



Company: Noble Energy
Rig: Production/ CoreTech
API # 05-123-25292
Date: 10/18/2013
Surveyor: Sean Bratt
VS: 0.000
Lat : 40.492
Long: -104.500

Well: McKenney 13-21
Location: Weld County, Colorado
North Reference: GRID
Convergence: Grid north is 0.65 Degr
Declination: 8.42 Degrees
Depth Reference: Ground Level
Elevation: 4669 Feet
Total Depth as Drilled: 7055 Feet

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
100.000	0.381	294.887	0.140	-0.302	99.999	0.381	0.140	0.333
200.000	0.081	215.229	0.222	-0.644	199.998	0.375	0.222	0.681
300.000	0.110	209.034	0.081	-0.732	299.998	0.030	0.081	0.736
400.000	0.135	213.585	-0.102	-0.843	399.998	0.028	-0.102	0.849
500.000	0.219	270.753	-0.198	-1.100	499.998	0.185	-0.198	1.117
600.000	0.100	255.244	-0.217	-1.375	599.997	0.125	-0.217	1.392
700.000	0.198	278.410	-0.214	-1.630	699.997	0.113	-0.214	1.644
800.000	0.281	236.128	-0.326	-2.004	799.996	0.189	-0.326	2.030
900.000	0.144	276.011	-0.449	-2.332	899.995	0.194	-0.449	2.375
1000.000	0.266	294.096	-0.341	-2.669	999.995	0.137	-0.341	2.691
1100.000	0.227	283.044	-0.202	-3.074	1099.994	0.062	-0.202	3.080
1200.000	0.199	274.604	-0.143	-3.440	1199.993	0.042	-0.143	3.443
1300.000	0.394	295.182	0.017	-3.924	1299.992	0.219	0.017	3.924
1400.000	0.210	284.299	0.209	-4.412	1399.990	0.191	0.209	4.417
1500.000	0.346	322.313	0.493	-4.774	1499.989	0.222	0.493	4.800
1600.000	0.473	291.664	0.884	-5.342	1599.987	0.248	0.884	5.415
1700.000	0.304	303.103	1.181	-5.948	1699.985	0.185	1.181	6.064
1800.000	0.696	255.065	1.170	-6.757	1799.981	0.542	1.170	6.858
1900.000	0.929	259.250	0.862	-8.141	1899.971	0.240	0.862	8.186
2000.000	0.795	245.588	0.424	-9.569	1999.960	0.245	0.424	9.579
2100.000	0.933	257.894	-0.034	-10.997	2099.948	0.230	-0.034	10.997
2200.000	1.032	268.435	-0.229	-12.693	2199.934	0.206	-0.229	12.695
2300.000	1.035	269.560	-0.261	-14.496	2299.917	0.020	-0.261	14.499
2400.000	0.874	278.310	-0.157	-16.153	2399.903	0.217	-0.157	16.154
2500.000	0.949	267.923	-0.077	-17.735	2499.891	0.181	-0.077	17.735
2600.000	0.880	269.495	-0.114	-19.330	2599.878	0.073	-0.114	19.331
2700.000	0.900	277.171	-0.023	-20.878	2699.866	0.121	-0.023	20.878
2800.000	0.989	275.033	0.151	-22.517	2799.853	0.095	0.151	22.517
2900.000	0.931	276.478	0.318	-24.183	2899.838	0.063	0.318	24.185
3000.000	0.864	266.828	0.368	-25.743	2999.826	0.165	0.368	25.746
3100.000	1.034	263.082	0.218	-27.392	3099.813	0.181	0.218	27.392
3200.000	0.753	270.724	0.118	-28.944	3199.800	0.305	0.118	28.944
3300.000	0.092	300.726	0.167	-29.670	3299.797	0.675	0.167	29.671
3400.000	0.254	85.549	0.225	-29.519	3399.797	0.333	0.225	29.519
3500.000	0.612	112.292	0.040	-28.804	3499.794	0.402	0.040	28.804

