



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

Company	Antero Resources Corporation	Country	USA
Well	GALT 3H		
Field	Marcellus		
County	TYLER		
State	WV		
Location:	SEC TWP RGE	API #: 47095025630000	Other Services API A05132
Permanent Datum	Ground Level	Elevation	Elevation
Log Measured From	R.K.B. 30'		K.B. D.F. G.L.
Drilling Measured From	R.K.B.		

Date	17-DEC-2019
Run Number	ONE
Depth Driller	14464'
Depth Logger	6367'
Bottom Logged Interval	6367'
Top Log Interval	Surface
Open Hole Size	8.25"
Type Fluid	F/W
Density / Viscosity	N/A
Max. Recorded Temp.	135 DEG
Estimated Cement Top	2550'
Time Well Ready	N/A
Time Logger on Bottom	N/A
Equipment Number	214182
Location	Bridgeport,WV
Recorded By	P DAVIDSON
Witnessed By	B ETCHER

Run Number	Borehole Record		Tubing Record	
	Bit Size	From	To	To
ONE	24"			
TWO	17.5"			
THREE	12.25"			
FOUR	8.25"			
Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	13.375"	54.5	Surface	
Prot. String	9.625"	40	Surface	
Production String	5.5"	20	Surface	
Liner				14464'

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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**

Zero @ R.K.B. 30'  
Marker Joint 5107'-5117'  
Log TD 6367'  
Cement Top @ 2550'  
Log Ran Under 1500 PSI

RECEIVED  
Office of  
SEP 24 2019  
WV Dept  
Environment



# 1500 PSI PRESSURE PASS

Database File ant\_galt3h.db  
 Dataset Pathname pass8.1  
 Presentation Format antero  
 Dataset Creation Tue Dec 17 13:16:24 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)	100
180	GR	360

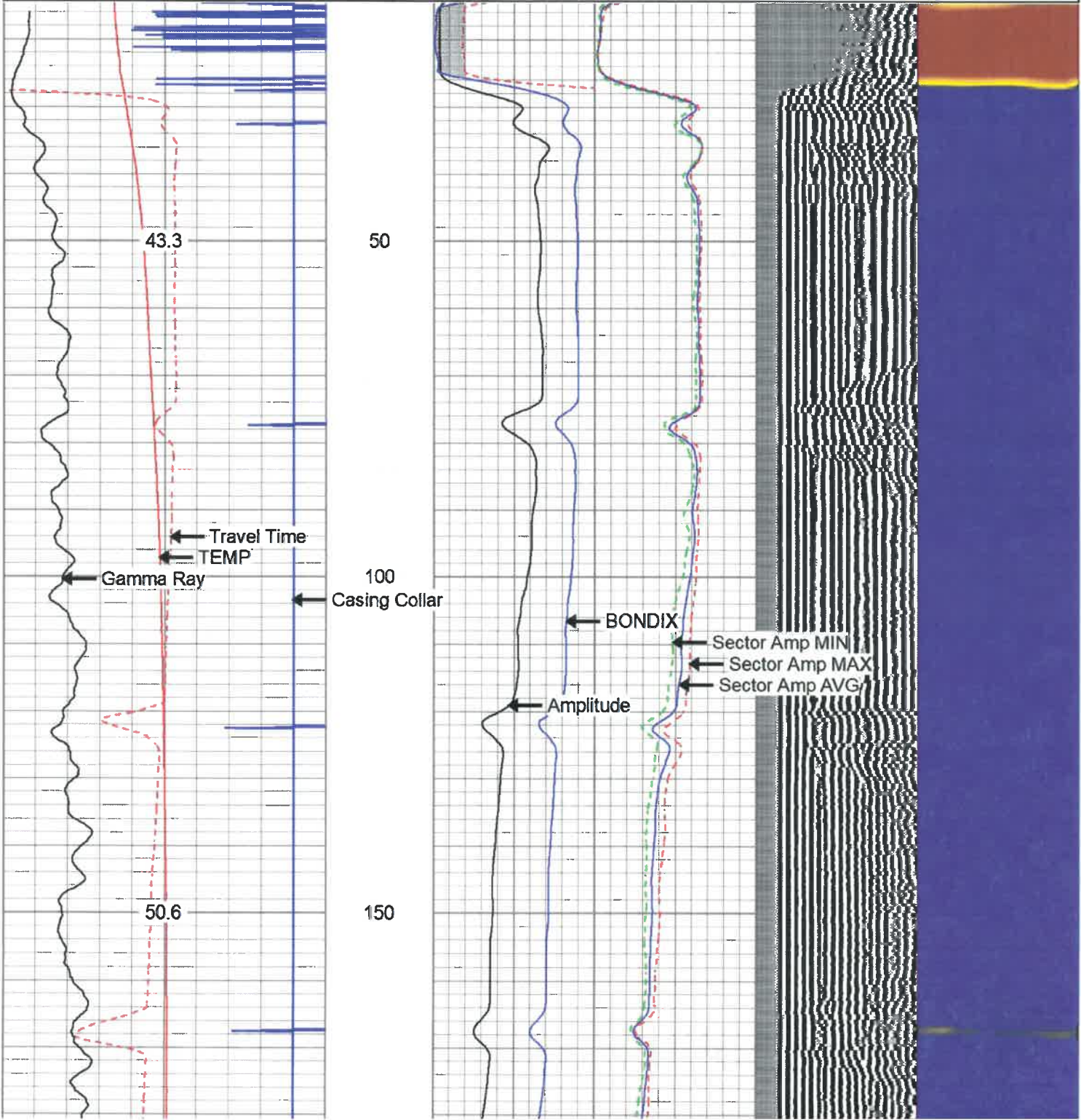
Amplitude		Sector Amp AVG
0	(mV) 100	Sector Amp MAX
Amp X5		Sector Amp MIN
0	(mV) 20	
1	BONDIX	0

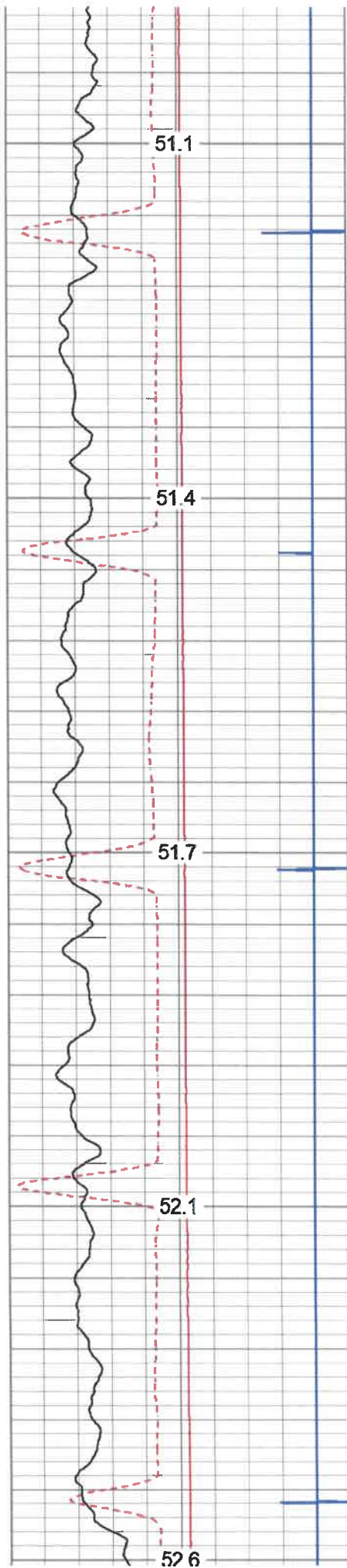
VDL  
 200 (usec) 1200

1 Sector Map 12



TEMP
(degF)





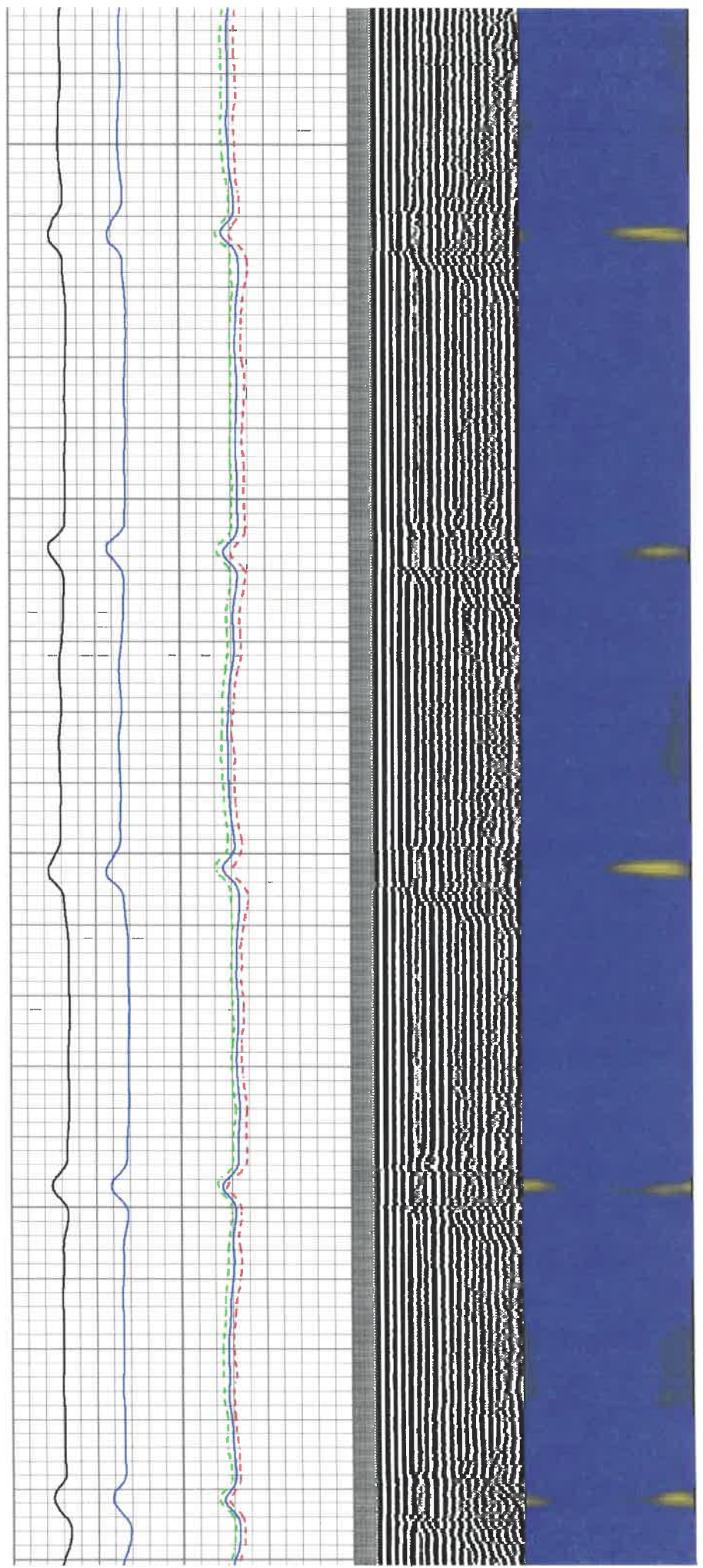
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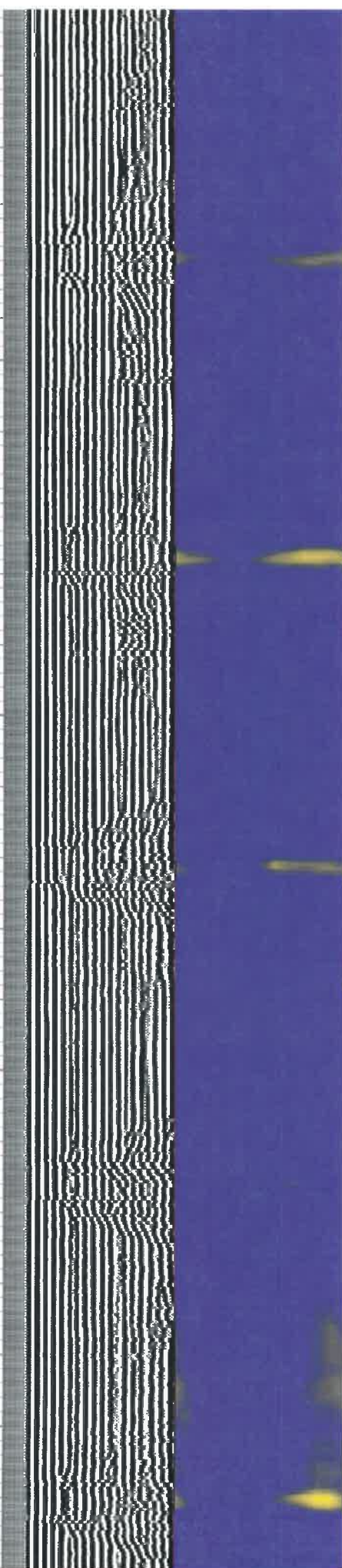
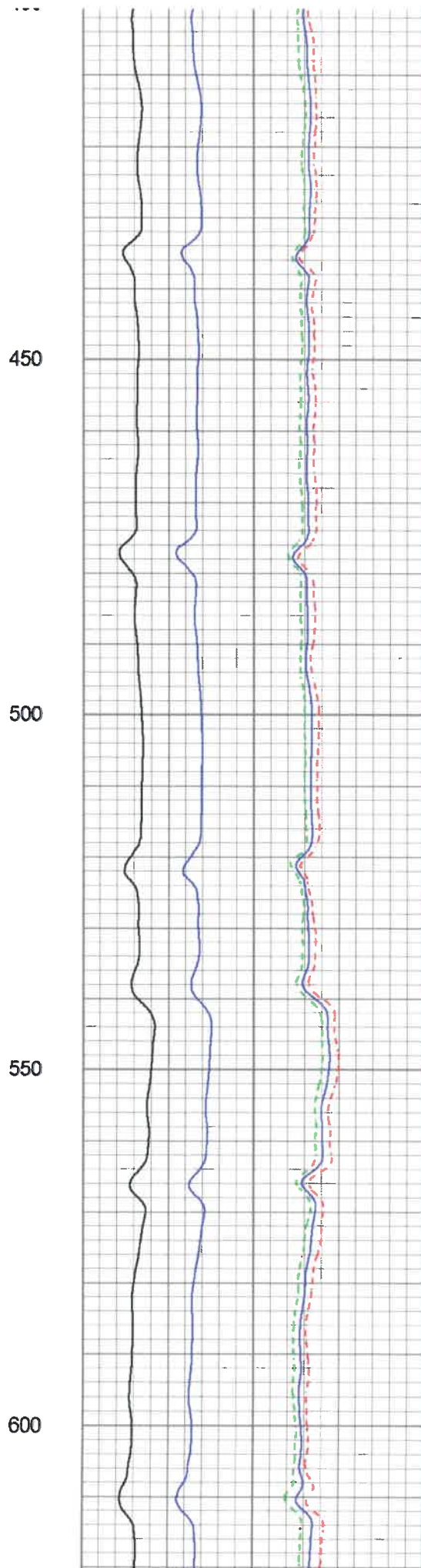
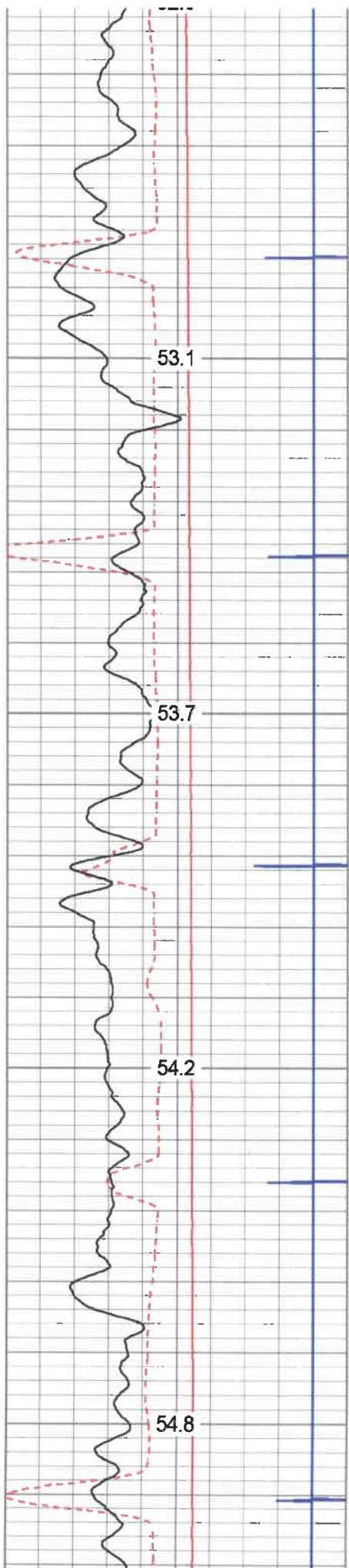
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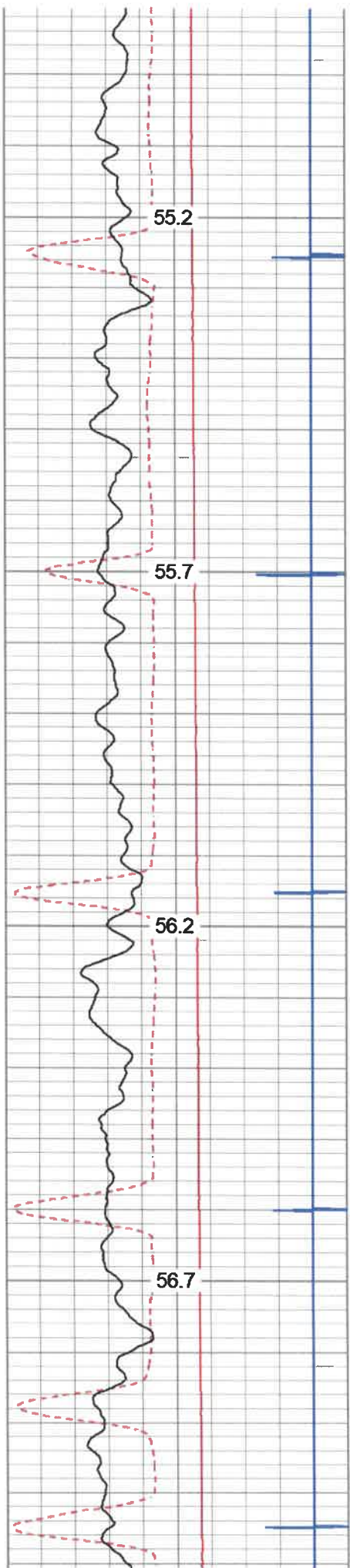
300

350

400





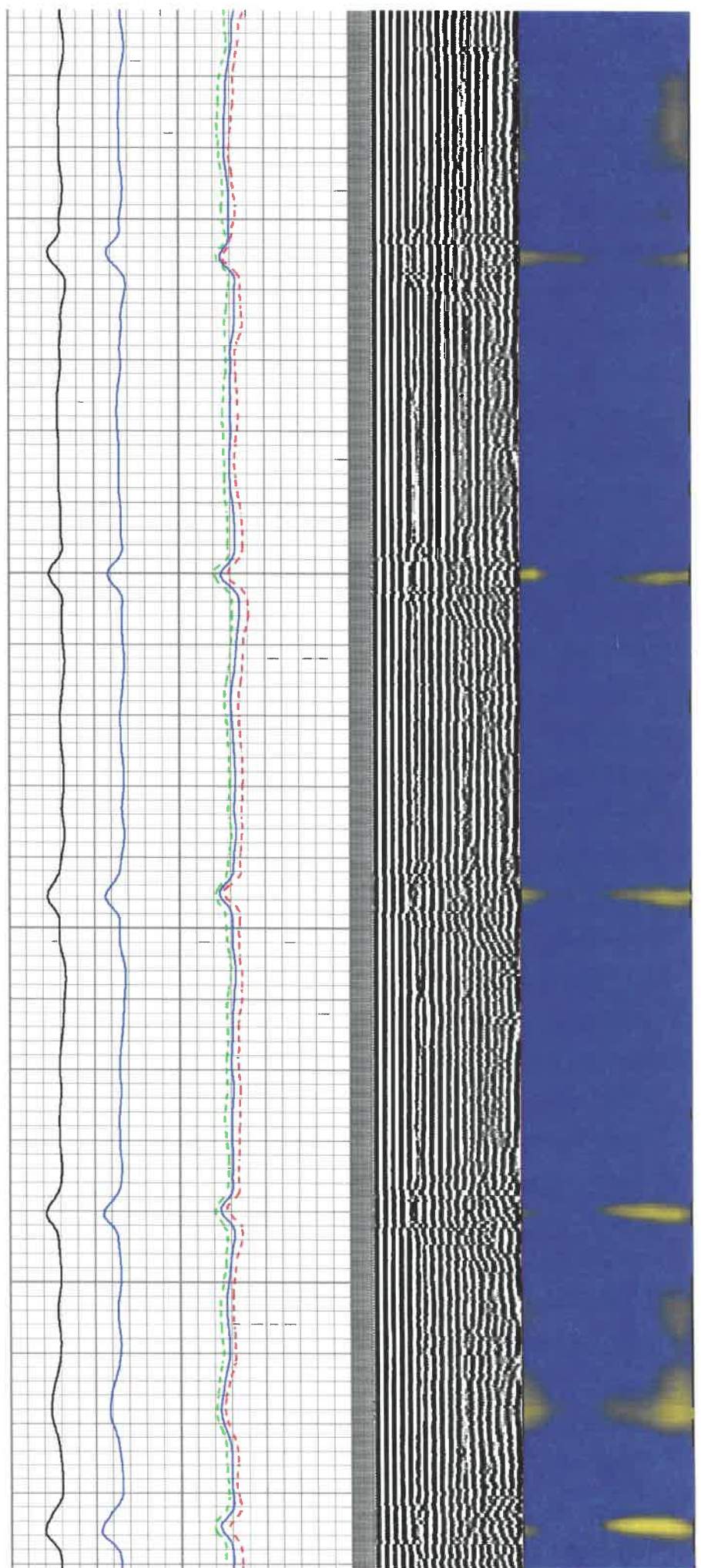


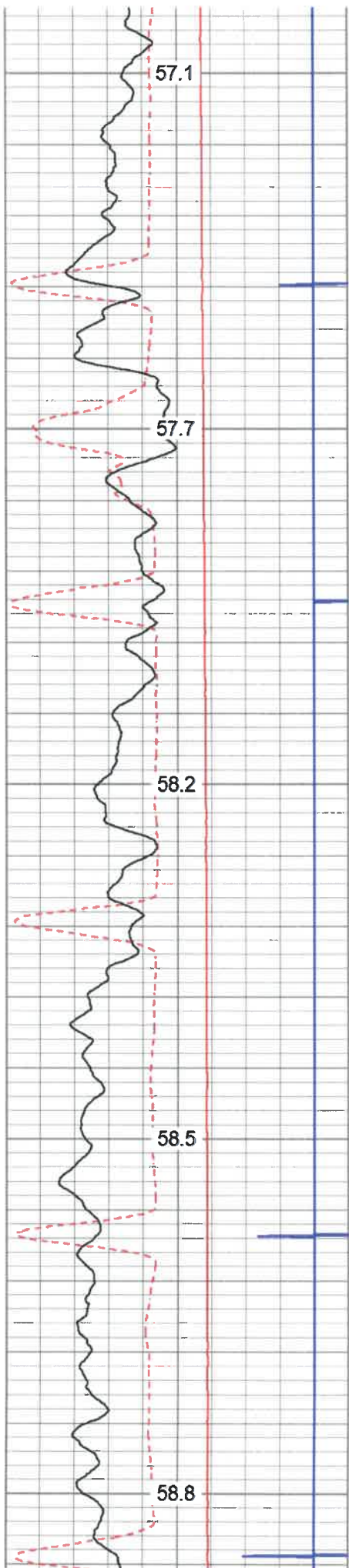
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700

