

# NM OIL CONSERVATION

ARTESIA DISTRICT

State of New Mexico

Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION

1220 South St. Francis Dr.

Santa Fe, NM 87505

Form C-102

Revised August 1, 2011

Submit one copy to appropriate

District Office

District I  
1625 N. French Dr., Hobbs, NM 88240  
Phone: (575) 393-6161 Fax: (575) 393-0720  
District II  
811 S. First St., Artesia, NM 88210  
Phone: (575) 748-1283 Fax: (575) 748-9720  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
Phone: (505) 334-6178 Fax: (505) 334-6170  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505  
Phone: (505) 476-3460 Fax: (505) 476-3462

RECEIVED

☐ AMENDED REPORT

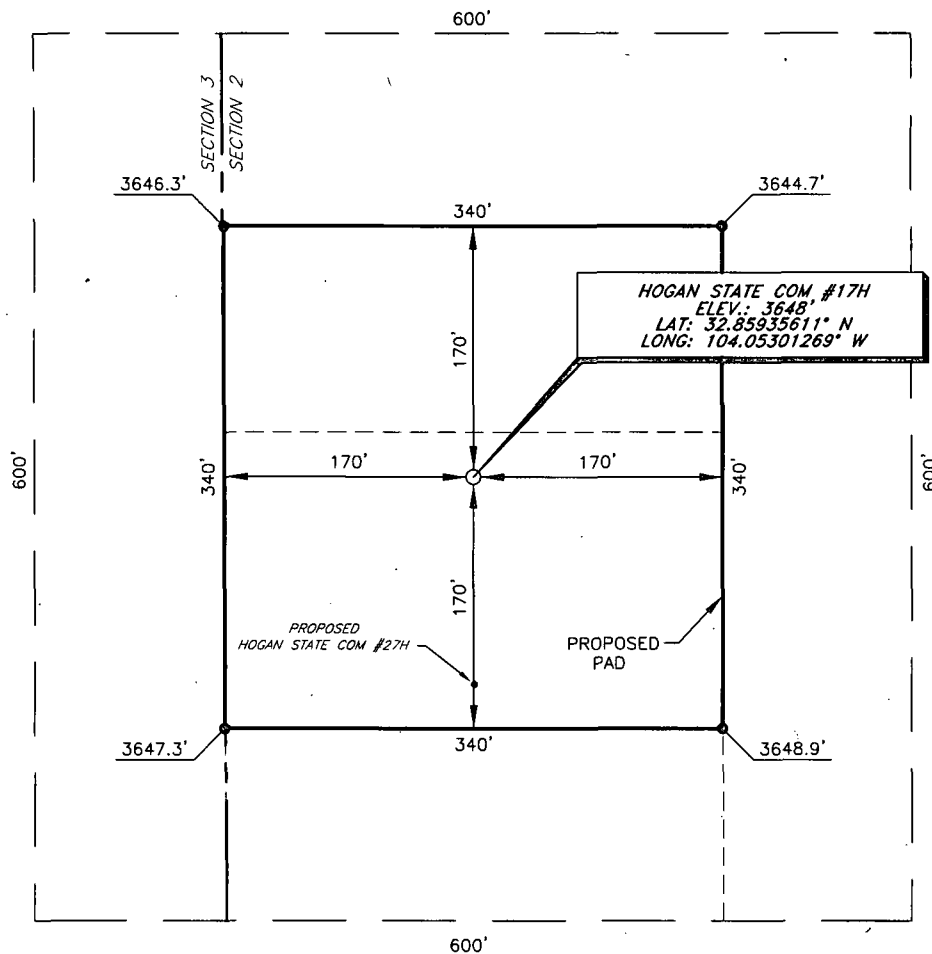
## WELL LOCATION AND ACREAGE DEDICATION PLAT

|                                                   |                     |                                              |                     |                                                   |                                  |
|---------------------------------------------------|---------------------|----------------------------------------------|---------------------|---------------------------------------------------|----------------------------------|
| 1 API Number<br><b>30-015- 43336</b>              |                     | 2 Pool Code<br><b>39291</b>                  |                     | 3 Pool Name<br><b>Empire; Glorieta Yeso, East</b> |                                  |
| 4 Property Code<br><b>39291</b>                   |                     | 5 Property Name<br><b>HOGAN STATE COM</b>    |                     |                                                   | 6 Well Number<br><b>17H</b>      |
| 7 GRID NO.<br><b>229137</b>                       |                     | 8 Operator Name<br><b>COG OPERATING, LLC</b> |                     |                                                   | 9 Elevation<br><b>3648'</b>      |
| 10 Surface Location                               |                     |                                              |                     |                                                   |                                  |
| UL or lot no.<br><b>M</b>                         | Section<br><b>2</b> | Township<br><b>17S</b>                       | Range<br><b>29E</b> | Lot Idn                                           | Feet from the<br><b>1130</b>     |
|                                                   |                     |                                              |                     |                                                   | North/South line<br><b>SOUTH</b> |
|                                                   |                     |                                              |                     |                                                   | Feet from the<br><b>170</b>      |
|                                                   |                     |                                              |                     |                                                   | East/West line<br><b>WEST</b>    |
|                                                   |                     |                                              |                     |                                                   | County<br><b>EDDY</b>            |
| 11 Bottom Hole Location If Different From Surface |                     |                                              |                     |                                                   |                                  |
| UL or lot no.<br><b>P</b>                         | Section<br><b>2</b> | Township<br><b>17S</b>                       | Range<br><b>29E</b> | Lot Idn                                           | Feet from the<br><b>990</b>      |
|                                                   |                     |                                              |                     |                                                   | North/South line<br><b>SOUTH</b> |
|                                                   |                     |                                              |                     |                                                   | Feet from the<br><b>330</b>      |
|                                                   |                     |                                              |                     |                                                   | East/West line<br><b>EAST</b>    |
|                                                   |                     |                                              |                     |                                                   | County<br><b>EDDY</b>            |
| 12 Dedicated Acres<br><b>160</b>                  |                     | 13 Joint or Infill                           |                     | 14 Consolidation Code                             |                                  |
|                                                   |                     |                                              |                     | 15 Order No.                                      |                                  |

