

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals

HOEBS OGD 5

23 OCT

SUBMIT IN TRIPLICATE - Other Instructions on page 2.

1. Type of Well <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input checked="" type="checkbox"/> Other		RECEIVED 8. Well Name and No. Gunner 8 Federal #4H
2. Name of Operator COG Operating LLC		
3a. Address 2208 W. Main Street Artesia, NM 88210	3b. Phone No. (include area code) 575-748-6940	9. API Well No. 30-025-41187
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) 190' FSL & 380' FEL Unit Letter P (SESE) Sec 8-26S-34E 1650' FNL & 380' FEL Unit Letter H (SENE) Sec 5-26S-34E		10. Field and Pool, or Exploratory Area Wildcat; Bone Spring
Lat. Long.		11. County or Parish, State Lea County NM

12. CHECK APPROPRIATE BOX(S) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION		TYPE OF ACTION		
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/ Resume)	<input type="checkbox"/> Water Shut-off
	<input type="checkbox"/> Altering Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other <u>BHL change</u>
	<input checked="" type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and abandon	<input type="checkbox"/> Temporarily Abandon	<u>Participating Area</u>
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug back	<input type="checkbox"/> Water Disposal	<u>& Name Change</u>

13. Describe Proposed or Completed Operation (clearly state all pertinent details including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths or pertinent markers and sands. Attach the Bond under which the work will be performed or provide the Bond No. on file with the BLM/ BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notice shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

COG Operating LLC respectfully requests approval for the following changes to the original approved APD.

Name Change:

From Gunner 8 Federal Com #4H

To: Gunner 8 Federal #4H

Participating Area:

See Attached C-102

Plan to drill 7-7/8" hole to 18,388' MD (9809' TVD). See attached directional plan.

With this change, production tail cement slurry volume needs to be decreased to 1750 sx of the same blend.

5 1/2" New 17# LTC P-110 casing as described in APD will be set at 18,388'.

STATE COA WILL REQUIRE NSP

14. I hereby certify that the foregoing is true and correct.		APPROVED	
Name (Printed/ Typed)		Title:	
Mayte Reyes		Regulatory Analyst	
Signature: <i>Mayte Reyes</i>		Date:	
		9/16/13	
THIS SPACE FOR FEDERAL OR STATE OFFICE USE			
Approved by:		Title:	
Conditions of approval, if any are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.			BUREAU OF LAND MANAGEMENT CARLSBAD FIELD OFFICE
		Office:	

Title 18 U.S.C. Section 1001 AND Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

OCT 24 2013

HOBS OGD

OCT 23 2013

DISTRICT I

1825 N. FANCH DR., HOBBS, NM 88240

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102

Revised October 12, 2010

Submit to Appropriate District Office

State Lease - 4 Copies

Fee Lease - 3 Copies

DISTRICT II

1301 W. GRAND AVENUE, ARTESIA, NM 88210

RECEIVED

OIL CONSERVATION DIVISION

11885 SOUTH ST. FRANCIS DR.

Santa Fe, New Mexico 87505

DISTRICT III

1000 RIO BRAZOS RD., AZTEC, NM 87410

DISTRICT IV

11885 S. ST. FRANCIS DR., SANTA FE, NM 87505

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number 30-025-41187	Pool Code 978927	Pool Name Wildcat G-06 S263407P; Bone Spring
Property Code 39912	Property Name GUNNER 8 FEDERAL	Well Number 4H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3335.0'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	8	26-S	34-E		190	SOUTH	380	EAST	LEA

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	5	26-S	34-E		1650	NORTH	380	EAST	LEA
Dedicated Acres 280	Joint or Infill	Consolidation Code	Order No.						

