



Radial Cement Bond
Variable Density Log
W/Gamma Ray/CCL/Temp

Company ANTERO
Well Elk Fork Tygart 2H
Field RABBIT EARS
County TYLER
State WEST VIRGINIA Country USA

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Location: API #: 47-095-02722
Lat: 39.539881
Long: -80.887809
SEC TWP RGE
Permanent Datum Ground Level Elevation 25'
Log Measured From Kelly Bushing 25.5' A.P.D.
Drilling Measured From Kelly Bushing

Other Services
Elevation
K.B. N/A
D.F. N/A
G.L. N/A

Date	18-Mar-2021						
Run Number	ONE						
Depth Driller	22.181'						
Depth Logger	6.770'						
Bottom Logged Interval	6.800'						
Top Log Interval	SURFACE						
Open Hole Size	8.50"						
Type Fluid	FRESH WATER						
Density / Viscosity	8.4#						
Max. Recorded Temp.	146 Deg.F.						
Estimated Cement Top	3.232'						
Time Well Ready	7.15						
Time Logger on Bottom	7.45						
Equipment Number	TK-104 / P1,G2						
Location	CHARLEROI, PA						
Recorded By	Matt McNally						
Witnessed By	Chris Young						
Borehole Record							
Run Number	Bit	From	To	Size	Weight	From	To
Tubing Record							
Casing Record	Size	Wgt/Ft	Top	Bottom			
Surface String							
Prot. String							
Production String	5 1/2"	23#	SURFACE	22.181'			
Liner							

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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 @ 5,816' -5,826"
Depth Correction -28'

100%FREE PIPE=71.9mv
100%BOND=3.4mv

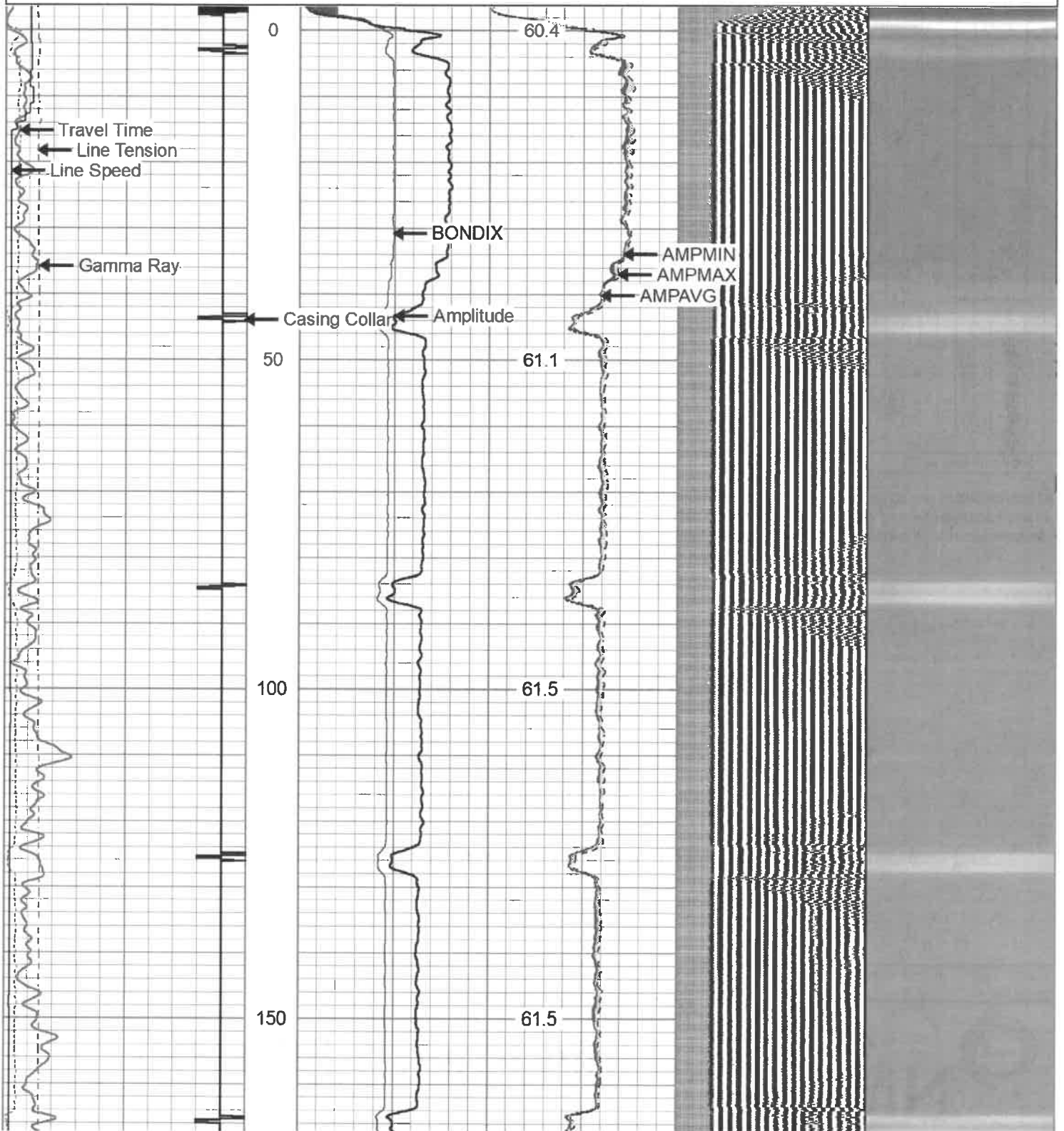
Thank You for Choosing Nine Energy Service.Charleroi, PA

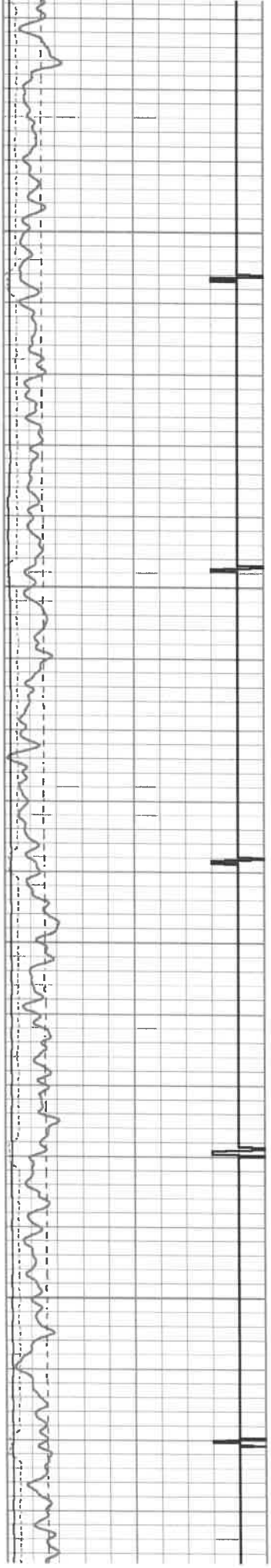


Main Pass 1,500 PSI

Database File antero_elk_fork_tygart_2h_rcbl_19_mar_2021.db
 Dataset Pathname rabbit_ears/2h/run1/pass4
 Presentation Format rcbl-bond index for antero 1020
 Dataset Creation Fri Mar 19 07:44:41 2021
 Charted by Depth in Feet scaled 1:240

265	Travel Time (usec)	165	0	Amplitude (mV)	100	0	AMPMIN	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	1	BONDIX	0	0	AMPMAX	150	200 (usec)	1200		
0	Gamma Ray (GAPI)	150	0	AMPAVG	150							
	Line Speed			TEMP								
-100	(ft/min)	100		(degF)								
0	Line Tension (lb)	2000										





200

250

300

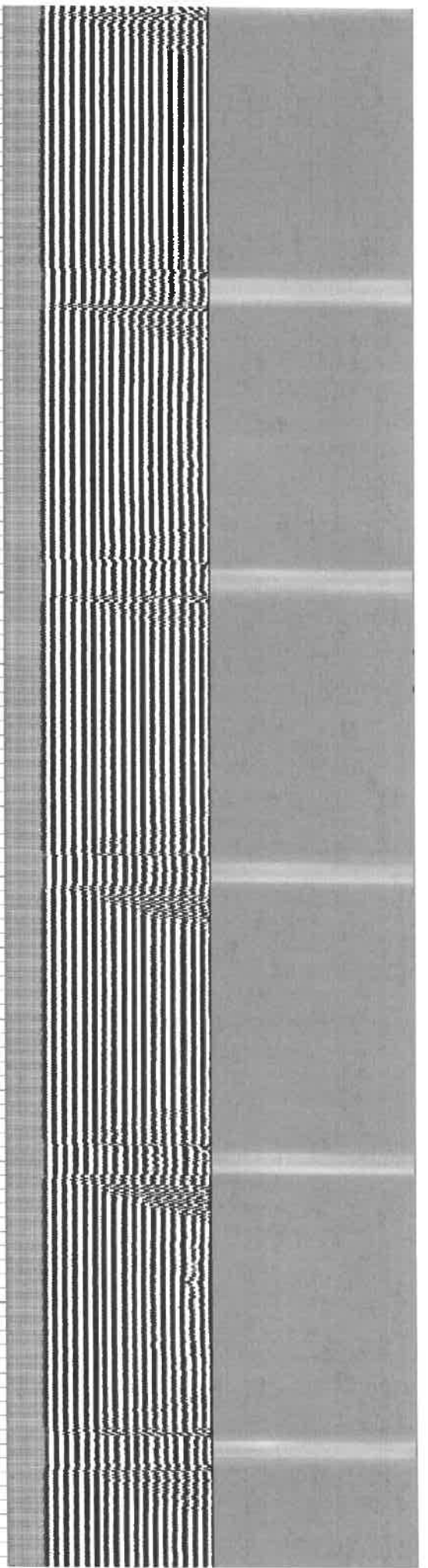
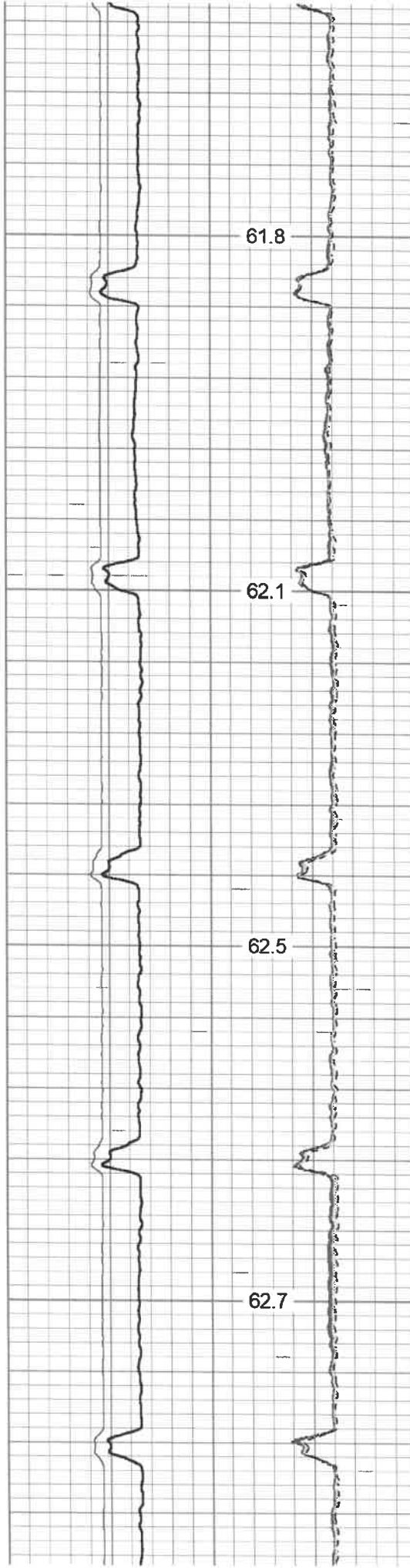
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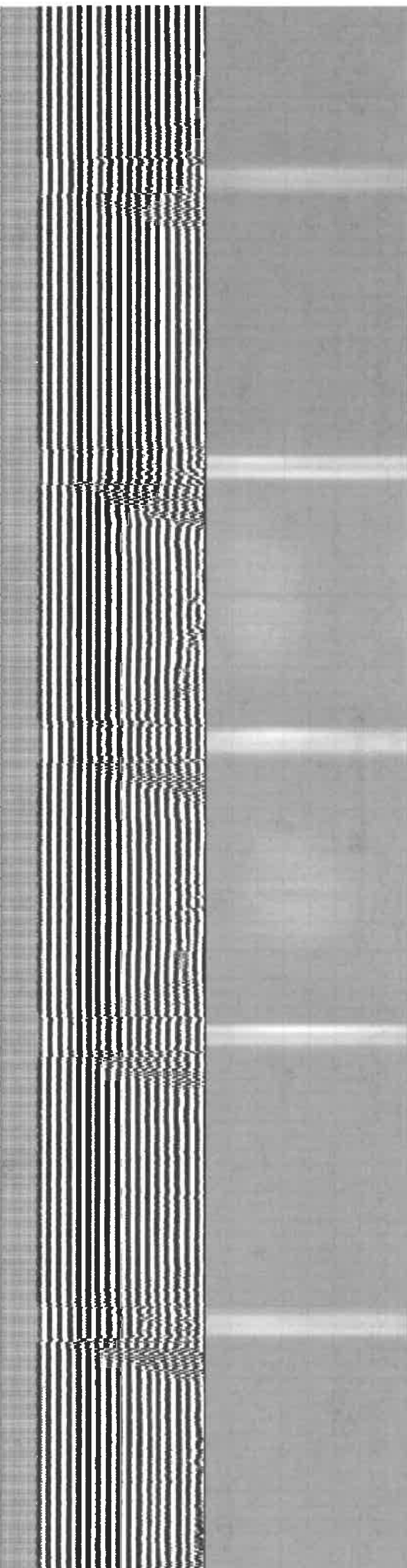
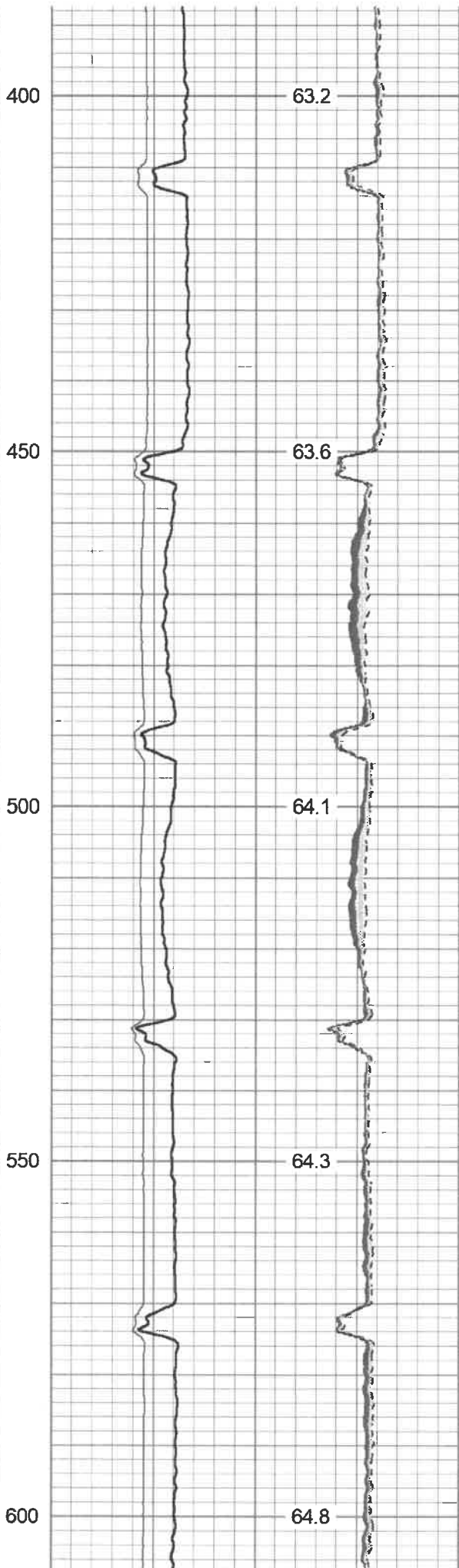
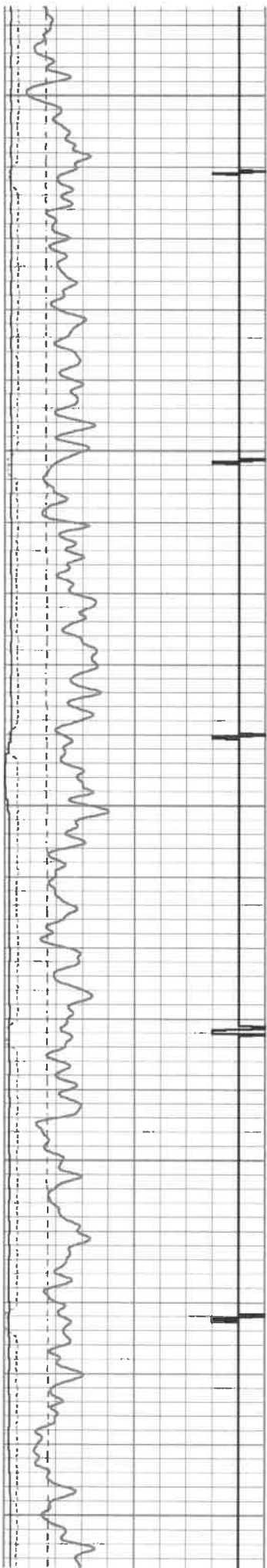
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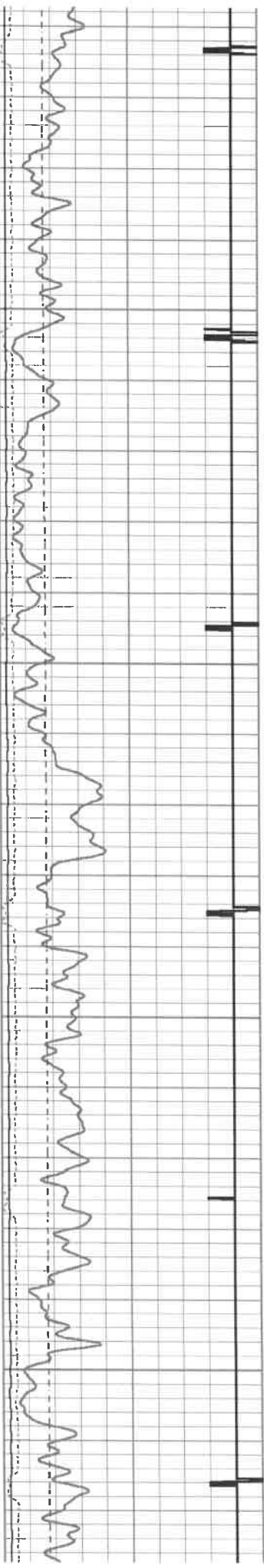
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62.5

