



Company: Noble Energy
Lease/Well: Trebor B / 12-4
Location: S-12 T-5N R-64W
Rig Name: Production
State/County: Colorado / Weld County
Latitude: 40.42, Longitude: -104.51
GRID North is 0.64 Degrees East of True North
VS-Azi: 0.00 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: inrun_ed.ut
Minimum Curvature Method
Report Date/Time: 7/20/2011 / 19:32

Vaughn Energy Services
Henderson, CO
970-625-8041
Robert Davis

| Measured Depth FT | Incl Angle Deg | Drift Direction Deg | TVD FT | +N-S FT | +E-W FT | Vertical Section FT | Closure Distance FT | Closure Direction Deg | Dogleg Severity Deg/100 |
|-------------------------|----------------------|---------------------------|-----------|------------|------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | **** |
| 100.00 | 0.16 | 136.35 | 100.00 | -0.10 | 0.10 | -0.10 | 0.14 | 136.35 | 0.16 |
| 200.00 | 0.42 | 77.98 | 200.00 | -0.12 | 0.55 | -0.12 | 0.56 | 102.60 | 0.36 |
| 300.00 | 0.14 | 258.47 | 300.00 | -0.07 | 0.79 | -0.07 | 0.79 | 95.13 | 0.56 |
| 400.00 | 0.13 | 223.84 | 400.00 | -0.18 | 0.59 | -0.18 | 0.62 | 106.56 | 0.08 |
| 500.00 | 0.21 | 263.04 | 500.00 | -0.28 | 0.33 | -0.28 | 0.43 | 130.24 | 0.14 |
| 600.00 | 0.41 | 32.54 | 600.00 | 0.00 | 0.34 | 0.00 | 0.34 | 89.58 | 0.57 |
| 700.00 | 0.31 | 22.49 | 699.99 | 0.55 | 0.64 | 0.55 | 0.84 | 48.96 | 0.12 |
| 800.00 | 0.30 | 48.03 | 799.99 | 0.98 | 0.93 | 0.98 | 1.35 | 43.72 | 0.13 |
| 900.00 | 0.37 | 27.60 | 899.99 | 1.43 | 1.28 | 1.43 | 1.92 | 41.67 | 0.13 |
| 1000.00 | 0.33 | 19.61 | 999.99 | 1.99 | 1.52 | 1.99 | 2.50 | 37.42 | 0.06 |
| 1100.00 | 0.33 | 276.18 | 1099.99 | 2.29 | 1.33 | 2.29 | 2.65 | 30.16 | 0.52 |
| 1200.00 | 0.28 | 61.49 | 1199.99 | 2.44 | 1.26 | 2.44 | 2.75 | 27.36 | 0.59 |
| 1300.00 | 0.26 | 93.90 | 1299.99 | 2.54 | 1.71 | 2.54 | 3.06 | 33.94 | 0.15 |
| 1400.00 | 0.28 | 239.34 | 1399.99 | 2.40 | 1.73 | 2.40 | 2.96 | 35.77 | 0.52 |
| 1500.00 | 0.36 | 177.20 | 1499.99 | 1.96 | 1.53 | 1.96 | 2.49 | 38.04 | 0.34 |
| 1600.00 | 0.44 | 168.61 | 1599.98 | 1.26 | 1.62 | 1.26 | 2.06 | 52.13 | 0.10 |
| 1700.00 | 0.42 | 189.88 | 1699.98 | 0.52 | 1.64 | 0.52 | 1.72 | 72.44 | 0.16 |
| 1800.00 | 1.35 | 206.19 | 1799.97 | -0.90 | 1.06 | -0.90 | 1.39 | 130.50 | 0.95 |
