

ATS-12-912

Form 3160-3  
(April 2004)

OCD Artesia

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

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

5 Lease Serial No.  
**SL: LC-028784B BL: LC-028793C**

6 If Indian, Allottee or Tribe Name  
N/A

7 If Unit or CA Agreement, Name and No  
**NMNM-88525X; Burch Keely Unit**

8 Lease Name and Well No  
**Burch Keely Unit #322H-947H**

9 API Well No.  
**30-015-40637**

10 Field and Pool, or Exploratory  
**Burch Keely; Glorieta-Upper Yeso**

11 Sec, T R M or Blk and Survey or Area  
**Sec 23 T17S R29E**

12 County or Parish  
**EDDY**

13 State  
**NM**

1a Type of work ☒ DRILL ☐ REENTER

1b Type of Well ☒ Oil Well ☐ Gas Well ☐ Other ☐ Single Zone ☐ Multiple Zone

2 Name of Operator  
**COG Operating LLC**

3a Address **550 W. Texas Ave., Suite 100  
Midland, TX 79701**

3b Phone No (include area code)  
**432-685-4384**

4 Location of Well (Report location clearly and in accordance with any State requirements \*)  
At surface **990' FNL & 330' FEL, Unit A**  
At proposed prod. zone **990' FNL & 330' FWL, Unit D**

14 Distance in miles and direction from nearest town or post office\*  
**2 miles from Loco Hills, NM**

15 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  
**SL:1264.52 BL:1115.22**

17 Spacing Unit dedicated to this well  
**40' 160**

18 Distance from proposed location\* to nearest well, drilling, completed, applied for, on this lease, ft. **195'**

19 Proposed Depth  
**TVD: 4778' MD: 9268'**

20 BLM/BIA Bond No on file  
**NMB000740; NMB000215**

21 Elevations (Show whether DF, KDB, RT, GL, etc)  
**3603' GL**


22 Approximate date work will start\*  
**08/30/2012**

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 **06/28/2012**

Title **Permitting Tech**

Approved by (Signature) **/s/ Don Peterson** Name (Printed/Typed) **Don Peterson** Date **AUG 27 2012**

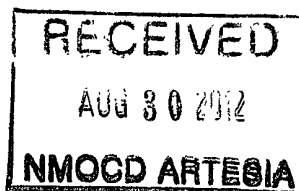
Title **FIELD MANAGER** Office **CARLSBAD FIELD OFFICE**

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 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 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**



**SEE ATTACHED FOR  
CONDITIONS OF APPROVAL**

**Approval Subject to General Requirements  
& Special Stipulations Attached**

Surface Use Plan  
COG Operating, LLC  
Burch Keely Unit 232H  
SL: 990' FNL & 330' FEL      UL A  
BHL: 990' FNL & 330' FWL      UL D  
Section 23, T-17-S, R29-E  
Eddy County, New Mexico

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I hereby certify that I, or persons under my direct supervision, have inspected the drill site and access road proposed herein; that I am familiar with the conditions that presently exist; that I have full knowledge of State and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or COG Operating, LLC, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements. Executed this 19th day of March, 2012.

Signed: Carl Bird

Printed Name: Carl Bird

Position: Drilling Engineer

Address: 550 W. Texas, Suite 1300, Midland, Texas 79701

Telephone: (432) 683-7443

Field Representative (if not above signatory): Same

E-mail: cbird@concho.com

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENTFORM APPROVED  
OMB NO 1004-0135  
Expires July 31, 2010**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.**5 Lease Serial No.  
NMLC028793C

6. If Indian, Allottee or Tribe Name

**SUBMIT IN TRIPLICATE - Other instructions on reverse side.**7 If Unit or CA/Agreement, Name and/or No  
NMNM88525X

## 1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other8 Well Name and No  
BURCH KEELY UNIT 232H

## 2 Name of Operator

COG OPERATING LLC

Contact KELLY J HOLLY

E-Mail: kholly@conchoresources.com

9. API Well No.

80-015-40637

## 3a Address

550 WEST TEXAS AVENUE SUITE 100  
MIDLAND, TX 79701

## 3b. Phone No. (include area code)

Ph: 432-685-4384

10. Field and Pool, or Exploratory  
BURCH KEELY-GLORIETA-UPPER Y

## 4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 23 T17S R29E NENE 990FNL 330FEL

11 County or Parish, and State

EDDY COUNTY, NM

## 12. CHECK APPROPRIATE BOX(ES) 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"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	Change to Original A
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	PD

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 recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with 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 recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices 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 permission to change the name and number of this well to:

Burch Keely Unit #947H

A revised C-102 is attached for your review.

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #145285 verified by the BLM Well Information System

For COG OPERATING LLC, sent to the Carlsbad

Committed to AFMSS for processing by BEVERLY WEATHERFORD on 08/09/2012 (12BMW0549SE)

Name (Printed/Typed) KELLY J HOLLY

Title PERMITTING TECH

Signature (Electronic Submission)

Date 08/08/2012

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

Approved By

Title

Date

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.

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 to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

**\*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\***

DISTRICT I  
1625 N. French Dr., Hobbs, NM 88240  
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II  
811 S. First St., Artesia, NM 88210  
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III  
1000 Rio Brazos Road, Aztec, NM 87410  
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505  
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico  
Energy, Minerals & Natural Resources Department  
OIL CONSERVATION DIVISION  
1220 South St. Francis Dr.  
Santa Fe, New Mexico 87505

Form C-102  
Revised August 1, 2011  
Submit one copy to appropriate  
District Office

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015- <b>40637</b>	Pool Code 97918	Pool Name Burch Keely; Glorieta Upper Yeso
Property Code 308086	Property Name BURCH KEELY UNIT	Well Number 947H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3603'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	23	17-S	29-E		990	NORTH	330	EAST	EDDY

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
D	23	17-S	29-E		990	NORTH	330	WEST	EDDY

Dedicated Acres 160	Joint or Infill	Consolidation Code	Order No. <b>9268 8/27</b>
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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>GRID. AZ. = 269°57'04" HORIZ. DIST. = 4623.1'</p> <p>SEE DETAIL</p> <p>DETAIL</p> <p>3601.8' 3601.8' 3603.0' 3604.2'</p> <p>CORNER COORDINATES TABLE</p> <p>① - Y=664760.5 N, X=585945.4 E ② - Y=664765.0 N, X=591228.9 E ③ - Y=663440.8 N, X=585950.5 E ④ - Y=663445.6 N, X=591231.7 E</p> <p>GEODETIC COORDINATES NAD 27 NME</p> <p>SURFACE LOCATION Y=663775.0 N X=590901.0 E LAT.=32.824455° N LONG =104 037421° W</p> <p>BOTTOM HOLE LOCATION Y=663771.1 N X=586279.1 E</p>	<p><b>OPERATOR CERTIFICATION</b></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> Signature Date 8-8-12</p> <p>Kelly J. Holly Printed Name</p> <p>kholly@concho.com E-mail Address</p> <p><b>SURVEYOR CERTIFICATION</b></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>FEBRUARY 14, 2012</p> <p>Date of Survey Signature &amp; Seal of Professional Surveyor:</p> <p> RONALD J. EIDSON 3239</p> <p>Certification Number Gary G. Eidson 12641 Ronald J. Eidson 3239</p> <p>DSR Rel. With 1203-1122 ANAVS W.O.: 12.13 1387</p>
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ATTACHMENT TO FORM 3160-3  
COG Operating, LLC  
BURCH KEELY UNIT #232H  
SHL: 990' FNL & 330' FEL, Unit A  
BHL: 990' FNL & 330' FWL, Unit D  
Sec 23, T17S, R29E  
Eddy County, NM

