



Radial Cement Bond
Gamma Ray
Casing Collar Log

Company	Kerr-McGee Oil & Gas OnShore L.P.			
Well	D K Norgren Unit C True 1			
Field	Wattenberg			
County	Weld			
State	Colorado			
Location:	API # : 05-123-11638			
SEC 14 TWP 3N RGE 67W	Other Services			
	Gauge Ring			
	Elevation			
	Permanent Datum Ground Level Elevation 4780'			
Log Measured From	Kelly Bushing			13 FT
Drilling Measured From	Kelly Bushing			
	K.B. 4793'			
	D.F. 4792'			
	G.L. 4780'			

Date	10-Feb-2016
Run Number	Two
Depth Driller	7917 FT
Depth Logger	7120 FT
Bottom Logged Interval	7115 FT
Top Log Interval	Surface
Open Hole Size	7.875"
Type Fluid	Water
Density / Viscosity	8.34 lbm/gal
Max. Recorded Temp.	232°F
Estimated Cement Top	3408 FT
Time Well Ready	1045
Time Logger on Bottom	1145
Equipment Number	HD-0361
Location	Fort Lupton, CO
Recorded By	Jack Amidei
Witnessed By	Mark Vandagriff

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	8 5/8	24	K-55	Surface	745 FT		
Intermediate #1	5 1/2	17	J-55	Surface	92 FT		
Intermediate #2	5 1/2	15 1/2	J-55	92 FT	5732 FT		
Liner	5 1/2	17	J-55	5732 FT	7227 FT		
Intermediate #4	5 1/2	17	N-80	7227 FT	7270 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 reported at 13 FT
Adjusted log -24 FT to correlate with Kelly Bushing
Gauge Ring/Junk Basket ran to 7220 FT with no debris found
Log ran from as deep as possible to surface
Recorded with 0 PSI surface induced pressure
No debris found on logging tools upon completion of operations

Thank you for choosing FMC Technologies Surface Integrated Services.



Main Pass

Recorded with 0 PSI Surface Induced Pressure

Database File: c:\warrior\data\0512311638_anadarko_d k norgren unit c true 1_2-10-16_rbl\processed_0512311638

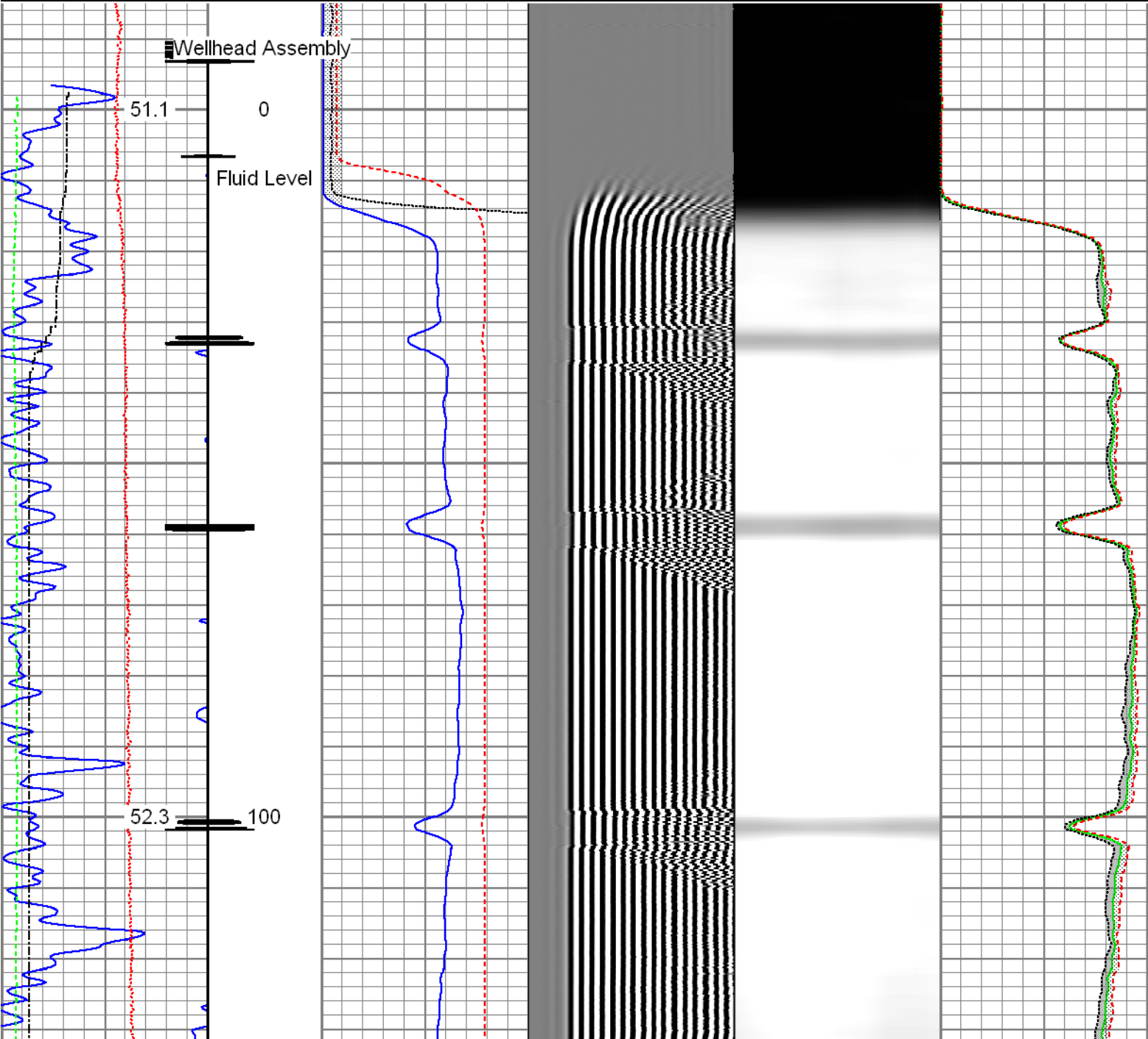
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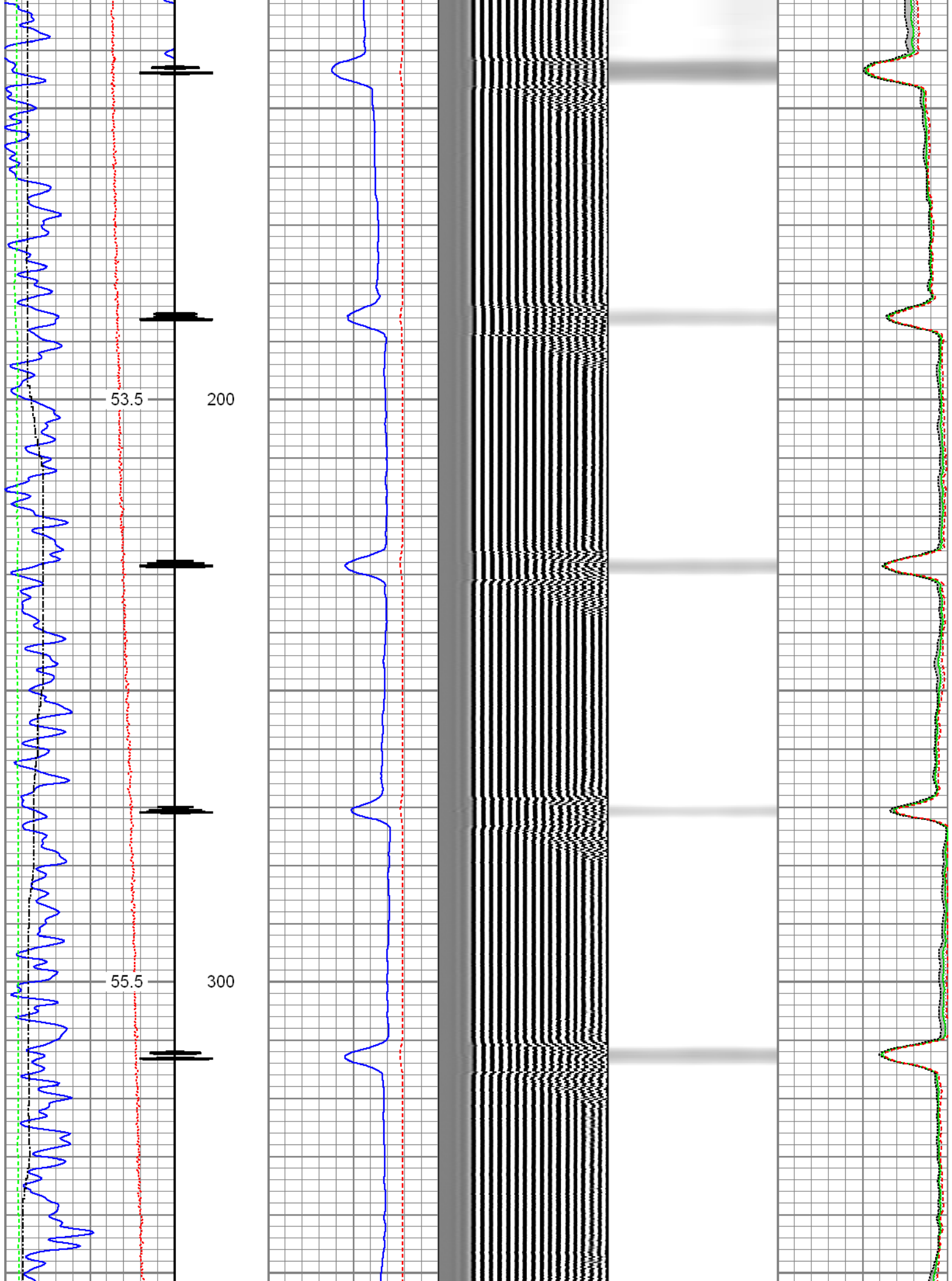
Presentation Format: radii

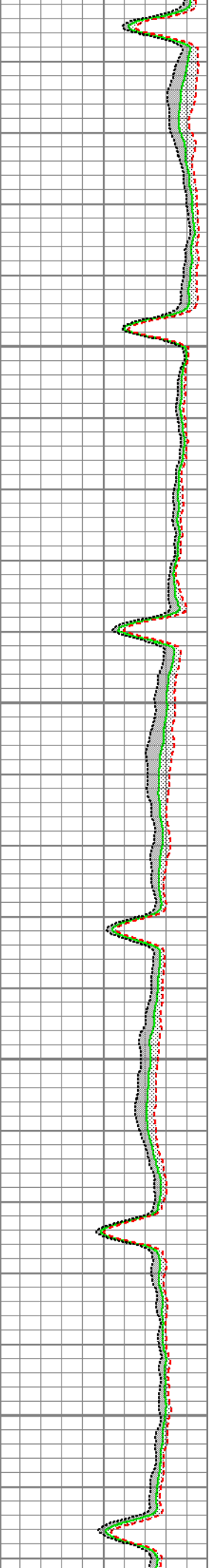
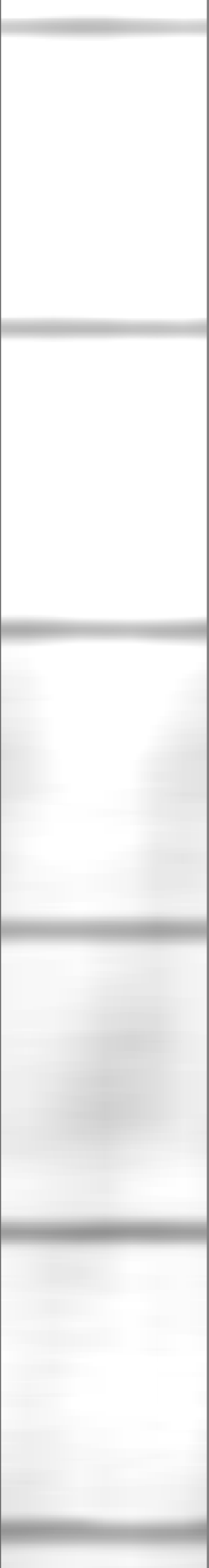
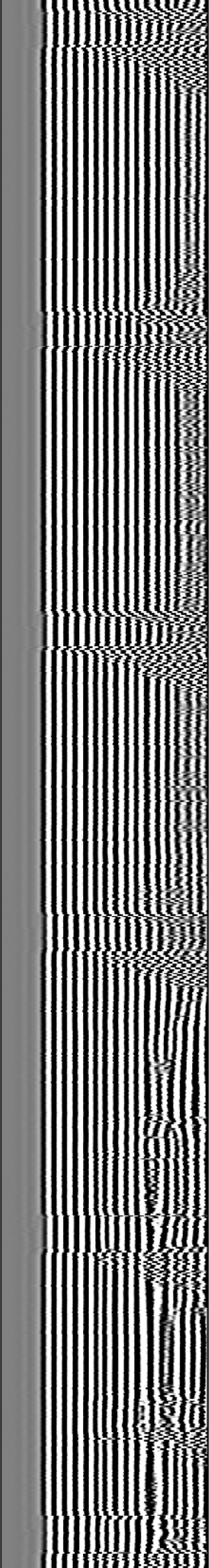
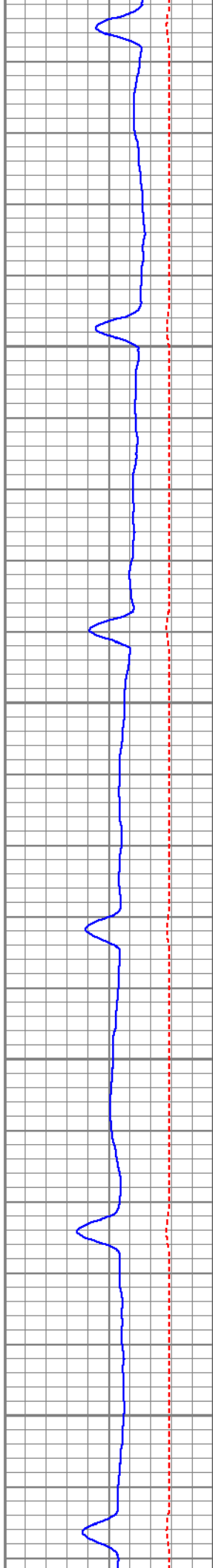
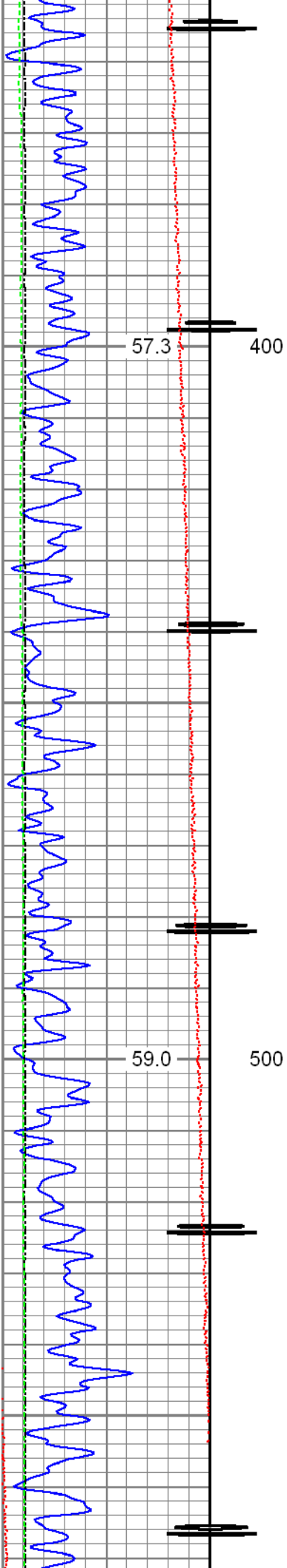
Dataset Creation: Wed Feb 10 11:49:03 2016 by Log 7.0 B1