No allowable will be assigned to this completion until all interest have been consolidated or a non-standard unit has been approved by the division.

|                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <p>16</p> <p>GEODETIC DATA<br/>NAD 27 GRID - NM EAST</p> <p>SURFACE LOCATION<br/>N 676459.3 - E 586077.8</p> <p>LAT: 32.85935611° N<br/>LONG: 104.05301269° W</p> <p>BOTTOM HOLE<br/>N 676312.6 - E 590870.0</p> <p>CORNER DATA<br/>NAD 27 GRID - NM EAST</p> <p>1: CALCULATED CORNER<br/>N 676650.5 - E 585907.0</p> <p>2: CALCULATED CORNER<br/>N 676642.0 - E 591199.7</p>                                      |  | <p>17 OPERATOR CERTIFICATION</p> <p>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p><i>[Signature]</i><br/>Signature<br/><b>Kelly J. Holly</b><br/>Printed Name<br/><b>kholly@concho.com</b><br/>E-mail Address</p> <p><b>9-2-15</b><br/>Date</p> |  |
| <p>18 SURVEYOR CERTIFICATION</p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p><b>6-18-2015</b><br/>Date of Survey</p> <p><i>[Signature]</i><br/>Signature and Seal of Professional Surveyor<br/><b>19680</b><br/>Certificate Number</p> |  | <p>19</p> <p>Estimated Completed Interval:<br/>990 FSL<br/>1650 FWL</p> <p>20</p> <p>Producing Area</p> <p>21</p> <p>Project Area</p> <p>22</p> <p>RRC - Firm No.: TX 10193838 NM 4655451 - Job No.: LS1505263</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |

COG OPERATING, LLC  
HOGAN STATE COM #17H  
(1130' FSL & 170' FWL)  
SECTION 2, T17S, R29E  
N. M. P. M., EDDY CO., NEW MEXICO



DIRECTIONS TO LOCATION

From the intersection of CR-215 (Kewanee Road) and US Hwy. 82;  
Go North on CR-215 approx. 2.5 miles to a lease road on the left;  
Turn left and go West approx. 0.9 miles to the Petra State Com #1;  
Location is approx. 688 feet Northwest of existing well.

SCALE: 1" = 100'  
0 50 100  
BEARINGS ARE  
NAD 27 GRID - NM EAST  
DISTANCES ARE  
GROUND.

Firm No.: TX 10193838 NM 4655451

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| NO.       | REVISION   | DATE |
|-----------|------------|------|
| JOB NO.:  | LS1505263  |      |
| DWG. NO.: | 1505263PAD |      |

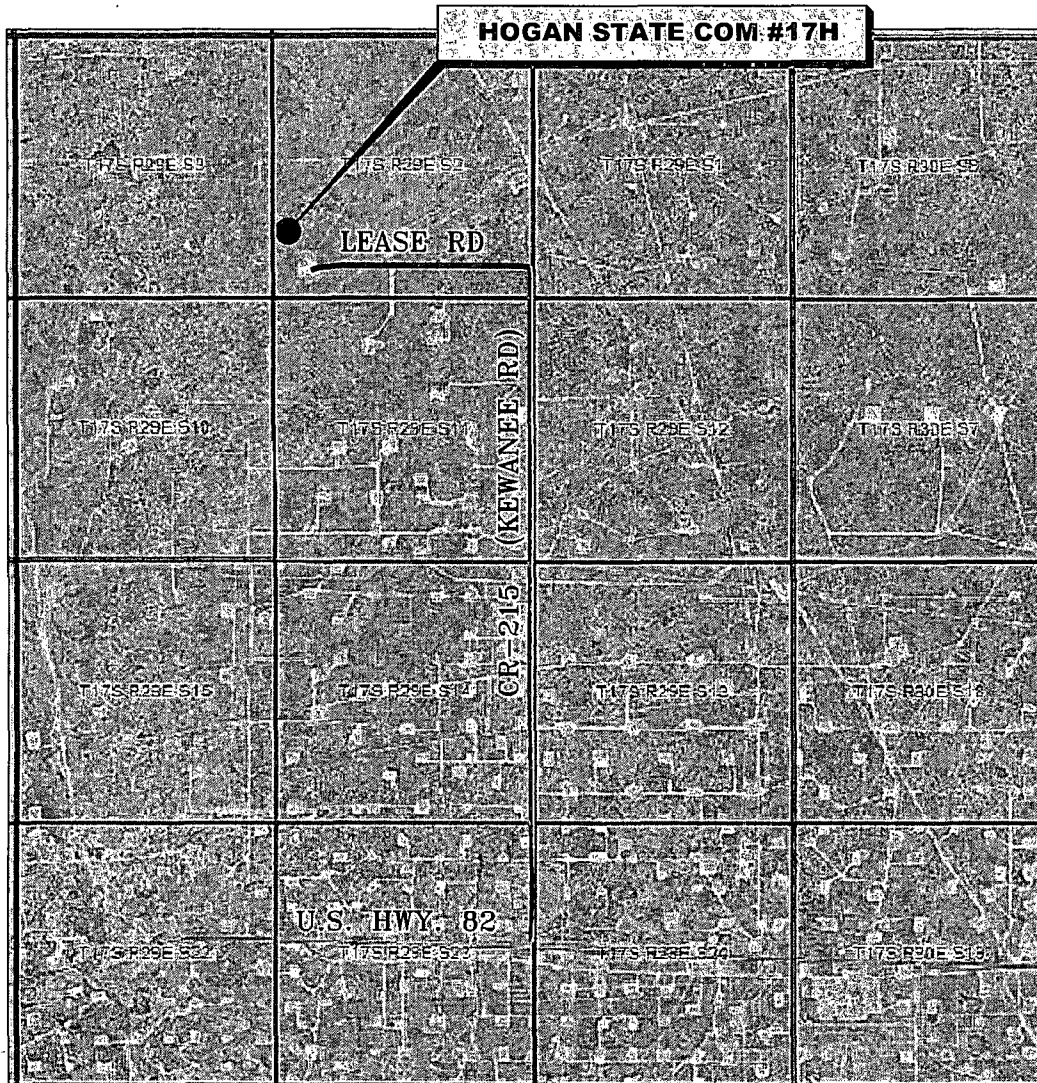
**RRC**

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

|                    |
|--------------------|
| SCALE: 1" = 100'   |
| DATE: 6-18-15      |
| SURVEYED BY: GB/CG |
| DRAWN BY: JC       |
| APPROVED BY: RMH   |
| SHEET : 1 OF 1     |

