



COMPANY/RIG: Noble Energy/Production/CoreTech  
WELL/API: Harvey USX AC 25-12/05-123-26102  
DECLINATION: 8.02 Degrees  
TD AS DRILLED: 6968 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.54342, Longitude: -104.39215  
Grid North = True North -0.72 degs (NAD 27)  
Grid Correction Applied = -0.72 degs



DEPTH REFERENCE : RKB = GL Elevation = 4737

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyrosurvey.ut

Minimum Curvature Method

Report Date/Time: 6/12/2017 / 12:50

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: JUSTIN WILLIAMS / Harvey USX AC 25-12

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	0.727	247.041	99.997	-0.247	-0.584	-0.247	0.634	247.041	0.727
200.000	0.525	239.078	199.991	-0.730	-1.561	-0.730	1.723	244.932	0.220
300.000	0.455	232.036	299.988	-1.210	-2.267	-1.210	2.569	241.913	0.092
400.000	0.352	233.001	399.985	-1.639	-2.825	-1.639	3.266	239.884	0.104
500.000	0.343	213.932	499.983	-2.071	-3.237	-2.071	3.843	237.383	0.115
600.000	0.031	138.464	599.983	-2.340	-3.386	-2.340	4.116	235.351	0.336
700.000	0.095	115.510	699.983	-2.396	-3.293	-2.396	4.073	233.961	0.067
800.000	0.101	174.688	799.983	-2.520	-3.210	-2.520	4.081	231.874	0.097
900.000	0.101	70.253	899.982	-2.578	-3.119	-2.578	4.046	230.428	0.160
1000.000	0.154	158.861	999.982	-2.673	-2.987	-2.673	4.009	228.173	0.183
1100.000	0.122	216.921	1099.982	-2.884	-3.003	-2.884	4.164	226.151	0.137
1200.000	0.131	209.762	1199.982	-3.069	-3.124	-3.069	4.379	225.504	0.018
1300.000	0.102	230.029	1299.982	-3.226	-3.249	-3.226	4.578	225.203	0.050
1400.000	0.281	237.809	1399.981	-3.413	-3.524	-3.413	4.906	225.914	0.180
1500.000	0.246	234.610	1499.980	-3.668	-3.906	-3.668	5.358	226.801	0.038
1600.000	0.332	231.006	1599.979	-3.975	-4.306	-3.975	5.860	227.293	0.089