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

<p>NAD 27 PROPOSED BOTTOM HOLE LOCATION Y=392070.3 N X=763029.5 E LAT.=32.075071° N LONG.=103.484158° W</p> <p>SECTION 5 SECTION 8</p> <p>NAD 27 SURFACE LOCATION Y=383347.5 N X=763104.7 E LAT.=32.051093° N LONG.=103.484136° W</p> <p>1/16 CORNER Y=383150.3 N X=762164.8 E</p>	<p>1/16 CORNER Y=392403.6 N X=763406.5 E</p> <p>1/4 CORNER Y=391084.6 N X=763418.1 E</p> <p>1/16 CORNER Y=384482.3 N X=763474.9 E</p> <p>SE CORNER Y=383160.5 N X=763486.3 E</p>	<p>OPERATOR CERTIFICATION</p> <p>I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p><i>Melanie J. Parker</i> 9/16/13 Signature Date Printed Name</p>
	<p>SURVEYOR CERTIFICATION</p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p>NOVEMBER 19, 2012 Date Surveyed Signature & Seal of Professional Surveyor</p>	<p>CHAD L. HARCROW NEW MEXICO 17777 LICENSED PROFESSIONAL SURVEYOR</p>
	<p>Certificate No. CHAD HARCROW 17777 W.O. # 12-216 2012-037</p>	



COG Operating LLC

**Lea County, NM
Gunner 8 Federal
#4H**

OH

Plan: Design #1

HOEBS OCD

OCT 23 2013

RECEIVED

Standard Planning Report

17 July, 2013



Wellplanning Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #4H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3365.0usft (Original Well Elev)
Project:	Lea County, NM	MD Reference:	WELL @ 3365.0usft (Original Well Elev)
Site:	Gunner 8 Federal	North Reference:	Grid
Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #1		

Project	Lea County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Gunner 8 Federal		
Site Position:		Northing:	383,347.50 usft
From:	Map	Easting:	763,104.70 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 3' 3.934 N
		Longitude:	103° 29' 2.891 W
		Grid Convergence:	0.45 °

Well	#4H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	3.0 usft	Wellhead Elevation:	Ground Level:
			3,335.0 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/16/2013	7.28	59.99	48,313

Design	Design #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	359.55

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
9,392.5	0.00	0.00	9,392.5	0.0	0.0	0.00	0.00	0.00	0.00	
10,146.1	90.42	359.55	9,870.0	481.0	-3.8	12.00	12.00	0.00	359.55	
18,388.4	90.42	359.55	9,809.6	8,722.9	-68.5	0.00	0.00	0.00	0.00	PBHL(Gunner #4H)



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Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00



Wellplanning Planning Report

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Site:	Gunner 8 Federal	North Reference:	Grid
Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,200.0	0.00	0.00	6,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,600.0	0.00	0.00	6,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,800.0	0.00	0.00	6,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,400.0	0.00	0.00	7,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,600.0	0.00	0.00	7,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,700.0	0.00	0.00	7,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,800.0	0.00	0.00	7,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,900.0	0.00	0.00	7,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,000.0	0.00	0.00	8,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,100.0	0.00	0.00	8,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,200.0	0.00	0.00	8,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,300.0	0.00	0.00	8,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,400.0	0.00	0.00	8,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,600.0	0.00	0.00	8,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,700.0	0.00	0.00	8,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,800.0	0.00	0.00	8,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,900.0	0.00	0.00	8,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,000.0	0.00	0.00	9,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,100.0	0.00	0.00	9,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,200.0	0.00	0.00	9,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,300.0	0.00	0.00	9,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,392.5	0.00	0.00	9,392.5	0.0	0.0	0.0	0.00	0.00	0.00	
KOP - 9392.5 'MD, 0.00° INC, 0.00° AZI										
9,400.0	0.90	359.55	9,400.0	0.1	0.0	0.1	12.00	12.00	0.00	
9,425.0	3.90	359.55	9,425.0	1.1	0.0	1.1	12.00	12.00	0.00	
9,450.0	6.90	359.55	9,449.9	3.5	0.0	3.5	12.00	12.00	0.00	
9,475.0	9.90	359.55	9,474.6	7.1	-0.1	7.1	12.00	12.00	0.00	
9,500.0	12.90	359.55	9,499.1	12.0	-0.1	12.0	12.00	12.00	0.00	
9,525.0	15.90	359.55	9,523.3	18.3	-0.1	18.3	12.00	12.00	0.00	
9,550.0	18.90	359.55	9,547.2	25.7	-0.2	25.7	12.00	12.00	0.00	
9,575.0	21.90	359.55	9,570.6	34.5	-0.3	34.5	12.00	12.00	0.00	
9,600.0	24.90	359.55	9,593.5	44.4	-0.3	44.4	12.00	12.00	0.00	
9,625.0	27.90	359.55	9,615.9	55.5	-0.4	55.5	12.00	12.00	0.00	
9,650.0	30.90	359.55	9,637.7	67.8	-0.5	67.8	12.00	12.00	0.00	



