



**RADIAL CEMENT BOND LOG  
VARIABLE DENSITY LOG  
GAMMA/CCL/TEMP**

Company Antero Resources  
Well Mamba 1H  
Field Rabbit Ears  
County Tyler  
State WV

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Well Mamba 1H  
Field Rabbit Ears  
County Tyler State WV

Location: API #: 47-095-02820

Other Services

Permanent Datum	SEC	TWP	RGE	Ground Level	Elevation	1,223'	Elevation
Log Measured From				Kelly Bushing 30'	K.B. 1,253'		D.F. 1,253'
Drilling Measured From				Kelly Bushing	G.L. 1,223'		

Date	02/18/2023						
Run Number	ONE						
Depth Driller	23,147'						
Depth Logger	7,016'						
Bottom Logged Interval	7,012'						
Top Log Interval	Surface						
Open Hole Size	NA						
Type Fluid	Fresh Water						
Density / Viscosity	8.6 LB/GAL						
Max. Recorded Temp.	140.7 DEG.F.						
Estimated Cement Top	3,361'						
Time Well Ready	Arrival						
Time Logger on Bottom	8:40						
Equipment Number	116						
Location	Charleroi, PA						
Recorded By	Calvin Drummond						
Witnessed By	Jerrako Evans						
Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
Casing Record	Size	Wgt/Ft	Top	Bottom			
Conductor String	20"	78.67#	Surface	130'			
Surface String	13.375"	54.5#	Surface	541'			
Intermediate String	9.625"	36#	Surface	3,372'			
Intermediate String							
Production String	5.5"	23#	Surface	23,147'			

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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 CORRELATED TO MARKER JOINT  
DEPTH SHIFT -3  
MARKER JOINT 6,227' - 6,237'

MAIN PASS LOGGED WITH 1500 PSI  
REPEAT PASS LOGGED WITH 0 PSI

ESTIMATED CEMENT TOP 3,361'

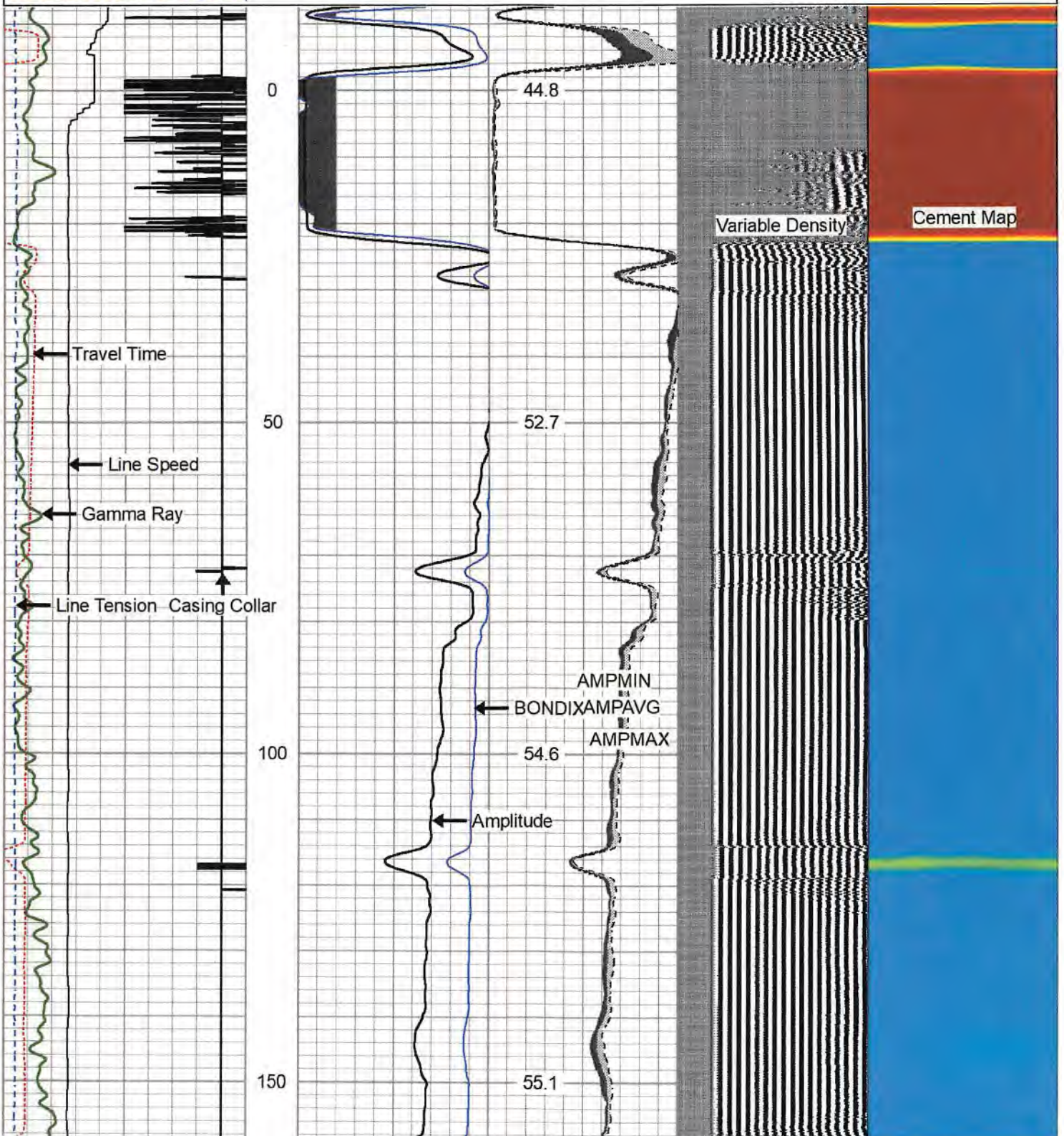
THANK YOU FOR USING NINE ENERGY SERVICES

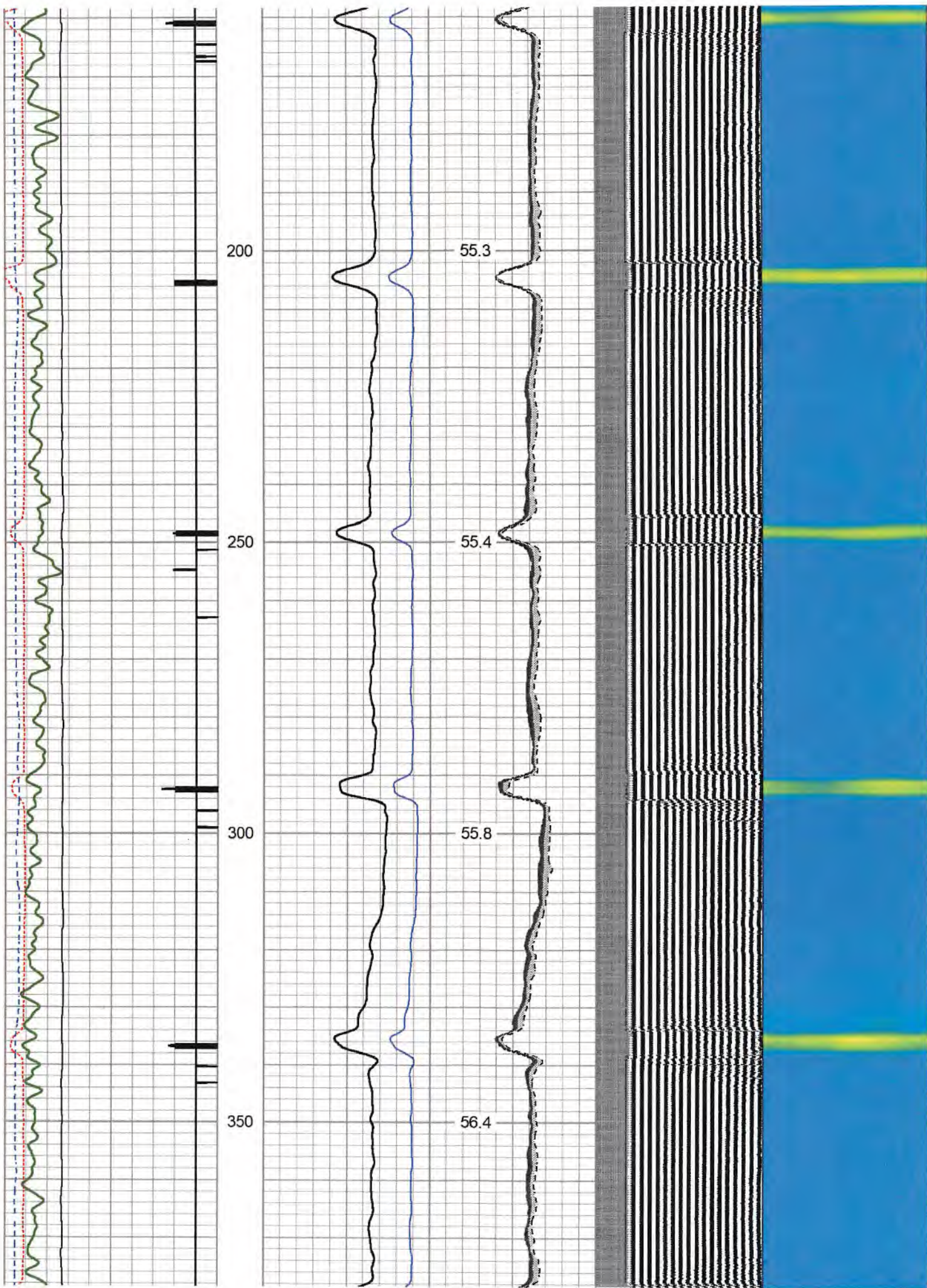


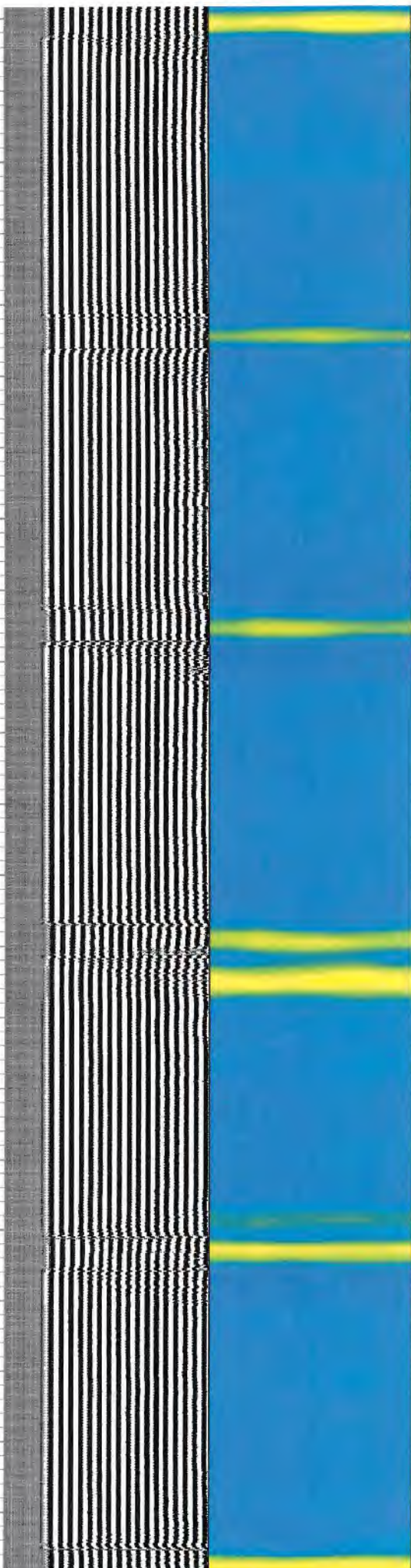
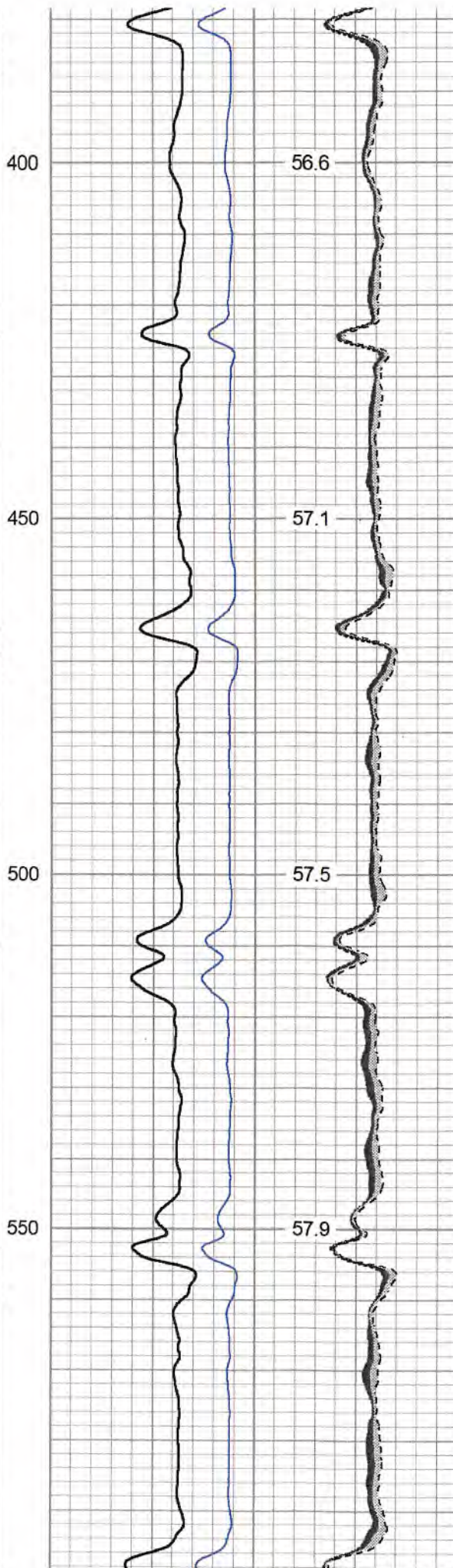
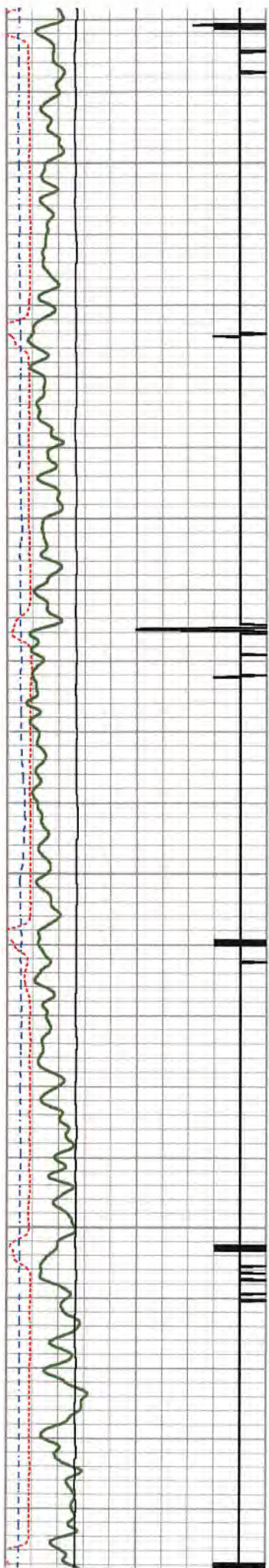
**Main Pass 1500 PSI**

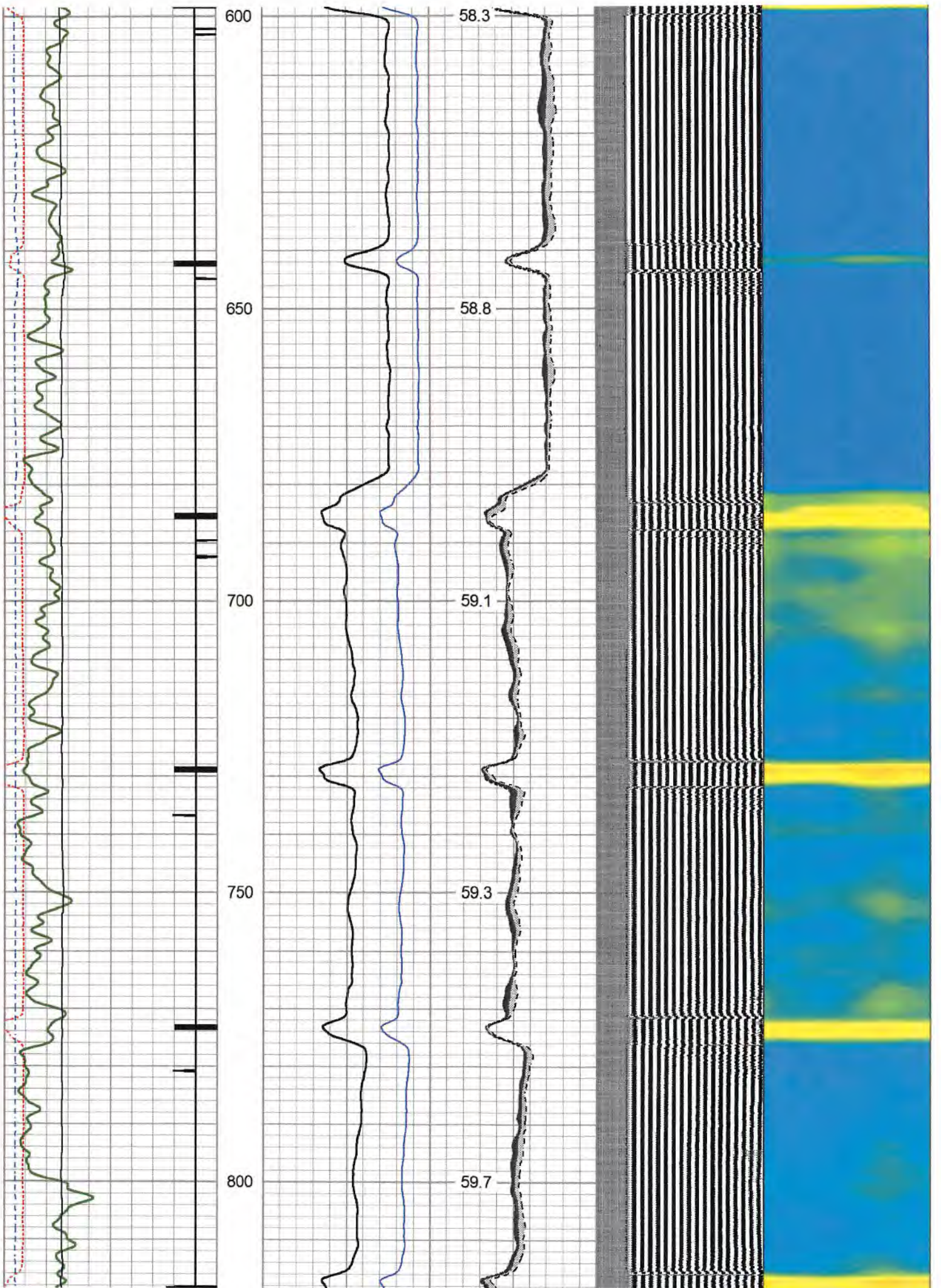
Database File antero\_mamba\_1h\_rcbl\_18\_feb\_2023.db  
 Dataset Pathname pass8  
 Presentation Format rcbl 2  
 Dataset Creation Sat Feb 18 08:39:07 2023  
 Charted by Depth in Feet scaled 1:240

