



**Company:** Noble Energy  
**Rig:** Production/VES  
**API #** 05-123-33282  
**Date:** 12/13/2013  
**Surveyor:** Jason Kinchelow

**Well:** Johnson PC EE 33-23D  
**Location:** Weld County, Colorado  
**North Reference:** GRID  
**Convergence:** Grid north is 0.54 degrees East of

**VS:** 0.000  
**Lat :** 40.524  
**Long:** -104.665  
**Declination:** 8.49  
**Depth Reference:** RKB = Ground Level  
**Elevation:** 4781'  
**Total Depth as Drilled:** 7490'

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

HA 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	0.329	277.880	0.039	-0.284	99.999	0.329	0.039	0.287	277.880
200.000	0.289	278.485	0.116	-0.818	199.998	0.040	0.116	0.826	278.065
300.000	0.206	295.988	0.232	-1.229	299.997	0.111	0.232	1.251	280.682
400.000	0.352	0.425	0.618	-1.388	399.996	0.322	0.618	1.519	293.994
500.000	0.462	36.107	1.251	-1.148	499.994	0.270	1.251	1.698	317.445
600.000	0.537	53.203	1.857	-0.535	599.990	0.166	1.857	1.933	343.919
700.000	1.106	68.912	2.485	0.741	699.979	0.607	2.485	2.593	16.594
800.000	0.982	67.018	3.167	2.430	799.963	0.128	3.167	3.992	37.499
900.000	0.835	82.736	3.594	3.943	899.950	0.288	3.594	5.335	47.647
1000.000	0.918	35.488	4.339	5.131	999.940	0.707	4.339	6.720	49.781
1100.000	1.999	19.641	6.634	6.182	1099.906	1.143	6.634	9.068	42.982
1200.000	3.354	19.548	11.034	7.748	1199.795	1.355	11.034	13.482	35.076
1300.000	4.635	20.138	17.584	10.117	1299.550	1.282	17.584	20.287	29.915
1400.000	5.902	22.968	26.111	13.515	1399.126	1.293	26.111	29.401	27.366
1500.000	8.522	20.948	37.766	18.171	1498.326	2.632	37.766	41.910	25.694
1600.000	10.475	21.929	53.120	24.215	1596.950	1.959	53.120	58.379	24.506
1700.000	12.400	21.327	71.555	31.516	1694.960	1.929	71.555	78.188	23.770
1800.000	13.905	22.055	92.694	39.933	1792.334	1.513	92.694	100.930	23.306
1900.000	14.693	21.949	115.594	49.185	1889.235	0.789	115.594	125.623	23.050
2000.000	15.657	25.908	139.495	59.822	1985.750	1.415	139.495	151.782	23.212
2100.000	16.601	20.623	165.005	70.750	2081.818	1.745	165.005	179.533	23.208
2200.000	18.074	19.074	193.037	80.851	2177.272	1.544	193.037	209.285	22.726
2300.000	18.339	20.982	222.386	91.553	2272.267	0.652	222.386	240.495	22.376
2400.000	19.751	18.069	253.141	102.428	2366.793	1.702	253.141	273.078	22.030
2500.000	19.134	20.120	284.594	113.307	2461.091	0.920	284.594	306.320	21.709
2600.000	19.555	22.371	315.459	125.314	2555.447	0.856	315.459	339.438	21.665
2700.000	19.709	23.200	346.435	138.327	2649.634	0.318	346.435	373.030	21.766
2800.000	19.231	21.817	377.223	151.090	2743.915	0.664	377.223	406.356	21.828
2900.000	19.078	21.814	407.684	163.284	2838.379	0.153	407.684	439.167	21.827
3000.000	18.719	22.076	437.726	175.387	2932.989	0.369	437.726	471.556	21.835
3100.000	18.672	23.336	467.294	187.759	3027.713	0.407	467.294	503.604	21.890
3200.000	18.435	23.376	496.507	200.373	3122.515	0.237	496.507	535.414	21.977
3300.000	19.043	23.382	525.995	213.121	3217.214	0.607	525.995	567.531	22.057
3400.000	18.950	24.955	555.690	226.446	3311.768	0.520	555.690	600.058	22.171