750

800





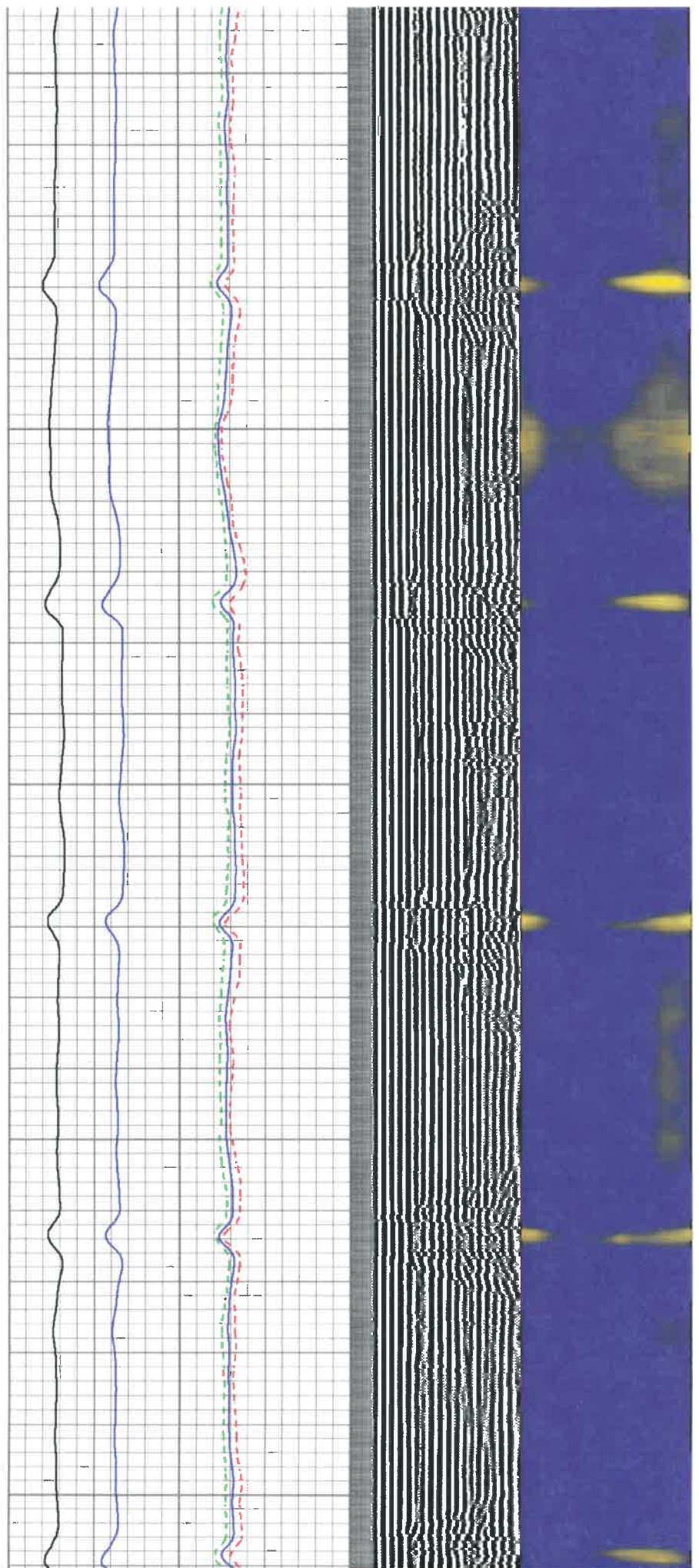
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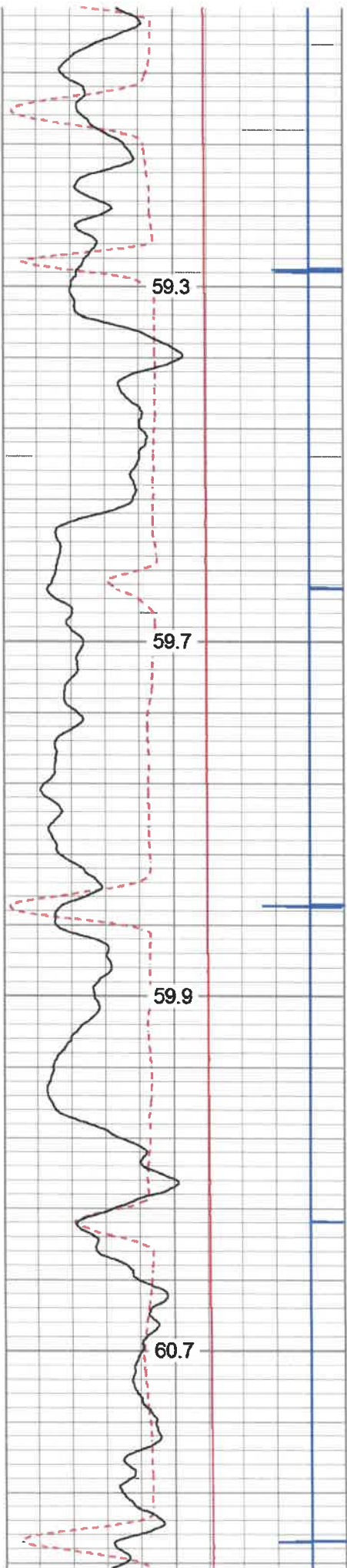
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950

1000

1050



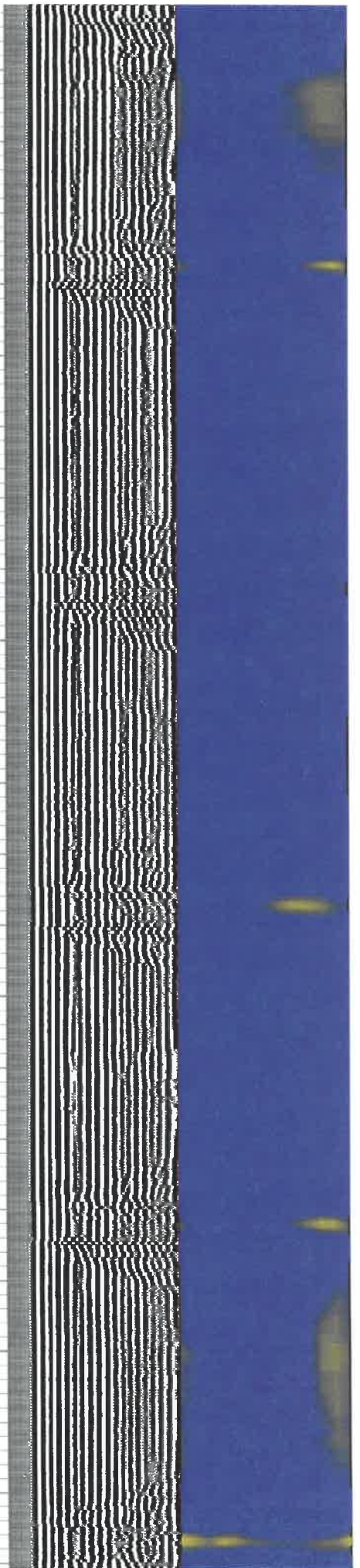
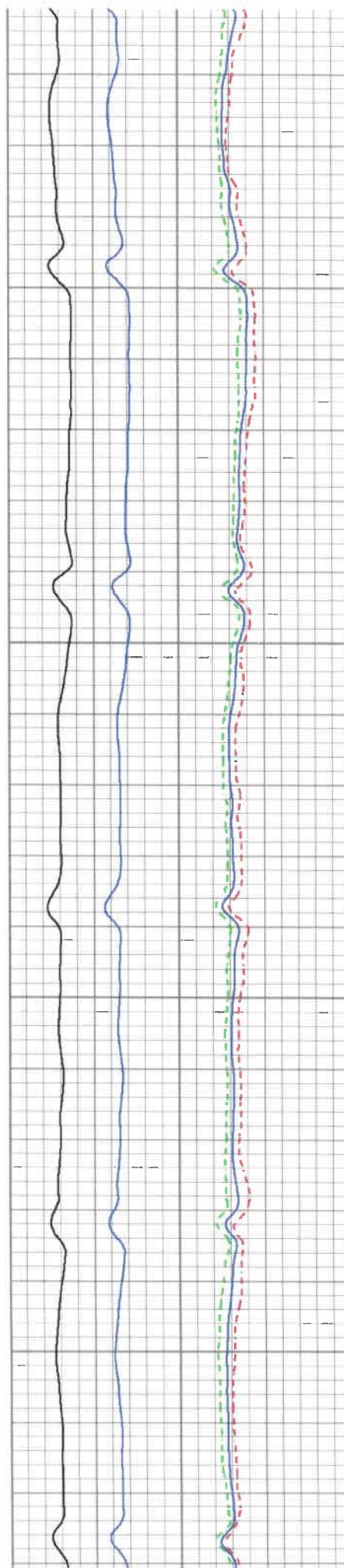


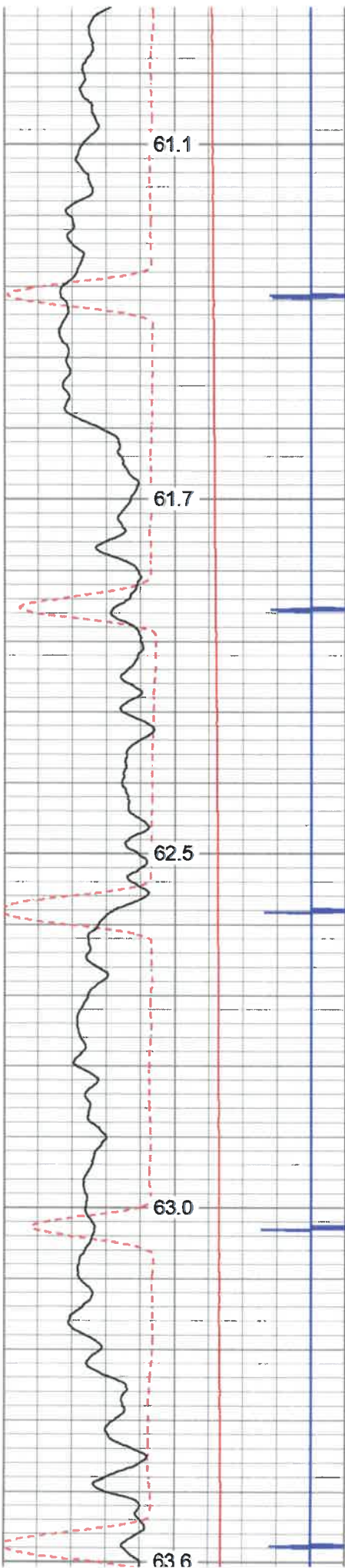
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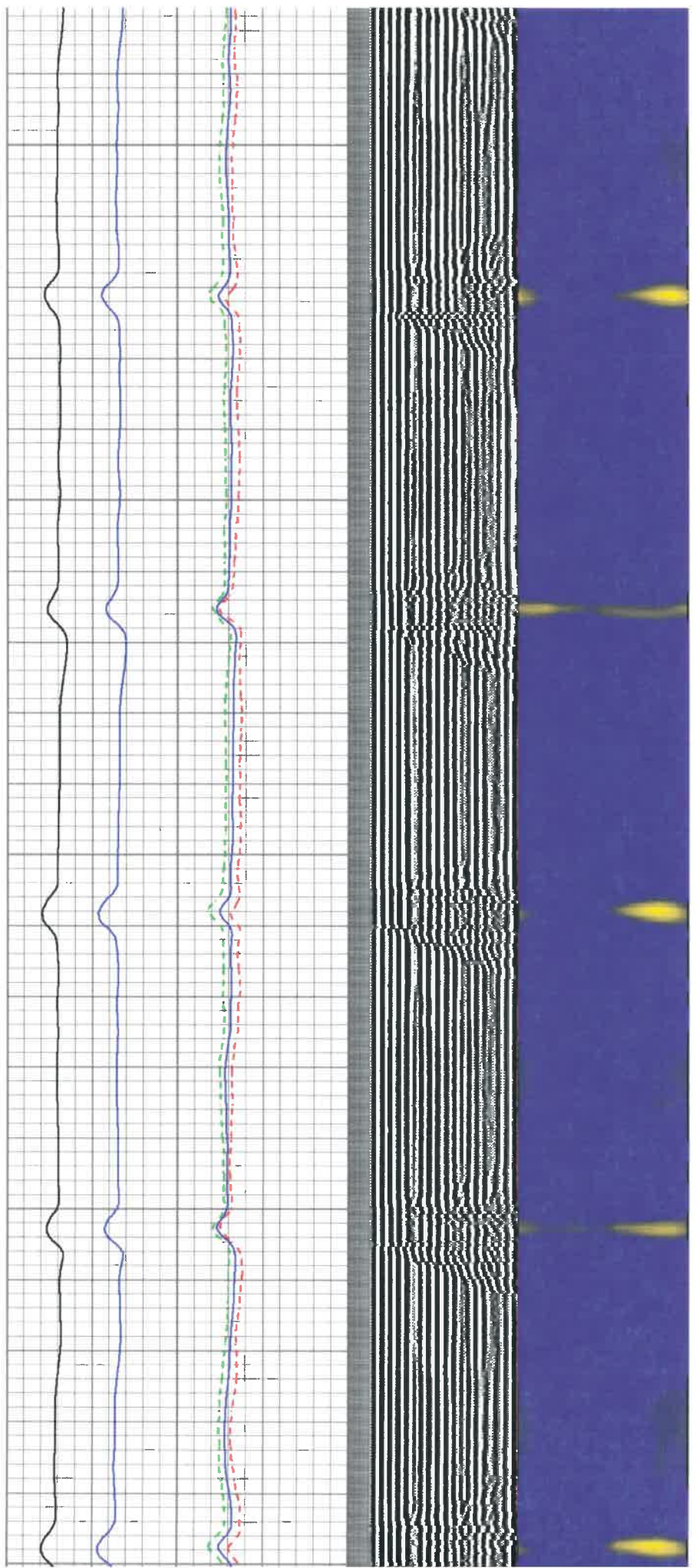
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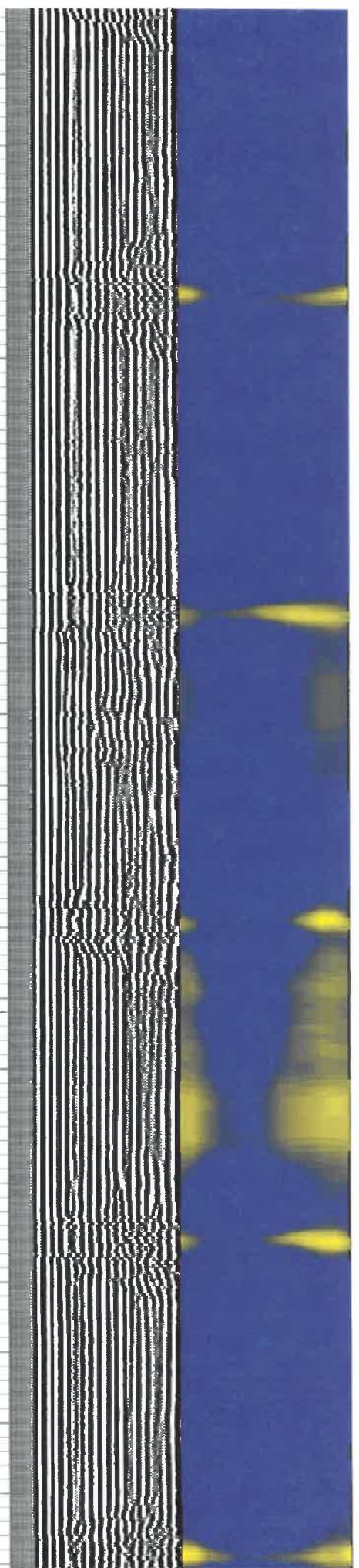
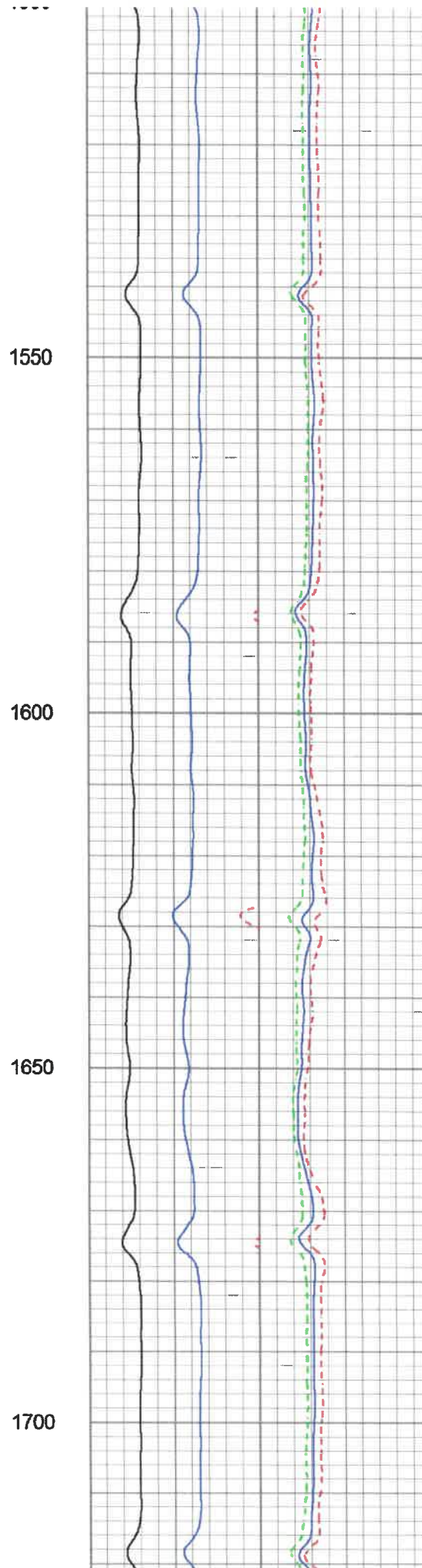
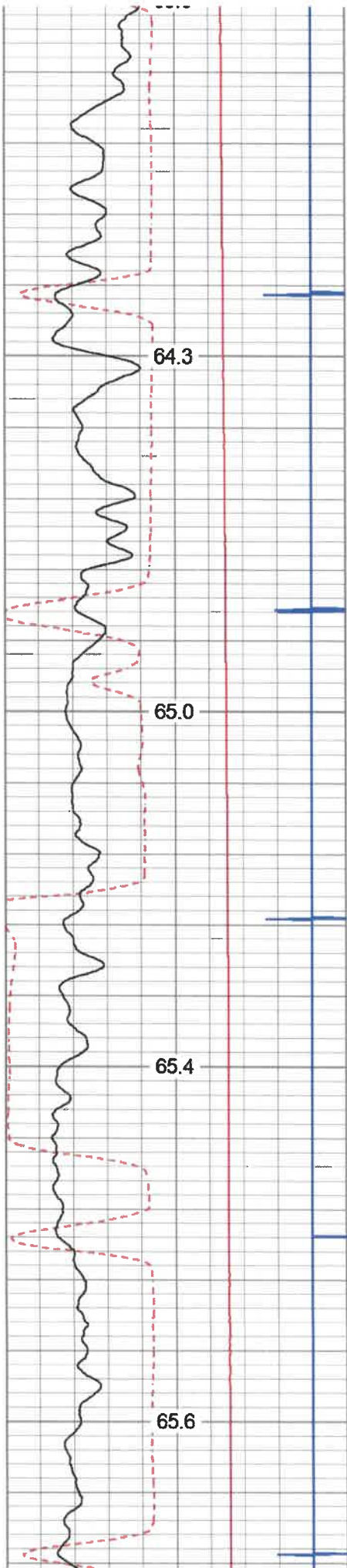


