HOBBS OCD

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Form 3160-3
(April 2004)

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.
**NMNM-0315713**

6. If Indian, Allotee or Tribe Name
**N/A**

7. If Unit or CA Agreement, Name and No.
**N/A**

1a. Type of work: ☑ DRILL ☐ REENTER

1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☐ Single Zone ☐ Multiple Zone

8. Lease Name and Well No. <39447
**Branex-COG Federal Com #8H**

2. Name of Operator
**COG Operating LLC** <229137>

9. API Well No.
**30-025-** 41007

3a. Address **One Concho Center 600 W Illinois Ave**
**Midland, TX 79701**

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

10. Field and Pool, or Exploratory
**Maljamar; Yeso, West** <44500>

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface **SHL: 330' FSL & 330' FWL, UL M**
At proposed prod. zone **BHL: 330' FSL & 330' FEL, UL P**

11. Sec., T. R. M. or Blk. and Survey or Area
**Sec 9, T17S, R32E**

14. Distance in miles and direction from nearest town or post office*
**1.3 miles Southwest of Maljamar**

12. County or Parish
**Lea**

13. State
**NM**

| 15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) | 16. No. of acres in lease | 17. Spacing Unit dedicated to this well |
|---|---|---|
| **330'** | **160.30** | **160** |
| 18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. | 19. Proposed Depth | 20. BLM/BIA Bond No. on file |
| **423'** | **TVD: 6578' MD: 11070'** | **NMB000740; NMB000215** |
| 21. Elevations (Show whether DF, KDB, RT, GL, etc.) | 22. Approximate date work will start* | 23. Estimated duration |
| **4055' GL** | **11/30/2012** | **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.
2. A Drilling Plan.
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).
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification
6. Such other site specific information and/or plans as may be required by the authorized officer.

| 25. Signature | Name *(Printed/Typed)* | Date |
|---|---|---|
| | **Kelly J. Holly** | **09/05/2012** |

Title
**Permitting Tech**

| Approved by *(Signature)* /s/ James A. Amos | Name *(Printed/Typed)* | Date FEB 20 2013 |
|---|---|---|
| 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

FEB 27 2013

**ATTACHMENT TO FORM 3160-3**
**COG Operating, LLC**
**BRANEX-COG FEDERAL COM #8H**
**SHL: 330' FSL & 330' FWL, Unit M**
**BHL: 330' FSL & 330' FEL, Unit P**
**Sec 9, T17S, R32E**
**Eddy County, NM**

1. Proration Unit Spacing: 160 Acres

2. Ground Elevation: 4055'

3. Proposed Depths: Horizontal TVD = 6578', MD =11070'

4. Estimated tops of geological markers:

| | |
|---|---|
| Rustler | 918' |
| Top of Salt | 1470' |
| Base of Salt | 2064' |
| Yates | 2236' |
| Seven Rivers | 2581' |
| Queen | 3212' |
| Grayburg | 3631' |
| San Andres | 3964' |
| Glorieta | 5450' |
| Paddock | 5497' |
| Blinebry | 5937' |
| Tubb | 6870' |

5. Possible mineral bearing formations:

| | | |
|---|---|---|
| Water Sand | 150' | Fresh Water |
| Grayburg | 3631' | |
| San Andres | 3964' | |
| Glorieta | 5450' | |
| Paddock | 5497' | |
| Blinebry | 5937' | |
| Tubb | 6870' | |

No other formations are expected to give up oil, gas or fresh water in measurable quantities. Setting 13 3/8" casing to 943' (25' into Rustler) 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 2250' and circulating cement back to surface in a single or multi-stage job and/or with an ECP. Any shallower zones above TD, which contain commercial quantities of oil and/or gas, will have cement circulated across them or be isolated by external casing packers. This will be achieved by cementing from the KOP by single or multi-stage job using ECP & DV Tools as necessary. The 7" portion of the tapered 7" x 5 ½" production casing will be cemented back to a minimum of 200' into the intermediate casing (although cement volume is actually calculated to surface). At the KOP the 7" casing will be tapered to 5 ½" casing which will be run thru curve and lateral with external casing packers for zone isolation. 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 Com

## 6. Proposed Mud System

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

| DEPTH (MD) | TYPE | WEIGHT | VISCOSITY | WATERLOSS |
|---|---|---|---|---|
| 0-943' | Fresh Water | 8.5 | 28 | N.C. |
| 943'-2250' | Brine | 10 | 30 | N.C. |
| 2250'-6173' | Cut Brine | 8.7-9.2 | 30 | N.C. |
| 6173'-7095' | Cut Brine/polymer mud | 8.7-9.2 | 30 | N.C. |
| 7095'-11070' | Cut Brine/polymer mud | 8.7-9.2 | 30 | 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.

## 6. Proposed Casing Program

| Hole Size | Interval MD | OD Casing | Weight | Grade | Condition | Jt. | brst/clps/ten |
|---|---|---|---|---|---|---|---|
| 17 ½" | 0-943' | 13 3/8" | 48# | H-40/J-55 Hybrid | New | ST&C | 1.83/1.85/8.17 |
| 12 ¼" | 943'-2250' | 9 5/8" | 40# | J/K-55 | New | ST&C | 1.76/2.20/14.00 |
| 8 ¾" | 2250'-6173' | 7" | 26# | L-80 | New | LT&C | 1.17/1.83/3.70 |
| 8 ¾" | 6173'-7095' | 5 ½" | 17# | L-80 | New | LT&C | 2.08/2.82/4.36 |
| 7 7/8" | 7095'-11070' | 5 ½" | 17# | L-80 | New | LT&C | 2.08/2.82/4.36 |

Production string will be a tapered string with 7" 26# L-80 LTC run from surface to kick off point (6173') and then crossed over to 5 ½" 17# L-80 LTC.

