



Company/Rig: Noble Energy/ CoreTech
WELL/API#: Wells Ranch USX BB 3-10/05-123-26448
DECLINATION: 8.12 Degrees
TD AS DRILLED: 6868 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.42669, Longitude: -104.42123
Grid North = True North -0.70 degs (NAD 27)
Grid Correction Applied = -0.70 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4707 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 8/11/2016 / 08:22

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt / Wells Ranch USX BB 3-10

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	0.136	99.821	100.000	-0.020	0.117	-0.020	0.119	99.821	0.136
200.000	0.255	47.802	199.999	0.109	0.399	0.109	0.414	74.786	0.202
300.000	0.140	129.382	299.999	0.180	0.658	0.180	0.683	74.713	0.272
400.000	0.241	260.810	399.999	0.069	0.545	0.069	0.550	82.833	0.350
500.000	0.196	161.088	499.998	-0.127	0.393	-0.127	0.413	107.896	0.336
600.000	0.212	320.635	599.998	-0.146	0.331	-0.146	0.362	113.756	0.402
700.000	0.361	272.821	699.997	0.013	-0.100	0.013	0.101	277.258	0.269
800.000	0.018	328.631	799.996	0.041	-0.423	0.041	0.425	275.596	0.351
900.000	0.209	201.885	899.996	-0.115	-0.499	-0.115	0.512	257.019	0.220
1000.000	0.131	291.845	999.996	-0.242	-0.673	-0.242	0.715	250.232	0.247
1100.000	0.320	217.426	1099.995	-0.421	-0.949	-0.421	1.039	246.071	0.312
1200.000	0.246	165.115	1199.994	-0.851	-1.064	-0.851	1.362	231.361	0.258
1300.000	0.137	223.824	1299.993	-1.144	-1.092	-1.144	1.582	223.653	0.210
1400.000	0.287	210.325	1399.993	-1.447	-1.301	-1.447	1.946	221.965	0.157
1500.000	0.386	294.436	1499.991	-1.523	-1.734	-1.523	2.308	228.709	0.457
1600.000	0.491	300.431	1599.988	-1.167	-2.411	-1.167	2.678	244.179	0.114

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	0.351	229.374	1699.986	-1.149	-3.013	-1.149	3.225	249.126	0.503
1800.000	0.252	131.652	1799.985	-1.495	-3.081	-1.495	3.424	244.122	0.459
1900.000	0.347	94.338	1899.984	-1.664	-2.615	-1.664	3.099	237.535	0.212
2000.000	0.593	95.622	1999.981	-1.737	-1.799	-1.737	2.501	225.995	0.246
2100.000	0.691	91.751	2099.974	-1.806	-0.681	-1.806	1.930	200.655	0.108
2200.000	0.721	79.017	2199.967	-1.705	0.540	-1.705	1.788	162.418	0.159
2300.000	0.324	117.189	2299.963	-1.714	1.410	-1.714	2.219	140.565	0.508
2400.000	0.404	130.697	2399.961	-2.073	1.928	-2.073	2.831	137.072	0.117
2500.000	0.654	183.586	2499.957	-2.872	2.160	-2.872	3.593	143.060	0.522
2600.000	0.723	184.010	2599.950	-4.071	2.080	-4.071	4.571	152.939	0.069
2700.000	0.717	203.497	2699.942	-5.274	1.786	-5.274	5.568	161.289	0.244
2800.000	0.908	224.978	2799.932	-6.408	0.977	-6.408	6.482	171.333	0.356
2900.000	0.957	203.101	2899.919	-7.736	0.089	-7.736	7.737	179.339	0.357
3000.000	1.218	195.756	2999.901	-9.527	-0.527	-9.527	9.541	183.165	0.295
3100.000	1.045	173.939	3099.882	-11.456	-0.719	-11.456	11.479	183.591	0.460
3200.000	0.607	122.939	3199.873	-12.652	-0.178	-12.652	12.653	180.806	0.814
3300.000	1.086	102.111	3299.862	-13.139	1.194	-13.139	13.193	174.808	0.562
3400.000	1.856	96.061	3399.828	-13.509	3.731	-13.509	14.015	164.559	0.785
3500.000	2.594	91.719	3499.752	-13.748	7.604	-13.748	15.710	151.052	0.756
3600.000	2.779	95.009	3599.642	-14.027	12.281	-14.027	18.644	138.797	0.241
3700.000	3.086	89.959	3699.511	-14.237	17.388	-14.237	22.473	129.309	0.401
3800.000	3.171	90.846	3799.362	-14.276	22.846	-14.276	26.939	122.000	0.097
3900.000	2.458	96.452	3899.241	-14.557	27.741	-14.557	31.329	117.688	0.764
4000.000	1.802	114.892	3999.173	-15.460	31.298	-15.460	34.908	116.288	0.940
4100.000	1.189	143.362	4099.139	-16.954	33.343	-16.954	37.406	116.952	0.945
4200.000	0.540	199.396	4199.129	-18.231	33.805	-18.231	38.408	118.337	0.993
4300.000	1.248	249.518	4299.117	-19.056	32.629	-19.056	37.786	120.286	0.992
4400.000	1.254	253.327	4399.094	-19.751	30.561	-19.751	36.387	122.874	0.083
4500.000	1.642	262.835	4499.062	-20.244	28.091	-20.244	34.625	125.778	0.456
4600.000	1.870	254.377	4599.015	-20.862	25.097	-20.862	32.636	129.734	0.345
4700.000	2.746	253.122	4698.933	-21.997	21.233	-21.997	30.573	136.012	0.878
4800.000	2.994	254.276	4798.807	-23.400	16.427	-23.400	28.590	144.931	0.254
4900.000	2.459	252.883	4898.694	-24.739	11.863	-24.739	27.436	154.382	0.539
5000.000	2.136	254.233	4998.613	-25.877	8.019	-25.877	27.091	162.782	0.328
5100.000	1.920	267.173	5098.551	-26.466	4.553	-26.466	26.855	170.238	0.505
5200.000	1.495	274.200	5198.506	-26.453	1.579	-26.453	26.500	176.584	0.472
5300.000	1.260	274.697	5298.477	-26.267	-0.818	-26.267	26.280	181.783	0.236
5400.000	0.884	274.222	5398.460	-26.121	-2.682	-26.121	26.258	185.863	0.376
5500.000	0.876	293.488	5498.448	-25.759	-4.153	-25.759	26.092	189.159	0.295

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	0.560	304.480	5598.440	-25.177	-5.257	-25.177	25.721	191.795	0.344
5700.000	0.257	287.344	5698.438	-24.834	-5.874	-24.834	25.519	193.308	0.323
5800.000	0.645	179.950	5798.435	-25.330	-6.088	-25.330	26.051	193.514	0.762
5900.000	0.790	184.508	5898.428	-26.580	-6.141	-26.580	27.280	193.010	0.155
6000.000	0.417	212.089	5998.422	-27.575	-6.389	-27.575	28.306	193.045	0.462
6100.000	0.070	7.044	6098.421	-27.823	-6.575	-27.823	28.589	193.296	0.482
6200.000	1.033	56.392	6198.416	-27.263	-5.817	-27.263	27.877	192.044	0.988
6300.000	1.398	73.796	6298.393	-26.424	-3.895	-26.424	26.709	188.385	0.515
6400.000	1.377	44.495	6398.365	-25.226	-1.881	-25.226	25.296	184.264	0.702
6500.000	1.260	64.936	6498.339	-23.903	-0.042	-23.903	23.903	180.102	0.482
6600.000	1.029	55.969	6598.319	-22.935	1.698	-22.935	22.998	175.767	0.292