



Company/Rig: NOBLE ENERGY / PRODUCTION
WELL/API#: WELLS RANCH USX BB 5-15 / 05-123-25281
DECLINATION: 8.26 DEGREES
TD AS DRILLED: 6972 FEET
COUNTY/STATE: WELD / COLORADO
VS-Azi: 0.000 Degrees
Latitude: 40.42329, Longitude: -104.45841
Grid Convergence Applied = -0.67 degs (NAD 27)
Grid North = True North -0.67 degs



DEPTH REFERENCE : RKB=SURFACE ELEVATION=4728 FEET

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut
Minimum Curvature Method
Report Date/Time: 5/12/2015 / 12:54

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	0.215	309.572	100.000	0.120	-0.145	0.120	0.188	309.572	0.215
200.000	0.250	287.256	199.999	0.304	-0.498	0.304	0.583	301.421	0.096
300.000	0.368	288.031	299.997	0.468	-1.011	0.468	1.115	294.840	0.119
400.000	0.721	272.940	399.993	0.600	-1.945	0.600	2.036	287.140	0.378
500.000	0.855	266.842	499.983	0.591	-3.319	0.591	3.371	280.099	0.158
600.000	1.135	278.831	599.968	0.702	-5.042	0.702	5.091	277.926	0.347
700.000	1.217	268.155	699.947	0.820	-7.082	0.820	7.129	276.603	0.234
800.000	1.214	275.026	799.925	0.878	-9.199	0.878	9.241	275.455	0.146
900.000	1.233	275.227	899.902	1.069	-11.325	1.069	11.376	275.394	0.019
1000.000	1.001	277.263	999.883	1.278	-13.263	1.278	13.324	275.503	0.235
1100.000	0.942	276.987	1099.869	1.488	-14.945	1.488	15.019	275.686	0.059
1200.000	0.904	280.003	1199.856	1.725	-16.538	1.725	16.627	275.955	0.062
1300.000	0.803	291.214	1299.845	2.116	-17.968	2.116	18.092	276.716	0.194
1400.000	0.684	300.504	1399.836	2.673	-19.136	2.673	19.322	277.951	0.169
1500.000	0.660	291.142	1499.829	3.183	-20.187	3.183	20.437	278.961	0.112
1600.000	0.726	295.768	1599.822	3.666	-21.295	3.666	21.608	279.769	0.087
1700.000	0.783	304.506	1699.814	4.328	-22.428	4.328	22.842	280.923	0.128
1800.000	0.488	251.159	1799.808	4.578	-23.394	4.578	23.837	281.071	0.628

