



Radial Cement Bond
Variable Density Log
W/ Temp/GammaRay/CCL

Company Antero Resources

Well Rockies 1H

Field North Canton

County Tyler State West Virginia

Location: SEC N/A TWP N/A RGE N/A
39.403892 -80.787906
API #: 47095026580000
Other Services N/A

Company Antero Resources
Well Rockies 1H
Field North Canton
County Tyler
State West Virginia

Permanent Datum Ground Level Elevation
Log Measured From Kelly Bushing 25' A.P.D.
Drilling Measured From Kelly Bushing

Elevation
K.B.
D.F.
G.L.

Date 1-May-20

Run Number One

Depth Driller 18,601 ft.

Depth Logger 6,880 ft.

Bottom Logged Interval 6,880 ft.

Top Log Interval Surface

Open Hole Size n/a

Type Fluid Freshwater

Density / Viscosity n/a

Max. Recorded Temp. 165 deg F

Estimated Cement Top 5,574 ft.

Time Well Ready 07:00

Time Logger on Bottom 07:41

Equipment Number 132

Location Marietta, Ohio

Recorded By Tom Weese

Witnessed By Chris Young

Borehole Record		Tubing Record	
Run Number	Bit From To	Size	Weight From To

Casing Record		Mgt/Ft		Top		Bottom	
Surface String	Size	13 3/8 in.	54.5 #	Surface	434 ft.	Surface	3,068 ft.
Prot. String	9 5/8 in.		36 #	Surface		Surface	18,601 ft.
Production String	5 1/2		20 #	Surface		Surface	18,601 ft.
Liner							
Marker Joint				5,661 ft.			5,670 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

Primary Log on Well

Log Correlated to Marker Joint at (5,661' - 5,670')
Depth Correction (-10)


Main Pass 0 PSI
Repeat Pass 0 PSI

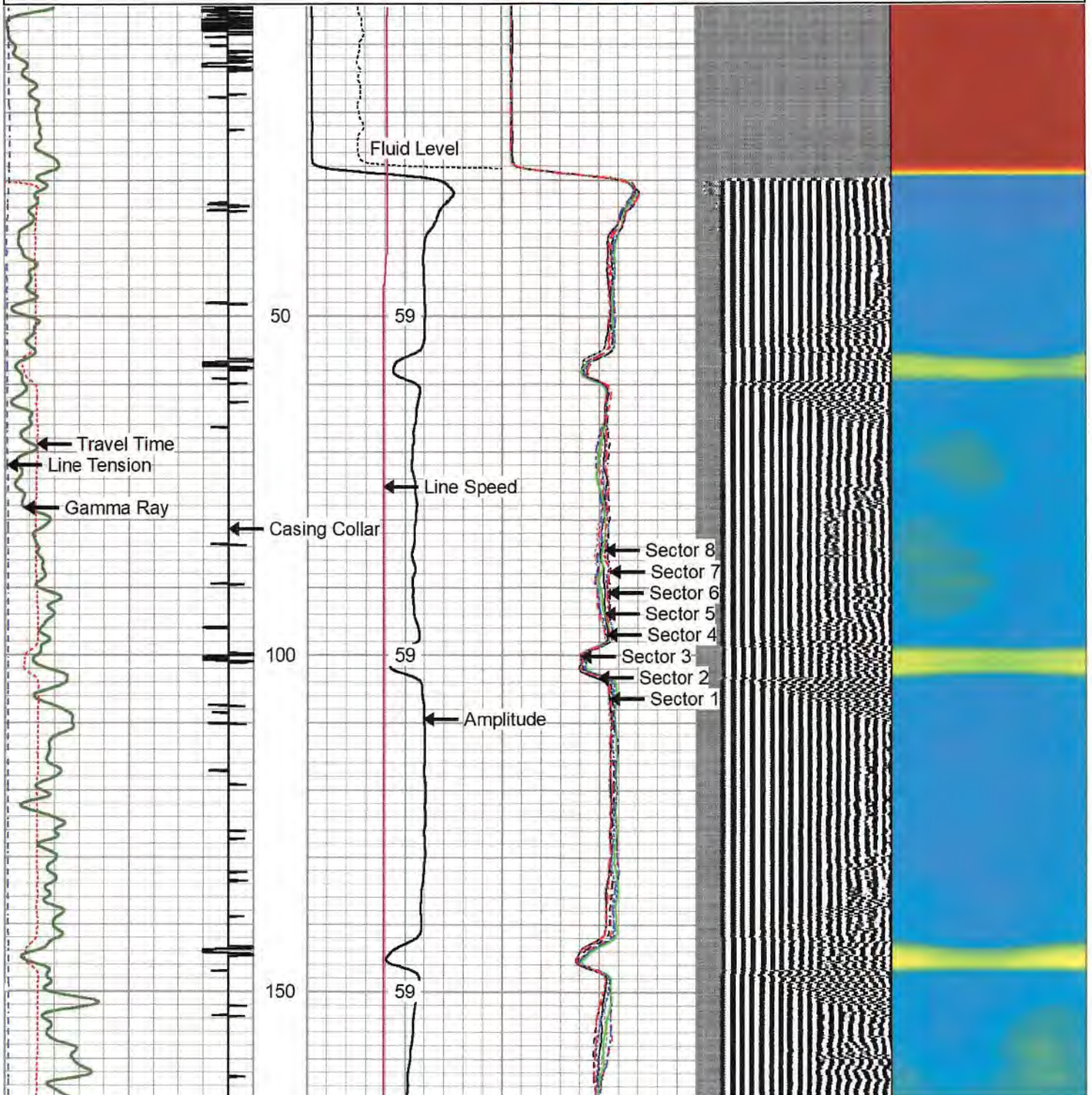
Thank You For Using Nine Energy Wireline of Marietta, Ohio

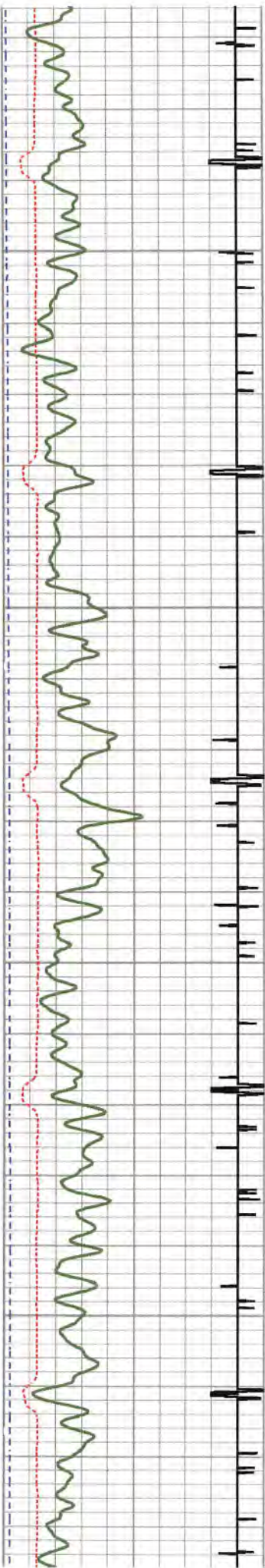


Main Pass 0 PSI

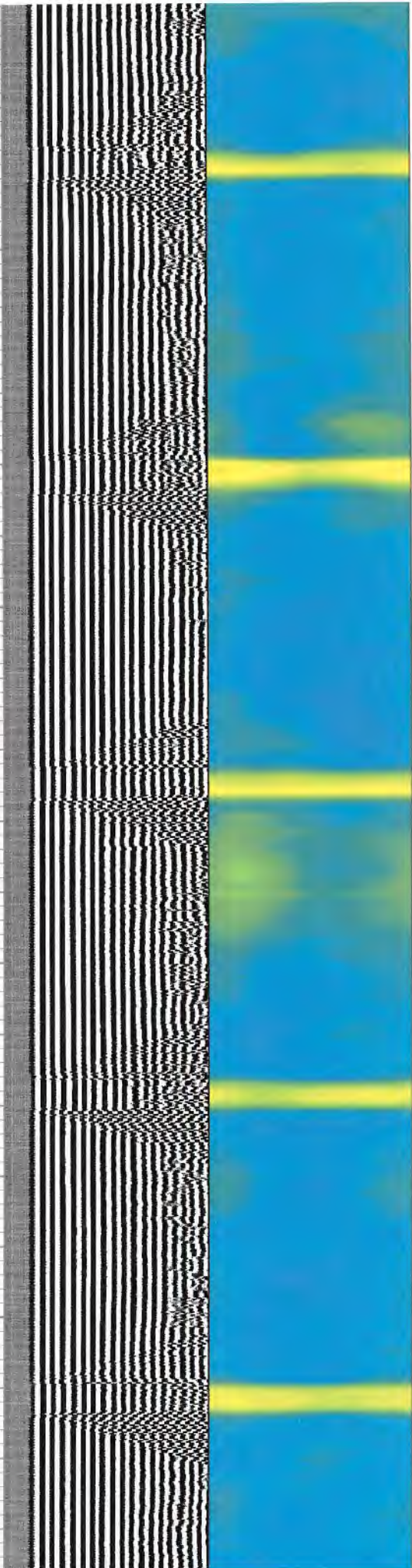
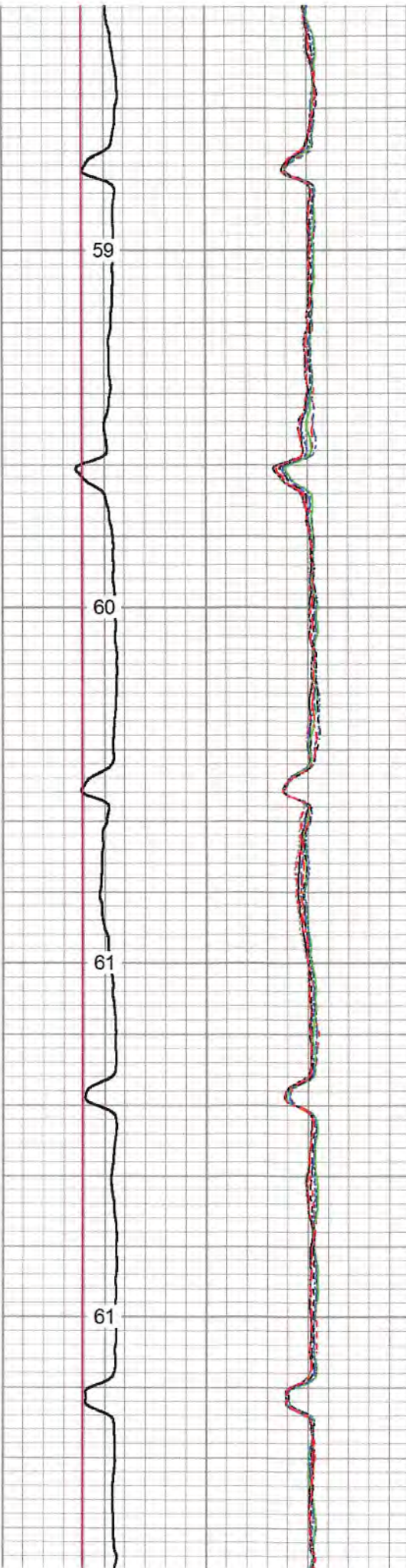
Database File antero_coloradowest_rockies_1h_rcbl_nineenergy_may_1_2020.db
 Dataset Pathname Marcellus/Rockies_1H/RCBL_1/pass4.2
 Presentation Format 9rcbl
 Dataset Creation Fri May 01 08:52:55 2020
 Charted by Depth in Feet scaled 1:240

270	Travel Time (usec)	200	0	Amplitude (mV)	100	-5	Sector 1	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	Amplified Amplitude		-5	Sector 2	150	200	(usec)	1200		
0	Gamma Ray (GAPI)	150	0	(mV)	10	-5	Sector 3	150				
0	Line Tension (lb)	5000	Line Speed		-5	Sector 4	150					
			-500	(ft/min)	500	-5	Sector 5	150				
			TEMP		-5	Sector 6	150					
			(degF)		-5	Sector 7	150					
					-5	Sector 8	150					

