

**UNOR-HODOX
LOCATION**

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

HOBBS OCD

APR 18 2016

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of Work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		RECEIVED	
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		7. If Unit or CA Agreement, Name and No. [36538]	
2. Name of Operator COG Production LLC.		8. Lease Name and Well No. Dos XX 27 Federal Com #2H	
3a. Address 2208 West Main Street Artesia, NM 88210	3b. Phone No. (include area code) 575-748-6940	9. API Well No. 30-025-43162	
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 190' FNL & 2260' FEL Unit Letter B (NWNE) Sec 27-T24S-R32E At proposed prod. Zone 330' FSL & 2260' FEL Unit Letter O (SWSE) Sec 27-T24S-R32E		10. Field and Pool, or Exploratory WC-025 G-06 S253201M; Upper Bone Spring (97784)	
14. Distance in miles and direction from nearest town or post office* Approximately 23 miles from Malaga		11. Sec., T.R.M. or Blk and Survey or Area Sec. 27 - T24S - R32E	
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. Unit line, if any) 190'		16. No. of acres in lease SHL: 1840 BHL: 1879.24	17. Spacing Unit dedicated to this well 160
18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL: 80' Proposed Dos XX #4H BHL: 3302'		20. BLM/BIA Bond No. on file NMB000860 & NMB000845	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3589.7' GL		22. Approximate date work will start* 6/1/20016	23. Estimated duration 30 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, shall be attached to this form:

- | | |
|---|--|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan | 5. Operator certification |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the authorized officer. |

25. Signature <i>Mayte Reyes</i>	Name (Printed/Typed) Mayte Reyes	Date 12-1-2015
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Title
Regulatory Analyst

Approved by (Signature) /S/ STEPHEN J. CAFFEY	Name (Printed/Typed)	Date APR 13 2016
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Title FOR FIELD MANAGER	Office BLM-CARLSBAD FIELD OFFICE
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Application approval does not constitute approval to conduct operations thereon. Conditions of approval, if any, shall be stated in the approval. Title 18 U.S.C. Section 1001. States any false, fictitious or fraudulent statements or transactions. The NMOCD Gas Capture Plan notice has been posted on the web site under Announcements/Notice to Operators. A copy of the GCP form is included with the notice and is also in the Forms section under Unnumbered forms. Please submit accordingly in a timely manner. rights in the subject lease which would entitle the applicant to APPROVAL FOR TWO YEARS and willfully to make to any department or agency of the United States.

(Continued on page 2) Carlsbad Controlled Water Basin

Witness Surface Casing (Instructions on page 2)

**APPROVAL SUBJECT TO
GENERAL REQUIREMENTS
AND SPECIAL STIPULATIONS
ATTACHED**

*K2
04/18/16*

**SEE ATTACHED FOR
CONDITIONS OF APPROVAL**

APR 22 2016

COG Production LLC – Dos XX 27 Fed Com 2H

1. Geologic Formations

TVD of target	9600'	Pilot hole depth	No
MD at TD:	14,151'	Deepest expected fresh water:	541

Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	1030	Water	
Top of Salt	1350	Salt	
Base of Salt	4628	Salt	
Delaware - Lamar	4859	Salt Water	
Bell Canyon	4903	Salt Water	
Cherry Canyon	5775	Oil/Gas	
Brushy Canyon	7146	Oil/Gas	
Bone Spring Lime	8771	Oil/Gas	
U. Avalon Shale	8922	Oil/Gas	
L. Avalon Shale	9412	Oil/Gas Target Zone	
1 st Bone Spring Sand	10,013	Not Penetrated	
2 nd Bone Spring Sand	10,555	Not Penetrated	
3 rd Bone Spring Sand	11,864	Not Penetrated	

2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
	From	To							
17.5"	0	1150	13.375"	54.5	J55	STC	1.277	1.19	8.3
12.25"	0	3500	9.625"	36	J55	LTC	1.09	1.215	3.6
12.25"	3500	4860	9.625"	40	J55	LTC	.997	1.355	9.56
8.75"	0	14,151'	5.5"	17	P110	LTC	1.642	2.342	2.727
BLM Minimum Safety Factor							1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/2 full while running casing to mitigate collapse.
 Intermediate burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface.
 All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y

