



Company: Noble Energy  
Lease / Well: State Clark / 36-31  
API#: 05-123-19008  
Rig Name: Production / Lightning Wireline  
State / County: Colorado / Weld County  
Latitude: 40.361, Longitude: -104.615  
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 / 19:06

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	0.263	112.023	100.000	-0.086	0.213	-0.086	0.230	112.023	0.263
200.000	0.256	107.720	199.999	-0.240	0.639	-0.240	0.683	110.615	0.021
300.000	0.164	168.801	299.998	-0.449	0.880	-0.449	0.988	117.011	0.228
400.000	0.246	38.556	399.998	-0.421	1.042	-0.421	1.123	112.007	0.373
500.000	0.331	53.560	499.996	-0.081	1.408	-0.081	1.410	93.308	0.114
600.000	0.405	42.033	599.994	0.353	1.877	0.353	1.910	79.361	0.104
700.000	0.428	7.416	699.992	0.985	2.162	0.985	2.376	65.493	0.249
800.000	0.333	6.853	799.990	1.644	2.244	1.644	2.782	53.773	0.096
900.000	0.375	13.330	899.988	2.251	2.355	2.251	3.257	46.289	0.058
1000.000	0.366	2.875	999.986	2.888	2.446	2.888	3.785	40.260	0.068
1100.000	0.376	351.001	1099.984	3.531	2.411	3.531	4.276	34.320	0.077
1200.000	0.437	20.869	1199.981	4.212	2.495	4.212	4.896	30.644	0.218
1300.000	0.543	13.244	1299.978	5.029	2.740	5.029	5.727	28.579	0.124
1400.000	0.565	31.087	1399.973	5.912	3.103	5.912	6.677	27.689	0.173
1500.000	0.601	328.643	1499.969	6.783	3.084	6.783	7.451	24.451	0.605
1600.000	0.595	322.070	1599.963	7.640	2.492	7.640	8.037	18.063	0.069
1700.000	0.817	343.911	1699.956	8.735	1.975	8.735	8.955	12.743	0.345
1800.000	0.961	343.381	1799.944	10.223	1.538	10.223	10.338	8.556	0.145
1900.000	1.166	325.686	1899.927	11.867	0.724	11.867	11.889	3.493	0.385
2000.000	1.429	311.688	1999.901	13.537	-0.780	13.537	13.559	356.701	0.410
2100.000	1.632	290.538	2099.866	14.866	-3.045	14.866	15.174	348.425	0.596
2200.000	1.711	278.608	2199.824	15.588	-5.854	15.588	16.651	339.418	0.356
2300.000	1.616	249.754	2299.784	15.324	-8.653	15.324	17.598	330.548	0.834
2400.000	1.795	276.387	2399.741	15.010	-11.532	15.010	18.929	322.465	0.805
2500.000	1.730	274.417	2499.694	15.300	-14.594	15.300	21.144	316.354	0.089
2600.000	2.003	275.393	2599.640	15.581	-17.839	15.581	23.685	311.135	0.275
2700.000	2.177	261.681	2699.575	15.470	-21.457	15.470	26.453	305.791	0.528
2800.000	2.167	251.008	2799.503	14.581	-25.124	14.581	29.048	300.129	0.404
2900.000	1.312	242.694	2899.456	13.440	-27.929	13.440	30.994	295.698	0.889
3000.000	0.894	257.605	2999.438	12.747	-29.708	12.747	32.327	293.224	0.504
3100.000	0.385	184.824	3099.432	12.246	-30.498	12.246	32.865	291.876	0.862
3200.000	1.110	181.118	3199.423	10.942	-30.545	10.942	32.446	289.709	0.727
3300.000	1.039	193.485	3299.406	9.092	-30.775	9.092	32.090	286.459	0.242
3400.000	1.261	187.921	3399.386	7.121	-31.138	7.121	31.942	282.882	0.248

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	0.287	204.799	3499.375	5.805	-31.395	5.805	31.927	280.475	0.990
3600.000	0.738	283.903	3599.372	5.732	-32.125	5.732	32.632	280.117	0.739
3700.000	1.106	272.116	3699.359	5.922	-33.714	5.922	34.230	279.963	0.413
3800.000	0.840	270.128	3799.344	5.960	-35.411	5.960	35.909	279.553	0.269
3900.000	0.789	283.334	3899.334	6.120	-36.814	6.120	37.319	279.439	0.194
4000.000	0.376	345.169	3999.330	6.596	-37.568	6.596	38.142	279.958	0.695
4100.000	0.150	14.950	4099.329	7.039	-37.618	7.039	38.271	280.599	0.257
4200.000	0.109	39.515	4199.329	7.239	-37.524	7.239	38.215	280.920	0.068
4300.000	0.506	59.203	4299.327	7.539	-37.084	7.539	37.842	281.491	0.405
4400.000	0.644	45.318	4399.322	8.160	-36.305	8.160	37.211	282.667	0.195
4500.000	0.762	79.173	4499.315	8.680	-35.253	8.680	36.306	283.832	0.425
4600.000	0.805	75.515	4599.305	8.980	-33.919	8.980	35.088	284.829	0.066
4700.000	1.123	53.558	4699.291	9.738	-32.450	9.738	33.880	286.704	0.482
4800.000	0.302	54.145	4799.283	10.475	-31.448	10.475	33.147	288.422	0.822
4900.000	0.518	156.215	4899.281	10.216	-31.053	10.216	32.690	288.210	0.651
5000.000	0.536	172.619	4999.277	9.338	-30.810	9.338	32.194	286.861	0.151
5100.000	0.388	225.938	5099.274	8.638	-30.994	8.638	32.175	285.574	0.435
5200.000	0.538	243.750	5199.271	8.195	-31.658	8.195	32.702	284.513	0.206
5300.000	0.634	181.179	5299.267	7.434	-32.091	7.434	32.941	283.043	0.614
5400.000	0.361	203.866	5399.263	6.593	-32.230	6.593	32.897	281.561	0.331
5500.000	0.278	111.114	5499.262	6.217	-32.131	6.217	32.727	280.951	0.466
5600.000	0.555	341.045	5599.260	6.588	-32.062	6.588	32.732	281.612	0.765
5700.000	0.496	23.338	5699.257	7.444	-32.048	7.444	32.901	283.077	0.383
5800.000	0.423	74.810	5799.254	7.939	-31.519	7.939	32.504	284.137	0.405
5900.000	0.517	335.653	5899.252	8.446	-31.348	8.446	32.466	285.079	0.718
6000.000	0.608	74.610	5999.249	8.998	-31.022	8.998	32.301	286.174	0.857
6100.000	0.920	28.135	6099.241	9.847	-30.132	9.847	31.700	288.097	0.668
6200.000	0.801	41.300	6199.229	11.080	-29.292	11.080	31.318	290.719	0.230
6300.000	1.327	23.364	6299.212	12.668	-28.372	12.668	31.071	294.060	0.617
6400.000	1.923	33.108	6399.171	15.136	-26.996	15.136	30.950	299.279	0.655
6500.000	2.227	53.948	6499.107	17.685	-24.508	17.685	30.223	305.814	0.808
6600.000	1.632	40.807	6599.051	19.907	-22.007	19.907	29.675	312.132	0.738
6700.000	1.349	13.559	6699.018	22.129	-20.800	22.129	30.370	316.773	0.754
6750.000	1.269	28.299	6749.005	23.188	-20.400	23.188	30.884	318.661	0.690
HORIZONTAL DISPLACEMENT IS 30.884 FEET AT 318.661 DEGREES									