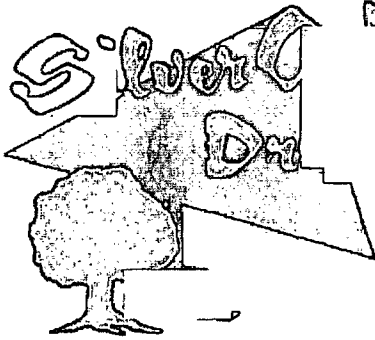
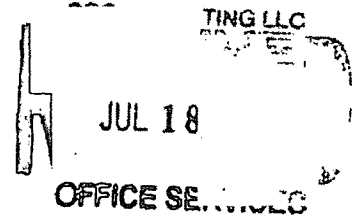
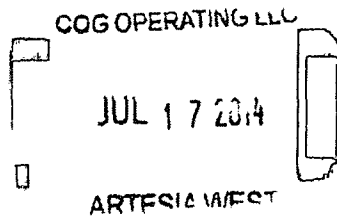


006135



PO Box 1370  
Artesia, NM 88211-1370  
(575) 748-1288



June 30, 2014

COG, LLC  
One Concho Center  
600 W. Illinois Ave.  
Midland, TX 79701

Deckard Federal Com #2H  
190' FNL & 1980' FWL  
Sec. 13, T24S, R33E  
Lea County, New Mexico

HOBBS OGD

MAR 09 2015

Dear Sir,

RECEIVED

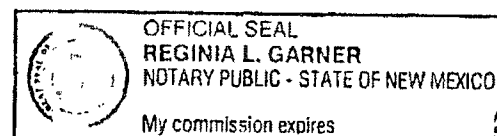
The attached is the Deviation Survey for the above captioned well.

Very truly yours,

Eddie LaRue  
Operations Manager

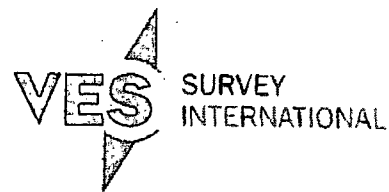
State of New Mexico  
County of Eddy

The foregoing was acknowledged before me this 30<sup>th</sup> day of June, 2014.



MAR 12 2015

AM



June 30, 2014

Concho Resources, Inc  
One Concho Center  
600 W. Illinois Avenue  
Midland, Texas 79701

HOBBSD

MAR 09 2015

RECEIVED

Attn: Kanicia Castillo

RE: Deckard Federal Com No. 002H

Please find enclosed a copy of the survey from 0.00' to 10,430.00' ran on the above referenced well.

Sincerely,

Keith Havelka  
Operations

STATE OF TEXAS §

§

COUNTY OF NUECES §

This instrument was acknowledged before  
A.D., 2014, by Keith Havelka.

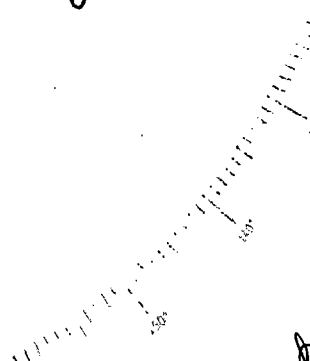
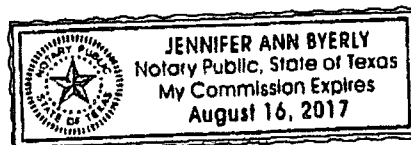
D

1

Ann

ky

VES Survey International  
P.O. Box 261021 Corpus Christi, TX 78426  
T(361) 767-0602 F(361) 767-0612  
www.vessurvey.com





INTERNATIONAL

Depth Reference : RKB= 18 Feet

## DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut

Minimum Curvature Method

Report Date/Time: 6/25/2014 / 10:32

VES Survey International

West Texas

(432) 663-5444

Surveyor: Bryan Massey

Deckard Federal Com No. 002H / API 30-025-41382

RECEIVED  
MAR 09 2015  
HOBBS OGD

| 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 | Vertical<br>Section<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                      | 0.00                        | ****                          |
| 100.00                  | 0.77                 | 6.05                      | 100.00    | 0.67        | 0.07        | 0.67                      | 0.67                      | 6.05                        | 0.77                          |
| 200.00                  | 0.72                 | 58.59                     | 199.98    | 1.66        | 0.68        | 1.66                      | 1.80                      | 22.08                       | 0.66                          |
| 300.00                  | 0.70                 | 69.51                     | 299.98    | 2.20        | 1.78        | 2.20                      | 2.83                      | 38.93                       | 0.14                          |
| 400.00                  | 0.46                 | 54.76                     | 399.98    | 2.65        | 2.68        | 2.65                      | 3.77                      | 45.33                       | 0.28                          |
| 500.00                  | 0.47                 | 36.65                     | 499.97    | 3.21        | 3.25        | 3.21                      | 4.57                      | 45.40                       | 0.15                          |
| 600.00                  | 0.11                 | 20.39                     | 599.97    | 3.63        | 3.53        | 3.63                      | 5.06                      | 44.22                       | 0.36                          |
| 700.00                  | 0.16                 | 29.46                     | 699.97    | 3.85        | 3.64        | 3.85                      | 5.29                      | 43.39                       | 0.05                          |
| 800.00                  | 0.14                 | 305.86                    | 799.97    | 4.04        | 3.81        | 4.04                      | 5.42                      | 41.77                       | 0.20                          |
| 900.00                  | 0.26                 | 299.37                    | 899.97    | 4.22        | 3.32        | 4.22                      | 5.37                      | 38.16                       | 0.12                          |
| 1000.00                 | 0.12                 | 1.57                      | 999.97    | 4.43        | 3.12        | 4.43                      | 5.42                      | 35.16                       | 0.23                          |
| 1100.00                 | 0.38                 | 252.59                    | 1099.97   | 4.44        | 2.81        | 4.44                      | 5.25                      | 32.31                       | 0.44                          |
| 1200.00                 | 0.46                 | 267.35                    | 1199.97   | 4.32        | 2.08        | 4.32                      | 4.79                      | 25.73                       | 0.13                          |
| 1300.00                 | 0.54                 | 289.39                    | 1299.96   | 4.46        | 1.23        | 4.46                      | 4.62                      | 15.48                       | 0.20                          |
| 1400.00                 | 0.46                 | 267.66                    | 1399.96   | 4.59        | 0.39        | 4.59                      | 4.81                      | 4.88                        | 0.20                          |
| 1500.00                 | 0.62                 | 273.65                    | 1499.96   | 4.61        | -0.55       | 4.61                      | 4.65                      | 353.22                      | 0.17                          |
| 1600.00                 | 0.45                 | 304.14                    | 1599.95   | 4.87        | -1.42       | 4.87                      | 5.07                      | 343.80                      | 0.32                          |
| 1700.00                 | 0.43                 | 297.39                    | 1699.95   | 5.27        | -2.08       | 5.27                      | 5.66                      | 338.45                      | 0.06                          |
| 1800.00                 | 0.44                 | 317.34                    | 1799.95   | 5.72        | -2.68       | 5.72                      | 6.32                      | 334.93                      | 0.15                          |

