

Radial Cement Bond Gamma Ray Casing Collar Log

Company	Noble Energy Inc.	Company	Noble Energy Inc.
Well	Wells Ranch BB01-655	Well	Wells Ranch BB01-655
Field	Wattenberg	Field	Wattenberg
County	Weld	County	Weld
State	Colorado	State	Colorado
Location:	API # : 05-123-41971	Other Services	---
Permanent Datum	SEC 5 TWP 5N RGE 62W	Elevation	
Log Measured From	Ground Level	Elevation	4678'
Drilling Measured From	Kelly Bushing	Elevation	30 FT
	Kelly Bushing	Elevation	K.B. 4708'
		Elevation	D.F. 4707'
		Elevation	G.L. 4678'

Date	02-Mar-2016
Run Number	One
Depth Driller	16335 FT
Depth Logger	6667 FT
Bottom Logged Interval	6663 FT
Top Log Interval	Surface
Open Hole Size	8.50"
Type Fluid	Water
Density / Viscosity	8.34 lbm/gal
Max. Recorded Temp.	222°F
Estimated Cement Top	233 FT
Time Well Ready	ROA
Time Logger on Bottom	11:45
Equipment Number	HD-0361
Location	Fort Lupton, CO
Recorded By	Sam Hopper
Witnessed By	Bill Mansfield

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
Casing Record	Size (in)	Wgt (lbs/ft)	Grade	Top	Bottom		
Surface Casing	9 5/8	36	J-55	30 FT	1883 FT		
Intermediate #1	5 1/2	20	P110-1C	30 FT	16316.1 FT		
Intermediate #2							
Liner							

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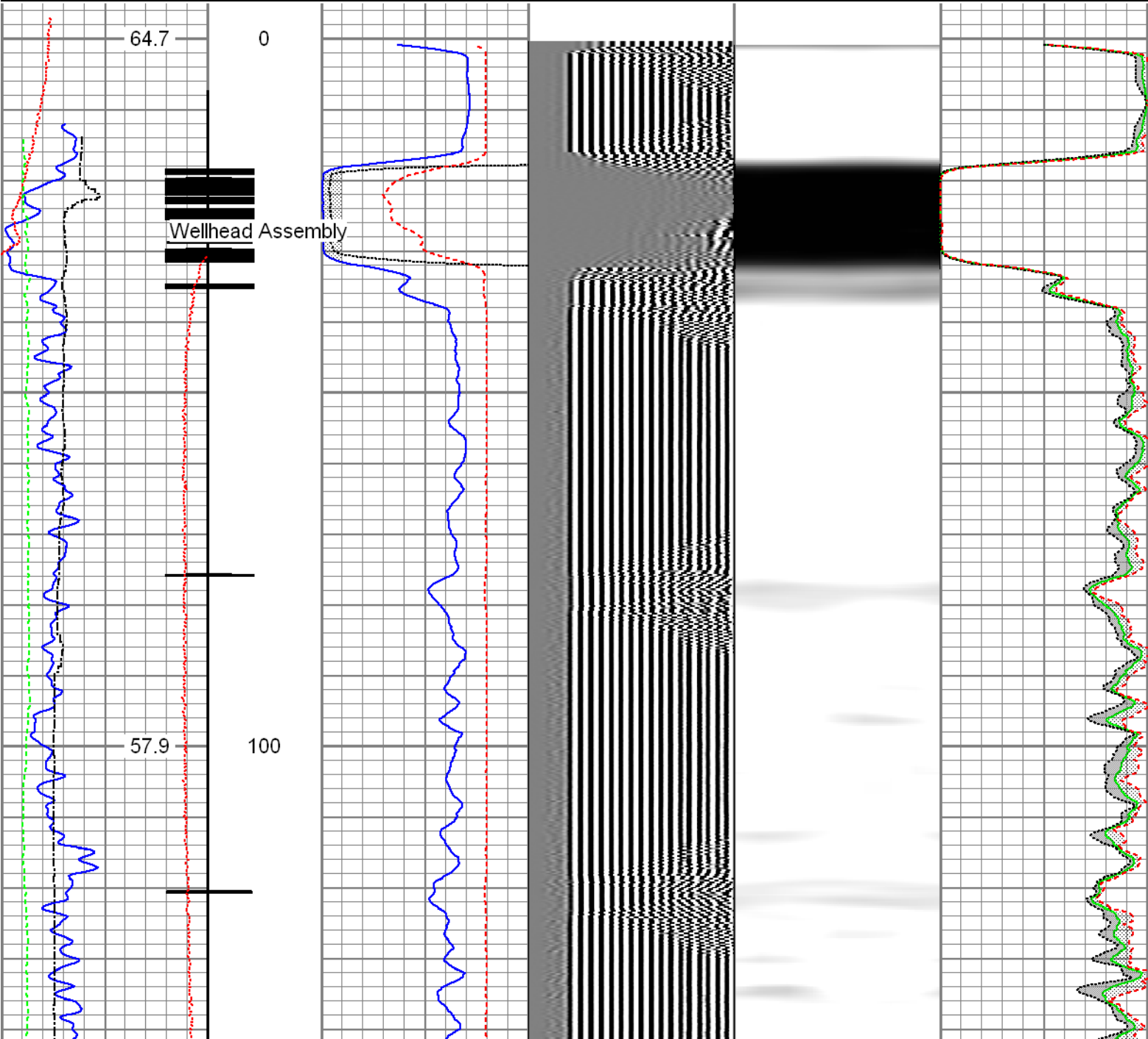
All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, 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.

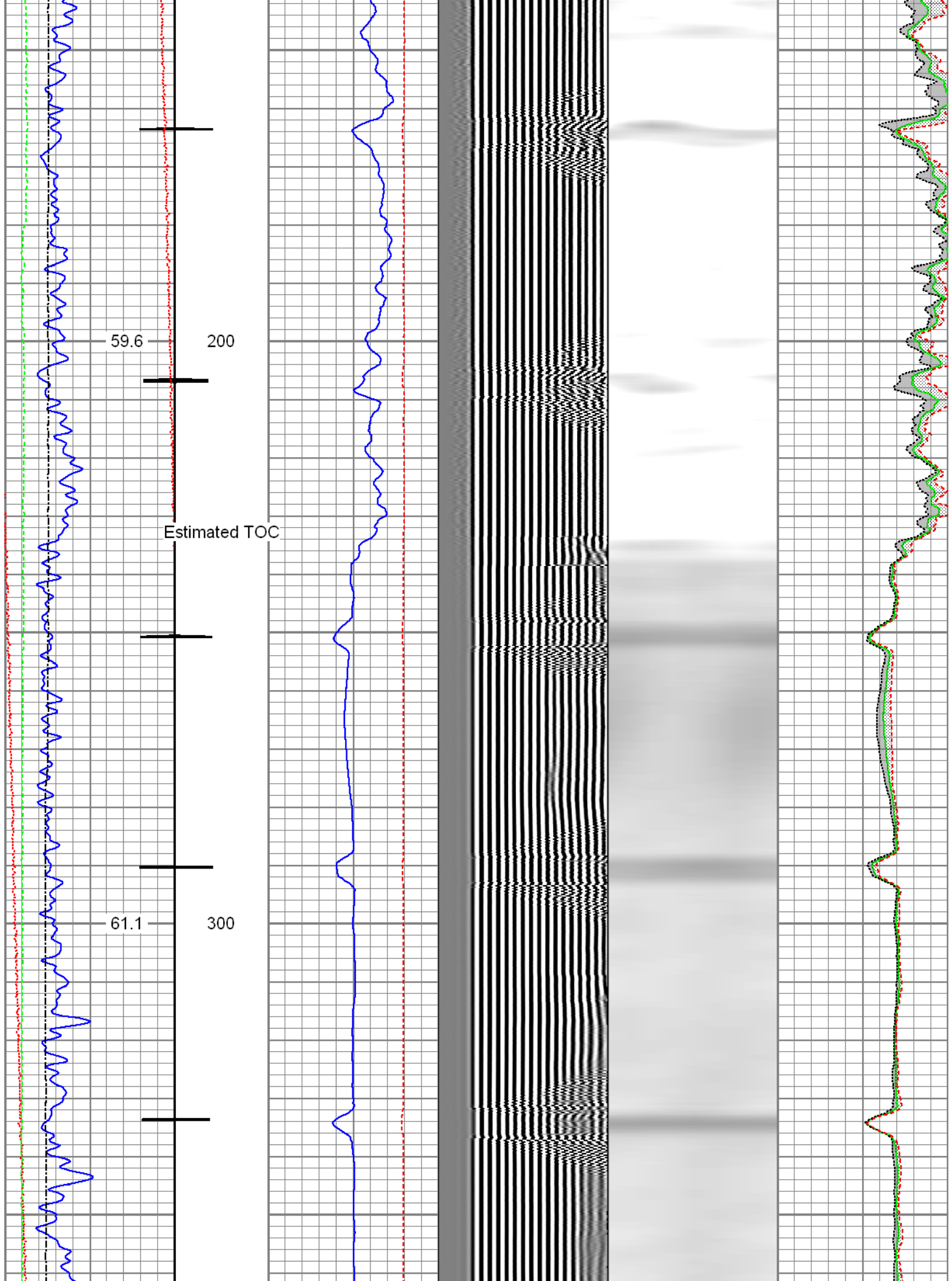
Comments

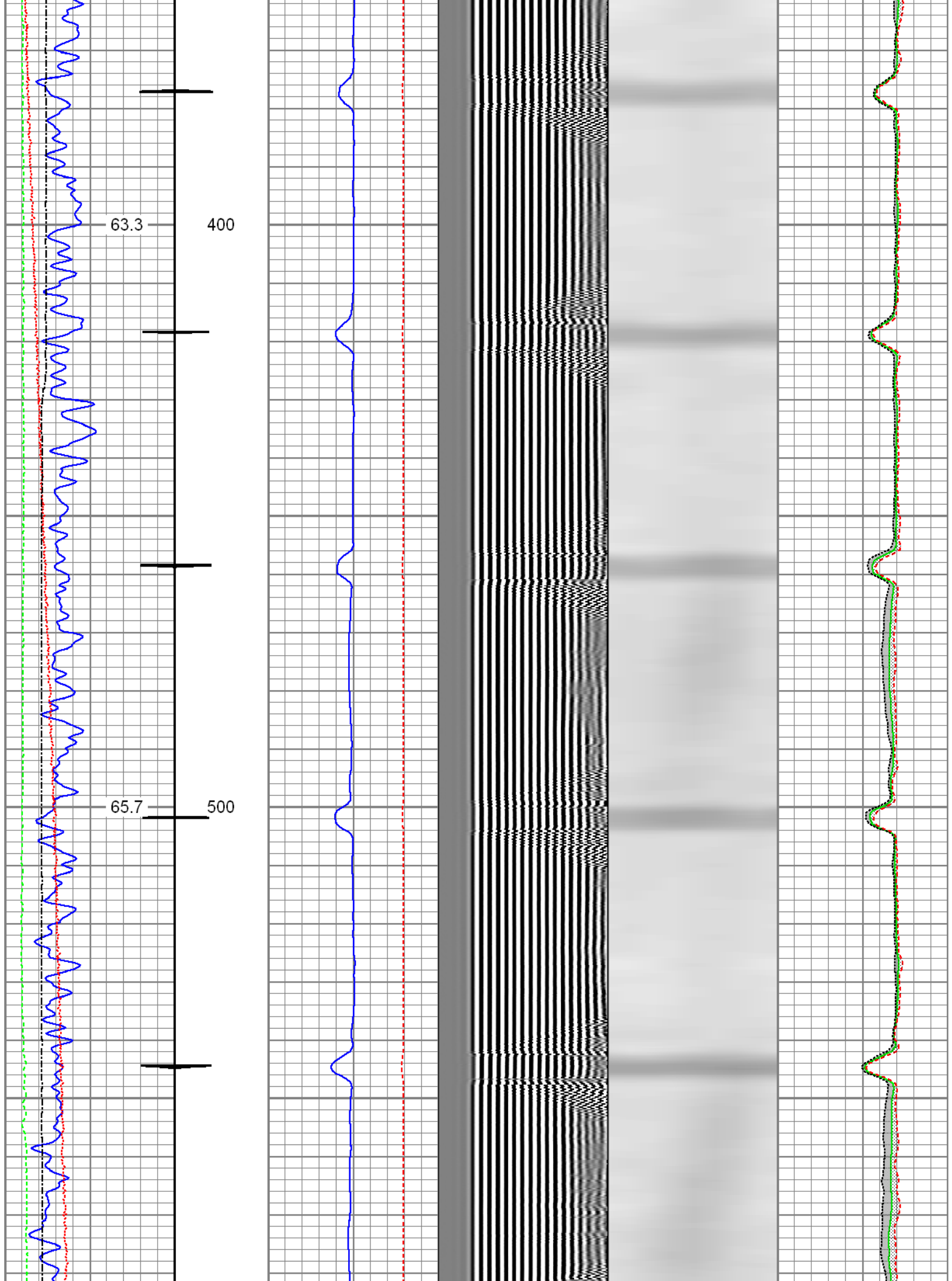
Log ran as per customer request
 Depth referenced to Kelly Bushing at 30 FT
 Recorded Marker Joint at 5525-5535 FT
 Log ran from as deep as possible in heel to surface
 Recorded with 2500 PSI surface induced pressure
 Logging tools were coated with a dark oil layer upon completion of operations
 Thank you for choosing FMC Technologies Surface Integrated Services.

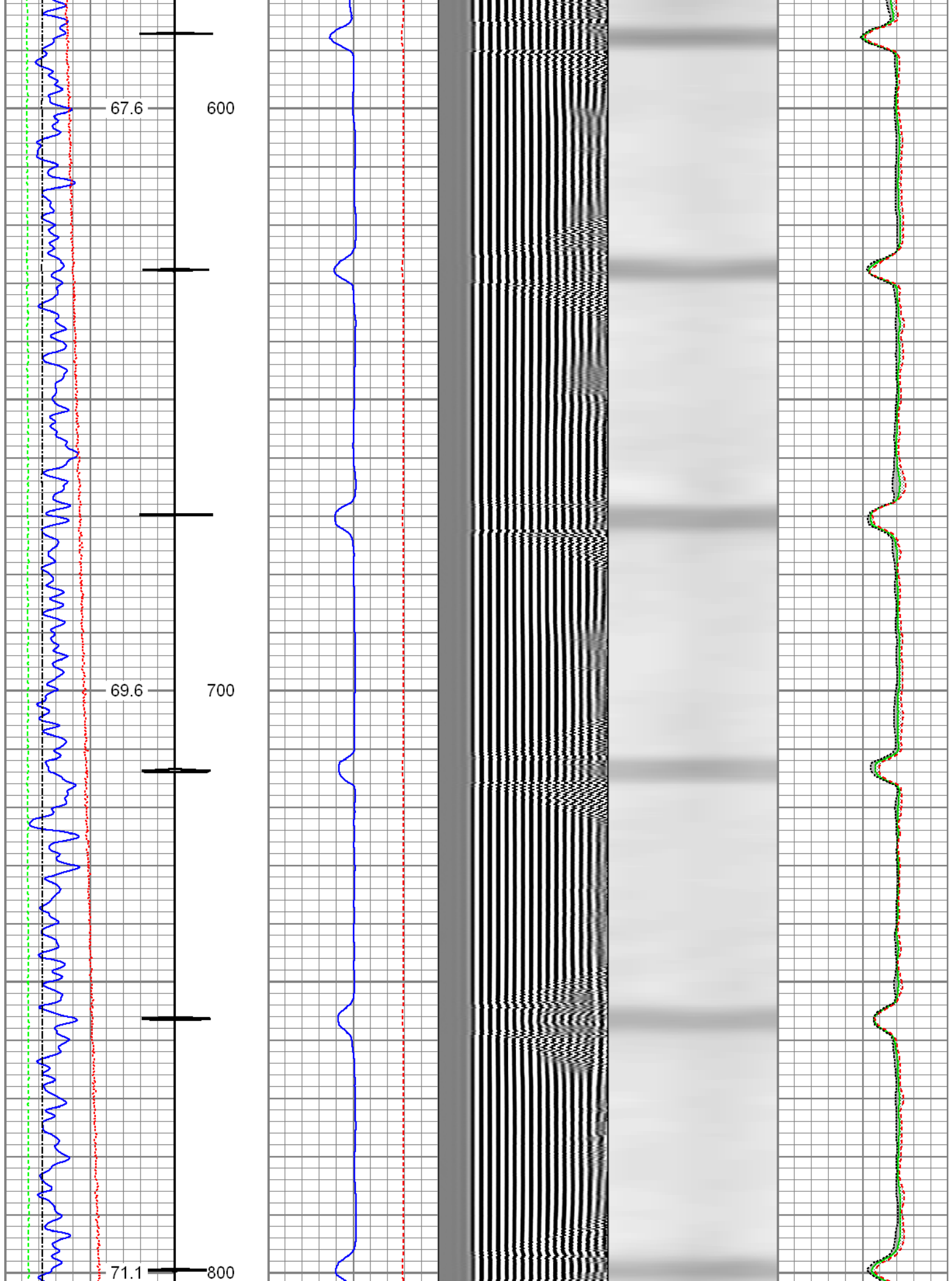
Database File: c:\warrior\data\03-02-16_noble energy_wells ranch bb01-655_rbl\03-02-16_noble energy_wells ranch
Dataset Pathname: pass8.2
Presentation Format: radii
Dataset Creation: Wed Mar 02 21:25:29 2016 by Calc 7.0 B1
Charted by: Depth in Feet scaled 1:240

