



Multifinger Imaging Caliper  
Gamma Ray  
Casing Collar Log

Company Kerr-McGee Oil & Gas Onshore, L.P.

Well Cowboy 21-5HZ

Field Wattenberg

County Weld State Colorado

Location: API #: 05-123-47100

SEC 21 TWP 2N RGE 67W

Other Services  
JB/GR  
RBP

Permanent Datum Ground Level Elevation 5041'

Log Measured From Kelly Bushing 26 FT

Drilling Measured From Kelly Bushing

Elevation  
K.B. 5067'  
D.F. ---  
G.L. 5041'

Date 09-NOV-2018

Run Number One

Depth Driller 21278 FT

Depth Logger 7070 FT

Bottom Logged Interval 7064 FT

Top Log Interval Surface

Open Hole Size ---

Type Fluid Water

Density / Viscosity 8.34 lb/gal

Max. Recorded Temp. 218°F

E. Estimated Cement Top ---

Time Well Ready ROA

Time Logger on Bottom 12:05

E. Equipment Number HD-325

Location Plateville, CO

Recorded By J. Morrison

Witnessed By Kyle Carver

Borehole Record

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Tubing Record

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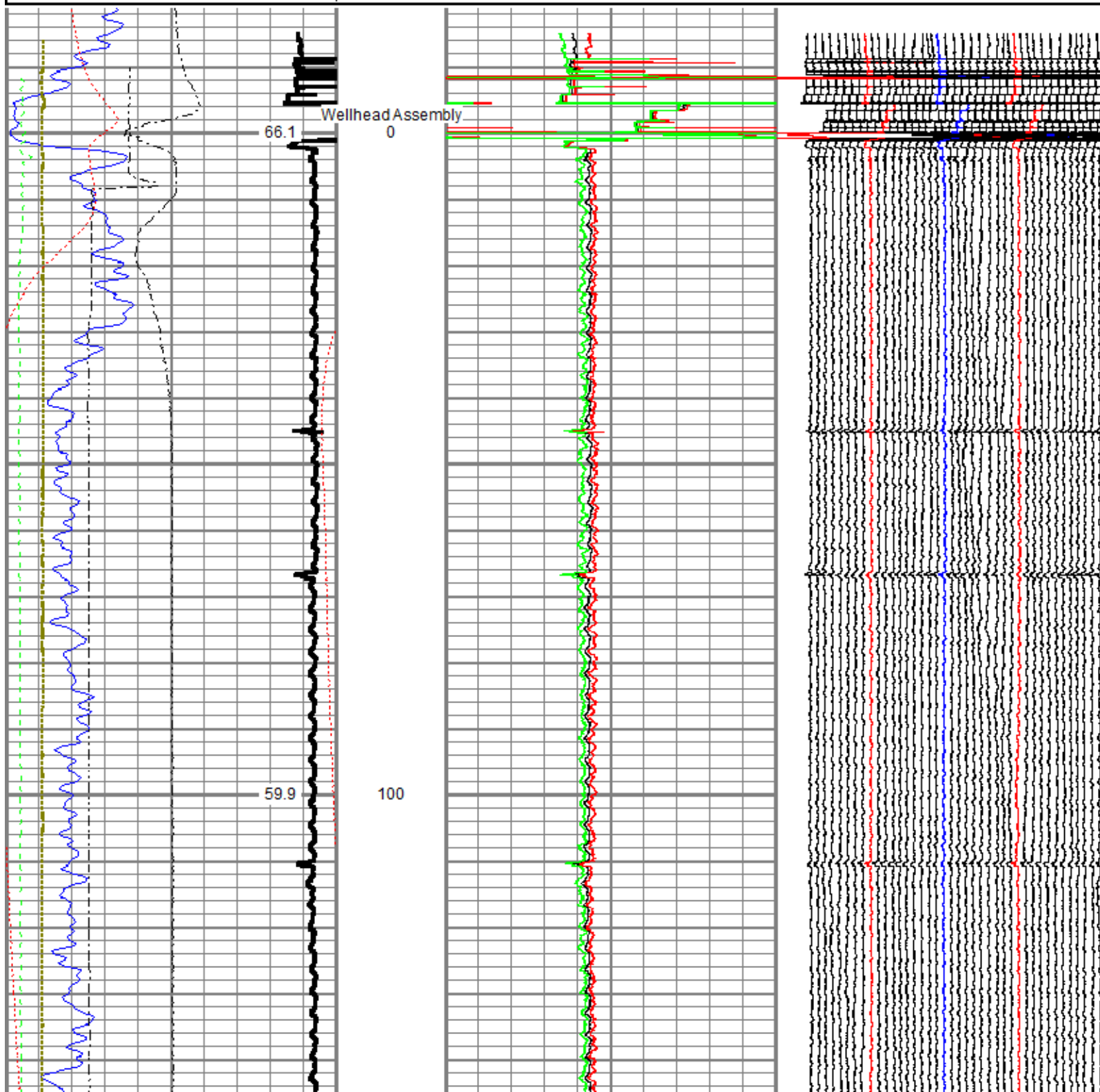
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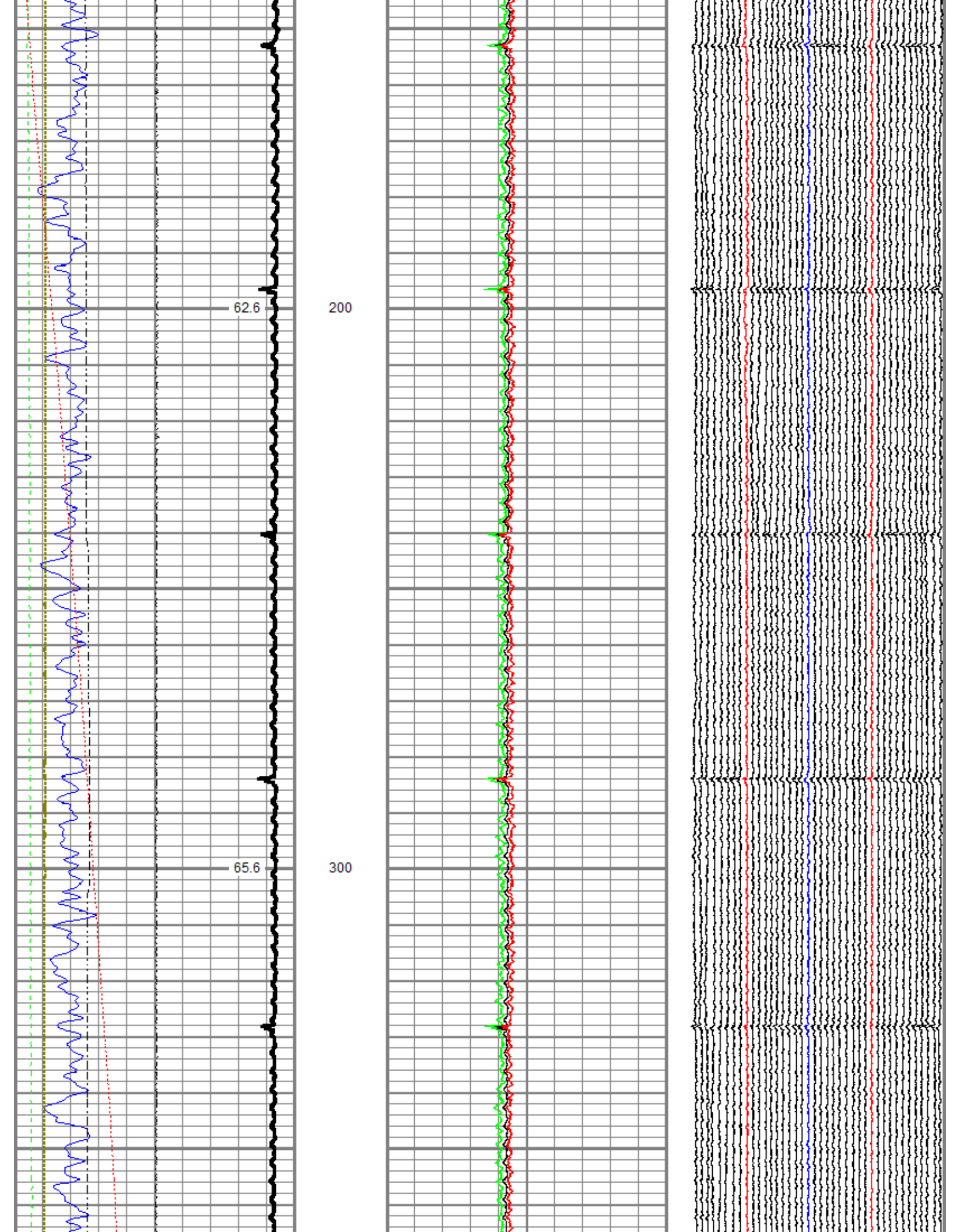
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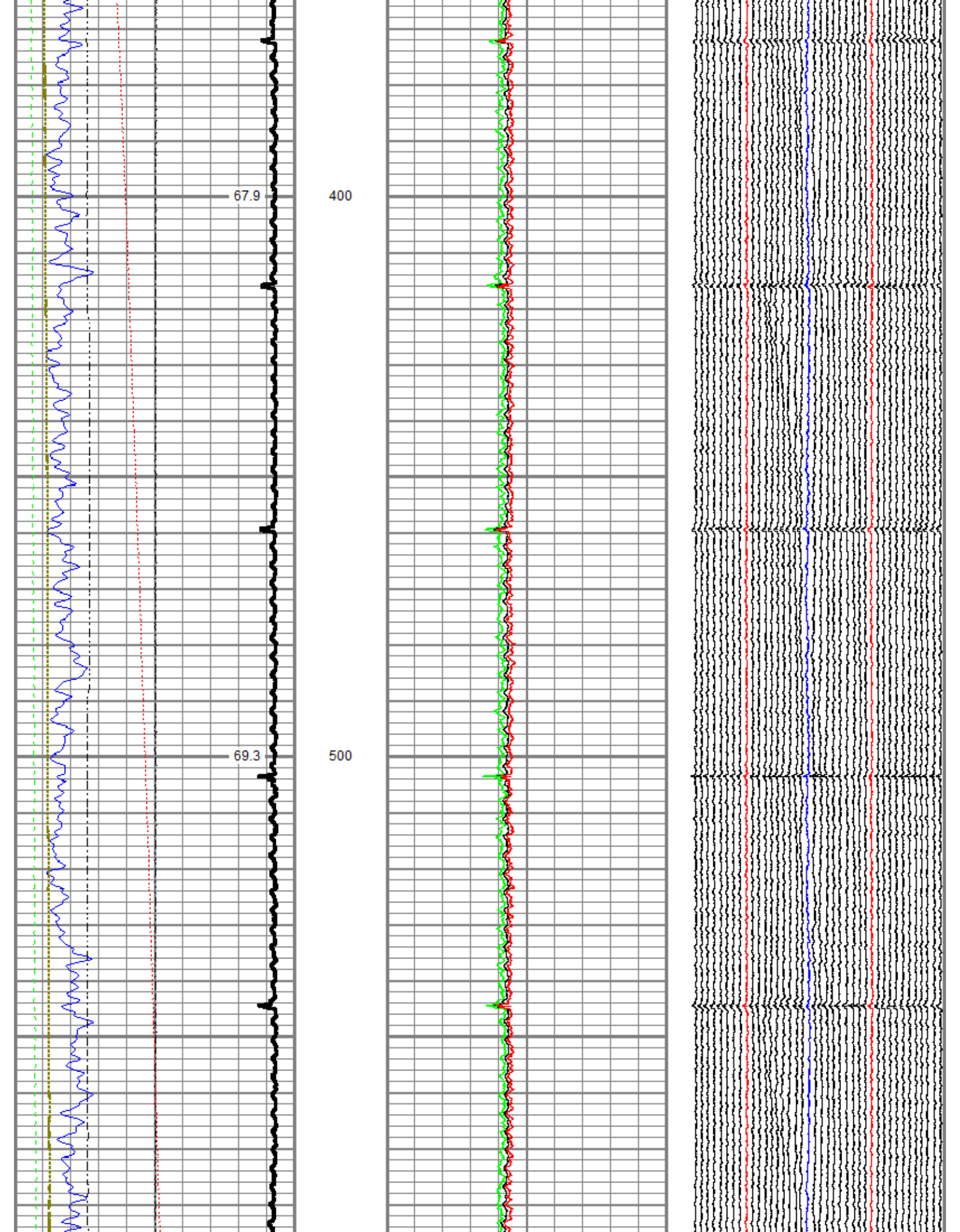
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Dataset Pathname	merge2
Presentation Format	ros_55mit40sx
Dataset Creation	Fri Nov 09 15:19:58 2018
Charted by	Depth in Feet scaled 1:240

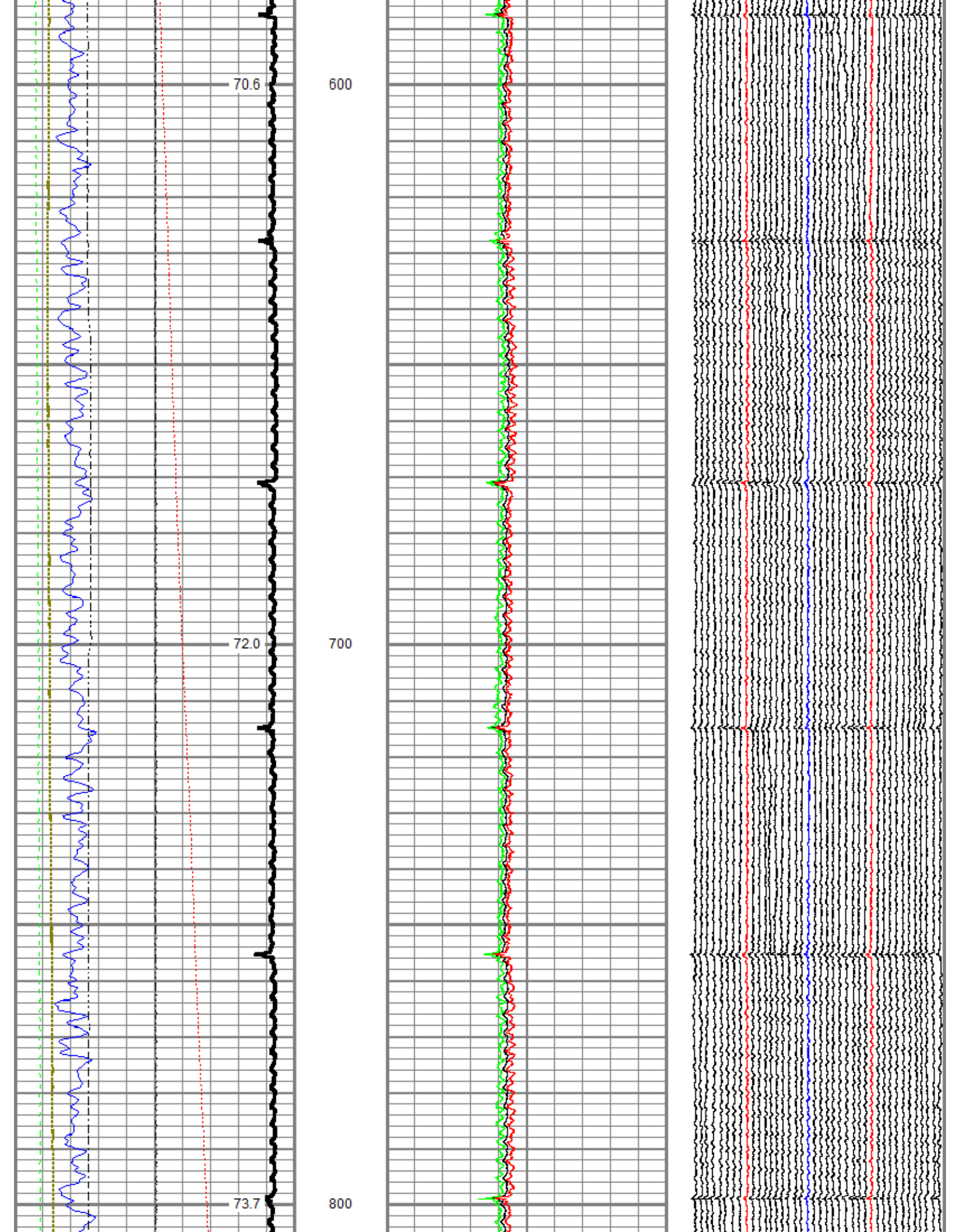
0	Gamma Ray (GAPI)	120
-10	Deviation (deg)	90
Casing Collar Locator		
0	Line Tension (lb)	2000
-100	Line Speed (ft/min)	100
-2	Differential Temperature (degF)	2
0	Temperature (degF)	20

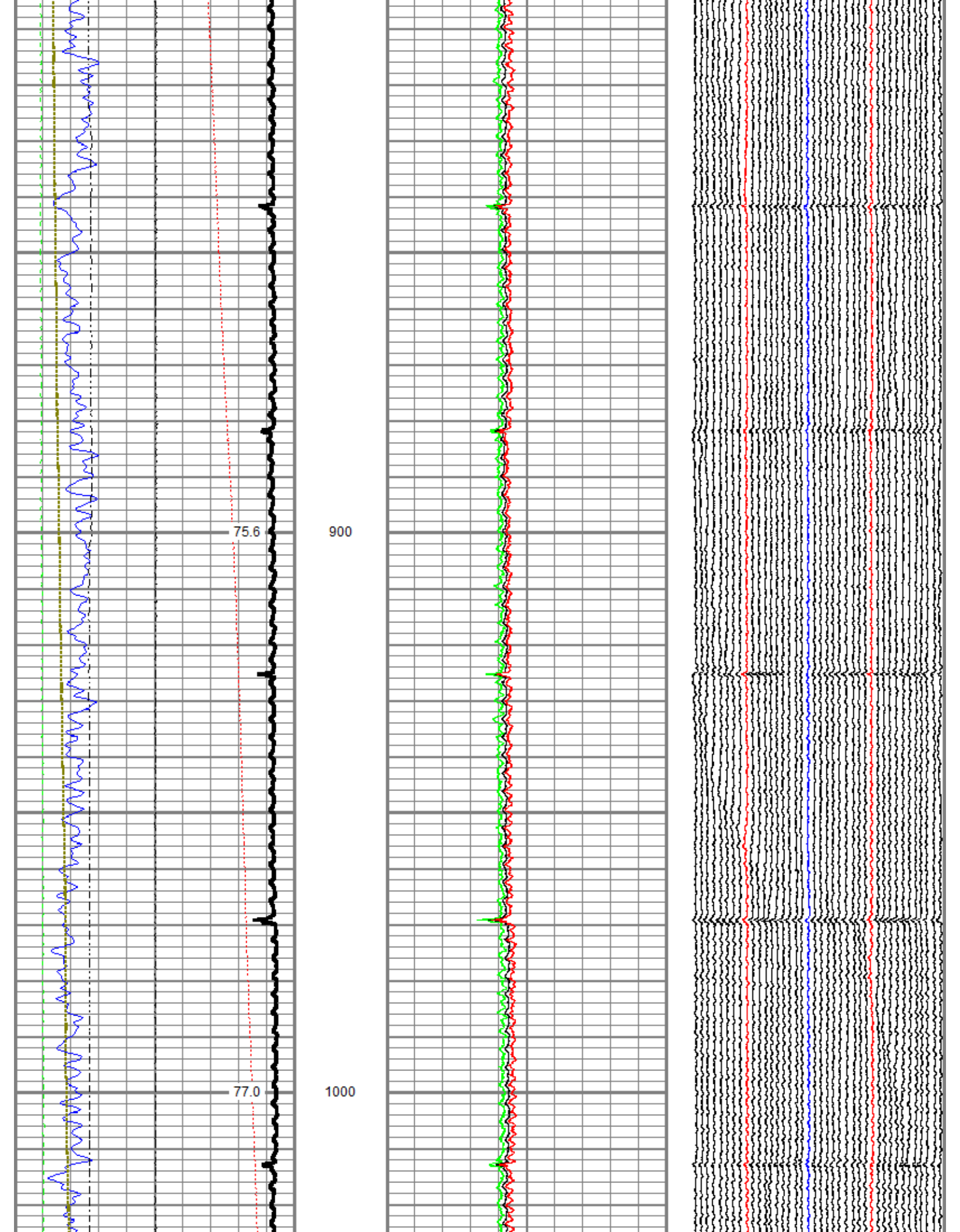
4.5	Average Diameter (in)	5.5	Caliper #10
4.5	Maximum Diameter (in)	5.5	Caliper #20
4.5	Minimum Diameter (in)	5.5	Caliper #30