1. Proration Unit Spacing: 160 Acres
2. Ground Elevation: 3603'
3. Proposed Depths: Horizontal TVD = 4778', MD = 9268'
4. Estimated tops of geological markers:

Quaternary	Surface
Rustler	300'
Top of Salt	495'
Base of Salt	880'
Yates	923'
Seven Rivers	1214'
Queen	1821'
Grayburg	2207'
San Andres	2522'
Glorieta	3977'
Paddock	4044'
Blaine	4470'
Tubb	5700'

5. Possible mineral bearing formations:

Water Sand	150'	Fresh Water
Grayburg	2207'	Oil/Gas
San Andres	2522'	Oil/Gas
Glorieta	3977'	Oil/Gas
Paddock	4044'	Oil/Gas
Blaine	4470'	Oil/Gas
Tubb	5700'	Oil/Gas

No other formations are expected to give up oil, gas or fresh water in measurable quantities. Setting 13 3/8" casing to 325' and circulating cement back to the surface will protect the surface fresh water sand. The Salt Section will be protected by setting 9 5/8" casing to 1350' 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 7" x 5 1/2" production casing back 200' into the intermediate casing (although cement volume is actually 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 environment.

See COA

See COA

**ATTACHMENT TO FORM 3160-3**  
**COG Operating, LLC**  
**BURCH KEELY UNIT #232H**  
**Page 2 of 4**

**6. Casing Program - Proposed**

<u>Hole size</u>	<u>Interval</u>	<u>OD of Casing</u>	<u>Weight</u>	<u>Cond.</u>	<u>Collar</u>	<u>Grade</u>
See COA 17-1/2"	0' - +/- 325' <sup>230</sup>	13-3/8"	48#	New	STC	H-40 or Hybrid J-55
Collapse sf – 5.36, Burst sf – 12.04, Tension sf – 20.64						
12-1/4"	0' - +/- 1350'	9-5/8"	36#	New	STC	J/K-55
Collapse sf – 3.16, Burst sf – 5.51, Tension sf – 9.32						
8-3/4" x 7 7/8"	0' – 9268'	7" x 5-1/2"	26#/17#	New	LTC	L-80
7" Csg - Collapse sf – 2.61, Burst sf – 2.03, Tension sf – 4.56						
5 1/2" Csg - Collapse sf – 2.74, Burst sf – 2.04, Tension sf – 4.22						

**Production string will be a tapered string with 7" 26# L-80 LTC ran from surface to kick off point and then crossed over to 5 1/2" 17# L-80 LTC.**

**7. Cement Program**

**13 3/8" Surface Csg:** Set at +/- 325'MD, 400sx Class "C" w/ 2% CaCl<sub>2</sub> & 0.25 pps CF, yield 1.32 cu.ft./sk., wt.14.8 ppg. 190% excess, calculated to surface.

**9 5/8" Intrmd. Csg:** Set at +/- 1350'MD.

Option #1: **Single Stage (TD to Surface):** Lead Slurry: 300 sx 50:50:10:C:Poz:Gel w/ 5% salt, 5 pps LCM-1, 0.25 pps CF, yield 2.45 cu.ft./sk., 11.8 ppg. Tail Slurry: 200 sx Class "C" w/ 2% CaCl<sub>2</sub>, yield 1.32 cu.ft./sk., wt. 14.8 ppg. 173% excess, calculated to surface.

See  
COA  
Option #2: **Multi Stage: Stage 1 (TD to DV Tool @ 375')** 200 sx Class "C" w/ 2% CaCl<sub>2</sub>, yield 1.32 cu.ft./sk., wt. 14.8 ppg. 91% excess. **Stage 2 (DV Tool to surface):** 300 sx 50:50:10:C:Poz:Gel w/ 5% salt, 5 pps LCM-1, 0.25 pps CF, yield 2.45 cu.ft./sk., wt. 14.8 ppg calculated to surface, 173% excess; assumption for tool is lost circulation. Multi stage tool to be set at approximately, depending on hole conditions, 375' (50' below the surface casing). Cement volumes will be adjusted proportionately for depth changes of multi stage tool.

**7" x 5 1/2" Production Csg:** Set at +/- 9268'MD.

Option#1: **Single Stage (KOP to surface):** Lead Slurry: 400 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 2.01 cu.ft./sk., wt. 12.5 ppg. Tail Slurry: 300 sx 50:50:2:C:Poz:Gel w/ 5% salt, 3 pps LCM, 0.6% SMS, 1% FL-25, 1% BA-58, 0.125 pps CF, 0.3% FL-52A; yield 1.37 cu.ft./sk., wt. 14.0 ppg. DV Tool and ECP to be set at kick off point with 7" cemented to surface and 5 1/2" run with +/- 18 isolation packers and sliding sleeves in uncemented lateral. 118% excess in open hole, from kick off point, calculated to surface. **This is a minimum volume and will be adjusted up after caliper is run.**

Option #2: **Multi Stage (DV Tool & ECP (external csg. packer)@ KOP and DV Tool at 3000')** **Stage 1:** (KOP To DV Tool at 3000'): 200 sx 50:50:2:C:Poz:Gel w/ 5% salt, 3 pps LCM, 0.6% SMS, 1% FL-25, 1% BA-58, .125 pps CF, 0.3% FL-52A; yield 1.37 cu.ft./sk., wt.14.00 ppg. 33% excess. **This is a minimum volume and will be adjusted up after caliper is run.** **Stage 2 (DV Tool to surface)** Lead Slurry: 400 sx 50:50:2:C:Poz:Gel w/ 5% salt, 3 pps LCM, 0.6% SMS, 1% FL-25, 1% BA-58, 0.125 pps CF, 0.3% FL-52A; yield 1.37 cu.ft./sk., wt. 14.0 ppg. Tail Slurry: 300 sx Class C w/ 0.3% R-3 + 1.5% CD-32, yield 1.02 cu.ft./sk., wt. 16.8 ppg. 154% excess calculated back to surface (no need for excess in casing overlap). **This is a minimum volume and will be adjusted up after caliper is run.**

ATTACHMENT TO FORM 3160-3  
COG Operating, LLC  
BURCH KEELY UNIT #232H  
Page 3 of 4

You will note that in option #2 the Multi stage tool (DV Tool) will be set at approximately 3000', depending on hole conditions. Cement volumes will be adjusted proportionately for depth changes of multi stage tool; assumption for use of tool is water flow.

