



Company/Rig: Noble Energy Inc/Production
WELL/API#: Connell C 4-5/05-123-21715
DECLINATION: 8.2 Degrees
TD AS DRILLED: 7050'
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.34354, Longitude: -104.56297
Grid North = True North -0.61 degs (NAD 27)
Grid Correction Applied = -0.61 degs



DEPTH REFERENCE : RKB=GL/Elevation=4707'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 6/21/2016 / 08:18

Lat/Long Obtained By Handheld GPS at Wellhead

North Reference: Grid

Denver, Colorado

303-853-4976

Surveyor: Jason Kinchelov / Connell C 4-5

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	0.489	207.744	99.999	-0.378	-0.199	-0.378	0.427	207.744	0.489
200.000	0.500	223.693	199.995	-1.071	-0.699	-1.071	1.279	213.119	0.138
300.000	0.109	185.889	299.994	-1.481	-1.010	-1.481	1.792	214.287	0.419
400.000	0.068	179.704	399.993	-1.635	-1.019	-1.635	1.927	211.934	0.041
500.000	0.104	323.908	499.993	-1.621	-1.072	-1.621	1.944	213.483	0.165
600.000	0.219	260.208	599.993	-1.580	-1.315	-1.580	2.056	219.756	0.197
700.000	0.143	305.372	699.993	-1.541	-1.605	-1.541	2.225	226.168	0.156
800.000	0.130	249.367	799.992	-1.508	-1.812	-1.508	2.358	230.231	0.129
900.000	0.265	267.845	899.992	-1.557	-2.150	-1.557	2.654	234.084	0.148
1000.000	0.179	257.123	999.991	-1.600	-2.533	-1.600	2.996	237.715	0.095
1100.000	0.343	243.008	1099.990	-1.771	-2.952	-1.771	3.443	239.038	0.175
1200.000	0.313	232.485	1199.988	-2.073	-3.436	-2.073	4.013	238.890	0.067
1300.000	0.295	258.889	1299.987	-2.289	-3.905	-2.289	4.527	239.620	0.140
1400.000	0.438	239.129	1399.985	-2.535	-4.486	-2.535	5.153	240.529	0.188
1500.000	0.441	266.991	1499.982	-2.751	-5.198	-2.751	5.881	242.111	0.212
1600.000	0.133	259.175	1599.981	-2.793	-5.696	-2.793	6.344	243.881	0.311
1700.000	0.312	330.415	1699.980	-2.578	-5.945	-2.578	6.480	246.558	0.298
1800.000	0.601	16.057	1799.977	-1.837	-5.934	-1.837	6.212	252.804	0.443

