



Radial Cement Bond  
Gamma Ray  
Casing Collar Log

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

Well Azul 13-13HZ

Field Wattenberg

County Weld State Colorado

Location: API #: 05-123-46103

SEC 13 TWP 1N RGE 66W

Permanent Datum Ground Level Elevation 5050'  
Log Measured From Kelly Bushing 21 FT  
Drilling Measured From Kelly Bushing

Other Services  
GR/JB  
RBP  
RBL 0 PSI  
Elevation  
K.B. 5071'  
D.F. ---  
G.L. 5050'

Company Kerr-McGee Oil & Gas Onshore, L.P.  
Well Azul 13-13HZ  
Field Wattenberg  
County Weld  
State Colorado

Date	29-JUN-2018	Four		
Run Number		12951 FT		
Depth Driller		6903 FT		
Depth Logger		6888 FT		
Bottom Logged Interval		Surface		
Top Log Interval		7.875"		
Open Hole Size		Water		
Type Fluid		8.34 lb/gal		
Density / Viscosity		207 °F		
Max. Recorded Temp.		See Log		
Estimated Cement Top		ROA		
Time Well Ready		8:40		
Time Logger on Bottom		HD-0325		
Equipment Number		Platteville, CO		
Location		R. Cameron		
Recorded By		Justin McMillen		
Witnessed By				
Borehole Record				
Run Number	Bit	From	To	Size
				Weight
				From
				To
Tubing Record				
Casing Record	Size (in)	Wgt (lbs/ft)	Grade	Top
Surface Casing	9 5/8	36	J-55	Surface
Intermediate #1	5 1/2	17	HCP-110	Surface
Intermediate #2				
Inner				

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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 Casing Tally reported Marker Joint at 6834 FT  
Adjusted -10 FT to correlate with Marker Joint Top  
Gauge Ring/Junk Basket ran to 7960 FT with no debris  
5.50" RBP Set @ 6920 FT  
Log ran from 6888 FT to surface  
Recorded with 2800 PSI surface induced pressure  
Logging tools were clean and free of any debris upon completion of operations  
Thank you for choosing Reliance Oilfield Services, LLC!!

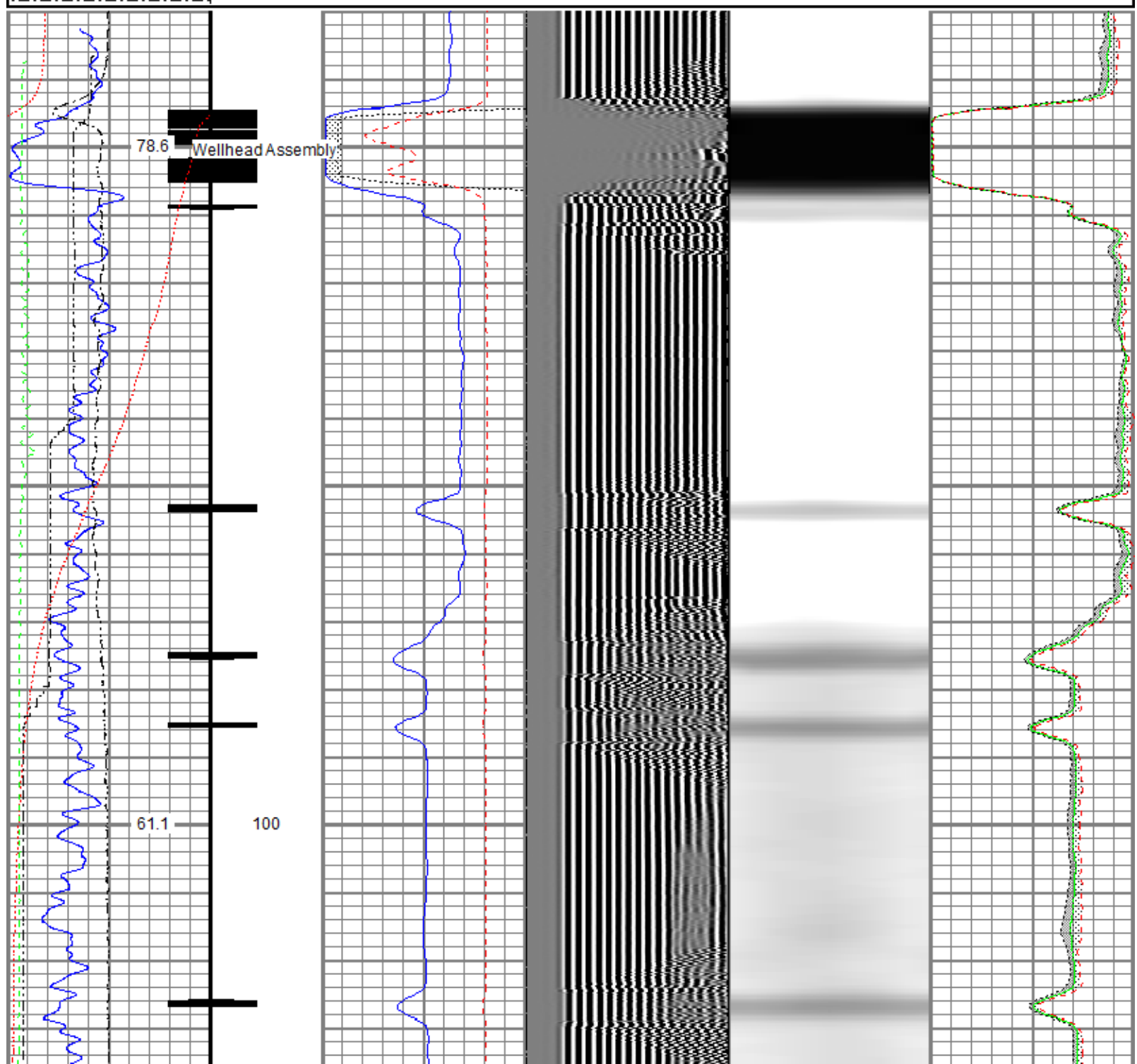
Main Pass

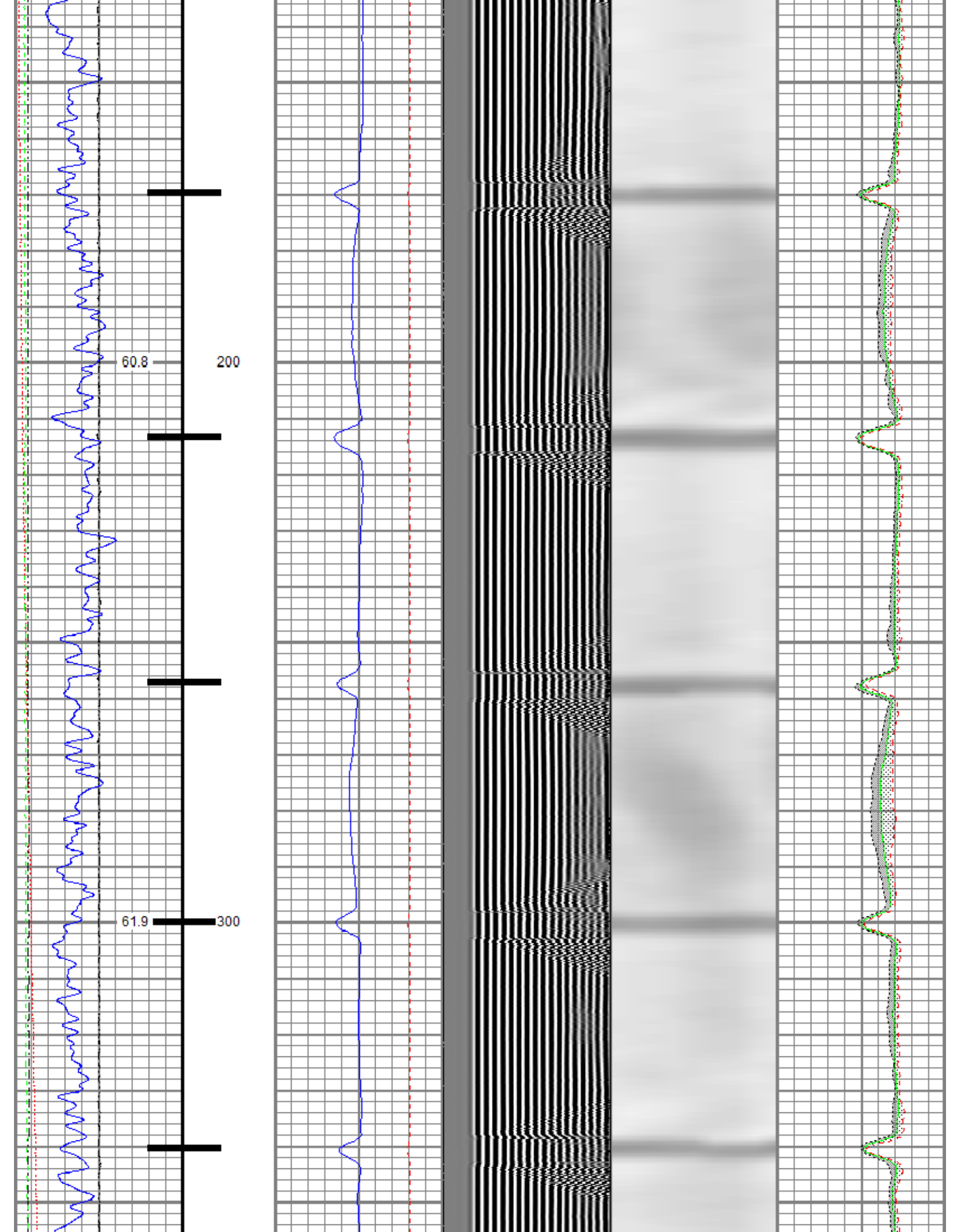


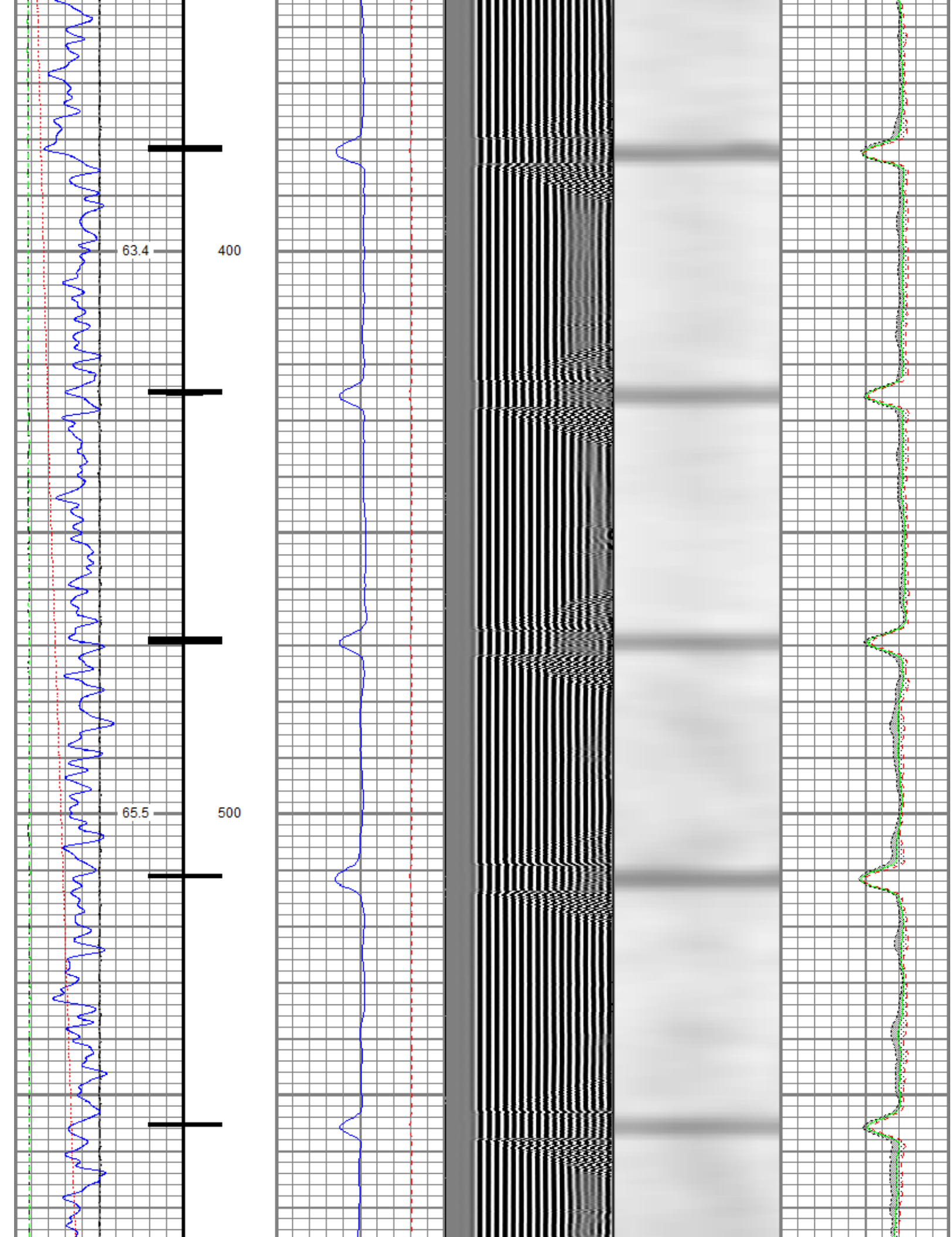
Recorded With 2800 PSI Surface Induced Pressure

Database File	0512346103_anadarko_azul 13-13hz_rbl_06-28-18\processed_0512346103_anadarko_azul 13-13hz_rbl_06-28-18_2800 psi
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Presentation Format	ros_radri
Dataset Creation	Fri Jun 29 08:52:58 2018
Charted by	Depth in Feet scaled 1:240

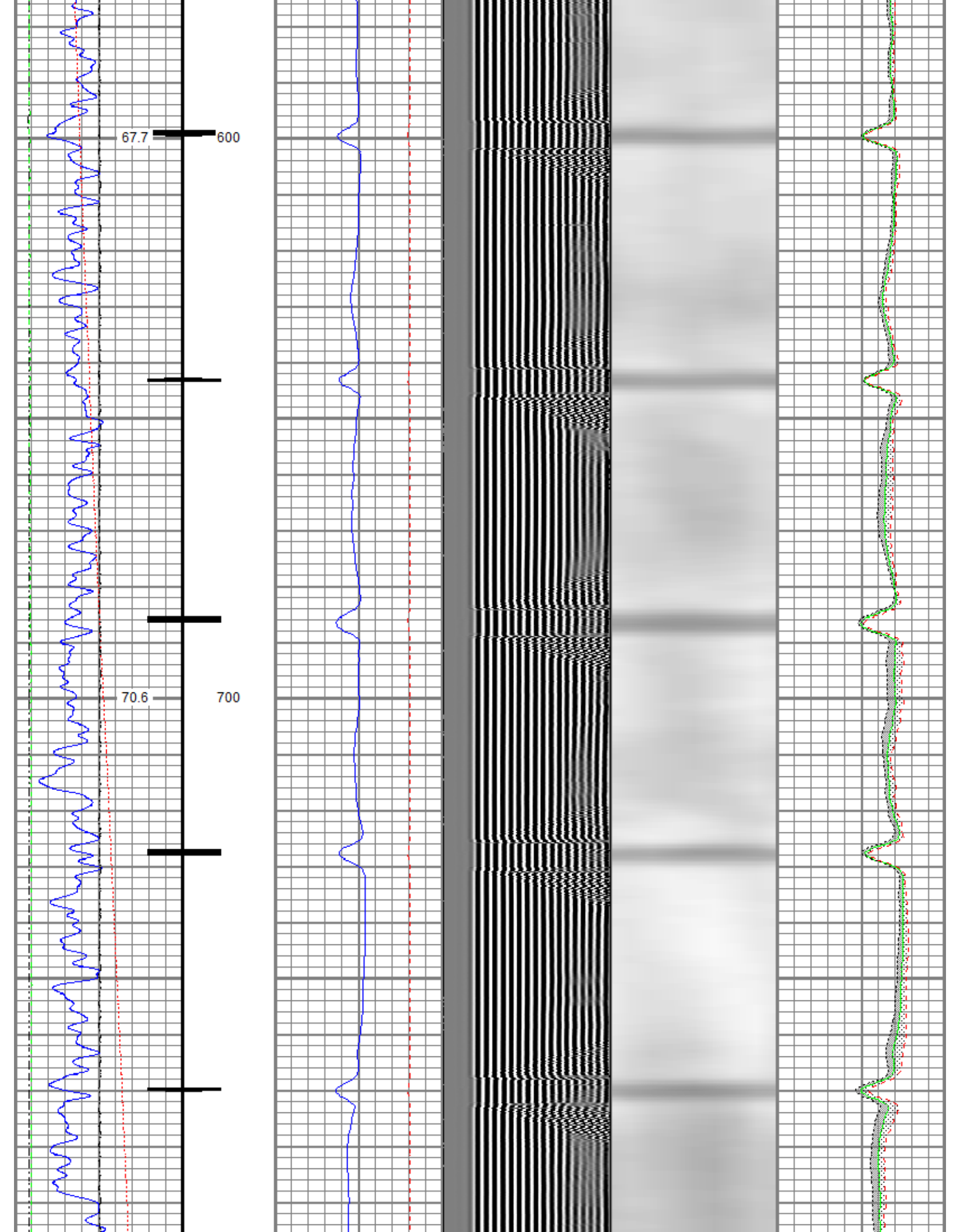
Gamma Ray	0	3' Amplitude (mV) 100	5' Variable Density Log	Sector Map	0	Average Amplitude 100
(GAPI) 120		3' Amplitude x 5	200			Minimum Amplitude
Casing Collar Locator		(mV) 20				
0 Temperature (degF) 20		3' Travel Time				Maximum Amplitude
Line Speed		650 (usec) 150				
-150 (ft/min) 150						
0 Line Tension (lb) 2000						
Differential Temperature						
-2 (degF) 2						