8. Pressure Control Equipment:

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" BOP will be used during the drilling of the well. A 13 5/8" permanent casing head will be installed on the 13 3/8" casing. The BOP will be nipped up on the 13 5/8" permanent casing head and tested to 2000 psi. After setting 9-5/8", permanent "B section" well head will be installed and the BOP will then be nipped up on the permanent B section well head 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.

9. Proposed Mud Circulating System

Interval	Mud Wt.	Visc.	FL	Type Mud System
0' - 325' <sup>230</sup>	8.5	28	NC	Fresh water native mud w/ paper for seepage and sweeps. Lime for PH.
325' - 1350'	10	30	NC	Brine mud, lime for PH and paper for seepage and sweeps.
1350' - 9268'	9.1	29	NC	Drill section with fresh water/cut brine circulating the reserve utilizing periodic sweeps of paper as needed for seepage control and solids removal.

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

10. Production Hole Drilling Summary:

**Drill 8 3/4" hole and kick off at +/- 4375', building curve over +/- 750' to horizontal at 4850' TVD. Drill 7 7/8" lateral section in a easterly direction for +/-4622' lateral to TD at +/-9268' MD, 4778' TVD. Run 7" x 5-1/2" production casing. 7" to be ran from surface to kickoff point and changed over to 5 1/2" with DV Tool and ECP at kickoff point. 5 1/2" casing will be ran from kickoff point to td and isolation packers set throughout lateral. 7" to be cemented from kickoff point to surface.**

11. 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.

ATTACHMENT TO FORM 3160-3  
COG Operating, LLC  
BURCH KEELY UNIT #232H  
Page 4 of 4

12. Logging, Testing and Coring Program:

- A. No electric logs to be run. *See COA*
- B. The mud logging program will consist of lagged 10' samples from intermediate casing point to T.D. in vertical pilot hole and from Kick off point to TD in Horizontal hole.
- C. Drill Stem test is not anticipated.
- D. No conventional coring is anticipated.
- E. Further testing procedures will be determined after the 7" x 5 1/2" production casing has been cemented at TD based on drill shows and log evaluation.

13. Abnormal Conditions, Pressures, Temperatures and Potential Hazards:

No abnormal pressures or temperatures are anticipated. The estimated bottom hole temperature at TD of pilot hole is 90 degrees and estimated maximum bottom hole pressure is 2102 psig. Measurable gas volumes or Hydrogen Sulfide levels have not been encountered during drilling operations in this area, however an H2S plan is attached to the Drilling Program. No major loss of circulation zones has been reported in offsetting wells.

14. Anticipated Starting Date

Drilling operations will commence approximately on August 30, 2012 with drilling and completion operations lasting approximately 90 days.



# **COG Operating LLC**

Eddy County, NM

Burch Keely Unit 232H

Burch Keely Unit 232H

Wellbore #1

Plan: Plan #2

## **Standard Planning Report**

28 June, 2012

# Planning Report

Database:	Houston R5000 Database	Local Co-ordinate Reference:	Site Burch Keely Unit 232H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3621.00ft (Silver Oak #8)
Project:	Eddy County, NM	MD Reference:	WELL @ 3621.00ft (Silver Oak #8)
Site:	Burch Keely Unit 232H	North Reference:	Grid
Well:	Burch Keely Unit 232H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2		

Project:	Eddy 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:	Burch Keely Unit 232H		
Site Position:		Northing:	663,775.00 ft
From:	Map	Easting:	590,901.00 ft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	32.82445113
		Longitude:	-104.03742538
		Grid Convergence:	0.16°

Well		Burch Keely Unit 232H				
Well Position	+N/-S	0.00 ft	Northing:	663,775.00 ft	Latitude:	32.82445113
	+E/-W	0.00 ft	Easting:	590,901.00 ft	Longitude:	-104.03742538
Position Uncertainty	0.00 ft	Wellhead Elevation:		Ground Level:	3,603.00 ft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/28/2012	7.75	60.64	48,846

Design					Plan #2					
Audit Notes:										
Version:		Phase:		PLAN			Tie On Depth:		0 00	
Vertical Section:		Depth From (TVD)		+N/-S		+E/-W		Direction		
		(ft)		(ft)		(ft)		(°)		
		0 00		0 00		0 00		269 95		

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,372.60	0.00	0.00	4,372.60	0.00	0.00	0.00	0.00	0.00	0.00	
5,130.94	91.00	269.95	4,850.00	-0.41	-485.80	12.00	12.00	0.00	269.95	
9,267.67	91.00	269.95	4,777.80	-3.89	-4,621.90	0.00	0.00	0.00	0.00	PBHL (Burch Keely U)

# Planning Report

Database:	Houston R5000 Database	Local Co-ordinate Reference:	Site Burch Keely Unit 232H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3621 00ft (Silver Oak #8)
Project:	Eddy County, NM	MD Reference:	WELL @ 3621 00ft (Silver Oak #8)
Site:	Burch-Keely Unit 232H	North Reference:	Grid
Well:	Burch Keely Unit 232H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2		

## Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,372.60	0.00	0.00	4,372.60	0.00	0.00	0.00	0.00	0.00	0.00
<b>KOP - Start Build @ 12.00°/100'</b>									
4,400.00	3.29	269.95	4,399.99	0.00	-0.79	0.79	12.00	12.00	0.00
4,500.00	15.29	269.95	4,498.49	-0.01	-16.90	16.90	12.00	12.00	0.00
4,600.00	27.29	269.95	4,591.50	-0.04	-53.13	53.13	12.00	12.00	0.00
4,700.00	39.29	269.95	4,674.94	-0.09	-107.92	107.92	12.00	12.00	0.00
4,800.00	51.29	269.95	4,745.17	-0.15	-178.85	178.85	12.00	12.00	0.00
4,900.00	63.29	269.95	4,799.11	-0.22	-262.84	262.84	12.00	12.00	0.00
5,000.00	75.29	269.95	4,834.41	-0.30	-356.20	356.20	12.00	12.00	0.00
5,100.00	87.29	269.95	4,849.53	-0.38	-454.87	454.87	12.00	12.00	0.00
5,130.94	91.00	269.95	4,850.00	-0.41	-485.80	485.80	12.00	12.00	0.00
<b>Landing Point - Hold @ 91.00° INC. 269.95° AZ</b>									
5,200.00	91.00	269.95	4,848.79	-0.47	-554.85	554.85	0.00	0.00	0.00
5,300.00	91.00	269.95	4,847.05	-0.55	-654.83	654.83	0.00	0.00	0.00
5,400.00	91.00	269.95	4,845.30	-0.64	-754.82	754.82	0.00	0.00	0.00
5,500.00	91.00	269.95	4,843.56	-0.72	-854.80	854.80	0.00	0.00	0.00
5,600.00	91.00	269.95	4,841.81	-0.80	-954.79	954.79	0.00	0.00	0.00
5,700.00	91.00	269.95	4,840.06	-0.89	-1,054.77	1,054.77	0.00	0.00	0.00
5,800.00	91.00	269.95	4,838.32	-0.97	-1,154.76	1,154.76	0.00	0.00	0.00
5,900.00	91.00	269.95	4,836.57	-1.06	-1,254.74	1,254.74	0.00	0.00	0.00
6,000.00	91.00	269.95	4,834.83	-1.14	-1,354.73	1,354.73	0.00	0.00	0.00
6,100.00	91.00	269.95	4,833.08	-1.23	-1,454.71	1,454.71	0.00	0.00	0.00
6,200.00	91.00	269.95	4,831.34	-1.31	-1,554.70	1,554.70	0.00	0.00	0.00
6,300.00	91.00	269.95	4,829.59	-1.39	-1,654.68	1,654.68	0.00	0.00	0.00
6,400.00	91.00	269.95	4,827.85	-1.48	-1,754.67	1,754.67	0.00	0.00	0.00
6,500.00	91.00	269.95	4,826.10	-1.56	-1,854.65	1,854.65	0.00	0.00	0.00
6,600.00	91.00	269.95	4,824.36	-1.65	-1,954.64	1,954.64	0.00	0.00	0.00
6,700.00	91.00	269.95	4,822.61	-1.73	-2,054.62	2,054.62	0.00	0.00	0.00
6,800.00	91.00	269.95	4,820.87	-1.81	-2,154.61	2,154.61	0.00	0.00	0.00
6,900.00	91.00	269.95	4,819.12	-1.90	-2,254.59	2,254.59	0.00	0.00	0.00
7,000.00	91.00	269.95	4,817.38	-1.98	-2,354.58	2,354.58	0.00	0.00	0.00
7,100.00	91.00	269.95	4,815.63	-2.07	-2,454.56	2,454.56	0.00	0.00	0.00
7,200.00	91.00	269.95	4,813.89	-2.15	-2,554.54	2,554.54	0.00	0.00	0.00
7,300.00	91.00	269.95	4,812.14	-2.24	-2,654.53	2,654.53	0.00	0.00	0.00
7,400.00	91.00	269.95	4,810.40	-2.32	-2,754.51	2,754.52	0.00	0.00	0.00
7,500.00	91.00	269.95	4,808.65	-2.40	-2,854.50	2,854.50	0.00	0.00	0.00
7,600.00	91.00	269.95	4,806.90	-2.49	-2,954.48	2,954.48	0.00	0.00	0.00
7,700.00	91.00	269.95	4,805.16	-2.57	-3,054.47	3,054.47	0.00	0.00	0.00
7,800.00	91.00	269.95	4,803.41	-2.66	-3,154.45	3,154.45	0.00	0.00	0.00
7,900.00	91.00	269.95	4,801.67	-2.74	-3,254.44	3,254.44	0.00	0.00	0.00
8,000.00	91.00	269.95	4,799.92	-2.83	-3,354.42	3,354.42	0.00	0.00	0.00
8,100.00	91.00	269.95	4,798.18	-2.91	-3,454.41	3,454.41	0.00	0.00	0.00
8,200.00	91.00	269.95	4,796.43	-2.99	-3,554.39	3,554.39	0.00	0.00	0.00
8,300.00	91.00	269.95	4,794.69	-3.08	-3,654.38	3,654.38	0.00	0.00	0.00
8,400.00	91.00	269.95	4,792.94	-3.16	-3,754.36	3,754.36	0.00	0.00	0.00
8,500.00	91.00	269.95	4,791.20	-3.25	-3,854.35	3,854.35	0.00	0.00	0.00
8,600.00	91.00	269.95	4,789.45	-3.33	-3,954.33	3,954.33	0.00	0.00	0.00
8,700.00	91.00	269.95	4,787.71	-3.41	-4,054.32	4,054.32	0.00	0.00	0.00
8,800.00	91.00	269.95	4,785.96	-3.50	-4,154.30	4,154.30	0.00	0.00	0.00
8,900.00	91.00	269.95	4,784.22	-3.58	-4,254.29	4,254.29	0.00	0.00	0.00
9,000.00	91.00	269.95	4,782.47	-3.67	-4,354.27	4,354.27	0.00	0.00	0.00
9,100.00	91.00	269.95	4,780.73	-3.75	-4,454.25	4,454.26	0.00	0.00	0.00
9,200.00	91.00	269.95	4,778.98	-3.84	-4,554.24	4,554.24	0.00	0.00	0.00

# Planning Report

Database:	Houston R5000 Database	Local Co-ordinate Reference:	Site Burch Keely Unit 232H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3621.00ft (Silver Oak #8)
Project:	Eddy County, NM	MD Reference:	WELL @ 3621.00ft (Silver Oak #8)
Site:	Burch Keely Unit 232H	North Reference:	Grid
Well:	Burch Keely Unit 232H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,267.67	91.00	269.95	4,777.80	-3.89	-4,621.90	4,621.90	0.00	0.00	0.00
TD @ 9267.67' MD, 4777.80' TVD - PBHL (Burch Keely Unit 232H Plan 2)									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
hit/miss target									
Shape									
PBHL (Burch Keely Unit	0.00	0.00	4,777.80	-3.89	-4,621.90	663,771.10	586,279.10	32.82447509	-104.05247098
- plan hits target center									
- Point									

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
4,372.60	4,372.60	0.00	0.00	KOP - Start Build @ 12.00°/100'	
5,130.94	4,850.00	-0.41	-485.80	Landing Point - Hold @ 91.00° INC, 269.95° AZ	
9,267.67	4,777.80	-3.89	-4,621.90	TD @ 9267.67' MD, 4777.80' TVD	



