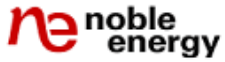


COMPANY/RIG: Noble Energy/Production/CoreTech
WELL/API: Wells Ranch BB 12-02/05-123-30130
DECLINATION: 8.21
TD AS DRILLED: 6766
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.41924, Longitude: -104.38312
Grid Convergence Applied = -0.72 degs (NAD 27)
Grid North = True North -0.72 degs



DEPTH REFERENCE : RKB = GL Elevation = 4648

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyrosurvey.ut

Minimum Curvature Method

Report Date/Time: 7/2/2015 / 13:16

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: JUSTIN WILLIAMS / API 05-123-30130

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	0.140	339.502	100.000	0.114	-0.043	0.114	0.122	339.502	0.140
200.000	0.438	290.066	199.999	0.360	-0.445	0.360	0.572	308.981	0.363
300.000	0.413	271.990	299.996	0.503	-1.163	0.503	1.268	293.397	0.136
400.000	0.358	237.992	399.994	0.350	-1.788	0.350	1.822	281.080	0.231
500.000	0.433	241.863	499.991	0.006	-2.386	0.006	2.386	270.154	0.079
600.000	0.421	181.685	599.989	-0.539	-2.730	-0.539	2.783	258.832	0.428
700.000	0.476	184.335	699.986	-1.321	-2.772	-1.321	3.071	244.528	0.059
800.000	0.475	203.927	799.983	-2.114	-2.972	-2.114	3.647	234.577	0.162
900.000	0.209	203.084	899.981	-2.661	-3.212	-2.661	4.170	230.360	0.265
1000.000	0.406	192.974	999.979	-3.174	-3.363	-3.174	4.624	226.655	0.203
1100.000	0.307	132.005	1099.978	-3.698	-3.243	-3.698	4.919	221.254	0.371
1200.000	0.350	179.721	1199.976	-4.183	-3.043	-4.183	5.173	216.038	0.269
1300.000	0.327	176.091	1299.974	-4.773	-3.022	-4.773	5.649	212.344	0.032
1400.000	0.311	201.381	1399.973	-5.310	-3.102	-5.310	6.149	210.292	0.140
1500.000	0.268	186.074	1499.972	-5.796	-3.226	-5.796	6.633	209.099	0.088
1600.000	0.299	47.260	1599.971	-5.852	-3.059	-5.852	6.603	207.600	0.531
1700.000	0.953	21.319	1699.965	-4.900	-2.566	-4.900	5.531	207.634	0.697
1800.000	0.823	354.889	1799.953	-3.411	-2.327	-3.411	4.129	214.306	0.425

