



Company: NOBLE ENERGY  
 Well: BASHOR STATE AA 16-10  
 API: 05-123-29263  
 Rig Name: PRODUCTION/LIGHTNING  
 State/County: COLORADO/WELD  
 Latitude: 40.485, Longitude: -104.440  
 GRID North is 0.680 Degrees East of True North  
 VS-Azi: 0.000 Degrees



# **FIELD COPY ONLY (NOT DEFINITIVE)**

Depth Reference : RKB=GOUND LEVEL

## **DRILLOG MS GYRO SURVEY CALCULATIONS**

Filename: msgyro\_run01-02-de\_01.ut

Minimum Curvature Method

Report Date/Time: 10/27/2012 / 16:16

VAUGHN ENERGY SERVICES

HENDERSON, COLORADO

866-835-8333

Nick Kula

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	0.230	288.379	100.000	0.063	-0.191	0.063	0.201	288.379	0.230
200.000	0.300	202.869	199.999	-0.115	-0.483	-0.115	0.497	256.636	0.364
300.000	0.057	181.451	299.998	-0.406	-0.586	-0.406	0.713	235.296	0.248
400.000	0.181	284.429	399.998	-0.417	-0.741	-0.417	0.850	240.652	0.202
500.000	0.569	342.990	499.996	0.098	-1.039	0.098	1.044	275.368	0.499
600.000	0.552	276.023	599.992	0.623	-1.664	0.623	1.776	290.530	0.619
700.000	0.705	314.408	699.987	1.104	-2.582	1.104	2.808	293.147	0.438
800.000	0.275	7.167	799.983	1.773	-2.991	1.773	3.477	300.649	0.581
900.000	0.245	269.540	899.983	2.009	-3.176	2.009	3.758	302.322	0.392
1000.000	0.218	335.228	999.982	2.180	-3.469	2.180	4.097	302.146	0.252
1100.000	0.463	351.786	1099.980	2.753	-3.607	2.753	4.537	307.354	0.262
1200.000	0.271	308.043	1199.978	3.299	-3.851	3.299	5.071	310.586	0.327
1300.000	0.337	313.884	1299.977	3.649	-4.249	3.649	5.601	310.652	0.073
1400.000	0.345	350.215	1399.975	4.150	-4.513	4.150	6.131	312.601	0.213
1500.000	0.365	328.324	1499.973	4.718	-4.731	4.718	6.682	314.918	0.136
1600.000	0.552	358.287	1599.970	5.471	-4.913	5.471	7.353	318.074	0.298
1700.000	0.492	8.980	1699.966	6.376	-4.861	6.376	8.018	322.682	0.114
1800.000	0.746	28.988	1799.960	7.370	-4.478	7.370	8.623	328.715	0.330
1900.000	0.891	25.025	1899.950	8.643	-3.834	8.643	9.455	336.079	0.155
2000.000	1.608	29.904	1999.926	10.564	-2.806	10.564	10.930	345.126	0.724
2100.000	1.531	76.220	2099.892	12.098	-0.809	12.098	12.125	356.174	1.236
2200.000	1.190	90.622	2199.864	12.405	1.527	12.405	12.498	7.015	0.480
2300.000	1.145	91.044	2299.843	12.375	3.564	12.375	12.878	16.066	0.046
2400.000	1.153	72.418	2399.823	12.661	5.522	12.661	13.813	23.564	0.372
2500.000	1.214	118.716	2499.804	12.456	7.410	12.456	14.493	30.749	0.932
2600.000	0.761	99.248	2599.789	11.840	8.995	11.840	14.869	37.225	0.558
2700.000	0.964	122.210	2699.778	11.285	10.362	11.285	15.321	42.560	0.396
2800.000	1.067	133.812	2799.763	10.192	11.746	10.192	15.551	49.051	0.230
2900.000	0.944	89.660	2899.749	9.552	13.241	9.552	16.327	54.194	0.764
3000.000	0.883	107.384	2999.736	9.327	14.800	9.327	17.494	57.782	0.288
3100.000	0.910	86.159	3099.724	9.150	16.328	9.150	18.717	60.735	0.331
3200.000	1.620	98.953	3199.699	8.983	18.517	8.983	20.581	64.121	0.760
3300.000	2.121	86.886	3299.646	8.863	21.761	8.863	23.497	67.839	0.634

