



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

Company ANTERO RESOURCES
Well PETER 4H
Field SOUTH CANTON
County DODDRIDGE
State WV

Company ANTERO RESOURCES
Well PETER 4H
Field SOUTH CANTON
County DODDRIDGE State WV

Location: API #: 47-017-06936

SEC	TWP	RGE	Elevation
Permanent Datum	GROUND LEVEL	Elevation	
Log Measured From	KELLY BUSHING 30'		K.B. 1,364'
Drilling Measured From	KELLY BUSHING		D.F. 1,364'
			G.L. 1,334'

Date	JANUARY 12, 2023		
Run Number	ONE		
Depth Driller	16,358'		
Depth Logger	8,090'		
Bottom Logged Interval	8,094'		
Top Log Interval	SURFACE		
Open Hole Size	NA		
Type Fluid	FRESH WATER		
Density / Viscosity	8.6 LB/GAL		
Max. Recorded Temp.	149 DEG.F.		
Estimated Cement Top	2,766'		
Time Well Ready	02:58		
Time Logger on Bottom	3:40		
Equipment Number	116		
Location	CHARLEROI, PA		
Recorded By	M.MCNALLY		
Witnessed By	RYAN RIVERA		

Run Number	Borehole Record		Tubing Record				
	Bit	From	To	Size	Weight	From	To
Casing Record				Size	Wgt/Ft	Top	Bottom
Conductor String							
Surface String							
Intermediate String				13.375"	54.5#	SURFACE	902'
Intermediate String				9.625"	36#	SURFACE	3,491'
Production String				5.5"	20#	SURFACE	16,358'

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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 -15'
MARKER JOINT 6,875'-6,885'
MAIN PASS LOGGED WITH 1500 PSI
REPEAT PASS LOGGED WITH 0 PSI

THANK YOU FOR USING NINE ENERGY SERVICES

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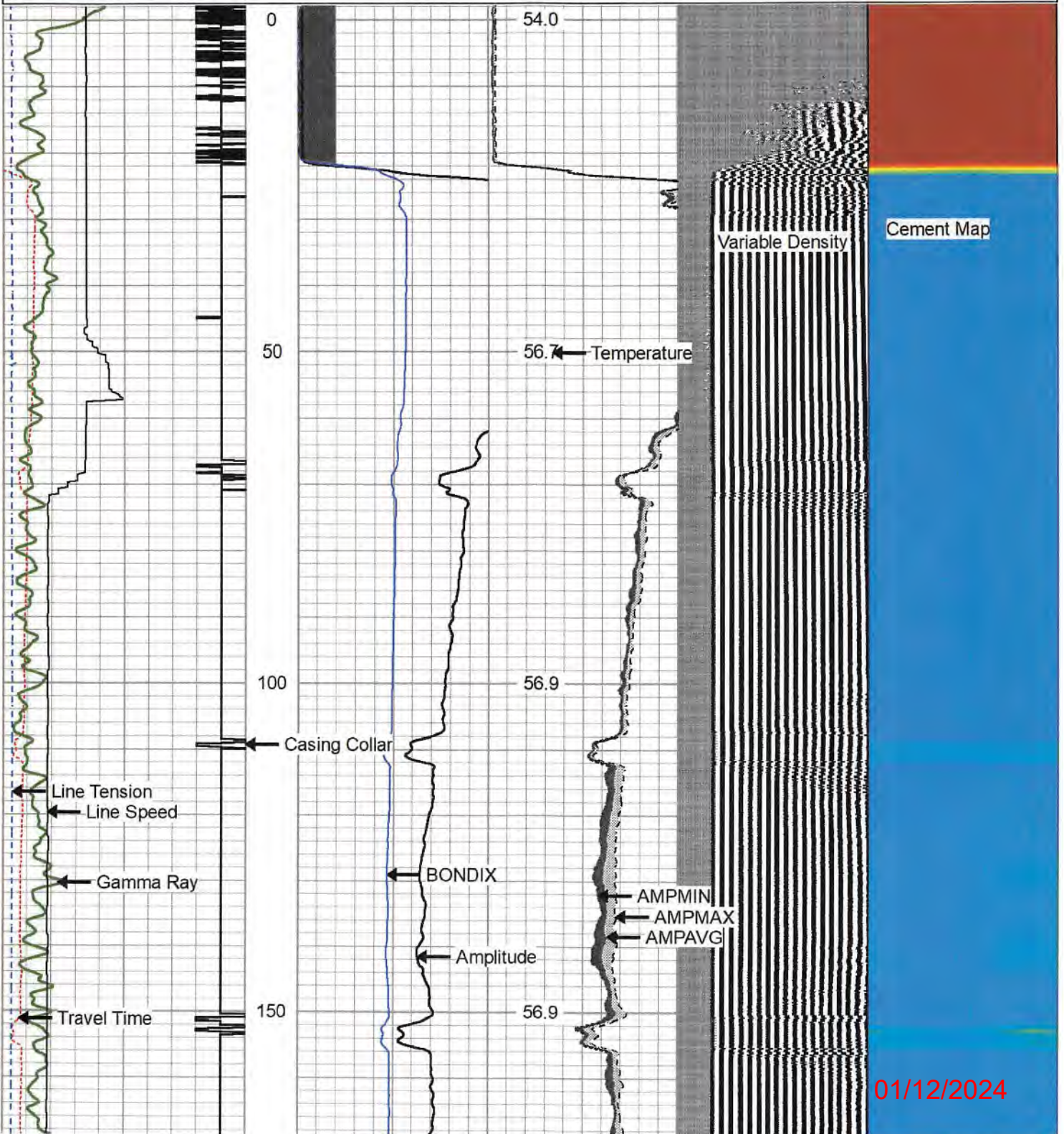
WV Department of
Environmental Protection

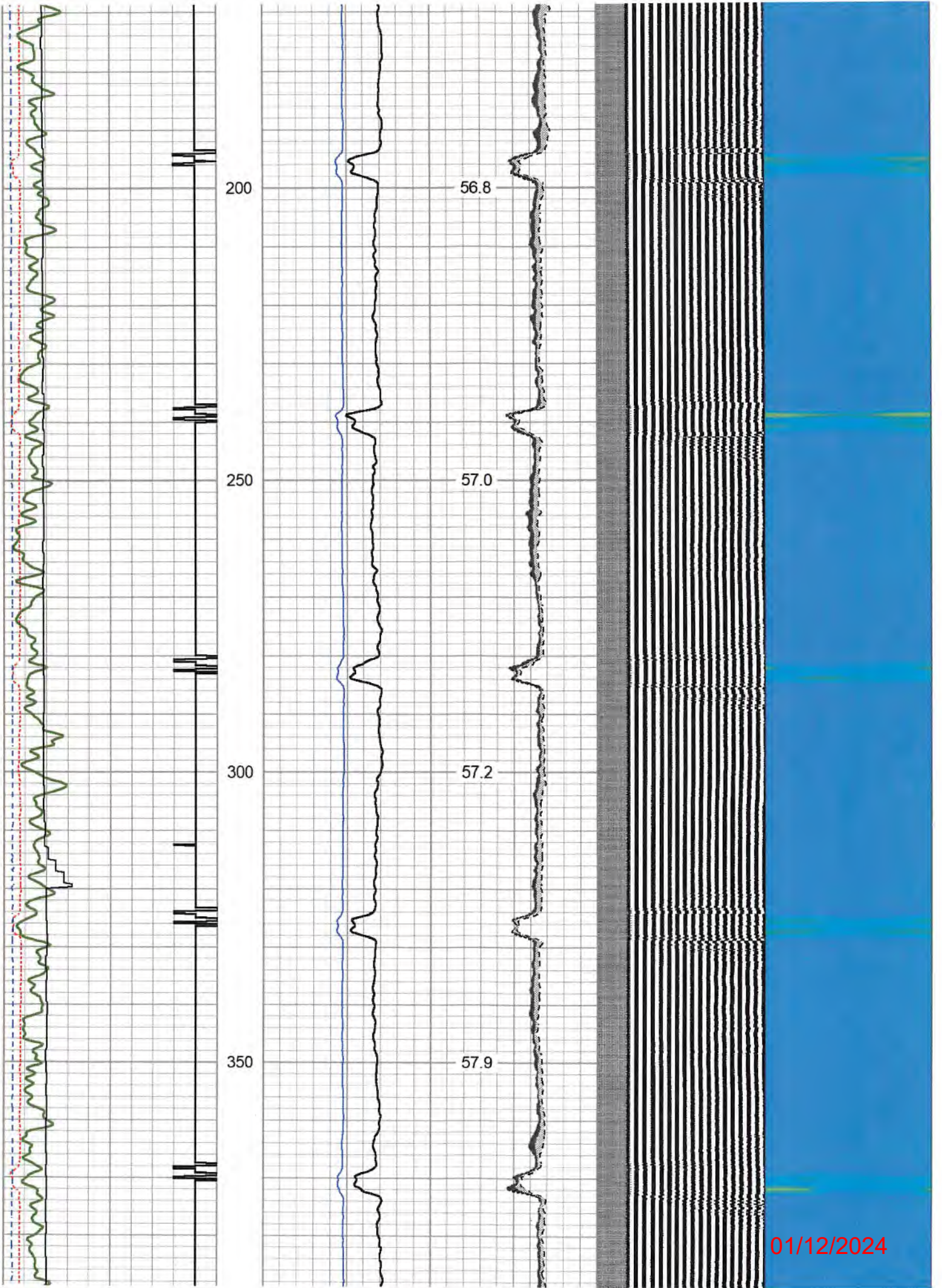


MAIN PASS 1,500 PSI

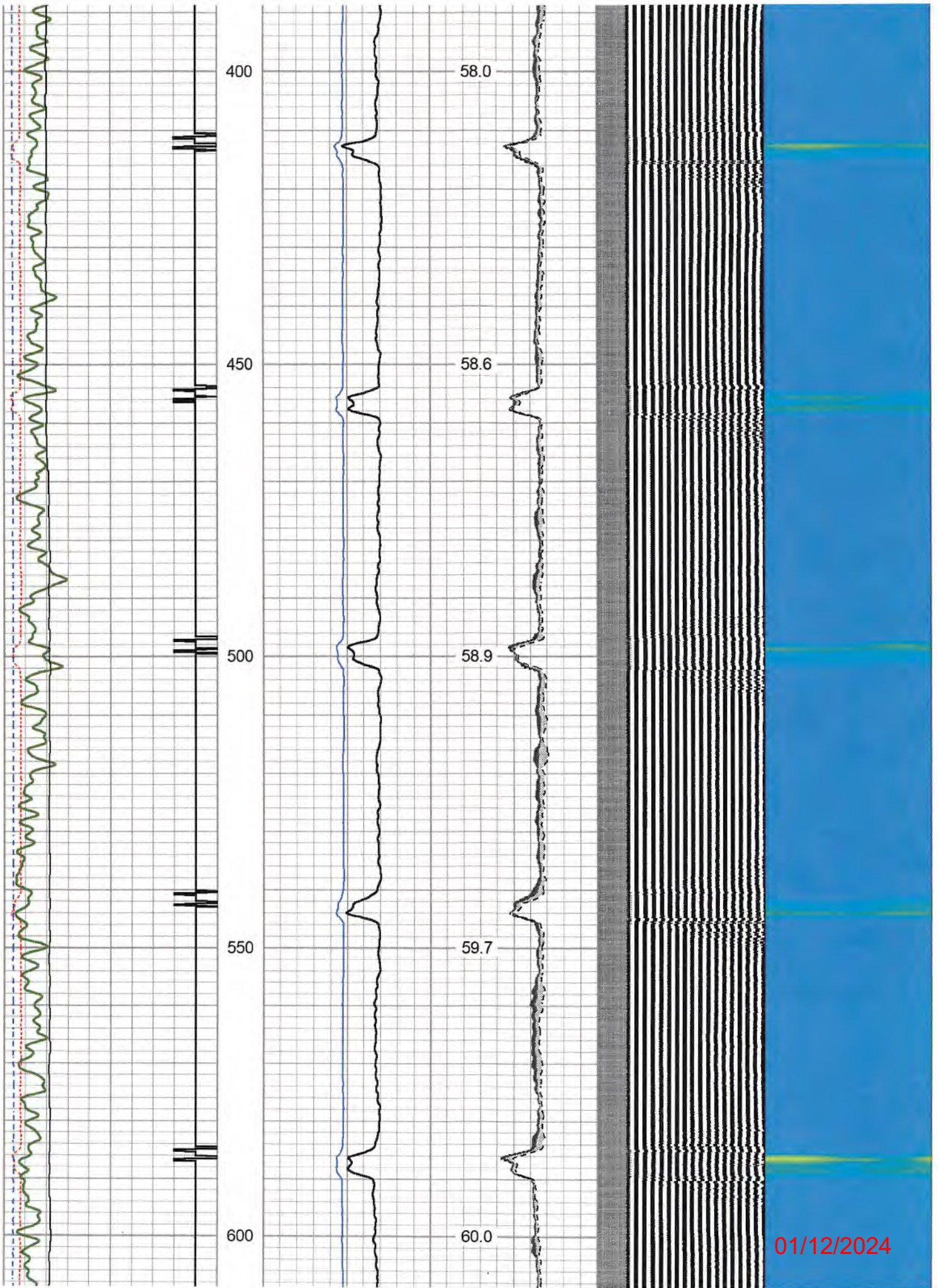
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 Dataset Pathname peter4h/run1/pass4
 Presentation Format rcbl 2
 Dataset Creation Thu Jan 12 03:31:58 2023
 Charted by Depth in Feet scaled 1:240

