

30.015.33692

## COG OPERATING

Empire, Yeso East  
Eddy County, NM  
Mesquite State #13  
VH - Job #320513-KW-465

Survey: Gyro

## SDI Standard Survey Report

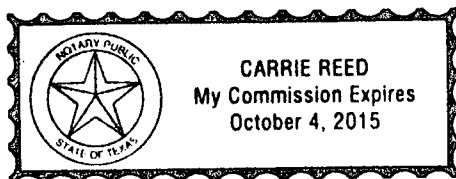
This survey is correct to the best of my knowledge and is supported by actual field data.

Kuhart

Notarized this date 3rd of June, 2013.

Carrie Reed

Notary Signature  
County of Midland  
State of Texas



**Scientific Drilling International, Inc.**  
SDI Standard Survey Report



|                  |                         |                                     |                                      |
|------------------|-------------------------|-------------------------------------|--------------------------------------|
| <b>Company:</b>  | COG OPERATING           | <b>Local Co-ordinate Reference:</b> | Well Mesquite State #13              |
| <b>Project:</b>  | Empire, Yeso East       | <b>TVD Reference:</b>               | WELL @ 0.00usft (Original Well Elev) |
| <b>Site:</b>     | Eddy County, NM         | <b>MD Reference:</b>                | WELL @ 0.00usft (Original Well Elev) |
| <b>Well:</b>     | Mesquite State #13      | <b>North Reference:</b>             | Grid                                 |
| <b>Wellbore:</b> | VH - Job #320513-KW-465 | <b>Survey Calculation Method:</b>   | Minimum Curvature                    |
| <b>Design:</b>   | VH - Job #320513-KW-465 | <b>Database:</b>                    | EDM-Regulatory                       |

|                    |                                      |                      |                |
|--------------------|--------------------------------------|----------------------|----------------|
| <b>Project</b>     | Empire, Yeso East                    |                      |                |
| <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>         | 667,566.74 usft  |
| <b>From:</b>                 | Lat/Long        | <b>Easting:</b>          | 572,079.69 usft  |
| <b>Position Uncertainty:</b> | 0.00 usft       | <b>Slot Radius:</b>      | 0"               |
|                              |                 | <b>Latitude:</b>         | 32° 50' 6.025 N  |
|                              |                 | <b>Longitude:</b>        | 104° 5' 55.187 W |
|                              |                 | <b>Grid Convergence:</b> | 0.13 °           |

|                             |                              |                            |                                  |
|-----------------------------|------------------------------|----------------------------|----------------------------------|
| <b>Well</b>                 | Mesquite State #13, Vertical |                            |                                  |
| <b>Well Position</b>        | +N/-S                        | 0.00 usft                  | <b>Northing:</b> 661,237.08 usft |
|                             | +E/-W                        | 0.00 usft                  | <b>Easting:</b> 571,690.67 usft  |
| <b>Position Uncertainty</b> | 0.00 usft                    | <b>Wellhead Elevation:</b> | usft                             |
|                             |                              | <b>Latitude:</b>           | 32° 49' 3.400 N                  |
|                             |                              | <b>Longitude:</b>          | 104° 5' 59.910 W                 |
|                             |                              | <b>Ground Level:</b>       | 0.00 usft                        |

|                  |                         |                    |                        |                      |                            |
|------------------|-------------------------|--------------------|------------------------|----------------------|----------------------------|
| <b>Wellbore</b>  | VH - Job #320513-KW-465 |                    |                        |                      |                            |
| <b>Magnetics</b> | <b>Model Name</b>       | <b>Sample Date</b> | <b>Declination (°)</b> | <b>Dip Angle (°)</b> | <b>Field Strength (nT)</b> |
|                  | IGRF2010                | 05/02/13           | 7.65                   | 60.60                | 48,753                     |

