

December 21, 2015

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

**HOBBS OCD**

DEC 15 2016

**RECEIVED**

Attn: Kanicia Castillo

RE: **Mas Federal No 003H**

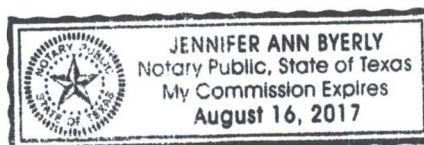
Please find enclosed a copy of the survey from 0' to 10,550' ran on the above referenced well.

Sincerely,  
  
Keith Havelka  
Operations

STATE OF TEXAS     §  
                                  §  
COUNTY OF NUECES §

This instrument was acknowledged before me on the 21 day of December  
A.D., 2015, by Keith Havelka.

  
Jennifer Ann Byerly  
Notary Public, State of Texas



Company: Concho  
Lease/Well: Mas Federal No/003H



Rig Name: Patriot 2  
State/County: New Mexico/Lea  
VS-Azi: 0.00 Degrees  
Latitude: 32.53620, Longitude: -103.54650  
Grid North = True North -0.42 degs (NAD 27)  
Grid Correction Applied = -0.42 degs



HOBBS OCD

DEC 15 2016

RECEIVED

Depth Reference : RKB = 20 Foot

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: mas federal 3h\_gyro survey.ut  
Minimum Curvature Method  
Report Date/Time: 12/21/2015 / 09:48

VES Survey International  
West Texas  
(432) 563-5444

Surveyor: Gene Heiss  
Mas Federal No 003H / API 30-025-42950

| 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                  | 0.14                 | 121.18                    | 100.00    | -0.07       | 0.11        | -0.07                     | 0.13                      | 121.18                      | 0.14                          |
| 200.00                  | 0.18                 | 126.65                    | 200.00    | -0.23       | 0.34        | -0.23                     | 0.41                      | 123.28                      | 0.04                          |
| 300.00                  | 0.32                 | 150.67                    | 300.00    | -0.56       | 0.61        | -0.56                     | 0.83                      | 132.89                      | 0.17                          |
| 400.00                  | 0.15                 | 162.42                    | 400.00    | -0.94       | 0.79        | -0.94                     | 1.22                      | 140.02                      | 0.17                          |
| 500.00                  | 0.12                 | 175.83                    | 500.00    | -1.17       | 0.83        | -1.17                     | 1.44                      | 144.54                      | 0.04                          |
| 600.00                  | 0.09                 | 184.51                    | 600.00    | -1.35       | 0.84        | -1.35                     | 1.59                      | 148.34                      | 0.04                          |
| 700.00                  | 0.14                 | 172.55                    | 700.00    | -1.55       | 0.84        | -1.55                     | 1.77                      | 151.44                      | 0.06                          |
| 800.00                  | 0.10                 | 163.96                    | 800.00    | -1.76       | 0.89        | -1.76                     | 1.97                      | 153.29                      | 0.04                          |
| 900.00                  | 0.15                 | 135.51                    | 900.00    | -1.94       | 1.00        | -1.94                     | 2.18                      | 152.72                      | 0.07                          |
| 1000.00                 | 0.15                 | 119.61                    | 1000.00   | -2.10       | 1.20        | -2.10                     | 2.42                      | 150.11                      | 0.04                          |
| 1100.00                 | 0.18                 | 101.49                    | 1100.00   | -2.19       | 1.47        | -2.19                     | 2.64                      | 146.15                      | 0.06                          |
| 1200.00                 | 0.25                 | 122.71                    | 1200.00   | -2.34       | 1.80        | -2.34                     | 2.95                      | 142.37                      | 0.11                          |
| 1300.00                 | 0.30                 | 162.11                    | 1299.99   | -2.71       | 2.07        | -2.71                     | 3.41                      | 142.62                      | 0.19                          |
| 1400.00                 | 0.37                 | 127.65                    | 1399.99   | -3.15       | 2.40        | -3.15                     | 3.96                      | 142.68                      | 0.21                          |
| 1500.00                 | 0.47                 | 171.31                    | 1499.99   | -3.75       | 2.72        | -3.75                     | 4.64                      | 144.10                      | 0.33                          |
| 1600.00                 | 0.51                 | 133.63                    | 1599.99   | -4.47       | 3.10        | -4.47                     | 5.44                      | 145.24                      | 0.32                          |