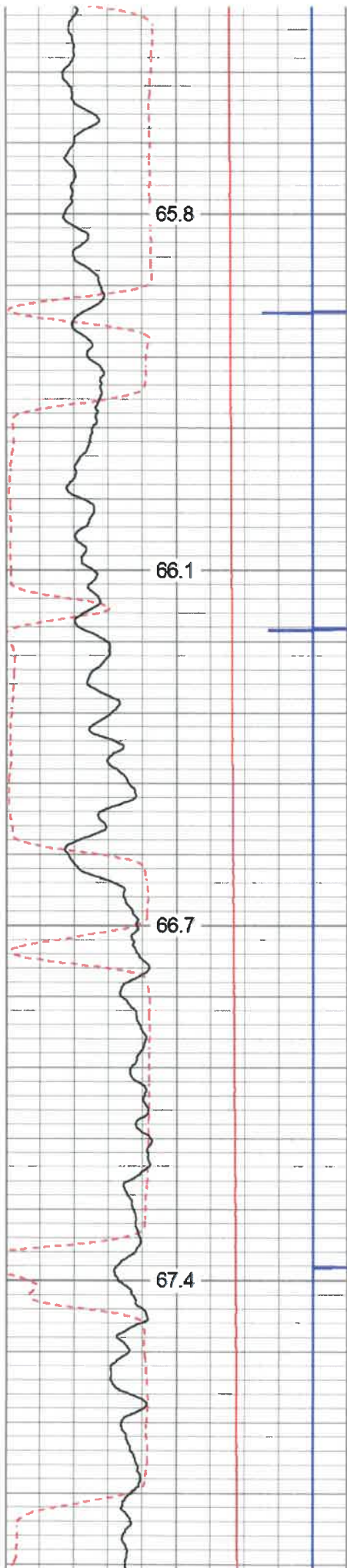


1300  
1350  
1400  
1450  
1500







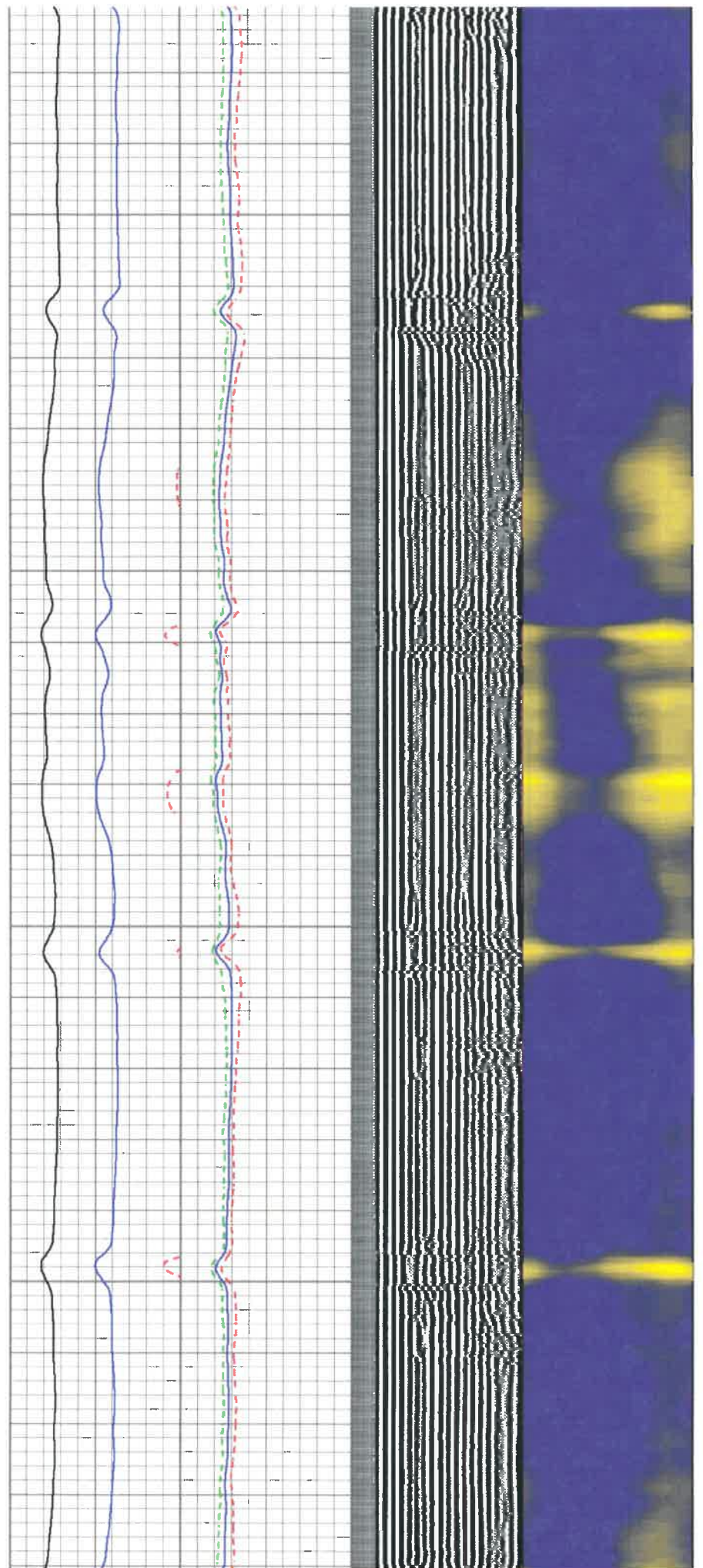


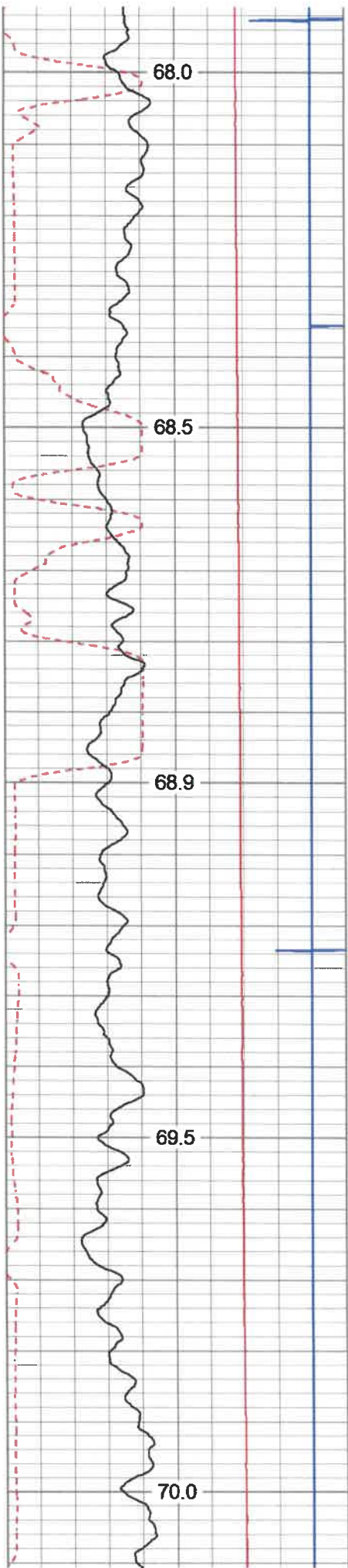
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1800

1850

1900





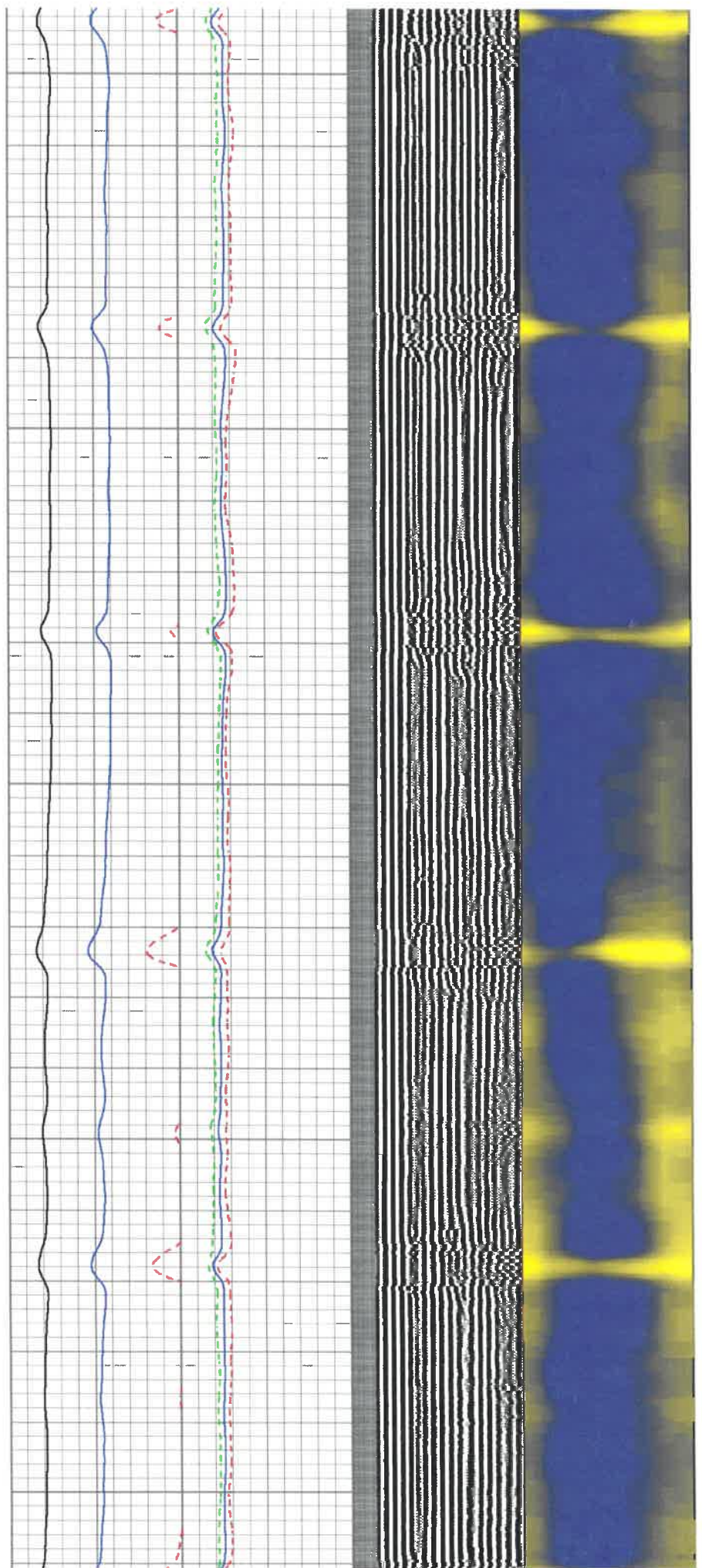
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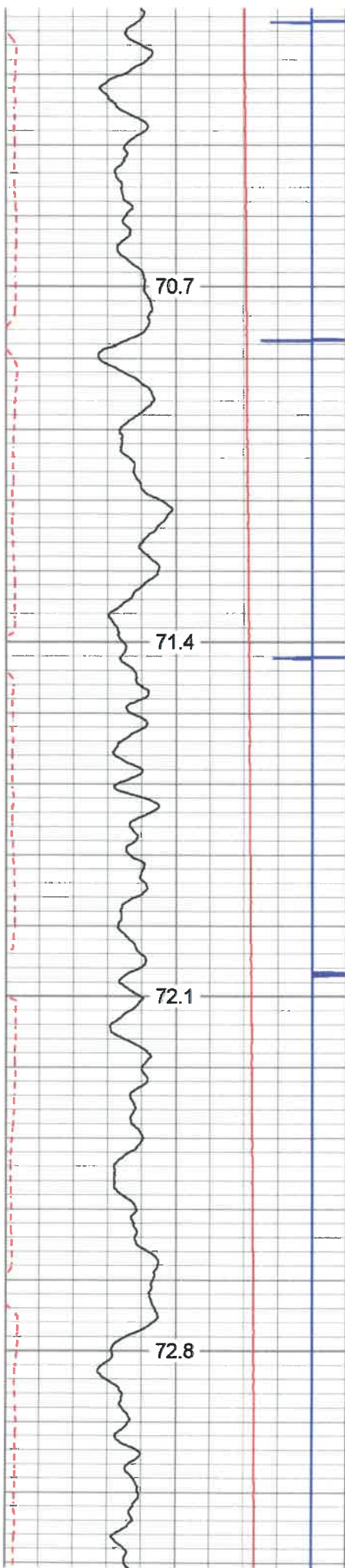
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2050

2100

2150



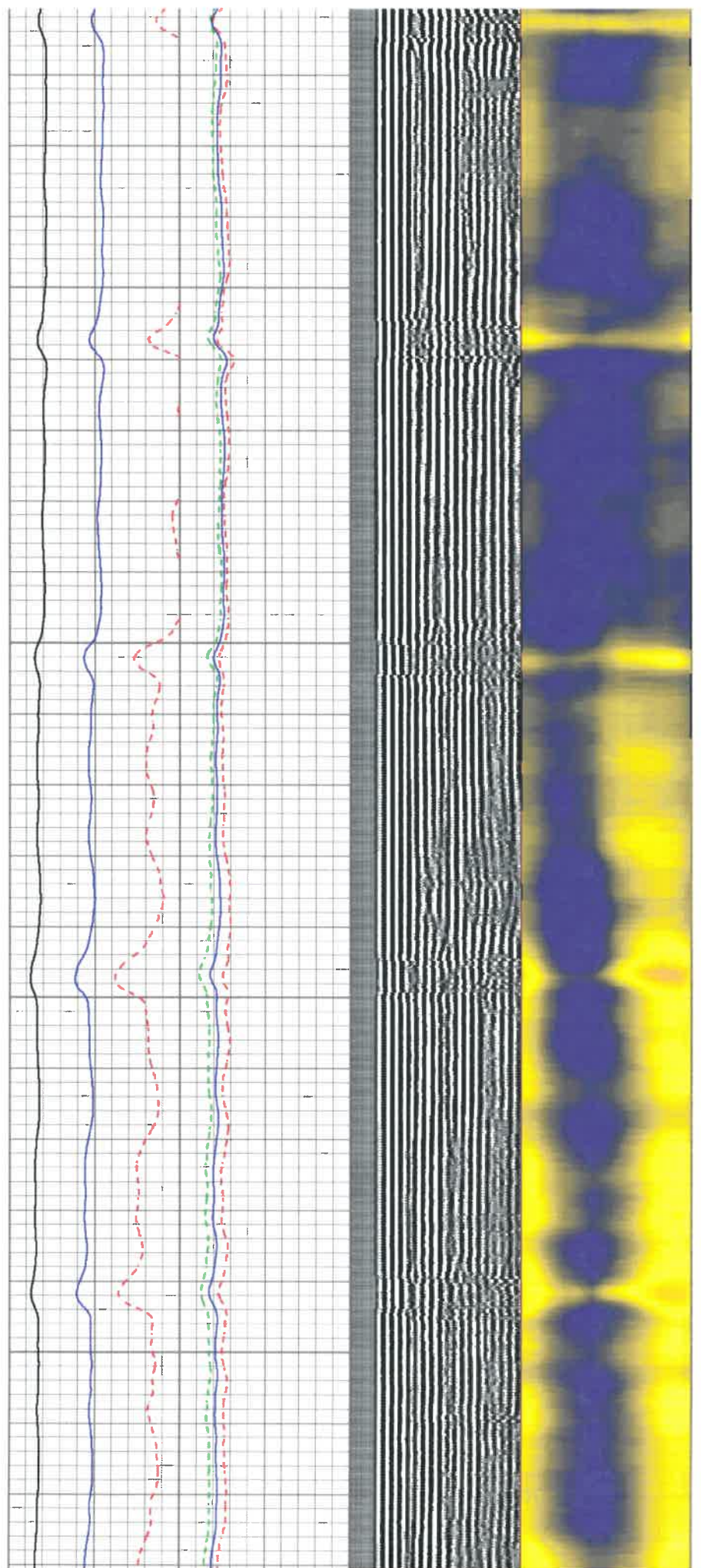


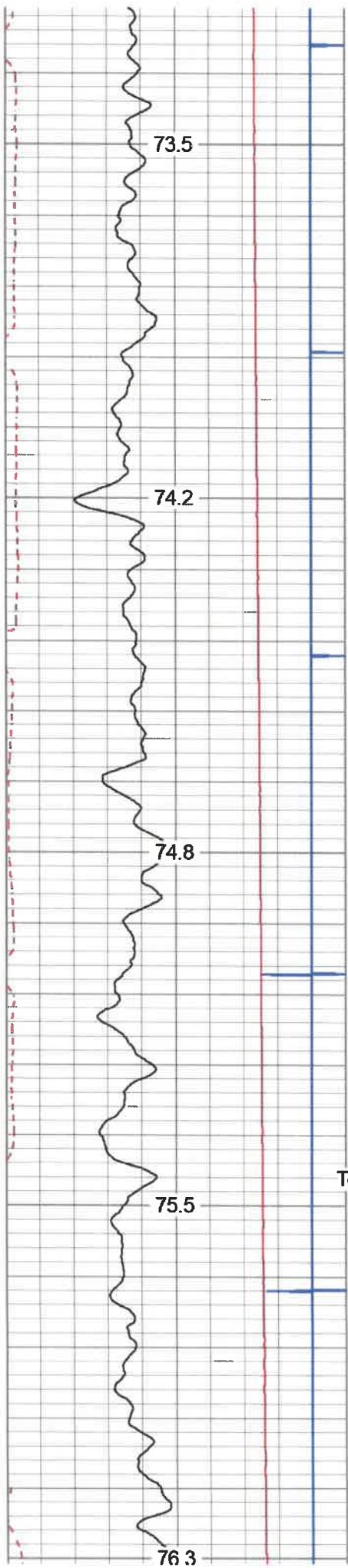
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2250