Wellplanning Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #4H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3365.0usft (Original Well Elev)
Project:	Lea County, NM	MD Reference:	WELL @ 3365.0usft (Original Well Elev)
Site:	Gunner 8 Federal	North Reference:	Grid
Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
9,675.0	33.90	359.55	9,658.8	81.2	-0.6	81.2	12.00	12.00	0.00	
9,700.0	36.90	359.55	9,679.2	95.6	-0.8	95.6	12.00	12.00	0.00	
9,725.0	39.90	359.55	9,698.8	111.2	-0.9	111.2	12.00	12.00	0.00	
9,750.0	42.90	359.55	9,717.5	127.7	-1.0	127.7	12.00	12.00	0.00	
9,775.0	45.90	359.55	9,735.4	145.2	-1.1	145.2	12.00	12.00	0.00	
9,800.0	48.90	359.55	9,752.3	163.6	-1.3	163.6	12.00	12.00	0.00	
9,825.0	51.89	359.55	9,768.2	182.8	-1.4	182.8	12.00	12.00	0.00	
9,850.0	54.89	359.55	9,783.2	202.9	-1.6	202.9	12.00	12.00	0.00	
9,875.0	57.89	359.55	9,797.0	223.7	-1.8	223.7	12.00	12.00	0.00	
9,900.0	60.89	359.55	9,809.7	245.2	-1.9	245.2	12.00	12.00	0.00	
9,925.0	63.89	359.55	9,821.3	267.4	-2.1	267.4	12.00	12.00	0.00	
9,950.0	66.89	359.55	9,831.7	290.1	-2.3	290.1	12.00	12.00	0.00	
9,975.0	69.89	359.55	9,840.9	313.3	-2.5	313.4	12.00	12.00	0.00	
10,000.0	72.89	359.55	9,848.9	337.0	-2.6	337.0	12.00	12.00	0.00	
10,025.0	75.89	359.55	9,855.6	361.1	-2.8	361.1	12.00	12.00	0.00	
10,050.0	78.89	359.55	9,861.1	385.5	-3.0	385.5	12.00	12.00	0.00	
10,075.0	81.89	359.55	9,865.2	410.2	-3.2	410.2	12.00	12.00	0.00	
10,100.0	84.89	359.55	9,868.1	435.0	-3.4	435.0	12.00	12.00	0.00	
10,125.0	87.89	359.55	9,869.7	459.9	-3.6	459.9	12.00	12.00	0.00	
10,146.1	90.42	359.55	9,870.0	481.0	-3.8	481.0	12.00	12.00	0.00	
EOC- 10146.1 'MD, 90.42° INC, 359.55° AZI										
10,200.0	90.42	359.55	9,869.6	534.9	-4.2	534.9	0.00	0.00	0.00	
10,300.0	90.42	359.55	9,868.9	634.9	-5.0	634.9	0.00	0.00	0.00	
10,400.0	90.42	359.55	9,868.1	734.9	-5.8	734.9	0.00	0.00	0.00	
10,500.0	90.42	359.55	9,867.4	834.9	-6.6	834.9	0.00	0.00	0.00	
10,600.0	90.42	359.55	9,866.7	934.9	-7.3	934.9	0.00	0.00	0.00	
10,700.0	90.42	359.55	9,865.9	1,034.9	-8.1	1,034.9	0.00	0.00	0.00	
10,800.0	90.42	359.55	9,865.2	1,134.9	-8.9	1,134.9	0.00	0.00	0.00	
10,900.0	90.42	359.55	9,864.5	1,234.9	-9.7	1,234.9	0.00	0.00	0.00	
11,000.0	90.42	359.55	9,863.7	1,334.9	-10.5	1,334.9	0.00	0.00	0.00	
11,100.0	90.42	359.55	9,863.0	1,434.9	-11.3	1,434.9	0.00	0.00	0.00	
11,200.0	90.42	359.55	9,862.3	1,534.9	-12.1	1,534.9	0.00	0.00	0.00	
11,300.0	90.42	359.55	9,861.5	1,634.9	-12.8	1,634.9	0.00	0.00	0.00	
11,400.0	90.42	359.55	9,860.8	1,734.9	-13.6	1,734.9	0.00	0.00	0.00	
11,500.0	90.42	359.55	9,860.1	1,834.8	-14.4	1,834.9	0.00	0.00	0.00	
11,600.0	90.42	359.55	9,859.3	1,934.8	-15.2	1,934.9	0.00	0.00	0.00	
11,700.0	90.42	359.55	9,858.6	2,034.8	-16.0	2,034.9	0.00	0.00	0.00	
11,800.0	90.42	359.55	9,857.9	2,134.8	-16.8	2,134.9	0.00	0.00	0.00	
11,900.0	90.42	359.55	9,857.1	2,234.8	-17.6	2,234.9	0.00	0.00	0.00	
12,000.0	90.42	359.55	9,856.4	2,334.8	-18.3	2,334.9	0.00	0.00	0.00	
12,100.0	90.42	359.55	9,855.7	2,434.8	-19.1	2,434.9	0.00	0.00	0.00	
12,200.0	90.42	359.55	9,854.9	2,534.8	-19.9	2,534.9	0.00	0.00	0.00	
12,300.0	90.42	359.55	9,854.2	2,634.8	-20.7	2,634.9	0.00	0.00	0.00	
12,400.0	90.42	359.55	9,853.5	2,734.8	-21.5	2,734.9	0.00	0.00	0.00	
12,500.0	90.42	359.55	9,852.7	2,834.8	-22.3	2,834.9	0.00	0.00	0.00	
12,600.0	90.42	359.55	9,852.0	2,934.8	-23.1	2,934.9	0.00	0.00	0.00	
12,700.0	90.42	359.55	9,851.3	3,034.8	-23.8	3,034.9	0.00	0.00	0.00	
12,800.0	90.42	359.55	9,850.5	3,134.8	-24.6	3,134.9	0.00	0.00	0.00	
12,900.0	90.42	359.55	9,849.8	3,234.8	-25.4	3,234.9	0.00	0.00	0.00	
13,000.0	90.42	359.55	9,849.1	3,334.8	-26.2	3,334.9	0.00	0.00	0.00	
13,100.0	90.42	359.55	9,848.3	3,434.8	-27.0	3,434.9	0.00	0.00	0.00	
13,200.0	90.42	359.55	9,847.6	3,534.7	-27.8	3,534.9	0.00	0.00	0.00	
13,300.0	90.42	359.55	9,846.9	3,634.7	-28.5	3,634.9	0.00	0.00	0.00	
13,400.0	90.42	359.55	9,846.1	3,734.7	-29.3	3,734.8	0.00	0.00	0.00	