# VICINITY MAP

NOT TO SCALE



*SECTION 2, TWP. 17 SOUTH, RGE. 29 EAST,  
N. M. P. M., EDDY COUNTY, NEW MEXICO*

OPERATOR: COG Operating, LLC  
LEASE: Hogan State Com  
WELL NO.: 17H

LOCATION: 1130' FSL & 170' FWL  
ELEVATION: 3648'

Firm No.: TX 10193838 NM 4655451

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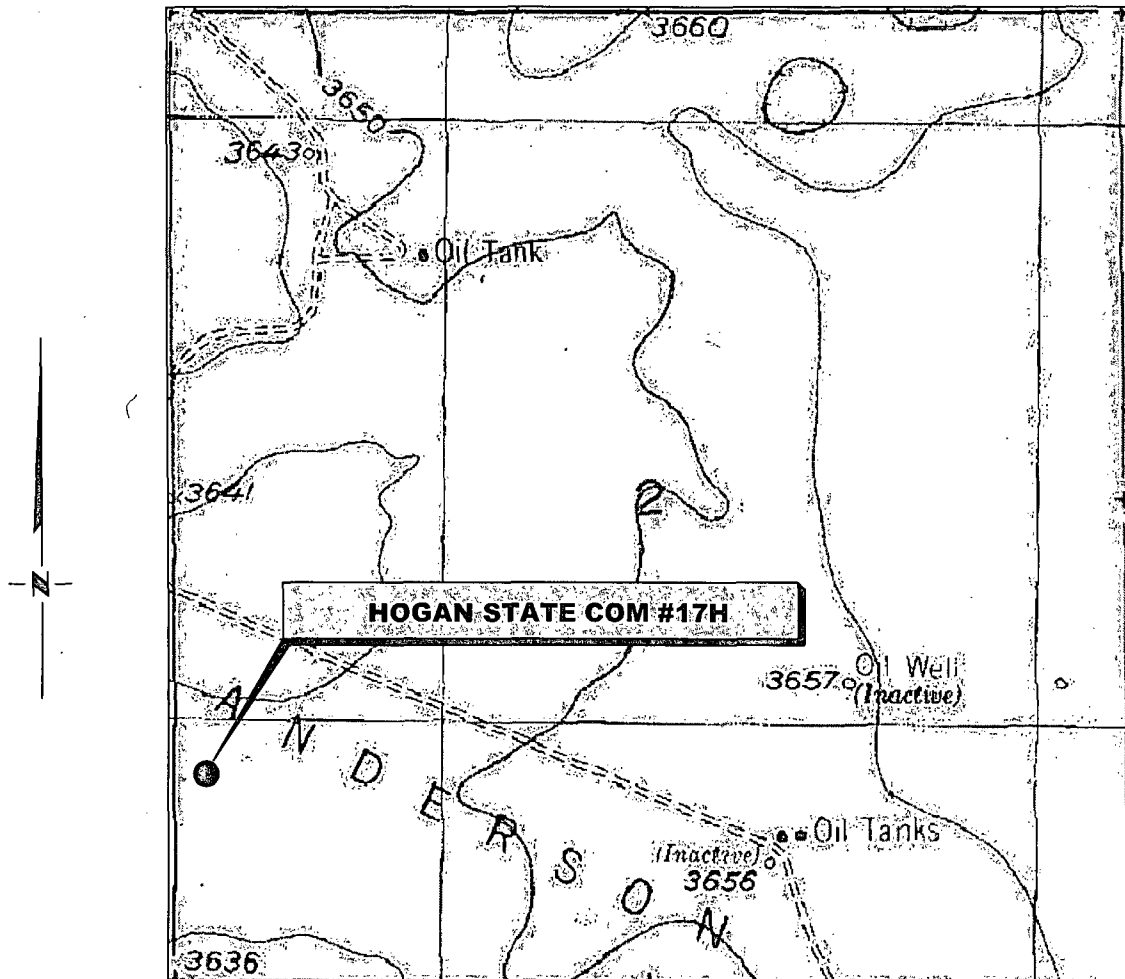
| NO.                 | REVISION | DATE |
|---------------------|----------|------|
| JOB NO.: LS1505263  |          |      |
| DWG. NO.: 1505263VM |          |      |

# RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

|                    |
|--------------------|
| SCALE: N.T.S.      |
| DATE: 6-18-15      |
| SURVEYED BY: GB/CG |
| DRAWN BY: JC       |
| APPROVED BY: RMH   |
| SHEET : 1 OF 1     |

# LOCATION VERIFICATION MAP



SECTION 2, TWP. 17 SOUTH, RGE. 29 EAST,  
N. M. P. M., EDDY COUNTY, NEW MEXICO

OPERATOR: COG Operating, LLC  
LEASE: Hogan State Com  
WELL NO.: 17H  
ELEVATION: 3648'

LOCATION: 1130' FSL & 170' FWL  
CONTOUR INTERVAL: 10'  
USGS TOPO. SOURCE MAP:  
Red Lake SE, NM (1955)

Firm No.: TX 10193838 NM 4655451

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| NO.                  | REVISION | DATE |
|----------------------|----------|------|
| JOB NO.: LS1505263   |          |      |
| DWG. NO.: 1505263LVM |          |      |

## RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 1000'  
DATE: 6-18-15  
SURVEYED BY: GB/CG  
DRAWN BY: JC  
APPROVED BY: RMH  
SHEET: 1 OF 1



## **COG Operating LLC**

**Eddy County, NM**

**Hogan State Com #17H**

**SHL: 1130' FSL, 170' FWL, Sec 2, T17S, R29E, Unit M**

**PP: 990.8' FSL, 680.6' FWL, Sec 2, T17S, R29E, Unit M**

**BHL: 990' FSL, 330' FEL, Sec 2, T17S, R29E, Unit P**

**Plan: Plan #1**

## **Standard Planning Report**

**12 August, 2015**



|           |                                                  |                              |                             |
|-----------|--------------------------------------------------|------------------------------|-----------------------------|
| Database: | EDM 5000.1 Single User Db                        | Local Co-ordinate Reference: | Site Hogan State Com #17H   |
| Company:  | COG Operating LLC                                | TVD Reference:               | KB @ 3660.0usft (United 43) |
| Project:  | Eddy County, NM                                  | MD Reference:                | KB @ 3660.0usft (United 43) |
| Site:     | Hogan State Com #17H                             | North Reference:             | Grid                        |
| Well:     | SHL 1130' FSL 170' FWL Sec 2, T17S, R29E, Unit M | Survey Calculation Method:   | Minimum Curvature           |
| Wellbore: | BHL 990' FSL 330' FEL Sec 2, T17S, R29E, Unit P  |                              |                             |
| Design:   | Plan #1                                          |                              |                             |

|             |                                      |               |                |
|-------------|--------------------------------------|---------------|----------------|
| Project:    | Eddy County, NM                      |               |                |
| Map System: | US State Plane 1927 (Exact solution) | System Datum: | Mean Sea Level |
| Geo Datum:  | NAD 1927 (NADCON CONUS)              |               |                |
| Map Zone:   | New Mexico East 3001                 |               |                |

|                       |                      |                   |                  |
|-----------------------|----------------------|-------------------|------------------|
| Site:                 | Hogan State Com #17H |                   |                  |
| Site Position:        |                      | Northing:         | 676,459.30 usft  |
| From:                 | Map                  | Easting:          | 586,077.80 usft  |
| Position Uncertainty: | 0.0 usft             | Slot Radius:      | 13-3/16 "        |
|                       |                      | Latitude:         | 32° 51' 33.682 N |
|                       |                      | Longitude:        | 104° 3' 10.846 W |
|                       |                      | Grid Convergence: | 0.15 °           |

|                      |                                                  |          |                     |                 |               |                  |
|----------------------|--------------------------------------------------|----------|---------------------|-----------------|---------------|------------------|
| Well                 | SHL 1130' FSL 170' FWL Sec 2, T17S, R29E, Unit M |          |                     |                 |               |                  |
| Well Position        | +N/-S                                            | 0.0 usft | Northing:           | 676,459.30 usft | Latitude:     | 32° 51' 33.682 N |
|                      | +E/-W                                            | 0.0 usft | Easting:            | 586,077.80 usft | Longitude:    | 104° 3' 10.846 W |
| Position Uncertainty |                                                  | 0.0 usft | Wellhead Elevation: | 0.0 usft        | Ground Level: | 3,648.0 usft     |

|           |                                                 |  |  |
|-----------|-------------------------------------------------|--|--|
| Wellbore: | BHL 990' FSL 330' FEL Sec 2, T17S, R29E, Unit P |  |  |
|-----------|-------------------------------------------------|--|--|

| Magnetics | Model Name | Sample Date | Declination<br>(°) | Dip Angle<br>(°) | Field Strength<br>(nT) |
|-----------|------------|-------------|--------------------|------------------|------------------------|
|           | IGRF2015   | 8/12/2015   | 7.42               | 60.59            | 48,453                 |

|                   |  |                  |  |        |         |        |               |           |     |  |
|-------------------|--|------------------|--|--------|---------|--------|---------------|-----------|-----|--|
| Design            |  |                  |  |        | Plan #1 |        |               |           |     |  |
| Audit Notes:      |  |                  |  |        |         |        |               |           |     |  |
| Version:          |  | Phase:           |  | PLAN   |         |        | Tie On Depth: |           | 0.0 |  |
| Vertical Section: |  | Depth From (TVD) |  | +N/-S  |         | +E/-W  |               | Direction |     |  |
|                   |  | (usft)           |  | (usft) |         | (usft) |               | (°)       |     |  |
|                   |  | 0.0              |  | 0.0    |         | 0.0    |               | 91.75     |     |  |

| Plan Sections               |                    |                |                             |                 |                 |                               |                              |                             |            |                   |
|-----------------------------|--------------------|----------------|-----------------------------|-----------------|-----------------|-------------------------------|------------------------------|-----------------------------|------------|-------------------|
| Measured<br>Depth<br>(usft) | Inclination<br>(°) | Azimuth<br>(°) | Vertical<br>Depth<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Dogleg<br>Rate<br>(°/100usft) | Build<br>Rate<br>(°/100usft) | Turn<br>Rate<br>(°/100usft) | TFO<br>(°) | Target            |
| 0.0                         | 0.00               | 0.00           | 0.0                         | 0.0             | 0.0             | 0.00                          | 0.00                         | 0.00                        | 0.00       |                   |
| 3,829.2                     | 0.00               | 0.00           | 3,829.2                     | 0.0             | 0.0             | 0.00                          | 0.00                         | 0.00                        | 0.00       |                   |
| 4,656.5                     | 91.00              | 105.31         | 4,350.0                     | -139.9          | 511.2           | 11.00                         | 11.00                        | 0.00                        | 105.31     |                   |
| 5,197.7                     | 91.00              | 89.07          | 4,340.5                     | -207.4          | 1,046.2         | 3.00                          | 0.00                         | -3.00                       | -89.87     |                   |
| 8,944.7                     | 91.00              | 89.07          | 4,275.4                     | -146.7          | 4,792.2         | 0.00                          | 0.00                         | 0.00                        | 0.00       | BHL (HSC #17H/OH) |



