



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

Company: Antero Resources		Well: Nomad 1H		Field: Rabbit Ears		County: Tyler		State: WV	
Location:		API #: 47-095-02822		Other Services					
Permanent Datum	Log Measured From	Drilling Measured From	SEC	TWP	RGE	Ground Level	Elevation	Elevation	
						Kelly Bushing 30'	1,223'	K.B. 1,253'	D.F. 1,253'
						Kelly Bushing		G.L. 1,223'	

Date	02/18/2023	
Run Number	ONE	
Depth Driller	23,243'	
Bottom Logged	7,042'	
Bottom Logged Interval	7,068'	
Top Log Interval	Surface	
Open Hole Size	NA	
Type Fluid	Fresh Water	
Density / Viscosity	8.6 LB/GAL	
Max. Recorded Temp.	140.0 DEG.F.	
Estimated Cement Top	NA	
Time Well Ready	Arrival	
Time Logger on Bottom	13:25	
Equipment Number	116	
Location	Charleroi, PA	
Recorded By	Calvin Drummond	
Witnessed By	Jerrako Evans	

	Borehole Record		Tubing Record				
	Bit	From	To	Size	Weight	From	To
Casing Record							
Conductor String		20"					
Surface String		13.375"					
Intermediate String		9.625"					
Intermediate String							
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 -3  
MARKER JOINT 6,246' - 6,256'

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

ESTIMATED CEMENT TOP NA

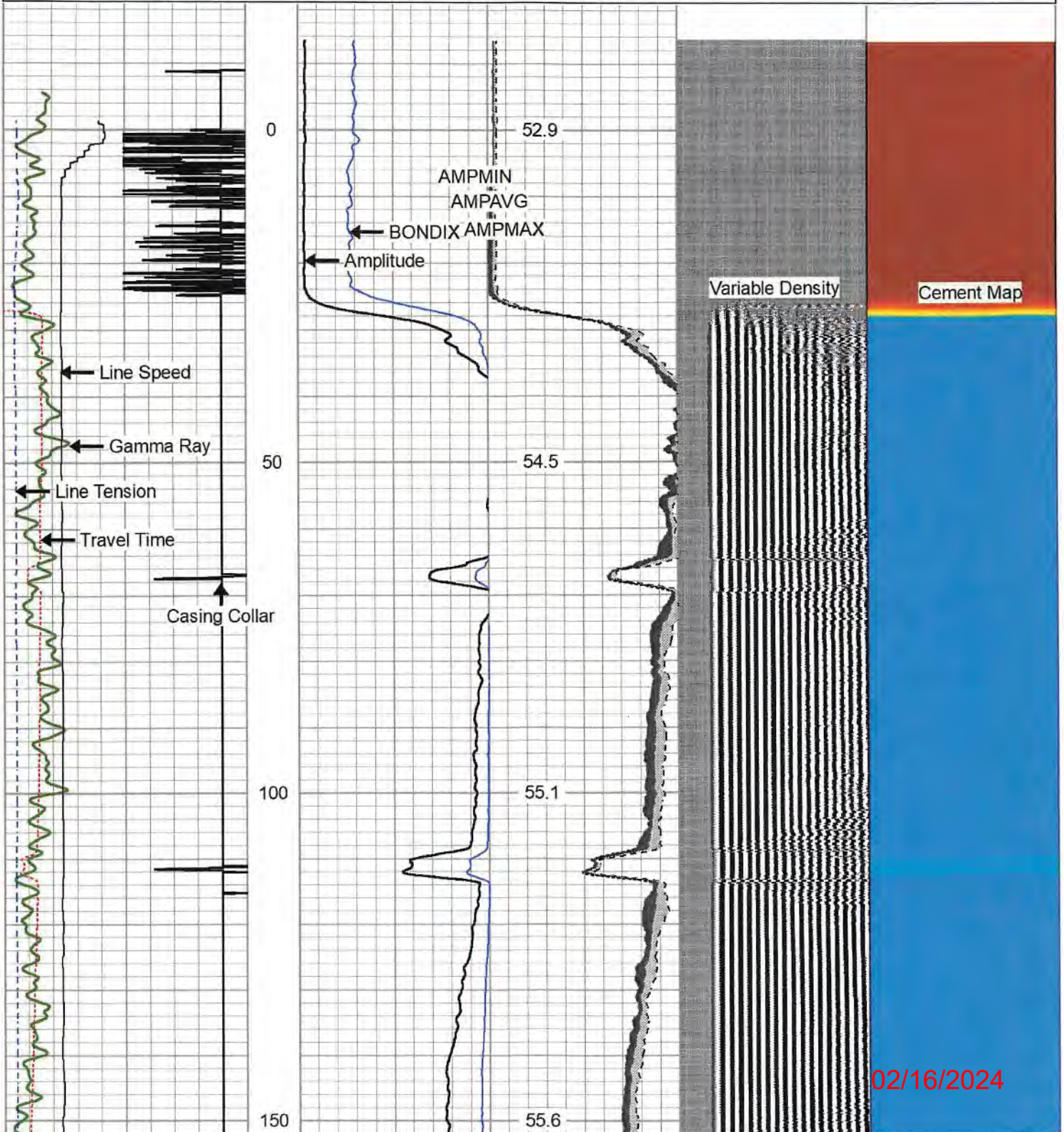
THANK YOU FOR USING NINE ENERGY SERVICES



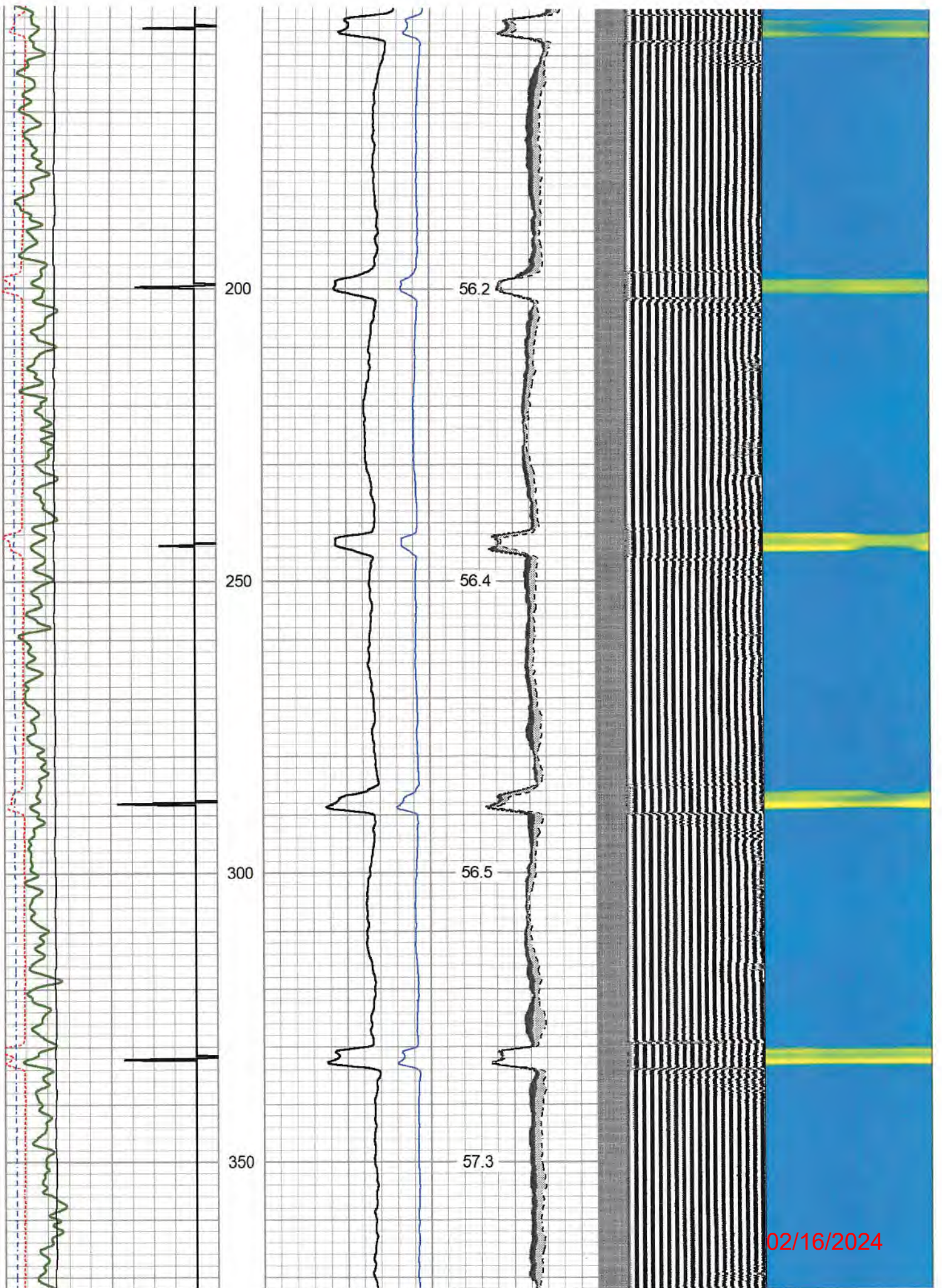
**Main Pass 1500 PSI**

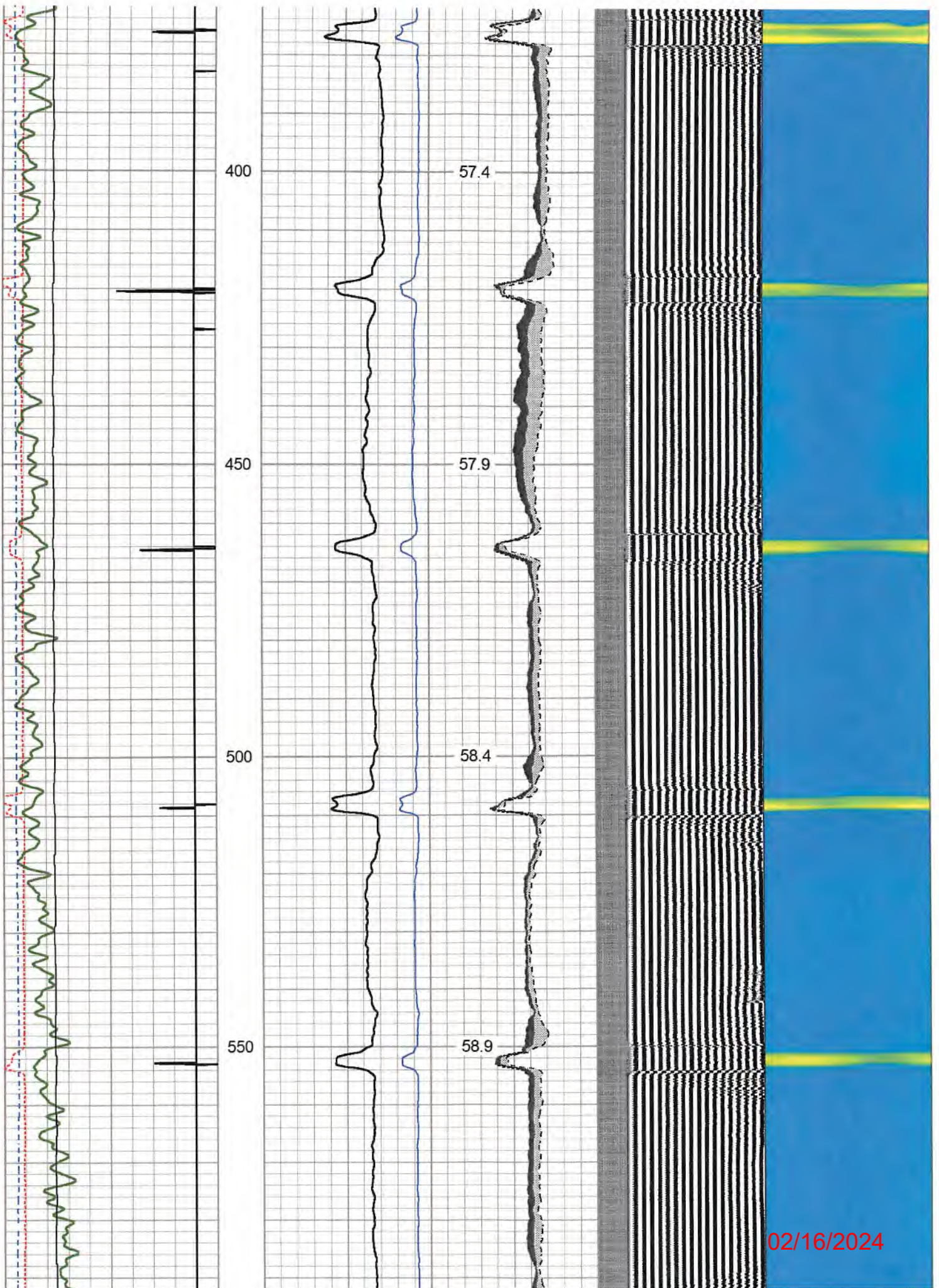
Database File antero\_nomad\_1h\_rcbl\_18\_feb\_2023.db  
 Dataset Pathname merge1  
 Presentation Format rcbl 2  
 Dataset Creation Sat Feb 18 21:46:32 2023  
 Charted by Depth in Feet scaled 1:240

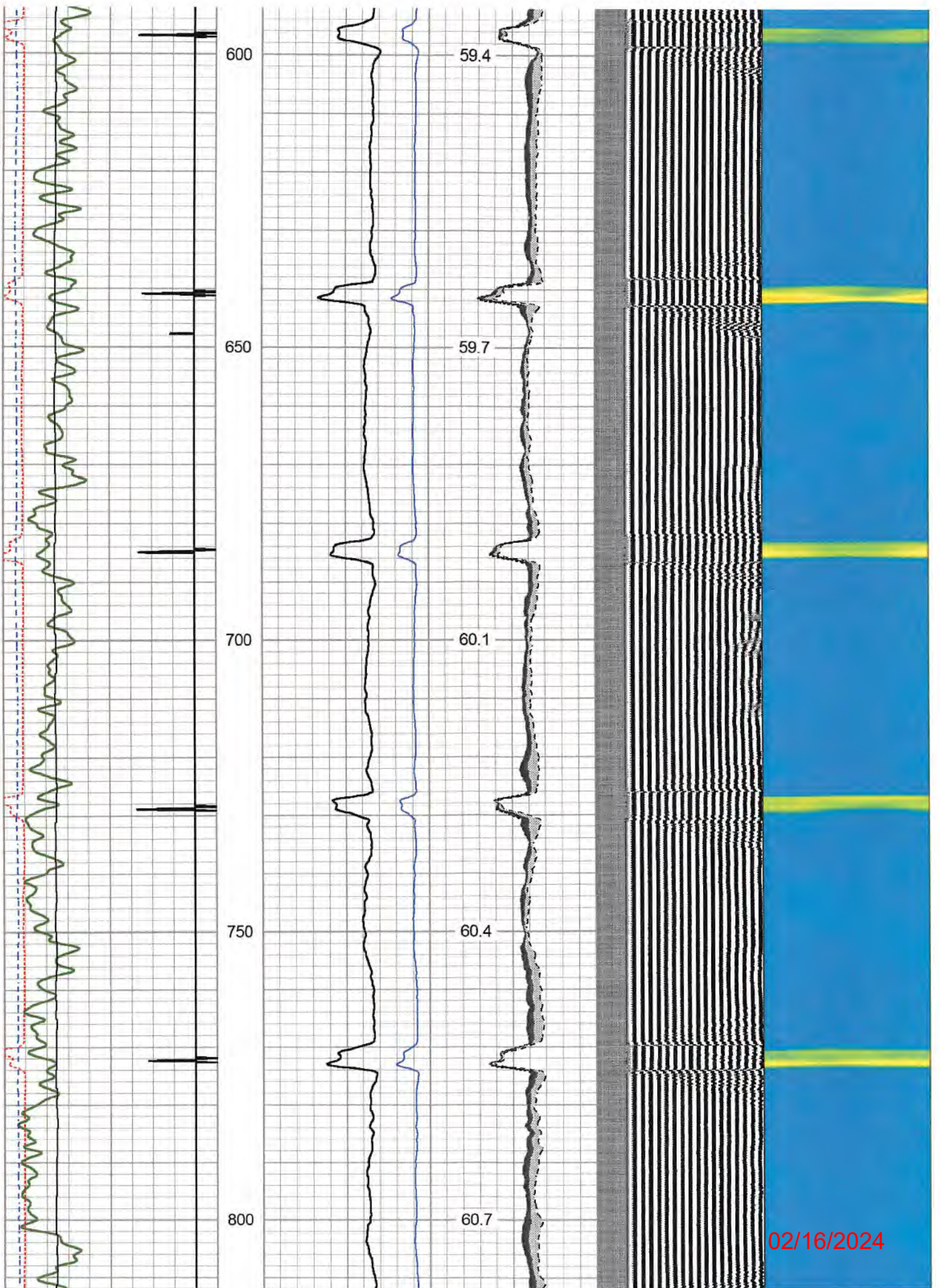
266	Travel Time (usec)	166	0	Amplitude (mV)	100	-5	AMPMIN	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	1	BONDIX	0	-5	AMPMAX	150	200	(usec)	1200	
0	Gamma Ray (GAPI)	150				-5	AMPAVG	150				
	Line Speed						TEMP					
-200	(ft/min)	200					(degF)					
0	Line Tension (lb)	5000										