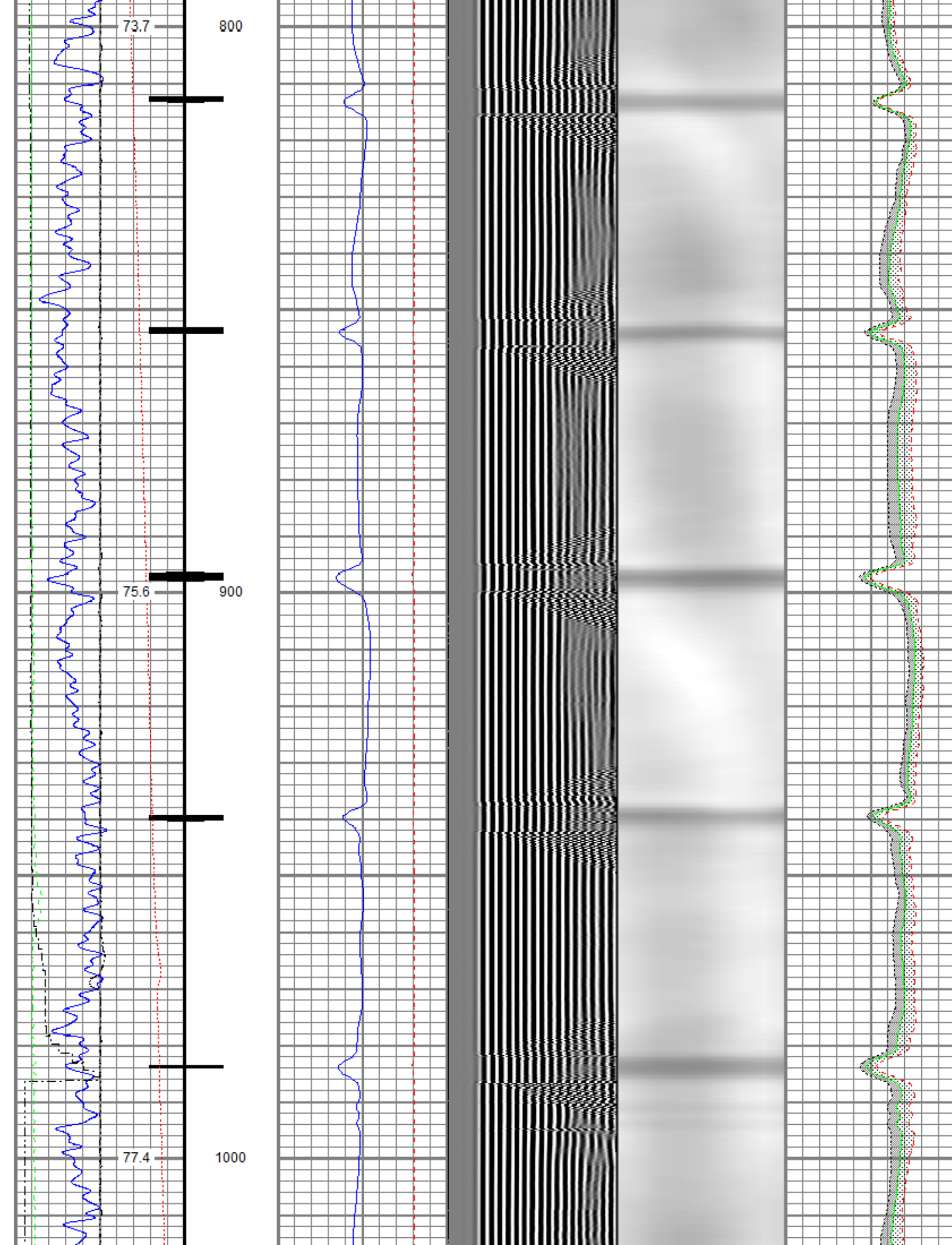


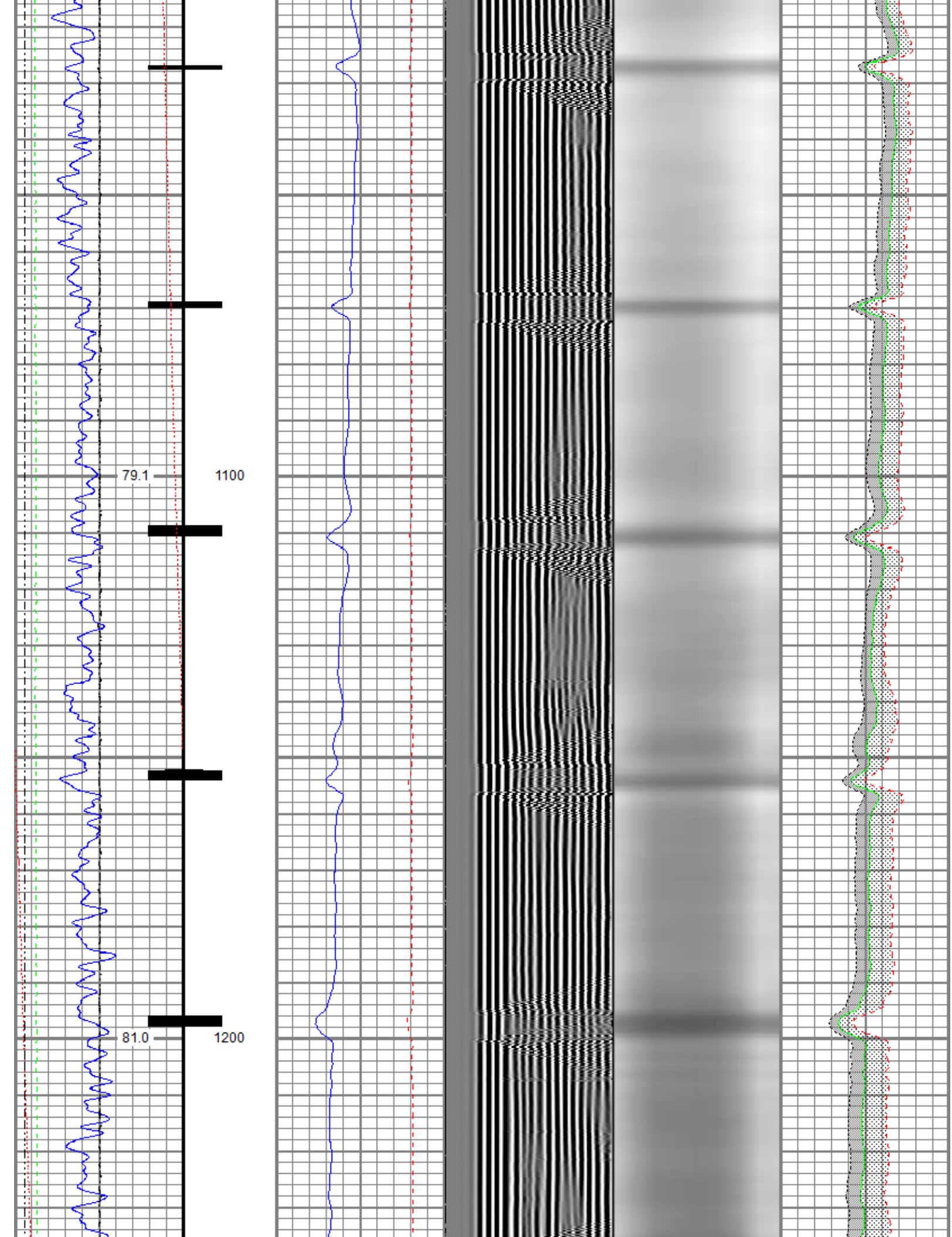




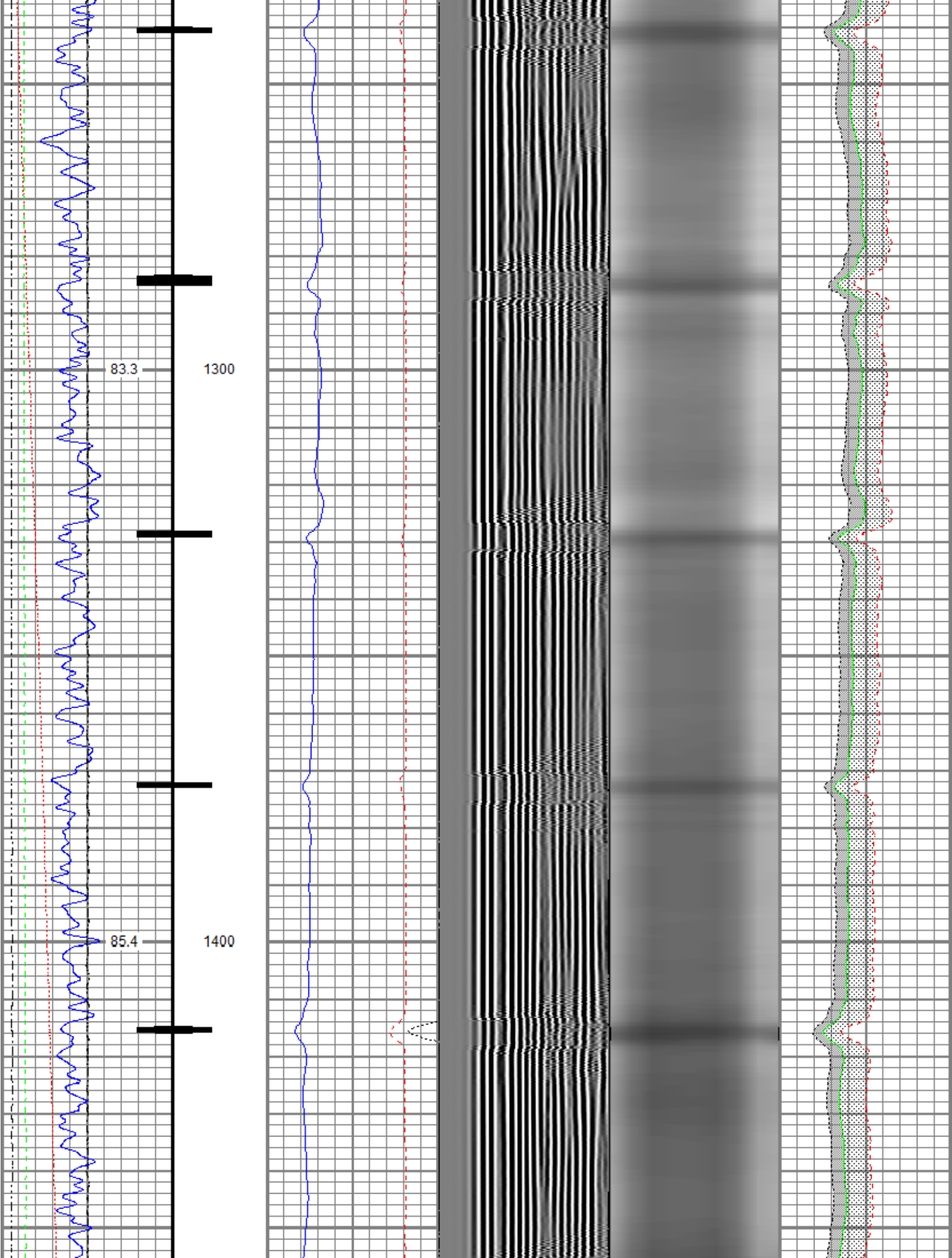




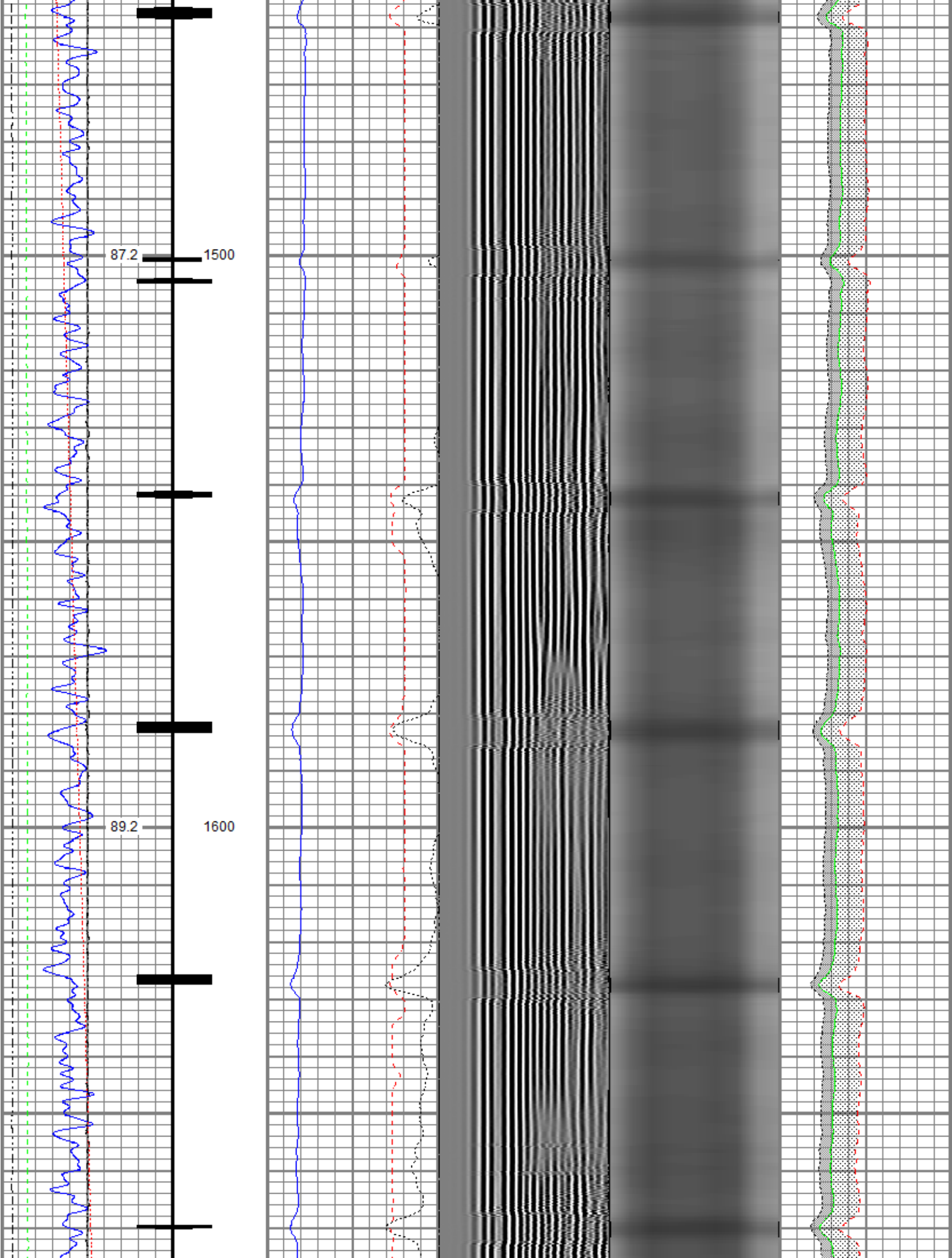


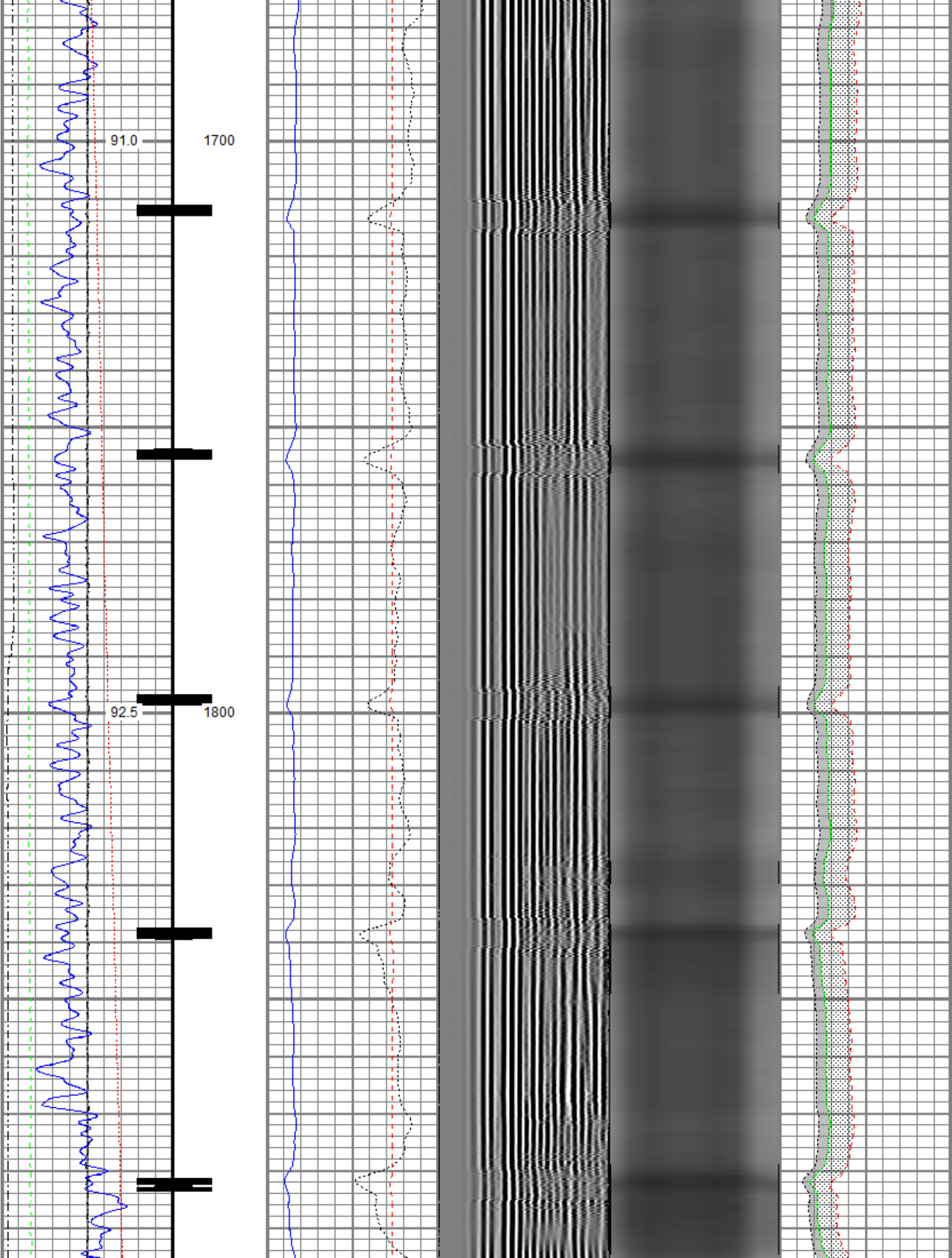


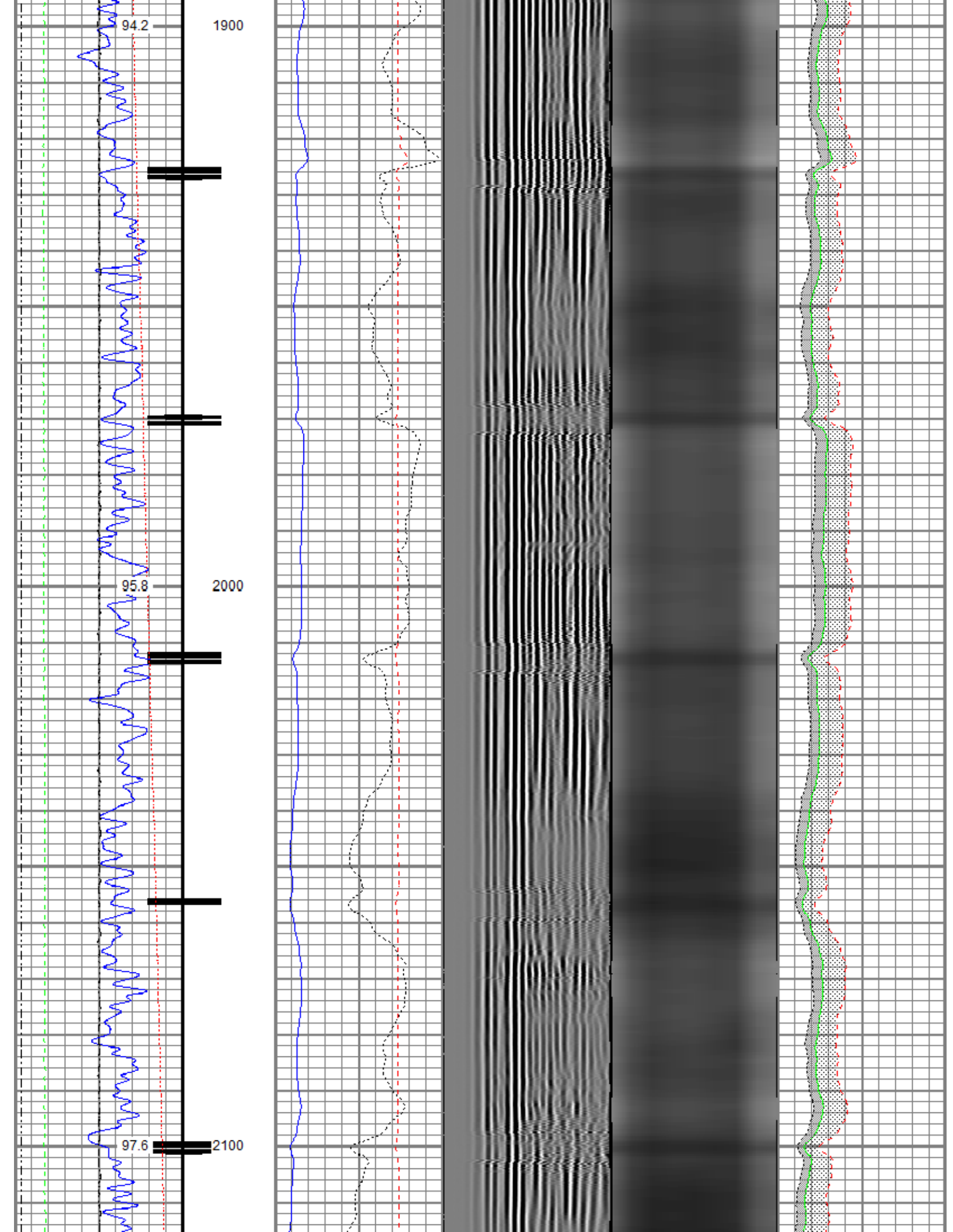




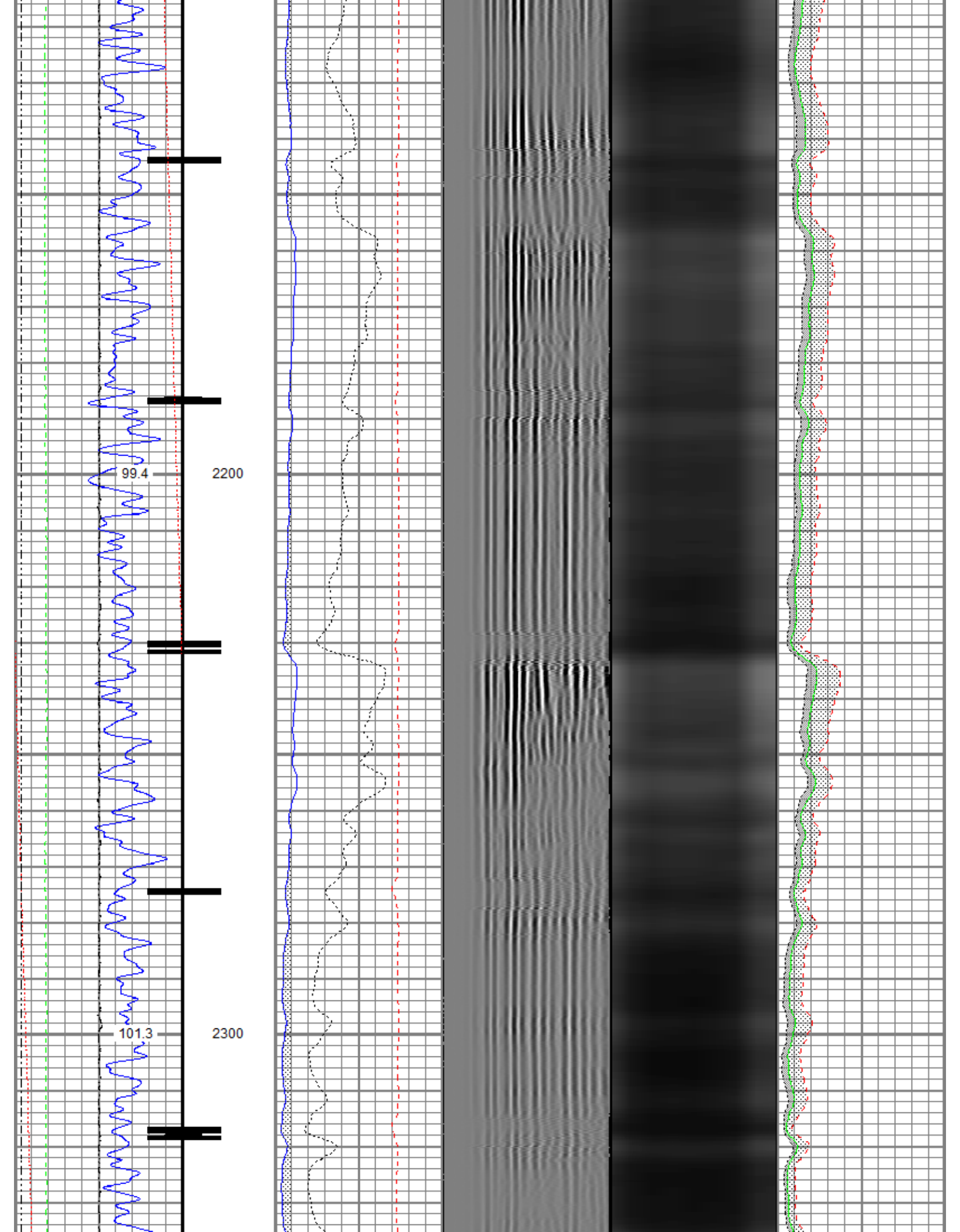




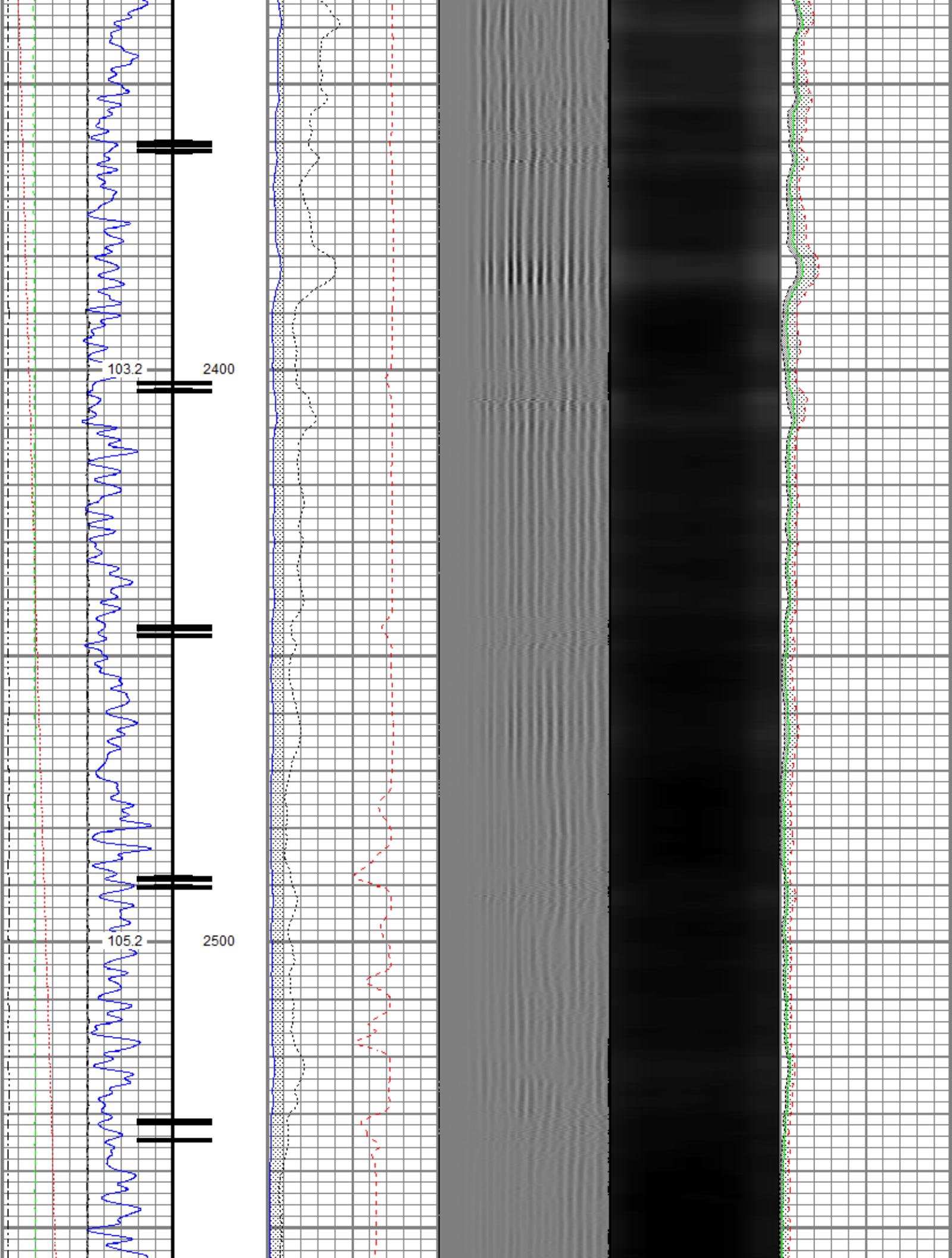


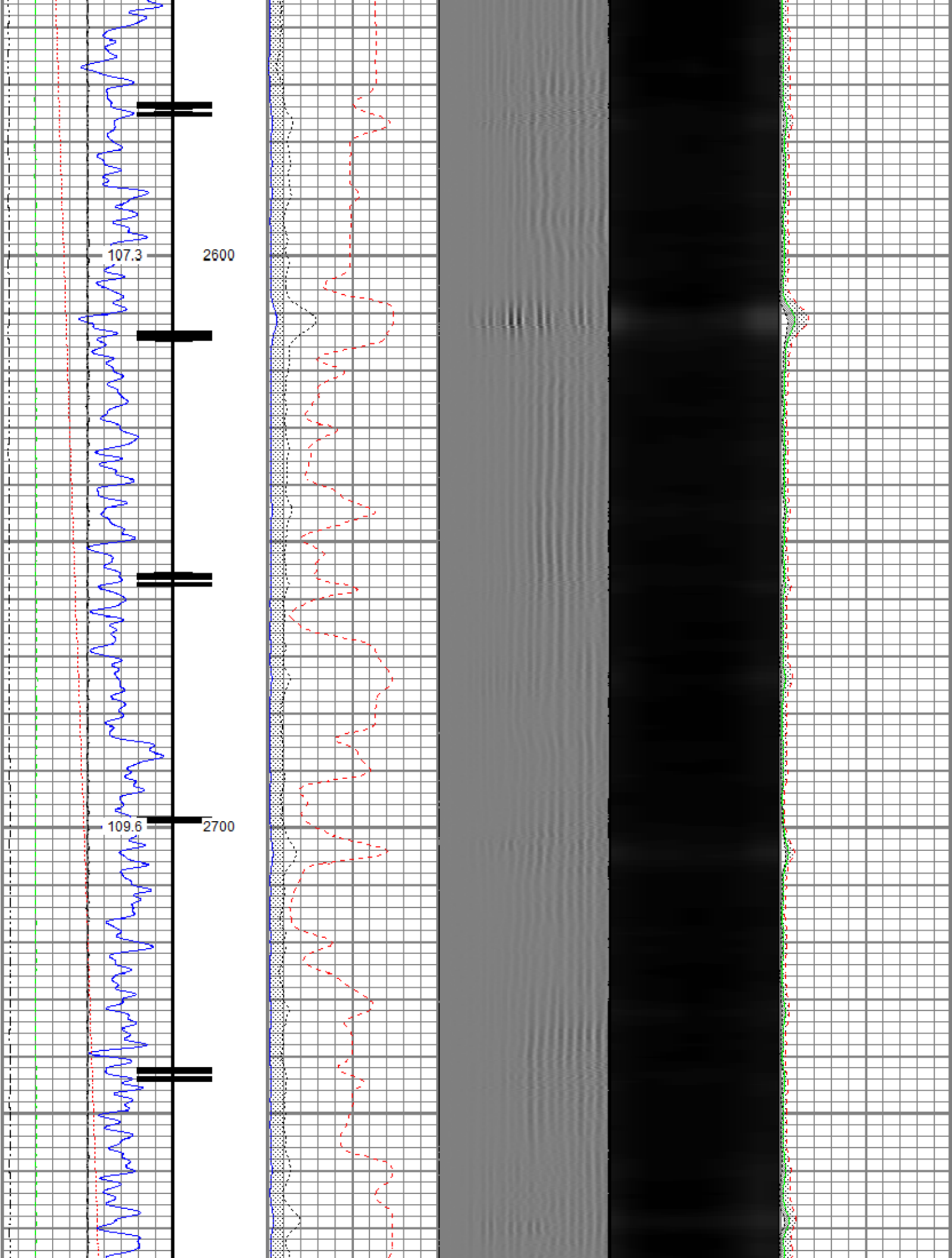


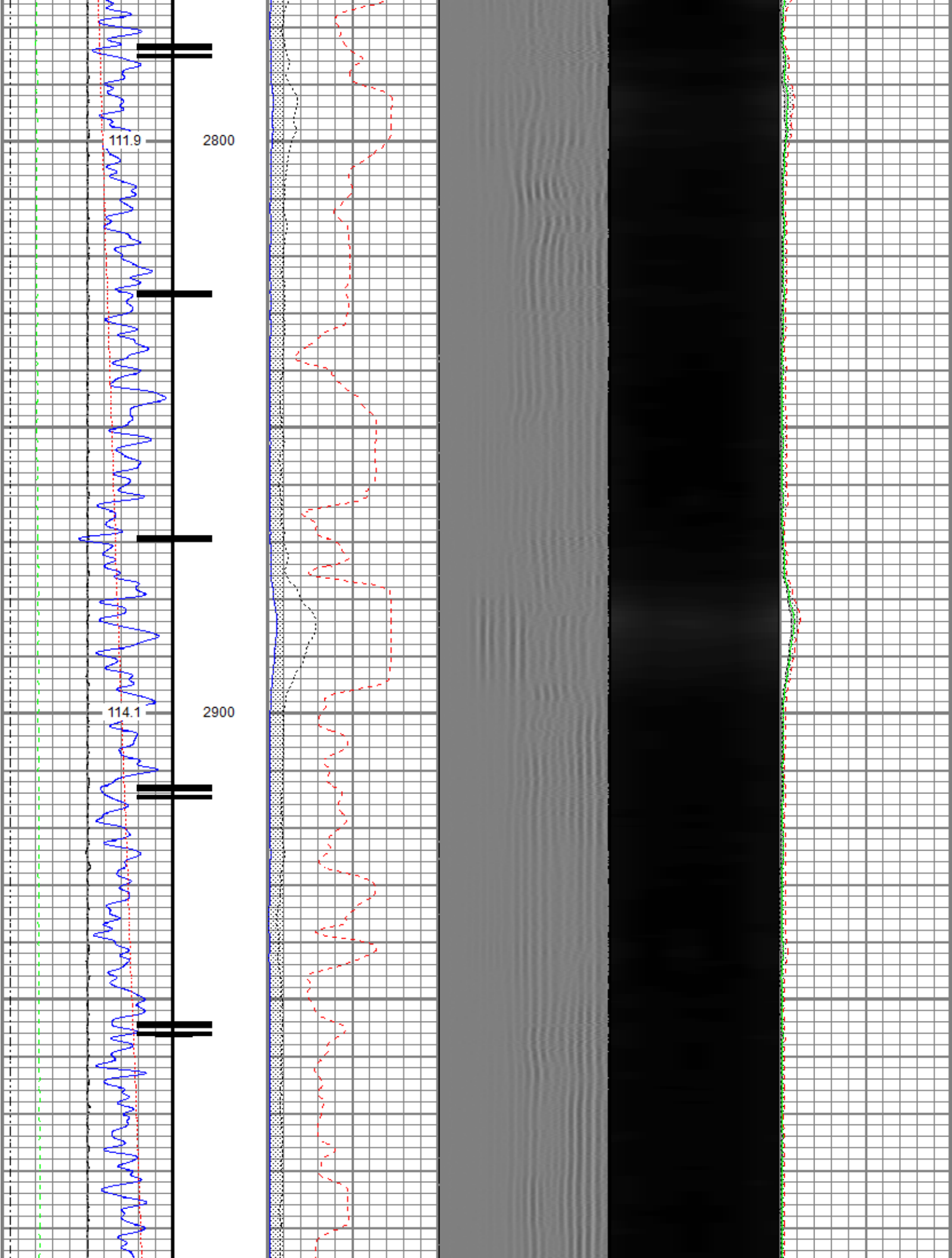


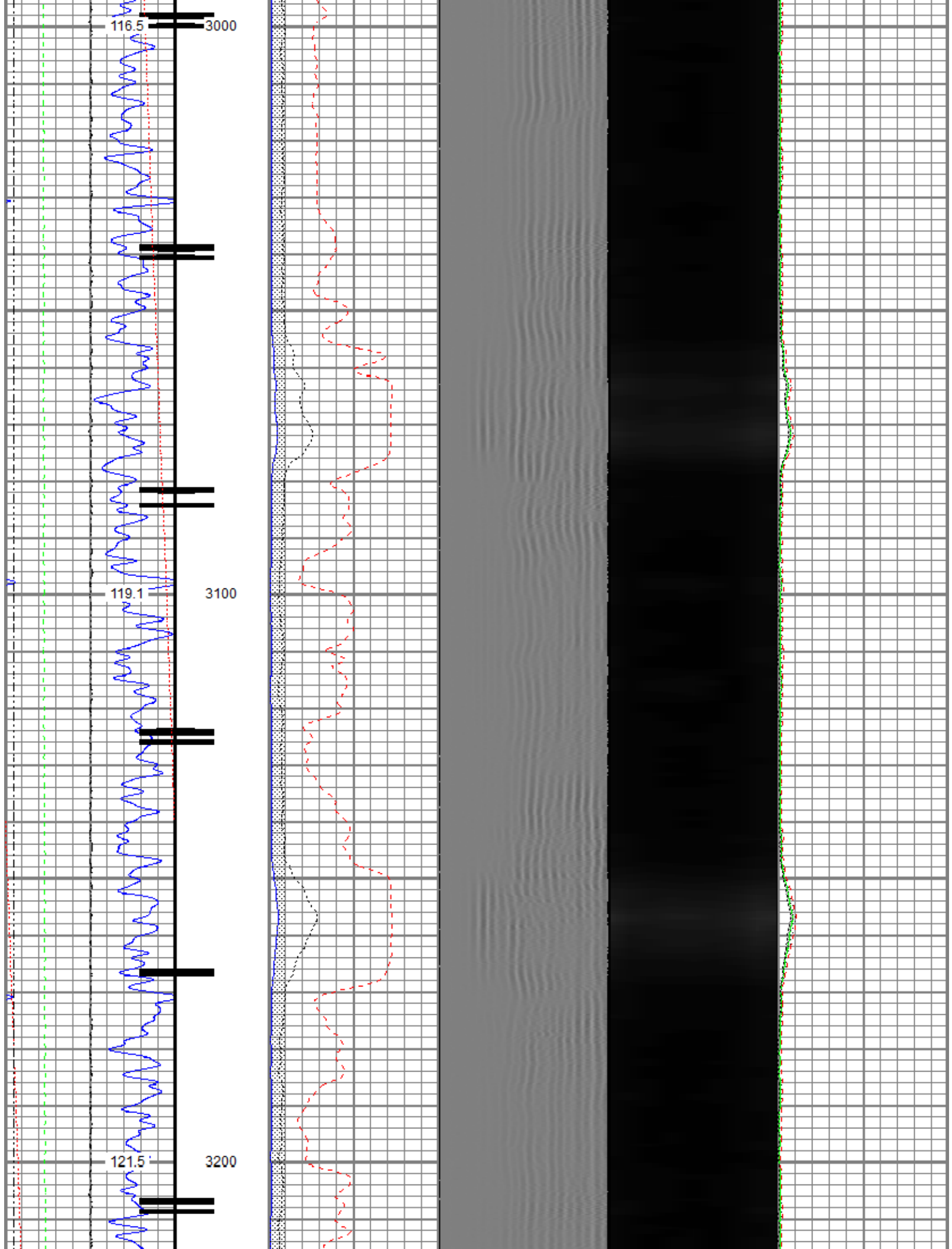




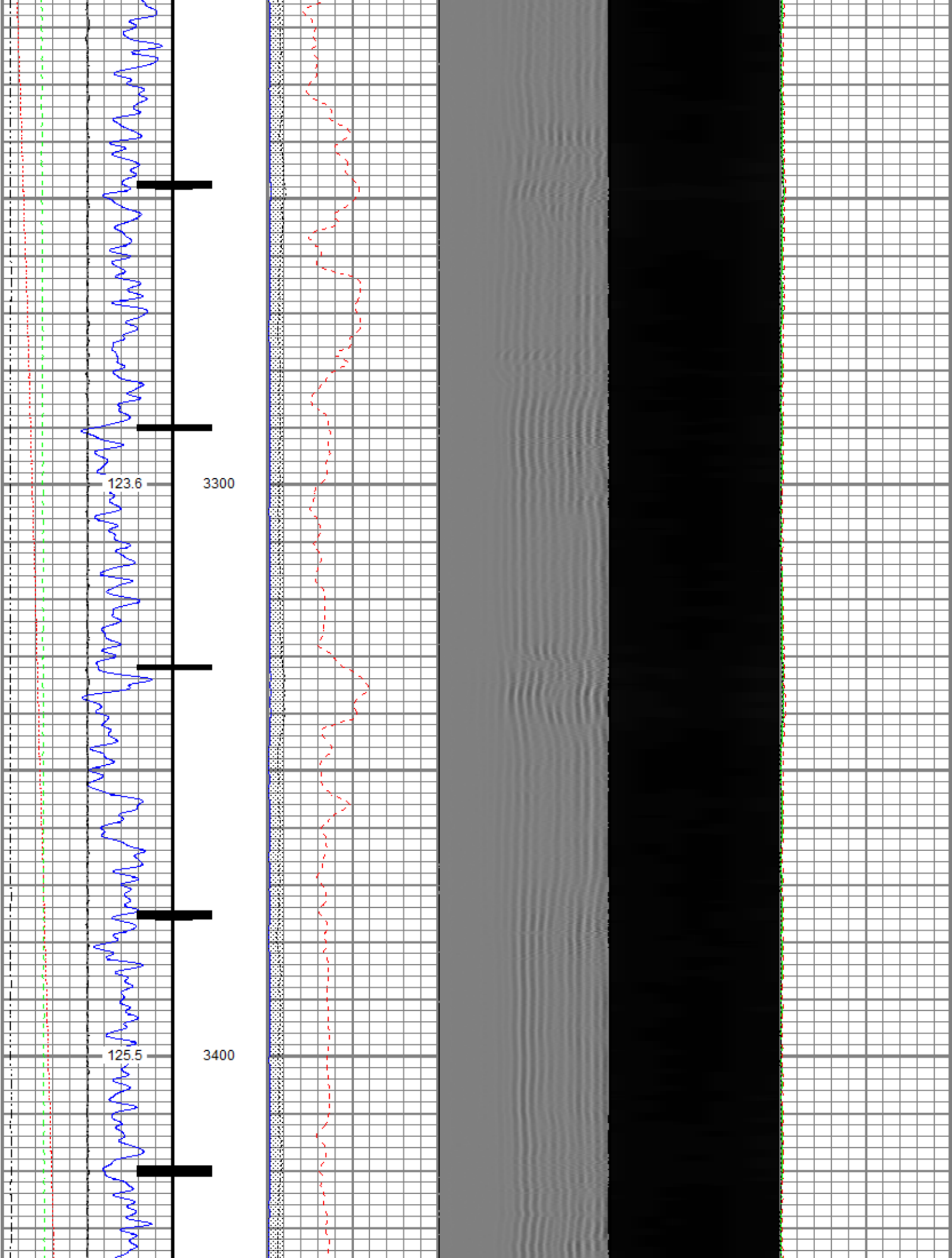


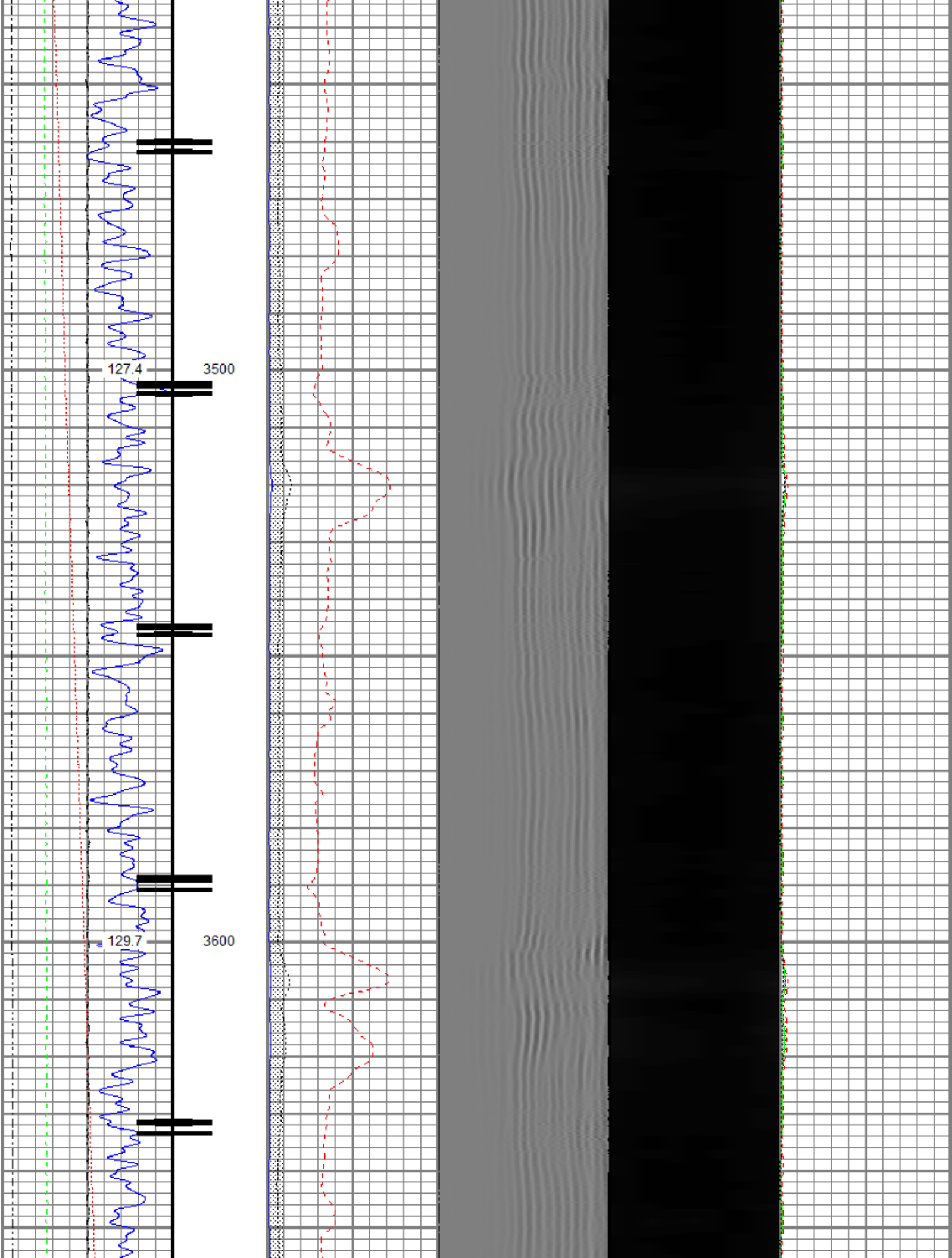


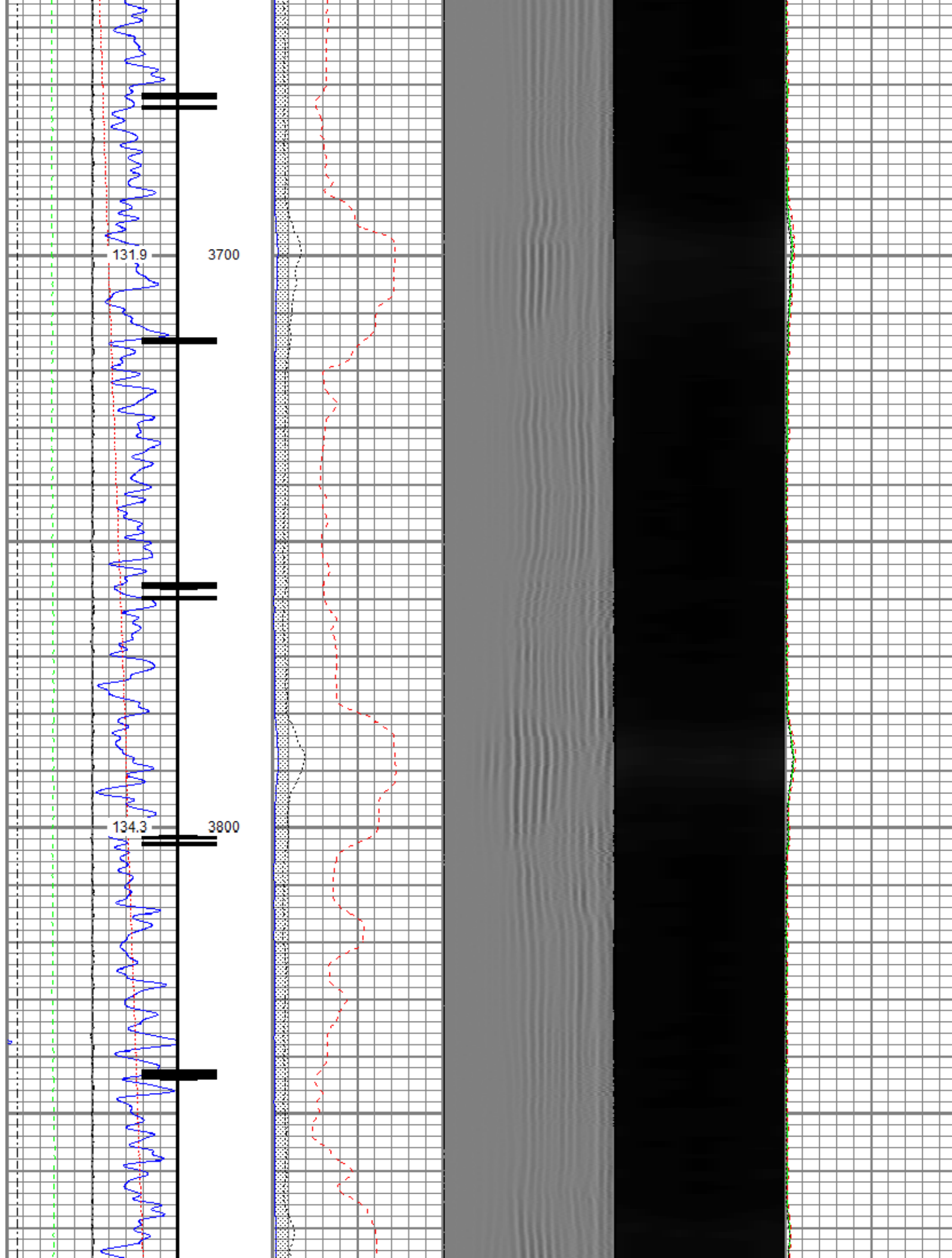


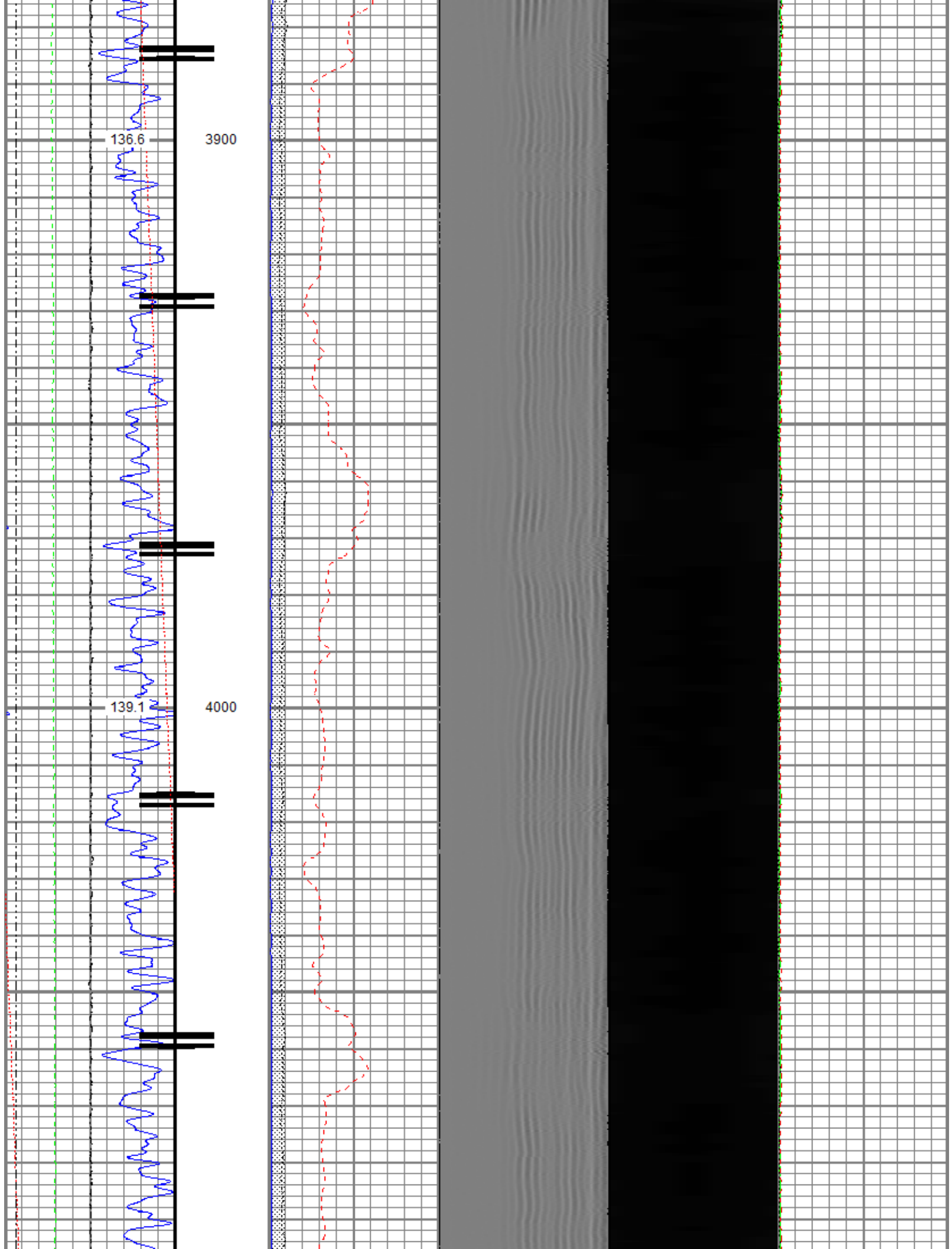




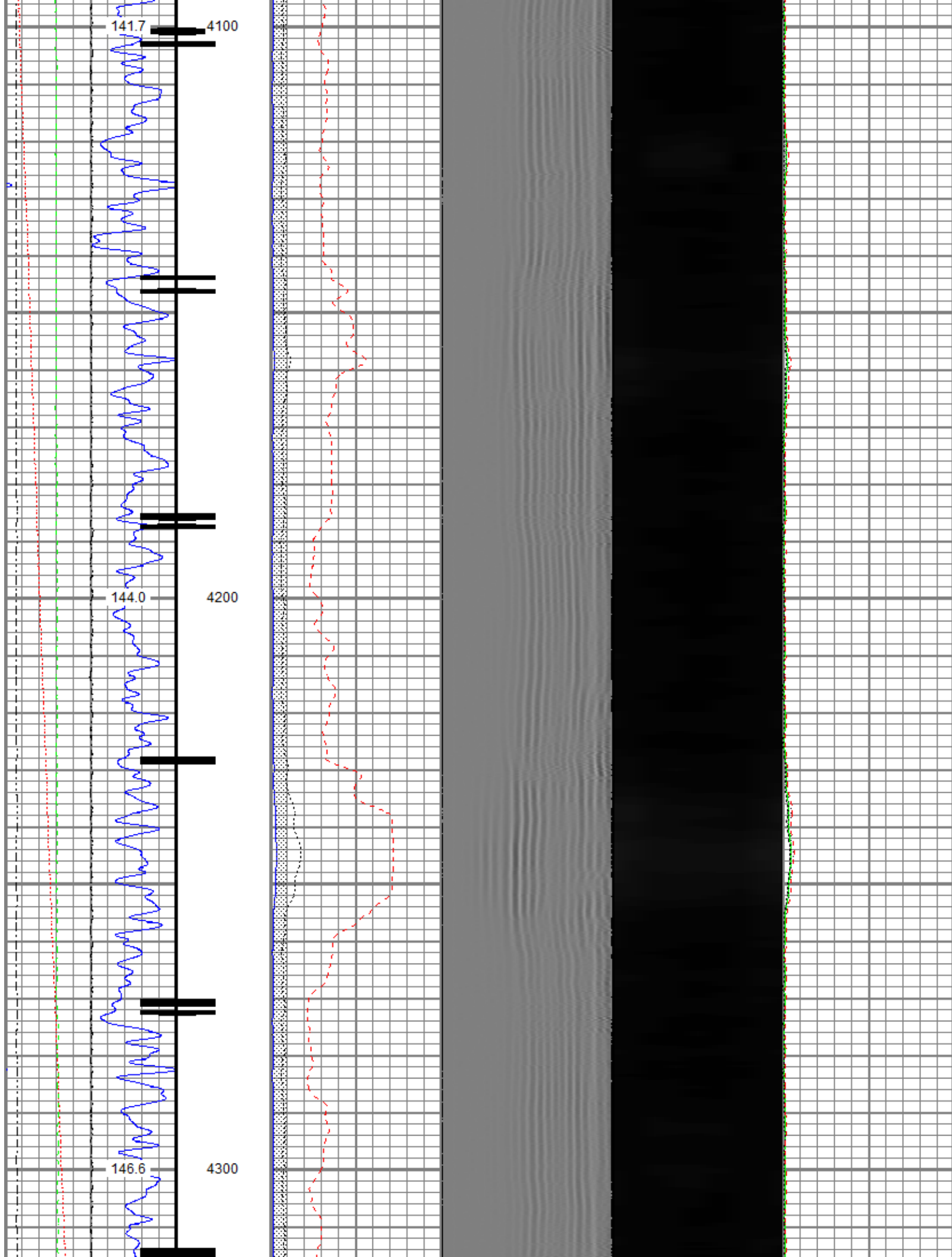


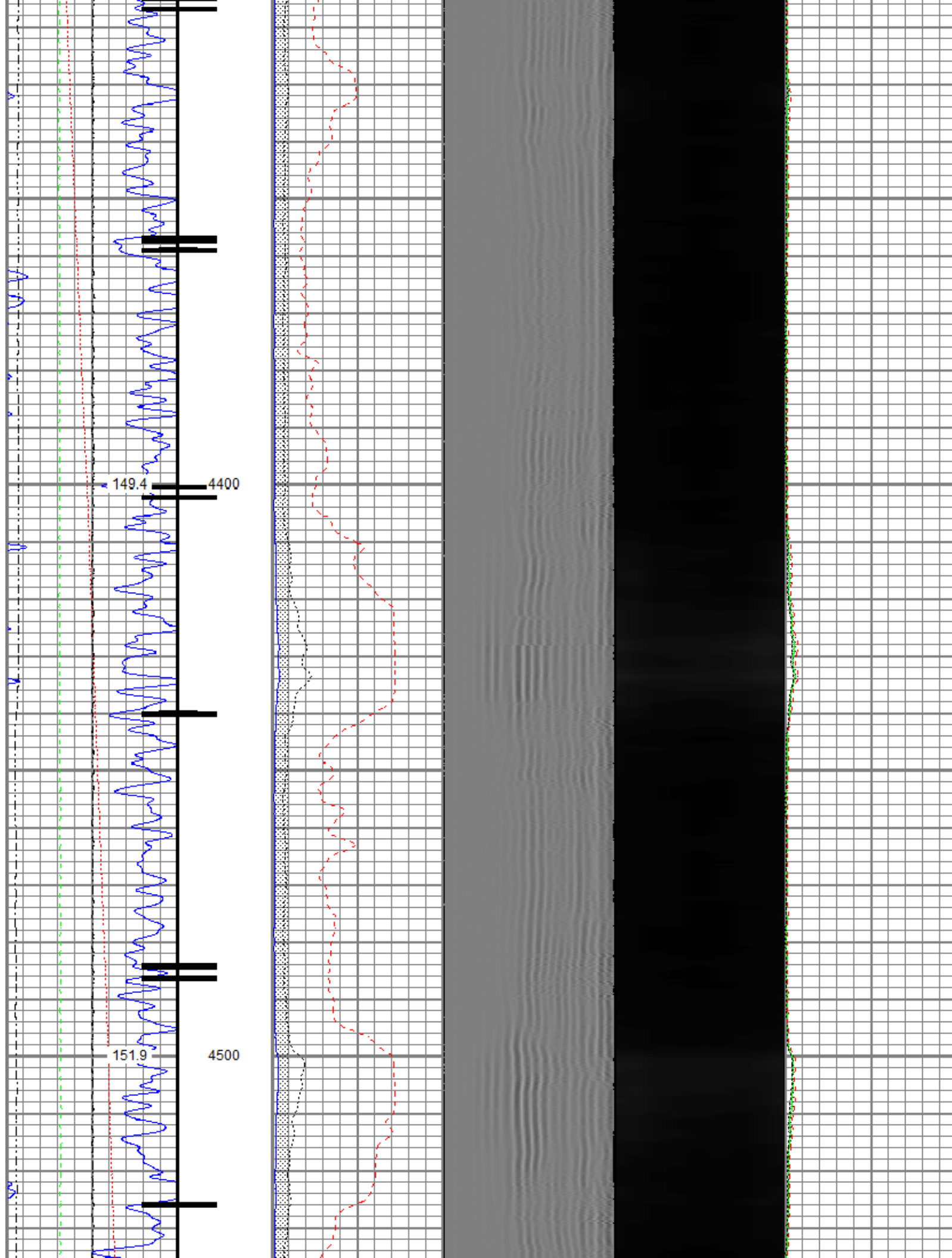


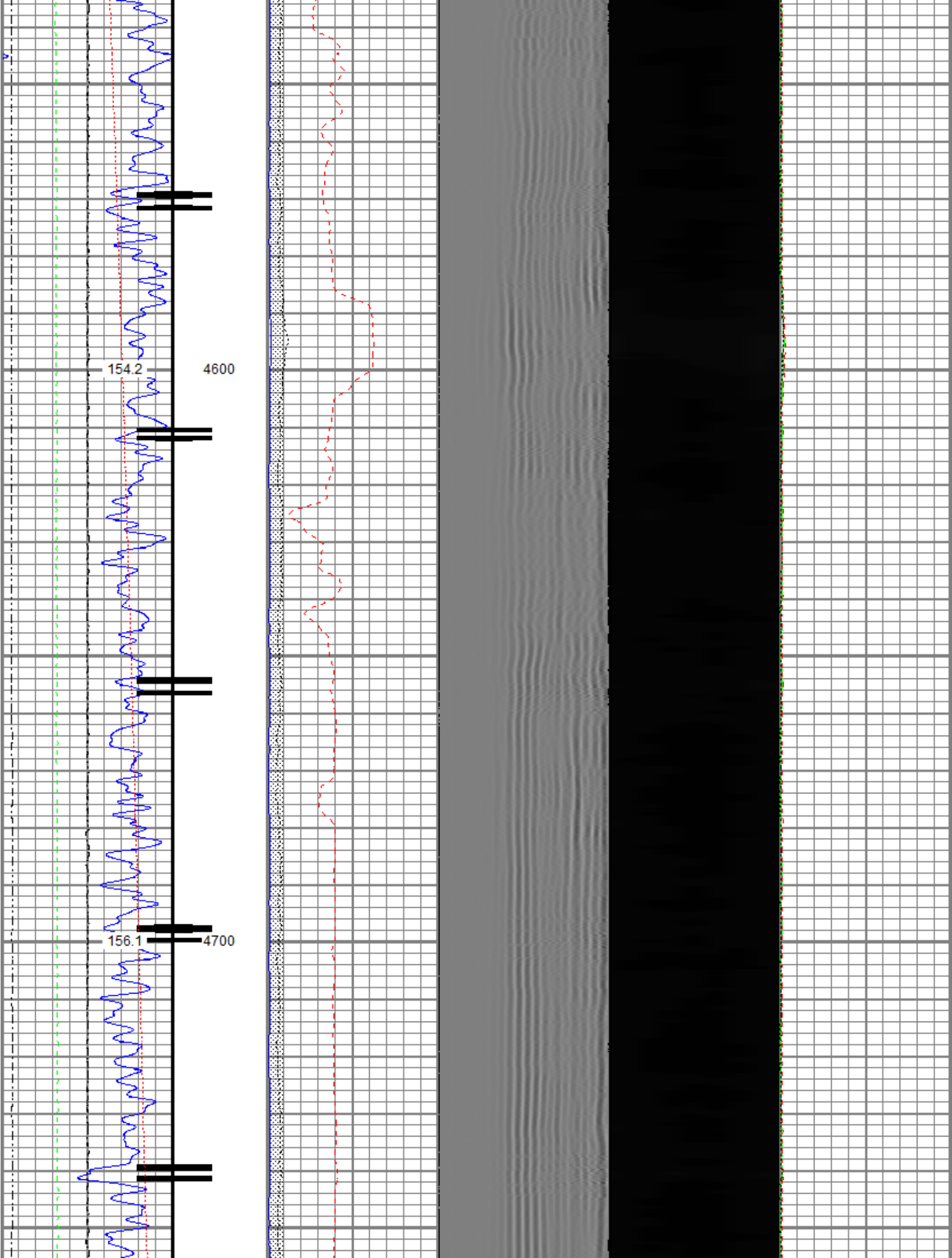


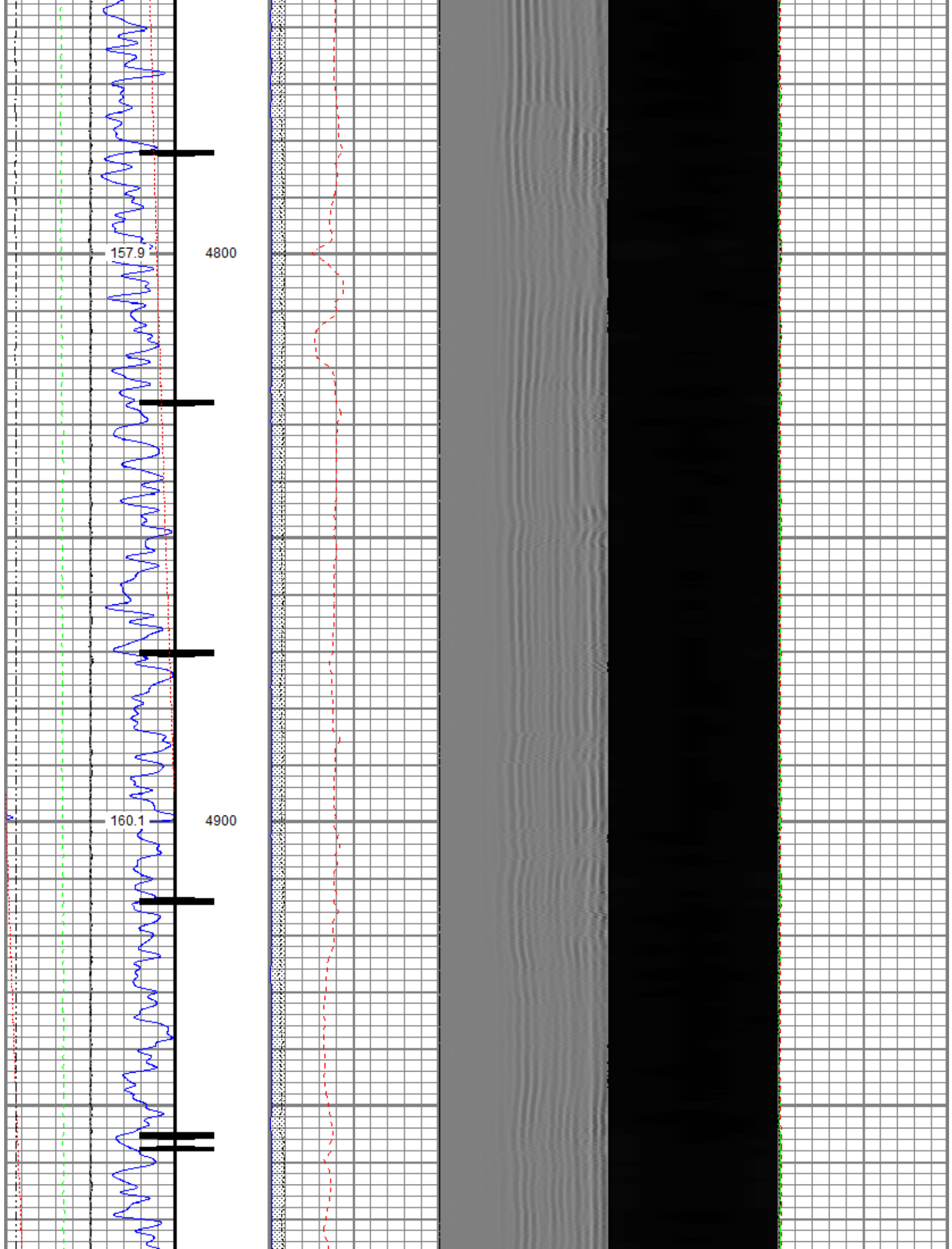




