



Company: Noble Energy
Rig: Production/Coretech
API # 05-123-30870
Date: 4/16/2014
Surveyor: Jason Kinchelow

Well: Hoffman B 33-19
Location: Weld County, Colorado
North Reference: GRID
Convergence: Grid north is 0.61 degrees East of
Declination: 8.37

VS: 0.000
Lat : 40.360
Long: -104.559
Depth Reference: RKB = Ground Level
Elevation: 4692'
Total Depth as Drilled: 7044'

Lat & Long obtained by handheld GPS at wellhead

MS 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	0.824	245.486	-0.298	-0.654	99.997	0.824	-0.298	0.719	245.486
200.000	0.756	258.282	-0.731	-1.955	199.987	0.189	-0.731	2.087	249.502
300.000	0.820	286.842	-0.658	-3.286	299.978	0.394	-0.658	3.351	258.681
400.000	0.803	338.656	0.202	-4.226	399.969	0.709	0.202	4.231	272.743
500.000	1.222	359.637	1.922	-4.488	499.954	0.553	1.922	4.882	293.182
600.000	1.446	0.543	4.250	-4.483	599.927	0.225	4.250	6.177	313.470
700.000	1.266	346.937	6.587	-4.720	699.899	0.367	6.587	8.104	324.373
800.000	1.575	352.975	9.027	-5.138	799.868	0.343	9.027	10.387	330.352
900.000	1.389	342.111	11.544	-5.679	899.835	0.336	11.544	12.866	333.808
1000.000	1.227	345.635	13.735	-6.316	999.809	0.181	13.735	15.118	335.303
1100.000	1.151	346.338	15.748	-6.819	1099.787	0.077	15.748	17.161	336.586
1200.000	1.300	0.404	17.859	-7.049	1199.764	0.334	17.859	19.199	338.461
1300.000	1.131	359.082	19.979	-7.056	1299.742	0.172	19.979	21.189	340.547
1400.000	1.112	3.236	21.935	-7.017	1399.723	0.083	21.935	23.030	342.259
1500.000	0.618	359.083	23.442	-6.971	1499.711	0.498	23.442	24.457	343.439
1600.000	0.432	281.977	24.060	-7.349	1599.708	0.670	24.060	25.157	343.015
1700.000	0.553	289.900	24.302	-8.171	1699.704	0.138	24.302	25.639	341.415
1800.000	0.689	279.726	24.568	-9.217	1799.698	0.174	24.568	26.240	339.435
1900.000	1.098	269.732	24.665	-10.767	1899.686	0.436	24.665	26.913	336.417
2000.000	1.451	264.255	24.534	-12.985	1999.661	0.373	24.534	27.758	332.109
2100.000	1.721	253.327	23.976	-15.682	2099.623	0.404	23.976	28.649	326.812
2200.000	1.173	252.371	23.235	-18.096	2199.591	0.549	23.235	29.451	322.089
2300.000	1.162	254.904	22.662	-20.050	2299.570	0.053	22.662	30.258	318.500
2400.000	0.875	244.537	22.069	-21.718	2399.554	0.339	22.069	30.963	315.460
2500.000	0.674	233.232	21.389	-22.879	2499.545	0.251	21.389	31.319	313.073
2600.000	0.363	289.782	21.144	-23.648	2599.541	0.563	21.144	31.722	311.800
2700.000	0.346	308.347	21.438	-24.182	2699.540	0.116	21.438	32.317	311.557
2800.000	0.480	293.032	21.789	-24.805	2799.537	0.173	21.789	33.016	311.297
2900.000	0.451	253.575	21.842	-25.568	2899.534	0.316	21.842	33.627	310.506
3000.000	0.322	212.715	21.494	-26.097	2999.532	0.296	21.494	33.809	309.475
3100.000	0.544	265.122	21.218	-26.722	3099.529	0.431	21.218	34.121	308.450
3200.000	0.888	289.265	21.433	-27.927	3199.521	0.450	21.433	35.203	307.505
3300.000	1.795	279.562	21.949	-30.203	3299.493	0.932	21.949	37.336	306.007
3400.000	2.020	274.122	22.336	-33.505	3399.438	0.288	22.336	40.267	303.689