## 7. Proposed Cement Program

**13 3/8" SURFACE**: **(Circulate to Surface)**

| | | | | |
|---|---|---|---|---|
| Lead: 0'-500'<br>Excess 144% | 500 sks | Class "C" w/4% Gel<br>+2% CaCl2+ 0.25 pps CF | 1.69 cf/sk | 13.5 ppg |
| Tail: 500'-943'<br>Excess 25% | 325 sks | Class C w/2% CaCl2 | 1.32 cf/sk | 14.8 ppg |

**9 5/8" INTERMEDIATE**:

**Option #1: Single Stage (Circulate to Surface)**

| | | | | |
|---|---|---|---|---|
| Lead:<br>0'-1750'<br>Excess 101% | 500 sks | 50:50:10 C:Poz:Gel<br>w/ 5% Salt+ 0.25% CF<br>+5 pps LCM | 2.45 cf/sk | 11.8 ppg |
| Tail:<br>1750'-2250'<br>Excess 52% | 200 sks | Class C w/2% CaCl2 | 1.32 cf/sk | 14.8 ppg |

**Option #2: Multi-stage w/ DV Tool @ +/-993'(DV Tool 50' below 13 3/8" csg. Shoe) (Circulate to Surface)**

| | | | | |
|---|---|---|---|---|
| Stage #1:<br>993'-2250'<br>Excess 61% | 500 sks | Class "C" w/2% CaCl2 | 1.32 cf/sk | 14.8 ppg |
| Stage #2<br>0'-993'<br>Excess 98% | 300 sks | 50:50:10 C:Poz:Gel w/5%<br>salt+ 0.25% CF+5 pps LCM | 2.45 cf/sk | 11.8 ppg |

Note: Multi-stage tool to be set depending on hole conditions at approximately 993' (50' below the surface casing shoe). Cement volumes will be adjusted proportionately for depth changes of multi-stage tool.

**7" X 5 ½" TAPERED PRODUCTION CASING**:

Cement details for 7" portion of tapered casing string as follows:.

**Option #1: Single Stage (Cement cal to Surface)**
**DV Tool & ECP (external csg. Packer ) @ 6173' KOP**:

| | | | | |
|---|---|---|---|---|
| Lead: 2050'-4173' (min. tie back 200' above 9 5/8"shoe) Excess 58.7% | 500 sks | 35:65:6 C:Poz Gel w/5% salt+ 5 pps LCM+ 0.2 % SMS+ 0.3% FL-52A+ 0.125 pps CF | 2.05 cf/sk | 12.5 ppg |
| Tail: 4173'-6173' Excess 36.5% | 300 sks | 50:50:2 C:Poz Gel w/5% salt+ 3 pps LCM+ 0.6 % SMS+0.125 pps CF+1% FL-25+ 1% BA-58 | 1.37 cf/sk | 14.0 ppg |

**Option #2: Multi-stage (2 Stages) w/DV Tool & ECP@ +/-6173'**
**2nd DV tool at 2300' (50' below 9 5/8" csg. Shoe)**

| | | | | |
|---|---|---|---|---|
| Stage #1: Lead: 2300'-5173' Excess 115% | 450 sks | 35:65:6 C:Poz Gel w/5% salt+ 5 pps LCM+ 0.2 % SMS+ 0.3% FL-52A+ 0.125 pps CF | 2.05 cf/sk | 12.5 ppg |
| Tail: 5173'-6173' Excess 130% | 250 sks | 50:50:2 C:Poz Gel w/5% salt+ 3 pps LCM+ 0.6% SMS + 0.3% FL-52A + 0.125 pps CF + 1% FL-25 +1% BA-58 | 1.37 cf/sk | 14.0 ppg |

**Stage #2: 2nd DV Tool @ 2300' (50' below 9 5/8" csg shoe) (Cement cal to Surface)**

| | | | | |
|---|---|---|---|---|
| Lead: 2050'-2300' (min. tie back 200' above 9 5/8" shoe) Excess 125% | 400 sks | 35:65:2 C:Poz Gel w/5% salt+ 5 pps LCM+ 0.6 % SMS+ 0.3% FL-52A+ 0.125 pps CF+1% FL-25+ 1% BA-58 | 2.05 cf/sk | 12.5 ppg |

Note: 5 ½" casing will be run from KOP at 6173' thru curve and lateral to TD of 11070' MD. Productive intervals will be isolated by a Peak Packer system or similar.

Note: Assumption for 2nd DV tool is water flow. Cement volumes will be adjusted proportionately for depth changes of multi-stage tool.

Note: FL-52A is fluid loss additive, R-3 is retarder.

Note: Multi-stage tool to be set depending on hole conditions at approximately 2300'
Cement volumes will be adjusted proportionately for depth changes of multi-stage tool.