62.7





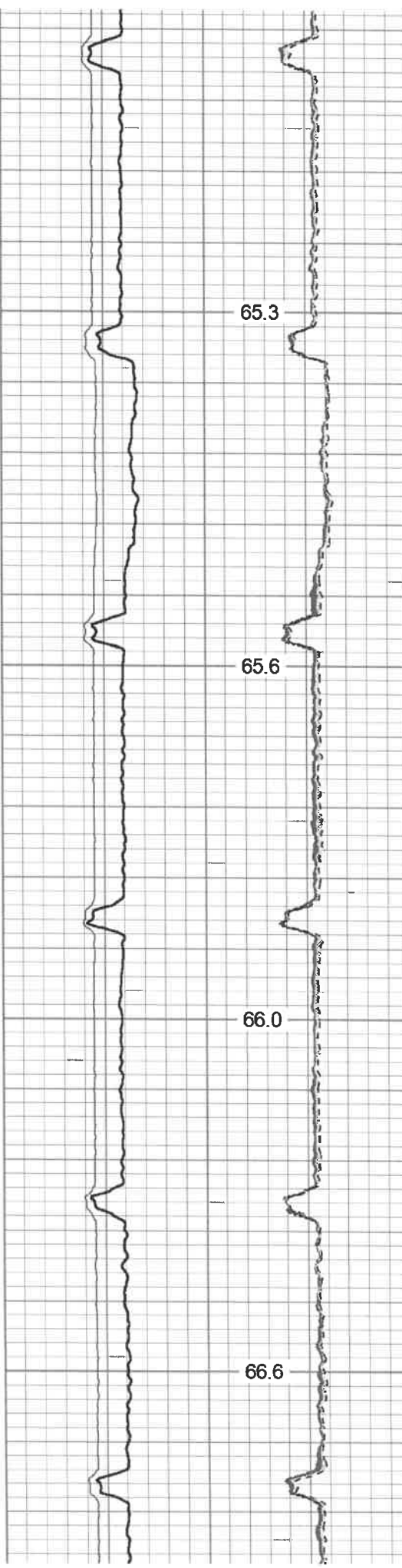


650

700

750

800

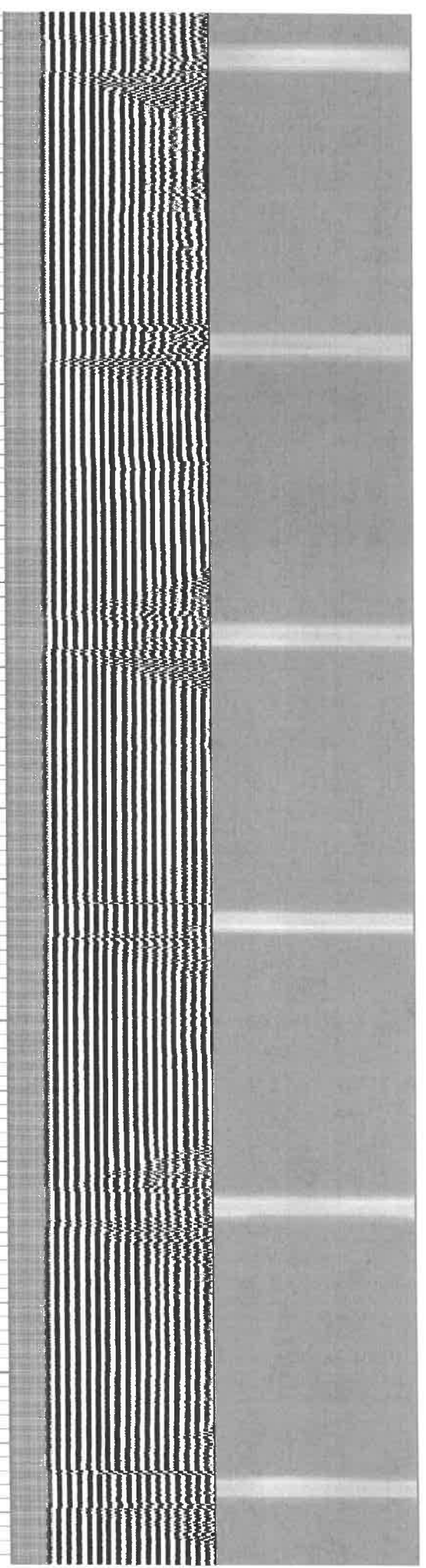


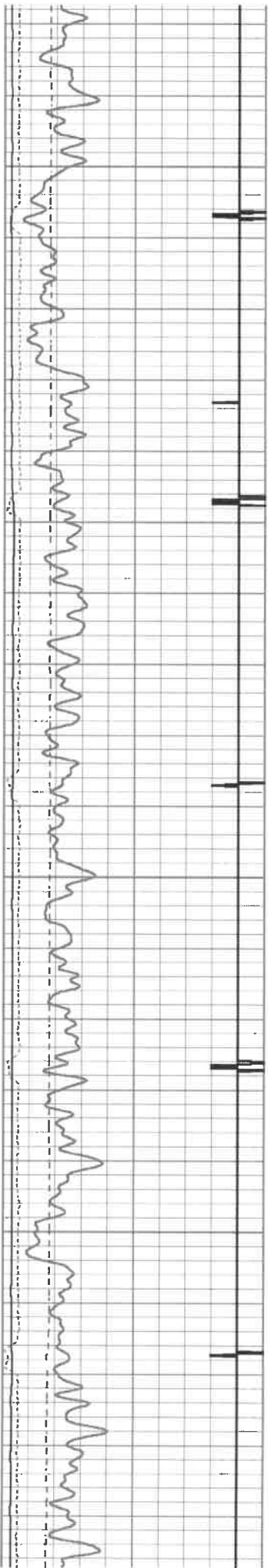
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65.6

66.0

66.6



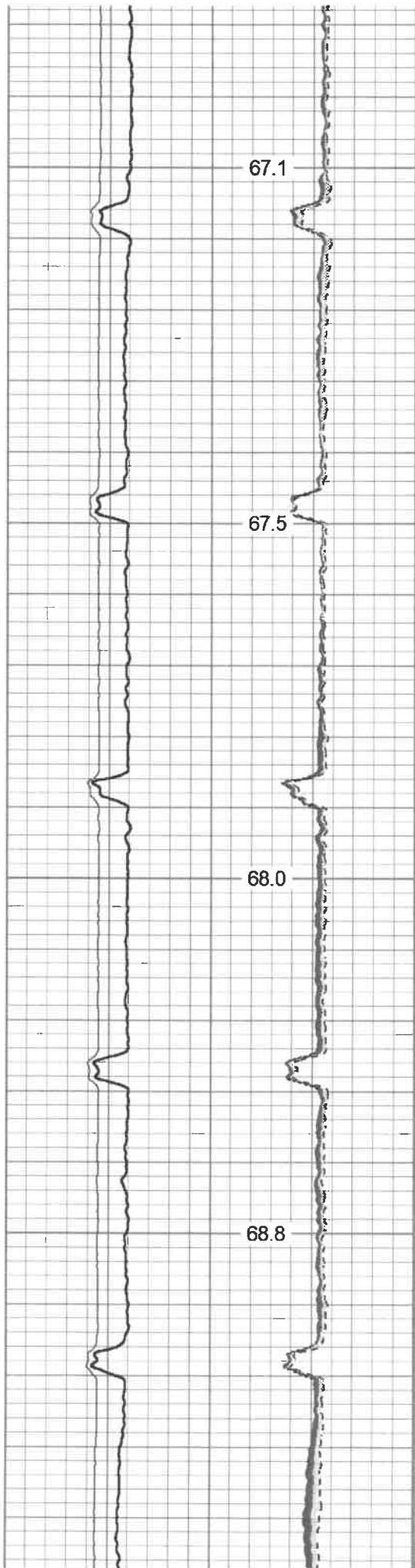


850

900

950

1000

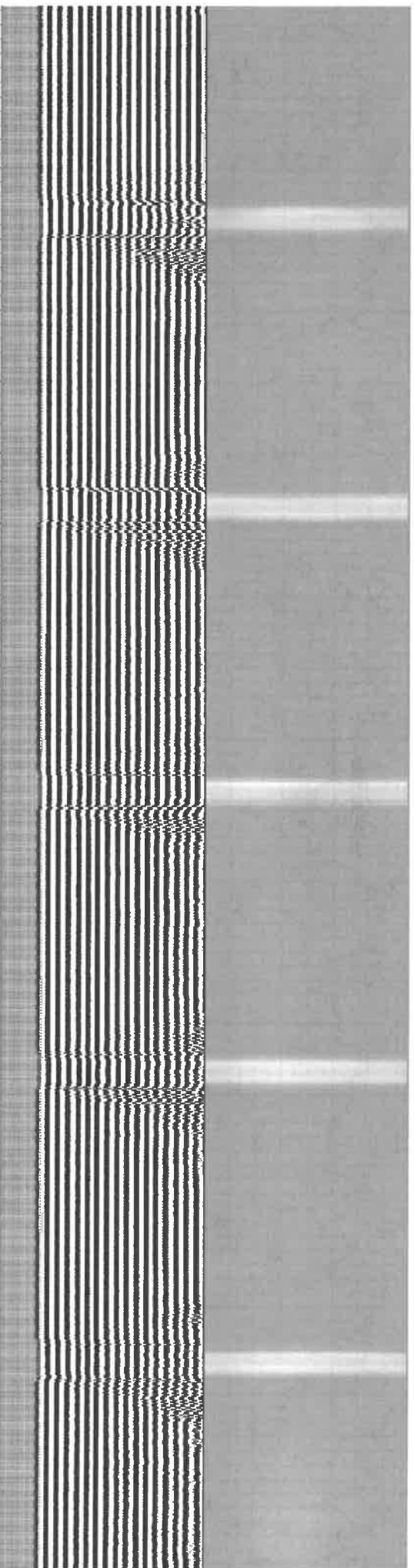


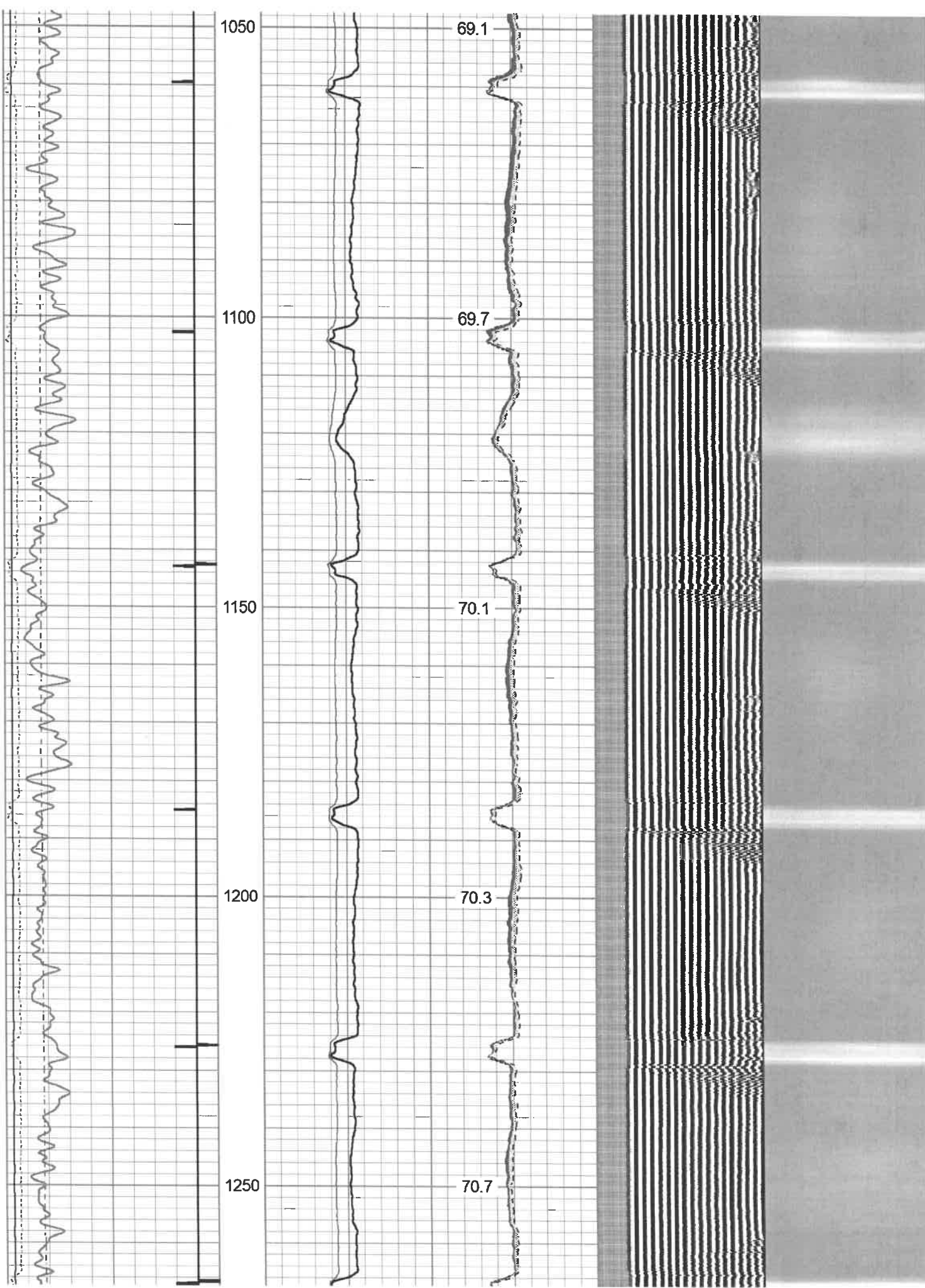
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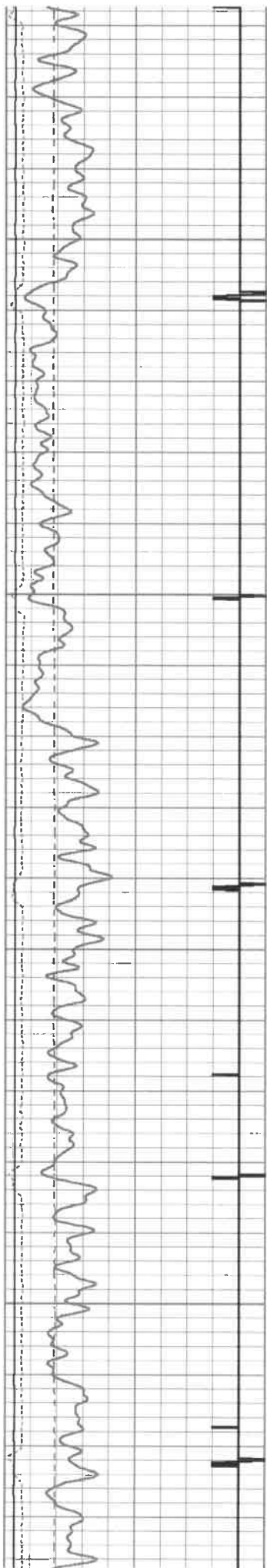
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68.0

