



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

Company ANTERO RESOURCES
Well Beech Run Atwood 1H
Field Rabbit Ears
County Tyler
State WV

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Location: API #: 47-095-02798

SEC	TWP	RGE	Elevation K.B. D.F. G.L.
Permanent Datum	GROUND LEVEL Elevation		
Log Measured From	KELLY BUSHING 25.5'		
Drilling Measured From	KELLY BUSHING		

Date	JANUARY 20, 2023		
Run Number	ONE		
Depth Driller	23,282'		
Depth Logger	7,110'		
Bottom Logged Interval	7,120'		
Top Log Interval	SURFACE		
Open Hole Size	NA		
Type Fluid	FRESH WATER		
Density / Viscosity	8.6 LB/GAL		
Max. Recorded Temp.	143 DEG.F.		
Estimated Cement Top	4,396'		
Time Well Ready	7:45		
Time Logger on Bottom	8:45		
Equipment Number	116		
Location	CHARLEROI, PA		
Recorded By	M.MCNALLY		
Witnessed By	Bob Reed		

Run Number	Borehole Record		Tubing Record				
	Bit	From	To	Size	Weight	From	To
Casing Record							
Conductor String		28"					
Surface String		17 1/2"					
Intermediate String		12 1/4"					
Intermediate String		8 3/4"					
Production String		5.5"					

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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 -7
MARKER JOINT 6,010'-6,020'
MAIN PASS LOGGED WITH 1500 PSI
REPEAT PASS LOGGED WITH 0 PSI

THANK YOU FOR USING NINE ENERGY SERVICES

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JUN 23 2023

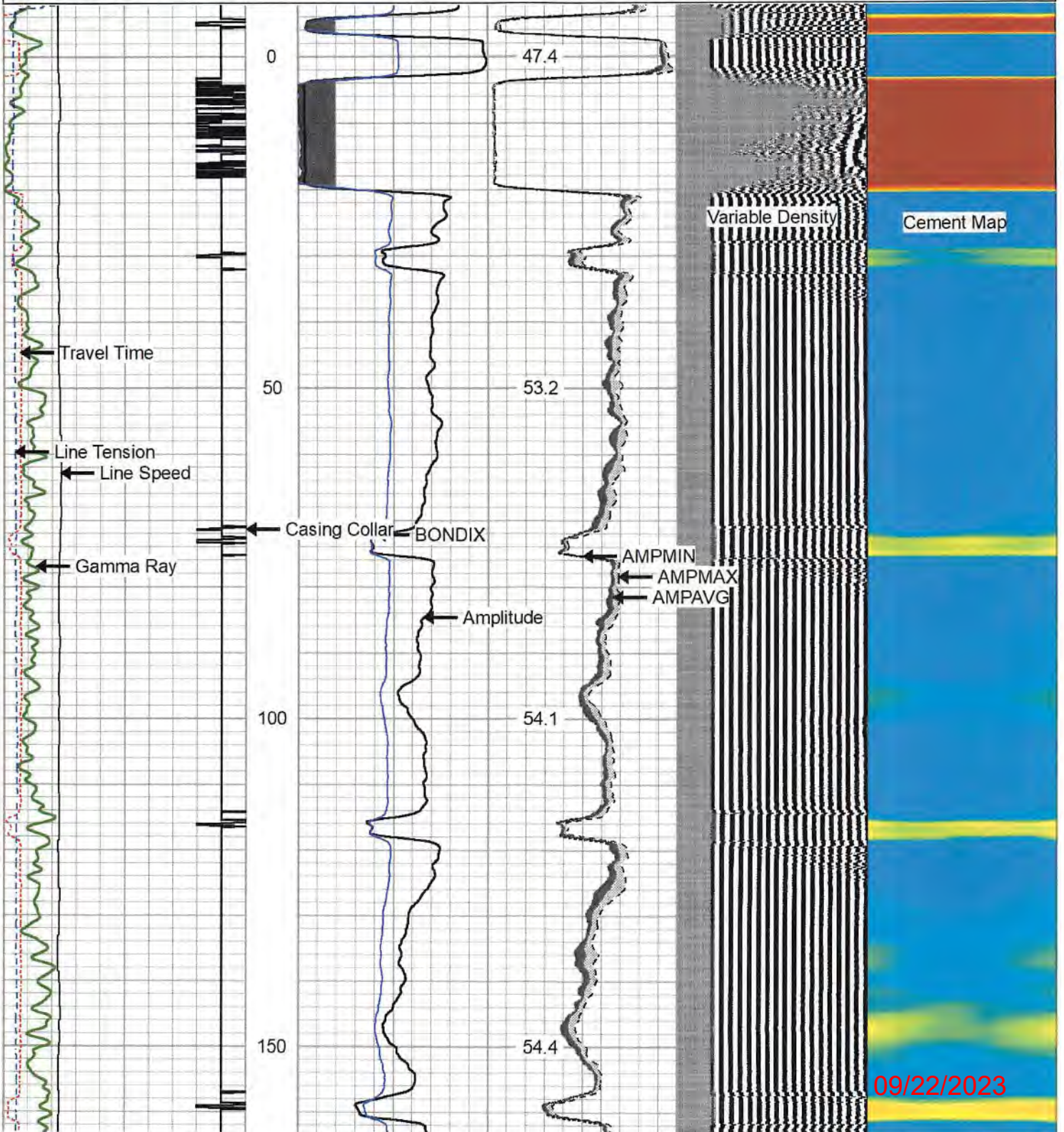
WV Department of
Environmental Protection

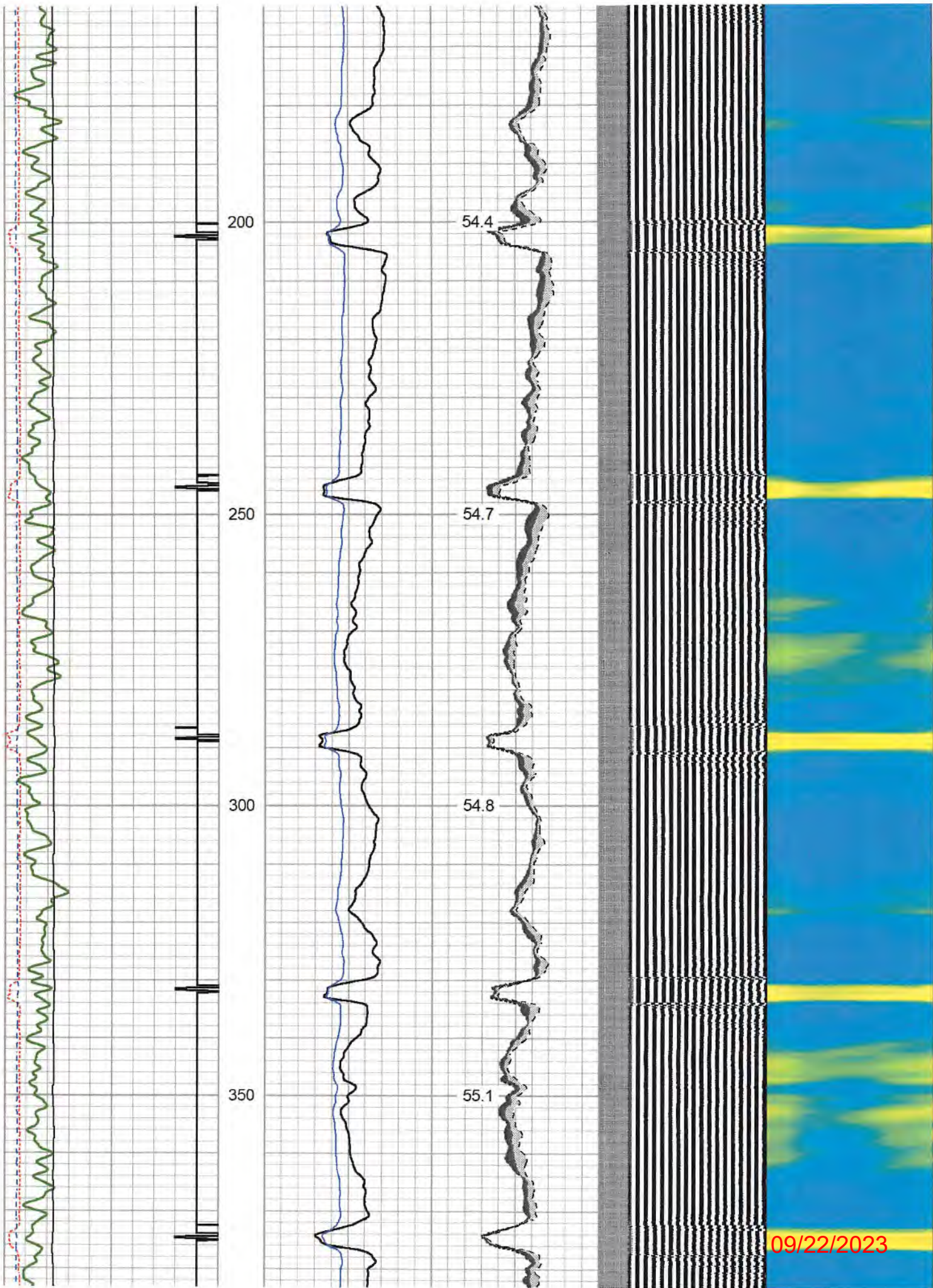


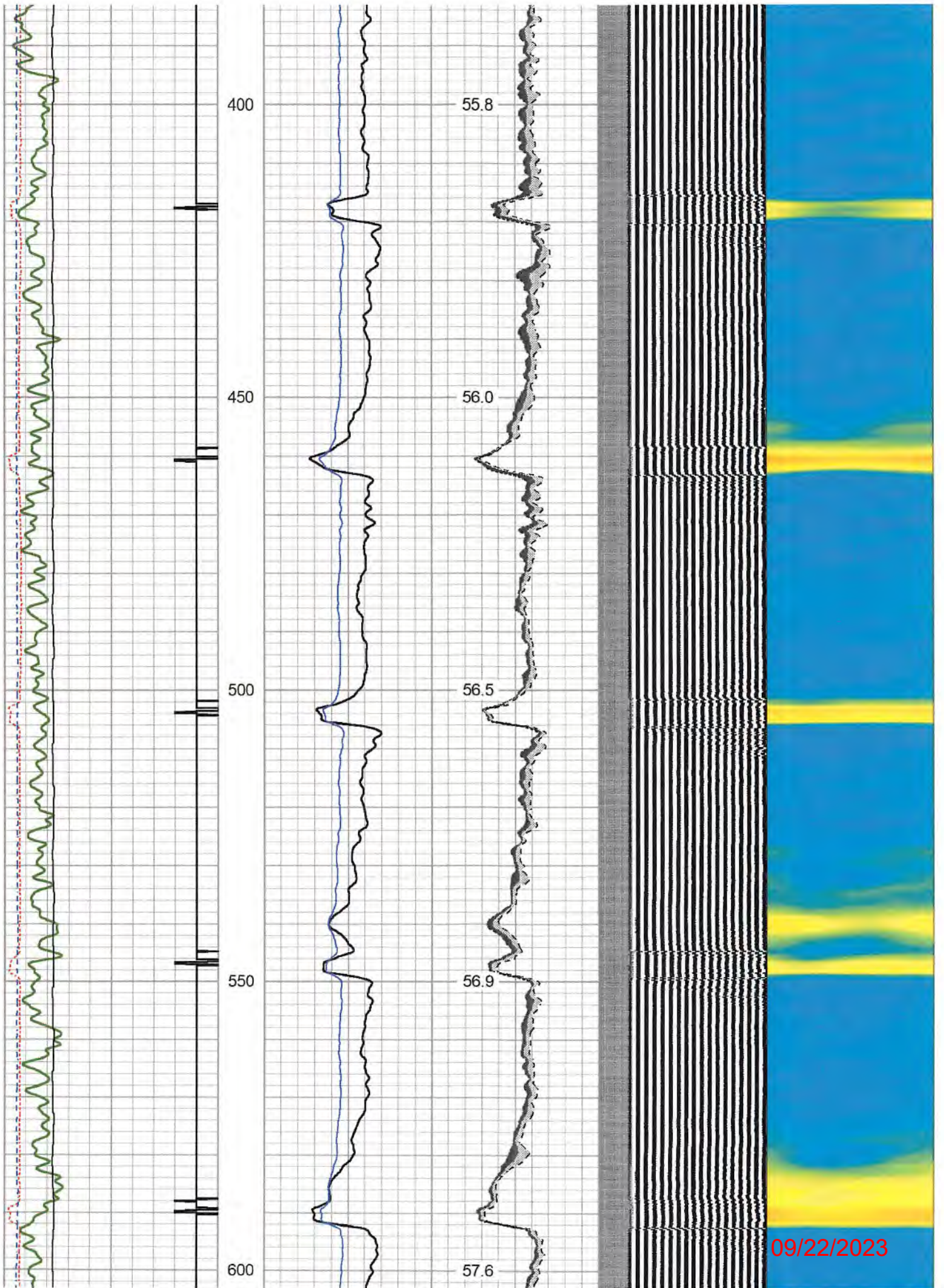
Main Pass 1500 PSI

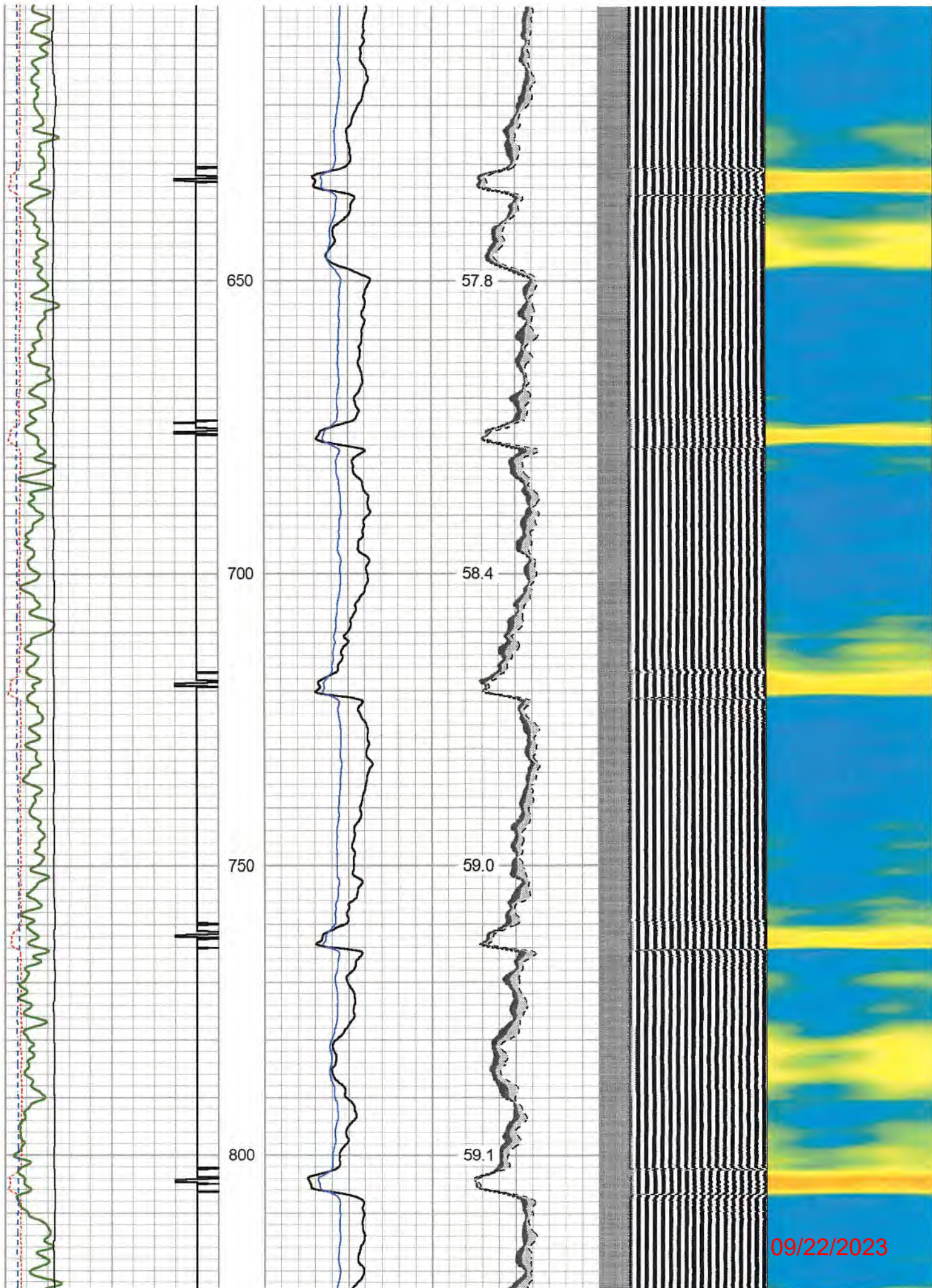
Database File f:\antero beech run rcbl\atwood 1h\antero_atwood_1h_rcbl_20_jan_2023.db
 Dataset Pathname atwood1h/run1/pass6
 Presentation Format rcbl 2
 Dataset Creation Fri Jan 20 08:35:32 2023
 Charted by Depth in Feet scaled 1:240