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	1.065	196.999	1899.800	3.551	-24.069	3.551	24.329	278.394	0.874
2000.000	1.050	198.425	1999.782	1.793	-24.630	1.793	24.695	274.165	0.030
2100.000	1.115	209.125	2099.765	0.074	-25.393	0.074	25.393	270.167	0.212
2200.000	0.894	222.264	2199.749	-1.353	-26.391	-1.353	26.426	267.065	0.318
2300.000	0.603	224.310	2299.741	-2.307	-27.284	-2.307	27.381	265.166	0.292
2400.000	0.292	217.558	2399.738	-2.886	-27.807	-2.886	27.957	264.074	0.315
2500.000	0.378	196.998	2499.736	-3.404	-28.059	-3.404	28.265	263.083	0.146
2600.000	0.304	197.485	2599.734	-3.972	-28.235	-3.972	28.513	261.992	0.074
2700.000	0.142	246.372	2699.733	-4.275	-28.429	-4.275	28.748	261.447	0.236
2800.000	0.396	300.488	2799.732	-4.150	-28.841	-4.150	29.138	261.812	0.333
2900.000	0.531	294.467	2899.729	-3.782	-29.560	-3.782	29.801	262.708	0.143
3000.000	0.397	305.203	2999.726	-3.391	-30.265	-3.391	30.454	263.607	0.159
3100.000	0.348	52.979	3099.725	-3.009	-30.306	-3.009	30.455	264.330	0.602
3200.000	0.470	77.267	3199.722	-2.736	-29.663	-2.736	29.789	264.731	0.210
3300.000	0.686	80.652	3299.717	-2.548	-28.673	-2.548	28.786	264.922	0.218
3400.000	0.933	67.627	3399.707	-2.141	-27.329	-2.141	27.413	265.521	0.307
3500.000	1.075	75.950	3499.692	-1.603	-25.666	-1.603	25.716	266.426	0.203
3600.000	0.977	74.339	3599.676	-1.145	-23.936	-1.145	23.963	267.261	0.102
3700.000	1.296	76.628	3699.656	-0.654	-22.015	-0.654	22.025	268.299	0.322
3800.000	1.513	81.592	3799.626	-0.199	-19.609	-0.199	19.610	269.418	0.249
3900.000	1.431	77.806	3899.593	0.258	-17.083	0.258	17.085	270.864	0.127
4000.000	0.837	56.003	3999.573	0.930	-15.257	0.930	15.285	273.487	0.724
4100.000	0.648	47.214	4099.565	1.723	-14.236	1.723	14.340	276.899	0.220
4200.000	0.583	95.718	4199.560	2.056	-13.314	2.056	13.472	278.779	0.509
4300.000	0.706	99.335	4299.553	1.906	-12.200	1.906	12.348	278.877	0.129
4400.000	0.791	138.246	4399.545	1.290	-11.132	1.290	11.207	276.612	0.505
4500.000	1.139	141.326	4499.531	-0.001	-10.051	-0.001	10.051	269.993	0.352
4600.000	1.666	141.775	4599.501	-1.919	-8.530	-1.919	8.744	257.320	0.526
4700.000	1.629	133.118	4699.460	-4.032	-6.594	-4.032	7.729	238.553	0.251
4800.000	1.186	102.913	4799.430	-5.235	-4.548	-5.235	6.934	220.980	0.849
4900.000	1.026	77.028	4899.412	-5.265	-2.666	-5.265	5.902	206.852	0.520
5000.000	1.078	79.935	4999.396	-4.900	-0.867	-4.900	4.976	190.035	0.074
5100.000	1.341	74.106	5099.373	-4.415	1.184	-4.415	4.571	164.983	0.290
5200.000	1.819	79.261	5199.335	-3.799	3.869	-3.799	5.422	134.473	0.498
5300.000	1.838	77.709	5299.284	-3.162	6.996	-3.162	7.677	114.320	0.053
5400.000	1.255	89.749	5399.247	-2.815	9.658	-2.815	10.060	106.252	0.665
5500.000	0.735	112.114	5499.232	-3.052	11.347	-3.052	11.751	105.055	0.639
5600.000	0.486	110.438	5599.227	-3.442	12.339	-3.442	12.810	105.586	0.250
5700.000	0.556	130.122	5699.223	-3.903	13.108	-3.903	13.676	106.581	0.191
5800.000	0.532	117.912	5799.218	-4.433	13.889	-4.433	14.579	107.701	0.118

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	1.089	119.535	5899.208	-5.119	15.126	-5.119	15.968	108.696	0.558
6000.000	1.483	111.505	5999.182	-6.061	17.157	-6.061	18.196	109.458	0.433
6100.000	1.850	102.474	6099.140	-6.885	19.937	-6.885	21.092	109.050	0.450
6200.000	2.572	105.507	6199.065	-7.833	23.676	-7.833	24.938	108.307	0.731
6300.000	3.441	97.237	6298.927	-8.811	28.815	-8.811	30.133	107.003	0.969
6400.000	4.095	98.929	6398.710	-9.744	35.320	-9.744	36.639	105.422	0.663
6500.000	3.146	99.626	6498.509	-10.757	41.553	-10.757	42.922	104.513	0.951
6600.000	2.201	103.497	6598.400	-11.664	46.125	-11.664	47.577	104.191	0.961
6700.000	1.232	107.525	6698.354	-12.436	49.018	-12.436	50.571	104.235	0.976