



Company/Rig: Noble Energy/ CoreTech
WELL/API#: Jewell 1/05-123-11037
DECLINATION: 8.15 Degrees
TD AS DRILLED: 6908 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.35398, Longitude: -104.54755
Grid North = True North -0.62 degs (NAD 27)
Grid Correction Applied = -0.62 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4660 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 11/22/2016 / 09:23

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt / Jewell 1

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	0.251	318.695	100.000	0.165	-0.145	0.165	0.219	318.695	0.251
200.000	0.077	217.131	199.999	0.276	-0.330	0.276	0.430	309.892	0.277
300.000	0.237	257.124	299.999	0.176	-0.572	0.176	0.599	287.107	0.185
400.000	0.125	259.497	399.998	0.110	-0.881	0.110	0.888	277.126	0.113
500.000	0.106	96.815	499.998	0.079	-0.896	0.079	0.900	275.058	0.228
600.000	0.134	205.066	599.998	-0.038	-0.854	-0.038	0.855	267.463	0.195
700.000	0.144	32.722	699.998	-0.038	-0.836	-0.038	0.836	267.383	0.278
800.000	0.131	35.632	799.998	0.161	-0.701	0.161	0.719	282.921	0.015
900.000	0.166	206.875	899.998	0.125	-0.699	0.125	0.711	280.114	0.296
1000.000	0.241	307.305	999.997	0.123	-0.933	0.123	0.941	277.532	0.317
1100.000	0.276	329.247	1099.996	0.458	-1.223	0.458	1.306	290.515	0.104
1200.000	0.429	304.317	1199.994	0.875	-1.655	0.875	1.872	297.871	0.213
1300.000	0.508	335.409	1299.991	1.489	-2.148	1.489	2.614	304.725	0.262
1400.000	0.581	336.765	1399.987	2.358	-2.533	2.358	3.460	312.953	0.075
1500.000	0.674	343.691	1499.981	3.388	-2.898	3.388	4.459	319.460	0.119
1600.000	0.899	357.401	1599.971	4.737	-3.099	4.737	5.660	326.807	0.292

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
1700.000	1.014	2.193	1699.957	6.405	-3.100	6.405	7.116	334.169	0.140
1800.000	1.245	17.105	1799.938	8.327	-2.747	8.327	8.768	341.742	0.372
1900.000	1.315	33.920	1899.914	10.317	-1.787	10.317	10.471	350.171	0.381
2000.000	1.516	46.298	1999.883	12.183	-0.191	12.183	12.184	359.102	0.365
2100.000	1.825	73.443	2099.842	13.550	2.292	13.550	13.743	9.599	0.840
2200.000	1.739	87.537	2199.794	14.069	5.334	14.069	15.047	20.764	0.445
2300.000	1.720	110.906	2299.750	13.599	8.252	13.599	15.907	31.251	0.701
2400.000	1.484	108.075	2399.711	12.662	10.885	12.662	16.698	40.685	0.249
2500.000	1.249	126.137	2499.683	11.618	12.996	11.618	17.432	48.206	0.488
2600.000	0.941	123.365	2599.664	10.523	14.562	10.523	17.967	54.147	0.312
2700.000	1.033	126.487	2699.650	9.535	15.973	9.535	18.603	59.165	0.106
2800.000	0.418	123.830	2799.641	8.796	17.001	8.796	19.142	62.644	0.616
2900.000	0.475	145.516	2899.638	8.251	17.539	8.251	19.383	64.805	0.177
3000.000	0.187	116.236	2999.636	7.838	17.920	7.838	19.559	66.377	0.325
3100.000	0.240	166.077	3099.636	7.562	18.117	7.562	19.632	67.343	0.186
3200.000	0.252	145.288	3199.635	7.178	18.292	7.178	19.650	68.574	0.090
3300.000	0.275	153.610	3299.634	6.783	18.524	6.783	19.727	69.890	0.044
3400.000	0.094	156.472	3399.633	6.492	18.664	6.492	19.761	70.819	0.181
3500.000	0.155	217.752	3499.633	6.310	18.614	6.310	19.654	71.274	0.137
3600.000	0.347	227.689	3599.632	5.999	18.307	5.999	19.265	71.857	0.196
3700.000	0.344	217.405	3699.630	5.557	17.901	5.557	18.743	72.755	0.062
3800.000	0.502	236.361	3799.628	5.076	17.354	5.076	18.081	73.697	0.209
3900.000	0.729	242.833	3899.622	4.543	16.424	4.543	17.041	74.538	0.237
4000.000	1.045	247.063	3999.610	3.897	15.019	3.897	15.516	75.452	0.323
4100.000	1.131	258.328	4099.592	3.342	13.212	3.342	13.629	75.803	0.230
4200.000	1.590	255.188	4199.563	2.788	10.905	2.788	11.256	75.658	0.464
4300.000	2.394	262.105	4299.502	2.147	7.495	2.147	7.796	74.017	0.838
4400.000	3.300	254.471	4399.378	1.089	2.652	1.089	2.867	67.676	0.980
4500.000	2.843	261.197	4499.234	-0.061	-2.572	-0.061	2.573	268.638	0.582
4600.000	2.102	265.499	4599.141	-0.585	-6.851	-0.585	6.876	265.123	0.763
4700.000	1.945	268.738	4699.078	-0.766	-10.376	-0.766	10.405	265.779	0.194
4800.000	1.344	267.004	4799.037	-0.865	-13.245	-0.865	13.273	266.265	0.603
4900.000	1.115	281.180	4899.014	-0.737	-15.371	-0.737	15.388	267.254	0.379
5000.000	0.748	292.255	4999.001	-0.301	-16.929	-0.301	16.932	268.980	0.407
5100.000	0.485	308.108	5098.995	0.207	-17.865	0.207	17.867	270.662	0.311
5200.000	0.283	285.841	5198.992	0.535	-18.435	0.535	18.443	271.662	0.247
5300.000	0.328	152.400	5298.992	0.349	-18.540	0.349	18.543	271.078	0.561
5400.000	0.848	117.266	5398.986	-0.243	-17.750	-0.243	17.752	269.214	0.610
5500.000	0.710	142.453	5498.978	-1.074	-16.715	-1.074	16.749	266.325	0.365

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
5600.000	0.636	133.422	5598.971	-1.946	-15.934	-1.946	16.053	263.037	0.129
5700.000	0.865	166.069	5698.962	-3.060	-15.350	-3.060	15.652	258.727	0.476
5800.000	1.028	172.276	5798.949	-4.681	-15.048	-4.681	15.759	252.719	0.193
5900.000	0.722	149.841	5898.937	-6.116	-14.610	-6.116	15.839	247.286	0.454
6000.000	0.575	180.134	5998.931	-7.163	-14.295	-7.163	15.989	243.386	0.368
6100.000	0.296	164.621	6098.928	-7.913	-14.227	-7.913	16.280	240.917	0.300
6200.000	0.381	198.114	6198.927	-8.479	-14.262	-8.479	16.592	239.270	0.211
6300.000	0.440	191.844	6298.924	-9.170	-14.444	-9.170	17.109	237.590	0.074
6400.000	0.468	263.378	6398.922	-9.593	-14.929	-9.593	17.745	237.276	0.531
6500.000	0.292	220.281	6498.919	-9.834	-15.499	-9.834	18.356	237.604	0.324
6600.000	0.660	266.866	6598.916	-10.060	-16.239	-10.060	19.102	238.221	0.506
6700.000	0.387	195.803	6698.913	-10.417	-16.905	-10.417	19.857	238.359	0.648