



**Company:** Noble Energy, Inc.  
**Rig:** Production/Lightning  
**Latitude:** 40.41194  
**Longitude:** -104.81861  
**API #** 05-123-25604  
**Date:** 8/15/2012

**Well:** Samuel J7-9  
**Location:** Weld County, Colorado  
**North Reference:** Grid North/-0.44  
**Depth Reference:** Ground Level  
**Surveyor:** Randy Holcomb  
**VS:** 0

MS 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	0.252	347.400	0.214	-0.048	100.000	0.252	0.214	0.220	347.400
200.000	0.305	320.324	0.633	-0.265	199.999	0.140	0.633	0.686	337.249
300.000	0.311	314.622	1.028	-0.628	299.997	0.031	1.028	1.205	328.570
400.000	0.356	331.190	1.491	-0.971	399.995	0.106	1.491	1.780	326.919
500.000	0.403	41.882	2.025	-0.886	499.994	0.441	2.025	2.211	336.373
600.000	0.407	82.183	2.336	-0.299	599.991	0.279	2.336	2.355	352.706
700.000	0.579	55.828	2.668	0.471	699.988	0.280	2.668	2.709	10.010
800.000	0.403	27.929	3.262	1.053	799.984	0.292	3.262	3.428	17.896
900.000	0.294	18.006	3.817	1.297	899.982	0.124	3.817	4.031	18.774
1000.000	0.578	12.183	4.554	1.483	999.979	0.287	4.554	4.789	18.040
1100.000	0.529	357.854	5.508	1.572	1099.975	0.146	5.508	5.728	15.932
1200.000	1.814	1.252	7.551	1.590	1199.952	1.287	7.551	7.717	11.887
1300.000	3.122	20.011	11.693	2.556	1299.858	1.521	11.693	11.969	12.331
1400.000	4.703	24.977	17.969	5.219	1399.622	1.616	17.969	18.711	16.197
1500.000	5.907	19.358	26.541	8.656	1499.193	1.310	26.541	27.917	18.064
1600.000	7.536	20.360	37.544	12.644	1598.502	1.633	37.544	39.616	18.612
1700.000	8.499	29.012	50.155	18.510	1697.527	1.541	50.155	53.461	20.256
1800.000	9.197	39.099	62.820	27.134	1796.343	1.698	62.820	68.429	23.361
1900.000	9.185	49.081	74.250	38.205	1895.065	1.593	74.250	83.503	27.228
2000.000	9.330	58.044	83.768	51.114	1993.768	1.448	83.768	98.131	31.391
2100.000	9.945	71.179	90.845	66.167	2092.368	2.278	90.845	112.387	36.068
2200.000	10.605	79.096	95.372	83.377	2190.769	1.557	95.372	126.679	41.161
2300.000	10.822	82.276	98.374	101.715	2289.027	0.629	98.374	141.504	45.957
2400.000	11.524	83.776	100.719	120.948	2387.131	0.760	100.719	157.394	50.214
2500.000	11.513	88.810	102.009	140.856	2485.120	1.005	102.009	173.914	54.088
2600.000	12.805	90.010	102.214	161.916	2582.874	1.316	102.214	191.480	57.737
2700.000	14.913	87.595	102.753	185.856	2679.959	2.185	102.753	212.369	61.063
2800.000	15.169	80.066	105.550	211.602	2776.542	1.969	105.550	236.466	63.489
2900.000	13.062	81.531	109.472	235.669	2873.518	2.137	109.472	259.853	65.084
3000.000	13.738	82.583	112.669	258.621	2970.795	0.719	112.669	282.098	66.460
3100.000	13.311	81.049	115.993	281.768	3068.022	0.558	115.993	304.709	67.625
3200.000	12.633	78.195	120.021	303.844	3165.470	0.933	120.021	326.690	68.446
3300.000	13.481	74.212	125.430	325.765	3262.886	1.236	125.430	349.079	68.942
3400.000	13.362	76.684	131.263	348.226	3360.155	0.586	131.263	372.145	69.346
3500.000	12.636	82.082	135.431	370.306	3457.596	1.414	135.431	394.294	69.911
3600.000	12.593	84.599	137.964	391.992	3555.183	0.551	137.964	415.562	70.610
3700.000	12.940	82.323	140.486	413.941	3652.711	0.611	140.486	437.131	71.254
3800.000	14.253	81.186	143.868	437.204	3749.907	1.340	143.868	460.266	71.786

