



**Radial Cement Bond
Variable Density Log
W/Gamma Ray/CCL**

Company **Noble Energy**
Well **Loeffler K01-66-1HN**
Field **Wattenberg**
County **Weld** State **Colorado**

Location: **API # : 05-123-35834**

Other Services
TEMP

SEC 1 TWP 4N RGE 66W

Permanent Datum **Ground Level** Elevation **4667'**
Log Measured From **16' Kelly Bushing**
Drilling Measured From **Kelly Bushing**

Elevation
K.B. 4683'
D.F. 4682'
G.L. 4667'

Date **December 12, 2013**

Run Number	1
Depth Driller	11303'
Depth Logger	14:57
Bottom Logged Interval	16:08
Top Log Interval	Surface
Open Hole Size	8.125
Type Fluid	Fresh Water
Density / Viscosity	8.33
Max. Recorded Temp.	212 Deg F
Estimated Cement Top	986'
Time Well Ready	14:57
Time Logger on Bottom	16:08
Equipment Number	13033
Location	Brighton
Recorded By	C. Rall
Witnessed By	Natalie Aaron

Borehole Record		Tubing Record					
Run Number	Bit	From	To	Size	Weight	From	To
One							
Two							
Three							
Four							

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	9 5/8	36#	Surface	635'
Prot. String				
Production String	7	26#	Surface	7386'
Liner	4 1/2	11 6#	Surface	11288'
Short Joint			5937'	6001'

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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

Primary Log on Well. Well Logged using 16' KB.

Main Pass Logged with 1700 PSI
Repeat Pass Logged with 1700 PSI

Estimated Top of Cement @ 986'

Short Joint @ 5937' To 6001'

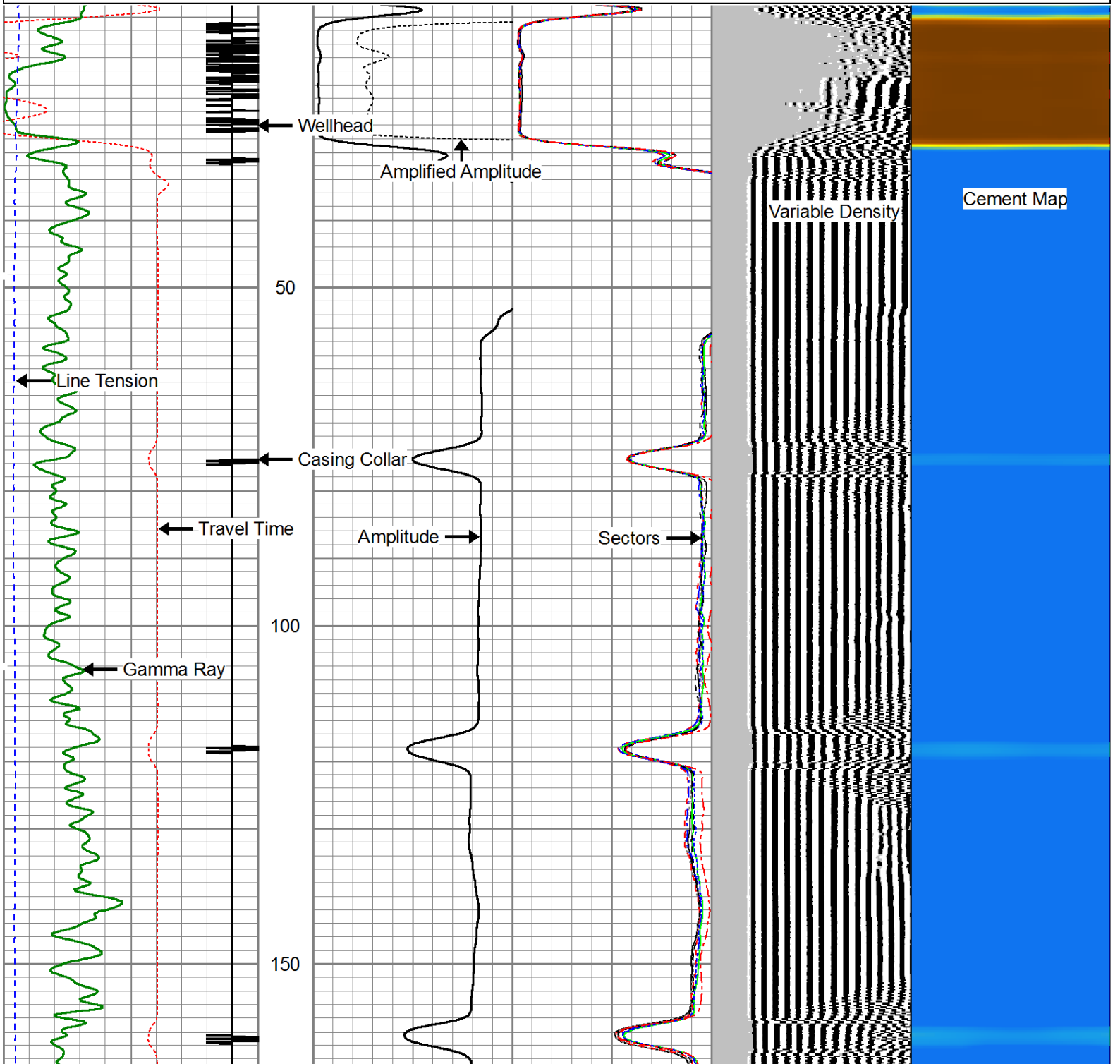
Thank you for using Allied Wireline.
(303)659-4609

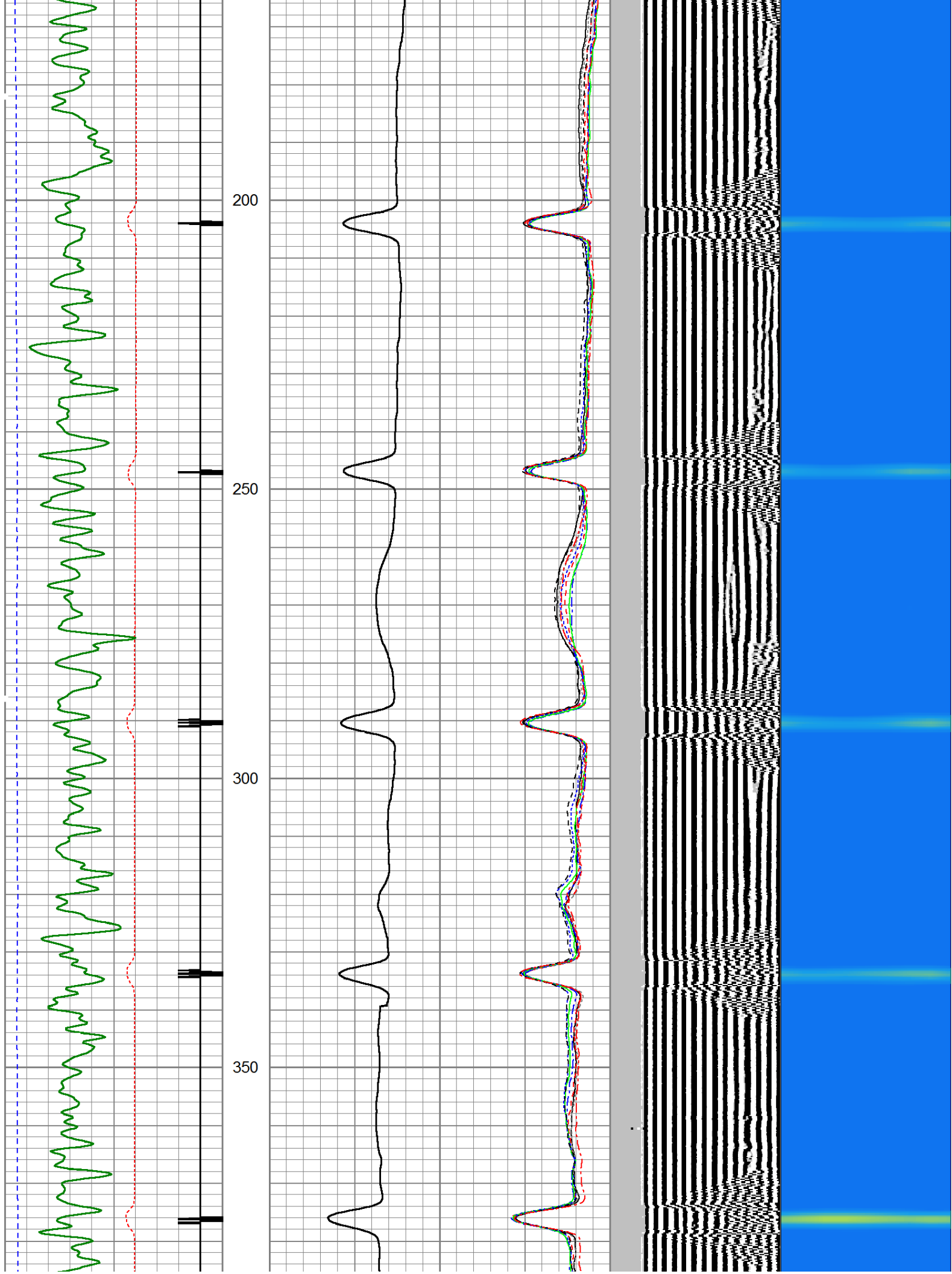


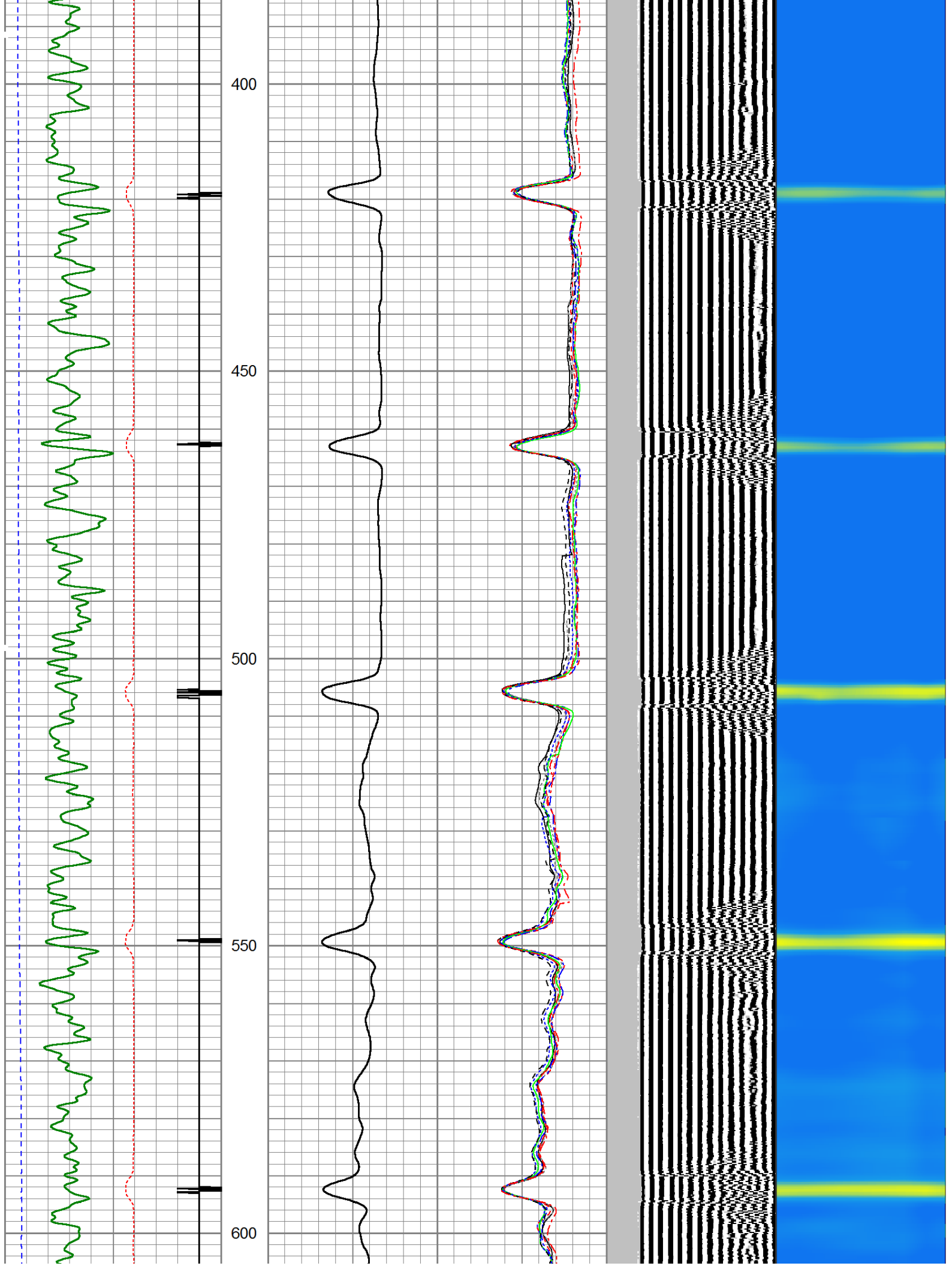
Main Pass (1700 PSI)

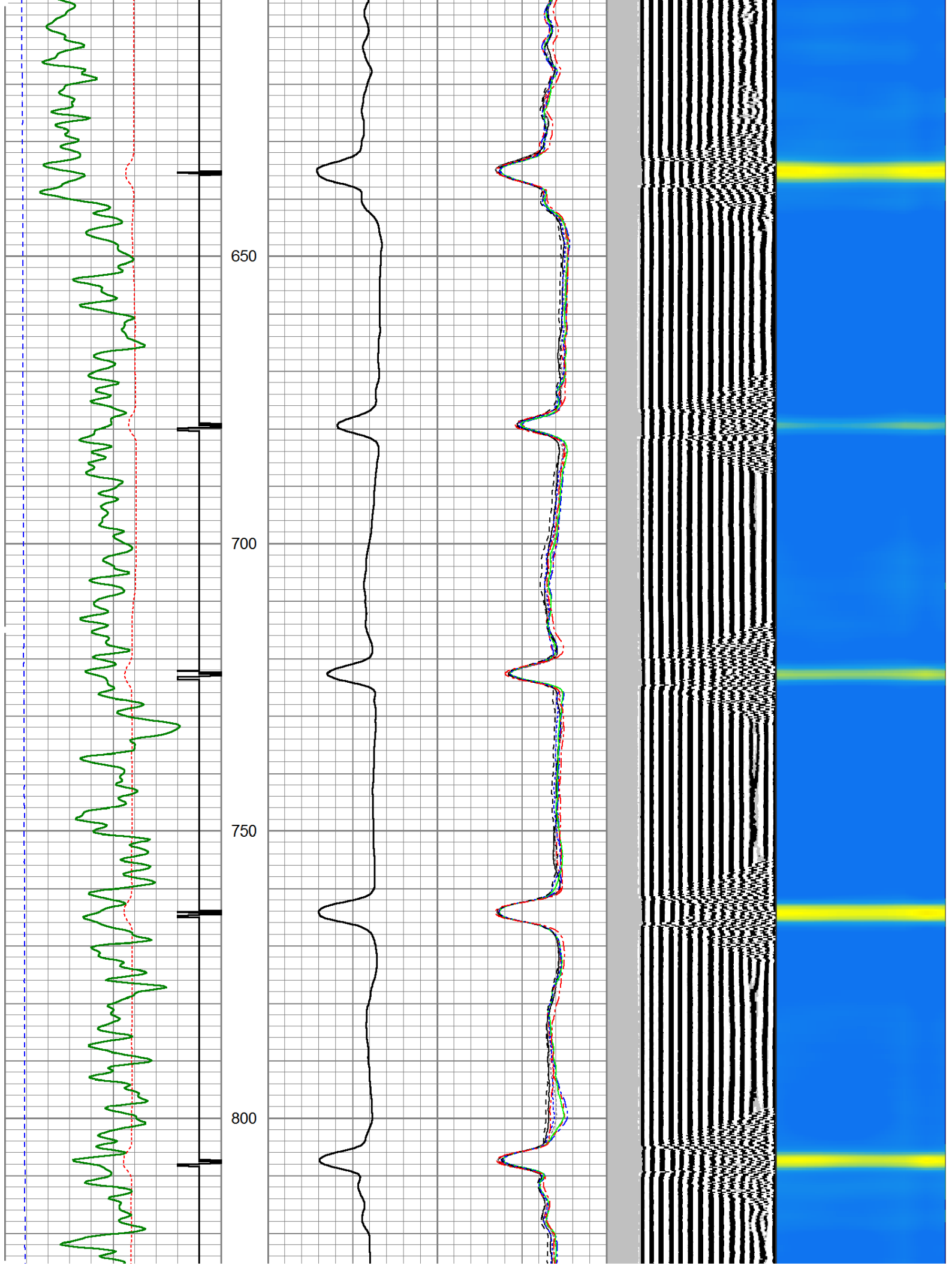
Database File: noble energy loeffler k01-66-1hn.db
 Dataset Pathname: pass1
 Presentation Format: scbl03
 Dataset Creation: Thu Dec 12 15:02:12 2013 by Log 0
 Charted by: Depth in Feet scaled 1:240