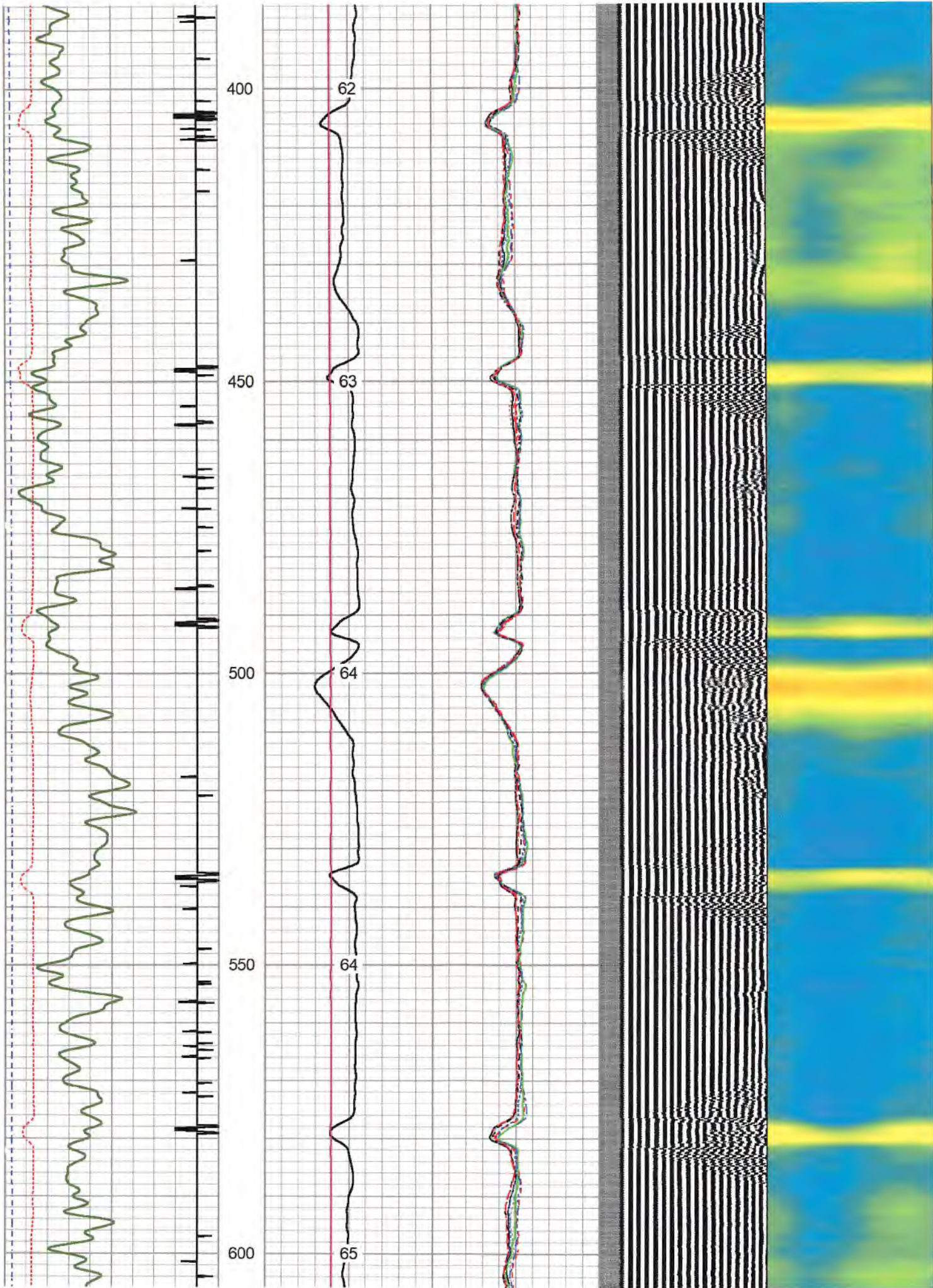


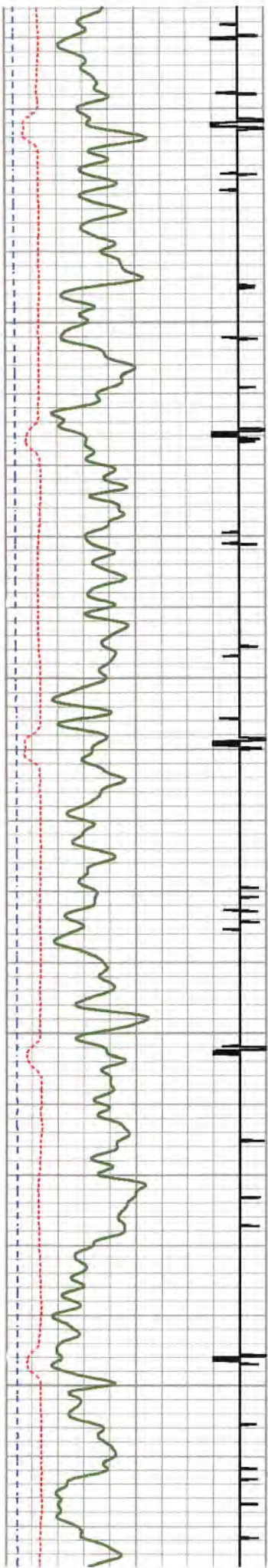


200
250
300
350



59
60
61
61



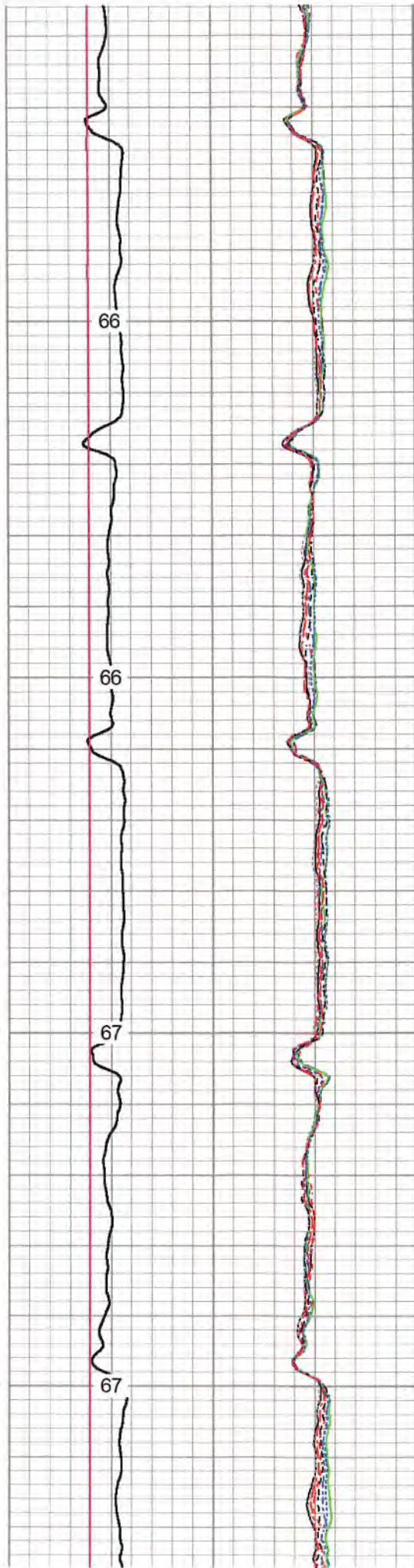


650

700

750

800

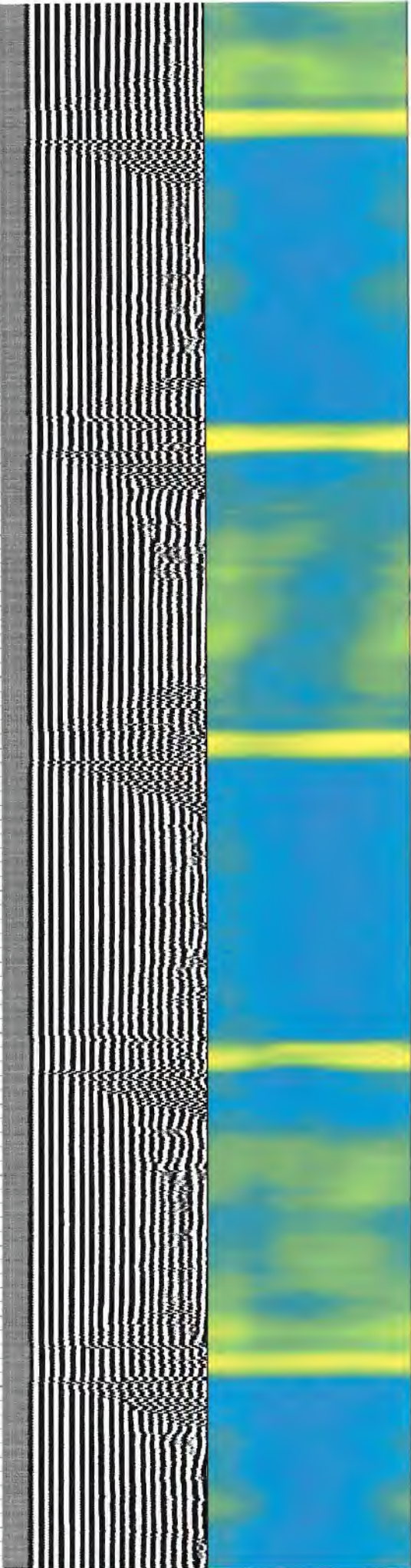


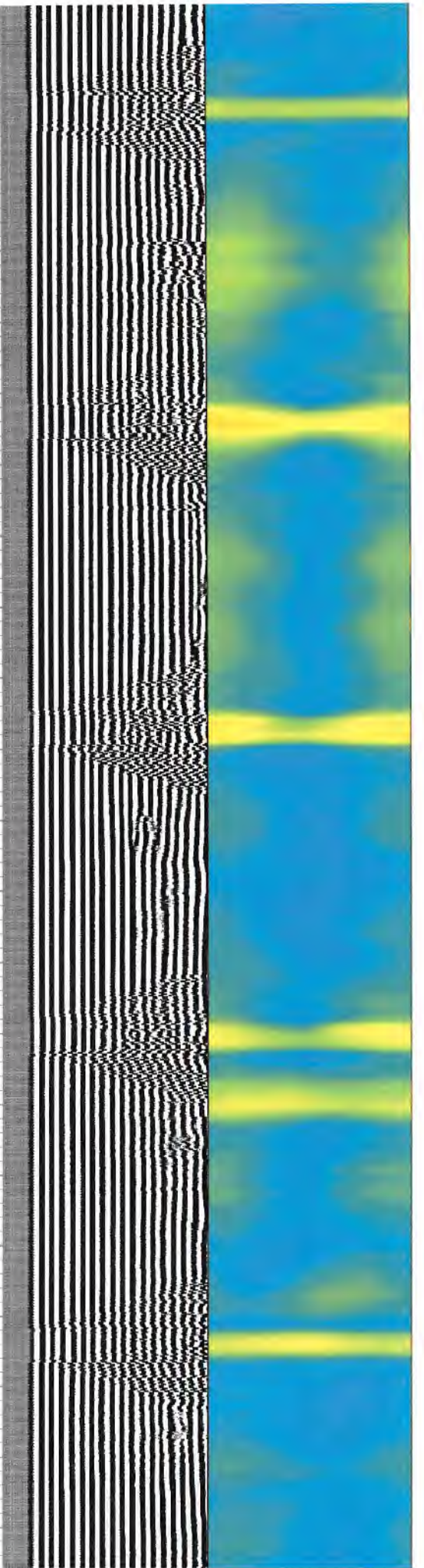
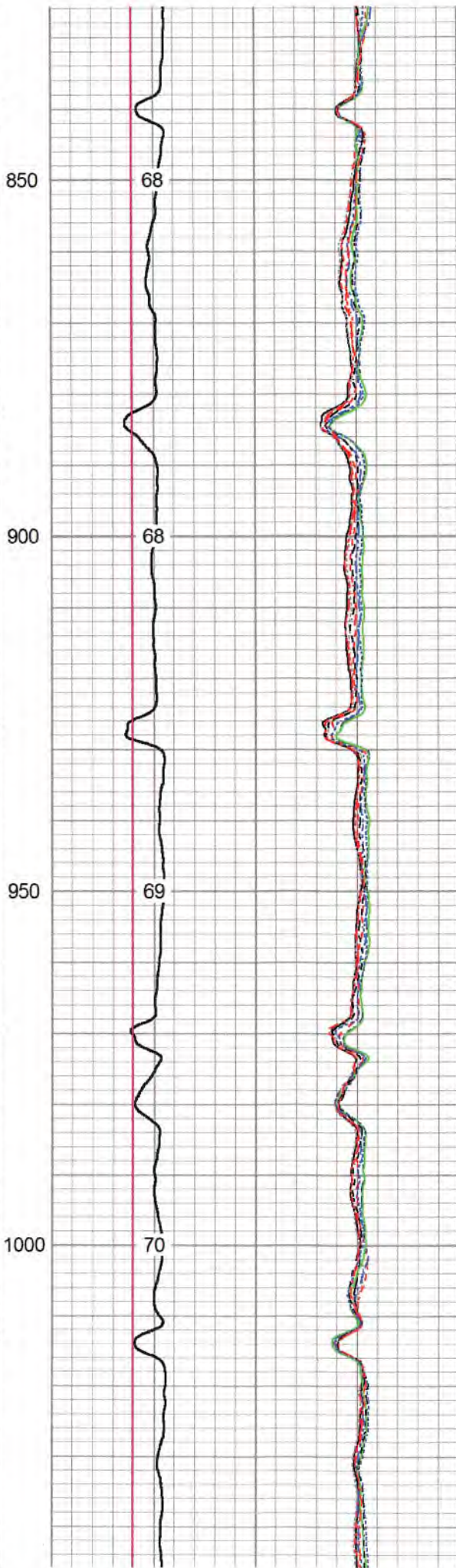
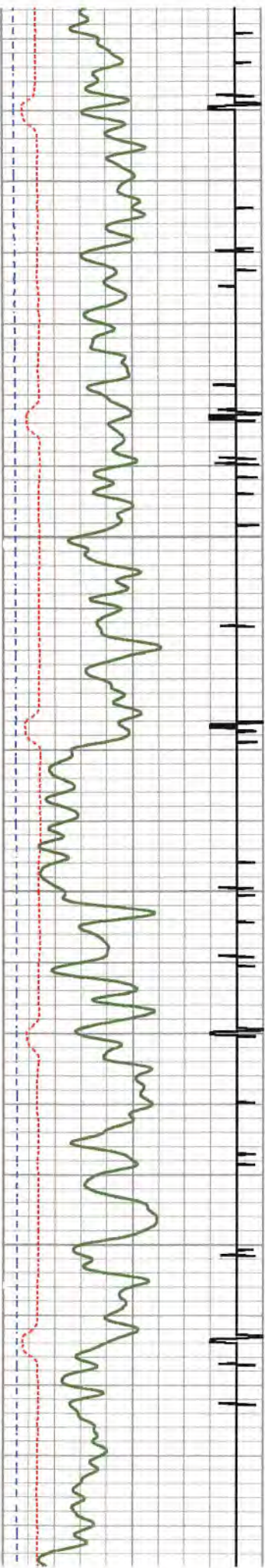
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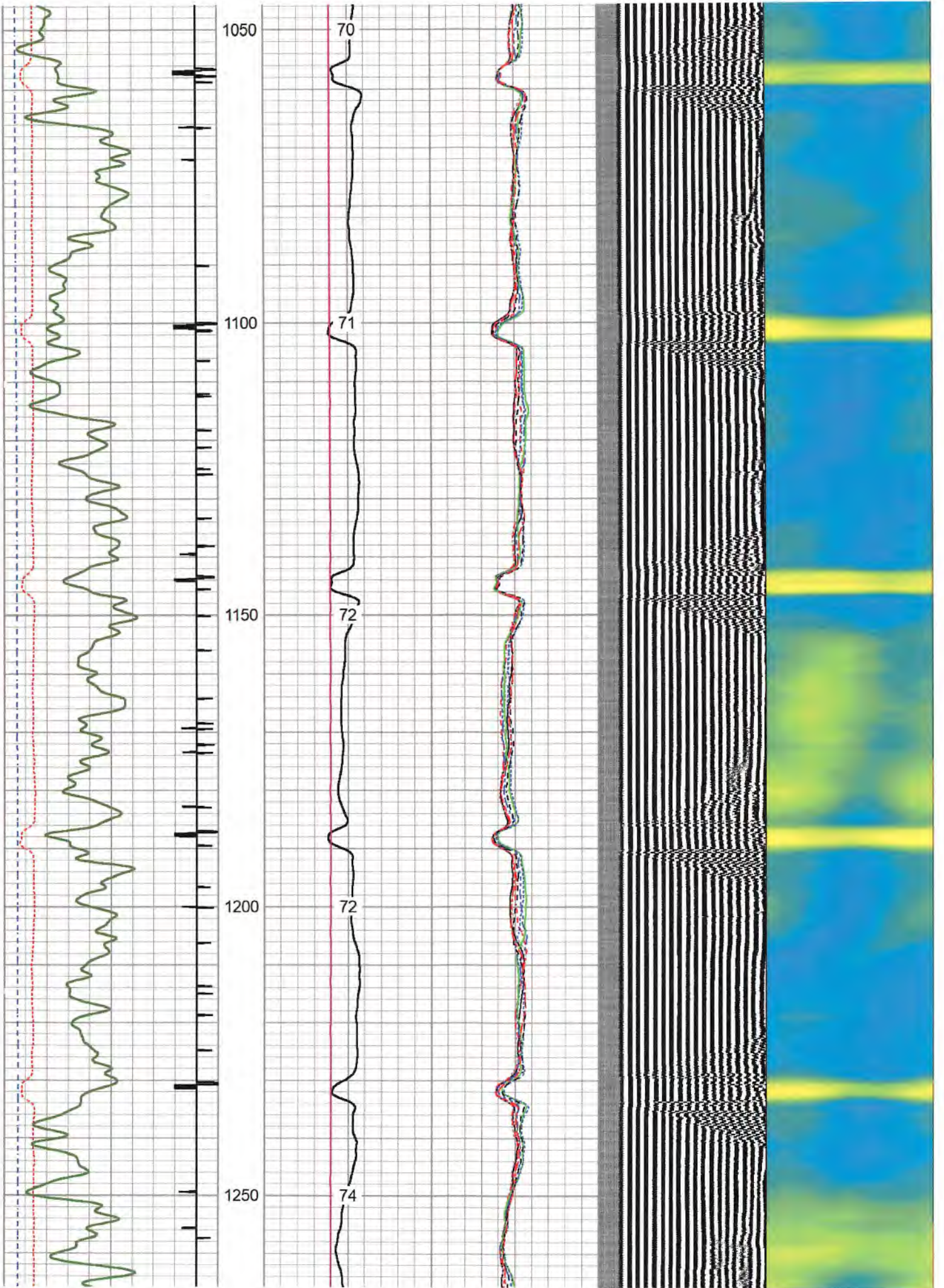
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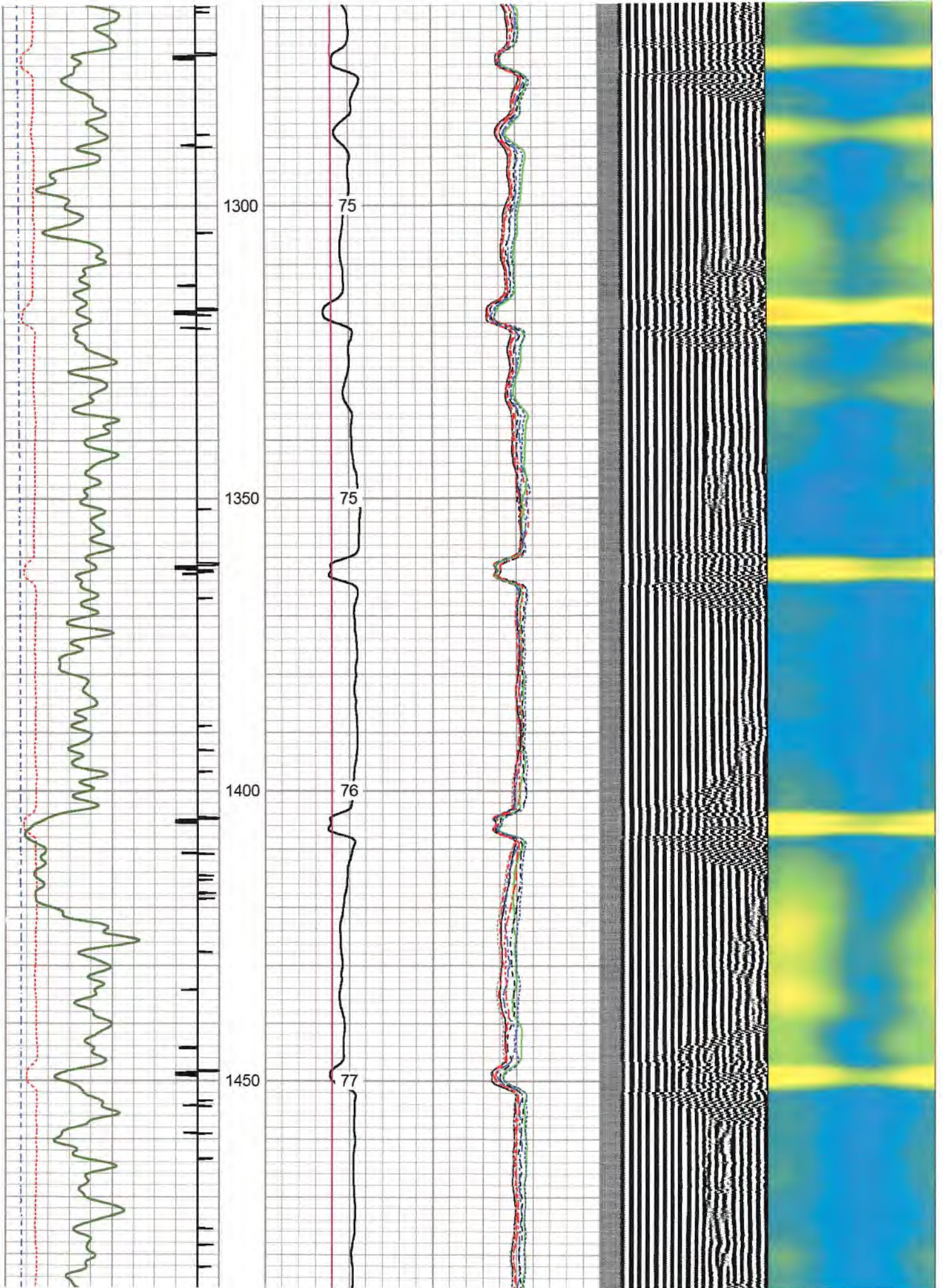
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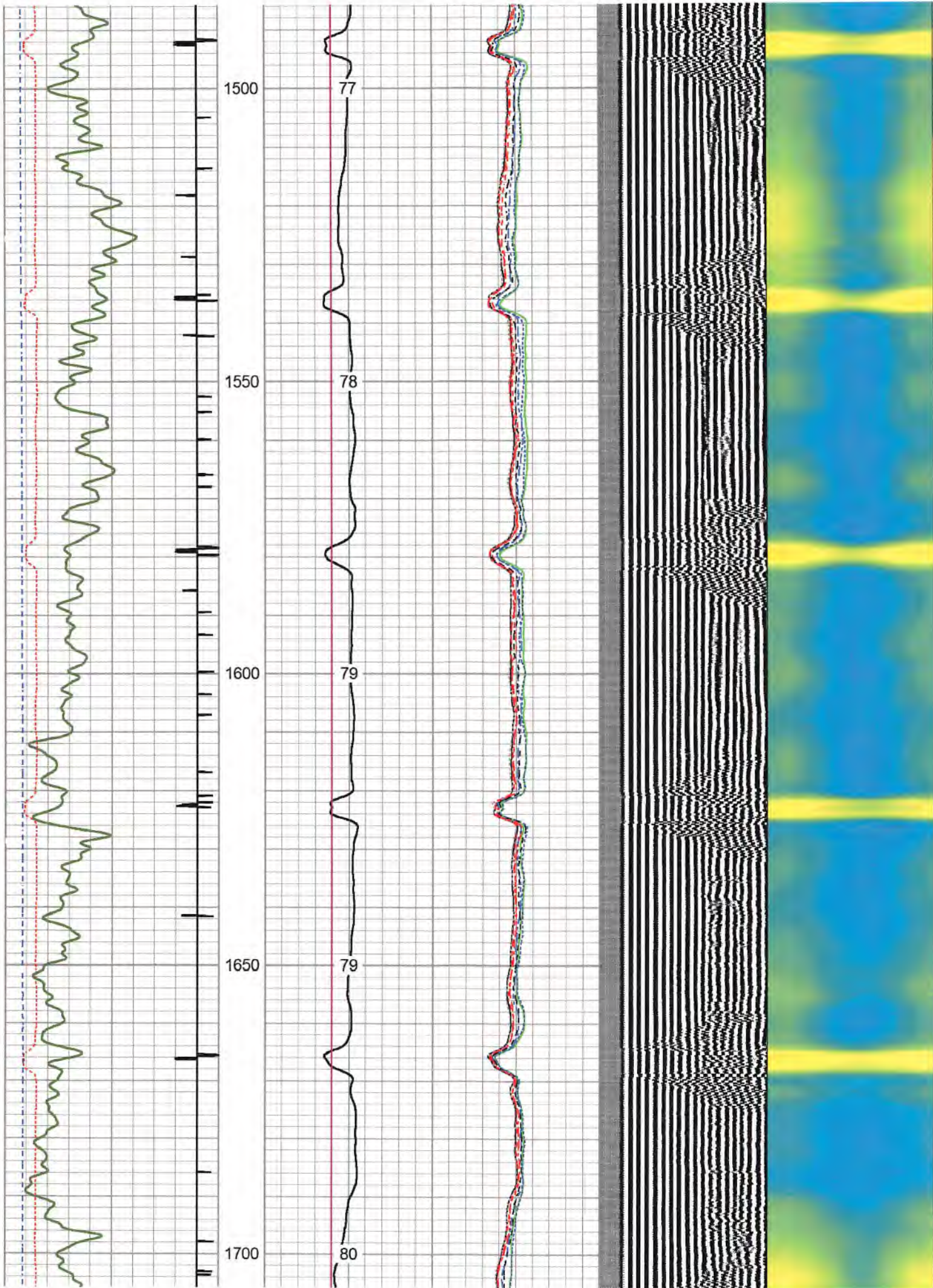
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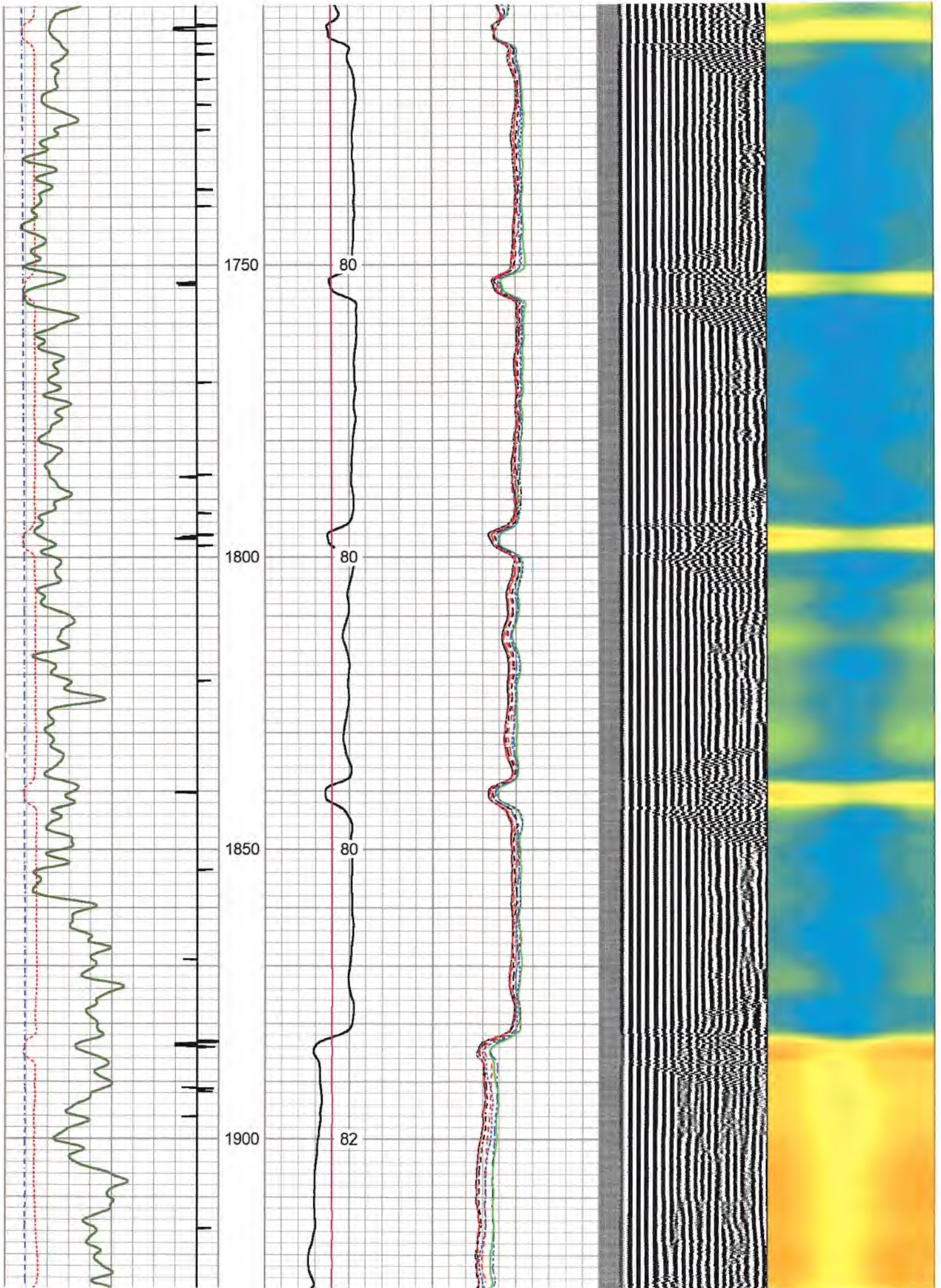


