

Split Estate

UNITED STATES

OCD Hobbs

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

UNORTHODOX  
LOCATION

|                                                                                                                                                                                                                                                                    |  |                                                                                                                            |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------|--|
| 1a. Type of Work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER                                                                                                                                                                       |  | 5. Lease Serial No.<br>SHL: Fee, BHL: NMLC063798                                                                           |  |
| 1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone                                             |  | 6. If Indian, Allottee or Tribe Name                                                                                       |  |
| 2. Name of Operator<br>COG Operating LLC.                                                                                                                                                                                                                          |  | 7. If Unit or CA Agreement, Name and No.<br>Roy Batty Federal Com #4H                                                      |  |
| 3a. Address<br>2208 West Main Street<br>Artesia, NM 88210                                                                                                                                                                                                          |  | 8. Lease Name and Well No.<br>30-025-41334                                                                                 |  |
| 3b. Phone No. (include area code)<br>575-748-6940                                                                                                                                                                                                                  |  | 9. API Well No.<br>30-025-41334                                                                                            |  |
| 4. Location of Well (Report location clearly and in accordance with any State requirements. *)<br>At surface 190' FSL & 380' FEL Unit Letter P (SESE) SHL Sec 11-T24S-R33E<br>At proposed prod. Zone 330' FNL & 380' FEL Unit Letter A (NENE) BHL Sec 11-T24S-R33E |  | 10. Field and Pool, or Exploratory<br>Bell Lake; Bone Spring                                                               |  |
| 14. Distance in miles and direction from nearest town or post office*<br>About 19 miles to Jal                                                                                                                                                                     |  | 11. Sec., T.R.M. or Blk and Survey or Area<br>Sec. 11- T24S - R33E                                                         |  |
| 15. Distance from proposed* location to nearest property or lease line, ft.<br>(Also to nearest drig. Unit line, if any) 190'                                                                                                                                      |  | 12. County or Parish<br>Lea County                                                                                         |  |
| 16. No. of acres in lease<br>SHL: Fee<br>BHL: 2480                                                                                                                                                                                                                 |  | 13. State<br>NM                                                                                                            |  |
| 17. Spacing Unit dedicated to this well<br>160                                                                                                                                                                                                                     |  | 18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft.<br>SHL: 1107' BHL: 4165' |  |
| 19. Proposed Depth<br>TVD: 10,970' MD: 15,540'                                                                                                                                                                                                                     |  | 20. BLM/BIA Bond No. on file<br>NMB000740 & NMB000215                                                                      |  |
| 21. Elevations (Show whether DF, KDB, RT, GL, etc.)<br>3605.4' GL                                                                                                                                                                                                  |  | 22. Approximate date work will start*<br>8/1/2013                                                                          |  |
| 23. Estimated duration<br>30 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:

- Well plat certified by a registered surveyor.
- A Drilling Plan
- A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office).
- Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
- Operator certification
- Such other site specific information and/or plans as may be required by the authorized officer.

|                                     |                                     |                   |
|-------------------------------------|-------------------------------------|-------------------|
| 25. Signature<br><i>Mayte Reyes</i> | Name (Printed/Typed)<br>Mayte Reyes | Date<br>5/28/2013 |
|-------------------------------------|-------------------------------------|-------------------|

|                                                     |                                        |
|-----------------------------------------------------|----------------------------------------|
| Title<br>Regulatory Analyst                         |                                        |
| Approved by (Signature)<br><i>/s/George MacDone</i> | Name (Printed/Typed)<br>George MacDone |
| Title<br>FIELD MANAGER                              | Office<br>CARLSBAD FIELD OFFICE        |

Application approval does not warrant or certify that the applicant holds lease or equitable interest in the subject lease which would entitle the applicant to conduct operations thereon.

APPROVAL FOR TWO YEARS

Conditions of approval, if any

**CONDITION OF APPROVAL:** Approval for Drilling ONLY. CANNOT produce without the OCD Santa Fe approval for Non-Standard Location.

Title 18 U.S.C. Section 1001  
States any false, fictitious or

I willfully to make to any department or agency of the United States

(Continued on page 2)

\*(Instructions on page 2)

Carlsbad Controlled Water Basin

SEE ATTACHED FOR  
CONDITIONS OF APPROVAL

Approval Subject to General Requirements  
& Special Stipulations Attached

AUG 16 2013

*Surface Use Plan*  
*COG Operating, LLC*  
*Roy Batty Federal Com #4H*  
*SL: 190' FSL & 380' FEL*      *UL P*  
*Section 11, T24S, R33E*  
*BHL: 330' FNL & 380' FEL*      *UL A*  
*Section Sec 11, T24S, R33E*  
*Lea County, New Mexico*

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**STATEMENT ACCEPTING RESPONSIBILITY FOR OPERATIONS**

The undersigned accepts all applicable terms, conditions, stipulations, and restrictions concerning operations conducted on the leased land or portion thereof, as described below:

Date:            May 28, 2013

Lease #:        SHL: Fee, BHL: NMLC0063798  
                    Roy Batty Federal Com #4H

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Legal Description:    Sec. 11 – T24S – R33E  
                              Lea County, New Mexico

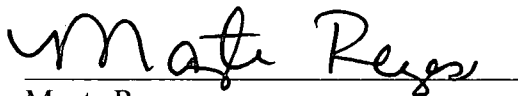
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Formation(s): Bone Spring

Bond Coverage: Statewide

BLM Bond File #: NMB000740 & NMB000215

COG OPERATING LLC



Mayte Reyes  
Regulatory Analyst

**COG Production LLC**  
**DRILLING AND OPERATIONS PROGRAM**  
**Roy Batty Federal Com 4H**  
**SHL: 190' FSL & 380' FEL**  
**BHL: 330' FNL & 380' FEL**  
**Section 11 T24S R33E**  
**Lea County, New Mexico**

In conjunction with Form 3160-3, Application for Permit to Drill subject well, COG Operating LLC submits the following eleven items of pertinent information in accordance with BLM requirements.

1. Geological surface formation: Permian
2. The estimated tops of geologic markers & estimated depths at which anticipated water, oil or gas formations are expected to be encountered are as follows:

|              |         |     |
|--------------|---------|-----|
| Fresh Water  | ~ 371'  |     |
| Rustler      | 1307'   |     |
| Top of Salt  | 1410'   |     |
| Base of Salt | 4995'   |     |
| Delaware     | 5247'   | Oil |
| Bone Spring  | 9027'   | Oil |
| Wolfcamp     | 11,910' |     |
| TD TVD       | 10,970' |     |
| TD MD        | 15,540' |     |

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No other formations are expected to give up oil, gas or fresh water in measurable quantities. The surface fresh water sands will be protected by setting 13-3/8" casing at 1400' 1300' and circulating cement back to surface. All intervals will be isolated by setting 5 1/2" casing to total depth and tying back cement to a minimum of 500' into 9-5/8" csg shoe.

**3. Proposed Casing Program: All casing is new and API approved**

See COA

| Hole Size | Depths       | Section                    | OD Casing | New/Used | Wt  | Collar | Grade | Collapse Design Factor | Burst Design Factor | Tension Design Factor |
|-----------|--------------|----------------------------|-----------|----------|-----|--------|-------|------------------------|---------------------|-----------------------|
| 17 1/2"   | 0' - 1350'   | Surface                    | 13 3/8"   | New      | 54# | STC    | J-55  | 1.125                  | 1.125               | 1.6                   |
| 12 1/4"   | 0' - 5200'   | Intrmd                     | 9 5/8"    | New      | 40# | LTC    | J-55  | 1.125                  | 1.125               | 1.6                   |
| 7 7/8"    | 0' - 15,540' | Production Curve & Lateral | 5 1/2"    | New      | 17# | LTC    | P-110 | 1.125                  | 1.125               | 1.6                   |

- See COA
- While running all casing strings, the pipe will be kept a minimum of 1/3 full at all times to avoid approaching the collapse pressure of casing.

