



Company: Noble Energy

Rig: Production / Coretech

API # 05-123-16606

Date: 5/28/2014

Surveyor: Norman Cowan

VS: 0.000

Lat : 40.128

Long: -104.571

Well: Keller 20-2

Location: Weld County, Colorado

North Reference: GRID

Convergence: Grid north is 0.6 Deg East of True

Declination: 8.34 Degrees

Depth Reference: Ground Level

Elevation: 4894 Feet

Total Depth as Drilled: 7693 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	0.190	262.856	-0.021	-0.165	100.000	0.190	-0.021	0.166	262.856
200.000	0.198	277.508	-0.019	-0.501	199.999	0.050	-0.019	0.502	267.859
300.000	0.094	148.340	-0.066	-0.630	299.999	0.267	-0.066	0.633	264.036
400.000	0.110	218.419	-0.211	-0.646	399.999	0.118	-0.211	0.680	251.953
500.000	0.191	181.730	-0.452	-0.711	499.999	0.122	-0.452	0.843	237.532
600.000	0.143	170.239	-0.742	-0.695	599.998	0.058	-0.742	1.017	223.127
700.000	0.308	277.187	-0.831	-0.940	699.998	0.375	-0.831	1.255	228.526
800.000	0.187	333.547	-0.652	-1.280	799.997	0.257	-0.652	1.436	243.010
900.000	0.518	2.652	-0.054	-1.331	899.995	0.366	-0.054	1.332	267.676
1000.000	0.671	6.469	0.979	-1.244	999.989	0.157	0.979	1.583	308.197
1100.000	0.723	14.418	2.171	-1.021	1099.982	0.110	2.171	2.400	334.808
1200.000	0.914	1.944	3.580	-0.837	1199.972	0.261	3.580	3.676	346.835
1300.000	1.000	12.649	5.229	-0.619	1299.958	0.198	5.229	5.265	353.247
1400.000	0.970	359.944	6.927	-0.429	1399.943	0.220	6.927	6.940	356.457
1500.000	1.130	0.868	8.759	-0.415	1499.927	0.160	8.759	8.769	357.289
1600.000	1.207	10.611	10.780	-0.206	1599.906	0.213	10.780	10.782	358.905
1700.000	1.201	11.396	12.842	0.195	1699.884	0.017	12.842	12.843	0.870
1800.000	1.159	356.445	14.878	0.339	1799.863	0.310	14.878	14.882	1.306
1900.000	1.135	358.658	16.878	0.253	1899.843	0.050	16.878	16.880	0.860
2000.000	1.370	2.711	19.062	0.287	1999.819	0.251	19.062	19.064	0.862
2100.000	1.107	359.243	21.222	0.330	2099.795	0.273	21.222	21.224	0.892
2200.000	1.236	8.701	23.254	0.481	2199.775	0.232	23.254	23.258	1.185
2300.000	1.001	18.566	25.148	0.922	2299.756	0.303	25.148	25.165	2.100
2400.000	1.154	19.346	26.926	1.534	2399.738	0.153	26.926	26.969	3.260
2500.000	1.096	22.765	28.758	2.237	2499.719	0.088	28.758	28.845	4.449
2600.000	1.054	26.148	30.466	3.013	2599.701	0.076	30.466	30.614	5.648
2700.000	1.012	20.302	32.120	3.725	2699.685	0.113	32.120	32.335	6.615
2800.000	0.637	19.076	33.474	4.213	2799.674	0.376	33.474	33.738	7.174
2900.000	0.560	12.413	34.476	4.500	2899.669	0.104	34.476	34.769	7.436
3000.000	0.759	1.796	35.616	4.626	2999.662	0.233	35.616	35.915	7.400
3100.000	0.722	343.202	36.881	4.464	3099.654	0.242	36.881	37.150	6.902
3200.000	0.663	359.159	38.062	4.274	3199.647	0.201	38.062	38.301	6.407
3300.000	0.900	343.529	39.393	4.043	3299.637	0.317	39.393	39.600	5.860
3400.000	0.785	345.813	40.810	3.652	3399.627	0.119	40.810	40.973	5.114
3500.000	0.991	339.738	42.286	3.185	3499.615	0.226	42.286	42.405	4.308

