

OCD Artesia

Form 3160-3  
(April 2004)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
**APPLICATION FOR PERMIT TO DRILL OR REENTER**

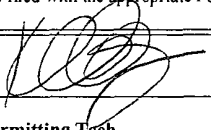
FORM APPROVED  
OMB No. 1004-0137  
Expires March 31, 2007

1a Type of work <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5 Lease Serial No. NMLC - 029418 (b)
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 Ave., Suite 1300 Midland, TX 79701	3b Phone No. (include area code) 432-685-4384	8 Lease Name and Well No. Tex Mack 11 Federal #46 37516
4 Location of Well (Report location clearly and in accordance with any State requirements *) At surface 2435' FSL & 635' FEL, Unit I At proposed prod zone 1650' FSL & 330' FEL, Unit I		9 API Well No. 30-015-39704
14 Distance in miles and direction from nearest town or post office* 6 miles East of Loco Hills, NM		10 Field and Pool, or Exploratory Fren; Glorieta-Yeso, East 24213
15 Distance from proposed* location to nearest property or lease line, ft (Also to nearest drg unit line, if any) 635'		11 Sec, T R M or Blk and Survey or Area Sec 11 T17S R31E
16 No of acres in lease 1200		12 County or Parish EDDY
17 Spacing Unit dedicated to this well 40		13. State NM
18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft 51'		19 Proposed Depth TVD: 7000' MD: 7061'
20 BLM/BIA Bond No on file NMB000740; NMB000215		21 Elevations (Show whether DF, KDB, RT, GL, etc) 3957' GR
22 Approximate date work will start* 11/30/2011		23 Estimated duration 15 days

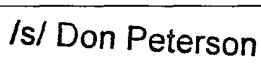
24. Attachments

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 09/09/2011
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Title  
Permitting Tech

Approved by (Signature) 	Name (Printed/Typed) Is/ Don Peterson	Date NOV 16 2011
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Title FIELD MANAGER	Office CARLSBAD FIELD OFFICE
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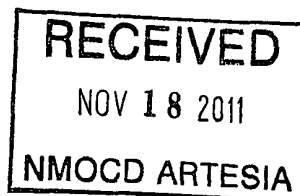
Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.  
Conditions of approval, if any, are attached.

**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 Attached

SEE ATTACHED FOR  
CONDITIONS OF APPROVAL

*Cost*

## MASTER DRILLING PROGRAM

### 1. Geologic Name of Surface Formation

Quaternary

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

Quaternary	Surface
Rustler	670'
Top of Salt	801'
Base of Salt	1771'
Yates	2006'
Seven Rivers	2332'
Queen	2952'
Grayburg	3392'
San Andres	3718'
Glorietta	5222'
Paddock	5285'
Blaine	5688'
Tubb	6700'

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

Water Sand	150'	Fresh Water
Grayburg	3392'	Oil/Gas
San Andres	3718'	Oil/Gas
Glorieta	5222'	Oil/Gas
Paddock	5285'	Oil/Gas
Blaine	5688'	Oil/Gas
Tubb	6700'	Oil/Gas

No other formations are expected to give up oil, gas or fresh water in measurable quantities. Setting 13 3/8" casing to 695' 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, (but calculated to surface) 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 1/2" 725	0-695	13 3/8"	48#	H-40orJ-55	New	ST&C	8.71/3.724/14.91
11" 1950	0-1800	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 *See COA*

13 3/8" Surface Casing:

Class C, 475 sx w/ 2% CaCl<sub>2</sub>, 0.25 pps CF, yield-1.32, back to surface 100% excess

8 5/8" Intermediate Casing:

##### 11" Hole:

**Single Stage:** LEAD 350 sx 50:50:10 C:Poz:Gel w/ 5% Salt +0.25% CF, yield-2.45 + TAIL 200 sx Class C w/2% CaCl<sub>2</sub>, yield-1.32, back to surface. 145% excess

**Multi-Stage:** Stage 1: 350 sx Class C, w/2% CaCl<sub>2</sub>, yield - 1.32. 40% excess  
Stage 2: 200 sx Class C w/2% CaCl<sub>2</sub>, yield - 1.32, back to surface, 108% excess  
Multi stage tool to be set at approximately, depending on hole conditions, 745' (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 500 sx 35:65:6 C:Poz:Gel w/ 5% Salt + 5 pps LCM + 0.2% SMS + 0.3% FL-52A + 0.125 pps CF, yield-2.05 + TAIL 400 sx 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, yield-1.37, to 200' minimum tie back to intermediate casing. 44.4% open hole excess, cement calculated back to surface (no need for excess in casing overlap).

**Multi-Stage:** Stage 1: (Assumed TD of 6900') 500 sx 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, yield - 1.37, 9% excess; **this is a**

**minimum volume and will be adjusted up after caliper is run.** Stage 2: LEAD 450 sx 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, yield - 1.37, + TAIL 250 sx Class C w/ 0.3% R-3 + 1.5% CD-32, yield - 1.02 152% open hole excess, cement calculated back to surface (no need for excess in casing overlap). Multi stage tool to be set at approximately, depending on hole conditions, 3000'. 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" 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.