270	Travel Time (usec)	160	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										

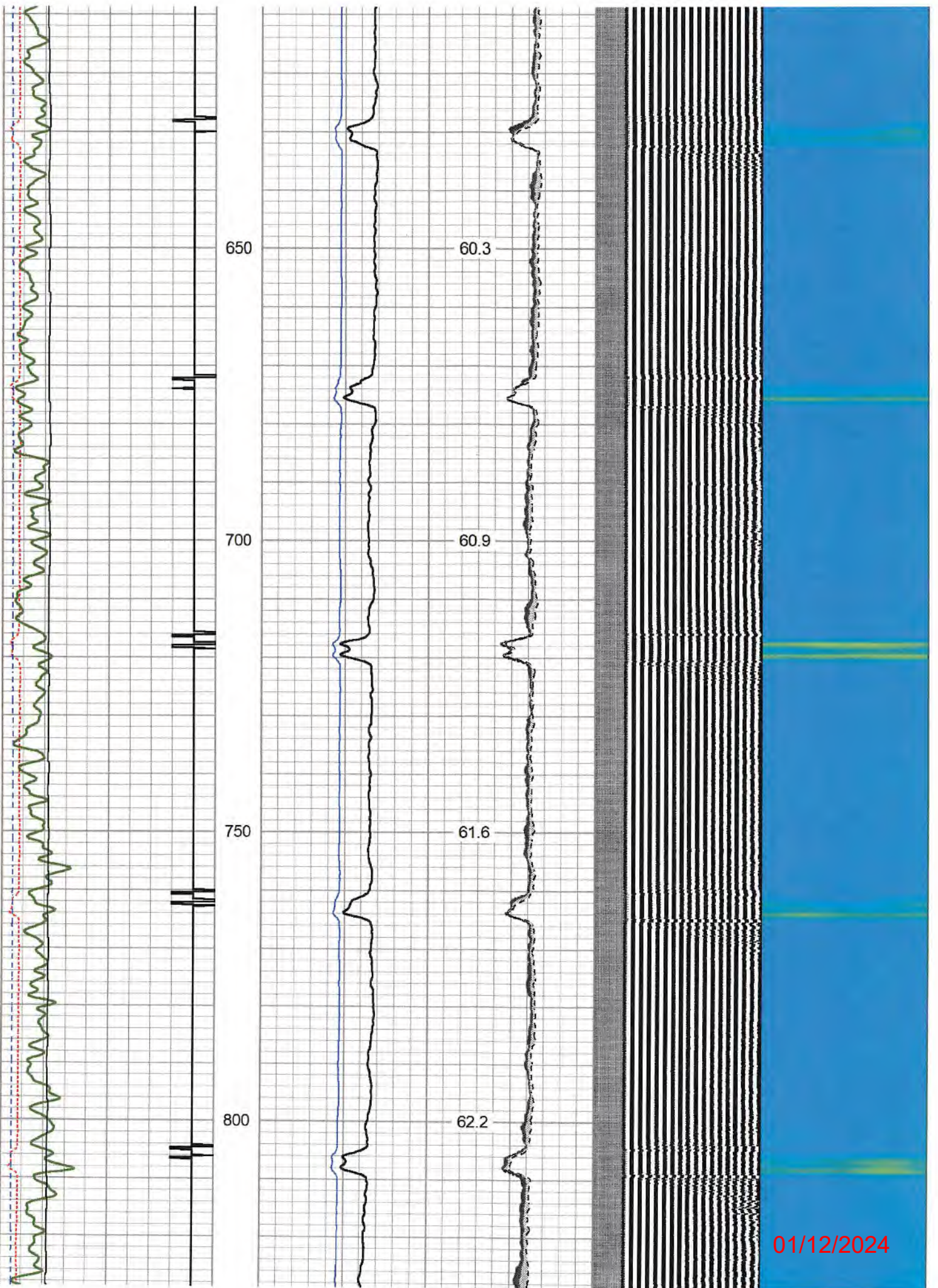


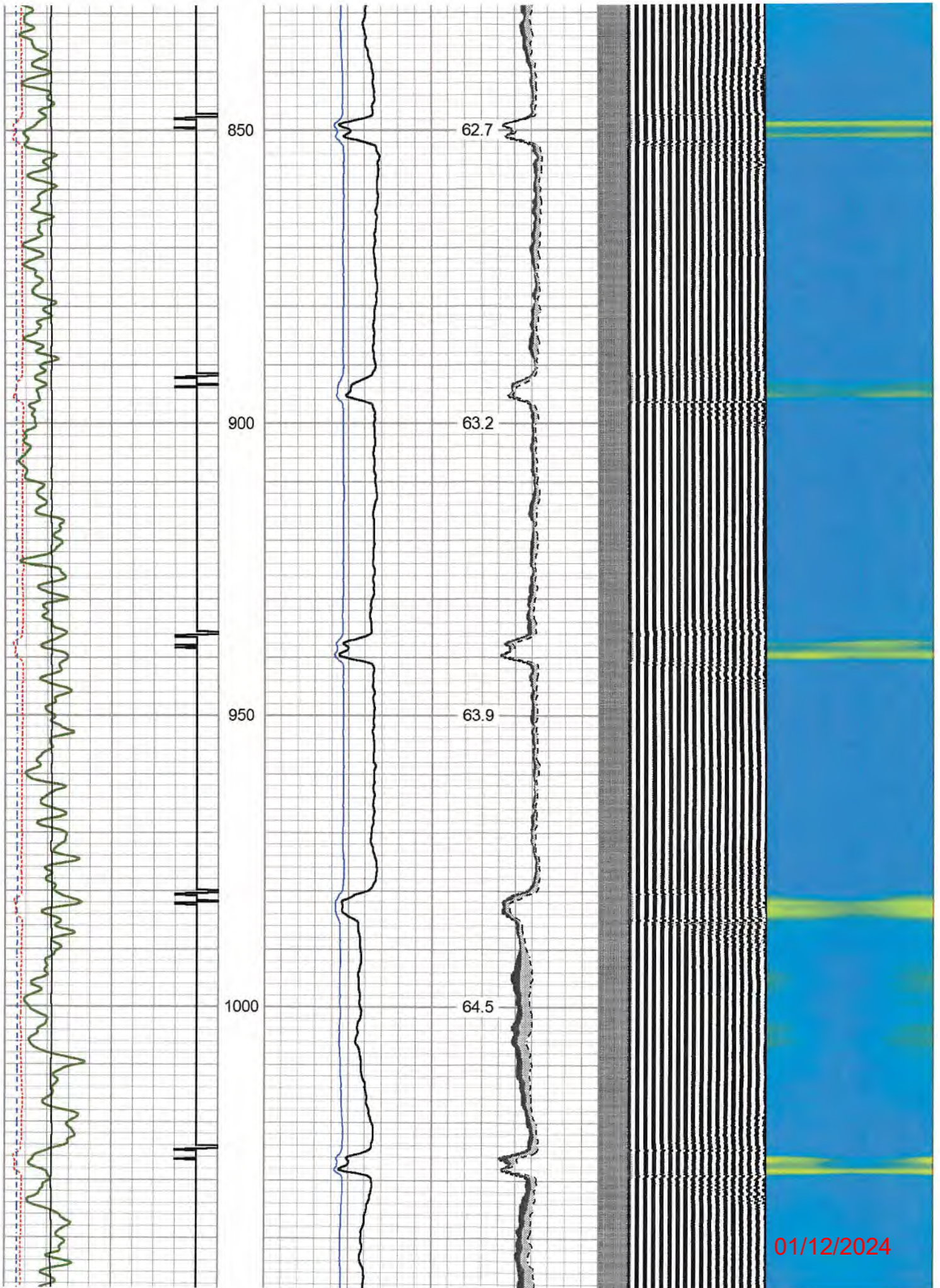


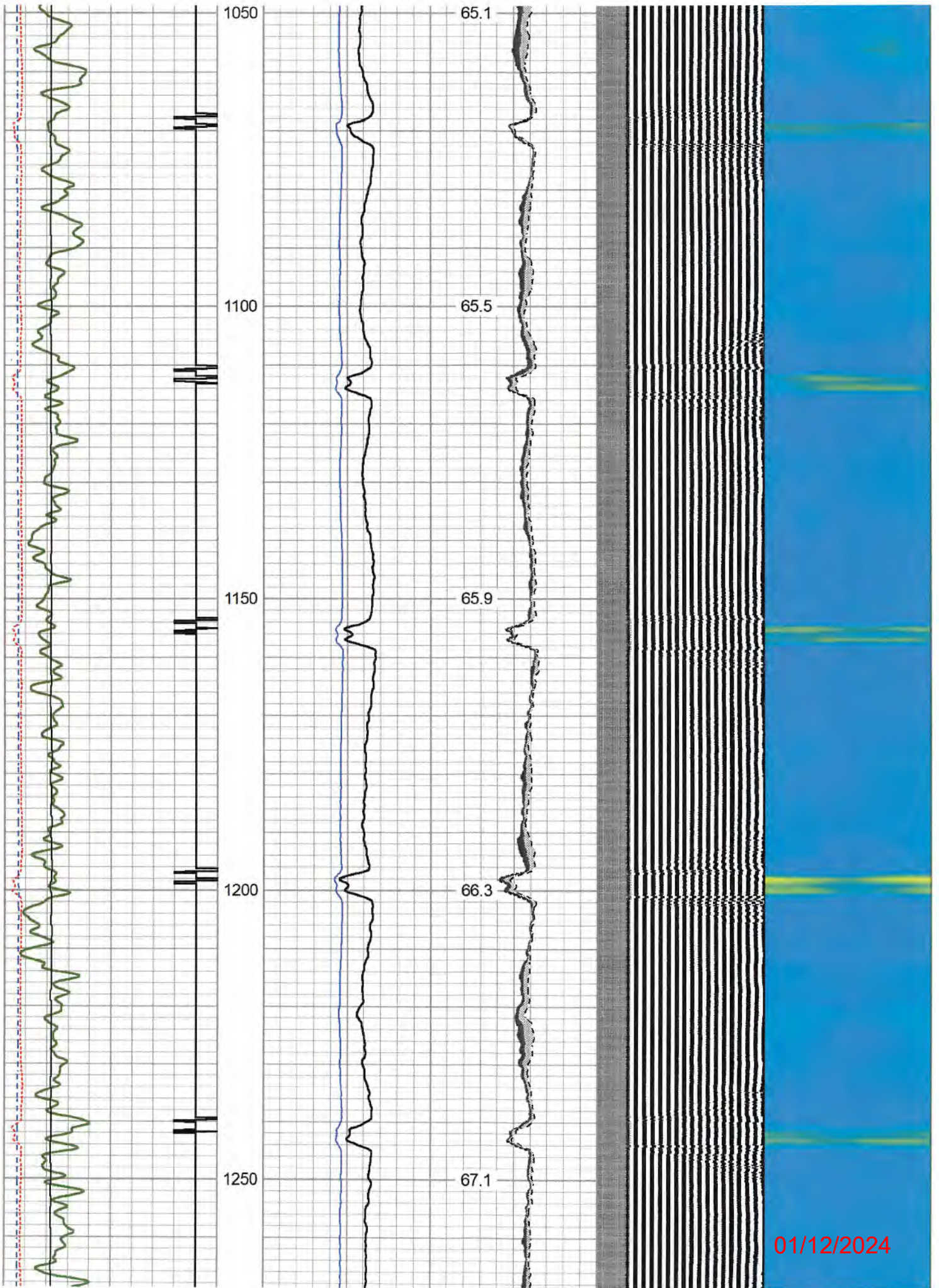
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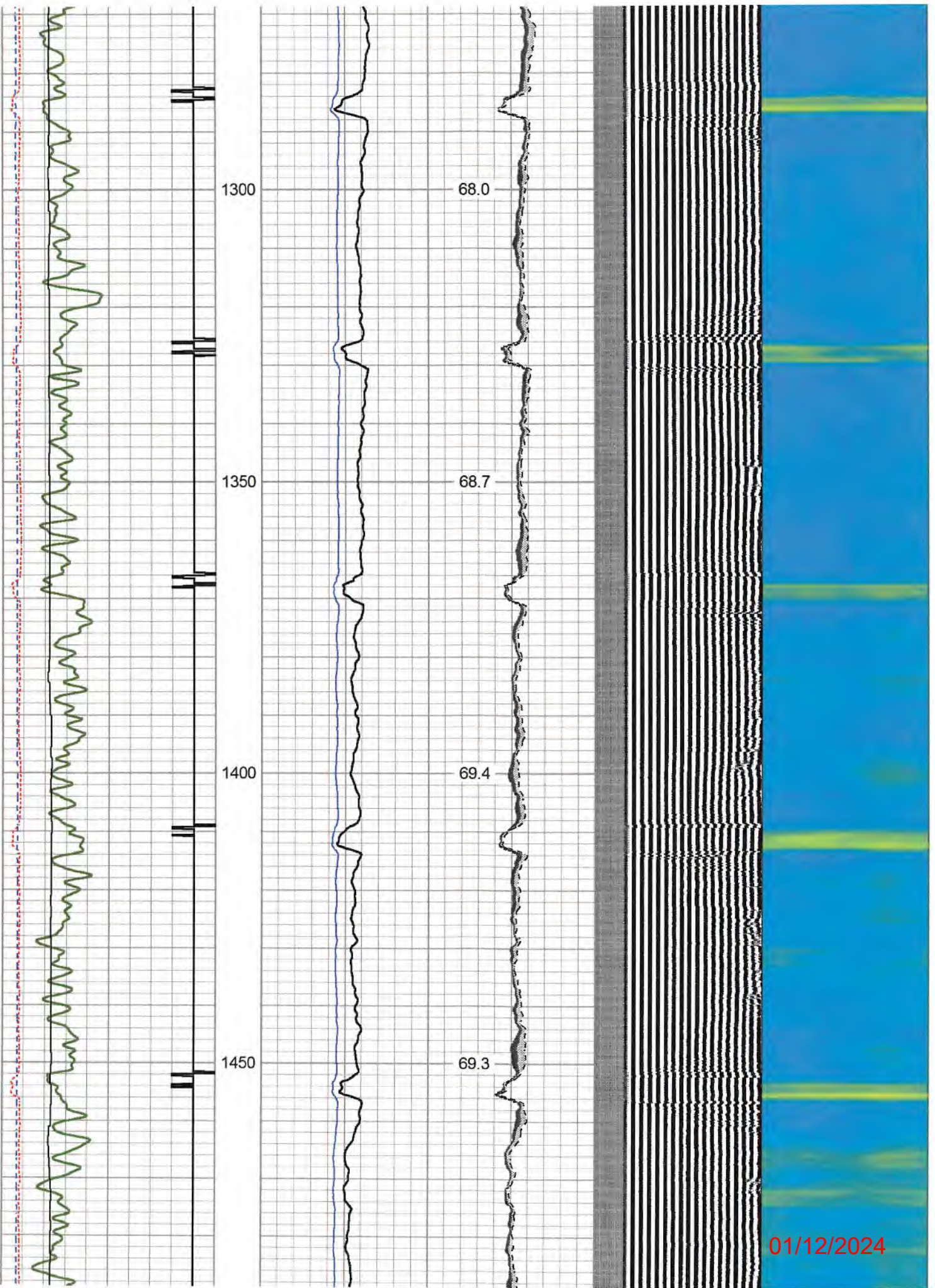


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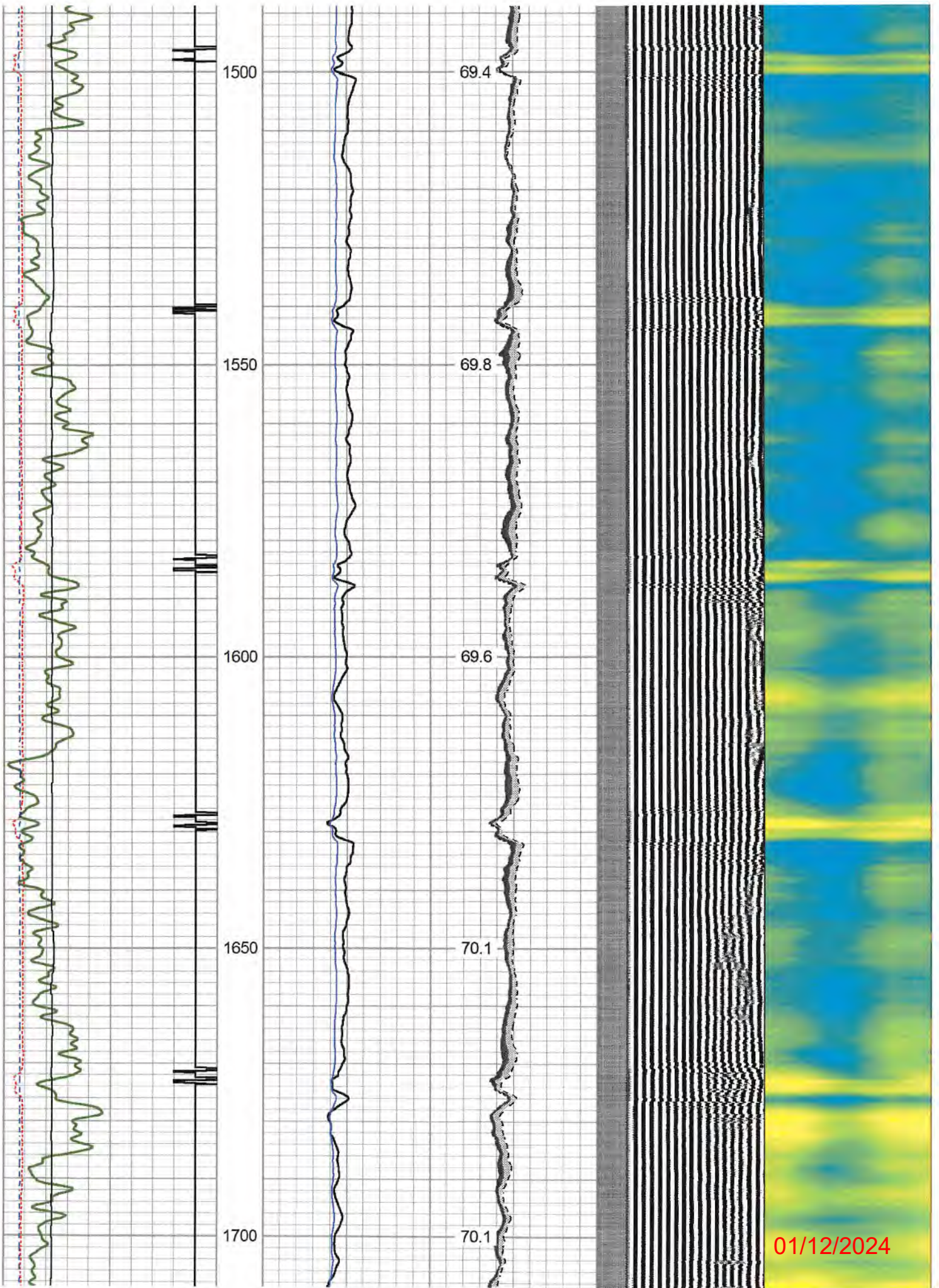