Wellplanning Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #4H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3365.0usft (Original Well Elev)
Project:	Lea County, NM	MD Reference:	WELL @ 3365.0usft (Original Well Elev)
Site:	Gunner 8 Federal	North Reference:	Grid
Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,500.0	90.42	359.55	9,845.4	3,834.7	-30.1	3,834.8	0.00	0.00	0.00
13,600.0	90.42	359.55	9,844.7	3,934.7	-30.9	3,934.8	0.00	0.00	0.00
13,700.0	90.42	359.55	9,843.9	4,034.7	-31.7	4,034.8	0.00	0.00	0.00
13,800.0	90.42	359.55	9,843.2	4,134.7	-32.5	4,134.8	0.00	0.00	0.00
13,900.0	90.42	359.55	9,842.5	4,234.7	-33.3	4,234.8	0.00	0.00	0.00
14,000.0	90.42	359.55	9,841.7	4,334.7	-34.0	4,334.8	0.00	0.00	0.00
14,100.0	90.42	359.55	9,841.0	4,434.7	-34.8	4,434.8	0.00	0.00	0.00
14,200.0	90.42	359.55	9,840.3	4,534.7	-35.6	4,534.8	0.00	0.00	0.00
14,300.0	90.42	359.55	9,839.6	4,634.7	-36.4	4,634.8	0.00	0.00	0.00
14,400.0	90.42	359.55	9,838.8	4,734.7	-37.2	4,734.8	0.00	0.00	0.00
14,500.0	90.42	359.55	9,838.1	4,834.7	-38.0	4,834.8	0.00	0.00	0.00
14,600.0	90.42	359.55	9,837.4	4,934.7	-38.8	4,934.8	0.00	0.00	0.00
14,700.0	90.42	359.55	9,836.6	5,034.7	-39.5	5,034.8	0.00	0.00	0.00
14,800.0	90.42	359.55	9,835.9	5,134.7	-40.3	5,134.8	0.00	0.00	0.00
14,900.0	90.42	359.55	9,835.2	5,234.6	-41.1	5,234.8	0.00	0.00	0.00
15,000.0	90.42	359.55	9,834.4	5,334.6	-41.9	5,334.8	0.00	0.00	0.00
15,100.0	90.42	359.55	9,833.7	5,434.6	-42.7	5,434.8	0.00	0.00	0.00
15,200.0	90.42	359.55	9,833.0	5,534.6	-43.5	5,534.8	0.00	0.00	0.00
15,300.0	90.42	359.55	9,832.2	5,634.6	-44.3	5,634.8	0.00	0.00	0.00
15,400.0	90.42	359.55	9,831.5	5,734.6	-45.0	5,734.8	0.00	0.00	0.00
15,500.0	90.42	359.55	9,830.8	5,834.6	-45.8	5,834.8	0.00	0.00	0.00
15,600.0	90.42	359.55	9,830.0	5,934.6	-46.6	5,934.8	0.00	0.00	0.00
15,700.0	90.42	359.55	9,829.3	6,034.6	-47.4	6,034.8	0.00	0.00	0.00
15,800.0	90.42	359.55	9,828.6	6,134.6	-48.2	6,134.8	0.00	0.00	0.00
15,900.0	90.42	359.55	9,827.8	6,234.6	-49.0	6,234.8	0.00	0.00	0.00
16,000.0	90.42	359.55	9,827.1	6,334.6	-49.8	6,334.8	0.00	0.00	0.00
16,100.0	90.42	359.55	9,826.4	6,434.6	-50.5	6,434.8	0.00	0.00	0.00
16,200.0	90.42	359.55	9,825.6	6,534.6	-51.3	6,534.8	0.00	0.00	0.00
16,300.0	90.42	359.55	9,824.9	6,634.6	-52.1	6,634.8	0.00	0.00	0.00
16,400.0	90.42	359.55	9,824.2	6,734.6	-52.9	6,734.8	0.00	0.00	0.00
16,500.0	90.42	359.55	9,823.4	6,834.6	-53.7	6,834.8	0.00	0.00	0.00
16,600.0	90.42	359.55	9,822.7	6,934.6	-54.5	6,934.8	0.00	0.00	0.00
16,700.0	90.42	359.55	9,822.0	7,034.5	-55.3	7,034.8	0.00	0.00	0.00
16,800.0	90.42	359.55	9,821.2	7,134.5	-56.0	7,134.8	0.00	0.00	0.00
16,900.0	90.42	359.55	9,820.5	7,234.5	-56.8	7,234.8	0.00	0.00	0.00
17,000.0	90.42	359.55	9,819.8	7,334.5	-57.6	7,334.8	0.00	0.00	0.00
17,100.0	90.42	359.55	9,819.0	7,434.5	-58.4	7,434.8	0.00	0.00	0.00
17,200.0	90.42	359.55	9,818.3	7,534.5	-59.2	7,534.7	0.00	0.00	0.00
17,300.0	90.42	359.55	9,817.6	7,634.5	-60.0	7,634.7	0.00	0.00	0.00
17,400.0	90.42	359.55	9,816.8	7,734.5	-60.7	7,734.7	0.00	0.00	0.00
17,500.0	90.42	359.55	9,816.1	7,834.5	-61.5	7,834.7	0.00	0.00	0.00
17,600.0	90.42	359.55	9,815.4	7,934.5	-62.3	7,934.7	0.00	0.00	0.00
17,700.0	90.42	359.55	9,814.6	8,034.5	-63.1	8,034.7	0.00	0.00	0.00
17,800.0	90.42	359.55	9,813.9	8,134.5	-63.9	8,134.7	0.00	0.00	0.00
17,900.0	90.42	359.55	9,813.2	8,234.5	-64.7	8,234.7	0.00	0.00	0.00
18,000.0	90.42	359.55	9,812.4	8,334.5	-65.5	8,334.7	0.00	0.00	0.00
18,100.0	90.42	359.55	9,811.7	8,434.5	-66.2	8,434.7	0.00	0.00	0.00
18,200.0	90.42	359.55	9,811.0	8,534.5	-67.0	8,534.7	0.00	0.00	0.00
18,300.0	90.42	359.55	9,810.2	8,634.5	-67.8	8,634.7	0.00	0.00	0.00
18,388.4	90.42	359.55	9,809.6	8,722.8	-68.5	8,723.1	0.00	0.00	0.00

