

30-015-40256

**RECEIVED**

MAR 21 2013

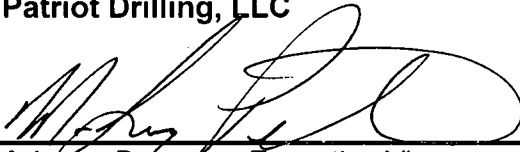
NMOCD ARTESIA

OPERATOR: COG Operating, LLC  
 WELL/LEASE: SRO State Unit # 31 H  
 COUNTY: Eddy Co., New Mexico  
 Sec. 4, T26S, R28E

**STATE OF NEW MEXICO  
 DEVIATION REPORT**

| <u>Depth</u> | <u>Deviation</u> | <u>Depth</u> | <u>Deviation</u> |
|--------------|------------------|--------------|------------------|
| 149          | 3/4              | 1,980        | 1                |
| 327          | 1                | 2,107        | 1/2              |
| 472          | 1/2              | 2,234        | 1                |
| 594          | 1/2              | 3,265        | 1                |
| 716          | 1/2              | 3,973        | 3/4              |
| 844          | 3/4              | 3,449        | 1                |
| 1,100        | 1                | 3,949        | 1 1/4            |
| 1,226        | 1                | 4,463        | 1                |
| 1,352        | 1 1/4            | 4,940        | 1                |
| 1,510        | 1 1/4            | 5,416        | 1 1/4            |
| 1,729        | 1 1/2            | 6,331        | 1                |
| 1,856        | 3/4              | 6,839        | 1 3/4            |

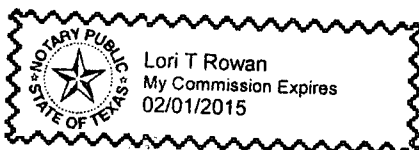
Patriot Drilling, LLC

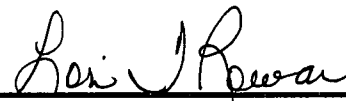


M. Leroy Peterson, Executive Vice-  
 President

The foregoing instrument was acknowledged before me on this 18th day of  
 December, 2012 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling,

My Commission Expires: 02/01/2015



  
 Lori T. Rowan  
 Notary Public for Ector Co., Texas



A GYRO TECHNOLOGIES INC. COMPANY

PO Box 261021  
Corpus Christi, Texas 78426  
(361) 767-0602 • (800) 606-GYRO • Fax (361) 767-0612

December 18, 2012

COG Operating LLC (Concho)  
One Concho Center  
600 W. Illinois Avenue  
Midland, TX 79701

Attn: Kanicia Castillo

Re: **SRO State Unit No 031H**

Please find enclosed a copy of the survey from 0' to 7,363' ran on the above referenced well.

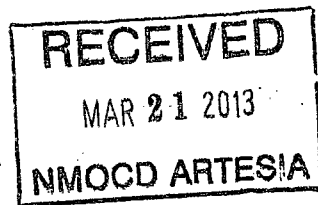
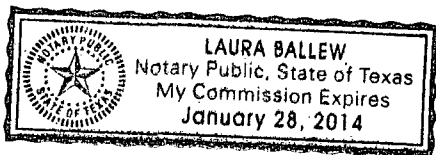
If I can be of any further service, please do not hesitate to call me at 800-606-4976.

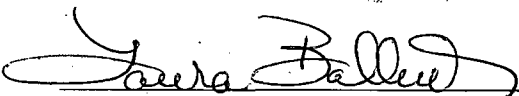
Sincerely,

  
Keith Havelka  
Operations

STATE OF TEXAS     §  
                                 §  
COUNTY OF NUECES §

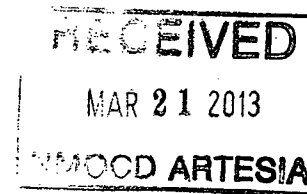
This instrument was acknowledged before me on the 20<sup>th</sup> day of December A.D., 2012, by Keith Havelka.



  
Laura Ballew  
Notary Public, State of Texas



Company: COG Operating LLC (Concho)  
Lease/Well: SRO State Unit/No 031H  
Location: S4 T26s R28e  
Rig Name: Patriot #3  
State/County: New Mexico/Eddy  
Latitude: 32.07, Longitude: -104.09  
GRID North is 0.13 Degrees East of True North  
VS-Azi: 0.00 Degrees



RKB : 17 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ...tate unit #31h gyro survey.ut

Minimum Curvature Method

Report Date/Time: 12/18/2012 / 09:47

Vaughn Energy Services

(432) 563-5444

Gardendale, TX 79758

Surveyor: Dustin Wedel

SRO State Unit No 031H / API 30-015-40256

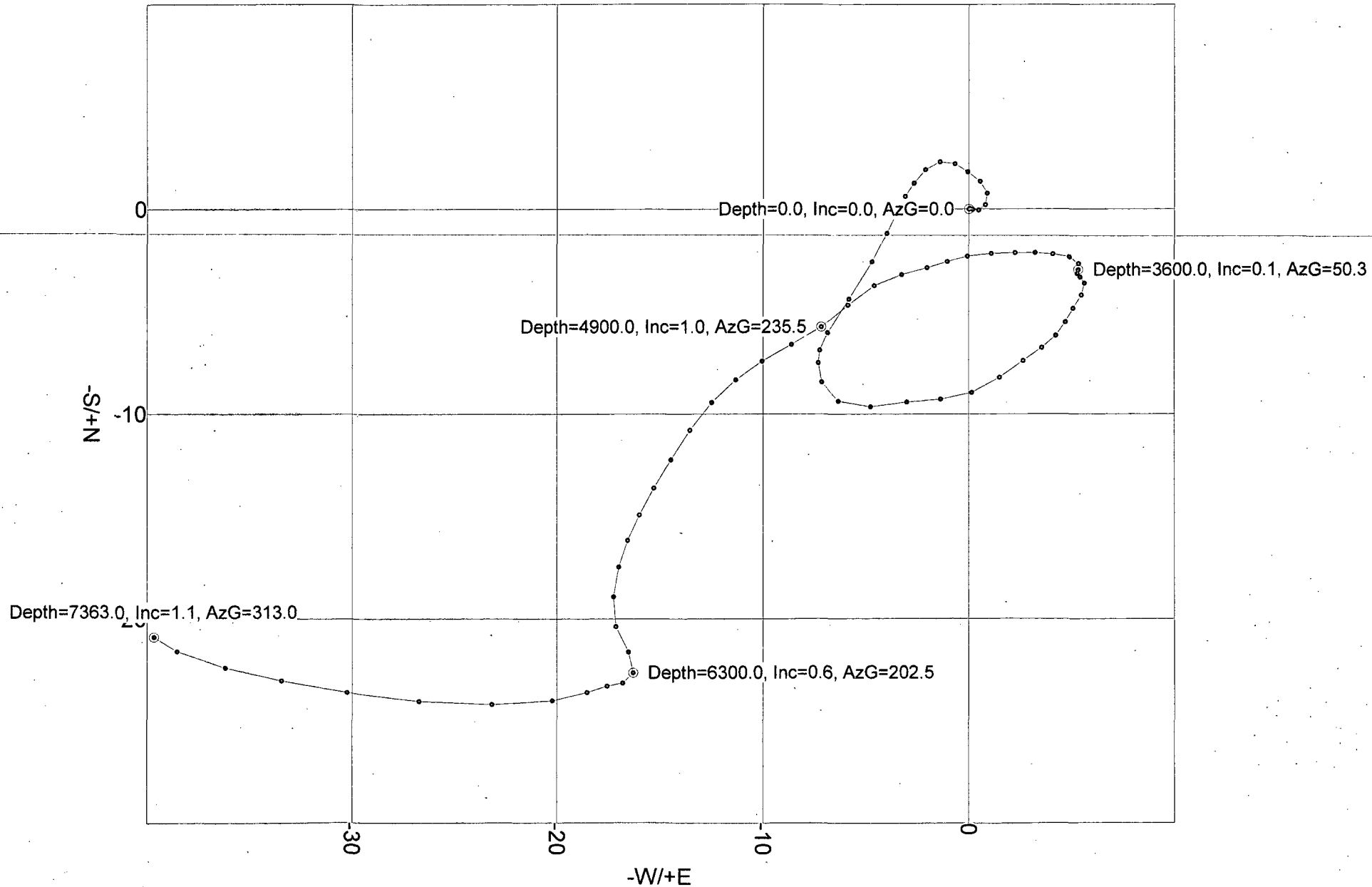
| Measured<br>Depth<br>FT | Incl<br>Angle<br>Deg | Drift<br>Direction<br>Deg | TVD<br>FT | +N/-S<br>FT | +E/-W<br>FT | Closure<br>Distance<br>FT | Closure<br>Direction<br>Deg | Dogleg<br>Severity<br>Deg/100 |
|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|-----------------------------|-------------------------------|
| 0.00                    | 0.00                 | 0.00                      | 0.00      | 0.00        | 0.00        | 0.00                      | 0.00                        | ****                          |
| 100.00                  | 0.06                 | 64.56                     | 100.00    | 0.02        | 0.05        | 0.06                      | 64.56                       | 0.06                          |
| 200.00                  | 0.13                 | 129.13                    | 200.00    | -0.02       | 0.19        | 0.19                      | 96.84                       | 0.12                          |
| 300.00                  | 0.22                 | 80.33                     | 300.00    | -0.06       | 0.46        | 0.47                      | 97.40                       | 0.17                          |
| 400.00                  | 0.32                 | 31.54                     | 400.00    | 0.21        | 0.80        | 0.83                      | 75.48                       | 0.24                          |
| 500.00                  | 0.38                 | 350.82                    | 500.00    | 0.77        | 0.89        | 1.18                      | 49.21                       | 0.25                          |
| 600.00                  | 0.44                 | 310.11                    | 599.99    | 1.35        | 0.54        | 1.45                      | 21.98                       | 0.29                          |
| 700.00                  | 0.43                 | 305.98                    | 699.99    | 1.81        | -0.05       | 1.81                      | 358.28                      | 0.03                          |
| 800.00                  | 0.41                 | 297.85                    | 799.99    | 2.20        | -0.67       | 2.30                      | 342.96                      | 0.06                          |
| 900.00                  | 0.46                 | 260.56                    | 899.99    | 2.30        | -1.39       | 2.69                      | 328.91                      | 0.28                          |
| 1000.00                 | 0.51                 | 223.26                    | 999.98    | 1.91        | -2.09       | 2.83                      | 312.47                      | 0.31                          |
| 1100.00                 | 0.47                 | 216.99                    | 1099.98   | 1.26        | -2.64       | 2.93                      | 295.56                      | 0.07                          |
| 1200.00                 | 0.43                 | 210.72                    | 1199.98   | 0.61        | -3.08       | 3.14                      | 281.29                      | 0.06                          |
| 1300.00                 | 0.58                 | 204.25                    | 1299.97   | -0.16       | -3.47       | 3.48                      | 267.28                      | 0.16                          |
| 1400.00                 | 0.72                 | 207.79                    | 1399.97   | -1.18       | -3.98       | 4.15                      | 253.45                      | 0.15                          |
| 1500.00                 | 1.06                 | 206.75                    | 1499.95   | -2.57       | -4.69       | 5.34                      | 241.29                      | 0.34                          |
| 1600.00                 | 1.40                 | 215.72                    | 1599.93   | -4.38       | -5.82       | 7.28                      | 232.99                      | 0.39                          |
| 1700.00                 | 0.83                 | 206.37                    | 1699.91   | -6.02       | -6.85       | 9.12                      | 228.67                      | 0.60                          |
| 1800.00                 | 0.26                 | 197.03                    | 1799.91   | -6.89       | -7.24       | 9.99                      | 226.42                      | 0.58                          |

