



Company: Noble Energy
Rig: Producton / V.E.S.

API # 05-123-15831

Date: 3/19/2014

Surveyor: Norman Cowan

VS: 0.000

Lat : 40.277

Long: -104.473

Well: Spike State CC 30-16

Location: Weld County, Colorado

North Reference: GRID

Convergence: Grid north is 0.66 Deg East of Tru

Declination: 8.33 Degrees

Depth Reference: Ground Level

Elevation: 4791 Feet

Total Depth as Drilled: 6964 Feet

Lat & Long obtained by handheld GPS at wellhead

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	0.273	164.813	-0.230	0.062	100.000	0.273	-0.230	0.238	164.813
200.000	0.296	85.776	-0.441	0.383	199.999	0.363	-0.441	0.584	139.032
300.000	0.122	58.946	-0.367	0.732	299.998	0.196	-0.367	0.819	116.630
400.000	0.819	119.437	-0.663	1.445	399.994	0.766	-0.663	1.590	114.653
500.000	0.233	143.342	-1.177	2.189	499.990	0.613	-1.177	2.485	118.276
600.000	0.346	111.291	-1.450	2.591	599.989	0.193	-1.450	2.969	119.228
700.000	0.080	143.489	-1.615	2.914	699.988	0.281	-1.615	3.332	119.004
800.000	0.597	207.234	-2.134	2.717	799.986	0.566	-2.134	3.455	128.154
900.000	0.856	205.755	-3.270	2.154	899.978	0.260	-3.270	3.916	146.631
1000.000	0.452	156.053	-4.304	1.989	999.972	0.661	-4.304	4.741	155.193
1100.000	0.766	82.763	-4.580	2.812	1099.967	0.769	-4.580	5.374	148.449
1200.000	0.475	171.617	-4.905	3.535	1199.963	0.893	-4.905	6.047	144.219
1300.000	0.488	212.297	-5.675	3.368	1299.960	0.335	-5.675	6.599	149.308
1400.000	0.663	171.650	-6.607	3.225	1399.955	0.432	-6.607	7.352	153.980
1500.000	0.824	224.871	-7.688	2.802	1499.948	0.681	-7.688	8.183	159.975
1600.000	0.795	291.069	-7.948	1.647	1599.940	0.884	-7.948	8.117	168.289
1700.000	0.947	268.063	-7.726	0.174	1699.928	0.378	-7.726	7.728	178.707
1800.000	0.799	240.700	-8.095	-1.259	1799.917	0.437	-8.095	8.193	188.840
1900.000	0.865	256.282	-8.615	-2.600	1899.907	0.235	-8.615	8.999	196.792
2000.000	0.664	191.981	-9.361	-3.453	1999.900	0.831	-9.361	9.978	200.248
2100.000	0.707	228.743	-10.334	-4.037	2099.893	0.434	-10.334	11.095	201.338
2200.000	0.267	169.405	-10.970	-4.458	2199.889	0.615	-10.970	11.842	202.114
2300.000	0.419	323.954	-10.904	-4.630	2299.889	0.671	-10.904	11.846	203.008
2400.000	0.427	249.403	-10.739	-5.194	2399.887	0.513	-10.739	11.929	205.812
2500.000	0.875	248.757	-11.147	-6.255	2499.880	0.449	-11.147	12.782	209.298
2600.000	0.774	273.979	-11.377	-7.640	2599.870	0.373	-11.377	13.704	213.885
2700.000	0.711	326.012	-10.816	-8.661	2699.863	0.654	-10.816	13.856	218.686
2800.000	0.983	349.084	-9.459	-9.170	2799.852	0.431	-9.459	13.174	224.110
2900.000	0.422	274.510	-8.588	-9.700	2899.846	0.961	-8.588	12.955	228.479
3000.000	0.754	310.250	-8.134	-10.570	2999.840	0.480	-8.134	13.337	232.420
3100.000	0.958	6.063	-6.877	-10.984	3099.831	0.821	-6.877	12.959	237.949
3200.000	0.435	0.611	-5.666	-10.891	3199.823	0.527	-5.666	12.277	242.515
3300.000	0.432	88.603	-5.277	-10.511	3299.821	0.602	-5.277	11.761	243.341
3400.000	0.442	89.804	-5.267	-9.749	3399.818	0.014	-5.267	11.081	241.621
3500.000	0.811	60.797	-4.920	-8.745	3499.812	0.476	-4.920	10.034	240.640

