

Company: NOBLE ENERGY

Well: OCOMA C17-16

API: 05-123-13771

Rig Name: PRODUCTION/LIGHTNING

State/County: COLORADO/WELD

Latitude: 40.307, Longitude: -104.567

GRID North is 0.600 Degrees East of True North

VS-Azi: 0.000 Degrees



**FIELD COPY ONLY (NOT DEFINITIVE)**

Depth Reference : RKB = GROUND LEVEL

**DRILLOG MS GYRO SURVEY CALCULATIONS**

Filename: msgyro\_run02-01-de\_01.ut

Minimum Curvature Method

Report Date/Time: 11/13/2012 / 18:26

VAUGHN ENERGY SERVICES

HENDERSON, COLORADO

866-835-8333

NICK KULA

DEPTH REFERENCE=GROUND LEVEL

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	0.484	68.557	99.999	0.154	0.393	0.154	0.422	68.557	0.484
200.000	0.303	55.481	199.996	0.459	1.004	0.459	1.104	65.447	0.201
300.000	0.155	69.608	299.996	0.656	1.349	0.656	1.500	64.071	0.158
400.000	0.288	147.099	399.995	0.492	1.612	0.492	1.685	73.021	0.296
500.000	0.270	148.782	499.994	0.080	1.870	0.080	1.872	87.554	0.019
600.000	0.260	151.953	599.993	-0.322	2.099	-0.322	2.124	98.720	0.018
700.000	0.256	148.945	699.992	-0.714	2.321	-0.714	2.429	107.098	0.014
800.000	0.208	143.465	799.991	-1.051	2.545	-1.051	2.753	112.450	0.053
900.000	0.161	131.332	899.990	-1.290	2.758	-1.290	3.045	115.062	0.061
1000.000	0.088	117.558	999.990	-1.418	2.931	-1.418	3.256	115.811	0.078
1100.000	0.179	99.147	1099.990	-1.478	3.152	-1.478	3.482	115.114	0.099
1200.000	0.339	77.335	1199.989	-1.438	3.595	-1.438	3.872	111.798	0.185
1300.000	0.225	14.741	1299.988	-1.183	3.933	-1.183	4.107	106.741	0.309
1400.000	0.212	327.775	1399.987	-0.837	3.885	-0.837	3.974	102.161	0.174
1500.000	0.126	320.115	1499.987	-0.596	3.715	-0.596	3.763	99.118	0.088
1600.000	0.100	163.581	1599.987	-0.596	3.669	-0.596	3.717	99.219	0.222
1700.000	0.383	309.031	1699.986	-0.469	3.435	-0.469	3.466	97.775	0.469
1800.000	0.918	345.163	1799.980	0.516	2.970	0.516	3.014	80.151	0.649
1900.000	1.239	7.318	1899.962	2.362	2.903	2.362	3.742	50.857	0.521
2000.000	1.347	12.181	1999.937	4.584	3.288	4.584	5.641	35.654	0.153
2100.000	1.177	25.221	2099.913	6.662	3.974	6.662	7.757	30.817	0.332
2200.000	1.131	28.756	2199.892	8.457	4.887	8.457	9.767	30.021	0.085
2300.000	1.093	38.425	2299.874	10.069	5.954	10.069	11.698	30.597	0.191
2400.000	0.846	50.940	2399.859	11.282	7.120	11.282	13.341	32.258	0.324
2500.000	0.532	58.292	2499.852	11.991	8.089	11.991	14.464	34.003	0.325
2600.000	0.546	63.224	2599.848	12.450	8.910	12.450	15.310	35.589	0.048
2700.000	0.572	77.204	2699.843	12.776	9.823	12.776	16.115	37.555	0.139
2800.000	0.534	61.371	2799.838	13.110	10.719	13.110	16.934	39.271	0.157
2900.000	0.761	94.246	2899.832	13.284	11.790	13.284	17.762	41.591	0.426
3000.000	0.768	94.671	2999.823	13.180	13.120	13.180	18.597	44.870	0.009
3100.000	0.838	109.992	3099.813	12.876	14.476	12.876	19.373	48.348	0.225
3200.000	1.112	146.522	3199.800	11.816	15.698	11.816	19.648	53.029	0.664