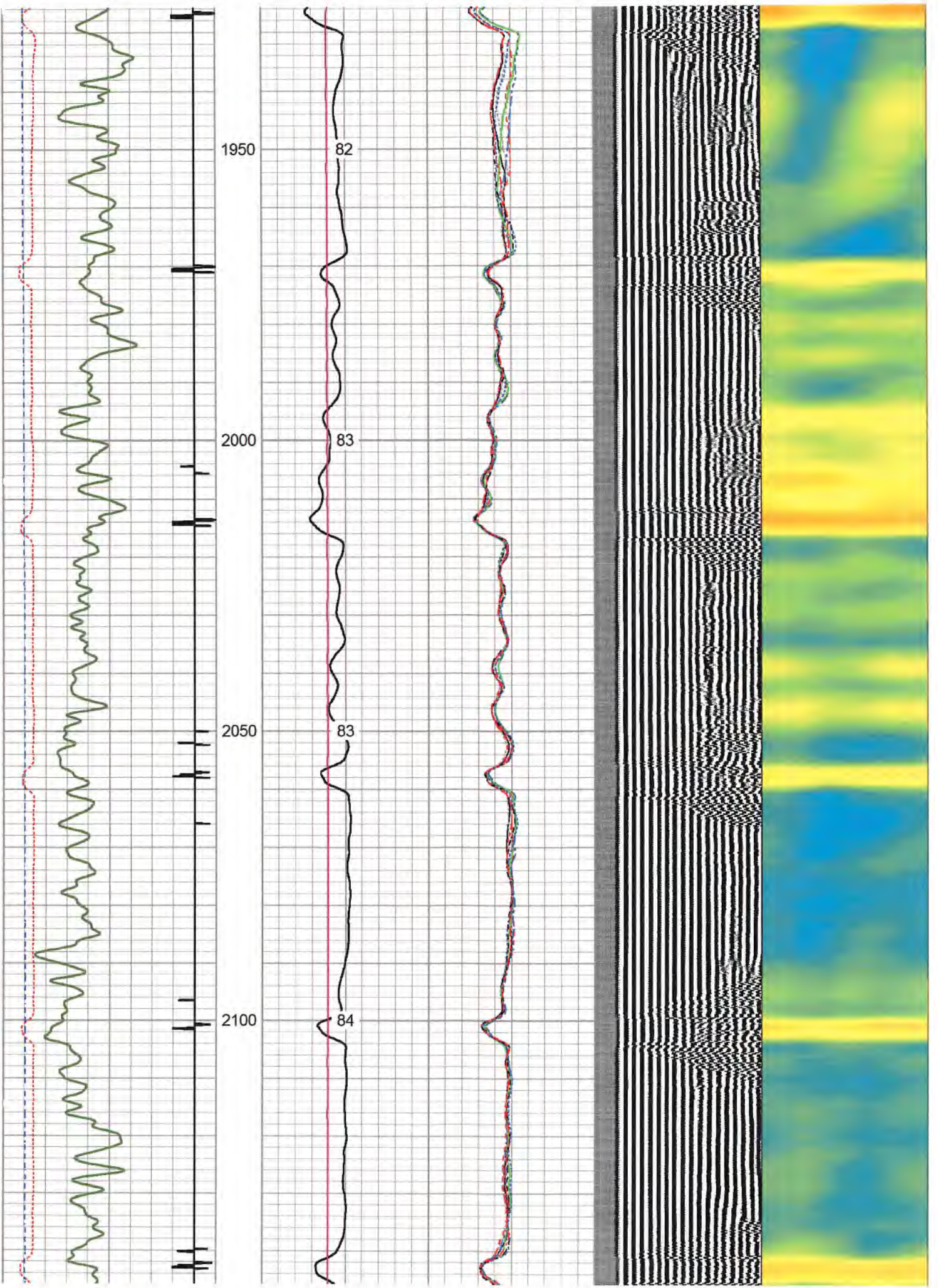


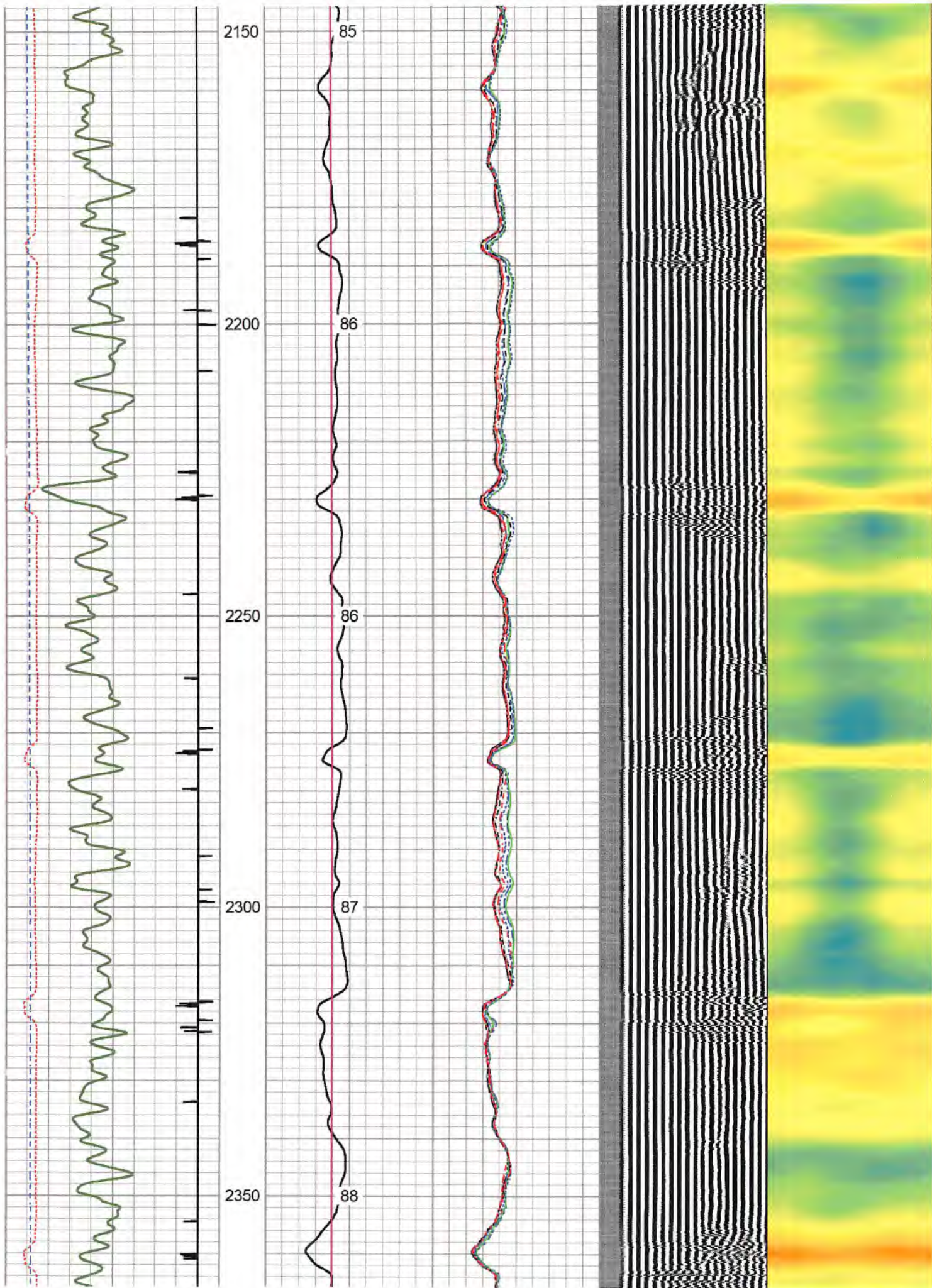


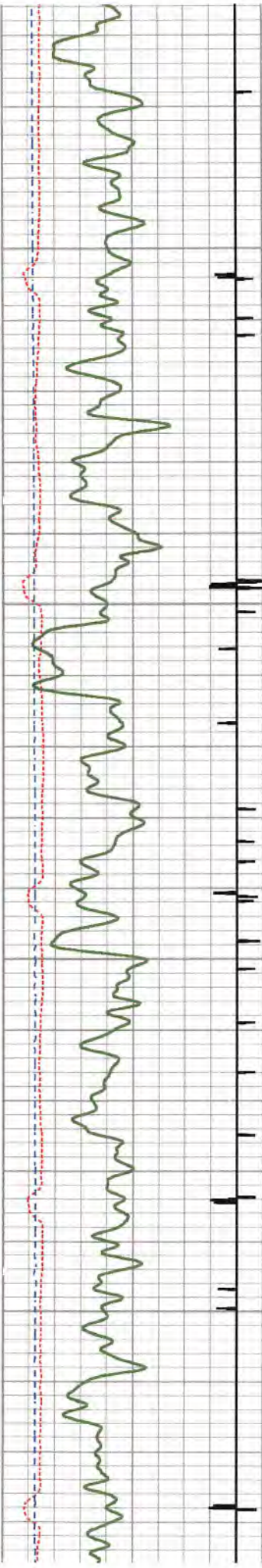












2400

2450

2500

2550

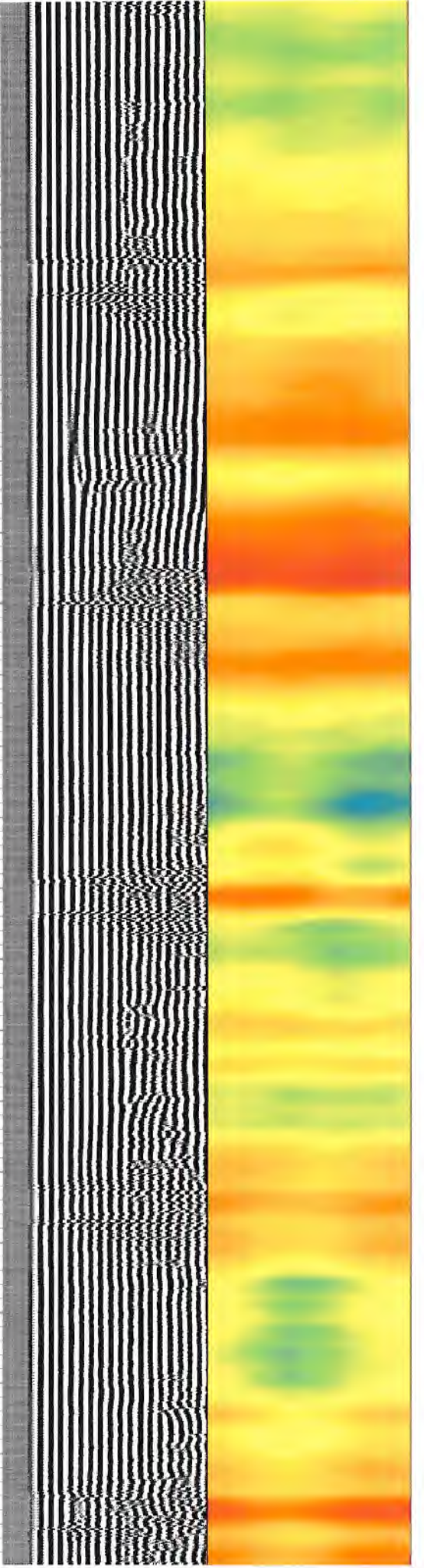


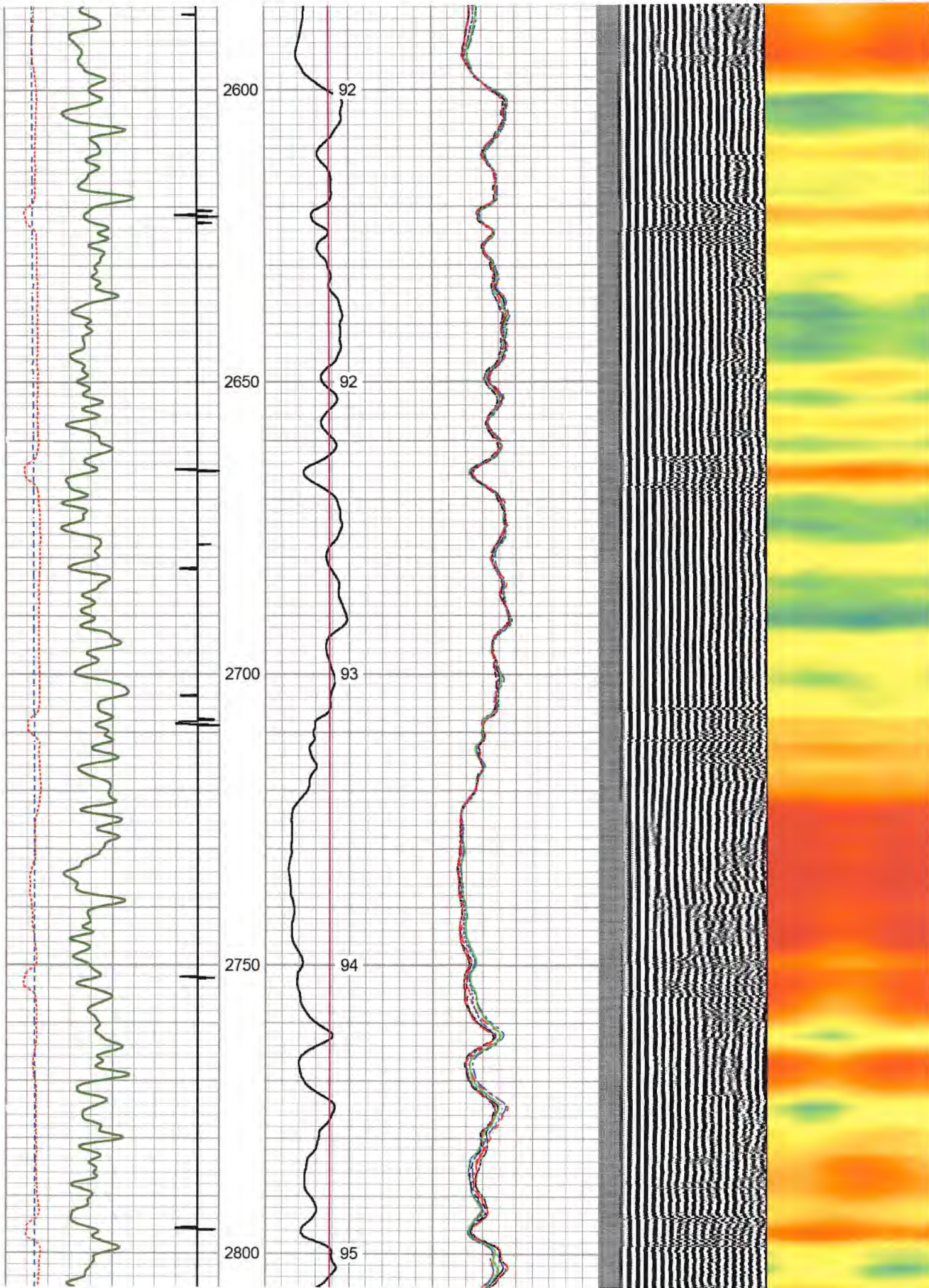
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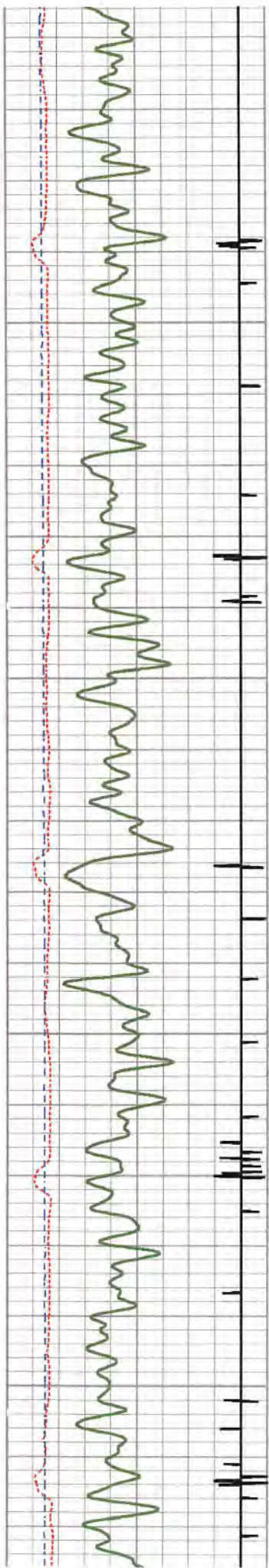
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90

