



Company/Rig: Noble Energy Inc/Production
WELL/API#: Connell 14-4/05-123-11735
DECLINATION: 8.21 Degrees
TD AS DRILLED: 7036'
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.33583, Longitude: -104.56261
Grid North = True North -0.61 degs (NAD 27)
Grid Correction Applied = -0.61 degs



DEPTH REFERENCE : RKB=GL/Elevation=4755'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 6/21/2016 / 08:07

Lat/Long Obtained By Handheld GPS at Wellhead

North Reference: Grid

Denver, Colorado

303-853-4976

Surveyor: Jason Kinchelow / Connell 14-4

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	0.985	57.144	99.995	0.466	0.722	0.466	0.859	57.144	0.985
200.000	0.738	71.310	199.984	1.139	2.054	1.139	2.349	60.993	0.324
300.000	0.453	51.980	299.978	1.589	2.976	1.589	3.374	61.899	0.345
400.000	0.537	42.054	399.975	2.181	3.602	2.181	4.210	58.805	0.120
500.000	0.441	52.448	499.971	2.764	4.221	2.764	5.045	56.786	0.130
600.000	0.313	36.175	599.969	3.219	4.688	3.219	5.686	55.524	0.166
700.000	0.497	48.053	699.966	3.729	5.171	3.729	6.375	54.204	0.201
800.000	0.439	31.307	799.963	4.346	5.692	4.346	7.161	52.641	0.148
900.000	0.308	46.848	899.961	4.856	6.087	4.856	7.787	51.417	0.164
1000.000	0.459	25.458	999.959	5.401	6.455	5.401	8.417	50.078	0.206
1100.000	0.495	33.794	1099.955	6.122	6.867	6.122	9.200	48.284	0.078
1200.000	0.543	38.309	1199.951	6.853	7.402	6.853	10.087	47.203	0.063
1300.000	0.620	54.271	1299.946	7.542	8.135	7.542	11.093	47.168	0.178
1400.000	0.551	37.542	1399.941	8.239	8.867	8.239	12.104	47.104	0.184
1500.000	0.687	41.269	1499.935	9.070	9.555	9.070	13.175	46.492	0.141
1600.000	0.801	32.849	1599.927	10.108	10.330	10.108	14.452	45.622	0.158
1700.000	0.929	41.373	1699.915	11.303	11.245	11.303	15.944	44.851	0.181
1800.000	1.050	22.394	1799.901	12.759	12.129	12.759	17.604	43.552	0.347