TDS  
Planning Report



|           |                                                    |                              |                             |
|-----------|----------------------------------------------------|------------------------------|-----------------------------|
| Database: | EDM 5000.1 Single User Db                          | Local Co-ordinate Reference: | Site Hogan State Com #17H   |
| Company:  | COG Operating LLC                                  | TVD Reference:               | KB @ 3660.0usft (United 43) |
| Project:  | Eddy County, NM                                    | MD Reference:                | KB @ 3660.0usft (United 43) |
| Site:     | Hogan State Com #17H                               | North Reference:             | Grid                        |
| Well:     | SHL 1130' FSL, 170' FWL, Sec 2, T17S, R29E, Unit M | Survey Calculation Method:   | Minimum Curvature           |
| Wellbore: | BHL 990' FSL, 330' FEL, Sec 2, T17S, R29E, Unit P  |                              |                             |
| Design:   | Plan #1                                            |                              |                             |

| Planned Survey          |                 |             |                       |              |              |                         |                         |                        |                       |
|-------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (usft)   | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 0.0                     | 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                  |
| 3,829.2                 | 0.00            | 0.00        | 3,829.2               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| KOP - Start Build 11.00 |                 |             |                       |              |              |                         |                         |                        |                       |
| 3,850.0                 | 2.29            | 105.31      | 3,850.0               | -0.1         | 0.4          | 0.4                     | 11.00                   | 11.00                  | 0.00                  |
| 3,900.0                 | 7.79            | 105.31      | 3,899.8               | -1.3         | 4.6          | 4.7                     | 11.00                   | 11.00                  | 0.00                  |
| 3,950.0                 | 13.29           | 105.31      | 3,948.9               | -3.7         | 13.5         | 13.6                    | 11.00                   | 11.00                  | 0.00                  |
| 4,000.0                 | 18.79           | 105.31      | 3,997.0               | -7.3         | 26.8         | 27.0                    | 11.00                   | 11.00                  | 0.00                  |
| 4,050.0                 | 24.29           | 105.31      | 4,043.4               | -12.2        | 44.5         | 44.8                    | 11.00                   | 11.00                  | 0.00                  |
| 4,100.0                 | 29.79           | 105.31      | 4,088.0               | -18.2        | 66.4         | 66.9                    | 11.00                   | 11.00                  | 0.00                  |
| 4,150.0                 | 35.29           | 105.31      | 4,130.1               | -25.3        | 92.3         | 93.0                    | 11.00                   | 11.00                  | 0.00                  |
| 4,200.0                 | 40.79           | 105.31      | 4,169.5               | -33.4        | 122.0        | 123.0                   | 11.00                   | 11.00                  | 0.00                  |
| 4,250.0                 | 46.29           | 105.31      | 4,205.7               | -42.5        | 155.2        | 156.4                   | 11.00                   | 11.00                  | 0.00                  |
| 4,300.0                 | 51.79           | 105.31      | 4,238.5               | -52.5        | 191.6        | 193.1                   | 11.00                   | 11.00                  | 0.00                  |
| 4,350.0                 | 57.29           | 105.31      | 4,267.5               | -63.2        | 230.9        | 232.7                   | 11.00                   | 11.00                  | 0.00                  |





TDS  
Planning Report



|           |                                                     |                              |                             |
|-----------|-----------------------------------------------------|------------------------------|-----------------------------|
| Database: | EDM 5000.1 Single User Db                           | Local Co-ordinate Reference: | Site Hogan State Com #17H   |
| Company:  | COG Operating LLC                                   | TVD Reference:               | KB @ 3660.0usft (United 43) |
| Project:  | Eddy County, NM                                     | MD Reference:                | KB @ 3660.0usft (United 43) |
| Site:     | Hogan State Com #17H                                | North Reference:             | Grid                        |
| Well:     | SHL: 1130' FSL, 170' FWL, Sec 2, T17S, R29E, Unit M | Survey Calculation Method:   | Minimum Curvature           |
| Wellbore: | BHL: 990' FSL, 330' FEL, Sec 2, T17S, R29E, Unit P  |                              |                             |
| Design:   | Plan #1                                             |                              |                             |