| 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 |
|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 1700.00                 | 0.45                 | 95.42                     | 1699.98   | -4.81       | 3.81        | -4.81                     | 6.14                      | 141.60                      | 0.32                          |
| 1800.00                 | 0.63                 | 94.28                     | 1799.98   | -4.89       | 4.76        | -4.89                     | 6.82                      | 135.79                      | 0.18                          |
| 1900.00                 | 1.15                 | 88.27                     | 1899.97   | -4.90       | 6.31        | -4.90                     | 7.99                      | 127.82                      | 0.53                          |
| 2000.00                 | 1.05                 | 90.46                     | 1999.95   | -4.88       | 8.23        | -4.88                     | 9.57                      | 120.65                      | 0.11                          |
| 2100.00                 | 1.02                 | 105.61                    | 2099.93   | -5.12       | 10.00       | -5.12                     | 11.23                     | 117.12                      | 0.27                          |
| 2200.00                 | 1.47                 | 99.96                     | 2199.91   | -5.58       | 12.12       | -5.58                     | 13.34                     | 114.73                      | 0.47                          |
| 2300.00                 | 1.30                 | 95.28                     | 2299.88   | -5.91       | 14.51       | -5.91                     | 15.67                     | 112.15                      | 0.21                          |
| 2400.00                 | 1.41                 | 104.14                    | 2399.85   | -6.31       | 16.84       | -6.31                     | 17.98                     | 110.56                      | 0.24                          |
| 2500.00                 | 1.50                 | 94.88                     | 2499.82   | -6.73       | 19.34       | -6.73                     | 20.48                     | 109.18                      | 0.25                          |
| 2600.00                 | 0.56                 | 110.43                    | 2599.80   | -7.01       | 21.10       | -7.01                     | 22.24                     | 108.37                      | 0.98                          |
| 2700.00                 | 0.63                 | 112.01                    | 2699.80   | -7.39       | 22.07       | -7.39                     | 23.28                     | 108.50                      | 0.07                          |
| 2800.00                 | 1.11                 | 95.69                     | 2799.78   | -7.69       | 23.55       | -7.69                     | 24.78                     | 108.08                      | 0.54                          |
| 2900.00                 | 1.39                 | 94.18                     | 2899.76   | -7.88       | 25.73       | -7.88                     | 26.91                     | 107.02                      | 0.28                          |
| 3000.00                 | 1.53                 | 85.55                     | 2999.73   | -7.86       | 28.28       | -7.86                     | 29.35                     | 105.53                      | 0.26                          |
| 3100.00                 | 1.01                 | 83.47                     | 3099.70   | -7.66       | 30.48       | -7.66                     | 31.43                     | 104.10                      | 0.52                          |
| 3200.00                 | 1.07                 | 72.16                     | 3199.69   | -7.27       | 32.25       | -7.27                     | 33.06                     | 102.70                      | 0.21                          |
| 3300.00                 | 1.13                 | 68.17                     | 3299.67   | -6.62       | 34.06       | -6.62                     | 34.69                     | 100.99                      | 0.09                          |
| 3400.00                 | 1.13                 | 74.48                     | 3399.65   | -5.99       | 35.92       | -5.99                     | 36.42                     | 99.46                       | 0.12                          |
| 3500.00                 | 1.21                 | 84.11                     | 3499.63   | -5.61       | 37.93       | -5.61                     | 38.34                     | 98.42                       | 0.21                          |
| 3600.00                 | 1.28                 | 98.88                     | 3599.60   | -5.68       | 40.08       | -5.68                     | 40.48                     | 98.06                       | 0.33                          |
| 3700.00                 | 1.26                 | 96.40                     | 3699.58   | -5.97       | 42.27       | -5.97                     | 42.69                     | 98.04                       | 0.06                          |
| 3800.00                 | 1.34                 | 113.85                    | 3799.55   | -6.57       | 44.43       | -6.57                     | 44.92                     | 98.41                       | 0.40                          |
| 3900.00                 | 1.40                 | 118.13                    | 3899.53   | -7.62       | 46.58       | -7.62                     | 47.20                     | 99.29                       | 0.12                          |
| 4000.00                 | 1.41                 | 100.59                    | 3999.50   | -8.42       | 48.87       | -8.42                     | 49.59                     | 99.77                       | 0.43                          |
| 4100.00                 | 1.49                 | 111.24                    | 4099.46   | -9.12       | 51.29       | -9.12                     | 52.09                     | 100.08                      | 0.28                          |
| 4200.00                 | 0.91                 | 96.16                     | 4199.44   | -9.67       | 53.29       | -9.67                     | 54.16                     | 100.29                      | 0.66                          |
| 4300.00                 | 0.96                 | 81.47                     | 4299.43   | -9.63       | 54.91       | -9.63                     | 55.74                     | 99.95                       | 0.24                          |
| 4400.00                 | 0.62                 | 83.64                     | 4399.42   | -9.45       | 56.27       | -9.45                     | 57.06                     | 99.53                       | 0.34                          |
| 4500.00                 | 0.59                 | 73.22                     | 4499.41   | -9.24       | 57.30       | -9.24                     | 58.04                     | 99.16                       | 0.11                          |
| 4600.00                 | 0.59                 | 78.80                     | 4599.41   | -8.99       | 58.30       | -8.99                     | 58.99                     | 98.77                       | 0.06                          |
| 4700.00                 | 0.50                 | 65.27                     | 4699.40   | -8.71       | 59.20       | -8.71                     | 59.83                     | 98.37                       | 0.16                          |
| 4800.00                 | 0.60                 | 72.00                     | 4799.40   | -8.37       | 60.08       | -8.37                     | 60.66                     | 97.93                       | 0.12                          |
| 4900.00                 | 0.45                 | 43.93                     | 4899.40   | -7.93       | 60.85       | -7.93                     | 61.36                     | 97.42                       | 0.29                          |
| 5000.00                 | 0.57                 | 45.82                     | 4999.39   | -7.30       | 61.48       | -7.30                     | 61.91                     | 96.77                       | 0.13                          |
| 5100.00                 | 0.34                 | 62.32                     | 5099.39   | -6.81       | 62.10       | -6.81                     | 62.47                     | 96.26                       | 0.26                          |
| 5200.00                 | 0.75                 | 44.46                     | 5199.38   | -6.20       | 62.83       | -6.20                     | 63.13                     | 95.64                       | 0.44                          |
| 5300.00                 | 0.52                 | 35.90                     | 5299.38   | -5.37       | 63.55       | -5.37                     | 63.78                     | 94.83                       | 0.25                          |
| 5400.00                 | 0.81                 | 42.01                     | 5399.37   | -4.47       | 64.29       | -4.47                     | 64.45                     | 93.98                       | 0.30                          |
| 5500.00                 | 0.76                 | 41.14                     | 5499.36   | -3.45       | 65.20       | -3.45                     | 65.29                     | 93.03                       | 0.05                          |

