C	Y - AFORM					MIL	a
Form 3160-3 (June 2015) HOBBS OCD UNITED STATE		D HICIOI D HICIOI REENTER		FORM A OMB No Expires: Jar	APPROVED 1004-0137 nuary 31, 2018	MIN FURP	Þ
HOBBY UNITED STATE HOBBY UNITED STATE THE ALL OF LAND MAN	ES INTERIOR NAGEMENT	Hobbo	OP	5. Lease Serial No.			
APPLICATION PERMIT TO I	DRILL OR	REENTER		6. If Indian, Allotee of	or Tribe Name		
1a. Type of work!	REENTER			7. If Unit or CA Agree	ement, Name a	nd No.	
	Other Single Zone	Multiple Zone		8. Lease Name and V COPPERLINE WES 7H	175	AL COM	
2. Name of Operator CAZA OPERATING LLC (249099)				9. API Well No. <b>30-025-</b>	4518	3	
3a. Address 200 N. Loraine Street, Suite 1550 Midland TX 79701	3b. Phone N (432)682-74	o. (include area cod <b>424</b>	le)	10. Field and Pool, o BELL LAKE / AVA	- · ·	40	
<ol> <li>Location of Well (Report location clearly and in accordance At surface NENW / 130 FNL / 2180 FWL / LAT 32.28 At proposed prod. zone SESW / 330 FSL / 2275 FWL /</li> </ol>	2496 / LONG	-103.493568	93239	11. Sec., T. R. M. or SEC 29 / T23S / R3		v or Area	
<ol> <li>Distance in miles and direction from nearest town or post of 18.5 miles</li> </ol>	ffice*	—, <u></u>		12. County or Parish LEA	13. St NM	ate	
15. Distance from proposed* location to nearest property or lease line, ft.	16. No of ac 560	res in lease	17. Spacin 160	ng Unit dedicated to th	is well		
(Also to nearest drig. unit line, if any) 18. Distance from proposed location*	19. Proposed	d Depth	20. BLM/I	BIA Bond No. in file			
to nearest well, drilling, completed, <b>50 feet</b>	9062 feet /	13637 feet	FED: NM	B000471			
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3539 feet	22. Approxii 03/22/2018	mate date work will	start*	23. Estimated duration 30 days	on		
	24. Attac	hments		I			
<ul> <li>Fhe following, completed in accordance with the requirements as applicable)</li> <li>Well plat certified by a registered surveyor.</li> <li>A Drilling Plan.</li> <li>A Surface Use Plan (if the location is on National Forest Syst SUPO must be filed with the appropriate Forest Service Office</li> </ul>	tem Lands, the	<ol> <li>Bond to cover th Item 20 above).</li> <li>Operator certific</li> </ol>	ne operations	ydraulic Fracturing ru s unless covered by an mation and/or plans as n	existing bond of	n file (see	
25. Signature (Electronic Submission)		(Printed/Typed) 3 Sam / Ph: (432)6	682-7424		Date 12/22/2017		
Title VP Operations							
Approved by (Signature) (Electronic Submission)		(Printed/Typed) Layton / Ph: (575)2	234-5959		Date 08/31/2018		
Title Assistant Field Manager Lands & Minerals	Office CARL						
Application approval does not warrant or certify that the applica applicant to conduct operations thereon. Conditions of approval, if any, are attached.	ant holds legal o	or equitable title to the	hose rights i	n the subject lease wh	ich would entitl	e the	
Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, of the United States any false, fictitious or fraudulent statements					iy department o	r agency	
Requested OCP 09/3/18 ECP REC 09/13/18				KZ	2/14		
5CP Rec 09/13/18	wen WI	TH CONDIT	IONS	091	7110		N.

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#### INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

ITEM I: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the wen, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionany drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

ITEM 24: If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

#### NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48( d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160

PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service wen or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.

ROUTINE USE: Information from the record and/or the record win be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM conects this information to anow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

**BURDEN HOURS STATEMENT:** Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Conection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

#### **Additional Operator Remarks**

#### Location of Well

SHL: NENW / 130 FNL / 2180 FWL / TWSP: 23S / RANGE: 34E / SECTION: 29 / LAT: 32.282496 / LONG: -103.493568 (TVD: 0 feet, MD: 0 feet)
 PPP: NENW / 269 FNL / 2250 FWL / TWSP: 23S / RANGE: 34E / SECTION: 29 / LAT: 32.282111 / LONG: -103.493364 (TVD: 8860 feet, MD: 8900 feet)
 BHL: SESW / 330 FSL / 2275 FWL / TWSP: 23S / RANGE: 34E / SECTION: 29 / LAT: 32.269251 / LONG: -103.493239 (TVD: 9062 feet, MD: 13637 feet)

#### **BLM Point of Contact**

Name: Priscilla Perez Title: Legal Instruments Examiner Phone: 5752345934 Email: pperez@blm.gov

(Form 3160-3, page 3)

#### **Review and Appeal Rights**

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

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#### U.S. Department of the Interior BUREAU OF LAND MANAGEMENT

## Application Data Report

100 m 10

08/31/2018

APD ID: 10400007991

Operator Name: CAZA OPERATING LLC

Well Name: COPPERLINE WEST 29 FEDERAL

Well Type: OIL WELL

Submission Date: 12/22/2017

Well Number: 7H Well Work Type: Drill NGNGDEHALSI NGNGDEHALSI NGNGDEHALSI

Show Final Text

Section 1 - General		
APD ID: 10400007991	Tie to previous NOS?	Submission Date: 12/22/2017
BLM Office: CARLSBAD	User: Tony B Sam	Title: VP Operations
Federal/Indian APD: FED	Is the first lease penetrate	ed for production Federal or Indian? FED
Lease number: NMNM092199	Lease Acres: 560	
Surface access agreement in place?	Allotted?	Reservation:
Agreement in place? NO	Federal or Indian agreem	ent:
Agreement number:		
Agreement name:		
Keep application confidential? NO		
Permitting Agent? YES	APD Operator: CAZA OPE	ERATING LLC
Operator letter of designation:		

**Operator Info** 

Operator Organization Name: CAZA OPERATING LLC

Operator Address: 200 N. Loraine Street, Suite 1550

**Operator PO Box:** 

Operator City: Midland State: TX

Zip: 79701

Operator Phone: (432)682-7424

**Operator Internet Address:** 

#### Section 2 - Well Information

Well in Master Development Plan? NO	Mater Development Plan name:	
Well in Master SUPO? NO	Master SUPO name:	
Well in Master Drilling Plan? NO	Master Drilling Plan name:	
Well Name: COPPERLINE WEST 29 FEDERAL	Well Number: 7H	Well API Number:
Field/Pool or Exploratory? Field and Pool	Field Name: BELL LAKE	Pool Name: AVALON

Is the proposed well in an area containing other mineral resources? USEABLE WATER

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 7H

Desc	ribe c	other	miner	als:															
Is the	e prop	osed	well i	in a H	elium	prod	uctio	n area?	N Use E	Existing W	ell Pa	d? YES	6 No	ew :	surface o	distur	bance	<b>?</b> Y	
Туре	e of W	ell Pa	d: MU	ILTIPL	E WE	ELL							EST NI	umt	<b>ber:</b> 3H				
Well	Class	: HOF	RIZON	ITAL						COPPERLINE 29 FEDERAL Number of Legs: 1									
Well	Work	Туре	: Drill																
Well	Type:	OIL	VELL																
Desc	ribe V	Veli T	ype:																
Well	sub-T	ype:	APPR	AISAL	_														
Desc	ribe s	ub-ty	pe:																
Dista	ance t	o tow	n: 18.	5 Mile	s		Dist	tance to	nearest v	<b>vell:</b> 50 FT	-	Dist	ance t	o le	ease line	: 130	FT		
Rese	ervoir	well s	pacin	ıg ass	ignec	d acre	s Me	asurem	ent: 160 A	cres									
Well	plat:	Co	pperli	ne_W	est_2	9_Fec	leral_	7H_C10	2_signed_	20180505	075530	).pdf							
Well	Vell plat:       Copperline_West_29_Federal_7H_C102_signed_20180505075530.pdf         Vell work start Date:       03/22/2018         Duration:       30 DAYS																		
	Sec	tion	3 - V	Vell	Loca	atior	n Tal	ble											
Surv	ey Tyj	be: RE	ECTAI	NGUL	AR														
Desc	ribe S	urvey	/ Туре	<b>:</b> :															
Datu	m: NA	D83							Vertic	al Datum:		88							
Surv	ey nui	nber:	16.11	.0555	i								x						
	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	DW	DVT	
SHL Leg #1	130	FNL	218 0	FWL	23S	34E	29	Aliquot NENW	32.28249 6	- 103.4935 68			NEW MEXI CO	S	STATE	353 9	0	0	
KOP Leg #1	130	FNL	218 0	FWL	23S	34E	29	Aliquot NENW	32.28249 6	- 103.4935 68	LEA		NEW MEXI CO	s	STATE	- 492 4	846 3	846 3	
PPP Leg #1	269	FNL	225 0	FWL	235	34E	29	Aliquot NENW		- 103.4933 64	LEA	1	NEW MEXI CO	S	STATE		890 0	886 0	

## FMSS **U.S. Department of the Interior**

**BUREAU OF LAND MANAGEMENT** 

## Drilling Plan Data Report 08/31/2018

and a fr

Submission Date: 12/22/2017

APD ID: 10400007991

**Operator Name: CAZA OPERATING LLC** 

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 7H

Well Type: OIL WELL

Well Work Type: Drill

#### Show Final Text

## **Section 1 - Geologic Formations**

Formation	····		True Vertical	Measured			Producing
D.	Formation Name	Elevation	Depth	Depth	Lithologies	Mineral Resources	Formation
1	RUSTLER	-2550	1013	1013		NONE	No
2	TOP SALT	-3763	1213	1213	SALT	NONE	No
3	BASE OF SALT	-7363	4813	4813		NONE	No
4	DELAWARE	-7656	5106	5106		OIL	No
5	CHERRY CANYON	-8353	5803	5803	<u></u>	NONE	No 1
6	BRUSHY CANYON	-9713	7163	7163		NONE	No
7	BONE SPRING	-11203	8653	8662		OIL	No
8	AVALON SAND	-11373	8823	8863		NATURAL GAS,OIL	Yes

## Section 2 - Blowout Prevention

Pressure Rating (PSI): 5M

Rating Depth: 15000

Equipment: Rotating head with a rating of 500psi will be used. A remote kill line and gas buster will be used

#### Requesting Variance? YES

Variance request: Variance is requested for the use of a coflex hose for the choke line to from the BOP to the choke manifold. A variance is requested to use 1502(15,000psi working pressure) hammer unions downstream of the Choke Manifold used to connect the mud/gas separator and panic line. See choke manifold diagram.

Testing Procedure: Minimum Working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the 13-3/8 inch casing shoe shall be 5000 (5M) psi. 5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips the minimum wait time before cut-off is eight hours after bumping the pug. BOP/BOPE testing can begin after cut-off or once cement reaches 500PSI compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified). The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 7H

exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (18 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater prior to initiating the test (see casing segment as lead cement may be critical item). a. The results of the test shall be reported to the appropriate BLM office. b. All Tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office. c. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug

#### **Choke Diagram Attachment:**

Copperline\_West\_29\_Federal\_7H\_Choke\_Schematic\_08-23-2017.docx

Copperline\_West\_29\_Fed\_7H\_Coflex\_Hose\_Cert\_20180505073325.pdf

#### **BOP Diagram Attachment:**

Copperline\_West\_29\_Federal\_7H\_BOP\_Schematic\_08-23-2017.docx

Section	3 -	Casing
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Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
	CONDUCT OR	26	20.0	NEW	API	N	0	120	0	120	-3539	-3419	120	H-40	94	STC						
2	SURFACE	17.5	13.375	NEW	API	N	0	1063	0	1063	-3539	-2550	1063	J-55	54.5	STC	2.3	1.3	DRY	8.87	DRY	14.7 3
	INTERMED IATE	12.2 5	9.625	NEW	API	N	0	3900	0	3900	-3539	361	3900	J-55	40	LTC	1.27	1.72	DRY	2.57	DRY	3.11
4	INTERMED IATE	12.2 5	9.625	NEW	API	N	3900	5056	3900	5056	361	1517	1156	HCL -80	40	LTC	1.61	1.34	DRY	18.1	DRY	19.8 2
	PRODUCTI ON	8.75	5.5	NEW	API	N	0	13637	0	9062	-3539	5523	13637	P- 110	17	BUTT	1.78	2.48	DRY	3.69	DRY	3.54

#### **Casing Attachments**

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 7H

Casing At	tachr	nents		•
Casing	) ID:	1	String Type: CONDUCTOR	
Inspec	tion	Document:		
Spec [	)ocu	ment:		
Tapere	ed Sti	ring Spec:		
Casing	) Des	ign Assump	tions and Worksheet(s):	
-	-	2 Document:	String Type: SURFACE	
inspec	uon	Document.		
Spec [	)ocu	ment:		
Tapere	ed Sti	ing Spec:		
Casing	) Des	ign Assump	tions and Worksheet(s):	
C	Сорре	erline_West_2	29_Federal_7H_Casing_and_Cement_Design_08-23-2017.pdf	
Casing	ID:	3	String Type: INTERMEDIATE	
Inspec	tion	Document:		
Spec [	)ocui	nent:		
Tapere	d Sti	ing Spec:		
Casing	Des	ign Assump	tions and Worksheet(s):	
C	орре	erline_West_2	29_Federal_7H_Casing_and_Cement_Design_08-23-2017.pdf	

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 7H

#### **Casing Attachments**

Casing ID: 4	String Type: INTERME	DIATE	
Inspection Do	ocument:		
Spec Docume	nt:		
-			

Casing Design Assumptions and Worksheet(s):

Copperline\_West\_29\_Federal\_7H\_Casing\_and\_Cement\_Design\_08-23-2017.pdf

Casing ID:5String Type: PRODUCTION

Inspection Document:

**Tapered String Spec:** 

**Spec Document:** 

Tapered String Spec:

#### Casing Design Assumptions and Worksheet(s):

Copperline\_West\_29\_Federal\_7H\_Casing\_and\_Cement\_Design\_08-23-2017.pdf

Section	Section 4 - Cement														
String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives				
INTERMEDIATE	Lead		0	0	0	0	0	0	0	NA	NA				

CONDUCTOR	Lead	0	120	75	1.93	13.5	1110	50	Class C	+ 4% bwoc Bentonite II + 2% bwoc Calcium Chloride + 0.25 lbs/sack
									1	Cello Flake + 0.005% bwoc Static Free + 0.005 gps FP- 6L

ν.

#### Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 7H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	763	315	1.93	13.5	608	50	Class C	4% bwoc Bentonite II + 2% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.005% bwoc Static Free + 0.005 gps FP- 6L
SURFACE	Tail		763	1063	166	1.34	14.8	215	50	Class C	1.5% bwoc Calcium Chloride + 0.005 Ibs/sack Static Free + 0.005 gps FP-6L
INTERMEDIATE	Lead		0	4565	1210	2.13	12.6	293	50	Class C	(35:65) + Poz (Fly Ash) + 4% bwoc Bentonite II + 5% bwoc MPA-5 + 0.25% bwoc FL-52 + 5 Ibs/sack LCM- 1 + 0.125 lbs/sack Cello Flake + 0.005 lbs/sack Static Free + 0.005 gps FP-6L + 1.2% bwoc Sodium Metasilicate + 5% bwow Sodium Chloride
INTERMEDIATE	Tail		4565	5065	220	1.33	14.8	293	. 50	Class C	none
PRODUCTION	Lead		0	8850	1550	2.38	11.8	3689	50	Class H	(50:50) + Poz (Fly Ash) + 10% bwoc Bentonite II + 5% bwow Sodium Chloride + 5 lbs/sack LCM-1 + 0.005 lbs/sack Static Free + 0.005 gps FP-6L
PRODUCTION	Tail		8850	1336 7	900	1.62	13.2	1458	50	Class H	(15:61:11) Poz (Fly Ash):Class H Cement:CSE-2 + 4% bwow Sodium Chloride + 3 lbs/sack LCM-1 + 0.6% bwoc FL-25 + 0.005 gps FP-6L + 0.005% bwoc Static

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 7H

#### Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

**Describe what will be on location to control well or mitigate other conditions:** Sufficient mud will be on location to control any abnormal conditions encountered. Such as but not limited to a kick, lost circulation and hole sloughing

**Describe the mud monitoring system utilized:** A Pason PVT system will be rigged up prior to spudding the well. A volume monitoring system that measures, calculates, and displays readings from the mud system on the rig to alert the rig crew of impending gas kicks and lost circulation issues. Components a) PVT Pit Bull monitor: Acts as the heart of the system, containing all the controls, switches, and alarms. Typically, it is mounted near the driller's console. b) Junction box: Provides a safe, convenient place for making the wiring connections. c) Mud probes: Measure the volume of drilling fluid in each individual tank. d) Flow sensor: Measures the relative amount of mud flowing in the return line.

#### **Circulating Medium Table**

Top Depth	Bottom Depth	Mud Type	Min Weight (Ibs/gal)	Max Weight (Ibs/gal)	Density (Ibs/cu ft)	Gel Strength (lbs/100 sqft)	Н	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
0	1063	SPUD MUD	8.4	8.9	66	0.12	9.5	10	0	0	
1063	5065	SALT SATURATED	9.8	10	75	0.1	9.5	2	150000	0	
5065	1363 7	WATER-BASED MUD	8.6	9.1	71	0.4	9.5	6	125000	18	Cut Brine

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 7H

#### Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

no production tests

List of open and cased hole logs run in the well: DS,MWD,MUDLOG

Coring operation description for the well:

no coring

1 - .

#### **Section 7 - Pressure**

Anticipated Bottom Hole Pressure: 3000

Anticipated Surface Pressure: 1050.8

Anticipated Bottom Hole Temperature(F): 149

Anticipated abnormal pressures, temperatures, or potential geologic hazards? NO

**Describe:** 

**Contingency Plans geoharzards description:** 

**Contingency Plans geohazards attachment:** 

Hydrogen Sulfide drilling operations plan required? NO

Hydrogen sulfide drilling operations plan:

#### **Section 8 - Other Information**

#### Proposed horizontal/directional/multi-lateral plan submission:

160803\_Copperline\_West\_29\_Fed\_7H\_Directional\_Plan\_08-23-2017.pdf

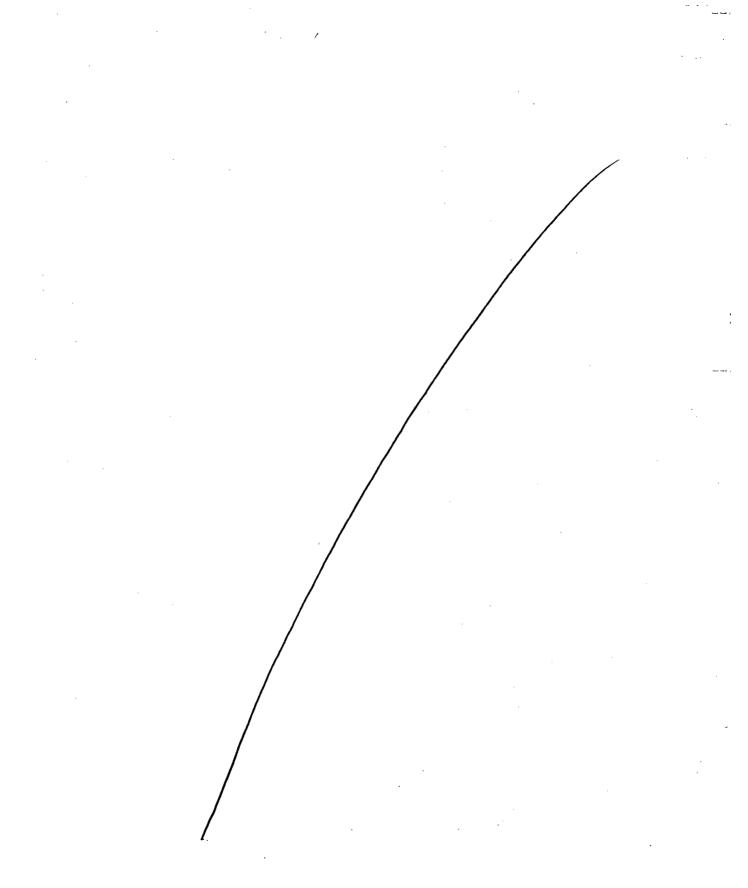
#### Other proposed operations facets description:

Gas Capture Plan H2S Plan

#### Other proposed operations facets attachment:

160803\_Copperline\_West\_29\_Fed\_7H\_Directional\_Plot\_08-23-2017.pdf Copperline\_West\_29\_Fed\_7H\_Gas\_Capture\_Plan\_20180505073524.pdf Copperline\_West\_29\_Fed\_7H\_H2S\_plan\_20180505073555.pdf

Other Variance attachment:



#### COPPER STATE RUBBER VISUAL INSPECTION / HYDROSTATIC TEST REPORT CHOKE & KILL HOSE 10,000 P.S.I. W/P X 15,000 P.S.I. T/P SPEC: 090-1915 HS H2S SUITABLE

SHOP ORDER NO .:	16454	SIZE:	4"	1.D.
SERIAL NO.:	22199	LENGTH _	50FT	IN.
CONNECTIONS:		<u>4-1/16" 10,000 PSI A</u> HT-X1840		
	. <u></u>			
	VISU	AL INSPECTION		
<ul> <li>(A) END CAPS / SLEE</li> <li>(B) EXTERIOR / COVI</li> <li>(C) INTERIOR TUBE:</li> </ul>		(	OK OK OK	
	HYDI	ROSTATIC TEST		
5 MIN. @ 10,000 P	SI	,		
2 MIN. @ 0 PSI		51'	OAL	
3 MIN. @ 15,000 PS	SI			
WITNESSED BY: DATE	November 20			
FORM QA-21- REV-2 3-22-00				

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a de Balanda de Santa		
- Miller A.		
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	ni in done.	
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	Copper State Rubber, Inc. Phoenix, Arizona	
	DATE 1/20/06	ZZEMMMAN
E E E E E E E E E E E E E E E E E E E	w.o18454	XIXIIII
E SCHERKIN	SERIAL 22199	XIIIM
	4" LD50'	KHAND
	LENGTH 50" TYPE OF ENDS 4-1/16" 10,000 PSI API FLANGES	E MARINE I I I I I I I I I I I I I I I I I I
	TYPE OF HOSE	
	CHOKE & KILL	