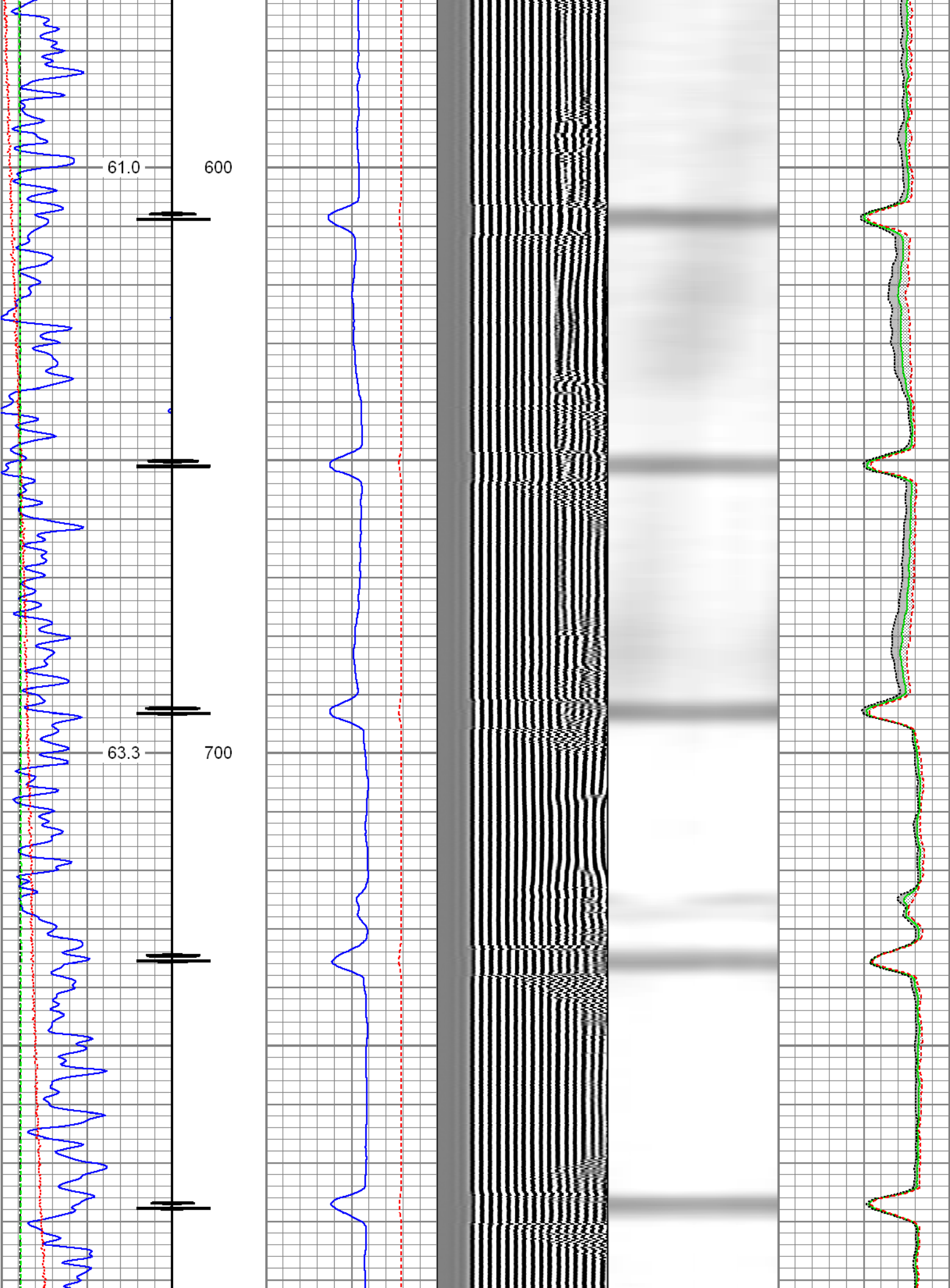
Charted by: Depth in Feet scaled 1:240

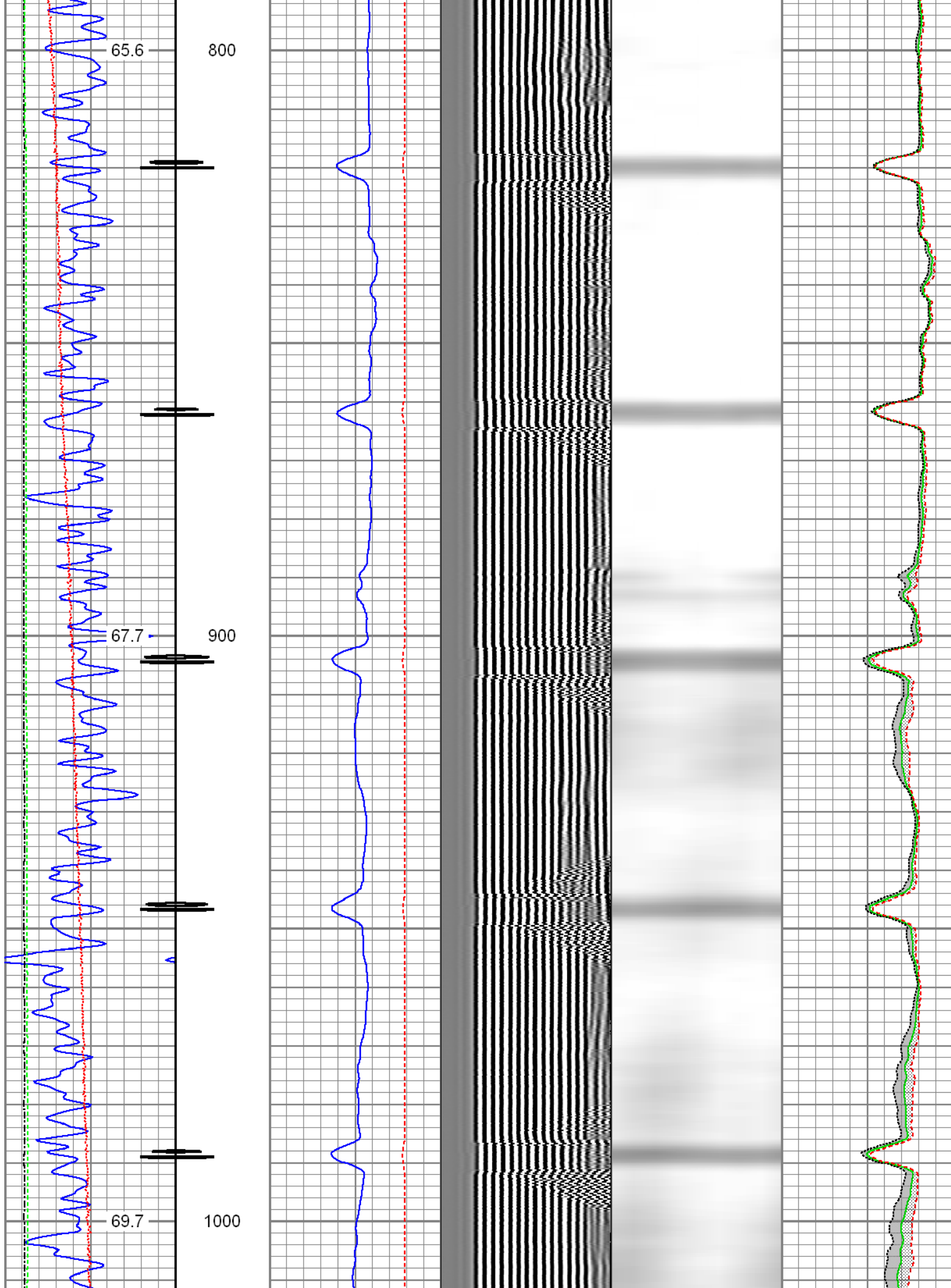
Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
30 (GAPI) 130	0 (mV) 100	200 1200		0 100
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
Temperature	0 (mV) 20			0 100
0 (degF) 20	3' Travel Time			Maximum Amplitude
Line Speed	650 (usec) 150			0 100
-150 (ft/min) 150				
Line Tension				
0 (lb) 2000				

