



**Radial Cement Bond  
Variable Density Log  
W/Gamma Ray/CCLTemp**

Company	ANTERO	Country	USA
Well	Elk Fork Yough 1H		
Field	RABBIT EARS		
County	TYLER		
State	WEST VIRGINIA		
Company	ANTERO	State	WEST VIRGINIA
Well	Elk Fork Yough 1H	County	TYLER
Field	RABBIT EARS		
Location:		API # :	47-095-02723
Permanent Datum	SEC	Lat:	39.539881
Log Measured From	TWP	Long:	-80.887809
Drilling Measured From	RGE	Ground Level	Elevation 25'
		Kelly Bushing	25.5' A.P.D.
		Kelly Bushing	
		Elevation	K.B. N/A D.F. N/A G.L. N/A

Date	18-Mar-2021		
Run Number	ONE		
Depth Driller	22,879'		
Depth Logger	6,990'		
Bottom Logged Interval	7,029'		
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	4,640'		
Time Well Ready	13:00		
Time Logger on Bottom	13:30		
Equipment Number	TK-104 / P1.G2		
Location	CHARLEROI, PA		
Recorded By	Matt McNally		
Witnessed By	Chris Young		
Borehole Record		Tubing Record	
Run Number	Bit	From	To
		Size	Weight
			From
			To
Casing Record	Size	Wgt/Ft	Top
Surface String			Bottom
Prot. String			
Production String	5 1/2"	23#	SURFACE
Liner			22,879'

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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 @ 5,833' -5,843'  
Depth Correction -27'

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

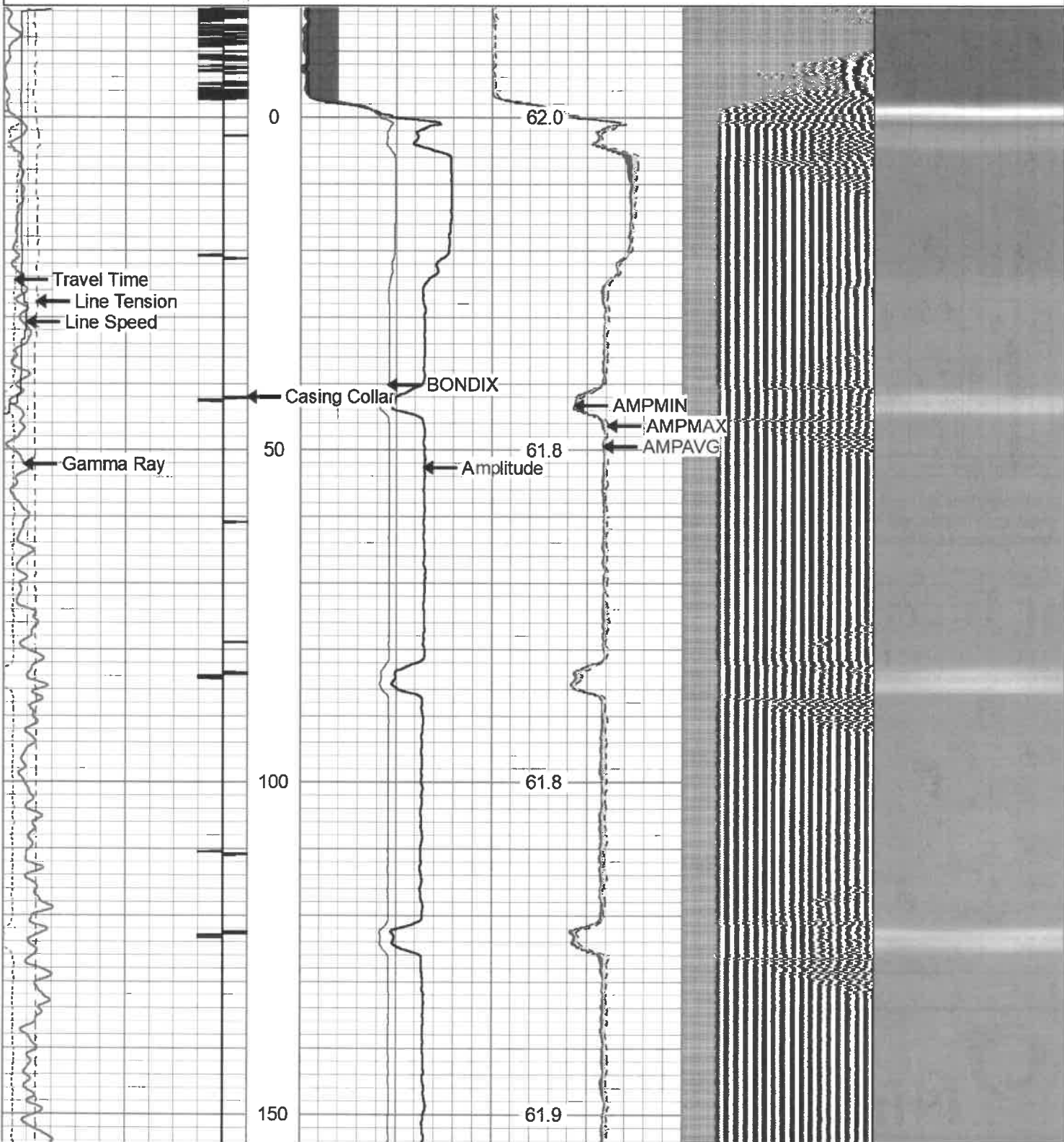
Thank You for Choosing Nine Energy Service.Charleroi, PA

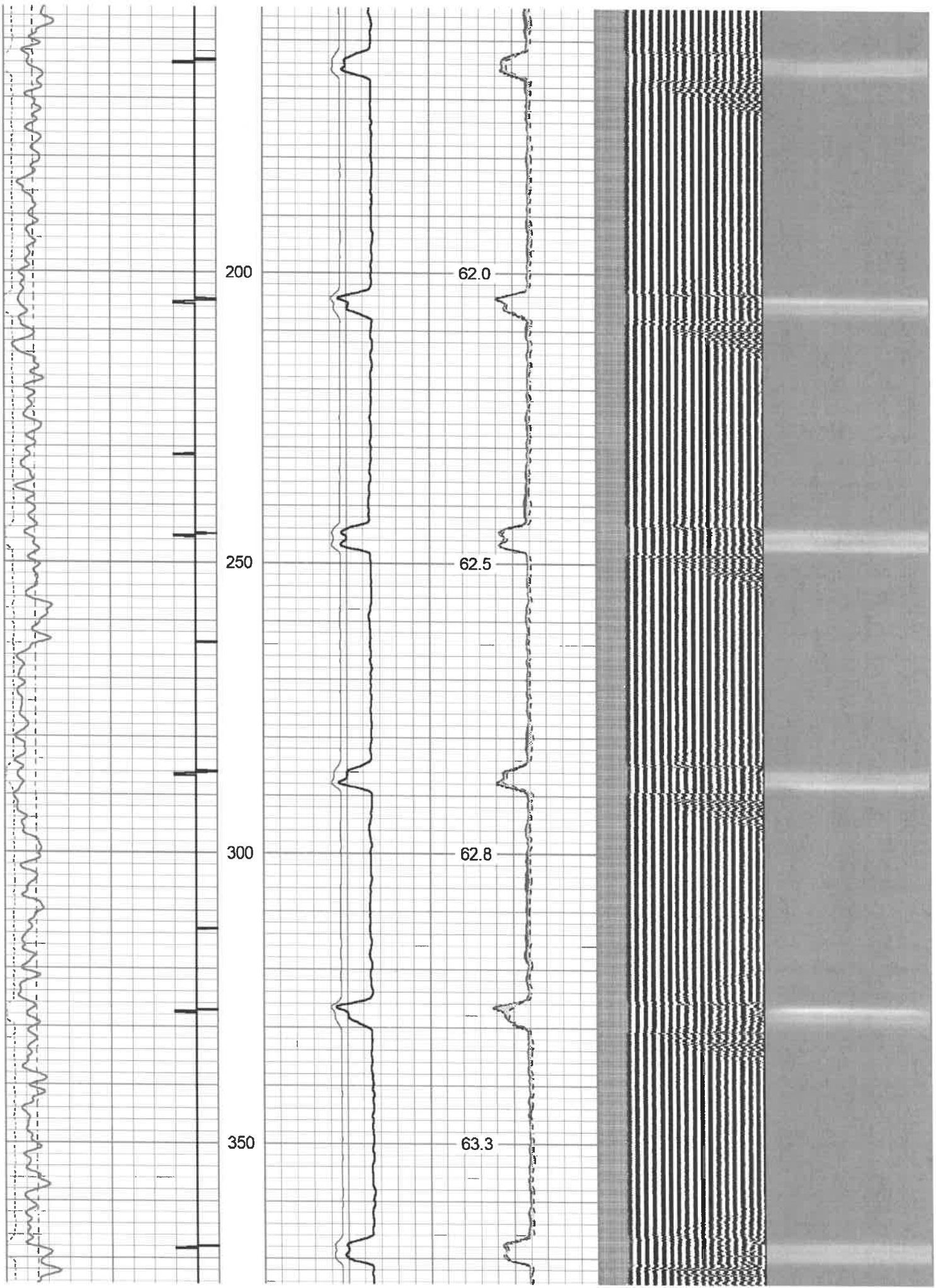


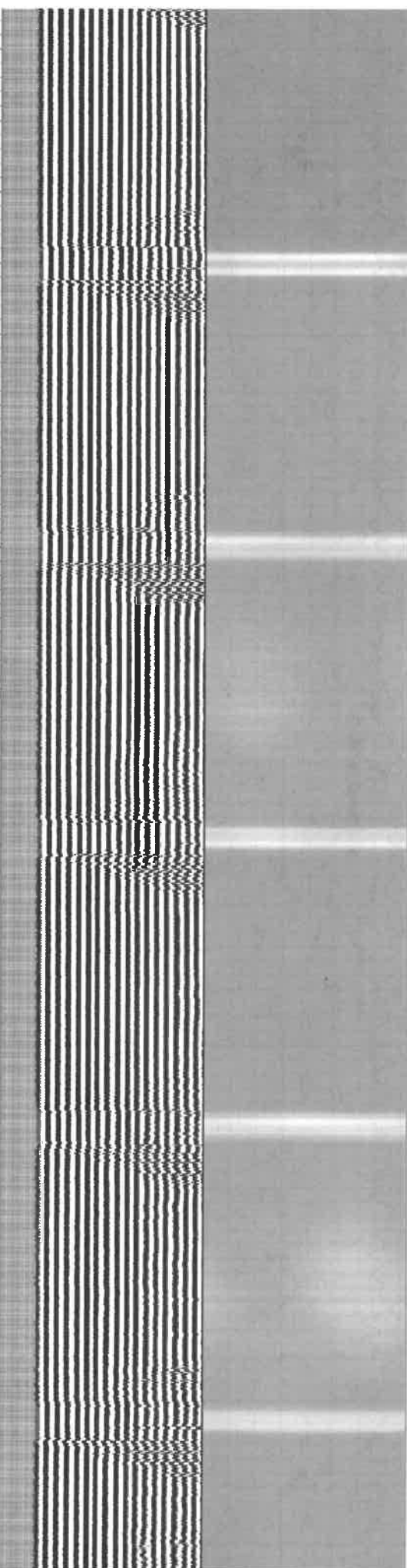
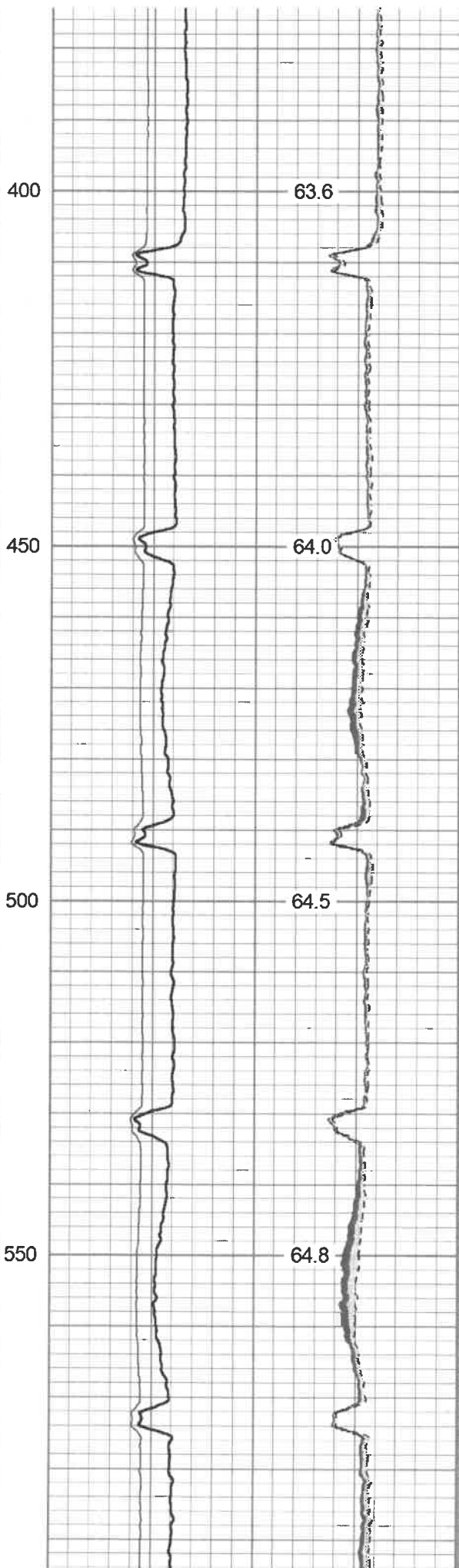
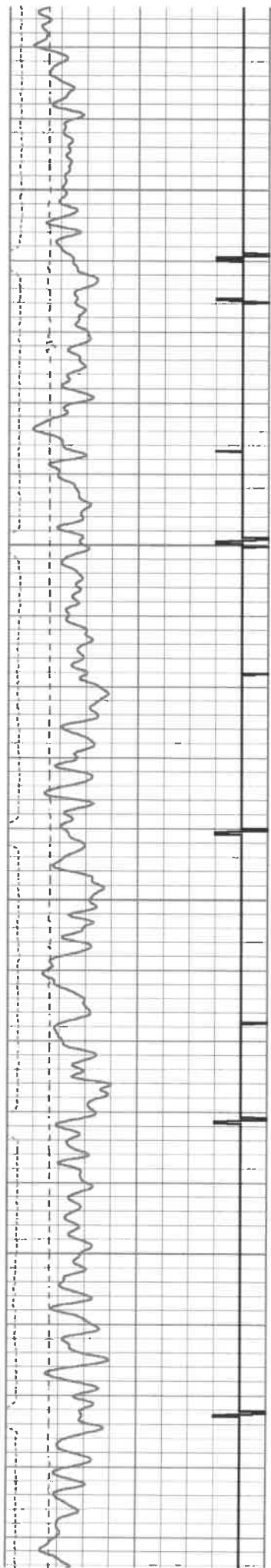
**Main Pass 1,500 PSI**

