



Radial Cement Bond  
Gamma Ray  
Casing Collar Log

Company TEP Rocky Mountain LLC		Well Federal SG 511-22		Field Grand Valley		County Garfield		State Colorado	
Location:		API #: 05-045-24136		Other Services		PN			
SEC 22 TWP 7S RGE 96W		Ground Level		Elevation		6090.8'			
Permanent Datum		Log Measured From		Kelly Bushing		24 FT		K.B. 6114.8'	
Drilling Measured From		Kelly Bushing		Elevation		6090.8'		D.F. ---	
Date		19-Mar-2019		Run Number		One			
Depth Driller		6105 FT		Depth Logger		6048 FT			
Bottom Logged Interval		6034 FT		Top Log Interval		Surface			
Open Hole Size		---		Type Fluid		Water			
Density / Viscosity		8.34 lb/gal		Max. Recorded Temp.		173°F			
Estimated Cement Top		See Log		Time Well Ready		ROA			
Time Logger on Bottom		08-15		Equipment Number		HD-0359			
Location		Grand Junction, CO		Recorded By		J. Donnelly			
Witnessed By		Dustin Welsh		Borehole Record		Tubing Record			
Run Number		Bit		From		To		Size	
								Weight	
								From	
								To	
Casing Record		Size (in)		Wgt (lbs/ft)		Grade		Top	
Surface Casing		9 5/8		32.3		H-40		Surface	
Intermediate #1		4 1/2		11.6		P-110		Surface	
Intermediate #2								Bottom	
Inner								1035 FT	
								6062 FT	

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

Log ran as per customer request  
Depth referenced to Kelly Bushing at 24 FT  
Marker Joints Logged from 2635-2656 FT and 3486-3508 FT  
Log ran from 6034 FT to Surface  
Recorded with 0 PSI Surface Induced Pressure

Thank you for choosing Reliance Oilfield Services, LLC!

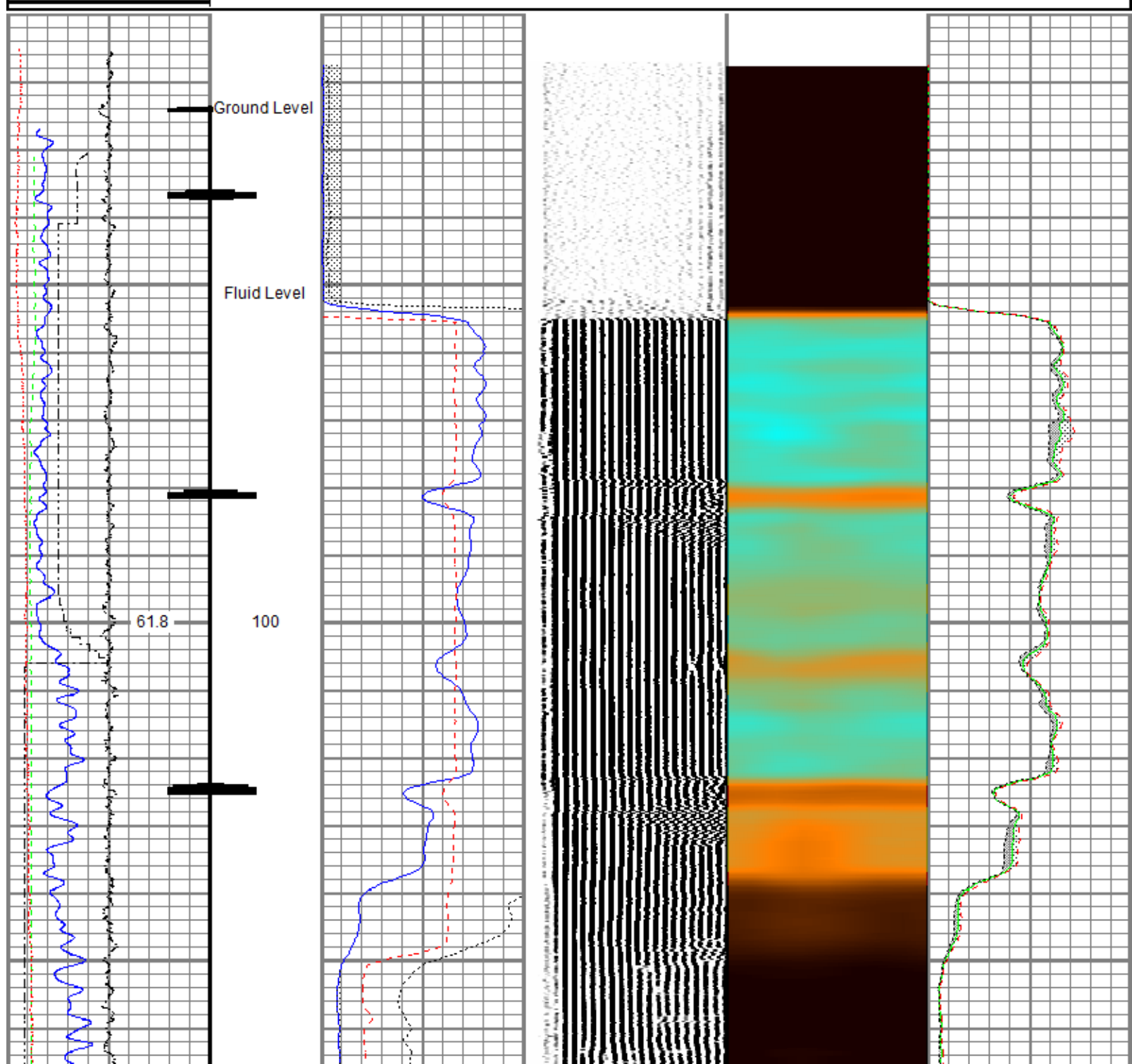


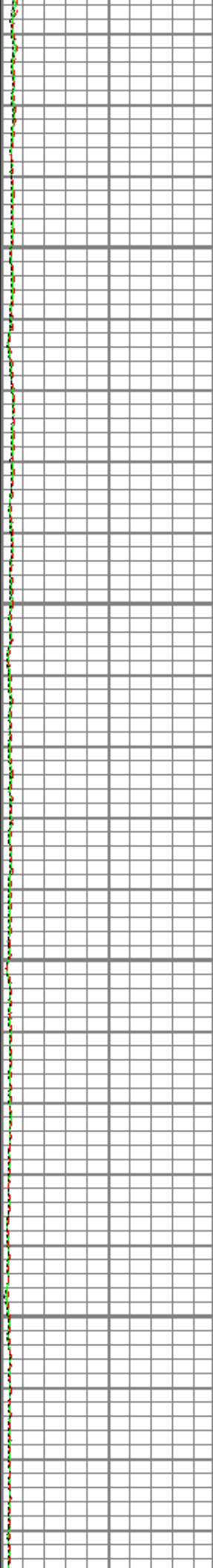
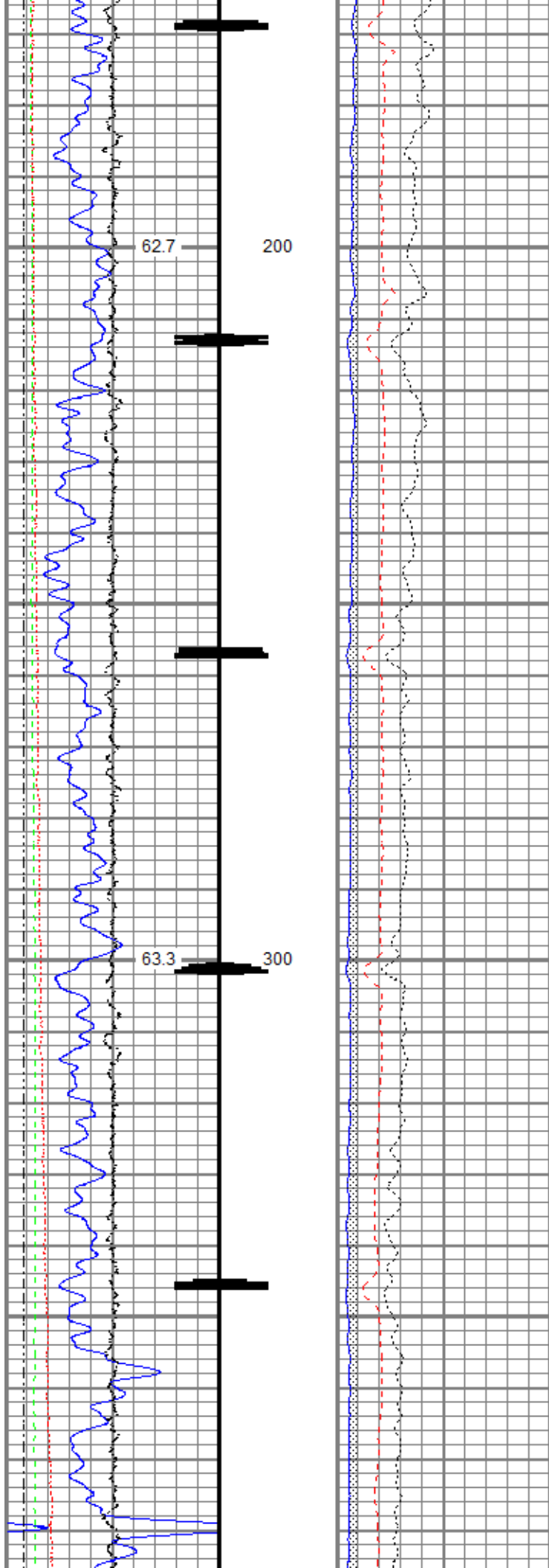
Main Pass

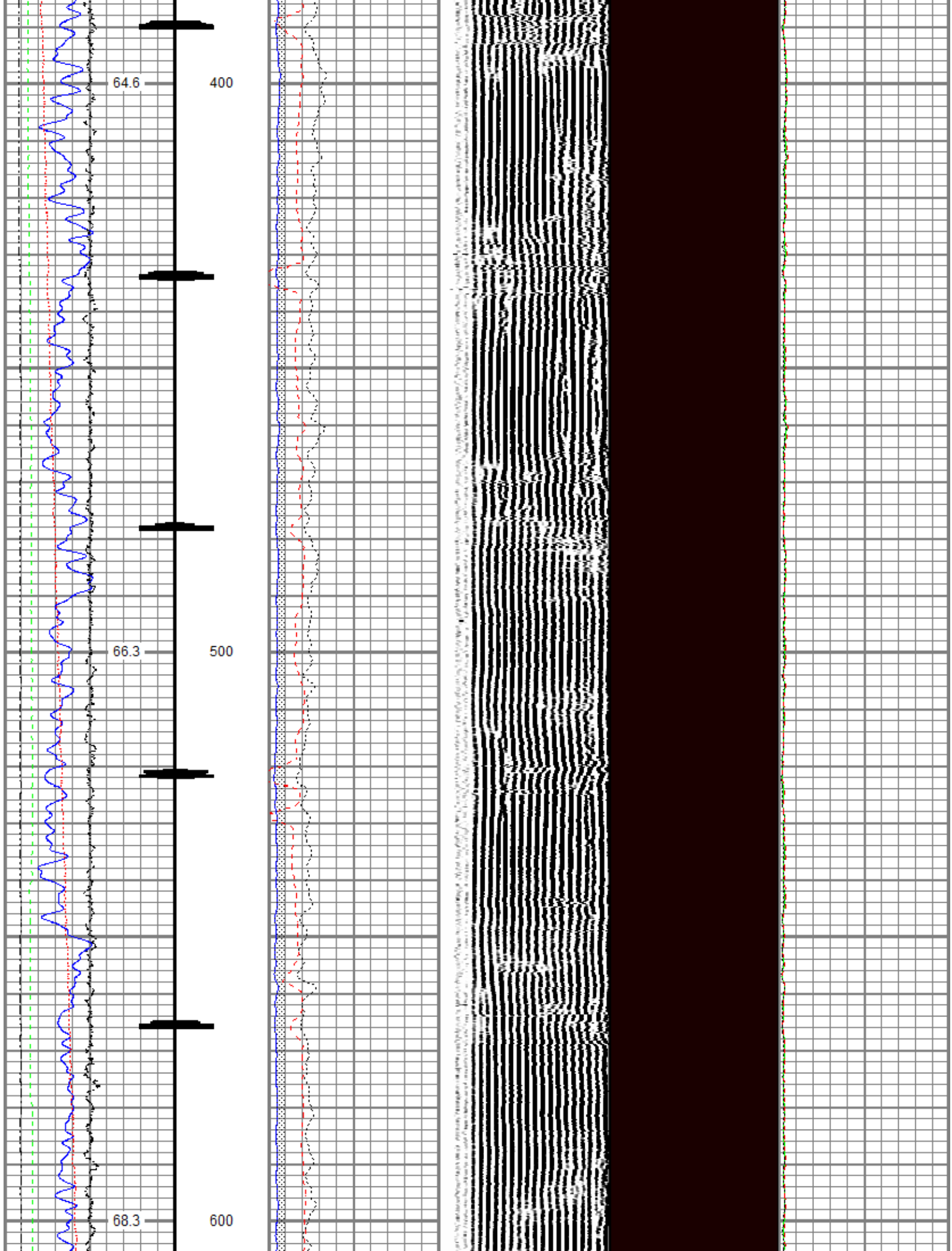
Recorded With 0 PSI Surface Induced Pressure

Database File tep\_federal sg 511-22\tep\_federal sg 511-22\_rbl\_03-19-19.db  
 Dataset Pathname Main.1  
 Presentation Format ros\_rbt004\_tep  
 Dataset Creation Wed Mar 20 12:47:39 2019  
 Charted by Depth in Feet scaled 1:240

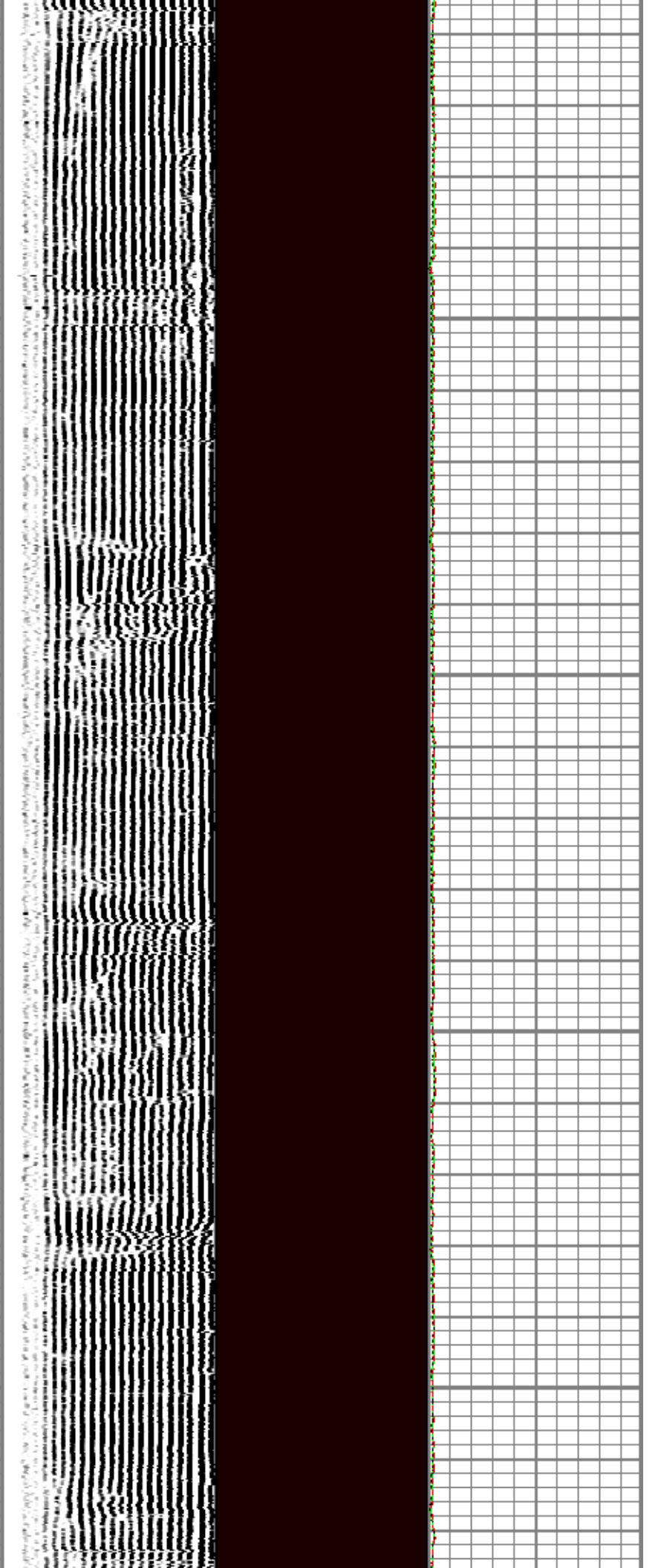
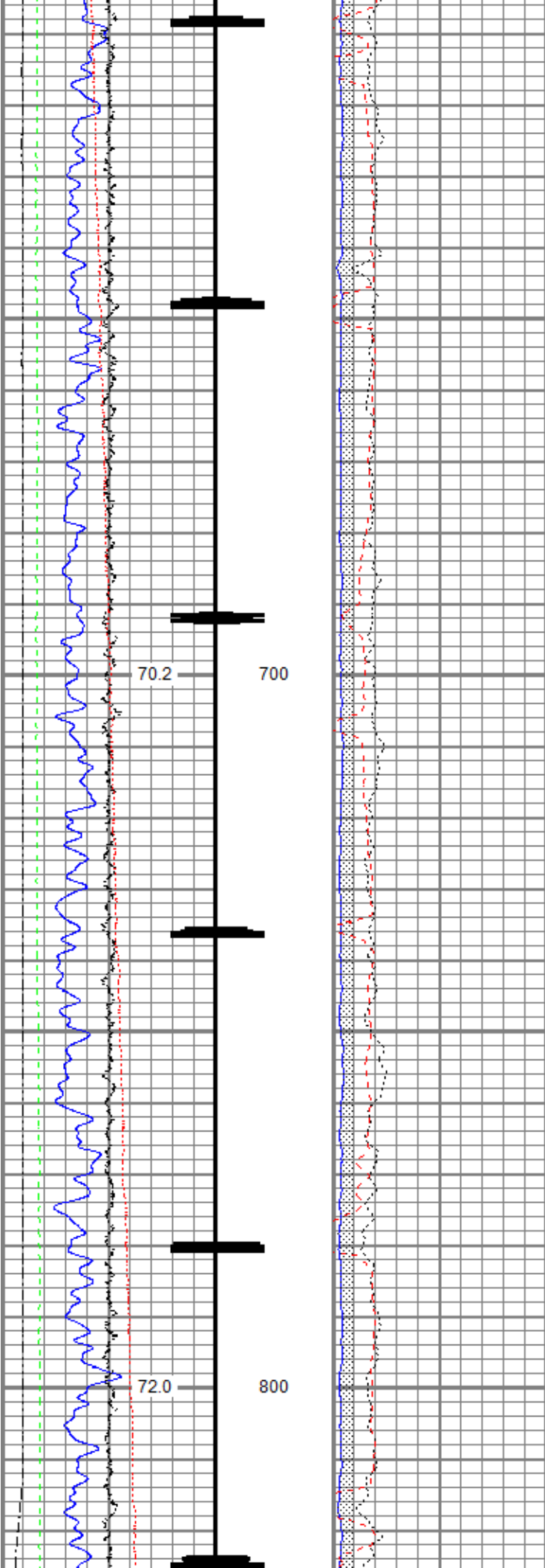
Gamma Ray	0	3' Amplitude (mV) 100	5' Variable Density Log	Sector Map	0	Average Amplitude 150
(GAPI) 200		3' Amplitude x 5	200 (usec) 1200			Minimum Amplitude
Line Speed	0	(mV) 20			0	150
(ft/min) 150		3' Travel Time				Maximum Amplitude
Line Tension (lb) 2000	0	(usec) 200			0	150
Differential Temperature						
(degF) 2	-2					
Temperature (degF) 20	0					
CCL 0	10					

