



**Company:** Noble Energy  
**Rig:** Production / V.E.S.

**API #** 05-123-16120

**Date:** 7/22/2013

**Surveyor:** Norman Cowan

**VS:** 0.000

**Lat :** 40.317

**Long:** -104.478

**Well:** Watkins CC 18-2

**Location:** Weld County, Colorado

**North Reference:** GRID

**Convergence:** Grid north is -0.66 Deg of True No

**Declination:** 8.42 Degrees

**Depth Reference:** Ground Level

**Elevation:** 4644 Feet

**Total Depth as Drilled:** 6878 Feet

**Lat & Long obtained by handheld GPS at wellhead**

HA Gyro Survey Calculations

Depth	Inc	AzG	N/-S	E/-W	TVD	DL	VS	CD	Cbrg
0.000	0.000	0.000	0.000	0.000	0.000	****	0.000	0.000	0.000
100.000	0.236	320.469	0.159	-0.131	100.000	0.236	0.159	0.206	320.469
200.000	0.419	305.866	0.531	-0.558	199.998	0.200	0.531	0.770	313.602
300.000	0.365	312.369	0.960	-1.089	299.996	0.069	0.960	1.452	311.390
400.000	0.419	333.380	1.502	-1.488	399.993	0.153	1.502	2.114	315.254
500.000	0.555	330.574	2.251	-1.890	499.990	0.138	2.251	2.939	319.974
600.000	0.497	339.767	3.079	-2.278	599.986	0.103	3.079	3.830	323.504
700.000	0.513	330.439	3.875	-2.649	699.982	0.084	3.875	4.694	325.646
800.000	0.506	330.349	4.648	-3.088	799.978	0.007	4.648	5.581	326.401
900.000	0.584	328.480	5.466	-3.573	899.973	0.080	5.466	6.530	326.830
1000.000	0.592	325.100	6.324	-4.135	999.968	0.036	6.324	7.556	326.823
1100.000	0.562	340.503	7.210	-4.594	1099.963	0.157	7.210	8.549	327.496
1200.000	0.579	321.890	8.070	-5.070	1199.958	0.185	8.070	9.531	327.863
1300.000	0.410	317.886	8.733	-5.622	1299.954	0.173	8.733	10.386	327.231
1400.000	0.450	326.571	9.326	-6.078	1399.952	0.076	9.326	11.132	326.909
1500.000	0.468	319.921	9.966	-6.557	1499.948	0.056	9.966	11.930	326.659
1600.000	0.320	298.247	10.411	-7.065	1599.946	0.207	10.411	12.582	325.836
1700.000	0.123	284.811	10.570	-7.415	1699.945	0.202	10.570	12.912	324.950
1800.000	0.116	321.107	10.676	-7.582	1799.945	0.075	10.676	13.095	324.618
1900.000	0.105	175.346	10.664	-7.638	1899.945	0.211	10.664	13.117	324.387
2000.000	0.088	234.423	10.528	-7.693	1999.945	0.096	10.528	13.039	323.844
2100.000	0.351	162.764	10.191	-7.665	2099.944	0.334	10.191	12.752	323.054
2200.000	0.549	177.304	9.420	-7.551	2199.941	0.228	9.420	12.073	321.283
2300.000	0.568	174.144	8.448	-7.478	2299.936	0.036	8.448	11.282	318.484
2400.000	0.495	172.291	7.527	-7.370	2399.932	0.075	7.527	10.534	315.604
2500.000	0.517	172.068	6.652	-7.249	2499.928	0.022	6.652	9.839	312.539
2600.000	0.511	165.077	5.774	-7.072	2599.924	0.063	5.774	9.130	309.230
2700.000	0.480	185.645	4.927	-6.999	2699.920	0.179	4.927	8.559	305.145
2800.000	0.311	176.691	4.239	-7.024	2799.918	0.179	4.239	8.204	301.113
2900.000	0.292	209.962	3.748	-7.136	2899.917	0.174	3.748	8.060	297.711
3000.000	0.523	240.404	3.302	-7.660	2999.914	0.309	3.302	8.341	293.321
3100.000	1.029	243.872	2.681	-8.863	3099.905	0.508	2.681	9.259	286.833
3200.000	0.680	258.004	2.163	-10.249	3199.894	0.405	2.163	10.475	281.914
3300.000	0.458	295.710	2.213	-11.191	3299.889	0.424	2.213	11.407	281.184
3400.000	0.525	356.254	2.843	-11.581	3399.886	0.499	2.843	11.925	283.792
3500.000	0.594	4.626	3.816	-11.569	3499.881	0.107	3.816	12.182	288.257

