



**Segmented Radial Cement Bond
W/Gamma Ray, CCL
Log**

Company ANTERO RESOURCES CORPORATION
 Well RIGGS UNIT 2H
 Field MARCELLUS
 County RITCHIE
 State W.V.
 Country

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 Well RIGGS UNIT 2H
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 State W.V.
 Country

Location: API #: 47085103850000
 AFE# A08525
 SEC TWP RGE
 Permanent Datum GROUND LEVEL Elevation 1149'
 Log Measured From K.B. OF 25'
 Drilling Measured From K.B.
 Other Services K.B. 1174'
 D.F. 1174'
 G.L. 1149'

Date	11/15/19
Run Number	ONE
Depth Driller	22146'
Depth Logger	6469'
Bottom Logged Interval	6469'
Top Log Interval	SURFACE
Open Hole Size	8.25"
Type Fluid	WATER
Density / Viscosity	N/A
Max. Recorded Temp.	136 DEG
Estimated Cement Top	3110'
Time Well Ready	N/A
Time Logger on Bottom	N/A
Equipment Number	214182
Location	BRIDGEPORT W.V.
Recorded By	S.MAXWELL
Witnessed By	JERRAKO EVANS

Borehole Record		Tubing Record					
Run Number	Bit	From	To	Size	Weight	From	To
ONE	24"	Surface	95'				
TWO	17.5"	95'	573'				
THREE	12.25"	573'	2538'				
FOUR	8.25"	2538'	22146'				
Casing Record		Size	Wgt/Ft	Top	Bottom		
Surface String		13.375"	54.5	Surface	573'		
Prot. String		9.625"	36	Surface	2538'		
Production String		5.5	23	Surface	22146'		
Liner							

<<< Fold Here >>>

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

THANK YOU FOR USING KLX ENERGY SERVICES
 LOG WAS RAN ON 5.5" CASING WITH 1500 PSI
 T.V.D. 6469'
 MARKER JOINT @ 5428-5438'
 CEMENT TOP @ 3110'

RECEIVED
 Office of Oil and Gas
 AUG 31 2020
 WV Department of
 Environmental Protection



MAIN PASS

Database File antero_riggs unit 2h .db
 Dataset Pathname pass3.1
 Presentation Format antero
 Dataset Creation Fri Nov 15 12:54:13 2019
 Charted by Depth in Feet scaled 1:240

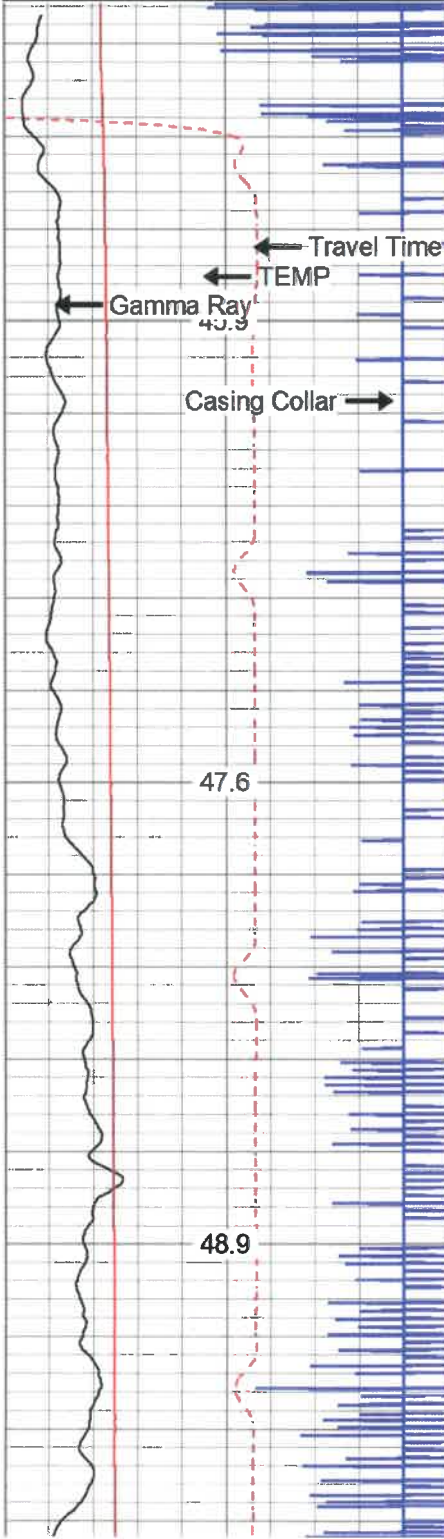
280	Travel Time (usec)	180
9	Casing Collar	-1
0	Gamma Ray	180
0	TEMP (degF)	200
180	GR	360

0	Amplitude (mV)	100
0	Amp X5 (mV)	20
1	BONDIX	0

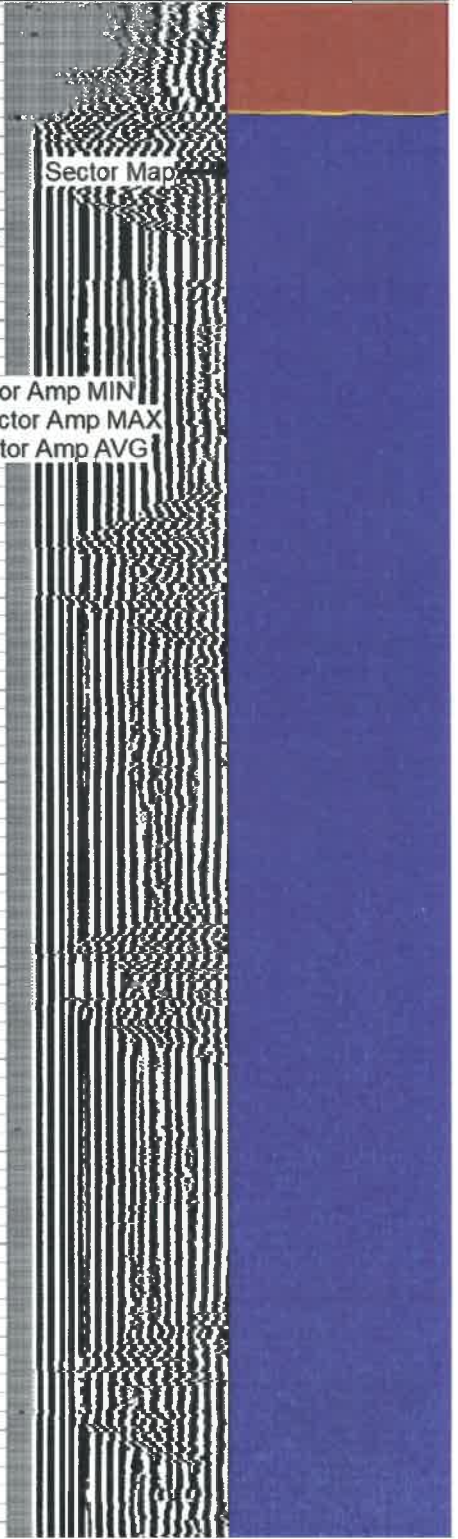
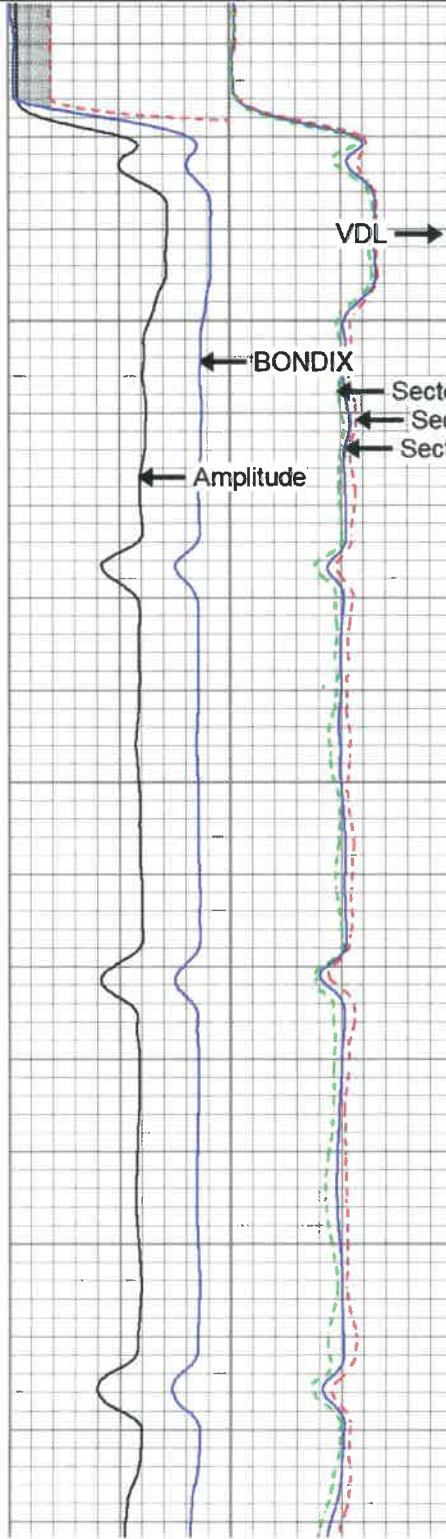
Sector Amp AVG	VDL
Sector Amp MAX	200 (usec) 1200
Sector Amp MIN	

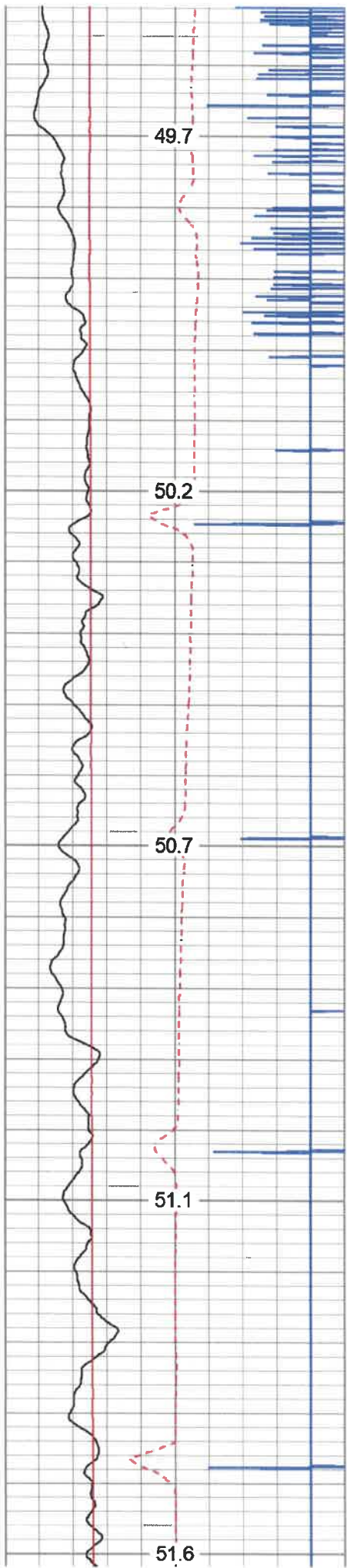


TEMP (degF)



50
100
150





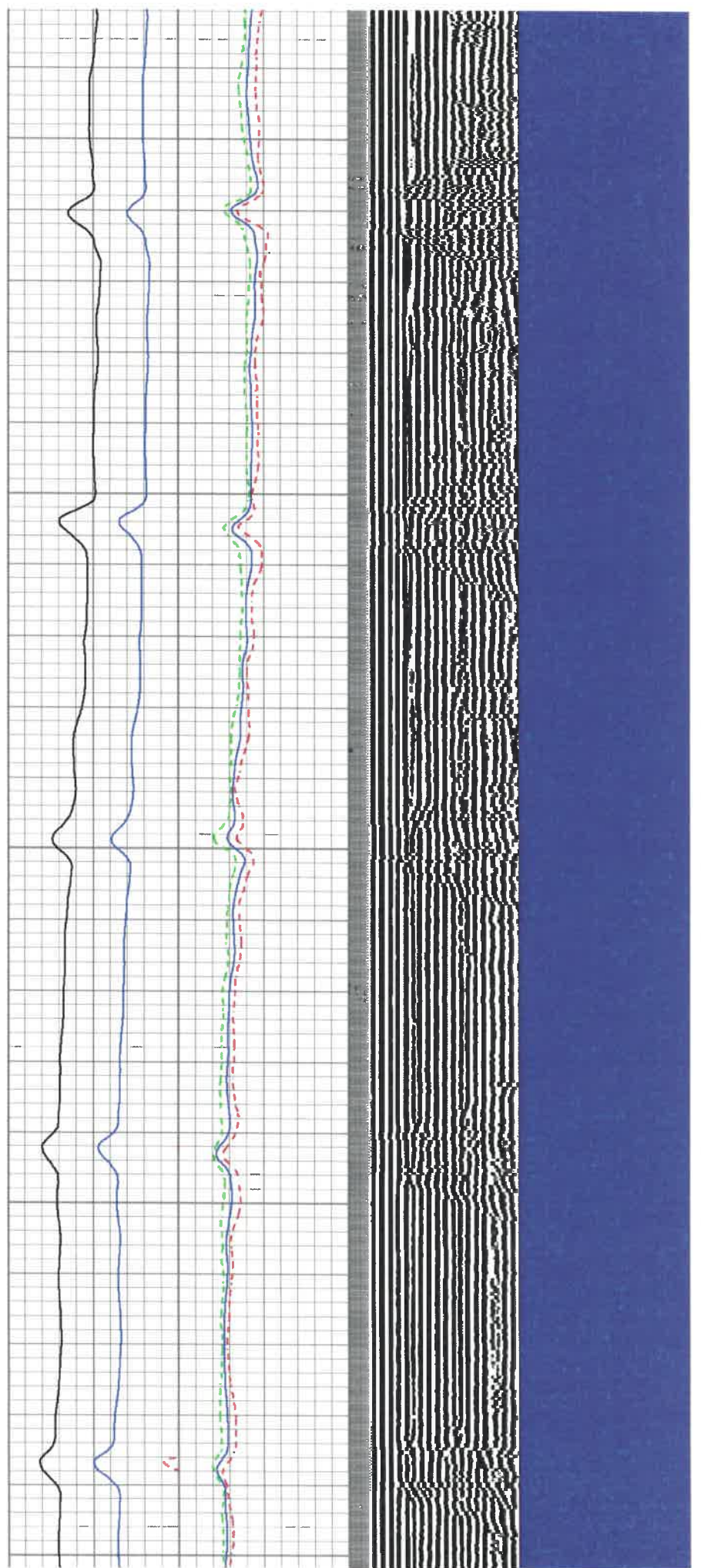
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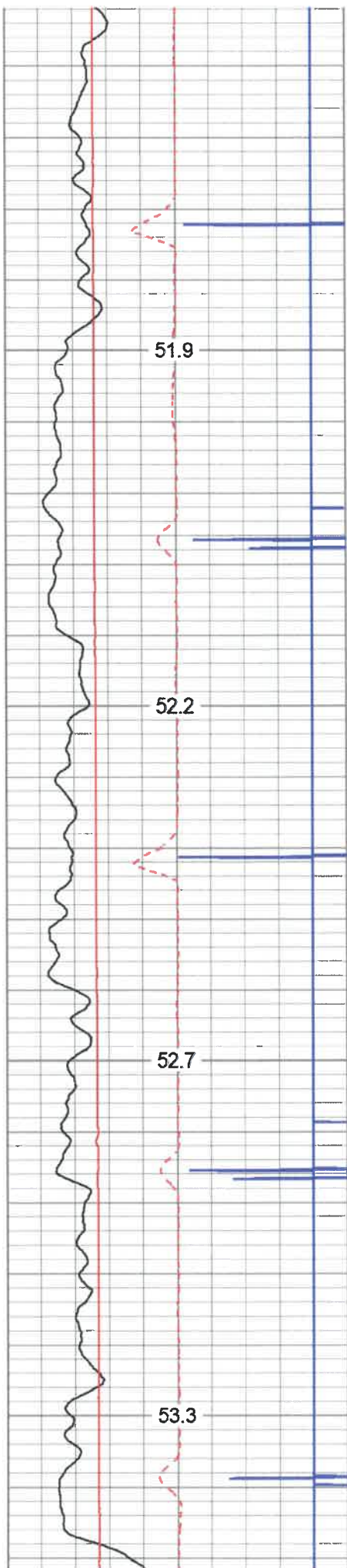
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300

350

400



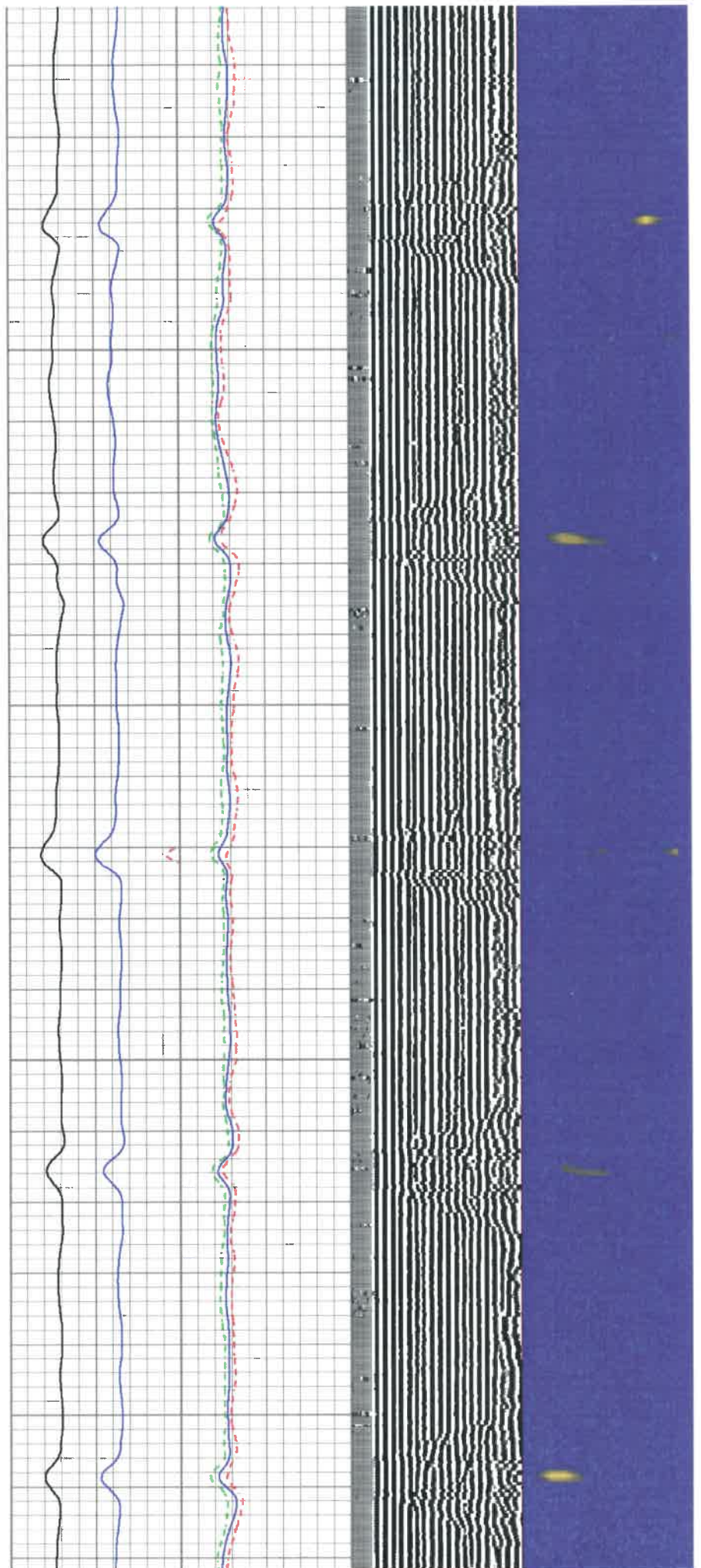


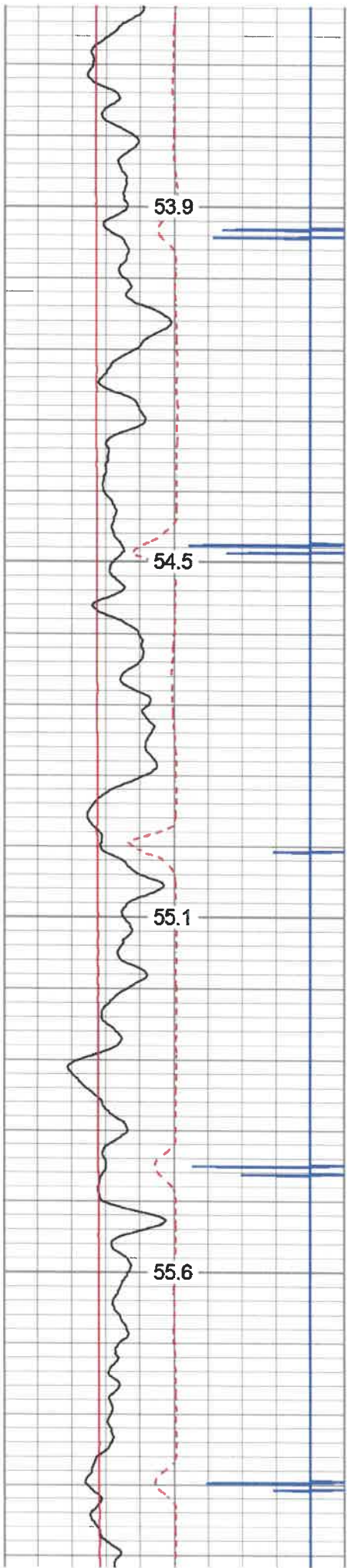
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500