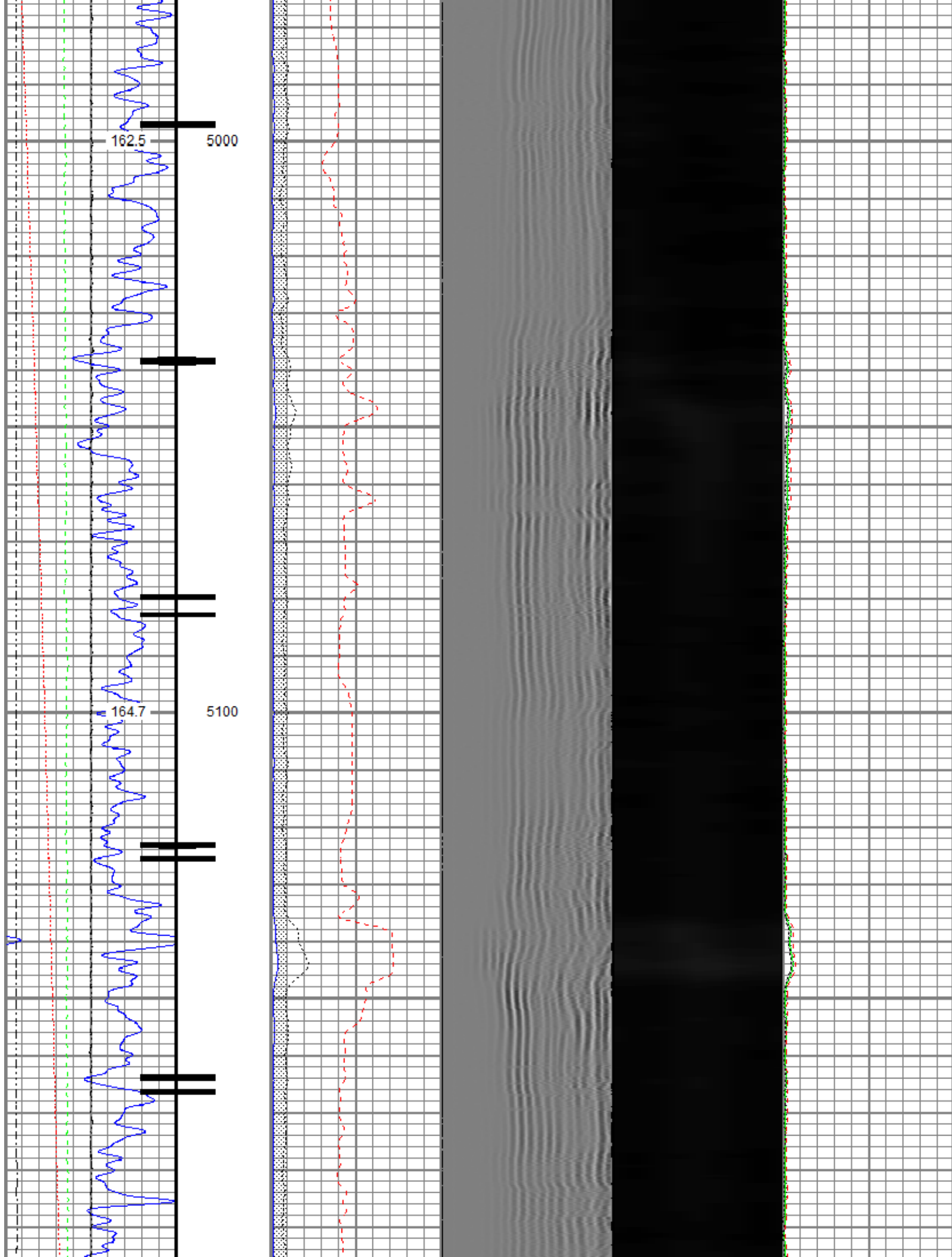


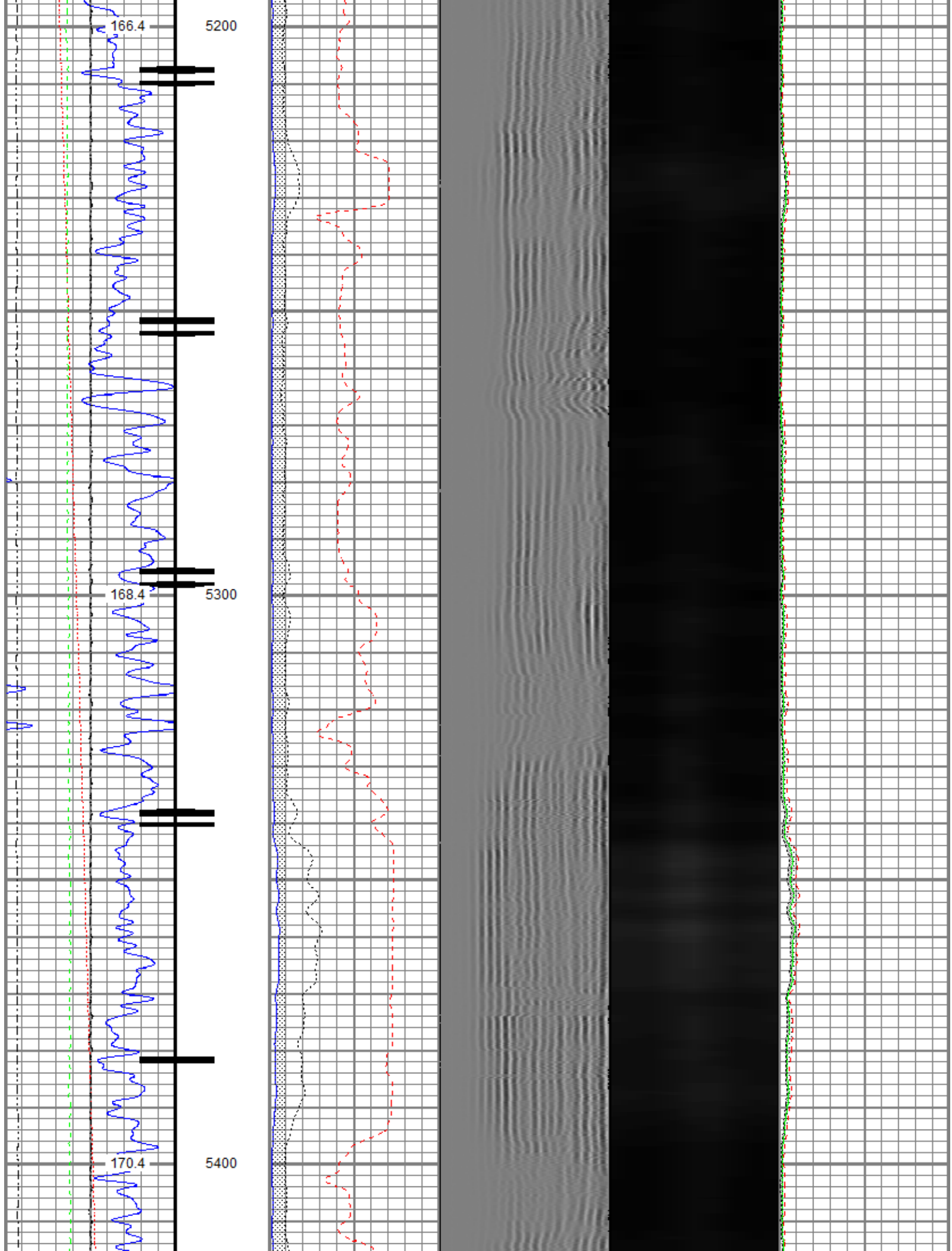


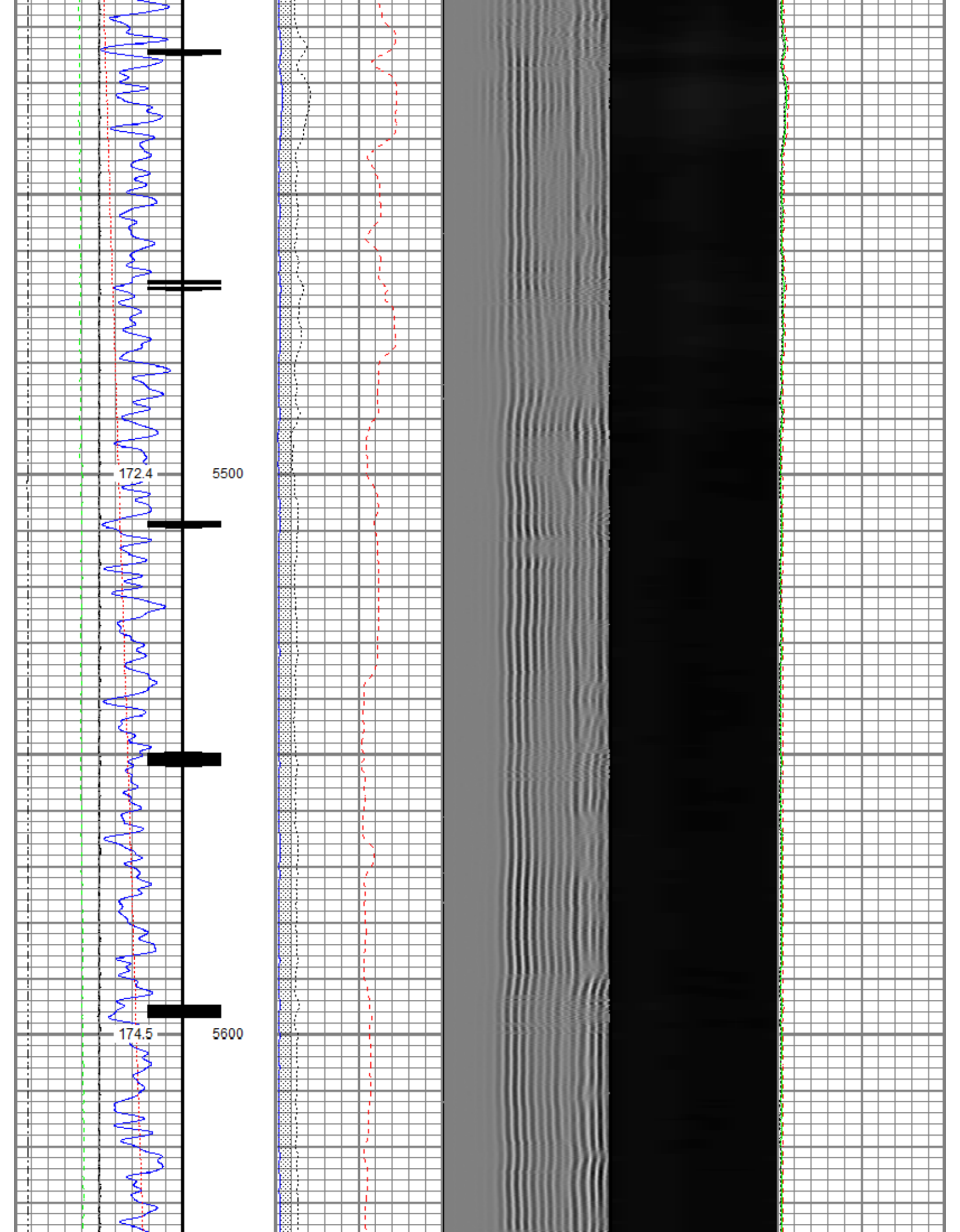


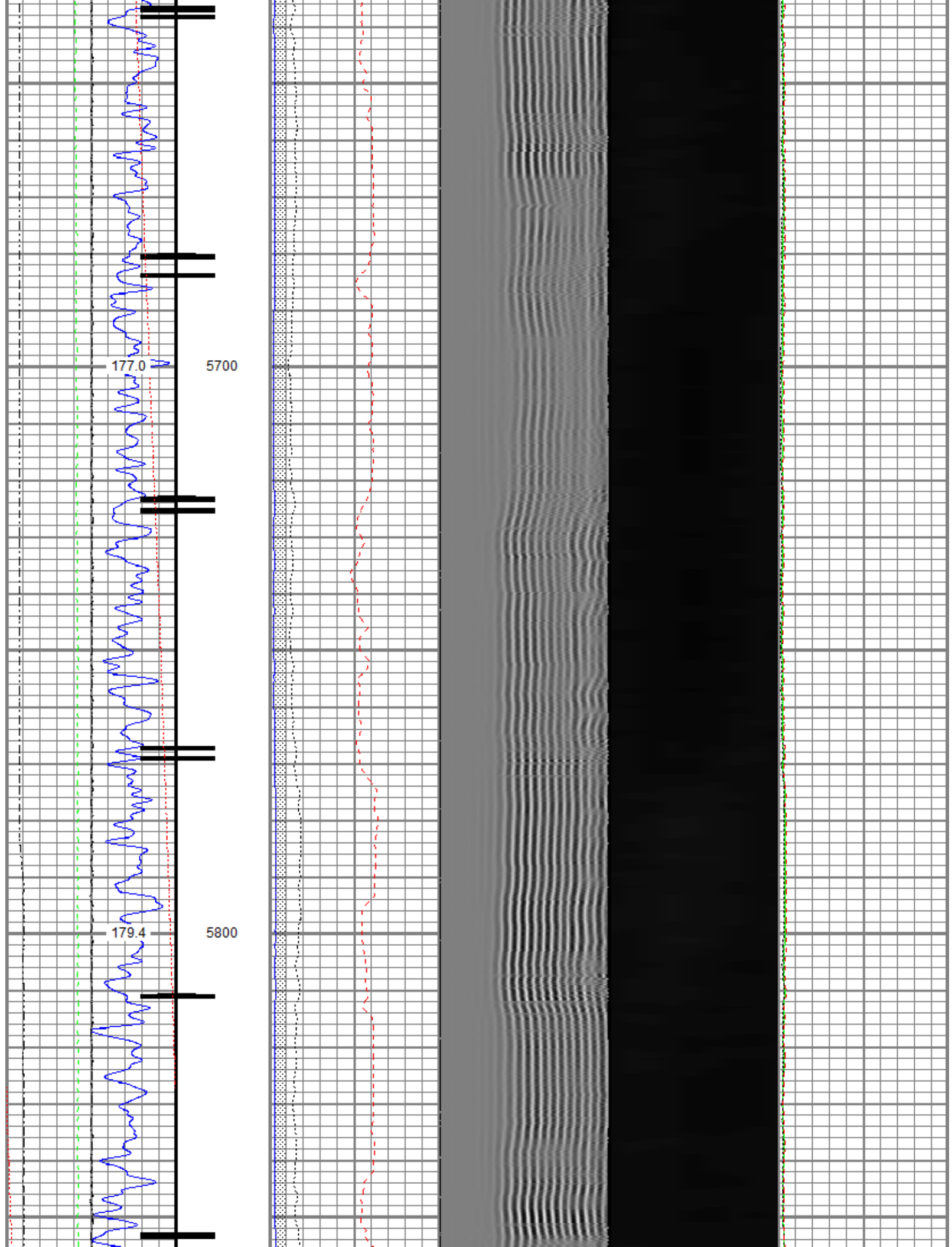




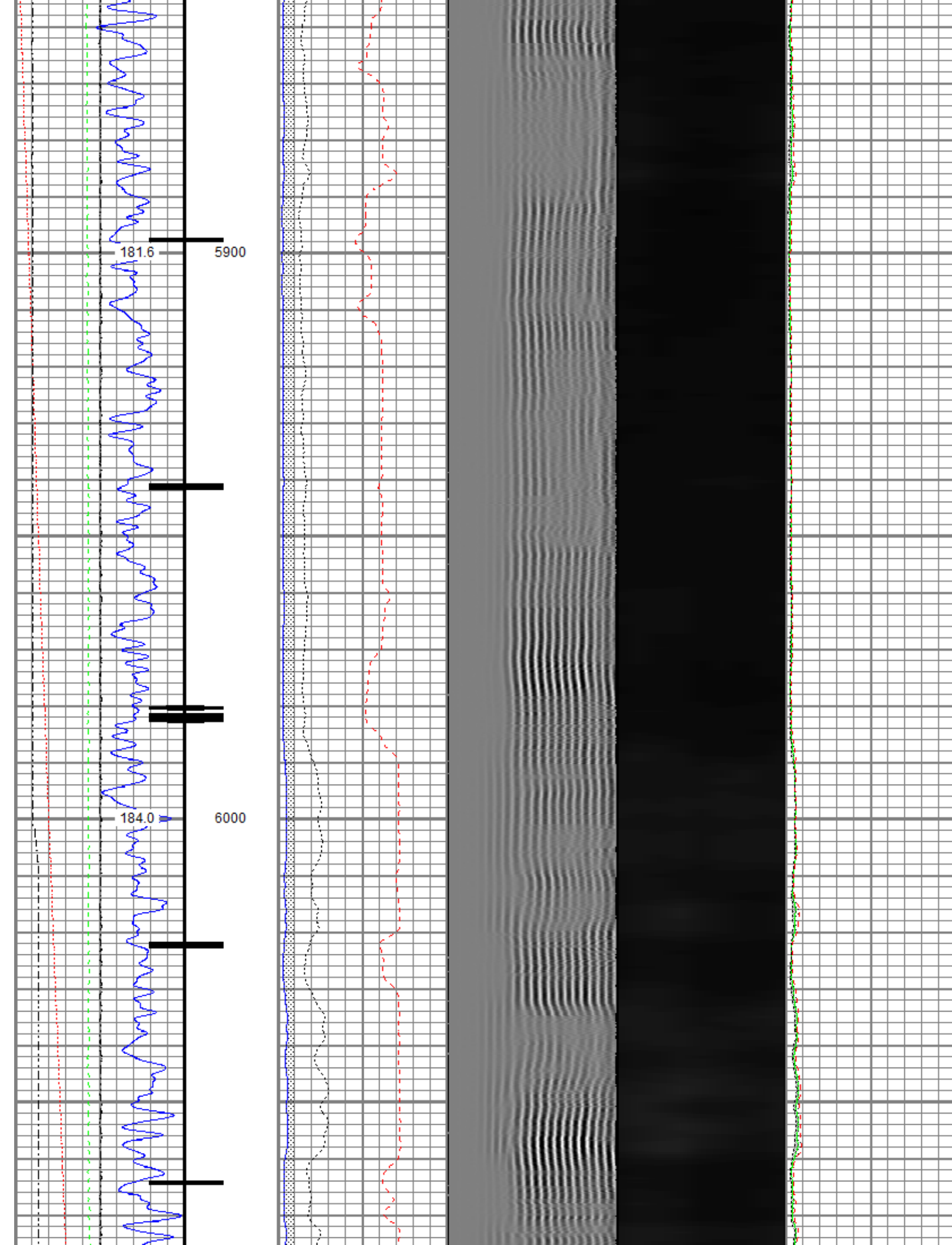


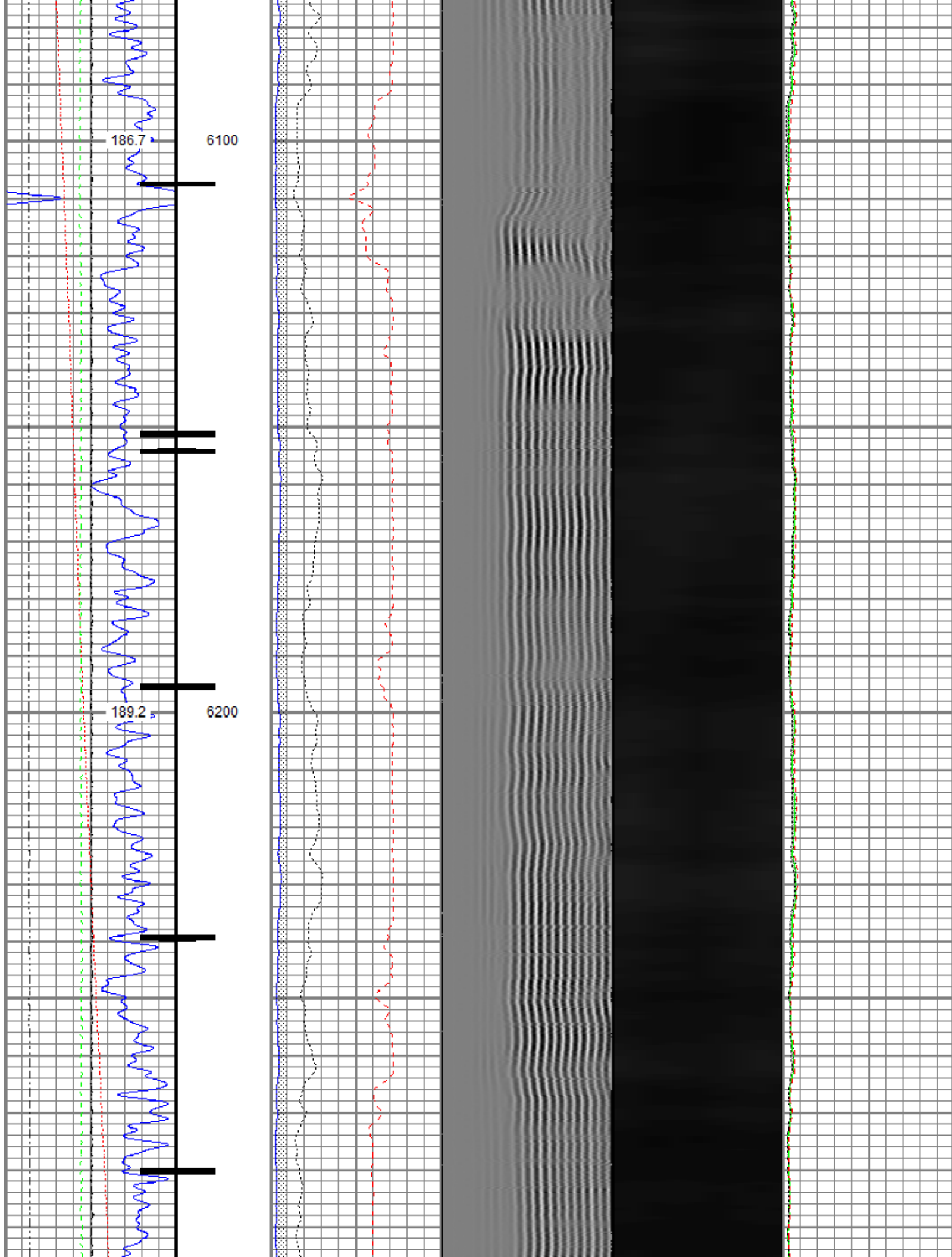


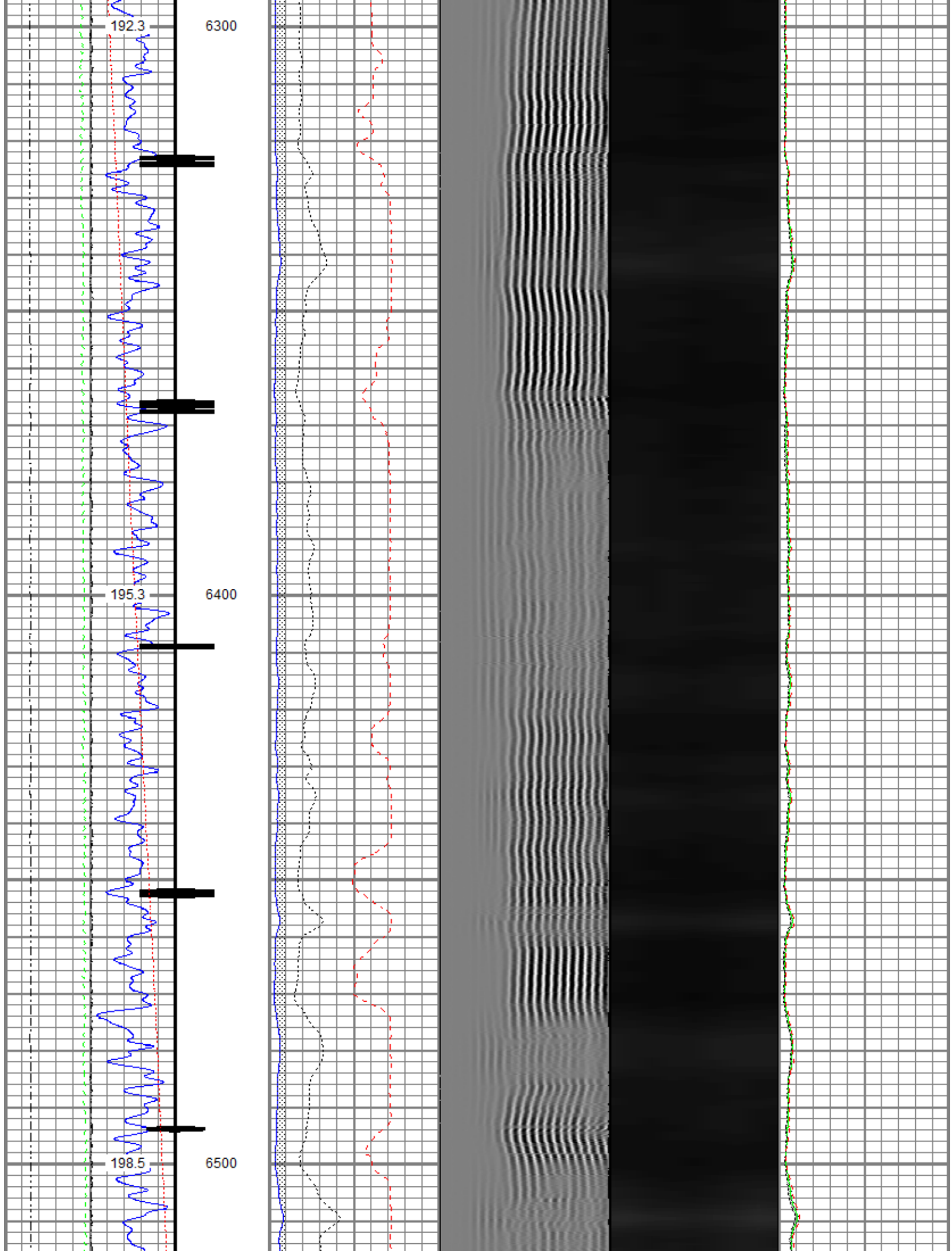


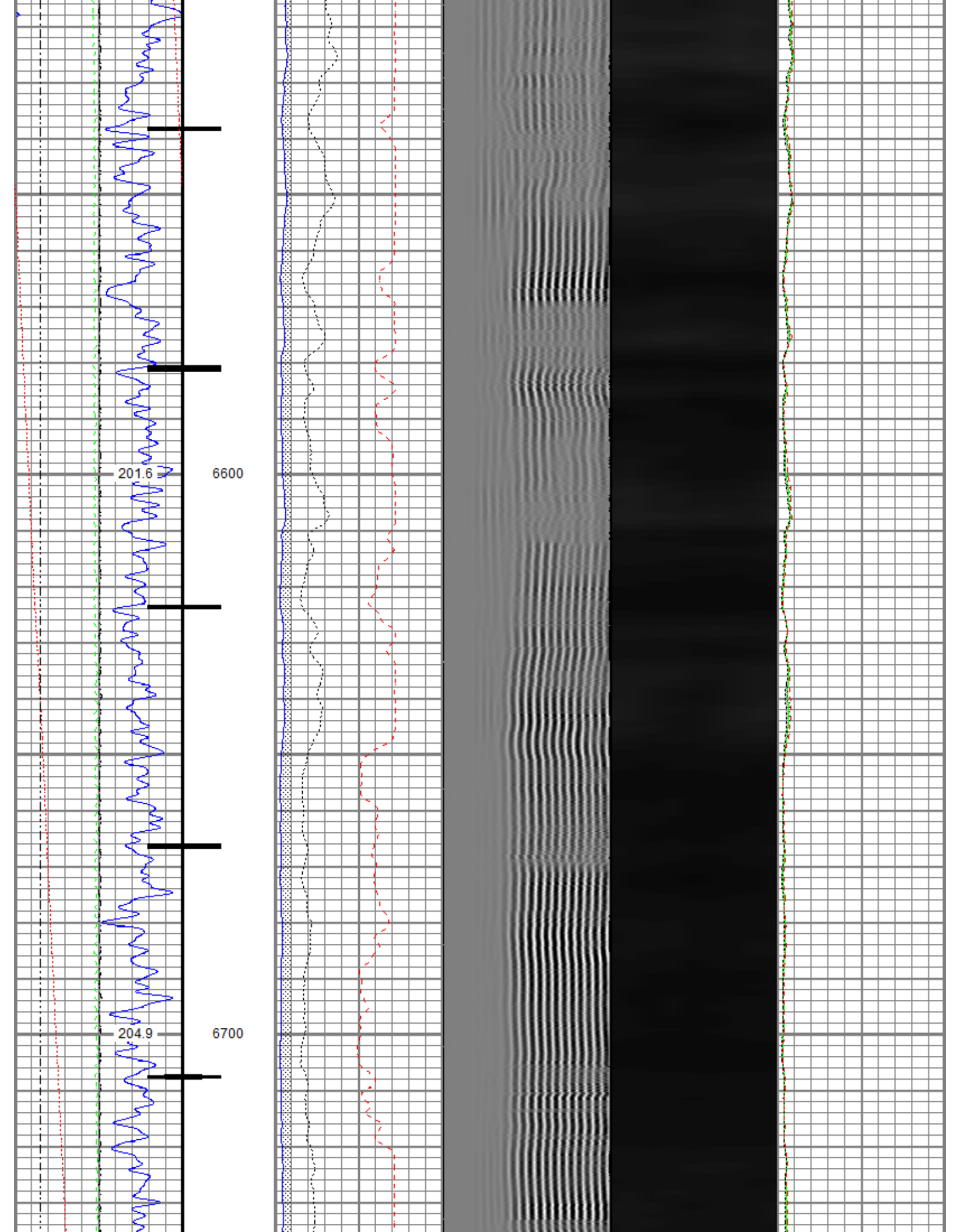




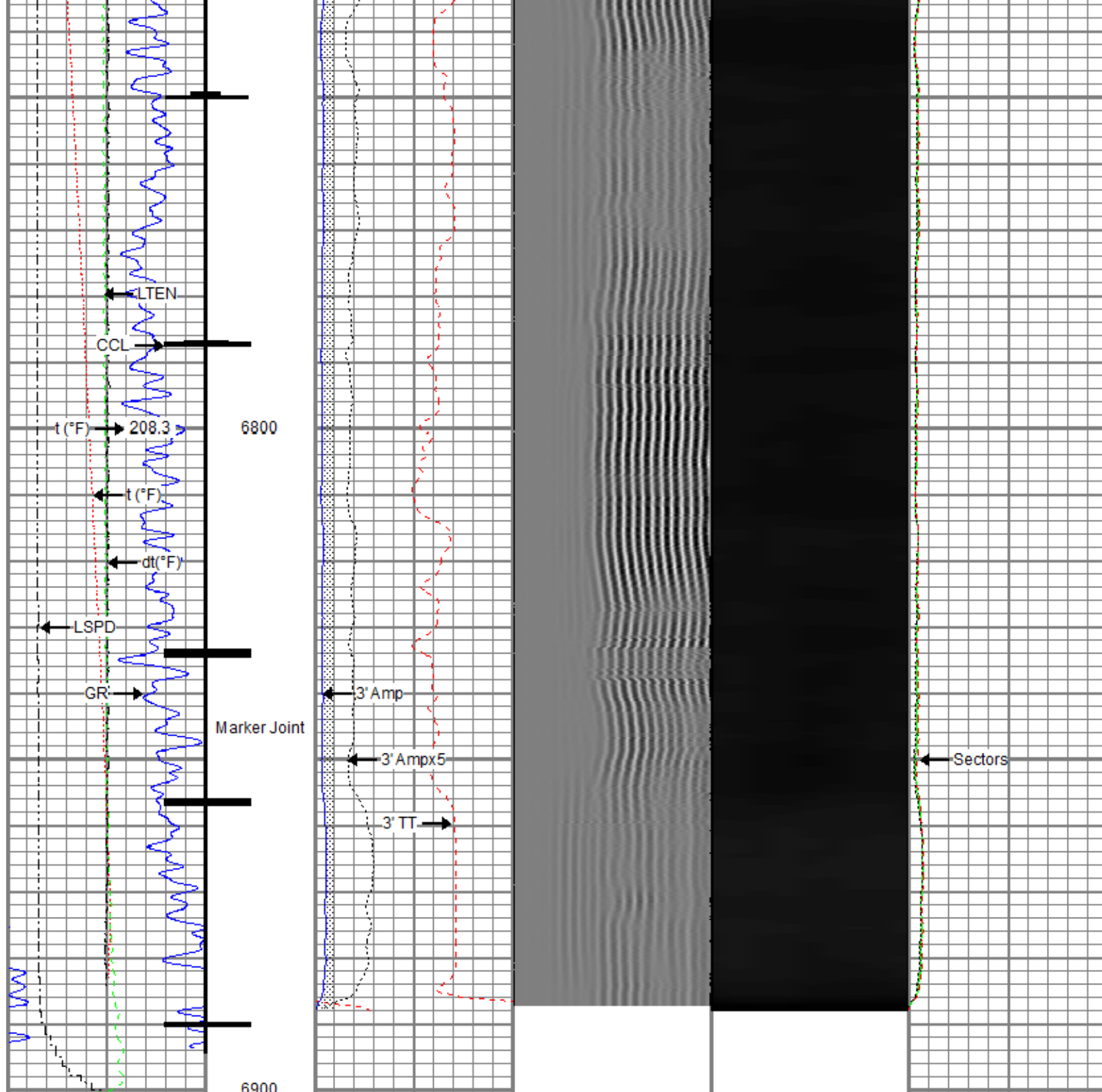










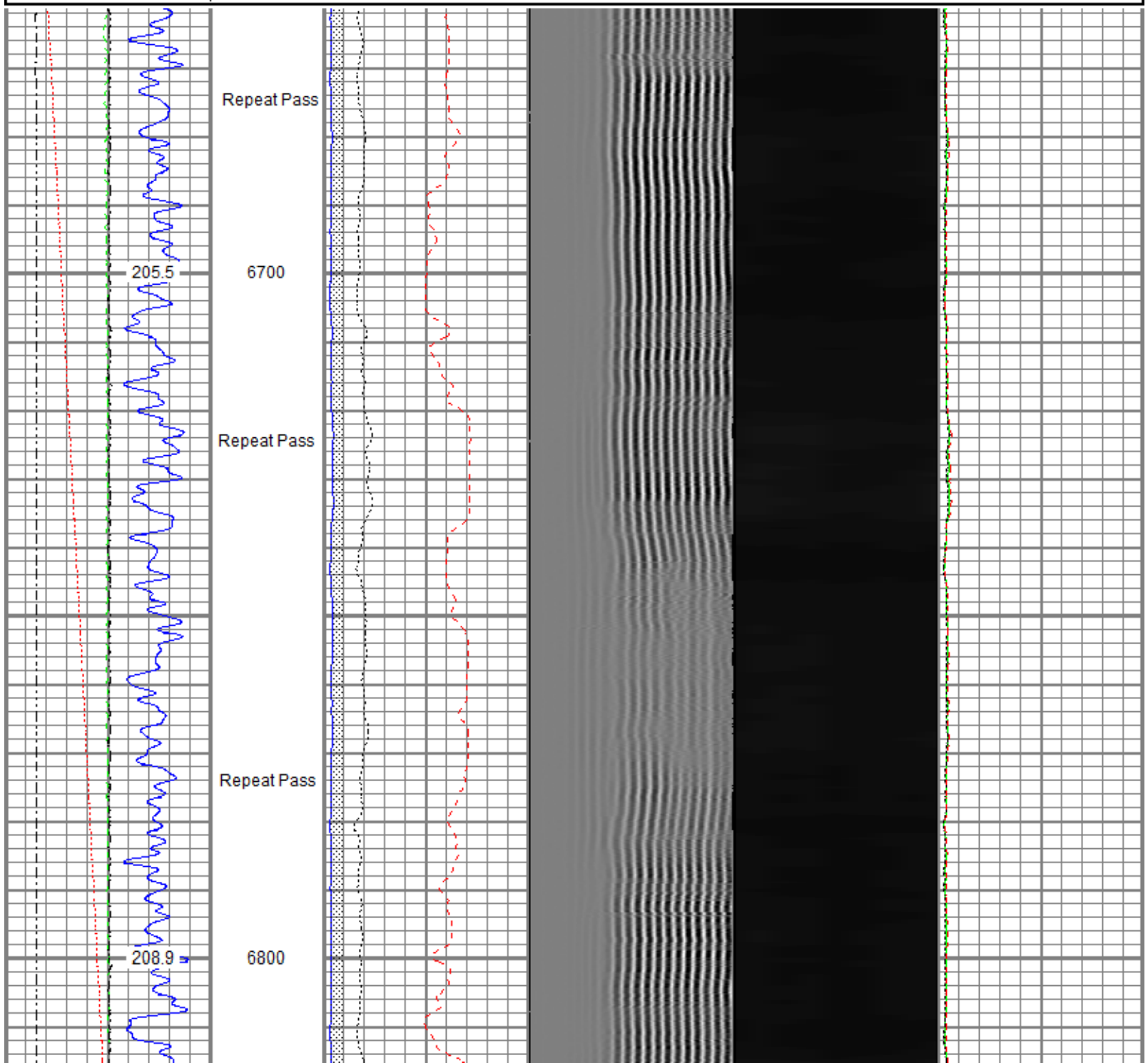


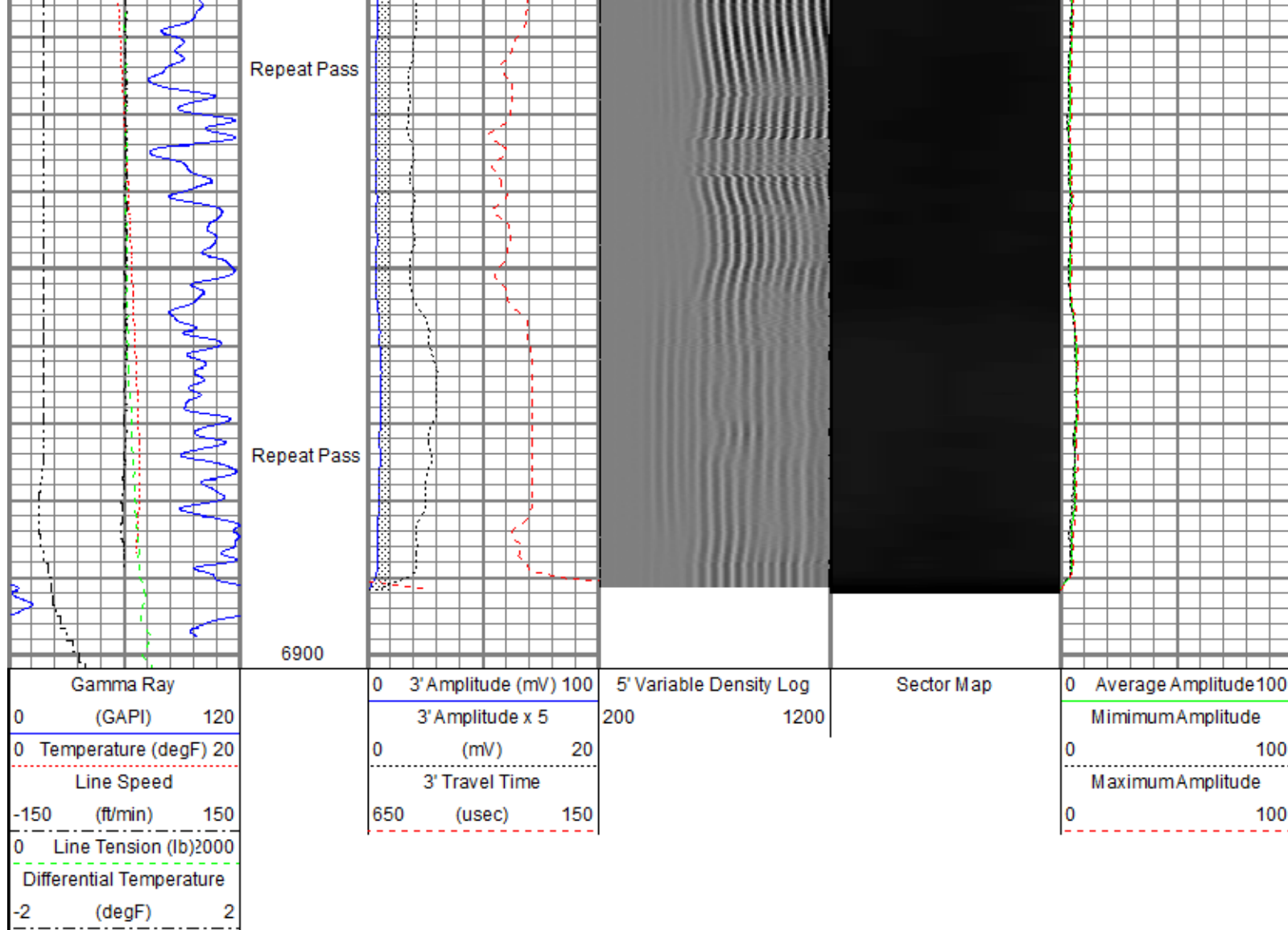
Gamma Ray (GAPI)	0	120	3' Amplitude (mV)	0	100	5' Variable Density Log	200	1200	Sector Map	Average Amplitude	0	100
Casing Collar Locator			3' Amplitude x 5							Minimum Amplitude		
Temperature (degF)	0	20	(mV)	0	20					Maximum Amplitude	0	100
Line Speed			3' Travel Time									
(ft/min)	-150	150	(usec)	650	150							
Line Tension (lb)	0	2000										
