

OCD-HOBBS

Form 3160-3  
(April 2004)

HOBBS OCD

FORM APPROVED  
OMB No 1004-0137  
Expires March 31, 2007UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

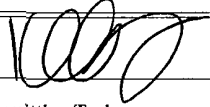
MAY 25 2012

## APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5 Lease Serial No. NMLC-029509A	
1b. Type of Well <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		6 If Indian, Allottee or Tribe Name N/A	
2. Name of Operator COG Operating LLC		7 If Unit or CA Agreement, Name and No N/A	
3a Address 550 W. Texas, Suite 100 Midland TX 79701		8 Lease Name and Well No. 302519 M C FEDERAL #68	
3b Phone No. (include area code) (432) 685-4384		9 API Well No. 30-025-40595	
4. Location of Well (Report location clearly and in accordance with any State requirements *) At surface 862' FSL & 1637' FWL, Unit N At proposed prod zone 330' FSL & 1650' FWL, Unit N		10 Field and Pool, or Exploratory Maljamar; Yeso, West 44500	
14 Distance in miles and direction from nearest town or post office* 2.5 miles south of Maljamar NM		11 Sec, T R M or Blk and Survey or Area Sec 21, T17S, R32E	
15 Distance from proposed* location to nearest property or lease line, ft (Also to nearest drig unit line, if any) 862'		12 County or Parish Lea	
16 No of acres in lease 640		13 State NM	
17 Spacing Unit dedicated to this well 40		18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft 157'	
19 Proposed Depth TVD: 7200' MD: 7226'		20 BLM/BIA Bond No. on file NMB000740; NMB000215	
21 Elevations (Show whether DF, KDB, RT, GL, etc ) 4020' GL		22 Approximate date work will start* 2-29-12	
23 Estimated duration 10 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 	Name (Printed/Typed) Kelly J. Holly	Date 1-10-12
Title Permitting Tech		

Approved by (Signature) /s/ Don Peterson	Name (Printed/Typed) CARLSBAD FIELD OFFICE	Date MAY 23 2012
Title FOR FIELD MANAGER		

Application approval 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

Conditions of approval, if any, are attached

**APPROVAL FOR TWO YEARS**

Title 18 USC Section 1001 and Title 43 USC Section 1212, make it a crime for any person knowingly and willfully to make to 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)

Roswell Controlled Water Basin

Approval Subject to General Requirements  
& Special Stipulations AttachedSEE ATTACHED FOR  
CONDITIONS OF APPROVAL

MAY 31 2012

## MASTER DRILLING PROGRAM

### 1. Geologic Name of Surface Formation

Quaternary

### 2. Estimated Tops of Important Geologic Markers:

Quaternary	Surface
Rustler	680'
Top of Salt	900'
Base of Salt	1700'
Yates	2010'
Seven Rivers	2375'
Queen	2980'
Grayburg	3355'
San Andres	3700'
Glorietta	5260'
Paddock	5310'
Blinbry	5870'
Tubb	6810'

### 3. Estimated Depths of Anticipated Fresh Water, Oil and Gas

Water Sand	150'	Fresh Water
Grayburg	3355'	Oil/Gas
San Andres	3700'	Oil/Gas
Glorietta	5260'	Oil/Gas
Paddock	5310'	Oil/Gas
Blinbry	5870'	Oil/Gas
Tubb	6810'	Oil/Gas

*See  
COA*

No other formations are expected to give up oil, gas or fresh water in measurable quantities. Setting 13 3/8" casing to ~~720'~~ and circulating cement back to the surface will protect the surface fresh water sand. The Salt Section will be protected by setting 8 5/8" casing to ~~2100'~~ and circulating cement, in a single or multi-stage job and/or with an ECP, back to the surface. Any shallower zones above TD, which contain commercial quantities of oil and/or gas, will have cement circulated across them. This will be achieved by cementing, with a single or multi-stage job, the 5 1/2" production casing back 200' into the intermediate casing, to be run at TD. If wellbore conditions arise that require immediate action and/or a change to this program, COG Operating LLC personnel will always react

*See  
COA*

#### 4. Casing Program

See  
COA

Hole Size	Interval	OD Casing	Weight	Grade	Jt., Condition	burst/collapse/tension
17 1/2"	0- <del>720</del> 335	13 3/8"	48#	H-40orJ-55	ST&C/New	6.03/2.578/10.32
11"	0-2100'	8 5/8"	24or32#	J-55	ST&C/New	1.85/1.241/4.78
7 7/8"	0-T.D.	5 1/2"	15.5or17#	J-55orL-80	LT&C/New	1.59/1.463/2.05

#### 5. Cement Program See COA

13 3/8" Surface Casing:

LEAD Class C, 4% Gel, 2% CaCl<sub>2</sub>, .25 pps CF, 325 sx, yield-1.75 + TAIL 200 sx w/ 2% CaCl<sub>2</sub>, 0.25 pps CF, yield-1.32. 133% excess

8 5/8" Intermediate Casing:

##### 11" Hole:

**Single Stage:** LEAD 50:50:10 C:Poz:Gel w/ 5% Salt +0.25% CF, 375 sx, yield-2.45 + TAIL Class C w/2% CaCl<sub>2</sub>, 200 sx, yield-1.32, back to surface. 133% excess

**Multi-Stage:** Stage 1: Class C w/2% CaCl<sub>2</sub>, 400 sx, yield - 1.32; 48% excess  
Stage 2: Class C w/2% CaCl<sub>2</sub>, 200 sx, yield - 1.32, back to surface, 48% excess; assumption for tool is lost circulation. Multi stage tool to be set at approximately, depending on hole conditions, 770' (50' below the surface casing). Cement volumes will be adjusted proportionately for depth changes of multi stage tool.