91





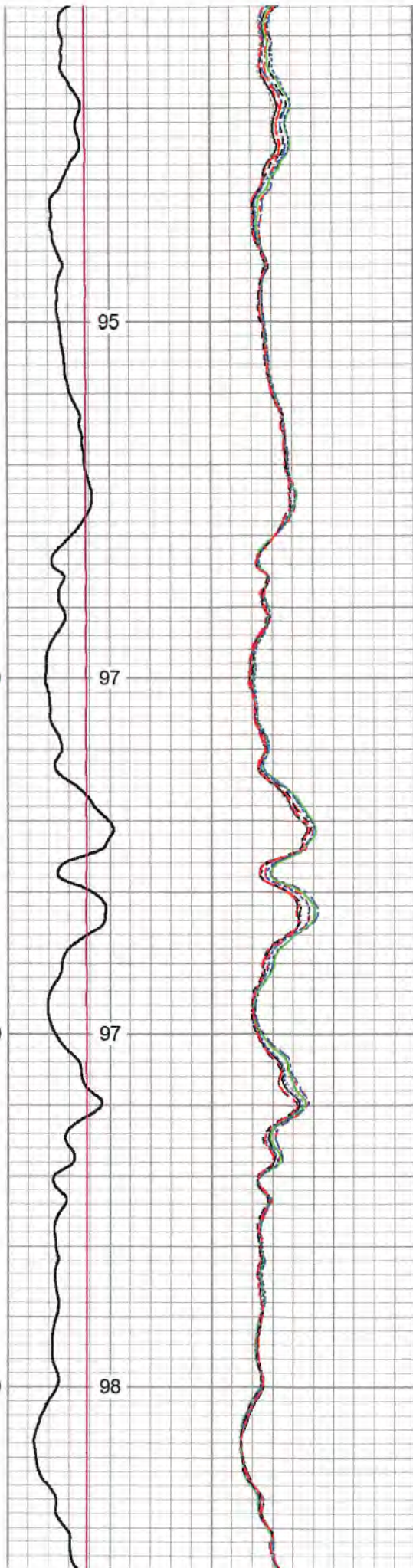


2850

2900

2950

3000

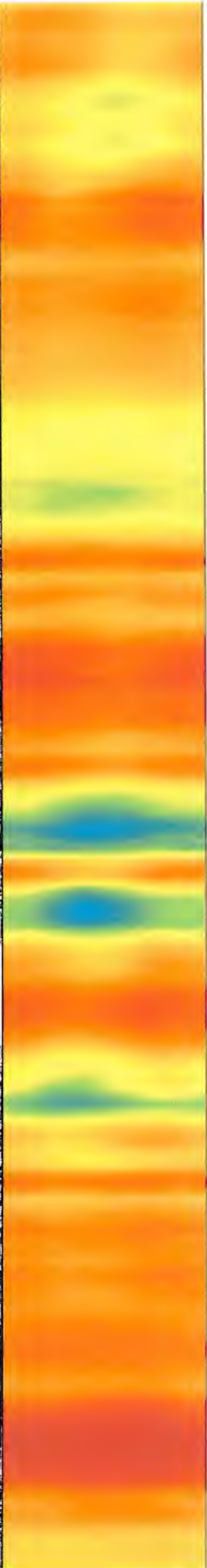
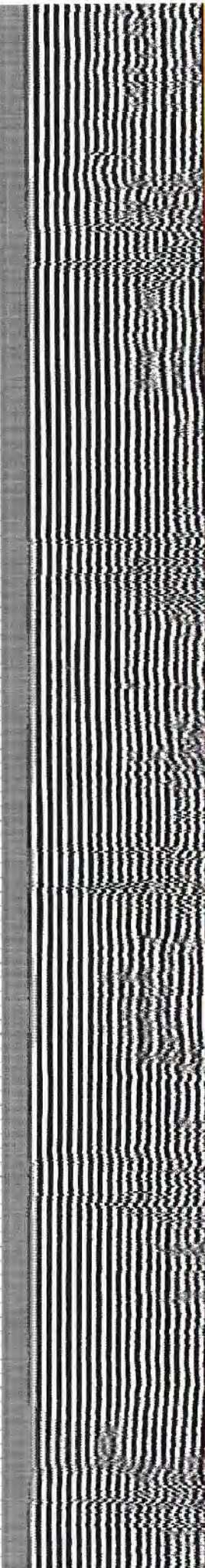


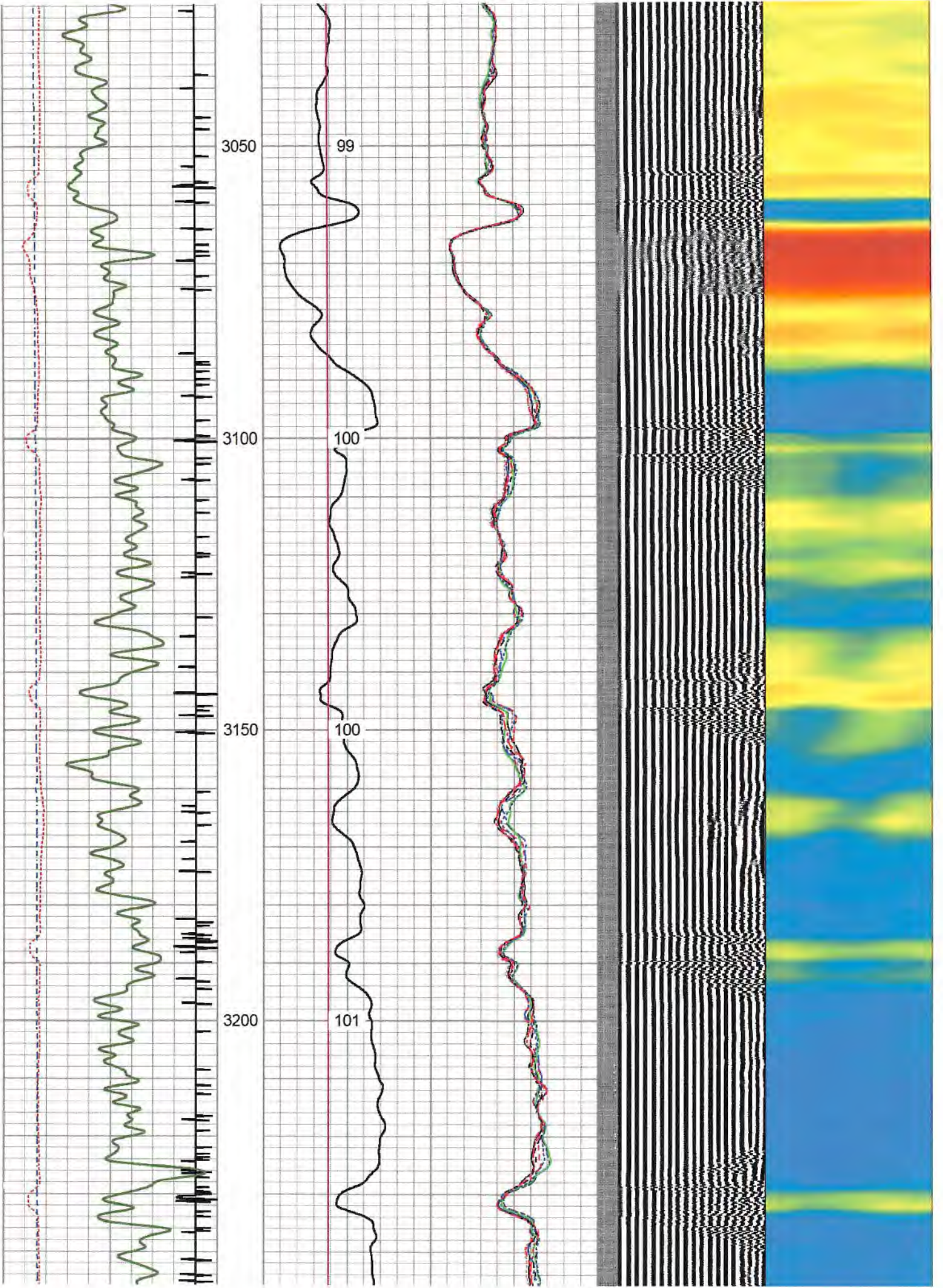
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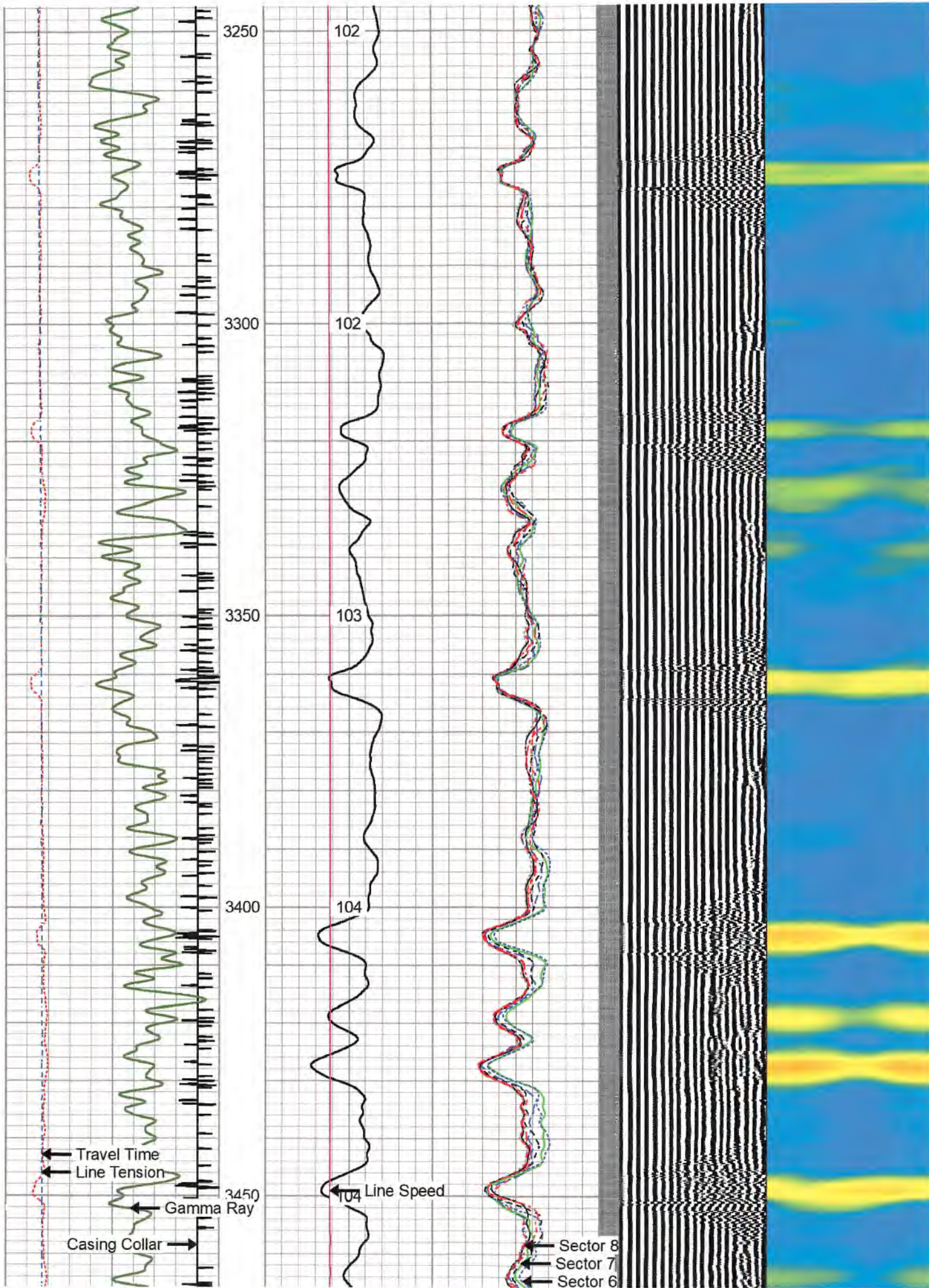
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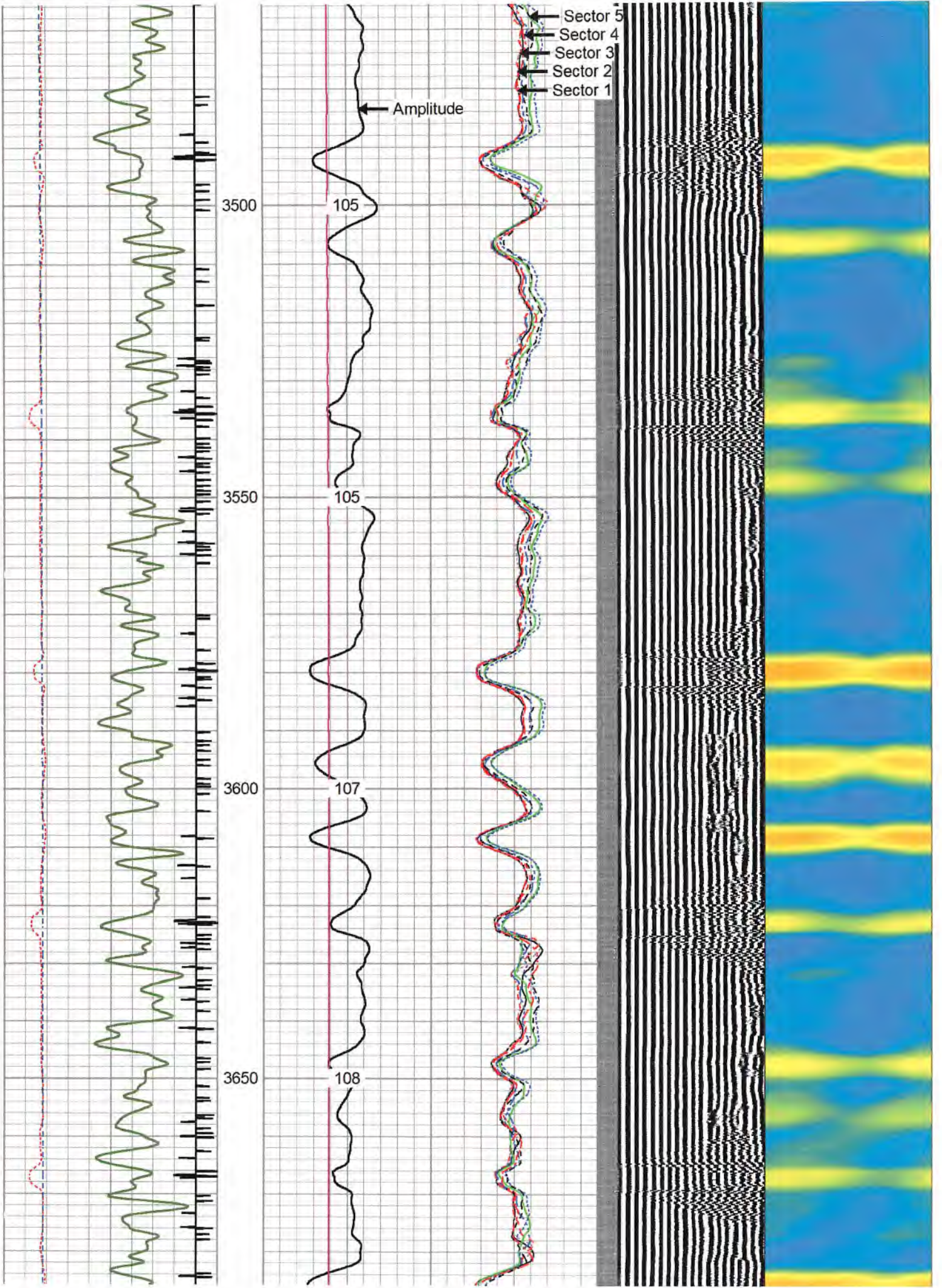
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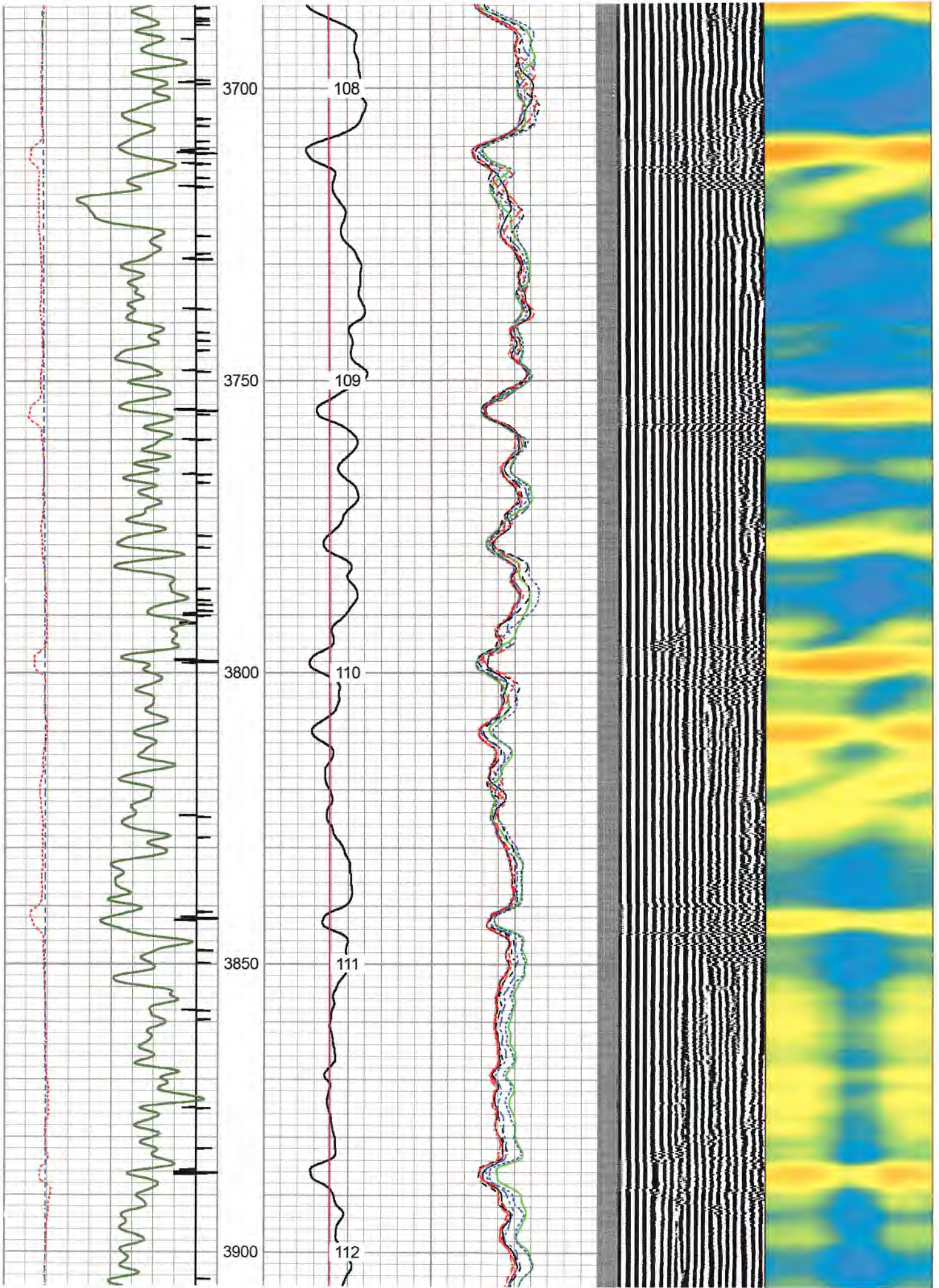
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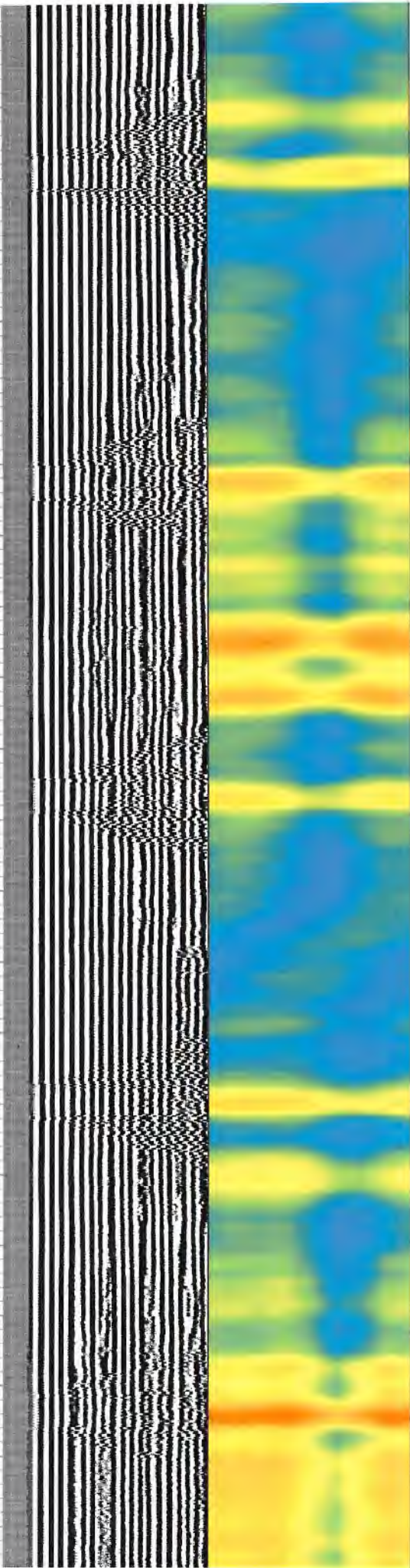
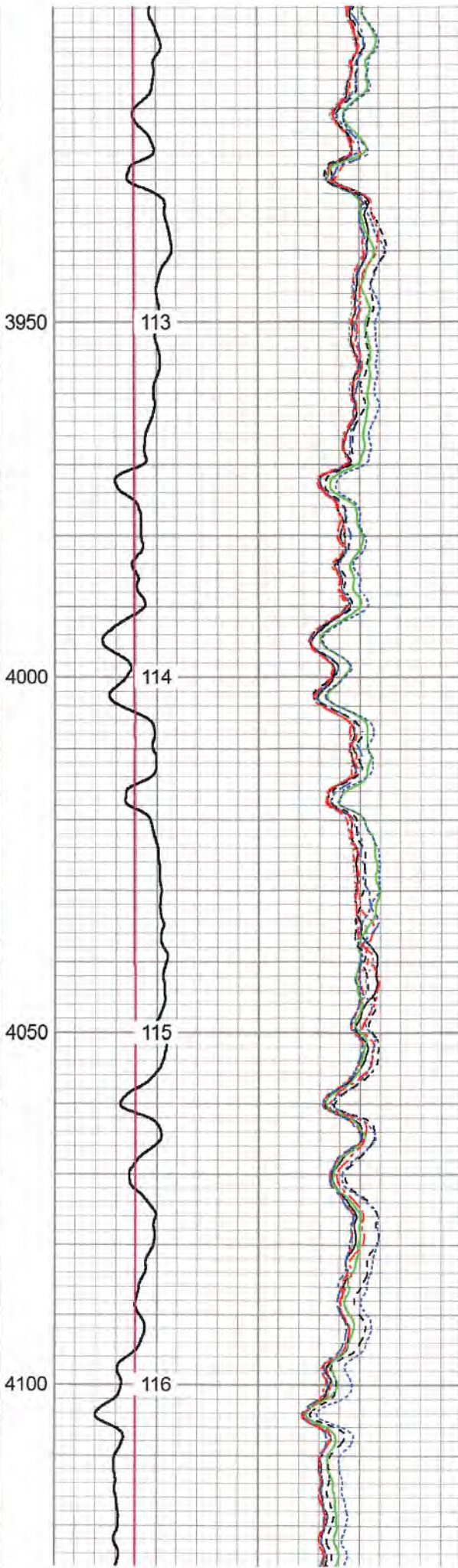
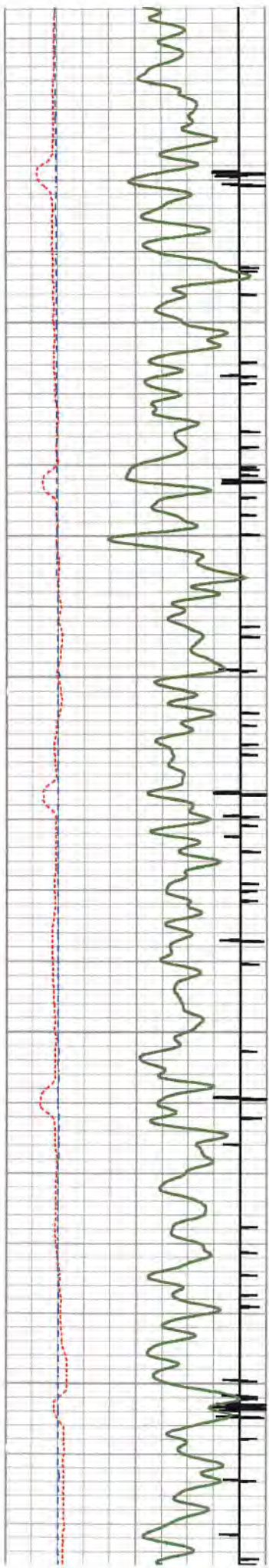