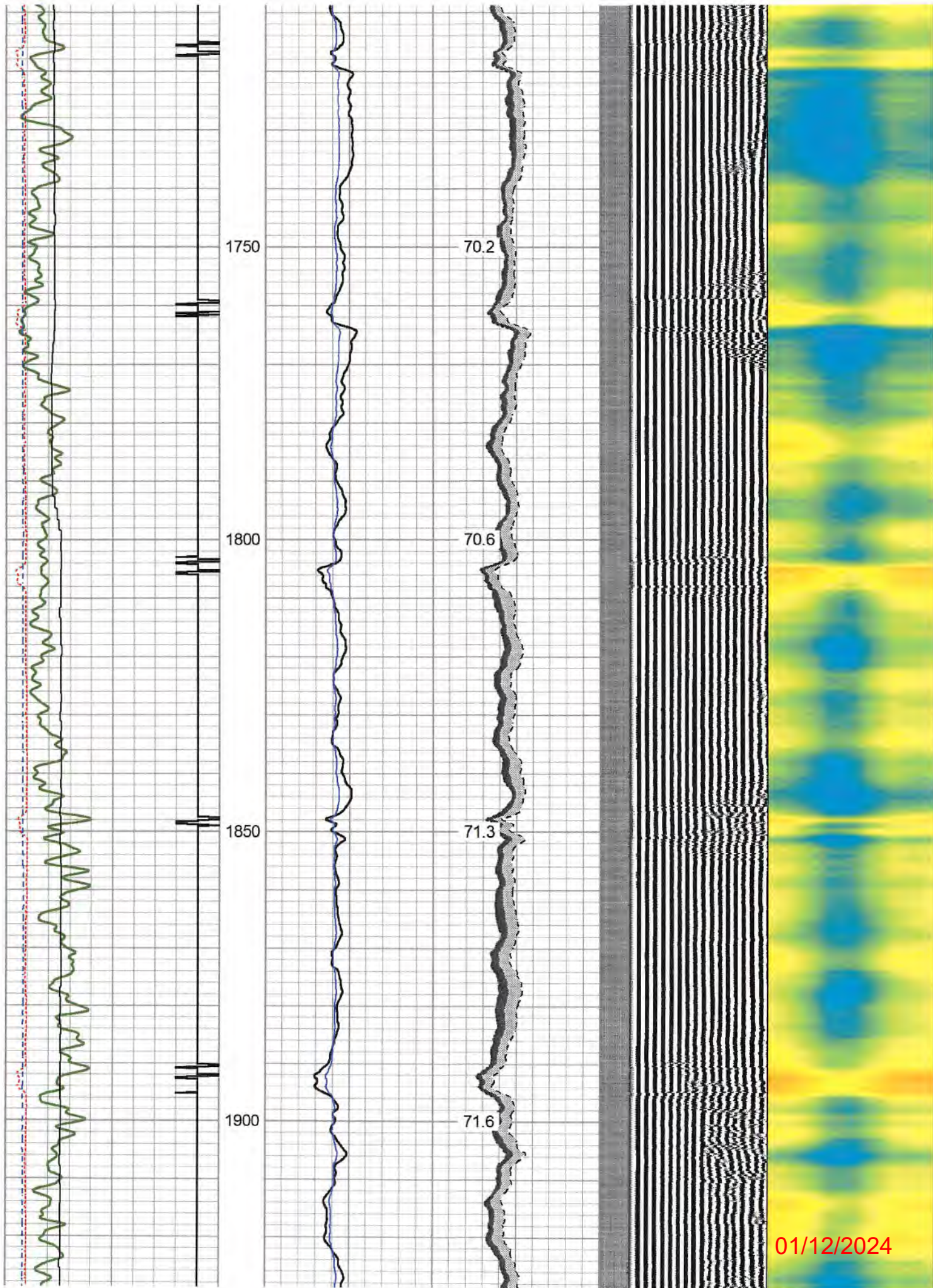


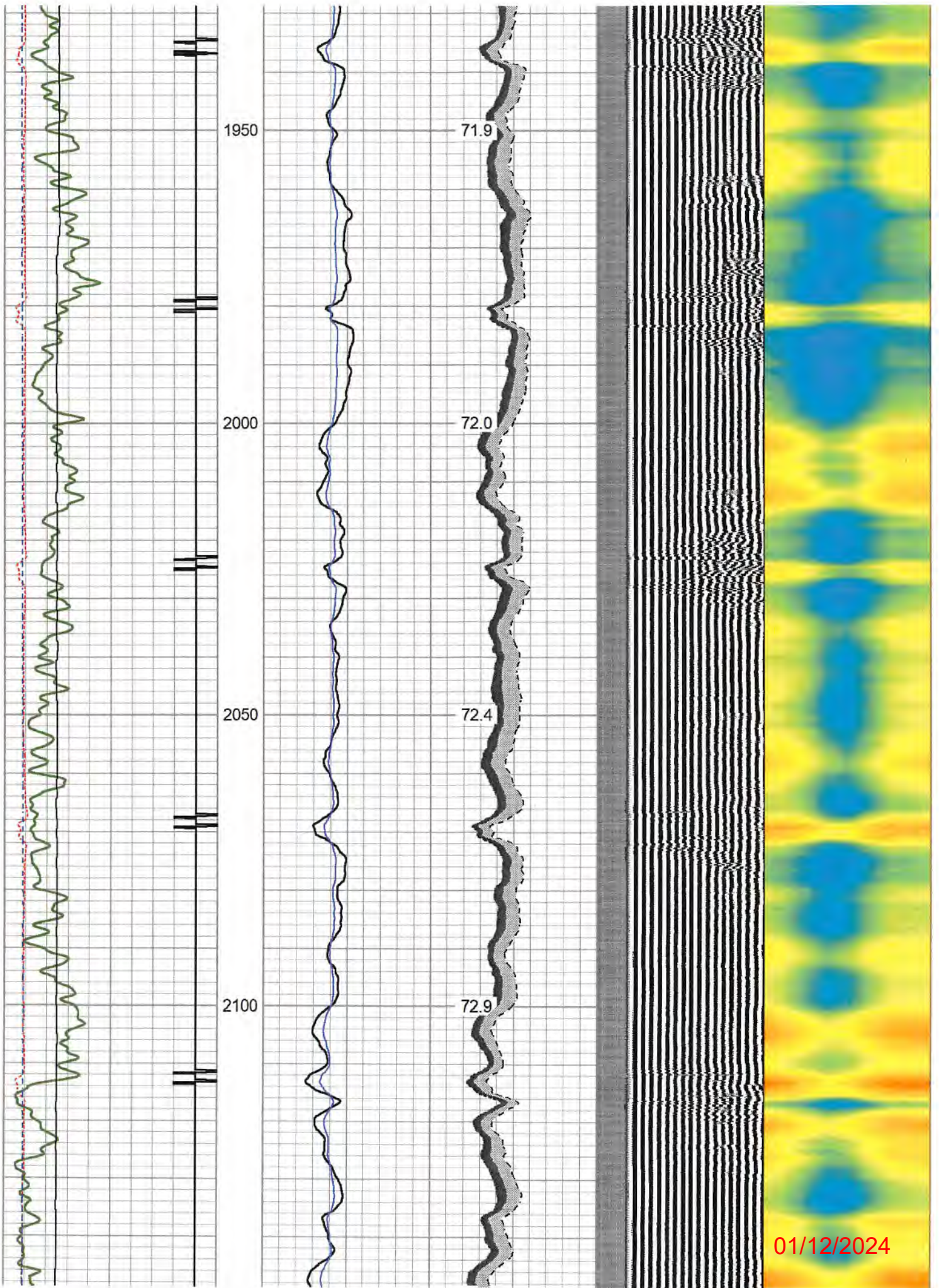


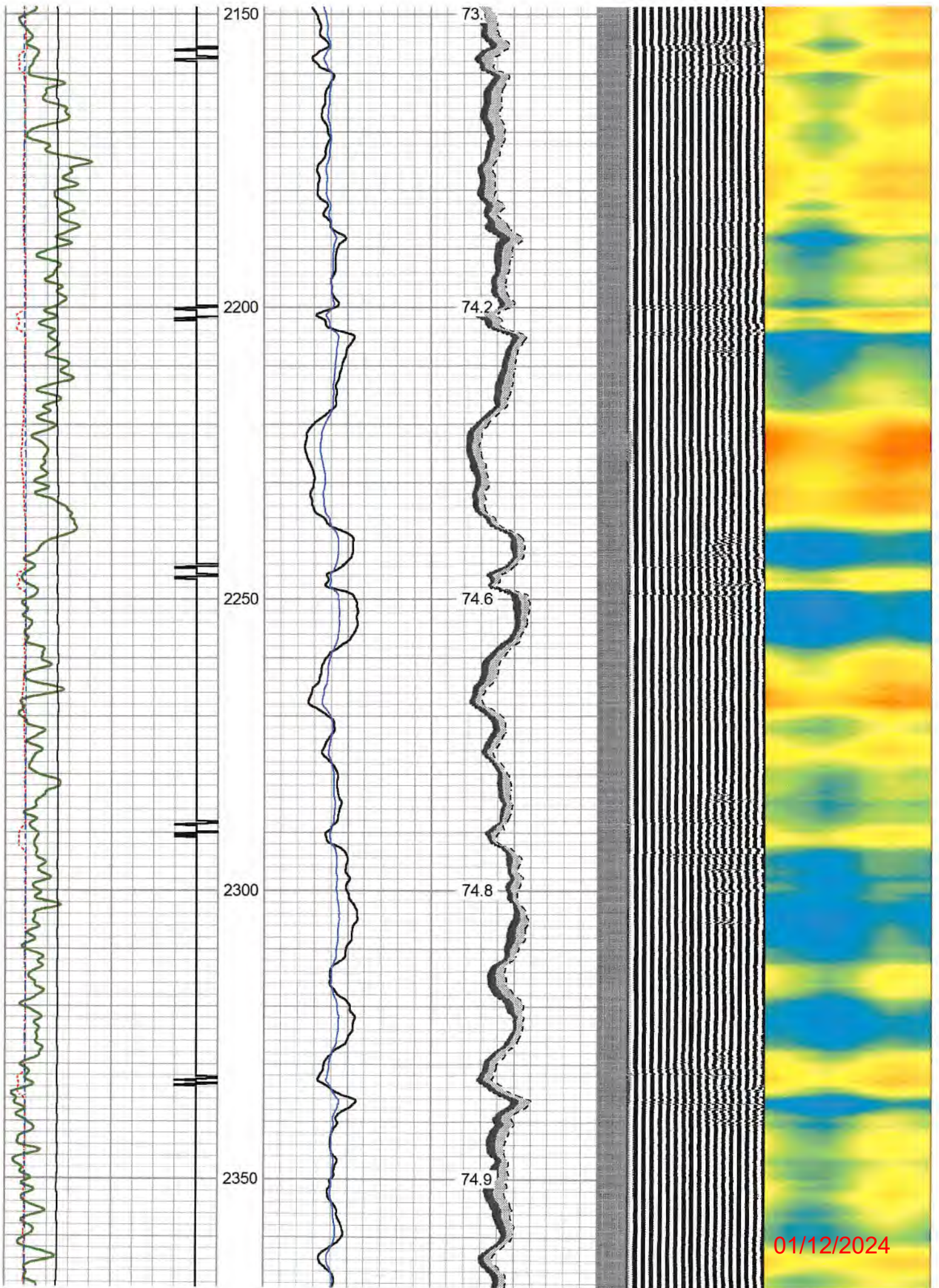
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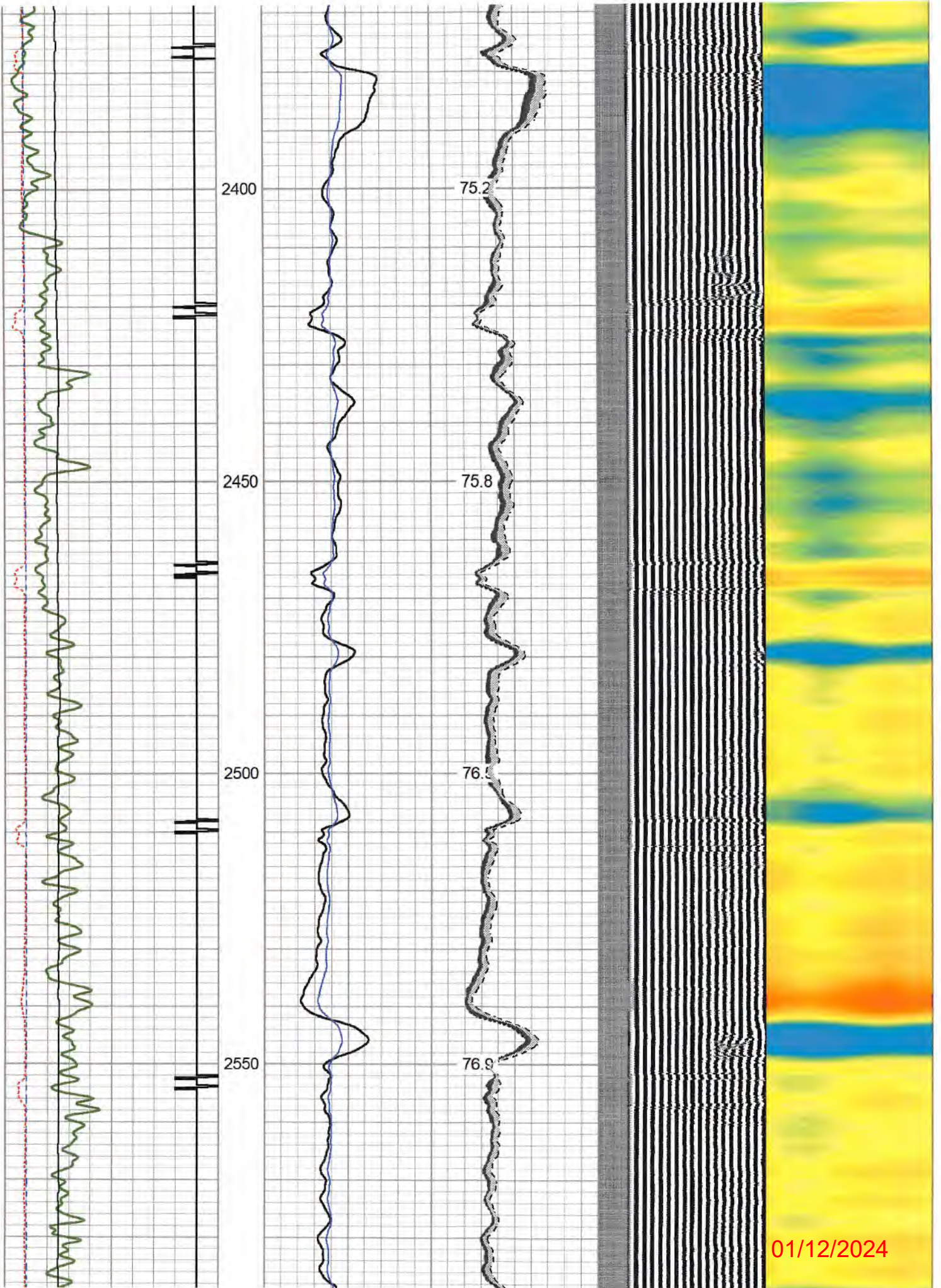
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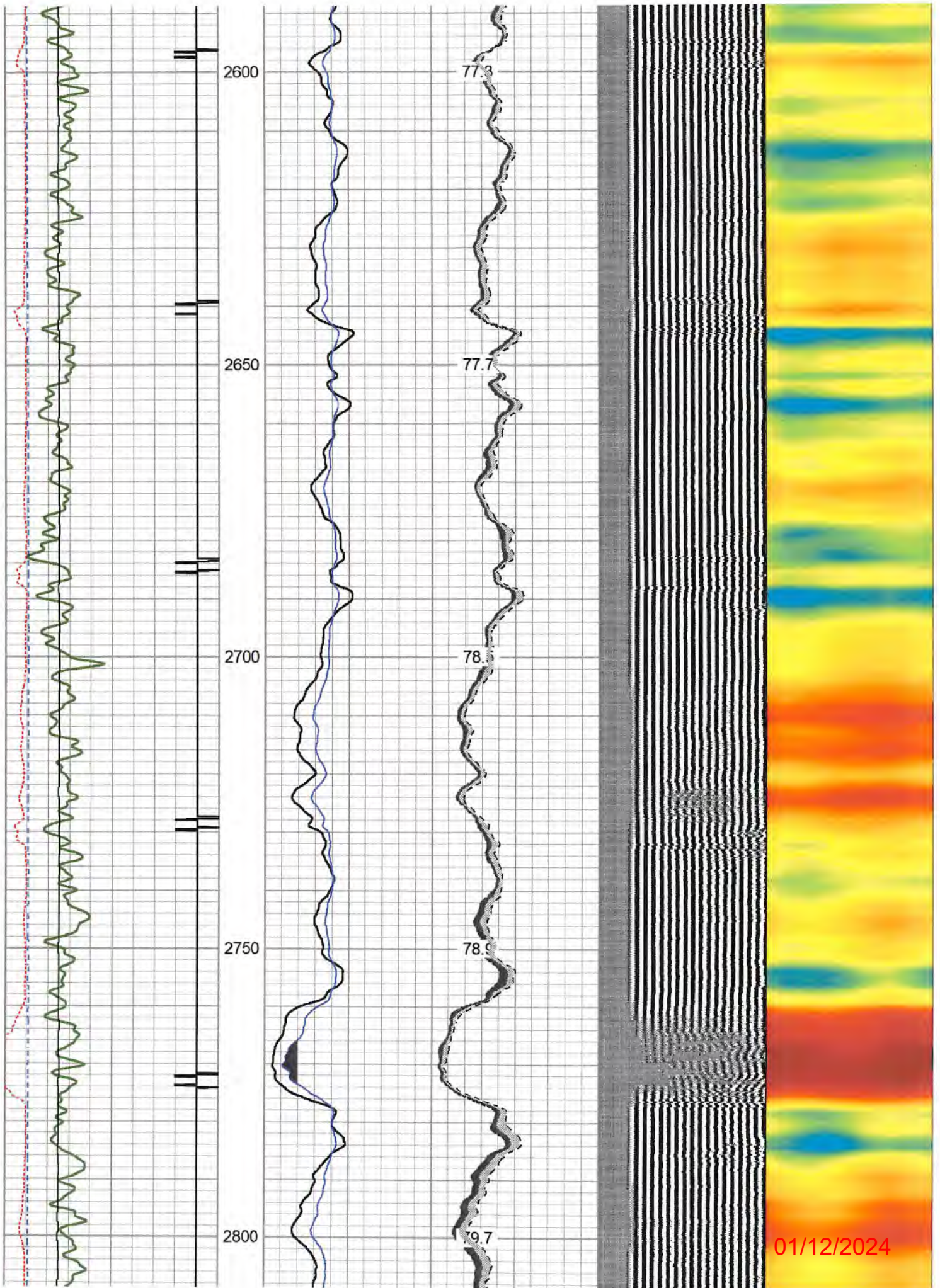


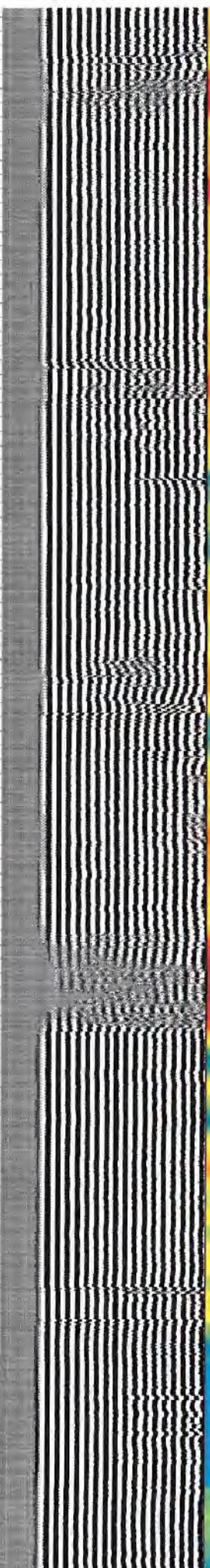
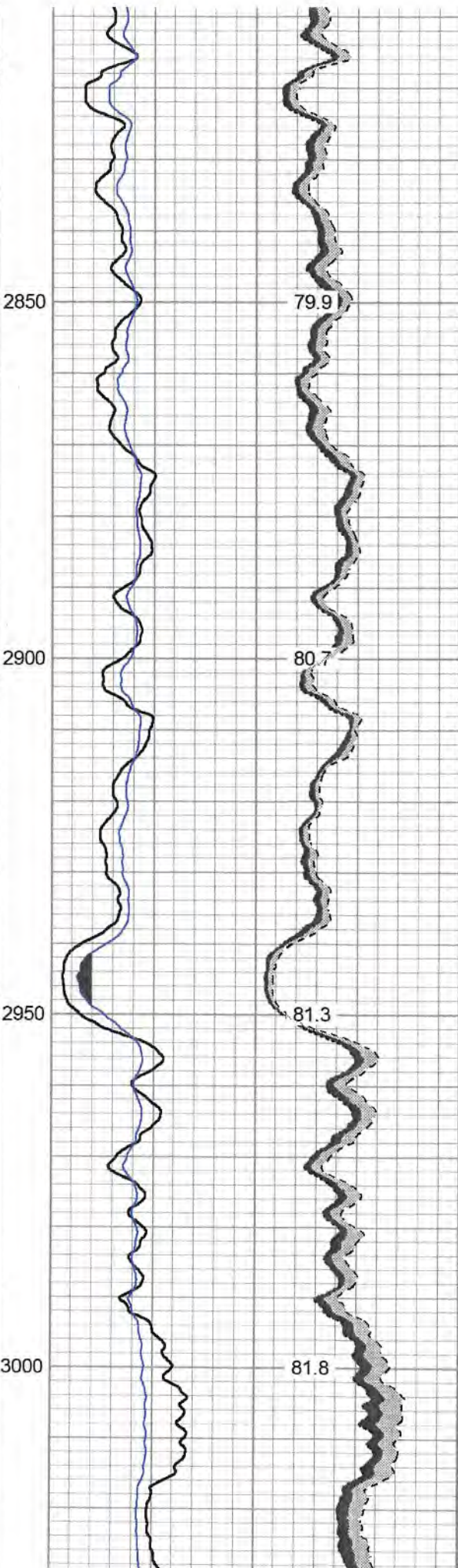
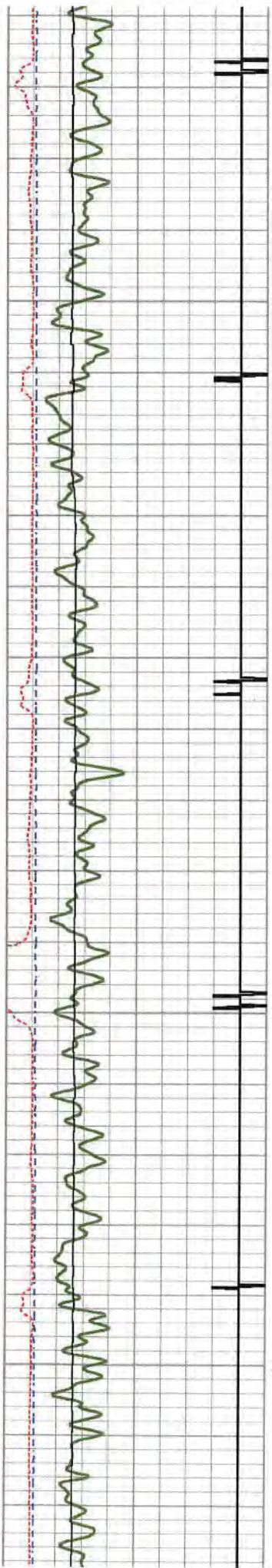


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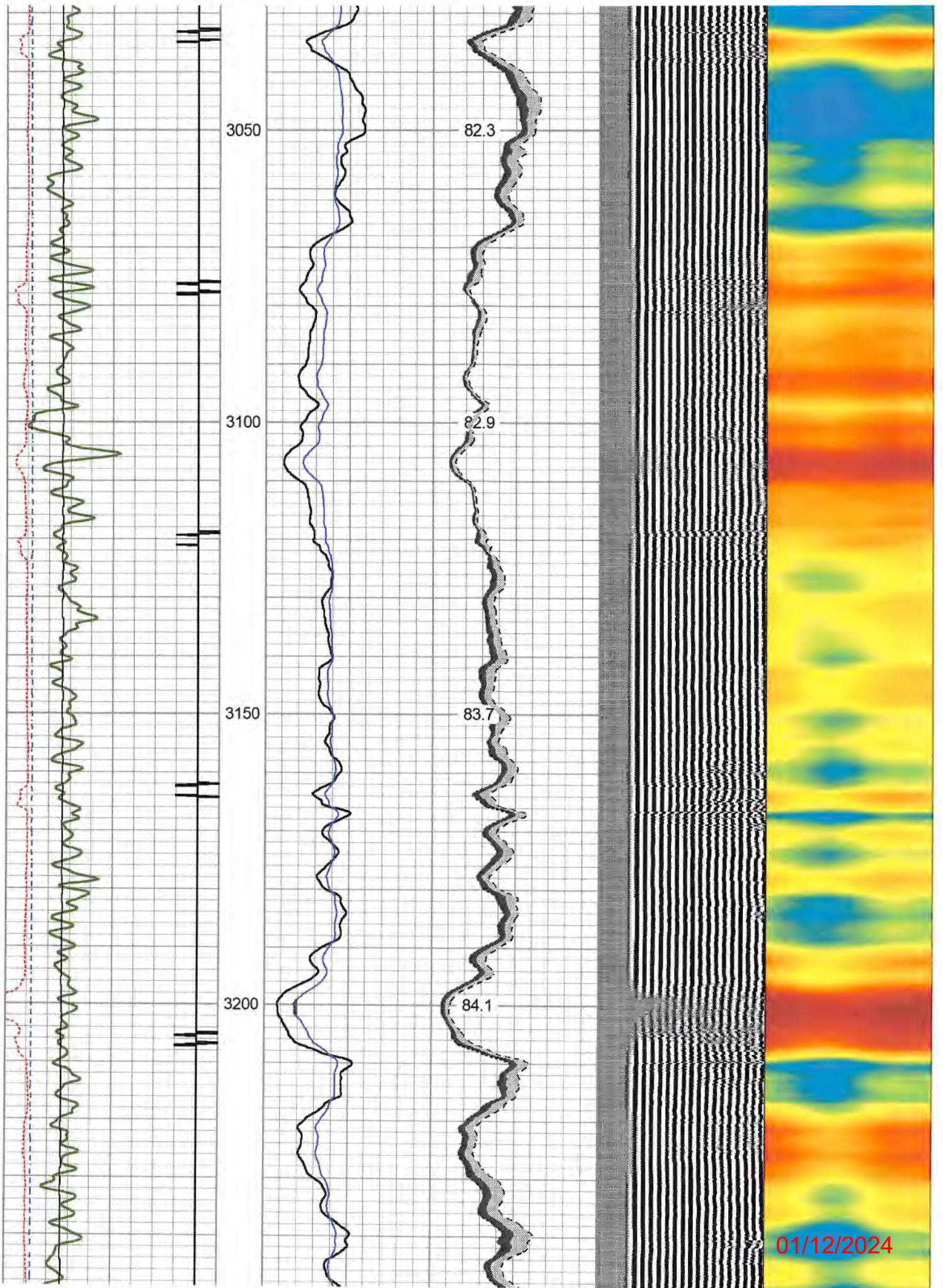


