



Company/Rig: Noble Energy/CoreTech  
WELL/API#: Wells Ranch USX AA 19-9/05-123-26433  
DECLINATION: 8.24 Degrees  
TD AS DRILLED: 6930 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.47009, Longitude: -104.47261  
Grid North = True North -0.66 degs (NAD 27)  
Grid Convergence Applied = -0.66 degs



DEPTH REFERENCE : RKB=GL Elevation=4656 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: survey-01-de\_01.ut

Minimum Curvature Method

Report Date/Time: 10/15/2015 / 10:59

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Geof Davis / Wells Ranch USX AA 19-9

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	0.252	103.566	100.000	-0.052	0.214	-0.052	0.220	103.566	0.252
200.000	0.278	116.261	199.999	-0.210	0.644	-0.210	0.678	108.071	0.064
300.000	0.251	59.600	299.998	-0.207	1.050	-0.207	1.071	101.124	0.252
400.000	0.158	154.238	399.997	-0.220	1.299	-0.220	1.318	99.618	0.307
500.000	0.659	137.893	499.994	-0.772	1.745	-0.772	1.908	113.848	0.509
600.000	0.799	141.131	599.986	-1.741	2.568	-1.741	3.103	124.131	0.145
700.000	0.310	190.611	699.982	-2.550	2.956	-2.550	3.904	130.779	0.642
800.000	0.494	180.546	799.979	-3.247	2.902	-3.247	4.355	138.210	0.197
900.000	0.110	280.574	899.978	-3.661	2.803	-3.661	4.611	142.553	0.525
1000.000	0.046	186.769	999.978	-3.682	2.704	-3.682	4.569	143.708	0.122
1100.000	0.290	357.400	1099.978	-3.469	2.688	-3.469	4.389	142.230	0.335
1200.000	0.514	17.437	1199.975	-2.789	2.811	-2.789	3.960	134.773	0.261
1300.000	0.687	3.677	1299.970	-1.763	2.984	-1.763	3.466	120.582	0.224
1400.000	1.291	354.522	1399.954	-0.044	2.915	-0.044	2.915	90.872	0.622
1500.000	1.400	348.623	1499.927	2.274	2.566	2.274	3.429	48.454	0.176
1600.000	1.284	340.141	1599.899	4.525	1.945	4.525	4.926	23.252	0.229
1700.000	1.083	328.406	1699.878	6.384	1.069	6.384	6.473	9.505	0.314
1800.000	1.089	320.482	1799.860	7.922	-0.031	7.922	7.922	359.778	0.150

