



Company: Noble Energy
Rig: Production/ V.E.S
API # 05-123-29838
Date: 3/4/2013
Surveyor: Rob Lampert
VS: 0.000
Lat : 40.4010616
Long: -104.819976

Well: Lundvall J18-17d
Location: Weld County, Colorado
North Reference: GRID
Convergence: Grid North is -0.44 of 1
Declination: 8.65
Depth Reference: Ground Level
Elevation: 4937'
Total Depth as Drilled: 7666'

Lat & Long obtained by handheld GPS at wellhead

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	0.116	85.648	0.008	0.101	100.000	0.116	0.008	0.101
200.000	0.142	24.433	0.128	0.253	200.000	0.133	0.128	0.284
300.000	0.167	71.393	0.288	0.443	299.999	0.125	0.288	0.528
400.000	0.227	64.934	0.418	0.760	399.999	0.064	0.418	0.867
500.000	0.285	29.827	0.718	1.063	499.998	0.164	0.718	1.283
600.000	0.570	15.021	1.414	1.316	599.995	0.303	1.414	1.931
700.000	0.637	13.239	2.435	1.572	699.989	0.070	2.435	2.899
800.000	0.624	12.038	3.509	1.813	799.983	0.019	3.509	3.950
900.000	0.617	12.646	4.567	2.044	899.978	0.010	4.567	5.004
1000.000	0.737	10.634	5.724	2.281	999.971	0.122	5.724	6.162
1100.000	0.774	4.582	7.030	2.454	1099.962	0.088	7.030	7.446
1200.000	0.630	0.164	8.253	2.509	1199.954	0.154	8.253	8.626
1300.000	0.457	81.649	8.860	2.905	1299.951	0.721	8.860	9.325
1400.000	0.498	148.347	8.548	3.528	1399.948	0.526	8.548	9.248
1500.000	0.256	156.983	7.973	3.843	1499.946	0.248	7.973	8.851
1600.000	0.864	15.962	8.492	4.138	1599.943	1.075	8.492	9.447
1700.000	2.911	37.226	11.239	5.882	1699.884	2.129	11.239	12.685
1800.000	5.159	46.093	16.380	10.658	1799.631	2.326	16.380	19.542
1900.000	6.998	46.220	23.713	18.296	1899.064	1.839	23.713	29.951
2000.000	9.478	44.053	33.847	28.421	1998.025	2.499	33.847	44.197
2100.000	10.744	39.131	46.995	40.029	2096.472	1.532	46.995	61.732
2200.000	11.852	40.202	62.070	52.540	2194.532	1.128	62.070	81.321
2300.000	13.906	38.099	79.371	66.585	2292.012	2.106	79.371	103.602
2400.000	14.240	35.411	98.852	81.126	2389.012	0.734	98.852	127.879
2500.000	13.088	33.312	118.339	94.471	2486.180	1.254	118.339	151.423
2600.000	13.903	40.853	136.890	108.549	2583.426	1.938	136.890	174.705
2700.000	15.833	43.729	155.837	125.840	2680.075	2.066	155.837	200.302
2800.000	18.218	45.528	176.649	146.427	2775.686	2.442	176.649	229.447
2900.000	18.765	45.685	198.836	169.091	2870.523	0.549	198.836	261.013
3000.000	16.992	40.366	221.209	190.066	2965.696	2.409	221.209	291.648
3100.000	18.377	38.264	244.721	209.293	3060.969	1.525	244.721	322.012
3200.000	18.815	36.085	270.130	228.553	3155.749	0.821	270.130	353.846
3300.000	17.683	35.627	295.507	246.898	3250.718	1.141	295.507	385.076
3400.000	17.393	35.187	320.068	264.358	3346.070	0.319	320.068	415.124
3500.000	15.307	34.785	343.126	280.503	3442.021	2.089	343.126	443.190