68.8





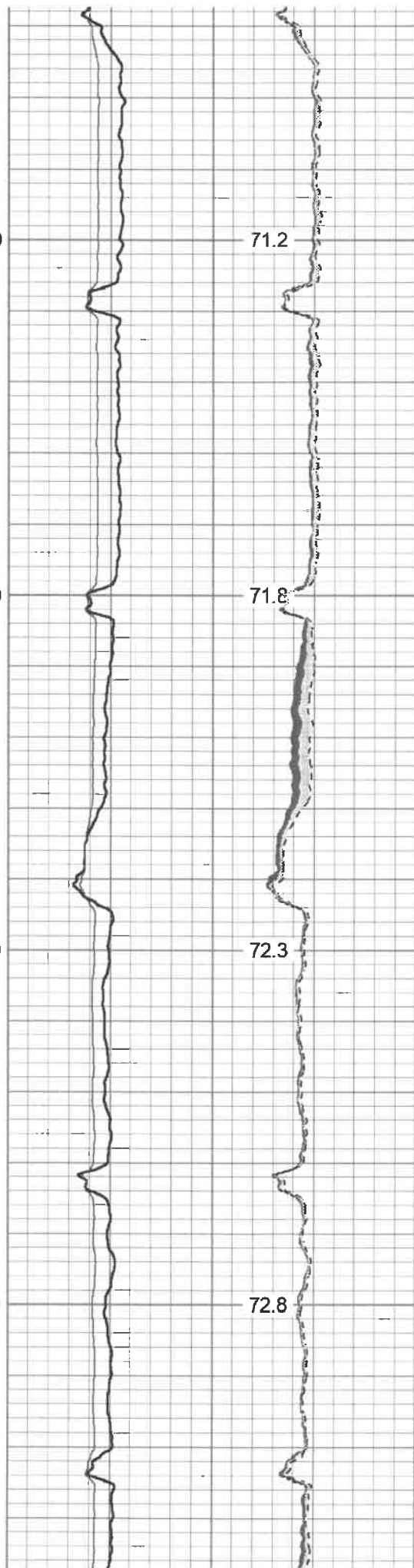


1300

1350

1400

1450

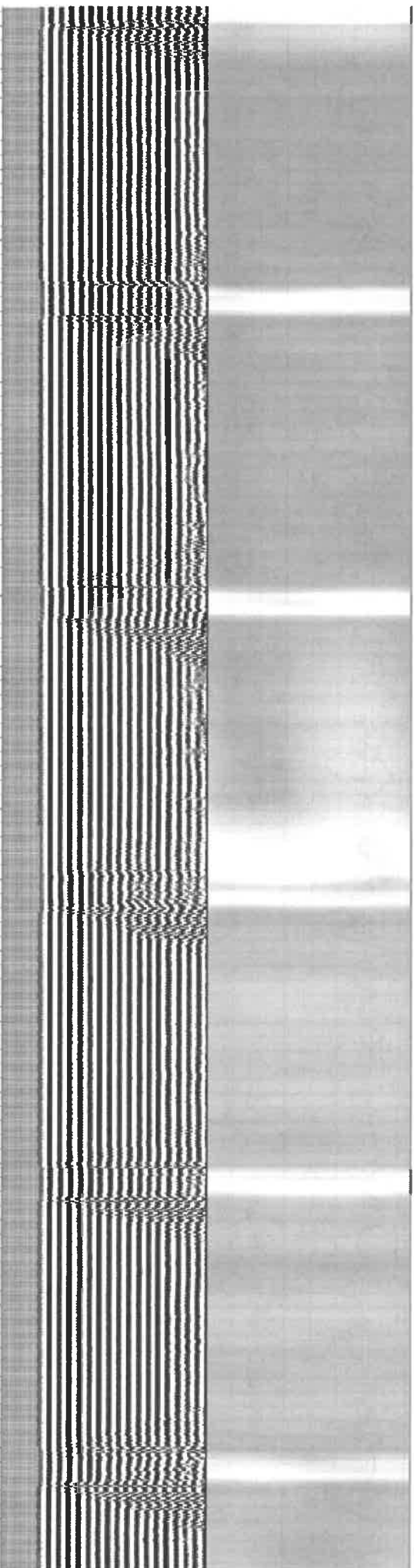


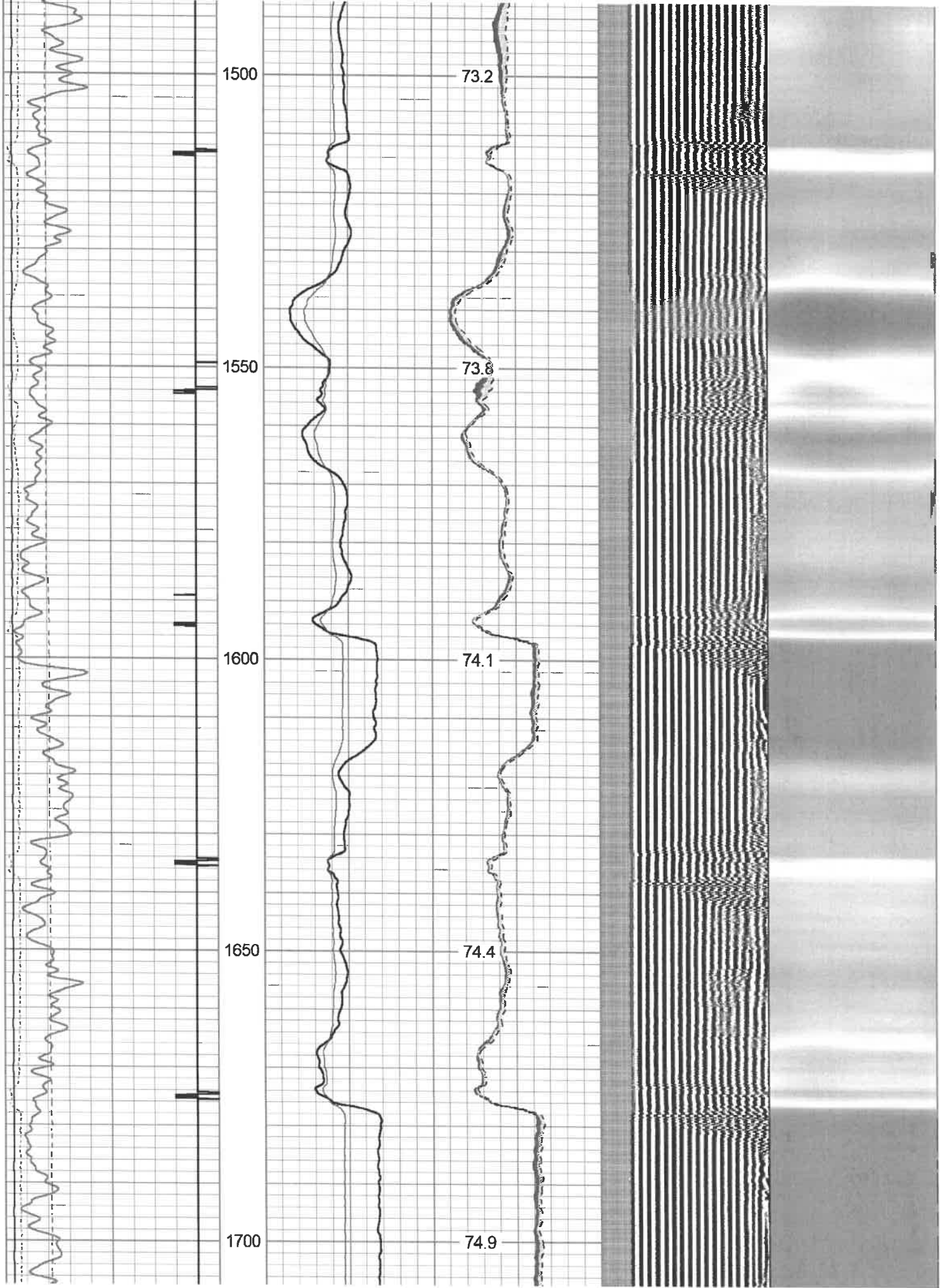
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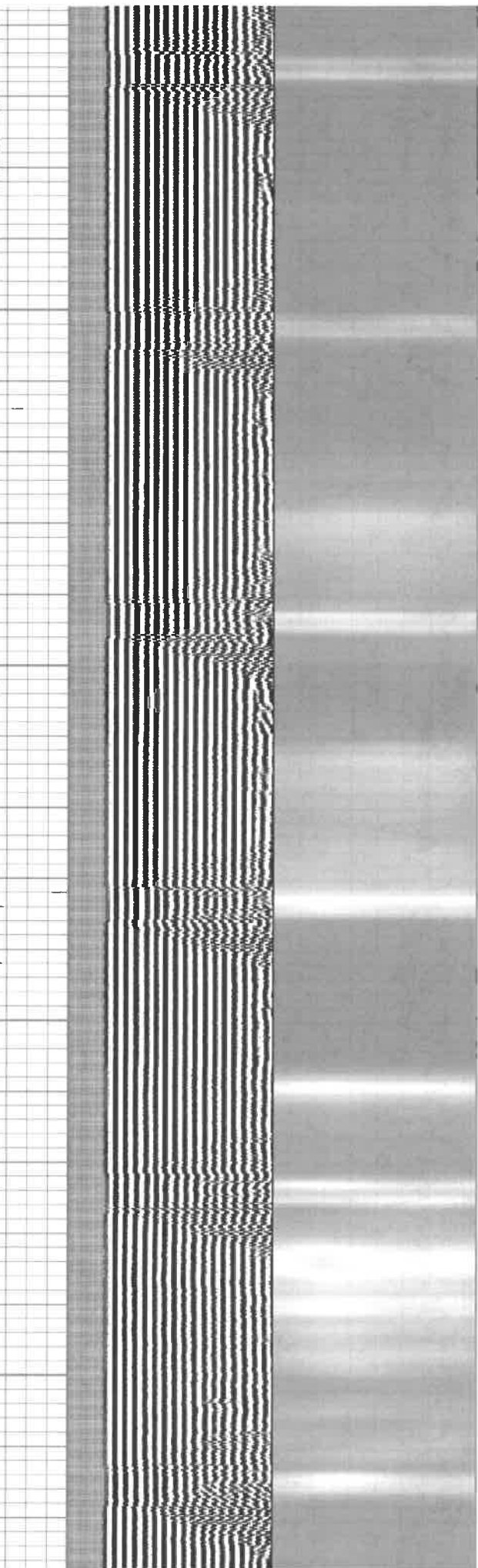
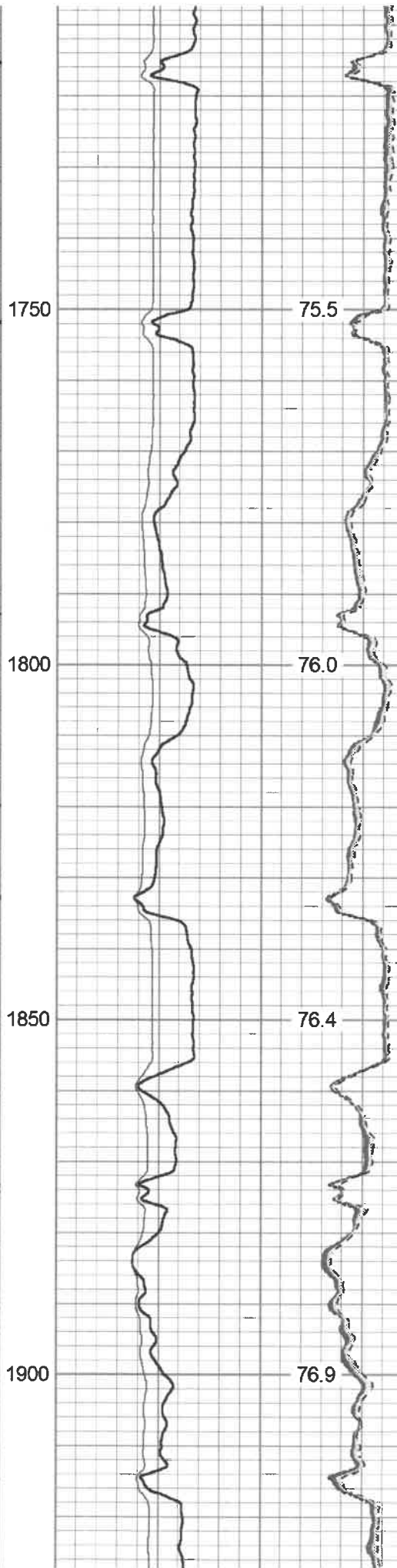
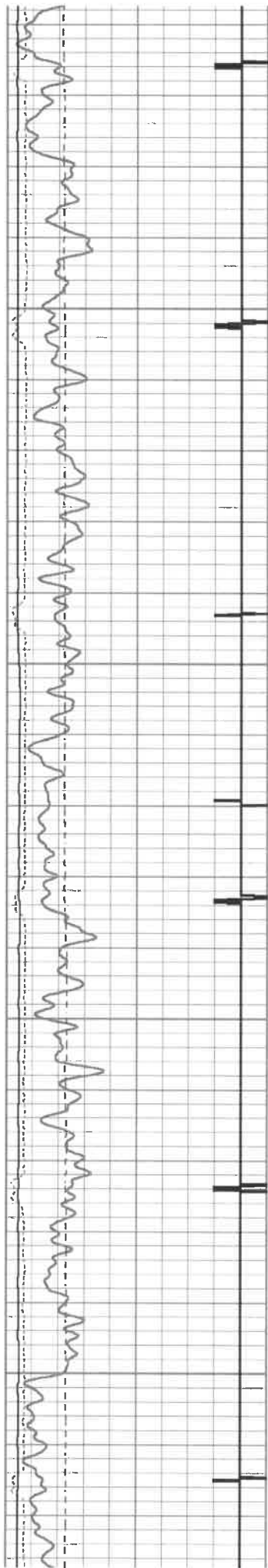
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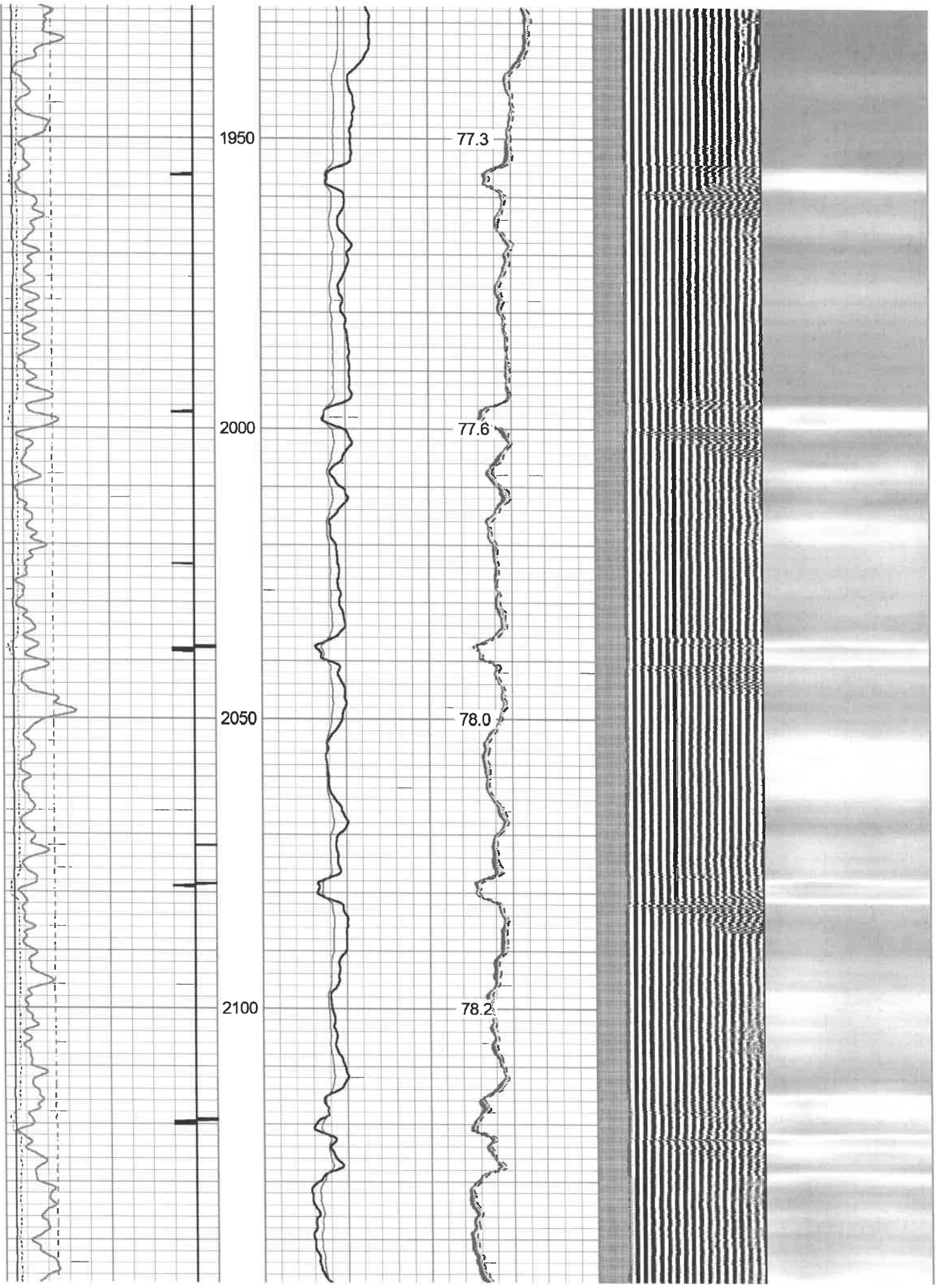
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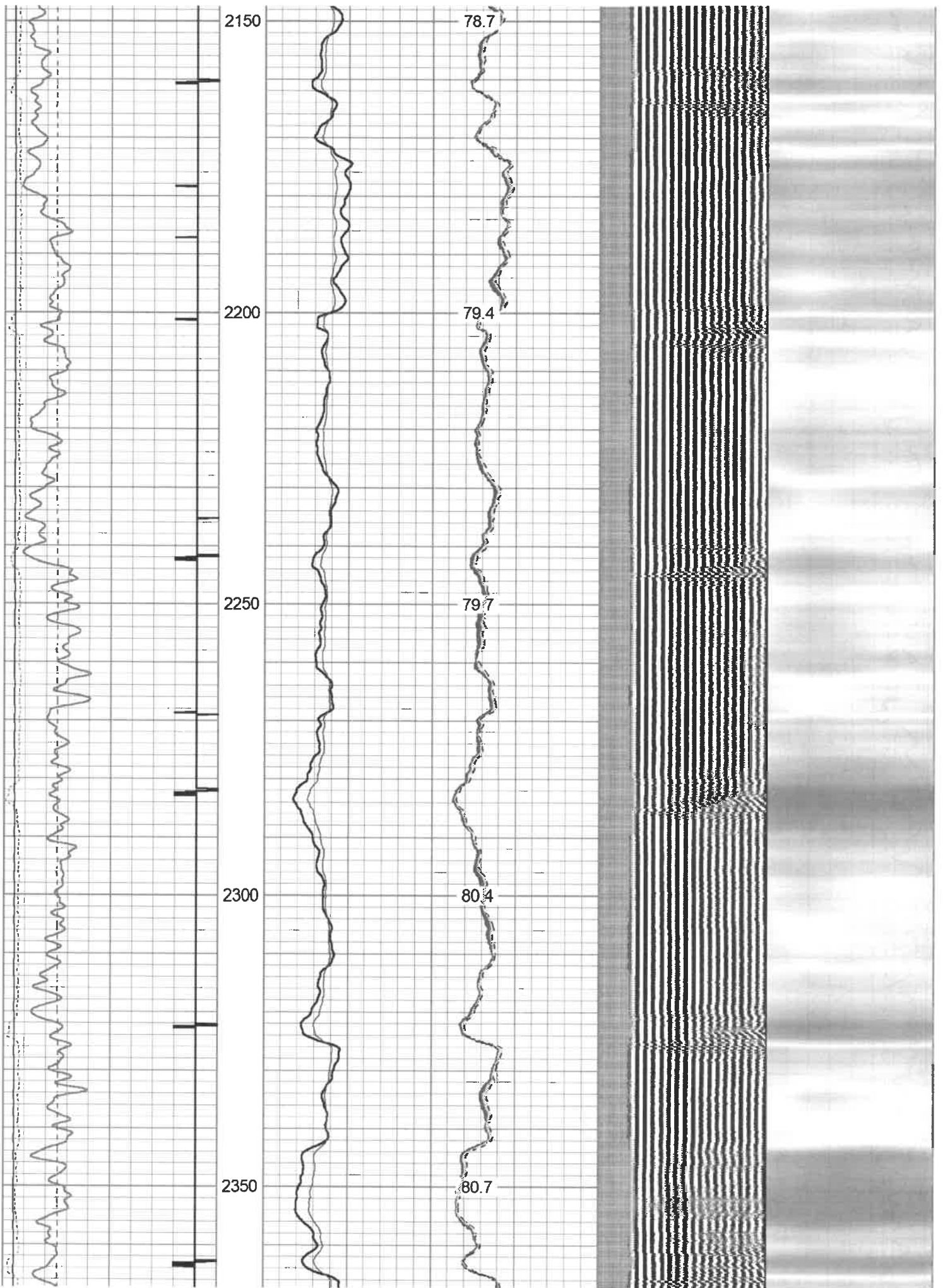
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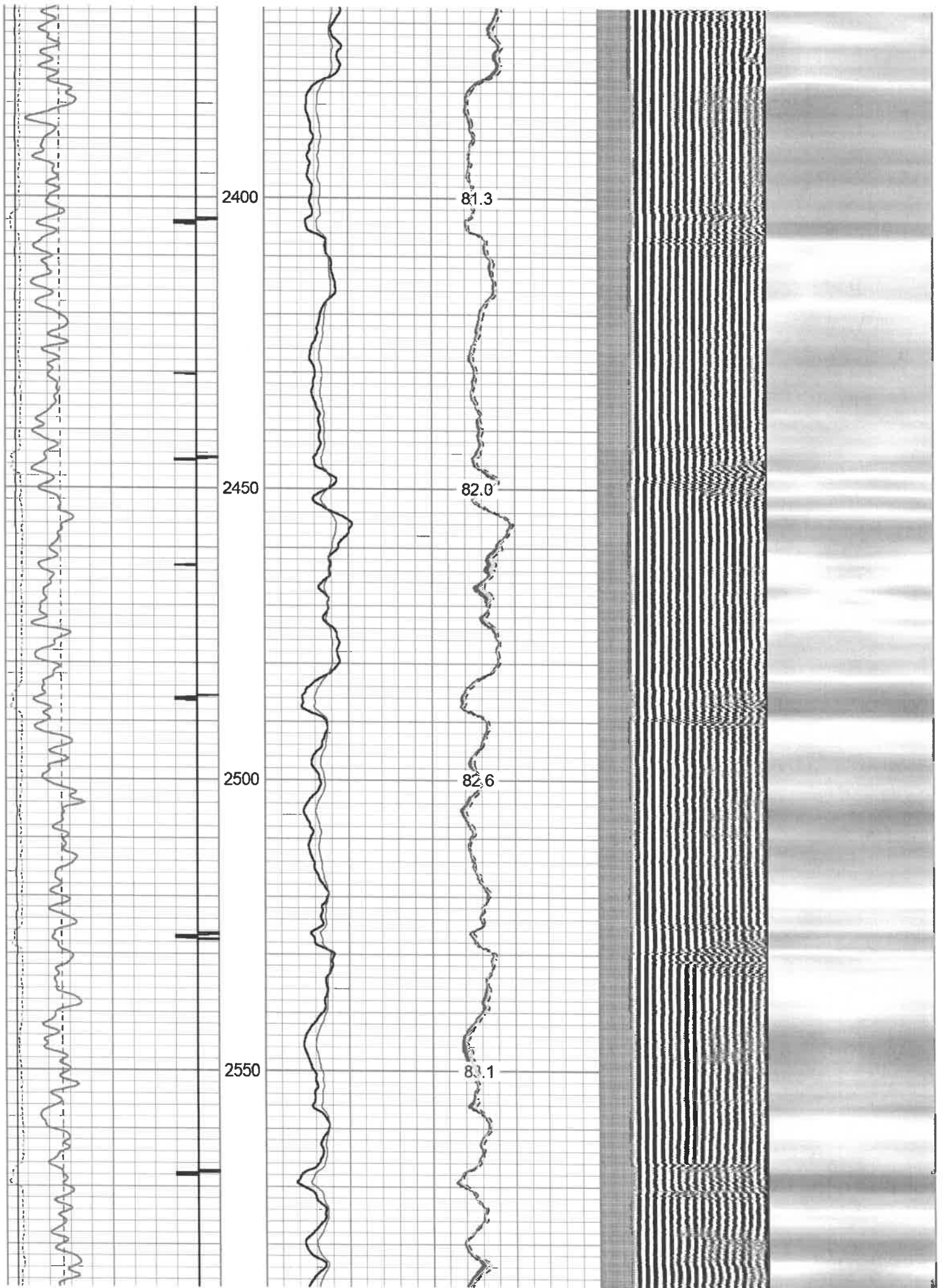