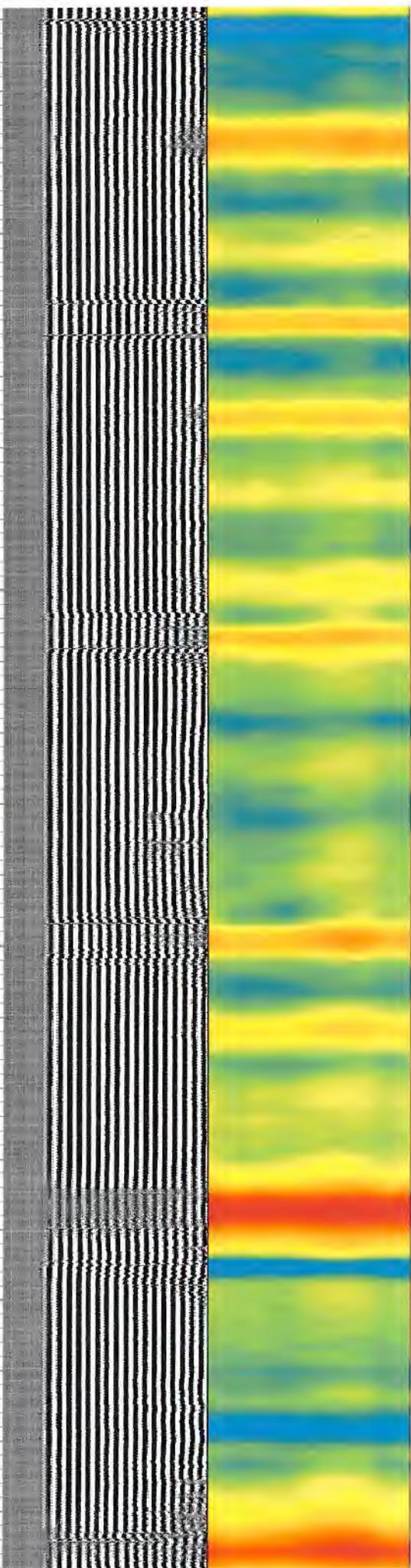
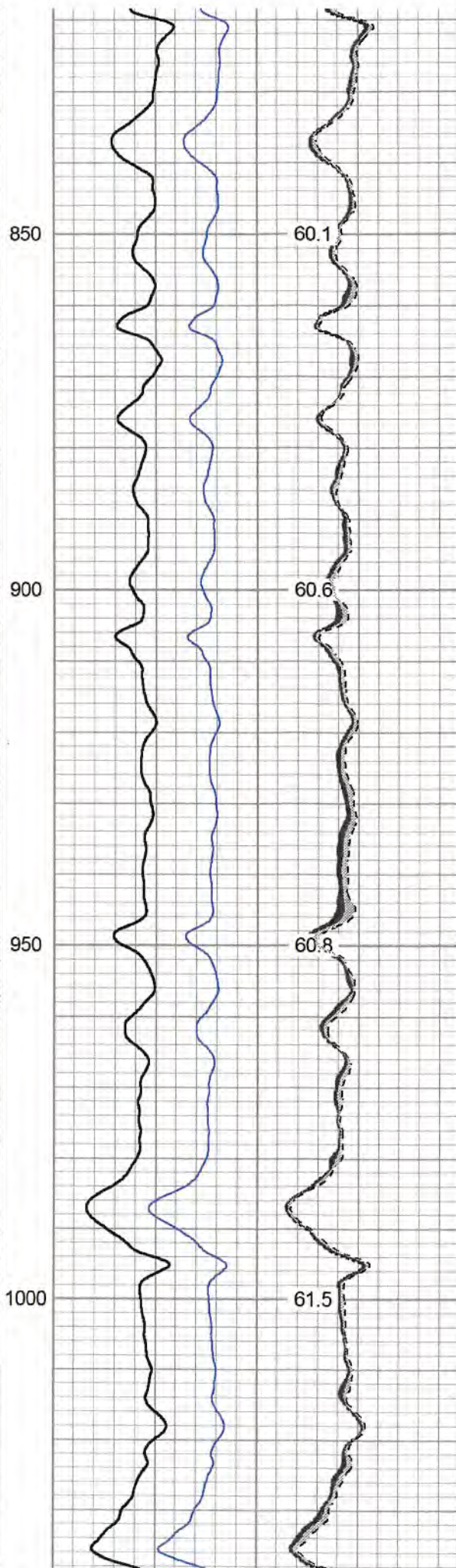
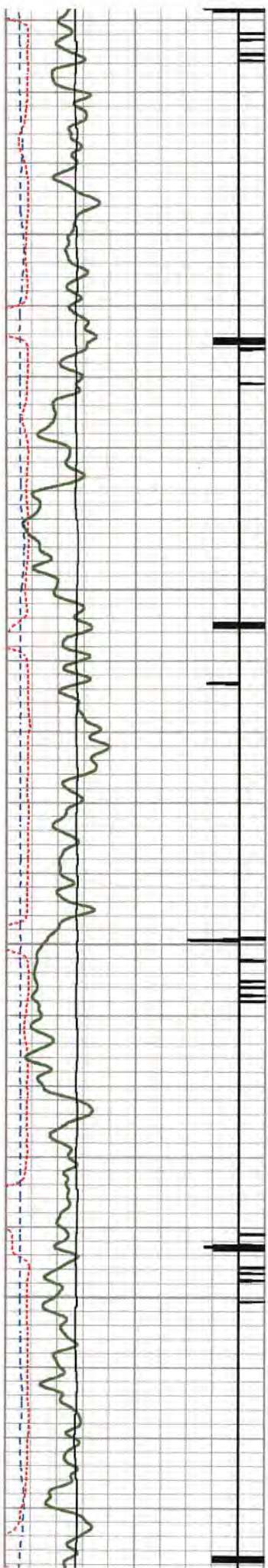
266	Travel Time (usec)	166	0	Amplitude (mV)	100	-5	AMPMIN	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	1	BONDIX	0	-5	AMPMAX	150	200 (usec)	1200		
0	Gamma Ray (GAPI)	150				-5	AMPAVG	150				
	Line Speed						TEMP					
-200	(ft/min)	200					(degF)					
0	Line Tension (lb)	5000										

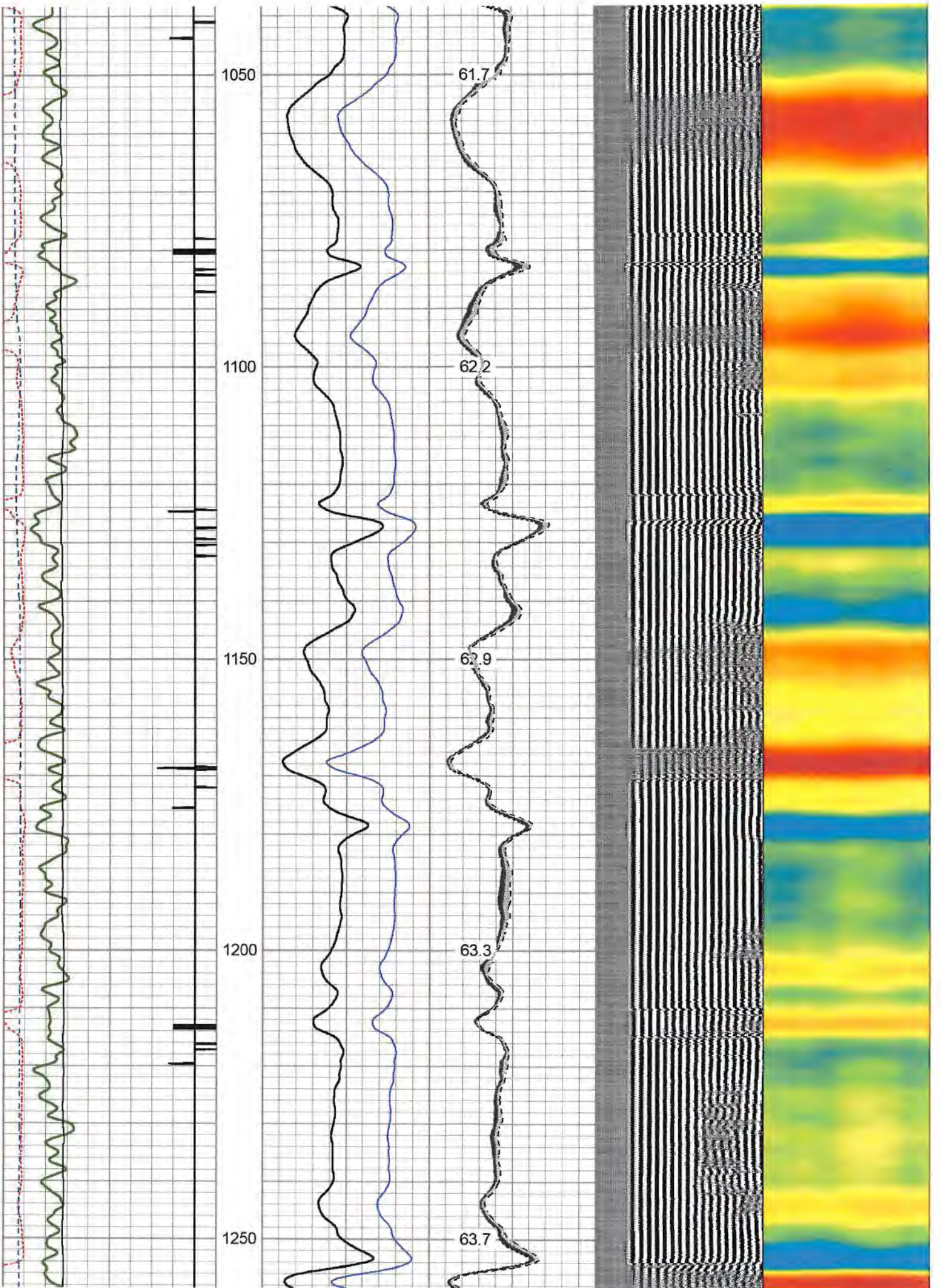


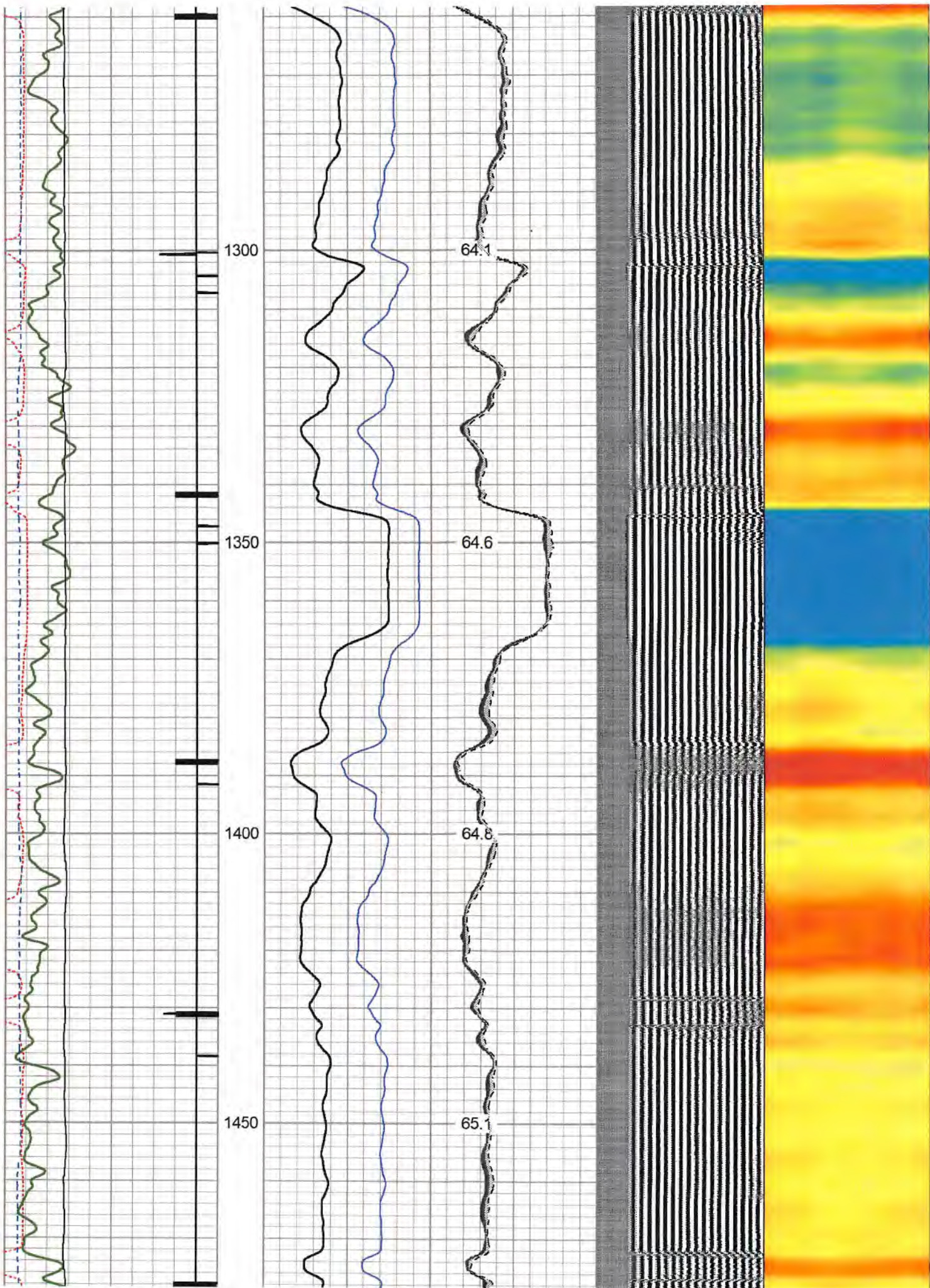




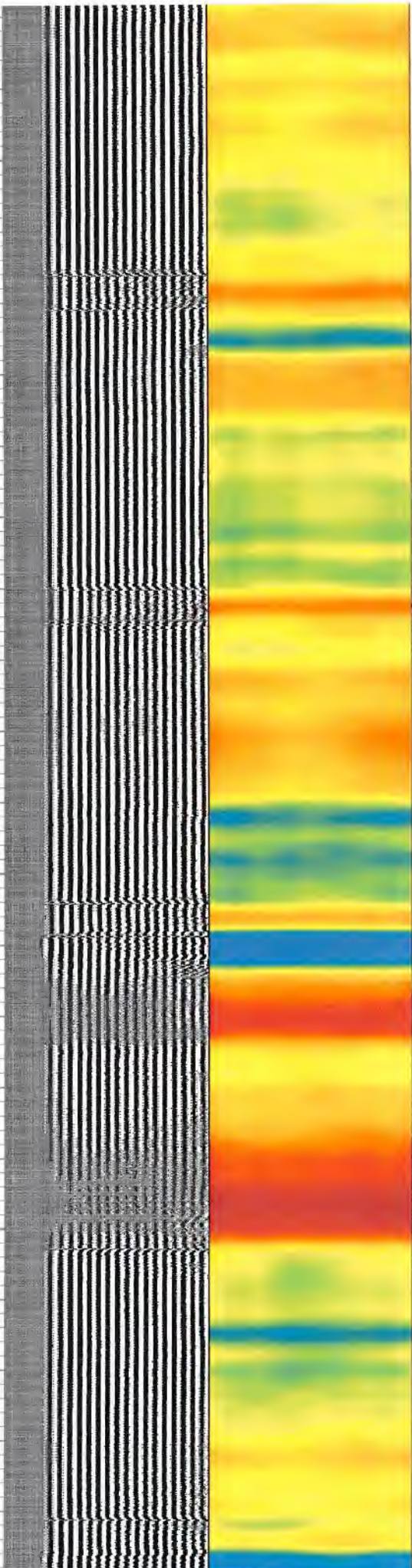
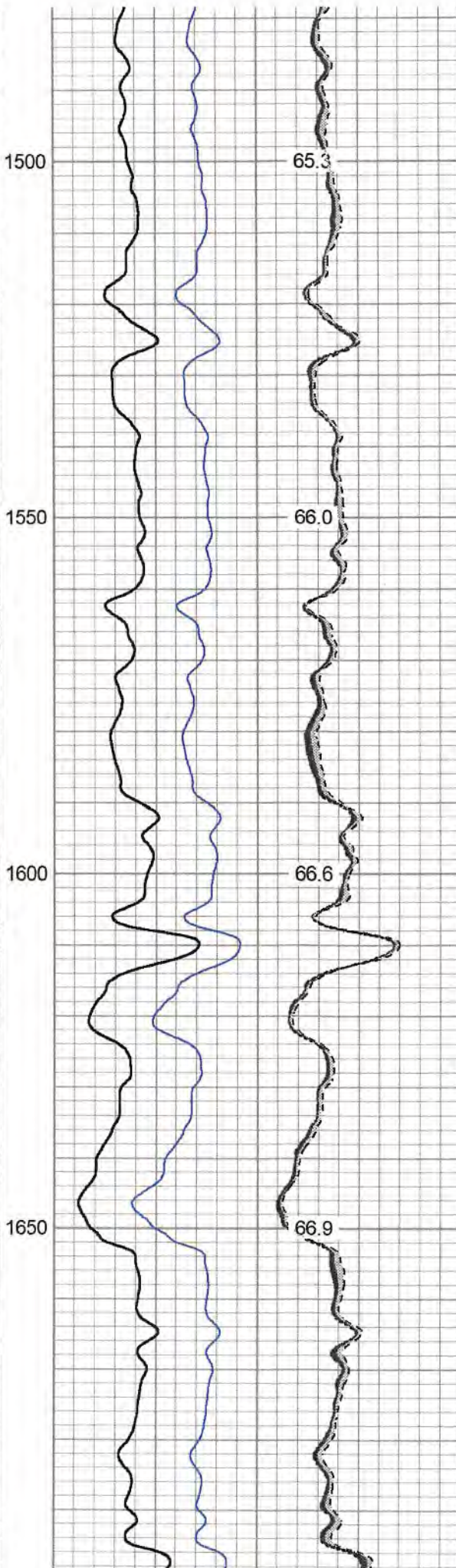
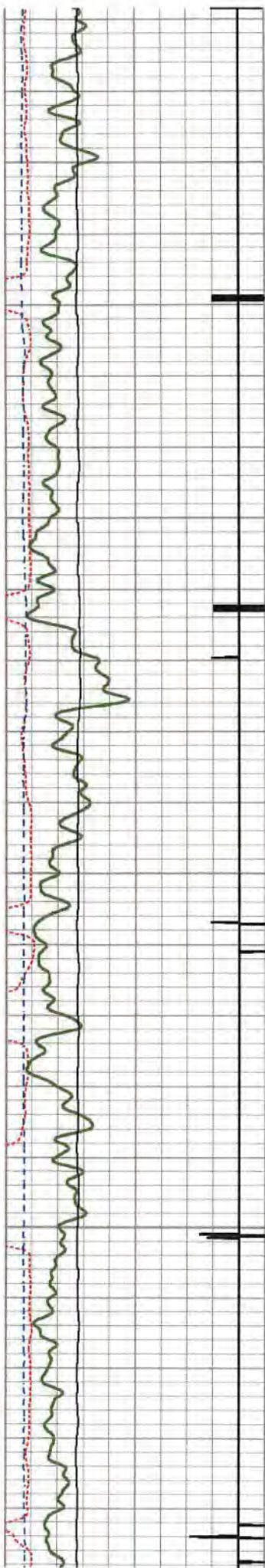


