



Company/ Rig: Noble Energy/ CoreTech
Well/API#: TRE-MAT 23-13/05-123-23551
Declination: 8.4 Degrees
TD as Drilled: 7344 Feet
County/State: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.47370, Longitude: -104.85850
Grid North = True North -0.41 degs (NAD 27)
Grid Correction Applied = -0.41 degs



Depth Reference : RKB= GL/ Elevation= 4777 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01_mrg.ut

Minimum Curvature Method

Report Date/Time: 3/9/2016 / 15:46

Lat & Long Obtained by Handheld GPS at Wellhead

North Reference: Grid

Henderson, Colorado

303-853-4976

Surveyor: Sean Bratt / TRE-MAT 23-13

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	0.563	259.774	99.998	-0.087	-0.483	-0.087	0.491	259.774	0.563
200.000	0.205	194.976	199.996	-0.347	-1.013	-0.347	1.071	251.077	0.510
300.000	0.326	183.534	299.995	-0.804	-1.077	-0.804	1.344	233.241	0.132
400.000	0.199	137.881	399.994	-1.218	-0.978	-1.218	1.562	218.762	0.235
500.000	0.197	164.955	499.994	-1.513	-0.816	-1.513	1.719	208.351	0.093
600.000	0.662	0.725	599.992	-1.101	-0.764	-1.101	1.341	214.761	0.853
700.000	0.215	22.603	699.989	-0.351	-0.685	-0.351	0.770	242.872	0.470
800.000	0.702	309.574	799.986	0.212	-1.085	0.212	1.106	281.050	0.671
900.000	0.736	303.301	899.978	0.955	-2.094	0.955	2.302	294.510	0.086
1000.000	0.856	300.561	999.968	1.687	-3.274	1.687	3.684	297.263	0.125
1100.000	0.797	321.753	1099.958	2.613	-4.348	2.613	5.073	301.007	0.309
1200.000	0.704	293.151	1199.950	3.401	-5.344	3.401	6.334	302.475	0.382
1300.000	0.540	278.171	1299.944	3.710	-6.375	3.710	7.376	300.196	0.230
1400.000	0.716	280.469	1399.938	3.890	-7.455	3.890	8.409	297.555	0.178
1500.000	0.428	281.393	1499.933	4.077	-8.436	4.077	9.369	295.797	0.288
1600.000	0.495	272.457	1599.930	4.170	-9.233	4.170	10.131	294.303	0.098
1700.000	0.583	296.498	1699.925	4.415	-10.121	4.415	11.042	293.570	0.241
1800.000	0.827	291.818	1799.918	4.911	-11.247	4.911	12.272	293.589	0.251