|                          |                         |               |              |                           |
|--------------------------|-------------------------|---------------|--------------|---------------------------|
| <b>Design</b>            | VH - Job #320513-KW-465 |               |              |                           |
| <b>Audit Notes:</b>      |                         |               |              |                           |
| <b>Version:</b>          | 1.0                     | <b>Phase:</b> | ACTUAL       | <b>Tie On Depth:</b> 0.00 |
| <b>Vertical Section:</b> | <b>Depth From (TVD)</b> | <b>+N/-S</b>  | <b>+E/-W</b> | <b>Direction</b>          |
|                          | (usft)                  | (usft)        | (usft)       | (°)                       |
|                          | 0.00                    | 0.00          | 0.00         | 300.35                    |

|                       |             |                                |                  |                    |  |
|-----------------------|-------------|--------------------------------|------------------|--------------------|--|
| <b>Survey Program</b> | <b>Date</b> | 06/09/13                       |                  |                    |  |
| <b>From</b>           | <b>To</b>   | <b>Survey (Wellbore)</b>       | <b>Tool Name</b> | <b>Description</b> |  |
| (usft)                | (usft)      |                                |                  |                    |  |
| 100.00                | 5,360.00    | Gyro (VH - Job #320513-KW-465) | Keeper           | Keeper Gyro        |  |

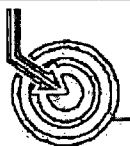
|                       |                    |                |                      |                    |                  |                        |                         |      |
|-----------------------|--------------------|----------------|----------------------|--------------------|------------------|------------------------|-------------------------|------|
| <b>Survey</b>         |                    |                |                      |                    |                  |                        |                         |      |
| <b>Measured Depth</b> | <b>Inclination</b> | <b>Azimuth</b> | <b>True Vertical</b> | <b>North/South</b> | <b>East/West</b> | <b>Closure Azimuth</b> | <b>Closure Distance</b> |      |
| (usft)                | (°)                | (°)            | Depth                | (usft)             | (usft)           | (°)                    | (usft)                  |      |
| 0.00                  | 0.00               | 0.00           | 0.00                 | 0.00               | 0.00             | 0.00                   | 0.00                    | 0.00 |
| 100.00                | 0.32               | 78.68          | 100.00               | 0.05               | 0.27             | 78.68                  | 0.28                    |      |
| 200.00                | 0.78               | 46.02          | 199.99               | 0.58               | 1.04             | 60.70                  | 1.19                    |      |
| 300.00                | 0.67               | 29.28          | 299.99               | 1.56               | 1.81             | 49.20                  | 2.40                    |      |
| 400.00                | 0.57               | 0.39           | 399.98               | 2.57               | 2.10             | 39.26                  | 3.32                    |      |
| 500.00                | 0.81               | 336.13         | 499.97               | 3.72               | 1.82             | 26.09                  | 4.14                    |      |
| 600.00                | 0.97               | 344.86         | 599.96               | 5.18               | 1.31             | 14.22                  | 5.34                    |      |
| 700.00                | 0.70               | 352.92         | 699.95               | 6.60               | 1.02             | 8.75                   | 6.68                    |      |
| 800.00                | 0.66               | 358.24         | 799.94               | 7.78               | 0.92             | 6.76                   | 7.84                    |      |
| 900.00                | 0.69               | 1.89           | 899.94               | 8.96               | 0.93             | 5.90                   | 9.01                    |      |
| 1,000.00              | 0.52               | 354.19         | 999.93               | 10.02              | 0.90             | 5.13                   | 10.06                   |      |
| 1,100.00              | 0.53               | 350.07         | 1,099.93             | 10.92              | 0.77             | 4.05                   | 10.95                   |      |

