



Company/Rig: Noble Energy/ CoreTech  
WELL/API#: Wells Ranch USX AA 33-8/05-123-26416  
DECLINATION: 8.17 Degrees  
TD AS DRILLED: 6988 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.44499, Longitude: -104.43468  
Grid Convergence Applied = -0.69 degs (NAD 27)  
Grid North = True North -0.69 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4782 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

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

Minimum Curvature Method

Report Date/Time: 5/7/2015 / 09:14

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt

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	0.487	273.979	99.999	0.029	-0.424	0.029	0.425	273.979	0.487
200.000	0.489	293.635	199.995	0.230	-1.239	0.230	1.260	280.516	0.167
300.000	0.453	272.813	299.992	0.420	-2.024	0.420	2.067	281.732	0.174
400.000	0.380	261.182	399.989	0.389	-2.747	0.389	2.774	278.058	0.111
500.000	0.245	280.602	499.988	0.377	-3.284	0.377	3.306	276.552	0.170
600.000	0.251	179.324	599.987	0.198	-3.492	0.198	3.497	273.243	0.383
700.000	0.140	194.392	699.987	-0.139	-3.519	-0.139	3.522	267.740	0.121
800.000	0.204	197.348	799.986	-0.427	-3.603	-0.427	3.628	263.244	0.065
900.000	0.422	138.323	899.985	-0.872	-3.411	-0.872	3.520	255.660	0.362
1000.000	0.509	161.124	999.982	-1.567	-3.022	-1.567	3.404	242.587	0.203
1100.000	0.092	175.348	1099.980	-2.068	-2.872	-2.068	3.539	234.247	0.420
1200.000	0.389	112.913	1199.979	-2.280	-2.552	-2.280	3.422	228.226	0.356
1300.000	0.483	129.471	1299.976	-2.680	-1.914	-2.680	3.294	215.535	0.156
1400.000	0.146	180.663	1399.975	-3.076	-1.590	-3.076	3.462	207.344	0.408
1500.000	0.046	139.158	1499.975	-3.233	-1.566	-3.233	3.592	205.841	0.116
1600.000	0.337	181.306	1599.974	-3.557	-1.546	-3.557	3.879	203.497	0.304
1700.000	0.338	182.141	1699.972	-4.146	-1.564	-4.146	4.431	200.672	0.005
1800.000	0.304	187.824	1799.971	-4.704	-1.611	-4.704	4.972	198.910	0.046