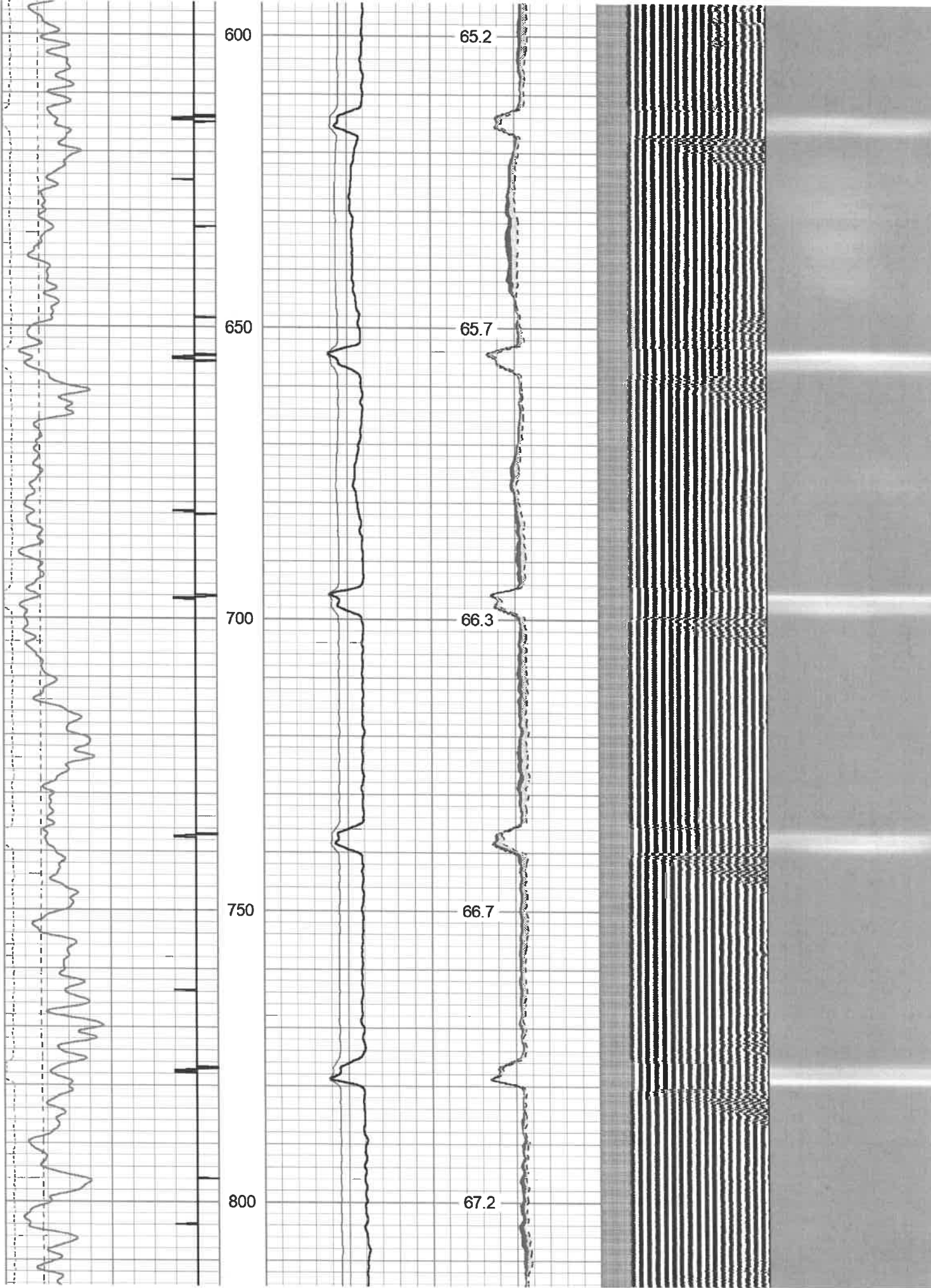
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 Dataset Pathname rabbit\_ears/yough\_1h/run1/pass6  
 Presentation Format rcbl-bond index for antero 1020  
 Dataset Creation Thu Mar 18 13:29:24 2021  
 Charted by Depth in Feet scaled 1:240

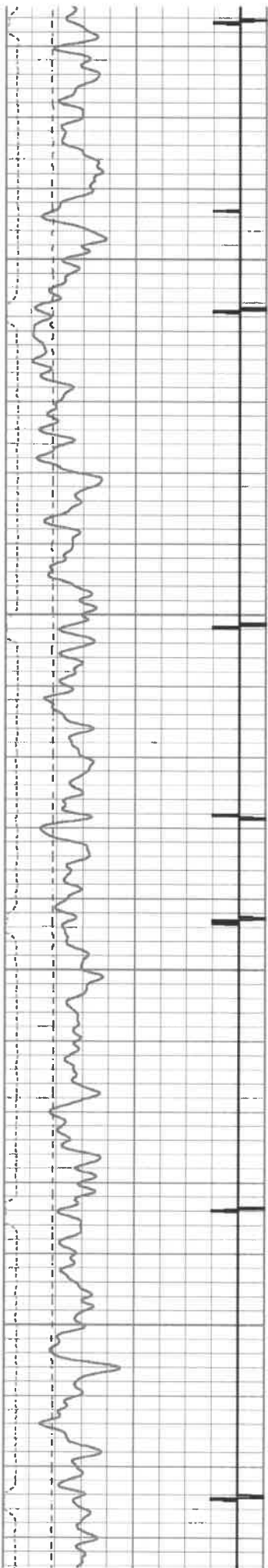
265	Travel Time (usec)	165	0	Amplitude (mV)	100	0	AMPMIN	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	1	BONDIX	0	0	AMPMAX	150	200 (usec)	1200		
0	Gamma Ray (GAPI)	150	0			0	AMPAVG	150				
	Line Speed						TEMP					
-100	(ft/min)	100					(degF)					
0	Line Tension (lb)	2000										











850

900

950

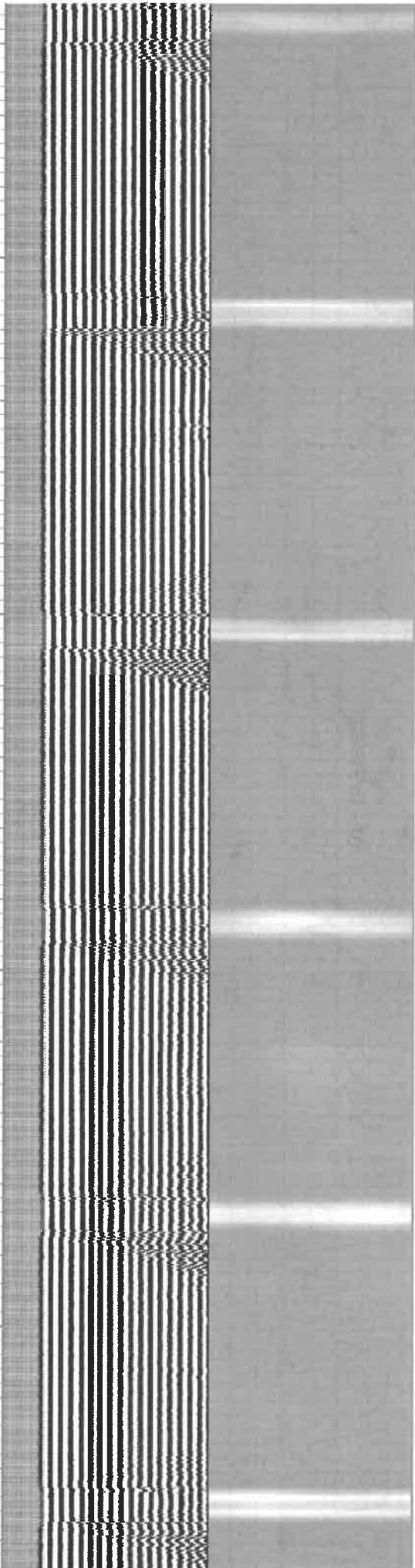
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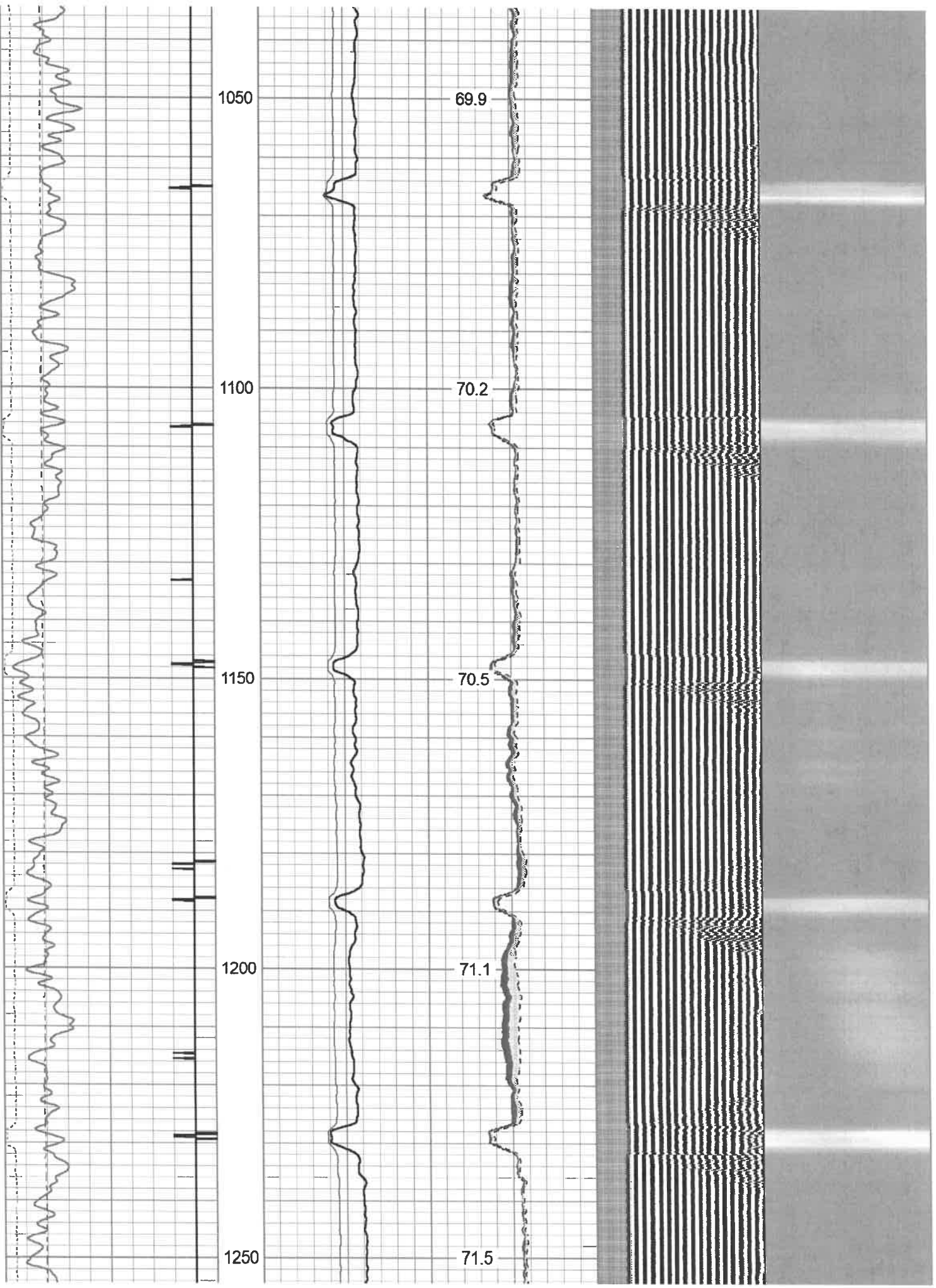
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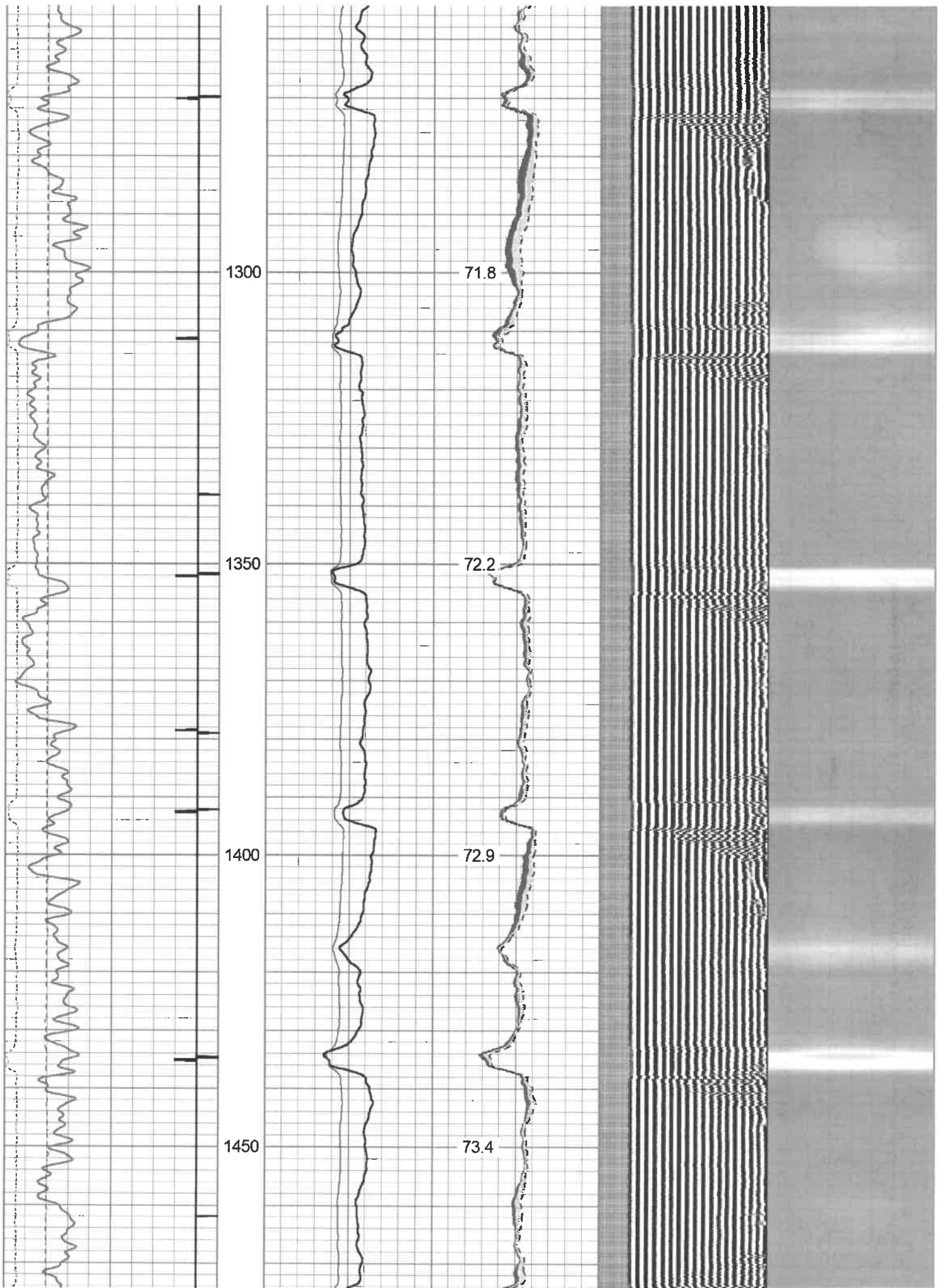
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69.0

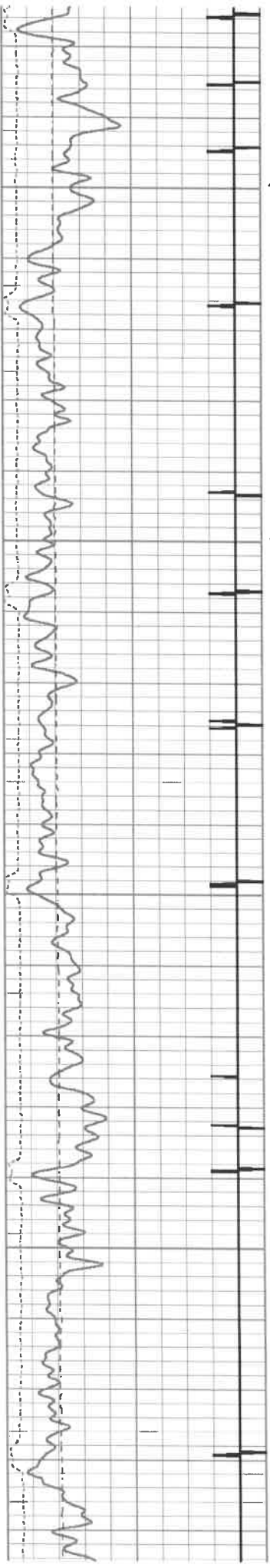
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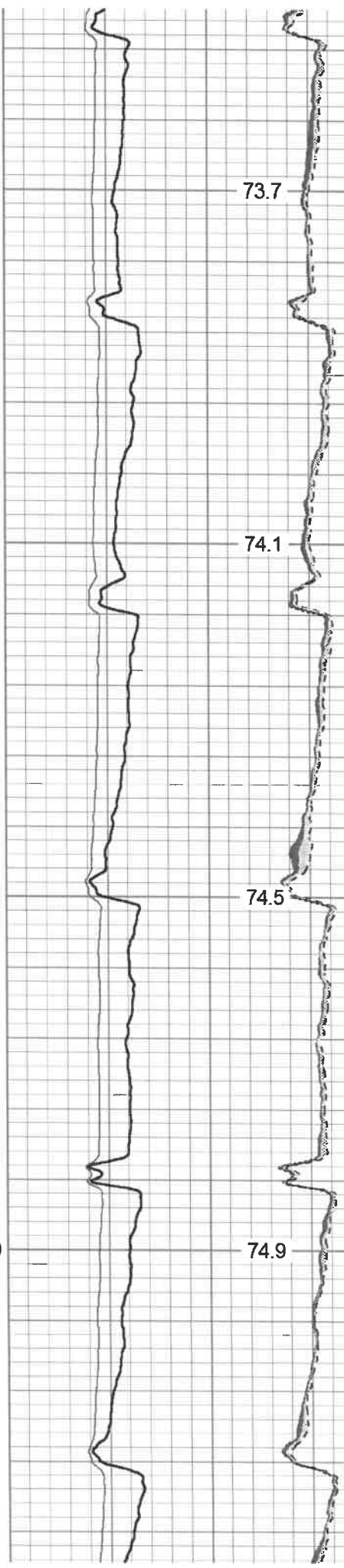


