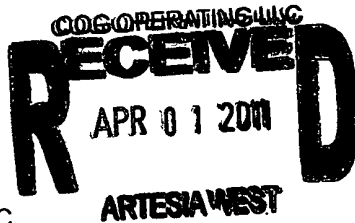


# DRILLING INC. Oil Well Drilling Contractor

Post Office Box 160 Artesia, New Mexico 88211-0160 Office (575) 748-8704 Fax (575) 748-8719

March 21, 2011



COG Operating, LLC  
PO Box 1630  
Artesia, NM 88211-1630

30-015-38071  
Re: SRO State Unit 16H  
Sec. 20, T-26-S, R-28-E  
Eddy County, New Mexico

Attn: Sheryl Baker

The following is a Deviation Survey on the referenced well in Eddy County, New Mexico:

|               |              |
|---------------|--------------|
| 160' - 1°     | 3867' - 1°   |
| 305' - 0.5°   | 4365' - 1°   |
| 545' - 0.5°   | 4866' - 2°   |
| 852' - 0.5°   | 5367' - 2°   |
| 1103' - 2.75° | 5864' - 2.5° |
| 1261' - 2°    |              |
| 1511' - 0.5°  |              |
| 1729' - 2°    |              |
| 1979' - 3.5°  |              |
| 2133' - 4°    |              |
| 2275' - 3°    |              |
| 2618' - 3°    |              |
| 2867' - 2.75° |              |
| 3367' - 1.75° |              |

Sincerely,

Gary W. Chappell  
Contracts Manager

STATE OF NEW MEXICO )  
COUNTY OF EDDY )

The foregoing was acknowledged before me this 21st day of March, 2011 by Gary W. Chappell.

MY COMMISSION EXPIRES



Crisha Morgan

NOTARY PUBLIC-STATE OF NEW MEXICO

My commission expires: 10/28/2011

NOTARY PUBLIC

# COG OPERATING

Hay Hollow  
Eddy County, NM  
SRO Unit State Com #16H  
VH - Job #32K0311232

Survey: Actual

## SDI Standard Survey Report

16 March, 2011

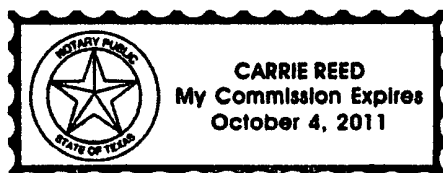
This survey is correct to the best of my knowledge and is supported by actual field data.

Richard

Notarized this date 7th of April, 2011.

Carrie Reed

Notary Signature  
County of Midland  
State of Texas



**Scientific Drilling**  
Directional Drilling Operations

# Scientific Drilling International, Inc.

SDI Standard Survey Report



|                  |                         |                                     |                                     |
|------------------|-------------------------|-------------------------------------|-------------------------------------|
| <b>Company:</b>  | COG OPERATING           | <b>Local Co-ordinate Reference:</b> | Well SRO Unit State Com #16H        |
| <b>Project:</b>  | Hay Hollow              | <b>TVD Reference:</b>               | WELL @ 0 0usft (Original Well Elev) |
| <b>Site:</b>     | Eddy County, NM         | <b>MD Reference:</b>                | WELL @ 0 0usft (Original Well Elev) |
| <b>Well:</b>     | SRO Unit State Com #16H | <b>North Reference:</b>             | Grid                                |
| <b>Wellbore:</b> | VH - Job #32K0311232    | <b>Survey Calculation Method:</b>   | Minimum Curvature                   |
| <b>Design:</b>   | VH - Job #32K0311232    | <b>Database:</b>                    | EDM-Regulatory                      |

|                    |                                      |                      |                |
|--------------------|--------------------------------------|----------------------|----------------|
| <b>Project</b>     | Hay Hollow                           |                      |                |
| <b>Map System:</b> | US State Plane 1927 (Exact solution) | <b>System Datum:</b> | Mean Sea Level |
| <b>Geo Datum:</b>  | NAD 1927 (NADCON CONUS)              |                      |                |
| <b>Map Zone:</b>   | New Mexico East 3001                 |                      |                |

|                              |                 |                          |                  |
|------------------------------|-----------------|--------------------------|------------------|
| <b>Site</b>                  | Eddy County, NM |                          |                  |
| <b>Site Position:</b>        |                 | <b>Northing:</b>         | 386,239 33 usft  |
| <b>From:</b>                 | Lat/Long        | <b>Easting:</b>          | 572,312 98 usft  |
| <b>Position Uncertainty:</b> | 0 0 usft        | <b>Slot Radius:</b>      | 13-3/16"         |
|                              |                 | <b>Latitude:</b>         | 32° 3' 42 020 N  |
|                              |                 | <b>Longitude:</b>        | 104° 5' 59 660 W |
|                              |                 | <b>Grid Convergence:</b> | 0 12 °           |

|                             |                                                   |                            |                                  |
|-----------------------------|---------------------------------------------------|----------------------------|----------------------------------|
| <b>Well</b>                 | SRO Unit State Com #16H, Directional (Pathfinder) |                            |                                  |
| <b>Well Position</b>        | +N/-S                                             | 0 0 usft                   | <b>Northing:</b> 372,160 90 usft |
|                             | +E/-W                                             | 0 0 usft                   | <b>Easting:</b> 567,045 51 usft  |
| <b>Position Uncertainty</b> | 0 0 usft                                          | <b>Wellhead Elevation:</b> | usft                             |
|                             |                                                   | <b>Latitude:</b>           | 32° 1' 22 800 N                  |
|                             |                                                   | <b>Longitude:</b>          | 104° 7' 1 200 W                  |
|                             |                                                   | <b>Ground Level:</b>       | 0 0 usft                         |

|                  |                      |                    |                        |                      |                            |
|------------------|----------------------|--------------------|------------------------|----------------------|----------------------------|
| <b>Wellbore</b>  | VH - Job #32K0311232 |                    |                        |                      |                            |
| <b>Magnetics</b> | <b>Model Name</b>    | <b>Sample Date</b> | <b>Declination (°)</b> | <b>Dip Angle (°)</b> | <b>Field Strength (nT)</b> |
|                  | BGGM2010             | 3/14/2011          | 7 91                   | 59 91                | 48,511                     |

|                          |                                |                     |                     |                          |
|--------------------------|--------------------------------|---------------------|---------------------|--------------------------|
| <b>Design</b>            | VH - Job #32K0311232           |                     |                     |                          |
| <b>Audit Notes:</b>      |                                |                     |                     |                          |
| <b>Version:</b>          | 1 0                            | <b>Phase:</b>       | ACTUAL              | <b>Tie On Depth:</b> 0 0 |
| <b>Vertical Section:</b> | <b>Depth From (TVD) (usft)</b> | <b>+N/-S (usft)</b> | <b>+E/-W (usft)</b> | <b>Direction (°)</b>     |
|                          | 0 0                            | 0 0                 | 0 0                 | 0 61                     |