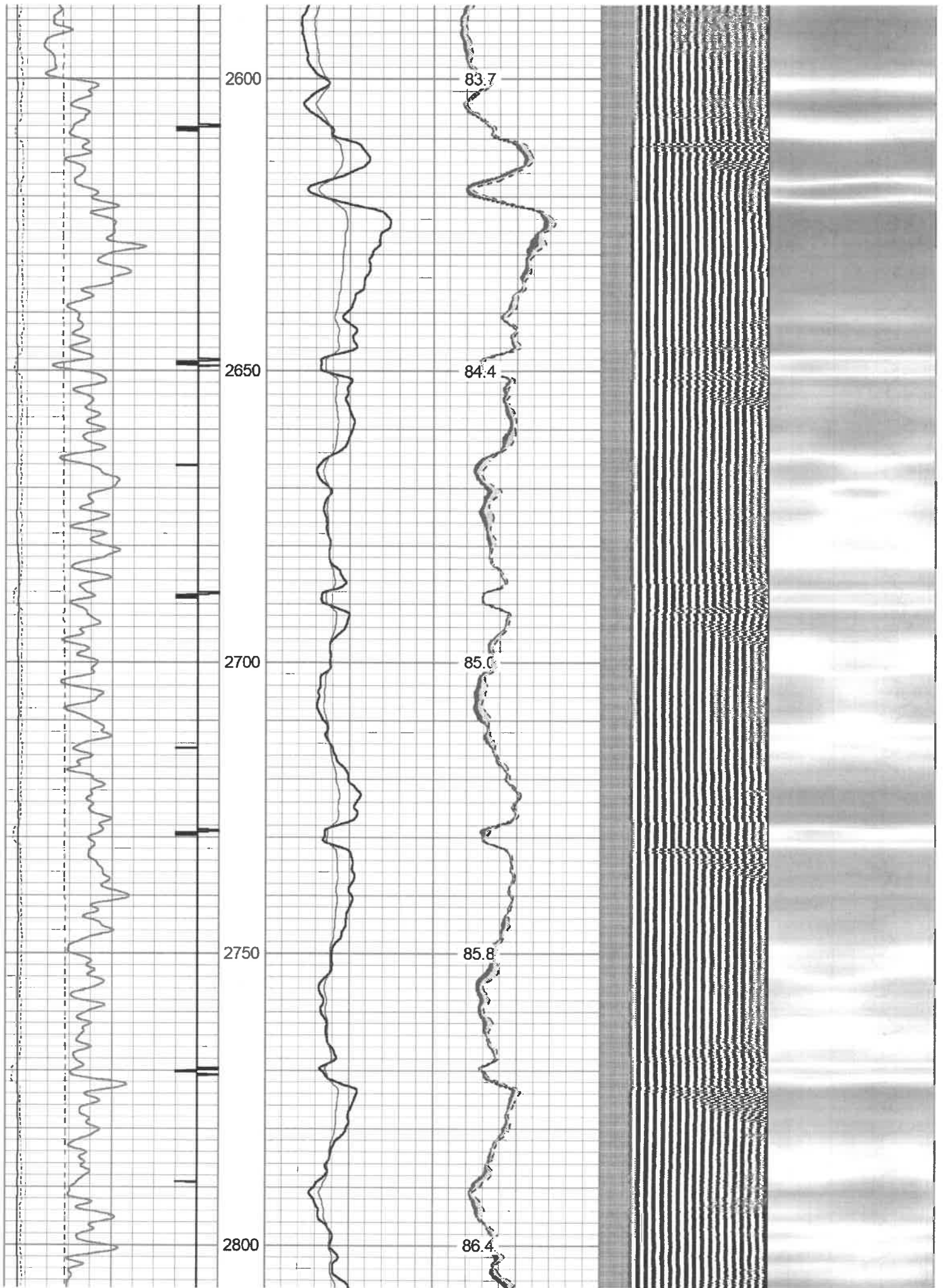


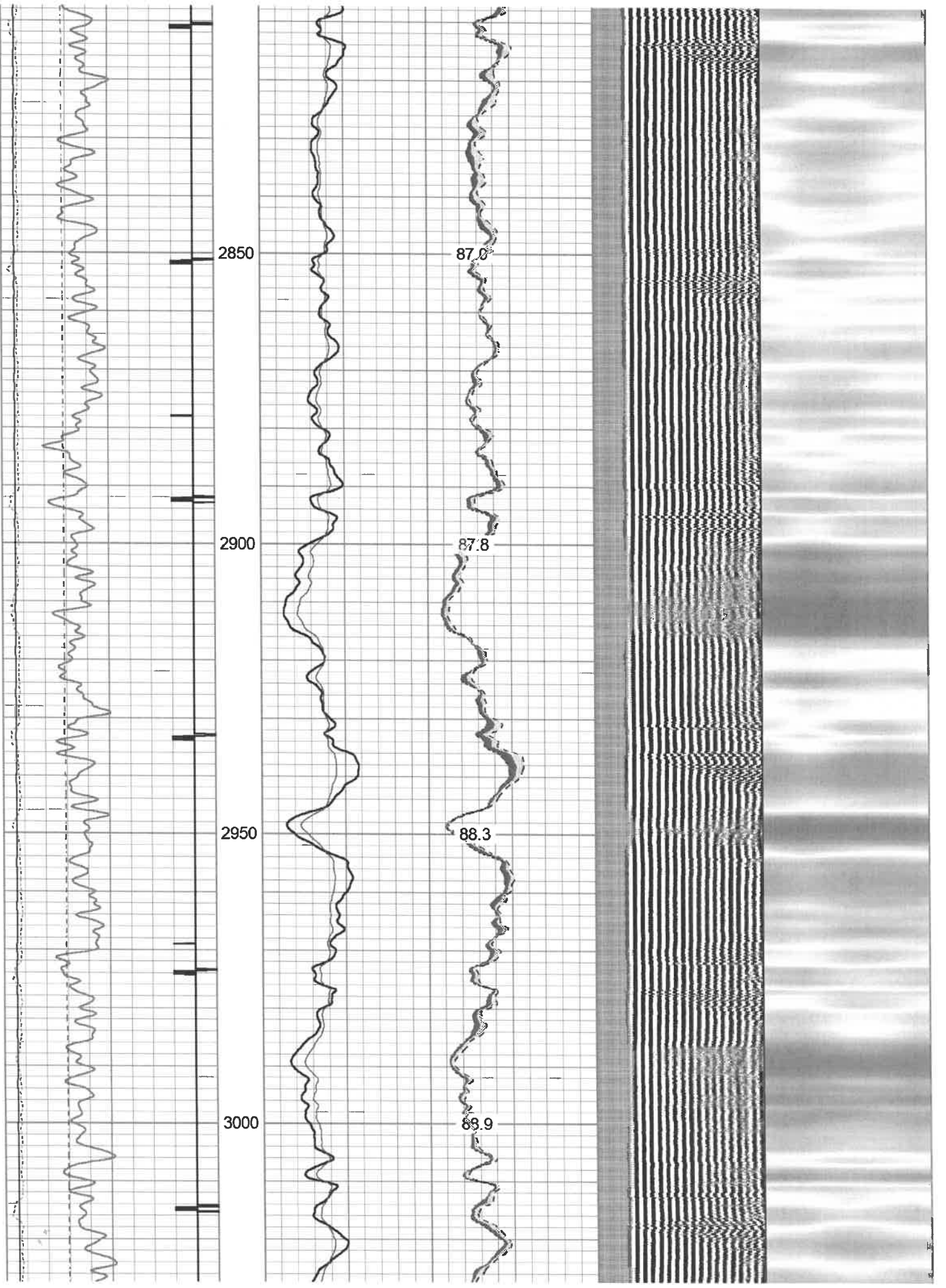


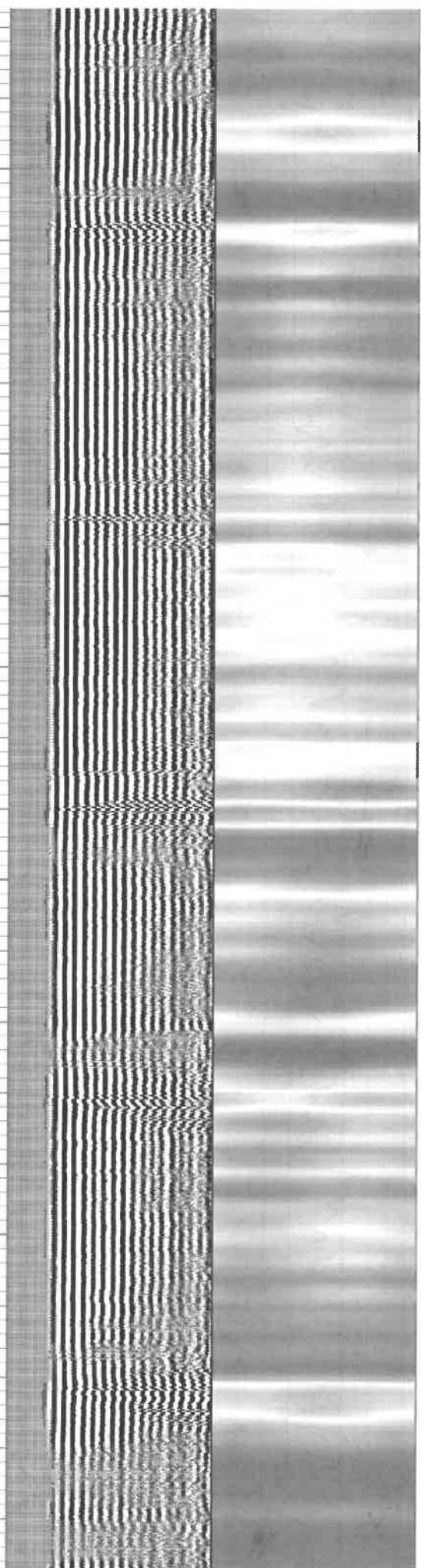
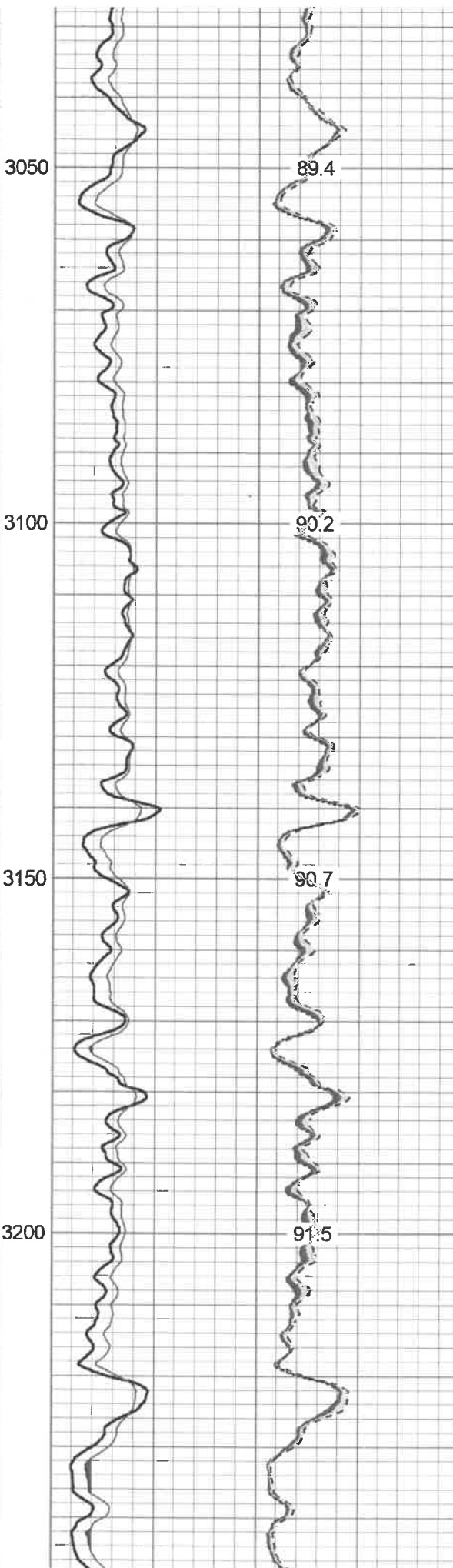
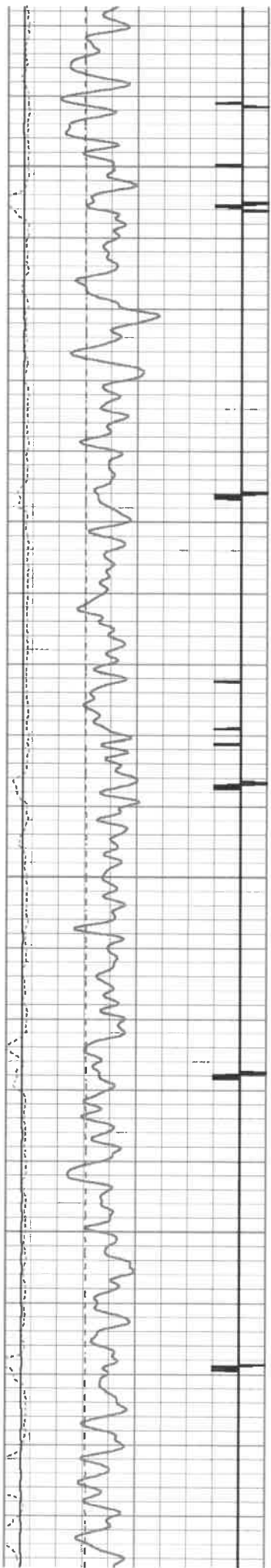