MS

| 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 | Vertical<br>Section<br>FT | Closure<br>Distance<br>FT | Closure<br>Direction<br>Deg | Dogleg<br>Severity<br>Deg/100 |
|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 1900.00                 | 0.52                 | 292.35                    | 1899.94   | 6.18        | -3.36       | 6.18                      | 7.03                      | 331.49                      | 0.22                          |
| 2000.00                 | 0.65                 | 294.13                    | 1999.94   | 6.58        | -4.29       | 6.58                      | 7.86                      | 328.89                      | 0.14                          |
| 2100.00                 | 0.61                 | 314.26                    | 2099.93   | 7.19        | -5.20       | 7.19                      | 8.87                      | 324.14                      | 0.23                          |
| 2200.00                 | 0.75                 | 288.87                    | 2199.92   | 7.77        | -6.20       | 7.77                      | 9.94                      | 321.43                      | 0.33                          |
| 2300.00                 | 0.77                 | 301.41                    | 2299.91   | 8.34        | -7.40       | 8.34                      | 11.15                     | 318.42                      | 0.17                          |
| 2400.00                 | 0.81                 | 290.18                    | 2399.91   | 8.94        | -8.64       | 8.94                      | 12.43                     | 315.96                      | 0.16                          |
| 2500.00                 | 0.76                 | 302.18                    | 2499.90   | 9.54        | -9.87       | 9.54                      | 13.72                     | 314.01                      | 0.17                          |
| 2600.00                 | 0.91                 | 306.50                    | 2599.89   | 10.36       | -11.08      | 10.36                     | 15.17                     | 313.10                      | 0.16                          |
| 2700.00                 | 0.74                 | 309.18                    | 2699.87   | 11.25       | -12.22      | 11.25                     | 16.60                     | 312.63                      | 0.18                          |
| 2800.00                 | 0.71                 | 334.14                    | 2799.87   | 12.21       | -12.99      | 12.21                     | 17.83                     | 313.24                      | 0.31                          |
| 2900.00                 | 0.94                 | 321.20                    | 2899.86   | 13.40       | -13.77      | 13.40                     | 19.22                     | 314.23                      | 0.29                          |
| 3000.00                 | 0.95                 | 331.21                    | 2999.84   | 14.77       | -14.68      | 14.77                     | 20.82                     | 315.17                      | 0.17                          |
| 3100.00                 | 0.97                 | 347.95                    | 3099.83   | 16.32       | -15.25      | 16.32                     | 22.34                     | 316.94                      | 0.28                          |
| 3200.00                 | 1.05                 | 356.33                    | 3199.81   | 18.06       | -15.49      | 18.06                     | 23.80                     | 319.38                      | 0.16                          |
| 3300.00                 | 1.01                 | 11.21                     | 3299.80   | 19.84       | -15.38      | 19.84                     | 25.10                     | 322.22                      | 0.27                          |
| 3400.00                 | 0.87                 | 17.58                     | 3399.78   | 21.43       | -14.98      | 21.43                     | 26.14                     | 325.05                      | 0.17                          |
| 3500.00                 | 1.01                 | 23.74                     | 3499.77   | 22.95       | -14.39      | 22.95                     | 27.09                     | 327.91                      | 0.17                          |
| 3600.00                 | 0.94                 | 9.06                      | 3599.76   | 24.57       | -13.91      | 24.57                     | 28.24                     | 330.48                      | 0.26                          |
| 3700.00                 | 0.76                 | 5.86                      | 3699.75   | 26.05       | -13.71      | 26.05                     | 29.44                     | 332.23                      | 0.19                          |
| 3800.00                 | 0.80                 | 10.85                     | 3799.74   | 27.39       | -13.51      | 27.39                     | 30.54                     | 333.74                      | 0.08                          |
| 3900.00                 | 0.66                 | 12.46                     | 3899.73   | 28.63       | -13.26      | 28.63                     | 31.56                     | 335.15                      | 0.14                          |
| 4000.00                 | 0.64                 | 2.64                      | 3999.72   | 29.75       | -13.11      | 29.75                     | 32.52                     | 336.22                      | 0.11                          |
| 4100.00                 | 0.50                 | 352.55                    | 4099.72   | 30.75       | -13.14      | 30.75                     | 33.44                     | 336.86                      | 0.18                          |
| 4200.00                 | 0.32                 | 334.56                    | 4199.71   | 31.43       | -13.32      | 31.43                     | 34.13                     | 337.04                      | 0.22                          |
| 4300.00                 | 0.20                 | 331.73                    | 4299.71   | 31.83       | -13.52      | 31.83                     | 34.58                     | 336.99                      | 0.12                          |
| 4400.00                 | 0.42                 | 20.33                     | 4399.71   | 32.32       | -13.47      | 32.32                     | 35.02                     | 337.37                      | 0.32                          |
| 4500.00                 | 0.89                 | 47.97                     | 4499.71   | 33.19       | -12.77      | 33.19                     | 35.56                     | 338.96                      | 0.56                          |
| 4600.00                 | 1.36                 | 79.88                     | 4599.69   | 33.92       | -11.02      | 33.92                     | 35.66                     | 341.99                      | 0.76                          |
| 4700.00                 | 1.63                 | 94.47                     | 4699.65   | 34.01       | -8.44       | 34.01                     | 35.04                     | 346.06                      | 0.47                          |
| 4800.00                 | 1.93                 | 103.00                    | 4799.61   | 33.52       | -5.39       | 33.52                     | 33.95                     | 350.87                      | 0.40                          |
| 4900.00                 | 2.23                 | 113.95                    | 4899.54   | 32.35       | -1.97       | 32.35                     | 32.41                     | 355.52                      | 0.50                          |
| 5000.00                 | 2.00                 | 118.37                    | 4999.47   | 30.73       | 1.35        | 30.73                     | 30.76                     | 2.52                        | 0.29                          |
| 5100.00                 | 1.44                 | 132.19                    | 5099.43   | 29.06       | 3.82        | 29.06                     | 29.31                     | 7.49                        | 0.69                          |
| 5200.00                 | 1.30                 | 118.18                    | 5199.40   | 27.68       | 5.75        | 27.68                     | 28.27                     | 11.74                       | 0.36                          |
| 5300.00                 | 0.98                 | 119.87                    | 5299.38   | 26.72       | 7.49        | 26.72                     | 27.75                     | 15.67                       | 0.32                          |
| 5400.00                 | 1.26                 | 122.20                    | 5399.36   | 25.71       | 9.16        | 25.71                     | 27.29                     | 19.62                       | 0.28                          |
| 5500.00                 | 0.84                 | 119.32                    | 5499.34   | 24.76       | 10.73       | 24.76                     | 26.99                     | 23.43                       | 0.42                          |
| 5600.00                 | 0.95                 | 116.54                    | 5599.33   | 24.03       | 12.12       | 24.03                     | 26.91                     | 26.76                       | 0.12                          |
| 5700.00                 | 0.95                 | 111.39                    | 5699.32   | 23.36       | 13.63       | 23.36                     | 27.05                     | 30.27                       | 0.09                          |

