



Company: Noble Energy
Rig: Production/Coretech
API # 05-123-23303
Date: 5-2-14
Surveyor: Justin Williams
VS: 0.000
Lat : 40.147
Long: -104.517

Well: Marolf 34-11
Location: Weld County, Colorado
North Reference: GRID
Convergence: GRID North is 0.64 De
Declination: 8.4
Depth Reference: RKB = Ground Level
Elevation: 4933
Total Depth as Drilled: 7815

Lat & Long obtained by handheld GPS at wellhead

MS Gyro Survey Calculations

Depth	Inc	AzG	N/-S	E/-W	TVD	DL	VS	CD
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
100.000	0.580	194.001	-0.491	-0.122	99.998	0.580	-0.491	0.506
200.000	0.433	185.783	-1.359	-0.283	199.994	0.163	-1.359	1.388
300.000	0.388	188.744	-2.070	-0.373	299.992	0.050	-2.070	2.103
400.000	1.074	184.964	-3.338	-0.505	399.983	0.687	-3.338	3.376
500.000	0.357	143.287	-4.522	-0.400	499.975	0.841	-4.522	4.540
600.000	0.253	122.781	-4.891	-0.028	599.974	0.150	-4.891	4.891
700.000	0.274	114.504	-5.110	0.375	699.973	0.044	-5.110	5.124
800.000	0.288	84.198	-5.184	0.842	799.971	0.148	-5.184	5.252
900.000	0.325	172.093	-5.439	1.132	899.971	0.426	-5.439	5.556
1000.000	0.448	174.404	-6.109	1.209	999.968	0.124	-6.109	6.227
1100.000	0.523	175.920	-6.952	1.279	1099.965	0.076	-6.952	7.069
1200.000	0.426	170.594	-7.774	1.372	1199.961	0.106	-7.774	7.894
1300.000	0.410	172.648	-8.495	1.479	1299.959	0.022	-8.495	8.623
1400.000	0.619	174.293	-9.387	1.578	1399.954	0.209	-9.387	9.519
1500.000	0.589	192.770	-10.426	1.518	1499.949	0.196	-10.426	10.536
1600.000	0.607	173.878	-11.455	1.461	1599.944	0.197	-11.455	11.548
1700.000	0.303	211.486	-12.208	1.379	1699.941	0.411	-12.208	12.285
1800.000	0.264	143.111	-12.617	1.379	1799.940	0.320	-12.617	12.692
1900.000	0.253	181.766	-13.022	1.510	1899.939	0.171	-13.022	13.109
2000.000	0.247	172.463	-13.457	1.532	1999.938	0.041	-13.457	13.544
2100.000	0.666	148.376	-14.166	1.865	2099.934	0.452	-14.166	14.289
2200.000	1.036	162.266	-15.522	2.445	2199.923	0.420	-15.522	15.714
2300.000	1.130	152.396	-17.257	3.178	2299.905	0.209	-17.257	17.547
2400.000	1.222	135.458	-18.891	4.382	2399.885	0.358	-18.891	19.392
2500.000	1.298	133.368	-20.429	5.954	2499.861	0.089	-20.429	21.279
2600.000	1.714	127.610	-22.120	7.963	2599.826	0.442	-22.120	23.509
2700.000	1.937	130.957	-24.140	10.424	2699.775	0.246	-24.140	26.294
2800.000	2.191	126.055	-26.373	13.245	2799.710	0.309	-26.373	29.512
2900.000	2.269	128.109	-28.719	16.348	2899.634	0.112	-28.719	33.046
3000.000	2.262	133.065	-31.288	19.347	2999.556	0.196	-31.288	36.787
3100.000	2.310	140.825	-34.198	22.061	3099.477	0.313	-34.198	40.696
3200.000	2.058	142.529	-37.185	24.426	3199.404	0.260	-37.185	44.490
3300.000	2.003	138.446	-39.917	26.678	3299.342	0.155	-39.917	48.012
3400.000	1.858	148.600	-42.609	28.682	3399.285	0.371	-42.609	51.363
3500.000	2.033	142.825	-45.406	30.598	3499.228	0.263	-45.406	54.753