2300

2350





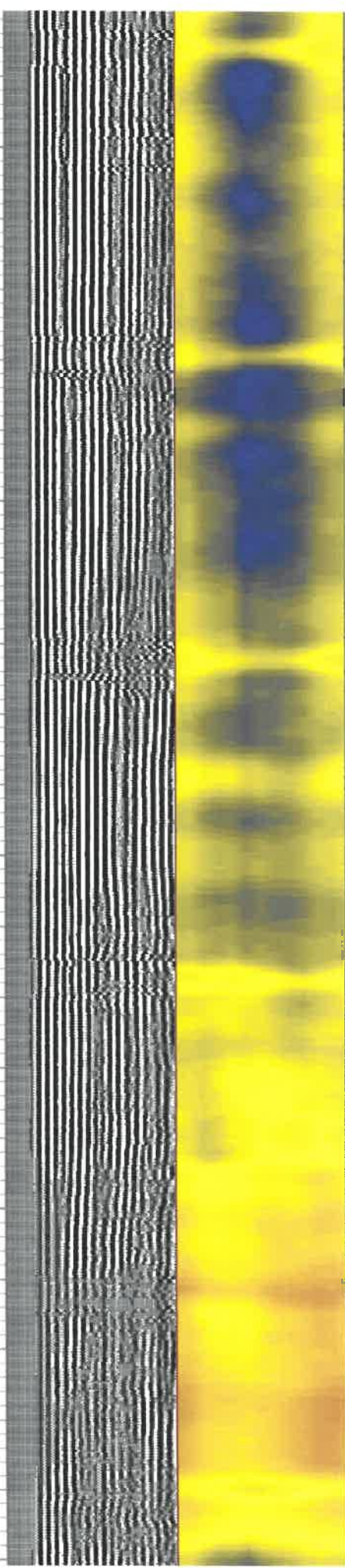
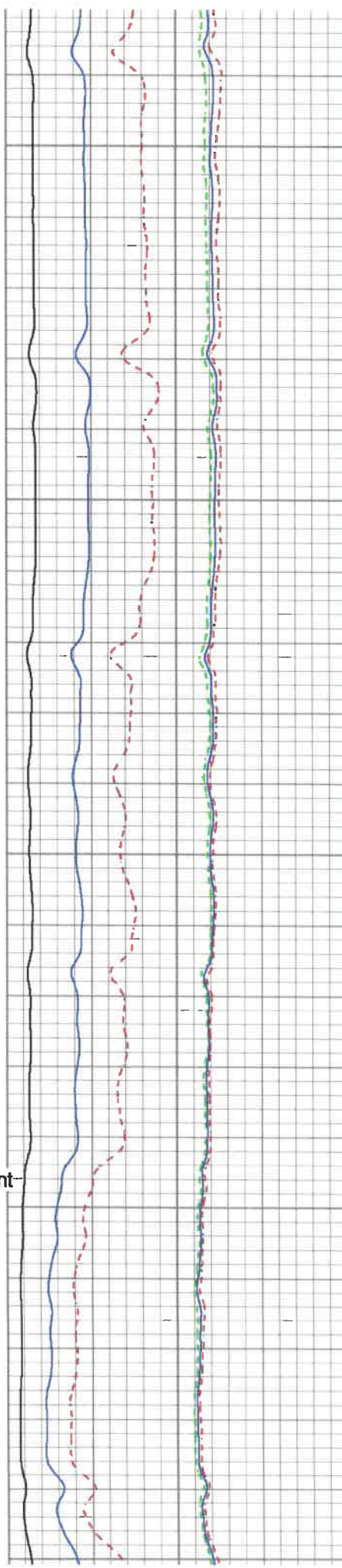
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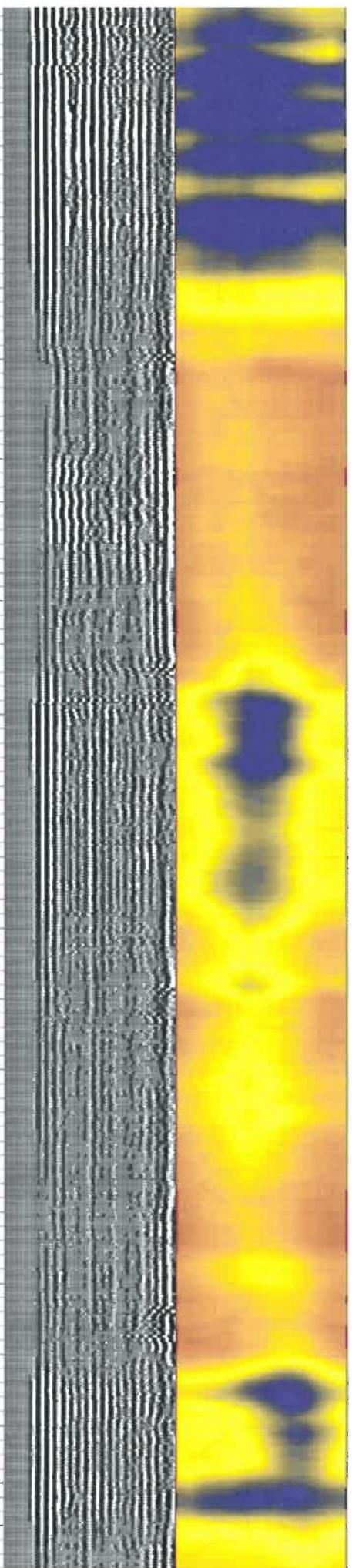
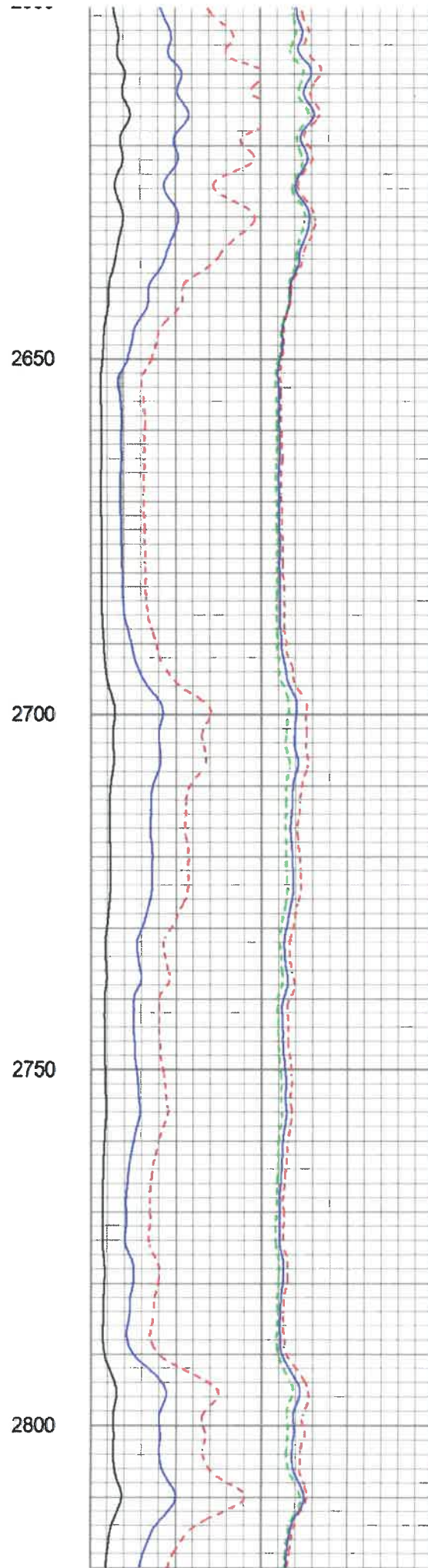
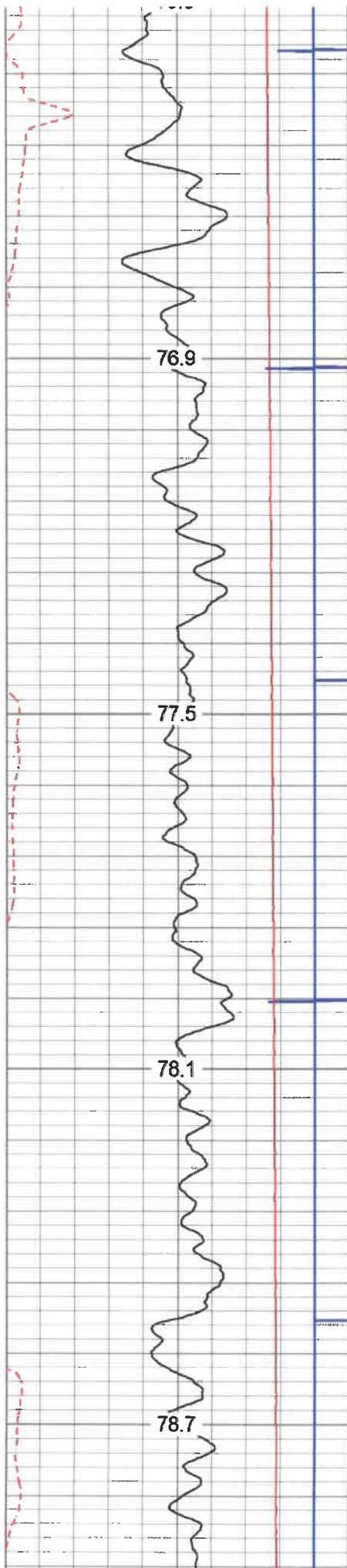
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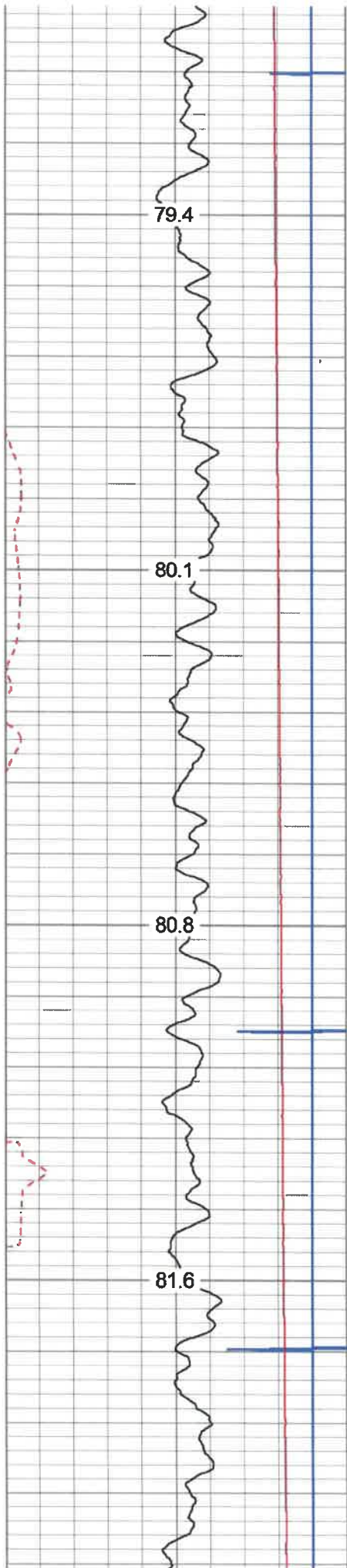
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Top of Cement  
2550

2600





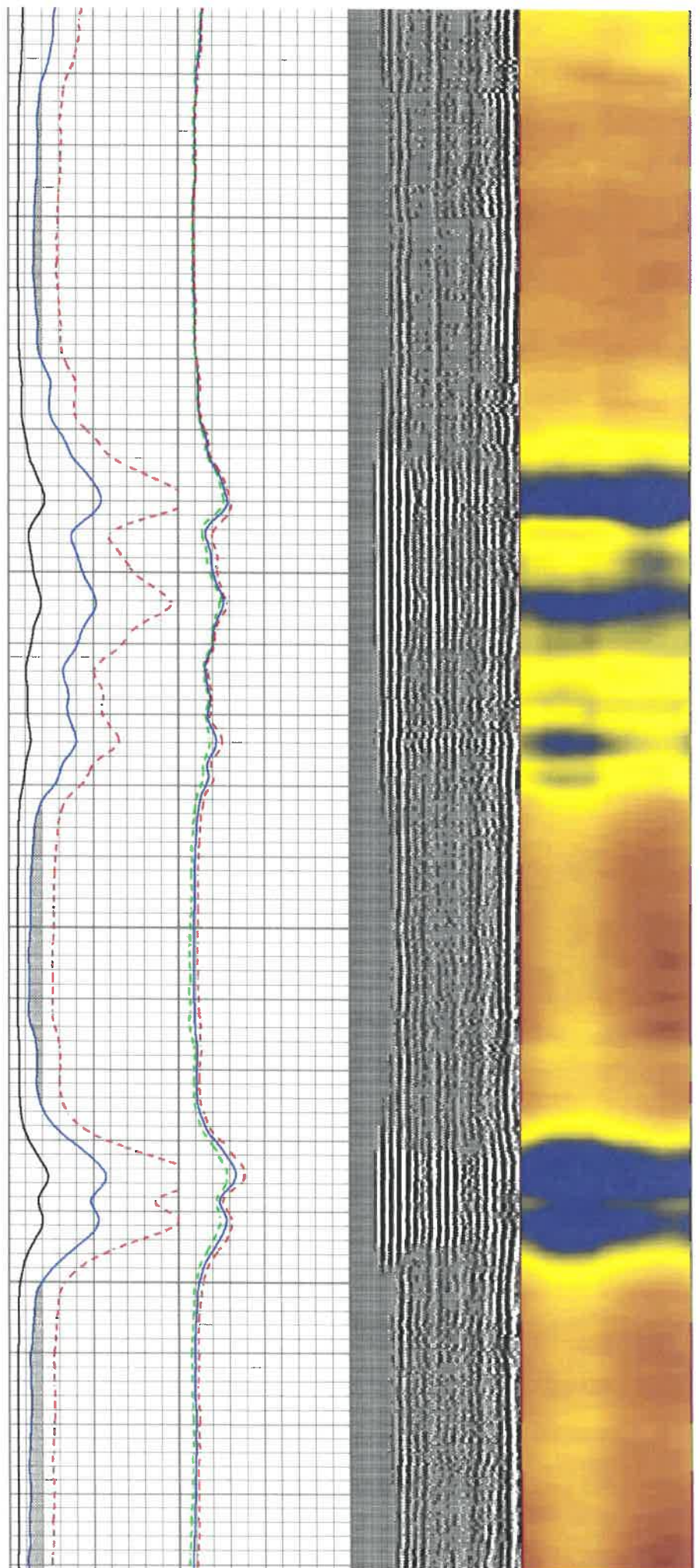


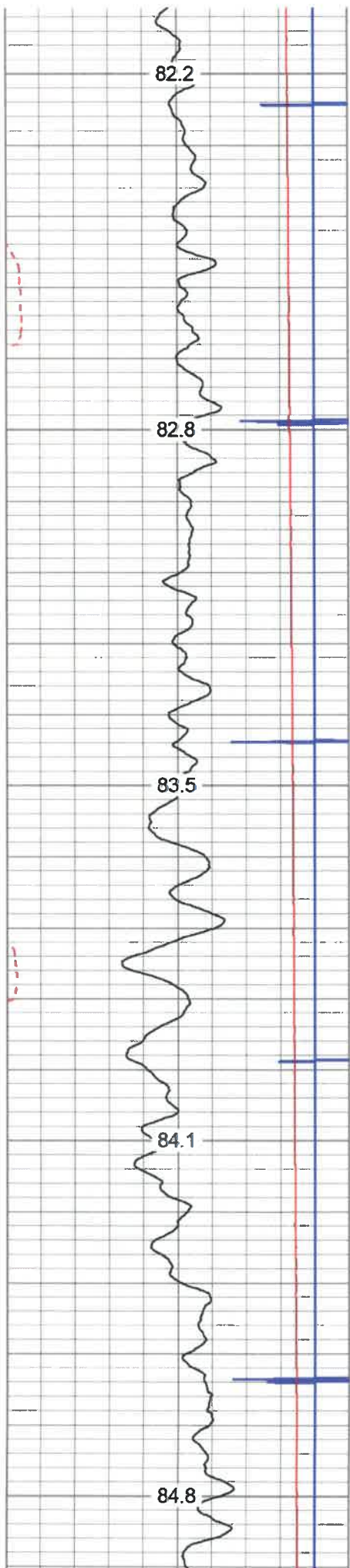
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2900

2950

3000





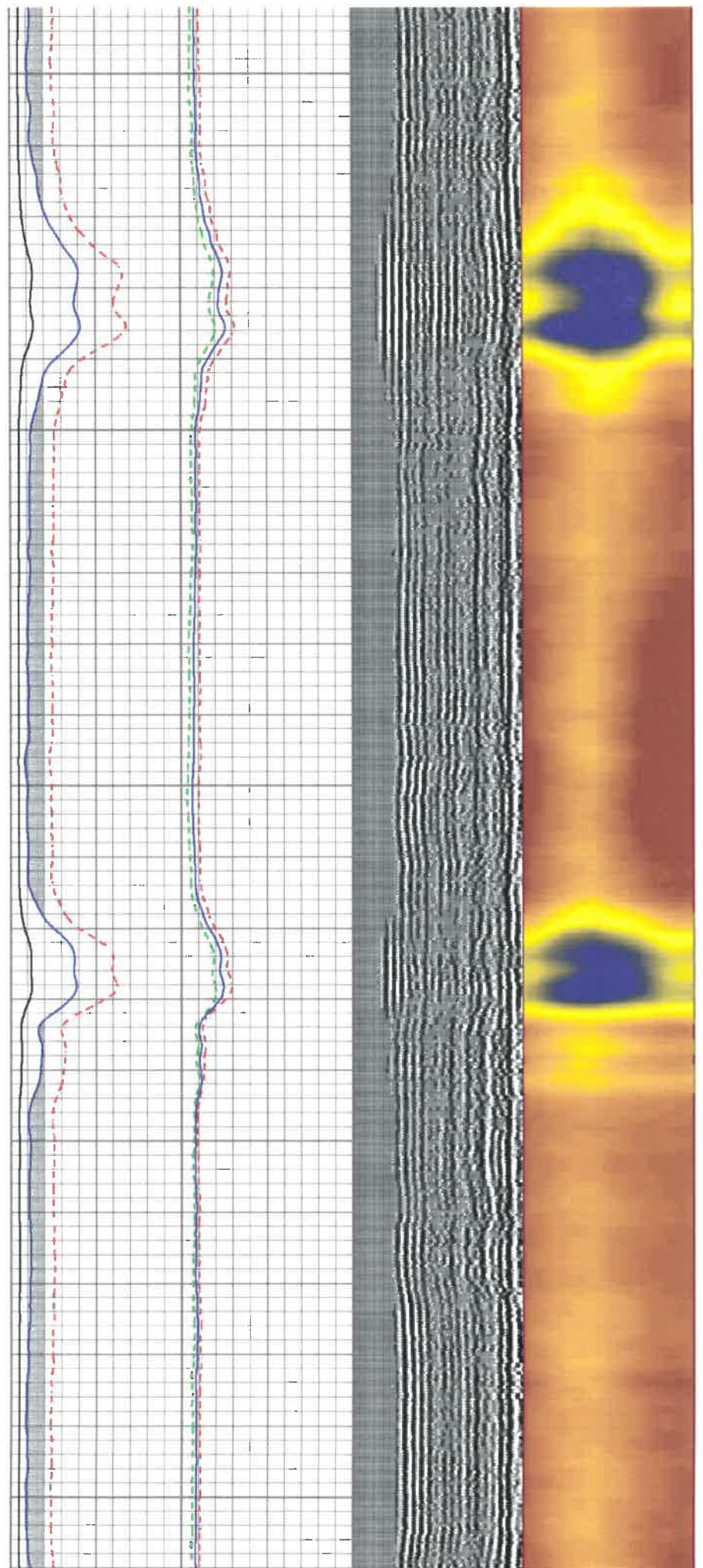
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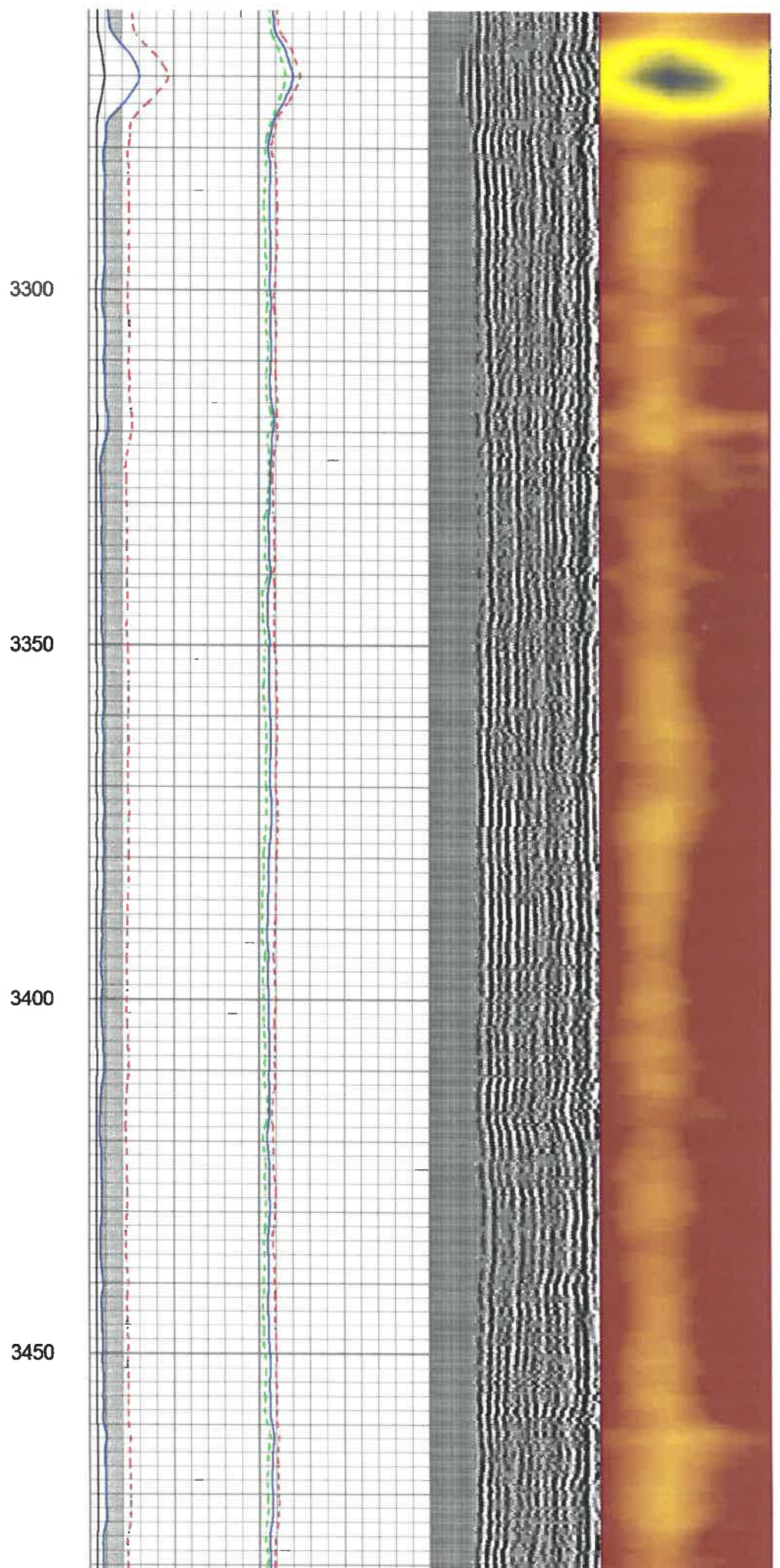
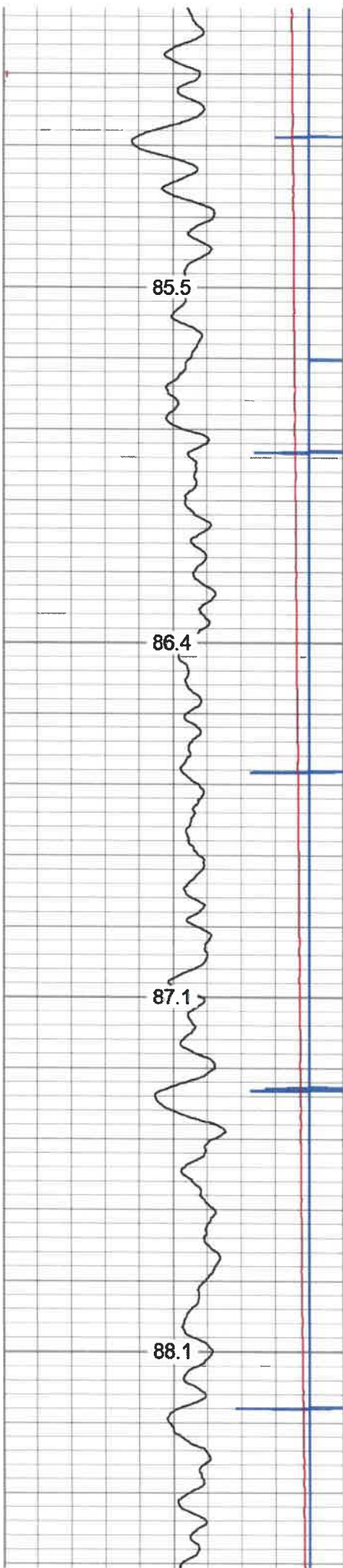
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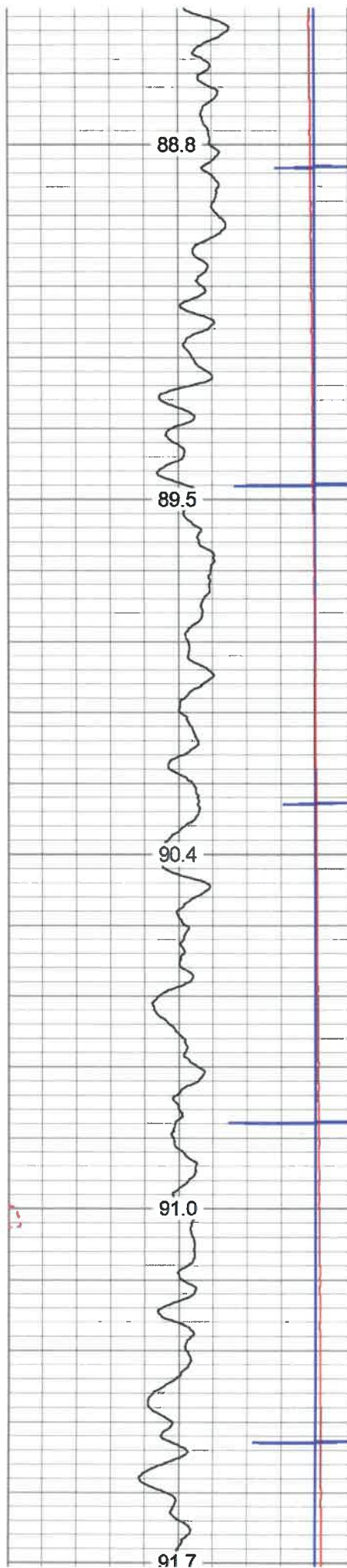
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3250