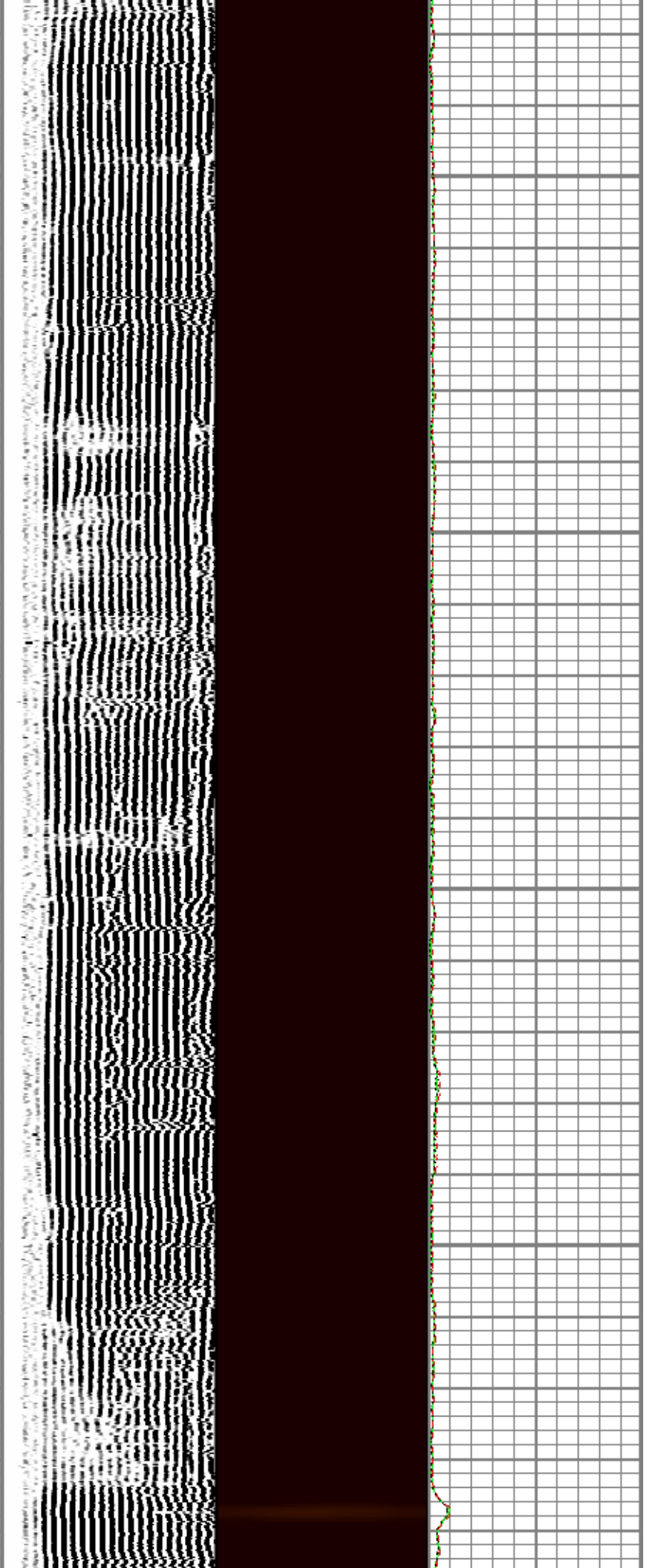
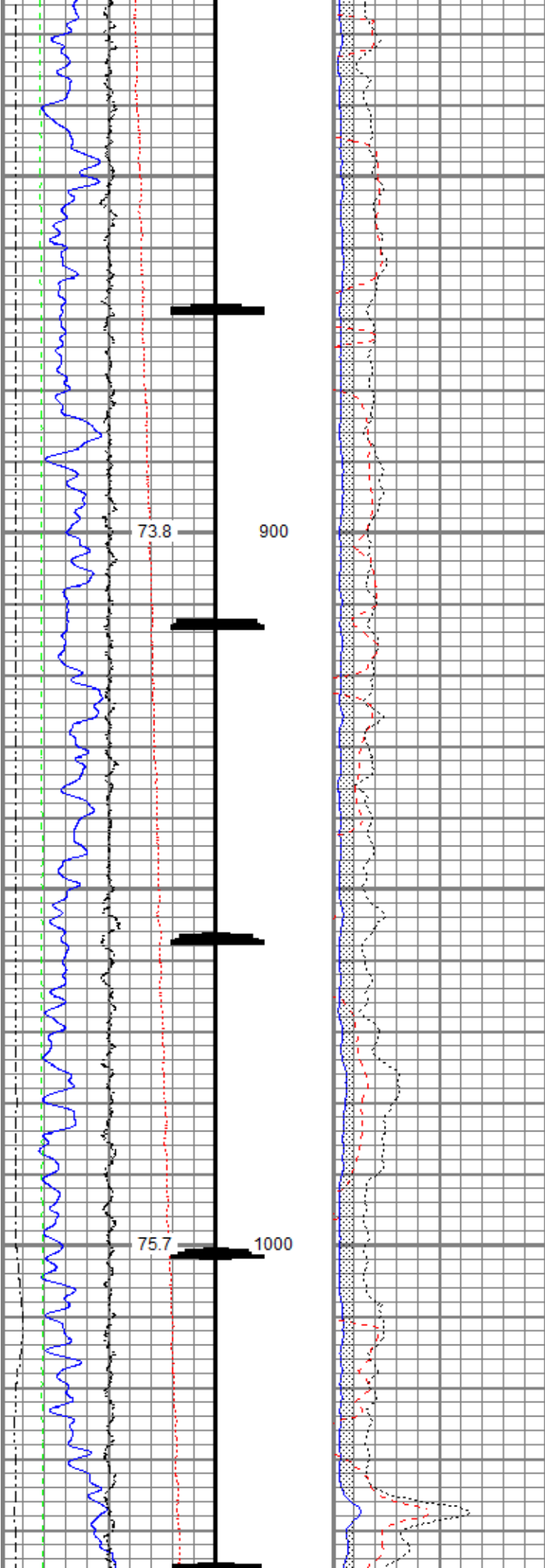


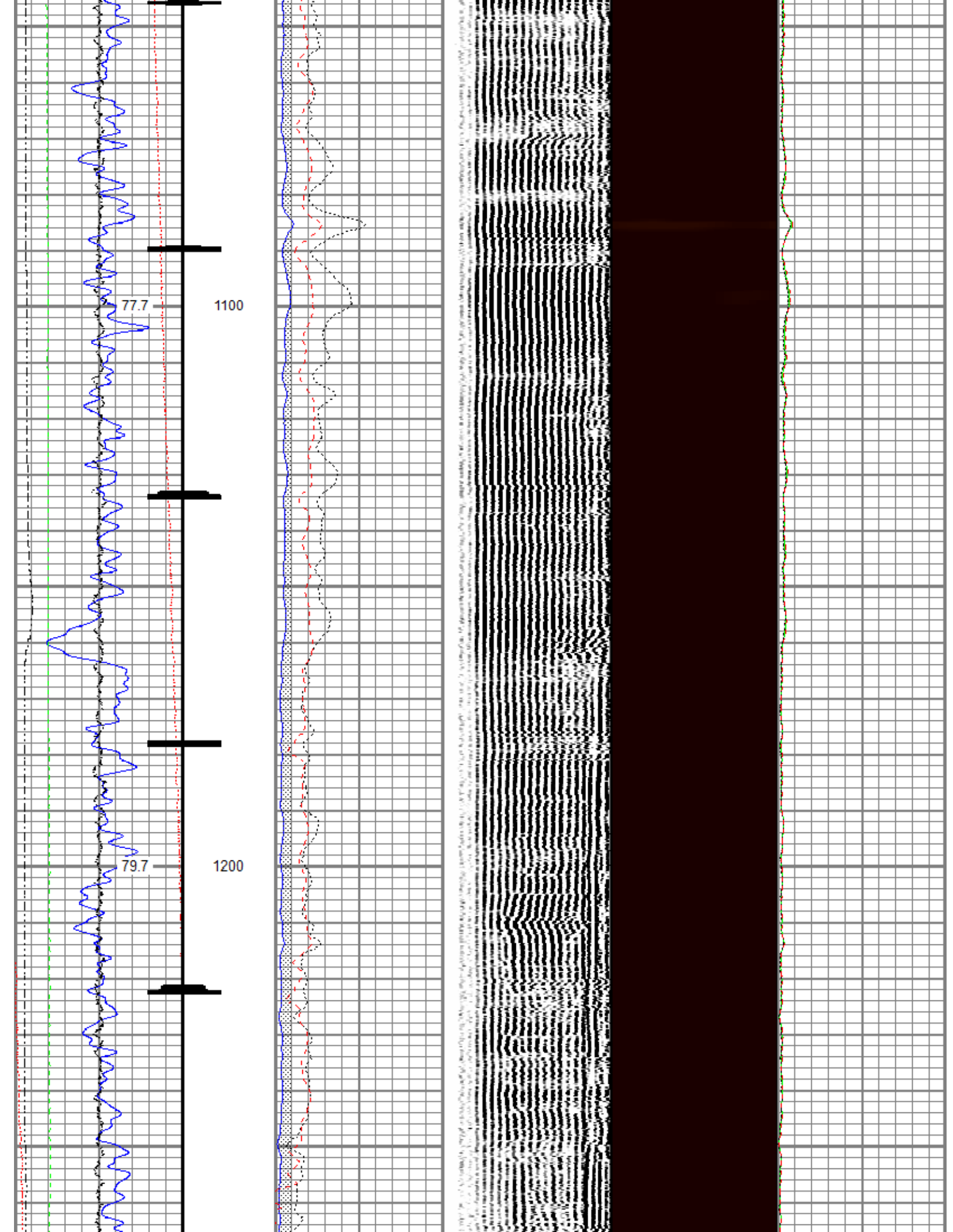




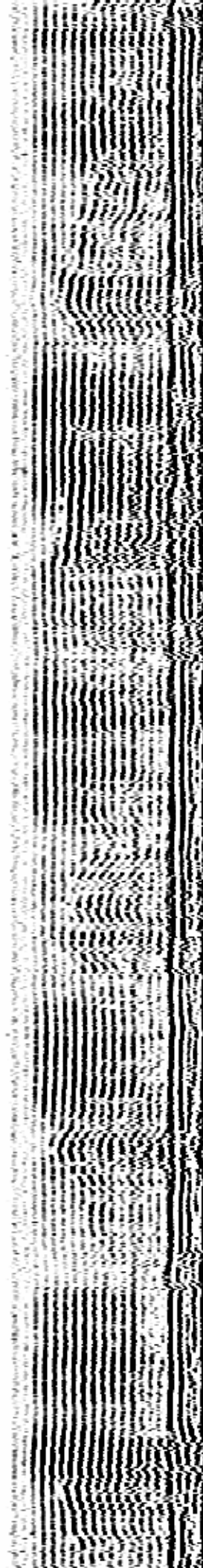
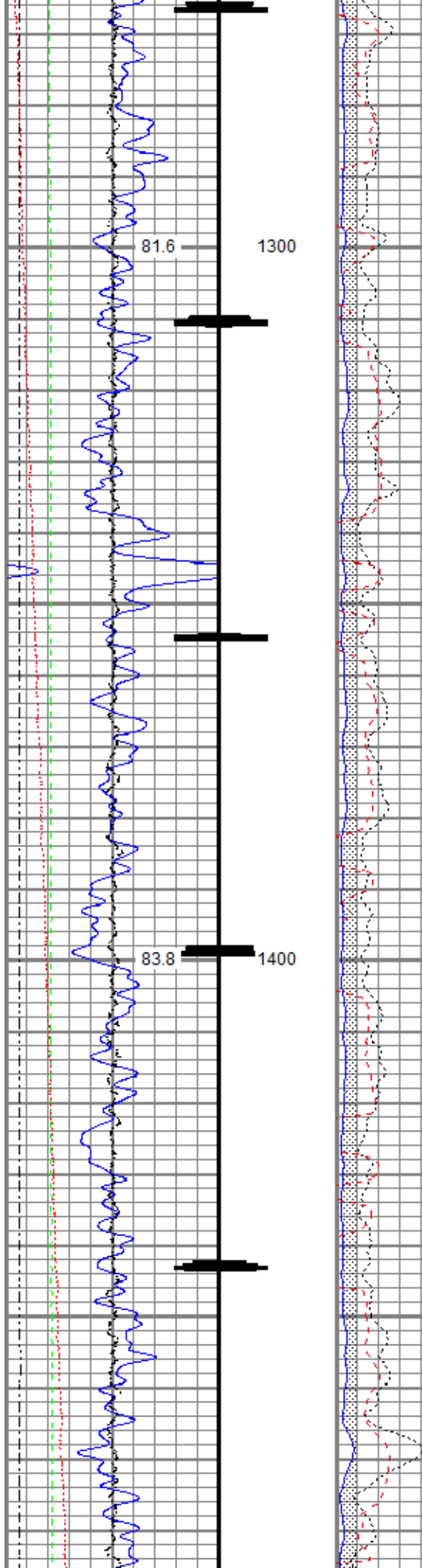




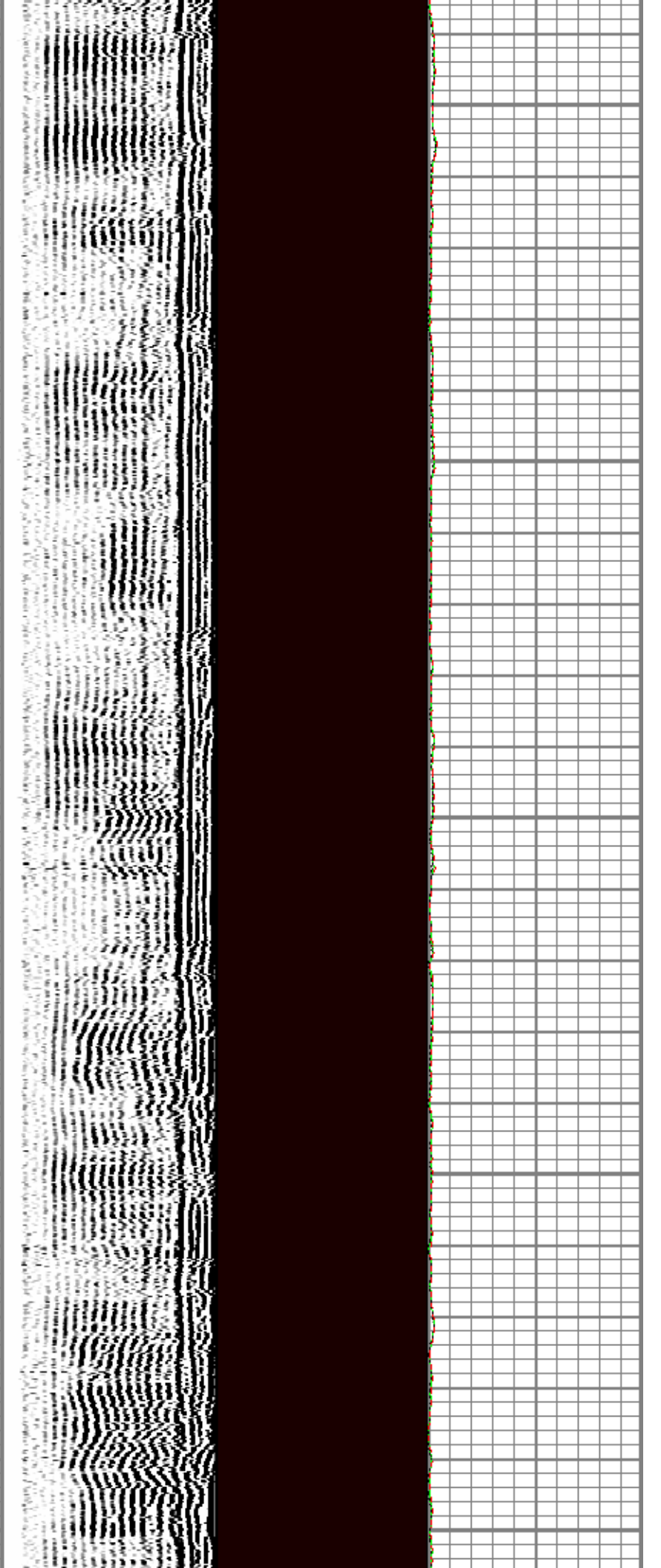
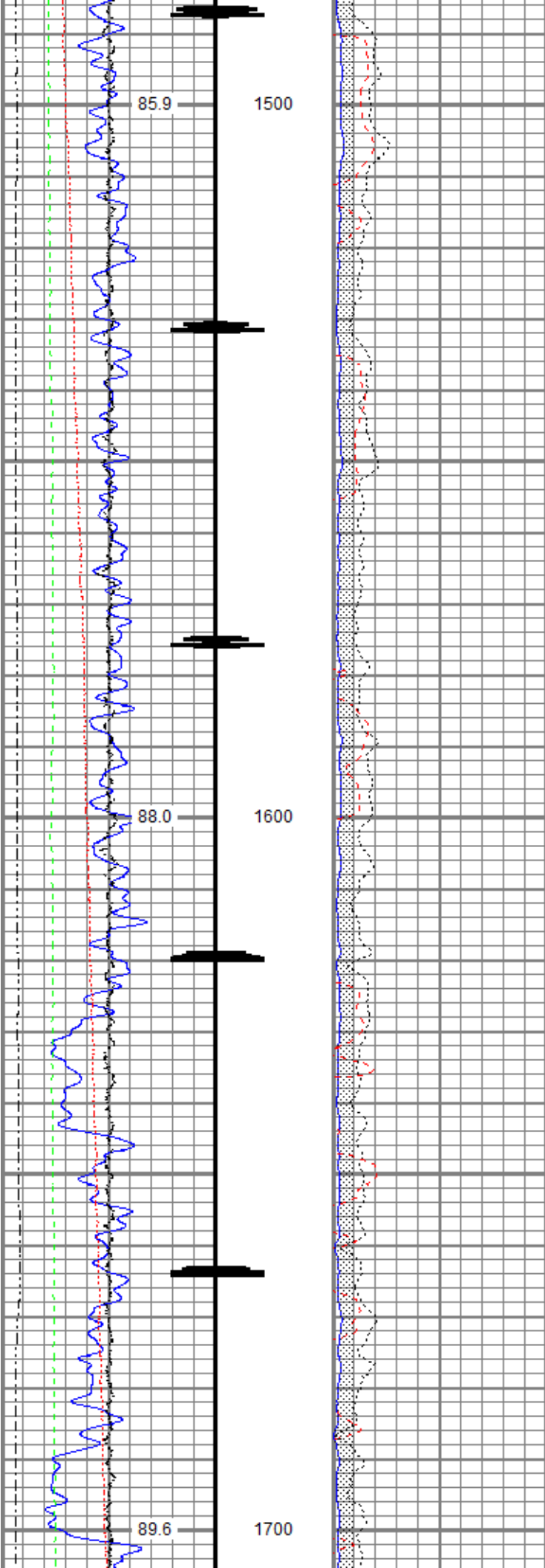


