

COMPANY/RIG: Noble Energy/Production/CoreTech
WELL/API: Wells Ranch BB 12-01/05-123-30128
DECLINATION: 8.2
TD AS DRILLED: 6734
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.41893, Longitude: -104.38312
Grid Convergence Applied = -0.72 degs (NAD 27)
Grid North = True North -0.72 degs



DEPTH REFERENCE : RKB = GL Elevation = 4639

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyrosurvey.ut

Minimum Curvature Method

Report Date/Time: 7/2/2015 / 13:05

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: JUSTIN WILLIAMS / API 05-123-30128

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	0.131	12.658	100.000	0.112	0.025	0.112	0.114	12.658	0.131
200.000	0.372	75.814	199.999	0.303	0.365	0.303	0.474	50.327	0.334
300.000	0.185	179.693	299.998	0.221	0.680	0.221	0.715	72.034	0.453
400.000	0.099	19.661	399.998	0.140	0.710	0.140	0.724	78.838	0.280
500.000	0.191	39.011	499.998	0.351	0.844	0.351	0.914	67.431	0.104
600.000	0.129	232.636	599.998	0.412	0.860	0.412	0.954	64.379	0.318
700.000	0.422	293.404	699.996	0.491	0.432	0.491	0.654	41.392	0.377
800.000	0.212	301.200	799.995	0.733	-0.064	0.733	0.736	355.010	0.214
900.000	0.500	326.891	899.993	1.194	-0.460	1.194	1.279	338.915	0.322
1000.000	0.302	337.684	999.990	1.803	-0.799	1.803	1.972	336.110	0.210
1100.000	0.469	322.856	1099.988	2.373	-1.146	2.373	2.635	334.227	0.193
1200.000	0.470	345.654	1199.985	3.097	-1.495	3.097	3.439	334.237	0.186
1300.000	0.302	345.545	1299.983	3.750	-1.662	3.750	4.101	336.093	0.168
1400.000	0.381	353.558	1399.981	4.335	-1.765	4.335	4.680	337.843	0.092
1500.000	0.621	331.869	1499.977	5.143	-2.058	5.143	5.539	338.191	0.302
1600.000	0.818	290.549	1599.970	5.871	-2.982	5.871	6.585	333.074	0.540
1700.000	0.640	287.171	1699.962	6.287	-4.184	6.287	7.552	326.351	0.183
1800.000	0.346	272.196	1799.958	6.463	-5.021	6.463	8.184	322.160	0.319

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
1900.000	0.272	219.114	1899.957	6.291	-5.472	6.291	8.338	318.981	0.284
2000.000	0.562	126.458	1999.955	5.815	-5.227	5.815	7.819	318.050	0.636
2100.000	0.963	111.273	2099.946	5.219	-4.049	5.219	6.606	322.192	0.445
2200.000	0.777	124.483	2199.934	4.530	-2.708	4.530	5.278	329.134	0.272
2300.000	0.840	134.488	2299.924	3.633	-1.626	3.633	3.980	335.886	0.154
2400.000	0.528	113.398	2399.917	2.936	-0.680	2.936	3.014	346.958	0.396
2500.000	0.406	98.173	2499.914	2.703	0.094	2.703	2.704	1.982	0.173
2600.000	0.101	263.115	2599.913	2.642	0.356	2.642	2.666	7.682	0.504
2700.000	0.205	17.054	2699.913	2.803	0.321	2.803	2.821	6.537	0.263
2800.000	0.249	281.433	2799.912	3.017	0.161	3.017	3.021	3.056	0.338
2900.000	0.247	279.329	2899.911	3.095	-0.264	3.095	3.106	355.116	0.009
3000.000	0.452	153.535	2999.910	2.777	-0.301	2.777	2.793	353.805	0.630
3100.000	0.515	139.113	3099.907	2.083	0.169	2.083	2.090	4.633	0.136
3200.000	0.617	140.200	3199.902	1.330	0.808	1.330	1.556	31.285	0.103
3300.000	1.469	164.830	3299.885	-0.322	1.488	-0.322	1.523	102.193	0.944
3400.000	1.927	184.904	3399.842	-3.234	1.680	-3.234	3.644	152.546	0.744
3500.000	2.210	188.668	3499.776	-6.815	1.246	-6.815	6.928	169.641	0.314
3600.000	2.300	176.708	3599.700	-10.724	1.070	-10.724	10.777	174.300	0.478
3700.000	2.829	173.378	3699.599	-15.178	1.470	-15.178	15.249	174.468	0.549
3800.000	1.930	179.736	3799.512	-19.313	1.762	-19.313	19.393	174.786	0.935
3900.000	0.837	234.940	3899.485	-21.417	1.172	-21.417	21.449	176.867	1.607
4000.000	2.289	312.103	3999.453	-20.497	-0.908	-20.497	20.517	182.535	2.256
4100.000	4.387	324.983	4099.279	-16.025	-4.585	-16.025	16.668	195.965	2.215
4200.000	4.876	333.262	4198.953	-9.098	-8.691	-9.098	12.582	223.691	0.827
4300.000	5.162	334.989	4298.570	-1.226	-12.505	-1.226	12.565	264.401	0.324
4400.000	5.428	341.363	4398.144	7.332	-15.918	7.332	17.526	294.732	0.645
4500.000	5.505	348.983	4497.690	16.523	-18.346	16.523	24.690	312.006	0.729
4600.000	4.842	345.861	4597.282	25.324	-20.294	25.324	32.452	321.292	0.721
4700.000	4.298	338.009	4696.965	32.891	-22.728	32.891	39.980	325.355	0.827
4800.000	4.106	339.511	4796.696	39.719	-25.384	39.719	47.138	327.417	0.222
4900.000	3.289	342.708	4896.487	45.811	-27.490	45.811	53.426	329.033	0.842
5000.000	1.883	342.290	4996.383	50.116	-28.843	50.116	57.823	330.079	1.406
5100.000	0.943	344.358	5096.352	52.474	-29.565	52.474	60.229	330.602	0.941
5200.000	0.467	353.775	5196.344	53.672	-29.831	53.672	61.405	330.935	0.489
5300.000	0.083	347.151	5296.342	54.148	-29.891	54.148	61.850	331.100	0.385
5400.000	0.356	191.828	5396.342	53.914	-29.971	53.914	61.684	330.930	0.433
5500.000	0.496	191.918	5496.339	53.186	-30.124	53.186	61.125	330.473	0.140
5600.000	0.605	173.101	5596.334	52.238	-30.150	52.238	60.315	330.008	0.210
5700.000	0.870	169.853	5696.326	50.967	-29.953	50.967	59.117	329.557	0.268
5800.000	0.817	166.918	5796.315	49.525	-29.658	49.525	57.726	329.085	0.068

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
5900.000	0.846	173.769	5896.305	48.097	-29.416	48.097	56.380	328.550	0.103
6000.000	0.555	176.342	5996.297	46.880	-29.305	46.880	55.286	327.990	0.292
6100.000	0.723	164.324	6096.291	45.790	-29.104	45.790	54.256	327.560	0.214
6200.000	0.345	176.894	6196.286	44.882	-28.917	44.882	53.391	327.206	0.394
6300.000	0.367	156.701	6296.285	44.287	-28.774	44.287	52.814	326.987	0.127
6400.000	0.676	179.558	6396.280	43.403	-28.643	43.403	52.002	326.578	0.366
6450.000	0.350	180.711	6446.278	42.956	-28.643	42.956	51.629	326.305	0.652