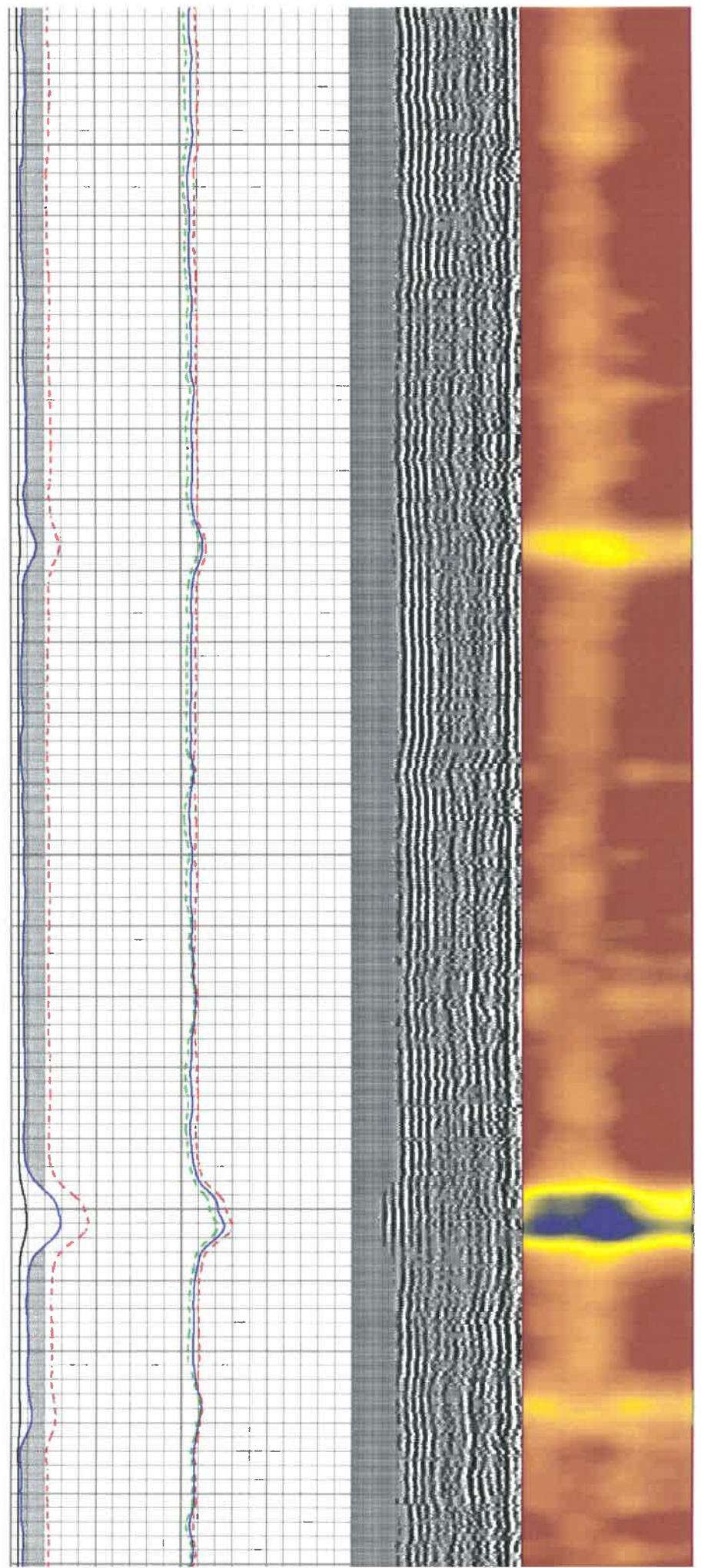
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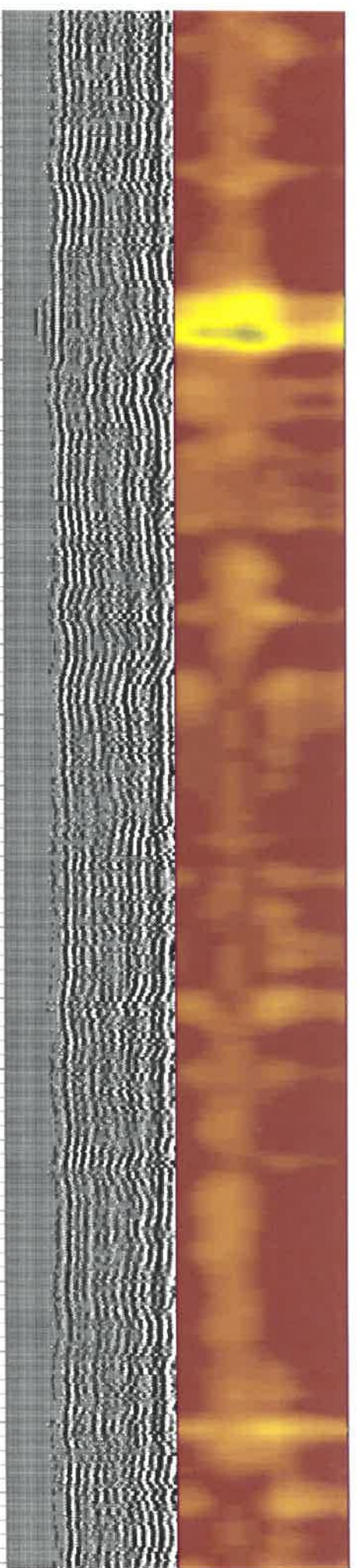
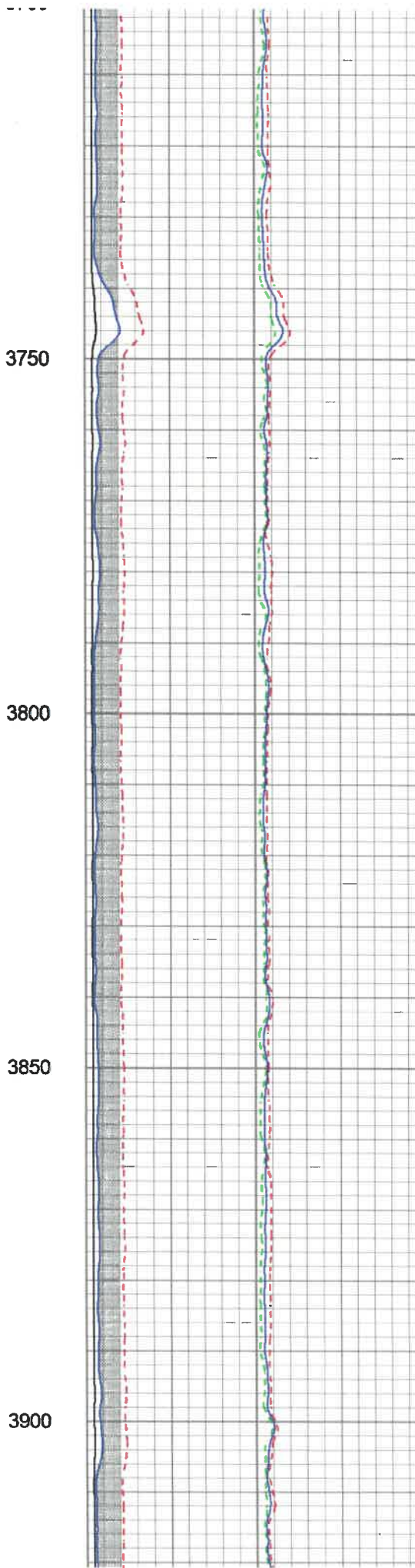
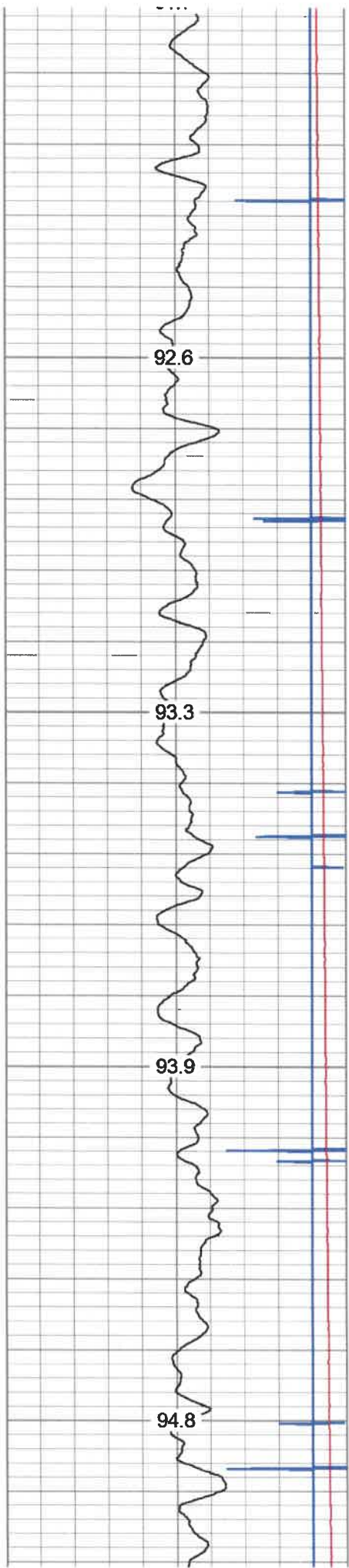
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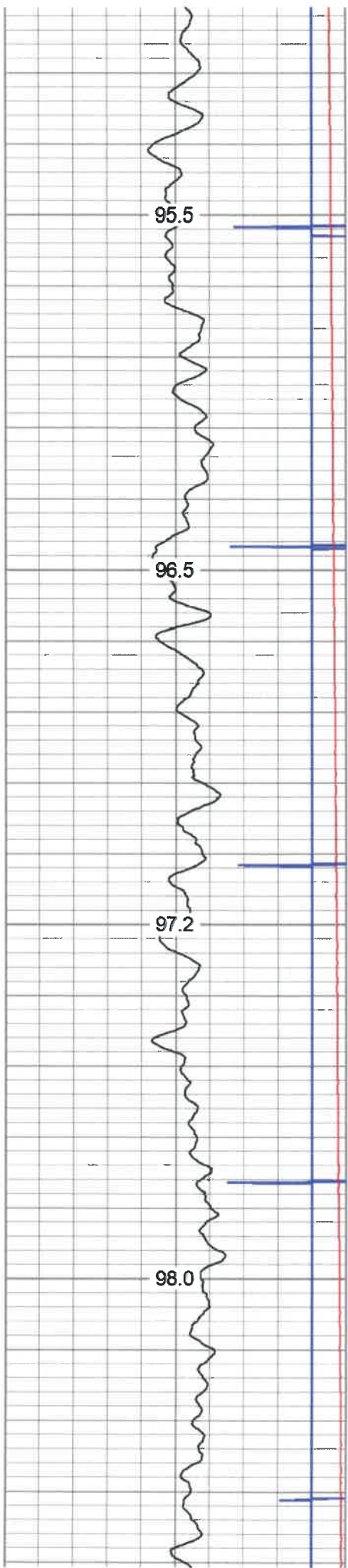
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3650

3700





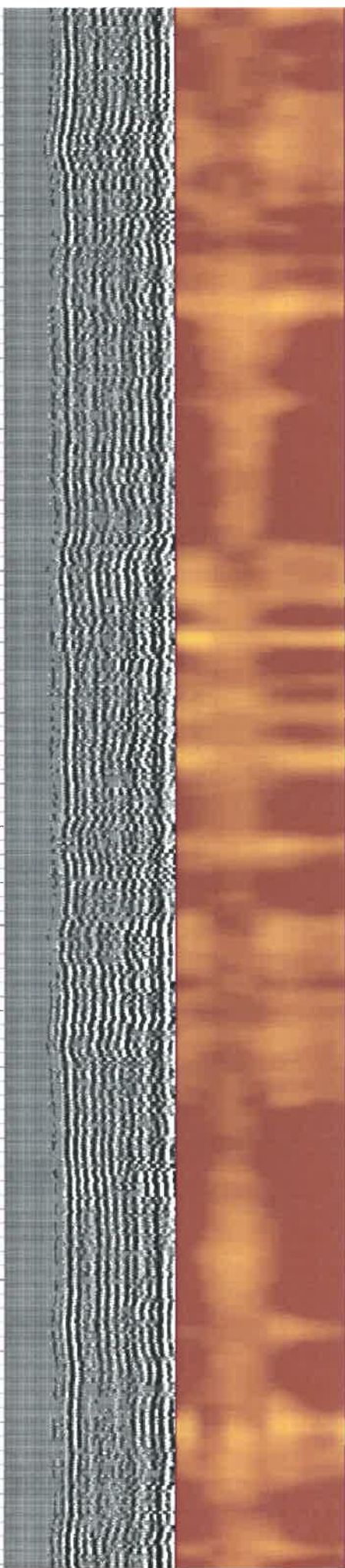
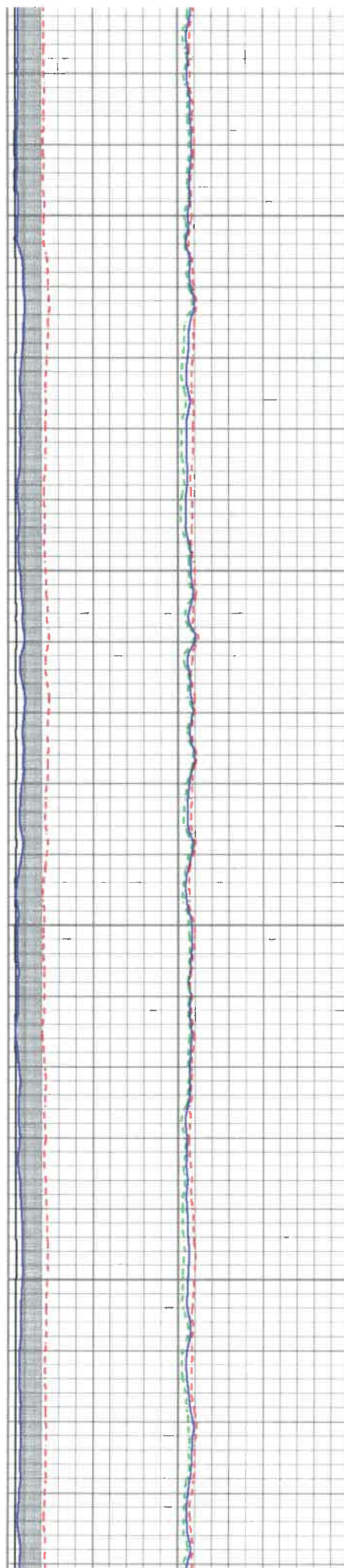


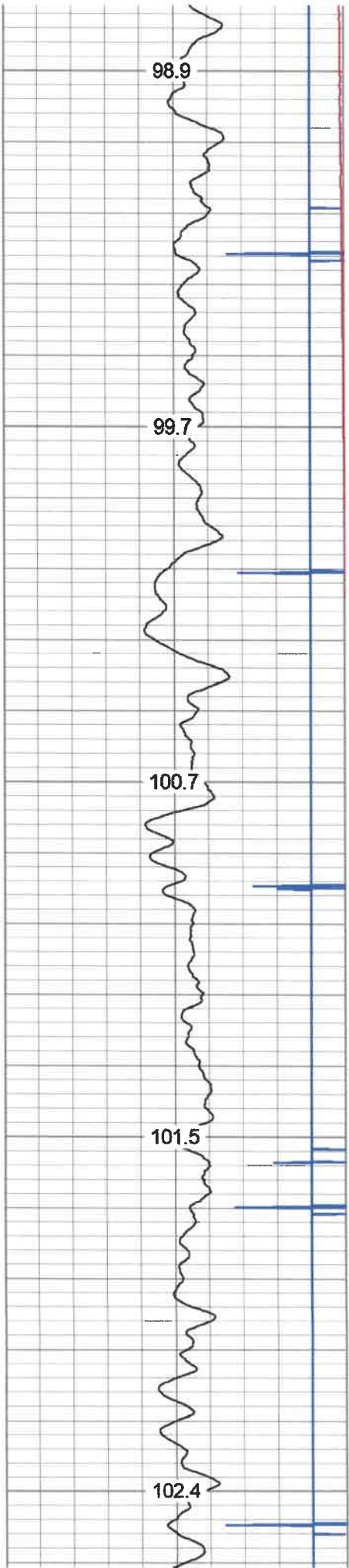
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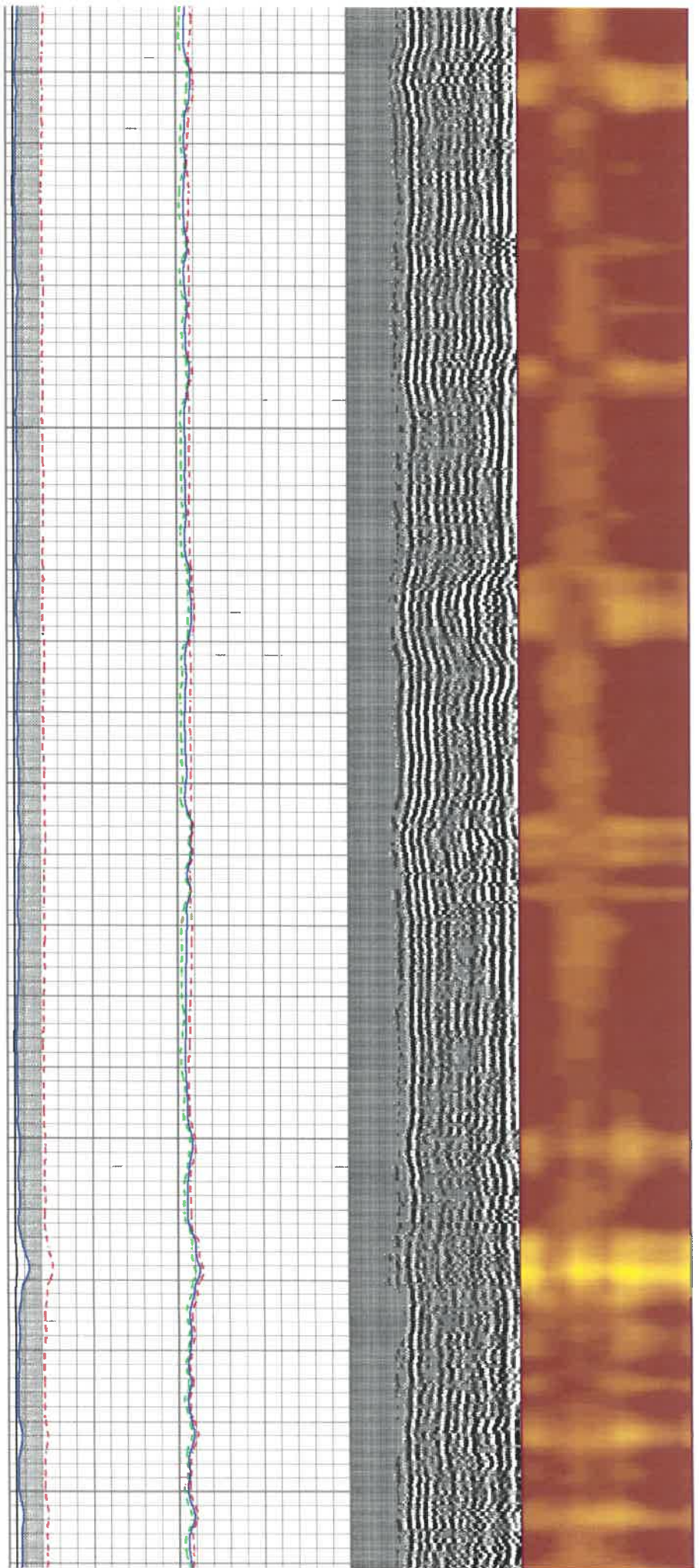
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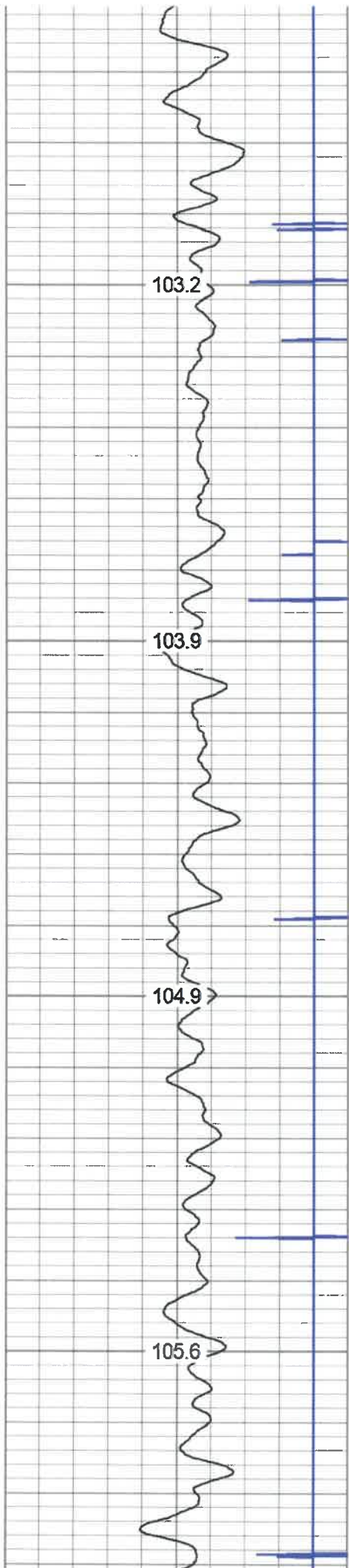
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4150  
4200  
4250  
4300  
4350