3600.000	0.799	147.275	-0.749	-27.933	3599.787	0.460	-0.749	27.943
3700.000	0.833	146.787	-1.943	-27.158	3699.777	0.036	-1.943	27.228
3800.000	0.833	145.982	-3.155	-26.353	3799.766	0.012	-3.155	26.541
3900.000	0.835	146.430	-4.365	-25.543	3899.755	0.007	-4.365	25.913
4000.000	0.834	144.634	-5.566	-24.719	3999.745	0.026	-5.566	25.338
4100.000	0.934	182.023	-6.974	-24.326	4099.734	0.575	-6.974	25.306
4200.000	1.470	220.457	-8.765	-25.187	4199.713	0.939	-8.765	26.669
4300.000	1.959	235.906	-10.699	-27.435	4299.668	0.669	-10.699	29.447
4400.000	2.344	235.725	-12.809	-30.540	4399.598	0.386	-12.809	33.117
4500.000	2.364	238.114	-15.050	-33.982	4499.513	0.100	-15.050	37.165
4600.000	2.081	262.686	-16.371	-37.534	4599.440	0.985	-16.371	40.949
4700.000	2.098	262.139	-16.852	-41.148	4699.374	0.026	-16.852	44.465
4800.000	1.934	261.949	-17.339	-44.632	4799.312	0.164	-17.339	47.881
4900.000	1.793	262.642	-17.775	-47.854	4899.259	0.143	-17.775	51.049
5000.000	1.395	260.535	-18.176	-50.606	4999.220	0.402	-18.176	53.771
5100.000	1.048	262.603	-18.494	-52.713	5099.197	0.349	-18.494	55.863
5200.000	0.856	276.035	-18.533	-54.364	5199.183	0.293	-18.533	57.436
5300.000	0.229	332.266	-18.278	-55.199	5299.179	0.754	-18.278	58.147
5400.000	0.087	3.628	-18.026	-55.288	5399.178	0.161	-18.026	58.152
5500.000	0.236	72.873	-17.890	-55.086	5499.178	0.221	-17.890	57.918
5600.000	0.429	91.174	-17.837	-54.515	5599.176	0.218	-17.837	57.359
5700.000	0.530	81.771	-17.778	-53.683	5699.173	0.128	-17.778	56.551
5800.000	0.584	104.106	-17.836	-52.732	5799.168	0.222	-17.836	55.667
5900.000	0.315	74.148	-17.885	-51.974	5899.165	0.348	-17.885	54.965
6000.000	0.247	123.657	-17.930	-51.530	5999.164	0.243	-17.930	54.561
6100.000	0.065	3.811	-17.993	-51.347	6099.164	0.285	-17.993	54.408
6200.000	0.194	53.334	-17.836	-51.208	6199.164	0.159	-17.836	54.225
6300.000	0.051	122.582	-17.758	-51.035	6299.163	0.182	-17.758	54.036
6400.000	0.051	227.116	-17.812	-51.030	6399.163	0.080	-17.812	54.050
6500.000	0.092	129.037	-17.893	-51.000	6499.163	0.112	-17.893	54.048
6600.000	0.157	126.959	-18.026	-50.828	6599.163	0.064	-18.026	53.930
6700.000	0.231	128.857	-18.235	-50.562	6699.162	0.075	-18.235	53.749

0

rees East of True North

Cbrg

0.000

294.887

289.021

276.287

263.132

259.815

261.020

262.511

260.772

259.105

262.721

266.249

267.621

270.251

272.707

275.893

279.394

281.232

279.819

276.042

272.535

269.824

268.967

268.970

269.442

269.751

269.662

269.938

270.385

270.754

270.820

270.456

270.233

270.322

270.437

270.079

268.465
265.907
263.174
260.303
257.311
254.003
250.813
248.696
247.247
246.112
246.435
247.728
248.770
249.622
250.243
250.667
251.175
251.679
251.942
252.008
251.883
251.677
251.312
251.011
250.815
250.689
250.797
250.814
250.758
250.667
250.473
250.168