Form 3160-3 (April 2004)  UNITED STATES  DEPARTMENT OF THE 13  BUREAU OF LAND MANA  APPLICATION FOR PERMIT TO I	AGEMENT		OMB No		07	-		
Ia. Type of work:	R	=	7. If Unit or CA Agre NMNM - 7103		ne and No.	-		
1b. Type of Well: Oil Well Gas Well Other	Single Zone Multi	iple Zone '	8. Lease Name and V		(30	560		
2. Name of Operator  COG Operating LLC (2.25)	7/37)		9. API Well No. 30-015- 25	2317				
3a. Address 550 W. Texas Ave., Suite 1300 Midland, TX 79701	3b. Phone No. (include area code) 432-685-4385		10. Field and Pool, or I	Exploratory	1	-		
4. Location of Well (Report location clearly and in accordance with any	<b>\</b> '		11. Sec., T. R. M. or B	lk. and Surv	vey of Area	-		
At surface SHL: 1215' FSL & 330' FWL Unit At proposed prod. zone BHL: 990' FSL & 330' FWL, Unit			Sec 22 T17S	R31E				
4. Distance in miles and direction from nearest town or post office*  9 miles East of Loco Hills, ?	NM		12. County or Parish EDDY		13. State NM	-		
5 Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)  330'	16. No. of acres in lease <b>720</b>	17. Spacir	ing Unit dedicated to this well					
8. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth  19. O TYD  19. O TYD  19. O TYD	20. BLM/	WBIA Bond No. on file NMB000215					
Elevations (Show whether DF, KDB, RT, GL, etc.) 3818' GL	22 Approximate date work will sta 12/31/2010	art*	23. Estimated duration	n days		-		
	24. Attachments					_		
he following, completed in accordance with the requirements of Onshore  Well plat certified by a registered surveyor.  A Drilling Plan.  A Surface Use Plan (if the location is on National Forest System L SUPO shall be filed with the appropriate Forest Service Office).	4. Bond to cover 1 tem 20 above).  Lands, the 5. Operator certifi	the operation	is form:  ns unless covered by an  ormation and/or plans as	_				
5. Signature	Name (Printed Typed) Robyn M. Odom			Date <b>09/0</b>	1/2010	_		
pproved by (Signature)	Name (Printed Typed)			Daje OV	1 2 201	0		
tle FIELD MANAGER  pplication approval does not warrant or certify that the applicant holds not operations thereon.	Office CARLSI legal or equitable title to those right	BAD F	IELD OFFI ject lease which woulde	CE ntitle the ap	pplicantto	-		
onditions of approval, if any, are attached.  itle 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a criticates any false fictitious or fraudulent, statements or representations as to	me for any person knowingly and	willfully to n	APPROV	ALFO	R TWO	YΕ		

\*(Instructions on page 2)

Roswell Controlled Water Basin

RECEIVED
NOV 1 5 2010
NMOCD ARTESIA

SEE ATTACHED FOR CONDITIONS OF APPROVA

APPROVAL SUBJECT TO GENERAL REQUIREMENTS AND SPECIAL STIPULATIONS ATTACHED

### MASTER DRILLING PROGRAM

### 1. Geologic Name of Surface Formation

Quaternary

## 2. Estimated Tops of Important Geologic Markers:

Quaternary	Surface
Top of Salt	560'
Base of Salt	1150'
Yates	1770'
Seven Rivers	2100'
Queen	2715'
Grayburg	3100'
San Andres	3450'
Glorietta	4950'
Yeso Group	4995'

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

Water Sand	150'	Fresh Water
Grayburg	3100'	Oil/Gas
San Andres	3450'	Oil/Gas
Glorieta	4950'	Oil/Gas
Yeso Group	4995'	Oil/Gas

No other formations are expected to give up oil, gas or fresh water in measurable quantities. Setting 13 3/8" casing to 450° 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 1800° 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 to protect the wellbore and/or the environment.