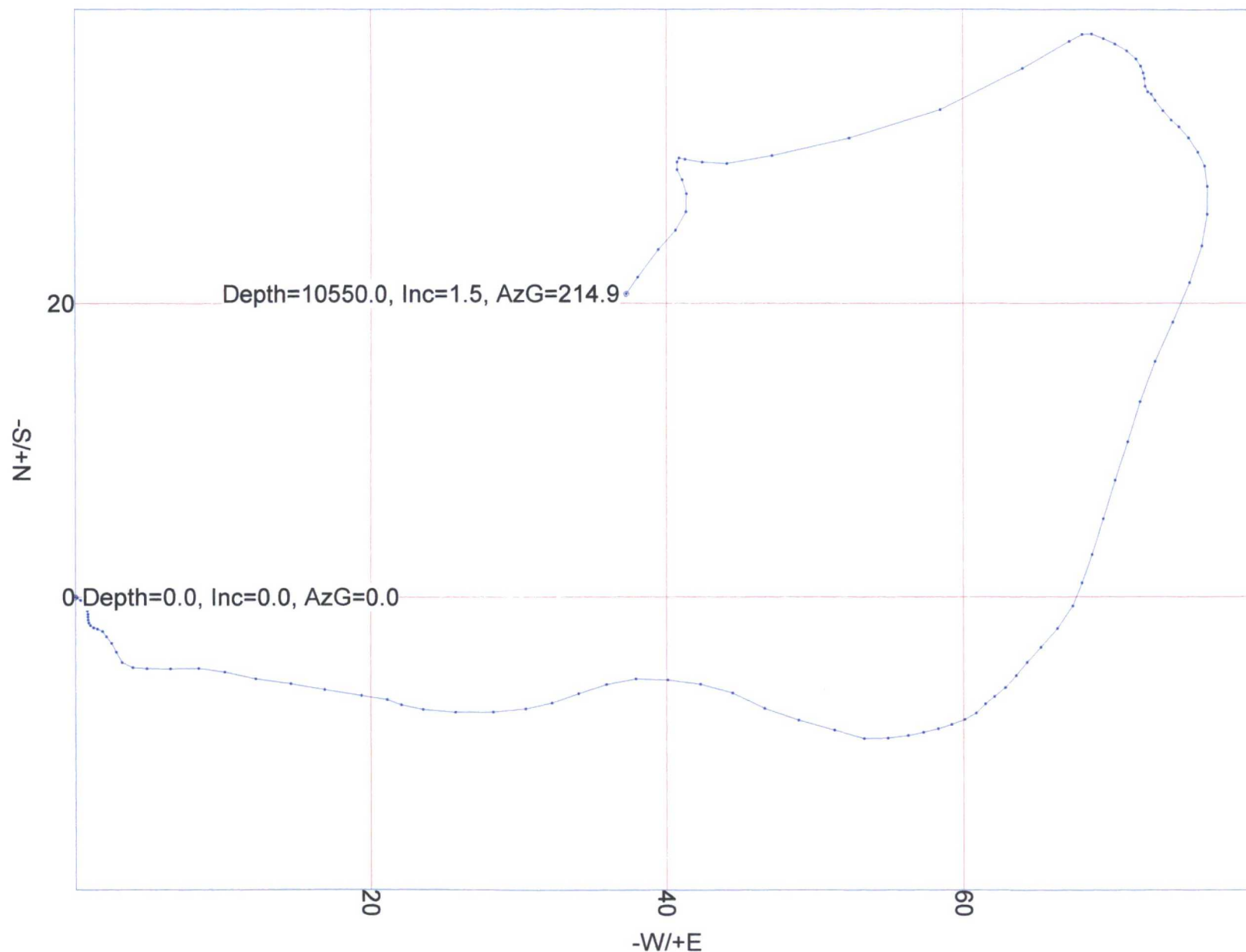


| Measured<br>Depth<br>FT | Incl<br>Angle<br>Deg | Drift<br>Direction<br>Deg | TVD<br>FT | +N/-S<br>FT | +E/-W<br>FT | Vertical<br>Section<br>FT | Closure<br>Distance<br>FT | Closure<br>Direction<br>Deg | Dogleg<br>Severity<br>Deg/100 |
|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 5600.00                 | 1.18                 | 40.71                     | 5599.35   | -2.16       | 66.31       | -2.16                     | 66.35                     | 91.87                       | 0.42                          |
| 5700.00                 | 0.96                 | 25.79                     | 5699.33   | -0.62       | 67.35       | -0.62                     | 67.35                     | 90.53                       | 0.35                          |
| 5800.00                 | 0.98                 | 17.31                     | 5799.32   | 0.95        | 67.97       | 0.95                      | 67.98                     | 89.20                       | 0.14                          |
| 5900.00                 | 1.36                 | 21.13                     | 5899.29   | 2.87        | 68.65       | 2.87                      | 68.71                     | 87.61                       | 0.39                          |
| 6000.00                 | 1.59                 | 14.17                     | 5999.26   | 5.32        | 69.42       | 5.32                      | 69.62                     | 85.62                       | 0.29                          |
| 6100.00                 | 1.55                 | 19.33                     | 6099.22   | 7.94        | 70.21       | 7.94                      | 70.66                     | 83.55                       | 0.15                          |
| 6200.00                 | 1.60                 | 17.64                     | 6199.19   | 10.55       | 71.08       | 10.55                     | 71.86                     | 81.56                       | 0.07                          |
| 6300.00                 | 1.68                 | 16.30                     | 6299.14   | 13.29       | 71.92       | 13.29                     | 73.13                     | 79.53                       | 0.09                          |
| 6400.00                 | 1.67                 | 24.22                     | 6399.10   | 16.03       | 72.92       | 16.03                     | 74.66                     | 77.61                       | 0.23                          |
| 6500.00                 | 1.70                 | 24.24                     | 6499.06   | 18.71       | 74.13       | 18.71                     | 76.46                     | 75.84                       | 0.03                          |
| 6600.00                 | 1.66                 | 21.67                     | 6599.02   | 21.41       | 75.28       | 21.41                     | 78.26                     | 74.12                       | 0.09                          |
| 6700.00                 | 1.35                 | 15.08                     | 6698.98   | 23.90       | 76.12       | 23.90                     | 79.78                     | 72.57                       | 0.36                          |
| 6800.00                 | 1.18                 | 2.66                      | 6798.96   | 26.07       | 76.47       | 26.07                     | 80.80                     | 71.18                       | 0.32                          |
| 6900.00                 | 0.99                 | 357.06                    | 6898.94   | 27.96       | 76.48       | 27.96                     | 81.43                     | 69.92                       | 0.22                          |
| 7000.00                 | 0.62                 | 347.76                    | 6998.93   | 29.35       | 76.32       | 29.35                     | 81.77                     | 68.97                       | 0.39                          |
| 7100.00                 | 0.62                 | 319.84                    | 7098.92   | 30.29       | 75.85       | 30.29                     | 81.68                     | 68.23                       | 0.30                          |
| 7200.00                 | 0.71                 | 333.67                    | 7198.92   | 31.26       | 75.23       | 31.26                     | 81.47                     | 67.43                       | 0.18                          |
| 7300.00                 | 0.48                 | 298.28                    | 7298.91   | 32.02       | 74.58       | 32.02                     | 81.16                     | 66.77                       | 0.42                          |
| 7400.00                 | 0.33                 | 327.45                    | 7398.91   | 32.46       | 74.06       | 32.46                     | 80.86                     | 66.33                       | 0.25                          |
| 7500.00                 | 0.65                 | 315.55                    | 7498.91   | 33.11       | 73.50       | 33.11                     | 80.61                     | 65.75                       | 0.34                          |
| 7600.00                 | 0.38                 | 334.55                    | 7598.90   | 33.82       | 72.96       | 33.82                     | 80.42                     | 65.13                       | 0.32                          |
| 7700.00                 | 0.20                 | 319.85                    | 7698.90   | 34.25       | 72.70       | 34.25                     | 80.37                     | 64.77                       | 0.19                          |
| 7800.00                 | 0.13                 | 276.43                    | 7798.90   | 34.40       | 72.48       | 34.40                     | 80.23                     | 64.61                       | 0.14                          |
| 7900.00                 | 0.43                 | 350.88                    | 7898.90   | 34.78       | 72.31       | 34.78                     | 80.24                     | 64.31                       | 0.41                          |
| 8000.00                 | 0.18                 | 359.71                    | 7998.90   | 35.31       | 72.25       | 35.31                     | 80.41                     | 63.95                       | 0.25                          |
| 8100.00                 | 0.26                 | 339.78                    | 8098.90   | 35.67       | 72.17       | 35.67                     | 80.50                     | 63.70                       | 0.10                          |
| 8200.00                 | 0.31                 | 340.12                    | 8198.89   | 36.14       | 72.00       | 36.14                     | 80.56                     | 63.35                       | 0.05                          |
| 8300.00                 | 0.37                 | 315.61                    | 8298.89   | 36.62       | 71.68       | 36.62                     | 80.49                     | 62.94                       | 0.16                          |
| 8400.00                 | 0.58                 | 308.79                    | 8398.89   | 37.17       | 71.06       | 37.17                     | 80.19                     | 62.38                       | 0.21                          |
| 8500.00                 | 0.48                 | 291.03                    | 8498.89   | 37.64       | 70.27       | 37.64                     | 79.72                     | 61.82                       | 0.19                          |
| 8600.00                 | 0.52                 | 298.80                    | 8598.88   | 38.01       | 69.48       | 38.01                     | 79.20                     | 61.32                       | 0.08                          |
| 8700.00                 | 0.45                 | 284.70                    | 8698.88   | 38.33       | 68.70       | 38.33                     | 78.67                     | 60.84                       | 0.14                          |
| 8800.00                 | 0.34                 | 244.14                    | 8798.88   | 38.30       | 68.05       | 38.30                     | 78.09                     | 60.63                       | 0.30                          |
| 8900.00                 | 0.80                 | 240.41                    | 8898.87   | 37.83       | 67.18       | 37.83                     | 77.10                     | 60.61                       | 0.47                          |
| 9000.00                 | 3.37                 | 239.44                    | 8998.80   | 35.99       | 64.04       | 35.99                     | 73.46                     | 60.66                       | 2.56                          |
| 9100.00                 | 3.80                 | 246.69                    | 9098.60   | 33.19       | 58.47       | 33.19                     | 67.23                     | 60.42                       | 0.63                          |
| 9200.00                 | 3.63                 | 258.54                    | 9198.39   | 31.25       | 52.32       | 31.25                     | 60.94                     | 59.15                       | 0.78                          |
| 9300.00                 | 2.50                 | 254.85                    | 9298.25   | 30.05       | 47.11       | 30.05                     | 55.88                     | 57.47                       | 1.15                          |
| 9400.00                 | 1.07                 | 271.99                    | 9398.20   | 29.51       | 44.08       | 29.51                     | 53.05                     | 56.20                       | 1.51                          |

