



Company/Rig: NOBLE ENERGY / PRODUCTION
WELL/API#: WELLS RANCH USX BB 5-12 / 05-123-26231
DECLINATION: 8.27 DEGREES
TD AS DRILLED: 6971 FEET
COUNTY/STATE: WELD / COLORADO
VS-Azi: 0.000 Degrees
Latitude: 40.42657, Longitude: -104.46747
Grid Convergence Applied = -0.67 degs (NAD 27)
Grid North = True North -0.67 degs



DEPTH REFERENCE : RKB=SURFACE ELEVATION=4692 FEET

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut
Minimum Curvature Method
Report Date/Time: 5/19/2015 / 15:25

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD
NORTH REFERENCE: GRID
HENDERSON, COLORADO
303-853-4976
Surveyor: NORMAN COWAN

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	0.959	279.442	99.995	0.137	-0.826	0.137	0.837	279.442	0.959
200.000	1.100	278.207	199.979	0.412	-2.601	0.412	2.634	278.992	0.143
300.000	0.996	256.918	299.963	0.352	-4.398	0.352	4.412	274.574	0.400
400.000	0.840	260.436	399.950	0.033	-5.968	0.033	5.968	270.320	0.166
500.000	1.627	247.564	499.926	-0.630	-8.002	-0.630	8.027	265.497	0.830
600.000	1.656	245.636	599.885	-1.768	-10.631	-1.768	10.777	260.557	0.063
700.000	1.717	240.809	699.842	-3.095	-13.255	-3.095	13.612	256.858	0.154
800.000	1.924	239.224	799.791	-4.685	-16.005	-4.685	16.677	253.686	0.213
900.000	1.984	237.378	899.733	-6.477	-18.906	-6.477	19.984	251.090	0.087
1000.000	2.068	234.330	999.671	-8.462	-21.829	-8.462	23.412	248.812	0.136
1100.000	2.180	234.377	1099.602	-10.622	-24.841	-10.622	27.017	246.849	0.113
1200.000	2.172	236.468	1199.530	-12.777	-27.967	-12.777	30.747	245.447	0.080
1300.000	2.215	234.951	1299.457	-14.933	-31.129	-14.933	34.525	244.372	0.072
1400.000	2.206	233.531	1399.382	-17.187	-34.258	-17.187	38.328	243.358	0.056
1500.000	2.124	235.455	1499.311	-19.381	-37.332	-19.381	42.063	242.563	0.109
1600.000	1.930	241.777	1599.248	-21.229	-40.342	-21.229	45.587	242.246	0.296
1700.000	1.653	265.307	1699.201	-22.143	-43.263	-22.143	48.600	242.896	0.779
1800.000	1.707	264.814	1799.158	-22.396	-46.183	-22.396	51.327	244.130	0.056

