



Company/Rig: NOBLE ENERGY/ VESSI
WELL/API#: Gurtler 24-16J/05-123-17695
DECLINATION: 8.31
TD AS DRILLED: 7190
COUNTY/STATE: WELD/COLORADO
Latitude: 40.205, Longitude: -104.605
GRID North is 0.570 Degrees East of True North
VS-Azi: 0.000 Degrees



DEPTH REFERENCE : RKB=SURFACE ELEVATION=4788

DRILLOG GYRO SURVEY CALCULATIONS

Filename: strapdown-de_02.ut
Minimum Curvature Method
Report Date/Time: 12/5/2014 / 16:18

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID
HENDERSON, COLORADO
303-853-4976

SURVEYOR: KEVIN MCDOWELL

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	0.281	292.979	100.000	0.096	-0.225	0.096	0.245	292.979	0.281
200.000	0.261	282.322	199.998	0.240	-0.673	0.240	0.715	289.601	0.054
300.000	0.255	264.437	299.997	0.267	-1.117	0.267	1.149	283.425	0.080
400.000	0.609	166.726	399.995	-0.272	-1.217	-0.272	1.247	257.386	0.692
500.000	0.551	96.668	499.991	-0.846	-0.617	-0.846	1.047	216.128	0.668
600.000	0.463	94.478	599.987	-0.933	0.263	-0.933	0.969	164.257	0.090
700.000	0.254	136.654	699.986	-1.126	0.818	-1.126	1.391	144.006	0.323
800.000	0.413	14.373	799.985	-0.937	1.059	-0.937	1.414	131.500	0.589
900.000	0.499	109.730	899.983	-0.734	1.559	-0.734	1.723	115.231	0.677
1000.000	0.358	181.791	999.980	-1.194	1.959	-1.194	2.294	121.367	0.517
1100.000	0.192	169.695	1099.979	-1.672	1.979	-1.672	2.591	130.187	0.175
1200.000	0.358	111.436	1199.978	-1.951	2.300	-1.951	3.015	130.307	0.304
1300.000	0.686	200.319	1299.975	-2.626	2.382	-2.626	3.545	137.783	0.767
1400.000	0.278	148.124	1399.972	-3.393	2.303	-3.393	4.100	145.835	0.560
1500.000	0.382	151.339	1499.970	-3.891	2.591	-3.891	4.674	146.346	0.106
1600.000	0.529	204.687	1599.967	-4.603	2.558	-4.603	5.266	150.938	0.429
1700.000	0.660	209.423	1699.962	-5.523	2.082	-5.523	5.903	159.342	0.140
1800.000	0.549	208.282	1799.956	-6.447	1.572	-6.447	6.636	166.292	0.111
1900.000	0.458	275.422	1899.953	-6.831	0.948	-6.831	6.896	172.102	0.562