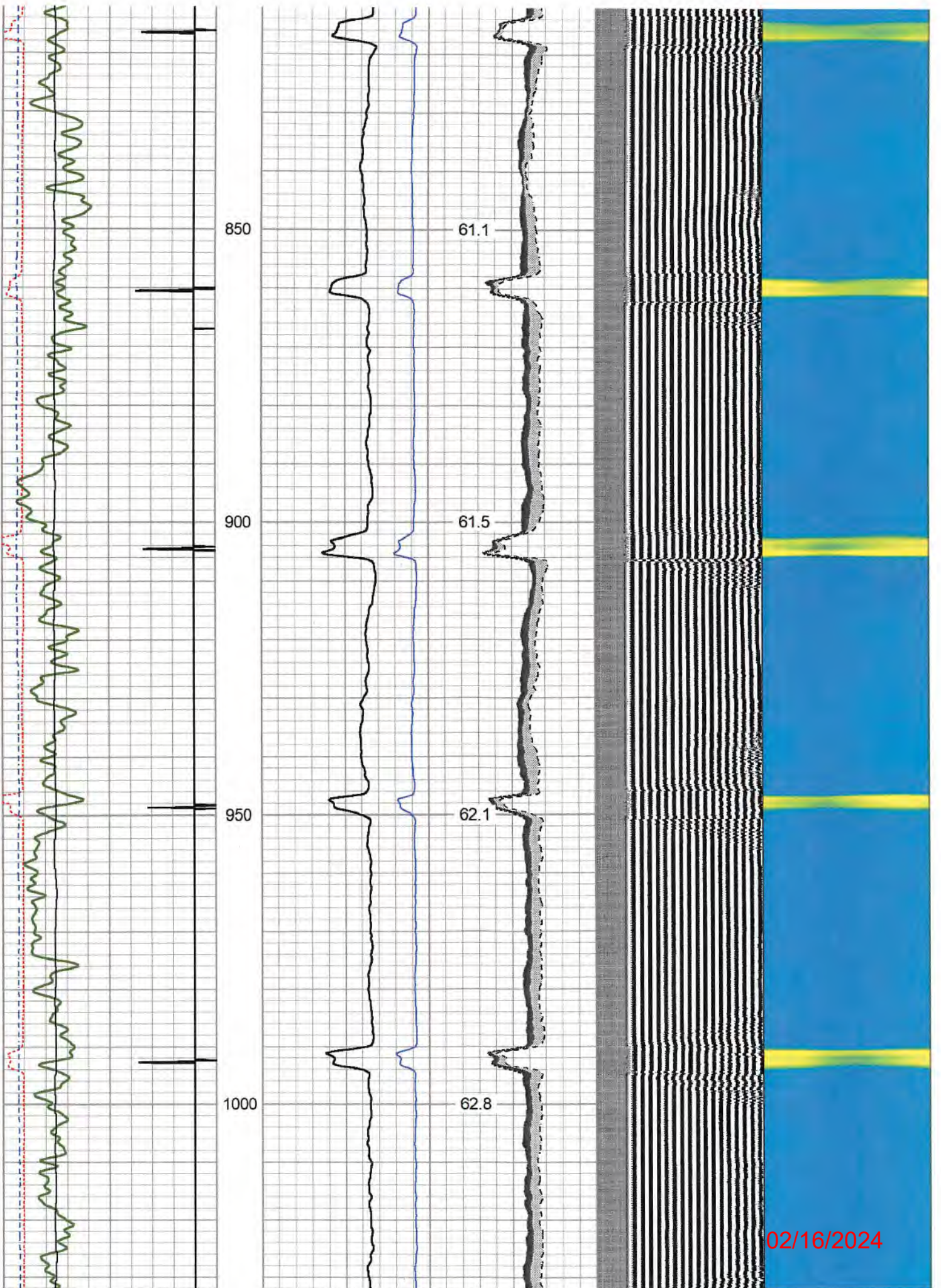
02/16/2024



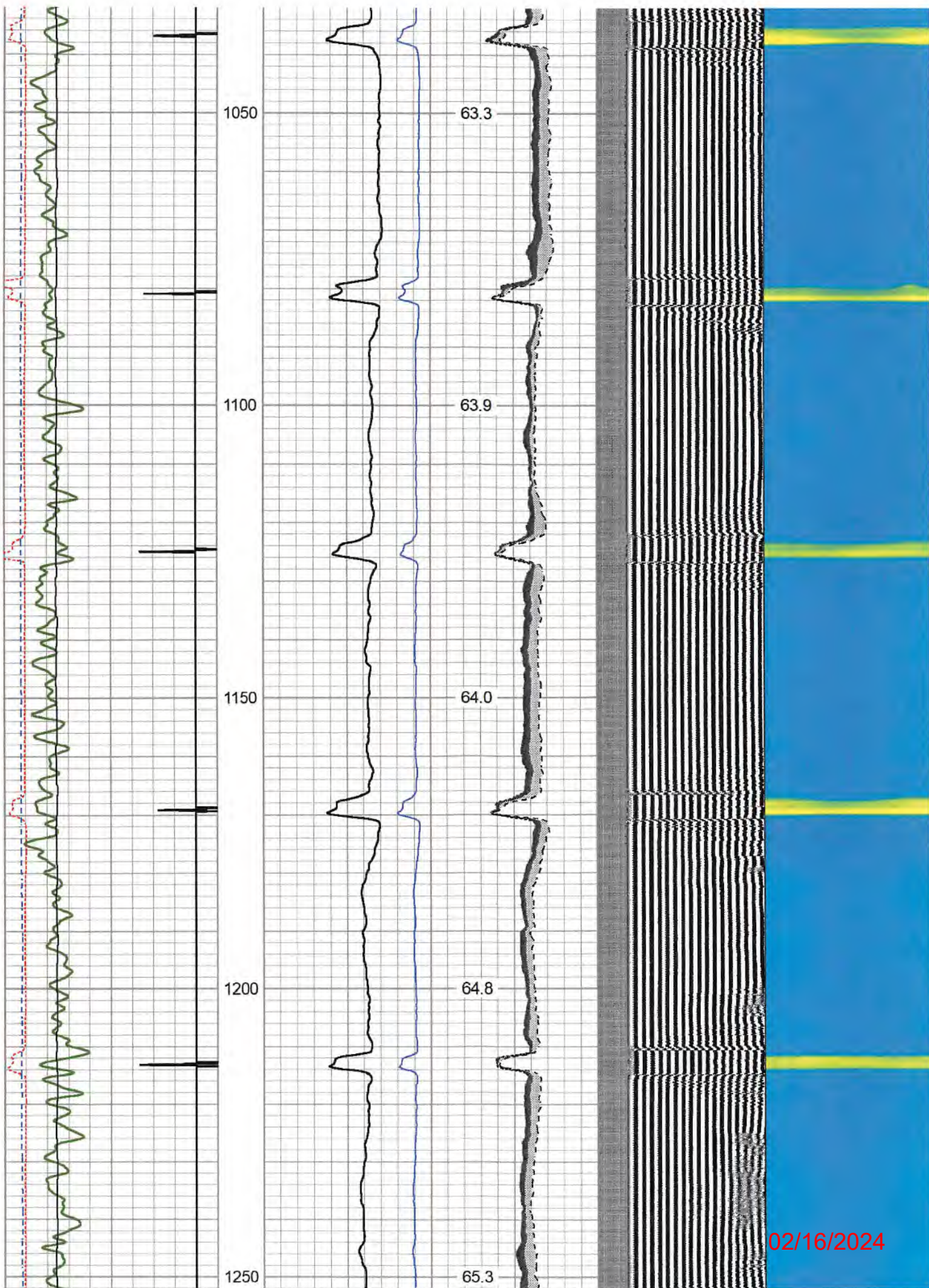


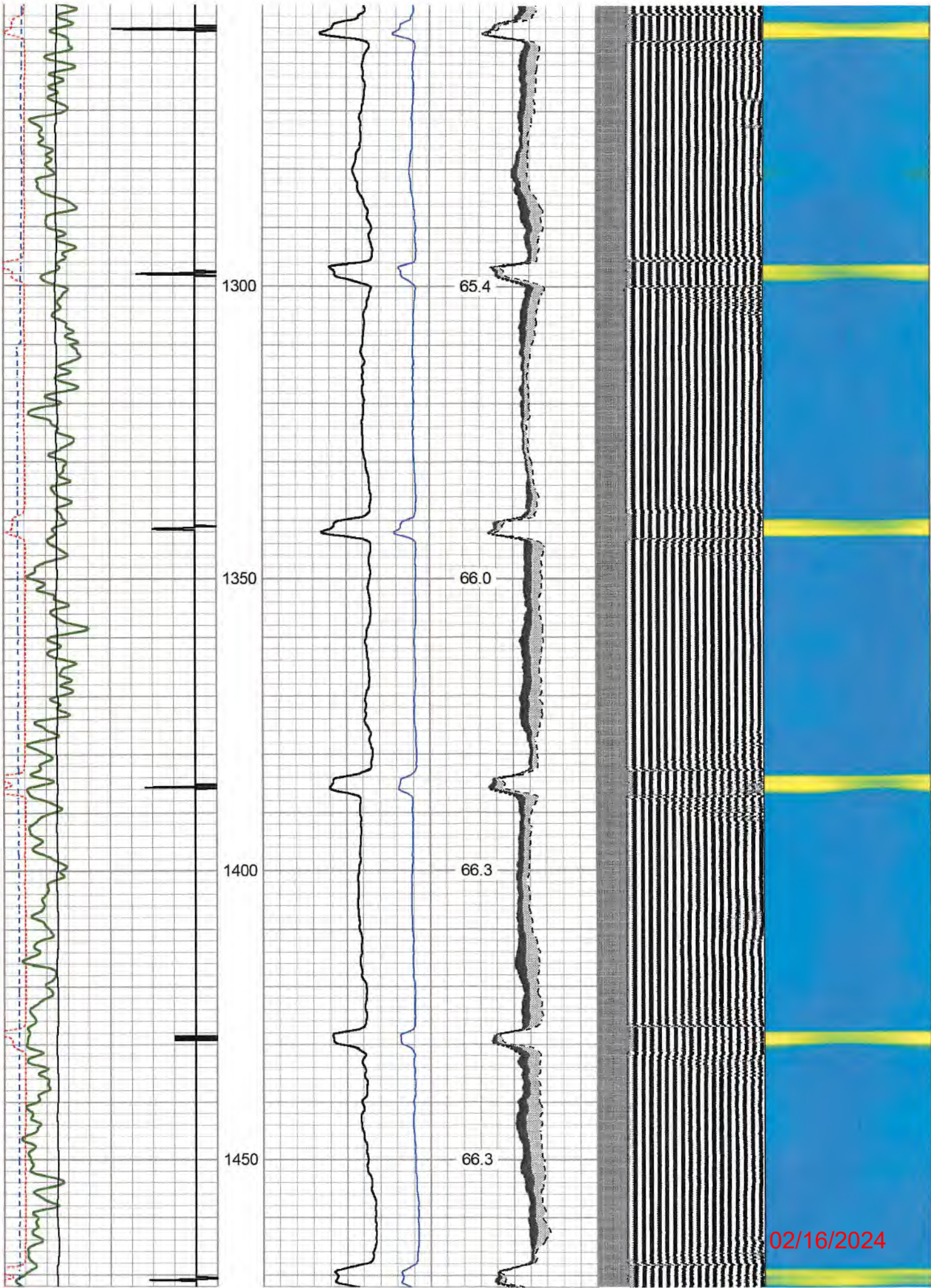


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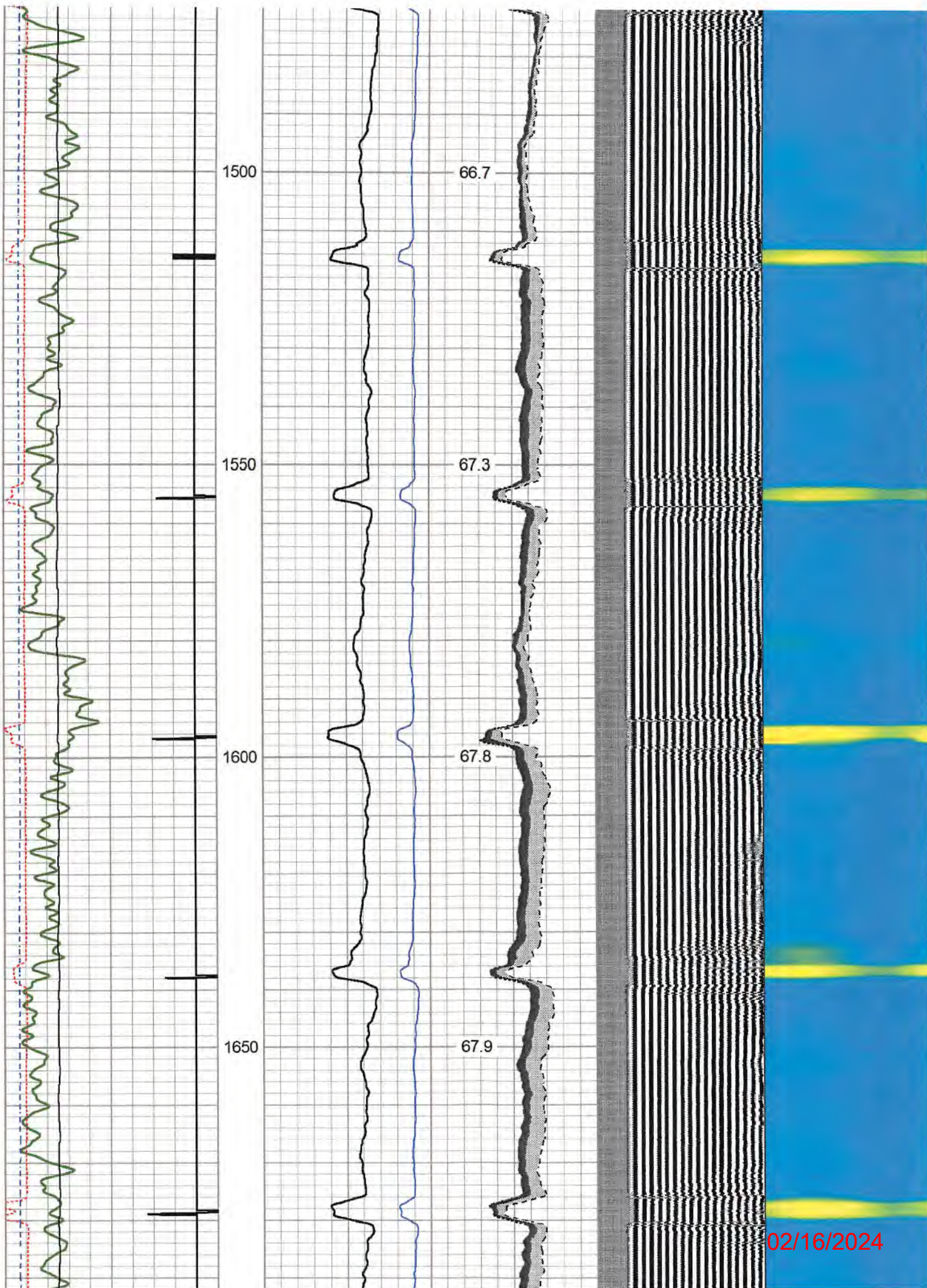
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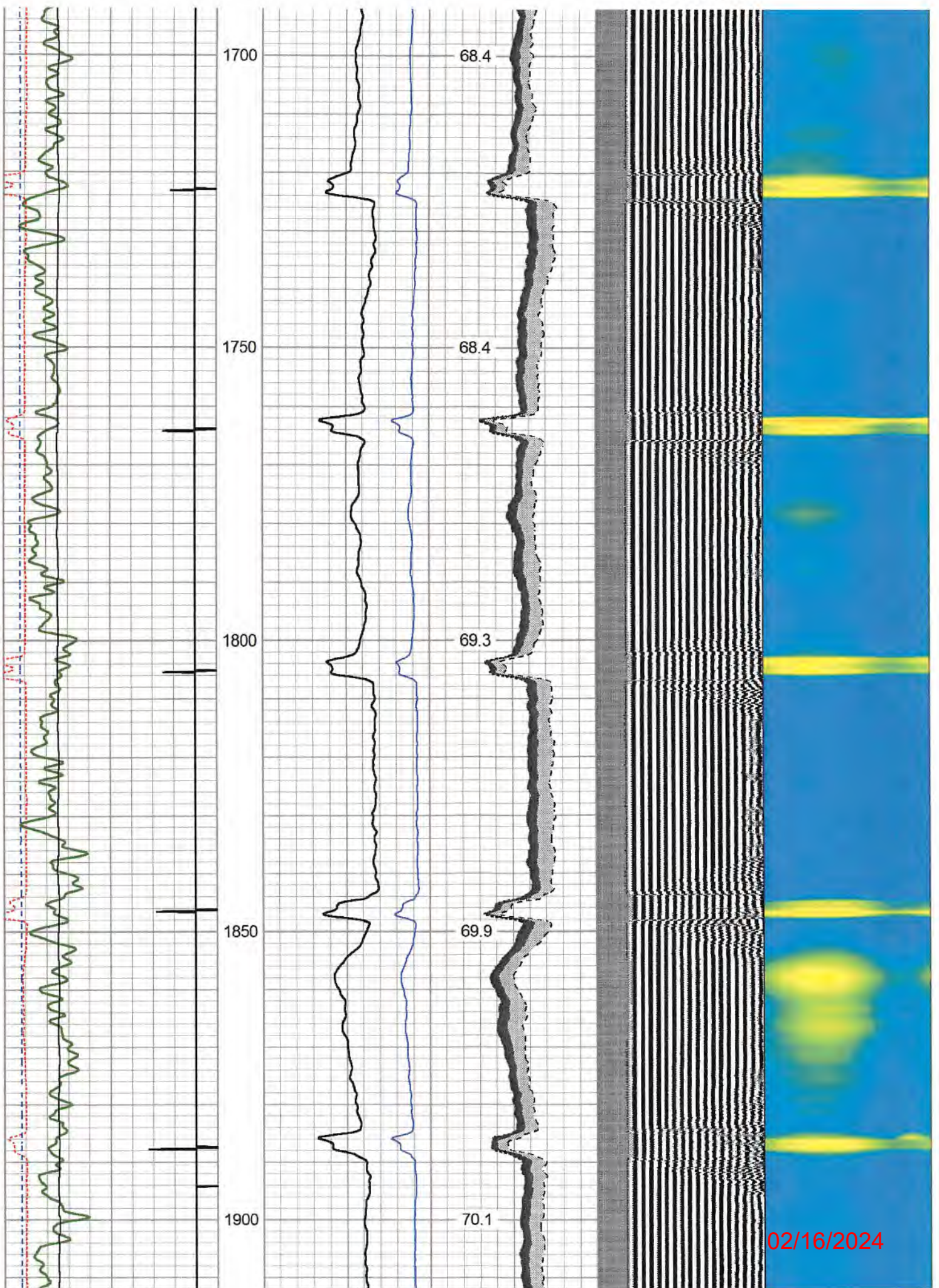


