboratory supply company or the testing laboratory designated to conduct analyses of the soil.

4.0 Chain of Custody

- 4.1 Prepare a Sample Plan. The plan will list the number, location and designation of each planned sample and the individual tests to be performed on the sample. The sampler will check the list against the available inventory of appropriate sample collection bottles to insure against shortage.
- 4.2 Transfer the data to the Laboratory Chain of Custody Form. Complete all sections of the form except those that relate to the time of delivery of the samples to the laboratory.
- 4.3 Pre-label the sample collection jars. Include all requested information except time of collection. (Use a fine point Sharpie to insure that the ink remains on the label.) Affix the labels to the jars.

5.0 Sampling Procedure

- 5.1.Do not touch the soil with your bare hands. Use new nitrile gloves to help minimize any cross-contamination.
- 5.2.If safe and within OSHA regulations, go to the sampling point with the sample container. If not analyzing for ions or metals, use a trowel to

obtain the soil. If the excavation is deeper than 6' BGS, do not enter the pit, but use a backhoe to assist in procurement of the sample. (If a backhoe is used, the backhoe will obtain an amount of soil from each composite point; bring the purchase to the surface staging area where a sample-portion of soil will be extracted from the backhoe purchase. The remainder of the backhoe purchase will be staged on the surface with other staged soils.)

- 5.3.Sidewall Samples
 - 5.3.1.On each sidewall, procure a 2oz sample from each of five distinct points on the sidewall with distinct points resembling the "W" pattern:



- 5.4.Pack the soil tightly into the container leaving the top slightly domed. Screw the lid down tightly. Enter the time of collection onto the sample collection jar label. Repeat for each sampling point.
- 5.5.Place the samples directly on ice for transport to the laboratory if required.
- 5.6.Complete the Chain of Custody form to include the collection times for each sample. Deliver all samples to the laboratory.

6.0 Documentation

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- 6.1 The testing laboratory shall provide the following minimum information:
 - a. Project and sample name.
 - b. Signed copy of the original Chain of Custody Form including the time the sample was received by the lab.
 - c. Results of the requested analyses
 - d. Test Methods employed
 - e. Quality Control methods and results

Procedure for Plugging & Abandonment of Cased Water Monitoring Wells

1.0 Purpose

This procedure outlines the methods to be employed to plug and abandon cased monitoring wells.

2.0 Scope

This procedure shall be used for developed, cased water monitoring wells located in the State of New Mexico

3.0 Preliminary

3.1 No well may be drilled, modified or plugged without NMOCD approval. Additional approvals may be required if the well is situated in a sensitive area, within municipal jurisdictions or on federal or tribal lands.

4.0 Plugging

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4.1 Each bore will be filled with a 1% - 3% bentonite/concrete slurry to three feet bgs. The remaining three feet will be capped with concrete only.

4.2 All wellheads will be removed to below ground surface.

6.0 Records

6.1 The company plugging the well shall prepare a report on their company letter head listing the site name and describing general well construction including total depth of the well, the diameter of casing, material used to plug the well (e.g. bentonite/cement slurry), and date of the plugging operation.

6.2 It is recommended but not required that photographs of the final surface restoration be taken and included within the records.

6.3 Copies of the plugging report shall be submitted to all appropriate agencies and retained by the well operator for a minimum period of ten years.