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 and 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 nippled up on the 13 5/8" permanent casing head and tested to 2000 psig. After setting 9-5/8", permanent "B section" well head will be installed and the BOP will then be nippled up on the permanent B . BOP and well head will be tested by a third party to 2000 psig 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 will include a Kelly cock and floor safety valve, choke lines and a choke manifold with a 2000 psi WP rating all of which will also be tested to working pressure by independent tester also. See COA

9. Production Hole Drilling Summary:

***Drill 8 ¾" hole and kick off at +/- 6173', building curve over +/- 758' to horizontal at 6931' MD/6650'TVD. Drill 7 7/8" lateral section in a easterly direction for +/4146' lateral to TD at +/- 11070' MD, 6578' TVD. Run 7" x 5-1/2" production casing. 7" to be run from surface to kickoff point and then changed over to 5 ½" with DV Tool and ECP at kickoff point. 5 ½" casing will be run from kickoff point to td and isolation packers set throughout lateral. 7" to be cemented from kickoff point to surface.***

10. 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.

11. Logging, Testing and Coring Program:

See COA

A. The following logs will be run in the vertical portion of the hole to KOP: SLB-PEX/HRLA,HNGS.

B. The mud logging program will consist of lagged 10' samples from KOP 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 ½" production casing has been cemented at TD based on drill shows and log evaluation.

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

No abnormal pressures or temperatures are anticipated. The estimated bottom hole temperature at TD is 98° Fahrenheit and estimated maximum bottom hole pressure is 2894 psi. Wells in the Majamar area will penetrate formations that are known or could reasonably be expected to contain Hydorgen Sulfide. Measurable gas volumes or Hydrogen Sulfide levels have not been encountered during drilling operations in this area, However as per Onshore order No. 6 a H2S drilling operations plan is included with this APD. No major loss of circulation zones has been reported in offsetting wells.

13. Anticipated Starting Date

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

# COG Operating LLC

**Lea County, NM (NAD 83)**
**Branex-COG Federal Com 8H**
**Branex-COG Federal Com 8H**

**Wellbore #1**

**Plan: Plan #1**

Surface: 330' FSL, 330' FWL, Sec 9, T17S, R32E, Unit M
BHL: 330' FSL, 330' FEL, Sec 9, T17S, R32E, Unit P

# Standard Planning Report

**30 August, 2012**

| | | | |
|---|---|---|---|
| **Database:** | Houston R5000 Database | **Local Co-ordinate Reference:** | Site Branex-COG Federal Com 8H |
| **Company:** | COG Operating LLC | **TVD Reference:** | WELL @ 4073.00ft (Original Well Elev) |
| **Project:** | Lea County, NM (NAD 83) | **MD Reference:** | WELL @ 4073.00ft (Original Well Elev) |
| **Site:** | Branex-COG Federal Com 8H | **North Reference:** | Grid |
| **Well:** | Branex-COG Federal Com 8H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan #1 | | |

| | | | |
|---|---|---|---|
| **Project** | Lea County, NM (NAD 83) | | |
| **Map System:** | US State Plane 1983 | **System Datum:** | Mean Sea Level |
| **Geo Datum:** | North American Datum 1983 | | |
| **Map Zone:** | New Mexico Eastern Zone | | |

| | | | | | |
|---|---|---|---|---|---|
| **Site** | Branex-COG Federal Com 8H | | | | |
| **Site Position:** | | **Northing:** | 670,731.00 ft | **Latitude:** | 32.843155 |
| **From:** | Map | **Easting:** | 670,413.90 ft | **Longitude:** | -103.913057 |
| **Position Uncertainty:** | 0.00 ft | **Slot Radius:** | 13.200 in | **Grid Convergence:** | 0.23 ° |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well** | Branex-COG Federal Com 8H | | | | | |
| **Well Position** | **+N/-S** | 0.00 ft | **Northing:** | 670,731.00 ft | **Latitude:** | 32.843155 |
| | **+E/-W** | 0.00 ft | **Easting:** | 670,413.90 ft | **Longitude:** | -103.913057 |
| **Position Uncertainty** | | 0.00 ft | **Wellhead Elevation:** | | **Ground Level:** | 4,055.00 ft |

| | | | | | |
|---|---|---|---|---|---|
| **Wellbore** | Wellbore #1 | | | | |
| **Magnetics** | **Model Name** | **Sample Date** | **Declination (°)** | **Dip Angle (°)** | **Field Strength (nT)** |
| | IGRF200510 | 7/11/2012 | 7.65 | 60.70 | 48,879 |

| | | | | | |
|---|---|---|---|---|---|
| **Design** | Plan #1 | | | | |
| **Audit Notes:** | | | | | |
| **Version:** | | **Phase:** | PLAN | **Tie On Depth:** | 0.00 |
| **Vertical Section:** | **Depth From (TVD) (ft)** | **+N/-S (ft)** | **+E/-W (ft)** | **Direction (°)** | |
| | 0.00 | 0.00 | 0.00 | 89.83 | |