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13 3/8	surface	csg in a	17 1/2 inch hole.		<u>D</u>	esign Facto	SURFACE		
Segment	#/ft	Gra	de	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	54.50		J 55	ST&C	8.87	2.3	1.04	1,063	57,934
"B"								0	0
w/8.4#	/g mud, 30min S	ifc Csg Test psig	: 1,447	Tail Cmt	does not	circ to sfc.	Totals:	1,063	57,934
<u>Comparison o</u>	f Proposed to	Minimum Re	equired Cem	ent Volumes					
Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist
Size	Volume	Cmt Sx	CuFt Cmt	Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole-Cplg
17 1/2	0.6946	1109	2042	812	152	8.90	1514	2M	1.56
· · · · · · · · · · · · · · · · · · ·		· · · · ·	· · · · · · · · · · · · · · · · · · ·	• • • •	· ·	· · ·	· · ·		
95/8	casing in	side the	13 3/8	,	~ ~ ~ ~ ~ ~ ~	Design Fac	ctors	INTERN	<b>NEDIATE</b>
Segment	#/ft	Gra		Coupling	Joint	Collapse	Burst	Length	Weight
"A"	40.00		J 55	LT&C	2.57	1.27	0.92	3,900	156,000
"B"	40.00	HCL		LT&C	18,10	1.61	1.34	1,156	46,240
	/g mud, 30min S						Totals:	5,056	202,240
The Hole	e cement volu Annular	me(s) are inte 1 Stage	ended to ach	ieve a top of Min	0 1 Stage	ft from su Drilling	Calc	1063 Req'd	overlap. Min Dist
Size	Volume	Cmt Sx	CuFt Cmt	Cu Ft	% Excess	1 Mar 1 18/4	MASP	•	
40 414						Mud Wt	MAJF	BOPE	Hole-Cpl
12 1/4	0.3132	2034	4016	1655	143	10.00	2291	SOPE	Hole-Cplo 0.81
1	0.3132 ting Depths fo			1655					0.81
Set				1655			2291	3M	0.81
Set excess cmt	ting Depths fo t by stage % :	or D V Tool(s)	: 3100	1655			2291 <u>sum of sx</u>	<b>3Μ</b> <u>Σ CuFt</u>	0.81 Σ%excess
Set excess cmt Class 'C' tail cm	t <b>ing Depths fo</b> t by stage % : it yld > 1.35	or D V Tool(s) 191	: 3100 44		143		2291 <u>sum of sx</u>	<b>3Μ</b> <u>Σ CuFt</u>	0.81 Σ%excess
Set excess cmt Class 'C' tail cm	t <b>ing Depths fo</b> t by stage % : it yld > 1.35	or D V Tool(s) 191 ment(s): A, B	: 3100 44		143		2291 sum of sx 1636	<b>3Μ</b> <u>Σ CuFt</u>	0.81 Σ%excess 100
Set excess cmt Class 'C' tail cm Burst Frac Grad	ting Depths fo t by stage % : it yld > 1.35 dient(s) for Seg	or D V Tool(s) 191 ment(s): A, B	: <b>3100</b> 44 , C, D = 1.01, <b>9 5/8</b>		143	10.00	2291 sum of sx 1636	3M ΣCuFt 3309	0.81 Σ%excess 100
Set excess cmt Class 'C' tail cm Burst Frac Grad 5 1/2	ting Depths fo t by stage % : it yld > 1.35 dient(s) for Seg casing in	or D V Tool(s) 191 ment(s): A, B side the Gra	: <b>3100</b> 44 , C, D = 1.01, <b>9 5/8</b>	b, c, d All > (	143	10.00 Design Fa	2291 <u>sum of sx</u> 1636 <u>ctors</u> P	3M Σ CuFt 3309 RODÚCTIO	0.81 Σ%excess 100 N Weight
Set excess cmt Class 'C' tail cm Burst Frac Grad 5 1/2 Segment	ting Depths fo t by stage % : it yld > 1.35 dient(s) for Seg casing in #/ft	or D V Tool(s) 191 ment(s): A, B side the Gra	: 3100 44 , C, D = 1.01, 9 5/8 de	b, c, d All > ( Coupling	143 0.70, ок. Во <b>ду</b>	10.00 <u>Design Fac</u> Collapse	2291 sum of sx 1636 ctors P Burst	3M ∑CuFt 3309 RODUCTIO Length	0.81 Σ%excess 100 N Weight
Set excess cmt Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" <b>"B"</b>	ting Depths fo t by stage % : it yld > 1.35 dient(s) for Seg casing in #/ft 20.00	or D V Tool(s) 191 side the Gra F	: 3100 44 , C, D = 1.01, 9 5/8 9 6 9 110 9 110	b, c, d All > 0 <b>Coupling</b> BUTT	143 .70, ОК. Во <b>ду</b> 3.54	10.00 <u>Design Fac</u> Collapse 2.63	2291 sum of sx 1636 ctors P Burst 2.95	3M ∑ CuFt 3309 RODÚCTIO Length 8,900	0.81 Σ%excess 100 N Weight 178,000 94,740
Set excess cmt Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" <b>"B"</b>	ting Depths fo t by stage % : it yld > 1.35 dient(s) for Seg casing in #/ft 20.00 20.00 /g mud, 30min S	or D V Tool(s) 191 side the Gra F ifc Csg Test psig	: 3100 44 , C, D = 1.01, 9 5/8 de 2 110 2 110 : 1,958	b, c, d All > 0 <b>Coupling</b> BUTT	143 .70, ОК. Во <b>ду</b> 3.54	10.00 <u>Design Fa</u> <u>Collapse</u> 2.63 2.10	2291 <u>sum of sx</u> 1636 <u>ctors</u> P Burst 2.95 2.95	3M Σ CuFt 3309 RODÚCTIO Length 8,900 4,737 13,637	0.81 Σ%excess 100 N Weight 178,000 94,740 272,740
Set excess cml Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B" w/8.4# B	ting Depths for t by stage % : it yld > 1.35 dient(s) for Seg casing in #/ft 20.00 20.00 /g mud, 30min S Segm	nr D V Tool(s) 191 side the Gra F Sifc Csg Test psig ient Design	: 3100 44 , C, D = 1.01, 9 5/8 de 2 110 2 110 : 1,958	b, c, d All > 0 Coupling BUTT BUTT	143 .70, OK Body 3.54 5.17	10.00 <u>Design Fa</u> <u>Collapse</u> 2.63 2.10	2291 <u>sum of sx</u> 1636 <u>ctors</u> P Burst 2.95 2.95 2.95 Totals:	3M Σ CuFt 3309 RODÚCTIO Length 8,900 4,737 13,637	0.81 Σ%excess 100 N Weight 178,000 94,740 272,740
Set excess cml Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B" w/8.4# B No Pi	ting Depths for t by stage % : it yld > 1.35 dient(s) for Seg casing in #/ft 20.00 20.00 /g mud, 30min S Segm ilot Hole Pla	or D V Tool(s) 191 side the Gra F Sife Csg Test psig Sife Csg Test psig Sife Csg Test psig Sife Csg Test psig	: 3100 44 , c, D = 1.01, 9 5/8 de 2 110 9 110 9 110 9 110 9 13637	b, c, d All > 0 Coupling BUTT BUTT BUTT would be: Max VTD 9065	143 0.70, ОК. Воду 3.54 5.17 194.27	10.00 <u>Design Fac</u> <u>Collapse</u> 2.63 2.10 2.59 Curve KOP 8900	2291 <u>sum of sx</u> 1636 <b>Ctors P</b> <b>Burst</b> 2.95 <b>2.95</b> Totals: if it were a Dogleg <sup>o</sup> 91	3M ∑ CuFt 3309 RODUCTIO Length 8,900 4,737 13,637 vertical we Severity° 17	0.81 Σ%excess 100 N Weight 178,000 94,740 272,740 illbore. MEOC 9420
Set excess cmt Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B" w/8.4# B No Pi	ting Depths for t by stage % : it yld > 1.35 dient(s) for Seg casing in #/ft 20.00 20.00 /g mud, 30min S Segm ilot Hole Pla e cement volue	r D V Tool(s) 191 side the Gra F Sife Csg Test psig ent Design nned me(s) are inter	: 3100 44 , C, D = 1.01, 9 5/8 de 2 110 2 110 2 110 3 1,958 5 Factors MTD 13637 ended to ach	b, c, d All > C Coupling BUTT BUTT BUTT would be: Max VTD 9065 ieve a top of	143 .70, ОК. Воду 3.54 5.17 194.27 Сsg VD 9065 0	10.00 <u>Design Fac</u> Collapse 2.63 2.10 2.59 Curve KOP 8900 ft from su	2291 sum of sx 1636 ctors P Burst 2.95 2.95 2.95 Totals: if it were a Dogleg <sup>o</sup> 91 urface or a	3M ∑ CuFt 3309 RODUCTIO Length 8,900 4,737 13,637 vertical we Severity° 17 5056	0.81 Σ%excess 100 N Weight 178,000 94,740 272,740 272,740 Ulbore. MEOC 9420 overlap.
Set excess cmt Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B" w/8.4# B No Pi The Hole	ting Depths for t by stage % : it yld > 1.35 dient(s) for Seg casing in #/ft 20.00 20.00 20.00 /g mud, 30min S Segm ilot Hole Pla e cement volu Annular	or D V Tool(s) 191 side the Gra F Side Csg Test psig ent Design nned me(s) are into 1 Stage	: 3100 44 , C, D = 1.01, 9 5/8 0 5/8 110 110 13637 ended to ach 1 Stage	b, c, d All > C Coupling BUTT BUTT BUTT would be: Max VTD 9065 ieve a top of Min	143 	10.00 Design Fac Collapse 2.63 2.10 2.59 Curve KOP 8900 ft from su Drilling	2291 sum of sx 1636 ctors P Burst 2.95 2.95 Totals: if it were a Dogleg° 91 urface or a Calc	3M ∑ CuFt 3309 RODÚCTIO Length 8,900 4,737 13,637 vertical we Severity° 17 5056 Req'd	0.81 Σ%excess 100 N Weight 178,000 94,740 272,740 272,740 Ilbore. MEOC 9420 overlap. Min Dist
Set excess cml Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B" w/8.4# B No Pi The	ting Depths for t by stage % : it yld > 1.35 dient(s) for Seg casing in #/ft 20.00 20.00 /g mud, 30min S Segm ilot Hole Pla e cement volue	r D V Tool(s) 191 side the Gra F Sife Csg Test psig ent Design nned me(s) are inter	: 3100 44 , C, D = 1.01, 9 5/8 de 2 110 2 110 2 110 3 1,958 5 Factors MTD 13637 ended to ach	b, c, d All > C Coupling BUTT BUTT BUTT would be: Max VTD 9065 ieve a top of Min	143 .70, ОК. Воду 3.54 5.17 194.27 Сsg VD 9065 0	10.00 <u>Design Fac</u> Collapse 2.63 2.10 2.59 Curve KOP 8900 ft from su	2291 sum of sx 1636 ctors P Burst 2.95 2.95 2.95 Totals: if it were a Dogleg <sup>o</sup> 91 urface or a	3M ∑ CuFt 3309 RODUCTIO Length 8,900 4,737 13,637 vertical we Severity° 17 5056	Σ%excess 100 N Weight 178,000 94,740 272,740 272,740 Ulbore. MEOC 9420 overlap.