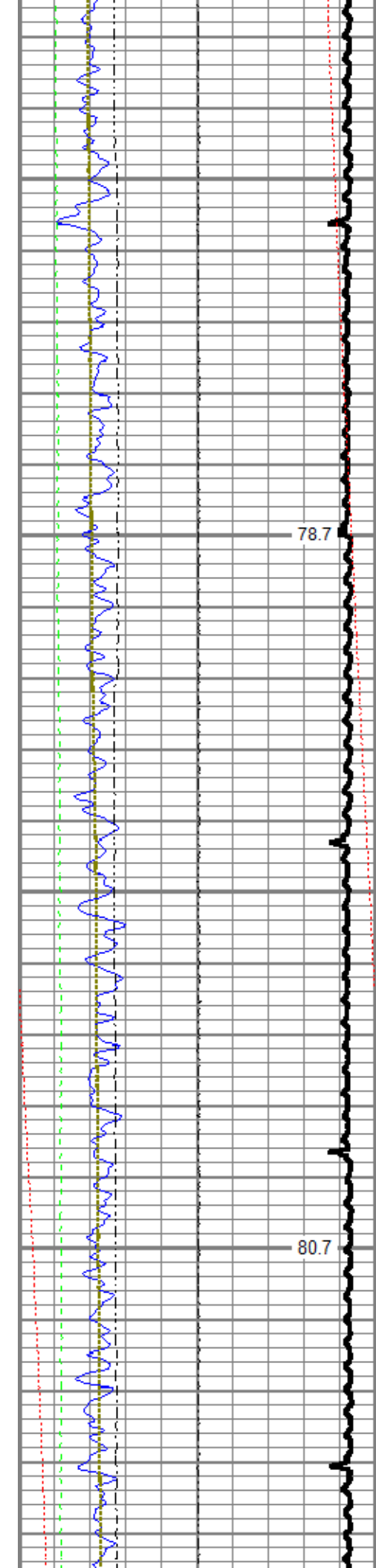






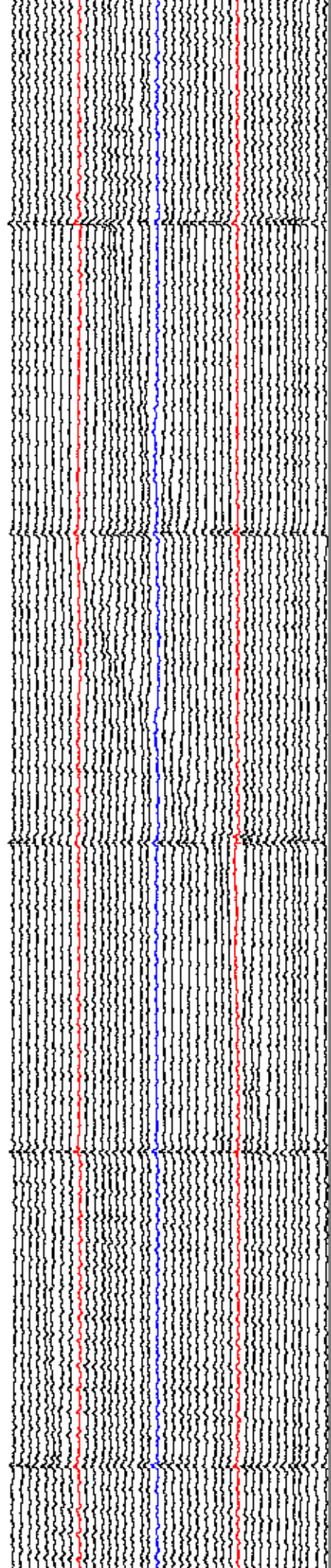
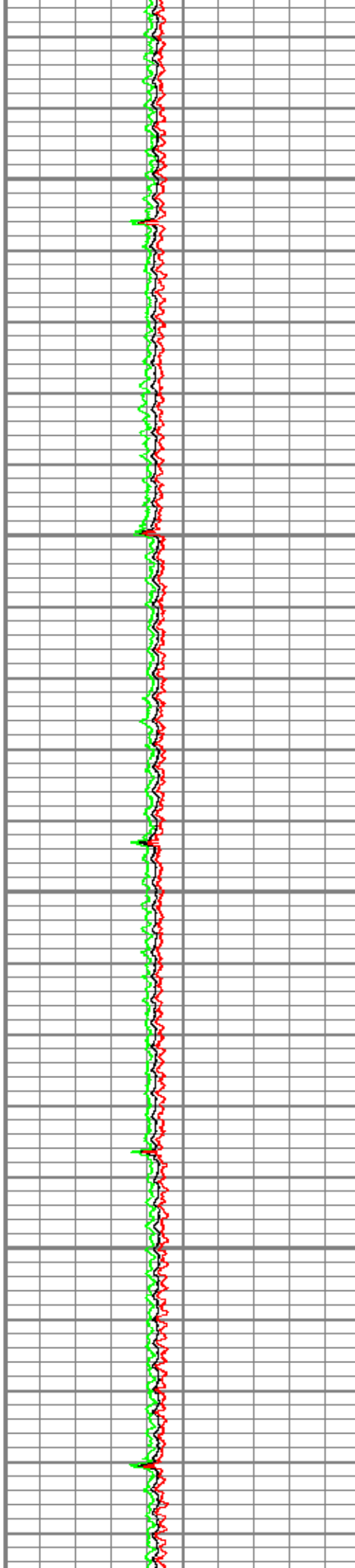


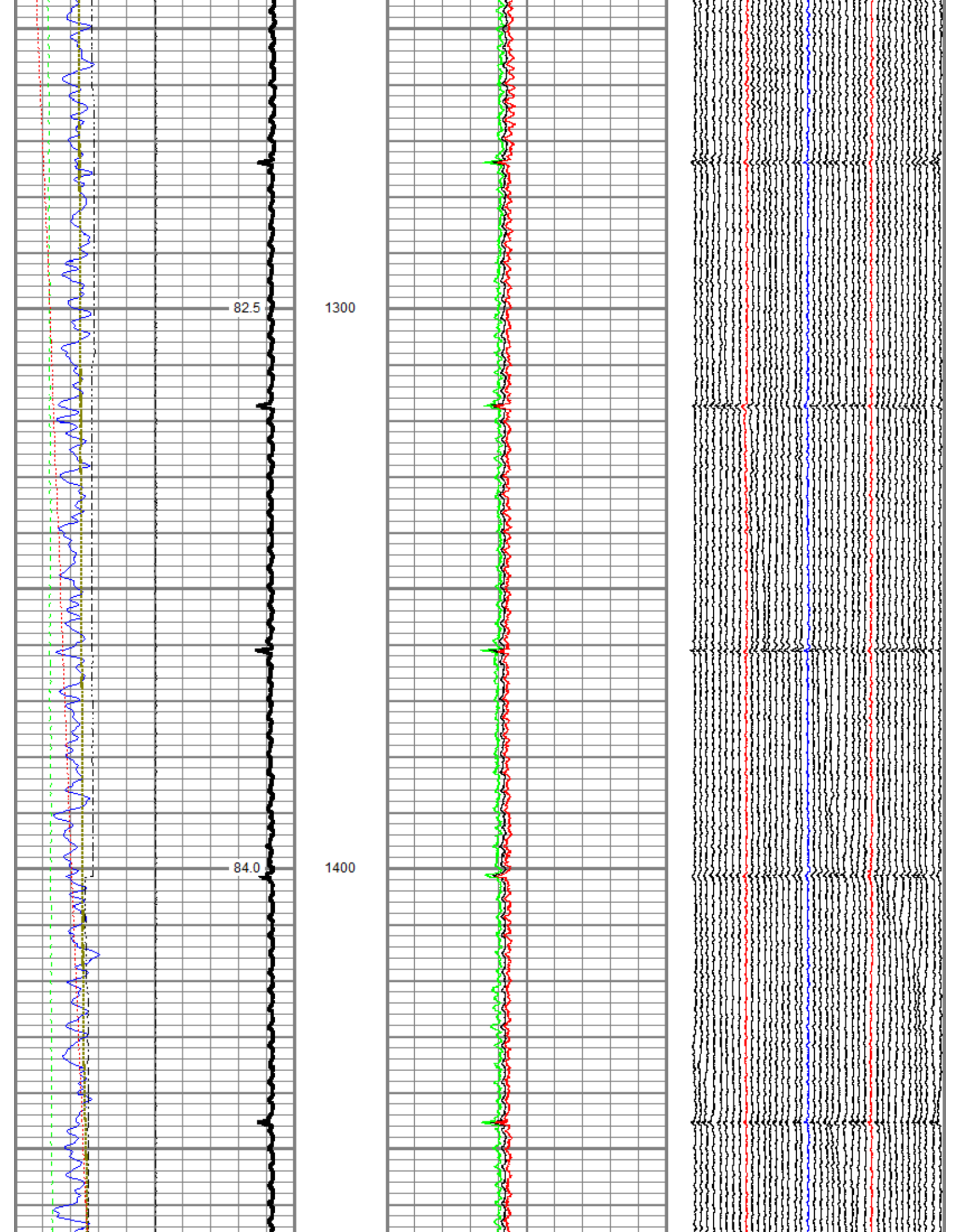


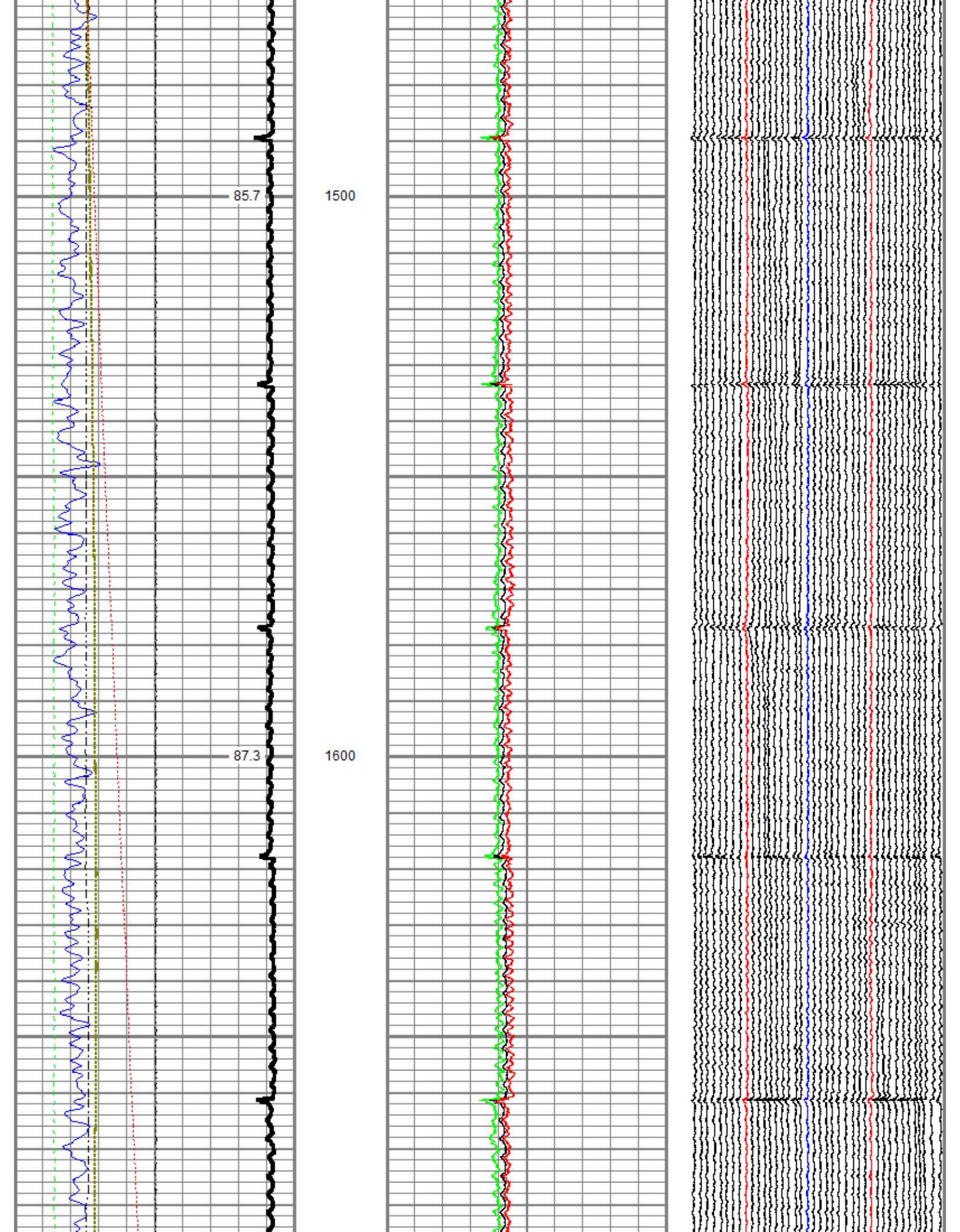


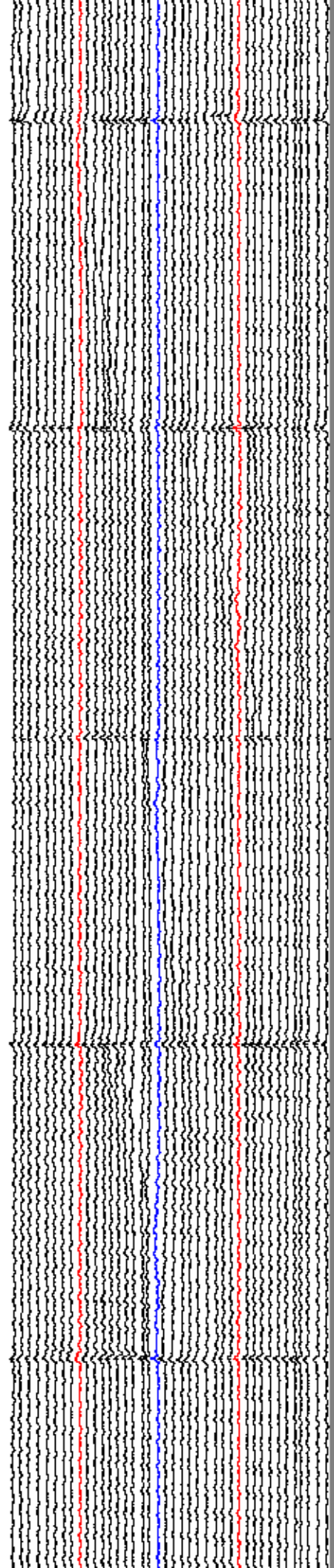
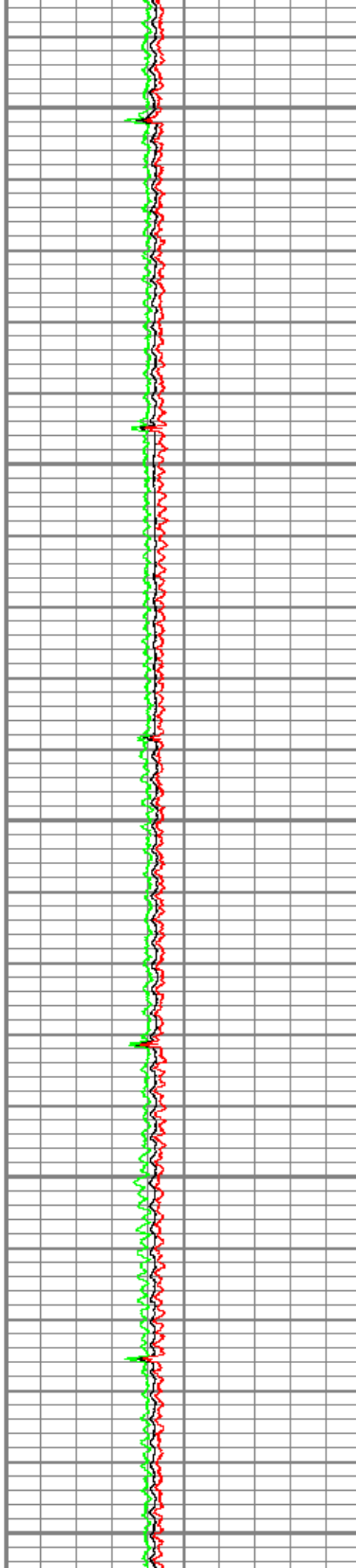
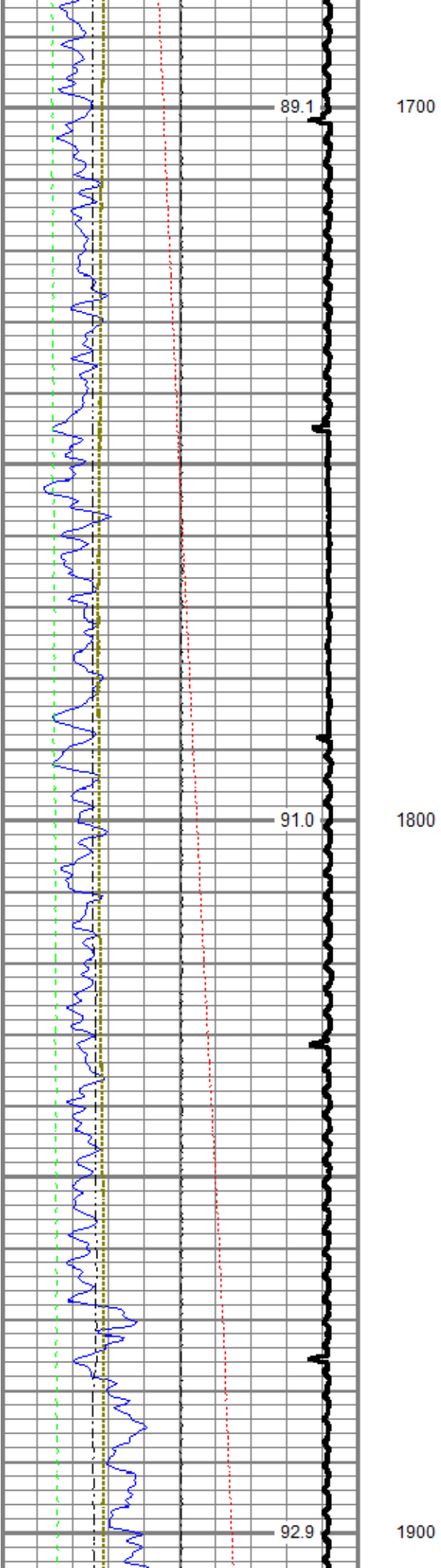
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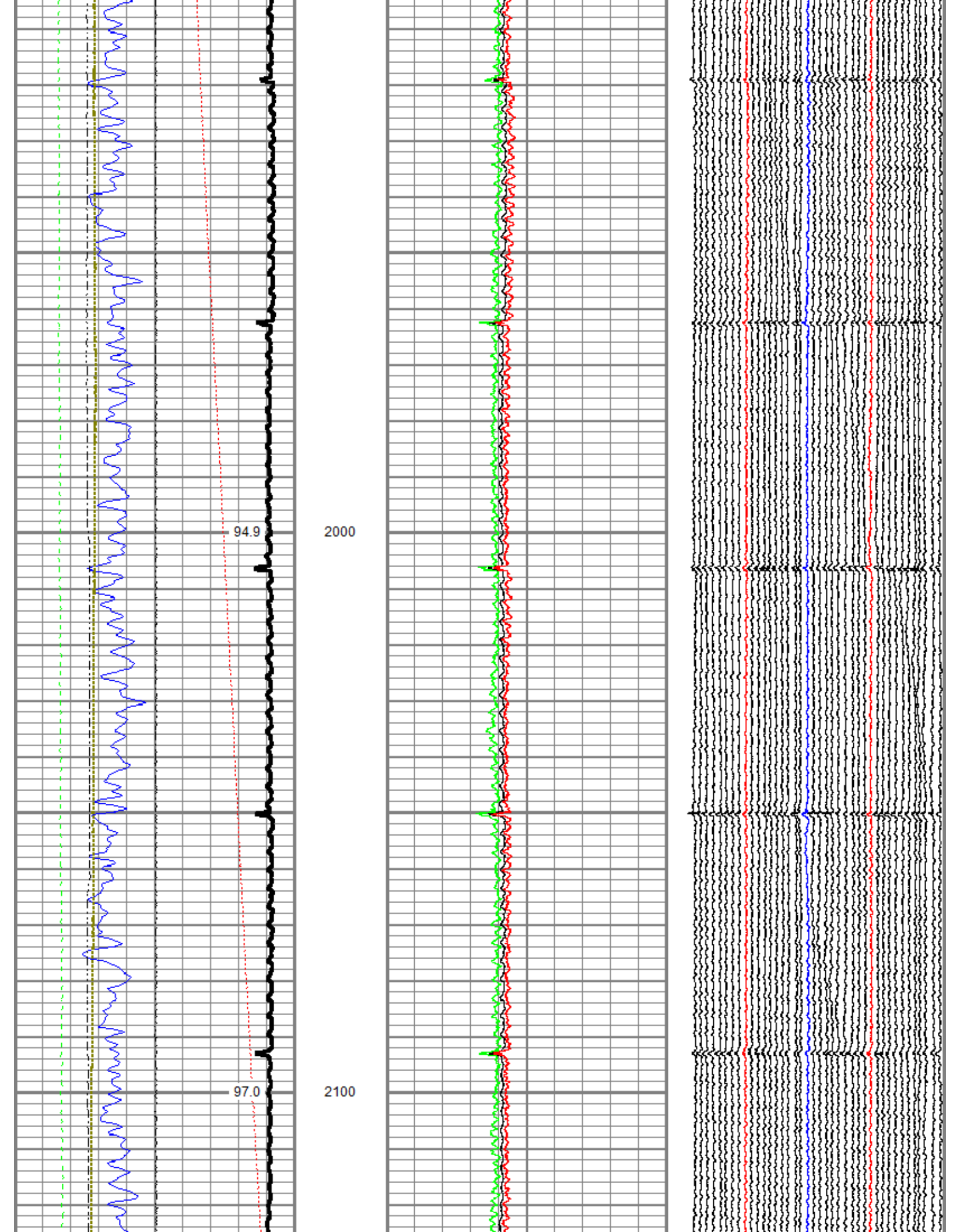
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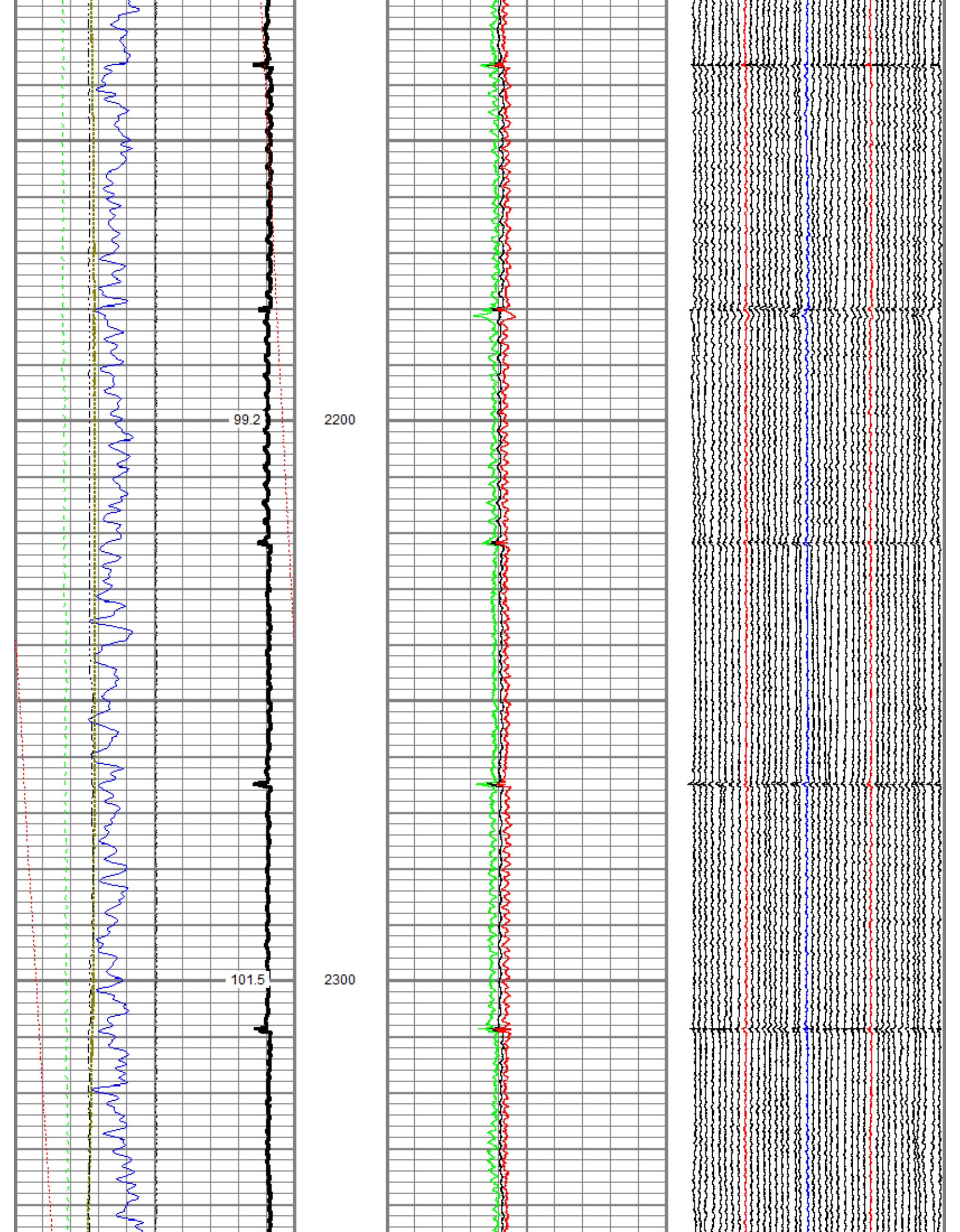