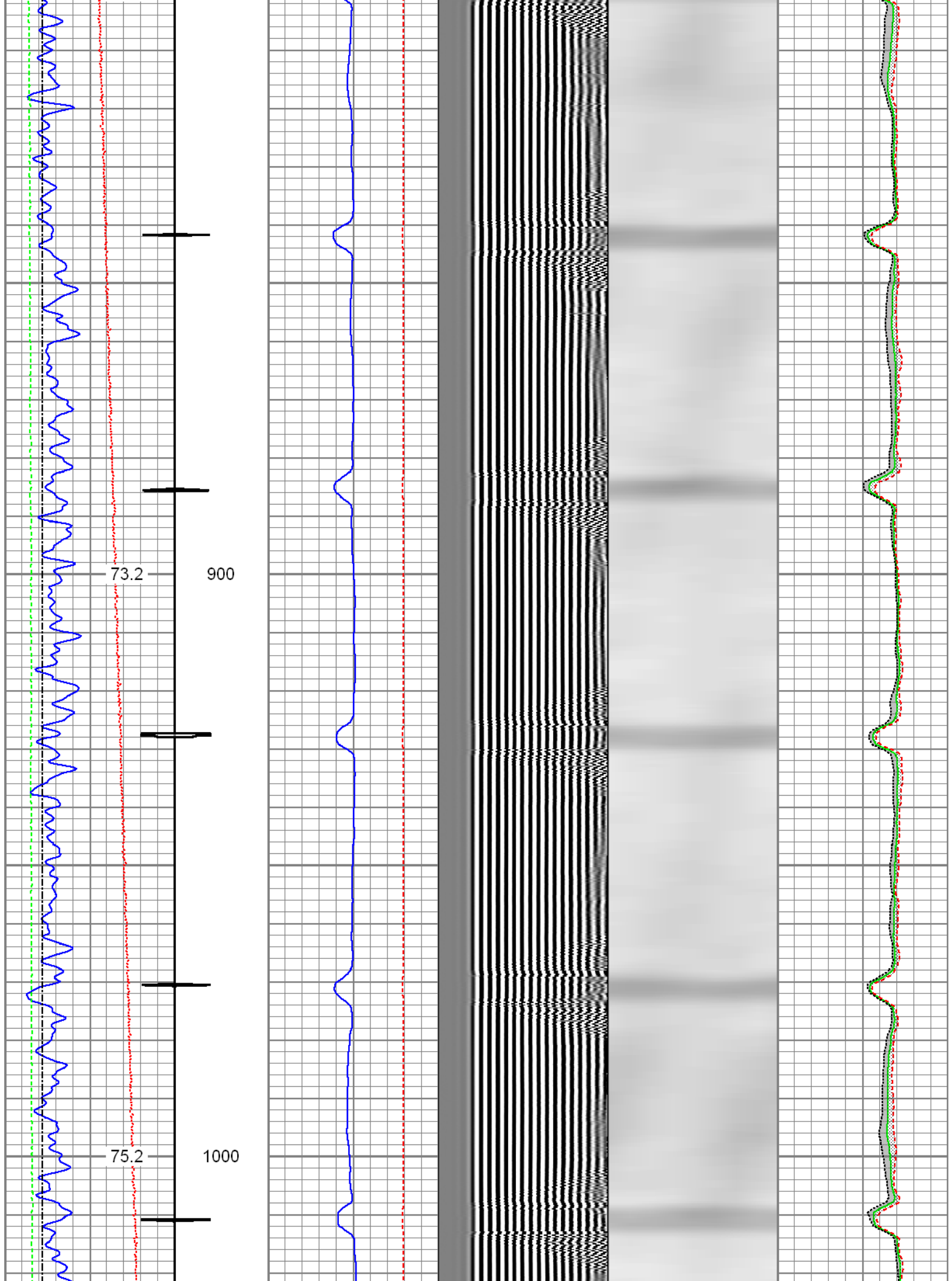
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 120	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
Temperature	0 (mV) 20			0 100
0 (degF) 20	3' Travel Time			Maximum Amplitude
Line Speed	650 (usec) 150			0 100
-150 (ft/min) 150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