| Measured<br>Depth<br>FT | Incl<br>Angle<br>Deg | Drift<br>Direction<br>Deg | TVD<br>FT | +N/-S<br>FT | +E/-W<br>FT | Closure<br>Distance<br>FT | Closure<br>Direction<br>Deg | Dogleg<br>Severity<br>Deg/100 |
|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|-----------------------------|-------------------------------|
| 1900.00                 | 0.45                 | 179.97                    | 1899.90   | -7.50       | -7.30       | 10.47                     | 224.24                      | 0.22                          |
| 2000.00                 | 0.65                 | 162.90                    | 1999.90   | -8.43       | -7.14       | 11.05                     | 220.23                      | 0.25                          |
| 2100.00                 | 0.86                 | 122.23                    | 2099.89   | -9.38       | -6.33       | 11.32                     | 214.03                      | 0.56                          |
| 2200.00                 | 1.08                 | 81.55                     | 2199.88   | -9.64       | -4.77       | 10.75                     | 206.31                      | 0.70                          |
| 2300.00                 | 0.98                 | 84.06                     | 2299.86   | -9.41       | -2.98       | 9.88                      | 197.59                      | 0.11                          |
| 2400.00                 | 0.89                 | 86.56                     | 2399.85   | -9.28       | -1.36       | 9.38                      | 188.33                      | 0.10                          |
| 2500.00                 | 0.89                 | 68.63                     | 2499.84   | -8.95       | 0.14        | 8.95                      | 179.11                      | 0.28                          |
| 2600.00                 | 0.90                 | 54.70                     | 2599.82   | -8.21       | 1.50        | 8.35                      | 169.63                      | 0.22                          |
| 2700.00                 | 0.72                 | 54.85                     | 2699.81   | -7.40       | 2.66        | 7.86                      | 160.25                      | 0.18                          |
| 2800.00                 | 0.55                 | 55.00                     | 2799.81   | -6.76       | 3.56        | 7.64                      | 152.24                      | 0.18                          |
| 2900.00                 | 0.49                 | 41.74                     | 2899.80   | -6.17       | 4.23        | 7.48                      | 145.54                      | 0.13                          |
| 3000.00                 | 0.44                 | 28.48                     | 2999.80   | -5.52       | 4.70        | 7.25                      | 139.57                      | 0.12                          |
| 3100.00                 | 0.44                 | 30.25                     | 3099.80   | -4.85       | 5.07        | 7.02                      | 133.72                      | 0.01                          |
| 3200.00                 | 0.44                 | 34.02                     | 3199.80   | -4.20       | 5.48        | 6.91                      | 127.45                      | 0.03                          |
| 3300.00                 | 0.30                 | 343.36                    | 3299.79   | -3.63       | 5.63        | 6.69                      | 122.81                      | 0.34                          |
| 3400.00                 | 0.16                 | 292.69                    | 3399.79   | -3.32       | 5.42        | 6.36                      | 121.49                      | 0.24                          |
| 3500.00                 | 0.14                 | 351.51                    | 3499.79   | -3.15       | 5.28        | 6.15                      | 120.84                      | 0.15                          |
| 3600.00                 | 0.11                 | 50.33                     | 3599.79   | -2.97       | 5.33        | 6.11                      | 119.11                      | 0.12                          |
| 3700.00                 | 0.29                 | 346.55                    | 3699.79   | -2.67       | 5.35        | 5.98                      | 116.47                      | 0.26                          |
| 3800.00                 | 0.46                 | 282.77                    | 3799.79   | -2.33       | 4.90        | 5.43                      | 115.46                      | 0.42                          |
| 3900.00                 | 0.48                 | 277.45                    | 3899.79   | -2.19       | 4.10        | 4.65                      | 118.13                      | 0.05                          |
| 4000.00                 | 0.50                 | 270.12                    | 3999.78   | -2.14       | 3.25        | 3.89                      | 123.35                      | 0.07                          |
| 4100.00                 | 0.61                 | 269.83                    | 4099.78   | -2.14       | 2.27        | 3.12                      | 133.23                      | 0.11                          |
| 4200.00                 | 0.73                 | 267.54                    | 4199.77   | -2.17       | 1.11        | 2.43                      | 152.97                      | 0.12                          |
| 4300.00                 | 0.62                 | 258.83                    | 4299.76   | -2.30       | -0.06       | 2.30                      | 181.52                      | 0.15                          |
| 4400.00                 | 0.52                 | 251.12                    | 4399.76   | -2.55       | -1.02       | 2.75                      | 201.83                      | 0.13                          |
| 4500.00                 | 0.66                 | 253.24                    | 4499.75   | -2.86       | -2.00       | 3.49                      | 214.95                      | 0.14                          |
| 4600.00                 | 0.80                 | 256.37                    | 4599.75   | -3.19       | -3.23       | 4.54                      | 225.32                      | 0.15                          |
| 4700.00                 | 0.88                 | 241.21                    | 4699.74   | -3.73       | -4.58       | 5.91                      | 230.86                      | 0.24                          |
| 4800.00                 | 0.96                 | 226.06                    | 4799.72   | -4.68       | -5.86       | 7.50                      | 231.38                      | 0.26                          |
| 4900.00                 | 0.97                 | 235.55                    | 4899.71   | -5.74       | -7.16       | 9.18                      | 231.28                      | 0.16                          |
| 5000.00                 | 0.97                 | 243.04                    | 4999.69   | -6.60       | -8.61       | 10.85                     | 232.52                      | 0.13                          |
| 5100.00                 | 0.93                 | 237.92                    | 5099.68   | -7.42       | -10.05      | 12.49                     | 233.58                      | 0.10                          |
| 5200.00                 | 0.88                 | 230.79                    | 5199.67   | -8.33       | -11.33      | 14.07                     | 233.68                      | 0.12                          |
| 5300.00                 | 0.95                 | 222.17                    | 5299.66   | -9.43       | -12.48      | 15.65                     | 232.93                      | 0.15                          |
| 5400.00                 | 1.02                 | 213.55                    | 5399.64   | -10.79      | -13.53      | 17.31                     | 231.44                      | 0.16                          |
| 5500.00                 | 0.95                 | 211.23                    | 5499.63   | -12.24      | -14.46      | 18.94                     | 229.74                      | 0.08                          |
| 5600.00                 | 0.89                 | 210.91                    | 5599.61   | -13.62      | -15.29      | 20.47                     | 228.30                      | 0.07                          |
| 5700.00                 | 0.82                 | 205.86                    | 5699.60   | -14.92      | -16.00      | 21.88                     | 226.98                      | 0.10                          |

