



Company: Noble Energy
Lease / Well: Ehrlich State PC F / 36-31D
API#: 05-123-32549
Rig Name: Production / Lightning Wireline
State / County: Colorado / Weld County
Latitude: 40.358, Longitude: -104.618
GRID North is 0.570 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: inrun_ed.ut

Minimum Curvature Method

Report Date/Time: 9/1/2011 / 17:23

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	0.420	19.642	99.999	0.345	0.123	0.345	0.367	19.642	0.420
200.000	0.248	348.278	199.997	0.903	0.203	0.903	0.925	12.641	0.245
300.000	0.133	262.806	299.997	1.101	0.044	1.101	1.101	2.271	0.272
400.000	0.264	185.558	399.997	0.857	-0.093	0.857	0.862	353.777	0.268
500.000	0.415	156.823	499.995	0.295	0.027	0.295	0.296	5.198	0.223
600.000	0.593	266.824	599.993	-0.067	-0.347	-0.067	0.353	259.136	0.832
700.000	0.574	257.036	699.987	-0.208	-1.351	-0.208	1.367	261.268	0.101
800.000	1.882	302.831	799.964	0.570	-3.219	0.570	3.269	280.049	1.538
900.000	3.031	316.648	899.871	3.383	-6.413	3.383	7.251	297.813	1.285
1000.000	4.592	317.980	999.647	8.280	-10.908	8.280	13.695	307.201	1.563
1100.000	6.870	320.773	1099.141	15.888	-17.371	15.888	23.541	312.447	2.294
1200.000	8.096	316.513	1198.288	25.631	-26.000	25.631	36.509	314.590	1.345
1300.000	10.153	316.722	1297.017	37.158	-36.890	37.158	52.360	315.207	2.057
1400.000	11.453	320.975	1395.244	51.289	-49.184	51.289	71.061	316.200	1.524
1500.000	11.116	315.497	1493.314	65.878	-62.194	65.878	90.597	316.648	1.123
1600.000	12.391	317.649	1591.216	80.683	-76.179	80.683	110.963	316.645	1.348
1700.000	13.035	316.860	1688.764	96.841	-91.118	96.841	132.969	316.744	0.668
1800.000	13.538	317.266	1786.086	113.667	-106.773	113.667	155.951	316.792	0.512
1900.000	14.691	316.587	1883.066	131.477	-123.431	131.477	180.337	316.808	1.165
2000.000	15.070	317.702	1979.712	150.304	-140.895	150.304	206.016	316.851	0.475
2100.000	15.483	314.725	2076.180	169.313	-159.128	169.313	232.354	316.776	0.886
2200.000	15.159	317.090	2172.627	188.282	-177.513	188.282	258.769	316.686	0.704
2300.000	15.305	314.990	2269.114	207.190	-195.749	207.190	285.036	316.626	0.571
2400.000	15.514	311.943	2365.521	225.460	-215.031	225.460	311.562	316.356	0.836
2500.000	15.513	310.040	2461.878	243.002	-235.218	243.002	338.197	315.933	0.509
2600.000	17.521	317.062	2557.756	262.630	-255.714	262.630	366.557	315.764	2.828
2700.000	17.530	315.323	2653.115	284.359	-276.557	284.359	396.666	315.797	0.524
2800.000	17.538	314.029	2748.469	305.540	-297.979	305.540	426.786	315.718	0.390
2900.000	16.445	313.632	2844.103	325.780	-319.058	325.780	455.994	315.597	1.099
3000.000	17.071	314.230	2939.855	345.786	-339.821	345.786	484.815	315.498	0.649
3100.000	16.688	318.098	3035.550	366.711	-359.928	366.711	513.834	315.535	1.187
3200.000	14.851	317.123	3131.782	386.791	-378.238	386.791	540.991	315.641	1.855
3300.000	14.589	315.619	3228.500	405.184	-395.767	405.184	566.397	315.674	0.464
3400.000	15.136	318.374	3325.156	423.944	-413.248	423.944	592.033	315.732	0.893