Differential Temperature												
(degF)	-2	2										

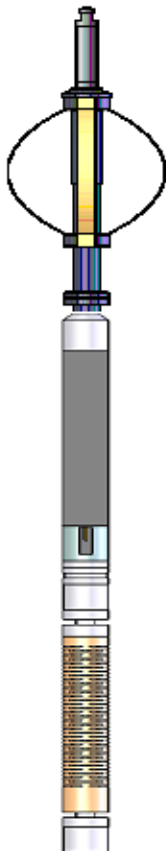
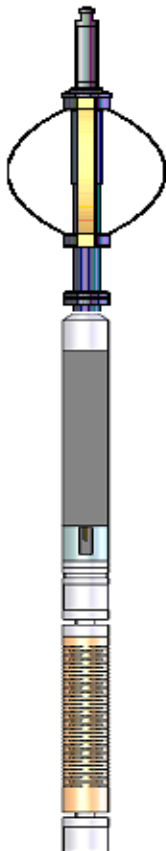
Repeat Pass

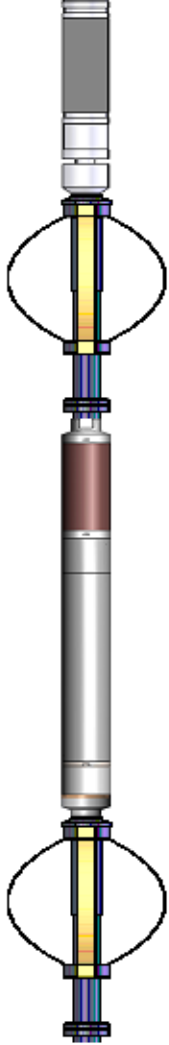
Database File	0512346103_anadarko_azul 13-13hz_rbl_06-28-18\processed_0512346103_anadarko_azul 13-13hz_rbl_06-28-18_2800 psi
Dataset Pathname	pass2
Presentation Format	ros_radrii
Dataset Creation	Fri Jun 29 08:47:59 2018
Charted by	Depth in Feet scaled 1:240

Gamma Ray	0	3' Amplitude (mV) 100	5' Variable Density Log	Sector Map	0	Average Amplitude 100
(GAPI) 120		3' Amplitude x 5	200			Minimum Amplitude
0 Temperature (degF) 20		(mV) 20			0	100
Line Speed		3' Travel Time				Maximum Amplitude
-150 (ft/min) 150		650 (usec) 150			0	100
0 Line Tension (lb) 2000						
Differential Temperature						
-2 (degF) 2						





Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
TEMP	17.33		Titan CHD-14375 GO	1.03	1.44	3.60
			Titan 1-7/16" Assembled Electric Cable Head w/ 1" Fishing Neck			
			Probe CENT-2750	2.88	2.75	20.00
			Probe 2-3/4" Electric Inline Bowspring Centralizer			
WVFS8	15.09		Probe Radii-2750 RBT (FW1305-096)	9.39	2.75	105.00
WVFS7	15.09		Probe 2-3/4" Radial Cement Bond Tool with Integral Temperature Sub			
WVFS6	15.09					
WVFS5	15.09					

WVFS4	15.09					
WVFS3	15.09					
WVFS2	15.09					
WVFS1	15.09					
WVFCAL	15.09					
WVF3FT	15.09					
WVF5FT	14.09					
HEADVOLT	10.84					
			Probe CENT-2750 Probe 2-3/4" Electric Inline Bowspring Centralizer	2.88	2.75	20.00
CCL\$2	7.08					
CCL\$1	7.08					
GR	5.75		Probe GR-CCL-2750 6PB (101001) Probe 2-3/4" rev.1 Digital Scintillation Gamma Ray/CCL Combined with 6 Pin Bottom for CNT	4.80	2.75	55.00
			Probe ADPT-6P-GO Probe 2-3/4" 6-Pin Top to GO Bottom Adaptor Sub	0.28	2.75	2.00
			Probe CENT-2750 Probe 2-3/4" Electric Inline Bowspring Centralizer	2.88	2.75	20.00
Dataset: PROCESSED_0512346103_Anadarko_Azul 13-13HZ_RBL_06-28-18_2800 PSI.db: field/well/run1/pass4 Total length: 24.15 ft Total weight: 225.60 lb O.D.: 2.75 in						

Calibration Report			
Database File	C:\ProgramData\Warrior\Data\0512346103_Anadarko_Azul 13-13HZ_RBL_06-28-18\PROCESSED_0512346103_Anadarko_Az		
Dataset Pathname	pass4		
Dataset Creation	Fri Jun 29 08:52:58 2018		
Gamma Ray Calibration Report			
Serial Number:	101001		
Tool Model:	2750 6PB		
Performed:	Sun Nov 12 11:25:32 2017		
Calibrator Value:	637.0	GAPI	
Background Reading:	100.6	cps	
Calibrator Reading:	981.1	cps	
Sensitivity:	0.7235	GAPI/cps	
Segmented Cement Bond Log Calibration Report			