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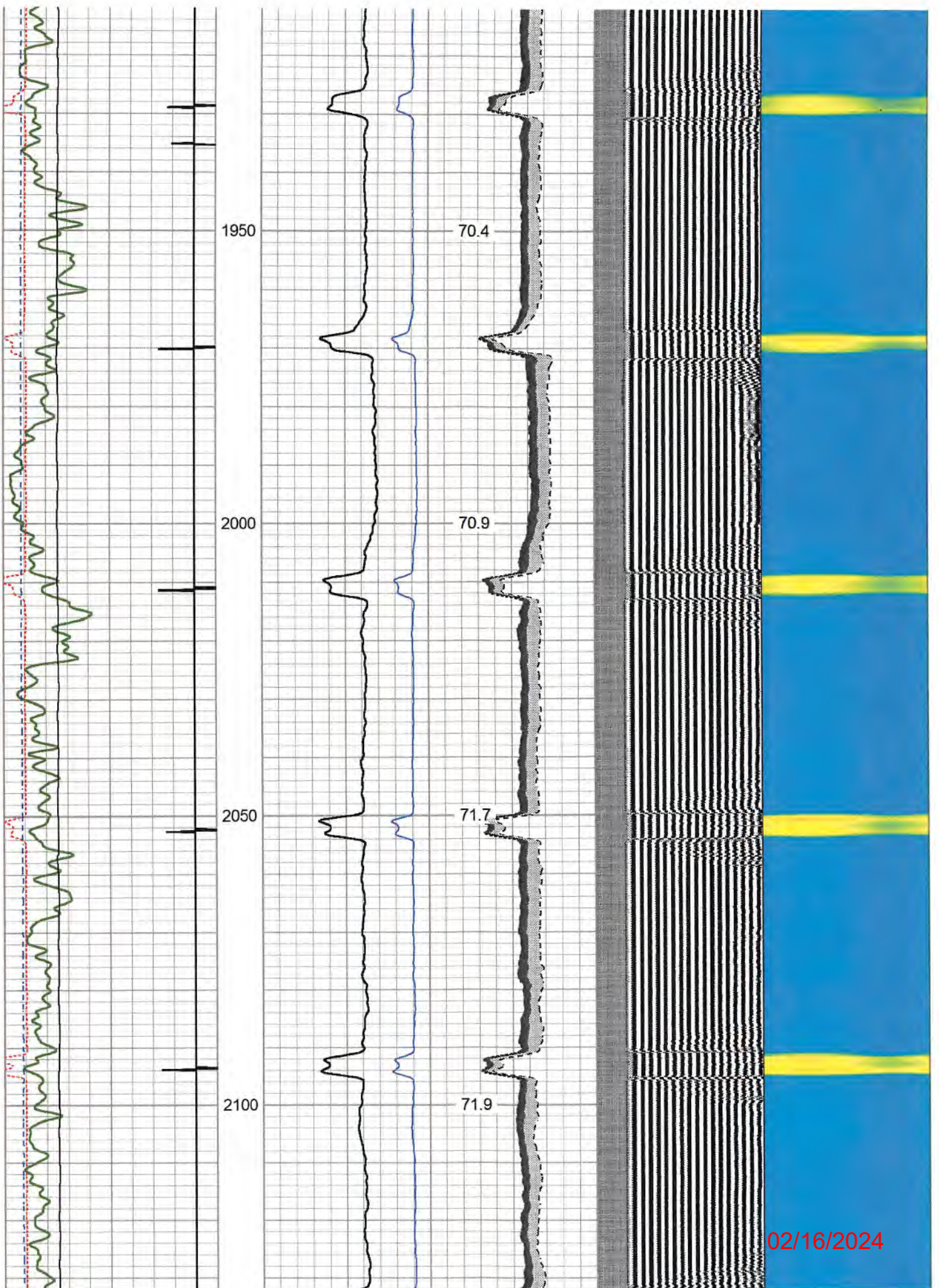




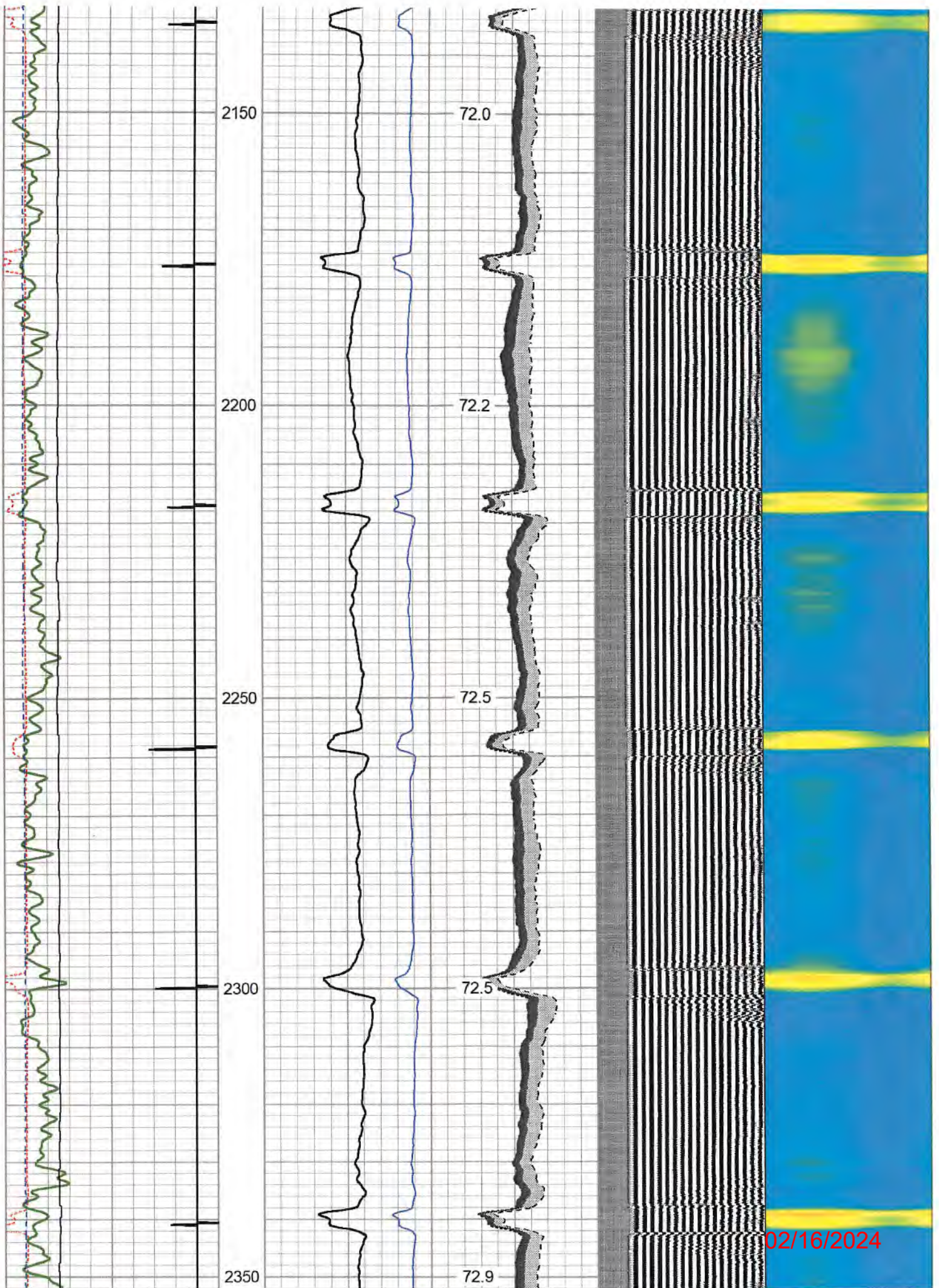
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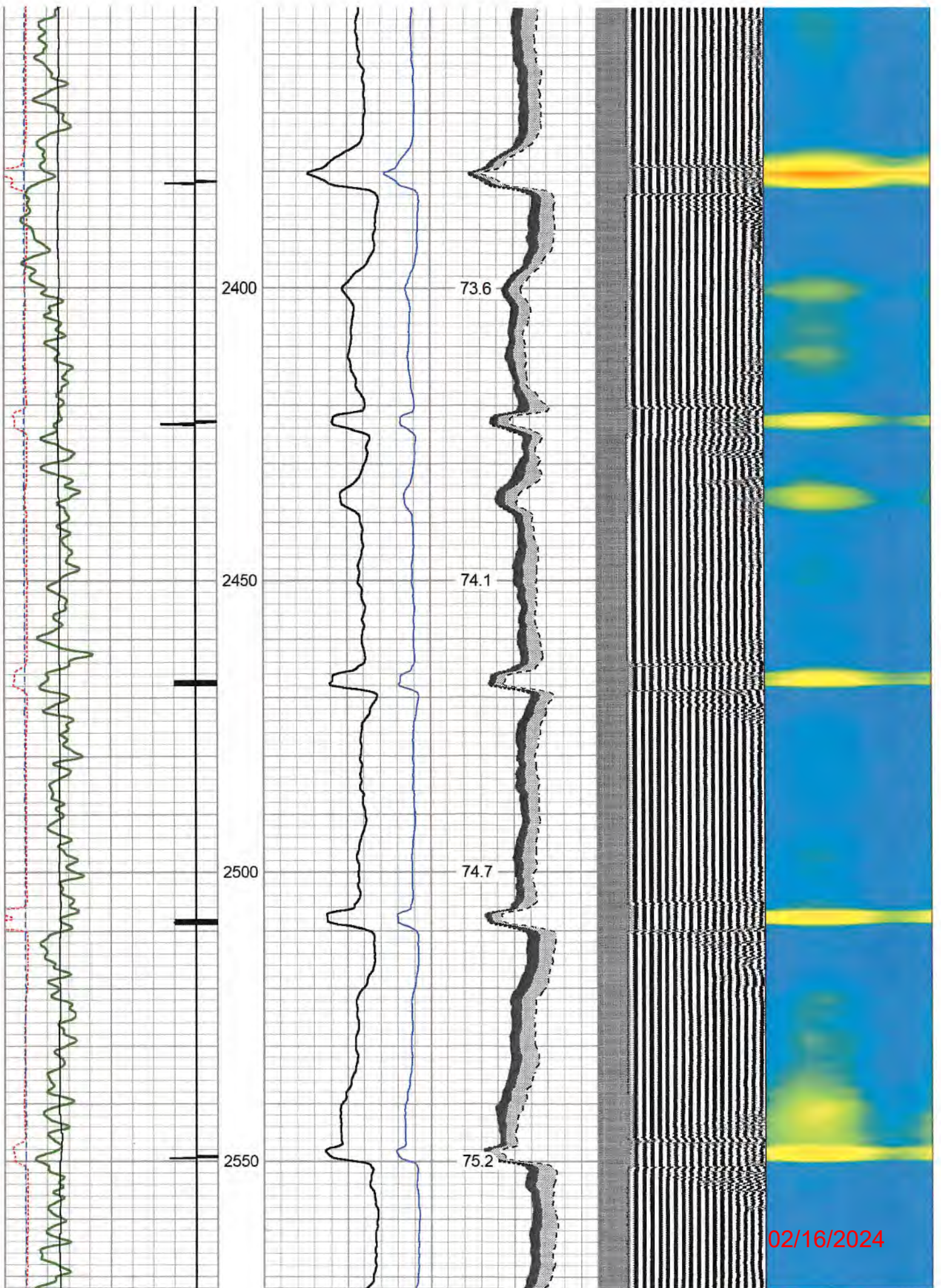


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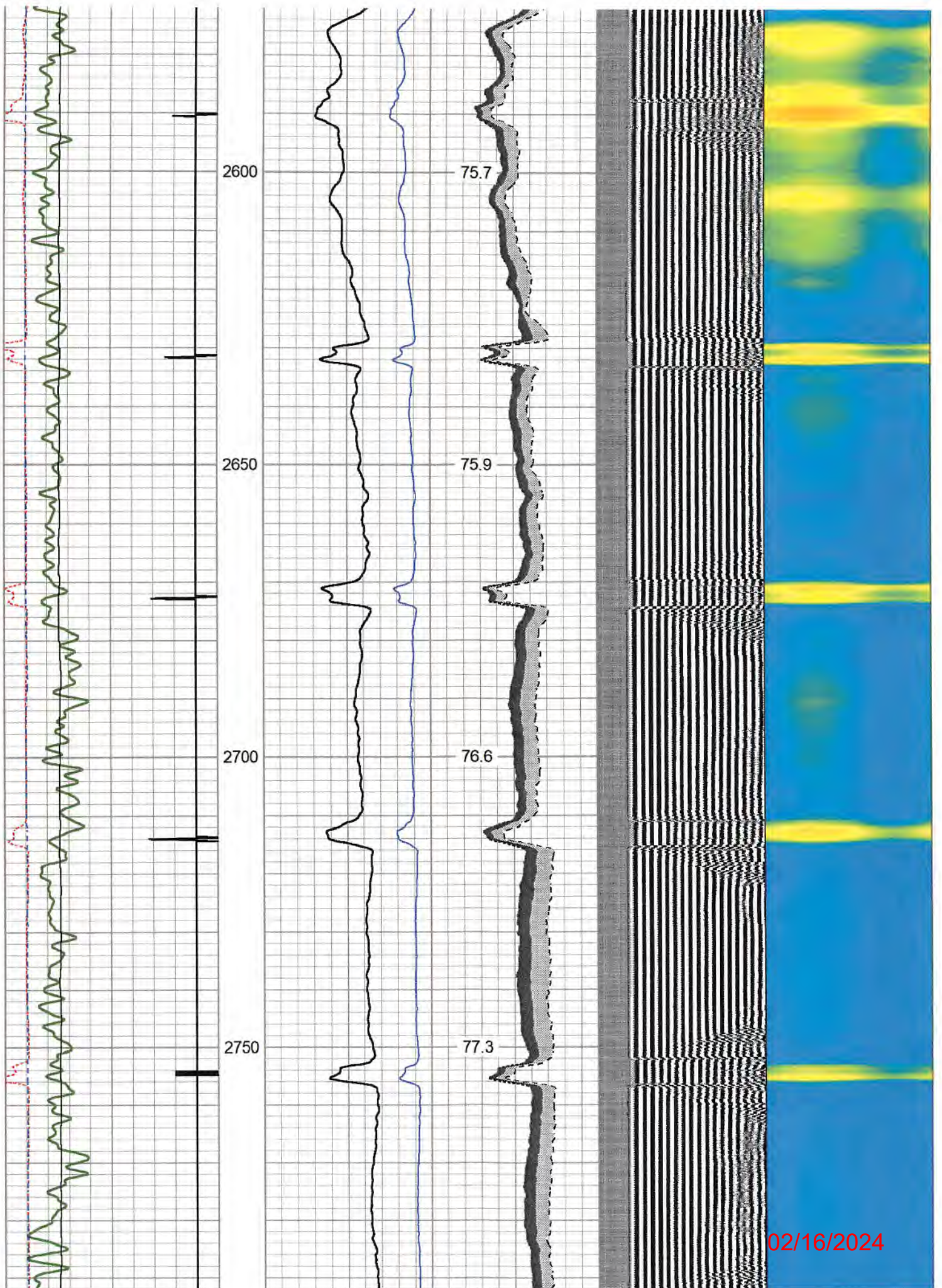


