



COMPANY/RIG: Noble Energy/Production/CoreTech  
WELL/API: Hamilton F 25-33/05-123-26655  
DECLINATION: 8.23 Degrees  
TD AS DRILLED: 7148 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.36595, Longitude: -104.62014  
Grid North = True North -0.57 degs (NAD 27)  
Grid Correction Applied = -0.57 degs



DEPTH REFERENCE : RKB = GL Elevation = 4669

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyrosurvey.ut

Minimum Curvature Method

Report Date/Time: 6/21/2016 / 12:50

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: JUSTIN WILLIAMS / Hamilton F 25-33

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	0.729	156.695	99.997	-0.584	0.252	-0.584	0.636	156.695	0.729
200.000	0.444	148.470	199.992	-1.498	0.706	-1.498	1.656	154.777	0.296
300.000	0.503	163.601	299.989	-2.249	1.032	-2.249	2.474	155.350	0.138
400.000	0.302	130.967	399.986	-2.842	1.355	-2.842	3.149	154.513	0.297
500.000	0.246	112.527	499.985	-3.098	1.752	-3.098	3.559	150.505	0.104
600.000	0.180	62.060	599.984	-3.106	2.089	-3.106	3.743	146.083	0.191
700.000	0.269	108.872	699.984	-3.109	2.450	-3.109	3.958	141.764	0.196
800.000	0.341	102.630	799.982	-3.250	2.962	-3.250	4.397	137.651	0.079
900.000	0.308	118.544	899.981	-3.443	3.488	-3.443	4.902	134.627	0.095
1000.000	0.555	115.641	999.978	-3.781	4.161	-3.781	5.623	132.261	0.248
1100.000	0.546	136.659	1099.973	-4.337	4.925	-4.337	6.563	131.370	0.201
1200.000	0.480	124.679	1199.969	-4.922	5.597	-4.922	7.453	131.333	0.125
1300.000	0.531	115.602	1299.965	-5.361	6.360	-5.361	8.318	130.132	0.095
1400.000	0.712	118.767	1399.960	-5.861	7.322	-5.861	9.379	128.673	0.183
1500.000	0.104	181.858	1499.957	-6.250	7.864	-6.250	10.045	128.480	0.671
1600.000	0.172	210.911	1599.956	-6.470	7.784	-6.470	10.122	129.735	0.095
1700.000	0.742	265.731	1699.953	-6.647	7.061	-6.647	9.698	133.269	0.658
1800.000	0.929	250.891	1799.943	-6.960	5.650	-6.960	8.965	140.932	0.284