Serial Number:	FW1305-096		
Tool Model:	2750 RBT		
Calibration Casing Diameter:	5.500	in	
Calibration Depth:	-62.051	ft	
Master Calibration, performed (Derived):			



	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.001	0.486	0.800	71.921	146.508	0.690
CAL	0.006	0.502				
5'	-0.000	0.453	0.800	71.921	156.903	0.811
SUM						
S1	0.000	0.465	0.000	100.000	215.025	-0.069
S2	0.001	0.482	0.000	100.000	207.897	-0.131
S3	0.000	0.496	0.000	100.000	201.733	-0.100
S4	-0.001	0.511	0.000	100.000	195.466	0.142
S5	0.000	0.514	0.000	100.000	194.820	-0.094
S6	0.001	0.503	0.000	100.000	199.447	-0.222
S7	0.001	0.489	0.000	100.000	204.967	-0.301
S8	0.001	0.473	0.000	100.000	211.914	-0.242

Internal Reference Calibration, performed (Not Performed):						
	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.006	0.502	1.000	0.000

Air Zero Calibration, performed Thu Jun 28 06:56:00 2018:						
	Raw (v)		Calibrated (v)		Results	
	Zero		Zero		Offset	
3'	0.006		0.000		-0.000	
5'	0.006		0.000		-0.000	
SUM						
S1	0.006		0.000		-0.001	
S2	0.006		0.000		-0.000	
S3	0.006		0.000		0.000	
S4	0.006		0.000		0.000	
S5	0.006		0.000		0.000	
S6	0.006		0.000		0.000	
S7	0.005		0.000		0.001	
S8	0.006		0.000		0.000	

Temperature Calibration Report						
Serial Number:	FW1305-096					
Tool Model:	2750 RBT					
Performed:	Sun Nov 12 13:42:10 2017					
	Reference		Reading			
Low Reference:	100.00 degF		109.43 degF			
High Reference:	350.00 degF		405.87 degF			
Gain:	0.84					
Offset:	7.72					
Delta Spacing	1					

 <b>RELIANCE</b> OILFIELD SERVICES	<b>Company</b>	Kerr-McGee Oil & Gas Onshore, L.P.
	<b>Well</b>	Azul 13-13HZ
	<b>Field</b>	Wattenberg
	<b>County</b>	Weld
	<b>State</b>	Colorado