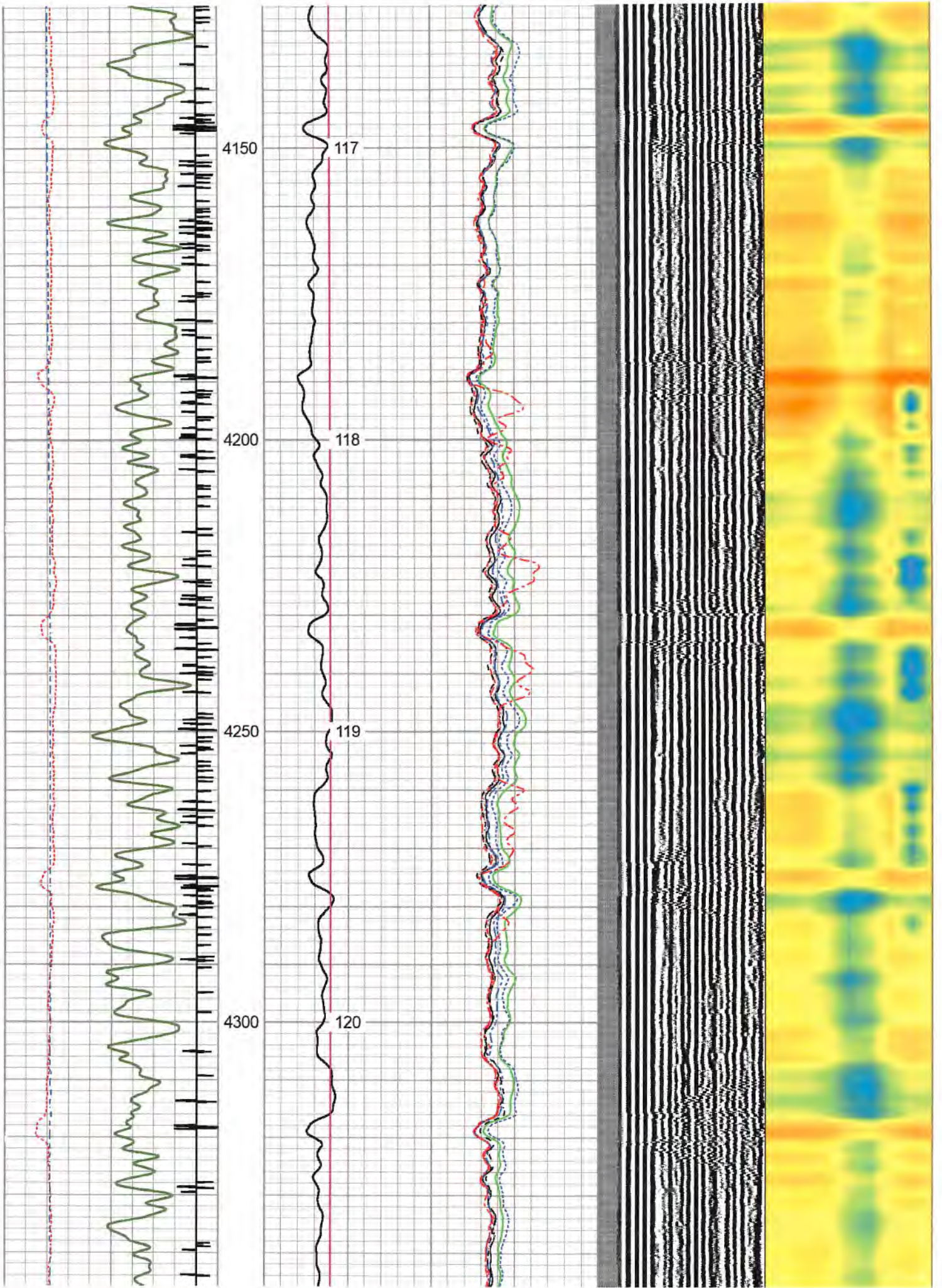


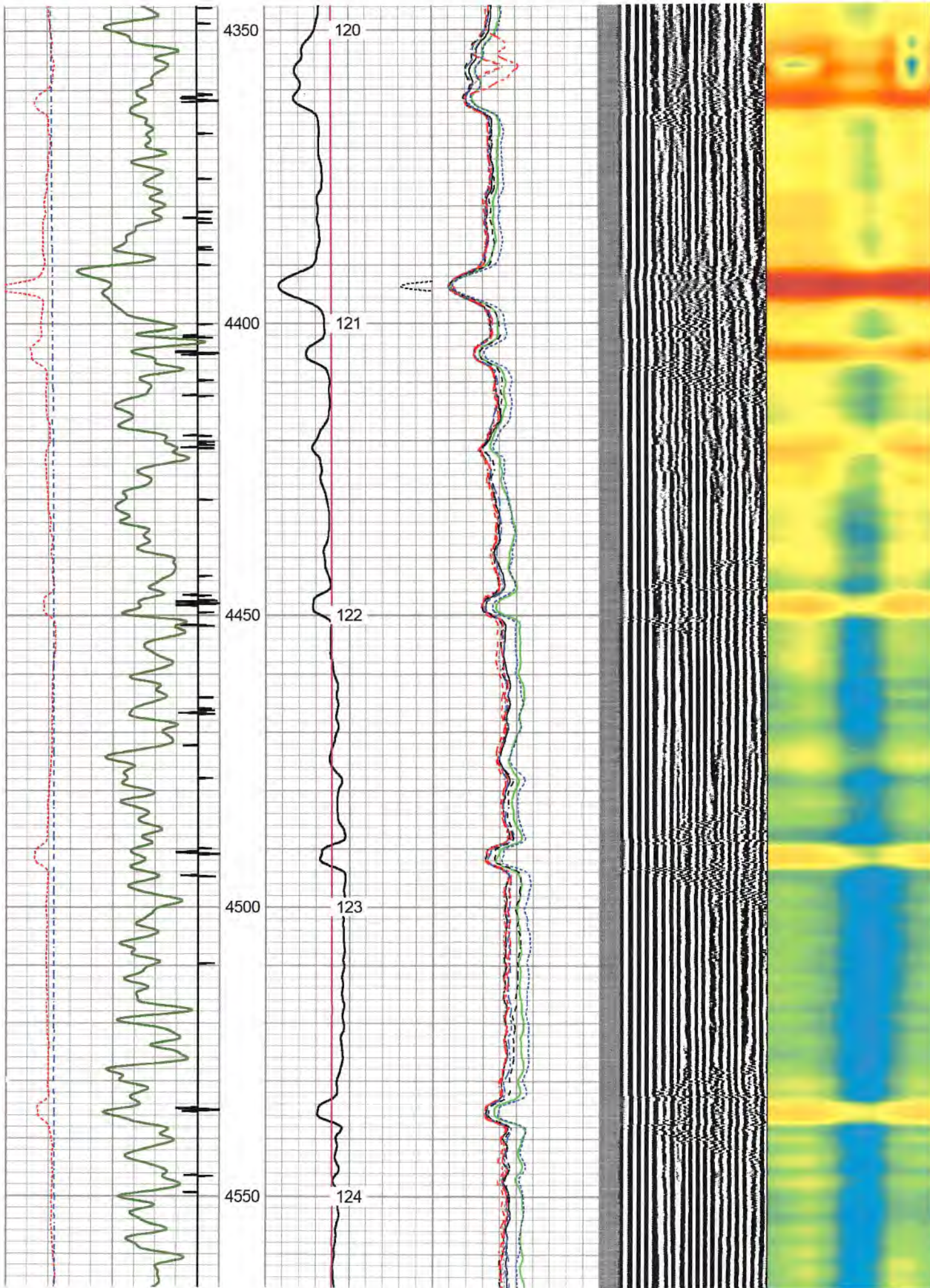


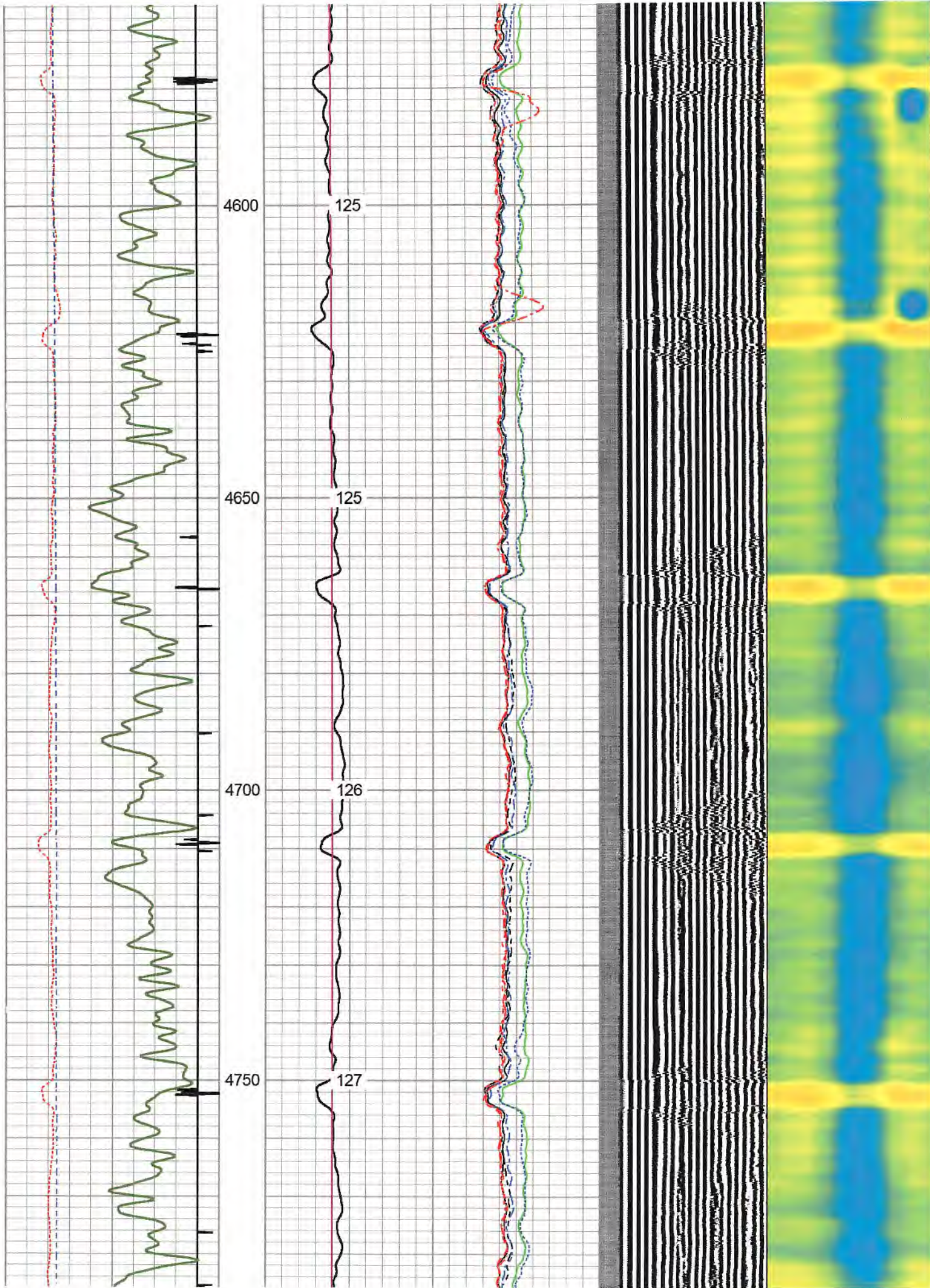


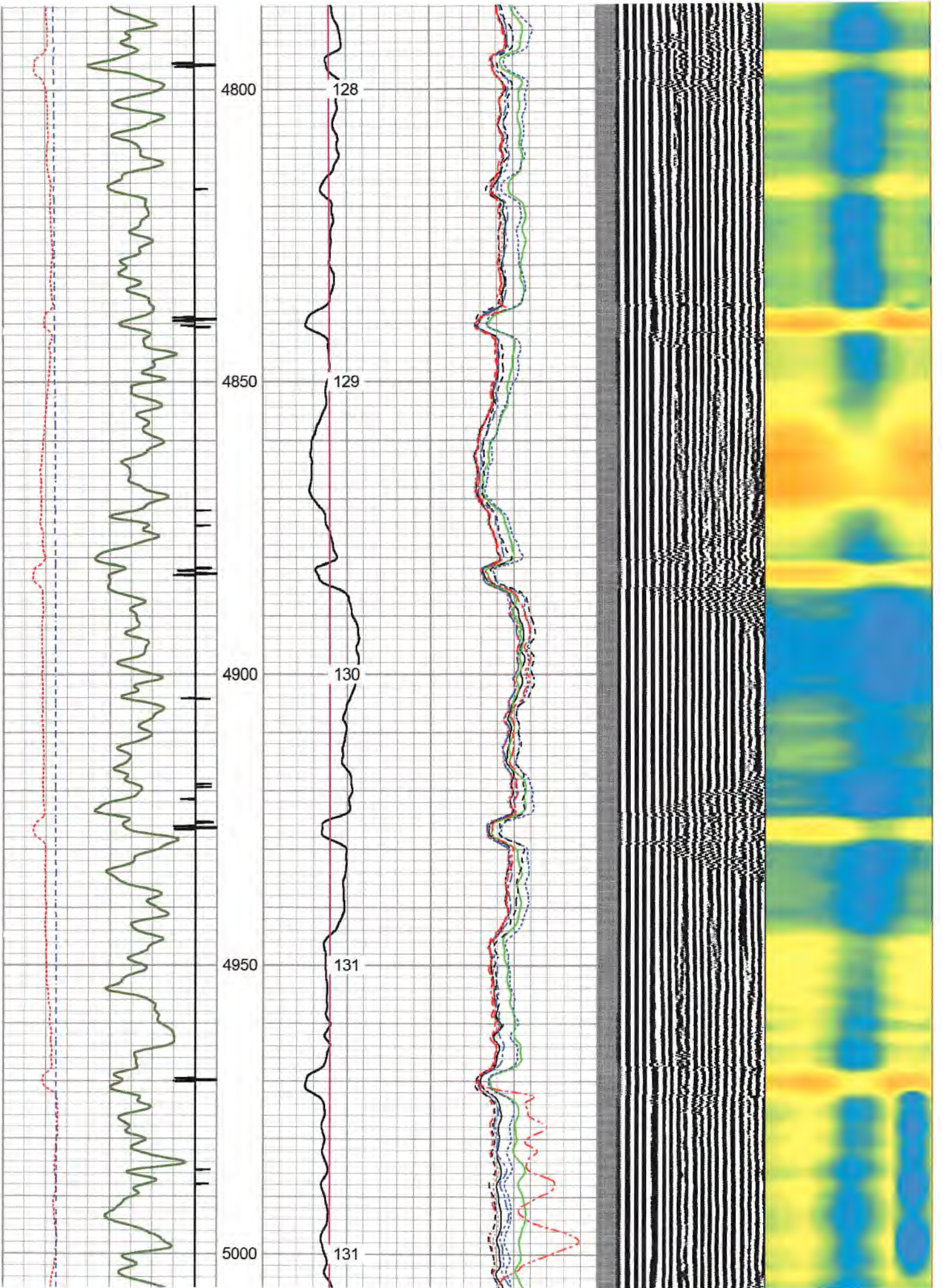


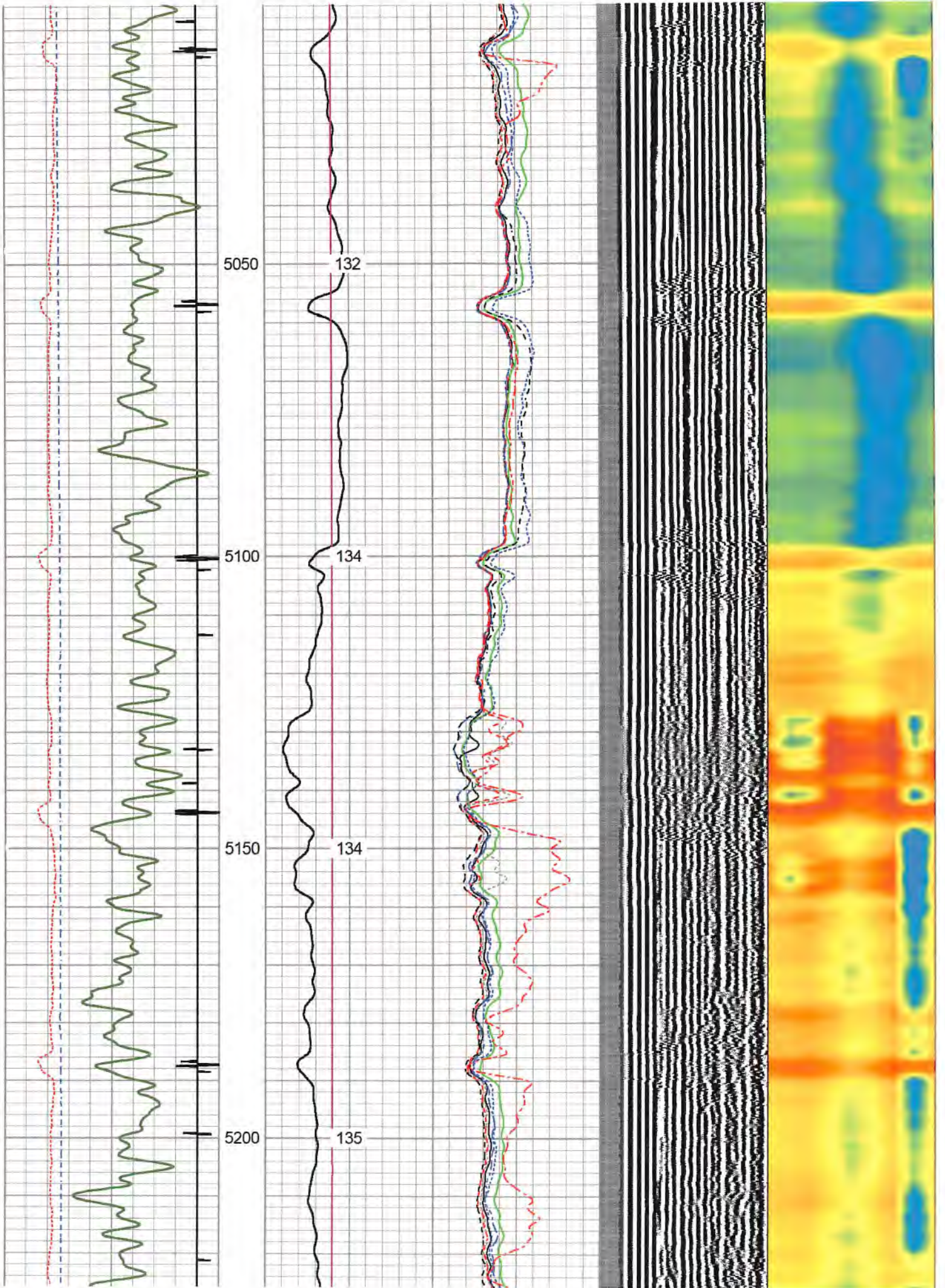


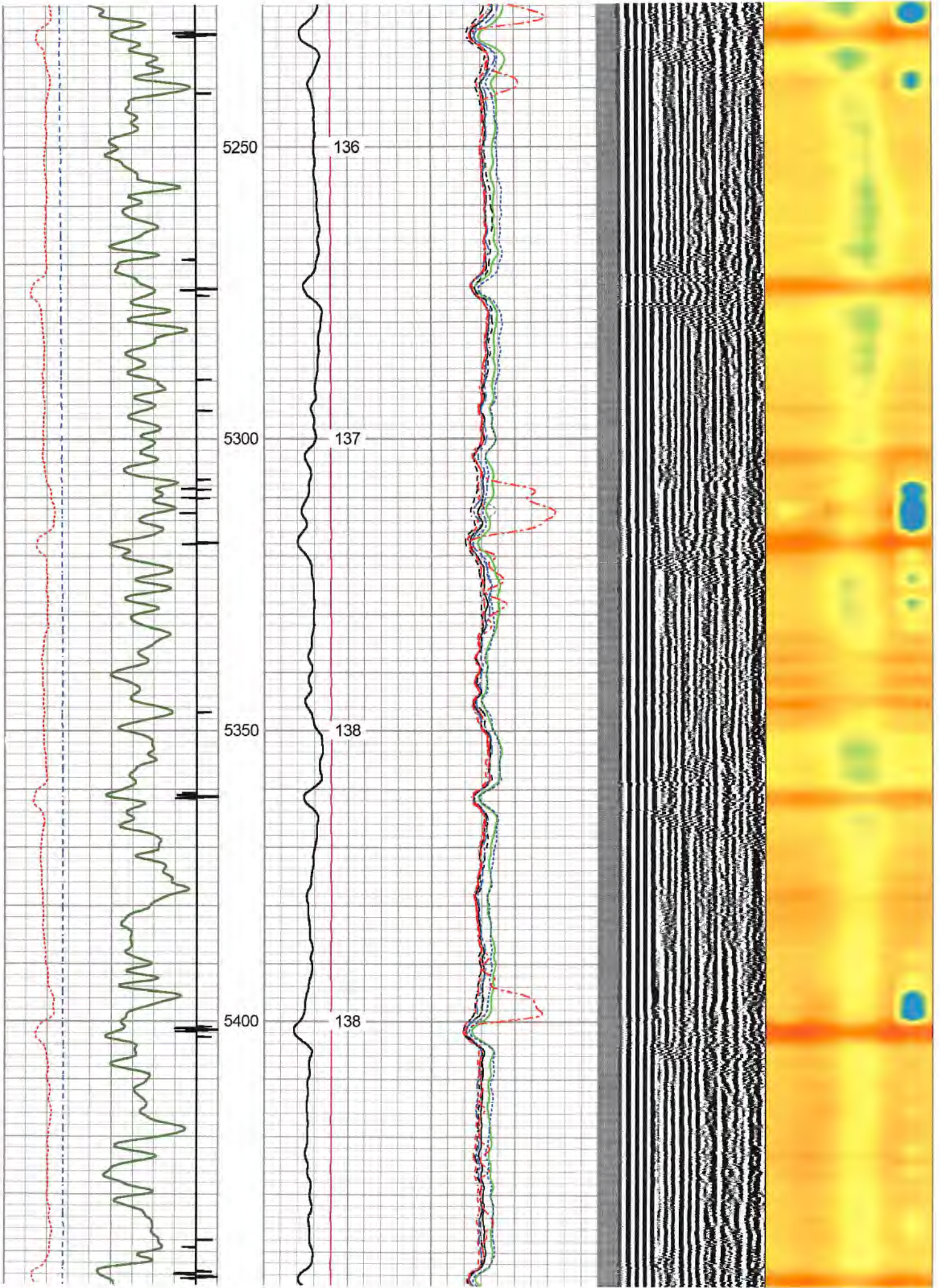


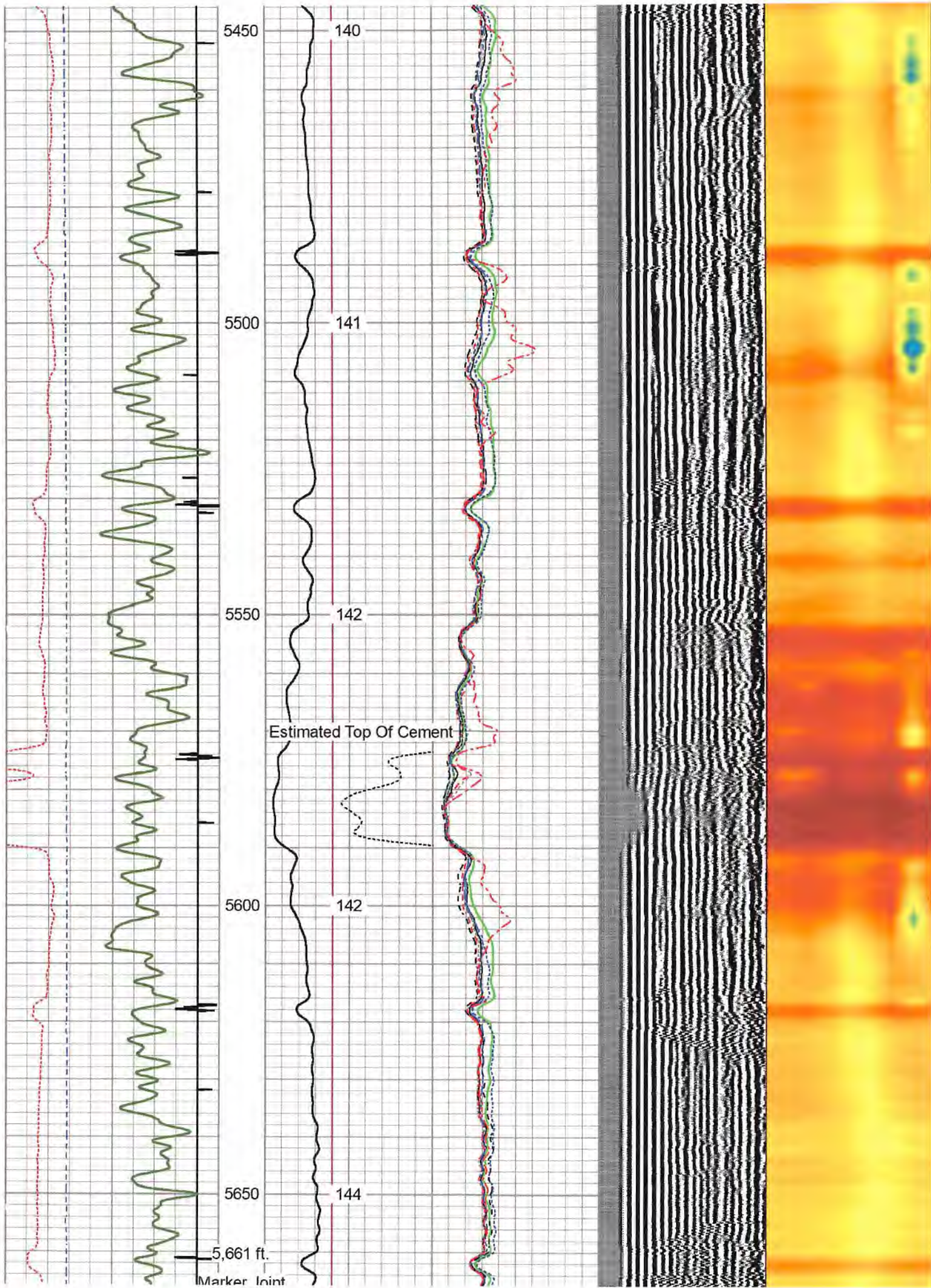


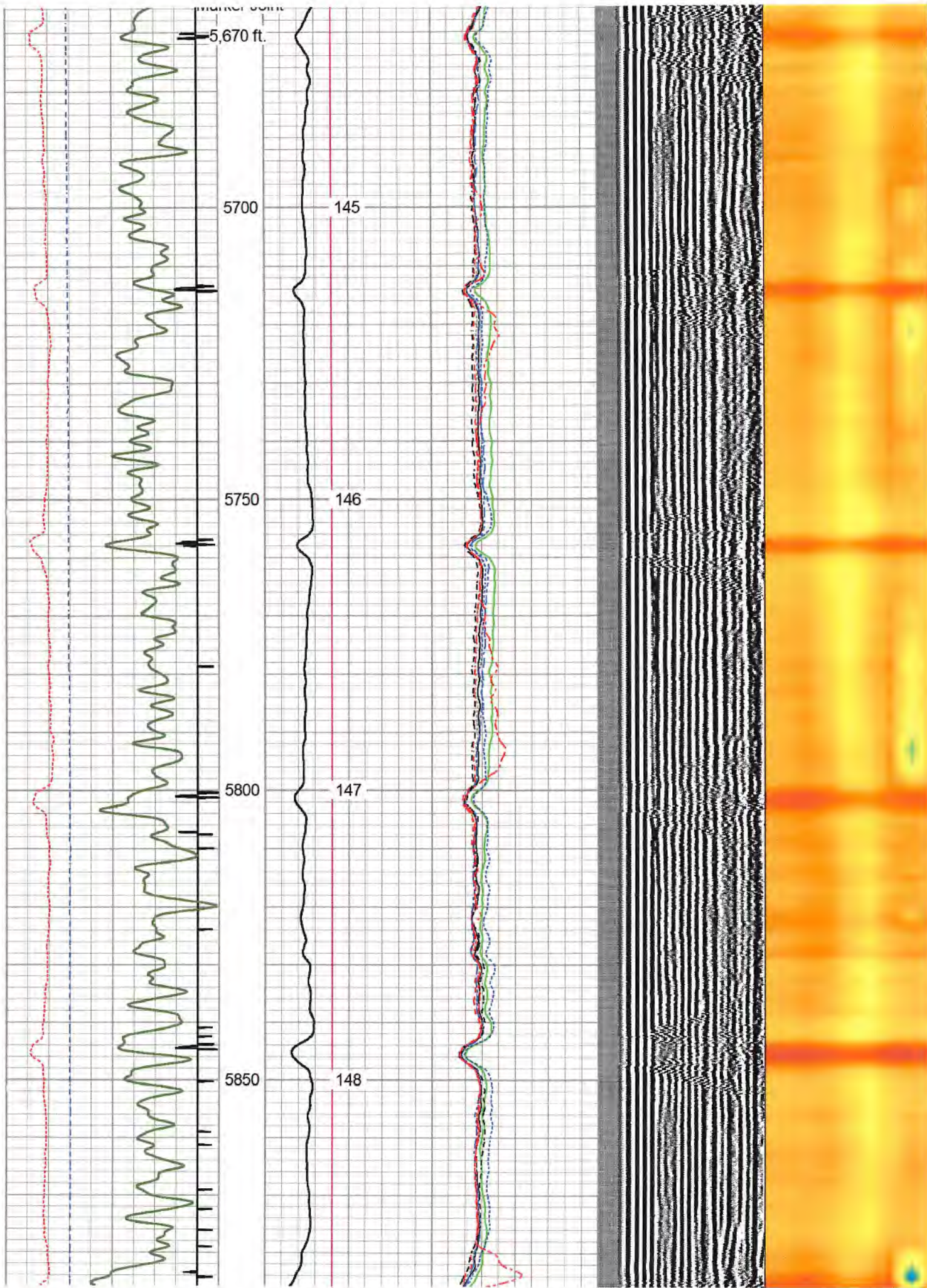


