



Company: Noble Energy

Well: Lucci B 1-21

API: 05-123-29932

Rig Name: Production/Lightning

Location: Weld County, Colorado

Latitude: 40.428, Longitude: -104.498

GRID North is 0.650 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-de_01.ut

Minimum Curvature Method

Report Date/Time: 12/12/2012 / 10:18

Vaughn Energy Services

Henderson, CO.

Justin Williams

303-853-4976

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	0.509	19.813	99.999	0.418	0.151	0.418	0.444	19.813	0.509
200.000	0.780	18.548	199.992	1.482	0.518	1.482	1.569	19.264	0.272
300.000	0.845	64.369	299.983	2.446	1.399	2.446	2.818	29.768	0.635
400.000	1.295	44.872	399.966	3.566	2.861	3.566	4.572	38.741	0.573
500.000	1.267	27.156	499.941	5.350	4.162	5.350	6.778	37.885	0.395
600.000	1.204	35.452	599.918	7.189	5.276	7.189	8.917	36.276	0.189
700.000	0.725	41.806	699.904	8.516	6.307	8.516	10.597	36.524	0.489
800.000	0.770	50.034	799.895	9.419	7.244	9.419	11.883	37.562	0.116
900.000	0.966	45.346	899.884	10.443	8.359	10.443	13.377	38.673	0.208
1000.000	0.918	43.853	999.870	11.614	9.514	11.614	15.013	39.323	0.053
1100.000	1.060	14.396	1099.856	13.088	10.299	13.088	16.654	38.199	0.521
1200.000	0.864	23.891	1199.842	14.673	10.834	14.673	18.240	36.441	0.252
1300.000	0.881	22.122	1299.830	16.075	11.429	16.075	19.724	35.412	0.032
1400.000	0.911	20.697	1399.818	17.532	12.000	17.532	21.245	34.390	0.037
1500.000	0.911	15.199	1499.805	19.043	12.489	19.043	22.773	33.259	0.087
1600.000	0.875	10.927	1599.793	20.559	12.842	20.559	24.241	31.991	0.076
1700.000	0.809	10.602	1699.782	22.003	13.117	22.003	25.616	30.802	0.066
1800.000	1.124	16.030	1799.768	23.639	13.518	23.639	27.231	29.763	0.328
1900.000	1.388	25.701	1899.744	25.673	14.314	25.673	29.393	29.142	0.338
2000.000	1.473	31.780	1999.713	27.857	15.516	27.857	31.887	29.117	0.174
2100.000	1.615	32.860	2099.677	30.134	16.958	30.134	34.578	29.369	0.144
2200.000	1.840	28.316	2199.631	32.731	18.484	32.731	37.589	29.455	0.263
2300.000	1.969	2.663	2299.578	35.860	19.325	35.860	40.736	28.321	0.855
2400.000	2.088	20.056	2399.516	39.288	20.030	39.288	44.099	27.014	0.625
2500.000	1.922	14.401	2499.455	42.624	21.072	42.624	47.548	26.307	0.258
2600.000	1.591	5.113	2599.408	45.631	21.613	45.631	50.490	25.344	0.435
2700.000	1.881	27.074	2699.363	48.475	22.484	48.475	53.435	24.883	0.720
2800.000	1.647	5.493	2799.317	51.368	23.368	51.368	56.433	24.462	0.699
2900.000	1.647	15.729	2899.275	54.182	23.895	54.182	59.217	23.799	0.294
3000.000	0.810	8.249	2999.252	56.265	24.386	56.265	61.322	23.433	0.851
3100.000	0.176	232.565	3099.249	56.871	24.366	56.871	61.871	23.193	0.944
3200.000	0.776	226.311	3199.245	56.309	23.754	56.309	61.115	22.873	0.602
3300.000	1.428	231.112	3299.226	55.059	22.295	55.059	59.402	22.044	0.657
3400.000	1.223	235.338	3399.199	53.671	20.448	53.671	57.434	20.856	0.227

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	1.119	220.477	3499.178	52.321	18.937	52.321	55.643	19.897	0.320
3600.000	1.247	239.907	3599.157	51.033	17.361	51.033	53.905	18.788	0.419
3700.000	1.385	243.004	3699.131	49.939	15.343	49.939	52.242	17.078	0.155
3800.000	1.555	232.908	3799.098	48.572	13.183	48.572	50.329	15.185	0.309
3900.000	1.682	221.516	3899.059	46.655	11.128	46.655	47.964	13.416	0.345
4000.000	1.799	219.383	3999.012	44.343	9.160	44.343	45.279	11.671	0.135
4100.000	1.779	218.701	4098.964	41.918	7.193	41.918	42.530	9.737	0.030
4200.000	1.923	219.505	4198.911	39.412	5.155	39.412	39.747	7.452	0.146
4300.000	1.642	219.546	4298.863	37.013	3.176	37.013	37.149	4.904	0.282
4400.000	1.220	219.069	4398.832	35.081	1.593	35.081	35.118	2.600	0.422
4500.000	1.128	223.654	4498.811	33.543	0.242	33.543	33.544	0.414	0.132
4600.000	0.884	198.694	4598.796	32.100	-0.684	32.100	32.107	358.779	0.495
4700.000	0.736	194.871	4698.786	30.748	-1.096	30.748	30.768	357.958	0.158
4800.000	0.815	220.915	4798.777	29.591	-1.727	29.591	29.641	356.660	0.358
4900.000	0.916	222.509	4898.765	28.464	-2.733	28.464	28.595	354.516	0.104
5000.000	0.701	186.071	4998.756	27.266	-3.338	27.266	27.470	353.021	0.545
5100.000	0.709	175.285	5098.748	26.042	-3.351	26.042	26.256	352.667	0.133
5200.000	0.818	195.582	5198.740	24.738	-3.492	24.738	24.983	351.965	0.290
5300.000	0.849	204.264	5298.729	23.375	-3.988	23.375	23.713	350.317	0.130
5400.000	0.736	203.087	5398.720	22.109	-4.544	22.109	22.572	348.385	0.115
5500.000	0.795	207.843	5498.711	20.905	-5.120	20.905	21.523	346.238	0.087
5600.000	0.773	198.226	5598.701	19.651	-5.655	19.651	20.449	343.945	0.133
5700.000	0.693	206.708	5698.693	18.471	-6.138	18.471	19.464	341.618	0.134
5800.000	0.830	202.055	5798.684	17.259	-6.682	17.259	18.507	338.836	0.150
5900.000	0.825	214.321	5898.674	15.993	-7.360	15.993	17.605	335.290	0.177
6000.000	0.775	217.900	5998.664	14.865	-8.181	14.865	16.968	331.175	0.071
6100.000	0.846	205.215	6098.654	13.664	-8.911	13.664	16.312	326.890	0.192
6200.000	0.682	237.699	6198.646	12.678	-9.728	12.678	15.980	322.500	0.455
6300.000	0.823	305.203	6298.639	12.774	-10.817	12.774	16.739	319.740	0.844
6400.000	3.429	325.590	6398.562	15.655	-13.094	15.655	20.410	320.090	2.673
6500.000	2.615	315.908	6498.423	19.762	-16.372	19.762	25.663	320.359	0.958
6600.000	1.584	312.035	6598.355	22.326	-18.986	22.326	29.308	319.621	1.040
6700.000	0.861	294.060	6698.332	23.558	-20.699	23.558	31.360	318.696	0.810
HORIZONTAL DISPLACEMENT IS 31.360 FEET AT 318.696 DEGREES									