



Company: Noble Energy
 Rig: Production/Coretech
 API # 05-123-25652
 Date: 10/14/13
 Surveyor: Levi Sheldon
 VS: 0.000
 Lat : 40.294
 Long: -104.607

Well: Broomfield 24-45
 Location: Weld County, Colorado
 North Reference: GRID
 Convergence: GRID North is 0.580 Degrees East
 Declination: 8.46
 Depth Reference: Ground Level
 Elevation: 4,814 Feet
 Total Depth as Drilled: 7,270 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	0.680	134.574	-0.416	0.422	99.998	0.680	-0.416	0.593	134.574
200.000	0.835	134.317	-1.342	1.367	199.989	0.156	-1.342	1.915	134.476
300.000	0.121	94.923	-1.860	1.994	299.985	0.746	-1.860	2.727	133.018
400.000	0.669	125.639	-2.209	2.573	399.982	0.568	-2.209	3.392	130.649
500.000	0.573	146.268	-2.966	3.326	499.976	0.242	-2.966	4.456	131.724
600.000	0.622	171.576	-3.918	3.683	599.971	0.266	-3.918	5.377	136.772
700.000	0.202	176.787	-4.630	3.772	699.968	0.421	-4.630	5.972	140.833
800.000	0.980	180.283	-5.662	3.778	799.962	0.778	-5.662	6.806	146.288
900.000	0.950	167.260	-7.325	3.956	899.948	0.221	-7.325	8.325	151.627
1000.000	0.895	171.424	-8.906	4.255	999.935	0.086	-8.906	9.870	154.461
1100.000	0.654	199.256	-10.217	4.184	1099.926	0.440	-10.217	11.040	157.731
1200.000	0.669	218.406	-11.213	3.633	1199.920	0.220	-11.213	11.787	162.047
1300.000	0.637	218.996	-12.102	2.921	1299.913	0.032	-12.102	12.450	166.432
1400.000	0.479	233.564	-12.783	2.234	1399.909	0.211	-12.783	12.976	170.085
1500.000	0.648	286.574	-12.870	1.356	1499.904	0.525	-12.870	12.941	173.985
1600.000	0.611	254.671	-12.849	0.301	1599.899	0.348	-12.849	12.853	178.660
1700.000	0.468	273.983	-12.962	-0.620	1699.894	0.229	-12.962	12.977	182.740
1800.000	0.719	166.402	-13.544	-0.880	1799.891	0.969	-13.544	13.572	183.716
1900.000	1.085	164.499	-15.067	-0.479	1899.878	0.367	-15.067	15.074	181.821
2000.000	1.443	160.525	-17.166	0.194	1999.854	0.368	-17.166	17.167	179.353
2100.000	1.758	134.985	-19.438	1.699	2099.816	0.771	-19.438	19.512	175.006
2200.000	2.022	139.865	-21.871	3.921	2199.762	0.309	-21.871	22.219	169.837
2300.000	2.171	158.419	-24.981	5.755	2299.696	0.692	-24.981	25.635	167.028
2400.000	2.055	184.933	-28.529	6.297	2399.630	0.975	-28.529	29.216	167.552
2500.000	1.801	204.574	-31.744	5.490	2499.575	0.703	-31.744	32.215	170.188
2600.000	1.485	231.407	-33.981	3.823	2599.535	0.822	-33.981	34.195	173.580
2700.000	1.205	229.626	-35.471	2.009	2699.507	0.283	-35.471	35.528	176.758
2800.000	1.933	217.922	-37.483	0.171	2799.469	0.792	-37.483	37.483	179.739
2900.000	2.075	205.660	-40.445	-1.650	2899.409	0.451	-40.445	40.479	182.336
3000.000	1.812	231.146	-43.069	-3.665	2999.353	0.895	-43.069	43.225	184.864
3100.000	1.729	263.281	-44.238	-6.395	3099.307	0.983	-44.238	44.698	188.225
3200.000	1.276	273.303	-44.350	-9.005	3199.273	0.522	-44.350	45.255	191.477
3300.000	0.615	275.538	-44.234	-10.651	3299.259	0.663	-44.234	45.498	193.538
3400.000	0.737	290.465	-43.958	-11.787	3399.252	0.213	-43.958	45.510	195.011
3500.000	0.134	273.529	-43.725	-12.507	3499.249	0.610	-43.725	45.479	195.962