| Measured<br>Depth<br>FT | Incl<br>Angle<br>Deg | Drift<br>Direction<br>Deg | TVD<br>FT | +N/-S<br>FT | +E/-W<br>FT | Closure<br>Distance<br>FT | Closure<br>Direction<br>Deg | Dogleg<br>Severity<br>Deg/100 |
|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|-----------------------------|-------------------------------|
| 5800.00                 | 0.75                 | 202.80                    | 5799.59   | -16.17      | -16.56      | 23.14                     | 225.69                      | 0.08                          |
| 5900.00                 | 0.82                 | 194.41                    | 5899.58   | -17.46      | -16.99      | 24.36                     | 224.22                      | 0.13                          |
| 6000.00                 | 0.88                 | 186.02                    | 5999.57   | -18.92      | -17.25      | 25.60                     | 222.36                      | 0.14                          |
| 6100.00                 | 0.83                 | 164.23                    | 6099.56   | -20.38      | -17.13      | 26.63                     | 220.04                      | 0.33                          |
| 6200.00                 | 0.78                 | 142.43                    | 6199.55   | -21.63      | -16.51      | 27.21                     | 217.36                      | 0.31                          |
| 6300.00                 | 0.58                 | 202.47                    | 6299.55   | -22.64      | -16.29      | 27.89                     | 215.74                      | 0.70                          |
| 6400.00                 | 0.37                 | 262.51                    | 6399.54   | -23.15      | -16.80      | 28.60                     | 215.98                      | 0.51                          |
| 6500.00                 | 0.52                 | 255.82                    | 6499.54   | -23.30      | -17.56      | 29.18                     | 217.01                      | 0.15                          |
| 6600.00                 | 0.66                 | 249.14                    | 6599.53   | -23.61      | -18.54      | 30.02                     | 218.13                      | 0.16                          |
| 6700.00                 | 1.35                 | 259.96                    | 6699.52   | -24.02      | -20.24      | 31.41                     | 220.11                      | 0.72                          |
| 6800.00                 | 2.05                 | 270.77                    | 6799.47   | -24.21      | -23.19      | 33.52                     | 223.77                      | 0.76                          |
| 6900.00                 | 2.03                 | 274.30                    | 6899.41   | -24.05      | -26.74      | 35.96                     | 228.03                      | 0.13                          |
| 7000.00                 | 2.02                 | 279.82                    | 6999.35   | -23.62      | -30.24      | 38.37                     | 232.01                      | 0.20                          |
| 7100.00                 | 1.75                 | 281.27                    | 7099.29   | -23.02      | -33.47      | 40.62                     | 235.49                      | 0.27                          |
| 7200.00                 | 1.48                 | 284.72                    | 7199.25   | -22.39      | -36.23      | 42.59                     | 238.28                      | 0.28                          |
| 7300.00                 | 1.35                 | 293.82                    | 7299.22   | -21.59      | -38.56      | 44.19                     | 240.76                      | 0.26                          |
| 7363.00                 | 1.07                 | 312.96                    | 7362.21   | -20.89      | -39.66      | 44.83                     | 242.23                      | 0.78                          |



Vaughn Energy Services  
(432) 563-5444  
Gardendale, TX 79758  
Surveyor: Dustin Wedel  
SRO State Unit No 031H / API 30-015-40256



VES Survey Date: 12/08/2012



# **COG Operating, LLC**

**Eddy County, NM (NAD 83)**

**Sec 4, T-26-S, R-28-E**

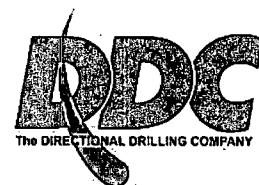
**SRO State Unit #31H**

**Wellbore #1**

**Design: Wellbore #1**

## **DDC Survey Report**

**20 December, 2012**





DDC  
Survey Report



|                  |                          |                                     |                                |
|------------------|--------------------------|-------------------------------------|--------------------------------|
| <b>Company:</b>  | COG Operating, LLC       | <b>Local Co-ordinate Reference:</b> | Well SRO State Unit #31H       |
| <b>Project:</b>  | Eddy County, NM (NAD 83) | <b>TVD Reference:</b>               | WELL @ 3004.1usft (Patriot #3) |
| <b>Site:</b>     | Sec 4, T-26-S, R-28-E    | <b>MD Reference:</b>                | WELL @ 3004.1usft (Patriot #3) |
| <b>Well:</b>     | SRO State Unit #31H      | <b>North Reference:</b>             | Grid                           |
| <b>Wellbore:</b> | Wellbore #1              | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Design:</b>   | Wellbore #1              | <b>Database:</b>                    | EDM 5000.1 Single User Db      |

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

|                       |          |                       |                 |                   |                  |
|-----------------------|----------|-----------------------|-----------------|-------------------|------------------|
| Site                  |          | Sec 4, T-26-S, R-28-E |                 |                   |                  |
| Site Position:        |          | Northing:             | 390,954.48 usft | Latitude:         | 32° 4' 28.491 N  |
| From:                 | Map      | Easting:              | 616,582.53 usft | Longitude:        | 104° 5' 25.446 W |
| Position Uncertainty: | 0.0 usft | Slot Radius:          | 13-3/16 "       | Grid Convergence: | 0.13 °           |

|                      |                     |          |                     |                 |               |                  |
|----------------------|---------------------|----------|---------------------|-----------------|---------------|------------------|
| Well                 | SRO State Unit #31H |          |                     |                 |               |                  |
| Well Position        | +N/-S               | 0.0 usft | Northing:           | 390,954.48 usft | Latitude:     | 32° 4' 28.491 N  |
|                      | +E/-W               | 0.0 usft | Easting:            | 616,582.53 usft | Longitude:    | 104° 5' 25.446 W |
| Position Uncertainty |                     | 0.0 usft | Wellhead Elevation: | usft            | Ground Level: | 2,987.1 usft     |

|           |             |             |                 |               |                     |
|-----------|-------------|-------------|-----------------|---------------|---------------------|
| Wellbore  | Wellbore #1 |             |                 |               |                     |
| Magnetics | Model Name  | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|           | IGRF2010    | 11/27/2012  | 7.63            | 59.92         | 48.327              |

|                   |                            |                 |                 |                  |     |
|-------------------|----------------------------|-----------------|-----------------|------------------|-----|
| Design            |                            | Wellbore #1     |                 |                  |     |
| Audit Notes:      |                            |                 |                 |                  |     |
| Version:          | 1.0                        | Phase:          | ACTUAL          | Tie On Depth:    | 0.0 |
| Vertical Section: | Depth From (TVD)<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Direction<br>(°) |     |
|                   | 0.0                        | 0.0             | 0.0             | 179.52           |     |

|                |           |                    |             |                |
|----------------|-----------|--------------------|-------------|----------------|
| Survey Program |           | Date               | 12/20/2012  |                |
| From (usft)    | To (usft) | Survey (Wellbore)  | Tool Name   | Description    |
| 100.0          | 7,363.0   | GYRO (Wellbore #1) | Good_gyro   | Good Gyro      |
| 7,436.0        | 16,394.0  | MWD (Wellbore #1)  | MWD default | MWD - Standard |

|                              |                        |                    |                              |                     |                     |                                |                                |                               |                              |
|------------------------------|------------------------|--------------------|------------------------------|---------------------|---------------------|--------------------------------|--------------------------------|-------------------------------|------------------------------|
| <b>Survey</b>                |                        |                    |                              |                     |                     |                                |                                |                               |                              |
| <b>Measured Depth (usft)</b> | <b>Inclination (°)</b> | <b>Azimuth (°)</b> | <b>Vertical Depth (usft)</b> | <b>+N/-S (usft)</b> | <b>+E/-W (usft)</b> | <b>Vertical Section (usft)</b> | <b>Dogleg Rate (°/100usft)</b> | <b>Build Rate (°/100usft)</b> | <b>Turn Rate (°/100usft)</b> |
| 0.0                          | 0.00                   | 0.00               | 0.0                          | 0.0                 | 0.0                 | 0.0                            | 0.00                           | 0.00                          | 0.00                         |
| 100.0                        | 0.06                   | 64.56              | 100.0                        | 0.0                 | 0.0                 | 0.0                            | 0.06                           | 0.06                          | 0.00                         |
| 200.0                        | 0.13                   | 129.13             | 200.0                        | 0.0                 | 0.2                 | 0.0                            | 0.12                           | 0.07                          | 64.57                        |
| 300.0                        | 0.22                   | 80.33              | 300.0                        | -0.1                | 0.5                 | 0.1                            | 0.17                           | 0.09                          | -48.80                       |
| 400.0                        | 0.32                   | 31.54              | 400.0                        | 0.2                 | 0.8                 | -0.2                           | 0.24                           | 0.10                          | -48.79                       |
| 500.0                        | 0.38                   | 350.82             | 500.0                        | 0.8                 | 0.9                 | -0.8                           | 0.25                           | 0.06                          | -40.72                       |
| 600.0                        | 0.44                   | 310.11             | 600.0                        | 1.3                 | 0.5                 | -1.3                           | 0.29                           | 0.06                          | -40.71                       |
| 700.0                        | 0.43                   | 305.98             | 700.0                        | 1.8                 | -0.1                | -1.8                           | 0.03                           | -0.01                         | -4.13                        |
| 800.0                        | 0.41                   | 297.85             | 800.0                        | 2.2                 | -0.7                | -2.2                           | 0.06                           | -0.02                         | -8.13                        |
| 900.0                        | 0.46                   | 260.56             | 900.0                        | 2.3                 | -1.4                | -2.3                           | 0.28                           | 0.05                          | -37.29                       |



