



Company/Rig: Noble Energy Inc/Production  
WELL/API#: Uhrich 11-17/05-123-23041  
DECLINATION: 8.19 Degrees  
TD AS DRILLED: 7191 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.49146, Longitude: -104.58197  
Grid North = True North -0.59 degs (NAD 27)  
Grid Correction Applied = -0.59 degs



DEPTH REFERENCE : RKB=GL/Elevation=4721'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro\_run02-01-de\_01.ut

Minimum Curvature Method

Report Date/Time: 10/31/2016 / 08:43

Lat/Long Obtained By Handheld GPS at Wellhead

North Reference: Grid

Denver, Colorado

303-853-4976

Surveyor: Jason Kinchelow / Uhrich 11-17

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	0.495	106.458	99.999	-0.122	0.414	-0.122	0.432	106.458	0.495
200.000	0.252	96.112	199.997	-0.268	1.046	-0.268	1.080	104.363	0.251
300.000	0.358	109.375	299.995	-0.395	1.560	-0.395	1.609	104.211	0.127
400.000	0.212	112.122	399.994	-0.568	2.026	-0.568	2.104	105.671	0.146
500.000	0.394	106.683	499.992	-0.737	2.527	-0.737	2.632	106.256	0.184
600.000	0.206	99.371	599.991	-0.865	3.034	-0.865	3.154	105.911	0.191
700.000	0.355	65.042	699.990	-0.763	3.492	-0.763	3.574	102.331	0.218
800.000	0.441	62.212	799.987	-0.453	4.113	-0.453	4.138	96.290	0.088
900.000	0.560	60.499	899.984	-0.033	4.879	-0.033	4.879	90.390	0.120
1000.000	0.620	60.872	999.978	0.471	5.777	0.471	5.796	85.341	0.059
1100.000	0.665	67.170	1099.972	0.959	6.784	0.959	6.851	81.953	0.084
1200.000	0.658	72.106	1199.965	1.361	7.865	1.361	7.982	80.185	0.057
1300.000	0.720	63.082	1299.958	1.822	8.972	1.822	9.155	78.523	0.125
1400.000	0.739	64.488	1399.950	2.384	10.114	2.384	10.391	76.738	0.026
1500.000	0.782	62.583	1499.941	2.976	11.302	2.976	11.687	75.249	0.050
1600.000	0.625	58.811	1599.934	3.572	12.374	3.572	12.880	73.896	0.163