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

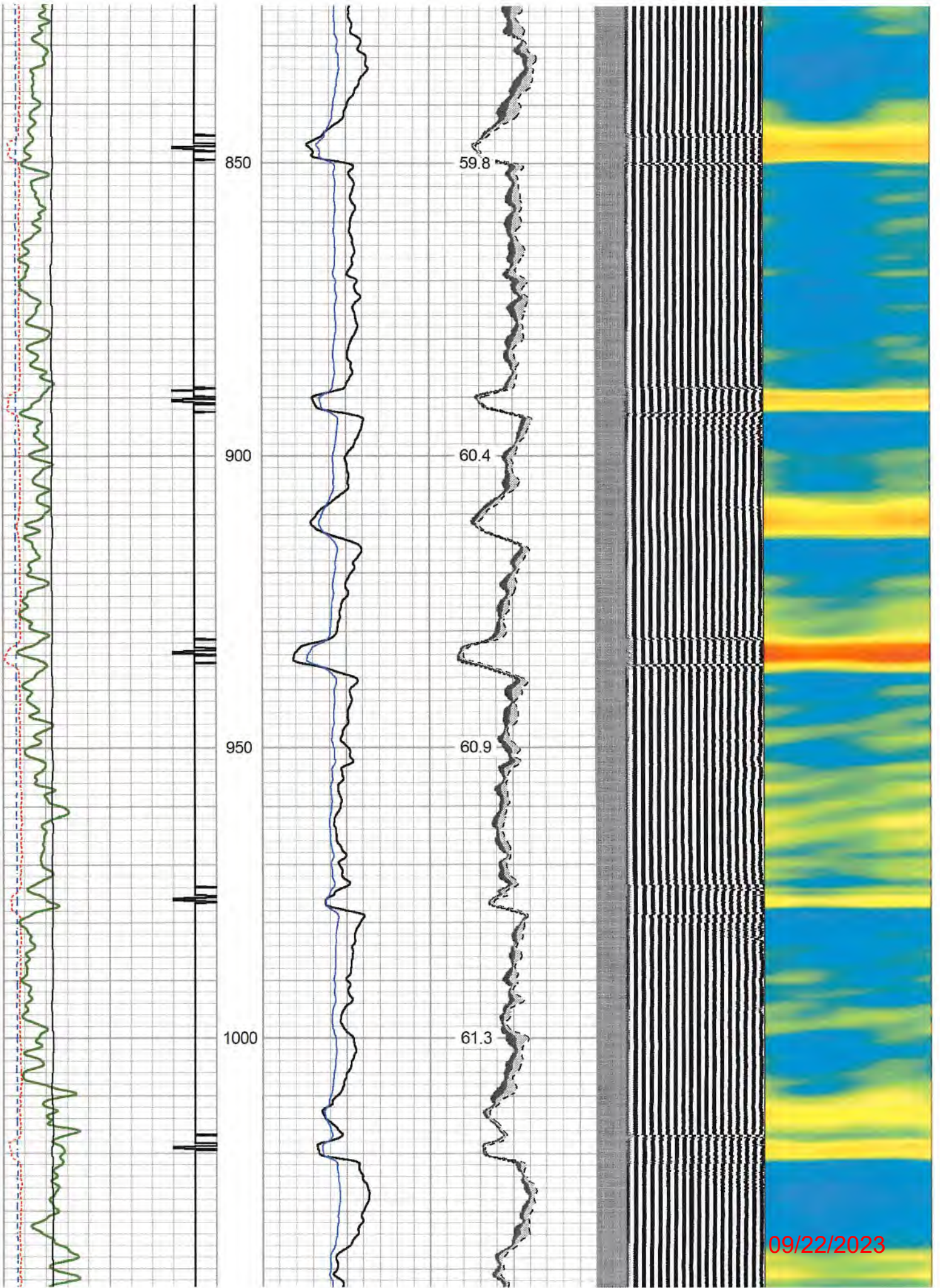


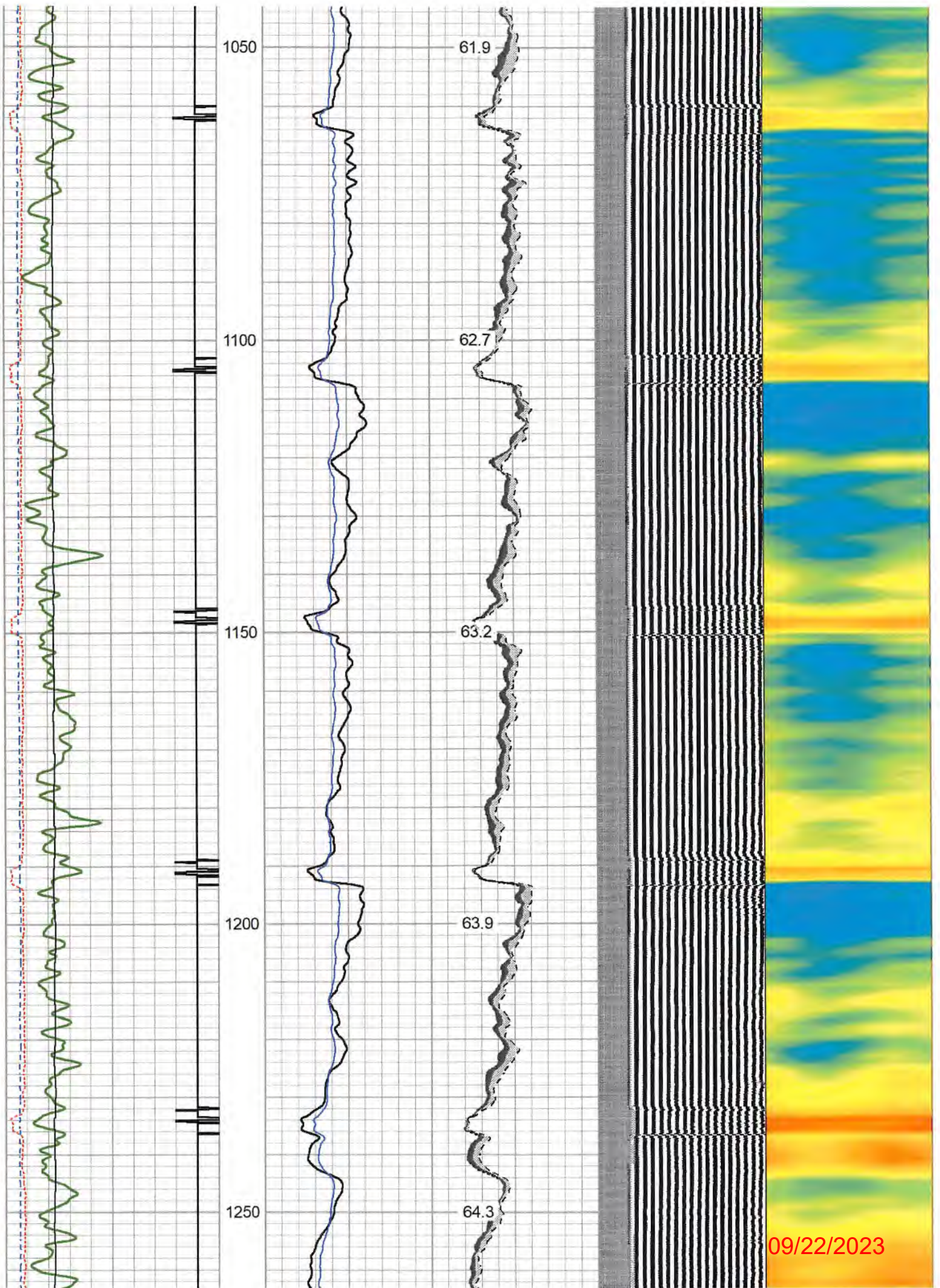




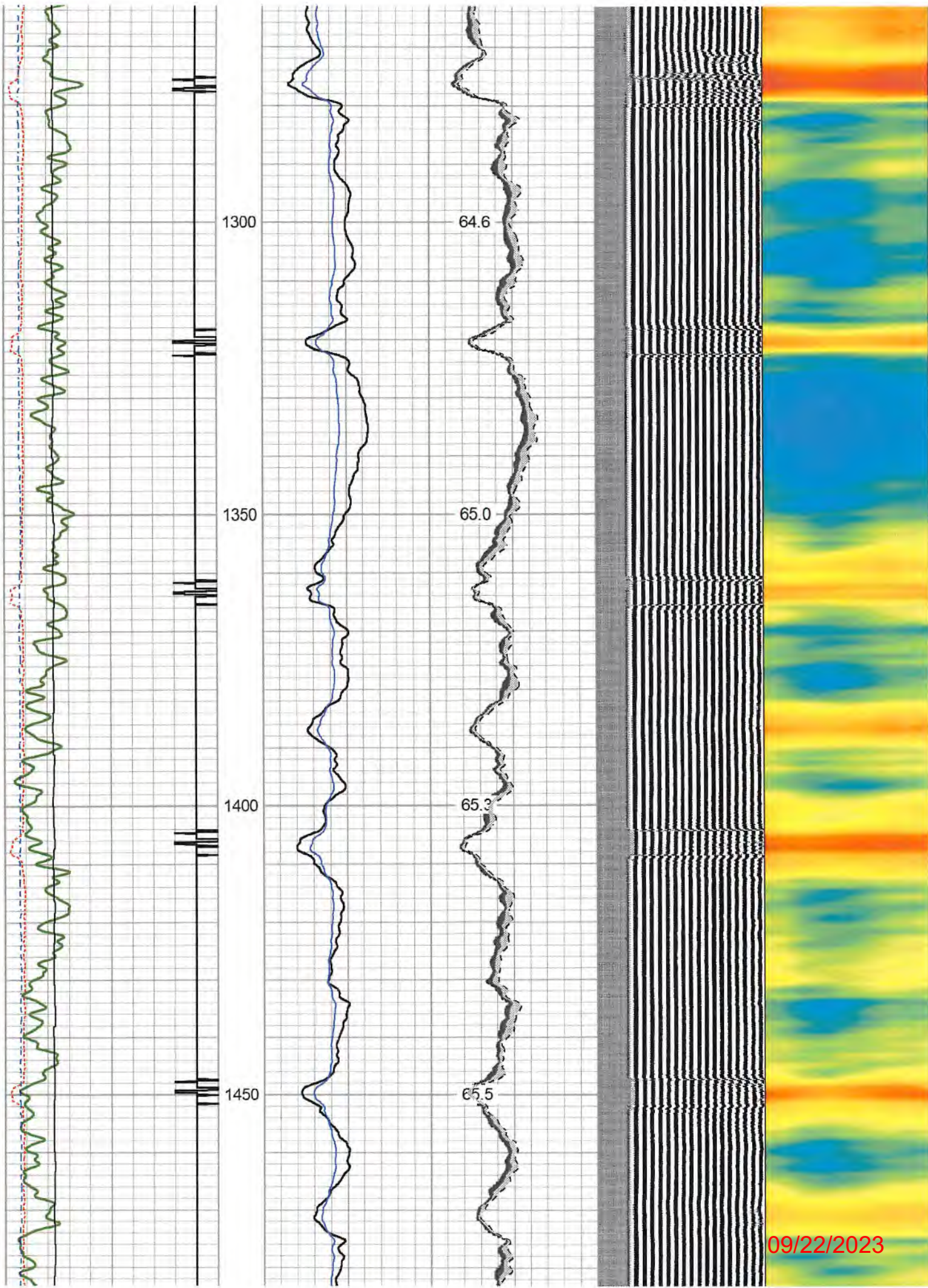


09/22/2023





09/22/2023



1300

64.6

1350

65.0

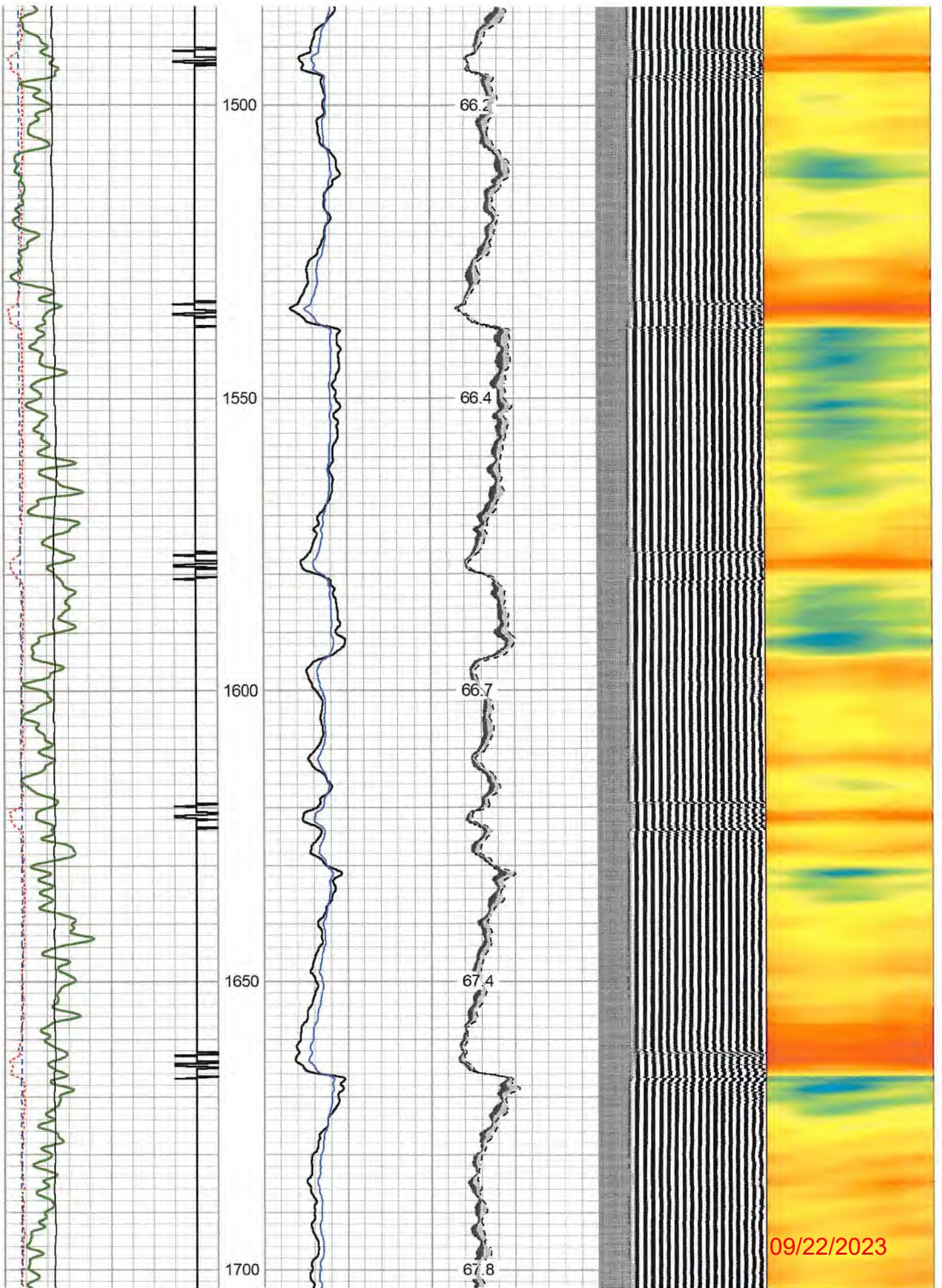
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65.3