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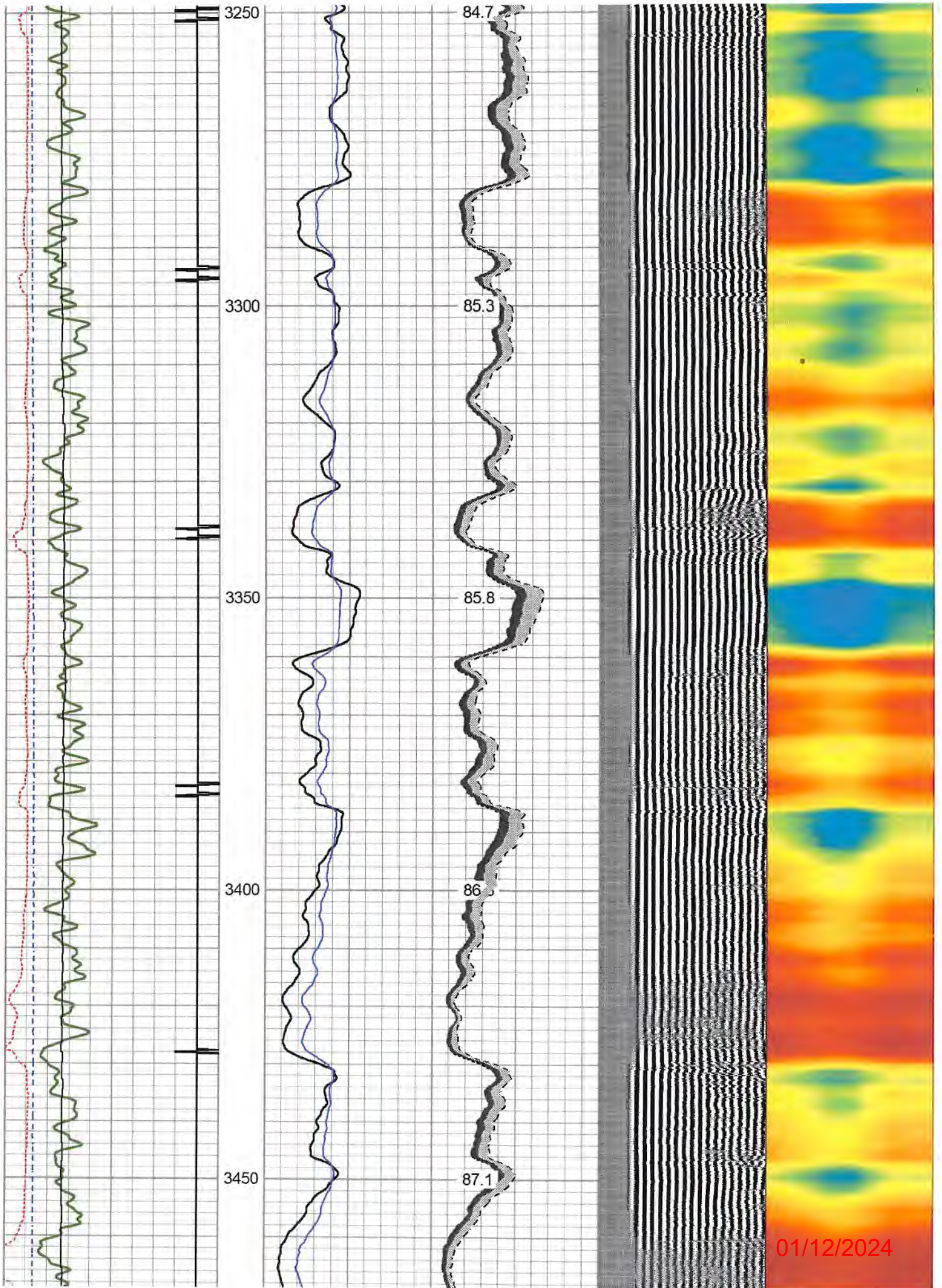


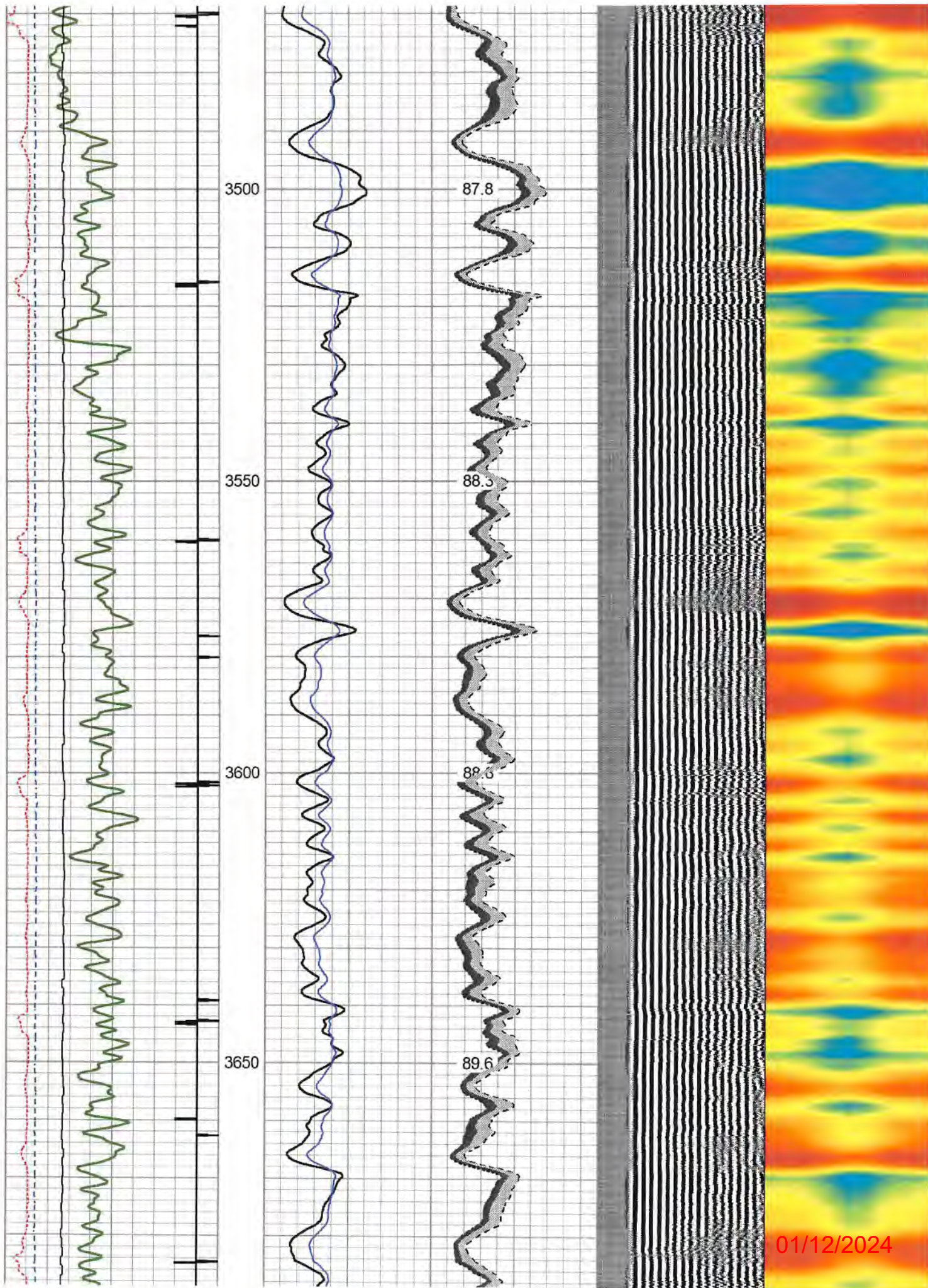


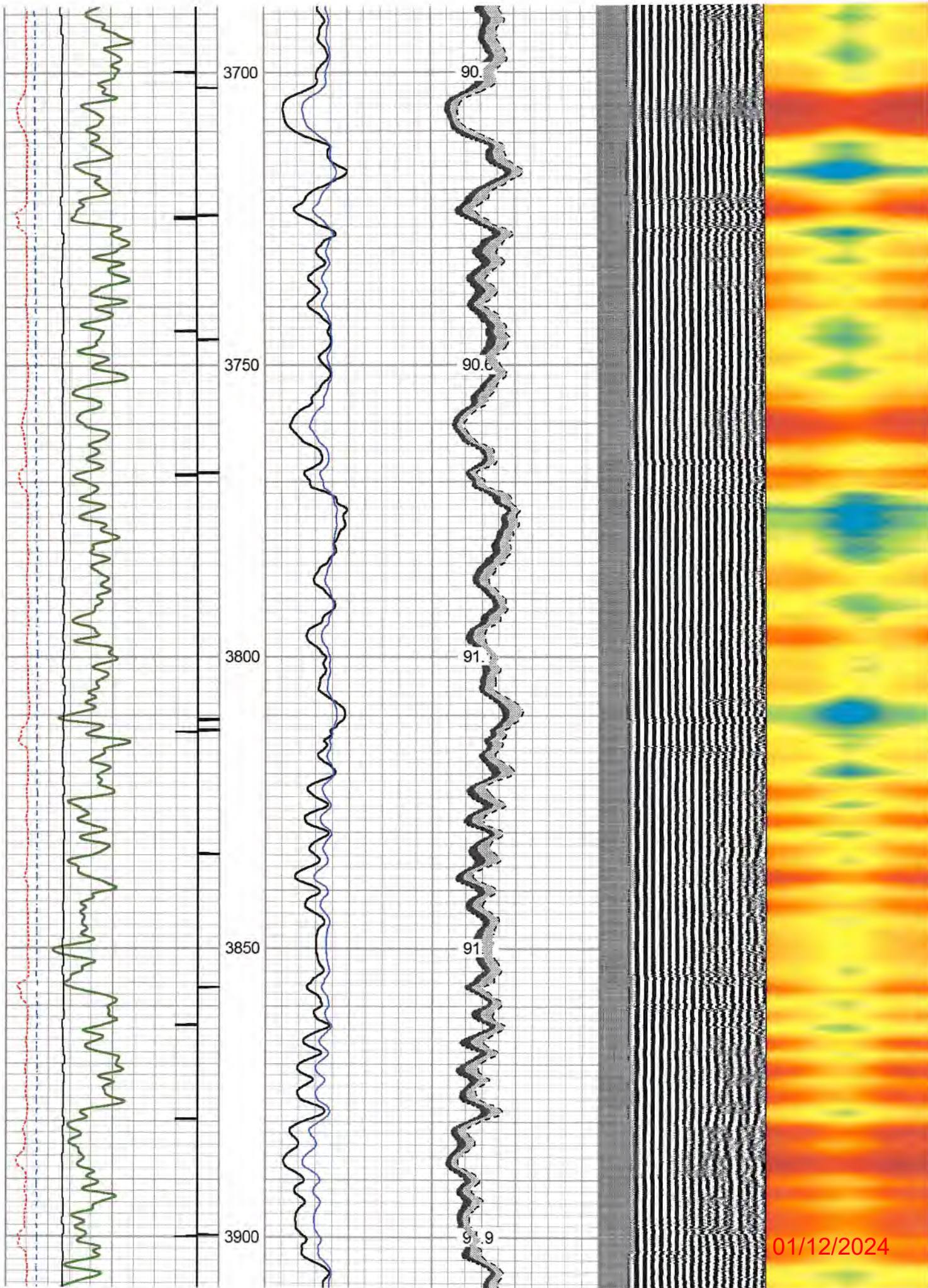
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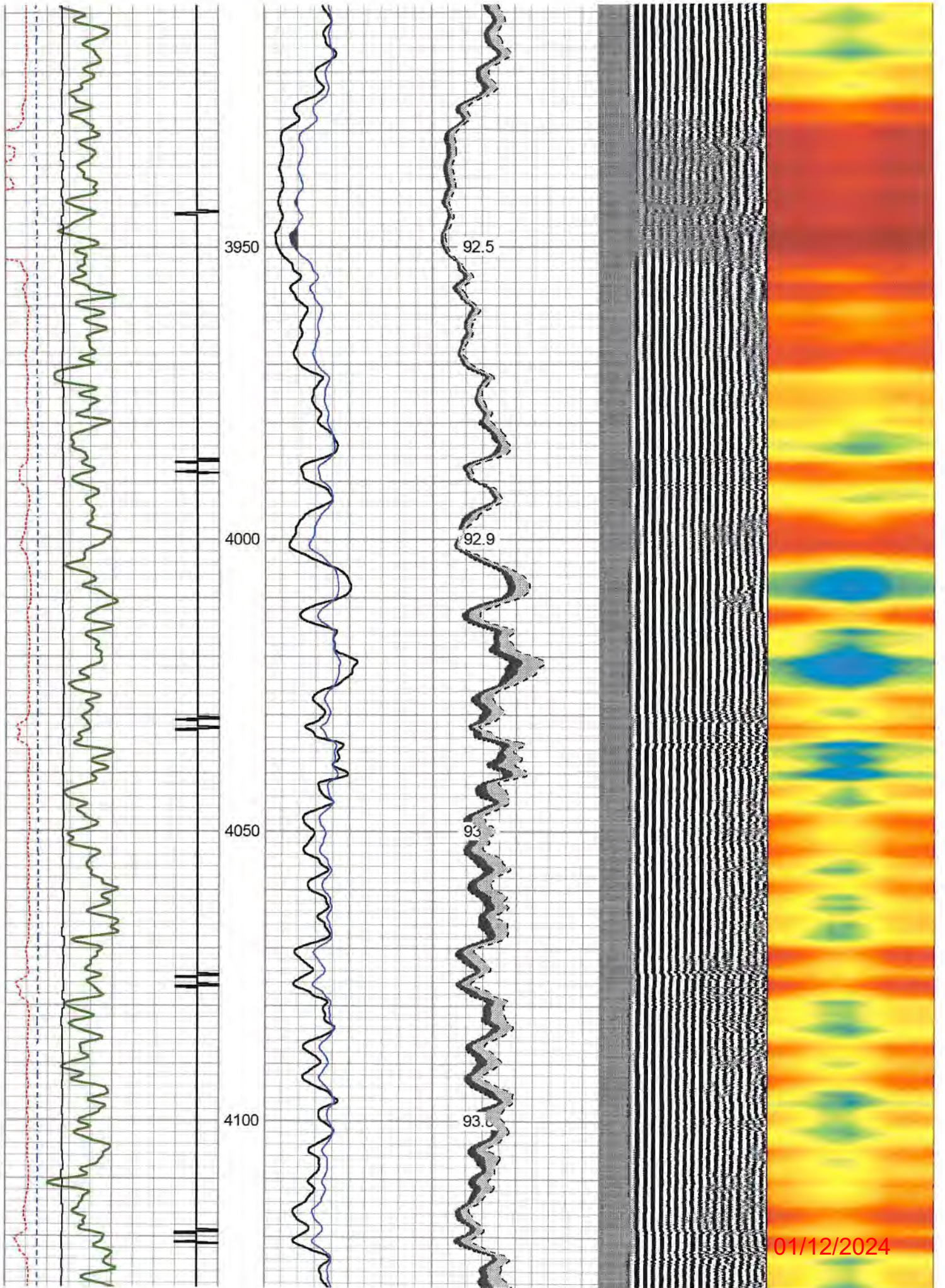


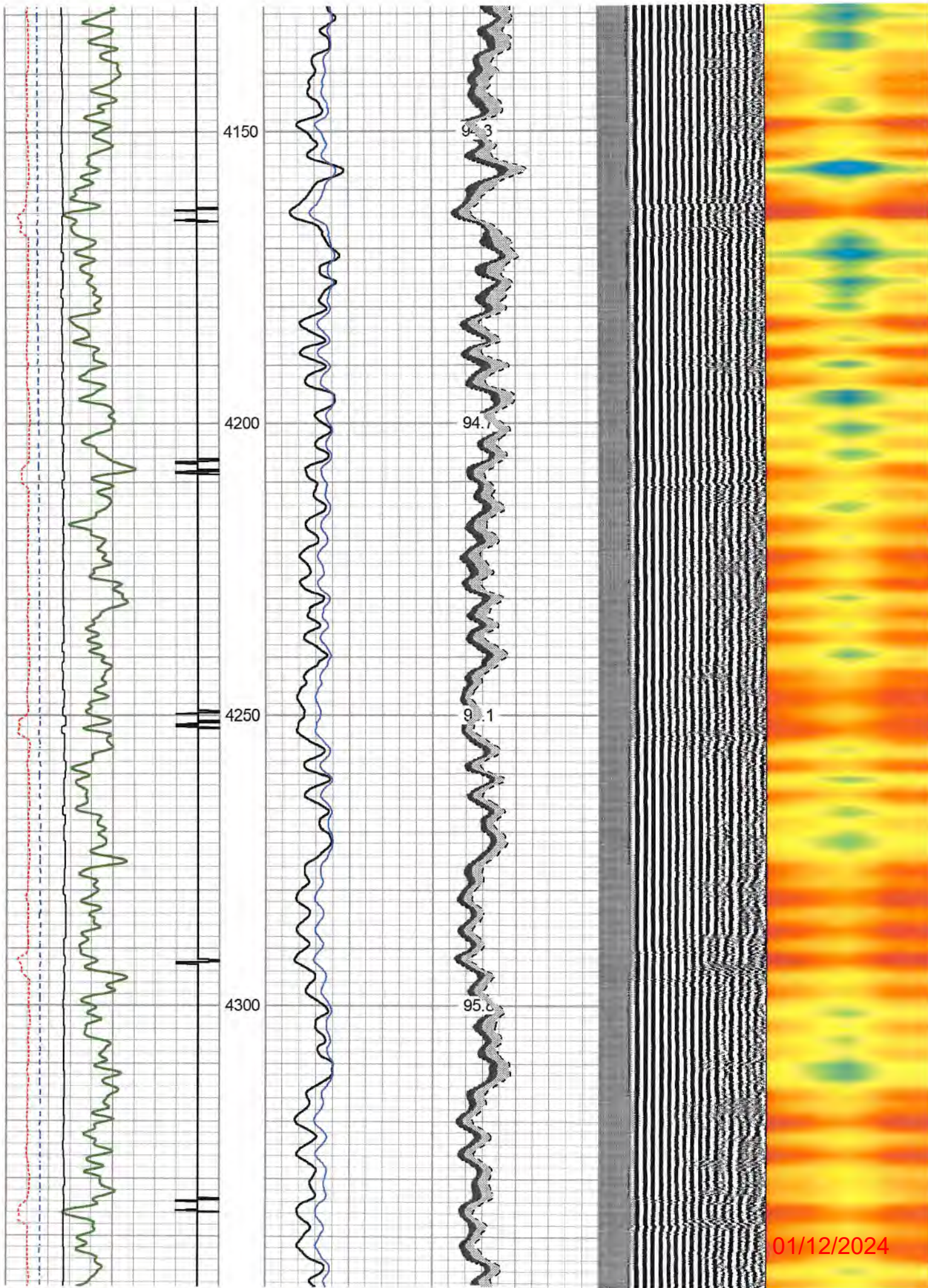
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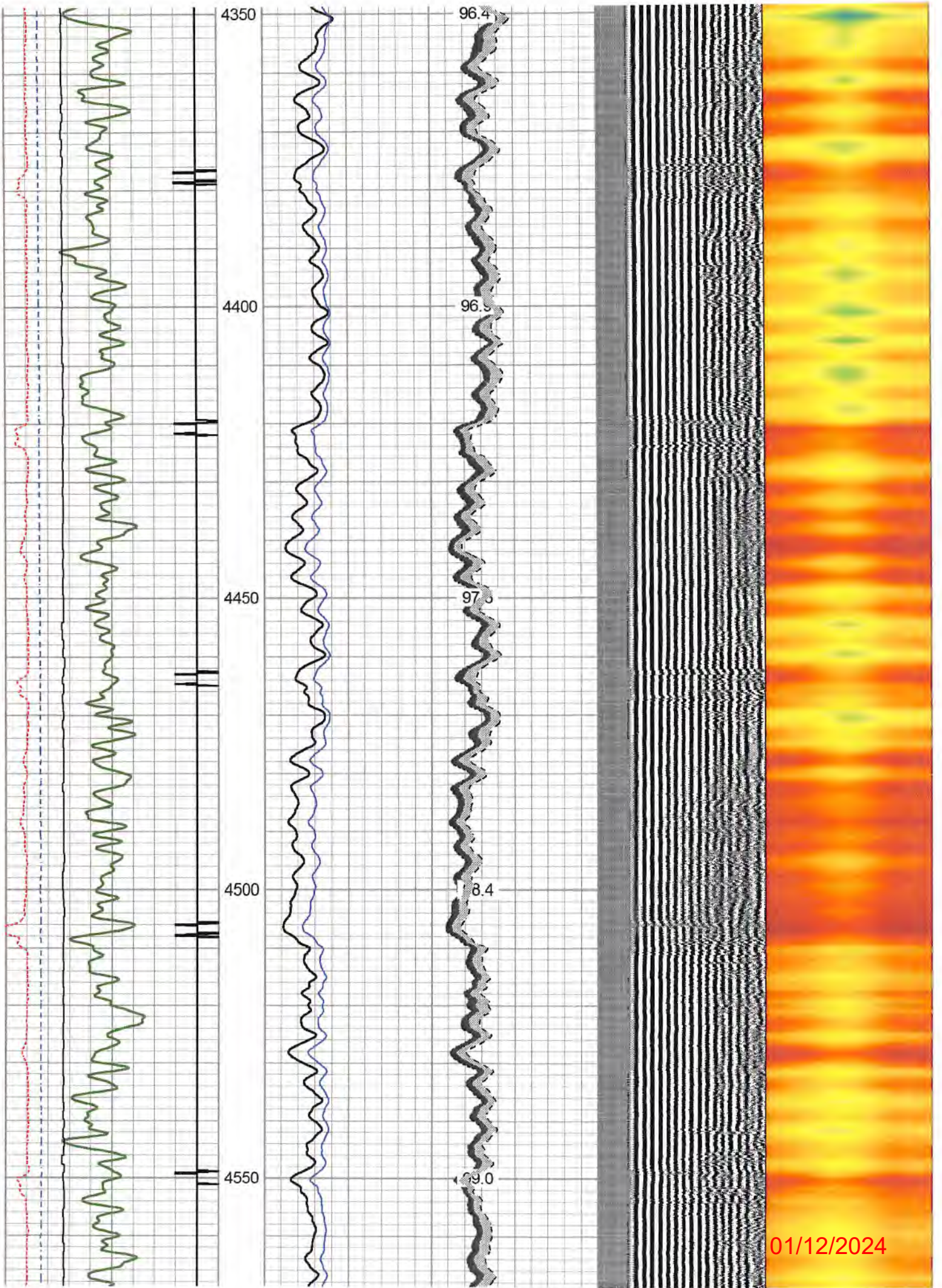


