



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

Company ANTERO RESOURCES  
Well REDWOOD 3H  
Field WEST UNION  
County DODDRIDGE  
State WV

Company ANTERO RESOURCES  
Well REDWOOD 3H  
Field WEST UNION  
County DODDRIDGE State WV

Location: 39.2566436, -80.791916 (ENTERANCE)  
API #: 47-017-06932

Other Services

Permanent Datum SEC TWP RGE  
Log Measured From GROUND LEVEL Elevation 25.5"  
Drilling Measured From KELLY BUSHING  
KELLY BUSHING

Elevation  
K.B. 1155.5  
D.F. 1145.5  
G.L. 1121

Date	NOVEMBER 13, 2022						
Run Number	ONE						
Depth Driller	17,802'						
Depth Logger	6,917'						
Bottom Logged Interval	6,894'						
Top Log Interval	SURFACE						
Open Hole Size	NA						
Type Fluid	FRESH WATER						
Density / Viscosity	8.6 LB/GAL						
Max. Recorded Temp.	150.4						
Estimated Cement Top	1,954'						
Time Well Ready	UPON ARRIVAL						
Time Logger on Bottom	12:25						
Equipment Number	116						
Location	CHARLEROI, PA						
Recorded By	C. DRUMMOND						
Witnessed By	Keith Stansbury						
Borehole Record		Tubing Record					
Run Number	Bit	From	To	Size	Weight	From	To
Casing Record	Size	Mq/ft		Top	Bottom		
Conductor String	13.375"	54.5 LBS.		SURFACE	331'		
Surface String	9.625"	36 LBS.		SURFACE	2,589'		
Intermediate String	5.5	20 LBS.		SURFACE	17,802'		
Production String							

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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 -9  
MARKER JOINT 5,679' - 5,690'  
MAIN PASS LOGGED WITH 1500 PSI  
REPEAT PASS LOGGED WITH 0 PSI  
  
THANK YOU FOR USING NINE ENERGY SERVICES

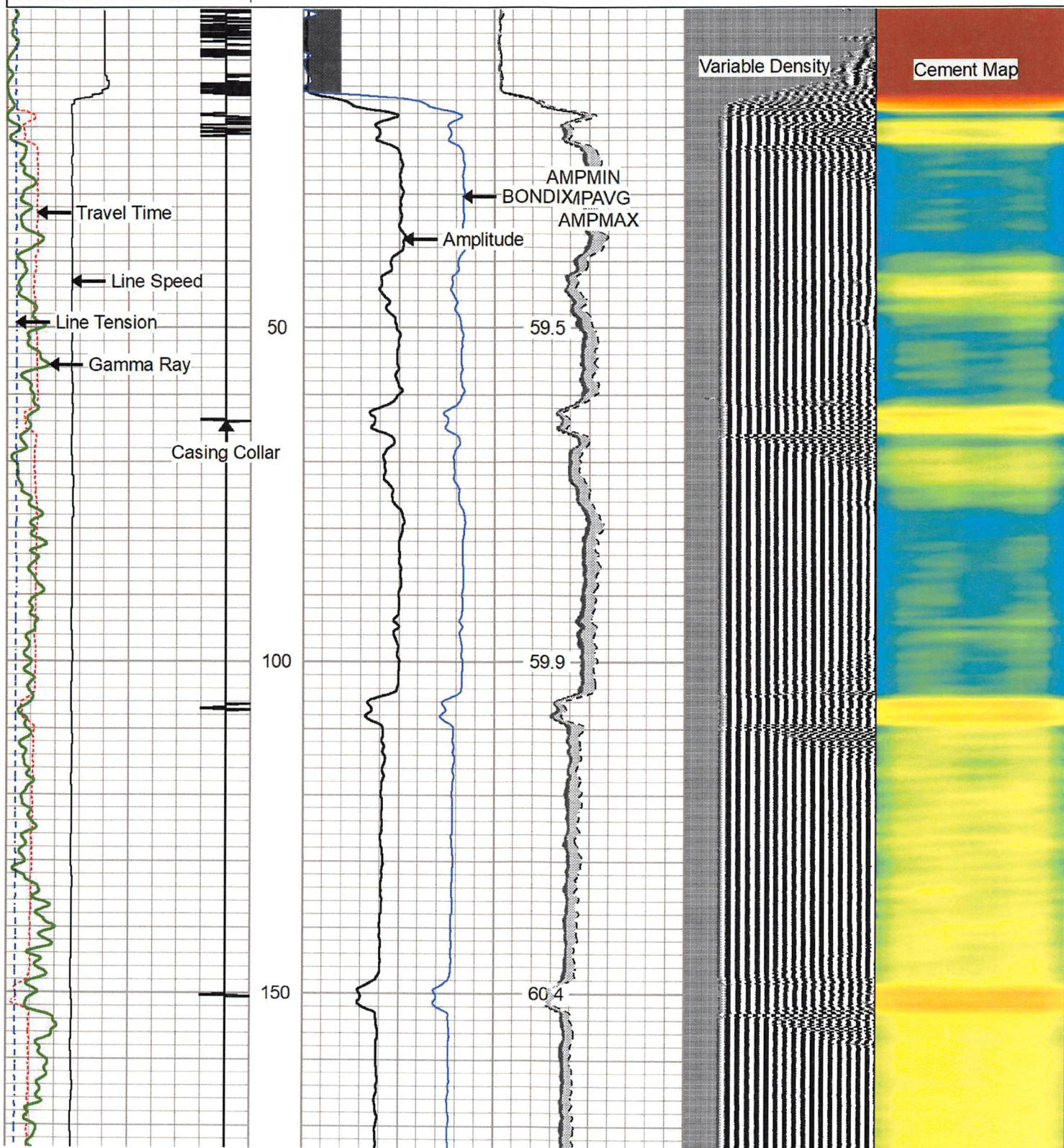
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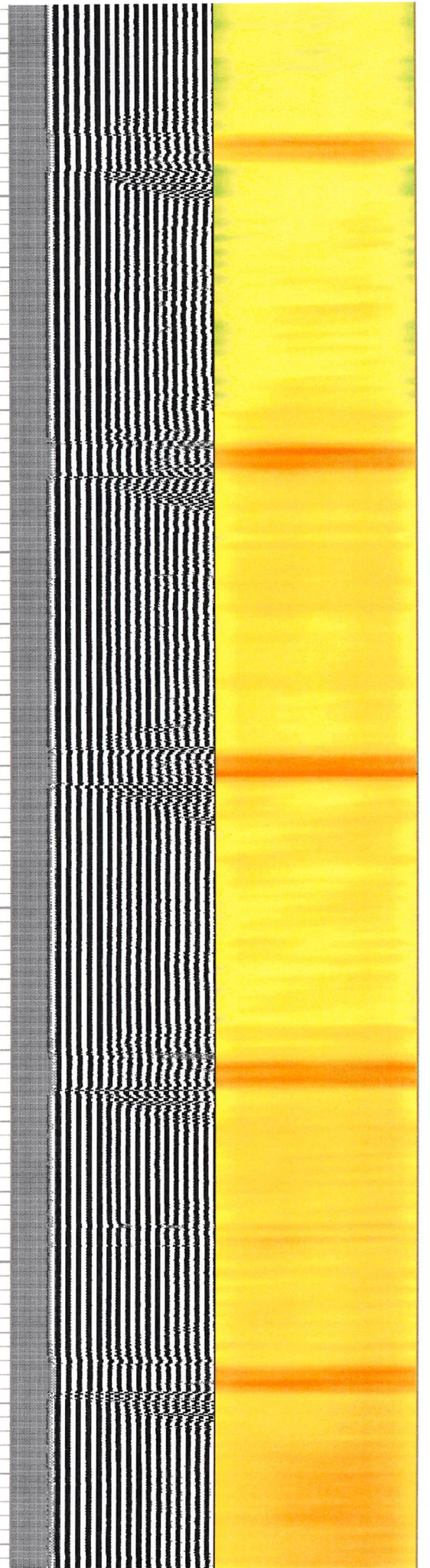
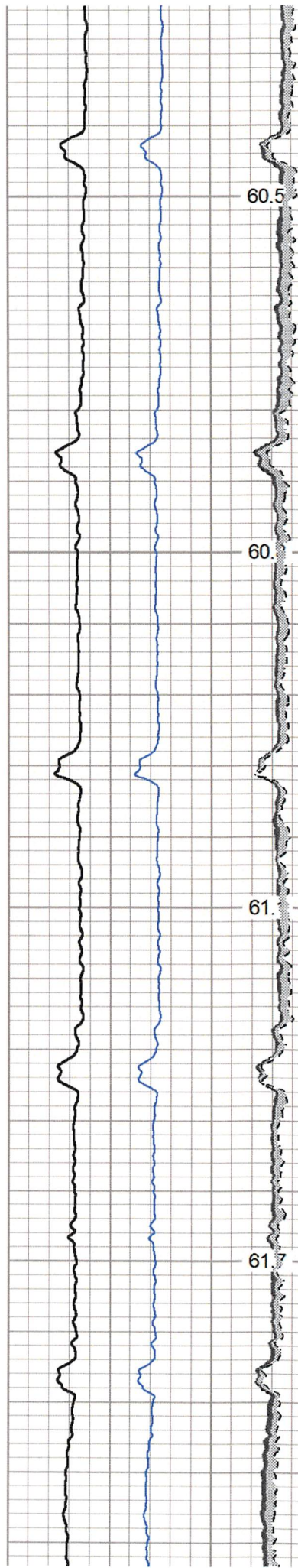
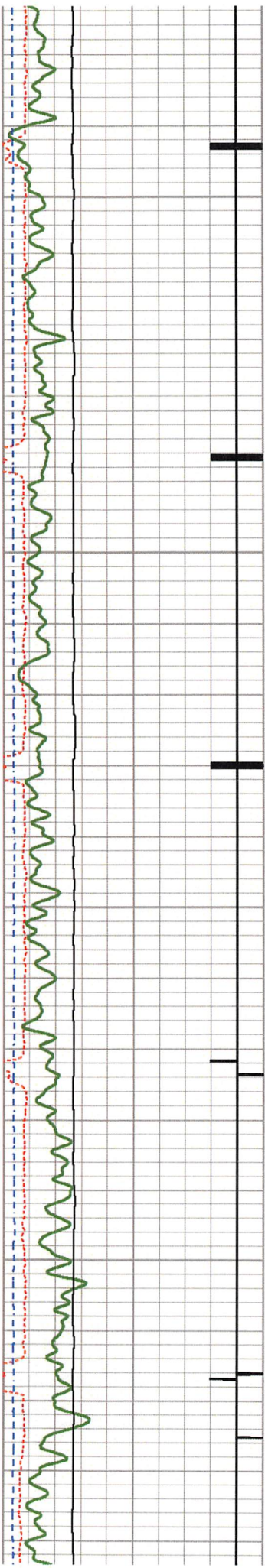


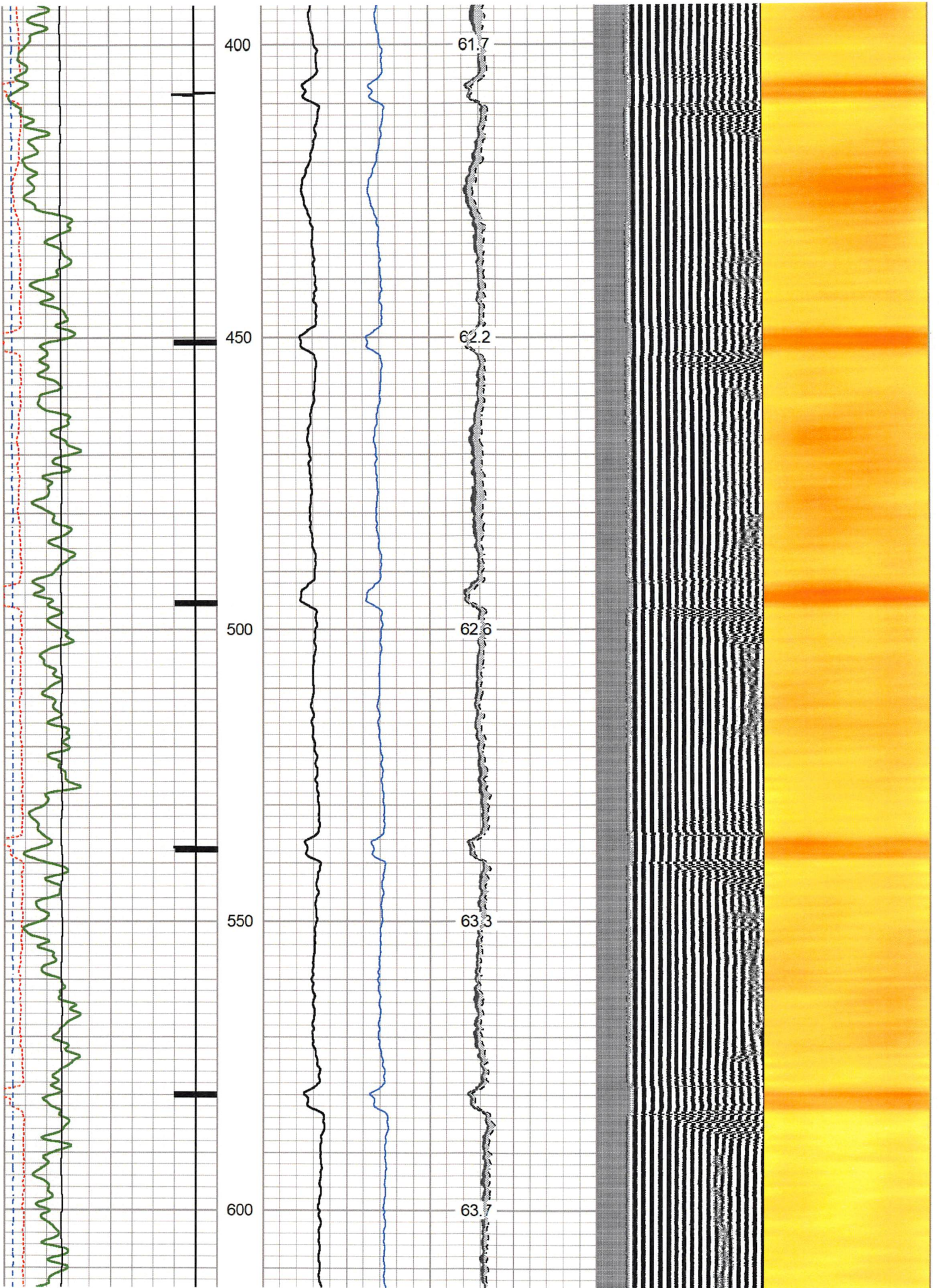
**Main Pass 1500PSI**

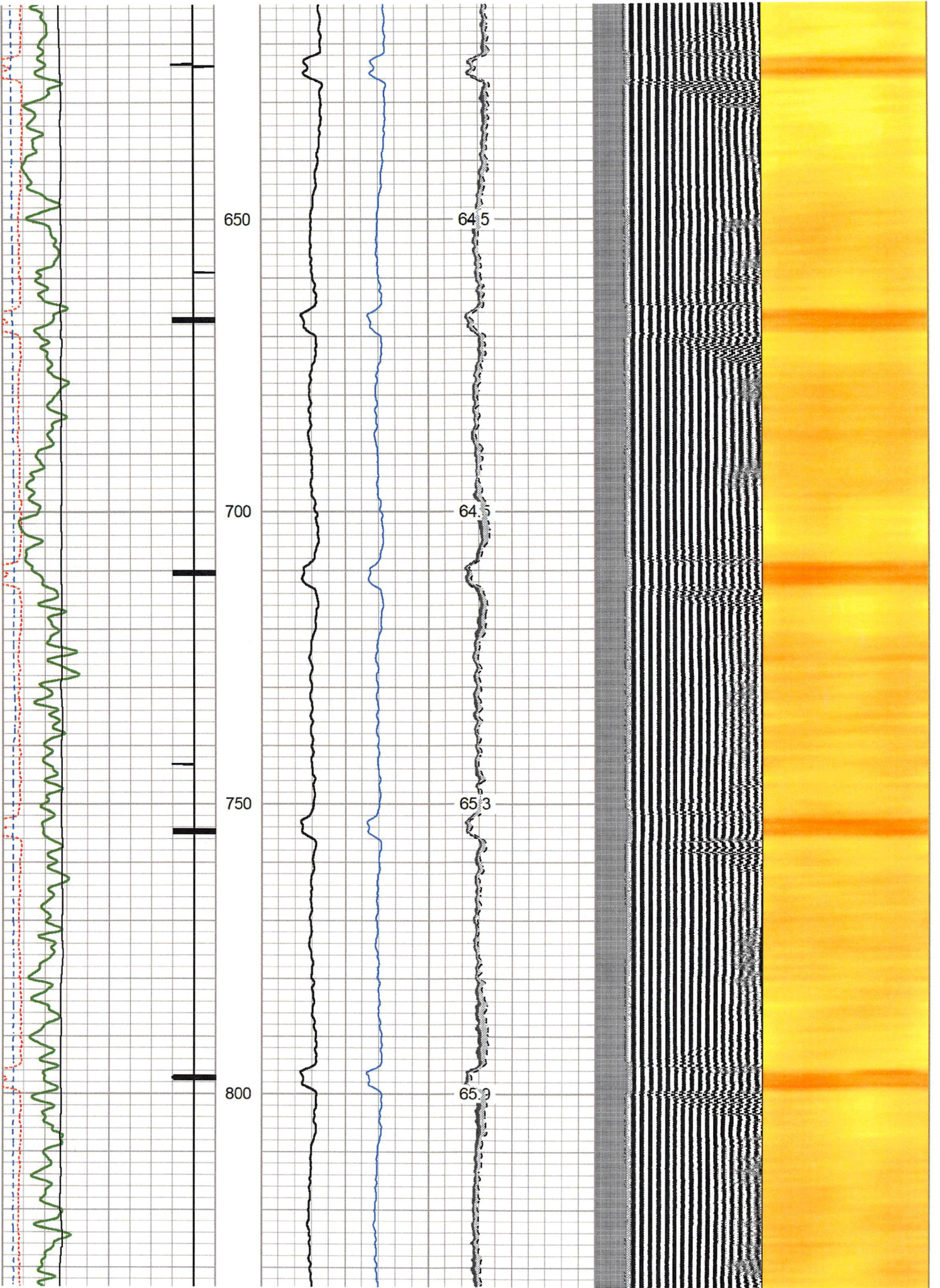
Database File antero\_redwood\_3h\_rcbl\_13\_nov\_2022.db  
 Dataset Pathname pass5  
 Presentation Format rcbl-bond index for antero 1020  
 Dataset Creation Sun Nov 13 12:40:03 2022  
 Charted by Depth in Feet scaled 1:240