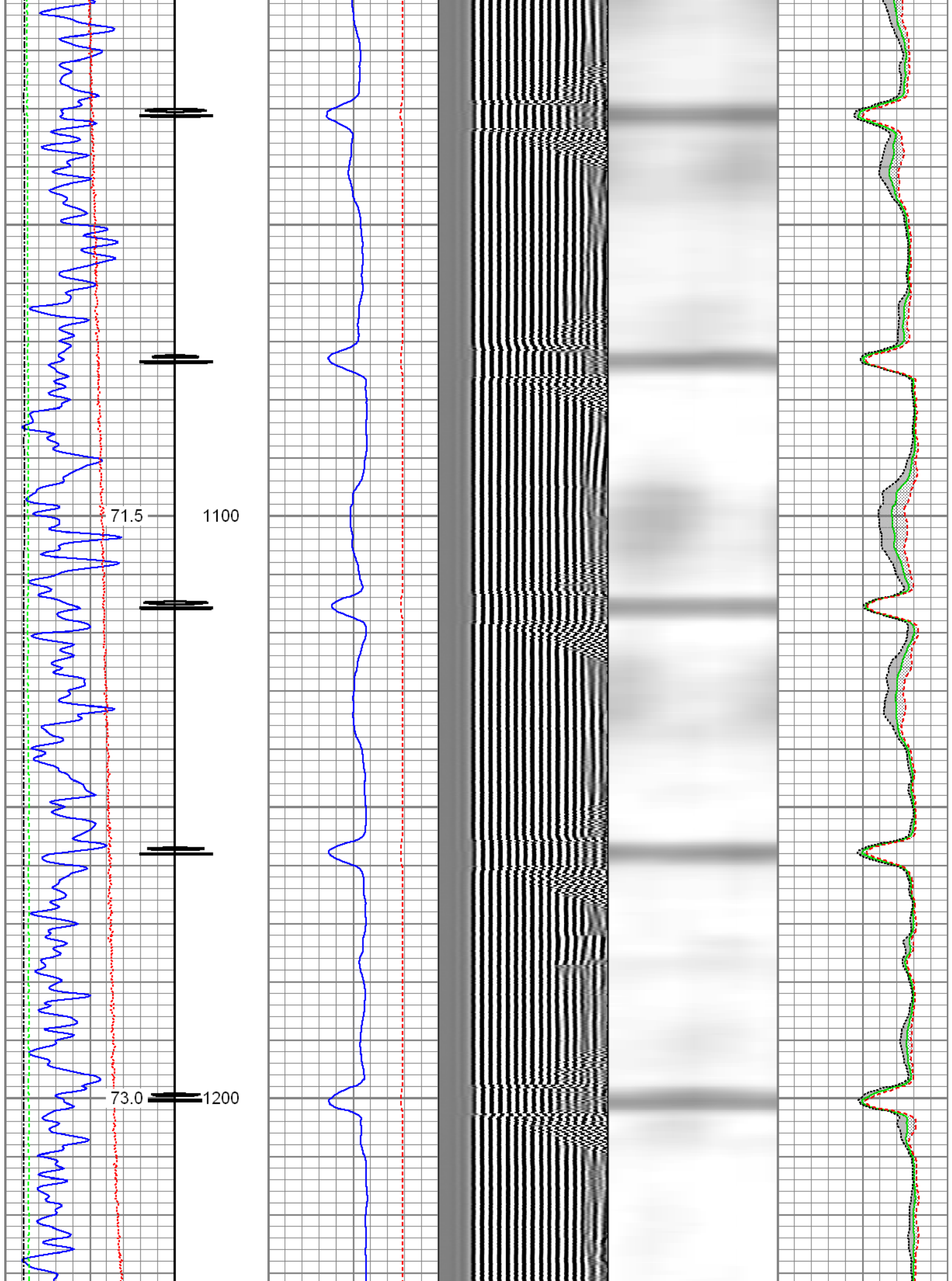


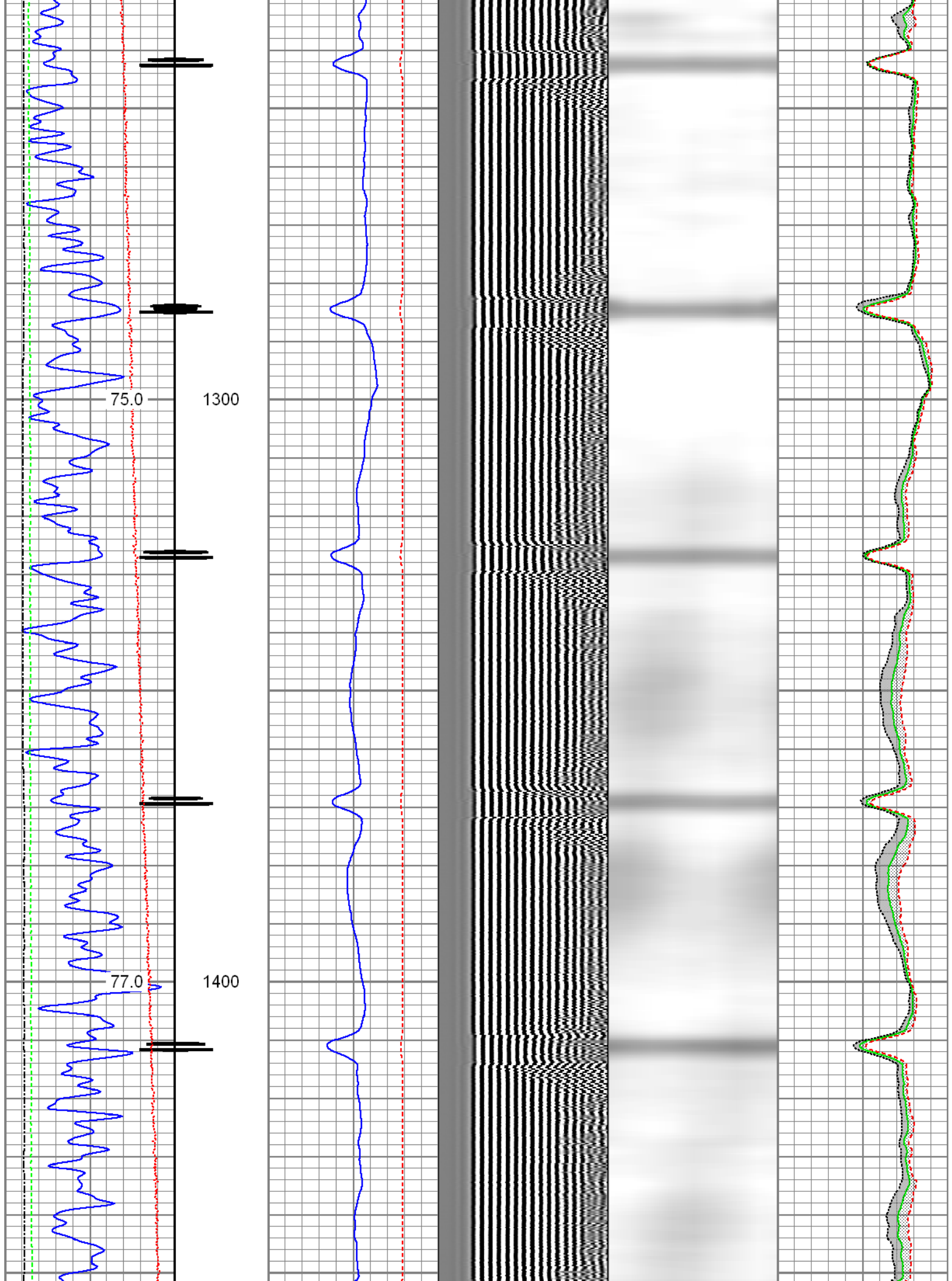


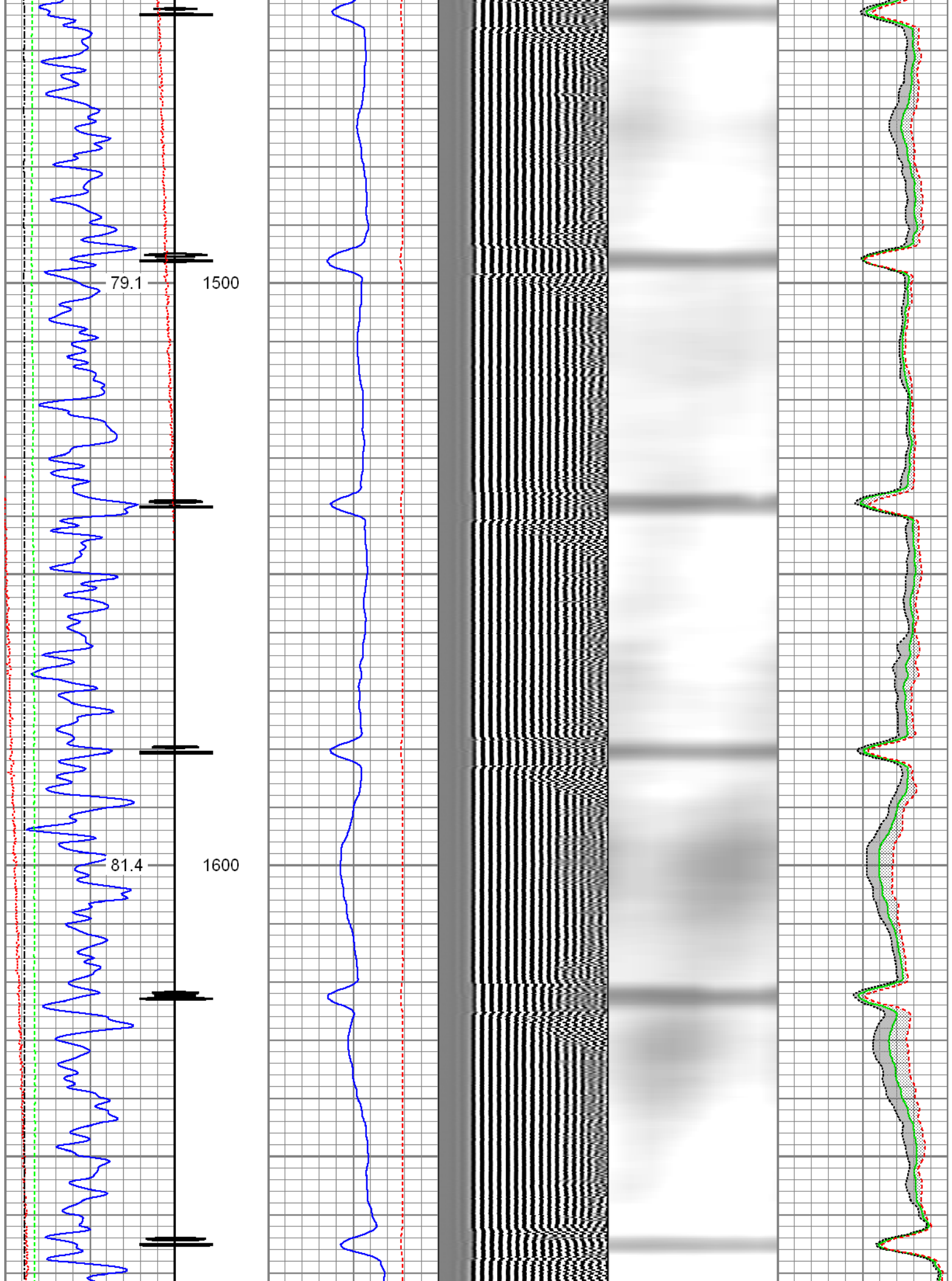


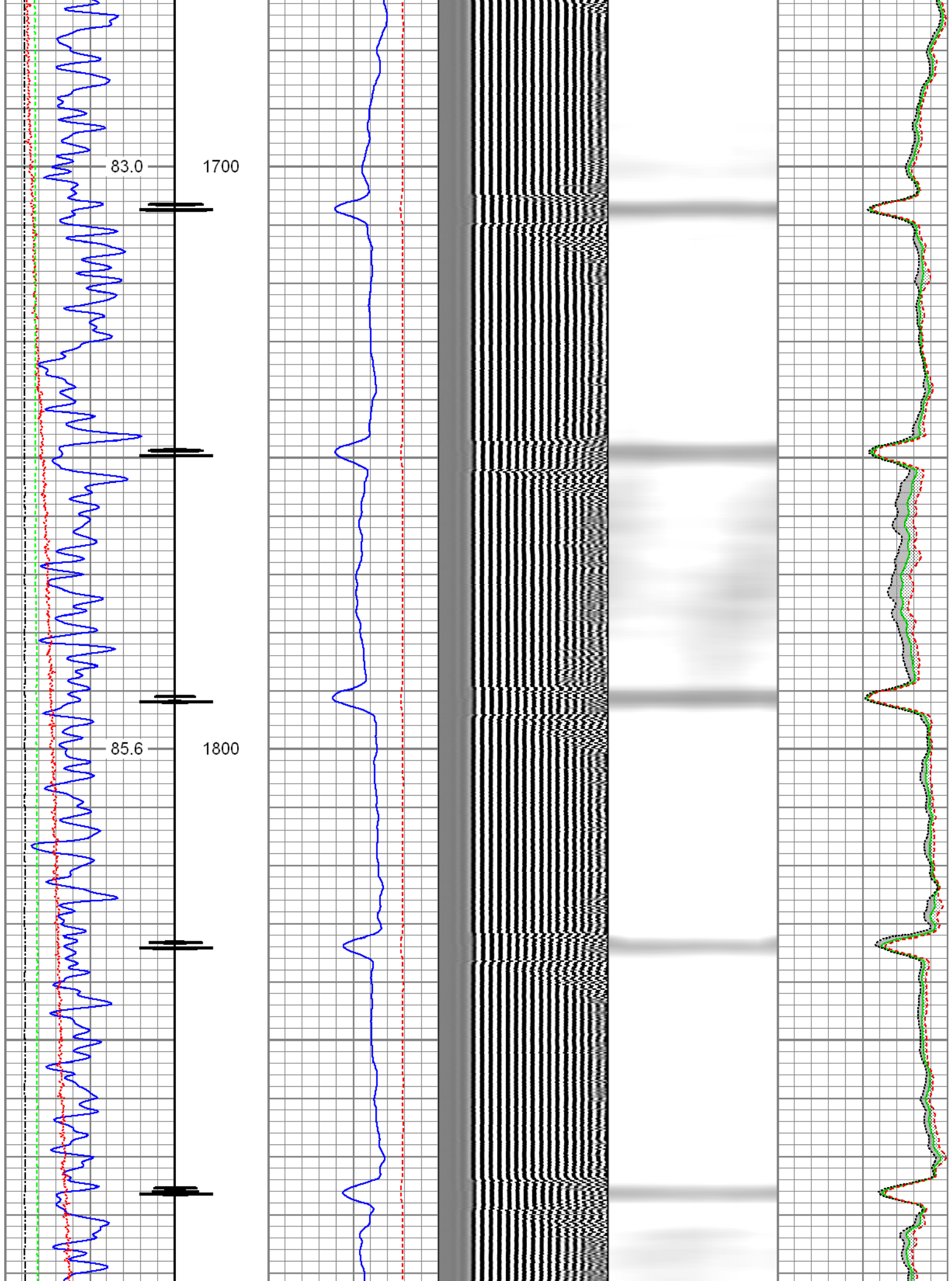


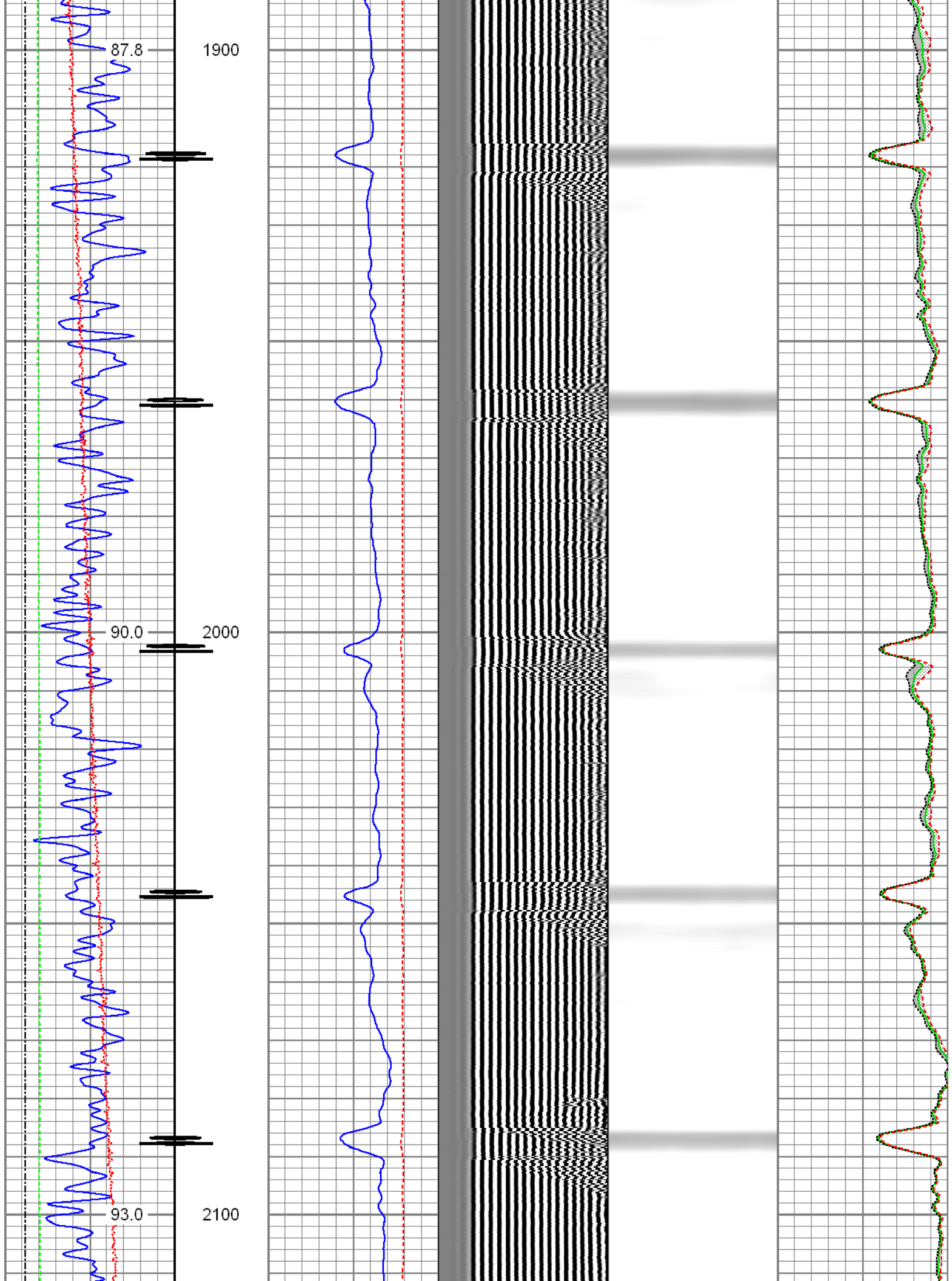


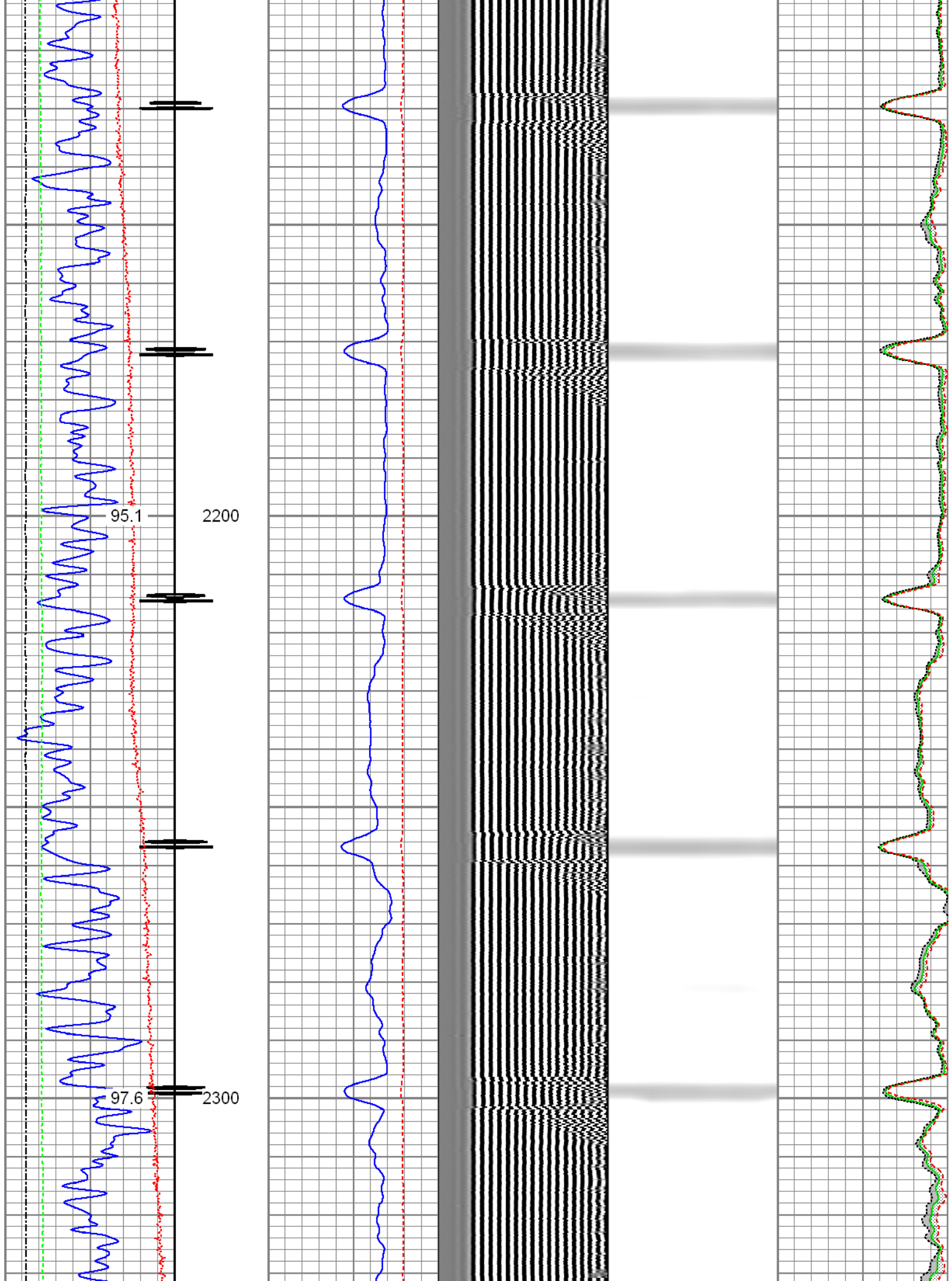


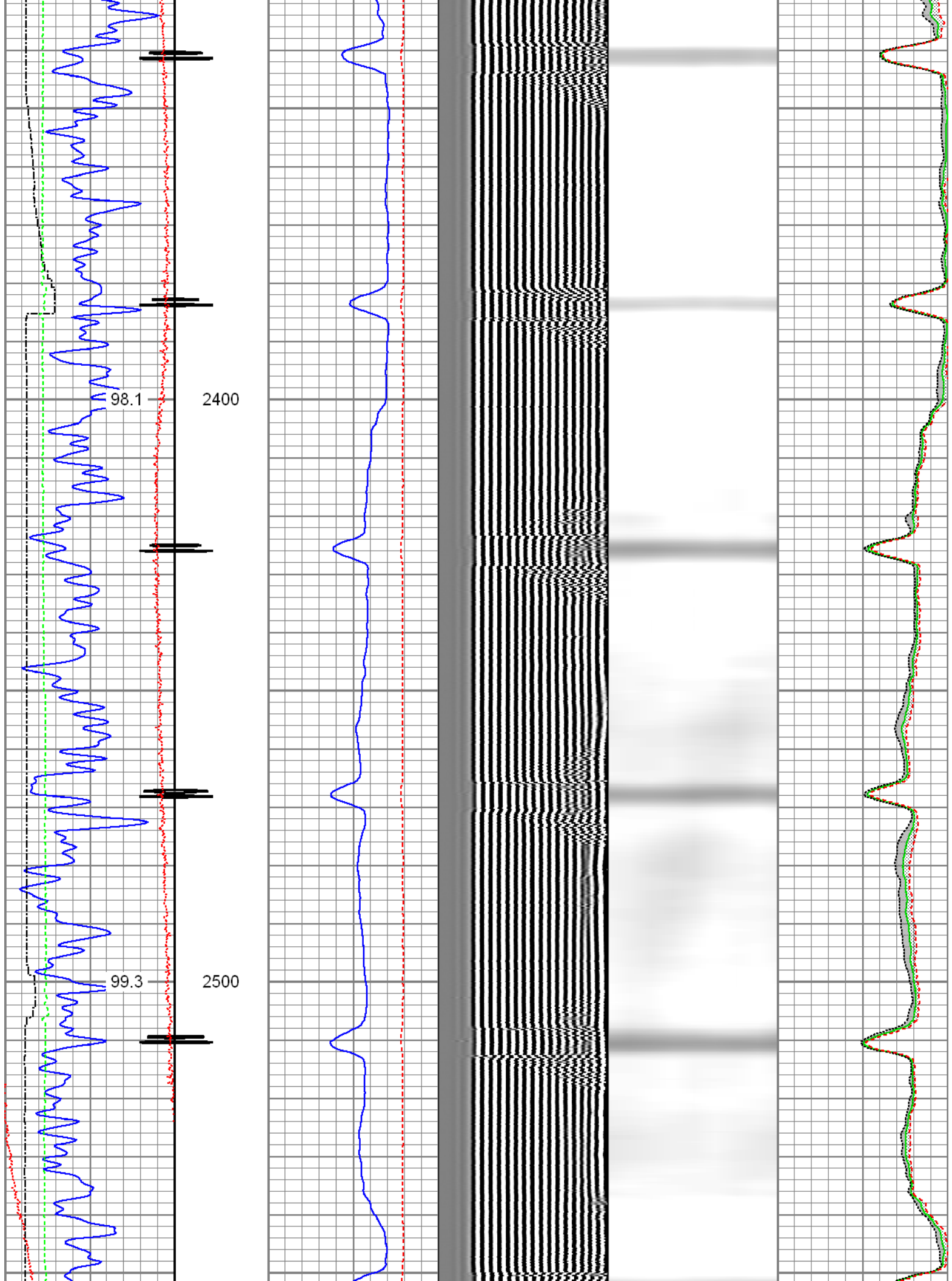


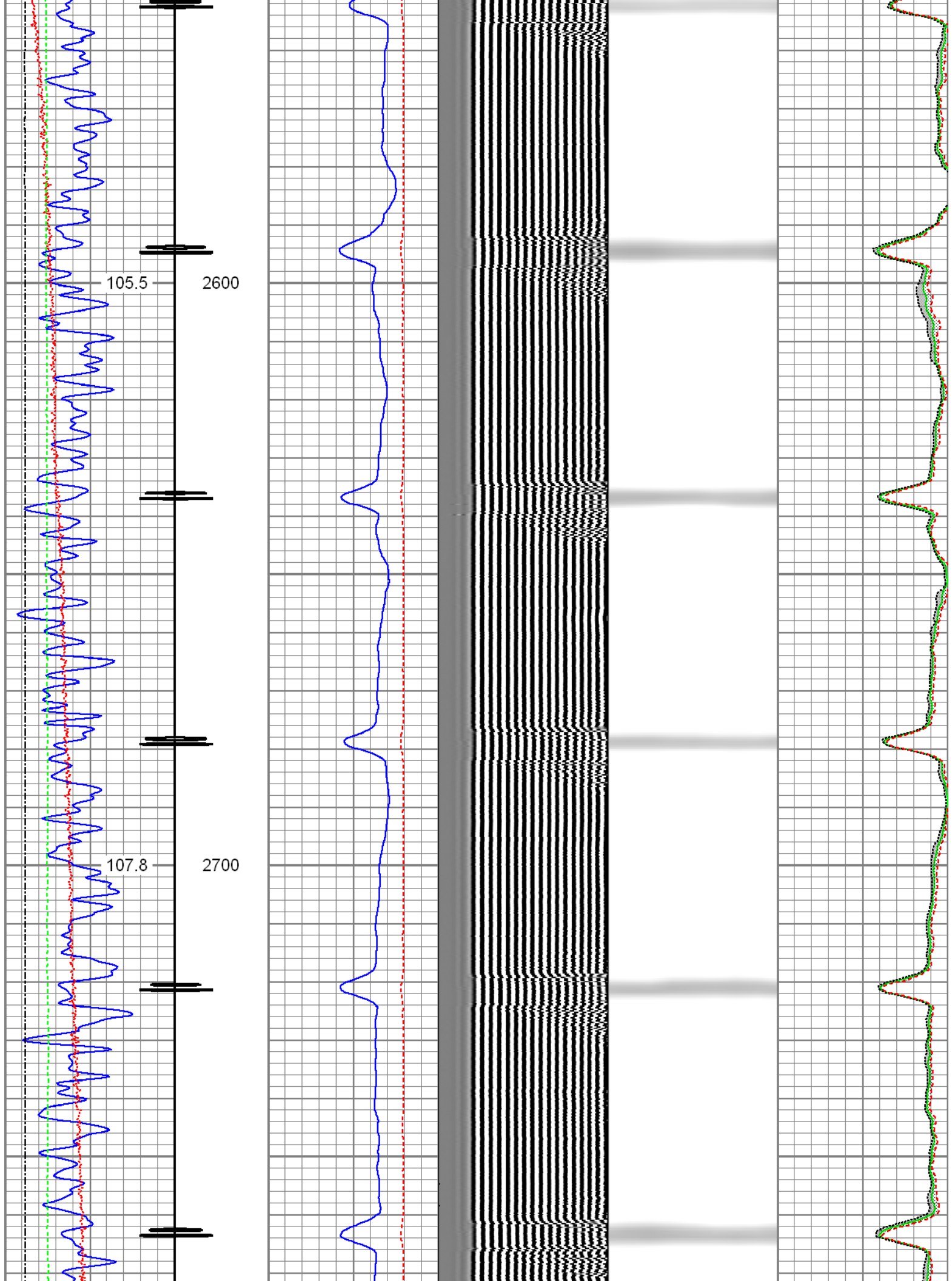


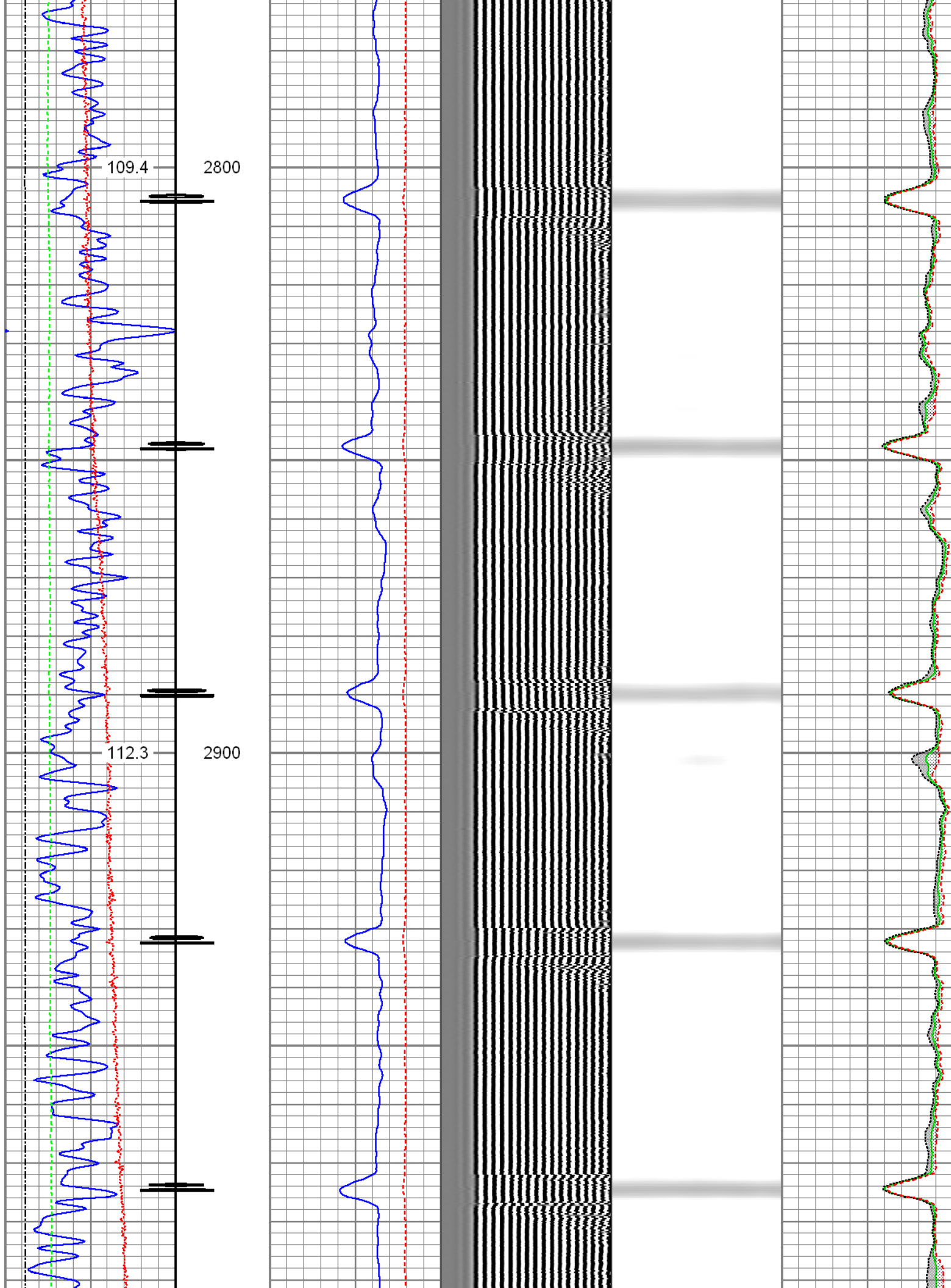


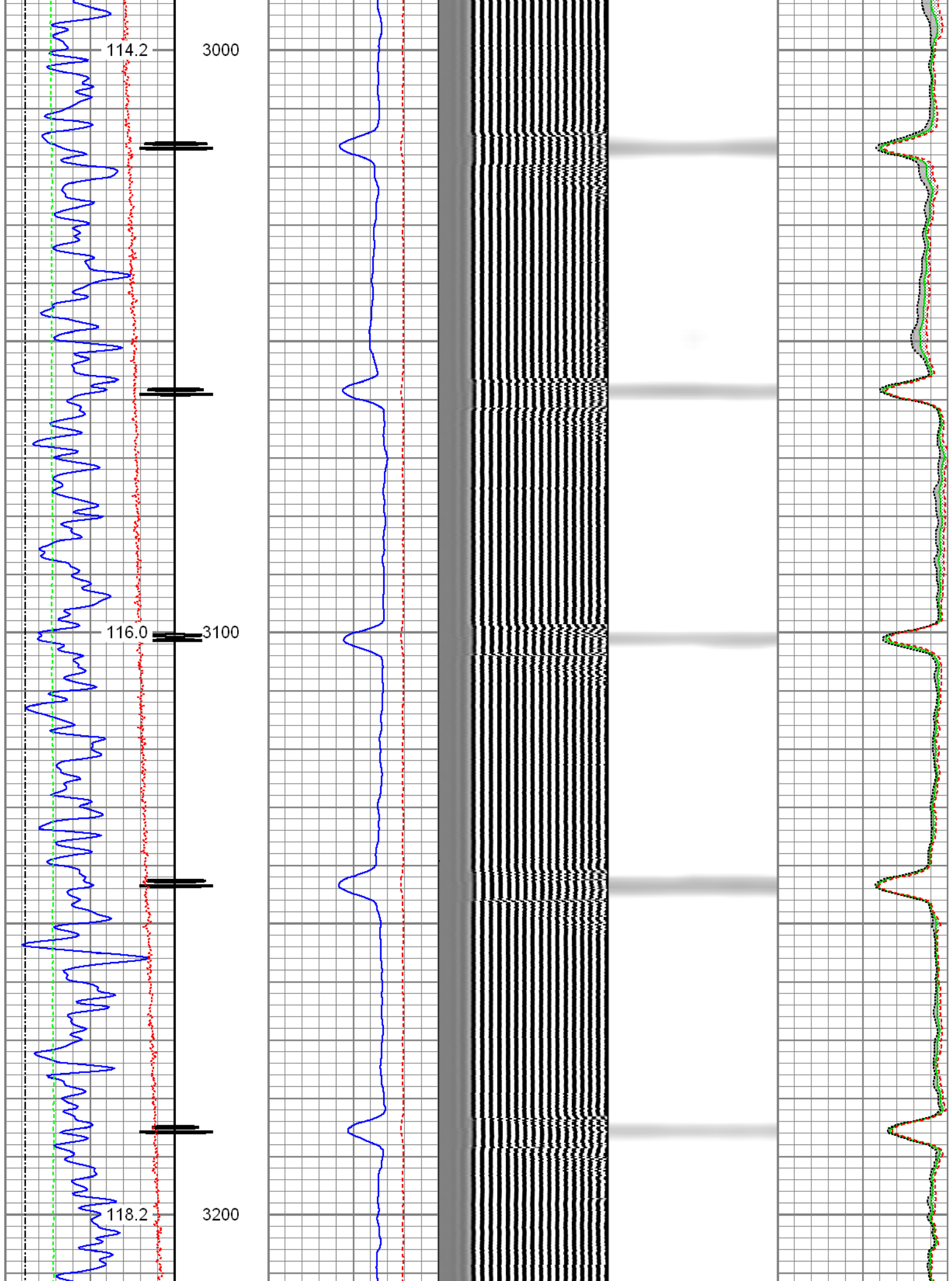


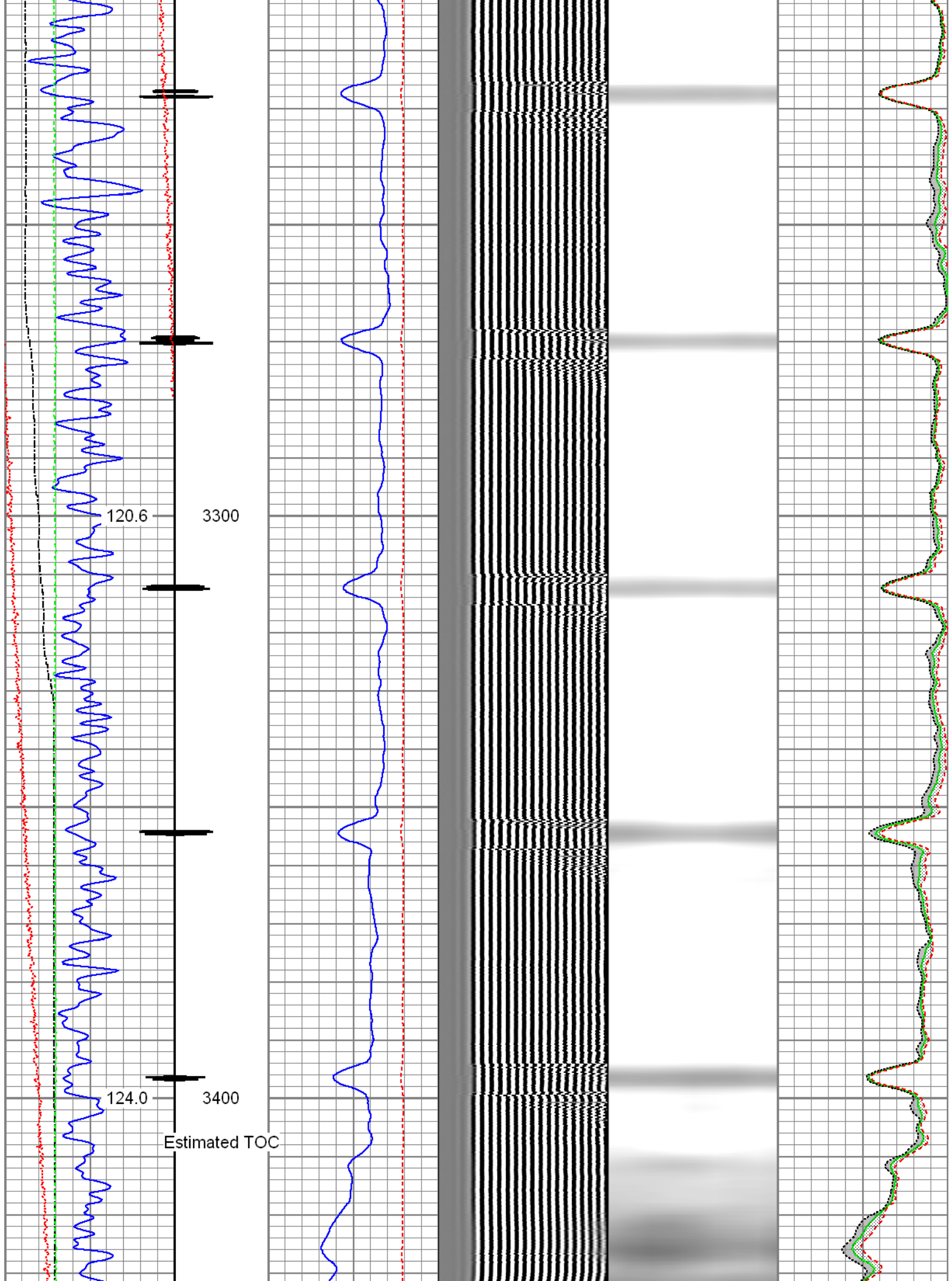


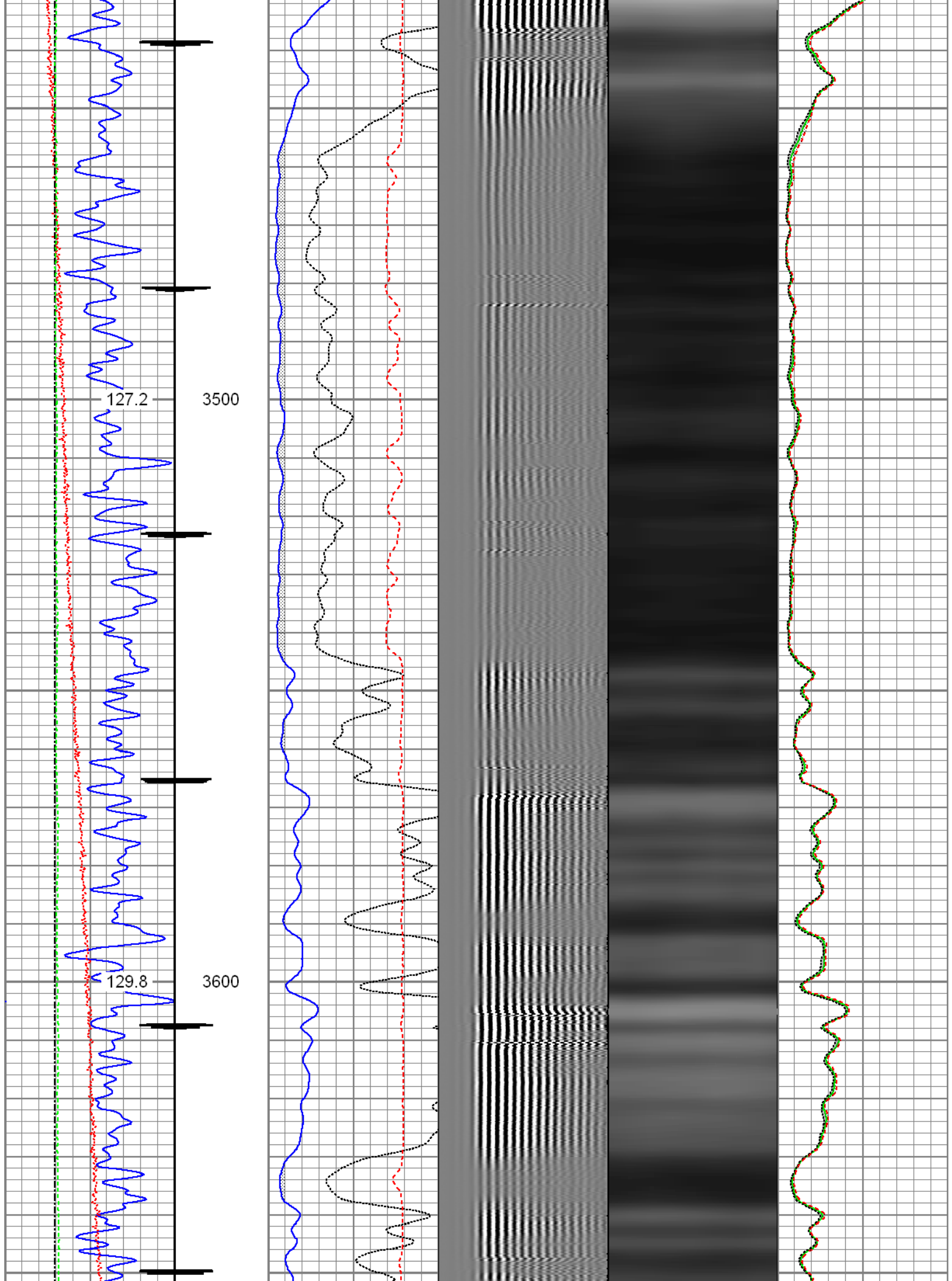


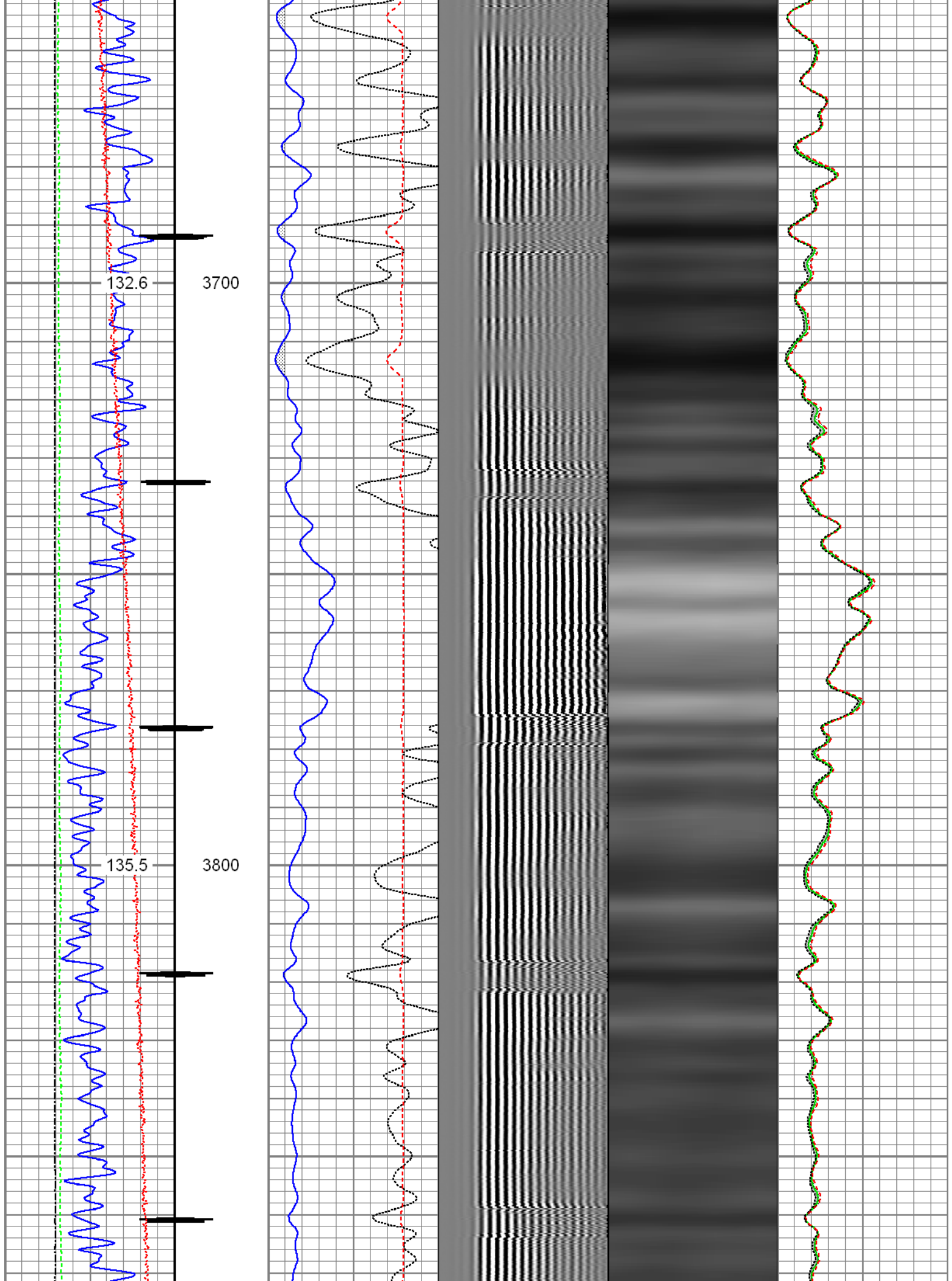


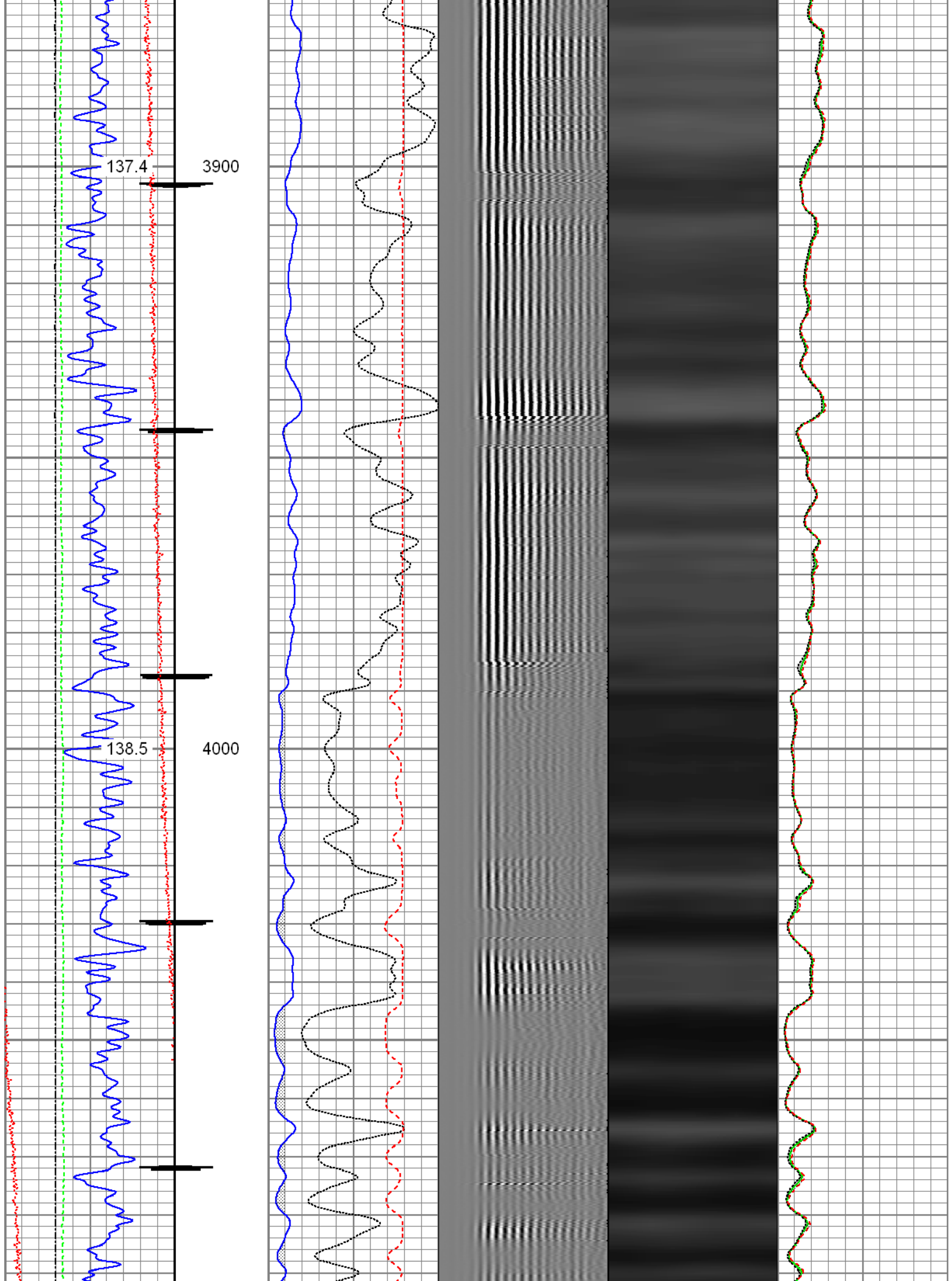


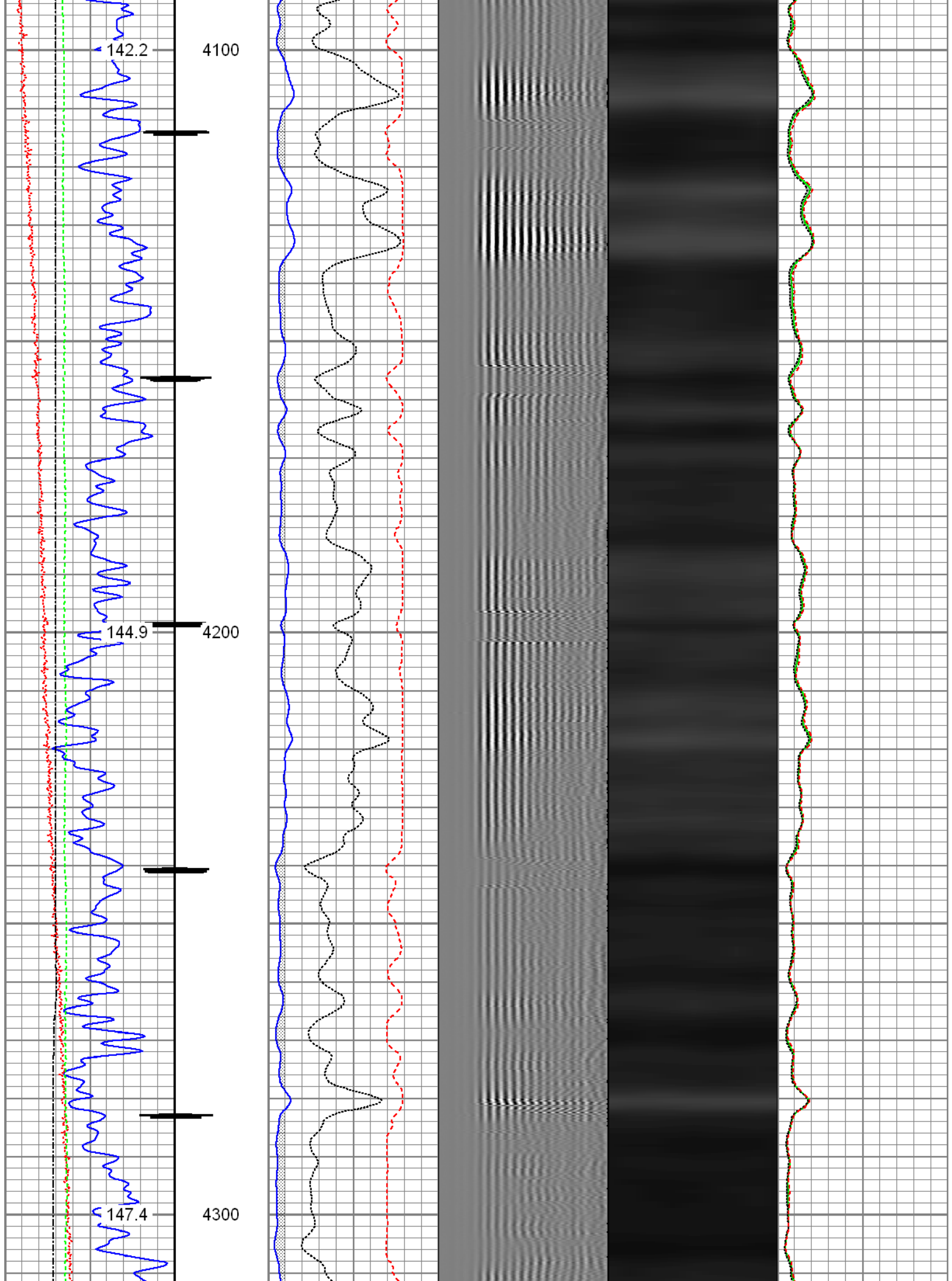


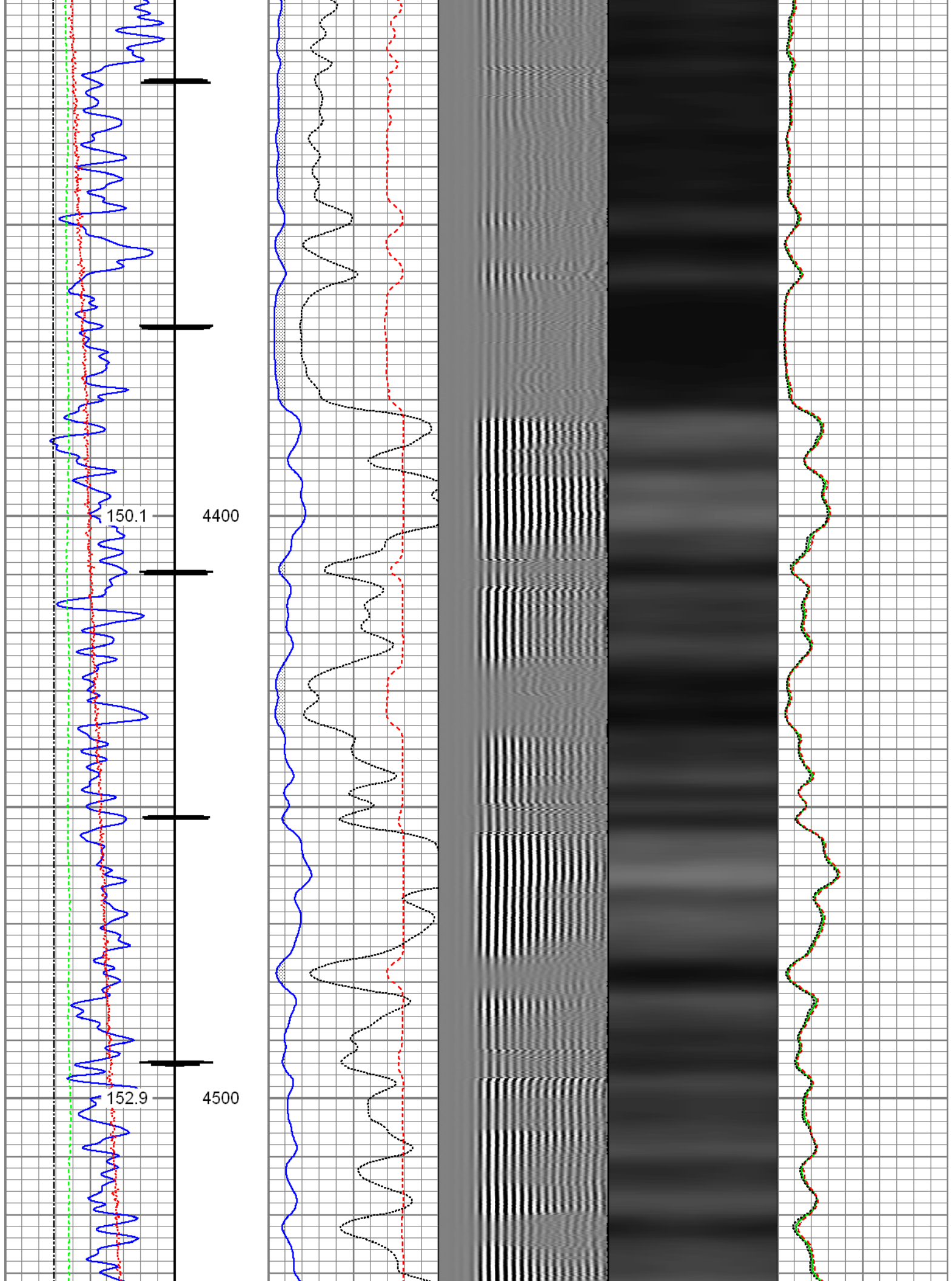


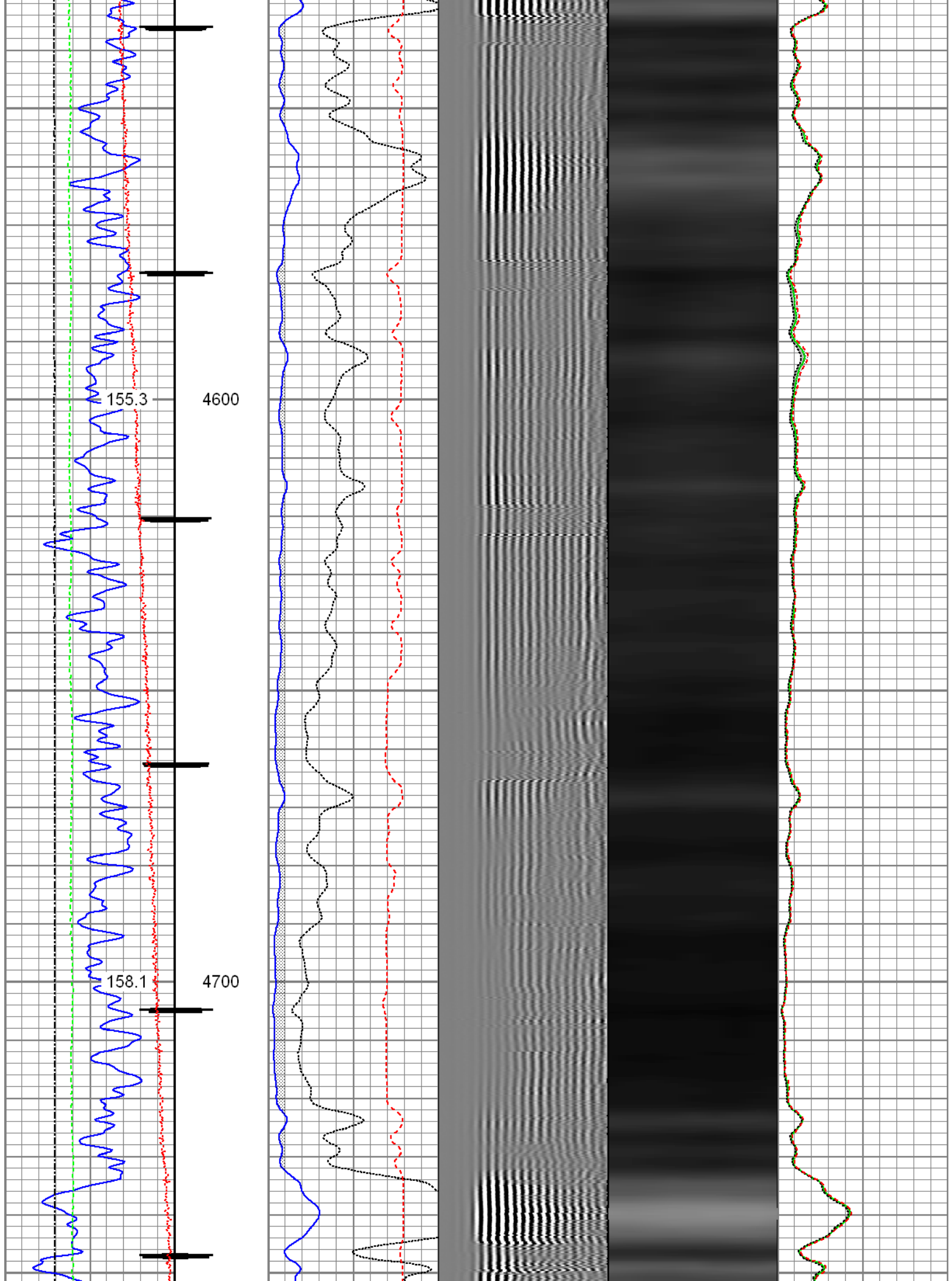


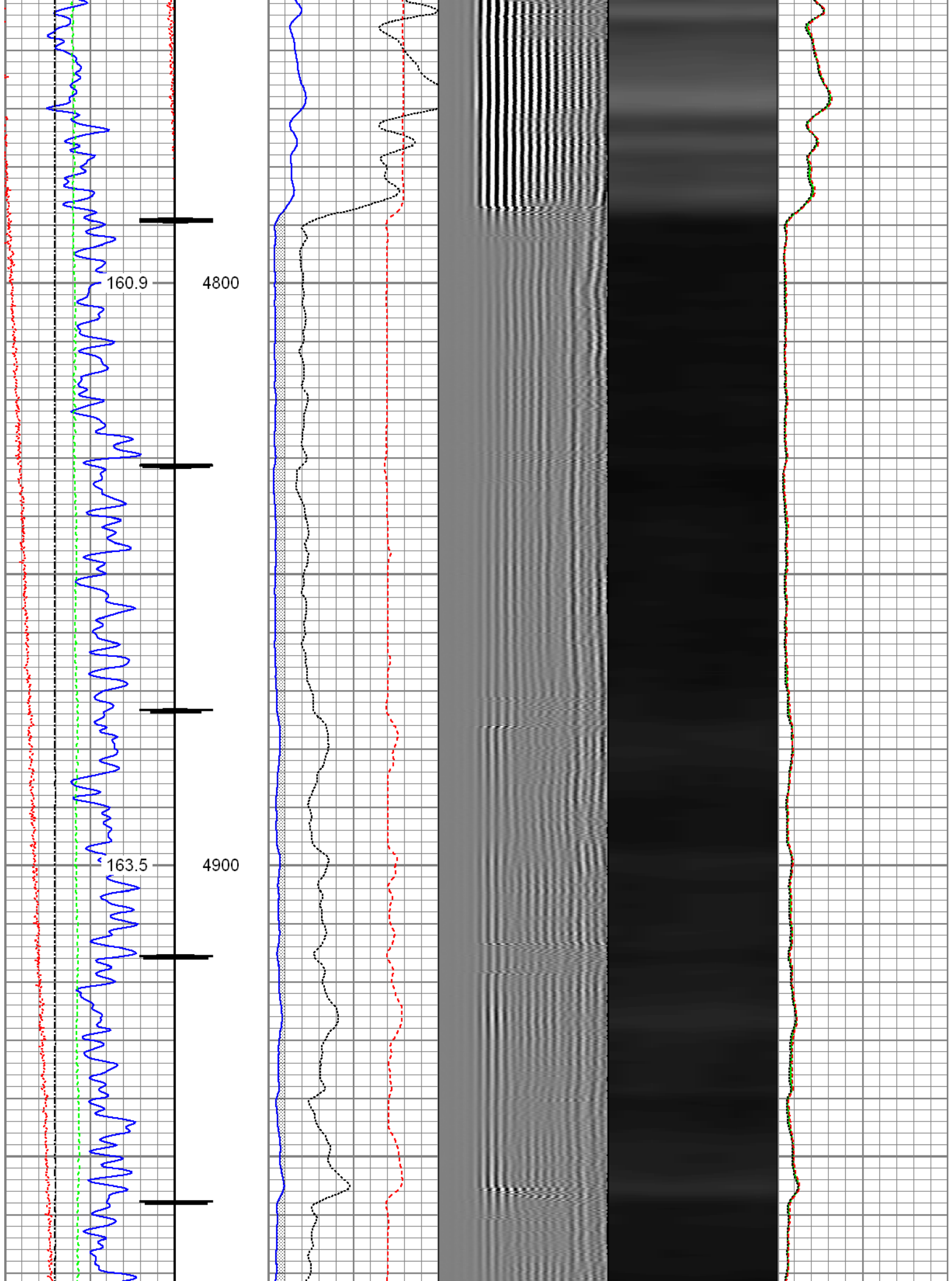


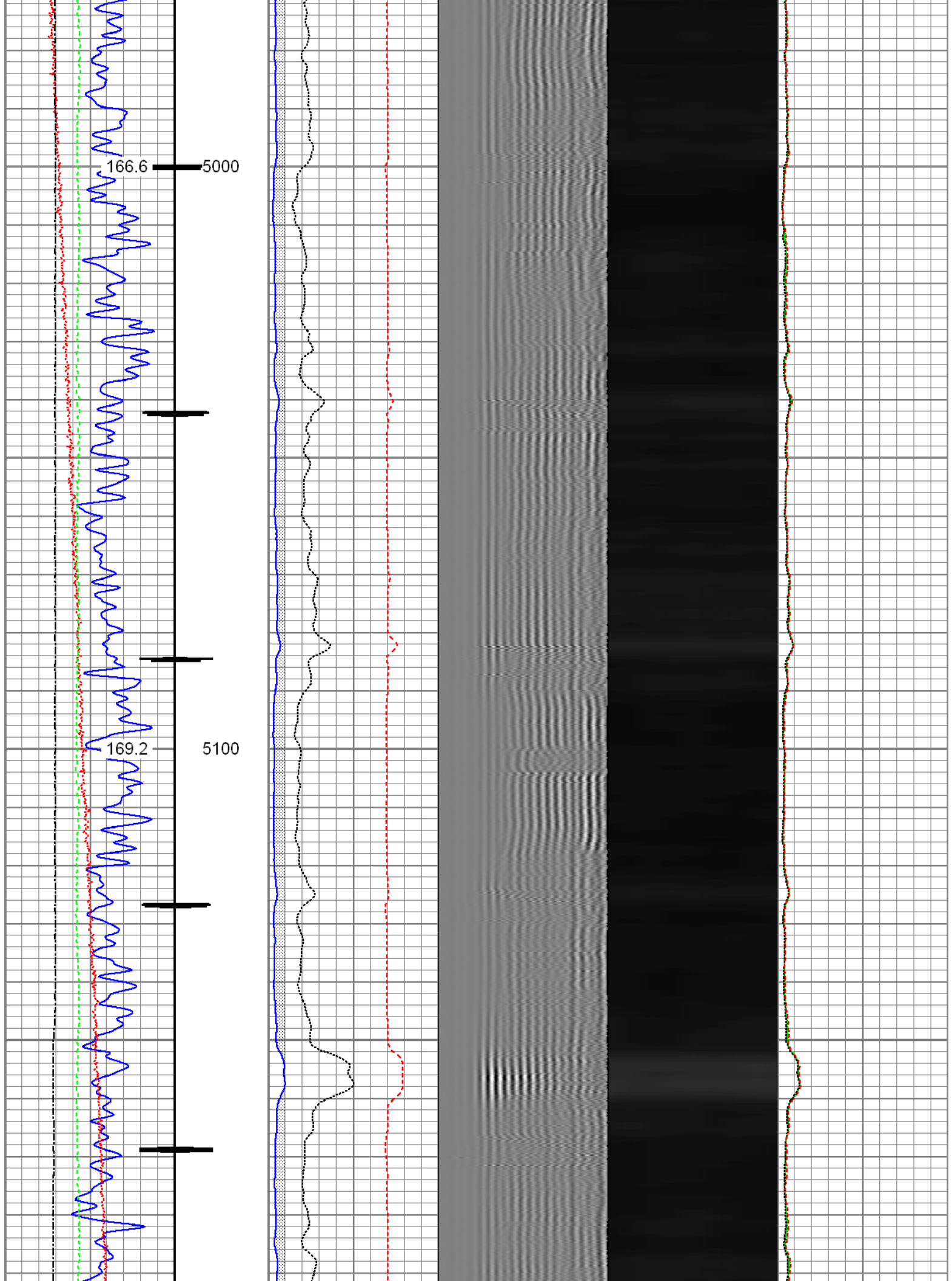


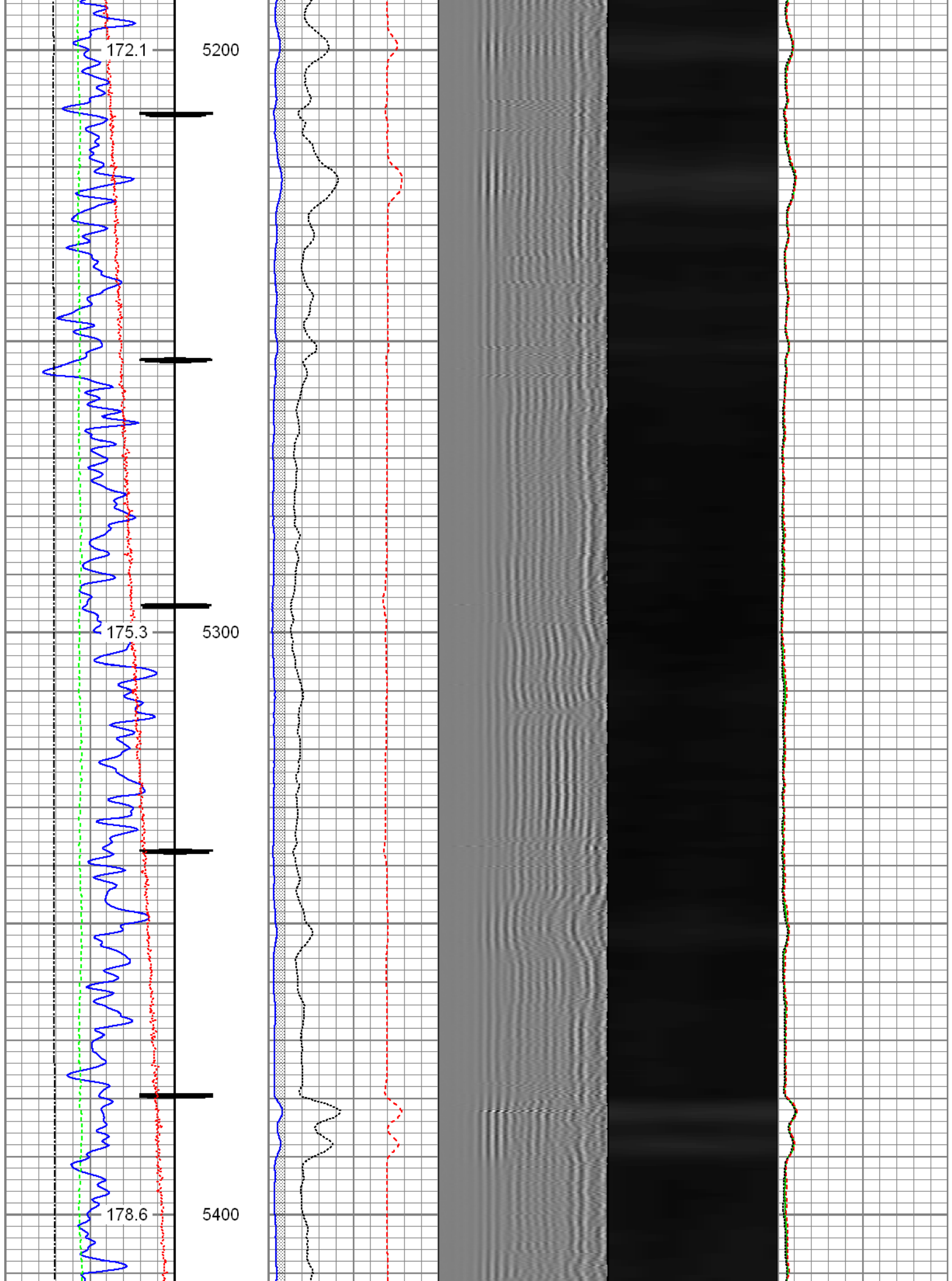