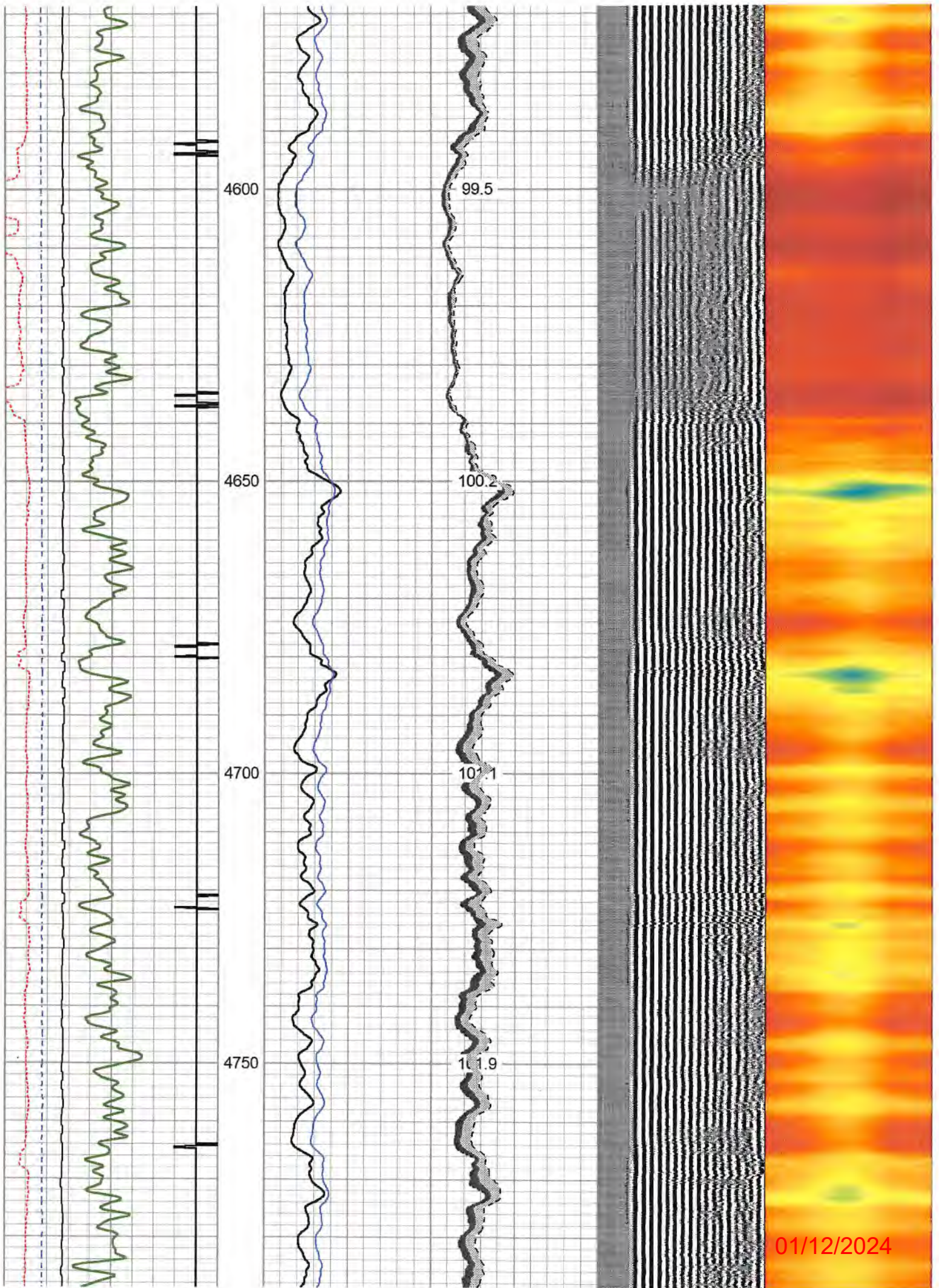


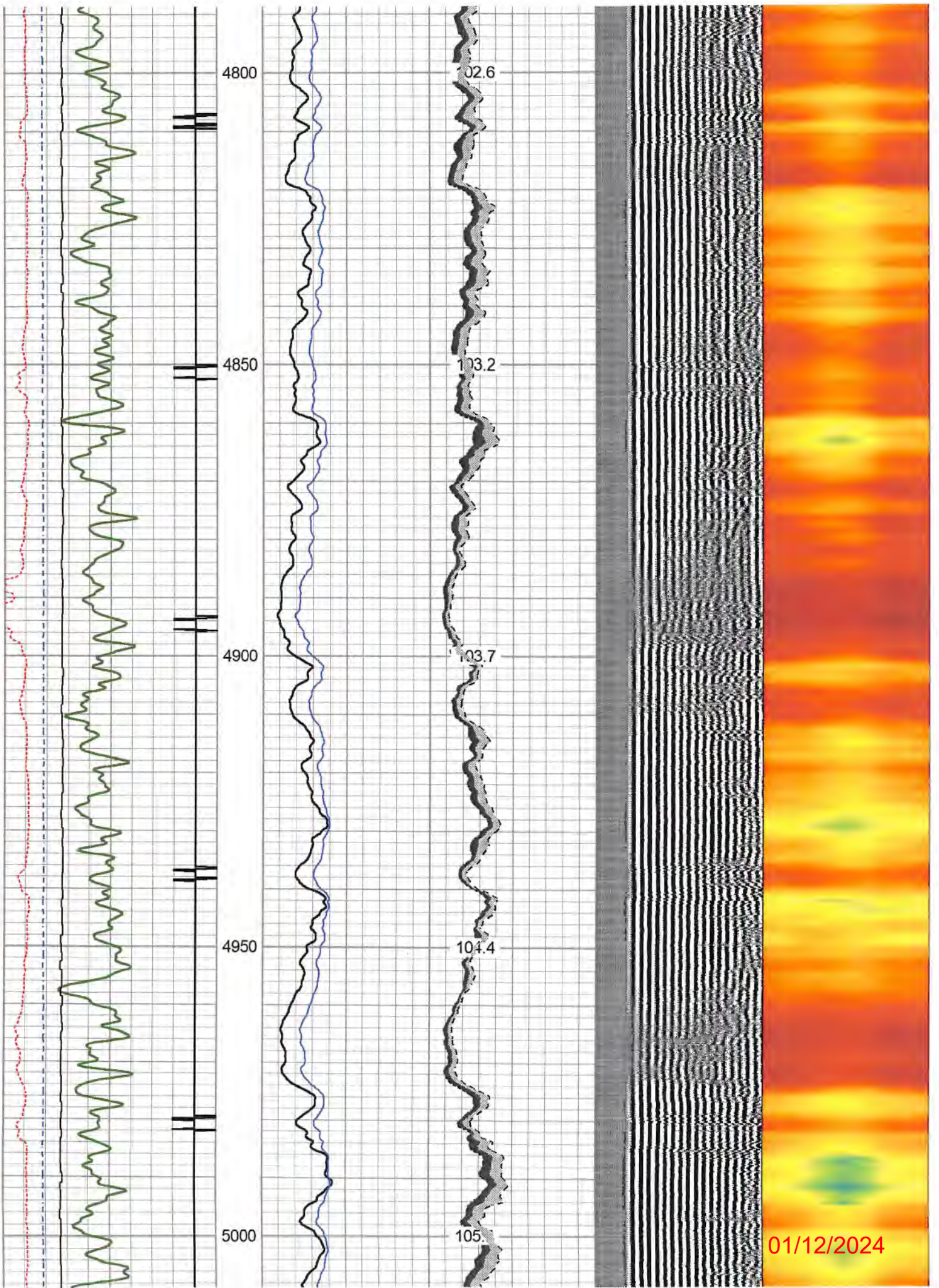


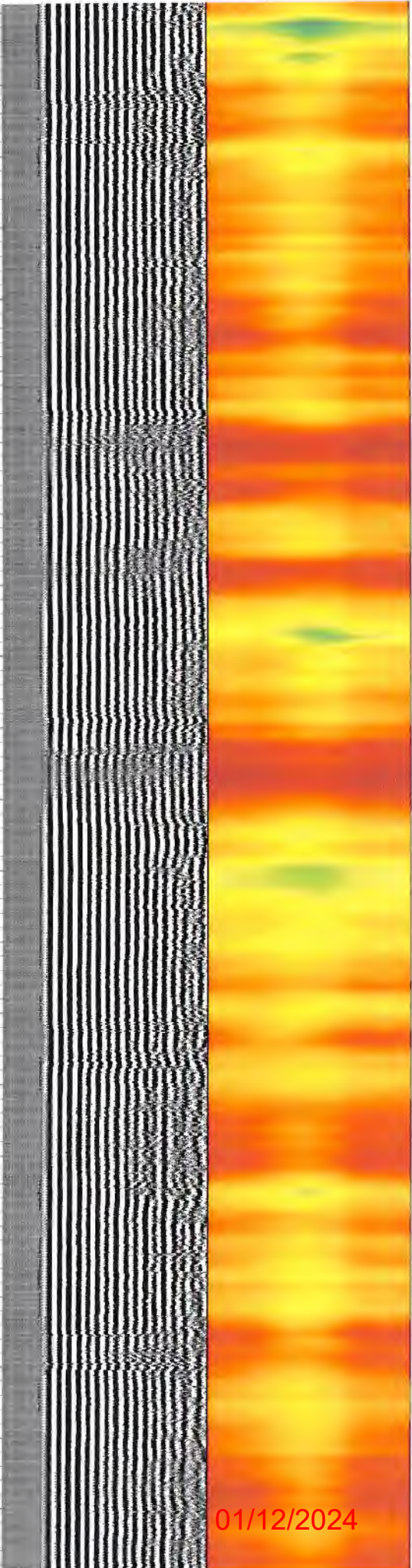
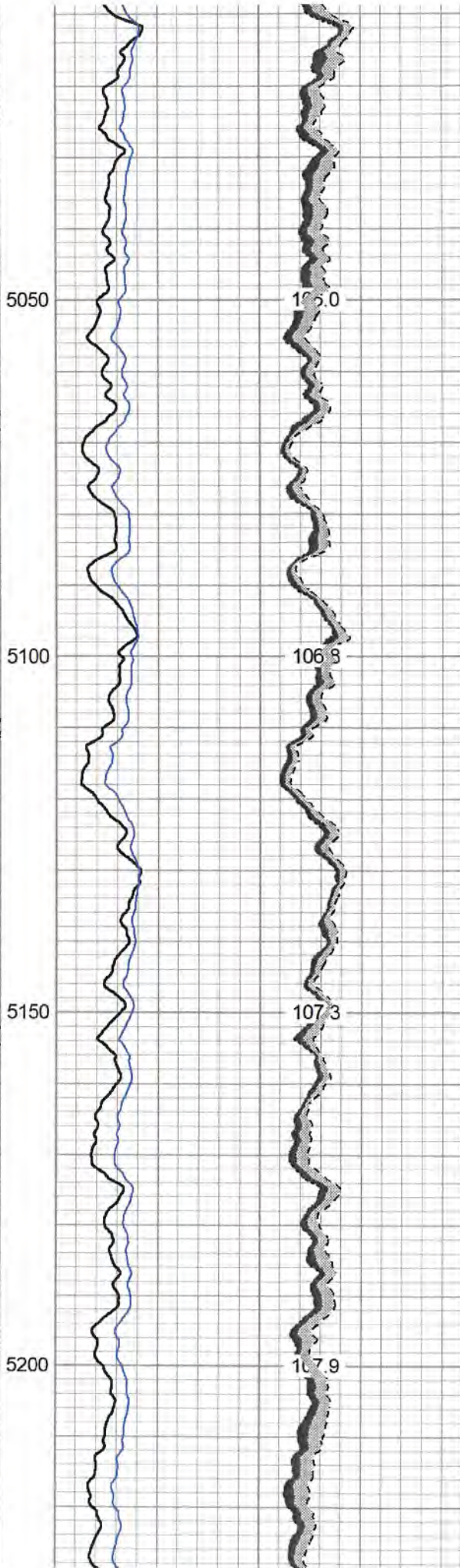
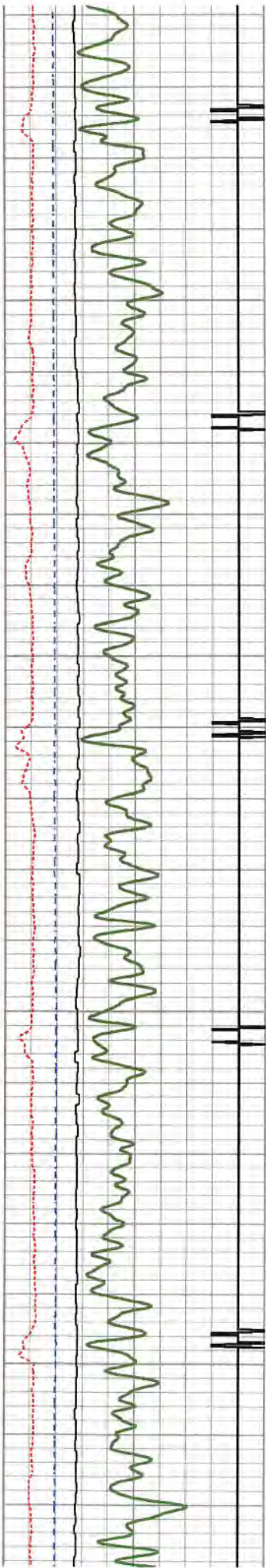




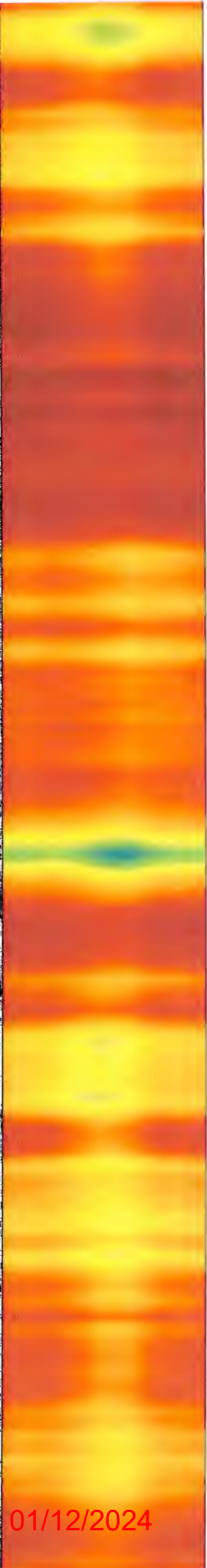
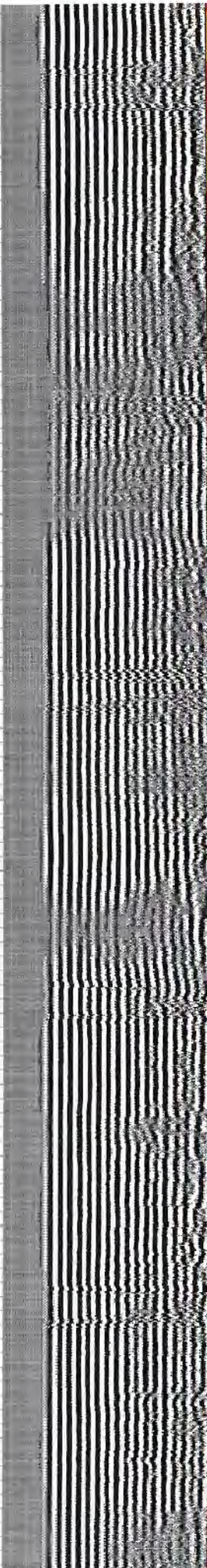
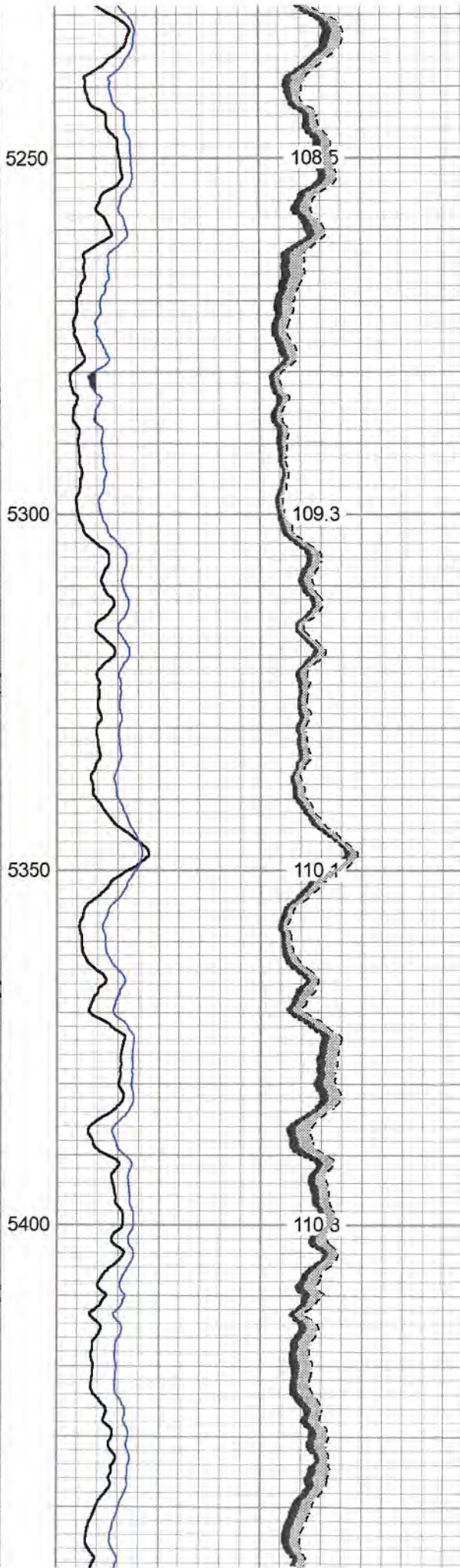
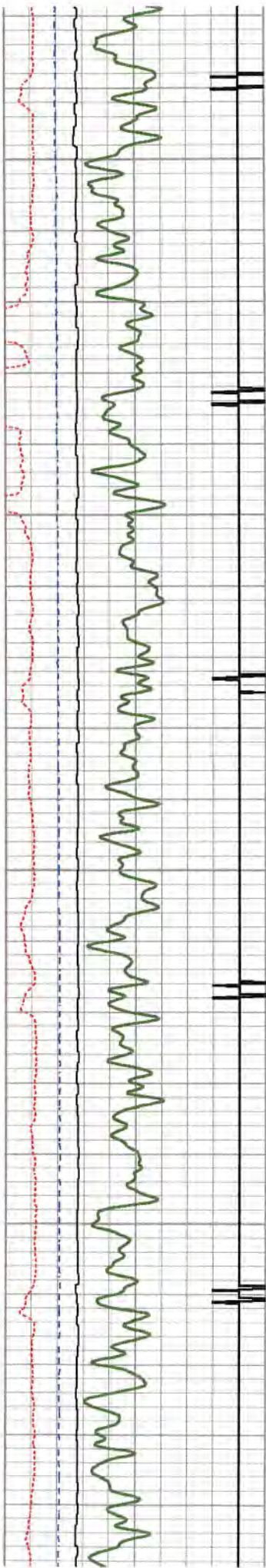