#### 4. Proposed Cement Program

- [illegible]

- The above cement volumes could be revised pending the caliper measurements.
- The 9-5/8" intermediate cement is designed to circulate to surface.
- The production TOC will tie back a minimum 500' into previous shoe

### 5. Minimum Specifications for Pressure Control:

6000 COA { Nipple up on 13 3/8 with annular preventer tested to 50% of rated working pressure by independent tester and the rest of the 2M system tested to 2000 psi.  
Nipple up on 9 5/8 with 3M system tested to 3000 psi by independent tester.  
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. A 2" kill line and a minimum 3" choke line will be included in the drilling spool located below the ram-type BOP. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold with 5000 psi WP rating.

## 6. Estimated BHP & BHT:

Lateral TD = 4840 psi  
Lateral TD = 160°F

**7. Mud Program:** The applicable depths and properties of this system are as follows:

| See COA | Depth                     | Type System | Mud       | Viscosity | Waterloss | HOBBBS OCD  |
|---------|---------------------------|-------------|-----------|-----------|-----------|-------------|
|         |                           |             | Weight    | (sec)     | (cc)      |             |
|         | 0' - 1350'                | Fresh Water | 8.4       | 29        | N.C.      | AUG 10 2013 |
|         | 1350' - 5200'             | Brine       | 10        | 29        | N.C.      |             |
|         | 5200' - 15,540' (Lateral) | Cut Brine   | 8.9 - 9.2 | 29        | N.C.      |             |

- The necessary mud products for weight addition and fluid loss control will be on location at all times.
- A visual and electronic mud monitoring system will be rigged up prior to spud to detect changes in the volume of mud system. The electronic system consists of a pit volume totalizer, stroke counter and flow sensor at flow line.
- If weight and/or viscosity are introduced to the mud system a daily mud check will be performed by mud contractor, along with tourly check by rig personnel.
- After setting intermediate casing, a third party gas unit detection system will be installed at the flow line.

### 8. Auxiliary Well Control and Monitoring Equipment:

- See COA
- A Kelly cock will be in the drill string at all times.
  - A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor at all times.
  - Hydrogen Sulfide detection equipment will be in operation after drilling out the 13 3/8" casing shoe until the 5 1/2" casing is cemented. Breathing equipment will be on location upon drilling the 13 3/8" shoe until total depth is reached.

### 9. Testing, Logging and Coring Program:

- Drill stem tests will be based on geological sample shows.
- If open hole electrical logging is performed, the program will be:
  - Total Depth to Intermediate Casing: Dual Laterolog-Micro Laterolog and Gamma Ray. Compensated Neutron - Z Density log with Gamma Ray and Caliper.
  - Total Depth to Surface: Compensated Neutron with Gamma Ray
  - No coring program is planned
  - Additional testing will be initiated subsequent to setting the 5 1/2" production casing. Specific intervals will be targeted based on log evaluation, geological sample shows and drill stem tests.

### 10. Potential Hazards:

- See COA
- No abnormal pressures or temperatures are expected. There is no known presence of H2S in this area. If H2S is encountered the operator will comply with the provisions of Onshore Oil and Gas Order No. 6. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. No H2S is anticipated to be encountered.

### 11. Anticipated starting date and Duration of Operations:

- Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon as possible after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 30 days.



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## **COG Operating LLC**

Lea County, NM

Roy Batty Federal Com

#4H

OH

Plan: Design #1

## **Standard Planning Report**

17 May, 2013





## Planning Report



|           |                       |                              |                                        |
|-----------|-----------------------|------------------------------|----------------------------------------|
| Database: | test                  | Local Co-ordinate Reference: | Well #4H                               |
| Company:  | COG Operating LLC     | TVD Reference:               | WELL @ 3623.4usft (Original Well Elev) |
| Project:  | Lea County, NM        | MD Reference:                | WELL @ 3623.4usft (Original Well Elev) |
| Site:     | Roy Batty Federal Com | North Reference:             | Grid                                   |
| Well:     | #4H                   | Survey Calculation Method:   | Minimum Curvature                      |
| Wellbore: | OH                    |                              |                                        |
| Design:   | Design #1             |                              |                                        |

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|             |                                      |               |                |
|-------------|--------------------------------------|---------------|----------------|
| Project     | Lea 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                 |               |                |

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|                       |                       |                   |                   |
|-----------------------|-----------------------|-------------------|-------------------|
| Site                  | Roy Batty Federal Com |                   |                   |
| Site Position:        |                       | Northing:         | 446,564.70 usft   |
| From:                 | Map                   | Easting:          | 743,757.70 usft   |
| Position Uncertainty: | 0.0 usft              | Slot Radius:      | 13-3/16 "         |
|                       |                       | Latitude:         | 32° 13' 30.955 N  |
|                       |                       | Longitude:        | 103° 32' 42.296 W |
|                       |                       | Grid Convergence: | 0.42 °            |

|                      |          |                     |                  |
|----------------------|----------|---------------------|------------------|
| Well                 | #4H      |                     |                  |
| Well Position        | +N/-S    | 18.6 usft           | Northing:        |
|                      | +E/-W    | 3,008.1 usft        | Easting:         |
| Position Uncertainty | 3.0 usft | Wellhead Elevation: |                  |
|                      |          | Latitude:           | 32° 13' 30.920 N |
|                      |          | Longitude:          | 103° 32' 7.279 W |
|                      |          | Ground Level:       | 3,605.4 usft     |

|           |            |             |                |
|-----------|------------|-------------|----------------|
| Wellbore  | OH         |             |                |
| Magnetics | Model Name | Sample Date | Declination    |
|           |            |             | (°)            |
|           | IGRF2010   | 5/17/2013   | 7.33           |
|           |            |             | Dip Angle      |
|           |            |             | (°)            |
|           |            |             | Field Strength |
|           |            |             | (nT)           |
|           |            |             | 60.15          |
|           |            |             | 48,428         |

|                   |                  |        |               |
|-------------------|------------------|--------|---------------|
| Design            | Design #1        |        |               |
| Audit Notes:      |                  |        |               |
| Version:          | Phase:           | PLAN   | Tie On Depth: |
|                   |                  |        | 0.0           |
| Vertical Section: | Depth From (TVD) | +N/-S  | +E/-W         |
|                   | (usft)           | (usft) | (usft)        |
|                   | 0.0              | 0.0    | 0.0           |
|                   |                  |        | Direction     |
|                   |                  |        | (°)           |
|                   |                  |        | 359.48        |

| Plan Sections         |                 |             |                       |              |              |                         |                        |                       |         |             |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|------------------------|-----------------------|---------|-------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | TFO (°) | Target      |
| 0.0                   | 0.00            | 0.00        | 0.0                   | 0.0          | 0.0          | 0.00                    | 0.00                   | 0.00                  | 0.00    |             |
| 10,502.5              | 0.00            | 0.00        | 10,502.5              | 0.0          | 0.0          | 0.00                    | 0.00                   | 0.00                  | 0.00    |             |
| 11,253.6              | 90.13           | 359.48      | 10,980.0              | 478.6        | -4.3         | 12.00                   | 12.00                  | 0.00                  | 359.48  |             |
| 15,540.8              | 90.13           | 359.48      | 10,970.3              | 4,765.5      | -43.3        | 0.00                    | 0.00                   | 0.00                  | 0.00    | PBHL(RB#4H) |