TD at 18388.4 - PBHL(Gunner #4H)



Wellplanning Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #4H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3365.0usft (Original Well Elev)
Project:	Lea County, NM	MD Reference:	WELL @ 3365.0usft (Original Well Elev)
Site:	Gunner 8 Federal	North Reference:	Grid
Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #1		

Design Targets									
Target Name	Dip Angle	Dip.Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
PBHL(Gunner #4H)	0.00	0.00	9,810.0	8,722.8	-75.2	392,070.30	763,029.50	32° 4' 30.257 N	103° 29' 2.967 W
- plan misses target center by 6.7usft at 18388.4usft MD (9809.6 TVD, 8722.8 N, -68.5 E)									
- Point									

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
9,392.5	9,392.5	0.0	0.0	KOP - 9392.5 'MD, 0.00° INC, 0.00° AZI
10,146.1	9,870.0	481.0	-3.8	EOC- 10146.1 'MD, 90.42° INC, 359.55° AZI
18,388.4	9,809.6	8,722.9	-68.5	TD at 18388.4



COG Operating LLC
Project: Lea County, NM
Site: Gunner 8 Federal

Well: #4H
Wellbore: OH
Plan: Design #1 (#4H/OH)

Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	9392.5	0.00	0.00	9392.5	0.0	0.0	0.00	0.00	0.0	
3	10146.1	90.42	359.55	9870.0	481.0	-3.8	12.00	359.55	481.0	
4	18388.4	90.42	359.55	9809.6	8722.9	-68.5	0.00	0.00	8723.1	PBHL(Gunner #4H)

