



Company: Noble Energy
Well: Napoleon J7-6
API #: 05-123-22819
Rig Name: Production/Lightning
State/County: Colorado/Weld
Latitude: 40.420, Longitude: -104.826
GRID North is 0.440 Degrees East of True North
VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01_ed.ut

Minimum Curvature Method

Report Date/Time: 8/22/2012 / 12:07

Vaughn Energy Services

Henderson, Colorado

866-835-8333

Randy Holcomb

RKB=Ground Level

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	0.243	188.459	100.000	-0.210	-0.031	-0.210	0.212	188.459	0.243
200.000	0.225	307.355	199.999	-0.300	-0.219	-0.300	0.371	216.083	0.403
300.000	0.298	253.544	299.998	-0.255	-0.625	-0.255	0.675	247.833	0.246
400.000	0.253	249.841	399.997	-0.405	-1.082	-0.405	1.155	249.502	0.049
500.000	0.304	177.592	499.996	-0.745	-1.278	-0.745	1.480	239.752	0.331
600.000	0.296	47.973	599.996	-0.838	-1.076	-0.838	1.363	232.093	0.542
700.000	0.289	122.513	699.995	-0.800	-0.671	-0.800	1.044	219.981	0.354
800.000	0.235	124.081	799.994	-1.051	-0.289	-1.051	1.090	195.357	0.055
900.000	0.191	106.296	899.993	-1.212	0.041	-1.212	1.213	178.067	0.079
1000.000	0.240	354.051	999.993	-1.051	0.179	-1.051	1.066	170.338	0.358
1100.000	0.282	343.205	1099.992	-0.608	0.086	-0.608	0.614	171.926	0.065
1200.000	0.946	183.276	1199.988	-1.196	-0.032	-1.196	1.196	181.537	1.215
1300.000	2.171	171.964	1299.949	-3.896	0.186	-3.896	3.900	177.273	1.257
1400.000	4.096	169.761	1399.795	-9.286	1.085	-9.286	9.349	173.334	1.929
1500.000	5.743	171.987	1499.423	-17.756	2.418	-17.756	17.920	172.246	1.657
1600.000	8.124	166.714	1598.686	-29.589	4.739	-29.589	29.966	170.900	2.463
1700.000	9.644	168.549	1697.483	-44.677	8.026	-44.677	45.392	169.815	1.546
1800.000	11.046	171.201	1795.856	-62.355	11.155	-62.355	63.345	169.857	1.480
1900.000	13.412	174.450	1893.581	-83.369	13.743	-83.369	84.494	170.640	2.463
2000.000	14.533	173.399	1990.620	-107.377	16.307	-107.377	108.608	171.365	1.149
2100.000	16.051	172.889	2087.077	-133.561	19.460	-133.561	134.971	171.710	1.524
2200.000	17.147	173.129	2182.908	-161.916	22.935	-161.916	163.532	171.938	1.098
2300.000	17.841	174.262	2278.283	-191.794	26.230	-191.794	193.579	172.212	0.773
2400.000	19.904	175.298	2372.902	-224.004	29.158	-224.004	225.894	172.584	2.090
2500.000	21.046	176.310	2466.583	-258.889	31.709	-258.889	260.824	173.017	1.196
2600.000	22.174	172.804	2559.557	-295.533	35.228	-295.533	297.625	173.202	1.714
2700.000	24.243	170.833	2651.461	-334.528	40.864	-334.528	337.015	173.036	2.210
2800.000	25.522	169.438	2742.177	-375.976	48.083	-375.976	379.038	172.712	1.407
2900.000	22.173	174.044	2833.635	-415.937	53.992	-415.937	419.427	172.604	3.830
3000.000	21.894	171.874	2926.333	-453.164	58.586	-453.164	456.935	172.634	0.861
3100.000	22.607	168.618	3018.889	-490.465	65.015	-490.465	494.756	172.449	1.424
3200.000	20.418	166.756	3111.919	-526.292	72.805	-526.292	531.304	172.124	2.293
3300.000	20.822	171.176	3205.518	-560.836	79.528	-560.836	566.447	171.929	1.607
3400.000	20.948	171.886	3298.948	-596.096	84.778	-596.096	602.094	171.906	0.283