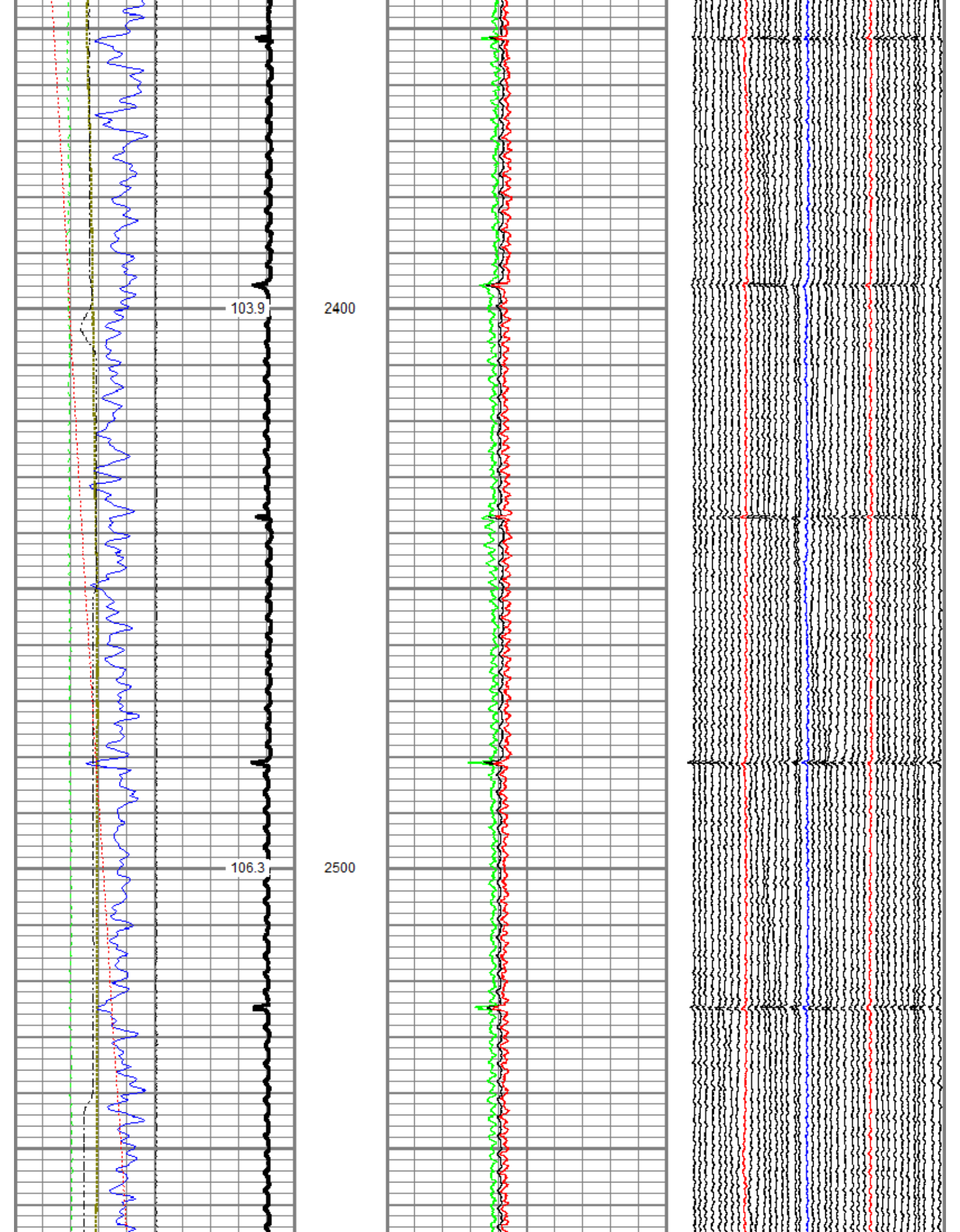


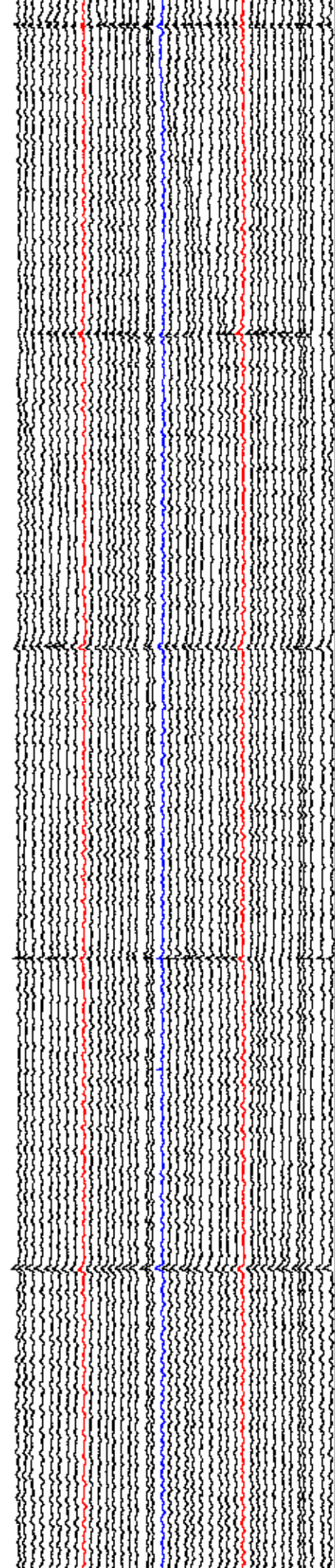
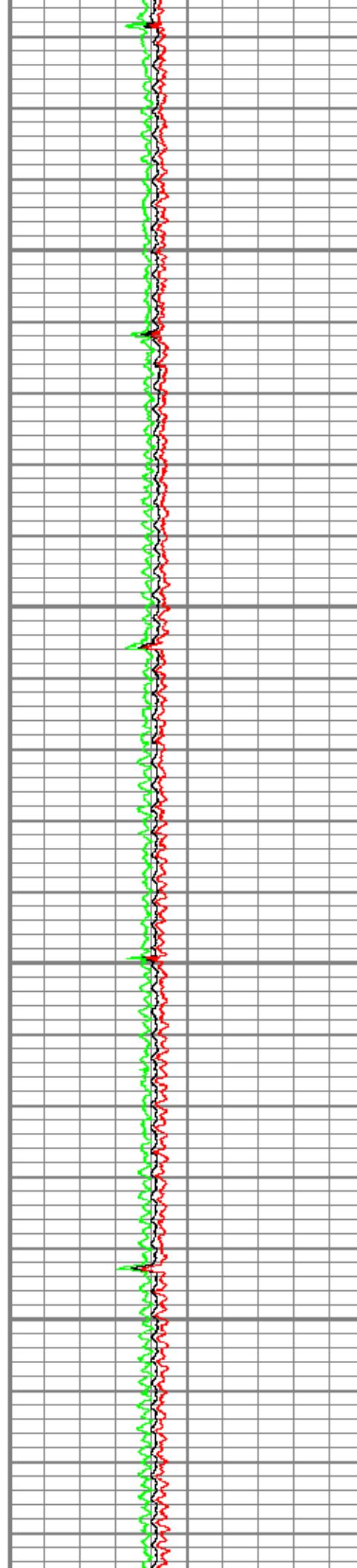
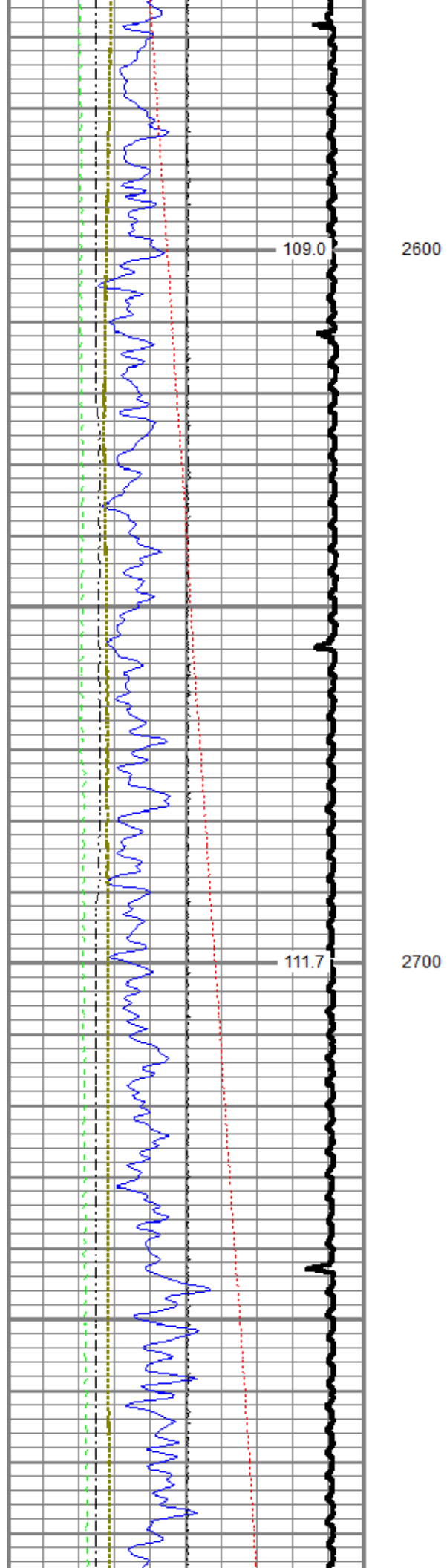


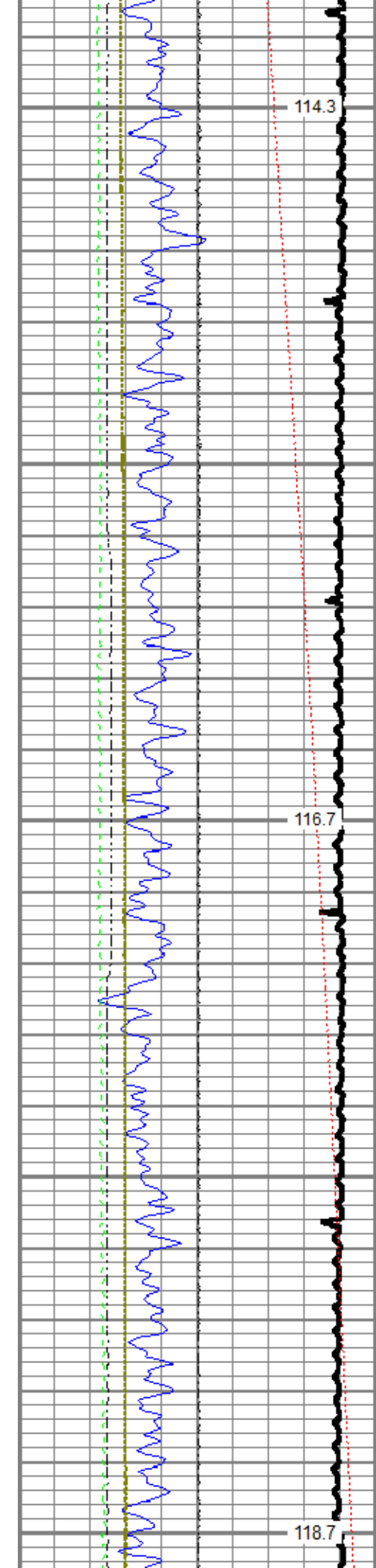








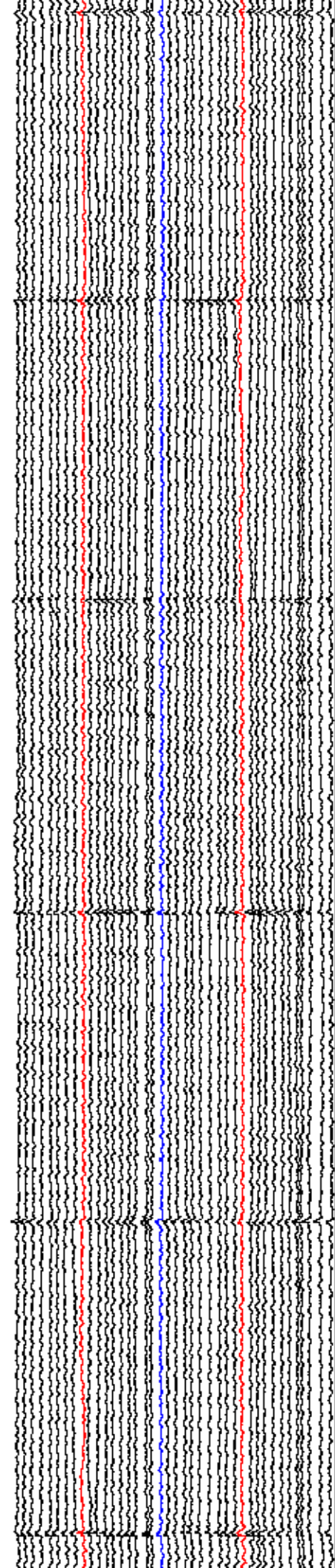
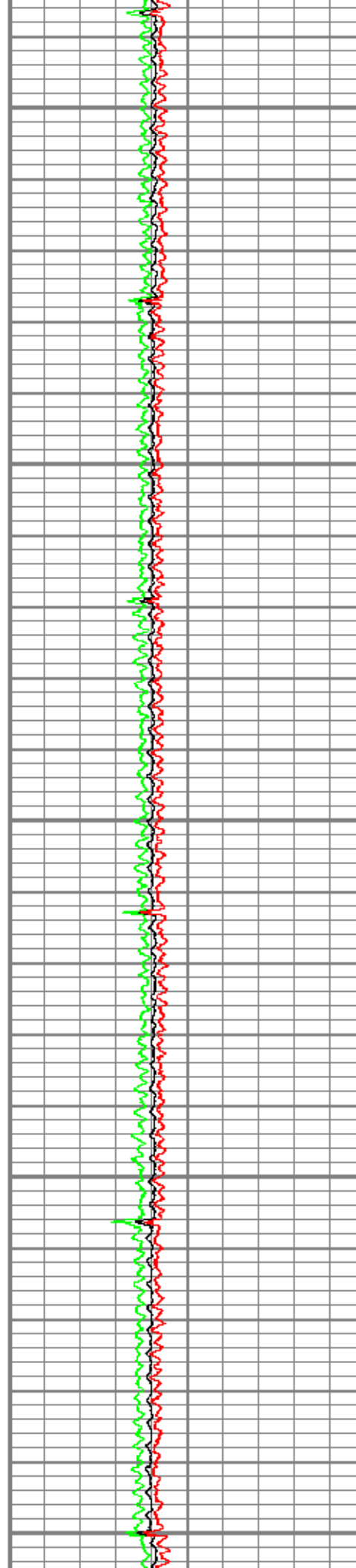