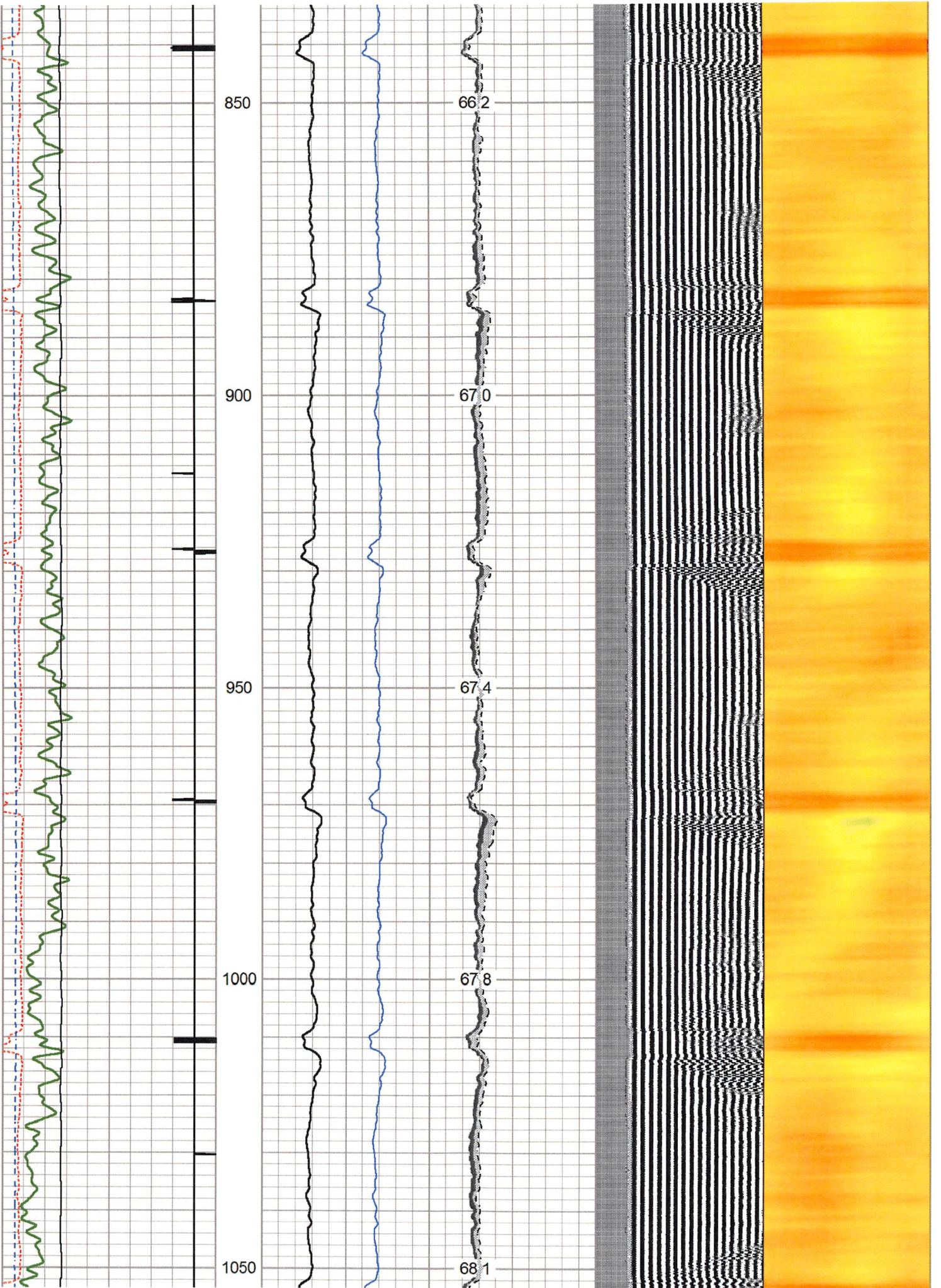
265	Travel Time (usec)	165	0	Amplitude (mV)	100	-5	AMPMIN	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	1	BONDIX	0	-5	AMPMAX	150	200 (usec)	1200		
0	Gamma Ray (GAPI)	150				-5	AMPAVG	150				
	Line Speed						TEMP					
-200	(ft/min)	200					(degF)					
0	Line Tension (lb)	4000										

