



COMPANY/RIG: Noble Energy/Production/CoreTech
WELL/API: Hoshiko 7-2/05-123-12970
DECLINATION: 8.13 Degrees
TD AS DRILLED: 6894 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.34368, Longitude: -104.51559
Grid North = True North -0.64 degs (NAD 27)
Grid Correction Applied = -0.64 degs



DEPTH REFERENCE : RKB = GL Elevation = 4616

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyrosurvey.ut

Minimum Curvature Method

Report Date/Time: 11/15/2016 / 11:32

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: JUSTIN WILLIAMS / Hoshiko 7-2

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	0.482	259.600	99.999	-0.076	-0.414	-0.076	0.421	259.600	0.482
200.000	0.295	263.242	199.996	-0.182	-1.084	-0.182	1.099	260.453	0.188
300.000	0.200	277.966	299.996	-0.188	-1.513	-0.188	1.524	262.899	0.114
400.000	0.128	90.006	399.995	-0.164	-1.574	-0.164	1.582	264.042	0.327
500.000	0.382	96.720	499.994	-0.203	-1.132	-0.203	1.150	259.818	0.255
600.000	0.301	88.690	599.993	-0.236	-0.538	-0.236	0.587	246.288	0.093
700.000	0.345	109.205	699.991	-0.329	0.009	-0.329	0.329	178.363	0.123
800.000	0.495	117.800	799.988	-0.630	0.676	-0.630	0.923	132.981	0.162
900.000	0.456	135.776	899.985	-1.116	1.335	-1.116	1.740	129.895	0.153
1000.000	0.555	139.692	999.981	-1.771	1.926	-1.771	2.617	132.594	0.105
1100.000	0.532	170.140	1099.977	-2.598	2.319	-2.598	3.483	138.245	0.286
1200.000	0.608	173.091	1199.972	-3.583	2.463	-3.583	4.348	145.496	0.081
1300.000	0.519	182.332	1299.967	-4.563	2.508	-4.563	5.207	151.201	0.127
1400.000	0.372	191.636	1399.964	-5.333	2.424	-5.333	5.858	155.555	0.164
1500.000	0.202	243.571	1499.963	-5.729	2.201	-5.729	6.138	158.984	0.294
1600.000	0.303	289.652	1599.962	-5.719	1.794	-5.719	5.994	162.581	0.219

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	0.502	309.514	1699.959	-5.351	1.207	-5.351	5.486	167.287	0.240
1800.000	0.726	324.333	1799.954	-4.558	0.500	-4.558	4.586	173.737	0.273
1900.000	1.142	344.440	1899.940	-3.084	-0.136	-3.084	3.087	182.530	0.524
2000.000	1.333	350.438	1999.917	-0.977	-0.597	-0.977	1.145	211.425	0.231
2100.000	1.546	7.767	2099.886	1.507	-0.608	1.507	1.625	338.032	0.482
2200.000	1.804	24.680	2199.844	4.274	0.232	4.274	4.280	3.106	0.555
2300.000	1.686	25.152	2299.797	7.036	1.515	7.036	7.197	12.148	0.119
2400.000	1.812	31.772	2399.751	9.712	2.972	9.712	10.157	17.017	0.238
2500.000	1.707	24.350	2499.704	12.413	4.419	12.413	13.176	19.596	0.251
2600.000	1.545	26.665	2599.663	14.975	5.638	14.975	16.001	20.632	0.175
2700.000	1.710	28.862	2699.623	17.486	6.963	17.486	18.821	21.713	0.177
2800.000	1.509	27.540	2799.584	19.960	8.292	19.960	21.614	22.560	0.205
2900.000	1.150	32.331	2899.557	21.975	9.438	21.975	23.916	23.242	0.375
3000.000	0.931	21.749	2999.540	23.578	10.275	23.578	25.719	23.548	0.291
3100.000	0.523	14.343	3099.532	24.774	10.689	24.774	26.982	23.339	0.418
3200.000	0.041	218.510	3199.531	25.189	10.780	25.189	27.399	23.170	0.560
3300.000	0.355	195.421	3299.530	24.862	10.676	24.862	27.058	23.239	0.318
3400.000	0.739	201.486	3399.525	23.964	10.357	23.964	26.106	23.374	0.388
3500.000	1.062	204.786	3499.513	22.523	9.733	22.523	24.535	23.371	0.327
3600.000	1.106	207.152	3599.495	20.822	8.904	20.822	22.646	23.151	0.063
3700.000	1.122	212.742	3699.476	19.140	7.934	19.140	20.719	22.514	0.110
3800.000	1.078	222.345	3799.458	17.621	6.770	17.621	18.877	21.018	0.189
3900.000	1.202	242.500	3899.438	16.442	5.207	16.442	17.246	17.571	0.417
4000.000	1.353	250.346	3999.413	15.560	3.164	15.560	15.879	11.494	0.231
4100.000	1.905	267.236	4099.373	15.083	0.392	15.083	15.088	1.489	0.725
4200.000	2.566	263.875	4199.296	14.764	-3.493	14.764	15.172	346.687	0.674
4300.000	2.987	266.126	4299.179	14.349	-8.319	14.349	16.586	329.898	0.435
4400.000	3.250	265.180	4399.031	13.935	-13.743	13.935	19.572	315.397	0.268
4500.000	3.090	273.710	4498.878	13.871	-19.258	13.871	23.733	305.765	0.498
4600.000	2.984	270.483	4598.738	14.067	-24.550	14.067	28.295	299.813	0.201
4700.000	2.232	268.454	4698.634	14.037	-29.099	14.037	32.308	295.752	0.758
4800.000	2.184	278.918	4798.560	14.280	-32.928	14.280	35.891	293.444	0.405
4900.000	1.380	280.332	4898.511	14.791	-35.996	14.791	38.916	292.338	0.805
5000.000	1.368	290.632	4998.482	15.428	-38.297	15.428	41.288	291.941	0.247
5100.000	1.656	304.494	5098.447	16.666	-40.605	16.666	43.892	292.316	0.464
5200.000	1.415	290.325	5198.412	17.913	-42.954	17.913	46.539	292.638	0.448
5300.000	1.370	297.298	5298.382	18.890	-45.173	18.890	48.964	292.693	0.175
5400.000	1.655	323.665	5398.349	20.602	-47.091	20.602	51.400	293.629	0.744
5500.000	2.173	336.923	5498.293	23.509	-48.690	23.509	54.068	295.773	0.678

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	1.606	347.557	5598.238	26.621	-49.735	26.621	56.411	298.158	0.664
5700.000	1.596	345.429	5698.199	29.336	-50.387	29.336	58.305	300.209	0.060
5800.000	1.388	347.589	5798.165	31.866	-50.997	31.866	60.135	302.000	0.215
5900.000	1.384	346.921	5898.136	34.225	-51.531	34.225	61.861	303.591	0.017
6000.000	1.414	341.901	5998.106	36.574	-52.187	36.574	63.727	305.024	0.126
6100.000	1.395	352.254	6098.077	38.952	-52.735	38.952	65.561	306.451	0.254
6200.000	1.372	345.860	6198.048	41.319	-53.191	41.319	67.354	307.840	0.156
6300.000	1.505	341.286	6298.016	43.723	-53.905	43.723	69.408	309.046	0.175
6400.000	1.302	339.207	6397.986	46.029	-54.729	46.029	71.512	310.065	0.209
6500.000	1.484	348.216	6497.957	48.359	-55.397	48.359	73.535	311.119	0.284
6600.000	1.102	345.239	6597.931	50.556	-55.906	50.556	75.375	312.123	0.387