550

600



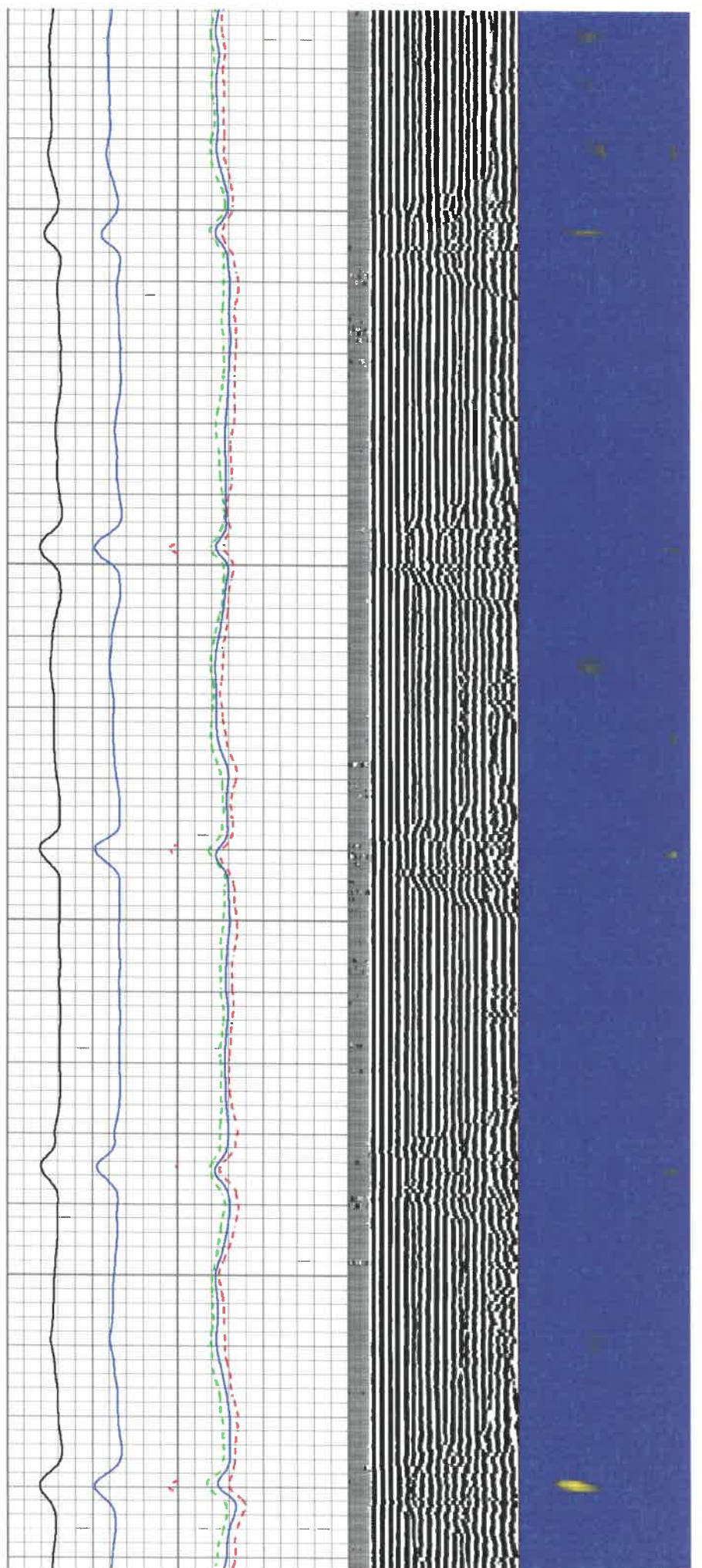


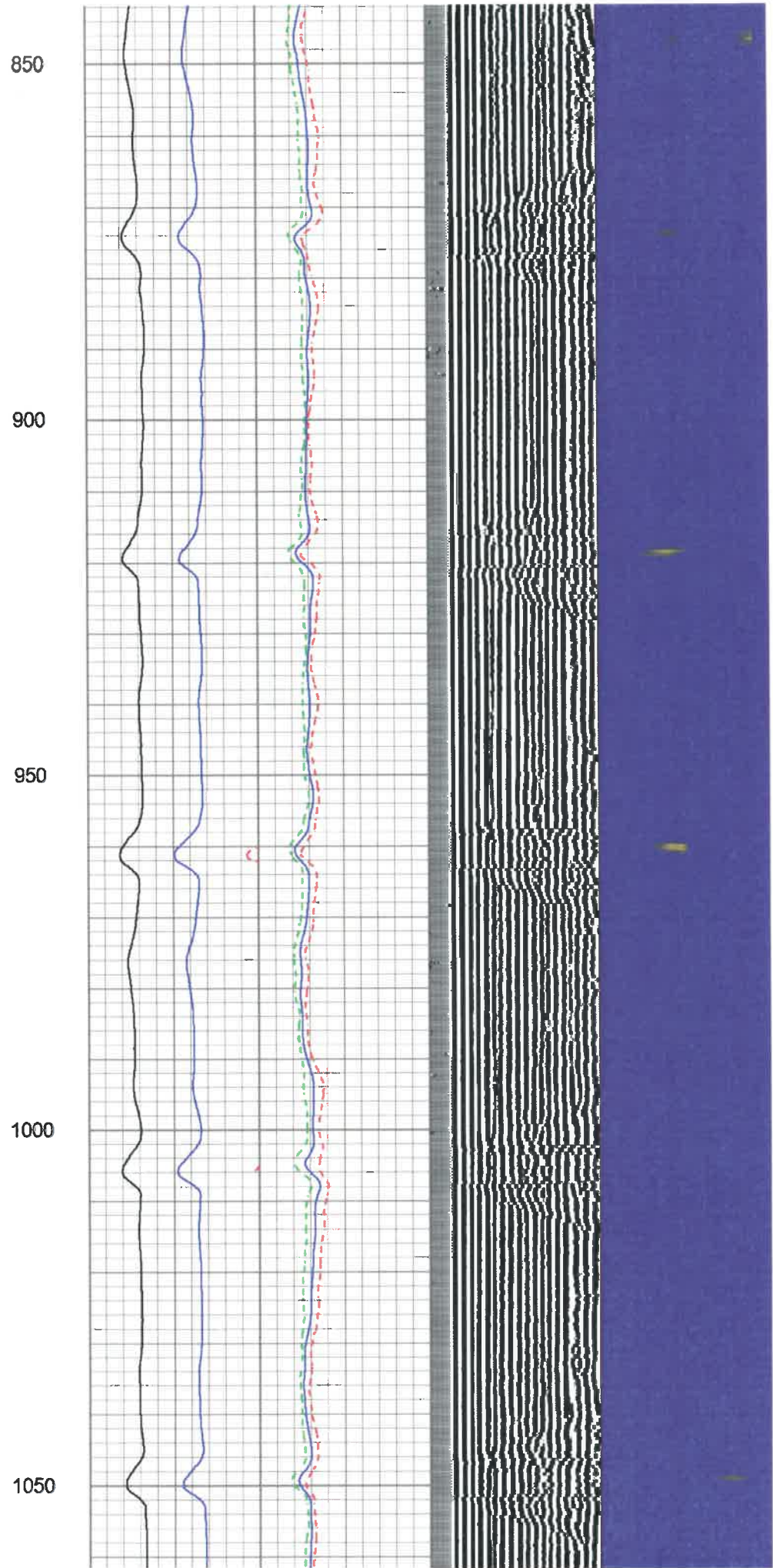
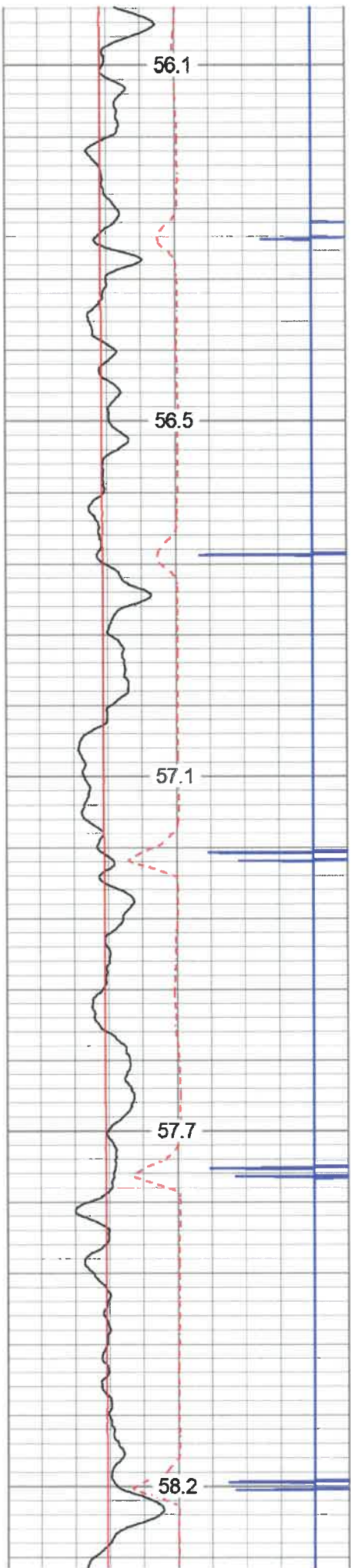
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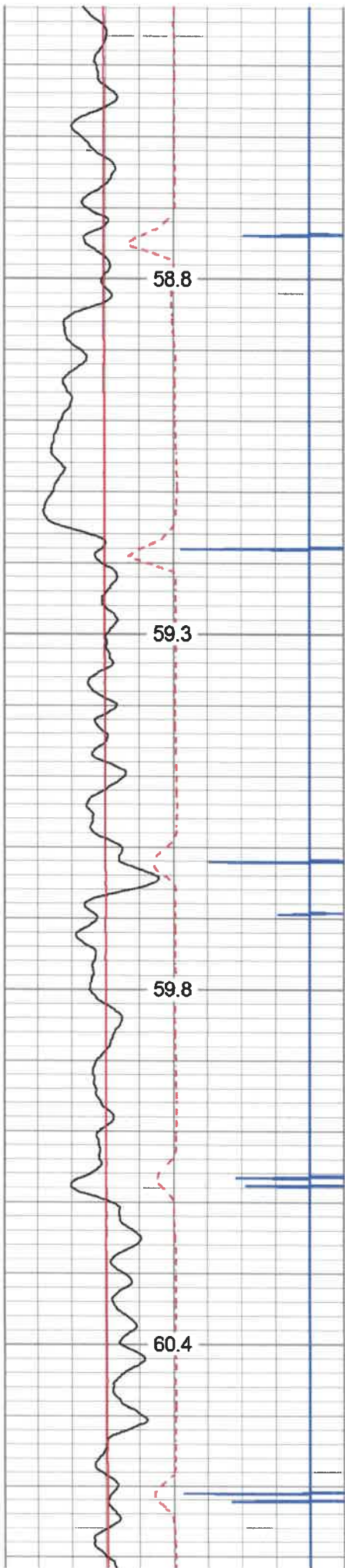
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750

800





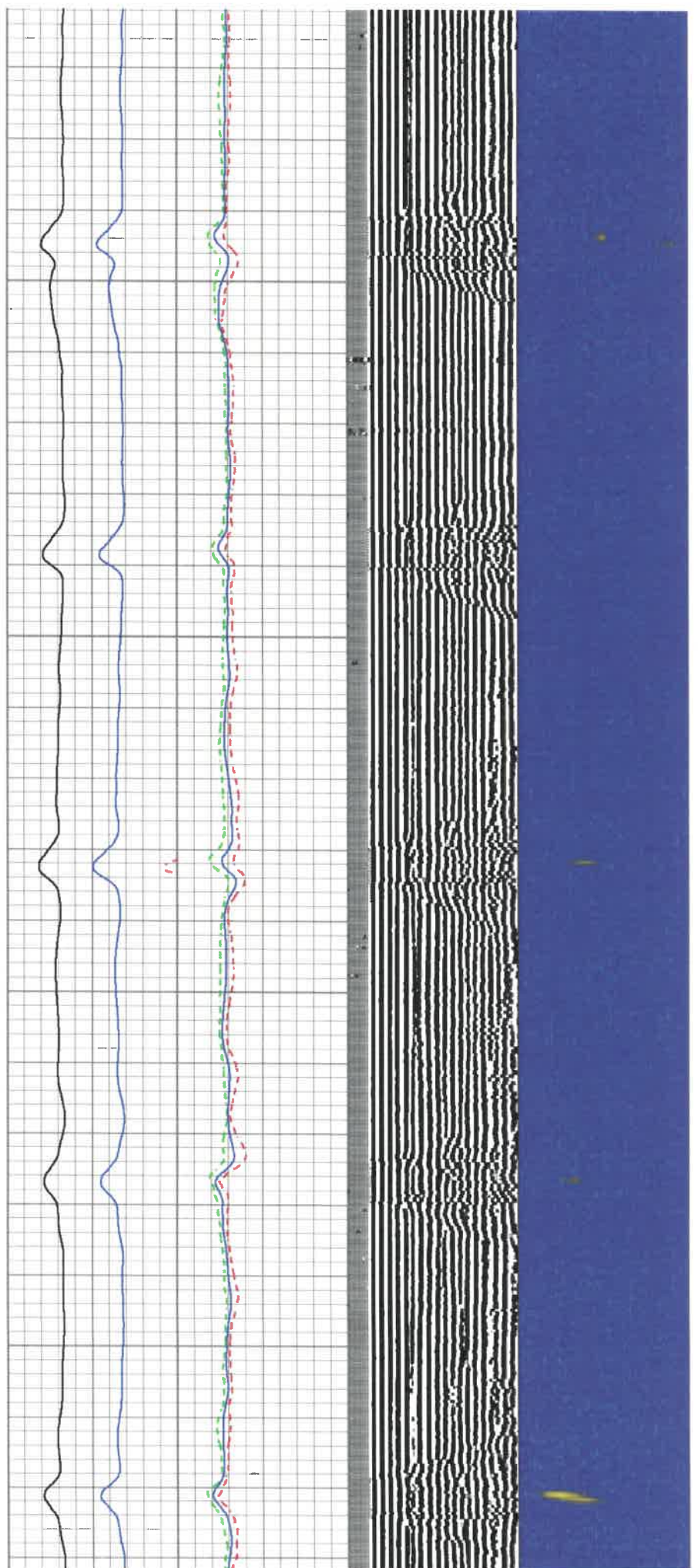


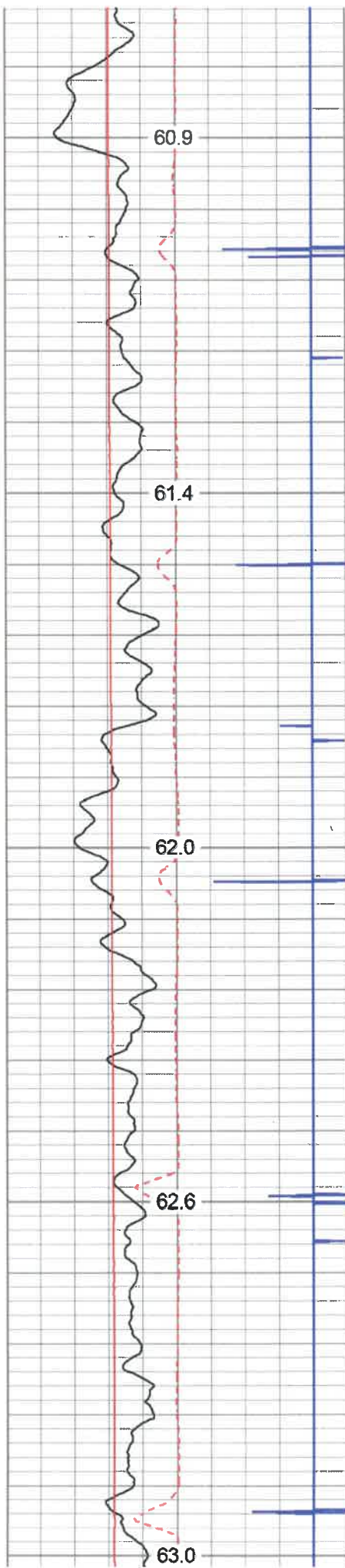
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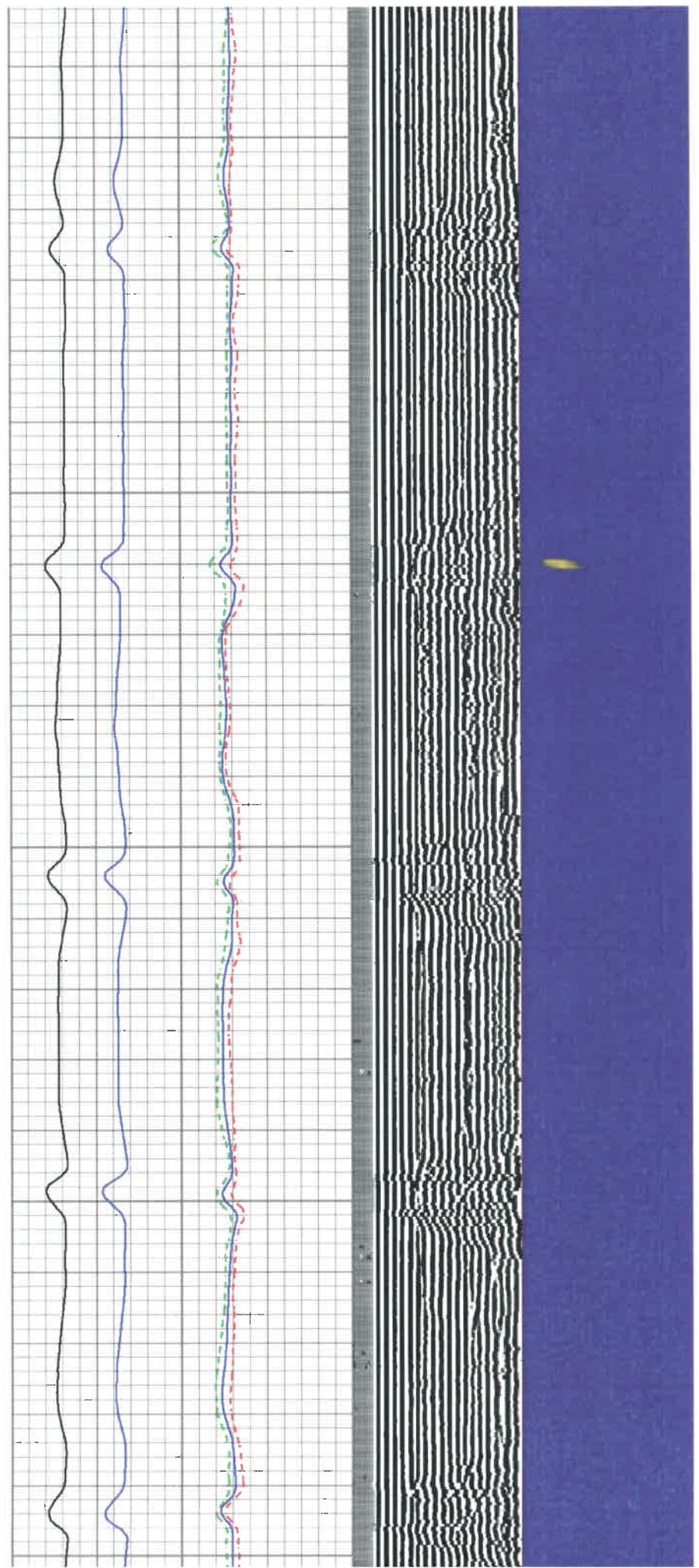
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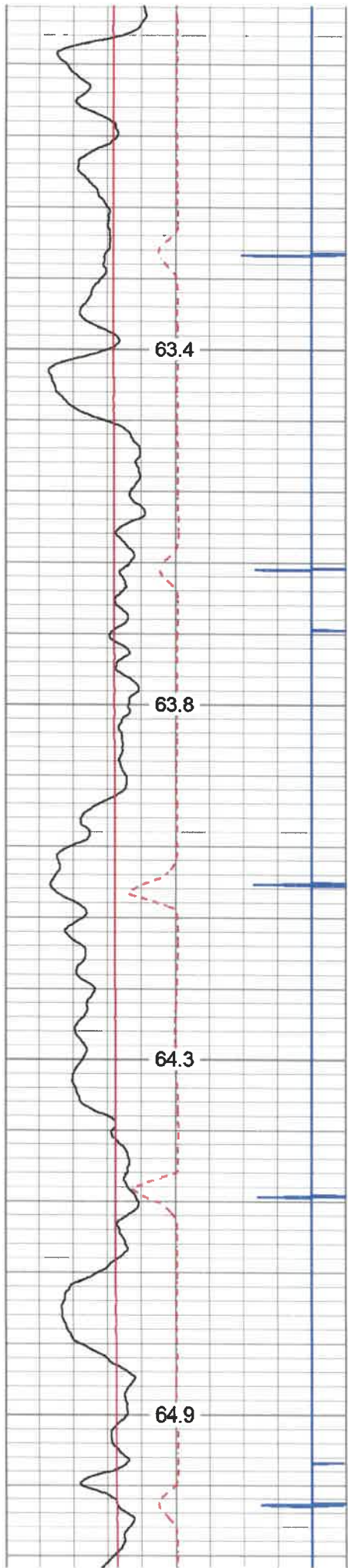
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1300
1350
1400
1450
1500



