



Company: Noble Energy Inc.

Rig: Production/V.E.S.

Latitude: 40.19875

Longitude: -104.65755

API # 05-123-21908

Date: 2/7/13

Well: Ritchey H27-5

Location: Weld County, Colorado

Grid North is: .54 Degrees East of True

Depth Reference: KB= Ground Level

Surveyor: Jay Hinman

VS: 0.000

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	0.468	213.482	-0.341	-0.225	99.999	0.468	-0.341	0.408
200.000	0.390	205.256	-0.989	-0.596	199.996	0.099	-0.989	1.154
300.000	0.220	206.899	-1.467	-0.828	299.995	0.170	-1.467	1.685
400.000	0.340	228.305	-1.836	-1.136	399.993	0.158	-1.836	2.159
500.000	0.395	216.323	-2.311	-1.562	499.991	0.094	-2.311	2.790
600.000	0.075	200.955	-2.650	-1.790	599.990	0.324	-2.650	3.198
700.000	0.053	301.909	-2.687	-1.852	699.990	0.099	-2.687	3.263
800.000	0.164	322.974	-2.548	-1.977	799.990	0.116	-2.548	3.225
900.000	0.308	304.019	-2.284	-2.286	899.989	0.162	-2.284	3.231
1000.000	0.371	282.329	-2.064	-2.825	999.988	0.142	-2.064	3.499
1100.000	0.234	287.636	-1.933	-3.336	1099.986	0.140	-1.933	3.856
1200.000	0.324	296.326	-1.746	-3.784	1199.985	0.099	-1.746	4.167
1300.000	0.542	303.577	-1.359	-4.431	1299.982	0.224	-1.359	4.635
1400.000	0.658	300.295	-0.808	-5.321	1399.977	0.121	-0.808	5.382
1500.000	0.453	289.683	-0.386	-6.188	1499.972	0.228	-0.386	6.200
1600.000	0.629	283.281	-0.126	-7.094	1599.967	0.186	-0.126	7.096
1700.000	0.823	302.833	0.389	-8.232	1699.959	0.312	0.389	8.241
1800.000	0.848	291.916	1.054	-9.521	1799.949	0.161	1.054	9.580
1900.000	1.054	287.928	1.614	-11.083	1899.935	0.217	1.614	11.200
2000.000	1.147	292.632	2.282	-12.882	1999.917	0.130	2.282	13.083
2100.000	1.095	299.843	3.143	-14.635	2099.898	0.151	3.143	14.968
2200.000	1.297	310.511	4.353	-16.323	2199.876	0.300	4.353	16.894
2300.000	1.443	310.925	5.913	-18.135	2299.847	0.146	5.913	19.074
2400.000	1.854	305.997	7.688	-20.395	2399.806	0.435	7.688	21.796
2500.000	1.947	304.555	9.603	-23.103	2499.751	0.104	9.603	25.019
2600.000	1.523	302.219	11.274	-25.626	2599.705	0.429	11.274	27.996
2700.000	1.335	302.024	12.601	-27.738	2699.674	0.188	12.601	30.466
2800.000	1.275	310.381	13.939	-29.574	2799.648	0.200	13.939	32.694
2900.000	1.472	313.259	15.540	-31.356	2899.619	0.209	15.540	34.996
3000.000	1.388	302.640	17.074	-33.311	2999.588	0.278	17.074	37.432
3100.000	1.323	310.368	18.474	-35.211	3099.560	0.194	18.474	39.763
3200.000	1.279	301.518	19.805	-37.041	3199.534	0.205	19.805	42.004
3300.000	0.923	294.956	20.729	-38.723	3299.516	0.377	20.729	43.922
3400.000	0.757	269.516	21.063	-40.114	3399.505	0.404	21.063	45.307
3500.000	0.566	235.918	20.781	-41.183	3499.499	0.424	20.781	46.129
3600.000	0.303	194.280	20.248	-41.657	3599.496	0.394	20.248	46.317
3700.000	0.751	194.764	19.357	-41.890	3699.492	0.448	19.357	46.146

3800.000	1.010	202.891	17.911	-42.399	3799.480	0.287	17.911	46.028
3900.000	1.120	231.546	16.492	-43.508	3899.463	0.538	16.492	46.528
4000.000	1.577	235.118	15.097	-45.402	3999.435	0.464	15.097	47.846
4100.000	1.994	238.695	13.406	-48.018	4099.387	0.432	13.406	49.854
4200.000	2.515	247.921	11.677	-51.538	4199.309	0.633	11.677	52.844
4300.000	3.277	256.986	10.208	-56.356	4299.181	0.887	10.208	57.273
4400.000	3.606	263.777	9.224	-62.267	4399.001	0.523	9.224	62.946
4500.000	3.612	273.996	9.103	-68.536	4498.804	0.642	9.103	69.138
4600.000	3.788	280.138	9.903	-74.930	4598.596	0.433	9.903	75.582
4700.000	3.621	282.582	11.173	-81.264	4698.387	0.229	11.173	82.028
4800.000	2.356	286.485	12.444	-86.317	4798.249	1.281	12.444	87.210
4900.000	1.725	292.103	13.594	-89.682	4898.185	0.661	13.594	90.707
5000.000	1.800	293.237	14.780	-92.520	4998.138	0.083	14.780	93.693
5100.000	1.620	311.086	16.329	-95.029	5098.094	0.560	16.329	96.422
5200.000	1.601	321.779	18.355	-96.960	5198.055	0.301	18.355	98.682
5300.000	1.588	324.152	20.576	-98.635	5298.016	0.067	20.576	100.759
5400.000	1.458	329.849	22.800	-100.086	5397.981	0.199	22.800	102.650
5500.000	1.622	330.276	25.129	-101.427	5497.944	0.164	25.129	104.493
5600.000	1.499	339.170	27.581	-102.594	5597.907	0.271	27.581	106.236
5700.000	0.938	346.128	29.598	-103.255	5697.885	0.580	29.598	107.414
5800.000	0.809	6.165	31.095	-103.376	5797.873	0.330	31.095	107.951
5900.000	0.610	315.421	32.175	-103.674	5897.866	0.634	32.175	108.552
6000.000	0.729	297.059	32.844	-104.615	5997.860	0.244	32.844	109.649
6100.000	1.049	277.702	33.257	-106.088	6097.848	0.435	33.257	111.179
6200.000	1.334	230.059	32.632	-107.888	6197.828	0.997	32.632	112.715
6300.000	1.444	231.508	31.101	-109.767	6297.799	0.115	31.101	114.088
6400.000	1.656	203.231	28.988	-111.323	6397.764	0.785	28.988	115.035
6500.000	0.895	182.341	26.880	-111.925	6497.739	0.880	26.880	115.107
6600.000	0.664	163.985	25.544	-111.797	6597.729	0.337	25.544	114.678
6700.000	0.645	122.814	24.682	-111.164	6697.723	0.461	24.682	113.871
6800.000	1.060	83.167	24.487	-109.772	6797.713	0.698	24.487	112.470
6900.000	1.363	51.885	25.331	-107.918	6897.692	0.715	25.331	110.851
7000.000	1.087	41.533	26.775	-106.353	6997.669	0.353	26.775	109.672
7100.000	0.963	19.151	28.279	-105.449	7097.653	0.416	28.279	109.175

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