| 1900.00 | 1.36 | 225.40 | 1899.94 | -2.79 | -0.31 | -2.79 | 2.81 | 186.33 | 0.45 |
| 2000.00 | 1.64 | 229.04 | 1999.91 | -4.57 | -2.24 | -4.57 | 5.08 | 206.12 | 0.30 |
| 2100.00 | 2.50 | 241.19 | 2099.84 | -6.56 | -5.23 | -6.56 | 8.39 | 218.60 | 0.96 |
| 2200.00 | 2.76 | 246.78 | 2199.73 | -8.56 | -9.36 | -8.56 | 12.69 | 227.56 | 0.36 |
| 2300.00 | 3.01 | 254.35 | 2299.61 | -10.22 | -14.11 | -10.22 | 17.42 | 234.08 | 0.46 |
| 2400.00 | 3.30 | 259.54 | 2399.46 | -11.45 | -19.47 | -11.45 | 22.59 | 239.54 | 0.40 |
| 2500.00 | 3.45 | 267.93 | 2499.28 | -12.08 | -25.30 | -12.08 | 28.04 | 244.48 | 0.51 |
| 2600.00 | 3.63 | 276.57 | 2599.09 | -11.83 | -31.45 | -11.83 | 33.60 | 249.39 | 0.56 |
| 2700.00 | 3.36 | 273.39 | 2698.91 | -11.29 | -37.52 | -11.29 | 39.18 | 253.25 | 0.33 |
| 2800.00 | 3.81 | 281.68 | 2798.71 | -10.45 | -43.69 | -10.45 | 44.92 | 256.55 | 0.68 |
| 2900.00 | 3.80 | 287.20 | 2898.49 | -8.80 | -50.10 | -8.80 | 50.87 | 260.04 | 0.37 |
| 3000.00 | 3.79 | 290.32 | 2998.27 | -6.67 | -56.37 | -6.67 | 56.76 | 263.25 | 0.21 |
| 3100.00 | 3.57 | 293.23 | 3098.07 | -4.29 | -62.33 | -4.29 | 62.48 | 266.06 | 0.29 |
| 3200.00 | 3.25 | 293.71 | 3197.89 | -1.93 | -67.78 | -1.93 | 67.81 | 268.37 | 0.33 |
| 3300.00 | 3.29 | 308.11 | 3297.73 | 0.99 | -72.64 | 0.99 | 72.64 | 270.78 | 0.82 |
| 3400.00 | 3.28 | 316.21 | 3397.57 | 4.82 | -76.88 | 4.82 | 77.03 | 273.59 | 0.46 |

| Measured Depth FT | Incl Angle Deg | Drift Direction Deg | TVD FT | +N/-S FT | +E/-W FT | Vertical Section FT | Closure Distance FT | Closure Direction Deg | Dogleg Severity Deg/100 |
|--|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 3500.00 | 2.90 | 316.15 | 3497.42 | 8.72 | -80.61 | 8.72 | 81.08 | 276.17 | 0.38 |
| 3600.00 | 2.33 | 313.48 | 3597.31 | 11.94 | -83.84 | 11.94 | 84.69 | 278.11 | 0.58 |
| 3700.00 | 2.33 | 305.45 | 3697.23 | 14.52 | -86.98 | 14.52 | 88.18 | 279.48 | 0.33 |
| 3800.00 | 2.30 | 316.30 | 3797.15 | 17.15 | -90.02 | 17.15 | 91.64 | 280.79 | 0.44 |
| 3900.00 | 1.72 | 313.20 | 3897.09 | 19.63 | -92.50 | 19.63 | 94.56 | 281.98 | 0.58 |
| 4000.00 | 1.17 | 319.29 | 3997.06 | 21.44 | -94.26 | 21.44 | 96.67 | 282.81 | 0.57 |
| 4100.00 | 1.07 | 324.57 | 4097.04 | 22.97 | -95.47 | 22.97 | 98.20 | 283.53 | 0.15 |
| 4200.00 | 1.68 | 301.39 | 4197.01 | 24.49 | -97.26 | 24.49 | 100.30 | 284.14 | 0.81 |