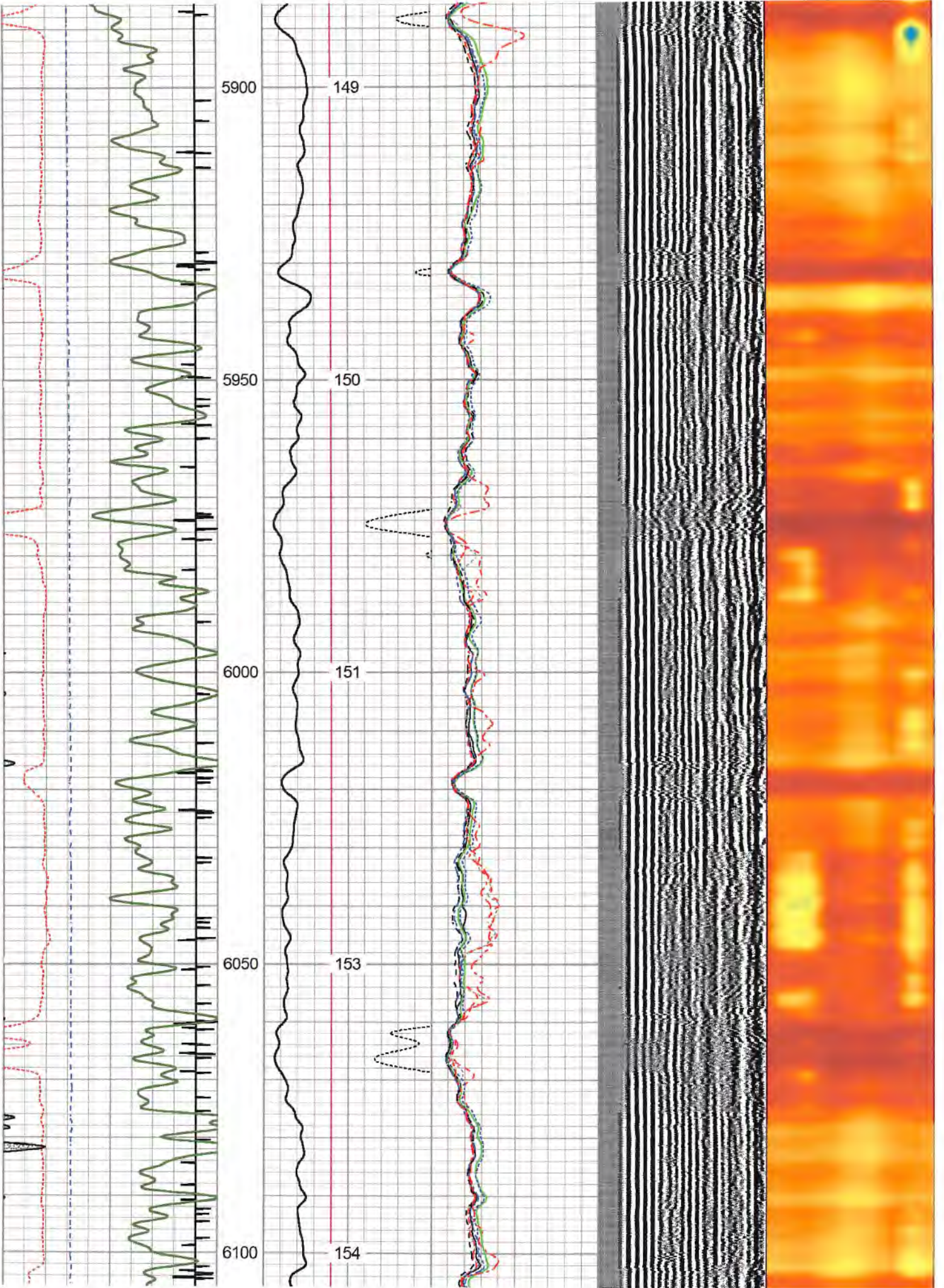


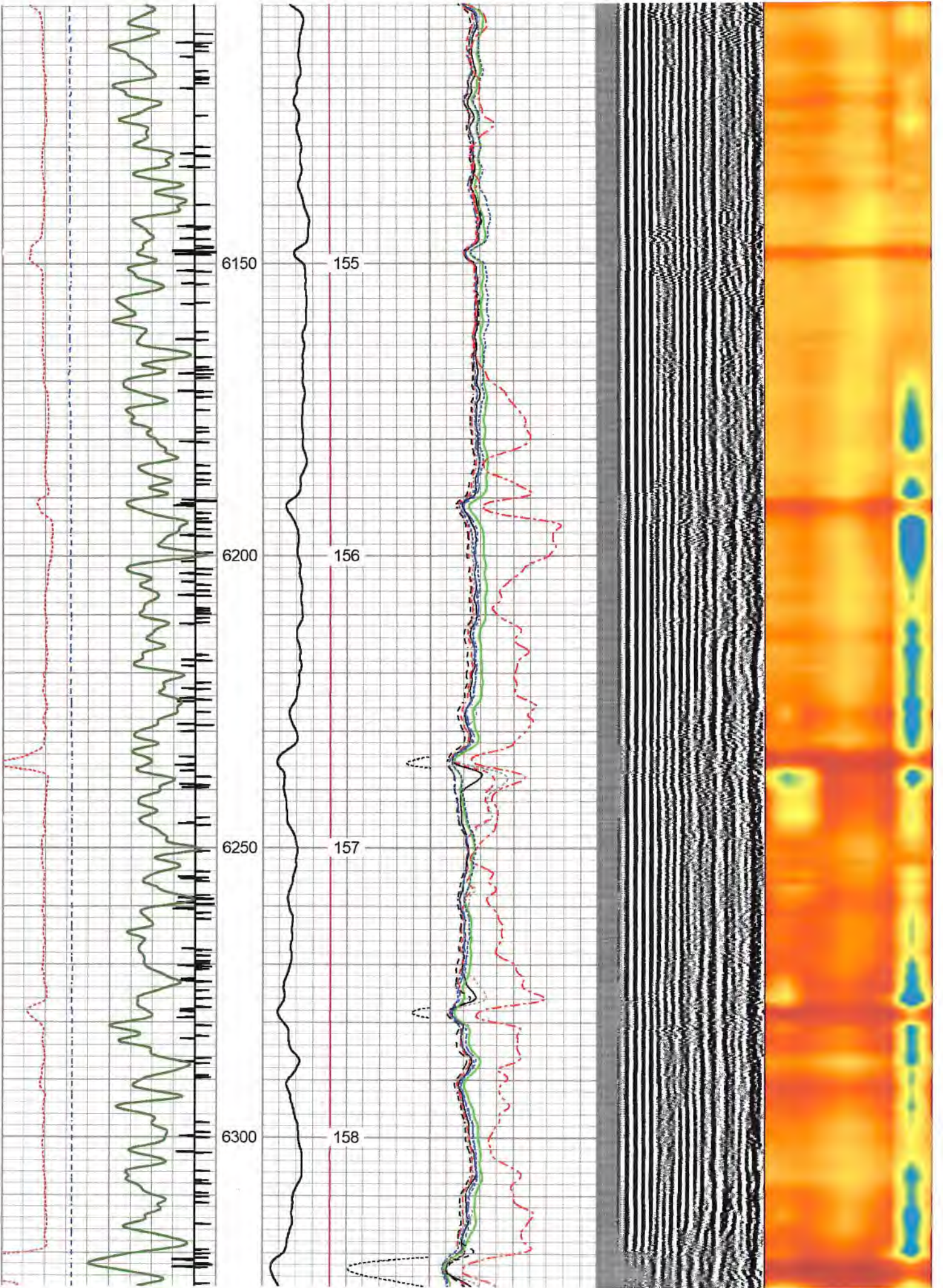


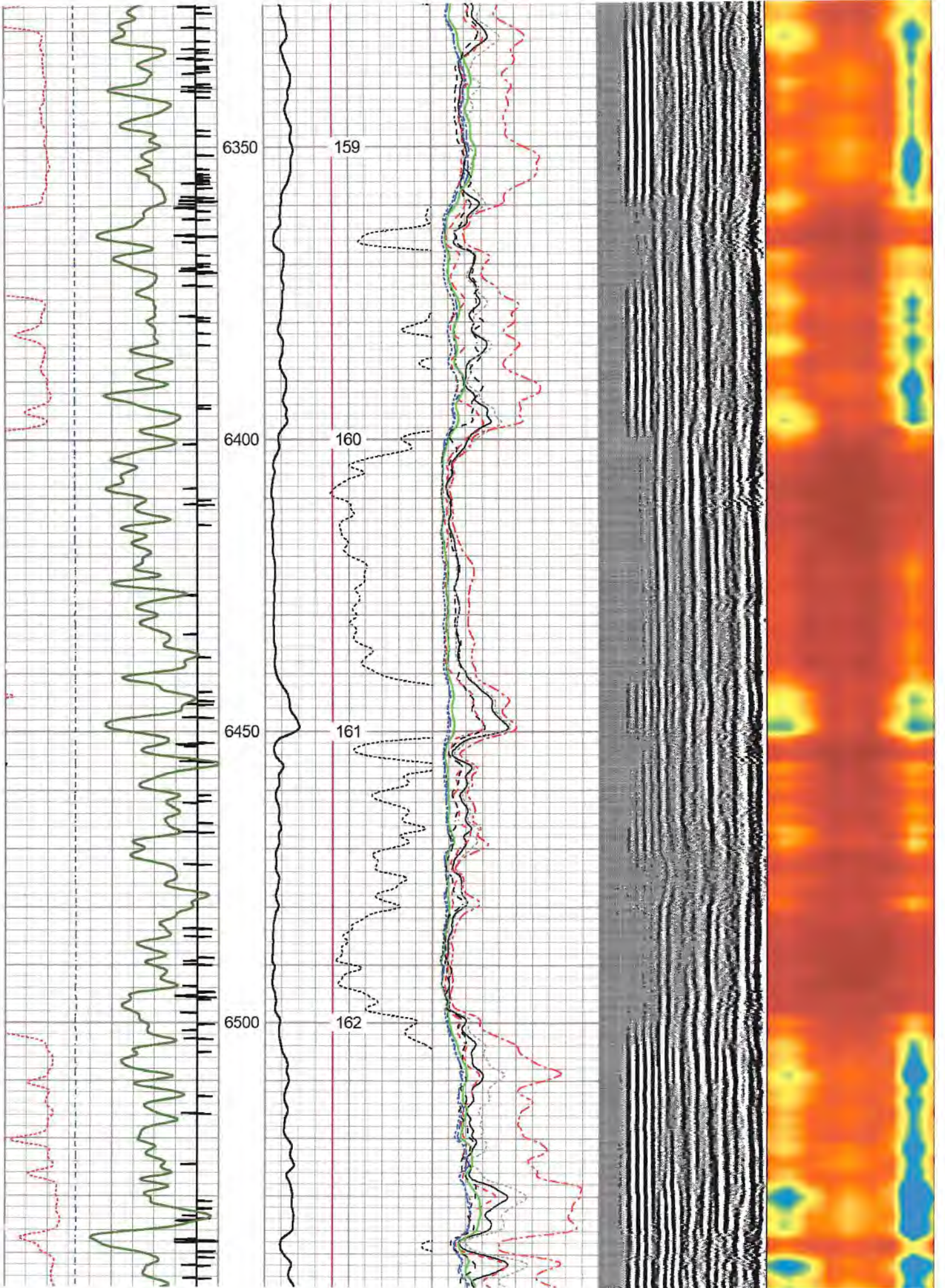


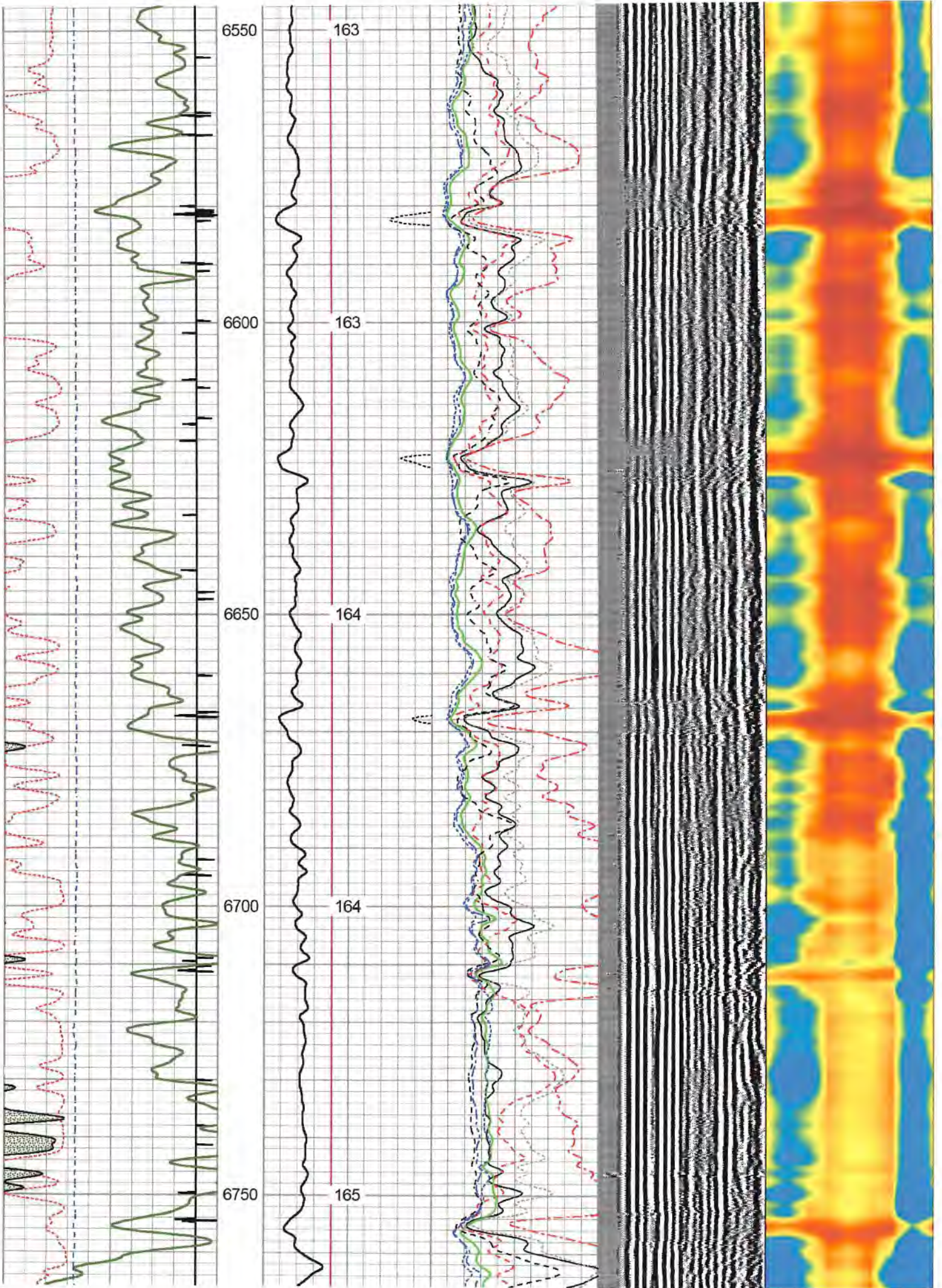


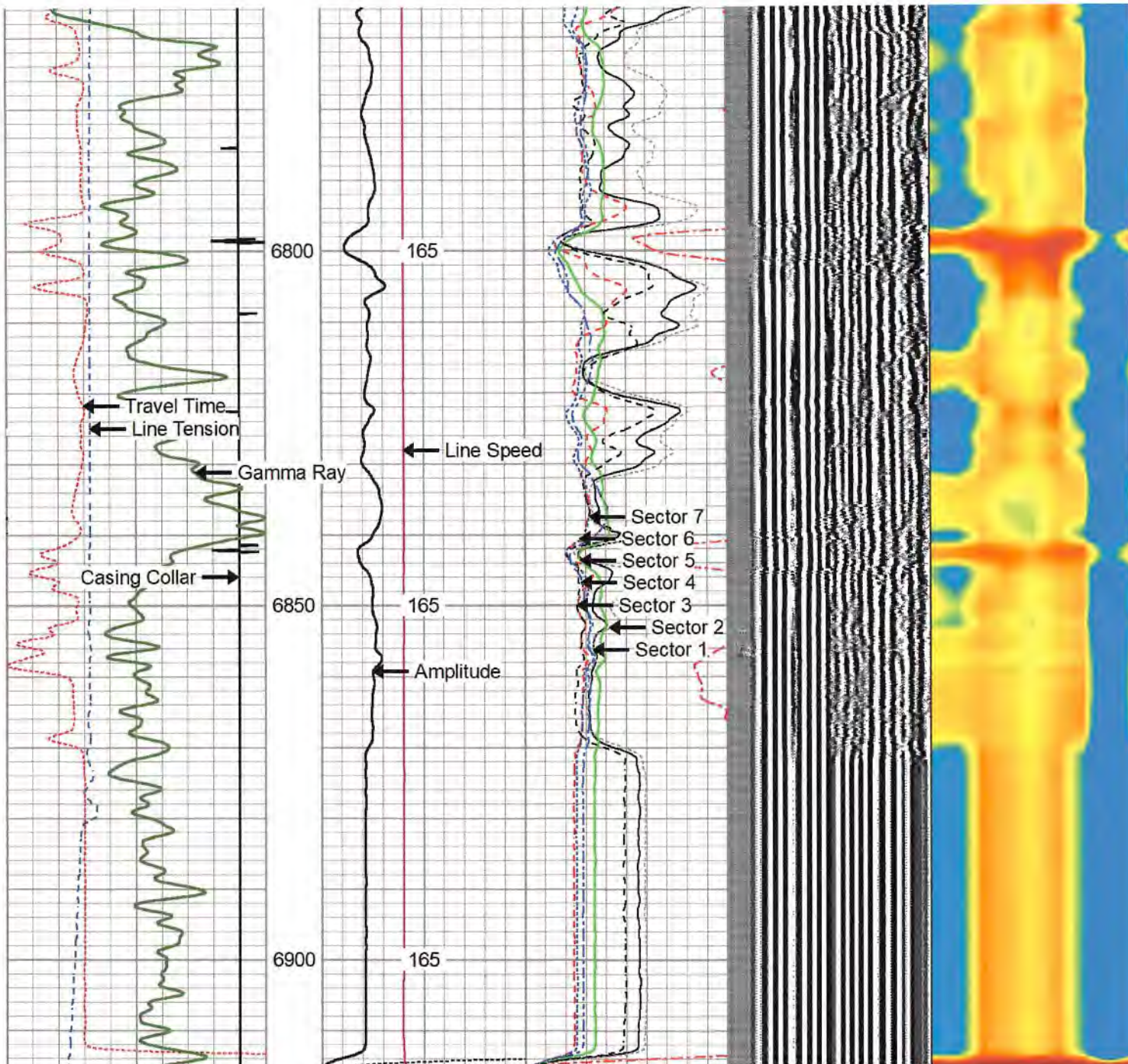












270	Travel Time (usec)	200	0	Amplitude (mV)	100	-5	Sector 1	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1		Amplified Amplitude	-5	-5	Sector 2	150				
0	Gamma Ray (GAPI)	150	0	(mV)	10	-5	Sector 3	150	200	(usec)	1200	
0	Line Tension (lb)	5000		Line Speed	-5	-5	Sector 4	150				
			-500	(ft/min)	500	-5	Sector 5	150				
				TEMP	-5	-5	Sector 6	150				
				(degF)	-5	-5	Sector 7	150				
					-5	-5	Sector 8	150				



