



Company/Rig: Noble Energy/CoreTech
WELL/API#: Achziger B5-16/05-123-13830
DECLINATION: 8.26 Degrees
TD AS DRILLED: 6963 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.42275, Longitude: -104.56655
Grid North = True North -0.60 degs (NAD 27)
Grid Correction Applied = -0.60 degs



DEPTH REFERENCE : RKB=GL Elevation=4609 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: survey-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 1/11/2016 / 14:33

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Geof Davis / Achziger B5-16

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	0.521	345.001	99.999	0.439	-0.118	0.439	0.455	345.001	0.521
200.000	0.331	345.157	199.996	1.158	-0.310	1.158	1.199	345.039	0.190
300.000	0.152	329.259	299.995	1.552	-0.452	1.552	1.616	343.778	0.190
400.000	0.038	18.248	399.995	1.698	-0.509	1.698	1.772	343.309	0.131
500.000	0.108	9.085	499.995	1.822	-0.484	1.822	1.885	345.130	0.070
600.000	0.123	30.257	599.994	2.008	-0.415	2.008	2.050	348.329	0.045
700.000	0.003	319.086	699.994	2.103	-0.362	2.103	2.134	350.224	0.122
800.000	0.133	328.193	799.994	2.203	-0.425	2.203	2.244	349.080	0.130
900.000	0.145	275.522	899.994	2.314	-0.612	2.314	2.393	345.183	0.124
1000.000	0.268	246.203	999.993	2.232	-0.952	2.232	2.426	336.903	0.158
1100.000	0.282	243.166	1099.992	2.026	-1.385	2.026	2.455	325.647	0.020
1200.000	0.266	251.959	1199.991	1.844	-1.825	1.844	2.594	315.288	0.045
1300.000	0.320	238.429	1299.990	1.626	-2.283	1.626	2.803	305.451	0.087
1400.000	0.245	249.489	1399.989	1.405	-2.721	1.405	3.062	297.309	0.092
1500.000	0.126	236.417	1499.988	1.269	-3.012	1.269	3.269	292.853	0.125
1600.000	0.130	197.750	1599.988	1.101	-3.138	1.101	3.325	289.331	0.085
1700.000	0.125	253.482	1699.988	0.962	-3.277	0.962	3.415	286.360	0.119
1800.000	0.108	226.923	1799.987	0.867	-3.450	0.867	3.557	284.099	0.056