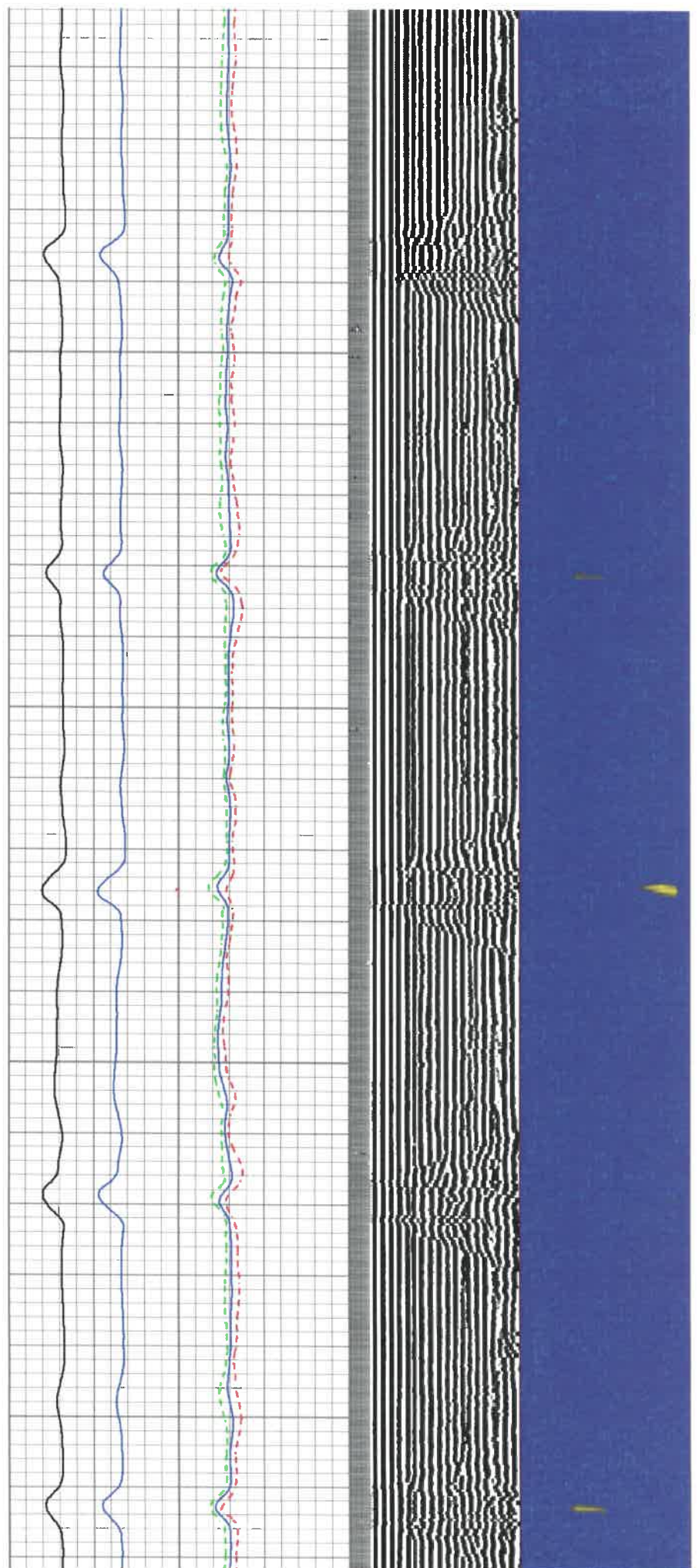


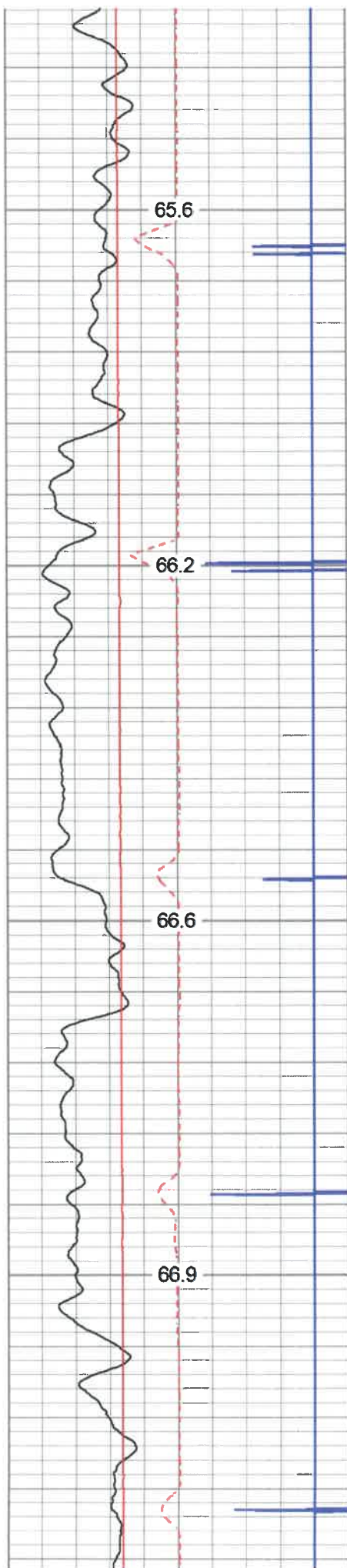
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1650

1700



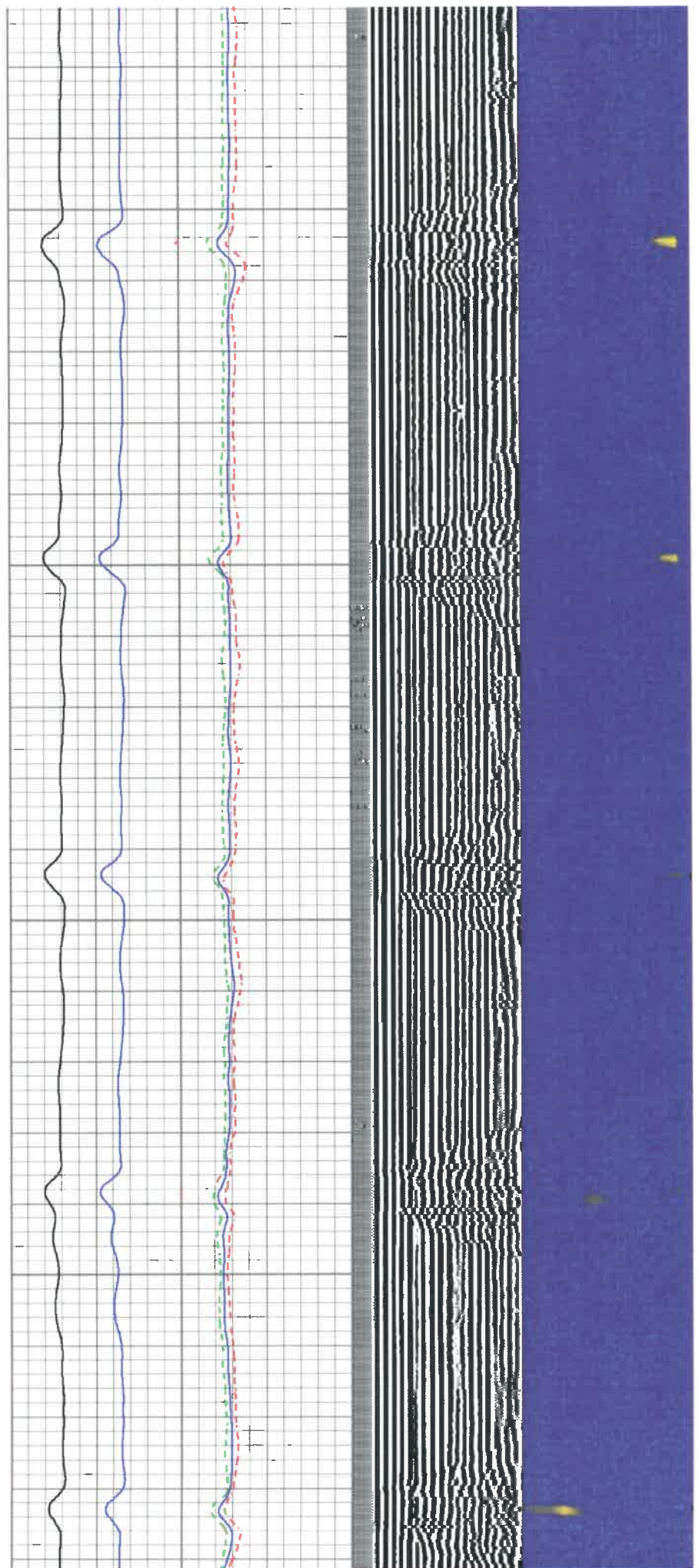


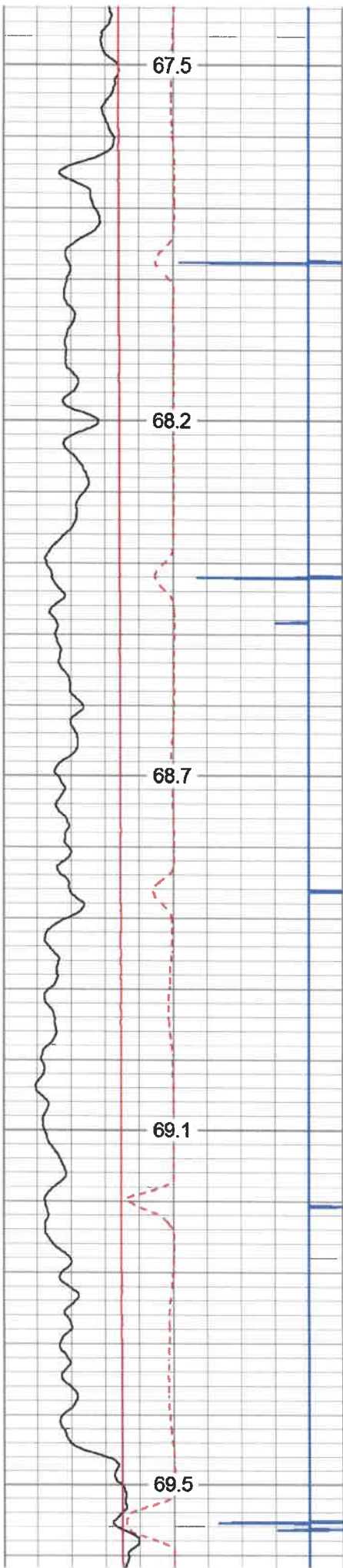
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1850

1900





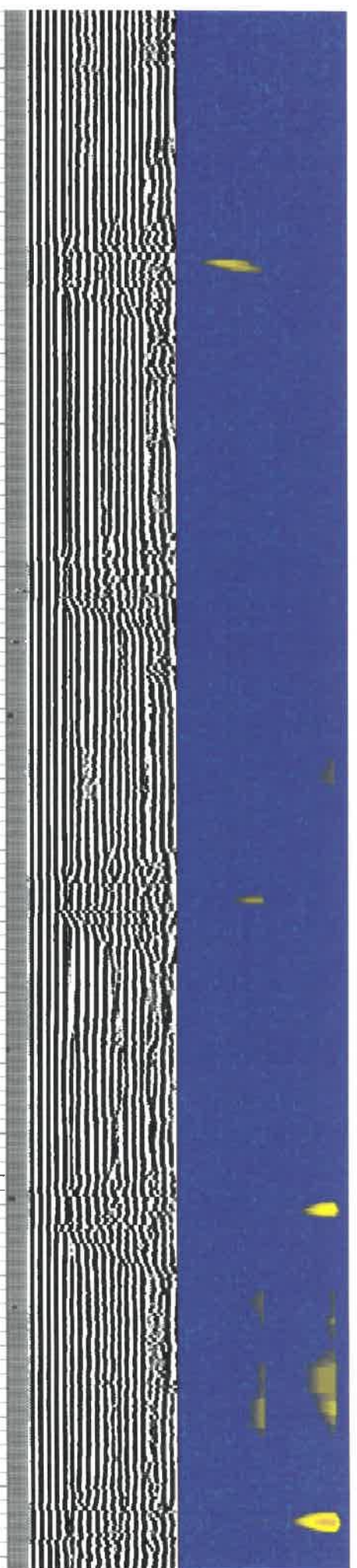
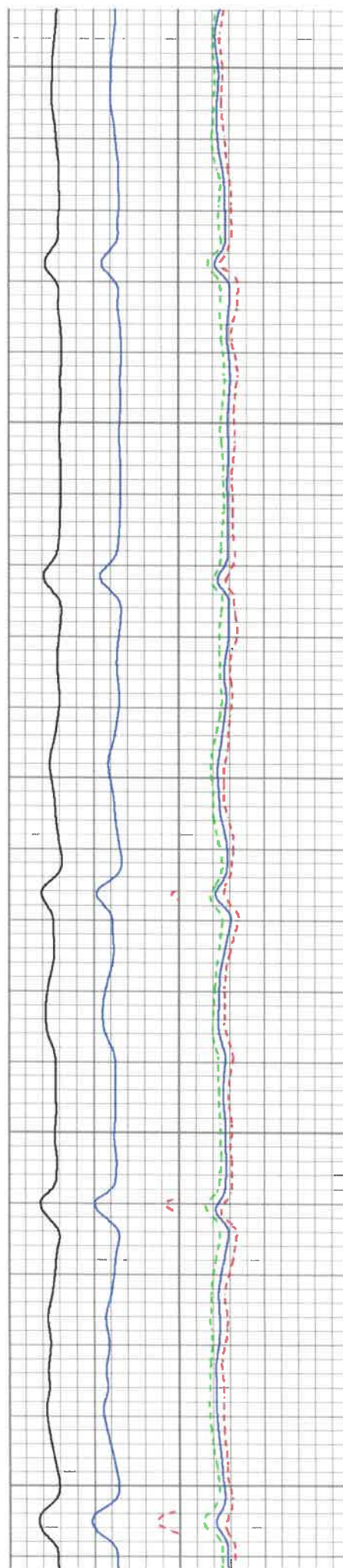
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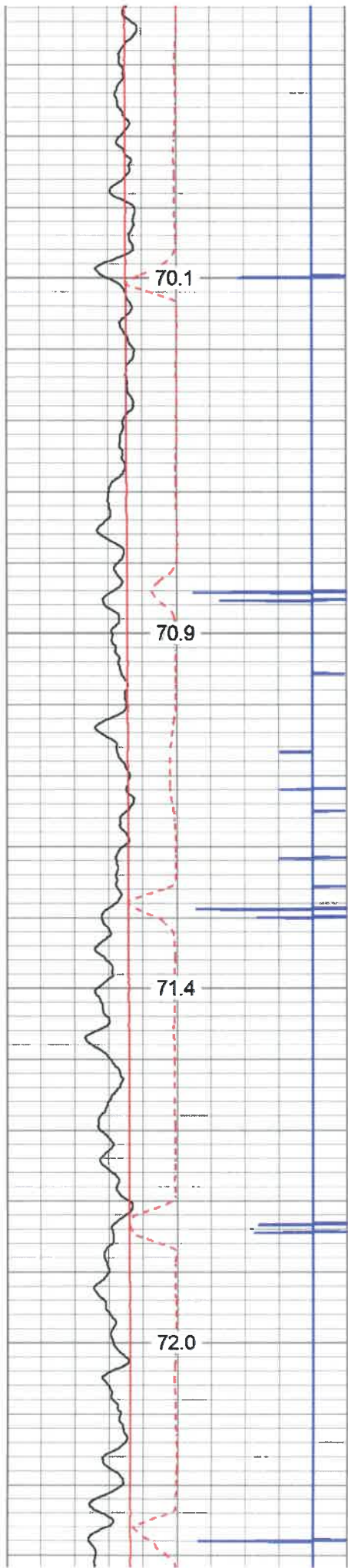
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2050

2100

2150



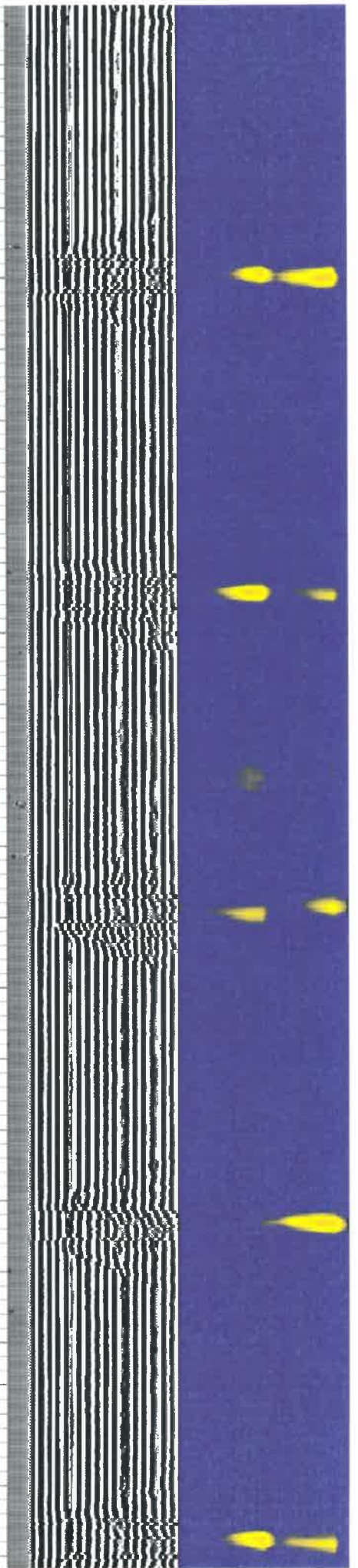
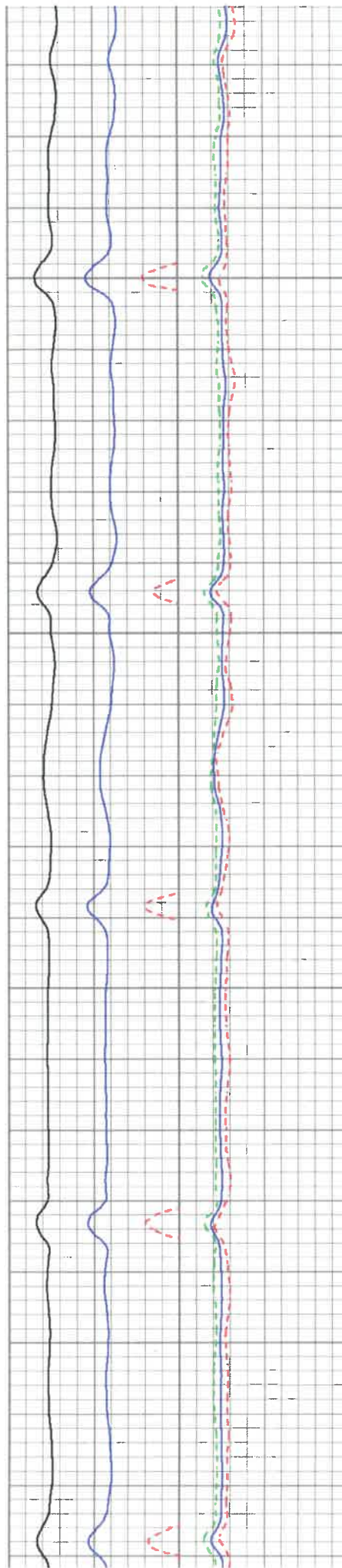


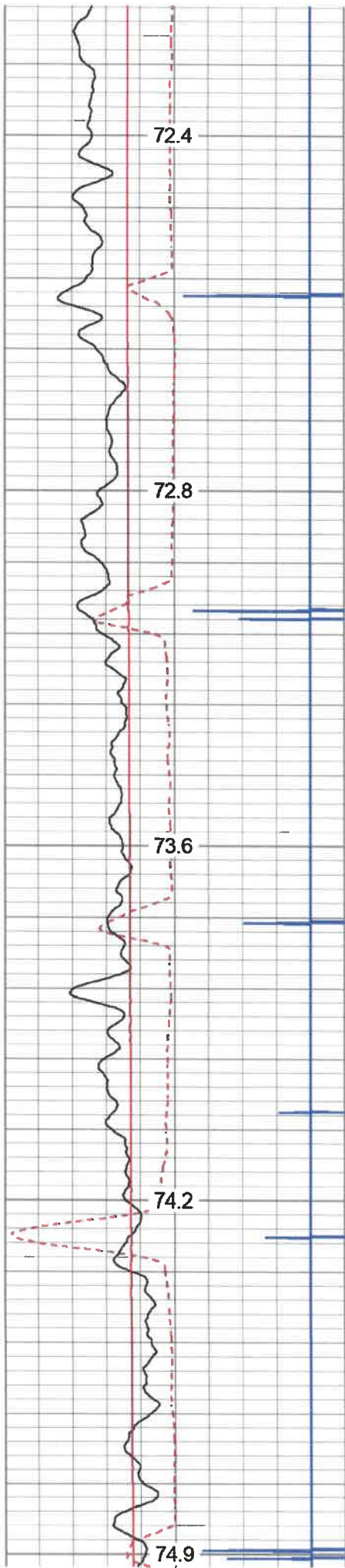
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2300