| 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 |
|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 9500.00                 | 0.83                 | 275.16                    | 9498.18   | 29.61       | 42.43       | 29.61                     | 51.74                     | 55.09                       | 0.24                          |
| 9600.00                 | 0.52                 | 285.93                    | 9598.18   | 29.80       | 41.27       | 29.80                     | 50.90                     | 54.16                       | 0.33                          |
| 9700.00                 | 0.06                 | 126.15                    | 9698.17   | 29.90       | 40.87       | 29.90                     | 50.63                     | 53.81                       | 0.57                          |
| 9800.00                 | 0.34                 | 215.08                    | 9798.17   | 29.62       | 40.73       | 29.62                     | 50.36                     | 53.97                       | 0.35                          |
| 9900.00                 | 0.38                 | 148.84                    | 9898.17   | 29.09       | 40.73       | 29.09                     | 50.05                     | 54.46                       | 0.40                          |
| 10000.00                | 0.49                 | 157.00                    | 9998.17   | 28.41       | 41.07       | 28.41                     | 49.94                     | 55.33                       | 0.13                          |
| 10100.00                | 0.65                 | 167.34                    | 10098.16  | 27.46       | 41.36       | 27.46                     | 49.65                     | 56.42                       | 0.18                          |
| 10200.00                | 0.80                 | 193.41                    | 10198.16  | 26.23       | 41.33       | 26.23                     | 48.95                     | 57.59                       | 0.36                          |
| 10300.00                | 0.91                 | 223.51                    | 10298.15  | 24.98       | 40.62       | 24.98                     | 47.69                     | 58.41                       | 0.46                          |
| 10400.00                | 1.11                 | 219.99                    | 10398.13  | 23.66       | 39.45       | 23.66                     | 46.00                     | 59.04                       | 0.20                          |
| 10500.00                | 1.58                 | 213.77                    | 10498.10  | 21.78       | 38.07       | 21.78                     | 43.86                     | 60.22                       | 0.49                          |
| 10550.00                | 1.55                 | 214.94                    | 10548.08  | 20.65       | 37.30       | 20.65                     | 42.63                     | 61.02                       | 0.09                          |



VES Survey International  
West Texas  
(432) 563-5444  
Surveyor: Gene Heiss  
Mas Federal No 003H / API 30-025-42950



VES Survey Date: 12/15/2015



HOBBS OCD  
DEC 15 2016  
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I Gene Heiss certify that I am employed by VES Survey International. That I did on the day(s) of 12/15/15 through 12/15/15 conduct or supervise the taking of a Rate Gyro survey from a depth of 0.00 feet to a depth of 10,550.00 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Vaughn Energy Services, that I am authorized and qualified to make this report; that this survey was conducted at the request of Concho for the Mas Federal No Well # 003H API # 30-025-42950 in Lea County / Parish New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Vaughn Energy Services

A handwritten signature in blue ink, appearing to read "Gene Heiss", is written over a horizontal line.