| 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) |
| 4,400.0                                   | 62.79           | 105.31      | 4,292.4               | -74.6        | 272.7        | 274.8                   | 11.00                   | 11.00                  | 0.00                  |
| 4,450.0                                   | 68.29           | 105.31      | 4,313.1               | -86.7        | 316.5        | 319.0                   | 11.00                   | 11.00                  | 0.00                  |
| 4,500.0                                   | 73.79           | 105.31      | 4,329.4               | -99.1        | 362.1        | 365.0                   | 11.00                   | 11.00                  | 0.00                  |
| 4,550.0                                   | 79.29           | 105.31      | 4,341.0               | -112.0       | 409.0        | 412.2                   | 11.00                   | 11.00                  | 0.00                  |
| 4,600.0                                   | 84.79           | 105.31      | 4,347.9               | -125.0       | 456.7        | 460.4                   | 11.00                   | 11.00                  | 0.00                  |
| 4,650.0                                   | 90.29           | 105.31      | 4,350.1               | -138.2       | 504.9        | 508.9                   | 11.00                   | 11.00                  | 0.00                  |
| 4,656.5                                   | 91.00           | 105.31      | 4,350.0               | -139.9       | 511.2        | 515.2                   | 11.00                   | 11.00                  | 0.00                  |
| EOC/TURN - Start DLS 3.00 TFO -89.87      |                 |             |                       |              |              |                         |                         |                        |                       |
| 4,700.0                                   | 91.00           | 104.00      | 4,349.2               | -150.9       | 553.3        | 557.6                   | 3.00                    | 0.01                   | -3.00                 |
| 4,800.0                                   | 91.01           | 101.00      | 4,347.5               | -172.6       | 650.9        | 655.8                   | 3.00                    | 0.00                   | -3.00                 |
| 4,900.0                                   | 91.01           | 98.00       | 4,345.7               | -189.1       | 749.5        | 754.9                   | 3.00                    | 0.00                   | -3.00                 |
| 5,000.0                                   | 91.01           | 95.00       | 4,344.0               | -200.4       | 848.8        | 854.5                   | 3.00                    | 0.00                   | -3.00                 |
| 5,100.0                                   | 91.00           | 92.00       | 4,342.2               | -206.5       | 948.6        | 954.5                   | 3.00                    | 0.00                   | -3.00                 |
| 5,197.7                                   | 91.00           | 89.07       | 4,340.5               | -207.4       | 1,046.2      | 1,052.1                 | 3.00                    | -0.01                  | -3.00                 |
| END TURN - Start 3747.0 hold at 5197.7 MD |                 |             |                       |              |              |                         |                         |                        |                       |
| 5,200.0                                   | 91.00           | 89.07       | 4,340.5               | -207.4       | 1,048.5      | 1,054.4                 | 0.00                    | 0.00                   | 0.00                  |
| 5,300.0                                   | 91.00           | 89.07       | 4,338.7               | -205.8       | 1,148.5      | 1,154.3                 | 0.00                    | 0.00                   | 0.00                  |
| 5,400.0                                   | 91.00           | 89.07       | 4,337.0               | -204.2       | 1,248.5      | 1,254.2                 | 0.00                    | 0.00                   | 0.00                  |
| 5,500.0                                   | 91.00           | 89.07       | 4,335.3               | -202.5       | 1,348.5      | 1,354.0                 | 0.00                    | 0.00                   | 0.00                  |
| 5,600.0                                   | 91.00           | 89.07       | 4,333.5               | -200.9       | 1,448.4      | 1,453.9                 | 0.00                    | 0.00                   | 0.00                  |
| 5,700.0                                   | 91.00           | 89.07       | 4,331.8               | -199.3       | 1,548.4      | 1,553.8                 | 0.00                    | 0.00                   | 0.00                  |
| 5,800.0                                   | 91.00           | 89.07       | 4,330.0               | -197.7       | 1,648.4      | 1,653.7                 | 0.00                    | 0.00                   | 0.00                  |
| 5,900.0                                   | 91.00           | 89.07       | 4,328.3               | -196.1       | 1,748.3      | 1,753.5                 | 0.00                    | 0.00                   | 0.00                  |
| 6,000.0                                   | 91.00           | 89.07       | 4,326.6               | -194.4       | 1,848.3      | 1,853.4                 | 0.00                    | 0.00                   | 0.00                  |
| 6,100.0                                   | 91.00           | 89.07       | 4,324.8               | -192.8       | 1,948.3      | 1,953.3                 | 0.00                    | 0.00                   | 0.00                  |
| 6,200.0                                   | 91.00           | 89.07       | 4,323.1               | -191.2       | 2,048.3      | 2,053.2                 | 0.00                    | 0.00                   | 0.00                  |
| 6,300.0                                   | 91.00           | 89.07       | 4,321.4               | -189.6       | 2,148.2      | 2,153.0                 | 0.00                    | 0.00                   | 0.00                  |
| 6,400.0                                   | 91.00           | 89.07       | 4,319.6               | -187.9       | 2,248.2      | 2,252.9                 | 0.00                    | 0.00                   | 0.00                  |
| 6,500.0                                   | 91.00           | 89.07       | 4,317.9               | -186.3       | 2,348.2      | 2,352.8                 | 0.00                    | 0.00                   | 0.00                  |
| 6,600.0                                   | 91.00           | 89.07       | 4,316.1               | -184.7       | 2,448.2      | 2,452.7                 | 0.00                    | 0.00                   | 0.00                  |
| 6,700.0                                   | 91.00           | 89.07       | 4,314.4               | -183.1       | 2,548.1      | 2,552.5                 | 0.00                    | 0.00                   | 0.00                  |
| 6,800.0                                   | 91.00           | 89.07       | 4,312.7               | -181.5       | 2,648.1      | 2,652.4                 | 0.00                    | 0.00                   | 0.00                  |
| 6,900.0                                   | 91.00           | 89.07       | 4,310.9               | -179.8       | 2,748.1      | 2,752.3                 | 0.00                    | 0.00                   | 0.00                  |
| 7,000.0                                   | 91.00           | 89.07       | 4,309.2               | -178.2       | 2,848.0      | 2,852.2                 | 0.00                    | 0.00                   | 0.00                  |
| 7,100.0                                   | 91.00           | 89.07       | 4,307.5               | -176.6       | 2,948.0      | 2,952.0                 | 0.00                    | 0.00                   | 0.00                  |
| 7,200.0                                   | 91.00           | 89.07       | 4,305.7               | -175.0       | 3,048.0      | 3,051.9                 | 0.00                    | 0.00                   | 0.00                  |
| 7,300.0                                   | 91.00           | 89.07       | 4,304.0               | -173.4       | 3,148.0      | 3,151.8                 | 0.00                    | 0.00                   | 0.00                  |
| 7,400.0                                   | 91.00           | 89.07       | 4,302.2               | -171.7       | 3,247.9      | 3,251.7                 | 0.00                    | 0.00                   | 0.00                  |
| 7,500.0                                   | 91.00           | 89.07       | 4,300.5               | -170.1       | 3,347.9      | 3,351.5                 | 0.00                    | 0.00                   | 0.00                  |
| 7,600.0                                   | 91.00           | 89.07       | 4,298.8               | -168.5       | 3,447.9      | 3,451.4                 | 0.00                    | 0.00                   | 0.00                  |
| 7,700.0                                   | 91.00           | 89.07       | 4,297.0               | -166.9       | 3,547.8      | 3,551.3                 | 0.00                    | 0.00                   | 0.00                  |
| 7,800.0                                   | 91.00           | 89.07       | 4,295.3               | -165.3       | 3,647.8      | 3,651.2                 | 0.00                    | 0.00                   | 0.00                  |
| 7,900.0                                   | 91.00           | 89.07       | 4,293.6               | -163.6       | 3,747.8      | 3,751.0                 | 0.00                    | 0.00                   | 0.00                  |
| 8,000.0                                   | 91.00           | 89.07       | 4,291.8               | -162.0       | 3,847.8      | 3,850.9                 | 0.00                    | 0.00                   | 0.00                  |
| 8,100.0                                   | 91.00           | 89.07       | 4,290.1               | -160.4       | 3,947.7      | 3,950.8                 | 0.00                    | 0.00                   | 0.00                  |
| 8,200.0                                   | 91.00           | 89.07       | 4,288.3               | -158.8       | 4,047.7      | 4,050.7                 | 0.00                    | 0.00                   | 0.00                  |
| 8,300.0                                   | 91.00           | 89.07       | 4,286.6               | -157.2       | 4,147.7      | 4,150.5                 | 0.00                    | 0.00                   | 0.00                  |
| 8,400.0                                   | 91.00           | 89.07       | 4,284.9               | -155.5       | 4,247.6      | 4,250.4                 | 0.00                    | 0.00                   | 0.00                  |
| 8,500.0                                   | 91.00           | 89.07       | 4,283.1               | -153.9       | 4,347.6      | 4,350.3                 | 0.00                    | 0.00                   | 0.00                  |
| 8,600.0                                   | 91.00           | 89.07       | 4,281.4               | -152.3       | 4,447.6      | 4,450.2                 | 0.00                    | 0.00                   | 0.00                  |
| 8,700.0                                   | 91.00           | 89.07       | 4,279.7               | -150.7       | 4,547.6      | 4,550.0                 | 0.00                    | 0.00                   | 0.00                  |
| 8,800.0                                   | 91.00           | 89.07       | 4,277.9               | -149.0       | 4,647.5      | 4,649.9                 | 0.00                    | 0.00                   | 0.00                  |



