

Company: Noble Energy

Lease/Well: Shaklee/3

API: 05-123-12636

Rig Name: Production

State/County: Colorado/Weld County, CO.

Latitude: 40.340, Longitude: -104.520

GRID North is 0.630 Degrees East of True North

VS-Azi: 0.000 Degrees

**FIELD COPY ONLY (NOT DEFINITIVE)****DRILLOG MS GYRO SURVEY CALCULATIONS**

Filename: msgyro_run01-01_ed.ut

Minimum Curvature Method

Report Date/Time: 8/11/2011 / 05:02

Vaughn Energy Services

Henderson Colorado

866-835-8333

RKB = Ground Level

Nick Campbell

| 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 | 0.450 | 144.575 | 99.999 | -0.320 | 0.228 | -0.320 | 0.393 | 144.575 | 0.450 |
| 200.000 | 0.678 | 167.066 | 199.994 | -1.217 | 0.588 | -1.217 | 1.352 | 154.218 | 0.314 |
| 300.000 | 0.609 | 170.920 | 299.988 | -2.319 | 0.804 | -2.319 | 2.454 | 160.870 | 0.082 |
| 400.000 | 0.582 | 199.896 | 399.983 | -3.321 | 0.715 | -3.321 | 3.397 | 167.846 | 0.299 |
| 500.000 | 0.566 | 177.986 | 499.978 | -4.292 | 0.560 | -4.292 | 4.328 | 172.571 | 0.219 |
| 600.000 | 0.531 | 218.979 | 599.974 | -5.146 | 0.285 | -5.146 | 5.153 | 176.826 | 0.385 |
| 700.000 | 0.657 | 205.700 | 699.968 | -6.023 | -0.255 | -6.023 | 6.028 | 182.425 | 0.186 |
| 800.000 | 0.370 | 212.809 | 799.964 | -6.811 | -0.679 | -6.811 | 6.845 | 185.690 | 0.294 |
| 900.000 | 0.709 | 208.350 | 899.960 | -7.627 | -1.147 | -7.627 | 7.712 | 188.554 | 0.342 |
| 1000.000 | 0.732 | 218.487 | 999.952 | -8.671 | -1.839 | -8.671 | 8.864 | 191.971 | 0.129 |
| 1100.000 | 0.719 | 219.536 | 1099.944 | -9.655 | -2.636 | -9.655 | 10.009 | 195.269 | 0.019 |
| 1200.000 | 0.844 | 196.290 | 1199.935 | -10.846 | -3.242 | -10.846 | 11.320 | 196.641 | 0.338 |
| 1300.000 | 0.847 | 230.160 | 1299.924 | -12.026 | -4.016 | -12.026 | 12.679 | 198.466 | 0.493 |
| 1400.000 | 0.685 | 239.921 | 1399.915 | -12.799 | -5.101 | -12.799 | 13.778 | 201.727 | 0.208 |
| 1500.000 | 0.928 | 229.843 | 1499.905 | -13.621 | -6.236 | -13.621 | 14.981 | 204.600 | 0.280 |
| 1600.000 | 1.399 | 238.056 | 1599.885 | -14.789 | -7.891 | -14.789 | 16.762 | 208.083 | 0.499 |
| 1700.000 | 1.108 | 253.087 | 1699.861 | -15.716 | -9.852 | -15.716 | 18.549 | 212.083 | 0.437 |
| 1800.000 | 1.516 | 253.454 | 1799.834 | -16.374 | -12.045 | -16.374 | 20.328 | 216.339 | 0.408 |
| 1900.000 | 1.556 | 246.899 | 1899.799 | -17.284 | -14.562 | -17.284 | 22.600 | 220.115 | 0.180 |
| 2000.000 | 1.655 | 247.721 | 1999.759 | -18.364 | -17.147 | -18.364 | 25.124 | 223.037 | 0.101 |
| 2100.000 | 1.668 | 255.706 | 2099.717 | -19.270 | -19.893 | -19.270 | 27.696 | 225.911 | 0.232 |
| 2200.000 | 1.736 | 254.769 | 2199.673 | -20.028 | -22.766 | -20.028 | 30.321 | 228.661 | 0.074 |
| 2300.000 | 1.444 | 251.302 | 2299.635 | -20.830 | -25.421 | -20.830 | 32.865 | 230.669 | 0.307 |
| 2400.000 | 1.688 | 271.895 | 2399.598 | -21.185 | -28.087 | -21.185 | 35.181 | 232.974 | 0.609 |
| 2500.000 | 1.498 | 248.078 | 2499.560 | -21.624 | -30.771 | -21.624 | 37.609 | 234.902 | 0.683 |
| 2600.000 | 1.585 | 267.218 | 2599.525 | -22.179 | -33.364 | -22.179 | 40.064 | 236.386 | 0.520 |
| 2700.000 | 1.497 | 260.585 | 2699.489 | -22.460 | -36.035 | -22.460 | 42.461 | 238.065 | 0.199 |
| 2800.000 | 1.162 | 252.188 | 2799.462 | -22.984 | -38.290 | -22.984 | 44.658 | 239.025 | 0.387 |
| 2900.000 | 1.568 | 274.742 | 2899.434 | -23.181 | -40.618 | -23.181 | 46.768 | 240.286 | 0.665 |
| 3000.000 | 1.465 | 259.814 | 2999.399 | -23.294 | -43.240 | -23.294 | 49.115 | 241.687 | 0.407 |