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	0.685	332.788	1899.945	-2.165	-2.664	-2.165	3.433	230.910	0.319
2000.000	0.702	273.250	1999.939	-1.598	-3.550	-1.598	3.893	245.758	0.689
2100.000	0.550	217.789	2099.933	-1.943	-4.455	-1.943	4.861	246.441	0.598
2200.000	1.243	194.752	2199.921	-3.371	-5.026	-3.371	6.052	236.147	0.768
2300.000	1.329	191.394	2299.896	-5.557	-5.531	-5.557	7.841	224.864	0.114
2400.000	1.018	193.203	2399.875	-7.559	-5.963	-7.559	9.628	218.269	0.314
2500.000	1.050	193.745	2499.858	-9.314	-6.384	-9.314	11.292	214.426	0.034
2600.000	0.897	202.386	2599.844	-10.928	-6.899	-10.928	12.924	212.267	0.212
2700.000	1.262	209.573	2699.826	-12.609	-7.741	-12.609	14.796	211.547	0.389
2800.000	1.203	211.353	2799.803	-14.464	-8.831	-14.464	16.947	211.406	0.070
2900.000	0.934	200.925	2899.785	-16.122	-9.669	-16.122	18.799	210.952	0.331
3000.000	1.378	215.409	2999.765	-17.863	-10.656	-17.863	20.800	210.818	0.528
3100.000	1.310	211.725	3099.738	-19.816	-11.954	-19.816	23.142	211.101	0.110
3200.000	1.105	253.991	3199.717	-21.054	-13.482	-21.054	25.001	212.634	0.892
3300.000	1.016	336.065	3299.705	-20.509	-14.769	-20.509	25.274	215.758	1.394
3400.000	2.330	16.184	3399.663	-17.746	-14.562	-17.746	22.956	219.372	1.686
3500.000	3.001	28.102	3499.555	-13.484	-12.763	-13.484	18.566	223.424	0.867
3600.000	3.630	23.270	3599.387	-8.267	-10.279	-8.267	13.191	231.191	0.688
3700.000	3.558	17.462	3699.191	-2.399	-8.097	-2.399	8.445	253.497	0.371
3800.000	3.502	15.686	3799.001	3.501	-6.340	3.501	7.243	298.910	0.123
3900.000	3.121	5.051	3898.835	9.154	-5.275	9.154	10.565	330.048	0.721
4000.000	3.160	349.721	3998.687	14.577	-5.527	14.577	15.590	339.237	0.838
4100.000	3.162	334.854	4098.536	19.785	-7.190	19.785	21.052	340.028	0.817
4200.000	3.383	322.015	4198.374	24.607	-10.178	24.607	26.629	337.529	0.764
4300.000	3.597	318.601	4298.189	29.286	-14.069	29.286	32.490	334.341	0.298
4400.000	4.157	315.079	4397.960	34.206	-18.703	34.206	38.985	331.332	0.609
4500.000	4.433	311.233	4497.679	39.320	-24.169	39.320	46.154	328.422	0.398
4600.000	4.220	311.623	4597.394	44.311	-29.825	44.311	53.413	326.056	0.215
4700.000	3.314	313.928	4697.177	48.760	-34.657	48.760	59.822	324.596	0.918
4800.000	2.649	316.394	4797.041	52.438	-38.332	52.438	64.955	323.833	0.677
4900.000	1.817	320.419	4896.965	55.333	-40.936	55.333	68.830	323.505	0.846
5000.000	1.065	330.205	4996.932	57.362	-42.408	57.362	71.336	323.524	0.788
5100.000	0.496	333.408	5096.923	58.556	-43.064	58.556	72.686	323.668	0.570
5200.000	0.789	39.294	5196.917	59.476	-42.822	59.476	73.288	324.247	0.741
5300.000	0.396	73.413	5296.912	60.108	-42.055	60.108	73.359	325.021	0.512
5400.000	0.558	106.651	5396.909	60.067	-41.257	60.067	72.871	325.517	0.314
5500.000	0.498	82.008	5496.905	59.988	-40.360	59.988	72.301	326.067	0.233
5600.000	0.431	108.303	5596.902	59.930	-39.573	59.930	71.817	326.562	0.221
5700.000	0.243	116.507	5696.900	59.717	-39.027	59.717	71.339	326.834	0.193
5800.000	0.146	157.485	5796.899	59.505	-38.789	59.505	71.031	326.902	0.164

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	0.181	277.906	5896.899	59.410	-38.896	59.410	71.010	326.787	0.284
6000.000	0.262	285.912	5996.898	59.494	-39.272	59.494	71.287	326.571	0.087
6100.000	0.581	309.314	6096.896	59.878	-39.884	59.878	71.945	326.333	0.356
6200.000	0.902	311.178	6196.887	60.718	-40.869	60.718	73.191	326.055	0.321
6300.000	0.880	342.510	6296.875	61.968	-41.693	61.968	74.688	326.067	0.482
6400.000	1.144	324.550	6396.860	63.514	-42.502	63.514	76.423	326.210	0.409
6450.000	1.302	334.195	6446.849	64.432	-43.039	64.432	77.484	326.258	0.518