#### In a Lesser Prairie-Chicken section.

In a Lesser Prairie-Chick	en section.
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13 3/8			inch hole.	<u>D</u>	esign Facto	SURFACE		
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	54.50	J 55	ST&C	8.87	2.3	1.04	1,063	57,934
" <b>B</b> "		· · · · · · · · · · · · · · · ·	• • • • • • • •				0	0
w/8.4#	/g mud, 30min s	Sfc Csg Test psig: 1,447	Tail Cmt	does not	circ to sfc.	Totals:	1,063	57,934
comparison o	f Proposed to	Minimum Required Cer	ment Volumes					
Hole	Annular	1 Stage 1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist
Size	Volume	Cmt Sx CuFt Cm	nt 🛛 Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole-Cplg
17 1/2	0.6946	<b>1109</b> 2042	812	152	8.90	1514	2M	1.56
						·		 
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9 5/8	casing in			<b>-</b>	Design Fa	ctors	INTERN	NEDIATE
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	40.00	J 55	LT&C	2.57	1.27	0.92	3,900	156,000
"B"	40.00	HCL 80	LT&C	18.10	1.61	1.34	1,156	46,240
w/8.4#	/g mud, 30min 9	Sfc Csg Test psig: 1,063				Totals:	5,056	202,240
Hole	Annular	me(s) are intended to ac 1 Stage 1 Stage	Min	0 1 Stage % Excess	ft from su Drilling Mud Wt	Calc	1063 Req'd	
Hole Size	Annular Volume	1 Stage 1 Stage Cmt Sx CuFt Cm	Min nt Cu Ft	1 Stage % Excess	Drilling Mud Wt	Caic MASP	Req'd BOPE	Min Dist
Hole Size 12 1/4	Annular Volume 0.3132	1 Stage1 StageCmt SxCuFt Cm20344016	Min	1 Stage	Drilling	Calc	Req'd	Min Dist Hole-Cplo 0.81
Hole Size 12 1/4 Set	Annular Volume 0.3132	1 Stage         1 Stage           Cmt Sx         CuFt Cm           2034         4016	Min nt Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP 2291	Req'd BOPE 3M	Min Dist Hole-Cplo 0.81
Hole Size 12 1/4 Set excess cmt	Annular Volume 0.3132 ting Depths fo	1 Stage         1 Stage           Cmt Sx         CuFt Cm           2034         4016           or D V Tool(s):         3100	Min nt Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP 2291 sum of sx	Req'd BOPE 3Μ Σ CuFt	Min Dist Hole-Cpl 0.81 Σ%excess
Hole Size 12 1/4 Set excess cmt lass 'C' tail cm	Annular Volume 0.3132 ting Depths fo by stage % it yld > 1.35	1 Stage         1 Stage           Cmt Sx         CuFt Cm           2034         4016           or D V Tool(s):         3100	Min nt Cu Ft 1655	1 Stage % Excess 143	Drilling Mud Wt	Calc MASP 2291 sum of sx	Req'd BOPE 3Μ Σ CuFt	Min Dist Hole-Cpl 0.81 Σ%excess
Hole Size 12 1/4 Set excess cmt lass 'C' tail cm surst Frac Grac	Annular Volume 0.3132 ting Depths for by stage % it yld > 1.35 dient(s) for Seg	1 Stage         1 Stage           Cmt Sx         CuFt Cm           2034         4016           or D V Tool(s):         3100           191         44           gment(s):         A, B, C, D = 1.01	Min nt Cu Ft 1655	1 Stage % Excess 143	Drilling Mud Wt 10.00	Calc MASP 2291 sum of sx 1636	Req'd BOPE 3M Σ CuFt 3309	Min Dist Hole-Cplo 0.81 Σ%excess 100
Hole Size 12 1/4 Set excess cmt lass 'C' tail cm uurst Frac Grac 5 1/2	Annular Volume 0.3132 ting Depths for by stage % it yld > 1.35 dient(s) for Seg casing in	1 Stage         1 Stage           Cmt Sx         CuFt Cm           2034         4016           or D V Tool(s):         3100           191         44           gment(s):         A, B, C, D = 1.01           uside the         9 5/8	Min t Cu Ft 1655	1 Stage % Excess 143 0.70, Ок.	Drilling Mud Wt 10.00 <u>Design Fac</u>	Calc MASP 2291 sum of sx 1636 <u>ctors</u> P	Req'd BOPE 3M Σ CuFt 3309 RODUCTIO	Min Dist Hole-Cplg 0.81 Σ%excess 100
Hole Size 12 1/4 Set excess cmt lass 'C' tail cm urst Frac Grac 5 1/2 Segment	Annular Volume 0.3132 ting Depths for by stage % it yld > 1.35 dient(s) for Seg casing in #/ft	1 Stage         1 Stage           Cmt Sx         CuFt Cm           2034         4016           or D V Tool(s):         3100           191         44           gment(s):         A, B, C, D = 1.01           iside the         9 5/8           Grade	Min t Cu Ft 1655 1, b, c, d All > ( Coupling	1 Stage % Excess 143 0.70, Ок. Воdy	Drilling Mud Wt 10.00 <u>Design Fac</u> Collapse	Calc MASP 2291 sum of sx 1636 <u>ctors</u> P Burst	Req'd BOPE 3M Σ CuFt 3309 RODUCTIO Length	Min Dist Hole-Cplg 0.81 Σ%excess 100 N Weight
Hole Size 12 1/4 Set excess cmt lass 'C' tail cm urst Frac Grac 5 1/2 Segment "A"	Annular Volume 0.3132 ting Depths for t by stage % it yld > 1.35 dient(s) for Seg casing in #/ft 20.00	1 Stage         1 Stage           Cmt Sx         CuFt Cm           2034         4016           or D V Tool(s):         3100           191         44           gment(s):         A, B, C, D = 1.01           uside the         9 5/8           Grade         P 110	Min Cu Ft 1655 1, b, c, d All > ( Coupling BUTT	1 Stage % Excess 143 0.70, ОК Воdу 3.54	Drilling Mud Wt 10.00 <u>Design Fac</u> Collapse 2.63	Calc MASP 2291 sum of sx 1636 <u>ctors</u> P Burst 2.95	Req'd BOPE 3M Σ CuFt 3309 RODUCTIO Length 8,900	Min Dist Hole-Cplo 0.81 Σ%excess 100 N Weight 178,000
Hole Size 12 1/4 Set excess cmt lass 'C' tail cm turst Frac Grac 5 1/2 Segment "A" "B"	Annular Volume 0.3132 ting Depths for by stage % it yld > 1.35 dient(s) for Seg casing in #/ft 20.00 20.00	1 Stage         1 Stage           Cmt Sx         CuFt Cm           2034         4016           or D V Tool(s):         3100           191         44           gment(s):         A, B, C, D = 1.01           uside the         9 5/8           Grade           P 110           P 110	Min t Cu Ft 1655 1, b, c, d All > ( Coupling	1 Stage % Excess 143 0.70, Ок. Воdy	Drilling Mud Wt 10.00 <u>Design Fac</u> Collapse	Calc MASP 2291 <u>sum of sx</u> 1636 <u>ctors</u> P Burst 2.95 2.95	Req'd           BOPE           3M           ∑ CuFt           3309	Min Dist Hole-Cplo 0.81 Σ%excess 100 N Weight 178,000 94,740
Hole Size 12 1/4 Set excess cmt lass 'C' tail cm turst Frac Grac 5 1/2 Segment "A" "B" w/8.4#,	Annular Volume 0.3132 ting Depths for by stage % it yld > 1.35 dient(s) for Seg casing in #/ft 20.00 20.00 /g mud, 30min S	1 Stage         1 Stage           Cmt Sx         CuFt Cm           2034         4016           or D V Tool(s):         3100           191         44           gment(s):         A, B, C, D = 1.01           uside the         9 5/8           Grade         P 110           P 110         Sfc Csg Test psig:           10         Sfc Csg Test psig:	Min t Cu Ft 1655 1, b, c, d All > ( Coupling BUTT BUTT	1 Stage % Excess 143 0.70, OK. Body 3.54 5.17	Drilling Mud Wt 10.00 <u>Design Fac</u> Collapse 2.63 2.10	Calc MASP 2291 <u>sum of sx</u> 1636 <u>ctors</u> P Burst 2.95 2.95 2.95 Totals:	Req'd           BOPE           3M           ∑ CuFt           3309   RODUCTIO           Length           8,900           4,737           13,637	Min Dist Hole-Cplo 0.81 Σ%excess 100 N Weight 178,000 94,740 272,740
Hole Size 12 1/4 Set excess cmt lass 'C' tail cm burst Frac Grac 5 1/2 Segment "A" "B" w/8.4#, B	Annular Volume 0.3132 ting Depths for by stage % it yld > 1.35 dient(s) for Seg casing in #/ft 20.00 20.00 /g mud, 30min S Segm	1 Stage         1 Stage           Cmt Sx         CuFt Cm           2034         4016           or D V Tool(s):         3100           191         44           gment(s):         A, B, C, D = 1.01           uside the         9 5/8           Grade           P         110           P 110           Sfc Csg Test psig:         1,958           hent Design         Factors	Min t Cu Ft 1655 1, b, c, d All > ( Coupling BUTT BUTT	1 Stage % Excess 143 0.70, ОК Воdу 3.54	Drilling Mud Wt 10.00 <u>Design Fac</u> Collapse 2.63 2.10	Calc MASP 2291 <u>sum of sx</u> 1636 <u>ctors</u> P Burst 2.95 2.95	Req'd           BOPE           3M           Σ CuFt           3309   RODUCTIO Length 8,900 4,737 13,637 vertical we	Min Dist Hole-Cplo 0.81 Σ%excess 100 N Weight 178,000 94,740 272,740
Hole Size 12 1/4 Set excess cmt lass 'C' tail cm burst Frac Grac 5 1/2 Segment "A" "B" w/8.4#, B	Annular Volume 0.3132 ting Depths for by stage % it yld > 1.35 dient(s) for Seg casing in #/ft 20.00 20.00 /g mud, 30min S	1 Stage         1 Stage           Cmt Sx         CuFt Cm           2034         4016           or D V Tool(s):         3100           191         44           gment(s):         A, B, C, D = 1.01           uside the         9 5/8           Grade           P         110           P 110           Sfc Csg Test psig:         1,958           hent Design         Factors	Min t Cu Ft 1655 1, b, c, d All > ( Coupling BUTT BUTT BUTT s would be: Max VTD	1 Stage % Excess 143 0.70, ОК. Воду 3.54 5.17 194.27	Drilling Mud Wt 10.00 Design Fac Collapse 2.63 2.10 2.59	Calc MASP 2291 sum of sx 1636 ctors P Burst 2.95 2.95 2.95 Totals: if it were a	Req'd           BOPE           3M           ∑ CuFt           3309   RODUCTIO           Length           8,900           4,737           13,637	Min Dist Hole-Cplg 0.81 Σ%excess 100 N Weight 178,000 94,740 272,740 Ilbore. MEOC
Hole Size 12 1/4 Set excess cmt Class 'C' tail cm Burst Frac Grac 5 1/2 Segment "A" "B" w/8.4#, B No Pi	Annular Volume 0.3132 ting Depths for t by stage % it yld > 1.35 dient(s) for Seg casing in #/ft 20.00 20.00 /g mud, 30min S Segm ilot Hole Pla	1 Stage         1 Stage           Cmt Sx         CuFt Cm           2034         4016           or D V Tool(s):         3100           191         44           gment(s):         A, B, C, D = 1.01           uside the         9 5/8           Grade         P 110           P 110         P 110           Stc Csg Test psig:         1,958           hent Design         Factors           MTD         MTD	Min t Cu Ft 1655 1, b, c, d All > 0 Coupling BUTT BUTT BUTT S would be: Max ∨TD 9065	1 Stage % Excess 143 0.70, ОК. Воду 3.54 5.17 194.27 Сsg VD	Drilling Mud Wt 10.00 Design Fac Collapse 2.63 2.10 2.59 Curve KOP	Calc MASP 2291 sum of sx 1636 <u>ctors</u> P Burst 2.95 2.95 2.95 Totals: if it were a Dogleg <sup>o</sup> 91	Req'd           BOPE           3M           Σ CuFt           3309           RODUCTIO           Length           8,900           4,737           13,637           vertical we Severity°	Min Dist Hole-Cplg 0.81 Σ%excess 100 <b>Weight</b> 178,000 <b>94,740</b> 272,740 Ilbore. MEOC 9420
Hole Size 12 1/4 Set excess cmt Class 'C' tail cm Burst Frac Grac 5 1/2 Segment "A" "B" w/8.4#, B No Pi	Annular Volume 0.3132 ting Depths for t by stage % it yld > 1.35 dient(s) for Seg casing in #/ft 20.00 20.00 /g mud, 30min S Segm ilot Hole Pla	1 Stage         1 Stage           Cmt Sx         CuFt Cm           2034         4016           or D V Tool(s):         3100           191         44           gment(s): A, B, C, D = 1.01           iside the         9 5/8           Grade           P 110           P 110           Stc Csg Test psig:         1,958           nent Design         Factors           inned         MTD           13637	Min Cu Ft 1655 1, b, c, d All > 0 Coupling BUTT BUTT BUTT s would be: Max VTD 9065 chieve a top of	1 Stage % Excess 143 0.70, OK. Body 3.54 5.17 194.27 Csg VD 9065	Drilling Mud Wt 10.00 Design Fac Collapse 2.63 2.10 2.59 Curve KOP 8900	Calc MASP 2291 sum of sx 1636 <u>ctors</u> P Burst 2.95 2.95 2.95 Totals: if it were a Dogleg <sup>o</sup> 91	Req'd           BOPE           3M           Σ CuFt           3309           RODUCTIO           Length           8,900           4,737           13,637           vertical we           Severity°           17           5056	Min Dist Hole-Cplg 0.81 Σ%excess 100 N Weight 178,000 94,740 272,740 Ilbore. MEOC 9420 overlap.
Hole Size 12 1/4 Set excess cmt Class 'C' tail cm burst Frac Grac 5 1/2 Segment "A" "B" w/8.4#, B No Pi The	Annular Volume 0.3132 ting Depths for by stage % it yld > 1.35 dient(s) for Seg casing in #/ft 20.00 20.00 /g mud, 30min S Segr ilot Hole Pla cement volu	1 Stage1 StageCmt SxCuFt Cm20344016or D V Tool(s):310019144gment(s): A, B, C, D = 1.01iside the9 5/8GradeP 110P 110Stc Csg Test psig:1,958nent DesignFactorsinnedMTD13637me(s) are intended to action	Min Cu Ft 1655 1, b, c, d All > 0 Coupling BUTT BUTT BUTT S would be: Max VTD 9065 Chieve a top of Min	1 Stage % Excess 143 0.70, OK. 	Drilling Mud Wt 10.00 Design Fac Collapse 2.63 2.10 2.59 Curve KOP 8900 ft from su	Calc MASP 2291 sum of sx 1636 Ctors P Burst 2.95 2.95 2.95 Totals: if it were a v Dogleg° 91 urface or a	Req'd           BOPE           3M           Σ CuFt           3309           RODUCTIO           Length           8,900           4,737           13,637           vertical we severity°           17	Min Dist Hole-Cplg 0.81 Σ%excess 100 <b>Weight</b> 178,000 <b>94,740</b> 272,740 Ilbore. MEOC 9420 <b>overlap.</b> Min Dist
Hole Size 12 1/4 Set excess cmt class 'C' tail cm Burst Frac Grac 5 1/2 Segment "A" "B" w/8.4#, B No Pi The Hole	Annular Volume 0.3132 ting Depths for by stage % it yld > 1.35 dient(s) for Seg casing in #/ft 20.00 20.00 /g mud, 30min S Segr ilot Hole Pla cement volu Annular	1 Stage1 StageCmt SxCuFt Cm20344016or D V Tool(s):310019144gment(s): A, B, C, D = 1.01iside the9 5/8GradeP 110P 110Stc Csg Test psig:1,958nent DesignFactorsinned13637me(s) are intended to ac1 Stage1 Stage	Min Cu Ft 1655 1, b, c, d All > 0 Coupling BUTT BUTT BUTT S would be: Max VTD 9065 Chieve a top of Min	1 Stage % Excess 143 0.70, OK. Body 3.54 5.17 194.27 Csg ∨D 9065 0 1 Stage	Drilling Mud Wt 10.00 Design Fac Collapse 2.63 2.10 2.59 Curve KOP 8900 ft from su Drilling	Calc MASP 2291 sum of sx 1636 Ctors P Burst 2.95 2.95 Totals: if it were a Dogleg <sup>o</sup> 91 Inface or a Calc	Req'd           BOPE           3M           ∑ CuFt           3309 <b>RODUCTIO</b> Length 8,900 4,737 13,637 vertical we Severity° 17 5056 Req'd	Min Dist Hole-Cplg 0.81 Σ%excess 100 N Weight 178,000 94,740 272,740 Ilbore. MEOC 9420 overlap. Min Dist
Hole Size 12 1/4 Set excess cmt Class 'C' tail cm Burst Frac Grac 5 1/2 Segment "A" "B" w/8.4#, B No Pi The Hole Size	Annular Volume 0.3132 ting Depths for t by stage % it yld > 1.35 dient(s) for Seg casing in #/ft 20.00 20.00 /g mud, 30min S Segm flot Hole Pla cement volu Annular Volume 0.2526	1 Stage1 StageCmt SxCuFt Cm20344016or D V Tool(s):310019144gment(s): A, B, C, D = 1.01uside the9 5/8GradeP 110P 110P 110Sfc Csg Test psig:1,958nent DesignFactorsinnedMTD13637me(s) are intended to ac1 Stage1 StageCmt SxCuFt Cm	Min t Cu Ft 1655 1, b, c, d All > 0 Coupling BUTT BUTT BUTT S would be: Max VTD 9065 chieve a top of Min t Cu Ft	1 Stage % Excess 143 0.70, OK. Body 3.54 5.17 194.27 Csg ∨D 9065 0 1 Stage % Excess	Drilling Mud Wt 10.00 Design Fac Collapse 2.63 2.10 2.59 Curve KOP 8900 ft from su Drilling Mud Wt	Calc MASP 2291 sum of sx 1636 Ctors P Burst 2.95 2.95 Totals: if it were a Dogleg <sup>o</sup> 91 Inface or a Calc	Req'd           BOPE           3M           ∑ CuFt           3309 <b>RODUCTIO</b> Length 8,900 4,737 13,637 vertical we Severity° 17 5056 Req'd	Min Dist Hole-Cplg 0.81 Σ%excess 100 <b>Weight</b> 178,000 <b>94,740</b> 272,740 Ilbore. MEOC 9420 <b>overlap.</b> Min Dist Hole-Cplg