*See COA*

**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
0-695' <del>125</del>	Fresh Water	8.5	28	N.C.
<del>695-1800' 1450</del>	Brine	10	30	N.C.
1800'-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. 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)

Tex Mack 11 Federal #46

Tex Mack 11 Fed #46

OH

Plan: Plan #1 - 7-7/8" Hole

SHL = 2435' FSL & 635' FEL

BHL = 1700' FSL & 380' FEL

Top of Paddock = 462' South of Surface & 164' East of Surface @ 5220' TVD

## **Standard Planning Report**

18 August, 2011





# Scientific Drilling Planning Report



Database: EDM-Julio  
Company: COG Operating LLC  
Project: Eddy County, NM (NAN27 NME)  
Site: Tex Mack 11 Federal #46  
Well: Tex Mack 11 Fed #46  
Wellbore: OH  
Design: Plan #1 - 7-7/8" Hole

Local Co-ordinate Reference: Site Tex Mack 11 Federal #46  
TVD Reference: Ground Elev @ 3957 00usft  
MD Reference: Ground Elev @ 3957 00usft  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature

Project	Eddy County, NM (NAN27 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	Tex Mack 11 Federal #46		
Site Position:		Northing:	672,753 50 usft
From: Map		Easting:	653,572 40 usft
Position Uncertainty:	0 00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 50' 54.545 N
		Longitude:	103° 49' 59 783 W
		Grid Convergence:	0 27 °

Well	Tex Mack 11 Fed #46		
Well Position	+N/-S	0 00 usft	Northing:
	+E/-W	0 00 usft	Easting:
Position Uncertainty	0 00 usft	Wellhead Elevation:	
		Latitude:	32° 50' 54 545 N
		Longitude:	103° 49' 59 783 W
		Ground Level:	3,957 00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010	2011/08/18	7 73
			60 71
			48,942

Design	Plan #1 - 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
			160 51

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	
1,950 00	0 00	0 00	1,950 00	0 00	0 00	0 00	0 00	0 00	0 00	
2,408 02	9 16	160 51	2,406 07	-34 44	12 19	2.00	2.00	35 05	160 51	
7,061 29	9 16	160 51	7,000 00	-732 80	259 30	0 00	0 00	0 00	0 00	PBHL- Tex Mack 11 #





Scientific Drilling  
Planning Report



Database: EDM-Julio  
Company: COG Operating LLC  
Project: Eddy County, NM (NAN27 NME)  
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Local Co-ordinate Reference: Site Tex Mack 11 Federal #46  
TVD Reference: Ground Elev @ 3957 00usft  
MD Reference: Ground Elev @ 3957 00usft  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature