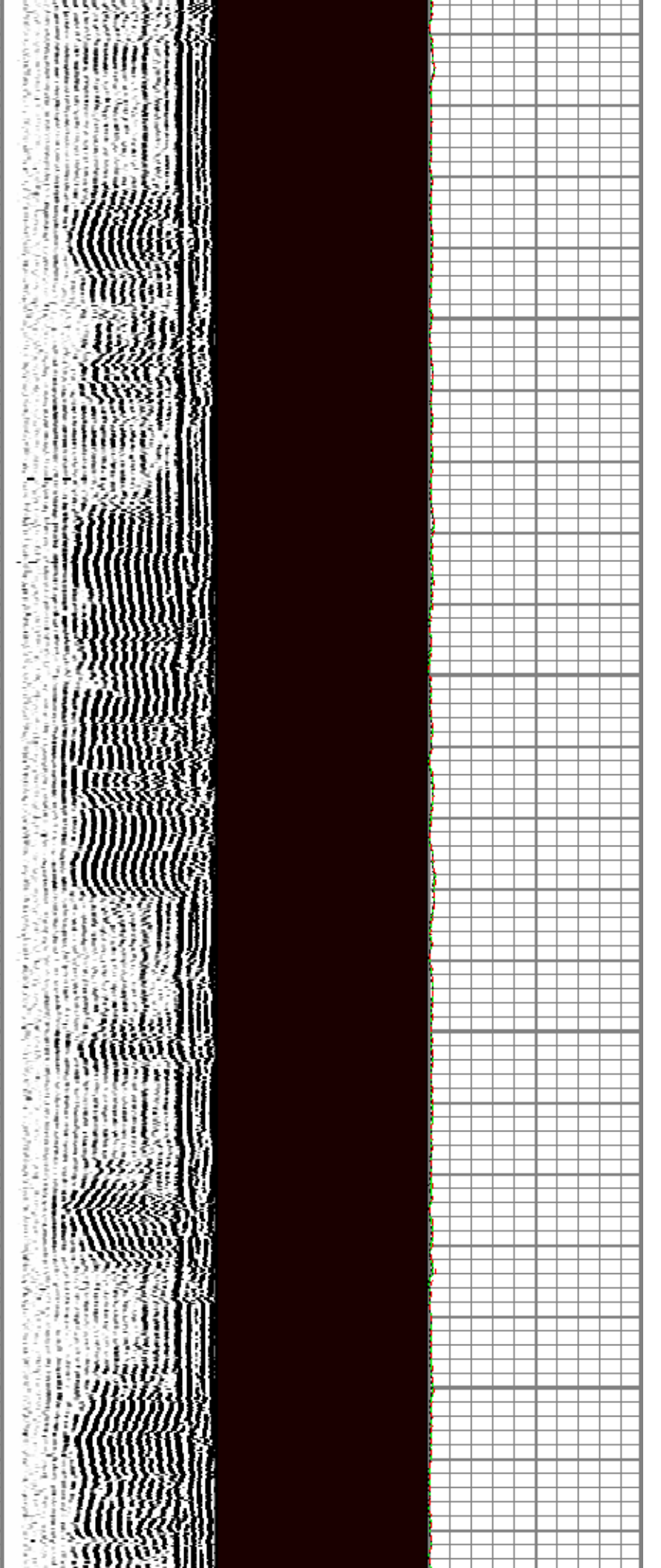
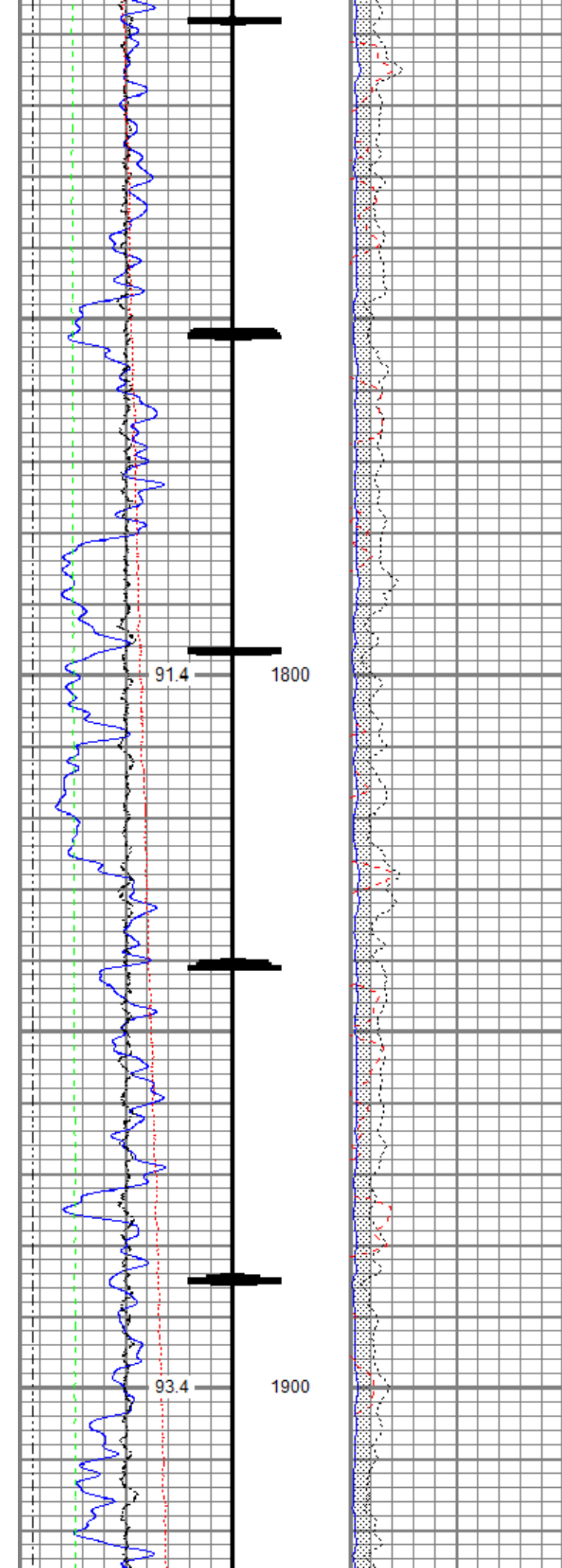


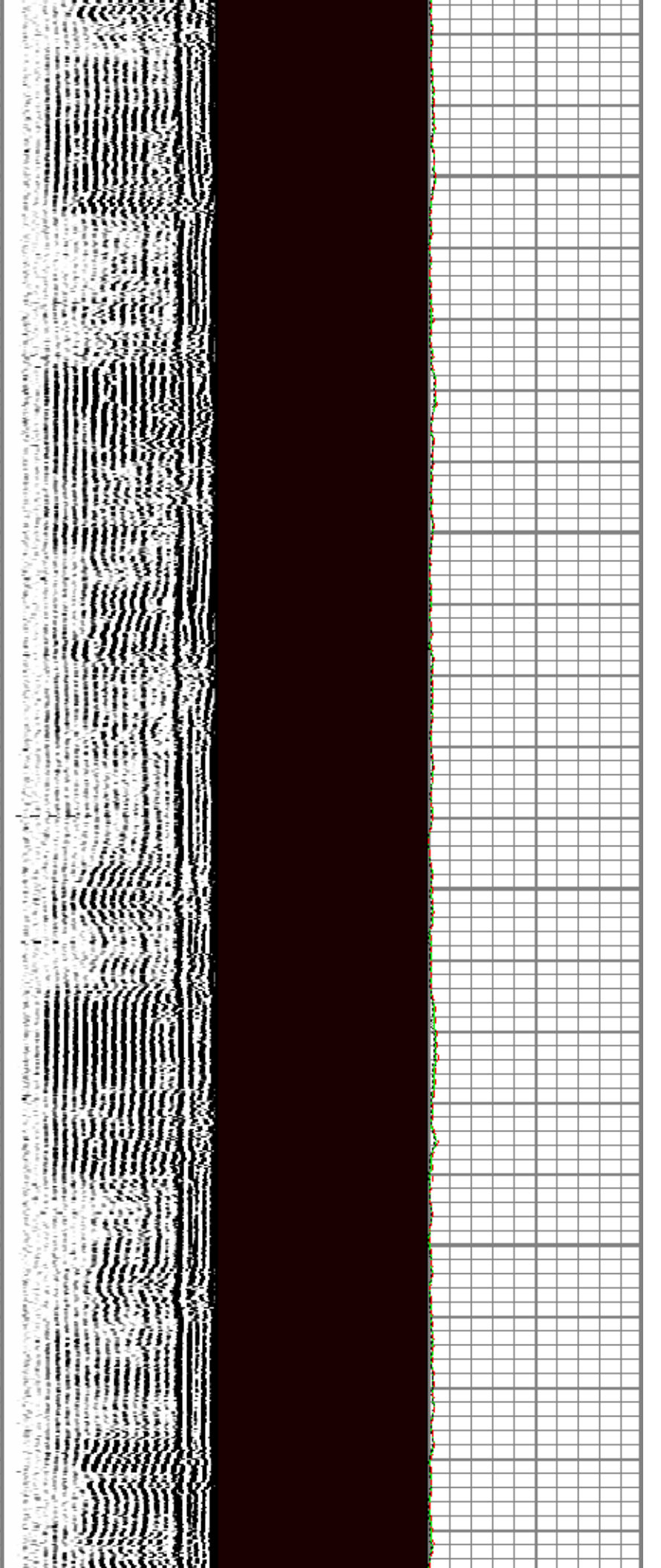
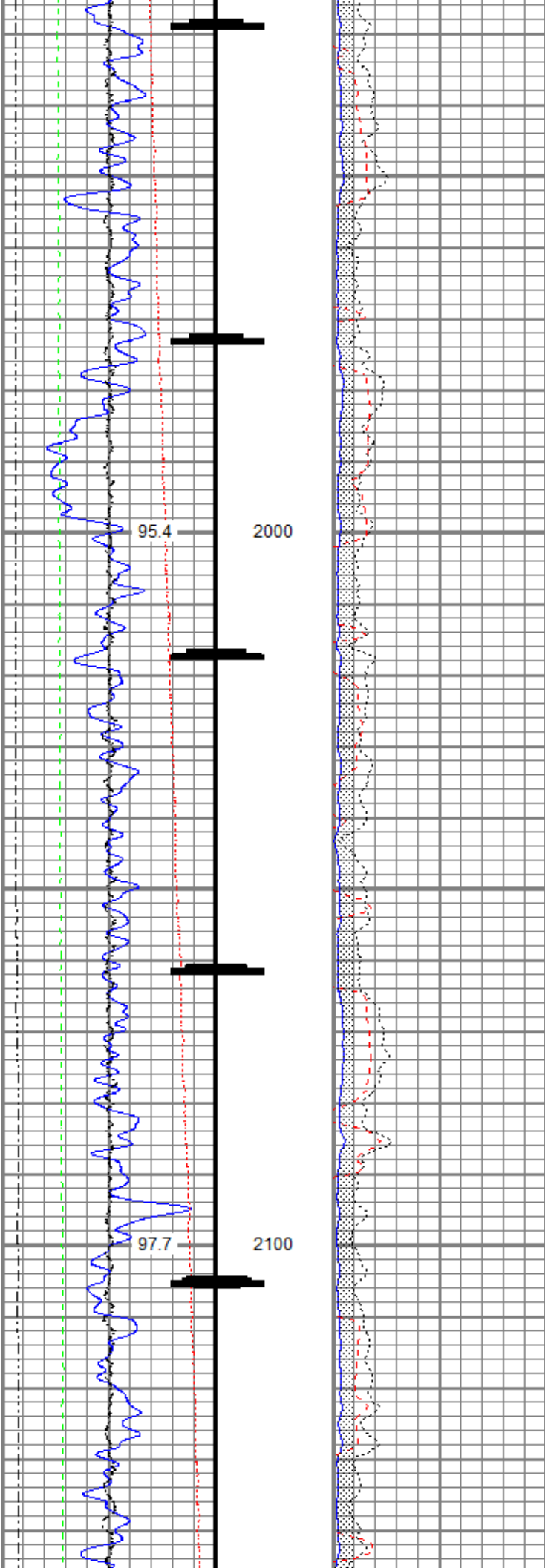




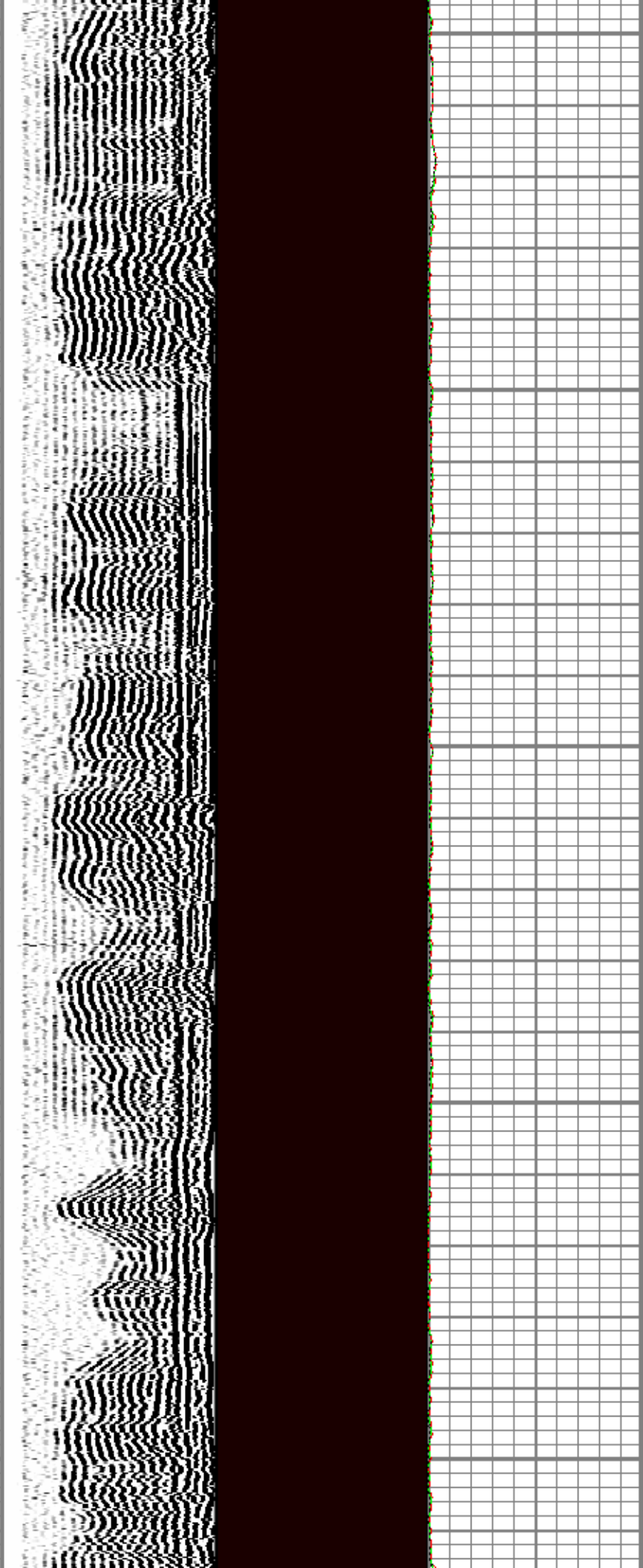
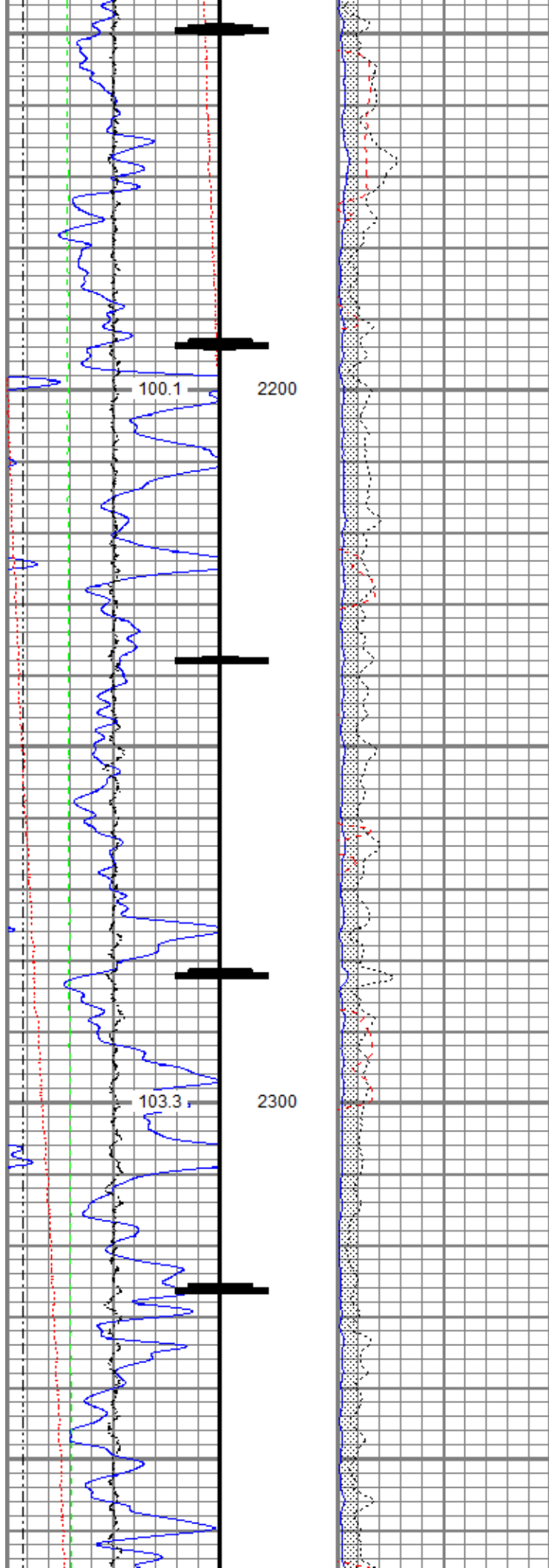