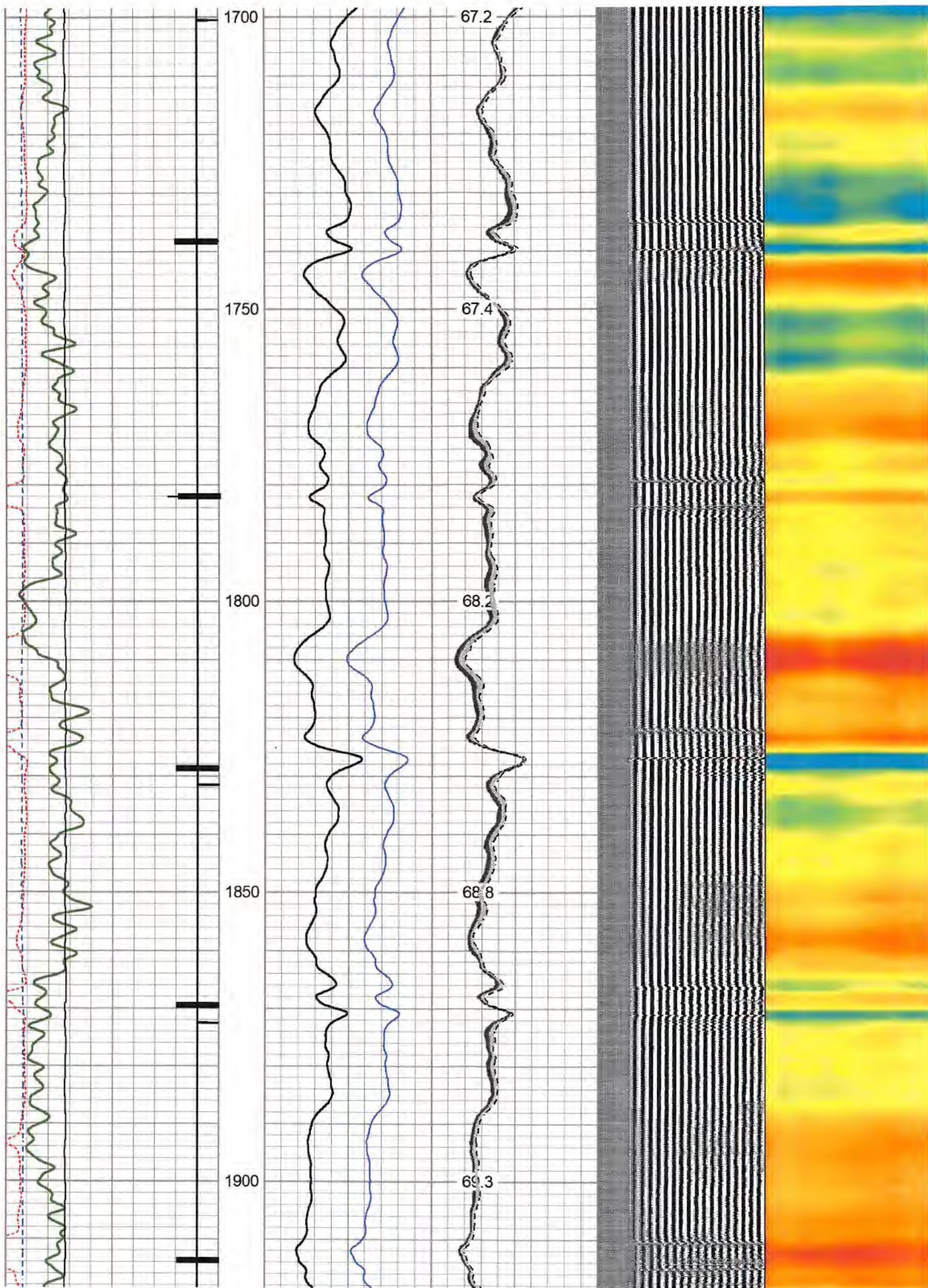


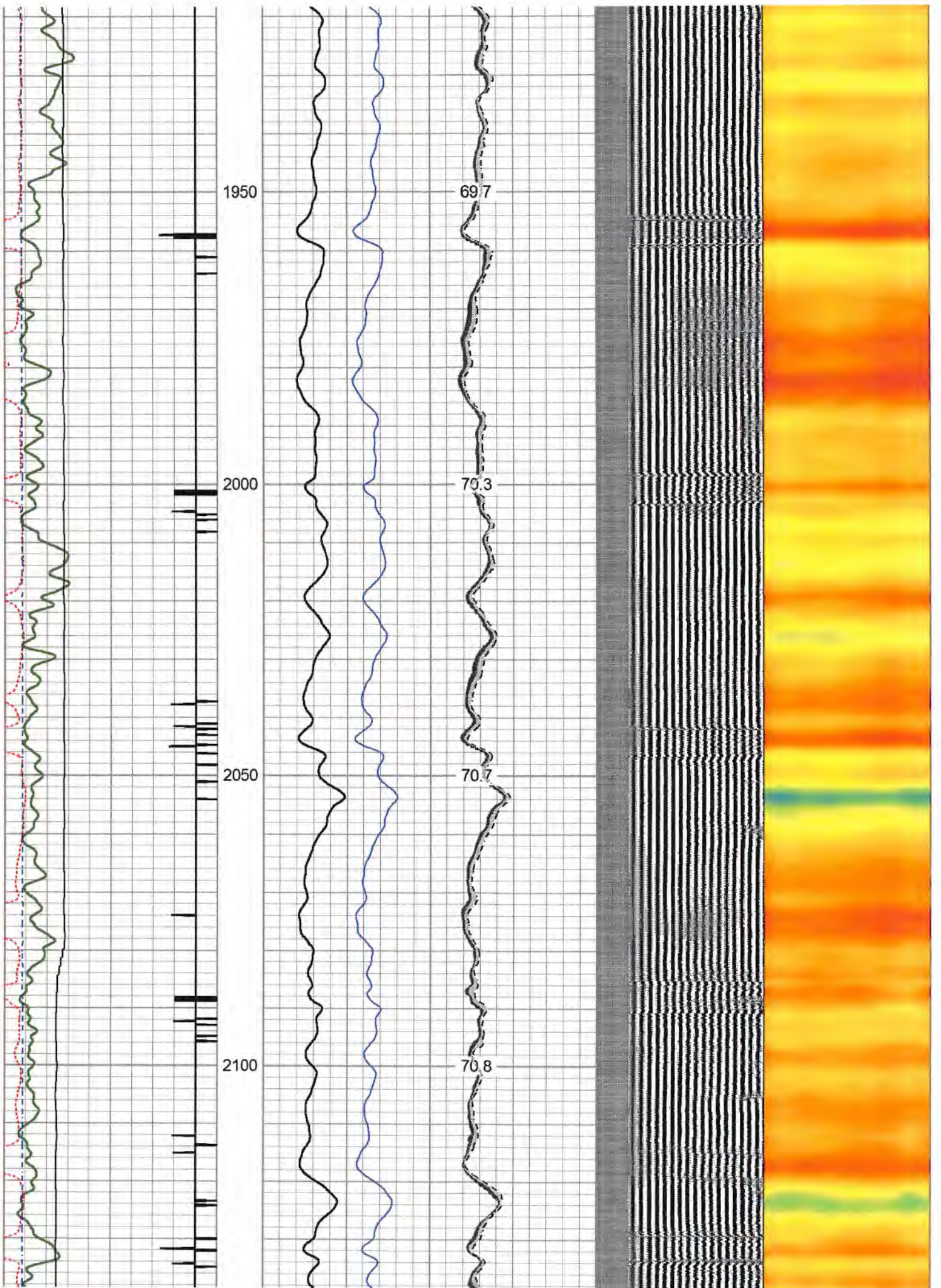


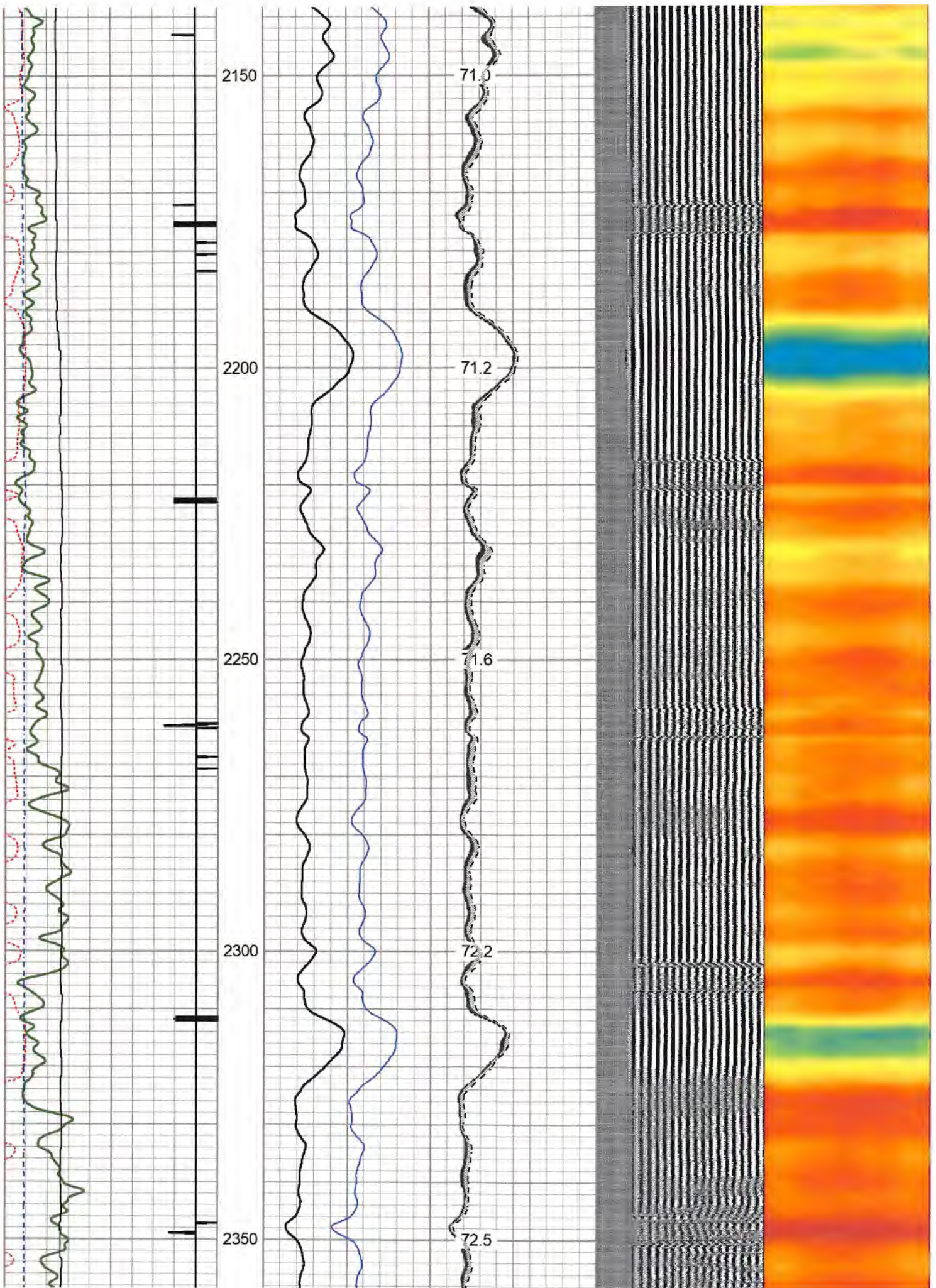


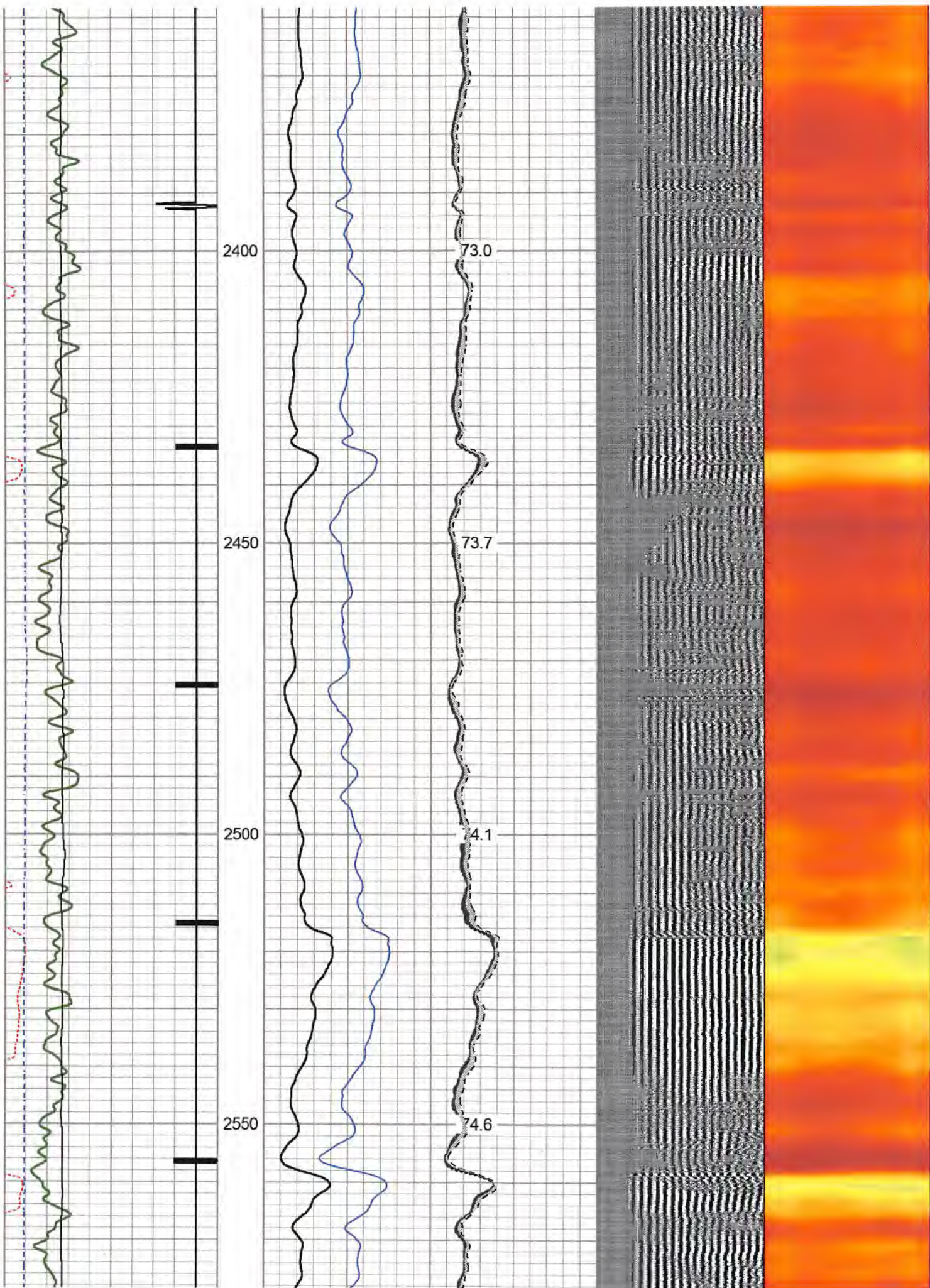


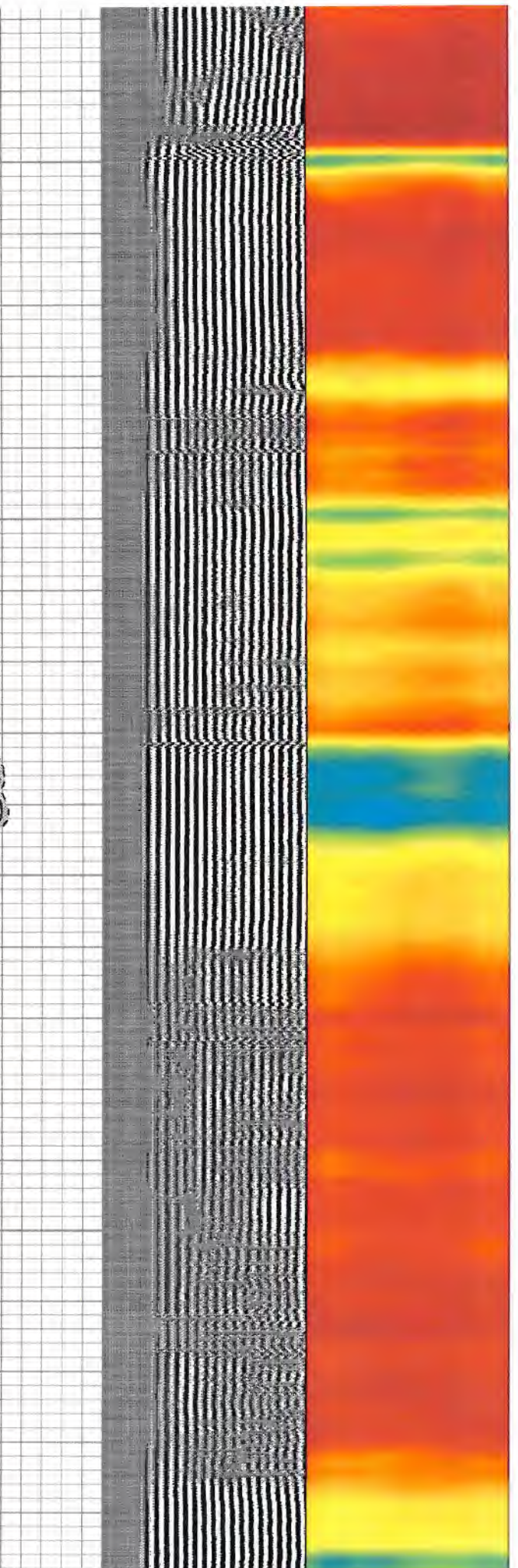
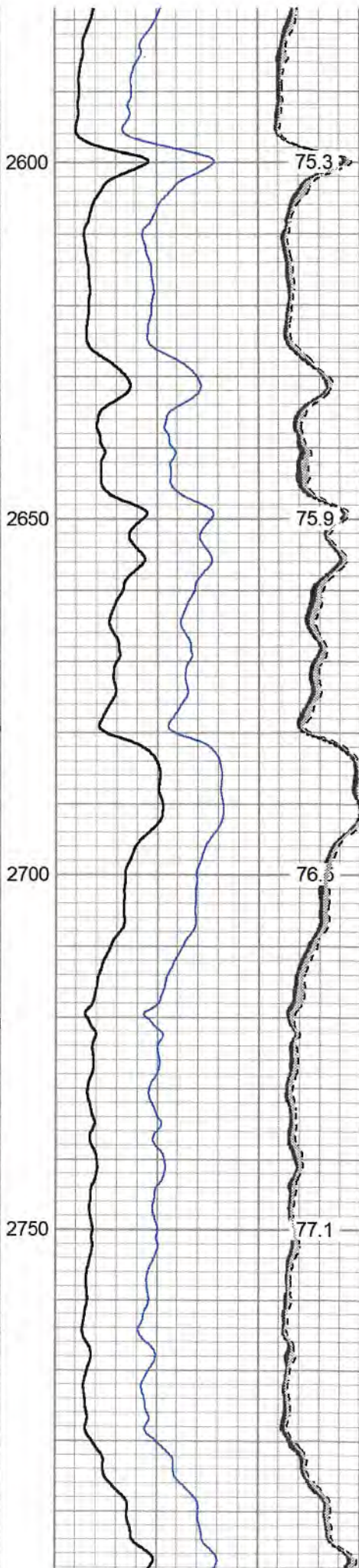
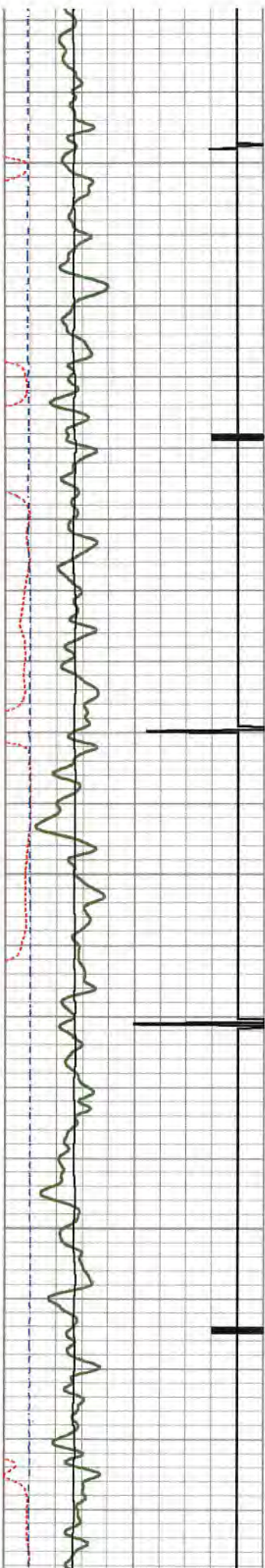


