



Company/Rig: NOBLE ENERGY/ CORETECH  
WELL/API#: STARMAN USX A 17-16/05-123-29570  
DECLINATION: 8.25 Degrees  
TD AS DRILLED: 7,190 FEET  
COUNTY/STATE: WELD/COLORADO  
VS-Azi: 0.000 Degrees  
Latitude: 40.48002, Longitude: -104.56629  
Grid North = True North -0.60 degs (NAD 27)  
Grid Correction Applied = -0.60 degs



DEPTH REFERENCE : RKB=SURFACE ELEVATION=4,784 FEET

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro\_run01-01-de\_01.ut

Minimum Curvature Method

Report Date/Time: 1/25/2016 / 15:00

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: LEVI SHELTON / Starman USX A 17-16

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	0.206	67.047	100.000	0.070	0.165	0.070	0.180	67.047	0.206
200.000	0.237	100.445	199.999	0.103	0.534	0.103	0.544	79.124	0.131
300.000	0.190	66.513	299.998	0.131	0.889	0.131	0.899	81.609	0.132
400.000	0.232	106.428	399.998	0.140	1.236	0.140	1.244	83.544	0.150
500.000	0.507	159.860	499.996	-0.333	1.583	-0.333	1.617	101.880	0.413
600.000	0.722	193.486	599.990	-1.361	1.588	-1.361	2.092	130.604	0.411
700.000	0.675	190.563	699.983	-2.554	1.333	-2.554	2.881	152.435	0.059
800.000	0.721	175.556	799.976	-3.760	1.274	-3.760	3.970	161.286	0.188
900.000	0.837	167.375	899.966	-5.100	1.482	-5.100	5.311	163.795	0.161
1000.000	0.810	168.540	999.956	-6.506	1.782	-6.506	6.746	164.679	0.032
1100.000	0.578	157.559	1099.949	-7.665	2.115	-7.665	7.952	164.571	0.266
1200.000	0.422	149.477	1199.945	-8.449	2.495	-8.449	8.810	163.547	0.171
1300.000	0.460	151.813	1299.942	-9.120	2.872	-9.120	9.561	162.521	0.042
1400.000	0.391	143.852	1399.939	-9.749	3.263	-9.749	10.281	161.497	0.090
1500.000	0.331	154.242	1499.937	-10.285	3.590	-10.285	10.894	160.760	0.089
1600.000	0.317	191.231	1599.936	-10.817	3.661	-10.817	11.420	161.300	0.206
1700.000	0.368	224.429	1699.934	-11.318	3.383	-11.318	11.812	163.360	0.202
1800.000	0.563	233.465	1799.931	-11.839	2.763	-11.839	12.158	166.862	0.208