| 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 | Vertical<br>Section<br>FT | Closure<br>Distance<br>FT | Closure<br>Direction<br>Deg | Dogleg<br>Severity<br>Deg/100 |
|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 5800.00                 | 0.77                 | 107.31                    | 5799.30   | 22.86       | 15.04       | 22.86                     | 27.36                     | 33.35                       | 0.19                          |
| 5900.00                 | 0.79                 | 105.66                    | 5899.30   | 22.47       | 16.35       | 22.47                     | 27.79                     | 36.04                       | 0.03                          |
| 6000.00                 | 0.88                 | 112.74                    | 5999.28   | 21.99       | 17.73       | 21.99                     | 28.24                     | 38.88                       | 0.14                          |
| 6100.00                 | 0.88                 | 87.31                     | 6099.27   | 21.72       | 19.21       | 21.72                     | 29.00                     | 41.49                       | 0.39                          |
| 6200.00                 | 0.87                 | 63.02                     | 6199.26   | 22.10       | 20.65       | 22.10                     | 30.25                     | 43.06                       | 0.37                          |
| 6300.00                 | 0.76                 | 67.78                     | 6299.25   | 22.70       | 21.94       | 22.70                     | 31.57                     | 44.03                       | 0.13                          |
| 6400.00                 | 0.78                 | 72.82                     | 6399.24   | 23.16       | 23.20       | 23.15                     | 32.78                     | 45.07                       | 0.07                          |
| 6500.00                 | 0.70                 | 62.98                     | 6499.23   | 23.63       | 24.40       | 23.63                     | 33.96                     | 45.92                       | 0.15                          |
| 6600.00                 | 0.53                 | 58.55                     | 6599.23   | 24.14       | 25.33       | 24.14                     | 35.00                     | 46.38                       | 0.18                          |
| 6700.00                 | 0.80                 | 57.60                     | 6699.22   | 24.76       | 26.32       | 24.76                     | 36.13                     | 46.75                       | 0.27                          |
| 6800.00                 | 0.31                 | 57.69                     | 6799.22   | 25.28       | 27.14       | 25.28                     | 37.09                     | 47.03                       | 0.49                          |
| 6900.00                 | 0.66                 | 57.70                     | 6899.21   | 25.73       | 27.86       | 25.73                     | 37.92                     | 47.27                       | 0.35                          |
| 7000.00                 | 0.49                 | 86.39                     | 6999.21   | 26.07       | 28.77       | 26.07                     | 38.82                     | 47.82                       | 0.33                          |
| 7100.00                 | 0.41                 | 96.31                     | 7099.20   | 26.06       | 29.55       | 26.06                     | 39.40                     | 48.60                       | 0.11                          |
| 7200.00                 | 0.44                 | 108.68                    | 7199.20   | 25.89       | 30.27       | 25.89                     | 39.83                     | 49.45                       | 0.10                          |
| 7300.00                 | 0.27                 | 130.36                    | 7299.20   | 25.62       | 30.81       | 25.62                     | 40.07                     | 50.25                       | 0.21                          |
| 7400.00                 | 0.45                 | 176.62                    | 7399.20   | 25.07       | 31.01       | 25.07                     | 39.88                     | 51.04                       | 0.33                          |
| 7500.00                 | 0.61                 | 146.37                    | 7499.19   | 24.23       | 31.33       | 24.23                     | 39.61                     | 52.28                       | 0.31                          |
| 7600.00                 | 0.75                 | 179.23                    | 7599.19   | 23.14       | 31.63       | 23.14                     | 39.19                     | 53.81                       | 0.40                          |
| 7700.00                 | 0.82                 | 175.60                    | 7699.18   | 21.78       | 31.69       | 21.78                     | 38.46                     | 55.50                       | 0.09                          |
| 7800.00                 | 0.81                 | 145.88                    | 7799.17   | 20.49       | 32.14       | 20.49                     | 38.12                     | 57.49                       | 0.42                          |
| 7900.00                 | 0.67                 | 131.63                    | 7899.16   | 19.52       | 32.97       | 19.52                     | 38.32                     | 59.38                       | 0.23                          |
| 8000.00                 | 1.04                 | 108.48                    | 7999.15   | 18.84       | 34.27       | 18.84                     | 39.11                     | 61.19                       | 0.50                          |
| 8100.00                 | 1.25                 | 79.03                     | 8099.13   | 18.76       | 36.20       | 18.76                     | 40.77                     | 62.60                       | 0.62                          |
| 8200.00                 | 1.81                 | 60.56                     | 8199.10   | 19.75       | 38.64       | 19.75                     | 43.39                     | 62.93                       | 0.74                          |
| 8300.00                 | 1.45                 | 57.20                     | 8299.05   | 21.21       | 41.08       | 21.21                     | 46.23                     | 62.69                       | 0.37                          |
| 8400.00                 | 1.22                 | 50.40                     | 8399.03   | 22.57       | 42.96       | 22.57                     | 48.53                     | 62.28                       | 0.27                          |
| 8500.00                 | 1.11                 | 52.56                     | 8499.01   | 23.84       | 44.55       | 23.84                     | 50.53                     | 61.85                       | 0.12                          |
| 8600.00                 | 1.10                 | 61.40                     | 8598.99   | 24.89       | 46.17       | 24.89                     | 52.45                     | 61.67                       | 0.17                          |
| 8700.00                 | 1.29                 | 64.86                     | 8698.97   | 26.00       | 47.93       | 26.00                     | 54.53                     | 61.52                       | 0.23                          |
| 8800.00                 | 1.03                 | 43.49                     | 8798.95   | 27.30       | 49.47       | 27.30                     | 56.50                     | 61.11                       | 0.35                          |
| 8900.00                 | 0.89                 | 63.73                     | 8898.93   | 28.41       | 50.71       | 28.41                     | 58.13                     | 60.74                       | 0.22                          |
| 9000.00                 | 0.61                 | 46.27                     | 8998.92   | 29.24       | 51.73       | 29.24                     | 59.42                     | 60.52                       | 0.30                          |
| 9100.00                 | 0.53                 | 74.82                     | 9098.92   | 29.73       | 52.56       | 29.73                     | 60.39                     | 60.51                       | 0.29                          |
| 9200.00                 | 0.79                 | 66.35                     | 9198.91   | 30.13       | 53.64       | 30.13                     | 61.52                     | 60.68                       | 0.27                          |
| 9300.00                 | 0.73                 | 41.34                     | 9298.90   | 30.88       | 54.69       | 30.88                     | 62.81                     | 60.55                       | 0.33                          |
| 9400.00                 | 0.61                 | 28.59                     | 9398.90   | 31.83       | 55.37       | 31.83                     | 63.87                     | 60.10                       | 0.19                          |
| 9500.00                 | 0.42                 | 47.04                     | 9498.89   | 32.55       | 55.89       | 32.55                     | 64.68                     | 59.78                       | 0.25                          |
| 9600.00                 | 0.62                 | 95.63                     | 9598.89   | 32.74       | 56.70       | 32.74                     | 65.47                     | 59.99                       | 0.46                          |