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
1900.000	0.620	15.121	1899.971	-0.810	-5.648	-0.810	5.706	261.836	0.021
2000.000	0.856	16.791	1999.963	0.427	-5.291	0.427	5.308	274.610	0.237
2100.000	0.855	20.264	2099.952	1.841	-4.817	1.841	5.157	290.916	0.052
2200.000	0.966	16.751	2199.939	3.348	-4.316	3.348	5.462	307.804	0.125
2300.000	0.720	332.120	2299.929	4.711	-4.367	4.711	6.424	317.173	0.680
2400.000	0.906	301.964	2399.920	5.686	-5.332	5.686	7.795	316.840	0.460
2500.000	0.928	292.777	2499.907	6.418	-6.749	6.418	9.314	313.558	0.148
2600.000	0.847	287.930	2599.895	6.959	-8.199	6.959	10.754	310.321	0.110
2700.000	0.684	293.532	2699.886	7.425	-9.450	7.425	12.018	308.157	0.180
2800.000	0.424	293.324	2799.881	7.809	-10.336	7.809	12.954	307.072	0.260
2900.000	0.310	306.088	2899.879	8.115	-10.894	8.115	13.584	306.682	0.139
3000.000	0.454	302.213	2999.877	8.485	-11.447	8.485	14.249	306.547	0.146
3100.000	0.385	315.036	3099.874	8.934	-12.020	8.934	14.977	306.622	0.116
3200.000	0.764	338.096	3199.869	9.791	-12.507	9.791	15.883	308.056	0.436
3300.000	0.961	344.066	3299.858	11.216	-12.986	11.216	17.159	310.817	0.216
3400.000	1.250	3.060	3399.839	13.111	-13.158	13.111	18.575	314.898	0.463
3500.000	1.725	8.337	3499.806	15.689	-12.881	15.689	20.300	320.614	0.494
3600.000	1.721	6.906	3599.760	18.670	-12.482	18.670	22.458	326.234	0.043
3700.000	1.598	4.270	3699.718	21.551	-12.198	21.551	24.763	330.489	0.145
3800.000	1.654	4.154	3799.678	24.380	-11.990	24.380	27.168	333.813	0.056
3900.000	1.159	339.003	3899.649	26.763	-12.248	26.763	29.432	335.410	0.780
4000.000	0.741	288.449	3999.636	27.912	-13.224	27.912	30.886	334.650	0.895
4100.000	1.204	237.917	4099.623	27.559	-14.727	27.559	31.247	331.881	0.930
4200.000	1.820	226.625	4199.588	25.910	-16.771	25.910	30.865	327.086	0.682
4300.000	2.462	229.557	4299.518	23.426	-19.560	23.426	30.519	320.139	0.651
4400.000	2.855	237.758	4399.410	20.704	-23.302	20.704	31.171	311.622	0.546
4500.000	2.824	241.440	4499.288	18.198	-27.572	18.198	33.036	303.425	0.185
4600.000	2.964	244.748	4599.160	15.917	-32.074	15.917	35.807	296.393	0.217
4700.000	3.136	242.785	4699.018	13.563	-36.845	13.563	39.262	290.209	0.202
4800.000	2.919	235.590	4798.879	10.873	-41.378	10.873	42.783	284.723	0.437
4900.000	2.742	233.726	4898.757	8.019	-45.407	8.019	46.110	280.016	0.199
5000.000	2.534	229.972	4998.651	5.182	-49.028	5.182	49.301	276.034	0.270
5100.000	1.916	225.313	5098.575	2.585	-51.909	2.585	51.974	272.851	0.644
5200.000	1.535	219.141	5198.530	0.371	-53.943	0.371	53.944	270.394	0.423
5300.000	1.328	211.885	5298.499	-1.652	-55.401	-1.652	55.425	268.292	0.275
5400.000	1.803	213.846	5398.461	-3.943	-56.889	-3.943	57.026	266.035	0.478
5500.000	1.611	212.288	5498.417	-6.438	-58.517	-6.438	58.870	263.721	0.198
5600.000	1.222	210.315	5598.386	-8.547	-59.806	-8.547	60.414	261.867	0.392
5700.000	0.680	193.961	5698.372	-10.044	-60.487	-10.044	61.316	260.572	0.601
5800.000	0.506	163.391	5798.367	-11.043	-60.504	-11.043	61.504	259.656	0.355

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
5900.000	0.475	138.826	5898.363	-11.779	-60.105	-11.779	61.248	258.912	0.211
6000.000	0.879	128.206	5998.356	-12.565	-59.230	-12.565	60.548	258.023	0.421
6100.000	0.928	110.860	6098.344	-13.327	-57.871	-13.327	59.386	257.031	0.277
6200.000	1.025	109.758	6198.329	-13.918	-56.273	-13.918	57.969	256.108	0.099
6300.000	1.168	106.266	6298.311	-14.505	-54.453	-14.505	56.352	255.084	0.158
6400.000	0.881	108.841	6398.295	-15.039	-52.747	-15.039	54.849	254.086	0.291
6500.000	0.837	165.549	6498.285	-15.995	-51.837	-15.995	54.249	252.852	0.817
6600.000	0.502	201.676	6598.279	-17.110	-51.817	-17.110	54.568	251.727	0.523
6700.000	0.473	256.456	6698.276	-17.614	-52.380	-17.614	55.262	251.414	0.450
6800.000	0.696	279.385	6798.271	-17.611	-53.380	-17.611	56.211	251.741	0.319