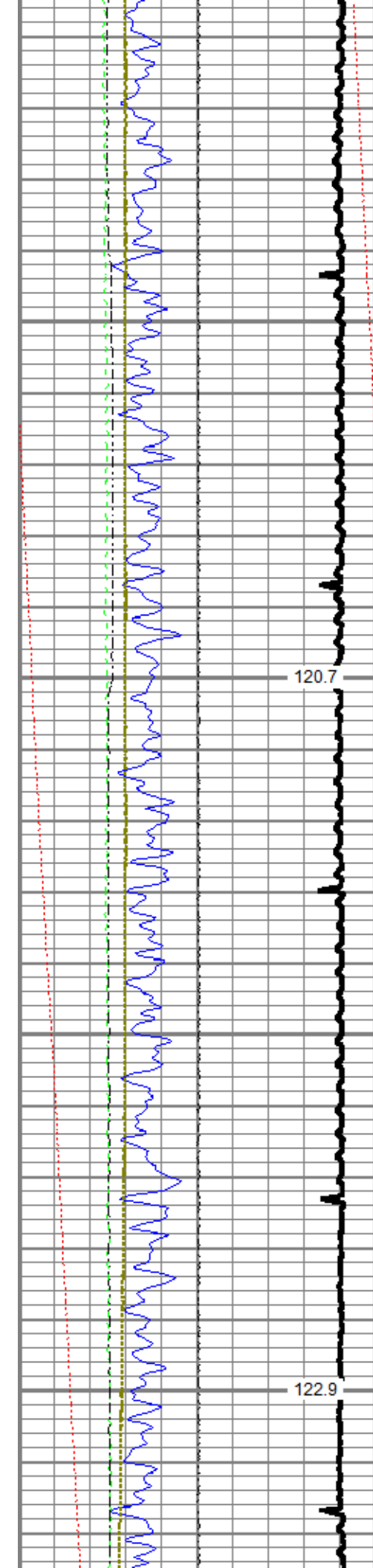


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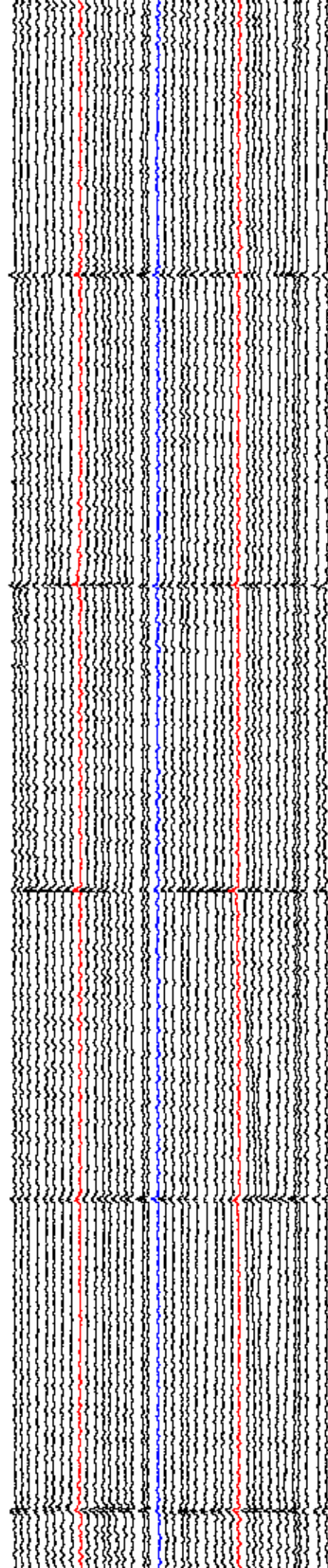
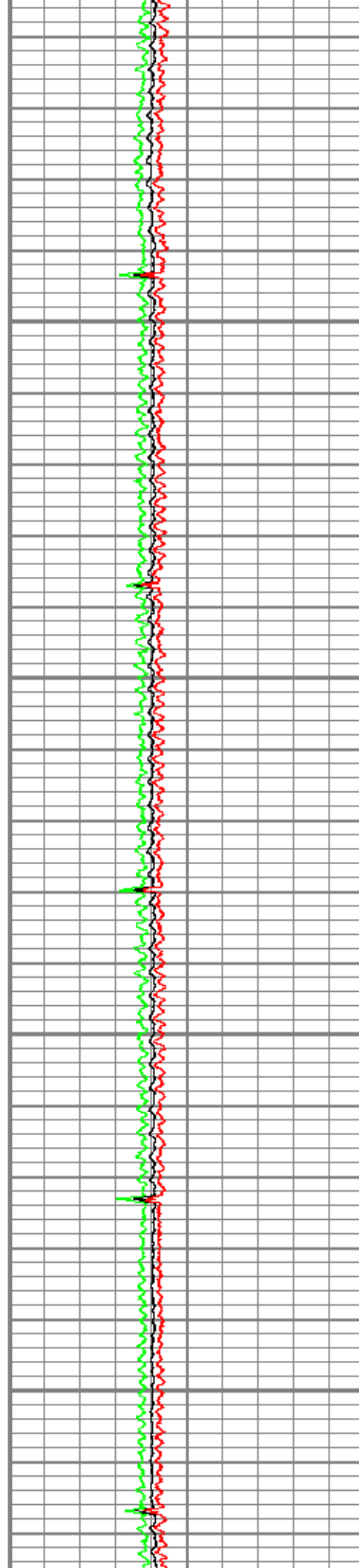
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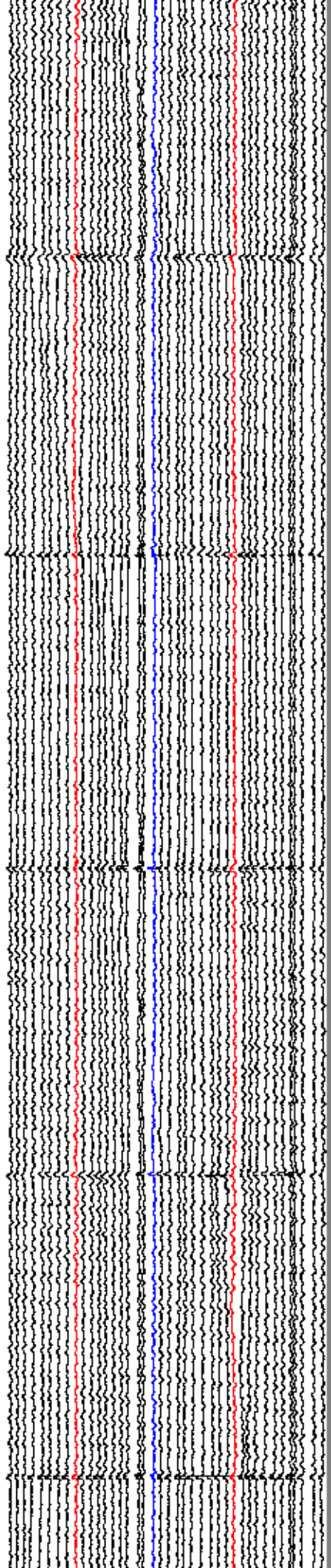
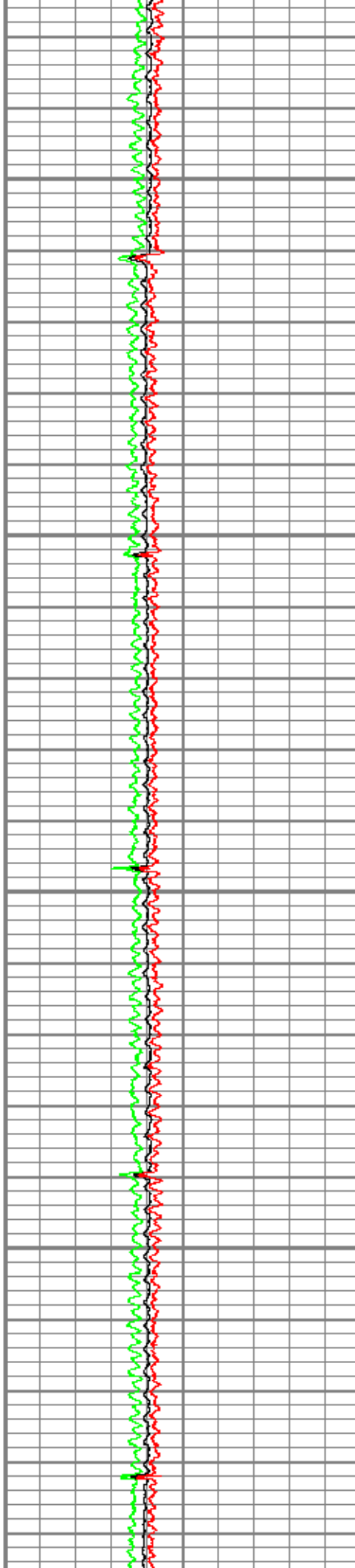
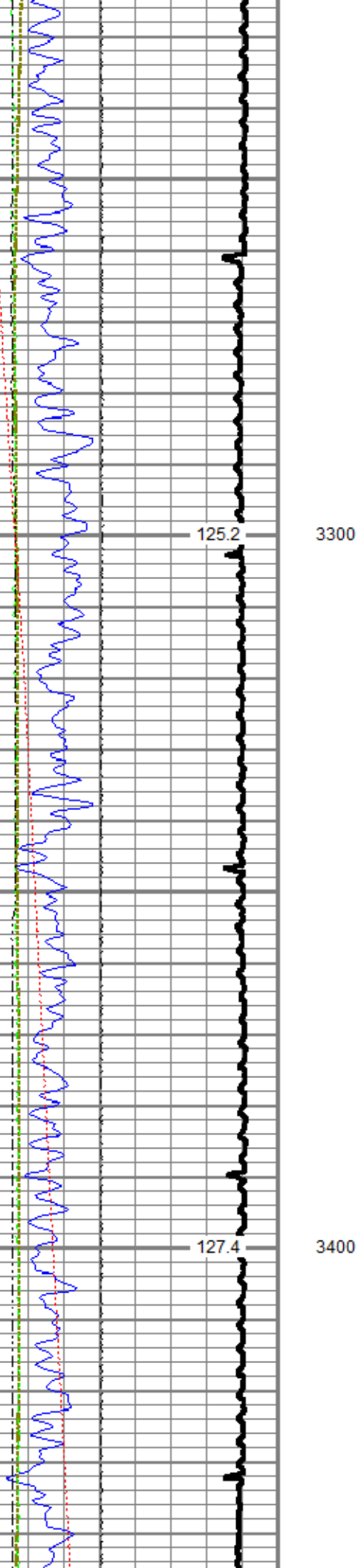


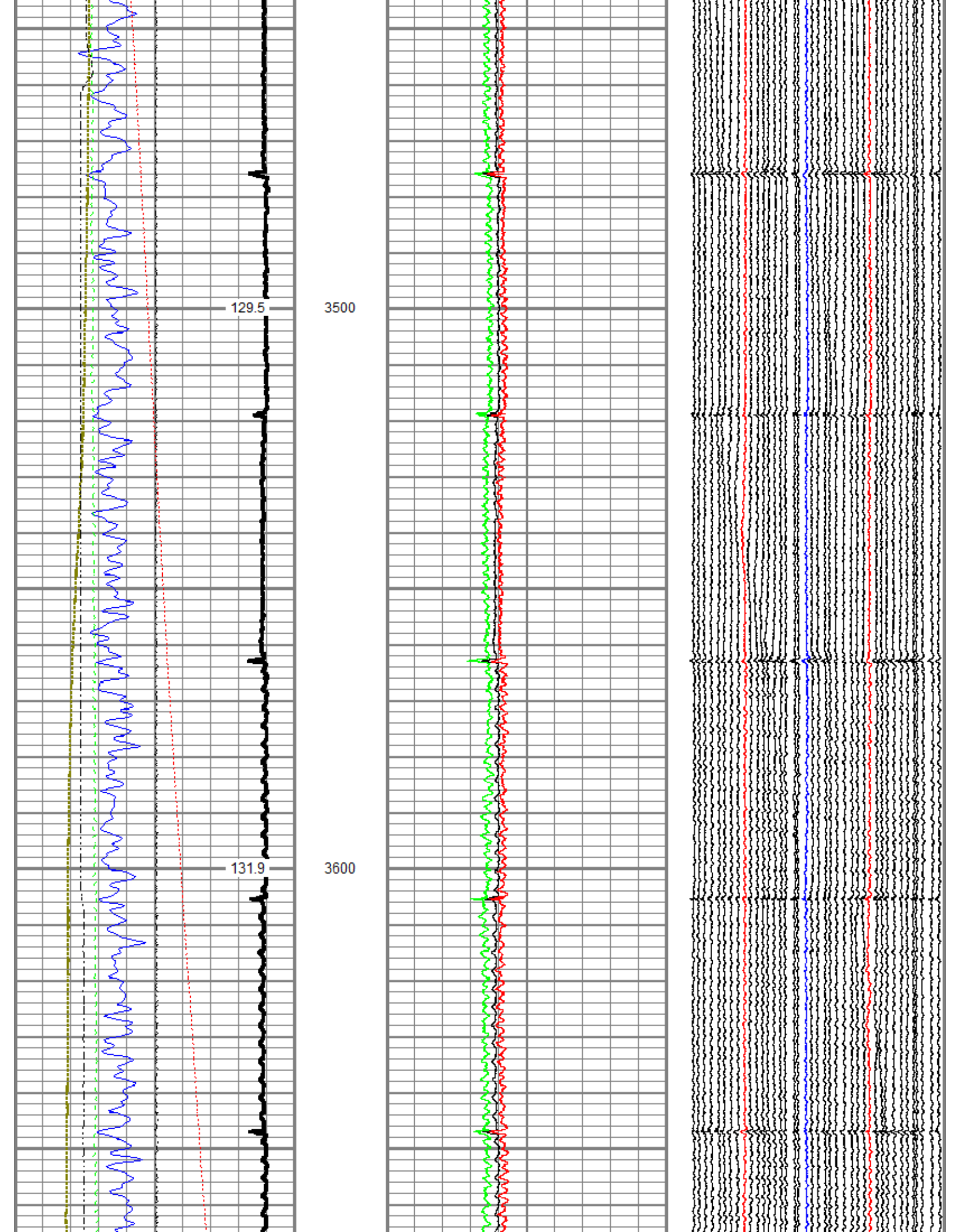


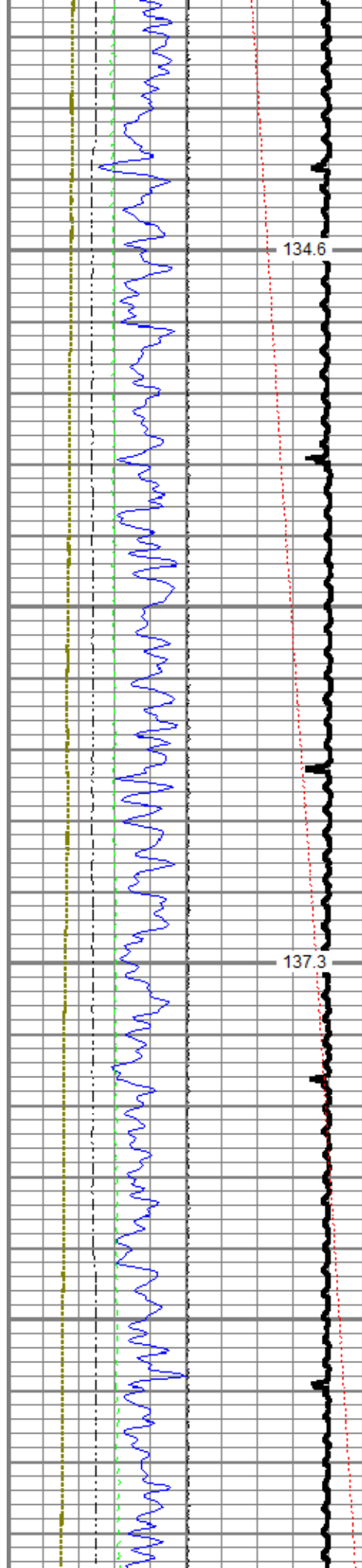
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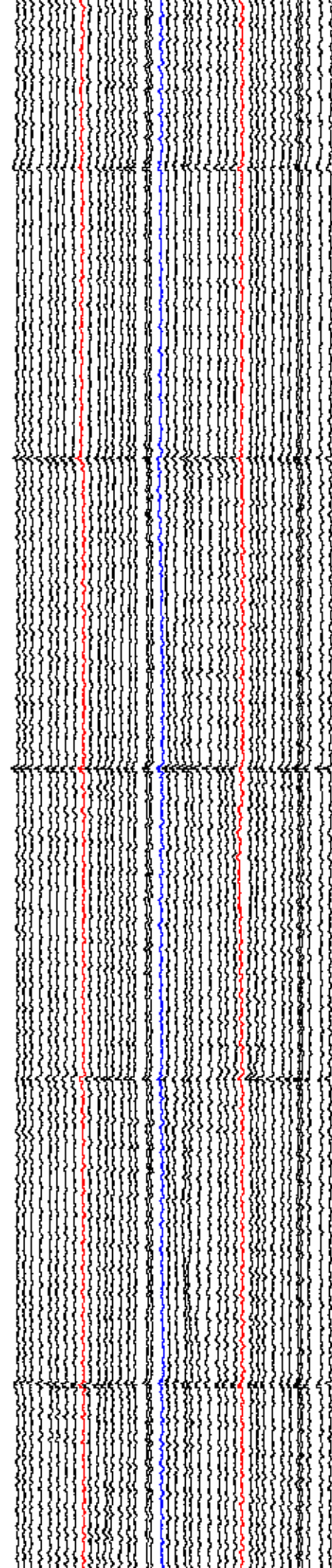
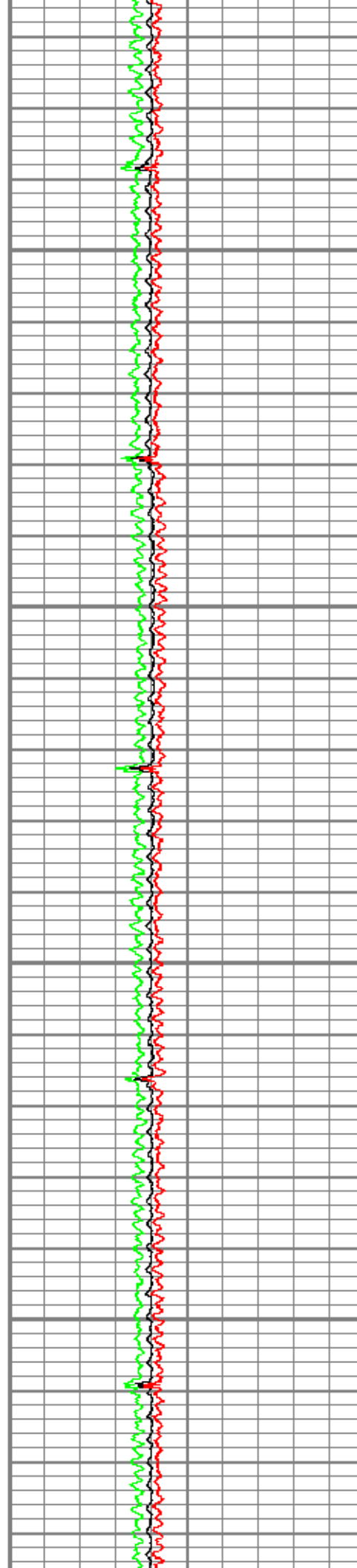


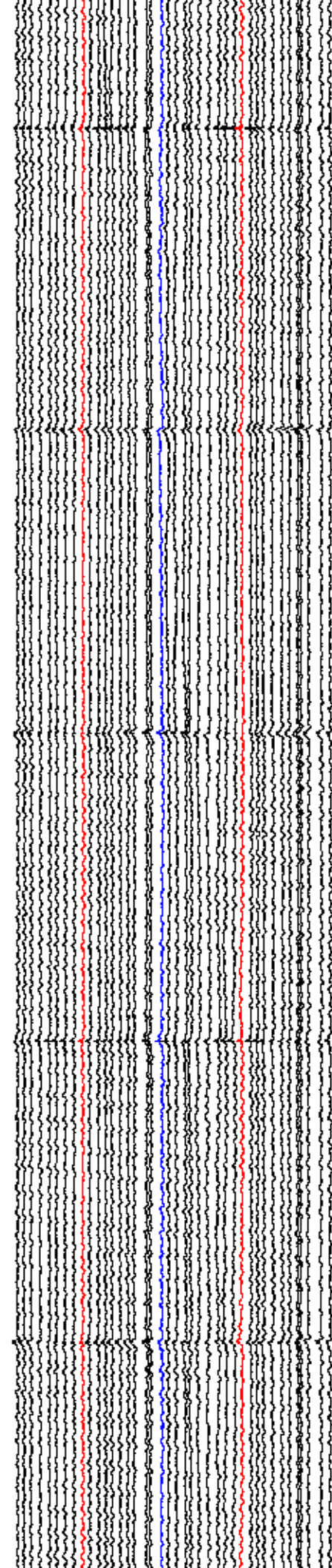
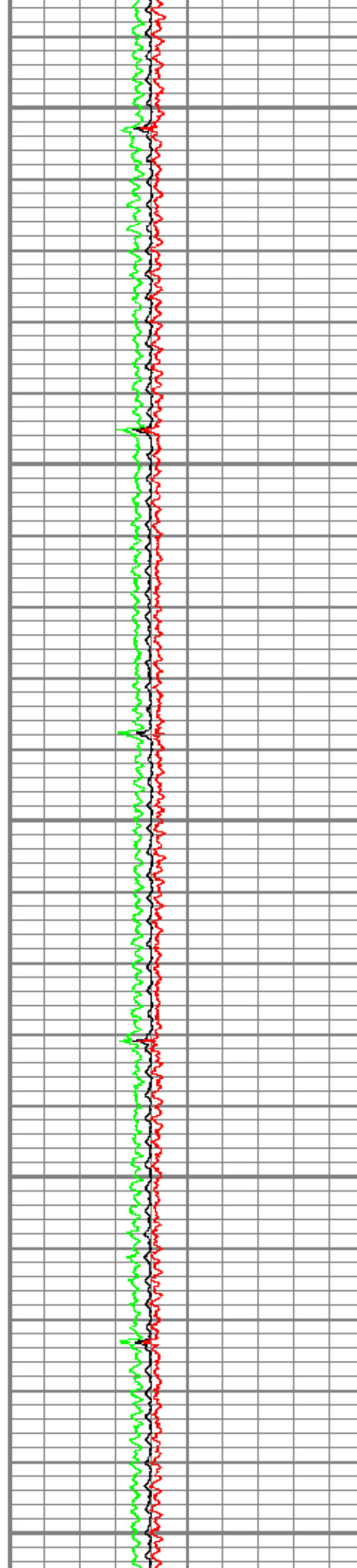
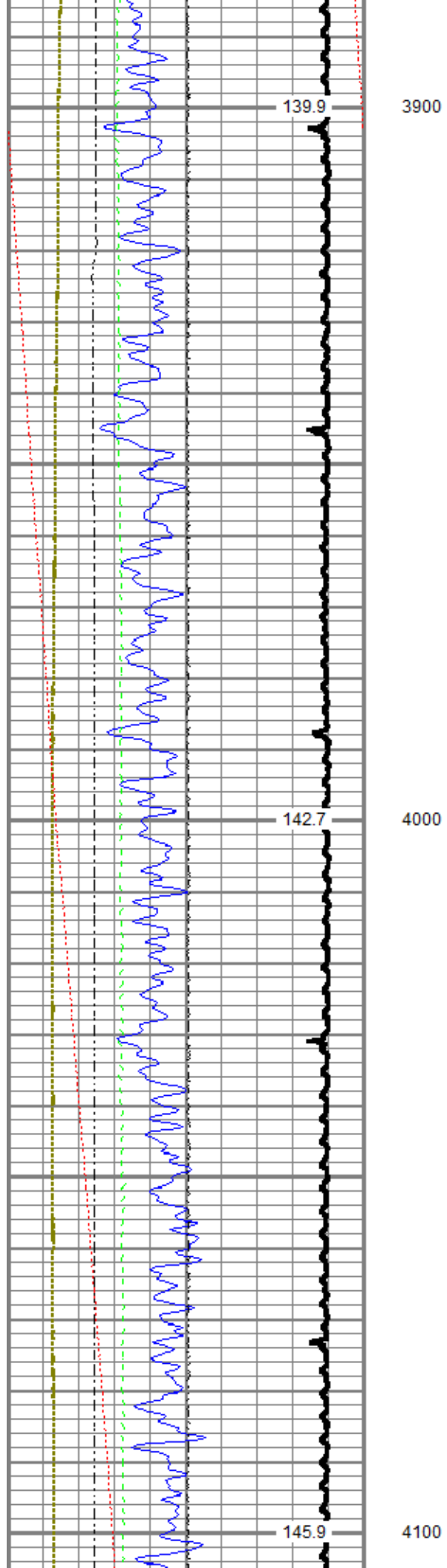