**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 | |
| 6,172.60 | 0.00 | 0.00 | 6,172.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 6,930.93 | 91.00 | 84.09 | 6,649.99 | 50.02 | 483.22 | 12.00 | 12.00 | 0.00 | 84.09 | |
| 7,094.57 | 91.00 | 90.64 | 6,647.13 | 57.54 | 646.56 | 4.00 | 0.00 | 4.00 | 89.95 | |
| 11,069.65 | 91.00 | 90.64 | 6,577.82 | 13.40 | 4,620.80 | 0.00 | 0.00 | 0.00 | 0.00 | PBHL (Branex-COG F |

| | | | |
|---|---|---|---|
| **Database:** | Houston R5000 Database | **Local Co-ordinate Reference:** | Site Branex-COG Federal Com 8H |
| **Company:** | COG Operating LLC | **TVD Reference:** | WELL @ 4073.00ft (Original Well Elev) |
| **Project:** | Lea County, NM (NAD 83) | **MD Reference:** | WELL @ 4073.00ft (Original Well Elev) |
| **Site:** | Branex-COG Federal Com 8H | **North Reference:** | Grid |
| **Well:** | Branex-COG Federal Com 8H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan #1 | | |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 6,172.60 | 0.00 | 0.00 | 6,172.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **KOP - Start Build @ 12.00°/100'** | | | | | | | | | |
| 6,200.00 | 3.29 | 84.09 | 6,199.99 | 0.08 | 0.78 | 0.78 | 12.00 | 12.00 | 0.00 |
| 6,300.00 | 15.29 | 84.09 | 6,298.49 | 1.74 | 16.81 | 16.81 | 12.00 | 12.00 | 0.00 |
| 6,400.00 | 27.29 | 84.09 | 6,391.50 | 5.47 | 52.85 | 52.87 | 12.00 | 12.00 | 0.00 |
| 6,500.00 | 39.29 | 84.09 | 6,474.94 | 11.11 | 107.35 | 107.38 | 12.00 | 12.00 | 0.00 |
| 6,600.00 | 51.29 | 84.09 | 6,545.17 | 18.42 | 177.90 | 177.96 | 12.00 | 12.00 | 0.00 |
| 6,700.00 | 63.29 | 84.09 | 6,599.11 | 27.06 | 261.44 | 261.52 | 12.00 | 12.00 | 0.00 |
| 6,800.00 | 75.29 | 84.09 | 6,634.41 | 36.68 | 354.31 | 354.42 | 12.00 | 12.00 | 0.00 |
| 6,900.00 | 87.29 | 84.09 | 6,649.53 | 46.84 | 452.46 | 452.59 | 12.00 | 12.00 | 0.00 |
| 6,930.93 | 91.00 | 84.09 | 6,649.99 | 50.02 | 483.22 | 483.36 | 12.00 | 12.00 | 0.00 |
| **Landing Point - Start Turn @ 4.00°/100'** | | | | | | | | | |
| 7,000.00 | 91.00 | 86.85 | 6,648.79 | 55.47 | 552.05 | 552.21 | 4.00 | 0.00 | 4.00 |
| 7,094.57 | 91.00 | 90.64 | 6,647.13 | 57.54 | 646.56 | 646.73 | 4.00 | 0.00 | 4.00 |
| **EOT - Hold @ 90.64° AZ** | | | | | | | | | |
| 7,100.00 | 91.00 | 90.64 | 6,647.04 | 57.48 | 651.99 | 652.16 | 0.00 | 0.00 | 0.00 |
| 7,200.00 | 91.00 | 90.64 | 6,645.30 | 56.37 | 751.97 | 752.13 | 0.00 | 0.00 | 0.00 |
| 7,300.00 | 91.00 | 90.64 | 6,643.55 | 55.26 | 851.95 | 852.11 | 0.00 | 0.00 | 0.00 |
| 7,400.00 | 91.00 | 90.64 | 6,641.81 | 54.15 | 951.93 | 952.08 | 0.00 | 0.00 | 0.00 |
| 7,500.00 | 91.00 | 90.64 | 6,640.06 | 53.04 | 1,051.91 | 1,052.06 | 0.00 | 0.00 | 0.00 |
| 7,600.00 | 91.00 | 90.64 | 6,638.32 | 51.93 | 1,151.89 | 1,152.03 | 0.00 | 0.00 | 0.00 |
| 7,700.00 | 91.00 | 90.64 | 6,636.58 | 50.82 | 1,251.87 | 1,252.01 | 0.00 | 0.00 | 0.00 |
| 7,800.00 | 91.00 | 90.64 | 6,634.83 | 49.71 | 1,351.84 | 1,351.98 | 0.00 | 0.00 | 0.00 |
| 7,900.00 | 91.00 | 90.64 | 6,633.09 | 48.60 | 1,451.82 | 1,451.96 | 0.00 | 0.00 | 0.00 |
| 8,000.00 | 91.00 | 90.64 | 6,631.35 | 47.49 | 1,551.80 | 1,551.93 | 0.00 | 0.00 | 0.00 |
| 8,100.00 | 91.00 | 90.64 | 6,629.60 | 46.38 | 1,651.78 | 1,651.91 | 0.00 | 0.00 | 0.00 |