**COG Operating LLC  
Burch-Keely Unit 232H  
Eddy County, NM  
Plan #2**



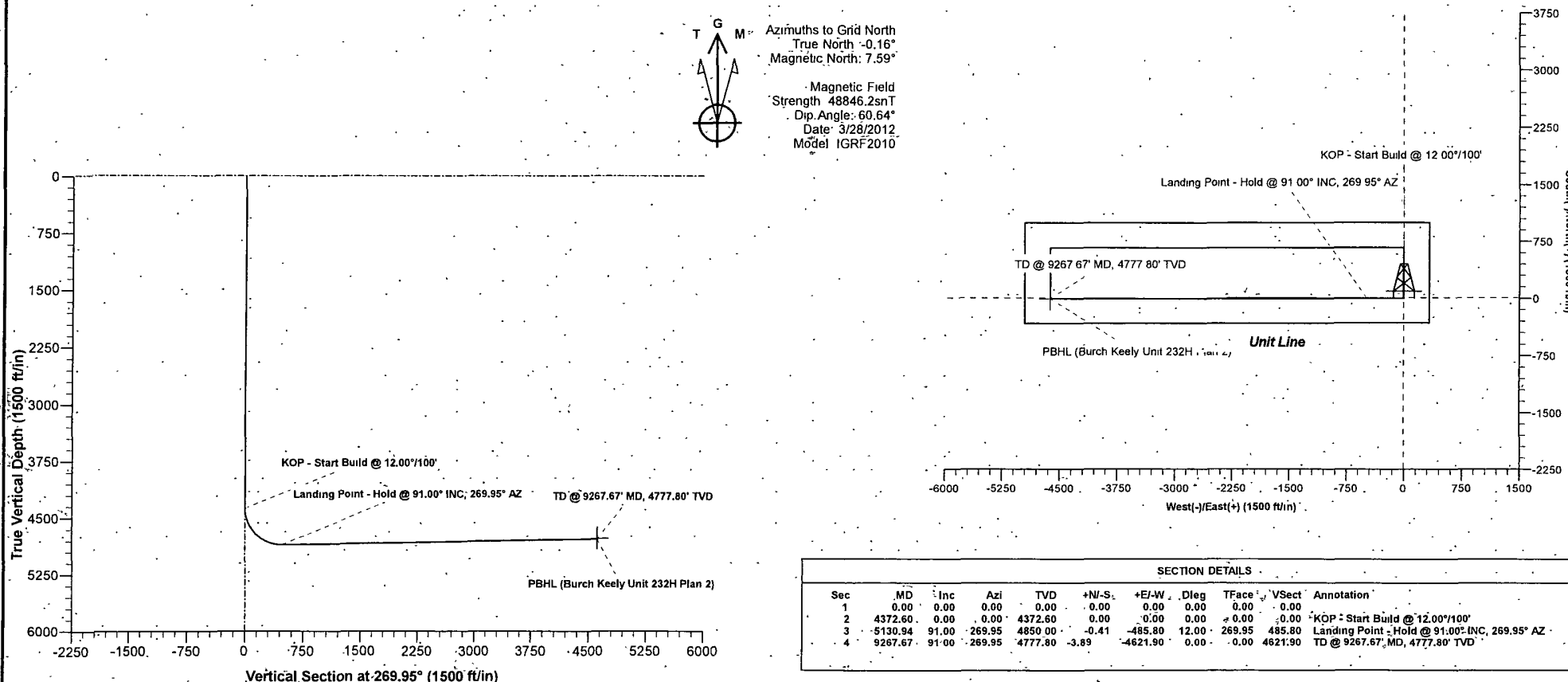
Surface Location		Ground Elev.: 3603.00 WELL @ 3621.00ft (Silver Oak #8)			
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0:00	0:00	663774.99	590901.00	32.82445113	-104.03742537

TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL (Burch Keely Unit 232H Plan 2)	4777.80	-3.89	-4621.90	663771.10	586279.10	32.82447509	-104.05247098



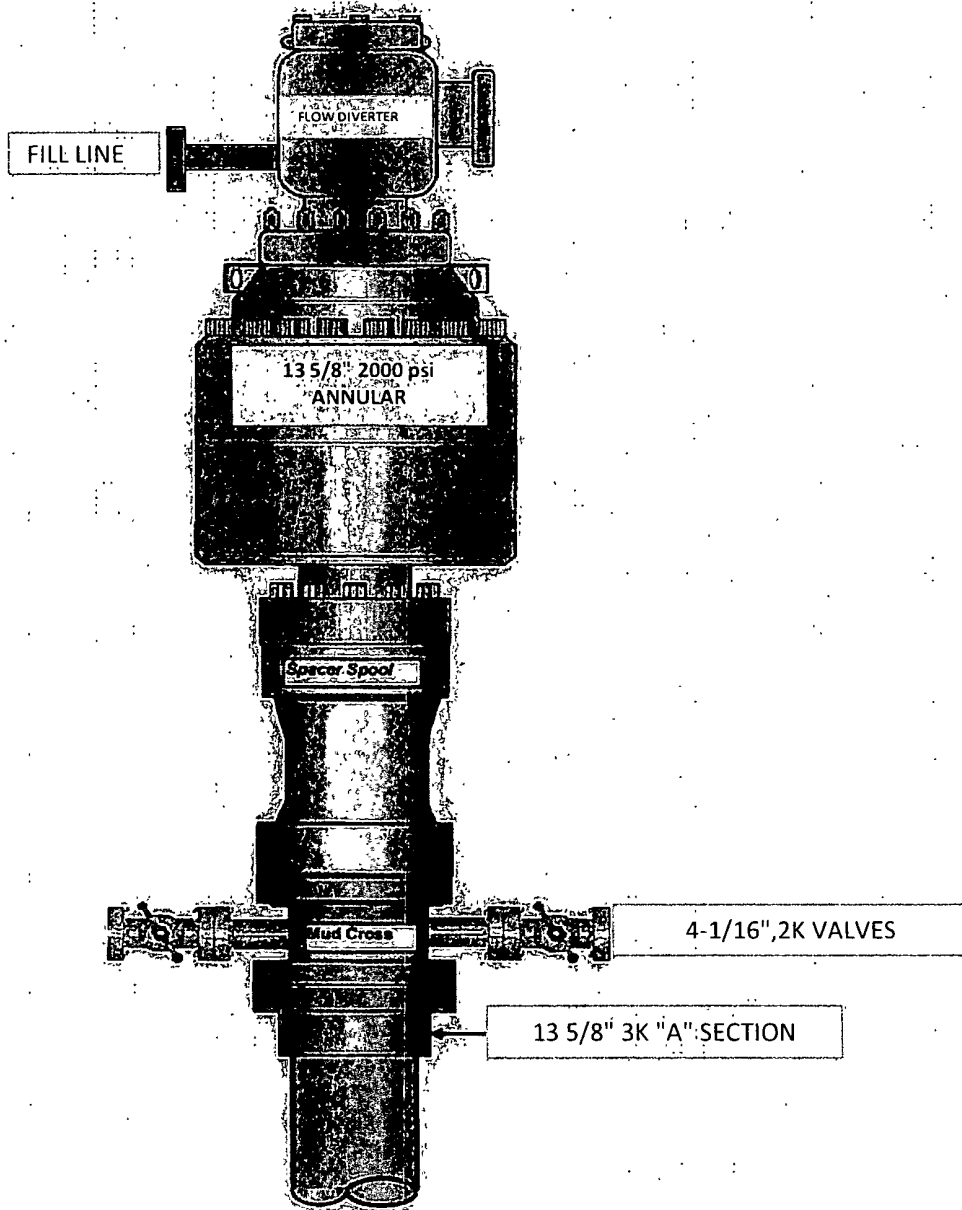
Azimuths to Grid North  
True North: -0.16°  
Magnetic North: 7.59°