| 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 | Vertical<br>Section<br>FT | Closure<br>Distance<br>FT | Closure<br>Direction<br>Deg | Dogleg<br>Severity<br>Deg/100 |
|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 9700.00                 | 1.03                 | 106.41                    | 9698.88   | 32.44       | 58.10       | 32.44                     | 66.54                     | 60.83                       | 0.44                          |
| 9800.00                 | 0.74                 | 55.46                     | 9798.87   | 32.55       | 59.50       | 32.55                     | 67.82                     | 61.32                       | 0.81                          |
| 9900.00                 | 1.84                 | 49.15                     | 9898.84   | 33.97       | 61.25       | 33.97                     | 70.04                     | 60.99                       | 1.11                          |
| 10000.00                | 1.50                 | 71.96                     | 9998.80   | 35.43       | 63.71       | 35.43                     | 72.90                     | 60.92                       | 0.74                          |
| 10100.00                | 1.84                 | 69.75                     | 10098.76  | 36.39       | 66.46       | 36.39                     | 75.77                     | 61.30                       | 0.35                          |
| 10200.00                | 1.54                 | 64.77                     | 10198.71  | 37.52       | 69.19       | 37.52                     | 78.70                     | 61.53                       | 0.34                          |
| 10300.00                | 1.37                 | 25.53                     | 10298.68  | 39.17       | 70.92       | 39.17                     | 81.01                     | 61.09                       | 0.99                          |
| 10430.00                | 0.49                 | 316.37                    | 10428.67  | 40.97       | 71.21       | 40.97                     | 82.15                     | 60.08                       | 0.99                          |