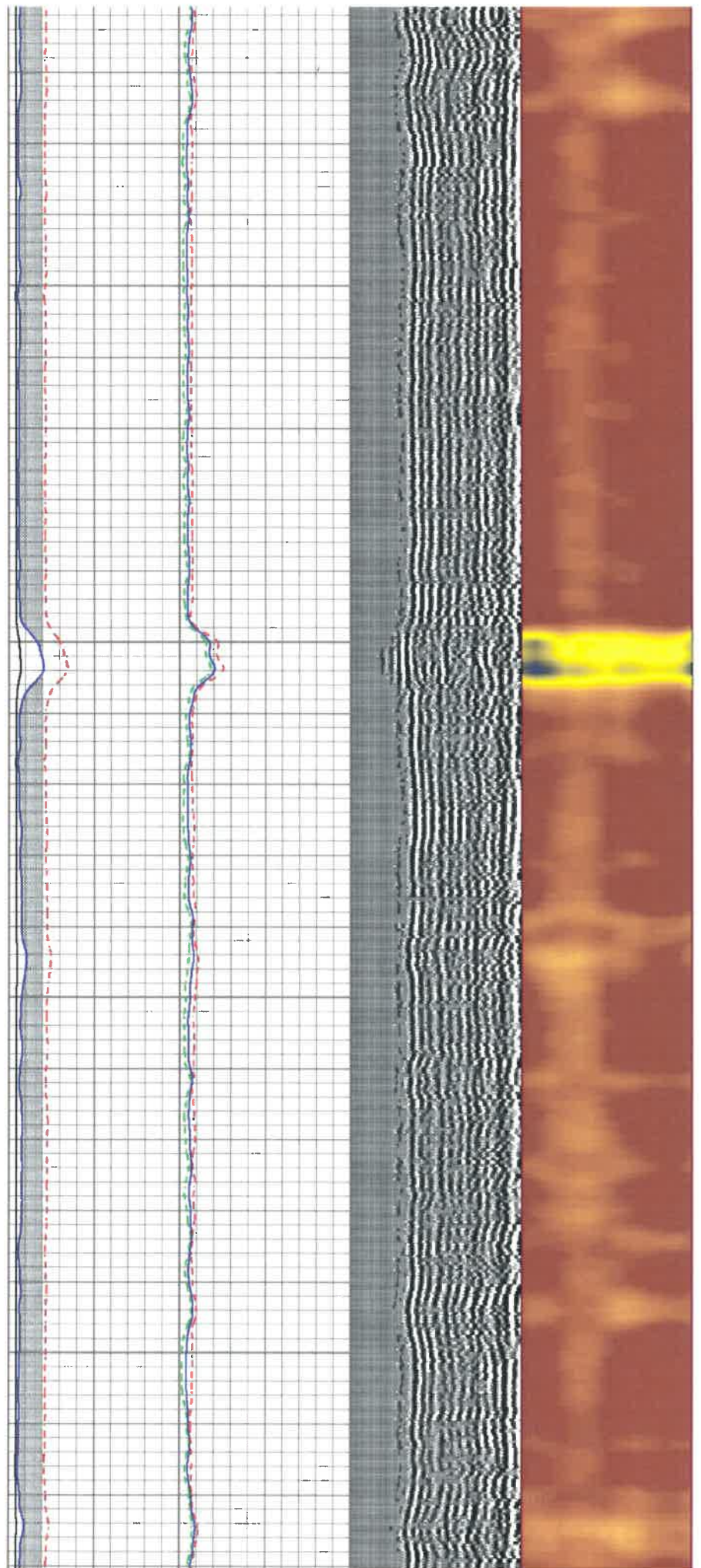


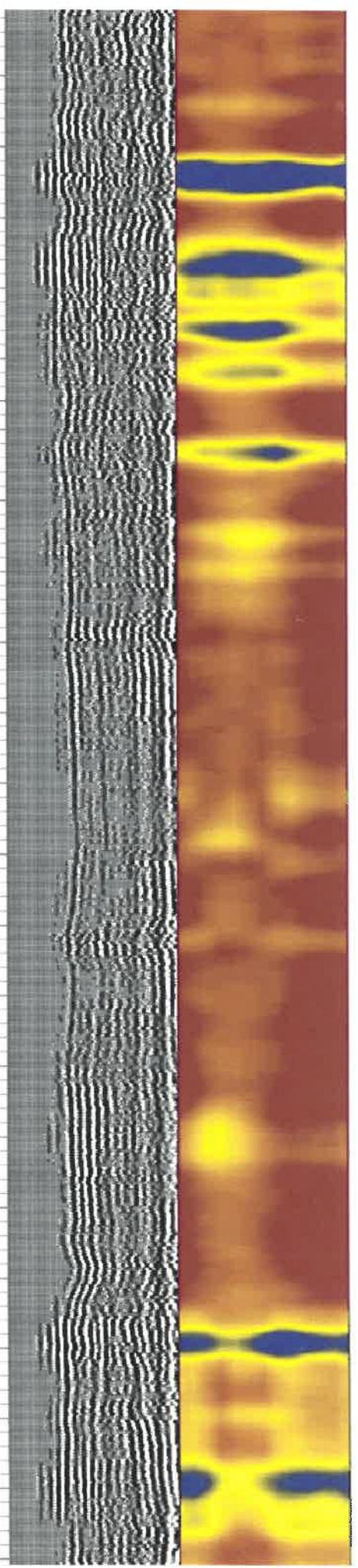
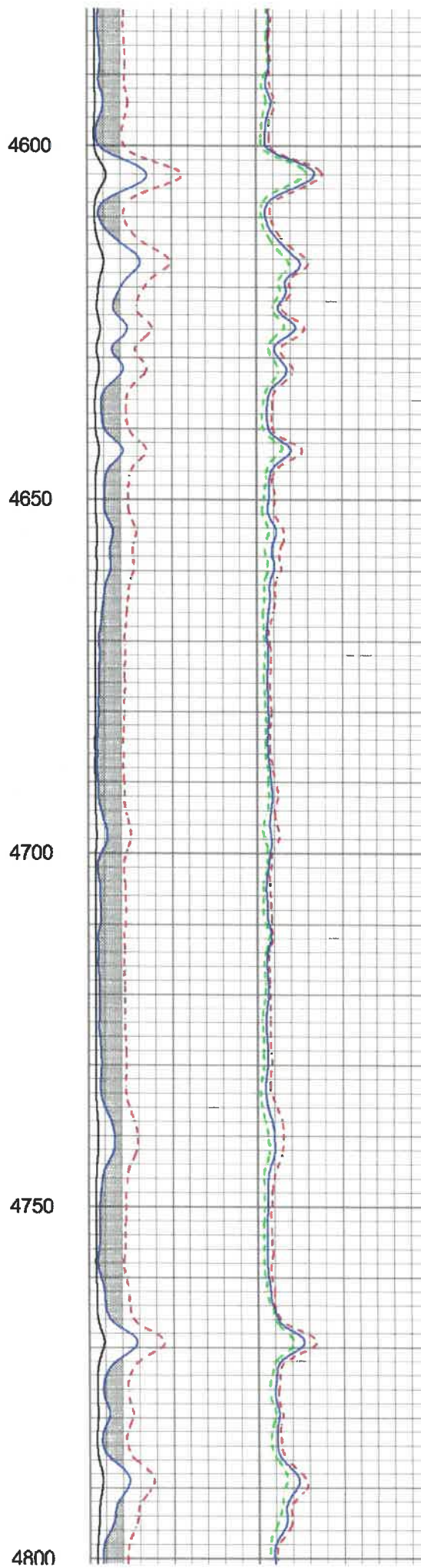
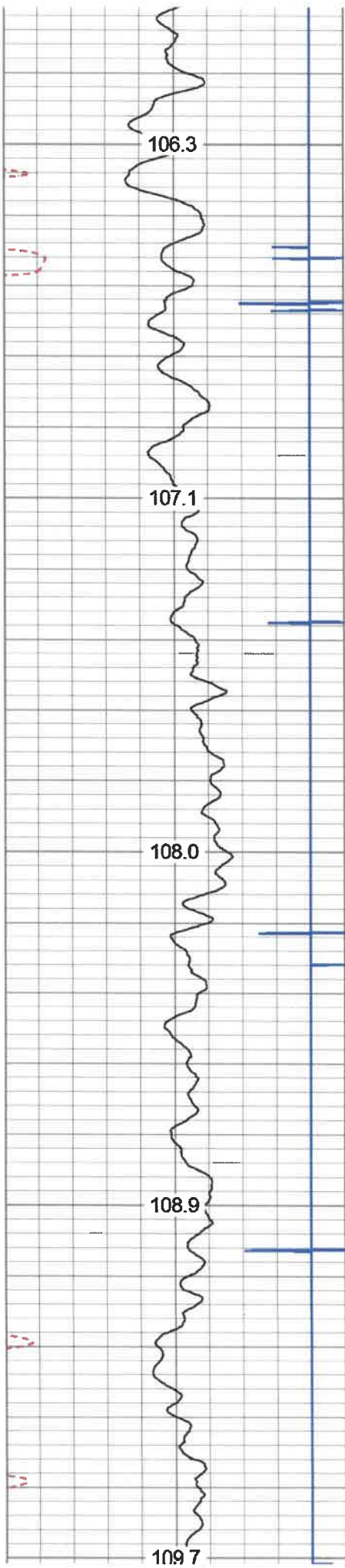
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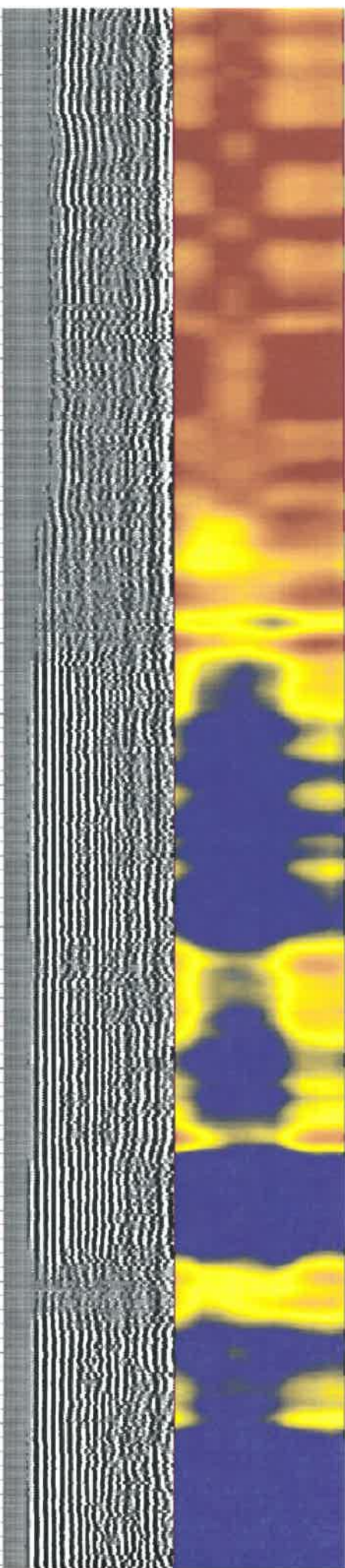
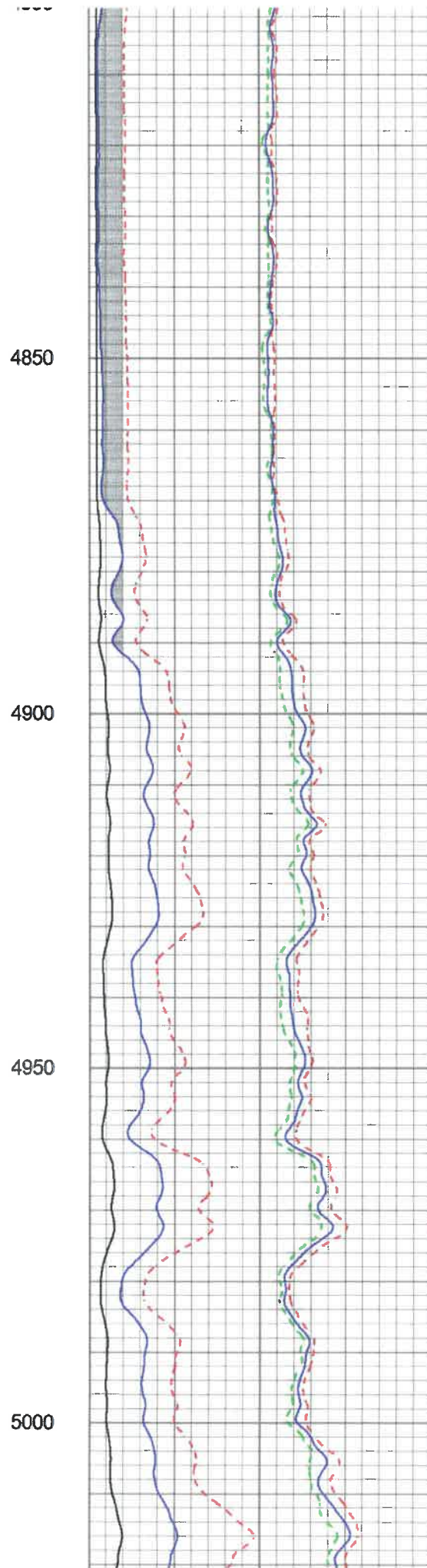
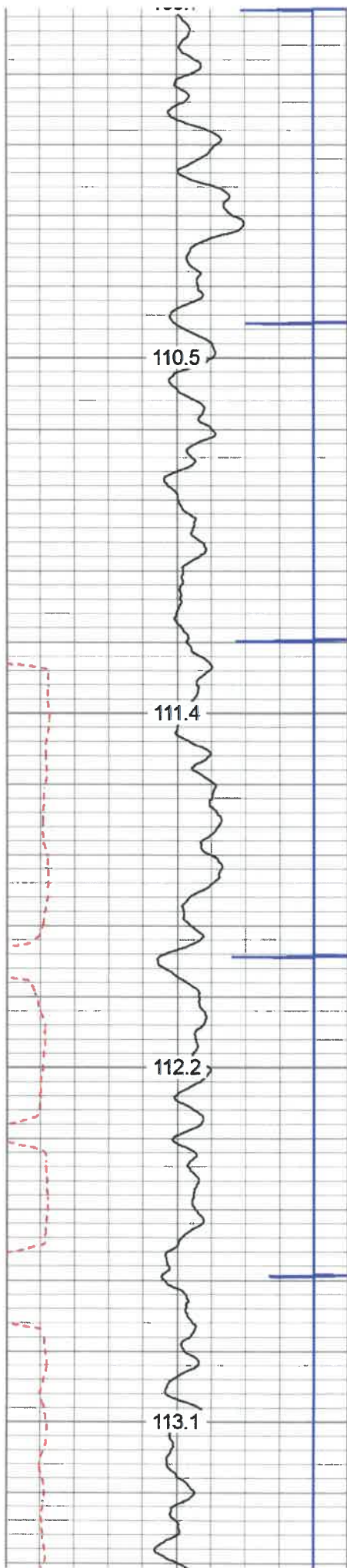
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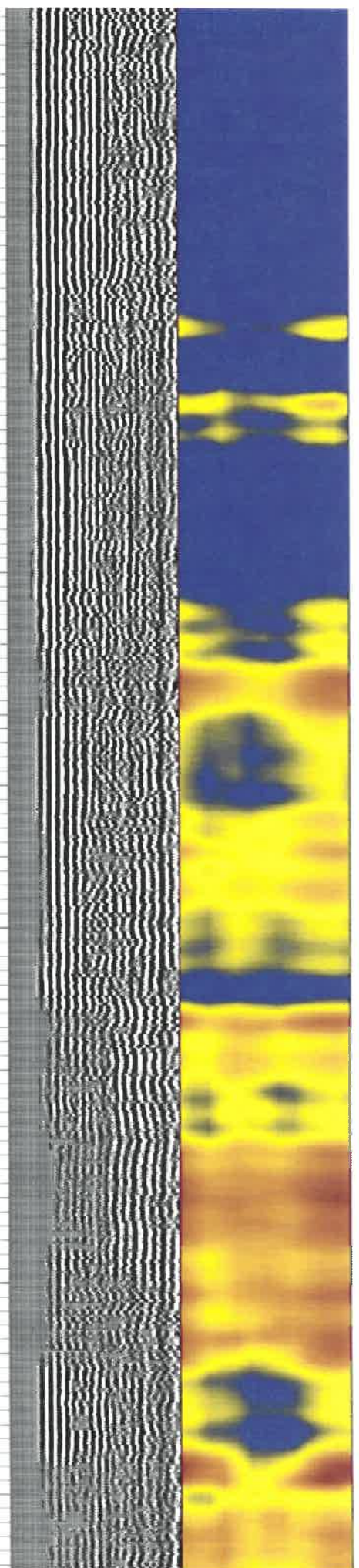
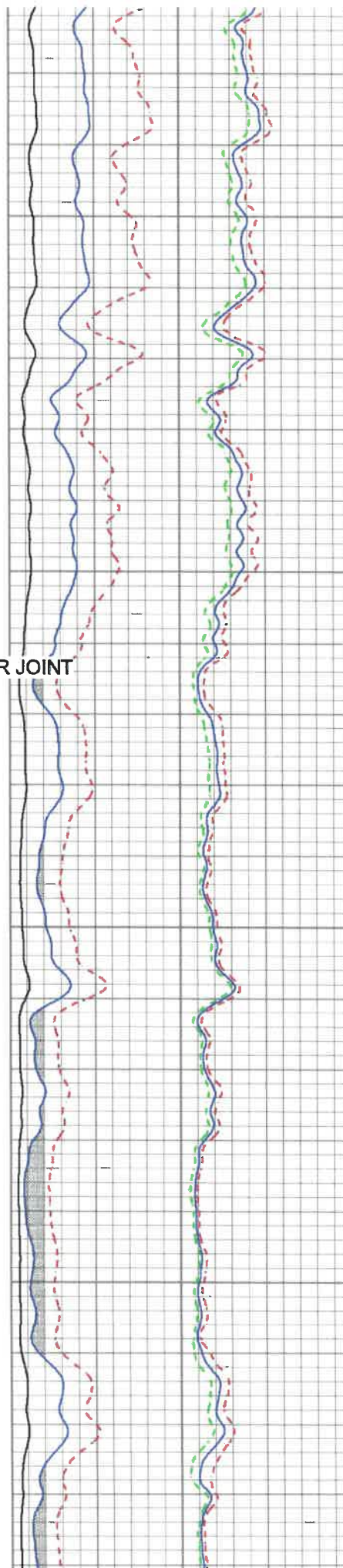
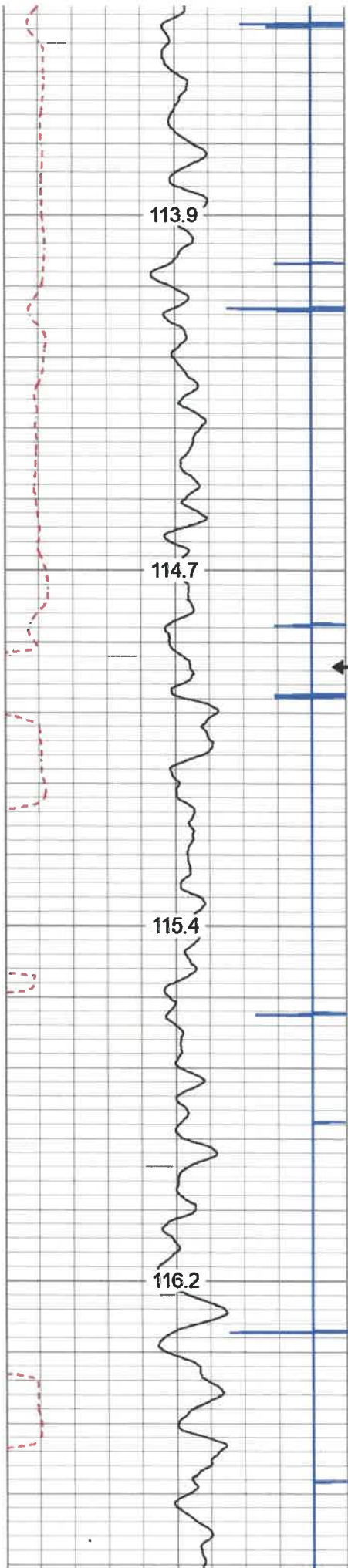
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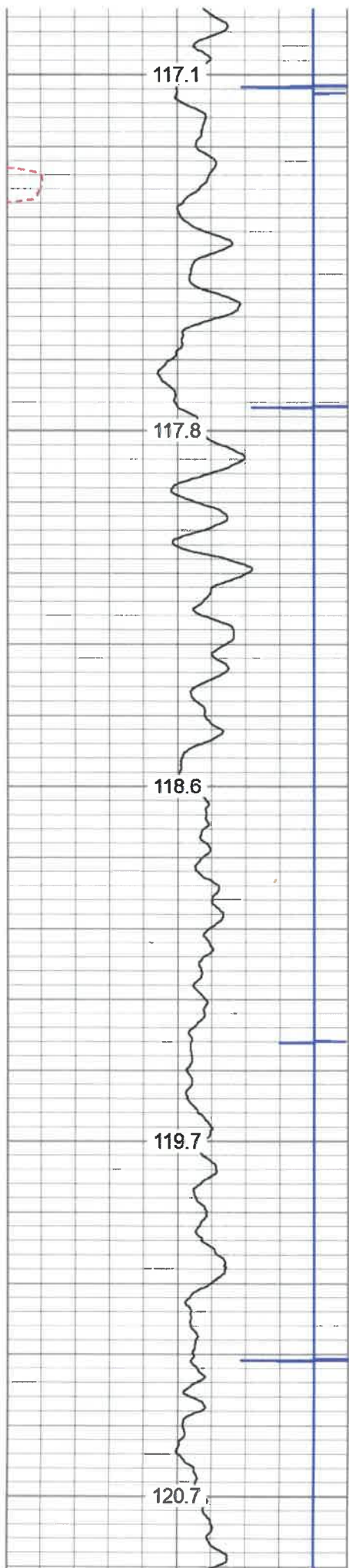