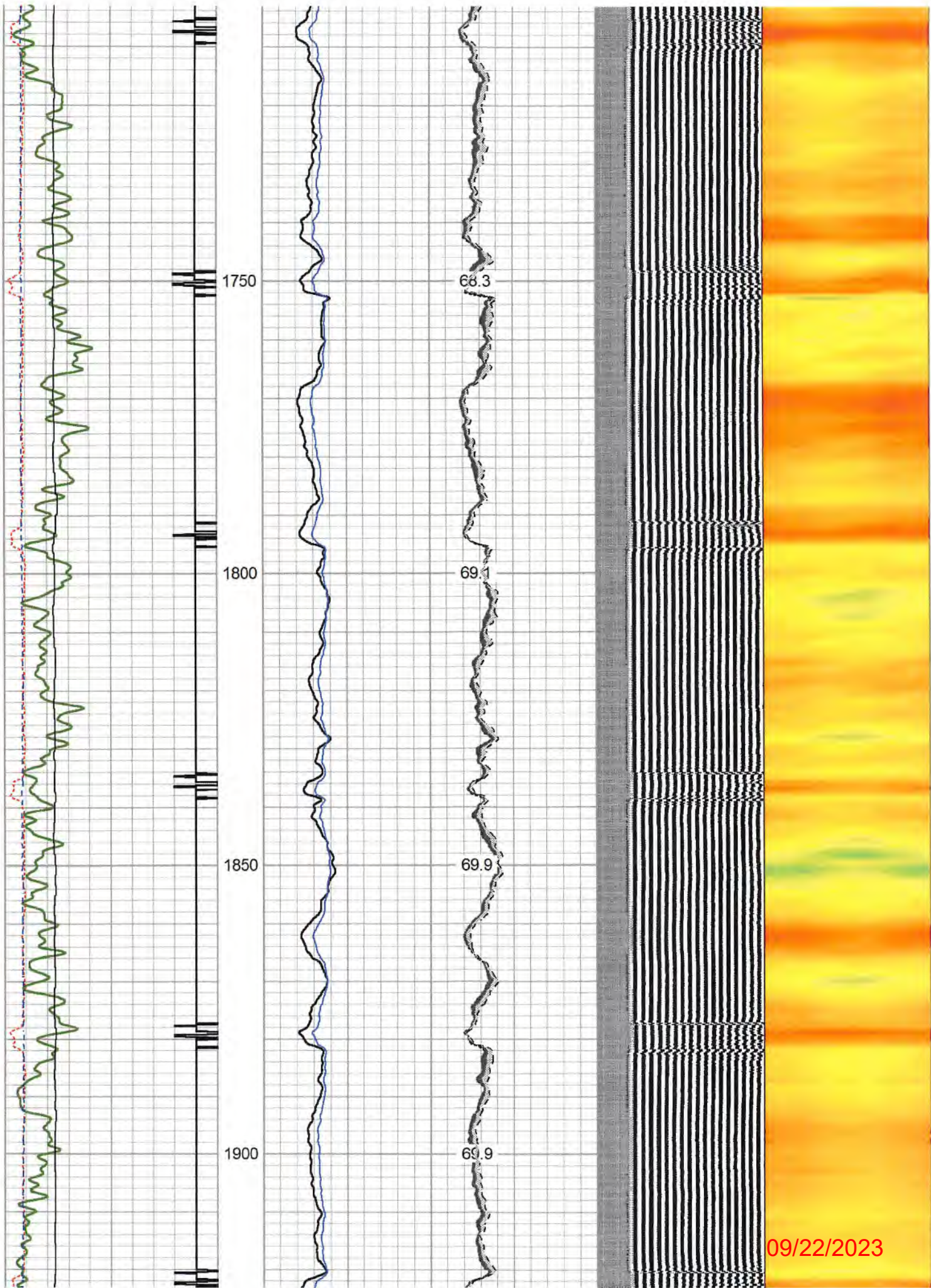
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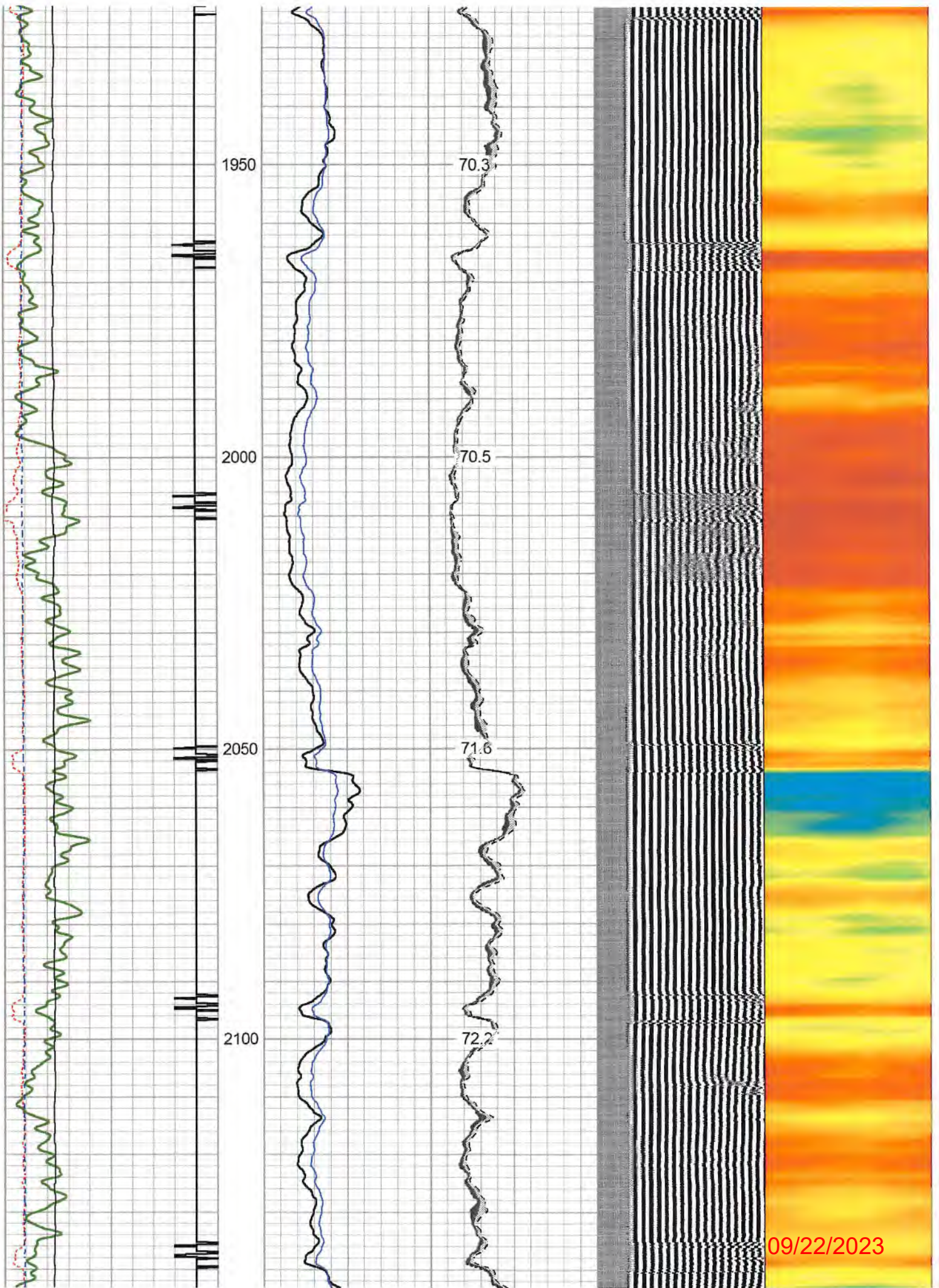
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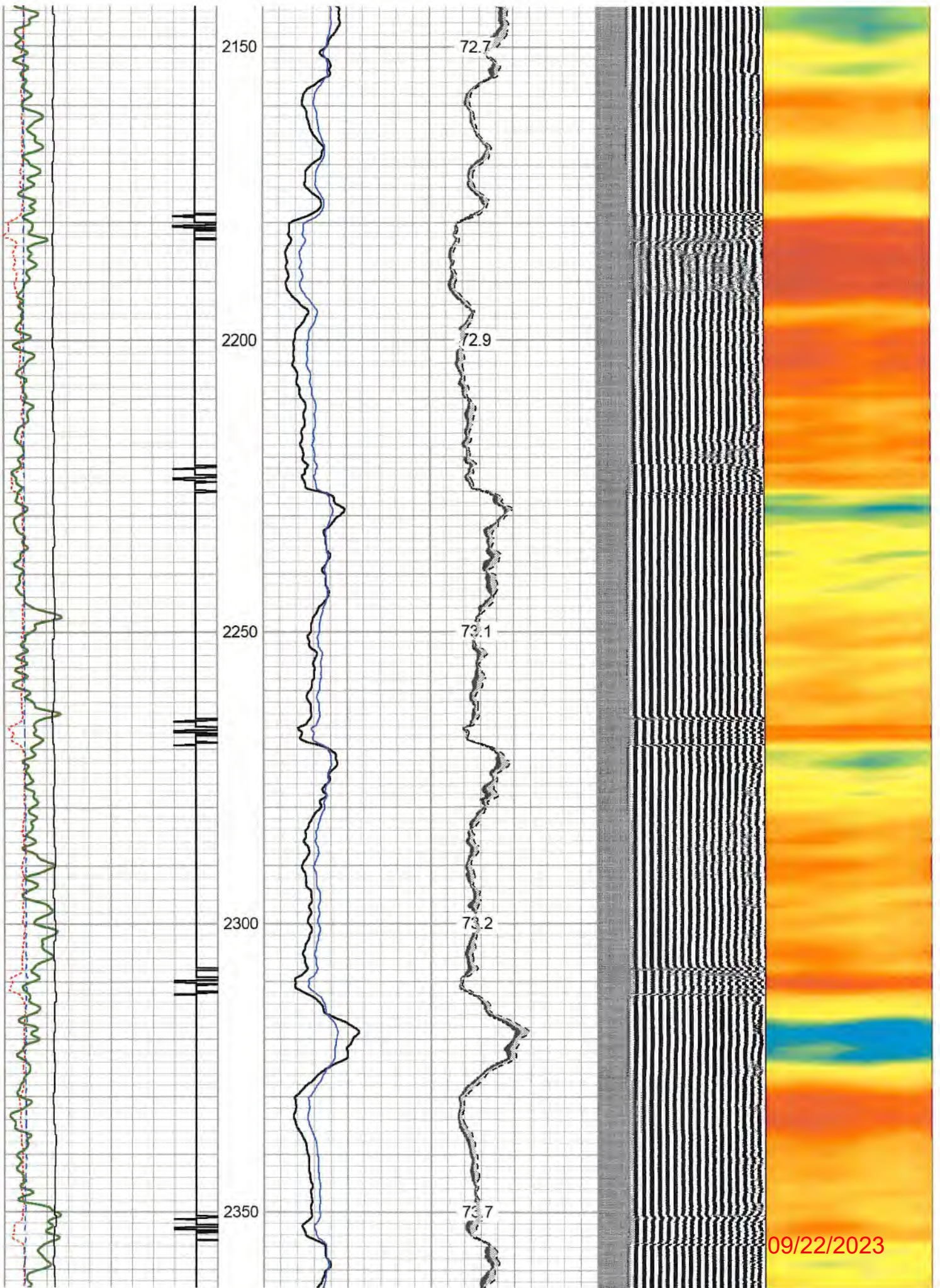
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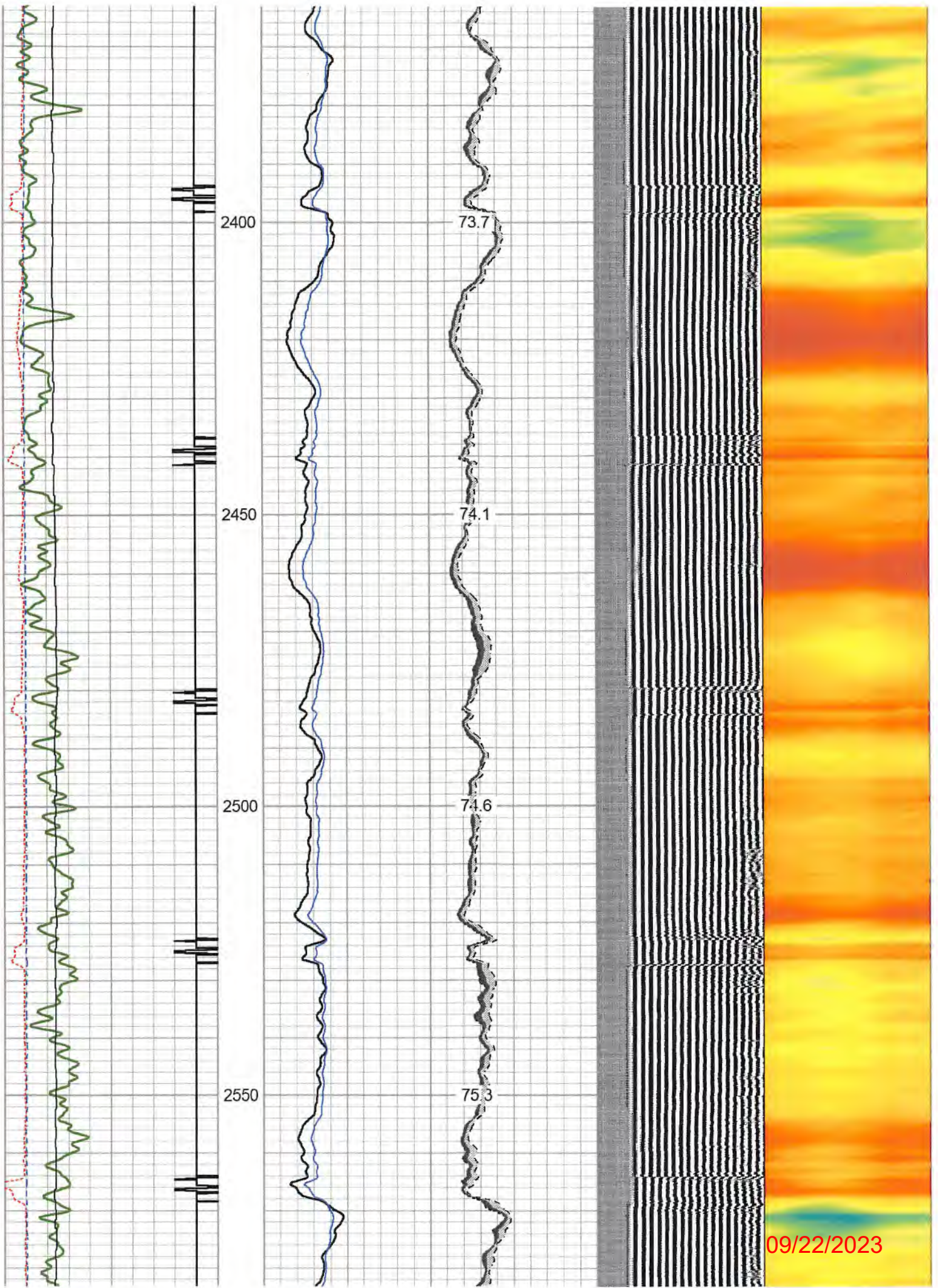


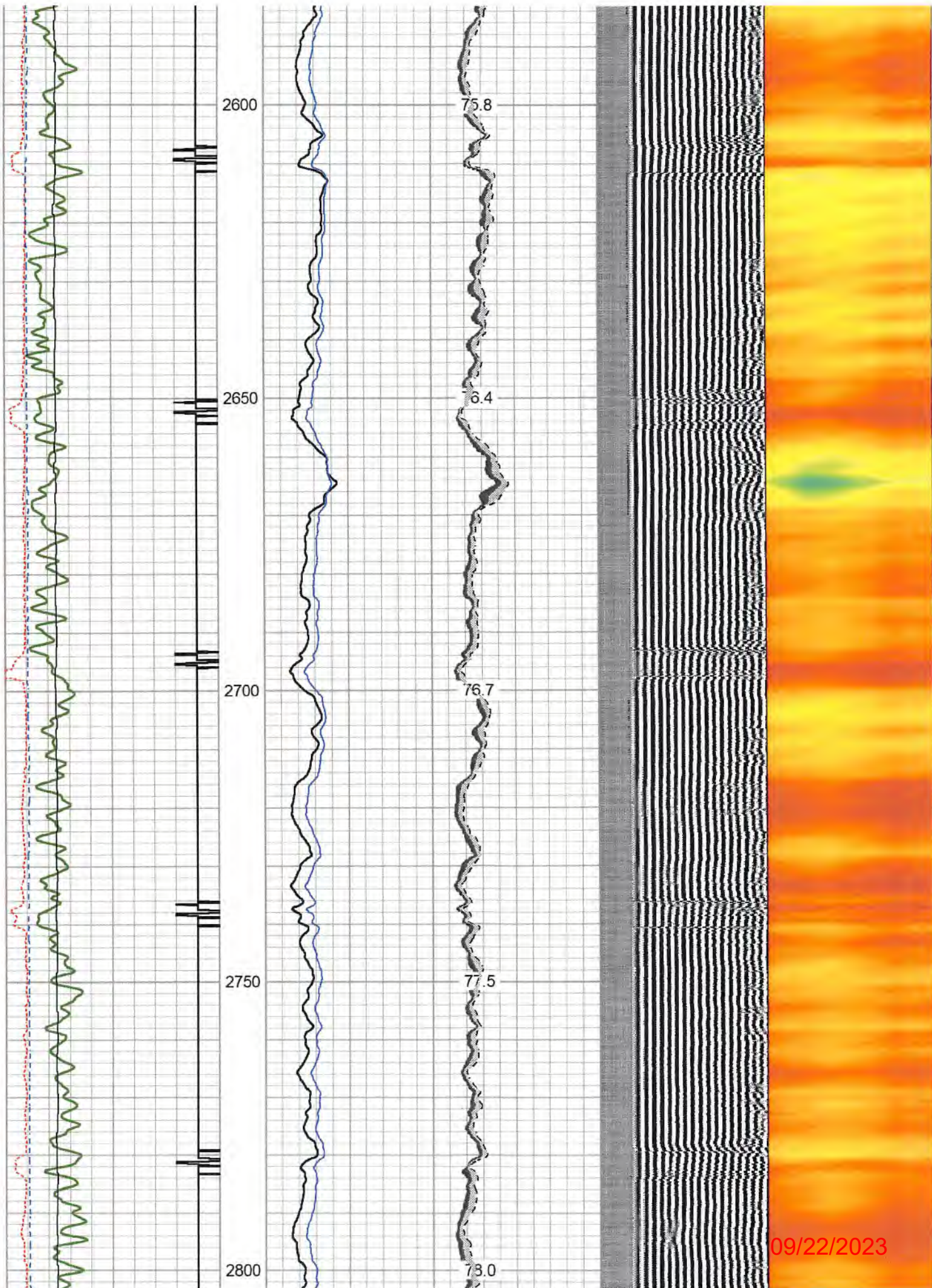
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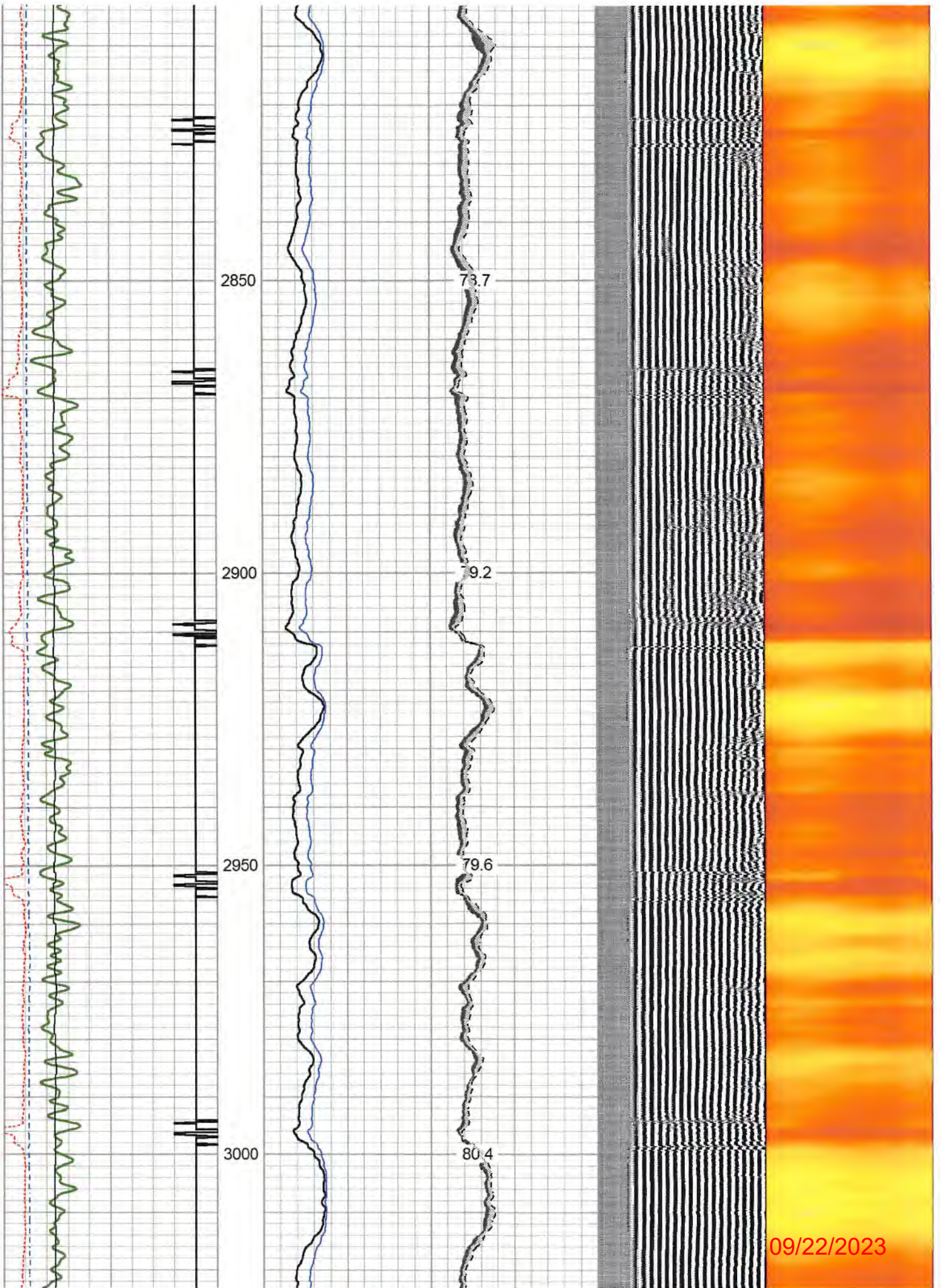