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|                  |                         |                                     |                                      |
|------------------|-------------------------|-------------------------------------|--------------------------------------|
| <b>Company:</b>  | COG OPERATING           | <b>Local Co-ordinate Reference:</b> | Well Mesquite State #13              |
| <b>Project:</b>  | Empire, Yeso East       | <b>TVD Reference:</b>               | WELL @ 0.00usft (Original Well Elev) |
| <b>Site:</b>     | Eddy County, NM         | <b>MD Reference:</b>                | WELL @ 0.00usft (Original Well Elev) |
| <b>Well:</b>     | Mesquite State #13      | <b>North Reference:</b>             | Grid                                 |
| <b>Wellbore:</b> | VH - Job #320513-KW-465 | <b>Survey Calculation Method:</b>   | Minimum Curvature                    |
| <b>Design:</b>   | VH - Job #320513-KW-465 | <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) |  |
| 1,200.00                 | 0.46               | 314.62         | 1,199.92               | 11.66                 | 0.41                | 2.01                   | 11.67                      |  |
| 1,300.00                 | 0.48               | 286.25         | 1,299.92               | 12.06                 | -0.28               | 358.67                 | 12.06                      |  |
| 1,400.00                 | 0.64               | 267.99         | 1,399.92               | 12.16                 | -1.24               | 354.18                 | 12.22                      |  |
| 1,500.00                 | 0.65               | 277.86         | 1,499.91               | 12.21                 | -2.36               | 349.07                 | 12.44                      |  |
| 1,600.00                 | 0.67               | 264.21         | 1,599.90               | 12.23                 | -3.50               | 344.02                 | 12.73                      |  |
| 1,700.00                 | 0.75               | 260.16         | 1,699.90               | 12.06                 | -4.73               | 338.59                 | 12.96                      |  |
| 1,800.00                 | 0.94               | 269.95         | 1,799.88               | 11.95                 | -6.20               | 332.60                 | 13.46                      |  |
| 1,900.00                 | 1.05               | 272.29         | 1,899.87               | 11.99                 | -7.93               | 326.51                 | 14.37                      |  |
| 2,000.00                 | 1.06               | 271.37         | 1,999.85               | 12.04                 | -9.77               | 320.95                 | 15.51                      |  |
| 2,100.00                 | 0.97               | 279.11         | 2,099.84               | 12.20                 | -11.53              | 316.61                 | 16.79                      |  |
| 2,200.00                 | 0.94               | 286.72         | 2,199.82               | 12.57                 | -13.15              | 313.70                 | 18.19                      |  |
| 2,300.00                 | 0.89               | 298.54         | 2,299.81               | 13.18                 | -14.62              | 312.03                 | 19.68                      |  |
| 2,400.00                 | 0.83               | 299.49         | 2,399.80               | 13.91                 | -15.93              | 311.11                 | 21.15                      |  |
| 2,500.00                 | 0.89               | 287.81         | 2,499.79               | 14.50                 | -17.30              | 309.96                 | 22.58                      |  |
| 2,600.00                 | 0.76               | 292.10         | 2,599.78               | 14.99                 | -18.66              | 308.77                 | 23.93                      |  |
| 2,700.00                 | 0.59               | 292.19         | 2,699.77               | 15.43                 | -19.75              | 308.00                 | 25.06                      |  |
| 2,800.00                 | 0.56               | 296.58         | 2,799.77               | 15.84                 | -20.66              | 307.48                 | 26.04                      |  |
| 2,900.00                 | 0.43               | 293.64         | 2,899.76               | 16.21                 | -21.44              | 307.09                 | 26.88                      |  |
| 3,000.00                 | 0.40               | 290.32         | 2,999.76               | 16.48                 | -22.11              | 306.70                 | 27.58                      |  |
