



Company/Rig: Noble Energy/ CoreTech
WELL/API#: Vigilant State AC16-07/05-123-37248

DECLINATION:

TD AS DRILLED: 8966 Feet
COUNTY/STATE: Weld/Colorado

VS-Azi: 0.000 Degrees

Latitude: 40.57603, Longitude: -104.43906

Grid North = True North -0.69 degs (NAD 27)

Grid Convergence Applied = -0.69 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4850 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 7/16/2015 / 08:38

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	****
100.000	0.992	31.261	99.995	0.740	0.449	0.740	0.866	31.261	0.992
200.000	0.994	33.022	199.980	2.207	1.371	2.207	2.599	31.849	0.031
300.000	0.981	43.273	299.965	3.558	2.431	3.558	4.309	34.340	0.177
400.000	0.868	46.758	399.952	4.700	3.569	4.700	5.902	37.213	0.126
500.000	0.810	66.754	499.942	5.498	4.771	5.498	7.280	40.948	0.297
600.000	0.683	75.923	599.933	5.922	5.998	5.922	8.429	45.366	0.174
700.000	0.542	86.458	699.927	6.096	7.048	6.096	9.319	49.142	0.180
800.000	0.023	75.494	799.926	6.131	7.540	6.131	9.718	50.886	0.519
900.000	0.066	69.734	899.926	6.156	7.613	6.156	9.790	51.043	0.043
1000.000	0.054	56.704	999.926	6.201	7.706	6.201	9.891	51.176	0.018
1100.000	0.083	228.258	1099.926	6.179	7.692	6.179	9.866	51.224	0.136
1200.000	0.199	305.783	1199.926	6.233	7.497	6.233	9.749	50.261	0.199
1300.000	0.159	171.167	1299.925	6.198	7.377	6.198	9.635	49.966	0.331
1400.000	0.102	344.625	1399.925	6.146	7.375	6.146	9.600	50.191	0.260
1500.000	0.117	53.051	1499.925	6.293	7.433	6.293	9.739	49.746	0.124
1600.000	0.192	229.384	1599.925	6.246	7.387	6.246	9.674	49.787	0.310
1700.000	0.156	299.531	1699.925	6.203	7.141	6.203	9.459	49.020	0.203
1800.000	0.186	194.250	1799.924	6.113	6.983	6.113	9.281	48.797	0.272