## Planning Report



|           |                       |                              |                                        |
|-----------|-----------------------|------------------------------|----------------------------------------|
| Database: | test                  | Local Co-ordinate Reference: | Well #4H                               |
| Company:  | COG Operating LLC     | TVD Reference:               | WELL @ 3623.4usft (Original Well Elev) |
| Project:  | Lea County, NM        | MD Reference:                | WELL @ 3623.4usft (Original Well Elev) |
| Site:     | Roy Batty Federal Com | North Reference:             | Grid                                   |
| Well:     | #4H                   | Survey Calculation Method:   | Minimum Curvature                      |
| Wellbore: | OH                    |                              |                                        |
| Design:   | Design #1             |                              |                                        |

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## Planned Survey

| Measured<br>Depth<br>(usft) | Inclination<br>(°) | Azimuth<br>(°) | Vertical<br>Depth<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Vertical<br>Section<br>(usft) | Dogleg<br>Rate<br>(°/100usft) | Build<br>Rate<br>(°/100usft) | Turn<br>Rate<br>(°/100usft) |
|-----------------------------|--------------------|----------------|-----------------------------|-----------------|-----------------|-------------------------------|-------------------------------|------------------------------|-----------------------------|
| 0.0                         | 0.00               | 0.00           | 0.0                         | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 100.0                       | 0.00               | 0.00           | 100.0                       | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 200.0                       | 0.00               | 0.00           | 200.0                       | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 300.0                       | 0.00               | 0.00           | 300.0                       | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 400.0                       | 0.00               | 0.00           | 400.0                       | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 500.0                       | 0.00               | 0.00           | 500.0                       | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 600.0                       | 0.00               | 0.00           | 600.0                       | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 700.0                       | 0.00               | 0.00           | 700.0                       | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 800.0                       | 0.00               | 0.00           | 800.0                       | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 900.0                       | 0.00               | 0.00           | 900.0                       | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 1,000.0                     | 0.00               | 0.00           | 1,000.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 1,100.0                     | 0.00               | 0.00           | 1,100.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 1,200.0                     | 0.00               | 0.00           | 1,200.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 1,300.0                     | 0.00               | 0.00           | 1,300.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 1,400.0                     | 0.00               | 0.00           | 1,400.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 1,500.0                     | 0.00               | 0.00           | 1,500.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 1,600.0                     | 0.00               | 0.00           | 1,600.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 1,700.0                     | 0.00               | 0.00           | 1,700.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 1,800.0                     | 0.00               | 0.00           | 1,800.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 1,900.0                     | 0.00               | 0.00           | 1,900.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 2,000.0                     | 0.00               | 0.00           | 2,000.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 2,100.0                     | 0.00               | 0.00           | 2,100.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 2,200.0                     | 0.00               | 0.00           | 2,200.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 2,300.0                     | 0.00               | 0.00           | 2,300.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 2,400.0                     | 0.00               | 0.00           | 2,400.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 2,500.0                     | 0.00               | 0.00           | 2,500.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 2,600.0                     | 0.00               | 0.00           | 2,600.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 2,700.0                     | 0.00               | 0.00           | 2,700.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 2,800.0                     | 0.00               | 0.00           | 2,800.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 2,900.0                     | 0.00               | 0.00           | 2,900.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 3,000.0                     | 0.00               | 0.00           | 3,000.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 3,100.0                     | 0.00               | 0.00           | 3,100.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 3,200.0                     | 0.00               | 0.00           | 3,200.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 3,300.0                     | 0.00               | 0.00           | 3,300.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 3,400.0                     | 0.00               | 0.00           | 3,400.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 3,500.0                     | 0.00               | 0.00           | 3,500.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 3,600.0                     | 0.00               | 0.00           | 3,600.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 3,700.0                     | 0.00               | 0.00           | 3,700.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 3,800.0                     | 0.00               | 0.00           | 3,800.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 3,900.0                     | 0.00               | 0.00           | 3,900.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 4,000.0                     | 0.00               | 0.00           | 4,000.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 4,100.0                     | 0.00               | 0.00           | 4,100.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 4,200.0                     | 0.00               | 0.00           | 4,200.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 4,300.0                     | 0.00               | 0.00           | 4,300.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 4,400.0                     | 0.00               | 0.00           | 4,400.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 4,500.0                     | 0.00               | 0.00           | 4,500.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 4,600.0                     | 0.00               | 0.00           | 4,600.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 4,700.0                     | 0.00               | 0.00           | 4,700.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 4,800.0                     | 0.00               | 0.00           | 4,800.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 4,900.0                     | 0.00               | 0.00           | 4,900.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 5,000.0                     | 0.00               | 0.00           | 5,000.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 5,100.0                     | 0.00               | 0.00           | 5,100.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 5,200.0                     | 0.00               | 0.00           | 5,200.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |
| 5,300.0                     | 0.00               | 0.00           | 5,300.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |





## Planning Report



Database: test  
Company: COG Operating LLC  
Project: Lea County, NM  
Site: Roy Batty Federal Com  
Well: #4H  
Wellbore: OH  
Design: Design #1

Local Co-ordinate Reference: Well #4H  
TVD Reference: WELL @ 3623.4usft (Original Well Elev)  
MD Reference: WELL @ 3623.4usft (Original Well Elev)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature

AUG 10 2013

## 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) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 5,400.0               | 0.00            | 0.00        | 5,400.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 5,500.0               | 0.00            | 0.00        | 5,500.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 5,600.0               | 0.00            | 0.00        | 5,600.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 5,700.0               | 0.00            | 0.00        | 5,700.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 5,800.0               | 0.00            | 0.00        | 5,800.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 5,900.0               | 0.00            | 0.00        | 5,900.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 6,000.0               | 0.00            | 0.00        | 6,000.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 6,100.0               | 0.00            | 0.00        | 6,100.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 6,200.0               | 0.00            | 0.00        | 6,200.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 6,300.0               | 0.00            | 0.00        | 6,300.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 6,400.0               | 0.00            | 0.00        | 6,400.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 6,500.0               | 0.00            | 0.00        | 6,500.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 6,600.0               | 0.00            | 0.00        | 6,600.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 6,700.0               | 0.00            | 0.00        | 6,700.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 6,800.0               | 0.00            | 0.00        | 6,800.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 6,900.0               | 0.00            | 0.00        | 6,900.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 7,000.0               | 0.00            | 0.00        | 7,000.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 7,100.0               | 0.00            | 0.00        | 7,100.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 7,200.0               | 0.00            | 0.00        | 7,200.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 7,300.0               | 0.00            | 0.00        | 7,300.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 7,400.0               | 0.00            | 0.00        | 7,400.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 7,500.0               | 0.00            | 0.00        | 7,500.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 7,600.0               | 0.00            | 0.00        | 7,600.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 7,700.0               | 0.00            | 0.00        | 7,700.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 7,800.0               | 0.00            | 0.00        | 7,800.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 7,900.0               | 0.00            | 0.00        | 7,900.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 8,000.0               | 0.00            | 0.00        | 8,000.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 8,100.0               | 0.00            | 0.00        | 8,100.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 8,200.0               | 0.00            | 0.00        | 8,200.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 8,300.0               | 0.00            | 0.00        | 8,300.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 8,400.0               | 0.00            | 0.00        | 8,400.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 8,500.0               | 0.00            | 0.00        | 8,500.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 8,600.0               | 0.00            | 0.00        | 8,600.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 8,700.0               | 0.00            | 0.00        | 8,700.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 8,800.0               | 0.00            | 0.00        | 8,800.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 8,900.0               | 0.00            | 0.00        | 8,900.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 9,000.0               | 0.00            | 0.00        | 9,000.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 9,100.0               | 0.00            | 0.00        | 9,100.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 9,200.0               | 0.00            | 0.00        | 9,200.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 9,300.0               | 0.00            | 0.00        | 9,300.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 9,400.0               | 0.00            | 0.00        | 9,400.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 9,500.0               | 0.00            | 0.00        | 9,500.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 9,600.0               | 0.00            | 0.00        | 9,600.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 9,700.0               | 0.00            | 0.00        | 9,700.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 9,800.0               | 0.00            | 0.00        | 9,800.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 9,900.0               | 0.00            | 0.00        | 9,900.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 10,000.0              | 0.00            | 0.00        | 10,000.0              | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 10,100.0              | 0.00            | 0.00        | 10,100.0              | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 10,200.0              | 0.00            | 0.00        | 10,200.0              | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 10,300.0              | 0.00            | 0.00        | 10,300.0              | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 10,400.0              | 0.00            | 0.00        | 10,400.0              | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 10,502.5              | 0.00            | 0.00        | 10,502.5              | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |

KOP @ 10502.5' MD



## Planning Report



|           |                       |                              |                                        |
|-----------|-----------------------|------------------------------|----------------------------------------|
| Database: | test                  | Local Co-ordinate Reference: | Well #4H                               |
| Company:  | COG Operating LLC     | TVD Reference:               | WELL @ 3623.4usft (Original Well Elev) |
| Project:  | Lea County, NM        | MD Reference:                | WELL @ 3623.4usft (Original Well Elev) |
| Site:     | Roy Batty Federal Com | North Reference:             | Grid                                   |
| Well:     | #4H                   | Survey Calculation Method:   | Minimum Curvature                      |
| Wellbore: | OH                    |                              |                                        |
| Design:   | Design #1             |                              |                                        |

AUG 10 2013

## 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) |
|-----------------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 10,525.0                                | 2.70            | 359.48      | 10,525.0              | 0.5          | 0.0          | 0.5                     | 12.00                   | 12.00                  | 0.00                  |
| 10,550.0                                | 5.70            | 359.48      | 10,549.9              | 2.4          | 0.0          | 2.4                     | 12.00                   | 12.00                  | 0.00                  |
| 10,575.0                                | 8.70            | 359.48      | 10,574.7              | 5.5          | 0.0          | 5.5                     | 12.00                   | 12.00                  | 0.00                  |
| 10,600.0                                | 11.70           | 359.48      | 10,599.3              | 9.9          | -0.1         | 9.9                     | 12.00                   | 12.00                  | 0.00                  |
| 10,625.0                                | 14.70           | 359.48      | 10,623.7              | 15.6         | -0.1         | 15.6                    | 12.00                   | 12.00                  | 0.00                  |
| 10,650.0                                | 17.70           | 359.48      | 10,647.7              | 22.6         | -0.2         | 22.6                    | 12.00                   | 12.00                  | 0.00                  |
| 10,675.0                                | 20.70           | 359.48      | 10,671.3              | 30.8         | -0.3         | 30.8                    | 12.00                   | 12.00                  | 0.00                  |
| 10,700.0                                | 23.70           | 359.48      | 10,694.4              | 40.3         | -0.4         | 40.3                    | 12.00                   | 12.00                  | 0.00                  |
| 10,725.0                                | 26.70           | 359.48      | 10,717.0              | 50.9         | -0.5         | 50.9                    | 12.00                   | 12.00                  | 0.00                  |
| 10,750.0                                | 29.70           | 359.48      | 10,739.1              | 62.7         | -0.6         | 62.7                    | 12.00                   | 12.00                  | 0.00                  |
| 10,775.0                                | 32.70           | 359.48      | 10,760.4              | 75.7         | -0.7         | 75.7                    | 12.00                   | 12.00                  | 0.00                  |
| 10,800.0                                | 35.70           | 359.48      | 10,781.1              | 89.7         | -0.8         | 89.7                    | 12.00                   | 12.00                  | 0.00                  |
| 10,825.0                                | 38.70           | 359.48      | 10,801.0              | 104.8        | -1.0         | 104.8                   | 12.00                   | 12.00                  | 0.00                  |
| 10,850.0                                | 41.70           | 359.48      | 10,820.1              | 121.0        | -1.1         | 121.0                   | 12.00                   | 12.00                  | 0.00                  |
| 10,875.0                                | 44.70           | 359.48      | 10,838.4              | 138.1        | -1.3         | 138.1                   | 12.00                   | 12.00                  | 0.00                  |
| 10,900.0                                | 47.70           | 359.48      | 10,855.7              | 156.1        | -1.4         | 156.1                   | 12.00                   | 12.00                  | 0.00                  |
| 10,925.0                                | 50.70           | 359.48      | 10,872.0              | 175.0        | -1.6         | 175.0                   | 12.00                   | 12.00                  | 0.00                  |
| 10,950.0                                | 53.70           | 359.48      | 10,887.3              | 194.8        | -1.8         | 194.8                   | 12.00                   | 12.00                  | 0.00                  |
| 10,975.0                                | 56.70           | 359.48      | 10,901.6              | 215.3        | -2.0         | 215.3                   | 12.00                   | 12.00                  | 0.00                  |
| 11,000.0                                | 59.70           | 359.48      | 10,914.8              | 236.5        | -2.1         | 236.6                   | 12.00                   | 12.00                  | 0.00                  |
| 11,025.0                                | 62.70           | 359.48      | 10,926.8              | 258.4        | -2.3         | 258.5                   | 12.00                   | 12.00                  | 0.00                  |
| 11,050.0                                | 65.69           | 359.48      | 10,937.7              | 281.0        | -2.5         | 281.0                   | 12.00                   | 12.00                  | 0.00                  |
| 11,075.0                                | 68.69           | 359.48      | 10,947.4              | 304.0        | -2.8         | 304.0                   | 12.00                   | 12.00                  | 0.00                  |
| 11,100.0                                | 71.69           | 359.48      | 10,955.8              | 327.5        | -3.0         | 327.5                   | 12.00                   | 12.00                  | 0.00                  |
| 11,125.0                                | 74.69           | 359.48      | 10,963.1              | 351.4        | -3.2         | 351.5                   | 12.00                   | 12.00                  | 0.00                  |
| 11,150.0                                | 77.69           | 359.48      | 10,969.0              | 375.7        | -3.4         | 375.7                   | 12.00                   | 12.00                  | 0.00                  |
| 11,175.0                                | 80.69           | 359.48      | 10,973.7              | 400.3        | -3.6         | 400.3                   | 12.00                   | 12.00                  | 0.00                  |
| 11,200.0                                | 83.69           | 359.48      | 10,977.1              | 425.0        | -3.9         | 425.1                   | 12.00                   | 12.00                  | 0.00                  |
| 11,225.0                                | 86.69           | 359.48      | 10,979.2              | 449.9        | -4.1         | 450.0                   | 12.00                   | 12.00                  | 0.00                  |
| 11,250.0                                | 89.69           | 359.48      | 10,980.0              | 474.9        | -4.3         | 474.9                   | 12.00                   | 12.00                  | 0.00                  |
| 11,253.6                                | 90.13           | 359.48      | 10,980.0              | 478.6        | -4.3         | 478.6                   | 12.00                   | 12.00                  | 0.00                  |
| EOC @ 11253.6'MD, 90.13°INC, 359.48°AZI |                 |             |                       |              |              |                         |                         |                        |                       |
| 11,300.0                                | 90.13           | 359.48      | 10,979.9              | 524.9        | -4.8         | 524.9                   | 0.00                    | 0.00                   | 0.00                  |
| 11,400.0                                | 90.13           | 359.48      | 10,979.7              | 624.9        | -5.7         | 624.9                   | 0.00                    | 0.00                   | 0.00                  |
| 11,500.0                                | 90.13           | 359.48      | 10,979.4              | 724.9        | -6.6         | 724.9                   | 0.00                    | 0.00                   | 0.00                  |
| 11,600.0                                | 90.13           | 359.48      | 10,979.2              | 824.9        | -7.5         | 824.9                   | 0.00                    | 0.00                   | 0.00                  |
| 11,700.0                                | 90.13           | 359.48      | 10,979.0              | 924.9        | -8.4         | 924.9                   | 0.00                    | 0.00                   | 0.00                  |
| 11,800.0                                | 90.13           | 359.48      | 10,978.8              | 1,024.9      | -9.3         | 1,024.9                 | 0.00                    | 0.00                   | 0.00                  |
| 11,900.0                                | 90.13           | 359.48      | 10,978.5              | 1,124.9      | -10.2        | 1,124.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,000.0                                | 90.13           | 359.48      | 10,978.3              | 1,224.9      | -11.1        | 1,224.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,100.0                                | 90.13           | 359.48      | 10,978.1              | 1,324.9      | -12.0        | 1,324.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,200.0                                | 90.13           | 359.48      | 10,977.9              | 1,424.9      | -12.9        | 1,424.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,300.0                                | 90.13           | 359.48      | 10,977.6              | 1,524.9      | -13.8        | 1,524.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,400.0                                | 90.13           | 359.48      | 10,977.4              | 1,624.9      | -14.7        | 1,624.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,500.0                                | 90.13           | 359.48      | 10,977.2              | 1,724.9      | -15.7        | 1,724.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,600.0                                | 90.13           | 359.48      | 10,976.9              | 1,824.9      | -16.6        | 1,824.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,700.0                                | 90.13           | 359.48      | 10,976.7              | 1,924.9      | -17.5        | 1,924.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,800.0                                | 90.13           | 359.48      | 10,976.5              | 2,024.9      | -18.4        | 2,024.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,900.0                                | 90.13           | 359.48      | 10,976.3              | 2,124.9      | -19.3        | 2,124.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,000.0                                | 90.13           | 359.48      | 10,976.0              | 2,224.8      | -20.2        | 2,224.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,100.0                                | 90.13           | 359.48      | 10,975.8              | 2,324.8      | -21.1        | 2,324.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,200.0                                | 90.13           | 359.48      | 10,975.6              | 2,424.8      | -22.0        | 2,424.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,300.0                                | 90.13           | 359.48      | 10,975.4              | 2,524.8      | -22.9        | 2,524.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,400.0                                | 90.13           | 359.48      | 10,975.1              | 2,624.8      | -23.8        | 2,624.9                 | 0.00                    | 0.00                   | 0.00                  |



