



Company: Noble Energy
Rig: Production/VES
API # 05-123-29835
Date: 3/4/2013
Surveyor: Jason Kinchelow
VS: 0.000
Lat : 40.401
Long: -104.82

Well: Lundvall J 18-18D
Location: Weld County, Colorado
North Reference: GRID
Convergence: Grid North is .440 Degrees East of
Declination: 8.66
Depth Reference: Ground Level
Elevation: 4934
Total Depth as Drilled: 7734

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	0.101	356.404	0.088	-0.006	100.000	0.101	0.088	0.088	356.404
200.000	0.182	18.015	0.327	0.038	200.000	0.096	0.327	0.329	6.670
300.000	0.067	321.375	0.524	0.051	299.999	0.156	0.524	0.526	5.548
400.000	0.159	309.409	0.657	-0.093	399.999	0.094	0.657	0.664	351.969
500.000	0.332	1.910	1.034	-0.190	499.998	0.267	1.034	1.052	349.585
600.000	0.906	325.628	1.976	-0.627	599.992	0.668	1.976	2.073	342.402
700.000	2.791	345.202	4.982	-1.695	699.937	1.961	4.982	5.263	341.213
800.000	5.449	349.133	12.000	-3.212	799.669	2.672	12.000	12.422	345.015
900.000	8.020	344.066	23.373	-6.023	898.972	2.637	23.373	24.136	345.550
1000.000	9.451	339.353	37.765	-10.833	997.811	1.599	37.765	39.288	343.994
1100.000	9.333	339.923	53.063	-16.512	1096.470	0.151	53.063	55.573	342.715
1200.000	12.312	334.568	70.311	-23.875	1194.683	3.141	70.311	74.254	341.244
1300.000	13.869	319.917	89.116	-36.175	1292.109	3.652	89.116	96.179	337.906
1400.000	15.213	311.948	107.059	-53.653	1388.913	2.407	107.059	119.751	333.382
1500.000	15.451	309.247	124.257	-73.727	1485.355	0.753	124.257	144.484	329.317
1600.000	15.143	307.691	140.670	-94.379	1581.813	0.513	140.670	169.397	326.141
1700.000	15.720	307.989	156.994	-115.391	1678.207	0.582	156.994	194.839	323.684
1800.000	14.714	306.813	172.942	-136.236	1774.700	1.052	172.942	220.158	321.771
1900.000	14.362	306.078	187.856	-156.427	1871.498	0.398	187.856	244.457	320.216
2000.000	14.597	307.820	202.886	-176.405	1968.322	0.495	202.886	268.852	318.994
2100.000	14.645	308.627	218.504	-196.235	2065.084	0.209	218.504	293.688	318.073
2200.000	14.347	306.994	233.851	-216.007	2161.901	0.506	233.851	318.348	317.271
2300.000	14.752	306.781	248.929	-236.100	2258.694	0.409	248.929	343.087	316.515
2400.000	14.711	305.470	263.920	-256.638	2355.407	0.336	263.920	368.126	315.801
2500.000	14.803	306.097	278.814	-277.301	2452.109	0.184	278.814	393.234	315.156
2600.000	14.820	308.536	294.308	-297.627	2548.787	0.624	294.308	418.568	314.679
2700.000	15.974	309.470	311.023	-318.254	2645.196	1.181	311.023	444.995	314.342
2800.000	15.527	308.049	328.020	-339.417	2741.442	0.590	328.020	472.018	314.022
2900.000	16.715	307.068	344.939	-361.433	2837.508	1.219	344.939	499.616	313.662
3000.000	16.826	307.709	362.460	-384.358	2933.254	0.216	362.460	528.307	313.320
3100.000	15.859	308.272	379.776	-406.536	3029.213	0.980	379.776	556.329	313.051
3200.000	16.379	308.388	396.995	-428.315	3125.281	0.521	396.995	584.003	312.827
3300.000	15.770	309.088	414.319	-449.915	3221.371	0.639	414.319	611.624	312.641
3400.000	14.837	310.294	431.168	-470.229	3317.824	0.986	431.168	637.982	312.519

