



Company: Noble Energy
Rig: Production/ V.E.S
API # 05-123-26663
Date: 1/3/2014
Surveyor: Jay Hinman
VS: 0.000
Lat : 40.194545
Long: -104.652273

Well: Ritchey H27-11
Location: Weld County, Colorado
North Reference: GRID
Convergence: Grid North is 0.55 Deg
Declination: 8.44
Depth Reference: Ground Level
Elevation: 4819'
Total Depth as Drilled: 7285'

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	0.350	137.084	-0.224	0.208	99.999	0.350	-0.224	0.306
200.000	0.136	146.189	-0.547	0.483	199.998	0.217	-0.547	0.729
300.000	0.265	111.584	-0.731	0.764	299.998	0.171	-0.731	1.057
400.000	0.390	115.192	-0.961	1.287	399.996	0.128	-0.961	1.606
500.000	0.363	120.375	-1.266	1.868	499.994	0.044	-1.266	2.257
600.000	0.446	129.276	-1.672	2.443	599.992	0.104	-1.672	2.960
700.000	0.508	59.530	-1.694	3.126	699.989	0.548	-1.694	3.555
800.000	0.592	59.678	-1.208	3.954	799.984	0.084	-1.208	4.134
900.000	0.733	64.737	-0.675	4.978	899.977	0.152	-0.675	5.023
1000.000	0.380	48.145	-0.181	5.803	999.973	0.384	-0.181	5.806
1100.000	0.341	32.947	0.291	6.212	1099.971	0.103	0.291	6.219
1200.000	0.193	32.276	0.683	6.464	1199.970	0.149	0.683	6.500
1300.000	0.252	350.193	1.041	6.516	1299.969	0.169	1.041	6.599
1400.000	0.188	36.152	1.390	6.576	1399.968	0.181	1.390	6.721
1500.000	0.255	334.196	1.723	6.576	1499.968	0.235	1.723	6.798
1600.000	0.520	5.037	2.375	6.518	1599.965	0.328	2.375	6.938
1700.000	0.418	310.574	3.064	6.282	1699.962	0.438	3.064	6.989
1800.000	0.525	325.199	3.677	5.743	1799.959	0.161	3.677	6.820
1900.000	0.395	305.670	4.255	5.201	1899.956	0.202	4.255	6.720
2000.000	0.373	228.368	4.239	4.678	1999.954	0.480	4.239	6.313
2100.000	0.515	210.372	3.636	4.207	2099.951	0.197	3.636	5.561
2200.000	0.329	189.248	2.965	3.934	2199.949	0.239	2.965	4.926
2300.000	0.595	161.077	2.190	4.057	2299.945	0.343	2.190	4.610
2400.000	0.312	159.210	1.445	4.322	2399.942	0.284	1.445	4.557
2500.000	0.531	155.108	0.770	4.613	2499.939	0.221	0.770	4.677
2600.000	0.746	187.107	-0.296	4.727	2599.933	0.408	-0.296	4.737
2700.000	1.038	173.813	-1.843	4.744	2699.921	0.356	-1.843	5.090
2800.000	1.202	187.318	-3.784	4.708	2799.902	0.310	-3.784	6.040
2900.000	1.396	194.882	-6.001	4.262	2899.877	0.258	-6.001	7.361
3000.000	1.419	204.894	-8.302	3.428	2999.847	0.247	-8.302	8.981
3100.000	0.528	218.874	-9.784	2.617	3099.831	0.915	-9.784	10.128
3200.000	0.205	8.464	-9.965	2.354	3199.830	0.713	-9.965	10.240
3300.000	0.137	288.279	-9.751	2.268	3299.830	0.226	-9.751	10.011
3400.000	0.156	227.795	-9.805	2.054	3399.830	0.148	-9.805	10.018

3500.000	0.548	351.816	-9.423	1.885	3499.828	0.648	-9.423	9.610
3600.000	1.047	359.002	-8.036	1.801	3599.818	0.509	-8.036	8.236
3700.000	1.307	354.902	-5.987	1.684	3699.797	0.273	-5.987	6.219
3800.000	1.745	1.182	-3.328	1.614	3799.761	0.468	-3.328	3.699
3900.000	1.490	4.759	-0.510	1.753	3899.721	0.274	-0.510	1.826
4000.000	1.585	8.064	2.155	2.055	3999.685	0.130	2.155	2.978
4100.000	1.179	4.729	4.549	2.334	4099.656	0.414	4.549	5.113
4200.000	0.998	349.968	6.432	2.267	4199.638	0.332	6.432	6.819
4300.000	1.127	339.045	8.207	1.764	4299.621	0.239	8.207	8.395
4400.000	1.747	353.470	10.640	1.239	4399.590	0.713	10.640	10.712
4500.000	2.061	352.778	13.938	0.839	4499.534	0.314	13.938	13.964
4600.000	2.065	343.244	17.447	0.094	4599.470	0.343	17.447	17.448
4700.000	2.365	350.260	21.207	-0.775	4699.395	0.404	21.207	21.221
4800.000	2.233	1.467	25.188	-1.074	4799.315	0.468	25.188	25.211
4900.000	2.097	342.719	28.882	-1.568	4899.245	0.718	28.882	28.925
5000.000	2.389	344.170	32.635	-2.680	4999.168	0.297	32.635	32.745
5100.000	2.677	339.046	36.821	-4.084	5099.070	0.366	36.821	37.047
5200.000	2.649	340.869	41.186	-5.676	5198.962	0.089	41.186	41.575
5300.000	2.097	328.970	44.937	-7.377	5298.877	0.737	44.937	45.538
5400.000	1.371	328.123	47.521	-8.952	5398.830	0.726	47.521	48.357
5500.000	0.868	314.206	49.065	-10.127	5498.811	0.569	49.065	50.099
5600.000	0.579	309.432	49.914	-11.060	5598.803	0.294	49.914	51.125
5700.000	0.167	250.673	50.187	-11.588	5698.801	0.513	50.187	51.508
5800.000	0.907	221.080	49.542	-12.245	5798.796	0.766	49.542	51.033
5900.000	1.197	205.094	48.000	-13.208	5898.779	0.410	48.000	49.784
6000.000	0.916	216.205	46.409	-14.124	5998.762	0.346	46.409	48.510
6100.000	1.011	216.438	45.054	-15.120	6098.748	0.095	45.054	47.523
6200.000	0.961	229.086	43.795	-16.278	6198.733	0.223	43.795	46.722
6300.000	1.284	243.677	42.749	-17.916	6298.714	0.429	42.749	46.351
6400.000	2.201	255.265	41.763	-20.778	6398.667	0.978	41.763	46.646
6500.000	1.494	263.878	41.136	-23.931	6498.615	0.758	41.136	47.590
6600.000	0.651	240.865	40.720	-25.724	6598.597	0.930	40.720	48.165
6700.000	0.291	252.374	40.366	-26.463	6698.593	0.371	40.366	48.267
6800.000	0.214	142.062	40.142	-26.591	6798.593	0.417	40.142	48.150
6900.000	0.149	310.163	40.078	-26.575	6898.593	0.362	40.078	48.089
7000.000	0.630	26.813	40.653	-26.427	6998.590	0.613	40.653	48.488

0

rees East of True North

Cbrg

0.000
137.084
138.563
133.734
126.743
124.118
124.395
118.452
106.994
97.718
91.782
87.321
83.970
80.922
78.064
75.316
69.979
63.998
57.368
50.717
47.815
49.170
52.999
61.636
71.518
80.521
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168.169

168.686
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164.289
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346.999
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344.615
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329.810
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326.452
326.974