



Company: Noble Energy  
 Rig: Production/VES  
 API # 05-123-26190  
 Date: 10/22/13  
 Surveyor: Levi Sheldon  
 VS: 0.000  
 Lat : 40.510  
 Long: -104.458

Well: Cache USX AA05-15  
 Location: Weld County, Colorado  
 North Reference: GRID  
 Convergence: GRID North is 0.670 Degrees East  
 Declination: 8.39  
 Depth Reference: Ground Level  
 Elevation: 4,709 Feet  
 Total Depth as Drilled: 6,968 Feet

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	0.726	102.791	-0.140	0.618	99.997	0.726	-0.140	0.634	102.791
200.000	0.720	88.444	-0.264	1.864	199.989	0.181	-0.264	1.882	98.048
300.000	0.582	112.896	-0.444	2.959	299.983	0.307	-0.444	2.992	98.532
400.000	0.549	118.155	-0.867	3.849	399.978	0.061	-0.867	3.945	102.699
500.000	0.621	136.021	-1.483	4.648	499.973	0.195	-1.483	4.879	107.703
600.000	0.678	143.210	-2.347	5.378	599.967	0.099	-2.347	5.868	113.578
700.000	0.589	101.099	-2.920	6.237	699.961	0.463	-2.920	6.887	115.086
800.000	0.590	97.756	-3.088	7.251	799.956	0.034	-3.088	7.881	113.068
900.000	0.299	100.487	-3.205	8.017	899.953	0.291	-3.205	8.634	111.790
1000.000	0.167	99.464	-3.277	8.418	999.952	0.132	-3.277	9.033	111.268
1100.000	0.193	40.328	-3.172	8.671	1099.951	0.179	-3.172	9.233	110.092
1200.000	0.100	191.656	-3.129	8.763	1199.951	0.285	-3.129	9.305	109.649
1300.000	0.052	217.723	-3.250	8.717	1299.951	0.058	-3.250	9.304	110.449
1400.000	0.101	100.034	-3.302	8.776	1399.951	0.134	-3.302	9.377	110.618
1500.000	0.132	148.353	-3.416	8.924	1499.951	0.100	-3.416	9.555	110.944
1600.000	0.122	291.368	-3.475	8.885	1599.951	0.241	-3.475	9.540	111.360
1700.000	0.050	223.739	-3.468	8.755	1699.951	0.113	-3.468	9.417	111.606
1800.000	0.297	281.026	-3.450	8.471	1799.950	0.273	-3.450	9.147	112.156
1900.000	0.017	262.351	-3.402	8.203	1899.950	0.281	-3.402	8.880	112.526
2000.000	0.061	272.427	-3.402	8.135	1999.950	0.044	-3.402	8.817	112.693
2100.000	0.092	342.387	-3.323	8.057	2099.950	0.091	-3.323	8.716	112.414
2200.000	0.117	320.578	-3.168	7.968	2199.950	0.047	-3.168	8.575	111.682
2300.000	0.207	333.328	-2.927	7.822	2299.949	0.096	-2.927	8.352	110.518
2400.000	0.254	247.666	-2.850	7.536	2399.949	0.316	-2.850	8.056	110.716
2500.000	0.108	213.350	-3.013	7.279	2499.948	0.176	-3.013	7.877	112.487
2600.000	0.158	312.827	-2.998	7.126	2599.948	0.205	-2.998	7.731	112.818
2700.000	0.134	5.705	-2.788	7.036	2699.948	0.132	-2.788	7.569	111.617
2800.000	0.331	163.029	-2.949	7.132	2799.947	0.457	-2.949	7.718	112.462
2900.000	0.089	58.000	-3.184	7.283	2899.947	0.365	-3.184	7.948	113.615
3000.000	0.096	96.894	-3.153	7.432	2999.947	0.062	-3.153	8.073	112.988
3100.000	0.076	36.187	-3.109	7.554	3099.946	0.089	-3.109	8.169	112.372
3200.000	0.146	308.293	-2.976	7.493	3199.946	0.162	-2.976	8.062	111.664
3300.000	0.116	239.390	-2.949	7.306	3299.946	0.150	-2.949	7.878	111.981
3400.000	0.182	107.314	-3.048	7.371	3399.946	0.274	-3.048	7.976	112.465
3500.000	0.151	59.564	-3.029	7.636	3499.946	0.138	-3.029	8.215	111.634

