



Company: Noble Energy

Rig: Production / Coretech

API # 05-123-21878

Date: 1/15/14

Surveyor: Brian Brewbaker

VS: 0.000

Lat : 40.257

Long: -104.492

Well: Abbey D01-08 JI

Location: Weld County, Colorado

North Reference: GRID

Convergence: Grid north is 0.65 degrees East of

Declination: 8.36

Depth Reference: Ground Level

Elevation: 4767

Total Depth as Drilled: 7482

Lat & Long obtained by handheld GPS at wellhead

MS Gyro Survey Calculations

Depth	Inc	AzG	N/-S	E/-W	TVD	DL	VS	CD	Cbrg
100.000	0.581	171.204	-0.501	0.078	99.998	0.581	-0.501	0.507	171.204
200.000	0.443	166.674	-1.379	0.244	199.994	0.143	-1.379	1.400	169.954
300.000	0.906	196.894	-2.511	0.104	299.987	0.568	-2.511	2.514	177.633
400.000	0.615	148.056	-3.723	0.158	399.979	0.682	-3.723	3.726	177.569
500.000	0.804	186.383	-4.876	0.364	499.972	0.499	-4.876	4.889	175.731
600.000	0.905	203.606	-6.297	-0.030	599.961	0.275	-6.297	6.297	180.277
700.000	0.860	196.097	-7.742	-0.555	699.949	0.124	-7.742	7.762	184.099
800.000	0.575	231.350	-8.776	-1.155	799.942	0.512	-8.776	8.851	187.496
900.000	1.015	227.598	-9.686	-2.201	899.932	0.443	-9.686	9.933	192.800
1000.000	0.910	205.035	-11.003	-3.191	999.918	0.390	-11.003	11.456	196.171
1100.000	0.737	243.802	-12.006	-4.103	1099.909	0.570	-12.006	12.688	198.869
1200.000	0.894	239.207	-12.689	-5.350	1199.899	0.170	-12.689	13.771	202.861
1300.000	0.942	223.738	-13.682	-6.588	1299.886	0.252	-13.682	15.186	205.712
1400.000	0.888	223.340	-14.840	-7.689	1399.873	0.055	-14.840	16.713	207.389
1500.000	0.669	253.749	-15.567	-8.781	1499.864	0.460	-15.567	17.873	209.427
1600.000	0.902	220.576	-16.328	-9.854	1599.855	0.501	-16.328	19.072	211.111
1700.000	0.968	226.524	-17.508	-10.979	1699.842	0.117	-17.508	20.665	212.092
1800.000	0.779	233.446	-18.493	-12.138	1799.830	0.216	-18.493	22.121	213.278
1900.000	0.561	183.771	-19.387	-12.716	1899.824	0.596	-19.387	23.185	213.261
2000.000	1.136	188.744	-20.855	-12.899	1999.813	0.579	-20.855	24.522	211.737
2100.000	1.158	209.733	-22.713	-13.551	2099.793	0.418	-22.713	26.448	210.821
2200.000	0.901	246.372	-23.905	-14.772	2199.778	0.691	-23.905	28.101	211.714
2300.000	1.083	290.484	-23.889	-16.378	2299.764	0.764	-23.889	28.964	214.433
2400.000	0.812	351.450	-22.858	-17.369	2399.753	0.989	-22.858	28.708	217.230
2500.000	1.396	32.710	-21.132	-16.815	2499.735	0.951	-21.132	27.006	218.511
2600.000	1.371	56.860	-19.452	-15.155	2599.707	0.579	-19.452	24.659	217.922
2700.000	1.360	61.850	-18.238	-13.107	2699.679	0.119	-18.238	22.459	215.703
2800.000	1.600	63.236	-17.049	-10.814	2799.645	0.243	-17.049	20.190	212.385
2900.000	1.550	55.955	-15.664	-8.447	2899.608	0.206	-15.664	17.796	208.337
3000.000	1.361	52.279	-14.180	-6.387	2999.575	0.210	-14.180	15.552	204.248
3100.000	1.158	59.401	-12.939	-4.578	3099.551	0.256	-12.939	13.725	199.485
3200.000	1.317	42.940	-11.584	-2.926	3199.528	0.388	-11.584	11.947	194.175
3300.000	2.004	36.693	-9.340	-1.098	3299.486	0.710	-9.340	9.404	186.704
3400.000	1.725	32.894	-6.674	0.764	3399.433	0.306	-6.674	6.718	173.467
3500.000	1.462	13.734	-4.172	1.884	3499.395	0.590	-4.172	4.578	155.691
3600.000	1.957	345.640	-1.279	1.764	3599.351	0.959	-1.279	2.179	125.943