3500.000	18.408	25.588	584.652	240.116	3406.501	0.578	584.652	632.040	22.328
3600.000	17.920	24.058	612.941	253.207	3501.518	0.683	612.941	663.182	22.446
3700.000	17.744	21.738	641.144	265.122	3596.715	0.732	641.144	693.797	22.466
3800.000	17.794	20.427	669.617	276.098	3691.945	0.403	669.617	724.305	22.407
3900.000	19.322	23.238	699.140	287.960	3786.744	1.770	699.140	756.120	22.386
4000.000	20.784	22.970	730.679	301.412	3880.679	1.465	730.679	790.406	22.417
4100.000	22.230	23.099	764.417	315.758	3973.714	1.447	764.417	827.065	22.444
4200.000	22.553	23.483	799.406	330.821	4066.174	0.355	799.406	865.155	22.481
4300.000	20.497	24.069	832.985	345.605	4159.194	2.067	832.985	901.835	22.534
4400.000	19.939	24.579	864.477	359.838	4253.033	0.586	864.477	936.378	22.599
4500.000	20.693	24.399	896.073	374.228	4346.811	0.757	896.073	971.079	22.667
4600.000	19.067	25.896	926.859	388.661	4440.849	1.704	926.859	1005.050	22.750
4700.000	18.897	22.897	956.471	402.095	4535.414	0.990	956.471	1037.553	22.802
4800.000	17.393	22.412	985.207	414.095	4630.438	1.512	985.207	1068.694	22.798
4900.000	15.192	22.683	1011.117	424.848	4726.417	2.202	1011.117	1096.746	22.791
5000.000	14.490	22.532	1034.762	434.695	4823.080	0.703	1034.762	1122.360	22.787
5100.000	13.526	21.148	1057.226	443.708	4920.105	1.020	1057.226	1146.561	22.767
5200.000	11.574	22.402	1077.409	451.751	5017.711	1.972	1077.409	1168.285	22.748
5300.000	10.620	23.046	1095.163	459.182	5115.840	0.962	1095.163	1187.531	22.747
5400.000	9.232	22.422	1111.058	465.849	5214.341	1.392	1111.058	1204.768	22.748
5500.000	7.505	21.134	1124.566	471.264	5313.273	1.737	1124.566	1219.319	22.737
5600.000	5.964	19.329	1135.561	475.339	5412.580	1.556	1135.561	1231.034	22.714
5700.000	4.637	35.314	1143.762	479.395	5512.155	1.973	1143.762	1240.166	22.740
5800.000	2.984	65.574	1148.137	484.102	5611.940	2.549	1148.137	1246.023	22.862
5900.000	1.492	157.169	1148.014	486.978	5711.885	3.372	1148.014	1247.030	22.986
6000.000	0.949	232.458	1146.310	486.826	5811.867	1.551	1146.310	1245.402	23.010
6100.000	0.861	267.521	1145.773	485.420	5911.855	0.551	1145.773	1244.359	22.960
6200.000	1.003	258.300	1145.563	483.812	6011.842	0.207	1145.563	1243.539	22.896
6300.000	1.200	268.257	1145.354	481.908	6111.824	0.274	1145.354	1242.606	22.819
6400.000	1.340	266.891	1145.258	479.693	6211.799	0.143	1145.258	1241.661	22.726
6500.000	1.846	270.190	1145.200	476.915	6311.760	0.514	1145.200	1240.537	22.609
6600.000	1.487	275.972	1145.341	474.015	6411.718	0.396	1145.341	1239.554	22.483
6700.000	1.951	281.609	1145.818	471.057	6511.672	0.493	1145.818	1238.868	22.348
6800.000	2.215	278.212	1146.437	467.478	6611.606	0.291	1146.437	1238.084	22.184
6900.000	2.060	275.814	1146.895	463.777	6711.537	0.179	1146.895	1237.116	22.017
7000.000	1.941	306.032	1148.073	460.620	6811.479	1.049	1148.073	1237.029	21.861
7100.000	1.967	302.327	1149.986	457.801	6911.420	0.129	1149.986	1237.760	21.707
7200.000	3.106	310.172	1152.652	454.281	7011.321	1.188	1152.652	1238.942	21.510

True North