WELL DETAILS: #4H

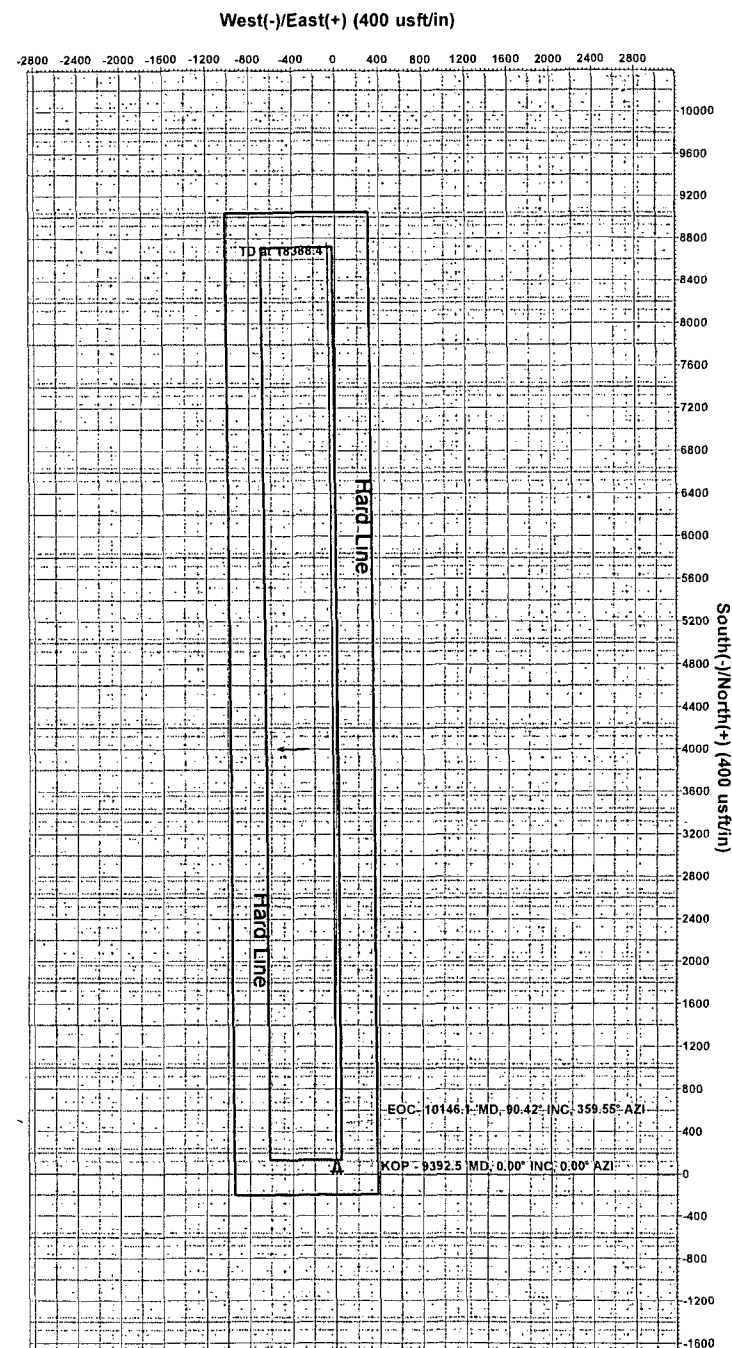
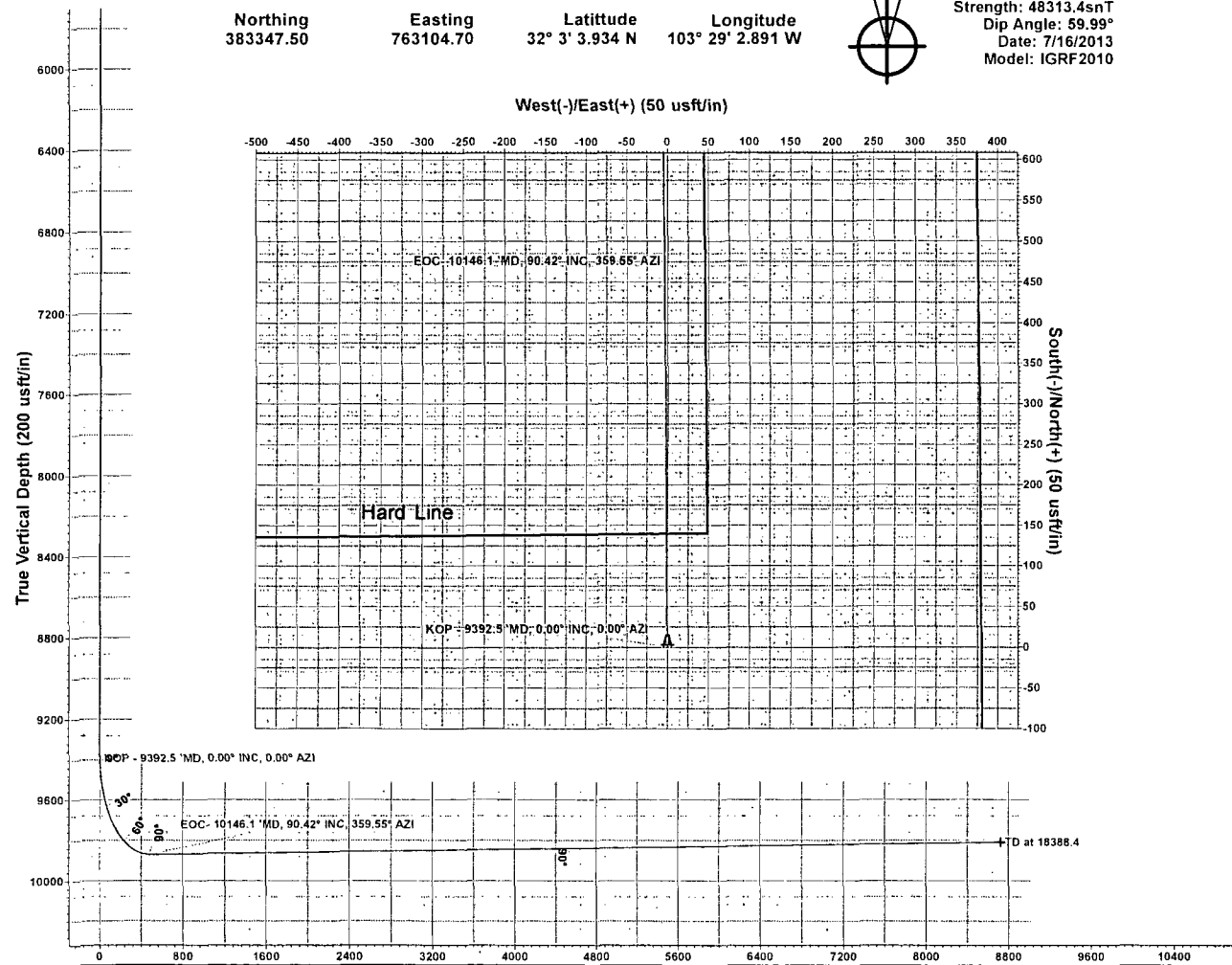
Ground Elevation:: 3335.0
RKB Elevation: WELL @ 3365.0usft (Original Well Elev)
Rig Name: Original Well Elev