1500

1550

1600

1650

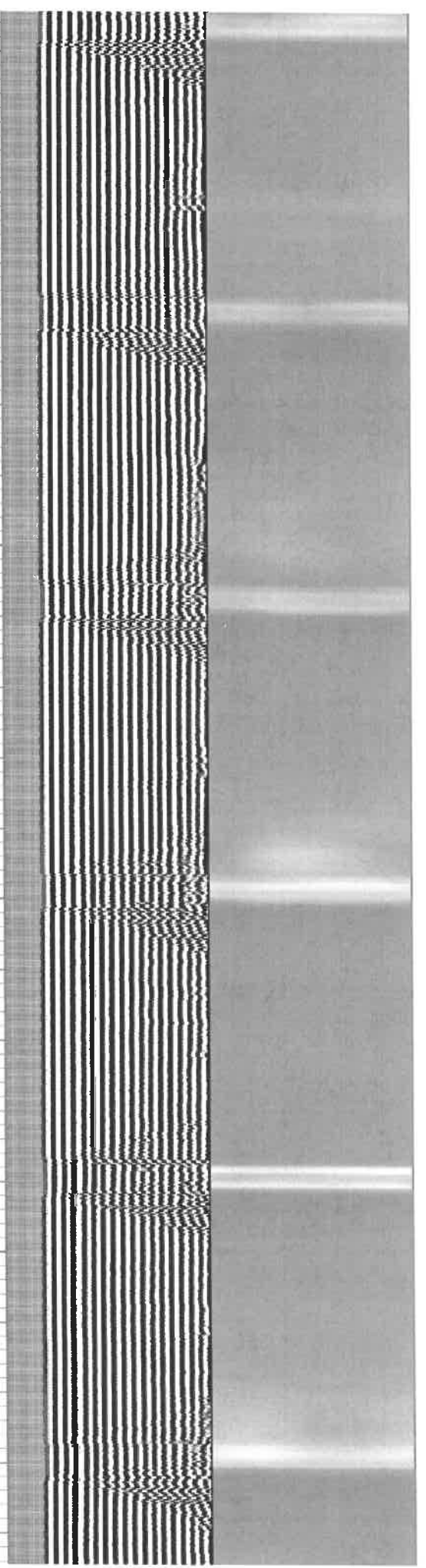


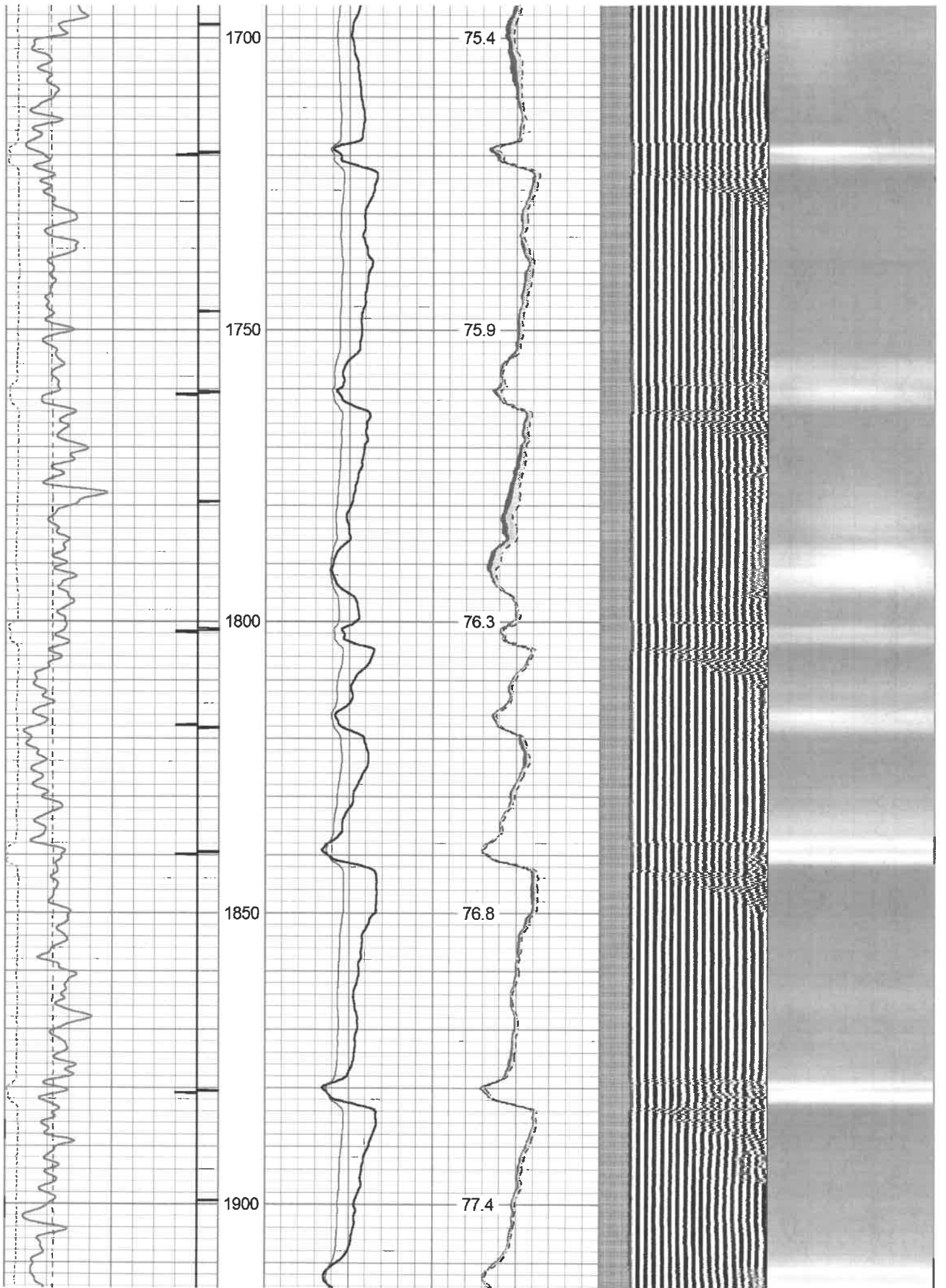
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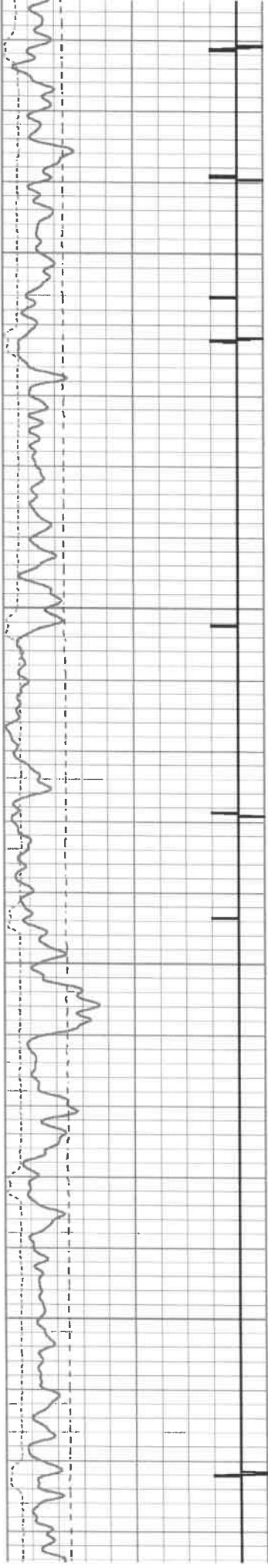
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74.5