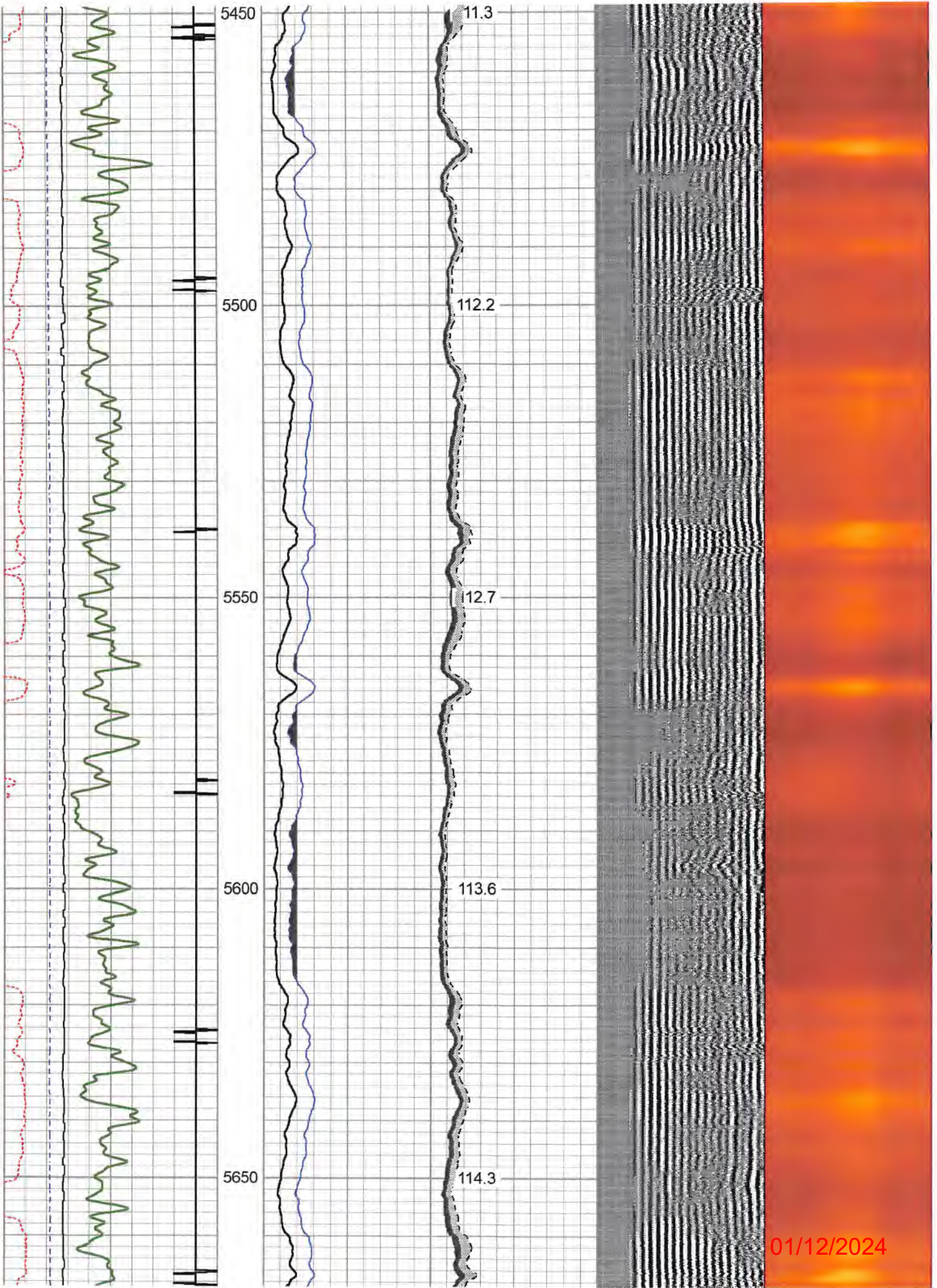


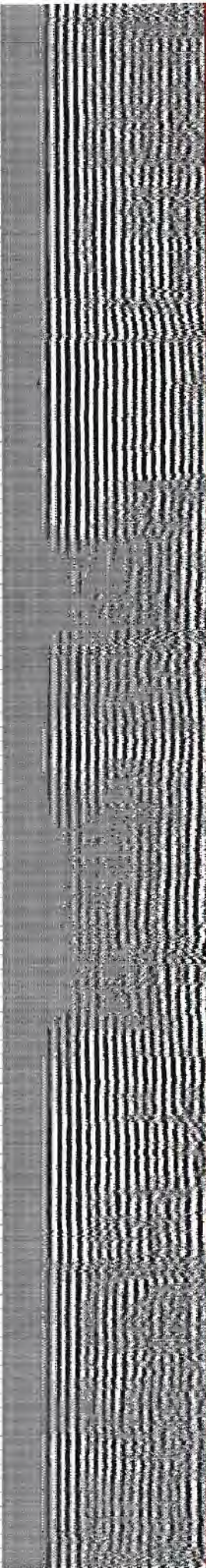
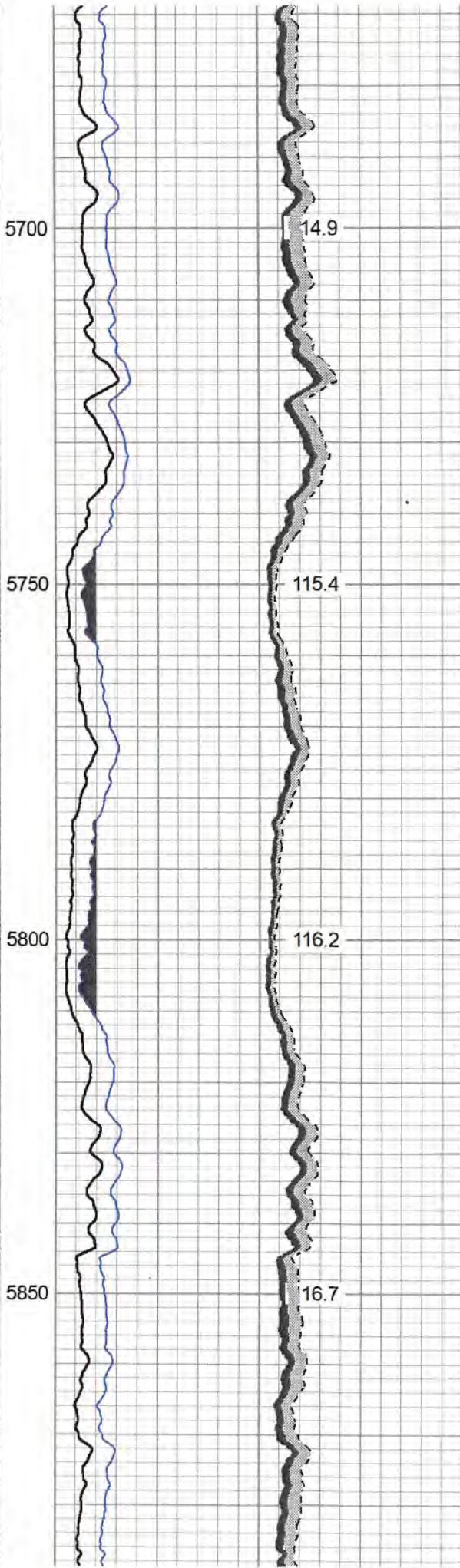
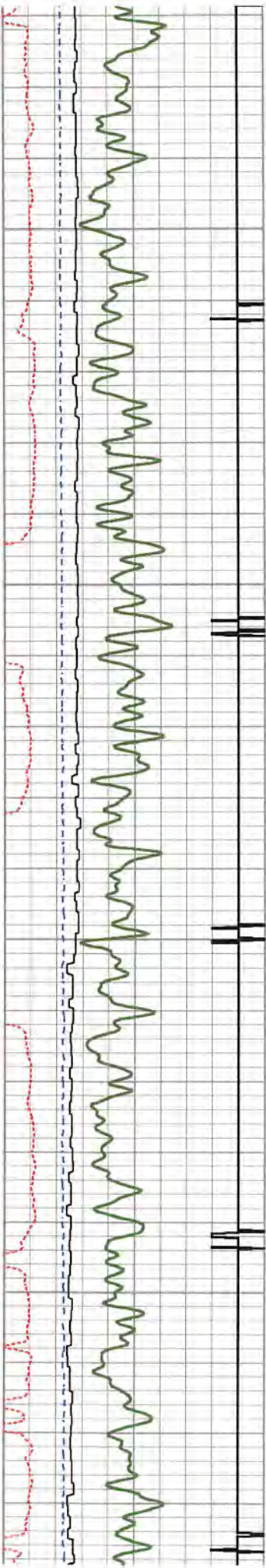


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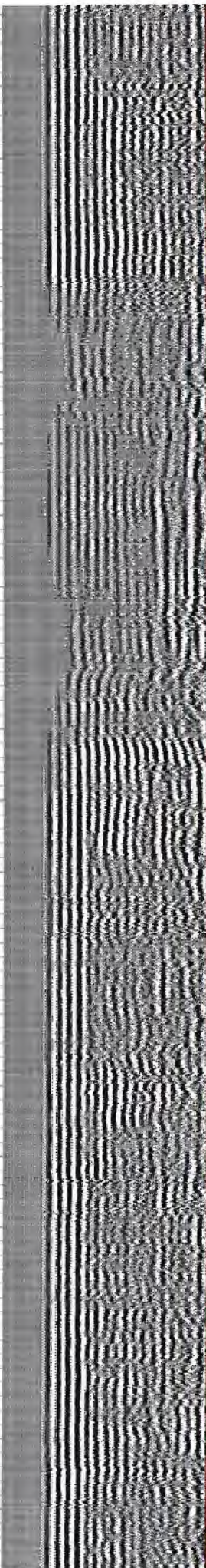
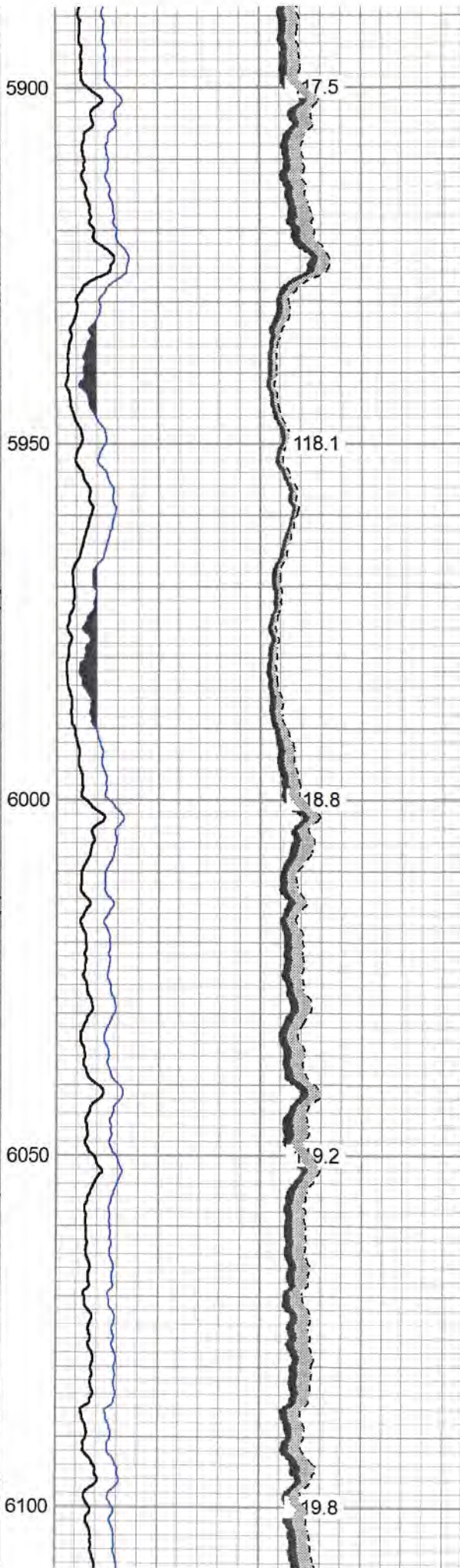
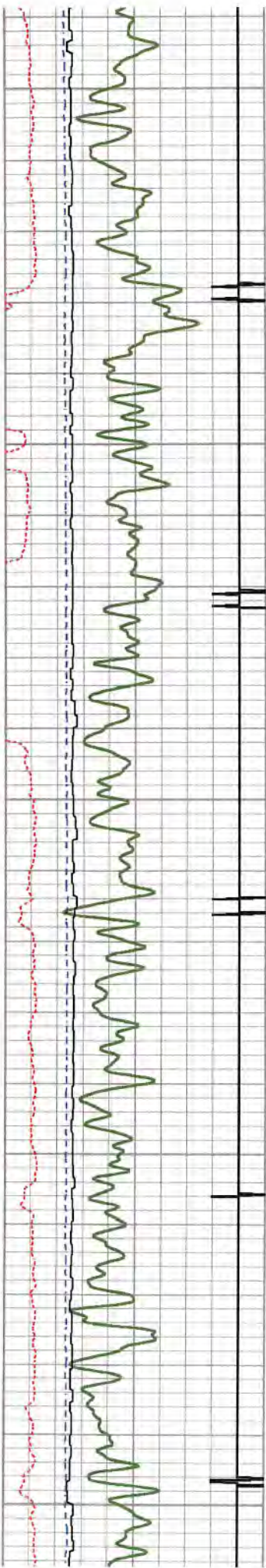


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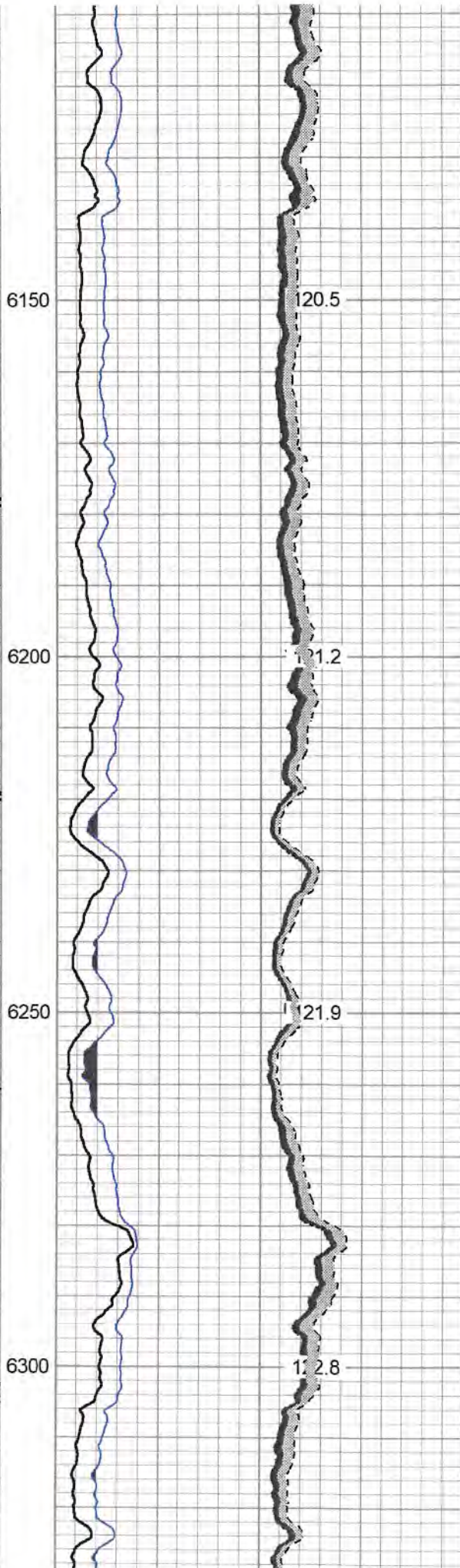
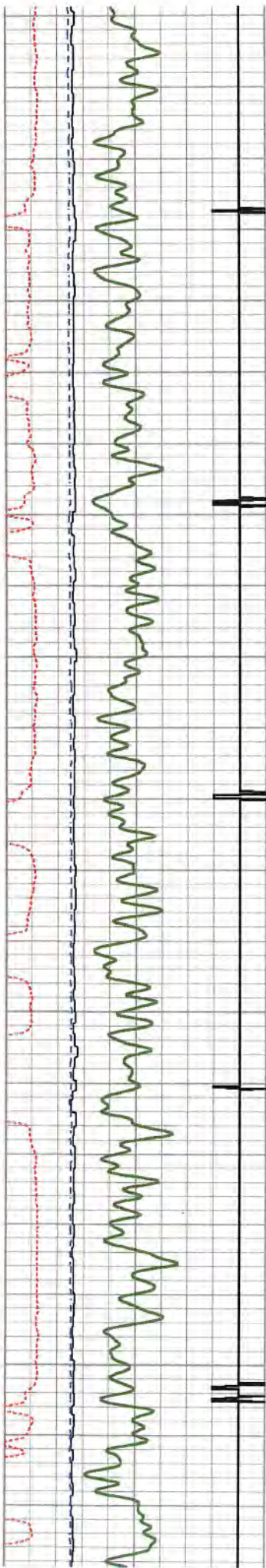