3600.000	2.096	119.654	-47.724	33.259	3599.164	0.831	-47.724	58.170
3700.000	2.508	122.332	-49.799	36.697	3699.084	0.425	-49.799	61.859
3800.000	3.105	110.512	-51.918	41.082	3798.964	0.828	-51.918	66.206
3900.000	3.038	109.549	-53.753	46.115	3898.820	0.084	-53.753	70.824
4000.000	3.219	118.645	-55.986	51.076	3998.672	0.528	-55.986	75.784
4100.000	3.167	123.556	-58.859	55.842	4098.517	0.278	-58.859	81.134
4200.000	3.532	132.149	-62.453	60.428	4198.347	0.619	-62.453	86.901
4300.000	3.663	129.338	-66.544	65.182	4298.150	0.220	-66.544	93.149
4400.000	3.615	133.356	-70.733	69.945	4397.948	0.259	-70.733	99.476
4500.000	3.441	140.022	-75.197	74.165	4497.759	0.445	-75.197	105.617
4600.000	3.379	140.958	-79.786	77.949	4597.582	0.083	-79.786	111.543
4700.000	3.414	144.574	-84.501	81.532	4697.406	0.217	-84.501	117.422
4800.000	3.444	141.257	-89.270	85.138	4797.227	0.201	-89.270	123.360
4900.000	3.989	138.984	-94.238	89.300	4897.017	0.564	-94.238	129.828
5000.000	4.726	137.458	-99.897	94.368	4996.727	0.746	-99.897	137.422
5100.000	5.158	134.652	-106.092	100.351	5096.355	0.495	-106.092	146.034
5200.000	5.174	139.554	-112.682	106.474	5195.950	0.441	-112.682	155.029
5300.000	4.229	140.337	-118.952	111.753	5295.612	0.947	-118.952	163.212
5400.000	3.486	145.656	-124.301	115.822	5395.385	0.824	-124.301	169.898
5500.000	3.194	140.793	-128.970	119.298	5495.215	0.407	-128.970	175.685
5600.000	2.568	127.589	-132.495	122.834	5595.090	0.908	-132.495	180.673
5700.000	2.435	127.999	-135.169	126.283	5694.994	0.134	-135.169	184.981
5800.000	1.951	129.910	-137.569	129.263	5794.921	0.490	-137.569	188.770
5900.000	1.878	123.216	-139.558	131.939	5894.865	0.235	-139.558	192.053
6000.000	1.976	128.899	-141.538	134.651	5994.809	0.215	-141.538	195.356
6100.000	1.299	112.132	-143.048	137.043	6094.768	0.822	-143.048	198.100
6200.000	1.040	113.519	-143.837	138.925	6194.747	0.261	-143.837	199.973
6300.000	1.757	138.209	-145.342	140.779	6294.717	0.921	-145.342	202.344
6400.000	1.433	120.877	-147.127	142.873	6394.679	0.578	-147.127	205.083
6500.000	1.096	126.340	-148.335	144.716	6494.654	0.357	-148.335	207.234
6600.000	0.799	95.515	-148.969	146.180	6594.641	0.579	-148.969	208.711
6700.000	0.758	100.262	-149.153	147.525	6694.632	0.076	-149.153	209.787
6800.000	0.757	129.105	-149.688	148.689	6794.624	0.377	-149.688	210.985
6900.000	1.221	129.940	-150.789	150.018	6894.608	0.465	-150.789	212.703

0

degrees East of True North

Cbrg

0.000
194.001
191.768
190.207
188.607
185.055
180.331
175.805
170.769
168.247
168.808
169.574
169.988
170.125
170.456
171.714
172.730
173.553
173.762
173.384
173.506
172.500
171.047
169.567
166.939
163.751
160.202
156.646
153.333
150.350
148.270
147.174
146.699
146.244
146.054
146.025

145.127
143.613
141.646
139.374
137.626
136.506
135.944
135.593
135.321
135.396
135.667
136.025
136.357
136.541
136.630
136.593
136.623
136.787
137.022
137.231
137.167
136.947
136.783
136.608
136.429
136.228
135.995
135.914
135.840
135.707
135.541
135.314
135.192
135.147