VES Survey International

West Texas

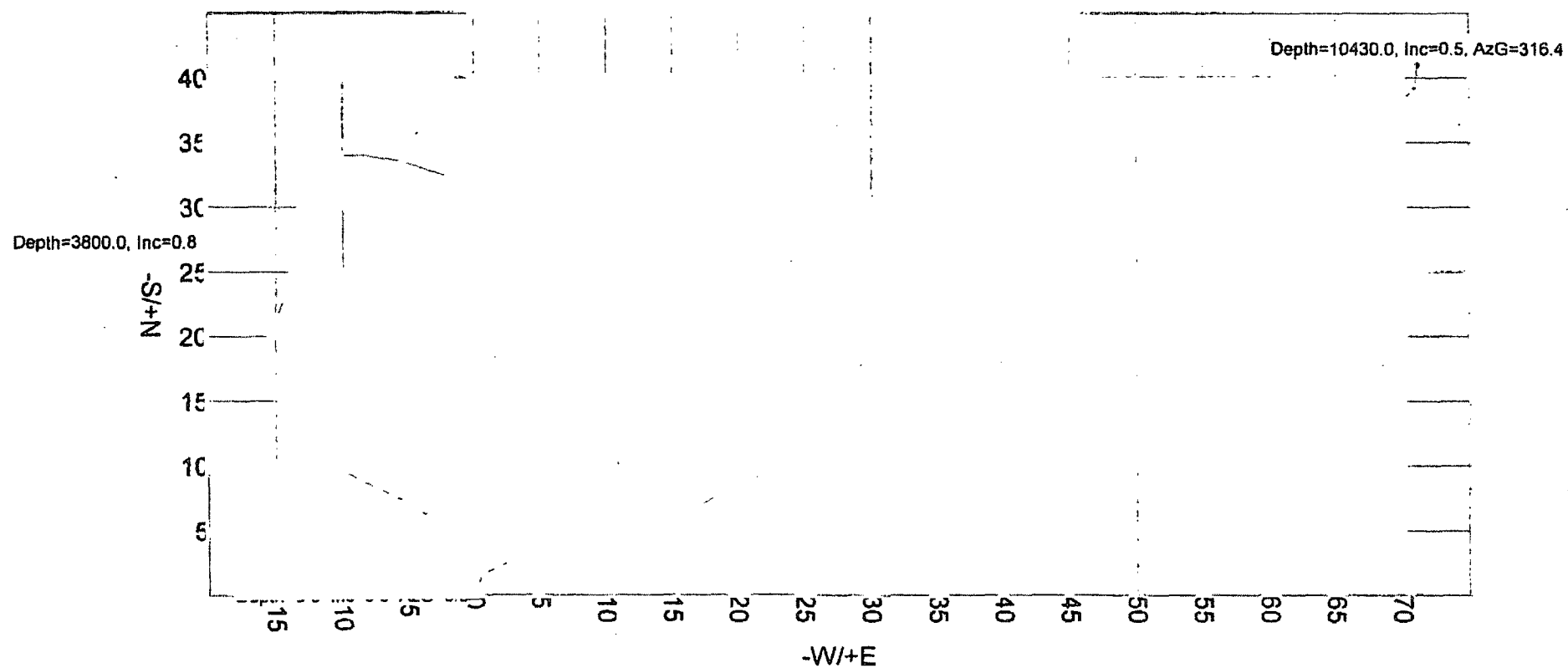
(432) 563-5444

Surveyor: Bryan Massey

Deckard Federal

.002H / API 30-025-41382

VES SURVEY  
INTERNATIONAL



VES Survey Date: 06/14/2014



**COG Operating LLC**

**Lea County, NM**

**Deckard Federal Com**

**#2H**

**OH**

**Survey: MWD ST01**

## **Standard Survey Report**

**30 June, 2014**

**HOBBSD**

**MAR 09 2015**

**RECEIVED**

*AM*



# Wellplanning Survey Report

**Company:** COG Operating LLC  
**Project:** Lea County, NM  
**Site:** Deckard Federal Com  
**Well:** #2H  
**Wellbore:** OH  
**Design:** OH

**Local Co-ordinate Reference:** Well #2H  
**TVD Reference:** WELL @ 3610.4usft (Original Well Elev)  
**MD Reference:** WELL @ 3610.4usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Single User Db

|                    |                                      |                      |                |
|--------------------|--------------------------------------|----------------------|----------------|
| <b>Project</b>     | Lea County, NM                       |                      |                |
| <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                 |                      |                |

**Site** Deckard Federal Com

**Site Position:** **Map** **Northing:** 446,229.30 usft **Latitude:** 32° 13' 27.045 N  
**From:** **Easting:** 751,773.80 usft **Longitude:** 103° 31' 9.014 W  
**Position Uncertainty:** 0.0 usft **Slot Radius:** 13-3/16 " **Grid Convergence:** 0.43

**Well** #2H

**Well Position** **+N-S** 0.0 usft **Northing:** 446,215.70 usft **Latitude:** 32° 13' 27.108 N  
**+E-W** 0.0 usft **Easting:** 749,128.50 usft **Longitude:** 103° 31' 39.808 W  
**Position Uncertainty** 0.0 usft **Wellhead Elevation:** usft **Ground Level:** 3,592.4 usft

**Wellbore** OH

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|-----------|------------|-------------|-----------------|---------------|---------------------|
|           | IGRF2010   | 5/27/2014   | 7.20            | 60            | 48,325              |

**Design** OH

**Audit Notes:**

**Version:** 1.0 **Phase:** ACTUAL **Tie On Depth:**  
**Vertical Section:** **Depth From (TVD)** **+N-S** **+E-W** **Direction**  
 (usft) (usft) (usft) (°)

179.55

D 8/30/2014

oy ellbore)

|          |                      |     |                |
|----------|----------------------|-----|----------------|
| 100.0    | 10,430.0 GYRO (OH)   | MWD | MWD - Standard |
| 10,520.0 | 13,176.0 MWD #1 (OH) | MWD | MWD - Standard |