Gene Heiss  
Service Technician  
Vaughn Energy Services



## **COG Operating LLC**

Lea County, NM (NAD27 NME)

Mas Fed

#3H

OH

**HOBBS OCD**  
DEC 15 2016  
**RECEIVED**

Survey: MWD #1

## **Survey Report - Geographic**

30 December, 2015





## Wellplanning

### Survey Report - Geographic

|           |                            |                              |                           |
|-----------|----------------------------|------------------------------|---------------------------|
| Company:  | COG Operating LLC          | Local Co-ordinate Reference: | Well #3H                  |
| Project:  | Lea County, NM (NAD27 NME) | TVD Reference:               | well1 @ 3737.2usft        |
| Site:     | Mas Fed                    | MD Reference:                | well1 @ 3737.2usft        |
| Well:     | #3H                        | North Reference:             | Grid                      |
| Wellbore: | OH                         | Survey Calculation Method:   | Minimum Curvature         |
| Design:   | OH                         | Database:                    | EDM 5000.1 Single User Db |

|             |                                      |               |                |
|-------------|--------------------------------------|---------------|----------------|
| Project     | Lea County, NM (NAD27 NME)           |               |                |
| 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                  | Mas Fed  |                   |                   |
| Site Position:        |          | Northing:         | 559,699.50 usft   |
| From:                 | Map      | Easting:          | 745,455.60 usft   |
| Position Uncertainty: | 0.0 usft | Slot Radius:      | 13-3/16 "         |
|                       |          | Latitude:         | 32° 32' 10.321 N  |
|                       |          | Longitude:        | 103° 32' 12.727 W |
|                       |          | Grid Convergence: | 0.43 °            |

|                      |          |                     |                           |
|----------------------|----------|---------------------|---------------------------|
| Well                 | #3H      |                     |                           |
| Well Position        | +N/-S    | 0.0 usft            | Northing: 559,677.40 usft |
|                      | +E/-W    | 0.0 usft            | Easting: 742,485.60 usft  |
| Position Uncertainty | 0.0 usft | Wellhead Elevation: | usft                      |
|                      |          | Latitude:           | 32° 32' 10.320 N          |
|                      |          | Longitude:          | 103° 32' 47.420 W         |
|                      |          | Ground Level:       | 3,717.2 usft              |

|           |            |             |                     |
|-----------|------------|-------------|---------------------|
| Wellbore  | OH         |             |                     |
| Magnetics | Model Name | Sample Date | Declination (°)     |
|           | IGRF2015   | 7/22/2015   | 7.17                |
|           |            |             | Dip Angle (°)       |
|           |            |             | 60.38               |
|           |            |             | Field Strength (nT) |
|           |            |             | 48,321              |

|                   |                         |               |               |
|-------------------|-------------------------|---------------|---------------|
| Design            | OH                      |               |               |
| Audit Notes:      |                         |               |               |
| Version:          | 1.0                     | Phase:        | ACTUAL        |
|                   |                         | Tie On Depth: | 0.0           |
| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft)  | +E/-W (usft)  |
|                   | 0.0                     | 0.0           | 0.0           |
|                   |                         |               | Direction (°) |
|                   |                         |               | 175.63        |

|                |                 |                   |                                  |
|----------------|-----------------|-------------------|----------------------------------|
| Survey Program | Date 12/30/2015 |                   |                                  |
| From (usft)    | To (usft)       | Survey (Wellbore) | Tool Name                        |
| 100.0          | 10,550.0        | GYRO (OH)         | NS-GYRO-MS                       |
| 10,652.0       | 15,772.0        | MWD #1 (OH)       | MWD                              |
|                |                 |                   | Description                      |
|                |                 |                   | North sensing gyrocompassing m/s |
|                |                 |                   | MWD - Standard                   |

|                       |                 |             |                       |              |              |                     |                    |                  |                   |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|---------------------|--------------------|------------------|-------------------|
| Survey                |                 |             |                       |              |              |                     |                    |                  |                   |
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude         | Longitude         |
| 10,550.0              | 1.55            | 214.94      | 10,548.1              | 20.6         | 37.3         | 559,698.03          | 742,522.88         | 32° 32' 10.522 N | 103° 32' 46.983 W |
| 10,652.0              | 2.20            | 201.00      | 10,650.0              | 17.7         | 35.8         | 559,695.07          | 742,521.39         | 32° 32' 10.493 N | 103° 32' 47.000 W |
| 10,684.0              | 2.80            | 184.20      | 10,682.0              | 16.3         | 35.5         | 559,693.71          | 742,521.11         | 32° 32' 10.479 N | 103° 32' 47.004 W |
| 10,715.0              | 5.80            | 166.70      | 10,712.9              | 14.0         | 35.8         | 559,691.43          | 742,521.41         | 32° 32' 10.457 N | 103° 32' 47.000 W |
| 10,746.0              | 9.30            | 173.70      | 10,743.6              | 10.0         | 36.5         | 559,687.42          | 742,522.05         | 32° 32' 10.417 N | 103° 32' 46.993 W |
| 10,778.0              | 12.40           | 179.00      | 10,775.1              | 4.0          | 36.8         | 559,681.41          | 742,522.39         | 32° 32' 10.357 N | 103° 32' 46.990 W |
| 10,810.0              | 15.80           | 178.70      | 10,806.1              | -3.8         | 37.0         | 559,673.62          | 742,522.55         | 32° 32' 10.280 N | 103° 32' 46.989 W |
| 10,842.0              | 18.10           | 177.80      | 10,836.7              | -13.1        | 37.2         | 559,664.30          | 742,522.84         | 32° 32' 10.188 N | 103° 32' 46.986 W |
| 10,873.0              | 20.60           | 174.30      | 10,865.9              | -23.3        | 38.0         | 559,654.06          | 742,523.57         | 32° 32' 10.087 N | 103° 32' 46.978 W |
| 10,905.0              | 24.10           | 173.10      | 10,895.5              | -35.4        | 39.3         | 559,641.96          | 742,524.91         | 32° 32' 9.967 N  | 103° 32' 46.964 W |
| 10,936.0              | 27.50           | 172.30      | 10,923.4              | -48.8        | 41.0         | 559,628.58          | 742,526.63         | 32° 32' 9.834 N  | 103° 32' 46.945 W |





