



**Company:** Noble Energy  
**Rig:** Production / VES  
**API #** 05-123-26228

**Date:** 10/22/2013

**Surveyor:** CJ Hines

**VS:** 0.000

**Lat :** 40.507

**Long:** -104.468

**Well:** New Cache #8-22

**Location:** Weld County, Colorado

**North Reference:** GRID

**Convergence:** Grid north is 0.67 Deg East of True

**Declination:** 8.39

**Depth Reference:** Ground Level

**Elevation:** 4696

**Total Depth as Drilled:** 7100

**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	0.390	25.652	0.307	0.147	99.999	0.390	0.307	0.340	25.652
200.000	0.214	50.562	0.732	0.439	199.998	0.216	0.732	0.854	30.942
300.000	0.111	138.935	0.778	0.647	299.998	0.238	0.778	1.012	39.748
400.000	0.098	122.987	0.659	0.782	399.997	0.032	0.659	1.023	49.902
500.000	0.108	177.425	0.518	0.858	499.997	0.095	0.518	1.002	58.882
600.000	0.407	136.201	0.167	1.108	599.996	0.333	0.167	1.120	81.415
700.000	0.307	127.822	-0.254	1.566	699.994	0.112	-0.254	1.586	99.198
800.000	0.434	71.520	-0.298	2.137	799.992	0.367	-0.298	2.158	97.935
900.000	0.905	85.050	-0.110	3.283	899.985	0.494	-0.110	3.285	91.911
1000.000	0.830	72.861	0.172	4.763	999.974	0.199	0.172	4.766	87.930
1100.000	1.012	60.190	0.825	6.222	1099.961	0.272	0.825	6.276	82.450
1200.000	0.969	56.624	1.729	7.694	1199.946	0.075	1.729	7.886	77.336
1300.000	1.149	69.707	2.542	9.340	1299.929	0.300	2.542	9.680	74.777
1400.000	1.023	52.966	3.427	10.993	1399.911	0.340	3.427	11.515	72.685
1500.000	1.030	75.318	4.193	12.576	1499.896	0.398	4.193	13.257	71.561
1600.000	1.083	60.002	4.893	14.264	1599.879	0.286	4.893	15.080	71.066
1700.000	0.401	52.213	5.580	15.359	1699.870	0.687	5.580	16.342	70.033
1800.000	0.188	9.535	5.957	15.663	1799.869	0.292	5.957	16.758	69.177
1900.000	0.443	283.227	6.208	15.314	1899.868	0.470	6.208	16.525	67.934
2000.000	0.716	280.440	6.410	14.323	1999.862	0.275	6.410	15.692	65.892
2100.000	1.022	279.850	6.675	12.830	2099.851	0.306	6.675	14.463	62.512
2200.000	0.928	290.566	7.112	11.193	2199.836	0.205	7.112	13.262	57.568
2300.000	1.189	294.483	7.827	9.491	2299.819	0.271	7.827	12.302	50.490
2400.000	1.418	311.099	9.070	7.614	2399.794	0.440	9.070	11.843	40.013
2500.000	0.878	306.483	10.340	6.065	2499.773	0.548	10.340	11.987	30.397
2600.000	0.909	295.304	11.134	4.732	2599.761	0.177	11.134	12.098	23.024
2700.000	1.068	304.092	11.996	3.243	2699.746	0.219	11.996	12.426	15.127
2800.000	1.015	302.195	12.990	1.721	2799.730	0.063	12.990	13.104	7.548
2900.000	0.964	301.209	13.898	0.252	2899.715	0.054	13.898	13.901	1.038
3000.000	1.028	326.378	15.082	-0.964	2999.700	0.439	15.082	15.112	356.341
3100.000	0.839	353.200	16.556	-1.548	3099.687	0.471	16.556	16.628	354.658
3200.000	0.713	32.327	17.808	-1.302	3199.679	0.533	17.808	17.856	355.819
3300.000	1.485	60.191	18.978	0.155	3299.660	0.917	18.978	18.979	0.469
3400.000	1.969	74.063	20.094	2.932	3399.615	0.636	20.094	20.307	8.301
3500.000	1.998	95.304	20.405	6.320	3499.556	0.732	20.405	21.361	17.208

3600.000	2.060	94.935	20.089	9.846	3599.494	0.063	20.089	22.372	26.111
3700.000	2.027	105.673	19.457	13.339	3699.430	0.384	19.457	23.590	34.434
3800.000	2.288	101.031	18.597	17.001	3799.360	0.315	18.597	25.197	42.433
3900.000	2.171	107.012	17.661	20.772	3899.284	0.260	17.661	27.265	49.628
4000.000	1.939	111.389	16.490	24.159	3999.220	0.280	16.490	29.250	55.684
4100.000	1.707	114.797	15.248	27.086	4099.169	0.256	15.248	31.083	60.622
4200.000	1.661	121.036	13.876	29.680	4199.126	0.189	13.876	32.763	64.942
4300.000	1.182	125.320	12.533	31.763	4299.095	0.491	12.533	34.146	68.467
4400.000	1.002	142.659	11.242	33.134	4399.077	0.374	11.242	34.990	71.259
4500.000	0.752	160.908	9.927	33.879	4499.065	0.372	9.927	35.304	73.669
4600.000	1.490	184.407	8.011	33.994	4599.046	0.855	8.011	34.925	76.739
4700.000	2.278	196.586	4.811	33.327	4698.992	0.880	4.811	33.672	81.786
4800.000	2.664	212.516	0.946	31.510	4798.900	0.784	0.946	31.524	88.280
4900.000	3.080	222.693	-2.988	28.439	4898.774	0.656	-2.988	28.596	95.997
5000.000	2.528	225.441	-6.509	25.047	4998.654	0.568	-6.509	25.879	104.568
5100.000	2.146	232.792	-9.189	21.984	5098.571	0.485	-9.189	23.827	112.684
5200.000	1.747	227.224	-11.356	19.374	5198.513	0.441	-11.356	22.457	120.377
5300.000	1.260	226.442	-13.149	17.458	5298.479	0.488	-13.149	21.856	126.987
5400.000	1.263	219.989	-14.752	15.953	5398.454	0.142	-14.752	21.728	132.759
5500.000	1.069	208.450	-16.416	14.800	5498.434	0.304	-16.416	22.103	137.964
5600.000	0.789	224.442	-17.728	13.874	5598.421	0.379	-17.728	22.511	141.953
5700.000	0.393	212.037	-18.510	13.210	5698.415	0.413	-18.510	22.740	144.485
5800.000	0.447	219.427	-19.102	12.780	5798.413	0.077	-19.102	22.983	146.215
5900.000	0.444	211.191	-19.735	12.332	5898.410	0.064	-19.735	23.271	148.000
6000.000	0.534	235.637	-20.329	11.747	5998.406	0.225	-20.329	23.479	149.980
6100.000	0.358	256.045	-20.668	11.059	6098.403	0.234	-20.668	23.440	151.849
6200.000	0.465	254.998	-20.848	10.363	6198.400	0.107	-20.848	23.282	153.568
6300.000	0.330	238.015	-21.106	9.727	6298.398	0.178	-21.106	23.239	155.257
6400.000	0.488	180.044	-21.684	9.482	6398.396	0.420	-21.684	23.667	156.381
6500.000	0.353	154.395	-22.388	9.615	6498.393	0.228	-22.388	24.365	156.758
6600.000	0.442	198.105	-23.033	9.628	6598.391	0.308	-23.033	24.964	157.314
6700.000	0.377	174.175	-23.727	9.541	6698.389	0.182	-23.727	25.573	158.093

☞ North