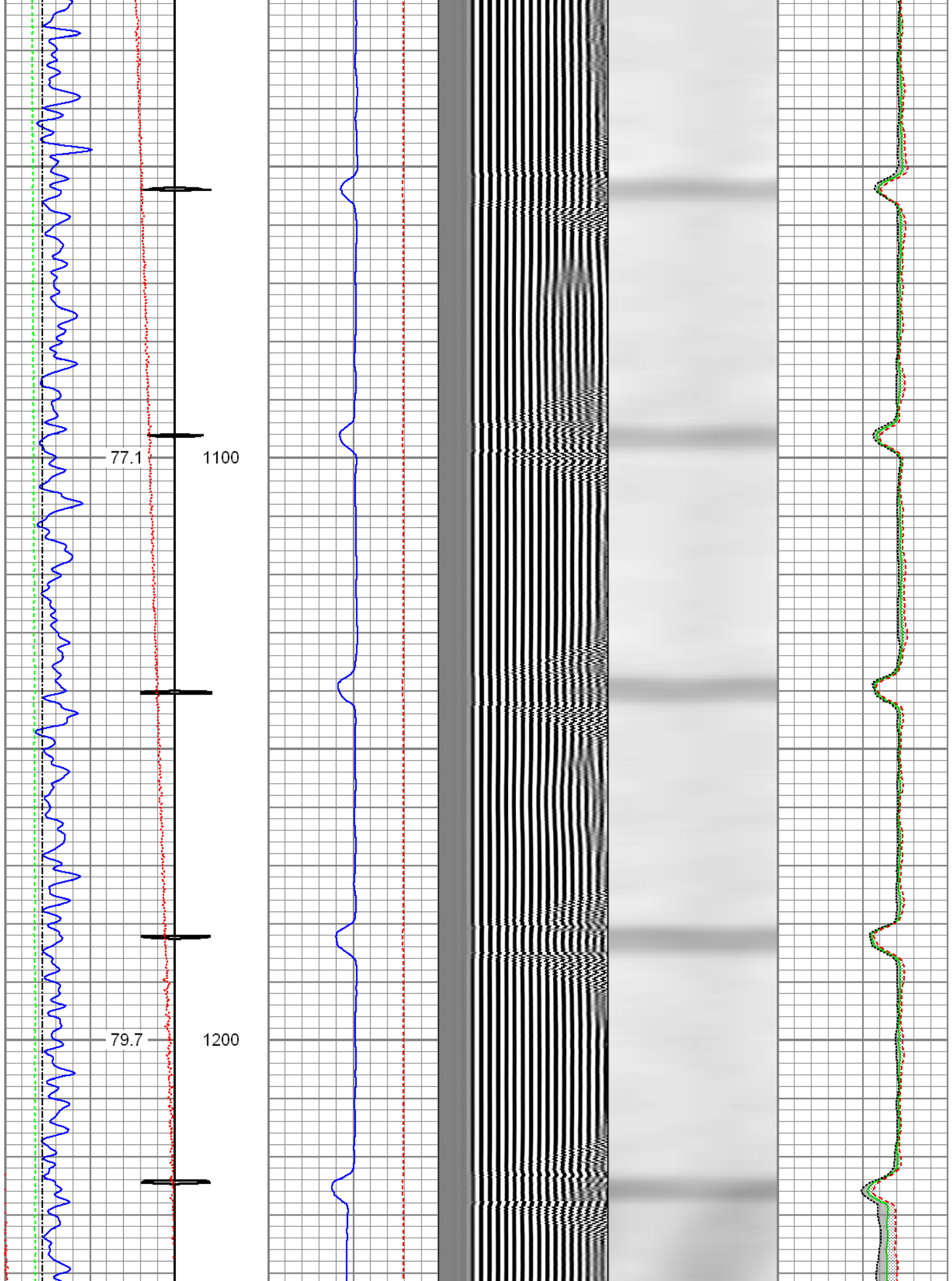


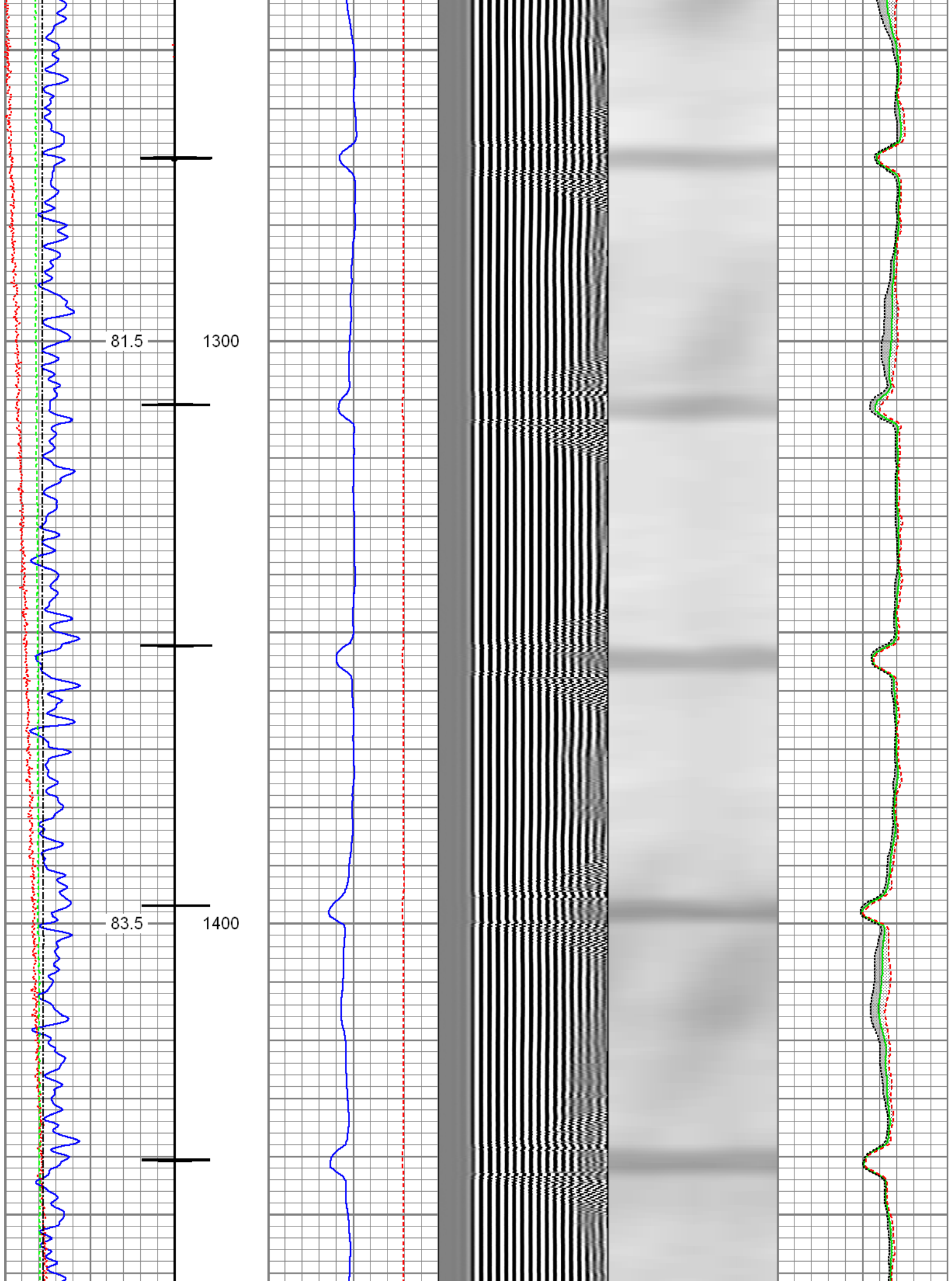


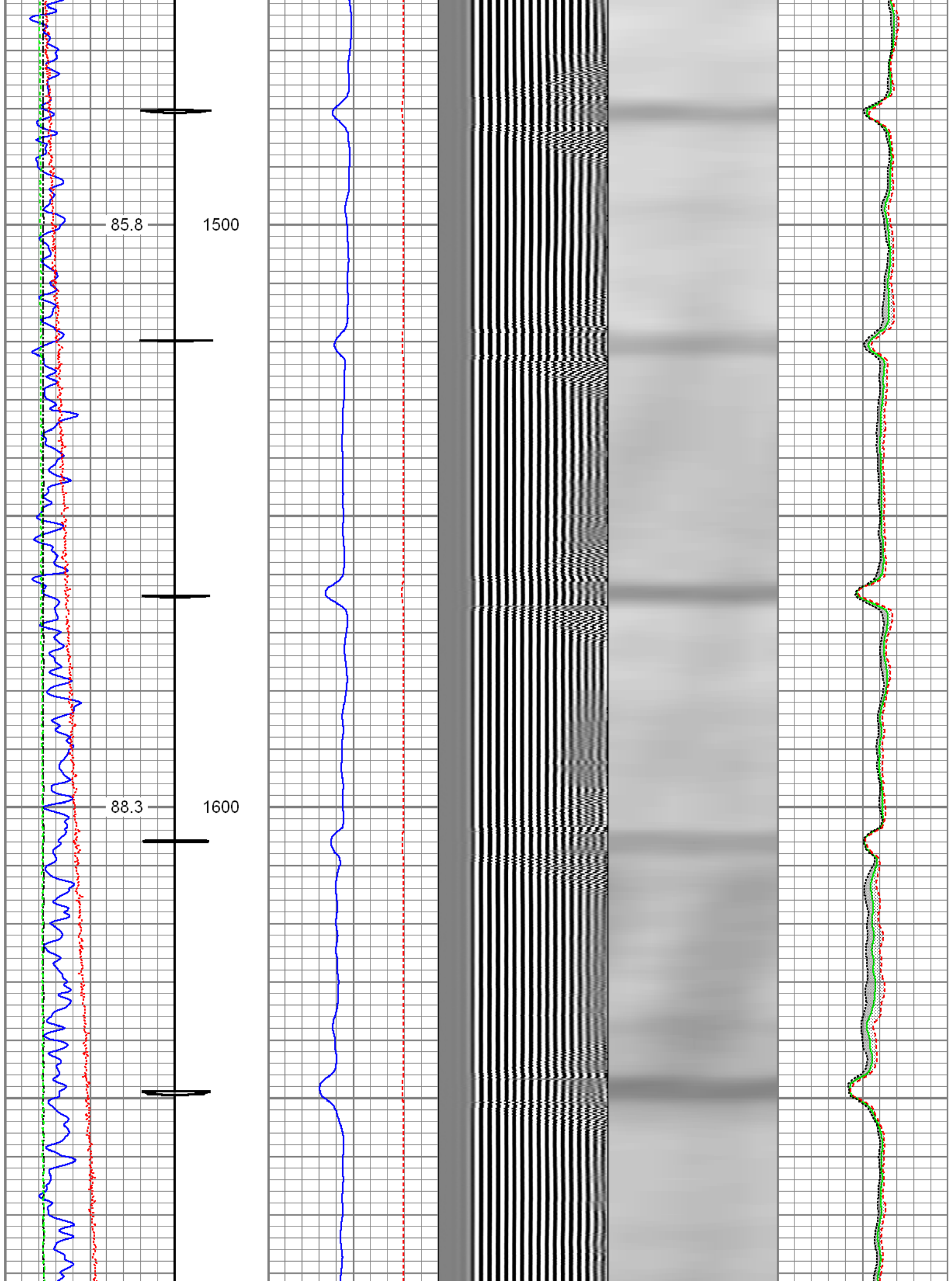


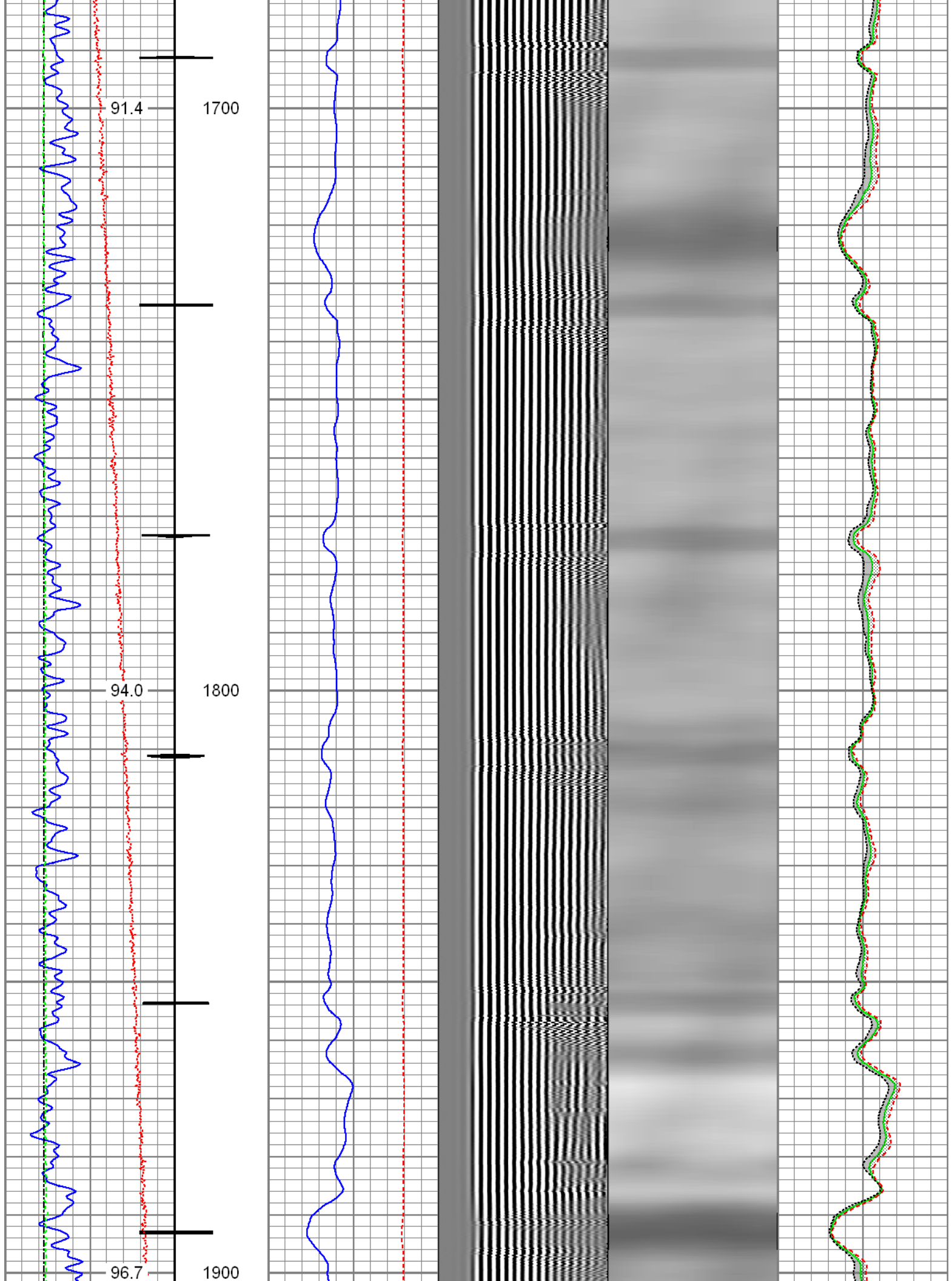


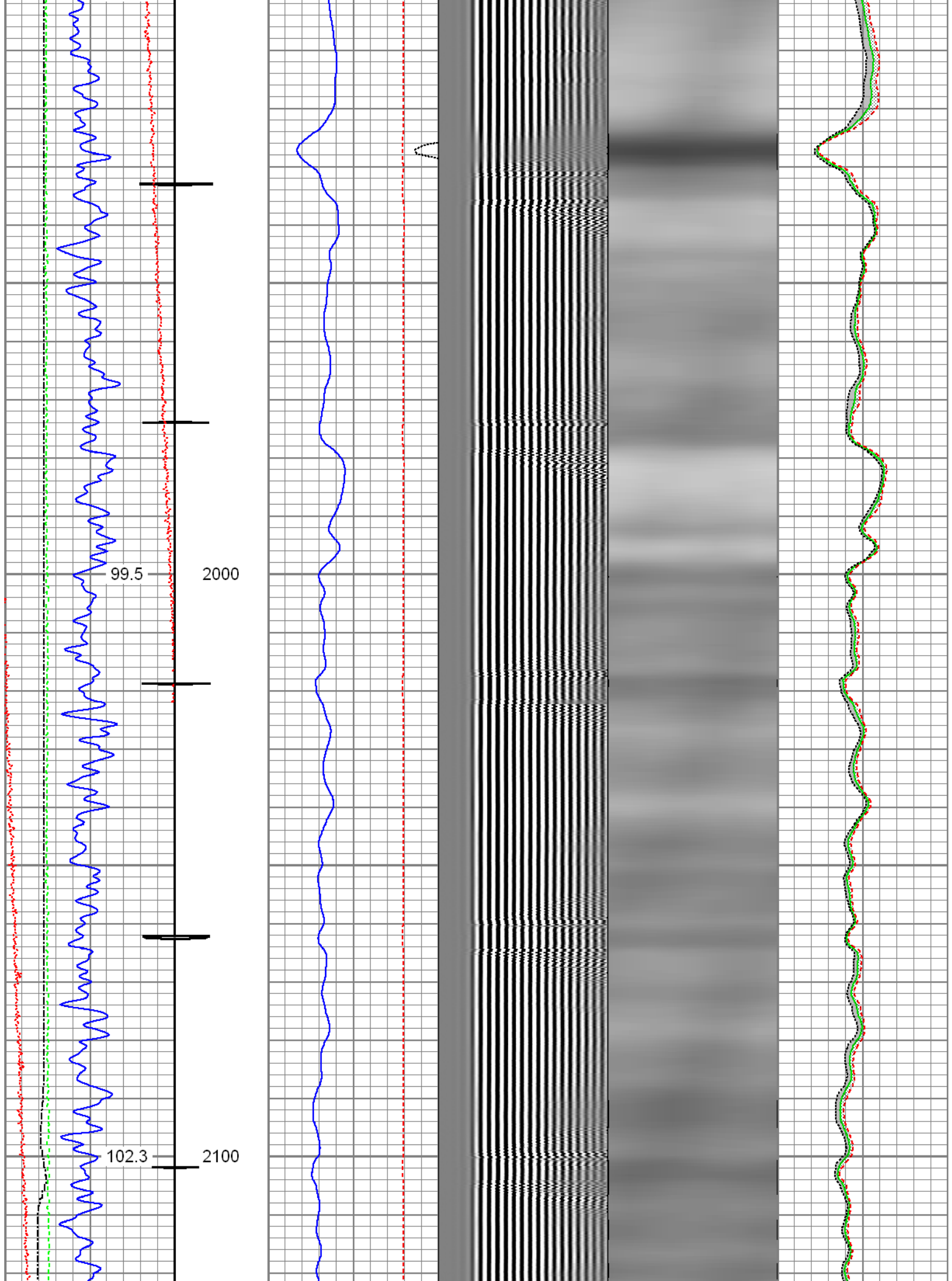


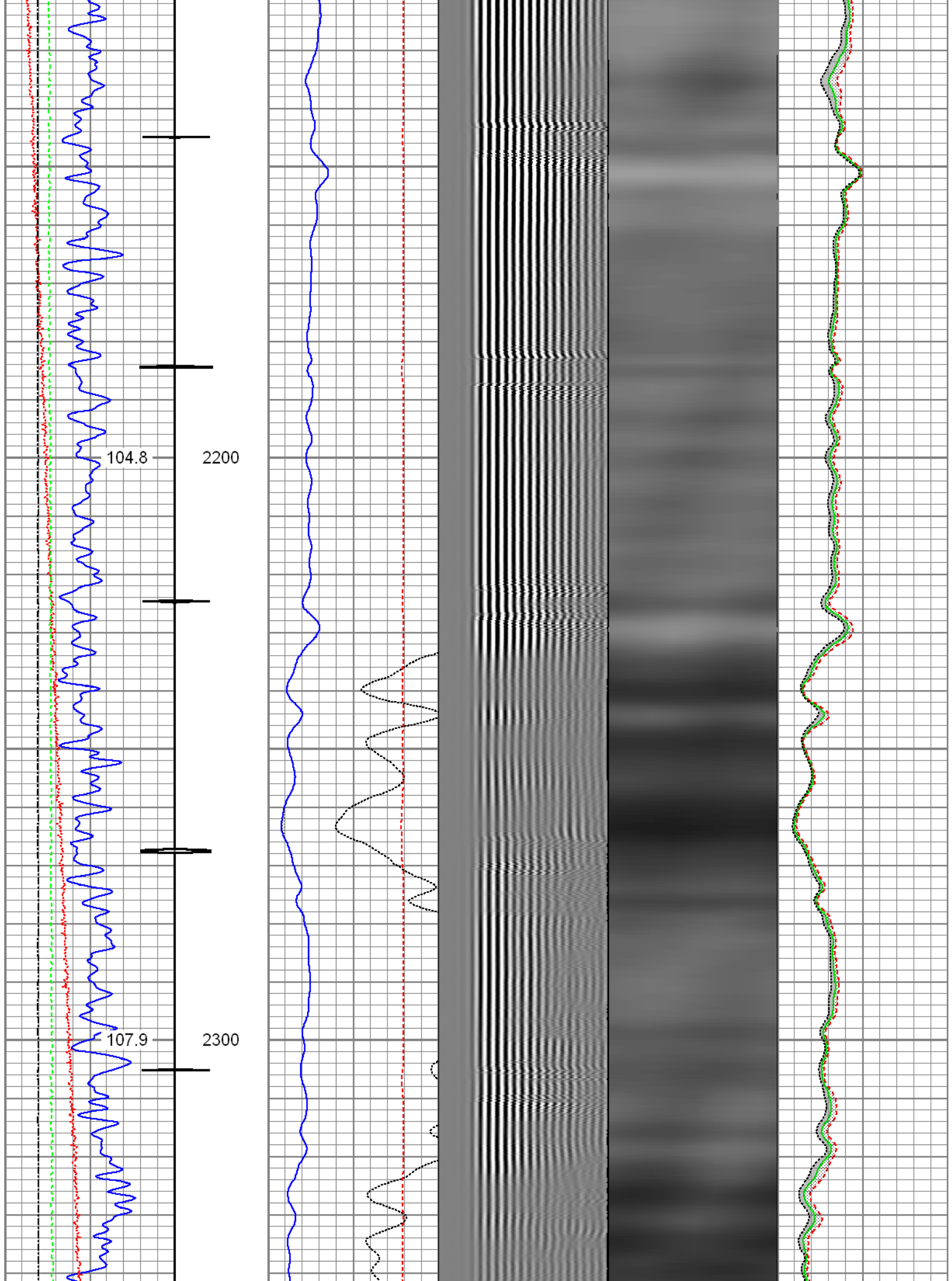


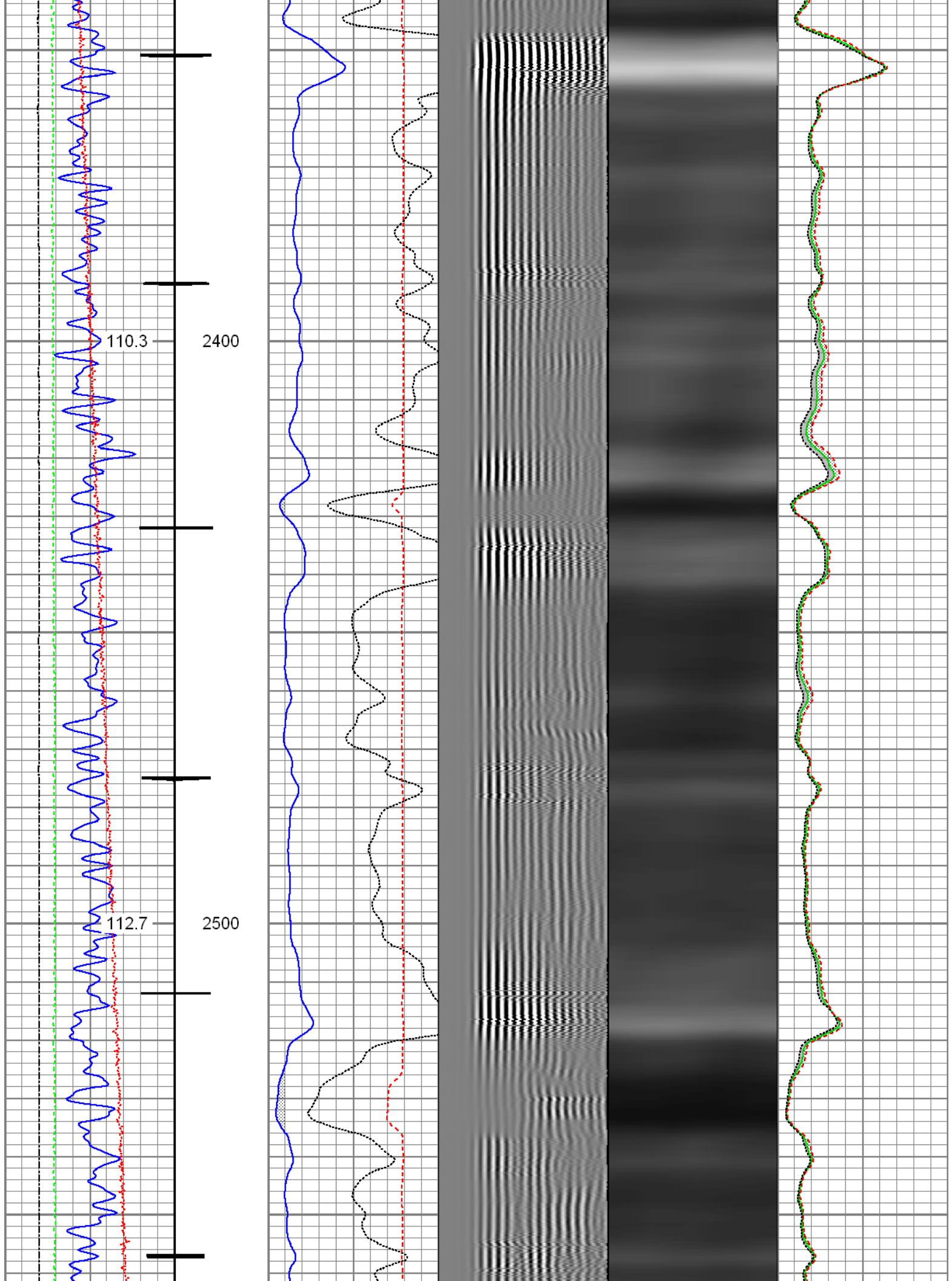


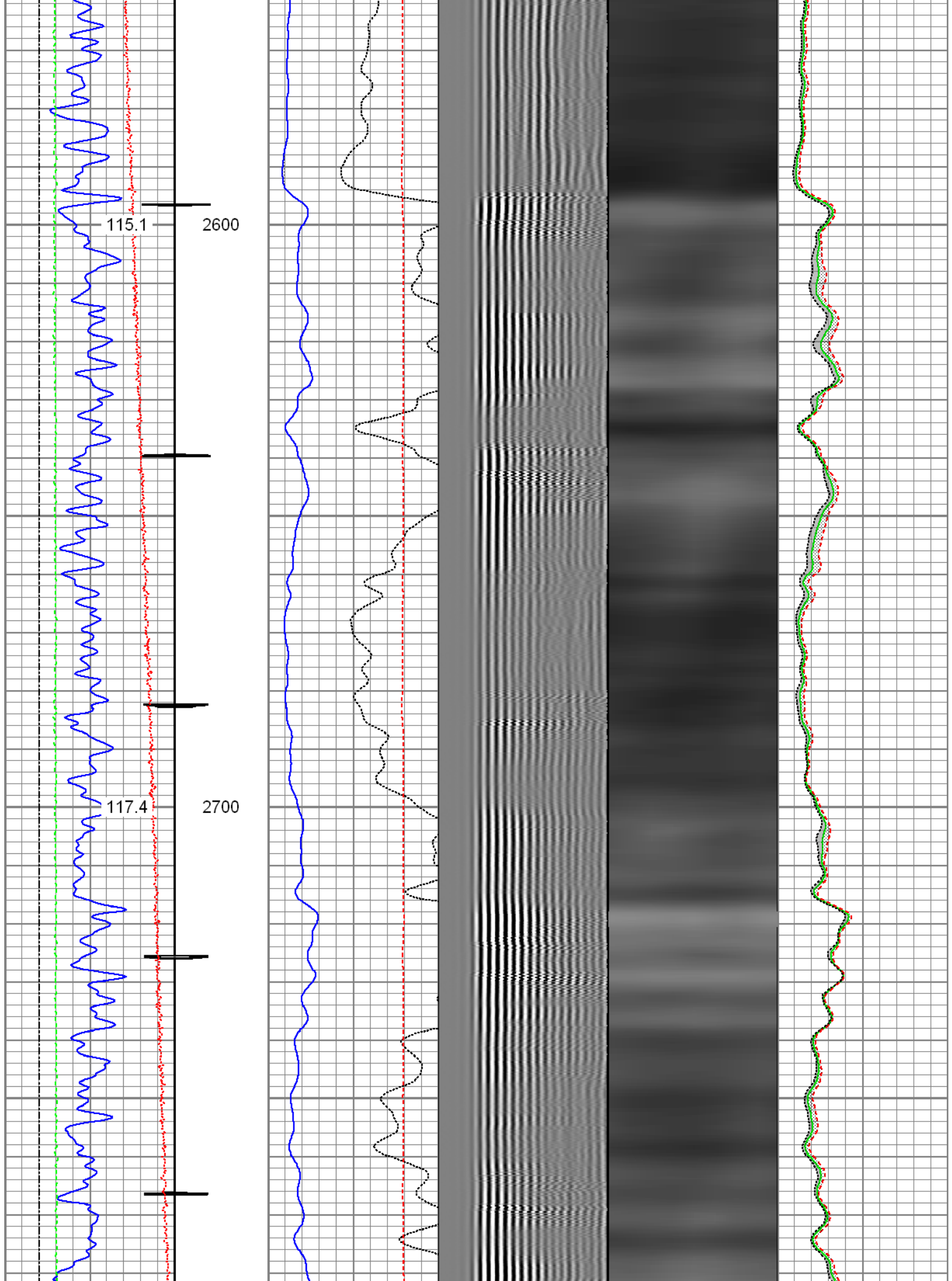


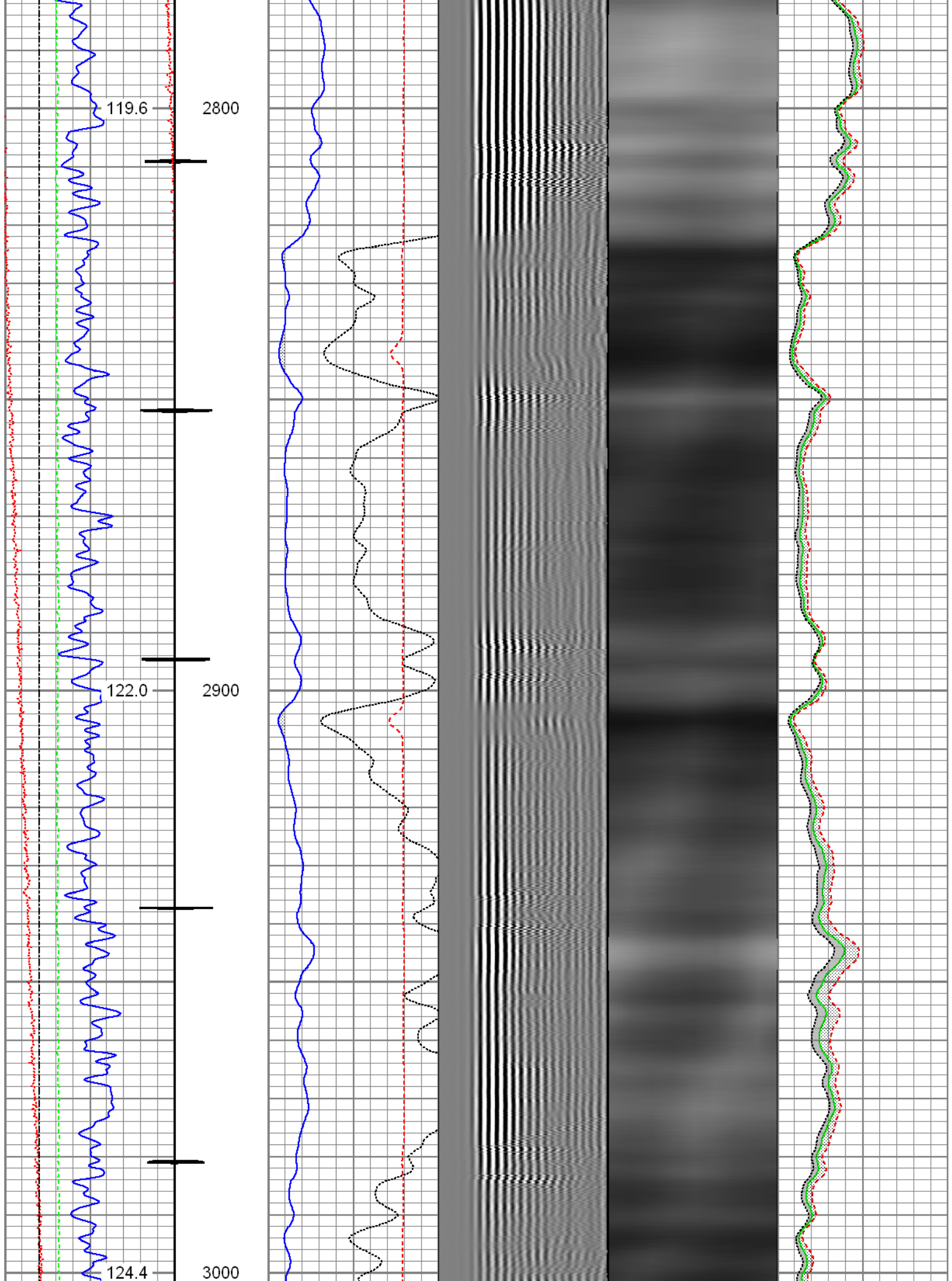


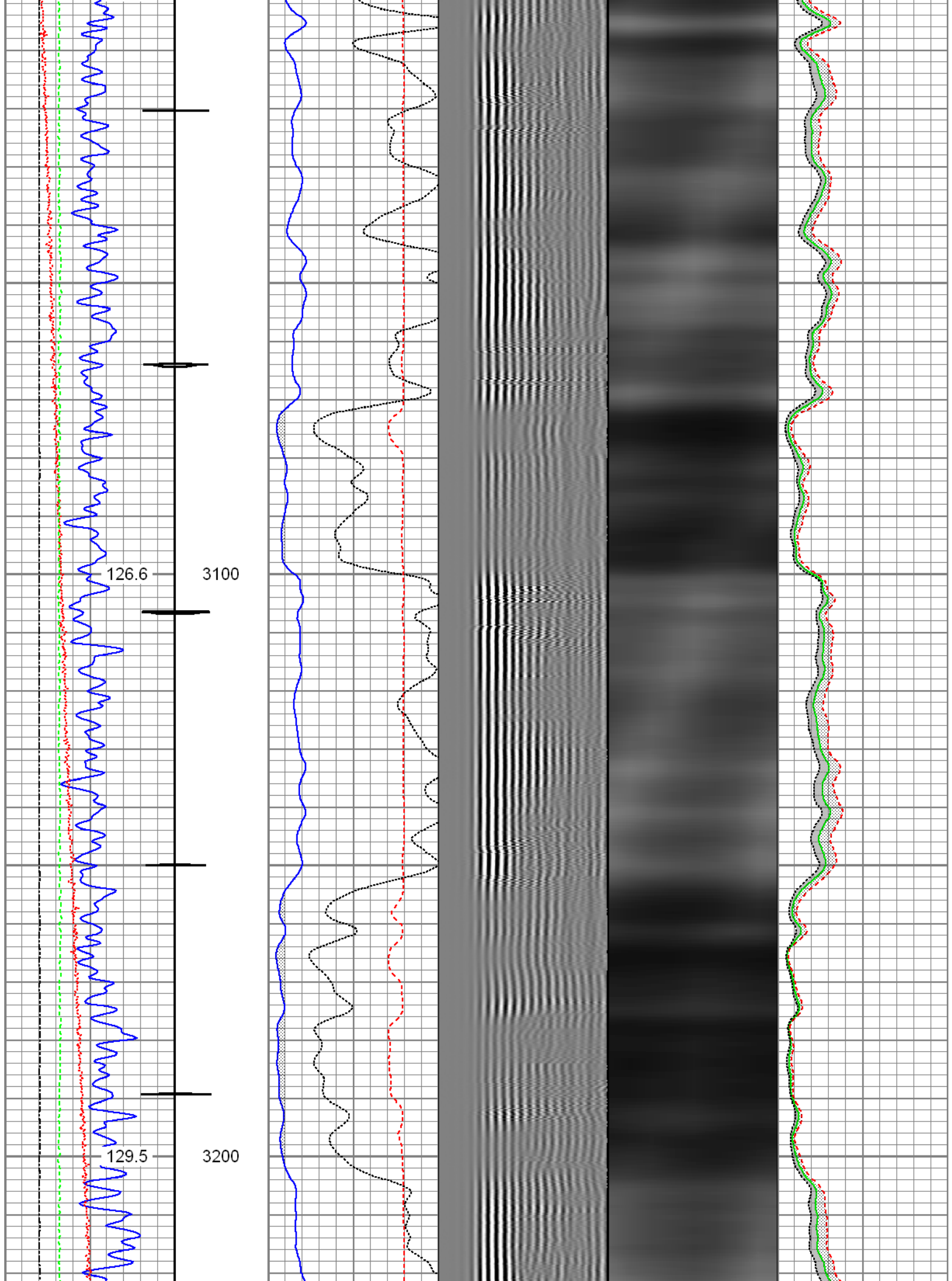


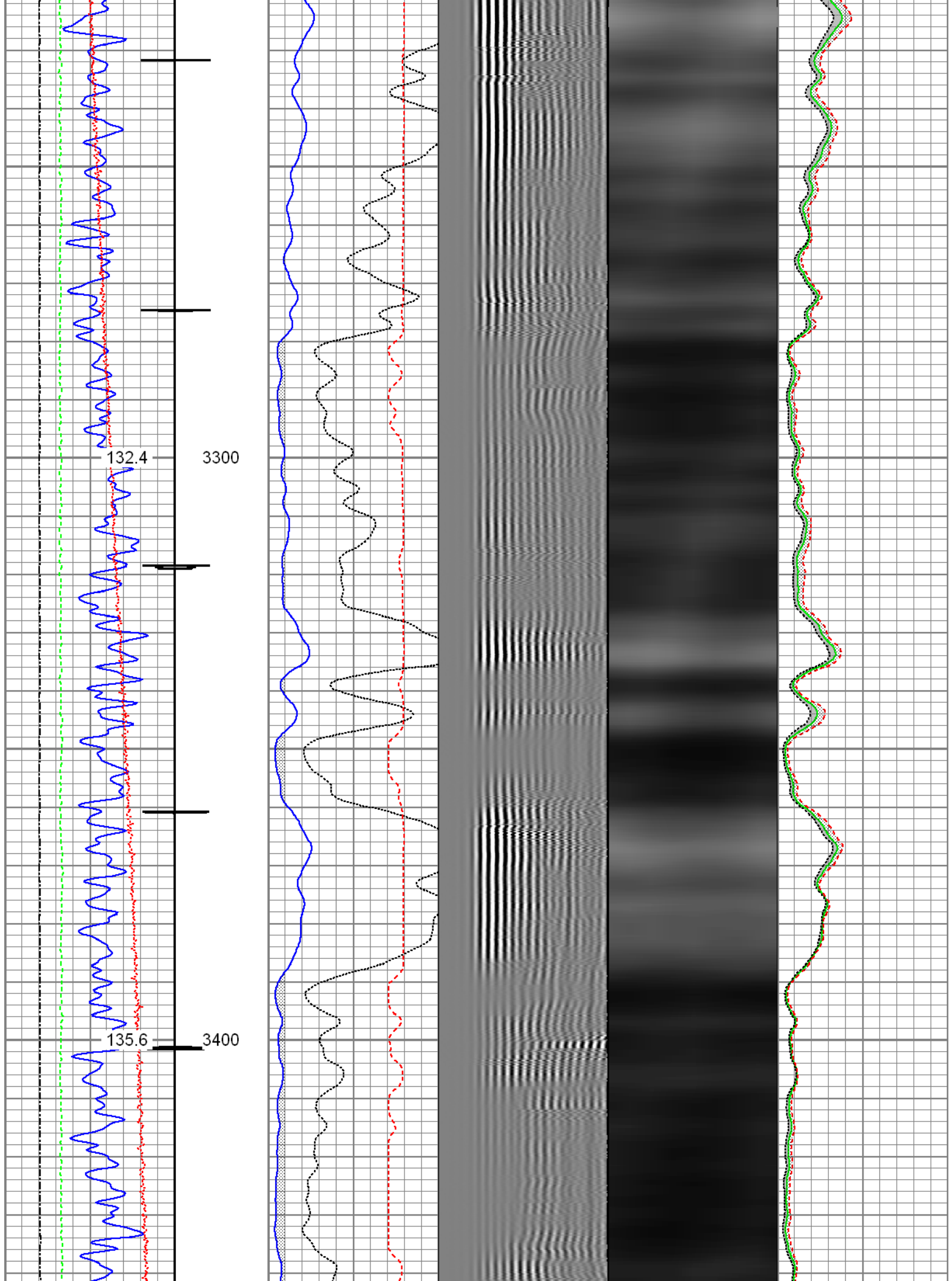


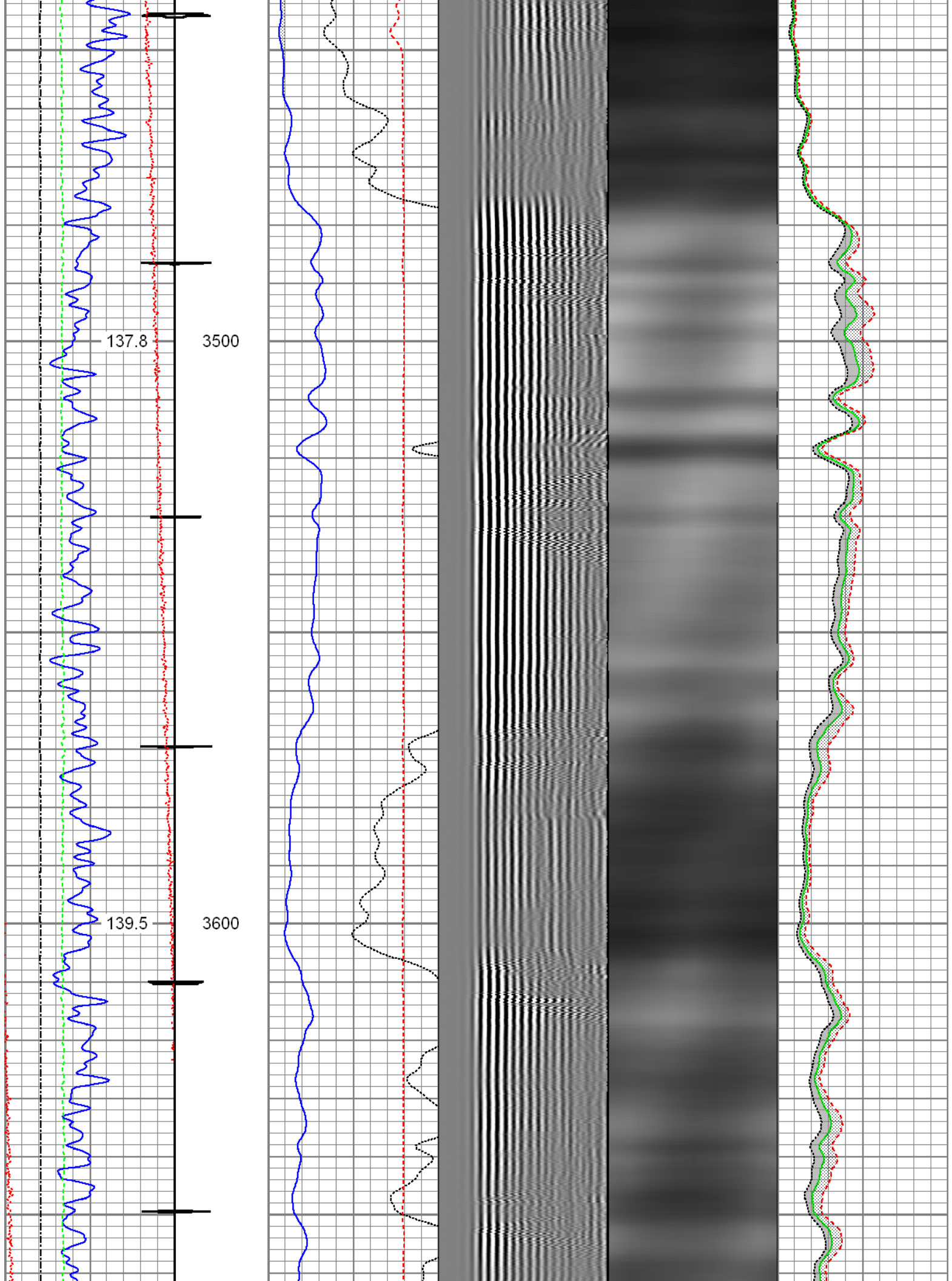


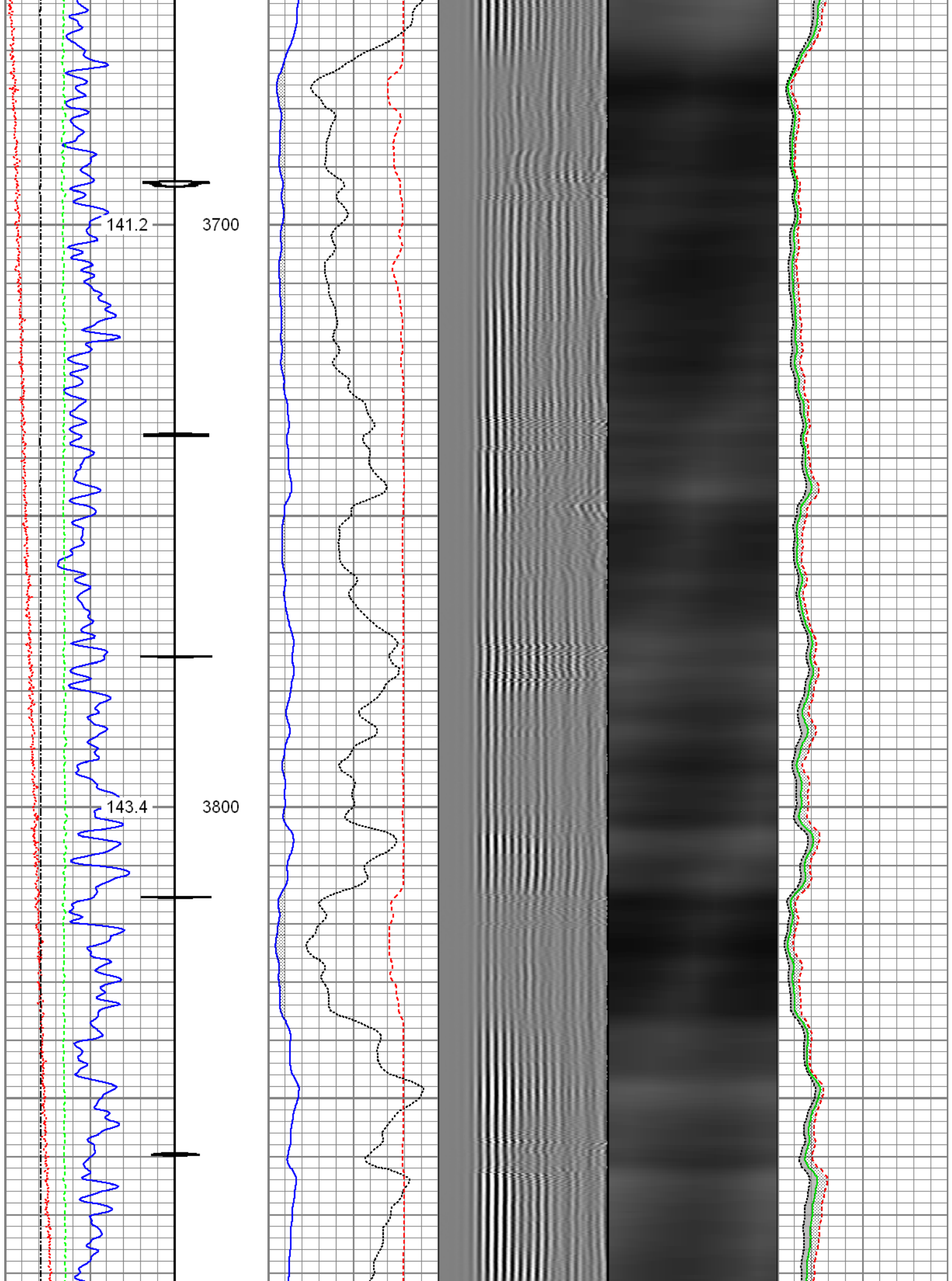


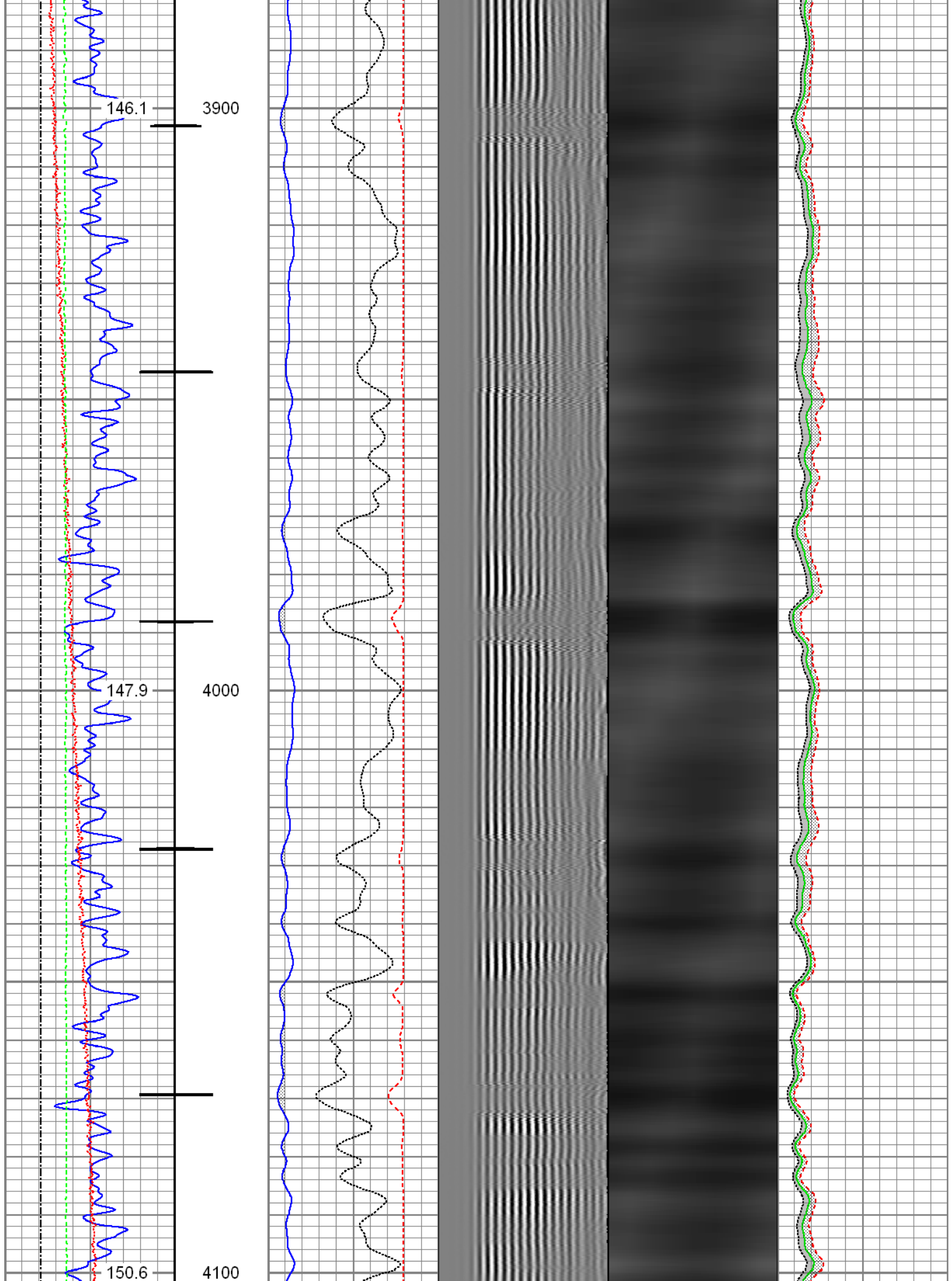


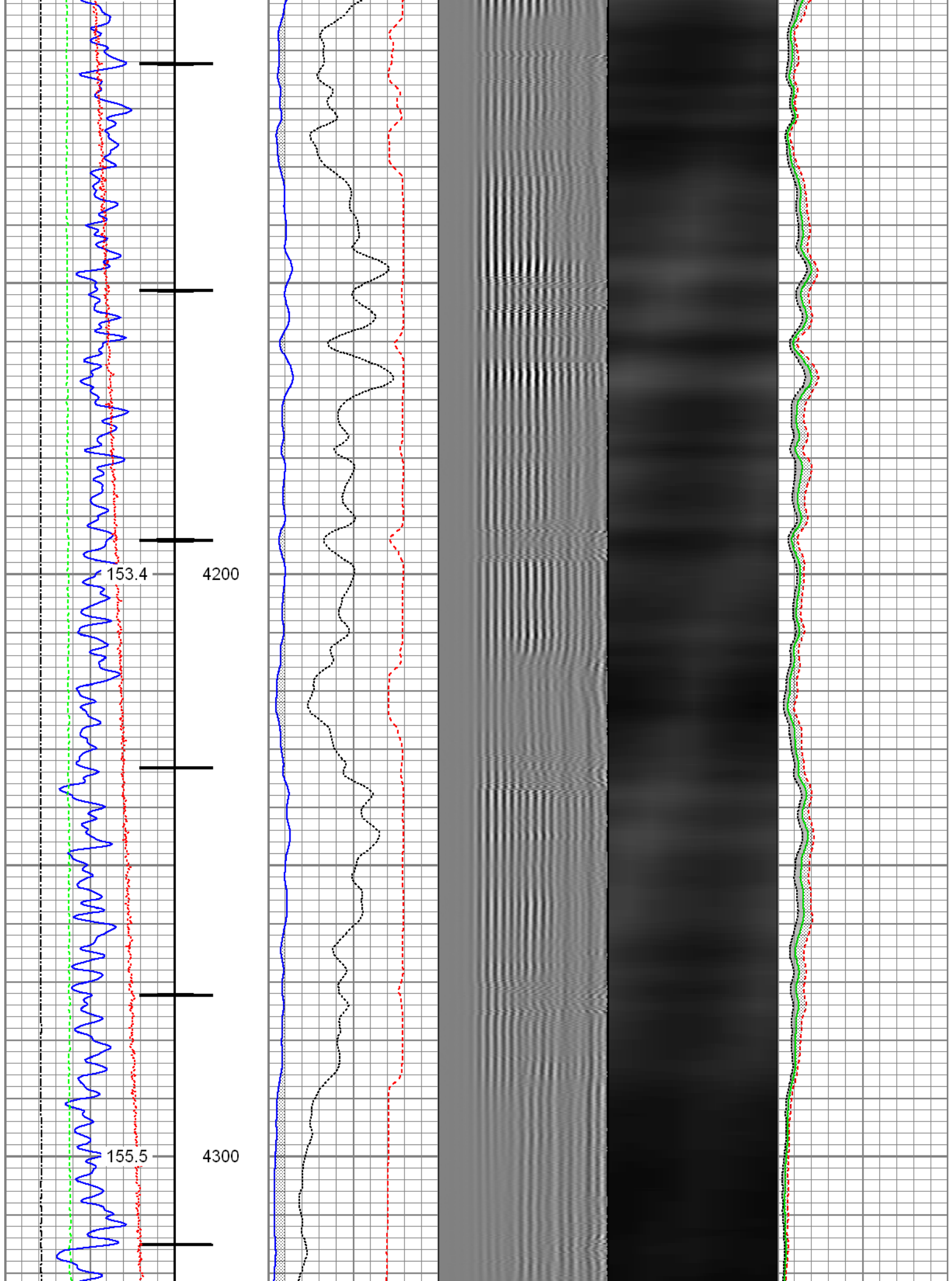