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	15.808	319.983	3421.532	444.134	-430.679	444.134	618.660	315.881	0.798
3600.000	13.918	320.264	3518.182	463.816	-447.127	463.816	644.242	316.050	1.892
3700.000	15.268	317.476	3614.955	482.769	-463.715	482.769	669.401	316.153	1.522
3800.000	16.047	317.401	3711.243	502.648	-481.970	502.648	696.384	316.203	0.780
3900.000	16.188	319.436	3807.313	523.412	-500.391	523.412	724.121	316.288	0.582
4000.000	15.181	317.660	3903.589	543.681	-518.275	543.681	751.131	316.370	1.116
4100.000	13.204	319.604	4000.532	562.058	-534.497	562.058	775.627	316.440	2.034
4200.000	10.966	313.336	4098.314	577.286	-548.819	577.286	796.531	316.448	2.591
4300.000	8.977	311.422	4196.799	588.976	-561.589	588.976	813.803	316.364	2.016
4400.000	6.776	307.072	4295.850	597.695	-572.147	597.695	827.401	316.251	2.279
4500.000	5.457	302.999	4395.279	603.842	-580.843	603.842	837.856	316.112	1.388
4600.000	4.075	305.290	4494.931	608.484	-587.731	608.484	845.979	315.994	1.395
4700.000	2.194	304.908	4594.777	611.632	-592.201	611.632	851.349	315.925	1.881
4800.000	0.614	327.324	4694.745	613.178	-594.060	613.178	853.753	315.907	1.643
4900.000	0.321	115.745	4794.743	613.507	-594.097	613.507	854.015	315.921	0.903
5000.000	0.556	108.037	4894.740	613.236	-593.383	613.236	853.324	315.943	0.242
5100.000	0.626	101.026	4994.735	612.981	-592.386	612.981	852.448	315.979	0.101
5200.000	0.595	125.971	5094.729	612.572	-591.429	612.572	851.488	316.006	0.266
5300.000	0.962	91.933	5194.720	612.239	-590.171	612.239	850.375	316.051	0.575
5400.000	1.116	111.891	5294.704	611.847	-588.428	611.847	848.885	316.118	0.391
5500.000	1.039	101.708	5394.687	611.300	-586.637	611.300	847.249	316.179	0.206
5600.000	1.095	94.165	5494.669	611.047	-584.797	611.047	845.793	316.258	0.151
5700.000	1.054	86.969	5594.652	611.026	-582.925	611.026	844.485	316.348	0.141
5800.000	0.952	103.956	5694.637	610.875	-581.201	610.875	843.186	316.426	0.313
5900.000	1.043	67.696	5794.622	611.019	-579.553	611.019	842.156	316.514	0.626
6000.000	1.647	82.507	5894.595	611.552	-577.287	611.552	840.985	316.651	0.693
6100.000	1.369	95.407	5994.560	611.627	-574.673	611.627	839.248	316.784	0.437
6200.000	0.917	91.800	6094.540	611.489	-572.684	611.489	837.786	316.877	0.457
6300.000	0.837	50.139	6194.529	611.933	-571.323	611.933	837.181	316.966	0.628
6400.000	1.601	59.092	6294.506	613.119	-569.563	613.119	836.849	317.109	0.785
6500.000	0.869	57.847	6394.482	614.240	-567.723	614.240	836.421	317.254	0.733
6600.000	0.865	66.212	6494.471	614.948	-566.390	614.948	836.037	317.354	0.127
6700.000	0.399	56.830	6594.464	615.442	-565.408	615.442	835.737	317.426	0.476
6800.000	0.545	336.668	6694.462	616.070	-565.306	616.070	836.130	317.460	0.618
6900.000	0.161	216.258	6794.461	616.394	-565.577	616.394	836.552	317.462	0.642
7000.000	0.292	338.666	6894.460	616.518	-565.753	616.518	836.762	317.459	0.402
7085.000	0.730	281.695	6979.457	616.830	-566.362	616.830	837.404	317.442	0.731
HORIZONTAL DISPLACEMENT IS 837.404 FEET AT 317.442 DEGREES									