|                       |                       |                               |                  |                    |
|-----------------------|-----------------------|-------------------------------|------------------|--------------------|
| <b>Survey Program</b> | <b>Date</b> 3/16/2011 |                               |                  |                    |
| <b>From (usft)</b>    | <b>To (usft)</b>      | <b>Survey (Wellbore)</b>      | <b>Tool Name</b> | <b>Description</b> |
| 100 0                 | 5,910 0               | Actual (VH - Job #32K0311232) | Keeper           | Keeper Gyro        |

|                              |                        |                    |                            |                           |                         |                            |                                |      |
|------------------------------|------------------------|--------------------|----------------------------|---------------------------|-------------------------|----------------------------|--------------------------------|------|
| <b>Survey</b>                |                        |                    |                            |                           |                         |                            |                                |      |
| <b>Measured Depth (usft)</b> | <b>Inclination (°)</b> | <b>Azimuth (°)</b> | <b>True Vertical Depth</b> | <b>North/South (usft)</b> | <b>East/West (usft)</b> | <b>Closure Azimuth (°)</b> | <b>Closure Distance (usft)</b> |      |
| 0 0                          | 0 00                   | 0 00               | 0 0                        | 0 0                       | 0 0                     | 0 00                       | 0 0                            | 0 0  |
| 100 0                        | 0 28                   | 132 88             | 100 0                      | -0 2                      | 0 2                     | 132 88                     | 0 2                            | 0 2  |
| 200 0                        | 0 28                   | 147 14             | 200 0                      | -0 5                      | 0 5                     | 137 62                     | 0 7                            | 0 7  |
| 300 0                        | 0 36                   | 140 51             | 300 0                      | -1 0                      | 0 8                     | 140 13                     | 1 3                            | 1 3  |
| 400 0                        | 0 43                   | 148 52             | 400 0                      | -1 5                      | 1 2                     | 141 78                     | 2 0                            | 2 0  |
| 500 0                        | 0 39                   | 135 53             | 500 0                      | -2 1                      | 1 7                     | 141 93                     | 2 7                            | 2 7  |
| 600 0                        | 0 60                   | 166 54             | 600 0                      | -2 9                      | 2 0                     | 144 88                     | 3 5                            | 3 5  |
| 700 0                        | 1 08                   | 163 86             | 700 0                      | -4 3                      | 2 4                     | 150 73                     | 4 9                            | 4 9  |
| 800 0                        | 1 51                   | 169 17             | 800 0                      | -6 5                      | 2 9                     | 155 83                     | 7 1                            | 7 1  |
| 900 0                        | 1 96                   | 183 12             | 899 9                      | -9 5                      | 3 1                     | 162 10                     | 10 0                           | 10 0 |
| 1,000 0                      | 2 12                   | 193 49             | 999 8                      | -13 0                     | 2 5                     | 168 95                     | 13 2                           | 13 2 |
| 1,100 0                      | 2 29                   | 214 14             | 1,099 8                    | -16 4                     | 1 0                     | 176 57                     | 16 5                           | 16 5 |

# Scientific Drilling International, Inc.

SDI Standard Survey Report



|                  |                         |                                     |                                     |
|------------------|-------------------------|-------------------------------------|-------------------------------------|
| <b>Company:</b>  | COG OPERATING           | <b>Local Co-ordinate Reference:</b> | Well SRO Unit State Com #16H        |
| <b>Project:</b>  | Hay Hollow              | <b>TVD Reference:</b>               | WELL @ 0 0usft (Original Well Elev) |
| <b>Site:</b>     | Eddy County, NM         | <b>MD Reference:</b>                | WELL @ 0 0usft (Original Well Elev) |
| <b>Well:</b>     | SRO Unit State Com #16H | <b>North Reference:</b>             | Grid                                |
| <b>Wellbore:</b> | VH - Job #32K0311232    | <b>Survey Calculation Method:</b>   | Minimum Curvature                   |
| <b>Design:</b>   | VH - Job #32K0311232    | <b>Database:</b>                    | EDM-Regulatory                      |

