



**Company:** Noble Energy  
**Rig:** Production/ V.E.S  
**API #** 05-123-25903  
**Date:** 1/4/2014  
**Surveyor:** Jay Hinman  
**VS:** 0.000  
**Lat :** 40.189378  
**Long:** -104.650233

**Well:** Ritchey H34-28  
**Location:** Weld County, Colorado  
**North Reference:** GRID  
**Convergence:** Grid North is 0.55 Deg  
**Declination:** 8.44  
**Depth Reference:** Ground Level  
**Elevation:** 4825'  
**Total Depth as Drilled:** 7318'

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

#### HA 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	0.470	196.745	-0.392	-0.118	99.999	0.470	-0.392	0.410
200.000	0.292	226.151	-0.961	-0.420	199.997	0.259	-0.961	1.049
300.000	0.211	234.176	-1.245	-0.753	299.996	0.088	-1.245	1.455
400.000	0.416	16.749	-1.005	-0.797	399.995	0.597	-1.005	1.283
500.000	0.238	184.900	-0.865	-0.710	499.994	0.650	-0.865	1.119
600.000	0.652	172.474	-1.636	-0.654	599.991	0.423	-1.636	1.762
700.000	0.579	159.206	-2.672	-0.400	699.985	0.160	-2.672	2.702
800.000	0.715	176.955	-3.768	-0.187	799.979	0.241	-3.768	3.772
900.000	0.762	173.535	-5.051	-0.079	899.971	0.064	-5.051	5.052
1000.000	0.827	176.569	-6.433	0.039	999.961	0.078	-6.433	6.433
1100.000	1.021	181.431	-8.044	0.060	1099.948	0.209	-8.044	8.044
1200.000	0.901	193.654	-9.699	-0.148	1199.934	0.237	-9.699	9.700
1300.000	1.211	182.700	-11.519	-0.383	1299.917	0.369	-11.519	11.525
1400.000	1.328	186.396	-13.726	-0.562	1399.893	0.142	-13.726	13.737
1500.000	1.226	183.257	-15.945	-0.752	1499.868	0.123	-15.945	15.963
1600.000	1.269	193.282	-18.091	-1.067	1599.844	0.222	-18.091	18.123
1700.000	1.419	195.660	-20.361	-1.656	1699.817	0.160	-20.361	20.428
1800.000	1.491	194.715	-22.811	-2.321	1799.784	0.076	-22.811	22.929
1900.000	1.268	205.010	-25.073	-3.119	1899.756	0.332	-25.073	25.266
2000.000	1.210	216.608	-26.923	-4.217	1999.732	0.257	-26.923	27.252
2100.000	1.218	211.228	-28.680	-5.398	2099.710	0.114	-28.680	29.184
2200.000	1.129	217.738	-30.368	-6.551	2199.689	0.160	-30.368	31.067
2300.000	1.155	210.443	-32.016	-7.665	2299.669	0.148	-32.016	32.920
2400.000	1.063	217.927	-33.616	-8.745	2399.650	0.172	-33.616	34.735
2500.000	0.988	238.414	-34.799	-10.050	2499.635	0.372	-34.799	36.221
2600.000	1.286	261.594	-35.414	-11.894	2599.615	0.542	-35.414	37.358
2700.000	1.272	265.944	-35.657	-14.111	2699.591	0.098	-35.657	38.348
2800.000	1.541	281.896	-35.458	-16.533	2799.561	0.473	-35.458	39.123
2900.000	1.882	291.685	-34.575	-19.375	2899.516	0.448	-34.575	39.633
3000.000	1.841	287.655	-33.481	-22.431	2999.464	0.137	-33.481	40.300
3100.000	1.850	270.279	-32.986	-25.575	3099.412	0.557	-32.986	41.739
3200.000	1.658	269.109	-33.000	-28.636	3199.366	0.195	-33.000	43.693
3300.000	1.316	244.076	-33.525	-31.115	3299.333	0.726	-33.525	45.739
3400.000	1.363	220.704	-34.928	-32.924	3399.306	0.544	-34.928	48.000