2350





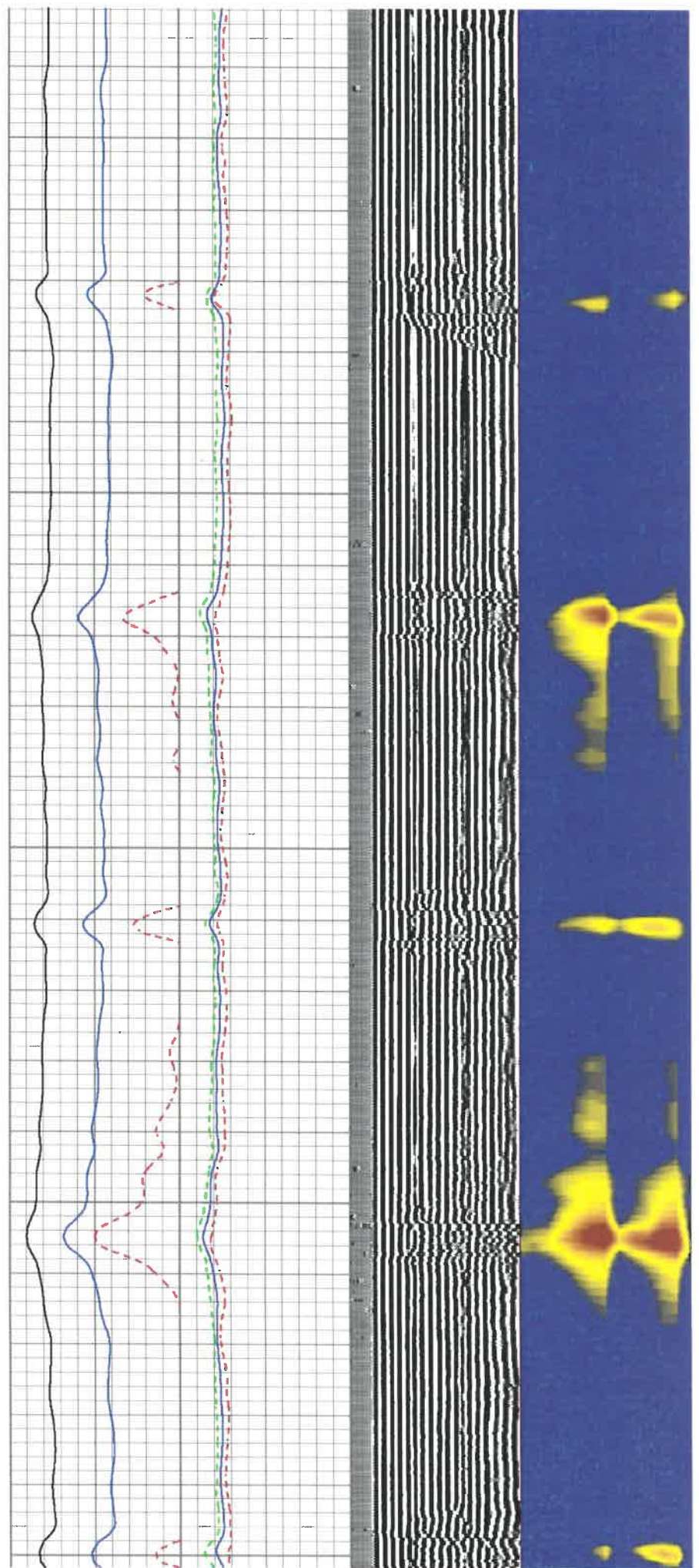
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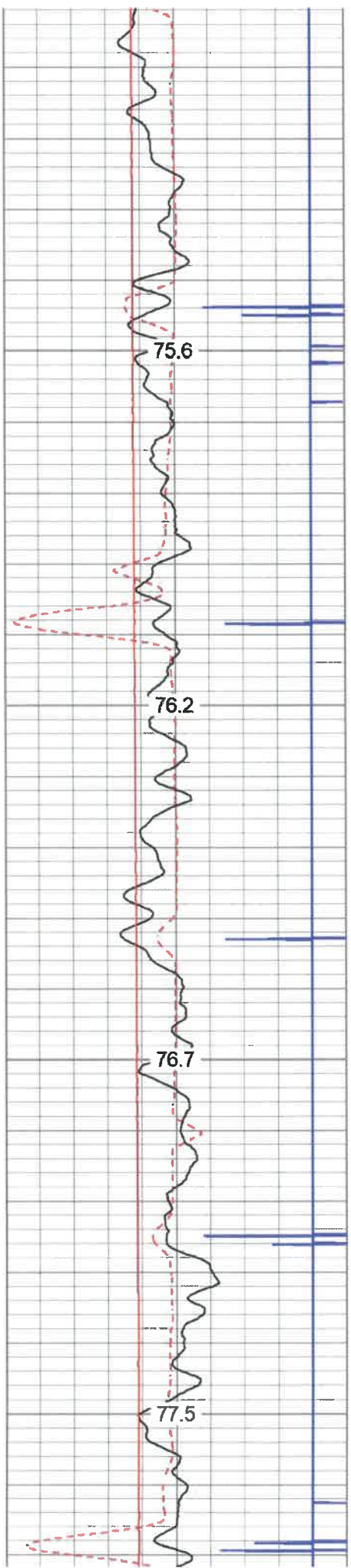
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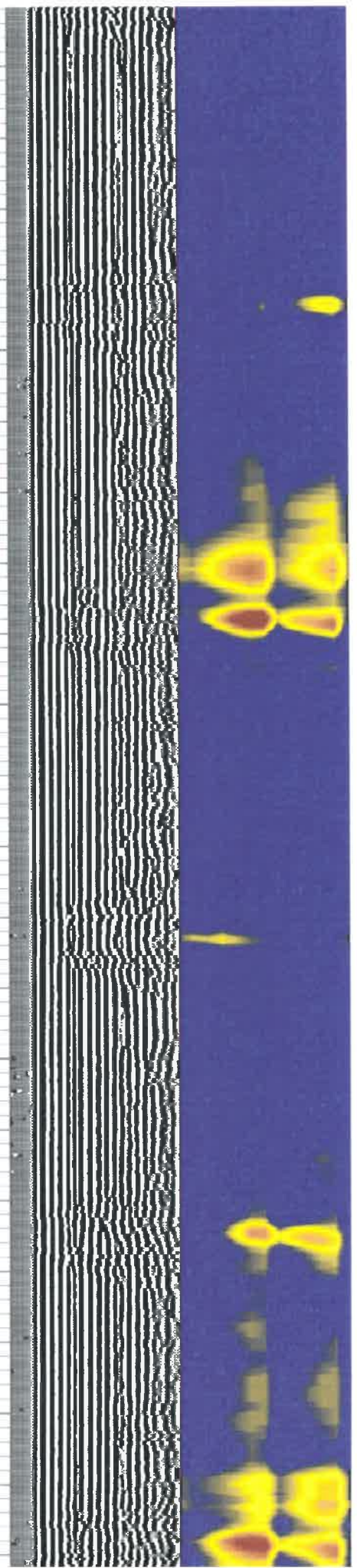
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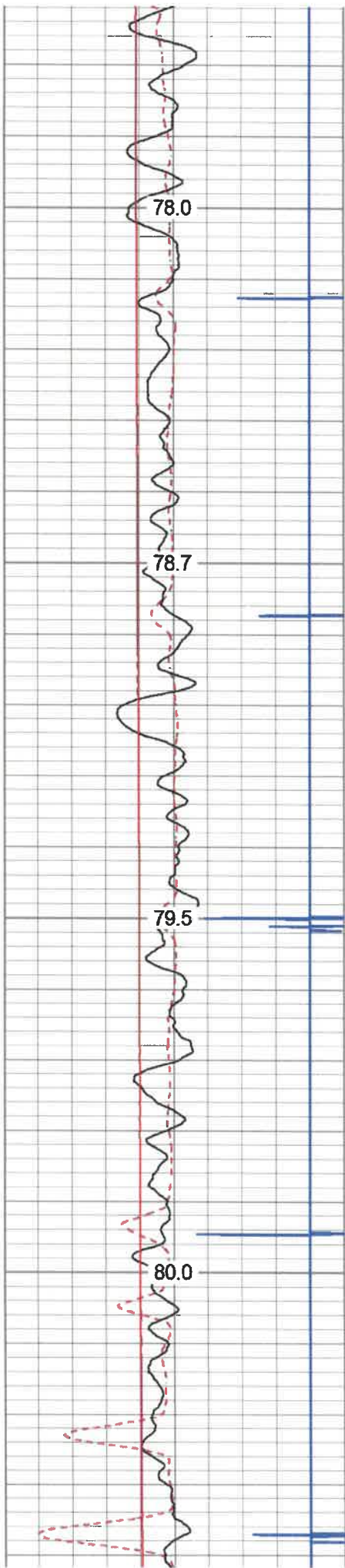
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2650
2700
2750
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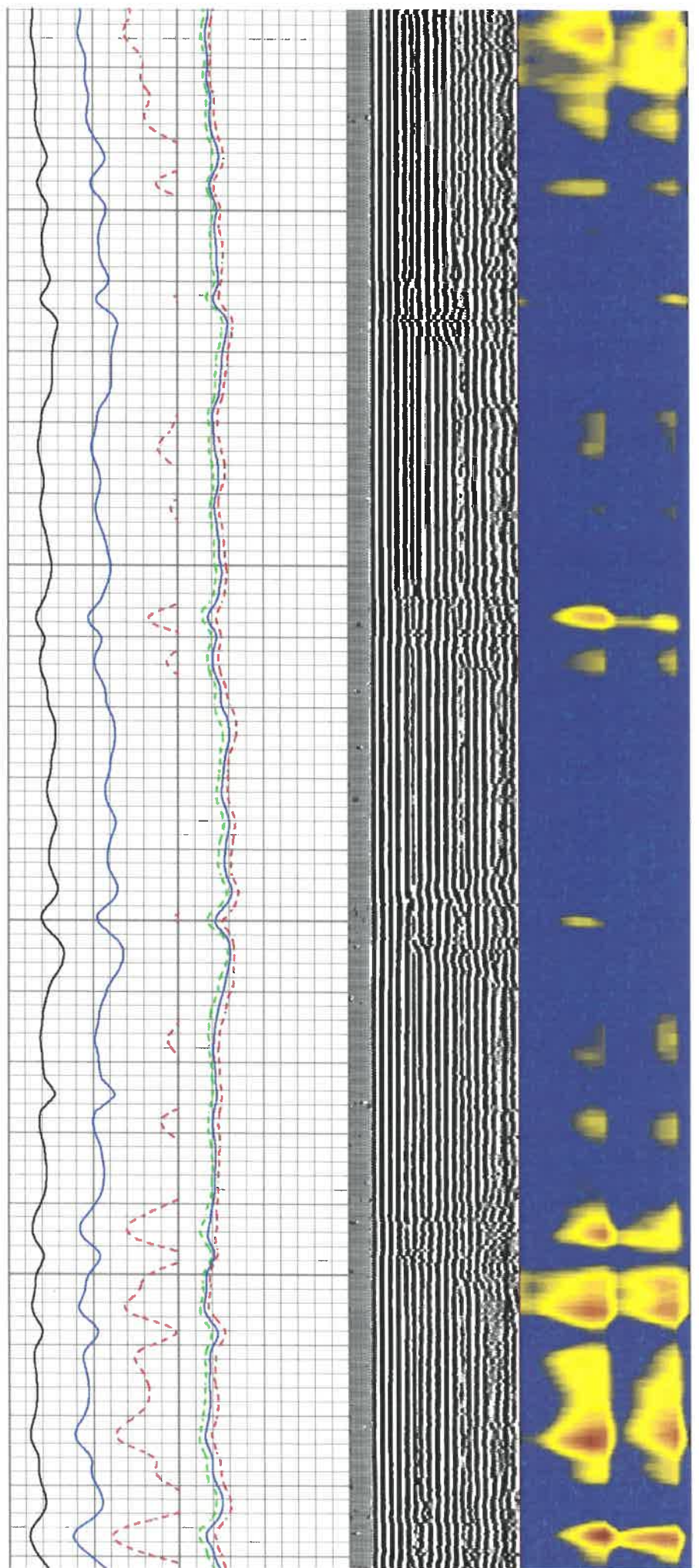


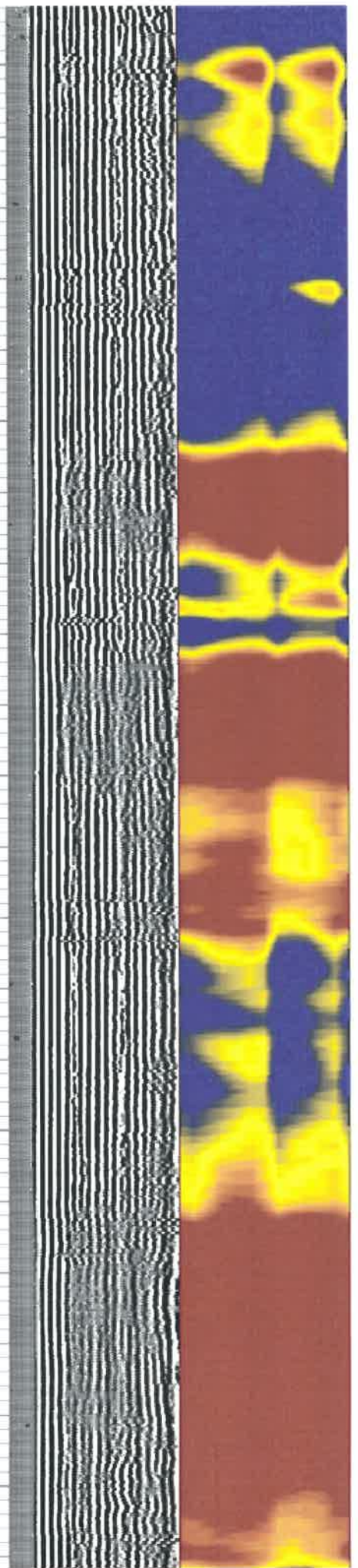
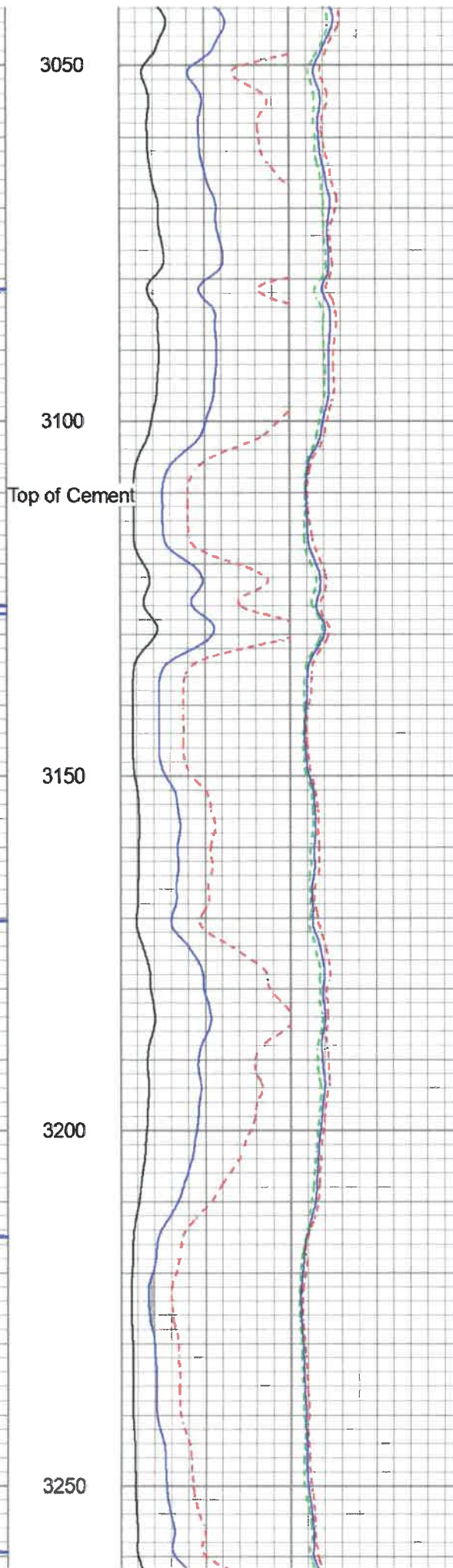
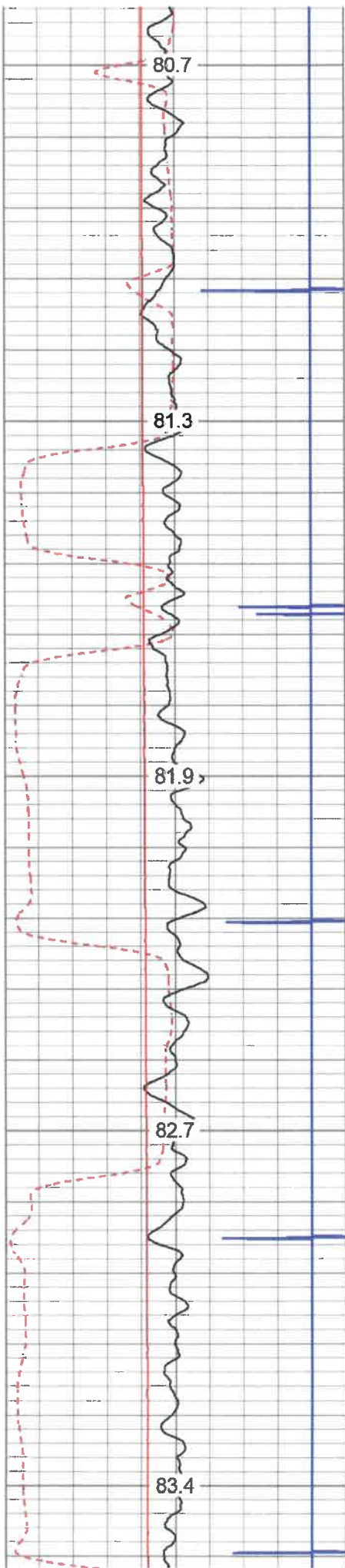
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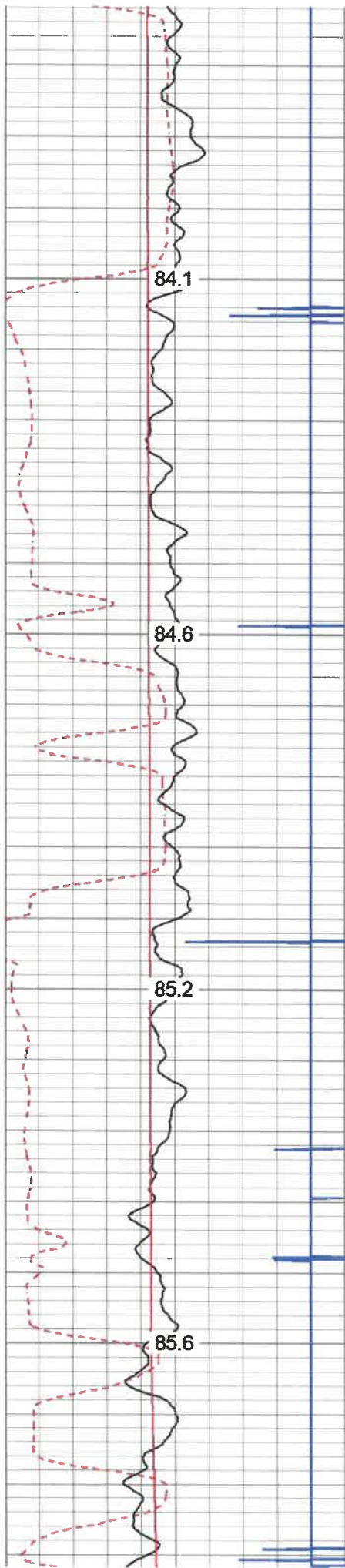
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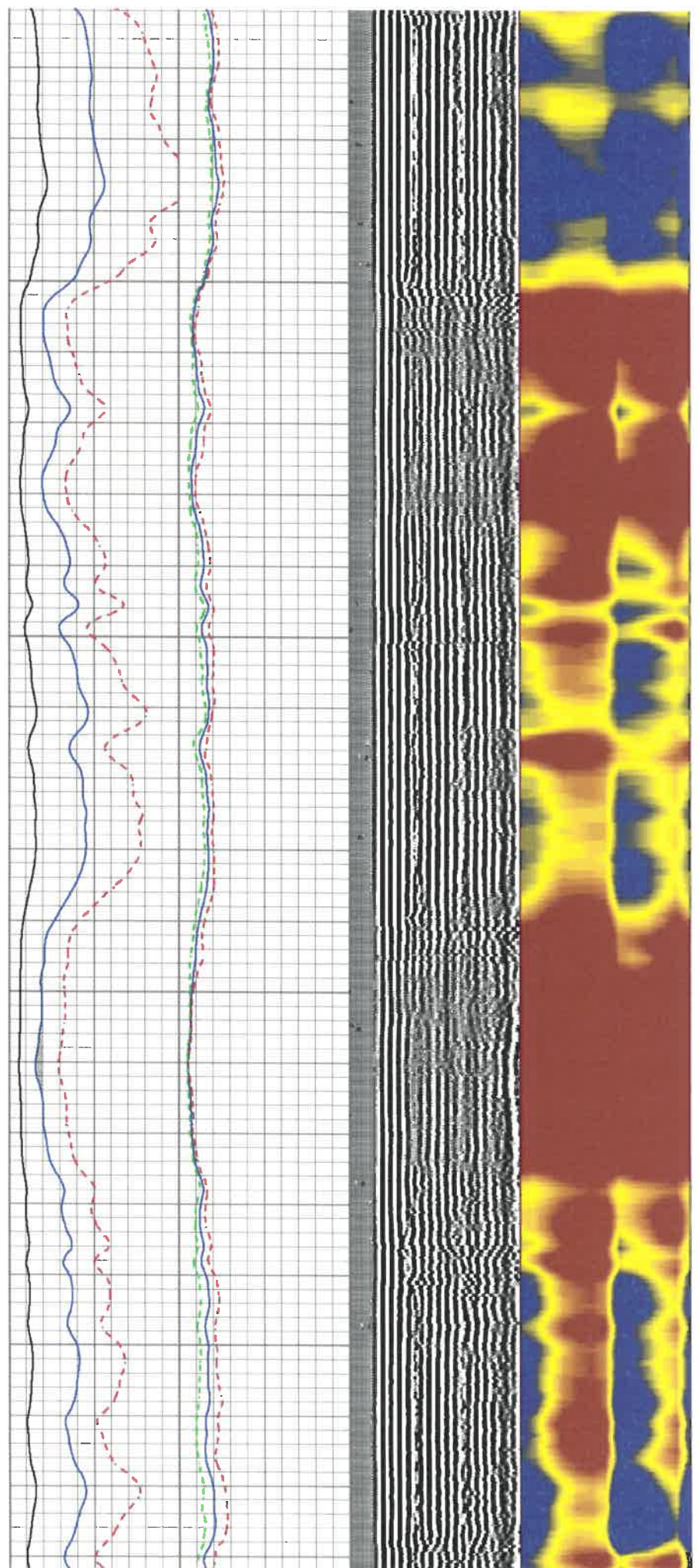