#### In a Lesser Prairie-Chicken section.

	surface of		17 1/2			esign racio	n Factors		SURFACE	
Segment	#/ft	Gra	and the second second	Coupling	Joint	Collapse	Burst	Length	Weight	
"A"	54.50	•	J 55	ST&C	8.87	2.3	1.04	1,063	57,934	
"B"								0	0	
w/8.4#	#/g mud, 30min Sf	fc Csg Test psig	: 1,447	Tail Cmt	does not	circ to sfc.	Totals:	1,063	57,934	
Comparison o	of Proposed to	Minimum Re	equired Cem	ent Volumes						
Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist	
Size	Volume	Cmt Sx	a CuFt Cmt	Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole-Cplg	
17 1/2	0.6946	1109	2042	812	152	8.90	1514	2M	1.56	
									: :	
					,	, , , , , , , , , , , , , , , , , , ,	• - • - • - • - •	, , , , , , , , , , , , , , , , , , ,		
95/8	casing ins		13 3/8			<u>Design Fa</u>	to the financiants into the second second terms		MEDIATE	
Segment	#/ft	Gra	<ul> <li>A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 - A 1 -</li></ul>	Coupling	Joint	Collapse	Burst	Length	Weight	
"A"	40.00		J 55	LT&C	2.57	1.27	0.92	3,900	156,000	
"B"	40.00	HCL	. 80	LT&C	18.10	1.61	1.34	1,156	<b>46,240</b> 202,240	
	ŧ/g mud, 30min Sf						Totals:	5,056	,	
The	e cement volun	ne(s) are inte	ended to ach	ieve a top of	. 0	ft from su	Inface or a	1063	overlap.	
Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist	
Size								i toq u	i min bist	
JIZE	Volume	Cmt Sx	CuFt Cmt	Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole-Cpl	
12 1/4	Volume 0.3132	Cmt Sx 2034	CuFt Cmt 4016	Cu Ft 1655	% Excess 143			•	Hole-Cplg 0.81	
12 1/4 Set	0.3132 tting Depths for	2034	4016 : <b>3100</b>	·		Mud Wt	MASP	<b>ΒΟΡΕ</b> <b>3Μ</b> <u>Σ CuFt</u>	Hole-Cplg 0.81 Σ%excess	
12 1/4 Set excess cm	0.3132 tting Depths for t by stage % :	2034	4016	·		Mud Wt	MASP 2291	BOPE 3M	Hole-Cplg 0.81	
12 1/4 Set excess cm Class 'C' tail cm	0.3132 tting Depths for t by stage % nt yld > 1.35	<b>2034</b> r D V Tool(s) 191	4016 : 3100 44	1655	143	Mud Wt	MASP 2291 sum of sx	<b>ΒΟΡΕ</b> <b>3Μ</b> <u>Σ CuFt</u>	Hole-Cplg 0.81 Σ%excess	
12 1/4 Set excess cm lass 'C' tail cm	0.3132 tting Depths for t by stage % :	<b>2034</b> r D V Tool(s) 191	4016 : 3100 44	1655	143	Mud Wt	MASP 2291 sum of sx	<b>ΒΟΡΕ</b> <b>3Μ</b> <u>Σ CuFt</u>	Hole-Cplg 0.81 Σ%excess	
12 1/4 Set excess cm lass 'C' tail cm urst Frac Grad 5 1/2	0.3132 tting Depths for t by stage % it yld > 1.35 dient(s) for Segr casing ins	2034 r D V Tool(s) 191 nent(s): A, B side the	4016 : 3100 44 , C, D = 1.01, 9 5/8	1655 b, c, d All > (	143 0.70, OK.	Mud Wt 10.00 Design Fa	MASP 2291 <u>sum of sx</u> 1636	<b>ΒΟΡΕ</b> <b>3Μ</b> <u>Σ CuFt</u>	Hole-Cpl 0.81 Σ%excess 100	
12 1/4 Set excess cm class 'C' tail cm burst Frac Grad 5 1/2 Segment	0.3132 tting Depths for t by stage %: nt yld > 1.35 dient(s) for Segr casing ins #/ft	2034 r D V Tool(s) 191 nent(s): A, B side the Gra	4016 : 3100 44 , C, D = 1.01, 9 5/8 ide	1655 b, c, d All > ( Coupling	143 0.70, ок. Воdy	Mud Wt 10.00 <u>Design Fa</u> Collapse	MASP 2291 sum of sx 1636 ctors P Burst	BOPE 3M Σ CuFt 3309 RODUCTIO Length	Hole-Cplg 0.81 Σ%excess 100 N Weight	
12 1/4 Set excess cm lass 'C' tail cm wrst Frac Grad 5 1/2 Segment "A"	0.3132 tting Depths for t by stage %: nt yld > 1.35 dient(s) for Segr casing ins #/ft 20.00	2034 r D V Tool(s) 191 nent(s): A, B side the Gra	4016 : 3100 44 , C, D = 1.01, 9 5/8 ide 2 110	1655 b, c, d All > ( Coupling BUTT	143 0.70, ОК. Воdy 3.54	Mud Wt 10.00 Design Fa Collapse 2.63	MASP 2291 sum of sx 1636 ctors P Burst 2.95	BOPE 3M Σ CuFt 3309 RODUCTIO Length 8,900	Hole-Cplg 0.81 Σ%excess 100 N Weight 178,000	
12 1/4 Set excess cm class 'C' tail cm burst Frac Grad 5 1/2 Segment "A" "B"	0.3132 tting Depths for t by stage % it yld > 1.35 dient(s) for Segr casing ins #/ft 20.00 20.00	2034 r D V Tool(s) 191 ment(s): A, B side the Gra F	4016 : 3100 44 , C, D = 1.01, 9 5/8 de 110 110	1655 b, c, d All > ( Coupling	143 0.70, ок. Воdy	Mud Wt 10.00 <u>Design Fa</u> Collapse	MASP 2291 sum of sx 1636 <u>ctors</u> P Burst 2.95 2.95	BOPE 3M ∑ CuFt 3309 RODUCTIO Length 8,900 4,737	Hole-Cpl 0.81 Σ%excess 100 N Weight 178,000 94,740	
12 1/4 Set excess cm class 'C' tail cm urst Frac Grad 5 1/2 Segment "A" "B" w/8.4#	0.3132 tting Depths for t by stage % : it yld > 1.35 dient(s) for Segr casing ins #/ft 20.00 20.00 //g mud, 30min Sf	2034 r D V Tool(s) 191 side the Gra F c Csg Test psig	4016 <b>3100</b> 44 , C, D = 1.01, <b>9 5/8</b> <b>10</b> <b>110</b> <b>110</b> <b>130</b> <b>110</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>130</b> <b>1</b>	1655 b, c, d All > ( Coupling BUTT BUTT	143 0.70, ОК. Воду 3.54 5.17	Mud Wt 10.00 Design Fa Collapse 2.63 2.10	MASP 2291 sum of sx 1636 <u>ctors</u> P Burst 2.95 2.95 2.95 Totals:	BOPE 3M Σ CuFt 3309 RODUCTIO Length 8,900 4,737 13,637	Hole-Cpl 0.81 Σ%excess 100 N Weight 178,000 94,740 272,740	
12 1/4 Set excess cm Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B"	0.3132 tting Depths for t by stage % : it yld > 1.35 dient(s) for Segr casing ins #/ft 20.00 20.00 //g mud, 30min Sf	2034 r D V Tool(s) 191 side the Gra F c Csg Test psig	4016 3100 44 , C, D = 1.01, 9 5/8 9 5/8 9 110 9 110 1,958 1,958 Factors	1655 b, c, d All > ( Coupling BUTT BUTT would be:	143 0.70, ОК. Воду 3.54 5.17 194.27	Mud Wt 10.00 <u>Design Fa</u> Collapse 2.63 2.10 2.59	MASP 2291 sum of sx 1636 ctors P Burst 2.95 2.95 Totals: if it were a	BOPE 3M Σ CuFt 3309 RODUCTIO Length 8,900 4,737 13,637 vertical we	Hole-Cpl 0.81 Σ%excess 100 N Weight 178,000 94,740 272,740 ellbore.	
12 1/4 set excess cm class 'C' tail cm burst Frac Grad 5 1/2 Segment "A" "B" w/8.4# B	0.3132 tting Depths for t by stage % : it yld > 1.35 dient(s) for Segr casing ins #/ft 20.00 20.00 t/g mud, 30min Sf Segme	2034 r D V Tool(s) 191 side the Gra F c Csg Test psige ent Design	4016 3100 44 , C, D = 1.01; 9 5/8 9 5/8 9 110 9 110 1,958 1 Factors MTD	1655 b, c, d All > ( Coupling BUTT BUTT Would be: Max VTD	143 0.70, ОК. Воду 3.54 5.17 194.27 Сsg VD	Mud Wt 10.00 Design Fa Collapse 2.63 2.10 2.59 Curve KOP	MASP 2291 sum of sx 1636 ctors P Burst 2.95 2.95 2.95 Totals: if it were a Dogleg <sup>o</sup>	BOPE 3M Σ CuFt 3309 RODUCTIO Length 8,900 4,737 13,637 vertical we Severity°	Hole-Cplg 0.81 Σ%excess 100 N Weight 178,000 94,740 272,740 ellbore. MEOC	
12 1/4 set excess cm class 'C' tail cm surst Frac Grad 5 1/2 Segment "A" "B" w/8.4# B No P	0.3132 tting Depths for t by stage % : nt yld > 1.35 dient(s) for Segr casing ins #/ft 20.00 20.00 t/g mud, 30min Sf Segme ilot Hole Plan	2034 r D V Tool(s) 191 side the Gra F c Csg Test psig ent Design	4016 3100 44 , C, D = 1.01; 9 5/8 0 110 110 1,958 1,958 13637	1655 b, c, d All > ( Coupling BUTT BUTT BUTT would be: Max VTD 9065	143 0.70, ОК. Воду 3.54 5.17 194.27 Сsg VD 9065	Mud Wt 10.00 <u>Design Fa</u> 2.63 2.10 2.59 Curve KOP 8900	MASP 2291 sum of sx 1636 ctors P Burst 2.95 2.95 2.95 Totals: if it were a Dogleg <sup>o</sup> 91	BOPE 3M Σ CuFt 3309 RODUCTIO Length 8,900 4,737 13,637 vertical we Severity° 17	Hole-Cplg 0.81 Σ%excess 100 N Weight 178,000 94,740 272,740 ellbore. MEOC 9420	
12 1/4 set excess cm class 'C' tail cm burst Frac Grad 5 1/2 Segment "A" "B" w/8.4# B No P The	0.3132 tting Depths for t by stage %: it yld > 1.35 dient(s) for Segr casing ins #/ft 20.00 20.00 t/g mud, 30min Sf Segme ilot Hole Plar e cement volum	2034 r D V Tool(s) 191 side the Gra F C Csg Test psig ent Design nned ne(s) are inter	4016 <b>3100</b> 44 , c, D = 1.01, <b>9 5/8</b> <b>110</b> <b>110</b> <b>110</b> <b>13637</b> <b>anded to ach</b>	1655 b, c, d All > 0 Coupling BUTT BUTT Would be: Max VTD 9065 ieve a top of	143 0.70, ОК. Воду 3.54 5.17 194.27 Сsg VD 9065 0	Mud Wt 10.00 Design Fa Collapse 2.63 2.10 2.59 Curve KOP 8900 ft from su	MASP 2291 sum of sx 1636 ctors P Burst 2.95 2.95 Totals: if it were a Dogleg° 91 urface or a	BOPE 3M Σ CuFt 3309 RODUCTIO Length 8,900 4,737 13,637 vertical we Severity° 17 5056	Hole-Cplg 0.81 Σ%excess 100 N Weight 178,000 94,740 272,740 272,740 272,740 272,740 272,740 272,740 272,740 272,740 272,740 272,740 272,740	
12 1/4 set excess cm Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B" w/8.4# B No P The Hole	0.3132 tting Depths for t by stage %: it yld > 1.35 dient(s) for Segr casing ins #/ft 20.00 20.00 t/g mud, 30min Sf Segme ilot Hole Plar cement volum Annular	2034 r D V Tool(s) 191 side the Gra F C Csg Test psige ent Design nned ne(s) are inter 1 Stage	4016 3100 44 , c, D = 1.01, 95/8 110 13637 ended to ach 1 Stage	1655 b, c, d All > 0 Coupling BUTT BUTT BUTT Would be: Max VTD 9065 ieve a top of Min	143 0.70, ОК. Воду 3.54 5.17 194.27 Сsg VD 9065 0 1 Stage	Mud Wt 10.00 Design Fa Collapse 2.63 2.10 2.59 Curve KOP 8900 ft from su Drilling	MASP 2291 sum of sx 1636 ctors P Burst 2.95 2.95 Totals: if it were a Dogleg° 91 urface or a Calc	BOPE 3M ∑ CuFt 3309 RODUCTIO Length 8,900 4,737 13,637 vertical we Severity° 17 5056 Req'd	Hole-Cplg 0.81 Σ%excess 100 N Weight 178,000 94,740 272,740 272,740 sillbore. MEOC 9420 overlap. Min Dist	
12 1/4 set excess cm Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B" w/8.4# B No P The Hole Size	0.3132 tting Depths for t by stage % : nt yld > 1.35 dient(s) for Segr casing ins #/ft 20.00 20.00 20.00 t/g mud, 30min Sf Segme ilot Hole Plan e cement volum Annular Volume	2034 r D V Tool(s) 191 side the Gra F c Csg Test psig ent Desigr ned ne(s) are inte 1 Stage Cmt Sx	4016 3100 44 , c, D = 1.01, 95/8 110 110 13637 ended to ach 1 Stage CuFt Cmt	1655 b, c, d All > 0 Coupling BUTT BUTT Would be: Max VTD 9065 ieve a top of Min Cu Ft	143 0.70, ОК. Воду 3.54 5.17 194.27 Сsg VD 9065 0 1 Stage % Excess	Mud Wt 10.00 Design Fa Collapse 2.63 2.10 2.59 Curve KOP 8900 ft from su Drilling Mud Wt	MASP 2291 sum of sx 1636 ctors P Burst 2.95 2.95 Totals: if it were a Dogleg° 91 urface or a	BOPE 3M Σ CuFt 3309 RODUCTIO Length 8,900 4,737 13,637 vertical we Severity° 17 5056	Hole-Cplg 0.81 Σ%excess 100 Weight 178,000 94,740 272,740 ellbore. MEOC 9420 overlap. Min Dist Hole-Cplg	
12 1/4 set excess cm Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B" w/8.4# B No P The Hole Size 8 3/4	0.3132 tting Depths for t by stage % : nt yld > 1.35 dient(s) for Segr casing ins #/ft 20.00 20.00 t/g mud, 30min Sf Segme ilot Hole Plan e cement volum Annular Volume 0.2526	2034 r D V Tool(s) 191 side the Gra F C Csg Test psige ent Design nned ne(s) are inter 1 Stage	4016 3100 44 , c, D = 1.01, 95/8 110 13637 ended to ach 1 Stage	1655 b, c, d All > 0 Coupling BUTT BUTT BUTT Would be: Max VTD 9065 ieve a top of Min	143 0.70, ОК. Воду 3.54 5.17 194.27 Сsg VD 9065 0 1 Stage	Mud Wt 10.00 Design Fa Collapse 2.63 2.10 2.59 Curve KOP 8900 ft from su Drilling	MASP 2291 sum of sx 1636 ctors P Burst 2.95 2.95 Totals: if it were a Dogleg° 91 urface or a Calc	BOPE 3M ∑ CuFt 3309 RODUCTIO Length 8,900 4,737 13,637 vertical we Severity° 17 5056 Req'd	Hole-Cplg 0.81 Σ%excess 100 N Weight 178,000 94,740 272,740 ellbore. MEOC 9420	
12 1/4 set excess cm Class 'C' tail cm Burst Frac Grad 5 1/2 Segment "A" "B" w/8.4# B No P The Hole Size	0.3132 tting Depths for t by stage % : nt yld > 1.35 dient(s) for Segr casing ins #/ft 20.00 20.00 t/g mud, 30min Sf Segme ilot Hole Plan e cement volum Annular Volume 0.2526	2034 r D V Tool(s) 191 side the Gra F c Csg Test psig ent Desigr ned ne(s) are inte 1 Stage Cmt Sx	4016 3100 44 , c, D = 1.01, 95/8 110 110 13637 ended to ach 1 Stage CuFt Cmt	1655 b, c, d All > 0 Coupling BUTT BUTT Would be: Max VTD 9065 ieve a top of Min Cu Ft	143 0.70, ОК. Воду 3.54 5.17 194.27 Сsg VD 9065 0 1 Stage % Excess	Mud Wt 10.00 Design Fa Collapse 2.63 2.10 2.59 Curve KOP 8900 ft from su Drilling Mud Wt	MASP 2291 sum of sx 1636 ctors P Burst 2.95 2.95 Totals: if it were a Dogleg° 91 urface or a Calc	BOPE 3M ∑ CuFt 3309 RODUCTIO Length 8,900 4,737 13,637 vertical we Severity° 17 5056 Req'd	Hole-Cpl 0.81 Σ%exces 100 N Weigh 178,000 94,740 272,740 272,740 272,740 272,740 9420 overlap. Min Dis Hole-Cpl	