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	0.070	321.755	1899.987	0.850	-3.557	0.850	3.657	283.437	0.133
2000.000	0.122	329.803	1999.987	0.989	-3.648	0.989	3.779	285.173	0.054
2100.000	0.206	330.588	2099.987	1.237	-3.789	1.237	3.986	288.084	0.084
2200.000	0.211	324.868	2199.986	1.544	-3.983	1.544	4.272	291.187	0.021
2300.000	0.237	326.198	2299.985	1.866	-4.204	1.866	4.599	293.934	0.027
2400.000	0.207	330.859	2399.985	2.195	-4.406	2.195	4.923	296.479	0.035
2500.000	0.367	326.845	2499.983	2.621	-4.670	2.621	5.355	299.303	0.162
2600.000	0.351	332.958	2599.981	3.162	-4.984	3.162	5.902	302.389	0.042
2700.000	0.324	339.504	2699.980	3.699	-5.222	3.699	6.399	305.310	0.047
2800.000	0.148	349.279	2799.979	4.090	-5.345	4.090	6.731	307.427	0.179
2900.000	0.251	24.756	2899.978	4.417	-5.277	4.417	6.882	309.929	0.156
3000.000	0.294	72.999	2999.977	4.691	-4.940	4.691	6.812	313.523	0.226
3100.000	0.683	85.945	3099.973	4.809	-4.100	4.809	6.319	319.550	0.401
3200.000	0.849	97.623	3199.964	4.752	-2.771	4.752	5.501	329.755	0.227
3300.000	1.157	125.021	3299.950	4.075	-1.209	4.075	4.250	343.467	0.562
3400.000	1.869	136.528	3399.914	2.312	0.739	2.312	2.427	17.736	0.770
3500.000	2.250	136.240	3499.849	-0.289	3.219	-0.289	3.232	95.137	0.381
3600.000	2.377	139.177	3599.768	-3.276	5.932	-3.276	6.777	118.912	0.174
3700.000	2.546	140.027	3699.676	-6.548	8.715	-6.548	10.900	126.919	0.173
3800.000	2.641	138.805	3799.573	-9.983	11.659	-9.983	15.349	130.573	0.110
3900.000	2.247	133.991	3899.482	-13.078	14.586	-13.078	19.591	131.879	0.444
4000.000	1.389	133.278	3999.431	-15.270	16.879	-15.270	22.761	132.136	0.859
4100.000	1.206	133.013	4099.405	-16.819	18.530	-16.819	25.025	132.228	0.183
4200.000	0.374	120.116	4199.395	-17.700	19.582	-17.700	26.396	132.111	0.846
4300.000	0.431	106.268	4299.393	-17.969	20.225	-17.969	27.055	131.620	0.113
4400.000	0.410	109.484	4399.390	-18.194	20.924	-18.194	27.728	131.008	0.032
4500.000	0.554	306.438	4499.389	-18.026	20.872	-18.026	27.578	130.816	0.954
4600.000	0.839	334.118	4599.381	-17.080	20.163	-17.080	26.425	130.268	0.433
4700.000	1.108	337.564	4699.367	-15.528	19.475	-15.528	24.908	128.567	0.275
4800.000	1.011	354.180	4799.350	-13.757	19.016	-13.757	23.471	125.883	0.321
4900.000	1.127	3.409	4899.333	-11.897	18.985	-11.897	22.405	122.074	0.207
5000.000	1.215	354.125	4999.312	-9.861	18.935	-9.861	21.349	117.509	0.209
5100.000	1.328	335.654	5099.288	-7.750	18.349	-7.750	19.919	112.899	0.423
5200.000	1.681	326.201	5199.253	-5.475	17.055	-5.475	17.912	107.798	0.430
5300.000	1.939	318.168	5299.203	-2.995	15.110	-2.995	15.404	101.212	0.361
5400.000	2.512	326.565	5399.128	0.094	12.774	0.094	12.775	89.578	0.657
5500.000	2.145	328.197	5499.045	3.513	10.581	3.513	11.149	71.631	0.372
5600.000	1.797	330.097	5598.986	6.463	8.813	6.463	10.929	53.743	0.355
5700.000	1.331	345.194	5698.949	8.945	7.734	8.945	11.825	40.848	0.618
5800.000	0.720	332.231	5798.932	10.624	7.145	10.624	12.803	33.922	0.649

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	0.678	335.498	5898.925	11.718	6.607	11.718	13.452	29.413	0.058
6000.000	0.566	337.123	5998.919	12.712	6.169	12.712	14.130	25.886	0.114
6100.000	0.615	336.035	6098.913	13.658	5.759	13.658	14.822	22.863	0.050
6200.000	0.507	341.380	6198.909	14.567	5.400	14.567	15.536	20.339	0.120
6300.000	0.333	348.467	6298.906	15.271	5.200	15.271	16.132	18.806	0.181
6400.000	0.484	350.762	6398.903	15.973	5.074	15.973	16.760	17.624	0.152
6500.000	0.429	352.404	6498.900	16.761	4.957	16.761	17.479	16.476	0.057
6600.000	0.267	350.708	6598.898	17.362	4.870	17.362	18.032	15.670	0.162
6700.000	0.151	317.409	6698.898	17.688	4.744	17.688	18.313	15.012	0.163
6750.000	0.152	336.492	6748.898	17.797	4.673	17.797	18.401	14.711	0.100