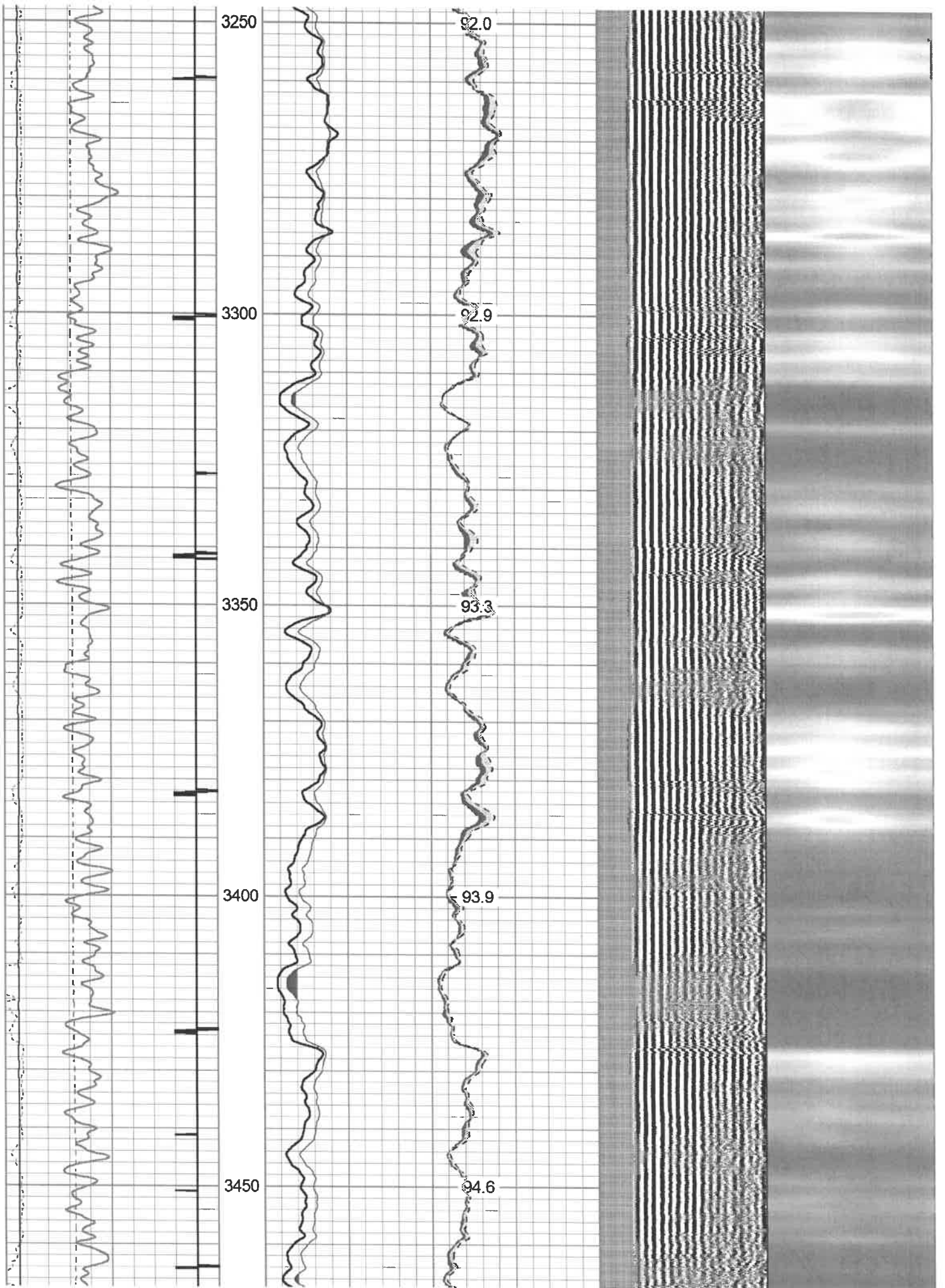


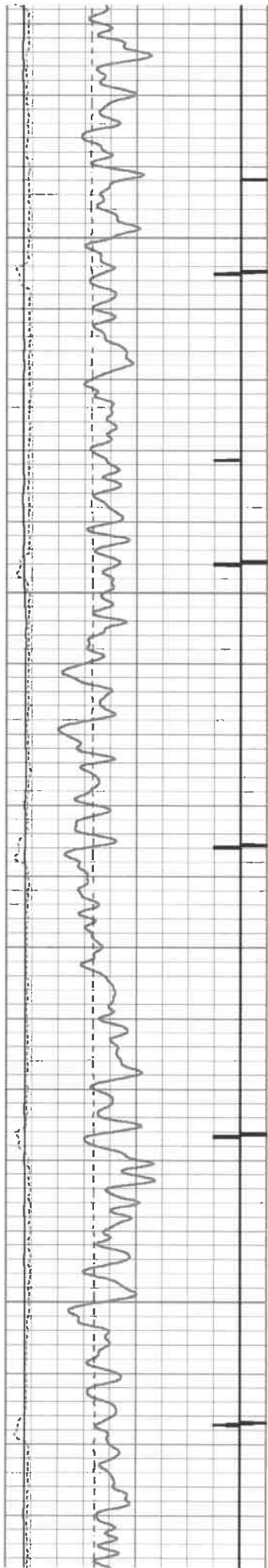










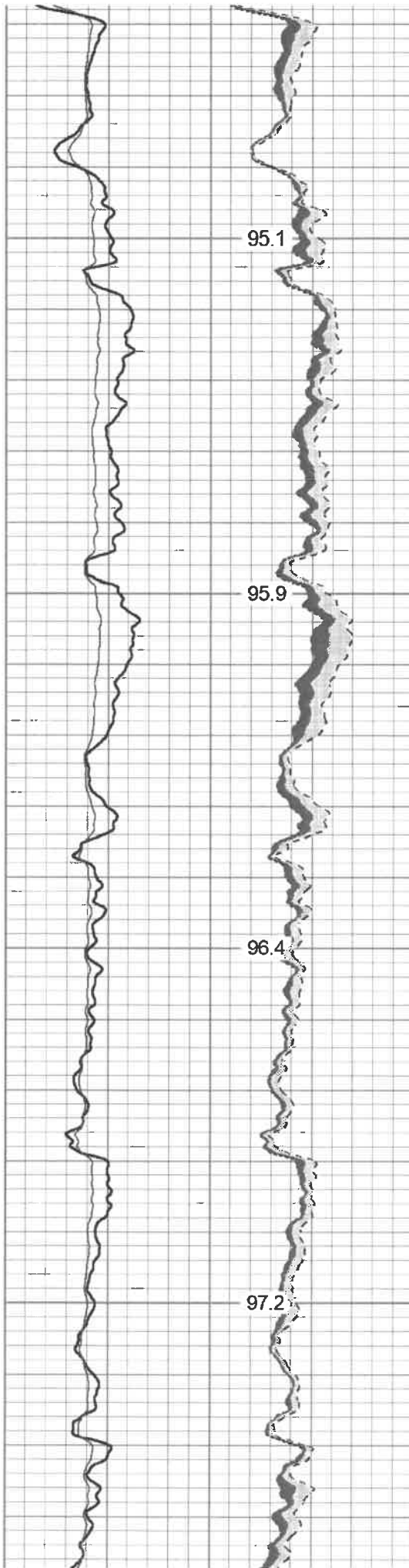


3500

3550

3600

3650

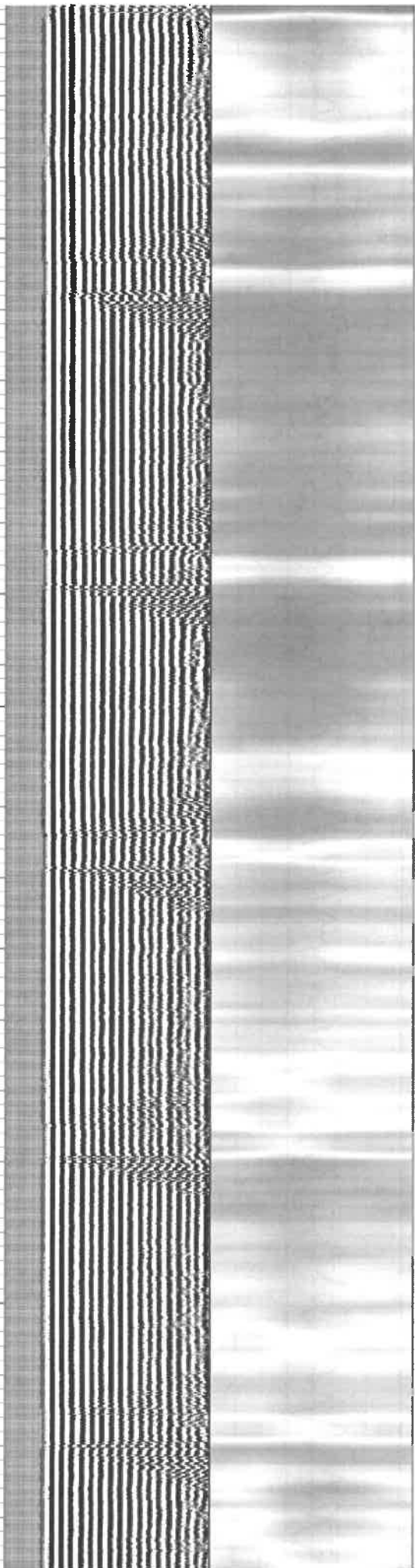


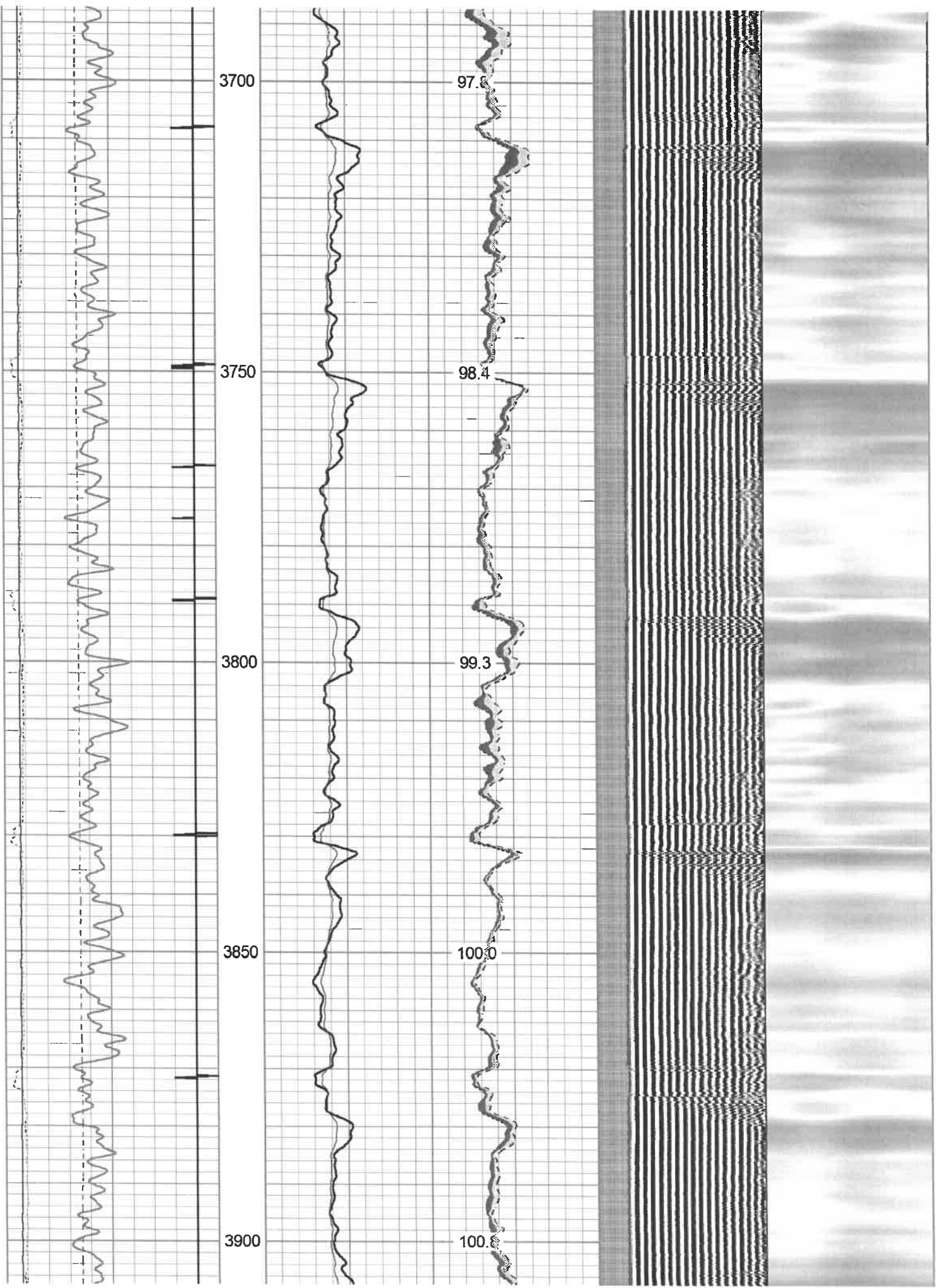
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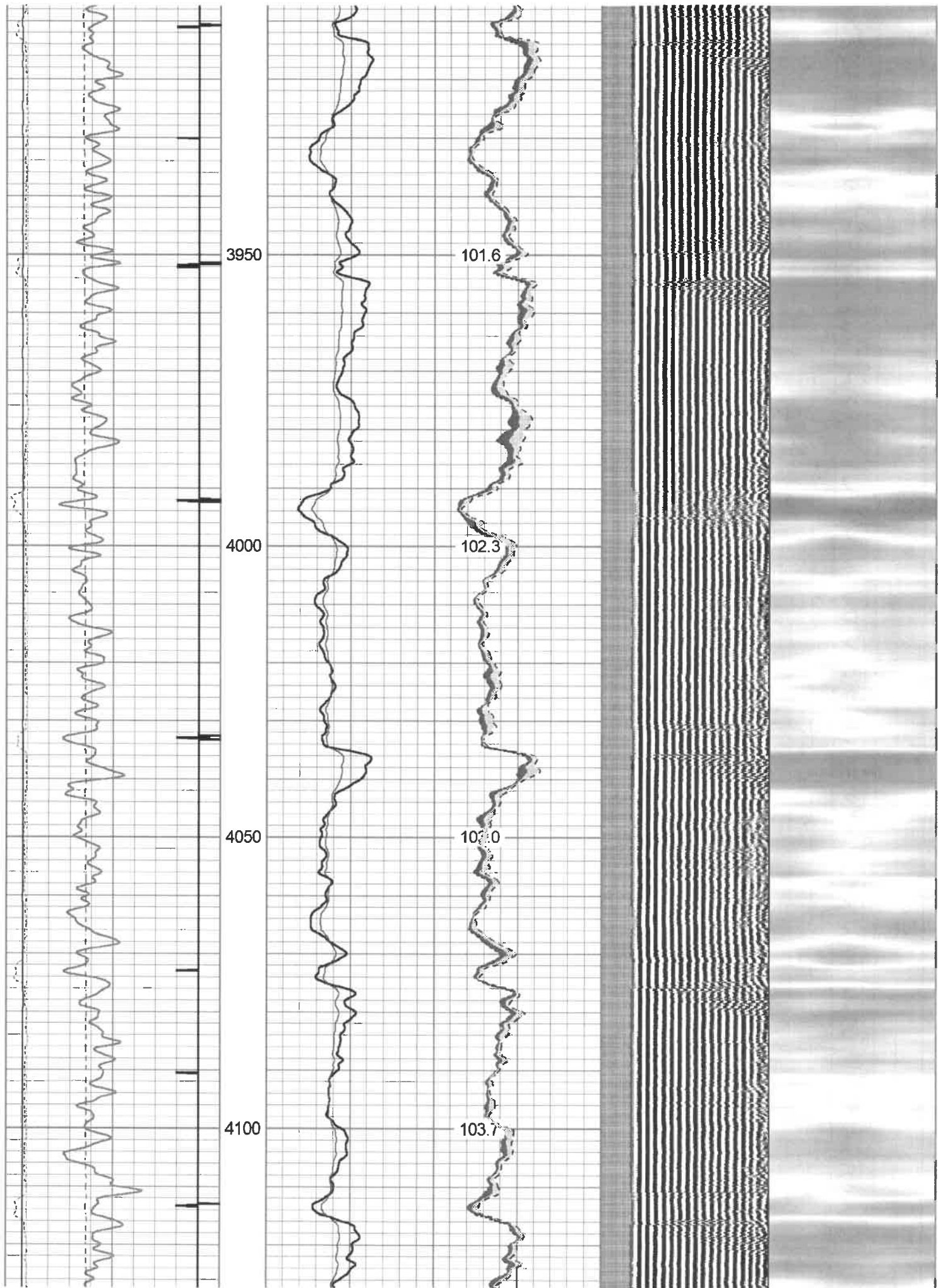
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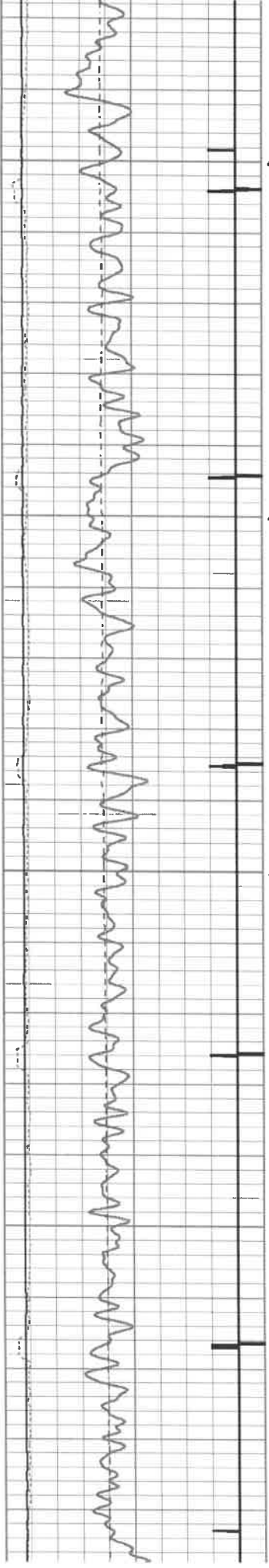
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97.2