Magnetic Field  
Strength: 48846.2snT  
Dip Angle: 60.64°  
Date: 3/28/2012  
Model: IGRF2010



SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	4372.60	0.00	0.00	4372.60	0.00	0.00	0.00	0.00	0.00	KOP: Start Build @ 12.00°/100'
3	5130.94	91.00	269.95	4850.00	-0.41	-485.80	12.00	269.95	485.80	Landing Point - Hold @ 91.00° INC, 269.95° AZ
4	9267.67	91.00	269.95	4777.80	-3.89	-4621.90	0.00	0.00	4621.90	TD @ 9267.67' MD, 4777.80' TVD

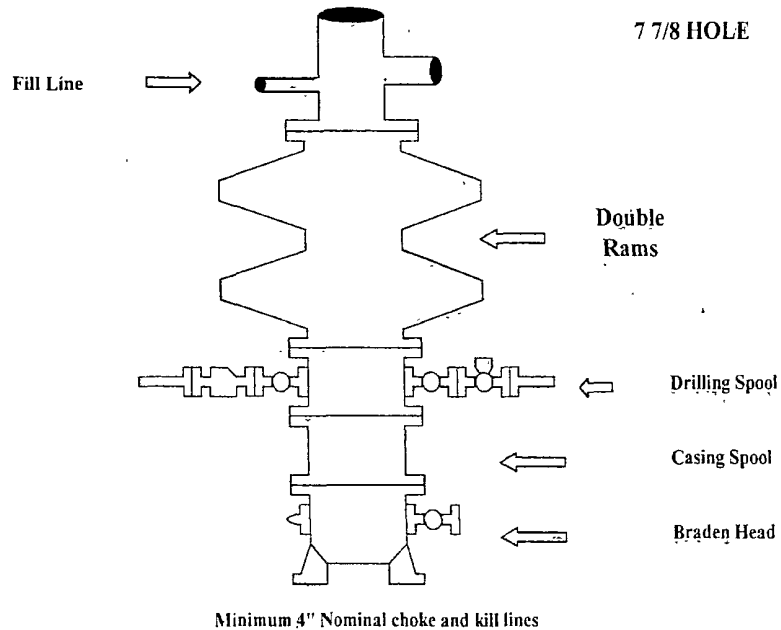
13 5/8" 2K ANNULAR



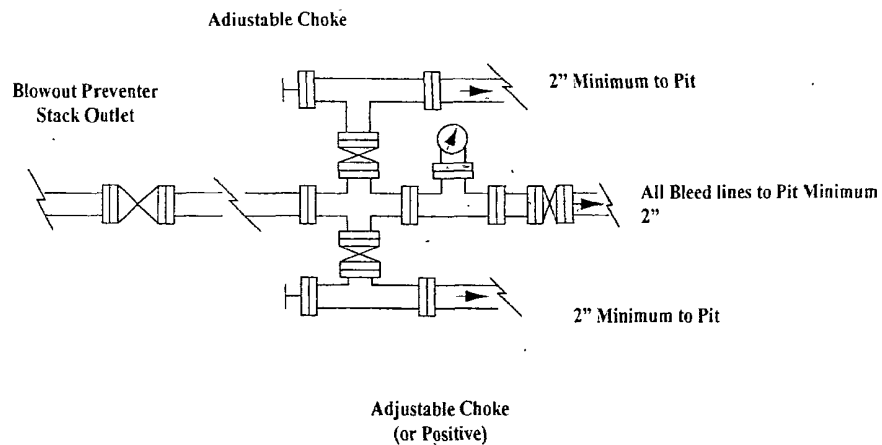
# COG Operating LLC

## 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.



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:

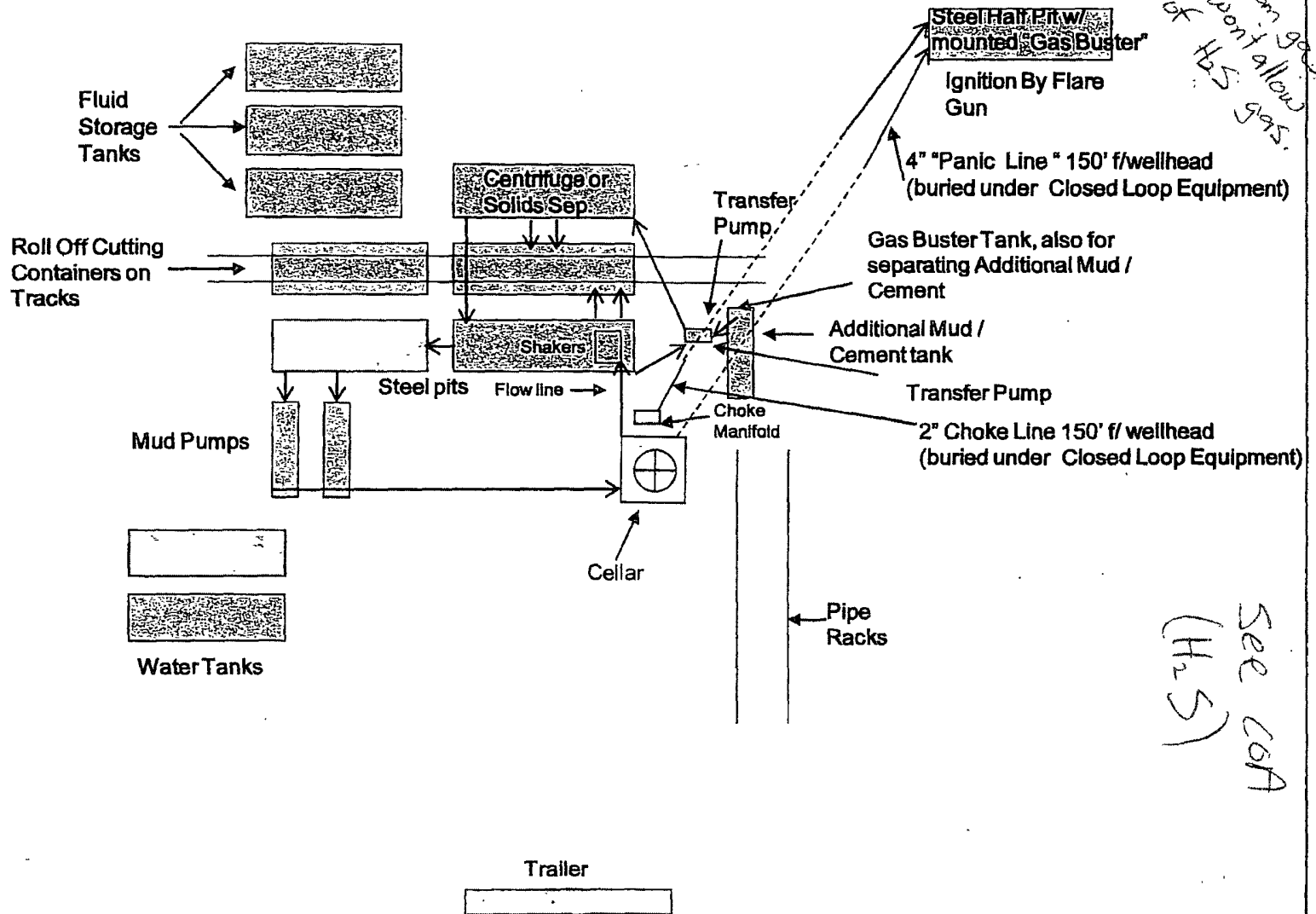
CRI (permit number R9166)