**Wellplanning**  
Survey Report - Geographic

|                  |                            |                                     |                           |
|------------------|----------------------------|-------------------------------------|---------------------------|
| <b>Company:</b>  | COG Operating LLC          | <b>Local Co-ordinate Reference:</b> | Well #3H                  |
| <b>Project:</b>  | Lea County, NM (NAD27 NME) | <b>TVD Reference:</b>               | well1 @ 3737.2usft        |
| <b>Site:</b>     | Mas Fed                    | <b>MD Reference:</b>                | well1 @ 3737.2usft        |
| <b>Well:</b>     | #3H                        | <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 |

| Survey                |                 |             |                       |              |              |                     |                    |                  |                   |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|---------------------|--------------------|------------------|-------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude         | Longitude         |
| 10,968.0              | 31.20           | 172.30      | 10,951.3              | -64.4        | 43.1         | 559,613.04          | 742,528.73         | 32° 32' 9.680 N  | 103° 32' 46.922 W |
| 10,998.0              | 35.00           | 173.80      | 10,976.5              | -80.6        | 45.1         | 559,596.78          | 742,530.70         | 32° 32' 9.519 N  | 103° 32' 46.900 W |
| 11,030.0              | 38.00           | 175.10      | 11,002.2              | -99.6        | 46.9         | 559,577.84          | 742,532.54         | 32° 32' 9.332 N  | 103° 32' 46.880 W |
| 11,062.0              | 41.10           | 175.70      | 11,026.9              | -119.9       | 48.6         | 559,557.53          | 742,534.17         | 32° 32' 9.131 N  | 103° 32' 46.863 W |
| 11,094.0              | 43.70           | 174.50      | 11,050.5              | -141.4       | 50.4         | 559,536.04          | 742,536.02         | 32° 32' 8.918 N  | 103° 32' 46.843 W |
| 11,125.0              | 45.30           | 171.70      | 11,072.6              | -162.9       | 53.0         | 559,514.47          | 742,538.63         | 32° 32' 8.704 N  | 103° 32' 46.815 W |
| 11,157.0              | 48.60           | 171.20      | 11,094.4              | -186.1       | 56.5         | 559,491.35          | 742,542.11         | 32° 32' 8.475 N  | 103° 32' 46.776 W |
| 11,188.0              | 52.00           | 171.70      | 11,114.2              | -209.6       | 60.1         | 559,467.77          | 742,545.65         | 32° 32' 8.242 N  | 103° 32' 46.737 W |
| 11,219.0              | 55.60           | 172.00      | 11,132.5              | -234.4       | 63.6         | 559,443.01          | 742,549.20         | 32° 32' 7.996 N  | 103° 32' 46.697 W |
| 11,251.0              | 58.60           | 171.80      | 11,149.9              | -261.0       | 67.4         | 559,416.41          | 742,552.98         | 32° 32' 7.733 N  | 103° 32' 46.655 W |
| 11,282.0              | 62.30           | 172.60      | 11,165.2              | -287.7       | 71.0         | 559,389.70          | 742,556.64         | 32° 32' 7.468 N  | 103° 32' 46.615 W |
| 11,314.0              | 66.70           | 172.70      | 11,179.0              | -316.3       | 74.7         | 559,361.06          | 742,560.33         | 32° 32' 7.185 N  | 103° 32' 46.574 W |
| 11,345.0              | 70.50           | 173.60      | 11,190.3              | -345.0       | 78.2         | 559,332.41          | 742,563.77         | 32° 32' 6.901 N  | 103° 32' 46.537 W |
| 11,376.0              | 74.40           | 174.40      | 11,199.6              | -374.4       | 81.3         | 559,303.02          | 742,566.86         | 32° 32' 6.610 N  | 103° 32' 46.503 W |
| 11,408.0              | 78.90           | 175.50      | 11,207.0              | -405.4       | 84.0         | 559,272.01          | 742,569.60         | 32° 32' 6.303 N  | 103° 32' 46.474 W |
| 11,437.0              | 82.60           | 176.60      | 11,211.7              | -433.9       | 86.0         | 559,243.46          | 742,571.57         | 32° 32' 6.020 N  | 103° 32' 46.453 W |
| 11,468.0              | 85.00           | 176.60      | 11,215.0              | -464.7       | 87.8         | 559,212.70          | 742,573.39         | 32° 32' 5.716 N  | 103° 32' 46.435 W |
| 11,499.0              | 86.60           | 176.50      | 11,217.3              | -495.6       | 89.7         | 559,181.84          | 742,575.26         | 32° 32' 5.410 N  | 103° 32' 46.415 W |
| 11,531.0              | 88.20           | 176.50      | 11,218.8              | -527.5       | 91.6         | 559,149.94          | 742,577.21         | 32° 32' 5.094 N  | 103° 32' 46.395 W |
| 11,626.0              | 89.90           | 176.20      | 11,220.3              | -622.3       | 97.7         | 559,055.15          | 742,583.25         | 32° 32' 4.156 N  | 103° 32' 46.333 W |
| 11,720.0              | 89.70           | 177.50      | 11,220.7              | -716.1       | 102.8        | 558,961.29          | 742,588.42         | 32° 32' 3.227 N  | 103° 32' 46.281 W |
| 11,814.0              | 88.30           | 178.40      | 11,222.3              | -810.0       | 106.2        | 558,867.37          | 742,591.78         | 32° 32' 2.297 N  | 103° 32' 46.250 W |
| 11,909.0              | 87.60           | 176.80      | 11,225.7              | -904.9       | 110.2        | 558,772.52          | 742,595.76         | 32° 32' 1.359 N  | 103° 32' 46.211 W |
| 12,004.0              | 88.40           | 176.30      | 11,229.0              | -999.7       | 115.9        | 558,677.75          | 742,601.47         | 32° 32' 0.420 N  | 103° 32' 46.153 W |
| 12,099.0              | 86.90           | 177.60      | 11,232.9              | -1,094.4     | 120.9        | 558,582.97          | 742,606.52         | 32° 31' 59.482 N | 103° 32' 46.102 W |