## Planning Report



Database: test  
 Company: COG Operating LLC  
 Project: Lea County, NM  
 Site: Roy Batty Federal Com  
 Well: #4H  
 Wellbore: OH  
 Design: Design #1

Local Co-ordinate Reference: Well #4H  
 TVD Reference: WELL @ 3623.4usft (Original Well Elev)  
 MD Reference: WELL @ 3623.4usft (Original Well Elev)  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

HOBS COCD  
 AUG 10 2013

## 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) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 13,500.0              | 90.13           | 359.48      | 10,974.9              | 2,724.8      | -24.7        | 2,724.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,600.0              | 90.13           | 359.48      | 10,974.7              | 2,824.8      | -25.6        | 2,824.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,700.0              | 90.13           | 359.48      | 10,974.4              | 2,924.8      | -26.5        | 2,924.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,800.0              | 90.13           | 359.48      | 10,974.2              | 3,024.8      | -27.5        | 3,024.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,900.0              | 90.13           | 359.48      | 10,974.0              | 3,124.8      | -28.4        | 3,124.9                 | 0.00                    | 0.00                   | 0.00                  |
| 14,000.0              | 90.13           | 359.48      | 10,973.8              | 3,224.8      | -29.3        | 3,224.9                 | 0.00                    | 0.00                   | 0.00                  |
| 14,100.0              | 90.13           | 359.48      | 10,973.5              | 3,324.8      | -30.2        | 3,324.9                 | 0.00                    | 0.00                   | 0.00                  |
| 14,200.0              | 90.13           | 359.48      | 10,973.3              | 3,424.8      | -31.1        | 3,424.9                 | 0.00                    | 0.00                   | 0.00                  |
| 14,300.0              | 90.13           | 359.48      | 10,973.1              | 3,524.8      | -32.0        | 3,524.9                 | 0.00                    | 0.00                   | 0.00                  |
| 14,400.0              | 90.13           | 359.48      | 10,972.9              | 3,624.8      | -32.9        | 3,624.9                 | 0.00                    | 0.00                   | 0.00                  |
| 14,500.0              | 90.13           | 359.48      | 10,972.6              | 3,724.8      | -33.8        | 3,724.9                 | 0.00                    | 0.00                   | 0.00                  |
| 14,600.0              | 90.13           | 359.48      | 10,972.4              | 3,824.8      | -34.7        | 3,824.9                 | 0.00                    | 0.00                   | 0.00                  |
| 14,700.0              | 90.13           | 359.48      | 10,972.2              | 3,924.8      | -35.6        | 3,924.9                 | 0.00                    | 0.00                   | 0.00                  |
| 14,800.0              | 90.13           | 359.48      | 10,972.0              | 4,024.8      | -36.5        | 4,024.9                 | 0.00                    | 0.00                   | 0.00                  |
| 14,900.0              | 90.13           | 359.48      | 10,971.7              | 4,124.8      | -37.4        | 4,124.9                 | 0.00                    | 0.00                   | 0.00                  |
| 15,000.0              | 90.13           | 359.48      | 10,971.5              | 4,224.8      | -38.3        | 4,224.9                 | 0.00                    | 0.00                   | 0.00                  |
| 15,100.0              | 90.13           | 359.48      | 10,971.3              | 4,324.8      | -39.3        | 4,324.9                 | 0.00                    | 0.00                   | 0.00                  |
| 15,200.0              | 90.13           | 359.48      | 10,971.0              | 4,424.8      | -40.2        | 4,424.9                 | 0.00                    | 0.00                   | 0.00                  |
| 15,300.0              | 90.13           | 359.48      | 10,970.8              | 4,524.7      | -41.1        | 4,524.9                 | 0.00                    | 0.00                   | 0.00                  |
| 15,400.0              | 90.13           | 359.48      | 10,970.6              | 4,624.7      | -42.0        | 4,624.9                 | 0.00                    | 0.00                   | 0.00                  |
| 15,500.0              | 90.13           | 359.48      | 10,970.4              | 4,724.7      | -42.9        | 4,724.9                 | 0.00                    | 0.00                   | 0.00                  |
| 15,540.8              | 90.13           | 359.48      | 10,970.3              | 4,765.5      | -43.3        | 4,765.7                 | 0.00                    | 0.00                   | 0.00                  |