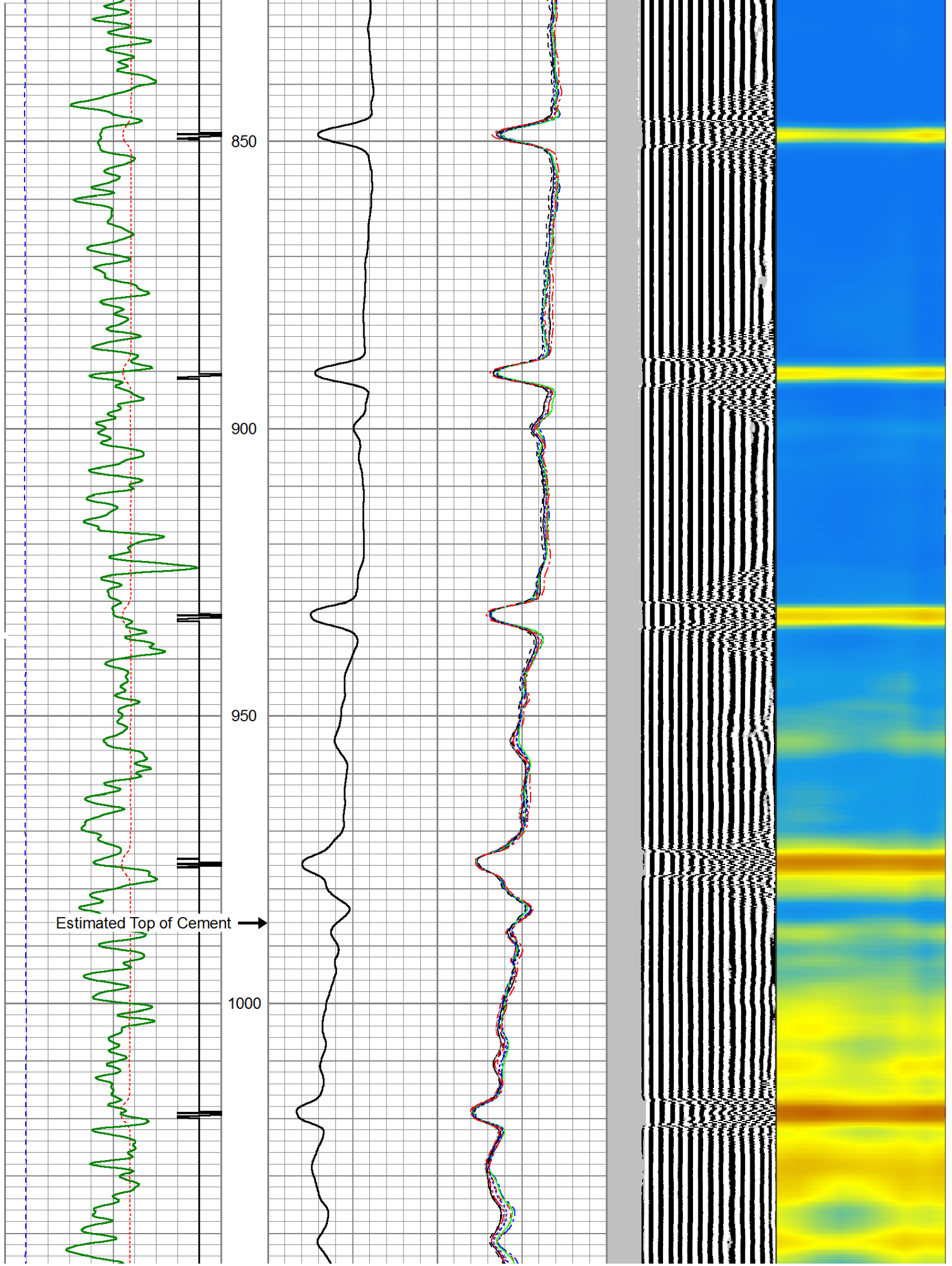
400	Travel Time (usec)	200	0	Amplitude (mV)	100	-5	AMPS1	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1		Amplified Amplitude		-5	AMPS2	150	200	1200	0	100
0	Gamma Ray (GAPI)	150	0	(mV)	10	-5	AMPS3	150				
0	Line Tension (lb)	2000				-5	AMPS4	150				
						-5	AMPS5	150				
						-5	AMPS6	150				
						-5	AMPS7	150				
						-5	AMPS8	150				