3700.000	2.498	348.349	2.509	0.900	3699.276	0.551	2.509	2.666	19.738
3800.000	2.483	349.624	6.774	0.070	3799.181	0.057	6.774	6.774	0.593
3900.000	2.512	357.177	11.093	-0.428	3899.086	0.330	11.093	11.102	357.791
4000.000	2.770	356.282	15.693	-0.693	3998.980	0.261	15.693	15.708	357.473
4100.000	3.149	346.770	20.778	-1.478	4098.847	0.620	20.778	20.831	355.932
4200.000	3.718	348.277	26.627	-2.765	4198.667	0.576	26.627	26.770	354.071
4300.000	3.534	338.169	32.663	-4.570	4298.468	0.664	32.663	32.981	352.035
4400.000	3.430	343.552	38.394	-6.564	4398.284	0.343	38.394	38.951	350.299
4500.000	2.951	357.932	43.836	-7.504	4498.130	0.929	43.836	44.473	350.286
4600.000	2.720	12.831	48.722	-7.070	4598.009	0.770	48.722	49.232	351.744
4700.000	3.021	10.505	53.626	-6.062	4697.883	0.323	53.626	53.968	353.550
4800.000	3.038	13.000	58.799	-4.986	4797.744	0.133	58.799	59.010	355.153
4900.000	2.849	9.792	63.829	-3.967	4897.612	0.250	63.829	63.953	356.443
5000.000	2.728	21.777	68.488	-2.662	4997.494	0.594	68.488	68.540	357.774
5100.000	2.215	10.105	72.601	-1.440	5097.401	0.716	72.601	72.616	358.864
5200.000	1.704	9.969	75.968	-0.843	5197.343	0.512	75.968	75.973	359.364
5300.000	1.259	10.905	78.511	-0.378	5297.309	0.446	78.511	78.512	359.724
5400.000	1.002	357.406	80.463	-0.210	5397.290	0.368	80.463	80.464	359.851
5500.000	0.904	349.516	82.113	-0.393	5497.276	0.164	82.113	82.114	359.726
5600.000	0.717	359.966	83.514	-0.537	5597.266	0.237	83.514	83.516	359.632
5700.000	0.653	337.329	84.666	-0.757	5697.259	0.276	84.666	84.669	359.488
5800.000	0.558	308.651	85.496	-1.357	5797.253	0.314	85.496	85.507	359.091
5900.000	0.690	289.364	86.000	-2.305	5897.248	0.246	86.000	86.031	358.465
6000.000	0.680	276.286	86.265	-3.463	5997.240	0.156	86.265	86.334	357.701
6100.000	0.641	254.416	86.179	-4.591	6097.234	0.253	86.179	86.302	356.951
6200.000	0.502	154.627	85.633	-4.942	6197.231	0.879	85.633	85.776	356.697
6300.000	0.595	190.174	84.726	-4.846	6297.227	0.347	84.726	84.864	356.727
6400.000	0.895	154.326	83.511	-4.599	6397.219	0.540	83.511	83.637	356.848
6500.000	1.250	142.028	81.947	-3.590	6497.201	0.421	81.947	82.026	357.492
6600.000	1.364	127.626	80.361	-1.976	6597.175	0.347	80.361	80.385	358.591
6700.000	1.405	96.593	79.494	0.184	6697.147	0.742	79.494	79.494	0.133
6800.000	1.245	71.347	79.700	2.431	6797.122	0.600	79.700	79.737	1.747
6900.000	0.713	88.066	80.069	4.083	6897.107	0.598	80.069	80.173	2.919
7000.000	0.251	51.967	80.225	4.877	6997.103	0.532	80.225	80.373	3.479
7100.000	0.193	354.099	80.527	5.032	7097.102	0.221	80.527	80.684	3.576
7200.000	0.420	351.930	81.058	4.964	7197.101	0.227	81.058	81.210	3.504

True North