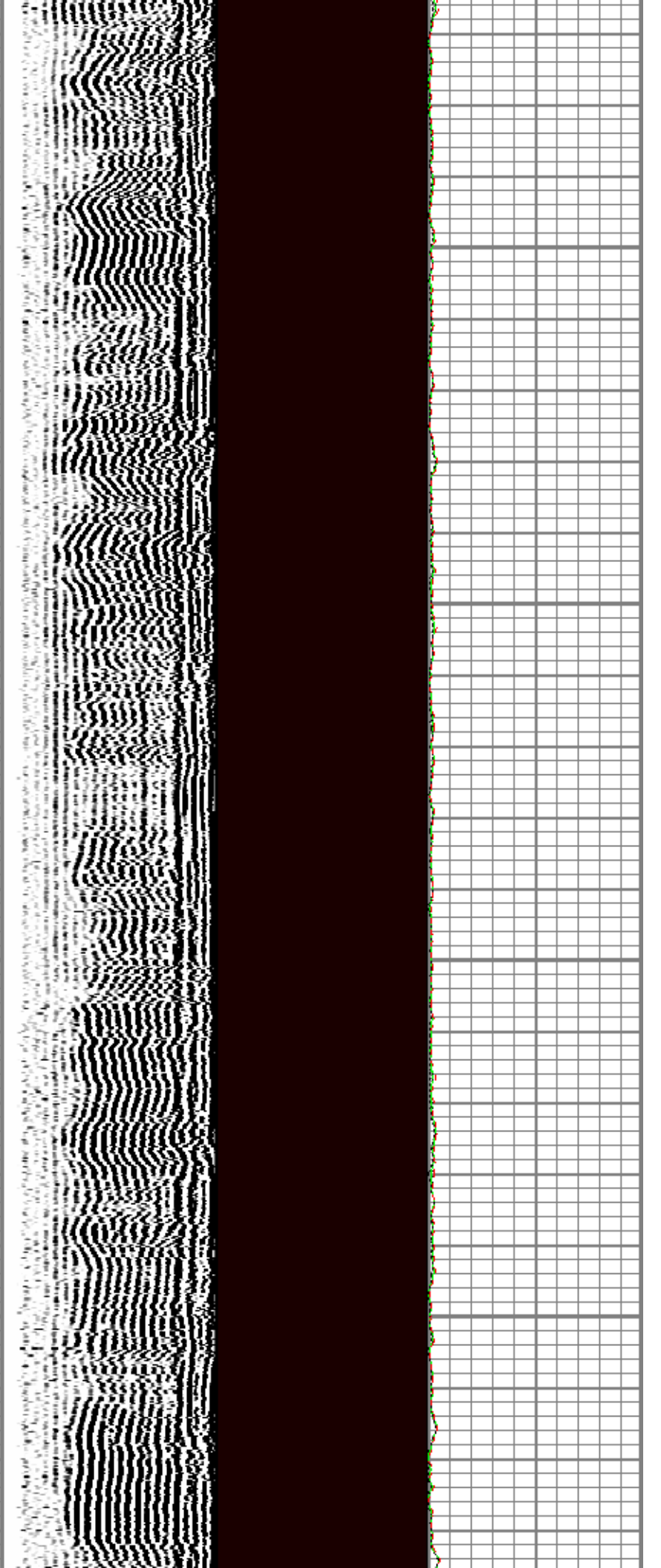
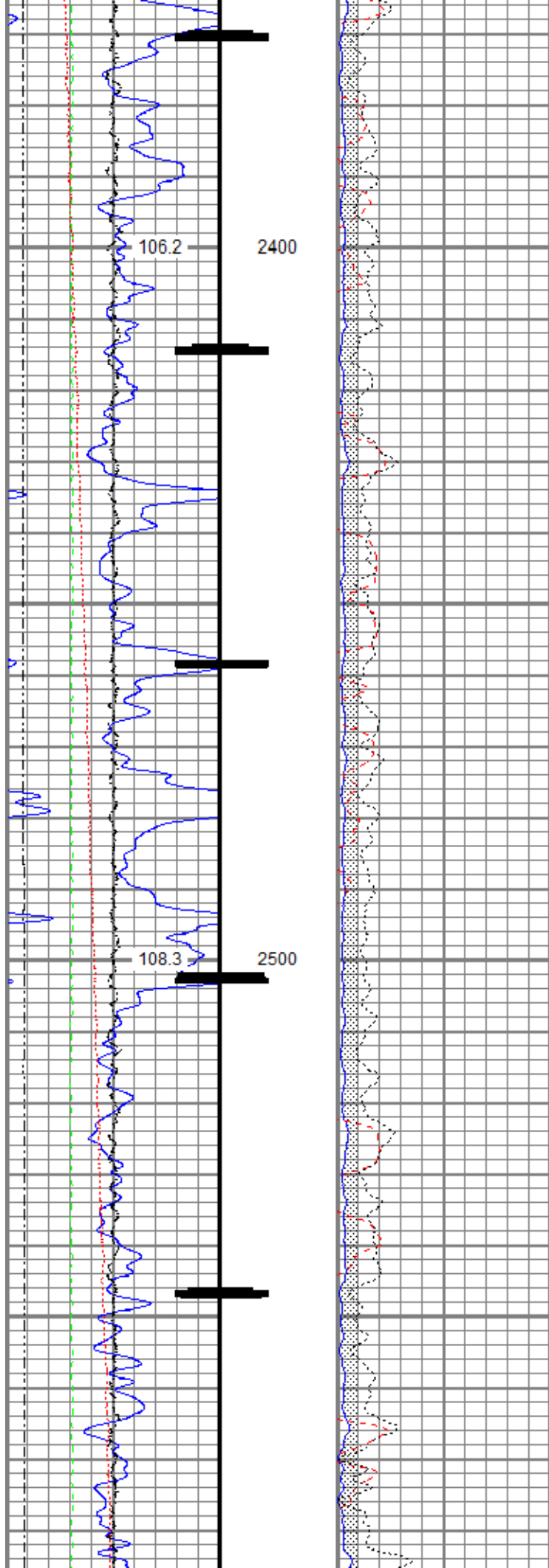












110.0

2600

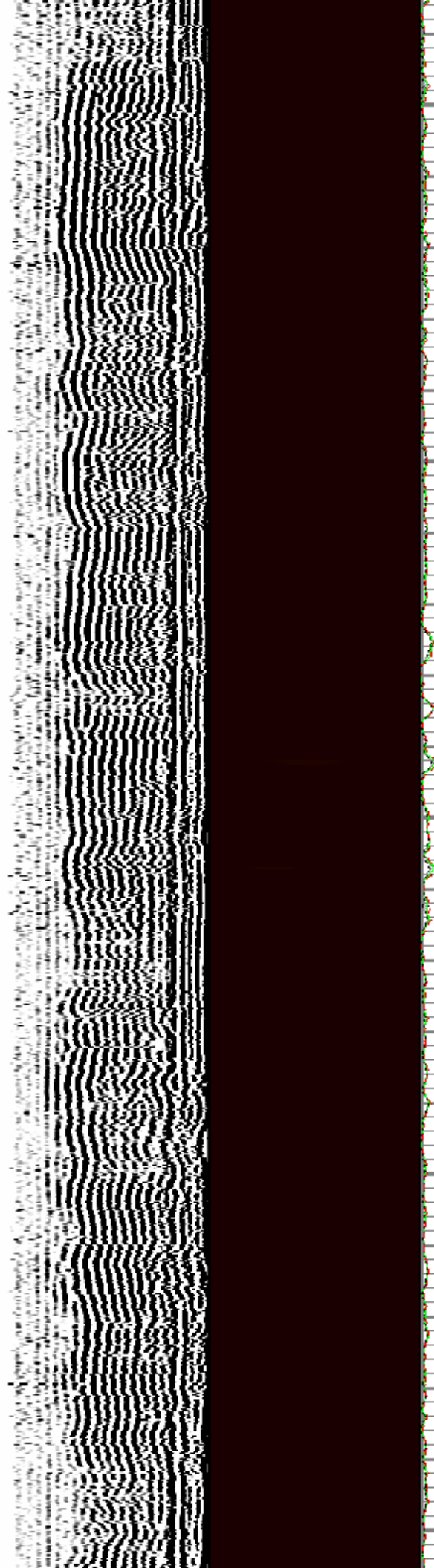
Marker Joint

112.0

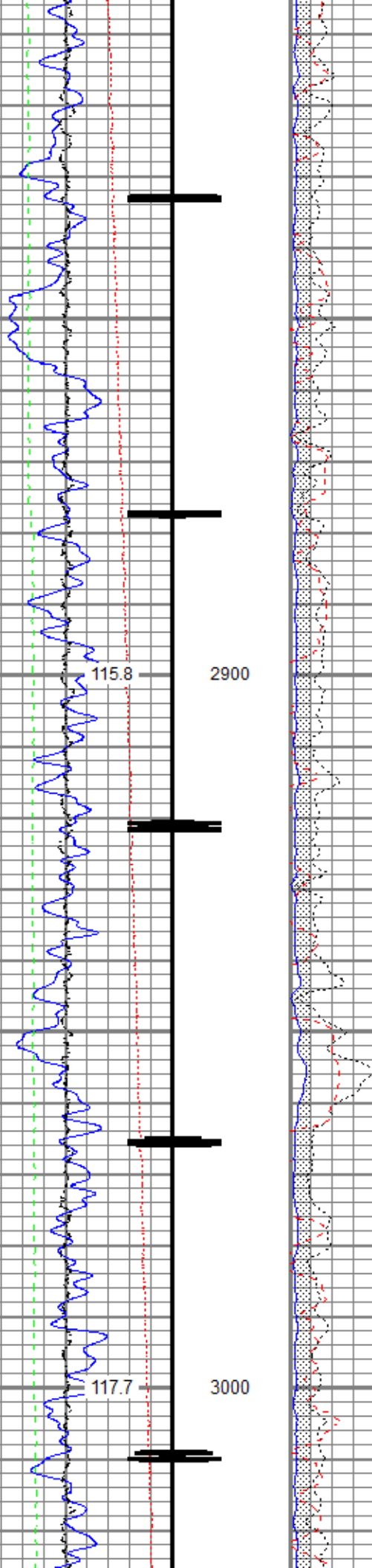
2700

114.0

2800





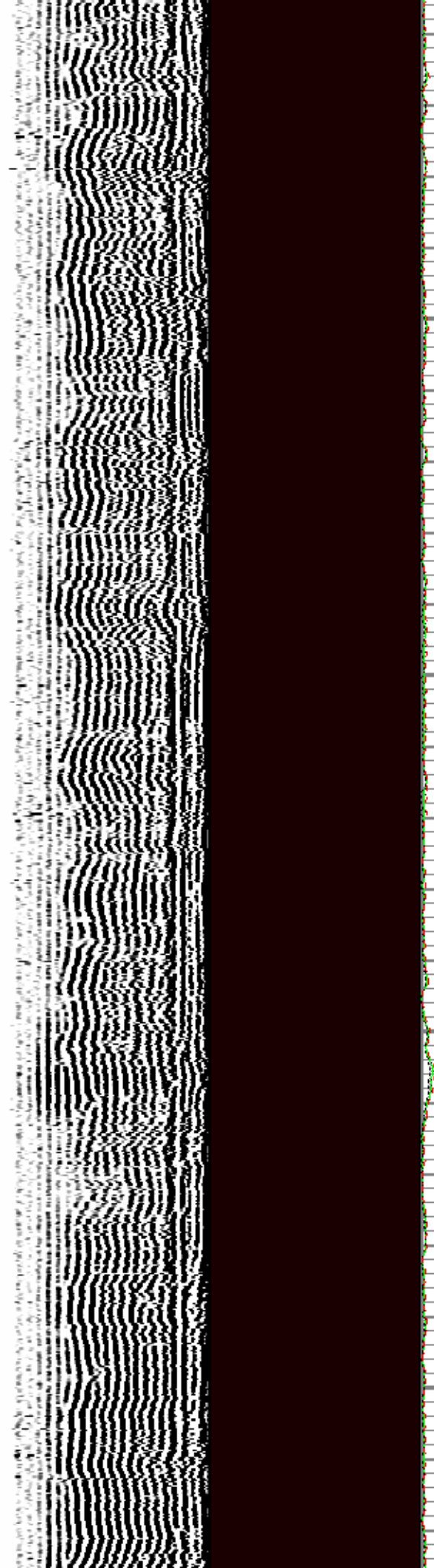


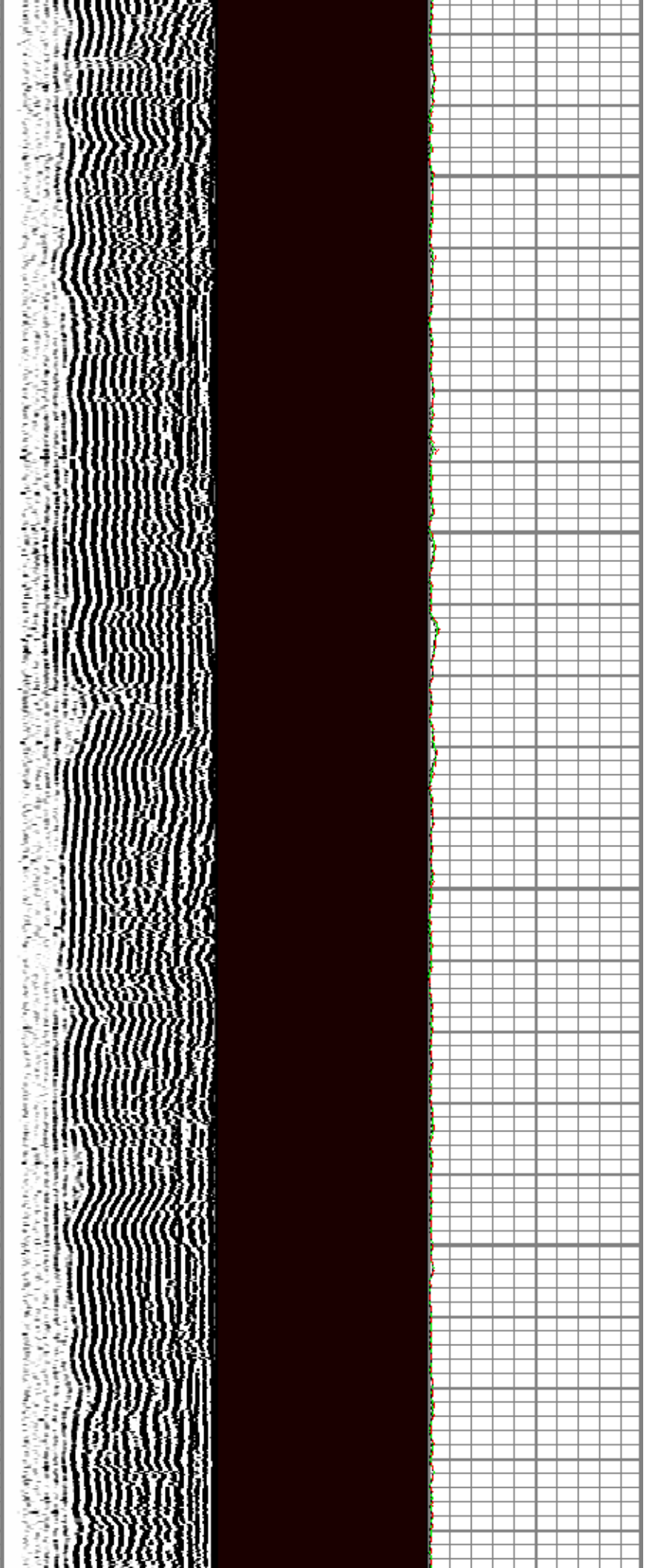
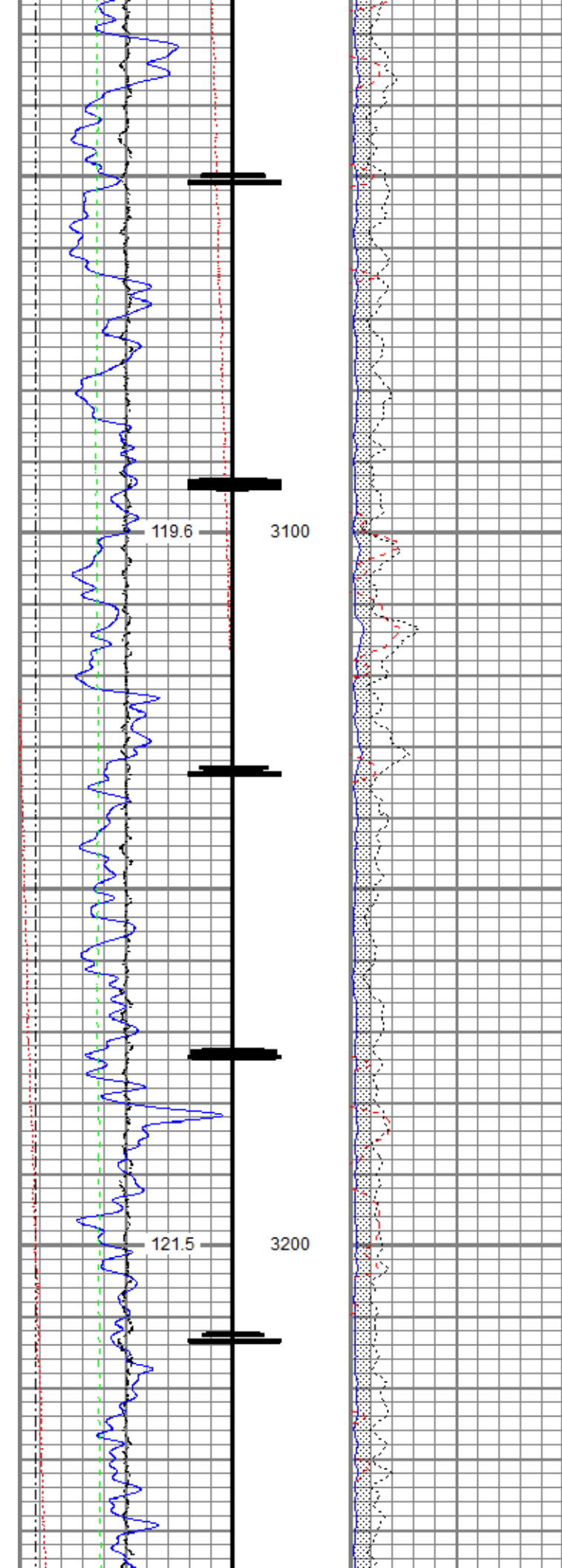
115.8

