

Company: Noble Energy

Lease/Well: UPRC / 23-11 I7

API: 05-123-18312

Rig Name: Production / Lightning Wireline

State/County: Colorado / Weld

Latitude: 40.293, Longitude: -104.859

GRID North is 0.410 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: 9/25/2012 / 01:29

Vaughn Energy Services

Henderson Colorado

866-835-8333

Norman Cowan

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	0.286	22.227	100.000	0.231	0.094	0.231	0.250	22.227	0.286
200.000	0.246	299.636	199.999	0.568	0.002	0.568	0.568	0.199	0.353
300.000	0.151	38.403	299.998	0.778	-0.103	0.778	0.785	352.451	0.308
400.000	0.390	203.682	399.998	0.569	-0.158	0.569	0.591	344.487	0.537
500.000	0.089	282.301	499.997	0.274	-0.371	0.274	0.461	306.486	0.383
600.000	0.150	256.286	599.997	0.260	-0.574	0.260	0.630	294.342	0.080
700.000	0.410	215.890	699.996	-0.061	-0.911	-0.061	0.913	266.141	0.311
800.000	0.457	310.178	799.994	-0.094	-1.425	-0.094	1.429	266.228	0.637
900.000	0.909	227.054	899.988	-0.377	-2.311	-0.377	2.341	260.734	0.967
1000.000	0.674	236.526	999.979	-1.242	-3.382	-1.242	3.603	249.837	0.268
1100.000	0.941	268.761	1099.969	-1.584	-4.694	-1.584	4.954	251.351	0.517
1200.000	0.803	228.804	1199.958	-2.063	-6.042	-2.063	6.384	251.145	0.610
1300.000	0.631	260.206	1299.951	-2.618	-7.112	-2.618	7.578	249.787	0.422
1400.000	0.994	268.323	1399.941	-2.737	-8.522	-2.737	8.951	252.192	0.380
1500.000	0.981	286.008	1499.926	-2.527	-10.213	-2.527	10.521	256.104	0.304
1600.000	1.277	279.287	1599.907	-2.111	-12.136	-2.111	12.318	260.134	0.323
1700.000	1.220	275.133	1699.883	-1.836	-14.296	-1.836	14.413	262.684	0.107
1800.000	1.411	259.721	1799.857	-1.960	-16.568	-1.960	16.684	263.253	0.401
1900.000	1.696	263.717	1899.820	-2.342	-19.251	-2.342	19.392	263.064	0.304
2000.000	0.872	276.225	1999.794	-2.421	-21.477	-2.421	21.613	263.568	0.865
2100.000	1.208	250.829	2099.778	-2.685	-23.229	-2.685	23.384	263.407	0.562
2200.000	1.119	234.588	2199.758	-3.596	-25.020	-3.596	25.277	261.820	0.340
2300.000	0.764	220.127	2299.744	-4.672	-26.246	-4.672	26.658	259.906	0.424
2400.000	0.834	168.771	2399.736	-5.896	-26.534	-5.896	27.181	257.472	0.696
2500.000	0.842	242.546	2499.728	-6.949	-27.044	-6.949	27.922	255.590	1.006
2600.000	0.988	197.777	2599.716	-8.108	-27.959	-8.108	29.111	253.827	0.710
2700.000	0.996	237.489	2699.702	-9.397	-28.955	-9.397	30.442	252.021	0.674
2800.000	0.972	161.240	2799.691	-10.666	-29.415	-10.666	31.290	250.069	1.215
2900.000	0.940	186.109	2899.678	-12.285	-29.230	-12.285	31.707	247.204	0.413
3000.000	0.664	192.566	2999.668	-13.667	-29.444	-13.667	32.461	245.101	0.290
3100.000	0.407	212.663	3099.663	-14.532	-29.761	-14.532	33.120	243.975	0.315
3200.000	0.735	234.118	3199.658	-15.207	-30.473	-15.207	34.056	243.479	0.386
3300.000	0.457	253.531	3299.653	-15.696	-31.374	-15.696	35.081	243.423	0.340
3400.000	0.787	267.579	3399.647	-15.838	-32.443	-15.838	36.102	243.980	0.362