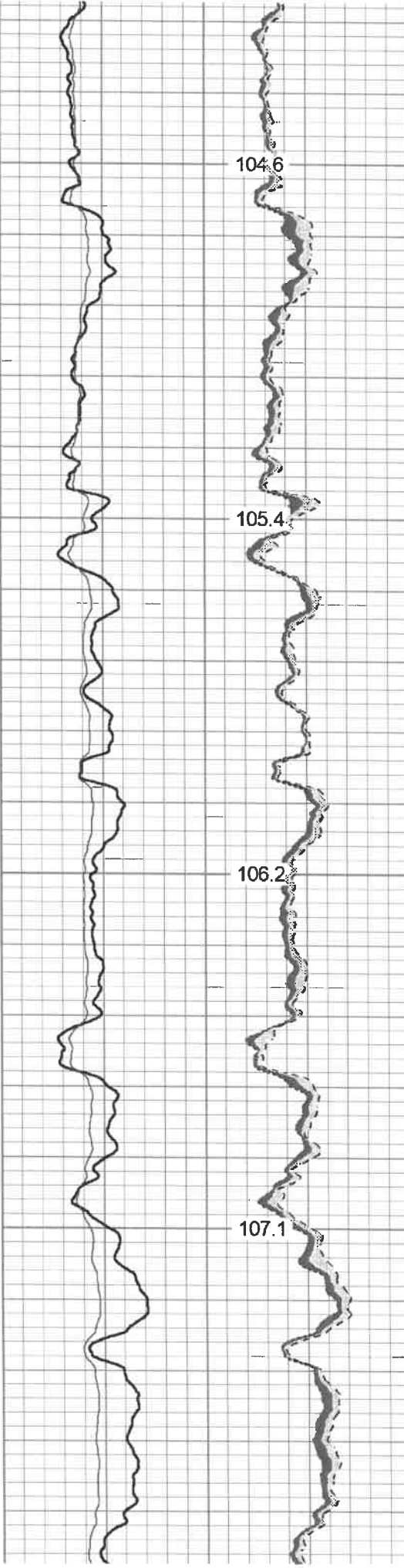


4150

4200

4250

4300

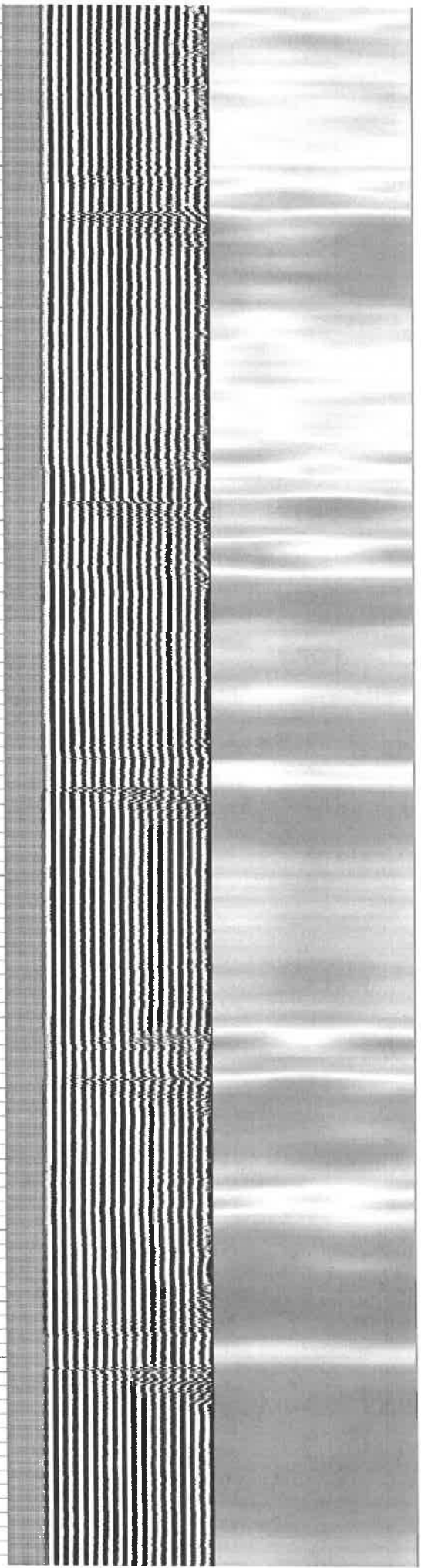


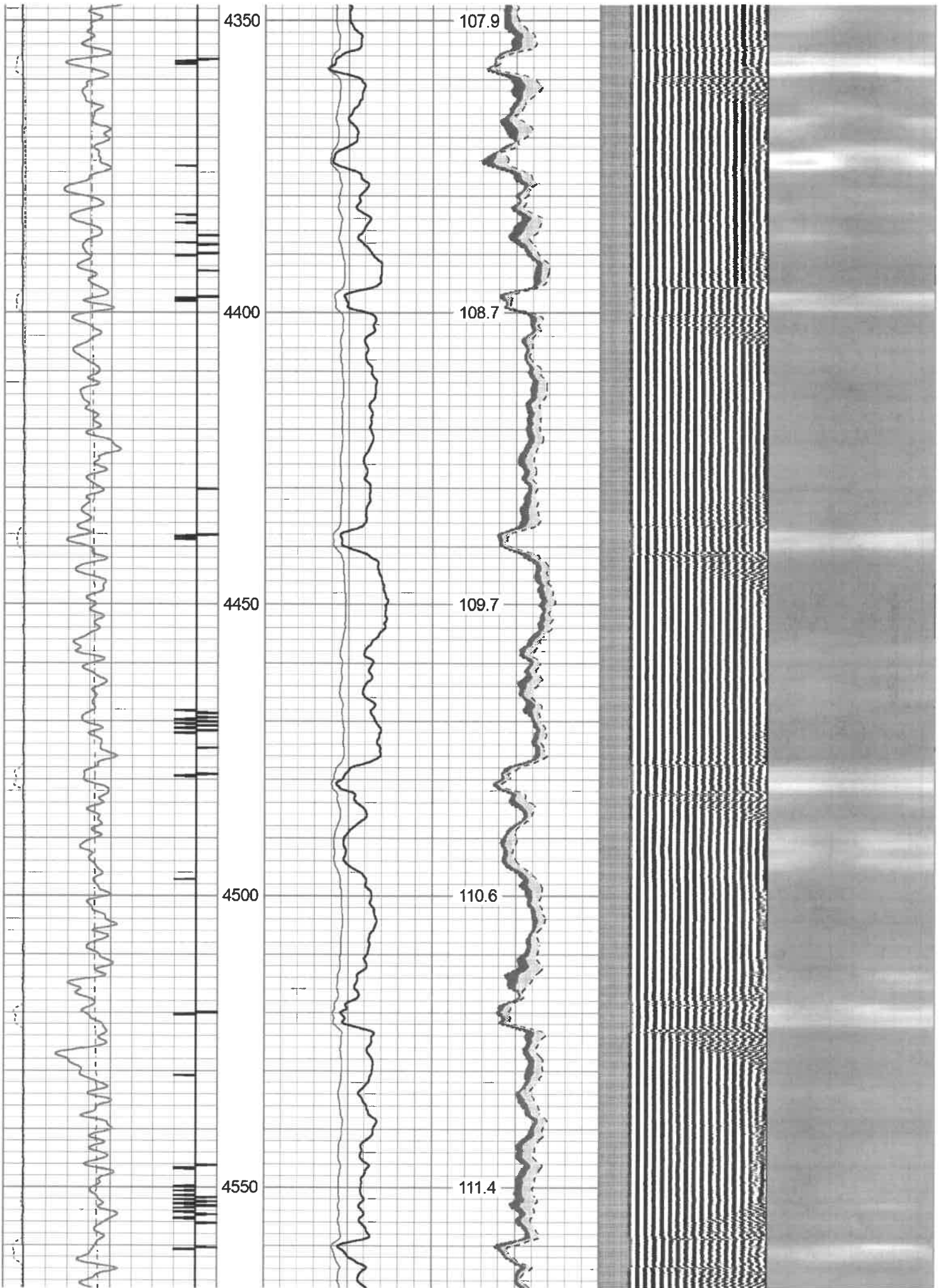
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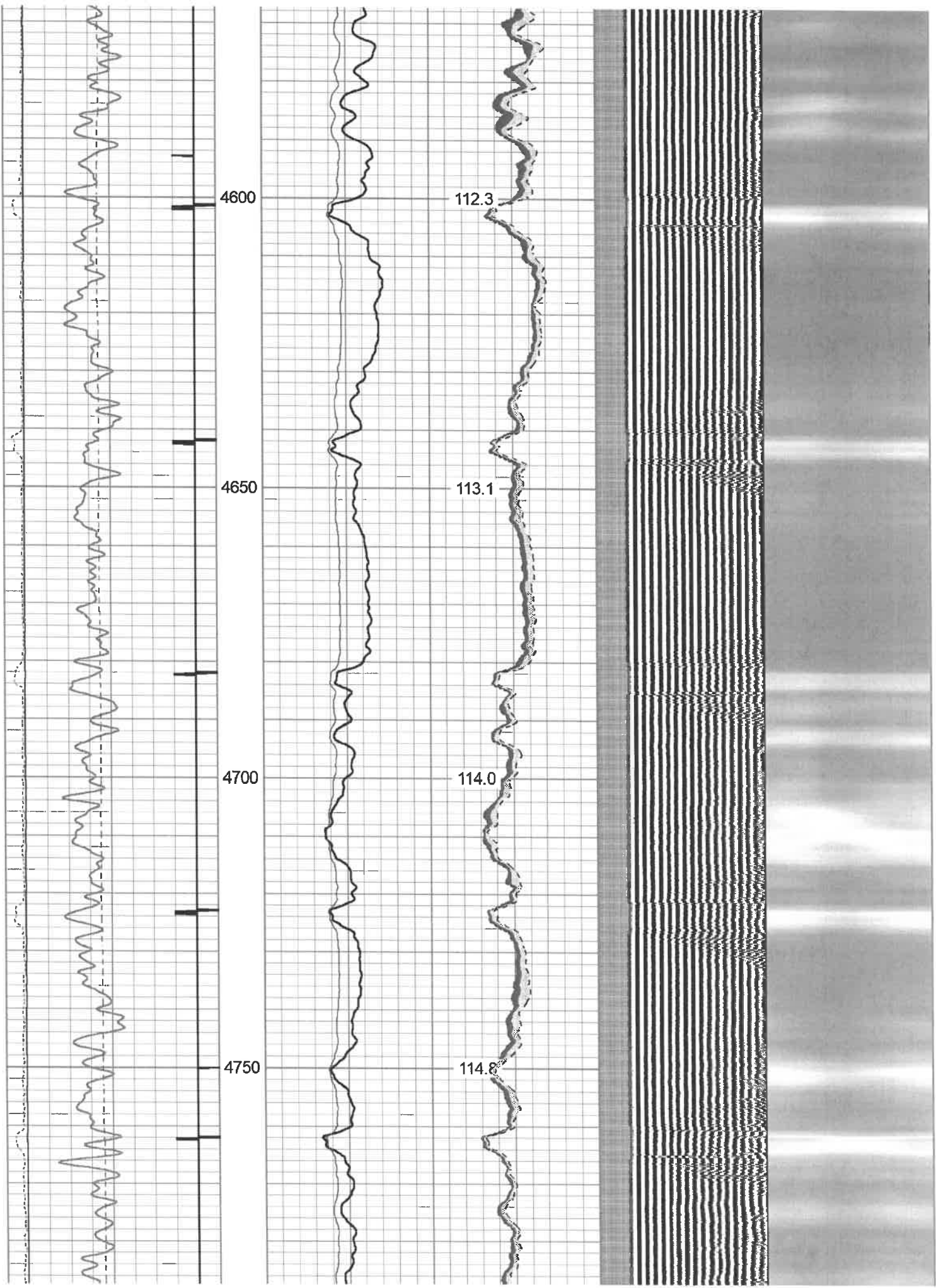
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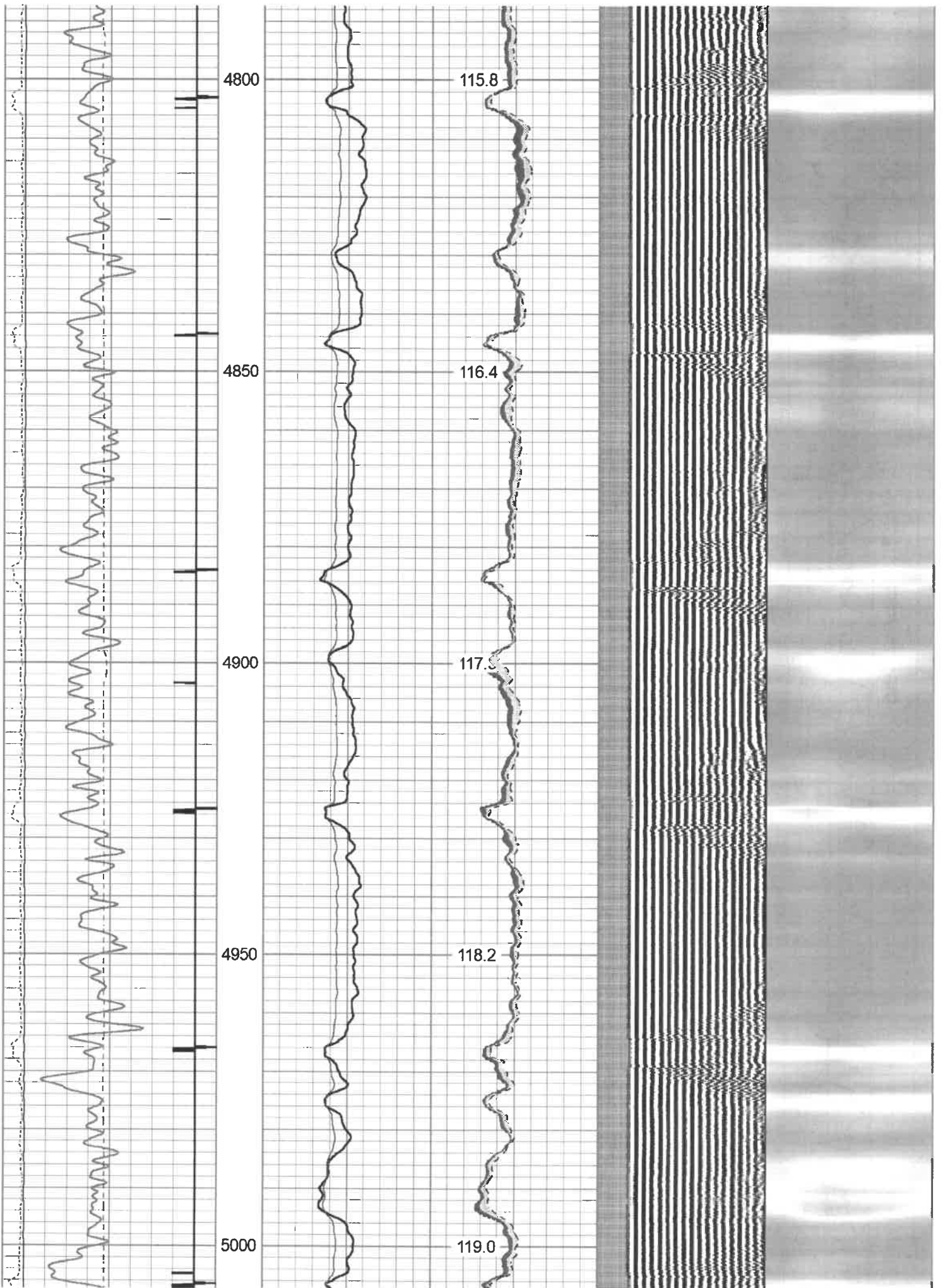
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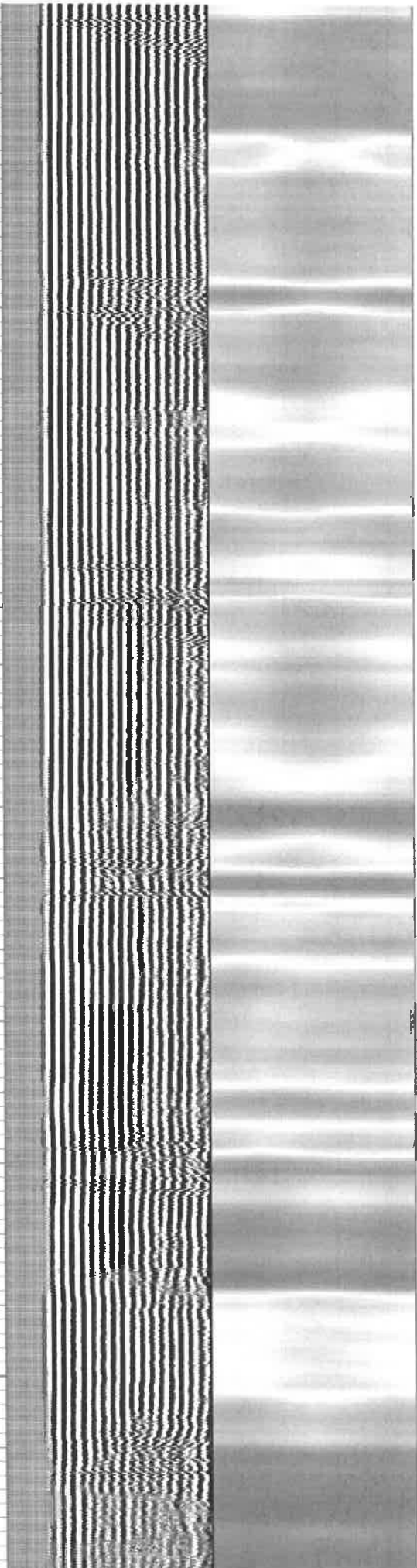
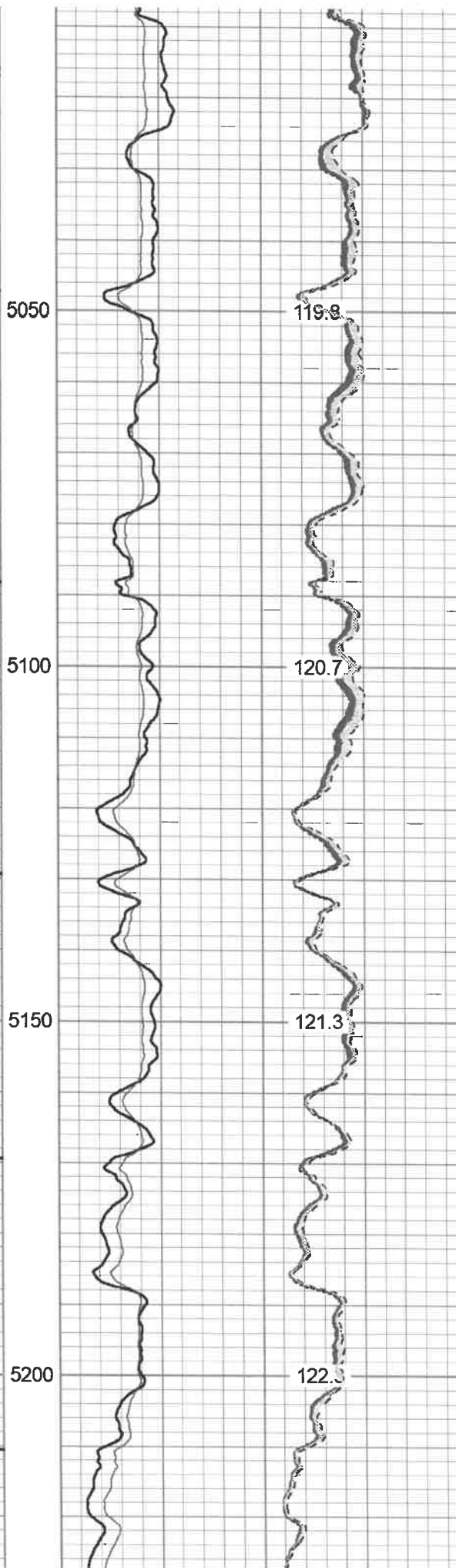
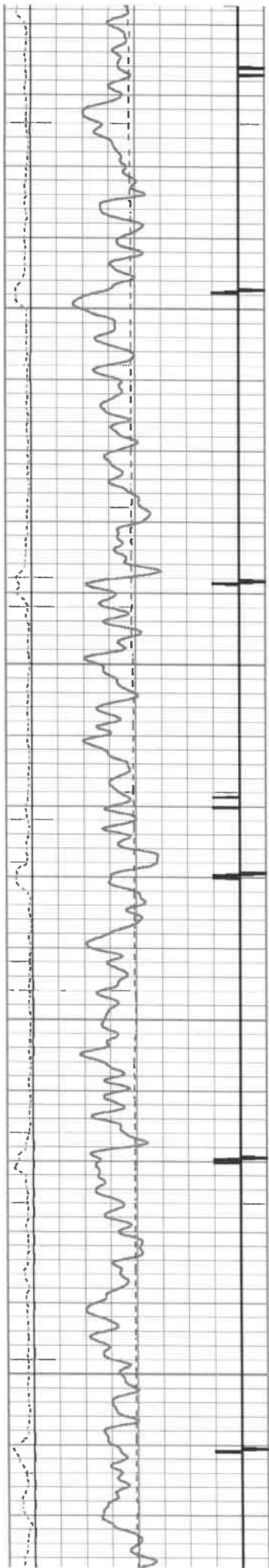
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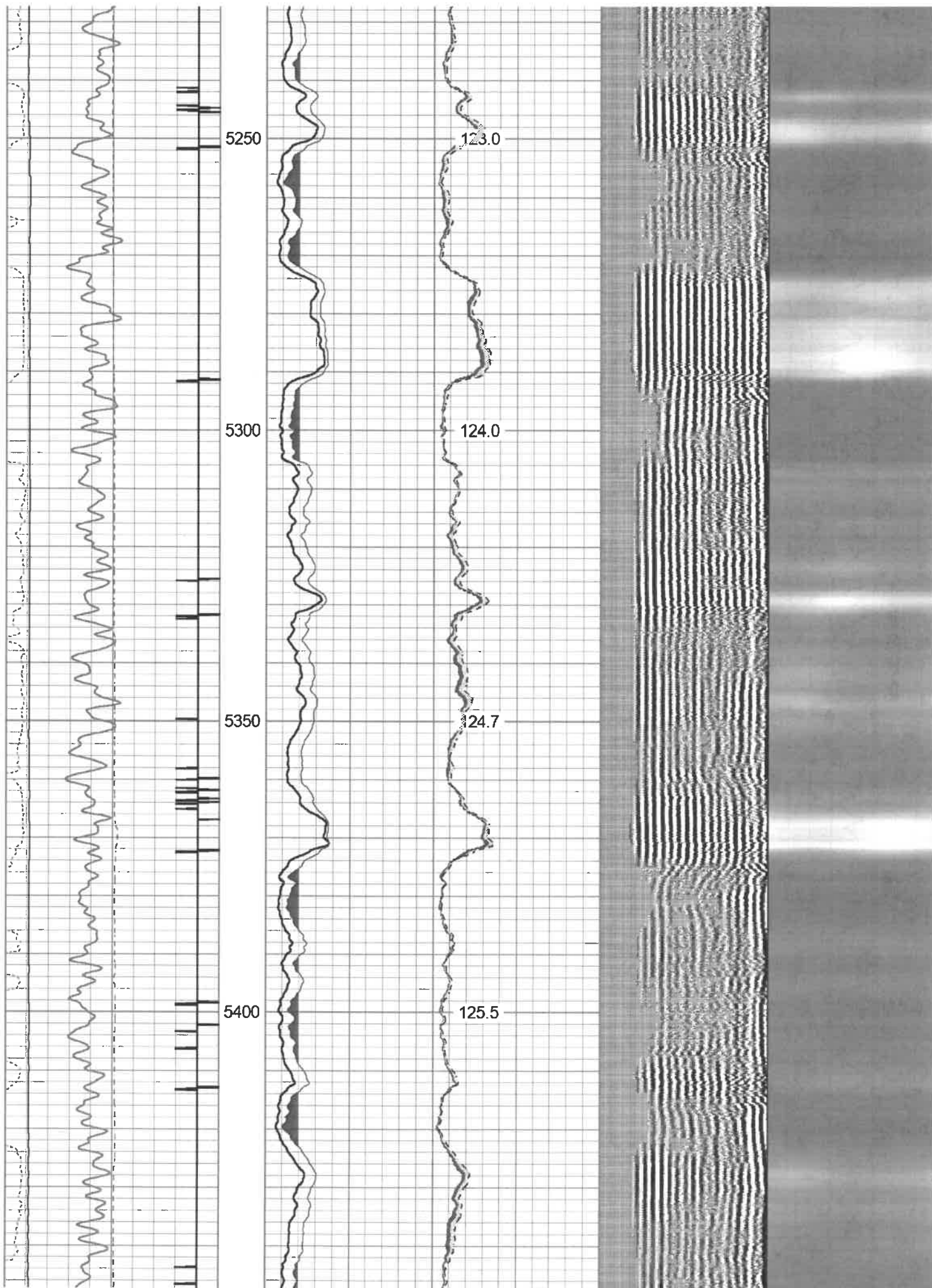