5 1/2" Production Casing:

**Single Stage:** LEAD 35:65:6 C:Poz:Gel w/ 5% Salt + 5 pps LCM + 0.2% SMS + 0.3% FL-52A + 0.125 pps CF, 500 sx, yield-2.05 + TAIL 50:50:2 C:Poz:Gel w/ 5% Salt + 3 pps LCM + 0.6% SMS + 1% FL-25 + 1% BA-58 + 0.3% FL-52A + 0.125 pps CF, 400 sx, yield-1.37, to 200' minimum tie back to intermediate casing. 30% excess back to surface (no need for excess in casing overlap).

**Multi-Stage:** Stage 1: (Assumed TD of 7200' to DV at 3500') 50:50:2, C:Poz:Gel w/ 5% Salt + 3 pps LCM + 0.6% SMS + 1% FL-25 + 1% BA-58 + 0.3% FL-52A + 0.125 pps CF, 550 sx, yield - 1.37, 13% excess; **this is a minimum volume and will be adjusted up after caliper is run.** Stage 2: LEAD 50:50:2 C:Poz:Gel w/ 5% Salt + 3 pps LCM + 0.6% SMS + 1% FL-25 + 1% BA-58 + 0.3% FL-52A + 0.125 pps CF, 450 sx, yield - 1.37, + TAIL Class C w/ 0.3% R-3 + 1.5% CD-32, 250 sx, yield - 1.02 43% excess calculated back to surface (no need for excess in casing overlap). Multi stage tool to be set at approximately, depending on hole conditions, 3500'. Cement volumes will be adjusted proportionately for depth changes of multi stage tool, assumption for tool is water flow.

## 6. Minimum Specifications for Pressure Control

The blowout preventer equipment (BOP) shown in Exhibit #9 will consist of a double ram-type (2000 psi WP) preventer, and in some cases possibly a 2000 psi Hydril type annular preventer as provided for in Onshore Order #2. This unit will be hydraulically operated and the ram type preventer will be equipped with blind rams on top of 4 1/2" drill pipe rams on the bottom. A 13-5/8" or 11" BOP will be used, depending on the rig selected, during the drilling of the well. The BOP will be nipped up on the 13 3/8" surface casing with BOP equipment and tested to 2000 psi. When 11" BOP is used the special drilling flange will be utilized on the 13-3/8" head to allow testing the BOP with a retrievable test plug. After setting 8-5/8" the BOP will then be nipped up on the 8 5/8" intermediate casing and tested by a third party to 2000 psi and used continuously until total depth is reached. 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 (Exhibit #10) will include a Kelly cock and floor safety valve, choke lines and a choke manifold (Exhibit #11) with a 2000 psi WP rating.

The majority of the rigs currently in use have a 13-5/8" BOP, so no special provision is needed for most wells in the area for conventionally testing the BOP with a test plug. However, due to the vagaries of rig scheduling, it might be that one of the few rigs with 11" BOP's might be called upon to drill any specific well in the area. Note that intermediate hole size is always 11". Therefore, COG

Operating LLC respectfully requests a variance to the requirement of 13-5/8" *See COA*  
BOP on 13-3/8" casing. When that circumstance is encountered the special  
flange will be utilized to allow testing the entire BOP with a test plug, without  
subjecting the casing to test pressure. The special flange also allows the return to  
full-open capability if desired.

## 7. Types and Characteristics of the Proposed Mud System

The well will be drilled to TD with a combination of brine, cut brine and polymer  
mud system. The applicable depths and properties of this system are as follows:

DEPTH	TYPE	WEIGHT	VISCOSITY	WATERLOSS
<del>0-720'</del> 0-335'	Fresh Water	8.5	28	N.C.
<del>720-2100'</del>	Brine	10	30	N.C.
2100'-TD	Cut Brine	8.7-9.1	29	N.C.

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

## 8. Auxiliary Well Control and Monitoring Equipment

- A. Kelly cock will be kept in the drill string at all times.
- B. A full opening drill pipe-stabbing valve with proper drill pipe connections  
will be on the rig floor at all times.

## 9. Logging, Testing and Coring Program *See COA*

- A. The electric logging program will consist of GR-Dual Laterolog, Spectral  
Density, Dual Spaced Neutron, CSNG Log and will be run from TD to 8  
5/8" casing shoe.
- B. Drill Stem test is not anticipated.
- C. No conventional coring is anticipated.
- D. Further testing procedures will be determined after the 5 1/2" production  
casing has been cemented at TD, based on drill shows and log evaluation.