3500.000	1.286	228.847	-36.568	-34.544	3499.280	0.203	-36.568	50.304
3600.000	1.633	214.495	-38.481	-36.196	3599.247	0.502	-38.481	52.829
3700.000	1.650	202.980	-40.981	-37.565	3699.207	0.330	-40.981	55.593
3800.000	2.088	193.619	-44.077	-38.556	3799.153	0.532	-44.077	58.561
3900.000	2.359	191.025	-47.867	-39.379	3899.078	0.289	-47.867	61.983
4000.000	2.828	193.800	-52.283	-40.361	3998.975	0.486	-52.283	66.049
4100.000	2.702	207.623	-56.767	-42.042	4098.860	0.677	-56.767	70.640
4200.000	2.622	216.452	-60.695	-44.494	4198.752	0.417	-60.695	75.257
4300.000	2.859	223.240	-64.352	-47.561	4298.638	0.402	-64.352	80.020
4400.000	2.907	227.256	-67.890	-51.132	4398.512	0.208	-67.890	84.991
4500.000	3.256	232.686	-71.332	-55.253	4498.367	0.455	-71.332	90.228
4600.000	3.579	235.533	-74.820	-60.085	4598.189	0.364	-74.820	95.959
4700.000	3.607	242.195	-78.054	-65.440	4697.993	0.418	-78.054	101.857
4800.000	3.409	244.025	-80.823	-70.895	4797.806	0.228	-80.823	107.510
4900.000	3.087	242.533	-83.367	-75.957	4897.645	0.332	-83.367	112.781
5000.000	2.858	249.719	-85.473	-80.684	4997.511	0.437	-85.473	117.540
5100.000	2.949	251.915	-87.136	-85.468	5097.383	0.144	-87.136	122.055
5200.000	3.280	260.065	-88.428	-90.731	5197.235	0.552	-88.428	126.695
5300.000	3.373	263.774	-89.241	-96.473	5297.067	0.234	-89.241	131.419
5400.000	3.504	261.543	-90.009	-102.420	5396.887	0.188	-90.009	136.351
5500.000	2.903	254.485	-91.136	-107.884	5496.731	0.718	-91.136	141.226
5600.000	2.634	261.800	-92.141	-112.598	5596.614	0.444	-92.141	145.494
5700.000	2.719	266.956	-92.595	-117.242	5696.505	0.255	-92.595	149.397
5800.000	3.048	267.121	-92.854	-122.266	5796.378	0.328	-92.854	153.528
5900.000	2.946	264.953	-93.214	-127.481	5896.242	0.152	-93.214	157.924
6000.000	3.024	260.739	-93.865	-132.644	5996.106	0.233	-93.865	162.496
6100.000	3.071	259.793	-94.764	-137.884	6095.965	0.069	-94.764	167.308
6200.000	3.087	264.026	-95.519	-143.198	6195.820	0.228	-95.519	172.132
6300.000	3.037	255.625	-96.456	-148.441	6295.678	0.451	-96.456	177.027
6400.000	3.104	260.409	-97.565	-153.677	6395.535	0.265	-97.565	182.032
6500.000	3.526	258.205	-98.645	-159.357	6495.367	0.440	-98.645	187.418
6600.000	3.904	256.597	-100.063	-165.679	6595.157	0.392	-100.063	193.551
6700.000	4.183	267.088	-101.037	-172.633	6694.909	0.789	-101.037	200.027
6800.000	4.327	259.726	-101.895	-179.987	6794.634	0.565	-101.895	206.828
6900.000	4.779	249.047	-104.058	-187.589	6894.320	0.959	-104.058	214.517
7000.000	5.700	248.994	-107.327	-196.115	6993.901	0.921	-107.327	223.563
7050.000	6.113	246.431	-109.282	-200.873	7043.636	0.980	-109.282	228.676

0

rees East of True North

**Cbrg**

0.000  
196.745  
203.590  
211.147  
218.410  
219.400  
201.779  
188.506  
182.844  
180.898  
179.654  
179.574  
180.875  
181.907  
182.346  
182.701  
183.376  
184.650  
185.809  
187.091  
188.901  
190.658  
192.174  
193.464  
194.583  
196.108  
198.565  
201.591  
204.998  
209.265  
213.820  
217.788  
220.950  
222.865  
223.308

223.369  
223.247  
222.510  
221.178  
219.443  
217.667  
216.524  
216.244  
216.467  
216.986  
217.761  
218.766  
219.976  
221.256  
222.337  
223.349  
224.446  
225.737  
227.230  
228.690  
229.810  
230.706  
231.699  
232.785  
233.826  
234.715  
235.500  
236.295  
236.984  
237.590  
238.242  
238.870  
239.661  
240.485  
240.982  
241.310  
241.452