



Company: Noble Energy
 Well: Drake 8-13 H 6
 API: 05-123-18154
 Rig Name: Production/Lightning Wireline
 State/County: Colorado/ Weld
 Latitude: 40.409, Longitude: -104.810
 GRID North is 0.450 Degrees East of True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01_ed.ut

Minimum Curvature Method

Report Date/Time: 9/18/2012 / 17:06

Vaughn Energy Services
 Henderson, Colorado
 866-835-8333
 Jason Kinchelow

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	0.421	80.480	99.999	0.061	0.363	0.061	0.368	80.480	0.421
200.000	0.239	51.729	199.997	0.251	0.889	0.251	0.924	74.239	0.241
300.000	0.577	18.376	299.995	0.858	1.212	0.858	1.485	54.703	0.399
400.000	0.643	4.116	399.989	1.895	1.411	1.895	2.362	36.665	0.165
500.000	0.762	3.867	499.982	3.118	1.496	3.118	3.458	25.629	0.119
600.000	0.664	14.753	599.974	4.342	1.688	4.342	4.659	21.248	0.166
700.000	0.488	11.039	699.969	5.321	1.918	5.321	5.656	19.818	0.180
800.000	0.657	337.243	799.964	6.268	1.777	6.268	6.515	15.832	0.370
900.000	0.609	322.108	899.958	7.216	1.229	7.216	7.320	9.666	0.173
1000.000	0.724	299.685	999.952	7.949	0.354	7.949	7.957	2.547	0.283
1100.000	1.124	314.712	1099.938	8.952	-0.892	8.952	8.996	354.308	0.464
1200.000	0.927	325.870	1199.923	10.311	-2.043	10.311	10.512	348.793	0.280
1300.000	1.260	320.193	1299.904	11.825	-3.201	11.825	12.251	344.855	0.350
1400.000	1.295	350.906	1399.881	13.785	-4.083	13.785	14.377	343.502	0.677
1500.000	1.240	332.730	1499.856	15.862	-4.757	15.862	16.560	343.306	0.404
1600.000	0.962	296.928	1599.839	17.204	-6.001	17.204	18.220	340.771	0.726
1700.000	1.027	291.533	1699.824	17.913	-7.583	17.913	19.451	337.056	0.114
1800.000	1.024	265.060	1799.809	18.165	-9.307	18.165	20.410	332.872	0.470
1900.000	0.732	226.121	1899.798	17.645	-10.657	17.645	20.614	328.869	0.647
2000.000	0.713	311.516	1999.792	17.615	-11.584	17.615	21.083	326.671	0.980
2100.000	0.670	327.894	2099.785	18.523	-12.361	18.523	22.269	326.285	0.202
2200.000	0.417	344.183	2199.780	19.369	-12.771	19.369	23.200	326.602	0.294
2300.000	0.387	269.984	2299.778	19.720	-13.208	19.720	23.734	326.187	0.486
2400.000	0.479	250.268	2399.776	19.578	-13.938	19.578	24.033	324.552	0.174
2500.000	0.902	251.406	2499.768	19.186	-15.078	19.186	24.402	321.838	0.424
2600.000	0.809	253.201	2599.757	18.731	-16.500	18.731	24.962	318.625	0.097
2700.000	0.720	249.510	2699.748	18.308	-17.764	18.308	25.509	315.864	0.102
2800.000	0.812	298.612	2799.740	18.427	-18.974	18.427	26.450	314.162	0.642
2900.000	0.479	281.211	2899.734	18.848	-20.006	18.848	27.486	313.292	0.383
3000.000	0.412	282.825	2999.731	19.009	-20.766	19.009	28.153	312.470	0.068
3100.000	0.382	197.337	3099.729	18.771	-21.216	18.771	28.328	311.500	0.539
3200.000	0.226	221.490	3199.728	18.305	-21.446	18.305	28.196	310.482	0.199
3300.000	0.106	256.998	3299.727	18.136	-21.667	18.136	28.256	309.931	0.153
3400.000	0.584	126.549	3399.726	17.812	-21.347	17.812	27.803	309.841	0.657