## Survey

| Measured Depth<br>(usft) | Inclination<br>(°) | Azimuth<br>(°) | True Vertical<br>Depth | North/South<br>(usft) | East/West<br>(usft) | Closure Azimuth<br>(°) | Closure Distance<br>(usft) |
|--------------------------|--------------------|----------------|------------------------|-----------------------|---------------------|------------------------|----------------------------|
| 1,200 0                  | 2 29               | 230 14         | 1,199 7                | -19 4                 | -1 7                | 184 93                 | 19 4                       |
| 1,300 0                  | 1 97               | 235 66         | 1,299 6                | -21 6                 | -4 6                | 192 07                 | 22 1                       |
| 1,400 0                  | 1 90               | 234 46         | 1,399 6                | -23 6                 | -7 4                | 197 42                 | 24 7                       |
| 1,500 0                  | 1 15               | 246 60         | 1,499 5                | -24 9                 | -9 7                | 201 19                 | 26 7                       |
| 1,600 0                  | 0 73               | 172 39         | 1,599 5                | -25 9                 | -10 5               | 202 03                 | 28 0                       |
| 1,700 0                  | 1 98               | 110 89         | 1,699 5                | -27 2                 | -8 8                | 197 93                 | 28 6                       |
| 1,800 0                  | 2 17               | 106 71         | 1,799 4                | -28 4                 | -5 4                | 190 73                 | 28 9                       |
| 1,900 0                  | 3 13               | 104 77         | 1,899 3                | -29 6                 | -0 9                | 181 78                 | 29 6                       |
| 2,000 0                  | 4 65               | 99 56          | 1,999 1                | -31 0                 | 5 7                 | 169 54                 | 31 5                       |
| 2,100 0                  | 5 19               | 95 17          | 2,098 7                | -32 0                 | 14 2                | 156 07                 | 35 1                       |
| 2,200 0                  | 4 55               | 96 70          | 2,198 4                | -32 9                 | 22 7                | 145 45                 | 40 0                       |
| 2,300 0                  | 3 52               | 95 53          | 2,298 1                | -33 7                 | 29 7                | 138 63                 | 44 9                       |
| 2,400 0                  | 2 83               | 92 31          | 2,398 0                | -34 1                 | 35 2                | 134 08                 | 49 0                       |
| 2,500 0                  | 2 57               | 90 40          | 2,497 8                | -34 2                 | 39 9                | 130 60                 | 52 5                       |
| 2,600 0                  | 2 29               | 84 82          | 2,597 8                | -34 0                 | 44 1                | 127 63                 | 55 7                       |
| 2,700 0                  | 1 98               | 84 36          | 2,697 7                | -33 7                 | 47 8                | 125 14                 | 58 5                       |
| 2,800 0                  | 1 97               | 80 53          | 2,797 6                | -33 2                 | 51 2                | 122 95                 | 61 1                       |
| 2,900 0                  | 1 71               | 85 82          | 2,897 6                | -32 8                 | 54 4                | 121 09                 | 63 6                       |
| 3,000 0                  | 1 41               | 94 69          | 2,997 5                | -32 8                 | 57 1                | 119 87                 | 65 9                       |
| 3,100 0                  | 1 27               | 90 06          | 3,097 5                | -32 9                 | 59 5                | 118 96                 | 68 0                       |
| 3,200 0                  | 1 07               | 93 39          | 3,197 5                | -33 0                 | 61 5                | 118 19                 | 69 8                       |
| 3,300 0                  | 0 98               | 102 38         | 3,297 5                | -33 2                 | 63 3                | 117 69                 | 71 5                       |
| 3,400 0                  | 0 84               | 96 02          | 3,397 5                | -33 5                 | 64 8                | 117 30                 | 73 0                       |
| 3,500 0                  | 0 80               | 91 13          | 3,497 4                | -33 6                 | 66 3                | 116 86                 | 74 3                       |
| 3,600 0                  | 0 56               | 116 43         | 3,597 4                | -33 8                 | 67 4                | 116 63                 | 75 4                       |
| 3,700 0                  | 0 54               | 105 80         | 3,697 4                | -34 1                 | 68 3                | 116 56                 | 76 4                       |
| 3,800 0                  | 0 48               | 117 34         | 3,797 4                | -34 5                 | 69 1                | 116 50                 | 77 2                       |
| 3,900 0                  | 0 55               | 141 89         | 3,897 4                | -35 0                 | 69 8                | 116 65                 | 78 1                       |
| 4,000 0                  | 0 50               | 126 28         | 3,997 4                | -35 7                 | 70 4                | 116 85                 | 79 0                       |
| 4,100 0                  | 0 60               | 151 22         | 4,097 4                | -36 4                 | 71 0                | 117 12                 | 79 8                       |
| 4,200 0                  | 0 65               | 156 95         | 4,197 4                | -37 4                 | 71 5                | 117 58                 | 80 7                       |
| 4,300 0                  | 0 54               | 138 53         | 4,297 4                | -38 2                 | 72 1                | 117 96                 | 81 6                       |
| 4,400 0                  | 0 45               | 157 80         | 4,397 4                | -39 0                 | 72 5                | 118 25                 | 82 3                       |
| 4,500 0                  | 0 36               | 193 04         | 4,497 4                | -39 6                 | 72 6                | 118 63                 | 82 7                       |
| 4,600 0                  | 0 47               | 206 16         | 4,597 4                | -40 3                 | 72 3                | 119 12                 | 82 8                       |
| 4,700 0                  | 0 52               | 198 45         | 4,697 4                | -41 1                 | 72 0                | 119 71                 | 82 9                       |
| 4,800 0                  | 0 59               | 194 05         | 4,797 4                | -42 0                 | 71 7                | 120 36                 | 83 2                       |
| 4,900 0                  | 0 66               | 190 47         | 4,897 4                | -43 1                 | 71 5                | 121 07                 | 83 5                       |
| 5,000 0                  | 0 52               | 189 98         | 4,997 4                | -44 1                 | 71 3                | 121 73                 | 83 9                       |
| 5,100 0                  | 0 44               | 181 73         | 5,097 4                | -44 9                 | 71 2                | 122 24                 | 84 2                       |
| 5,200 0                  | 0 58               | 173 73         | 5,197 4                | -45 8                 | 71 3                | 122 73                 | 84 7                       |
| 5,300 0                  | 0 74               | 170 49         | 5,297 4                | -47 0                 | 71 5                | 123 32                 | 85 5                       |
| 5,400 0                  | 0 95               | 161 06         | 5,397 4                | -48 4                 | 71 8                | 123 97                 | 86 6                       |
| 5,500 0                  | 0 95               | 150 65         | 5,497 3                | -49 9                 | 72 5                | 124 53                 | 88 0                       |

# Scientific Drilling International, Inc.

SDI Standard Survey Report



|                  |                         |                                     |                                     |
|------------------|-------------------------|-------------------------------------|-------------------------------------|
| <b>Company:</b>  | COG OPERATING           | <b>Local Co-ordinate Reference:</b> | Well SRO Unit State Com #16H        |
| <b>Project:</b>  | Hay Hollow              | <b>TVD Reference:</b>               | WELL @ 0'0usft (Original Well Elev) |
| <b>Site:</b>     | Eddy County, NM         | <b>MD Reference:</b>                | WELL @ 0'0usft (Original Well Elev) |
| <b>Well:</b>     | SRO Unit State Com #16H | <b>North Reference:</b>             | Grid                                |
| <b>Wellbore:</b> | VH - Job #32K0311232    | <b>Survey Calculation Method:</b>   | Minimum Curvature                   |
| <b>Design:</b>   | VH - Job #32K0311232    | <b>Database:</b>                    | EDM-Regulatory                      |

| Survey                   |                    |                |                        |                       |                     |                        |                            |
|--------------------------|--------------------|----------------|------------------------|-----------------------|---------------------|------------------------|----------------------------|
| Measured Depth<br>(usft) | Inclination<br>(°) | Azimuth<br>(°) | True Vertical<br>Depth | North/South<br>(usft) | East/West<br>(usft) | Closure Azimuth<br>(°) | Closure Distance<br>(usft) |
| 5,600 0                  | 0 88               | 165 20         | 5,597 3                | -51 4                 | 73 1                | 125 09                 | 89 3                       |
| 5,700 0                  | 0 94               | 184 06         | 5,697 3                | -52 9                 | 73 2                | 125 85                 | 90 4                       |
| 5,800 0                  | 1 21               | 199 68         | 5,797 3                | -54 7                 | 72 8                | 126 93                 | 91 1                       |
| 5,900 0                  | 1 24               | 246 82         | 5,897 3                | -56 2                 | 71 5                | 128 15                 | 90 9                       |
| 5,910 0                  | 1 25               | 251 25         | 5,907 3                | -56 2                 | 71 3                | 128 27                 | 90 8                       |