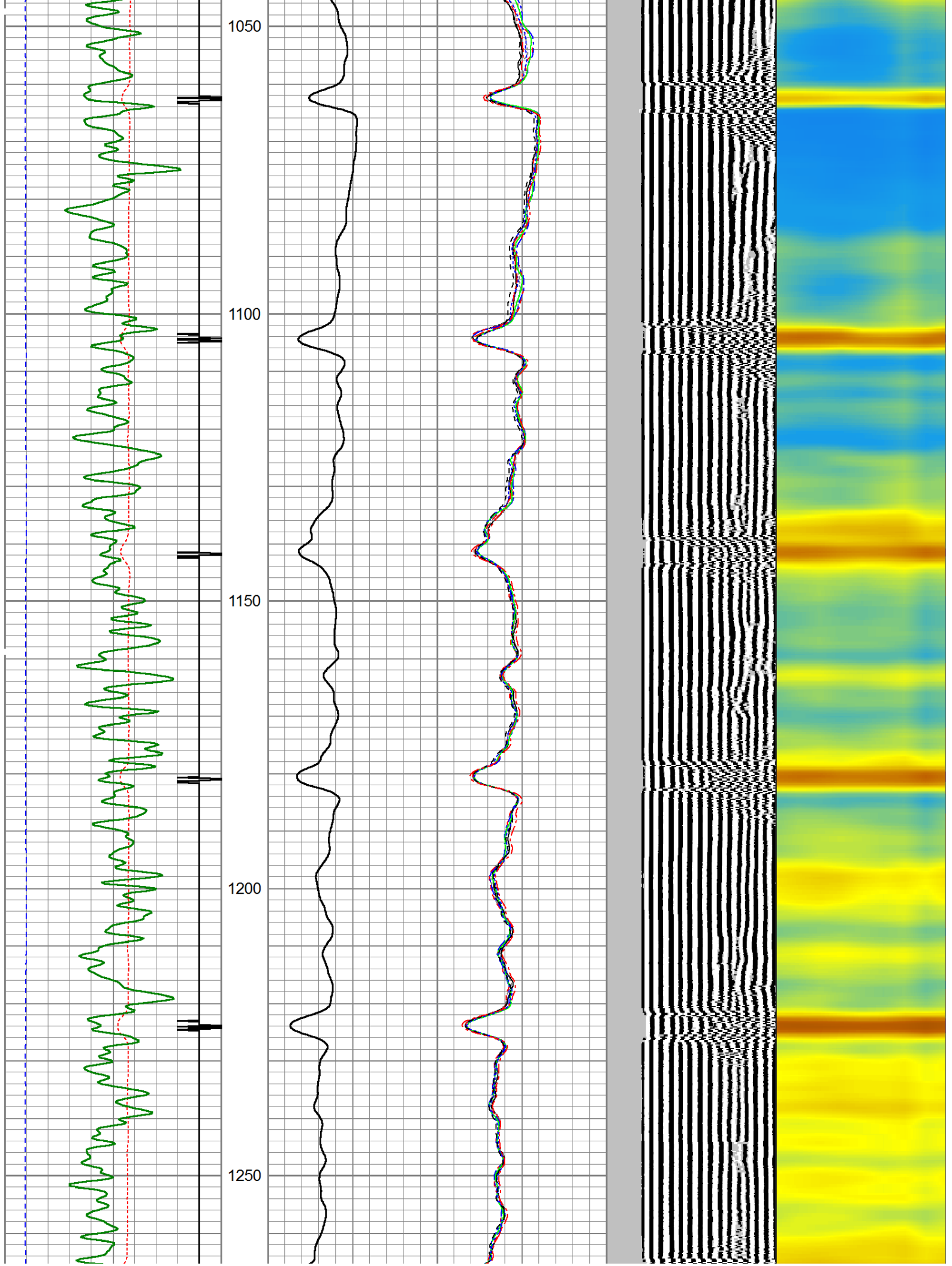


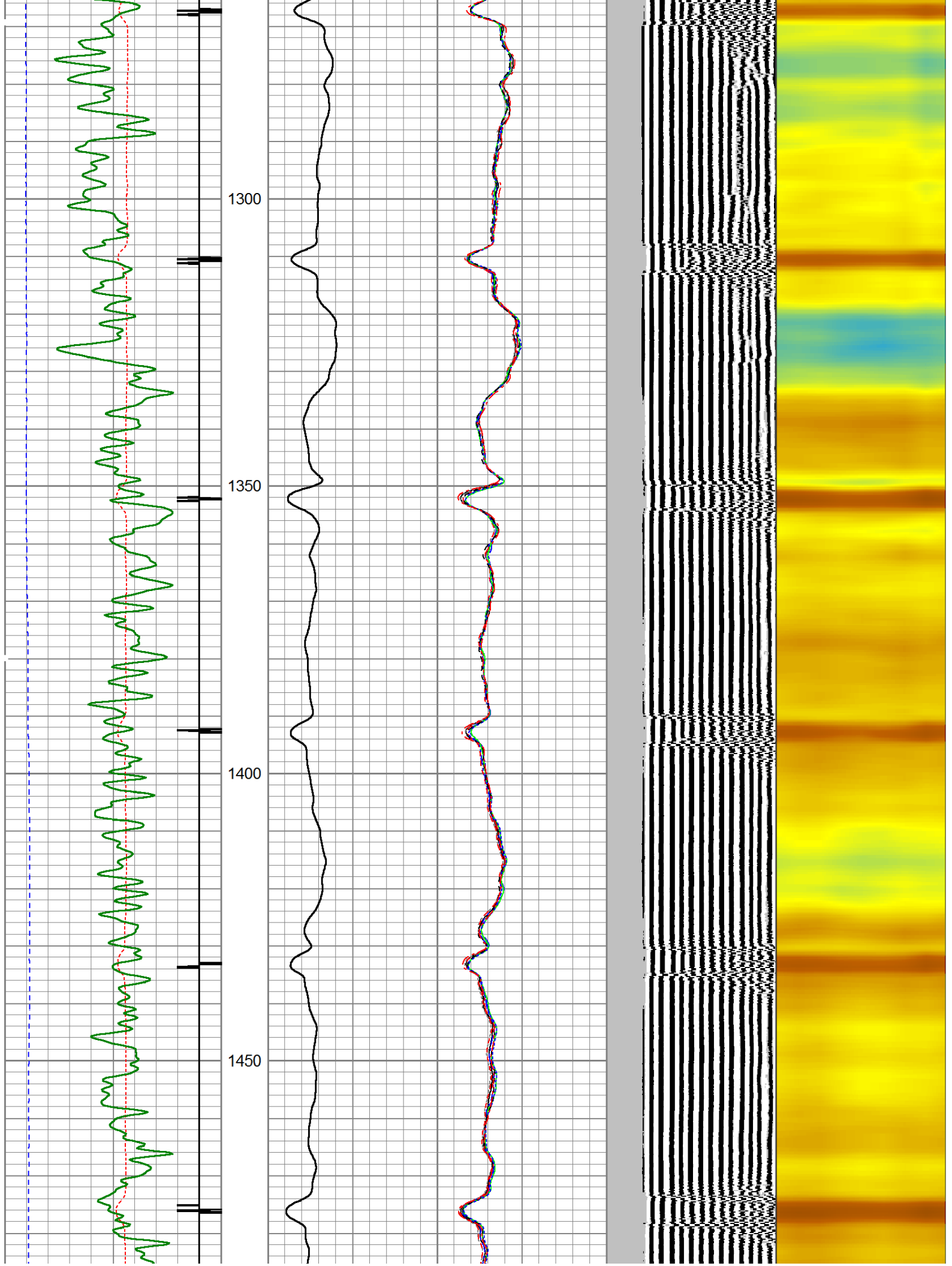


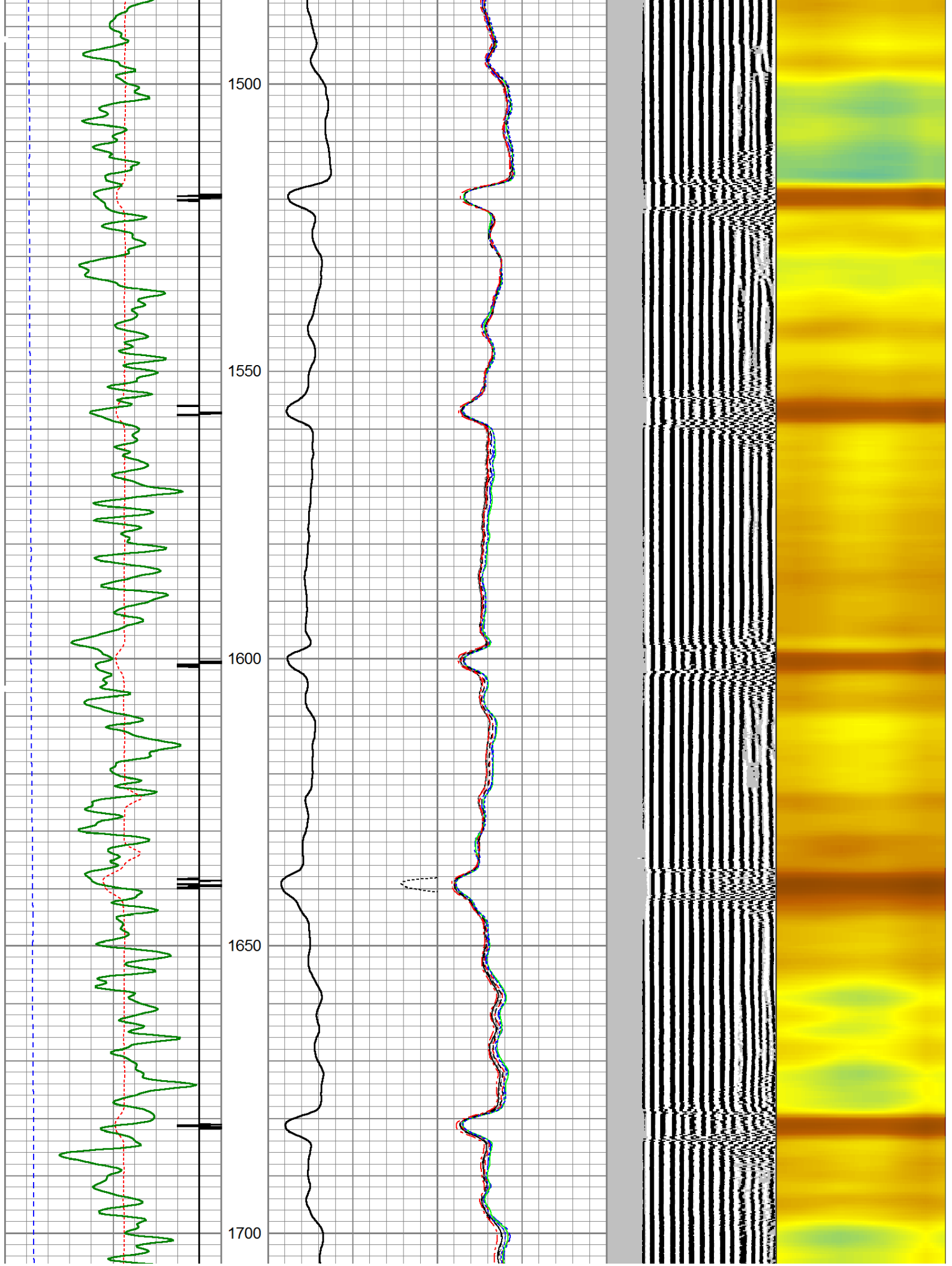


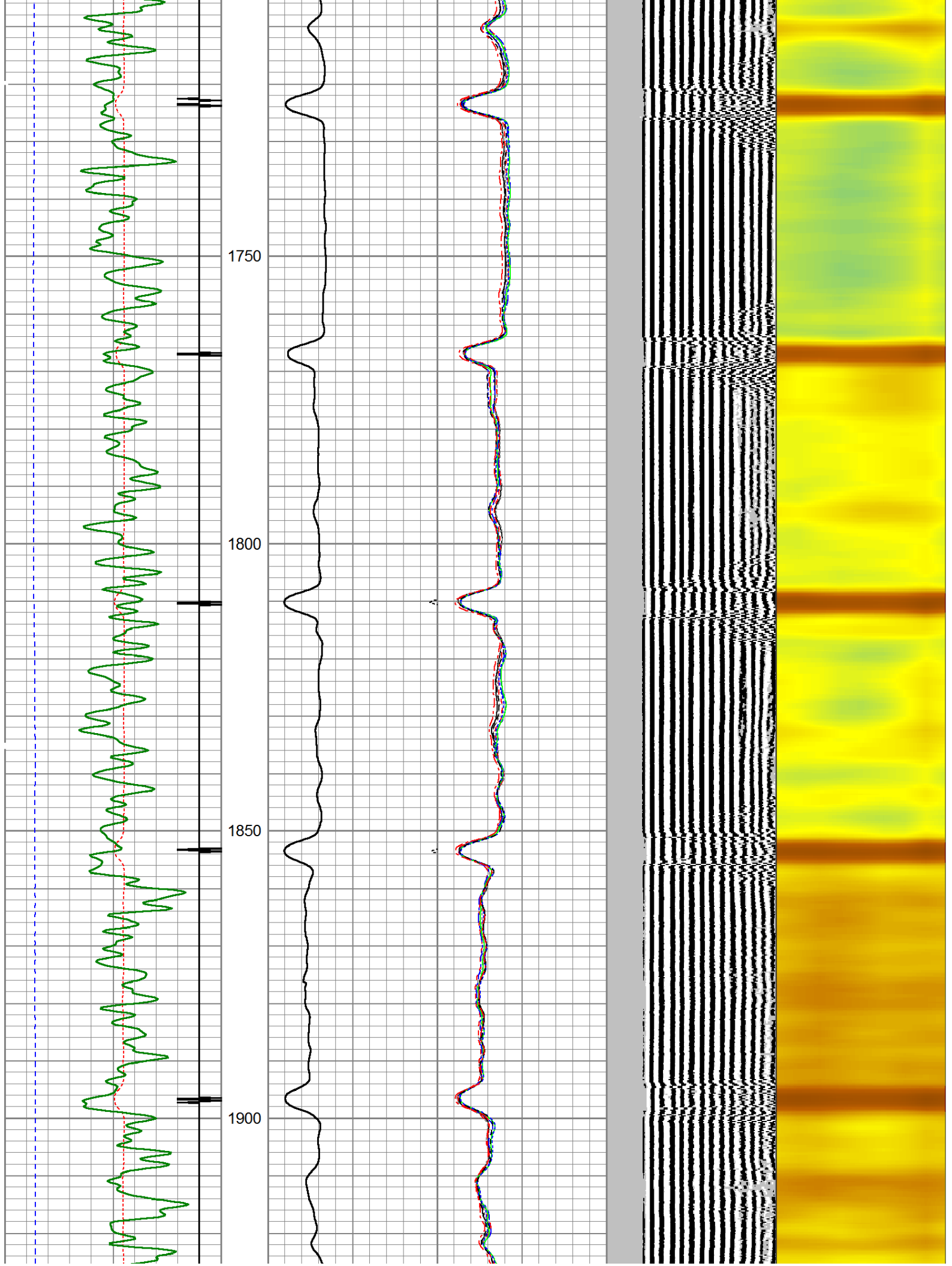


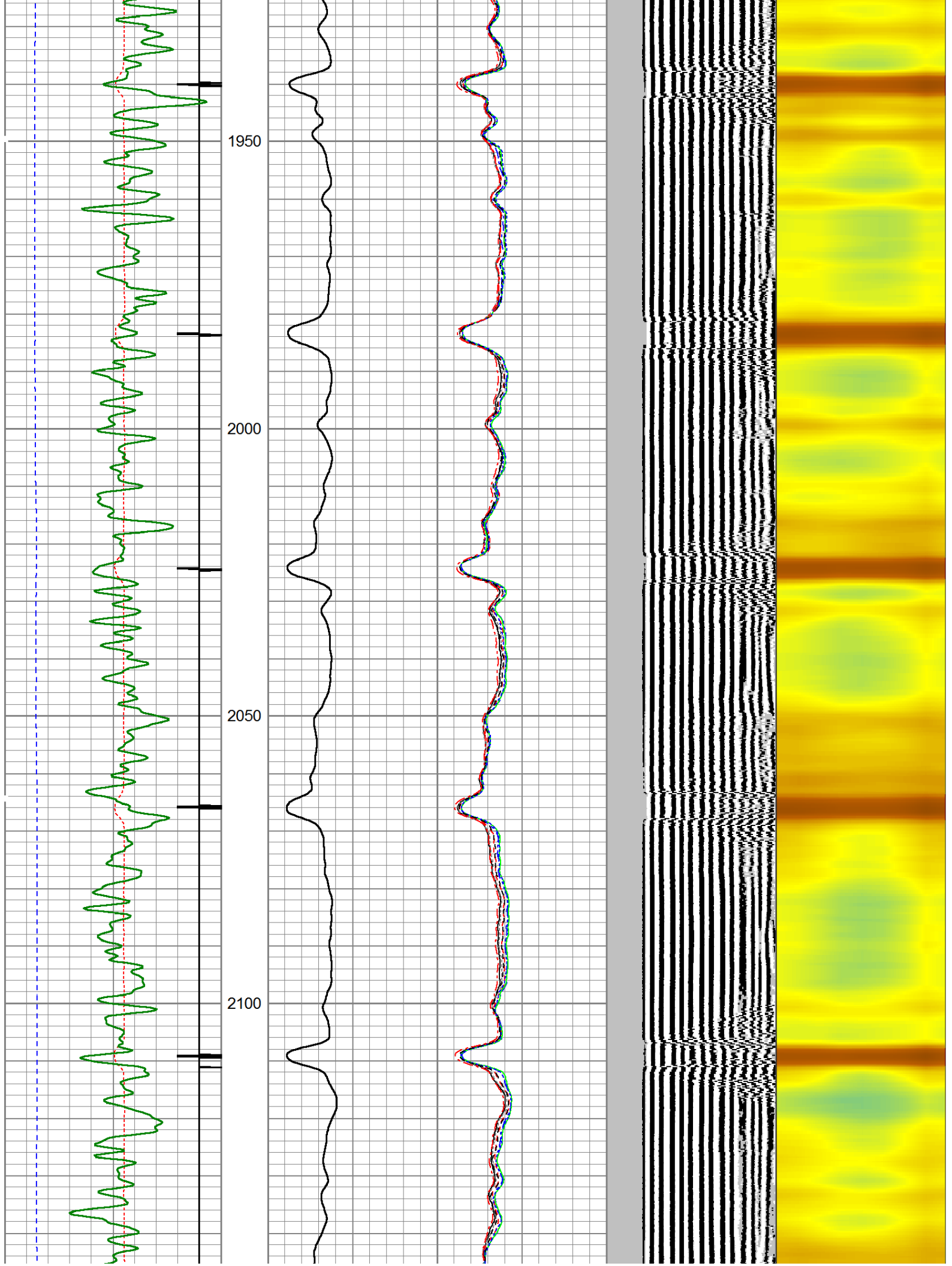


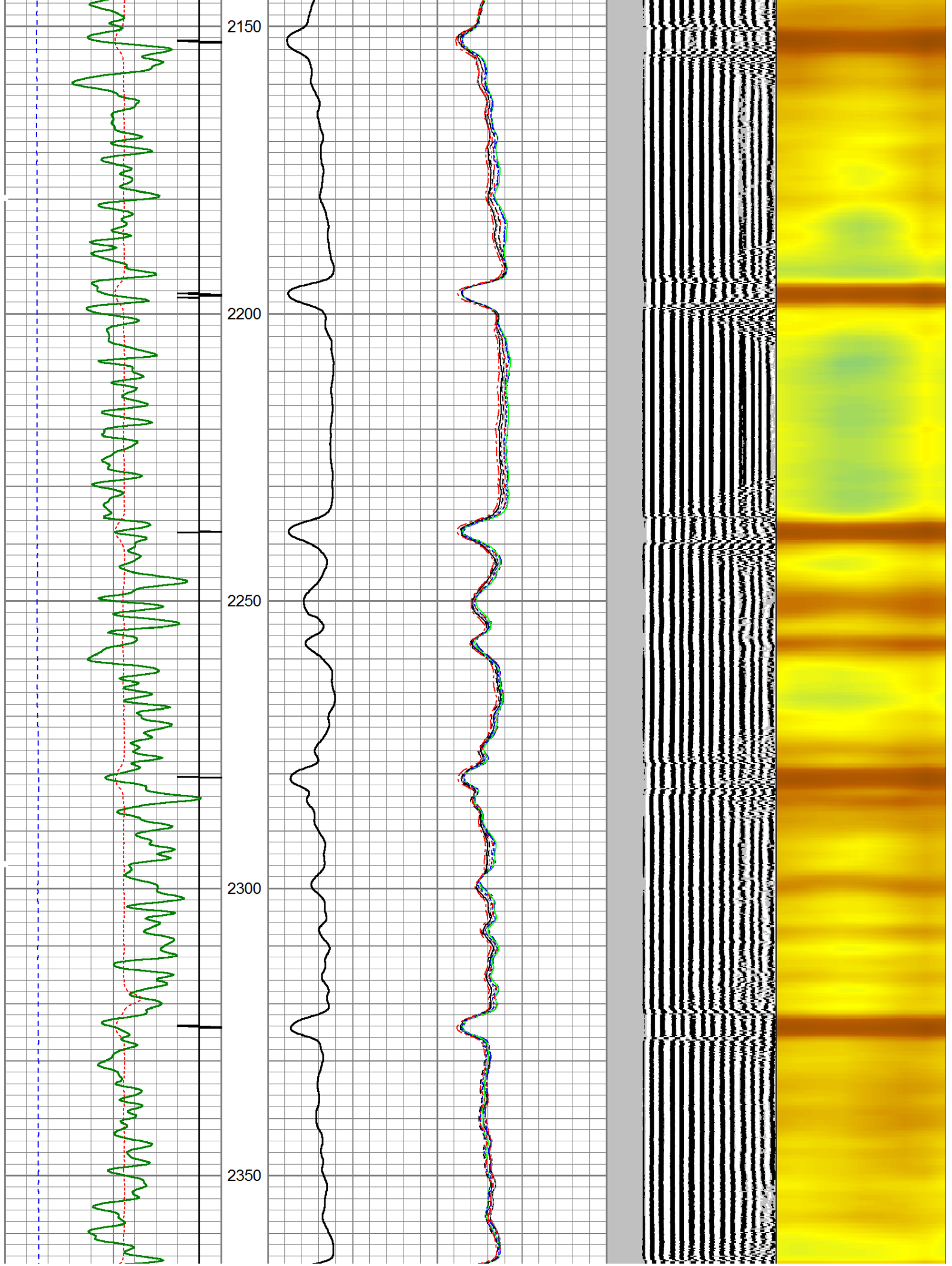


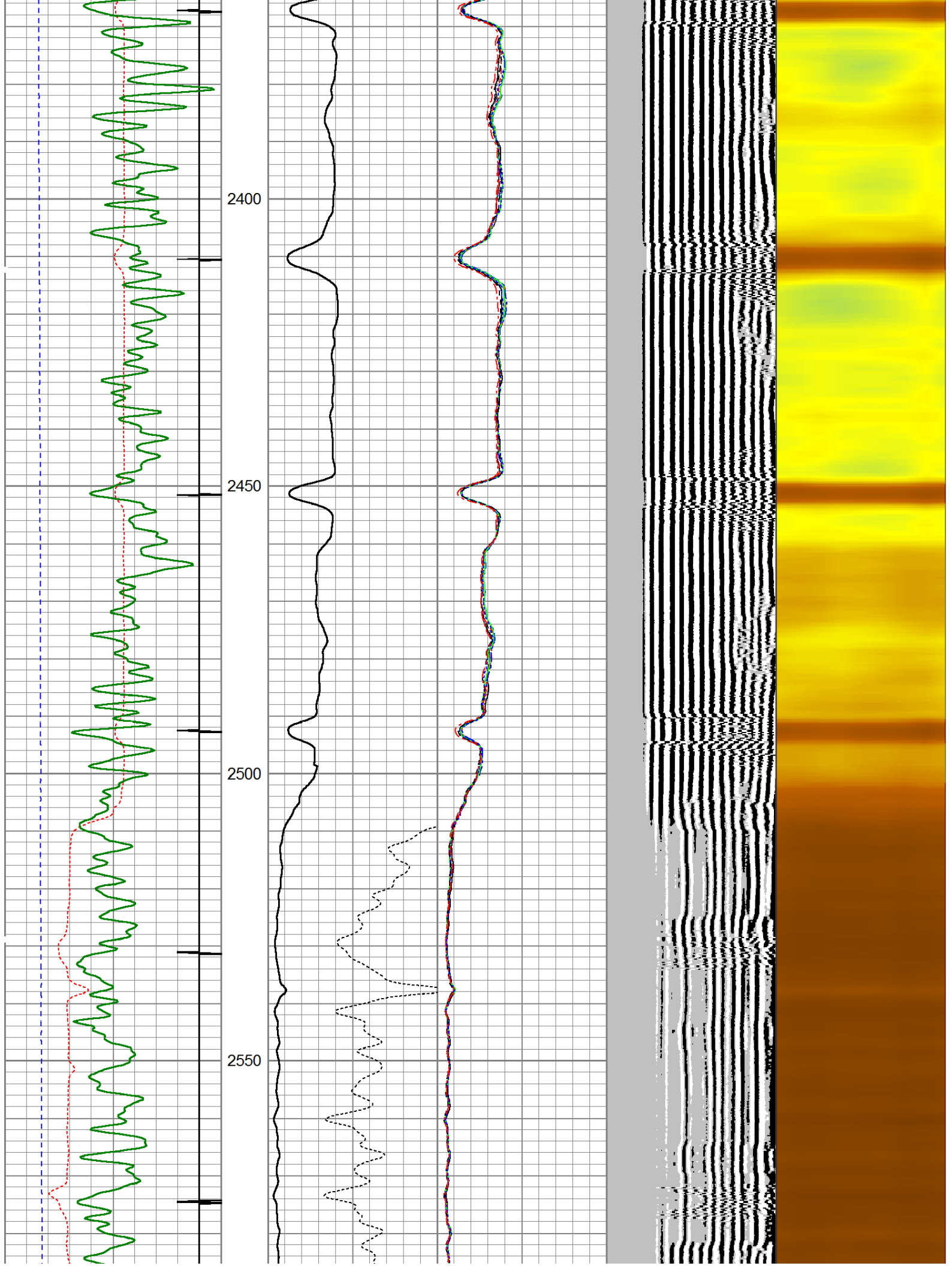


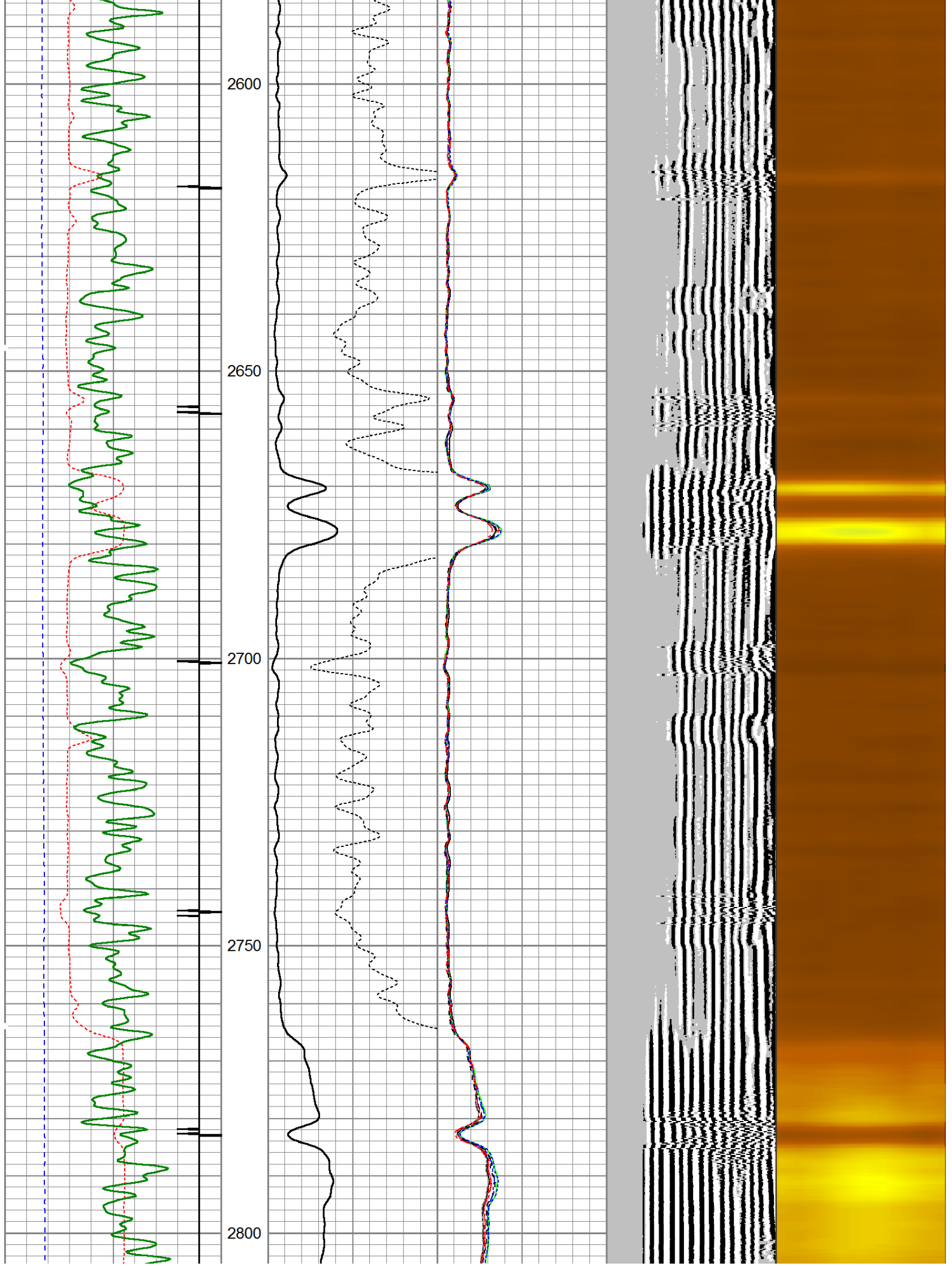


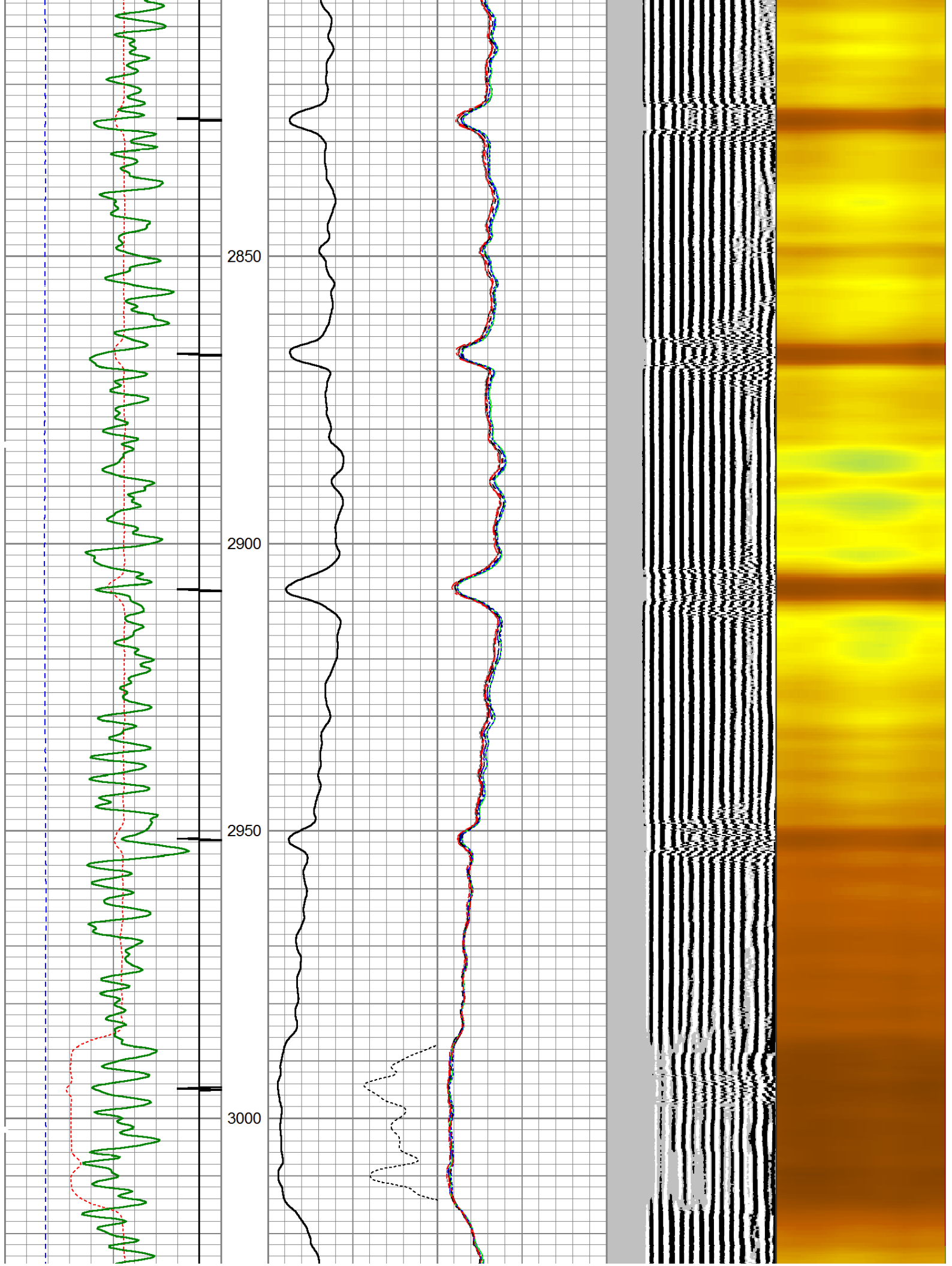


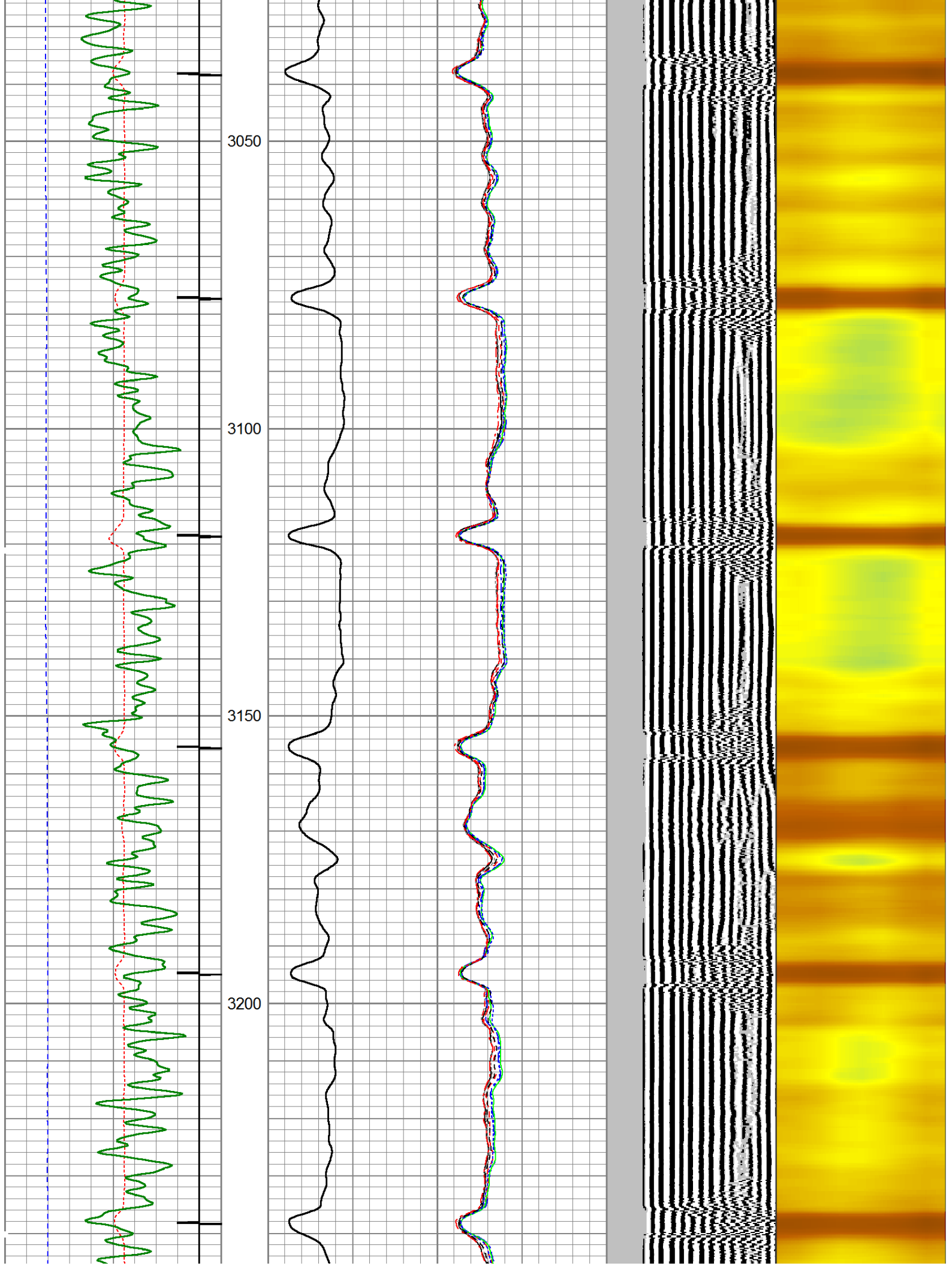


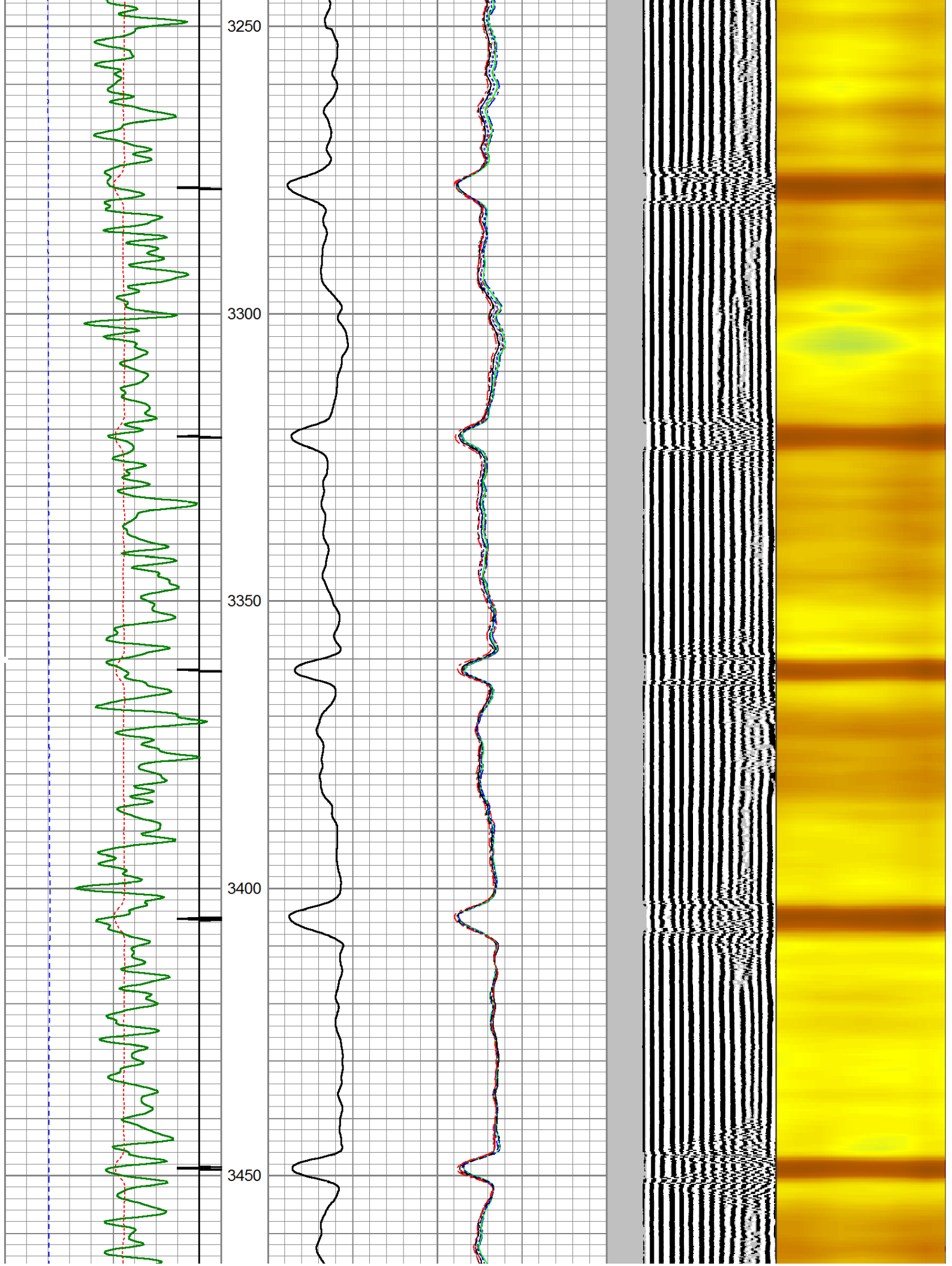


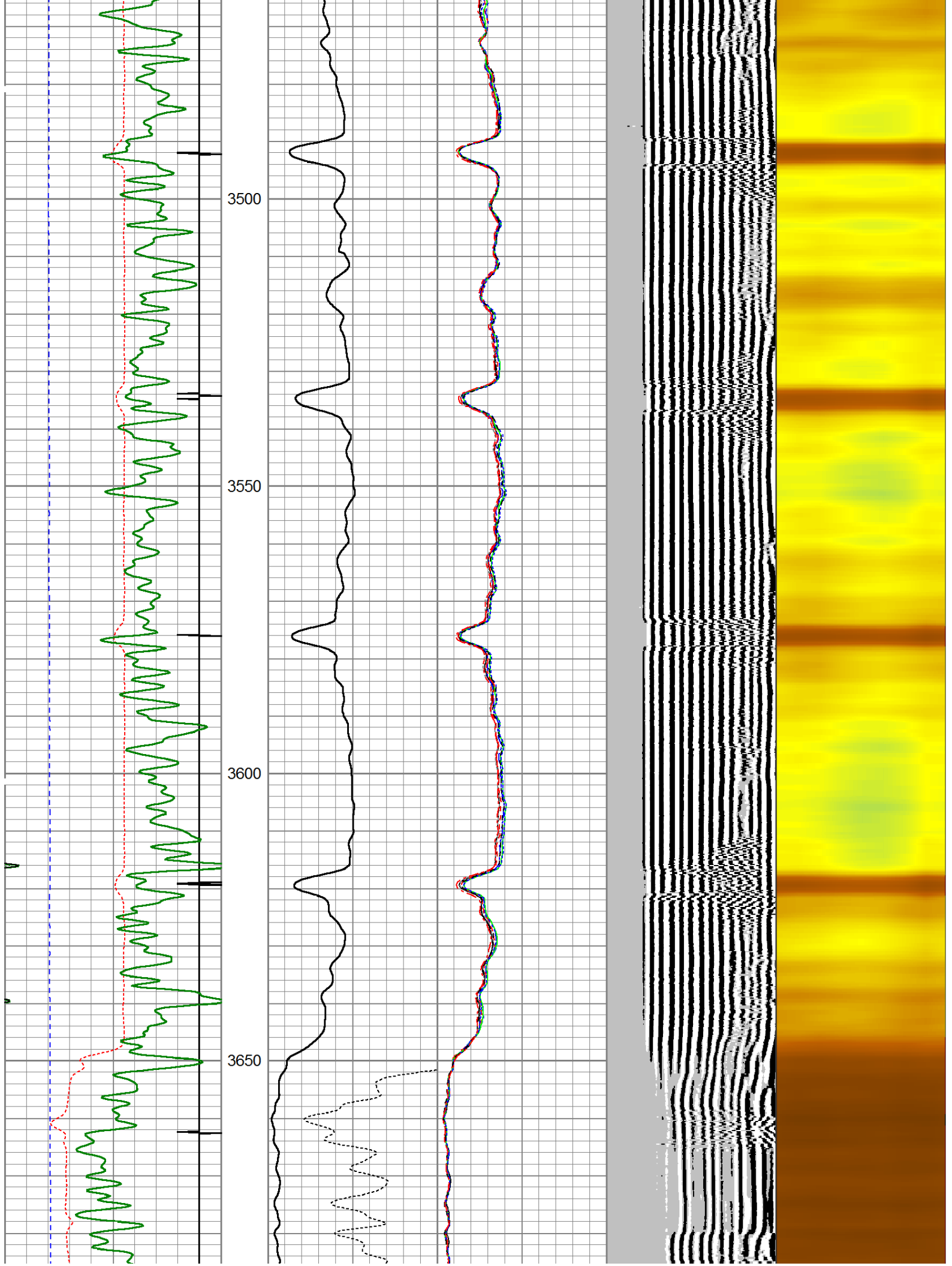


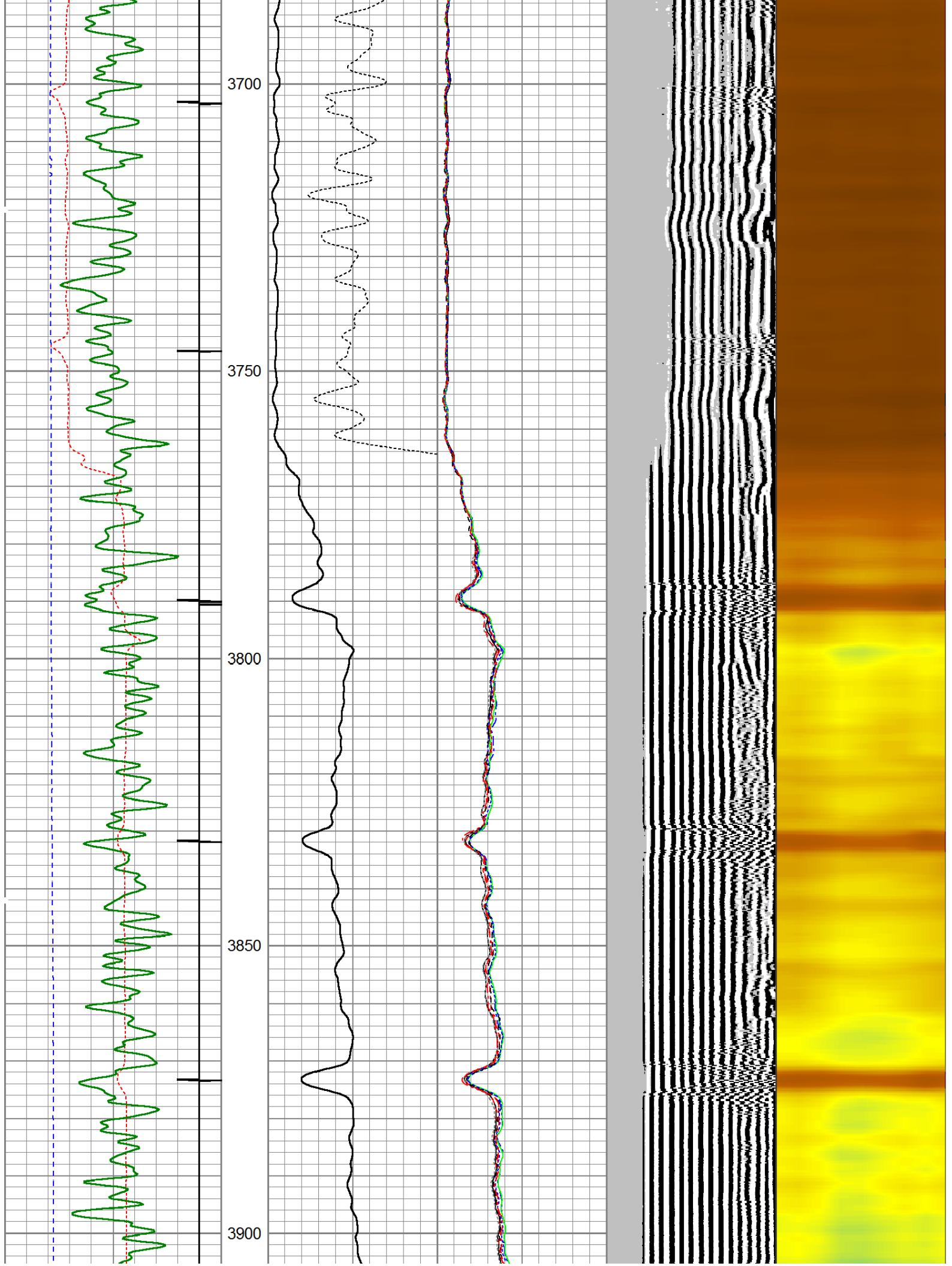


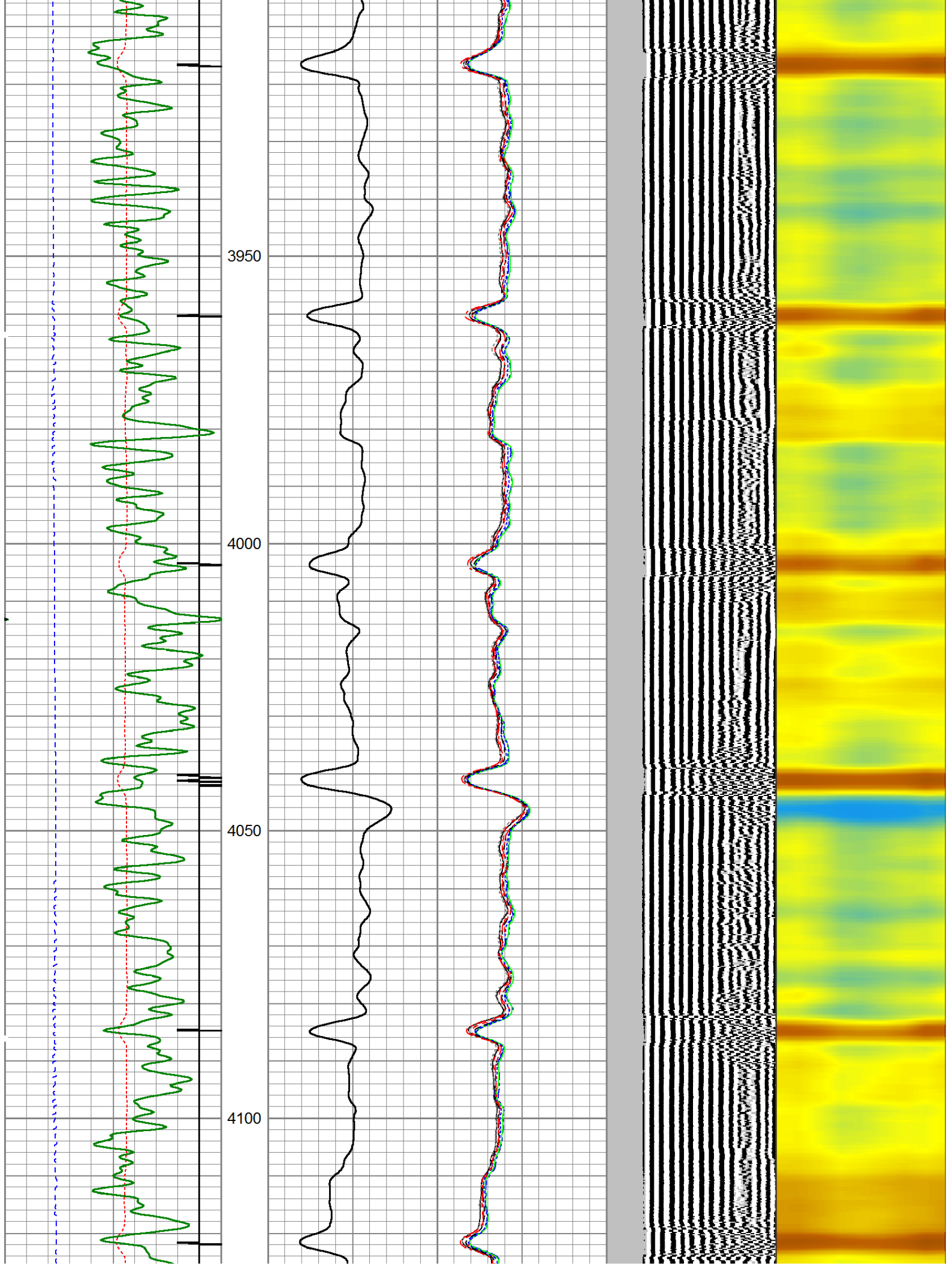


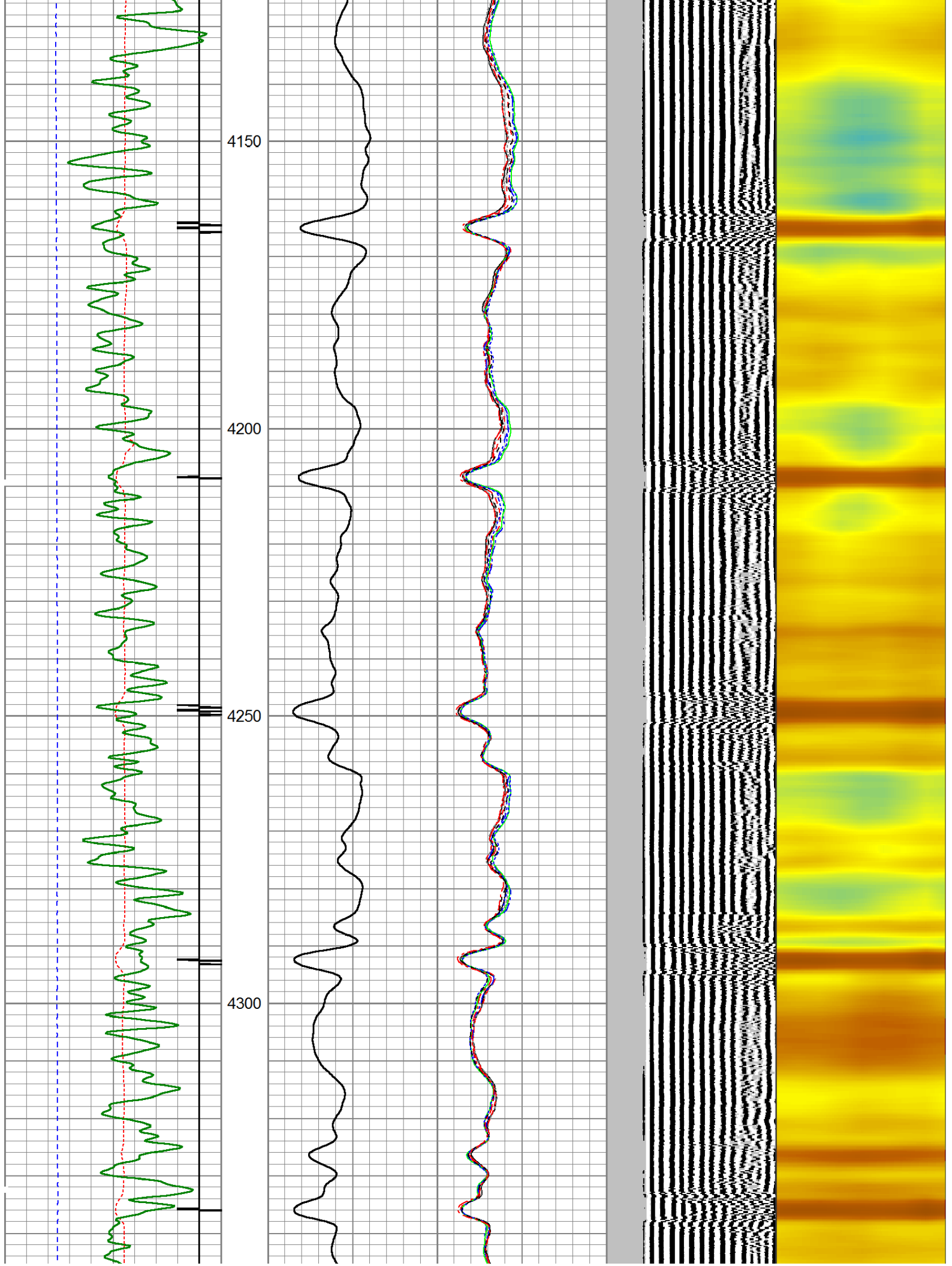


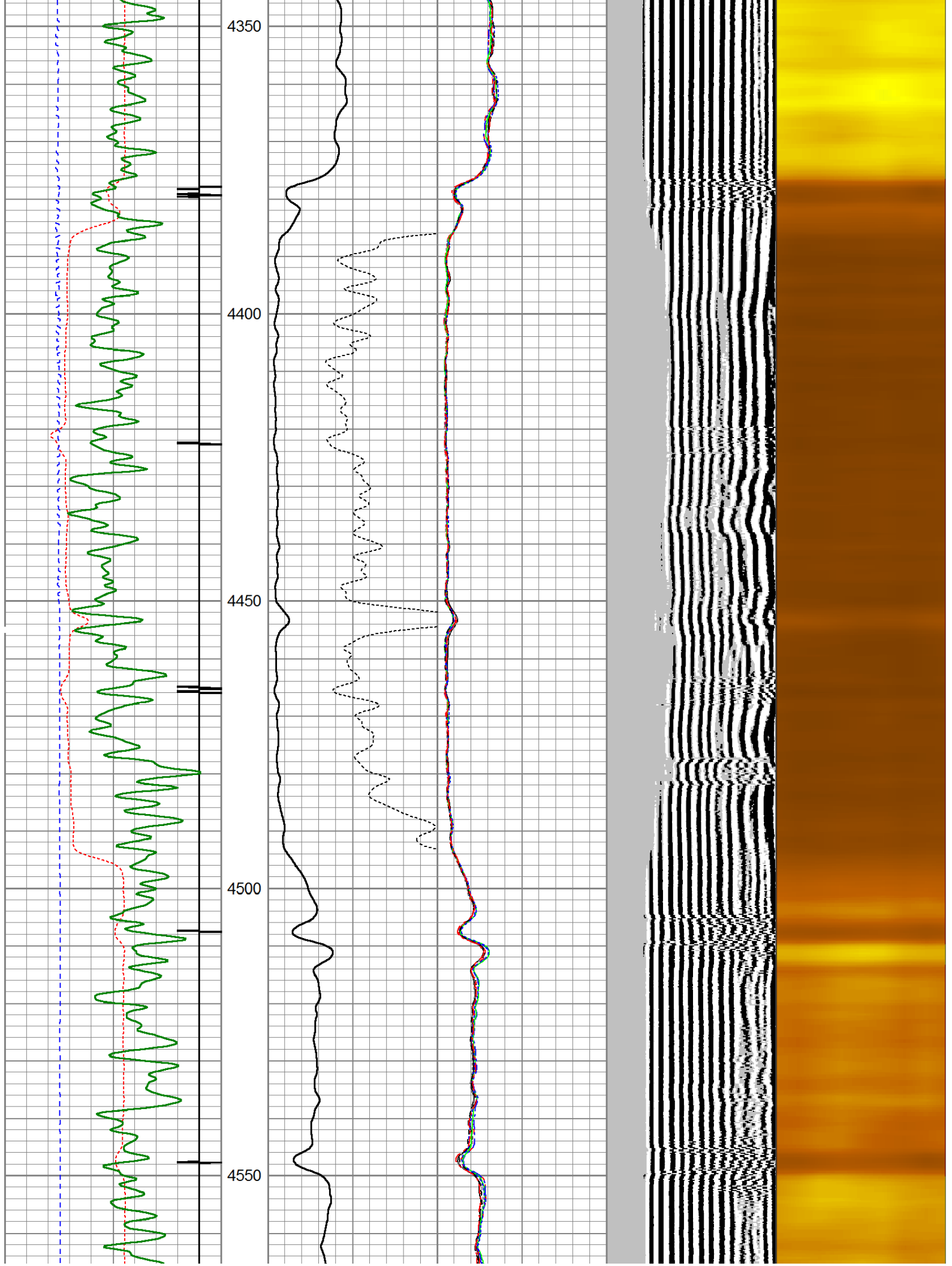


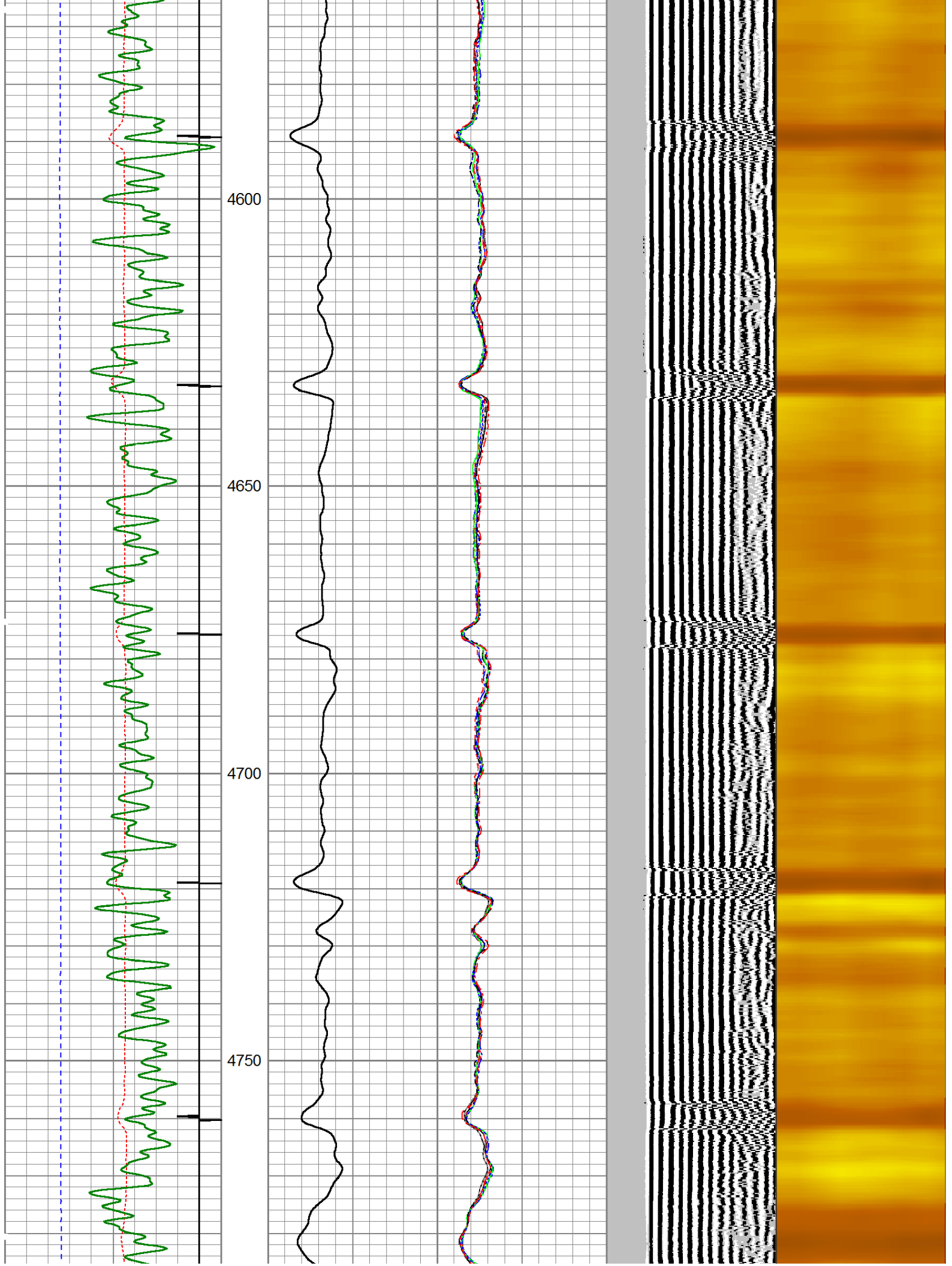