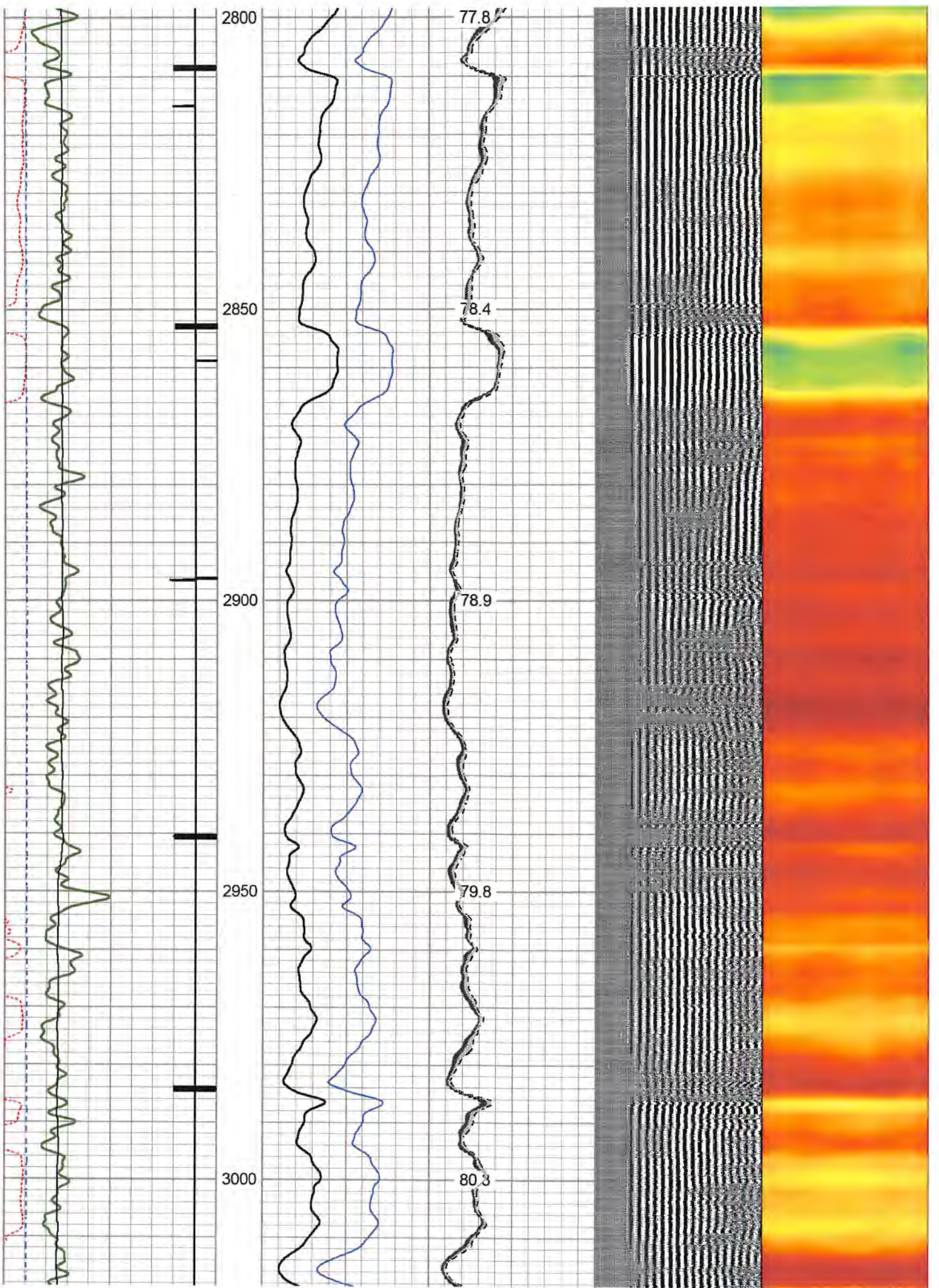


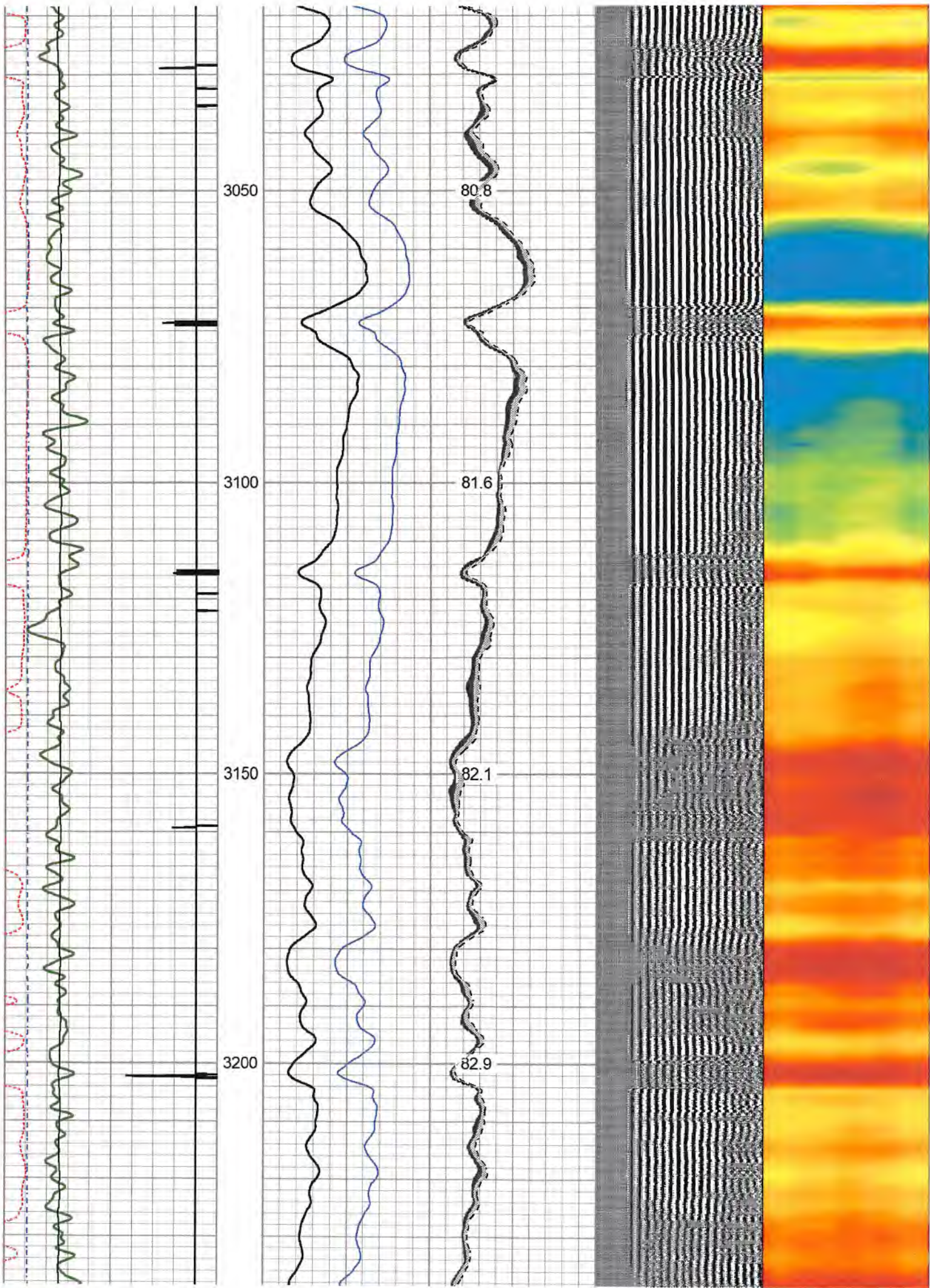




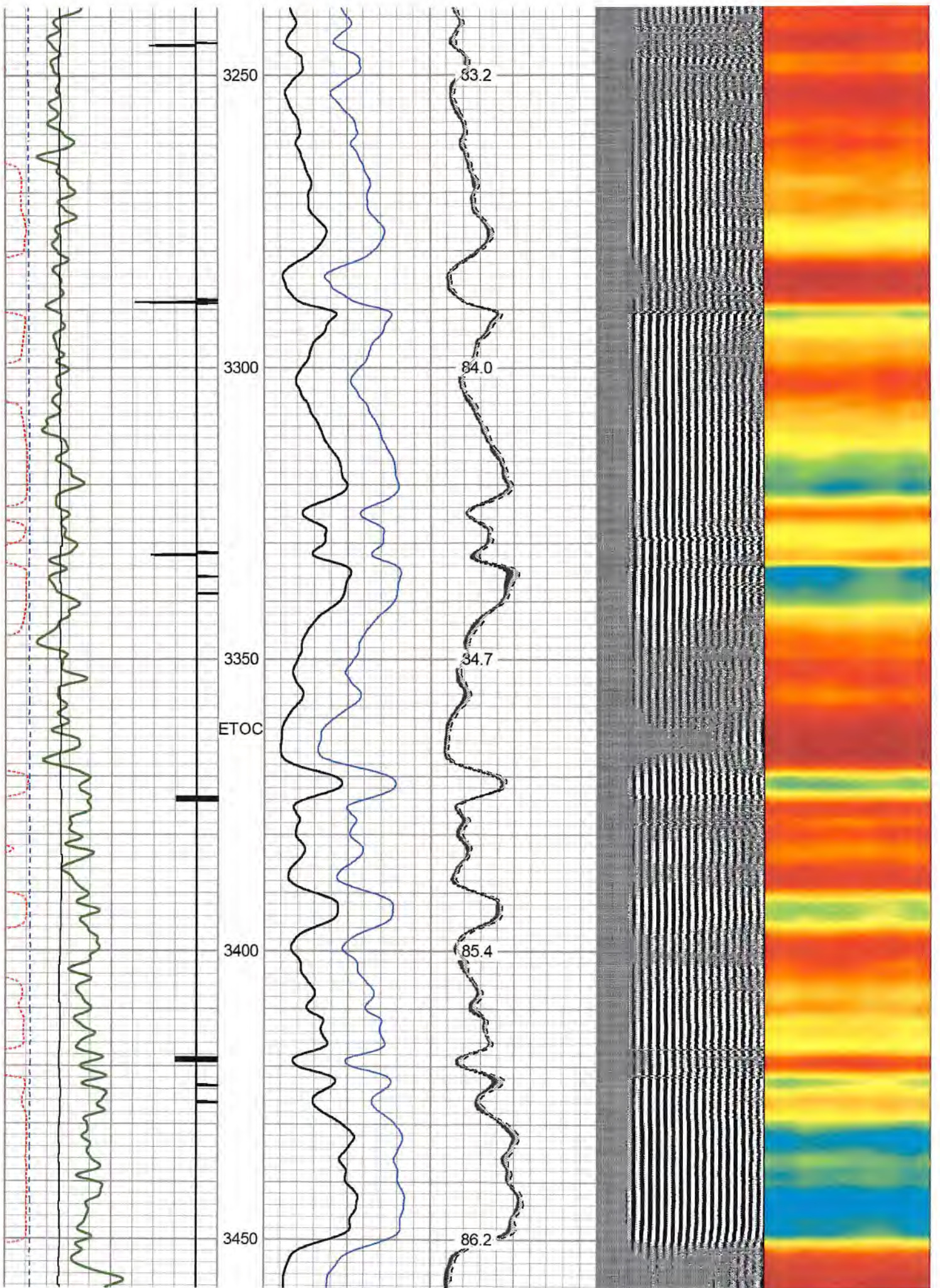


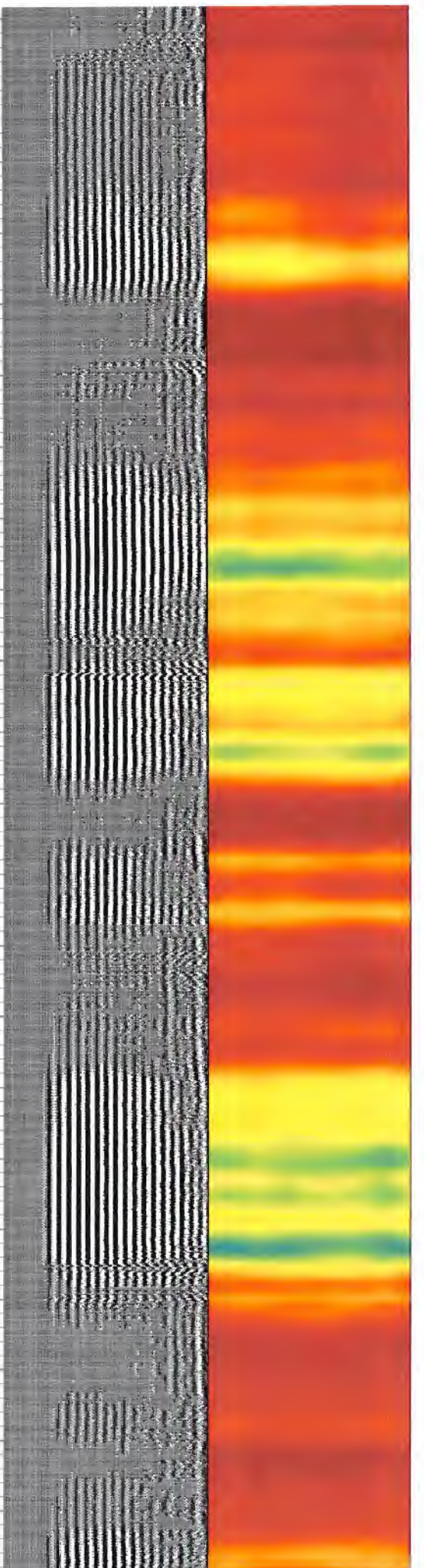
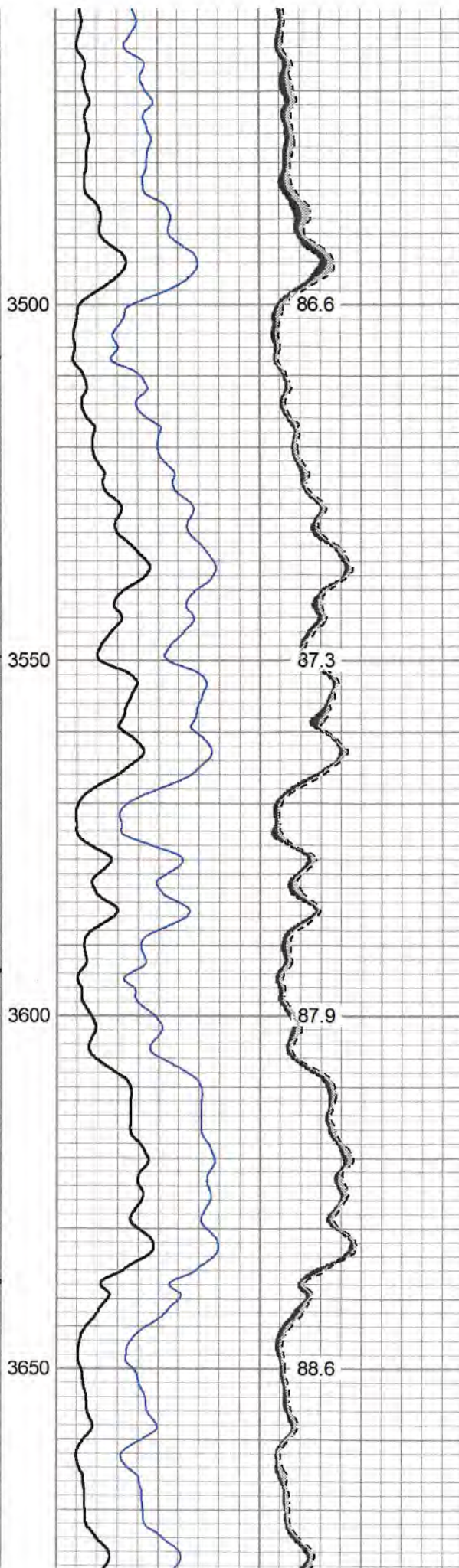
