



Company/Rig: Noble Energy Inc/Production  
 WELL/API#: Annie B 03-23/05-123-32630  
 DECLINATION: 8.2 Degrees  
 TD AS DRILLED: 7000 Feet  
 COUNTY/STATE: Weld/Colorado  
 VS-Azi: 0.000 Degrees  
 Latitude: 40.42508, Longitude: -104.53195  
 Grid North = True North -0.63 degs (NAD 27)  
 Grid Correction Applied = -0.63 degs



DEPTH REFERENCE : RKB=GL/Elevation=4613'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro\_run01-01-de\_01.ut  
 Minimum Curvature Method  
 Report Date/Time: 5/25/2016 / 14:31

Lat/Long Obtained By Handheld GPS at Wellhead  
 North Reference: Grid  
 Denver, Colorado  
 303-853-4976

Surveyor: Jason Kinchelov / Annie B03-23

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	0.118	187.940	100.000	-0.102	-0.014	-0.102	0.103	187.940	0.118
200.000	0.301	173.684	199.999	-0.464	0.000	-0.464	0.464	179.939	0.189
300.000	0.306	159.366	299.998	-0.975	0.124	-0.975	0.983	172.781	0.076
400.000	0.309	169.472	399.996	-1.491	0.267	-1.491	1.515	169.845	0.054
500.000	0.307	166.705	499.995	-2.018	0.378	-2.018	2.053	169.386	0.015
600.000	0.220	162.985	599.994	-2.462	0.496	-2.462	2.512	168.611	0.089
700.000	0.522	109.226	699.992	-2.796	0.982	-2.796	2.963	160.642	0.430
800.000	0.610	113.425	799.987	-3.157	1.901	-3.157	3.685	148.955	0.097
900.000	0.592	112.553	899.982	-3.567	2.866	-3.567	4.576	141.219	0.020
1000.000	0.393	111.669	999.978	-3.892	3.662	-3.892	5.344	136.743	0.199
1100.000	0.111	139.104	1099.977	-4.092	4.045	-4.092	5.754	135.335	0.299
1200.000	0.186	275.637	1199.977	-4.150	3.947	-4.150	5.727	136.435	0.277
1300.000	0.293	274.773	1299.976	-4.113	3.530	-4.113	5.420	139.355	0.107
1400.000	0.589	278.094	1399.973	-4.019	2.767	-4.019	4.879	145.456	0.297
1500.000	0.617	283.422	1499.967	-3.822	1.734	-3.822	4.196	155.594	0.063
1600.000	0.584	296.193	1599.962	-3.471	0.753	-3.471	3.552	167.767	0.138
1700.000	0.657	324.484	1699.956	-2.780	-0.038	-2.780	2.780	180.782	0.311
1800.000	0.152	63.161	1799.954	-2.253	-0.252	-2.253	2.267	186.392	0.696