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	1.287	283.756	1899.124	-22.263	-48.757	-22.263	53.600	245.458	0.643
2000.000	0.802	298.712	1999.107	-21.660	-50.462	-21.660	54.914	246.770	0.552
2100.000	0.906	315.873	2099.096	-20.756	-51.627	-20.756	55.643	248.098	0.275
2200.000	0.779	330.564	2199.086	-19.596	-52.511	-19.596	56.049	249.535	0.249
2300.000	0.760	332.695	2299.077	-18.415	-53.150	-18.415	56.249	250.890	0.035
2400.000	0.404	335.574	2399.071	-17.504	-53.600	-17.504	56.385	251.914	0.357
2500.000	0.242	314.989	2499.070	-17.034	-53.895	-17.034	56.523	252.460	0.197
2600.000	0.160	151.619	2599.069	-17.007	-53.978	-17.007	56.594	252.511	0.398
2700.000	0.261	140.069	2699.069	-17.305	-53.766	-17.305	56.482	252.159	0.109
2800.000	0.155	135.973	2799.068	-17.576	-53.526	-17.576	56.338	251.821	0.107
2900.000	0.391	111.237	2899.067	-17.797	-53.114	-17.797	56.016	251.475	0.258
3000.000	0.537	151.993	2999.064	-18.334	-52.576	-18.334	55.681	250.776	0.351
3100.000	0.686	145.609	3099.058	-19.241	-52.018	-19.241	55.463	249.701	0.164
3200.000	1.256	149.526	3199.043	-20.680	-51.125	-20.680	55.149	247.977	0.574
3300.000	2.229	150.579	3298.996	-23.318	-49.613	-23.318	54.820	244.826	0.974
3400.000	2.447	141.309	3398.913	-26.678	-47.324	-26.678	54.326	240.588	0.436
3500.000	2.303	123.641	3498.828	-29.458	-44.316	-29.458	53.214	236.387	0.743
3600.000	2.163	115.991	3598.753	-31.398	-40.947	-31.398	51.599	232.519	0.329
3700.000	2.261	114.024	3698.678	-33.029	-37.448	-33.029	49.933	228.588	0.124
3800.000	2.164	111.269	3798.604	-34.517	-33.886	-34.517	48.371	224.472	0.144
3900.000	1.909	114.299	3898.540	-35.887	-30.608	-35.887	47.168	220.461	0.277
4000.000	1.761	124.193	3998.489	-37.436	-27.819	-37.436	46.641	216.616	0.349
4100.000	1.803	133.638	4098.441	-39.385	-25.410	-39.385	46.871	212.828	0.296
4200.000	1.843	150.174	4198.391	-41.866	-23.472	-41.866	47.997	209.277	0.526
4300.000	1.924	156.869	4298.337	-44.805	-22.012	-44.805	49.920	206.165	0.234
4400.000	1.892	155.762	4398.282	-47.854	-20.675	-47.854	52.129	203.367	0.049
4500.000	2.136	156.399	4498.220	-51.067	-19.251	-51.067	54.575	200.656	0.245
4600.000	2.539	156.550	4598.137	-54.806	-17.624	-54.806	57.570	197.826	0.403
4700.000	2.290	151.684	4698.048	-58.597	-15.795	-58.597	60.688	195.086	0.322
4800.000	2.112	152.122	4797.974	-61.984	-13.986	-61.984	63.543	192.715	0.179
4900.000	1.886	149.238	4897.913	-65.027	-12.283	-65.027	66.177	190.696	0.247
5000.000	1.542	155.264	4997.868	-67.663	-10.878	-67.663	68.532	189.133	0.388
5100.000	1.286	171.257	5097.838	-69.994	-10.145	-69.994	70.725	188.247	0.468
5200.000	0.910	185.360	5197.820	-71.893	-10.048	-71.893	72.592	187.956	0.460
5300.000	0.617	161.382	5297.811	-73.194	-9.951	-73.194	73.867	187.742	0.428
5400.000	0.498	170.912	5397.806	-74.132	-9.710	-74.132	74.766	187.462	0.150
5500.000	0.379	189.862	5497.804	-74.887	-9.698	-74.887	75.513	187.379	0.186
5600.000	0.451	203.474	5597.801	-75.575	-9.912	-75.575	76.222	187.472	0.122
5700.000	0.373	190.068	5697.798	-76.256	-10.126	-76.256	76.925	187.564	0.124
5800.000	0.357	206.634	5797.796	-76.855	-10.322	-76.855	77.545	187.649	0.106

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	0.313	199.452	5897.795	-77.390	-10.552	-77.390	78.106	187.765	0.060
6000.000	0.263	209.460	5997.793	-77.848	-10.756	-77.848	78.588	187.867	0.071
6100.000	0.157	241.870	6097.793	-78.113	-10.990	-78.113	78.882	188.009	0.156
6200.000	0.497	282.357	6197.791	-78.084	-11.534	-78.084	78.932	188.403	0.391
6300.000	0.667	298.379	6297.786	-77.715	-12.470	-77.715	78.709	189.116	0.234
6400.000	0.714	322.749	6397.779	-76.942	-13.359	-76.942	78.093	189.850	0.295
6500.000	1.185	357.422	6497.766	-75.413	-13.783	-75.413	76.662	190.357	0.723
6600.000	1.375	356.369	6597.741	-73.182	-13.905	-73.182	74.491	190.759	0.191
6700.000	1.738	353.974	6697.704	-70.476	-14.140	-70.476	71.881	191.345	0.369