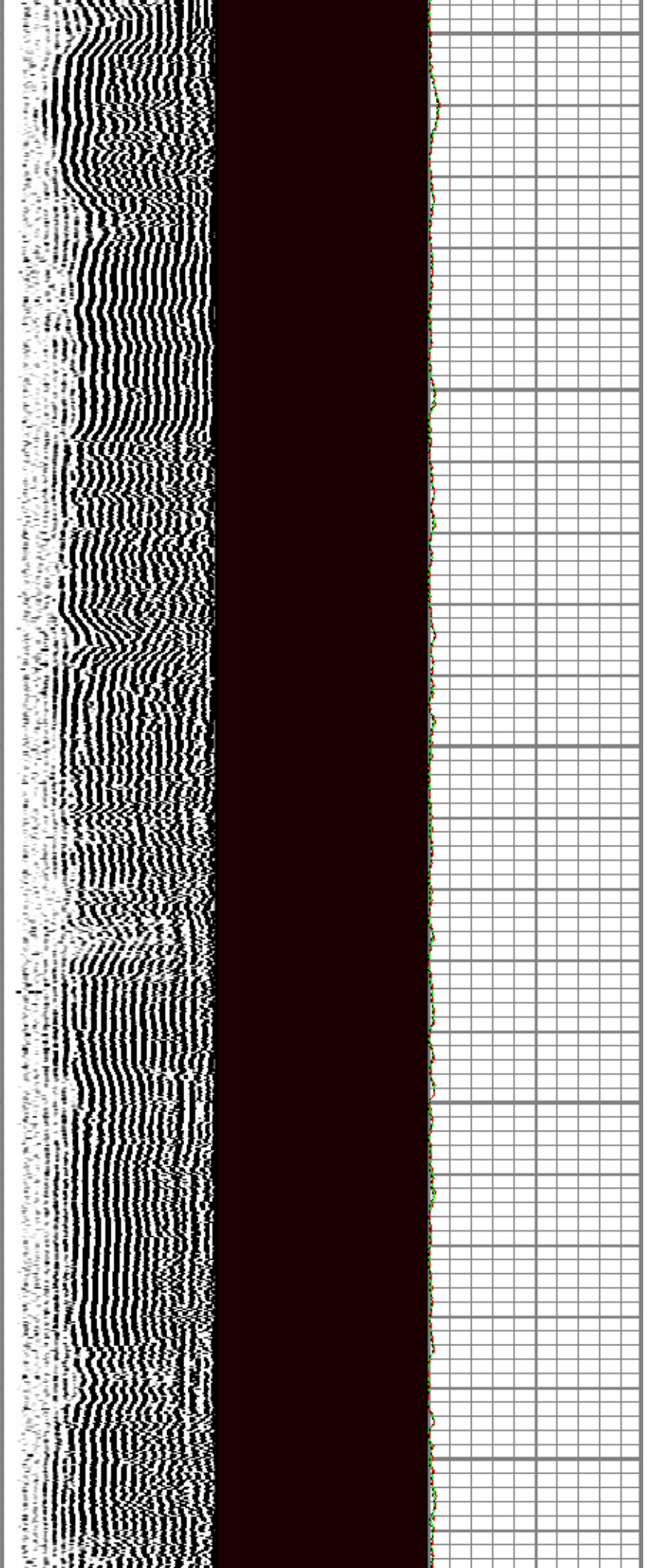
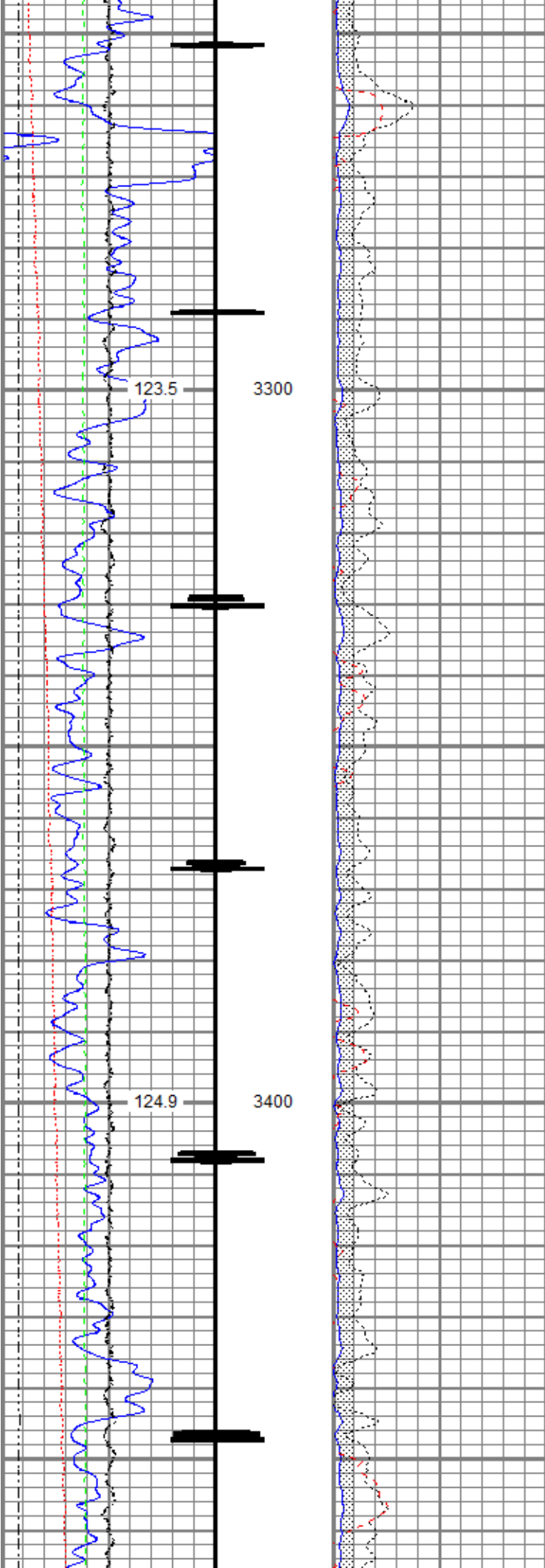
2900

117.7

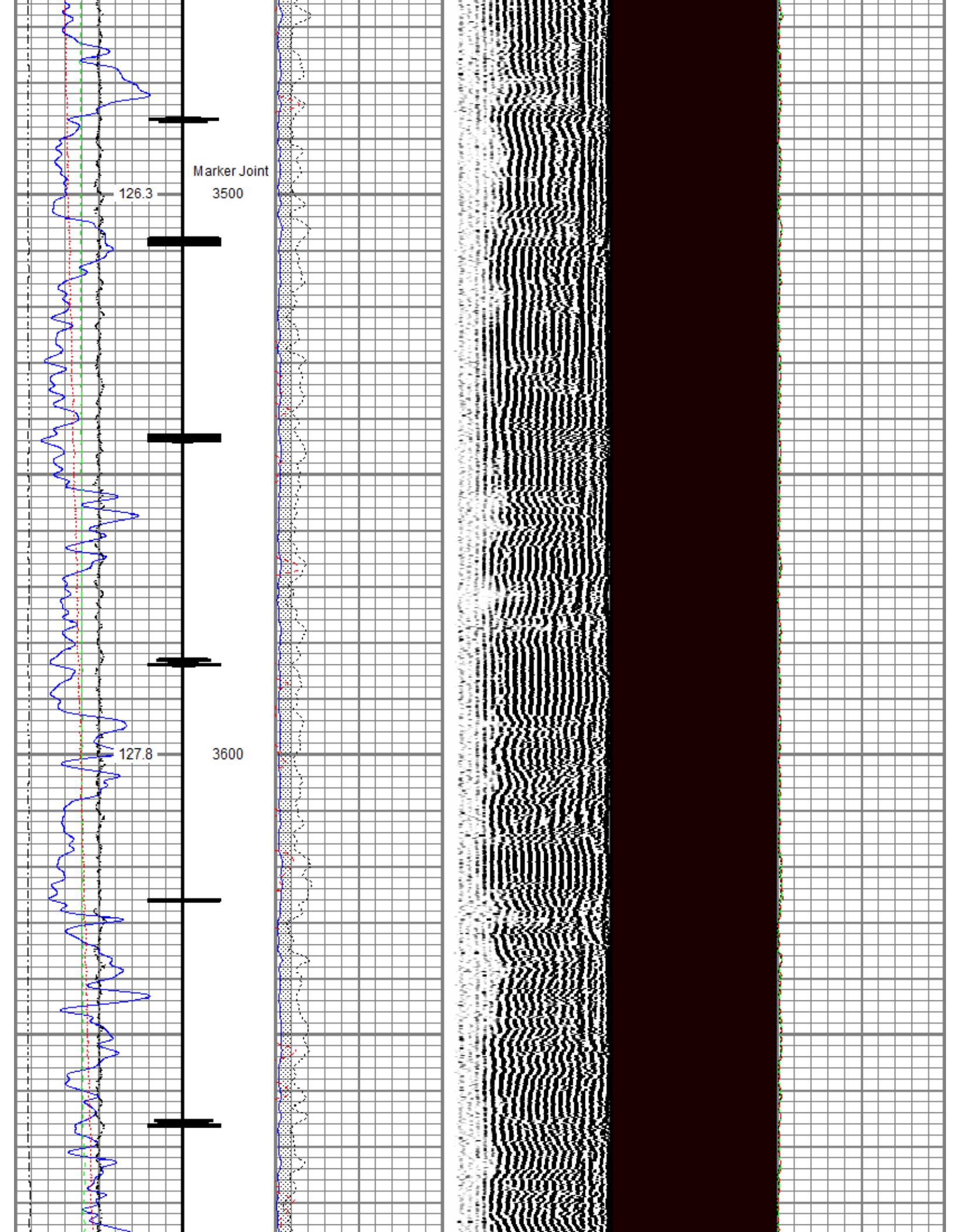
3000

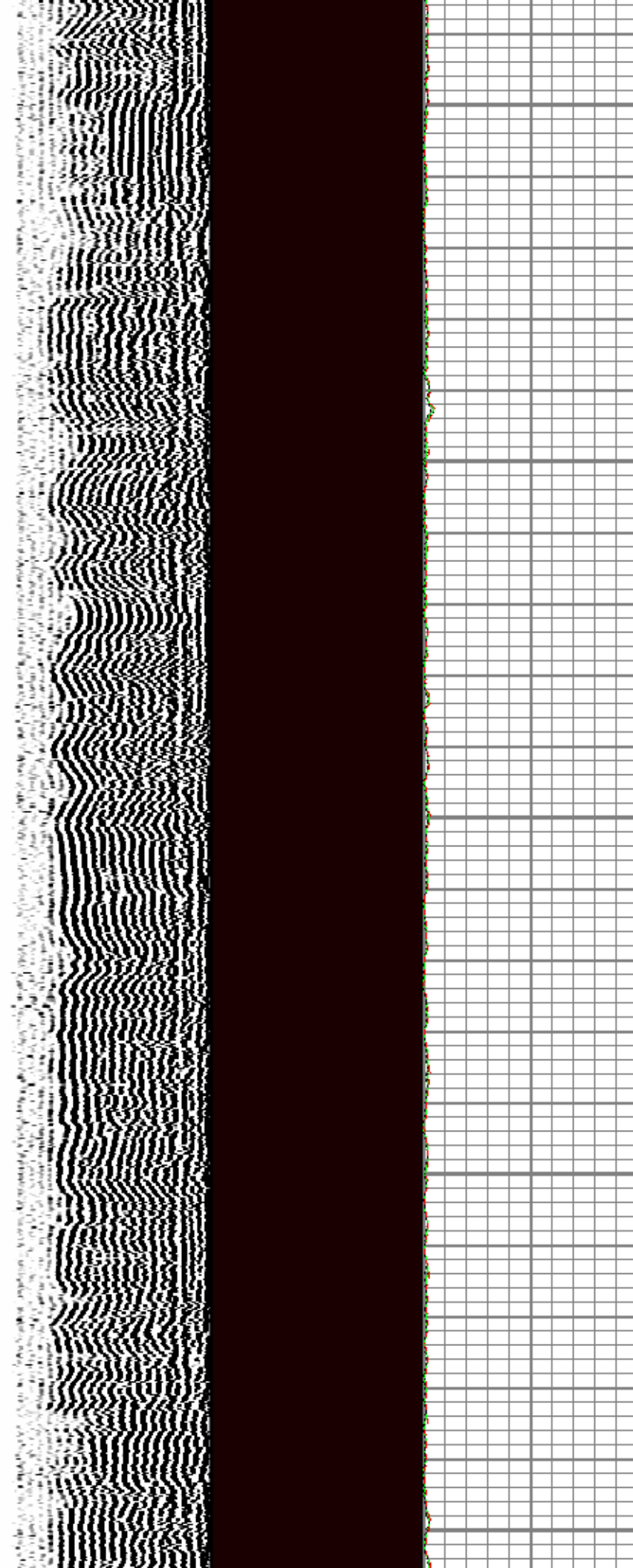
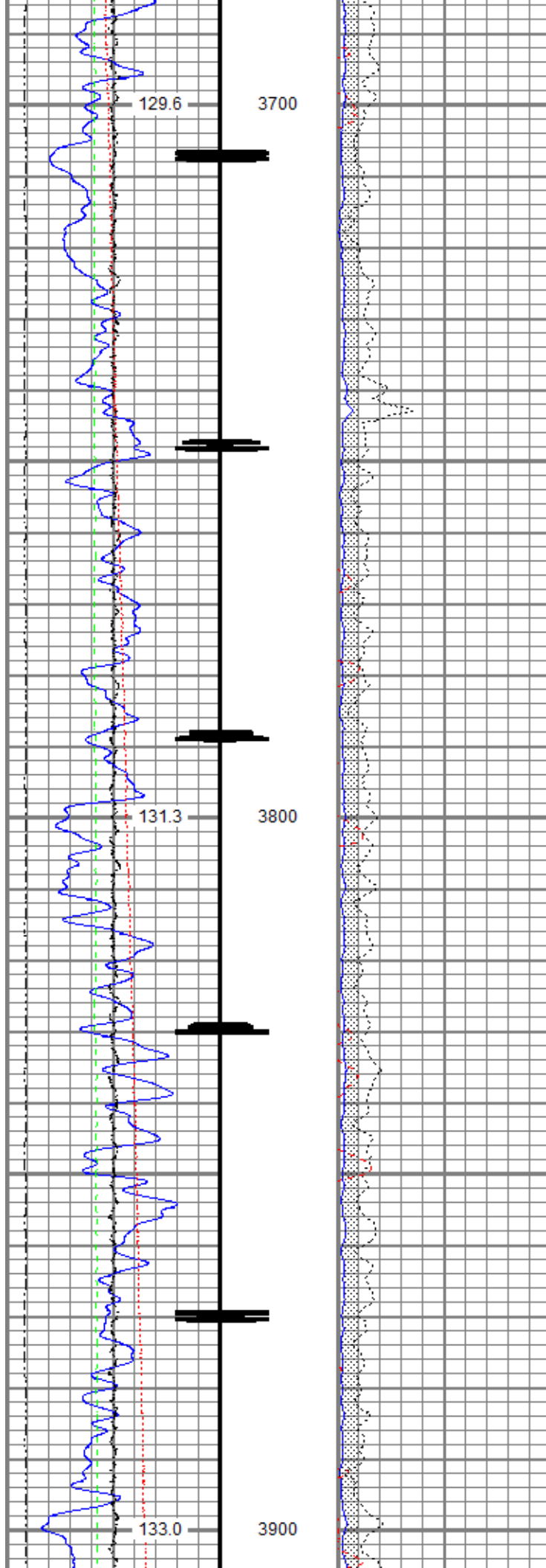


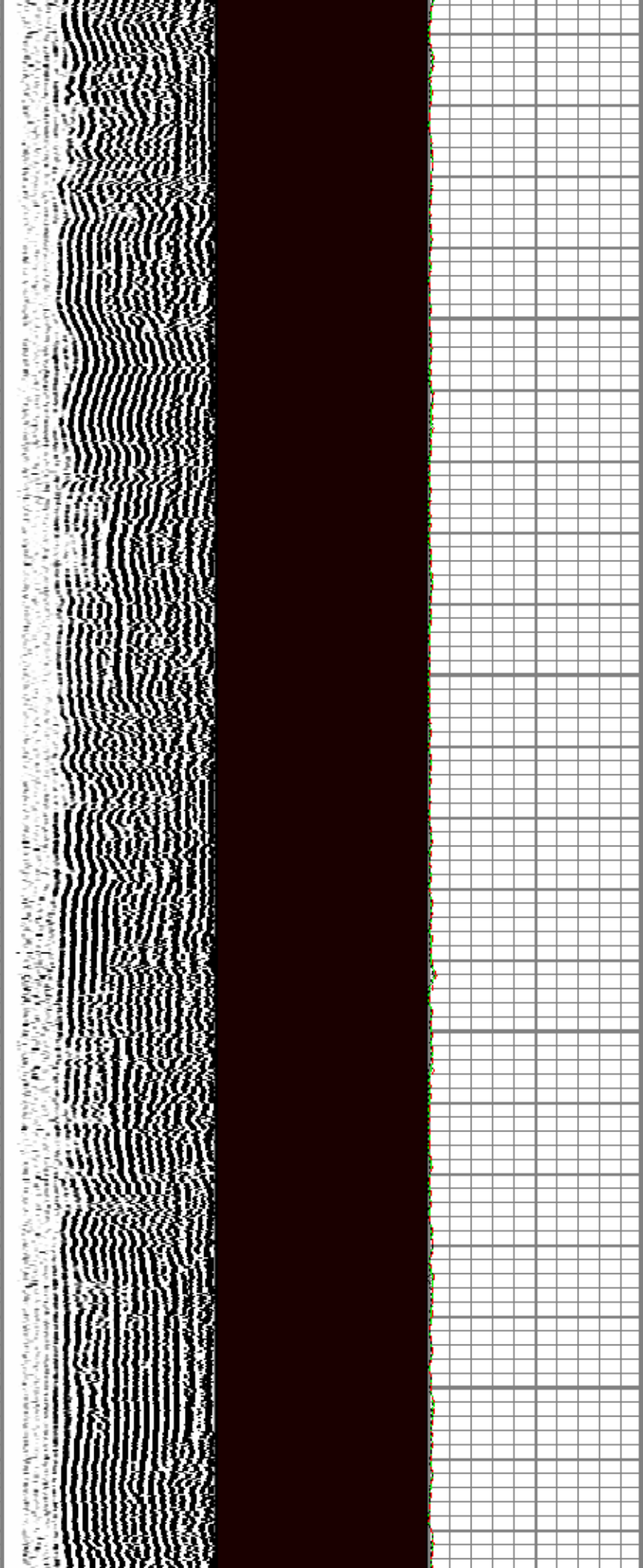
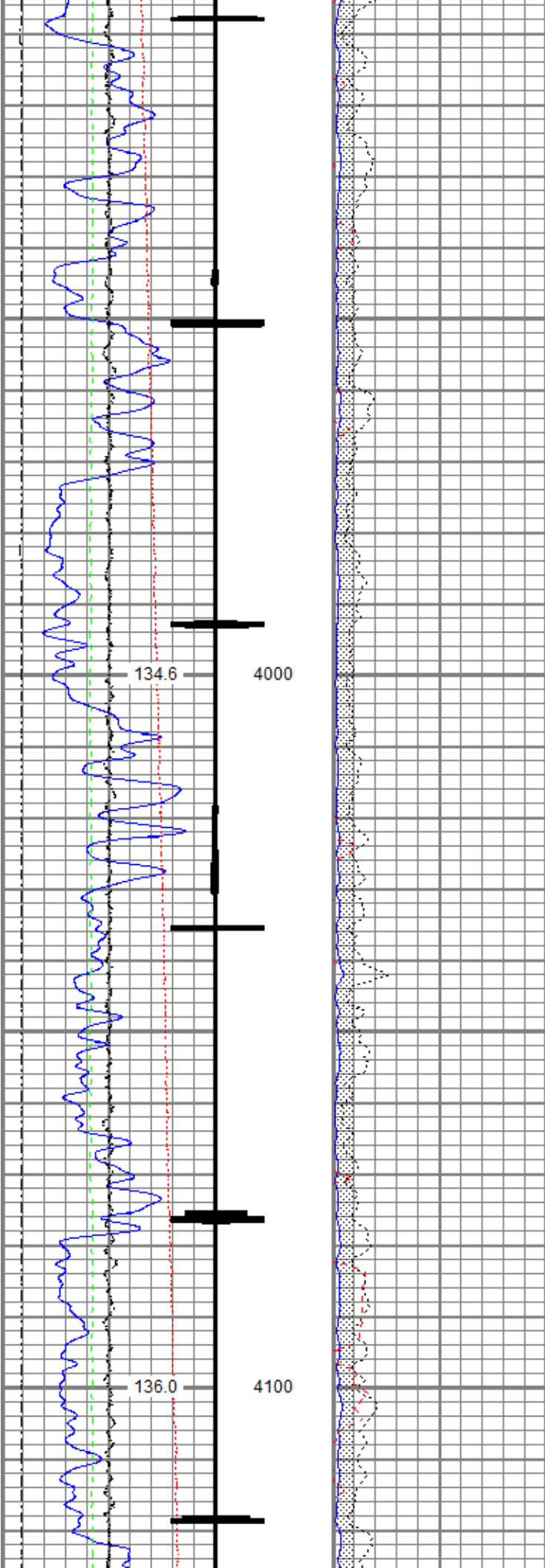