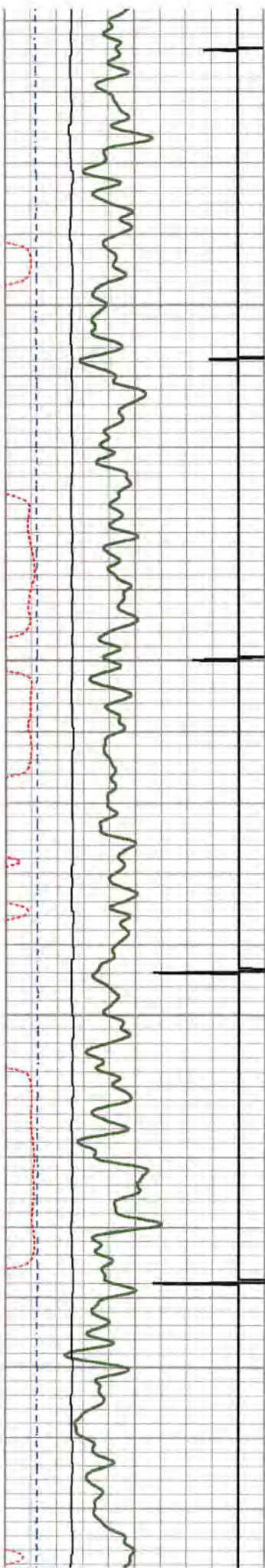


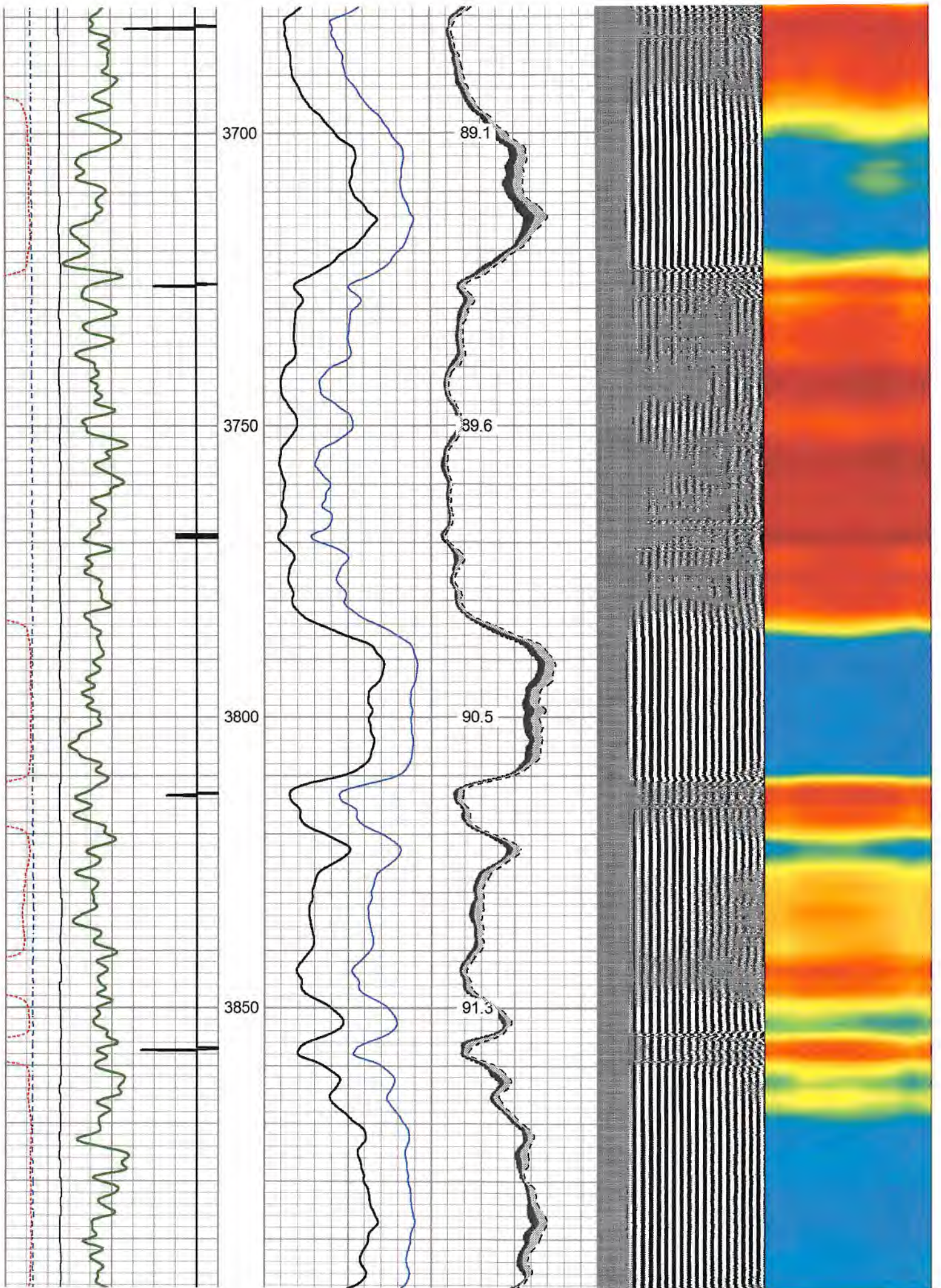


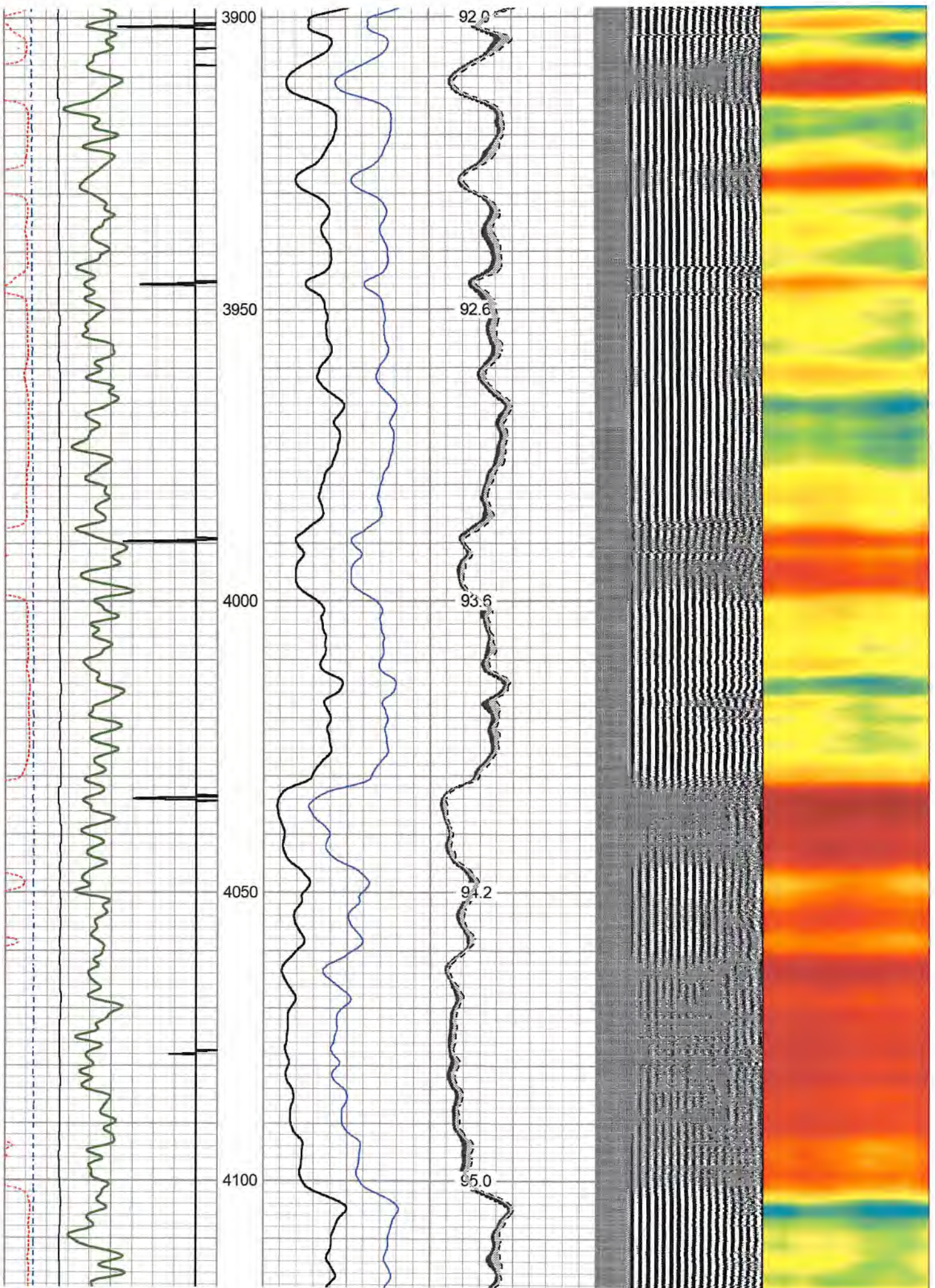


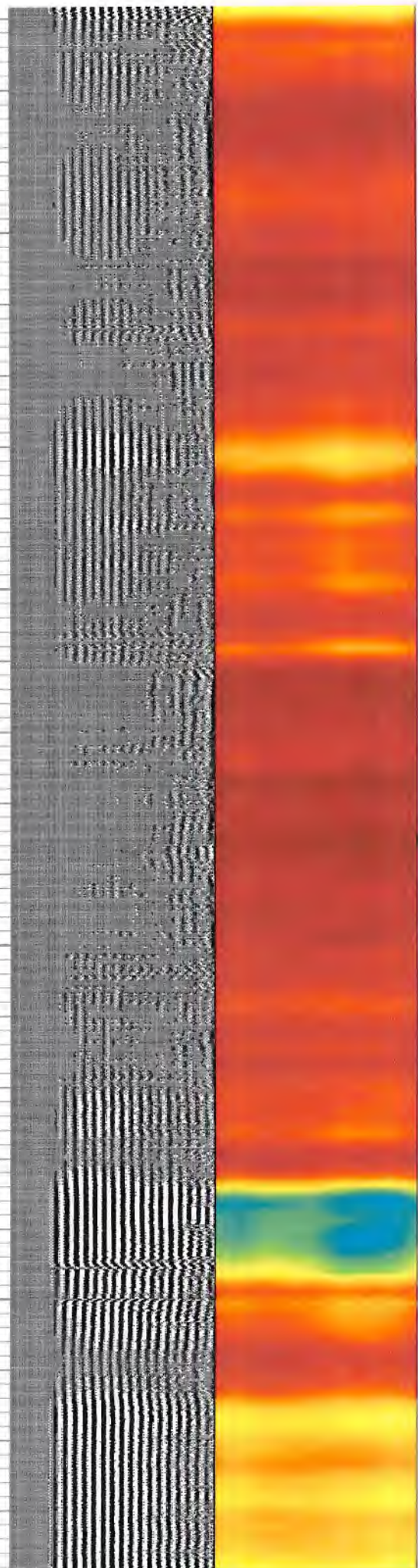
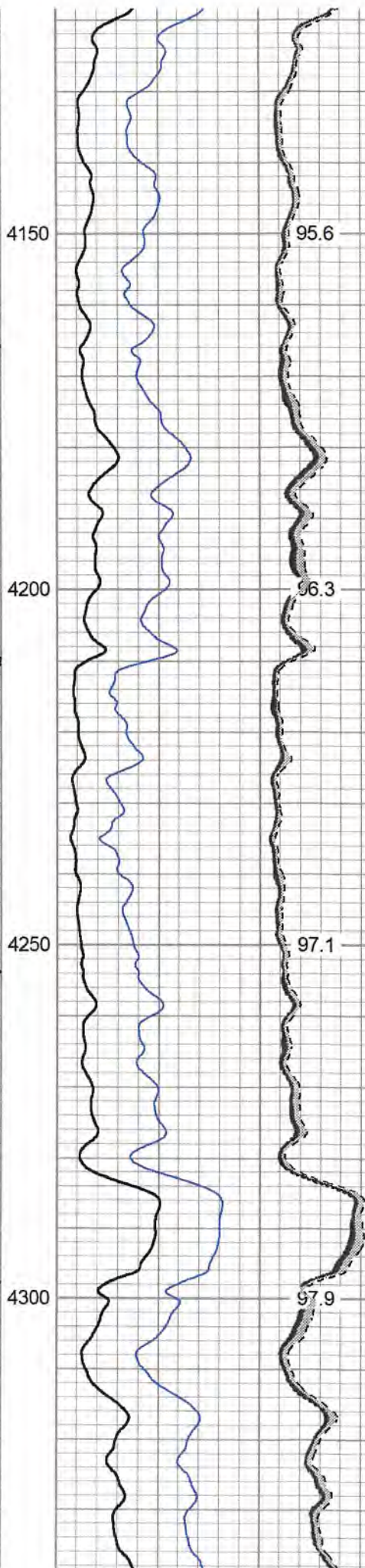
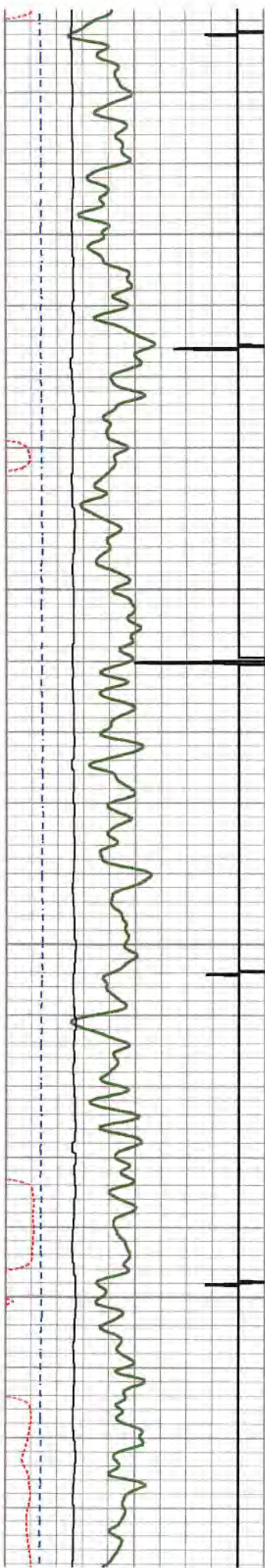


