



Company: Noble Energy
Rig: Production/ VES
API # 05-123-32579
Date: 12/30/2013
Surveyor: Sean Bratt
VS: 0.000
Lat : 40.207
Long: -104.650

Well: Frank PC H22-20D
Location: Weld County, Colorado
North Reference: GRID
Convergence: Grid north is 0.55 Degr
Declination: 8.46 Degrees
Depth Reference: Ground Level
Elevation: 4808 feet
Total Depth as Drilled: 7690 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	0.980	119.123	-0.416	0.747	99.995	0.980	-0.416	0.855
200.000	0.509	136.183	-1.153	1.801	199.987	0.515	-1.153	2.138
300.000	0.431	132.716	-1.728	2.385	299.983	0.083	-1.728	2.945
400.000	0.480	154.668	-2.362	2.840	399.980	0.180	-2.362	3.694
500.000	0.757	168.128	-3.387	3.156	499.974	0.311	-3.387	4.629
600.000	1.011	178.466	-4.915	3.315	599.962	0.299	-4.915	5.928
700.000	1.450	191.907	-7.034	3.078	699.939	0.523	-7.034	7.678
800.000	1.276	231.969	-8.958	1.939	799.913	0.948	-8.958	9.166
900.000	1.918	293.628	-8.974	-0.471	899.880	1.727	-8.974	8.986
1000.000	3.258	313.452	-6.349	-4.067	999.778	1.592	-6.349	7.539
1100.000	4.713	320.521	-1.223	-8.742	1099.534	1.533	-1.223	8.827
1200.000	6.269	319.663	6.110	-14.888	1199.072	1.558	6.110	16.094
1300.000	8.162	318.734	15.609	-23.105	1298.276	1.896	15.609	27.884
1400.000	9.951	319.849	27.549	-33.359	1397.025	1.797	27.549	43.264
1500.000	11.960	319.155	41.993	-45.708	1495.198	2.013	41.993	62.069
1600.000	13.583	315.164	58.159	-60.765	1592.722	1.847	58.159	84.113
1700.000	14.154	318.508	75.645	-77.145	1689.808	0.984	75.645	108.045
1800.000	16.671	319.752	95.755	-94.516	1786.205	2.539	95.755	134.545
1900.000	18.161	320.264	118.688	-113.747	1881.618	1.497	118.688	164.394
2000.000	19.053	321.963	143.529	-133.767	1976.390	1.044	143.529	196.199
2100.000	20.577	321.157	170.073	-154.847	2070.467	1.549	170.073	230.005
2200.000	21.937	320.511	198.177	-177.749	2163.661	1.380	198.177	266.212
2300.000	24.351	321.835	228.807	-202.370	2255.607	2.469	228.807	305.461
2400.000	24.316	320.658	260.939	-228.162	2346.724	0.486	260.939	346.622
2500.000	25.339	319.233	293.069	-255.188	2437.481	1.185	293.069	388.601
2600.000	26.973	320.958	326.893	-283.449	2527.239	1.803	326.893	432.669
2700.000	28.430	320.949	362.996	-312.732	2615.775	1.457	362.996	479.132
2800.000	29.976	320.111	400.653	-343.752	2703.062	1.599	400.653	527.909
2900.000	30.127	321.907	439.572	-375.257	2789.621	0.912	439.572	577.963
3000.000	30.283	322.634	479.362	-406.041	2876.045	0.398	479.362	628.218
3100.000	30.091	321.778	519.097	-436.854	2962.484	0.471	519.097	678.456
3200.000	27.884	320.967	556.961	-467.095	3049.951	2.242	556.961	726.900
3300.000	27.809	321.644	593.417	-496.297	3138.371	0.325	593.417	773.599
3400.000	27.581	320.631	629.606	-525.457	3226.915	0.523	629.606	820.066
3500.000	26.434	319.925	664.536	-554.472	3316.009	1.191	664.536	865.475

