



Company/Rig: NOBLE ENERGY/ CORETECH
WELL/API#: ROTH 1-30/05-123-13030
DECLINATION: 8.29 Degrees
TD AS DRILLED: 7028 Feet
COUNTY/STATE: WELD/COLORADO
VS-Azi: 0.000 Degrees
Latitude: 40.46227, Longitude: -104.58626
Grid North = True North -0.59 degs (NAD 27)
Grid Convergence Applied = -0.59 degs



DEPTH REFERENCE : RKB=SURFACE ELEVATION=4693

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 10/13/2015 / 08:16

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: BRIAN BREWBAKER / Roth 1-30

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	0.709	27.036	99.997	0.551	0.281	0.551	0.619	27.036	0.709
200.000	0.273	30.849	199.994	1.307	0.685	1.307	1.475	27.651	0.437
300.000	0.076	137.084	299.993	1.463	0.852	1.463	1.693	30.211	0.303
400.000	0.151	2.310	399.993	1.546	0.902	1.546	1.790	30.265	0.211
500.000	0.040	3.983	499.993	1.713	0.910	1.713	1.939	27.984	0.111
600.000	0.152	61.489	599.993	1.811	1.029	1.811	2.083	29.607	0.135
700.000	0.066	233.429	699.993	1.840	1.099	1.840	2.143	30.855	0.218
800.000	0.068	48.251	799.993	1.845	1.097	1.845	2.146	30.737	0.134
900.000	0.060	186.699	899.993	1.832	1.135	1.832	2.155	31.781	0.120
1000.000	0.112	304.990	999.993	1.836	1.049	1.836	2.115	29.741	0.150
1100.000	0.109	322.314	1099.992	1.968	0.911	1.968	2.168	24.834	0.033
1200.000	0.178	293.287	1199.992	2.105	0.710	2.105	2.221	18.634	0.098
1300.000	0.157	278.676	1299.992	2.187	0.432	2.187	2.229	11.171	0.047
1400.000	0.057	151.786	1399.992	2.163	0.320	2.163	2.187	8.418	0.197
1500.000	0.068	204.850	1499.991	2.065	0.319	2.065	2.090	8.777	0.057
1600.000	0.138	161.984	1599.991	1.898	0.331	1.898	1.926	9.902	0.099
1700.000	0.299	141.329	1699.991	1.579	0.532	1.579	1.666	18.606	0.177
1800.000	0.378	134.956	1799.989	1.142	0.928	1.142	1.472	39.094	0.087