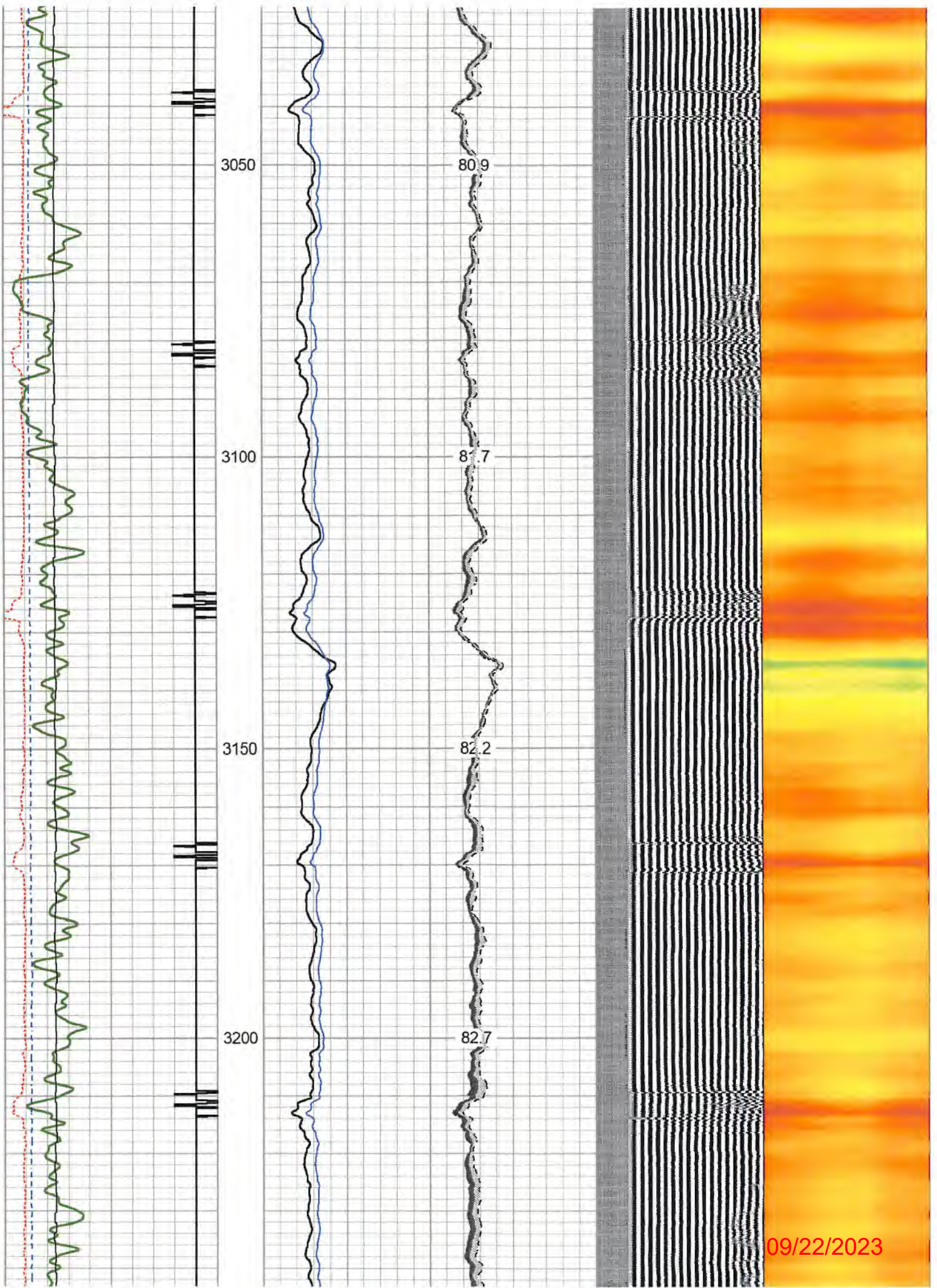


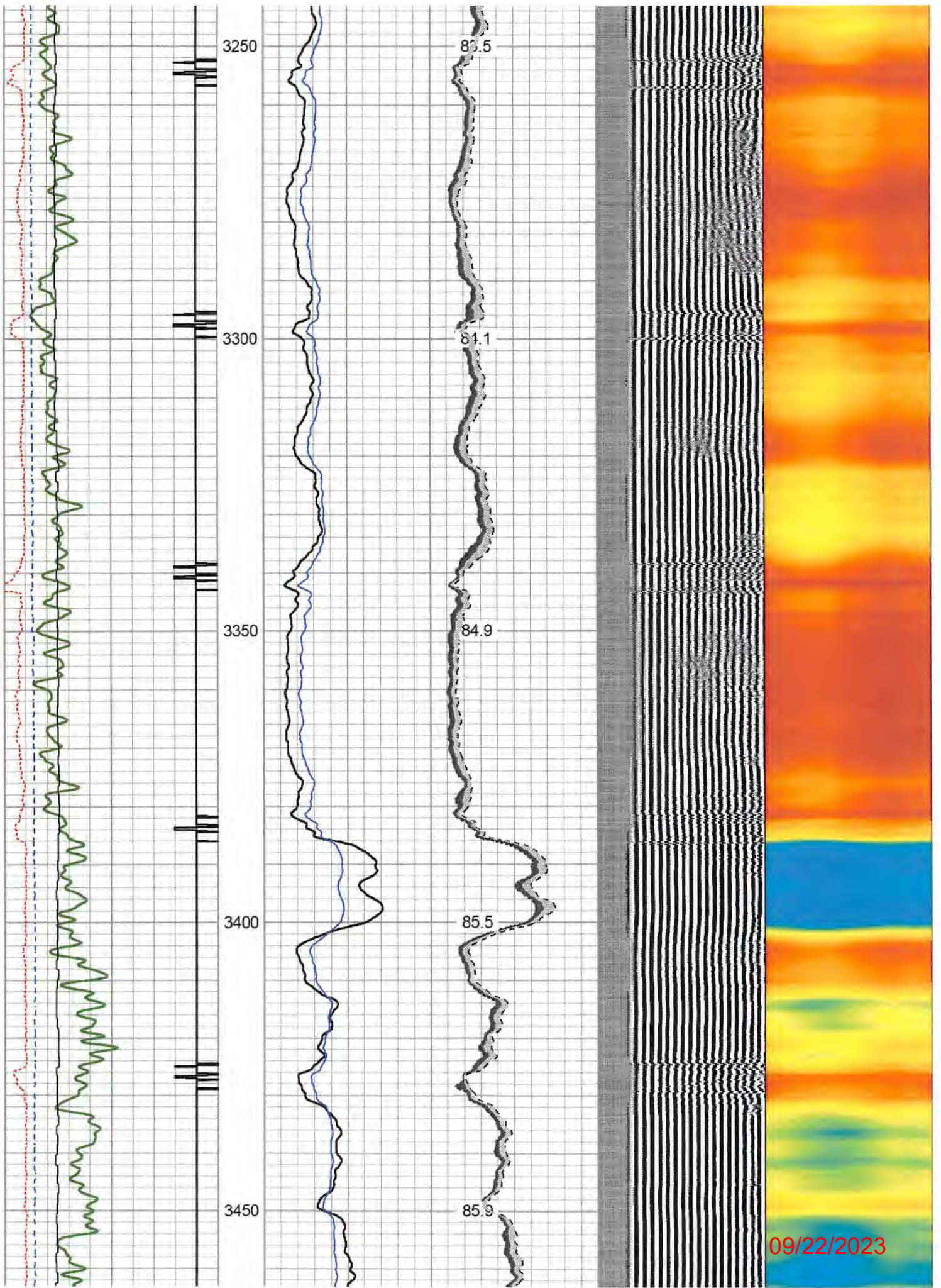


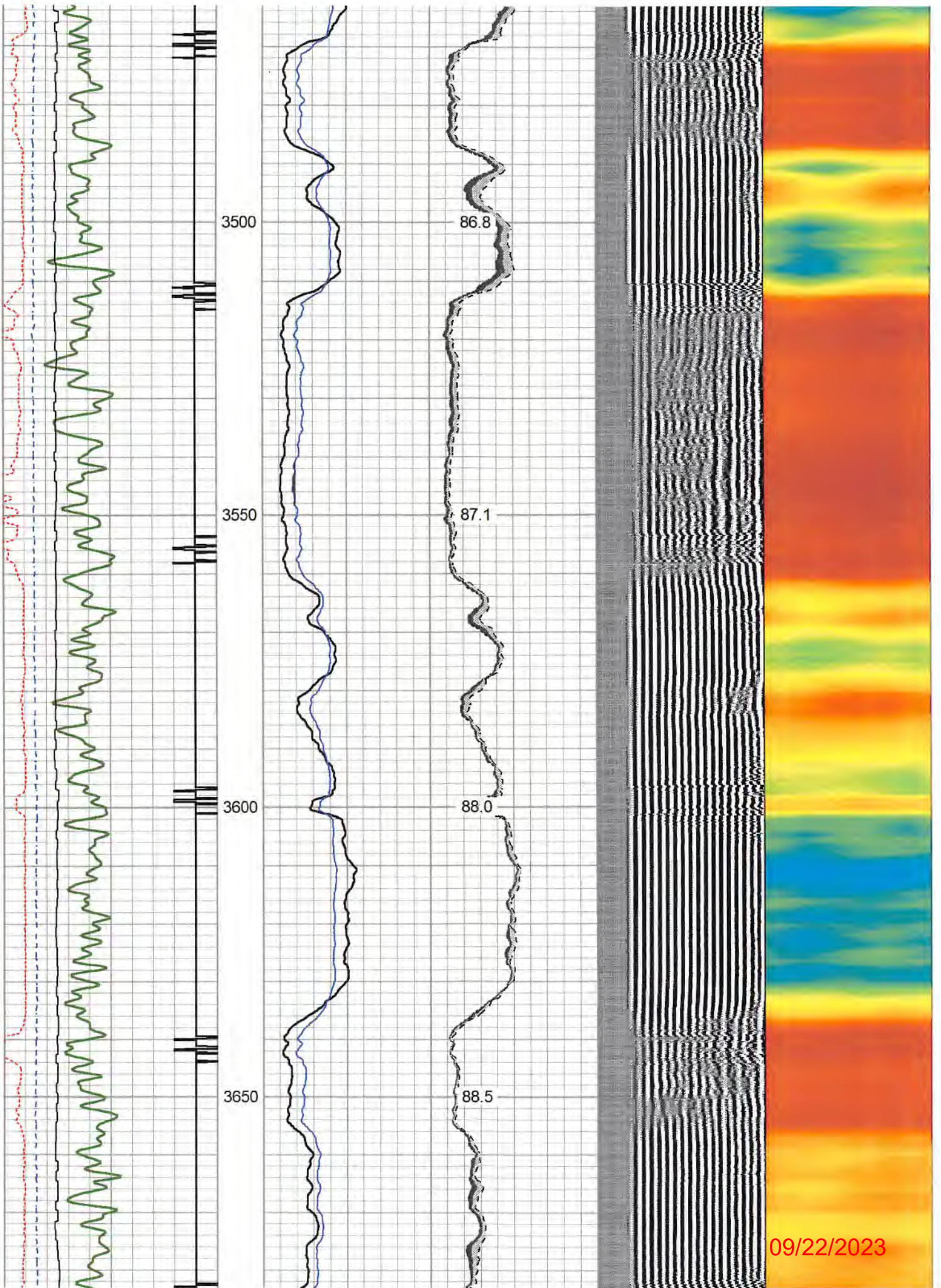


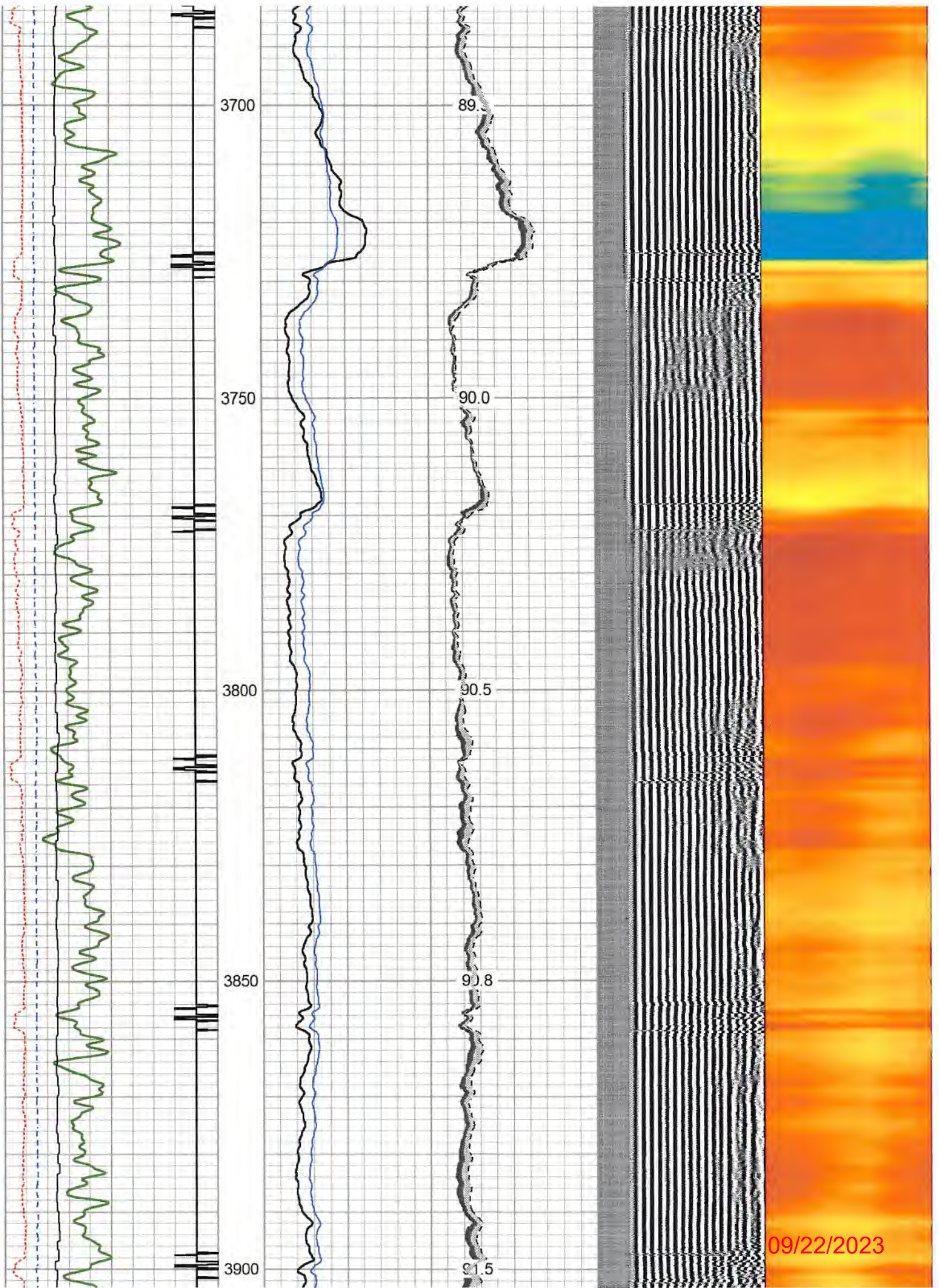


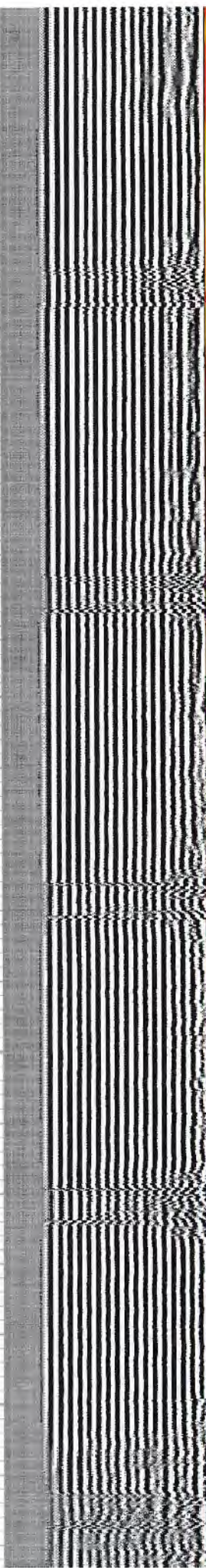
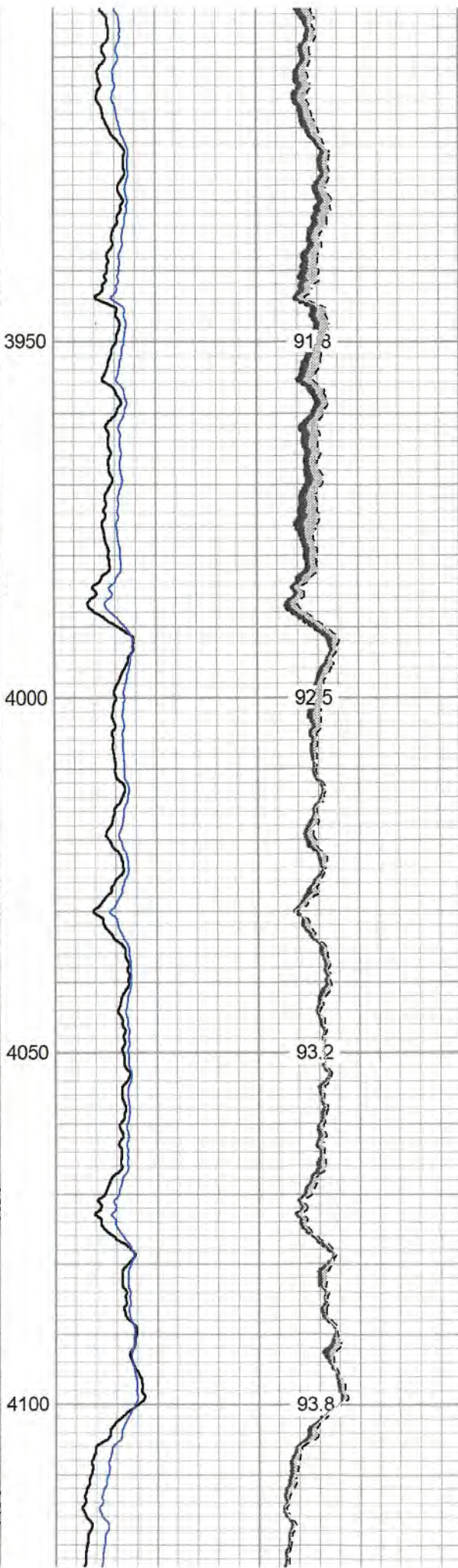
