



**Company:** Noble Energy  
**Rig:** Production/VES  
**API #** 05-123-26804  
**Date:** 3/30/2013  
**Surveyor:** Nick Kula  
**VS:** 0.000  
**Lat :** 40.46667  
**Long:** -104.449

**Well:** Wells Ranch AA 21-13  
**Location:** Weld County, Colorado  
**North Reference:** GRID  
**Convergence:** Grid North is 0.680 Degrees East c  
**Declination:** 8.46  
**Depth Reference:** Ground Level  
**Elevation:** 4697'  
**Total Depth as Drilled:** 6932'

**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	0.000
100.000	0.980	238.724	-0.444	-0.731	99.995	0.980	-0.444	0.855	238.724
200.000	1.004	239.865	-1.328	-2.220	199.980	0.031	-1.328	2.586	239.110
300.000	0.890	238.716	-2.171	-3.641	299.966	0.116	-2.171	4.239	239.194
400.000	0.846	237.235	-2.973	-4.925	399.955	0.049	-2.973	5.753	238.878
500.000	0.647	261.788	-3.454	-6.104	499.947	0.372	-3.454	7.013	240.500
600.000	0.545	240.136	-3.771	-7.075	599.941	0.245	-3.771	8.017	241.943
700.000	0.595	264.507	-4.057	-8.004	699.937	0.246	-4.057	8.974	243.120
800.000	0.887	280.141	-3.971	-9.283	799.928	0.352	-3.971	10.096	246.841
900.000	1.054	262.783	-3.950	-10.957	899.914	0.336	-3.950	11.647	250.175
1000.000	0.906	280.703	-3.919	-12.647	999.900	0.338	-3.919	13.240	252.783
1100.000	0.856	268.465	-3.792	-14.170	1099.888	0.194	-3.792	14.669	255.019
1200.000	1.167	260.701	-3.976	-15.921	1199.872	0.339	-3.976	16.410	255.977
1300.000	1.192	268.376	-4.170	-17.965	1299.851	0.160	-4.170	18.443	256.931
1400.000	0.751	280.067	-4.085	-19.650	1399.837	0.481	-4.085	20.070	258.256
1500.000	0.637	281.652	-3.858	-20.840	1499.829	0.116	-3.858	21.194	259.511
1600.000	0.650	279.834	-3.649	-21.944	1599.823	0.025	-3.649	22.245	260.558
1700.000	0.642	242.174	-3.814	-22.998	1699.817	0.417	-3.814	23.312	260.584
1800.000	0.450	268.786	-4.084	-23.886	1799.813	0.313	-4.084	24.233	260.298
1900.000	0.655	234.855	-4.421	-24.746	1899.808	0.377	-4.421	25.138	259.871
2000.000	1.187	242.584	-5.227	-26.133	1999.795	0.545	-5.227	26.651	258.689
2100.000	0.768	253.598	-5.893	-27.696	2099.780	0.457	-5.893	28.316	257.988
2200.000	0.432	212.129	-6.401	-28.539	2199.775	0.529	-6.401	29.248	257.358
2300.000	0.684	209.359	-7.240	-29.032	2299.770	0.253	-7.240	29.921	255.996
2400.000	0.302	294.761	-7.650	-29.564	2399.767	0.725	-7.650	30.537	255.492
2500.000	0.178	299.877	-7.462	-29.938	2499.766	0.126	-7.462	30.854	256.004
2600.000	0.452	311.813	-7.122	-30.366	2599.765	0.280	-7.122	31.190	256.801
2700.000	0.173	300.958	-6.781	-30.790	2699.763	0.284	-6.781	31.528	257.580
2800.000	0.536	301.695	-6.457	-31.318	2799.761	0.363	-6.457	31.977	258.350
2900.000	0.895	305.968	-5.753	-32.348	2899.753	0.362	-5.753	32.856	259.916
3000.000	1.831	320.106	-4.069	-34.004	2999.724	0.988	-4.069	34.247	263.177
3100.000	1.982	328.926	-1.362	-35.921	3099.669	0.329	-1.362	35.947	267.828
3200.000	1.784	348.857	1.646	-37.115	3199.616	0.680	1.646	37.151	272.539
3300.000	1.181	7.229	4.196	-37.286	3299.583	0.760	4.196	37.521	276.421
3400.000	0.529	145.575	4.838	-36.895	3399.576	1.616	4.838	37.211	277.470