| 3,100.00                 | 0.32               | 300.44         | 3,099.76               | 16.75                 | -22.68              | 306.44                 | 28.19                      |  |
| 3,200.00                 | 0.20               | 305.00         | 3,199.76               | 16.99                 | -23.07              | 306.37                 | 28.65                      |  |
| 3,300.00                 | 0.35               | 233.21         | 3,299.76               | 16.91                 | -23.45              | 305.78                 | 28.91                      |  |
| 3,400.00                 | 0.40               | 240.39         | 3,399.75               | 16.55                 | -24.00              | 304.59                 | 29.15                      |  |
| 3,500.00                 | 0.52               | 254.21         | 3,499.75               | 16.25                 | -24.74              | 303.30                 | 29.60                      |  |
| 3,600.00                 | 0.61               | 261.44         | 3,599.75               | 16.05                 | -25.70              | 301.98                 | 30.31                      |  |
| 3,700.00                 | 0.39               | 276.65         | 3,699.74               | 16.01                 | -26.57              | 301.08                 | 31.02                      |  |
| 3,800.00                 | 0.26               | 273.65         | 3,799.74               | 16.07                 | -27.13              | 300.63                 | 31.53                      |  |
| 3,900.00                 | 0.55               | 349.56         | 3,899.74               | 16.55                 | -27.45              | 301.09                 | 32.05                      |  |
| 4,000.00                 | 0.57               | 28.29          | 3,999.73               | 17.46                 | -27.30              | 302.61                 | 32.41                      |  |
| 4,100.00                 | 0.35               | 29.56          | 4,099.73               | 18.17                 | -26.91              | 304.02                 | 32.47                      |  |
| 4,200.00                 | 0.26               | 5.83           | 4,199.73               | 18.66                 | -26.74              | 304.91                 | 32.60                      |  |
| 4,300.00                 | 0.49               | 334.87         | 4,299.73               | 19.27                 | -26.90              | 305.62                 | 33.09                      |  |
| 4,400.00                 | 0.35               | 2.73           | 4,399.72               | 19.96                 | -27.06              | 306.41                 | 33.63                      |  |
| 4,500.00                 | 0.09               | 43.04          | 4,499.72               | 20.32                 | -27.00              | 306.98                 | 33.79                      |  |
| 4,600.00                 | 0.29               | 197.93         | 4,599.72               | 20.14                 | -27.02              | 306.70                 | 33.70                      |  |
| 4,700.00                 | 0.21               | 245.78         | 4,699.72               | 19.83                 | -27.26              | 306.02                 | 33.71                      |  |
| 4,800.00                 | 0.40               | 240.81         | 4,799.72               | 19.58                 | -27.74              | 305.22                 | 33.95                      |  |
| 4,900.00                 | 0.36               | 251.69         | 4,899.72               | 19.31                 | -28.34              | 304.27                 | 34.29                      |  |
| 5,000.00                 | 0.48               | 239.64         | 4,999.72               | 19.00                 | -29.00              | 303.23                 | 34.67                      |  |
| 5,100.00                 | 0.58               | 256.72         | 5,099.71               | 18.67                 | -29.85              | 302.03                 | 35.21                      |  |
| 5,200.00                 | 0.71               | 262.84         | 5,199.70               | 18.48                 | -30.96              | 300.83                 | 36.06                      |  |
| 5,300.00                 | 0.59               | 291.12         | 5,299.70               | 18.59                 | -32.06              | 300.11                 | 37.06                      |  |
| 5,360.00                 | 0.64               | 338.85         | 5,359.70               | 19.01                 | -32.46              | 300.35                 | 37.62                      |  |