| 12,194.0              | 87.50           | 178.00      | 11,237.5              | -1,189.3     | 124.6        | 558,488.15          | 742,610.16         | 32° 31' 58.544 N | 103° 32' 46.068 W |
| 12,288.0              | 88.20           | 177.80      | 11,241.1              | -1,283.1     | 128.0        | 558,394.28          | 742,613.60         | 32° 31' 57.615 N | 103° 32' 46.035 W |
| 12,383.0              | 88.90           | 177.50      | 11,243.5              | -1,378.0     | 131.9        | 558,299.39          | 742,617.50         | 32° 31' 56.675 N | 103° 32' 45.998 W |
| 12,478.0              | 89.50           | 177.30      | 11,244.8              | -1,472.9     | 136.2        | 558,204.50          | 742,621.81         | 32° 31' 55.736 N | 103° 32' 45.956 W |
| 12,572.0              | 88.10           | 177.10      | 11,246.8              | -1,566.8     | 140.8        | 558,110.63          | 742,626.40         | 32° 31' 54.807 N | 103° 32' 45.911 W |
| 12,666.0              | 88.90           | 177.00      | 11,249.2              | -1,660.6     | 145.6        | 558,016.79          | 742,631.23         | 32° 31' 53.878 N | 103° 32' 45.862 W |
| 12,761.0              | 89.40           | 176.90      | 11,250.6              | -1,755.5     | 150.7        | 557,921.94          | 742,636.29         | 32° 31' 52.939 N | 103° 32' 45.811 W |
| 12,856.0              | 90.00           | 176.60      | 11,251.1              | -1,850.3     | 156.1        | 557,827.09          | 742,641.67         | 32° 31' 52.000 N | 103° 32' 45.757 W |
| 12,950.0              | 87.90           | 176.60      | 11,252.9              | -1,944.1     | 161.7        | 557,733.28          | 742,647.25         | 32° 31' 51.072 N | 103° 32' 45.700 W |
| 13,044.0              | 88.50           | 176.10      | 11,255.8              | -2,037.9     | 167.6        | 557,639.51          | 742,653.23         | 32° 31' 50.143 N | 103° 32' 45.638 W |
| 13,139.0              | 89.10           | 175.70      | 11,257.8              | -2,132.6     | 174.4        | 557,544.78          | 742,660.02         | 32° 31' 49.205 N | 103° 32' 45.567 W |
| 13,234.0              | 88.00           | 176.20      | 11,260.2              | -2,227.4     | 181.1        | 557,450.05          | 742,666.73         | 32° 31' 48.268 N | 103° 32' 45.497 W |
| 13,329.0              | 88.60           | 176.20      | 11,263.0              | -2,322.1     | 187.4        | 557,355.30          | 742,673.02         | 32° 31' 47.330 N | 103° 32' 45.431 W |
| 13,423.0              | 89.40           | 176.00      | 11,264.7              | -2,415.9     | 193.8        | 557,261.53          | 742,679.41         | 32° 31' 46.401 N | 103° 32' 45.365 W |
| 13,517.0              | 86.70           | 174.90      | 11,267.9              | -2,509.5     | 201.3        | 557,167.89          | 742,686.86         | 32° 31' 45.474 N | 103° 32' 45.286 W |
| 13,612.0              | 87.00           | 174.20      | 11,273.1              | -2,603.9     | 210.3        | 557,073.47          | 742,695.87         | 32° 31' 44.539 N | 103° 32' 45.189 W |
| 13,707.0              | 88.50           | 174.30      | 11,276.8              | -2,698.4     | 219.8        | 556,979.02          | 742,705.38         | 32° 31' 43.604 N | 103° 32' 45.086 W |
| 13,802.0              | 89.10           | 173.90      | 11,278.8              | -2,792.9     | 229.5        | 556,884.54          | 742,715.15         | 32° 31' 42.668 N | 103° 32' 44.980 W |
| 13,898.0              | 89.60           | 173.60      | 11,279.9              | -2,888.3     | 240.0        | 556,789.12          | 742,725.60         | 32° 31' 41.723 N | 103° 32' 44.866 W |
| 13,993.0              | 90.10           | 173.00      | 11,280.1              | -2,982.6     | 251.1        | 556,694.77          | 742,736.68         | 32° 31' 40.789 N | 103° 32' 44.745 W |
| 14,088.0              | 88.60           | 174.10      | 11,281.2              | -3,077.0     | 261.8        | 556,600.38          | 742,747.35         | 32° 31' 39.854 N | 103° 32' 44.628 W |
| 14,182.0              | 88.60           | 173.40      | 11,283.5              | -3,170.4     | 272.0        | 556,506.97          | 742,757.58         | 32° 31' 38.929 N | 103° 32' 44.517 W |
| 14,276.0              | 87.80           | 173.80      | 11,286.5              | -3,263.8     | 282.5        | 556,413.60          | 742,768.05         | 32° 31' 38.005 N | 103° 32' 44.403 W |
| 14,371.0              | 88.00           | 173.60      | 11,290.0              | -3,358.2     | 292.9        | 556,319.24          | 742,778.47         | 32° 31' 37.070 N | 103° 32' 44.289 W |
| 14,466.0              | 87.50           | 175.50      | 11,293.7              | -3,452.7     | 301.9        | 556,224.75          | 742,787.49         | 32° 31' 36.134 N | 103° 32' 44.192 W |
| 14,561.0              | 88.70           | 177.00      | 11,296.8              | -3,547.4     | 308.1        | 556,130.01          | 742,793.70         | 32° 31' 35.197 N | 103° 32' 44.128 W |
| 14,656.0              | 88.90           | 176.60      | 11,298.8              | -3,642.2     | 313.4        | 556,035.18          | 742,799.00         | 32° 31' 34.258 N | 103° 32' 44.074 W |
| 14,751.0              | 88.90           | 176.10      | 11,300.6              | -3,737.0     | 319.4        | 555,940.39          | 742,805.05         | 32° 31' 33.319 N | 103° 32' 44.011 W |
| 14,846.0              | 89.30           | 176.10      | 11,302.1              | -3,831.8     | 325.9        | 555,845.62          | 742,811.51         | 32° 31' 32.381 N | 103° 32' 43.944 W |
| 14,941.0              | 89.50           | 176.20      | 11,303.1              | -3,926.6     | 332.3        | 555,750.84          | 742,817.88         | 32° 31' 31.443 N | 103° 32' 43.878 W |