| 8,200.00 | 91.00 | 90.64 | 6,627.86 | 45.27 | 1,751.76 | 1,751.88 | 0.00 | 0.00 | 0.00 |
| 8,300.00 | 91.00 | 90.64 | 6,626.12 | 44.16 | 1,851.74 | 1,851.86 | 0.00 | 0.00 | 0.00 |
| 8,400.00 | 91.00 | 90.64 | 6,624.37 | 43.05 | 1,951.72 | 1,951.83 | 0.00 | 0.00 | 0.00 |
| 8,500.00 | 91.00 | 90.64 | 6,622.63 | 41.94 | 2,051.69 | 2,051.81 | 0.00 | 0.00 | 0.00 |
| 8,600.00 | 91.00 | 90.64 | 6,620.88 | 40.83 | 2,151.67 | 2,151.78 | 0.00 | 0.00 | 0.00 |
| 8,700.00 | 91.00 | 90.64 | 6,619.14 | 39.72 | 2,251.65 | 2,251.76 | 0.00 | 0.00 | 0.00 |
| 8,800.00 | 91.00 | 90.64 | 6,617.40 | 38.60 | 2,351.63 | 2,351.73 | 0.00 | 0.00 | 0.00 |
| 8,900.00 | 91.00 | 90.64 | 6,615.65 | 37.49 | 2,451.61 | 2,451.71 | 0.00 | 0.00 | 0.00 |
| 9,000.00 | 91.00 | 90.64 | 6,613.91 | 36.38 | 2,551.59 | 2,551.68 | 0.00 | 0.00 | 0.00 |
| 9,100.00 | 91.00 | 90.64 | 6,612.17 | 35.27 | 2,651.57 | 2,651.66 | 0.00 | 0.00 | 0.00 |
| 9,200.00 | 91.00 | 90.64 | 6,610.42 | 34.16 | 2,751.55 | 2,751.63 | 0.00 | 0.00 | 0.00 |
| 9,300.00 | 91.00 | 90.64 | 6,608.68 | 33.05 | 2,851.52 | 2,851.61 | 0.00 | 0.00 | 0.00 |
| 9,400.00 | 91.00 | 90.64 | 6,606.93 | 31.94 | 2,951.50 | 2,951.58 | 0.00 | 0.00 | 0.00 |
| 9,500.00 | 91.00 | 90.64 | 6,605.19 | 30.83 | 3,051.48 | 3,051.56 | 0.00 | 0.00 | 0.00 |
| 9,600.00 | 91.00 | 90.64 | 6,603.45 | 29.72 | 3,151.46 | 3,151.53 | 0.00 | 0.00 | 0.00 |
| 9,700.00 | 91.00 | 90.64 | 6,601.70 | 28.61 | 3,251.44 | 3,251.51 | 0.00 | 0.00 | 0.00 |
| 9,800.00 | 91.00 | 90.64 | 6,599.96 | 27.50 | 3,351.42 | 3,351.48 | 0.00 | 0.00 | 0.00 |
| 9,900.00 | 91.00 | 90.64 | 6,598.22 | 26.39 | 3,451.40 | 3,451.46 | 0.00 | 0.00 | 0.00 |
| 10,000.00 | 91.00 | 90.64 | 6,596.47 | 25.28 | 3,551.37 | 3,551.43 | 0.00 | 0.00 | 0.00 |
| 10,100.00 | 91.00 | 90.64 | 6,594.73 | 24.17 | 3,651.35 | 3,651.41 | 0.00 | 0.00 | 0.00 |
| 10,200.00 | 91.00 | 90.64 | 6,592.98 | 23.06 | 3,751.33 | 3,751.38 | 0.00 | 0.00 | 0.00 |
| 10,300.00 | 91.00 | 90.64 | 6,591.24 | 21.95 | 3,851.31 | 3,851.36 | 0.00 | 0.00 | 0.00 |
| 10,400.00 | 91.00 | 90.64 | 6,589.50 | 20.84 | 3,951.29 | 3,951.33 | 0.00 | 0.00 | 0.00 |
| 10,500.00 | 91.00 | 90.64 | 6,587.75 | 19.73 | 4,051.27 | 4,051.31 | 0.00 | 0.00 | 0.00 |
| 10,600.00 | 91.00 | 90.64 | 6,586.01 | 18.62 | 4,151.25 | 4,151.28 | 0.00 | 0.00 | 0.00 |
| 10,700.00 | 91.00 | 90.64 | 6,584.27 | 17.51 | 4,251.22 | 4,251.26 | 0.00 | 0.00 | 0.00 |
| 10,800.00 | 91.00 | 90.64 | 6,582.52 | 16.39 | 4,351.20 | 4,351.23 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | Houston R5000 Database | **Local Co-ordinate Reference:** | Site Branex-COG Federal Com 8H |
| **Company:** | COG Operating LLC | **TVD Reference:** | WELL @ 4073.00ft (Original Well Elev) |
| **Project:** | Lea County, NM (NAD 83) | **MD Reference:** | WELL @ 4073.00ft (Original Well Elev) |
| **Site:** | Branex-COG Federal Com 8H | **North Reference:** | Grid |
| **Well:** | Branex-COG Federal Com 8H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan #1 | | |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 10,900.00 | 91.00 | 90.64 | 6,580.78 | 15.28 | 4,451.18 | 4,451.21 | 0.00 | 0.00 | 0.00 |
| 11,000.00 | 91.00 | 90.64 | 6,579.03 | 14.17 | 4,551.16 | 4,551.18 | 0.00 | 0.00 | 0.00 |
| 11,069.65 | 91.00 | 90.64 | 6,577.82 | 13.40 | 4,620.80 | 4,620.82 | 0.00 | 0.00 | 0.00 |