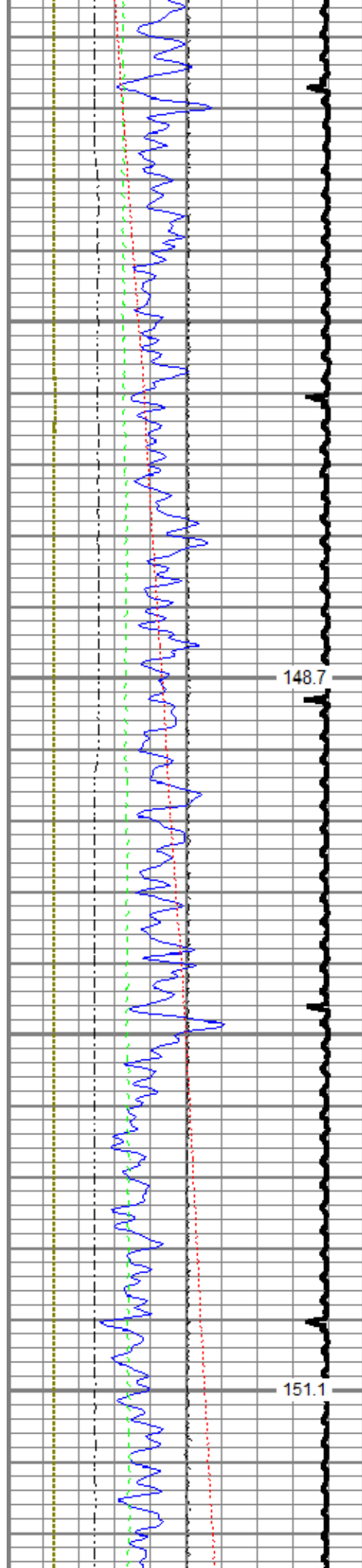


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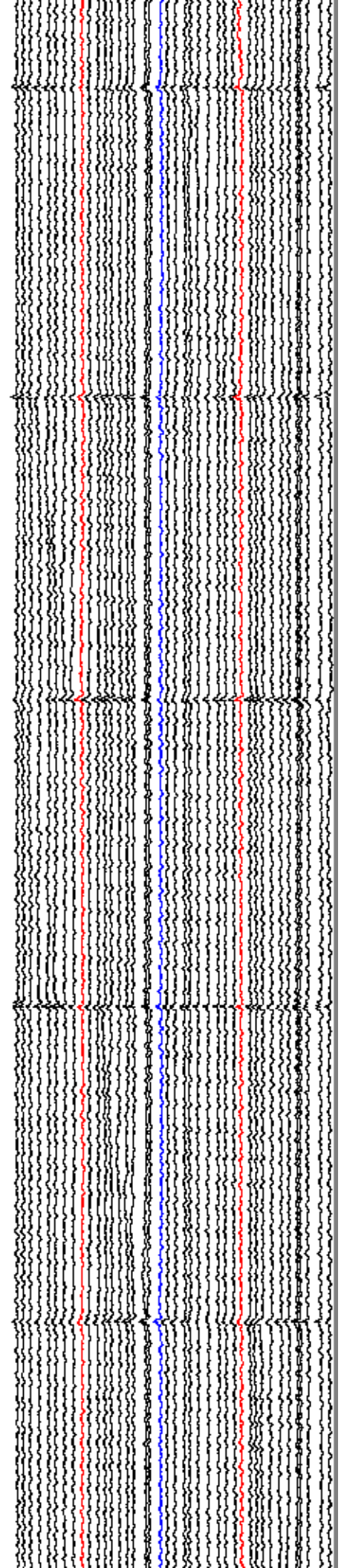
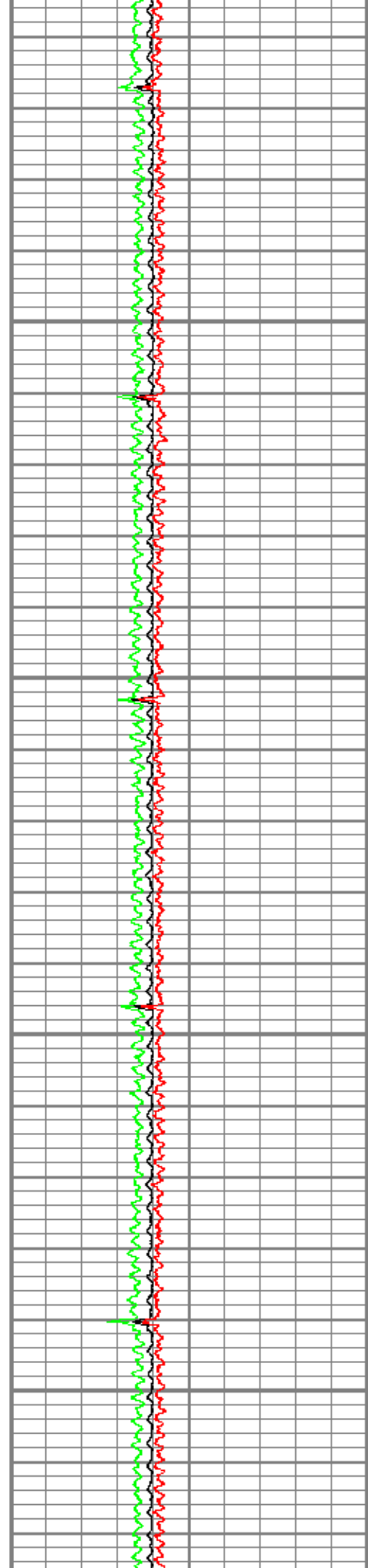


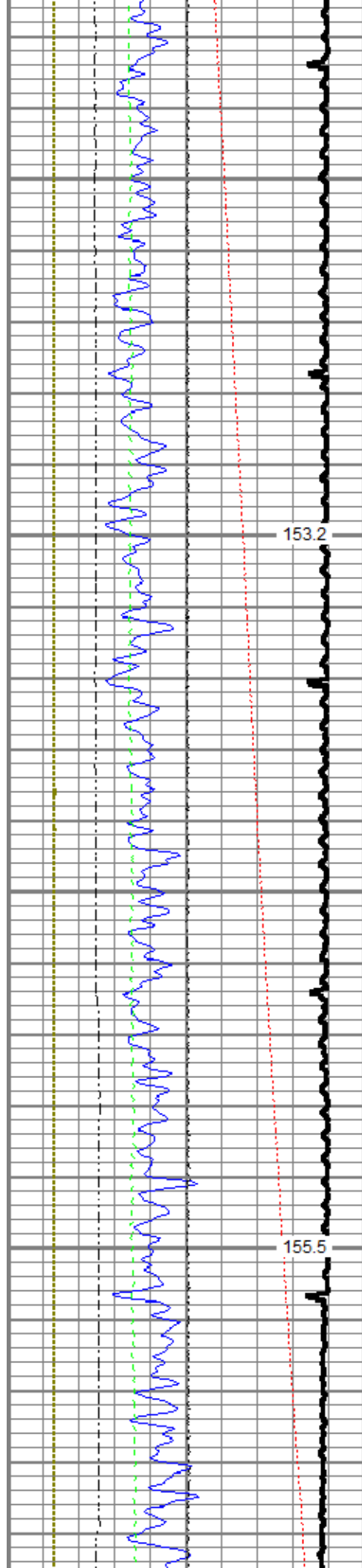




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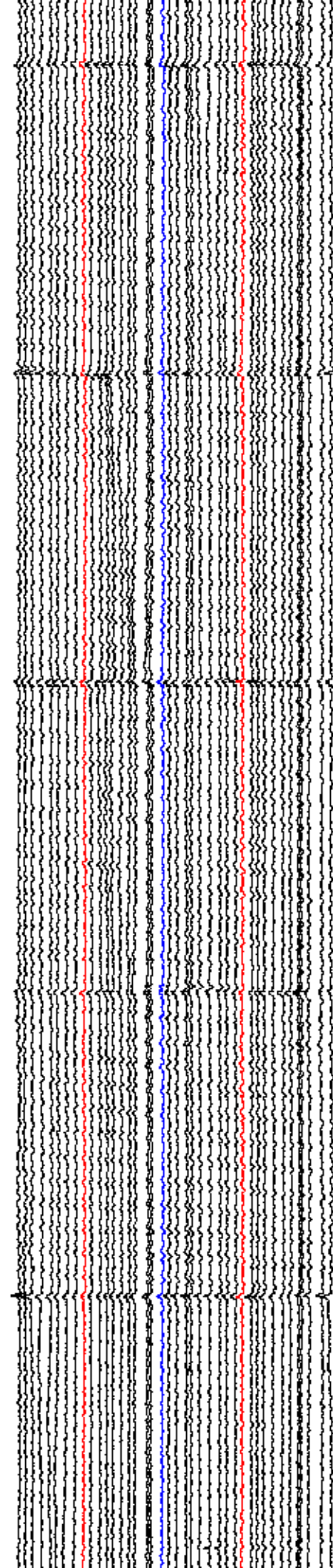
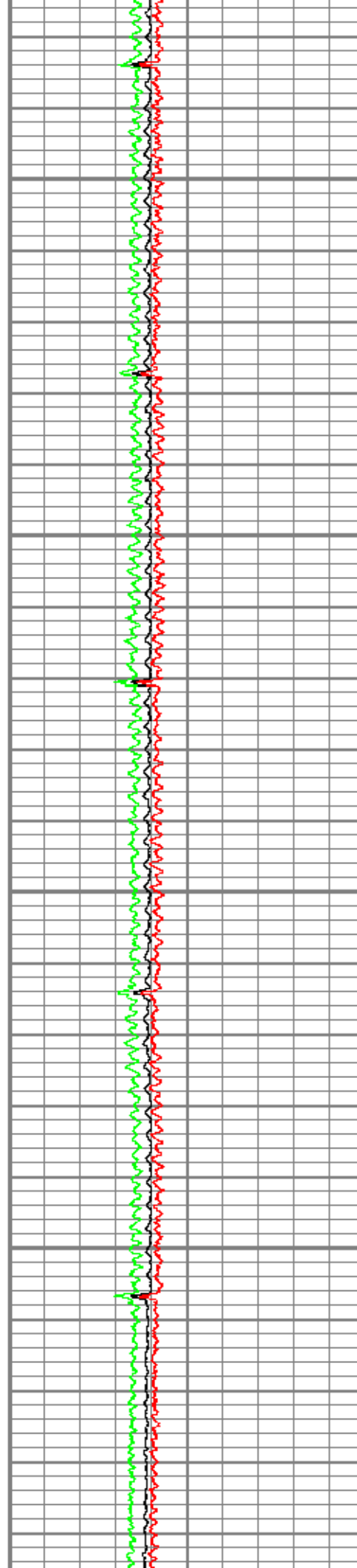
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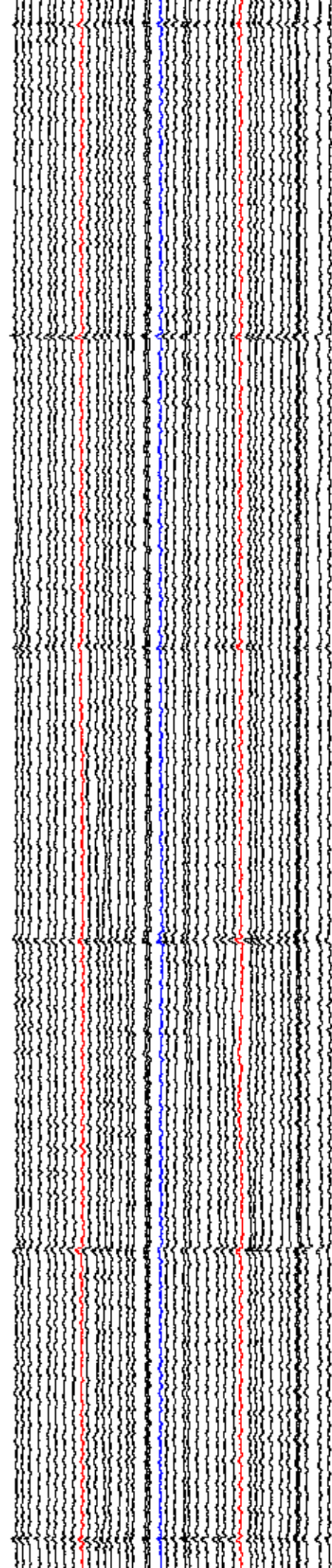
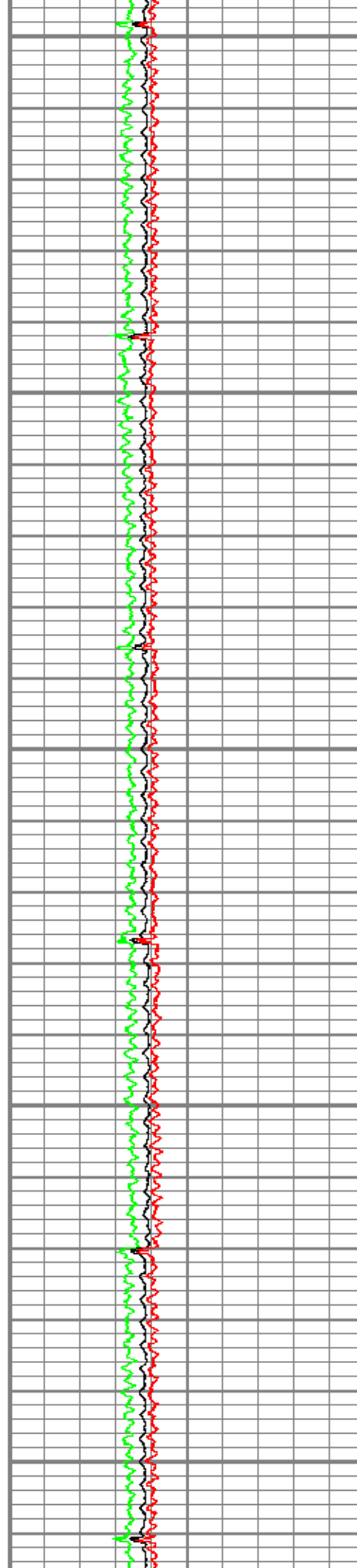
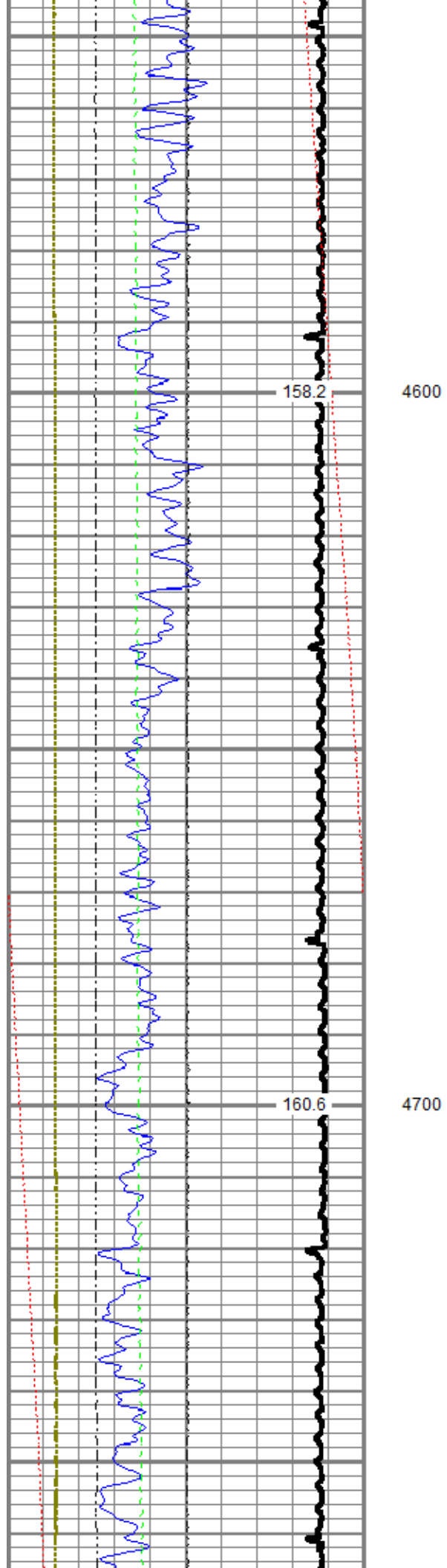