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-Tex Mack 11 #46 - South HL-Tex Mack 11 #46									
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 2.00°/100' - 8-5/8" Casing									
2,000 00	1 00	160 51	2,000 00	-0 41	0 15	0 44	2 00	2 00	0 00
2,100 00	3 00	160 51	2,099 93	-3 70	1 31	3 93	2 00	2 00	0 00
2,200 00	5 00	160 51	2,199 68	-10 28	3 64	10 90	2 00	2 00	0 00
2,300 00	7 00	160 51	2,299 13	-20 13	7 12	21 35	2 00	2 00	0 00
2,400 00	9 00	160 51	2,398 15	-33 25	11 77	35 27	2 00	2 00	0 00
2,408 01	9 16	160 51	2,406 06	-34 44	12 19	36 53	2 00	2 00	0 00
EOC hold 9.16°									
2,500 00	9 16	160 51	2,496 88	-48 25	17 07	51 18	0 00	0 00	0 00
2,600 00	9 16	160 51	2,595 60	-63 26	22 38	67 10	0 00	0 00	0 00
2,700 00	9 16	160 51	2,694 33	-78 26	27 69	83 02	0 00	0 00	0 00
2,800 00	9 16	160 51	2,793 05	-93 27	33 00	98 94	0 00	0 00	0 00
2,900 00	9 16	160 51	2,891 78	-108 28	38 31	114 86	0 00	0 00	0 00
3,000 00	9 16	160 51	2,990 50	-123 29	43 62	130 78	0 00	0 00	0 00
3,100 00	9 16	160 51	3,089 23	-138 29	48 94	146 70	0 00	0 00	0 00
3,200 00	9 16	160 51	3,187 95	-153 30	54 25	162 62	0 00	0 00	0 00
3,300 00	9 16	160 51	3,286 68	-168 31	59 56	178 54	0 00	0 00	0 00
3,400 00	9 16	160 51	3,385 40	-183 32	64 87	194 46	0 00	0 00	0 00
3,500 00	9 16	160 51	3,484 13	-198 33	70 18	210 38	0 00	0 00	0 00
3,600 00	9 16	160 51	3,582 85	-213 33	75 49	226 30	0 00	0 00	0 00
3,700 00	9 16	160 51	3,681 57	-228 34	80 80	242 22	0 00	0 00	0 00
3,800 00	9 16	160 51	3,780 30	-243 35	86 11	258 14	0 00	0 00	0 00
3,900 00	9 16	160 51	3,879 02	-258 36	91 42	274 05	0 00	0 00	0 00
4,000 00	9 16	160 51	3,977 75	-273 37	96 73	289 97	0 00	0 00	0 00
4,100 00	9 16	160 51	4,076 47	-288 37	102 04	305 89	0 00	0 00	0 00
4,200 00	9 16	160 51	4,175 20	-303 38	107 35	321 81	0 00	0 00	0 00
4,300 00	9 16	160 51	4,273 92	-318 39	112 66	337 73	0 00	0 00	0 00
4,400 00	9 16	160 51	4,372 65	-333 40	117 97	353 65	0 00	0 00	0 00
4,500 00	9 16	160 51	4,471 37	-348 40	123 28	369 57	0 00	0 00	0 00
4,600 00	9 16	160 51	4,570 10	-363 41	128 59	385 49	0 00	0 00	0 00
4,700 00	9 16	160 51	4,668 82	-378 42	133 90	401 41	0 00	0 00	0 00
4,800 00	9 16	160 51	4,767 55	-393 43	139 21	417 33	0 00	0 00	0 00
4,900 00	9 16	160 51	4,866 27	-408 44	144 52	433 25	0 00	0 00	0 00
5,000 00	9 16	160 51	4,965 00	-423 44	149 83	449 17	0 00	0 00	0 00
5,100 00	9 16	160 51	5,063 72	-438 45	155 15	465 09	0 00	0 00	0 00
5,200 00	9 16	160 51	5,162 44	-453 46	160 46	481 01	0 00	0 00	0 00
5,258 30	9 16	160 51	5,220 00	-462 21	163 55	490 29	0 00	0 00	0 00
Top of Paddock									
5,300 00	9 16	160 51	5,261 17	-468 47	165 77	496 93	0 00	0 00	0 00
5,400 00	9 16	160 51	5,359 89	-483 48	171 08	512 85	0 00	0 00	0 00
5,500 00	9 16	160 51	5,458 62	-498 48	176 39	528 77	0 00	0 00	0 00
5,600 00	9 16	160 51	5,557 34	-513 49	181 70	544 69	0 00	0 00	0 00
5,700 00	9 16	160 51	5,656 07	-528 50	187 01	560 61	0 00	0 00	0 00
5,800 00	9 16	160 51	5,754 79	-543 51	192 32	576 53	0 00	0 00	0 00
5,900 00	9 16	160 51	5,853 52	-558 51	197 63	592 45	0 00	0 00	0 00
6,000 00	9 16	160 51	5,952 24	-573 52	202 94	608 37	0 00	0 00	0 00
6,100 00	9 16	160 51	6,050 97	-588 53	208 25	624 29	0 00	0 00	0 00
6,200 00	9 16	160 51	6,149 69	-603 54	213 56	640 21	0 00	0 00	0 00
6,300 00	9 16	160 51	6,248 42	-618 55	218 87	656 13	0 00	0 00	0 00
6,400 00	9 16	160 51	6,347 14	-633 55	224 18	672 05	0 00	0 00	0 00
6,500 00	9 16	160 51	6,445 87	-648 56	229 49	687 97	0 00	0 00	0 00



# Scientific Drilling Planning Report



Database: EDM-Julio  
Company: COG Operating LLC  
Project: Eddy County, NM (NAN27 NME)  
Site: Tex Mack 11 Federal #46  
Well: Tex Mack 11 Fed #46  
Wellbore: OH  
Design: Plan #1 - 7-7/8" Hole

Local Co-ordinate Reference:  
TVD Reference:  
MD Reference:  
North Reference:  
Survey Calculation Method:

Site Tex Mack 11 Federal #46  
Ground Elev @ 3957.00usft  
Ground Elev @ 3957.00usft  
Grid  
Minimum Curvature

## 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)
6,600.00	9.16	160.51	6,544.59	-663.57	234.80	703.89	0.00	0.00	0.00
6,700.00	9.16	160.51	6,643.31	-678.58	240.11	719.81	0.00	0.00	0.00
6,800.00	9.16	160.51	6,742.04	-693.59	245.42	735.73	0.00	0.00	0.00
6,900.00	9.16	160.51	6,840.76	-708.59	250.73	751.65	0.00	0.00	0.00
7,000.00	9.16	160.51	6,939.49	-723.60	256.05	767.57	0.00	0.00	0.00
7,061.29	9.16	160.51	7,000.00	-732.80	259.30	777.32	0.00	0.00	0.00