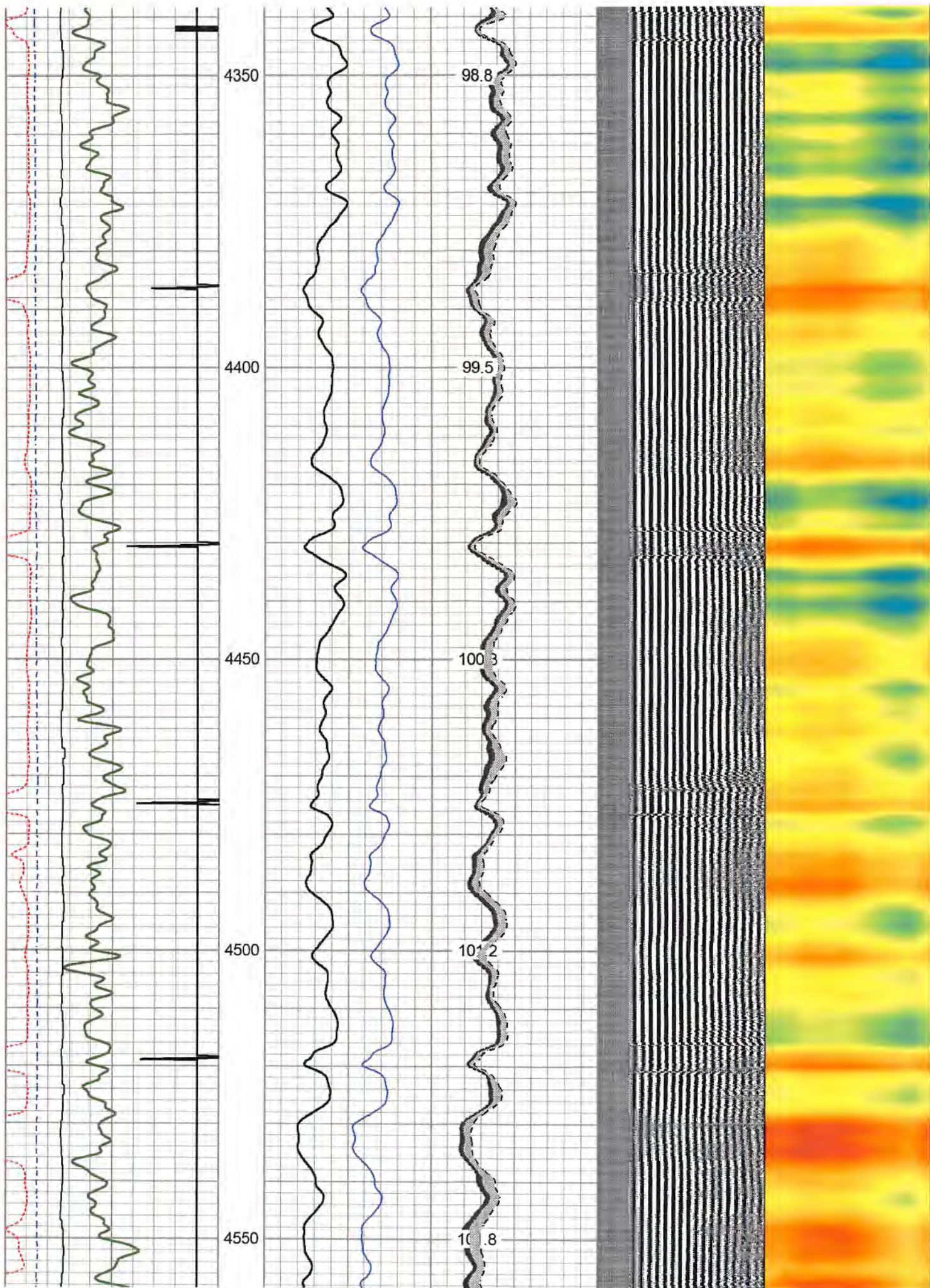


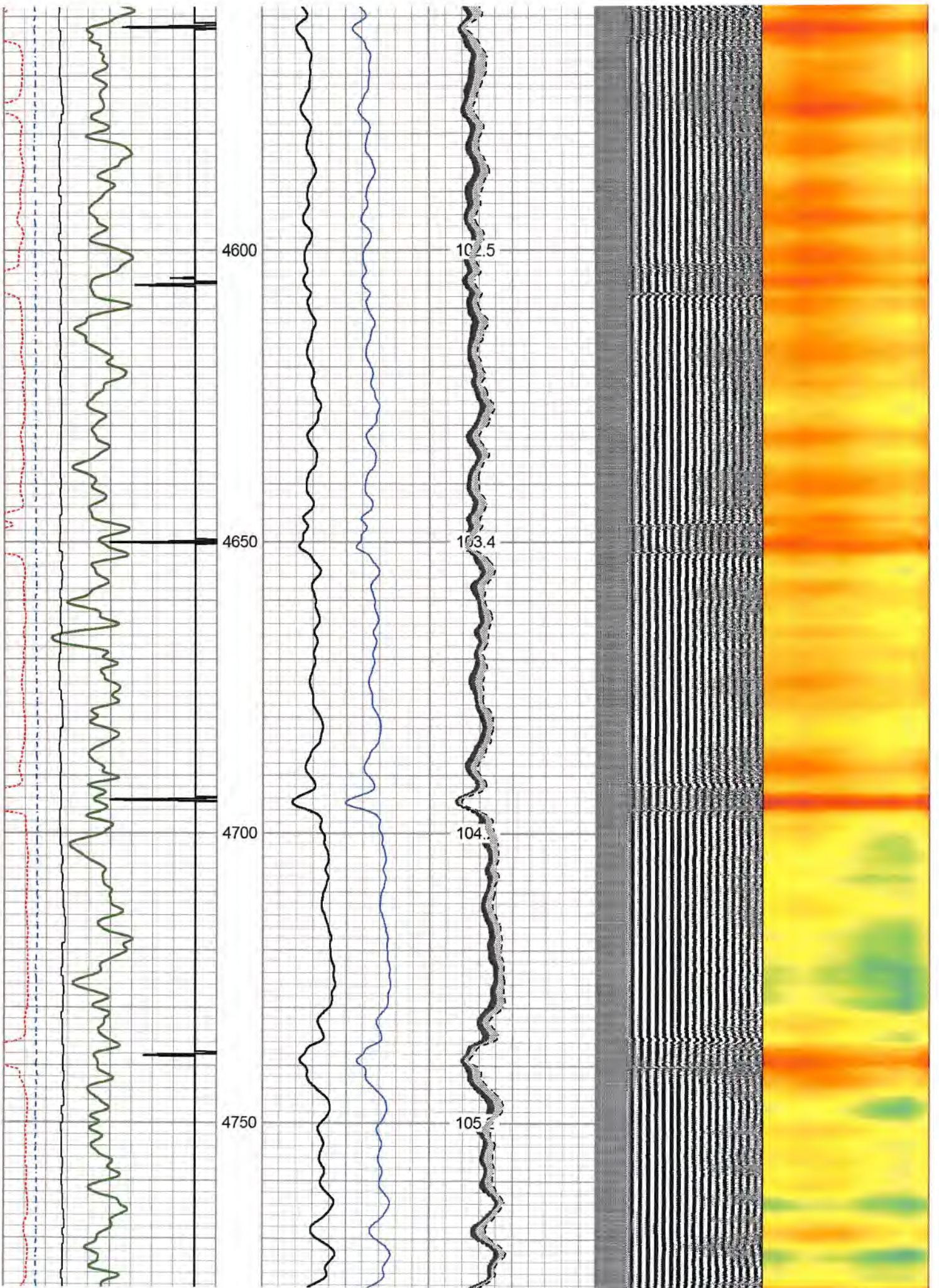


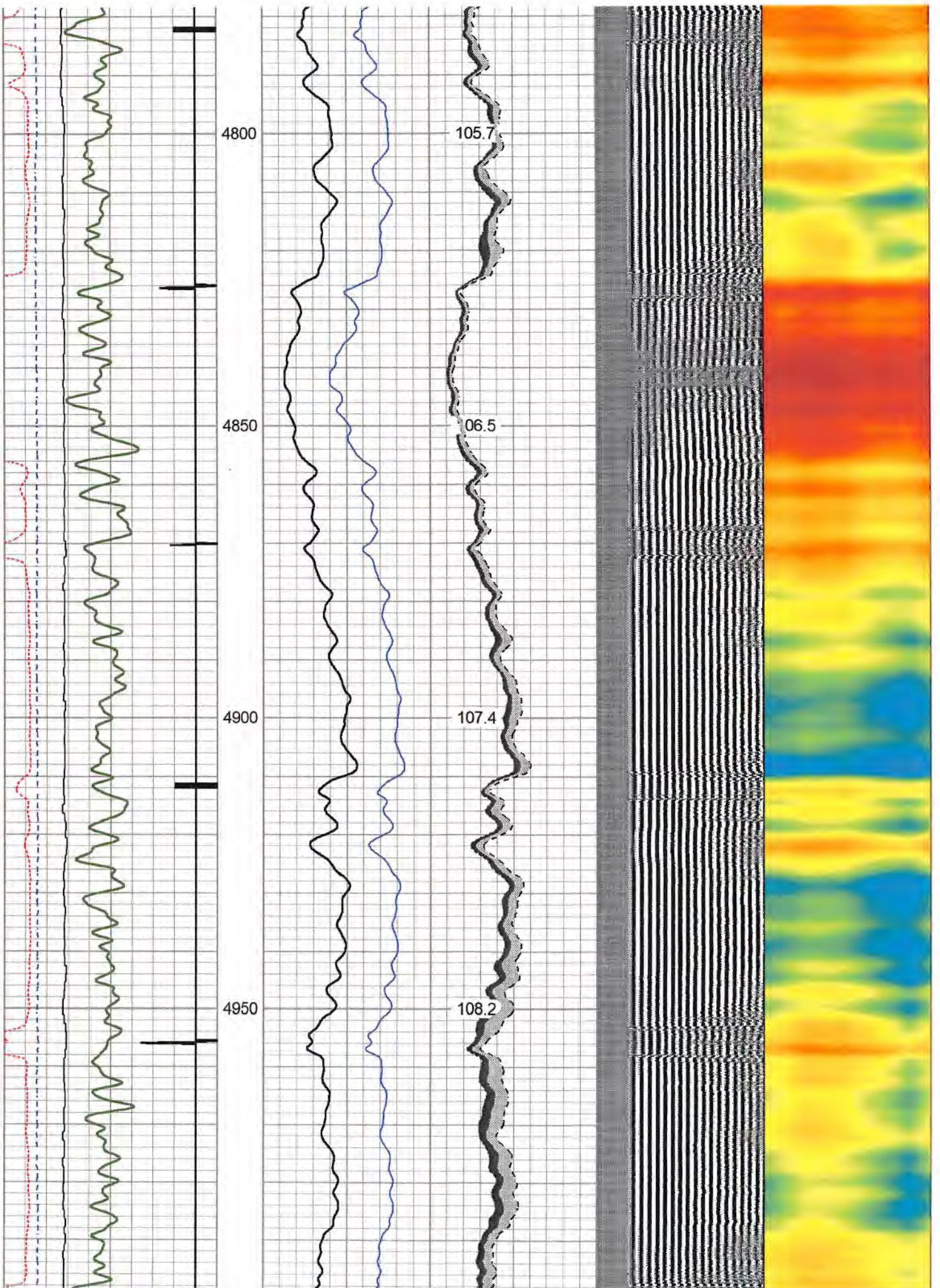




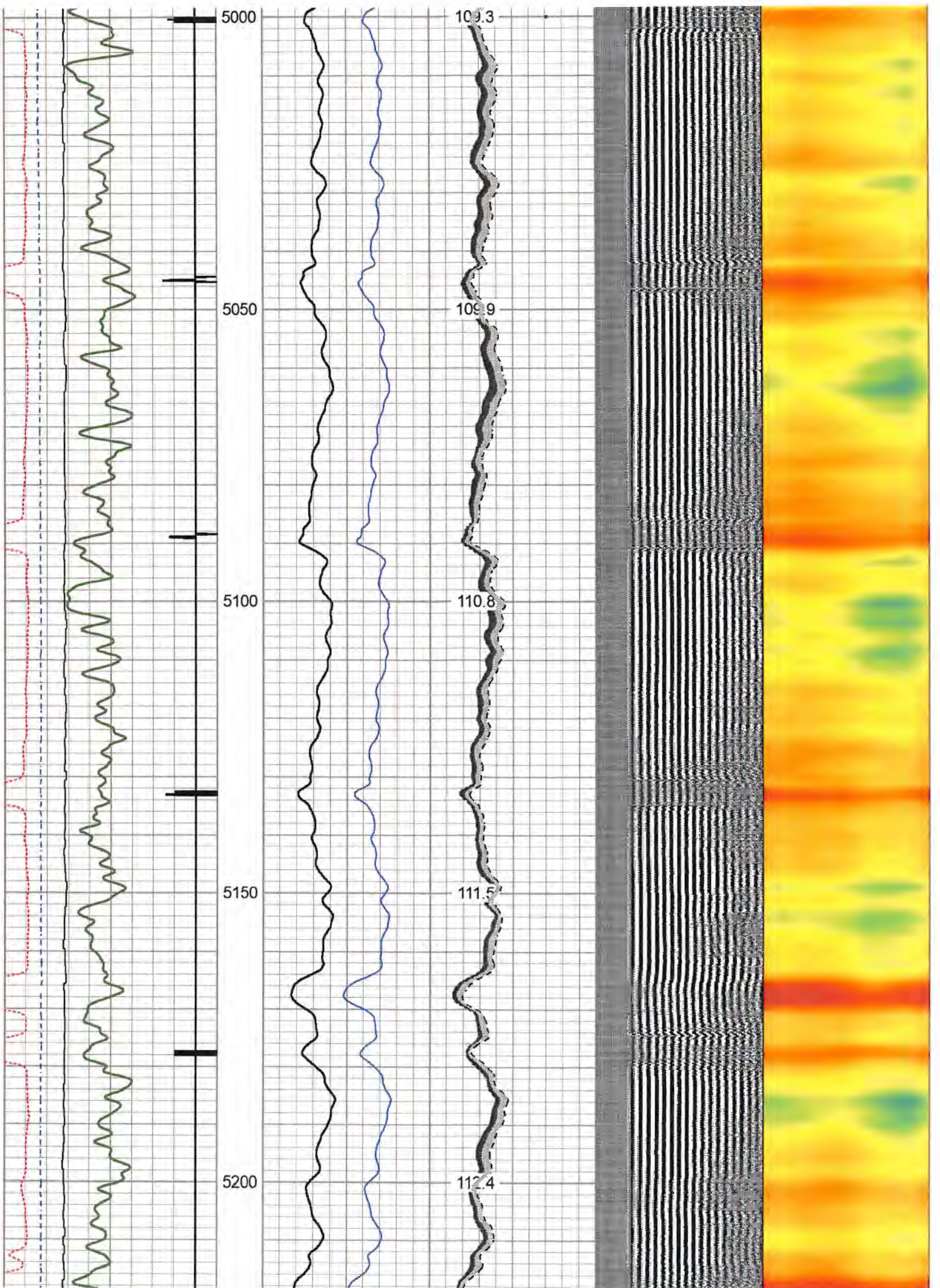


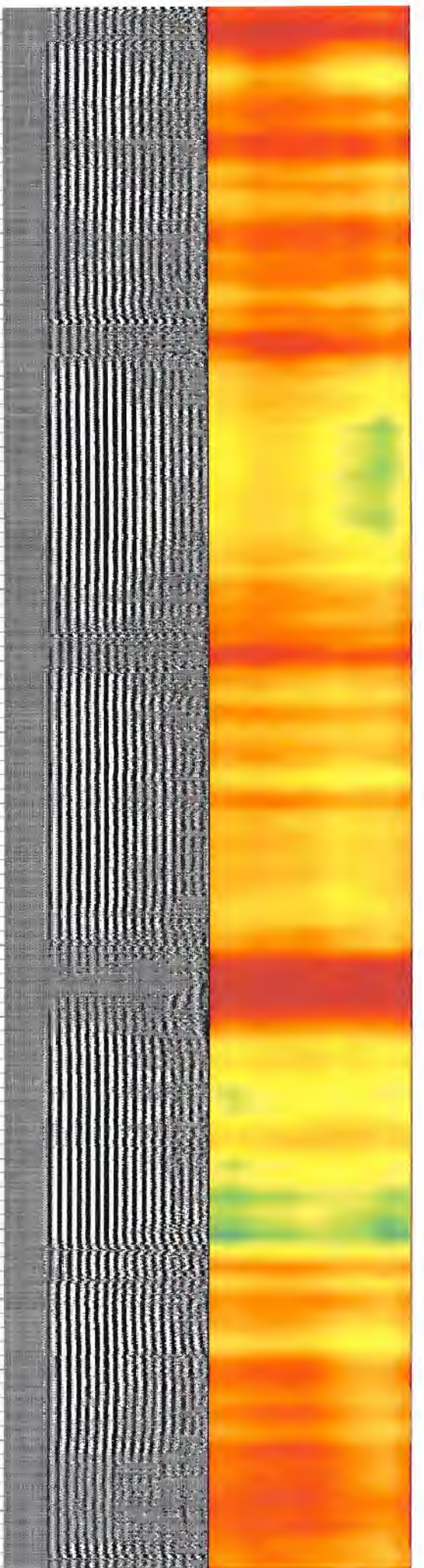
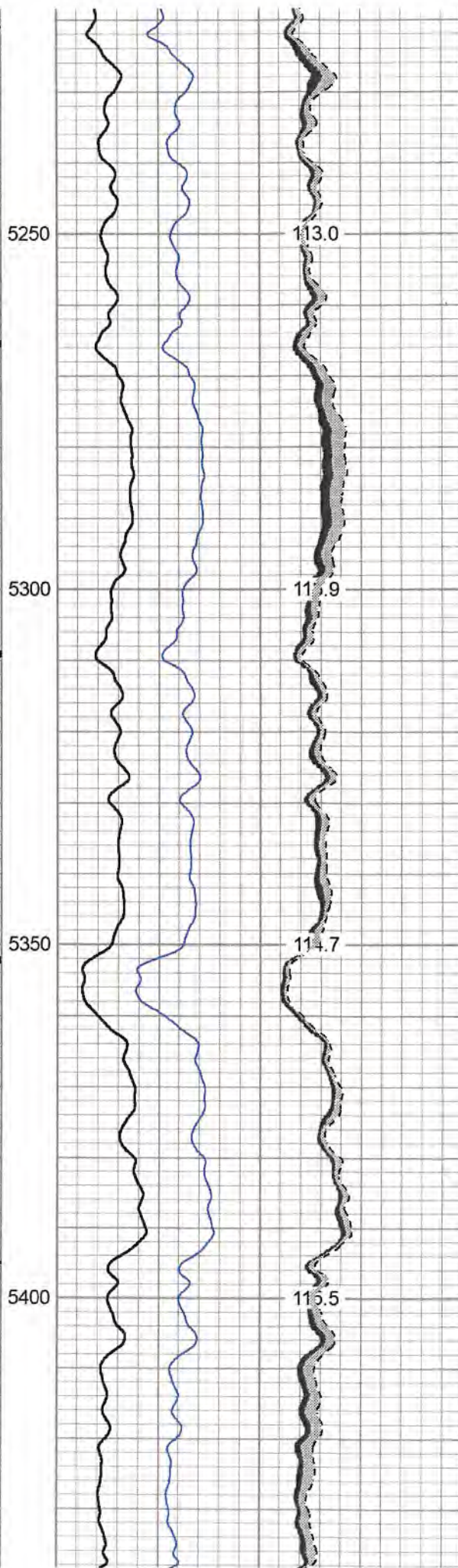
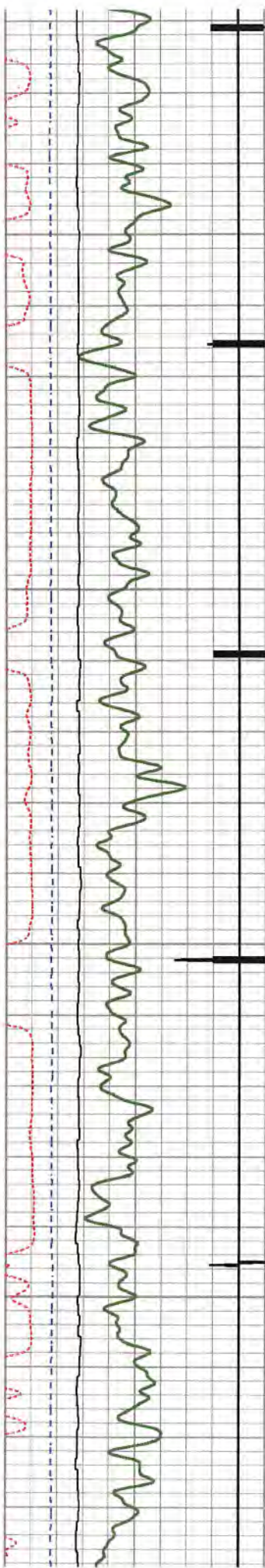


