



Company: Noble Energy
Rig: Production/VES
API # 05-123-14155
Date: 8/26/13
Surveyor: Levi Sheldon
VS: 0.000
Lat : 40.310
Long: -104.775

Well: Schaeffer PM K16-09
Location: Weld County, Colorado
North Reference: GRID
Convergence: GRID North is 0.470 Degrees East
Declination: 8.57
Depth Reference: Ground Level
Elevation: 4,743 Feet
Total Depth as Drilled: 7,427 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	0.261	138.428	-0.170	0.151	100.000	0.261	-0.170	0.227	138.428
200.000	0.295	58.476	-0.206	0.521	199.999	0.358	-0.206	0.560	111.563
300.000	0.174	30.805	0.059	0.818	299.998	0.162	0.059	0.820	85.864
400.000	0.435	229.537	-0.057	0.607	399.997	0.603	-0.057	0.609	95.355
500.000	0.258	321.592	-0.127	0.177	499.996	0.514	-0.127	0.218	125.541
600.000	0.346	309.198	0.241	-0.197	599.995	0.109	0.241	0.311	320.762
700.000	0.175	196.145	0.285	-0.473	699.994	0.445	0.285	0.552	301.020
800.000	0.290	283.158	0.195	-0.762	799.993	0.331	0.195	0.786	284.358
900.000	0.046	156.047	0.216	-0.992	899.993	0.319	0.216	1.015	282.291
1000.000	0.345	281.156	0.238	-1.271	999.992	0.373	0.238	1.293	280.600
1100.000	0.443	275.565	0.334	-1.951	1099.990	0.106	0.334	1.979	279.702
1200.000	0.149	172.613	0.242	-2.319	1199.989	0.499	0.242	2.332	275.953
1300.000	0.416	255.326	0.021	-2.653	1299.988	0.423	0.021	2.653	270.447
1400.000	0.411	310.816	0.163	-3.275	1399.986	0.385	0.163	3.279	272.855
1500.000	0.076	175.209	0.332	-3.541	1499.985	0.468	0.332	3.557	275.350
1600.000	0.484	265.531	0.233	-3.957	1599.984	0.490	0.233	3.964	273.364
1700.000	0.787	289.802	0.432	-5.024	1699.978	0.399	0.432	5.043	274.919
1800.000	0.839	289.506	0.910	-6.361	1799.968	0.052	0.910	6.425	278.139
1900.000	0.825	313.386	1.649	-7.574	1899.957	0.345	1.649	7.752	282.281
2000.000	0.572	292.571	2.335	-8.559	1999.950	0.355	2.335	8.871	285.262
2100.000	0.649	297.902	2.792	-9.520	2099.944	0.096	2.792	9.921	286.345
2200.000	0.931	315.939	3.641	-10.586	2199.935	0.372	3.641	11.195	288.980
2300.000	0.680	328.470	4.731	-11.461	2299.925	0.305	4.731	12.399	292.428
2400.000	0.921	26.570	5.956	-11.412	2399.917	0.806	5.956	12.873	297.558
2500.000	0.733	70.411	6.889	-10.450	2499.907	0.642	6.889	12.516	303.394
2600.000	0.655	58.940	7.398	-9.358	2599.900	0.159	7.398	11.929	308.331
2700.000	0.495	64.679	7.878	-8.478	2699.895	0.170	7.878	11.573	312.900
2800.000	0.352	27.385	8.335	-7.946	2799.892	0.303	8.335	11.516	316.370
2900.000	0.755	262.869	8.526	-8.458	2899.889	0.997	8.526	12.010	315.229
3000.000	0.743	238.910	8.109	-9.667	2999.881	0.311	8.109	12.618	309.993
3100.000	0.603	264.395	7.723	-10.746	3099.874	0.327	7.723	13.234	305.704
3200.000	0.589	261.333	7.594	-11.778	3199.869	0.035	7.594	14.014	302.812
3300.000	0.494	246.549	7.345	-12.682	3299.865	0.169	7.345	14.656	300.078
3400.000	0.468	319.117	7.483	-13.345	3399.862	0.570	7.483	15.300	299.280
3500.000	0.495	2.198	8.223	-13.596	3499.859	0.354	8.223	15.889	301.166