3600.000	27.640	320.056	699.353	-583.694	3405.079	1.208	699.353	910.930
3700.000	27.867	320.745	735.233	-613.375	3493.575	0.393	735.233	957.495
3800.000	28.165	321.543	771.811	-642.842	3581.857	0.479	771.811	1004.459
3900.000	28.032	319.583	808.183	-672.756	3670.073	0.932	808.183	1051.551
4000.000	27.787	319.008	843.668	-703.281	3758.441	0.364	843.668	1098.353
4100.000	28.592	320.599	879.753	-733.760	3846.581	1.101	879.753	1145.587
4200.000	30.022	321.246	917.754	-764.610	3933.780	1.465	917.754	1194.529
4300.000	30.767	322.842	957.648	-795.720	4020.037	1.099	957.648	1245.094
4400.000	31.729	322.572	998.915	-827.151	4105.529	0.972	998.915	1296.923
4500.000	28.904	323.730	1039.289	-857.436	4191.846	2.885	1039.289	1347.338
4600.000	29.440	323.598	1078.554	-886.317	4279.162	0.540	1078.554	1396.008
4700.000	29.426	324.042	1118.219	-915.326	4366.255	0.219	1118.219	1445.073
4800.000	28.687	323.982	1157.516	-943.864	4453.669	0.739	1157.516	1493.561
4900.000	26.563	325.013	1195.253	-970.802	4542.264	2.177	1195.253	1539.833
5000.000	25.234	325.923	1231.229	-995.567	4632.219	1.388	1231.229	1583.376
5100.000	23.725	329.093	1266.149	-1017.850	4723.231	2.000	1266.149	1624.544
5200.000	21.283	331.148	1299.311	-1036.940	4815.611	2.566	1299.311	1662.364
5300.000	19.436	330.513	1329.692	-1053.890	4909.360	1.859	1329.692	1696.691
5400.000	18.449	327.222	1357.480	-1070.650	5003.946	1.454	1357.480	1728.882
5500.000	17.172	324.805	1382.849	-1087.720	5099.153	1.475	1382.849	1759.377
5600.000	14.669	321.829	1404.871	-1104.060	5195.311	2.632	1404.871	1786.786
5700.000	12.820	319.247	1423.231	-1119.130	5292.444	1.948	1423.231	1810.533
5800.000	10.220	315.880	1438.007	-1132.550	5390.422	2.684	1438.007	1830.444
5900.000	7.219	318.186	1449.061	-1142.910	5489.255	3.021	1449.061	1845.544
6000.000	5.228	317.477	1457.102	-1150.180	5588.661	1.992	1457.102	1856.359
6100.000	4.603	308.594	1462.963	-1156.400	5688.294	0.983	1462.963	1864.811
6200.000	3.939	291.070	1466.701	-1162.740	5788.020	1.456	1466.701	1871.678
6300.000	2.957	277.186	1468.259	-1168.500	5887.840	1.282	1468.259	1876.483
6400.000	1.448	261.739	1468.400	-1172.310	5987.764	1.608	1468.400	1878.968
6500.000	1.281	225.401	1467.434	-1174.360	6087.737	0.866	1467.434	1879.491
6600.000	1.065	175.646	1465.722	-1175.090	6187.719	1.006	1465.722	1878.608
6700.000	0.853	351.185	1465.531	-1175.130	6287.714	1.917	1465.531	1878.486
6800.000	1.629	358.687	1467.687	-1175.280	6387.690	0.791	1467.687	1880.261
6900.000	1.790	348.674	1470.640	-1175.620	6487.645	0.339	1470.640	1882.778
7000.000	1.853	341.946	1473.708	-1176.420	6587.595	0.223	1473.708	1885.680
7100.000	1.784	9.258	1476.782	-1176.670	6687.546	0.861	1476.782	1888.239
7200.000	1.693	3.161	1479.793	-1176.340	6787.500	0.206	1479.793	1890.388
7300.000	1.701	5.636	1482.746	-1176.110	6887.457	0.074	1482.746	1892.559
7400.000	1.583	3.698	1485.602	-1175.880	6987.416	0.131	1485.602	1894.652

0

degrees East of True North

Cbrg

0.000

119.123

122.618

125.929

129.746

137.026

146.001

156.370

167.784

183.003

212.643

262.035

292.314

304.041

309.551

312.574

313.745

314.438

315.373

316.218

317.016

317.683

318.111

318.509

318.834

318.952

319.071

319.254

319.371

319.513

319.734

319.917

320.015

320.093

320.152

320.159

320.151
320.163
320.209
320.225
320.185
320.170
320.201
320.276
320.374
320.477
320.588
320.698
320.805
320.916
321.041
321.205
321.408
321.600
321.737
321.812
321.837
321.821
321.777
321.736
321.714
321.675
321.594
321.486
321.397
321.330
321.280
321.276
321.313
321.361
321.401
321.453
321.518
321.579
321.638