74.9





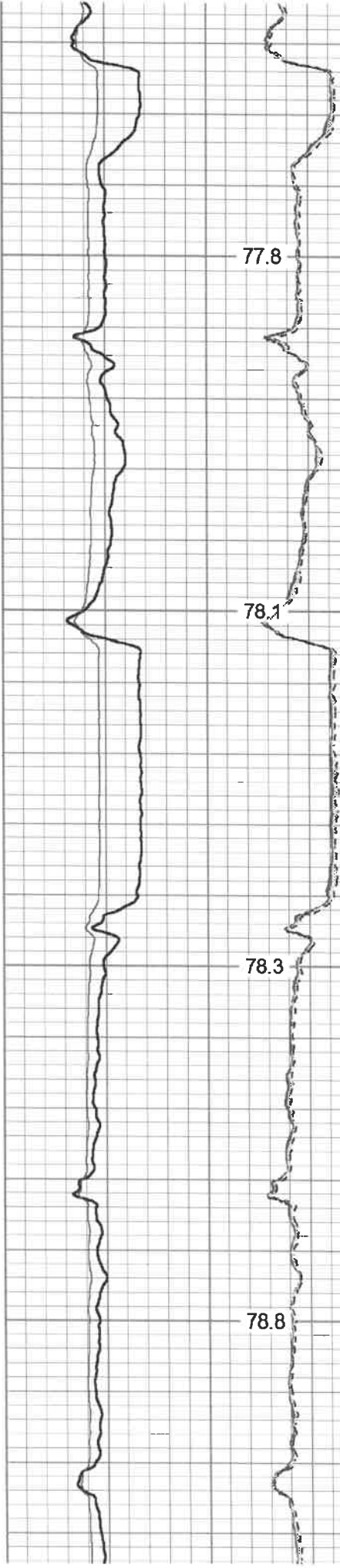


1950

2000

2050

2100

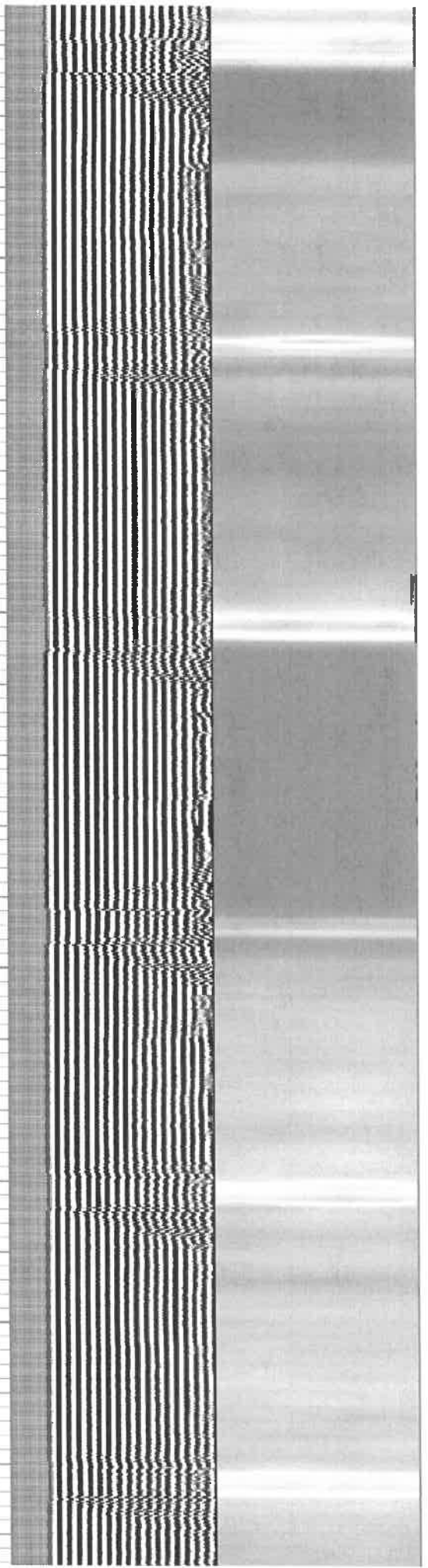


77.8

78.1

78.3

78.8

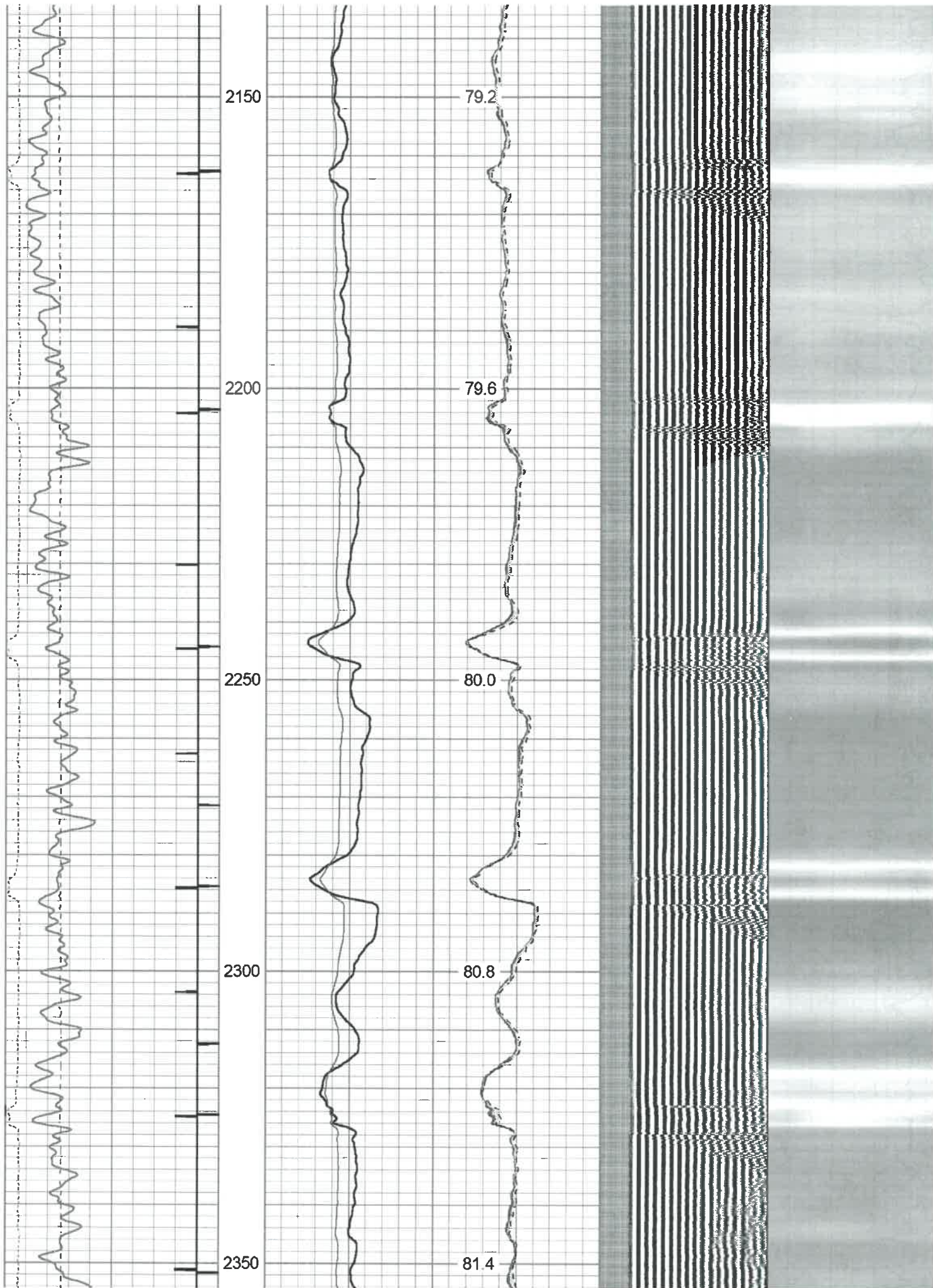


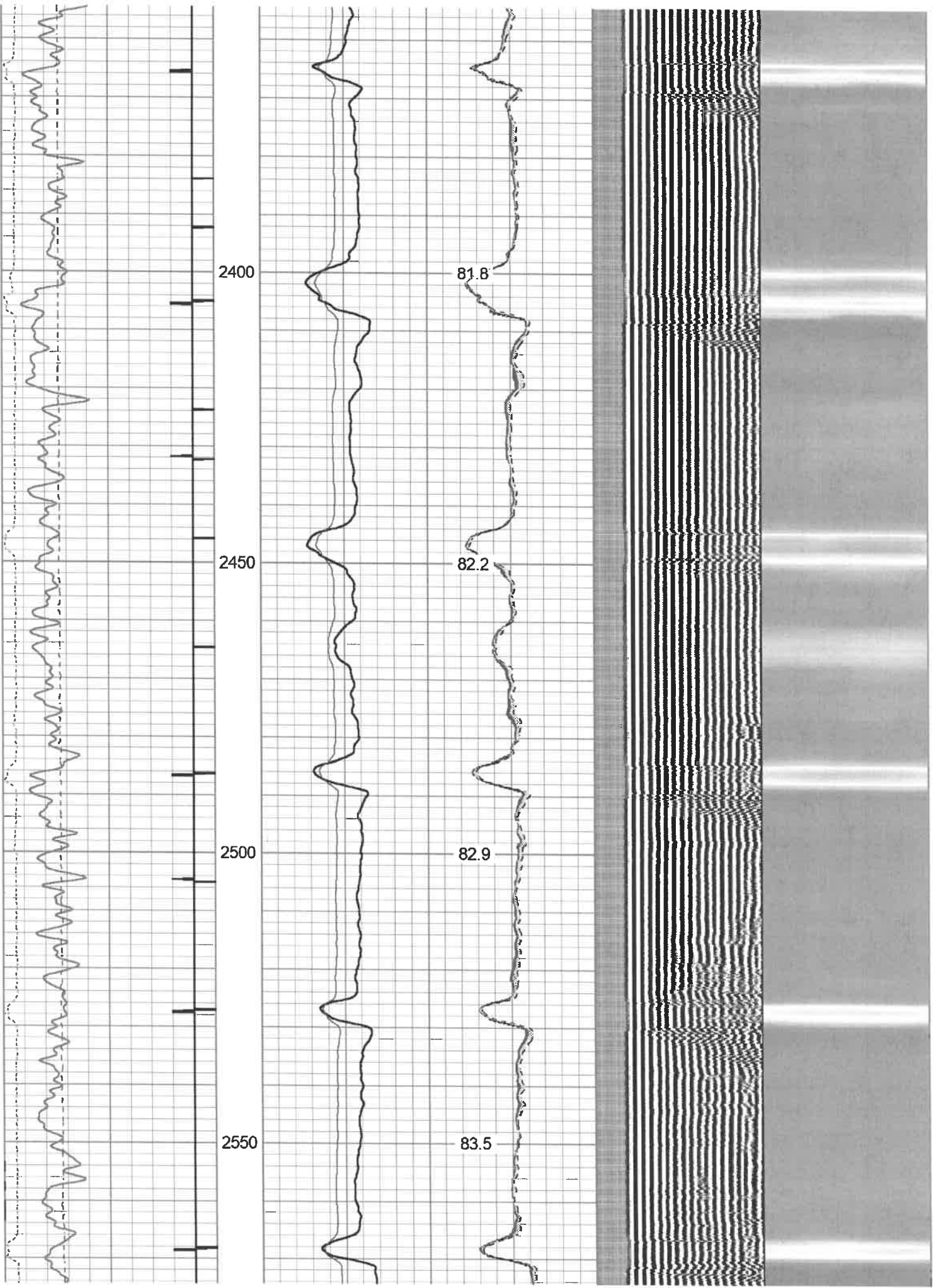
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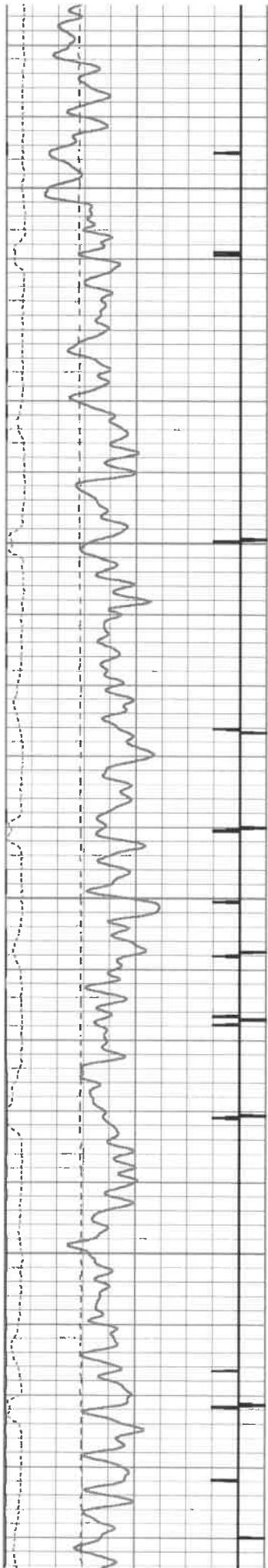
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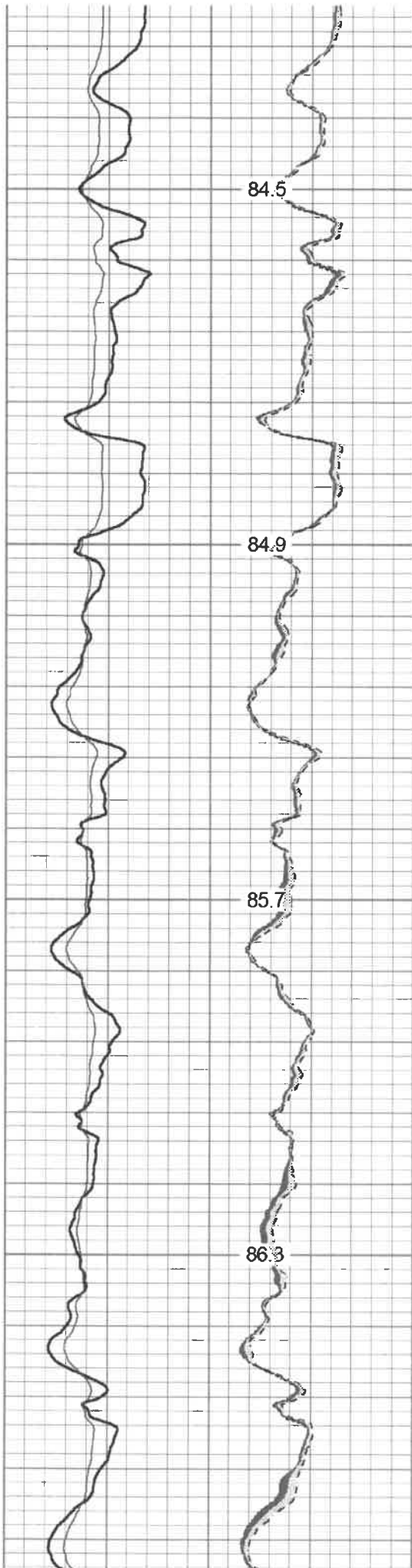


2600

2650

2700

2750

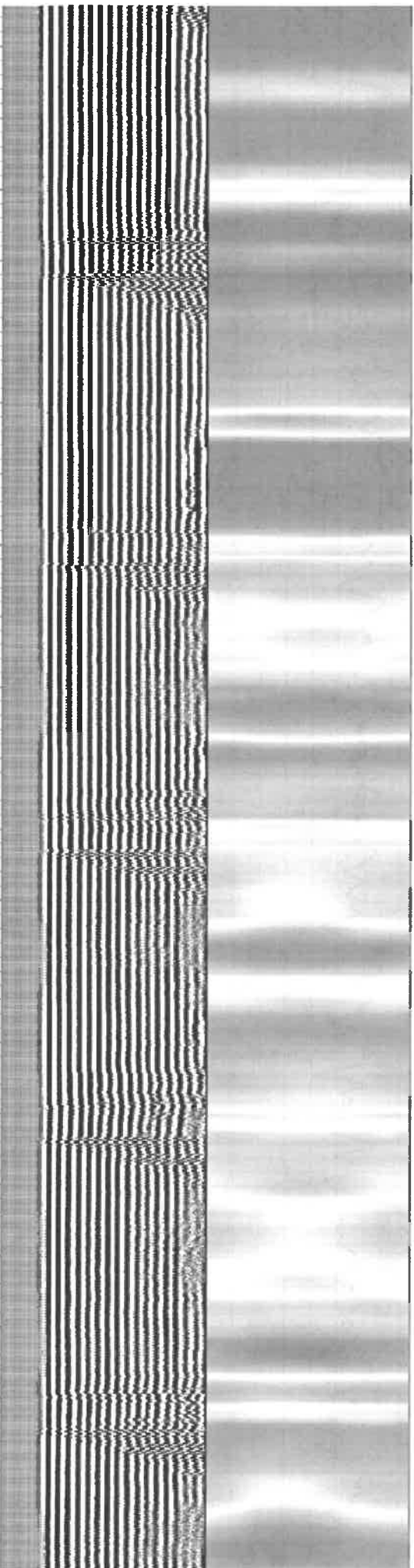


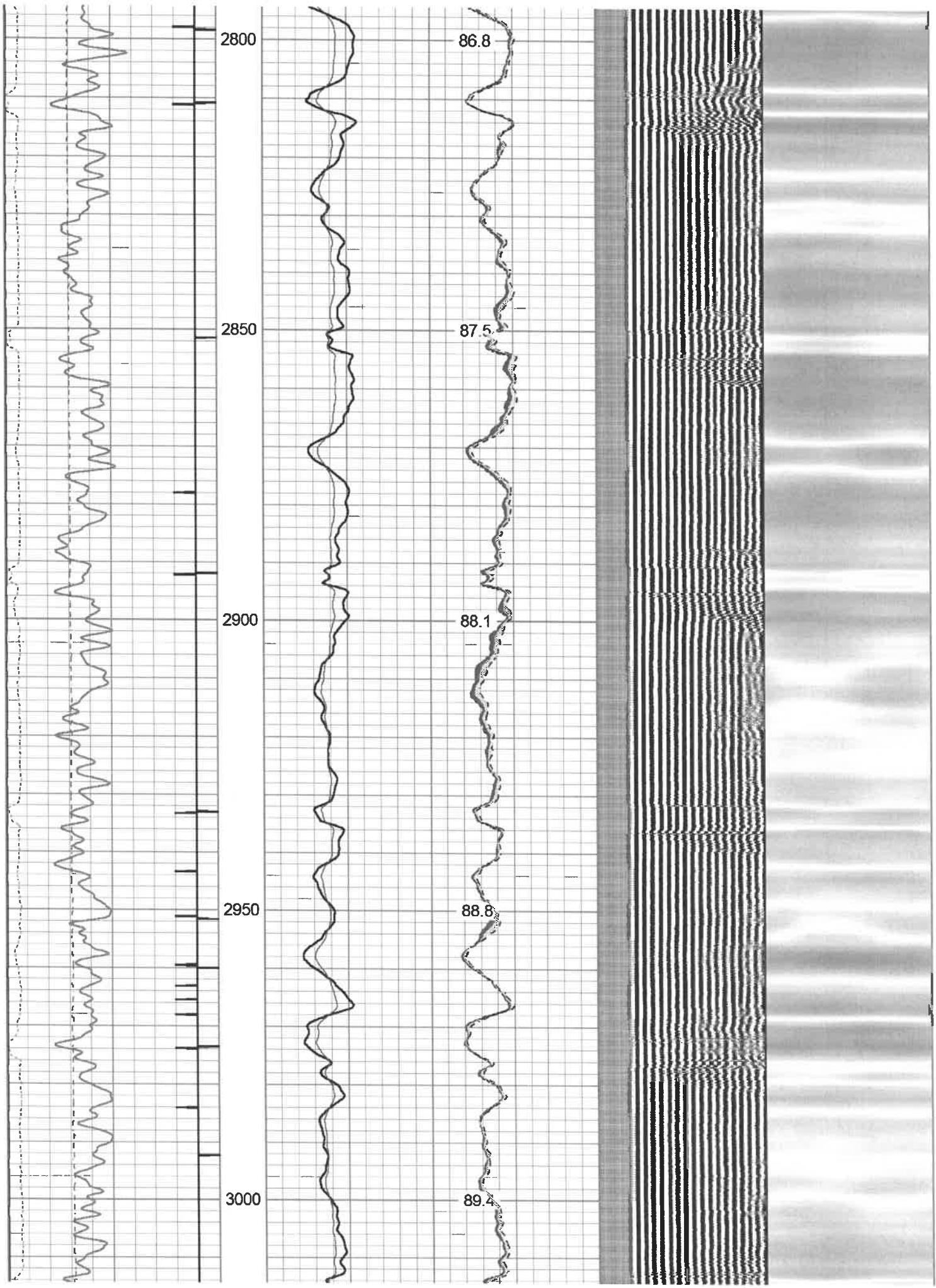
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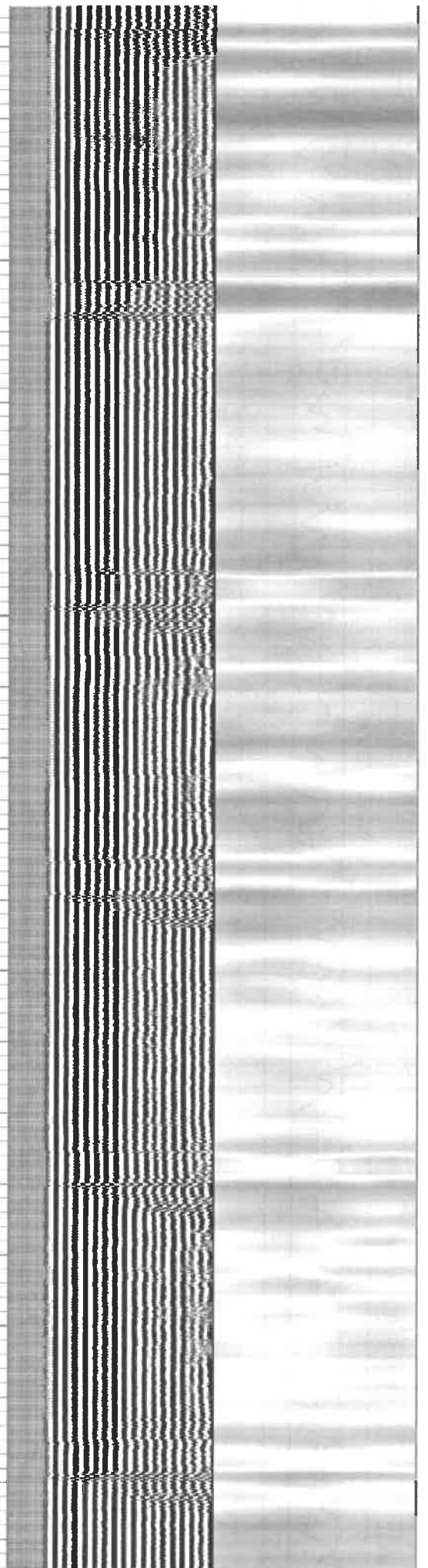
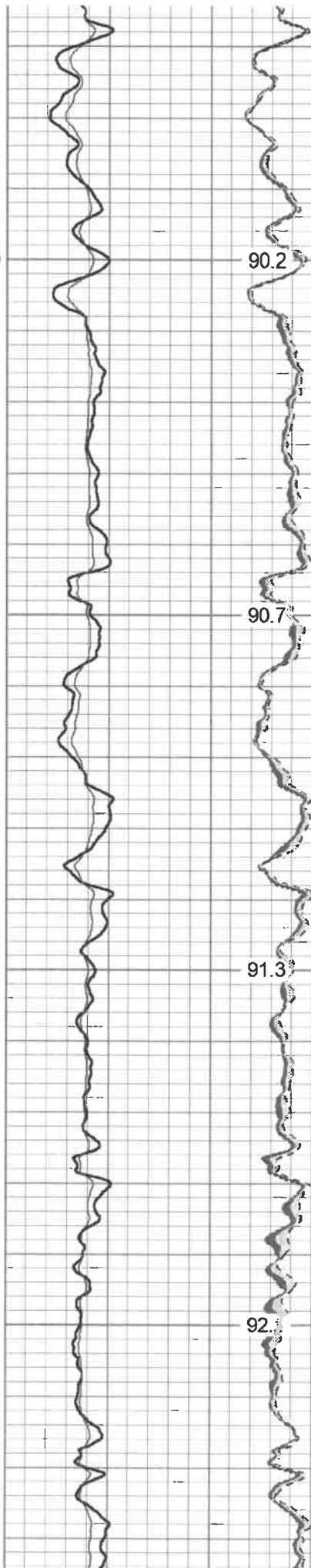
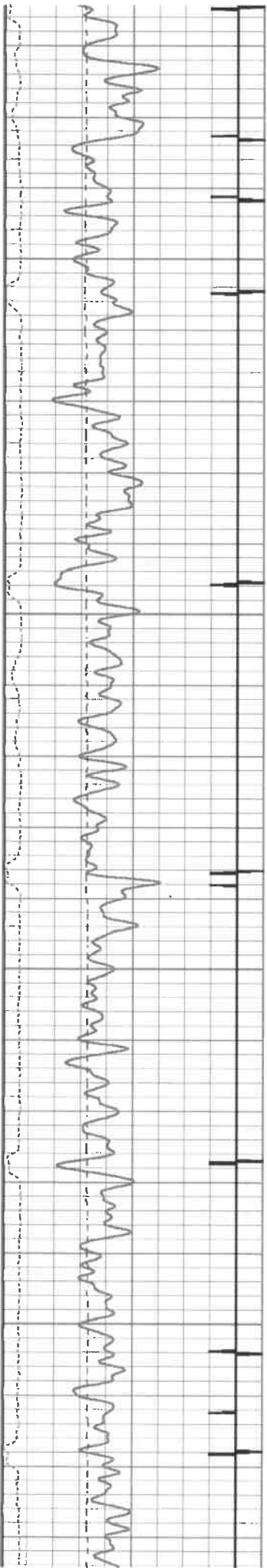
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85.7