3600.000	1.005	315.683	43.724	2.273	3599.600	0.416	43.724	43.783	2.976
3700.000	1.115	292.754	44.728	0.763	3699.583	0.435	44.728	44.734	0.978
3800.000	1.138	295.650	45.534	-1.029	3799.564	0.061	45.534	45.545	358.706
3900.000	1.099	295.111	46.371	-2.792	3899.545	0.040	46.371	46.455	356.554
4000.000	1.286	293.832	47.231	-4.688	3999.523	0.189	47.231	47.463	354.332
4100.000	1.229	288.432	48.024	-6.732	4099.499	0.132	48.024	48.494	352.020
4200.000	1.101	274.341	48.436	-8.707	4199.479	0.313	48.436	49.212	349.809
4300.000	1.335	263.831	48.383	-10.824	4299.456	0.323	48.383	49.579	347.390
4400.000	1.401	257.831	48.000	-13.178	4399.428	0.158	48.000	49.776	344.649
4500.000	1.492	255.182	47.410	-15.631	4499.396	0.113	47.410	49.920	341.752
4600.000	1.466	254.368	46.732	-18.122	4599.362	0.034	46.732	50.123	338.805
4700.000	1.257	250.250	46.017	-20.386	4699.334	0.230	46.017	50.330	336.106
4800.000	1.426	242.128	45.064	-22.518	4799.307	0.254	45.064	50.377	333.449
4900.000	1.014	238.914	44.026	-24.376	4899.284	0.417	44.026	50.323	331.028
5000.000	1.104	195.253	42.639	-25.388	4999.268	0.792	42.639	49.625	329.230
5100.000	1.478	176.476	40.422	-25.562	5099.243	0.560	40.422	47.826	327.692
5200.000	1.408	171.026	37.921	-25.291	5199.212	0.154	37.921	45.581	326.300
5300.000	0.844	151.511	36.060	-24.748	5299.192	0.674	36.060	43.736	325.539
5400.000	0.588	143.642	35.000	-24.092	5399.184	0.273	35.000	42.490	325.458
5500.000	0.691	108.901	34.391	-23.217	5499.178	0.394	34.391	41.494	325.977
5600.000	1.317	114.833	33.713	-21.603	5599.163	0.634	33.713	40.041	327.348
5700.000	0.702	73.806	33.401	-19.972	5699.148	0.912	33.401	38.916	329.123
5800.000	0.184	336.356	33.719	-19.448	5799.145	0.749	33.719	38.925	330.025
5900.000	0.096	277.934	33.878	-19.595	5899.145	0.157	33.878	39.137	329.955
6000.000	0.720	255.658	33.734	-20.286	5999.142	0.632	33.734	39.364	328.979
6100.000	1.158	256.580	33.344	-21.877	6099.128	0.438	33.344	39.880	326.730
6200.000	1.158	244.759	32.678	-23.775	6199.108	0.239	32.678	40.411	323.962
6300.000	1.109	257.070	32.030	-25.632	6299.089	0.248	32.030	41.024	321.332
6400.000	1.936	248.441	31.193	-28.146	6399.052	0.856	31.193	42.015	317.939
6500.000	2.098	250.963	29.975	-31.448	6498.990	0.184	29.975	43.445	313.627
6600.000	2.234	252.139	28.780	-35.033	6598.919	0.143	28.780	45.339	309.404
6700.000	2.590	256.904	27.671	-39.089	6698.830	0.409	27.671	47.892	305.295
6800.000	2.886	255.556	26.531	-43.727	6798.716	0.303	26.531	51.147	301.247
6900.000	2.905	253.078	25.165	-48.590	6898.588	0.127	25.165	54.720	297.380
7000.000	2.971	255.253	23.768	-53.521	6998.457	0.130	23.768	58.561	293.946
7100.000	2.961	246.986	22.098	-58.405	7098.324	0.428	22.098	62.445	290.725
7200.000	2.614	238.488	19.897	-62.726	7198.205	0.539	19.897	65.806	287.599
7300.000	2.452	233.029	17.419	-66.379	7298.108	0.290	17.419	68.626	284.704
7400.000	2.091	226.293	14.872	-69.406	7398.029	0.448	14.872	70.981	282.094
7450.000	2.235	226.777	13.574	-70.776	7447.994	0.291	13.574	72.066	280.857

North