



**Company:** Noble Energy  
**Rig:** Production/ V.E.S  
**API #** 05-123-25357  
**Date:** 9/25/2013  
**Surveyor:** Jay Hinman  
**VS:** 0.000  
**Lat :** 40.27236  
**Long:** -104.6115

**Well:** Petro State G36-18  
**Location:** Weld County, Colorado  
**North Reference:** GRID  
**Convergence:** Grid North is 0.57 Deg  
**Declination:** 8.47  
**Depth Reference:** Ground Level  
**Elevation:** 4825'  
**Total Depth as Drilled:** 7708'

**Lat & Long obtained by handheld GPS at wellhead**

**MS Gyro Survey Calculations**

| Depth    | Inc   | AzG     | N/-S    | E/-W   | TVD      | DL    | VS      | CD     |
|----------|-------|---------|---------|--------|----------|-------|---------|--------|
| 0.000    | 0.000 | 0.000   | 0.000   | 0.000  | 0.000    | ****  | 0.000   | 0.000  |
| 100.000  | 0.293 | 46.378  | 0.177   | 0.185  | 100.000  | 0.293 | 0.177   | 0.256  |
| 200.000  | 0.292 | 277.237 | 0.385   | 0.118  | 199.999  | 0.529 | 0.385   | 0.403  |
| 300.000  | 0.363 | 257.184 | 0.347   | -0.443 | 299.997  | 0.134 | 0.347   | 0.563  |
| 400.000  | 0.252 | 261.383 | 0.244   | -0.970 | 399.996  | 0.113 | 0.244   | 1.000  |
| 500.000  | 0.200 | 170.306 | 0.039   | -1.158 | 499.995  | 0.324 | 0.039   | 1.158  |
| 600.000  | 0.830 | 107.677 | -0.352  | -0.438 | 599.991  | 0.759 | -0.352  | 0.562  |
| 700.000  | 0.802 | 74.341  | -0.384  | 0.926  | 699.982  | 0.469 | -0.384  | 1.002  |
| 800.000  | 1.237 | 68.626  | 0.199   | 2.605  | 799.966  | 0.447 | 0.199   | 2.612  |
| 900.000  | 0.903 | 43.687  | 1.162   | 4.154  | 899.949  | 0.566 | 1.162   | 4.314  |
| 1000.000 | 1.219 | 48.332  | 2.439   | 5.493  | 999.931  | 0.328 | 2.439   | 6.011  |
| 1100.000 | 0.904 | 52.242  | 3.629   | 6.912  | 1099.914 | 0.323 | 3.629   | 7.807  |
| 1200.000 | 0.630 | 56.626  | 4.415   | 7.995  | 1199.905 | 0.280 | 4.415   | 9.133  |
| 1300.000 | 0.820 | 18.176  | 5.397   | 8.677  | 1299.898 | 0.510 | 5.397   | 10.218 |
| 1400.000 | 0.713 | 4.276   | 6.697   | 8.946  | 1399.889 | 0.214 | 6.697   | 11.175 |
| 1500.000 | 0.545 | 35.279  | 7.705   | 9.267  | 1499.883 | 0.373 | 7.705   | 12.052 |
| 1600.000 | 0.759 | 330.630 | 8.670   | 9.217  | 1599.878 | 0.720 | 8.670   | 12.654 |
| 1700.000 | 0.414 | 335.204 | 9.575   | 8.741  | 1699.872 | 0.348 | 9.575   | 12.965 |
| 1800.000 | 0.509 | 335.540 | 10.307  | 8.406  | 1799.869 | 0.095 | 10.307  | 13.300 |
| 1900.000 | 0.866 | 298.742 | 11.074  | 7.559  | 1899.862 | 0.551 | 11.074  | 13.408 |
| 2000.000 | 1.074 | 311.738 | 12.062  | 6.197  | 1999.848 | 0.302 | 12.062  | 13.561 |
| 2100.000 | 0.630 | 287.788 | 12.854  | 4.974  | 2099.837 | 0.561 | 12.854  | 13.783 |
| 2200.000 | 0.507 | 229.310 | 12.733  | 4.116  | 2199.833 | 0.565 | 12.733  | 13.382 |
| 2300.000 | 1.135 | 198.014 | 11.503  | 3.474  | 2299.822 | 0.750 | 11.503  | 12.016 |
| 2400.000 | 1.839 | 179.281 | 8.957   | 3.187  | 2399.789 | 0.846 | 8.957   | 9.507  |
| 2500.000 | 2.396 | 185.669 | 5.273   | 3.001  | 2499.720 | 0.604 | 5.273   | 6.067  |
| 2600.000 | 3.360 | 188.976 | 0.298   | 2.337  | 2599.593 | 0.978 | 0.298   | 2.356  |
| 2700.000 | 4.300 | 189.586 | -6.293  | 1.256  | 2699.368 | 0.941 | -6.293  | 6.417  |
| 2800.000 | 5.035 | 186.105 | -14.353 | 0.165  | 2799.036 | 0.787 | -14.353 | 14.354 |
| 2900.000 | 5.321 | 190.191 | -23.280 | -1.122 | 2898.628 | 0.467 | -23.280 | 23.307 |
| 3000.000 | 4.401 | 186.210 | -31.657 | -2.358 | 2998.268 | 0.980 | -31.657 | 31.745 |
| 3100.000 | 3.446 | 186.484 | -38.458 | -3.112 | 3098.032 | 0.954 | -38.458 | 38.583 |
| 3200.000 | 2.931 | 174.217 | -43.988 | -3.194 | 3197.879 | 0.852 | -43.988 | 44.103 |
| 3300.000 | 2.049 | 169.599 | -48.290 | -2.613 | 3297.783 | 0.904 | -48.290 | 48.360 |
| 3400.000 | 1.406 | 164.689 | -51.231 | -1.967 | 3397.737 | 0.659 | -51.231 | 51.269 |
| 3500.000 | 0.696 | 142.669 | -52.898 | -1.274 | 3497.720 | 0.804 | -52.898 | 52.913 |

