



Company/Rig: Noble Energy Inc/Production
 WELL/API#: Schmier B 32-32/05-123-29039
 DECLINATION: 8.22 Degrees
 TD AS DRILLED: 7193'
 COUNTY/STATE: Weld/Colorado
 VS-Azi: 0.000 Degrees
 Latitude: 40.35575, Longitude: -104.58242
 Grid North = True North -0.59 degs (NAD 27)
 Grid Correction Applied = -0.59 degs



DEPTH REFERENCE : RKB=GL/Elevation=4770'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 6/16/2016 / 08:15

Lat/Long Obtained By Handheld GPS at Wellhead

North Reference: Grid

Denver, Colorado

303-853-4976

Surveyor: Jason Kinchelow / Schmier B 32-32

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	0.234	21.640	100.000	0.190	0.075	0.190	0.204	21.640	0.234
200.000	0.269	38.025	199.999	0.564	0.295	0.564	0.636	27.606	0.080
300.000	0.449	2.658	299.997	1.140	0.458	1.140	1.229	21.866	0.278
400.000	0.287	33.150	399.995	1.742	0.613	1.742	1.846	19.386	0.249
500.000	0.306	13.109	499.994	2.211	0.810	2.211	2.355	20.127	0.105
600.000	0.156	304.445	599.993	2.548	0.758	2.548	2.659	16.573	0.288
700.000	0.313	182.842	699.992	2.352	0.632	2.352	2.436	15.042	0.417
800.000	0.345	187.124	799.991	1.781	0.581	1.781	1.873	18.080	0.041
900.000	0.812	225.534	899.986	0.985	0.039	0.985	0.986	2.238	0.582
1000.000	1.032	217.849	999.973	-0.222	-1.020	-0.222	1.043	257.722	0.253
1100.000	1.008	221.055	1099.957	-1.597	-2.150	-1.597	2.678	233.402	0.062
1200.000	1.097	232.482	1199.940	-2.843	-3.488	-2.843	4.500	230.810	0.228
1300.000	1.139	233.514	1299.921	-4.017	-5.046	-4.017	6.450	231.475	0.046
1400.000	1.095	226.552	1399.902	-5.265	-6.539	-5.265	8.395	231.156	0.143
1500.000	1.091	228.224	1499.884	-6.556	-7.942	-6.556	10.298	230.459	0.032
1600.000	0.737	247.888	1599.871	-7.432	-9.247	-7.432	11.864	231.210	0.468
1700.000	0.472	300.460	1699.866	-7.466	-10.198	-7.466	12.639	233.793	0.586
1800.000	0.140	248.446	1799.865	-7.302	-10.666	-7.302	12.926	235.605	0.401