**Wellplanning**  
Survey Report - Geographic

|           |                            |                              |                           |
|-----------|----------------------------|------------------------------|---------------------------|
| Company:  | COG Operating LLC          | Local Co-ordinate Reference: | Well #3H                  |
| Project:  | Lea County, NM (NAD27 NME) | TVD Reference:               | well1 @ 3737.2usft        |
| Site:     | Mas Fed                    | MD Reference:                | well1 @ 3737.2usft        |
| Well:     | #3H                        | North Reference:             | Grid                      |
| Wellbore: | OH                         | Survey Calculation Method:   | Minimum Curvature         |
| Design:   | OH                         | Database:                    | EDM 5000.1 Single User Db |

| Survey                |                 |             |                       |              |              |                     |                    |                  |                   |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|---------------------|--------------------|------------------|-------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude         | Longitude         |
| 15,034.0              | 89.70           | 176.30      | 11,303.8              | -4,019.4     | 338.4        | 555,658.04          | 742,823.97         | 32° 31' 30.524 N | 103° 32' 43.815 W |
| 15,129.0              | 89.80           | 176.30      | 11,304.2              | -4,114.2     | 344.5        | 555,563.24          | 742,830.10         | 32° 31' 29.586 N | 103° 32' 43.751 W |
| 15,223.0              | 90.10           | 175.00      | 11,304.3              | -4,207.9     | 351.6        | 555,469.51          | 742,837.23         | 32° 31' 28.658 N | 103° 32' 43.676 W |
| 15,318.0              | 89.10           | 175.00      | 11,304.9              | -4,302.5     | 359.9        | 555,374.88          | 742,845.51         | 32° 31' 27.721 N | 103° 32' 43.588 W |
| 15,412.0              | 87.70           | 173.90      | 11,307.6              | -4,396.0     | 369.0        | 555,281.36          | 742,854.59         | 32° 31' 26.795 N | 103° 32' 43.490 W |
| 15,507.0              | 87.80           | 174.40      | 11,311.3              | -4,490.5     | 378.7        | 555,186.92          | 742,864.27         | 32° 31' 25.860 N | 103° 32' 43.385 W |
| 15,601.0              | 88.40           | 173.90      | 11,314.4              | -4,583.9     | 388.2        | 555,093.47          | 742,873.84         | 32° 31' 24.934 N | 103° 32' 43.281 W |
| 15,720.0              | 89.00           | 173.30      | 11,317.1              | -4,702.2     | 401.5        | 554,975.24          | 742,887.11         | 32° 31' 23.763 N | 103° 32' 43.136 W |
| 15,770.7              | 89.00           | 173.30      | 11,318.0              | -4,752.5     | 407.4        | 554,924.90          | 742,893.02         | 32° 31' 23.265 N | 103° 32' 43.072 W |
| <b>PBHL(MasF#3H)</b>  |                 |             |                       |              |              |                     |                    |                  |                   |
| 15,772.0              | 89.00           | 173.30      | 11,318.0              | -4,753.8     | 407.6        | 554,923.60          | 742,893.17         | 32° 31' 23.252 N | 103° 32' 43.070 W |

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





**PATRIOT DRILLING, LLC**

**HOBBS OCD**

**DEC 15 2016**

**RECEIVED**

OPERATOR:  
WELL/LEASE:  
COUNTY:

COG Operating, LLC  
Mas Federal #3H  
Lea Co., New Mexico  
Sec. 34, T 20S, R 34E

**STATE OF NEW MEXICO  
DEVIATION REPORT**

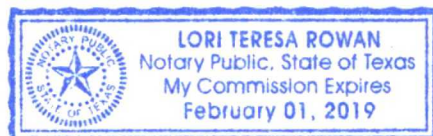
| <u>Depth</u> | <u>Deviation</u> | <u>Depth</u> | <u>Deviation</u> |
|--------------|------------------|--------------|------------------|
| 487          | 1/2              | 6,564        | 2                |
| 978          | 1/2              | 6,955        | 1 1/4            |
| 1,461        | 3/4              | 7,302        | 3/4              |
| 1,714        | 3/4              | 7,648        | 1                |
| 2,028        | 1 1/4            | 8,100        | 1/4              |
| 2,625        | 1/2              | 8,499        | 1/2              |
| 3,192        | 1                | 8,938        | 1 1/2            |
| 3,567        | 1 1/2            | 9,583        | 1/2              |
| 3,943        | 1 1/2            | 10,056       | 1/2              |
| 4,504        | 3/4              | 10,433       | 1                |
| 5,070        | 3/4              |              |                  |
| 5,450        | 1                |              |                  |
| 5,996        | 1                |              |                  |

**Patriot Drilling, LLC**

M. Leroy Peterson, Executive Vice-President

The foregoing instrument was acknowledged before me on this 4th day of January 2016 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling, LLC.

My Commission Expires: 02/01/2019



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



**MAS FEDERAL #3H**

30-025-42950

Sec 34-T20S-R34E

**HOBBS OCD**

DEC 15 2016

**RECEIVED**

| <u>Perfs</u>  | <u>7 1/2% Acid (Gal)</u> | <u>Sand (#)</u> | <u>Fluid (Gal)</u> |
|---------------|--------------------------|-----------------|--------------------|
| 15482-15605   | 4032                     | 312562          | 469266             |
| 15318-15441   | 3024                     | 309593          | 440454             |
| 15153-15277   | 3024                     | 312744          | 330036             |
| 14987-15112   | 2982                     | 311574          | 321342             |
| 14821-14947   | 3024                     | 310892          | 318318             |
| 14661-14787   | 3024                     | 313396          | 325752             |
| 14496-14620   | 3024                     | 314376          | 330582             |
| 14373-14455   | 3024                     | 315615          | 329238             |
| 14168-14291   | 3024                     | 314090          | 328566             |
| 14004-14127   | 3024                     | 312205          | 330078             |
| 13839-13963   | 3024                     | 312427          | 316344             |
| 13673-13798   | 3024                     | 312329          | 318990             |
| 13516-13633   | 3024                     | 314280          | 329406             |
| 13347-13474   | 3024                     | 313494          | 329364             |
| 13183-13306   | 3024                     | 313277          | 324240             |
| 13018-13142   | 3024                     | 313285          | 322896             |
| 12854-12977   | 3024                     | 312004          | 308238             |
| 12690-12813   | 3024                     | 313241          | 320754             |
| 12526-12649   | 3024                     | 311192          | 317646             |
| 12359-12485   | 3024                     | 312129          | 320628             |
| 12199-12316   | 2982                     | 311231          | 321930             |
| 12033-12156   | 2982                     | 312092          | 309162             |
| 11869-11992   | 3024                     | 311519          | 312270             |
| 11704-11828   | 3024                     | 312206          | 316680             |
| 11540-11663   | 3024                     | 312157          | 316554             |
| 11376-11496   | 3024                     | 313816          | 313110             |
| <b>Totals</b> | <b>79506</b>             | <b>8127726</b>  | <b>8621844</b>     |