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	0.396	145.281	1899.987	0.625	1.358	0.625	1.495	65.273	0.072
2000.000	0.138	205.917	1999.986	0.233	1.502	0.233	1.520	81.175	0.350
2100.000	0.265	274.046	2099.985	0.141	1.219	0.141	1.227	83.389	0.249
2200.000	0.441	320.016	2199.983	0.452	0.741	0.452	0.868	58.610	0.319
2300.000	0.672	343.608	2299.979	1.310	0.328	1.310	1.350	14.077	0.321
2400.000	0.732	340.672	2399.971	2.476	-0.049	2.476	2.476	358.873	0.070
2500.000	0.640	340.454	2499.964	3.605	-0.447	3.605	3.633	352.932	0.093
2600.000	0.414	340.223	2599.960	4.471	-0.756	4.471	4.534	350.404	0.226
2700.000	0.557	337.198	2699.956	5.258	-1.066	5.258	5.365	348.536	0.146
2800.000	0.442	354.568	2799.952	6.091	-1.291	6.091	6.226	348.030	0.189
2900.000	0.264	346.468	2899.950	6.699	-1.382	6.699	6.840	348.345	0.185
3000.000	0.341	312.758	2999.949	7.125	-1.654	7.125	7.315	346.928	0.190
3100.000	0.225	300.475	3099.948	7.427	-2.042	7.427	7.703	344.625	0.131
3200.000	0.510	298.097	3199.946	7.737	-2.604	7.737	8.163	341.395	0.286
3300.000	0.887	302.494	3299.938	8.362	-3.650	8.362	9.124	336.417	0.380
3400.000	0.712	299.402	3399.928	9.083	-4.844	9.083	10.294	331.927	0.181
3500.000	0.939	261.467	3499.918	9.266	-6.196	9.266	11.147	326.232	0.578
3600.000	1.605	232.987	3599.894	8.301	-8.125	8.301	11.616	315.616	0.899
3700.000	1.477	236.336	3699.858	6.744	-10.316	6.744	12.324	303.176	0.157
3800.000	1.667	231.441	3799.820	5.123	-12.525	5.123	13.533	292.245	0.233
3900.000	1.534	231.547	3899.781	3.384	-14.711	3.384	15.096	282.953	0.133
4000.000	1.393	245.666	3999.749	2.050	-16.867	2.050	16.992	276.930	0.386
4100.000	0.963	252.962	4099.728	1.303	-18.778	1.303	18.824	273.970	0.455
4200.000	1.026	260.716	4199.713	0.913	-20.465	0.913	20.485	272.553	0.148
4300.000	1.172	273.172	4299.694	0.825	-22.370	0.825	22.385	272.111	0.280
4400.000	1.359	273.249	4399.670	0.949	-24.576	0.949	24.594	272.210	0.187
4500.000	1.729	276.824	4499.633	1.195	-27.258	1.195	27.284	272.510	0.382
4600.000	1.733	290.341	4599.588	1.900	-30.174	1.900	30.233	273.603	0.407
4700.000	1.369	291.132	4699.551	2.856	-32.706	2.856	32.831	274.991	0.365
4800.000	1.539	291.883	4799.519	3.788	-35.067	3.788	35.271	276.165	0.171
4900.000	1.845	297.320	4899.476	5.027	-37.744	5.027	38.077	277.587	0.345
5000.000	1.869	301.160	4999.423	6.610	-40.570	6.610	41.105	279.254	0.127
5100.000	2.010	303.186	5099.366	8.414	-43.434	8.414	44.241	280.964	0.157
5200.000	1.464	308.971	5199.319	10.178	-45.894	10.178	47.009	282.504	0.573
5300.000	1.461	308.575	5299.287	11.776	-47.884	11.776	49.311	283.816	0.011
5400.000	1.186	293.817	5399.260	12.989	-49.828	12.989	51.493	284.611	0.436
5500.000	0.931	337.156	5499.245	14.156	-51.090	14.156	53.015	285.487	0.817
5600.000	1.286	339.797	5599.226	15.958	-51.793	15.958	54.196	287.124	0.358
5700.000	0.656	326.404	5699.211	17.487	-52.498	17.487	55.334	288.423	0.665
5800.000	0.937	345.551	5799.202	18.756	-53.018	18.756	56.238	289.482	0.383

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	0.780	345.284	5899.190	20.207	-53.395	20.207	57.091	290.729	0.157
6000.000	0.639	18.994	5999.183	21.393	-53.387	21.393	57.514	291.837	0.433
6100.000	0.682	3.090	6099.176	22.514	-53.173	22.514	57.743	292.948	0.187
6200.000	0.658	1.622	6199.170	23.682	-53.125	23.682	58.164	294.026	0.029
6300.000	0.419	102.407	6299.167	24.177	-52.752	24.177	58.028	294.623	0.844
6400.000	0.667	343.079	6399.164	24.655	-52.564	24.655	58.059	295.129	0.945
6500.000	0.551	318.741	6499.159	25.573	-53.050	25.573	58.892	295.737	0.280
6600.000	0.503	56.452	6599.156	26.177	-53.001	26.177	59.113	296.284	0.794
6700.000	0.582	91.430	6699.152	26.407	-52.128	26.407	58.435	296.866	0.334
6800.000	0.467	104.696	6799.148	26.291	-51.226	26.291	57.579	297.168	0.166