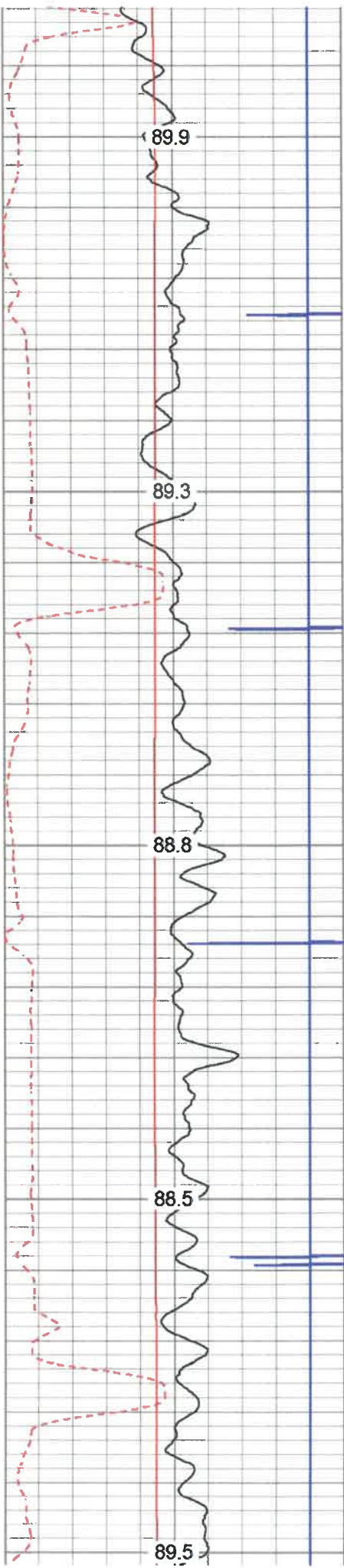
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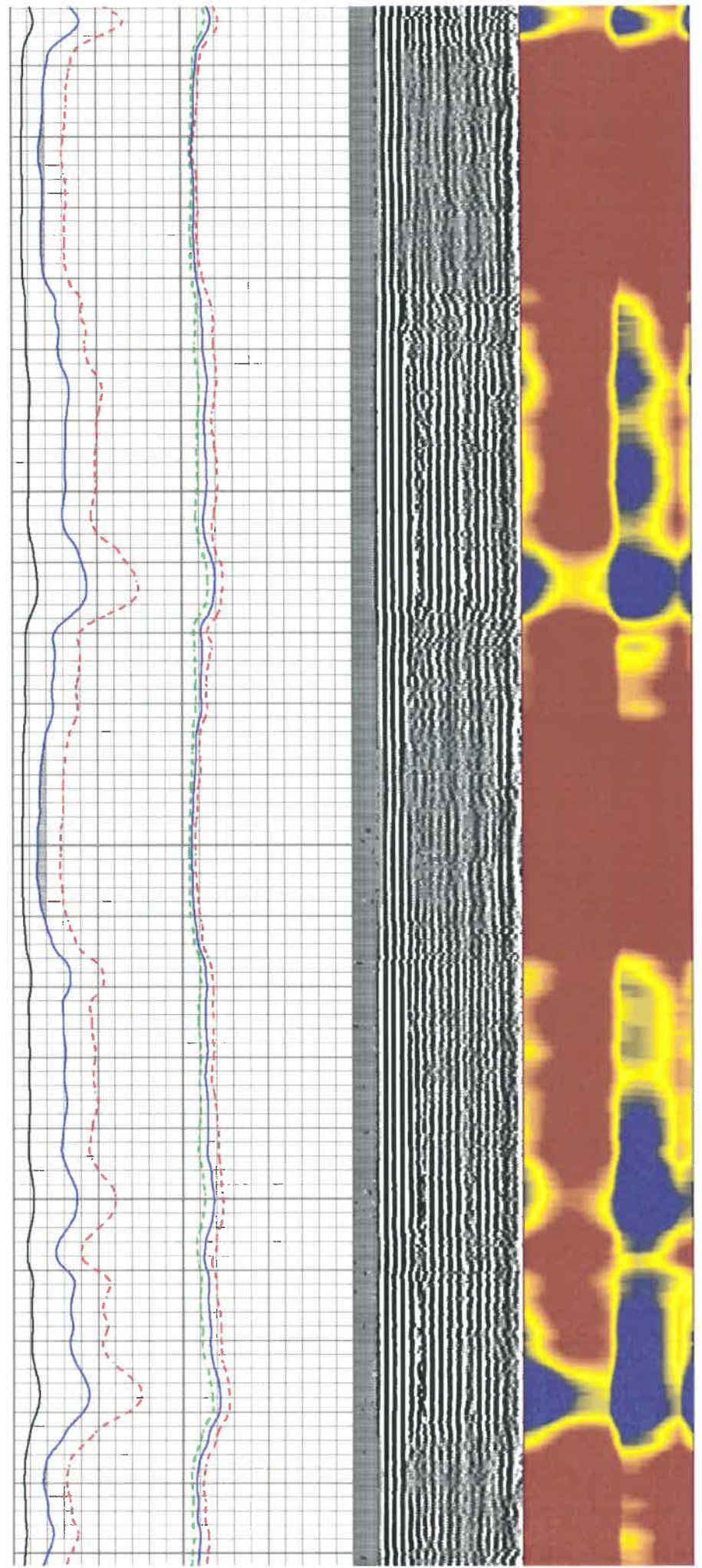
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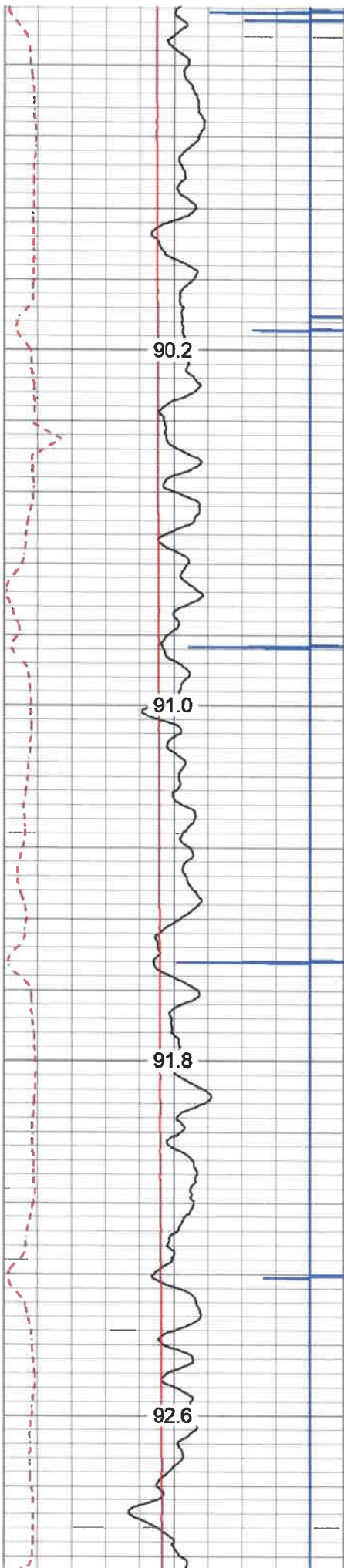
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3700



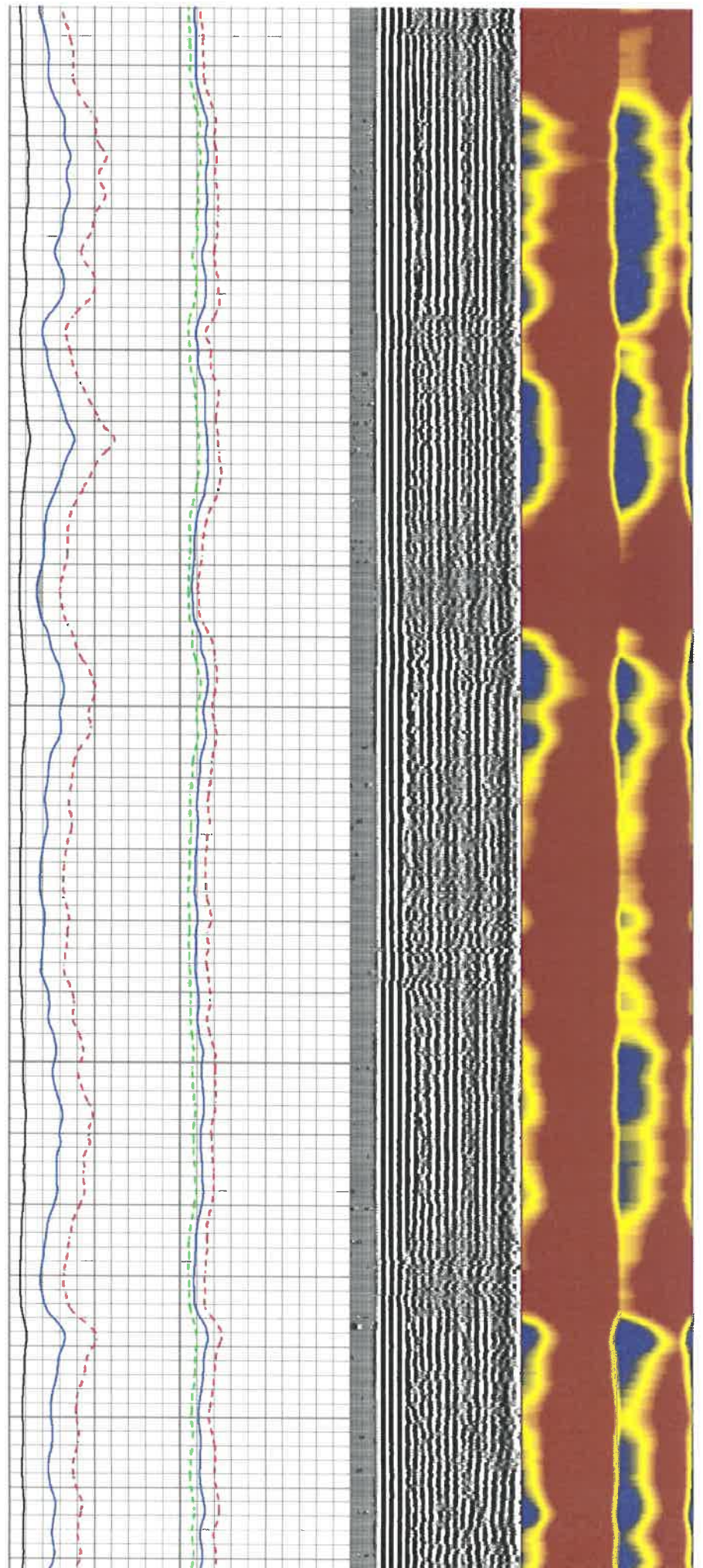


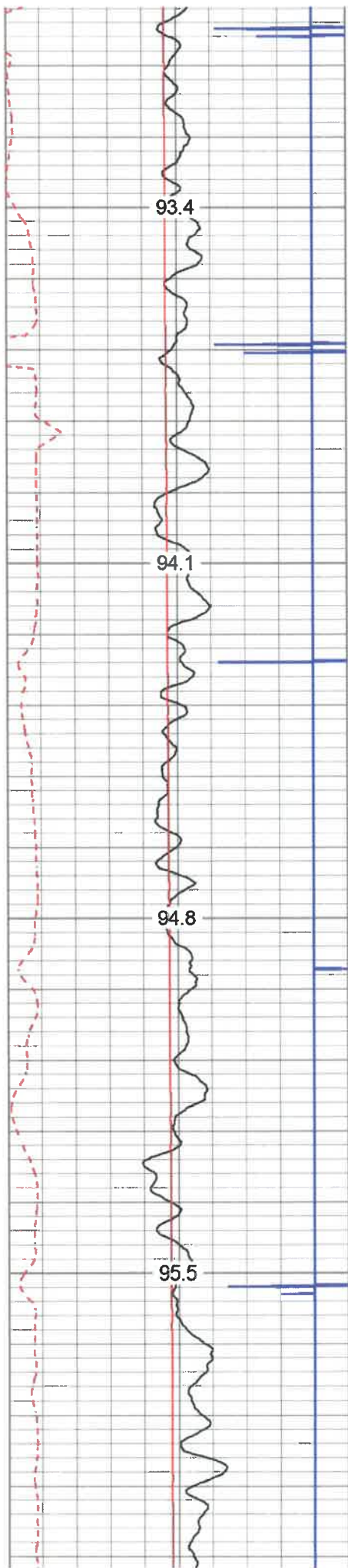
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3800

3850

3900



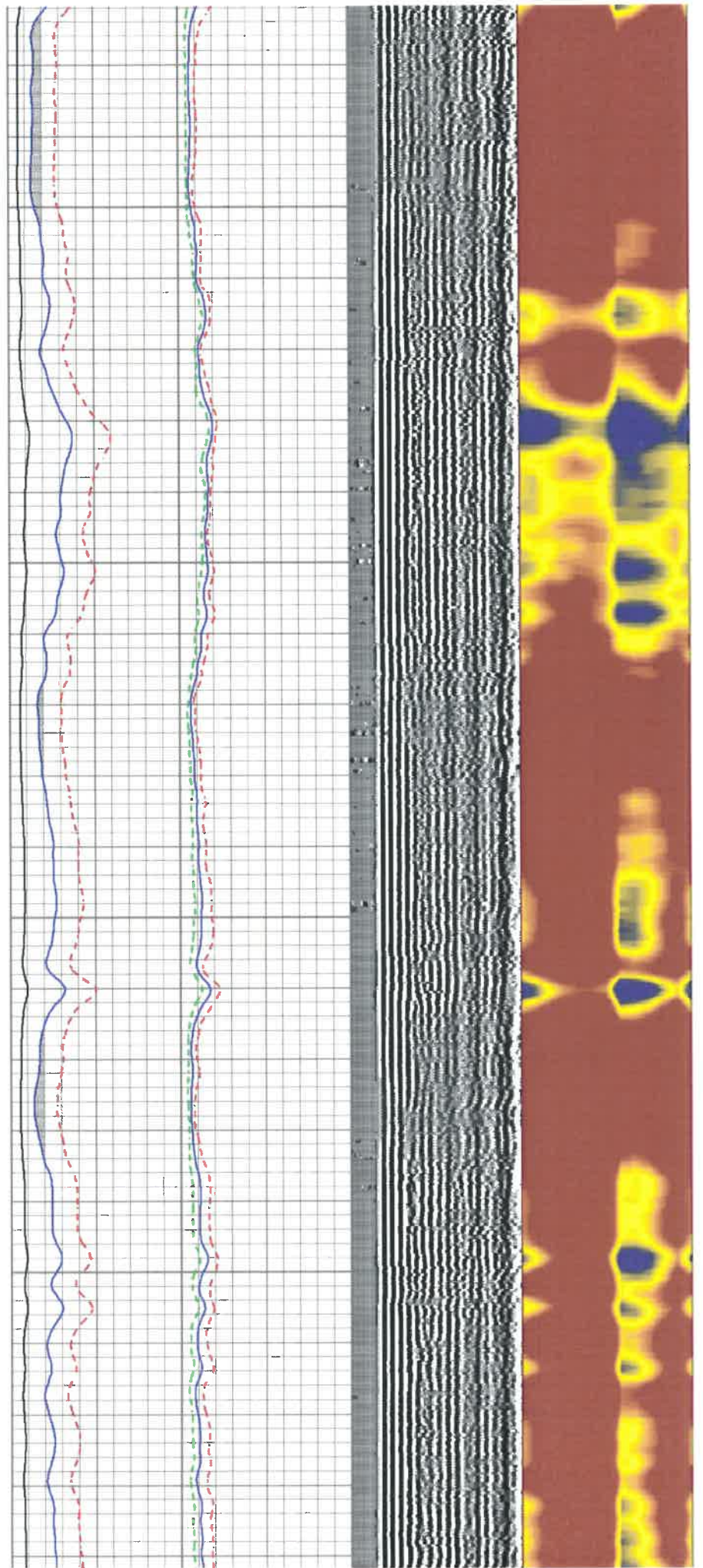


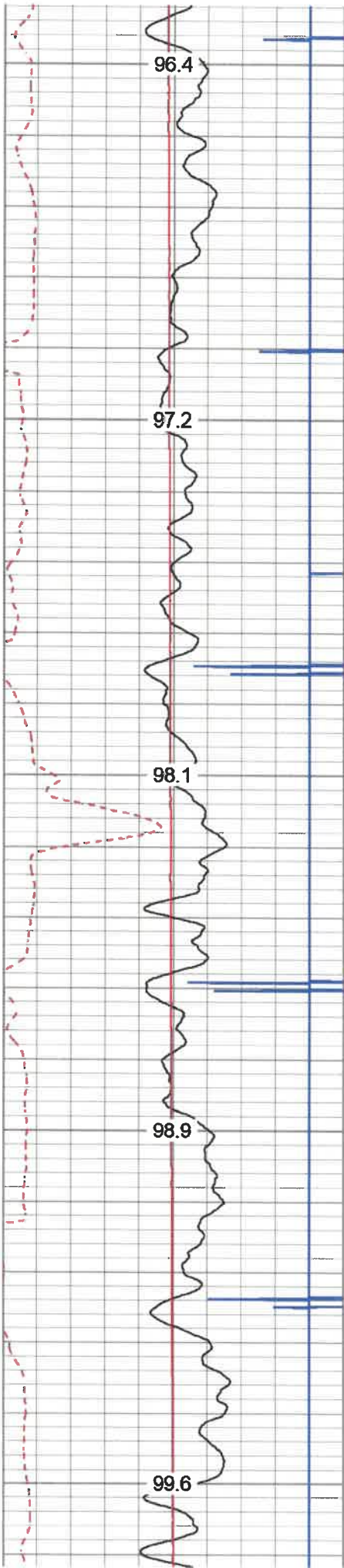
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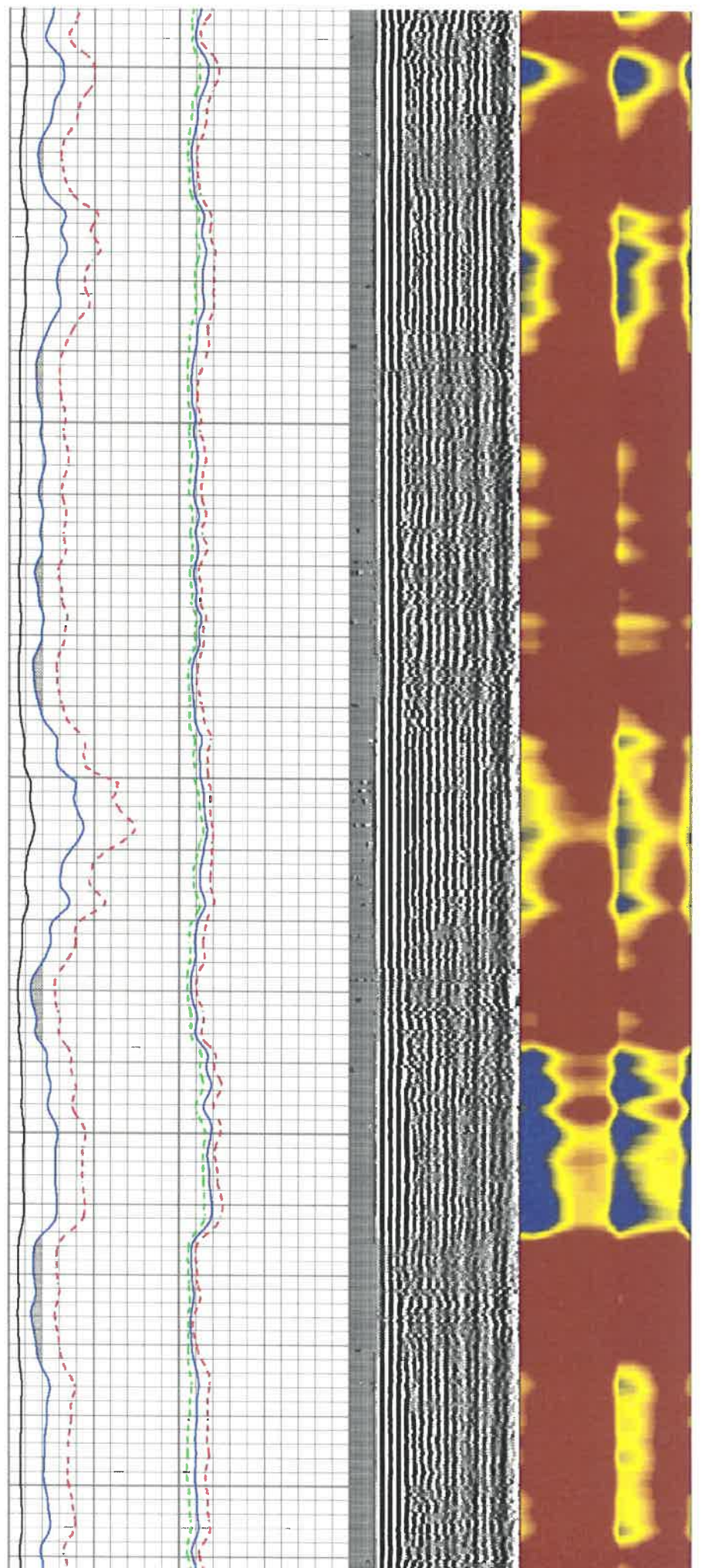
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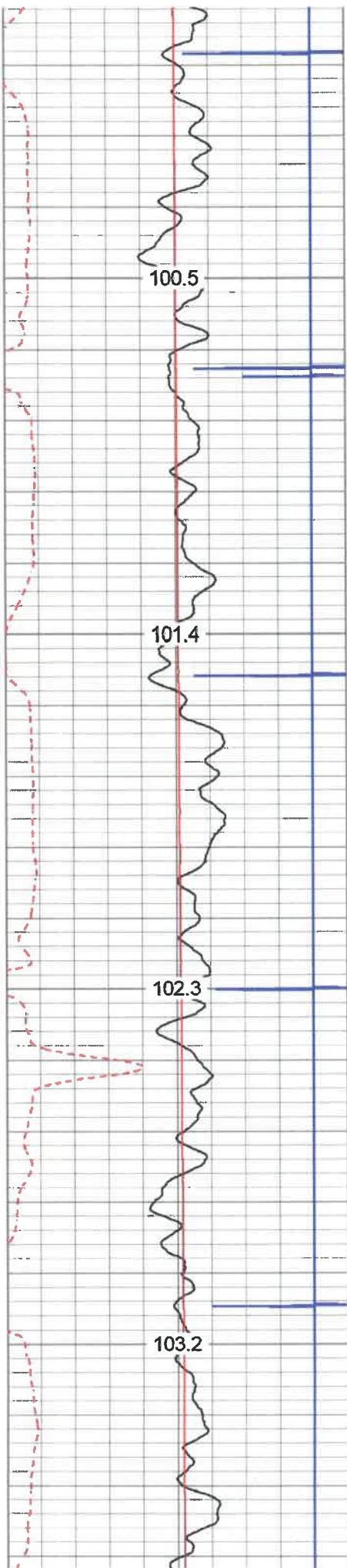
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4150
4200
4250
4300
4350