3900.000	15.926	80.764	147.957	462.912	3846.455	1.676	147.957	485.982	72.275
4000.000	16.199	81.024	152.335	490.232	3942.551	0.283	152.335	513.355	72.738
4100.000	15.322	81.696	156.420	517.084	4038.791	0.896	156.420	540.225	73.169
4200.000	14.435	82.040	160.054	542.503	4135.437	0.891	160.054	565.620	73.562
4300.000	14.144	81.419	163.603	566.928	4232.343	0.330	163.603	590.062	73.903
4400.000	13.937	80.880	167.335	590.899	4329.356	0.245	167.335	614.136	74.189
4500.000	14.750	79.414	171.583	615.304	4426.238	0.890	171.583	638.780	74.418
4600.000	14.816	80.730	175.981	640.437	4522.928	0.342	175.981	664.175	74.635
4700.000	13.043	77.498	180.484	664.074	4619.985	1.936	180.484	688.164	74.795
4800.000	13.666	78.296	185.323	686.658	4717.280	0.650	185.323	711.227	74.896
4900.000	13.491	81.402	189.463	709.760	4814.487	0.750	189.463	734.612	75.054
5000.000	13.608	83.239	192.591	732.975	4911.704	0.446	192.591	757.855	75.278
5100.000	13.813	78.123	196.433	756.340	5008.858	1.229	196.433	781.432	75.441
5200.000	12.338	77.711	201.164	778.463	5106.263	1.477	201.164	804.035	75.511
5300.000	11.901	77.547	205.662	798.971	5204.034	0.439	205.662	825.016	75.565
5400.000	10.495	78.273	209.737	817.957	5302.128	1.413	209.737	844.419	75.618
5500.000	9.859	83.060	212.622	835.373	5400.556	1.058	212.622	862.007	75.720
5600.000	7.833	84.284	214.335	850.653	5499.361	2.034	214.335	877.240	75.858
5700.000	6.267	83.837	215.600	862.861	5598.602	1.567	215.600	889.389	75.971
5800.000	4.402	82.900	216.660	872.096	5698.164	1.868	216.660	898.606	76.048
5900.000	2.711	84.567	217.359	878.259	5797.968	1.693	217.359	904.756	76.099
6000.000	1.442	90.457	217.573	881.872	5897.901	1.286	217.573	908.314	76.141
6100.000	0.395	147.089	217.273	883.317	5997.888	1.268	217.273	909.646	76.181
6200.000	0.366	167.346	216.672	883.574	6097.886	0.137	216.672	909.753	76.222
6300.000	0.417	178.473	215.996	883.654	6197.883	0.091	215.996	909.669	76.264
6400.000	0.407	183.433	215.278	883.642	6297.881	0.037	215.278	909.488	76.308
6500.000	0.342	185.759	214.626	883.591	6397.879	0.067	214.626	909.284	76.347
6600.000	0.203	189.053	214.154	883.533	6497.877	0.140	214.154	909.116	76.375
6700.000	0.257	198.374	213.766	883.434	6597.877	0.066	213.766	908.929	76.398
6800.000	0.286	216.264	213.352	883.216	6697.875	0.089	213.352	908.620	76.420
6900.000	0.296	229.530	212.983	882.872	6797.874	0.068	212.983	908.199	76.437
7000.000	0.410	204.851	212.490	882.525	6897.872	0.187	212.490	907.746	76.462
7100.000	0.403	190.488	211.820	882.311	6997.870	0.102	211.820	907.381	76.500
7200.000	0.395	175.808	211.131	882.272	7097.867	0.102	211.131	907.183	76.542
7300.000	0.391	157.456	210.472	882.428	7197.865	0.125	210.472	907.181	76.585