



**Company:** Noble Energy  
**Rig:** Production/Coretech  
**API #** 05-123-19494  
**Date:** 12/30/10  
**Surveyor:** Levi Sheldon  
**VS:** 0.000  
**Lat :** 40.368  
**Long:** -104.557

**Well:** Welch B 28-11  
**Location:** Weld County, Colorado  
**North Reference:** GRID  
**Convergence:** GRID North is 0.610 Degrees East  
**Declination:** 8.37  
**Depth Reference:** Ground Level  
**Elevation:** 4,630 Feet  
**Total Depth as Drilled:** 7,010 Feet

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

MS 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	0.302	347.626	0.257	-0.056	100.000	0.302	0.257	0.264	347.626
200.000	0.273	0.170	0.753	-0.112	199.998	0.069	0.753	0.761	351.524
300.000	0.372	302.187	1.164	-0.386	299.997	0.324	1.164	1.227	341.653
400.000	0.165	127.339	1.250	-0.546	399.996	0.536	1.250	1.364	336.392
500.000	0.549	356.498	1.641	-0.461	499.995	0.669	1.641	1.704	344.306
600.000	0.534	309.430	2.415	-0.850	599.991	0.433	2.415	2.560	340.605
700.000	0.628	304.829	3.024	-1.660	699.986	0.105	3.024	3.450	331.235
800.000	0.770	323.801	3.879	-2.507	799.979	0.269	3.879	4.618	327.130
900.000	0.229	274.636	4.437	-3.103	899.975	0.643	4.437	5.414	325.035
1000.000	0.374	312.933	4.676	-3.541	999.973	0.240	4.676	5.865	322.859
1100.000	0.667	331.050	5.407	-4.062	1099.969	0.333	5.407	6.763	323.086
1200.000	1.261	320.916	6.771	-5.038	1199.955	0.616	6.771	8.440	323.350
1300.000	1.526	333.821	8.821	-6.319	1299.925	0.409	8.821	10.851	324.382
1400.000	1.292	340.711	11.080	-7.279	1399.895	0.289	11.080	13.257	326.696
1500.000	1.473	329.226	13.248	-8.309	1499.866	0.330	13.248	15.639	327.904
1600.000	1.009	288.052	14.626	-9.805	1599.844	0.975	14.626	17.608	326.164
1700.000	1.670	321.168	16.034	-11.556	1699.818	0.992	16.034	19.764	324.220
1800.000	1.502	314.119	18.082	-13.411	1799.779	0.258	18.082	22.512	323.437
1900.000	1.381	274.966	19.099	-15.552	1899.750	0.973	19.099	24.630	320.844
2000.000	0.907	230.137	18.696	-17.360	1999.732	0.977	18.696	25.513	317.121
2100.000	1.119	266.496	18.129	-18.943	2099.717	0.664	18.129	26.220	313.743
2200.000	1.174	217.961	17.262	-20.548	2199.699	0.944	17.262	26.836	310.033
2300.000	0.999	166.900	15.605	-20.980	2299.683	0.949	15.605	26.147	306.643
2400.000	0.914	178.825	13.959	-20.766	2399.670	0.216	13.959	25.022	303.910
2500.000	0.614	240.118	12.896	-21.214	2499.662	0.820	12.896	24.826	301.294
2600.000	0.606	139.826	12.224	-21.338	2599.659	0.937	12.224	24.591	299.808
2700.000	0.256	260.075	11.781	-21.216	2699.657	0.768	11.781	24.268	299.044
2800.000	0.540	100.156	11.660	-20.972	2799.656	0.785	11.660	23.996	299.073
2900.000	0.506	162.748	11.155	-20.378	2899.652	0.544	11.155	23.231	298.697
3000.000	0.874	83.183	10.823	-19.489	2999.647	0.927	10.823	22.293	299.046
3100.000	1.227	121.803	10.350	-17.822	3099.631	0.770	10.350	20.609	300.145
3200.000	1.386	123.401	9.120	-15.903	3199.605	0.163	9.120	18.332	299.834
3300.000	1.337	139.706	7.565	-14.139	3299.577	0.389	7.565	16.035	298.148
3400.000	1.795	110.800	6.119	-11.921	3399.541	0.899	6.119	13.399	297.171
3500.000	1.817	91.357	5.525	-8.872	3499.492	0.610	5.525	10.451	301.914