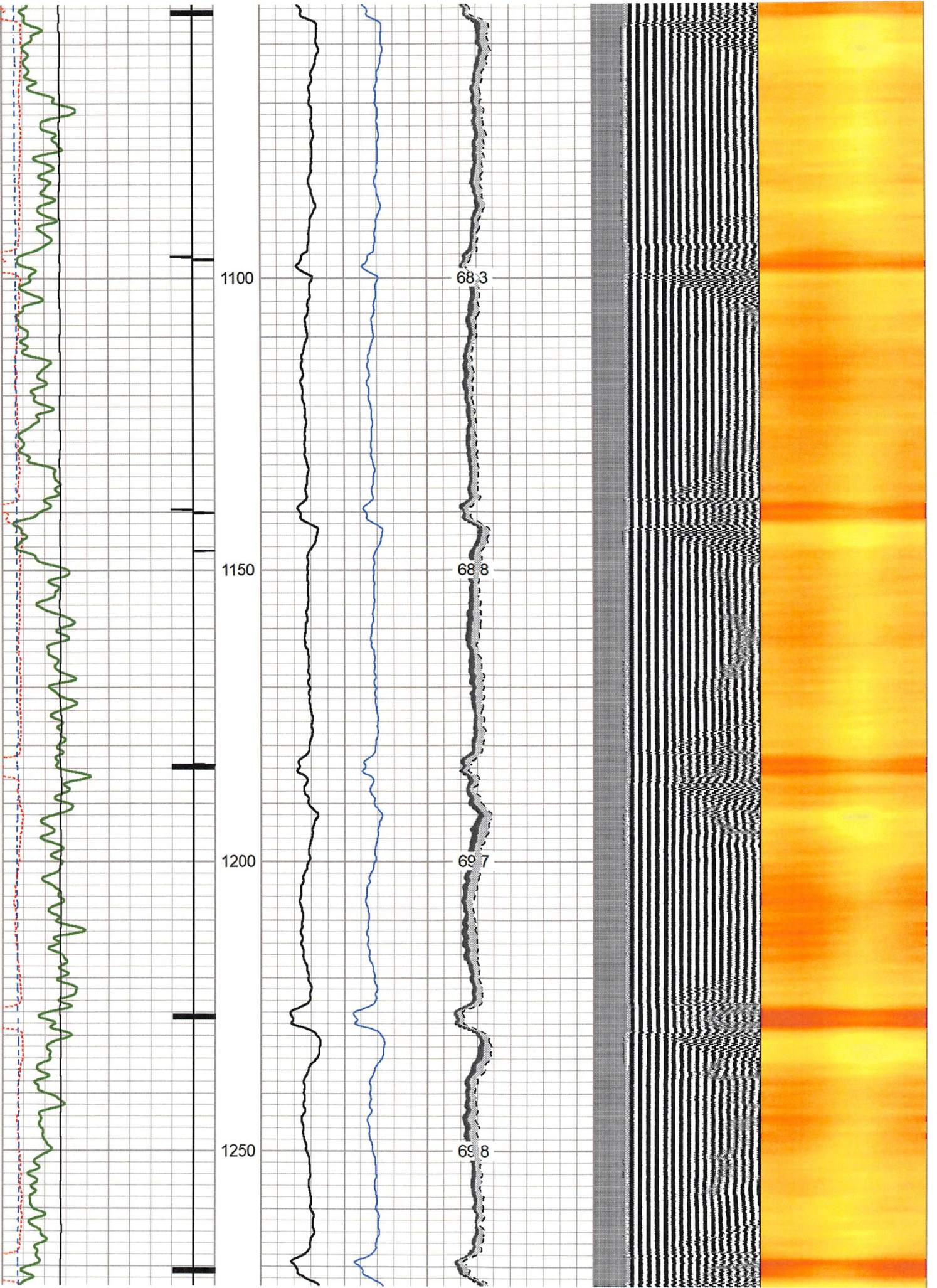


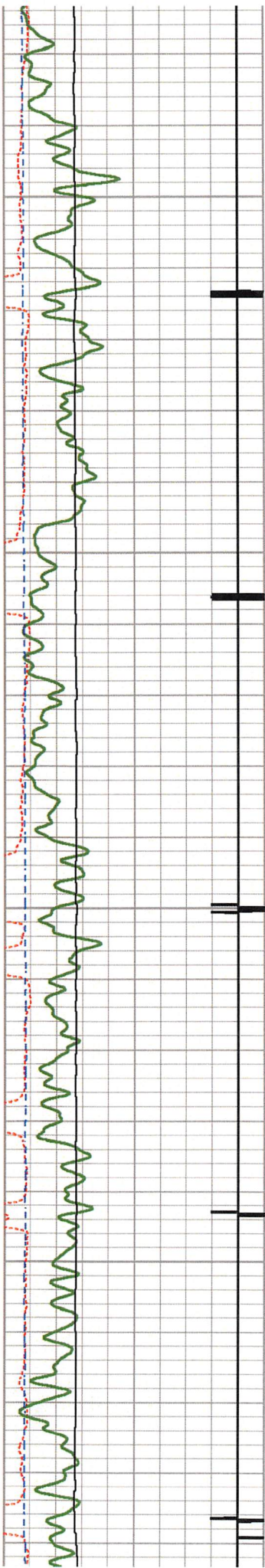










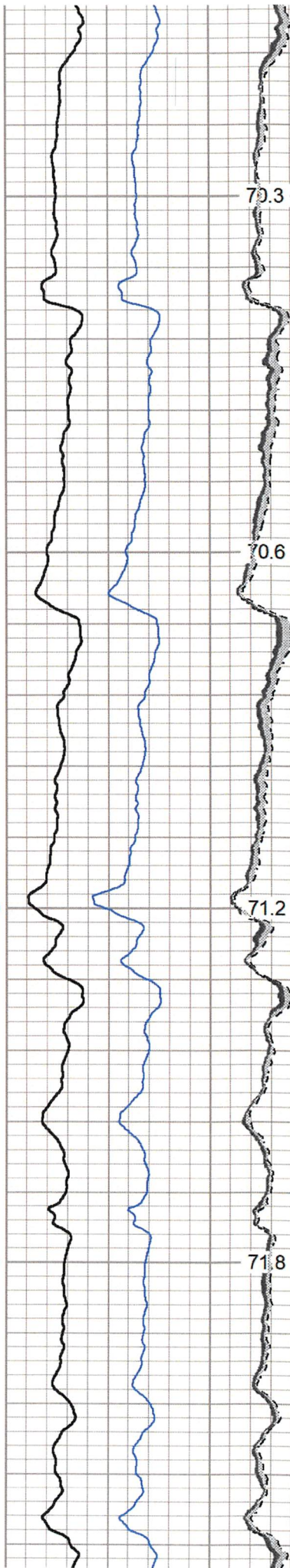


1300

1350

1400

1450

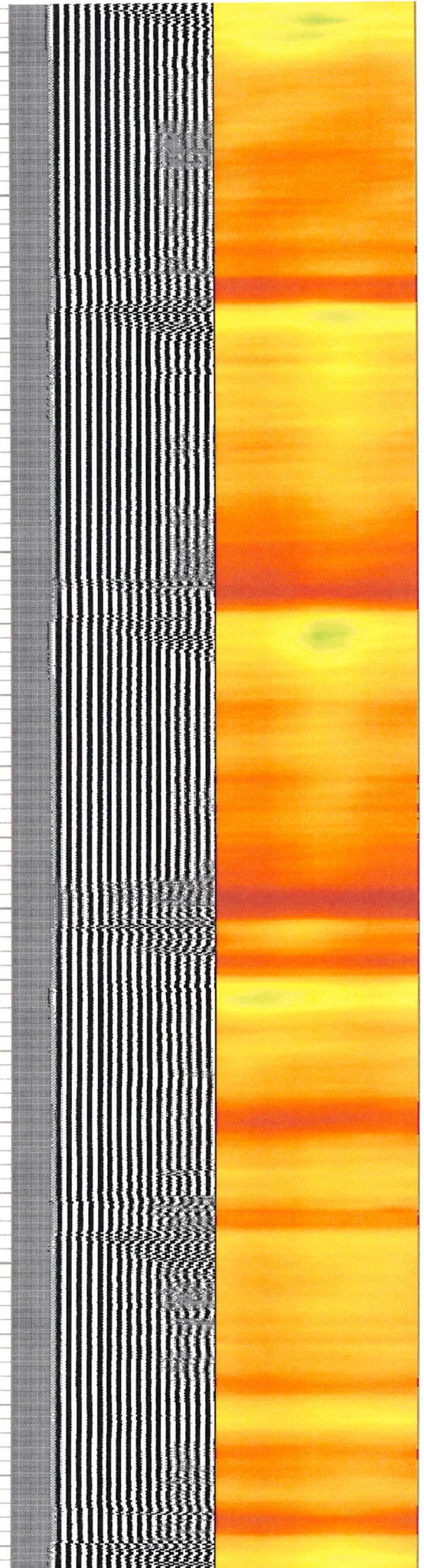


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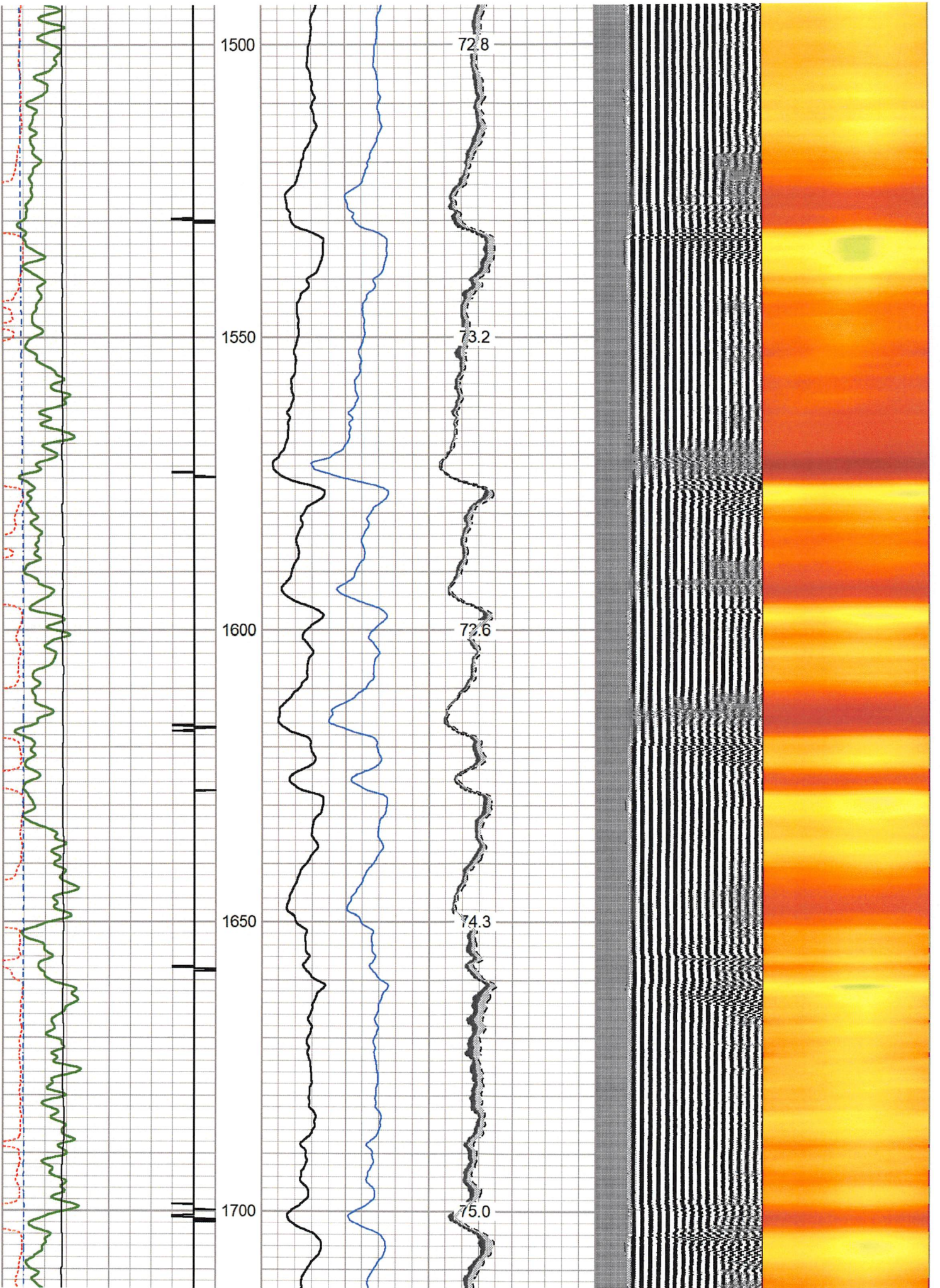
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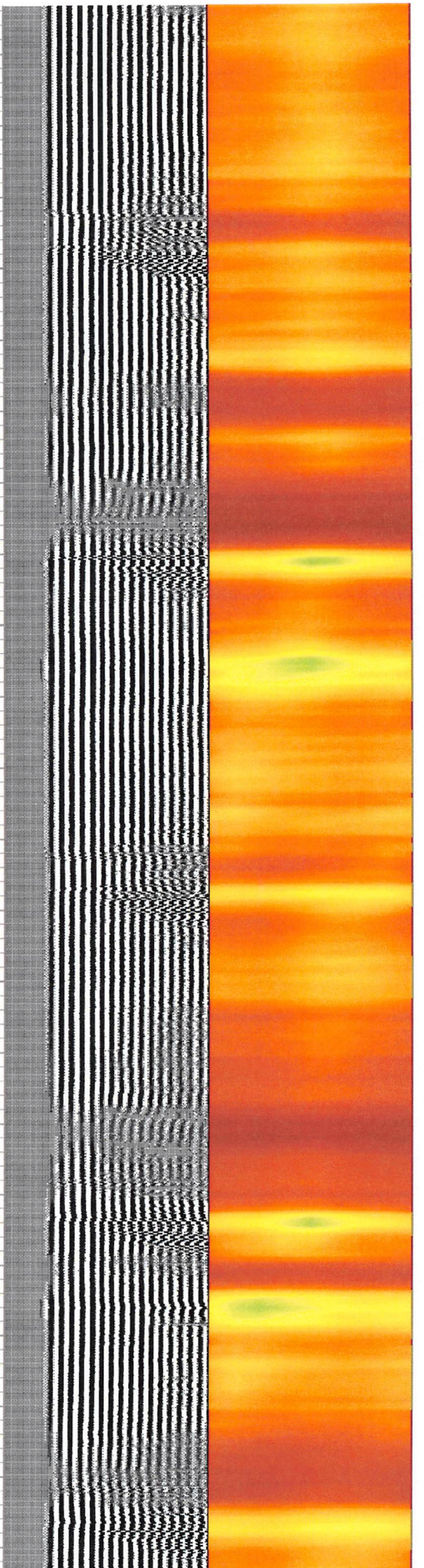
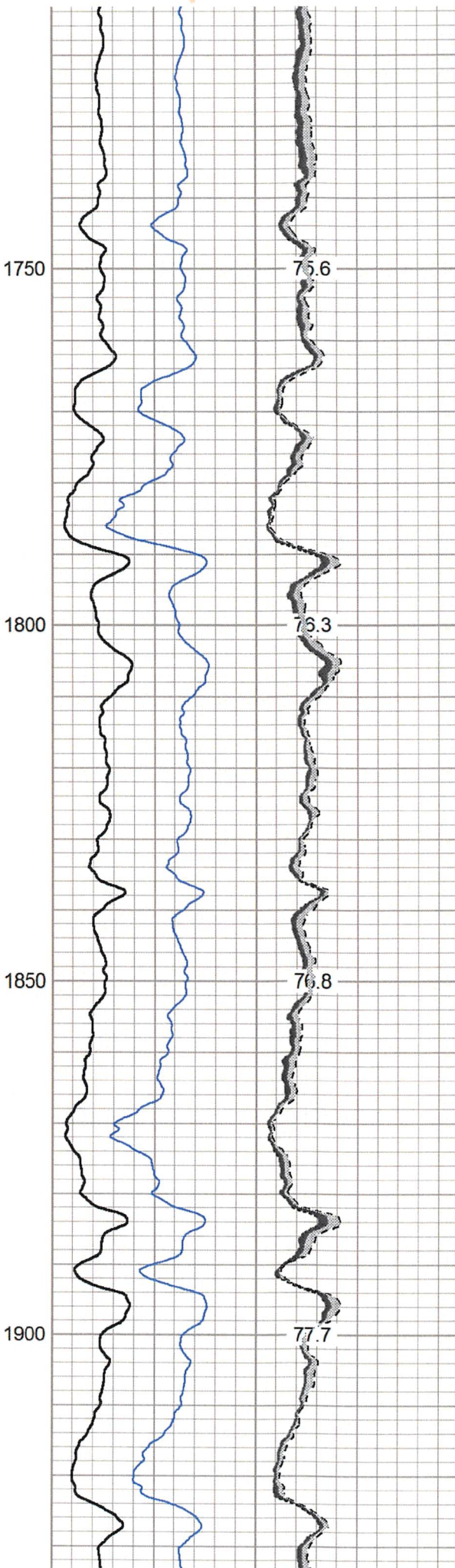
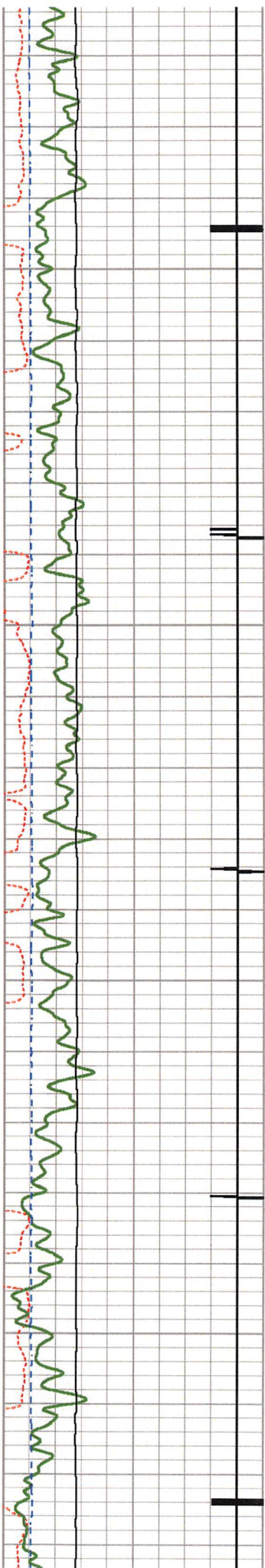
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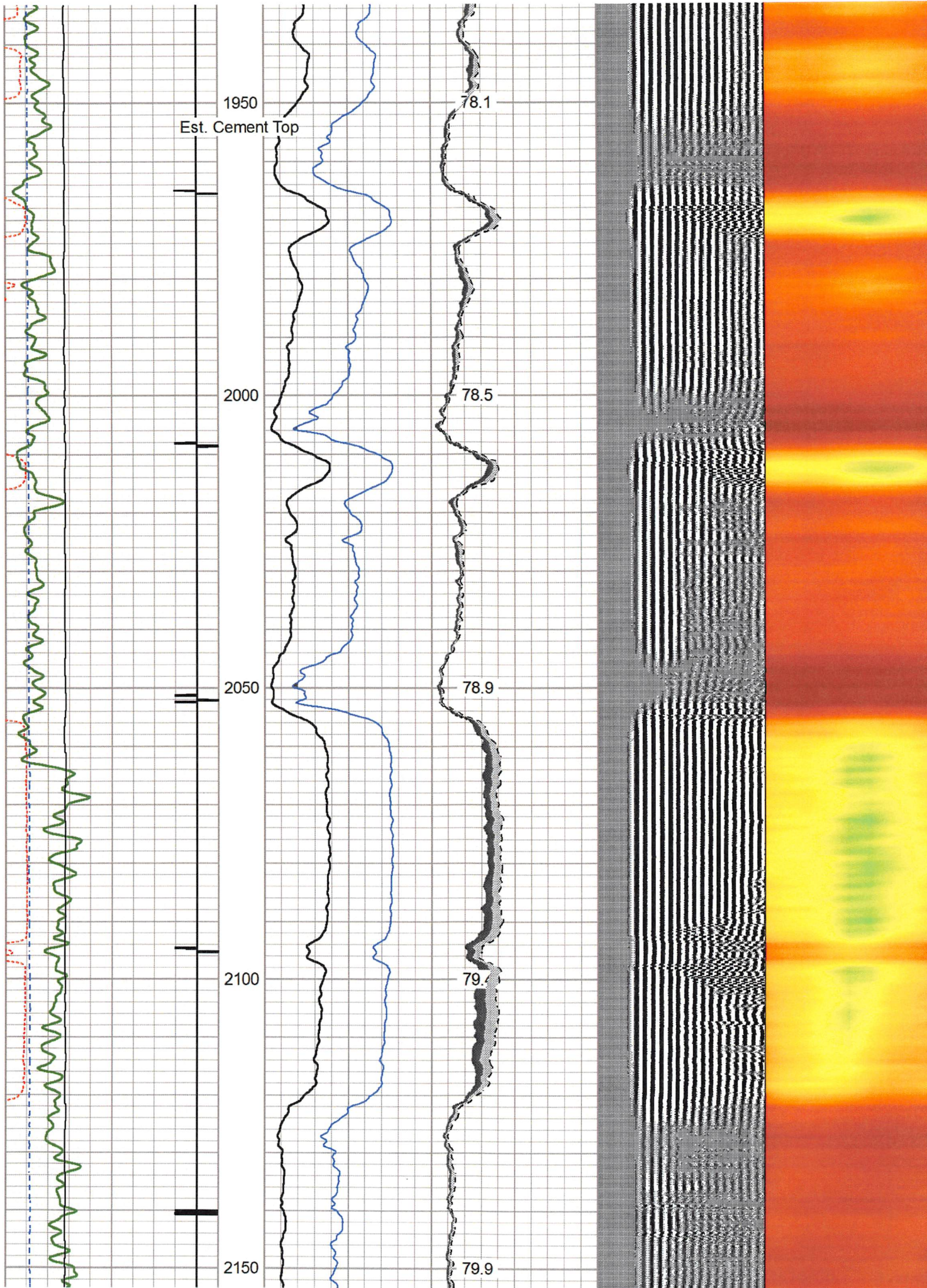
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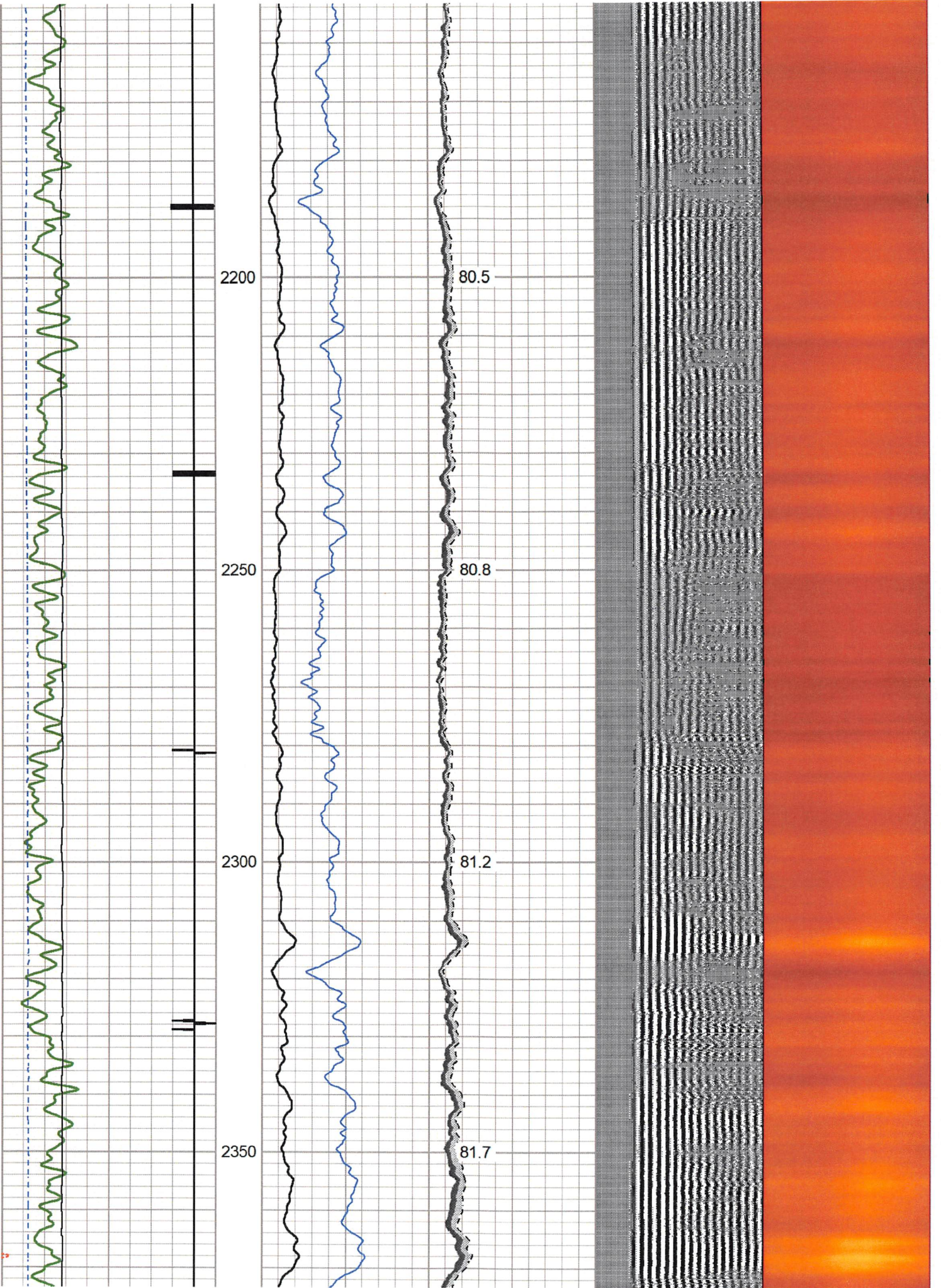