86.3

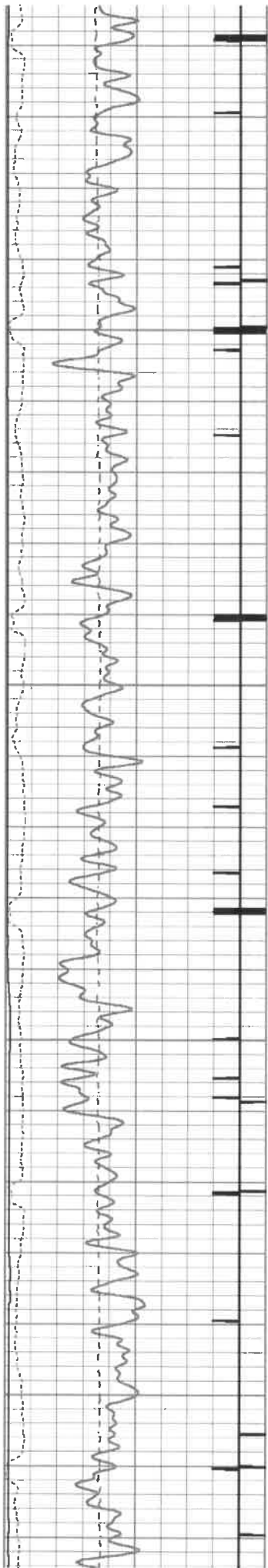










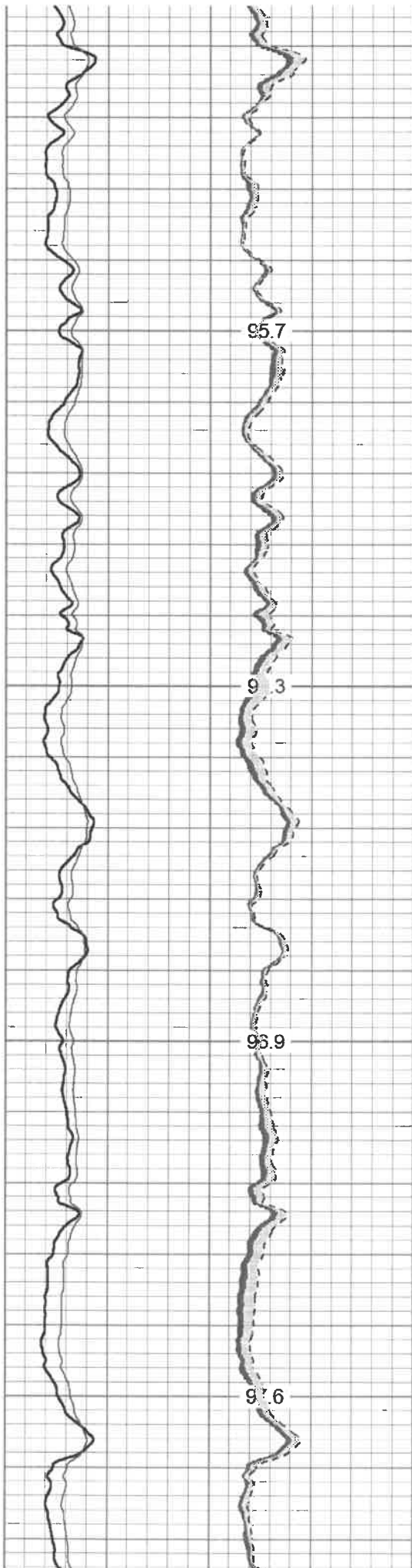


3500

3550

3600

3650

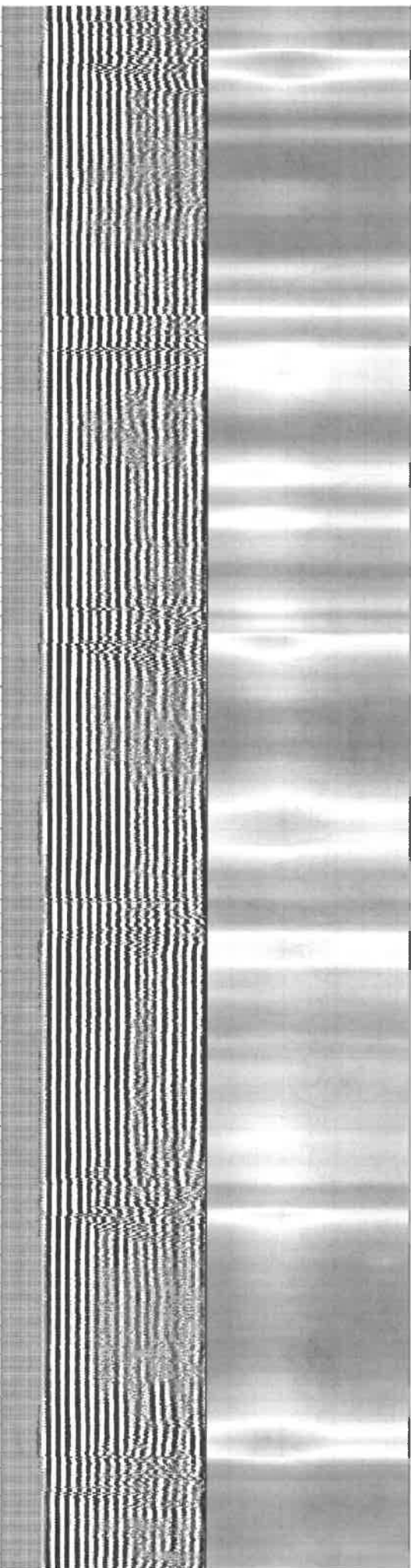


95.7

93.3

95.9

97.6



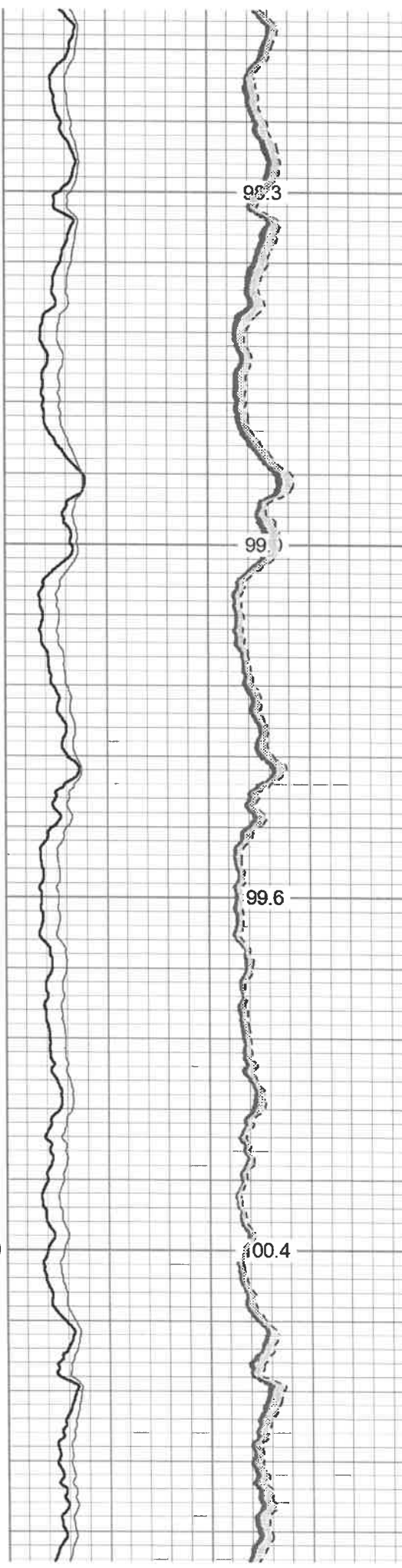


3700

3750

3800

3850

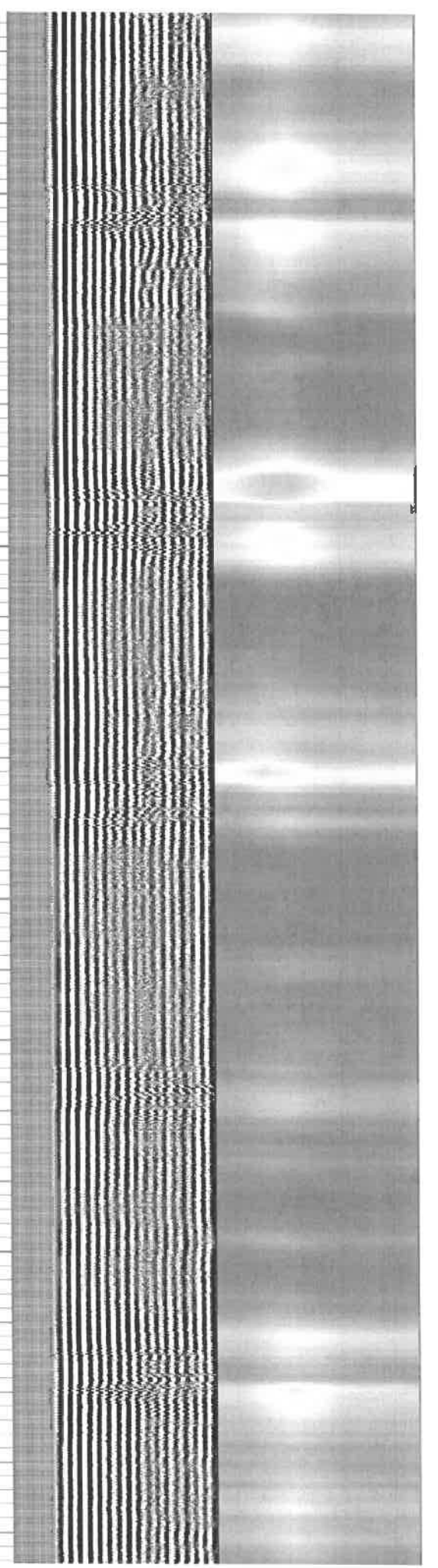


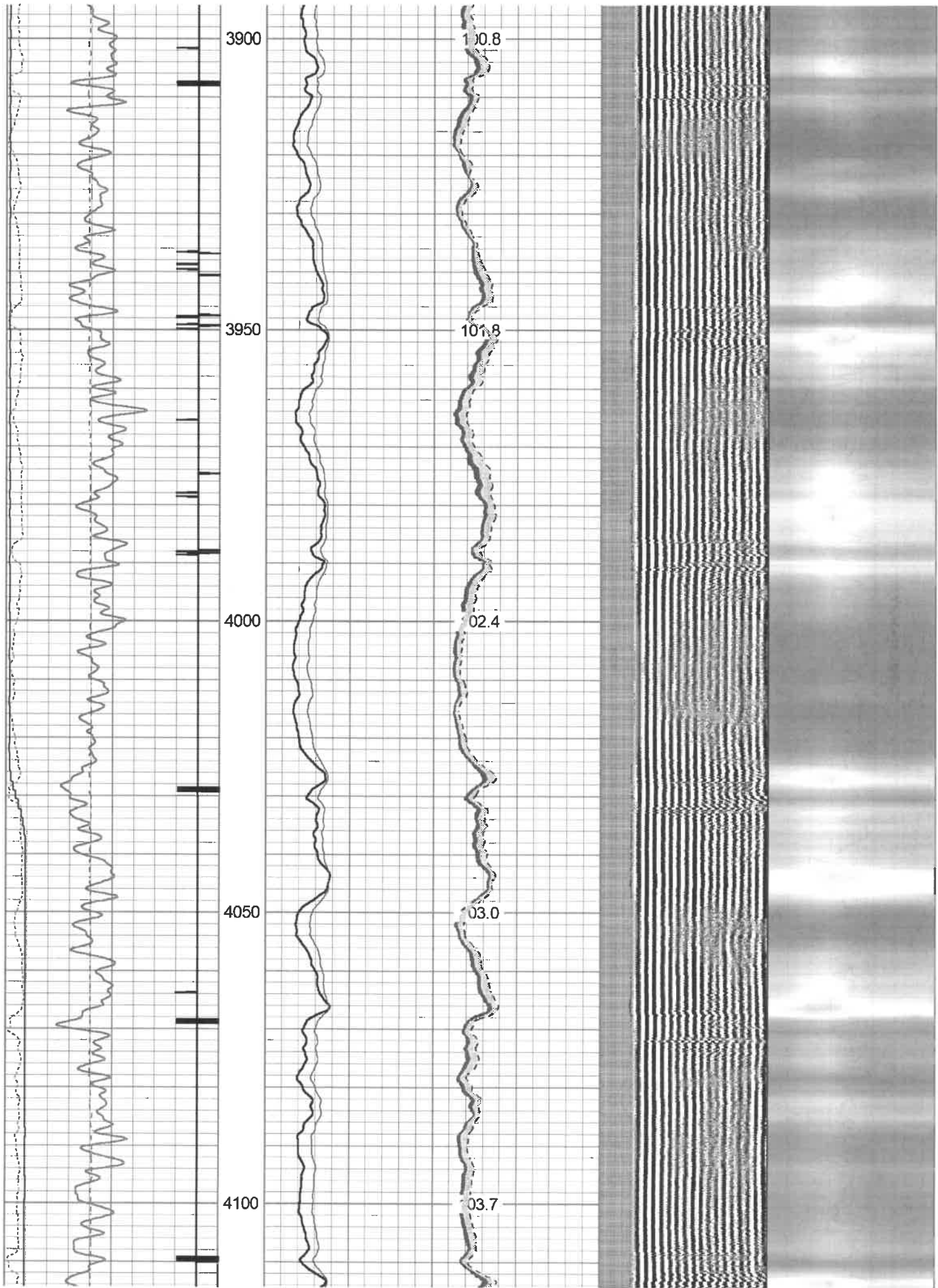
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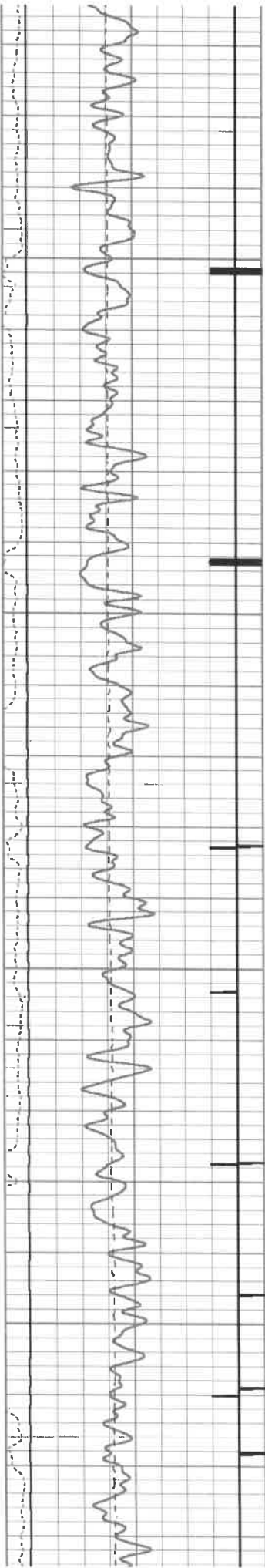
99