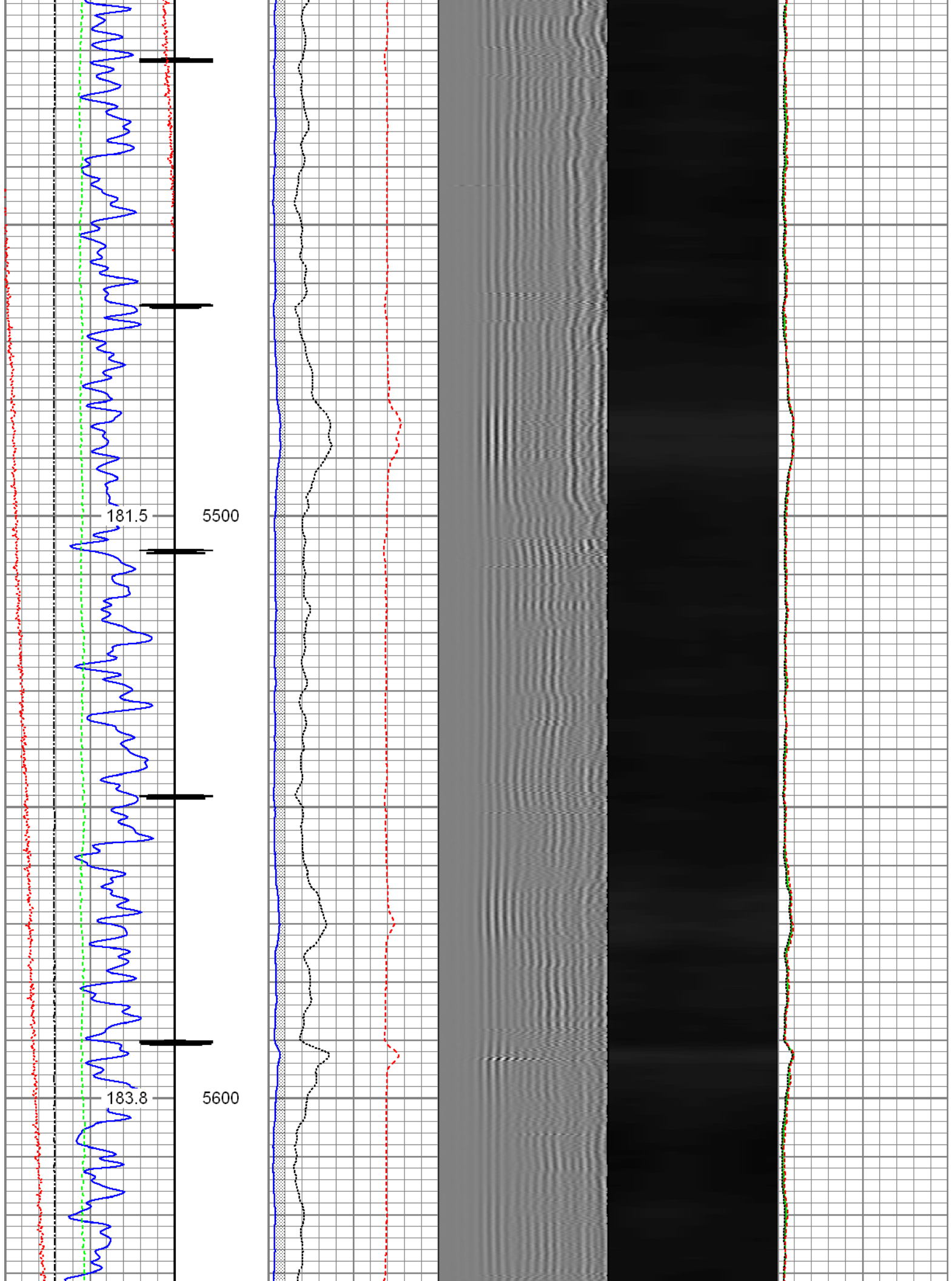


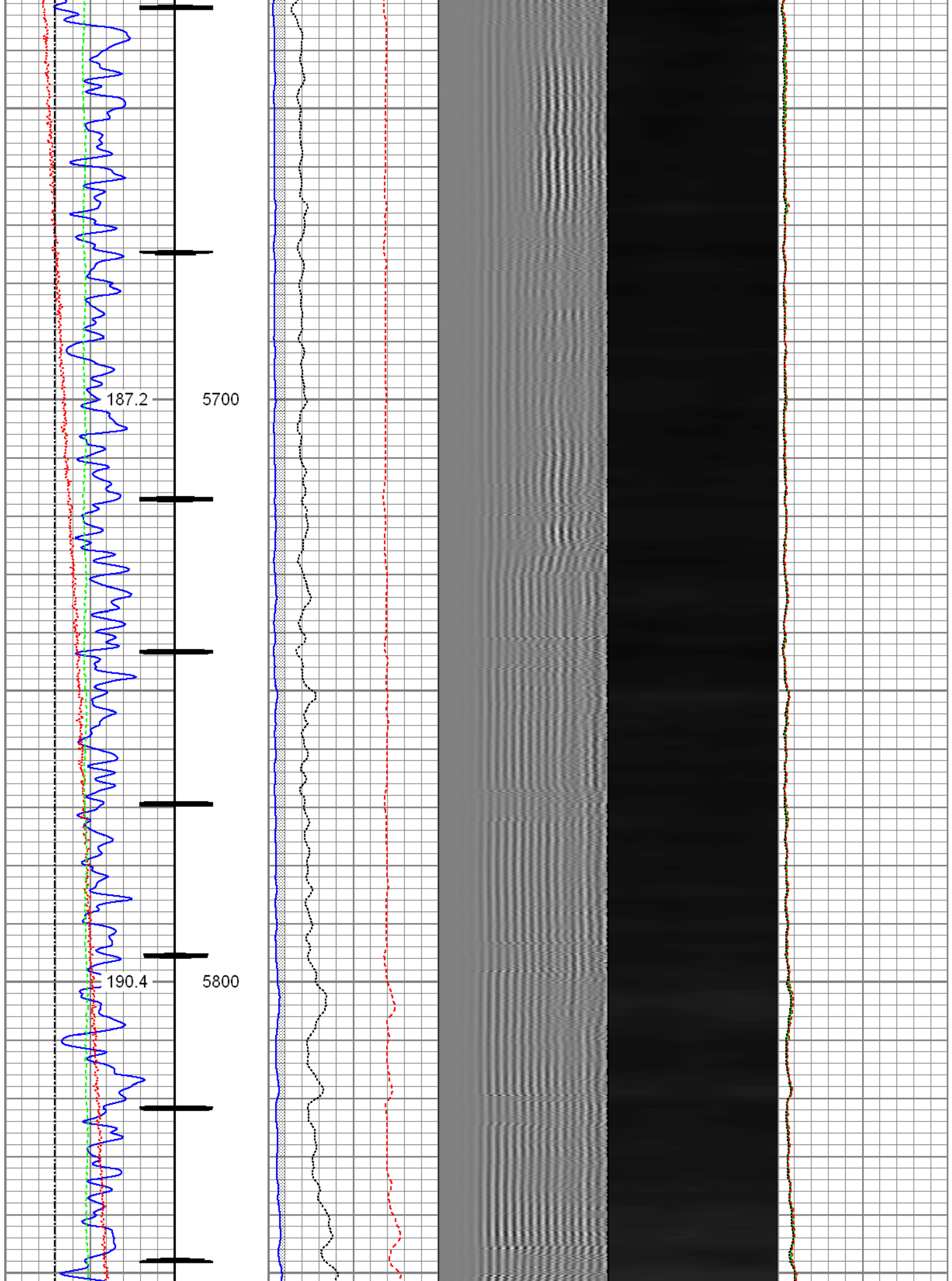


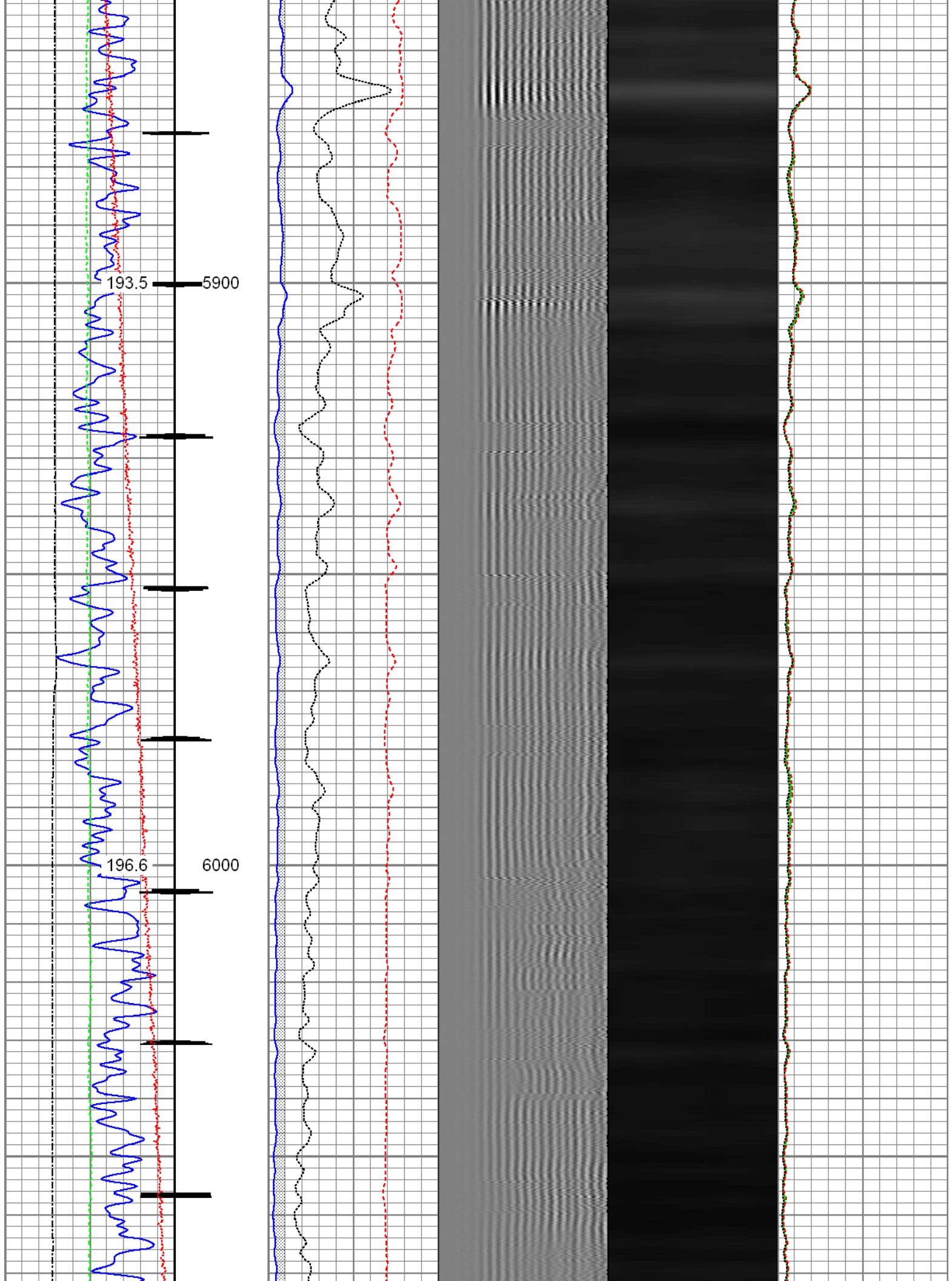


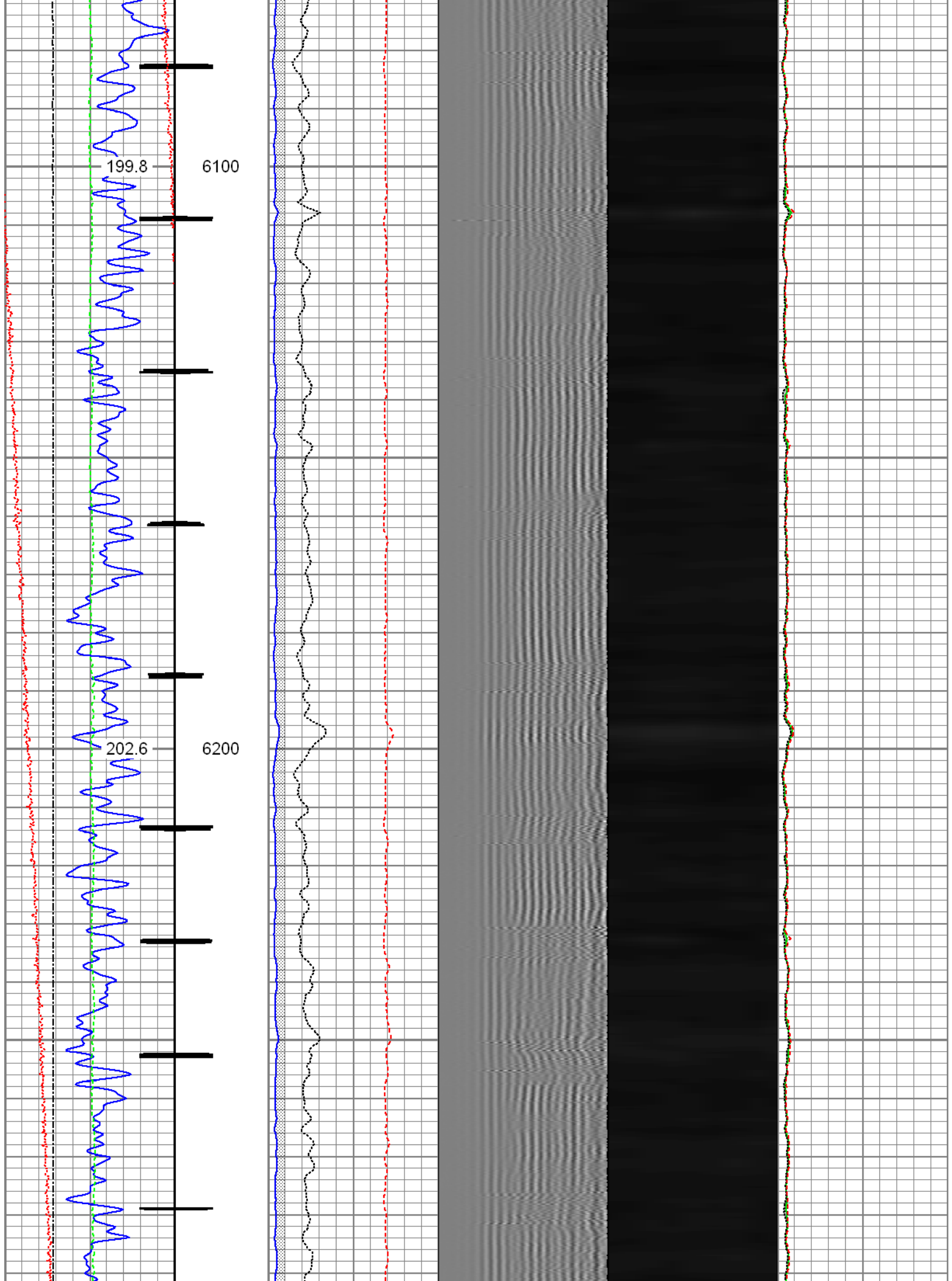


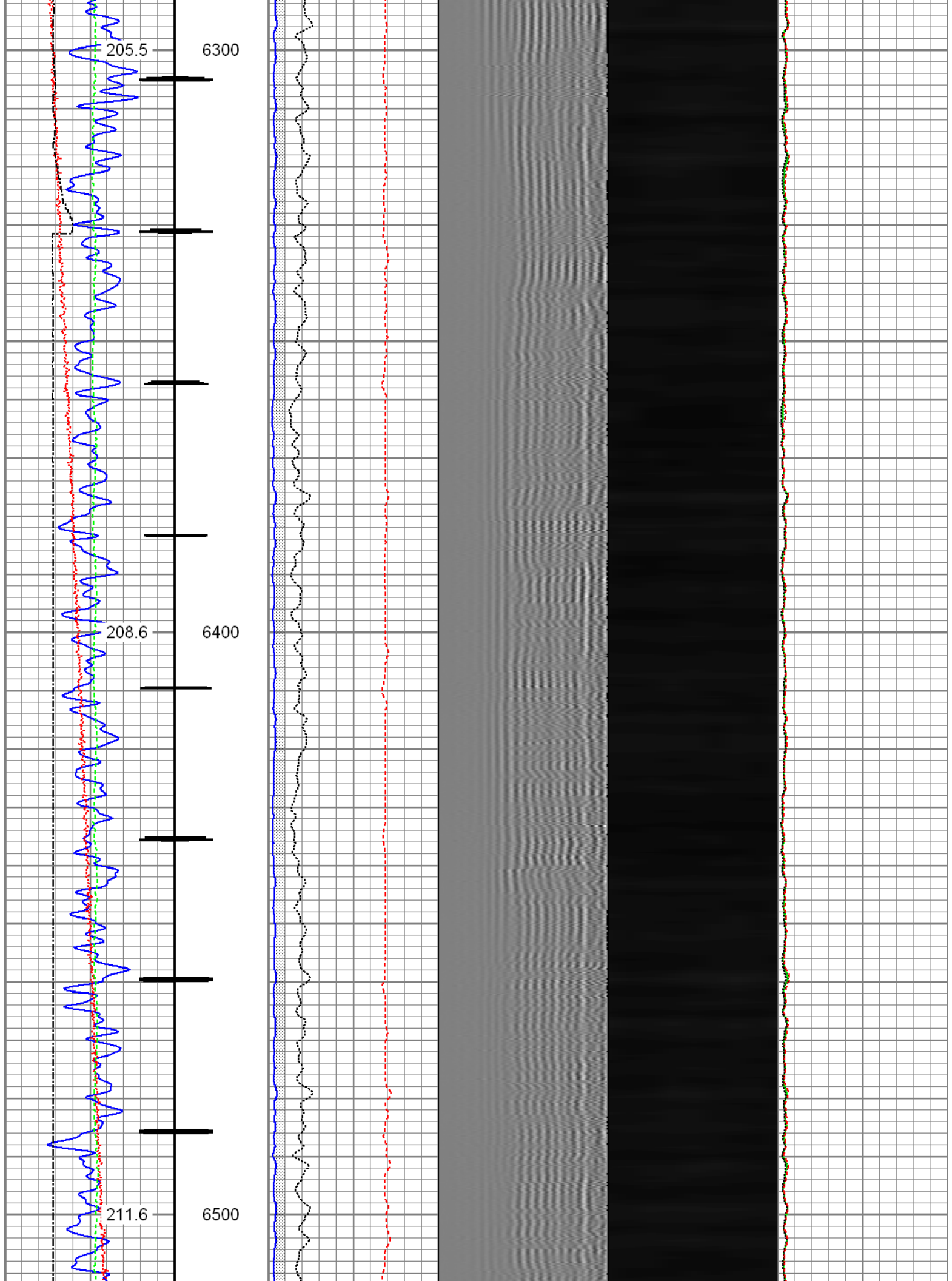


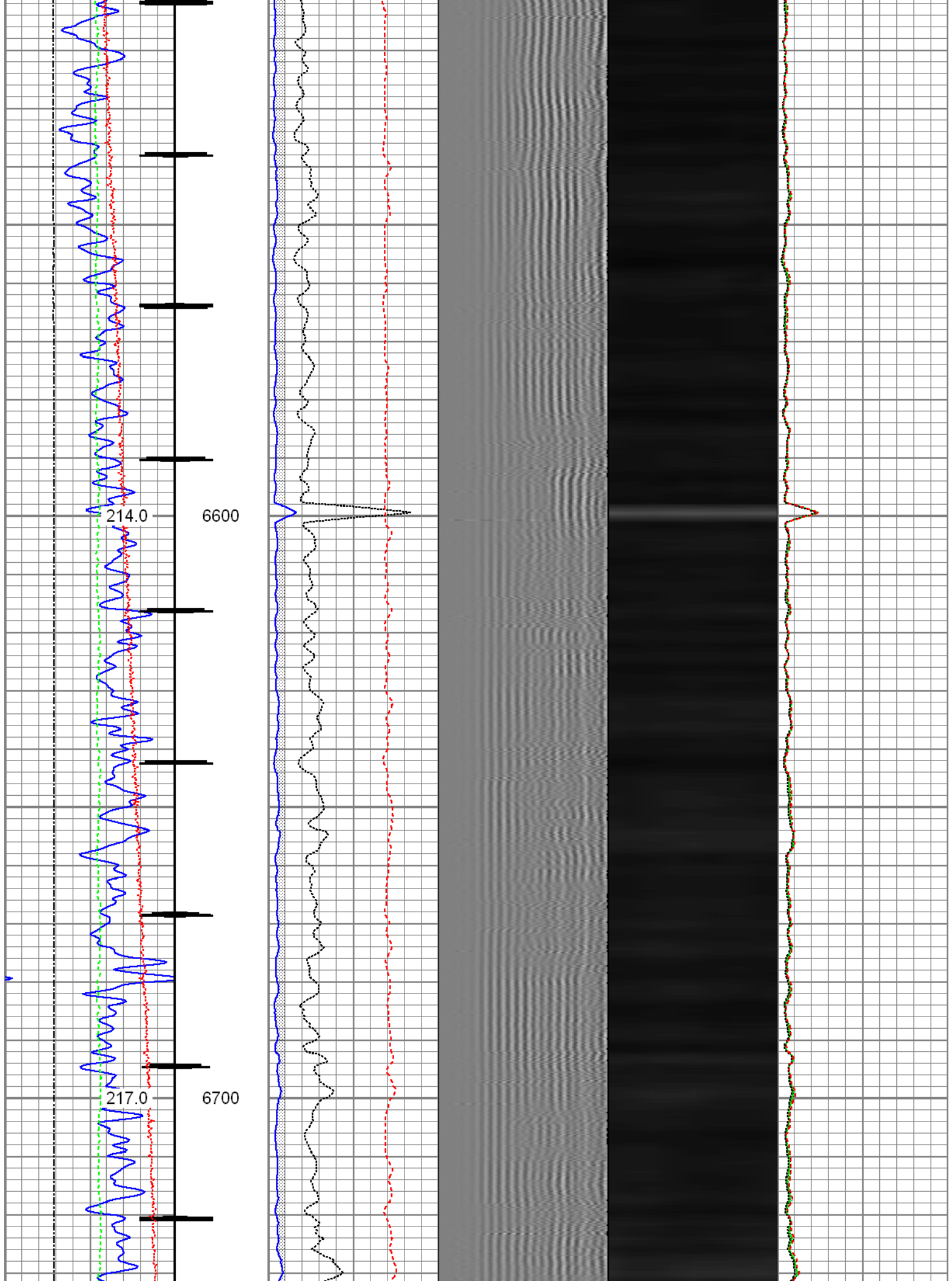


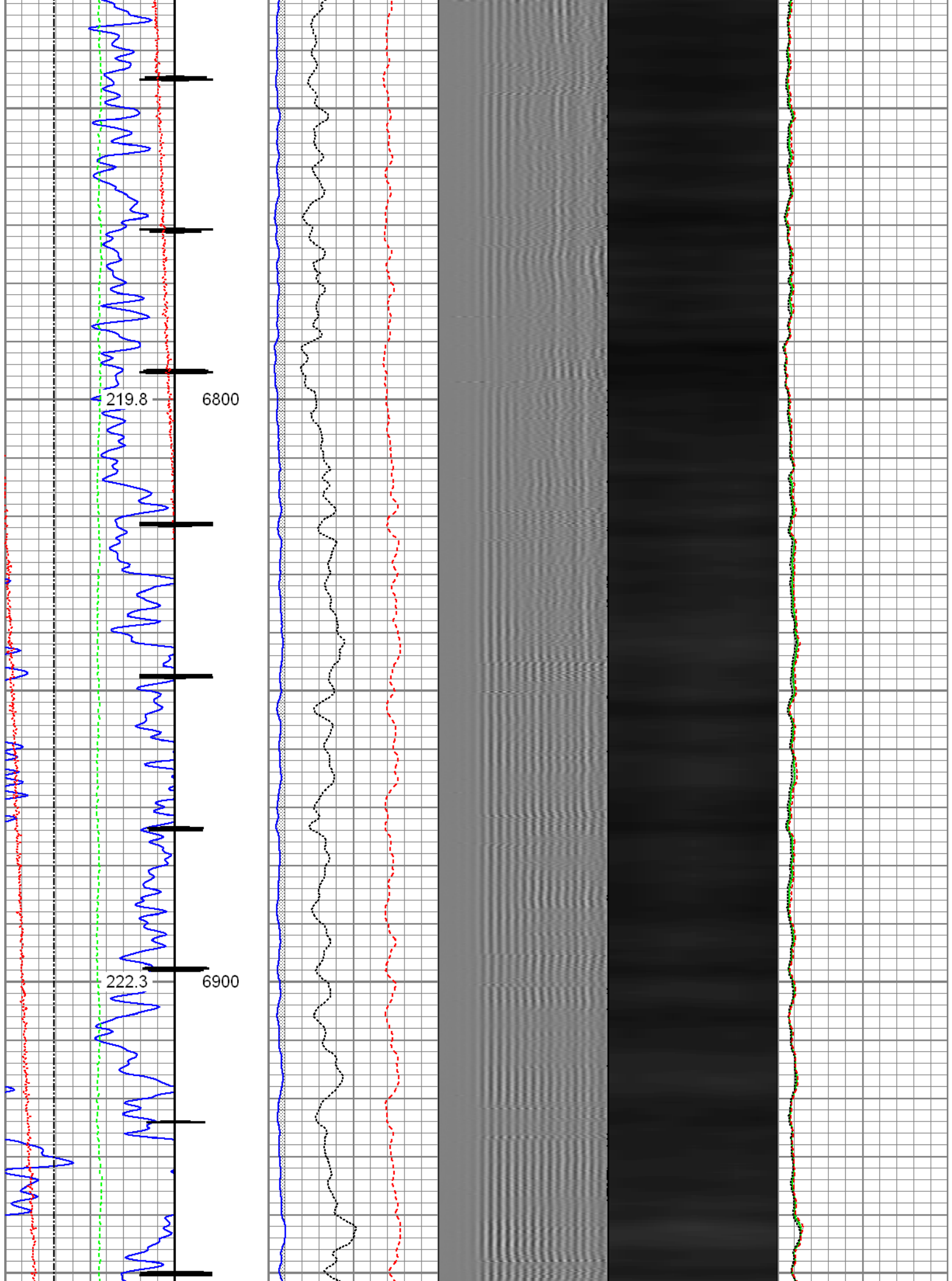


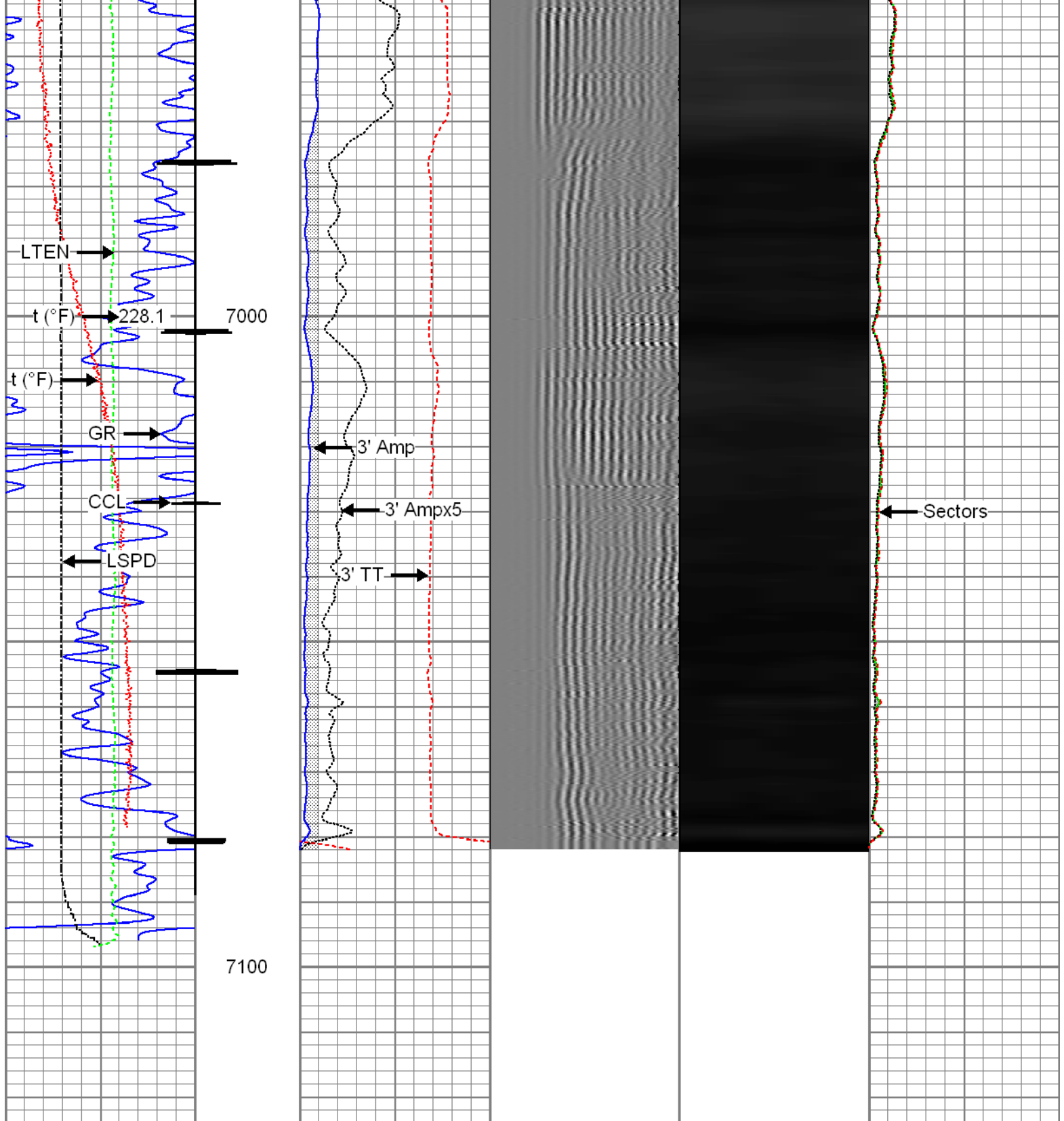












<div>Gamma Ray</div> <div>30 (GAPI) 130</div> <div>Casing Collar Locator</div> <div>Temperature</div> <div>0 (degF) 20</div> <div>Line Speed</div> <div>-150 (ft/min) 150</div> <div>Line Tension</div> <div>0 (lb) 2000</div>	<div>3' Amplitude</div> <div>0 (mV) 100</div> <div>3' Amplitude x 5</div> <div>0 (mV) 20</div> <div>3' Travel Time</div> <div>650 (usec) 150</div>	<div>5' Variable Density Log</div> <div>200 1200</div>	<div>Sector Map</div>	<div>Average Amplitude</div> <div>0 100</div> <div>Minimum Amplitude</div> <div>0 100</div> <div>Maximum Amplitude</div> <div>0 100</div>