## 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) |
|-----------------------|-----------------|-------------|-----------------------|-------------|-------------|-------------------------|-------------------------|------------------------|-----------------------|
|                       |                 | 3           | 10,428.7              | 41.0        | 71.2        | -40.4                   | 0.00                    | 0.00                   | 0.00                  |
| 10,520.0              | 1.00            | 14.10       | 10,518.7              | 42.0        | 71.2        | -41.4                   | 0.94                    | 0.57                   | 64.14                 |
| 10,552.0              | 0.80            | 162.80      | 10,550.7              | 42.0        | 71.3        | -41.5                   | 5.42                    | -0.83                  | 484.88                |
| 10,583.0              | 5.00            | 178.30      | 10,581.8              | 40.5        | 71.4        | -39.9                   | 13.66                   | 13.55                  | 50.00                 |
| 10,615.0              | 10.00           | 180.40      | 10,613.3              | 36.3        | 71.4        | 35.8                    | 15.65                   | 15.63                  | 6.56                  |
| 10,647.0              | 15.30           | 181.80      | 10,644.5              | 29.3        | 71.3        | 28.8                    | 16.59                   | 16.58                  | 4.38                  |
| 10,678.0              | 20.90           | 183.10      | 10,674.0              | 19.7        | 70.8        | -19.1                   | 18.11                   | 18.06                  | 4.19                  |
| 10,710.0              | 26.00           | 182.70      | 10,703.3              | 7.0         | 70.2        | -8.4                    | 15.95                   | 15.94                  | -1.25                 |
| 10,741.0              | 30.80           | 181.80      | 10,730.8              | -7.7        | 69.6        | 8.3                     | 15.54                   | 15.48                  | -2.90                 |
| 10,773.0              | 35.30           | 181.50      | 10,757.4              | -25.2       | 69.1        | 25.7                    | 14.07                   | 14.06                  | -0.94                 |



Company: COG Operating LLC  
 Project: Lea County, NM  
 Site: Deckard Federal Con  
 Well: #2H  
 Wellbore: OH  
 Design: OH

# Well Planning Survey Report

Local Control Data Reference:  
 TWD Reference:  
 MWD Reference:  
 North Arrow:  
 Survey Calculation Method:  
 Database:

Well #2H  
 WELL @ 3610.4usft (Original Well Elev)  
 WELL @ 3610.4usft (Original Well Elev)  
 Grid  
 Minimum Curvature  
 EDM 5000.1 Single User (b)