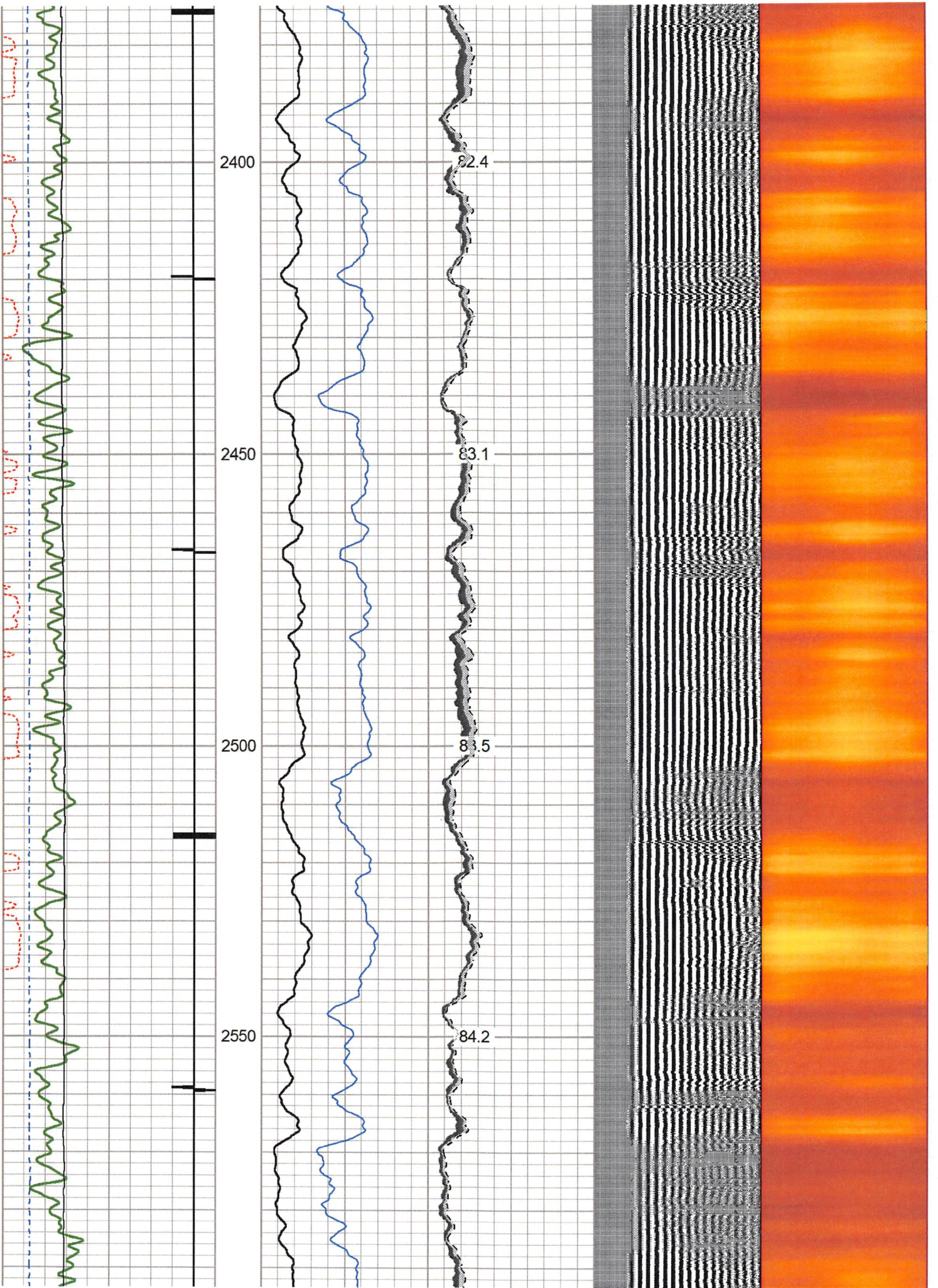


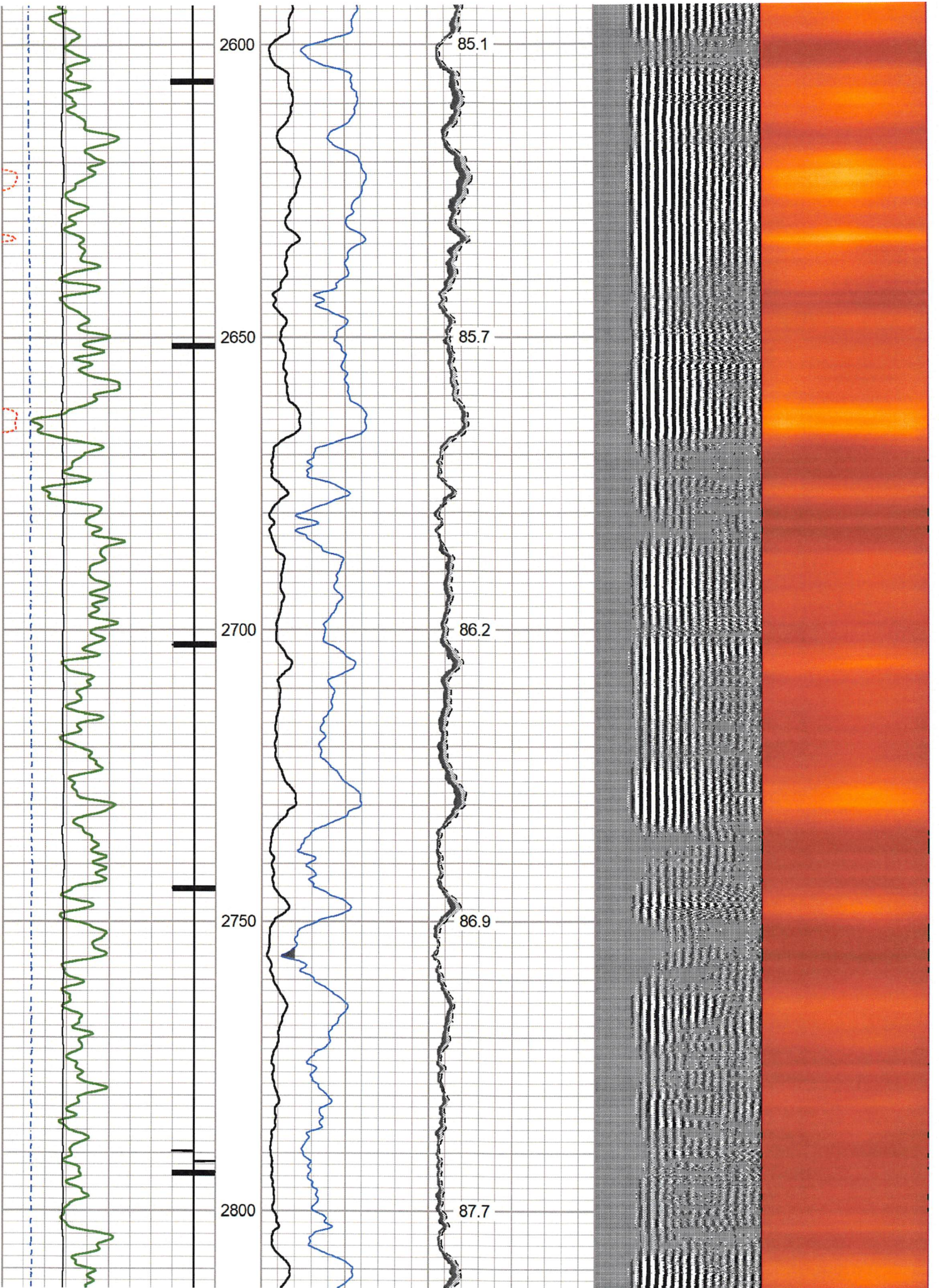


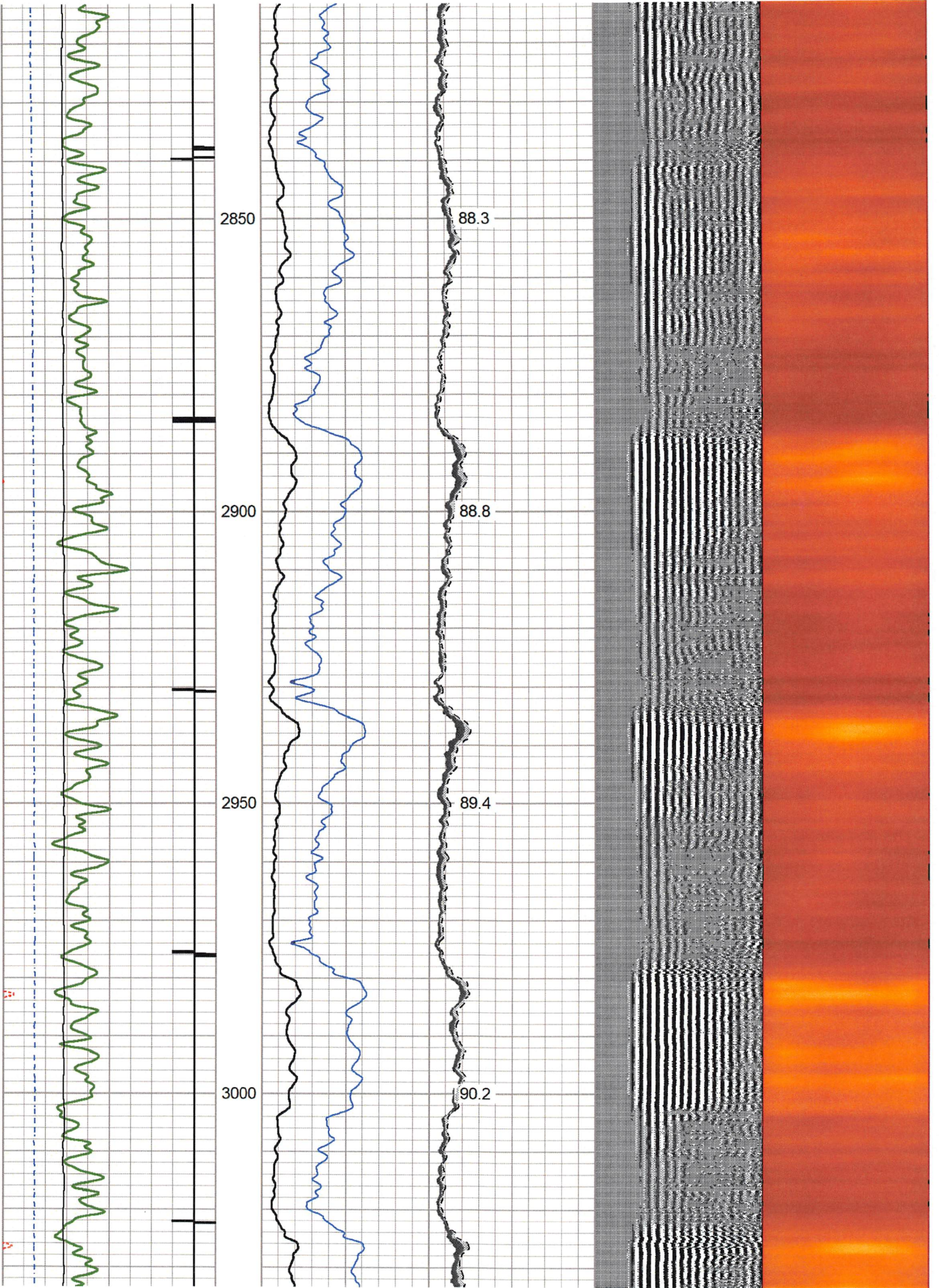


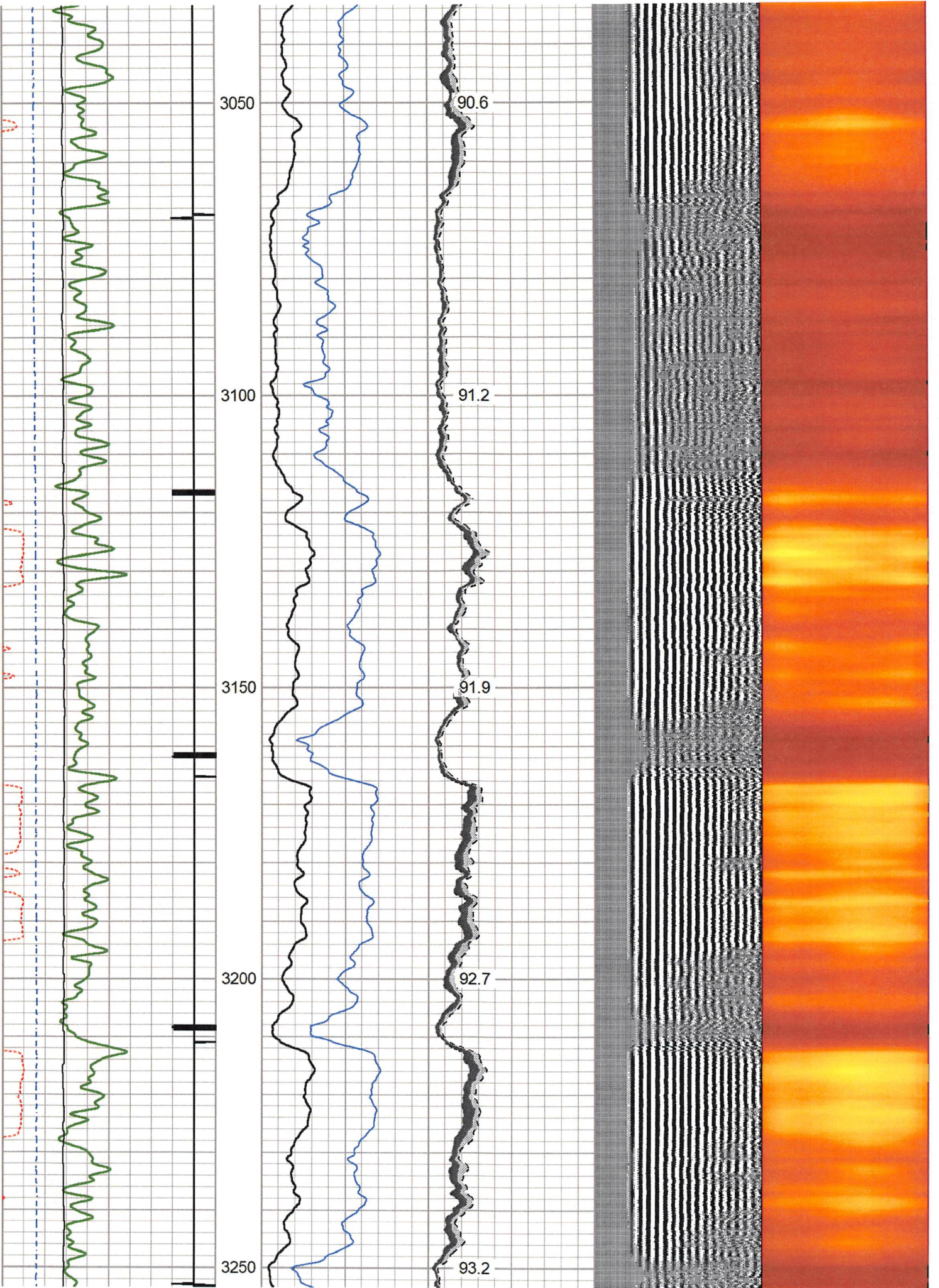




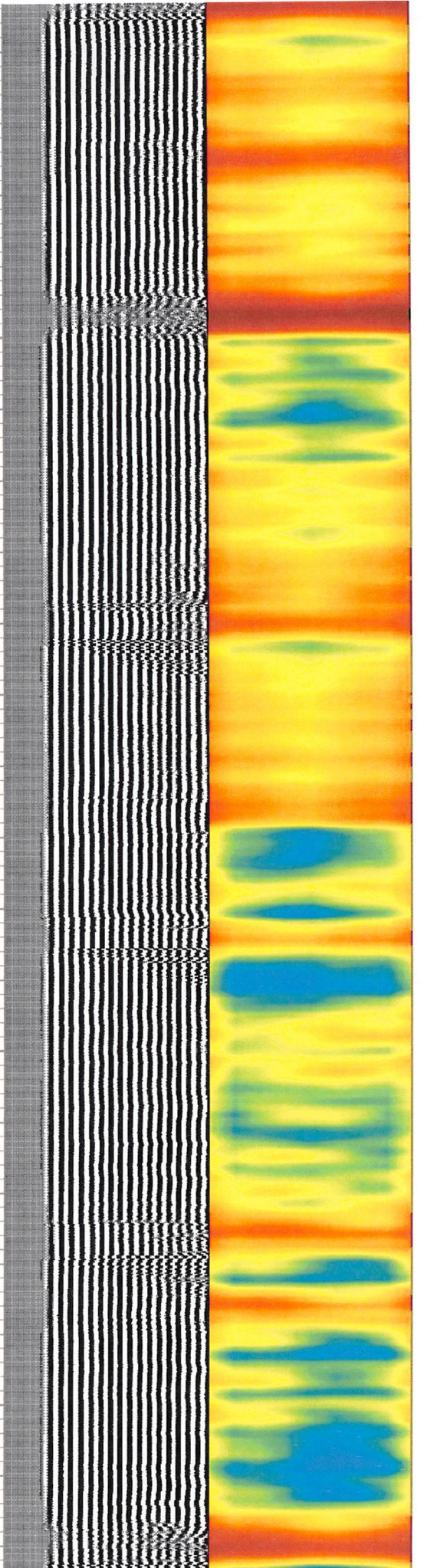
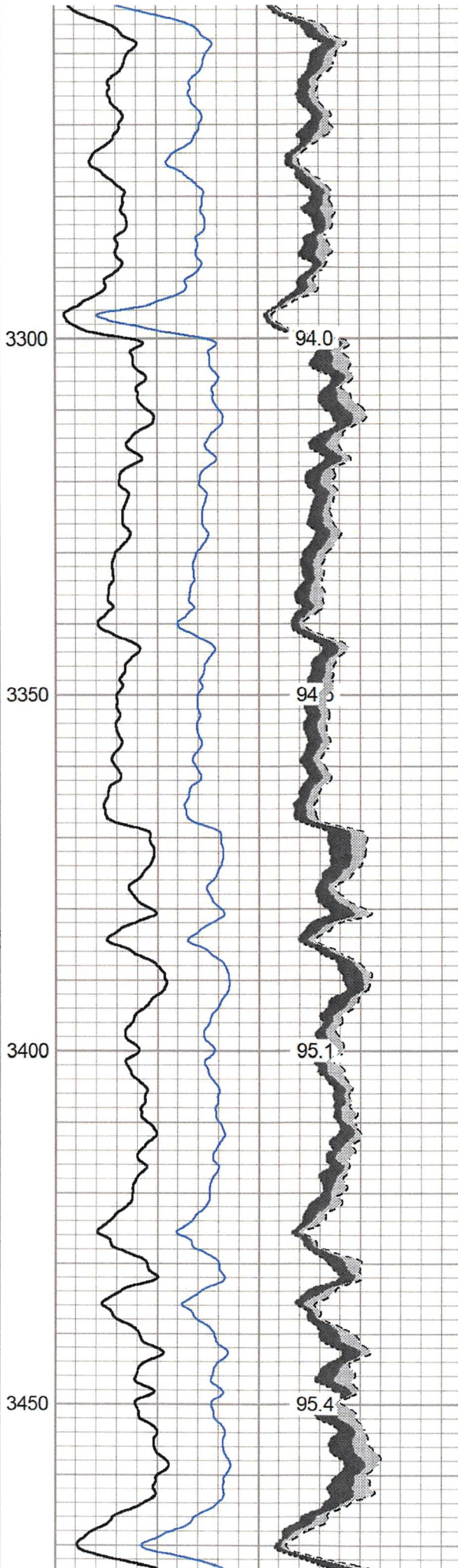
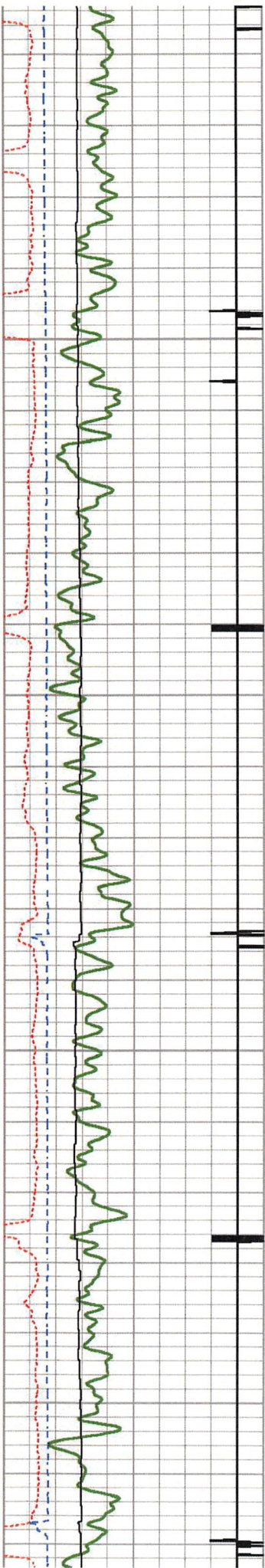