#### In a Lesser Prairie-Chicken section.

<b>13 378</b>	The second se		inch hole.	<u>D</u>	esign Facto	rs	SURFACE		
Segment	#/ft	Gra	de	Coupling	Joint	Collapse	Burst	Length	Weight
"A" "B"	54.50	J	55	ST&C	8.87	2.3	1.04	1,063 0	57,934 0
w/8.4#	/g mud, 30min S	fc Csg Test psig:	: 1,447	Tail Cmt	does not	circ to sfc.	Totals:	1,063	57,934
Comparison o	of Proposed to	Minimum Re	quired Cem	ent Volumes_					
Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist
Size	Volume	Cmt Sx	: CuFt Cmt	Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole-Cplg
17 1/2	0.6946	1109	2042	812	152	8.90	1514	2M	1.56
· · · · · · · · · · · · · · · · · · ·	··· ··· ··· ··· ··· ··· ··· ··· ··· ··			··· · · · · · · · · · · · · · · · · ·					
		o a co a co a co				Design Fa			MEDIATE
9 5/8 Segment	casing in: #/ft	Gra	13 3/8	Coupling	Joint	Collapse	Burst		Weight
Segment "A"	40.00		55	Coupling LT&C	2.57	1.27	0.92	Length 3,900	156,000
"B"	40.00	HCL		LT&C	18.10	1.61	1.34	<b>1,156</b>	46,240
	/g mud, 30min S				10.10		Totals:	5,056	202,240
The	e cement volur Annular			ieve a top of Min	0 1 Stage	ft from su Drilling	Inface or a Calc	1063 Rea'd	overlap. Min Dist
Hole Size 12 1/4		1 Stage Cmt Sx 2034	1 Stage CuFt Cmt 4016		0 1 Stage % Excess 143			1063 Req'd BOPE 3M Σ CuFt	Min Dist Hole-Cplg 0.81 Σ%excess
Hole Size 12 1/4 Set excess cm	Annular Volume 0.3132 tting Depths fo t by stage % :	1 Stage Cmt Sx 2034	1 Stage CuFt Cmt 4016	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP 2291	Req'd BOPE 3M	Min Dist Hole-Cplg 0.81
Hole Size 12 1/4 Set excess cm class 'C' tail cm	Annular Volume 0.3132 tting Depths fo t by stage % : nt yld > 1.35	1 Stage Cmt Sx 2034 or D V Tool(s): 191	1 Stage CuFt Cmt 4016 3100 44	Min Cu Ft 1655	1 Stage % Excess 143	Drilling Mud Wt	Calc MASP 2291 sum of sx	Req'd           BOPE           3Μ           Σ CuFt	Min Dist Hole-Cplg 0.81 Σ%excess
Hole Size 12 1/4 Set excess cm lass 'C' tail cm	Annular Volume 0.3132 tting Depths fo t by stage % :	1 Stage Cmt Sx 2034 or D V Tool(s): 191	1 Stage CuFt Cmt 4016 3100 44	Min Cu Ft 1655	1 Stage % Excess	Drilling Mud Wt	Calc MASP 2291 sum of sx	Req'd           BOPE           3Μ           Σ CuFt	Min Dist Hole-Cpl 0.81 Σ%excess
Hole Size 12 1/4 Set excess cm lass 'C' tail cm furst Frac Grac 5 1/2	Annular Volume 0.3132 tting Depths fo t by stage % : nt yld > 1.35 dient(s) for Segu casing in:	1 Stage Cmt Sx 2034 or D V Tool(s): 191 ment(s): A, B, side the	1 Stage CuFt Cmt 4016 3100 44 C, D = 1.01, 9 5/8	Min Cu Ft 1655 b, c, d All > (	1 Stage % Excess 143	Drilling Mud Wt 10.00 Design Fac	Calc MASP 2291 sum of sx 1636 ctors P	Req'd           BOPE           3M           Σ CuFt           3309	Min Dist Hole-Cplg 0.81 Σ%excess 100
Hole Size 12 1/4 Set excess cm lass 'C' tail cm urst Frac Grad 5 1/2 Segment	Annular Volume 0.3132 tting Depths fo t by stage % : nt yld > 1.35 dient(s) for Seg casing in #/ft	1 Stage Cmt Sx 2034 or D V Tool(s): 191 ment(s): A, B, Side the Gra	1 Stage CuFt Cmt 4016 3100 44 C, D = 1.01, <b>9 5/8</b> de	Min Cu Ft 1655 b, c, d All > ( Coupling	1 Stage % Excess 143 0.70, OK. Body	Drilling Mud Wt 10.00 <u>Design Fac</u> Collapse	Calc MASP 2291 sum of sx 1636 <u>ctors</u> P Burst	Req'd BOPE 3M Σ CuFt 3309 RODUCTIO Length	Min Dist Hole-Cplg 0.81 Σ%excess 100
Hole Size 12 1/4 Set excess cm lass 'C' tail cm urst Frac Grac 5 1/2 Segment "A"	Annular Volume 0.3132 tting Depths fo t by stage % : nt yld > 1.35 dient(s) for Seg casing in: #/ft 17.00	1 Stage Cmt Sx 2034 or D V Tool(s): 191 ment(s): A, B, side the Gra	1 Stage CuFt Cmt 4016 3100 44 C, D = 1.01, <b>9 5/8</b> de 110	Min Cu Ft 1655 b, c, d All > ( Coupling BUTT	1 Stage % Excess 143 0.70, ОК. Воdy 3.54	Drilling Mud Wt 10.00 <u>Design Fac</u> Collapse 1.78	Calc MASP 2291 sum of sx 1636 <u>ctors</u> P Burst 2.48	Req'd BOPE 3M Σ CuFt 3309 RODUCTIO Length 8,900	Min Dist Hole-Cplg 0.81 Σ%excess 100 N Weight 151,300
Hole Size 12 1/4 Set excess cm lass 'C' tail cm urst Frac Grac 5 1/2 Segment "A" "B"	Annular Volume 0.3132 tting Depths fo t by stage % int yld > 1.35 dient(s) for Segu casing in: #/ft 17.00 17.00	1 Stage Cmt Sx 2034 or D V Tool(s): 191 ment(s): A, B, side the Gra P P	1 Stage CuFt Cmt 4016 3100 44 C, D = 1.01, <b>9 5/8</b> de 110 110	Min Cu Ft 1655 b, c, d All > ( Coupling	1 Stage % Excess 143 0.70, OK. Body	Drilling Mud Wt 10.00 <u>Design Fac</u> Collapse	Calc MASP 2291 <u>sum of sx</u> 1636 <u>ctors</u> P Burst 2.48 2.48	Req'd           BOPE           3M           ∑ CuFt           3309	Min Dist Hole-Cplg 0.81 Σ%excess 100 N Weight 151,300 80,529
Hole Size 12 1/4 Set excess cm Class 'C' tail cm Surst Frac Grad 5 1/2 Segment "A" "B" w/8.4#	Annular Volume 0.3132 tting Depths fo t by stage % : nt yld > 1.35 dient(s) for Seg casing in: #/ft 17.00 17.00	1 Stage Cmt Sx 2034 or D V Tool(s): 191 ment(s): A, B, side the Grae P fc Csg Test psig:	1 Stage CuFt Cmt 4016 3100 44 C, D = 1.01, <b>9 5/8</b> de 110 1,958	Min Cu Ft 1655 b, c, d All > ( Coupling BUTT BUTT	1 Stage % Excess 143 0.70, OK Body 3.54 5.18	Drilling Mud Wt 10.00 <u>Design Fac</u> Collapse 1.78 1.46	Calc MASP 2291 <u>sum of sx</u> 1636 Ctors P Burst 2.48 2.48 2.48 Totals:	Req'd           BOPE           3M           ∑ CuFt           3309           RODÚCTIO           Length           8,900           4,737           13,637	Min Dist Hole-Cplg 0.81 Σ%excess 100 <b>Weight</b> 151,300 <b>80,529</b> 231,829
Hole Size 12 1/4 Set excess cm lass 'C' tail cm lurst Frac Grac 5 1/2 Segment "A" "B"	Annular Volume 0.3132 tting Depths fo t by stage % : nt yld > 1.35 dient(s) for Seg casing in: #/ft 17.00 17.00	1 Stage Cmt Sx 2034 or D V Tool(s): 191 ment(s): A, B, side the Gra P P	1 Stage CuFt Cmt 4016 3100 44 C, D = 1.01, <b>9 5/8</b> de 110 1,958 Factors	Min Cu Ft 1655 b, c, d All > ( Coupling BUTT BUTT Would be:	1 Stage % Excess 143 0.70, ОК. Воду 3.54 5.18 194.60	Drilling Mud Wt 10.00 Design Fac Collapse 1.78 1.46 1.75	Calc MASP 2291 sum of sx 1636 ctors P Burst 2.48 2.48 2.48 Totals: if it were a v	Req'd           BOPE           3M           Σ CuFt           3309   RODUCTIO Length 8,900 4,737 13,637 vertical we	Min Dist Hole-Cplg 0.81 Σ%excess 100 <b>Weight</b> 151,300 <b>80,529</b> 231,829 ellbore.
Hole Size 12 1/4 Set excess cm lass 'C' tail cm surst Frac Grad 5 1/2 Segment "A" "B" w/8.4# B	Annular Volume 0.3132 tting Depths fo t by stage % : nt yld > 1.35 dient(s) for Seg casing in: #/ft 17.00 17.00	1 Stage Cmt Sx 2034 or D V Tool(s): 191 side the Graa P P fc Csg Test psig: ent Design	1 Stage CuFt Cmt 4016 3100 44 C, D = 1.01, 9 5/8 de 110 1,958 Factors MTD	Min Cu Ft 1655 b, c, d All > ( Coupling BUTT BUTT Would be: Max VTD	1 Stage % Excess 143 0.70, ОК. Воdу 3.54 5.18 194.60 Сsg ∨D	Drilling Mud Wt 10.00 Design Fac Collapse 1.78 1.46 1.75 Curve KOP	Calc MASP 2291 sum of sx 1636 <u>ctors</u> P Burst 2.48 2.48 2.48 Totals: if it were a v Dogleg <sup>o</sup>	Req'd           BOPE           3M           Σ CuFt           3309           RODUCTIO           Length           8,900           4,737           13,637           vertical we severity°	Min Dist Hole-Cplg 0.81 Σ%excess 100 <b>Weight</b> 151,300 <b>80,529</b> 231,829 ellbore. MEOC
Hole Size 12 1/4 Set excess cm class 'C' tail cm burst Frac Grad 5 1/2 Segment "A" "B" w/8.4# B No P	Annular Volume 0.3132 tting Depths fo t by stage % : nt yld > 1.35 dient(s) for Seg casing in #/ft 17.00 17.00 17.00 t/g mud, 30min S Segmi	1 Stage Cmt Sx 2034 or D V Tool(s): 191 side the Gran P fc Csg Test psig: ent Design nned	1 Stage CuFt Cmt 4016 3100 44 C, D = 1.01, 9 5/8 de 110 1,958 Factors MTD 13637	Min Cu Ft 1655 b, c, d All > 0 Coupling BUTT BUTT BUTT would be: Max VTD 9065	1 Stage % Excess 143 0.70, OK Body 3.54 5.18 194.60 Csg VD 9065	Drilling Mud Wt 10.00 Design Fac Collapse 1.78 1.46 1.75 Curve KOP 8900	Calc MASP 2291 sum of sx 1636 <u>ctors</u> P Burst 2.48 2.48 2.48 Totals: if it were a v Dogleg <sup>o</sup> 91	Req'd           BOPE           3M           Σ CuFt           3309           RODUCTIO           Length           8,900           4,737           13,637           vertical we severity°           17	Min Dist Hole-Cplg 0.81 Σ%excess 100 Weight 151,300 80,529 231,829 ellbore. MEOC 9420