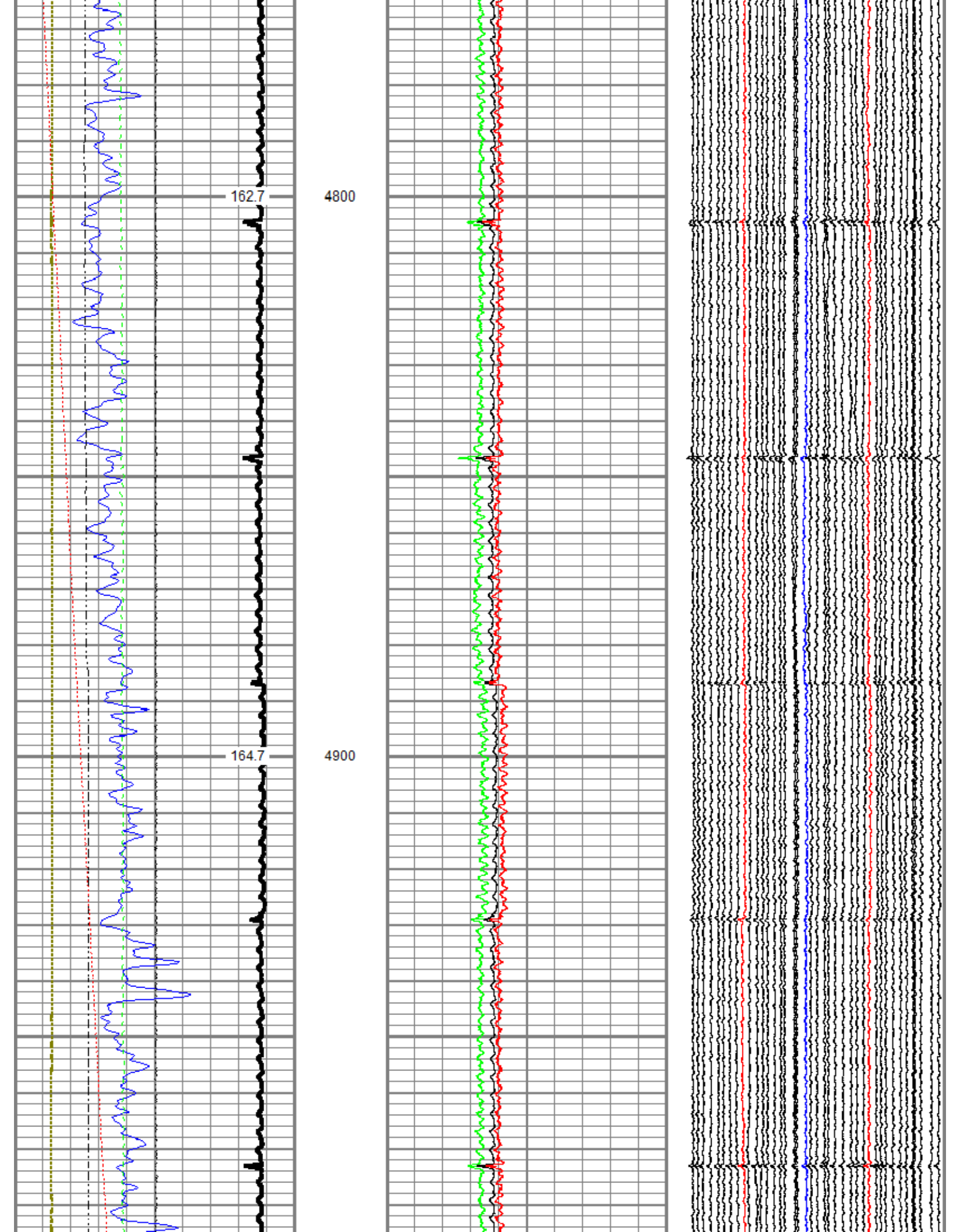


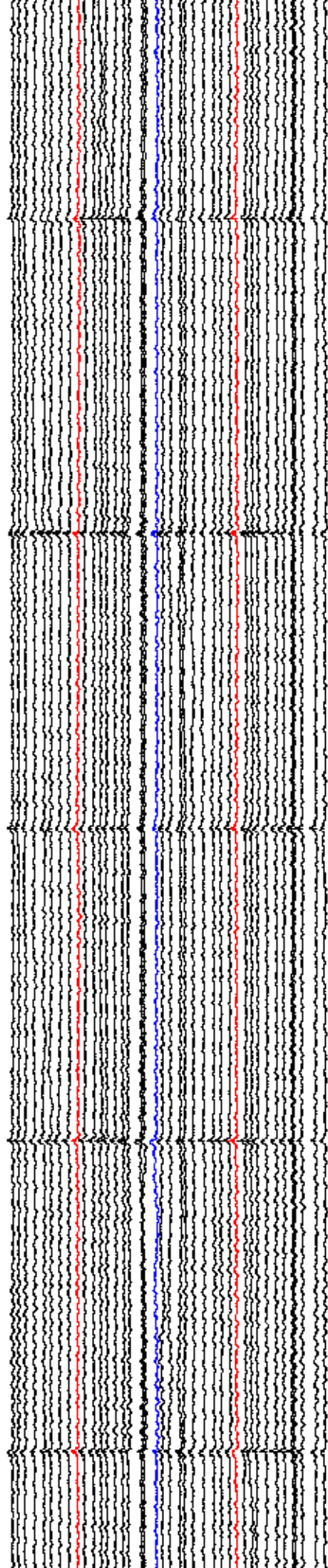
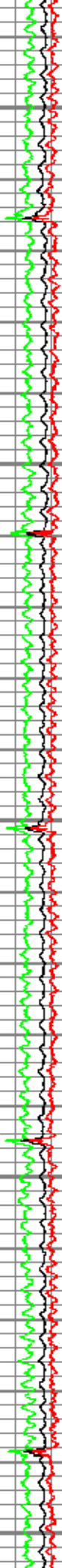
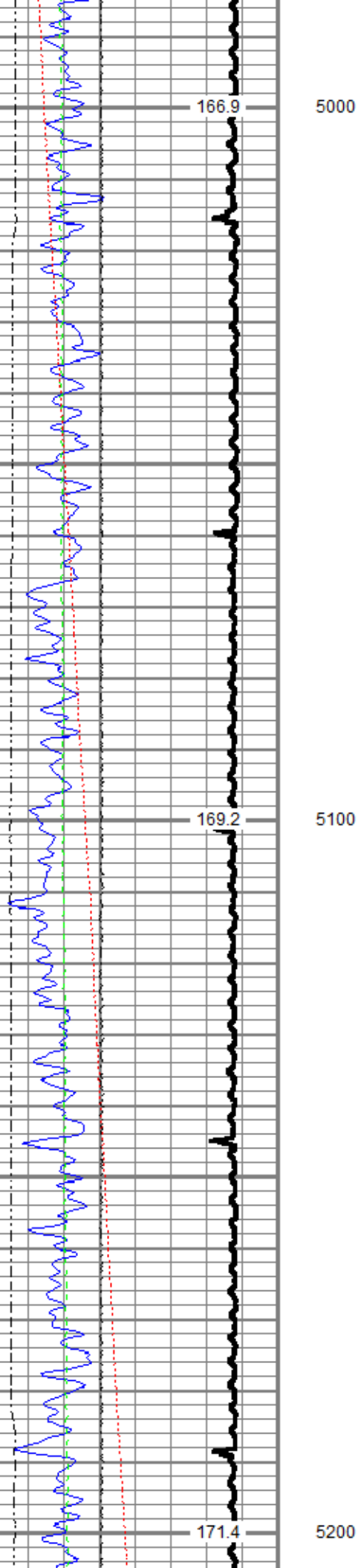
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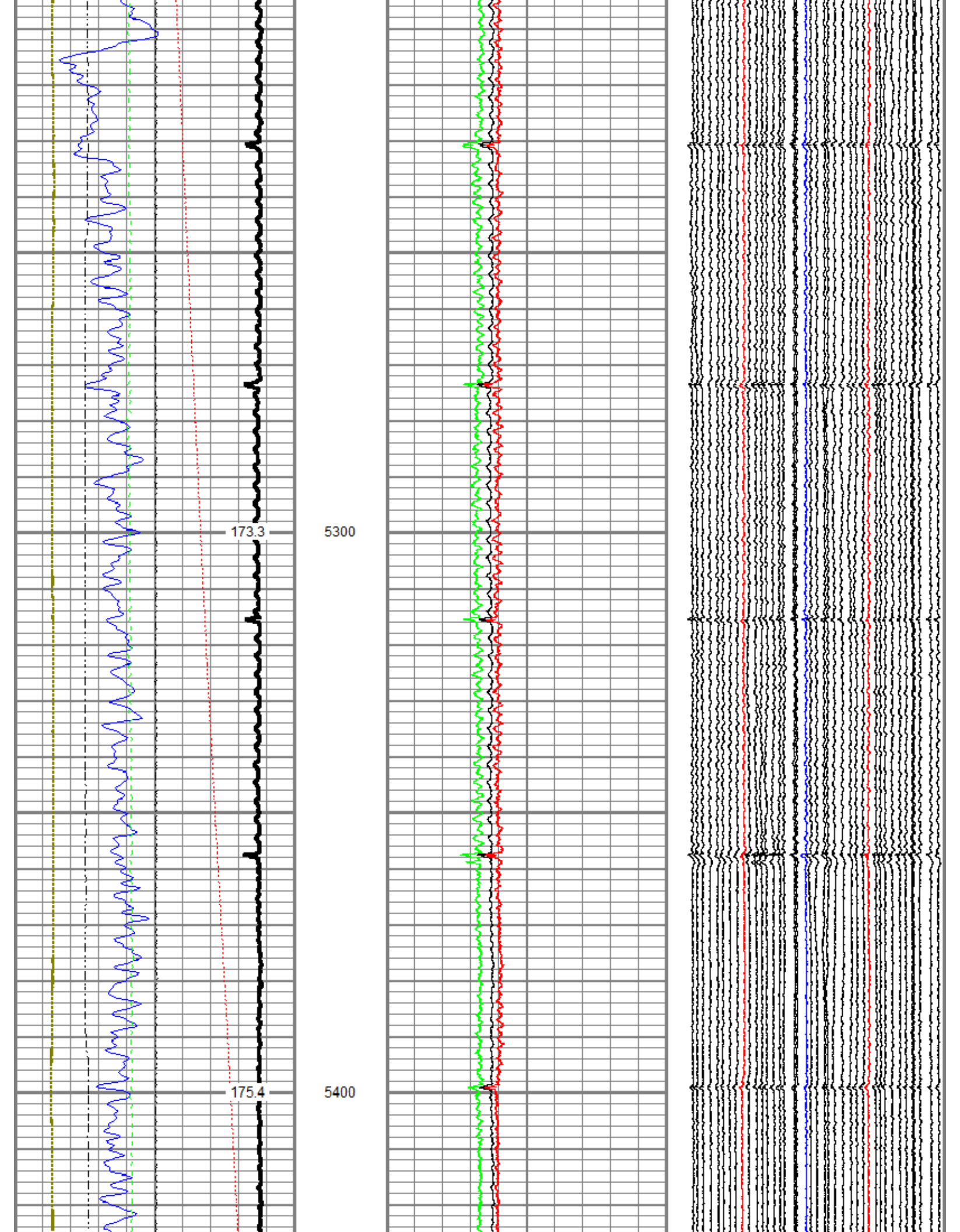
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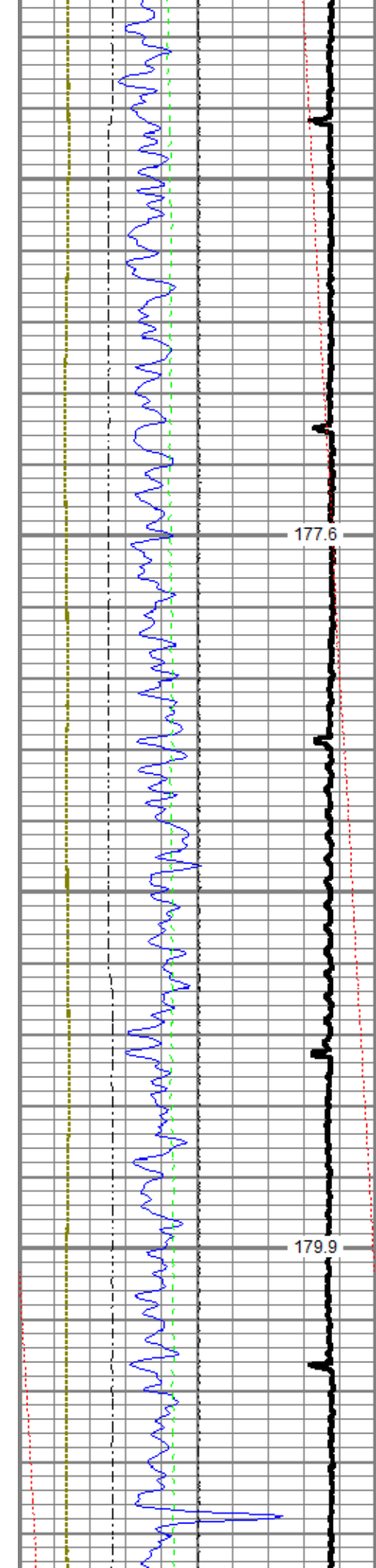






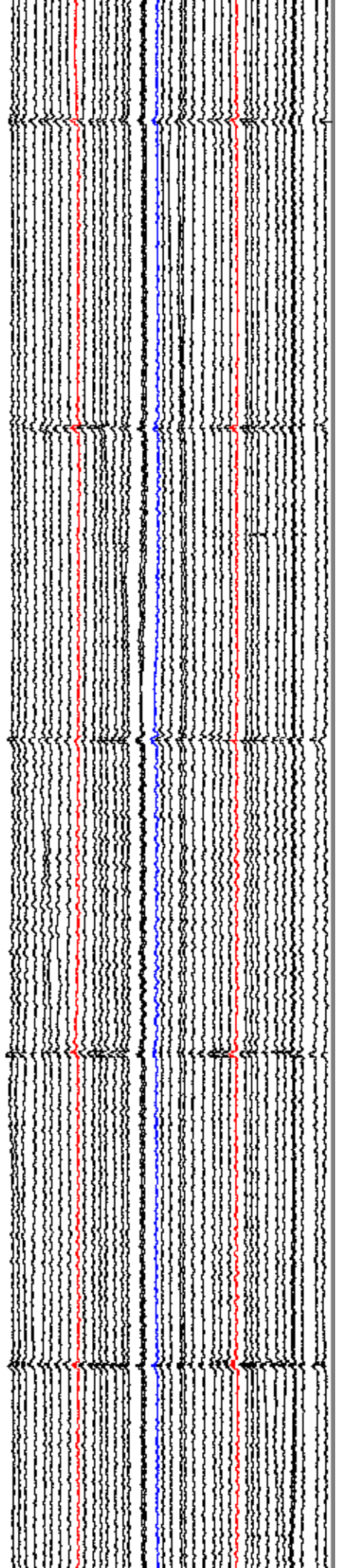
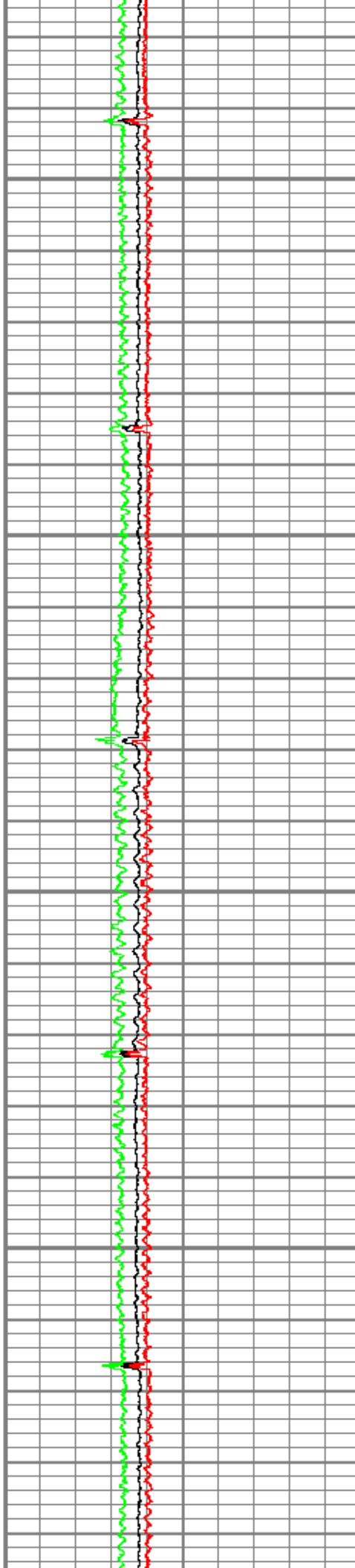


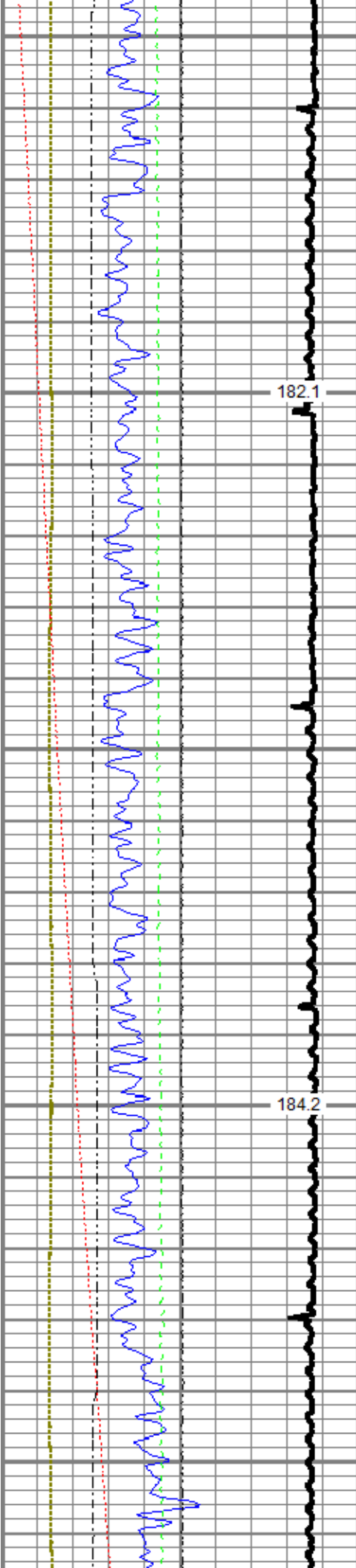




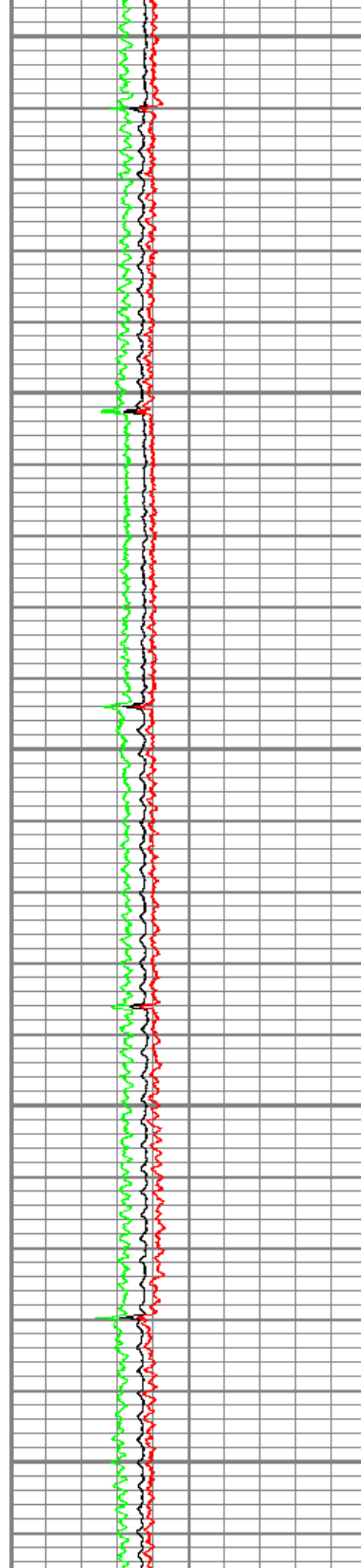
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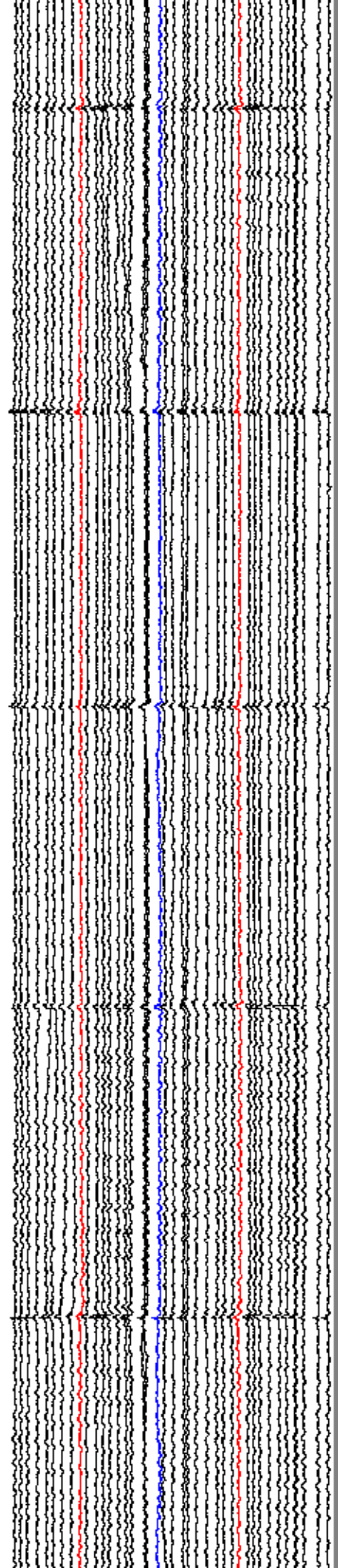


