



Company/Rig: Noble Energy/ CoreTech  
WELL/API#: Wells Ranch USX BB 3-8/05-123-26209  
DECLINATION: 8.11 Degrees  
TD AS DRILLED: 6799 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.43003, Longitude: -104.41630  
Grid North = True North -0.70 degs (NAD 27)  
Grid Correction Applied = -0.70 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4702 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro\_run01-01-de\_01.ut

Minimum Curvature Method

Report Date/Time: 8/11/2016 / 08:08

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt / Wells Ranch USX BB 3-8

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	0.867	50.527	99.996	0.481	0.584	0.481	0.756	50.527	0.867
200.000	0.668	51.702	199.987	1.323	1.625	1.323	2.095	50.854	0.200
300.000	0.499	60.555	299.982	1.898	2.462	1.898	3.108	52.367	0.190
400.000	0.429	67.055	399.979	2.258	3.186	2.258	3.905	54.670	0.088
500.000	0.589	58.637	499.975	2.672	3.969	2.672	4.785	56.057	0.177
600.000	0.628	60.760	599.969	3.207	4.887	3.207	5.845	56.724	0.045
700.000	0.580	45.102	699.964	3.832	5.724	3.832	6.889	56.197	0.171
800.000	0.879	64.846	799.956	4.516	6.777	4.516	8.144	56.323	0.386
900.000	0.791	83.210	899.945	4.923	8.156	4.923	9.527	58.884	0.280
1000.000	1.019	76.907	999.933	5.206	9.708	5.206	11.016	61.795	0.249
1100.000	1.170	75.429	1099.914	5.665	11.563	5.665	12.876	63.899	0.154
1200.000	1.226	73.484	1199.892	6.226	13.577	6.226	14.936	65.365	0.069
1300.000	1.505	71.028	1299.864	6.957	15.844	6.957	17.304	66.294	0.285
1400.000	1.651	70.767	1399.826	7.858	18.445	7.858	20.050	66.925	0.146
1500.000	1.627	72.084	1499.785	8.769	21.156	8.769	22.901	67.486	0.045
1600.000	1.463	73.672	1599.749	9.565	23.732	9.565	25.587	68.049	0.169

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
1700.000	1.032	85.410	1699.725	9.996	25.854	9.996	27.719	68.863	0.499
1800.000	1.183	86.900	1799.706	10.124	27.783	10.124	29.570	69.979	0.154
1900.000	1.232	96.193	1899.684	10.063	29.883	10.063	31.532	71.388	0.202
2000.000	1.007	116.444	1999.665	9.556	31.738	9.556	33.146	73.243	0.452
2100.000	0.690	151.638	2099.655	8.635	32.811	8.635	33.928	75.256	0.595
2200.000	0.834	218.909	2199.648	7.539	32.640	7.539	33.499	76.995	0.853
2300.000	1.115	231.707	2299.633	6.369	31.419	6.369	32.058	78.540	0.354
2400.000	1.262	244.641	2399.612	5.295	29.661	5.295	30.129	79.879	0.305
2500.000	1.033	260.613	2499.592	4.676	27.776	4.676	28.167	80.444	0.391
2600.000	0.832	275.183	2599.579	4.595	26.164	4.595	26.564	80.040	0.309
2700.000	1.043	277.185	2699.566	4.774	24.538	4.774	24.998	78.990	0.213
2800.000	0.907	292.192	2799.551	5.187	22.903	5.187	23.482	77.239	0.288
2900.000	1.039	256.574	2899.538	5.275	21.288	5.275	21.932	76.082	0.608
3000.000	0.816	287.422	2999.525	5.278	19.727	5.278	20.421	75.021	0.538
3100.000	0.996	289.694	3099.513	5.784	18.230	5.784	19.125	72.397	0.183
3200.000	0.812	275.395	3199.500	6.143	16.707	6.143	17.800	69.810	0.290
3300.000	0.985	224.891	3299.489	5.601	15.395	5.601	16.382	70.007	0.782
3400.000	0.992	222.860	3399.475	4.358	14.200	4.358	14.853	72.939	0.036
3500.000	1.093	234.833	3499.458	3.174	12.831	3.174	13.217	76.107	0.240
3600.000	1.219	235.850	3599.438	2.027	11.170	2.027	11.353	79.715	0.127
3700.000	1.246	220.048	3699.415	0.597	9.590	0.597	9.609	86.436	0.340
3800.000	1.092	214.099	3799.394	-1.024	8.356	-1.024	8.419	96.986	0.196
3900.000	1.084	257.806	3899.378	-2.013	6.897	-2.013	7.185	106.269	0.810
4000.000	1.916	277.014	3999.343	-2.009	4.313	-2.009	4.758	114.970	0.961
4100.000	2.410	296.982	4099.273	-0.850	0.780	-0.850	1.154	137.469	0.894
4200.000	3.341	300.763	4199.146	1.594	-3.597	1.594	3.935	293.897	0.949
4300.000	4.280	302.588	4298.924	5.094	-9.245	5.094	10.555	298.854	0.947
4400.000	4.648	310.487	4398.621	9.734	-15.470	9.734	18.278	302.178	0.715
4500.000	4.577	317.266	4498.298	15.295	-21.259	15.295	26.189	305.734	0.549
4600.000	4.350	318.597	4597.995	21.070	-26.474	21.070	33.835	308.515	0.250
4700.000	3.523	320.232	4697.758	26.276	-30.948	26.276	40.598	310.333	0.834
4800.000	2.784	320.224	4797.606	30.504	-34.467	30.504	46.027	311.510	0.739
4900.000	2.747	318.487	4897.490	34.165	-37.609	34.165	50.811	312.253	0.092
5000.000	2.082	320.201	4997.400	37.355	-40.360	37.355	54.994	312.786	0.669
5100.000	1.927	321.221	5097.339	40.062	-42.576	40.062	58.461	313.257	0.159
5200.000	1.546	334.102	5197.293	42.586	-44.218	42.586	61.391	313.923	0.543
5300.000	1.251	348.221	5297.264	44.869	-45.030	44.869	63.568	314.897	0.452
5400.000	0.784	7.552	5397.248	46.615	-45.163	46.615	64.906	315.906	0.573
5500.000	0.467	53.087	5497.243	47.538	-44.748	47.538	65.286	316.732	0.566

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
5600.000	0.341	59.957	5597.240	47.932	-44.165	47.932	65.177	317.343	0.134
5700.000	0.509	111.417	5697.238	47.919	-43.493	47.919	64.714	317.772	0.399
5800.000	0.769	105.365	5797.231	47.579	-42.433	47.579	63.752	318.272	0.268
5900.000	0.658	130.424	5897.224	47.029	-41.348	47.029	62.621	318.678	0.328
6000.000	0.721	125.205	5997.216	46.294	-40.397	46.294	61.441	318.891	0.089
6100.000	0.691	144.218	6097.209	45.441	-39.530	45.441	60.229	318.980	0.235
6200.000	0.548	106.252	6197.204	44.818	-38.718	44.818	59.227	319.176	0.425
6300.000	0.390	173.409	6297.201	44.346	-38.220	44.346	58.544	319.243	0.535
6400.000	0.773	185.012	6397.196	43.336	-38.240	43.336	57.796	318.575	0.399
6500.000	0.793	232.741	6497.187	42.245	-38.850	42.245	57.393	317.397	0.634
6600.000	0.824	179.719	6597.179	41.107	-39.398	41.107	56.938	316.216	0.722