TD at 15540.8 - PBHL(RB#4H)

## 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        |
|-------------------------------------------------------------------------------------------|---------------|--------------|------------|--------------|--------------|-----------------|----------------|------------------|------------------|
| - Shape                                                                                   |               |              |            |              |              |                 |                |                  |                  |
| PBHL(RB#4H)                                                                               | 0.00          | 0.00         | 10,970.0   | 4,765.5      | -42.9        | 451,348.80      | 746,722.90     | 32° 14' 18.079 N | 103° 32' 7.366 W |
| - plan misses target center by 0.4usft at 15540.8usft MD (10970.3 TVD, 4765.5 N, -43.3 E) |               |              |            |              |              |                 |                |                  |                  |
| - Point                                                                                   |               |              |            |              |              |                 |                |                  |                  |

## Plan Annotations

| Measured Depth (usft) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Comment                                    |
|-----------------------|-----------------------|--------------|--------------|--------------------------------------------|
| 10,502.5              | 10,502.5              | 0.0          | 0.0          | KOP @ 10502.5' MD                          |
| 11,253.6              | 10,980.0              | 478.6        | -4.3         | EOC @ 11253.6' MD, 90.13° INC, 359.48° AZI |
| 15,540.8              | 10,970.3              | 4,765.5      | -43.3        | TD at 15540.8                              |



COG Operating LLC  
Project: Lea County, NM  
Site: Roy Batty Federal Com  
Well: #4H  
Wellbore: OH  
Plan: Design #1 (#4H/OH)

#### Section Details

| Sec | MD      | Inc   | Azi    | TVD     | +N/-S  | +E/-W | Dleg  | TFace  | Vsect  |             |
|-----|---------|-------|--------|---------|--------|-------|-------|--------|--------|-------------|
| 1   | 0.0     | 0.00  | 0.00   | 0.0     | 0.0    | 0.0   | 0.00  | 0.00   | 0.0    |             |
| 2   | 10502.5 | 0.00  | 0.00   | 10502.5 | 0.0    | 0.0   | 0.00  | 0.00   | 0.0    |             |
| 3   | 11253.6 | 90.13 | 359.48 | 10980.0 | 478.6  | -4.3  | 12.00 | 359.48 | 478.6  |             |
| 4   | 15540.8 | 90.13 | 359.48 | 10970.3 | 4765.5 | -43.3 | 0.00  | 0.00   | 4765.7 | PBHL(RB#4H) |

#### WELL DETAILS: #4H

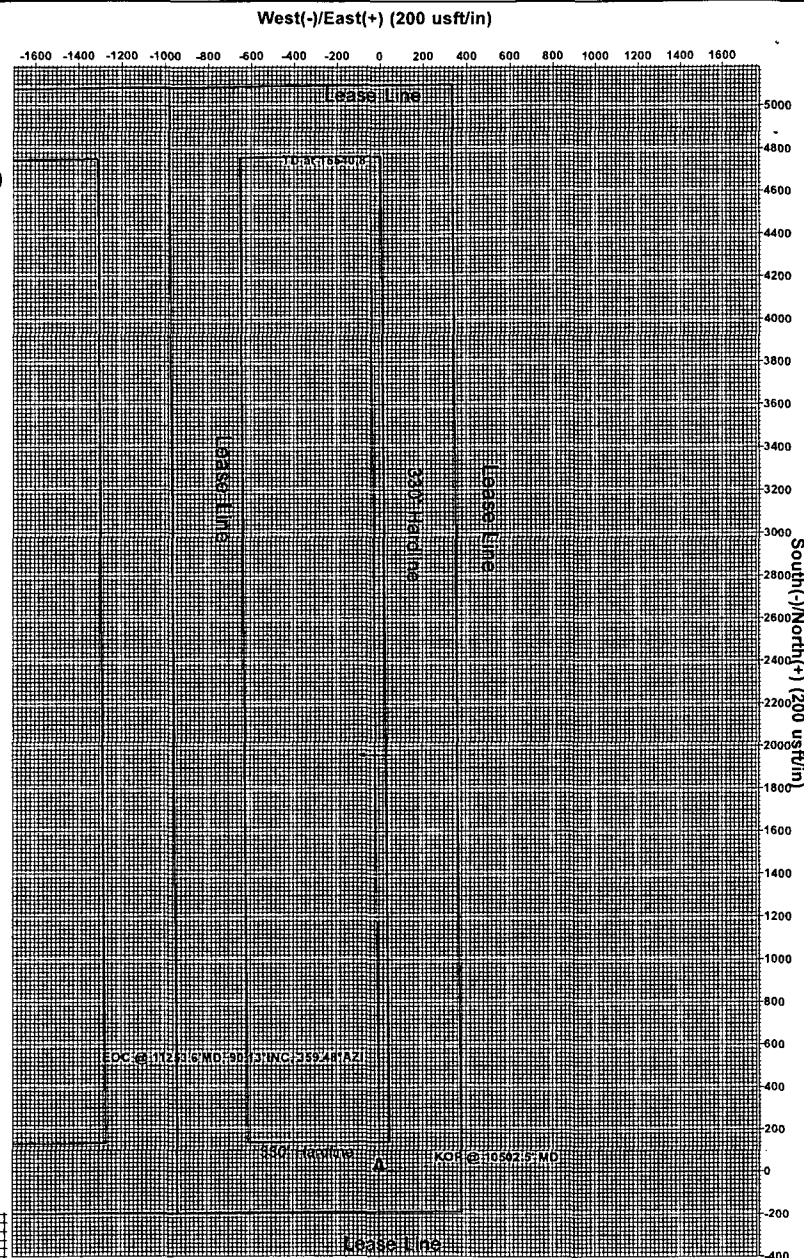
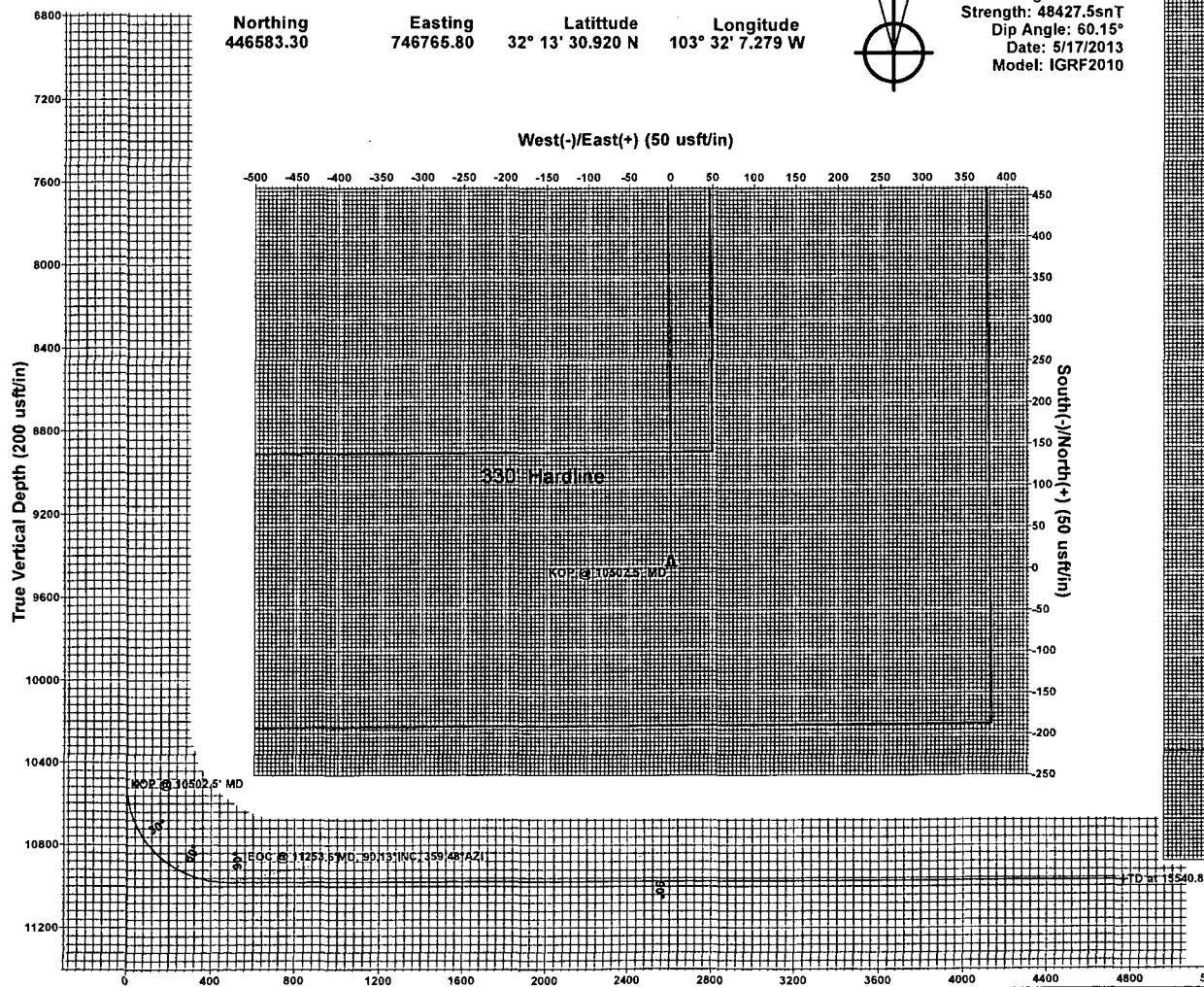
Ground Elevation:: 3605.4  
RKB Elevation: WELL @ 3623.4usft (Original Well Elev)  
Rig Name: Original Well Elev