DDC  
Survey Report



|           |                          |                              |                                |
|-----------|--------------------------|------------------------------|--------------------------------|
| Company:  | COG Operating, LLC       | Local Co-ordinate Reference: | Well SRO State Unit #31H       |
| Project:  | Eddy County, NM (NAD 83) | TVD Reference:               | WELL @ 3004.1usft (Patriot #3) |
| Site:     | Sec 4, T-26-S, R-28-E    | MD Reference:                | WELL @ 3004.1usft (Patriot #3) |
| Well:     | SRO State Unit #31H      | North Reference:             | Grid                           |
| Wellbore: | Wellbore #1              | Survey Calculation Method:   | Minimum Curvature              |
| Design:   | Wellbore #1              | Database:                    | EDM 5000.1 Single User Db      |

| 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) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 1,000.0               | 0.51            | 223.26      | 1,000.0               | 1.9          | -2.1         | -1.9                    | 0.31                    | 0.05                   | -37.30                |
| 1,100.0               | 0.47            | 216.99      | 1,100.0               | 1.3          | -2.6         | -1.3                    | 0.07                    | -0.04                  | -6.27                 |
| 1,200.0               | 0.43            | 210.72      | 1,200.0               | 0.6          | -3.1         | -0.6                    | 0.06                    | -0.04                  | -6.27                 |
| 1,300.0               | 0.58            | 204.25      | 1,300.0               | -0.2         | -3.5         | 0.1                     | 0.16                    | 0.15                   | -6.47                 |
| 1,400.0               | 0.72            | 207.79      | 1,400.0               | -1.2         | -4.0         | 1.2                     | 0.15                    | 0.14                   | 3.54                  |
| 1,500.0               | 1.06            | 206.75      | 1,500.0               | -2.6         | -4.7         | 2.5                     | 0.34                    | 0.34                   | -1.04                 |
| 1,600.0               | 1.40            | 215.72      | 1,599.9               | -4.4         | -5.8         | 4.3                     | 0.39                    | 0.34                   | 8.97                  |
| 1,700.0               | 0.83            | 206.37      | 1,699.9               | -6.0         | -6.9         | 6.0                     | 0.60                    | -0.57                  | -9.35                 |
| 1,800.0               | 0.26            | 197.03      | 1,799.9               | -6.9         | -7.2         | 6.8                     | 0.57                    | -0.57                  | -9.34                 |
| 1,900.0               | 0.45            | 179.97      | 1,899.9               | -7.5         | -7.3         | 7.4                     | 0.22                    | 0.19                   | -17.06                |
| 2,000.0               | 0.65            | 162.90      | 1,999.9               | -8.4         | -7.1         | 8.4                     | 0.26                    | 0.20                   | -17.07                |
| 2,100.0               | 0.86            | 122.23      | 2,099.9               | -9.4         | -6.3         | 9.3                     | 0.56                    | 0.21                   | -40.67                |
| 2,200.0               | 1.08            | 81.55       | 2,199.9               | -9.6         | -4.8         | 9.6                     | 0.71                    | 0.22                   | -40.68                |
| 2,300.0               | 0.98            | 84.06       | 2,299.9               | -9.4         | -3.0         | 9.4                     | 0.11                    | -0.10                  | 2.51                  |
| 2,400.0               | 0.89            | 86.56       | 2,399.8               | -9.3         | -1.4         | 9.3                     | 0.10                    | -0.09                  | 2.50                  |
| 2,500.0               | 0.89            | 68.63       | 2,499.8               | -9.0         | 0.1          | 9.0                     | 0.28                    | 0.00                   | -17.93                |
| 2,600.0               | 0.90            | 54.70       | 2,599.8               | -8.2         | 1.5          | 8.2                     | 0.22                    | 0.01                   | -13.93                |
| 2,700.0               | 0.72            | 54.85       | 2,699.8               | -7.4         | 2.7          | 7.4                     | 0.18                    | -0.18                  | 0.15                  |
| 2,800.0               | 0.55            | 55.00       | 2,799.8               | -6.8         | 3.6          | 6.8                     | 0.17                    | -0.17                  | 0.15                  |
| 2,900.0               | 0.49            | 41.74       | 2,899.8               | -6.2         | 4.2          | 6.2                     | 0.13                    | -0.06                  | -13.26                |
| 3,000.0               | 0.44            | 28.48       | 2,999.8               | -5.5         | 4.7          | 5.6                     | 0.12                    | -0.05                  | -13.26                |
| 3,100.0               | 0.44            | 30.25       | 3,099.8               | -4.8         | 5.1          | 4.9                     | 0.01                    | 0.00                   | 1.77                  |
| 3,200.0               | 0.44            | 34.02       | 3,199.8               | -4.2         | 5.5          | 4.2                     | 0.03                    | 0.00                   | 3.77                  |
| 3,300.0               | 0.30            | 343.36      | 3,299.8               | -3.6         | 5.6          | 3.7                     | 0.34                    | -0.14                  | -50.66                |
| 3,400.0               | 0.16            | 292.69      | 3,399.8               | -3.3         | 5.4          | 3.4                     | 0.23                    | -0.14                  | -50.67                |
| 3,500.0               | 0.14            | 351.51      | 3,499.8               | -3.1         | 5.3          | 3.2                     | 0.15                    | -0.02                  | 58.82                 |
| 3,600.0               | 0.11            | 50.33       | 3,599.8               | -3.0         | 5.3          | 3.0                     | 0.13                    | -0.03                  | 58.82                 |
| 3,700.0               | 0.29            | 346.55      | 3,699.8               | -2.7         | 5.4          | 2.7                     | 0.26                    | 0.18                   | -63.78                |
| 3,800.0               | 0.46            | 282.77      | 3,799.8               | -2.3         | 4.9          | 2.4                     | 0.42                    | 0.17                   | -63.78                |
| 3,900.0               | 0.48            | 277.45      | 3,899.8               | -2.2         | 4.1          | 2.2                     | 0.05                    | 0.02                   | -5.32                 |
| 4,000.0               | 0.50            | 270.12      | 3,999.8               | -2.1         | 3.2          | 2.2                     | 0.07                    | 0.02                   | -7.33                 |
| 4,100.0               | 0.61            | 269.83      | 4,099.8               | -2.1         | 2.3          | 2.1                     | 0.11                    | 0.11                   | -0.29                 |
| 4,200.0               | 0.73            | 267.54      | 4,199.8               | -2.2         | 1.1          | 2.2                     | 0.12                    | 0.12                   | -2.29                 |
| 4,300.0               | 0.62            | 258.83      | 4,299.8               | -2.3         | -0.1         | 2.3                     | 0.15                    | -0.11                  | -8.71                 |
| 4,400.0               | 0.52            | 251.12      | 4,399.8               | -2.5         | -1.0         | 2.5                     | 0.13                    | -0.10                  | -7.71                 |
| 4,500.0               | 0.66            | 253.24      | 4,499.8               | -2.9         | -2.0         | 2.8                     | 0.14                    | 0.14                   | 2.12                  |
| 4,600.0               | 0.80            | 256.37      | 4,599.7               | -3.2         | -3.2         | 3.2                     | 0.15                    | 0.14                   | 3.13                  |
| 4,700.0               | 0.88            | 241.21      | 4,699.7               | -3.7         | -4.6         | 3.7                     | 0.24                    | 0.08                   | -15.16                |
| 4,800.0               | 0.96            | 226.06      | 4,799.7               | -4.7         | -5.9         | 4.6                     | 0.26                    | 0.08                   | -15.15                |
| 4,900.0               | 0.97            | 235.55      | 4,899.7               | -5.7         | -7.2         | 5.7                     | 0.16                    | 0.01                   | 9.49                  |
| 5,000.0               | 0.97            | 243.04      | 4,999.7               | -6.6         | -8.6         | 6.5                     | 0.13                    | 0.00                   | 7.49                  |
| 5,100.0               | 0.93            | 237.92      | 5,099.7               | -7.4         | -10.1        | 7.3                     | 0.09                    | -0.04                  | -5.12                 |
| 5,200.0               | 0.88            | 230.79      | 5,199.7               | -8.3         | -11.3        | 8.2                     | 0.12                    | -0.05                  | -7.13                 |