|           |                                                     |                              |                             |
|-----------|-----------------------------------------------------|------------------------------|-----------------------------|
| Database: | EDM 5000.1 Single User Db                           | Local Co-ordinate Reference: | Site Hogan State Com #17H:  |
| Company:  | COG Operating LLC                                   | TVD Reference:               | KB @ 3660.0usft (United 43) |
| Project:  | Eddy County, NM                                     | MD Reference:                | KB @ 3660.0usft (United 43) |
| Site:     | Hogan State Com #17H                                | North Reference:             | Grid                        |
| Well:     | SHL: 1130' FSL, 170' FWL, Sec 2, T17S, R29E, Unit M | Survey Calculation Method:   | Minimum Curvature           |
| Wellbore: | BHL: 990' FSL, 330' FEL, Sec 2, T17S, R29E, Unit P  |                              |                             |
| Design:   | Plan #1                                             |                              |                             |

| 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) |  |
| 8,900.0               | 91.00           | 89.07       | 4,276.2               | -147.4       | 4,747.5      | 4,749.8                 | 0.00                    | 0.00                   | 0.00                  |  |
| 8,944.7               | 91.00           | 89.07       | 4,275.4               | -146.7       | 4,792.2      | 4,794.4                 | 0.00                    | 0.00                   | 0.00                  |  |
| TD at 8944.7          |                 |             |                       |              |              |                         |                         |                        |                       |  |

| 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        |
| BHL (HSC #17H/OH)    | - plan hits target center<br>- Point | 0.00          | 0.00         | 4,275.4    | -146.7       | 4,792.2      | 676,312.60      | 590,870.00     | 32° 51' 32.101 N | 104° 2' 14.669 W |
| PP/EOC (HSC #17H/OH) | - plan hits target center<br>- Point | 0.00          | 0.00         | 4,350.0    | -139.9       | 511.2        | 676,319.36      | 586,588.98     | 32° 51' 32.284 N | 104° 3' 4.858 W  |

| Plan Annotations      |                       |                   |              |                                           |  |
|-----------------------|-----------------------|-------------------|--------------|-------------------------------------------|--|
| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates |              |                                           |  |
|                       |                       | +N/-S (usft)      | +E/-W (usft) | Comment                                   |  |
| 3,829.2               | 3,829.2               | 0.0               | 0.0          | KOP - Start Build 11.00                   |  |
| 4,656.5               | 4,350.0               | -139.9            | 511.2        | EOC/TURN - Start DLS 3.00 TFO -89.87      |  |
| 5,197.7               | 4,340.5               | -207.4            | 1,046.2      | END TURN - Start 3747.0 hold at 5197.7 MD |  |
| 8,944.7               | 4,275.4               | -146.7            | 4,792.2      | TD at 8944.7                              |  |



| Section Details |        |       |        |        |        |        |       |        |        |                   |
|-----------------|--------|-------|--------|--------|--------|--------|-------|--------|--------|-------------------|
| Sec             | MD     | Inc   | Azi    | TVD    | +N/-S  | +E/-W  | Dleg  | TFace  | VSec   | Target            |
| 1               | 0.0    | 0.00  | 0.00   | 0.0    | 0.0    | 0.0    | 0.00  | 0.00   | 0.0    |                   |
| 2               | 3829.2 | 0.00  | 0.00   | 3829.2 | 0.0    | 0.0    | 0.00  | 0.00   | 0.0    |                   |
| 3               | 4656.5 | 91.00 | 105.31 | 4350.0 | -139.9 | 511.2  | 11.00 | 105.31 | 515.2  |                   |
| 4               | 5197.7 | 91.00 | 89.07  | 4340.5 | -207.4 | 1046.2 | 3.00  | -89.87 | 1052.1 |                   |
| 5               | 8944.7 | 91.00 | 89.07  | 4275.4 | -146.7 | 4792.2 | 0.00  | 0.00   | 4794.4 | BHL (HSC #17H/OH) |

Ground Elevation:: 3648.0  
RKB Elevation: KB @ 3660.0usft (United 43)

Northing 676459.30 Easting 586077.80 Latitude 32° 51' 33.682 N Longitude 104° 3' 10.846 W