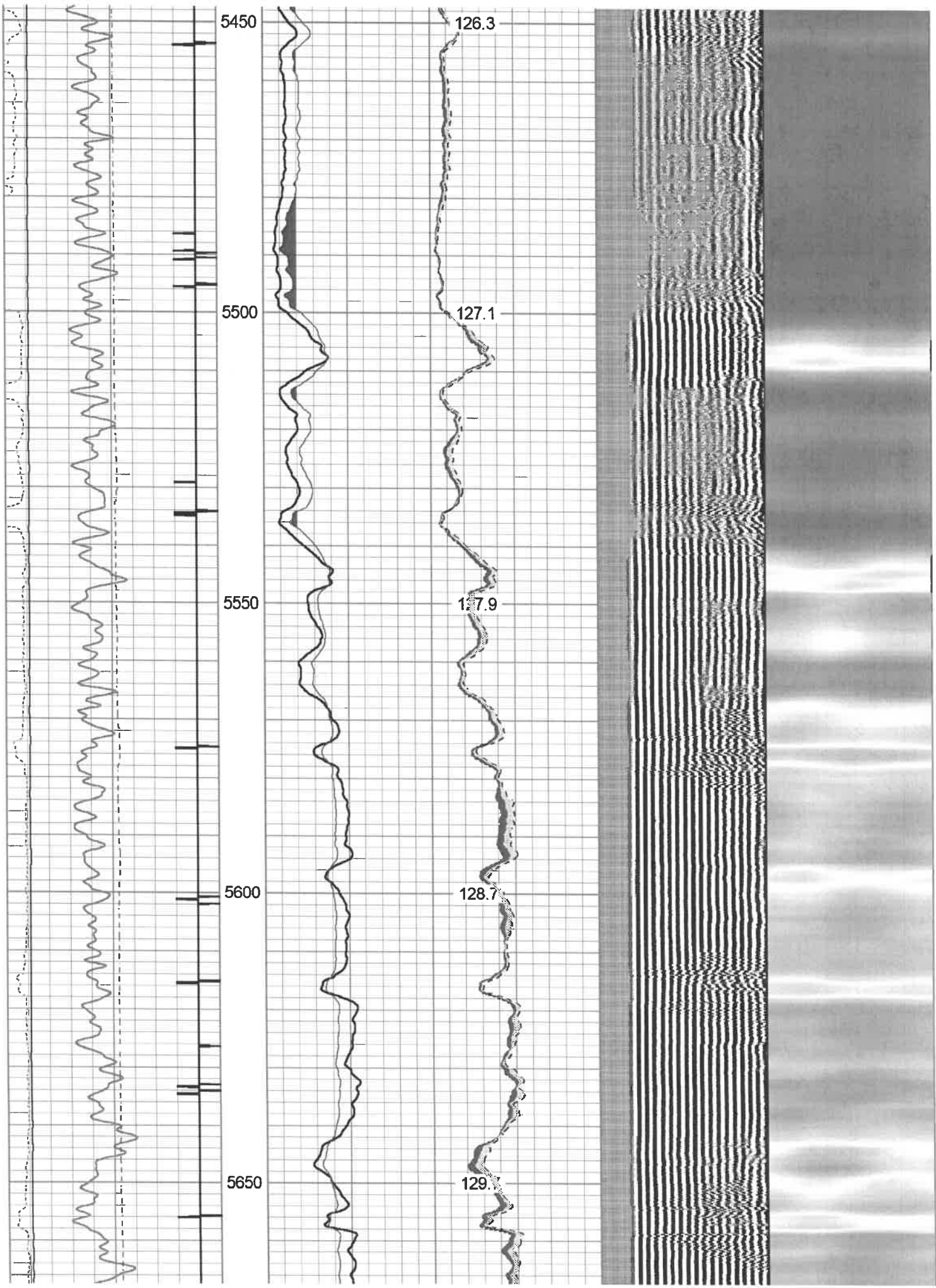


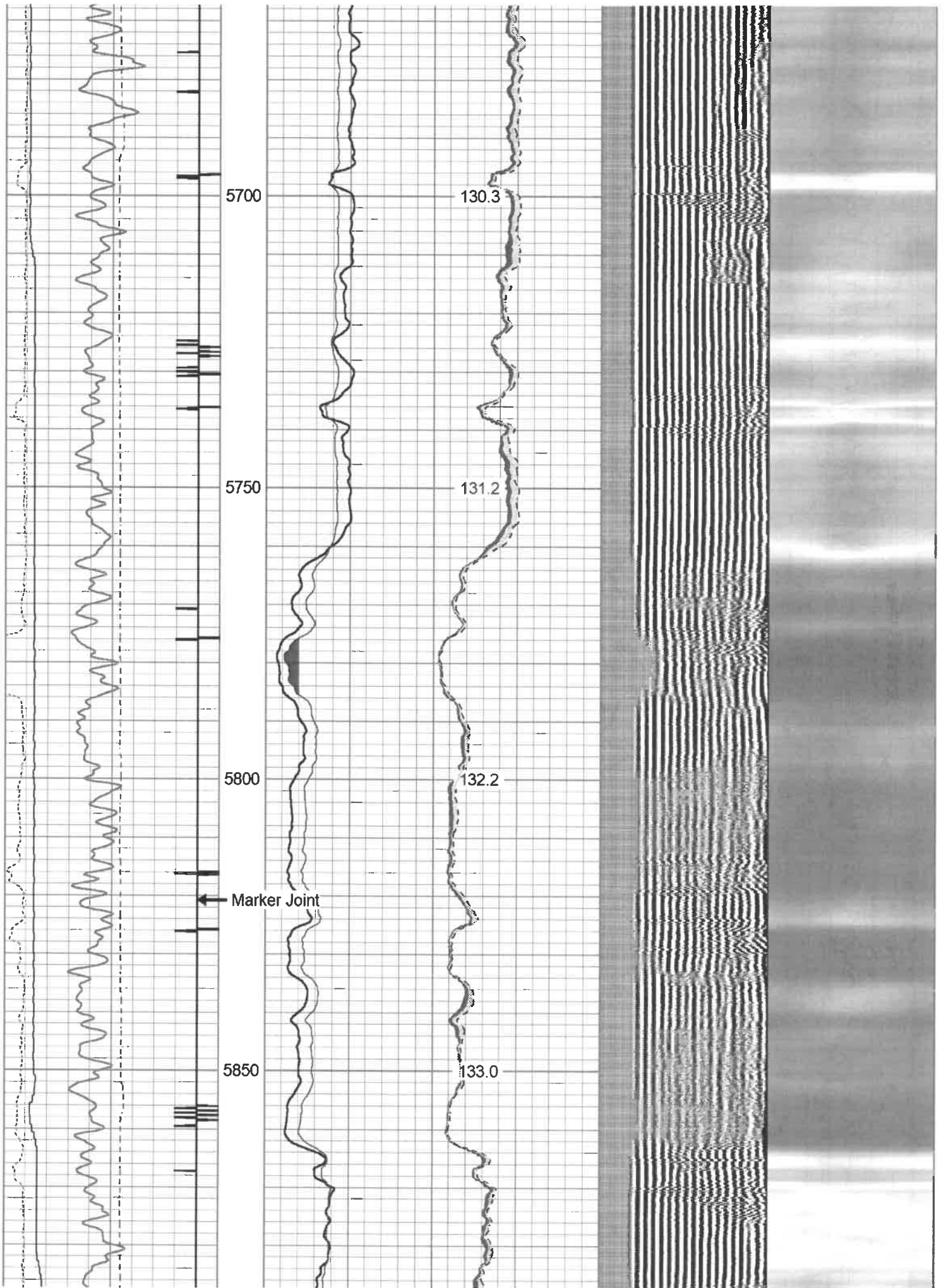


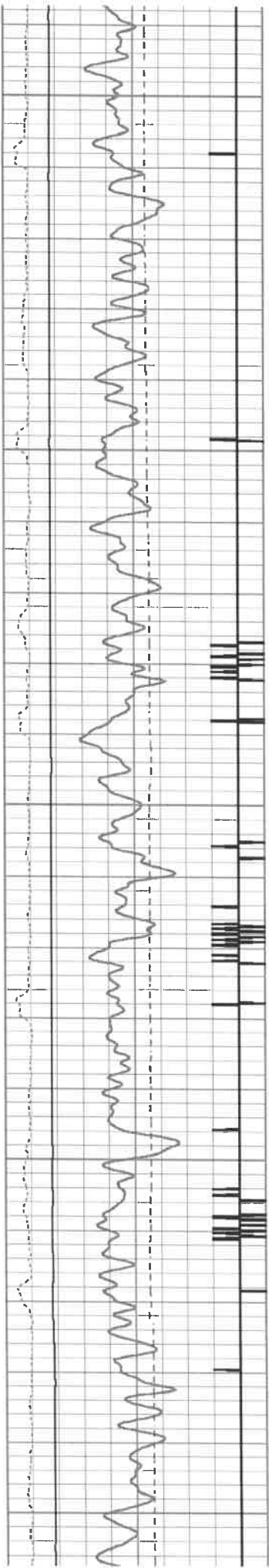












5900

5950

6000

6050

6100

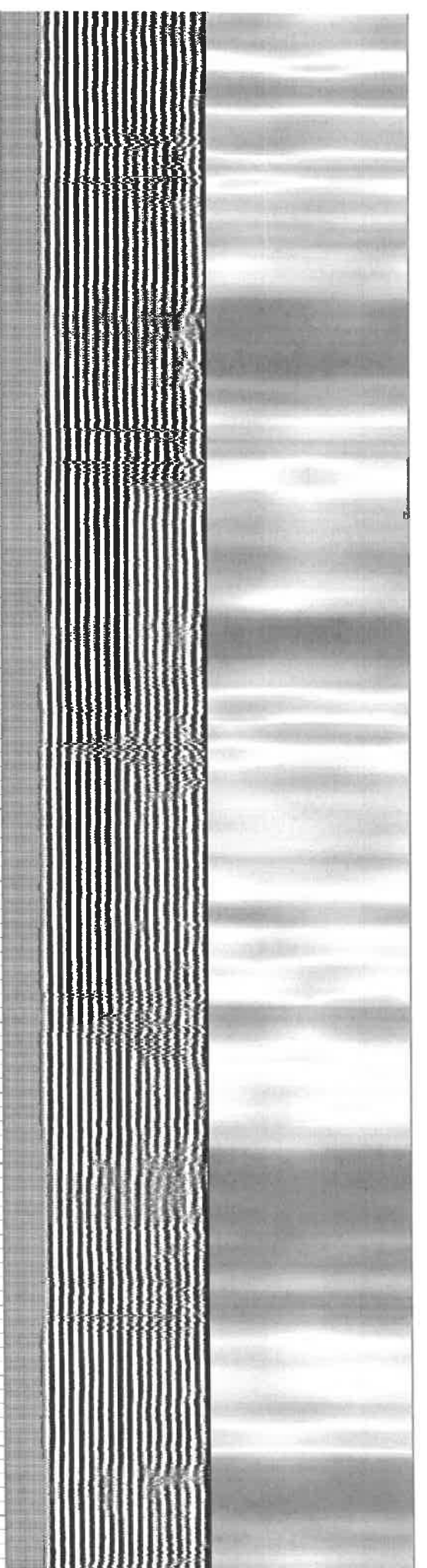
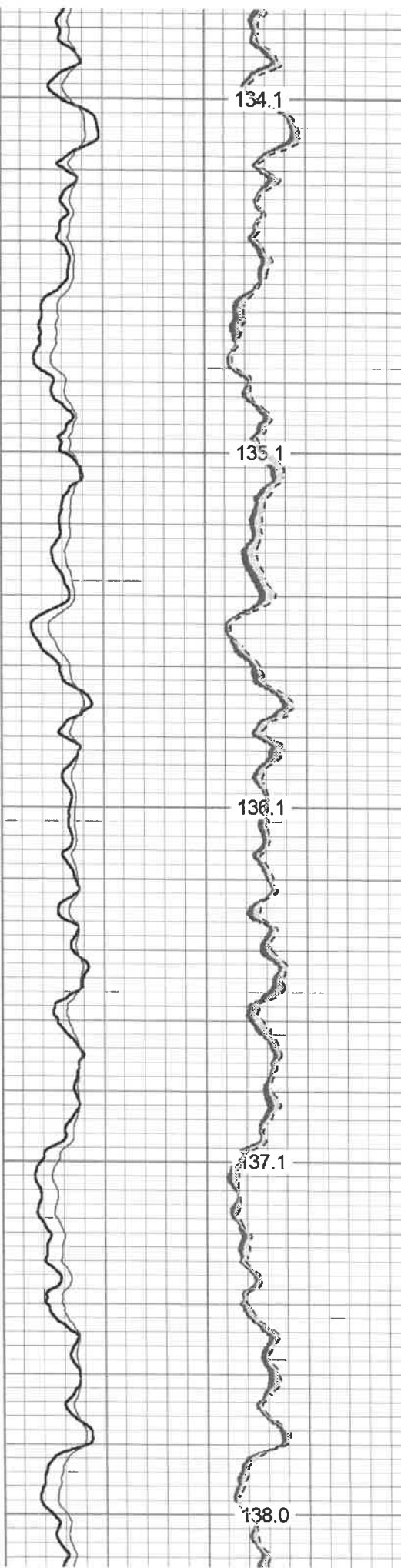
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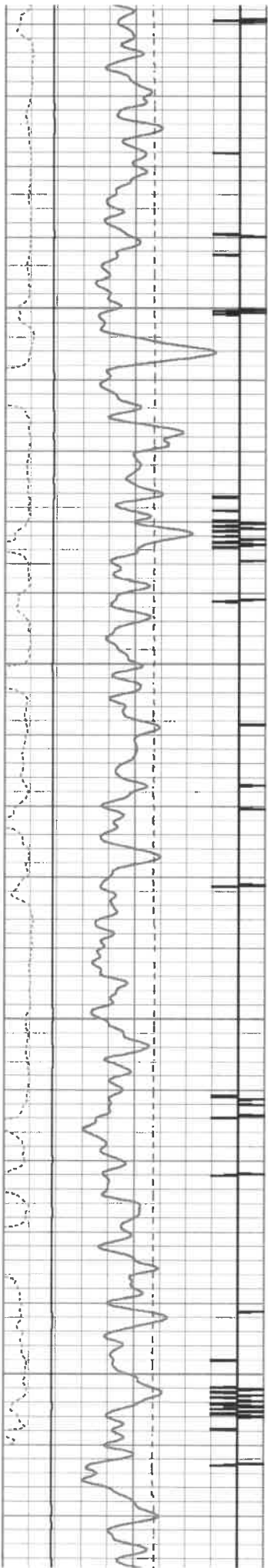
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136.1

137.1

138.0



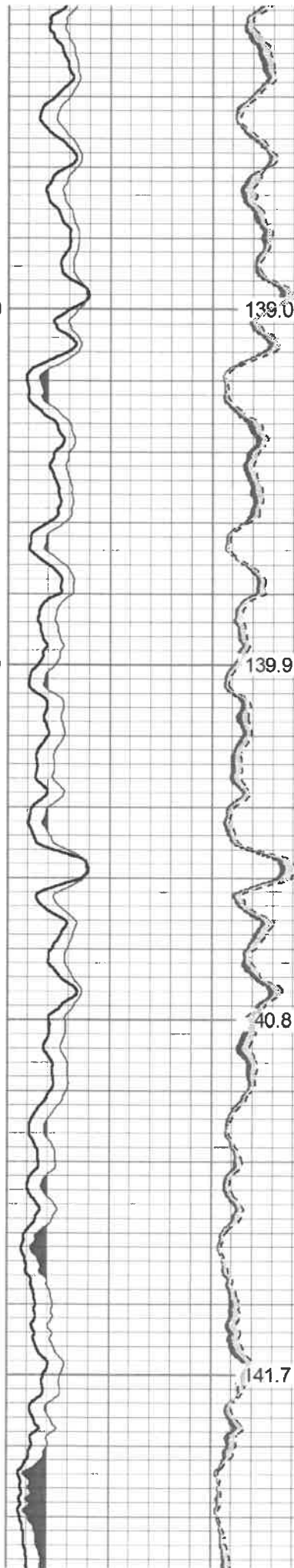


6150

6200

6250

6300

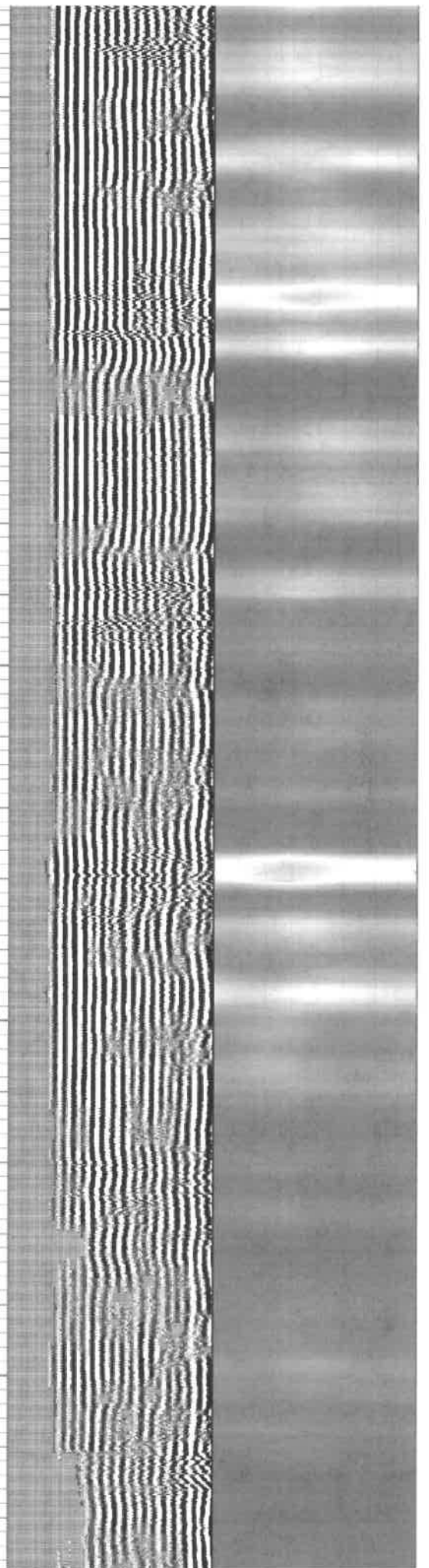


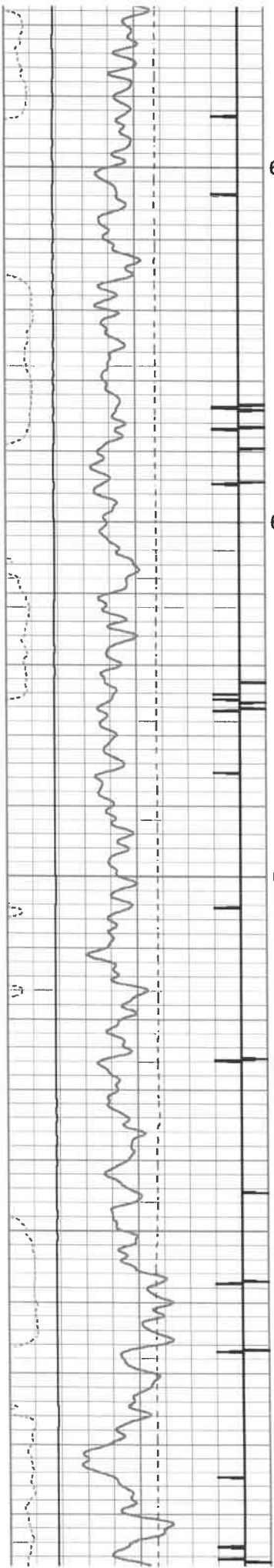
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139.9