## 10. Abnormal Conditions, Pressure, Temperatures and Potential Hazards

No abnormal pressures or temperatures are anticipated. Based on BHP tests in  
this area, the estimated bottom hole at TD is 110 degrees and the estimated

maximum bottom hold pressure is 2300 psig. Measurable gas volumes or Hydrogen Sulfide levels have not been encountered during drilling operations in this area, although a Hydrogen Sulfide Drilling Operation Plan is attached to this program. No major loss of circulation zones has been reported in offsetting wells.

**11. Anticipated Starting Date and Duration of Operations**

Road and location work will not begin until approval has been received from the BLM. As this is a Master Drilling plan, please refer to the Form 3160-3 for the anticipated start date. Once commenced, drilling operations should be finished in approximately 15 days. If the well is productive, an additional 30 days will be required for completion and testing before a decision is made to install permanent facilities.



## **COG Operating LLC**

Lea County, NM (NAD27 NME)

MC Federal #68

MC Federal #68

OH

Plan: Plan #2 - 7-7/8" Hole

SHL = 862' FSL & 1637' FWL

BHL = 380' FSL & 1660' FWL

Top of Paddock = 382' S of Surface & 21' E of Surface @ 5450' TVD

## **Standard Planning Report**

16 May, 2011





Scientific Drilling  
Planning Report



Database:	EDM-Julio	Local Co-ordinate Reference:	Well MC Federal #68
Company:	COG Operating LLC	TVD Reference:	GL Elev @ 4020 00usft
Project:	Lea County, NM (NAD27 NME)	MD Reference:	GL Elev @ 4020 00usft
Site:	MC Federal #68	North Reference:	Grid
Well:	MC Federal #68	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2 - 7-7/8" Hole		

Project:	Lea County, NM (NAD27 NME)		
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:	MC Federal #68		
Site Position:		Northing:	660,711 20 usft
From:	Map	Easting:	671,781 80 usft
Position Uncertainty:	0 00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 48' 54 484 N
		Longitude:	103° 46' 27 083 W
		Grid Convergence:	0 30 °

Well:	MC Federal #68		
Well Position	+N/-S	0 00 usft	Northing:
	+E/-W	0 00 usft	Easting:
Position Uncertainty	0 00 usft	Wellhead Elevation:	Ground Level:
			4,020 00 usft

Wellbore:	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	2011/05/16	7 73
			Dip Angle
			(°)
			60 70
			Field Strength
			(nT)
			48,954

Design:	Plan #2 - 7-7/8" Hole		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0 00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0 00	0 00	0 00
			Direction
			(°)
			176 86

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(usft)	(usft)	Rate	Rate	Rate	(°)	
(usft)			(usft)			(°/100usft)	(°/100usft)	(°/100usft)		
0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	
2,200 00	0 00	0 00	2,200 00	0 00	0 00	0 00	0 00	0 00	0 00	
2,561 68	7 23	176 86	2,560 72	-22 77	1 25	2 00	2 00	0 00	176 86	
5,275 28	7 23	176 86	5,252 72	-363 94	19 94	0 00	0 00	0 00	0 00	
5,473 43	3 27	176 86	5,450 00	-382 05	20 93	2 00	-2 00	0 00	180 00	TG1-MC Fed #68
7,226 28	3 27	176 86	7,200 00	-481 90	26 40	0 00	0 00	0 00	0 00	PBHL-MC Fed #86





Scientific Drilling  
Planning Report



Database:	EDM-Julio	Local Co-ordinate Reference:	Well MC Federal #68
Company:	COG Operating LLC	TVD Reference:	GL Elev @ 4020.00usft
Project:	Lea County NM (NAD27 NME)	MD Reference:	GL Elev @ 4020.00usft
Site:	MC Federal #68	North Reference:	Gnd
Well:	MC Federal #68	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2 - 7-7/8" Hole		