See COA

See COA

#### 4. **Casing Program**

Hole Size	Interval	OD Casing	Weight	Grade	Jt., Condition	Jt.	burst/collapse/tension
17 ½"	0-500	13 3/8"	48#	H-40orJ-55	New	ST&C	8.71/3.724/14.91
11"or121/4"	0-1700	8 5/8"	24or32#	J-55	New	ST&C	2.91/1.46/5.65
7 7/8"	0-T.D.	5 1/2"	15.5 or17#	J-55orL80	New	LT&C	1.71/1.574/2.20

#### 5. **Cement Program**

13 3/8" Surface Casing:

Class C, 500 sx, yield 1.32, back to surface

8 5/8" Intermediate Casing:

11" Hole:

Single Stage: 50:50:10, 350 sx lead, yield-2.45 + Class C, 200 sx tail, yield-1.32, back to surface.

Multi-Stage: Stage 1: Class C, 350 sx, Stage 2: 50:50:10, 200 sx, yield-1.32. yield-2.45, back to surface. Multi stage tool to be set at approximately, depending on hole conditions, 4502 See COA

5 1/2" Production Casing:

Single Stage: 35:65:6, 500 sx Lead, yield-2.05 + 50:50:2, 400 sx Tail, yield-1.37, to 200' minimum tie back to intermediate casing.

Stage 1: 50:50:2, 400 sx,→ See COA Multi-Stage: yield - 1.37; Stage 2: 35:65:6, 500 sx, yield - 2.05, to 200' minimum tie back to intermediate casing. Multi stage tool to be set at approximately, depending on hole conditions, TD-20002. See COA

#### 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. 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. The BOP will be nippled up on the 13 3/8" surface casing with BOP equipment and tested, together to 1000 psi by rig pump Sec COA in one test. The BOP will then be nippled 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. All BOP's and accessory equipment will be tested to 2000 psi before drilling out of the intermediate casing. 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.

#### 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
0-450" 500'	Fresh Water	8.5	28	N.C.
450-1800' 1700	'Brine	10	30	N.C.
1800'-TD	Cut Brine	8.7-9.1	29	N.C.

COA

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

- Kelly cock will be kept in the drill string at all times. A.
- В. 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

- 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 ½" 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. 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 12 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**

Eddy County, NM (NAN27 NME) Skelly Unit #739 Skelly Unit #739

OH

Plan: Plan #1 - 7-7/8" Hole SHL = 1215' FSL & 330' FWL BHL = 980' FSL & 340' FWL Top of Paddock = 980' FSL & 340' FWL @ 4900' TVD

# **Standard Planning Report**

09 September, 2010





### **Scientific Drilling**

Planning Report

TVD Reference:

MD Reference:

North Reference:

Local Co-ordinate Reference

Survey Calculation Method:



Database:

EDM-Julio

Company: Project:

COG Operating LLC

Site:

Eddy County, NM (NAN27 NME)

Well:

Skelly Unit #739 Skelly Unit #739

Wellbore:

ОН

Design:

Project

Plan #1 - 7-7/8" Hole

Map System:

Eddy County, NM (NAN27 NME)

US State Plane 1927 (Exact solution) NAD 1927 (NADCON CONUS)

Geo Datum:

Map Zone:

New Mexico East 3001

System Datum:

Mean Sea Level

Grid

Site Skelly Unit #739

Minimum Curvature

GL Elev @ 3818.00usft

GL Elev @ 3818.00usft

Site Skelly Unit #739

Site Position:

From:

Map

Northing: Easting:

660,905.10 usft 644,044.70 usft Latitude:

Longitude:

32° 48' 57.737 N 103° 51' 52.082 W

Position Uncertainty:

0.00 usft

Slot Radius:

13-3/16 "

Grid Convergence:

0.25

Well

Skelly Unit #739

Well Position

0.00 usft 0.00 usft

Northing: Easting:

660,905,10 usfl 644,044.70 usft

7.92

Latitude: Longitude:

32° 48' 57.737 N 103° 51' 52.082 W

49,053

Position Uncertainty

0.00 usft

Wellhead Elevation:

2010/09/09

Ground Level:

60.71

3,818.00 usft

Wellbore

ОН

+N/-S

+E/-W

Magnetics

**Model Name** 

Plan #1 - 7-7/8" Hole

Sample Date

Declination

Dip Angle

Field Strength

BGGM2010

Design **Audit Notes:** 

Version:

Phase:

PLAN

0.00

Tie On Depth:

0.00

Vertical Section:

Depth From (TVD) (usft)

0.00

+N/-S (usft) +E/-W (usft) 0.00

Direction (°) 177.25

Plan Sections Vertical Measured Dogleg Build Turn Depth Inclination Azimuth Depth +N/-S +E/-W Rate Rate Rate TFO (usft) (usft) (°/100usft) (°/100usft) (usft) (usft) (°/100usft) (°) (°) Target 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 1,950.00 0.00 0.00 1,950.00 0.00 0.00 0.00 0.00 0.00 0.00 2,198.92 4.98 177.25 2,198.60 -10.79 0.52 2.00 2.00 0.00 177.25 4,661.00 4.98 177.25 4,651.40 -224.21 10.78 0.00 0.00 0.00 0.00 4,909.91 0.00 0.00 4,900.00 -235.00 11.30 2.00 -2.00 0.00 180.00 TG1-SU #739 6,909.91 0.00 0.00 6,900.00 -235.00 11.30 0.00 0.00 0.00 0.00 PBHL-SU #739



### **Scientific Drilling**

Planning Report



Database: Company:

EDM-Julio

COG Operating LLC

Project:

Site:

Eddy County, NM (NAN27 NME) Skelly Unit #739

Skelly Unit #739

Well: Wellbore:

ОН

Design: Plan #1 - 7-7/8" Hole Local Co-ordinate Reference:

TVD Reference:

MD Reference:

North Reference: Survey Calculation Method: Site Skelly Unit #739 GL Elev @ 3818.00usft GL Elev @ 3818.00usft