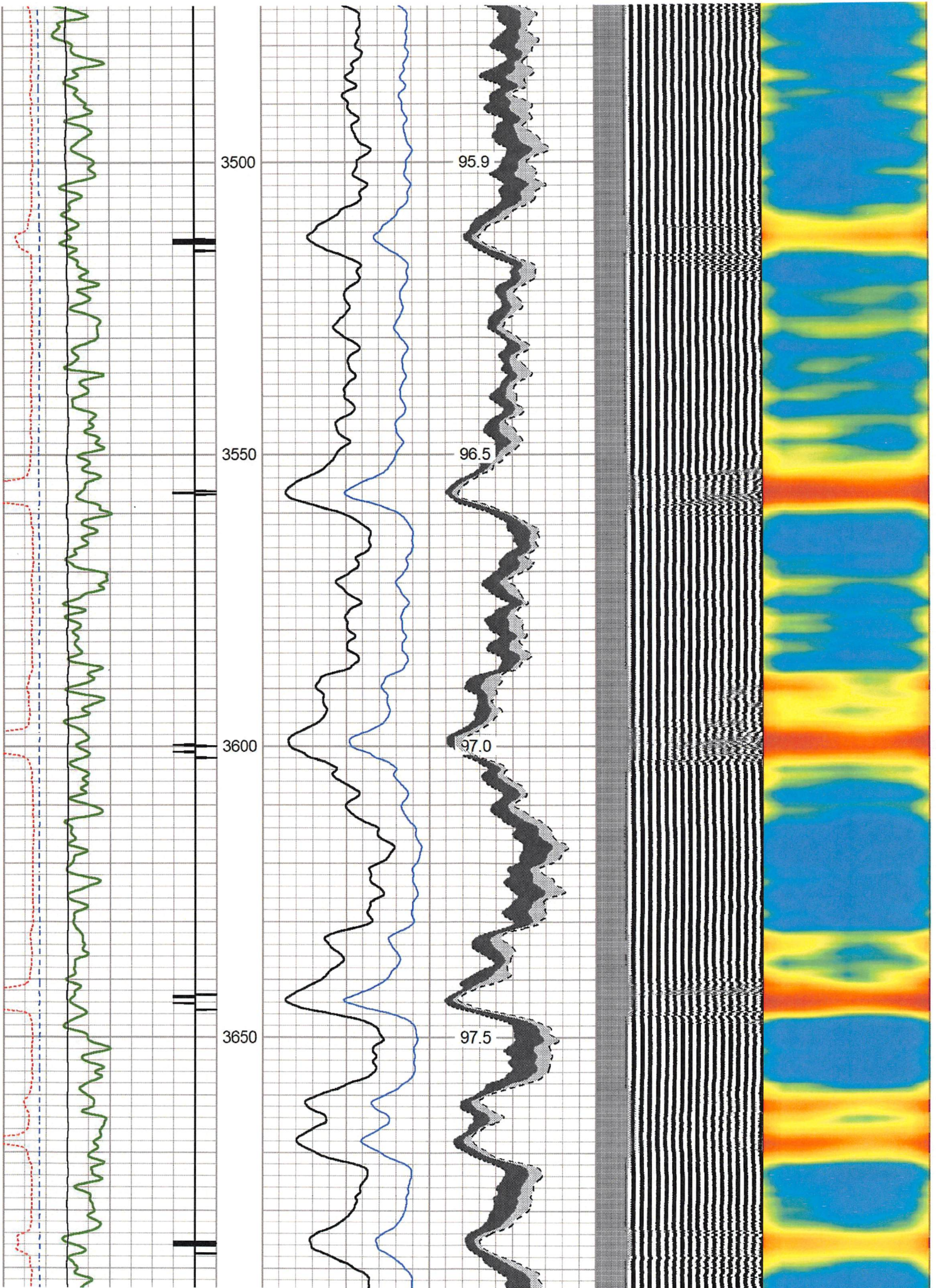


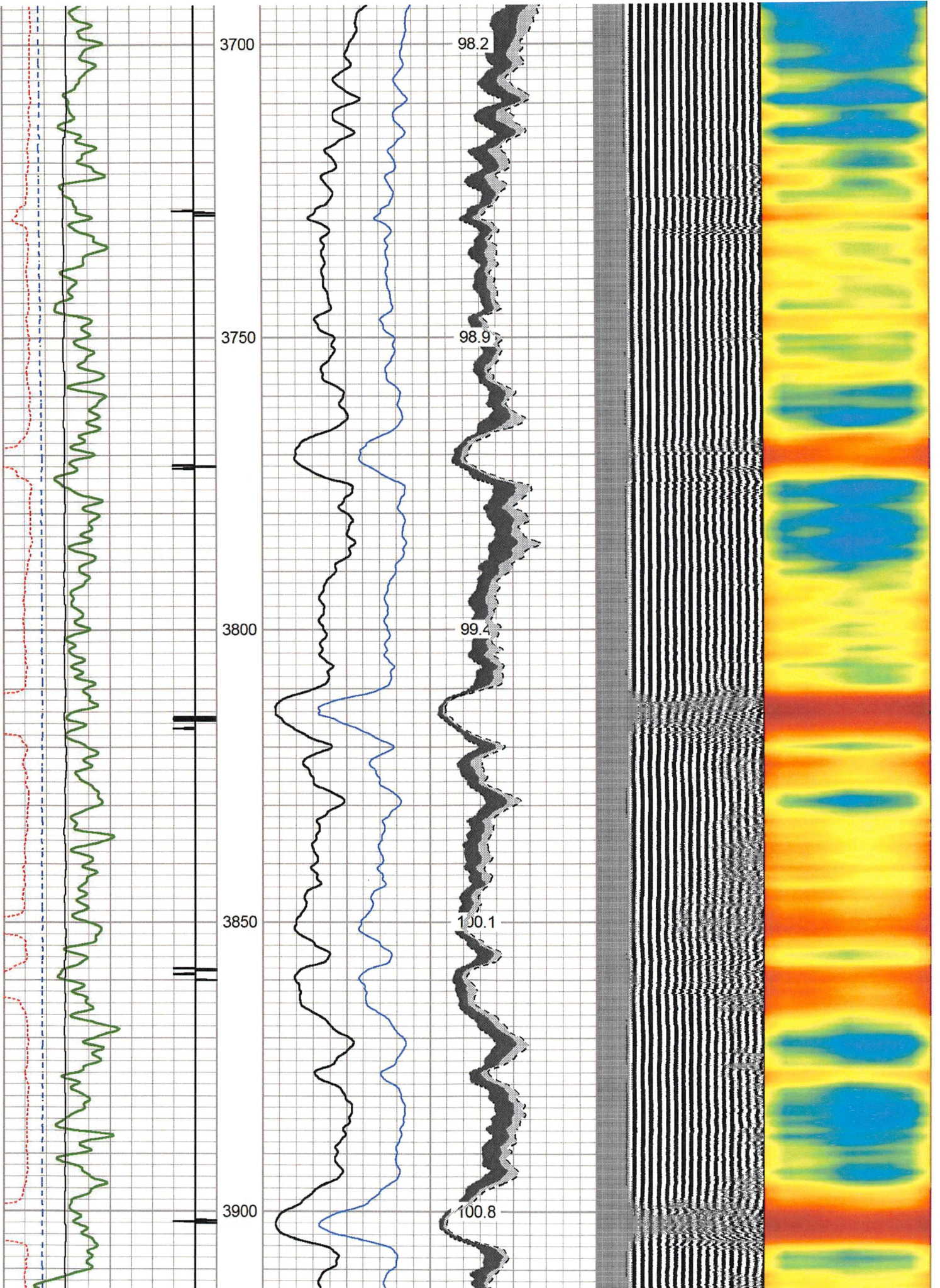


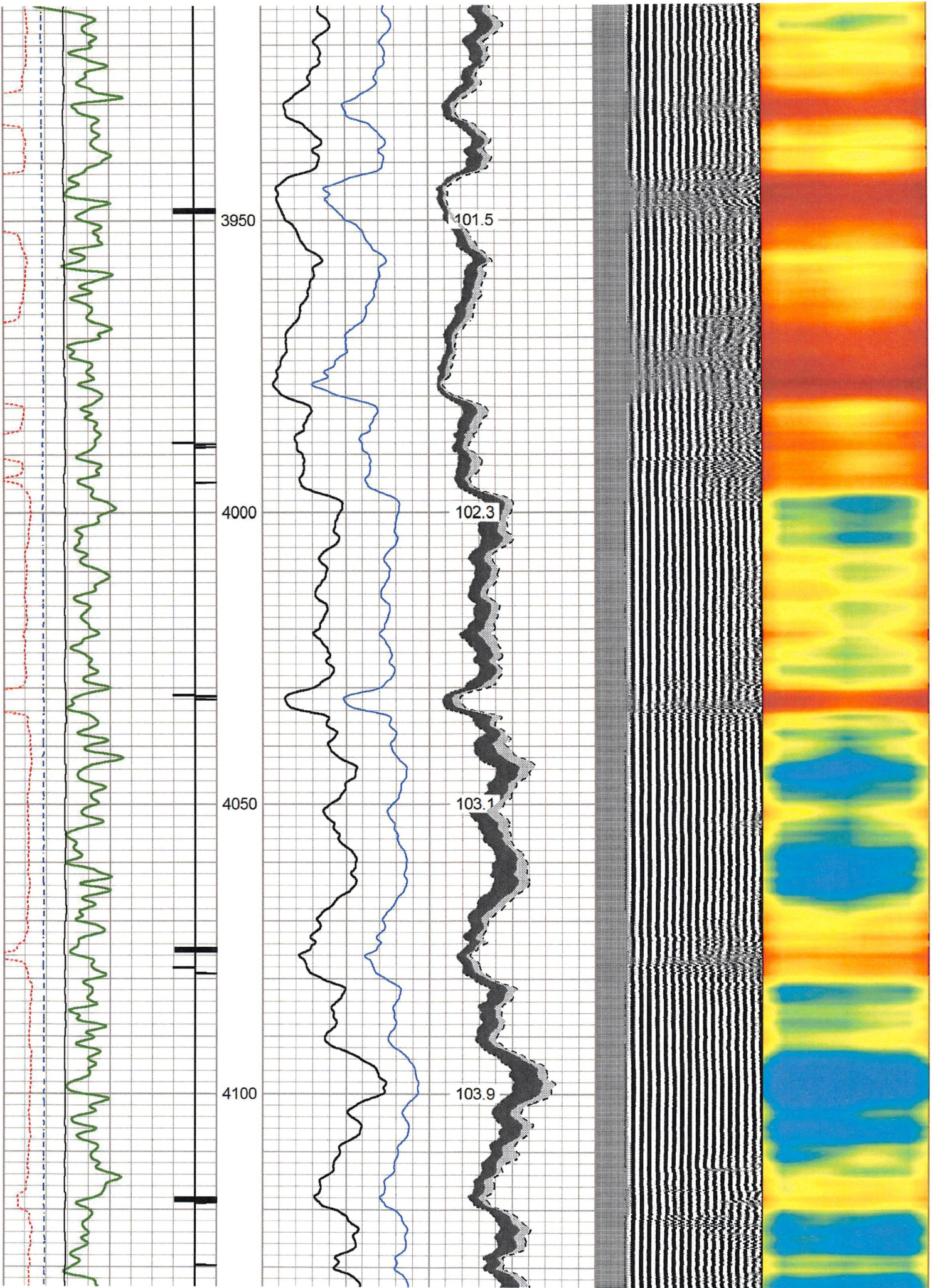


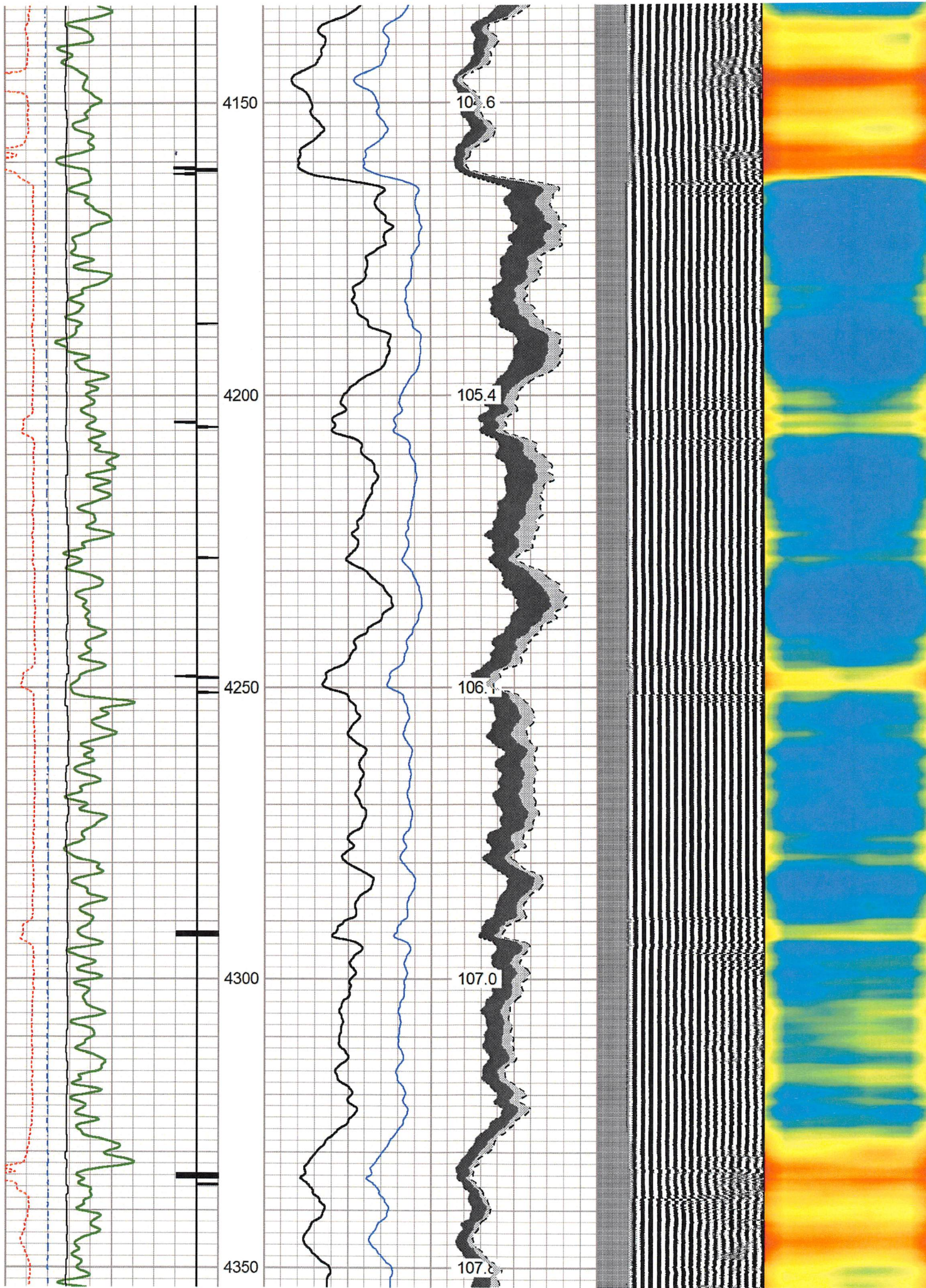


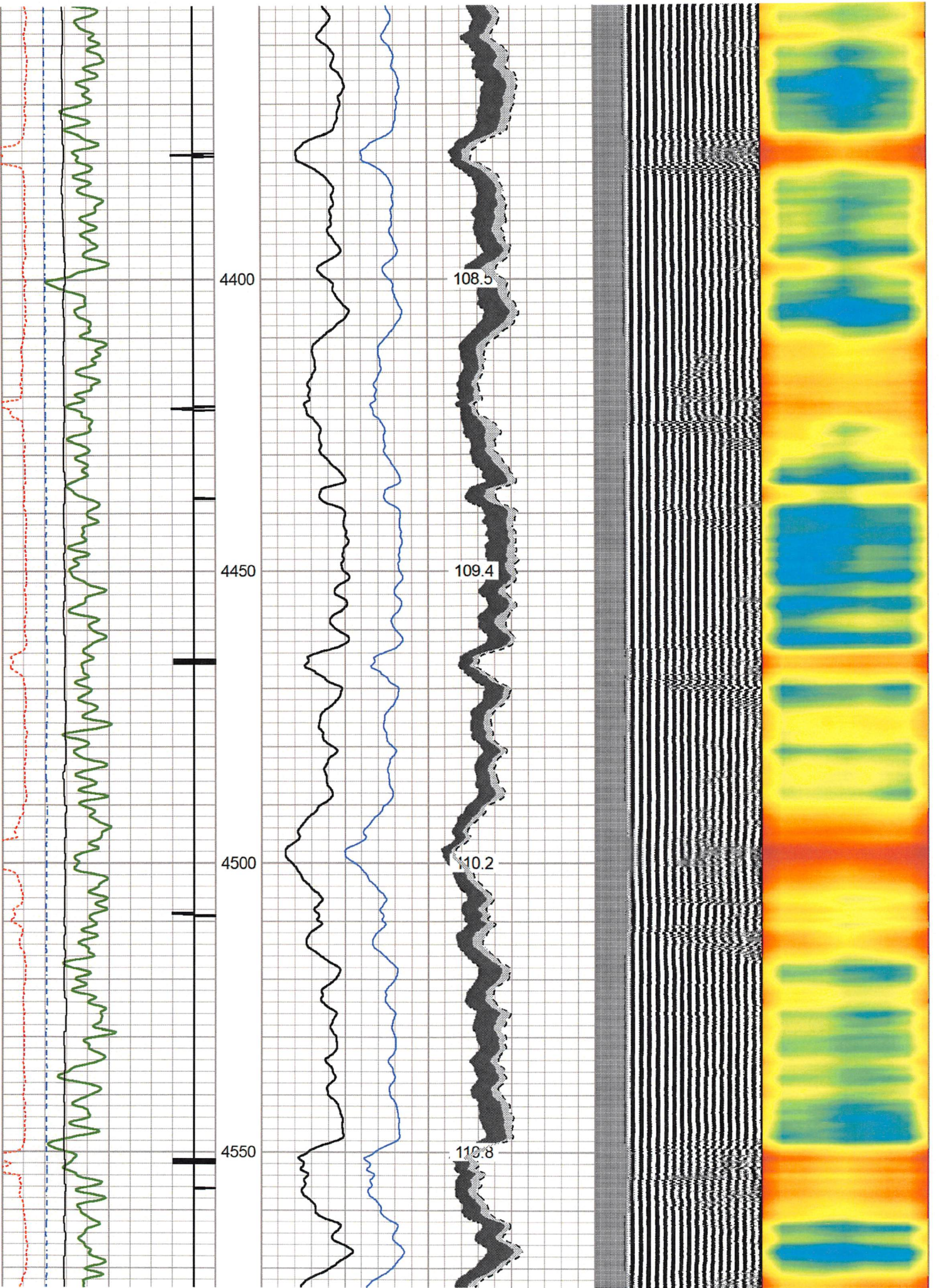


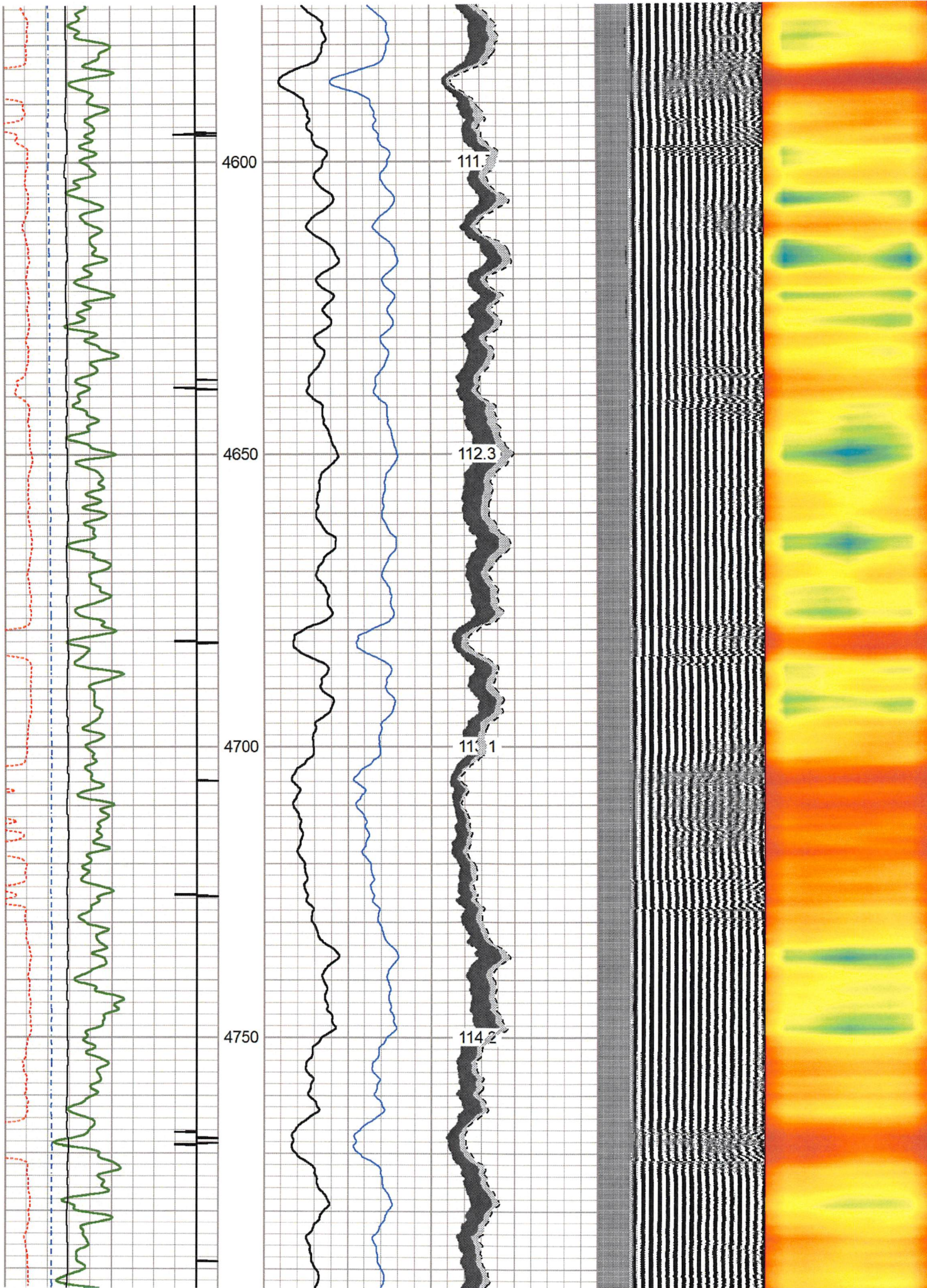


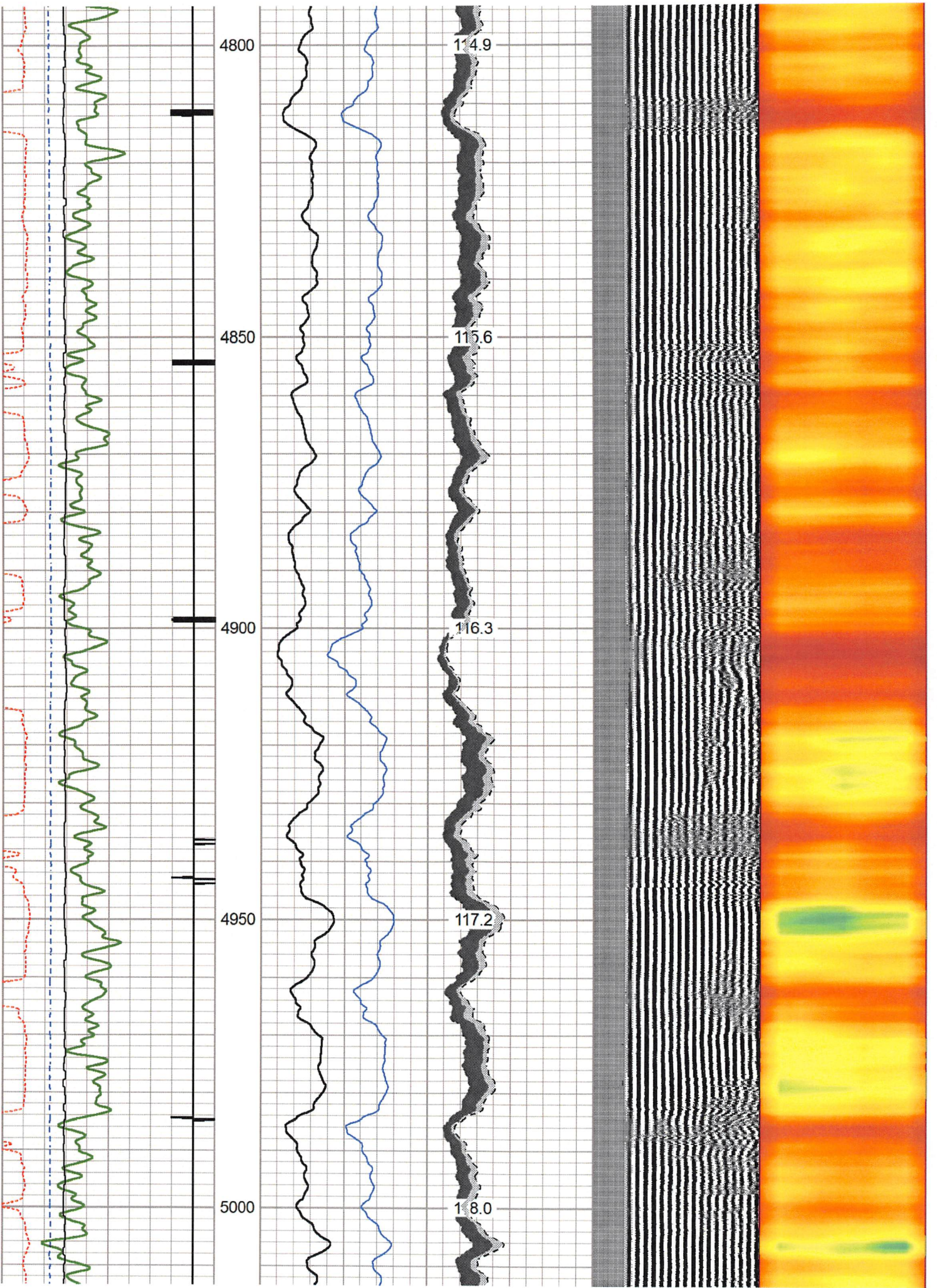




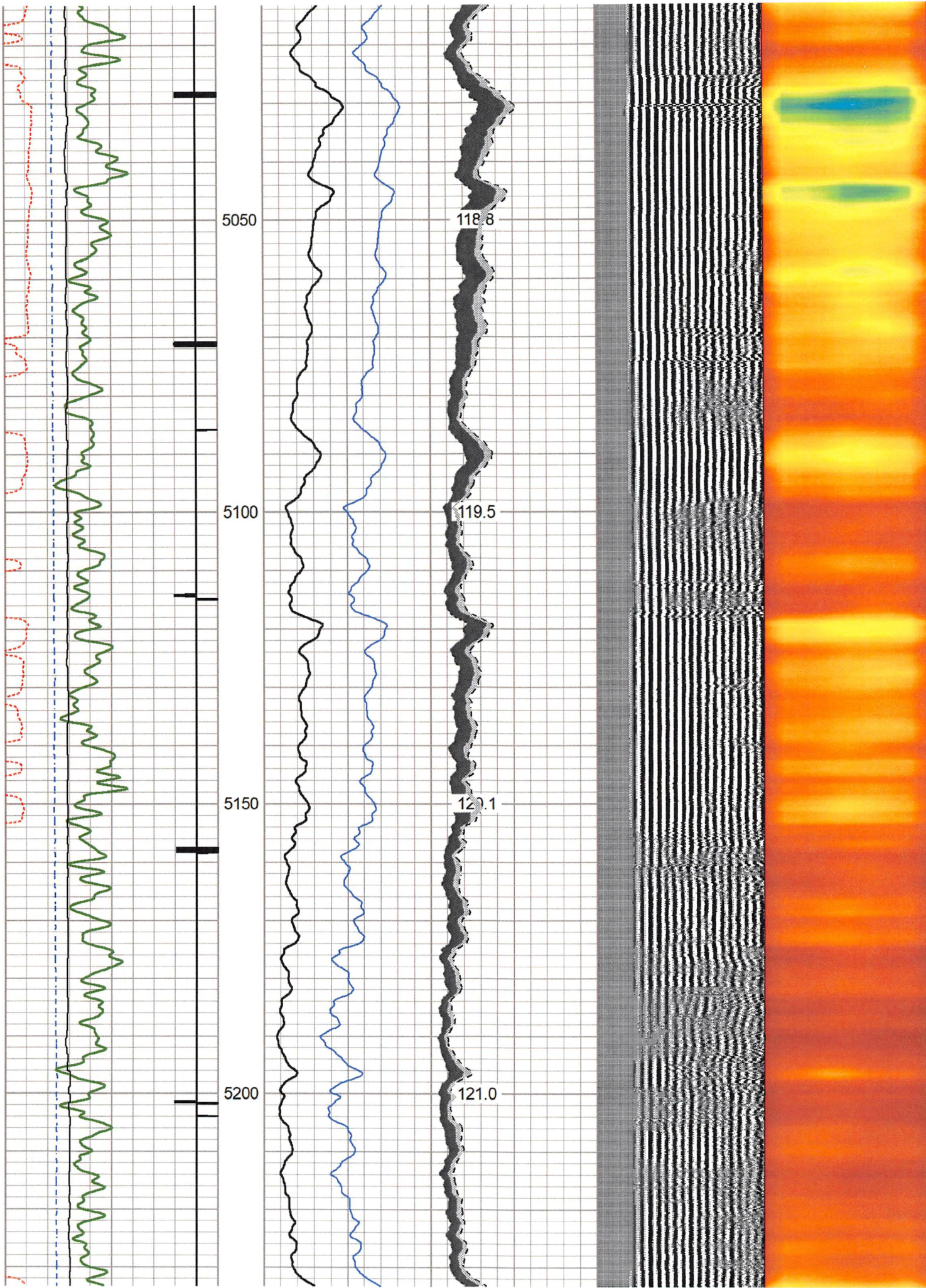


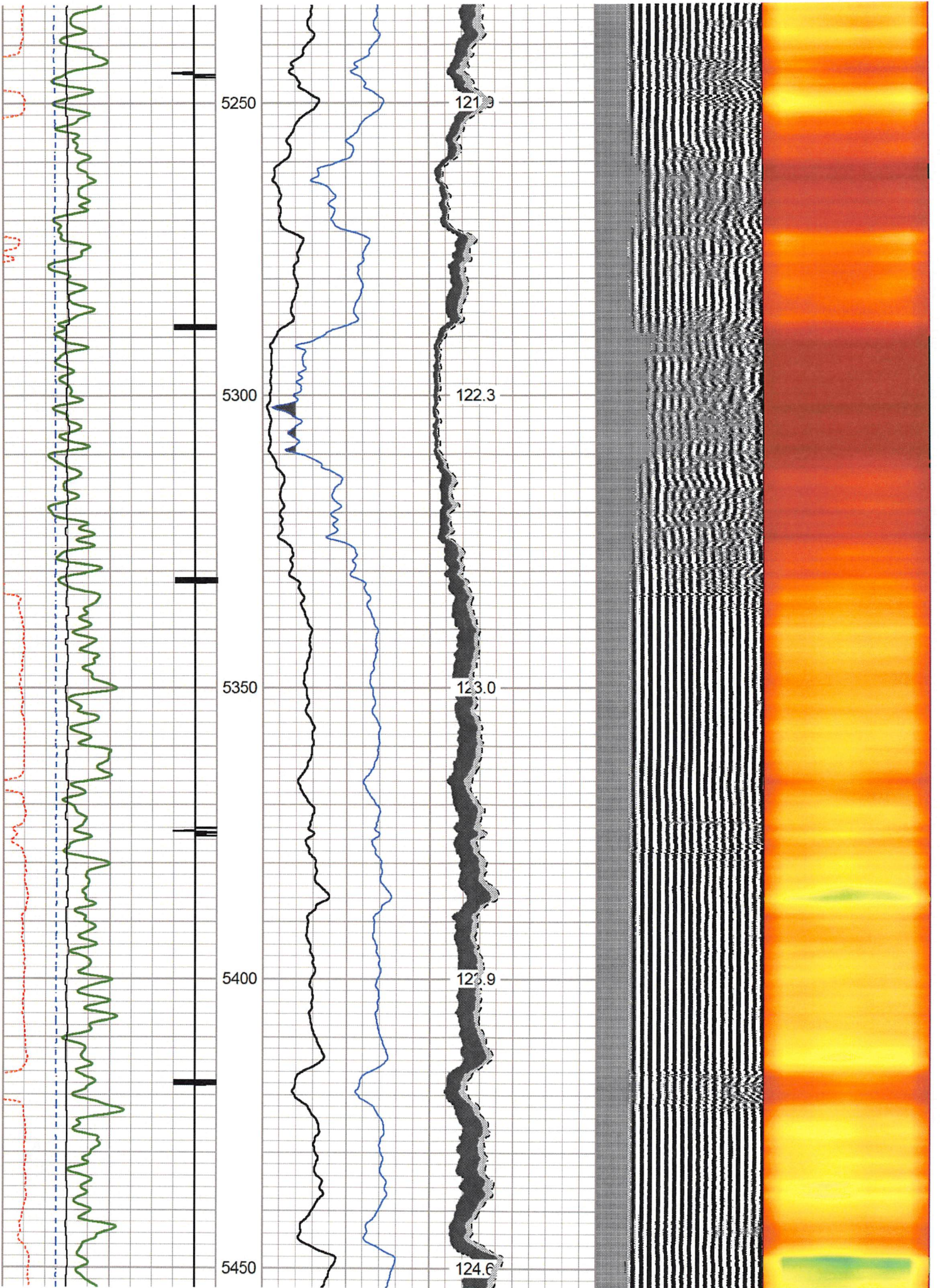


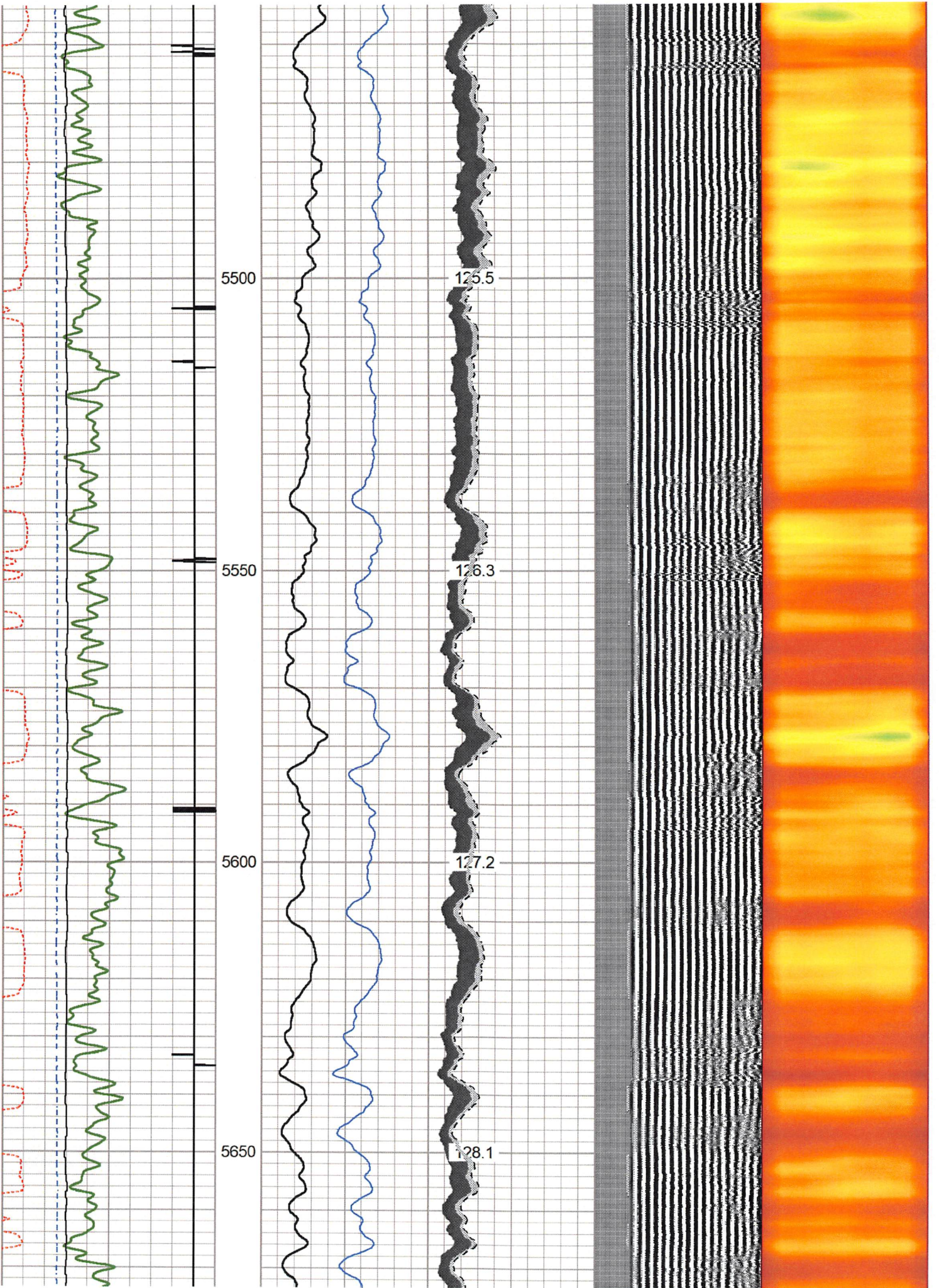


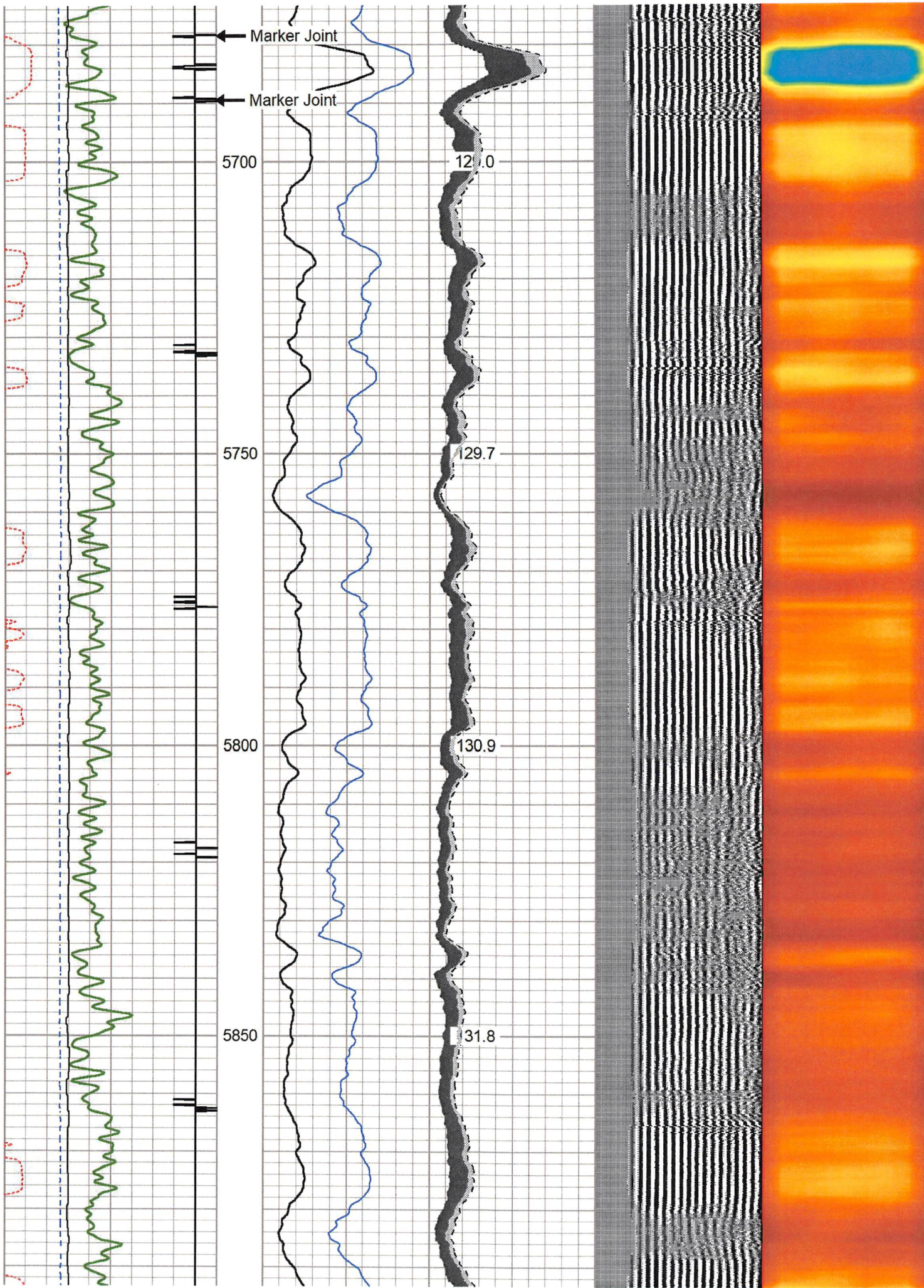


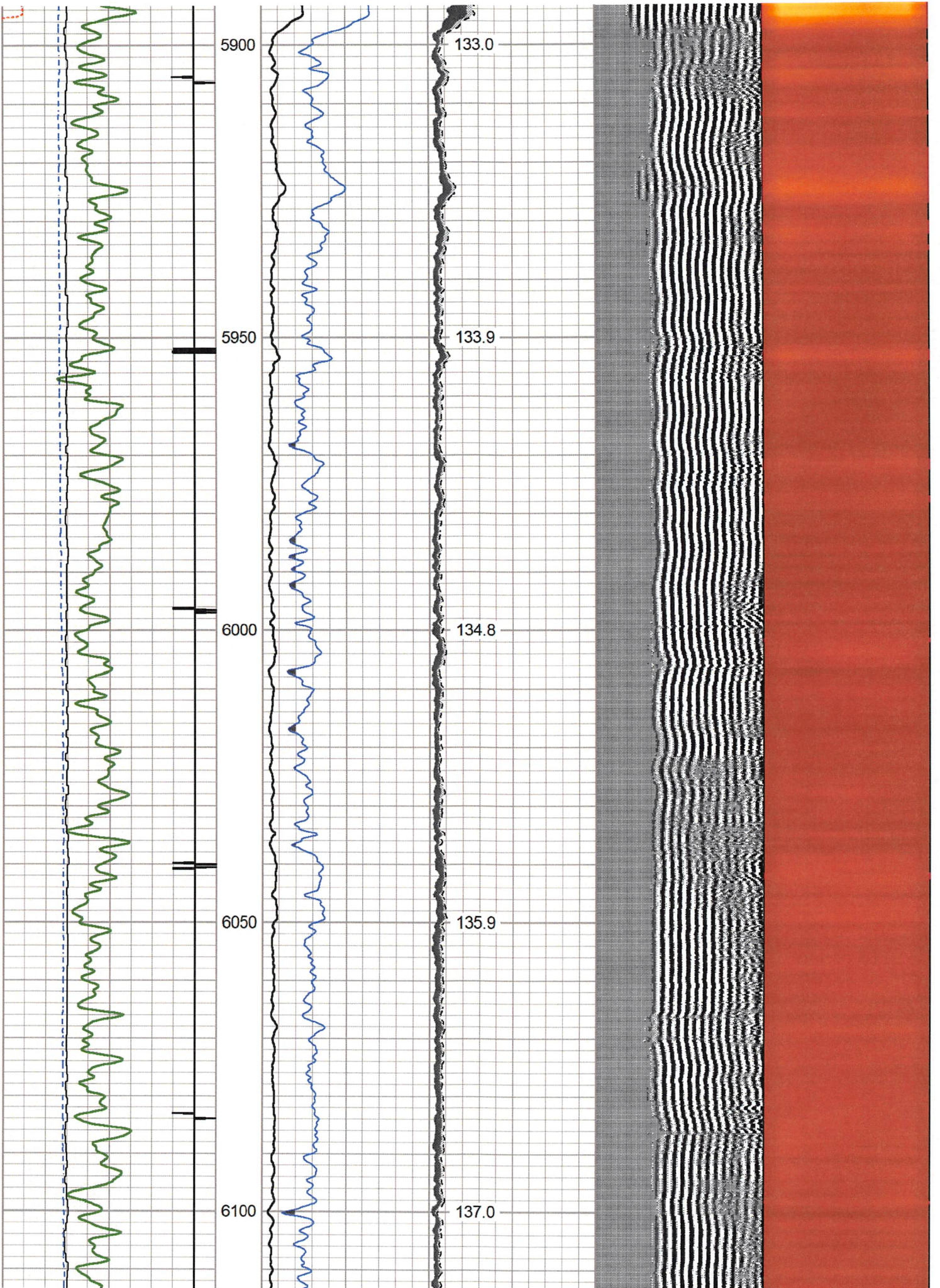


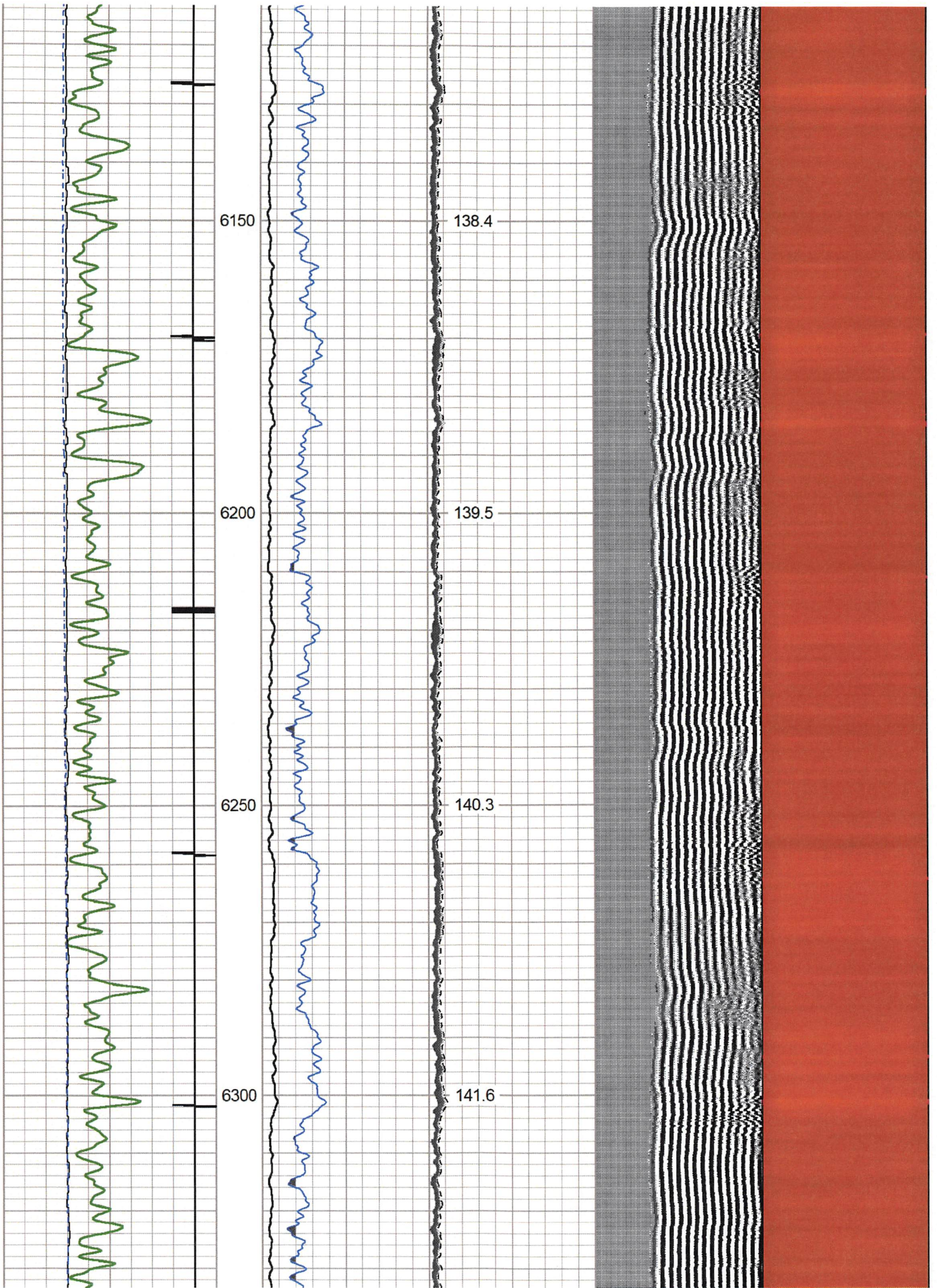


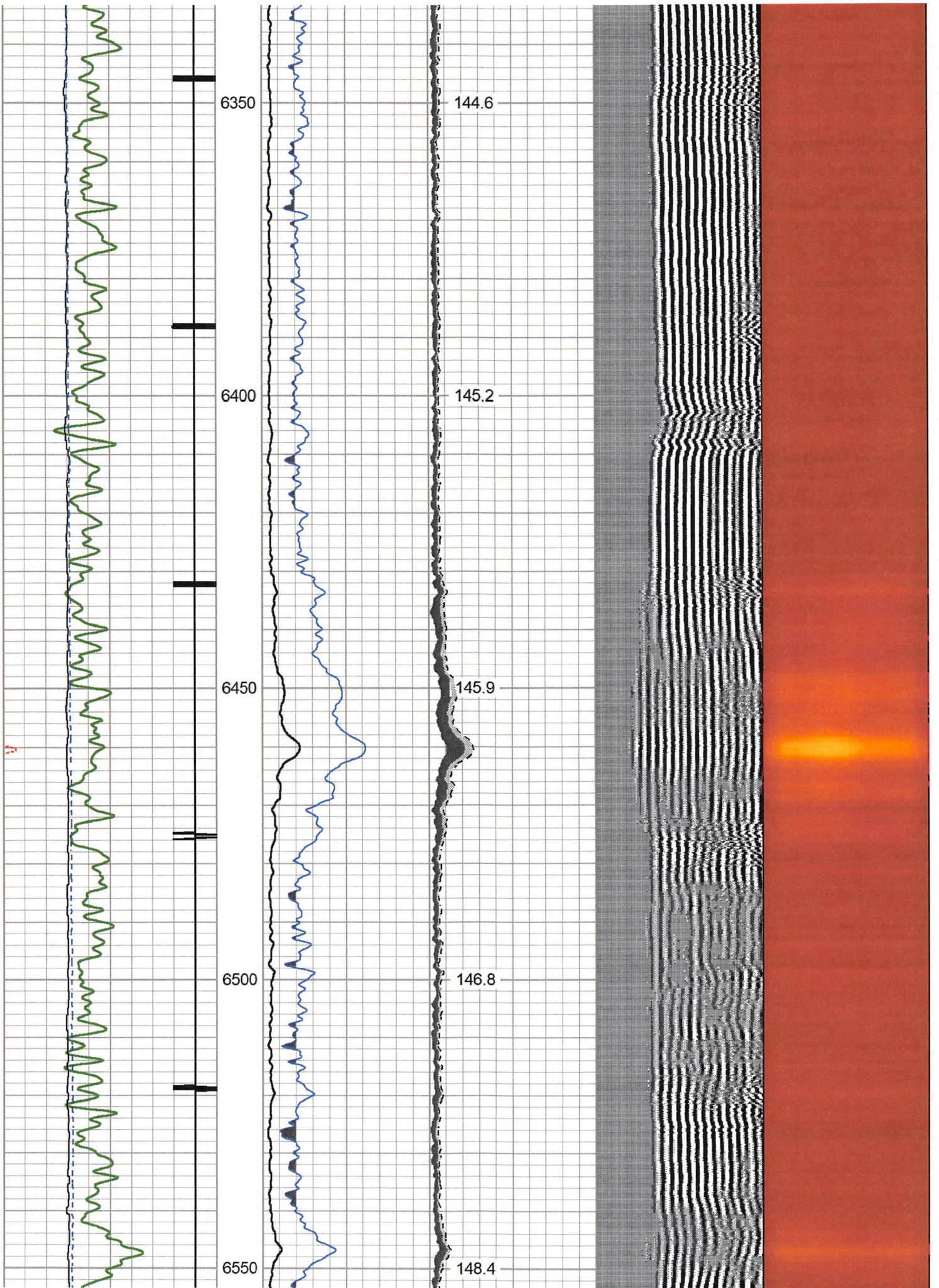


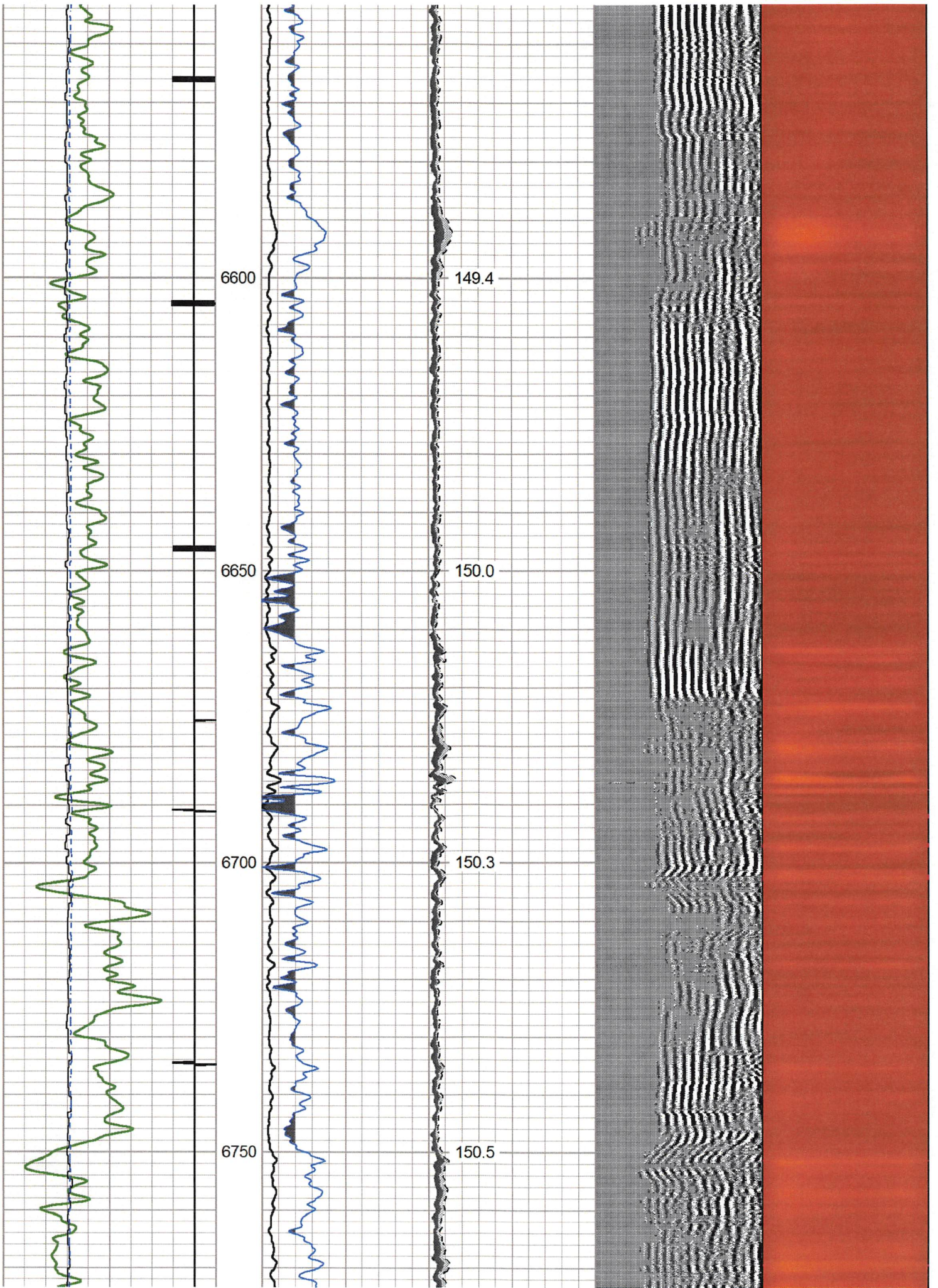




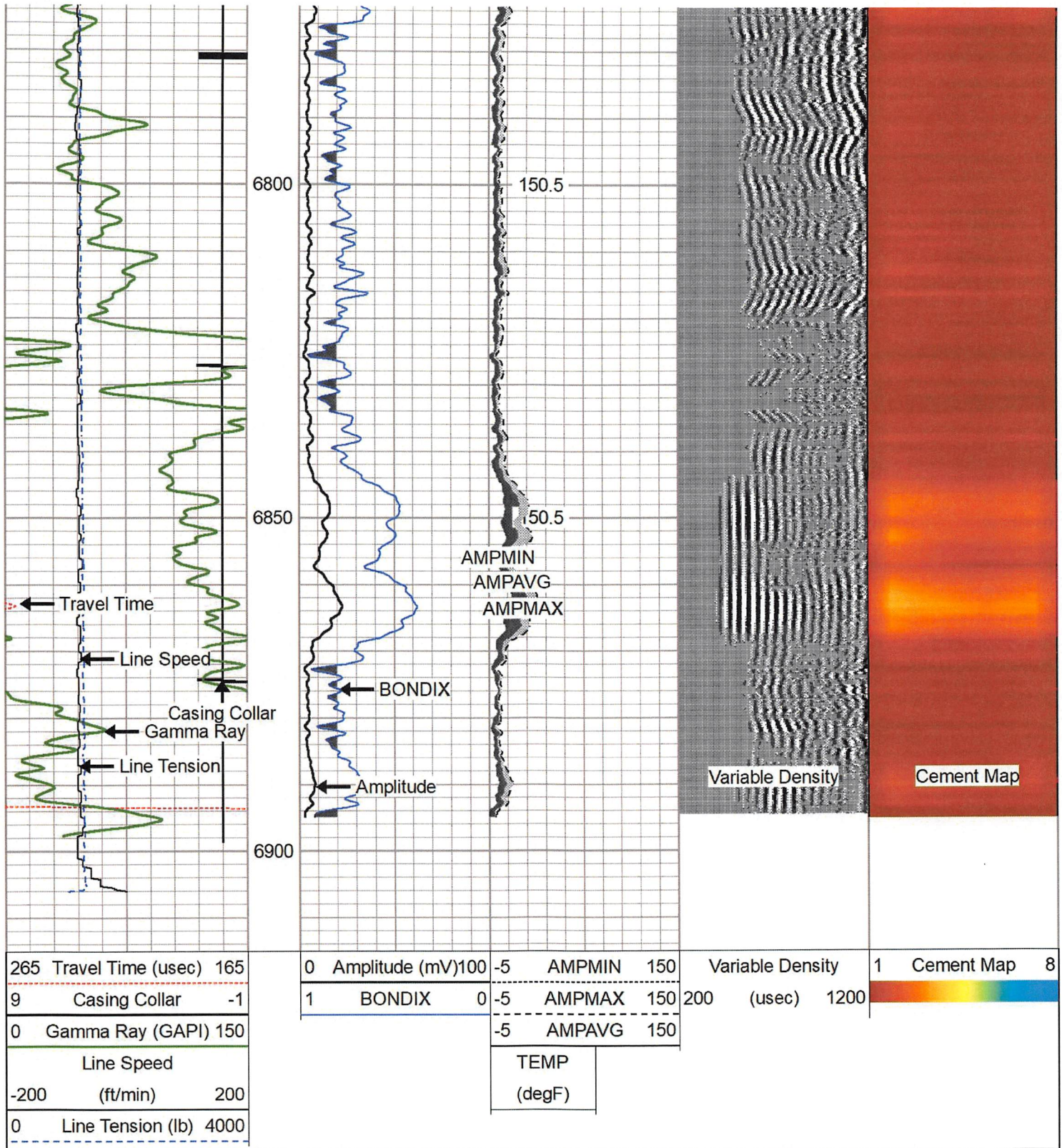












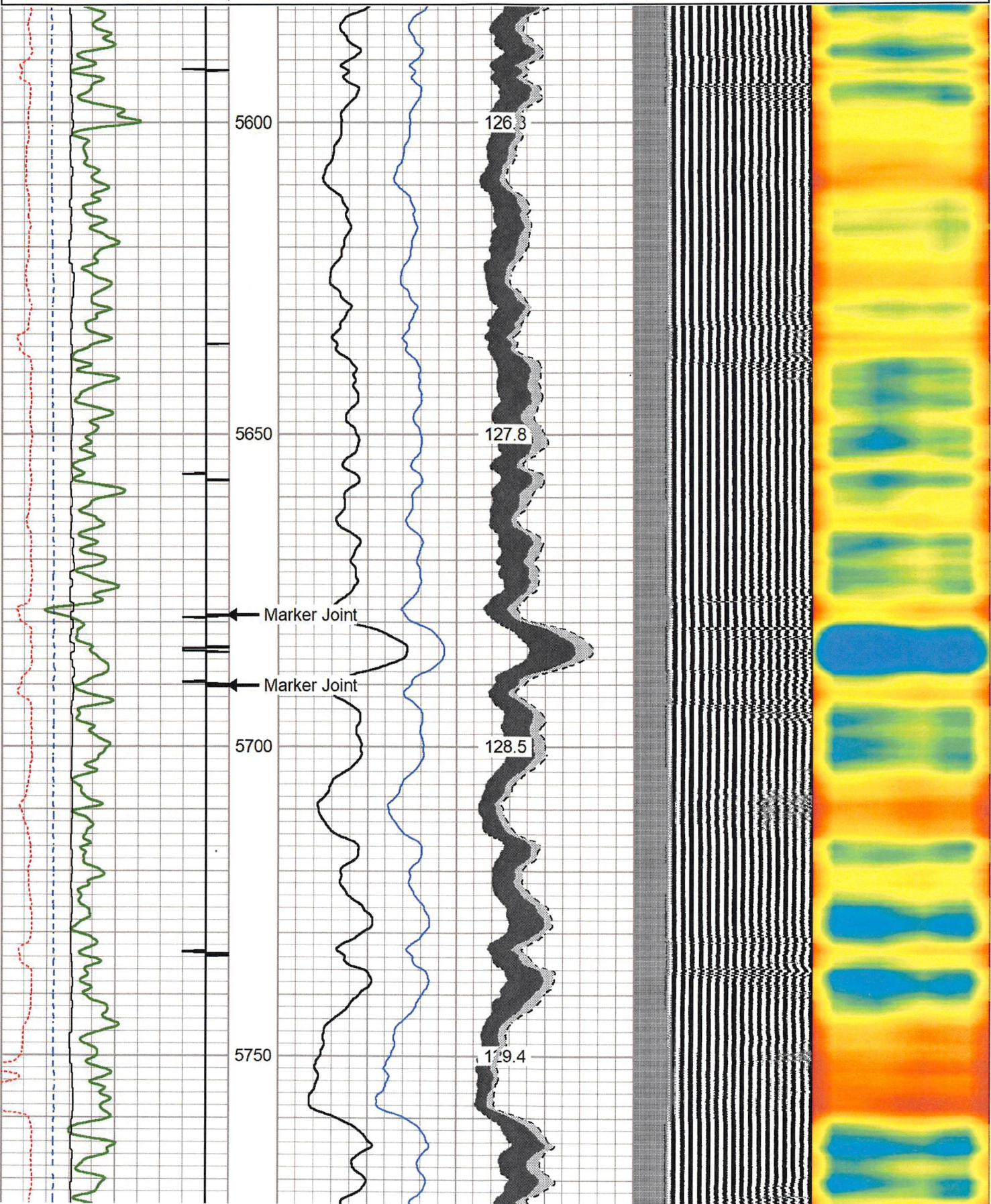

# Repeat Pass 0 PSI

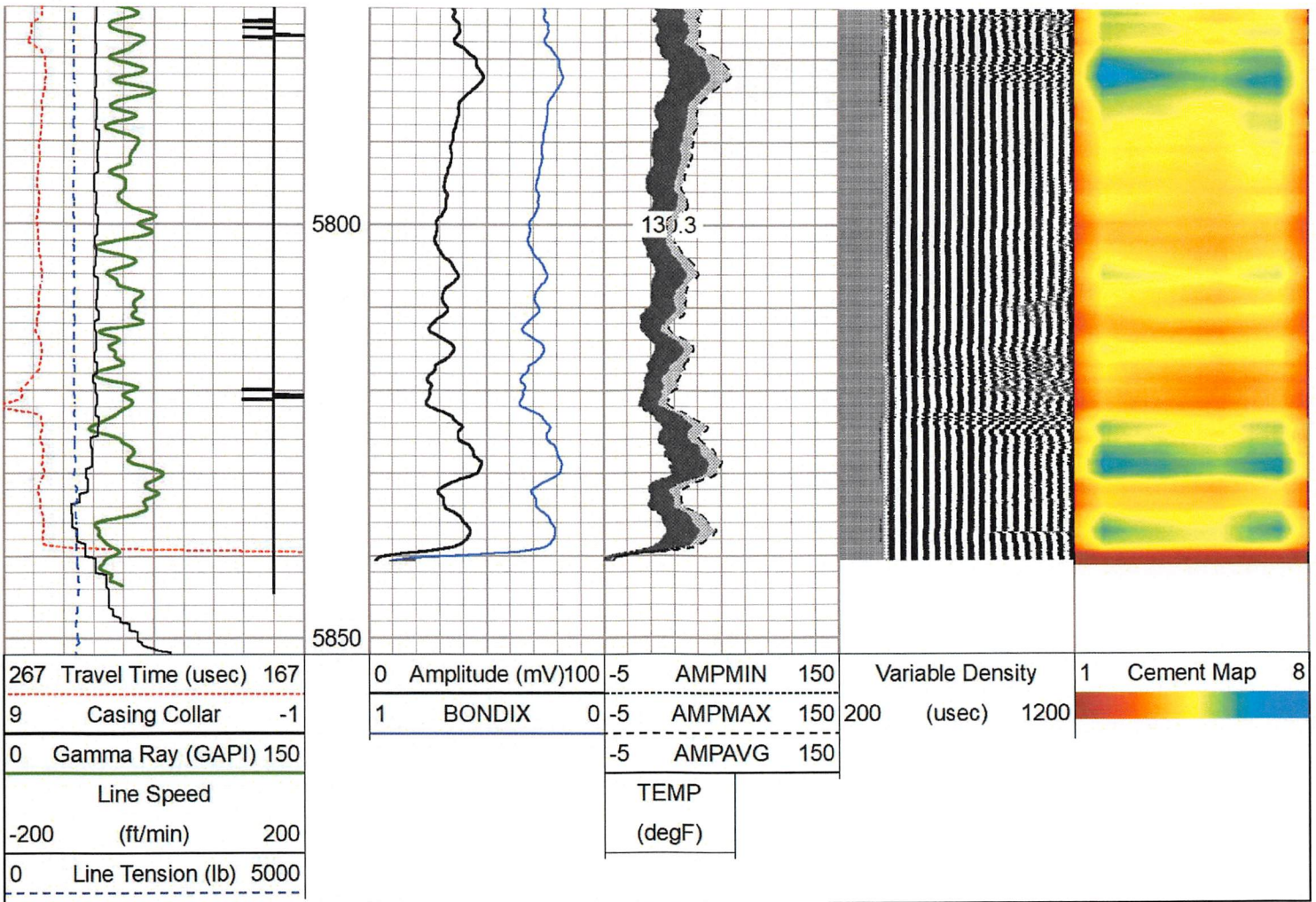
Database File	antero_redwood_3h_rcbl_13_nov_2022.db
Dataset Pathname	pass3
Presentation Format	rcbl-bond index for antero 1020
Dataset Creation	Sun Nov 13 12:13:47 2022
Charted by	Depth in Feet scaled 1:240