99.6

100.4





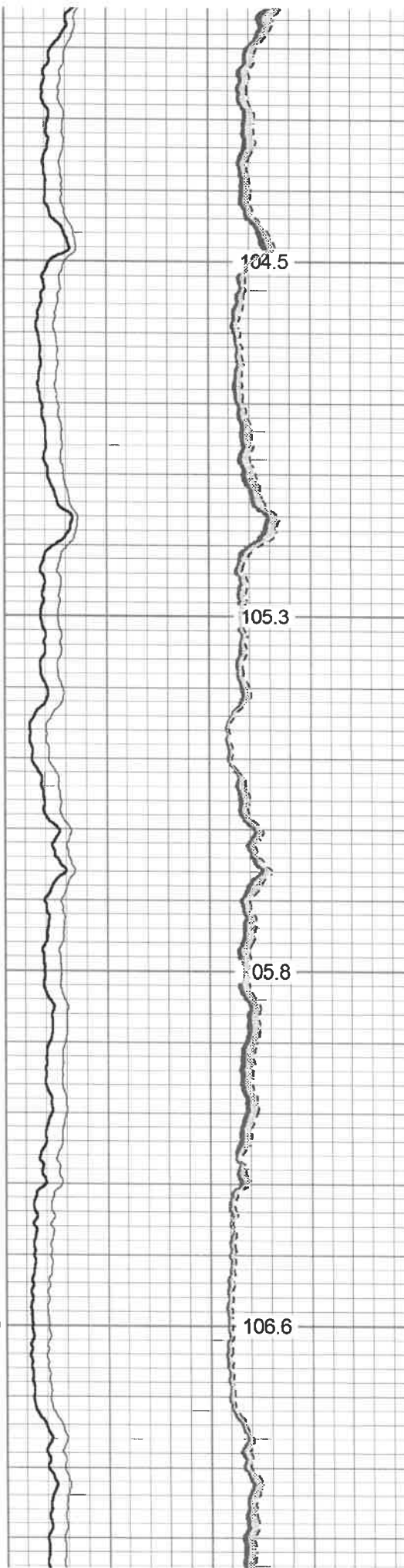


4150

4200

4250

4300

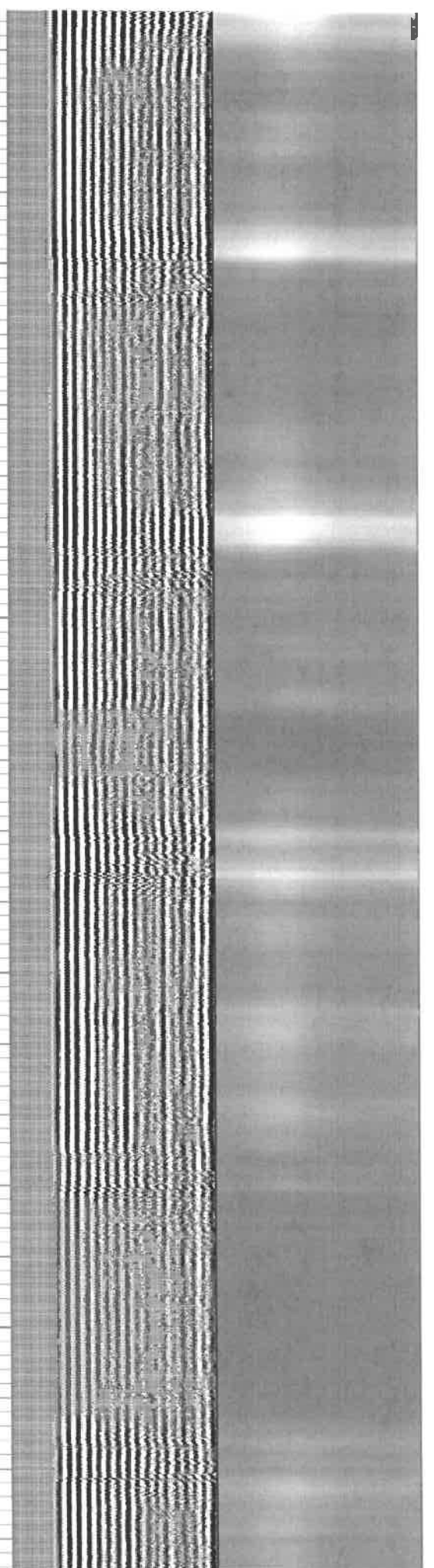


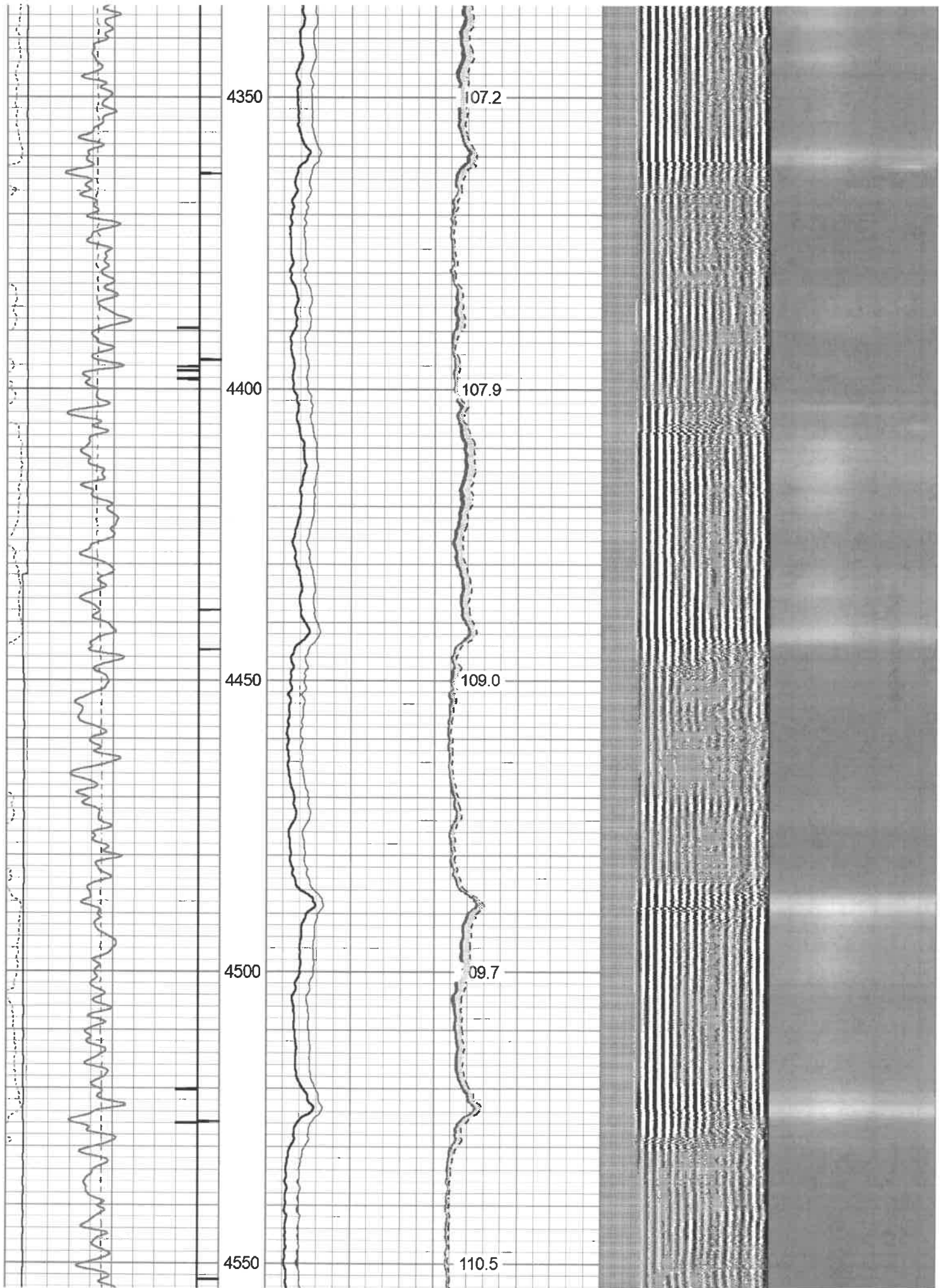
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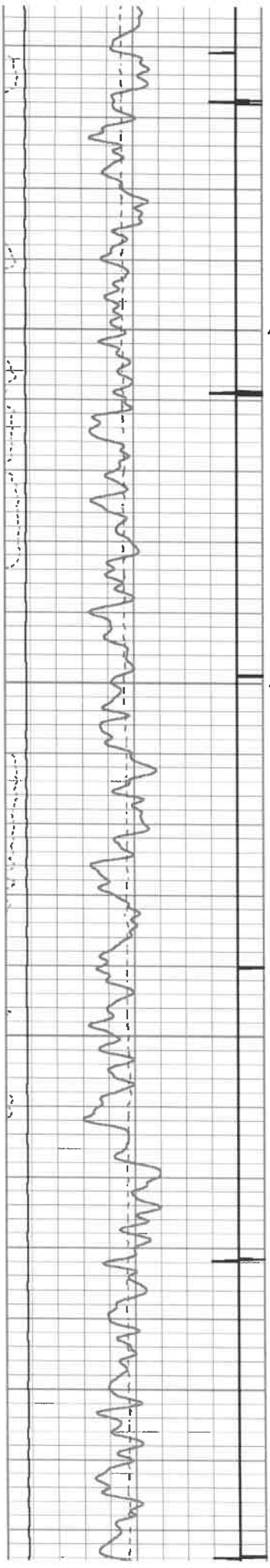
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105.8

106.6





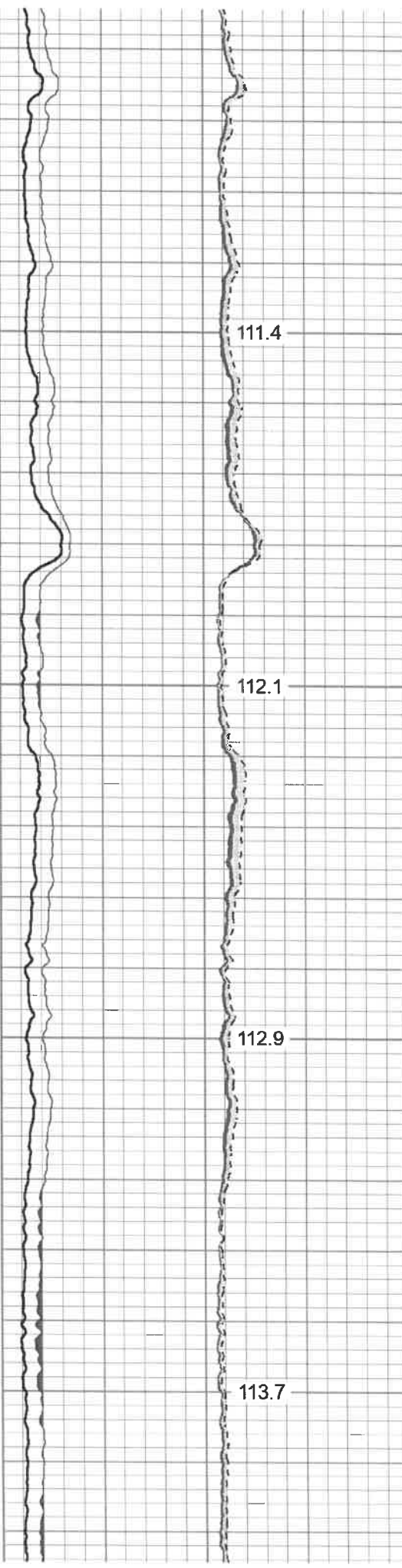


4600

4650

4700

4750

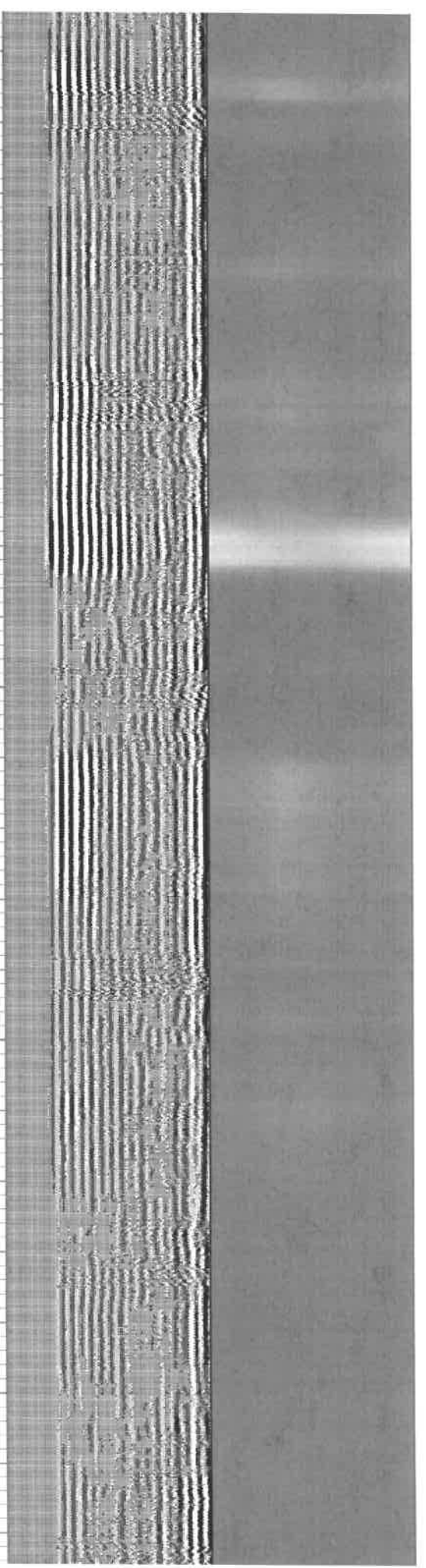


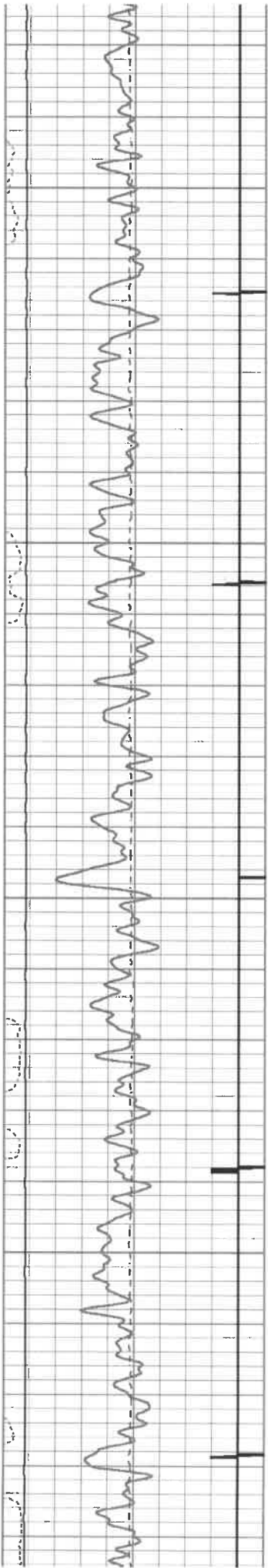
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112.1