PBHL-Tex Mack 11 #46

## 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-Tex Mack 11 #4		0.00	0.01	0.00	-782.80	309.30	671,970.70	653,881.70	32° 50' 46.785 N	103° 49' 56.201 W
- plan misses target center by 841.69usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)										
- Rectangle (sides W0.00 H200.00 D0.00)										
South HL-Tex Mack 11 #		0.00	0.01	0.00	-782.80	309.30	671,970.70	653,881.70	32° 50' 46.785 N	103° 49' 56.201 W
- plan misses target center by 841.69usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)										
- Rectangle (sides W200.00 H0.00 D0.00)										
PBHL-Tex Mack 11 #46		0.00	0.01	7,000.00	-732.80	259.30	672,020.70	653,831.70	32° 50' 47.282 N	103° 49' 56.784 W
- plan hits target center										
- Circle (radius 50.00)										

## Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,950.00	1,950.00	8-5/8" Casing	8-5/8	12-1/4

## Formations

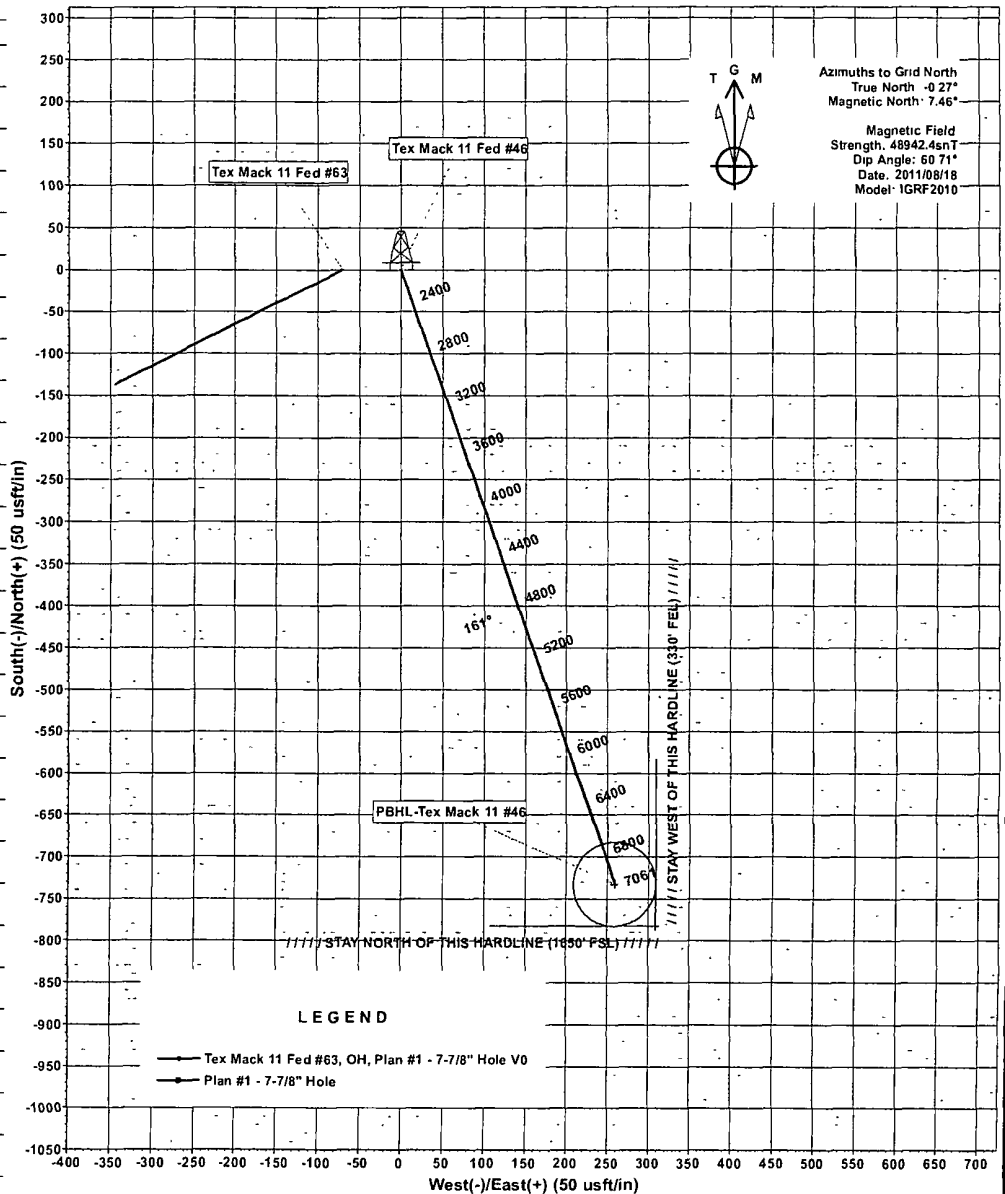
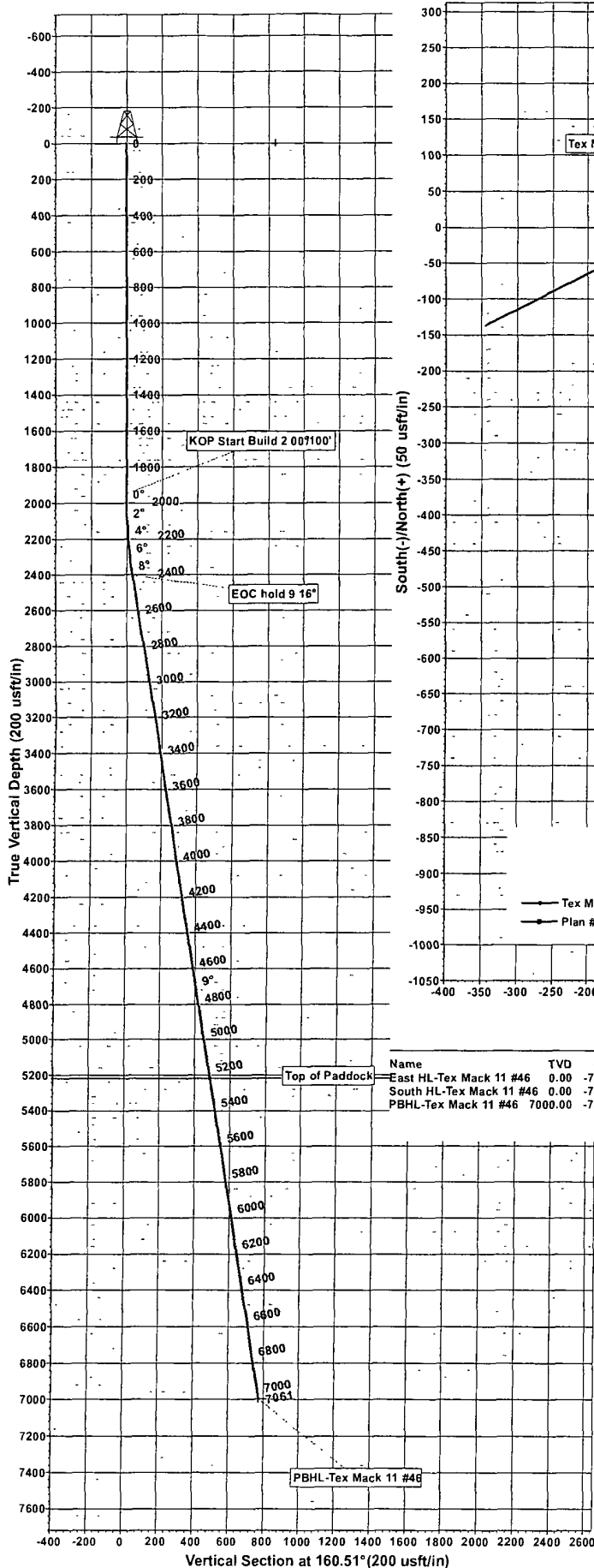
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
5,258.30	5,220.00	Top of Paddock		0.00	

## Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates	Comment
1,950.00	1,950.00	0.00 0.00	KOP Start Build 2.00°/100'
2,408.01	2,406.06	-34.44 12.19	EOC hold 9.16°



Scientific Drilling for COG Operating LLC  
Site: Eddy County, NM (NAN27 NME)  
Well: Tex Mack 11 Fed #46  
Wellbore: OH  
Design: Plan #1 - 7-7/8" Hole



#### LEGEND

- Tex Mack 11 Fed #63, OH, Plan #1 - 7-7/8" Hole V0
- Plan #1 - 7-7/8" Hole

#### WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
East HL-Tex Mack 11 #46	0.00	-782.80	309.30	671970.70	653881.70	32°50' 46.785 N	103°49' 56.201 W	Rectangle ( Sides L200.00 W0.00)
South HL-Tex Mack 11 #46	0.00	-782.80	309.30	671970.70	653881.70	32°50' 46.785 N	103°49' 56.201 W	Rectangle ( Sides L0.00 W200.00)
PBHL-Tex Mack 11 #46	7000.00	-732.80	259.30	672020.70	653831.70	32°50' 47.282 N	103°49' 56.784 W	Circle (Rad ius 50.00)

#### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSeet	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1950.00	0.00	0.00	1950.00	0.00	0.00	0.00	0.00	0.00	
3	2408.01	9.16	160.51	2406.07	-34.44	12.19	2.00	160.51	36.54	
4	7061.29	9.16	160.51	7000.00	-732.80	259.30	0.00	0.00	777.32	PBHL-Tex Mack 11 #46

#### WELL DETAILS: Tex Mack 11 Fed #46

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	672753.50	653572.40	32°50' 54.545 N	103°49' 59.783 W	

#### PROJECT DETAILS: Eddy County, NM (NAN27 NME) Plan Plan #1 - 7-7/8" Hole (Tex Mack 11 Fed #46/OH)

Geodetic System: US State Plane 1927 (Exact solution)	Created By: Julio Pina	Date: 18-Aug-11
Datum: NAD 1927 (NADCON CONUS)		
Ellipsoid: Clarke 1866	Checked: _____	Date: _____
Zone: New Mexico East 3001		
System Datum: Mean Sea Level	Reviewed: _____	Date: _____
	Approved: _____	Date: _____