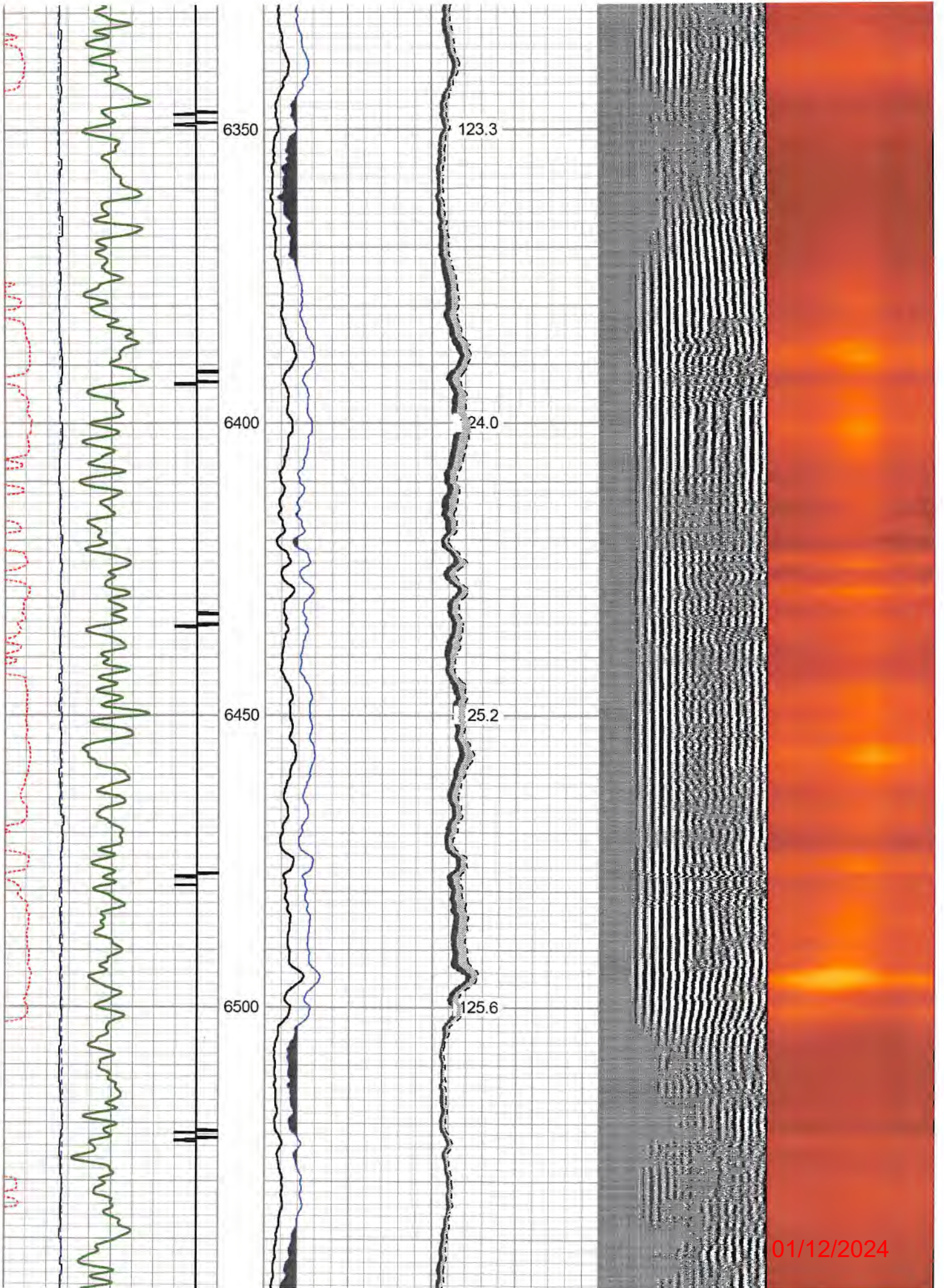
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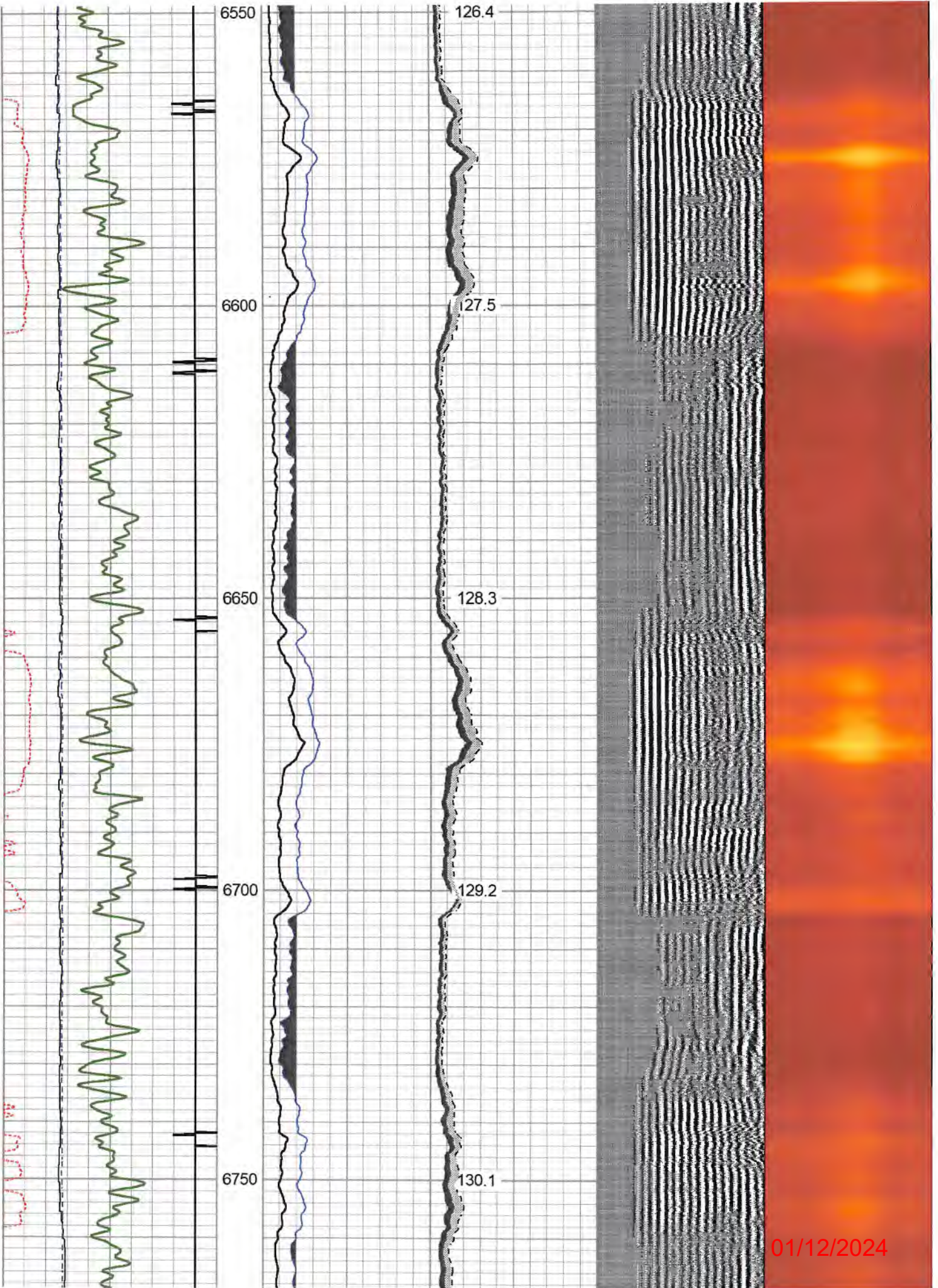


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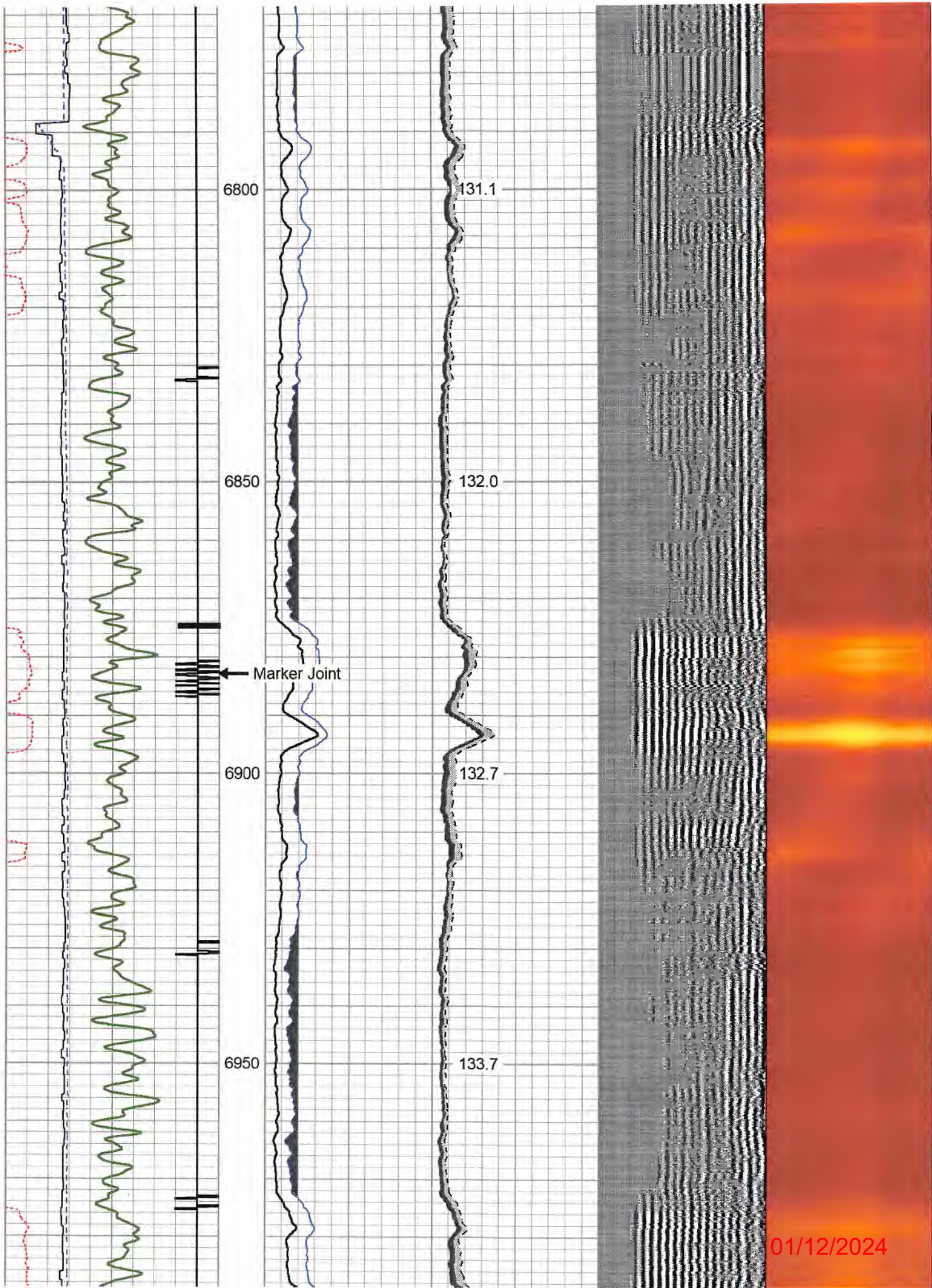


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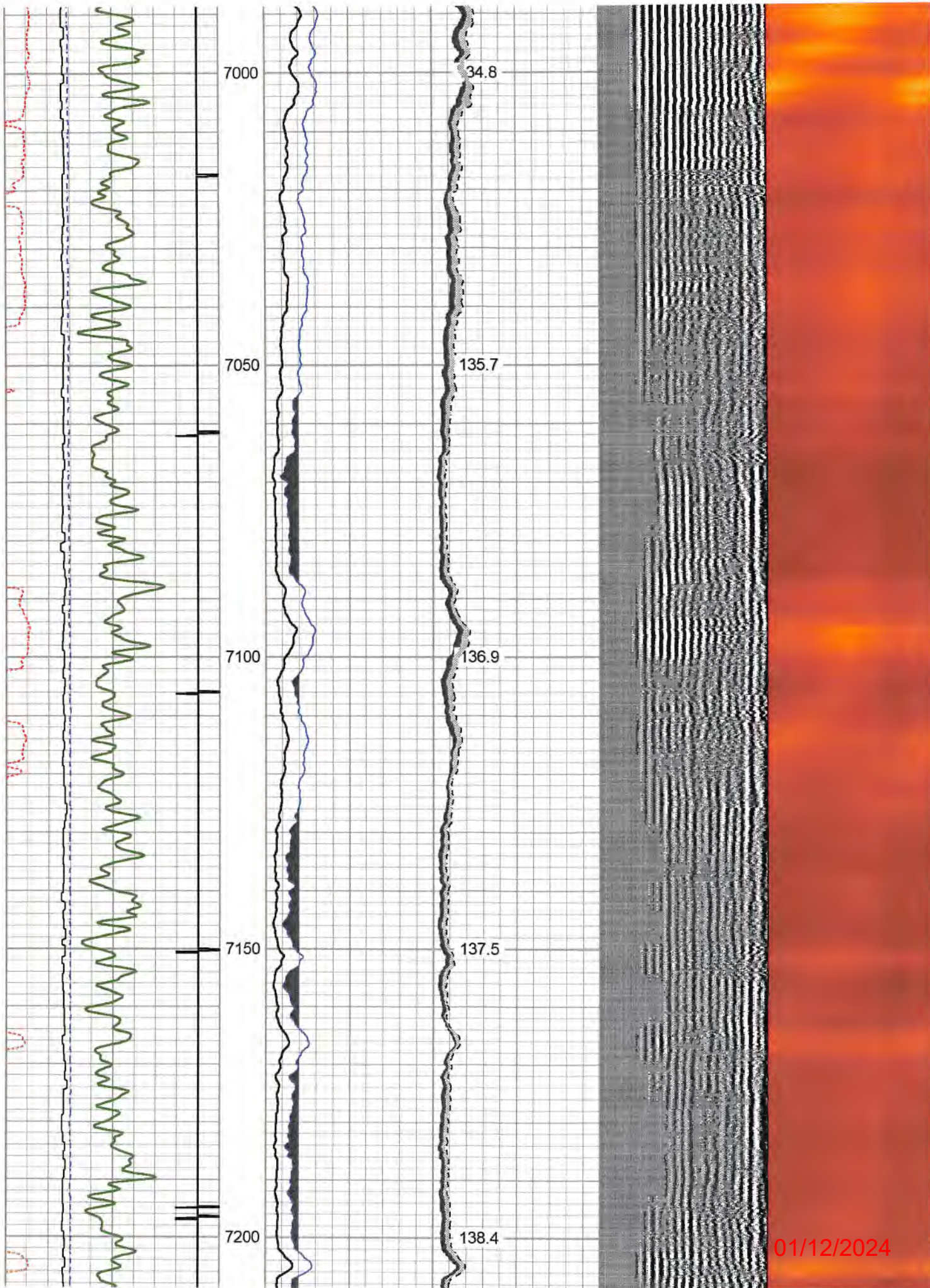


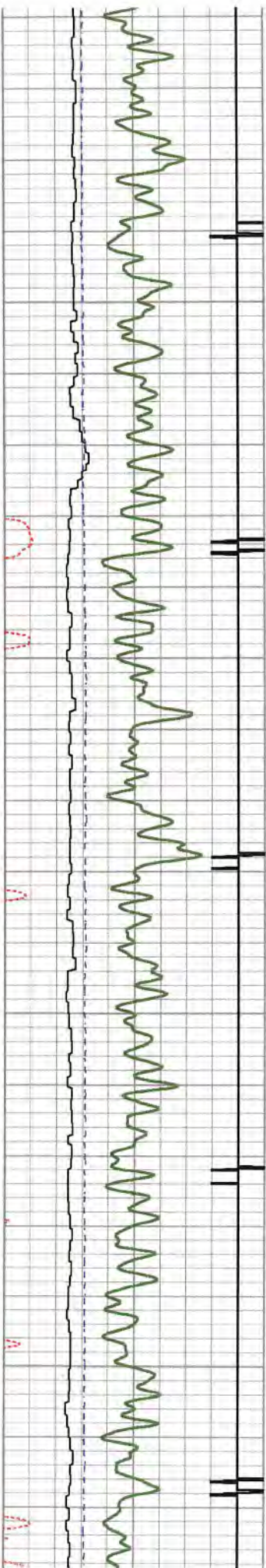


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7250

7300

7350

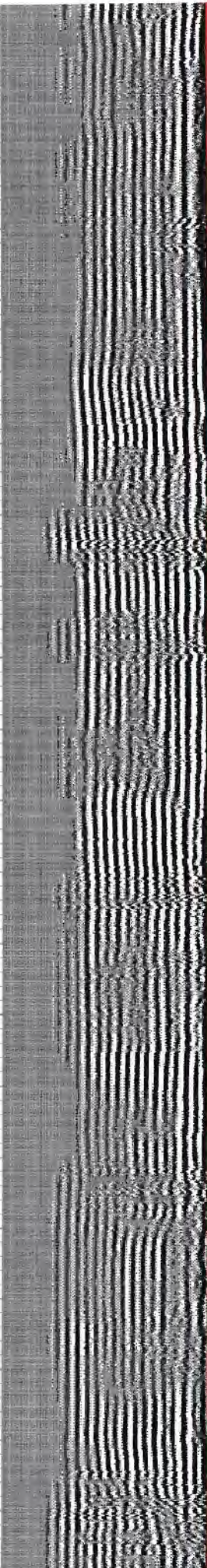
7400

139.5

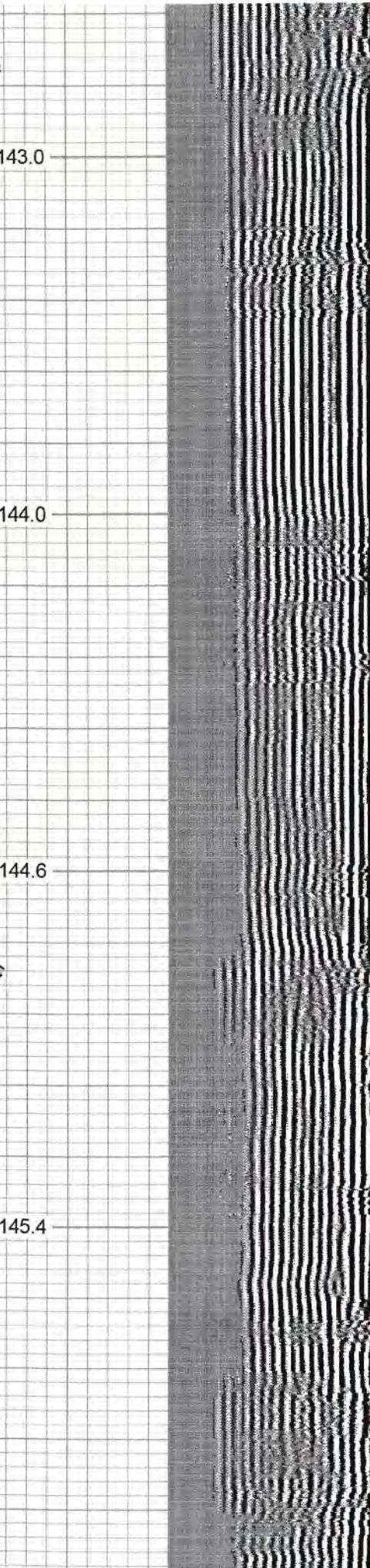
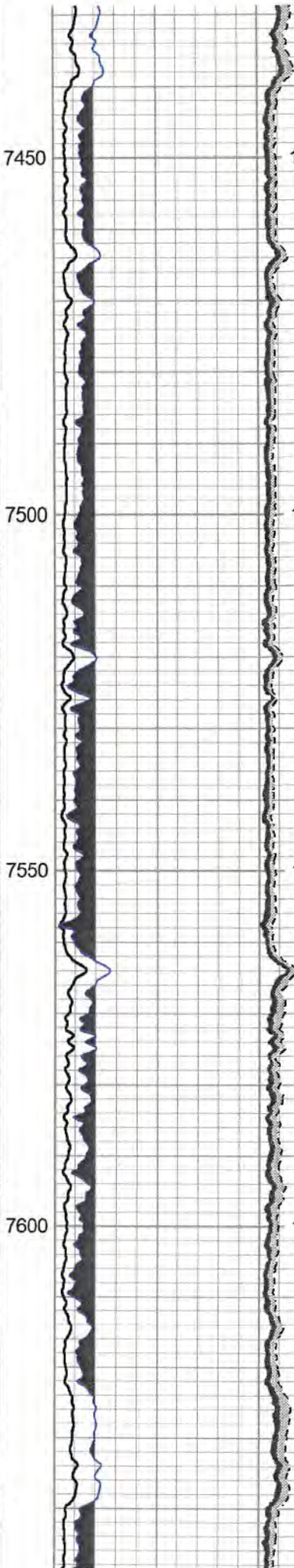
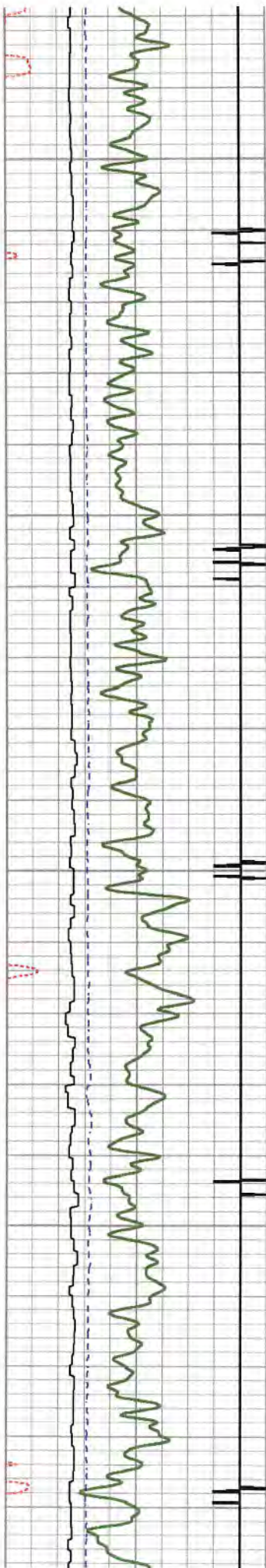
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141.3

