



Company/Rig: Noble Energy/Production/CoreTech
WELL/API#: KESSLER 19-21/05-123-22379
DECLINATION: 8.24 Degrees
TD AS DRILLED: 7325'
COUNTY/STATE: WELD/COLORADO
VS-Azi: 0.000 Degrees
Latitude: 40.47828, Longitude: -104.82456
Grid North = True North -0.44 degs (NAD 27)
Grid Correction Applied = -0.44 degs



Depth Reference : RKB=SURFACE ELEVATION=4791'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: run1-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 6/5/2017 / 09:27

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

COMMERCE CITY, COLORADO

303-853-4976

Surveyor: JAY HINMAN / Kessler 19-21

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	0.242	332.786	100.000	0.188	-0.096	0.188	0.211	332.786	0.242
200.000	0.075	26.309	199.999	0.433	-0.164	0.433	0.463	339.265	0.206
300.000	0.101	131.163	299.999	0.433	-0.069	0.433	0.439	351.005	0.140
400.000	0.102	136.512	399.999	0.310	0.060	0.310	0.316	10.865	0.010
500.000	0.179	175.399	499.999	0.090	0.134	0.090	0.161	55.991	0.118
600.000	0.195	210.513	599.998	-0.212	0.059	-0.212	0.220	164.334	0.114
700.000	0.192	239.746	699.998	-0.444	-0.172	-0.444	0.476	201.202	0.098
800.000	0.278	274.225	799.997	-0.510	-0.559	-0.510	0.757	227.619	0.162
900.000	0.290	272.304	899.996	-0.482	-1.054	-0.482	1.159	245.415	0.015
1000.000	0.323	266.971	999.994	-0.487	-1.588	-0.487	1.661	252.951	0.044
1100.000	0.439	277.788	1099.992	-0.450	-2.249	-0.450	2.293	258.686	0.136
1200.000	0.502	277.726	1199.989	-0.339	-3.062	-0.339	3.081	263.681	0.063
1300.000	0.499	279.502	1299.985	-0.208	-3.926	-0.208	3.931	266.962	0.016
1400.000	0.602	246.387	1399.981	-0.347	-4.837	-0.347	4.849	265.896	0.329
1500.000	0.703	252.419	1499.974	-0.743	-5.903	-0.743	5.950	262.827	0.122
1600.000	0.651	226.439	1599.967	-1.320	-6.900	-1.320	7.025	259.170	0.309