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
3300.000	0.750	117.687	3299.787	10.703	16.812	10.703	19.930	57.518	0.581
3400.000	1.143	165.612	3399.775	9.433	17.639	9.433	20.003	61.862	0.848
3500.000	1.036	146.829	3499.757	7.711	18.382	7.711	19.934	67.243	0.371
3600.000	0.747	159.135	3599.745	6.345	19.109	6.345	20.134	71.631	0.345
3700.000	0.860	163.619	3699.735	5.017	19.552	5.017	20.185	75.609	0.129
3800.000	0.808	169.407	3799.724	3.604	19.893	3.604	20.217	79.731	0.099
3900.000	0.626	186.318	3899.717	2.368	19.963	2.368	20.103	83.234	0.277
4000.000	0.501	245.671	3999.712	1.645	19.504	1.645	19.574	85.178	0.568
4100.000	0.877	292.983	4099.706	1.764	18.402	1.764	18.486	84.524	0.651
4200.000	0.738	320.068	4199.696	2.557	17.284	2.557	17.472	81.586	0.402
4300.000	1.672	325.793	4299.673	4.257	16.050	4.257	16.605	75.145	0.941
4400.000	1.861	330.242	4399.625	6.874	14.424	6.874	15.978	64.520	0.233
4500.000	1.848	330.696	4499.573	9.690	12.829	9.690	16.077	52.935	0.020
4600.000	1.510	324.667	4599.530	12.171	11.277	12.171	16.592	42.818	0.381
4700.000	1.678	319.380	4699.491	14.357	9.562	14.357	17.250	33.665	0.223
4800.000	1.802	302.842	4799.446	16.321	7.289	16.321	17.874	24.065	0.515
4900.000	2.071	293.739	4899.389	17.901	4.314	17.901	18.413	13.548	0.408
5000.000	2.126	303.158	4999.322	19.642	1.107	19.642	19.674	3.226	0.349
5100.000	2.060	297.279	5099.256	21.481	-2.043	21.481	21.577	354.567	0.224
5200.000	1.876	300.773	5199.197	23.142	-5.047	23.142	23.686	347.696	0.220
5300.000	1.886	301.965	5299.143	24.851	-7.850	24.851	26.061	342.470	0.040
5400.000	1.677	318.044	5399.095	26.809	-10.223	26.809	28.693	339.126	0.539
5500.000	1.518	320.363	5499.056	28.918	-12.047	28.918	31.326	337.384	0.171
5600.000	1.633	320.394	5599.018	31.036	-13.800	31.036	33.966	336.027	0.115
5700.000	1.080	320.041	5698.990	32.856	-15.314	32.856	36.250	335.010	0.554
5800.000	1.328	325.072	5798.968	34.528	-16.583	34.528	38.304	334.347	0.269
5900.000	0.875	334.539	5898.949	36.168	-17.574	36.168	40.211	334.085	0.486
6000.000	1.411	359.902	5998.929	38.088	-17.905	38.088	42.087	334.823	0.724
6100.000	1.705	1.905	6098.892	40.806	-17.857	40.806	44.542	336.365	0.300
6200.000	1.853	7.341	6198.844	43.897	-17.601	43.897	47.294	338.151	0.224
6300.000	1.843	5.573	6298.792	47.101	-17.238	47.101	50.156	339.898	0.058
6400.000	2.197	6.880	6398.730	50.605	-16.853	50.605	53.337	341.581	0.357
6500.000	2.362	12.255	6498.651	54.521	-16.186	54.521	56.873	343.465	0.270
6600.000	2.783	20.608	6598.550	58.807	-14.894	58.807	60.664	345.788	0.563
6700.000	3.371	17.242	6698.406	63.887	-13.168	63.887	65.230	348.354	0.614
6800.000	3.496	31.596	6798.228	69.291	-10.699	69.291	70.113	351.222	0.866

HORIZONTAL DISPLACEMENT IS  
70.113 FEET AT 351.222 DEGREES