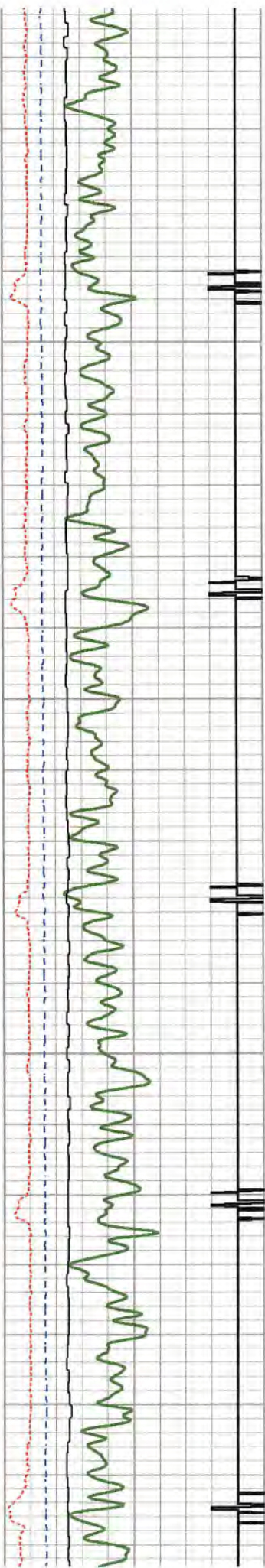




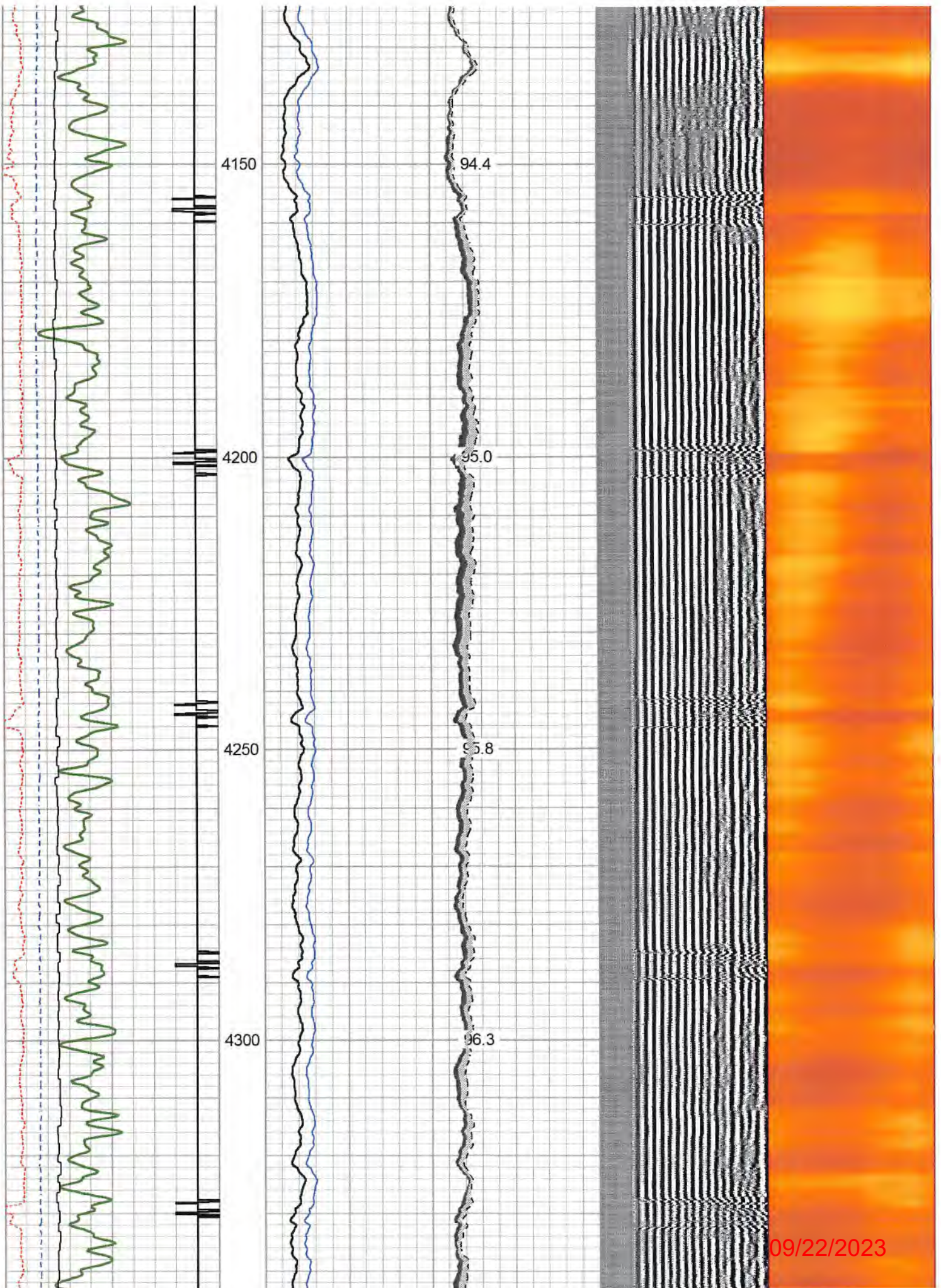


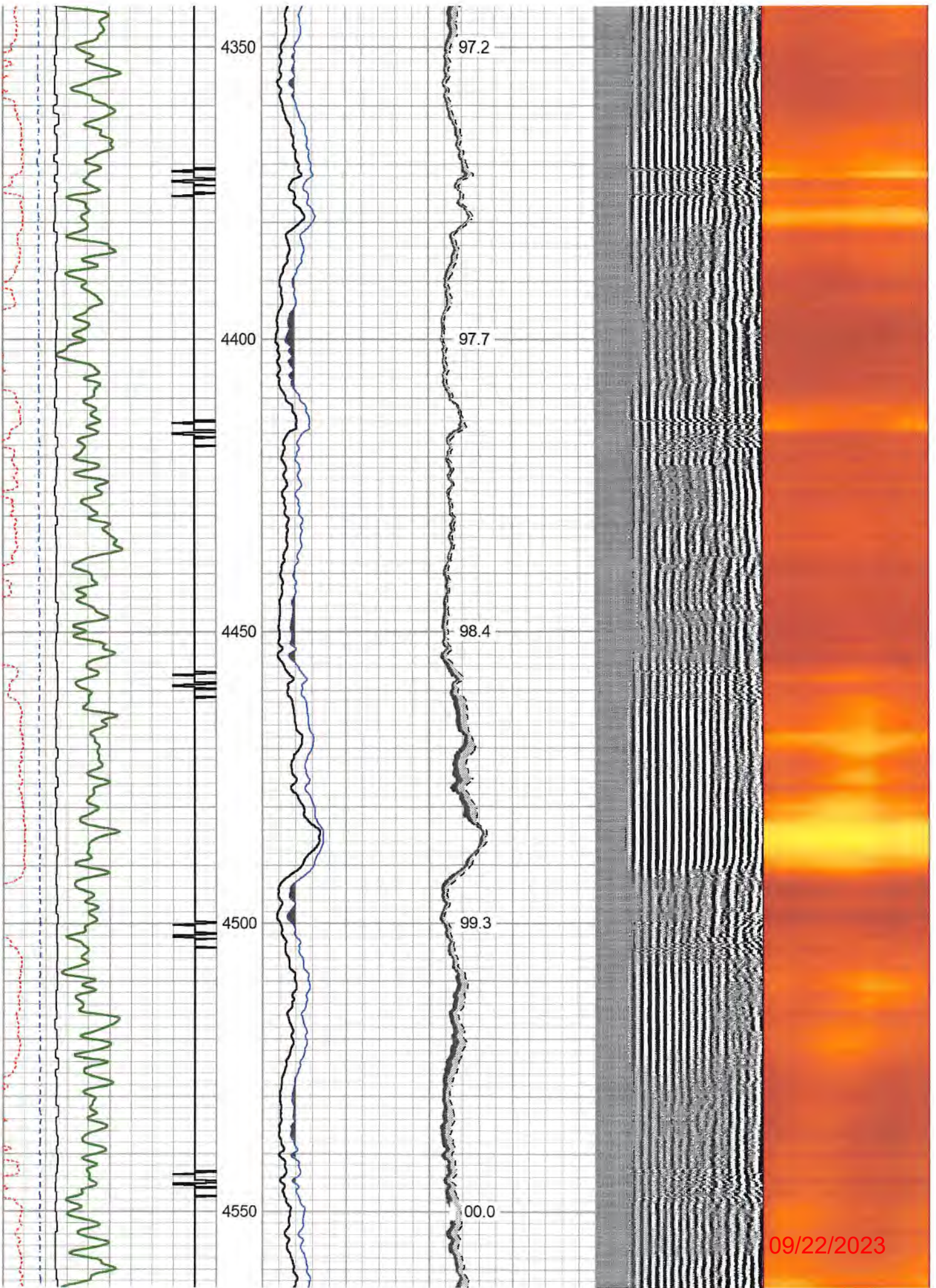


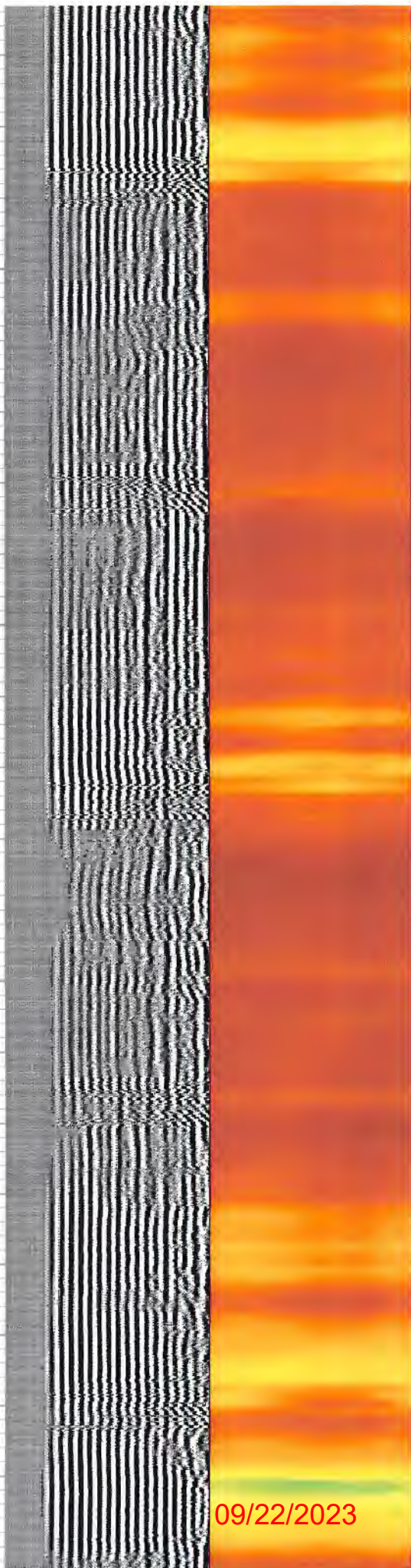
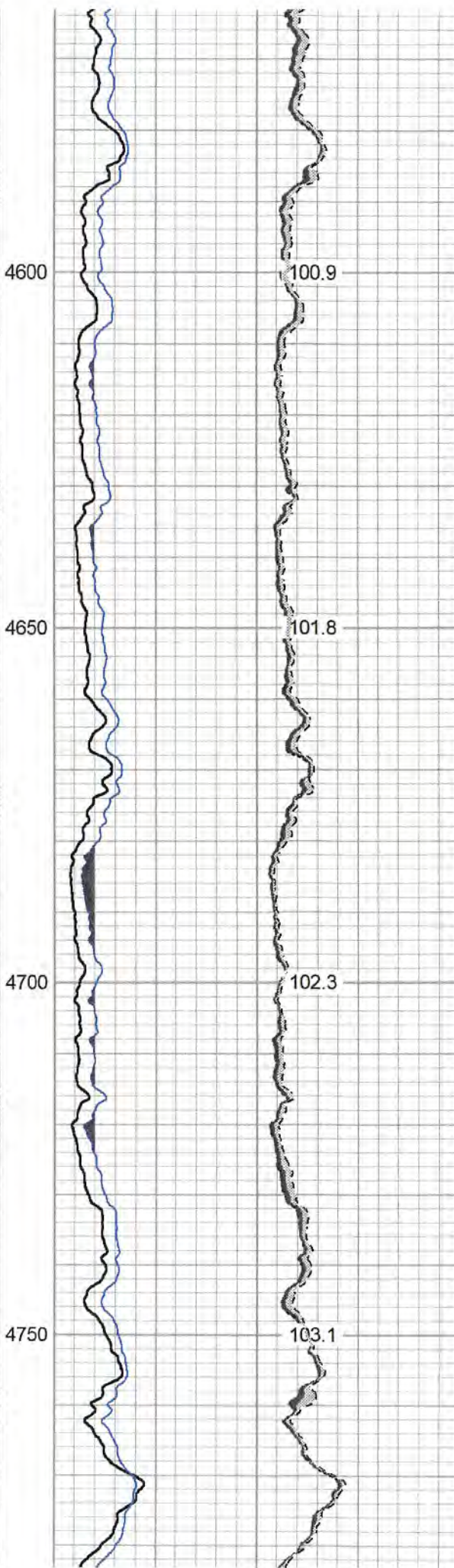
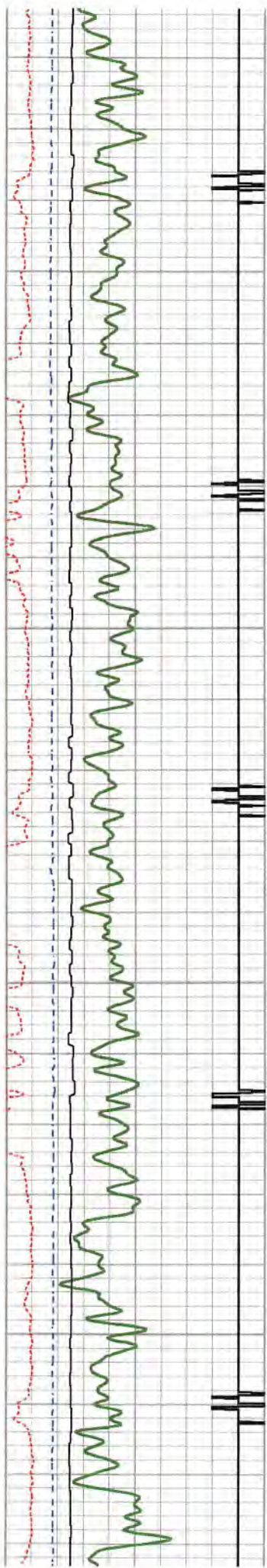