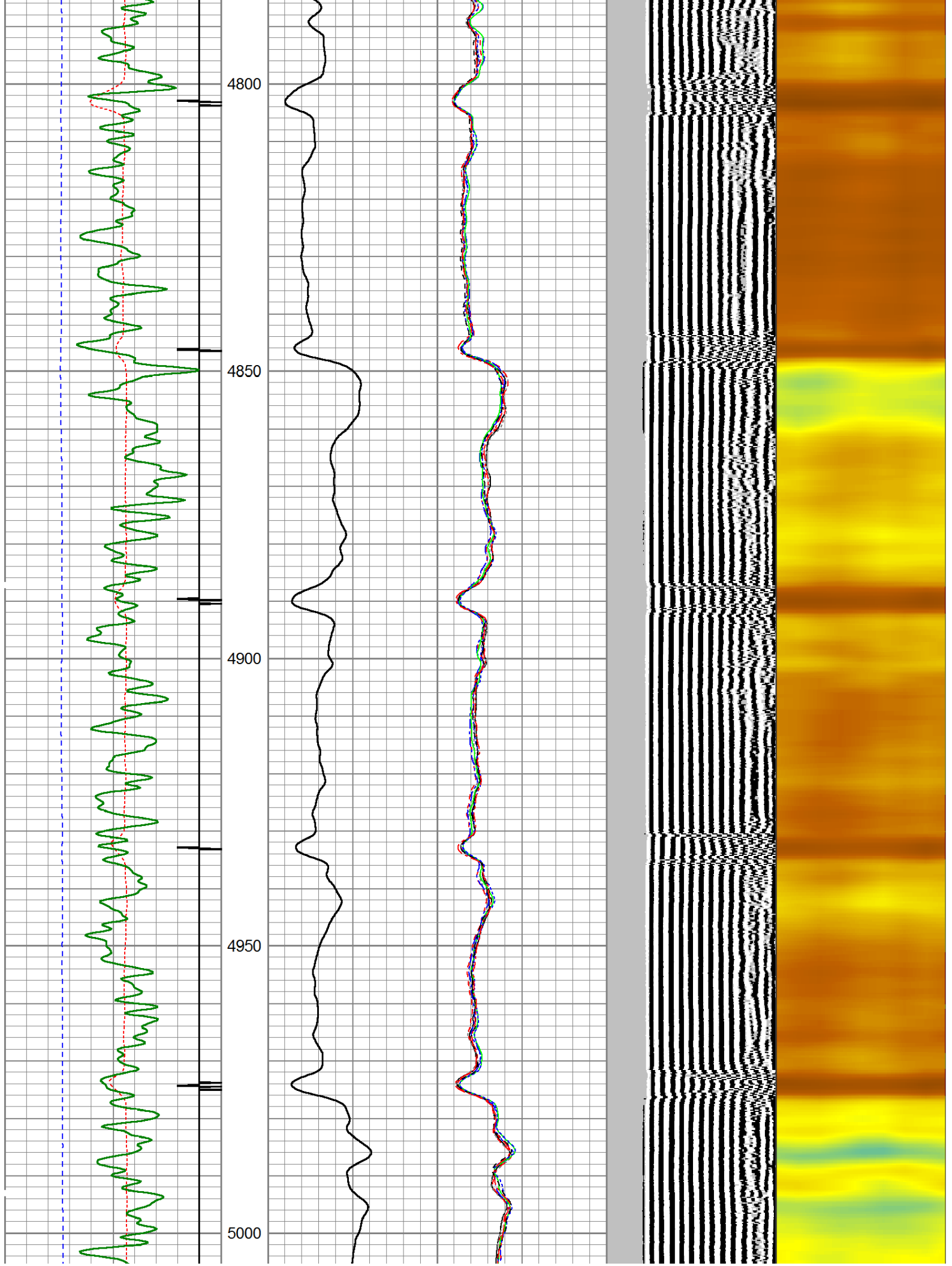


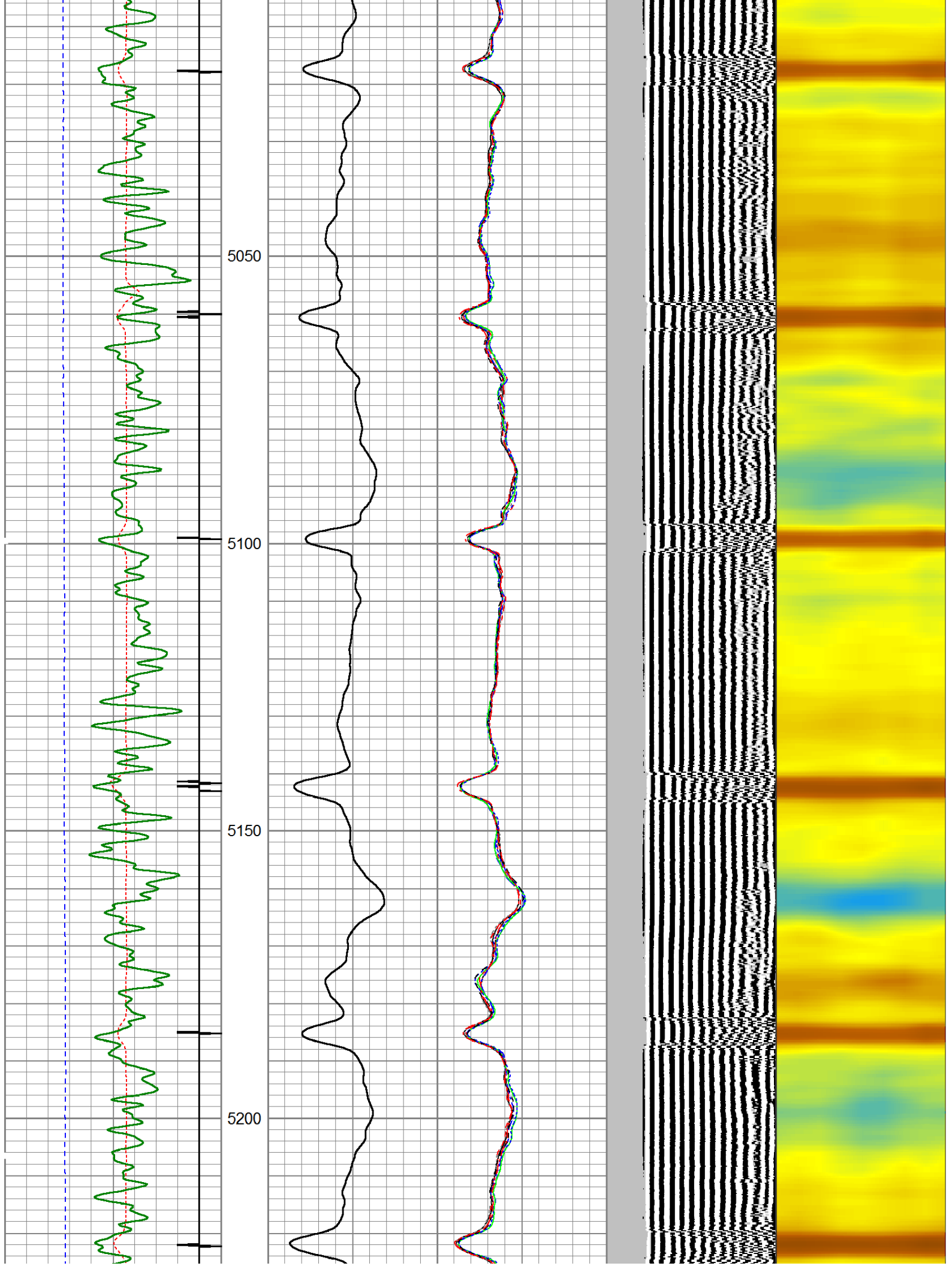


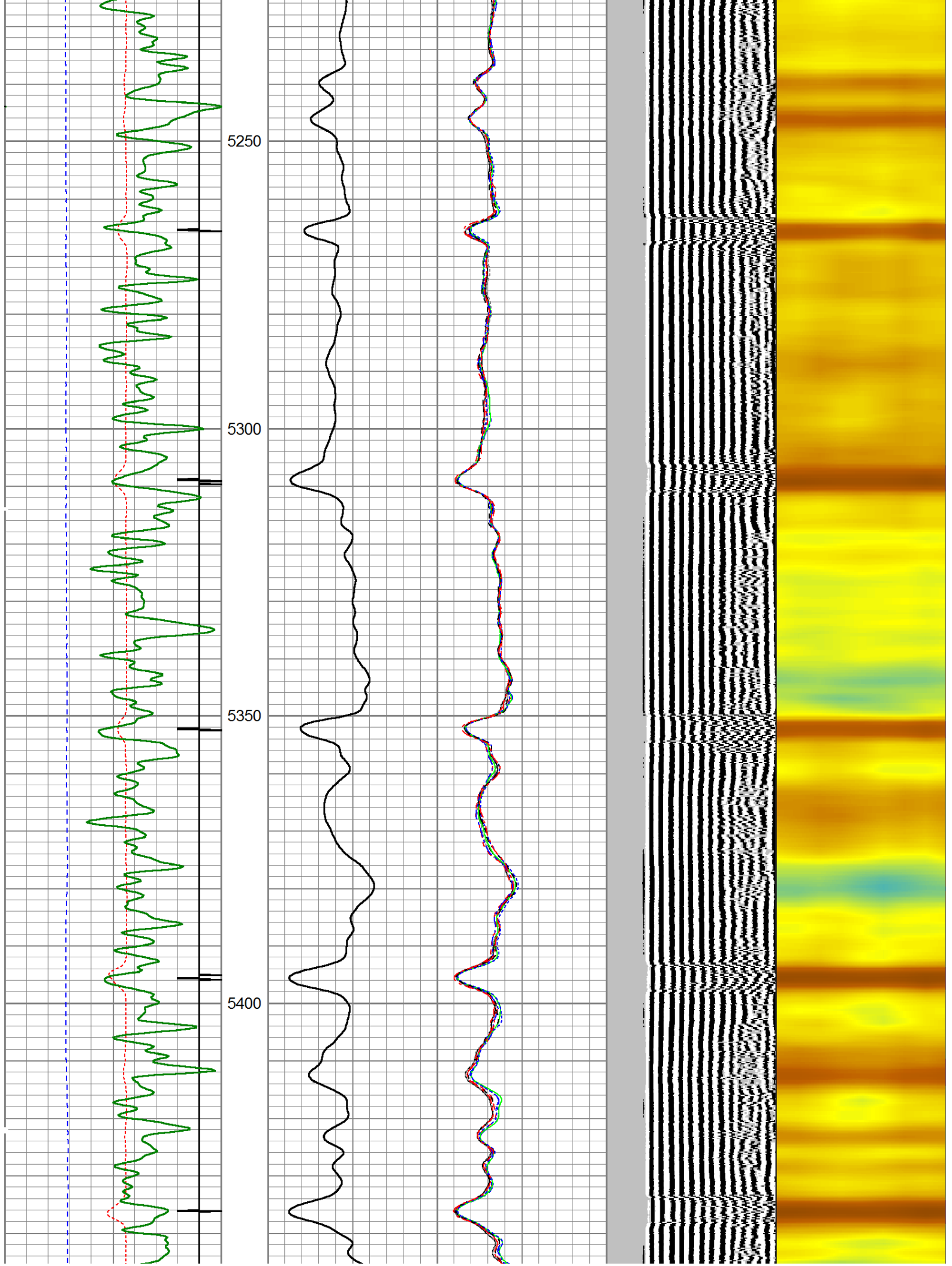


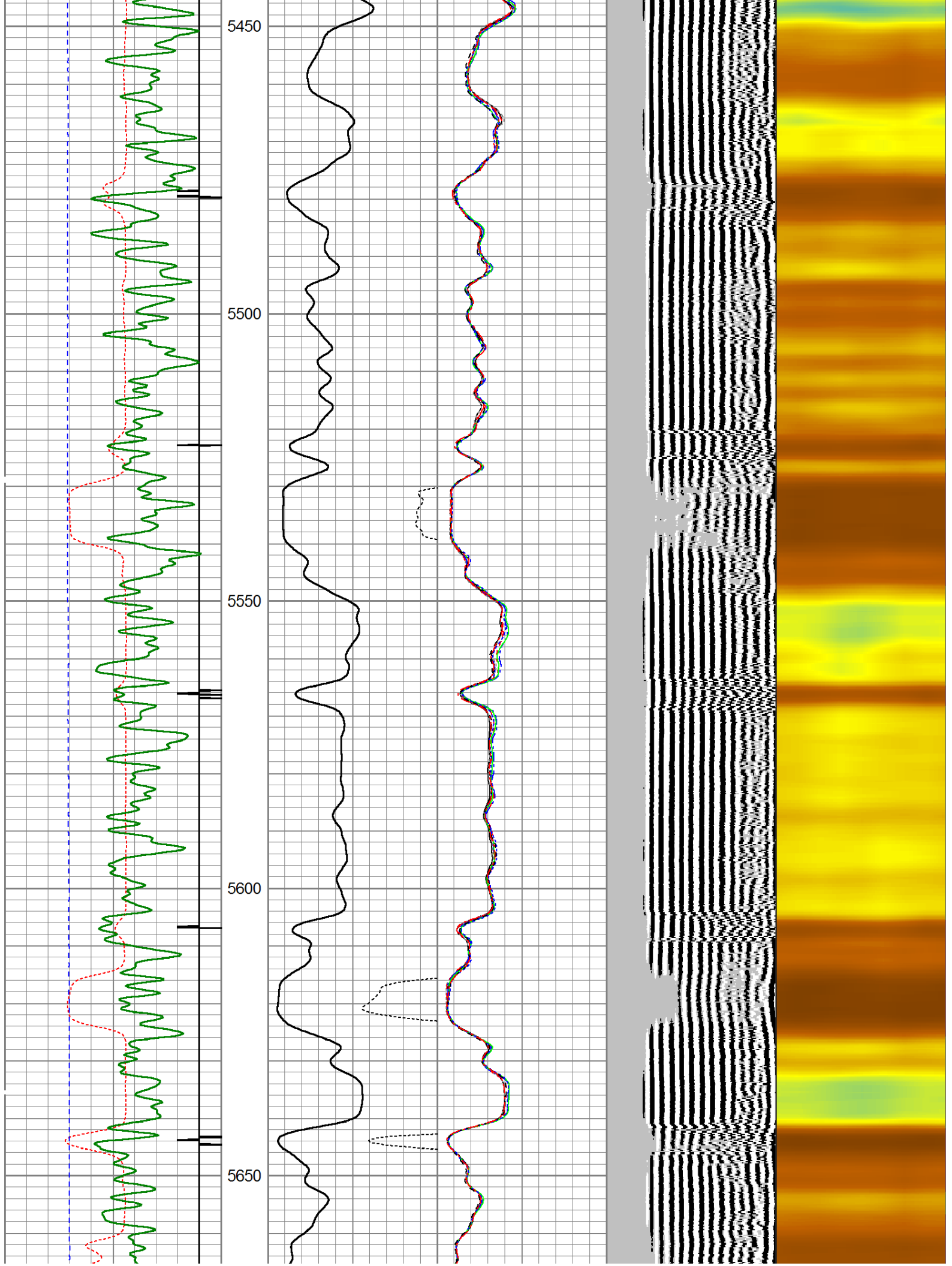


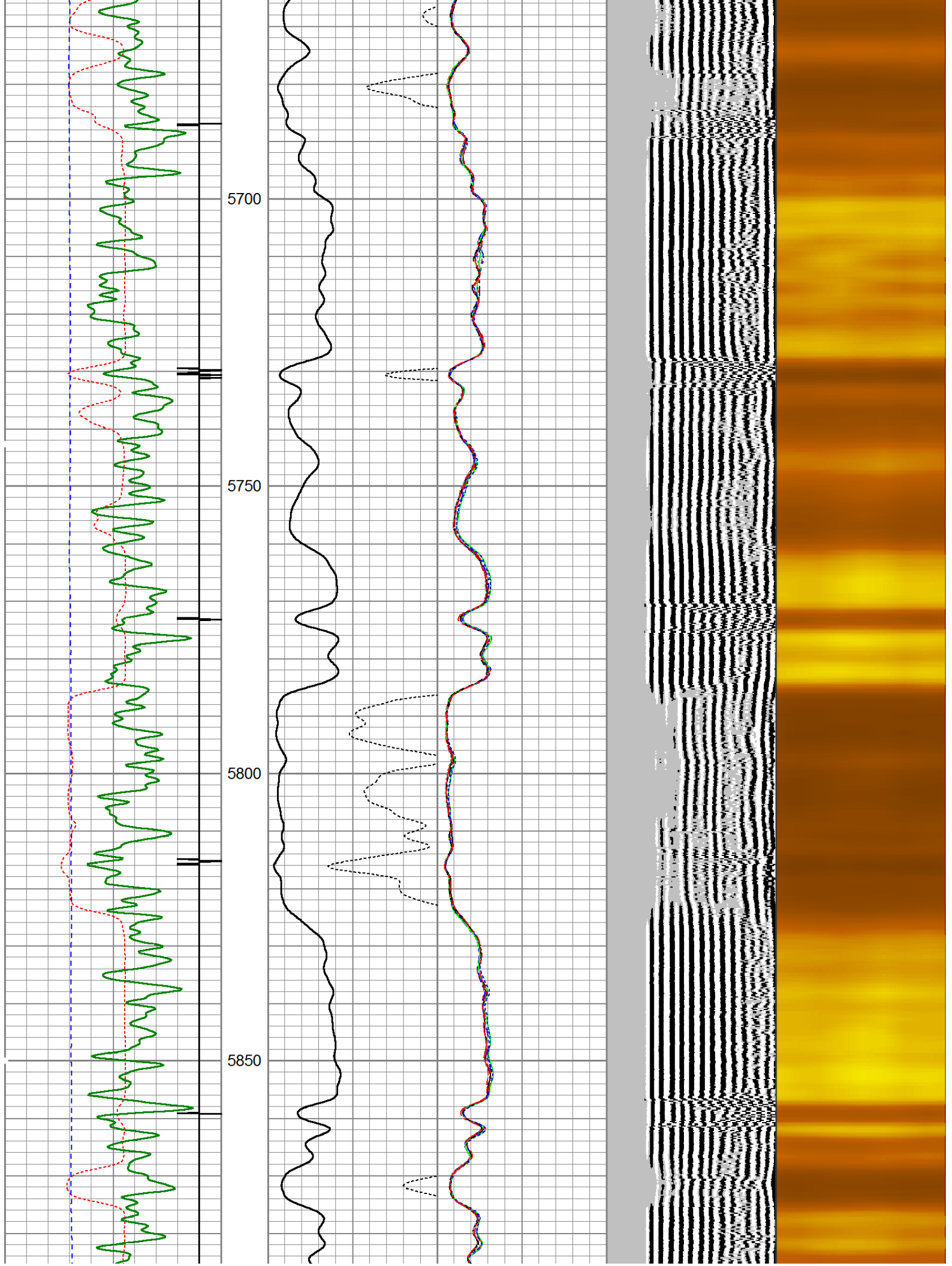


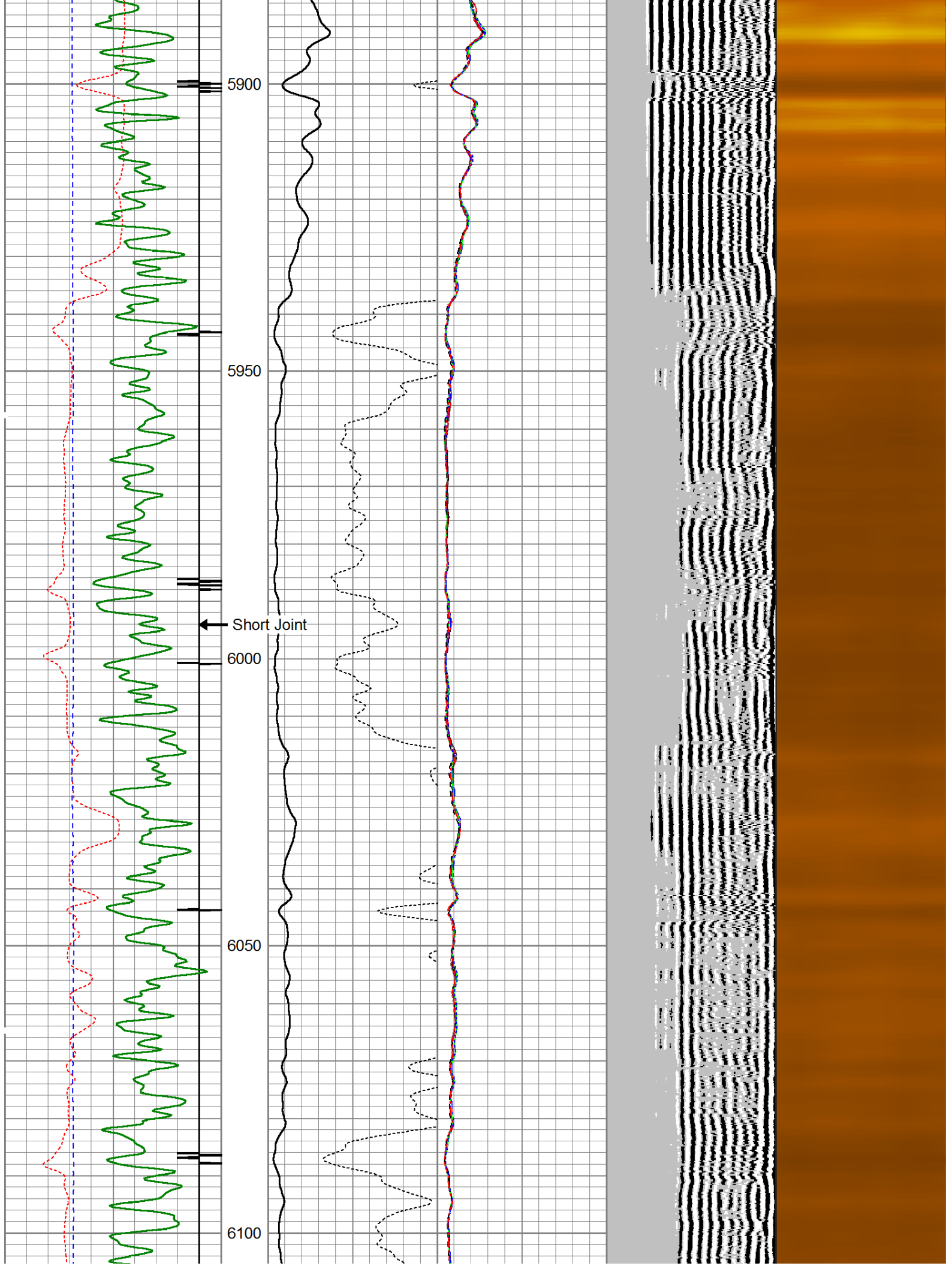


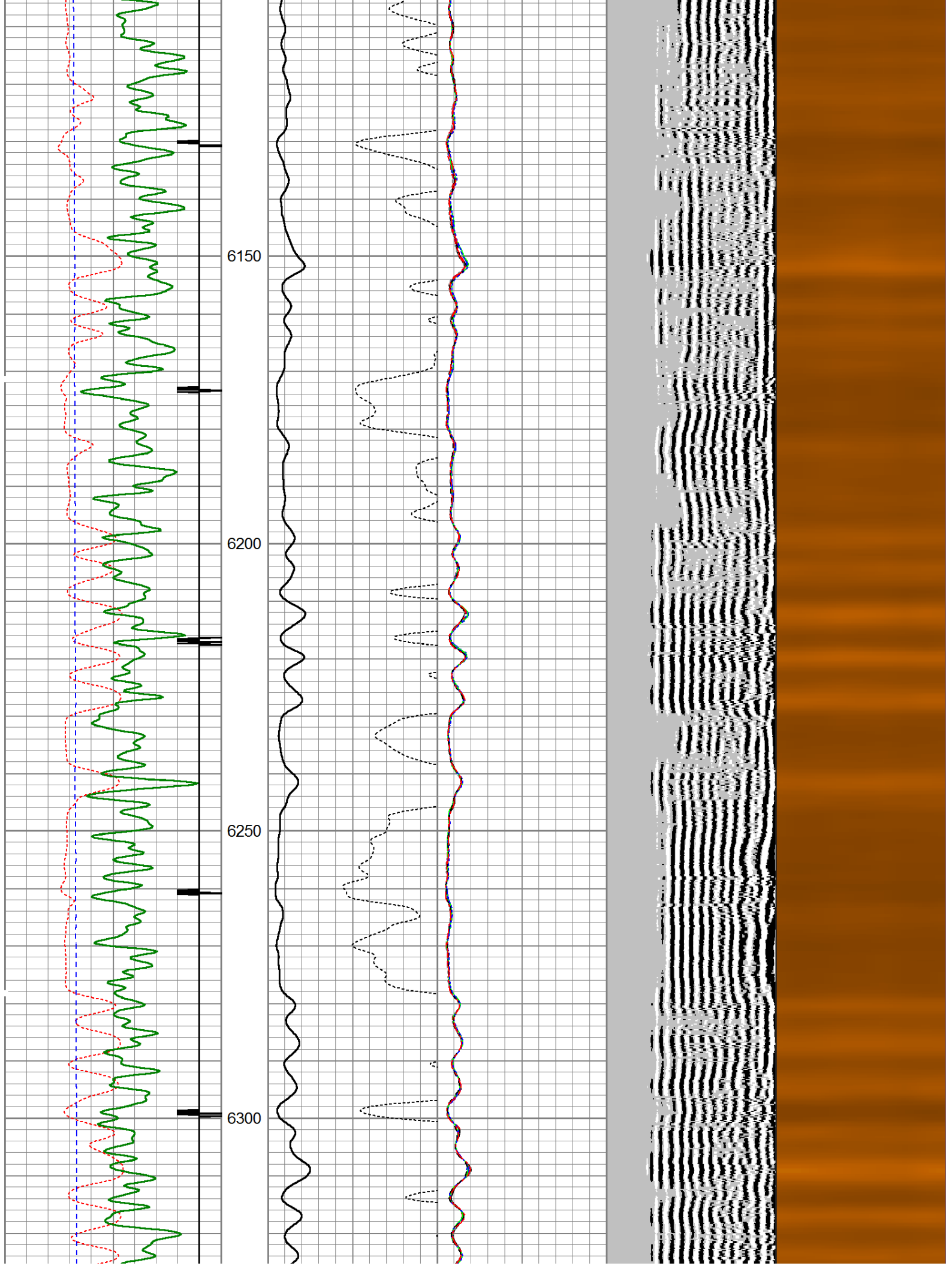


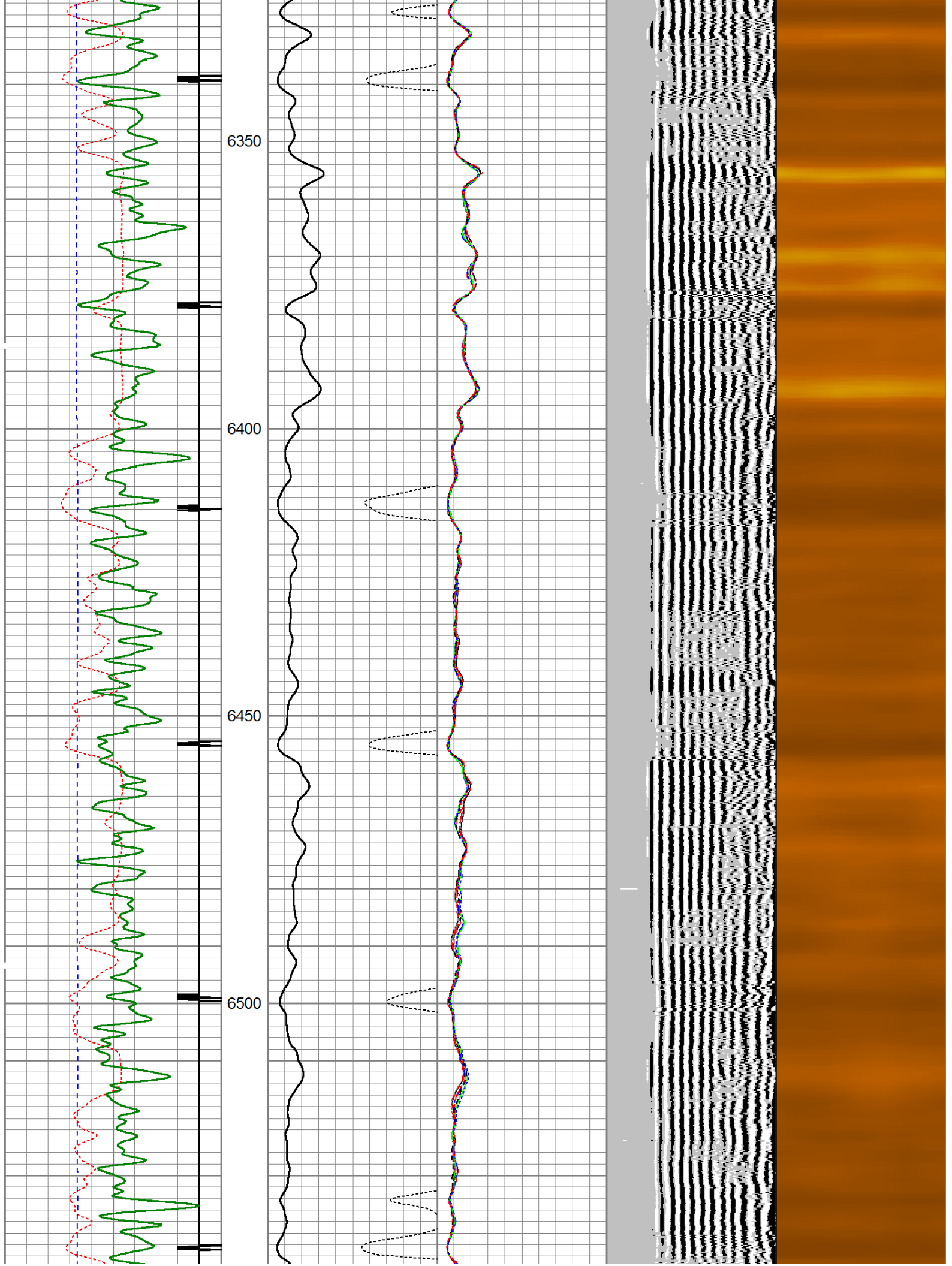


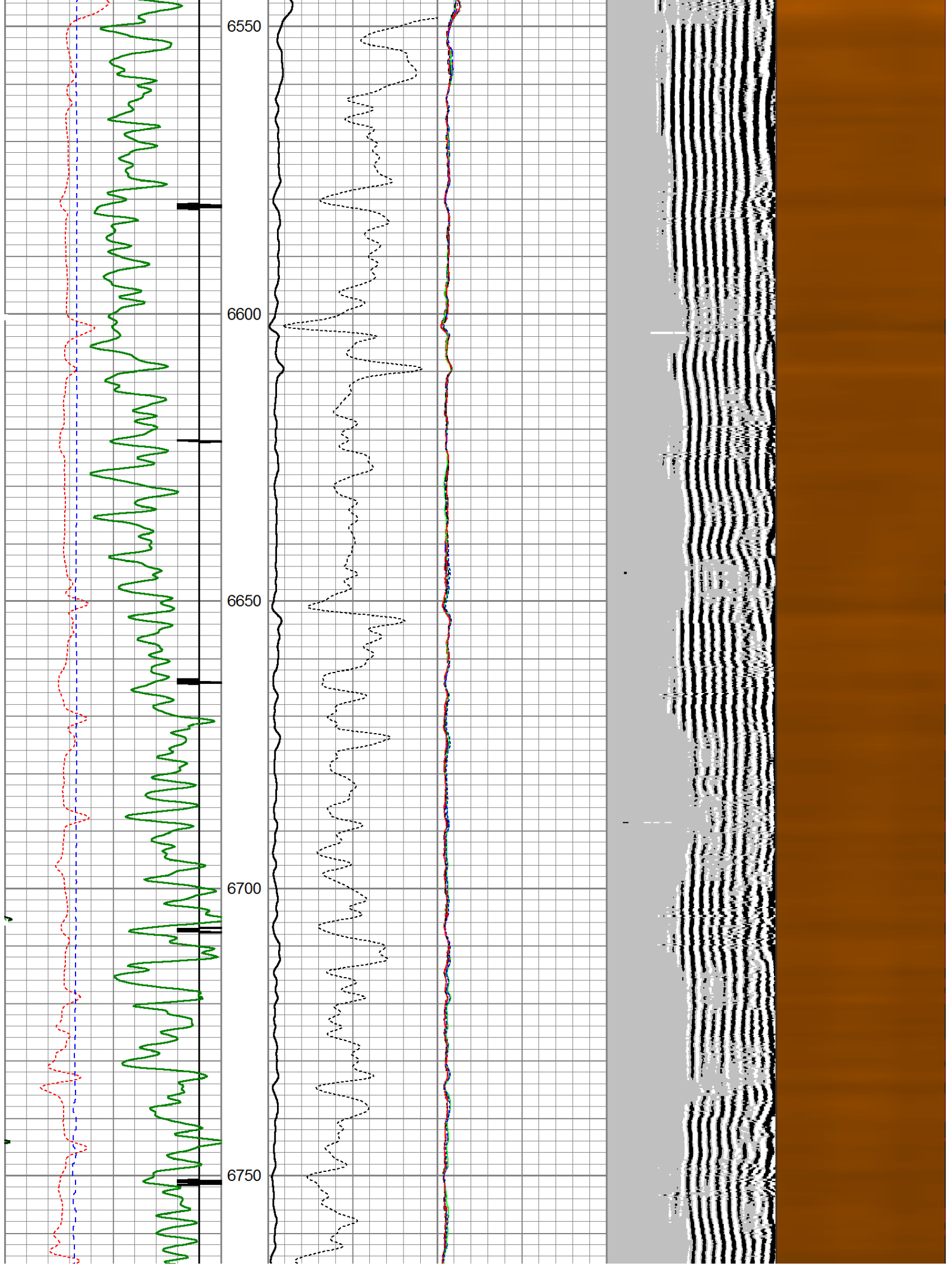


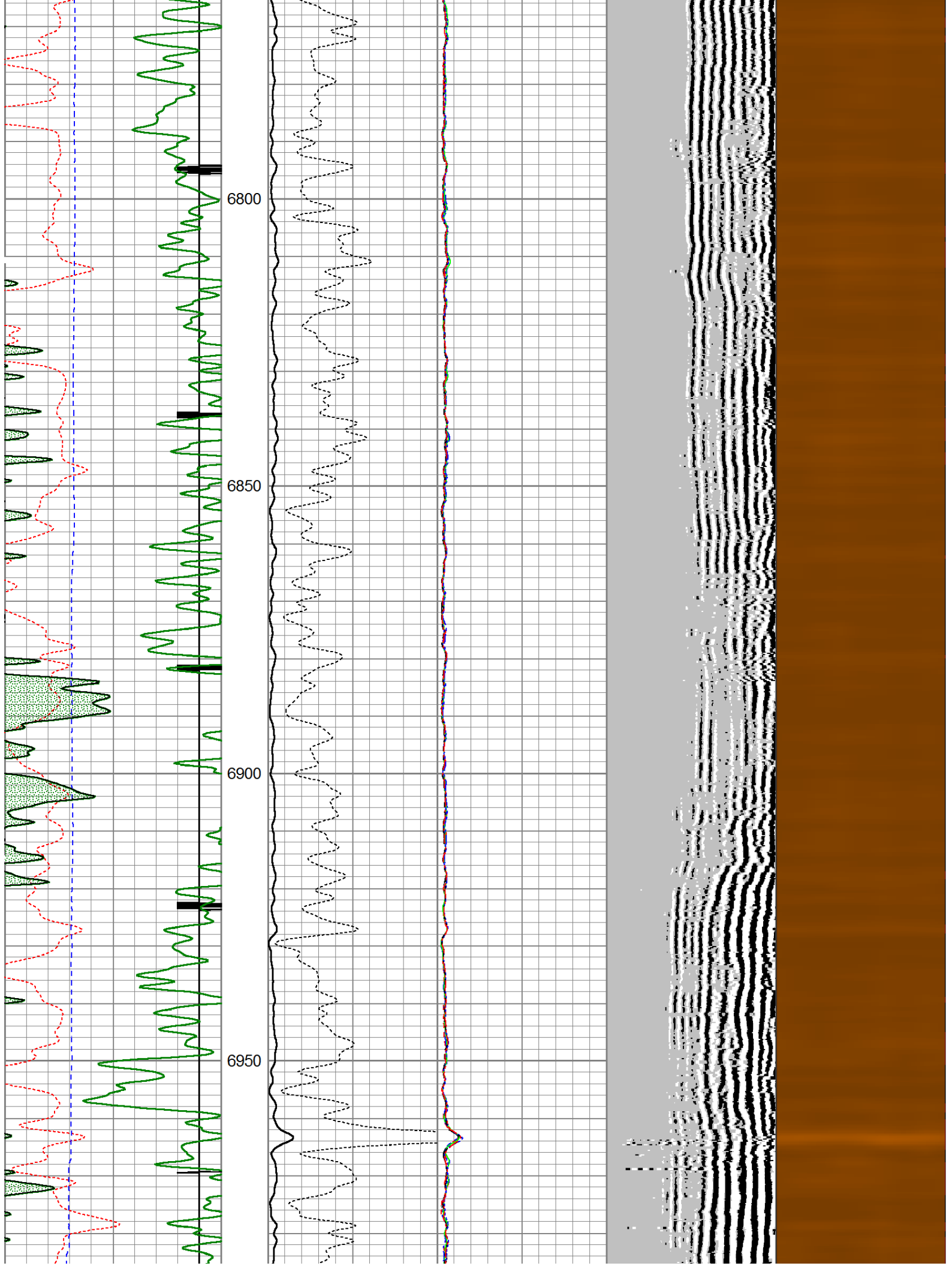


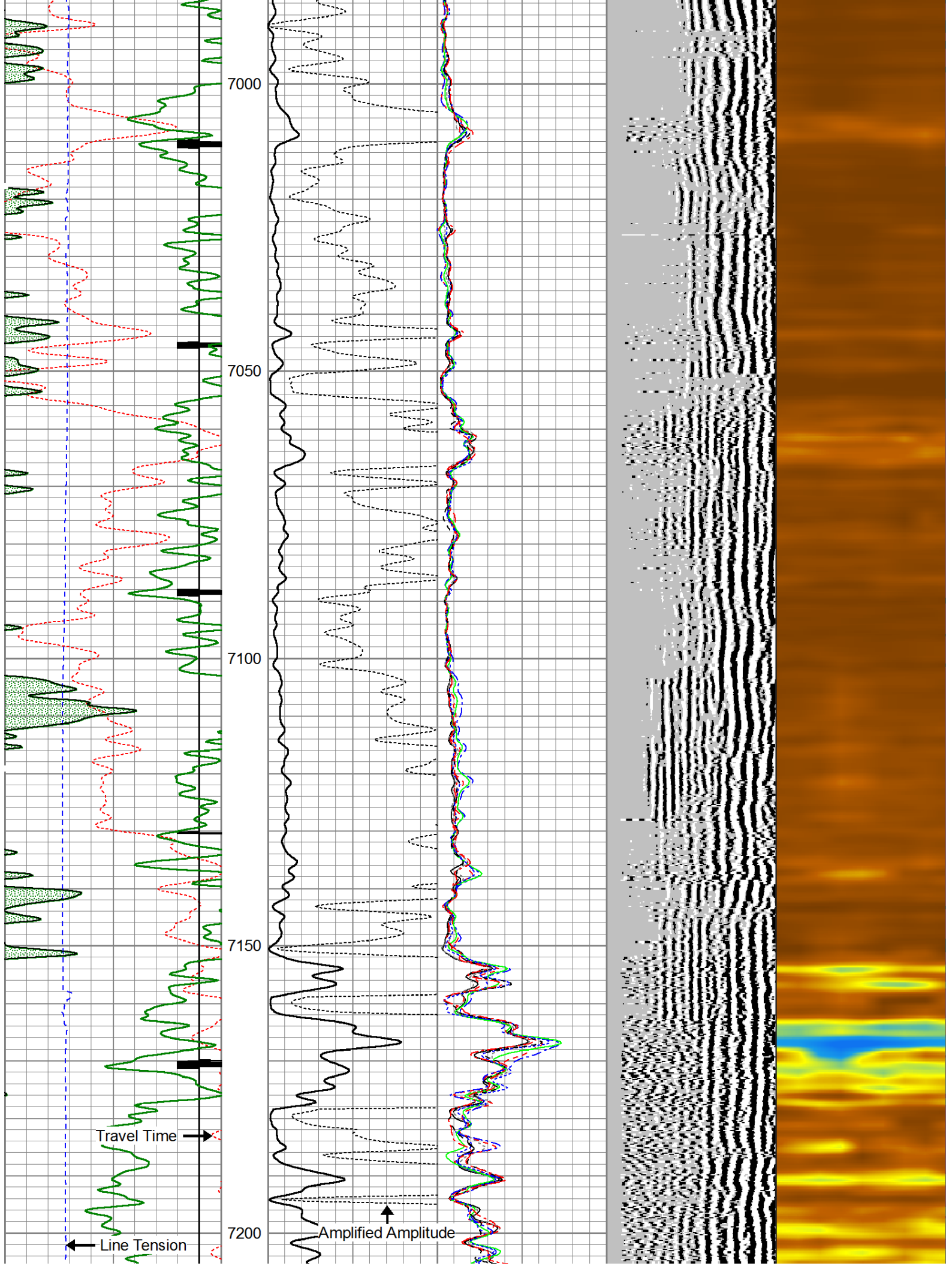


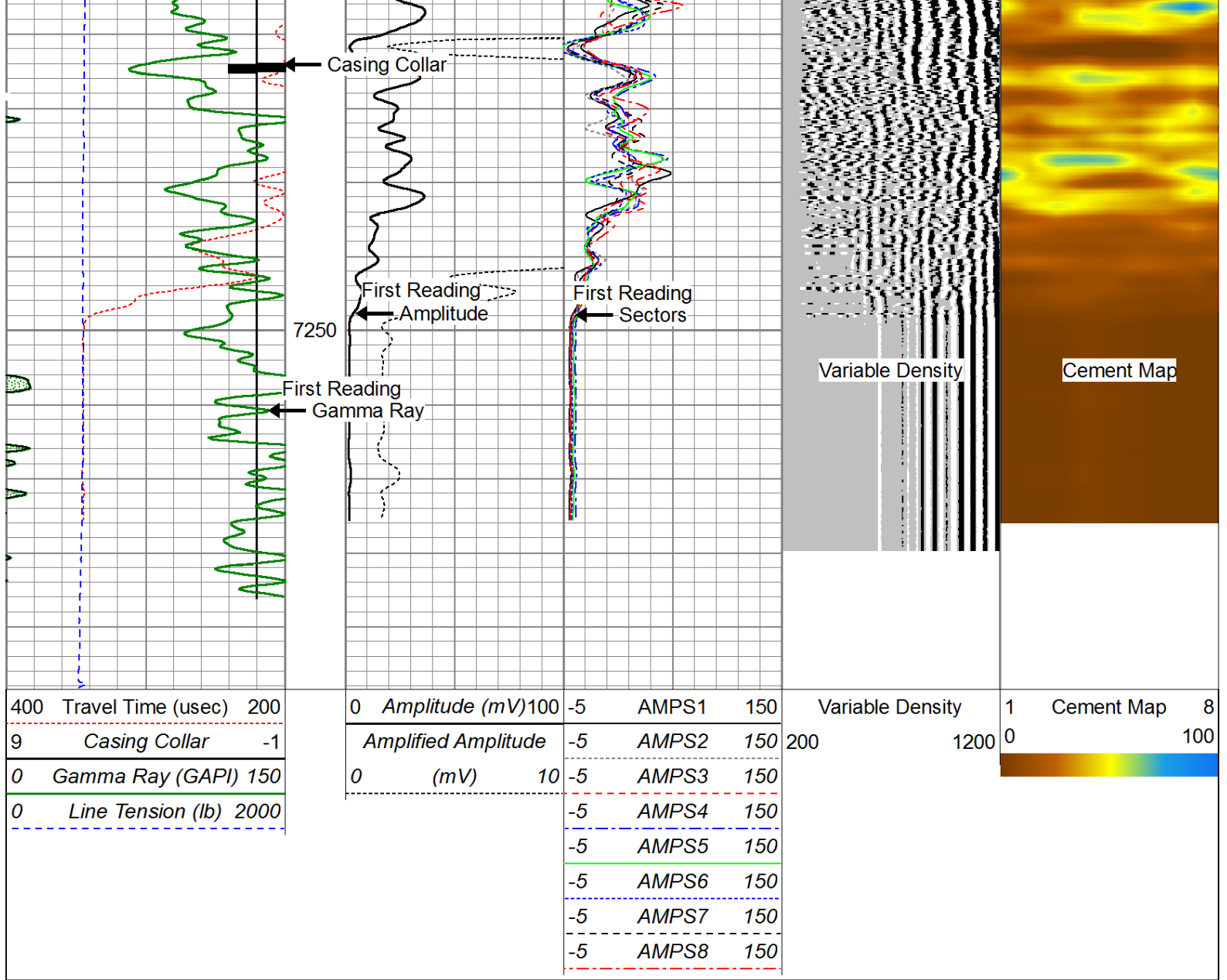






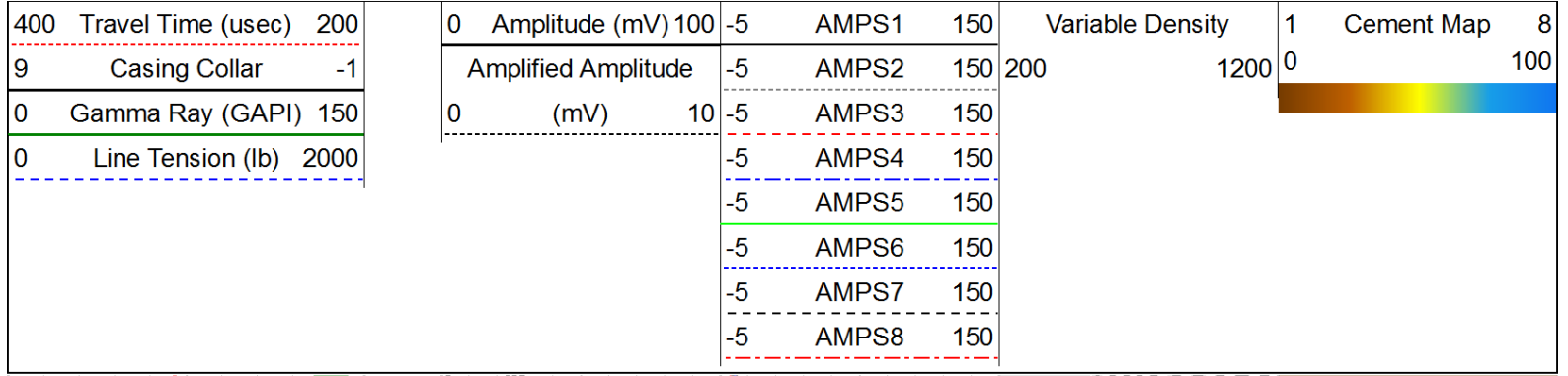


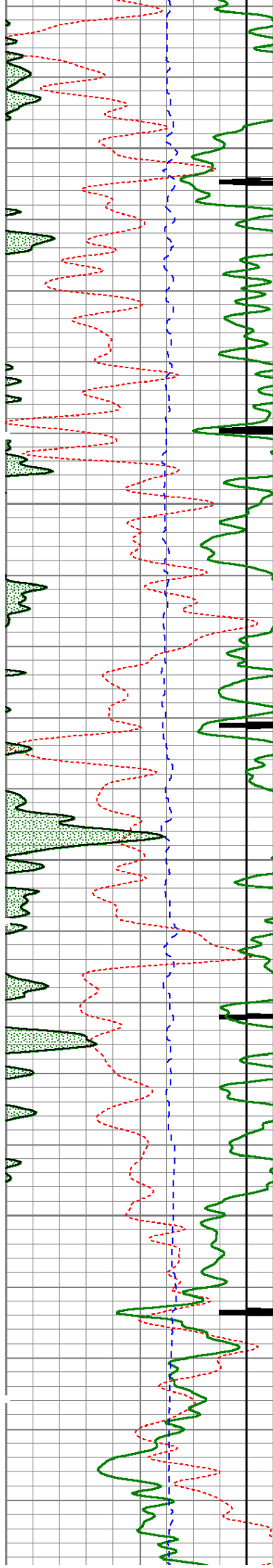




Repeat Pass (1700 PSI)

Database File: noble energy loeffler k01-66-1hn.db
 Dataset Pathname: pass2
 Presentation Format: scbl03