**TD @ 11069.65' MD, 6577.82' TVD - PBHL (Branex-COG Federal Com 8H Plan 1)**

**Design Targets**

| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (ft) | Easting (ft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| PBHL (Branex-COG Fec - plan hits target center - Point | 0.00 | 0.00 | 6,577.82 | 13.40 | 4,620.80 | 670,744.40 | 675,034.70 | 32.843141 | -103.898011 |

**Plan Annotations**

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates +N/-S (ft) | Local Coordinates +E/-W (ft) | Comment |
|---|---|---|---|---|
| 6,172.60 | 6,172.60 | 0.00 | 0.00 | KOP - Start Build @ 12.00°/100' |
| 6,930.93 | 6,649.99 | 50.02 | 483.22 | Landing Point - Start Turn @ 4.00°/100' |
| 7,094.57 | 6,647.13 | 57.54 | 646.56 | EOT - Hold @ 90.64° AZ |
| 11,069.65 | 6,577.82 | 13.40 | 4,620.80 | TD @ 11069.65' MD, 6577.82' TVD |

# COG Operating LLC
# Branex-COG Federal Com 8H
# Lea County, NM (NAD 83)
# Plan #1

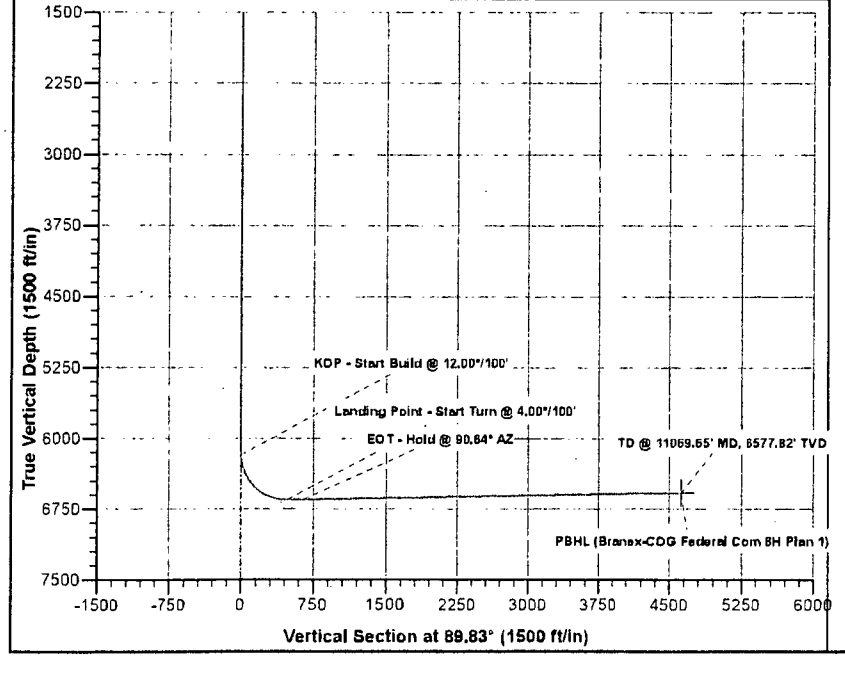
| Surface Location | | Ground Elev: 4055.00 WELL @ 4073.00ft (Original Well Elev) | | | |
|---|---|---|---|---|---|
| +N/-S | +E/-W | Northing | Easting | Latitude | Longitude |
| 0.00 | 0.00 | 670731.00 | 670413.90 | 32.843155 | -103.913056 |

**TARGET DETAILS**

| Name | TVD | +N/-S | +E/-W | Northing | Easting | Latitude | Longitude |
|---|---|---|---|---|---|---|---|
| PBHL (Branex-COG Federal Com 8H Plan 1) | 6577.82 | 13.40 | 4620.80 | 670744.40 | 675034.70 | 32.843140 | -103.898011 |

**SECTION DETAILS**

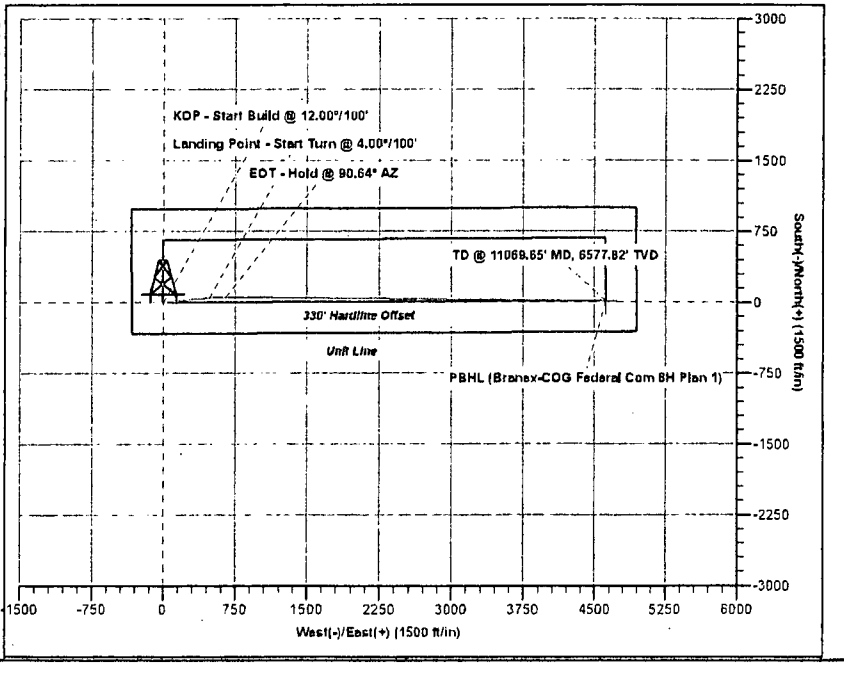
| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | Annotation |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2 | 6172.60 | 0.00 | 0.00 | 6172.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | KOP - Start Build @ 12.00°/100' |
| 3 | 6930.93 | 91.00 | 84.09 | 6649.99 | 50.02 | 483.22 | 12.00 | 84.09 | 483.36 | Landing Point - Start Turn @ 4.00°/100' |
| 4 | 7094.57 | 91.00 | 90.64 | 6647.13 | 57.54 | 646.56 | 4.00 | 89.95 | 646.73 | EOT - Hold @ 90.64° AZ |
| 5 | 11069.65 | 91.00 | 90.64 | 6577.82 | 13.40 | 4620.80 | 0.00 | 0.00 | 4620.82 | TD @ 11069.65' MD, 6577.82' TVD |



