



Company/Rig: Noble Energy/CoreTech  
WELL/API#: Oster RG 27-13/05-123-13248  
DECLINATION: 8.33  
TD AS DRILLED: 7270'  
COUNTY/STATE: Weld/Colorado  
Latitude: 40.278, Longitude: -104.657  
GRID North is 0.540 Degrees East of True North  
VS-Azi: 0.000 Degrees



DEPTH REFERENCE : RKB=Surface Elevation=4775'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro\_run01-01-de\_01.ut

Minimum Curvature Method

Report Date/Time: 12/10/2014 / 16:25

Lat & Long Obtained By Handheld GPS At Wellhead

North Reference: Grid

Henderson, Co.

303-853-4976

Surveyor: Mark Simmons

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	0.086	296.085	100.000	0.033	-0.068	0.033	0.075	296.085	0.086
200.000	0.078	6.293	200.000	0.134	-0.128	0.134	0.185	316.249	0.095
300.000	0.270	356.952	299.999	0.437	-0.133	0.437	0.456	343.039	0.194
400.000	0.393	350.174	399.998	1.010	-0.204	1.010	1.030	348.568	0.129
500.000	0.322	28.568	499.996	1.594	-0.129	1.594	1.600	355.391	0.245
600.000	0.374	17.905	599.994	2.151	0.106	2.151	2.154	2.819	0.083
700.000	0.435	347.922	699.992	2.833	0.127	2.833	2.836	2.560	0.218
800.000	0.475	13.839	799.989	3.607	0.146	3.607	3.610	2.323	0.208
900.000	0.578	15.764	899.984	4.494	0.382	4.494	4.511	4.864	0.105
1000.000	0.679	20.129	999.978	5.536	0.723	5.536	5.583	7.443	0.111
1100.000	0.682	27.122	1099.971	6.622	1.198	6.622	6.729	10.259	0.083
1200.000	0.823	24.064	1199.963	7.808	1.763	7.808	8.005	12.724	0.147
1300.000	0.864	26.042	1299.952	9.141	2.387	9.141	9.448	14.634	0.050
1400.000	0.842	34.192	1399.941	10.426	3.131	10.426	10.886	16.714	0.123
1500.000	0.921	22.903	1499.929	11.775	3.857	11.775	12.390	18.135	0.190
1600.000	0.609	41.948	1599.920	12.910	4.525	12.910	13.680	19.314	0.398
1700.000	0.494	71.404	1699.916	13.443	5.288	13.443	14.446	21.475	0.302
1800.000	0.498	70.455	1799.912	13.726	6.107	13.726	15.023	23.984	0.009
1900.000	0.405	80.512	1899.909	13.929	6.864	13.929	15.529	26.233	0.122