Hole Size 12 1/4 Set excess cm class 'C' tail cm burst Frac Grac 5 1/2 Segment "A" "B" w/8.4# B No P The	Annular Volume 0.3132 tting Depths fo t by stage % : nt yld > 1.35 dient(s) for Seg casing in: #/ft 17.00 17.00 17.00 if gmud, 30min S Segma ilot Hole Plan	1 Stage Cmt Sx 2034 or D V Tool(s): 191 side the Gra P fc Csg Test psig: ent Design nned nned ne(s) are inte	1 Stage CuFt Cmt 4016 3100 44 C, D = 1.01, <b>9 5/8</b> de 110 1,958 Factors MTD 13637 nded to ach	Min Cu Ft 1655 b, c, d All > ( Coupling BUTT BUTT BUTT Would be: Max VTD 9065 ieve a top of	1 Stage % Excess 143 0.70, OK Body 3.54 5.18 194.60 Csg VD 9065 0	Drilling Mud Wt 10.00 <u>Design Fac</u> Collapse 1.78 1.46 1.75 Curve KOP 8900 ft from su	Calc MASP 2291 sum of sx 1636 <u>ctors</u> P Burst 2.48 2.48 2.48 Totals: if it were a v Dogleg <sup>o</sup> 91 urface or a	Req'd           BOPE           3M           Σ CuFt           3309           RODUCTIO           Length           8,900           4,737           13,637           vertical we severity°           17           5056	Min Dist Hole-Cpl 0.81 Σ%excess 100 Weight 151,300 80,529 231,829 231,829 ellbore. MEOC 9420 overlap.
Hole Size 12 1/4 Set excess cm class 'C' tail cm Burst Frac Grac 5 1/2 Segment "A" "B" w/8.4# B No P The Hole	Annular Volume 0.3132 tting Depths fo t by stage % : nt yld > 1.35 dient(s) for Seg casing in: #/ft 17.00 17.00 17.00 t/g mud, 30min S Segma ilot Hole Plan e cement volum	1 Stage Cmt Sx 2034 or D V Tool(s): 191 side the Graa P P fc Csg Test psig: ent Design nned ne(s) are inte 1 Stage	1 Stage CuFt Cmt 4016 3100 44 C, D = 1.01, <b>9 5/8</b> de 110 1,958 Factors MTD 13637 nded to ach 1 Stage	Min Cu Ft 1655 b, c, d All > ( Coupling BUTT BUTT BUTT Would be: Max VTD 9065 ieve a top of Min	1 Stage % Excess 143 0.70, OK 3.54 5.18 194.60 Csg ∨D 9065 0 1 Stage	Drilling Mud Wt 10.00 Design Fac Collapse 1.78 1.46 1.75 Curve KOP 8900 ft from su Drilling	Calc MASP 2291 <u>sum of sx</u> 1636 Ctors P Burst 2.48 2.48 2.48 Totals: if it were a v Dogleg <sup>o</sup> 91 urface or a Calc	Req'd           BOPE           3M           ∑ CuFt           3309           RODUCTIO           Length           8,900           4,737           13,637           vertical we severity°           17           5056           Req'd	Min Dist Hole-Cplg 0.81 Σ%excess 100 Weight 151,300 80,529 231,829 231,829 ellbore. MEOC 9420 overlap. Min Dist
Hole Size 12 1/4 Set excess cm class 'C' tail cm	Annular Volume 0.3132 tting Depths fo t by stage % : nt yld > 1.35 dient(s) for Seg Casing in: #/ft 17.00 17.00 17.00 ilot Hole Plan cement volum Annular Volume	1 Stage Cmt Sx 2034 or D V Tool(s): 191 ment(s): A, B, side the Gra P fc Csg Test psig: ent Design nned ne(s) are inte 1 Stage Cmt Sx	1 Stage CuFt Cmt 4016 3100 44 C, D = 1.01, 9 5/8 de 110 10 1958 Factors MTD 13637 nded to ach 1 Stage CuFt Cmt	Min Cu Ft 1655 b, c, d All > ( Coupling BUTT BUTT Would be: Max VTD 9065 ieve a top of Min Cu Ft	1 Stage % Excess 143 0.70, OK Body 3.54 5.18 194.60 Csg ∨D 9065 0 1 Stage % Excess	Drilling Mud Wt 10.00 Design Fac Collapse 1.78 1.46 1.75 Curve KOP 8900 ft from su Drilling Mud Wt	Calc MASP 2291 sum of sx 1636 <u>ctors</u> P Burst 2.48 2.48 2.48 Totals: if it were a v Dogleg <sup>o</sup> 91 urface or a	Req'd           BOPE           3M           Σ CuFt           3309           RODUCTIO           Length           8,900           4,737           13,637           vertical we severity°           17           5056	Min Dist Hole-Cplg 0.81 Σ%excess 100 Weight 151,300 80,529 231,829 231,829 ellbore. MEOC 9420 overlap. Min Dist Hole-Cplg
Hole Size 12 1/4 Set excess cm lass 'C' tail cm surst Frac Grac 5 1/2 Segment "A" "B" w/8.4# B No P The Hole	Annular Volume 0.3132 tting Depths fo t by stage % : nt yld > 1.35 dient(s) for Seg casing in: #/ft 17.00 17.00 17.00 t/g mud, 30min S Segmi ilot Hole Plan e cement volum Annular Volume 0.2526	1 Stage Cmt Sx 2034 or D V Tool(s): 191 side the Graa P P fc Csg Test psig: ent Design nned ne(s) are inte 1 Stage	1 Stage CuFt Cmt 4016 3100 44 C, D = 1.01, <b>9 5/8</b> de 110 1,958 Factors MTD 13637 nded to ach 1 Stage	Min Cu Ft 1655 b, c, d All > ( Coupling BUTT BUTT BUTT Would be: Max VTD 9065 ieve a top of Min	1 Stage % Excess 143 0.70, OK 3.54 5.18 194.60 Csg ∨D 9065 0 1 Stage	Drilling Mud Wt 10.00 Design Fac Collapse 1.78 1.46 1.75 Curve KOP 8900 ft from su Drilling	Calc MASP 2291 <u>sum of sx</u> 1636 Ctors P Burst 2.48 2.48 2.48 Totals: if it were a v Dogleg <sup>o</sup> 91 urface or a Calc	Req'd           BOPE           3M           ∑ CuFt           3309           RODUCTIO           Length           8,900           4,737           13,637           vertical we severity°           17           5056           Req'd	Min Dist Hole-Cplg 0.81 Σ%excess 100 Weight 151,300 80,529 231,829 ellbore. MEOC 9420

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 7H

Existing Wells description:

#### Section 4 - Location of Existing and/or Proposed Production Facilities

Submit or defer a Proposed Production Facilities plan? SUBMIT

**Production Facilities description:** There is an existing production facility that is used for the Copperline West 29 Fed 1H and 3H wells. This facility and containment will be used for the 5H. Tankage and a metered 3 phase separator will be added to the existing facility. The pad will have all 3 wells on it. **Production Facilities map:** 

Copperline\_West\_29\_Federal\_Production\_Facility\_08-23-2017.pdf

#### Section 5 - Location and Types of Water Supply

#### Water Source Table

Water source use type: INTERMEDIATE/PRODUCTION CASING, STIMULATION, SURFACE CASING Describe type:

Source latitude:

Source datum: NAD83

Water source permit type: PRIVATE CONTRACT

Source land ownership: FEDERAL

Water source transport method: TRUCKING

Source transportation land ownership: FEDERAL

Water source volume (barrels): 180000

Source volume (gal): 7560000

#### Water source and transportation map:

Copperline\_West\_29\_Federal\_7H\_Water\_Supply\_Map\_08-23-2017.pdf

Water source comments: Water will be supplied by the surface tenant's water well, Limestone Livestock LLC. Bill Angell Limestone Livestock, LLC 76 Angell Road Lovington, NM 88260 575-369-6303 New water well? NO

#### New Water Well Info

Well latitude:

Well Longitude:

Well datum:

Well target aquifer:

Est. depth to top of aquifer(ft):

Est thickness of aquifer:

Aquifer comments:

Aquifer documentation:

Source longitude:

Water source type: GW WELL

Source volume (acre-feet): 23.200758

Well Name: COPPERLINE WEST 29 FEDERAL

Well depth (ft): Well casing outside diameter (in.): New water well casing? Drilling method: Grout material: Casing length (ft.): Well Production type: Water well additional information: State appropriation permit:

Additional information attachment:

#### Section 6 - Construction Materials

Construction Materials description: caliche from existing location and from pit

#### Construction Materials source location attachment:

Copperline\_West\_29\_Fed\_7H\_Construction\_Material\_Map\_20180505080851.pdf

#### Section 7 - Methods for Handling Waste

Waste type: DRILLING

Waste content description: Drill cuttings

Amount of waste: 1163640 pounds

Waste disposal frequency : Daily

Safe containment description: roll off bins

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL Disposal location ownership: PRIVATE FACILITY Disposal type description:

Disposal location description: R360 commercial disposal facility

Waste type: DRILLING

Waste content description: Drill fluids

Amount of waste: 2500 barrels

Waste disposal frequency : Weekly

Safe containment description: rig mud tanks

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL Disposal location ownership: PRIVATE FACILITY

Well Number: 7H

Well casing inside diameter (in.):

Well casing type:

**Drill material:** 

Grout depth:

Used casing source:

Casing top depth (ft.):

**Completion Method:** 

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 7H

Disposal type description:

Disposal location description: Siana SWD

**Reserve Pit** 

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit?