9	Casing Collar	-1
0	Gamma Ray (GAPI)	150
Line Speed		
-200	(ft/min)	200
0	Line Tension (lb)	5000

1	BONDIX	0	-5	AMPMAX	150
			-5	AMPAVG	150
TEMP					
(degF)					

Variable Density 200 (usec) 1200





### Log Variables

Database: C:\ProgramData\Warrior\Data\antero\_redwood\_3h\_rcbl\_13\_nov\_2022.db  
Dataset: field/well/run1/pass5/\_vars\_

**Top - Bottom**

BHTEMP_Src	BOREID	BOTTEMP	CASEOD	CASETHCK	CASEWGHT	MAXAMPL	MINAMPL
TEMP	7.875	100	5.5	0	20	71.9	2.2
MINATTN	PERFS	PPT	SRFTEMP	TDEPTH			
0.8	No	261	0	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	

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**Calibration Report**

Database File	antero_redwood_3h_rcbl_13_nov_2022.db
Dataset Pathname	pass5
Dataset Creation	Sun Nov 13 12:40:03 2022

WV Department of  
Environmental Protection

Serial Number: FW1211-86  
 Tool Model: Probe  
 Performed: Sun Nov 13 11:04:25 2022

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps  
 Calibrator Reading: 1.0 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: 185.392 ft

Master Calibration, performed Sun Nov 13 11:51:14 2022:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.006	0.497	2.200	71.921	138.613	2.965
CAL	0.837	0.842				
5'	-0.002	0.515	2.200	71.921	134.900	2.505
SUM						
S1	0.014	0.263	0.000	100.000	402.456	-5.650
S2	-0.002	0.512	0.000	100.000	194.400	0.411
S3	-0.005	0.515	0.000	100.000	192.359	0.923
S4	-0.005	0.520	0.000	100.000	190.738	0.859
S5	-0.003	0.512	0.000	100.000	193.907	0.637
S6	-0.004	0.519	0.000	100.000	191.295	0.696
S7	-0.004	0.561	0.000	100.000	176.860	0.764
S8	-0.004	0.553	0.000	100.000	179.311	0.803

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

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.837	0.842	1.000	0.000

Air Zero Calibration, performed Sun Nov 13 08:37:25 2022:

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

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Sensor	Start (ft)	Component	Description	Length (ft)	O.D. (in)	Weight (lb)