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	0.580	224.234	1899.863	-7.710	-11.133	-7.710	13.542	235.297	0.457
2000.000	0.729	207.954	1999.856	-8.634	-11.785	-8.634	14.609	233.770	0.237
2100.000	1.272	174.246	2099.841	-10.301	-11.971	-10.301	15.793	229.290	0.779
2200.000	1.565	161.818	2199.811	-12.703	-11.434	-12.703	17.091	221.991	0.423
2300.000	1.711	159.789	2299.770	-15.401	-10.492	-15.401	18.636	214.264	0.157
2400.000	1.657	155.556	2399.727	-18.118	-9.378	-18.118	20.401	207.367	0.136
2500.000	1.821	170.965	2499.681	-21.003	-8.531	-21.003	22.669	202.105	0.494
2600.000	1.514	184.777	2599.639	-23.888	-8.391	-23.888	25.319	199.355	0.504
2700.000	1.151	208.632	2699.613	-26.085	-8.983	-26.085	27.589	199.001	0.655
2800.000	1.264	213.615	2799.591	-27.886	-10.075	-27.886	29.650	199.864	0.154
2900.000	1.238	217.311	2899.567	-29.664	-11.340	-29.664	31.757	200.921	0.085
3000.000	1.126	230.364	2999.546	-31.150	-12.751	-31.150	33.659	202.262	0.291
3100.000	1.297	227.214	3099.523	-32.545	-14.338	-32.545	35.563	203.777	0.184
3200.000	1.115	226.742	3199.501	-33.980	-15.877	-33.980	37.507	205.045	0.183
3300.000	0.982	223.740	3299.484	-35.266	-17.179	-35.266	39.228	205.971	0.143
3400.000	0.918	223.945	3399.471	-36.462	-18.327	-36.462	40.809	206.685	0.065
3500.000	1.119	259.538	3499.456	-37.216	-19.843	-37.216	42.175	208.066	0.651
3600.000	2.004	273.346	3599.418	-37.291	-22.549	-37.291	43.578	211.160	0.956
3700.000	1.789	274.110	3699.363	-37.077	-25.852	-37.077	45.200	214.886	0.217
3800.000	1.898	266.105	3799.311	-37.078	-29.061	-37.078	47.109	218.089	0.279
3900.000	1.964	263.774	3899.255	-37.376	-32.416	-37.376	49.475	220.935	0.103
4000.000	1.815	269.010	3999.200	-37.589	-35.703	-37.589	51.843	223.526	0.228
4100.000	1.542	281.777	4099.158	-37.342	-38.603	-37.342	53.709	225.951	0.461
4200.000	1.417	299.048	4199.125	-36.467	-41.001	-36.467	54.872	228.350	0.461
4300.000	1.053	321.606	4299.102	-35.147	-42.653	-35.147	55.268	230.511	0.601
4400.000	0.816	309.686	4399.089	-33.972	-43.771	-33.972	55.408	232.184	0.305
4500.000	0.768	272.340	4499.080	-33.490	-44.988	-33.490	56.085	233.335	0.509
4600.000	1.284	292.382	4599.064	-33.037	-46.693	-33.037	57.199	234.720	0.621
4700.000	1.835	318.008	4699.028	-31.420	-48.800	-31.420	58.040	237.224	0.876
4800.000	1.543	323.874	4798.984	-29.143	-50.665	-29.143	58.448	240.092	0.338
4900.000	1.273	306.566	4898.954	-27.393	-52.351	-27.393	59.085	242.378	0.501
5000.000	1.284	295.607	4998.930	-26.247	-54.254	-26.247	60.269	244.183	0.244
5100.000	1.424	293.374	5098.902	-25.270	-56.405	-25.270	61.807	245.867	0.149
5200.000	1.271	301.851	5198.874	-24.192	-58.487	-24.192	63.293	247.529	0.251
5300.000	1.619	312.408	5298.842	-22.654	-60.472	-22.654	64.576	249.463	0.437
5400.000	2.135	313.108	5398.788	-20.429	-62.875	-20.429	66.110	252.001	0.516
5500.000	1.944	314.356	5498.725	-17.970	-65.447	-17.970	67.870	254.646	0.196
5600.000	1.458	301.340	5598.681	-16.123	-67.747	-16.123	69.639	256.614	0.618
5700.000	1.815	295.327	5698.640	-14.783	-70.265	-14.783	71.804	258.119	0.396
5800.000	3.245	319.004	5798.542	-11.970	-73.554	-11.970	74.521	260.757	1.742

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	2.644	312.019	5898.410	-8.289	-77.124	-8.289	77.568	263.865	0.698
6000.000	1.817	301.348	5998.334	-5.921	-80.191	-5.921	80.410	265.777	0.923
6100.000	1.450	303.974	6098.293	-4.389	-82.594	-4.389	82.711	266.958	0.374
6200.000	1.465	307.763	6198.261	-2.899	-84.654	-2.899	84.704	268.039	0.098
6300.000	1.991	306.617	6298.215	-1.080	-87.059	-1.080	87.066	269.289	0.527
6400.000	2.291	328.288	6398.147	1.657	-89.505	1.657	89.520	271.061	0.857
6500.000	1.623	331.259	6498.088	4.599	-91.236	4.599	91.352	272.886	0.676
6600.000	0.748	339.977	6598.066	6.453	-92.141	6.453	92.366	274.006	0.891
6700.000	0.764	37.384	6698.058	7.597	-91.959	7.597	92.272	274.722	0.726
6800.000	0.613	95.188	6798.052	8.078	-91.021	8.078	91.379	275.072	0.679
6900.000	0.607	94.355	6898.047	7.990	-89.961	7.990	90.315	275.075	0.011