Grid

Minimum Curvature

ined Survey	i Tanana da a da a da a da a da a da a da	man, in assess a compa-	7 82 TG= 6 - 1 T+ 2 - TTT	ها از از داد خرجیست	.jo enganti	en alasta materiales es esta	n in Antaromina & South offi	neg rors wows section is	(z nagrewa
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Depth Inc (usft)	lination (°)	Azimuth (°)	Depth (usft)	+N/-S (usft)	+E/-W (usft)	(usft)	(°/100usft)		°/100usft)
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0.00	0.00	0.00	0.00	0,00	0.00	0.00	0.00	0.00	0.00
South HL-SU #73						0.00	0.00	2.22	0.00
1,850.00	0.00	0.00	1,850.00	0.00	0.00	0.00	0.00	0.00	0.00
8-5/8" Casing	0.00	0.00	4.050.00	0.00	0.00	0.00	0.00	0.00	0.00
1,950.00	0.00	0.00	1,950.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP Start Build 2		177.05	2 000 00	-0.44	0.02	0.44	2.00	2.00	0.00
2,000.00 2,100.00	1.00 3.00	177.25 177.25	2,000.00 2,099.93	-0.44 -3.92	0.02	3.93	2.00	2.00	0.00
·									
2,198.92	4.98	177.25	2,198.61	-10.79	0.52	10.81	2.00	2.00	0.00
EOC hold 4.98°								,	
2,200.00	4.98	177.25	2,199.68	-10.89	0.52	10.90	0.00	0.00	0.00
2,300.00	4.98	177.25	2,299.31	-19.56	0.94	19.58	0.00	0.00	0.00 0.00
2,400.00 2,500.00	4.98 4.98	177.25 177.25	2,398.93 2,498.55	-28.22 -36.89	1.36 1.77	28.26 36.93	0.00 0.00	0.00 0.00	0.00
•			,						
2,600.00	4.98	177.25	2,598.17	-45.56	2.19	45.61	0.00	0.00	0.00
2,700.00	4.98	177.25	2,697.80	-54.23	2.61	54.29	0.00	0.00	0.00
2,800.00	4.98	177.25	2,797.42	-62.90	3.02	62.97	0.00 0.00	0.00 0.00	0.00 0.00
2,900.00 3,000.00	4.98 4.98	177.25 177.25	2,897.04 2,996.66	-71.56 -80.23	3.44 3.86	71,65 80.32	0.00	0.00	0.00
,			,						
3,100.00	4.98	177.25	3,096.29	-88.90	4.27	89.00	0.00	0.00	0.00
3,200.00	4.98	177.25	3,195.91	-97.57	4.69	97.68	0.00	0.00	0.00
3,300.00 3,400.00	4.98	177.25 177.25	3,295.53 3,395.16	-106.24 -114.90	5.11 5.53	106,36 115,04	0.00 0.00	0.00 0.00	0.00 0.00
3,500.00	4.98 4.98	177.25	3,494.78	-123.57	5.53 5.94	123.71	0.00	0.00	0.00
			·						
3,600.00	4.98	177.25	3,594.40	-132.24	6.36	132.39	0.00	0.00	0.00
3,700.00	4.98	177.25	3,694.02	-140.91	6.78	141.07	0.00	0.00	0.00
3,800.00	4.98	177.25	3,793.65	-149.57	7.19	149.75 158.43	0.00	0.00 0.00	0.00 0.00
3,900.00 4,000.00	4.98 4.98	177.25 177.25	3,893.27 3,992.89	-158.24 -166.91	7.61 8.03	156.43	0.00 0.00	0.00	0.00
·									
4,100.00	4.98	177.25	4,092.52	-175.58	8.44	175.78	0.00	0.00	0.00
4,200.00	4.98	177.25	4,192.14	-184.25	8.86	184.46	0.00	0.00	0.00
4,300.00	4.98 4.98	177.25	4,291.76	-192.91 -201.58	9.28 9.69	193.14 201.82	0.00 0.00	0.00 0.00	0.00 0.00
4,400.00 4,500.00	4.98 4.98	177.25 177.25	4,391.38 4,491.01	-201.58 -210.25	10.11	201.82	0.00	0.00	0.00
4,600.00	4.98	177.25	4,590.63	-218.92	10.53	219.17	0.00	0.00	0.00
4,661.00	4.98	177.25	4,651.40	-224.21	10.78	224.46	0.00	0.00	0.00
Start DLS 2.00°/10		477.05	4.000.07	227.22	40.00	227.50	2.02	2.00	0.00
4,700.00 4,800.00	4.20 2.20	177.25 177.25	4,690.27 4,790.11	-227.32 -232.89	10.93 11.20	227.58 233.16	2.00 2.00	-2.00 -2.00	0.00
4,900.00	0.20	177.25 177.25	4,790.11	-232.69 -234.98	11.20	235.25	2.00	-2.00 -2.00	0.00
4,909.91	0.00	0.00	4,900.00	-235.00	11.30	235.27	2.00	-2.00	0.00
EOC hold 0.00° -	•			225.00	44.00	225.07	0.00	0.00	0.00
6,909.91	0.00	0.00	6,900.00	-235.00	11.30	235.27	0.00	0.00	0.00



### **Scientific Drilling**

Planning Report



Database: Company: EDM-Julio

COG Operating LLC

Project:

Eddy County, NM (NAN27 NME)

Site:

Skelly Unit #739

Well: Wellbore: Skelly Unit #739 ОН

Design:

Plan #1 - 7-7/8" Hole

Local Co-ordinate Reference:

TVD Reference:

MD Reference: North Reference:

Survey Calculation Method:

Site Skelly Unit #739

GL Elev @ 3818.00usft GL Elev @ 3818.00usft

Grid

Minimum Curvature

Design Targets  Target Name hit/miss target Shape	Angle	Dip Dir.	TVD (usft)	+N/S (üsft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
South HL-SU #739 - plan misses target cente - Rectangle (sides W200			0.00 Ousft MD (0	-225.00 .00 TVD, 0.00	1.30 N, 0.00 E)	660,680.10	644,046.00	32° 48′ 55.510 N	103° 51' 52.079 W
East HL-SU #739 - plan misses target cente - Rectangle (sides W0.00			0.00 Ousft MD (0	-225.00 0.00 TVD, 0.00	1.30 <b>N</b> , 0.00 E)	660,680.10	644,046.00	32° 48′ 55.510 N	103° 51' 52.079 W
TG1-SU #739 - plan hits target center - Point	0.00	0.01	4,900.00	-235.00	11.30	660,670.10	644,056.00	32° 48' 55.411 N	103° 51' 51.962 W
PBHL-SU #739 - plan hits target center - Circle (radius 10.00)	0.00	0.00	6,900.00	-235.00	11.30	660,670.10	644,056.00	32° 48' 55.411 N	103° 51' 51.962 W

Casing Points		A CONTRACTOR CONTRACTO
		뿔잎 등에 나가를 되는 것이 되었다.
Measured Vert		Casing Hole
Depth De (usft) (us		Diameter Diameter
	Name of the second of the seco	Constitution of the Consti
1,850.00 1,	,850.00 8-5/8" Casing	8-5/8 12-1/4

Formations  Measured Vertical Depth Depth	Dip Dip Direction
(usft) (usft) Name 4,909.91 4,900.00 Top of Paddock	Litthology (°) (°)

Plan Annotal	Measured  Depth (usft)	Vertical Depth (usft)	Local Coo +N/-S (usft)	rdinates +E/-W (usft)	Coṃment
	1,950.00	1,950.00	0.00	0.00	KOP Start Build 2.00°/100'
	2,198.92	2,198.61	-10.79	0.52	EOC hold 4.98°
	4,661.00	4,651.40	-224.21	10.78	Start DLS 2.00°/100'
	4,909.91	4,900.00	-235,00	11.30	EOC hold 0.00°



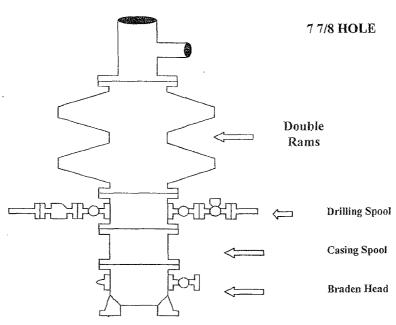
Scientific Drilling for COG Operating LLC Site: Eddy County, NM (NAN27 NME) Well: Skelly Unit #739 Wellbore: OH Design: Plan #1 - 7-7/8" Hole



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2000-			2°	2000				=:		<del></del>	-140																						
2200-			4°	2200		, ====					South(-)/North(+)				1			.38	00,										- :-:-				
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2400			24	00	EOC I	old 4.9	8°			-	S -180							- 6	200 -						- 1								
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# **COG Operating LLC**

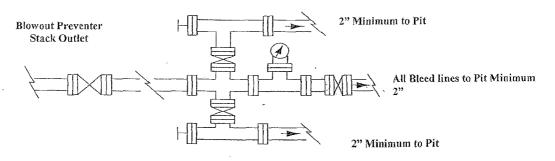
# Exhibit #9 BOPE and Choke Schematic



Minimum 4" Nominal choke and kill lines

# Choke Manifold Requirement (2000 psi WP) No Annular Required

### Adiustable Choke



Adjustable Choke (or Positive)

# 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.

Blowout Preventers Page 2