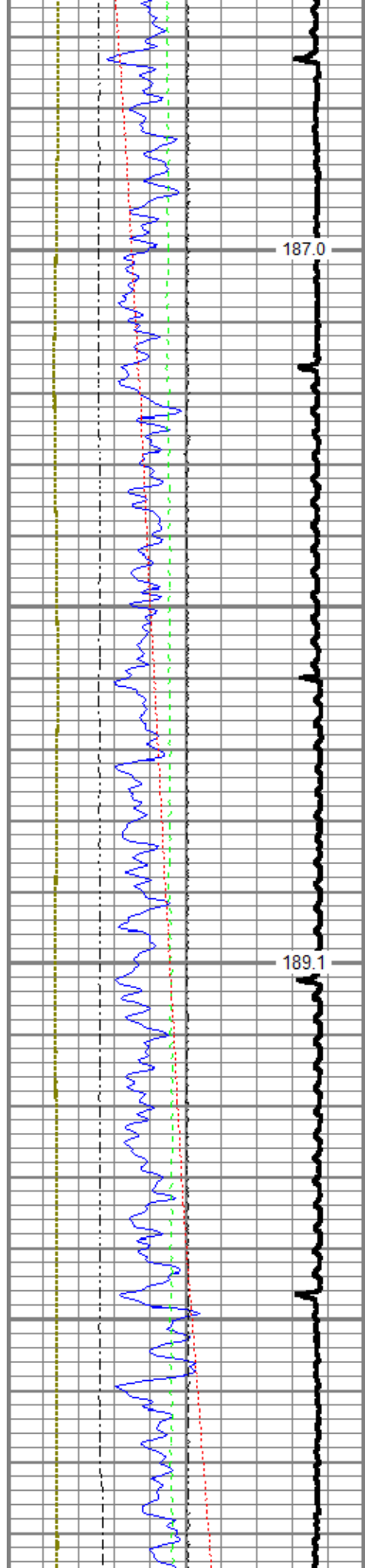


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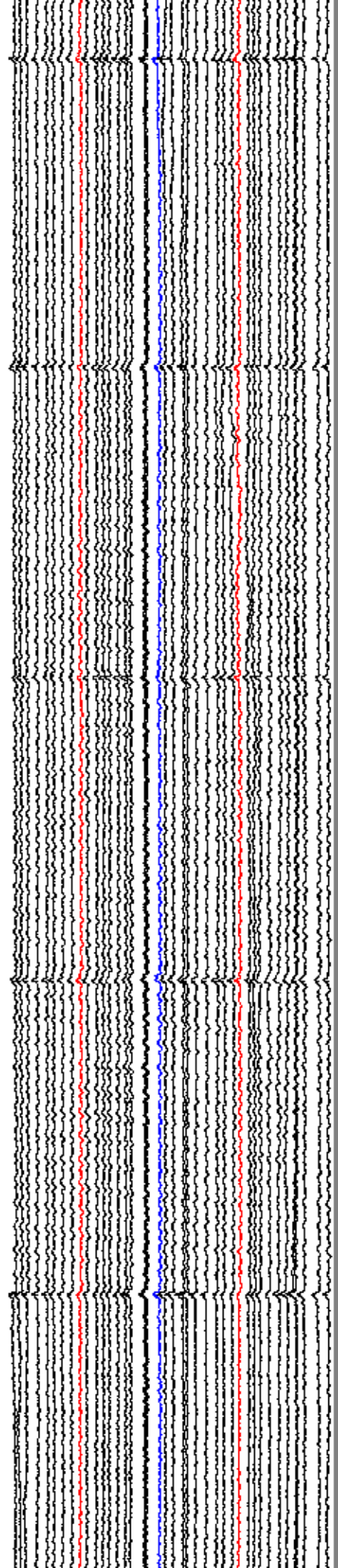
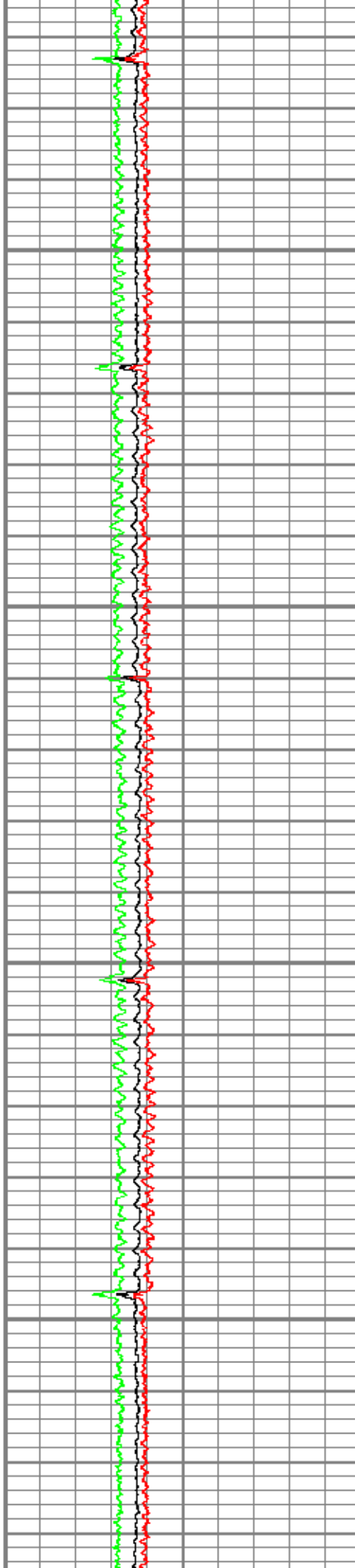
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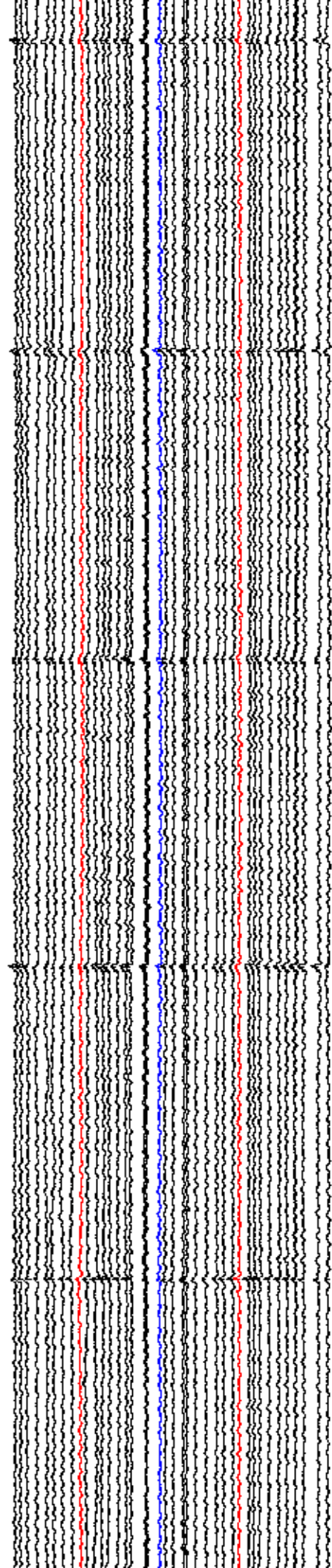
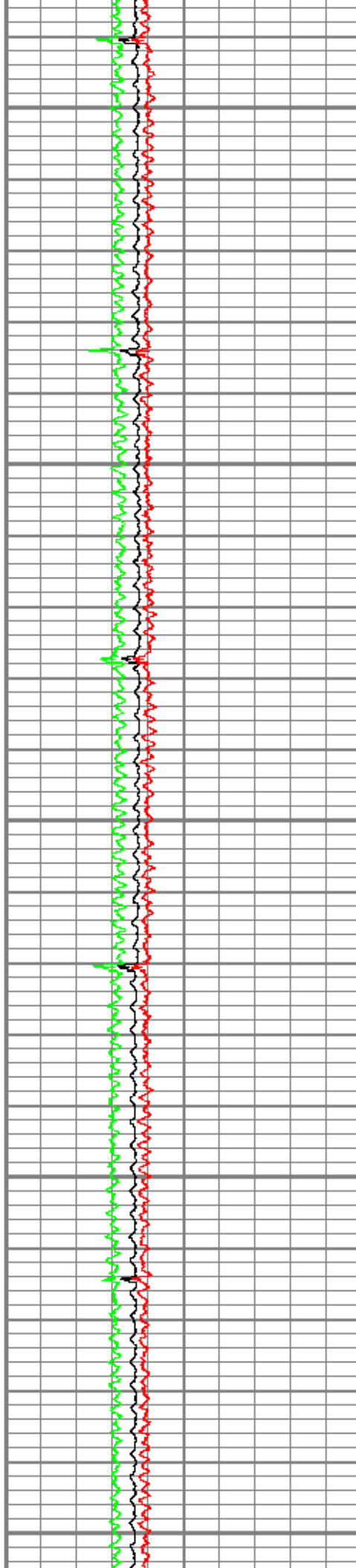
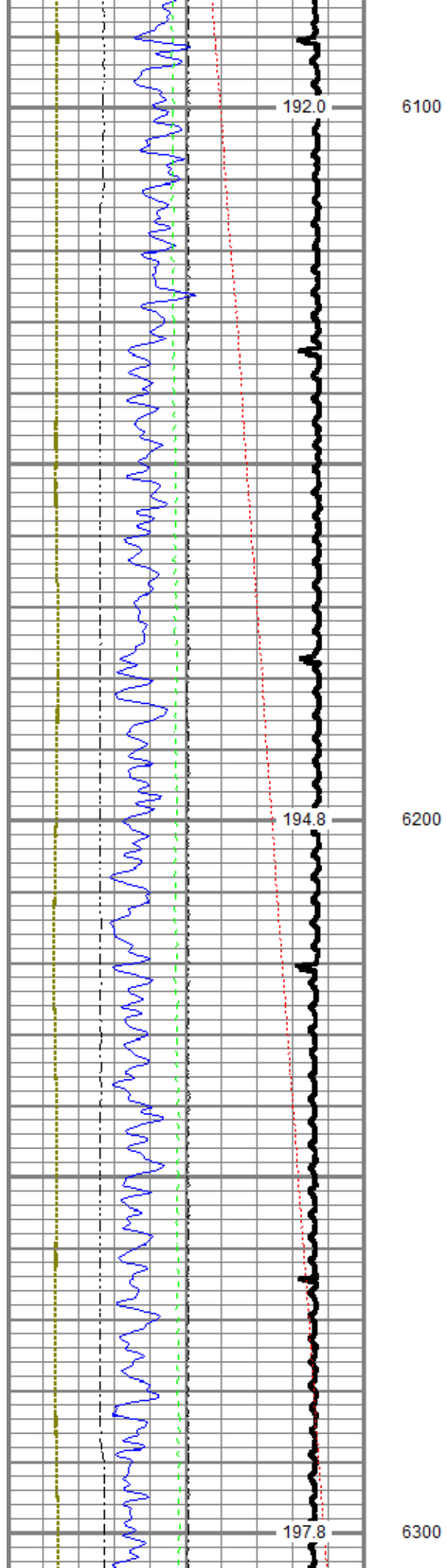


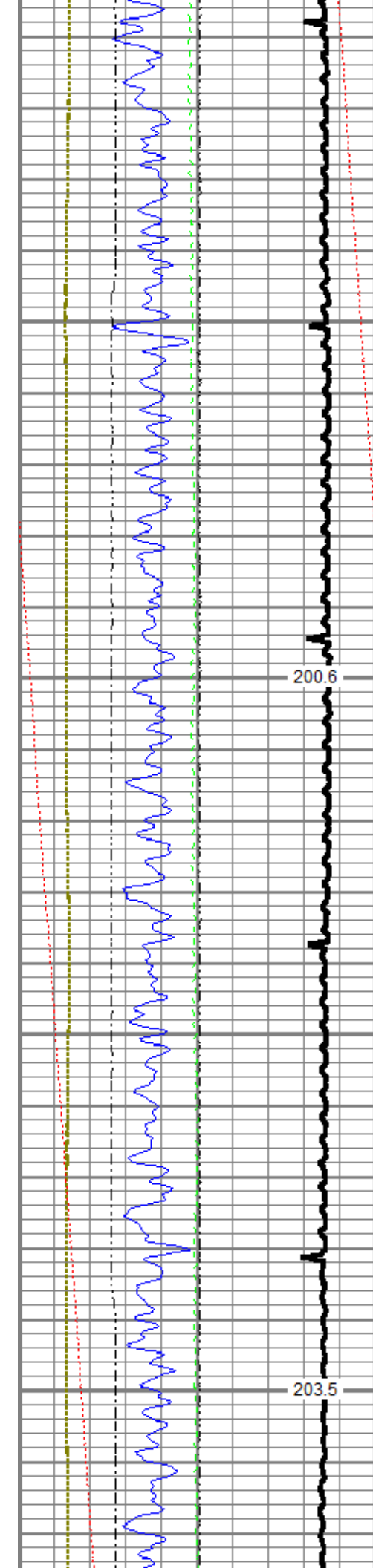


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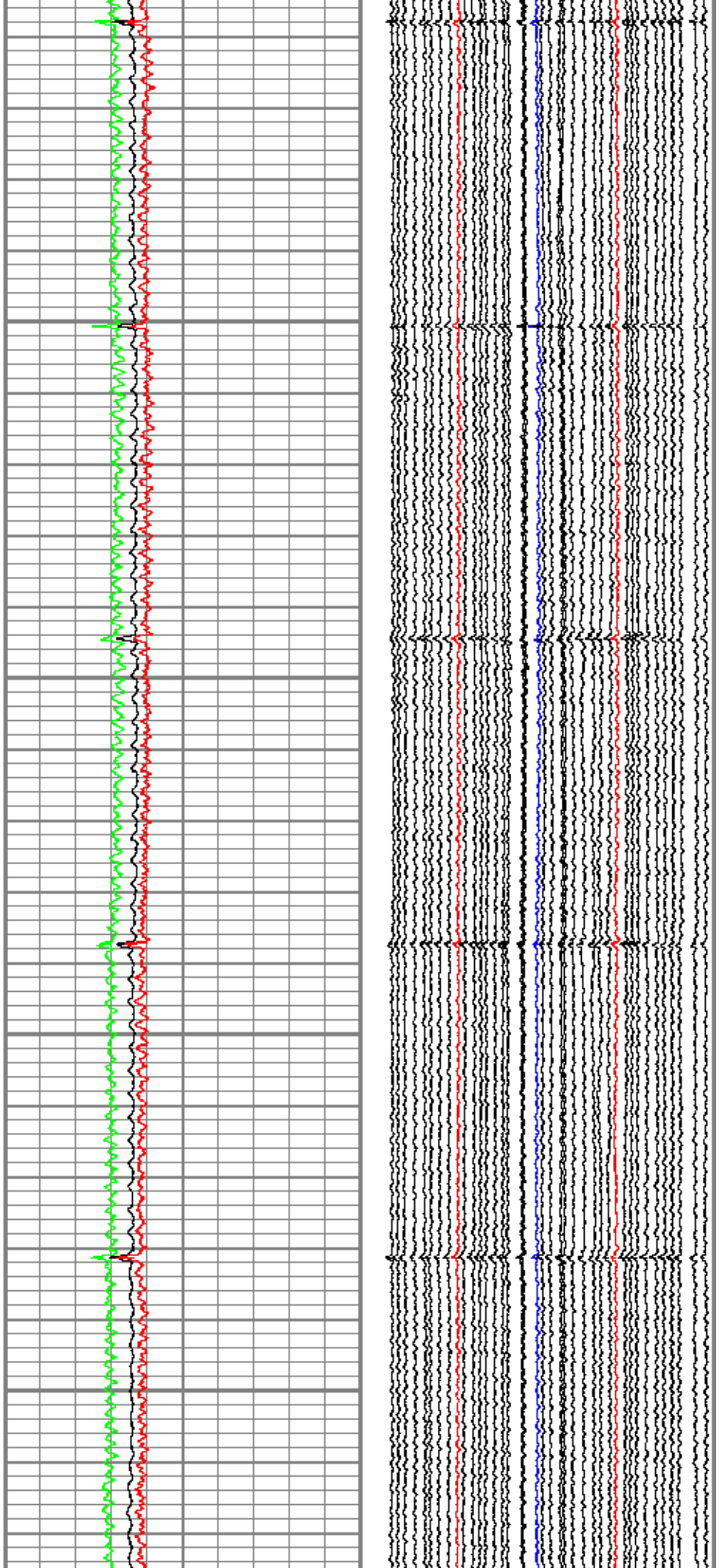


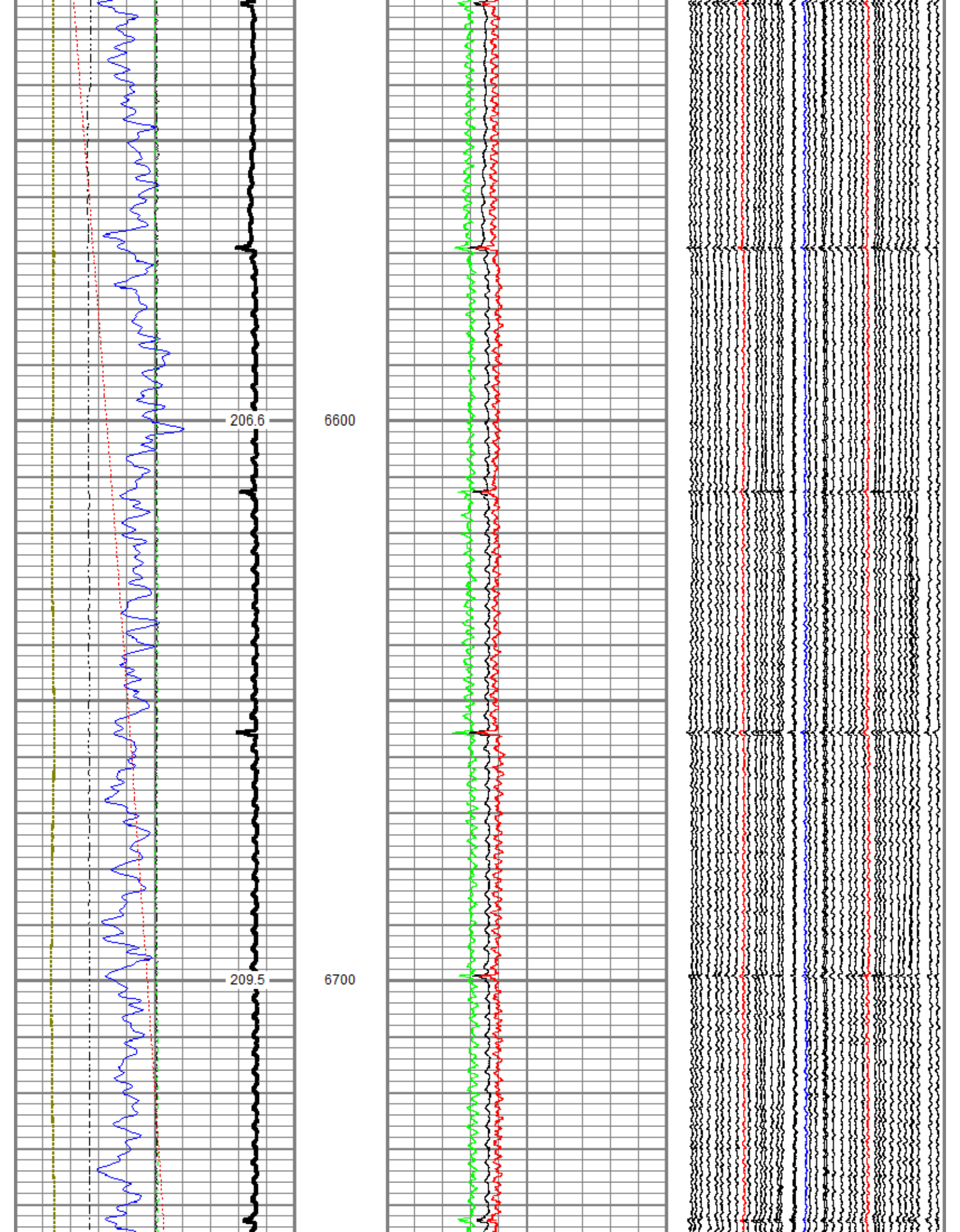


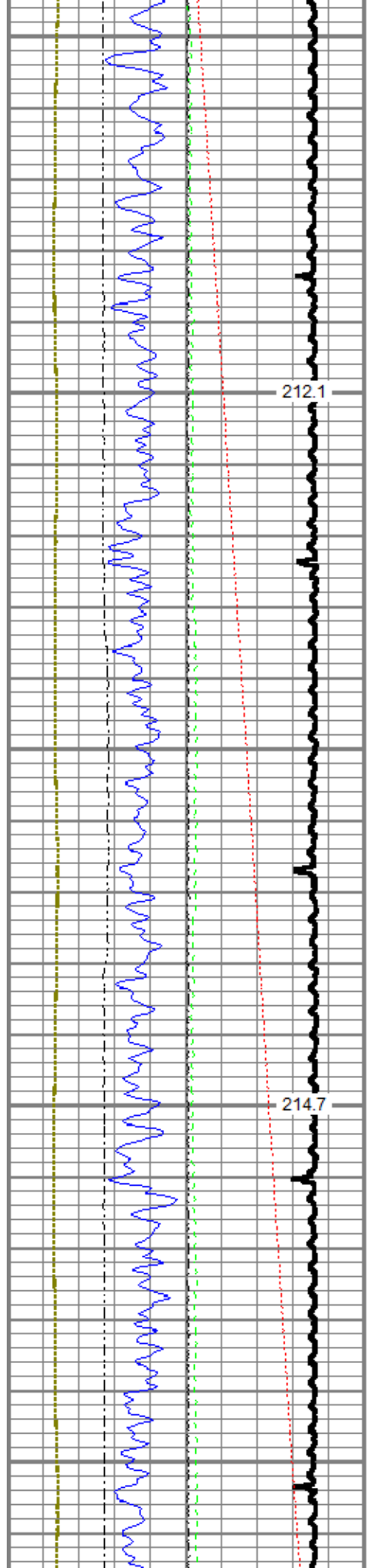


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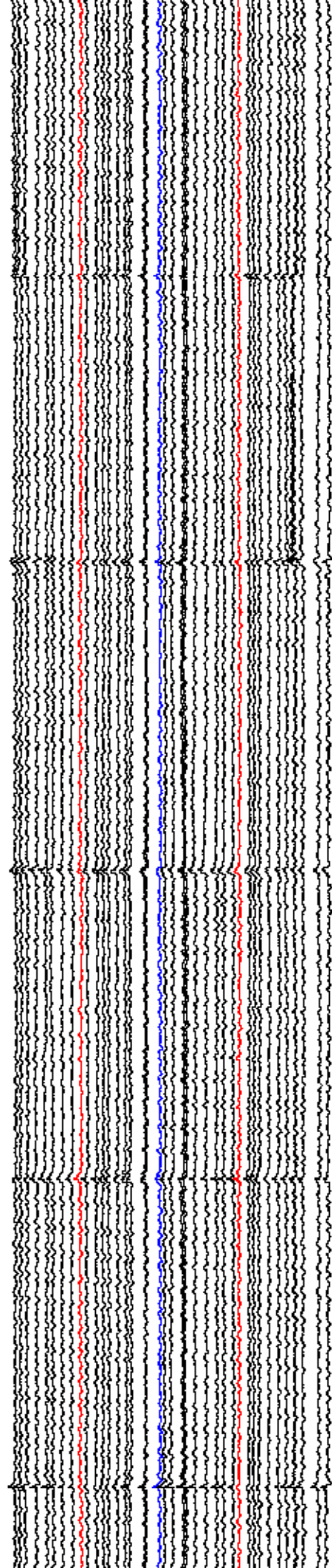
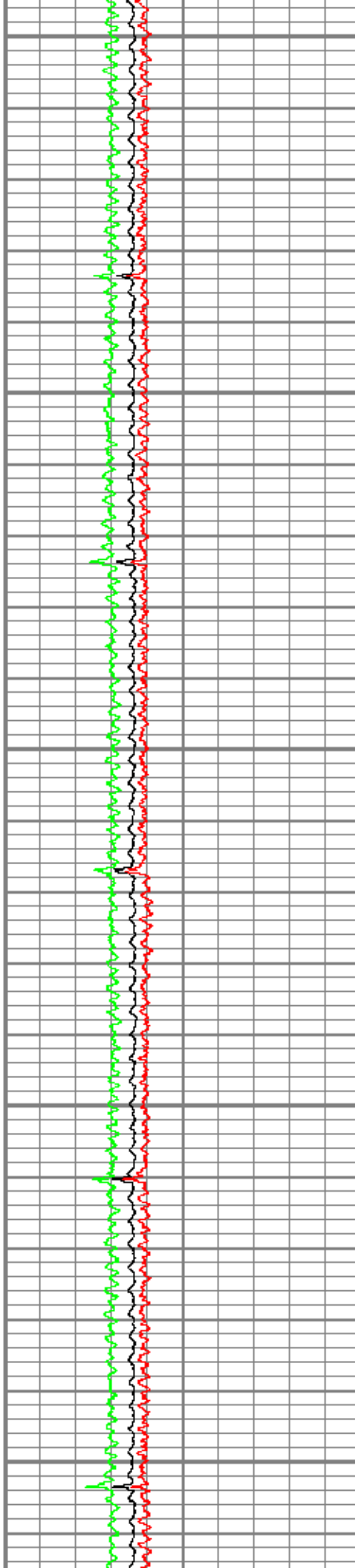