Reserve pit length (ft.) Reserve pit width (ft.)

Reserve pit depth (ft.)

Reserve pit volume (cu. yd.)

Is at least 50% of the reserve pit in cut?

**Reserve pit liner** 

Reserve pit liner specifications and installation description

Cuttings	Area
----------	------

Cuttings Area being used? NO

Are you storing cuttings on location? NO

**Description of cuttings location** 

Cuttings area length (ft.)

Cuttings area depth (ft.)

Cuttings area width (ft.)

Cuttings area volume (cu. yd.)

Is at least 50% of the cuttings area in cut?

WCuttings area liner

Cuttings area liner specifications and installation description

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities?: NO Ancillary Facilities attachment:

Comments:

Section 9 - Well Site Layout

Well Site Layout Diagram:

Copperline\_West\_29\_Federal\_7H\_Well\_Site\_Layout\_20171222083423.pdf

Well Number: 7H

Comments:

### Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance Multiple Well Pad Name: WEST COPPERLINE 29 FEDERAL Multiple Well Pad Number: 3H

Recontouring attachment:

**Drainage/Erosion control construction:** Per BLM instructions as identified during onsite **Drainage/Erosion control reclamation:** Per BLM instructions as identified during onsite

Wellpad long term disturbance (acres): 2	Wellpad short term disturbance (acres): 4
Access road long term disturbance (acres): 0.03	Access road short term disturbance (acres): 0.03
Pipeline long term disturbance (acres): 0	Pipeline short term disturbance (acres): 0
Other long term disturbance (acres): 0	Other short term disturbance (acres): 0
Total long term disturbance: 2.03	Total short term disturbance: 4.03

**Disturbance Comments:** 

Reconstruction method: Interim reclamation as identified during onsite Topsoil redistribution: Interim reclamation as identified during onsite Soil treatment: Interim reclamation as identified during onsite Existing Vegetation at the well pad: age brush and native grasses Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road: Sage brush and native grasses Existing Vegetation Community at the road attachment: Existing Vegetation Community at the pipeline: Sage brush and native grasses Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances: Sage brush and native grasses Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO Non native seed description: Seedling transplant description: Will seedlings be transplanted for this project? NO

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 7H

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Seed harvest description attachment:

## **Seed Management Seed Table** Seed type: Seed source: Seed name: Source address: Source name: Source phone: Seed cultivar: Seed use location: PLS pounds per acre: Proposed seeding season: **Total pounds/Acre:** Seed Summary Seed Type **Pounds/Acre**

Seed reclamation attachment:

<b>Operator Contact/Responsible</b>	e Official Contact Info
First Name: Kevin	Last Name: Garrett
Phone: (432)556-8508	Email: kgarrett@cazapetro.cor
Seedbed prep: Harrow	
Seed BMP: Per BLM instructions	
Seed method: Broadcast followed by a drag c	hain
Existing invasive species? NO	
Existing invasive species treatment descrip	tion:
Existing invasive species treatment attachn	nent:
Weed treatment plan description: Spray for	cheat grass
Weed treatment plan attachment:	
Monitoring plan description: Visual inspection	on in spring and late fall
Monitoring plan attachment:	

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 7H

Success standards: 80% coverage by 2nd growing season of native species with less than 5% invasive species

Pit closure description: No pits to be used

Pit closure attachment:

## Section 11 - Surface Ownership

Disturbance type: WELL PAD

Describe:

Other surface owner description:	
BIA Local Office:	
BOR Local Office:	
COE Local Office:	
DOD Local Office:	
NPS Local Office:	
State Local Office:	
Military Local Office:	
USFWS Local Office:	
Other Local Office:	
USFS Region:	
USFS Forest/Grassland: USFS Ranger District:	



Surface use plan certification document:

W\_Copperline\_Executed\_Surface\_Agmt\_and\_Amdt\_20180809132430.pdf

Surface Access Bond BLM or Forest Service:

**BLM Surface Access Bond number:** 

**USFS Surface access bond number:** 

Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 7H

#### Section 12 - Other Information

Right of Way needed? NO

ROW Type(s):

Use APD as ROW?

**ROW Applications** 

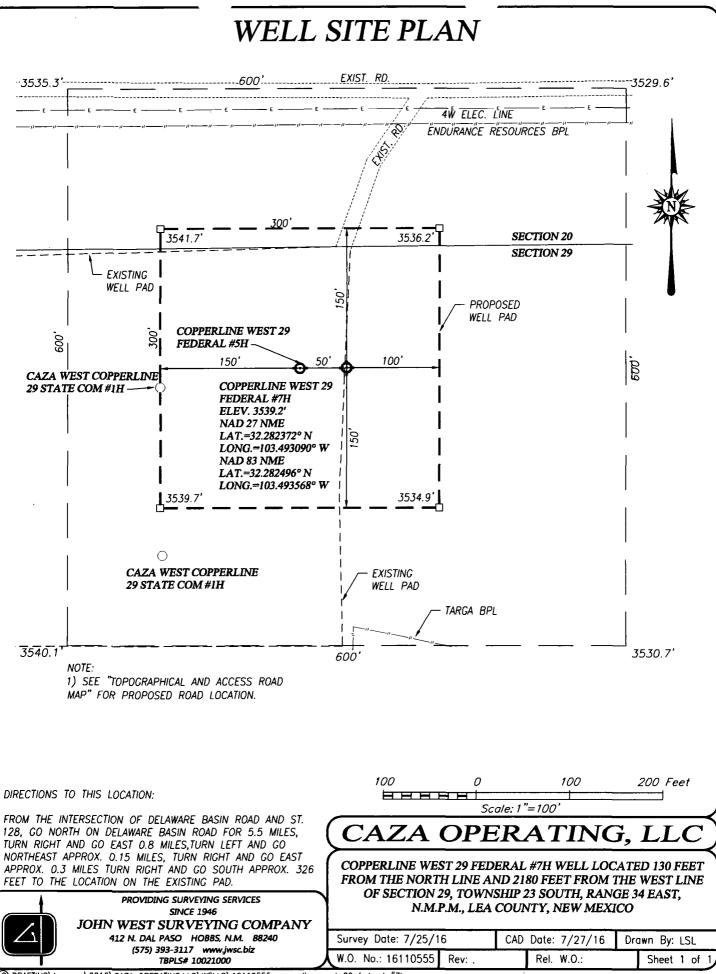
SUPO Additional Information:

Use a previously conducted onsite? YES

Residers Circle Internation Configure Wishing The Science I. The mail resident to the APD standard Wishing Scie Resider on State 1999

## Other SUPO Attachment

Copperline\_West\_29\_Federal\_7H\_Interim\_Reclamation\_Plat\_20180505073834.pdf



C DRAFTING\Lorenzo\2016\CAZA OPERATING,LLC\WELLS\16110555 copperline west 29 federal #7h



February 26, 2014

Mr. Bill Angell Limestone Livestock LLC P. O. Box 189 Lovington, New Mexico

> Re: Amendment to Surface Damage Agreement Section 29, T23S-R34E W. Copperline Prospect Lea County, New Mexico

Dear Bill:

Reference is hereby made to that certain Surface Damage Agreement ("Surface Damage Agreement) dated August 19, 2013, covering the NW/4 Section 29, T23S-R34E, Lea County, New Mexico, by and between Linestone Livestock LLC, "Owner", and Caza Petroleum, Inc., "Company".

Whereas, Owner and Company desire to amend the description in the first paragraph of the Surface Damage Agreement, Owner and Company hereby agree to the following description change, to wit:

Delete: NW/4 of Section 29, T23S-R34E, Lea County, NM

Add: W/2 of Section 29, T23S-R34E, Lea County, NM.

All other provisions of the Surface Damage Agreement shall remain unchanged and in full effect.

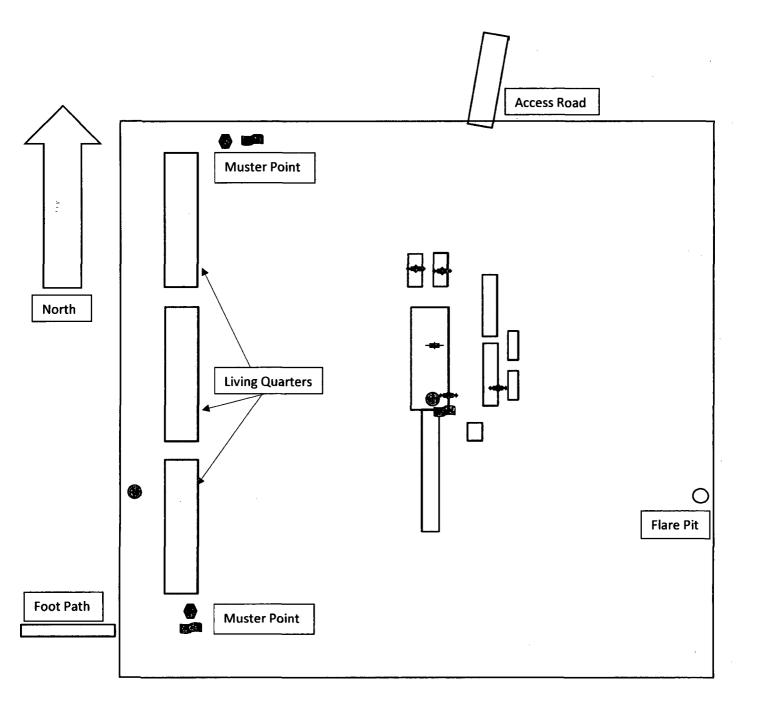
Very truly yours, Caza Petroleurh, Inc. John E. Brown, CPL Land Manager

I hereby agree to the foregoing description change this \_\_\_\_ day of February, 2014.

Limestone Livestock, LLC

Bv: Bill Angell

Managing Partner







U.S. Department of the Interior BUREAU OF LAND MANAGEMENT

#### **Section 1 - General**

Would you like to address long-term produced water disposal? NO

#### **Section 2 - Lined Pits**

Would you like to utilize Lined Pit PWD options? NO Produced Water Disposal (PWD) Location: PWD surface owner: Lined pit PWD on or off channel: Lined pit PWD discharge volume (bbl/day): Lined pit specifications: Pit liner description: Pit liner manufacturers information: Precipitated solids disposal: Decribe precipitated solids disposal: Precipitated solids disposal permit: Lined pit precipitated solids disposal schedule: Lined pit precipitated solids disposal schedule: Lined pit precipitated solids disposal schedule: Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

Lined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

**PWD disturbance (acres):** 

### **Section 3 - Unlined Pits**

#### Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

**Unlined pit Monitor attachment:** 

Do you propose to put the produced water to beneficial use?

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

**Unlined Produced Water Pit Estimated percolation:** 

Unlined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

#### Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

PWD disturbance (acres):

PWD disturbance (acres):

Injection well type:



Injection well number:

Assigned injection well API number?

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

## Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location: PWD surface owner: Surface discharge PWD discharge volume (bbl/day): Surface Discharge NPDES Permit? Surface Discharge NPDES Permit attachment: Surface Discharge site facilities information: Surface discharge site facilities map:

## Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location: PWD surface owner: Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:



### Injection well API number:

PWD disturbance (acres):

PWD disturbance (acres):



U.S. Department of the Interior BUREAU OF LAND MANAGEMENT

#### **Bond Information**

Federal/Indian APD: FED

BLM Bond number: NMB000471

**BIA Bond number:** 

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

**BLM reclamation bond number:** 

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

**Reclamation bond number:** 

**Reclamation bond amount:** 

**Reclamation bond rider amount:** 

Additional reclamation bond information attachment:

1.1

08/31/2018

## Well Name: COPPERLINE WEST 29 FEDERAL

Well Number: 7H

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	() OW	TVD
EXIT Leg #1	330	FSL	227 5	FWL	23S	34E	29	Aliquot SESW	32.26912 7	- 103.4927 61	LEA	NEW MEXI CO	1.40		NMNM 092199	- 552 3	136 37	906 2
BHL Leg #1	330	FSL	227 5	FWL	23S	34E	29	Aliquot SESW	32.26925 1	- 103.4932 39	LEA	MEXI		F	NMNM 092199	- 552 3	136 37	906 2