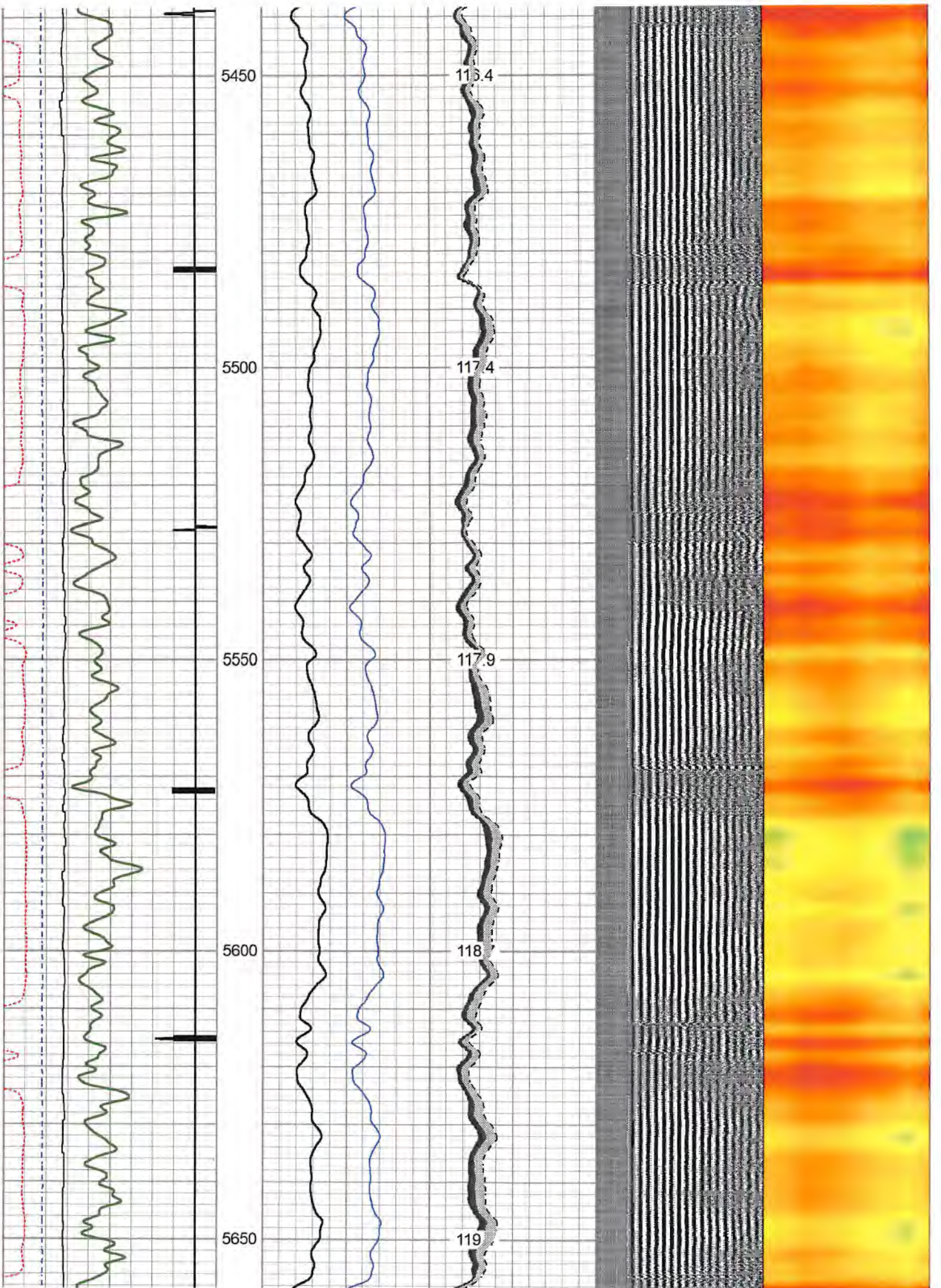


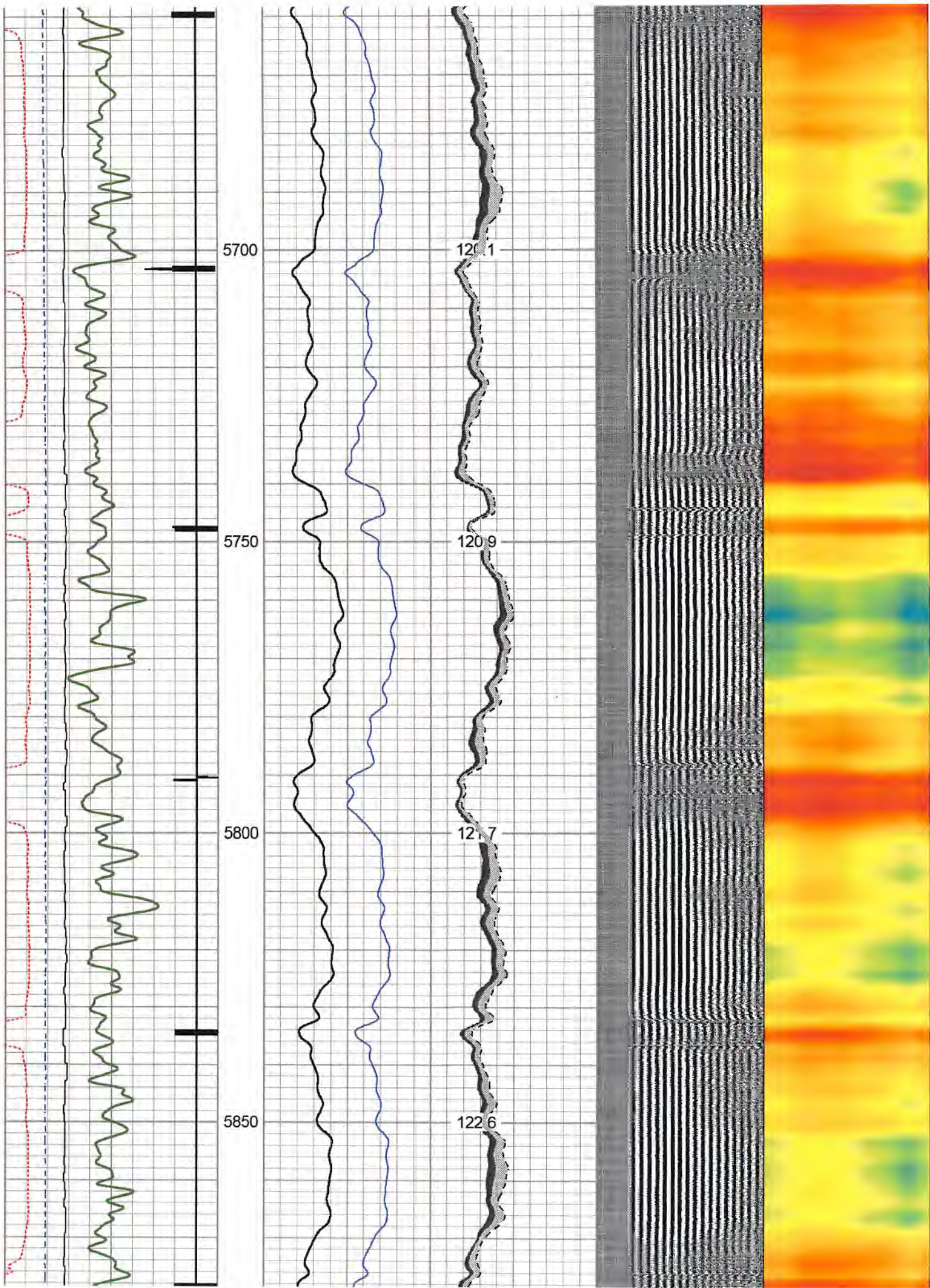


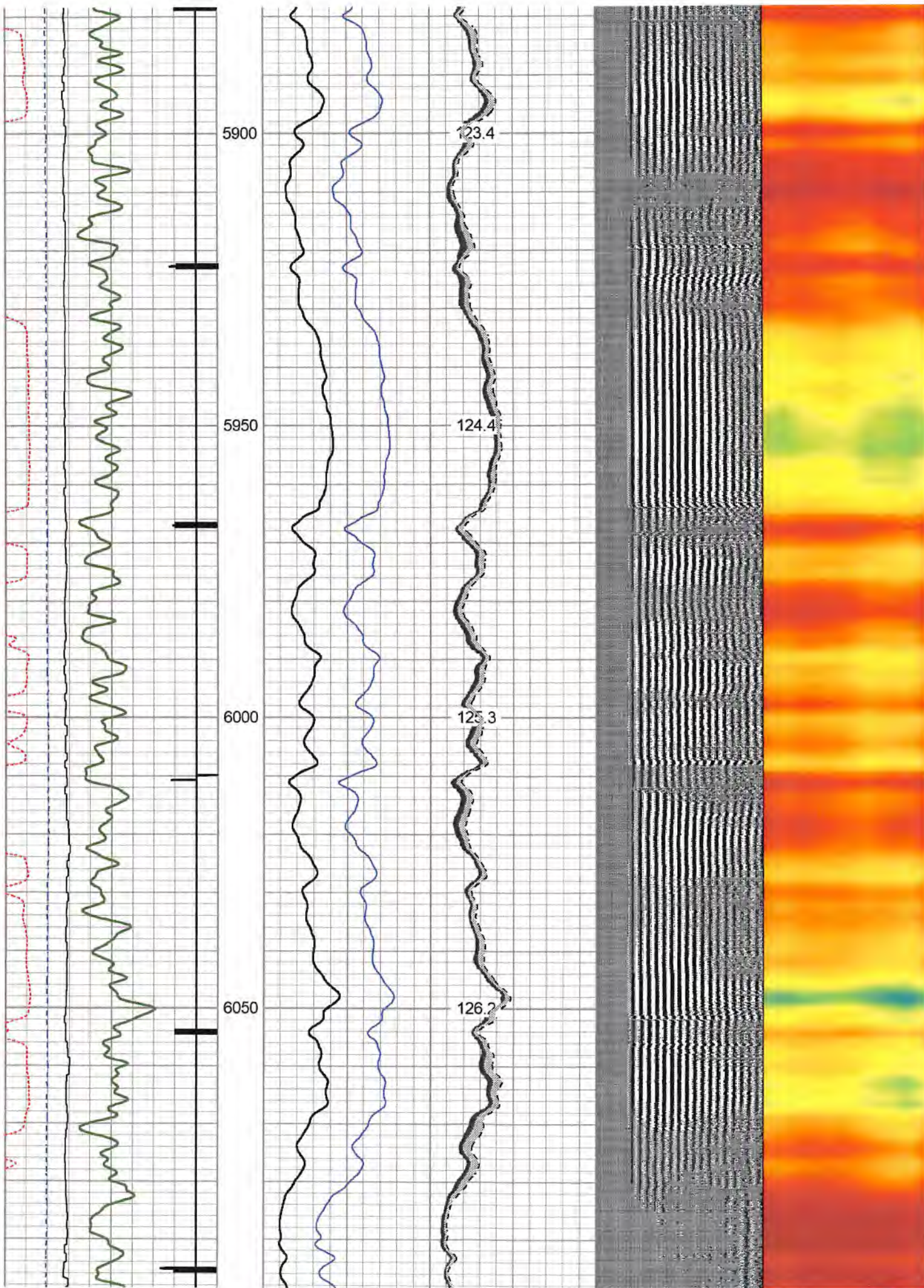


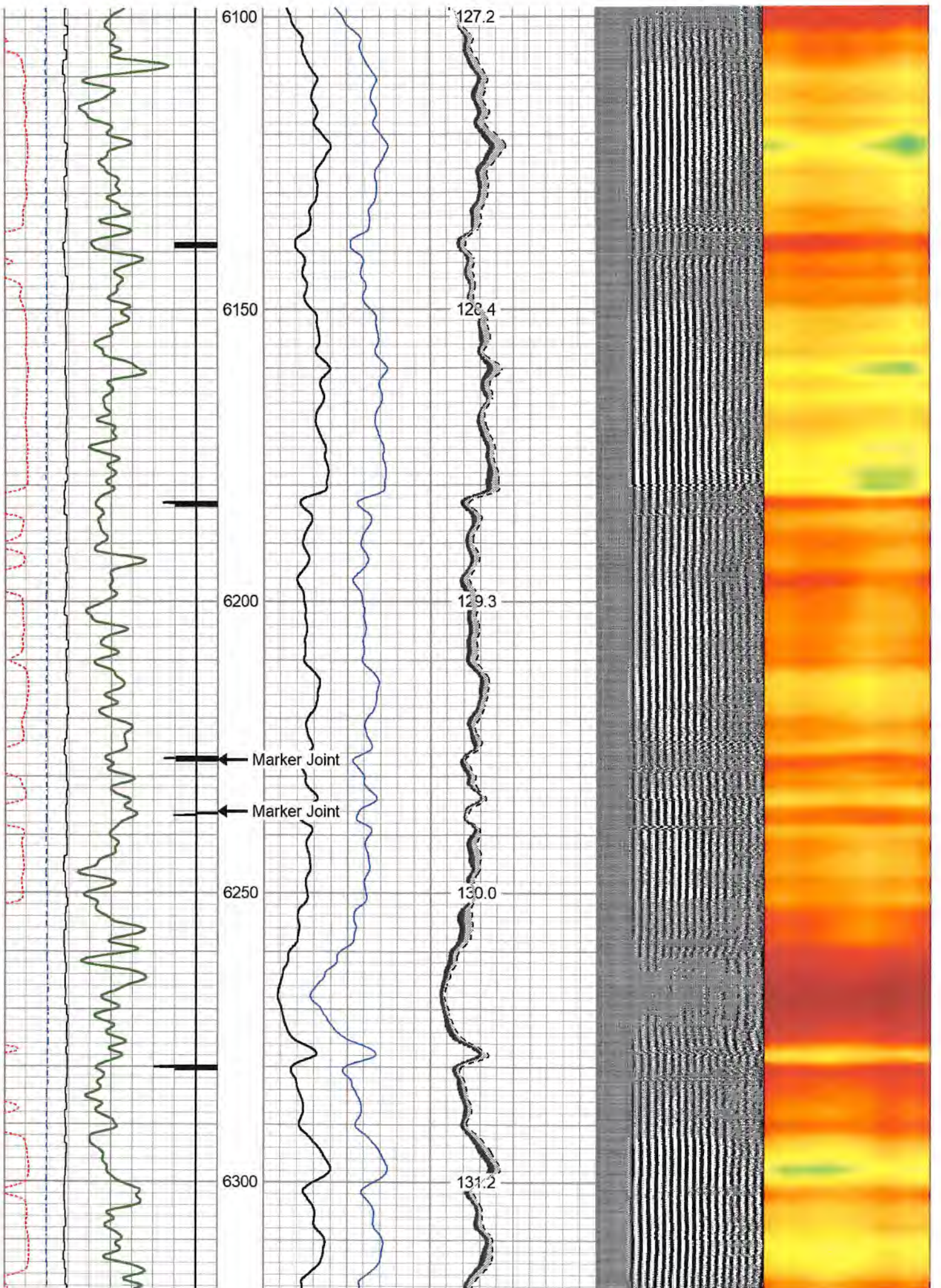


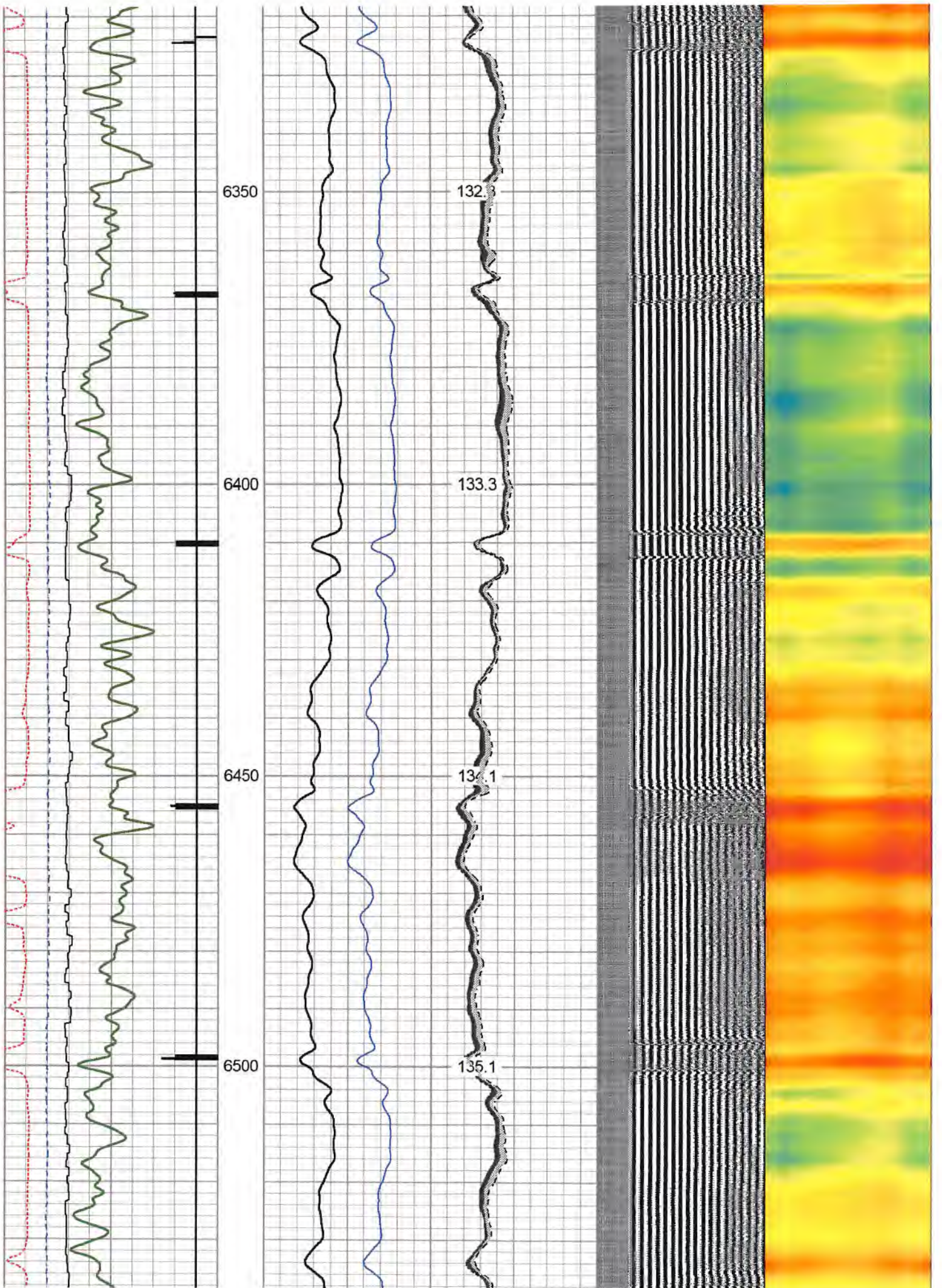


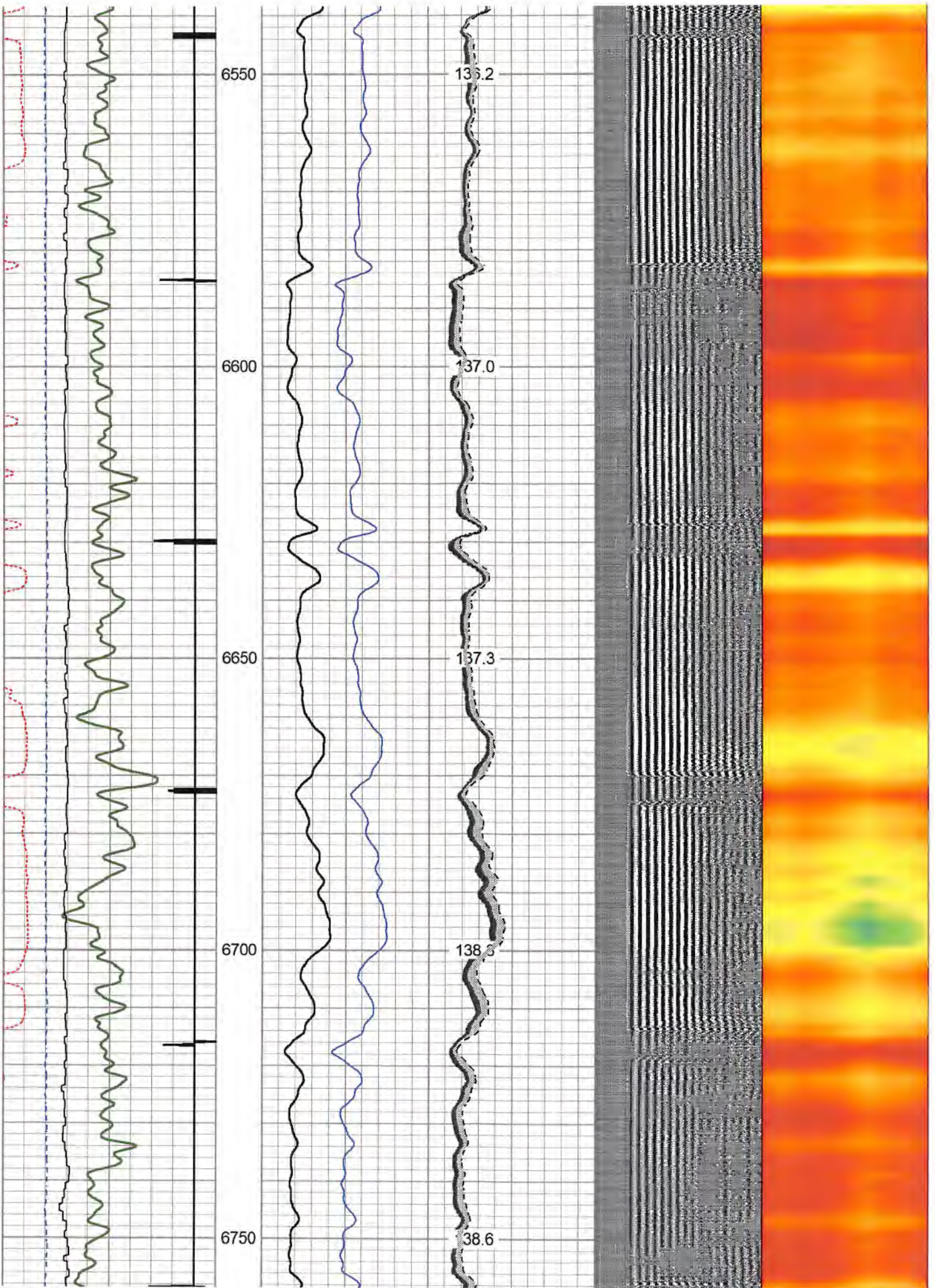




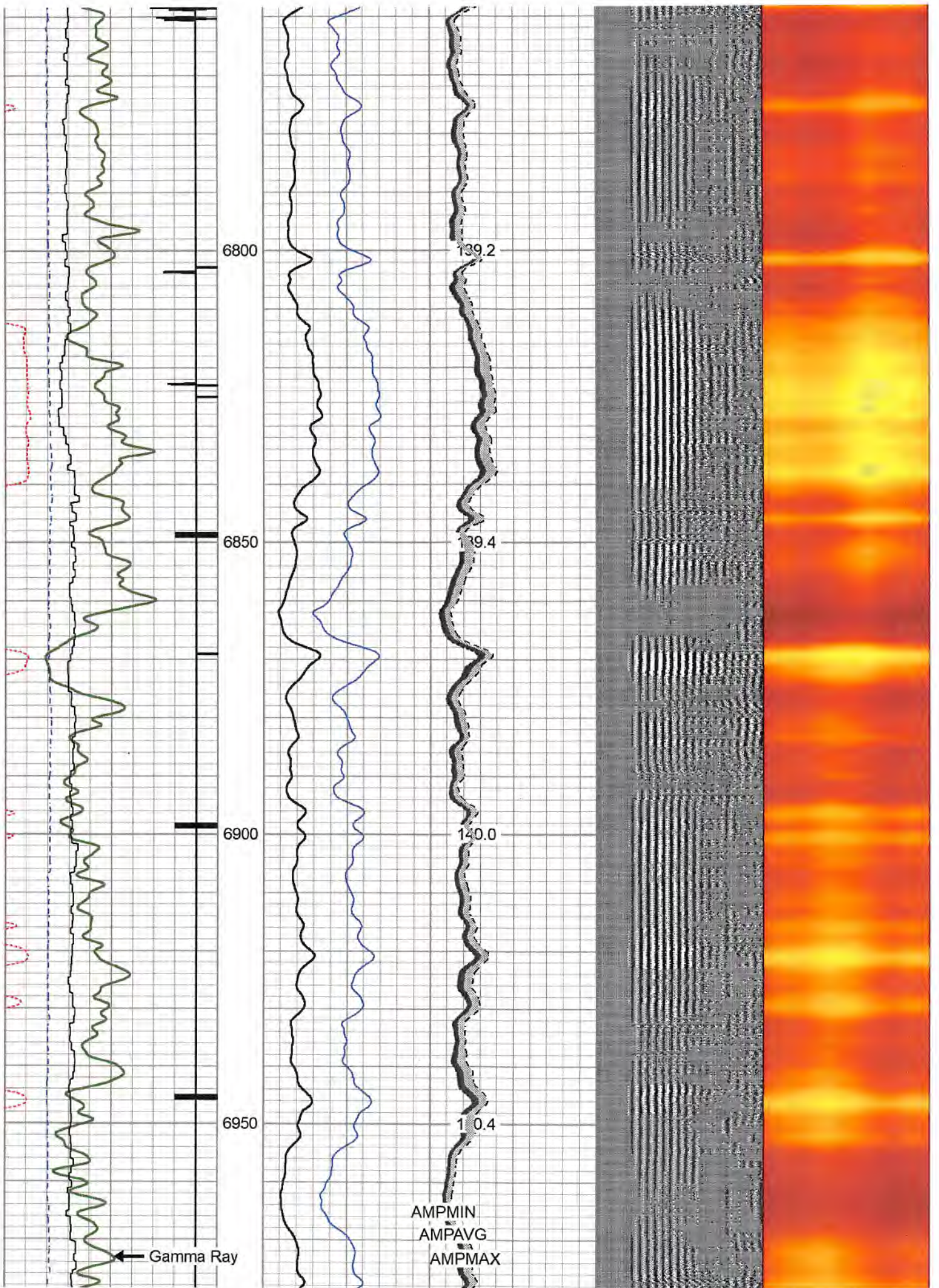




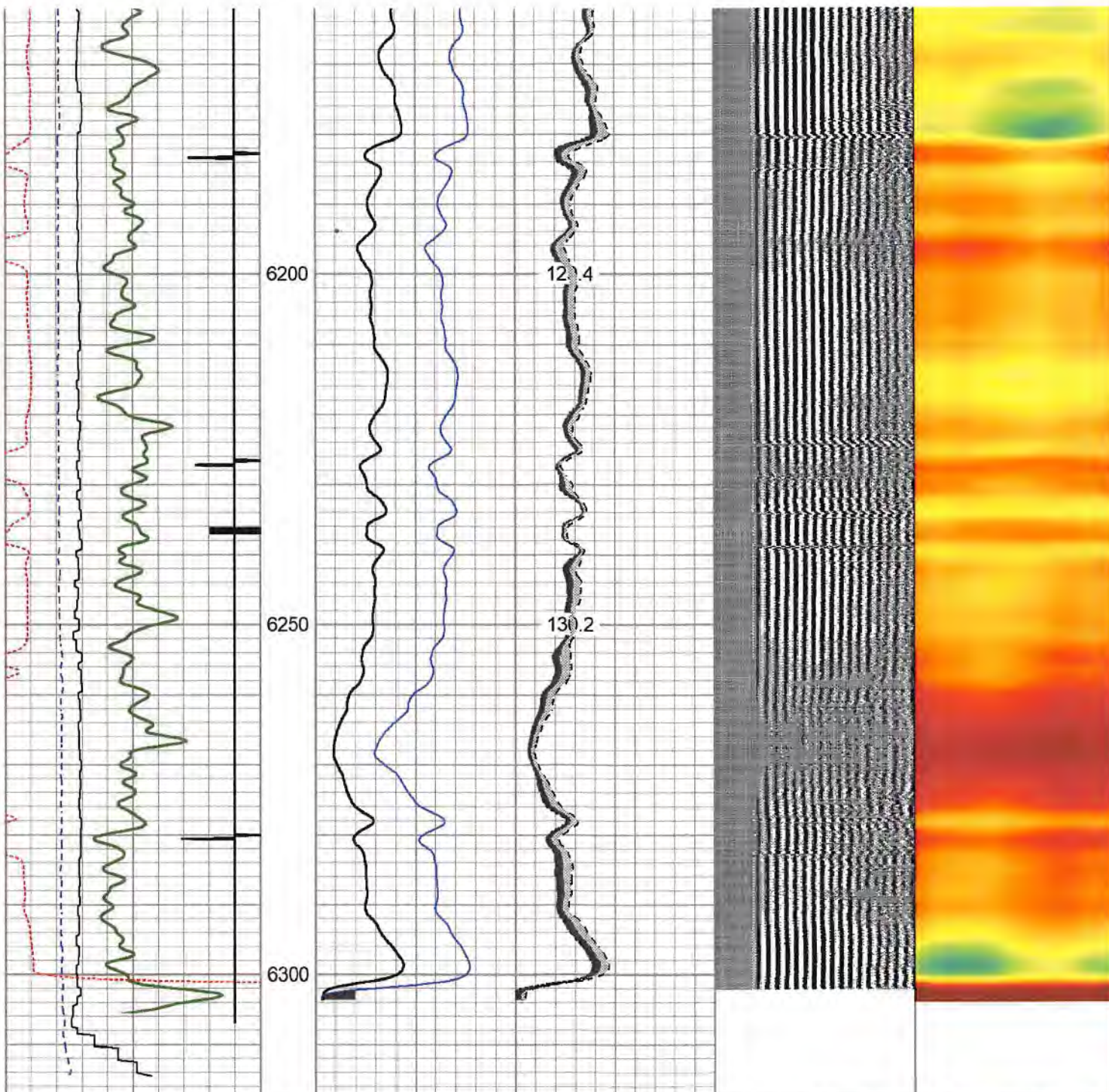












266	Travel Time (usec)	166	0	Amplitude (mV)	100	-5	AMPMIN	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	1	BONDIX	0	-5	AMPMAX	150	200	(usec)	1200	
0	Gamma Ray (GAPI)	150				-5	AMPAVG	150				
	Line Speed						TEMP					
-200	(ft/min)	200					(degF)					
0	Line Tension (lb)	5000										

### Log Variables

Database: C:\ProgramData\Warrior\Data\antero\_mamba\_1h\_rcbl\_18\_feb\_2023.db  
 Dataset: field/well/run1/pass8/\_vars\_

**Top - Bottom**

BHTEMP_Src	BOREID	BOTTEMP	CASEOD	CASETHCK	CASEWGHT	MAXAMPL	MINAMPL
	in	degF	in	in	lb/ft	mV	mV
TEMP	7.875	100	5.5	0	23	71.9	3.4

MINATTN db/ft 0.8	PERFS No	PPT usec 260	SRFTEMP degF 24	TDEPTH ft 0
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**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\_mamba\_1h\_rcbl\_18\_feb\_2023.db  
Dataset Pathname pass8  
Dataset Creation Sat Feb 18 08:39:07 2023

**Gamma Ray Calibration Report**

Serial Number: 275  
Tool Model: Probe  
Performed: Sat Feb 18 08:07:03 2023

Calibrator Value: 100.0 GAPI

Background Reading: 35.0 cps  
Calibrator Reading: 160.0 cps

Sensitivity: 0.5000 GAPI/cps

**Segmented Cement Bond Log Calibration Report**

Serial Number: 2.75"  
Tool Model: Probe275T

Calibration Casing Diameter: 5.500 in  
Calibration Depth: 678.333 ft

**Master Calibration, performed Sat Feb 18 07:55:05 2023:**

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.002	0.324	3.400	71.921	210.478	3.731
CAL	0.559	0.564				