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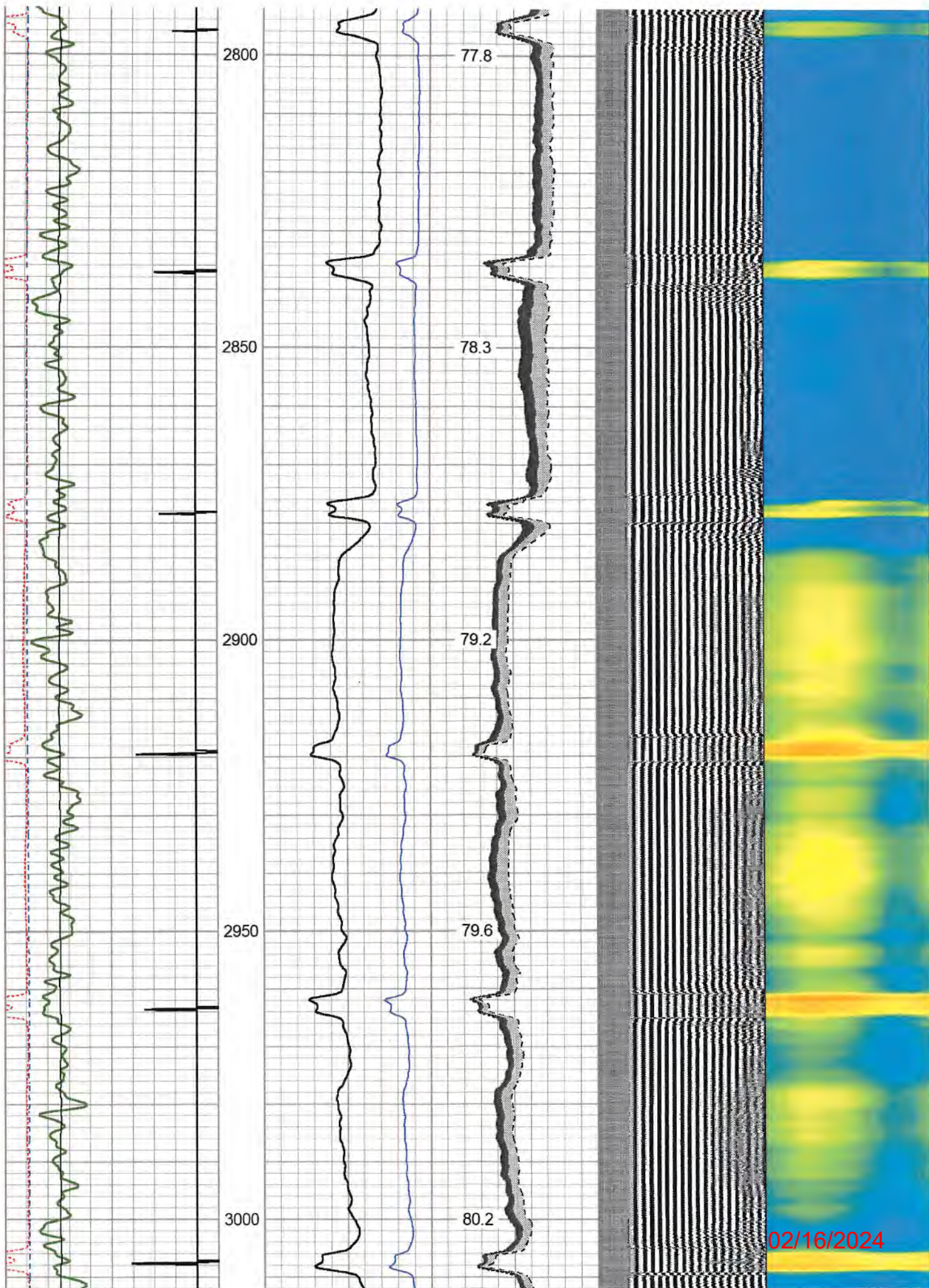


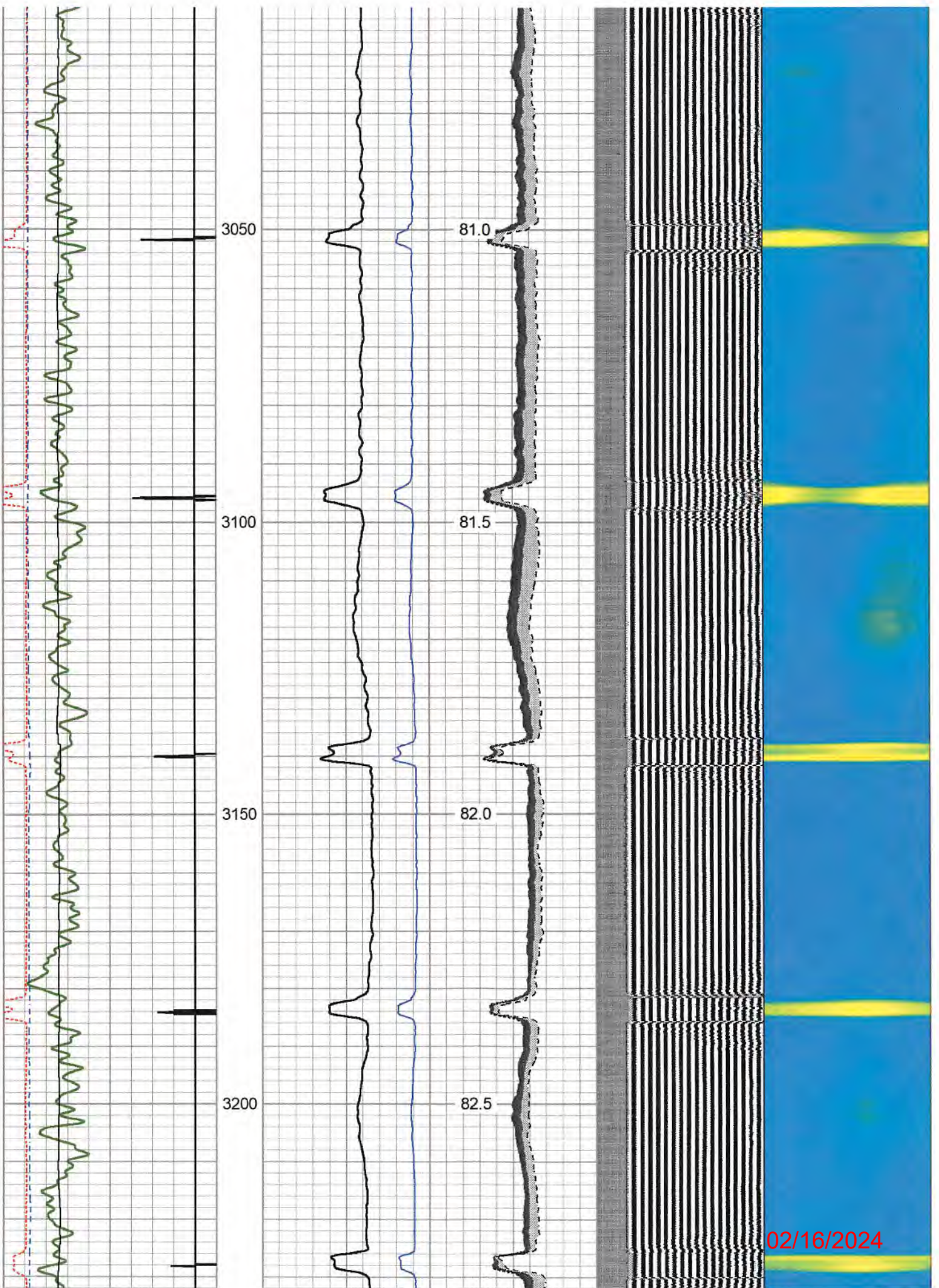


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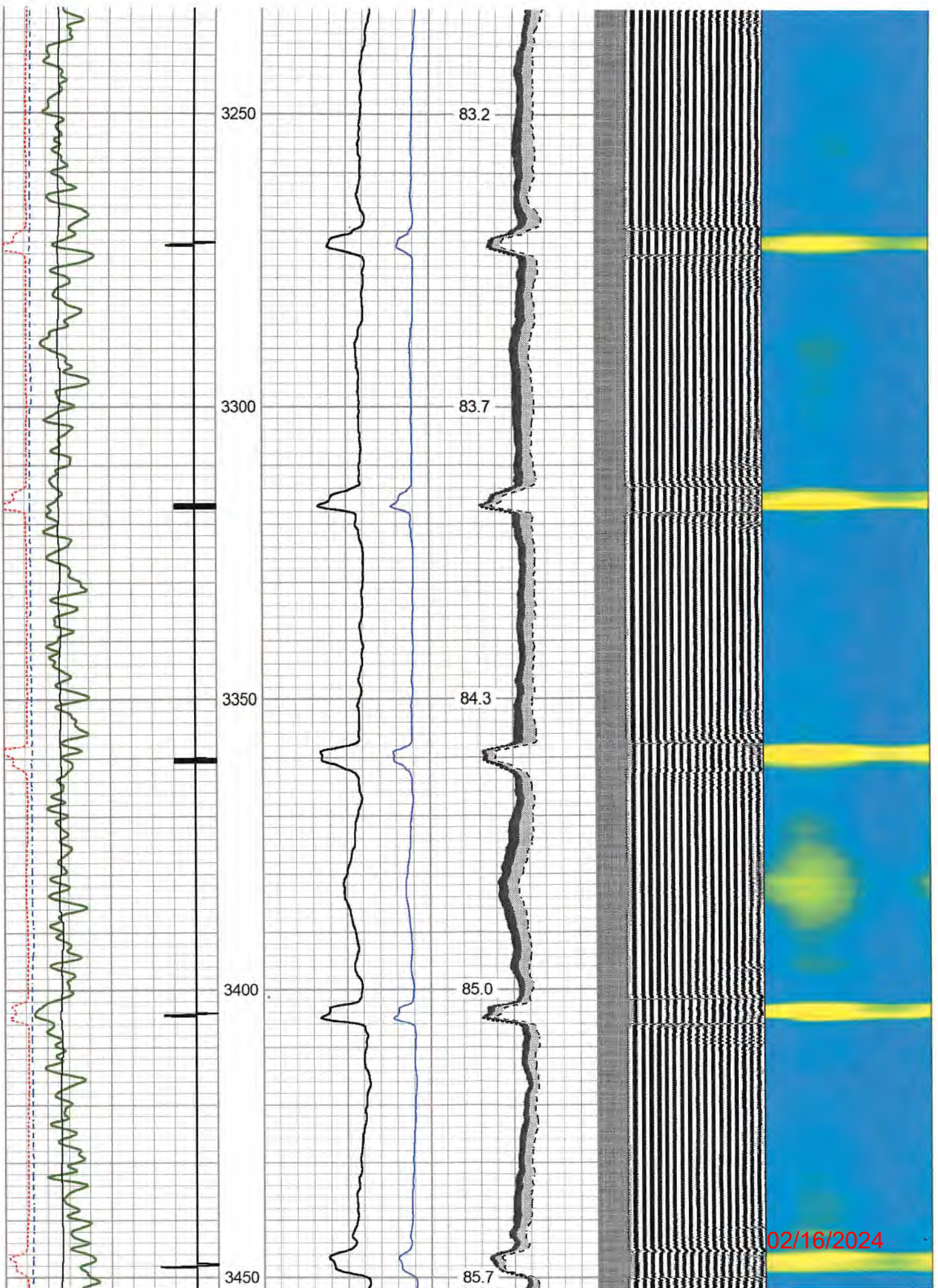
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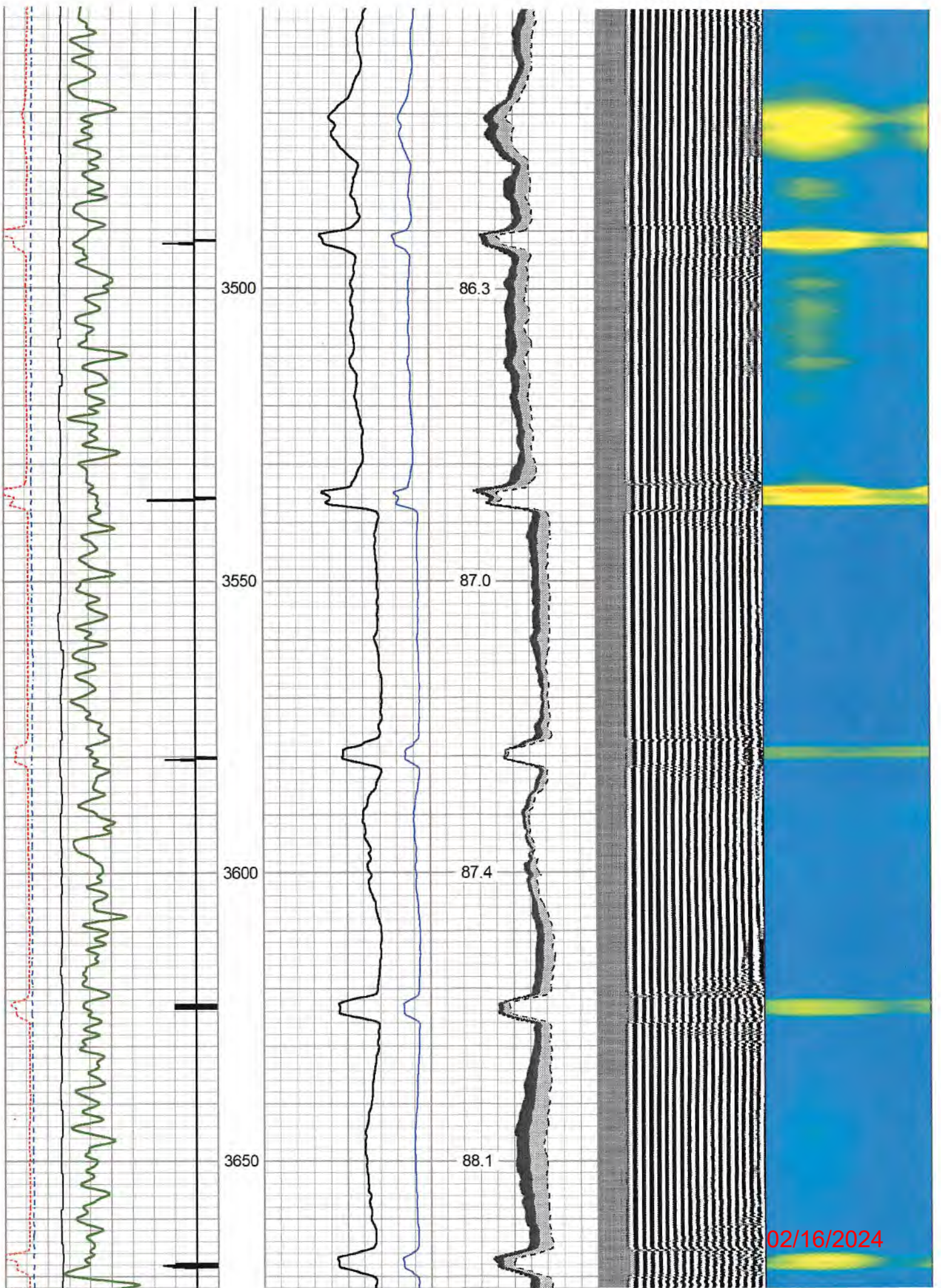