# DDC Survey Report



|                  |                          |                                     |                                 |
|------------------|--------------------------|-------------------------------------|---------------------------------|
| <b>Company:</b>  | COG Operating, LLC       | <b>Local Co-ordinate Reference:</b> | Well SRO State Unit #31H        |
| <b>Project:</b>  | Eddy County, NM (NAD 83) | <b>TVD Reference:</b>               | WELL @ 3004.1usft (Patriot #3)  |
| <b>Site:</b>     | Sec 4, T-26-S, R-28-E    | <b>MD Reference:</b>                | WELL @ 3004.1usft (Patriot #3), |
| <b>Well:</b>     | SRO State Unit #31H      | <b>North Reference:</b>             | Grid                            |
| <b>Wellbore:</b> | Wellbore #1              | <b>Survey Calculation Method:</b>   | Minimum Curvature               |
| <b>Design:</b>   | Wellbore #1              | <b>Database:</b>                    | EDM 5000.1 Single User Db       |

| 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) |  |
| 5,300.0                                 | 0.95            | 222.17      | 5,299.7               | -9.4         | -12.5        | 9.3                     | 0.15                    | 0.07                   | -8.62                 |  |
| 5,400.0                                 | 1.02            | 213.55      | 5,399.6               | -10.8        | -13.5        | 10.7                    | 0.16                    | 0.07                   | -8.62                 |  |
| 5,500.0                                 | 0.95            | 211.23      | 5,499.6               | -12.2        | -14.5        | 12.1                    | 0.08                    | -0.07                  | -2.32                 |  |
| 5,600.0                                 | 0.89            | 210.91      | 5,599.6               | -13.6        | -15.3        | 13.5                    | 0.06                    | -0.06                  | -0.32                 |  |
| 5,700.0                                 | 0.82            | 205.86      | 5,699.6               | -14.9        | -16.0        | 14.8                    | 0.10                    | -0.07                  | -5.05                 |  |
| 5,800.0                                 | 0.75            | 202.80      | 5,799.6               | -16.2        | -16.6        | 16.0                    | 0.08                    | -0.07                  | -3.06                 |  |
| 5,900.0                                 | 0.82            | 194.41      | 5,899.6               | -17.5        | -17.0        | 17.3                    | 0.13                    | 0.07                   | -8.39                 |  |
| 6,000.0                                 | 0.88            | 186.02      | 5,999.6               | -18.9        | -17.3        | 18.8                    | 0.14                    | 0.06                   | -8.39                 |  |
| 6,100.0                                 | 0.83            | 164.23      | 6,099.6               | -20.4        | -17.1        | 20.2                    | 0.33                    | -0.05                  | -21.79                |  |
| 6,200.0                                 | 0.78            | 142.43      | 6,199.6               | -21.6        | -16.5        | 21.5                    | 0.31                    | -0.05                  | -21.80                |  |
| 6,300.0                                 | 0.58            | 202.47      | 6,299.5               | -22.6        | -16.3        | 22.5                    | 0.70                    | -0.20                  | 60.04                 |  |
| 6,400.0                                 | 0.37            | 262.51      | 6,399.5               | -23.1        | -16.8        | 23.0                    | 0.51                    | -0.21                  | 60.04                 |  |
| 6,500.0                                 | 0.52            | 255.82      | 6,499.5               | -23.3        | -17.6        | 23.1                    | 0.16                    | 0.15                   | -6.69                 |  |
| 6,600.0                                 | 0.66            | 249.14      | 6,599.5               | -23.6        | -18.6        | 23.4                    | 0.16                    | 0.14                   | -6.68                 |  |
| 6,700.0                                 | 1.35            | 259.96      | 6,699.5               | -24.0        | -20.3        | 23.8                    | 0.71                    | 0.69                   | 10.82                 |  |
| 6,800.0                                 | 2.05            | 270.77      | 6,799.5               | -24.2        | -23.2        | 24.0                    | 0.77                    | 0.70                   | 10.81                 |  |
| 6,900.0                                 | 2.03            | 274.30      | 6,899.4               | -24.0        | -26.8        | 23.8                    | 0.13                    | -0.02                  | 3.53                  |  |
| 7,000.0                                 | 2.02            | 279.82      | 6,999.3               | -23.6        | -30.3        | 23.3                    | 0.20                    | -0.01                  | 5.52                  |  |
| 7,100.0                                 | 1.75            | 281.27      | 7,099.3               | -23.0        | -33.5        | 22.7                    | 0.27                    | -0.27                  | 1.45                  |  |
| 7,200.0                                 | 1.48            | 284.72      | 7,199.3               | -22.4        | -36.2        | 22.1                    | 0.29                    | -0.27                  | 3.45                  |  |
| 7,300.0                                 | 1.35            | 293.82      | 7,299.2               | -21.6        | -38.6        | 21.2                    | 0.26                    | -0.13                  | 9.10                  |  |
| 7,363.0                                 | 1.07            | 312.96      | 7,362.2               | -20.9        | -39.7        | 20.5                    | 0.77                    | -0.44                  | 30.38                 |  |
| TIE IN @ 7436' MD / 7435' TVD           |                 |             |                       |              |              |                         |                         |                        |                       |  |
| 7,436.0                                 | 0.80            | 255.80      | 7,435.2               | -20.5        | -40.7        | 20.2                    | 1.27                    | -0.37                  | -78.30                |  |
| 7,468.0                                 | 4.00            | 173.70      | 7,467.2               | -21.7        | -40.8        | 21.4                    | 12.41                   | 10.00                  | -256.56               |  |
| 7,500.0                                 | 8.70            | 165.20      | 7,499.0               | -25.1        | -40.0        | 24.8                    | 14.94                   | 14.69                  | -26.56                |  |
| 7,532.0                                 | 13.00           | 163.30      | 7,530.4               | -30.9        | -38.4        | 30.6                    | 13.48                   | 13.44                  | -5.94                 |  |
| 7,563.0                                 | 16.80           | 166.60      | 7,560.3               | -38.6        | -36.3        | 38.3                    | 12.56                   | 12.26                  | 10.65                 |  |
| 7,595.0                                 | 20.20           | 173.00      | 7,590.7               | -48.6        | -34.6        | 48.3                    | 12.36                   | 10.63                  | 20.00                 |  |
| 7,627.0                                 | 24.10           | 173.40      | 7,620.3               | -60.6        | -33.2        | 60.3                    | 12.20                   | 12.19                  | 1.25                  |  |
| CROSSED HARDLINE @ 7649' MD / 7640' TVD |                 |             |                       |              |              |                         |                         |                        |                       |  |
| 7,649.0                                 | 26.87           | 172.74      | 7,640.2               | -70.0        | -32.0        | 69.7                    | 12.64                   | 12.58                  | -3.02                 |  |
| 7,658.0                                 | 28.00           | 172.50      | 7,648.2               | -74.1        | -31.5        | 73.8                    | 12.64                   | 12.59                  | -2.62                 |  |
| 7,690.0                                 | 31.40           | 171.90      | 7,676.0               | -89.8        | -29.3        | 89.6                    | 10.67                   | 10.63                  | -1.88                 |  |
| 7,722.0                                 | 34.40           | 175.50      | 7,702.8               | -107.1       | -27.4        | 106.8                   | 11.19                   | 9.38                   | 11.25                 |  |
| 7,753.0                                 | 37.00           | 180.90      | 7,728.0               | -125.1       | -26.9        | 124.9                   | 13.17                   | 8.39                   | 17.42                 |  |
| 7,785.0                                 | 39.70           | 184.90      | 7,753.1               | -145.0       | -27.9        | 144.7                   | 11.46                   | 8.44                   | 12.50                 |  |
| 7,817.0                                 | 42.80           | 185.60      | 7,777.2               | -166.0       | -29.9        | 165.7                   | 9.79                    | 9.69                   | 2.19                  |  |
| 7,848.0                                 | 45.10           | 183.20      | 7,799.5               | -187.4       | -31.5        | 187.1                   | 9.16                    | 7.42                   | -7.74                 |  |
| 7,880.0                                 | 47.10           | 179.20      | 7,821.7               | -210.5       | -32.0        | 210.2                   | 10.96                   | 6.25                   | -12.50                |  |
| 7,912.0                                 | 49.90           | 177.30      | 7,842.9               | -234.4       | -31.2        | 234.1                   | 9.81                    | 8.75                   | -5.94                 |  |
| 7,944.0                                 | 52.80           | 176.80      | 7,862.9               | -259.4       | -29.9        | 259.1                   | 9.14                    | 9.06                   | -1.56                 |  |
| 7,975.0                                 | 55.60           | 176.80      | 7,881.0               | -284.5       | -28.5        | 284.2                   | 9.03                    | 9.03                   | 0.00                  |  |
| 8,007.0                                 | 58.50           | 176.80      | 7,898.4               | -311.3       | -27.0        | 311.0                   | 9.06                    | 9.06                   | 0.00                  |  |