|          |       |         |         |        |          |       |         |        |
|----------|-------|---------|---------|--------|----------|-------|---------|--------|
| 3600.000 | 0.822 | 148.685 | -53.994 | -0.533 | 3597.711 | 0.149 | -53.994 | 53.996 |
| 3700.000 | 0.529 | 160.456 | -55.042 | -0.006 | 3697.704 | 0.323 | -55.042 | 55.042 |
| 3800.000 | 0.169 | 76.400  | -55.442 | 0.292  | 3797.703 | 0.539 | -55.442 | 55.443 |
| 3900.000 | 0.484 | 106.909 | -55.531 | 0.840  | 3897.701 | 0.350 | -55.531 | 55.537 |
| 4000.000 | 0.189 | 110.346 | -55.711 | 1.398  | 3997.699 | 0.296 | -55.711 | 55.728 |
| 4100.000 | 0.054 | 336.927 | -55.725 | 1.534  | 4097.699 | 0.229 | -55.725 | 55.746 |
| 4200.000 | 0.483 | 4.231   | -55.262 | 1.547  | 4197.698 | 0.436 | -55.262 | 55.284 |
| 4300.000 | 1.011 | 25.832  | -54.048 | 1.963  | 4297.689 | 0.590 | -54.048 | 54.083 |
| 4400.000 | 1.760 | 33.241  | -51.969 | 3.189  | 4397.659 | 0.769 | -51.969 | 52.067 |
| 4500.000 | 2.088 | 17.488  | -48.947 | 4.578  | 4497.603 | 0.619 | -48.947 | 49.160 |
| 4600.000 | 1.998 | 3.168   | -45.468 | 5.222  | 4597.540 | 0.517 | -45.468 | 45.767 |
| 4700.000 | 2.250 | 11.322  | -41.802 | 5.704  | 4697.472 | 0.393 | -41.802 | 42.190 |
| 4800.000 | 2.556 | 3.830   | -37.653 | 6.238  | 4797.384 | 0.438 | -37.653 | 38.166 |
| 4900.000 | 2.221 | 10.980  | -33.526 | 6.756  | 4897.297 | 0.448 | -33.526 | 34.200 |
| 5000.000 | 1.276 | 9.834   | -30.527 | 7.315  | 4997.250 | 0.945 | -30.527 | 31.391 |
| 5100.000 | 1.246 | 25.491  | -28.448 | 7.974  | 5097.226 | 0.345 | -28.448 | 29.545 |
| 5200.000 | 1.235 | 27.410  | -26.510 | 8.938  | 5197.202 | 0.043 | -26.510 | 27.976 |
| 5300.000 | 1.207 | 47.357  | -24.839 | 10.209 | 5297.180 | 0.424 | -24.839 | 26.855 |
| 5400.000 | 1.342 | 89.562  | -24.117 | 12.154 | 5397.157 | 0.926 | -24.117 | 27.006 |
| 5500.000 | 1.220 | 70.265  | -23.748 | 14.327 | 5497.133 | 0.446 | -23.748 | 27.735 |
| 5600.000 | 1.425 | 34.086  | -22.359 | 16.026 | 5597.108 | 0.844 | -22.359 | 27.509 |