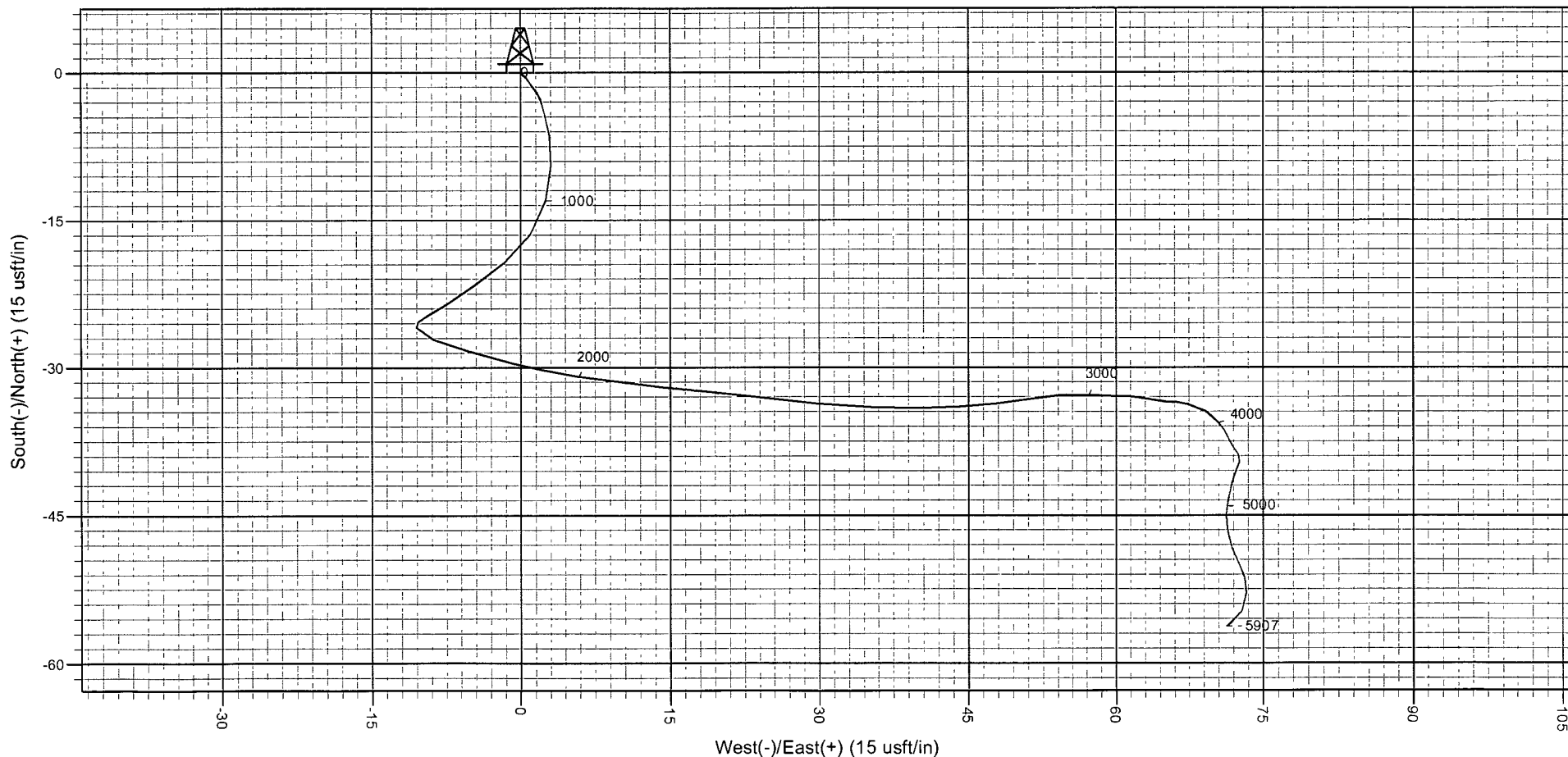
Project: Hay Hollow  
 Eddy County, NM  
 Well: SRO Unit State Com #16H  
 Wellbore: VH - Job #32K0311232  
 Design: VH - Job #32K0311232



Azimuths to Grid North  
 True North -0 12°  
 Magnetic North 7 79°  
 Magnetic Field  
 Strength 48510 9snT  
 Dip Angle 59 91°  
 Date 3/14/2011  
 Model BGGM2010

WELL DETAILS: SRO Unit State Com #16H  
 WELL @ 0.0usft (Original Well Elev)

|       |       |           |           |                 |                 |      |
|-------|-------|-----------|-----------|-----------------|-----------------|------|
| +N/-S | +E/-W | Northing  | Easting   | Latitude        | Longitude       | Slot |
| 0 0   | 0.0   | 372160.90 | 567045 51 | 32° 1' 22.800 N | 104° 7' 1 200 W |      |



PROJECT DETAILS: Hay Hollow  
 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

SITE DETAILS: Eddy County, NM  
 Site Centre Latitude: 32° 3' 42.020 N  
 Longitude: 104° 5' 59.660 W  
 Positional Uncertainty: 0.0  
 Convergence: 0.12  
 Local North: Grid



## **Cog Operating LLC- Eastern NM**

**Eddy County**

**SRO State Unit Com**

**#16H**

**OH**

**Survey: MWD #1**

## **Pathfinder X & Y Survey Report**

**14 April, 2011**

**PATHFINDER<sup>®</sup>**

**A Schlumberger Company**



Pathfinder  
Pathfinder X & Y Survey Report

**PATHFINDER**  
A Schlumberger Company

|                  |                               |                                     |                               |
|------------------|-------------------------------|-------------------------------------|-------------------------------|
| <b>Company:</b>  | Cog Operating LLC- Eastern NM | <b>Local Co-ordinate Reference:</b> | Well #16H                     |
| <b>Project:</b>  | Eddy County                   | <b>TVD Reference:</b>               | RKB-19' @ 3038.00usft (JW #3) |
| <b>Site:</b>     | SRO State Unit Com            | <b>MD Reference:</b>                | RKB-19' @ 3038.00usft (JW #3) |
| <b>Well:</b>     | #16H                          | <b>North Reference:</b>             | Grid                          |
| <b>Wellbore:</b> | OH                            | <b>Survey Calculation Method:</b>   | Minimum Curvature             |
| <b>Design:</b>   | OH                            | <b>Database:</b>                    | EDM 5000.1 Single User Db     |

|             |                                      |               |                |
|-------------|--------------------------------------|---------------|----------------|
| Project     |                                      | Eddy County   |                |
| 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                  |           | SRO State Unit Com |                  |                   |                  |
| Site Position:        |           | Northing:          | 391,812.000 usft | Latitude:         | 32° 4' 37.166 N  |
| From:                 | Map       | Easting:           | 572,493.500 usft | Longitude:        | 104° 5' 57.422 W |
| Position Uncertainty: | 0.00 usft | Slot Radius:       | 13-3/16 "        | Grid Convergence: | 0.12 °           |

|                      |       |           |                     |                  |               |                  |
|----------------------|-------|-----------|---------------------|------------------|---------------|------------------|
| Well                 | #16H  |           |                     |                  |               |                  |
| Well Position        | +N/-S | 0.00 usft | Northing:           | 371,999.100 usft | Latitude:     | 32° 1' 21.196 N  |
|                      | +E/-W | 0.00 usft | Easting:            | 567,193.500 usft | Longitude:    | 104° 6' 59.485 W |
| Position Uncertainty |       | 0.00 usft | Wellhead Elevation: | usft             | Ground Level: | 3,019.00 usft    |

|           |            |             |                 |               |                     |
|-----------|------------|-------------|-----------------|---------------|---------------------|
| Wellbore  | OH         |             |                 |               |                     |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|           | IGRF200510 | 03/13/11    | 7.84            | 59.93         | 48,499              |

|                   |  |                  |  |        |        |        |        |               |           |      |  |
|-------------------|--|------------------|--|--------|--------|--------|--------|---------------|-----------|------|--|
| Design            |  |                  |  |        | OH     |        |        |               |           |      |  |
| Audit Notes:      |  |                  |  |        |        |        |        |               |           |      |  |
| Version:          |  | 1.0              |  | Phase: |        | ACTUAL |        | Tie On Depth: |           | 0.00 |  |
| Vertical Section: |  | Depth From (TVD) |  |        | +N/-S  |        | +E/-W  |               | Direction |      |  |
|                   |  | (usft)           |  |        | (usft) |        | (usft) |               | (°)       |      |  |
|                   |  | 0.00             |  |        | 0.00   |        | 0.00   |               | 0.62      |      |  |