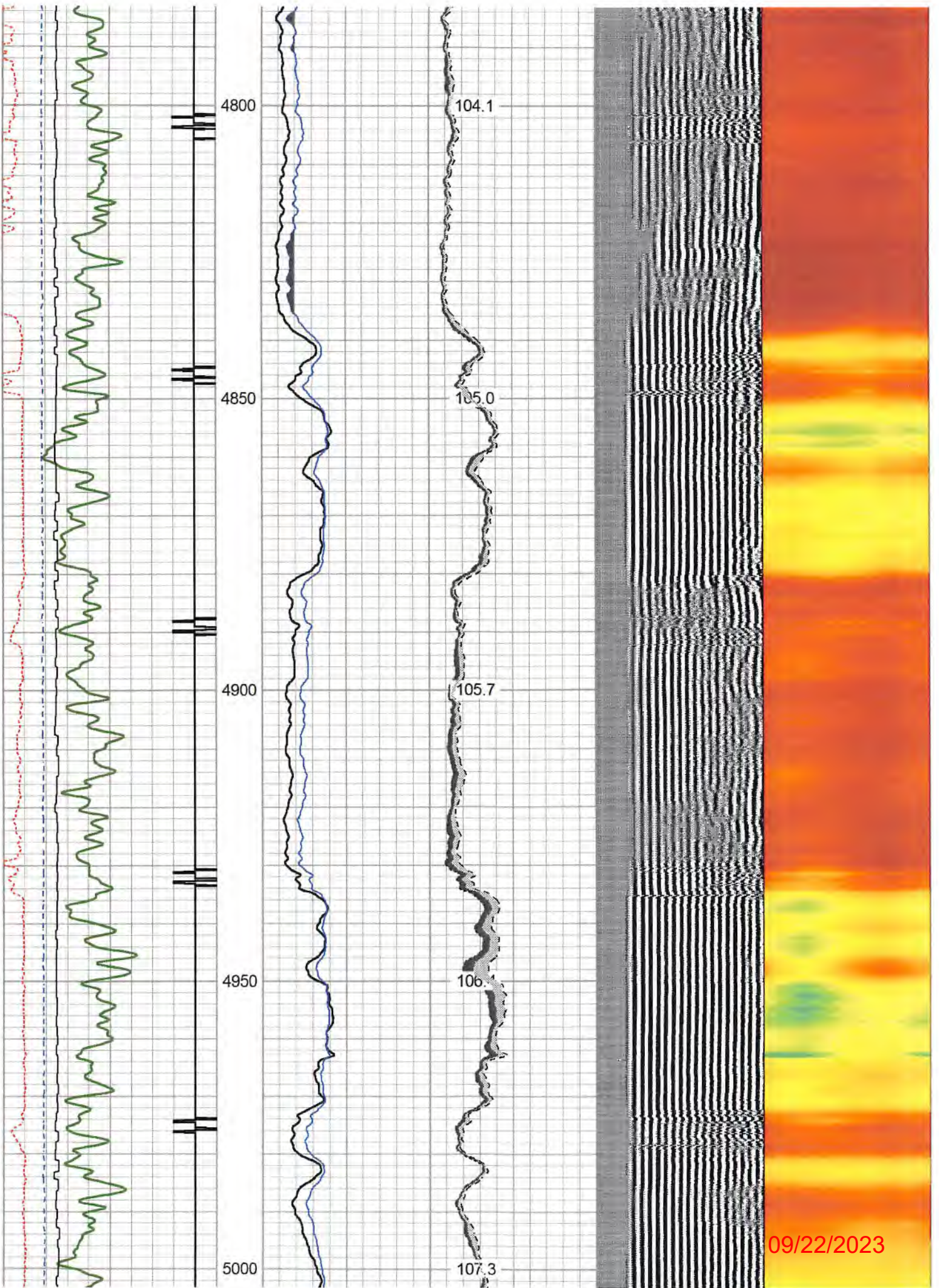
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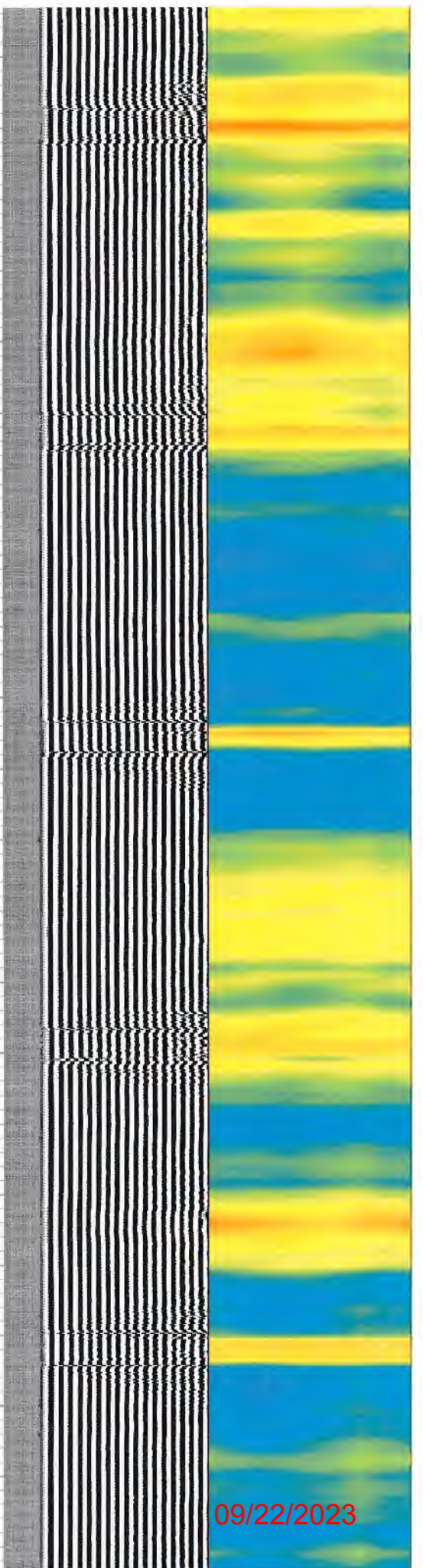
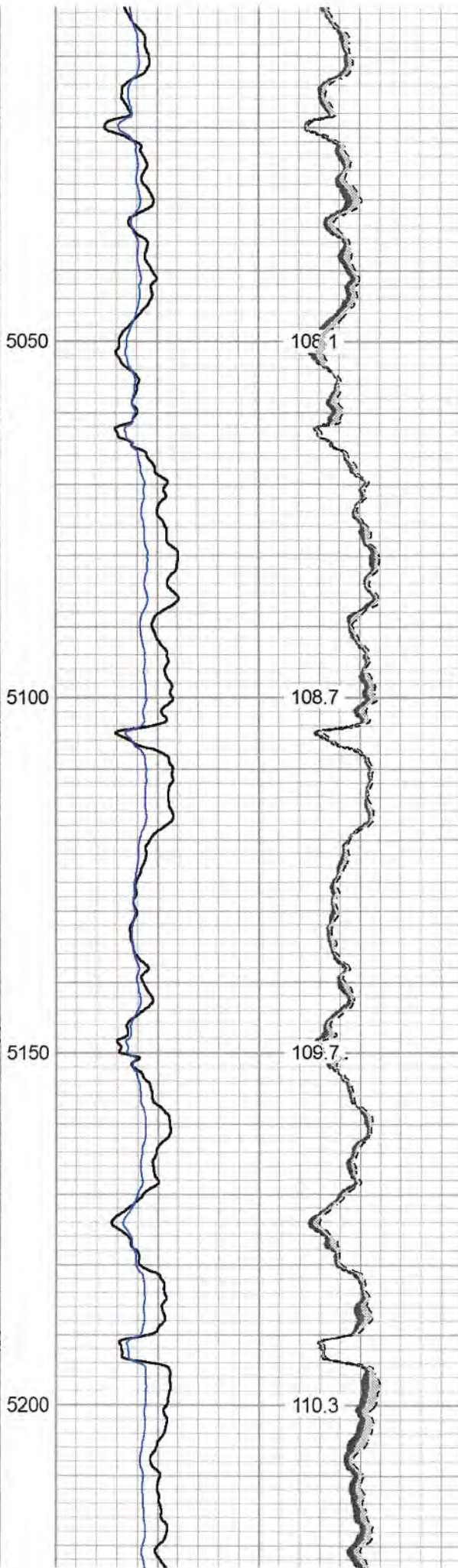
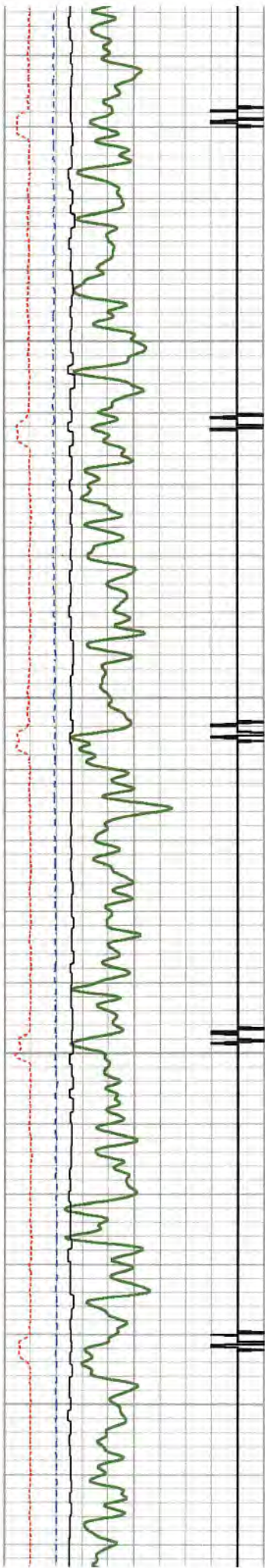




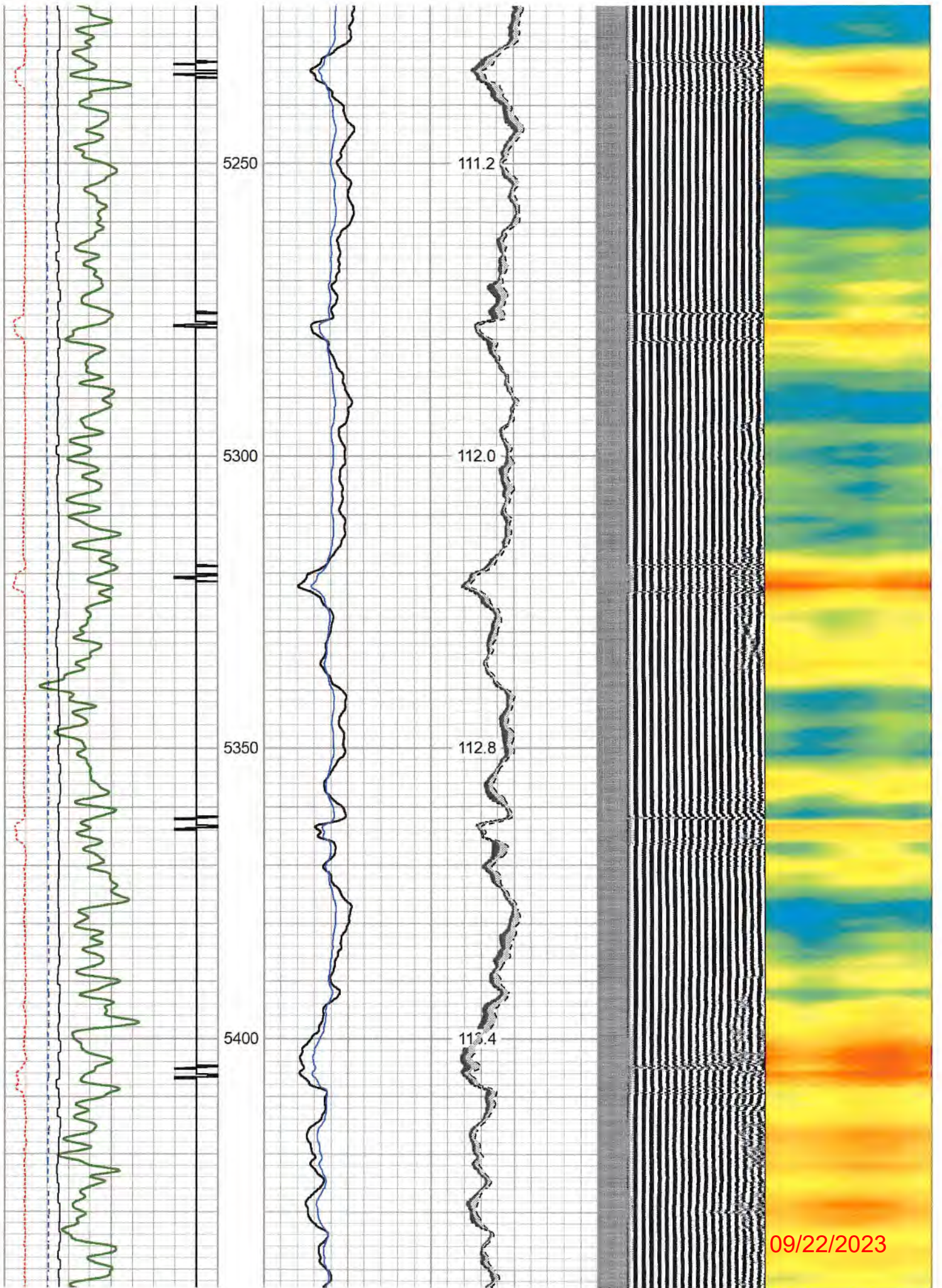
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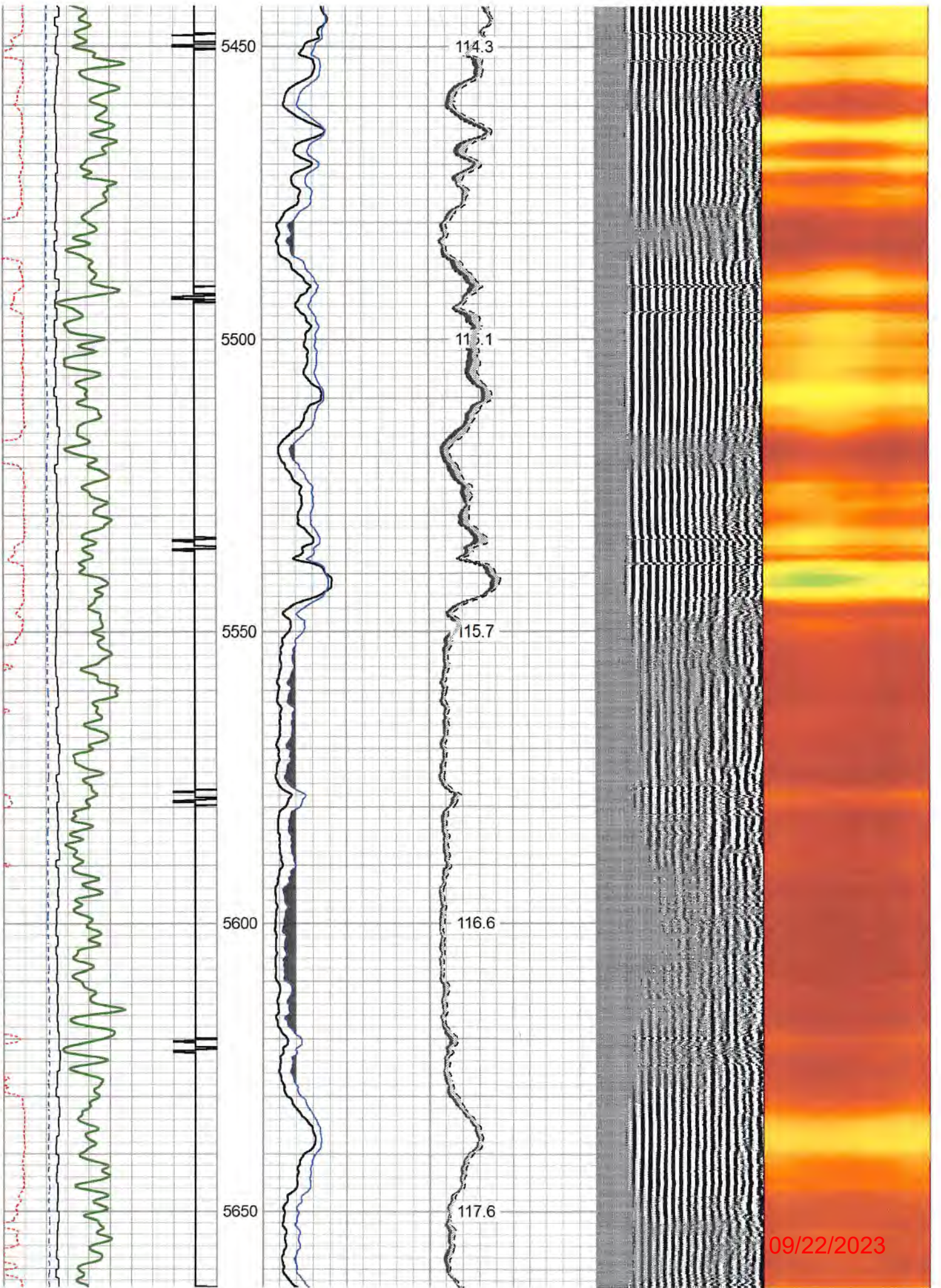
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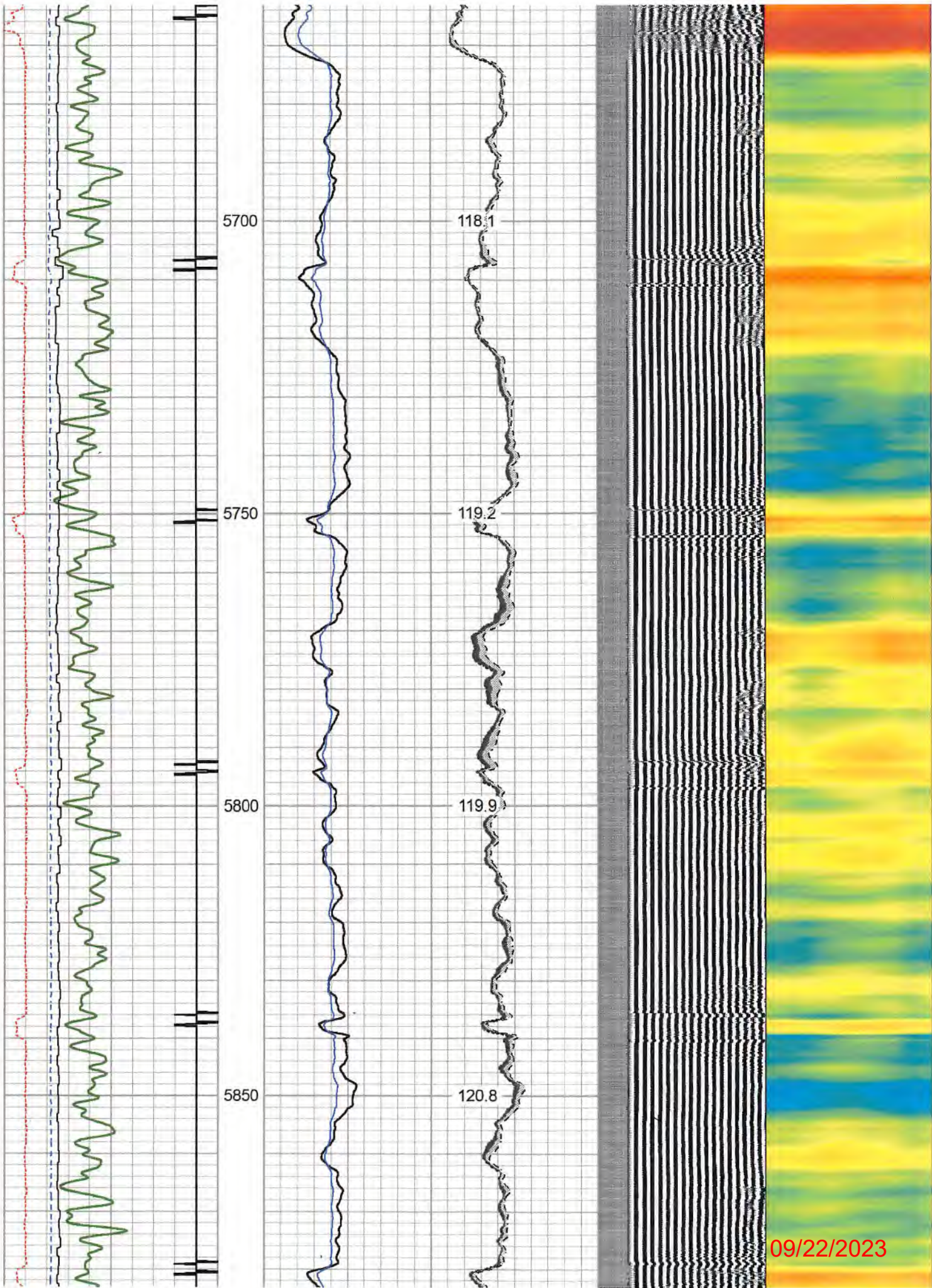