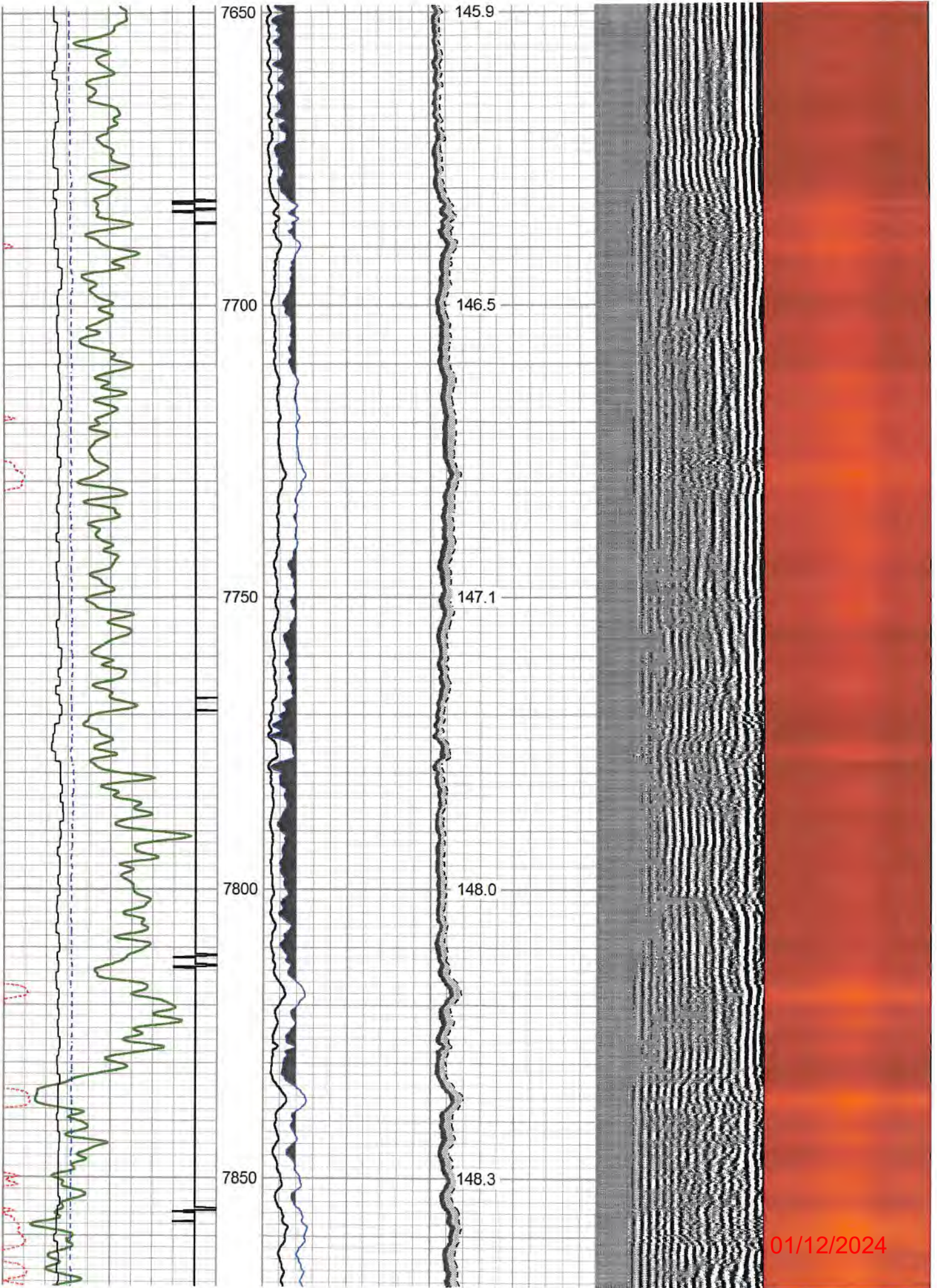
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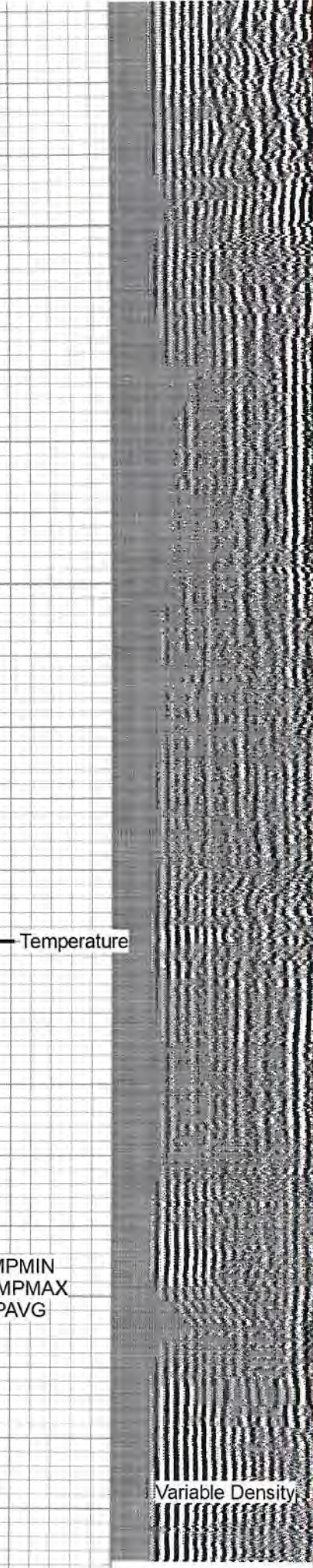
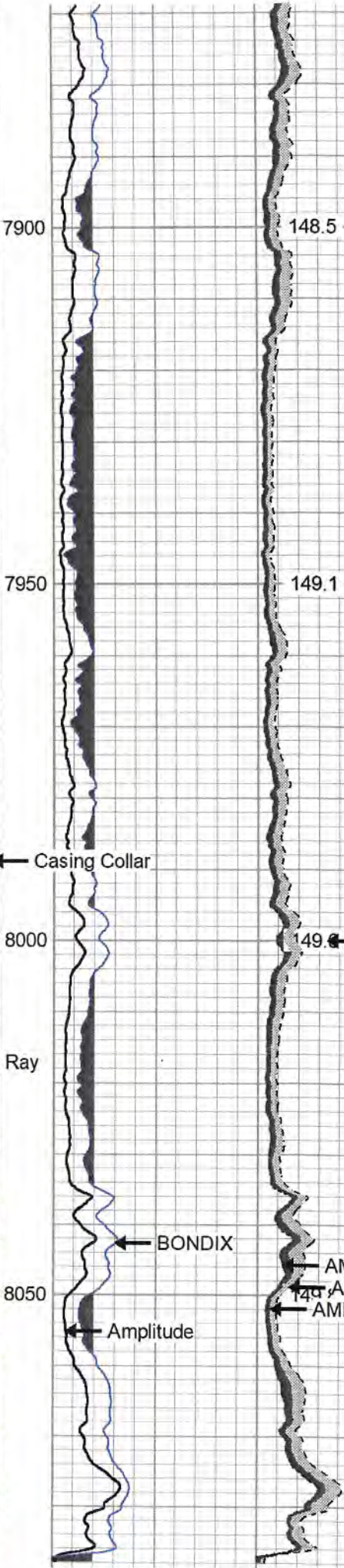
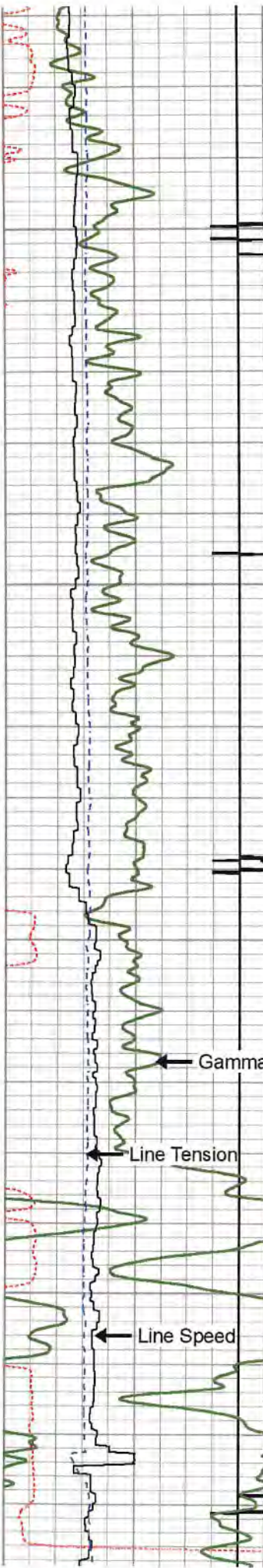
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01/12/2024



01/12/2024



7900

148.5

7950

149.1

8000

149.6

8050

149.9

Casing Collar

Gamma Ray

Line Tension

Line Speed

BONDIX

Amplitude

Temperature

AMPMIN

AMPMAX

AMPAVG

Variable Density

Cement Map

01/12/2024

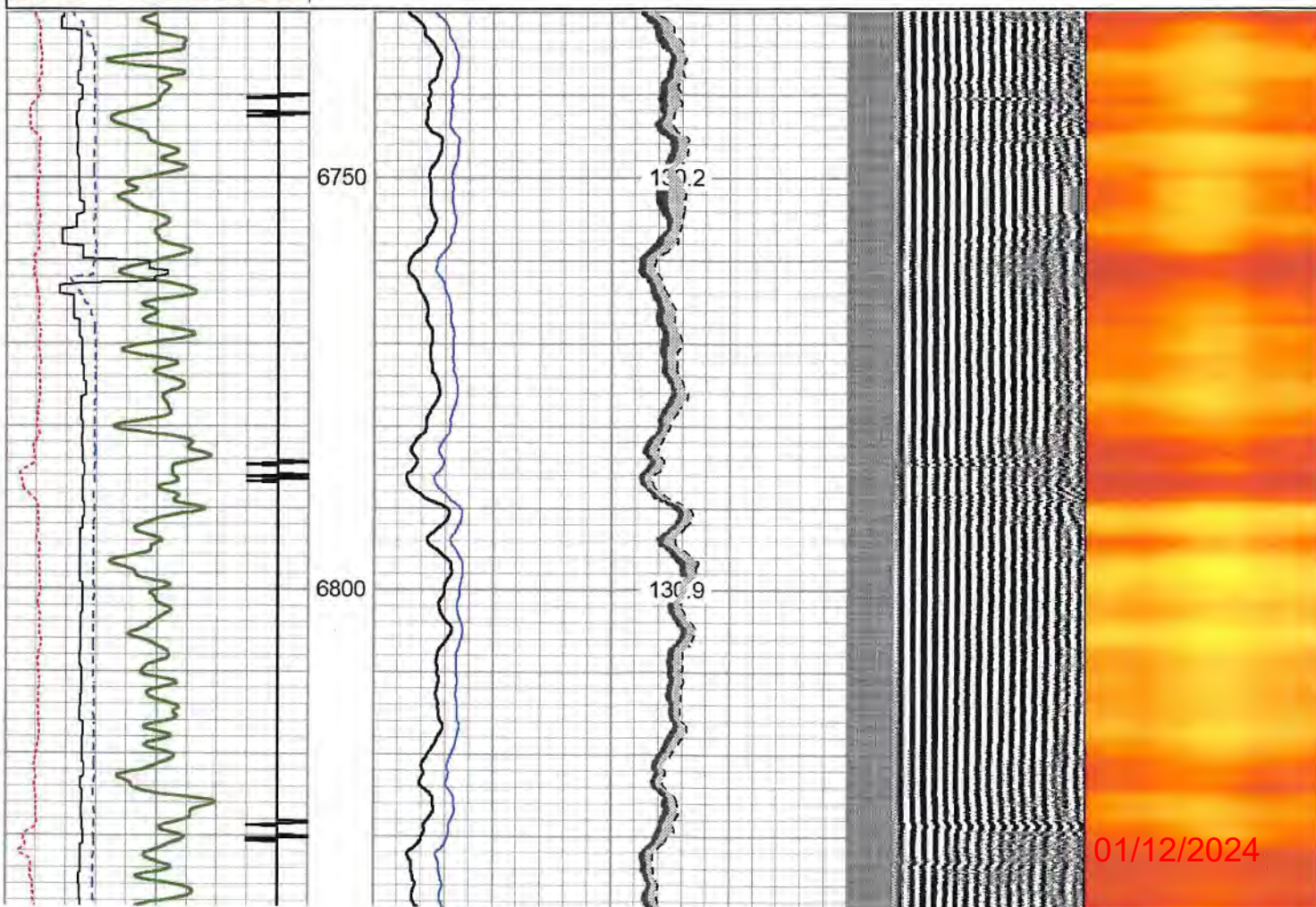
270	Travel Time (usec)	160	0	Amplitude (mV)	100	-5	AMPMIN	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	1	BONDIX	0	-5	AMPMAX	150	200	(usec)	1200	
0	Gamma Ray (GAPI)	150				-5	AMPAVG	150				
	Line Speed						TEMP					
-200	(ft/min)	200					(degF)					
0	Line Tension (lb)	5000										

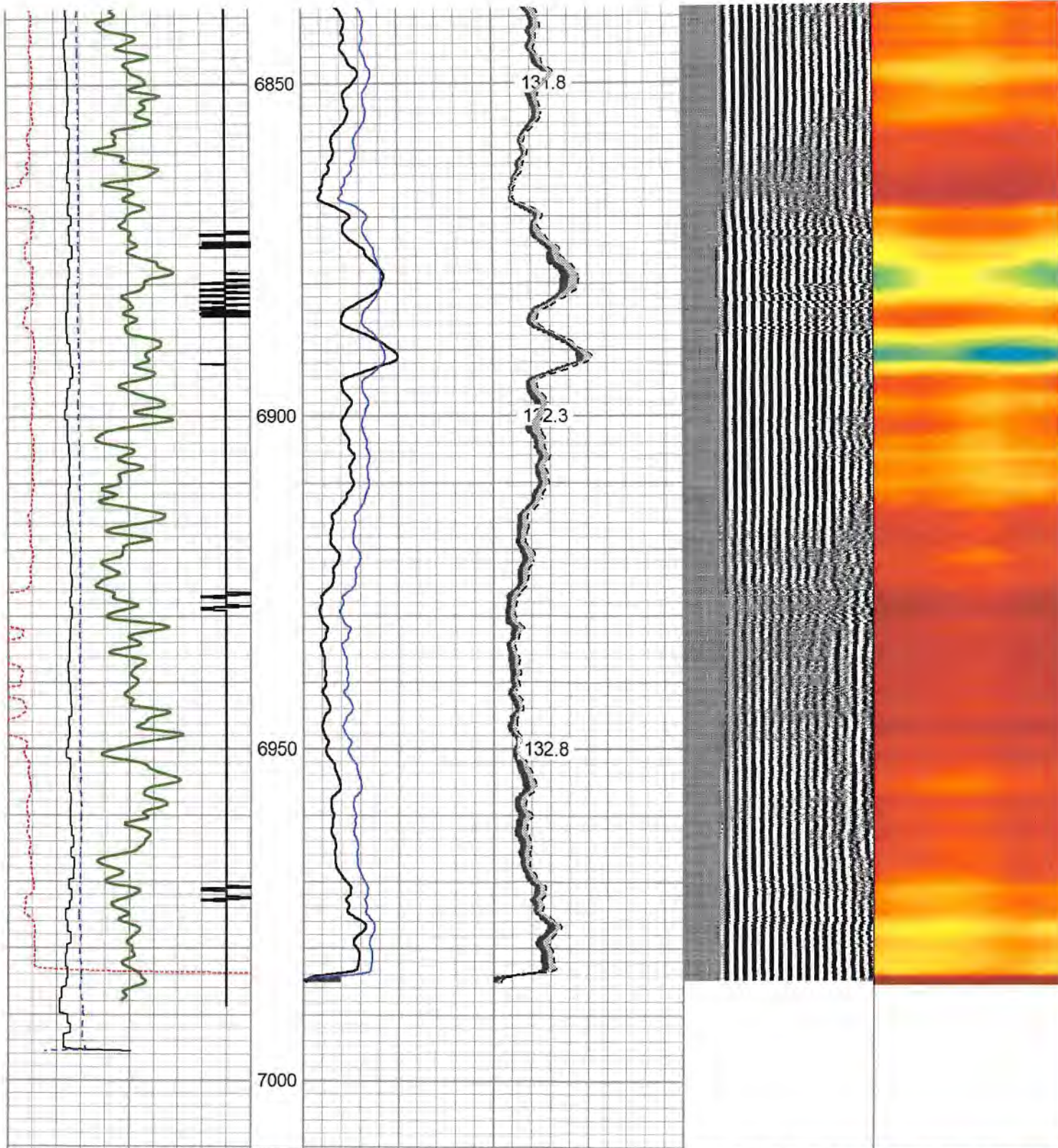


REPEAT PASS 0 PSI

Database File antero_peter_4h_rcbl_12_jan_2023.db
 Dataset Pathname peter4h/run1/pass2
 Presentation Format rcbl 2
 Dataset Creation Thu Jan 12 03:22:31 2023
 Charted by Depth in Feet scaled 1:240

270	Travel Time (usec)	160	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										





270	Travel Time (usec)	160
9	Casing Collar	-1
0	Gamma Ray (GAPI)	150
Line Speed		
-200	(ft/min)	200
0	Line Tension (lb)	5000

0	Amplitude (mV)	100	-5	AMPMIN	150
1	BONDIX	0	-5	AMPMAX	150
			-5	AMPAVG	150
TEMP					
(degF)					

Variable Density	1	Cement Map	8
200	(usec)	1200	

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BHTEMP_Src TEMP	BOREID in 7.875	BOTTEMP degF 149	CASEOD in 5.5	CASETHCK in 0.361	CASEWGHT lb/ft 20	MAXAMPL mV 71.9	MINAMPL mV 2.2
MINATTN db/ft 10.8	PERFS No	PPT usec 261	SRFTEMP degF 48	TDEPTH ft 8090			

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_peter_4h_rcbl_12_jan_2023.db
Dataset Pathname peter4h/run1/pass4
Dataset Creation Thu Jan 12 03:31:58 2023

Gamma Ray Calibration Report

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: 339.675 ft

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Master Calibration, performed (Derived):

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.007	0.881	2.200	71.921	79.834	1.615
CAL	0.993	1.456				
5'	-0.005	0.900	2.200	71.921	77.077	2.576
SUM						
S1	0.089	0.889	0.000	100.000	125.048	-11.146
S2	0.006	0.813	0.000	100.000	123.882	-0.732
S3	-0.001	0.871	0.000	100.000	114.770	0.086
S4	-0.005	0.919	0.000	100.000	108.216	0.544
S5	-0.009	0.936	0.000	100.000	105.804	0.944
S6	-0.013	0.949	0.000	100.000	104.002	1.314
S7	0.000	0.920	0.000	100.000	108.707	-0.042
S8	0.004	0.871	0.000	100.000	115.335	-0.424

01/12/2024

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	0.993	1.456	1.000	0.000

Air Zero Calibration, performed Wed Jan 11 18:02:46 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	

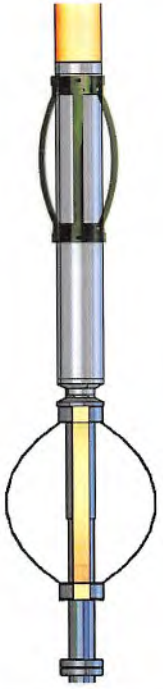
Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
HeadVolt	16.95		CHD-Titan Standard 1 7/16" Cable Head	1.02	1.44	1.00
Temp	14.10		CENT-Overbody Antelope (SP-919-0233)	1.67	4.88	5.00
WVFS8	11.86		RBT-Probe275T (2.75") Probe 2.75" Radial with Integral Temperature Sub	9.39	2.75	90.00
WVFS7	11.86					
WVFS6	11.86					
WVFS5	11.86					
WVFS4	11.86					
WVFS3	11.86					
WVFS2	11.86					
WVFS1	11.86					
WVF3FT	11.86					
WVF5FT	10.86					
WVFCAL	7.61					
HEADVOLT	7.61					
COI	6.71					

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01/12/2024

CCL	0.71					
GR	5.38		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
			Centralizer-Probe_2.75 Bowspring Centralizer	2.83	2.75	24.00

Dataset: antero_peter_4h_rcbl_12_jan_2023.db: field/peter4h/run1/pass4
 Total length: 18.03 ft
 Total weight: 182.00 lb
 O.D.: 4.88 in

	Company	ANTERO RESOURCES
	Well	PETER 4H
	Field	SOUTH CANTON
	County	DODDRIDGE
	State	WV

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