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
1700.000	0.880	231.932	1699.958	-2.185	-7.917	-2.185	8.213	254.568	0.240
1800.000	1.080	241.541	1799.944	-3.108	-9.350	-3.108	9.853	251.612	0.258
1900.000	1.183	246.994	1899.924	-3.960	-11.128	-3.960	11.812	250.410	0.149
2000.000	0.946	270.888	1999.907	-4.351	-12.904	-4.351	13.618	251.367	0.498
2100.000	0.706	229.058	2099.898	-4.742	-14.195	-4.742	14.967	251.528	0.631
2200.000	0.637	235.278	2199.891	-5.463	-15.118	-5.463	16.075	250.133	0.100
2300.000	0.810	268.063	2299.883	-5.803	-16.282	-5.803	17.285	250.382	0.441
2400.000	0.746	273.857	2399.874	-5.784	-17.638	-5.784	18.562	251.845	0.101
2500.000	0.400	224.289	2499.869	-5.989	-18.531	-5.989	19.475	252.089	0.574
2600.000	0.656	230.448	2599.865	-6.604	-19.216	-6.604	20.319	251.034	0.263
2700.000	0.533	200.294	2699.860	-7.405	-19.819	-7.405	21.157	249.513	0.332
2800.000	0.817	144.615	2799.854	-8.423	-19.568	-8.423	21.303	246.711	0.679
2900.000	0.726	171.078	2899.845	-9.629	-19.056	-9.629	21.351	243.192	0.364
3000.000	0.640	172.533	2999.838	-10.809	-18.886	-10.809	21.760	240.217	0.088
3100.000	0.824	176.335	3099.830	-12.080	-18.767	-12.080	22.319	237.232	0.191
3200.000	0.819	201.414	3199.820	-13.463	-18.982	-13.463	23.272	234.654	0.357
3300.000	0.375	270.837	3299.815	-14.124	-19.570	-14.124	24.134	234.183	0.772
3400.000	0.641	13.772	3399.813	-13.576	-19.764	-13.576	23.978	235.516	0.812
3500.000	0.967	60.831	3499.804	-12.621	-18.895	-12.621	22.722	236.258	0.708
3600.000	0.974	73.685	3599.789	-11.971	-17.342	-11.971	21.073	235.382	0.217
3700.000	1.008	73.407	3699.774	-11.481	-15.683	-11.481	19.436	233.793	0.034
3800.000	0.590	88.063	3799.765	-11.213	-14.325	-11.213	18.192	231.949	0.462
3900.000	0.832	58.613	3899.757	-10.817	-13.191	-10.817	17.059	230.647	0.431
4000.000	0.873	55.932	3999.746	-10.012	-11.940	-10.012	15.583	230.019	0.057
4100.000	0.800	86.161	4099.736	-9.539	-10.613	-9.539	14.269	228.050	0.442
4200.000	0.570	60.976	4199.729	-9.251	-9.481	-9.251	13.246	225.705	0.374
4300.000	0.539	53.236	4299.724	-8.728	-8.670	-8.728	12.302	224.808	0.081
4400.000	0.477	13.906	4399.721	-8.042	-8.193	-8.042	11.481	225.531	0.347
4500.000	0.881	331.546	4499.714	-6.962	-8.459	-6.962	10.956	230.545	0.619
4600.000	0.954	322.705	4599.701	-5.624	-9.330	-5.624	10.894	238.919	0.159
4700.000	1.069	310.303	4699.686	-4.359	-10.545	-4.359	11.411	247.543	0.247
4800.000	0.609	302.036	4799.675	-3.473	-11.707	-3.473	12.212	253.475	0.474
4900.000	0.568	312.970	4899.670	-2.853	-12.521	-2.853	12.842	257.162	0.119
5000.000	0.285	290.457	4999.667	-2.428	-13.117	-2.428	13.340	259.511	0.324
5100.000	0.631	234.034	5099.664	-2.665	-13.795	-2.665	14.050	259.067	0.529
5200.000	0.570	205.271	5199.659	-3.438	-14.453	-3.438	14.856	256.621	0.304
5300.000	0.685	201.497	5299.652	-4.444	-14.885	-4.444	15.534	253.377	0.123
5400.000	0.714	220.643	5399.645	-5.473	-15.510	-5.473	16.447	250.563	0.234
5500.000	0.385	327.009	5499.642	-5.664	-16.098	-5.664	17.066	250.617	0.902

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
5600.000	0.282	119.877	5599.642	-5.505	-16.068	-5.505	16.984	251.089	0.649
5700.000	0.407	125.004	5699.640	-5.831	-15.563	-5.831	16.619	249.460	0.128
5800.000	0.591	152.055	5799.636	-6.490	-15.030	-6.490	16.372	246.644	0.294
5900.000	0.803	151.718	5899.629	-7.563	-14.457	-7.563	16.315	242.383	0.212
6000.000	0.965	121.590	5999.617	-8.622	-13.407	-8.622	15.940	237.257	0.485
6100.000	1.114	140.649	6099.601	-9.814	-12.074	-9.814	15.559	230.893	0.374
6200.000	1.389	123.763	6199.577	-11.239	-10.450	-11.239	15.347	222.915	0.457
6300.000	1.414	117.804	6299.548	-12.488	-8.351	-12.488	15.023	213.772	0.148
6400.000	1.551	118.599	6399.514	-13.712	-6.072	-13.712	14.996	203.884	0.139
6500.000	1.394	114.346	6499.481	-14.861	-3.775	-14.861	15.333	194.252	0.192
6600.000	1.820	118.192	6599.441	-16.113	-1.267	-16.113	16.163	184.495	0.440
6700.000	2.145	114.706	6699.381	-17.645	1.833	-17.645	17.740	174.068	0.346
6800.000	2.313	140.063	6799.308	-19.975	4.829	-19.975	20.550	166.410	0.992
6900.000	2.736	144.191	6899.211	-23.457	7.521	-23.457	24.634	162.224	0.461
7000.000	2.967	130.751	6999.088	-27.083	10.878	-27.083	29.186	158.117	0.705
7100.000	3.606	118.984	7098.924	-30.296	15.589	-30.296	34.071	152.771	0.926