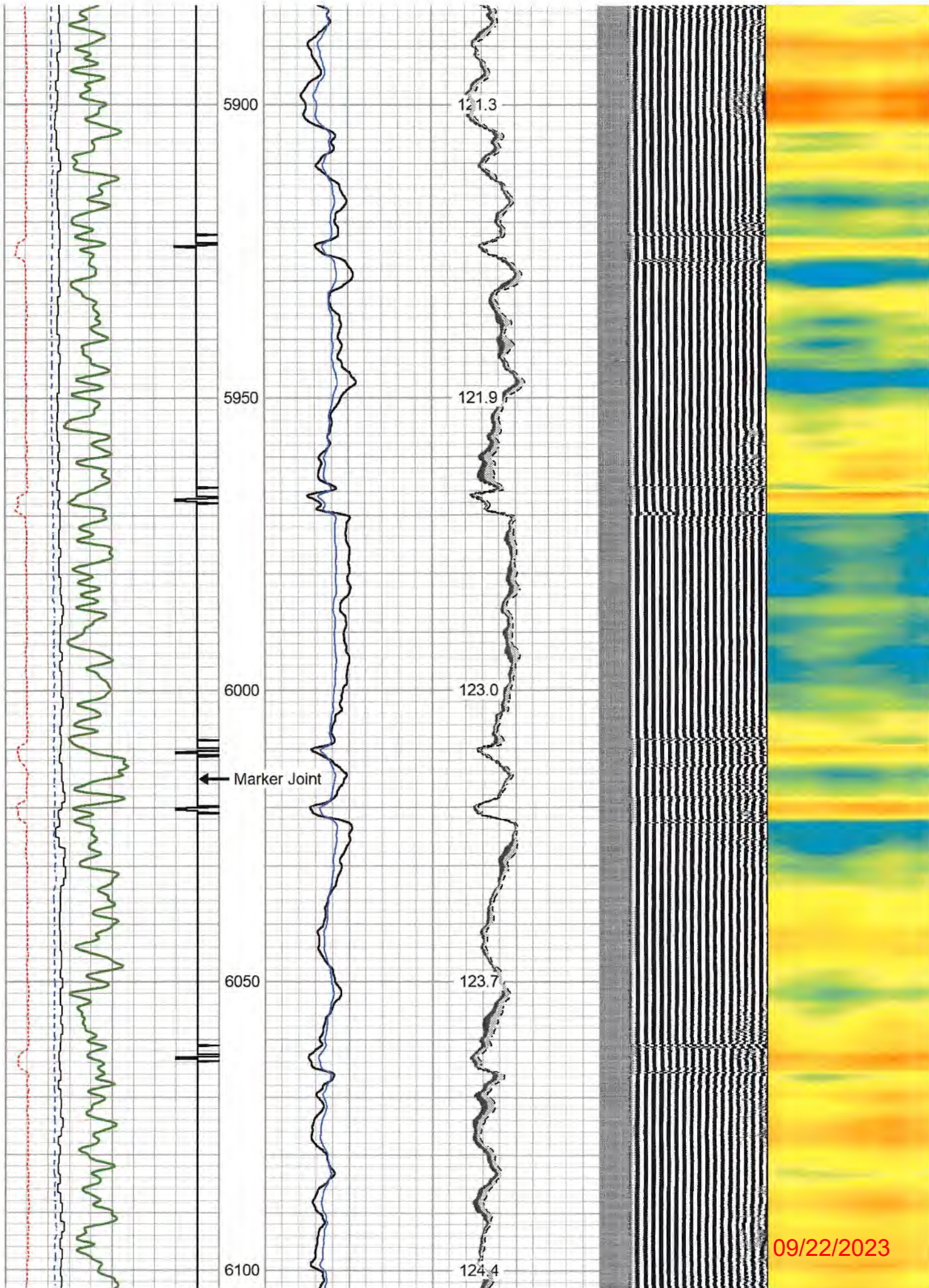
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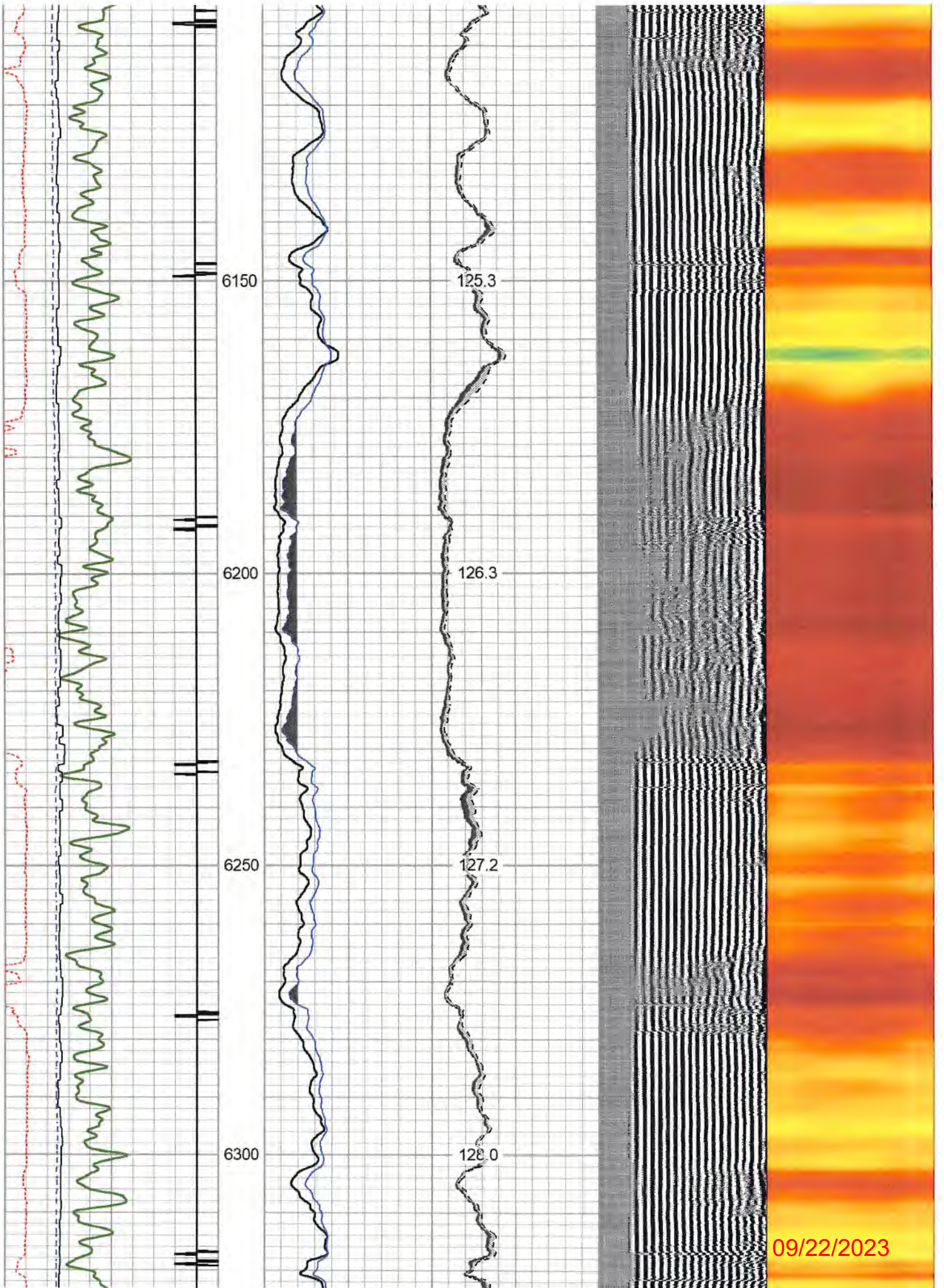


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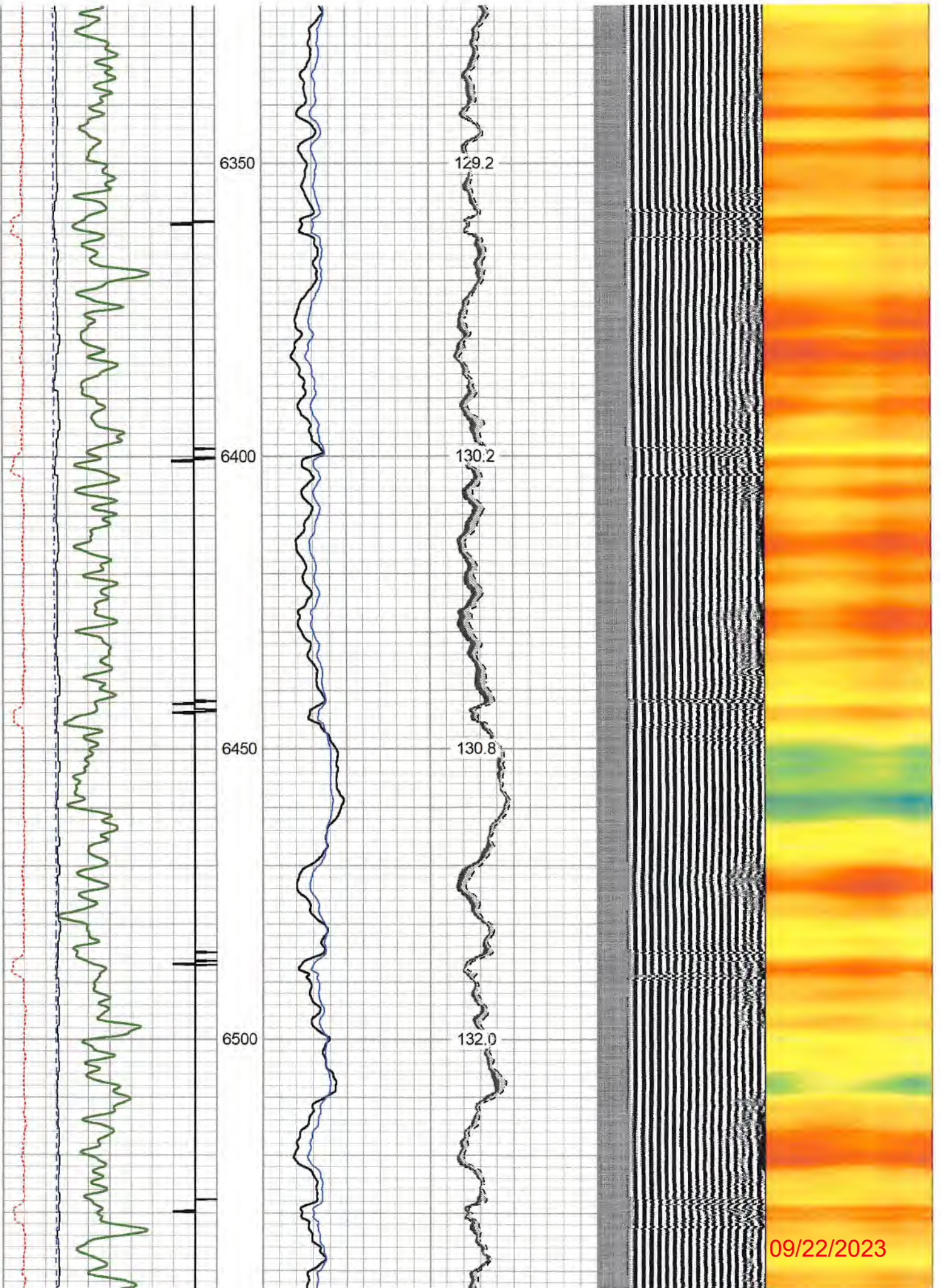