Pathfinder  
Pathfinder X & Y Survey Report

**PATHFINDER**  
A Schlumberger Company

|           |                               |                              |                               |
|-----------|-------------------------------|------------------------------|-------------------------------|
| Company:  | Cog Operating LLC- Eastern NM | Local Co-ordinate Reference: | Well #16H                     |
| Project:  | Eddy County                   | TVD Reference:               | RKB-19' @ 3038.00usft (JW #3) |
| Site:     | SRO State Unit Com            | MD Reference:                | RKB-19' @ 3038.00usft (JW #3) |
| Well:     | #16H                          | North Reference:             | Gnd                           |
| Wellbore: | OH                            | Survey Calculation Method:   | Minimum Curvature             |
| Design:   | OH                            | Database:                    | EDM 5000.1 Single User Db     |

| Survey Program |           | Date              | 04/14/11   |                             |  |  |
|----------------|-----------|-------------------|------------|-----------------------------|--|--|
| From (usft)    | To (usft) | Survey (Wellbore) | Tool Name  | Description                 |  |  |
| 100.00         | 5,910.00  | GYRO (OH)         | CB-GYRO-MS | Camera based gyro multishot |  |  |
| 5,964.00       | 10,684.99 | MWD #1 (OH)       | MWD        | MWD - Standard              |  |  |

| Survey    |         |         |            |              |            |            |               |                  |                 |                |
|-----------|---------|---------|------------|--------------|------------|------------|---------------|------------------|-----------------|----------------|
| MD (usft) | Inc (°) | Azi (°) | TVD (usft) | TVDSS (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Northing (usft) | Easting (usft) |
| 5,910.00  | 1.25    | 251.25  | 5,907.28   | -2,869.28    | -56.23     | 71.28      | -55.46        | 0.00             | 371,942.87      | 567,264.78     |
| 5,964.00  | 1.41    | 255.23  | 5,961.26   | -2,923.26    | -56.59     | 70.08      | -55.83        | 0.34             | 371,942.51      | 567,263.58     |
| 5,995.00  | 1.58    | 255.93  | 5,992.25   | -2,954.25    | -56.79     | 69.29      | -56.04        | 0.55             | 371,942.31      | 567,262.79     |
| 6,026.00  | 1.67    | 257.87  | 6,023.24   | -2,985.24    | -56.99     | 68.44      | -56.25        | 0.34             | 371,942.11      | 567,261.94     |
| 6,058.00  | 1.67    | 257.34  | 6,055.22   | -3,017.22    | -57.19     | 67.53      | -56.46        | 0.05             | 371,941.91      | 567,261.03     |
| 6,089.00  | 1.67    | 253.38  | 6,086.21   | -3,048.21    | -57.42     | 66.65      | -56.69        | 0.37             | 371,941.68      | 567,260.15     |
| 6,120.00  | 1.85    | 297.42  | 6,117.20   | -3,079.20    | -57.32     | 65.78      | -56.60        | 4.29             | 371,941.78      | 567,259.28     |
| 6,152.00  | 4.66    | 339.78  | 6,149.15   | -3,111.15    | -55.86     | 64.87      | -55.15        | 11.00            | 371,943.24      | 567,258.37     |
| 6,182.00  | 8.44    | 347.08  | 6,178.95   | -3,140.95    | -52.57     | 63.95      | -51.87        | 12.88            | 371,946.53      | 567,257.45     |
| 6,214.00  | 12.40   | 348.66  | 6,210.41   | -3,172.41    | -46.91     | 62.75      | -46.23        | 12.41            | 371,952.19      | 567,256.25     |
| 6,245.00  | 15.56   | 347.96  | 6,240.49   | -3,202.49    | -39.58     | 61.23      | -38.91        | 10.21            | 371,959.52      | 567,254.73     |
| 6,277.00  | 18.29   | 348.39  | 6,271.10   | -3,233.10    | -30.46     | 59.32      | -29.81        | 8.54             | 371,968.64      | 567,252.82     |
| 6,308.00  | 21.19   | 349.89  | 6,300.28   | -3,262.28    | -20.18     | 57.36      | -19.55        | 9.50             | 371,978.92      | 567,250.86     |
| 6,339.00  | 24.09   | 351.21  | 6,328.89   | -3,290.89    | -8.40      | 55.41      | -7.80         | 9.50             | 371,990.70      | 567,248.91     |
| 6,371.00  | 27.35   | 350.85  | 6,357.71   | -3,319.71    | 5.31       | 53.24      | 5.89          | 10.20            | 372,004.41      | 567,246.74     |
| 6,402.00  | 30.42   | 351.29  | 6,384.85   | -3,346.85    | 20.10      | 50.92      | 20.65         | 9.93             | 372,019.20      | 567,244.42     |
| 6,433.00  | 33.41   | 351.29  | 6,411.16   | -3,373.16    | 36.30      | 48.44      | 36.82         | 9.65             | 372,035.40      | 567,241.94     |
| 6,459.00  | 35.61   | 351.92  | 6,432.59   | -3,394.59    | 50.87      | 46.29      | 51.37         | 8.57             | 372,049.97      | 567,239.79     |
| 6,490.00  | 38.77   | 353.79  | 6,457.28   | -3,419.28    | 69.46      | 43.97      | 69.93         | 10.83            | 372,068.56      | 567,237.47     |
| 6,521.00  | 41.42   | 356.66  | 6,480.99   | -3,442.99    | 89.35      | 42.33      | 89.81         | 10.42            | 372,088.45      | 567,235.83     |
| 6,549.00  | 44.49   | 359.11  | 6,501.48   | -3,463.48    | 108.41     | 41.63      | 108.86        | 12.48            | 372,107.51      | 567,235.13     |



Pathfinder  
Pathfinder X & Y Survey Report



Company: Cog Operating LLC- Eastern NM  
Project: Eddy County  
Site: SRO State Unit Com  
Well: #16H  
Wellbore: OH  
Design: OH

Local Co-ordinate Reference:  
TVD Reference:  
MD Reference:  
North Reference:  
Survey Calculation Method:  
Database:

Well #16H  
RKB-19' @ 3038.00usft (JW #3)  
RKB-19' @ 3038.00usft (JW #3)  
Grid  
Minimum Curvature  
EDM 5000.1 Single User Db

