



Company: Noble Energy
Rig: Production/ CoreTech
API # 05-123-25693
Date: 9/27/2013
Surveyor: Sean Bratt
VS: 0.000
Lat : 40.338
Long: -104.615

Well: Muirhead #1-35
Location: Weld County, Colorado
North Reference: GRID
Convergence: Grid north is 0.57 Degr
Declination: 8.47 Degrees
Depth Reference: Ground Level
Elevation: 4751 Feet
Total Depth as Drilled: 7226 Feet

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	0.274	106.656	-0.069	0.229	100.000	0.274	-0.069	0.239
200.000	0.320	154.445	-0.389	0.579	199.998	0.244	-0.389	0.697
300.000	0.290	169.730	-0.890	0.744	299.997	0.086	-0.890	1.160
400.000	0.073	112.264	-1.163	0.848	399.997	0.258	-1.163	1.439
500.000	0.257	85.792	-1.170	1.130	499.996	0.194	-1.170	1.627
600.000	0.277	112.942	-1.248	1.576	599.995	0.127	-1.248	2.010
700.000	0.291	131.060	-1.509	1.990	699.994	0.090	-1.509	2.497
800.000	0.587	147.979	-2.110	2.453	799.991	0.320	-2.110	3.236
900.000	0.676	152.251	-3.067	2.999	899.985	0.100	-3.067	4.290
1000.000	0.799	152.891	-4.210	3.592	999.976	0.123	-4.210	5.534
1100.000	0.789	156.347	-5.461	4.186	1099.967	0.049	-5.461	6.880
1200.000	1.035	150.130	-6.875	4.912	1199.954	0.265	-6.875	8.449
1300.000	0.837	168.086	-8.372	5.512	1299.941	0.352	-8.372	10.024
1400.000	0.986	166.093	-9.922	5.870	1399.928	0.153	-9.922	11.528
1500.000	0.937	161.565	-11.533	6.335	1499.914	0.091	-11.533	13.158
1600.000	0.552	156.847	-12.751	6.783	1599.906	0.389	-12.751	14.443
1700.000	0.228	172.843	-13.392	6.997	1699.903	0.338	-13.392	15.109
1800.000	0.333	168.717	-13.874	7.079	1799.902	0.107	-13.874	15.575
1900.000	0.339	164.383	-14.443	7.215	1899.900	0.026	-14.443	16.145
2000.000	0.467	162.705	-15.117	7.416	1999.898	0.129	-15.117	16.838
2100.000	0.394	144.796	-15.787	7.735	2099.895	0.152	-15.787	17.580
2200.000	0.051	191.428	-16.112	7.924	2199.894	0.360	-16.112	17.955
2300.000	0.301	222.532	-16.349	7.738	2299.894	0.258	-16.349	18.088
2400.000	1.290	229.855	-17.269	6.700	2399.883	0.993	-17.269	18.523
2500.000	1.559	234.205	-18.790	4.736	2499.852	0.289	-18.790	19.378
2600.000	1.624	241.967	-20.252	2.382	2599.813	0.225	-20.252	20.391
2700.000	1.727	244.115	-21.576	-0.225	2699.770	0.120	-21.576	21.577
2800.000	1.667	242.325	-22.909	-2.869	2799.727	0.081	-22.909	23.088
2900.000	1.653	240.679	-24.291	-5.414	2899.685	0.050	-24.291	24.887
3000.000	1.236	255.607	-25.265	-7.716	2999.653	0.559	-25.265	26.417
3100.000	1.056	264.835	-25.616	-9.679	3099.633	0.257	-25.616	27.384
3200.000	0.889	261.996	-25.807	-11.365	3199.619	0.174	-25.807	28.199
3300.000	0.906	273.795	-25.863	-12.922	3299.606	0.185	-25.863	28.911
3400.000	1.341	306.156	-25.120	-14.656	3399.588	0.753	-25.120	29.083
3500.000	1.611	305.426	-23.615	-16.746	3499.555	0.270	-23.615	28.950