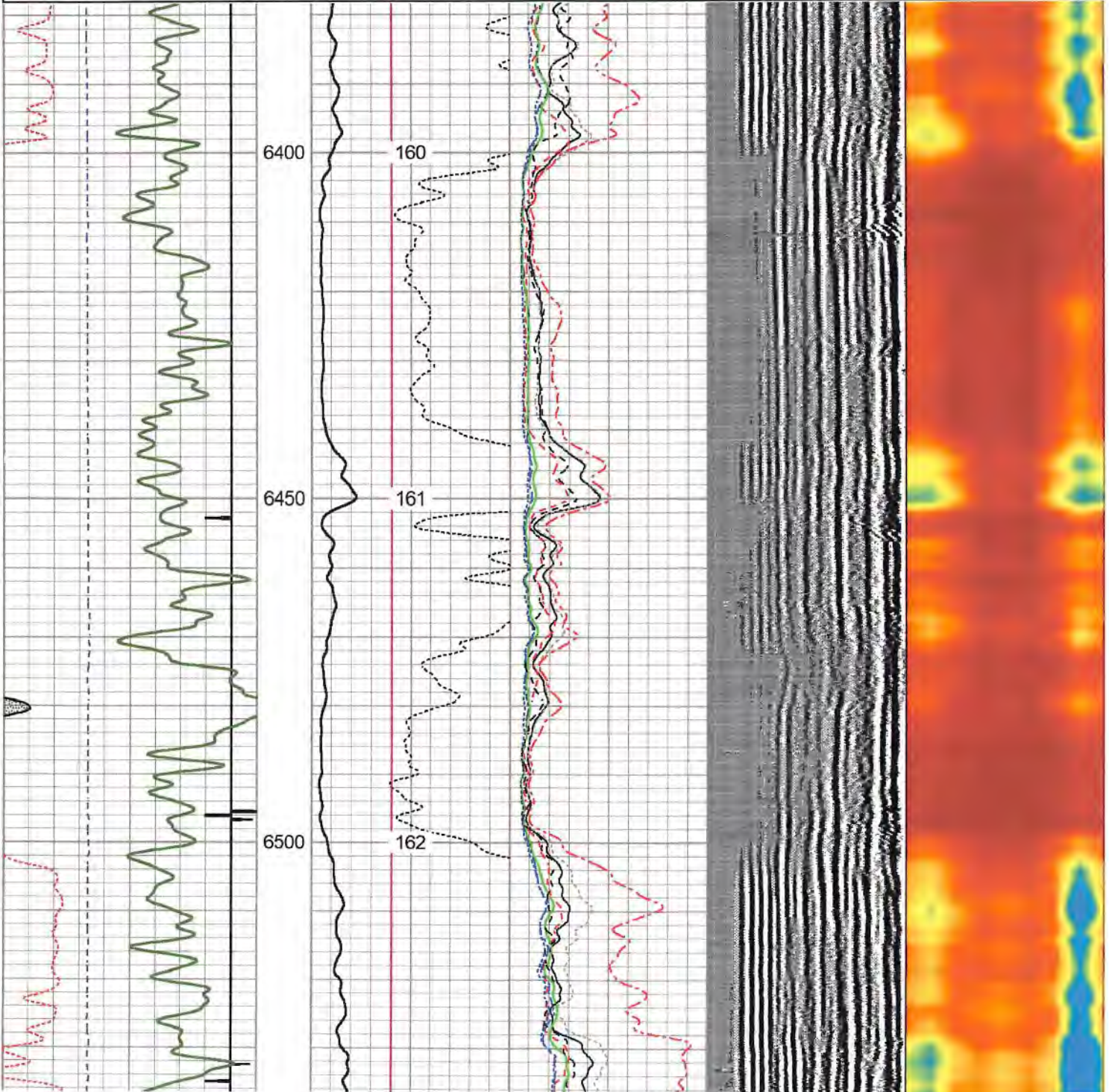
Repeat Pass 0 PSI

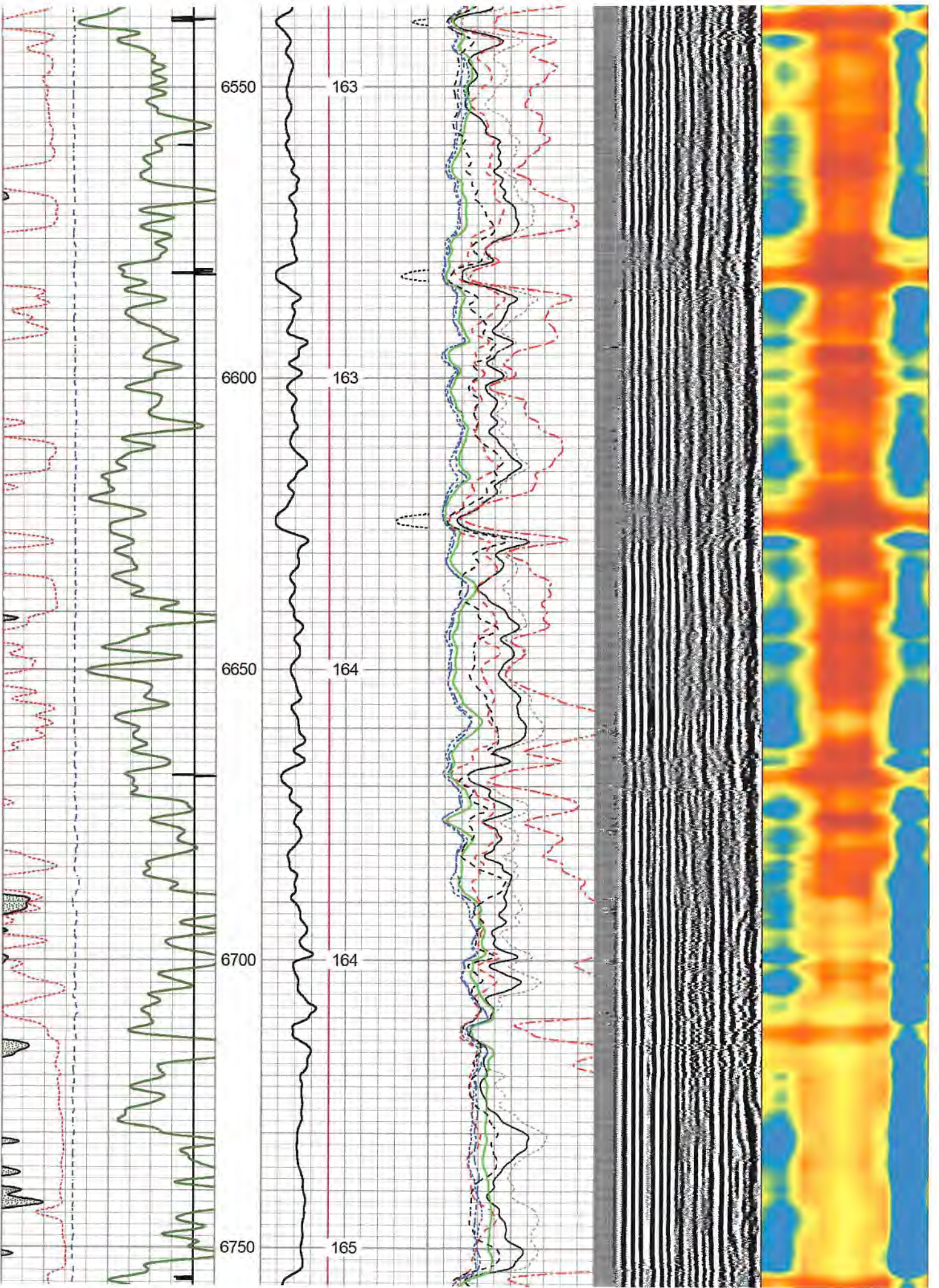
Database File antero_coloradowest_rockies_1h_rcbl_nineenergy_may_1_2020.db
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 Presentation Format 9rcbl
 Dataset Creation Fri May 01 07:33:22 2020
 Charted by Depth in Feet scaled 1:240

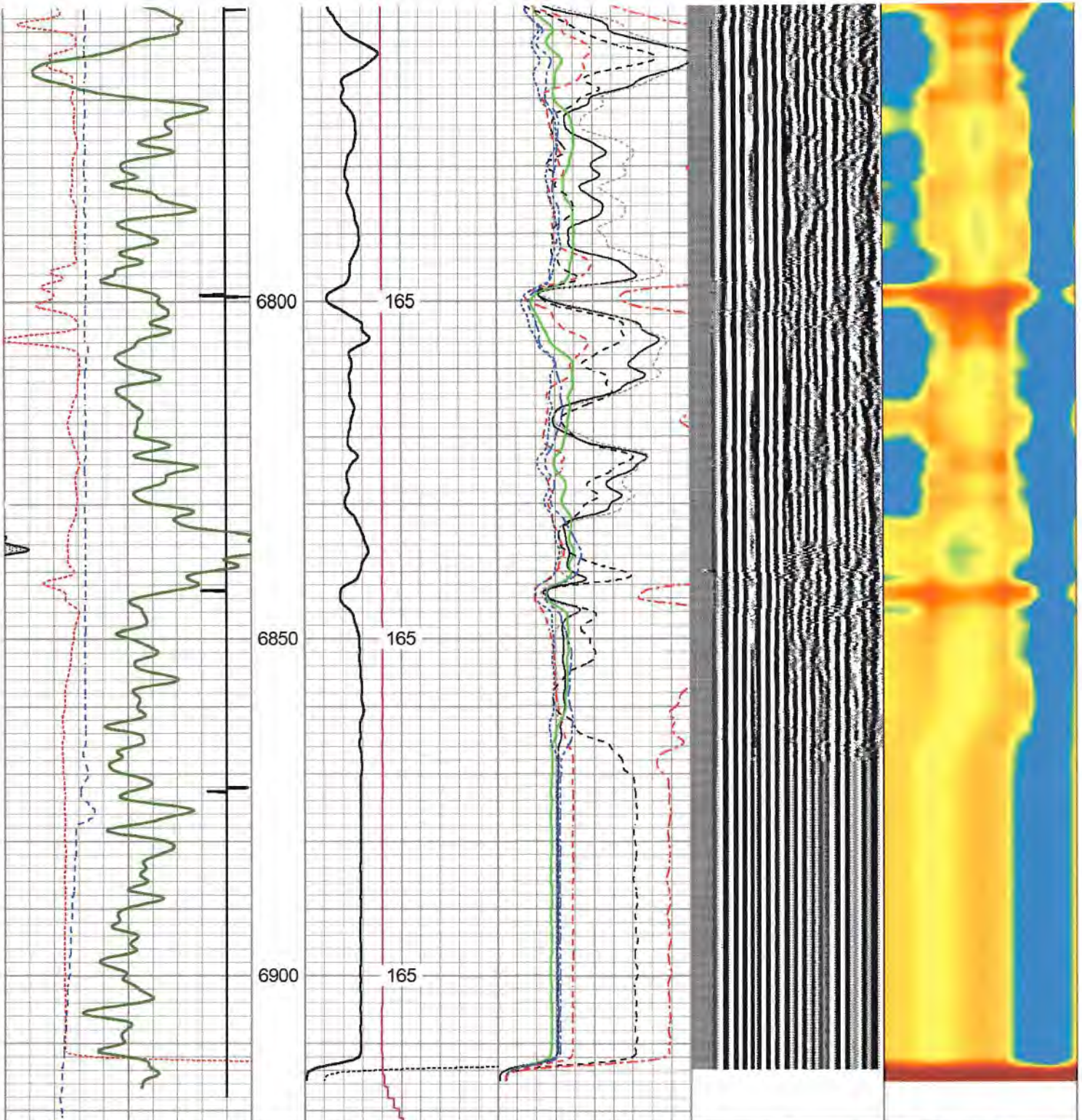
270 Travel Time (usec) 200
 9 Casing Collar -1
 0 Gamma Ray (GAPI) 150
 0 Line Tension (lb) 5000

0 Amplitude (mV)100	-5	Sector 1	150
Amplified Amplitude	-5	Sector 2	150
0 (mV) 10	-5	Sector 3	150
Line Speed	-5	Sector 4	150
-500 (ft/min) 500	-5	Sector 5	150
TEMP	-5	Sector 6	150
(degF)	-5	Sector 7	150
	-5	Sector 8	150

Variable Density 1 Cement Map 8
 200 (usec) 1200







270	Travel Time (usec)	200
9	Casing Collar	-1
0	Gamma Ray (GAPI)	150
0	Line Tension (lb)	5000

0	Amplitude (mV)	100	-5	Sector 1	150
	Amplified Amplitude		-5	Sector 2	150
0	(mV)	10	-5	Sector 3	150
	Line Speed		-5	Sector 4	150
-500	(ft/min)	500	-5	Sector 5	150
	TEMP		-5	Sector 6	150
	(degF)		-5	Sector 7	150
			-5	Sector 8	150

Variable Density	1	Cement Map	8
200	(usec)	1200	

Top - Bottom

BHTEMP_Src TEMP	BOREID in 7.875	BOTTEMP degF 148	CASEOD in 5.5	CASETHCK in 0.361	CASEWGHT lb/ft 20	MAXAMPL mV 71.9	MINAMPL mV 2.2
MINATTN db/ft 0.8	PERFS No	PPT usec 0	SRFTEMP degF 0	TDEPTH ft 0			

Variable Description

BHTEMP_Src : BHTEMP Input Source Selector	MINAMPL : Minimum Amplitude
BOREID : Borehole I.D.	MINATTN : Minimum Attenuation
BOTTEMP : Bottom Hole Temperature	PERFS : Perforation Flag
CASEOD : Casing O.D.	PPT : Predicted Pipe Time
CASETHCK : Casing Thickness	SRFTEMP : Surface Temperature
CASEWGHT : Casing Weight	TDEPTH : Total Depth
MAXAMPL : Maximum Amplitude	

Calibration Report

Database File antero_coloradowest_rockies_1h_rcbl_nineenergy_may_1_2020.db
 Dataset Pathname Marcellus/Rockies_1H/RCBL_1/pass4.2
 Dataset Creation Fri May 01 08:52:55 2020

Gamma Ray Calibration Report

Serial Number: FW1211-86
 Tool Model: Probe
 Performed: Thu Dec 19 22:27:19 2019

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps
 Calibrator Reading: 1.0 cps

Sensitivity: 0.8000 GAPI/cps

Segmented Cement Bond Log Calibration Report

Serial Number: FW1312-32
 Tool Model: Probe275T

Calibration Casing Diameter: 5.500 in
 Calibration Depth: 14.308 ft

Master Calibration, performed Fri May 01 06:40:53 2020:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.015	0.877	2.200	71.921	104.838	0.994
CAL	1.002	1.004				
5'	0.015	0.873	2.200	71.921	111.278	0.943
SUM						
S1	0.050	0.894	2.200	100.000	145.966	-3.637
S2	0.009	0.868	2.200	100.000	143.804	1.226
S3	0.007	0.853	2.200	100.000	145.618	1.391
S4	0.007	0.863	2.200	100.000	144.253	1.440
S5	0.007	0.868	2.200	100.000	143.560	1.450
S6	0.007	0.874	2.200	100.000	142.834	1.431
S7	0.006	0.865	2.200	100.000	143.893	1.485
S8	0.007	0.872	2.200	100.000	143.007	1.434


Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	1.002	1.004	1.000	0.000

Air Zero Calibration, performed Fri May 01 05:29:25 2020:

	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	Length (ft)	O.D. (in)	Weight (lb)
			CHD-Titan Titan 1 7/16" GO Cablehead	1.00	1.44	5.00
			CENT-Overbody Antelope (SP-919-0233)	1.67	4.88	5.00
Temp	11.27		RBT-Probe275T (FW1312-32) Probe 2.75" Radial with Integral Temperature Sub	9.39	2.75	90.00
WVFS8	9.03					
WVFS7	9.03					
WVFS6	9.03					
WVFS5	9.03					
WVFS4	9.03					
WVFS3	9.03					
WVFS2	9.03					
WVFS1	9.03					
WVF3FT	9.03					
WVF5FT	8.03					

HeadVolt	4.78					
WVFCAL	4.78					
CCL	3.88					
GR	2.54		GR-Probe (FW1211-86) Probe 2 3/4" Logging Gamma Ray	4.78	2.75	57.00
			CENT-Overbody Antelope (SP-919-0233)	1.67	4.88	5.00
Dataset: antero_coloradowest_rookies_1h_rcbl_nineenergy_may_1_2020.db: Marcellus/Rockies_1H/RCBL_1/pass4.2 Total length: 15.17 ft Total weight: 162.00 lb O.D.: 4.88 in						

	Company	Antero Resources
	Well	Rockies 1H
	Field	North Canton
	County	Tyler
	State	West Virginia