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
East HL MC Fed #68 North HL MC Fed #68									
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
8-5/8" Casing									
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP Start Build 2.00°/100'									
2,300.00	2.00	176.86	2,299.98	-1.74	0.10	1.75	2.00	2.00	0.00
2,400.00	4.00	176.86	2,399.84	-6.97	0.38	6.98	2.00	2.00	0.00
2,500.00	6.00	176.86	2,499.45	-15.67	0.86	15.69	2.00	2.00	0.00
2,561.68	7.23	176.86	2,560.72	-22.77	1.25	22.80	2.00	2.00	0.00
EOC hold 7.23°									
2,600.00	7.23	176.86	2,598.74	-27.58	1.51	27.63	0.00	0.00	0.00
2,700.00	7.23	176.86	2,697.94	-40.16	2.20	40.22	0.00	0.00	0.00
2,800.00	7.23	176.86	2,797.14	-52.73	2.89	52.81	0.00	0.00	0.00
2,900.00	7.23	176.86	2,896.35	-65.30	3.58	65.40	0.00	0.00	0.00
3,000.00	7.23	176.86	2,995.55	-77.88	4.27	77.99	0.00	0.00	0.00
3,100.00	7.23	176.86	3,094.76	-90.45	4.96	90.58	0.00	0.00	0.00
3,200.00	7.23	176.86	3,193.96	-103.02	5.64	103.18	0.00	0.00	0.00
3,300.00	7.23	176.86	3,293.16	-115.59	6.33	115.77	0.00	0.00	0.00
3,400.00	7.23	176.86	3,392.37	-128.17	7.02	128.36	0.00	0.00	0.00
3,500.00	7.23	176.86	3,491.57	-140.74	7.71	140.95	0.00	0.00	0.00
3,600.00	7.23	176.86	3,590.78	-153.31	8.40	153.54	0.00	0.00	0.00
3,700.00	7.23	176.86	3,689.98	-165.88	9.09	166.13	0.00	0.00	0.00
3,800.00	7.23	176.86	3,789.18	-178.46	9.78	178.72	0.00	0.00	0.00
3,900.00	7.23	176.86	3,888.39	-191.03	10.47	191.32	0.00	0.00	0.00
4,000.00	7.23	176.86	3,987.59	-203.60	11.15	203.91	0.00	0.00	0.00
4,100.00	7.23	176.86	4,086.80	-216.18	11.84	216.50	0.00	0.00	0.00
4,200.00	7.23	176.86	4,186.00	-228.75	12.53	229.09	0.00	0.00	0.00
4,300.00	7.23	176.86	4,285.20	-241.32	13.22	241.68	0.00	0.00	0.00
4,400.00	7.23	176.86	4,384.41	-253.89	13.91	254.27	0.00	0.00	0.00
4,500.00	7.23	176.86	4,483.61	-266.47	14.60	266.87	0.00	0.00	0.00
4,600.00	7.23	176.86	4,582.82	-279.04	15.29	279.46	0.00	0.00	0.00
4,700.00	7.23	176.86	4,682.02	-291.61	15.98	292.05	0.00	0.00	0.00
4,800.00	7.23	176.86	4,781.23	-304.18	16.66	304.64	0.00	0.00	0.00
4,900.00	7.23	176.86	4,880.43	-316.76	17.35	317.23	0.00	0.00	0.00
5,000.00	7.23	176.86	4,979.63	-329.33	18.04	329.82	0.00	0.00	0.00
5,100.00	7.23	176.86	5,078.84	-341.90	18.73	342.42	0.00	0.00	0.00
5,200.00	7.23	176.86	5,178.04	-354.48	19.42	355.01	0.00	0.00	0.00
5,275.28	7.23	176.86	5,252.72	-363.94	19.94	364.49	0.00	0.00	0.00
Start Drop 2.00°/100'									
5,300.00	6.74	176.86	5,277.26	-366.94	20.10	367.49	2.00	-2.00	0.00
5,400.00	4.74	176.86	5,376.75	-376.93	20.65	377.49	2.00	-2.00	0.00
5,473.43	3.27	176.86	5,450.00	-382.05	20.93	382.62	2.00	-2.00	0.00
EOC hold 3.27° TG1 MC Fed #68									
5,500.00	3.27	176.86	5,476.53	-383.56	21.01	384.14	0.00	0.00	0.00
5,600.00	3.27	176.86	5,576.36	-389.26	21.32	389.84	0.00	0.00	0.00
5,700.00	3.27	176.86	5,676.20	-394.95	21.64	395.55	0.00	0.00	0.00
5,800.00	3.27	176.86	5,776.04	-400.65	21.95	401.25	0.00	0.00	0.00
5,900.00	3.27	176.86	5,875.88	-406.35	22.26	406.96	0.00	0.00	0.00
6,000.00	3.27	176.86	5,975.71	-412.04	22.57	412.66	0.00	0.00	0.00
6,100.00	3.27	176.86	6,075.55	-417.74	22.89	418.37	0.00	0.00	0.00
6,200.00	3.27	176.86	6,175.39	-423.44	23.20	424.07	0.00	0.00	0.00
6,300.00	3.27	176.86	6,275.22	-429.13	23.51	429.78	0.00	0.00	0.00

Database:	EDM-Julio	Local Co-ordinate Reference:	Well MC Federal #68
Company:	COG Operating, LLC	TVD Reference:	GL Elev @ 4020'00usft
Project:	Lea County NM (NAD27 NME)	MD Reference:	GL Elev @ 4020'00usft
Site:	MC Federal #68	North Reference:	Grid
Well:	MC Federal #68	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2 - 7-7/8" Hole		