 Dataset Creation: Thu Dec 12 16:09:06 2013 by Log 0
 Charted by: Depth in Feet scaled 1:240



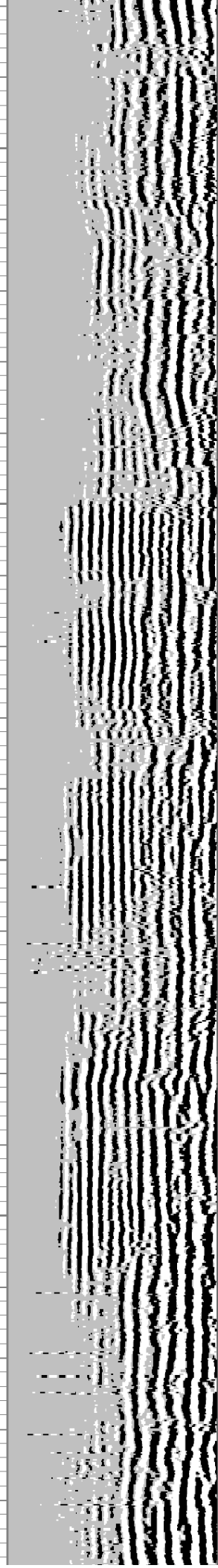
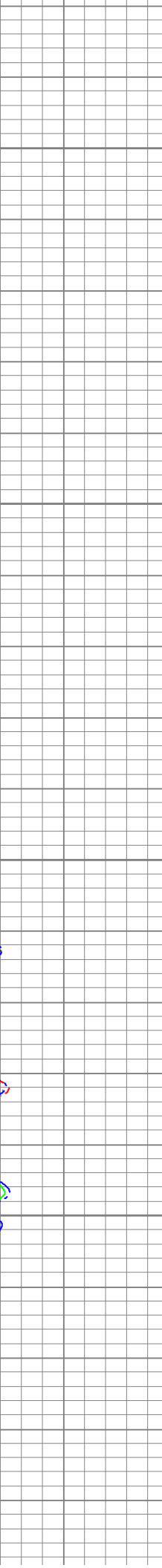
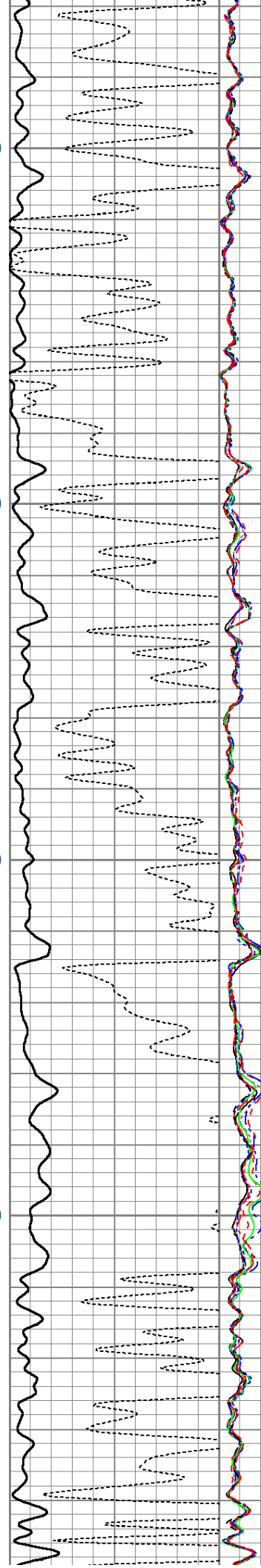


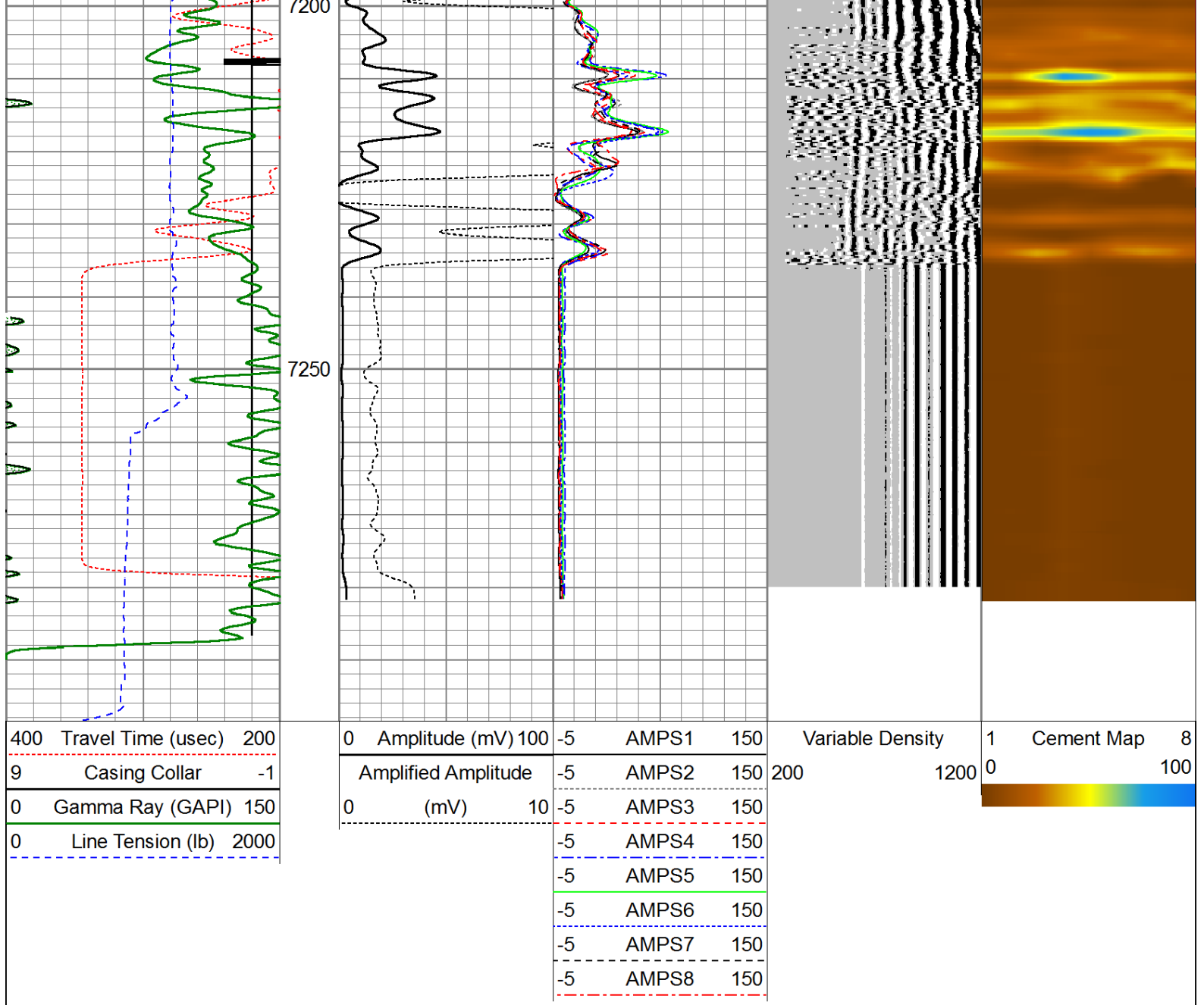
7000

7050

7100

7150





400	Travel Time (usec)	200
9	Casing Collar	-1
0	Gamma Ray (GAPI)	150
0	Line Tension (lb)	2000

0	Amplitude (mV)	100	-5	AMPS1	150
	Amplified Amplitude		-5	AMPS2	150
0	(mV)	10	-5	AMPS3	150
			-5	AMPS4	150
			-5	AMPS5	150
			-5	AMPS6	150
			-5	AMPS7	150
			-5	AMPS8	150

Variable Density	1	Cement Map	8
	0		100

Calibration Report

Database File: noble energy loeffler k01-66-1hn.db
 Dataset Pathname: pass1
 Dataset Creation: Thu Dec 12 15:02:12 2013 by Log 0

Gamma Ray Calibration Report

