

Company: NOBLE ENERGY

Well: MONFORT 01-10

API: 05-123-11424

Rig Name: PRODUCTION/VES

State/County: COLORADO/WELD

Latitude: 40.331, Longitude: -104.767

GRID North is 0.470 Degrees East of True North

VS-Azi: 0.000 Degrees

**FIELD COPY ONLY (NOT DEFINITIVE)**

Depth Reference : RKB = GROUND LEVEL

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: run_01-de_01.ut

Minimum Curvature Method

Report Date/Time: 12/24/2012 / 15:36

VAUGHN ENERGY SERVICES

HENDERSON, COLORADO

866-835-8333

NICK KULA

DEPTH REFERENCE=GROUND LEVEL

| 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 | 0.155 | 289.934 | 100.000 | 0.046 | -0.127 | 0.046 | 0.135 | 289.934 | 0.155 |
| 200.000 | 0.195 | 275.774 | 199.999 | 0.109 | -0.424 | 0.109 | 0.437 | 284.460 | 0.059 |
| 300.000 | 0.202 | 232.361 | 299.999 | 0.019 | -0.733 | 0.019 | 0.733 | 271.478 | 0.147 |
| 400.000 | 0.209 | 262.047 | 399.998 | -0.114 | -1.053 | -0.114 | 1.059 | 263.829 | 0.106 |
| 500.000 | 0.070 | 257.577 | 499.998 | -0.152 | -1.294 | -0.152 | 1.303 | 263.286 | 0.140 |
| 600.000 | 0.190 | 225.304 | 599.998 | -0.282 | -1.471 | -0.282 | 1.498 | 259.154 | 0.136 |
| 700.000 | 0.347 | 182.354 | 699.997 | -0.701 | -1.601 | -0.701 | 1.748 | 246.354 | 0.245 |
| 800.000 | 0.064 | 188.845 | 799.996 | -1.059 | -1.622 | -1.059 | 1.937 | 236.853 | 0.283 |
| 900.000 | 0.362 | 170.183 | 899.995 | -1.426 | -1.577 | -1.426 | 2.126 | 227.882 | 0.301 |
| 1000.000 | 0.140 | 208.806 | 999.994 | -1.844 | -1.582 | -1.844 | 2.430 | 220.632 | 0.267 |
| 1100.000 | 0.250 | 173.272 | 1099.994 | -2.168 | -1.616 | -2.168 | 2.704 | 216.698 | 0.158 |
| 1200.000 | 0.336 | 211.334 | 1199.992 | -2.634 | -1.742 | -2.634 | 3.158 | 213.481 | 0.207 |
| 1300.000 | 0.449 | 143.439 | 1299.990 | -3.199 | -1.661 | -3.199 | 3.605 | 207.445 | 0.448 |
| 1400.000 | 0.551 | 119.926 | 1399.987 | -3.753 | -1.012 | -3.753 | 3.887 | 195.086 | 0.227 |
| 1500.000 | 0.389 | 227.497 | 1499.985 | -4.222 | -0.845 | -4.222 | 4.306 | 191.323 | 0.764 |
| 1600.000 | 0.384 | 225.416 | 1599.982 | -4.686 | -1.334 | -4.686 | 4.872 | 195.889 | 0.015 |
| 1700.000 | 0.325 | 240.539 | 1699.981 | -5.061 | -1.819 | -5.061 | 5.378 | 199.773 | 0.110 |
| 1800.000 | 0.124 | 187.658 | 1799.980 | -5.308 | -2.081 | -5.308 | 5.701 | 201.406 | 0.269 |
| 1900.000 | 0.363 | 206.180 | 1899.979 | -5.699 | -2.235 | -5.699 | 6.122 | 201.412 | 0.248 |
| 2000.000 | 0.780 | 209.210 | 1999.974 | -6.577 | -2.707 | -6.577 | 7.112 | 202.368 | 0.418 |
| 2100.000 | 0.844 | 214.789 | 2099.964 | -7.776 | -3.459 | -7.776 | 8.511 | 203.981 | 0.102 |
| 2200.000 | 0.900 | 203.877 | 2199.952 | -9.099 | -4.197 | -9.099 | 10.021 | 204.763 | 0.175 |
| 2300.000 | 0.842 | 223.922 | 2299.941 | -10.347 | -5.025 | -10.347 | 11.502 | 205.903 | 0.309 |
| 2400.000 | 0.675 | 251.626 | 2399.932 | -11.062 | -6.094 | -11.062 | 12.629 | 208.849 | 0.398 |
| 2500.000 | 1.006 | 254.843 | 2499.921 | -11.477 | -7.500 | -11.477 | 13.711 | 213.166 | 0.334 |
| 2600.000 | 0.904 | 241.997 | 2599.908 | -12.077 | -9.045 | -12.077 | 15.088 | 216.830 | 0.237 |
| 2700.000 | 0.850 | 263.752 | 2699.896 | -12.528 | -10.478 | -12.528 | 16.332 | 219.908 | 0.335 |
| 2800.000 | 0.879 | 271.144 | 2799.885 | -12.593 | -11.983 | -12.593 | 17.383 | 223.576 | 0.115 |
| 2900.000 | 0.986 | 274.824 | 2899.872 | -12.506 | -13.607 | -12.506 | 18.481 | 227.415 | 0.122 |