Survey

| MD<br>(usft) | Inc<br>(°) | Azi<br>(°) | TVD<br>(usft) | TVDSS<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | V. Sec<br>(usft) | DLeg<br>(°/100usft) | Northing<br>(usft) | Easting<br>(usft) |
|--------------|------------|------------|---------------|-----------------|---------------|---------------|------------------|---------------------|--------------------|-------------------|
| 6,581.00     | 48.72      | 359.13     | 6,523.46      | -3,485.46       | 131.66        | 41.28         | 132.10           | 13.22               | 372,130.76         | 567,234.78        |
| 6,611.00     | 53.64      | 357.82     | 6,542.27      | -3,504.27       | 155.02        | 40.65         | 155.45           | 16.75               | 372,154.12         | 567,234.15        |
| 6,642.00     | 58.74      | 357.21     | 6,559.51      | -3,521.51       | 180.74        | 39.52         | 181.16           | 16.53               | 372,179.84         | 567,233.02        |
| 6,673.00     | 63.66      | 357.00     | 6,574.44      | -3,536.44       | 207.86        | 38.15         | 208.26           | 15.88               | 372,206.96         | 567,231.65        |
| 6,705.00     | 69.12      | 358.03     | 6,587.25      | -3,549.25       | 237.15        | 36.89         | 237.53           | 17.32               | 372,236.25         | 567,230.39        |
| 6,736.00     | 74.83      | 358.84     | 6,596.84      | -3,558.84       | 266.60        | 36.09         | 266.98           | 18.59               | 372,265.70         | 567,229.59        |
| 6,768.00     | 79.76      | 359.64     | 6,603.88      | -3,565.88       | 297.80        | 35.67         | 298.17           | 15.60               | 372,296.90         | 567,229.17        |
| 6,800.00     | 81.43      | 0.23       | 6,609.10      | -3,571.10       | 329.37        | 35.64         | 329.74           | 5.53                | 372,328.47         | 567,229.14        |
| 6,829.00     | 82.83      | 0.62       | 6,613.08      | -3,575.08       | 358.10        | 35.85         | 358.46           | 5.01                | 372,357.20         | 567,229.35        |
| 6,862.00     | 85.38      | 0.86       | 6,616.46      | -3,578.46       | 390.92        | 36.28         | 391.29           | 7.76                | 372,390.02         | 567,229.78        |
| 6,892.00     | 87.85      | 1.11       | 6,618.24      | -3,580.24       | 420.86        | 36.79         | 421.23           | 8.28                | 372,419.96         | 567,230.29        |
| 6,924.00     | 89.43      | 1.19       | 6,619.00      | -3,581.00       | 452.84        | 37.43         | 453.22           | 4.94                | 372,451.94         | 567,230.93        |
| 6,955.00     | 88.55      | 1.18       | 6,619.54      | -3,581.54       | 483.83        | 38.07         | 484.21           | 2.84                | 372,482.93         | 567,231.57        |
| 7,018.00     | 88.72      | 0.65       | 6,621.04      | -3,583.04       | 546.80        | 39.08         | 547.20           | 0.88                | 372,545.90         | 567,232.58        |
| 7,080.00     | 89.78      | 1.82       | 6,621.85      | -3,583.85       | 608.78        | 40.42         | 609.18           | 2.55                | 372,607.88         | 567,233.92        |
| 7,143.00     | 89.52      | 1.15       | 6,622.24      | -3,584.24       | 671.76        | 42.05         | 672.18           | 1.14                | 372,670.86         | 567,235.55        |
| 7,238.00     | 88.99      | 1.25       | 6,623.47      | -3,585.47       | 766.73        | 44.04         | 767.16           | 0.57                | 372,765.83         | 567,237.54        |
| 7,332.00     | 89.25      | 359.89     | 6,624.92      | -3,586.92       | 860.71        | 44.97         | 861.15           | 1.47                | 372,859.81         | 567,238.47        |
| 7,426.00     | 90.13      | 0.51       | 6,625.43      | -3,587.43       | 954.71        | 45.30         | 955.14           | 1.15                | 372,953.81         | 567,238.80        |
| 7,520.00     | 88.81      | 359.86     | 6,626.30      | -3,588.30       | 1,048.70      | 45.60         | 1,049.13         | 1.57                | 373,047.80         | 567,239.10        |
| 7,614.00     | 89.52      | 359.14     | 6,627.67      | -3,589.67       | 1,142.69      | 44.78         | 1,143.11         | 1.08                | 373,141.79         | 567,238.28        |
| 7,708.00     | 90.31      | 359.34     | 6,627.81      | -3,589.81       | 1,236.68      | 43.54         | 1,237.08         | 0.87                | 373,235.78         | 567,237.04        |
| 7,802.00     | 91.01      | 359.77     | 6,626.72      | -3,588.72       | 1,330.67      | 42.81         | 1,331.05         | 0.87                | 373,329.77         | 567,236.31        |
| 7,896.00     | 91.36      | 359.89     | 6,624.78      | -3,586.78       | 1,424.65      | 42.53         | 1,425.02         | 0.39                | 373,423.75         | 567,236.03        |
| 7,990.00     | 89.34      | 359.11     | 6,624.20      | -3,586.20       | 1,518.64      | 41.71         | 1,519.00         | 2.30                | 373,517.74         | 567,235.21        |
| 8,083.00     | 88.99      | 358.75     | 6,625.56      | -3,587.56       | 1,611.61      | 39.97         | 1,611.95         | 0.54                | 373,610.71         | 567,233.47        |
| 8,177.00     | 89.16      | 0.20       | 6,627.08      | -3,589.08       | 1,705.59      | 39.11         | 1,705.92         | 1.55                | 373,704.69         | 567,232.61        |



Pathfinder  
Pathfinder X & Y Survey Report

**PATHFINDER**  
A Schlumberger Company

|           |                               |                              |                               |
|-----------|-------------------------------|------------------------------|-------------------------------|
| Company:  | Cog Operating LLC- Eastern NM | Local Co-ordinate Reference: | Well #16H                     |
| Project:  | Eddy County                   | TVD Reference:               | RKB-19' @ 3038.00usft (JW #3) |
| Site:     | SRO State Unit Com            | MD Reference:                | RKB-19' @ 3038.00usft (JW #3) |
| Well:     | #16H                          | North Reference:             | Grid                          |
| Wellbore: | OH                            | Survey Calculation Method:   | Minimum Curvature             |
| Design:   | OH                            | Database:                    | EDM 5000 1 Single User Db     |