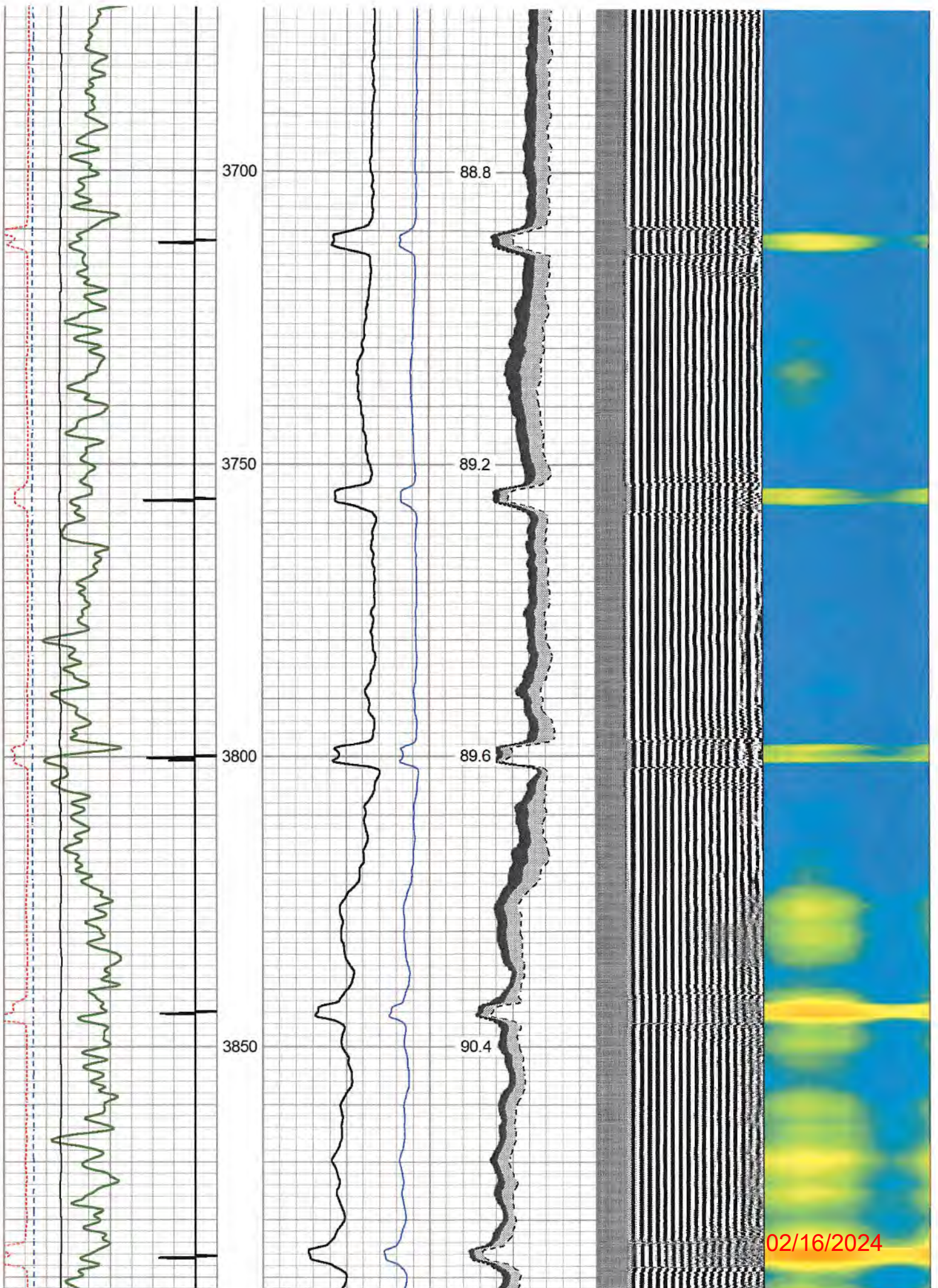
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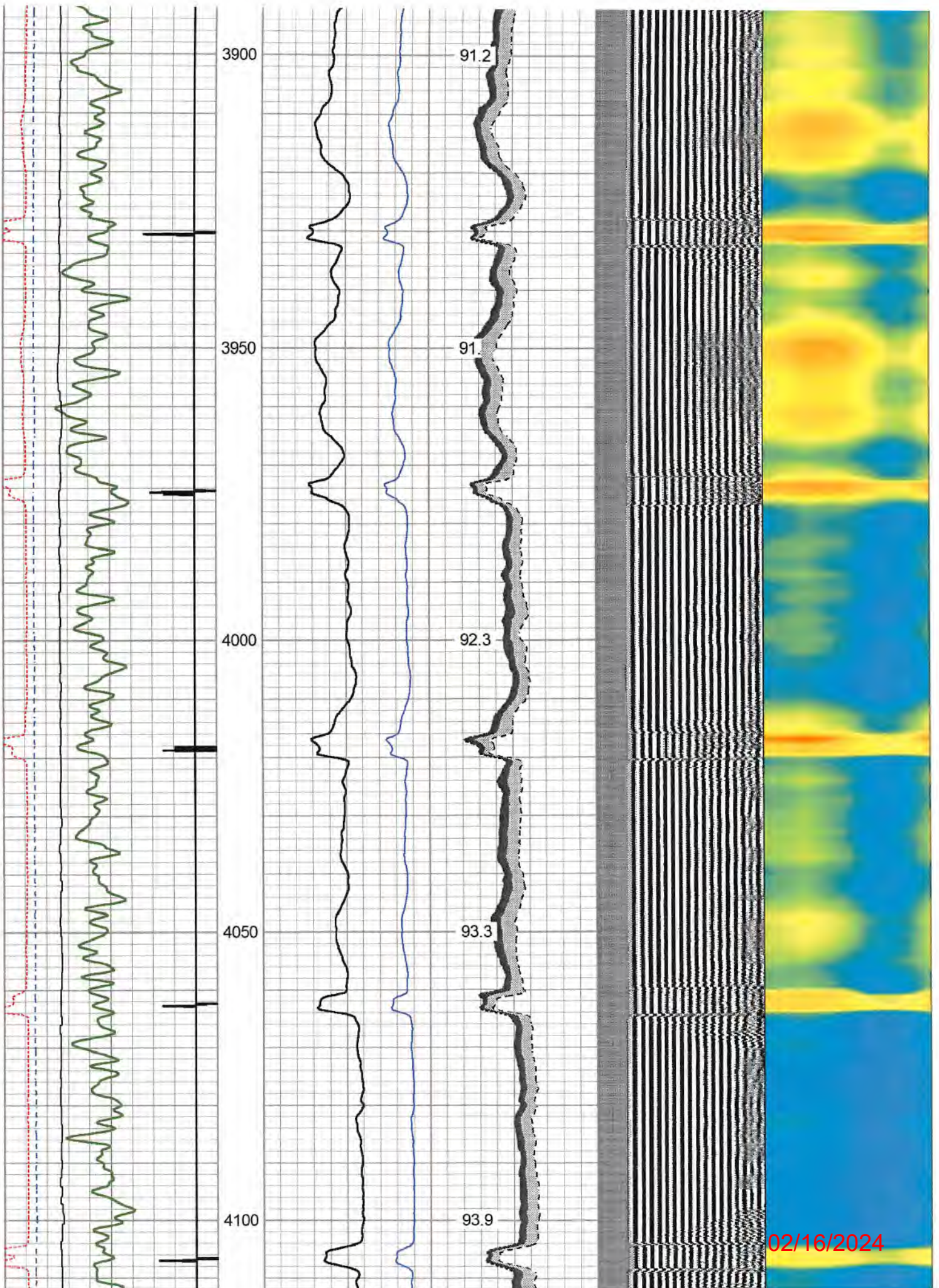


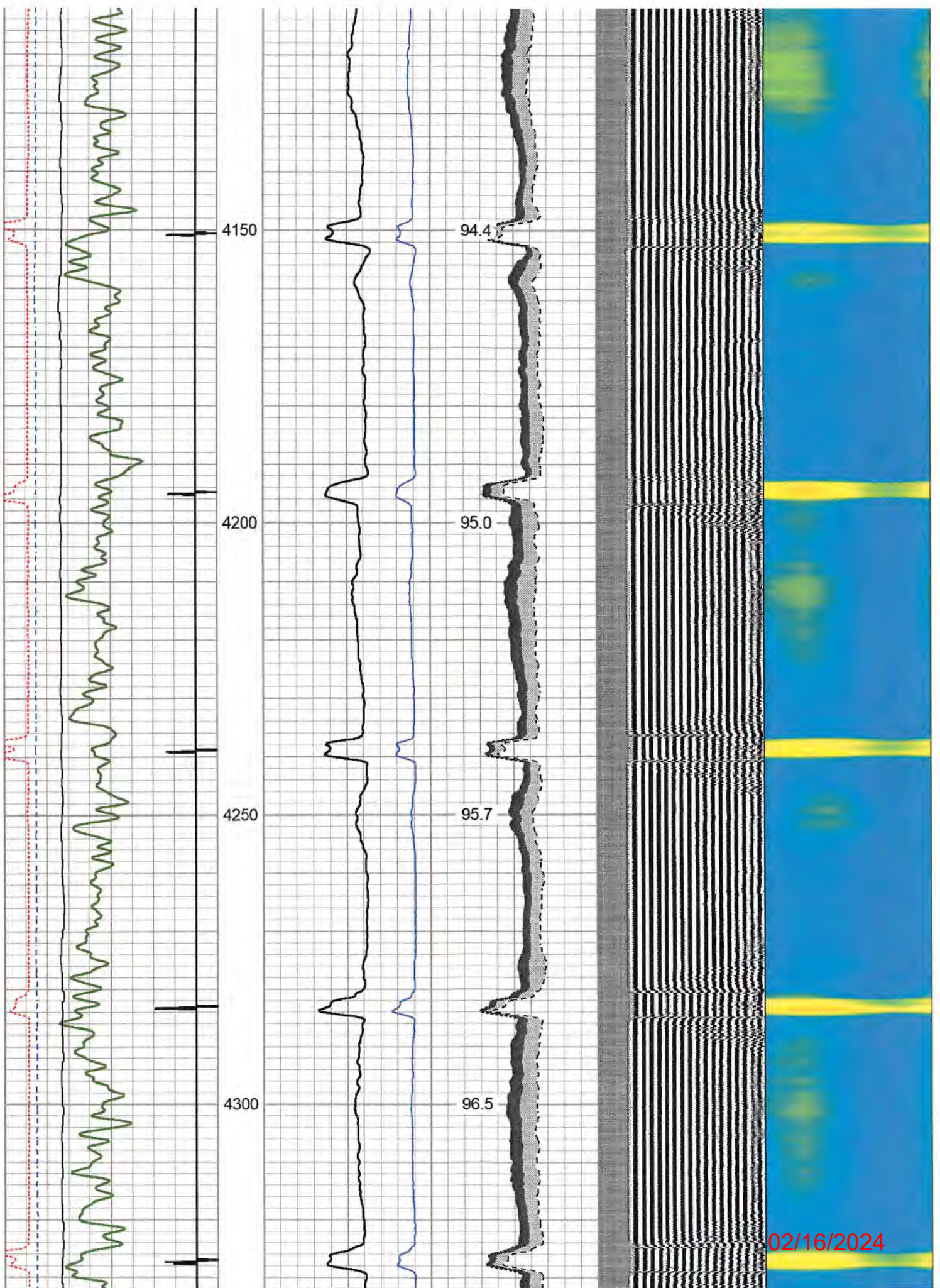


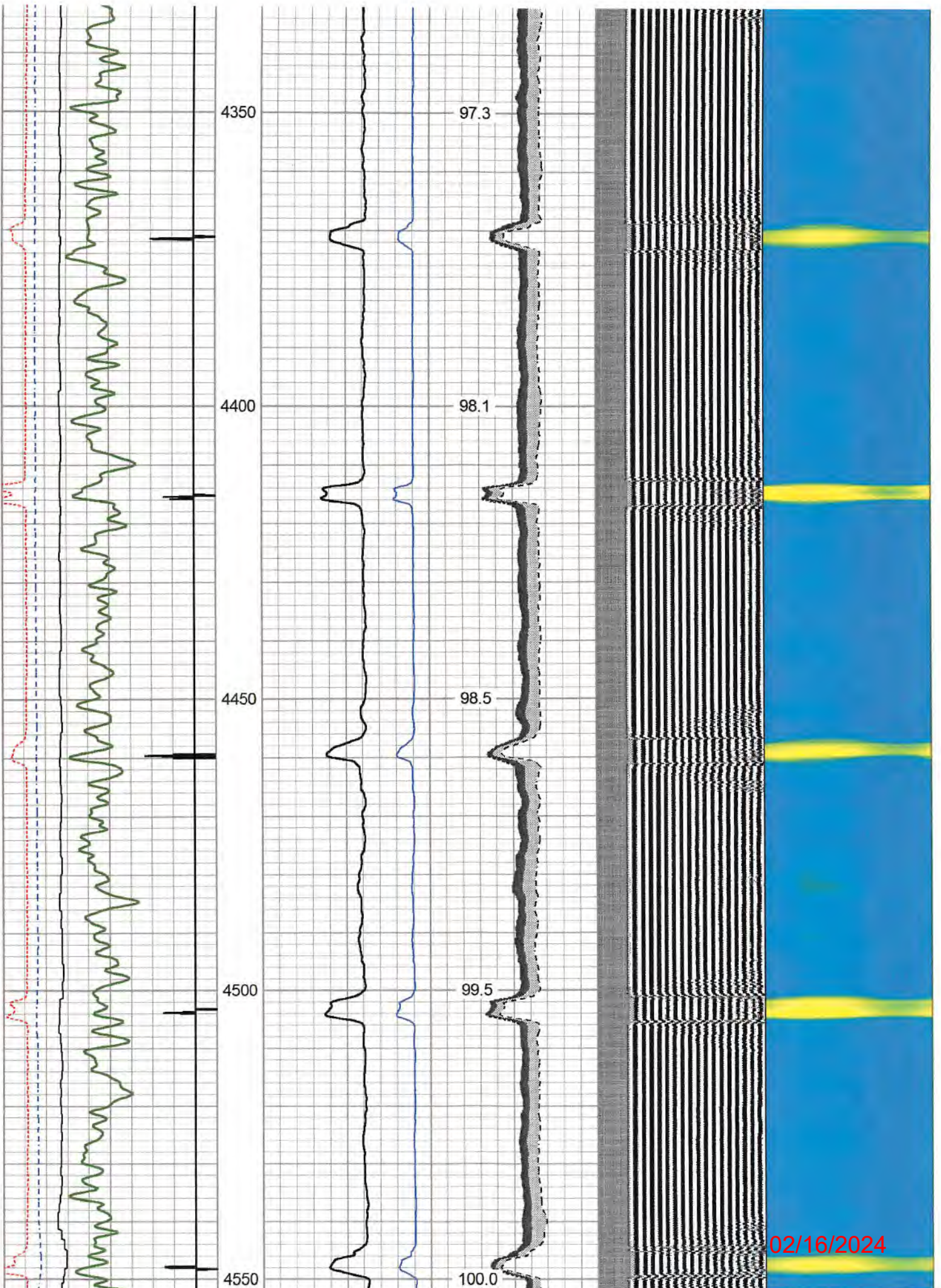
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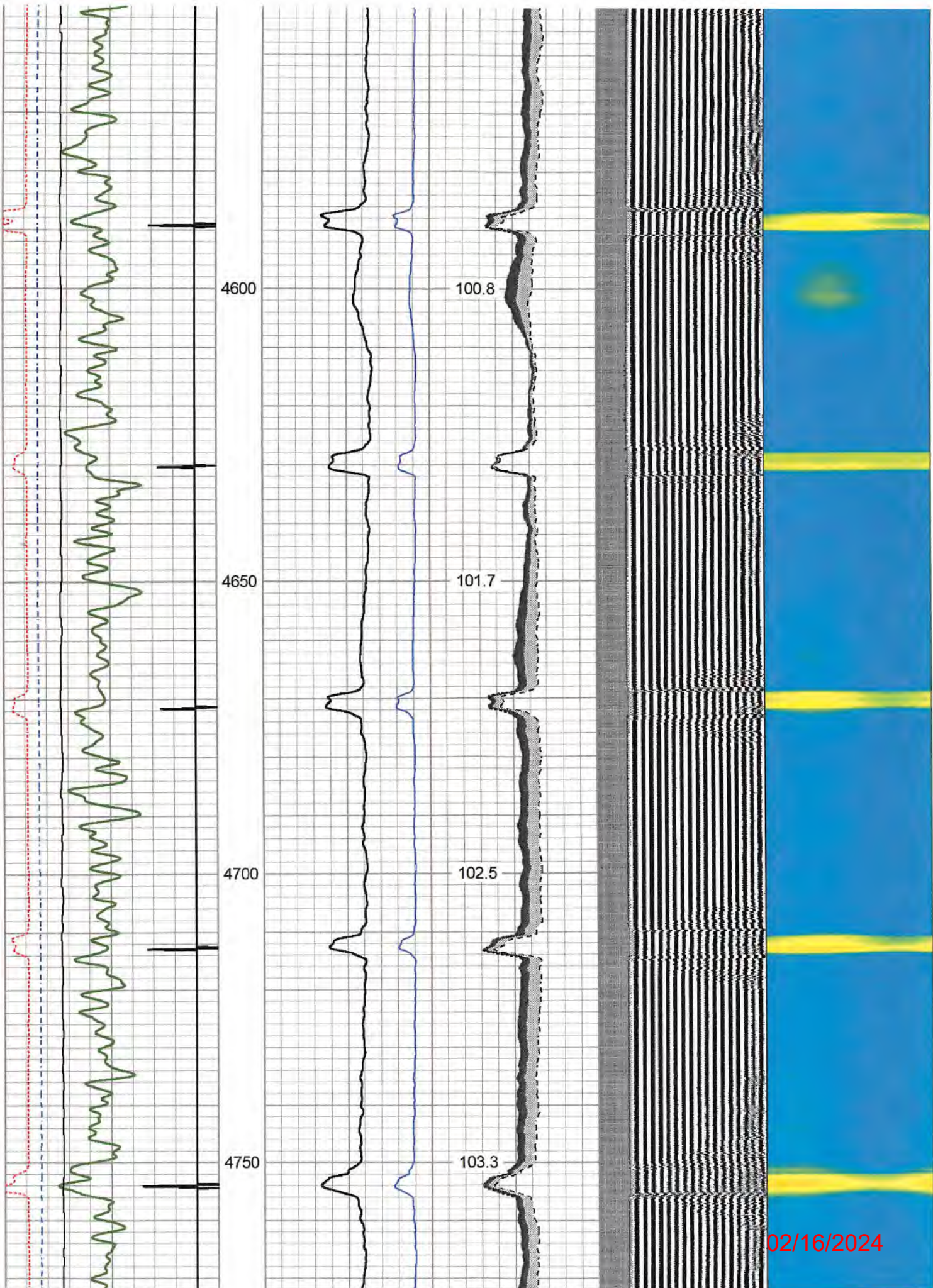


