



Company: Noble Energy
Well: McKenney 14-13
API#: 05-123-24244
Rig Name: Production / Lightning
Location: Weld County, Colorado
Latitude: 40.488, Longitude: -104.515
GRID North is 0.640 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: mckenney 14-13_ed.ut

Minimum Curvature Method

Report Date/Time: 2/28/2012 / 13:27

Vaughn Energy Services
Henderson, CO
303-853-4976
Robert Davis

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	0.147	5.569	100.000	0.128	0.012	0.128	0.129	5.569	0.147
200.000	0.382	37.106	199.999	0.522	0.226	0.522	0.569	23.435	0.268
300.000	0.384	31.095	299.997	1.075	0.601	1.075	1.231	29.192	0.040
400.000	0.510	24.418	399.994	1.767	0.957	1.767	2.010	28.453	0.136
500.000	0.357	36.683	499.991	2.422	1.327	2.422	2.762	28.728	0.178
600.000	0.155	32.248	599.990	2.786	1.586	2.786	3.205	29.647	0.203
700.000	0.147	217.152	699.989	2.798	1.580	2.798	3.213	29.458	0.301
800.000	0.287	114.051	799.989	2.594	1.732	2.594	3.119	33.734	0.351
900.000	0.568	218.160	899.987	2.102	1.655	2.102	2.675	38.214	0.696
1000.000	0.398	227.461	999.984	1.477	1.093	1.477	1.837	36.488	0.187
1100.000	0.588	223.745	1099.980	0.872	0.482	0.872	0.996	28.933	0.193
1200.000	0.519	184.640	1199.975	0.050	0.090	0.050	0.103	61.182	0.376
1300.000	0.481	160.754	1299.972	-0.798	0.192	-0.798	0.821	166.457	0.210
1400.000	0.706	172.740	1399.966	-1.805	0.408	-1.805	1.851	167.254	0.256
1500.000	0.576	173.622	1499.960	-2.916	0.542	-2.916	2.966	169.469	0.131
1600.000	0.393	183.438	1599.957	-3.758	0.577	-3.758	3.802	171.265	0.201
1700.000	0.292	184.837	1699.955	-4.353	0.535	-4.353	4.386	172.989	0.101
1800.000	0.618	158.701	1799.952	-5.109	0.710	-5.109	5.158	172.091	0.379
1900.000	0.360	120.810	1899.948	-5.773	1.175	-5.773	5.891	168.492	0.401
2000.000	0.167	141.741	1999.947	-6.047	1.535	-6.047	6.239	165.758	0.213
2100.000	0.326	252.813	2099.946	-6.246	1.353	-6.246	6.391	167.776	0.416
2200.000	0.527	321.198	2199.944	-5.972	0.793	-5.972	6.024	172.434	0.507
2300.000	0.909	302.050	2299.936	-5.192	-0.167	-5.192	5.195	181.847	0.446
2400.000	0.615	296.365	2399.927	-4.533	-1.321	-4.533	4.721	196.247	0.303
2500.000	0.770	306.319	2499.920	-3.897	-2.343	-3.897	4.547	211.021	0.196
2600.000	0.103	33.066	2599.917	-3.424	-2.836	-3.424	4.446	219.634	0.771
2700.000	0.651	2.194	2699.914	-2.781	-2.765	-2.781	3.922	224.834	0.565
2800.000	0.244	33.923	2799.911	-2.037	-2.624	-2.037	3.322	232.182	0.461
2900.000	0.293	45.259	2899.910	-1.680	-2.324	-1.680	2.868	234.132	0.072
3000.000	0.676	58.452	2999.906	-1.192	-1.640	-1.192	2.027	233.990	0.396
3100.000	1.410	51.845	3099.889	-0.124	-0.170	-0.124	0.210	234.028	0.742
3200.000	1.949	38.136	3199.846	1.974	1.847	1.974	2.703	43.098	0.669
3300.000	1.823	28.350	3299.792	4.712	3.653	4.712	5.962	37.785	0.345
3400.000	1.244	15.644	3399.756	7.158	4.701	7.158	8.564	33.297	0.668