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	1.280	287.932	3499.631	-15.523	-34.192	-15.523	37.551	245.583	0.607
3600.000	1.119	312.103	3599.609	-14.524	-35.979	-14.524	38.800	248.017	0.526
3700.000	1.446	306.008	3699.584	-13.128	-37.724	-13.128	39.943	250.812	0.354
3800.000	1.401	305.161	3799.553	-11.683	-39.744	-11.683	41.425	253.620	0.050
3900.000	1.263	307.719	3899.526	-10.304	-41.615	-10.304	42.872	256.093	0.150
4000.000	1.132	287.092	3999.505	-9.340	-43.431	-9.340	44.424	257.863	0.448
4100.000	1.526	282.884	4099.478	-8.753	-45.673	-8.753	46.504	259.152	0.406
4200.000	1.249	273.331	4199.449	-8.392	-48.059	-8.392	48.787	260.095	0.360
4300.000	1.514	269.308	4299.420	-8.345	-50.468	-8.345	51.154	260.611	0.282
4400.000	1.405	267.352	4399.387	-8.418	-53.014	-8.418	53.678	260.978	0.120
4500.000	1.837	278.048	4499.347	-8.250	-55.826	-8.250	56.432	261.594	0.526
4600.000	4.721	338.449	4599.195	-4.196	-58.926	-4.196	59.075	265.927	4.134
4700.000	9.943	335.836	4698.343	7.517	-63.975	7.517	64.415	276.701	5.231
4800.000	16.739	331.777	4795.590	28.107	-74.332	28.107	79.468	290.713	6.856
4900.000	21.544	328.215	4890.036	56.421	-90.823	56.421	106.921	301.849	4.943
5000.000	22.481	334.114	4982.757	89.234	-108.844	89.234	140.747	309.346	2.400
5100.000	21.265	339.723	5075.566	123.450	-123.478	123.450	174.605	314.994	2.417
5200.000	22.996	337.551	5168.197	158.517	-137.223	158.517	209.661	319.118	1.915
5300.000	24.466	334.919	5259.742	195.328	-153.461	195.328	248.401	321.845	1.811
5400.000	24.912	333.990	5350.601	233.011	-171.475	233.011	289.306	323.650	0.592
5500.000	24.636	334.861	5441.398	270.808	-189.565	270.808	330.563	325.008	0.458
5600.000	24.073	341.349	5532.515	309.008	-204.944	309.008	370.794	326.446	2.733
5700.000	20.868	341.920	5624.911	345.272	-216.997	345.272	407.800	327.851	3.213
5800.000	21.612	342.680	5718.118	379.785	-228.007	379.785	442.972	329.021	0.794
5900.000	21.228	349.852	5811.226	415.193	-236.681	415.193	477.916	330.315	2.646
6000.000	19.066	342.472	5905.118	448.598	-244.793	448.598	511.042	331.379	3.333
6100.000	16.870	341.595	6000.235	477.944	-254.294	477.944	541.383	331.984	2.212
6200.000	16.788	340.537	6095.952	505.328	-263.687	505.328	569.989	332.444	0.317
6300.000	15.432	341.844	6192.024	531.588	-272.645	531.588	597.429	332.847	1.403
6400.000	12.745	346.291	6289.010	554.952	-279.407	554.952	621.321	333.276	2.896
6500.000	12.187	352.085	6386.656	576.123	-283.474	576.123	642.087	333.801	1.369
6600.000	9.267	353.917	6484.898	594.588	-285.781	594.588	659.702	334.329	2.939
6700.000	6.087	347.866	6583.990	607.782	-287.750	607.782	672.458	334.665	3.277
6800.000	4.688	343.229	6683.546	616.879	-290.043	616.879	681.663	334.818	1.464
6900.000	3.615	339.006	6783.283	623.736	-292.352	623.736	688.851	334.887	1.115
7000.000	2.681	332.917	6883.131	628.761	-294.546	628.761	694.333	334.899	0.991
7100.000	1.978	317.770	6983.049	632.121	-296.771	632.121	698.320	334.851	0.928
7200.000	1.912	314.514	7082.991	634.569	-299.121	634.569	701.535	334.762	0.129
7250.000	2.126	311.954	7132.960	635.774	-300.406	635.774	703.173	334.709	0.465
HORIZONTAL DISPLACEMENT IS 703.173 FEET AT 334.709 DEGREES									