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	0.797	155.351	1899.950	-2.825	0.156	-2.825	2.829	176.836	0.817
2000.000	0.828	149.562	1999.940	-4.080	0.812	-4.080	4.160	168.741	0.088
2100.000	0.536	194.381	2099.934	-5.156	1.062	-5.156	5.264	168.360	0.586
2200.000	0.481	181.925	2199.930	-6.028	0.932	-6.028	6.100	171.213	0.123
2300.000	0.862	107.781	2299.924	-6.677	1.634	-6.677	6.874	166.246	0.865
2400.000	1.258	112.187	2399.907	-7.322	3.368	-7.322	8.059	155.298	0.404
2500.000	1.346	125.231	2499.882	-8.414	5.344	-8.414	9.968	147.578	0.308
2600.000	1.246	138.580	2599.856	-9.907	7.023	-9.907	12.144	144.667	0.317
2700.000	1.231	145.987	2699.833	-11.613	8.344	-11.613	14.300	144.305	0.161
2800.000	1.486	150.481	2799.805	-13.632	9.584	-13.632	16.664	144.893	0.276
2900.000	1.560	173.214	2899.770	-16.112	10.383	-16.112	19.168	147.201	0.605
3000.000	1.336	200.313	2999.739	-18.557	10.140	-18.557	21.146	151.348	0.712
3100.000	1.503	205.761	3099.709	-20.831	9.165	-20.831	22.758	156.252	0.215
3200.000	2.200	197.793	3199.656	-23.840	8.008	-23.840	25.149	161.432	0.742
3300.000	2.015	178.035	3299.590	-27.424	7.482	-27.424	28.426	164.739	0.746
3400.000	1.868	149.800	3399.535	-30.589	8.362	-30.589	31.712	164.711	0.957
3500.000	2.063	142.828	3499.476	-33.432	10.269	-33.432	34.974	162.924	0.308
3600.000	2.360	150.775	3599.402	-36.663	12.362	-36.663	38.691	161.367	0.426
3700.000	2.289	145.388	3699.319	-40.103	14.502	-40.103	42.645	160.120	0.230
3800.000	1.999	150.279	3799.249	-43.261	16.501	-43.261	46.301	159.122	0.343
3900.000	1.672	162.490	3899.198	-46.167	17.804	-46.167	49.481	158.911	0.508
4000.000	1.332	158.382	3999.164	-48.639	18.671	-48.639	52.099	158.999	0.356
4100.000	0.683	201.544	4099.149	-50.274	18.881	-50.274	53.703	159.416	0.956
4200.000	0.691	254.550	4199.143	-50.990	18.080	-50.990	54.100	160.476	0.613
4300.000	0.891	267.128	4299.133	-51.189	16.722	-51.189	53.852	161.909	0.264
4400.000	1.095	290.815	4399.119	-50.889	15.052	-50.889	53.068	163.523	0.454
4500.000	1.271	288.842	4499.097	-50.191	13.110	-50.191	51.875	165.362	0.181
4600.000	1.002	243.402	4599.079	-50.225	11.278	-50.225	51.475	167.344	0.912
4700.000	1.504	211.243	4699.056	-51.738	9.815	-51.738	52.661	169.258	0.845
4800.000	1.261	200.163	4799.027	-53.893	8.755	-53.893	54.600	170.772	0.360
4900.000	1.187	205.299	4899.005	-55.863	7.933	-55.863	56.423	171.917	0.132
5000.000	1.071	187.844	4998.985	-57.724	7.363	-57.724	58.192	172.731	0.361
5100.000	0.783	188.274	5098.972	-59.326	7.137	-59.326	59.754	173.140	0.288
5200.000	0.739	198.787	5198.963	-60.613	6.831	-60.613	60.997	173.570	0.146
5300.000	0.624	113.299	5298.959	-61.438	7.124	-61.438	61.850	173.386	0.929
5400.000	0.754	62.992	5398.952	-61.355	8.210	-61.355	61.902	172.378	0.597
5500.000	0.239	333.430	5498.949	-60.870	8.703	-60.870	61.489	171.863	0.789
5600.000	0.347	272.216	5598.948	-60.672	8.308	-60.672	61.238	172.203	0.312
5700.000	0.458	260.864	5698.945	-60.724	7.611	-60.724	61.199	172.856	0.137
5800.000	0.993	286.657	5798.937	-60.539	6.385	-60.539	60.875	173.979	0.613

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	1.438	294.454	5898.915	-59.771	4.413	-59.771	59.934	175.777	0.474
6000.000	2.369	304.654	5998.859	-58.076	1.571	-58.076	58.098	178.451	0.987
6100.000	2.610	314.838	6098.765	-55.296	-1.744	-55.296	55.323	181.806	0.503
6200.000	2.406	317.214	6198.669	-52.150	-4.784	-52.150	52.369	185.241	0.229
6300.000	2.402	313.398	6298.581	-49.170	-7.732	-49.170	49.774	188.937	0.160
6400.000	3.355	311.595	6398.454	-45.788	-11.443	-45.788	47.196	194.032	0.957
6500.000	4.106	308.115	6498.241	-41.636	-16.448	-41.636	44.767	201.556	0.784
6650.000	1.745	295.012	6648.037	-37.355	-22.743	-37.355	43.734	211.335	1.626