Northing 383347.50 Easting 763104.70 Latitude 32° 3' 3.934 N Longitude 103° 29' 2.891 W



Azimuths to Grid North
True North: -0.45°
Magnetic North: 6.83°

Magnetic Field
Strength: 48313.4snT
Dip Angle: 59.99°
Date: 7/16/2013
Model: IGRF2010



Plan: Design #1 (#4H/OH)
Created By: Well Planner Date: 17:05, July 17 2013

Terra Directional Services
322 Spring Hill Drive, Suite A100, Spring, Texas 77386
432.425.7532

PROJECT DETAILS: Lea County, NM
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid

OCT 23 2013

RECEIVED

PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating LLC
LEASE NO.:	NMMN-124664
WELL NAME & NO.:	Gunner 8 Federal Com 4H
SURFACE HOLE FOOTAGE:	0190' FSL & 0380' FEL
BOTTOM HOLE FOOTAGE	1650' FNL & 0380' FEL Sec. 5, T. 26 S., R 34 E.
LOCATION:	Section 8, T. 26 S., R 34 E., NMPM
COUNTY:	Lea County, New Mexico
API:	30-025-41187

The original COAs still stand with the following drilling modifications:

I. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

☒ **Lea County**

Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240,
(575) 393-3612

1. **Although Hydrogen Sulfide has not been reported in the area, it is always a potential hazard. If Hydrogen Sulfide is encountered, please report measured amounts and formations to the BLM.**
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**
3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.

4. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

B. CASING

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.).

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

Wait on cement (WOC) time prior to drilling out for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater for all casing strings. DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. IF OPERATOR DOES NOT HAVE THE WELL SPECIFIC CEMENT DETAILS ONSITE PRIOR TO PUMPING THE CEMENT FOR EACH CASING STRING, THE WOC WILL BE 30 HOURS. See individual casing strings for details regarding lead cement slurry requirements.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Possible water and brine flows in the Salado, Castile, Delaware, and Bone Spring.

Possible lost circulation in the Delaware and Bone Springs formations.

Possible sulfur water flows from the Castile Group.

1. The **13-3/8** inch surface casing shall be set at approximately **800** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

- b. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**
- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
- d. If cement falls back, remedial cementing will be done prior to drilling out that string.

Intermediate casing shall be kept fluid filled while running into hole to meet BLM minimum collapse requirements.

- 2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.

Centralizers required on horizontal leg, must be type for horizontal service and a minimum of one every other joint.

- 3. The minimum required fill of cement behind the **5-1/2** inch production casing is:

☒ Cement should tie-back at least 500 feet into previous casing string. Operator shall provide method of verification.

- 4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

- 1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 -- Sec. 17.
- 2. **In the case where the only BOP installed is an annular preventer, it shall be tested to a minimum of 2000 psi (which may require upgrading to 3M or 5M annular).**
- 3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M) psi.**

4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** intermediate casing shoe shall be **3000 (3M)** psi.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. 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 plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi 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).
 - b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**.
 - c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock.
 - d. The results of the test shall be reported to the appropriate BLM office.
 - e. 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.**
 - f. 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. This test shall be performed prior to the test at full stack pressure.

D. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

E. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

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