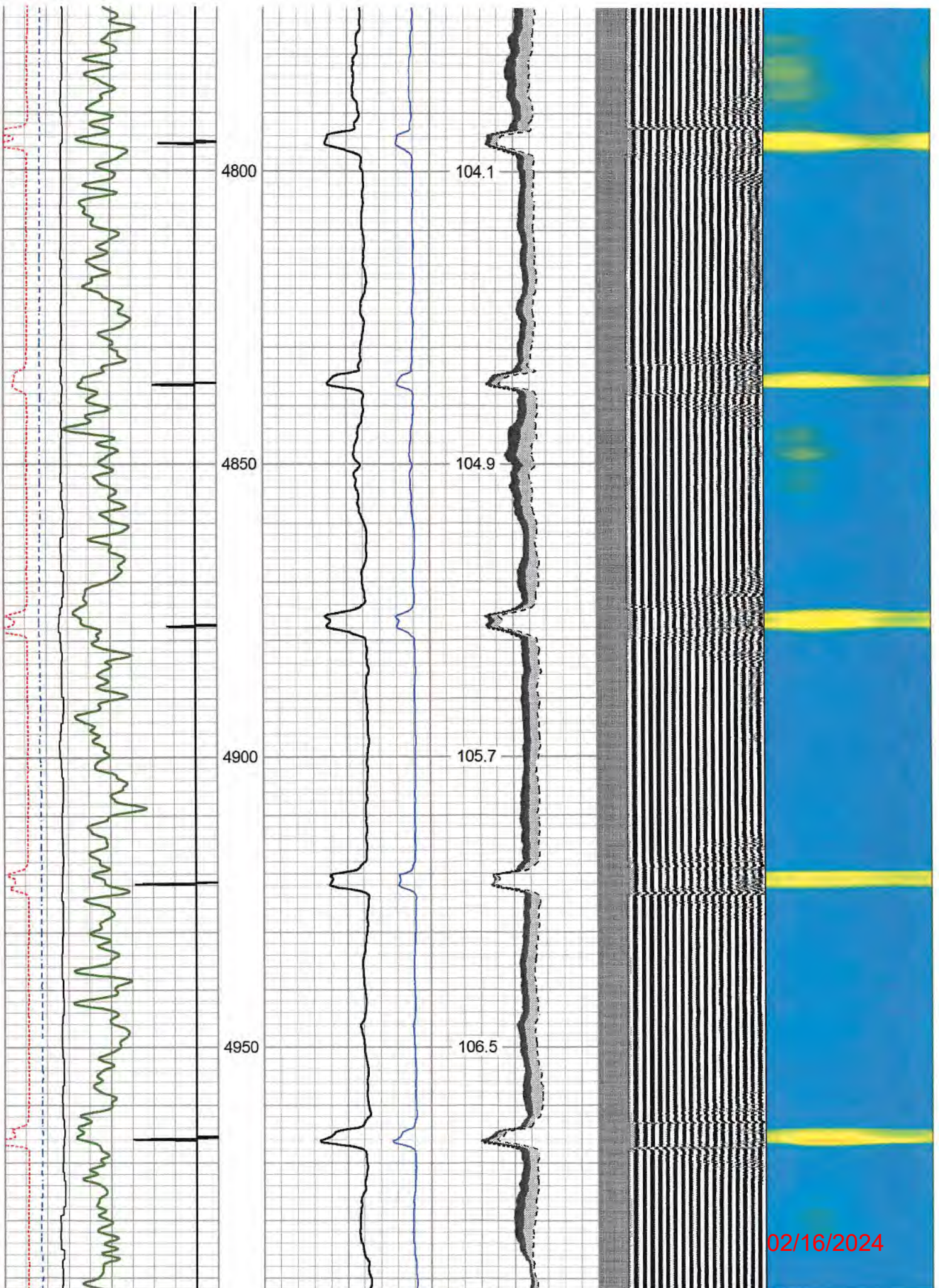






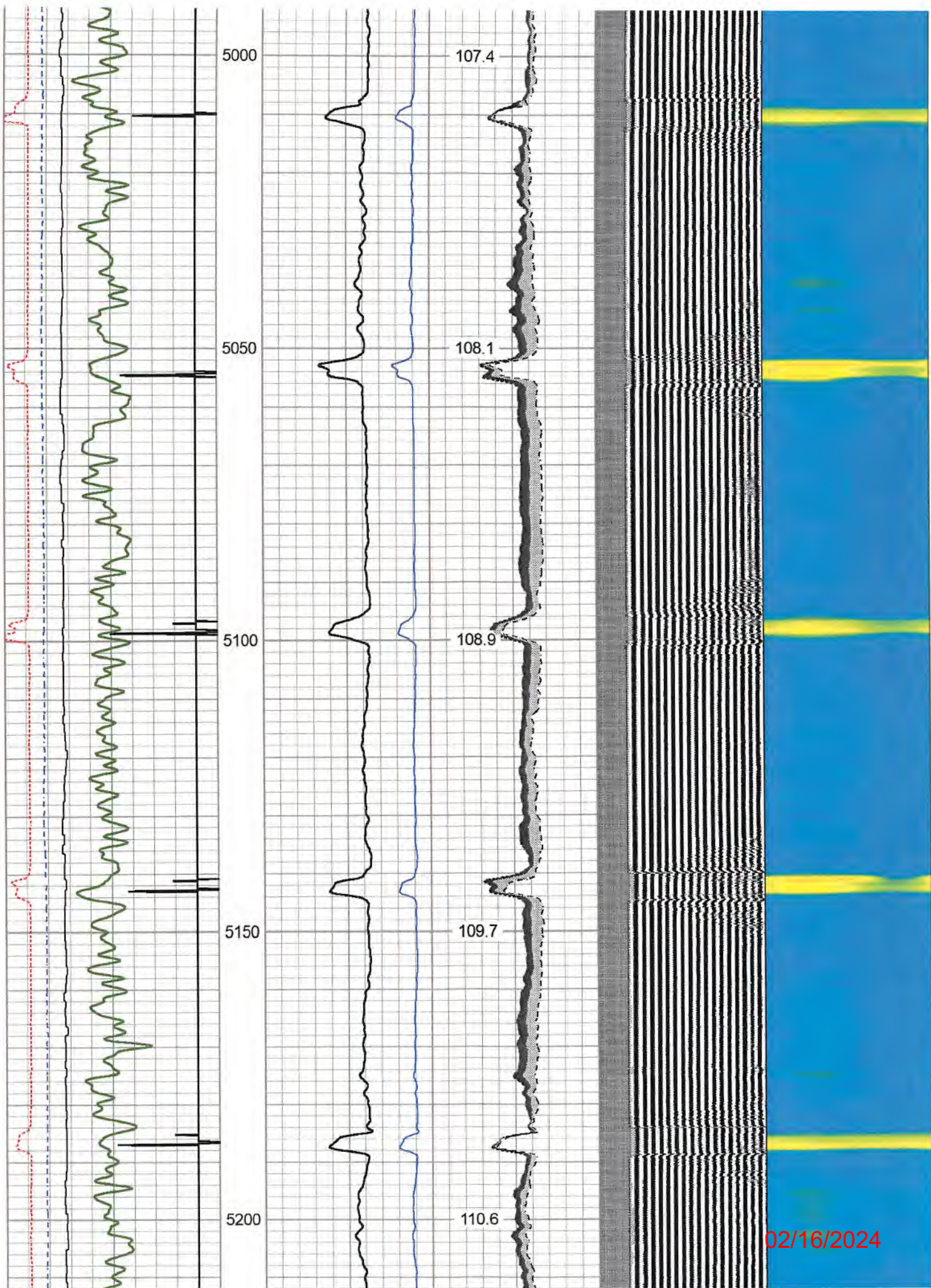
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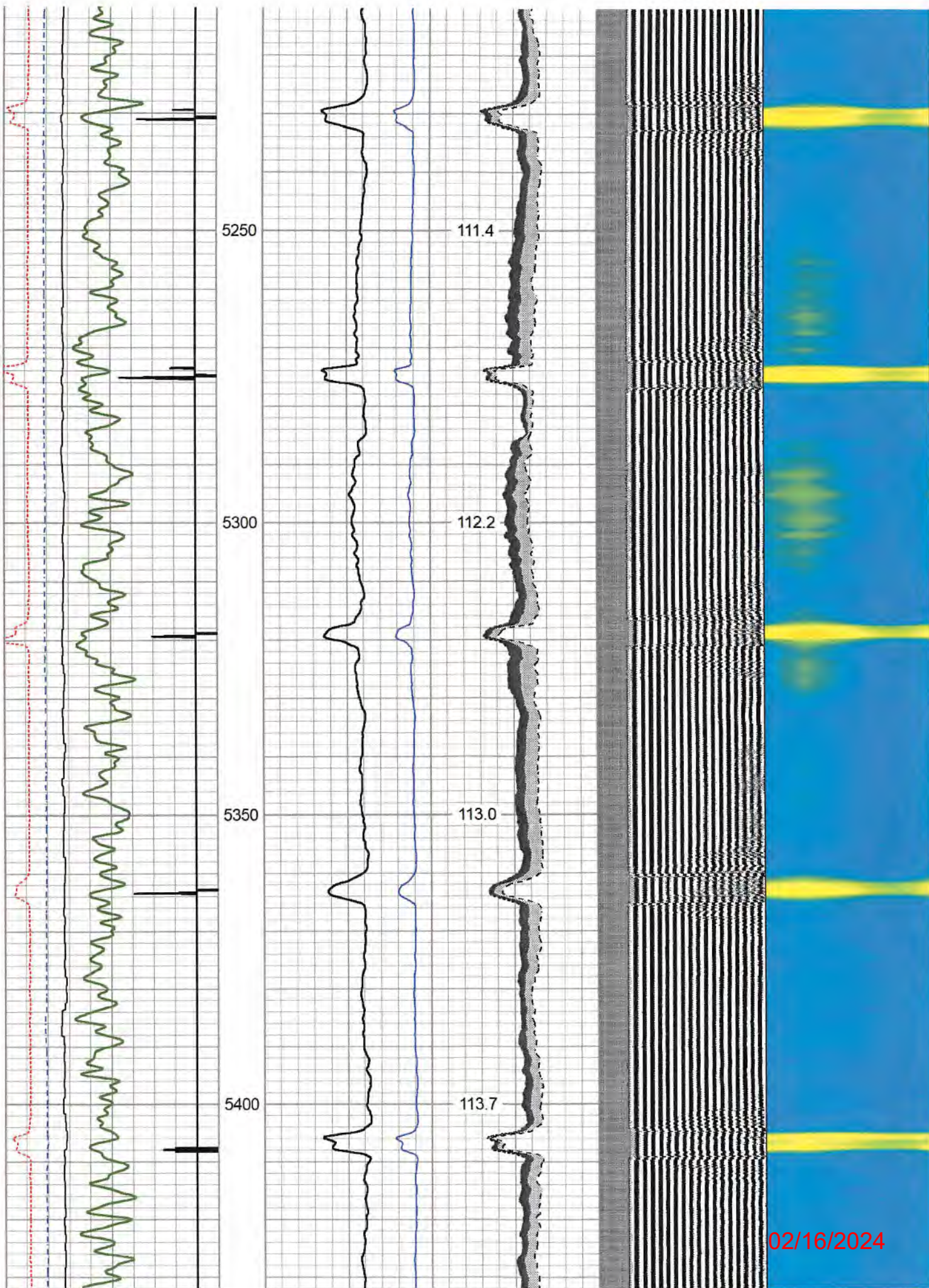