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	1.188	171.662	3499.714	16.483	-20.788	16.483	26.529	308.411	0.880
3600.000	1.292	170.636	3599.691	14.344	-20.454	14.344	24.982	305.041	0.106
3700.000	1.329	164.003	3699.665	12.117	-19.951	12.117	23.342	301.271	0.156
3800.000	1.116	201.321	3799.643	10.095	-19.985	10.095	22.390	296.798	0.808
3900.000	1.127	192.786	3899.624	8.229	-20.557	8.229	22.143	291.816	0.167
4000.000	1.202	204.897	3999.604	6.319	-21.216	6.319	22.137	286.585	0.257
4100.000	0.955	235.535	4099.587	4.896	-22.345	4.896	22.875	282.358	0.618
4200.000	0.773	205.254	4199.576	3.814	-23.320	3.814	23.629	279.289	0.484
4300.000	3.077	136.942	4299.520	1.243	-21.775	1.243	21.810	273.267	2.882
4400.000	2.719	125.192	4399.393	-2.085	-18.004	-2.085	18.124	263.394	0.691
4500.000	1.792	126.849	4499.315	-4.390	-14.814	-4.390	15.451	253.494	0.930
4600.000	1.067	155.110	4599.284	-6.172	-13.171	-6.172	14.546	244.891	0.990
4700.000	0.892	173.209	4699.270	-7.791	-12.687	-7.791	14.888	238.447	0.353
4800.000	0.432	257.828	4799.264	-8.644	-12.963	-8.644	15.581	236.306	0.954
4900.000	0.648	220.353	4899.260	-9.154	-13.698	-9.154	16.475	236.247	0.402
5000.000	0.781	307.685	4999.255	-9.168	-14.603	-9.168	17.242	237.879	0.991
5100.000	0.381	275.747	5099.250	-8.718	-15.473	-8.718	17.760	240.601	0.500
5200.000	0.418	311.756	5199.248	-8.442	-16.075	-8.442	18.157	242.294	0.249
5300.000	0.054	309.824	5299.247	-8.169	-16.384	-8.169	18.307	243.500	0.364
5400.000	0.081	154.411	5399.247	-8.202	-16.390	-8.202	18.327	243.416	0.132
5500.000	0.136	147.572	5499.246	-8.365	-16.296	-8.365	18.318	242.828	0.056
5600.000	0.571	112.919	5599.244	-8.659	-15.774	-8.659	17.994	241.236	0.466
5700.000	0.293	54.844	5699.242	-8.706	-15.106	-8.706	17.435	240.045	0.485
5800.000	0.360	43.143	5799.240	-8.329	-14.682	-8.329	16.880	240.433	0.094
5900.000	0.085	2.159	5899.239	-8.026	-14.465	-8.026	16.542	240.975	0.301
6000.000	0.183	24.823	5999.239	-7.807	-14.395	-7.807	16.375	241.528	0.110
6100.000	0.440	6.565	6099.237	-7.280	-14.284	-7.280	16.032	242.994	0.272
6200.000	0.260	188.317	6199.237	-7.122	-14.272	-7.122	15.951	243.479	0.700
6300.000	0.483	318.414	6299.236	-7.032	-14.585	-7.032	16.191	244.260	0.680
6400.000	0.296	39.574	6399.234	-6.518	-14.700	-6.518	16.080	246.088	0.526
6500.000	0.382	326.131	6499.233	-6.042	-14.722	-6.042	15.913	247.686	0.411
6600.000	0.248	206.546	6599.232	-5.958	-15.004	-5.958	16.144	248.342	0.549
6700.000	0.244	61.437	6699.231	-6.050	-14.914	-6.050	16.094	247.920	0.469
6800.000	0.662	15.112	6799.228	-5.390	-14.576	-5.390	15.541	249.705	0.524
6900.000	0.710	296.017	6899.223	-4.561	-14.983	-4.561	15.661	253.069	0.875
7000.000	0.326	62.356	6999.221	-4.157	-15.287	-4.157	15.842	254.788	0.941
7100.000	0.463	58.902	7099.218	-3.816	-14.689	-3.816	15.177	255.437	0.139
7200.000	0.583	56.660	7199.214	-3.328	-13.919	-3.328	14.311	256.553	0.121
7300.000	0.518	21.030	7299.210	-2.626	-13.332	-2.626	13.588	258.856	0.342
HORIZONTAL DISPLACEMENT IS 13.588 FEET AT 258.856 DEGREES									