COG Operating LLC  
Project: Eddy County, NM  
Site: Hogan State Com #17H

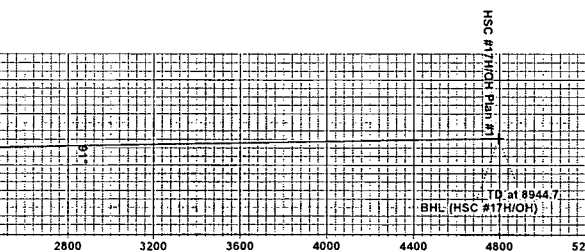
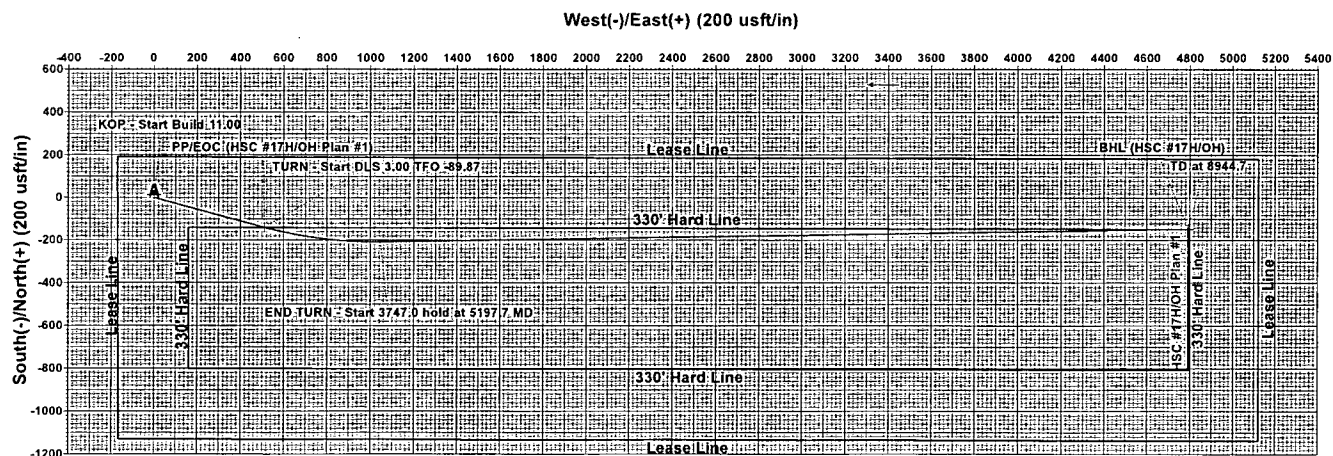
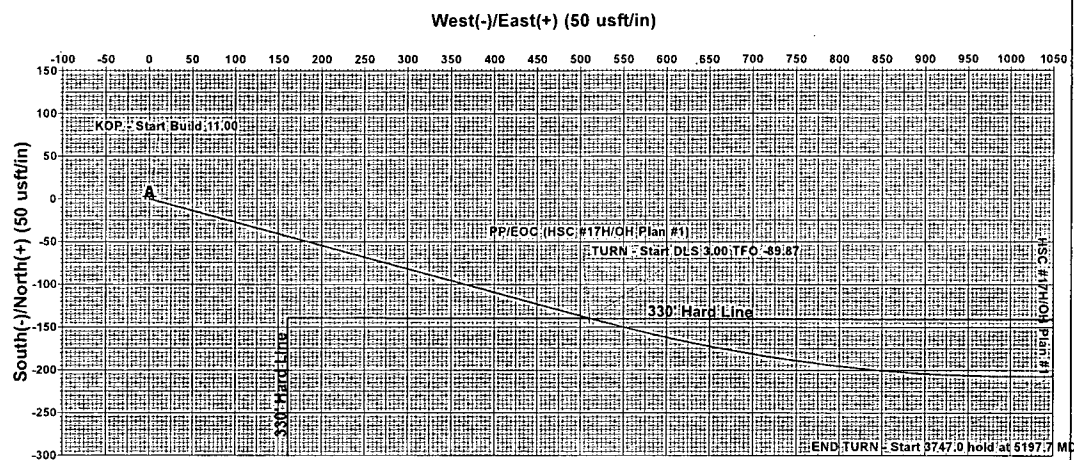
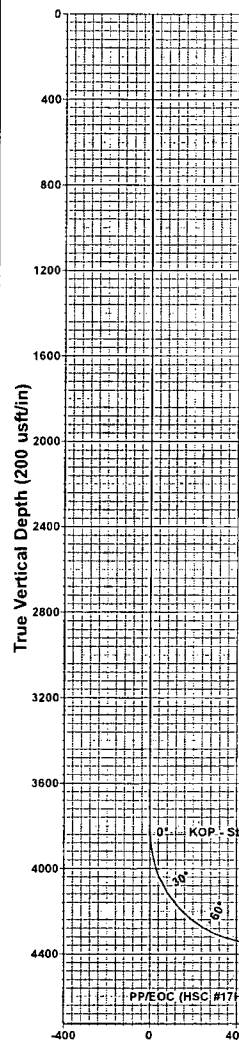
Well: SHL: 1130' FSL, 170' FWL, Sec 2, T17S, R29E, Unit M  
Wellbore: BHL: 990' FSL, 330' FEL, Sec 2, T17S, R29E, Unit P

Plan: Plan #1 (SHL: 1130' FSL, 170' FWL, Sec 2, T17S, R29E, Unit M/BHL: 990' FSL, 330' FEL, Sec 2, T17S, R29E, Unit P)



Azimuths to Grid North  
True North: -0.15°  
Magnetic North: 7.27°

Magnetic Field  
Strength: 48452.8nT  
Dip Angle: 60.59°  
Date: 8/12/2015  
Model: IGRF2015



Vertical Section at 91.75° (200 usft/in)  
Terra Directional Services LLC  
322 Spring Hill Drive, Suite A300, Spring, Tx 77386  
Phone: 432-425-7532

PROJECT DETAILS: Eddy 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