3600.000	13.572	30.532	364.075	293.995	3538.861	2.032	364.075	467.957
3700.000	14.371	34.933	384.357	307.063	3635.904	1.329	384.357	491.953
3800.000	13.532	34.568	404.165	320.807	3732.954	0.844	404.165	516.010
3900.000	14.547	33.125	424.317	334.308	3829.965	1.074	424.317	540.192
4000.000	16.596	31.804	446.974	348.699	3926.290	2.079	446.974	566.901
4100.000	17.370	30.487	471.975	363.799	4021.929	0.864	471.975	595.911
4200.000	17.378	29.213	497.873	378.661	4117.367	0.381	497.873	625.509
4300.000	16.300	32.167	522.787	393.421	4213.080	1.376	522.787	654.283
4400.000	15.430	29.752	546.217	407.494	4309.271	1.092	546.217	681.472
4500.000	15.724	31.479	569.322	421.172	4405.598	0.549	569.322	708.176
4600.000	15.136	37.550	591.231	436.205	4502.000	1.718	591.231	734.731
4700.000	16.149	41.869	611.939	453.445	4598.298	1.543	611.939	761.631
4800.000	16.891	39.456	633.512	471.959	4694.171	1.010	633.512	789.990
4900.000	15.091	40.609	654.614	489.666	4790.297	1.828	654.614	817.491
5000.000	15.228	37.165	674.963	506.073	4886.819	0.911	674.963	843.614
5100.000	16.227	32.987	697.150	521.615	4983.077	1.510	697.150	870.689
5200.000	14.288	30.435	719.512	535.475	5079.549	2.052	719.512	896.901
5300.000	10.616	26.913	738.372	545.900	5177.181	3.748	738.372	918.259
5400.000	9.447	26.561	753.927	553.739	5275.651	1.171	753.927	935.432
5500.000	7.777	24.017	767.449	560.163	5374.520	1.712	767.449	950.138
5600.000	4.709	23.576	777.395	564.560	5473.915	3.068	777.395	960.765
5700.000	2.567	26.177	783.167	567.190	5573.708	2.148	783.167	966.983
5800.000	0.958	43.845	785.781	568.757	5673.658	1.679	785.781	970.019
5900.000	1.163	53.378	786.989	570.151	5773.641	0.269	786.989	971.815
6000.000	0.440	68.026	787.738	571.321	5873.630	0.745	787.738	973.108
6100.000	0.282	38.440	788.074	571.830	5973.628	0.239	788.074	973.679
6200.000	0.300	35.993	788.479	572.137	6073.627	0.022	788.479	974.187
6300.000	0.446	37.805	788.998	572.529	6173.625	0.147	788.998	974.837
6400.000	0.186	67.028	789.369	572.917	6273.623	0.298	789.369	975.365
6500.000	0.214	356.190	789.618	573.054	6373.623	0.233	789.618	975.647
6600.000	0.295	250.876	789.720	572.798	6473.622	0.408	789.720	975.580
6700.000	0.183	222.133	789.517	572.447	6573.621	0.161	789.517	975.209
6800.000	0.358	201.021	789.107	572.227	6673.620	0.198	789.107	974.748
6900.000	0.284	188.247	788.570	572.080	6773.619	0.102	788.570	974.227
7000.000	0.430	212.352	788.008	571.844	6873.617	0.206	788.008	973.633
7100.000	0.435	235.350	787.475	571.331	6973.614	0.173	787.475	972.901
7200.000	0.371	198.017	786.951	570.918	7073.612	0.265	786.951	972.234
7300.000	0.452	215.566	786.322	570.588	7173.609	0.149	786.322	971.531
7400.000	0.324	95.122	785.976	570.640	7273.608	0.677	785.976	971.281
7500.000	0.091	65.644	785.983	570.994	7373.607	0.249	785.983	971.495
7600.000	0.165	212.491	785.894	570.989	7473.607	0.246	785.894	971.420

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True North

Cbrg

0.000
85.648
63.143
56.987
61.195
55.982
42.944
32.843
27.323
24.115
21.725
19.240
16.911
18.154
22.426
25.736
25.979
27.624
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37.652
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