



Company/Rig: Noble Energy/CoreTech
WELL/API#: Wells Ranch USX BB 11-2/05-123-26755
DECLINATION: 8.22 Degrees
TD AS DRILLED: 6859 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.41921, Longitude: -104.40198
Grid North = True North -0.71 degs (NAD 27)
Grid Convergence Applied = -0.71 degs



DEPTH REFERENCE : RKB=GL Elevation= 4676 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_survey.ut

Minimum Curvature Method

Report Date/Time: 7/16/2015 / 09:03

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Geof 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	0.190	29.916	100.000	0.144	0.083	0.144	0.166	29.916	0.190
200.000	0.198	25.726	199.999	0.443	0.240	0.443	0.504	28.479	0.017
300.000	0.352	17.932	299.998	0.891	0.410	0.891	0.981	24.704	0.158
400.000	0.320	342.269	399.996	1.450	0.420	1.450	1.510	16.142	0.208
500.000	0.271	342.789	499.995	1.942	0.265	1.942	1.960	7.764	0.050
600.000	0.375	354.252	599.994	2.493	0.162	2.493	2.498	3.719	0.123
700.000	0.691	339.059	699.989	3.382	-0.086	3.382	3.383	358.540	0.343
800.000	0.876	329.944	799.980	4.607	-0.684	4.607	4.657	351.549	0.222
900.000	1.021	344.783	899.966	6.128	-1.301	6.128	6.265	348.013	0.284
1000.000	0.845	337.326	999.953	7.668	-1.819	7.668	7.881	346.654	0.214
1100.000	0.909	356.952	1099.941	9.141	-2.146	9.141	9.389	346.791	0.306
1200.000	0.931	15.067	1199.929	10.717	-1.977	10.717	10.898	349.550	0.290
1300.000	0.778	11.965	1299.918	12.166	-1.625	12.166	12.274	352.394	0.159
1400.000	0.727	15.045	1399.909	13.443	-1.319	13.443	13.508	354.396	0.065
1500.000	0.712	29.545	1499.901	14.597	-0.848	14.597	14.621	356.675	0.182
1600.000	0.757	27.880	1599.893	15.721	-0.233	15.721	15.723	359.152	0.050
1700.000	0.685	29.151	1699.885	16.826	0.367	16.826	16.830	1.250	0.074
1800.000	0.913	26.698	1799.875	18.060	1.016	18.060	18.089	3.220	0.231

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	0.780	23.746	1899.864	19.395	1.648	19.395	19.465	4.858	0.140
2000.000	0.965	20.964	1999.853	20.804	2.224	20.804	20.923	6.101	0.189
2100.000	1.033	18.311	2099.837	22.446	2.808	22.446	22.621	7.131	0.083
2200.000	1.006	26.843	2199.822	24.085	3.487	24.085	24.336	8.239	0.154
2300.000	1.096	57.685	2299.806	25.379	4.692	25.379	25.809	10.474	0.565
2400.000	0.933	19.756	2399.791	26.656	5.775	26.656	27.275	12.224	0.677
2500.000	0.900	18.906	2499.778	28.165	6.304	28.165	28.862	12.617	0.036
2600.000	1.031	31.024	2599.764	29.679	7.022	29.679	30.498	13.312	0.242
2700.000	1.131	23.427	2699.746	31.355	7.878	31.355	32.330	14.104	0.175
2800.000	1.021	32.402	2799.729	33.013	8.748	33.013	34.152	14.842	0.201
2900.000	0.870	19.216	2899.715	34.482	9.475	34.482	35.760	15.365	0.264
3000.000	1.027	12.634	2999.702	36.074	9.921	36.074	37.413	15.378	0.191
3100.000	0.939	15.480	3099.687	37.738	10.336	37.738	39.128	15.317	0.101
3200.000	0.697	355.811	3199.677	39.134	10.510	39.134	40.521	15.033	0.368
3300.000	0.638	354.132	3299.670	40.294	10.409	40.294	41.616	14.485	0.062
3400.000	0.850	347.648	3399.662	41.571	10.194	41.571	42.803	13.778	0.228
3500.000	0.824	329.583	3499.651	42.916	9.671	42.916	43.992	12.700	0.264
3600.000	0.791	339.636	3599.641	44.182	9.067	44.182	45.103	11.597	0.145
3700.000	0.579	324.878	3699.634	45.242	8.536	45.242	46.041	10.685	0.274
3800.000	0.580	324.387	3799.629	46.067	7.951	46.067	46.748	9.793	0.005
3900.000	0.480	315.879	3899.625	46.779	7.365	46.779	47.355	8.947	0.127
4000.000	0.354	323.363	3999.622	47.328	6.889	47.328	47.827	8.281	0.137
4100.000	0.532	333.212	4099.619	47.990	6.495	47.990	48.428	7.708	0.192
4200.000	0.616	304.268	4199.614	48.707	5.842	48.707	49.056	6.839	0.298
4300.000	0.827	295.133	4299.606	49.316	4.745	49.316	49.544	5.495	0.240
4400.000	0.835	274.133	4399.596	49.675	3.364	49.675	49.789	3.874	0.303
4500.000	1.205	260.736	4499.580	49.558	1.599	49.558	49.584	1.848	0.438
4600.000	1.368	245.309	4599.555	48.890	-0.523	48.890	48.893	359.387	0.381
4700.000	1.576	213.603	4699.524	47.246	-2.370	47.246	47.305	357.129	0.829
4800.000	1.685	243.123	4799.485	45.435	-4.442	45.435	45.652	354.416	0.837
4900.000	1.674	220.473	4899.443	43.660	-6.702	43.660	44.171	351.273	0.660
5000.000	1.770	239.014	4999.399	41.753	-8.974	41.753	42.707	347.869	0.563
5100.000	1.570	269.221	5099.358	40.939	-11.668	40.939	42.570	344.092	0.891
5200.000	1.634	277.114	5199.319	41.097	-14.453	41.097	43.565	340.625	0.230
5300.000	1.469	257.130	5299.283	40.988	-17.118	40.988	44.419	337.334	0.562
5400.000	1.450	278.174	5399.251	40.883	-19.620	40.883	45.347	334.363	0.533
5500.000	1.420	281.179	5499.220	41.303	-22.089	41.303	46.838	331.862	0.081
5600.000	1.296	287.962	5599.192	41.892	-24.380	41.892	48.469	329.802	0.203
5700.000	1.124	265.475	5699.170	42.163	-26.433	42.163	49.764	327.915	0.501
5800.000	1.248	307.420	5799.151	42.747	-28.276	42.747	51.253	326.516	0.857

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	0.959	292.518	5899.132	43.729	-29.914	43.729	52.982	325.625	0.405
6000.000	0.867	301.315	5999.120	44.443	-31.333	44.443	54.378	324.816	0.167
6100.000	0.908	304.514	6099.108	45.285	-32.632	45.285	55.818	324.224	0.064
6200.000	0.847	315.743	6199.096	46.264	-33.801	46.264	57.296	323.848	0.182
6300.000	0.776	339.803	6299.086	47.429	-34.551	47.429	58.679	323.928	0.345
6400.000	0.813	324.882	6399.077	48.645	-35.193	48.645	60.041	324.116	0.210
6500.000	0.885	333.437	6499.066	49.916	-35.946	49.916	61.512	324.241	0.145