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	1.178	320.621	1899.841	9.450	-1.288	9.450	9.537	352.241	0.089
2000.000	1.341	322.680	1999.817	11.175	-2.649	11.175	11.485	346.662	0.169
2100.000	1.089	323.218	2099.794	12.867	-3.928	12.867	13.453	343.023	0.252
2200.000	1.098	324.256	2199.776	14.406	-5.057	14.406	15.268	340.658	0.021
2300.000	0.904	322.947	2299.760	15.813	-6.091	15.813	16.945	338.932	0.195
2400.000	0.442	318.870	2399.753	16.732	-6.820	16.732	18.069	337.824	0.464
2500.000	0.413	327.198	2499.751	17.326	-7.269	17.326	18.789	337.239	0.068
2600.000	0.373	318.450	2599.748	17.873	-7.681	17.873	19.453	336.745	0.072
2700.000	0.343	333.264	2699.746	18.384	-8.031	18.384	20.062	336.401	0.097
2800.000	0.686	331.396	2799.742	19.177	-8.453	19.177	20.958	336.213	0.343
2900.000	0.660	317.310	2899.735	20.126	-9.130	20.126	22.100	335.600	0.167
3000.000	0.278	283.600	2999.732	20.606	-9.756	20.606	22.799	334.666	0.455
3100.000	0.222	195.604	3099.731	20.477	-10.043	20.477	22.807	333.873	0.349
3200.000	0.619	94.150	3199.729	20.251	-9.556	20.251	22.392	334.738	0.698
3300.000	0.711	93.940	3299.722	20.169	-8.398	20.169	21.848	337.393	0.091
3400.000	0.671	100.093	3399.715	20.024	-7.203	20.024	21.280	340.214	0.084
3500.000	0.272	170.322	3499.712	19.687	-6.587	19.687	20.760	341.500	0.633
3600.000	0.315	196.070	3599.711	19.188	-6.623	19.188	20.299	340.957	0.137
3700.000	0.022	14.844	3699.710	18.943	-6.694	18.943	20.091	340.537	0.338
3800.000	0.523	37.340	3799.709	19.325	-6.413	19.325	20.361	341.642	0.502
3900.000	0.462	14.183	3899.705	20.078	-6.037	20.078	20.966	343.264	0.206
4000.000	0.861	14.815	3999.699	21.195	-5.747	21.195	21.960	344.830	0.399
4100.000	1.341	349.695	4099.680	23.073	-5.764	23.073	23.782	345.974	0.670
4200.000	1.848	343.567	4199.641	25.771	-6.429	25.771	26.561	345.992	0.535
4300.000	2.234	346.706	4299.578	29.215	-7.334	29.215	30.121	345.908	0.401
4400.000	2.730	341.364	4399.484	33.368	-8.543	33.368	34.445	345.639	0.547
4500.000	3.376	336.643	4499.341	38.328	-10.471	38.328	39.733	344.719	0.692
4600.000	3.877	335.008	4599.141	44.095	-13.067	44.095	45.990	343.494	0.512
4700.000	4.318	340.440	4698.885	50.707	-15.756	50.707	53.098	342.739	0.587
4800.000	3.746	332.080	4798.638	57.141	-18.546	57.141	60.076	342.018	0.819
4900.000	3.373	336.112	4898.445	62.718	-21.267	62.718	66.225	341.269	0.449
5000.000	2.809	339.969	4998.300	67.710	-23.298	67.710	71.606	341.013	0.600
5100.000	1.869	341.892	5098.215	71.563	-24.644	71.563	75.687	340.998	0.943
5200.000	0.647	324.988	5198.189	73.576	-25.475	73.576	77.862	340.902	1.264
5300.000	0.512	237.285	5298.186	73.797	-26.176	73.797	78.302	340.470	0.809
5400.000	0.396	211.245	5398.183	73.260	-26.731	73.260	77.985	339.954	0.234
5500.000	0.357	310.521	5498.181	73.167	-27.148	73.167	78.041	339.643	0.575
5600.000	0.334	18.706	5598.180	73.645	-27.291	73.645	78.539	339.667	0.388
5700.000	0.567	356.456	5698.177	74.415	-27.228	74.415	79.240	339.903	0.287
5800.000	0.497	23.234	5798.173	75.307	-27.088	75.307	80.031	340.217	0.256

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	0.776	27.550	5898.167	76.306	-26.603	76.306	80.811	340.779	0.283
6000.000	0.718	39.598	5998.158	77.390	-25.891	77.390	81.606	341.502	0.167
6100.000	0.822	19.211	6098.149	78.550	-25.255	78.550	82.510	342.177	0.291
6200.000	0.893	15.952	6198.138	79.976	-24.805	79.976	83.735	342.769	0.086
6300.000	0.771	11.500	6298.127	81.385	-24.457	81.385	84.980	343.274	0.137
6400.000	0.704	359.517	6398.119	82.659	-24.328	82.659	86.165	343.600	0.168
6500.000	0.461	1.701	6498.114	83.675	-24.321	83.675	87.138	343.793	0.244
6600.000	0.459	52.290	6598.111	84.322	-23.992	84.322	87.669	344.117	0.393
6650.000	0.209	49.092	6648.110	84.504	-23.765	84.504	87.782	344.293	0.501