3500.000	1.849	289.860	23.010	-36.779	3499.381	0.556	23.010	43.384	302.031
3600.000	1.907	291.108	24.158	-39.849	3599.328	0.072	24.158	46.600	301.226
3700.000	1.857	289.180	25.289	-42.932	3699.274	0.081	25.289	49.826	300.501
3800.000	1.761	299.879	26.587	-45.794	3799.224	0.351	26.587	52.952	300.138
3900.000	0.989	318.742	28.001	-47.695	3899.195	0.885	28.001	55.307	300.416
4000.000	0.610	0.131	29.181	-48.262	3999.186	0.667	29.181	56.399	301.159
4100.000	0.723	32.492	30.246	-47.922	4099.180	0.387	30.246	56.669	302.258
4200.000	1.179	26.187	31.701	-47.129	4199.166	0.467	31.701	56.799	303.927
4300.000	1.751	20.053	34.060	-46.151	4299.133	0.593	34.060	57.358	306.428
4400.000	1.955	8.833	37.181	-45.365	4399.081	0.415	37.181	58.655	309.338
4500.000	2.309	8.429	40.860	-44.808	4499.011	0.354	40.860	60.640	312.361
4600.000	2.927	13.633	45.333	-43.911	4598.906	0.661	45.333	63.113	315.913
4700.000	3.288	24.045	50.433	-42.141	4698.760	0.669	50.433	65.721	320.118
4800.000	2.383	32.164	54.812	-39.865	4798.637	0.987	54.812	67.776	323.971
4900.000	1.957	31.029	58.035	-37.878	4898.565	0.429	58.035	69.303	326.868
5000.000	1.858	30.384	60.897	-36.178	4998.510	0.101	60.897	70.833	329.286
5100.000	1.404	38.065	63.260	-34.603	5098.469	0.503	63.260	72.105	331.322
5200.000	1.131	25.409	65.116	-33.424	5198.445	0.390	65.116	73.193	332.828
5300.000	1.580	7.665	67.373	-32.817	5298.417	0.610	67.373	74.940	334.029
5400.000	0.651	11.352	69.296	-32.521	5398.397	0.931	69.296	76.547	334.859
5500.000	0.361	71.653	69.952	-32.110	5498.393	0.567	69.952	76.970	335.343
5600.000	0.625	124.905	69.739	-31.363	5598.390	0.501	69.739	76.467	335.785
5700.000	0.797	105.879	69.236	-30.247	5698.382	0.290	69.236	75.555	336.401
5800.000	0.649	110.148	68.851	-29.046	5798.374	0.158	68.851	74.727	337.127
5900.000	0.625	99.874	68.562	-27.978	5898.368	0.117	68.562	74.051	337.802
6000.000	0.436	75.728	68.563	-27.072	5998.364	0.288	68.563	73.714	338.454
6100.000	0.375	86.609	68.676	-26.376	6098.362	0.098	68.676	73.567	338.990
6200.000	0.390	68.254	68.821	-25.733	6198.359	0.123	68.821	73.475	339.498
6300.000	0.463	73.791	69.060	-25.029	6298.357	0.084	69.060	73.456	340.078
6400.000	0.341	131.834	68.975	-24.420	6398.355	0.404	68.975	73.170	340.504
6500.000	0.500	130.675	68.492	-23.867	6498.352	0.160	68.492	72.531	340.788
6600.000	0.657	90.152	68.206	-22.963	6598.347	0.427	68.206	71.968	341.393
6700.000	0.657	94.090	68.164	-21.818	6698.341	0.045	68.164	71.570	342.251

True North