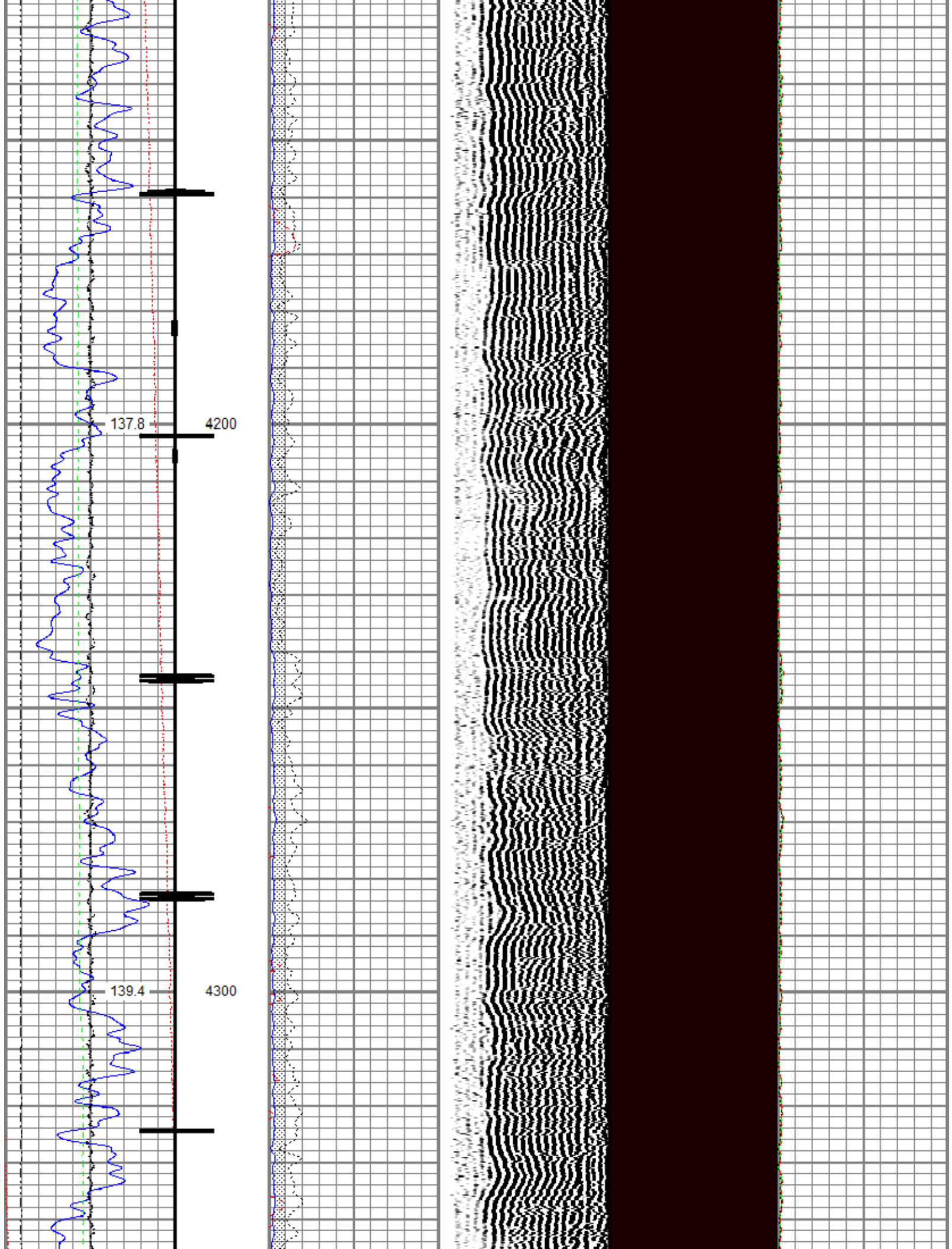


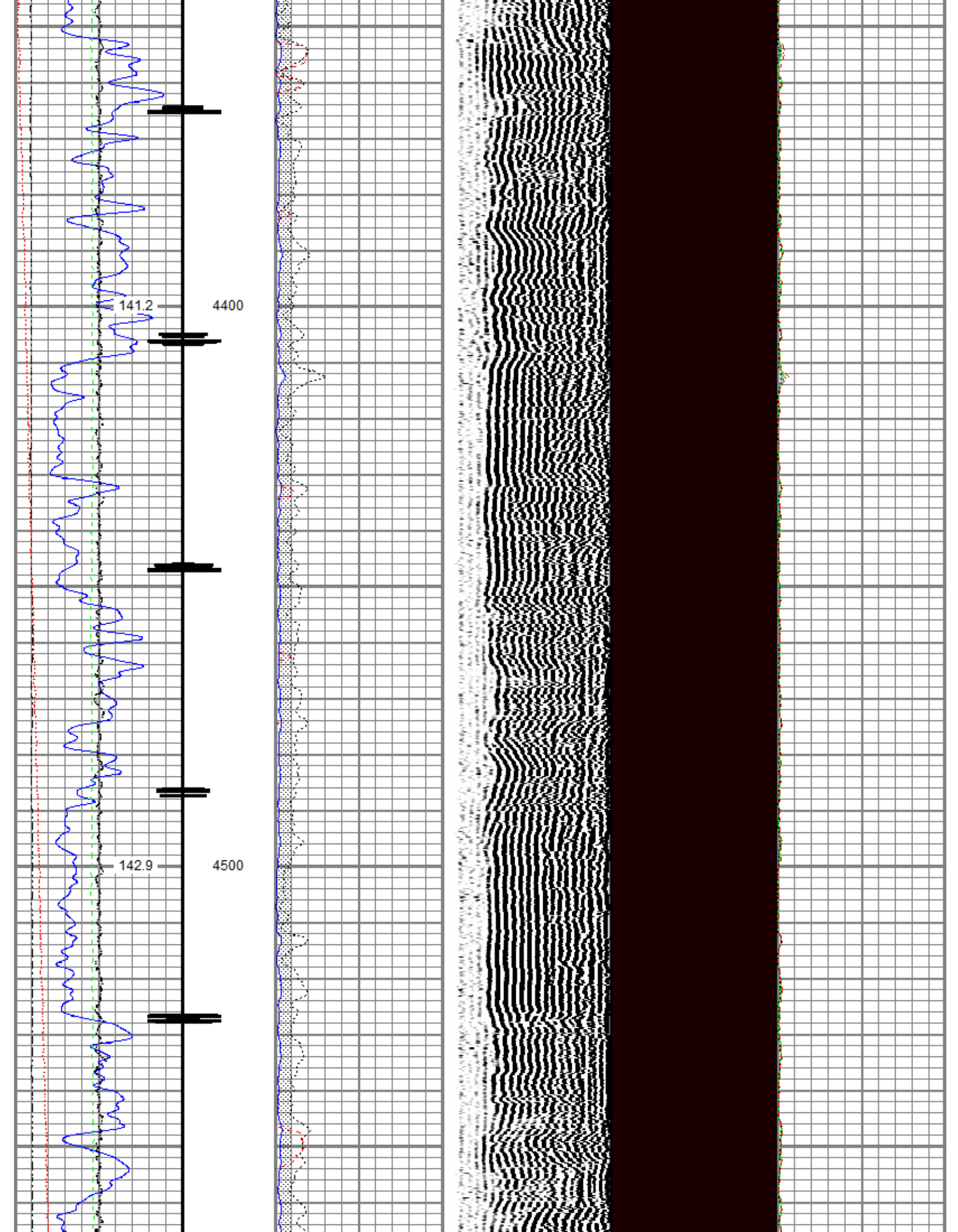


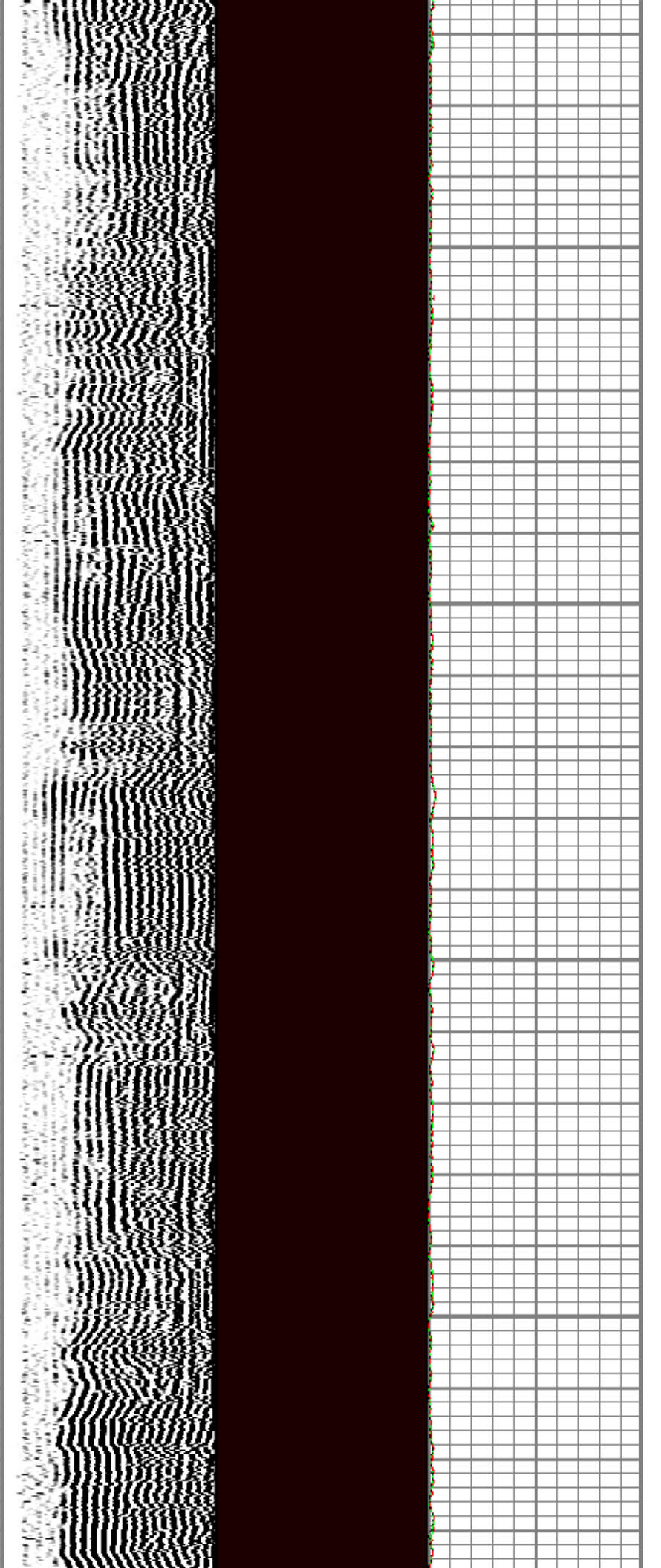
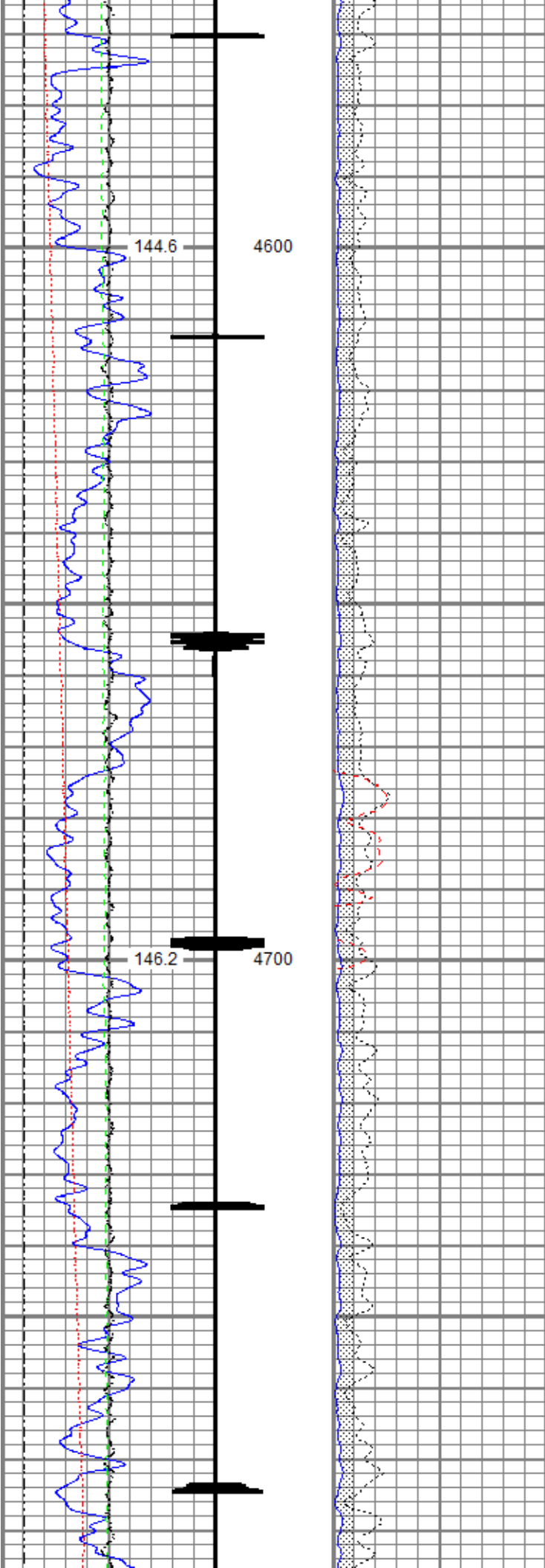




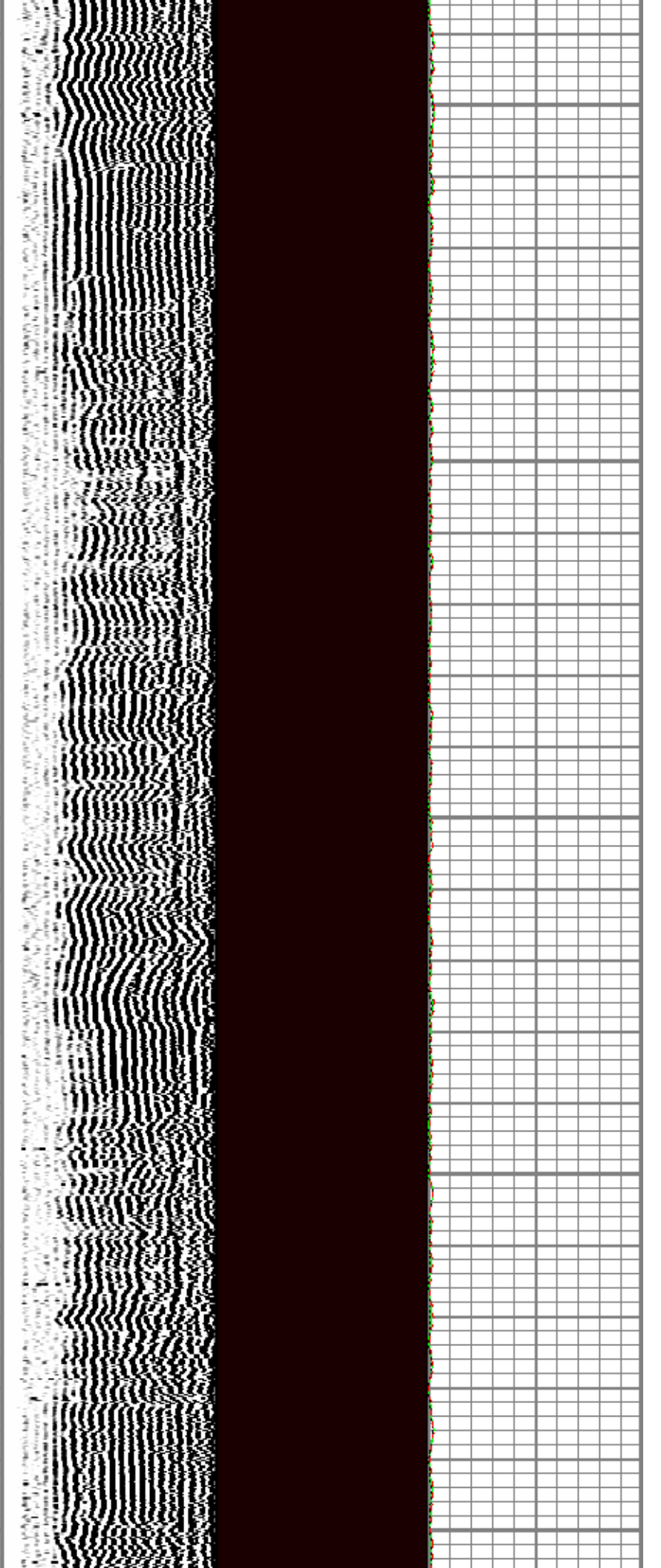
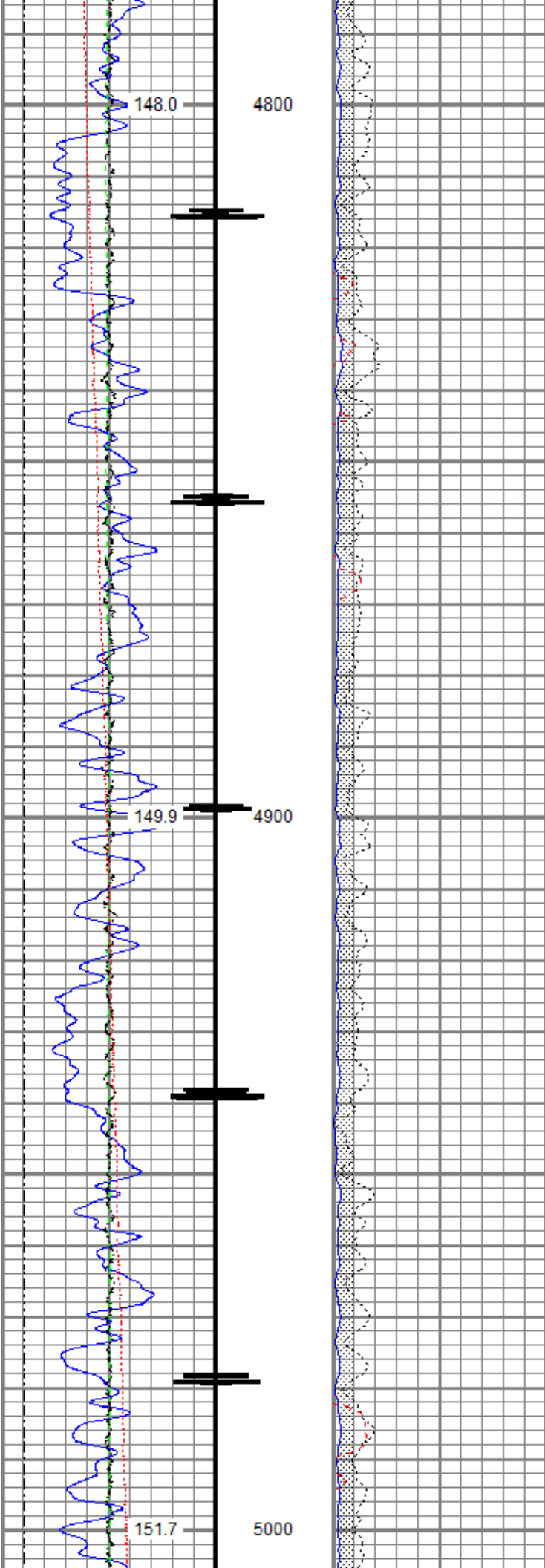


