



Company/Rig: Noble Energy Inc/Production
WELL/API#: Brown Davee 3-34/05-123-12650
DECLINATION: 8.22 Degrees
TD AS DRILLED: 7328'
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.45082, Longitude: -104.76160
Grid North = True North -0.48 degs (NAD 27)
Grid Correction Applied = -0.48 degs



DEPTH REFERENCE : RKB=GL/Elevation= 4689'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 6/12/2017 / 10:36

Lat/Long Obtained By Handheld GPS at Wellhead

North Reference: Grid

Denver, Colorado

303-853-4976

Surveyor: Jason Kinchelow / Brown Davee 3-34

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	0.349	92.404	99.999	-0.013	0.304	-0.013	0.304	92.404	0.349
200.000	0.385	88.944	199.997	-0.019	0.944	-0.019	0.944	91.173	0.043
300.000	0.245	86.197	299.996	0.001	1.493	0.001	1.493	89.959	0.140
400.000	0.305	46.084	399.995	0.200	1.899	0.200	1.909	83.988	0.197
500.000	0.482	94.787	499.993	0.350	2.510	0.350	2.534	82.070	0.362
600.000	0.273	85.987	599.990	0.331	3.167	0.331	3.184	84.030	0.216
700.000	0.299	89.226	699.989	0.351	3.665	0.351	3.682	84.524	0.031
800.000	0.545	55.965	799.986	0.621	4.321	0.621	4.365	81.817	0.338
900.000	0.802	67.728	899.980	1.153	5.363	1.153	5.485	77.867	0.290
1000.000	0.742	54.225	999.971	1.797	6.536	1.797	6.778	74.628	0.191
1100.000	0.686	94.897	1099.963	2.124	7.658	2.124	7.947	74.494	0.499
1200.000	0.779	111.633	1199.955	1.823	8.886	1.823	9.071	78.407	0.232
1300.000	0.773	129.849	1299.946	1.140	10.035	1.140	10.099	83.517	0.246
1400.000	0.771	133.454	1399.937	0.245	11.041	0.245	11.044	88.727	0.049
1500.000	0.919	142.677	1499.926	-0.855	12.016	-0.855	12.046	94.072	0.201
1600.000	0.907	166.171	1599.914	-2.262	12.692	-2.262	12.891	100.104	0.372