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)	
6,400 00	3 27	176 86	6,375 06	-434 83	23 82	435 48	0 00	0 00	0 00	
6,500 00	3 27	176 86	6,474 90	-440 53	24 13	441 19	0 00	0 00	0 00	
6,600 00	3 27	176 86	6,574 74	-446 22	24 45	446 89	0 00	0 00	0 00	
6,700 00	3 27	176 86	6,674 57	-451 92	24 76	452 60	0 00	0 00	0 00	
6,800 00	3 27	176 86	6,774 41	-457 62	25 07	458 30	0 00	0 00	0 00	
6,900 00	3 27	176 86	6,874 25	-463 31	25 38	464 01	0 00	0 00	0 00	
7,000 00	3 27	176 86	6,974 08	-469 01	25 69	469 71	0 00	0 00	0 00	
7,100 00	3 27	176 86	7,073 92	-474 71	26 01	475 42	0 00	0 00	0 00	
7,200 00	3 27	176 86	7,173 76	-480 40	26 32	481 12	0 00	0 00	0 00	
7,226 28	3 27	176 86	7,200 00	-481 90	26 40	482 62	0 00	0 00	0 00	
PBHL-MC Fed #86										

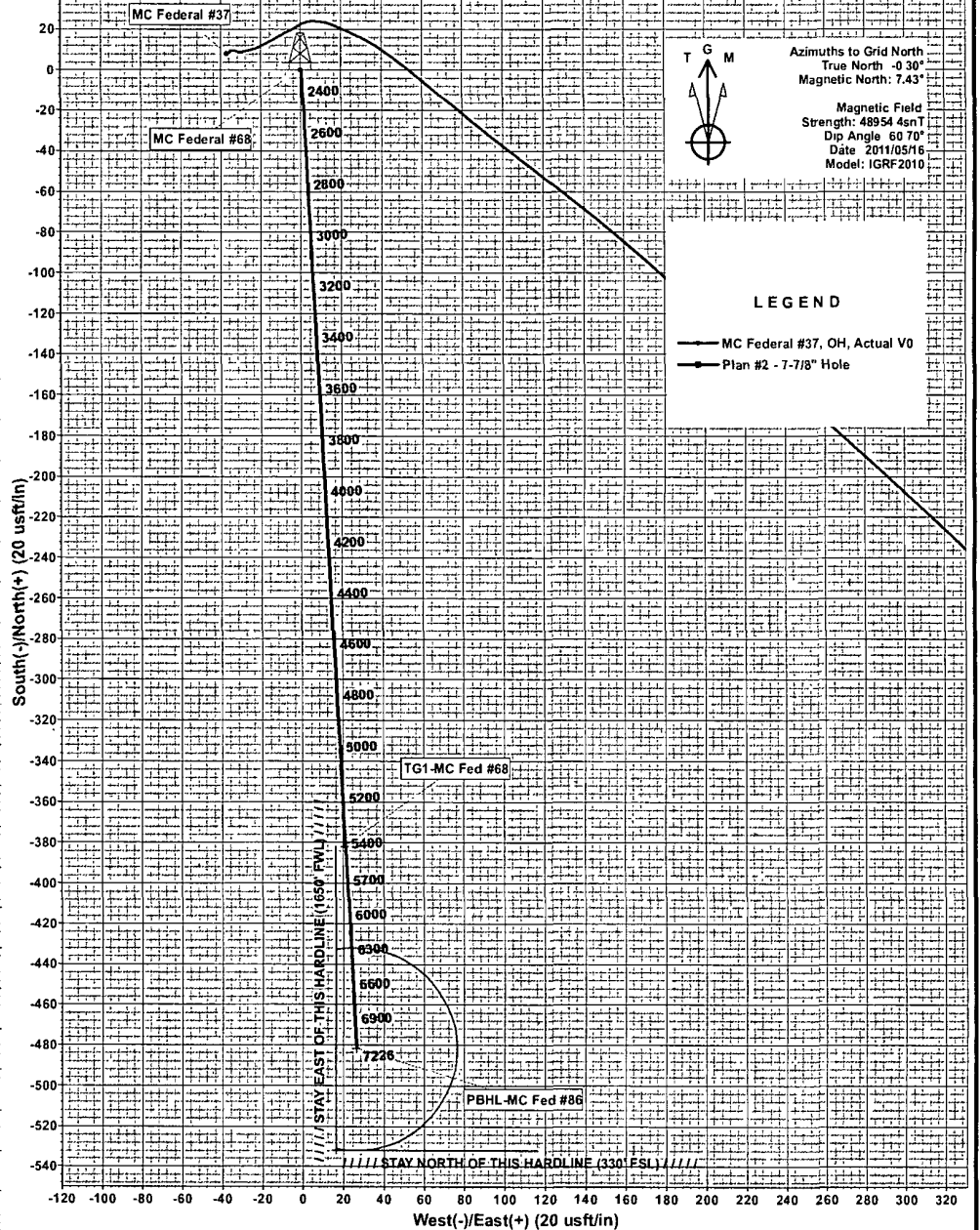
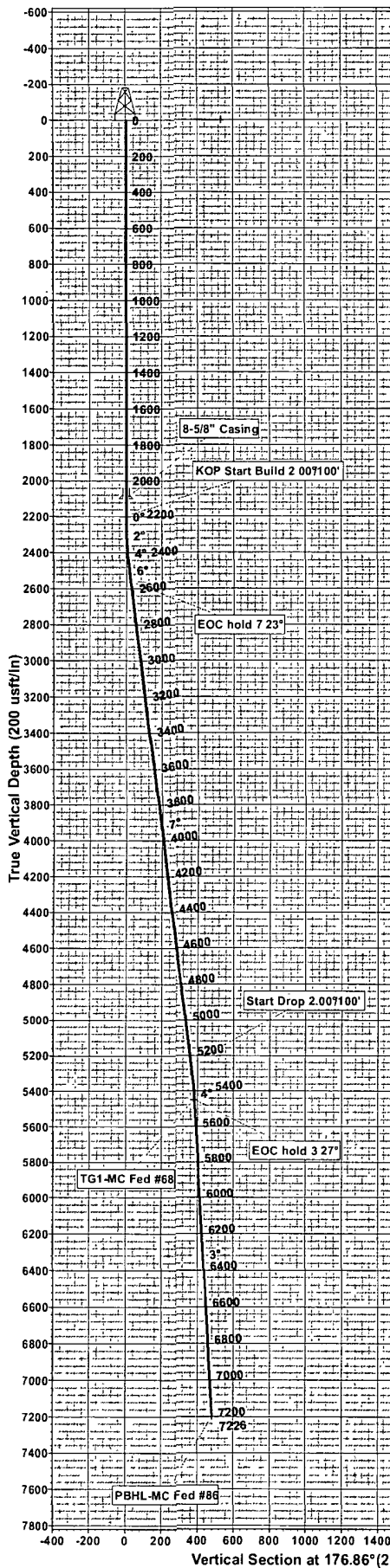
Design Targets										
Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
East HL-MC Fed #68		0 00	0 00	0 00	-531 90	16 40	660,179 30	671,798 20	32° 48' 49 220 N	103° 46' 26 924 W
- plan misses target center by 532 15usft at 0 00usft MD (0 00 TVD, 0 00 N, 0 00 E)										
- Rectangle (sides W0 00 H150 00 D0 00)										
North HL-MC Fed #68		0 00	0 01	0 00	-531 90	16 40	660,179 30	671,798 20	32° 48' 49 220 N	103° 46' 26 924 W
- plan misses target center by 532 15usft at 0 00usft MD (0 00 TVD, 0 00 N, 0 00 E)										
- Rectangle (sides W100 00 H0 00 D0 00)										
TG1-MC Fed #68		0 00	0 00	5,450 00	-382 05	20 93	660,329 16	671,802 72	32° 48' 50 702 N	103° 46' 26 861 W
- plan hits target center										
- Point										
PBHL-MC Fed #86		0 00	0 00	7,200 00	-481 90	26 40	660,229 30	671,808 20	32° 48' 49 714 N	103° 46' 26 803 W
- plan hits target center										
- Circle (radius 50 00)										