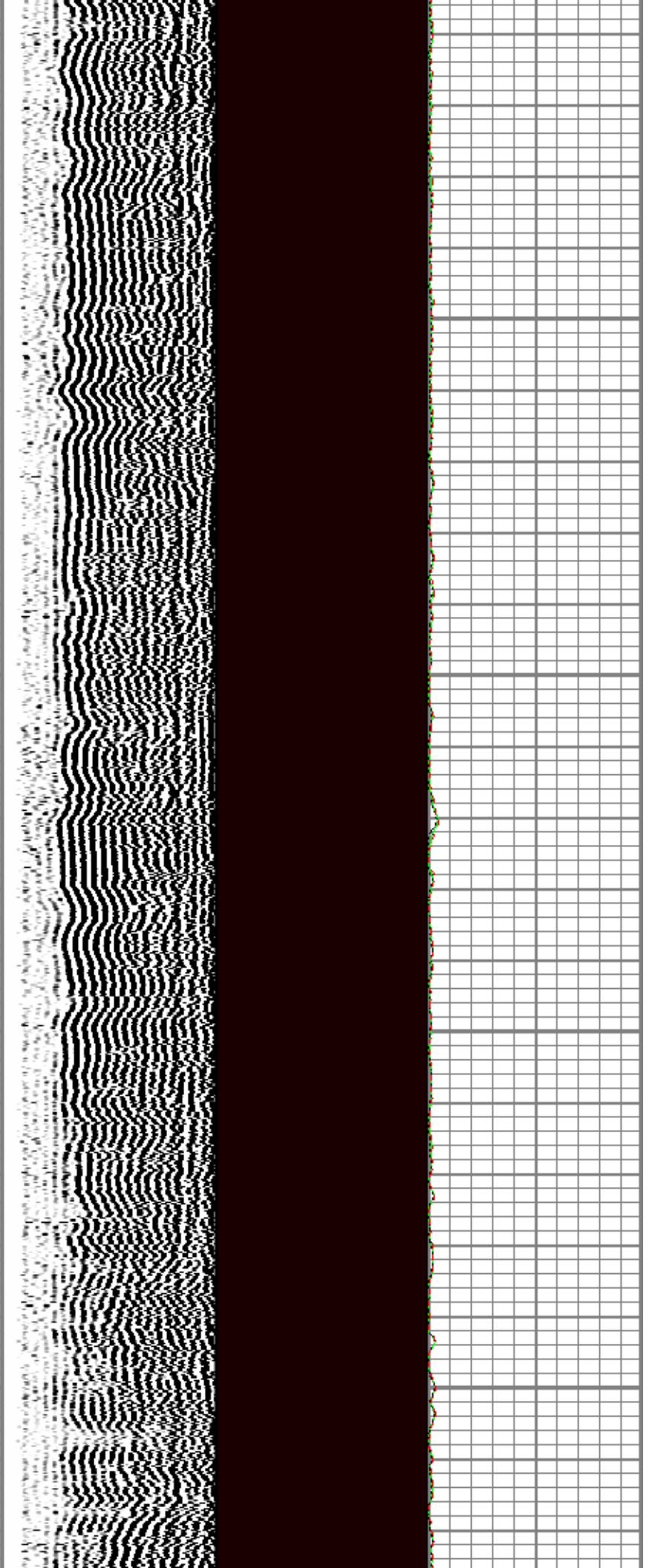
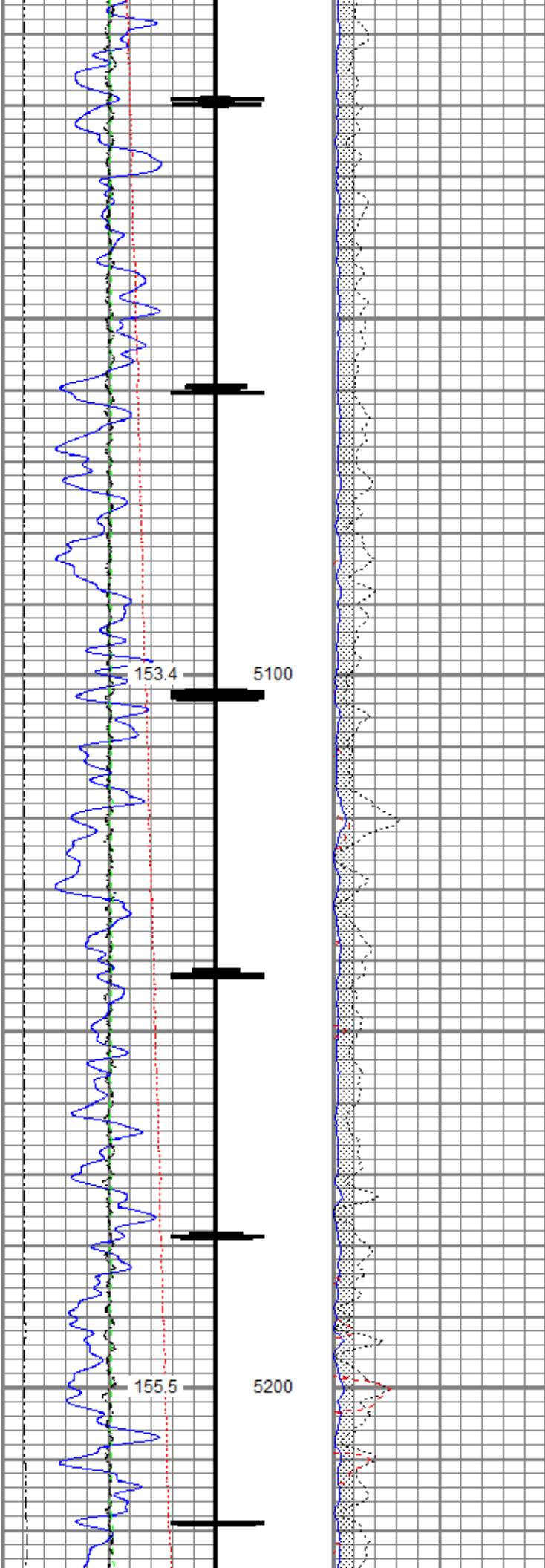


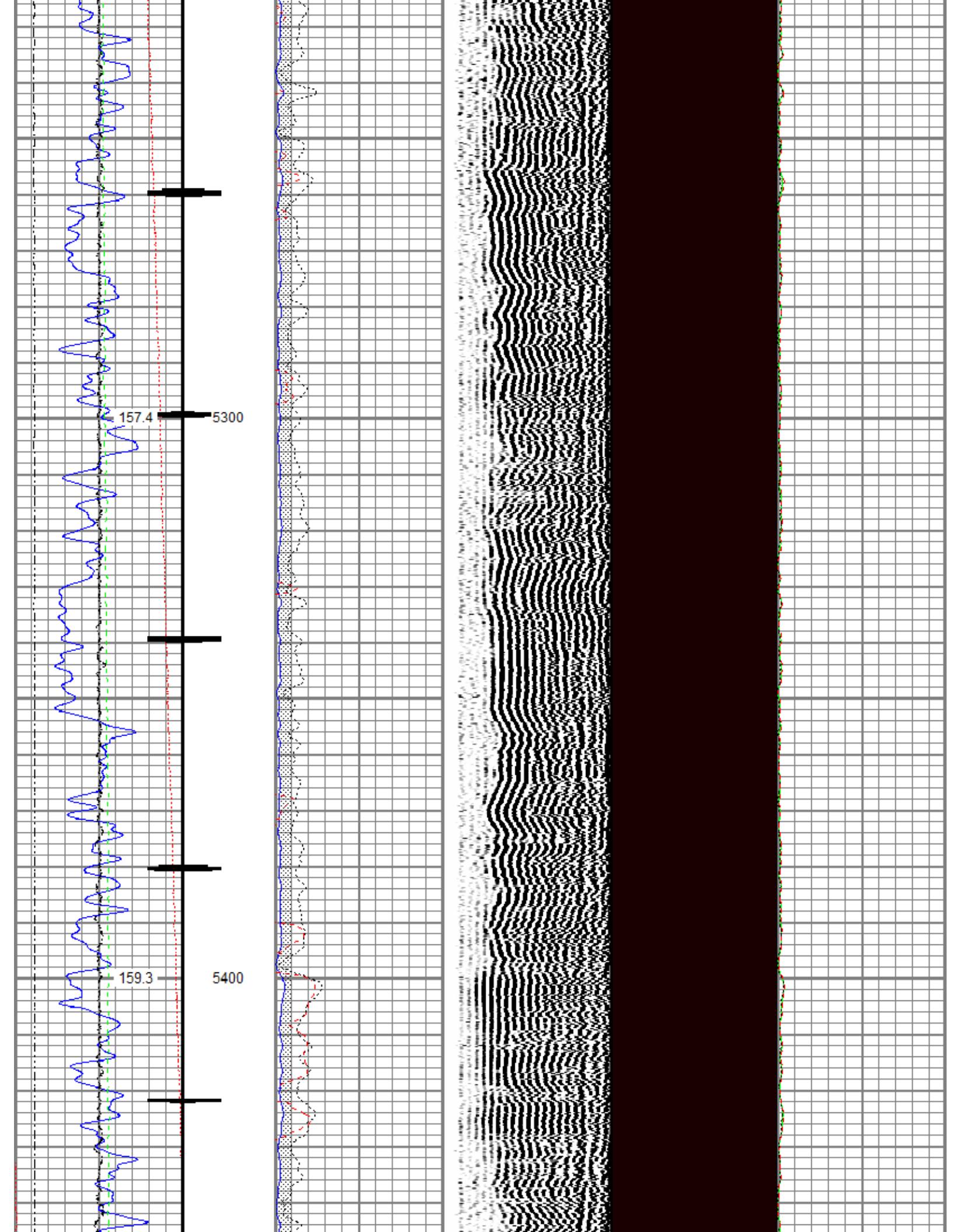




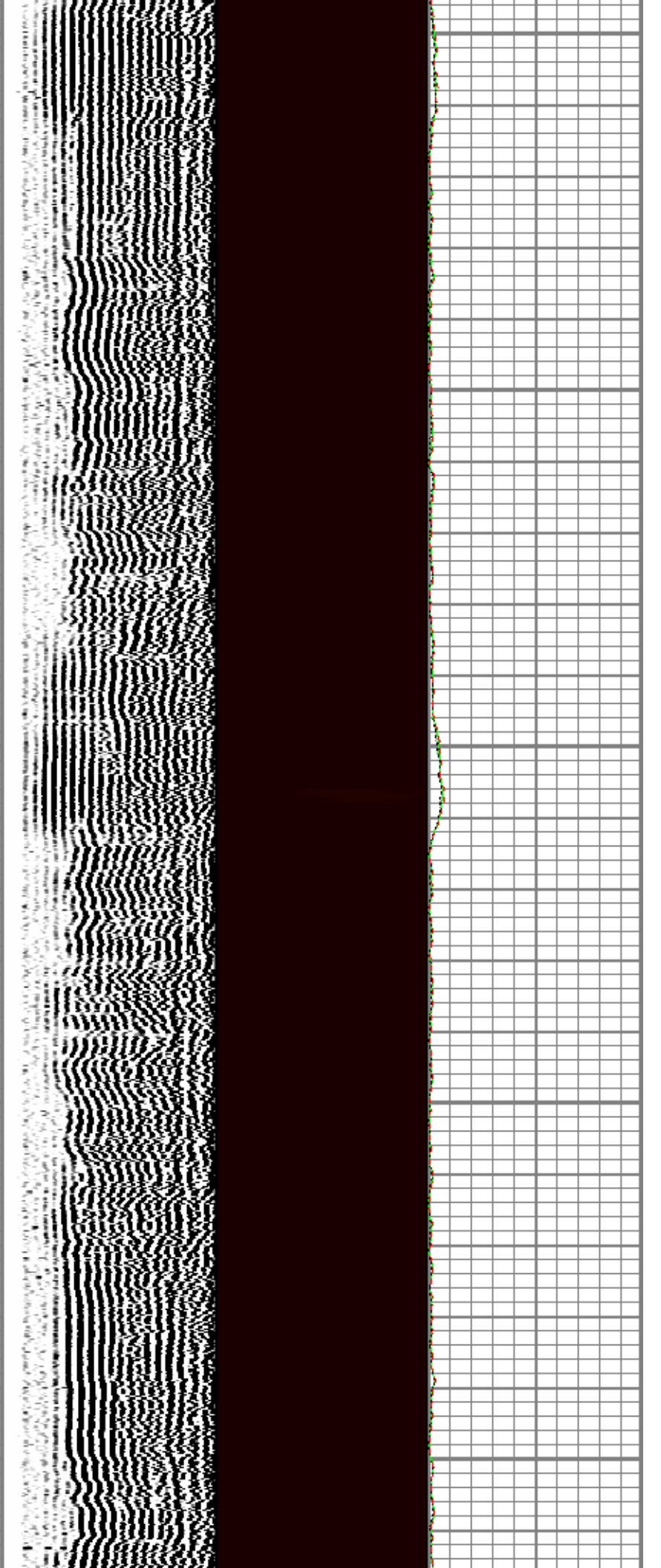
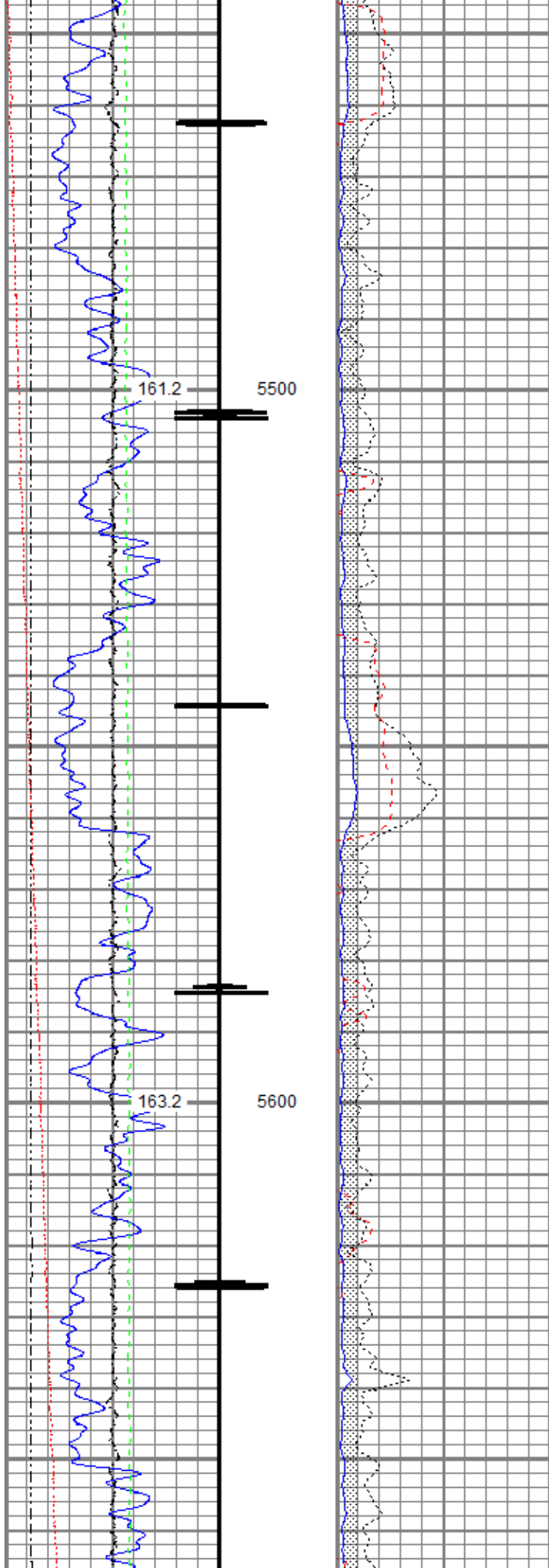