3600.000	2.269	289.905	-22.126	-19.753	3599.497	0.837	-22.126	29.660
3700.000	3.199	287.947	-20.592	-24.269	3699.383	0.934	-20.592	31.828
3800.000	3.462	281.887	-19.111	-29.878	3799.214	0.439	-19.111	35.467
3900.000	3.754	275.498	-18.175	-36.090	3899.016	0.496	-18.175	40.408
4000.000	3.697	263.093	-18.249	-42.549	3998.806	0.806	-18.249	46.298
4100.000	2.801	246.903	-19.596	-47.997	4098.647	1.274	-19.596	51.843
4200.000	2.361	231.474	-21.837	-51.856	4198.546	0.819	-21.837	56.267
4300.000	0.903	221.891	-23.707	-53.994	4298.503	1.478	-23.707	58.969
4400.000	0.925	189.163	-25.090	-54.648	4398.491	0.515	-25.090	60.133
4500.000	0.915	160.052	-26.637	-54.505	4498.479	0.462	-26.637	60.665
4600.000	0.717	148.931	-27.924	-53.909	4598.469	0.252	-27.924	60.712
4700.000	1.230	102.646	-28.695	-52.539	4698.455	0.899	-28.695	59.864
4800.000	1.122	121.528	-29.442	-50.658	4798.435	0.400	-29.442	58.592
4900.000	1.167	112.692	-30.346	-48.884	4898.415	0.182	-30.346	57.537
5000.000	0.269	100.934	-30.784	-47.713	4998.406	0.906	-30.784	56.782
5100.000	0.333	285.125	-30.753	-47.763	5098.405	0.601	-30.753	56.807
5200.000	0.677	308.303	-30.311	-48.507	5198.401	0.394	-30.311	57.199
5300.000	0.793	289.899	-29.709	-49.622	5298.393	0.262	-29.709	57.835
5400.000	0.931	296.957	-29.105	-50.997	5398.382	0.173	-29.105	58.718
5500.000	1.097	311.465	-28.102	-52.439	5498.366	0.305	-28.102	59.494
5600.000	1.788	302.523	-26.630	-54.472	5598.334	0.725	-26.630	60.632
5700.000	1.192	323.408	-24.955	-56.407	5698.301	0.797	-24.955	61.681
5800.000	0.728	4.124	-23.486	-56.982	5798.287	0.797	-23.486	61.632
5900.000	0.715	357.361	-22.230	-56.965	5898.280	0.086	-22.230	61.148
6000.000	0.781	324.058	-21.054	-57.394	5998.271	0.433	-21.054	61.134
6100.000	0.905	313.597	-19.958	-58.366	6098.261	0.197	-19.958	61.684
6200.000	1.459	295.947	-18.856	-60.082	6198.239	0.657	-18.856	62.972
6300.000	2.075	315.018	-17.019	-62.506	6298.192	0.843	-17.019	64.782
6400.000	2.365	291.069	-14.997	-65.712	6398.119	0.964	-14.997	67.401
6500.000	3.220	283.398	-13.604	-70.369	6498.000	0.931	-13.604	71.672
6600.000	2.787	268.107	-13.034	-75.531	6597.864	0.907	-13.034	76.648
6700.000	1.971	266.536	-13.218	-79.678	6697.777	0.819	-13.218	80.767
6800.000	1.135	266.265	-13.386	-82.383	6797.739	0.836	-13.386	83.463
6900.000	0.655	280.325	-13.348	-83.934	6897.727	0.524	-13.348	84.989
7000.000	0.259	271.063	-13.242	-84.723	6997.723	0.401	-13.242	85.751

0

rees East of True North

Cbrg

0.000

106.656

123.902

140.093

143.903

136.010

128.383

127.179

130.708

135.640

139.530

142.531

144.456

146.640

149.393

151.220

151.990

152.413

152.969

153.456

153.870

153.897

153.811

154.673

158.795

165.854

173.293

180.598

187.138

192.566

196.983

200.699

203.769

206.549

210.261

215.342

221.756
229.685
237.395
243.270
246.785
247.791
247.164
246.296
245.339
243.954
242.617
241.358
239.835
238.168
237.170
237.224
238.000
239.091
240.286
241.813
243.947
246.135
247.600
248.683
249.855
251.122
252.576
254.769
257.144
259.058
260.209
260.581
260.771
260.964
261.117