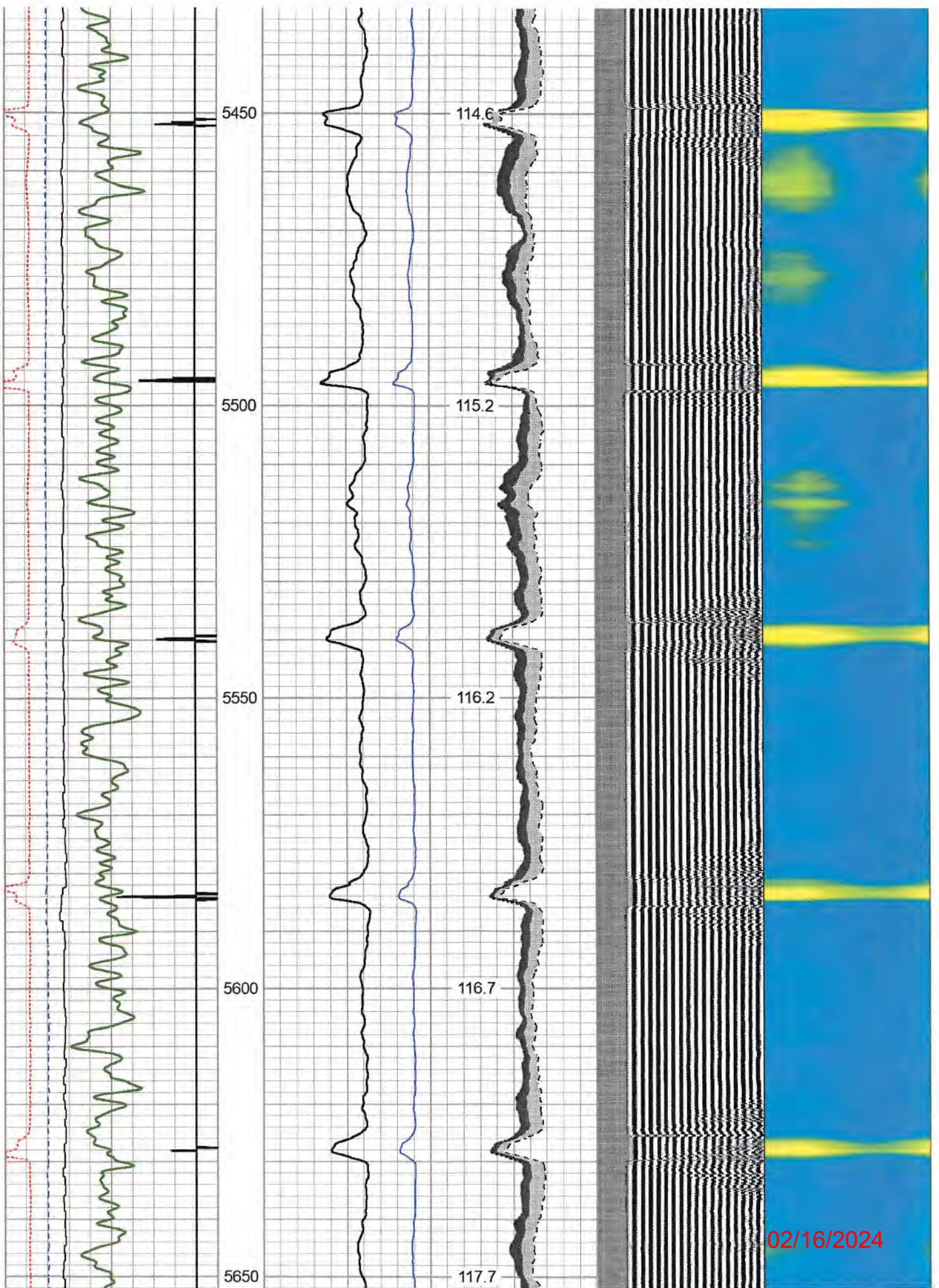
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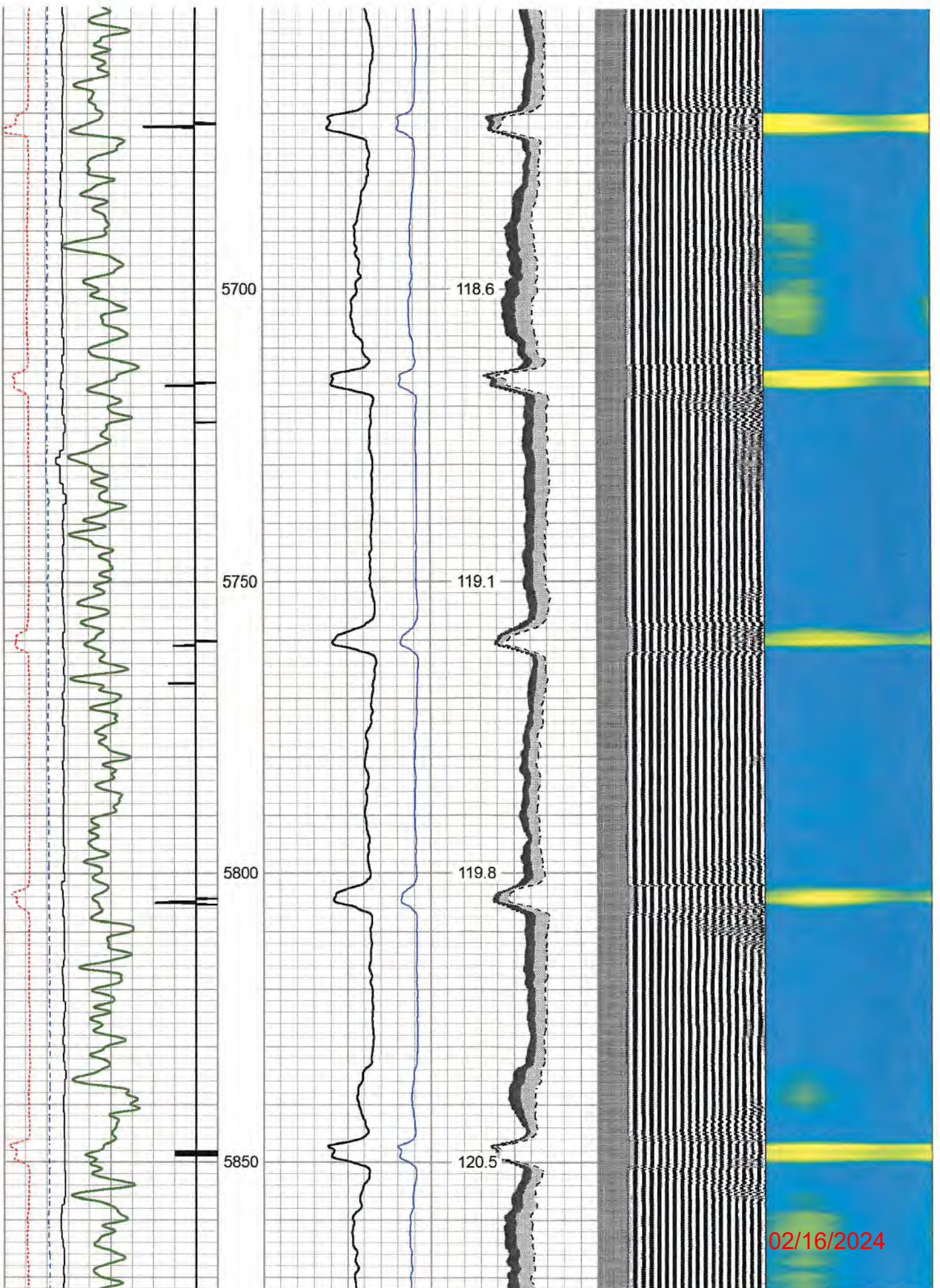


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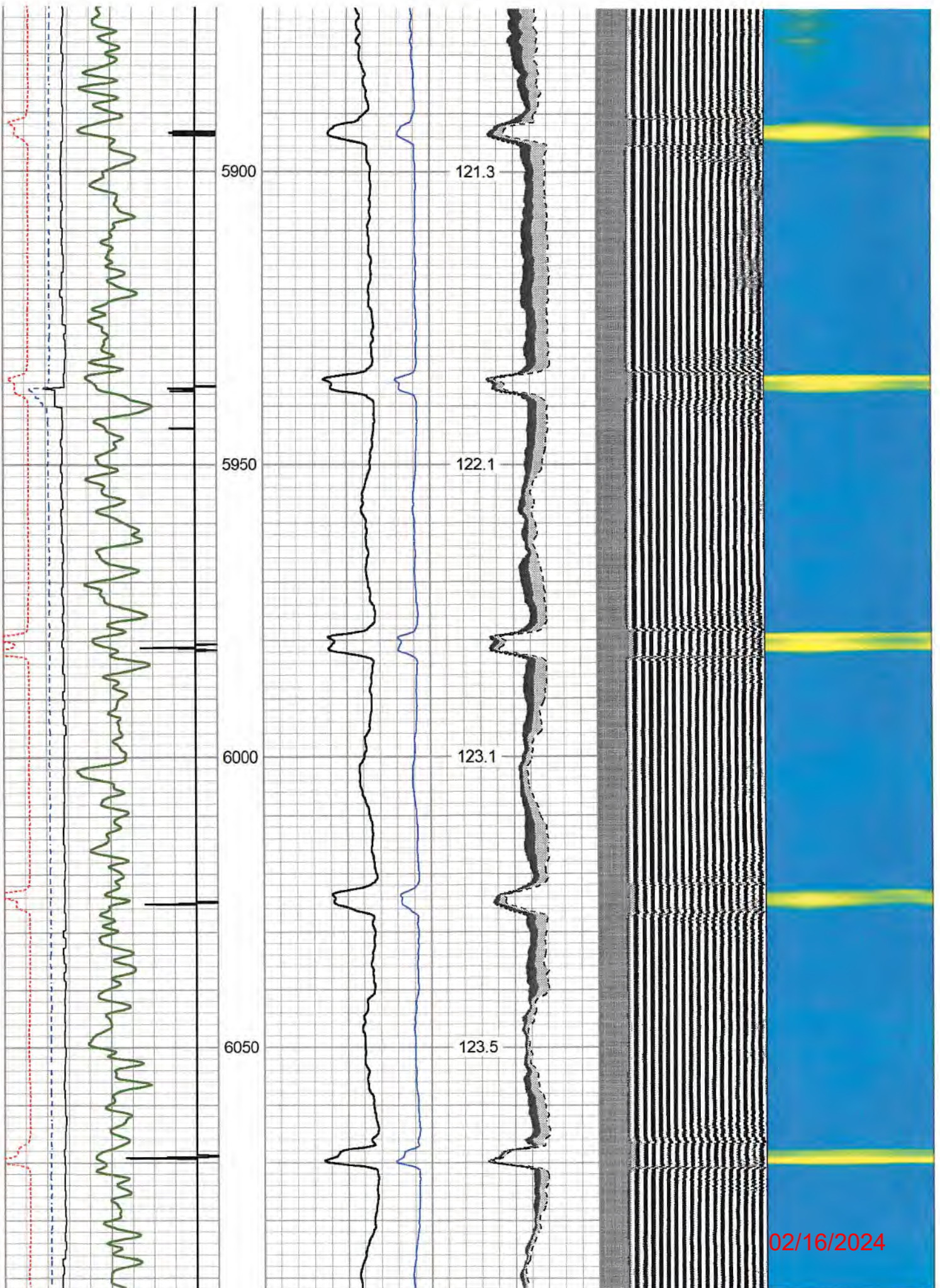




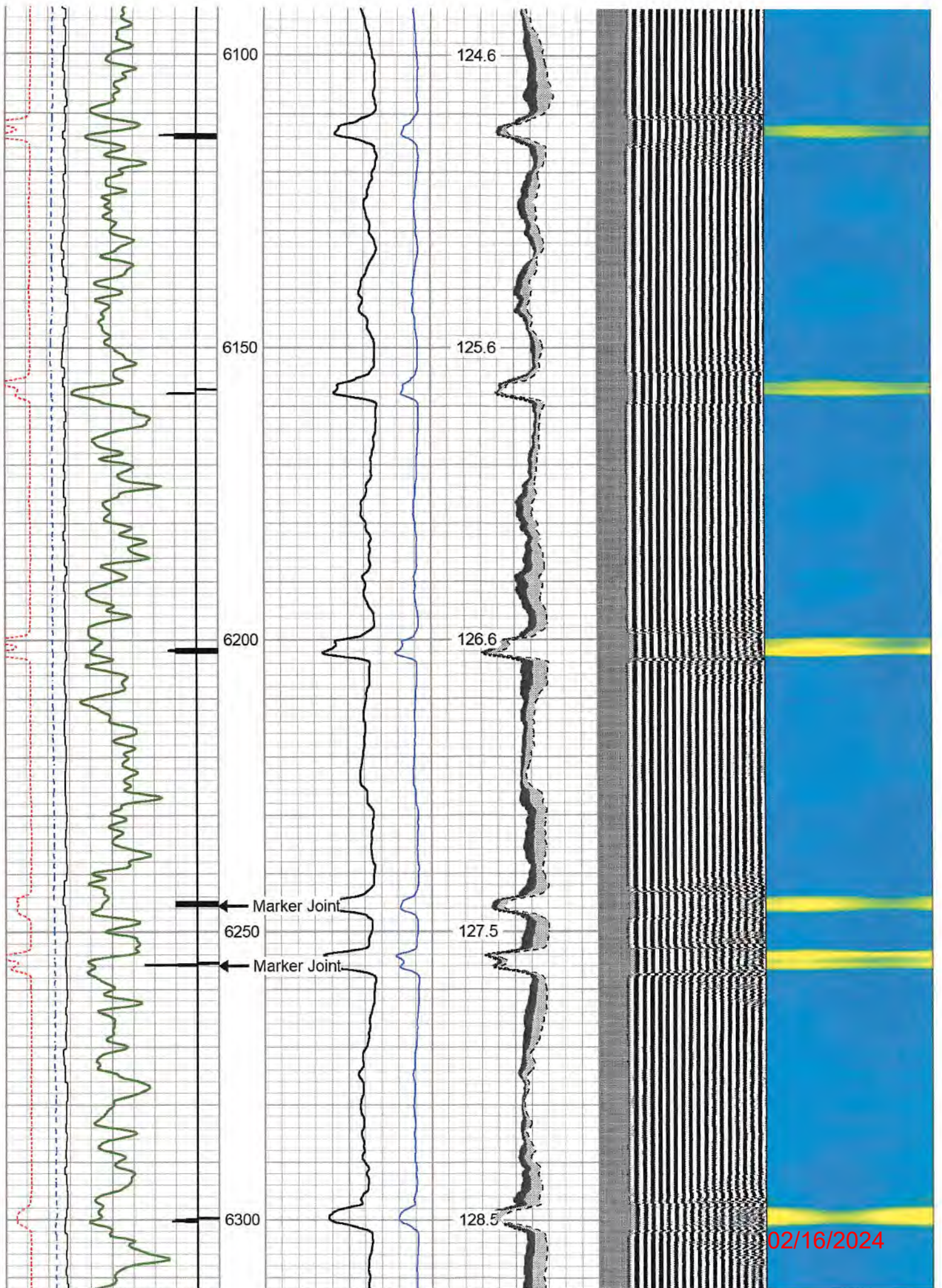
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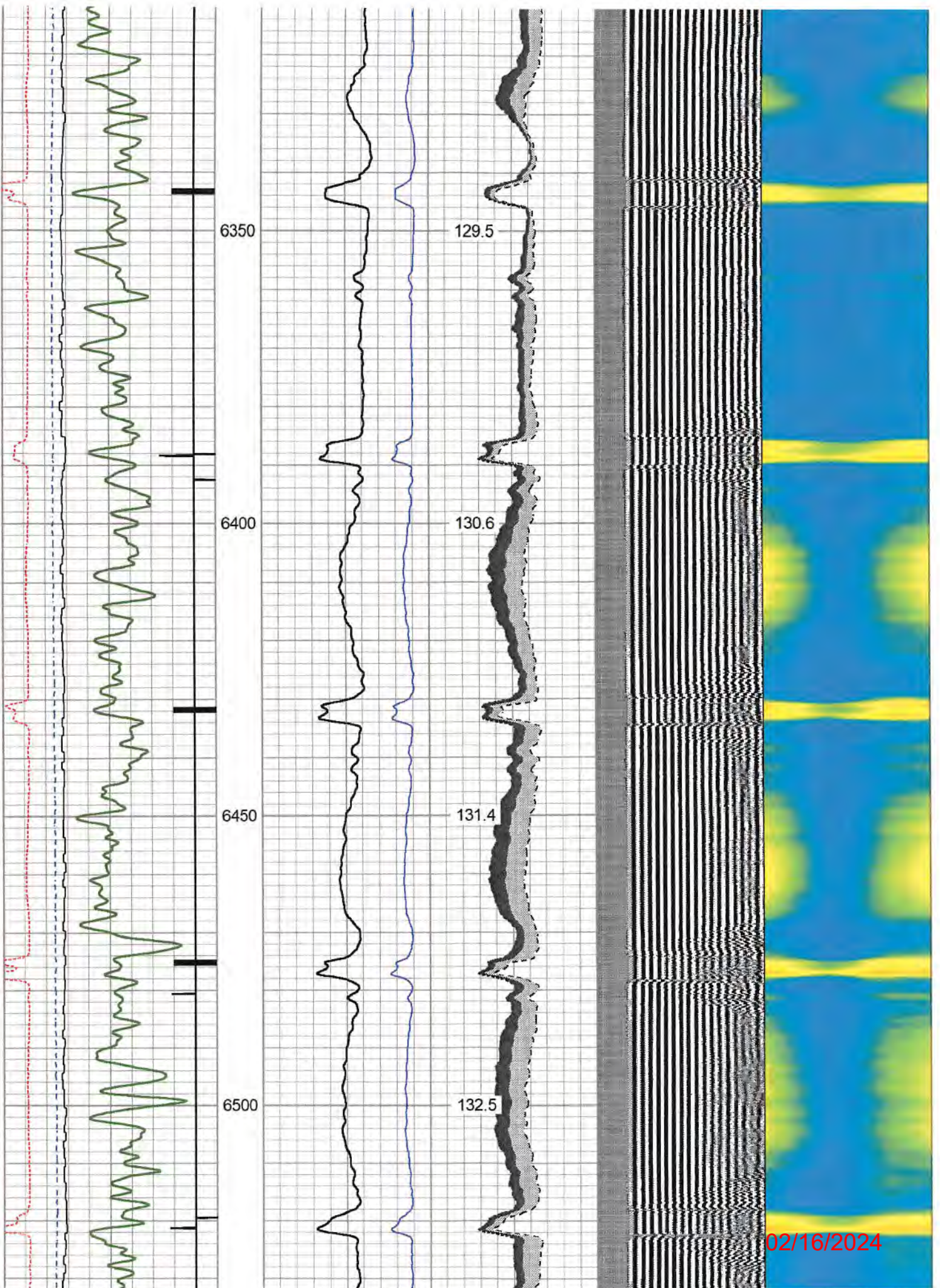
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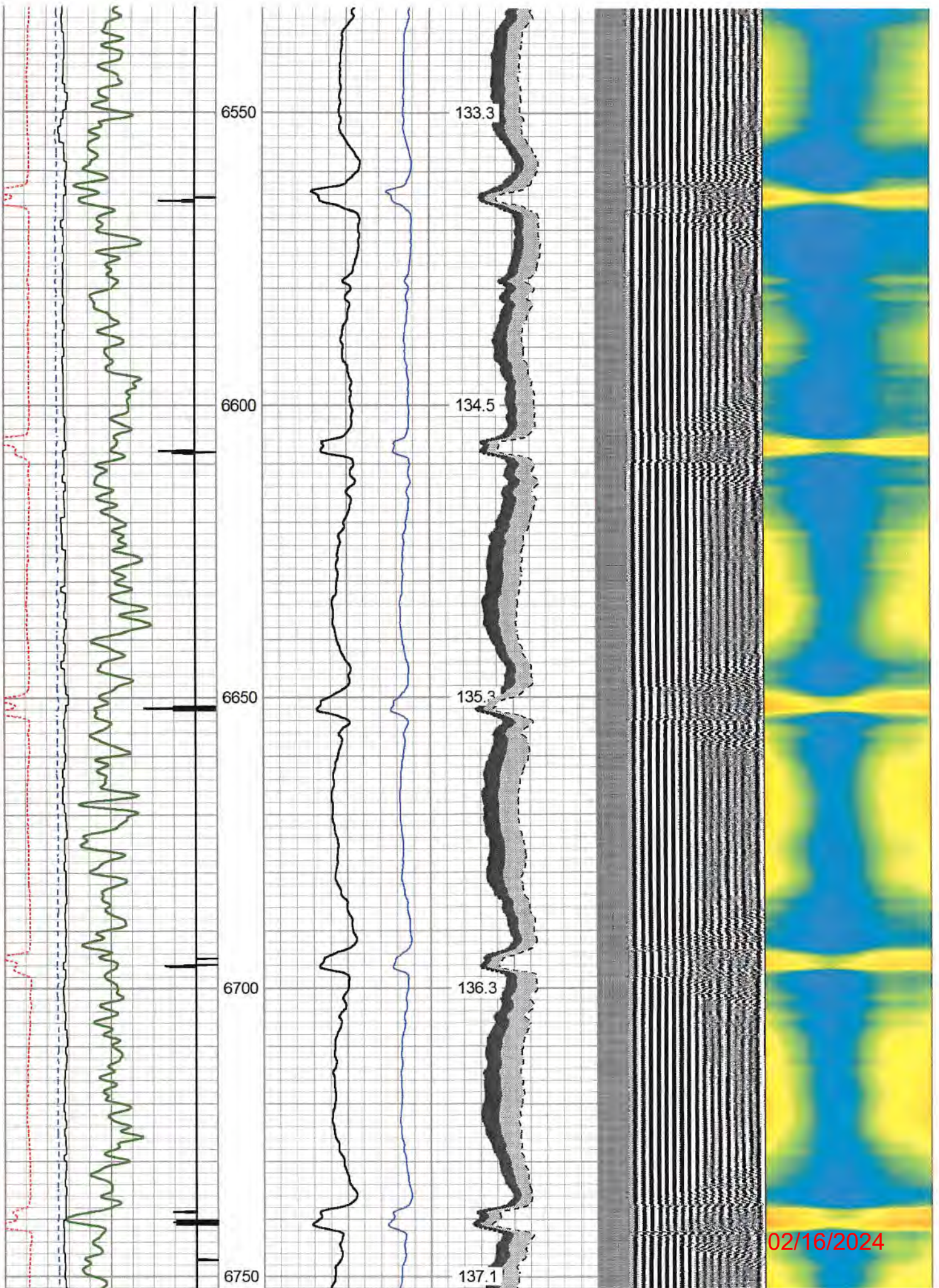


