

**GyroTracer Directional:**

Date: 2/5/2019  
 Operator : Adrian Bruner  
 API: 05-123-20752  
 Well Name : **LF Ranch 17-31**  
 Field : Noble Energy Inc  
 Tool Type And Number: 1717  
 Bottom Depth : 6300.00  
 Total Well Depth: 7548.00  
 Latitude : 40.31757 N  
 Longitude : 104.45925 W  
 Grid Offset : 0.67

**Starting Point Coordinates (in local grid):**

Northing: 0.00      Easting: 0.00      Altitude: 4711.00

**Description:**

*Azimuth measured in degrees and referenced to local grid*

*Inclination measured from Vertical*

*Length measured in US survey feet*

*Lat/Long/Elevation obtained by handheld GPS at wellhead. Device error ± 9 Feet*

**RKB = Ground Level Elevation**

Start Time: 2/5/2019 9:18

End Time: 2/5/2019 10:27

| Depth    | Inclination | Azimuth | Closure<br>Direction | True Depth | Coordinates |        | Dogleg Severity | Closure<br>Distance |
|----------|-------------|---------|----------------------|------------|-------------|--------|-----------------|---------------------|
|          |             |         |                      |            | +N/-S       | +E/-W  |                 |                     |
| 0.000    | 0.000       | 0.000   | 0.000                | 0.000      | 0.000       | 0.000  | 0.000           | 0.000               |
| 100.000  | 0.110       | 164.561 | 126.254              | 100.000    | -0.110      | 0.150  | 0.110           | 0.186               |
| 200.000  | 0.250       | 225.826 | 160.003              | 200.000    | -0.238      | 0.087  | 0.219           | 0.254               |
| 300.000  | 0.110       | 0.180   | 192.992              | 299.999    | -0.396      | -0.091 | 0.229           | 0.406               |
| 400.000  | 0.130       | 76.440  | 209.443              | 399.999    | -0.476      | -0.268 | 0.162           | 0.546               |
| 500.000  | 0.080       | 64.391  | 218.924              | 499.999    | -0.362      | -0.292 | 0.059           | 0.465               |
| 600.000  | 0.170       | 53.974  | 249.413              | 599.998    | -0.114      | -0.303 | 0.090           | 0.324               |
| 700.000  | 0.390       | 38.894  | 328.505              | 699.997    | 0.258       | -0.158 | 0.226           | 0.302               |
| 800.000  | 0.330       | 48.720  | 11.935               | 799.996    | 0.721       | 0.152  | 0.084           | 0.737               |
| 900.000  | 0.440       | 66.306  | 35.553               | 899.993    | 1.103       | 0.788  | 0.156           | 1.355               |
| 1000.000 | 0.430       | 51.384  | 44.697               | 999.990    | 1.471       | 1.456  | 0.114           | 2.070               |
| 1100.000 | 0.470       | 57.753  | 51.528               | 1099.986   | 1.807       | 2.274  | 0.062           | 2.904               |
| 1200.000 | 0.530       | 61.214  | 52.443               | 1199.982   | 2.285       | 2.972  | 0.069           | 3.749               |
| 1300.000 | 0.470       | 43.968  | 53.021               | 1299.978   | 2.742       | 3.642  | 0.161           | 4.559               |
| 1400.000 | 0.270       | 10.155  | 51.360               | 1399.974   | 3.398       | 4.251  | 0.280           | 5.443               |
| 1500.000 | 0.350       | 71.637  | 51.394               | 1499.972   | 3.814       | 4.777  | 0.277           | 6.113               |
| 1600.000 | 0.090       | 79.644  | 52.552               | 1599.971   | 3.994       | 5.214  | 0.263           | 6.568               |
| 1700.000 | 0.160       | 88.991  | 54.459               | 1699.970   | 4.050       | 5.670  | 0.049           | 6.968               |
| 1800.000 | 0.470       | 101.896 | 57.472               | 1799.967   | 4.027       | 6.314  | 0.256           | 7.488               |
| 1900.000 | 0.450       | 93.207  | 61.277               | 1899.964   | 3.894       | 7.106  | 0.087           | 8.103               |
| 2000.000 | 0.780       | 70.734  | 63.331               | 1999.957   | 4.115       | 8.193  | 0.395           | 9.168               |