or

GMI (permit number 711-019-001)

dependent upon which rig is available to drill this well.

COG Operating LLC  
Closed Loop Equipment Diagram



## COG Operating LLC

### Hydrogen Sulfide Drilling Operation Plan

#### I. HYDROGEN SULFIDE TRAINING

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well:

1. The hazards and characteristics of hydrogen sulfide (H<sub>2</sub>S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H<sub>2</sub>S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

1. The effects of H<sub>2</sub>S on metal components. If high tensile tubular are to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
3. The contents and requirements of the H<sub>2</sub>S Drilling Operations Plan and Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H<sub>2</sub>S zone (within 3 days or 500 feet) and weekly H<sub>2</sub>S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H<sub>2</sub>S Drilling Operations Plan and the Public Protection Plan. **The concentrations of H<sub>2</sub>S of wells in this area from surface to TD are low enough that a contingency plan is not required.**

---

## **II. H2S SAFETY EQUIPMENT AND SYSTEMS**

Note: All H2S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonable expected to contain H2S.

### **1. Well Control Equipment:**

- A. Flare line.
- B. Choke manifold.
- C. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.
- D. Auxiliary equipment may include if applicable: annular preventer & rotating head.

### **2. Protective equipment for essential personnel:**

- A. Mark II Survive air 30-minute units located in the doghouse and at briefing areas, as indicated on well site diagram.

### **3. H2S detection and monitoring equipment:**

- A. 1 portable H2S monitors positioned on location for best coverage and response. These units have warning lights and audible sirens when H2S levels of 20 PPM are reached.

### **4. Visual warning systems:**

- A. Wind direction indicators as shown on well site diagram (Exhibit #8).
- B. Caution/Danger signs (Exhibit #7) shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used, when appropriate. See example attached.

### **5. Mud program:**

- A. The mud program has been designed to minimize the volume of H2S circulated to surface. Proper mud weight, safe drilling practices, and the use of H2S scavengers will minimize hazards when penetrating H2S bearing zones.
-

**6. Metallurgy:**

- A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H2S service.
- B. All elastomers used for packing and seals shall be H2S trim.

**7. Communication:**

- A. Radio communications in company vehicles including cellular telephone and 2-way radio.
- B. Land line (telephone) communication at Office.

**8. Well testing:**

- A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safely and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H2S environment will use the closed chamber method of testing.
- B. There will be no drill stem testing.

**EXHIBIT #7**

**WARNING**  
**YOU ARE ENTERING AN H2S**  
**AUTHORIZED PERSONNEL ONLY**

- 1. BEARDS OR CONTACT LENSES NOT ALLOWED
- 2. HARD HATS REQUIRED
- 3. SMOKING IN DESIGNATED AREAS ONLY
- 4. BE WIND CONSCIOUS AT ALL TIMES
- 5. CHECK WITH COG OPERATING FOREMAN AT