| 4300.00 | 1.79 | 294.80 | 4296.96 | 25.91 | -99.93 | 25.91 | 103.23 | 284.54 | 0.23 |
| 4400.00 | 1.10 | 276.01 | 4396.93 | 26.67 | -102.30 | 26.67 | 105.72 | 284.61 | 0.83 |
| 4500.00 | 0.46 | 222.73 | 4496.92 | 26.47 | -103.52 | 26.47 | 106.85 | 284.34 | 0.90 |
| 4600.00 | 0.81 | 190.07 | 4596.92 | 25.49 | -103.92 | 25.49 | 106.99 | 283.78 | 0.49 |
| 4700.00 | 1.56 | 161.78 | 4696.90 | 23.50 | -103.61 | 23.50 | 106.24 | 282.78 | 0.93 |
| 4800.00 | 2.18 | 153.41 | 4796.84 | 20.51 | -102.34 | 20.51 | 104.37 | 281.33 | 0.67 |
| 4900.00 | 2.21 | 138.95 | 4896.77 | 17.35 | -100.22 | 17.35 | 101.71 | 279.82 | 0.55 |
| 5000.00 | 1.94 | 154.24 | 4996.70 | 14.37 | -98.21 | 14.37 | 99.26 | 278.32 | 0.61 |
| 5100.00 | 1.57 | 140.61 | 5096.66 | 11.78 | -96.61 | 11.78 | 97.32 | 276.95 | 0.56 |
| 5200.00 | 0.79 | 123.48 | 5196.64 | 10.34 | -95.16 | 10.34 | 95.72 | 276.20 | 0.85 |
| 5300.00 | 0.94 | 149.06 | 5296.62 | 9.26 | -94.16 | 9.26 | 94.62 | 275.62 | 0.41 |
| 5400.00 | 0.22 | 145.33 | 5396.62 | 8.40 | -93.63 | 8.40 | 94.01 | 275.13 | 0.71 |
| 5500.00 | 0.44 | 131.01 | 5496.62 | 7.99 | -93.23 | 7.99 | 93.57 | 274.90 | 0.23 |
| 5600.00 | 0.79 | 156.87 | 5596.61 | 7.10 | -92.67 | 7.10 | 92.94 | 274.38 | 0.44 |
| 5700.00 | 0.72 | 158.61 | 5696.60 | 5.88 | -92.17 | 5.88 | 92.36 | 273.65 | 0.08 |
| 5800.00 | 0.59 | 141.40 | 5796.60 | 4.89 | -91.62 | 4.89 | 91.75 | 273.05 | 0.23 |
| 5900.00 | 0.66 | 146.77 | 5896.59 | 4.00 | -90.97 | 4.00 | 91.06 | 272.51 | 0.09 |
| 6000.00 | 0.26 | 176.85 | 5996.59 | 3.28 | -90.64 | 3.28 | 90.70 | 272.07 | 0.46 |
| 6100.00 | 0.30 | 138.41 | 6096.59 | 2.85 | -90.46 | 2.85 | 90.50 | 271.81 | 0.19 |
| 6200.00 | 0.86 | 160.74 | 6196.58 | 1.95 | -90.03 | 1.95 | 90.05 | 271.24 | 0.59 |
| 6300.00 | 0.38 | 211.93 | 6296.57 | 0.95 | -89.96 | 0.95 | 89.96 | 270.61 | 0.69 |
| 6400.00 | 0.14 | 200.74 | 6396.57 | 0.55 | -90.18 | 0.55 | 90.18 | 270.35 | 0.24 |
| 6500.00 | 0.66 | 155.27 | 6496.57 | -0.09 | -89.98 | -0.09 | 89.98 | 269.94 | 0.57 |
| 6600.00 | 0.78 | 220.56 | 6596.56 | -1.13 | -90.19 | -1.13 | 90.19 | 269.28 | 0.78 |
| 6700.00 | 0.84 | 228.08 | 6696.55 | -2.13 | -91.17 | -2.13 | 91.20 | 268.66 | 0.12 |
| HORIZONTAL DISPLACEMENT IS 91.20 FEET AT 268.66 DEGREES | | | | | | | | | |