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
3400.000	2.140	108.705	3399.579	8.365	25.377	8.365	26.721	71.756	0.806
3500.000	2.337	98.108	3499.503	7.479	29.165	7.479	30.108	75.618	0.458
3600.000	2.298	78.489	3599.423	7.591	33.148	7.591	34.006	77.101	0.791
3700.000	2.130	75.290	3699.348	8.463	36.910	8.463	37.868	77.086	0.208
3800.000	2.067	93.929	3799.282	8.811	40.507	8.811	41.454	77.728	0.682
3900.000	1.596	107.891	3899.231	8.260	43.631	8.260	44.406	79.280	0.645
4000.000	1.224	140.291	3999.202	7.010	45.639	7.010	46.175	81.267	0.864
4100.000	1.550	179.828	4099.175	4.836	46.326	4.836	46.578	84.040	0.987
4200.000	1.789	208.082	4199.134	2.106	45.595	2.106	45.643	87.355	0.847
4300.000	1.641	229.368	4299.090	-0.204	43.773	-0.204	43.774	90.267	0.650
4400.000	1.099	212.147	4399.062	-1.947	42.177	-1.947	42.222	92.644	0.675
4500.000	0.851	236.446	4499.048	-3.170	41.048	-3.170	41.170	94.416	0.476
4600.000	1.125	240.073	4599.033	-4.070	39.578	-4.070	39.786	95.872	0.281
4700.000	1.659	263.144	4699.004	-4.733	37.290	-4.733	37.589	97.233	0.764
4800.000	1.313	284.047	4798.970	-4.628	34.741	-4.628	35.048	97.587	0.637
4900.000	1.535	306.602	4898.940	-3.551	32.554	-3.551	32.747	96.225	0.598
5000.000	1.108	310.786	4998.914	-2.121	30.747	-2.121	30.820	93.946	0.438
5100.000	1.285	311.360	5098.892	-0.748	29.174	-0.748	29.183	91.469	0.178
5200.000	0.823	308.256	5198.874	0.438	27.767	0.438	27.771	89.097	0.465
5300.000	0.526	8.264	5298.869	1.337	27.269	1.337	27.302	87.193	0.722
5400.000	0.553	330.258	5398.864	2.210	27.096	2.210	27.186	85.336	0.352
5500.000	0.553	359.127	5498.860	3.112	26.849	3.112	27.029	83.388	0.276
5600.000	0.498	1.076	5598.856	4.029	26.850	4.029	27.151	81.466	0.059
5700.000	0.868	21.263	5698.849	5.169	27.133	5.169	27.621	79.213	0.436
5800.000	0.961	3.616	5798.836	6.713	27.461	6.713	28.269	76.264	0.295
5900.000	1.048	24.331	5898.821	8.383	27.890	8.383	29.123	73.271	0.371
6000.000	1.179	344.056	5998.804	10.205	27.985	10.205	29.787	69.964	0.776
6100.000	1.231	357.480	6098.782	12.267	27.655	12.267	30.254	66.079	0.286
6200.000	1.180	336.865	6198.760	14.286	27.203	14.286	30.727	62.293	0.434
6300.000	0.593	16.697	6298.748	15.729	26.948	15.729	31.202	59.728	0.818
6400.000	0.584	37.057	6398.743	16.632	27.404	16.632	32.056	58.745	0.208
6500.000	0.744	52.972	6498.737	17.429	28.229	17.429	33.176	58.307	0.243
6600.000	0.495	27.408	6598.731	18.204	28.946	18.204	34.194	57.834	0.366
6700.000	0.354	50.123	6698.728	18.786	29.382	18.786	34.874	57.407	0.217
HORIZONTAL DISPLACEMENT IS 34.874 FEET AT 57.407 DEGREES									