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
1700.000	0.978	184.890	1699.901	-3.880	12.808	-3.880	13.383	106.854	0.314
1800.000	0.917	202.186	1799.887	-5.471	12.433	-5.471	13.584	113.751	0.291
1900.000	0.912	206.011	1899.875	-6.927	11.782	-6.927	13.667	120.451	0.061
2000.000	0.981	211.934	1999.861	-8.368	10.980	-8.368	13.806	127.311	0.120
2100.000	1.096	228.225	2099.845	-9.732	9.815	-9.732	13.821	134.757	0.315
2200.000	1.102	243.573	2199.827	-10.797	8.240	-10.797	13.582	142.649	0.294
2300.000	1.335	231.559	2299.804	-11.949	6.466	-11.949	13.587	151.582	0.345
2400.000	0.897	245.419	2399.785	-12.999	4.842	-12.999	13.872	159.572	0.512
2500.000	0.665	262.205	2499.776	-13.404	3.555	-13.404	13.867	165.146	0.323
2600.000	0.792	271.738	2599.768	-13.461	2.289	-13.461	13.655	170.350	0.175
2700.000	1.001	267.555	2699.755	-13.478	0.725	-13.478	13.497	176.920	0.219
2800.000	1.164	262.729	2799.737	-13.644	-1.155	-13.644	13.692	184.840	0.186
2900.000	0.941	277.252	2899.721	-13.668	-2.978	-13.668	13.989	192.290	0.346
3000.000	0.730	274.331	2999.710	-13.517	-4.428	-13.517	14.223	198.138	0.215
3100.000	0.894	275.937	3099.700	-13.388	-5.839	-13.388	14.606	203.564	0.165
3200.000	1.198	309.334	3199.684	-12.645	-7.423	-12.645	14.662	210.415	0.668
3300.000	1.274	346.262	3299.662	-10.902	-8.496	-10.902	13.821	217.928	0.786
3400.000	1.255	350.780	3399.638	-8.741	-8.935	-8.741	12.500	225.629	0.102
3500.000	1.188	356.494	3499.615	-6.625	-9.174	-6.625	11.316	234.164	0.139
3600.000	1.064	6.940	3599.596	-4.668	-9.125	-4.668	10.250	242.907	0.239
3700.000	1.099	12.528	3699.578	-2.810	-8.805	-2.810	9.242	252.299	0.111
3800.000	1.032	354.188	3799.561	-0.978	-8.688	-0.978	8.743	263.577	0.346
3900.000	1.182	345.472	3899.543	0.917	-9.038	0.917	9.085	275.793	0.225
4000.000	1.052	350.462	3999.524	2.821	-9.449	2.821	9.861	286.624	0.162
4100.000	1.146	331.972	4099.506	4.610	-10.071	4.610	11.076	294.593	0.365
4200.000	1.328	334.685	4199.482	6.539	-11.036	6.539	12.828	300.648	0.191
4300.000	1.020	332.772	4299.461	8.378	-11.939	8.378	14.586	305.060	0.310
4400.000	1.387	315.780	4399.439	10.037	-13.191	10.037	16.575	307.270	0.508
4500.000	1.185	295.018	4499.415	11.342	-14.972	11.342	18.783	307.147	0.504
4600.000	0.827	292.614	4599.399	12.057	-16.575	12.057	20.496	306.033	0.361
4700.000	0.984	250.414	4699.387	12.046	-18.050	12.046	21.701	303.719	0.668
4800.000	1.036	243.883	4799.372	11.361	-19.671	11.361	22.716	300.008	0.126
4900.000	0.784	264.671	4899.360	10.899	-21.164	10.899	23.805	297.247	0.412
5000.000	0.746	212.220	4999.352	10.284	-22.192	10.284	24.460	294.864	0.677
5100.000	0.391	317.703	5099.349	9.986	-22.769	9.986	24.863	293.681	0.931
5200.000	0.188	33.380	5199.348	10.376	-22.909	10.376	25.149	294.367	0.390
5300.000	0.665	39.531	5299.344	10.961	-22.449	10.961	24.982	296.025	0.478
5400.000	1.163	55.091	5399.332	11.990	-21.247	11.990	24.396	299.436	0.552
5500.000	1.599	49.526	5499.302	13.476	-19.353	13.476	23.583	304.850	0.456

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
5600.000	2.123	33.016	5599.250	15.935	-17.283	15.935	23.508	312.676	0.745
5700.000	1.302	47.334	5699.205	18.258	-15.438	18.258	23.910	319.783	0.919
5800.000	0.481	80.888	5799.192	19.094	-14.188	19.094	23.789	323.385	0.940
5900.000	0.477	95.187	5899.189	19.123	-13.359	19.123	23.327	325.062	0.119
6000.000	0.330	34.574	5999.187	19.323	-12.781	19.323	23.167	326.517	0.427
6100.000	0.335	7.790	6099.185	19.850	-12.578	19.850	23.500	327.639	0.154
6200.000	0.545	41.499	6199.182	20.496	-12.223	20.496	23.864	329.190	0.325
6300.000	0.301	154.145	6299.181	20.616	-11.793	20.616	23.751	330.228	0.717
6400.000	0.260	277.358	6399.180	20.409	-11.904	20.409	23.627	329.747	0.493
6500.000	0.457	213.410	6499.179	20.105	-12.348	20.105	23.594	328.442	0.415
6600.000	0.350	248.736	6599.176	19.661	-12.852	19.661	23.489	326.827	0.265
6700.000	0.716	192.694	6699.172	18.941	-13.274	18.941	23.129	324.976	0.596
6800.000	0.732	219.565	6799.165	17.838	-13.819	17.838	22.565	322.236	0.337
6900.000	0.718	222.220	6899.157	16.881	-14.647	16.881	22.350	319.053	0.036
7000.000	0.897	208.620	6999.147	15.730	-15.443	15.730	22.044	315.527	0.261
7100.000	0.594	170.424	7099.139	14.532	-15.732	14.532	21.416	312.729	0.565