**COG OPERATING LLC**

550 West Texas, Suite 1300

Midland, TX 79701

**DIRECTIONAL PLAN VARIANCE REQUEST**

**Tex Mack 11 Federal #46**

**EDDY, NM**

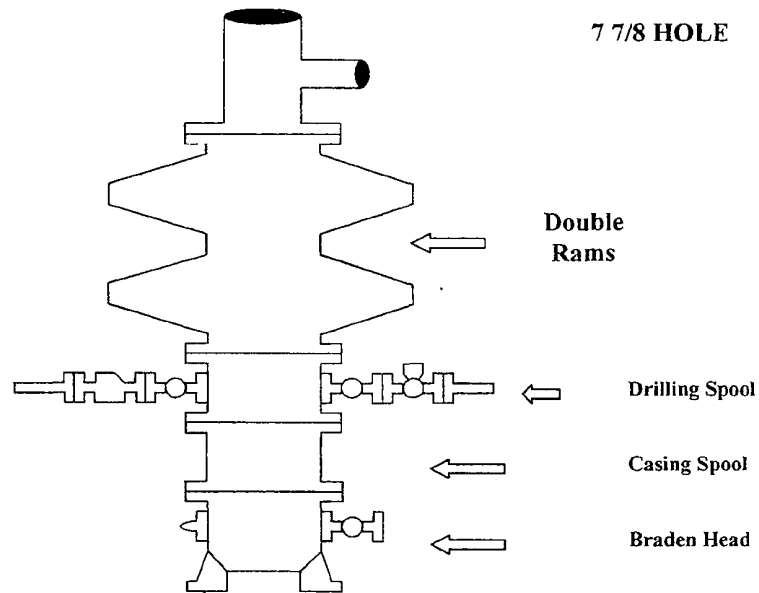
SHL	2435 FSL, 635 FEL	Sec 11, T17S, R31E, Unit I
BHL	1650 FSL, 330 FEL	Sec 11, T17S, R31E, Unit I