3600.000	1.873	101.067	5.174	-5.683	3599.441	0.317	5.174	7.685	312.317
3700.000	1.910	118.855	4.056	-2.619	3699.387	0.586	4.056	4.828	327.147
3800.000	2.087	93.552	3.139	0.657	3799.328	0.892	3.139	3.207	11.826
3900.000	2.139	100.947	2.672	4.307	3899.260	0.278	2.672	5.068	58.186
4000.000	2.520	84.162	2.541	8.327	3999.179	0.777	2.541	8.706	73.030
4100.000	1.806	78.350	3.083	12.058	4099.107	0.747	3.083	12.445	75.658
4200.000	1.027	83.233	3.507	14.490	4199.076	0.788	3.507	14.909	76.396
4300.000	0.662	147.347	3.126	15.692	4299.066	0.948	3.126	16.000	78.734
4400.000	0.770	208.505	2.049	15.683	4399.060	0.734	2.049	15.816	82.557
4500.000	0.700	161.415	0.879	15.557	4499.053	0.591	0.879	15.581	86.765
4600.000	1.206	124.423	-0.295	16.619	4599.039	0.772	-0.295	16.622	91.016
4700.000	1.208	125.086	-1.495	18.350	4699.017	0.014	-1.495	18.411	94.659
4800.000	0.648	147.879	-2.580	19.513	4799.004	0.661	-2.580	19.683	97.531
4900.000	1.077	125.848	-3.609	20.575	4898.993	0.535	-3.609	20.889	99.949
5000.000	0.800	93.380	-4.201	22.034	4998.980	0.589	-4.201	22.431	100.794
5100.000	0.871	108.339	-4.481	23.452	5098.969	0.229	-4.481	23.877	100.817
5200.000	0.614	170.322	-5.248	24.264	5198.962	0.796	-5.248	24.825	102.205
5300.000	1.363	170.345	-6.949	24.553	5298.947	0.749	-6.949	25.518	105.802
5400.000	1.383	177.239	-9.327	24.811	5398.918	0.166	-9.327	26.506	110.602
5500.000	1.407	173.093	-11.751	25.017	5498.888	0.104	-11.751	27.639	115.161
5600.000	1.362	171.412	-14.145	25.342	5598.859	0.061	-14.145	29.022	119.169
5700.000	0.856	160.512	-16.025	25.769	5698.840	0.545	-16.025	30.345	121.876
5800.000	1.107	191.716	-17.675	25.822	5798.826	0.581	-17.675	31.292	124.392
5900.000	0.682	177.846	-19.216	25.648	5898.814	0.474	-19.216	32.048	126.841
6000.000	0.504	176.721	-20.249	25.695	5998.809	0.178	-20.249	32.715	128.240
6100.000	0.809	155.588	-21.331	26.013	6098.802	0.385	-21.331	33.641	129.353
6200.000	0.514	164.364	-22.407	26.425	6198.795	0.311	-22.407	34.646	130.296
6300.000	0.536	150.468	-23.247	26.777	6298.791	0.129	-23.247	35.460	130.963
6400.000	0.490	152.373	-24.033	27.206	6398.787	0.049	-24.033	36.301	131.456
6500.000	0.482	155.157	-24.794	27.582	6498.783	0.025	-24.794	37.087	131.953
6600.000	0.487	153.996	-25.557	27.944	6598.780	0.011	-25.557	37.869	132.445
6700.000	0.386	154.600	-26.243	28.275	6698.777	0.101	-26.243	38.577	132.865

of True North