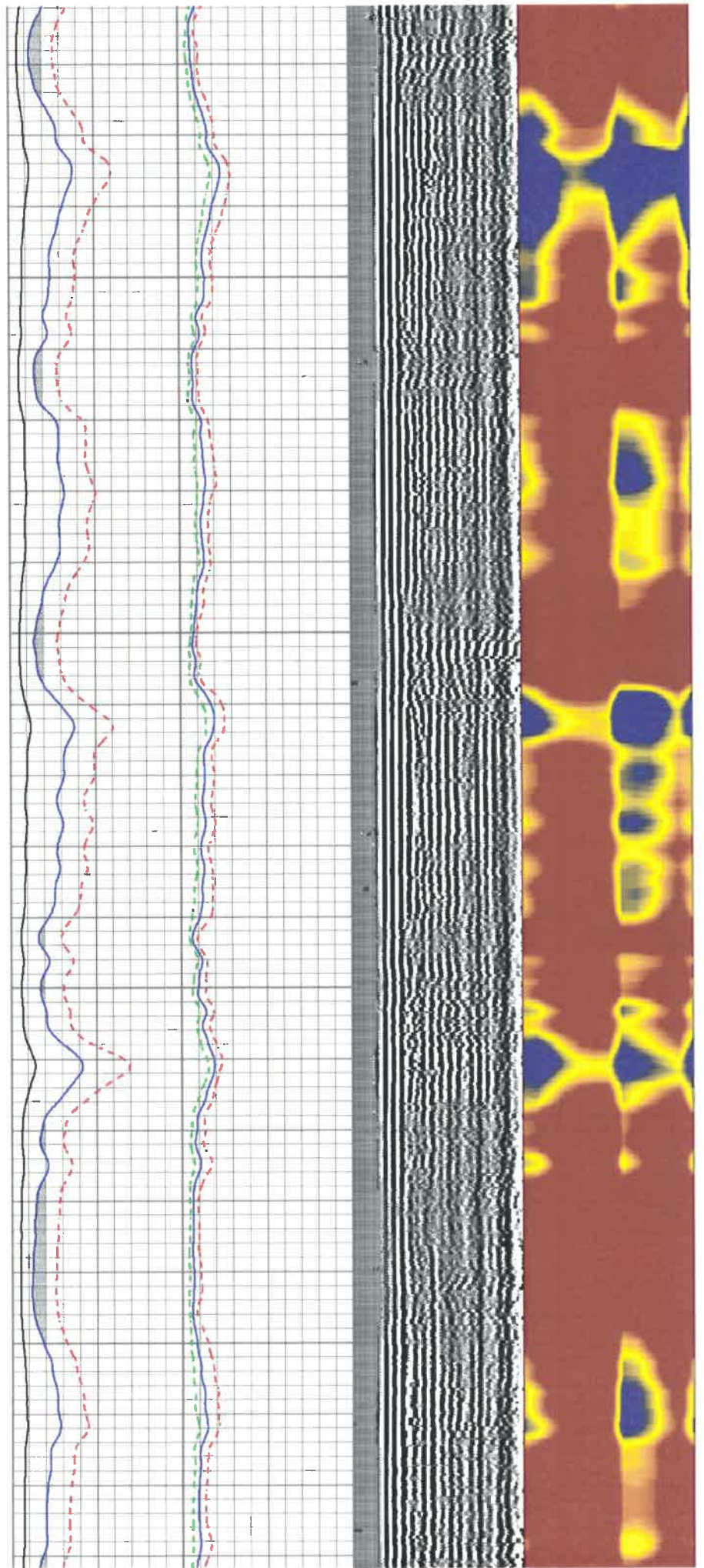


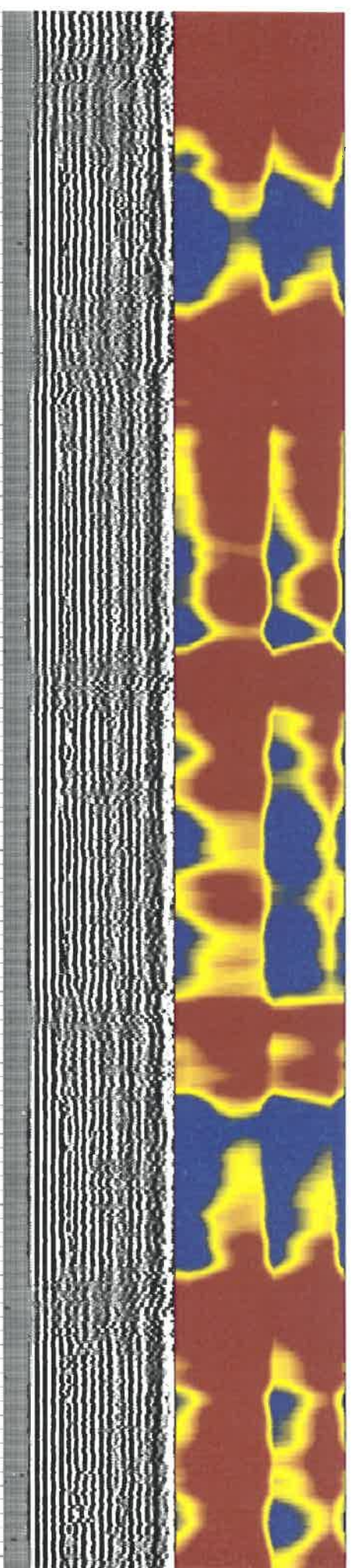
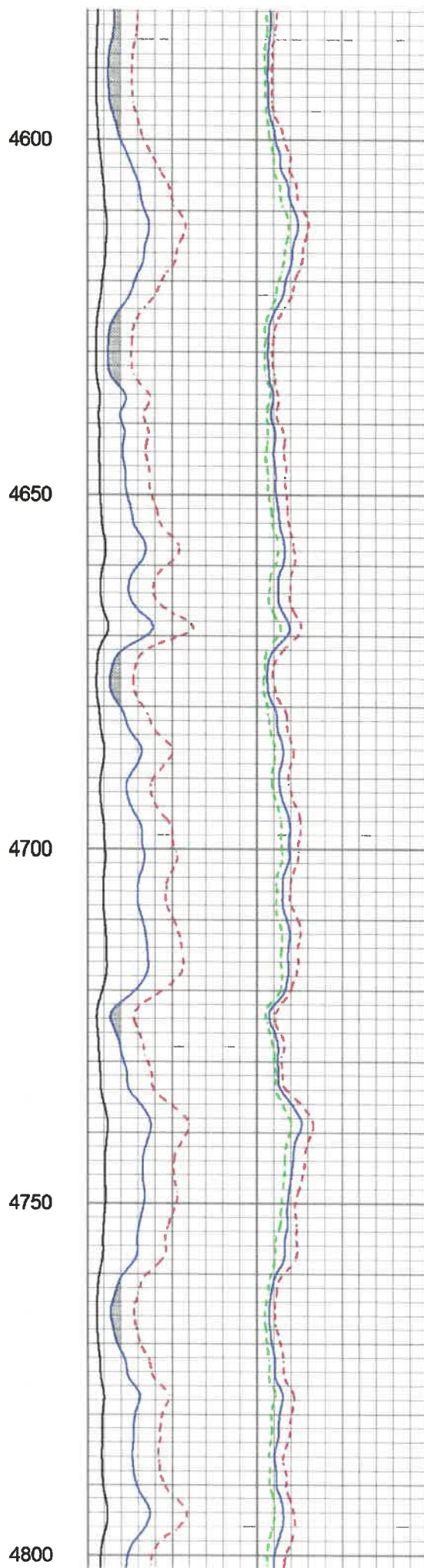
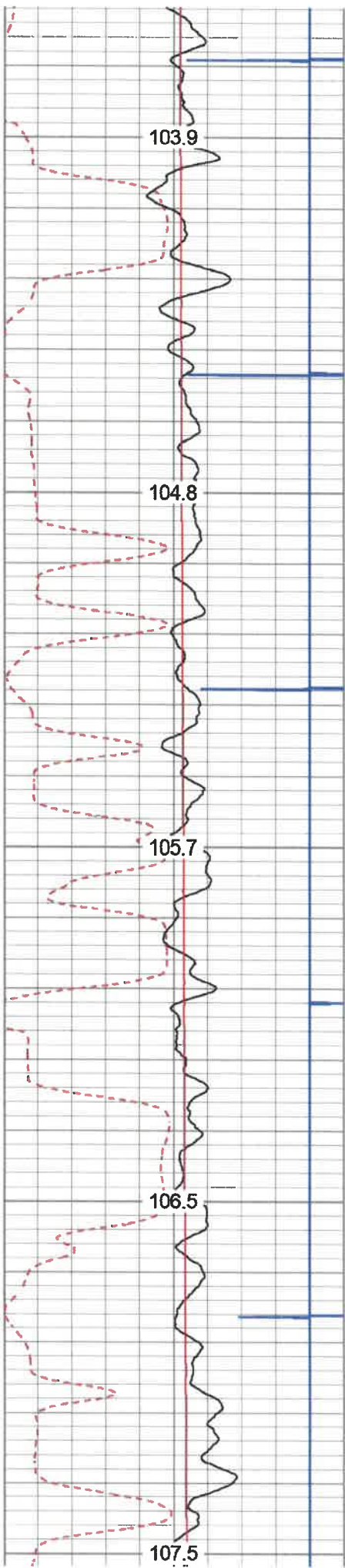
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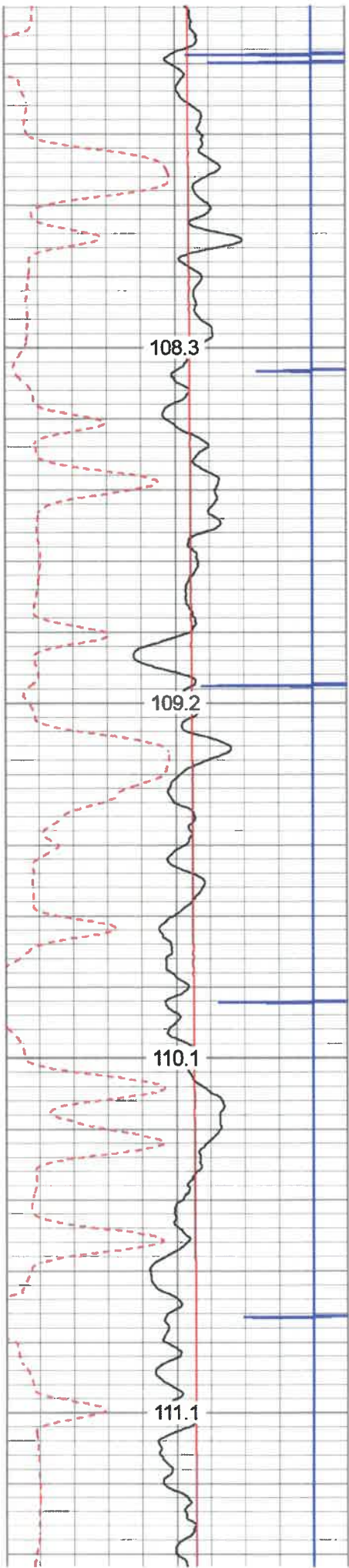
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4550





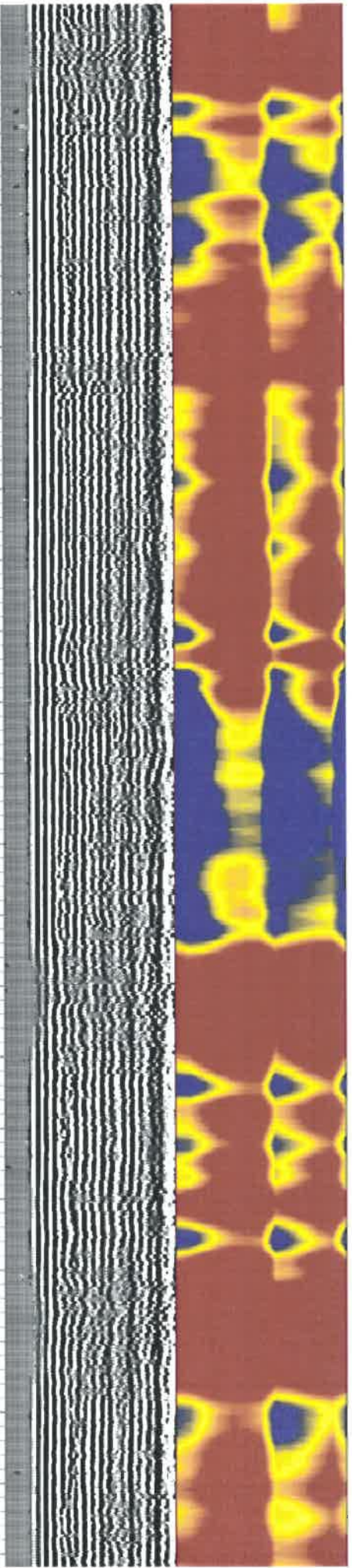
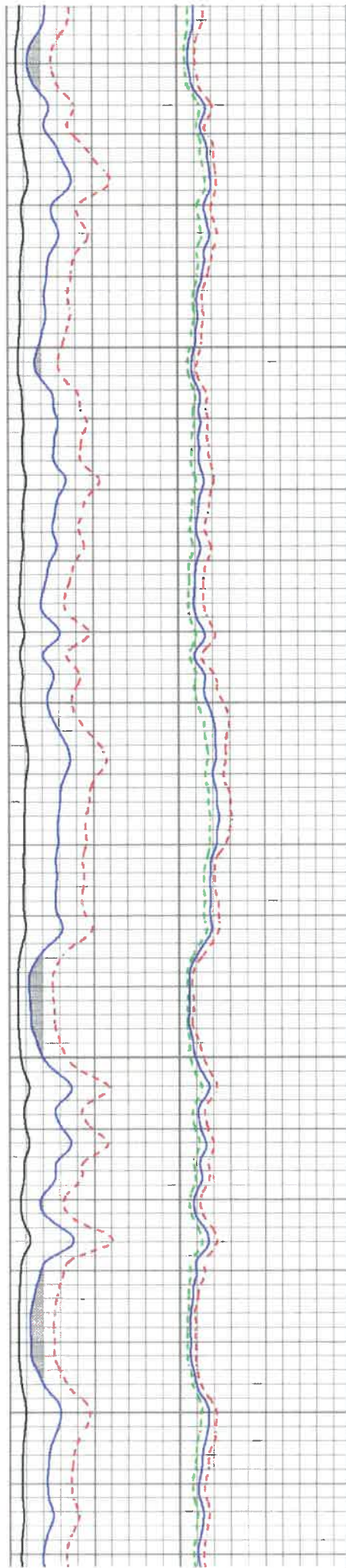


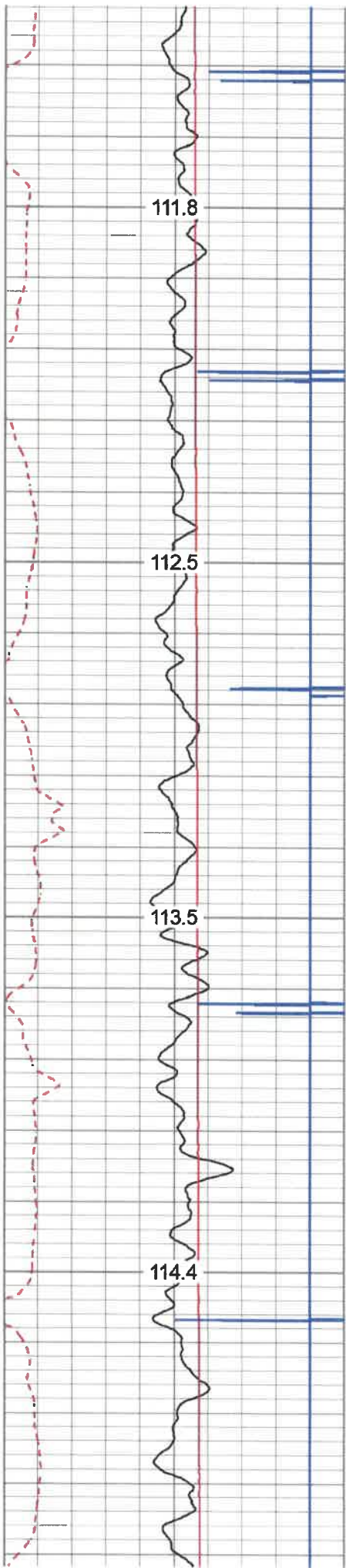
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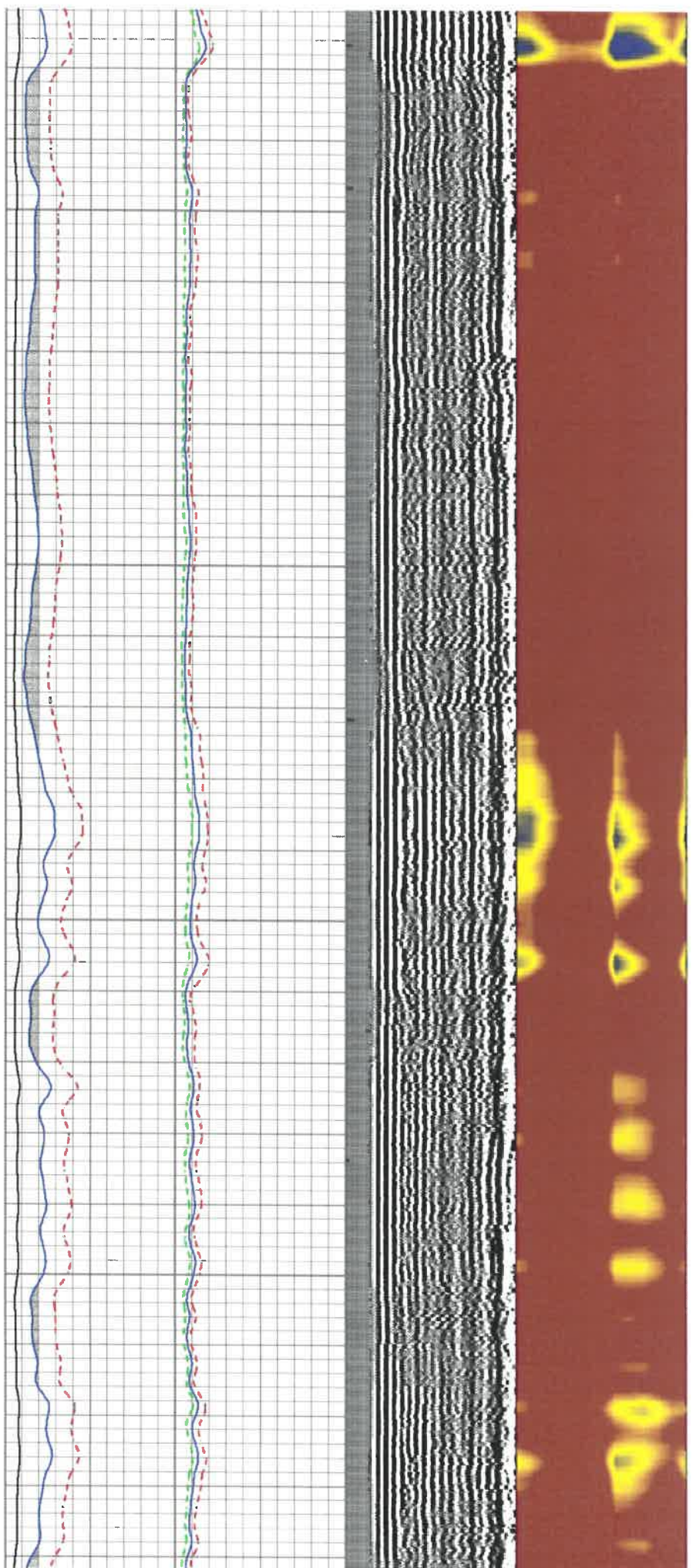