Casing Points						
Measured Depth (usft)	Vertical Depth (usft)	Name			Casing Diameter (")	Hole Diameter (")
2,100 00	2,100 00	8-5/8" Casing			8-5/8	12-1/4

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
2,200 00	2,200 00	0 00	0 00	KOP Start Build 2 00°/100'	
2,561 68	2,560 72	-22 77	1 25	EOC hold 7 23°	
5,275 28	5,252 72	-363 94	19 94	Start Drop 2 00°/100'	
5,473 43	5,450 00	-382 05	20 93	EOC hold 3 27°	



Scientific Drilling for COG Operating LLC  
Site: Lea County, NM (NAD27 NME)  
Well: MC Federal #68  
Wellbore: OH  
Design: Plan #2 - 7-7/8" Hole



Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
East HL-MC Fed #68	0.00	-531.90	16.40	660179.30	671798.20	32°48'49.220 N	103°46'26.924 W	Rectangle (Sides: L150.00 W0.00)
North HL-MC Fed #68	0.00	-531.90	16.40	660179.30	671798.20	32°48'49.220 N	103°46'26.924 W	Rectangle (Sides: L0.00 W100.00)
TG1-MC Fed #68	5450.00	-382.05	20.93	660329.15	671802.73	32°48'50.702 N	103°46'26.861 W	Point
PBHL-MC Fed #86	7200.00	-481.90	26.40	660229.30	671808.20	32°48'49.714 N	103°46'26.803 W	Circle (Radius 5.000)

#### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Deg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2200.00	0.00	0.00	2200.00	0.00	0.00	0.00	0.00	0.00	
3	2561.68	7.23	176.86	2560.72	-22.77	1.25	2.00	176.86	22.80	
4	5275.28	7.23	176.86	5252.72	-363.94	19.94	0.00	0.00	364.49	TG1-MC Fed #68
5	5473.43	3.27	176.86	5450.00	-382.05	20.93	2.00	180.00	382.62	
6	7226.28	3.27	176.86	7200.00	-481.90	26.40	0.00	0.00	482.62	PBHL-MC Fed #86

#### WELL DETAILS: MC Federal #68

+N/-S	+E/-W	Northing	Easting	Ground Level	Latitude	Longitude	Spot
0.00	0.00	660711.20	671781.80	4020.00	32°48'54.484 N	103°46'27.083 W	

#### PROJECT DETAILS: Lea County, NM (NAD27 NME)

Plan: Plan #2 - 7-7/8" Hole (MC Federal #68/OH)