| 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 |
|--|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 3100.000 | 1.017 | 279.813 | 3099.376 | -23.369 | -45.372 | -23.369 | 51.037 | 242.749 | 0.616 |
| 3200.000 | 0.969 | 252.374 | 3199.362 | -23.474 | -47.053 | -23.474 | 52.583 | 243.486 | 0.473 |
| 3300.000 | 1.398 | 262.533 | 3299.340 | -23.889 | -49.068 | -23.889 | 54.574 | 244.041 | 0.475 |
| 3400.000 | 1.019 | 258.601 | 3399.318 | -24.223 | -51.149 | -24.223 | 56.595 | 244.659 | 0.387 |
| 3500.000 | 1.296 | 288.683 | 3499.298 | -24.036 | -53.092 | -24.036 | 58.280 | 245.643 | 0.658 |
| 3600.000 | 1.405 | 273.261 | 3599.271 | -23.604 | -55.388 | -23.604 | 60.208 | 246.918 | 0.378 |
| 3700.000 | 1.107 | 265.468 | 3699.247 | -23.611 | -57.576 | -23.611 | 62.229 | 247.703 | 0.343 |
| 3800.000 | 1.322 | 262.291 | 3799.224 | -23.842 | -59.683 | -23.842 | 64.269 | 248.225 | 0.225 |
| 3900.000 | 1.295 | 284.684 | 3899.199 | -23.710 | -61.920 | -23.710 | 66.304 | 249.047 | 0.509 |
| 4000.000 | 1.977 | 298.935 | 3999.158 | -22.589 | -64.522 | -22.589 | 68.362 | 250.705 | 0.788 |
| 4100.000 | 2.276 | 301.726 | 4099.089 | -20.711 | -67.721 | -20.711 | 70.817 | 252.995 | 0.317 |
| 4200.000 | 2.434 | 310.763 | 4199.005 | -18.280 | -71.018 | -18.280 | 73.333 | 255.565 | 0.403 |
| 4300.000 | 2.620 | 306.145 | 4298.907 | -15.546 | -74.471 | -15.546 | 76.076 | 258.209 | 0.276 |
| 4400.000 | 2.263 | 314.853 | 4398.817 | -12.805 | -77.716 | -12.805 | 78.764 | 260.643 | 0.514 |
| 4500.000 | 1.928 | 310.321 | 4498.750 | -10.324 | -80.399 | -10.324 | 81.059 | 262.682 | 0.374 |
| 4600.000 | 1.542 | 308.436 | 4598.704 | -8.399 | -82.735 | -8.399 | 83.161 | 264.203 | 0.390 |
| 4700.000 | 1.443 | 307.412 | 4698.670 | -6.798 | -84.789 | -6.798 | 85.062 | 265.416 | 0.103 |
| 4800.000 | 1.756 | 318.802 | 4798.631 | -4.880 | -86.798 | -4.880 | 86.936 | 266.782 | 0.445 |
| 4900.000 | 1.229 | 331.122 | 4898.597 | -2.789 | -88.325 | -2.789 | 88.369 | 268.192 | 0.614 |
| 5000.000 | 1.622 | 359.411 | 4998.567 | -0.434 | -88.858 | -0.434 | 88.859 | 269.720 | 0.794 |
| 5100.000 | 0.658 | 12.211 | 5098.546 | 1.542 | -88.751 | 1.542 | 88.764 | 270.995 | 0.991 |
| 5200.000 | 1.142 | 48.270 | 5198.534 | 2.766 | -87.886 | 2.766 | 87.930 | 271.803 | 0.722 |
| 5300.000 | 0.741 | 351.566 | 5298.523 | 4.069 | -87.238 | 4.069 | 87.332 | 272.670 | 0.961 |
| 5400.000 | 1.035 | 45.435 | 5398.512 | 5.342 | -86.689 | 5.342 | 86.853 | 273.527 | 0.846 |
| 5500.000 | 0.410 | 357.195 | 5498.504 | 6.333 | -86.063 | 6.333 | 86.295 | 274.209 | 0.821 |
| 5600.000 | 0.809 | 23.388 | 5598.499 | 7.339 | -85.800 | 7.339 | 86.113 | 274.889 | 0.477 |
| 5700.000 | 0.841 | 11.645 | 5698.488 | 8.705 | -85.371 | 8.705 | 85.814 | 275.822 | 0.172 |
| 5800.000 | 0.759 | 7.107 | 5798.479 | 10.082 | -85.141 | 10.082 | 85.736 | 276.753 | 0.103 |
| 5900.000 | 0.207 | 62.414 | 5898.475 | 10.823 | -84.900 | 10.823 | 85.587 | 277.265 | 0.664 |
| 6000.000 | 0.703 | 314.612 | 5998.473 | 11.337 | -85.176 | 11.337 | 85.927 | 277.581 | 0.791 |
| 6100.000 | 0.764 | 256.328 | 6098.466 | 11.610 | -86.261 | 11.610 | 87.039 | 277.665 | 0.716 |
| 6200.000 | 2.160 | 284.612 | 6198.432 | 11.928 | -88.733 | 11.928 | 89.531 | 277.656 | 1.531 |
| 6300.000 | 1.529 | 297.656 | 6298.380 | 13.022 | -91.738 | 13.022 | 92.658 | 278.079 | 0.755 |
| 6400.000 | 0.861 | 322.136 | 6398.358 | 14.235 | -93.381 | 14.235 | 94.460 | 278.667 | 0.826 |
| 6500.000 | 0.878 | 4.959 | 6498.348 | 15.591 | -93.776 | 15.591 | 95.064 | 279.440 | 0.635 |
| 6600.000 | 1.018 | 62.571 | 6598.336 | 16.764 | -92.922 | 16.764 | 94.422 | 280.227 | 0.922 |
| 6700.000 | 0.273 | 59.733 | 6698.329 | 17.293 | -91.927 | 17.293 | 93.539 | 280.654 | 0.745 |
| HORIZONTAL DISPLACEMENT IS 93.539 FEET AT 280.654 DEGREES | | | | | | | | | |