| 5700.000 | 1.347 | 354.163 | -20.159 | 16.604 | 5697.081 | 0.949 | -20.159 | 26.117 |
| 5800.000 | 1.627 | 338.446 | -17.670 | 15.963 | 5797.047 | 0.492 | -17.670 | 23.812 |
| 5900.000 | 1.442 | 343.627 | -15.143 | 15.087 | 5897.012 | 0.231 | -15.143 | 21.375 |
| 6000.000 | 1.416 | 341.795 | -12.762 | 14.346 | 5996.981 | 0.052 | -12.762 | 19.201 |
| 6100.000 | 1.517 | 341.229 | -10.334 | 13.534 | 6096.948 | 0.102 | -10.334 | 17.028 |
| 6200.000 | 1.759 | 356.045 | -7.550  | 13.002 | 6196.907 | 0.485 | -7.550  | 15.035 |
| 6300.000 | 1.541 | 351.167 | -4.691  | 12.689 | 6296.866 | 0.259 | -4.691  | 13.529 |
| 6400.000 | 1.464 | 356.133 | -2.088  | 12.397 | 6396.831 | 0.151 | -2.088  | 12.571 |
| 6500.000 | 0.807 | 357.150 | -0.110  | 12.276 | 6496.811 | 0.657 | -0.110  | 12.276 |
| 6600.000 | 0.604 | 11.351  | 1.110   | 12.344 | 6596.804 | 0.267 | 1.110   | 12.394 |
| 6700.000 | 0.193 | 39.009  | 1.758   | 12.554 | 6696.801 | 0.442 | 1.758   | 12.677 |
| 6800.000 | 0.222 | 81.909  | 1.916   | 12.852 | 6796.801 | 0.154 | 1.916   | 12.994 |
| 6900.000 | 0.298 | 90.290  | 1.942   | 13.304 | 6896.800 | 0.085 | 1.942   | 13.445 |
| 7000.000 | 0.266 | 15.819  | 2.164   | 13.628 | 6996.799 | 0.342 | 2.164   | 13.798 |

0

rees East of True North

| Cbrg |
|------|
|------|

|         |
|---------|
| 0.000   |
| 46.378  |
| 17.028  |
| 308.064 |
| 284.130 |
| 271.945 |
| 231.180 |
| 112.506 |
| 85.638  |
| 74.374  |
| 66.059  |
| 62.296  |
| 61.091  |
| 58.119  |
| 53.184  |
| 50.259  |
| 46.751  |
| 42.393  |
| 39.199  |
| 34.317  |
| 27.193  |
| 21.156  |
| 17.911  |
| 16.804  |
| 19.589  |
| 29.648  |
| 82.733  |
| 168.715 |
| 179.342 |
| 182.760 |
| 184.259 |
| 184.626 |
| 184.153 |
| 183.098 |
| 182.198 |
| 181.380 |

180.566  
180.006  
179.698  
179.134  
178.562  
178.423  
178.396  
177.920  
176.489  
174.656  
173.448  
172.230  
170.593  
168.606  
166.524  
164.343  
161.368  
157.657  
153.253  
148.898  
144.368  
140.525  
137.906  
135.107  
131.656  
127.366  
120.144  
110.287  
99.558  
90.511  
84.860  
82.029  
81.520  
81.695  
80.978