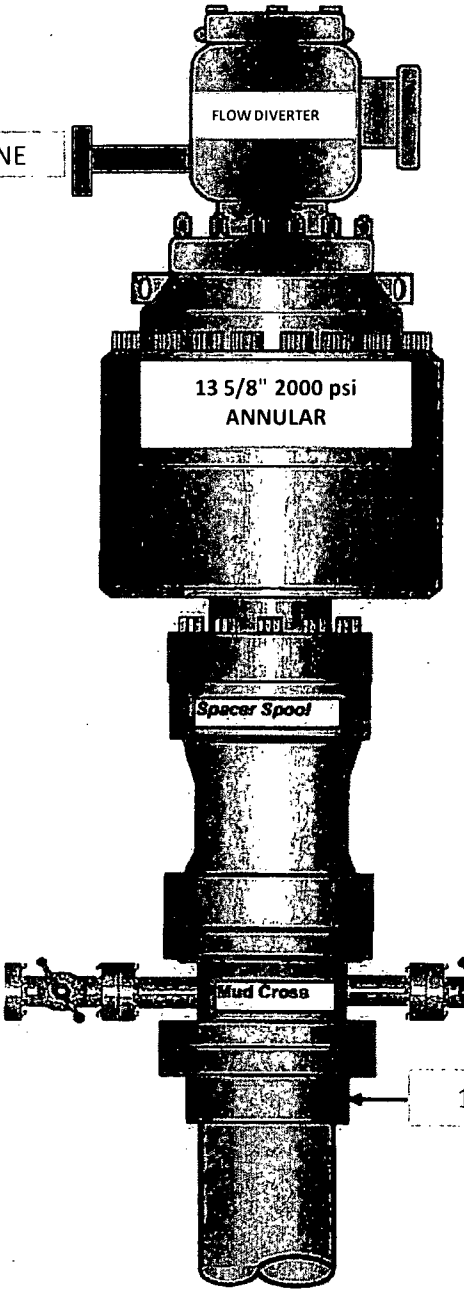


Azimuths to Grid North
True North: -0.23°
Magnetic North: 7.42°

Magnetic Field
Strength: 48878.9nT
Dip Angle: 60.70°
Date: 7/11/2012
Model: IGRF20051D