40.8

141.7





6350

6400

6450

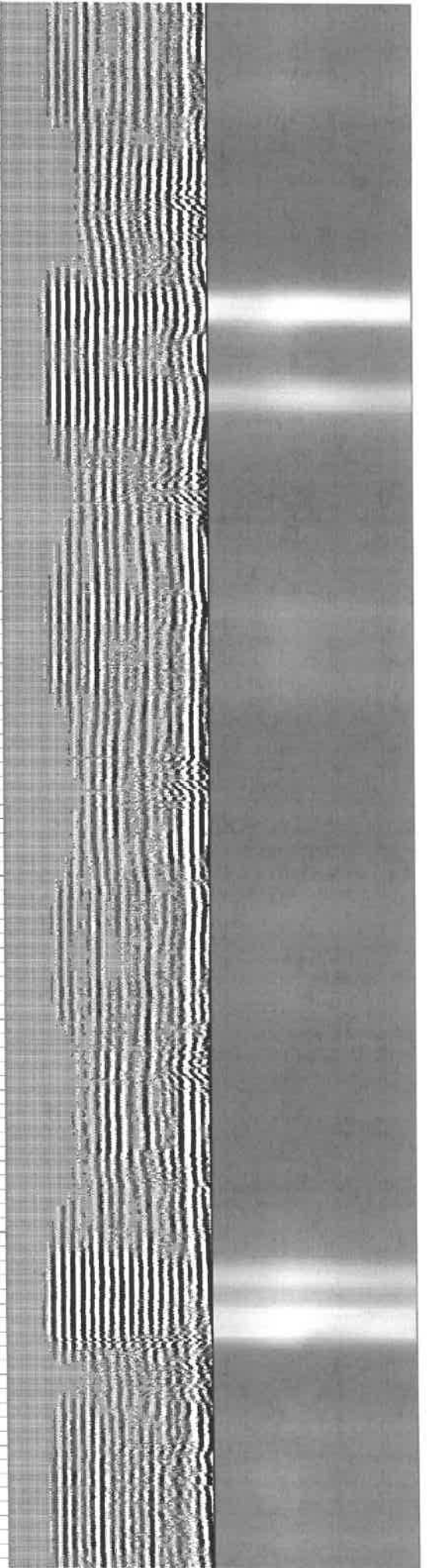
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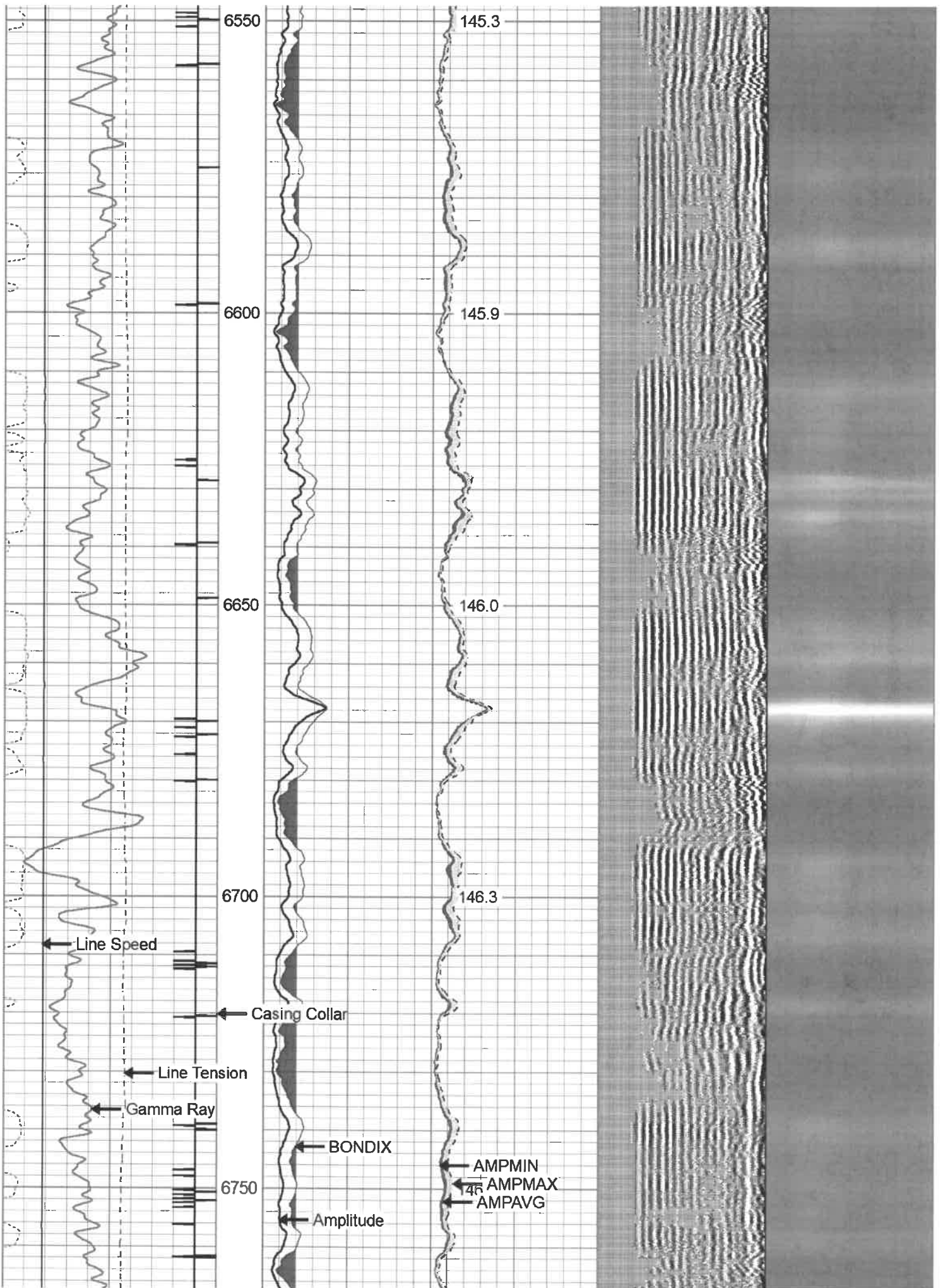
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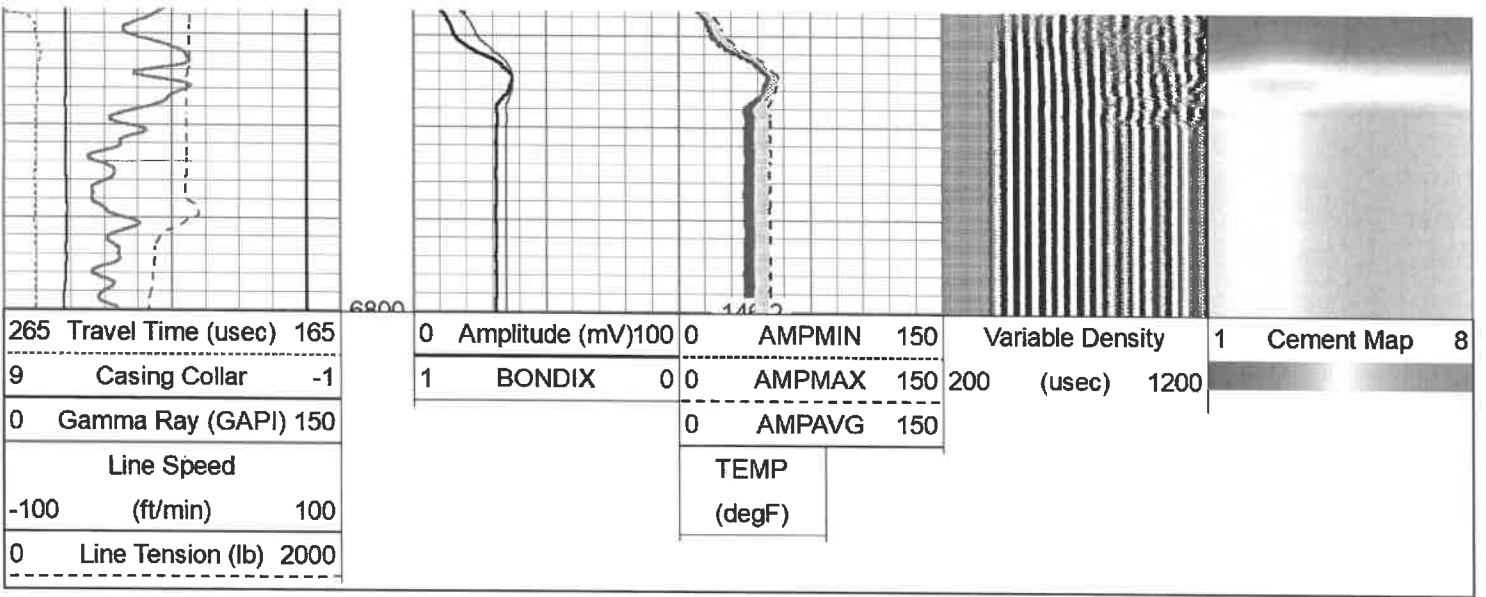
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144.6





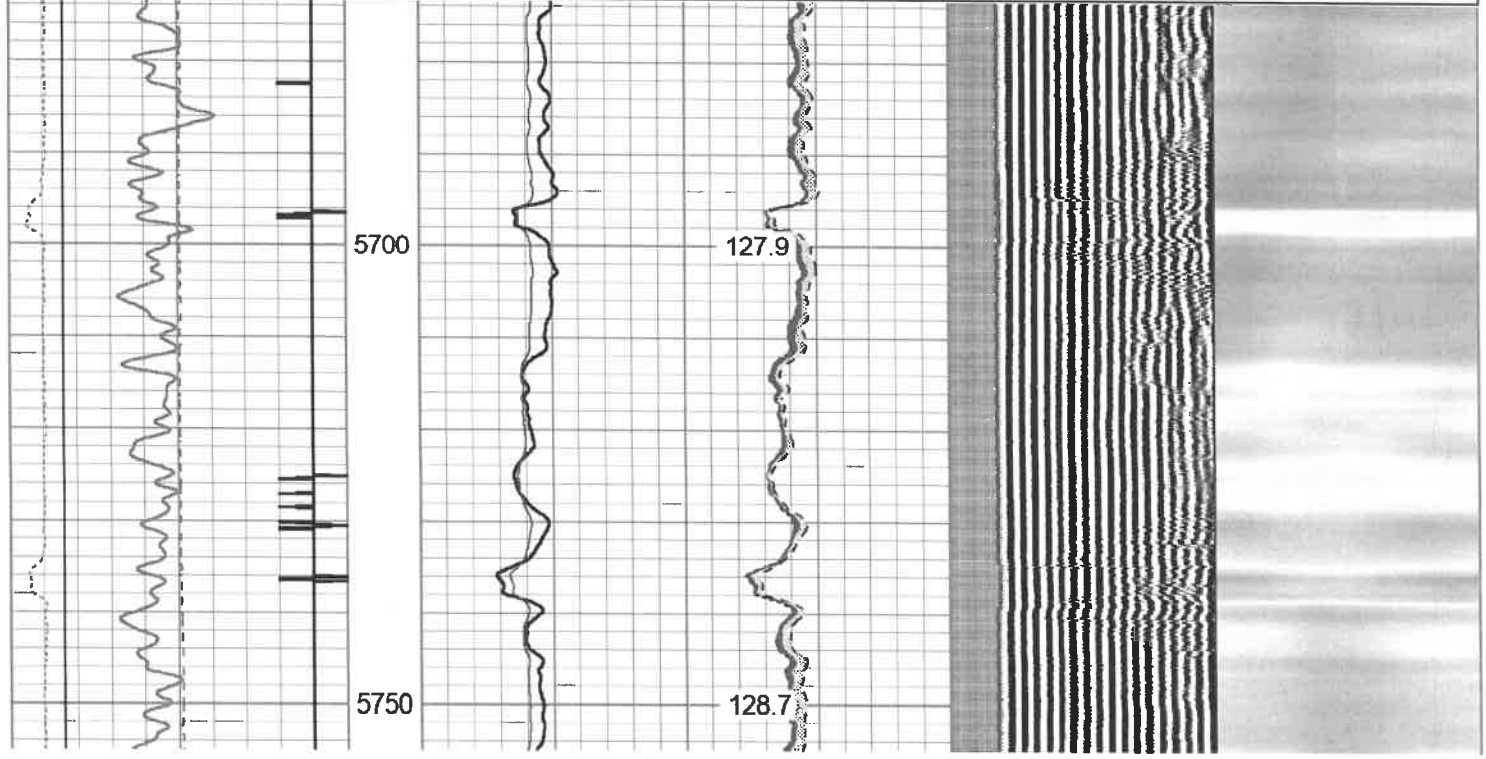


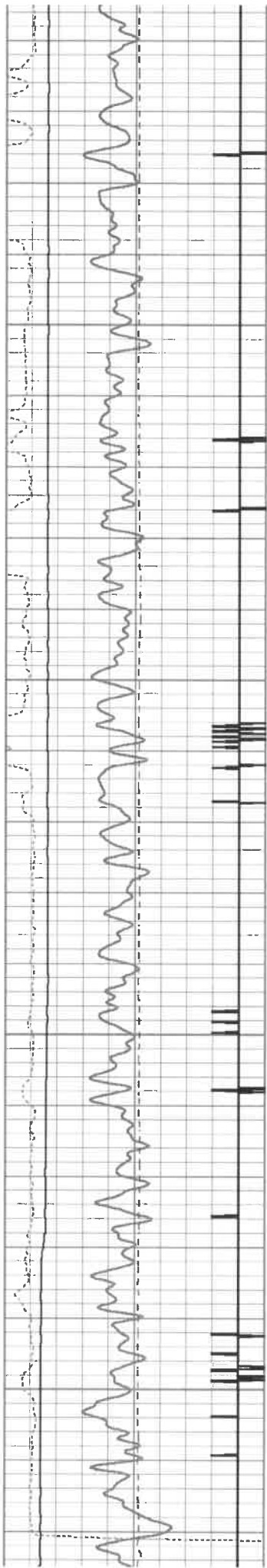


Repeat Pass 1,500 PSI

Database File	antero_elk_fork_tygart_2h_rcbl_19_mar_2021.db
Dataset Pathname	rabbit_ears/2h/run1/pass2.1
Presentation Format	rcbl-bond index for antero 1020
Dataset Creation	Fri Mar 19 10:32:49 2021
Charted by	Depth in Feet scaled 1:240

265	Travel Time (usec)	165	0	Amplitude (mV)	100	0	AMPMIN	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	1	BONDIX	0	0	AMPMAX	150	200 (usec)	1200		
0	Gamma Ray (GAPI)	150	0	AMPAVG	150							
	Line Speed			TEMP								
-100	(ft/min)	100		(degF)								
0	Line Tension (lb)	2000										



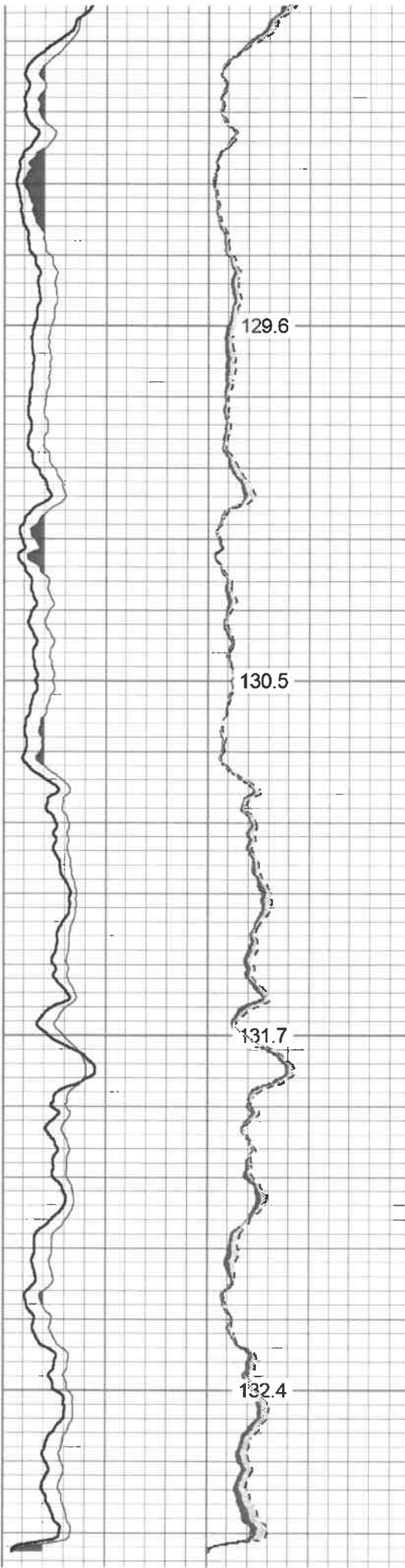


5800

5850

5900

5950

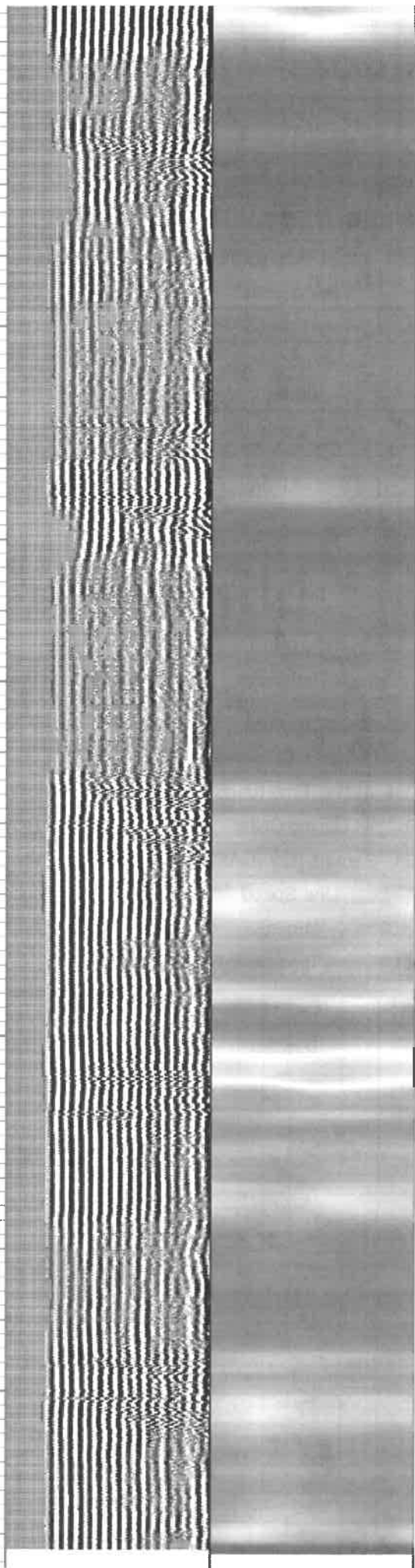


129.6

130.5

131.7

132.4



265 Travel Time (usec) 165	0 Amplitude (mV)100	0 AMPMIN 150	Variable Density	1 Cement Map	8
9 Casing Collar -1	1 BONDIX 0	0 AMPMAX 150	200 (usec) 1200		
0 Gamma Ray (GAPI) 150		0 AMPAVG 150			
Line Speed		TEMP			
-100 (ft/min) 100		(degF)			
0 Line Tension (lb) 2000					

Log Variables

DatabaseC:\ProgramData\Warrior\Data\antero_elk_fork_tygart_2h_rcbl_19_mar_2021.db
Dataset rabbit_ears/2h/run1/pass4/_vars_

Top - Bottom

BHTEMP_Src	BOREID	BOTTEMP	CASEOD	CASETHCK	CASEWGHT	MAXAMPL	MINAMPL
TEMP	in	degF	in	in	lb/ft	mV	mV
	8.5	146	5.5	0.415	23	71.9	3.4
MINATTN	PERFS	PPT	SRFTEMP	TDEPTH			
db/ft		usec	degF	ft			
9.6	No	260	25	6770			

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 antero_elk_fork_tygart_2h_rcbl_19_mar_2021.db
Dataset Pathname rabbit_ears/2h/run1/pass4
Dataset Creation Fri Mar 19 07:44:41 2021

Gamma Ray Calibration Report

Serial Number: FW1211-86
Tool Model: Probe
Performed: Wed Jan 20 08:05:30 2021

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: FW1312-32
Tool Model: Probe275T

Calibration Casing Diameter: 5.500 in
Calibration Depth: 59.283 ft

Master Calibration, performed Thu Mar 18 09:09:29 2021:


	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.020	0.990	3.400	71.921	67.873	4.751
CAL	0.064	1.065				
5'	-0.020	0.868	3.400	71.921	77.152	4.921
SUM						
S1	-0.011	1.039	0.000	100.000	95.301	1.025
S2	-0.019	1.065	0.000	100.000	92.192	1.788
S3	-0.020	1.088	0.000	100.000	90.251	1.842
S4	-0.020	1.046	0.000	100.000	93.843	1.880
S5	-0.021	0.976	0.000	100.000	100.350	2.059
S6	-0.021	0.917	0.000	100.000	106.626	2.235
S7	-0.021	0.890	0.000	100.000	109.737	2.285
S8	-0.021	0.933	0.000	100.000	104.866	2.177

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.064	1.065	1.000	0.000

Air Zero Calibration, performed Thu Mar 18 08:40:59 2021:

	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	16.86		CHD-Titan Titan 1 7/16" GO Cablehead	1.00	1.44	5.00
Temp	14.02		CENT-Overbody Antelope (SP-919-0233)	1.67	4.88	5.00
WATER	11.79		RBT-Probe275T (FW1312-32) Probe 2.75" Radial with Integral Temperature Sub	9.39	2.75	90.00

WVFS8	11.78					
WVFS7	11.78					
WVFS6	11.78					
WVFS5	11.78					
WVFS4	11.78					
WVFS3	11.78					
WVFS2	11.78					
WVFS1	11.78					
WVF3FT	11.78					
WVF5FT	10.78					
WVFCAL	7.53					
HEADVOLT	7.53					
CCL	6.63					
GR	5.29					
			CENT-Overbody Antelope (SP-919-0233)	1.67	4.88	5.00
			GR-Probe (FW1211-86) Probe 2 3/4" Logging Gamma Ray	4.78	2.75	57.00
			CENT-Titn275Adj Titan 2 3/4" Adjustable Centralizer	2.75	2.75	35.00

Dataset: antero_elk_fork_tygart_2h_rcbl_19_mar_2021.db: rabbit_ears/2h/run1/pass4
 Total length: 17.92 ft
 Total weight: 197.00 lb
 O.D.: 4.88 in

	Company	ANTERO	
	Well	Elk Fork Tygart 2H	
	Field	RABBIT EARS	
	County	TYLER	
	State	WEST VIRGINIA	Country USA