# DDC Survey Report



|                  |                          |                                     |                                |
|------------------|--------------------------|-------------------------------------|--------------------------------|
| <b>Company:</b>  | COG Operating, LLC       | <b>Local Co-ordinate Reference:</b> | Well SRO State Unit #31H       |
| <b>Project:</b>  | Eddy County, NM (NAD 83) | <b>TVD Reference:</b>               | WELL @ 3004.1usft (Patriot #3) |
| <b>Site:</b>     | Sec 4, T-26-S, R-28-E    | <b>MD Reference:</b>                | WELL @ 3004.1usft (Patriot #3) |
| <b>Well:</b>     | SRO State Unit #31H      | <b>North Reference:</b>             | Grid                           |
| <b>Wellbore:</b> | Wellbore #1              | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Design:</b>   | Wellbore #1              | <b>Database:</b>                    | EDM 5000.1 Single User Db      |

| 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) |  |
| 8,039.0               | 61.10           | 176.80      | 7,914.5               | -338.9       | -25.5        | 338.7                   | 8.13                    | 8.13                   | 0.00                  |  |
| 8,070.0               | 63.50           | 177.70      | 7,928.9               | -366.3       | -24.2        | 366.1                   | 8.16                    | 7.74                   | 2.90                  |  |
| 8,102.0               | 65.50           | 178.40      | 7,942.7               | -395.2       | -23.2        | 395.0                   | 6.55                    | 6.25                   | 2.19                  |  |
| 8,134.0               | 67.80           | 178.20      | 7,955.4               | -424.5       | -22.3        | 424.3                   | 7.21                    | 7.19                   | -0.63                 |  |
| 8,165.0               | 70.60           | 178.90      | 7,966.4               | -453.5       | -21.6        | 453.3                   | 9.28                    | 9.03                   | 2.26                  |  |
| 8,197.0               | 73.00           | 179.50      | 7,976.4               | -483.9       | -21.2        | 483.7                   | 7.71                    | 7.50                   | 1.88                  |  |
| 8,229.0               | 75.10           | 177.70      | 7,985.1               | -514.6       | -20.4        | 514.5                   | 8.50                    | 6.56                   | -5.63                 |  |
| 8,260.0               | 76.50           | 177.40      | 7,992.8               | -544.7       | -19.1        | 544.5                   | 4.61                    | 4.52                   | -0.97                 |  |
| 8,292.0               | 78.80           | 177.70      | 7,999.6               | -575.9       | -17.8        | 575.7                   | 7.25                    | 7.19                   | 0.94                  |  |
| 8,323.0               | 80.70           | 178.30      | 8,005.1               | -606.4       | -16.7        | 606.2                   | 6.42                    | 6.13                   | 1.94                  |  |
| 8,355.0               | 83.40           | 179.90      | 8,009.5               | -638.1       | -16.2        | 637.9                   | 9.78                    | 8.44                   | 5.00                  |  |
| 8,387.0               | 86.30           | 180.90      | 8,012.4               | -669.9       | -16.5        | 669.8                   | 9.58                    | 9.06                   | 3.13                  |  |
| 8,450.0               | 89.90           | 180.60      | 8,014.5               | -732.9       | -17.3        | 732.7                   | 5.73                    | 5.71                   | -0.48                 |  |
| 8,513.0               | 90.20           | 180.50      | 8,014.4               | -795.9       | -17.9        | 795.7                   | 0.50                    | 0.48                   | -0.16                 |  |
| 8,576.0               | 90.20           | 178.80      | 8,014.2               | -858.9       | -17.5        | 858.7                   | 2.70                    | 0.00                   | -2.70                 |  |
| 8,640.0               | 90.50           | 177.70      | 8,013.8               | -922.8       | -15.6        | 922.7                   | 1.78                    | 0.47                   | -1.72                 |  |
| 8,703.0               | 88.90           | 178.00      | 8,014.2               | -985.8       | -13.2        | 985.7                   | 2.58                    | -2.54                  | 0.48                  |  |
| 8,767.0               | 87.80           | 178.50      | 8,016.0               | -1,049.7     | -11.2        | 1,049.6                 | 1.89                    | -1.72                  | 0.78                  |  |
| 8,830.0               | 88.10           | 178.90      | 8,018.3               | -1,112.7     | -9.8         | 1,112.6                 | 0.79                    | 0.48                   | 0.63                  |  |
| 8,893.0               | 89.20           | 179.10      | 8,019.7               | -1,175.7     | -8.7         | 1,175.5                 | 1.77                    | 1.75                   | 0.32                  |  |
| 8,956.0               | 89.60           | 180.00      | 8,020.4               | -1,238.7     | -8.2         | 1,238.5                 | 1.56                    | 0.63                   | 1.43                  |  |
| 9,051.0               | 89.50           | 180.30      | 8,021.1               | -1,333.6     | -8.5         | 1,333.5                 | 0.33                    | -0.11                  | 0.32                  |  |
| 9,146.0               | 89.60           | 179.50      | 8,021.9               | -1,428.6     | -8.3         | 1,428.5                 | 0.85                    | 0.11                   | -0.84                 |  |
| 9,241.0               | 89.30           | 178.80      | 8,022.8               | -1,523.6     | -6.9         | 1,523.5                 | 0.80                    | -0.32                  | -0.74                 |  |
| 9,336.0               | 90.60           | 179.40      | 8,022.9               | -1,618.6     | -5.4         | 1,618.5                 | 1.51                    | 1.37                   | 0.63                  |  |
| 9,431.0               | 88.20           | 179.00      | 8,023.9               | -1,713.6     | -4.1         | 1,713.5                 | 2.56                    | -2.53                  | -0.42                 |  |
| 9,495.0               | 88.10           | 178.40      | 8,026.0               | -1,777.5     | -2.6         | 1,777.5                 | 0.95                    | -0.16                  | -0.94                 |  |
| 9,590.0               | 87.00           | 179.90      | 8,030.0               | -1,872.4     | -1.2         | 1,872.4                 | 1.96                    | -1.16                  | 1.58                  |  |
| 9,685.0               | 86.70           | 179.40      | 8,035.2               | -1,967.3     | -0.6         | 1,967.2                 | 0.61                    | -0.32                  | -0.53                 |  |
| 9,748.0               | 86.60           | 178.60      | 8,038.9               | -2,030.2     | 0.5          | 2,030.1                 | 1.28                    | -0.16                  | -1.27                 |  |
| 9,812.0               | 86.70           | 179.40      | 8,042.7               | -2,094.1     | 1.6          | 2,094.0                 | 1.26                    | 0.16                   | 1.25                  |  |
| 9,906.0               | 89.80           | 180.10      | 8,045.5               | -2,188.0     | 2.0          | 2,187.9                 | 3.38                    | 3.30                   | 0.74                  |  |
| 9,969.0               | 89.80           | 180.90      | 8,045.7               | -2,251.0     | 1.4          | 2,250.9                 | 1.27                    | 0.00                   | 1.27                  |  |
| 10,064.0              | 89.40           | 180.60      | 8,046.4               | -2,346.0     | 0.2          | 2,345.9                 | 0.53                    | -0.42                  | -0.32                 |  |
| 10,159.0              | 89.20           | 180.60      | 8,047.6               | -2,441.0     | -0.8         | 2,440.9                 | 0.21                    | -0.21                  | 0.00                  |  |
| 10,254.0              | 88.80           | 180.80      | 8,049.2               | -2,536.0     | -2.0         | 2,535.8                 | 0.47                    | -0.42                  | 0.21                  |  |
| 10,349.0              | 88.30           | 180.70      | 8,051.6               | -2,630.9     | -3.2         | 2,630.8                 | 0.54                    | -0.53                  | -0.11                 |  |
| 10,444.0              | 89.60           | 180.60      | 8,053.4               | -2,725.9     | -4.3         | 2,725.8                 | 1.37                    | 1.37                   | -0.11                 |  |
| 10,538.0              | 90.30           | 180.80      | 8,053.5               | -2,819.9     | -5.4         | 2,819.7                 | 0.77                    | 0.74                   | 0.21                  |  |
| 10,634.0              | 89.60           | 181.20      | 8,053.5               | -2,915.9     | -7.1         | 2,915.7                 | 0.84                    | -0.73                  | 0.42                  |  |
| 10,729.0              | 88.20           | 181.00      | 8,055.4               | -3,010.8     | -8.9         | 3,010.6                 | 1.49                    | -1.47                  | -0.21                 |  |
| 10,823.0              | 89.50           | 180.60      | 8,057.2               | -3,104.8     | -10.2        | 3,104.6                 | 1.45                    | 1.38                   | -0.43                 |  |
| 10,918.0              | 88.80           | 180.00      | 8,058.7               | -3,199.8     | -10.7        | 3,199.6                 | 0.97                    | -0.74                  | -0.63                 |  |



DDC  
Survey Report



|                  |                          |                                     |                                |
|------------------|--------------------------|-------------------------------------|--------------------------------|
| <b>Company:</b>  | COG Operating, LLC       | <b>Local Co-ordinate Reference:</b> | Well SRO State Unit #31H       |
| <b>Project:</b>  | Eddy County, NM (NAD 83) | <b>TVD Reference:</b>               | WELL @ 3004.1usft (Patriot #3) |
| <b>Site:</b>     | Sec 4, T-26-S, R-28-E    | <b>MD Reference:</b>                | WELL @ 3004.1usft (Patriot #3) |
| <b>Well:</b>     | SRO State Unit #31H      | <b>North Reference:</b>             | Grid                           |
| <b>Wellbore:</b> | Wellbore #1              | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Design:</b>   | Wellbore #1              | <b>Database:</b>                    | EDM 5000.1 Single User Db      |