Northing 446583.30 Easting 746765.80 Latitude 32° 13' 30.920 N Longitude 103° 32' 7.279 W



Azimuths to Grid North  
True North: -0.43°  
Magnetic North: 6.91°

Magnetic Field  
Strength: 48427.5snT  
Dip Angle: 60.15°  
Date: 5/17/2013  
Model: IGRF2010



HOBS OCD

AUG 10 2013

PROJECT DETAILS: Lea County, NM  
Geodetic System: US State Plane 1927 (Exact solution)  
Datum: NAD 1927 (NADCON CONUS)  
Ellipsoid: Clarke 1866  
Zone: New Mexico East 3001  
System Datum: Mean Sea Level  
Local North: Grid



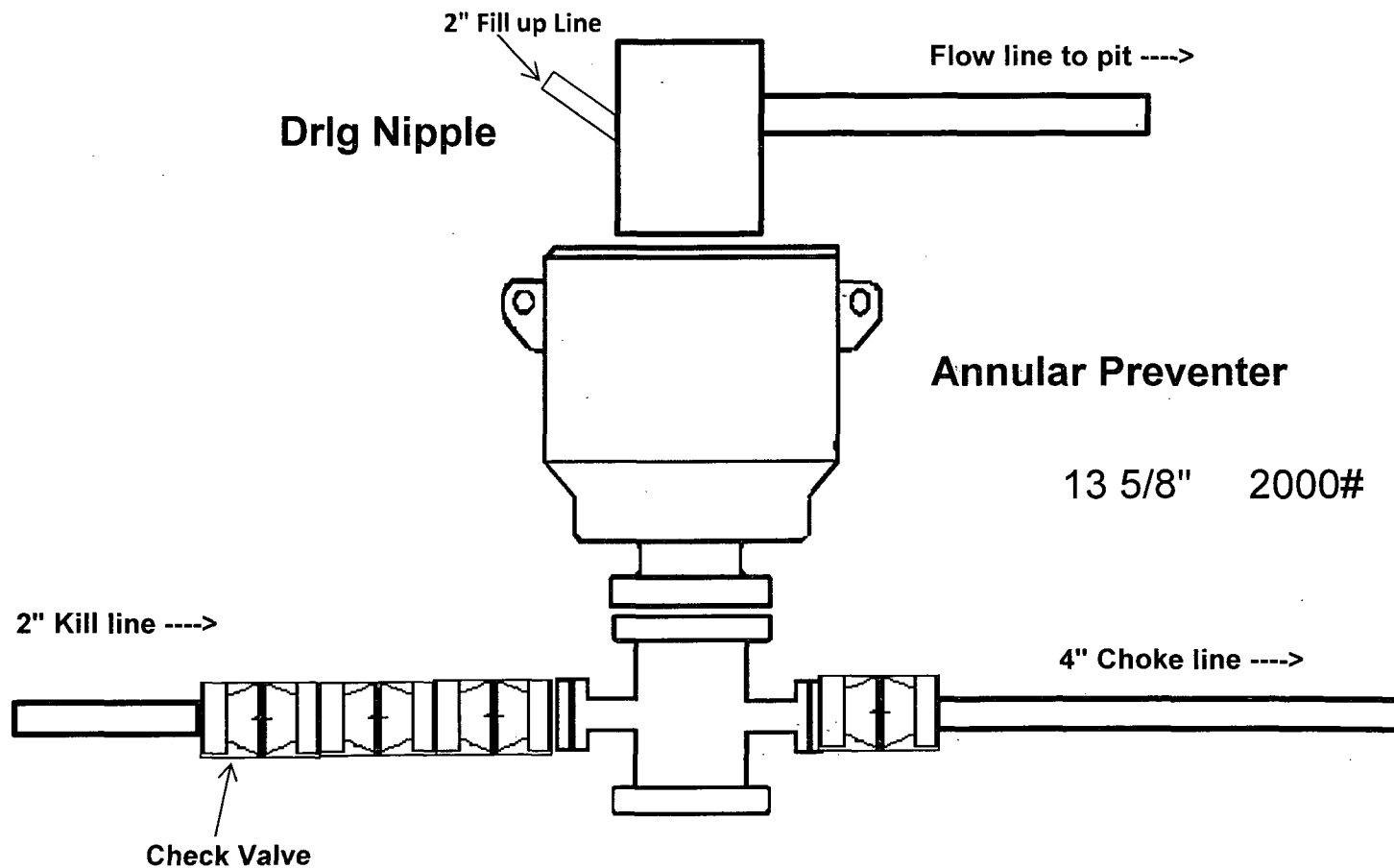
Vertical Section at 359.48° (200 usft/in)

Terra Directional Services  
322 Spring Hill Drive, Suite A100, Spring, Texas 77386  
432.425.7532