HeadVolt	17.53		CHD-Titan Standard 1 7/16" Cable Head	1.02	1.44	1.00
			Centralizer-2.75_Overbody	1.67	3.12	5.00
Temp	14.68					
			RBT-Probe275T (2.75") Probe 2.75" Radial with Integral Temperature Sub	9.39	2.75	90.00
WVFS8	12.45					
WVFS7	12.45					
WVFS6	12.45					
WVFS5	12.45					
WVFS4	12.45					
WVFS3	12.45					
WVFS2	12.45					
WVFS1	12.45					
WVF3FT	12.45					
WVF5FT	11.45					
WVFCAL	8.20					
HEADVOLT	8.20					
CCL	7.29					
GR	5.96					
			GR-Probe (FW1211-86) Probe 2 3/4" Logging Gamma Ray	4.78	2.75	57.00
			Centralizer-2.75_Overbody	1.67	3.12	5.00
			Centralizers-5419-312-S600 Titan 3 1/8" Adjustable Centralizer	3.42	3.13	34.00

Dataset: antero\_redwood\_3h\_rcbl\_13\_nov\_2022.db: field/well/run1/pass5  
 Total length: 18.61 ft  
 Total weight: 192.00 lb  
 O.D.: 3.13 in

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Nine

Company	ANTERO RESOURCES
Well	REDWOOD 3H
Field	WEST UNION
County	DODDRIDGE
State	WV

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