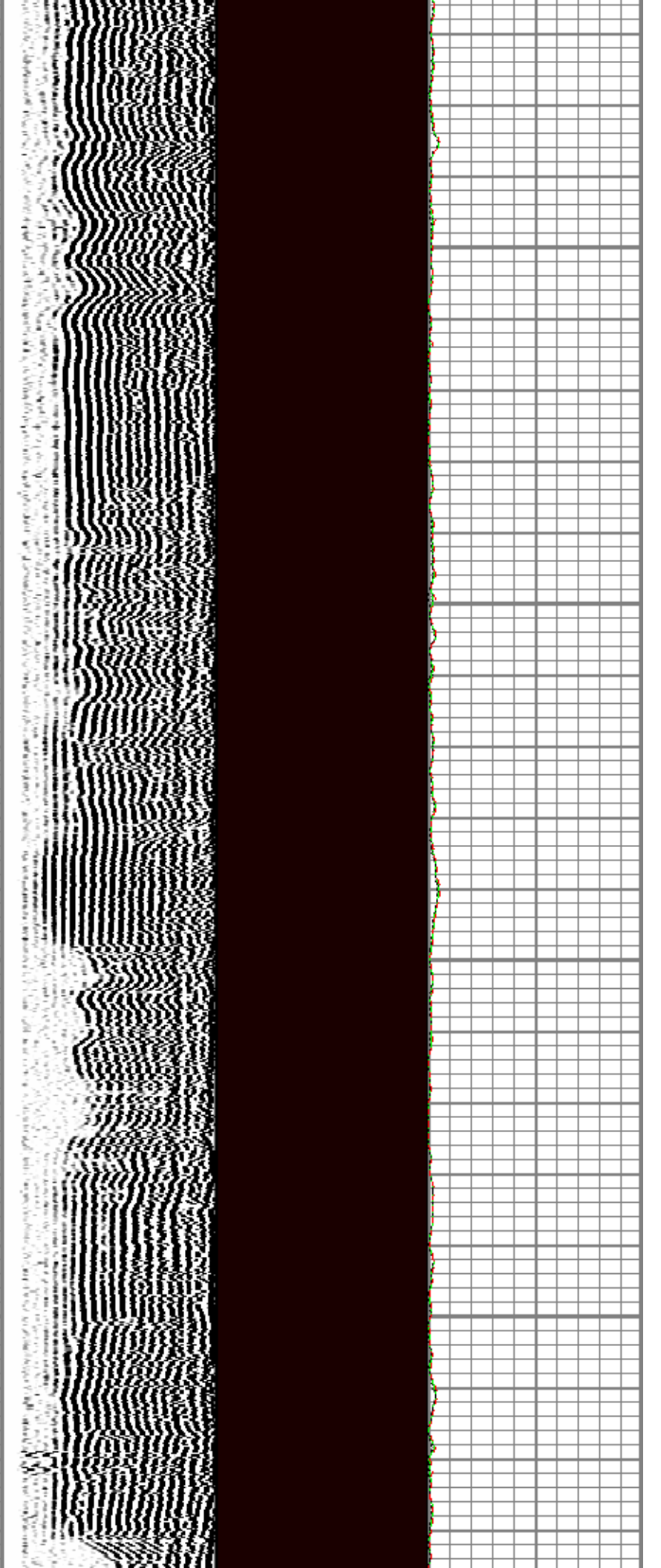
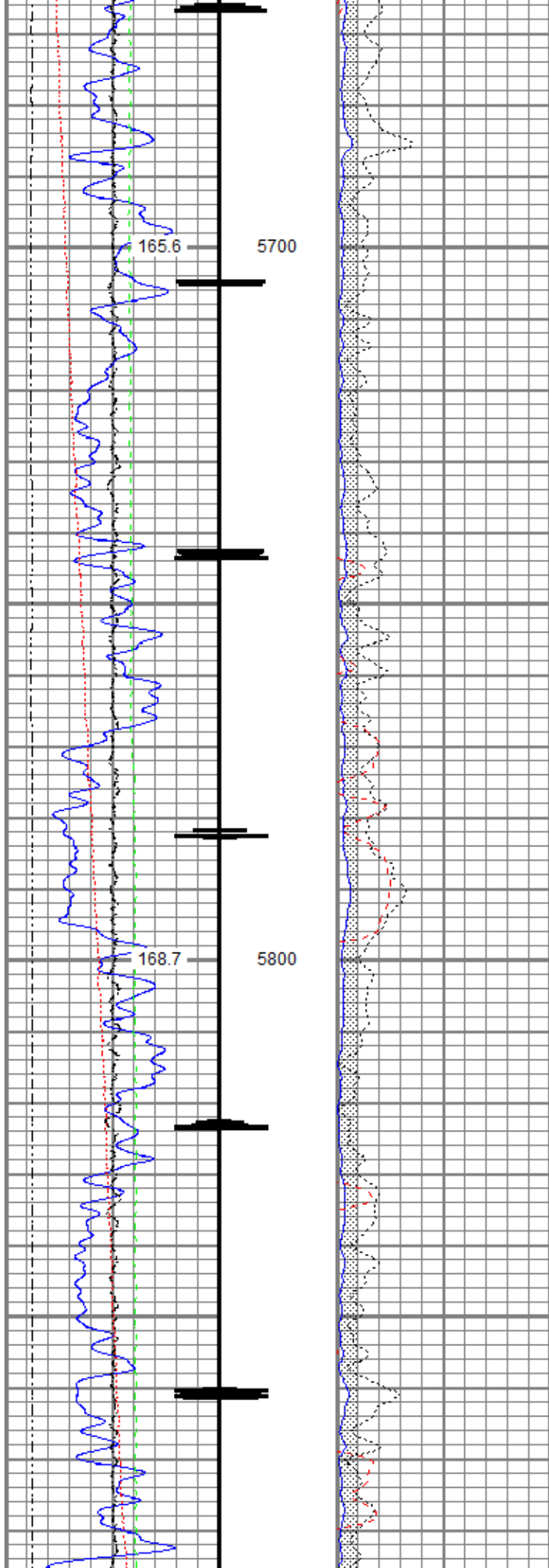


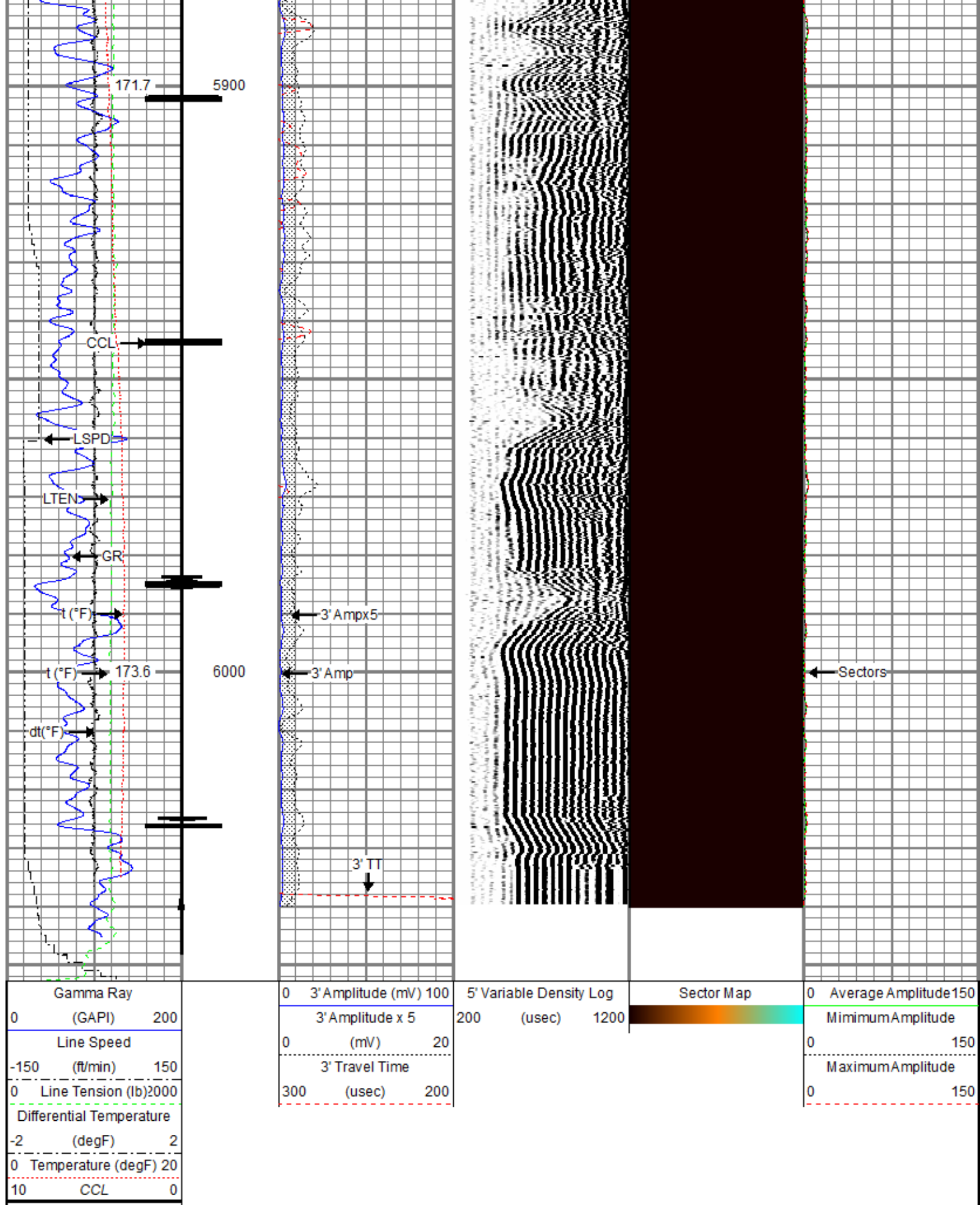










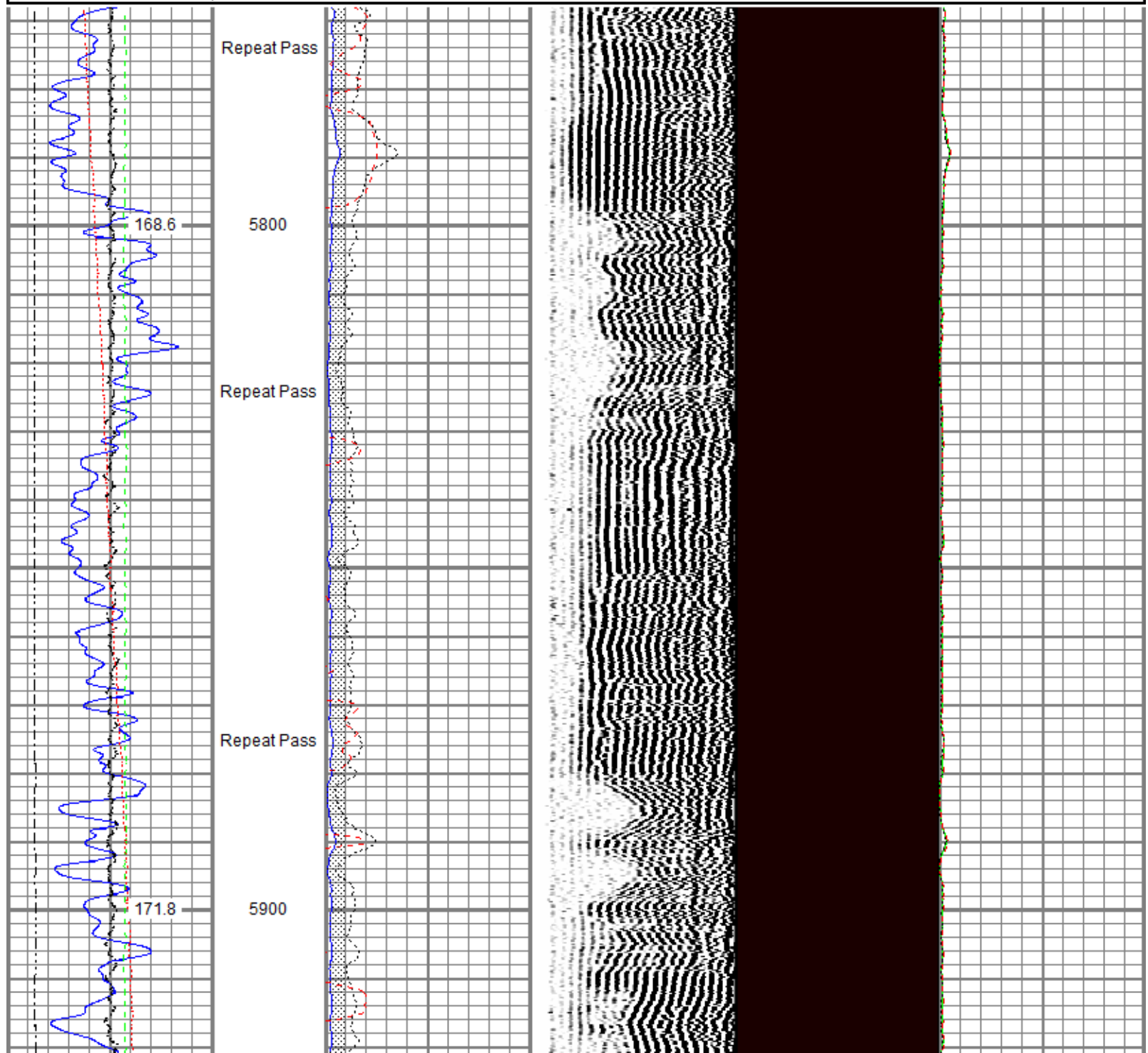


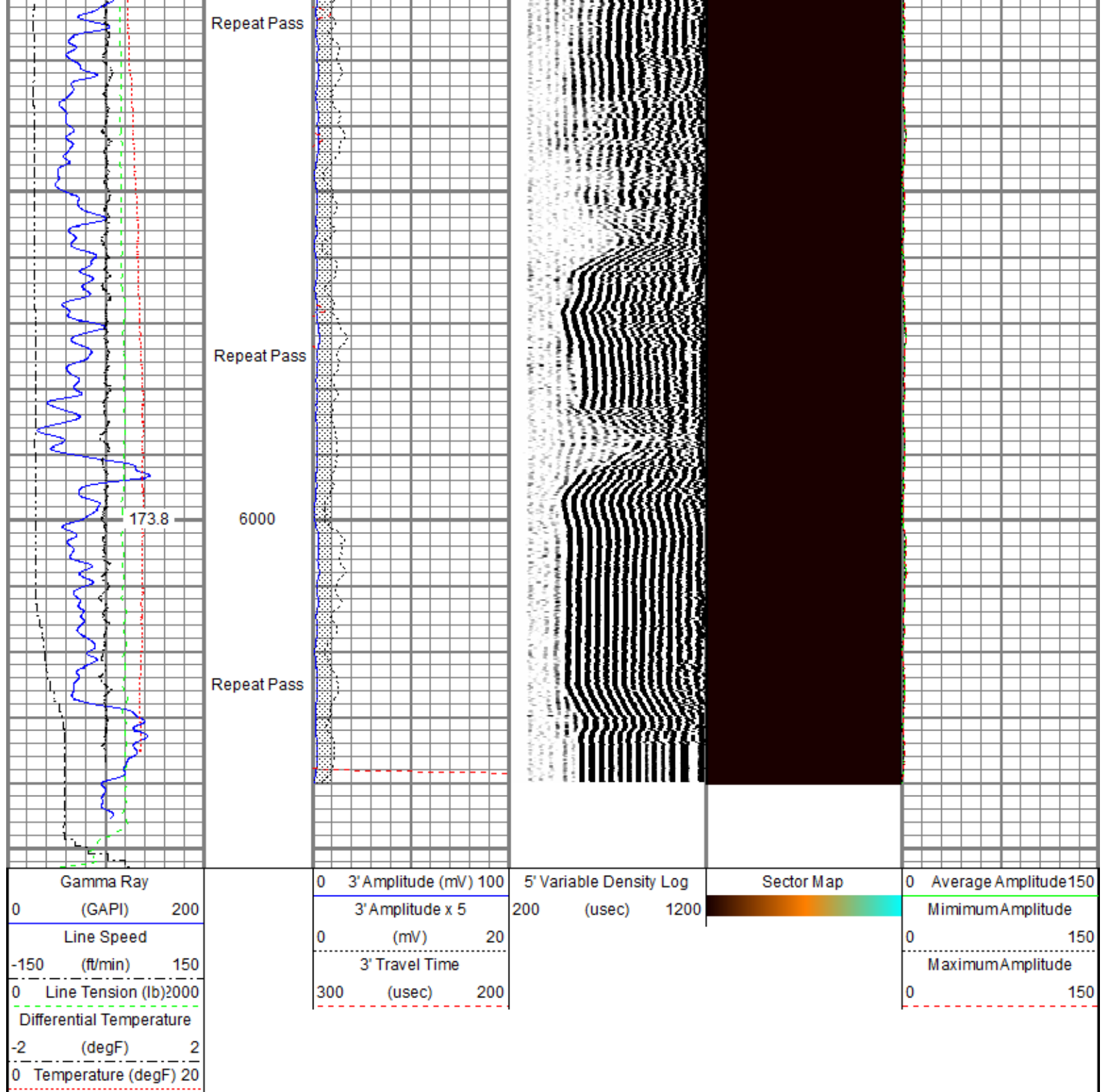
Repeat Pass



Database File tep\_federal sg 511-22\tep\_federal sg 511-22\_rbl\_03-19-19.db  
Dataset Pathname Repeat1.1  
Presentation Format ros\_rbt004\_tep  
Dataset Creation Wed Mar 20 12:51:59 2019  
Charted by Depth in Feet scaled 1:240

Gamma Ray	0	3' Amplitude (mV) 100	5' Variable Density Log	Sector Map	0	Average Amplitude 150
(GAPI) 200		3' Amplitude x 5	200 (usec) 1200			Minimum Amplitude
Line Speed	0	(mV) 20			0	150
-150 (ft/min) 150		3' Travel Time				Maximum Amplitude
0 Line Tension (lb) 2000	300	(usec) 200			0	150
Differential Temperature						
-2 (degF) 2						
0 Temperature (degF) 20						





Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
			Titan CHD-14375 GO Titan 1-7/16" Assembled Electric Cable Head w/ 1" Fishing Neck	1.03	1.44	3.60
			DSS RAC-2750 5A GO DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends	2.55	2.75	32.00

TEMP	16.33					
WVFS8	14.10			Probe Radii-2750 RBT (FW1307-063)	9.39	2.75
WVFS7	14.10			Probe 2-3/4" Radial Cement Bond Tool with Integral Temperature Sub		105.00
WVFS6	14.10					
WVFS5	14.10					
WVFS4	14.10					
WVFS3	14.10					
WVFS2	14.10					
WVFS1	14.10					
WVFCAL	14.10					
WVF3FT	14.10					
WVF5FT	13.10					
				DSS RAC-2750 5A GO	2.55	2.75
				DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends		32.00
CCL\$2	6.42					
CCL\$1	6.42					
GR	5.18			Probe GR-CCL-2750 GOB (FW1307-038)	4.51	2.75
				Probe 2-3/4" rev.2 Digital Scintillation Gamma Ray/CCL Combined		55.00
				DSS RAC-2750 5A GO	2.55	2.75
				DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends		32.00
				GO BN-14375	0.25	1.44
				GO 1-7/16" Bull Nose with Go Box Top		1.00
Dataset: tep_federal sg 511-22_rbl_03-19-19.db: field/well/run1/Main.1 Total length: 22.82 ft Total weight: 260.60 lb O.D.: 2.75 in						

Calibration Report		
Database File	c:\programdata\warrior\data\tep_federal sg 511-22\tep_federal sg 511-22_rbl_03-19-19.db	
Dataset Pathname	Main.1	
Dataset Creation	Wed Mar 20 12:47:39 2019	
Gamma Ray Calibration Report		
Serial Number:	FW1307-038	
Tool Model:	2750 GOB	
Performed:	Sun Nov 12 12:44:12 2017	
Calibrator Value:	637.0	GAPI
Background Reading:	113.2	cps



Background Reading:	113.2	cps
Calibrator Reading:	1022.4	cps
Sensitivity:	0.7007	GAPI/cps

### Segmented Cement Bond Log Calibration Report

Serial Number:	FW1307-063
Tool Model:	2750 RBT
Calibration Casing Diameter:	4.500 in
Calibration Depth:	32.980 ft

#### Master Calibration, performed (Derived):

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.002	0.872	0.800	81.196	92.002	0.952
CAL	-0.006	0.753				
5'	0.004	0.825	0.800	81.196	97.962	0.384
SUM						
S1	-0.002	0.996	0.000	100.000	100.294	0.152
S2	-0.003	0.937	0.000	100.000	106.415	0.300
S3	-0.002	0.839	0.000	100.000	118.886	0.254
S4	-0.003	0.793	0.000	100.000	125.609	0.333
S5	-0.003	0.795	0.000	100.000	125.315	0.315
S6	-0.002	0.818	0.000	100.000	121.860	0.290
S7	-0.002	0.869	0.000	100.000	114.806	0.278
S8	-0.003	0.954	0.000	100.000	104.462	0.298

#### Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	-0.006	0.753	1.000	0.000

#### Air Zero Calibration, performed Tue Mar 19 06:49:30 2019:

	Raw (v)	Calibrated (v)	Results
	Zero	Zero	Offset
3'	-0.002	0.000	-0.000
5'	0.011	0.000	-0.002
SUM			
S1	-0.002	0.000	0.001
S2	-0.001	0.000	-0.001
S3	-0.002	0.000	0.000
S4	-0.001	0.000	-0.000
S5	-0.001	0.000	0.000
S6	-0.001	0.000	0.001
S7	-0.002	0.000	0.000
S8	-0.002	0.000	-0.000

### Temperature Calibration Report

Serial Number:	FW1307-063
Tool Model:	2750 RBT
Performed:	Sun Nov 12 13:45:43 2017

	Reference	Reading
Low Reference:	100.00 degF	113.84 degF
High Reference:	350.00 degF	420.89 degF

Gain:	0.81
Offset:	7.31



<b>Company</b>	TEP Rocky Mountain LLC
<b>Well</b>	Federal SG 511-22
<b>Field</b>	Grand Valley
<b>County</b>	Garfield
<b>State</b>	Colorado