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

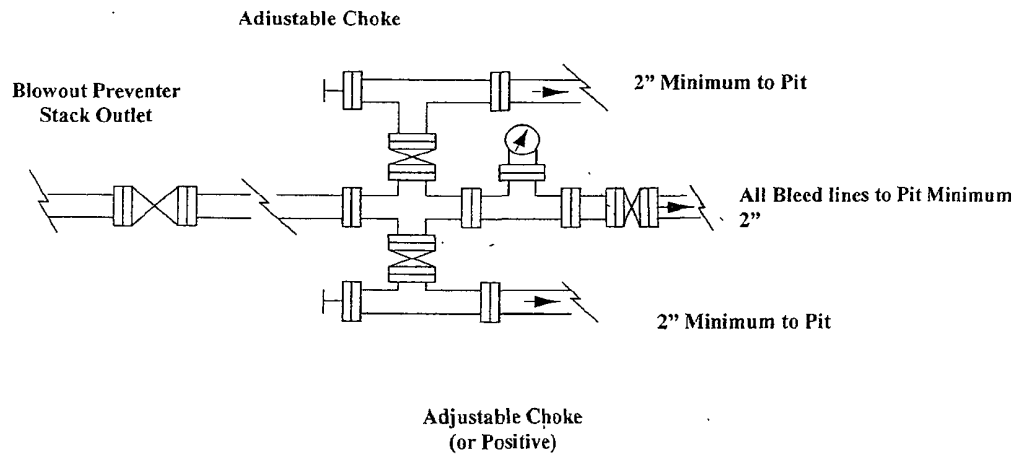
## Exhibit #9

### BOPE and Choke Schematic



Minimum 4" Nominal choke and kill lines

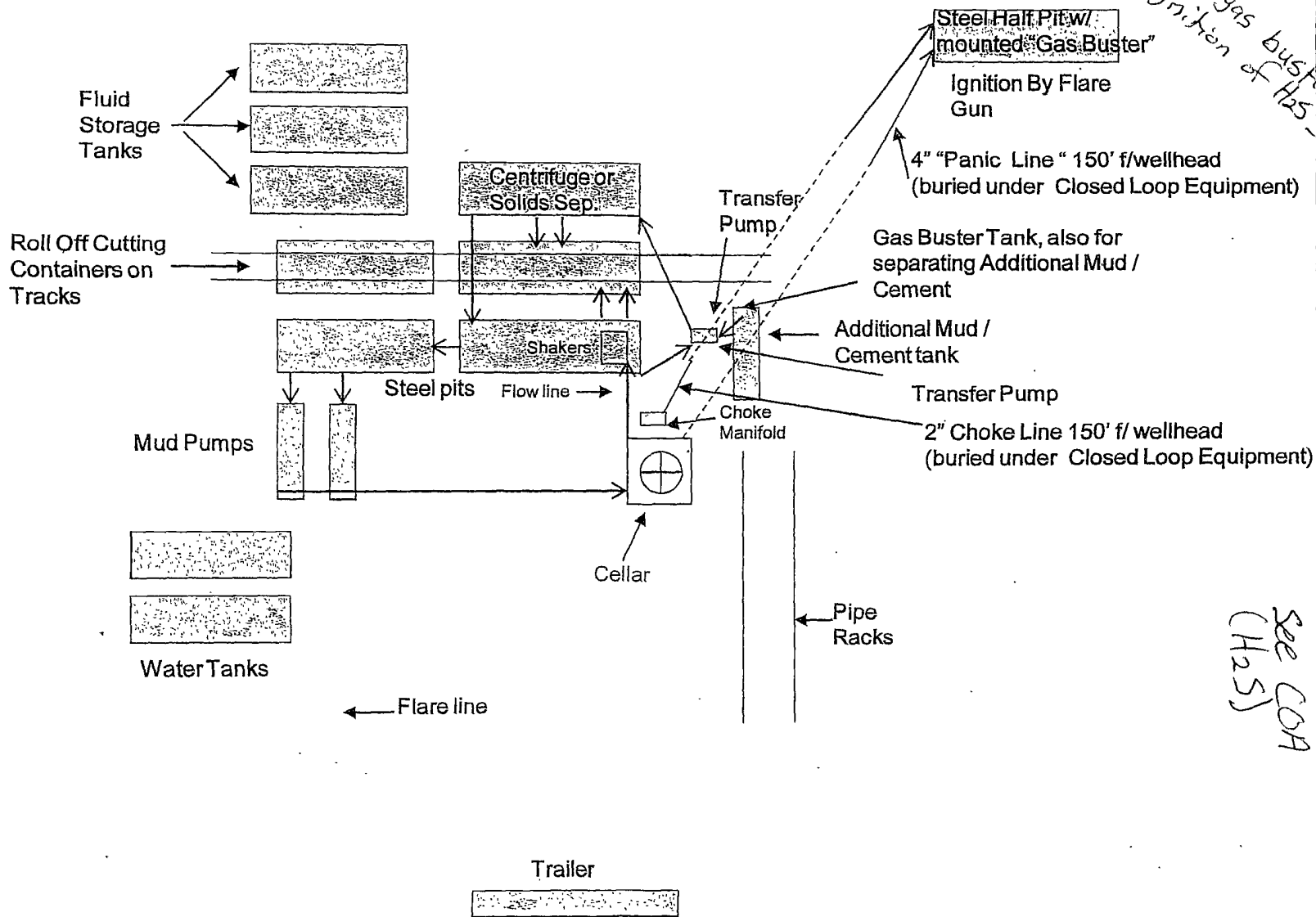
Choke Manifold Requirement (2000 psi WP)  
No Annular Required



**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:

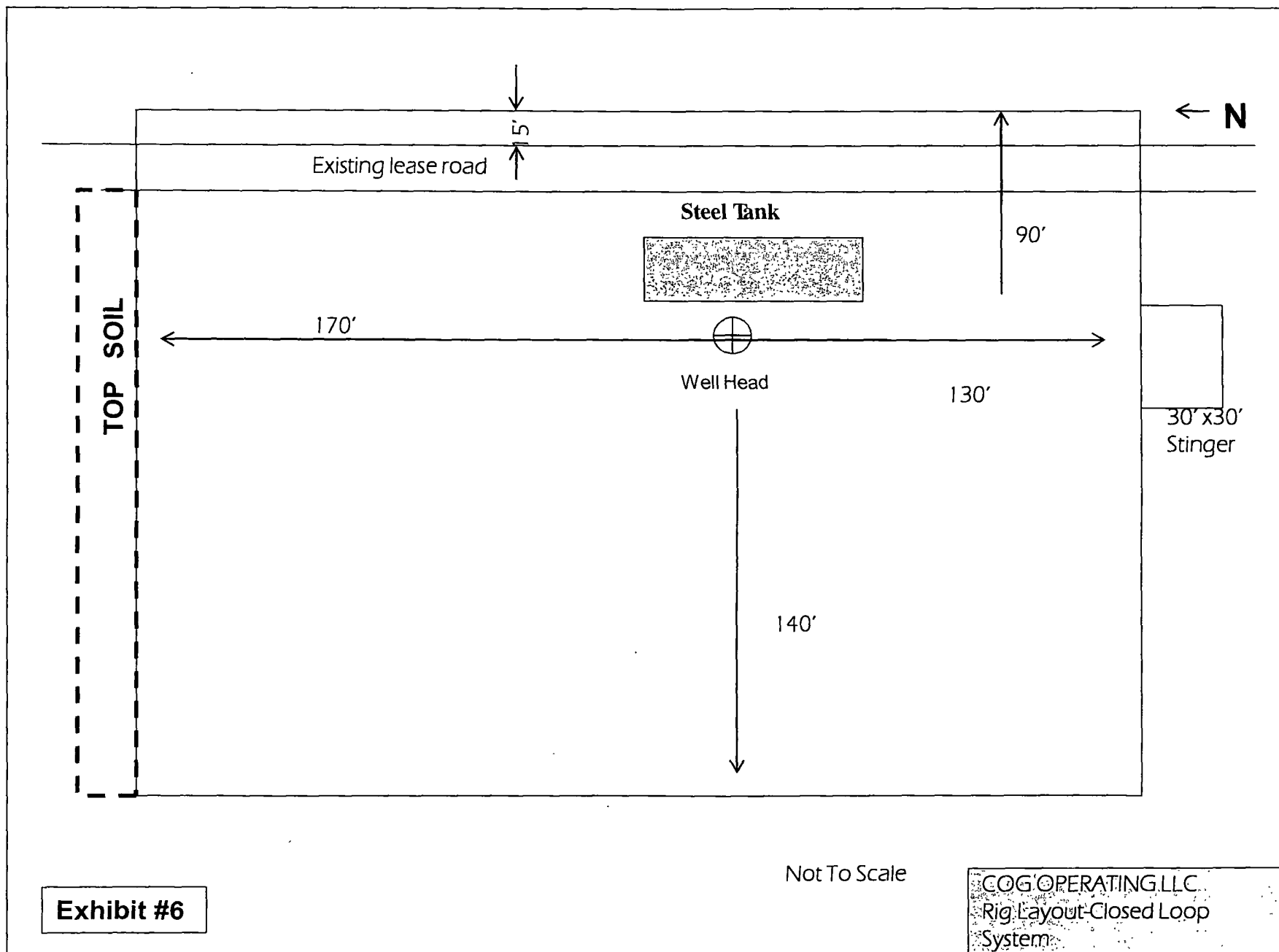
CRI (permit number R9166)