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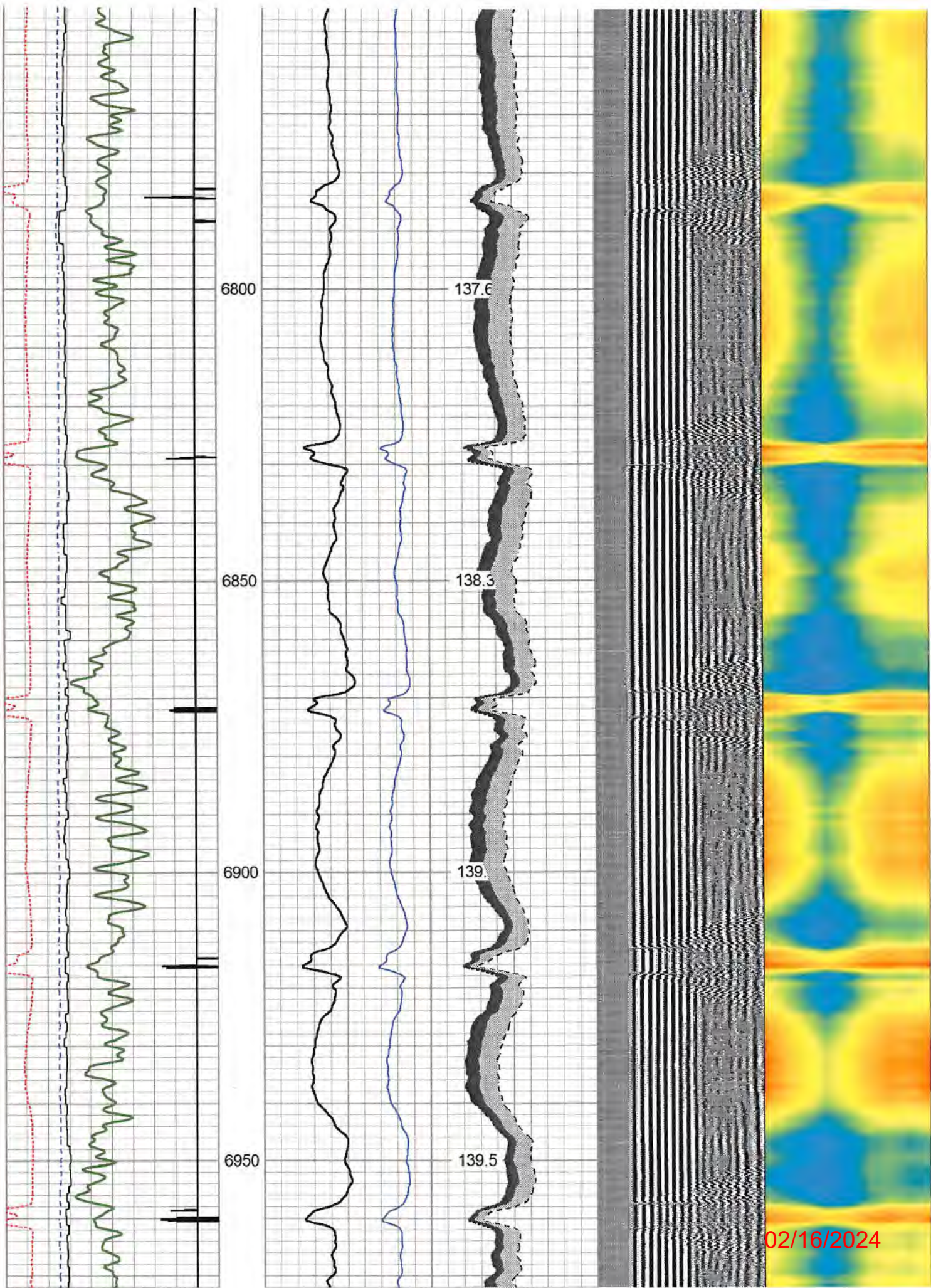


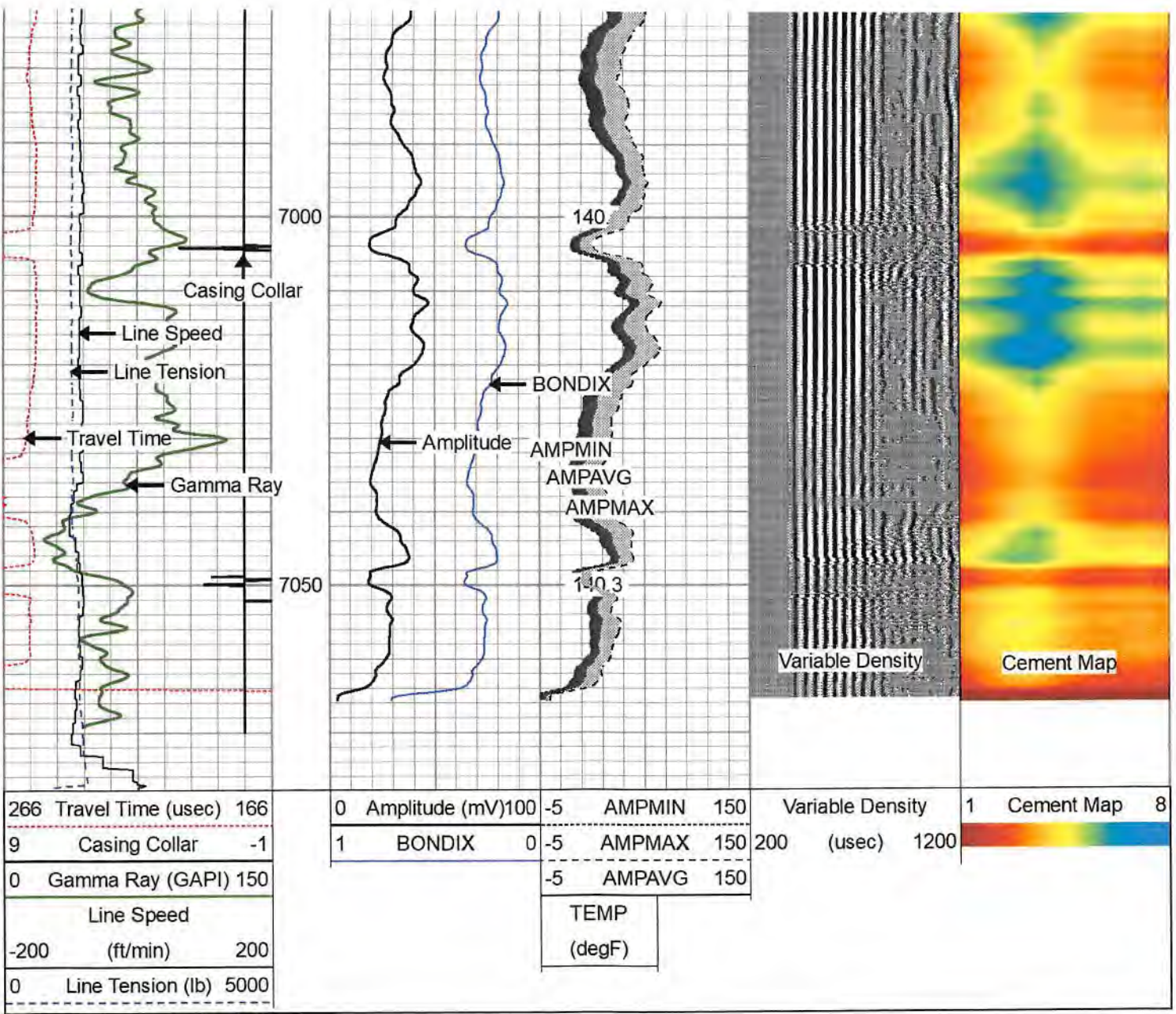
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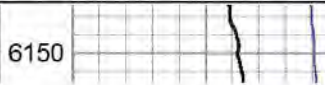
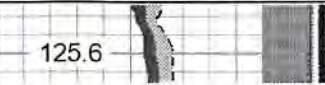



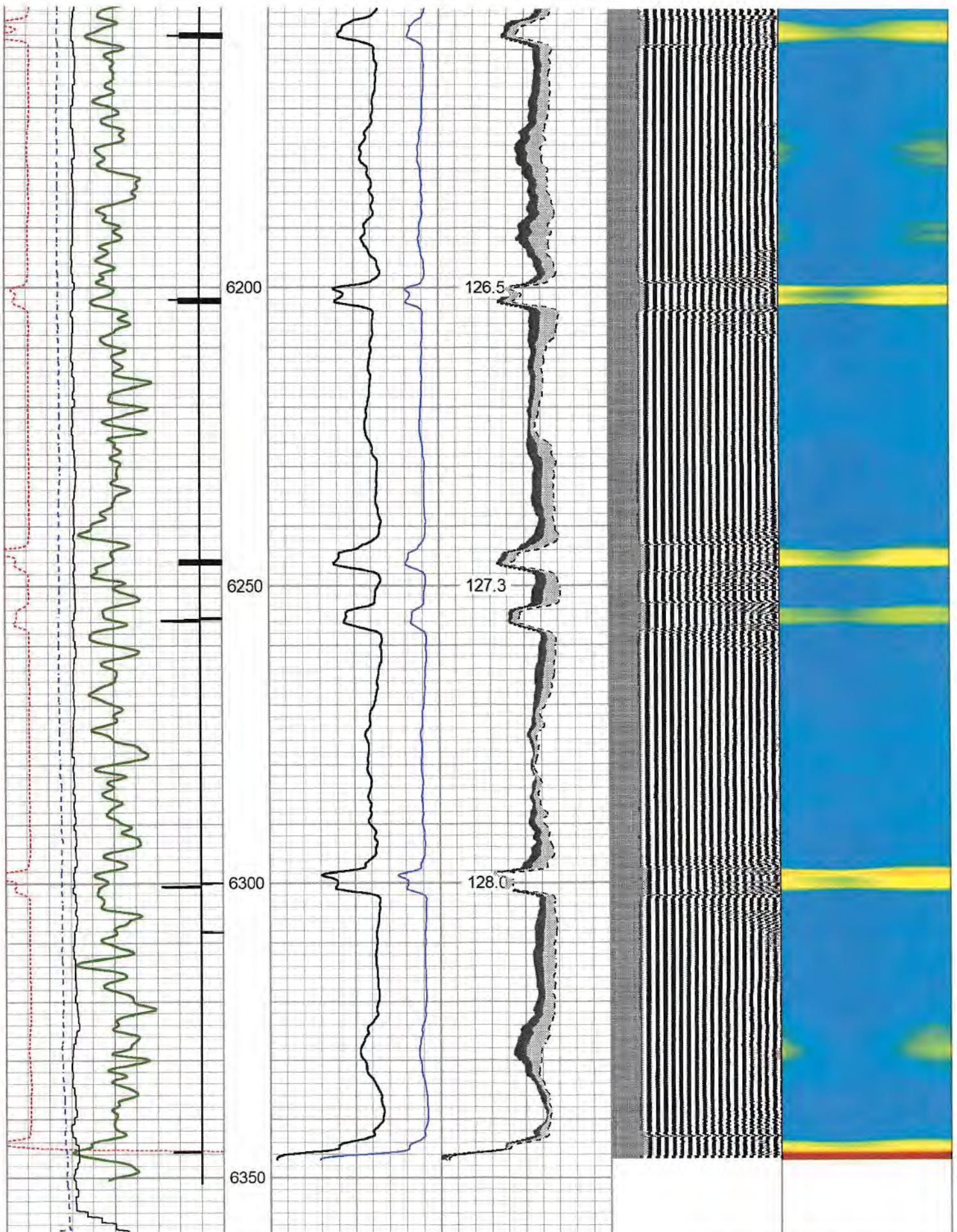


# Repeat Pass 0 PSI

Database File	antero_nomad_1h_rcbl_18_feb_2023.db											
Dataset Pathname	pass3											
Presentation Format	rcbl 2											
Dataset Creation	Sat Feb 18 13:44:48 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										


6150

125.6


02/16/2024



266 Travel Time (usec) 166  
 9 Casing Collar -1

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

Variable Density  
 200 (usec) 1200

Cement Map 8  
 02/16/2024

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

-5	AMPAVG	150
TEMP		
(degF)		

**Log Variables** DatabaseC:\ProgramData\Warrior\Data\antero\_nomad\_1h\_rcbl\_18\_feb\_2023.db  
Dataset field/well/run1/pass5/\_vars\_

**Top - Bottom**

BHTEMP_Src TEMP	BOREID in 7.875	BOTTEMP degF 140.3	CASEOD in 5.5	CASETHCK in 0	CASEWGHT lb/ft 23	MAXAMPL mV 71.9	MINAMPL mV 3.4
MINATTN db/ft 0.8	PERFS No	PPT usec 260	SRFTEMP degF 43	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\_nomad\_1h\_rcbl\_18\_feb\_2023.db  
Dataset Pathname pass5  
Dataset Creation Sat Feb 18 14:09:59 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: 356.750 ft

Master Calibration, performed Sat Feb 18 10:53:58 2023:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.002	0.330	3.400	71.921	206.932	3.726
CAL	0.559	0.563				

02/16/2024

5'	-0.009	0.319	3.400	71.921	209.449	5.208
SUM						
S1	0.030	0.321	0.000	100.000	344.158	-10.385
S2	-0.007	0.295	0.000	100.000	331.996	2.193
S3	-0.004	0.311	0.000	100.000	317.963	1.238
S4	-0.004	0.323	0.000	100.000	305.740	1.179
S5	-0.003	0.346	0.000	100.000	286.995	0.795
S6	-0.006	0.360	0.000	100.000	272.867	1.739
S7	-0.001	0.358	0.000	100.000	278.535	0.326
S8	-0.008	0.332	0.000	100.000	293.789	2.335

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	0.559	0.563	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					

02/16/2024

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 GR-Probe (275) Probe 2 3/4" Logging Gamma Ray	1.67 5.50	3.12 2.75	5.00 57.00
			Centralizers-5419-312-S600 Titan 3 1/8" Adjustable Centralizer	3.42	3.13	34.00
			Bull_Plug-1_7/16_GO Titan 1 7/16" Female Bull Plug	0.27	1.44	1.00

Dataset: antero\_nomad\_1h\_rcbl\_18\_feb\_2023.db: field/well/run1/pass5  
 Total length: 19.60 ft  
 Total weight: 193.00 lb  
 O.D.: 3.13 in

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