Geodetic System: US State Plane 1927 (Exact solution) Created By: Julio Pina Date: 16-May-11  
Datum: NAD 1927 (NADCON CONUS)  
Ellipsoid: Clarke 1866 Checked: \_\_\_\_\_ Date: \_\_\_\_\_  
Zone: New Mexico East 3001 Reviewed: \_\_\_\_\_ Date: \_\_\_\_\_  
System Datum: Mean Sea Level Approved: \_\_\_\_\_ Date: \_\_\_\_\_

**COG OPERATING LLC**

550 West Texas, Suite 1300  
Midland, TX 79701

**DIRECTIONAL PLAN VARIANCE REQUEST**

**M C FEDERAL #68  
LEA, NM**

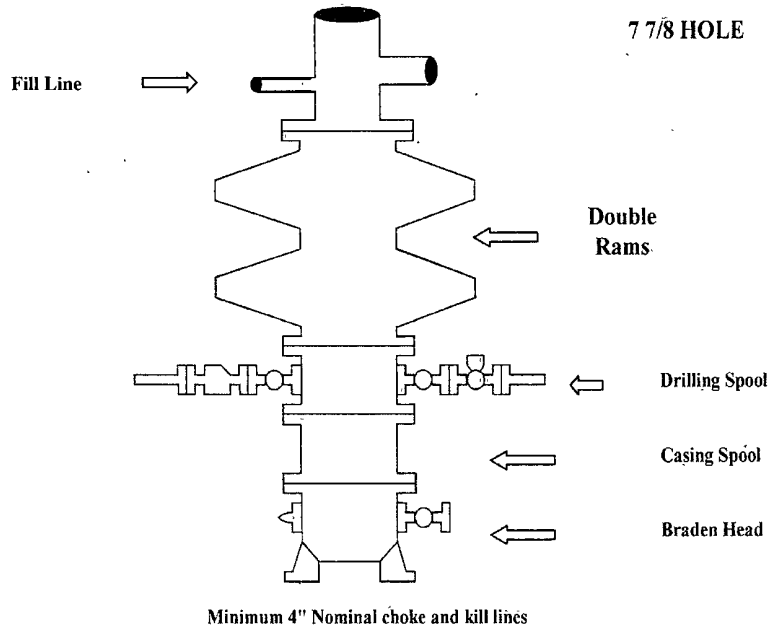
SHL	862 FSL, 1637 FWL	Sec 21, T17S, R32E, Unit N
BHL	330 FSL, 1650 FWL	Sec 21, T17S, R32E, Unit N

COG Operating LLC, as Operator, desires that the APD reflect the footages as stated on the surveyor's plat. However, Operator also desires to avoid inadvertently drilling the well to a non-standard location. Therefore, due to the proximity of the plat bottom hole location to the pro-ration unit hard line(s), the attached directional plan is designed to avoid the hard lines by as much as fifty feet; said fifty feet being in either (or both) the north-south and/or east-west directions as applicable.