|          |       |         |         |          |         |        |       |        |
|----------|-------|---------|---------|----------|---------|--------|-------|--------|
| 2100.000 | 0.800 | 74.081  | 64.730  | 2099.948 | 4.479   | 9.489  | 0.067 | 10.493 |
| 2200.000 | 0.580 | 47.089  | 63.613  | 2199.941 | 5.202   | 10.485 | 0.327 | 11.704 |
| 2300.000 | 0.780 | 44.501  | 61.440  | 2299.933 | 6.147   | 11.292 | 0.336 | 12.857 |
| 2400.000 | 0.500 | 57.630  | 59.609  | 2399.925 | 7.077   | 12.066 | 0.255 | 13.989 |
| 2500.000 | 0.290 | 55.540  | 59.844  | 2499.923 | 7.338   | 12.631 | 0.220 | 14.608 |
| 2600.000 | 0.430 | 62.010  | 59.799  | 2599.921 | 7.682   | 13.198 | 0.118 | 15.271 |
| 2700.000 | 0.430 | 32.073  | 59.655  | 2699.918 | 8.074   | 13.793 | 0.261 | 15.983 |
| 2800.000 | 0.310 | 41.350  | 59.188  | 2799.916 | 8.500   | 14.251 | 0.096 | 16.593 |
| 2900.000 | 0.280 | 352.963 | 57.878  | 2899.915 | 8.994   | 14.326 | 0.252 | 16.915 |
| 3000.000 | 0.430 | 351.411 | 55.673  | 2999.912 | 9.697   | 14.202 | 0.157 | 17.197 |
| 3100.000 | 0.220 | 343.156 | 54.193  | 3099.911 | 10.181  | 14.113 | 0.241 | 17.402 |
| 3200.000 | 0.200 | 103.998 | 54.026  | 3199.911 | 10.262  | 14.138 | 0.399 | 17.470 |
| 3300.000 | 0.370 | 152.644 | 55.815  | 3299.909 | 9.802   | 14.431 | 0.259 | 17.445 |
| 3400.000 | 0.530 | 210.701 | 57.815  | 3399.906 | 9.014   | 14.322 | 0.458 | 16.922 |
| 3500.000 | 0.820 | 216.978 | 59.489  | 3499.897 | 7.977   | 13.536 | 0.239 | 15.712 |
| 3600.000 | 0.720 | 216.495 | 61.656  | 3599.887 | 6.854   | 12.707 | 0.046 | 14.438 |
| 3700.000 | 0.860 | 206.122 | 64.659  | 3699.878 | 5.681   | 11.997 | 0.181 | 13.274 |
| 3800.000 | 0.790 | 206.919 | 68.706  | 3799.867 | 4.402   | 11.293 | 0.045 | 12.120 |
| 3900.000 | 0.800 | 207.536 | 73.534  | 3899.857 | 3.136   | 10.610 | 0.041 | 11.063 |
| 4000.000 | 0.660 | 169.403 | 79.465  | 3999.848 | 1.926   | 10.355 | 0.488 | 10.533 |
| 4100.000 | 1.850 | 130.549 | 88.637  | 4099.824 | 0.278   | 11.661 | 1.320 | 11.665 |
| 4200.000 | 2.210 | 117.702 | 96.497  | 4199.754 | -1.687  | 14.813 | 0.584 | 14.909 |
| 4300.000 | 2.520 | 108.346 | 100.319 | 4299.669 | -3.381  | 18.570 | 0.509 | 18.875 |
| 4400.000 | 3.010 | 100.427 | 101.203 | 4399.547 | -4.621  | 23.331 | 0.627 | 23.785 |
| 4500.000 | 2.920 | 90.995  | 100.190 | 4499.417 | -5.106  | 28.407 | 0.514 | 28.862 |
| 4600.000 | 2.600 | 87.505  | 98.412  | 4599.301 | -4.910  | 33.205 | 0.340 | 33.566 |
| 4700.000 | 2.080 | 87.416  | 97.000  | 4699.219 | -4.570  | 37.222 | 0.554 | 37.502 |
| 4800.000 | 1.900 | 88.608  | 96.033  | 4799.157 | -4.307  | 40.749 | 0.229 | 40.976 |
| 4900.000 | 1.620 | 91.395  | 95.889  | 4899.109 | -4.517  | 43.793 | 0.330 | 44.025 |
| 5000.000 | 1.230 | 106.783 | 96.043  | 4999.079 | -4.893  | 46.216 | 0.540 | 46.474 |
| 5100.000 | 0.680 | 123.575 | 96.459  | 5099.066 | -5.399  | 47.691 | 0.608 | 47.996 |
| 5200.000 | 0.430 | 145.898 | 97.151  | 5199.061 | -6.081  | 48.466 | 0.329 | 48.846 |
| 5300.000 | 0.270 | 142.267 | 97.776  | 5299.059 | -6.631  | 48.557 | 0.159 | 49.007 |
| 5400.000 | 0.340 | 124.980 | 98.074  | 5399.058 | -6.941  | 48.931 | 0.115 | 49.421 |
| 5500.000 | 0.490 | 154.277 | 98.530  | 5499.055 | -7.418  | 49.461 | 0.253 | 50.015 |
| 5600.000 | 0.580 | 121.962 | 99.118  | 5599.050 | -8.049  | 50.147 | 0.307 | 50.789 |
| 5700.000 | 0.650 | 86.392  | 99.321  | 5699.043 | -8.415  | 51.273 | 0.383 | 51.959 |
| 5800.000 | 0.540 | 114.506 | 99.438  | 5799.037 | -8.687  | 52.263 | 0.302 | 52.980 |
| 5900.000 | 0.680 | 116.664 | 99.708  | 5899.029 | -9.144  | 53.449 | 0.136 | 54.226 |
| 6000.000 | 0.560 | 130.898 | 100.254 | 5999.021 | -9.858  | 54.495 | 0.193 | 55.380 |
| 6100.000 | 0.680 | 108.500 | 100.682 | 6099.015 | -10.453 | 55.414 | 0.270 | 56.391 |
| 6200.000 | 0.720 | 110.760 | 101.057 | 6199.009 | -11.009 | 56.338 | 0.045 | 57.404 |
| 6300.000 | 0.480 | 107.230 | 101.206 | 6299.001 | -11.396 | 57.519 | 0.240 | 58.637 |