| Survey       |            |            |               |                 |               |               |                  |                     |                    |                   |
|--------------|------------|------------|---------------|-----------------|---------------|---------------|------------------|---------------------|--------------------|-------------------|
| MD<br>(usft) | Inc<br>(°) | Azi<br>(°) | TVD<br>(usft) | TVDSS<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | V. Sec<br>(usft) | DLeg<br>(°/100usft) | Northing<br>(usft) | Easting<br>(usft) |
| 8,271.00     | 91.01      | 0.75       | 6,626.94      | -3,588.94       | 1,799.58      | 39.89         | 1,799.91         | 2.05                | 373,798.68         | 567,233.39        |
| 8,365.00     | 91.10      | 0.65       | 6,625.21      | -3,587.21       | 1,893.56      | 41.04         | 1,893.89         | 0.14                | 373,892.66         | 567,234.54        |
| 8,458.00     | 90.75      | 359.92     | 6,623.71      | -3,585.71       | 1,986.55      | 41.50         | 1,986.88         | 0.87                | 373,985.65         | 567,235.00        |
| 8,552.00     | 91.19      | 359.81     | 6,622.11      | -3,584.11       | 2,080.53      | 41.28         | 2,080.86         | 0.48                | 374,079.63         | 567,234.78        |
| 8,614.00     | 91.01      | 359.12     | 6,620.92      | -3,582.92       | 2,142.52      | 40.70         | 2,142.83         | 1.15                | 374,141.62         | 567,234.20        |
| 8,677.00     | 89.78      | 358.90     | 6,620.49      | -3,582.49       | 2,205.51      | 39.61         | 2,205.81         | 1.98                | 374,204.61         | 567,233.11        |
| 8,771.00     | 89.43      | 358.85     | 6,621.14      | -3,583.14       | 2,299.49      | 37.77         | 2,299.76         | 0.38                | 374,298.59         | 567,231.27        |
| 8,865.00     | 88.46      | 359.32     | 6,622.87      | -3,584.87       | 2,393.46      | 36.26         | 2,393.71         | 1.15                | 374,392.56         | 567,229.76        |
| 8,959.00     | 89.52      | 359.50     | 6,624.53      | -3,586.53       | 2,487.44      | 35.30         | 2,487.67         | 1.14                | 374,486.54         | 567,228.80        |
| 9,053.00     | 89.60      | 358.86     | 6,625.25      | -3,587.25       | 2,581.42      | 33.95         | 2,581.64         | 0.69                | 374,580.52         | 567,227.45        |
| 9,146.00     | 89.78      | 0.57       | 6,625.75      | -3,587.75       | 2,674.42      | 33.49         | 2,674.62         | 1.85                | 374,673.52         | 567,226.99        |
| 9,240.00     | 89.78      | 0.95       | 6,626.11      | -3,588.11       | 2,768.41      | 34.74         | 2,768.62         | 0.40                | 374,767.51         | 567,228.24        |
| 9,335.00     | 90.22      | 0.80       | 6,626.11      | -3,588.11       | 2,863.40      | 36.19         | 2,863.62         | 0.49                | 374,862.50         | 567,229.69        |
| 9,429.00     | 90.48      | 359.61     | 6,625.54      | -3,587.54       | 2,957.39      | 36.52         | 2,957.61         | 1.30                | 374,956.49         | 567,230.02        |
| 9,522.00     | 90.13      | 0.27       | 6,625.04      | -3,587.04       | 3,050.39      | 36.43         | 3,050.61         | 0.80                | 375,049.49         | 567,229.93        |
| 9,616.00     | 90.75      | 0.00       | 6,624.32      | -3,586.32       | 3,144.39      | 36.65         | 3,144.60         | 0.72                | 375,143.49         | 567,230.15        |
| 9,711.00     | 88.99      | 359.70     | 6,624.54      | -3,586.54       | 3,239.38      | 36.40         | 3,239.59         | 1.88                | 375,238.48         | 567,229.90        |
| 9,803.00     | 89.16      | 0.30       | 6,626.02      | -3,588.02       | 3,331.37      | 36.40         | 3,331.57         | 0.68                | 375,330.47         | 567,229.90        |
| 9,897.00     | 90.04      | 359.81     | 6,626.68      | -3,588.68       | 3,425.37      | 36.49         | 3,425.56         | 1.07                | 375,424.47         | 567,229.99        |
| 9,991.00     | 89.52      | 0.92       | 6,627.04      | -3,589.04       | 3,519.36      | 37.09         | 3,519.56         | 1.30                | 375,518.46         | 567,230.59        |
| 10,083.00    | 90.04      | 0.31       | 6,627.39      | -3,589.39       | 3,611.36      | 38.08         | 3,611.56         | 0.87                | 375,610.46         | 567,231.58        |
| 10,177.00    | 90.04      | 1.64       | 6,627.33      | -3,589.33       | 3,705.34      | 39.67         | 3,705.55         | 1.41                | 375,704.44         | 567,233.17        |
| 10,271.00    | 90.40      | 1.02       | 6,626.96      | -3,588.96       | 3,799.31      | 41.86         | 3,799.54         | 0.76                | 375,798.41         | 567,235.36        |
| 10,364.00    | 90.04      | 0.10       | 6,626.61      | -3,588.61       | 3,892.31      | 42.77         | 3,892.54         | 1.06                | 375,891.41         | 567,236.27        |
| 10,458.00    | 90.40      | 359.54     | 6,626.25      | -3,588.25       | 3,986.30      | 42.47         | 3,986.53         | 0.71                | 375,985.40         | 567,235.97        |
| 10,551.00    | 89.96      | 359.18     | 6,625.95      | -3,587.95       | 4,079.30      | 41.43         | 4,079.51         | 0.61                | 376,078.40         | 567,234.93        |
| 10,631.00    | 89.96      | 358.83     | 6,626.01      | -3,588.01       | 4,159.29      | 40.04         | 4,159.48         | 0.44                | 376,158.39         | 567,233.54        |



Pathfinder  
Pathfinder X & Y Survey Report



|           |                               |                              |                               |
|-----------|-------------------------------|------------------------------|-------------------------------|
| Company:  | Cog Operating LLC- Eastern NM | Local Co-ordinate Reference: | Well #16H                     |
| Project:  | Eddy County                   | TVD Reference:               | RKB-19' @ 3038.00usft (JW #3) |
| Site:     | SRO State Unit Com            | MD Reference:                | RKB-19' @ 3038.00usft (JW #3) |
| Well:     | #16H                          | North Reference:             | Grd                           |
| Wellbore: | OH                            | Survey Calculation Method:   | Minimum Curvature             |
| Design:   | OH                            | Database:                    | EDM 5000 1 Single User Db     |

| Survey                                                                            |            |            |               |                 |               |               |                  |                     |                    |                   |
|-----------------------------------------------------------------------------------|------------|------------|---------------|-----------------|---------------|---------------|------------------|---------------------|--------------------|-------------------|
| MD<br>(usft)                                                                      | Inc<br>(°) | Azi<br>(°) | TVD<br>(usft) | TVDSS<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | V. Sec<br>(usft) | DLeg<br>(°/100usft) | Northing<br>(usft) | Easting<br>(usft) |
| 10,684.99                                                                         | 89.96      | 358.83     | 6,626.05      | -3,588.05       | 4,213.26      | 38.94         | 4,213.44         | 0.00                | 376,212.36         | 567,232.44        |
| BHL-10684.99°MD,89.96°INC,358.83°AZI, 6626.05°TVD, 4213.44°VS, 4213.26°N, 38.94°E |            |            |               |                 |               |               |                  |                     |                    |                   |

| Survey Annotations          |                             |                   |                 |                                                                          |
|-----------------------------|-----------------------------|-------------------|-----------------|--------------------------------------------------------------------------|
| Measured<br>Depth<br>(usft) | Vertical<br>Depth<br>(usft) | Local Coordinates |                 | Comment                                                                  |
|                             |                             | +N/-S<br>(usft)   | +E/-W<br>(usft) |                                                                          |
| 10,684.99                   | 6,626.05                    | 4,213.26          | 38.94           | BHL-10684.99°MD,89.96°INC,358.83°AZI, 6626.05°TVD, 4213.44°VS, 4213.26°N |