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	1.189	5.283	1899.882	14.639	12.574	14.639	19.298	40.660	0.361
2000.000	1.307	353.286	1999.858	16.806	12.536	16.806	20.966	36.721	0.286
2100.000	1.678	346.269	2099.824	19.361	12.055	19.361	22.808	31.909	0.413
2200.000	2.251	337.822	2199.765	22.603	10.966	22.603	25.122	25.881	0.641
2300.000	2.741	330.762	2299.670	26.508	9.057	26.508	28.013	18.863	0.578
2400.000	3.205	327.447	2399.535	30.951	6.385	30.951	31.603	11.655	0.494
2500.000	3.994	324.152	2499.337	36.131	2.841	36.131	36.242	4.495	0.816
2600.000	4.465	318.591	2599.065	41.874	-1.774	41.874	41.911	357.574	0.624
2700.000	4.553	322.605	2698.756	47.946	-6.759	47.946	48.420	351.976	0.327
2800.000	4.512	318.934	2798.443	54.065	-11.754	54.065	55.328	347.735	0.293
2900.000	4.247	318.029	2898.151	59.784	-16.814	59.784	62.104	344.292	0.274
3000.000	3.790	318.530	2997.905	65.014	-21.479	65.014	68.470	341.717	0.458
3100.000	3.481	319.033	3097.704	69.783	-25.659	69.783	74.351	339.812	0.311
3200.000	3.210	326.760	3197.534	74.417	-29.184	74.417	79.935	338.587	0.525
3300.000	2.986	327.698	3297.388	78.961	-32.111	78.961	85.240	337.870	0.229
3400.000	2.891	336.766	3397.257	83.480	-34.498	83.480	90.327	337.548	0.474
3500.000	2.653	344.466	3497.140	88.028	-36.112	88.028	95.147	337.695	0.441
3600.000	2.806	349.111	3597.026	92.661	-37.194	92.661	99.847	338.129	0.268
3700.000	2.647	352.680	3696.913	97.354	-37.951	97.354	104.490	338.703	0.232
3800.000	2.523	352.843	3796.812	101.829	-38.519	101.829	108.871	339.280	0.124
3900.000	2.438	354.477	3896.718	106.130	-38.998	106.130	113.068	339.824	0.111
4000.000	2.304	355.320	3996.632	110.250	-39.367	110.250	117.067	340.350	0.139
4100.000	2.319	355.231	4096.551	114.269	-39.699	114.269	120.969	340.842	0.016
4200.000	2.525	2.291	4196.462	118.486	-39.779	118.486	124.986	341.442	0.362
4300.000	2.382	5.015	4296.370	122.757	-39.510	122.757	128.959	342.159	0.184
4400.000	2.175	3.323	4396.291	126.722	-39.218	126.722	132.652	342.804	0.218
4500.000	2.052	355.555	4496.223	130.402	-39.247	130.402	136.180	343.250	0.312
4600.000	1.852	351.921	4596.165	133.787	-39.612	133.787	139.528	343.507	0.235
4700.000	2.063	343.671	4696.107	137.114	-40.346	137.114	142.926	343.604	0.351
4800.000	2.391	344.591	4796.031	140.851	-41.406	140.851	146.811	343.618	0.330
4900.000	2.740	342.950	4895.931	145.147	-42.661	145.147	151.287	343.621	0.357
5000.000	2.767	345.591	4995.815	149.770	-43.962	149.770	156.089	343.641	0.130
5100.000	2.467	342.482	5095.711	154.161	-45.211	154.161	160.654	343.655	0.331
5200.000	2.137	351.609	5195.631	158.058	-46.131	158.058	164.652	343.730	0.492
5300.000	1.957	356.362	5295.567	161.606	-46.511	161.606	168.166	343.944	0.248
5400.000	1.398	1.409	5395.524	164.530	-46.589	164.530	170.999	344.190	0.577
5500.000	1.570	8.912	5495.490	167.103	-46.347	167.103	173.411	344.498	0.259
5600.000	1.402	9.800	5595.456	169.661	-45.927	169.661	175.768	344.853	0.169
5700.000	1.243	357.462	5695.430	171.951	-45.767	171.951	177.937	345.096	0.325
5800.000	1.230	357.466	5795.407	174.107	-45.862	174.107	180.046	345.243	0.013

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	1.170	356.512	5895.385	176.199	-45.972	176.199	182.097	345.377	0.063
6000.000	0.920	342.713	5995.368	177.985	-46.272	177.985	183.901	345.427	0.353
6100.000	0.889	4.345	6095.356	179.525	-46.452	179.525	185.437	345.493	0.341
6200.000	0.935	357.627	6195.343	181.114	-46.427	181.114	186.970	345.622	0.116
6300.000	1.000	5.134	6295.329	182.798	-46.383	182.798	188.590	345.762	0.142
6400.000	0.979	354.447	6395.314	184.517	-46.387	184.517	190.259	345.888	0.185
6500.000	0.748	21.514	6495.303	185.975	-46.231	185.975	191.635	346.040	0.463
6600.000	0.743	3.525	6595.295	187.229	-45.951	187.229	192.786	346.211	0.233
6700.000	0.853	348.371	6695.285	188.606	-46.062	188.606	194.149	346.276	0.237
6800.000	0.743	322.335	6795.276	189.848	-46.608	189.848	195.486	346.207	0.375