3600.000	0.505	45.645	8.963	-13.264	3599.855	0.370	8.963	16.008	304.047
3700.000	0.558	354.195	9.756	-12.998	3699.851	0.464	9.756	16.252	306.890
3800.000	0.825	19.106	10.920	-12.812	3799.844	0.396	10.920	16.834	310.444
3900.000	0.550	356.221	12.080	-12.608	3899.837	0.384	12.080	17.461	313.775
4000.000	0.640	4.114	13.116	-12.599	3999.832	0.122	13.116	18.187	316.151
4100.000	0.219	317.600	13.814	-12.688	4099.829	0.515	13.814	18.757	317.433
4200.000	0.617	290.607	14.145	-13.321	4199.826	0.433	14.145	19.430	316.718
4300.000	0.646	267.724	14.312	-14.388	4299.820	0.252	14.312	20.295	314.848
4400.000	0.755	254.569	14.115	-15.587	4399.813	0.193	14.115	21.028	312.163
4500.000	0.695	249.601	13.728	-16.790	4499.805	0.087	13.728	21.688	309.271
4600.000	0.635	248.121	13.310	-17.872	4599.798	0.063	13.310	22.284	306.677
4700.000	0.690	194.092	12.520	-18.533	4699.792	0.604	12.520	22.365	304.040
4800.000	0.650	219.818	11.500	-19.043	4799.786	0.301	11.500	22.246	301.128
4900.000	0.434	205.514	10.723	-19.569	4899.781	0.253	10.723	22.314	298.720
5000.000	0.521	207.047	9.975	-19.939	4999.778	0.088	9.975	22.295	296.579
5100.000	0.624	220.479	9.156	-20.499	5099.773	0.169	9.156	22.451	294.068
5200.000	0.251	230.518	8.602	-21.022	5199.770	0.379	8.602	22.714	292.255
5300.000	0.376	248.975	8.345	-21.498	5299.768	0.159	8.345	23.061	291.216
5400.000	0.405	262.709	8.183	-22.155	5399.766	0.098	8.183	23.617	290.271
5500.000	0.517	223.996	7.813	-22.819	5499.763	0.323	7.813	24.120	288.901
5600.000	1.469	239.329	6.835	-24.235	5599.747	0.980	6.835	25.180	285.750
5700.000	1.574	241.064	5.516	-26.540	5699.712	0.115	5.516	27.107	281.742
5800.000	1.389	242.988	4.301	-28.822	5799.678	0.192	4.301	29.141	278.488
5900.000	1.150	235.303	3.179	-30.727	5899.653	0.293	3.179	30.891	275.907
6000.000	0.832	231.166	2.153	-32.118	5999.638	0.326	2.153	32.190	273.834
6100.000	0.860	229.420	1.209	-33.254	6099.627	0.038	1.209	33.276	272.082
6200.000	0.873	255.316	0.527	-34.561	6199.616	0.389	0.527	34.565	270.874
6300.000	0.458	192.691	-0.056	-35.386	6299.611	0.778	-0.056	35.386	269.909
6400.000	0.747	213.565	-0.989	-35.834	6399.605	0.358	-0.989	35.848	268.419
6500.000	0.870	234.377	-1.974	-36.812	6499.595	0.316	-1.974	36.864	266.931
6600.000	1.051	217.226	-3.146	-37.983	6599.581	0.338	-3.146	38.113	265.265
6700.000	1.143	211.031	-4.732	-39.053	6699.563	0.150	-4.732	39.338	263.092
6800.000	2.012	205.756	-7.168	-40.330	6799.524	0.879	-7.168	40.962	259.922
6900.000	4.025	202.744	-11.985	-42.449	6899.380	2.018	-11.985	44.109	254.233
7000.000	4.262	192.680	-18.847	-44.622	6999.120	0.764	-18.847	48.439	247.103
7100.000	3.269	191.284	-25.268	-45.995	7098.903	0.996	-25.268	52.479	241.217
7175.000	2.564	190.554	-29.015	-46.721	7173.806	0.942	-29.015	54.997	238.159

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