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

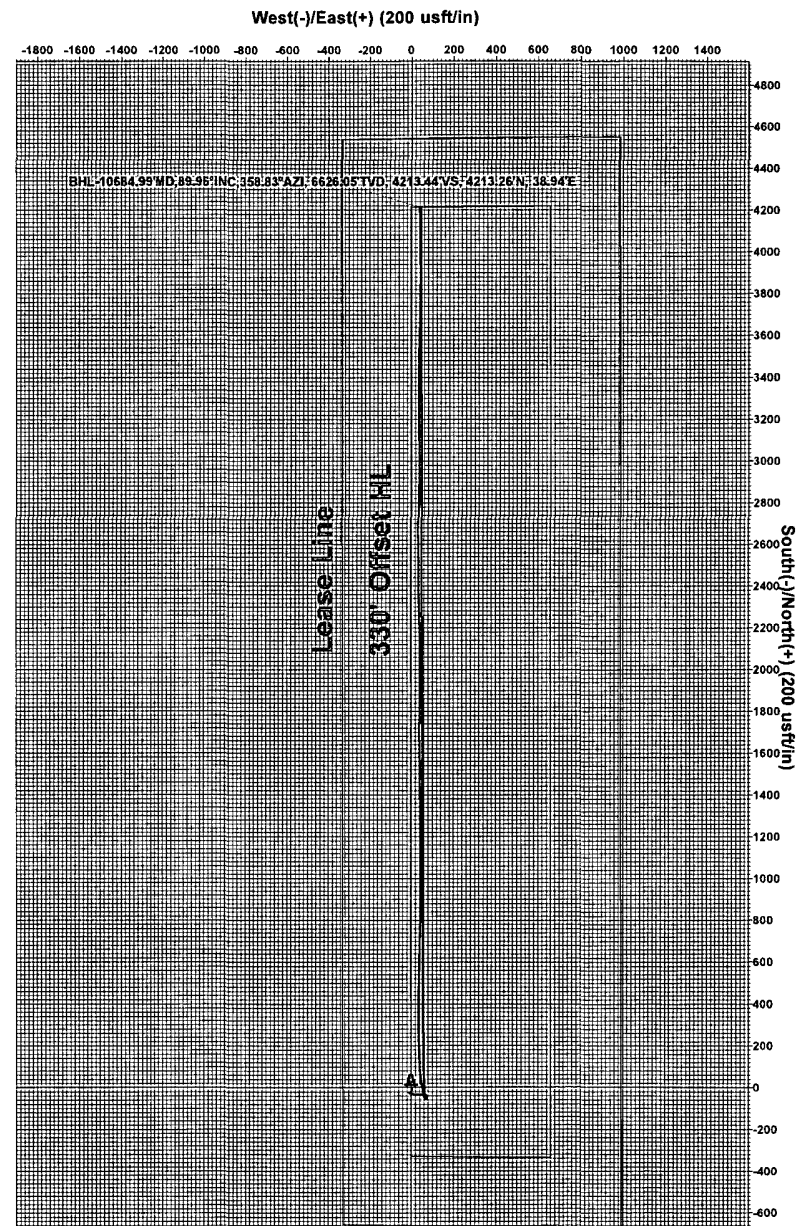
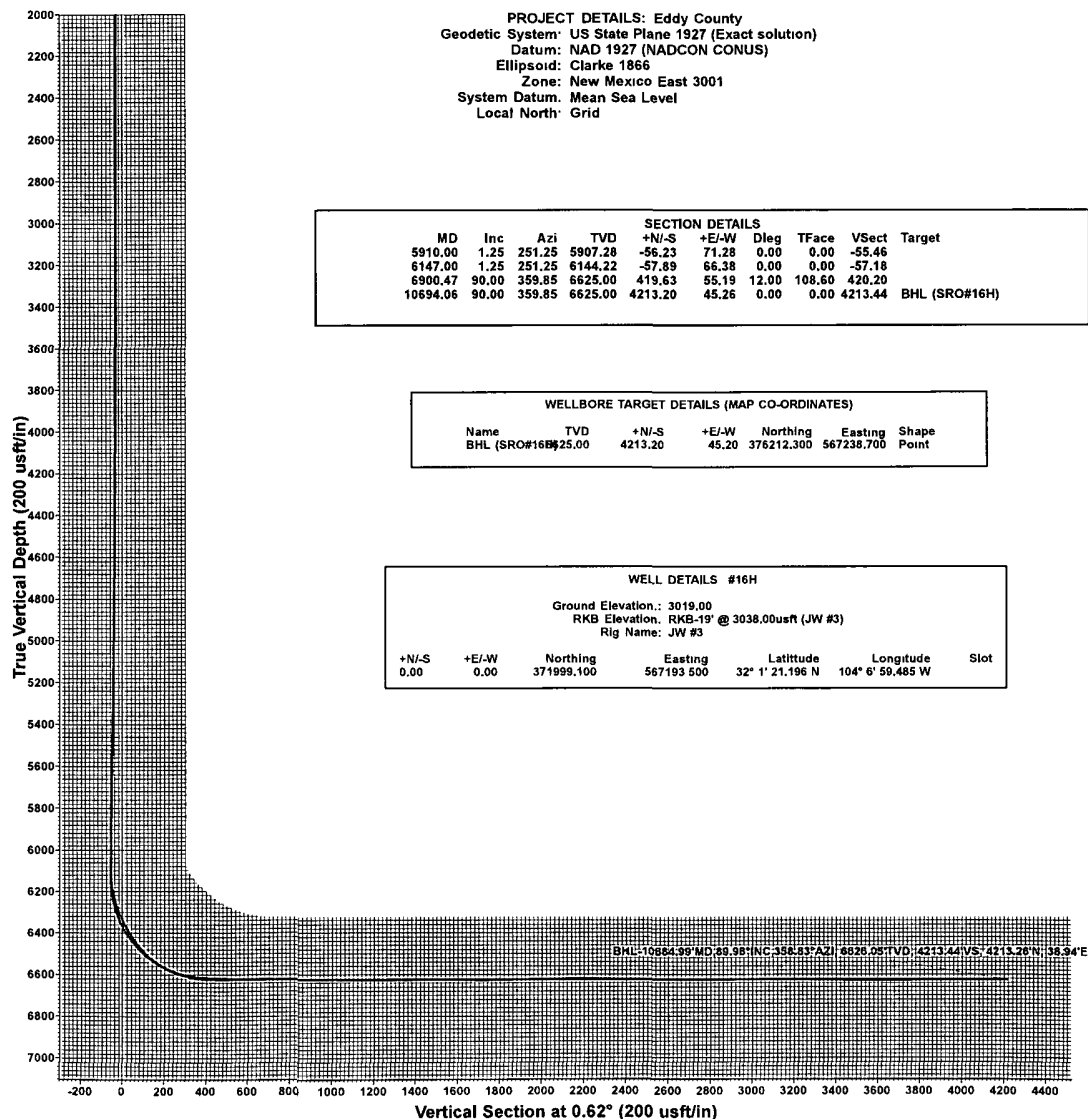


Project: Eddy County  
Site: SRO State Unit Coi  
Well: #16H  
Wellbore: OH  
Plan: Plan #3 (#16H/OH)



Azimuths to Grid North  
True North: -0.12°  
Magnetic North: 7.72°  
  
Magnetic Field  
Strength: 48498.7snT  
Dip Angle: 59.93°  
Date: 03/13/2011  
Model: IGRF200510

**PATHFINDER**  
A Schlumberger Company



Plan: Plan #3 (#16H/OH)  
Created By: Nate Bingham Date: 11/57, April 14 2011  
Checked: \_\_\_\_\_ Date: \_\_\_\_\_