3600.000	0.163	3.942	-43.577	-12.614	3599.248	0.212	-43.577	45.366	196.144
3700.000	0.145	201.203	-43.553	-12.650	3699.248	0.304	-43.553	45.353	196.196
3800.000	0.378	251.458	-43.776	-13.009	3799.247	0.306	-43.776	45.668	196.550
3900.000	0.331	268.805	-43.887	-13.610	3899.245	0.116	-43.887	45.949	197.230
4000.000	0.241	75.122	-43.839	-13.696	3999.245	0.568	-43.839	45.929	197.350
4100.000	0.505	128.568	-44.060	-13.148	4099.243	0.410	-44.060	45.980	196.616
4200.000	0.677	139.628	-44.785	-12.421	4199.238	0.205	-44.785	46.475	195.501
4300.000	0.525	109.164	-45.385	-11.605	4299.232	0.348	-45.385	46.846	194.343
4400.000	0.730	90.171	-45.538	-10.535	4399.226	0.289	-45.538	46.741	193.027
4500.000	0.382	333.371	-45.241	-10.048	4499.224	0.965	-45.241	46.344	192.522
4600.000	0.122	212.094	-45.033	-10.254	4599.223	0.458	-45.033	46.186	192.827
4700.000	0.854	247.145	-45.413	-10.997	4699.219	0.758	-45.413	46.725	193.613
4800.000	0.479	185.801	-46.119	-11.726	4799.213	0.753	-46.119	47.586	194.266
4900.000	0.513	8.734	-46.092	-11.701	4899.212	0.992	-46.092	47.554	194.244
5000.000	1.492	16.418	-44.401	-11.265	4999.195	0.986	-44.401	45.808	194.236
5100.000	1.294	55.315	-42.510	-9.969	5099.168	0.946	-42.510	43.663	193.197
5200.000	1.215	100.967	-42.069	-7.999	5199.146	0.976	-42.069	42.823	190.766
5300.000	1.600	134.366	-43.247	-5.960	5299.117	0.889	-43.247	43.656	187.847
5400.000	2.299	123.135	-45.320	-3.283	5399.059	0.793	-45.320	45.439	184.143
5500.000	3.100	118.880	-47.722	0.764	5498.948	0.825	-47.722	47.728	179.082
5600.000	2.251	111.775	-49.756	4.955	5598.838	0.910	-49.756	50.002	174.313
5700.000	1.280	109.008	-50.848	7.835	5698.789	0.974	-50.848	51.448	171.241
5800.000	0.537	62.441	-50.995	9.307	5798.777	0.991	-50.995	51.838	169.657
5900.000	1.426	33.921	-49.746	10.417	5898.762	0.988	-49.746	50.825	168.174
6000.000	1.838	2.224	-47.111	11.173	5998.723	0.976	-47.111	48.418	166.658
6100.000	2.425	342.632	-43.489	10.604	6098.655	0.927	-43.489	44.763	166.297
6200.000	2.661	359.851	-39.149	9.967	6198.558	0.796	-39.149	40.398	165.717
6300.000	3.299	356.809	-33.956	9.800	6298.422	0.657	-33.956	35.342	163.901
6400.000	3.397	0.620	-28.121	9.672	6398.252	0.243	-28.121	29.738	161.019
6500.000	2.760	346.745	-22.815	9.152	6498.108	0.976	-22.815	24.582	158.142
6600.000	3.269	2.055	-17.622	8.703	6597.971	0.948	-17.622	19.654	153.718
6700.000	3.197	3.762	-11.990	8.988	6697.812	0.120	-11.990	14.985	143.145
6800.000	3.902	359.778	-5.805	9.158	6797.620	0.746	-5.805	10.843	122.371
6900.000	4.342	3.003	1.378	9.343	6897.361	0.497	1.378	9.444	81.610
7000.000	2.497	3.329	7.333	9.668	6997.178	1.846	7.333	12.134	52.818

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