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
2000.000	0.905	302.583	1999.946	-6.368	-0.115	-6.368	6.369	181.038	0.540
2100.000	0.396	281.155	2099.940	-5.876	-1.119	-5.876	5.982	190.786	0.556
2200.000	0.232	288.744	2199.938	-5.744	-1.650	-5.744	5.976	196.023	0.169
2300.000	0.575	341.915	2299.936	-5.202	-1.997	-5.202	5.572	200.999	0.474
2400.000	1.412	14.318	2399.920	-3.532	-1.848	-3.532	3.986	207.620	0.977
2500.000	1.426	33.579	2499.890	-1.301	-0.855	-1.301	1.556	213.312	0.475
2600.000	1.398	52.628	2599.860	0.477	0.803	0.477	0.934	59.299	0.468
2700.000	1.431	50.079	2699.830	2.019	2.731	2.019	3.396	53.522	0.071
2800.000	1.232	42.029	2799.803	3.619	4.409	3.619	5.704	50.616	0.273
2900.000	1.166	61.156	2899.782	4.909	6.020	4.909	7.767	50.805	0.404
3000.000	1.170	11.278	2999.763	6.401	7.111	6.401	9.567	48.008	0.985
3100.000	0.852	326.003	3099.749	8.018	6.894	8.018	10.575	40.689	0.832
3200.000	1.127	305.708	3199.734	9.209	5.680	9.209	10.820	31.664	0.441
3300.000	1.380	312.965	3299.710	10.604	4.000	10.604	11.333	20.665	0.298
3400.000	1.263	317.817	3399.684	12.241	2.378	12.241	12.470	10.995	0.162
3500.000	1.319	327.044	3499.658	14.023	1.013	14.023	14.060	4.130	0.215
3600.000	1.273	304.307	3599.634	15.615	-0.531	15.615	15.624	358.054	0.513
3700.000	1.296	259.603	3699.611	16.036	-2.561	16.036	16.240	350.928	0.977
3800.000	1.440	288.590	3799.584	16.233	-4.864	16.233	16.946	343.320	0.699
3900.000	1.404	275.054	3899.553	16.741	-7.275	16.741	18.254	336.512	0.337
4000.000	1.063	274.689	3999.530	16.925	-9.420	16.925	19.370	330.900	0.341
4100.000	1.076	272.070	4099.512	17.035	-11.283	17.035	20.433	326.481	0.051
4200.000	0.713	222.632	4199.501	16.611	-12.643	16.611	20.875	322.725	0.818
4300.000	1.451	261.190	4299.484	15.960	-14.315	15.960	21.439	318.109	0.998
4400.000	1.593	254.580	4399.449	15.396	-16.907	15.396	22.867	312.322	0.225
4500.000	1.596	256.396	4499.410	14.699	-19.600	14.699	24.500	306.868	0.051
4600.000	1.676	272.791	4599.370	14.443	-22.414	14.443	26.664	302.795	0.473
4700.000	1.568	243.244	4699.331	13.898	-25.096	13.898	28.687	298.977	0.834
4800.000	1.819	224.737	4799.288	12.155	-27.435	12.155	30.007	293.896	0.598
4900.000	1.485	192.348	4899.249	9.761	-28.829	9.761	30.436	288.706	0.975
5000.000	1.293	200.991	4999.220	7.442	-29.510	7.442	30.434	284.154	0.284
5100.000	0.634	176.398	5099.205	5.837	-29.879	5.837	30.444	281.053	0.763
5200.000	0.511	130.924	5199.201	4.992	-29.507	4.992	29.927	279.603	0.457
5300.000	1.193	82.477	5299.190	4.836	-28.138	4.836	28.551	279.753	0.935
5400.000	1.705	54.255	5399.159	5.842	-25.899	5.842	26.550	282.711	0.864
5500.000	0.873	36.669	5499.133	7.322	-24.237	7.322	25.318	286.810	0.911
5600.000	1.197	343.263	5599.119	8.934	-24.082	8.934	25.686	290.354	0.974
5700.000	0.979	298.748	5699.102	10.346	-25.133	10.346	27.179	292.374	0.849
5800.000	0.759	300.517	5799.091	11.093	-26.453	11.093	28.684	292.751	0.222
5900.000	1.217	267.797	5899.077	11.389	-28.085	11.389	30.306	292.073	0.709

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
6000.000	1.691	295.159	5999.045	11.975	-30.481	11.975	32.749	291.448	0.828
6100.000	1.631	312.570	6099.004	13.565	-32.865	13.565	35.555	292.429	0.506
6200.000	1.649	288.951	6198.964	14.995	-35.274	14.995	38.329	293.031	0.671
6300.000	1.610	317.817	6298.925	16.503	-37.577	16.503	41.042	293.710	0.813
6400.000	1.372	325.825	6398.891	18.534	-39.193	18.534	43.354	295.309	0.316
6500.000	1.369	323.984	6498.863	20.491	-40.568	20.491	45.449	296.798	0.044
6600.000	0.901	350.274	6598.844	22.231	-41.403	22.231	46.994	298.234	0.689
6700.000	0.653	303.574	6698.835	23.321	-42.011	23.321	48.050	299.036	0.656
6800.000	0.650	31.582	6798.831	24.120	-42.189	24.120	48.597	299.757	0.906
6900.000	0.188	353.241	6898.828	24.766	-41.911	24.766	48.681	300.580	0.516
7000.000	0.145	184.793	6998.828	24.802	-41.940	24.802	48.725	300.599	0.331