3500.000	1.403	165.804	3.270	-36.333	3499.561	0.924	3.270	36.480	275.142
3600.000	1.858	166.900	0.504	-35.666	3599.521	0.456	0.504	35.669	270.810
3700.000	1.767	155.248	-2.474	-34.653	3699.471	0.379	-2.474	34.741	265.916
3800.000	1.753	148.615	-5.180	-33.211	3799.424	0.204	-5.180	33.612	261.135
3900.000	1.805	139.889	-7.691	-31.399	3899.376	0.276	-7.691	32.327	256.237
4000.000	1.798	156.367	-10.332	-29.756	3999.327	0.516	-10.332	31.498	250.851
4100.000	1.715	155.400	-13.130	-28.504	4099.280	0.087	-13.130	31.383	245.267
4200.000	1.792	145.130	-15.774	-26.987	4199.234	0.323	-15.774	31.259	239.692
4300.000	1.622	149.315	-18.275	-25.370	4299.189	0.211	-18.275	31.267	234.234
4400.000	1.916	154.097	-20.996	-23.918	4399.141	0.329	-20.996	31.826	228.722
4500.000	2.060	159.818	-24.186	-22.567	4499.081	0.245	-24.186	33.079	223.017
4600.000	2.620	150.820	-27.869	-20.833	4598.998	0.669	-27.869	34.795	216.780
4700.000	2.932	154.780	-32.178	-18.628	4698.880	0.366	-32.178	37.181	210.067
4800.000	3.451	166.462	-37.418	-16.834	4798.726	0.829	-37.418	41.031	204.222
4900.000	3.901	154.680	-43.420	-14.674	4898.522	0.877	-43.420	45.833	198.673
5000.000	3.354	162.233	-49.281	-12.327	4998.321	0.726	-49.281	50.799	194.043
5100.000	1.572	160.370	-53.359	-10.973	5098.225	1.783	-53.359	54.476	191.621
5200.000	0.794	130.536	-55.102	-9.985	5198.204	0.968	-55.102	56.000	190.271
5300.000	0.189	71.835	-55.501	-9.301	5298.200	0.715	-55.501	56.275	189.514
5400.000	0.376	23.188	-55.148	-9.015	5398.199	0.288	-55.148	55.880	189.284
5500.000	0.318	23.476	-54.592	-8.775	5498.197	0.058	-54.592	55.293	189.132
5600.000	0.540	104.879	-54.458	-8.209	5598.195	0.585	-54.458	55.074	188.572
5700.000	0.233	59.965	-54.478	-7.577	5698.193	0.410	-54.478	55.002	187.918
5800.000	0.610	76.266	-54.250	-6.885	5798.190	0.392	-54.250	54.685	187.232
5900.000	0.478	59.881	-53.914	-6.007	5898.185	0.203	-53.914	54.248	186.357
6000.000	0.758	83.688	-53.632	-4.989	5998.179	0.374	-53.632	53.864	185.314
6100.000	0.833	102.789	-53.721	-3.622	6098.170	0.274	-53.721	53.842	183.857
6200.000	0.524	142.890	-54.246	-2.637	6198.163	0.549	-54.246	54.310	182.783
6300.000	1.451	140.952	-55.594	-1.563	6298.147	0.927	-55.594	55.616	181.611
6400.000	2.201	134.281	-57.918	0.609	6398.096	0.779	-57.918	57.921	179.398
6500.000	0.605	135.004	-59.632	2.357	6498.063	1.596	-59.632	59.679	177.736
6600.000	0.865	277.511	-59.907	1.983	6598.059	1.395	-59.907	59.940	178.104
6700.000	0.942	319.928	-59.179	0.705	6698.048	0.658	-59.179	59.184	179.317
6730.000	0.885	333.025	-58.784	0.441	6728.044	0.720	-58.784	58.786	179.570

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