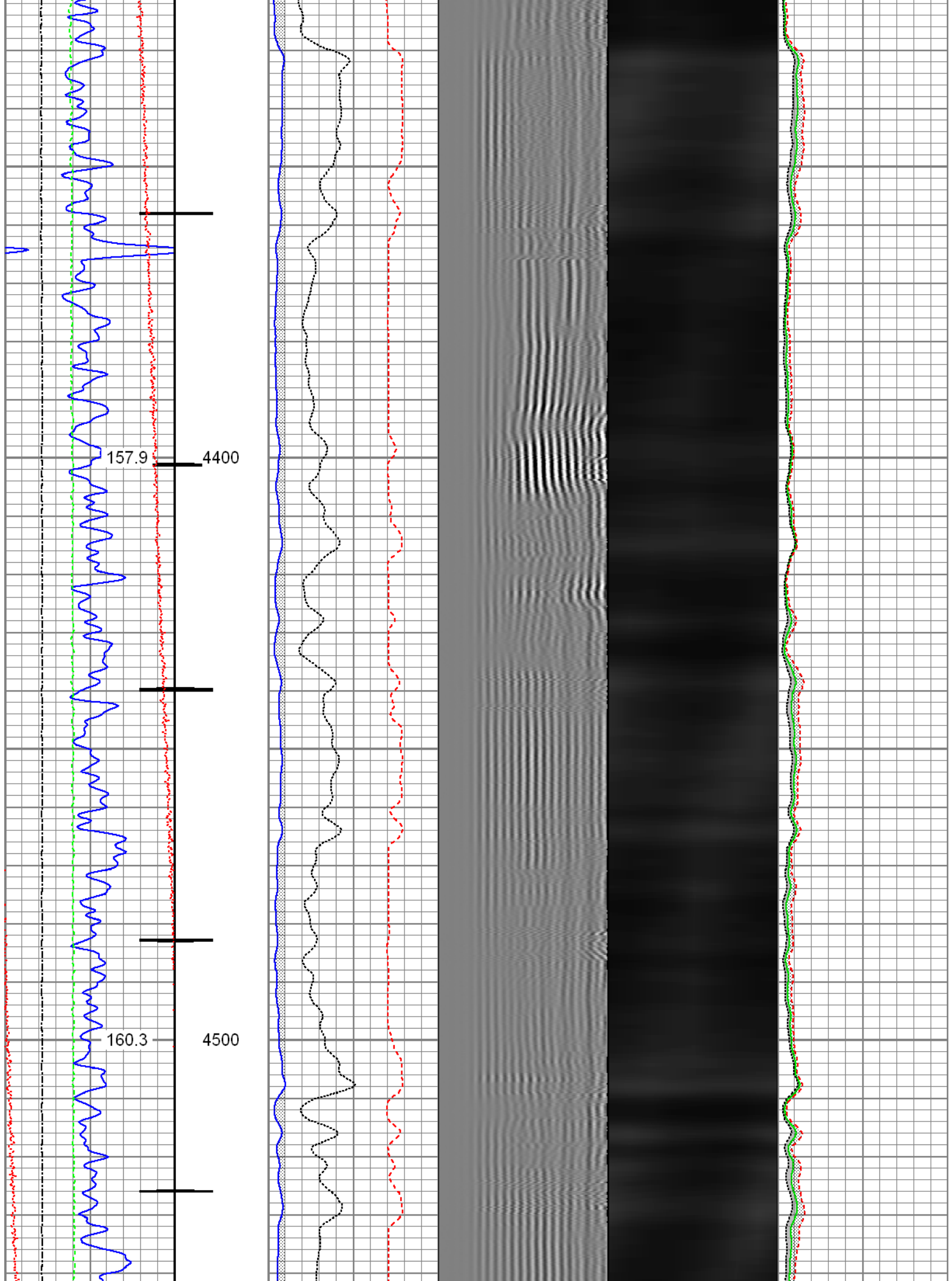


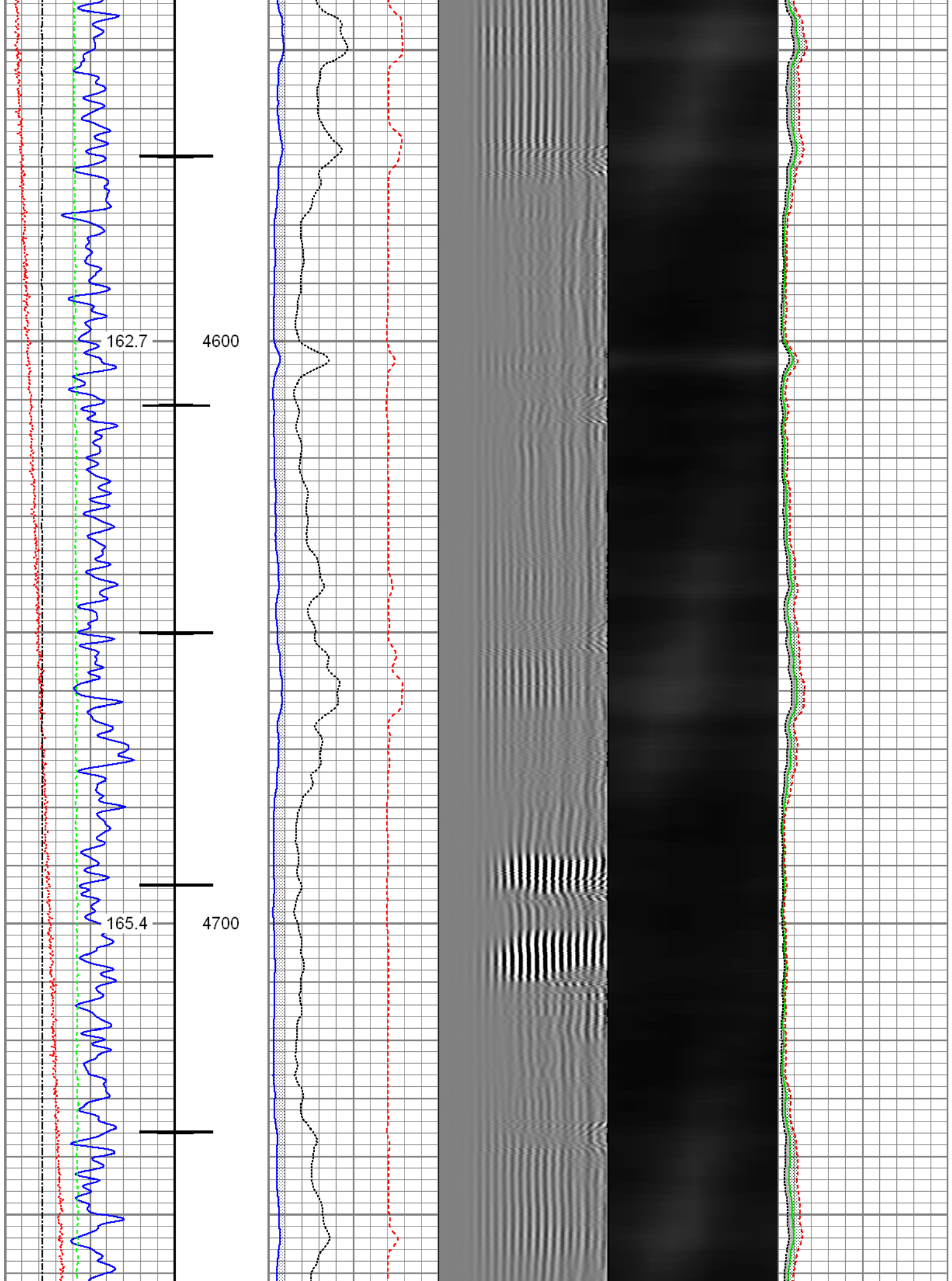


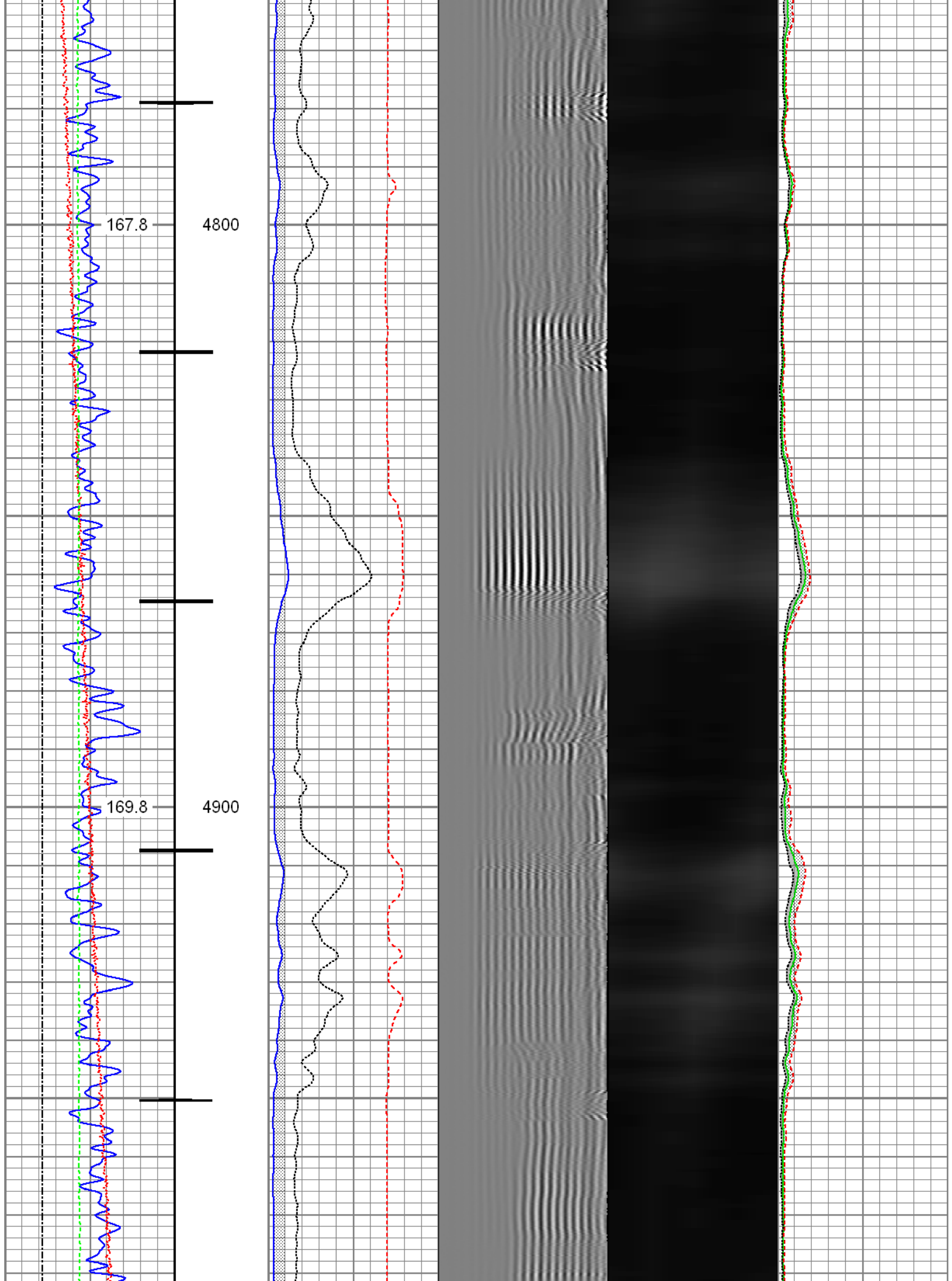


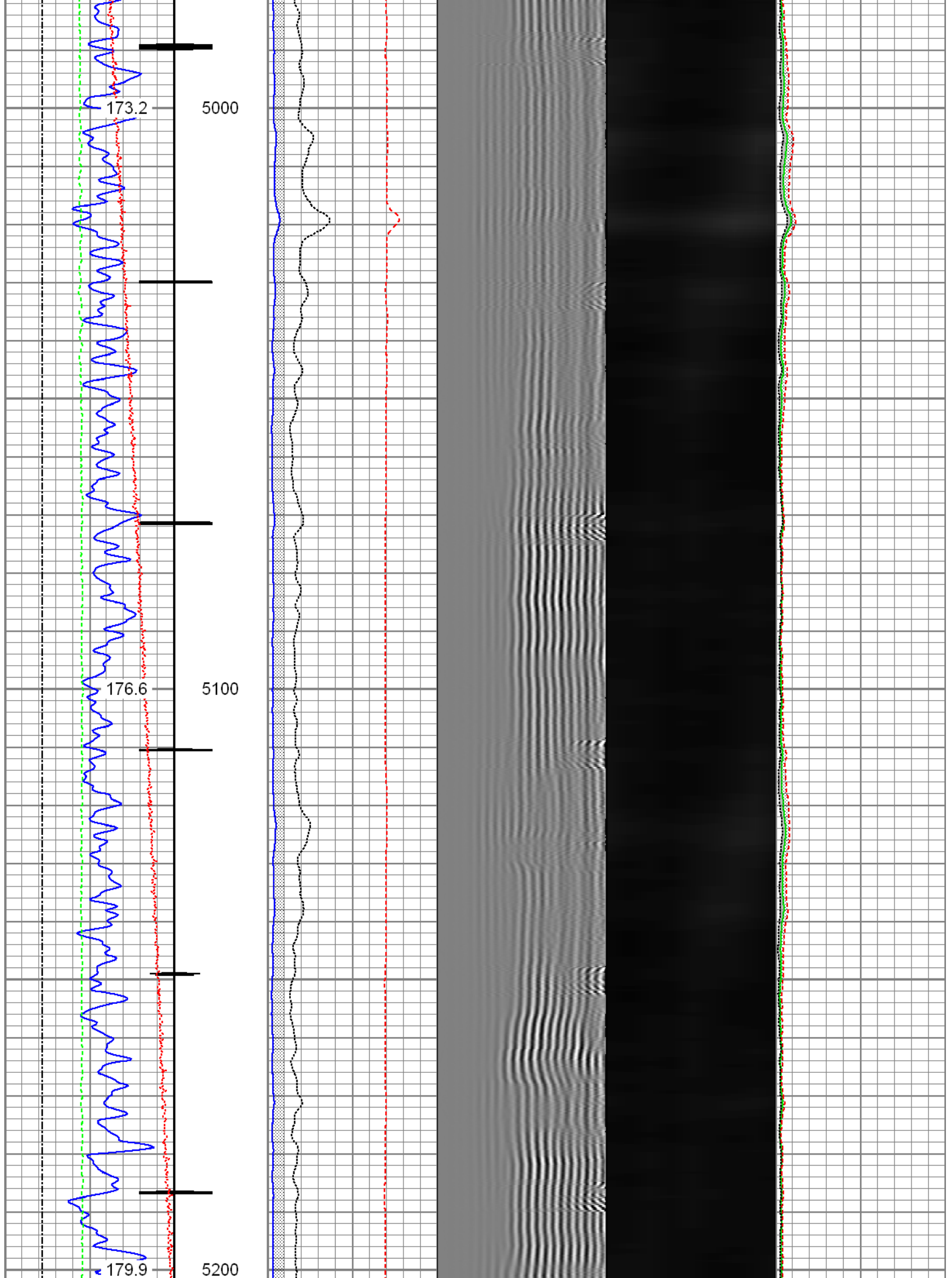


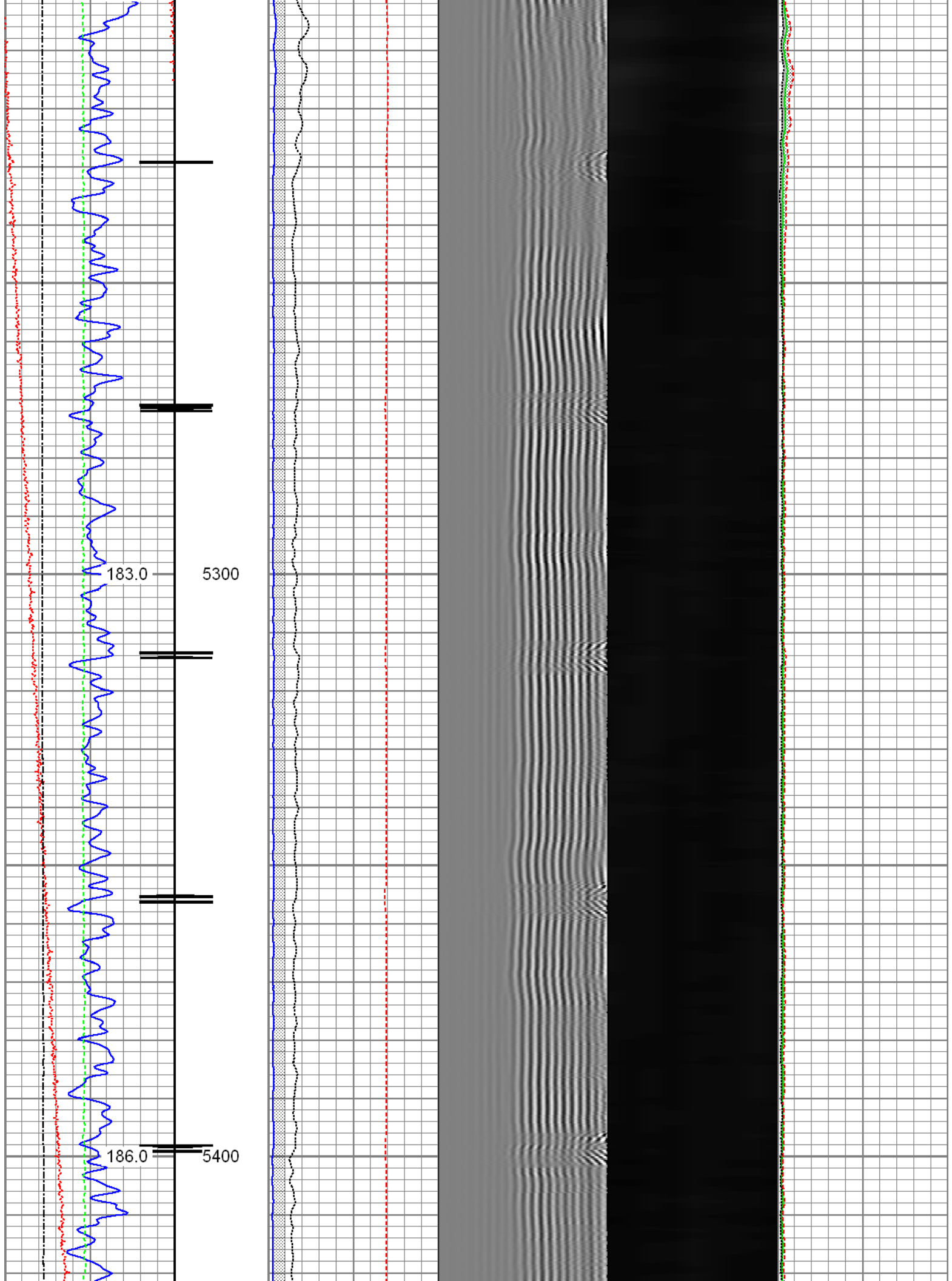


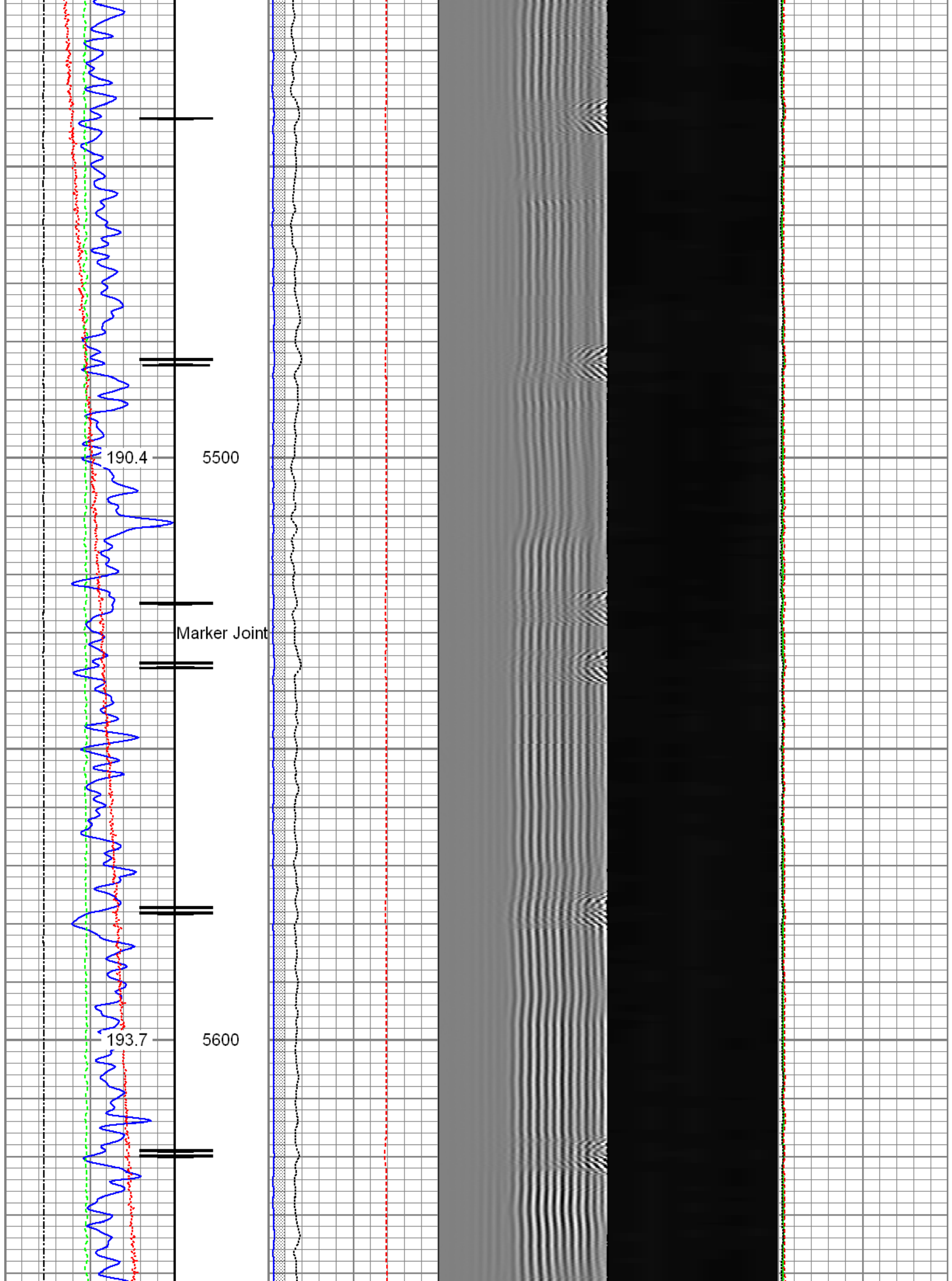


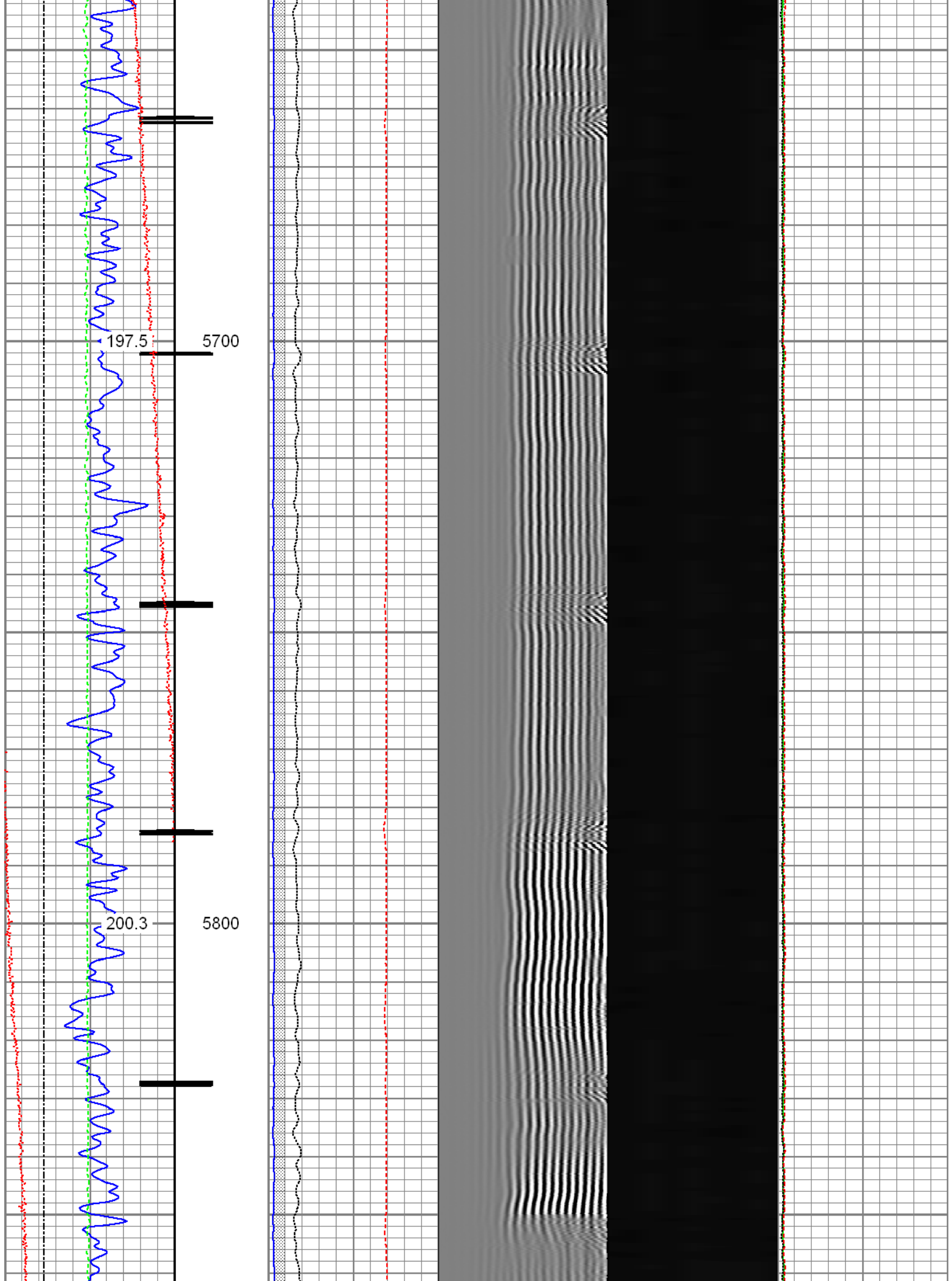


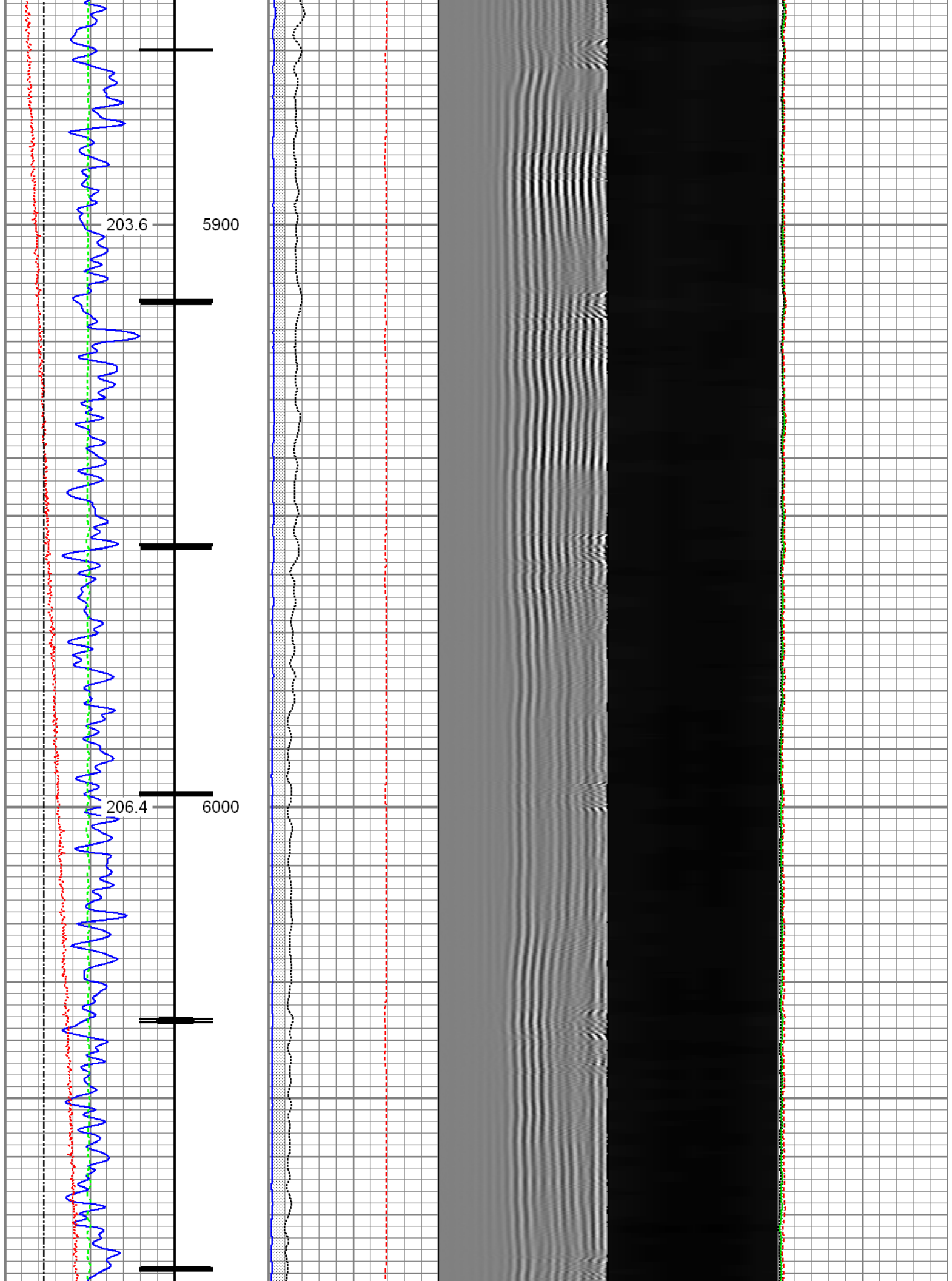


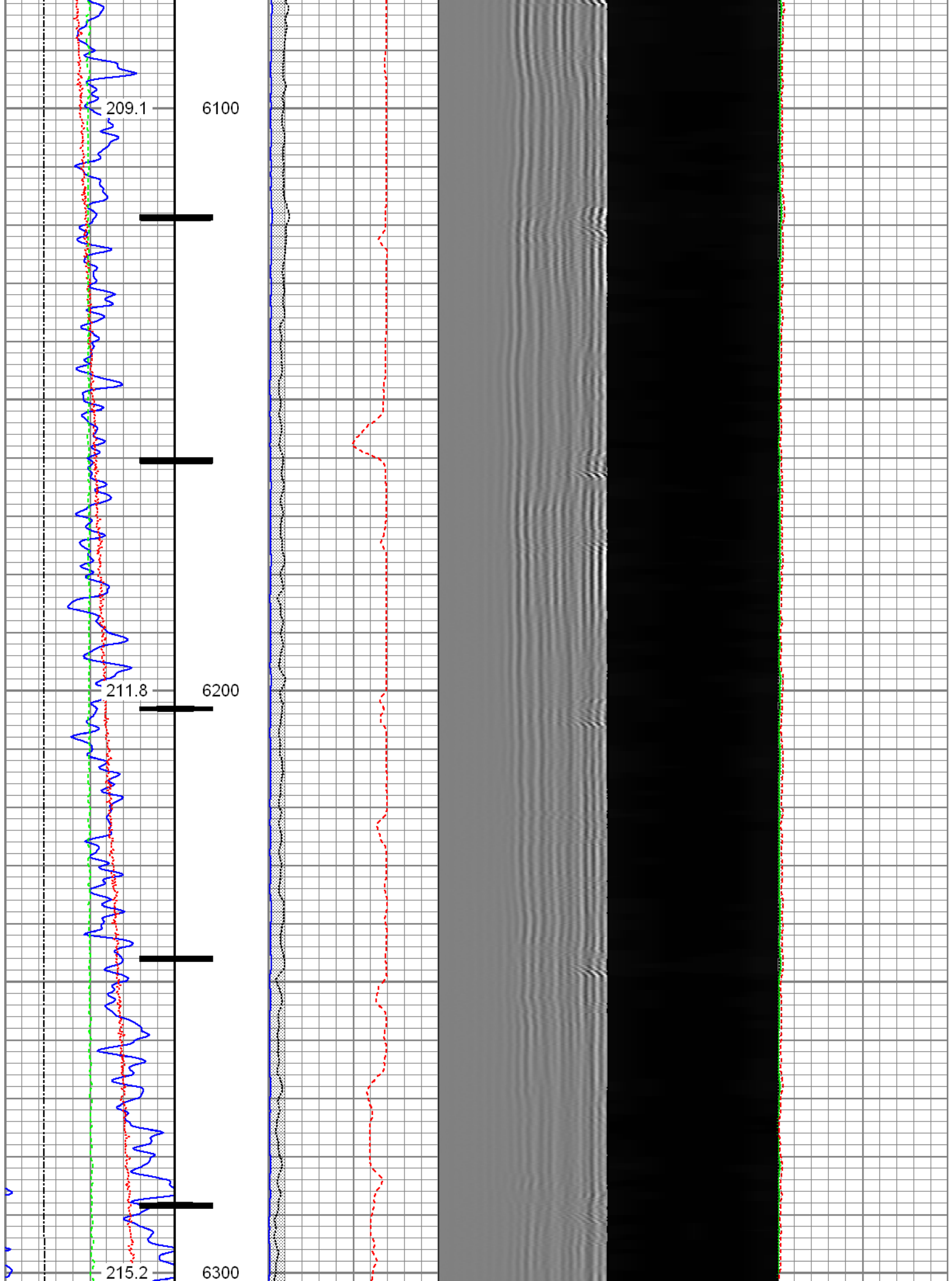


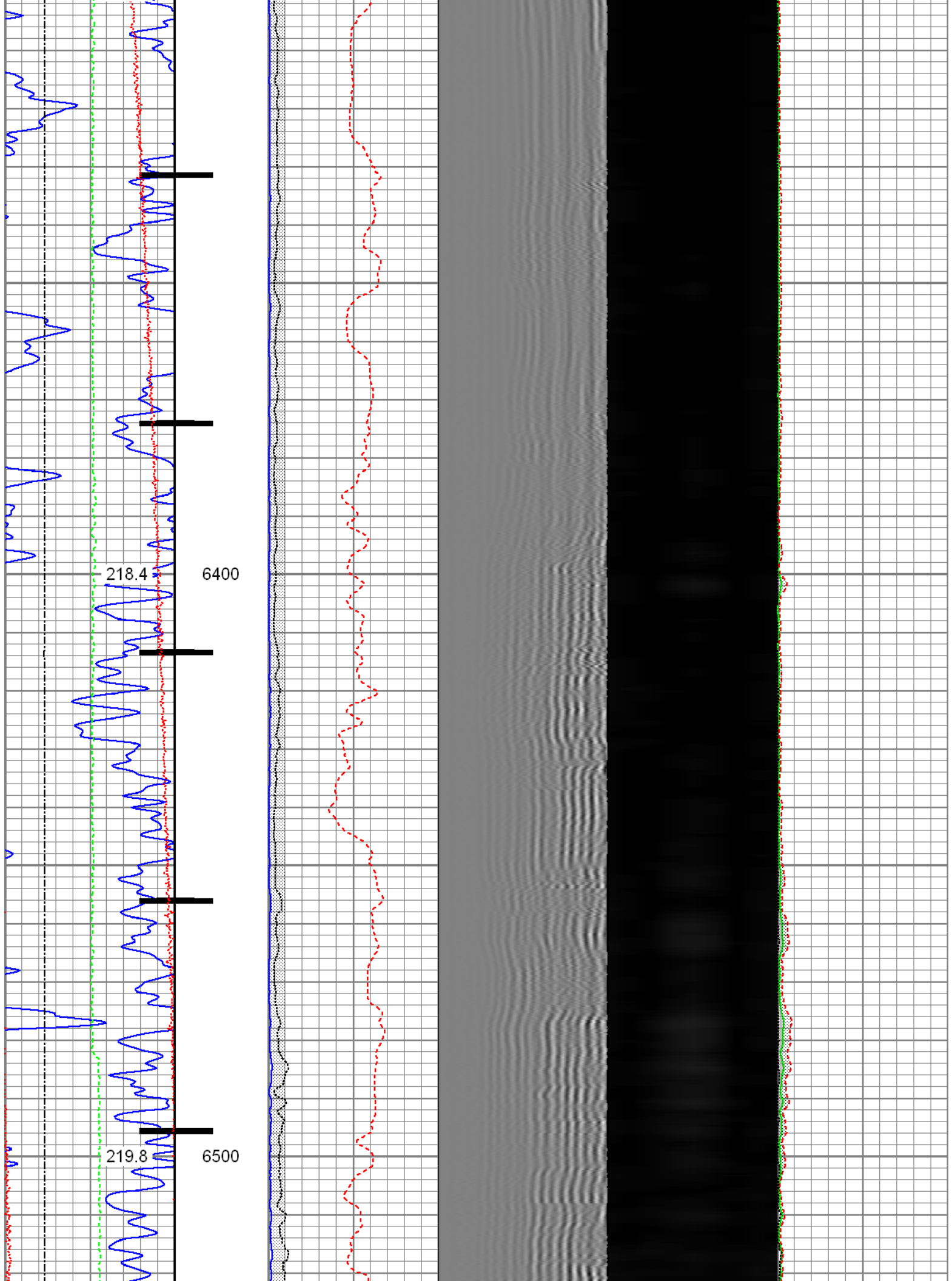


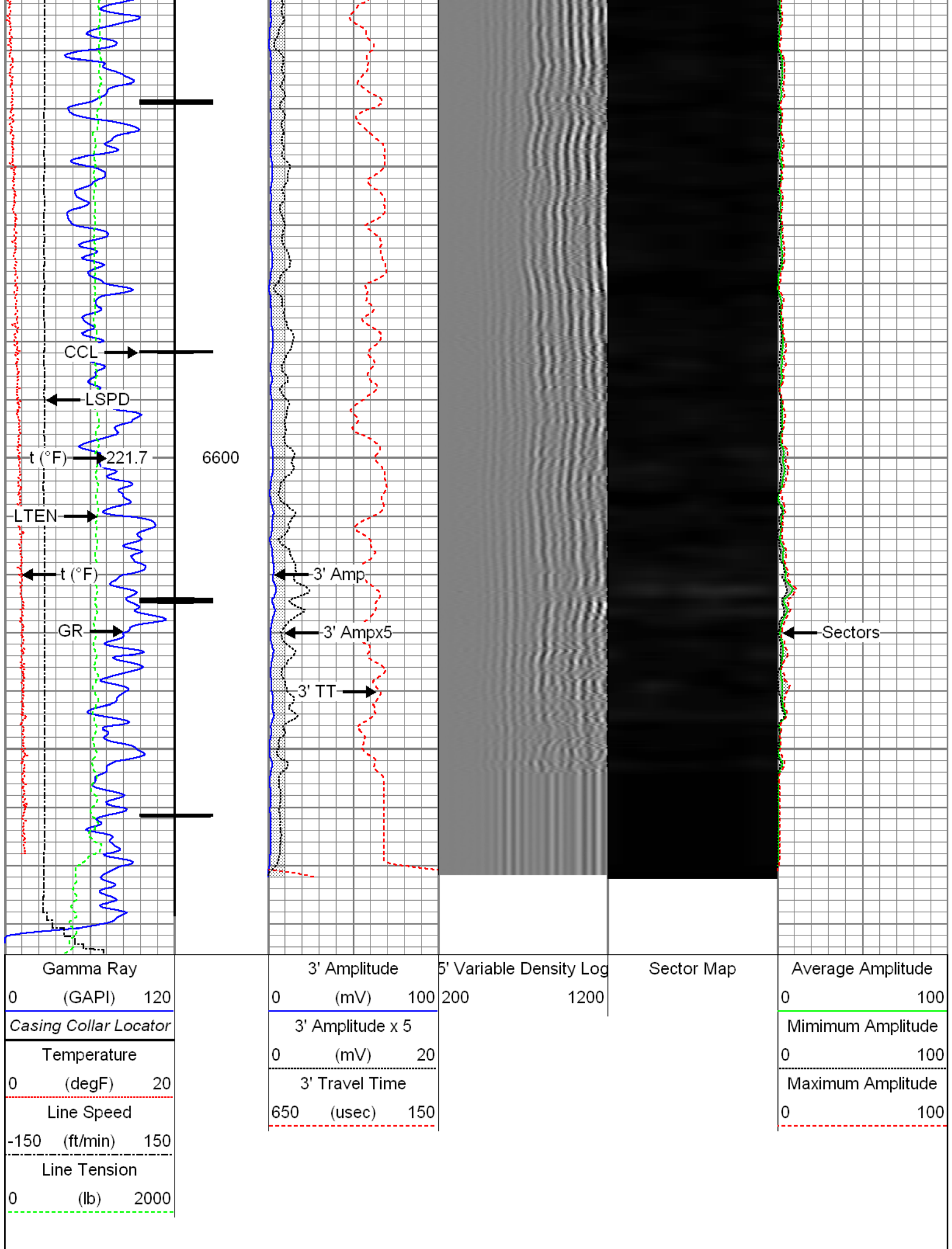










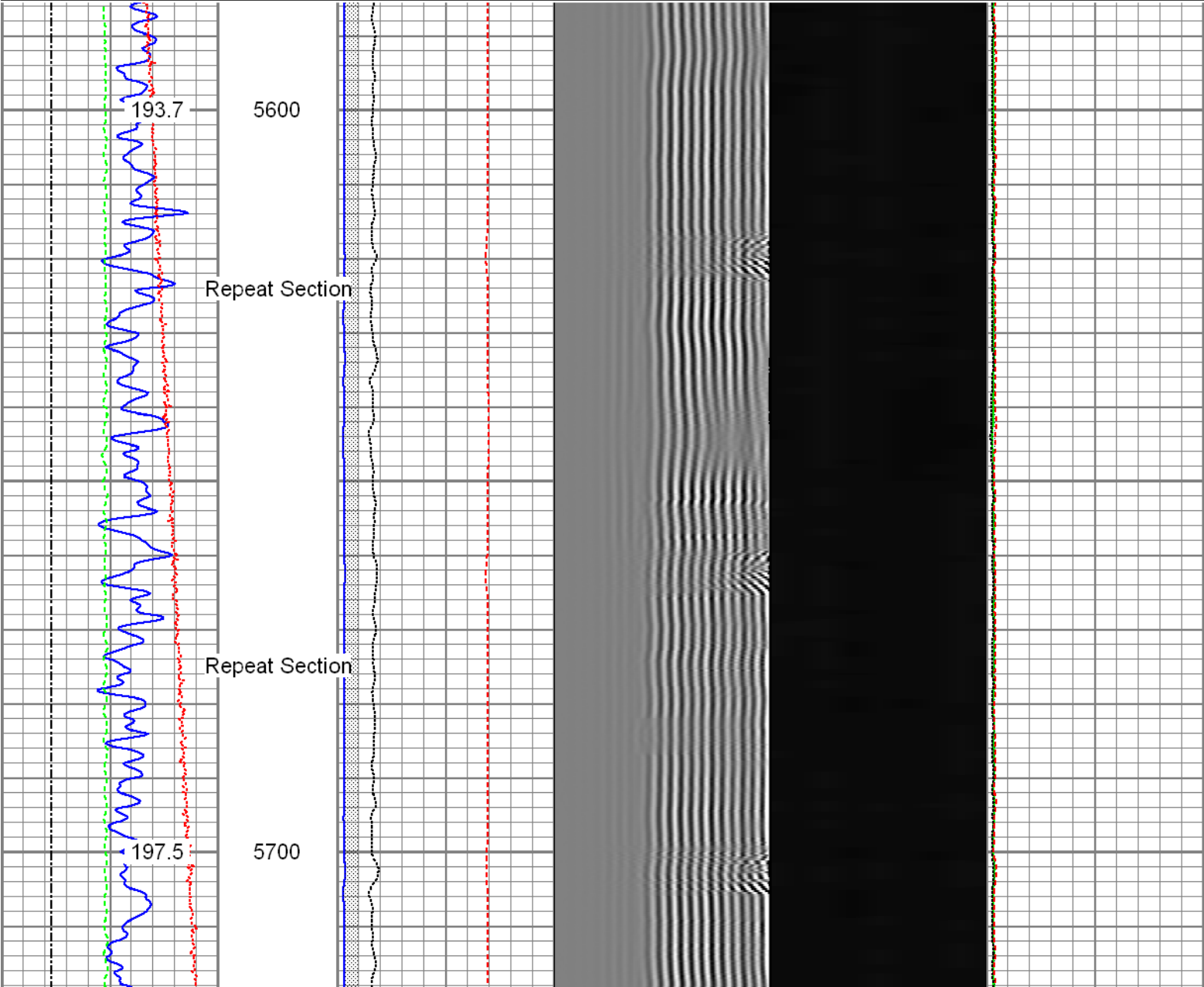


Recorded with 2500 PSI Surface Induced Pressure

Database File:
Dataset Pathname:
Presentation Format:
Dataset Creation:
Charted by:

c:\warrior\data\03-02-16_noble energy_wells ranch bb01-655_rb\03-02-16_noble energy_wells ranch
pass4.2
radii
Wed Mar 02 21:27:04 2016 by Calc 7.0 B1
Depth in Feet scaled 1:240

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



WVF3FT	14.55		Probe_RADII-C-2-3/4" (FW1302-002) Probe 2-3/4" Sector Cement Bond Tool with Temperature Probe	9.19	2.75	105.00
WVFCAL	14.55					
WVFS1	14.55					
WVFS2	14.55					
WVFS3	14.55					
WVFS4	14.55					
WVFS5	14.55					
WVFS6	14.55					
WVFS7	14.55					
WVFS8	14.55					
WVF5FT	13.55					
			Probe_IL_BS_Cent Probe 2-3/4" Inline Electrical Inline Bowspring Centralizer	2.88	2.75	10.00
CCL	6.51					
DCCL	6.51					
			Probe_CCL_GR-2.75"Digital (FW1211-026) Probe 2-3/4" Digital CCL / Gamma Ray Combined	4.54	2.75	55.00
GR	3.77					
			Probe_IL_BS_Cent Probe 2-3/4" Inline Electrical Inline Bowspring Centralizer	2.88	2.75	10.00
Dataset: 03-02-16_Noble Energy_Wells Ranch BB01-655_RBL.db: field/well/run1/pass8.2 Total Length: 23.40 ft Total Weight: 194.00 lb O.D. 2.75 in						

Calibration Report		
Database File:	C:\Warrior\Data\03-02-16_Noble Energy_Wells Ranch BB01-655_RBL\03-02-16_Noble Energy_Wells	
Dataset Pathname:	pass8.2	
Dataset Creation:	Wed Mar 02 21:25:29 2016 by Calc 7.0 B1	
Gamma Ray Calibration Report		
Serial Number:	FW1211-026	
Tool Model:	2.75"Digital	