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
1700.000	0.275	311.404	1699.978	-3.998	-4.712	-3.998	6.180	229.684	0.395
1800.000	0.209	21.361	1799.977	-3.670	-4.826	-3.670	6.063	232.749	0.283
1900.000	0.126	17.351	1899.977	-3.395	-4.727	-3.395	5.820	234.310	0.084
2000.000	0.098	83.746	1999.976	-3.281	-4.609	-3.281	5.658	234.552	0.125
2100.000	0.380	208.607	2099.976	-3.563	-4.683	-3.563	5.884	232.732	0.444
2200.000	0.419	208.293	2199.973	-4.177	-5.015	-4.177	6.527	230.212	0.039
2300.000	0.495	235.318	2299.970	-4.745	-5.544	-4.745	7.297	229.441	0.226
2400.000	0.755	240.962	2399.964	-5.310	-6.475	-5.310	8.374	230.644	0.267
2500.000	0.831	254.901	2499.955	-5.819	-7.750	-5.819	9.691	233.103	0.207
2600.000	0.891	253.005	2599.943	-6.235	-9.194	-6.235	11.109	235.858	0.067
2700.000	0.919	255.950	2699.931	-6.657	-10.716	-6.657	12.615	238.151	0.054
2800.000	0.990	266.332	2799.917	-6.907	-12.356	-6.907	14.155	240.795	0.187
2900.000	0.989	261.481	2899.902	-7.090	-14.071	-7.090	15.756	243.259	0.084
3000.000	1.124	261.334	2999.885	-7.365	-15.894	-7.365	17.518	245.137	0.136
3100.000	1.006	262.578	3099.868	-7.627	-17.735	-7.627	19.305	246.731	0.120
3200.000	1.072	262.632	3199.851	-7.860	-19.533	-7.860	21.055	248.081	0.065
3300.000	0.600	227.519	3299.841	-8.333	-20.847	-8.333	22.451	248.211	0.676
3400.000	0.826	196.704	3399.834	-9.377	-21.440	-9.377	23.401	246.378	0.437
3500.000	0.908	190.365	3499.822	-10.846	-21.789	-10.846	24.340	243.537	0.126
3600.000	1.090	206.290	3599.807	-12.478	-22.353	-12.478	25.600	240.828	0.330
3700.000	1.098	198.632	3699.789	-14.239	-23.081	-14.239	27.120	238.328	0.146
3800.000	1.143	228.715	3799.771	-15.805	-24.136	-15.805	28.850	236.782	0.583
3900.000	1.045	222.737	3899.753	-17.133	-25.504	-17.133	30.724	236.109	0.150
4000.000	0.974	217.888	3999.737	-18.473	-26.645	-18.473	32.423	235.266	0.111
4100.000	0.920	213.230	4099.723	-19.816	-27.608	-19.816	33.983	234.330	0.094
4200.000	0.528	231.130	4199.715	-20.777	-28.406	-20.777	35.194	233.817	0.449
4300.000	0.359	250.703	4299.712	-21.170	-29.060	-21.170	35.953	233.928	0.225
4400.000	0.463	289.909	4399.710	-21.135	-29.735	-21.135	36.481	234.595	0.292
4500.000	0.494	281.375	4499.706	-20.913	-30.537	-20.913	37.012	235.595	0.078
4600.000	0.723	321.185	4599.701	-20.336	-31.355	-20.336	37.373	237.034	0.467
4700.000	0.762	323.551	4699.693	-19.309	-32.146	-19.309	37.500	239.008	0.050
4800.000	1.200	356.192	4799.679	-17.729	-32.611	-17.729	37.119	241.469	0.693
4900.000	0.609	21.817	4899.666	-16.191	-32.483	-16.191	36.295	243.506	0.703
5000.000	0.560	58.509	4999.661	-15.443	-31.869	-15.443	35.414	244.147	0.371
5100.000	0.607	54.460	5099.656	-14.880	-31.022	-14.880	34.406	244.375	0.062
5200.000	0.674	35.964	5199.650	-14.096	-30.246	-14.096	33.370	245.012	0.216
5300.000	0.761	24.755	5299.642	-13.017	-29.623	-13.017	32.357	246.277	0.165
5400.000	0.820	32.014	5399.633	-11.807	-28.965	-11.807	31.279	247.823	0.116
5500.000	0.434	16.582	5499.626	-10.837	-28.477	-10.837	30.470	249.165	0.419

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
5600.000	0.447	1.124	5599.624	-10.084	-28.362	-10.084	30.101	250.426	0.119
5700.000	0.526	23.456	5699.620	-9.273	-28.171	-9.273	29.658	251.780	0.204
5800.000	0.549	23.569	5799.616	-8.412	-27.797	-8.412	29.042	253.162	0.023
5900.000	0.510	12.845	5899.611	-7.540	-27.506	-7.540	28.521	254.671	0.106
6000.000	0.667	14.510	5999.606	-6.542	-27.262	-6.542	28.036	256.505	0.158
6100.000	0.800	12.425	6099.598	-5.297	-26.966	-5.297	27.481	258.886	0.135
6200.000	1.164	11.414	6199.583	-3.620	-26.614	-3.620	26.860	262.254	0.365
6300.000	1.221	11.086	6299.561	-1.578	-26.208	-1.578	26.256	266.554	0.058
6400.000	1.618	8.828	6399.530	0.862	-25.787	0.862	25.801	271.916	0.400
6500.000	2.250	11.523	6499.473	4.181	-25.178	4.181	25.523	279.428	0.639
6600.000	2.277	28.509	6599.396	7.850	-23.838	7.850	25.097	288.227	0.669
6700.000	2.913	32.049	6699.293	11.749	-21.541	11.749	24.537	298.609	0.656