| 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 |
|--|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 3000.000 | 0.825 | 268.535 | 2999.859 | -12.452 | -15.184 | -12.452 | 19.636 | 230.645 | 0.189 |
| 3100.000 | 0.987 | 255.868 | 3099.847 | -12.680 | -16.738 | -12.680 | 20.999 | 232.853 | 0.257 |
| 3200.000 | 0.858 | 258.178 | 3199.834 | -13.044 | -18.306 | -13.044 | 22.478 | 234.528 | 0.134 |
| 3300.000 | 0.812 | 256.795 | 3299.823 | -13.359 | -19.729 | -13.359 | 23.827 | 235.896 | 0.050 |
| 3400.000 | 0.758 | 272.556 | 3399.814 | -13.492 | -21.080 | -13.492 | 25.028 | 237.379 | 0.222 |
| 3500.000 | 0.596 | 314.542 | 3499.807 | -13.098 | -22.111 | -13.098 | 25.699 | 239.360 | 0.508 |
| 3600.000 | 1.347 | 328.169 | 3599.792 | -11.735 | -23.102 | -11.735 | 25.911 | 243.072 | 0.780 |
| 3700.000 | 1.429 | 329.460 | 3699.763 | -9.662 | -24.355 | -9.662 | 26.202 | 248.361 | 0.088 |
| 3800.000 | 1.406 | 289.654 | 3799.735 | -8.175 | -26.144 | -8.175 | 27.393 | 252.635 | 0.965 |
| 3900.000 | 1.108 | 300.903 | 3899.711 | -7.266 | -28.129 | -7.266 | 29.052 | 255.516 | 0.385 |
| 4000.000 | 1.107 | 332.133 | 3999.693 | -5.915 | -29.410 | -5.915 | 29.999 | 258.628 | 0.596 |
| 4100.000 | 0.959 | 311.499 | 4099.677 | -4.506 | -30.489 | -4.506 | 30.820 | 261.592 | 0.398 |
| 4200.000 | 0.688 | 292.376 | 4199.667 | -3.723 | -31.671 | -3.723 | 31.889 | 263.295 | 0.383 |
| 4300.000 | 0.298 | 352.604 | 4299.663 | -3.237 | -32.260 | -3.237 | 32.422 | 264.271 | 0.599 |
| 4400.000 | 0.408 | 50.290 | 4399.662 | -2.751 | -32.019 | -2.751 | 32.137 | 265.090 | 0.354 |
| 4500.000 | 0.456 | 38.436 | 4499.659 | -2.211 | -31.497 | -2.211 | 31.575 | 265.984 | 0.101 |
| 4600.000 | 0.646 | 109.702 | 4599.655 | -2.090 | -30.719 | -2.090 | 30.790 | 266.108 | 0.661 |
| 4700.000 | 0.857 | 131.015 | 4699.647 | -2.770 | -29.624 | -2.770 | 29.753 | 264.657 | 0.346 |
| 4800.000 | 0.704 | 96.956 | 4799.638 | -3.335 | -28.450 | -3.335 | 28.645 | 263.313 | 0.480 |
| 4900.000 | 0.497 | 38.452 | 4899.633 | -3.070 | -27.570 | -3.070 | 27.741 | 263.645 | 0.614 |
| 5000.000 | 0.585 | 1.204 | 4999.629 | -2.221 | -27.290 | -2.221 | 27.380 | 265.348 | 0.355 |