3600.000	0.245	235.695	-3.083	7.572	3599.945	0.396	-3.083	8.176	112.151
3700.000	0.181	48.354	-3.099	7.513	3699.945	0.425	-3.099	8.127	112.412
3800.000	0.137	81.364	-2.976	7.749	3799.945	0.099	-2.976	8.301	111.009
3900.000	0.146	93.446	-2.966	7.994	3899.944	0.031	-2.966	8.526	110.355
4000.000	0.085	324.943	-2.913	8.078	3999.944	0.209	-2.913	8.587	109.828
4100.000	0.162	47.003	-2.756	8.139	4099.944	0.172	-2.756	8.593	108.708
4200.000	0.119	44.353	-2.586	8.315	4199.944	0.043	-2.586	8.707	107.275
4300.000	0.228	236.308	-2.622	8.222	4299.944	0.345	-2.622	8.630	107.688
4400.000	0.251	34.289	-2.551	8.180	4399.943	0.470	-2.551	8.568	107.323
4500.000	0.064	307.847	-2.336	8.259	4499.943	0.255	-2.336	8.583	105.794
4600.000	0.078	237.716	-2.338	8.157	4599.943	0.083	-2.338	8.486	105.996
4700.000	0.290	66.453	-2.274	8.331	4699.943	0.367	-2.274	8.636	105.266
4800.000	0.170	16.977	-2.031	8.606	4799.942	0.221	-2.031	8.842	103.277
4900.000	0.132	279.031	-1.870	8.535	4899.942	0.230	-1.870	8.738	102.360
5000.000	0.143	220.460	-1.947	8.340	4999.941	0.135	-1.947	8.564	103.143
5100.000	0.070	143.167	-2.092	8.296	5099.941	0.145	-2.092	8.555	104.151
5200.000	0.122	163.489	-2.243	8.363	5199.941	0.061	-2.243	8.658	105.011
5300.000	0.136	99.924	-2.365	8.510	5299.941	0.137	-2.365	8.833	105.530
5400.000	0.085	200.156	-2.455	8.602	5399.941	0.173	-2.455	8.945	105.931
5500.000	0.237	342.880	-2.327	8.515	5499.940	0.309	-2.327	8.828	105.286
5600.000	0.114	124.336	-2.186	8.536	5599.940	0.334	-2.186	8.812	104.361
5700.000	0.099	22.500	-2.162	8.651	5699.940	0.165	-2.162	8.917	104.029
5800.000	0.328	186.953	-2.366	8.650	5799.940	0.424	-2.366	8.968	105.297
5900.000	0.032	311.351	-2.631	8.594	5899.939	0.347	-2.631	8.988	107.024
6000.000	0.217	6.560	-2.425	8.595	5999.939	0.201	-2.425	8.931	105.756
6100.000	0.074	50.354	-2.196	8.667	6099.939	0.171	-2.196	8.940	104.217
6200.000	0.087	188.303	-2.229	8.705	6199.939	0.150	-2.229	8.986	104.363
6300.000	0.127	221.183	-2.387	8.622	6299.938	0.072	-2.387	8.946	105.479
6400.000	0.105	198.469	-2.558	8.520	6399.938	0.051	-2.558	8.895	106.711
6500.000	0.120	45.148	-2.571	8.565	6499.938	0.219	-2.571	8.942	106.707
6600.000	0.216	328.333	-2.336	8.540	6599.938	0.222	-2.336	8.854	105.300
6700.000	0.194	241.442	-2.257	8.292	6699.937	0.283	-2.257	8.594	105.224
6750.000	0.070	252.927	-2.306	8.188	6749.937	0.253	-2.306	8.507	105.728

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