112.9

113.7



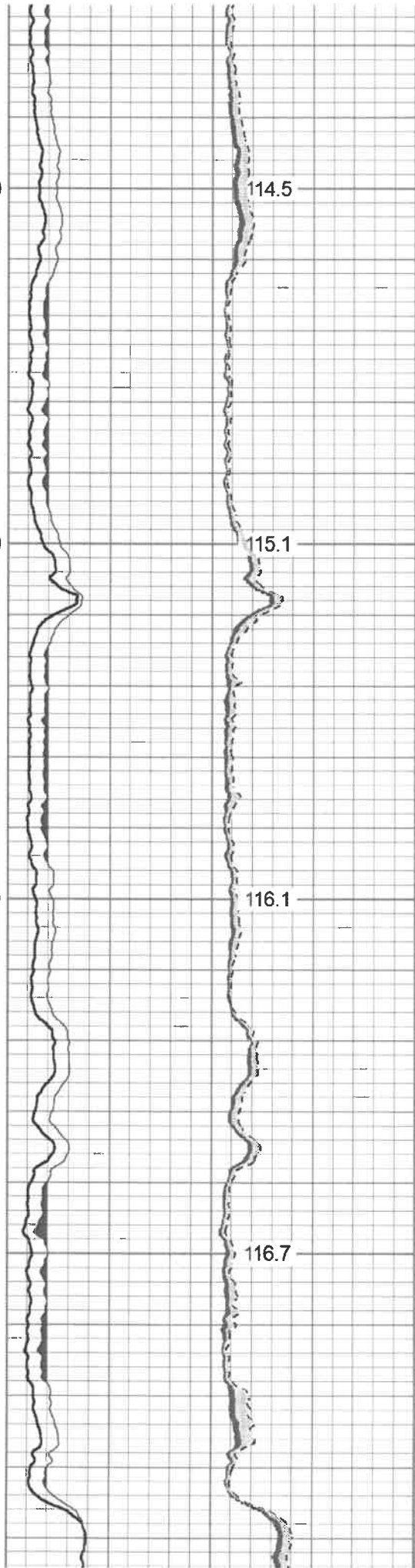


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4850

4900

4950

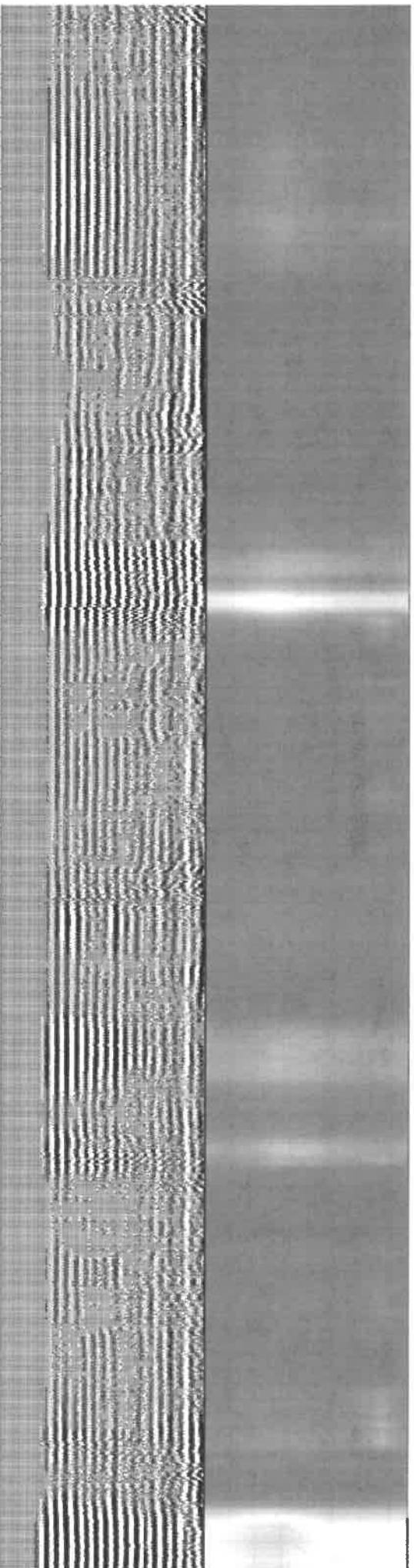


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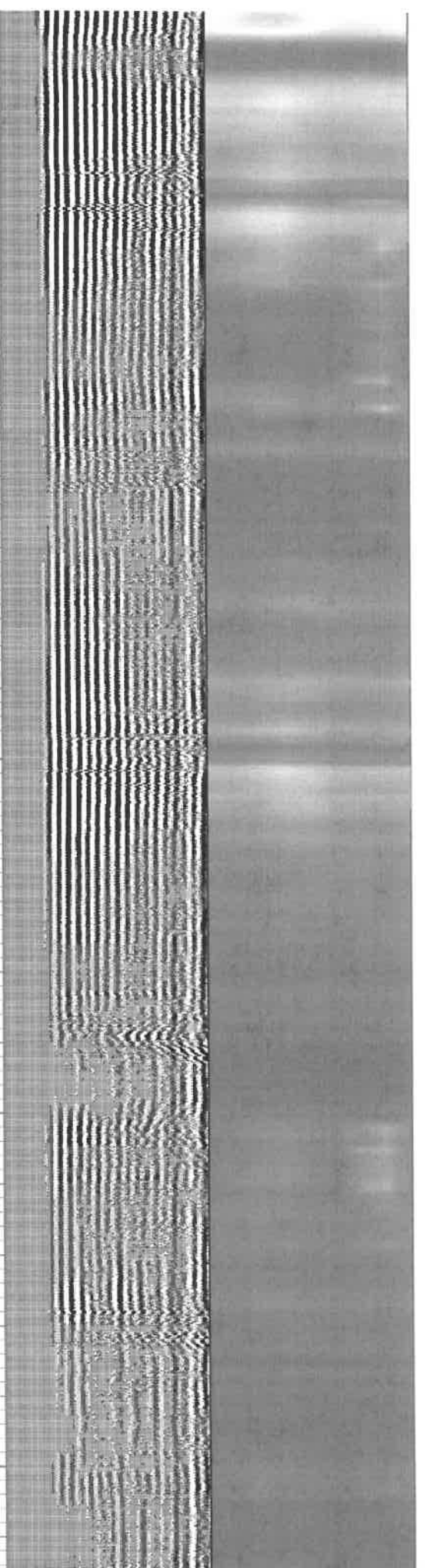
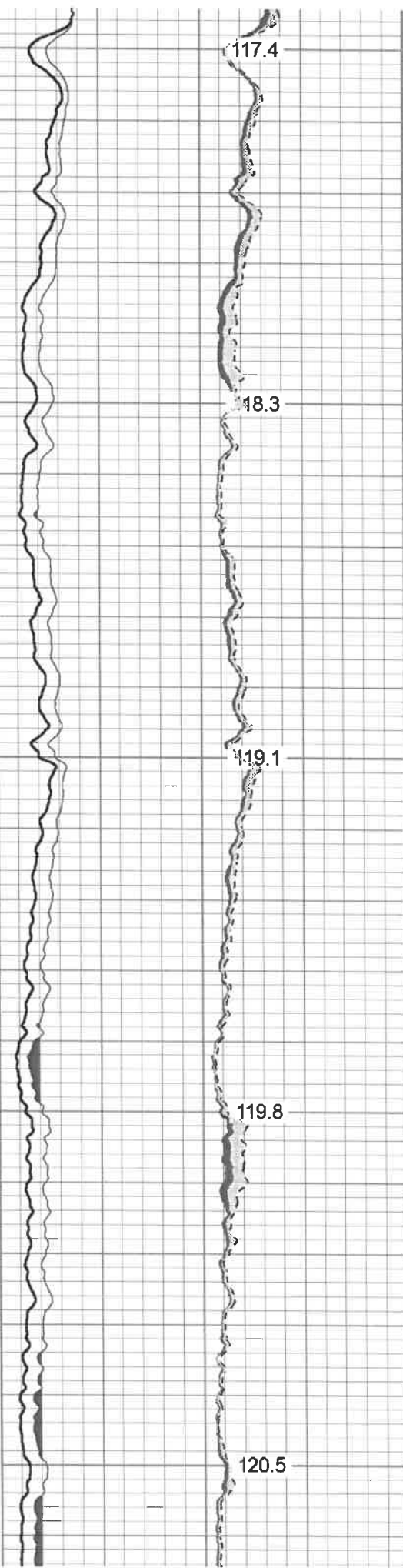
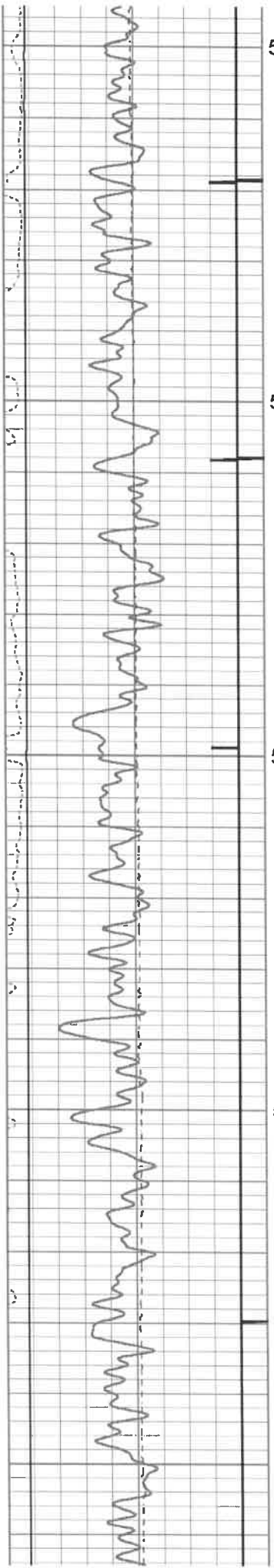
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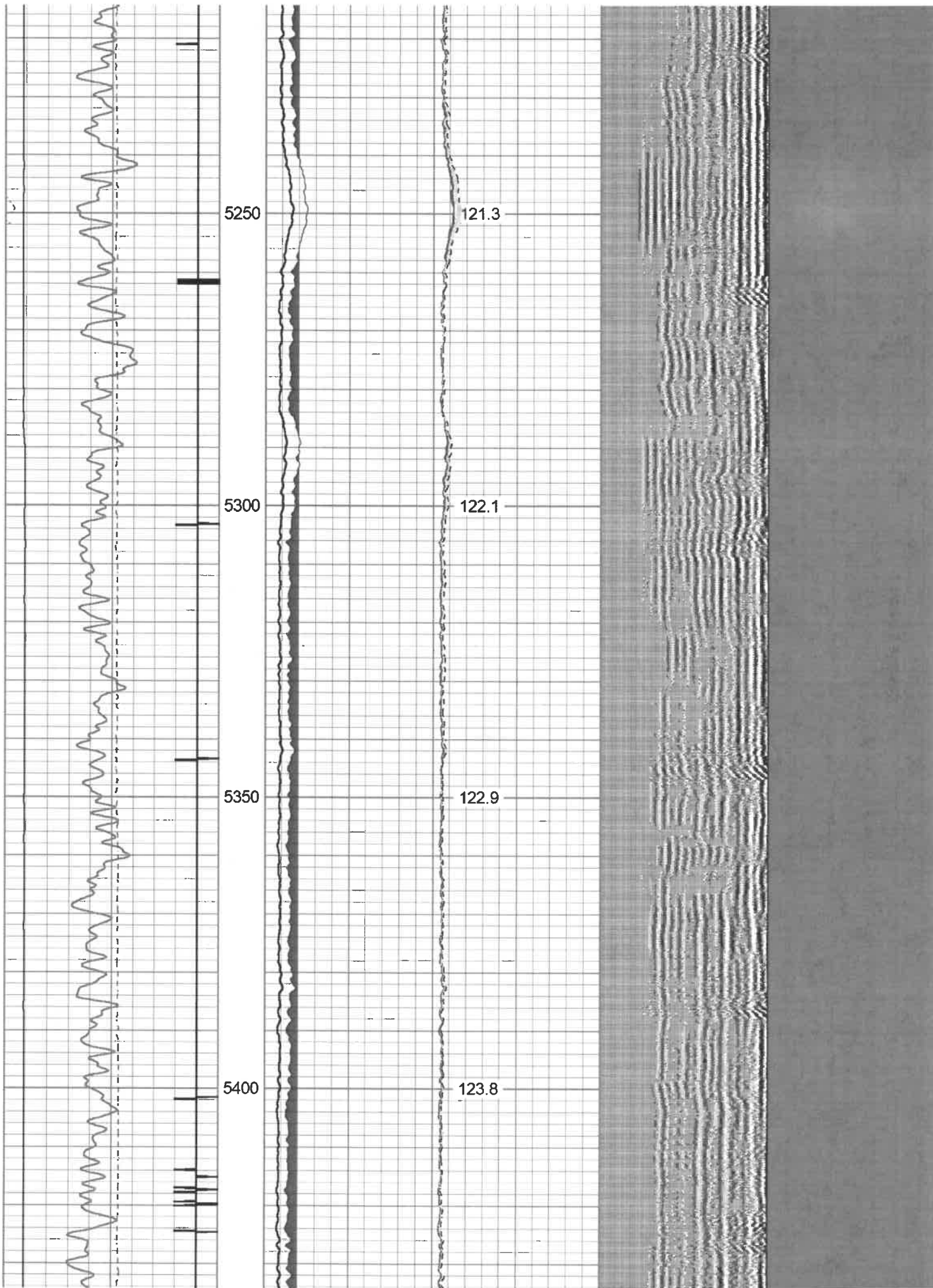
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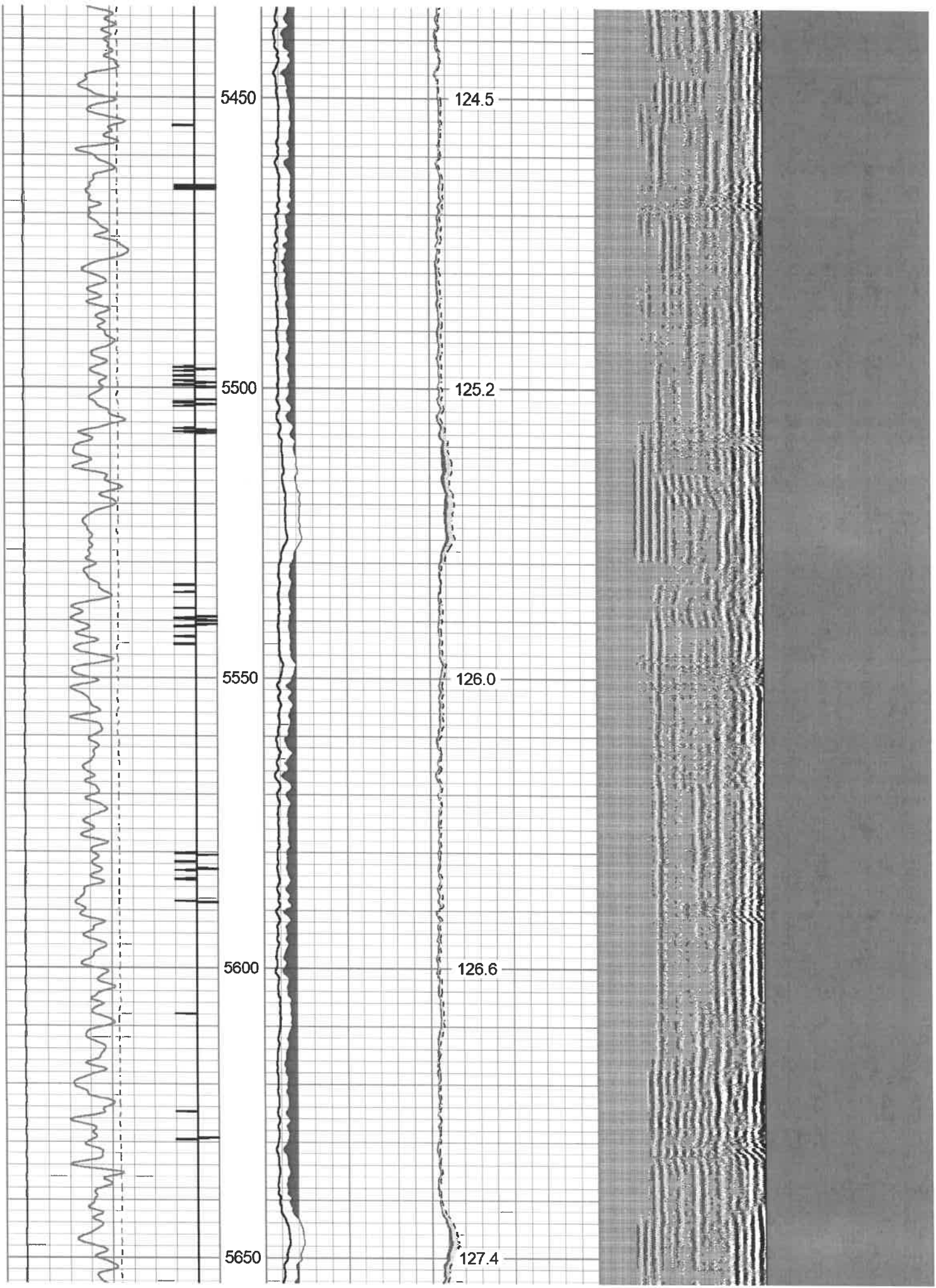
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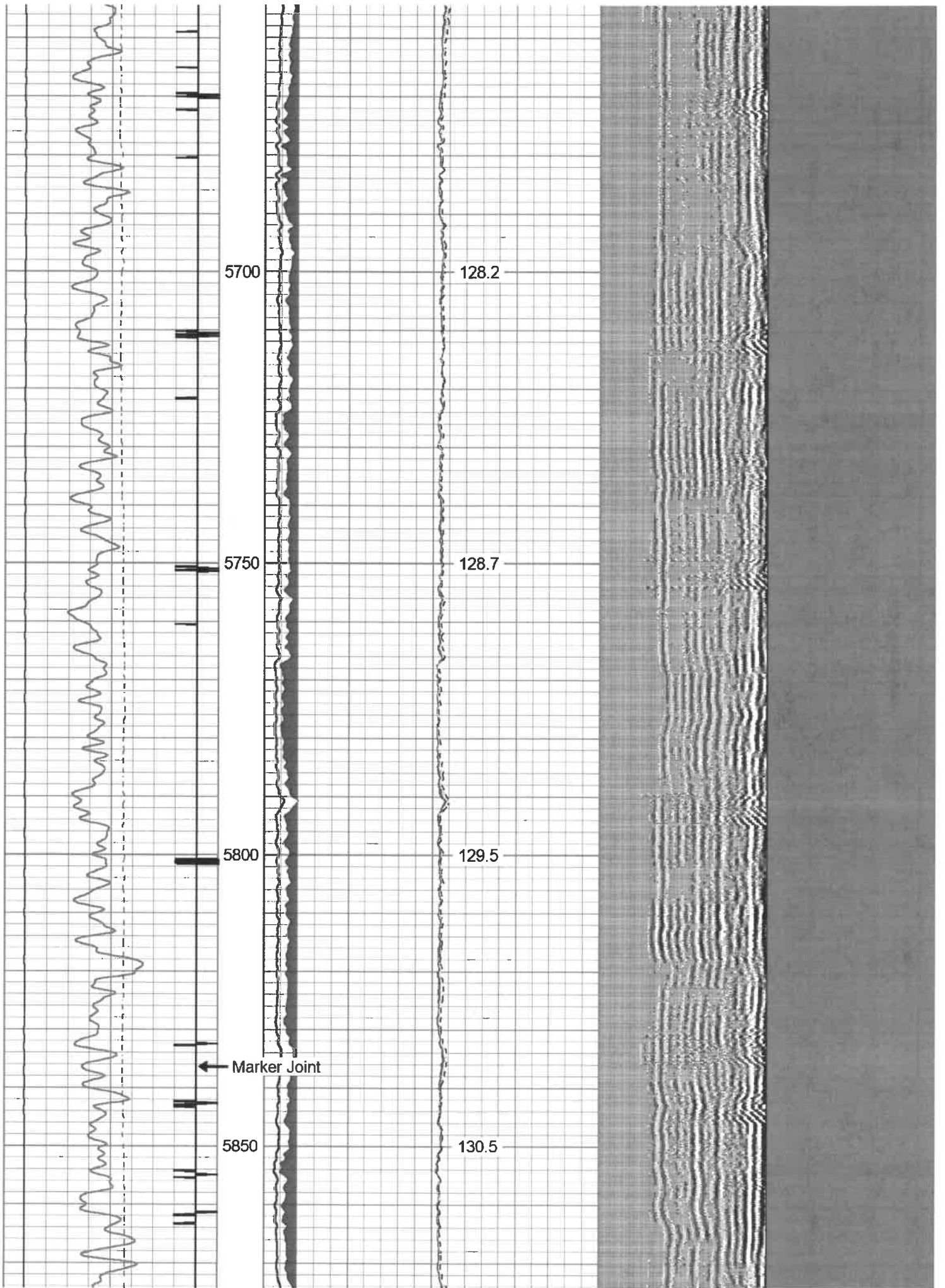