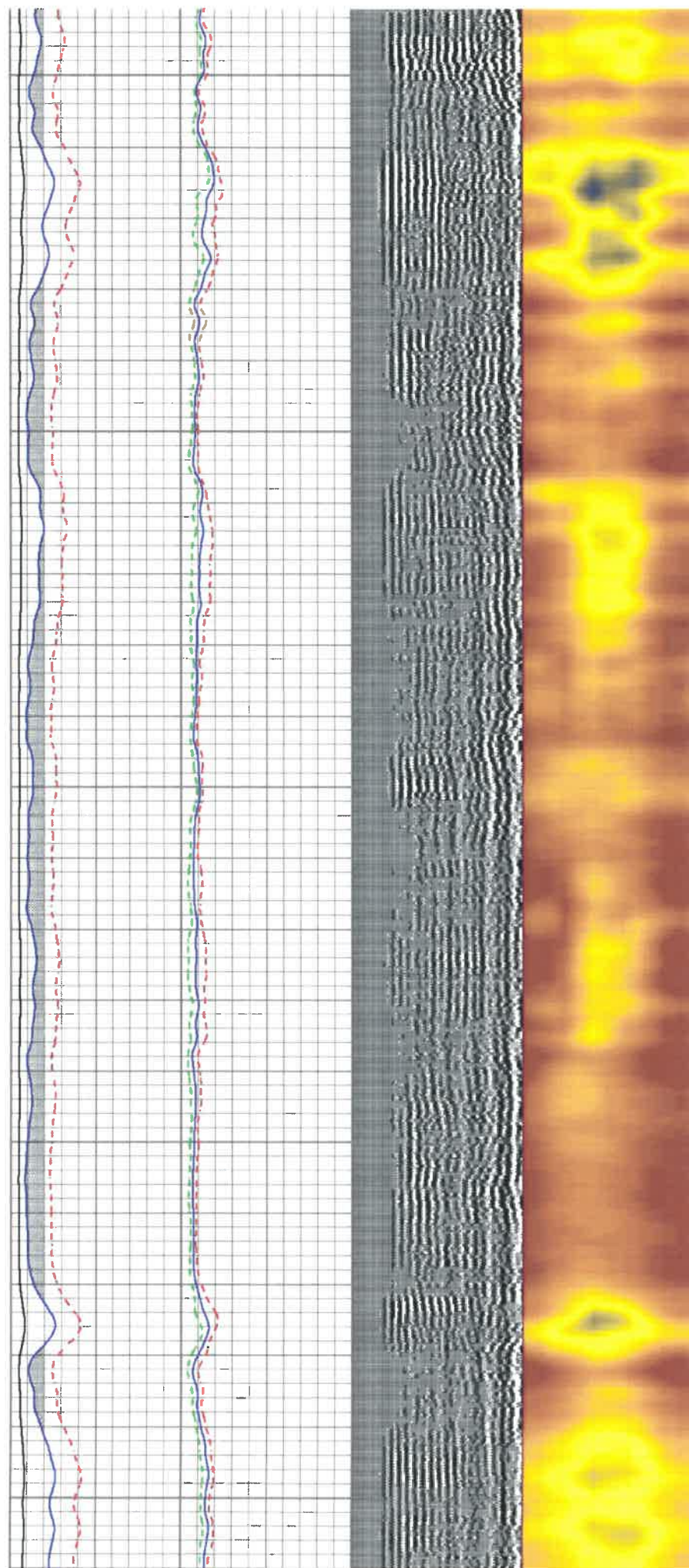
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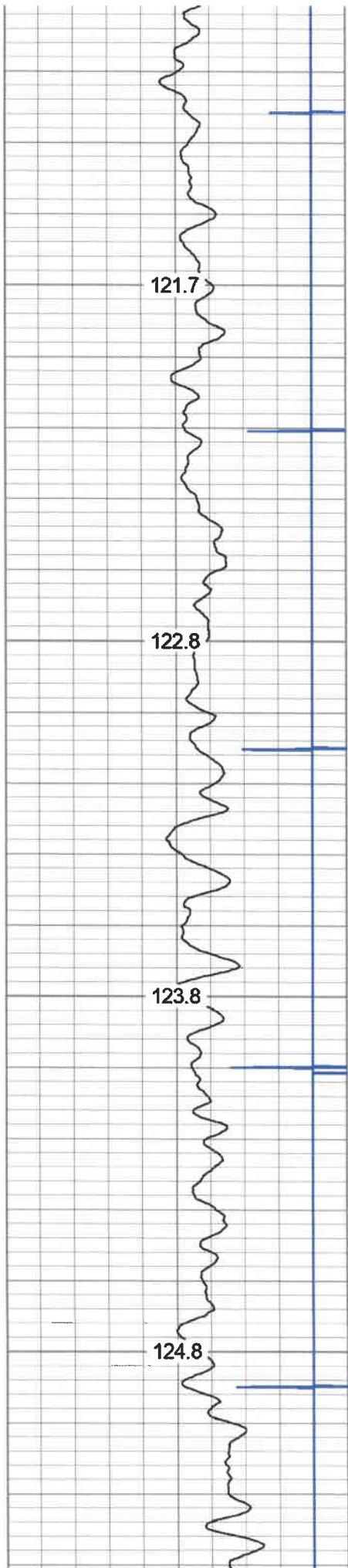
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5350

5400

5450



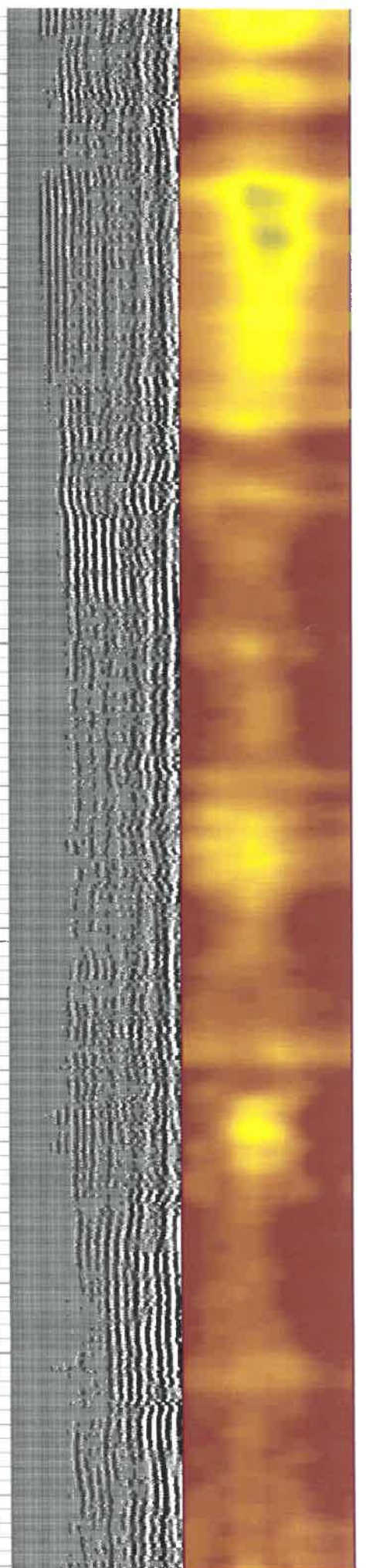
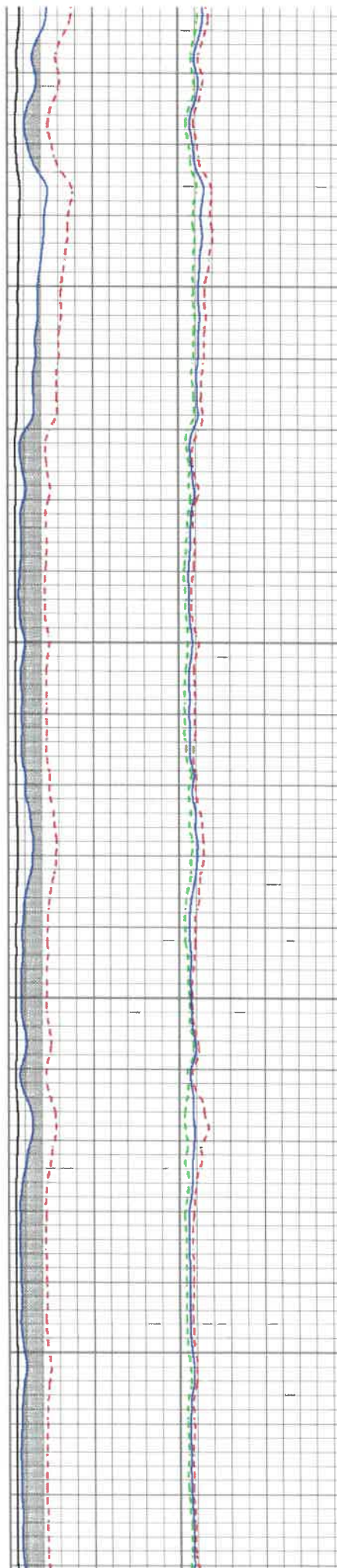


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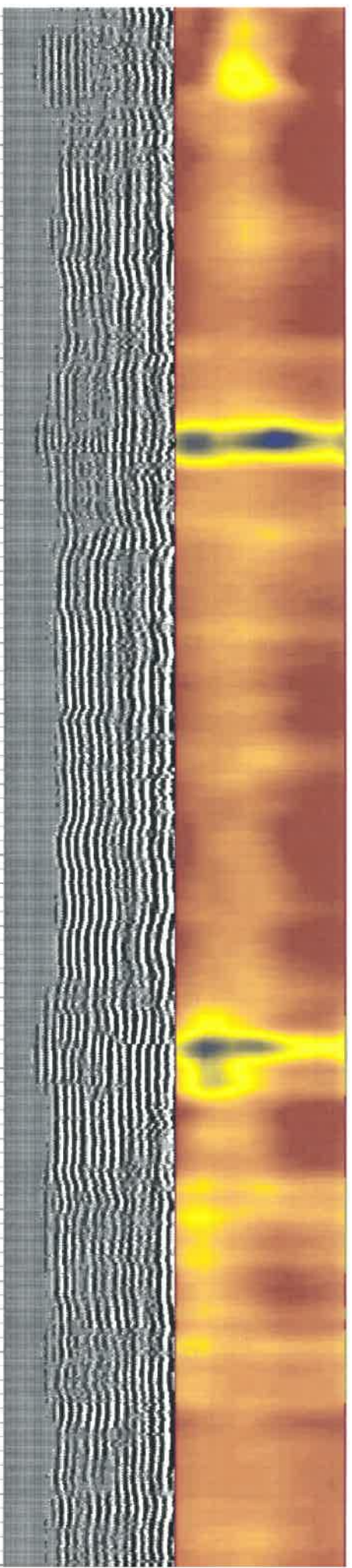
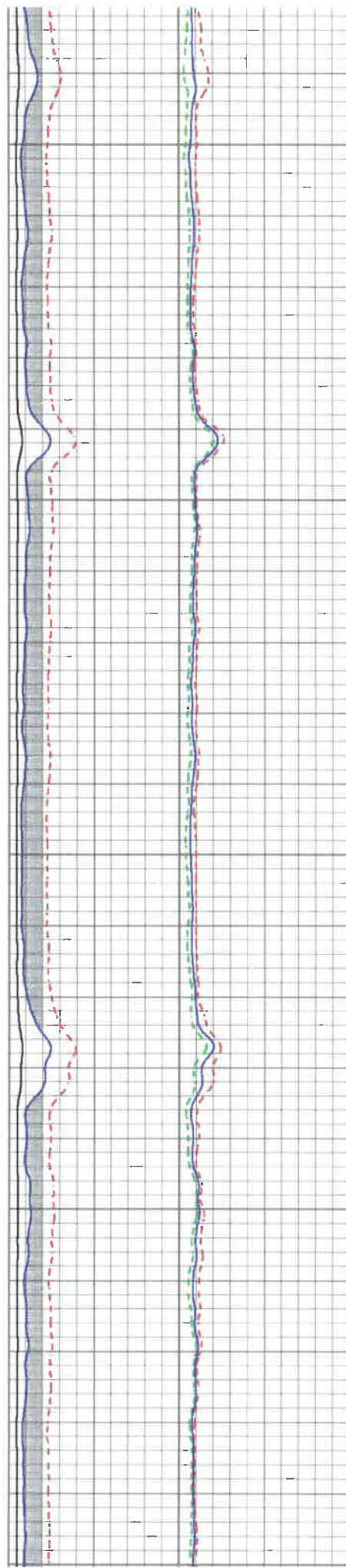
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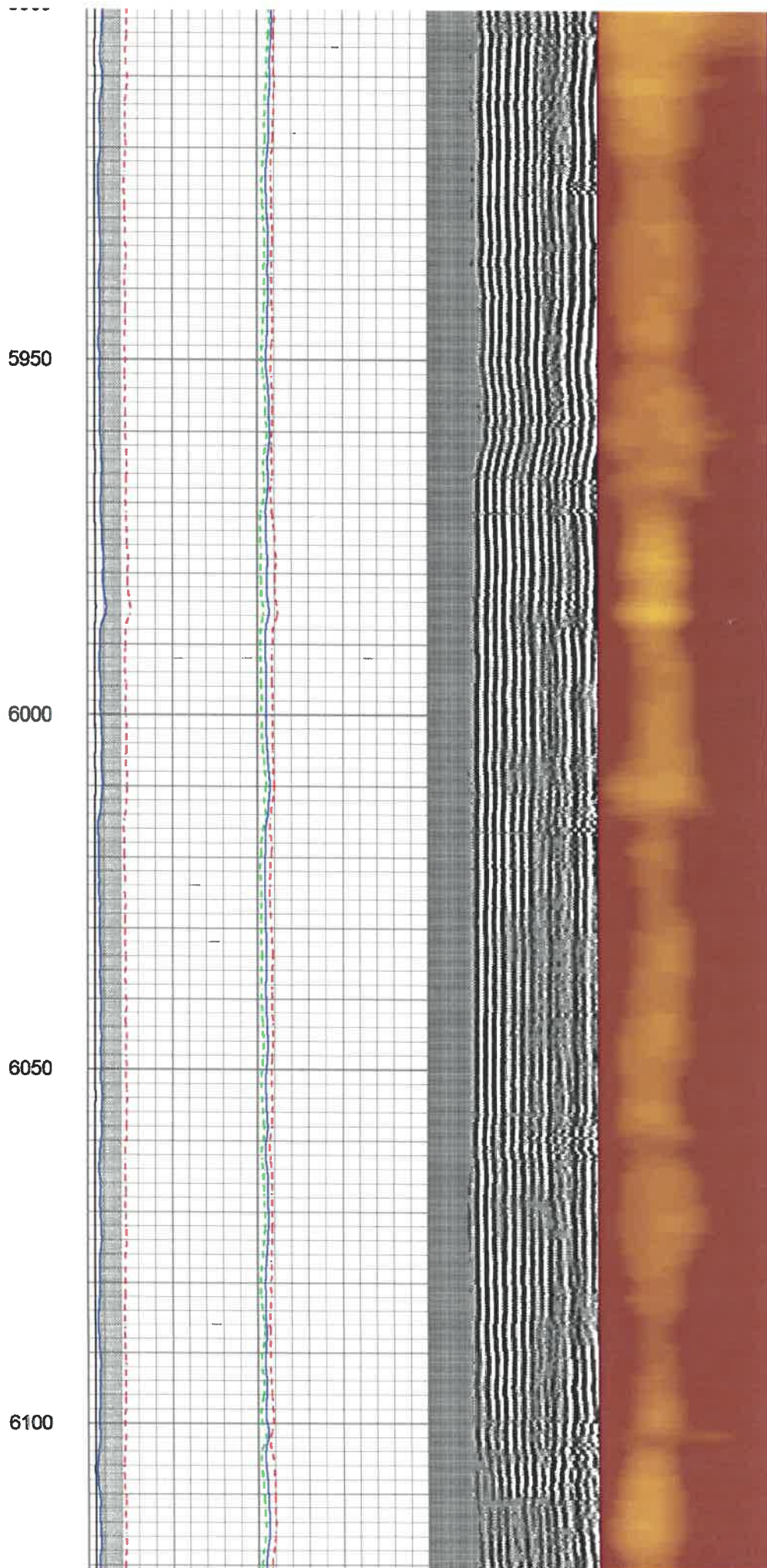
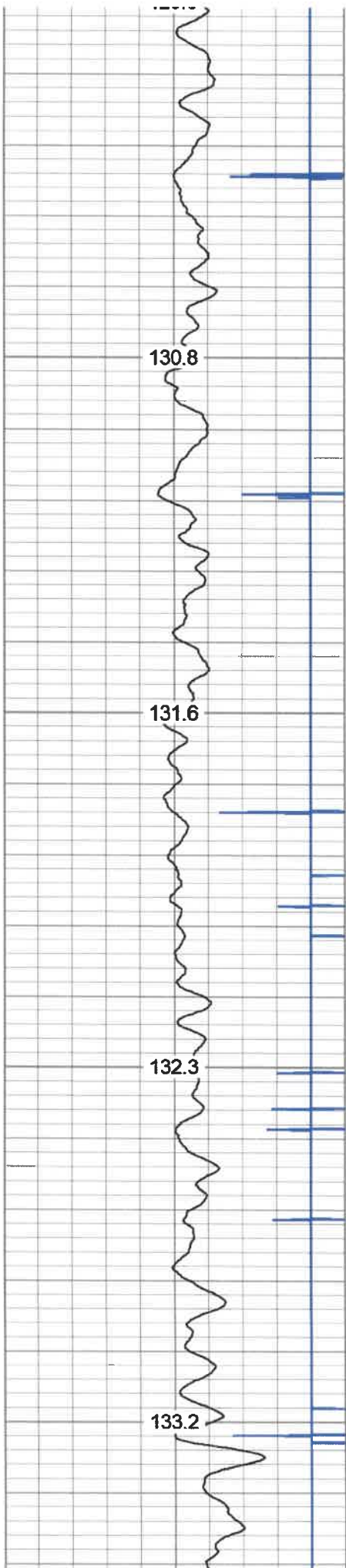
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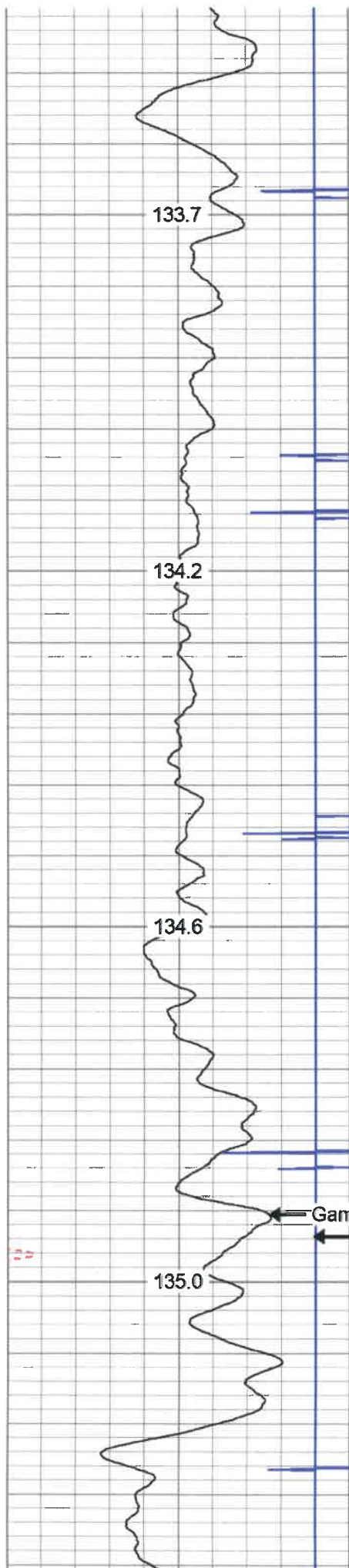