3600.000	0.360	80.014	-4.520	-7.818	3599.807	0.486	-4.520	9.030	239.965
3700.000	1.176	62.602	-3.993	-6.597	3699.797	0.839	-3.993	7.712	238.814
3800.000	0.493	74.881	-3.409	-5.272	3799.786	0.702	-3.409	6.278	237.109
3900.000	0.952	64.783	-2.943	-4.105	3899.778	0.475	-2.943	5.051	234.361
4000.000	0.609	355.719	-2.059	-3.393	3999.770	0.929	-2.059	3.969	238.751
4100.000	0.451	229.611	-1.784	-3.733	4099.768	0.948	-1.784	4.137	244.456
4200.000	1.169	283.306	-1.804	-5.025	4199.759	0.972	-1.804	5.339	250.248
4300.000	1.494	295.422	-1.010	-7.195	4299.732	0.428	-1.010	7.266	262.007
4400.000	1.380	257.237	-0.717	-9.546	4399.703	0.946	-0.717	9.573	265.706
4500.000	2.221	261.349	-1.274	-12.636	4499.652	0.850	-1.274	12.700	264.242
4600.000	1.362	257.819	-1.816	-15.713	4599.603	0.865	-1.816	15.818	263.406
4700.000	0.587	224.874	-2.430	-17.236	4699.588	0.926	-2.430	17.407	261.975
4800.000	0.659	130.751	-3.168	-17.162	4799.584	0.913	-3.168	17.452	259.540
4900.000	0.797	131.716	-4.007	-16.207	4899.576	0.138	-4.007	16.695	256.114
5000.000	0.753	135.770	-4.940	-15.229	4999.567	0.070	-4.940	16.010	252.027
5100.000	0.600	107.416	-5.568	-14.271	5099.560	0.363	-5.568	15.319	248.686
5200.000	0.149	85.214	-5.714	-13.642	5199.558	0.466	-5.714	14.791	247.274
5300.000	0.824	96.952	-5.790	-12.800	5299.554	0.679	-5.790	14.048	245.659
5400.000	1.576	72.069	-5.454	-10.778	5399.532	0.898	-5.454	12.079	243.159
5500.000	0.920	81.220	-4.908	-8.676	5499.507	0.683	-4.908	9.968	240.504
5600.000	1.473	65.787	-4.259	-6.711	5599.486	0.635	-4.259	7.948	237.603
5700.000	1.992	91.555	-3.779	-3.802	5699.441	0.924	-3.779	5.360	225.174
5800.000	1.399	104.799	-4.138	-0.884	5799.397	0.707	-4.138	4.231	192.063
5900.000	1.121	106.491	-4.727	1.234	5899.373	0.280	-4.727	4.886	165.370
6000.000	1.334	125.537	-5.682	3.120	5999.350	0.457	-5.682	6.482	151.230
6100.000	1.118	129.689	-6.982	4.818	6099.327	0.234	-6.982	8.483	145.390
6200.000	0.770	153.380	-8.205	5.870	6199.314	0.516	-8.205	10.089	144.421
6300.000	0.538	176.949	-9.275	6.196	6299.308	0.350	-9.275	11.154	146.256
6400.000	0.838	159.695	-10.430	6.475	6399.300	0.361	-10.430	12.276	148.169
6500.000	0.455	147.140	-11.450	6.944	6499.294	0.406	-11.450	13.391	148.764
6600.000	0.245	155.817	-11.979	7.247	6599.292	0.216	-11.979	14.001	148.825
6650.000	0.698	183.296	-12.381	7.274	6649.290	0.987	-12.381	14.359	149.565

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