5'	-0.009	0.315	3.400	71.921	211.517	5.225
SUM						
S1	0.030	0.321	0.000	100.000	343.552	-10.367
S2	-0.007	0.285	0.000	100.000	342.346	2.261
S3	-0.004	0.303	0.000	100.000	326.245	1.270
S4	-0.004	0.318	0.000	100.000	310.256	1.197
S5	-0.003	0.347	0.000	100.000	285.934	0.792
S6	-0.006	0.360	0.000	100.000	272.630	1.737
S7	-0.001	0.351	0.000	100.000	284.050	0.333
S8	-0.008	0.317	0.000	100.000	307.704	2.445

**Internal Reference Calibration, performed Wed Nov 23 14:17:52 2011:**


	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset

	Zero	Gain	Zero	Gain	Gain	Offset
CAL	0.000	0.000	0.559	0.564	1.000	0.000

Air Zero Calibration, performed Sat Feb 18 07:28:40 2023:

	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)
HeadVolt	18.52		CHD-Titan Standard 1 7/16" Cable Head	1.02	1.44	1.00
Temp	15.67		Centralizer-2.75_Overbody	1.67	3.12	5.00
WVFS8	13.44		RBT-Probe275T (2.75") Probe 2.75" Radial with Integral Temperature Sub	9.39	2.75	90.00
WVFS7	13.44					
WVFS6	13.44					
WVFS5	13.44					
WVFS4	13.44					
WVFS3	13.44					
WVFS2	13.44					
WVFS1	13.44					
WVF3FT	13.44					
WVF5FT	12.44					
WVFCAL	9.19					
HEADVOLT	9.19					
CCL	7.56					
GR	6.23	Centralizer-2.75_Overbody	1.67	3.12	5.00	
		GR-Probe (275) Probe 2 3/4" Logging Gamma Ray	5.50	2.75	57.00	

			<p>Centralizers-5419-312-S600 Titan 3 1/8" Adjustable Centralizer</p> <p>Bull_Plug-1_7/16_GO Titan 1 7/16" Female Bull Plug</p>	<p>3.42</p> <p>0.27</p>	<p>3.13</p> <p>1.44</p>	<p>34.00</p> <p>1.00</p>
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Dataset: antero\_mamba\_1h\_rcbl\_18\_feb\_2023.db: field/well/run1/pass8  
Total length: 19.60 ft  
Total weight: 193.00 lb  
O.D.: 3.13 in

	<p>Company Antero Resources  Well Mamba 1H  Field Rabbit Ears  County Tyler  State WV</p>
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