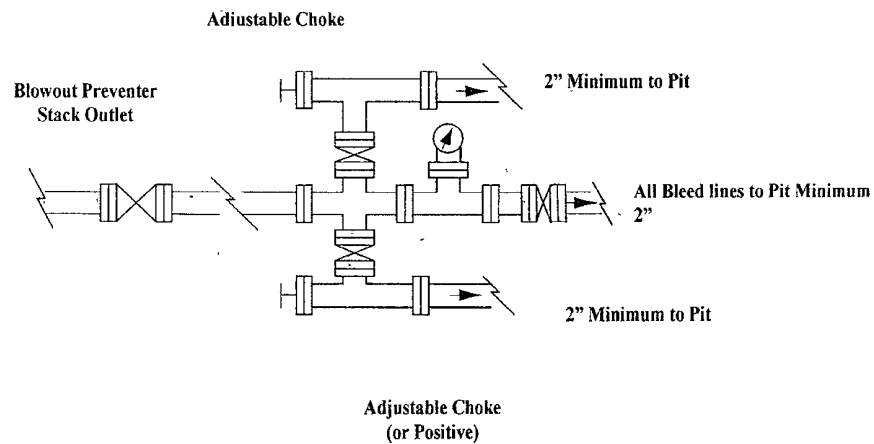
# COG Operating LLC

## Exhibit #9

### BOPE and Choke Schematic



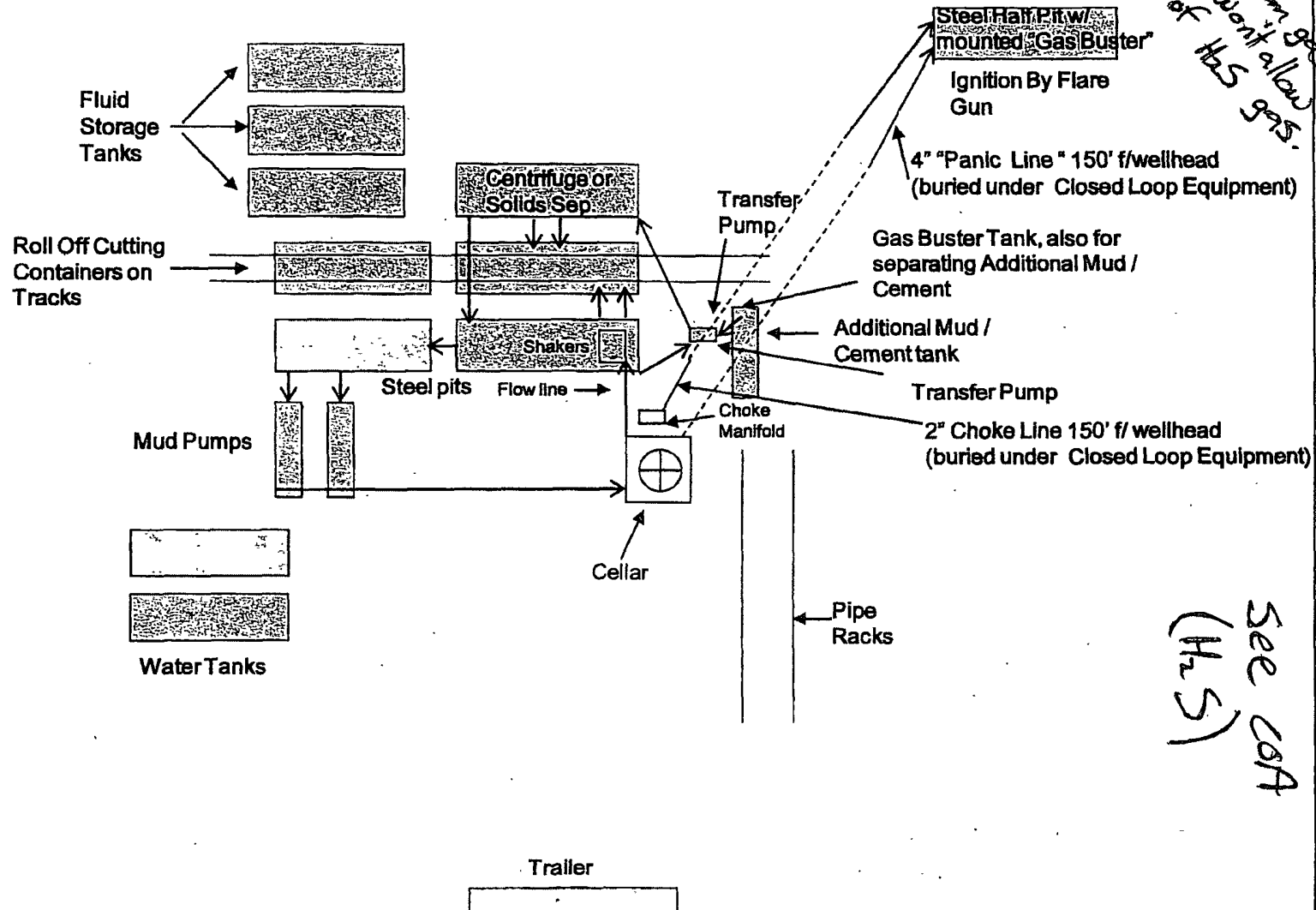
Choke Manifold Requirement (2000 psi WP)  
No Annular Required



**NOTES REGARDING THE BLOWOUT PREVENTERS****Master Drilling Plan  
Eddy County, New Mexico**

1. Drilling nipple to be so constructed that it can be removed without use of a welder through rotary table opening, with minimum I.D. equal to preventer bore.
2. Wear ring to be properly installed in head.
3. Blow out preventer and all fittings must be in good condition, 2000 psi WP minimum.
4. All fittings to be flanged.
5. Safety valve must be available on rig floor at all times with proper connections, valve to be full 2000 psi WP minimum.
6. All choke and fill lines to be securely anchored especially ends of choke lines.
7. Equipment through which bit must pass shall be at least as large as the diameter of the casing being drilled through.
8. Kelly cock on Kelly.
9. Extension wrenches and hands wheels to be properly installed.
10. Blow out preventer control to be located as close to driller's position as feasible.
11. Blow out preventer closing equipment to include minimum 40-gallon accumulator, two independent sources of pump power on each closing unit installation all API specifications.

COG Operating LLC  
Closed Loop Equipment Diagram



# Closed Loop Operation & Maintenance Procedure

All drilling fluid circulated over shaker(s) with cuttings discharged into roll off container.

Fluid and fines below shaker(s) are circulated with transfer pump through centrifuge(s) or solids separator with cuttings and fines discharged into roll off container.

Fluid is continuously re-circulated through equipment with polymer added to aid separation of cutting fines.

Roll off containers are lined and de-watered with fluids re-circulated into system.

Additional tank is used to capture unused drilling fluid or cement returns from casing jobs.

This equipment will be maintained 24 hrs./day by solids control personnel and or rig crews that stay on location.

Cuttings will be hauled to either:

CRI (permit number R9166)

or

GMI (permit number 711-019-001)

dependent upon which rig is available to drill this well.