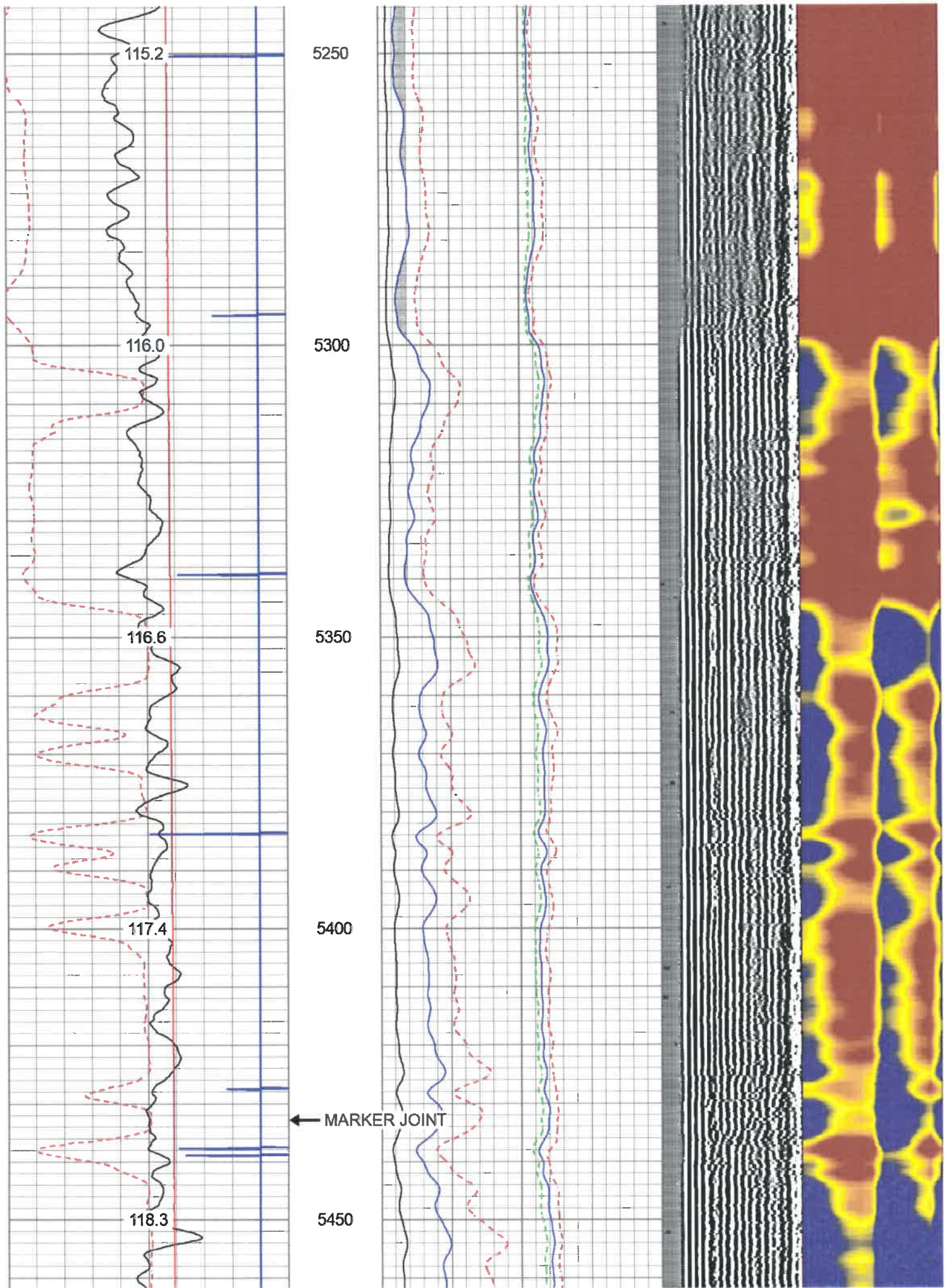
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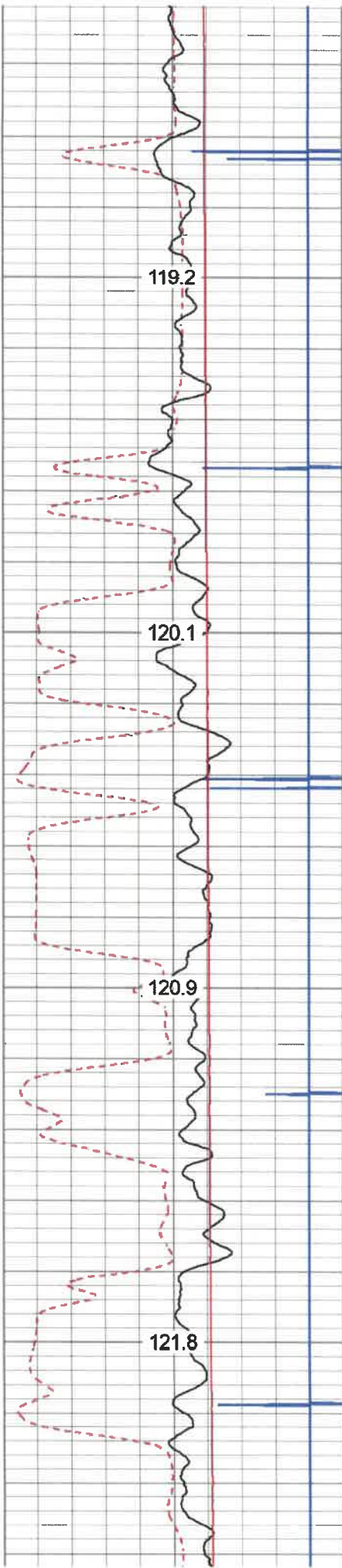
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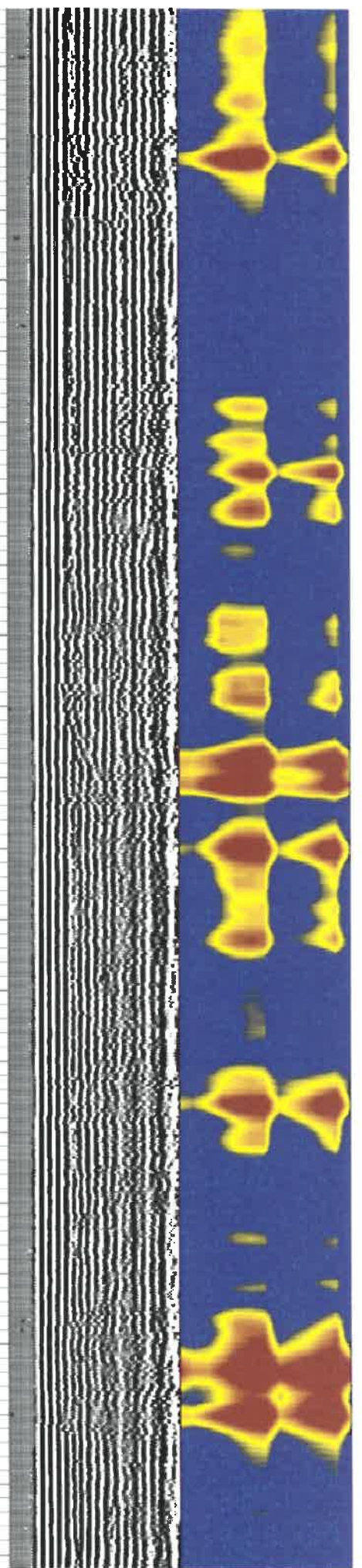
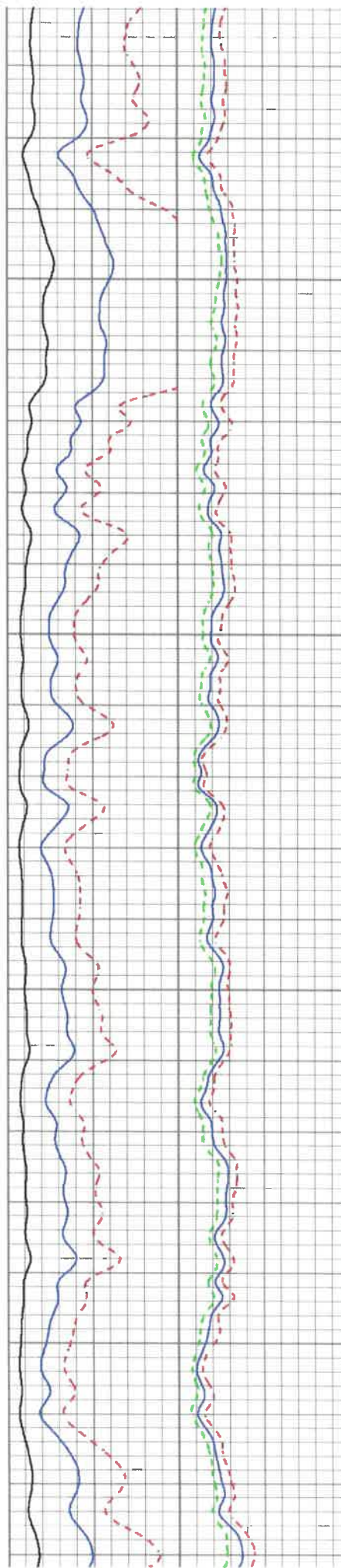


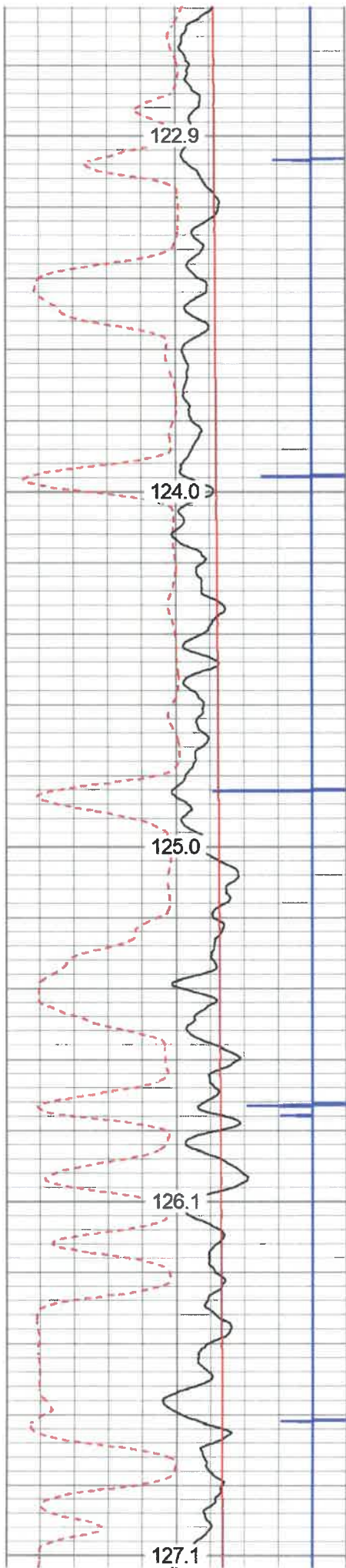
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5600

5650





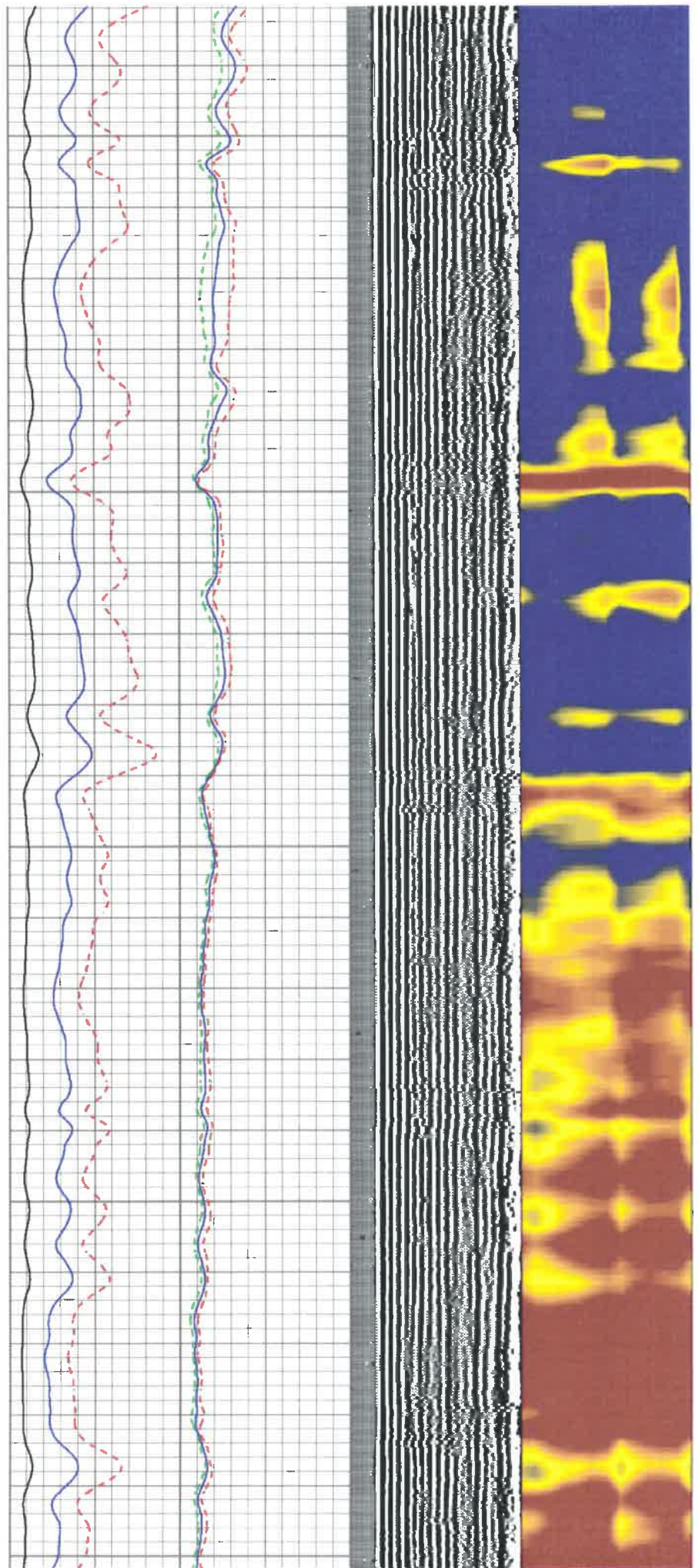
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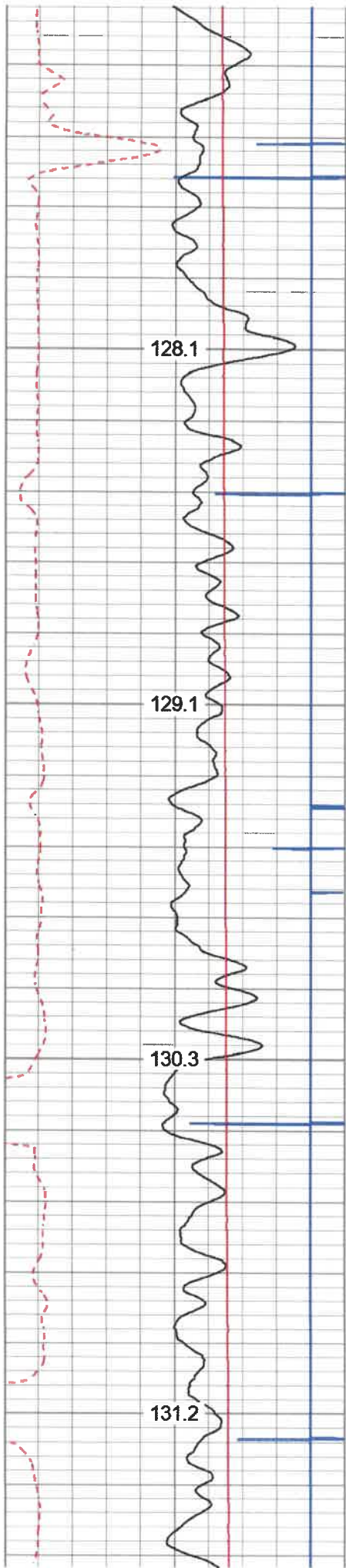
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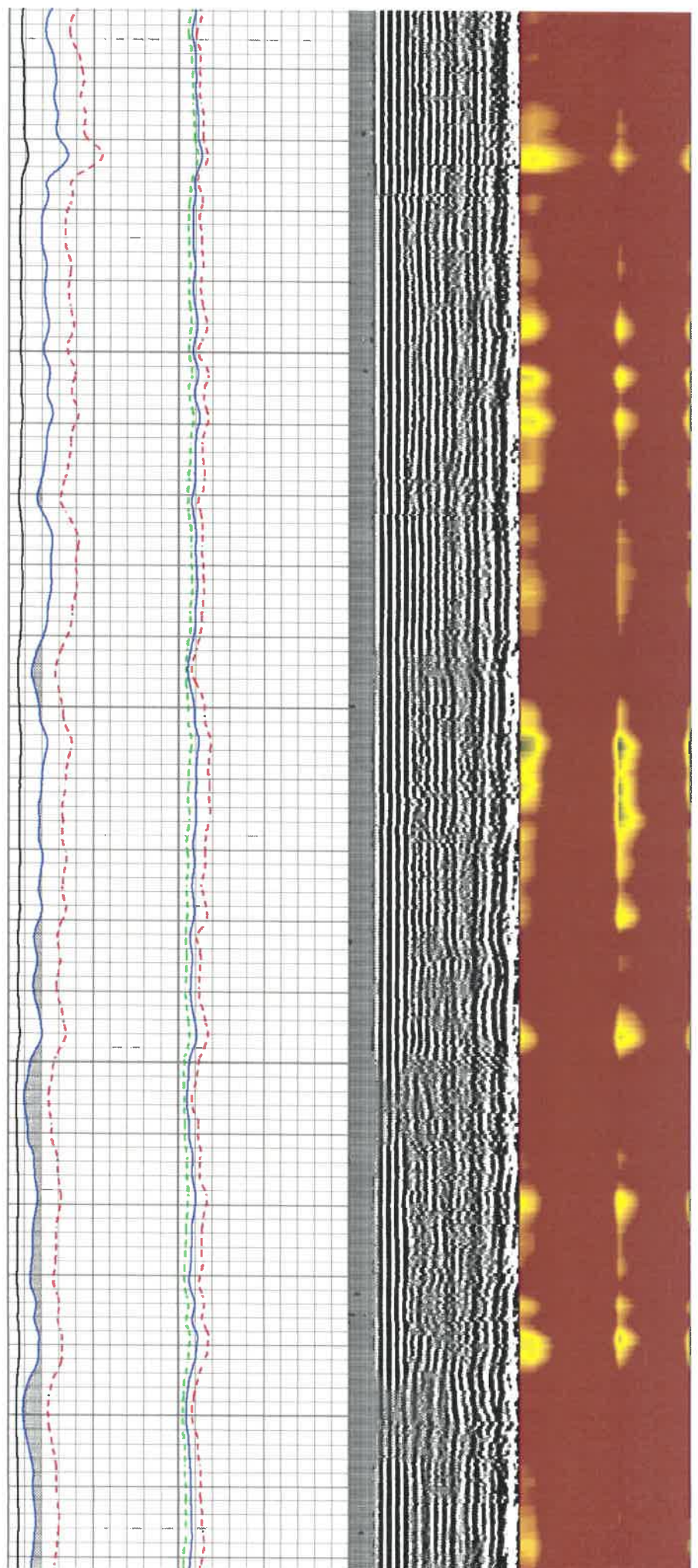