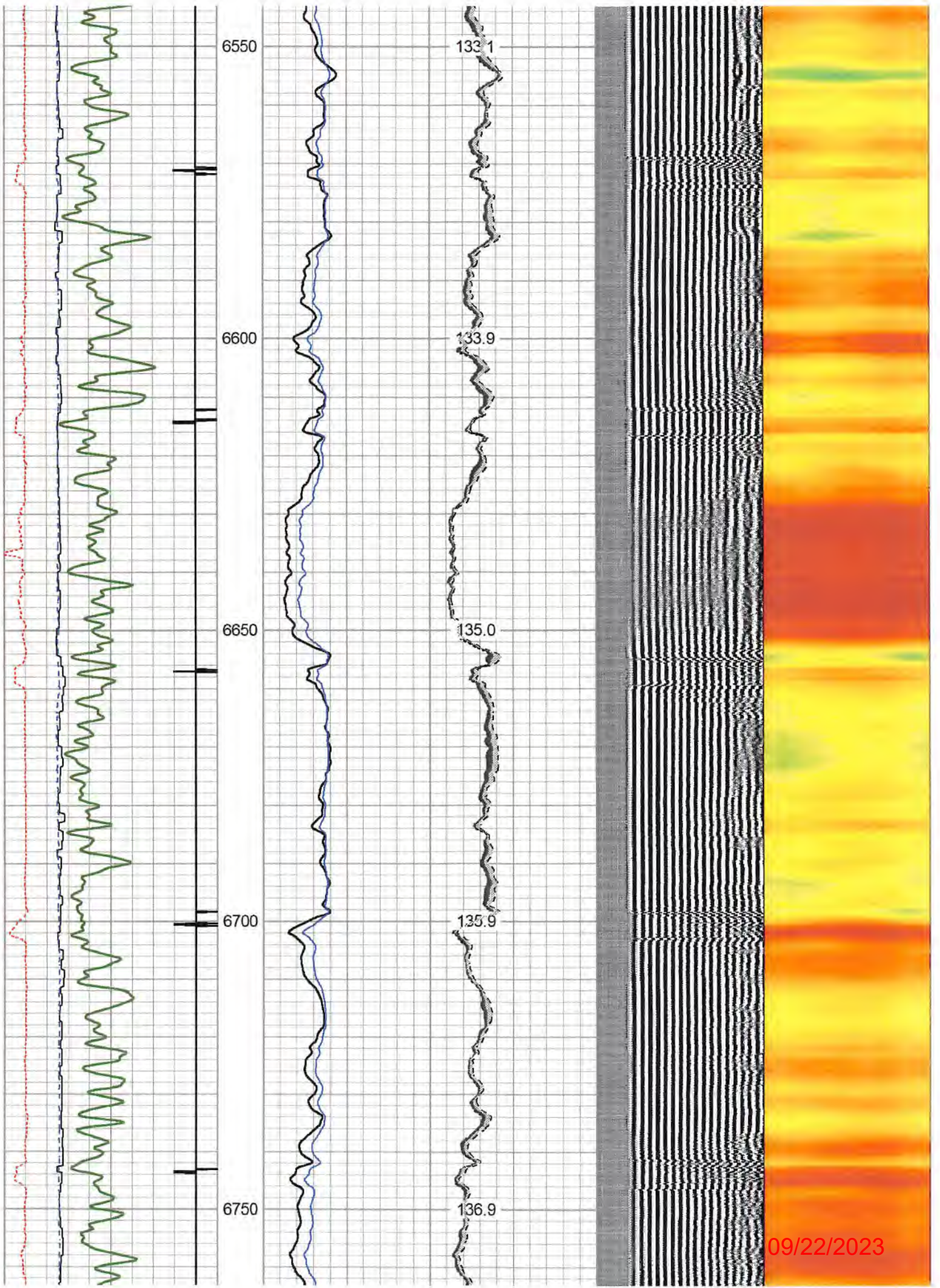




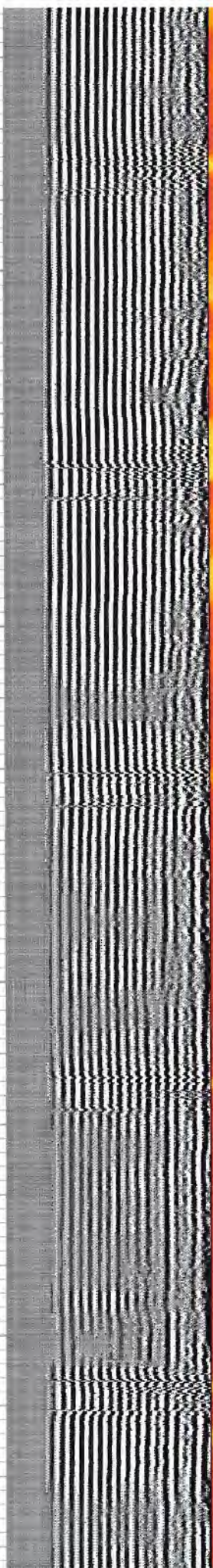
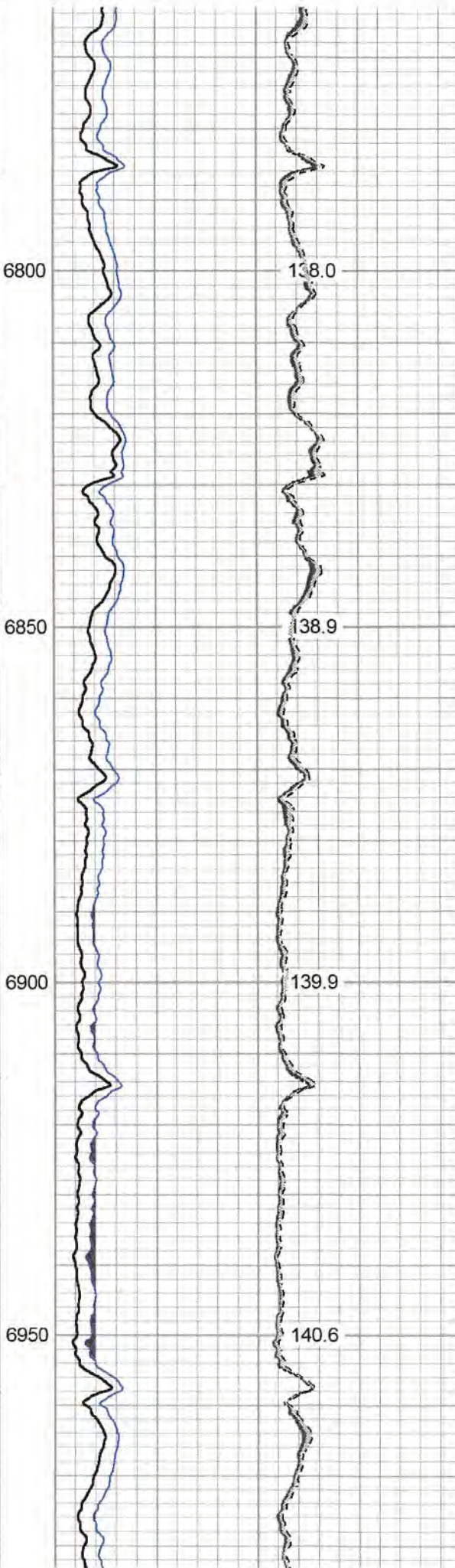
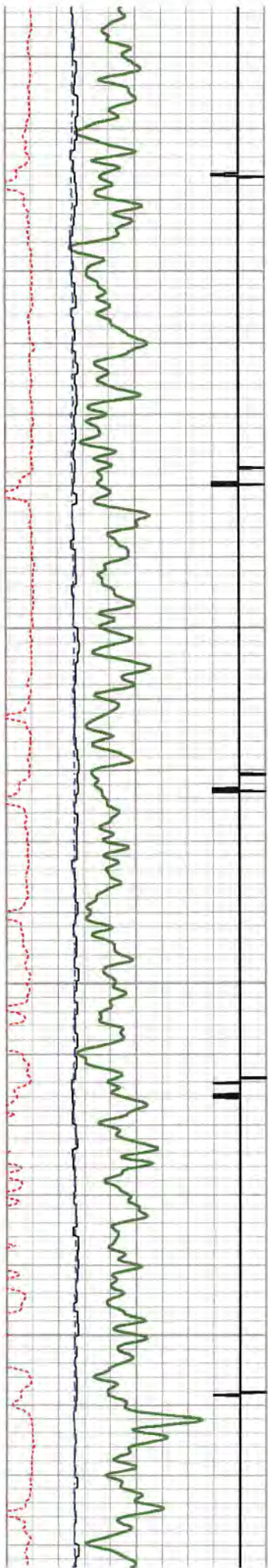


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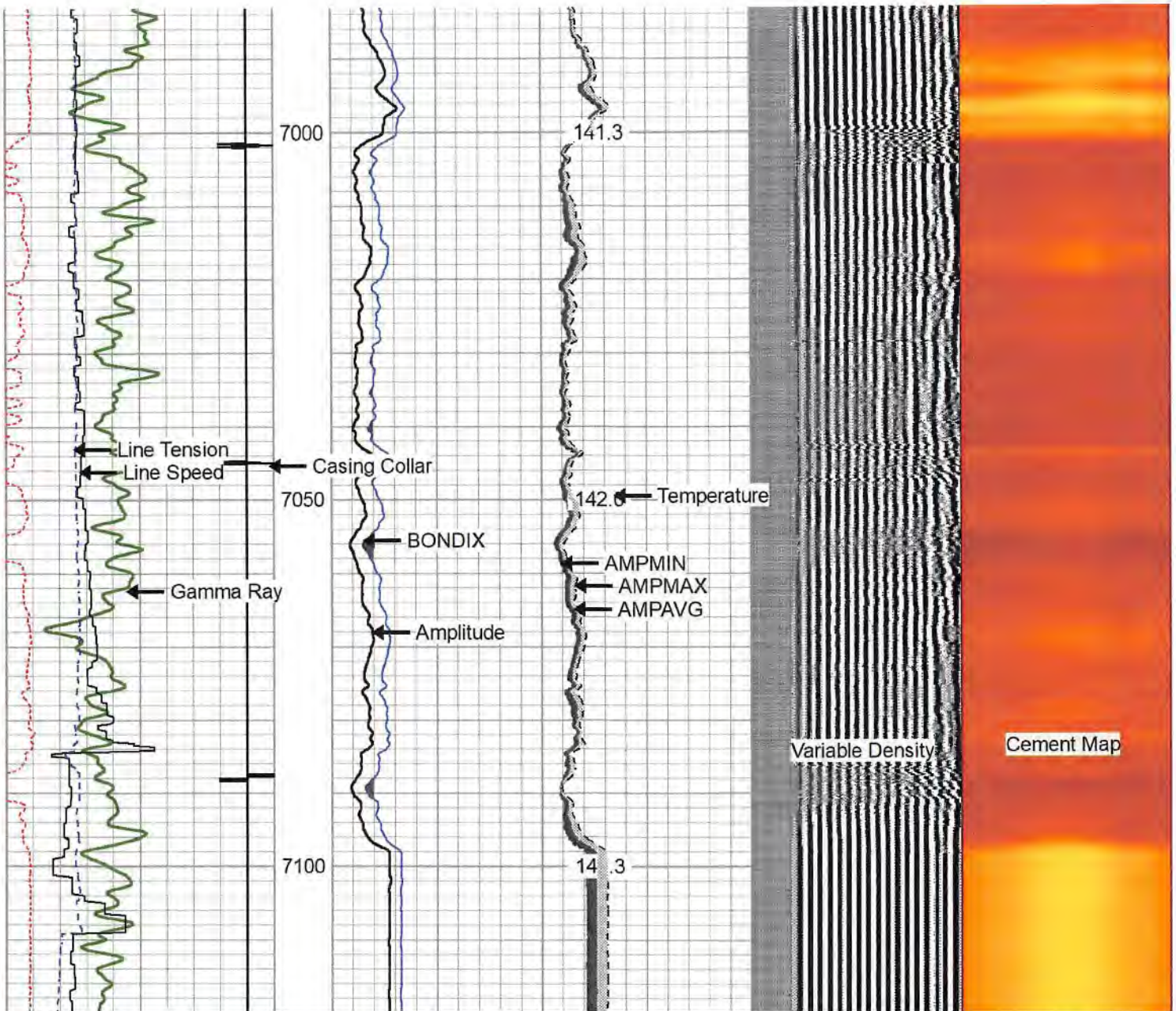
138.0

138.9

139.9

140.6

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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

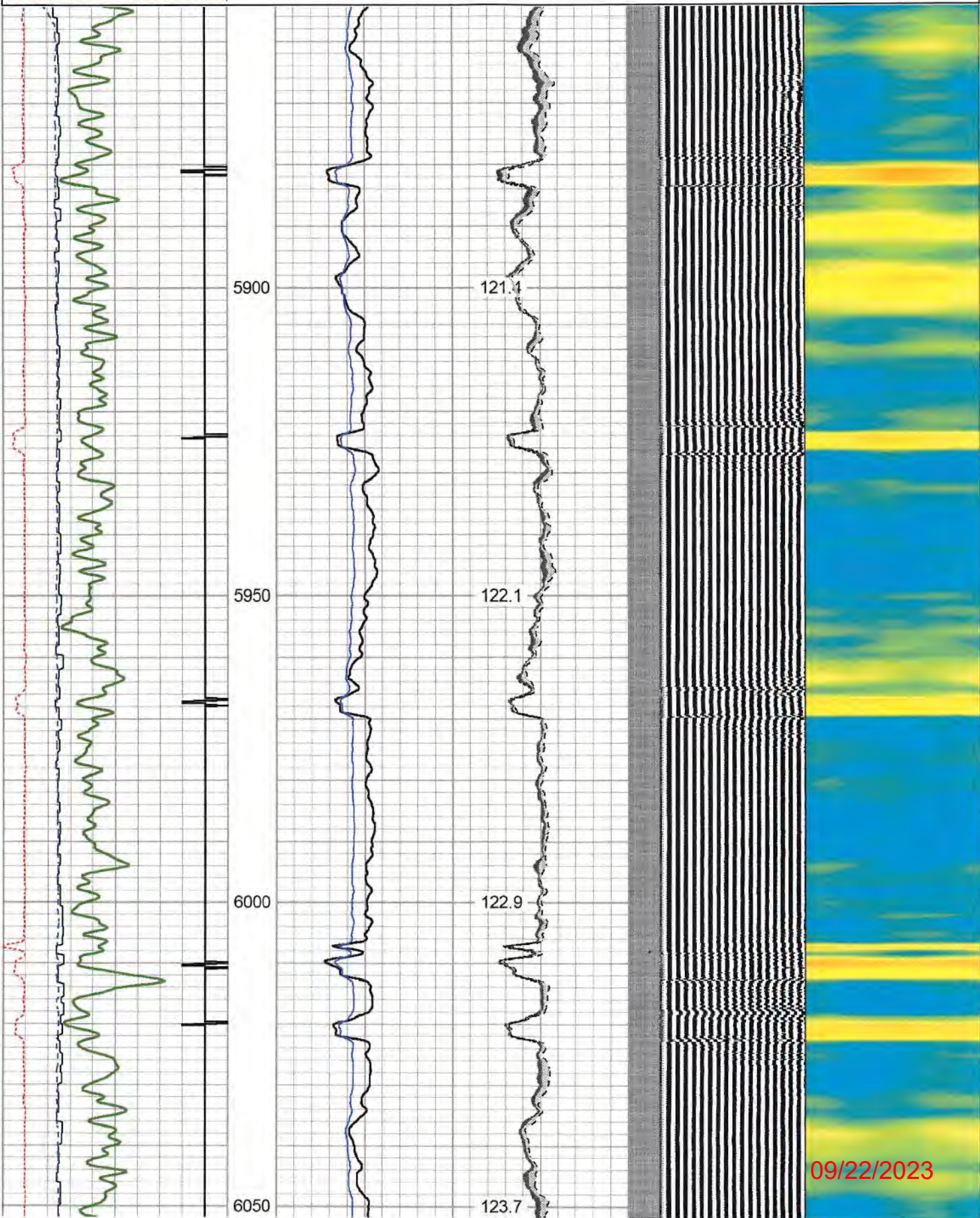
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 Presentation Format rcbl 2
 Dataset Creation Fri Jan 20 08:25:53 2023
 Charted by Depth in Feet scaled 1:240

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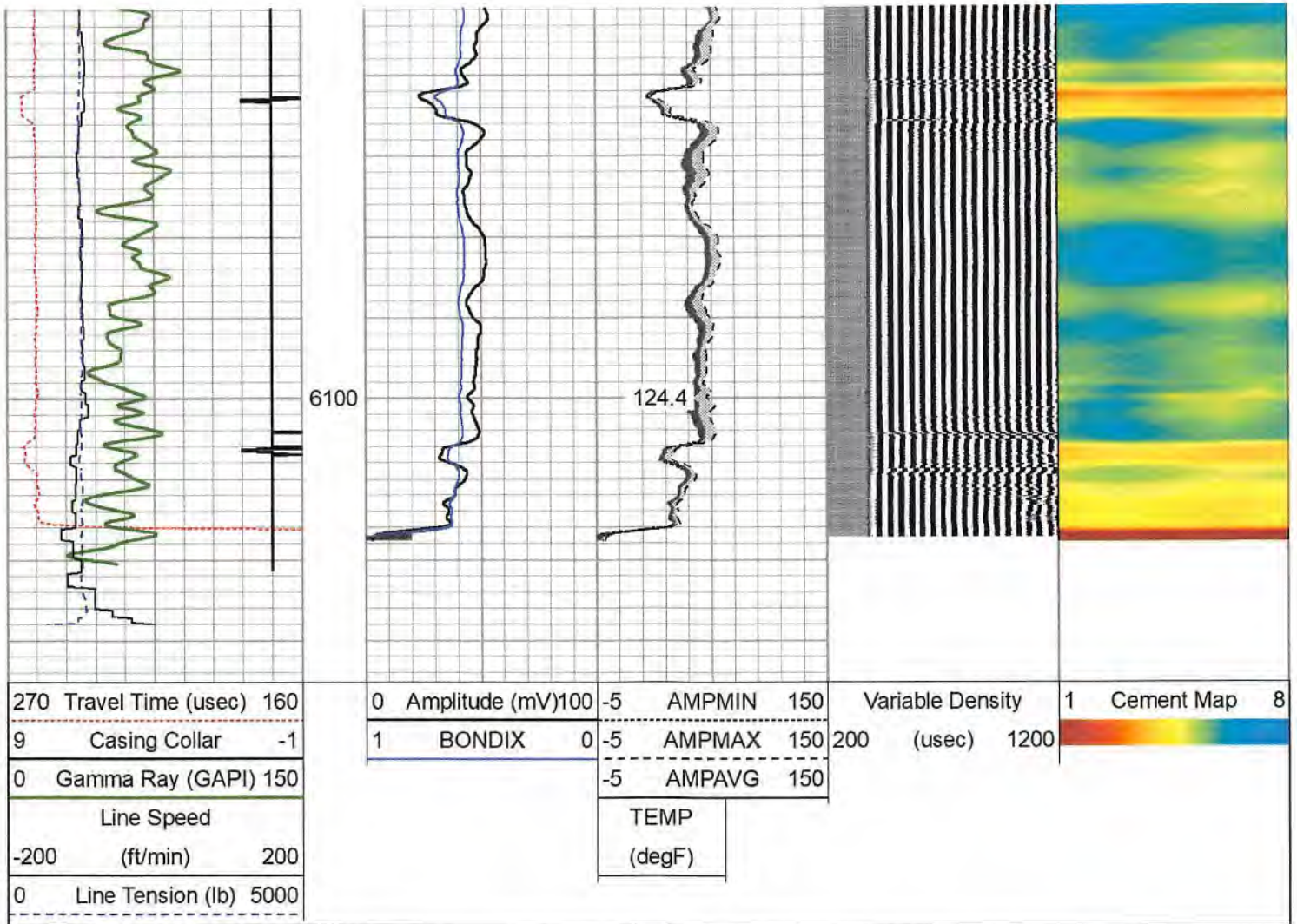
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9	Casing Collar	-1	1	BONDIX	0	-5	AMPMAX	150	200 (usec)	1200		

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

-5 AMPAVG 150
TEMP
(degF)



09/22/2023



Log Variables

Database: F:\Antero Beech Run RCBLs\Atwood 1H\antero_atwood_1h_rcbl_20_jan_2023.db
 Dataset: field/atwood1h/run1/pass6/_vars_

Top - Bottom

BHTEMP_Src	BOREID	BOTTEMP	CASEOD	CASETHCK	CASEWGHT	MAXAMPL	MINAMPL
	in	degF	in	in	lb/ft	mV	mV
TEMP	7.875	142	5.5	0.415	23	71.9	3.4
MINATTN	PERFS	PPT	SRFTEMP	TDEPTH			
db/ft		usec	degF	ft			
9.6	No	260	32	7110			

Variable Description

BHTEMP_Src : BHTEMP Input Source Selector
 BOREID : Borehole I.D.
 BOTTEMP : Bottom Hole Temperature
 CASEOD : Casing O.D.
 CASETHCK : Casing Thickness
 CASEWGHT : Casing Weight
 MAXAMPL : Maximum Amplitude

MINAMPL : Minimum Amplitude
 MINATTN : Minimum Attenuation
 PERFS : Perforation Flag
 PPT : Predicted Pipe Time
 SRFTEMP : Surface Temperature
 TDEPTH : Total Depth

Calibration Report

Database File: F:\Antero Beech Run RCBLs\Atwood 1H\antero_atwood_1h_rcbl_20_jan_2023.db
 Dataset Pathname: atwood1h/run1/pass6
 Dataset Creation: Fri Jan 20 08:35:32 2023

09/22/2023

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

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JUN 23 2023
 WV Department of
 Environmental Protection

Serial Number: 2.75"
 Tool Model: Probe275T

Calibration Casing Diameter: 5.500 in
 Calibration Depth: 3640.717 ft

Master Calibration, performed Fri Jan 20 08:15:41 2023:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.008	0.931	3.400	71.921	74.291	2.775
CAL	1.464	1.466				
5'	-0.006	0.770	3.400	71.921	88.258	3.933
SUM						
S1	0.075	0.942	0.000	100.000	115.262	-8.629
S2	-0.004	0.861	0.000	100.000	115.569	0.450
S3	-0.001	0.880	0.000	100.000	113.511	0.087
S4	-0.002	0.929	0.000	100.000	107.435	0.223
S5	0.001	0.973	0.000	100.000	102.872	-0.085
S6	-0.004	0.982	0.000	100.000	101.343	0.455
S7	-0.004	0.967	0.000	100.000	102.957	0.452
S8	-0.005	0.920	0.000	100.000	108.040	0.578

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	1.464	1.466	1.000	0.000

Air Zero Calibration, performed Fri Jan 20 07:41:47 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	

09/22/2023

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	
			CENT-Overbody Antelope (SP-919-0233)	1.67	4.88	5.00	
Temp	14.10						
			RBT-Probe275T (2.75") Probe 2.75" Radial with Integral Temperature Sub	9.39	2.75	90.00	
WVFS8	11.86						
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						
CCL	6.71						
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_atwood_1h_rcbl_20_jan_2023.db: field/atwood1h/run1/pass6
 Total length: 18.03 ft
 Total weight: 182.00 lb
 O.D.: 4.88 in

09/22/2023

	Company	ANTERO RESOURCES
	Well	Beech Run Atwood 1H
	Field	Rabbit Ears
	County	Tyler
	State	WV

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JUN 23 2023

WV Department of
Environmental Protection