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
3500.000	20.932	175.079	3392.347	-631.591	88.833	-631.591	637.808	171.994	1.141
3600.000	20.801	174.072	3485.788	-667.050	92.199	-667.050	673.392	172.130	0.382
3700.000	21.362	173.025	3579.095	-702.790	96.245	-702.790	709.350	172.202	0.676
3800.000	23.689	171.458	3671.460	-740.740	101.441	-740.740	747.654	172.202	2.403
3900.000	26.235	169.733	3762.113	-782.362	108.366	-782.362	789.831	172.114	2.648
4000.000	27.098	171.499	3851.477	-826.637	115.672	-826.637	834.691	172.034	1.171
4100.000	27.279	173.759	3940.431	-871.943	121.530	-871.943	880.372	172.065	1.048
4200.000	26.205	174.031	4029.734	-916.684	126.318	-916.684	925.346	172.154	1.080
4300.000	24.288	173.020	4120.178	-959.062	131.113	-959.062	967.982	172.215	1.965
4400.000	22.667	172.529	4211.897	-998.583	136.118	-998.583	1007.817	172.238	1.633
4500.000	22.372	175.244	4304.275	-1036.65	140.202	-1036.65	1046.092	172.298	1.081
4600.000	21.659	177.256	4396.984	-1074.05	142.663	-1074.05	1083.486	172.434	1.038
4700.000	21.009	174.952	4490.132	-1110.34	145.124	-1110.34	1119.787	172.554	1.060
4800.000	20.901	174.259	4583.519	-1145.95	148.486	-1145.95	1155.528	172.617	0.271
4900.000	20.742	173.927	4676.988	-1181.30	152.143	-1181.30	1191.061	172.661	0.198
5000.000	18.996	175.343	4771.032	-1215.14	155.339	-1215.14	1225.026	172.715	1.811
5100.000	17.920	176.228	4865.886	-1246.71	157.672	-1246.71	1256.642	172.792	1.113
5200.000	16.402	178.542	4961.433	-1276.18	159.043	-1276.18	1286.050	172.896	1.664
5300.000	12.905	181.253	5058.166	-1301.46	159.158	-1301.46	1311.161	173.028	3.562
5400.000	10.022	183.737	5156.161	-1321.32	158.347	-1321.32	1330.771	173.166	2.924
5500.000	7.367	191.620	5255.007	-1336.28	156.488	-1336.28	1345.414	173.321	2.904
5600.000	5.629	206.193	5354.367	-1346.97	153.031	-1346.97	1355.630	173.518	2.383
5700.000	3.489	231.037	5454.054	-1353.28	148.499	-1353.28	1361.404	173.738	2.865
5800.000	3.303	262.895	5553.887	-1355.55	143.275	-1355.55	1363.101	173.967	1.872
5900.000	2.402	286.507	5653.766	-1355.31	138.406	-1355.31	1362.360	174.169	1.462
6000.000	2.073	300.485	5753.690	-1353.80	134.838	-1353.80	1360.497	174.312	0.635
6100.000	2.046	310.130	5853.626	-1351.73	131.915	-1351.73	1358.152	174.426	0.347
6200.000	2.117	301.886	5953.560	-1349.60	128.982	-1349.60	1355.754	174.541	0.307
6300.000	1.968	319.001	6053.497	-1347.33	126.287	-1347.33	1353.239	174.645	0.625
6400.000	0.834	67.317	6153.477	-1345.76	125.832	-1345.76	1351.627	174.658	2.366
6500.000	0.964	120.556	6253.466	-1345.90	127.228	-1345.90	1351.904	174.600	0.814
6600.000	1.044	326.118	6353.461	-1345.58	127.445	-1345.58	1351.598	174.589	1.958
6700.000	2.258	315.270	6453.417	-1343.42	125.551	-1343.42	1349.274	174.661	1.248
6800.000	2.910	313.633	6553.315	-1340.27	122.328	-1340.27	1345.840	174.785	0.657
6900.000	3.471	312.118	6653.160	-1336.49	118.245	-1336.49	1341.708	174.944	0.567
7000.000	3.793	312.770	6752.959	-1332.21	113.571	-1332.21	1337.043	175.127	0.324
7100.000	4.212	310.056	6852.715	-1327.60	108.332	-1327.60	1332.014	175.335	0.460
7200.000	4.605	310.783	6952.419	-1322.62	102.481	-1322.62	1326.580	175.569	0.396
7300.000	4.919	309.697	7052.073	-1317.25	96.142	-1317.25	1320.759	175.826	0.327
7400.000	5.123	312.644	7151.690	-1311.49	89.559	-1311.49	1314.546	176.093	0.329
HORIZONTAL DISPLACEMENT IS 1314.546 FEET AT 176.093 DEGREES									