3600.000	0.571	359.627	4.832	-11.531	3599.876	0.056	4.832	12.502	292.735
3700.000	0.660	358.619	5.905	-11.548	3699.870	0.089	5.905	12.970	297.085
3800.000	0.595	11.981	6.989	-11.454	3799.864	0.159	6.989	13.418	301.391
3900.000	0.635	0.672	8.051	-11.339	3899.858	0.127	8.051	13.907	305.374
4000.000	0.730	353.591	9.238	-11.404	3999.851	0.127	9.238	14.676	309.009
4100.000	0.683	3.949	10.466	-11.434	4099.844	0.136	10.466	15.501	312.468
4200.000	0.908	21.943	11.795	-11.097	4199.834	0.333	11.795	16.195	316.746
4300.000	1.128	20.717	13.450	-10.453	4299.818	0.221	13.450	17.034	322.146
4400.000	1.148	18.794	15.318	-9.782	4399.799	0.043	15.318	18.175	327.438
4500.000	1.457	20.641	17.457	-9.011	4499.773	0.312	17.457	19.645	332.696
4600.000	0.842	31.497	19.273	-8.179	4599.752	0.650	19.273	20.937	337.004
4700.000	0.289	144.598	19.693	-7.649	4699.749	0.992	19.693	21.127	338.773
4800.000	0.417	139.842	19.209	-7.268	4799.747	0.131	19.209	20.538	339.275
4900.000	0.590	96.014	18.877	-6.522	4899.743	0.409	18.877	19.972	340.941
5000.000	1.131	77.859	19.031	-5.045	4999.732	0.599	19.031	19.688	345.154
5100.000	1.764	71.288	19.732	-2.622	5099.699	0.653	19.732	19.906	352.431
5200.000	1.926	72.536	20.730	0.439	5199.648	0.167	20.730	20.735	1.212
5300.000	1.995	73.472	21.730	3.710	5299.589	0.076	21.730	22.044	9.688
5400.000	1.998	76.355	22.636	7.072	5399.528	0.100	22.636	23.715	17.350
5500.000	2.050	78.548	23.402	10.519	5499.466	0.093	23.402	25.658	24.203
5600.000	1.991	78.025	24.118	13.971	5599.404	0.061	24.118	27.872	30.082
5700.000	1.959	77.699	24.842	17.340	5699.344	0.033	24.842	30.296	34.915
5800.000	2.096	81.541	25.476	20.820	5799.282	0.193	25.476	32.901	39.257
5900.000	2.169	80.361	26.061	24.494	5899.213	0.085	26.061	35.765	43.224
6000.000	2.528	80.918	26.726	28.537	5999.128	0.360	26.726	39.098	46.876
6100.000	2.708	80.117	27.480	33.042	6099.024	0.183	27.480	42.976	50.251
6200.000	2.913	83.711	28.164	37.894	6198.904	0.270	28.164	47.214	53.379
6300.000	3.249	84.617	28.708	43.241	6298.759	0.340	28.708	51.903	56.420
6400.000	3.854	86.474	29.181	49.417	6398.567	0.615	29.181	57.389	59.438
6500.000	4.461	86.386	29.632	56.652	6498.303	0.607	29.632	63.934	62.388
6600.000	3.945	91.829	29.768	63.972	6598.034	0.651	29.768	70.558	65.046
6700.000	3.215	100.905	29.127	70.164	6697.839	0.922	29.127	75.970	67.455
6715.000	3.162	100.831	28.970	70.983	6712.816	0.353	28.970	76.668	67.799

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