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
2000.000	0.534	85.861	1999.905	14.021	7.677	14.021	15.985	28.703	0.137
2100.000	0.131	170.132	2099.904	13.942	8.162	13.942	16.156	30.346	0.537
2200.000	0.222	176.534	2199.903	13.636	8.193	13.636	15.908	31.000	0.093
2300.000	0.196	176.253	2299.903	13.272	8.216	13.272	15.609	31.761	0.026
2400.000	0.219	321.195	2399.902	13.250	8.108	13.250	15.534	31.464	0.396
2500.000	0.521	319.256	2499.900	13.743	7.692	13.743	15.749	29.235	0.302
2600.000	0.542	321.147	2599.896	14.456	7.098	14.456	16.104	26.152	0.028
2700.000	0.607	330.879	2699.891	15.287	6.543	15.287	16.629	23.172	0.117
2800.000	0.594	314.384	2799.886	16.113	5.915	16.113	17.164	20.159	0.173
2900.000	0.591	326.862	2899.880	16.907	5.263	16.907	17.707	17.290	0.129
3000.000	0.637	322.613	2999.874	17.781	4.643	17.781	18.377	14.635	0.065
3100.000	0.648	320.746	3099.868	18.661	3.948	18.661	19.074	11.945	0.024
3200.000	0.709	313.327	3199.861	19.523	3.139	19.523	19.774	9.135	0.107
3300.000	0.545	325.771	3299.855	20.341	2.421	20.341	20.485	6.789	0.212
3400.000	0.753	335.127	3399.849	21.331	1.877	21.331	21.413	5.030	0.233
3500.000	0.509	339.833	3499.843	22.344	1.448	22.344	22.391	3.708	0.249
3600.000	0.717	345.282	3599.837	23.366	1.136	23.366	23.394	2.783	0.216
3700.000	0.437	348.433	3699.832	24.346	0.900	24.346	24.362	2.118	0.281
3800.000	0.641	355.244	3799.827	25.277	0.777	25.277	25.289	1.761	0.213
3900.000	0.632	337.889	3899.821	26.346	0.523	26.346	26.351	1.138	0.192
4000.000	0.596	341.486	3999.815	27.349	0.151	27.349	27.350	0.316	0.053
4100.000	0.561	350.741	4099.810	28.325	-0.093	28.325	28.325	359.812	0.099
4200.000	0.537	340.974	4199.806	29.252	-0.325	29.252	29.254	359.364	0.097
4300.000	0.555	345.370	4299.801	30.164	-0.600	30.164	30.170	358.861	0.046
4400.000	0.596	344.678	4399.796	31.134	-0.860	31.134	31.146	358.418	0.041
4500.000	0.847	356.446	4499.788	32.373	-1.043	32.373	32.390	358.155	0.290
4600.000	0.934	3.530	4599.776	33.924	-1.038	33.924	33.940	358.247	0.140
4700.000	0.993	13.154	4699.762	35.581	-0.791	35.581	35.590	358.726	0.172
4800.000	1.023	15.915	4799.747	37.283	-0.349	37.283	37.284	359.463	0.057
4900.000	0.875	12.169	4899.733	38.887	0.056	38.887	38.887	0.083	0.160
5000.000	0.671	24.362	4999.724	40.167	0.459	40.167	40.169	0.654	0.261
5100.000	0.613	28.847	5099.718	41.168	0.958	41.168	41.180	1.334	0.077
5200.000	0.423	32.870	5199.713	41.947	1.417	41.947	41.971	1.934	0.194
5300.000	0.374	48.043	5299.711	42.475	1.860	42.475	42.516	2.507	0.116
5400.000	0.186	81.729	5399.710	42.717	2.263	42.717	42.777	3.033	0.243
5500.000	0.428	87.959	5499.708	42.754	2.797	42.754	42.845	3.743	0.244
5600.000	0.222	180.942	5599.707	42.574	3.166	42.574	42.691	4.254	0.492
5700.000	0.246	177.357	5699.706	42.166	3.173	42.166	42.285	4.304	0.028
5800.000	0.387	227.782	5799.705	41.725	2.933	41.725	41.828	4.021	0.298
5900.000	0.406	248.703	5899.703	41.369	2.353	41.369	41.436	3.255	0.145

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
6000.000	0.464	200.330	5999.700	40.861	1.882	40.861	40.904	2.637	0.361
6100.000	0.719	181.153	6099.695	39.853	1.728	39.853	39.891	2.483	0.320
6200.000	0.699	198.864	6199.687	38.648	1.518	38.648	38.678	2.250	0.219
6300.000	0.734	188.084	6299.679	37.437	1.231	37.437	37.457	1.883	0.139
6400.000	0.738	217.346	6399.672	36.291	0.750	36.291	36.299	1.184	0.372
6500.000	0.715	176.717	6499.664	35.156	0.395	35.156	35.159	0.644	0.505
6600.000	0.870	183.935	6599.655	33.777	0.379	33.777	33.779	0.643	0.184
6700.000	0.848	175.930	6699.643	32.281	0.379	32.281	32.284	0.673	0.122
6800.000	1.155	155.437	6799.628	30.626	0.851	30.626	30.638	1.591	0.467
6900.000	1.306	155.879	6899.605	28.669	1.736	28.669	28.722	3.465	0.151
7000.000	1.480	156.763	6999.576	26.442	2.711	26.442	26.581	5.854	0.175
7050.000	1.386	149.876	7049.560	25.326	3.269	25.326	25.536	7.356	0.392