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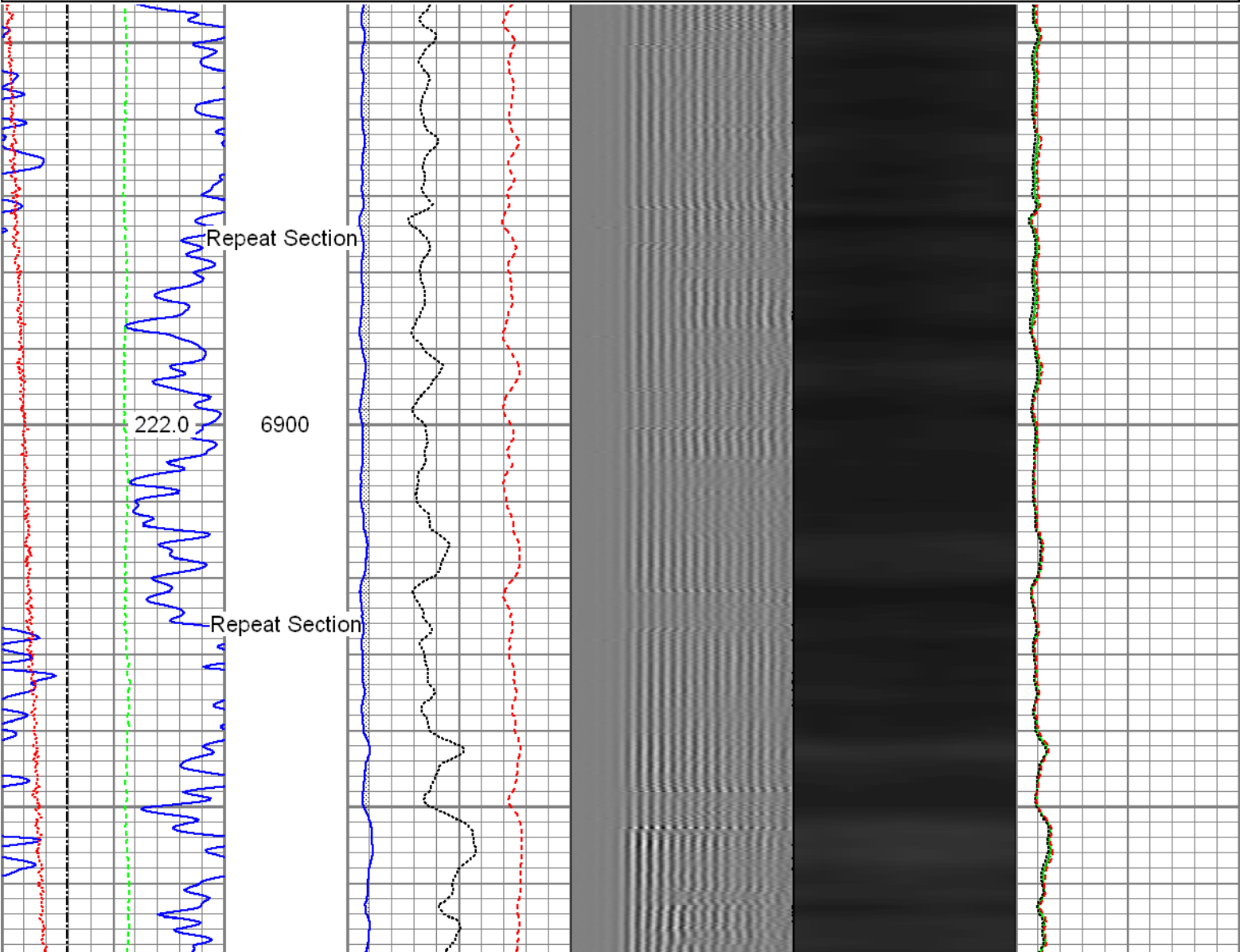


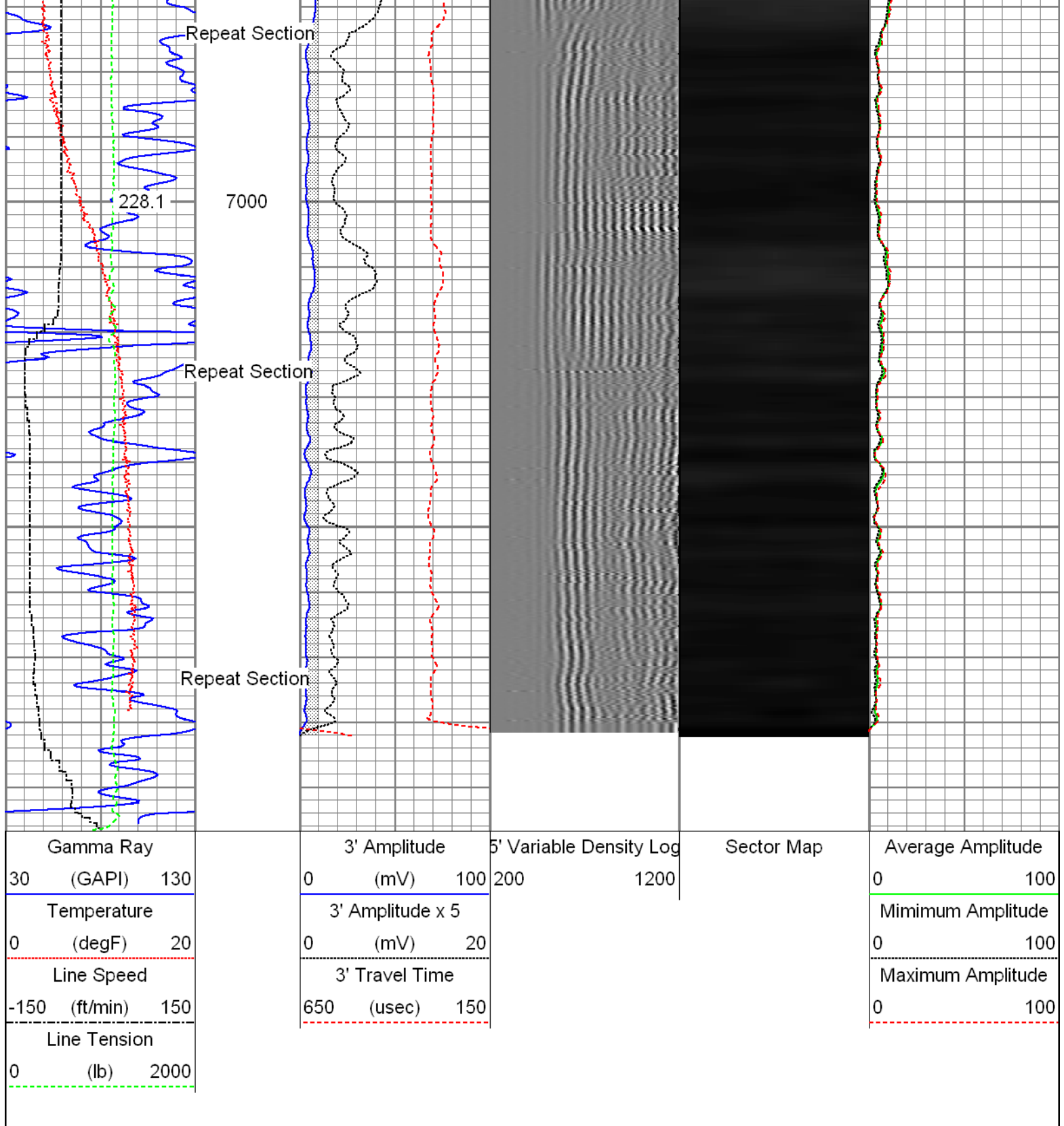
Repeat Pass

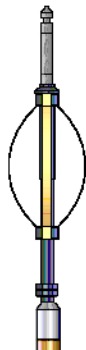
Recorded With 0 PSI Surface Induced Pressure


Database File: c:\warrior\data\0512311638_anadarko_d k norgren unit c true 1_2-10-16_rbl\processed_0512311638
Dataset Pathname: pass8
Presentation Format: radii
Dataset Creation: Wed Feb 10 11:40:57 2016 by Log 7.0 B1
Charted by: Depth in Feet scaled 1:240

Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
30 (GAPI) 130	0 (mV) 100	200 1200		0 100
Temperature	3' Amplitude x 5			Minimum 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				





Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
HeadVolt	20.94		T_CH14375_1_GO Titan 1-7/16" Assembled Electric Cable Head with 1" Fishing Neck	1.03	1.44	4.00