| 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) |  |
| 11,013.0              | 88.60           | 178.80      | 8,060.8               | -3,294.8     | -9.7         | 3,294.6                 | 1.28                    | -0.21                  | -1.26                 |  |
| 11,108.0              | 89.80           | 178.70      | 8,062.1               | -3,389.7     | -7.7         | 3,389.5                 | 1.27                    | 1.26                   | -0.11                 |  |
| 11,203.0              | 89.30           | 179.30      | 8,062.9               | -3,484.7     | -6.0         | 3,484.5                 | 0.82                    | -0.53                  | 0.63                  |  |
| 11,298.0              | 89.70           | 179.80      | 8,063.7               | -3,579.7     | -5.3         | 3,579.5                 | 0.67                    | 0.42                   | 0.53                  |  |
| 11,394.0              | 89.40           | 180.60      | 8,064.5               | -3,675.7     | -5.6         | 3,675.5                 | 0.89                    | -0.31                  | 0.83                  |  |
| 11,488.0              | 90.20           | 179.90      | 8,064.8               | -3,769.7     | -6.0         | 3,769.5                 | 1.13                    | 0.85                   | -0.74                 |  |
| 11,583.0              | 89.80           | 180.40      | 8,064.8               | -3,864.7     | -6.3         | 3,864.5                 | 0.67                    | -0.42                  | 0.53                  |  |
| 11,678.0              | 90.80           | 179.80      | 8,064.3               | -3,959.7     | -6.4         | 3,959.5                 | 1.23                    | 1.05                   | -0.63                 |  |
| 11,772.0              | 90.10           | 180.20      | 8,063.6               | -4,053.7     | -6.4         | 4,053.5                 | 0.86                    | -0.74                  | 0.43                  |  |
| 11,866.0              | 89.80           | 180.20      | 8,063.6               | -4,147.7     | -6.7         | 4,147.5                 | 0.32                    | -0.32                  | 0.00                  |  |
| 11,961.0              | 90.80           | 180.10      | 8,063.1               | -4,242.7     | -7.0         | 4,242.5                 | 1.06                    | 1.05                   | -0.11                 |  |
| 12,056.0              | 90.50           | 178.50      | 8,062.1               | -4,337.7     | -5.8         | 4,337.5                 | 1.71                    | -0.32                  | -1.68                 |  |
| 12,151.0              | 90.10           | 178.80      | 8,061.6               | -4,432.6     | -3.6         | 4,432.4                 | 0.53                    | -0.42                  | 0.32                  |  |
| 12,245.0              | 89.30           | 178.40      | 8,062.1               | -4,526.6     | -1.3         | 4,526.4                 | 0.95                    | -0.85                  | -0.43                 |  |
| 12,339.0              | 88.80           | 177.60      | 8,063.6               | -4,620.5     | 2.0          | 4,620.4                 | 1.00                    | -0.53                  | -0.85                 |  |
| 12,434.0              | 89.80           | 178.60      | 8,064.8               | -4,715.5     | 5.1          | 4,715.3                 | 1.49                    | 1.05                   | 1.05                  |  |
| 12,527.0              | 90.60           | 179.30      | 8,064.5               | -4,808.5     | 6.8          | 4,808.3                 | 1.14                    | 0.86                   | 0.75                  |  |
| 12,622.0              | 90.20           | 180.50      | 8,063.8               | -4,903.4     | 7.0          | 4,903.3                 | 1.33                    | -0.42                  | 1.26                  |  |
| 12,716.0              | 89.30           | 179.30      | 8,064.2               | -4,997.4     | 7.2          | 4,997.3                 | 1.60                    | -0.96                  | -1.28                 |  |
| 12,778.0              | 89.30           | 179.20      | 8,065.0               | -5,059.4     | 8.0          | 5,059.3                 | 0.16                    | 0.00                   | -0.16                 |  |
| 12,873.0              | 89.20           | 179.20      | 8,066.2               | -5,154.4     | 9.3          | 5,154.3                 | 0.11                    | -0.11                  | 0.00                  |  |
| 12,968.0              | 88.80           | 179.70      | 8,067.9               | -5,249.4     | 10.2         | 5,249.3                 | 0.67                    | -0.42                  | 0.53                  |  |
| 13,062.0              | 88.80           | 179.00      | 8,069.8               | -5,343.4     | 11.3         | 5,343.3                 | 0.74                    | 0.00                   | -0.74                 |  |
| 13,157.0              | 88.70           | 179.00      | 8,071.9               | -5,438.3     | 12.9         | 5,438.3                 | 0.11                    | -0.11                  | 0.00                  |  |
| 13,252.0              | 88.50           | 179.00      | 8,074.2               | -5,533.3     | 14.6         | 5,533.2                 | 0.21                    | -0.21                  | 0.00                  |  |
| 13,345.0              | 88.80           | 179.90      | 8,076.4               | -5,626.3     | 15.5         | 5,626.2                 | 1.02                    | 0.32                   | 0.97                  |  |
| 13,439.0              | 89.50           | 179.10      | 8,077.8               | -5,720.2     | 16.3         | 5,720.2                 | 1.13                    | 0.74                   | -0.85                 |  |
| 13,534.0              | 89.80           | 179.10      | 8,078.4               | -5,815.2     | 17.8         | 5,815.2                 | 0.32                    | 0.32                   | 0.00                  |  |
| 13,629.0              | 89.90           | 179.00      | 8,078.6               | -5,910.2     | 19.4         | 5,910.2                 | 0.15                    | 0.11                   | -0.11                 |  |
| 13,724.0              | 90.20           | 178.90      | 8,078.6               | -6,005.2     | 21.1         | 6,005.2                 | 0.33                    | 0.32                   | -0.11                 |  |
| 13,818.0              | 89.00           | 179.70      | 8,079.2               | -6,099.2     | 22.3         | 6,099.2                 | 1.53                    | -1.28                  | 0.85                  |  |
| 13,913.0              | 88.80           | 180.10      | 8,081.0               | -6,194.2     | 22.4         | 6,194.1                 | 0.47                    | -0.21                  | 0.42                  |  |
| 14,008.0              | 89.60           | 179.60      | 8,082.4               | -6,289.2     | 22.7         | 6,289.1                 | 0.99                    | 0.84                   | -0.53                 |  |
| 14,104.0              | 89.90           | 180.20      | 8,082.8               | -6,385.2     | 22.8         | 6,385.1                 | 0.70                    | 0.31                   | 0.63                  |  |
| 14,198.0              | 89.40           | 179.40      | 8,083.4               | -6,479.2     | 23.2         | 6,479.1                 | 1.00                    | -0.53                  | -0.85                 |  |
| 14,293.0              | 89.60           | 179.30      | 8,084.2               | -6,574.1     | 24.2         | 6,574.1                 | 0.24                    | 0.21                   | -0.11                 |  |
| 14,388.0              | 89.70           | 178.80      | 8,084.8               | -6,669.1     | 25.8         | 6,669.1                 | 0.54                    | 0.11                   | -0.53                 |  |
| 14,483.0              | 89.60           | 179.10      | 8,085.3               | -6,764.1     | 27.6         | 6,764.1                 | 0.33                    | -0.11                  | 0.32                  |  |
| 14,577.0              | 90.00           | 179.40      | 8,085.7               | -6,858.1     | 28.8         | 6,858.1                 | 0.53                    | 0.43                   | 0.32                  |  |
| 14,673.0              | 88.90           | 178.00      | 8,086.6               | -6,954.1     | 31.0         | 6,954.1                 | 1.85                    | -1.15                  | -1.46                 |  |
| 14,768.0              | 88.90           | 177.90      | 8,088.4               | -7,049.0     | 34.4         | 7,049.0                 | 0.11                    | 0.00                   | -0.11                 |  |
| 14,863.0              | 88.80           | 177.60      | 8,090.3               | -7,143.9     | 38.1         | 7,144.0                 | 0.33                    | -0.11                  | -0.32                 |  |
| 14,958.0              | 90.10           | 178.30      | 8,091.2               | -7,238.8     | 41.5         | 7,238.9                 | 1.55                    | 1.37                   | 0.74                  |  |



DDC  
Survey Report



|                  |                          |                                     |                                |
|------------------|--------------------------|-------------------------------------|--------------------------------|
| <b>Company:</b>  | COG Operating, LLC       | <b>Local Co-ordinate Reference:</b> | Well SRO State Unit #31H       |
| <b>Project:</b>  | Eddy County, NM (NAD 83) | <b>TVD Reference:</b>               | WELL @ 3004.1usft (Patriot #3) |
| <b>Site:</b>     | Sec 4, T-26-S, R-28-E    | <b>MD Reference:</b>                | WELL @ 3004.1usft (Patriot #3) |
| <b>Well:</b>     | SRO State Unit #31H      | <b>North Reference:</b>             | Grid                           |
| <b>Wellbore:</b> | Wellbore #1              | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Design:</b>   | Wellbore #1              | <b>Database:</b>                    | EDM 5000.1 Single User Db      |