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	1.059	266.105	1899.928	-7.288	3.962	-7.288	8.296	151.470	0.293
2000.000	1.444	263.108	1999.904	-7.502	1.789	-7.502	7.713	166.589	0.390
2100.000	1.817	272.807	2099.863	-7.576	-1.045	-7.576	7.648	187.855	0.462
2200.000	1.985	269.521	2199.808	-7.513	-4.360	-7.513	8.687	210.130	0.201
2300.000	2.137	282.588	2299.744	-7.121	-7.912	-7.121	10.645	228.013	0.493
2400.000	2.051	284.300	2399.677	-6.273	-11.466	-6.273	13.070	241.319	0.107
2500.000	1.589	294.963	2499.627	-5.245	-14.457	-5.245	15.379	250.058	0.571
2600.000	1.332	294.266	2599.594	-4.183	-16.774	-4.183	17.287	255.998	0.258
2700.000	1.211	291.631	2699.570	-3.315	-18.816	-3.315	19.105	260.007	0.134
2800.000	1.008	291.630	2799.551	-2.602	-20.616	-2.602	20.779	262.807	0.204
2900.000	0.896	301.505	2899.537	-1.869	-22.100	-1.869	22.178	265.166	0.198
3000.000	0.868	301.045	2999.525	-1.069	-23.415	-1.069	23.440	267.385	0.028
3100.000	1.010	313.178	3099.512	-0.076	-24.707	-0.076	24.708	269.825	0.243
3200.000	1.053	312.980	3199.496	1.154	-26.022	1.154	26.048	272.539	0.043
3300.000	1.011	351.343	3299.481	2.653	-26.828	2.653	26.958	275.647	0.679
3400.000	1.418	21.536	3399.459	4.676	-26.506	4.676	26.916	280.005	0.744
3500.000	2.237	28.402	3499.407	7.544	-25.124	7.544	26.232	286.713	0.847
3600.000	2.859	39.930	3599.309	11.173	-22.594	11.173	25.206	296.313	0.802
3700.000	2.998	41.618	3699.178	15.041	-19.257	15.041	24.435	307.992	0.164
3800.000	3.086	42.368	3799.037	18.984	-15.706	18.984	24.639	320.399	0.096
3900.000	2.828	43.745	3898.904	22.755	-12.187	22.755	25.813	331.829	0.267
4000.000	1.908	46.053	3998.817	25.693	-9.282	25.693	27.318	340.137	0.925
4100.000	1.662	50.009	4098.769	27.780	-6.972	27.780	28.642	345.911	0.275
4200.000	1.144	79.218	4198.740	28.899	-4.880	28.899	29.308	350.415	0.867
4300.000	0.919	85.113	4298.723	29.154	-3.100	29.154	29.318	353.931	0.249
4400.000	0.702	91.198	4398.713	29.210	-1.688	29.210	29.258	356.692	0.234
4500.000	0.649	130.083	4498.707	28.832	-0.643	28.832	28.839	358.723	0.452
4600.000	0.823	162.402	4598.699	27.783	0.008	27.783	27.783	0.016	0.443
4700.000	1.547	167.543	4698.677	25.780	0.516	25.780	25.785	1.147	0.731
4800.000	2.406	169.705	4798.617	22.397	1.182	22.397	22.428	3.022	0.862
4900.000	2.528	176.744	4898.524	18.130	1.683	18.130	18.208	5.303	0.327
5000.000	2.549	179.810	4998.426	13.704	1.815	13.704	13.824	7.546	0.137
5100.000	2.028	189.056	5098.346	9.734	1.544	9.734	9.855	9.014	0.636
5200.000	1.407	190.712	5198.301	6.780	1.037	6.780	6.859	8.700	0.623
5300.000	0.906	200.978	5298.280	4.835	0.526	4.835	4.864	6.211	0.540
5400.000	0.349	231.644	5398.274	3.908	0.004	3.908	3.908	0.065	0.632
5500.000	0.955	293.218	5498.268	4.048	-1.000	4.048	4.170	346.120	0.847
5600.000	1.790	301.306	5598.239	5.188	-3.100	5.188	6.044	329.136	0.854
5700.000	2.603	308.497	5698.165	7.413	-6.212	7.413	9.671	320.037	0.857
5800.000	3.005	298.674	5798.045	10.084	-10.289	10.084	14.407	314.424	0.625

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	3.796	288.593	5897.869	12.398	-15.727	12.398	20.026	308.249	0.989
6000.000	2.342	291.620	5997.723	14.206	-20.764	14.206	25.159	304.378	1.463
6100.000	0.061	61.648	6097.696	14.984	-22.617	14.984	27.131	303.525	2.382
6200.000	0.801	121.856	6197.692	14.640	-21.977	14.640	26.407	303.670	0.773
6300.000	1.162	133.322	6297.678	13.576	-20.645	13.576	24.709	303.328	0.408
6400.000	1.365	128.737	6397.653	12.135	-18.979	12.135	22.527	302.595	0.227
6500.000	1.660	141.969	6497.619	10.249	-17.158	10.249	19.986	300.852	0.455
6600.000	1.276	152.645	6597.586	8.120	-15.754	8.120	17.723	297.266	0.470
6700.000	1.496	153.393	6697.556	5.963	-14.658	5.963	15.824	292.138	0.221
6800.000	1.275	168.368	6797.527	3.706	-13.848	3.706	14.336	284.983	0.423
6850.000	1.167	160.757	6847.516	2.681	-13.569	2.681	13.831	281.177	0.389