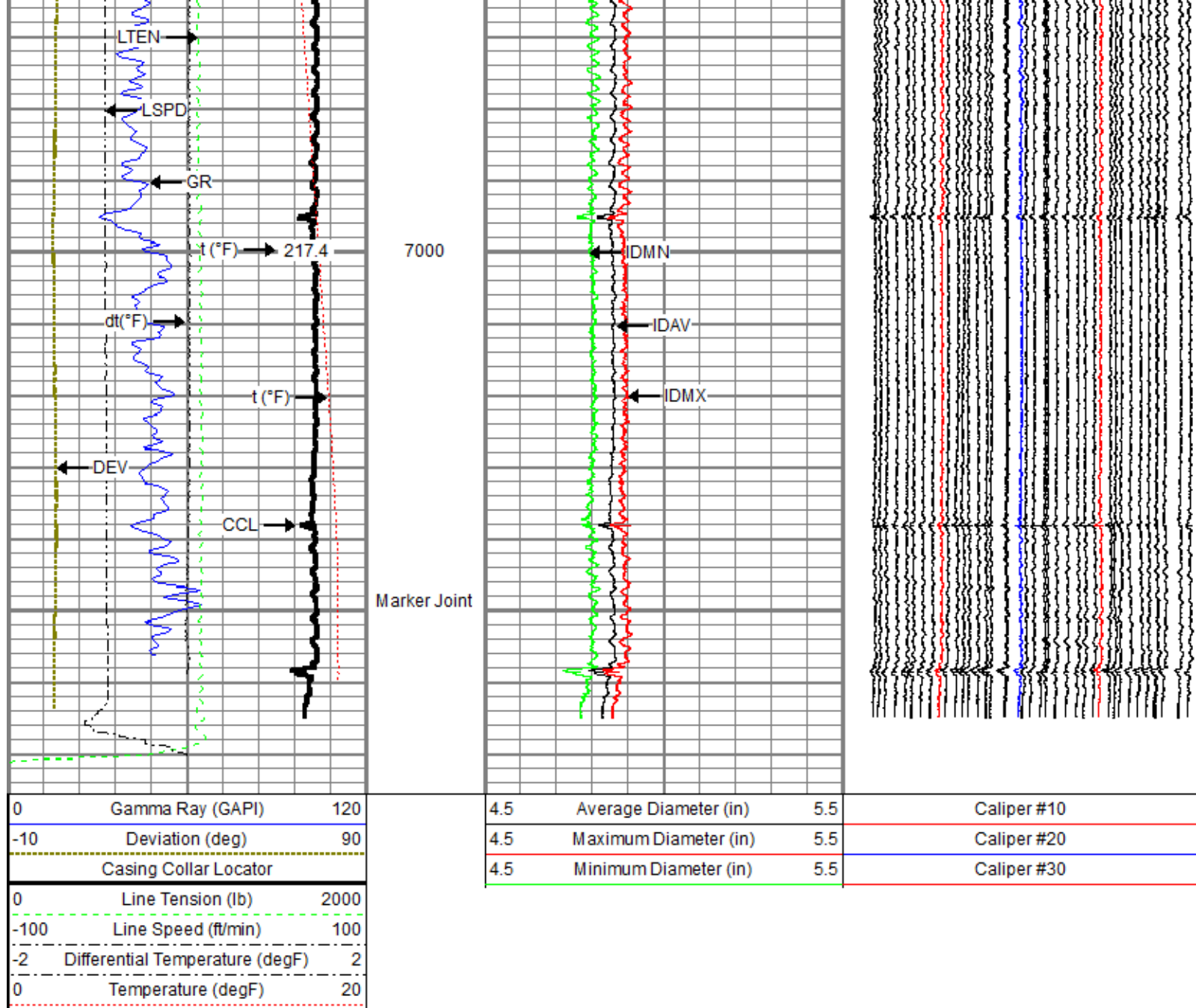




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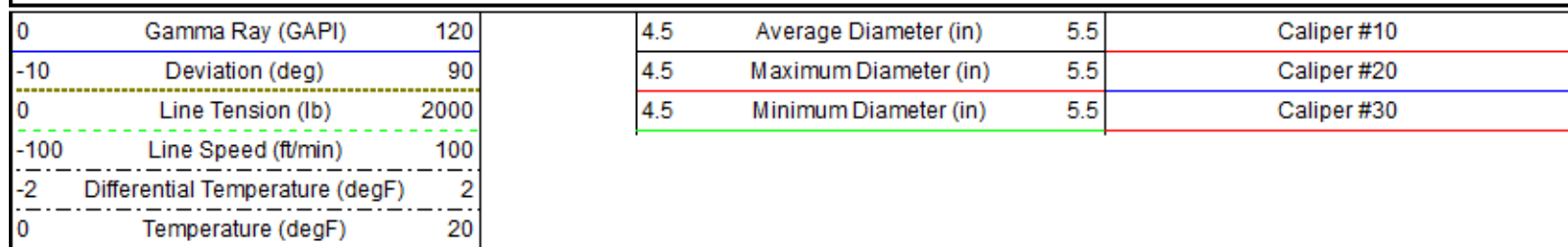


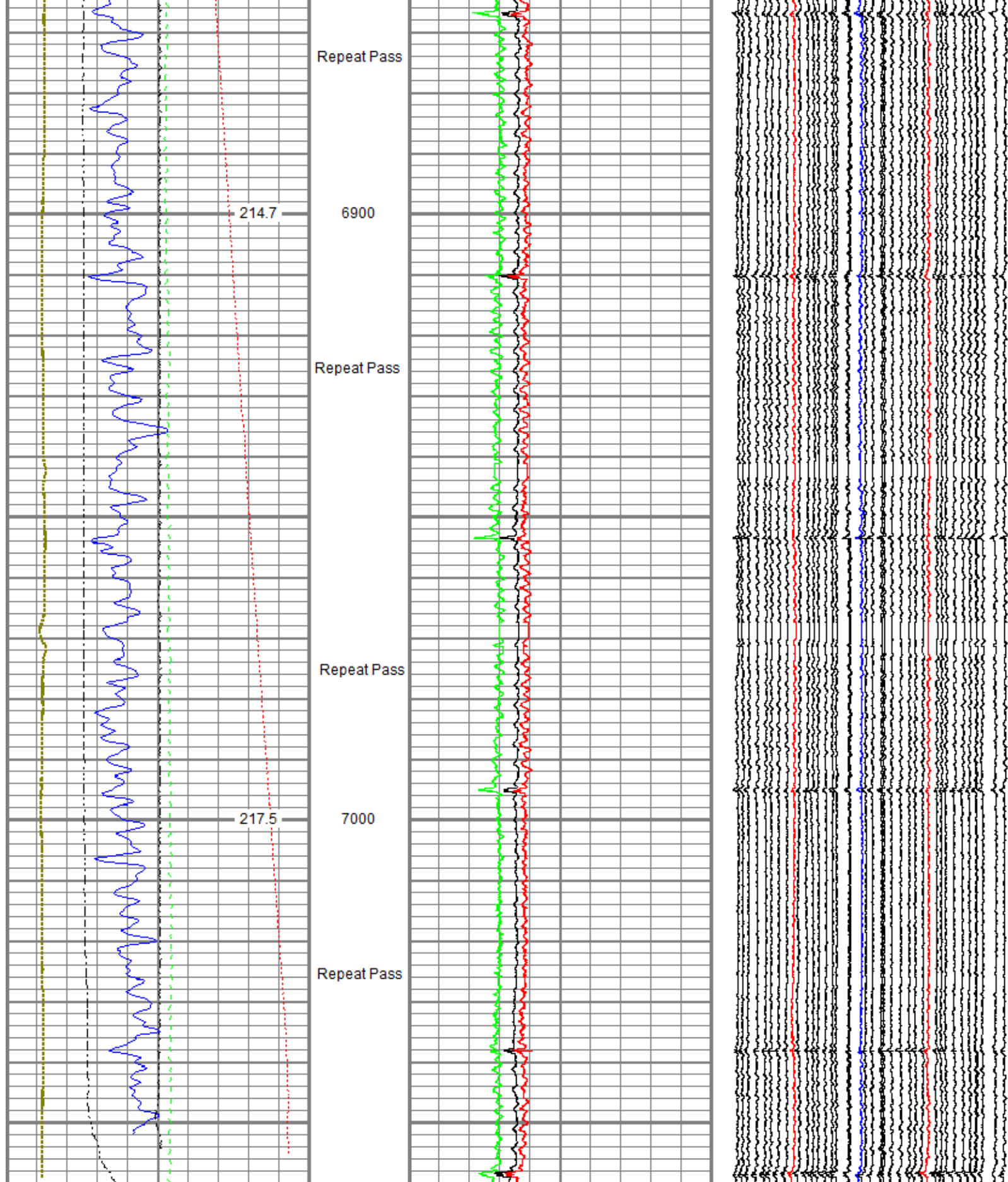


## Repeat Pass

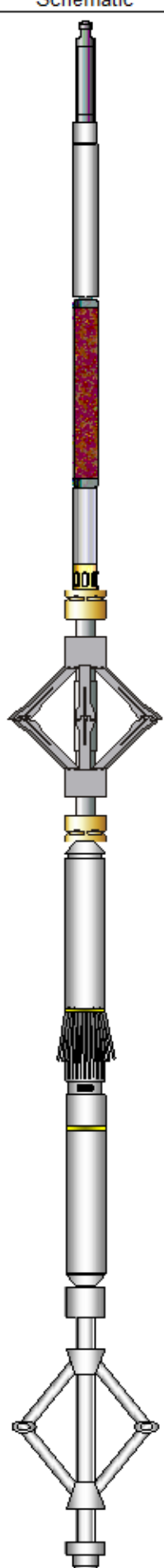
Recorded With 0 PSI Surface Induced Pressure

Database File 01\_anadarko\anadarko\_cowboy 21-5hz\0512347100\_anadarko\_cowboy 21-5hz\_mit\_11-09-18.db  
 Dataset Pathname Repeat  
 Presentation Format ros\_55mit40sx  
 Dataset Creation Fri Nov 09 12:01:54 2018  
 Charted by Depth in Feet scaled 1:240





0	Gamma Ray (GAPI)	120	4.5	Average Diameter (in)	5.5	Caliper #10
-10	Deviation (deg)	90	4.5	Maximum Diameter (in)	5.5	Caliper #20
0	Line Tension (lb)	2000	4.5	Minimum Diameter (in)	5.5	Caliper #30
-100	Line Speed (ft/min)	100				
-2	Differential Temperature (degF)	2				
0	Temperature (degF)	20				

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)	
GR	11.56		Titan CHD-14375 GO Titan 1-7/16" Assembled Electric Cable Head w/ 1" Fishing Neck	1.03	1.44	3.60	
			UW AGS-001 (211461) Sondex 1-11/16" Ultrawire Adapter - GO Box to Sondex UW Pin	0.21	1.69	1.00	
			UW XTU-002 (10017430) Sondex 1-11/16" Ultrawire Toolbus Crossover to Ultralink Telemetry	1.58	1.69	6.50	
TEMP	10.16		UW PGR-020 (050836) Sondex 1-11/16" Ultrawire Production Gamma Ray	1.92	1.69	9.50	
			UW PRT-016 (10024052) Sondex 1-11/16" Ultrawire Platinum Resistance Thermometer	1.04	1.69	5.20	
			UW CENT-DSS RAC 5 Arm 2-3/4" Roller Centralizer	2.55	2.75	32.00	
MIT	5.27		UW MIT-40 042 E (10012912) Sondex 2-3/4" Ultrawire 40-Arm Multifinger Imaging Tool Ext.	4.54	2.75	65.00	
			UW CENT-PRC 057 4 Arm 2-3/4" Production Roller Centralizer	2.71	2.75	32.00	
			UW BUL-006 (031422) Sondex 1-11/16" Ultrawire Bullnose Terminator Sub	0.22	1.69	1.20	
TSTAMP	0.00						

Dataset: 0512347100\_Anadarko\_Cowboy 21-5HZ\_MIT\_11-09-18.db: field/well/run1/merge2  
Total length: 15.81 ft

Total weight: 156.00 lb  
O.D.: 2.75 in

#### Calibration Report

Database File C:\ProgramData\Warrior\Data\01\_Anadarko\Anadarko\_Cowboy 21-5HZ\0512347100\_Anadarko\_Cowboy 21-5HZ\_MIT\_11-09-18  
Dataset Pathname Cal  
Dataset Creation Fri Nov 09 15:09:39 2018

#### Multifinger Imaging Tool Calibration Report

Serial Number: 10012912  
Number of Fingers: 40  
Tool Model: 40 042 E

#### Inclinometer Calibration Report

Performed: Mon Jul 15 09:39:36 2013  
Calibration Angle: 45

	Inc X	Inc Y
Vertical:	1968	1974
Finger 1 up:	1740	1744
Finger 31 up:	2215	1741
Finger 21 up:	2205	2224
Finger 11 up:	1731	2217
Sensitivity ratio:	0.992868	
X-axis angle:	134.307	
Deviation const:	335.589	

#### Finger Calibration Report

Performed: Fri Nov 09 11:09:46 2018

Ring size:	4		5		6		7
(in)		Sens		Sens		Sens	
Finger 01:	1064	360.0	1424	390.0	1814	404.0	2218
Finger 02:	1205	369.0	1574	390.0	1964	395.0	2359
Finger 03:	1083	374.0	1457	406.0	1863	421.0	2284
Finger 04:	1122	361.0	1483	394.0	1877	412.0	2289
Finger 05:	1123	365.0	1488	397.0	1885	415.0	2300
Finger 06:	1118	370.0	1488	400.0	1888	413.0	2301
Finger 07:	1104	372.0	1476	403.0	1879	414.0	2293
Finger 08:	1138	364.0	1502	395.0	1897	414.0	2311
Finger 09:	1125	365.0	1490	395.0	1885	412.0	2297
Finger 10:	1133	363.0	1496	394.0	1890	412.0	2302
Finger 11:	1130	360.0	1490	391.0	1881	408.0	2289
Finger 12:	1132	359.0	1491	389.0	1880	412.0	2292
Finger 13:	1143	357.0	1500	385.0	1885	402.0	2287
Finger 14:	1124	361.0	1485	392.0	1877	417.0	2294
Finger 15:	1084	367.0	1451	403.0	1854	430.0	2284
Finger 16:	1090	363.0	1453	403.0	1856	431.0	2287
Finger 17:	1001	343.0	1344	388.0	1732	434.0	2166
Finger 18:	1134	355.0	1489	386.0	1875	413.0	2288
Finger 19:	1102	357.0	1459	390.0	1849	422.0	2271
Finger 20:	1088	357.0	1445	396.0	1841	431.0	2272
Finger 21:	1090	362.0	1452	395.0	1847	416.0	2263
Finger 22:	1065	363.0	1428	401.0	1829	432.0	2261
Finger 23:	1014	361.0	1375	407.0	1782	446.0	2228
Finger 24:	1099	358.0	1457	386.0	1843	406.0	2249
Finger 25:	1034	364.0	1398	405.0	1803	440.0	2243
Finger 26:	1157	350.0	1507	378.0	1885	397.0	2282
Finger 27:	1086	365.0	1451	398.0	1849	422.0	2271
Finger 28:	1121	358.0	1479	383.0	1862	408.0	2270
Finger 29:	1051	366.0	1417	403.0	1820	429.0	2249
Finger 30:	1081	364.0	1445	396.0	1841	419.0	2260
Finger 31:	1116	362.0	1478	388.0	1866	414.0	2280
Finger 32:	1175	395.0	1570	422.0	1992	436.0	2428
Finger 33:	1176	361.0	1537	374.0	1911	391.0	2302
Finger 34:	1111	371.0	1482	402.0	1884	418.0	2302
Finger 35:	985	341.0	1326	381.0	1707	406.0	2113
Finger 36:	1083	369.0	1452	402.0	1854	419.0	2273
Finger 37:	1127	370.0	1497	393.0	1890	408.0	2298
Finger 38:	1150	362.0	1512	387.0	1899	394.0	2293

Finger 39:	1161	364.0	1525	386.0	1911	395.0	2306
Finger 40:	1114	370.0	1484	400.0	1884	411.0	2295

Post Survey Calibration Check								
Performed:			Fri Nov 09 15:09:02 2018					
Ring size: (in)	4	Nom. wear	5	Nom. wear	6	Nom. wear	7	Nom. wear
Finger 01:	3.994	-0.003	4.996	-0.002	6.002	0.001	6.998	-0.001
Finger 02:	3.993	-0.003	4.997	-0.002	5.997	-0.002	6.998	-0.001
Finger 03:	3.987	-0.006	4.992	-0.004	5.996	-0.002	6.998	-0.001
Finger 04:	3.984	-0.008	5.000	-0.000	6.003	0.002	7.002	0.001
Finger 05:	3.975	-0.012	5.000	-0.000	5.996	-0.002	7.008	0.004
Finger 06:	3.992	-0.004	5.000	-0.000	5.998	-0.001	7.000	0.000
Finger 07:	3.992	-0.004	4.997	-0.001	5.996	-0.002	6.997	-0.001
Finger 08:	3.990	-0.005	5.000	0.000	5.998	-0.001	7.000	-0.000
Finger 09:	3.994	-0.003	5.000	0.000	6.002	0.001	6.998	-0.001
Finger 10:	3.989	-0.005	4.999	-0.001	6.000	0.000	7.001	0.000
Finger 11:	3.991	-0.005	5.002	0.001	5.999	-0.000	6.999	-0.000
Finger 12:	3.984	-0.008	4.998	-0.001	5.999	-0.001	7.008	0.004
Finger 13:	3.991	-0.005	5.000	0.000	5.999	-0.000	7.000	-0.000
Finger 14:	3.987	-0.007	4.997	-0.002	5.992	-0.004	6.989	-0.005
Finger 15:	3.989	-0.006	4.992	-0.004	5.997	-0.001	7.001	0.000
Finger 16:	3.979	-0.010	4.999	-0.000	5.996	-0.002	7.001	0.000
Finger 17:	3.986	-0.007	4.995	-0.002	5.998	-0.001	6.992	-0.004
Finger 18:	3.993	-0.003	4.996	-0.002	5.995	-0.002	6.998	-0.001
Finger 19:	3.989	-0.005	4.995	-0.002	5.993	-0.004	6.991	-0.004
Finger 20:	3.985	-0.007	4.994	-0.003	6.000	-0.000	7.001	0.000
Finger 21:	3.986	-0.007	4.999	-0.001	5.998	-0.001	7.000	0.000
Finger 22:	3.988	-0.006	4.996	-0.002	5.994	-0.003	6.998	-0.001
Finger 23:	3.988	-0.006	4.998	-0.001	6.001	0.001	7.002	0.001
Finger 24:	3.988	-0.006	4.995	-0.002	5.997	-0.002	6.995	-0.002
Finger 25:	3.992	-0.004	4.995	-0.002	5.998	-0.001	6.998	-0.001
Finger 26:	3.988	-0.006	4.995	-0.003	5.994	-0.003	7.002	0.001
Finger 27:	4.002	0.001	5.005	0.003	6.002	0.001	7.001	0.000
Finger 28:	3.990	-0.005	5.000	-0.000	6.002	0.001	7.003	0.001
Finger 29:	3.990	-0.005	4.997	-0.001	5.997	-0.002	7.008	0.004
Finger 30:	3.986	-0.007	4.994	-0.003	5.993	-0.004	6.995	-0.003
Finger 31:	3.990	-0.005	4.998	-0.001	6.006	0.003	7.003	0.002
Finger 32:	3.988	-0.006	4.993	-0.003	5.995	-0.002	6.993	-0.003
Finger 33:	3.970	-0.015	5.026	0.013	6.003	0.001	7.002	0.001
Finger 34:	3.986	-0.007	4.991	-0.005	5.991	-0.004	6.994	-0.003
Finger 35:	3.986	-0.007	4.995	-0.003	6.000	-0.000	7.001	0.001
Finger 36:	3.988	-0.006	4.996	-0.002	5.997	-0.002	6.999	-0.000
Finger 37:	3.994	-0.003	4.997	-0.001	5.999	-0.000	7.002	0.001
Finger 38:	3.984	-0.008	4.991	-0.005	5.992	-0.004	6.994	-0.003
Finger 39:	3.994	-0.003	4.992	-0.004	5.992	-0.004	6.992	-0.004
Finger 40:	3.990	-0.005	4.996	-0.002	5.995	-0.003	6.995	-0.003
Average:	3.988	-0.006	4.997	-0.001	5.997	-0.001	6.999	-0.001

Temperature Calibration Report					
Serial Number:			10024052		
Tool Model:			016		
Performed:			Mon Oct 01 10:54:16 2018		
Point #	Reading			Reference	
1	12242.00	cps		68.00	degF
2	18329.00	cps		104.00	degF
3	29563.00	cps		176.00	degF
4	41222.00	cps		248.00	degF
5	52988.00	cps		320.00	degF
6	58824.00	cps		356.00	degF
7		cps			degF
8		cps			degF
9		cps			degF
10		cps			degF

Gamma Ray Calibration Report	
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Serial Number:	050836
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Tool Model:	020	
Performed:	Mon Oct 01 10:55:18 2018	
Calibrator Value:	637.0	GAPI
Background Reading:	78.8	cps
Calibrator Reading:	1069.9	cps
Sensitivity:	0.6427	GAPI/cps



Company	Kerr-McGee Oil & Gas Onshore, L.P.
Well	Cowboy 21-5HZ
Field	Wattenberg
County	Weld
State	Colorado