COG Production LLC – Dos XX 27 Fed Com 2H

Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3 rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2 nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

3. Cementing Program

Casing	# Sks	Wt. lb/gal	Yld. ft ³ /sack	H ₂ O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surf.	510	13.5	1.75	9	12	Lead: Class C + 4% Gel + 2% CaCl ₂
	250	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl ₂
Inter.	1080	12.7	1.98	10.6	16	Lead: Econocem HLC 65:35:6 + 5% Salt
	250	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl
5.5 Prod	510	10.3	3.5	21	72	Lead: Halliburton Tune Lite Blend
	1195	14.4	1.24	5.7	19	Tail: Versacem 50:50:2 Class H + 1% Salt

Volumes Subject to Observed Hole Conditions and/or Fluid Caliper Results
 Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Casing String	TOC	% Excess
Surface	0'	50%
1 st Intermediate	0'	75%
Production	3860'	17% OH in Lateral (KOP to EOL) – 40% OH in Vertical - KOP then Tie In 1000' Inside 9-5/8" Casing Shoe @ 4860'

4. Pressure Control Equipment

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.
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See
COA

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
12-1/4"	13-5/8"	2M	Annular	x	2000 psi
			Blind Ram		2M
			Pipe Ram		
			Double Ram		
			Other*		
8-3/4"	13-5/8"	5M	Annular	x	50% testing pressure
			Blind Ram	x	5M
			Pipe Ram	x	
			Double Ram		
			Other*		

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

X	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
N	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
N	Are anchors required by manufacturer?
N	A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.

COG Production LLC – Dos XX 27 Fed Com 2H

5. Mud Program

From	Depth		Type	Weight (ppg)	Viscosity	Water Loss
	To					
0	Surf. Shoe (1150')		FW Gel	8.6-8.8	28-34	N/C
Surf csg (1150')	9-5/8" Int shoe (4860')		Saturated Brine	10.0-10.2	28-34	N/C
9-5/8" Int shoe	14,151' (Lateral TD)		Cut Brine	8.6 – 9.4	28-34	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring
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6. Logging and Testing Procedures

Logging, Coring and Testing	
Y	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
N	No Logs are planned based on well control or offset log information.
N	Drill stem test? If yes, explain
N	Coring? If yes, explain

Additional logs planned	Interval
N	Resistivity
N	Density
Y	CBL
Y	Mud log
N	PEX

COG Production LLC – Dos XX 27 Fed Com 2H

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	4543 psi at 9600' TVD (EOC and EOL)
Abnormal Temperature	NO

No abnormal pressure or temperature conditions are anticipated. Sufficient mud materials to maintain mud properties and weight increase requirements will be kept on location at all times.

Sufficient supplies of Paper/LCM for periodic sweeps to control seepage and losses will be maintained on location.

Offset Wellbore Proximity – Anticollision Considerations: The Dos XX 27 Fed 2H will be drilled 80' West of the future Dos XX 27 Federal Com 4H. Due to the proximity of both of these wells, directional straight hole control tools will be utilized to keep each wellbore as straight as practicable. The TVD of each well's laterals are separated by approximately 1300' and therefore, the curve and lateral drilling operations will not be in conflict with each other provided the vertical sections of each hole is monitored and kept reasonably straight. Current plans are for the Dos XX 27 Federal Com 4H to be drilled first. The Gyro Surveys on this well will be used for straight hole control planning and monitoring when subsequently drilling the Dos XX 27 Federal Com 2H. All other wells along or in the vicinity of the planned well path are too shallow any collision potential or threat.

Hydrogen Sulfide (H ₂ S) monitors will be installed prior to drilling out the surface shoe. If H ₂ S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
N	H ₂ S is present
Y	H ₂ S Plan attached

*See
COA*

8. Other facets of operation

Is this a walking operation? NO If yes, describe.
 Will be pre-setting casing? NO If yes, describe.

Attachments

- Directional Plan
- BOP & Choke Schematics
- C102 and supporting maps
- Rig plat
- H₂S schematic
- H₂S contingency plan
- Interim reclamation plat