



Company/Rig: NOBLE ENERGY/ CORETECH
WELL: MD RADKE 22-01
DECLINATION: 8.4
TD AS DRILLED: 7,324 FEET
COUNTY/STATE: WELD/COLORADO
Latitude: 40.213, Longitude: -104.657
GRID North is 0.540 Degrees East of True North
VS-Azi: 0.000 Degrees



DEPTH REFERENCE : RKB=SURFACE ELEVATION=4,813 FEET

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run02-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 11/14/2014 / 12:11

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

SURVEYOR: LEVI SHELDON

| 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 |
|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | **** |
| 100.000 | 0.176 | 110.240 | 100.000 | -0.053 | 0.144 | -0.053 | 0.153 | 110.240 | 0.176 |
| 200.000 | 0.322 | 113.420 | 199.999 | -0.218 | 0.546 | -0.218 | 0.587 | 111.760 | 0.147 |
| 300.000 | 0.312 | 135.228 | 299.997 | -0.522 | 0.995 | -0.522 | 1.124 | 117.706 | 0.120 |
| 400.000 | 0.137 | 226.692 | 399.997 | -0.798 | 1.099 | -0.798 | 1.358 | 125.973 | 0.344 |
| 500.000 | 0.287 | 278.490 | 499.996 | -0.843 | 0.764 | -0.843 | 1.138 | 137.811 | 0.229 |
| 600.000 | 0.221 | 301.244 | 599.995 | -0.706 | 0.351 | -0.706 | 0.788 | 153.543 | 0.119 |
| 700.000 | 0.057 | 250.405 | 699.995 | -0.622 | 0.139 | -0.622 | 0.638 | 167.364 | 0.191 |
| 800.000 | 0.050 | 340.587 | 799.995 | -0.597 | 0.078 | -0.597 | 0.602 | 172.530 | 0.076 |
| 900.000 | 0.245 | 296.092 | 899.994 | -0.462 | -0.128 | -0.462 | 0.479 | 195.500 | 0.212 |
| 1000.000 | 0.215 | 337.986 | 999.994 | -0.194 | -0.390 | -0.194 | 0.436 | 243.615 | 0.167 |
| 1100.000 | 0.113 | 244.268 | 1099.993 | -0.062 | -0.550 | -0.062 | 0.554 | 263.534 | 0.250 |
| 1200.000 | 0.347 | 273.775 | 1199.993 | -0.085 | -0.941 | -0.085 | 0.945 | 264.816 | 0.254 |
| 1300.000 | 0.193 | 282.662 | 1299.991 | -0.029 | -1.408 | -0.029 | 1.408 | 268.834 | 0.159 |
| 1400.000 | 0.299 | 260.743 | 1399.991 | -0.034 | -1.829 | -0.034 | 1.830 | 268.941 | 0.140 |
| 1500.000 | 0.258 | 308.711 | 1499.990 | 0.065 | -2.263 | 0.065 | 2.264 | 271.642 | 0.230 |
| 1600.000 | 0.362 | 288.221 | 1599.988 | 0.304 | -2.738 | 0.304 | 2.755 | 276.340 | 0.150 |
| 1700.000 | 0.310 | 293.192 | 1699.986 | 0.509 | -3.286 | 0.509 | 3.325 | 278.810 | 0.059 |
| 1800.000 | 0.367 | 268.552 | 1799.985 | 0.608 | -3.854 | 0.608 | 3.902 | 278.959 | 0.155 |
| 1900.000 | 0.397 | 229.429 | 1899.983 | 0.374 | -4.438 | 0.374 | 4.454 | 274.818 | 0.257 |

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|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 2000.000 | 0.621 | 244.596 | 1999.979 | -0.084 | -5.190 | -0.084 | 5.191 | 269.076 | 0.259 |
| 2100.000 | 0.597 | 226.052 | 2099.973 | -0.678 | -6.055 | -0.678 | 6.093 | 263.613 | 0.198 |
| 2200.000 | 0.710 | 247.163 | 2199.967 | -1.280 | -7.001 | -1.280 | 7.117 | 259.639 | 0.264 |
| 2300.000 | 0.969 | 230.328 | 2299.956 | -2.060 | -8.223 | -2.060 | 8.477 | 255.934 | 0.355 |