Serial Number: 110108-Dig
 Tool Model: Probe275
 Performed: Fri Nov 29 14:39:10 2013

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps
 Calibrator Reading: 1.0 cps

Sensitivity: 0.8500 GAPI/cps

Temperature Calibration Report

Serial Number: 110108-Dig
 Tool Model: Probe275
 Performed: Sun Jun 13 13:33:21 1993

	Reference	Reading
Low Reference:	0.00 degF	0.00 cps
High Reference:	1.00 degF	1.00 cps
Gain:	1.00	
Offset:	0.00	
Delta Spacing	2	

Segmented Cement Bond Log Calibration Report

Serial Number: 101225
Tool Model: Probe
Calibration Casing Diameter: 7.000 in
Calibration Depth: 479.253 ft

Master Calibration, performed Thu Dec 12 12:57:51 2013:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.005	0.627	1.000	62.165	135.677	3.554
CAL	-0.030	0.868				
5'	-0.020	0.605	1.000	62.165	97.820	2.974
SUM						
S1	-0.004	0.719	0.000	100.000	128.334	0.496
S2	-0.013	0.650	0.000	100.000	140.888	1.940
S3	-0.016	0.574	0.000	100.000	159.579	2.656
S4	-0.018	0.528	0.000	100.000	173.090	3.306
S5	-0.016	0.565	0.000	100.000	162.115	2.778
S6	-0.018	0.653	0.000	100.000	139.100	2.610
S7	-0.012	0.735	0.000	100.000	123.769	1.617
S8	-0.015	0.705	0.000	100.000	128.913	2.093

Internal Reference Calibration, performed Mon Oct 10 09:42:03 2005:

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	-0.030	0.868	1.000	0.000

Air Zero Calibration, performed Thu Dec 05 13:36:03 2013:

	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

Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
			Titan	1.00	1.44	10.00

			Cable_head			
			Probe275 2.75" Centralizer	2.88	2.75	20.00
			RBT-Probe (101225) Probe Radii Bond Tool with Digital Telemetry	8.75	2.75	90.00
WVF3FT	19.72					
WVFCAL	19.72					
WVFS1	19.72					
WVFS2	19.72					
WVFS3	19.72					
WVFS4	19.72					
WVFS5	19.72					
WVFS6	19.72					
WVFS7	19.72					
WVFS8	19.72					
WVF5FT	18.72		Probe275 2.75" Centralizer	2.88	2.75	20.00
CCL	11.75					
TEMP	10.88					
GR	10.42		GR-Probe275 (110108-Dig) Probe 2 3/4" Logging Gamma Ray	4.78	2.75	57.00
			Probe275 2.75" Centralizer	2.88	2.75	20.00
			A Sinker Bar	5.00	2.75	50.00

Dataset: noble energy loeffler k01-66-1hn.db: field/well/run1/pass1
 Total Length: 28.16 ft
 Total Weight: 267.00 lb
 O.D.: 2.75 in