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	0.936	293.496	1899.906	5.505	-12.666	5.505	13.810	293.491	0.112
2000.000	0.762	301.334	1999.895	6.176	-13.983	6.176	15.286	293.831	0.209
2100.000	0.913	294.586	2099.884	6.853	-15.275	6.853	16.742	294.164	0.180
2200.000	1.194	334.278	2199.868	8.124	-16.452	8.124	18.348	296.279	0.763
2300.000	1.100	302.556	2299.849	9.579	-17.713	9.579	20.137	298.404	0.634
2400.000	0.960	310.421	2399.833	10.639	-19.160	10.639	21.916	299.042	0.199
2500.000	1.426	327.163	2499.812	12.228	-20.473	12.228	23.846	300.848	0.577
2600.000	1.186	330.862	2599.786	14.177	-21.651	14.177	25.880	303.216	0.254
2700.000	0.952	288.791	2699.770	15.349	-22.942	15.349	27.603	303.783	0.798
2800.000	0.825	267.563	2799.758	15.586	-24.448	15.586	28.994	302.518	0.351
2900.000	0.406	248.317	2899.752	15.424	-25.497	15.424	29.799	301.172	0.461
3000.000	0.783	245.558	2999.746	15.011	-26.448	15.011	30.411	299.578	0.378
3100.000	0.481	246.330	3099.740	14.560	-27.454	14.560	31.076	297.939	0.302
3200.000	0.977	266.439	3199.732	14.339	-28.688	14.339	32.072	296.556	0.551
3300.000	0.867	249.746	3299.719	14.024	-30.248	14.024	33.341	294.874	0.289
3400.000	0.953	269.430	3399.707	13.754	-31.789	13.754	34.637	293.396	0.322
3500.000	1.042	264.809	3499.692	13.663	-33.526	13.663	36.203	292.173	0.120
3600.000	0.956	266.447	3599.676	13.529	-35.264	13.529	37.770	290.990	0.091
3700.000	0.822	255.904	3699.664	13.303	-36.792	13.303	39.123	289.878	0.211
3800.000	0.679	260.786	3799.656	13.033	-38.073	13.033	40.242	288.897	0.157
3900.000	0.701	272.358	3899.649	12.964	-39.269	12.964	41.354	288.269	0.141
4000.000	0.257	341.770	3999.645	13.202	-39.951	13.202	42.076	288.286	0.657
4100.000	0.488	333.101	4099.643	13.795	-40.214	13.795	42.514	288.934	0.238
4200.000	0.886	18.873	4199.637	14.906	-40.157	14.906	42.834	290.365	0.648
4300.000	0.840	25.696	4299.625	16.298	-39.589	16.298	42.813	292.376	0.113
4400.000	0.712	349.196	4399.617	17.568	-39.388	17.568	43.128	294.039	0.501
4500.000	0.896	18.844	4499.607	18.919	-39.252	18.919	43.573	295.733	0.448
4600.000	1.064	52.855	4599.593	20.220	-38.259	20.220	43.273	297.856	0.595
4700.000	0.814	23.253	4699.580	21.433	-37.238	21.433	42.966	299.923	0.537
4800.000	0.662	58.304	4799.573	22.388	-36.467	22.388	42.791	301.547	0.467
4900.000	0.215	121.513	4899.570	22.593	-35.815	22.593	42.346	302.245	0.596
5000.000	0.285	210.280	4999.569	22.280	-35.780	22.280	42.150	301.910	0.354
5100.000	0.446	208.272	5099.567	21.723	-36.090	21.723	42.123	301.044	0.161
5200.000	0.536	241.659	5199.564	21.158	-36.685	21.158	42.350	299.974	0.295
5300.000	0.528	227.127	5299.559	20.623	-37.435	20.623	42.739	298.850	0.135
5400.000	0.895	243.914	5399.552	19.966	-38.475	19.966	43.346	297.426	0.418
5500.000	0.514	275.564	5499.544	19.665	-39.623	19.665	44.234	296.396	0.531
5600.000	0.795	290.477	5599.538	19.952	-40.719	19.952	45.344	296.104	0.326
5700.000	0.419	284.268	5699.532	20.284	-41.723	20.284	46.393	295.927	0.381
5800.000	0.361	295.935	5799.529	20.512	-42.361	20.512	47.066	295.837	0.098

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	0.479	254.345	5899.527	20.537	-43.047	20.537	47.695	295.506	0.318
6000.000	0.444	239.419	5999.524	20.228	-43.782	20.228	48.229	294.797	0.125
6100.000	0.490	288.903	6099.521	20.169	-44.520	20.169	48.875	294.372	0.393
6200.000	0.498	225.572	6199.518	20.003	-45.235	20.003	49.460	293.856	0.519
6300.000	0.427	306.784	6299.515	19.922	-45.843	19.922	49.985	293.488	0.604
6400.000	0.329	306.605	6399.513	20.316	-46.372	20.316	50.627	293.659	0.097
6500.000	0.286	357.582	6499.512	20.737	-46.613	20.737	51.018	293.983	0.268
6600.000	0.170	355.614	6599.511	21.134	-46.635	21.134	51.200	294.378	0.116
6700.000	0.583	84.647	6699.509	21.329	-46.140	21.329	50.831	294.809	0.605
6800.000	0.607	124.069	6799.504	21.080	-45.194	21.080	49.869	295.005	0.402
6900.000	0.598	77.435	6899.499	20.897	-44.247	20.897	48.933	295.280	0.477
7000.000	0.680	73.719	6999.493	21.177	-43.168	21.177	48.082	296.131	0.091
7100.000	0.279	123.147	7099.490	21.209	-42.395	21.209	47.404	296.578	0.541