## Survey

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | True North (usft) | East (usft) | Vertical Separation (usft) | Deg/deg Ratio (°/100usft) | Build (usft) | Turn Rate (°/100usft) |
|-----------------------|-----------------|-------------|-----------------------|-------------------|-------------|----------------------------|---------------------------|--------------|-----------------------|
| 10,805.0              | 39.00           | 181.80      | 10,782.9              | 144.5             | 68.6        | 45.0                       | 11.56                     | 11.53        | 0.84                  |
| 10,836.0              | 43.20           | 181.90      | 10,806.3              | 94.9              | 67.9        | 65.4                       | 13.55                     | 13.53        | 0.32                  |
| 10,968.0              | 48.40           | 181.50      | 10,828.6              | 97.8              | 67.2        | 60.3                       | 16.27                     | 16.25        | 1.25                  |
| 10,900.0              | 52.30           | 181.00      | 10,849.0              | 112.4             | 66.7        | 112.9                      | 12.25                     | 12.18        | 1.5                   |
| 10,931.0              | 55.40           | 180.20      | 10,867.3              | 137.4             | 66.4        | 118.0                      | 10.21                     | 0.00         | 2.56                  |
| 10,863.0              | 59.30           | 179.30      | 10,864.5              | 164.4             | 66.6        | 134.9                      | 12.42                     | 12.19        | 2.8                   |
| 10,994.0              | 64.50           | 179.00      | 10,899.1              | 181.7             | 67.0        | 182.2                      | 18.80                     | 1            | 0.9                   |
| 11,026.0              | 69.30           | 179.10      | 10,911.7              | 221.1             | 67.5        | 221.7                      | 15.00                     | 15           | 3                     |
| 11,058.0              | 72.30           | 179.60      | 10,922.2              | 251.9             | 67.8        | 251.9                      | 9.49                      | 8            | 1.56                  |
| 11,087.0              | 74.80           | 180.00      | 10,930.4              | 279.2             | 67.9        | 279.7                      | 8.72                      | 8.2          | 1.38                  |
| 11,119.0              | 77.80           | 180.40      | 10,938.0              | 310.2             | 67.8        | 310.6                      | 9.45                      | 38           | 1.25                  |
| 11,150.0              | 81.00           | 180.50      | 10,943.7              | 340.7             | 67.5        | 341.2                      | 10.33                     | 10.32        | 0.32                  |
| 11,182.0              | 82.50           | 180.70      | 10,948.3              | 372.4             | 67.2        | 372.9                      | 4.73                      | 9            | 0.63                  |
| 11,214.0              | 83.40           | 180.60      | 10,952.2              | 404.1             | 66.9        | 404.6                      | 2.83                      | 2.81         | 0.31                  |
| 11,246.0              | 84.80           | 181.40      | 10,955.5              | 436.0             | 66.3        | 436.5                      | 5.03                      | 4.8          | 2.50                  |
| 11,277.0              | 86.00           | 181.60      | 10,958.0              | 468.8             | 65.5        | 467.3                      | 3.92                      | 87           | 0.65                  |
| 11,309.0              | 86.70           | 181.80      | 10,960.0              | 499.8             | 64.9        | 499.3                      | 2.19                      | 2.19         | 0.00                  |
| 11,340.0              | 88.20           | 181.20      | 10,961.4              | 529.7             | 63.8        | 530.2                      | 5.01                      | 4.84         | 1.29                  |
| 11,372.0              | 88.80           | 181.20      | 10,962.2              | 561.7             | 63.2        | 562.2                      | 1.88                      | 1.88         | 0.00                  |
| 11,467.0              | 89.30           | 180.30      | 10,963.8              | 659.7             | 61.9        | 657.2                      | 1.08                      | 0.53         | 95                    |
| 11,562.0              | 90.00           | 180.40      | 10,964.4              | 751.7             | 61.3        | 752.1                      | 0.74                      | 0.74         | 0.11                  |
| 11,657.0              | 88.40           | 180.60      | 10,963.7              | 846.7             | 60.5        | 847.1                      | 1.70                      | 1.88         | 0.21                  |
| 11,752.0              | 88.10           | 179.80      | 10,968.6              | 841.8             | 60.2        | 842.1                      | 0.90                      | 0.32         | 0.84                  |
| 11,847.0              | 86.60           | 179.40      | 10,973.0              | 1,035.5           | 60.8        | 1,037.0                    | 1.63                      | 1.58         | 42                    |
| 11,941.0              | 86.30           | 178.50      | 10,978.8              | 1,130.3           | 62.6        | 1,130.6                    | 1.01                      | 32           | 0.98                  |
| 12,036.0              | 87.00           | 177.60      | 10,984.4              | 1,225.1           | 63.5        | 1,225.6                    | 0.97                      | 0.4          | 0.63                  |
| 12,131.0              | 87.90           | 176.50      | 10,990.6              | 1,320.0           | 66.5        | 1,320.5                    | 1.14                      | 0.95         | 0.63                  |
| 12,226.0              | 88.60           | 178.90      | 10,991.5              | 1,414.9           | 70.7        | 1,415.4                    | 0.85                      | 0.7          | 0.42                  |
| 12,321.0              | 89.60           | 179.70      | 10,993.0              | 1,509.9           | 71.8        | 1,510.4                    | 1.35                      | 1.05         | 0.84                  |
| 12,416.0              | 90.50           | 179.00      | 10,992.9              | 1,604.9           | 72.9        | 1,605.4                    | 1.20                      | 0.95         | 0.74                  |
| 12,511.0              | 90.50           | 178.60      | 10,992.1              | 1,699.6           | 74.7        | 1,700.4                    | 0.11                      | 0.00         | 0.11                  |
| 12,606.0              | 88.30           | 180.30      | 10,993.4              | 1,794.8           | 75.3        | 1,795.4                    | 2.74                      | -2.32        | 1.47                  |
| 12,701.0              | 86.70           | 180.20      | 10,995.6              | 1,889.6           | 74.9        | 1,890.3                    | 0.43                      | 0.42         | 0.11                  |
| 12,796.0              | 87.30           | 181.40      | 10,998.9              | 1,984.7           | 73.6        | 1,985.2                    | 1.94                      | -1.47        | 1.26                  |
| 12,891.0              | 87.50           | 182.10      | 11,003.2              | 2,079.6           | 70.7        | 2,080.1                    | 0.77                      | 0.21         | 0.74                  |
| 12,986.0              | 86.80           | 184.30      | 11,007.9              | 2,174.3           | 65.4        | 2,174.9                    | 2.40                      | 63           | 2.32                  |
| 13,081.0              | 85.00           | 184.70      | 11,013.7              | 2,269.6           | 58.0        | 2,269.2                    | 1.04                      | 95           | 0.42                  |
| 13,176.0              | 87.50           | 185.80      | 11,019.1              | 2,363.3           | 49.4        | 2,363.6                    | 1.84                      | 58           | 0.65                  |
| 13,271.0              | 88.70           | 185.30      | 11,022.3              | 2,457.6           | 41.4        | 2,458.1                    | 1.30                      |              | 0.32                  |
| 13,366.0              | 88.40           | 184.80      | 11,024.7              | 2,552.4           | 32.1        | 2,552.6                    | 0.61                      | 2            | 0.53                  |
| 13,461.0              | 89.50           | 184.80      | 11,026.4              | 2,647.1           | 24.3        | 2,647.2                    | 1.18                      |              | 21                    |
| 13,556.0              | 90.30           | 182.90      | 11,028.6              | 2,741.9           | 18.1        | 2,741.9                    | 1.98                      | 0            | 9                     |
| 13,651.0              | 89.80           | 181.10      | 11,028.5              | 2,836.8           | 14.7        | 2,836.8                    | 1.97                      | -0           | 9                     |



# Wellplanning Survey Report

Company: COG Operating LLC  
Project: Lea County, NM  
Site: Deckard Federal Com  
Well: #2H  
Wellbore: OH  
Design: OH

Local Co-ordinate Reference: Well #2H  
TVD Reference: WELL @ 3810.4usft (Original Well Elev)  
MID Reference: WELL @ 3810.4usft (Original Well Elev)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Database: EDM 5000 1 Single User Db