3500.000	15.042	311.890	448.113	-489.655	3414.444	0.460	448.113	663.753	312.464
3600.000	13.870	310.327	464.535	-508.454	3511.277	1.236	464.535	688.707	312.416
3700.000	14.952	311.002	480.756	-527.327	3608.129	1.095	480.756	713.583	312.355
3800.000	16.325	311.229	498.483	-547.634	3704.425	1.374	498.483	740.532	312.310
3900.000	16.920	310.901	517.273	-569.202	3800.246	0.603	517.273	769.131	312.264
4000.000	16.820	311.478	536.384	-591.041	3895.942	0.195	536.384	798.146	312.225
4100.000	17.837	311.045	556.024	-613.432	3991.402	1.025	556.024	827.927	312.190
4200.000	19.009	313.194	577.229	-636.857	4086.277	1.355	577.229	859.523	312.188
4300.000	19.148	310.922	599.119	-661.123	4180.785	0.756	599.119	892.204	312.183
4400.000	17.168	312.392	619.815	-684.418	4275.801	2.032	619.815	923.362	312.164
4500.000	16.589	312.219	639.358	-705.890	4371.493	0.581	639.358	952.397	312.169
4600.000	15.303	309.194	657.292	-726.691	4467.644	1.531	657.292	979.853	312.129
4700.000	15.774	305.600	673.544	-747.971	4563.991	1.071	673.544	1006.539	312.003
4800.000	13.403	303.015	687.773	-768.744	4660.762	2.458	687.773	1031.503	311.818
4900.000	10.620	298.196	698.444	-786.587	4758.565	2.956	698.444	1051.924	311.603
5000.000	8.806	288.350	705.208	-801.975	4857.134	2.454	705.208	1067.934	311.326
5100.000	6.096	288.138	709.272	-814.288	4956.281	2.710	709.272	1079.876	311.057
5200.000	3.391	275.932	711.231	-822.277	5055.932	2.872	711.231	1087.193	310.858
5300.000	1.118	228.560	710.890	-825.951	5155.854	2.759	710.890	1089.752	310.718
5400.000	0.572	163.689	709.765	-826.542	5255.844	1.017	709.765	1089.467	310.653
5500.000	0.547	154.122	708.856	-826.194	5355.840	0.097	708.856	1088.611	310.629
5600.000	0.783	148.010	707.848	-825.624	5455.833	0.246	707.848	1087.521	310.608
5700.000	0.747	152.229	706.692	-824.958	5555.824	0.067	706.692	1086.264	310.585
5800.000	0.612	137.538	705.721	-824.293	5655.817	0.219	705.721	1085.127	310.569
5900.000	1.259	180.163	704.228	-823.936	5755.804	0.909	704.228	1083.885	310.521
6000.000	1.688	165.895	701.701	-823.580	5855.771	0.561	701.701	1081.974	310.431
6100.000	1.233	142.000	699.424	-822.559	5955.739	0.751	699.424	1079.721	310.375
6200.000	0.961	146.703	697.875	-821.435	6055.721	0.286	697.875	1077.862	310.351
6300.000	0.653	129.385	696.813	-820.535	6155.711	0.390	696.813	1076.487	310.339
6400.000	0.640	112.499	696.237	-819.579	6255.705	0.190	696.237	1075.386	310.348
6500.000	0.783	113.783	695.748	-818.437	6355.697	0.144	695.748	1074.200	310.368
6600.000	1.053	91.766	695.444	-816.893	6455.684	0.440	695.444	1072.827	310.409
6700.000	0.965	98.837	695.287	-815.143	6555.669	0.152	695.287	1071.392	310.463
6800.000	0.663	90.507	695.152	-813.732	6655.659	0.323	695.152	1070.232	310.506
6900.000	0.658	86.411	695.183	-812.579	6755.652	0.048	695.183	1069.376	310.548
7000.000	0.339	65.236	695.343	-811.737	6855.648	0.363	695.343	1068.840	310.584
7100.000	0.545	86.891	695.493	-810.993	6955.645	0.261	695.493	1068.373	310.616
7200.000	0.355	88.890	695.525	-810.209	7055.642	0.190	695.525	1067.798	310.644
7300.000	0.615	82.279	695.603	-809.368	7155.638	0.265	695.603	1067.211	310.677
7400.000	0.288	82.176	695.709	-808.587	7255.635	0.327	695.709	1066.688	310.709
7500.000	0.322	68.674	695.846	-808.076	7355.634	0.079	695.846	1066.390	310.732

True North