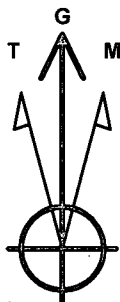
| Survey                       |                 |             |                       |              |              |                         |                         |                        |                       |
|------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 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) |
| 15,053.0                     | 89.70           | 179.20      | 8,091.4               | -7,333.8     | 43.6         | 7,333.9                 | 1.04                    | -0.42                  | 0.95                  |
| 15,147.0                     | 89.60           | 179.30      | 8,092.0               | -7,427.8     | 44.8         | 7,427.9                 | 0.15                    | -0.11                  | 0.11                  |
| 15,242.0                     | 89.40           | 179.10      | 8,092.8               | -7,522.8     | 46.1         | 7,522.9                 | 0.30                    | -0.21                  | -0.21                 |
| 15,337.0                     | 89.10           | 178.80      | 8,094.0               | -7,617.8     | 47.9         | 7,617.9                 | 0.45                    | -0.32                  | -0.32                 |
| 15,432.0                     | 89.30           | 179.50      | 8,095.4               | -7,712.7     | 49.3         | 7,712.9                 | 0.77                    | 0.21                   | 0.74                  |
| 15,527.0                     | 89.50           | 178.90      | 8,096.4               | -7,807.7     | 50.6         | 7,807.9                 | 0.67                    | 0.21                   | -0.63                 |
| 15,623.0                     | 89.40           | 179.00      | 8,097.3               | -7,903.7     | 52.4         | 7,903.9                 | 0.15                    | -0.10                  | 0.10                  |
| 15,717.0                     | 89.20           | 178.60      | 8,098.4               | -7,997.7     | 54.3         | 7,997.9                 | 0.48                    | -0.21                  | -0.43                 |
| 15,813.0                     | 89.60           | 179.00      | 8,099.4               | -8,093.7     | 56.3         | 8,093.8                 | 0.59                    | 0.42                   | 0.42                  |
| 15,908.0                     | 89.80           | 179.00      | 8,099.9               | -8,188.6     | 58.0         | 8,188.8                 | 0.21                    | 0.21                   | 0.00                  |
| 16,002.0                     | 89.80           | 178.80      | 8,100.3               | -8,282.6     | 59.8         | 8,282.8                 | 0.21                    | 0.00                   | -0.21                 |
| 16,097.0                     | 90.00           | 178.00      | 8,100.4               | -8,377.6     | 62.5         | 8,377.8                 | 0.87                    | 0.21                   | -0.84                 |
| 16,192.0                     | 90.10           | 178.20      | 8,100.4               | -8,472.5     | 65.6         | 8,472.8                 | 0.24                    | 0.11                   | 0.21                  |
| 16,287.0                     | 90.10           | 178.00      | 8,100.2               | -8,567.5     | 68.8         | 8,567.7                 | 0.21                    | 0.00                   | -0.21                 |
| 16,342.0                     | 90.40           | 178.10      | 8,099.9               | -8,622.4     | 70.6         | 8,622.7                 | 0.57                    | 0.55                   | 0.18                  |
| TD @ 16394' MD / 8099.6' TVD |                 |             |                       |              |              |                         |                         |                        |                       |
| 16,394.0                     | 90.40           | 178.10      | 8,099.6               | -8,674.4     | 72.4         | 8,674.7                 | 0.00                    | 0.00                   | 0.00                  |

| Design Annotations    |                       |                   |              |                                         |
|-----------------------|-----------------------|-------------------|--------------|-----------------------------------------|
| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates |              | Comment                                 |
|                       |                       | +N/-S (usft)      | +E/-W (usft) |                                         |
| 7,436.0               | 7,435.2               | -20.5             | -40.7        | TIE IN @ 7436' MD / 7435' TVD           |
| 7,649.0               | 7,640.2               | -70.0             | -32.0        | CROSSED HARDLINE @ 7649' MD / 7640' TVD |
| 16,394.0              | 8,099.6               | -8,674.4          | 72.4         | TD @ 16394' MD / 8099.6' TVD            |

|                   |                    |             |
|-------------------|--------------------|-------------|
| Checked By: _____ | Approved By: _____ | Date: _____ |
|-------------------|--------------------|-------------|

Company Name: COG Operating, LLC  
 SRO State Unit #31H  
 Eddy County, NM (NAD 83)  
 Rig: Patriot #3  
 Created By: TIFFANI MIZELL  
 Date: 12/20/2012

SRO State Unit #31H  
 Eddy County, NM (NAD 83)  
 Q120366 & WT-12900  
 Target Change #1



Azimuths to Grid North

Magnetic North: 7.51°

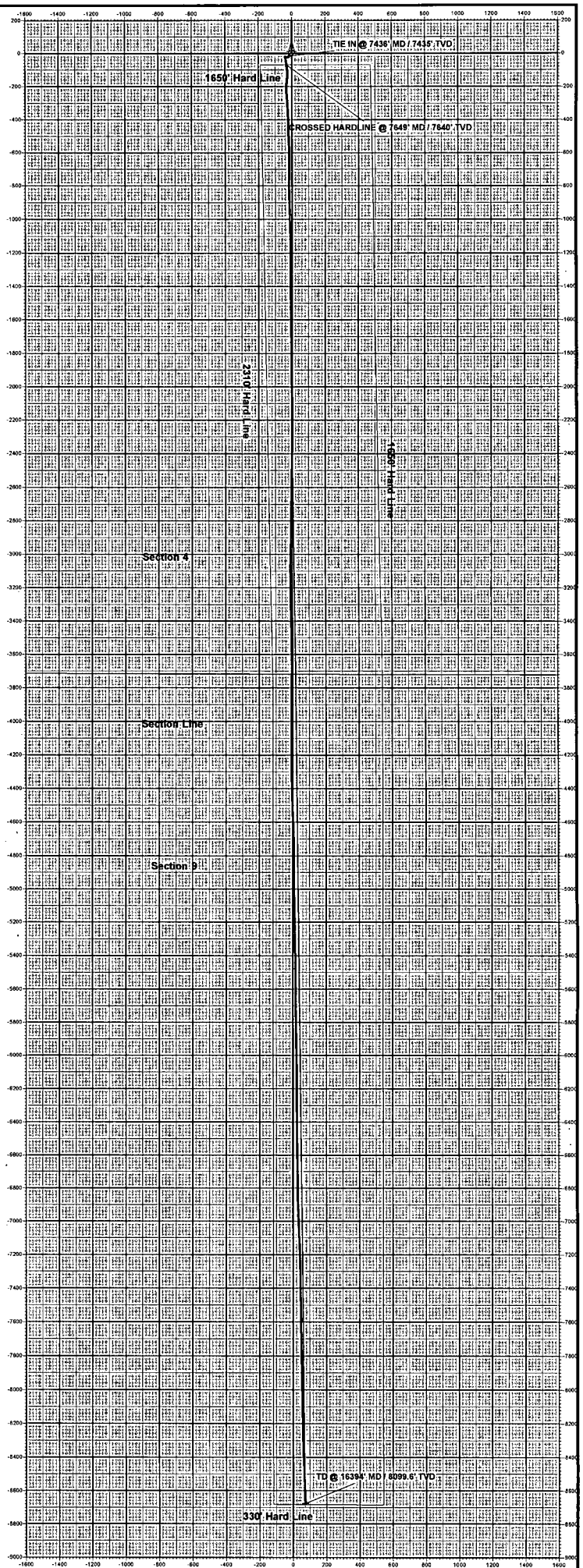
Magnetic Field

Strength: 48326.6snT

Dip Angle: 59.92°

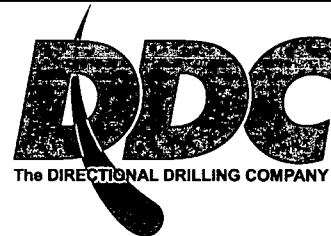
Date: 11/27/2012

Model: IGRF2010



Company Name: COG Operating, LLC  
 SRO State Unit #31H  
 Eddy County, NM (NAD 83)  
 Rig: Patriot #3  
 Created By: TIFFANI MIZELL  
 Date: 12/20/2012

SRO State Unit #31H  
 Eddy County, NM (NAD 83)  
**Q120366 & WT-12900**  
 Target Change #1



PROJECT DETAILS: Eddy County, NM (NAD 83)

Geodetic System: US State Plane 1983  
 Datum: North American Datum 1983  
 Ellipsoid: GRS 1980  
 Zone: New Mexico Eastern Zone  
 System Datum: Mean Sea Level

#### ANNOTATIONS

| MD      | Inc   | Azi    | TVD    | +N/-S   | +E/-W | Vsect  | Departure | Annotation                              |
|---------|-------|--------|--------|---------|-------|--------|-----------|-----------------------------------------|
| 7436.0  | 0.80  | 255.80 | 7435.2 | -20.5   | -40.7 | 20.2   | 95.1      | TIE IN @ 7436' MD / 7435' TVD           |
| 7649.0  | 26.87 | 172.74 | 7640.2 | -70.0   | -32.0 | 69.7   | 145.8     | CROSSED HARDLINE @ 7649' MD / 7640' TVD |
| 16394.0 | 90.40 | 178.10 | 8099.6 | -8674.4 | 72.4  | 8674.7 | 8752.2    | TD @ 16394' MD / 8099.6' TVD            |

#### DESIGN TARGET DETAILS

| Name                                                        | TVD    | +N/-S   | +E/-W | Northing  | Eastings  | Latitude       | Longitude        |
|-------------------------------------------------------------|--------|---------|-------|-----------|-----------|----------------|------------------|
| PBHL SRO State Unit #31H TC #1<br>- plan hits target center | 8100.0 | -8675.7 | 72.0  | 382278.78 | 616654.53 | 32° 3' 2.632 N | 104° 5' 24.836 W |

#### WELL DETAILS: SRO State Unit #31H

| +N/-S | +E/-W | Ground Level: | 2987.1           |
|-------|-------|---------------|------------------|
| 0.0   | 0.0   | Northing      | 390954.48        |
|       |       | Eastings      | 616582.53        |
|       |       | Latitude      | 32° 4' 28.491 N  |
|       |       | Longitude     | 104° 5' 25.446 W |