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.000	0.147	354.644	1899.924	6.084	6.931	6.084	9.223	48.720	0.328
2000.000	0.179	272.865	1999.924	6.220	6.762	6.220	9.188	47.391	0.215
2100.000	0.063	18.207	2099.924	6.280	6.623	6.280	9.127	46.524	0.205
2200.000	0.040	328.781	2199.924	6.362	6.622	6.362	9.183	46.149	0.048
2300.000	0.014	252.075	2299.924	6.388	6.593	6.388	9.180	45.904	0.039
2400.000	0.047	76.540	2399.924	6.394	6.621	6.394	9.204	46.001	0.061
2500.000	0.013	54.428	2499.924	6.410	6.670	6.410	9.250	46.140	0.035
2600.000	0.010	60.592	2599.924	6.421	6.687	6.421	9.270	46.163	0.003
2700.000	0.044	86.278	2699.924	6.427	6.733	6.427	9.308	46.331	0.036
2800.000	0.012	112.044	2799.924	6.426	6.782	6.426	9.343	46.543	0.034
2900.000	0.063	279.590	2899.924	6.431	6.738	6.431	9.314	46.334	0.075
3000.000	0.061	247.834	2999.924	6.420	6.634	6.420	9.232	45.940	0.034
3100.000	0.094	334.047	3099.923	6.474	6.550	6.474	9.209	45.333	0.108
3200.000	0.106	208.799	3199.923	6.466	6.469	6.466	9.147	45.012	0.178
3300.000	0.171	291.497	3299.923	6.440	6.285	6.440	8.998	44.304	0.190
3400.000	0.131	204.550	3399.923	6.390	6.098	6.390	8.833	43.661	0.210
3500.000	0.130	163.850	3499.923	6.177	6.082	6.177	8.669	44.558	0.091
3600.000	0.149	80.143	3599.923	6.090	6.242	6.090	8.721	45.707	0.187
3700.000	0.106	262.076	3699.922	6.100	6.279	6.100	8.754	45.830	0.255
3800.000	0.143	324.004	3799.922	6.188	6.114	6.188	8.699	44.657	0.132
3900.000	0.142	54.945	3899.922	6.360	6.142	6.360	8.842	44.002	0.203
4000.000	0.138	32.956	3999.922	6.532	6.309	6.532	9.082	44.006	0.054
4100.000	0.080	341.584	4099.922	6.699	6.353	6.699	9.232	43.481	0.108
4200.000	0.018	149.830	4199.922	6.751	6.339	6.751	9.261	43.197	0.098
4300.000	0.058	165.268	4299.922	6.688	6.360	6.688	9.229	43.560	0.041
4400.000	0.033	0.667	4399.921	6.668	6.373	6.668	9.224	43.706	0.091
4500.000	0.051	78.752	4499.921	6.706	6.417	6.706	9.281	43.740	0.055
4600.000	0.071	359.434	4599.921	6.776	6.460	6.776	9.362	43.631	0.079
4700.000	0.060	96.268	4699.921	6.832	6.512	6.832	9.438	43.623	0.098
4800.000	0.045	298.433	4799.921	6.845	6.529	6.845	9.460	43.646	0.104
4900.000	0.014	58.428	4899.921	6.871	6.505	6.871	9.461	43.434	0.054
5000.000	0.044	335.443	4999.921	6.912	6.499	6.912	9.488	43.237	0.045
5100.000	0.089	216.505	5099.921	6.885	6.437	6.885	9.425	43.075	0.117
5200.000	0.168	337.255	5199.921	6.957	6.334	6.957	9.409	42.317	0.226
5300.000	0.144	140.469	5299.921	6.995	6.358	6.995	9.453	42.269	0.309
5400.000	0.165	216.952	5399.921	6.783	6.352	6.783	9.293	43.120	0.192
5500.000	0.146	168.741	5499.920	6.543	6.290	6.543	9.077	43.872	0.128
5600.000	0.108	8.034	5599.920	6.512	6.329	6.512	9.081	44.182	0.251
5700.000	0.163	193.012	5699.920	6.467	6.310	6.467	9.036	44.294	0.271
5800.000	0.119	37.083	5799.920	6.412	6.340	6.412	9.017	44.679	0.275

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5900.000	0.119	205.382	5899.920	6.401	6.358	6.401	9.022	44.810	0.236
6000.000	0.158	122.268	5999.920	6.234	6.430	6.234	8.956	45.889	0.186
6100.000	0.131	131.597	6099.920	6.085	6.632	6.085	9.000	47.466	0.035
6200.000	0.066	123.662	6199.919	5.977	6.766	5.977	9.027	48.544	0.066
6300.000	0.099	56.454	6299.919	5.992	6.886	5.992	9.128	48.970	0.095
6400.000	0.077	227.369	6399.919	5.994	6.908	5.994	9.146	49.052	0.176
6500.000	0.047	263.848	6499.919	5.944	6.817	5.944	9.045	48.916	0.048
6600.000	0.096	356.979	6599.919	6.023	6.772	6.023	9.063	48.348	0.110
6700.000	0.063	158.758	6699.919	6.056	6.788	6.056	9.097	48.260	0.158
6800.000	0.081	243.979	6799.919	5.973	6.744	5.973	9.009	48.467	0.099
6900.000	0.099	105.115	6899.919	5.920	6.763	5.920	8.988	48.804	0.169
7000.000	0.094	30.790	6999.919	5.968	6.888	5.968	9.114	49.096	0.116
7100.000	0.092	201.736	7099.919	5.964	6.901	5.964	9.120	49.166	0.186
7200.000	0.109	68.295	7199.919	5.924	6.959	5.924	9.139	49.594	0.185
7300.000	0.162	201.883	7299.919	5.828	6.995	5.828	9.105	50.200	0.250
7400.000	0.078	255.959	7399.918	5.681	6.877	5.681	8.920	50.441	0.132
7500.000	0.107	349.851	7499.918	5.756	6.795	5.756	8.905	49.732	0.136
7600.000	0.170	172.071	7599.918	5.701	6.799	5.701	8.873	50.021	0.276
7700.000	0.148	220.112	7699.918	5.455	6.736	5.455	8.668	50.999	0.131
7800.000	0.154	347.623	7799.918	5.487	6.624	5.487	8.601	50.361	0.271
7900.000	0.207	224.866	7899.917	5.490	6.467	5.490	8.483	49.671	0.318