or

GMI (permit number 711-019-001)

dependent upon which rig is available to drill this well.





DISTRICT 2 -- CHECKLIST FOR INTENTS TO DRILL

Operator

COG-OP2

OGRID #

229134

Well Name & #

TGX MACULI FEDERAL #46

Surface Type (F) (S) (P)

Location: UL 1, Sect 11, Twnship 12 s, RNG 31 e,

Sub-surface Type (F) (S) (P)

A. Date C101 rec'd 11/16/2011 C101 reviewed 11/28/2011

B. 1. Check mark, Information is OK on Forms:

OGRID ☒ BONDING ☒ PROP CODE ☒ WELL # ☒ SIGNATURE ☒

2. Inactive Well list as of: 11/28/2011 # wells 3079, # Inactive wells 8

a. District Grant APD but see number of inactive wells:

No letter required ☒; Sent Letter to Operator ☐ to Santa Fe ☐

3. Additional Bonding as of: 11/28/2011

a. District Denial because operator needs addition bonding:

No Letter required ☒; Sent Letter to Operator ☐ To Santa Fe ☐

b. District Denial because of Inactive well list and Financial Assurance:

No Letter required ☒; Sent Letter to Operator ☐ To Santa Fe ☐

C. C102 YES ☒ NO ☐ Signature ☒

1. Pool FROM GORRITA - YOSO, east Code 9921397866

a. Dedicated acreage ☐ What Units ☐

b. SUR. Location Standard ☐: Non-Standard Location ☐

c. Well shares acres: Yes ☐ No ☐ # of wells ☐ plus this well # ☐

2. 2<sup>nd</sup>. Operator in same acreage, Yes ☐ No ☐

Agreement Letter ☐ Disagreement letter ☐

3. Intent to Directional Drill Yes ☐ No ☐

a. Dedicated acreage ☐ What Units ☐

b. Bottomhole Location Standard ☐ Non-Standard Bottomhole ☐

4. Downhole Commingle: Yes ☐ No ☐

a. Pool #2 ☐ Code ☐ Acres ☐

Pool #3 ☐ Code ☐ Acres ☐

Pool #4 ☐ Code ☐ Acres ☐

5. POTASH Area Yes ☐ No ☒

D. Blowout Preventer Yes ☒ No ☐

E. H2S Yes ☒ No ☐

F. C144 Pit Registration Yes ☒ No ☐

G. Does APD require Santa Fe Approval:

1. Non-Standard Location: Yes ☐ No ☒ NSL # ☐

2. Non-Standard Proration: Yes ☐ No ☒ NSP # ☐

3. Simultaneous Dedication: Yes ☐ No ☒ SD # ☐

Number of wells ☐ Plus # ☐

4. Injection order Yes ☐ No ☒ PMX # ☐ or WFX # ☐

5. SWD order Yes ☐ NO ☒ SWD # ☐

6. DHC from SF ☐; DHC-HOB ☐; Holding ☐

7. OCD Approval Date 11/28/2011

API #30-0 15-39704

8. Reviewers TES