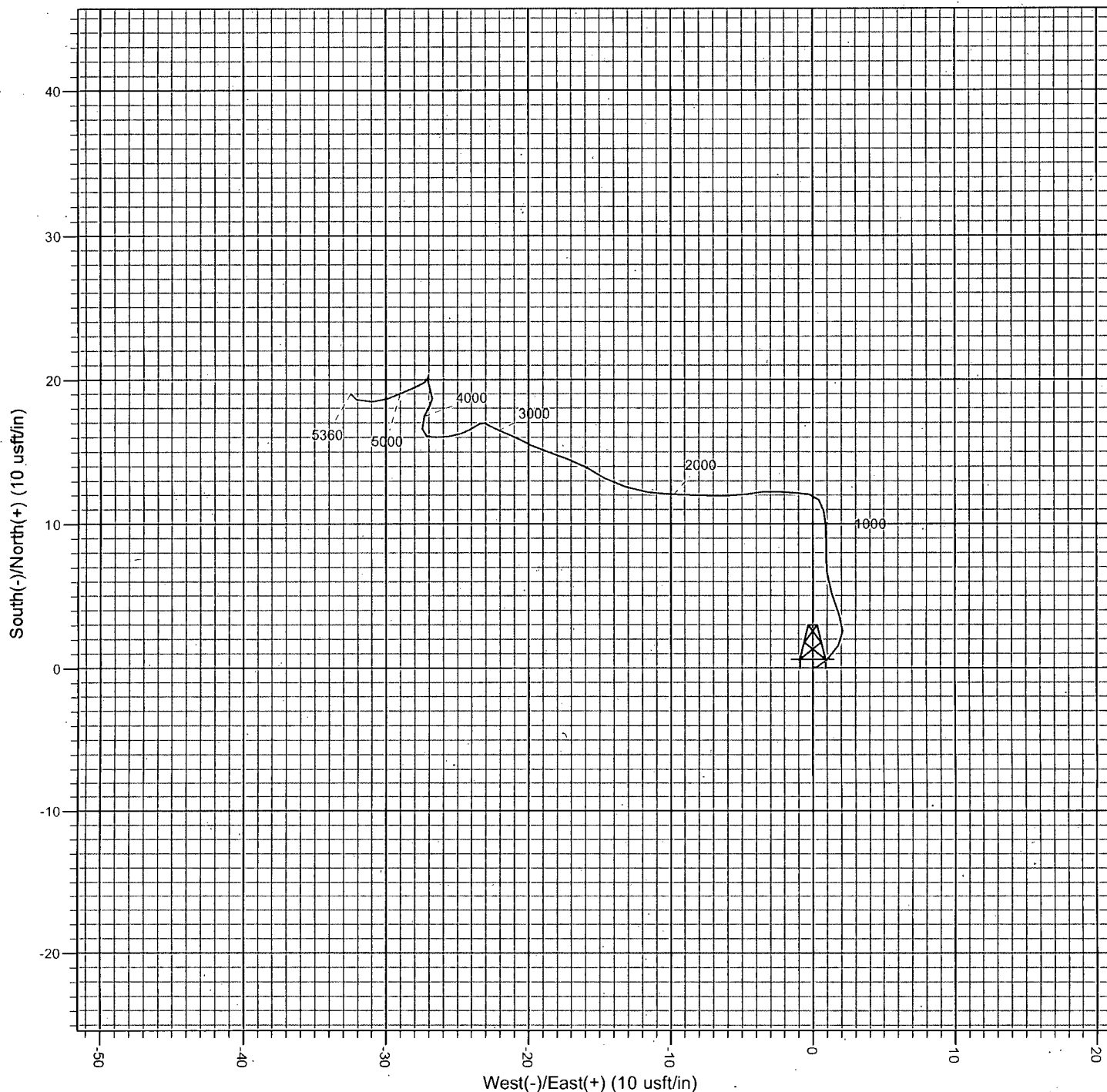


Scientific Drilling

Project: Empire, Yeso East  
Eddy County, NM  
Well: Mesquite State #13  
Wellbore: VH - Job #320513-KW-465  
Design: VH - Job #320513-KW-465

WELL DETAILS: Mesquite State #13  
WELL @ 0.00usft (Original Well Elev)  
Ground Level: 0.00

| +N/-S | +E/-W | Northing  | Easting   | Latitude        | Longitude        | Slot |
|-------|-------|-----------|-----------|-----------------|------------------|------|
| 0.00  | 0.00  | 661237.08 | 571690.67 | 32° 49' 3.400 N | 104° 5' 59.910 W |      |



|                                                       |                                       |
|-------------------------------------------------------|---------------------------------------|
| PROJECT DETAILS: Empire, Yeso East                    | SITE DETAILS: Eddy County, NM         |
| Geodetic System: US State Plane 1927 (Exact solution) | Site Centre Latitude: 32° 50' 6.025 N |
| Datum: NAD 1927 (NADCON CONUS)                        | Longitude: 104° 5' 55.187 W           |
| Ellipsoid: Clarke 1866                                | Positional Uncertainty: 0.00          |
| Zone: New Mexico East 3001                            | Convergence: 0.13                     |
| System Datum: Mean Sea Level                          | Local North: Grid                     |