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	0.520	69.396	1699.929	4.015	13.266	4.015	13.860	73.162	0.149
1800.000	0.129	118.837	1799.927	4.120	13.789	4.120	14.391	73.364	0.447
1900.000	0.639	124.580	1899.924	3.750	14.346	3.750	14.828	75.352	0.511
2000.000	0.664	127.011	1999.918	3.085	15.268	3.085	15.576	78.578	0.038
2100.000	0.625	117.812	2099.912	2.481	16.213	2.481	16.402	81.299	0.110
2200.000	0.463	118.242	2199.907	2.035	17.052	2.035	17.173	83.193	0.162
2300.000	0.449	61.445	2299.904	2.031	17.752	2.031	17.868	83.473	0.434
2400.000	0.795	15.492	2399.899	2.887	18.281	2.887	18.507	81.026	0.581
2500.000	0.764	15.470	2499.890	4.198	18.644	4.198	19.111	77.310	0.031
2600.000	0.885	0.717	2599.879	5.613	18.832	5.613	19.650	73.402	0.244
2700.000	0.748	349.739	2699.869	7.028	18.725	7.028	20.000	69.428	0.208
2800.000	0.701	352.871	2799.861	8.277	18.533	8.277	20.297	65.935	0.061
2900.000	0.614	341.394	2899.855	9.391	18.286	9.391	20.557	62.816	0.158
3000.000	0.677	329.770	2999.849	10.410	17.818	10.410	20.636	59.705	0.145
3100.000	0.663	315.494	3099.842	11.333	17.114	11.333	20.527	56.488	0.167
3200.000	0.747	281.434	3199.835	11.875	16.070	11.875	19.981	53.537	0.421
3300.000	0.988	267.940	3299.823	11.973	14.569	11.973	18.858	50.586	0.314
3400.000	0.953	283.402	3399.809	12.135	12.899	12.135	17.710	46.748	0.263
3500.000	0.897	292.186	3499.796	12.623	11.365	12.623	16.986	41.997	0.152
3600.000	0.376	315.029	3599.790	13.151	10.408	13.151	16.771	38.360	0.570
3700.000	0.387	315.951	3699.787	13.626	9.942	13.626	16.867	36.115	0.013
3800.000	0.290	322.096	3799.786	14.068	9.551	14.068	17.004	34.173	0.103
3900.000	0.255	318.323	3899.785	14.434	9.248	14.434	17.143	32.646	0.040
4000.000	0.336	351.229	3999.783	14.890	9.055	14.890	17.427	31.305	0.184
4100.000	0.199	6.050	4099.782	15.353	9.029	15.353	17.811	30.459	0.152
4200.000	0.180	107.946	4199.782	15.478	9.197	15.478	18.004	30.719	0.295
4300.000	0.385	132.229	4299.781	15.203	9.595	15.203	17.978	32.257	0.232
4400.000	0.675	139.714	4399.776	14.529	10.225	14.529	17.766	35.136	0.298
4500.000	0.627	150.349	4499.770	13.604	10.876	13.604	17.417	38.642	0.130
4600.000	0.659	143.886	4599.763	12.664	11.486	12.664	17.097	42.207	0.079
4700.000	0.617	172.773	4699.758	11.665	11.892	11.665	16.658	45.553	0.321
4800.000	0.927	157.521	4799.748	10.384	12.269	10.384	16.073	49.758	0.369
4900.000	1.773	142.589	4899.720	8.408	13.518	8.408	15.920	58.121	0.909
5000.000	2.367	125.093	4999.655	5.992	16.148	5.992	17.224	69.643	0.861
5100.000	2.049	124.606	5099.581	3.789	19.309	3.789	19.677	78.898	0.319
5200.000	1.275	138.216	5199.539	1.944	21.522	1.944	21.609	84.839	0.864
5300.000	0.639	152.976	5299.524	0.618	22.516	0.618	22.525	88.428	0.677
5400.000	0.469	190.133	5399.520	-0.281	22.698	-0.281	22.699	90.710	0.388
5500.000	0.554	239.987	5499.516	-0.925	22.207	-0.925	22.227	92.386	0.438

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	0.807	230.966	5599.509	-1.611	21.242	-1.611	21.303	94.337	0.275
5700.000	1.334	218.074	5699.491	-2.971	19.976	-2.971	20.196	98.460	0.576
5800.000	1.548	208.954	5799.460	-5.070	18.604	-5.070	19.283	105.243	0.313
5900.000	2.059	211.427	5899.410	-7.785	17.014	-7.785	18.710	114.586	0.516
6000.000	2.050	206.391	5999.346	-10.919	15.282	-10.919	18.782	125.546	0.181
6100.000	2.295	198.544	6099.274	-14.420	13.850	-14.420	19.994	136.154	0.385
6200.000	2.315	201.099	6199.193	-18.203	12.486	-18.203	22.074	145.552	0.105
6300.000	1.812	200.614	6299.128	-21.567	11.203	-21.567	24.303	152.551	0.503
6400.000	1.549	214.626	6399.085	-24.159	9.878	-24.159	26.101	157.762	0.486
6500.000	1.182	207.907	6499.057	-26.183	8.628	-26.183	27.568	161.762	0.400
6600.000	0.779	212.647	6599.042	-27.666	7.778	-27.666	28.739	164.296	0.411
6700.000	0.812	228.606	6699.033	-28.707	6.880	-28.707	29.520	166.522	0.223
6800.000	0.538	215.041	6799.026	-29.559	6.079	-29.559	30.178	168.378	0.315
6900.000	0.552	179.680	6899.021	-30.425	5.813	-30.425	30.976	169.184	0.331