RECEIVED

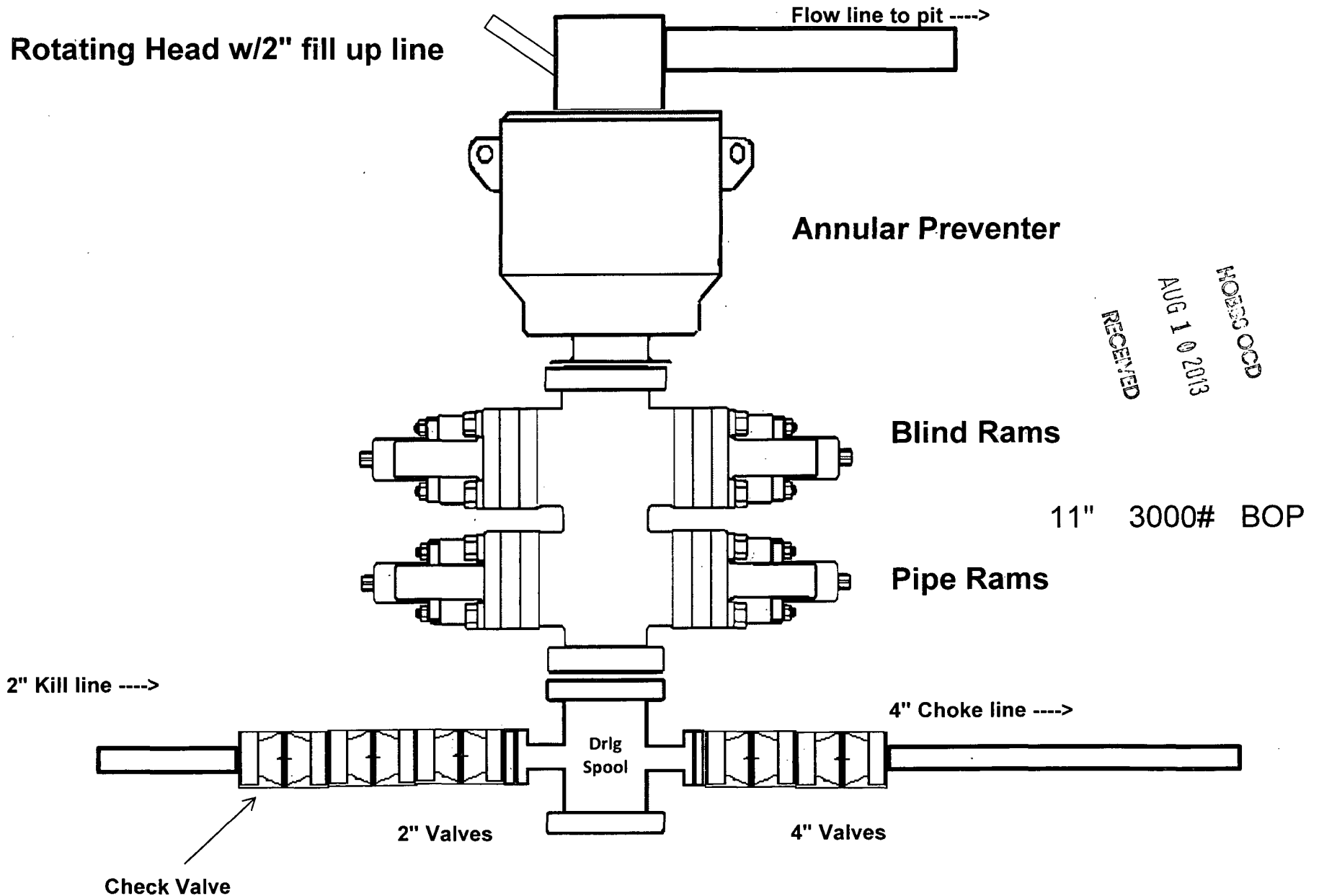
Plan: Design #1 (#4H/OH)  
Created By: Well Planner Date: 10:29, May 17 2013

# 2,000 psi BOP Schematic



HOESS OCD  
AUG 10 2013  
RECEIVED

# 3,000 psi BOP Schematic

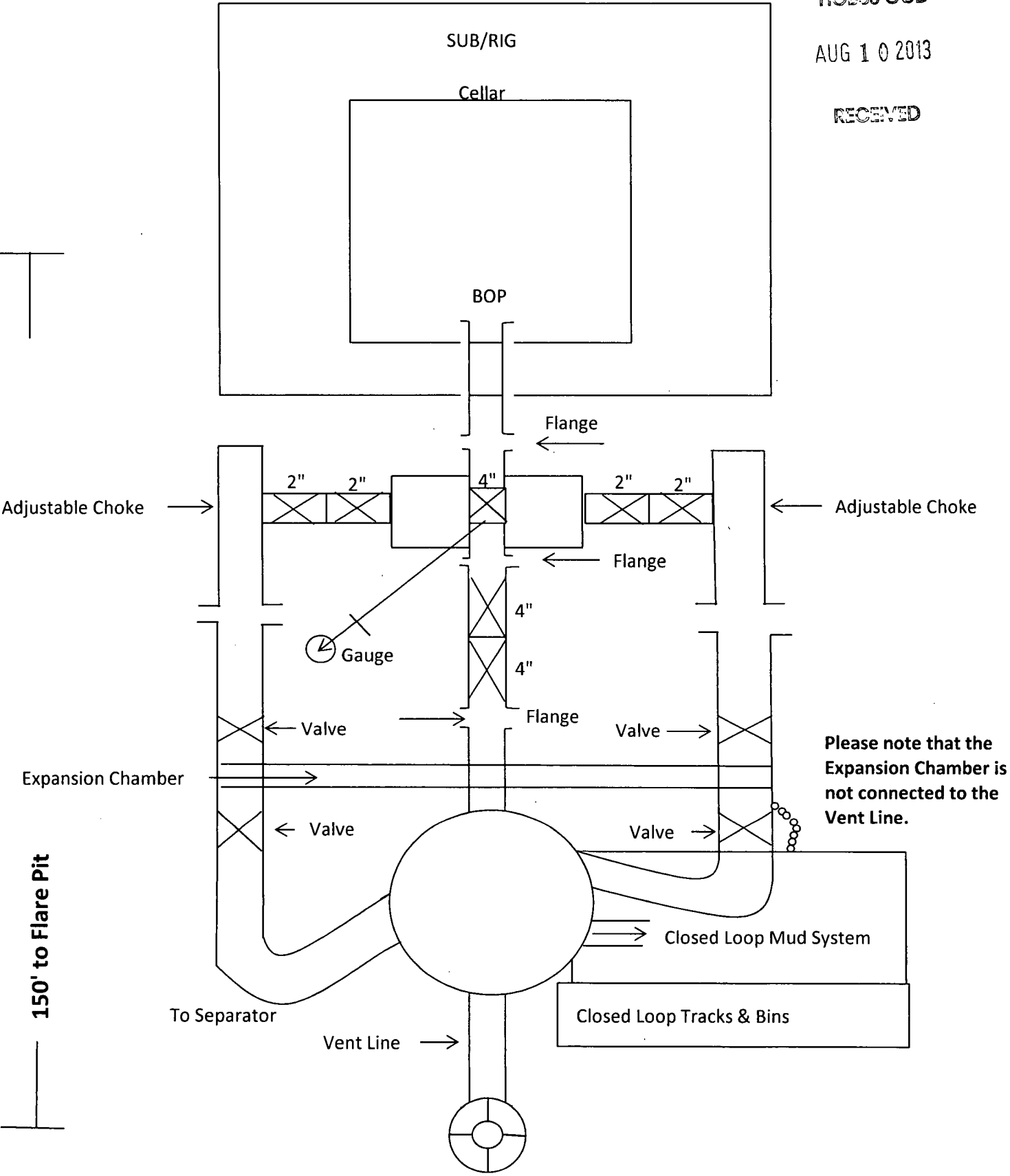


# 2M Choke Manifold Equipment

HOBSB OCD

AUG 1 0 2013

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# 3M Choke Manifold Equipment

HOBBS OCD

AUG 10 2013

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