



Company/Rig: Noble Energy/CoreTech
WELL/API#: Wells Ranch USX BB 11-7/05-123-25771
DECLINATION: 8.22 Degrees
TD AS DRILLED: 7220 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.41571, Longitude: -104.40162
Grid North = True North -0.71 degs (NAD 27)
Grid Convergence Applied = -0.71 degs



DEPTH REFERENCE : RKB=GL Elevation= 4659 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_survey.ut

Minimum Curvature Method

Report Date/Time: 7/16/2015 / 09:08

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	0.214	125.091	100.000	-0.107	0.153	-0.107	0.187	125.091	0.214
200.000	0.245	256.998	199.999	-0.263	0.098	-0.263	0.280	159.589	0.419
300.000	0.402	286.936	299.998	-0.209	-0.446	-0.209	0.493	244.946	0.226
400.000	0.311	307.272	399.996	0.058	-0.998	0.058	1.000	273.326	0.155
500.000	0.536	290.022	499.993	0.383	-1.654	0.383	1.697	283.025	0.257
600.000	0.598	285.083	599.988	0.679	-2.598	0.679	2.685	284.642	0.079
700.000	0.484	329.686	699.984	1.179	-3.315	1.179	3.518	289.580	0.424
800.000	0.198	273.356	799.983	1.554	-3.700	1.554	4.013	292.776	0.409
900.000	0.494	270.653	899.981	1.569	-4.304	1.569	4.581	290.026	0.297
1000.000	0.498	272.592	999.977	1.593	-5.169	1.593	5.409	287.129	0.017
1100.000	0.348	285.002	1099.974	1.692	-5.897	1.692	6.135	286.005	0.175
1200.000	0.255	268.943	1199.973	1.766	-6.413	1.766	6.652	285.396	0.125
1300.000	0.199	275.856	1299.972	1.780	-6.809	1.780	7.038	284.648	0.062
1400.000	0.227	280.403	1399.971	1.833	-7.177	1.833	7.407	284.329	0.033
1500.000	0.331	313.664	1499.970	2.068	-7.581	2.068	7.858	285.261	0.188
1600.000	0.432	287.017	1599.968	2.378	-8.150	2.378	8.490	286.266	0.201
1700.000	0.302	308.976	1699.966	2.654	-8.715	2.654	9.110	286.937	0.189
1800.000	0.108	2.849	1799.965	2.914	-8.916	2.914	9.380	288.100	0.254

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	0.306	69.287	1899.965	3.103	-8.661	3.103	9.200	289.710	0.281
2000.000	0.574	68.944	1999.962	3.377	-7.944	3.377	8.632	293.032	0.267
2100.000	1.054	79.917	2099.951	3.718	-6.571	3.718	7.550	299.502	0.503
2200.000	1.453	81.943	2199.927	4.057	-4.410	4.057	5.992	312.609	0.401
2300.000	1.918	86.203	2299.884	4.345	-1.485	4.345	4.592	341.130	0.482
2400.000	1.994	86.229	2399.825	4.571	1.920	4.571	4.958	22.791	0.075
2500.000	1.870	91.949	2499.769	4.629	5.287	4.629	7.027	48.792	0.229
2600.000	1.857	81.286	2599.716	4.819	8.519	4.819	9.788	60.502	0.346
2700.000	2.195	81.843	2699.653	5.337	12.017	5.337	13.148	66.054	0.338
2800.000	2.023	85.758	2799.586	5.739	15.673	5.739	16.691	69.889	0.224
2900.000	1.628	96.184	2899.535	5.716	18.846	5.716	19.694	73.126	0.515
3000.000	1.607	95.693	2999.495	5.424	21.654	5.424	22.323	75.937	0.026
3100.000	0.730	102.641	3099.473	5.146	23.671	5.146	24.224	77.735	0.887
3200.000	0.359	118.026	3199.469	4.859	24.569	4.859	25.045	78.812	0.396
3300.000	0.317	131.328	3299.467	4.530	25.053	4.530	25.459	79.751	0.089
3400.000	0.345	249.887	3399.466	4.244	24.978	4.244	25.336	80.358	0.569
3500.000	0.570	274.864	3499.463	4.183	24.200	4.183	24.559	80.194	0.296
3600.000	0.513	259.408	3599.459	4.142	23.264	4.142	23.630	79.904	0.156
3700.000	0.492	264.579	3699.455	4.020	22.397	4.020	22.755	79.825	0.050
3800.000	0.409	253.776	3799.452	3.879	21.627	3.879	21.972	79.831	0.119
3900.000	0.419	261.376	3899.449	3.725	20.923	3.725	21.252	79.906	0.056
4000.000	0.480	296.566	3999.446	3.857	20.187	3.857	20.552	79.182	0.278
4100.000	0.604	325.485	4099.442	4.479	19.514	4.479	20.021	77.074	0.296
4200.000	0.870	314.454	4199.434	5.444	18.673	5.444	19.451	73.746	0.300
4300.000	1.273	267.198	4299.418	5.921	17.022	5.921	18.023	70.819	0.935
4400.000	0.936	187.142	4399.404	5.057	15.811	5.057	16.600	72.264	1.444
4500.000	1.215	138.801	4499.388	3.449	16.407	3.449	16.766	78.128	0.916
4600.000	1.116	98.103	4599.369	2.514	18.070	2.514	18.244	82.078	0.816
4700.000	1.220	49.855	4699.351	3.064	19.848	3.064	20.083	81.226	0.959
4800.000	1.193	333.487	4799.334	4.681	20.197	4.681	20.732	76.951	1.492
4900.000	1.797	303.326	4899.301	6.474	18.422	6.474	19.526	70.637	0.973
5000.000	2.209	307.393	4999.240	8.506	15.580	8.506	17.751	61.367	0.435
5100.000	2.024	319.107	5099.172	11.012	12.893	11.012	16.955	49.499	0.469
5200.000	1.804	315.181	5199.116	13.464	10.627	13.464	17.152	38.284	0.256
5300.000	0.886	324.418	5299.088	15.209	9.067	15.209	17.707	30.802	0.940
5400.000	0.574	304.423	5399.080	16.122	8.204	16.122	18.089	26.970	0.399
5500.000	0.694	312.242	5499.074	16.812	7.342	16.812	18.345	23.592	0.148
5600.000	0.303	304.276	5599.070	17.368	6.675	17.368	18.607	21.024	0.396
5700.000	0.645	311.107	5699.066	17.887	6.033	17.887	18.877	18.637	0.346
5800.000	0.462	308.080	5799.061	18.506	5.291	18.506	19.247	15.956	0.185

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	0.616	307.175	5899.057	19.079	4.545	19.079	19.613	13.400	0.154
6000.000	1.202	307.223	5999.044	20.038	3.282	20.038	20.305	9.303	0.586
6100.000	1.065	299.084	6099.024	21.124	1.635	21.124	21.187	4.427	0.211
6200.000	1.354	292.292	6199.002	22.024	-0.270	22.024	22.026	359.298	0.322
6300.000	1.378	307.066	6298.974	23.197	-2.322	23.197	23.313	354.283	0.352
6400.000	1.329	294.628	6398.946	24.405	-4.336	24.405	24.787	349.925	0.297
6500.000	0.968	319.413	6498.927	25.530	-5.940	25.530	26.212	346.901	0.606