			Probe_IL_BS_Cent Probe 2-3/4" Inline Electrical Inline Bowspring Centralizer	2.88	2.75	10.00

Temp	18.17					
WVF3FT	16.00		Probe_RADII-C-2-3/4" (FW1305-098) Probe 2-3/4" Sector Cement Bond Tool with Temperature Probe	9.19	2.75	105.00
WVFCAL	16.00					
WVFS1	16.00					
WVFS2	16.00					
WVFS3	16.00					
WVFS4	16.00					
WVFS5	16.00					
WVFS6	16.00					
WVFS7	16.00					
WVFS8	16.00					
WVF5FT	15.00					
		Probe_IL_BS_Cent Probe 2-3/4" Inline Electrical Inline Bowspring Centralizer	2.88	2.75	10.00	
CCL	7.38	CCL_LOG-Probe_SA_CCL (FW1307-076)	2.66	2.75	35.00	
DCCL	7.38	Probe 2-3/4" Digital Six Magnet Logging CCL				
		GR-Probe_SA_GR (FW1307-078)	3.33	2.75	55.00	
		Probe 2-3/4" Scintillating Gamma Ray				
GR	2.88					
		Probe_IL_BS_Cent Probe 2-3/4" Inline Electrical Inline Bowspring Centralizer	2.88	2.75	10.00	