## Survey

| Measured<br>Depth<br>(usft) | Inclination<br>(°) | Azimuth<br>(°) | Vortical<br>Depth<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Vortical<br>Section<br>(usft) | Doglog<br>Rate<br>(°/100usft) | Build<br>Rate<br>(°/100usft) | Turn<br>Rate<br>(°/100usft) |
|-----------------------------|--------------------|----------------|-----------------------------|-----------------|-----------------|-------------------------------|-------------------------------|------------------------------|-----------------------------|
| 13,748.0                    | 89.50              | 179.80         | 11,027.1                    | -2,931.8        | 14.0            | 2,931.8                       | 1.40                          | -0.32                        | -1.37                       |
| 13,841.0                    | 89.20              | 179.60         | 11,028.2                    | -3,028.8        | 14.5            | 3,028.8                       | 0.38                          | -0.32                        | -0.21                       |
| 13,938.0                    | 89.50              | 178.90         | 11,029.2                    | -3,121.8        | 15.7            | 3,121.8                       | 0.80                          | 0.32                         | -0.74                       |
| 14,031.0                    | 89.10              | 178.80         | 11,030.4                    | -3,218.8        | 17.7            | 3,218.8                       | 0.43                          | -0.42                        | -0.11                       |
| 14,128.0                    | 90.20              | 178.70         | 11,031.0                    | -3,311.7        | 19.7            | 3,311.8                       | 1.16                          | 1.16                         | -0.11                       |
| 14,221.0                    | 89.80              | 178.90         | 11,031.0                    | -3,406.7        | 21.7            | 3,406.8                       | 0.47                          | -0.42                        | 0.21                        |
| 14,315.0                    | 89.20              | 179.10         | 11,031.8                    | -3,500.7        | 23.4            | 3,500.8                       | 0.67                          | -0.64                        | 0.21                        |
| 14,411.0                    | 88.50              | 178.60         | 11,033.7                    | -3,596.7        | 25.3            | 3,596.7                       | 0.90                          | -0.73                        | -0.52                       |
| 14,506.0                    | 88.20              | 177.70         | 11,036.5                    | -3,691.8        | 28.3            | 3,691.7                       | 1.00                          | -0.32                        | -0.85                       |
| 14,601.0                    | 87.90              | 177.40         | 11,039.7                    | -3,786.4        | 32.4            | 3,786.8                       | 0.45                          | -0.32                        | -0.32                       |
| 14,695.0                    | 87.60              | 178.70         | 11,043.4                    | -3,880.2        | 37.2            | 3,880.4                       | 0.81                          | -0.32                        | -0.74                       |
| 14,790.0                    | 87.60              | 178.80         | 11,047.4                    | -3,975.0        | 42.6            | 3,975.2                       | 0.11                          | 0.00                         | 0.11                        |
| 14,885.0                    | 87.10              | 177.40         | 11,051.8                    | -4,069.8        | 47.4            | 4,070.0                       | 0.82                          | -0.53                        | 0.63                        |
| 14,980.0                    | 86.10              | 178.20         | 11,054.9                    | -4,164.6        | 51.1            | 4,164.9                       | 2.27                          | 2.11                         | 0.84                        |
| 15,075.0                    | 89.20              | 178.40         | 11,058.3                    | -4,259.6        | 53.9            | 4,259.9                       | 0.24                          | 0.11                         | 0.21                        |
| 15,170.0                    | 89.50              | 178.50         | 11,057.4                    | -4,354.5        | 58.5            | 4,354.8                       | 0.33                          | 0.32                         | 0.11                        |
| 15,266.0                    | 89.10              | 178.50         | 11,058.6                    | -4,450.5        | 59.0            | 4,450.8                       | 0.42                          | -0.42                        | 0.00                        |
| 15,361.0                    | 88.50              | 178.10         | 11,060.5                    | -4,545.4        | 61.8            | 4,545.8                       | 0.76                          | -0.63                        | -0.42                       |
| 15,455.0                    | 87.60              | 177.60         | 11,063.7                    | -4,639.3        | 65.3            | 4,639.7                       | 1.10                          | -0.96                        | -0.53                       |
| 15,527.0                    | 87.60              | 177.60         | 11,068.8                    | -4,711.2        | 68.3            | 4,711.6                       | 0.00                          | 0.00                         | 0.00                        |

PBHL(DFed#2)

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



COG Operating LLC  
Project: Lea County, NM  
Site: Deckard Federal Com  
Well: #2H  
Wellbore: OH  
Plan: Plan #3 ST01 (#2H/OH)

### Section Details

| Sec | MD      | Inc   | Azi    | TVD     | +N/-S   | +E/-W | Dleg | TFace  | VSect  |              |
|-----|---------|-------|--------|---------|---------|-------|------|--------|--------|--------------|
| 1   | 12939.0 | 88.51 | 183.01 | 11005.0 | -2127.5 | 68.5  | 0.00 | 0.00   | 2127.5 | 1500         |
| 2   | 13140.2 | 87.50 | 191.00 | 11012.0 | -2326.9 | 44.0  | 4.00 | 97.34  | 2327.0 | 1200         |
| 3   | 13173.6 | 88.50 | 191.00 | 11013.2 | -2359.6 | 37.7  | 3.00 | 0.00   | 2359.7 |              |
| 4   | 13540.4 | 88.81 | 180.00 | 11021.5 | -2724.1 | 2.6   | 3.00 | -88.00 | 2724.1 |              |
| 5   | 15570.4 | 88.91 | 180.00 | 11050.1 | -4753.7 | 2.6   | 0.00 | 0.00   | 4753.7 | PBHL(DFed#2) |

### WELL DETAILS: #2H

Ground Elevation: 3592.4  
RKB Elevation: WELL @ 3610.4usft (Original Well Elev)  
Rig Name: Original Well Elev

Northing 446215.70 Easting 749128.60 Latitude 32° 13' 27.108 N Longitude 103° 31' 39.808 W



Azimuths to Grid North  
True North: -0.43°  
Magnetic North: 6.77°

Magnetic Field  
Strength: 48324.9anT  
Dip Angle: 60.12°  
Date: 5/27/2014  
Model: IGRF2010

West(-)/East(+) (50 usft/in)

-400 -350 -300 -250 -200 -150 -100 -50 0 50 100 150 200 250 300 350 400 450 500 550 600

South(-)/North(+) (50 usft/in)

1200

1500

1000

150

400

100

150

100

150

100

150

100

150

100

150

100

150

100

150

100

150

100

150

100

150

100

Vertical Section at 179.97° (200 usft/in)

DIRECTIONAL

S  
ONS, L.P.

Plan: Plan #3 ST01 (#2H/OH)  
Created By: W&B Planner Date: 20/10, June 20 2014

Nexus Directional Solutions L.P.  
3925 S County Road 1285, Odessa, TX 79766  
432.561.9270

PROJECT DETAILS: Lea County, NM  
GEOGRAPHIC SYSTEM: US DATA PLANS 1527 (EXTERIORUSURY)  
Datum: NAD 1983 (NADCON CONUS)  
Ellipsoid: Clarke 1858  
Zone: New Mexico East 3001  
System Datum: Mean Sea Level  
Local North: Grid