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	1.201	20.417	3499.734	9.186	5.360	9.186	10.635	30.263	0.111
3600.000	1.343	10.570	3599.709	11.320	5.940	11.320	12.784	27.689	0.260
3700.000	1.706	7.437	3699.674	13.948	6.348	13.948	15.325	24.471	0.373
3800.000	1.963	349.747	3799.623	17.110	6.236	17.110	18.211	20.024	0.619
3900.000	2.342	356.878	3899.552	20.836	5.820	20.836	21.633	15.606	0.463
4000.000	2.005	6.845	3999.481	24.612	5.917	24.612	25.313	13.518	0.505
4100.000	1.658	6.848	4099.429	27.786	6.298	27.786	28.491	12.771	0.347
4200.000	0.896	11.497	4199.404	29.989	6.626	29.989	30.712	12.460	0.769
4300.000	0.929	6.856	4299.391	31.560	6.879	31.560	32.301	12.296	0.081
4400.000	0.532	0.223	4399.383	32.828	6.978	32.828	33.561	12.000	0.405
4500.000	0.453	17.373	4499.379	33.669	7.097	33.669	34.409	11.904	0.166
4600.000	0.585	157.761	4599.378	33.573	7.409	33.573	34.380	12.444	0.978
4700.000	0.790	127.542	4699.371	32.680	8.148	32.680	33.680	14.001	0.409
4800.000	0.674	97.743	4799.363	32.181	9.278	32.181	33.491	16.082	0.393
4900.000	1.183	85.446	4899.349	32.183	10.889	32.183	33.976	18.693	0.544
5000.000	1.527	78.579	4999.321	32.529	13.225	32.529	35.115	22.124	0.380
5100.000	0.895	105.290	5099.299	32.587	15.285	32.587	35.994	25.129	0.831
5200.000	0.927	121.929	5199.287	31.953	16.725	31.953	36.066	27.628	0.265
5300.000	0.690	99.116	5299.277	31.430	18.006	31.430	36.222	29.807	0.395
5400.000	0.670	121.892	5399.270	31.026	19.097	31.026	36.432	31.613	0.269
5500.000	0.676	161.271	5499.264	30.158	19.783	30.158	36.068	33.264	0.454
5600.000	0.543	221.359	5599.259	29.243	19.659	29.243	35.237	33.911	0.621
5700.000	0.450	269.176	5699.256	28.882	18.953	28.882	34.545	33.274	0.412
5800.000	0.813	298.664	5799.250	29.216	17.938	29.216	34.283	31.548	0.476
5900.000	0.573	322.382	5899.242	29.953	17.010	29.953	34.446	29.592	0.369
6000.000	0.714	325.210	5999.236	30.861	16.349	30.861	34.924	27.913	0.145
6100.000	0.327	293.057	6099.232	31.485	15.730	31.485	35.196	26.548	0.470
6200.000	0.890	295.855	6199.226	31.935	14.769	31.935	35.185	24.819	0.563
6300.000	0.678	305.985	6299.217	32.621	13.592	32.621	35.339	22.619	0.253
6400.000	0.346	247.713	6399.213	32.854	12.834	32.854	35.272	21.338	0.576
6500.000	0.608	297.321	6499.210	32.983	12.084	32.983	35.127	20.121	0.465
6600.000	0.344	290.198	6599.206	33.330	11.331	33.330	35.203	18.776	0.270
6700.000	0.765	305.508	6699.201	33.821	10.506	33.821	35.416	17.256	0.443
6800.000	1.502	301.309	6799.181	34.890	8.843	34.890	35.993	14.222	0.741
HORIZONTAL DISPLACEMENT IS 35.993 FEET AT 14.222 DEGREES									