5700  
5750  
5800  
5850  
5900





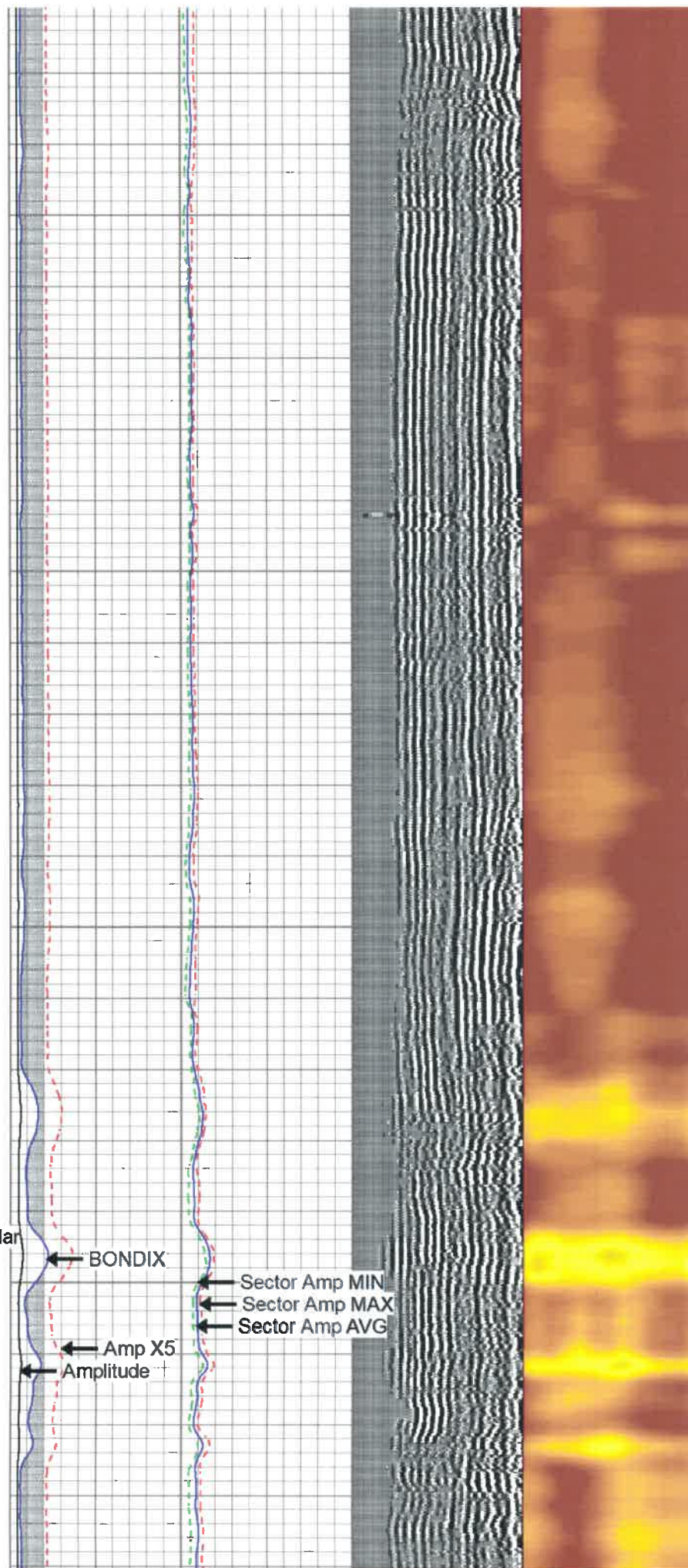


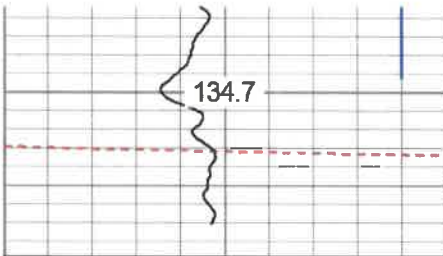
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6200

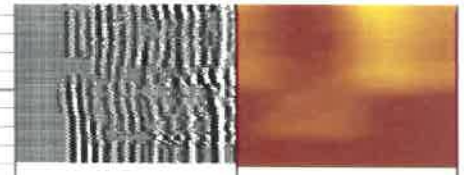
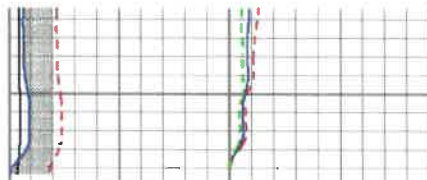
6250

6300





6350



280	Travel Time (usec)	180
9	Casing Collar	-1
0	Gamma Ray	180
0	TEMP (degF)	100
180	GR	360

TEMP  
(degF)

Amplitude		Sector Amp AVG	VDL	1 Sector Map 12	
0	(mV) 100	Sector Amp MAX			200 (usec) 1200
Amp X5		Sector Amp MIN			
0	(mV) 20				
1	BONDIX 0				



# 1500 PSI PRESSURE PASS



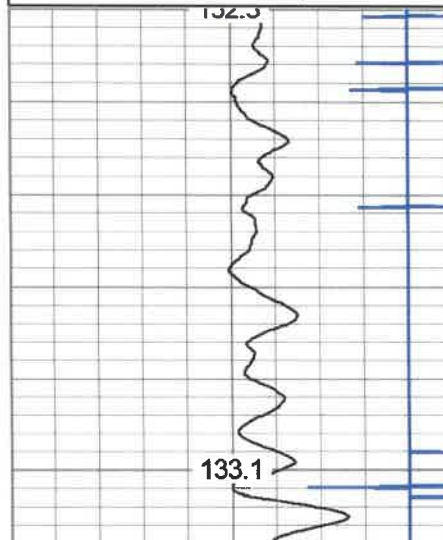
# REPEAT PASS

Database File ant\_galt3h.db  
 Dataset Pathname REPEAT1  
 Presentation Format antero  
 Dataset Creation Tue Dec 17 18:57:11 2019  
 Charted by Depth in Feet scaled 1:240

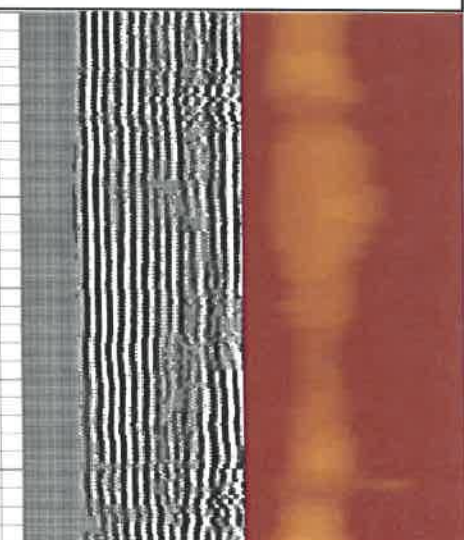
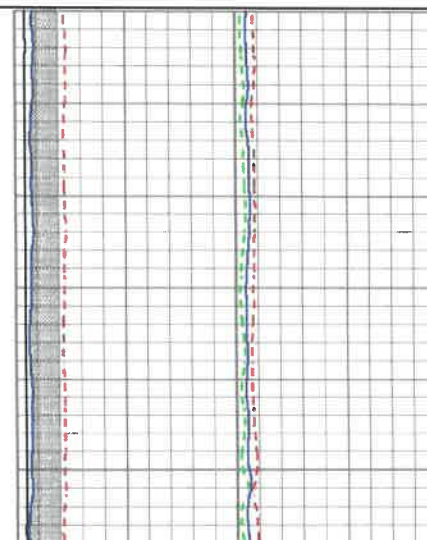
280	Travel Time (usec)	180
9	Casing Collar	-1
0	Gamma Ray	180
0	TEMP (degF)	100
180	GR	360

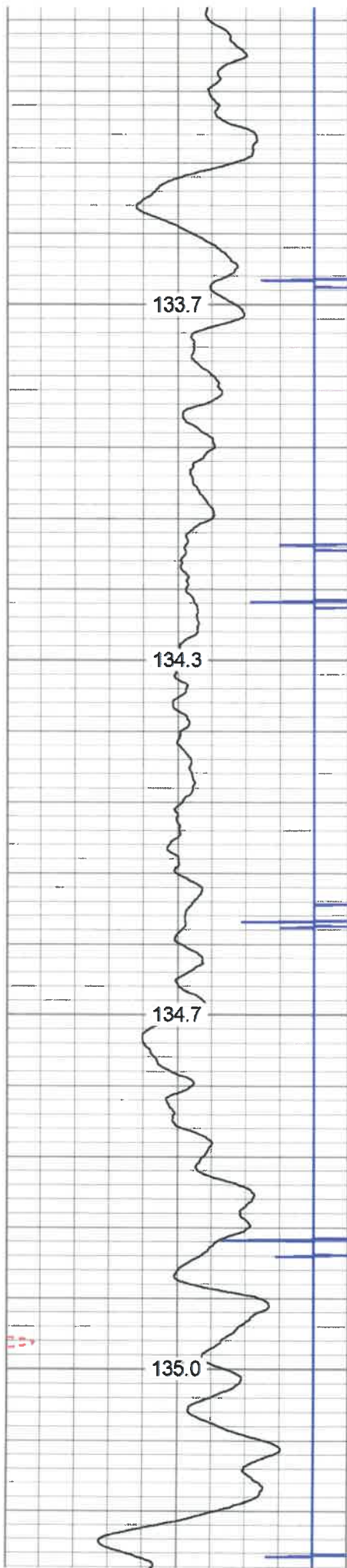
TEMP  
(degF)

Amplitude		Sector Amp AVG	VDL	1 Sector Map 12	
0	(mV) 100	Sector Amp MAX			200 (usec) 1200
Amp X5		Sector Amp MIN			
0	(mV) 20				
1	BONDIX 0				



6100



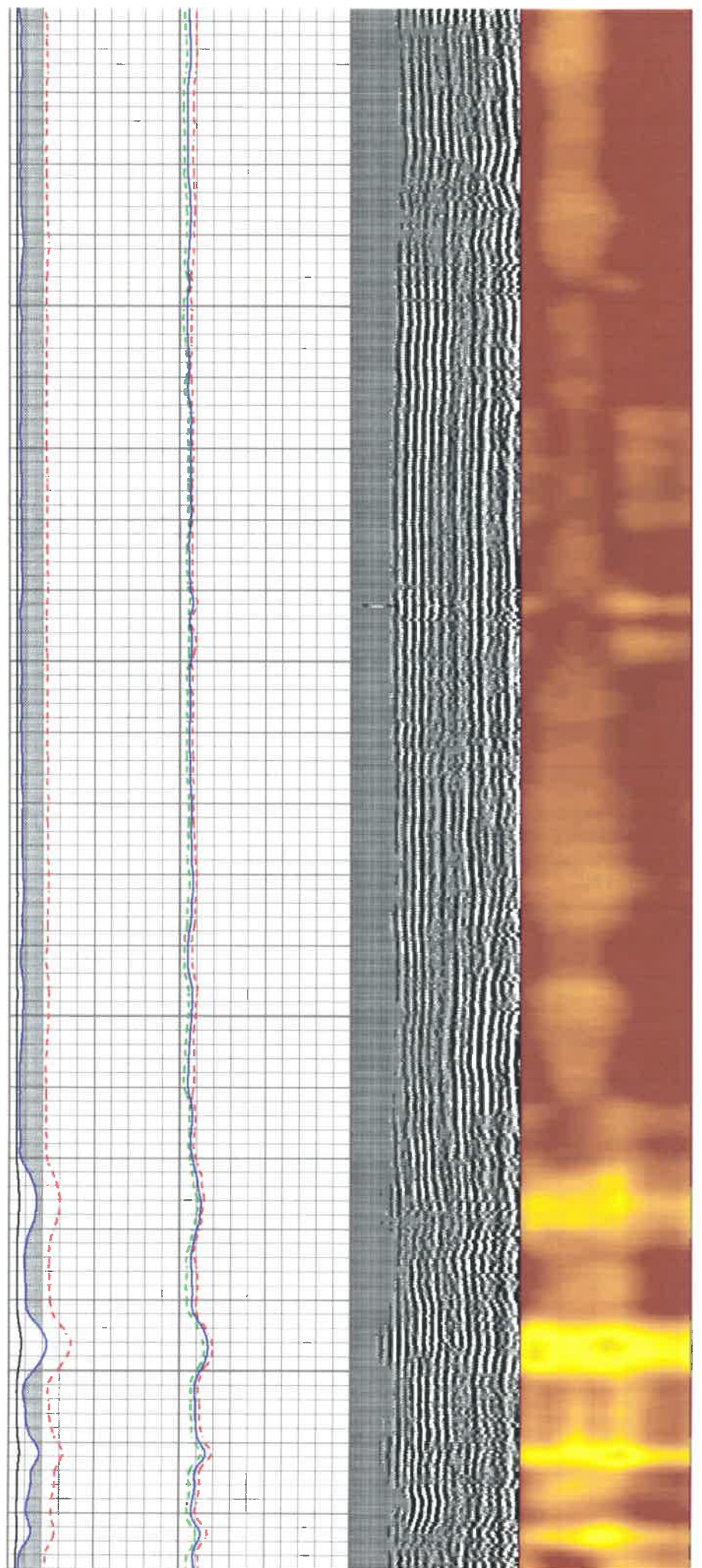


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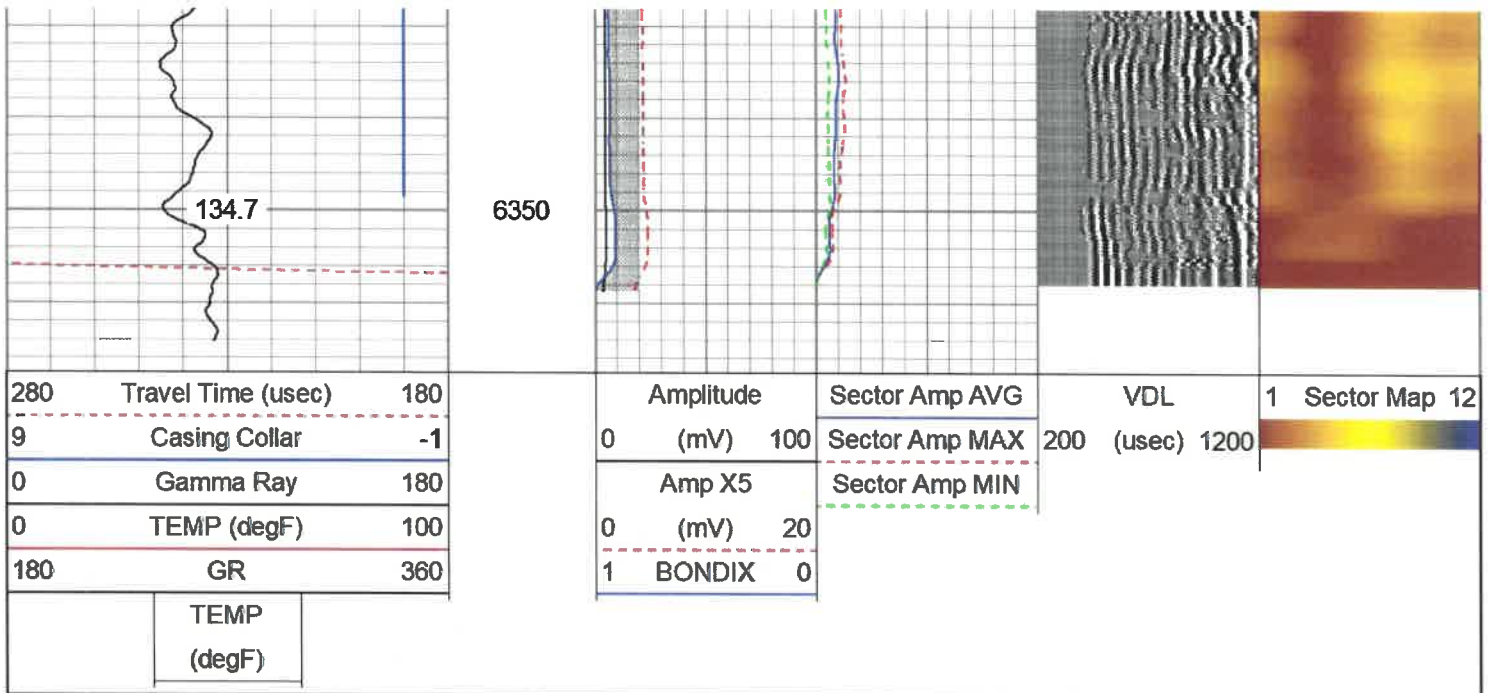
6200

6250

6300







# REPEAT PASS

## Log Variables

DatabaseC:\ProgramData\Warrior\Data\ant\_galt3h.db  
Dataset field/well/run1/pass8.1/\_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 20	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  
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 ant\_galt3h.db  
Dataset Pathname pass8.1  
Dataset Creation Tue Dec 17 13:16:24 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

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: IOL40-03\_5\_5  
 Tool Model: Tek12  
 Calibration Casing Diameter: 5.500 in  
 Calibration Depth: 76.317 ft


Master Calibration, performed (Derived):

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.000	1.451	3.500	71.921	47.152	3.484
CAL	0.022	0.412				
5'	-0.089	1.578	3.500	71.921	41.040	7.147
SUM						
S1	0.002	2.278	0.000	100.000	43.952	-0.104
S2	0.003	2.309	0.000	100.000	43.353	-0.120
S3	0.003	2.378	0.000	100.000	42.115	-0.140
S4	0.003	2.412	0.000	100.000	41.512	-0.143
S5	0.003	2.405	0.000	100.000	41.644	-0.145
S6	0.004	2.419	0.000	100.000	41.392	-0.147
S7	0.003	2.375	0.000	100.000	42.157	-0.142
S8	0.003	2.358	0.000	100.000	42.455	-0.123
S9	0.003	2.364	0.000	100.000	42.349	-0.109
S10	0.002	2.344	0.000	100.000	42.707	-0.103
S11	0.002	2.291	0.000	100.000	43.687	-0.098
S12	0.002	2.274	0.000	100.000	44.023	-0.098

Temperature Calibration Report

Serial Number: IOL40-03\_5\_5  
 Tool Model: Tek12  
 Performed: Fri Oct 20 09:51:21 2017

	Reference	Reading
Low Reference:	0.00 degF	0.00 usec
High Reference:	1.00 degF	1.00 usec
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 (IO8X3-01) 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 (IOL40-03_5_5) Tekco 400 Deg F 12 Sector RIB with Temp	9.13	3.25
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				
WVF3FT	10.73				
WVF5FT	9.73				
WVFSYNC	6.40				
WVFTEMP	6.40		Tek-2.75 2 3/4" Tekco Adjustable Centralizer	2.73	2.75
			GR-Tek-Co 2 3/4 (IPSNO-03) Tekco 2 3/4" 400 Deg. F Logging Gamma Ray	3.67	2.75
GR	1.04				40.00

Dataset: ant\_galt3h.db: field/well/run1/pass8.1  
 Total length: 20.07 ft  
 Total weight: 250.00 lb  
 O.D.: 3.25 in



Company Antero Resources Corporation  
 Well GALT 3H  
 Field Marcellus  
 County TYLER  
 State WV

REC'D  
 Office of Environmental Protection  
 SEP 24 2020  
 WV Dept. of Environmental Protection  
 Country USA