Performed:	Wed Feb 24 10:35:47 2016	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.6	cps
Sensitivity:	0.6061	GAPI/cps

Serial Number: FW1302-002
 Tool Model: 2-3/4"

Calibration Casing Diameter: 5.500 in
 Calibration Depth: 27.508 ft

Master Calibration, performed Wed Mar 02 21:25:13 2016:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.008	0.548	0.800	71.921	131.650	-0.199
CAL	0.006	0.650				
5'	0.008	0.474	0.800	71.921	152.783	-0.439
SUM						
S1	0.010	0.511	0.000	100.000	199.800	-2.085
S2	0.009	0.509	0.000	100.000	200.049	-1.881
S3	0.008	0.525	0.000	100.000	193.489	-1.487
S4	0.008	0.551	0.000	100.000	184.468	-1.564
S5	0.008	0.588	0.000	100.000	172.339	-1.405
S6	0.009	0.590	0.000	100.000	172.168	-1.496
S7	0.009	0.563	0.000	100.000	180.505	-1.692
S8	0.008	0.540	0.000	100.000	187.987	-1.539

Internal Reference Calibration, performed Wed Mar 02 11:14:33 2016:

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.006	0.647	0.006	0.650	1.004	0.000

Air Zero Calibration, performed Wed Mar 02 11:13:55 2016:

	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		0.000	
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	0.006		0.000		0.000	
S8	0.006		0.000		-0.000	



Company Noble Energy Inc.
 Well Wells Ranch BB01-655
 Field Wattenberg
 County Weld
 State Colorado