# 13 5/8" 2K ANNULAR




FILL LINE

See COA

2000 psi test required

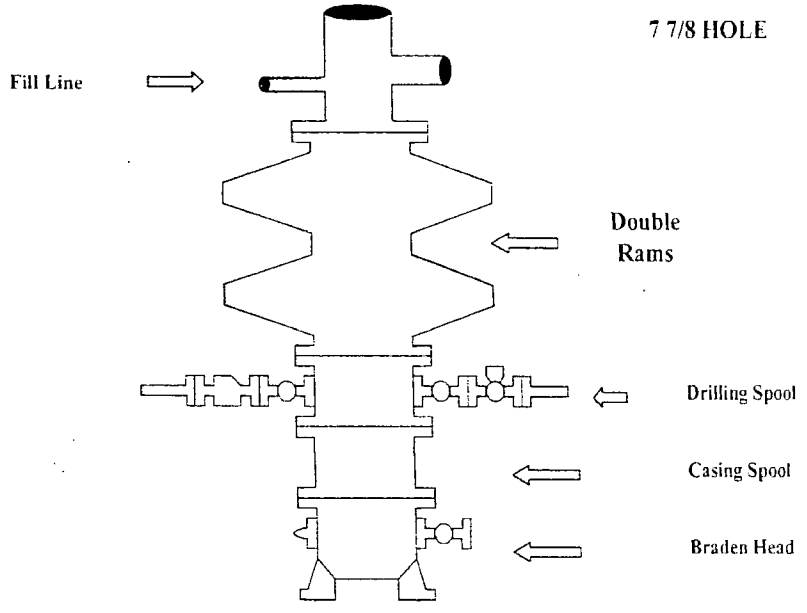
4-1/16",2K VALVES

13 5/8" 3K "A" SECTION

# COG Operating LLC

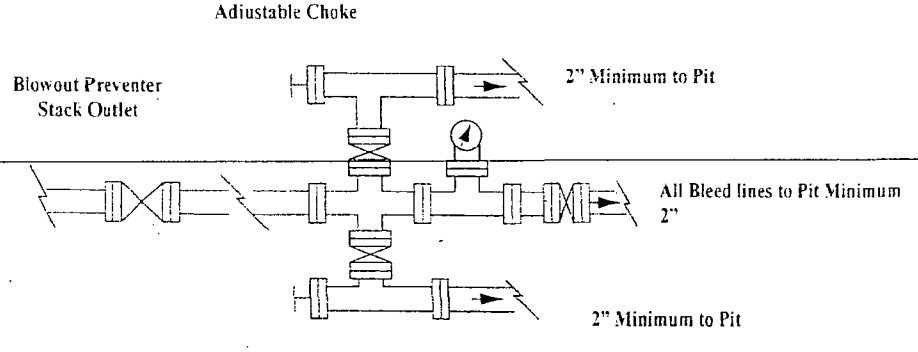
## Exhibit #9

## BOPE and Choke Schematic




Minimum 4" Nominal choke and kill lines

Choke Manifold Requirement (2000 psi WP)
No Annular Required



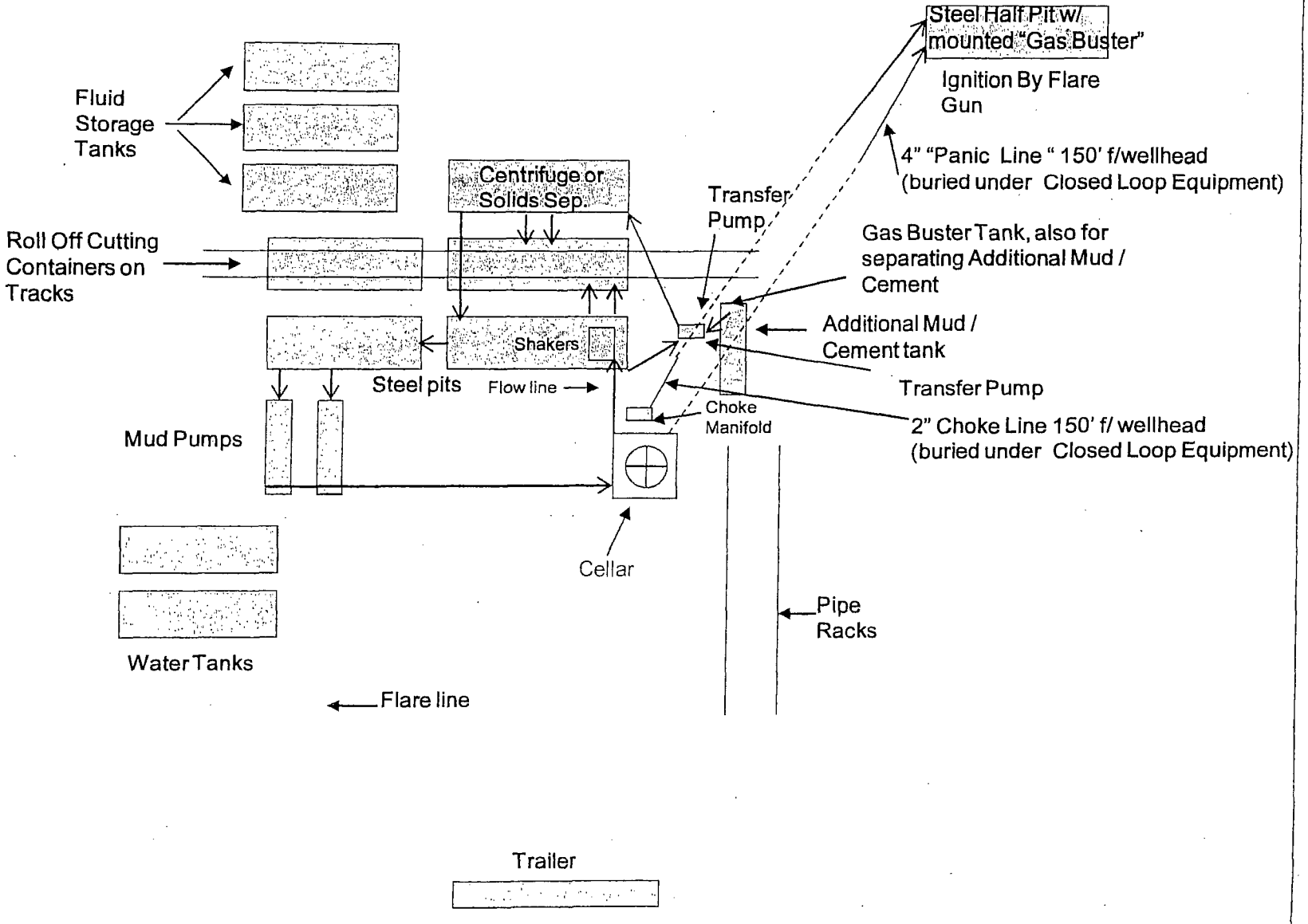

Adjustable Choke
(or Positive)

## 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.

COG Operating LLC

Closed Loop Equipment Diagram



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.