| 5100.000 | 0.681 | 346.487 | 5099.623 | -1.133 | -27.418 | -1.133 | 27.441 | 267.635 | 0.188 |
| 5200.000 | 1.068 | 27.740 | 5199.612 | 0.270 | -27.123 | 0.270 | 27.125 | 270.571 | 0.715 |
| 5300.000 | 0.372 | 11.177 | 5299.604 | 1.414 | -26.626 | 1.414 | 26.664 | 273.039 | 0.719 |
| 5400.000 | 0.965 | 19.589 | 5399.597 | 2.526 | -26.281 | 2.526 | 26.402 | 275.491 | 0.599 |
| 5500.000 | 0.864 | 32.794 | 5499.584 | 3.954 | -25.590 | 3.954 | 25.894 | 278.783 | 0.233 |
| 5600.000 | 0.874 | 89.329 | 5599.574 | 4.597 | -24.419 | 4.597 | 24.848 | 280.661 | 0.823 |
| 5700.000 | 1.484 | 118.540 | 5699.553 | 3.987 | -22.519 | 3.987 | 22.869 | 280.040 | 0.838 |
| 5800.000 | 0.587 | 137.443 | 5799.536 | 2.991 | -21.034 | 2.991 | 21.246 | 278.092 | 0.948 |
| 5900.000 | 0.990 | 200.385 | 5899.528 | 1.804 | -20.989 | 1.804 | 21.066 | 274.912 | 0.892 |
| 6000.000 | 0.524 | 248.599 | 5999.520 | 0.827 | -21.715 | 0.827 | 21.731 | 272.182 | 0.750 |
| 6100.000 | 0.169 | 238.670 | 6099.518 | 0.584 | -22.267 | 0.584 | 22.275 | 271.502 | 0.359 |
| 6200.000 | 0.415 | 9.955 | 6199.517 | 0.864 | -22.330 | 0.864 | 22.347 | 272.217 | 0.542 |
| 6300.000 | 0.567 | 344.572 | 6299.514 | 1.699 | -22.399 | 1.699 | 22.464 | 274.337 | 0.262 |
| 6400.000 | 0.572 | 106.261 | 6399.511 | 2.037 | -22.052 | 2.037 | 22.146 | 275.276 | 0.995 |
| 6500.000 | 0.370 | 247.367 | 6499.510 | 1.772 | -21.872 | 1.772 | 21.943 | 274.633 | 0.891 |
| 6600.000 | 0.331 | 261.048 | 6599.508 | 1.603 | -22.455 | 1.603 | 22.513 | 274.084 | 0.092 |
| 6700.000 | 0.537 | 64.201 | 6699.507 | 1.762 | -22.319 | 1.762 | 22.388 | 274.515 | 0.860 |
| 6800.000 | 0.419 | 21.907 | 6799.504 | 2.306 | -21.760 | 2.306 | 21.882 | 276.048 | 0.362 |
| 6900.000 | 0.643 | 294.071 | 6899.501 | 2.874 | -22.136 | 2.874 | 22.322 | 277.397 | 0.754 |
| 7000.000 | 0.547 | 13.114 | 6999.497 | 3.568 | -22.540 | 3.568 | 22.820 | 278.995 | 0.761 |
| 7100.000 | 0.152 | 114.312 | 7099.495 | 3.979 | -22.311 | 3.979 | 22.663 | 280.111 | 0.596 |
| 7180.000 | 0.245 | 88.174 | 7179.495 | 3.940 | -22.043 | 3.940 | 22.392 | 280.135 | 0.160 |
| HORIZONTAL DISPLACEMENT IS 22.392 FEET AT 280.135 DEGREES | | | | | | | | | |