**COG OPERATING LLC**  
**1-432-683-7443**  
**1-575-746-2010**

**EDDY COUNTY EMERGENCY NUMBERS**

ARTESIA FIRE DEPT. 575-746-5050  
ARTESIA POLICE DEPT. 575-746-5000  
EDDY CO. SHERIFF DEPT. 575-746-9888

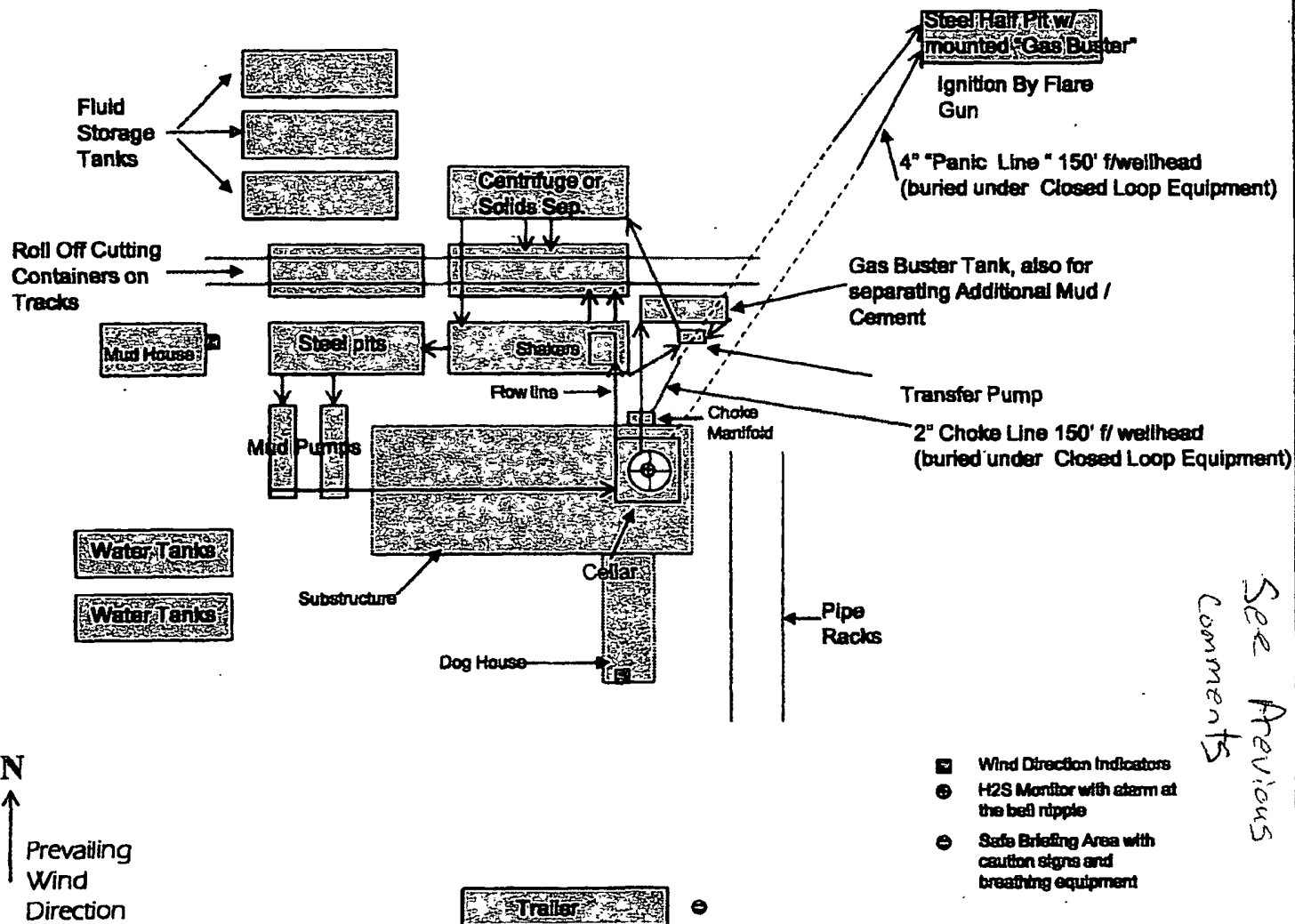
**LEA COUNTY EMERGENCY NUMBERS**

HOBBS FIRE DEPT. 575-397-9308  
HOBBS POLICE DEPT. 575-397-9285  
LEA CO. SHERIFF DEPT. 575-396-1196

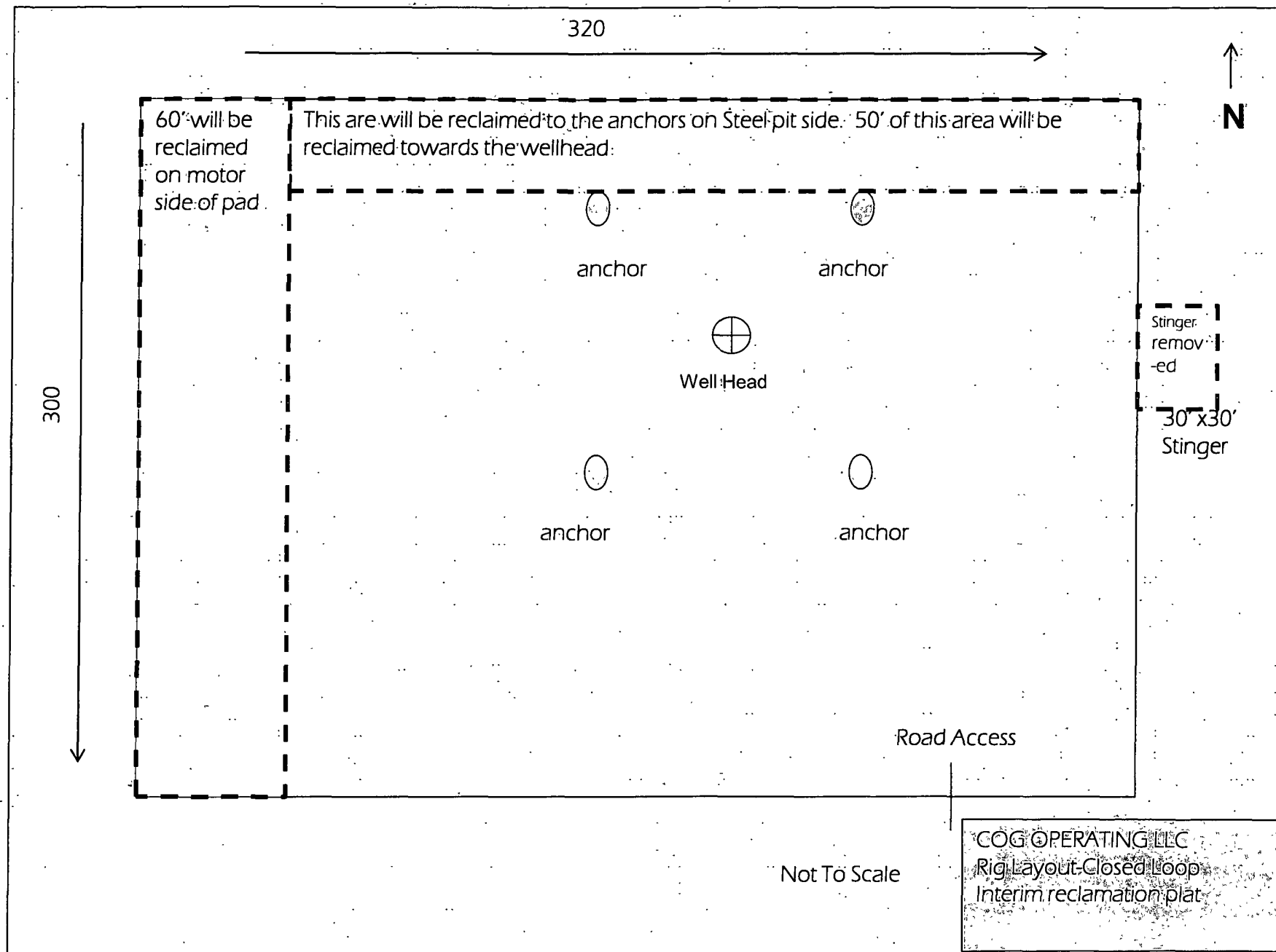
COG Operating LLC

# EXHIBIT 8

Drilling Location - H2S Safety Equipment Diagram



See Previous Comments



## PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG OPERATING, LLC
LEASE NO.:	NMCL028793C
WELL NAME & NO.:	947H-BURCH KEELY UNIT
SURFACE HOLE FOOTAGE:	0990'/N. & 0330'/E.
BOTTOM HOLE FOOTAGE:	0990'/N. & 0330'/W.
LOCATION:	Section 23, T. 17 S., R. 29 E., NMPM
COUNTY:	Eddy County, New Mexico

### TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☒ **Special Requirements**
  - Lesser Prairie-Chicken Timing Stipulations
  - Ground-level Abandoned Well Marker
- ☒ **Construction**
  - Notification
  - Topsoil
  - Closed Loop System
  - Federal Mineral Material Pits
  - Well Pads
  - Roads
- ☐ **Road Section Diagram**
- ☒ **Drilling**
  - H2S requirement
  - Logging requirement
  - Waste Material and Fluids
- ☒ **Production (Post Drilling)**
  - Well Structures & Facilities
  - Pipelines
- ☐ **Interim Reclamation**
- ☒ **Final Abandonment & Reclamation**