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	0.989	235.696	1899.921	-12.618	1.656	-12.618	12.726	172.524	0.427
2000.000	1.610	241.687	1999.895	-13.771	-0.294	-13.771	13.774	181.224	0.635
2100.000	1.682	239.305	2099.854	-15.187	-2.793	-15.187	15.441	190.422	0.099
2200.000	2.079	239.729	2199.800	-16.850	-5.622	-16.850	17.764	198.452	0.398
2300.000	2.410	247.700	2299.723	-18.563	-9.134	-18.563	20.688	206.201	0.454
2400.000	2.296	252.183	2399.639	-19.973	-12.986	-19.973	23.824	213.031	0.216
2500.000	1.504	253.812	2499.583	-20.952	-16.154	-20.952	26.456	217.632	0.795
2600.000	1.245	260.927	2599.554	-21.489	-18.486	-21.489	28.346	220.704	0.310
2700.000	0.920	263.060	2699.536	-21.757	-20.356	-21.757	29.795	223.094	0.327
2800.000	0.765	280.033	2799.526	-21.738	-21.810	-21.738	30.793	225.095	0.292
2900.000	0.574	286.127	2899.519	-21.483	-22.948	-21.483	31.434	226.889	0.204
3000.000	0.865	286.687	2999.511	-21.127	-24.152	-21.127	32.089	228.823	0.292
3100.000	0.797	289.155	3099.500	-20.682	-25.532	-20.682	32.858	230.991	0.077
3200.000	0.627	250.209	3199.493	-20.639	-26.703	-20.639	33.750	232.299	0.501
3300.000	0.873	169.767	3299.487	-21.574	-27.083	-21.574	34.625	231.459	0.987
3400.000	1.624	145.666	3399.463	-23.494	-26.148	-23.494	35.153	228.060	0.900
3500.000	2.423	155.177	3499.400	-26.583	-24.462	-26.583	36.125	222.620	0.865
3600.000	3.057	164.662	3599.286	-31.073	-22.869	-31.073	38.581	216.352	0.777
3700.000	3.113	177.463	3699.142	-36.357	-22.043	-36.357	42.518	211.228	0.690
3800.000	2.887	180.282	3799.005	-41.589	-21.935	-41.589	47.019	207.809	0.270
3900.000	2.727	174.847	3898.885	-46.476	-21.734	-46.476	51.307	205.063	0.311
4000.000	2.535	176.983	3998.780	-51.053	-21.404	-51.053	55.358	202.746	0.216
4100.000	1.685	175.680	4098.711	-54.728	-21.177	-54.728	58.682	201.154	0.851
4200.000	1.164	192.398	4198.680	-57.186	-21.284	-57.186	61.018	200.415	0.662
4300.000	0.828	191.335	4298.665	-58.886	-21.644	-58.886	62.738	200.182	0.336
4400.000	0.368	190.269	4398.659	-59.910	-21.843	-59.910	63.768	200.032	0.460
4500.000	0.365	168.029	4498.657	-60.538	-21.835	-60.538	64.355	199.833	0.141
4600.000	0.318	147.346	4598.655	-61.083	-21.619	-61.083	64.796	199.490	0.131
4700.000	0.668	97.817	4698.652	-61.396	-20.892	-61.396	64.853	198.792	0.521
4800.000	1.538	95.697	4798.632	-61.609	-18.979	-61.609	64.466	197.122	0.871
4900.000	2.043	86.457	4898.584	-61.632	-15.865	-61.632	63.641	194.435	0.581
5000.000	2.473	97.411	4998.506	-61.800	-11.946	-61.800	62.944	190.940	0.608
5100.000	1.796	102.703	5098.436	-62.423	-8.277	-62.423	62.969	187.554	0.705
5200.000	1.400	98.978	5198.397	-62.958	-5.542	-62.958	63.201	185.031	0.409
5300.000	0.657	92.026	5298.380	-63.169	-3.763	-63.169	63.281	183.409	0.752
5400.000	0.172	17.045	5398.378	-63.045	-3.146	-63.045	63.124	182.857	0.634
5500.000	0.739	312.708	5498.375	-62.465	-3.576	-62.465	62.567	183.277	0.682
5600.000	0.523	307.215	5598.369	-61.752	-4.413	-61.752	61.909	184.088	0.224
5700.000	0.770	320.454	5698.362	-60.958	-5.204	-60.958	61.180	184.879	0.287
5800.000	0.946	321.717	5798.351	-59.792	-6.143	-59.792	60.107	185.866	0.178

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	0.975	328.056	5898.337	-58.422	-7.105	-58.422	58.852	186.934	0.110
6000.000	0.999	320.407	5998.322	-57.028	-8.111	-57.028	57.602	188.095	0.134
6100.000	1.290	342.378	6098.303	-55.283	-9.007	-55.283	56.012	189.254	0.521
6200.000	1.771	355.658	6198.267	-52.670	-9.465	-52.670	53.514	190.187	0.594
6300.000	2.007	346.490	6298.213	-49.427	-9.991	-49.427	50.426	191.428	0.383
6400.000	2.071	4.495	6398.150	-45.922	-10.258	-45.922	47.054	192.593	0.641
6500.000	0.651	94.054	6498.126	-44.160	-9.550	-44.160	45.181	192.203	2.166
6600.000	2.469	180.164	6598.093	-46.355	-8.990	-46.355	47.218	190.975	2.510
6700.000	3.115	189.093	6697.974	-51.191	-9.425	-51.191	52.052	190.432	0.777
6800.000	3.378	177.702	6797.815	-56.818	-9.737	-56.818	57.646	189.724	0.695
6900.000	3.563	164.182	6897.633	-62.752	-8.771	-62.752	63.362	187.957	0.837
6950.000	3.606	156.742	6947.535	-65.691	-7.727	-65.691	66.144	186.709	0.933