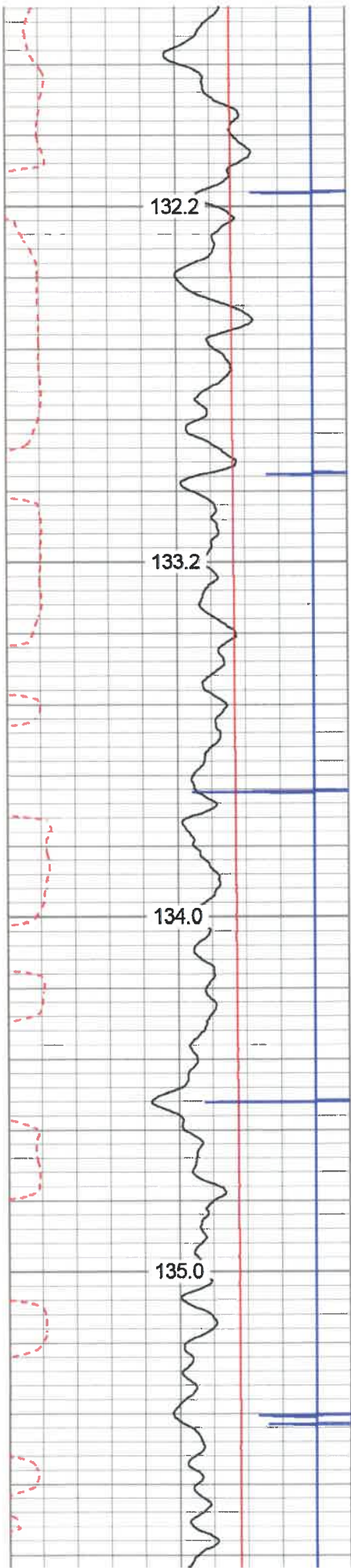
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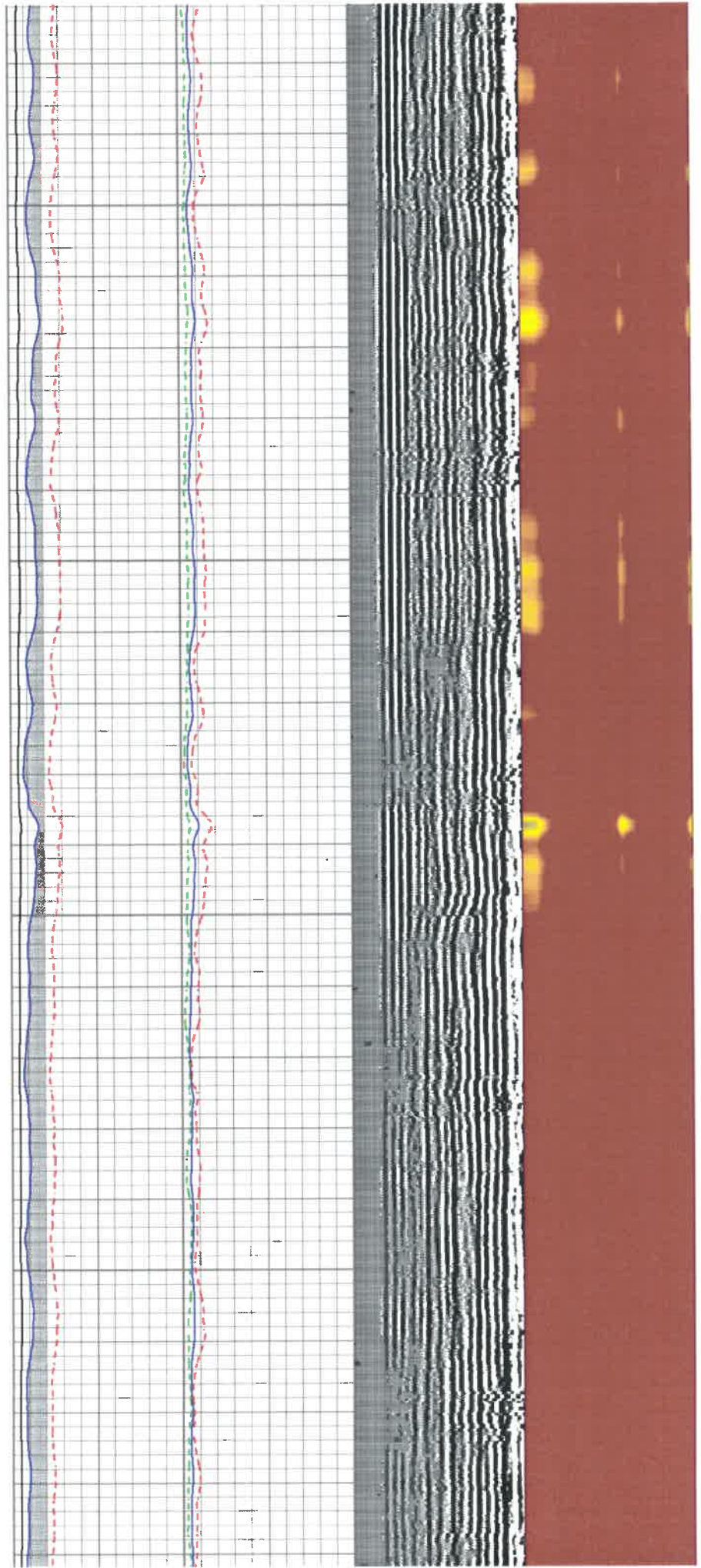


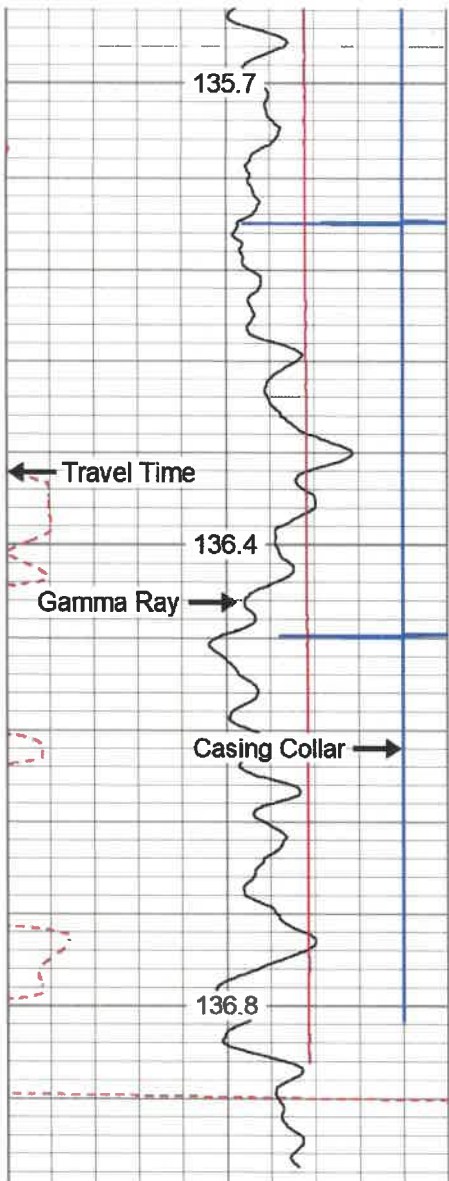
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6200

6250

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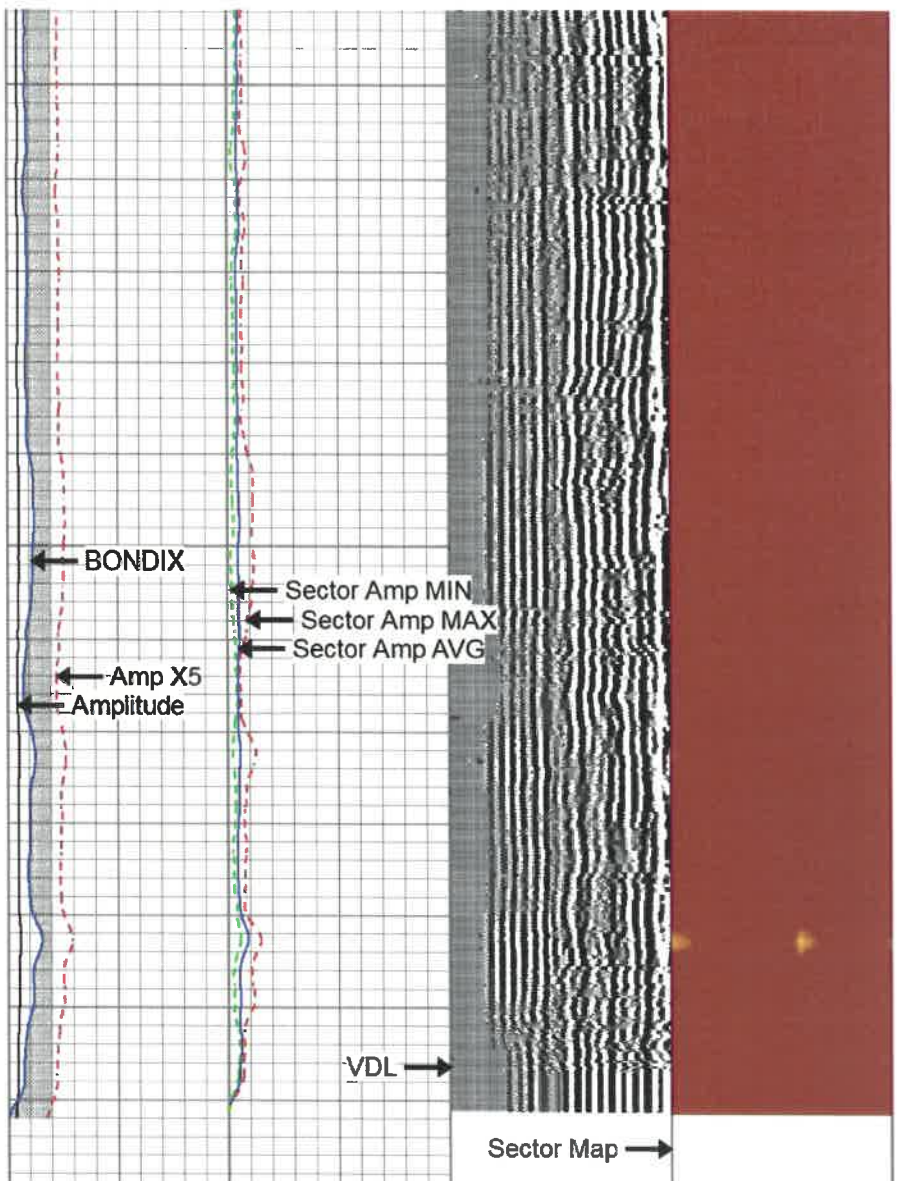




6350

6400

6450



280	Travel Time (usec)	180
9	Casing Collar	-1
0	Gamma Ray	180
0	TEMP (degF)	200
180	GR	360

0	Amplitude (mV)	100
0	Amp X5 (mV)	20
1	BONDIX	0

1	Sector Map	12
200	VDL (usec)	1200

TEMP
(degF)



REPEAT PASS

Database File antero_riggs unit 2h .db
 Dataset Pathname passREP
 Presentation Format antero
 Dataset Creation Fri Nov 15 13:00:13 2019
 Charted by Depth in Feet scaled 1:240

280	Travel Time (usec)	180
9	Casing Collar	-1

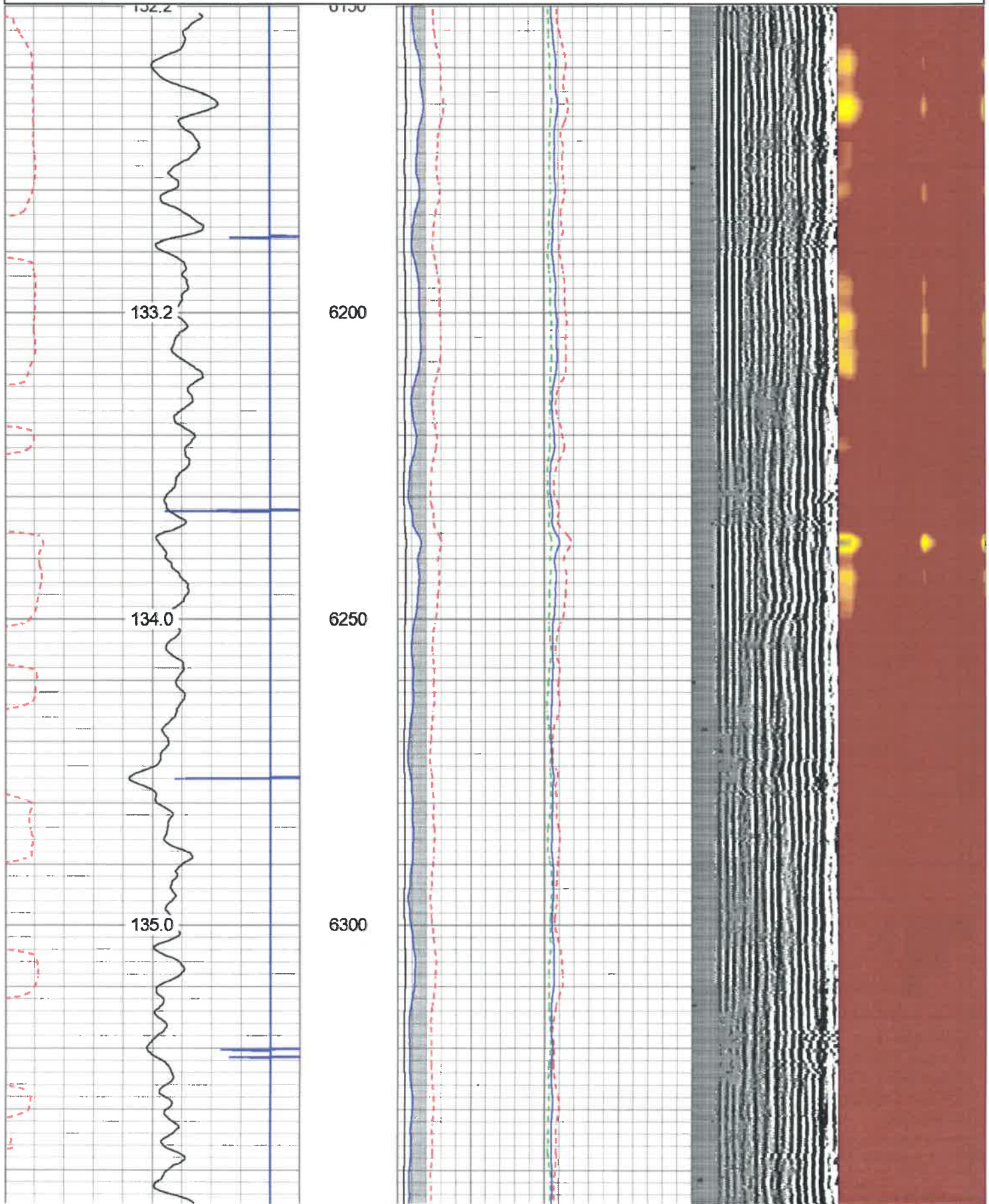
0	Amplitude (mV)	100
1	BONDIX	0

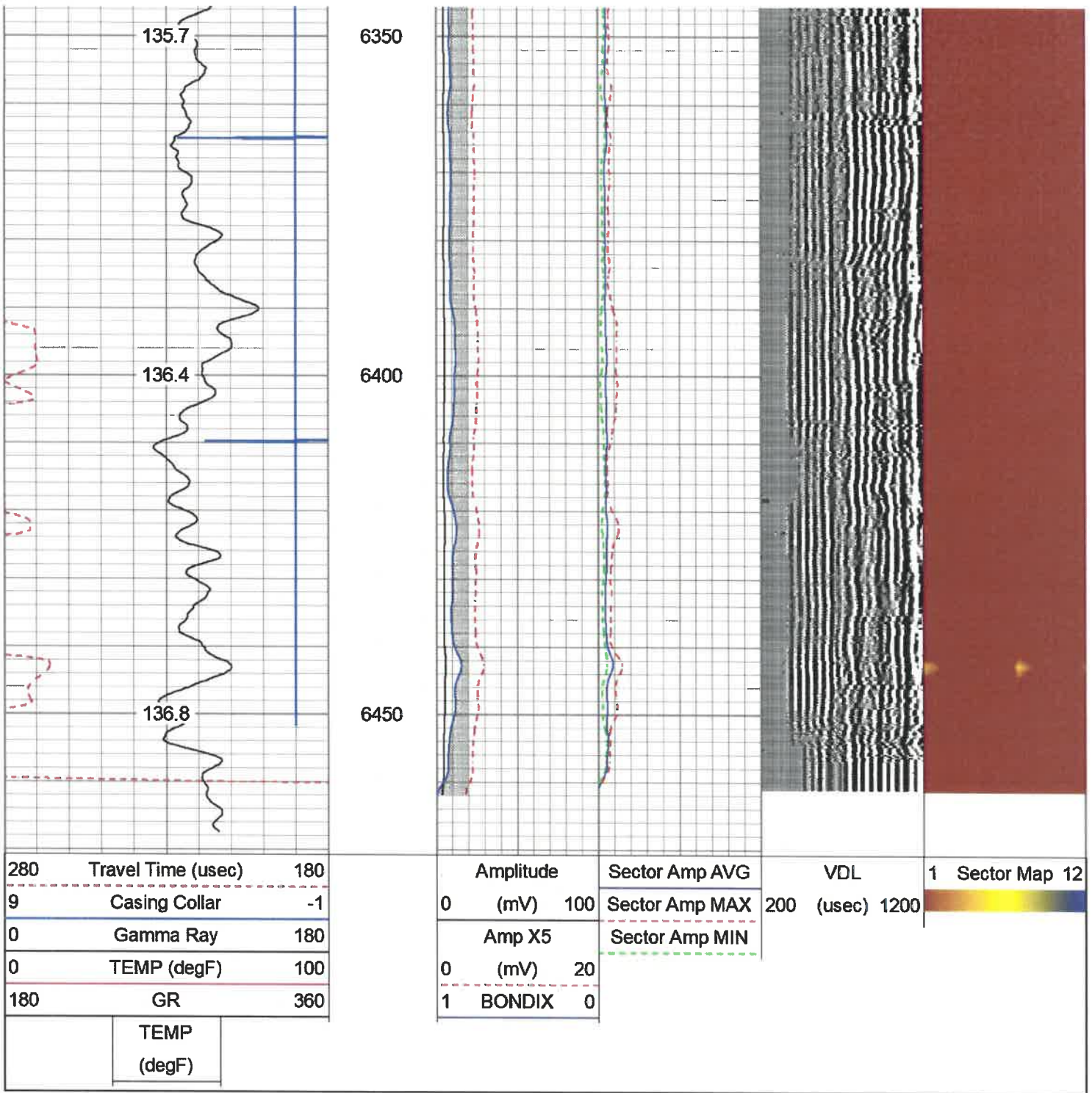
1	Sector Map	12
200	VDL (usec)	1200

0	Gamma Ray	180
0	TEMP (degF)	100
180	GR	360

Amp X5		Sector Amp MIN
0	(mV)	20
1	BONDIX	0

TEMP
(degF)





Log Variables

DatabaseC:\ProgramData\Warrior\Data\antero_riggs unit 2h .db
 Dataset field/well/run1/pass3.1/_vars_

Top - Bottom							
BHTEMP_Src	BOREID	BOTTEMP	CASEOD	CASETHCK	CASEWGHT	MAXAMPL	MINAMPL
TEMP	in 8.25	degF 100	in 5.5	in 0	lb/ft 23	mV 71.9	mV 3.5
MINATTN	PERFS	PPT	SRFTEMP	TDEPTH			
db/ft 0.8	No	uSec 219	degF 0	ft 0			

Variable Description

BHTEMP_Src : BHTEMP Input Source Selector MINAMPL : Minimum Amplitude

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

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

Calibration Report

Database File antero_riggs unit 2h .db
 Dataset Pathname pass3.1
 Dataset Creation Fri Nov 15 12:54:13 2019

Gamma Ray Calibration Report

Serial Number: IPSNO-03
 Tool Model: Tek-Co 2 3/4
 Performed: Tue Nov 12 16:11:18 2019

 Calibrator Value: 1.0

 Background Reading: 0.0 cps
 Calibrator Reading: 1.0 cps

 Sensitivity: 0.5000 /cps

Segmented Cement Bond Log Calibration Report

Serial Number: IOL40-05
 Tool Model: Tek12

 Calibration Casing Diameter: 5.500 in
 Calibration Depth: 66.642 ft

Master Calibration, performed (Derived):

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.000	1.904	3.500	71.921	35.942	3.488
CAL	0.012	0.565				
5'	-0.004	1.938	3.500	71.921	35.235	3.630
SUM						
S1	0.002	2.359	0.000	100.000	42.431	-0.097
S2	0.003	2.381	0.000	100.000	42.049	-0.125
S3	0.003	2.311	0.000	100.000	43.324	-0.124
S4	0.002	2.192	0.000	100.000	45.672	-0.100
S5	0.002	2.040	0.000	100.000	49.055	-0.095
S6	0.002	1.901	0.000	100.000	52.652	-0.096
S7	0.002	1.996	0.000	100.000	50.138	-0.095
S8	0.002	2.389	0.000	100.000	41.901	-0.090
S9	0.002	2.324	0.000	100.000	43.058	-0.085
S10	0.002	2.216	0.000	100.000	45.171	-0.098
S11	0.002	2.106	0.000	100.000	47.524	-0.106
S12	0.002	1.990	0.000	100.000	50.299	-0.099

Temperature Calibration Report

Serial Number: IOL40-05
 Tool Model: Tek12
 Performed: Wed Jul 31 10:53:14 2013

	Reference	Reading
Low Reference:	0.00 degF	0.00 usec
High Reference:	1.00 degF	1.00 usec

High Reference: 1.00 uegr 1.00 useg

Gain: 0.33
 Offset: 0.00
 Delta Spacing: 2

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)	
CCL	18.93		CCL-312tekco (I08X3-01) Tekco 3 1/8" 450 Deg. "F" SmCo Logging CCL	1.82	3.12	25.00	
			Tek-2.75 2 3/4" Tekco Adjustable Centralizer	2.73	2.75	25.00	
TEMP	12.77						
WVFS12	11.48						
WVFS11	11.48						
WVFS10	11.48			SCBL-Tek12 (I0L40-05) Tekco 400 Deg F 12 Sector RIB with Temp	9.13	3.25	135.00
WVFS9	11.48						
WVFS8	11.48						
WVFS7	11.48						
WVFS6	11.48						
WVFS5	11.48						
WVFS4	11.48						
WVFS3	11.48						
WVFS2	11.48						
WVFS1	11.48						
WVFCAL	10.73						
WV3FT	10.73						
WV5FT	9.73						
WVFSYNC	6.40						
WVTEMP	6.40		Tek-2.75 2 3/4" Tekco Adjustable Centralizer	2.73	2.75	25.00	
GR	1.04		GR-Tek-Co 2 3/4 (IPSNO-03) Tekco 2 3/4" 400 Deg. F Logging Gamma Ray	3.67	2.75	40.00	

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WV Department of
Environmental Protection

Dataset:	antero_riggs unit 2h .db: field/well/run1/pass3.1
Total length:	20.07 ft
Total weight:	250.00 lb
O.D.:	3.25 in



Company	ANTERO RESOURCES	
Well	RIGGS UNIT 2H	
Field	MARCELLUS	
County	RITCHIE	
State	W.V.	Country