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	0.515	141.447	1899.968	-5.318	-1.367	-5.318	5.491	194.419	0.376
2000.000	0.562	126.151	1999.964	-5.959	-0.691	-5.959	5.999	186.614	0.151
2100.000	0.748	99.840	2099.958	-6.360	0.348	-6.360	6.370	176.865	0.349
2200.000	0.803	82.431	2199.949	-6.379	1.686	-6.379	6.599	165.193	0.241
2300.000	0.766	95.739	2299.939	-6.354	3.046	-6.354	7.046	154.386	0.186
2400.000	0.502	50.295	2399.934	-6.141	4.048	-6.141	7.355	146.605	0.547
2500.000	0.300	19.642	2499.931	-5.615	4.473	-5.615	7.179	141.454	0.288
2600.000	0.464	11.344	2599.929	-4.971	4.641	-4.971	6.801	136.967	0.173
2700.000	0.288	28.878	2699.927	-4.353	4.842	-4.353	6.511	131.957	0.208
2800.000	0.262	358.987	2799.926	-3.904	4.960	-3.904	6.312	128.210	0.144
2900.000	0.267	338.662	2899.925	-3.459	4.871	-3.459	5.974	125.377	0.093
3000.000	0.388	342.317	2999.923	-2.919	4.683	-2.919	5.519	121.937	0.122
3100.000	0.691	344.165	3099.918	-2.017	4.416	-2.017	4.855	114.548	0.304
3200.000	0.376	341.966	3199.914	-1.125	4.150	-1.125	4.300	105.166	0.316
3300.000	0.531	311.196	3299.911	-0.508	3.700	-0.508	3.734	97.814	0.283
3400.000	1.023	252.356	3399.903	-0.473	2.500	-0.473	2.545	100.714	0.875
3500.000	0.842	223.041	3499.890	-1.281	1.148	-1.281	1.720	138.126	0.503
3600.000	1.253	214.987	3599.873	-2.714	0.019	-2.714	2.714	179.591	0.436
3700.000	1.280	208.132	3699.849	-4.595	-1.134	-4.595	4.733	193.868	0.154
3800.000	1.050	197.253	3799.828	-6.455	-1.933	-6.455	6.738	196.670	0.318
3900.000	1.051	194.374	3899.811	-8.219	-2.432	-8.219	8.571	196.486	0.053
4000.000	0.984	201.756	3999.796	-9.904	-2.978	-9.904	10.342	196.736	0.147
4100.000	0.791	186.402	4099.784	-11.387	-3.373	-11.387	11.876	196.501	0.305
4200.000	0.439	207.129	4199.778	-12.414	-3.625	-12.414	12.932	196.278	0.411
4300.000	1.094	263.395	4299.770	-12.865	-4.748	-12.865	13.713	200.257	0.925
4400.000	1.985	275.829	4399.733	-12.799	-7.419	-12.799	14.793	210.098	0.946
4500.000	2.004	296.992	4499.674	-11.829	-10.699	-11.829	15.950	222.128	0.733
4600.000	2.077	322.980	4599.612	-9.589	-13.348	-9.589	16.435	234.308	0.920
4700.000	1.568	331.220	4699.562	-6.943	-15.098	-6.943	16.618	245.305	0.572
4800.000	1.579	334.581	4799.524	-4.499	-16.348	-4.499	16.956	254.612	0.093
4900.000	1.205	325.693	4899.494	-2.386	-17.532	-2.386	17.694	262.251	0.431
5000.000	0.906	306.147	4999.478	-1.051	-18.763	-1.051	18.793	266.794	0.464
5100.000	0.572	301.348	5099.469	-0.325	-19.828	-0.325	19.831	269.061	0.339
5200.000	1.179	293.793	5199.457	0.350	-21.196	0.350	21.199	270.947	0.617
5300.000	1.393	294.683	5299.432	1.273	-23.243	1.273	23.278	273.135	0.215
5400.000	0.473	272.000	5399.418	1.795	-24.760	1.795	24.825	274.147	0.974
5500.000	0.771	173.984	5499.414	1.140	-25.102	1.140	25.128	272.601	0.959
5600.000	1.145	147.859	5599.400	-0.375	-24.500	-0.375	24.503	269.124	0.566
5700.000	1.313	123.999	5699.378	-1.861	-23.019	-1.861	23.094	265.378	0.534
5800.000	1.290	116.677	5799.352	-3.007	-21.064	-3.007	21.277	261.876	0.168

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	0.800	128.391	5899.335	-3.946	-19.511	-3.946	19.906	258.568	0.532
6000.000	0.958	93.746	5999.324	-4.434	-18.130	-4.434	18.664	256.258	0.544
6100.000	1.063	110.560	6099.309	-4.814	-16.428	-4.814	17.119	253.667	0.313
6200.000	1.007	101.920	6199.292	-5.321	-14.700	-5.321	15.633	250.100	0.166
6300.000	0.992	84.169	6299.277	-5.415	-12.979	-5.415	14.063	247.354	0.309
6400.000	0.843	93.652	6399.265	-5.374	-11.384	-5.374	12.588	244.730	0.212
6500.000	0.753	101.229	6499.255	-5.549	-10.004	-5.549	11.440	240.986	0.139
6600.000	0.627	103.122	6599.248	-5.801	-8.826	-5.801	10.562	236.685	0.128
6700.000	1.158	81.377	6699.235	-5.774	-7.294	-5.774	9.303	231.635	0.620