<div>Dataset: PROCESSED_0512311638_Anadarko_D K Norgren Unit C True 1_2-10-16_RBL.db: field/well/run1/pass10</div> <div>Total Length: 24.85 ft</div> <div>Total Weight: 229.00 lb</div> <div>O.D. 2.75 in</div>						

Calibration Report	
Database File:	C:\Warrior\Data\0512311638_Anadarko_D K Norgren Unit C True 1_2-10-16_RBL\PROCESSED_051
Dataset Pathname:	pass10
Dataset Creation:	Wed Feb 10 11:49:03 2016 by Log 7.0 B1
Gamma Ray Calibration Report	
Serial Number:	FW1307-078
Tool Model:	Probe_SA_GR
Performed:	Wed Dec 02 09:26:20 2015

Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.0	cps
Sensitivity:	0.6300	GAPI/cps

Segmented Cement Bond Log Calibration Report

Serial Number:	FW1305-098
Tool Model:	2-3/4"
Calibration Casing Diameter:	5.500 in
Calibration Depth:	7120.728 ft

Master Calibration, performed Wed Feb 10 11:40:52 2016:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.006	0.574	0.800	71.921	125.185	0.068
CAL	0.006	0.726				
5'	0.006	0.514	0.800	71.921	140.114	-0.057
SUM						
S1	0.006	0.573	0.000	100.000	176.244	-1.076
S2	0.006	0.584	0.000	100.000	172.929	-1.053
S3	0.006	0.591	0.000	100.000	170.959	-1.018
S4	0.006	0.585	0.000	100.000	172.816	-1.029
S5	0.006	0.583	0.000	100.000	173.090	-0.997
S6	0.006	0.568	0.000	100.000	177.897	-1.012
S7	0.006	0.560	0.000	100.000	180.393	-1.037
S8	0.006	0.560	0.000	100.000	180.421	-1.046

Internal Reference Calibration, performed Wed Dec 30 13:01:11 2015:

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.006	0.726	1.000	0.000

Air Zero Calibration, performed Wed Feb 10 10:41:01 2016:

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



Company	Kerr-McGee Oil & Gas OnShore L.P.
Well	D K Norgren Unit C True 1
Field	Wattenberg
County	Weld
State	Colorado