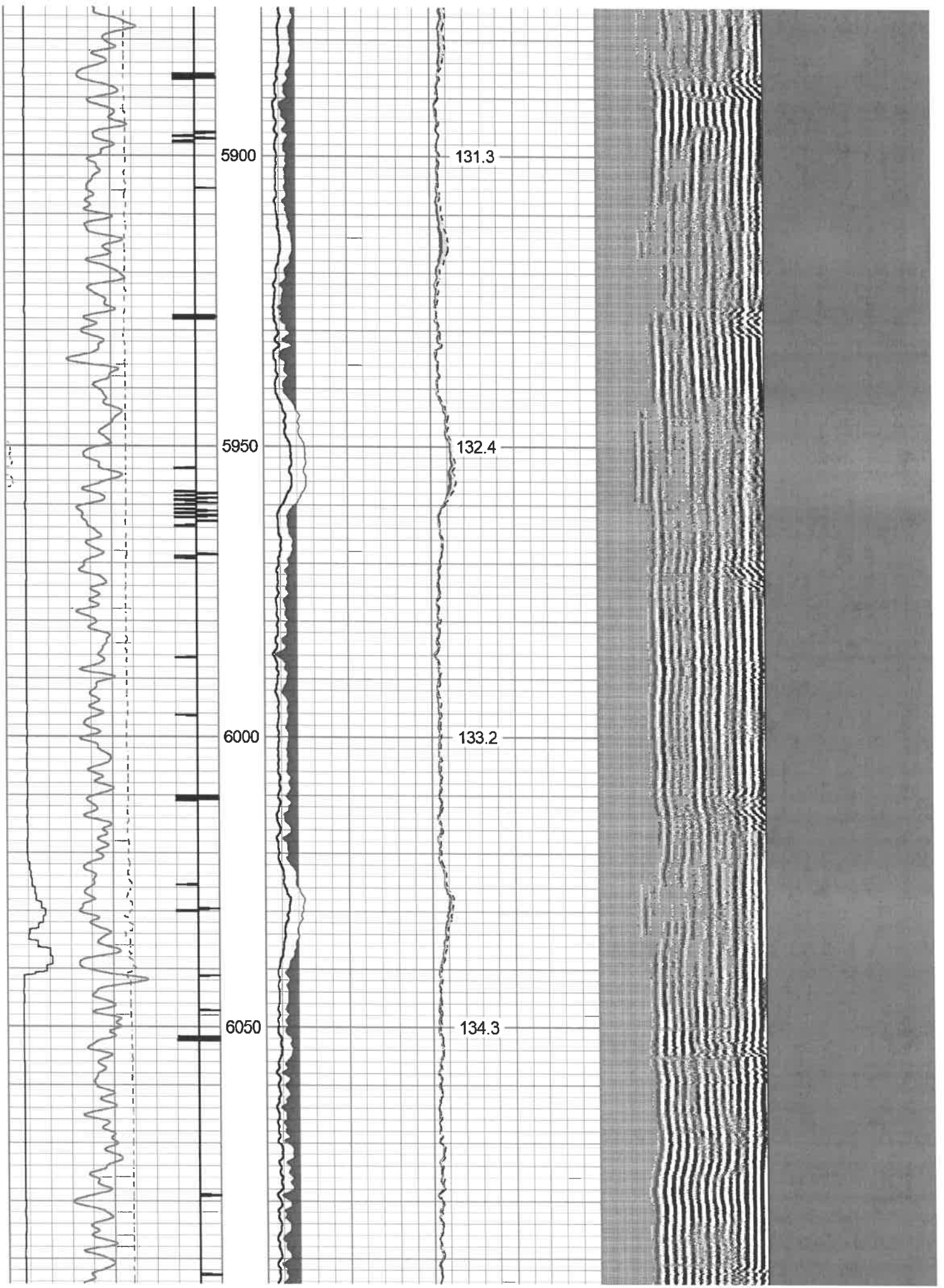


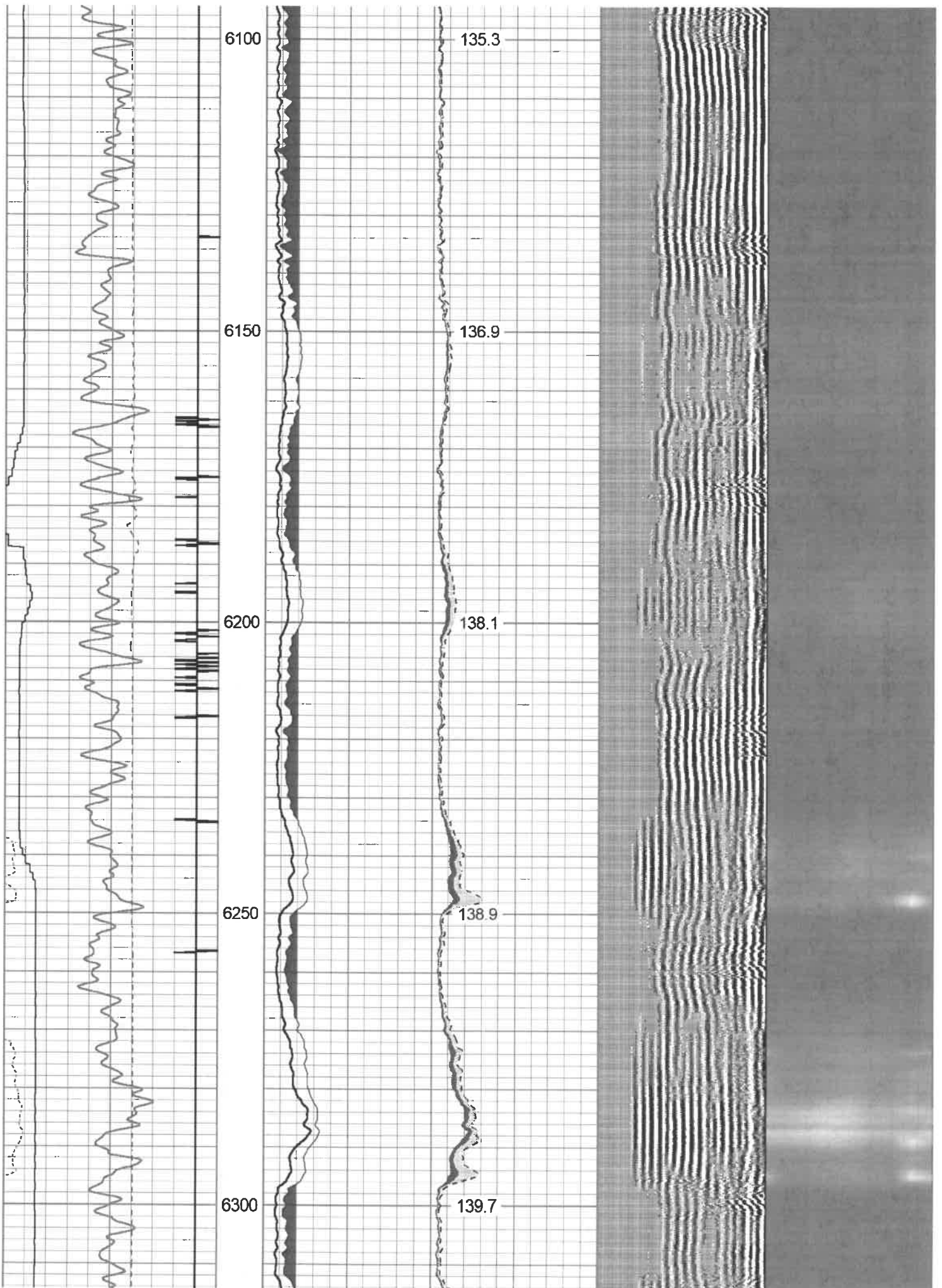


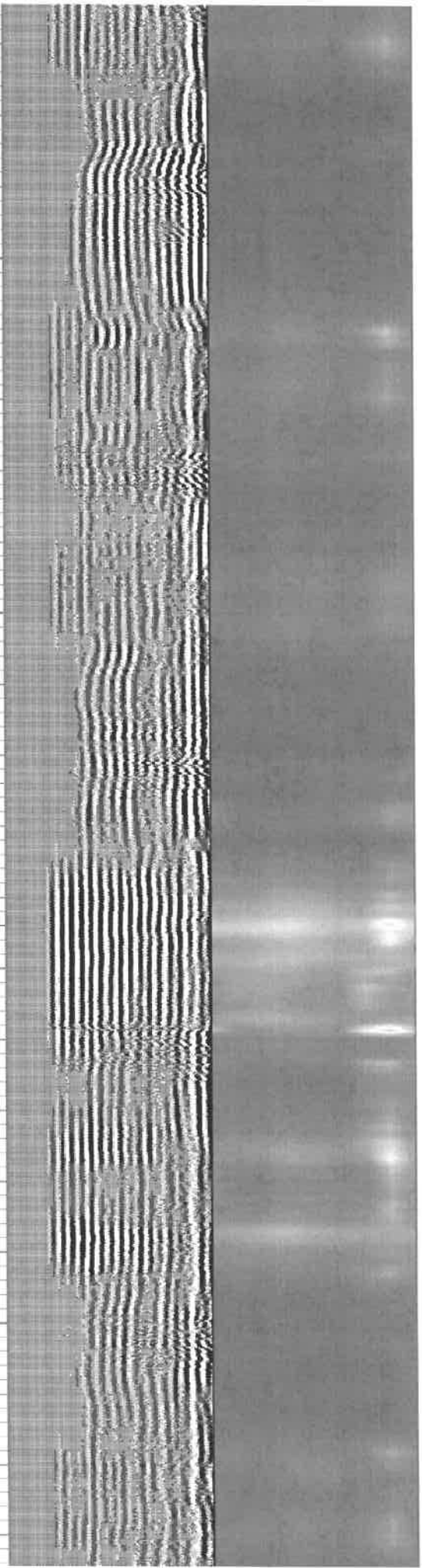
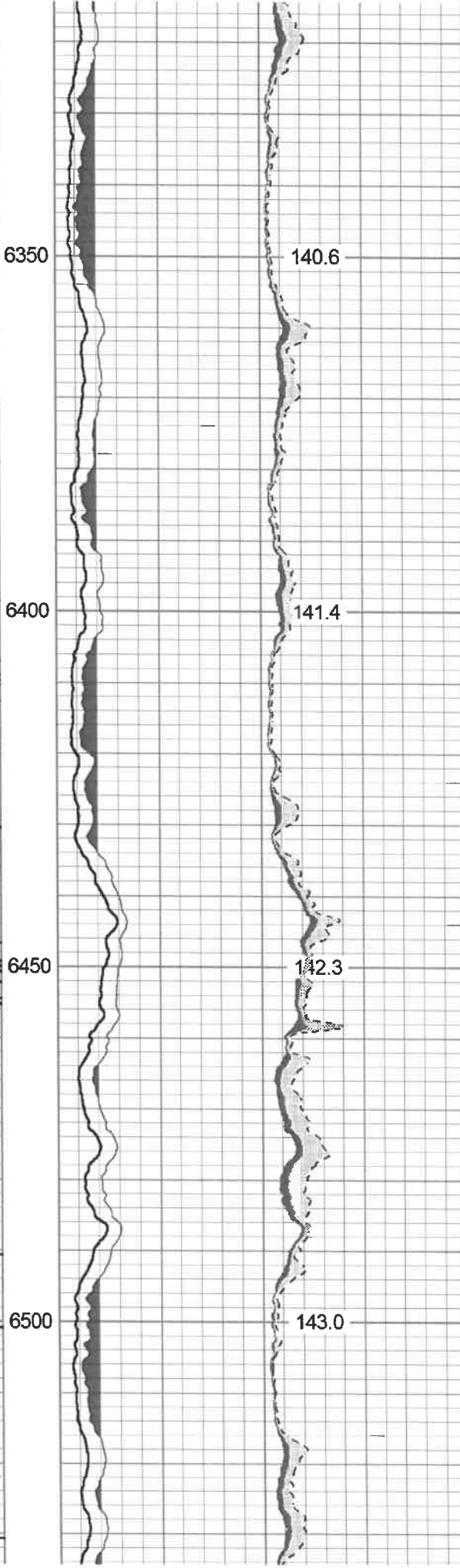
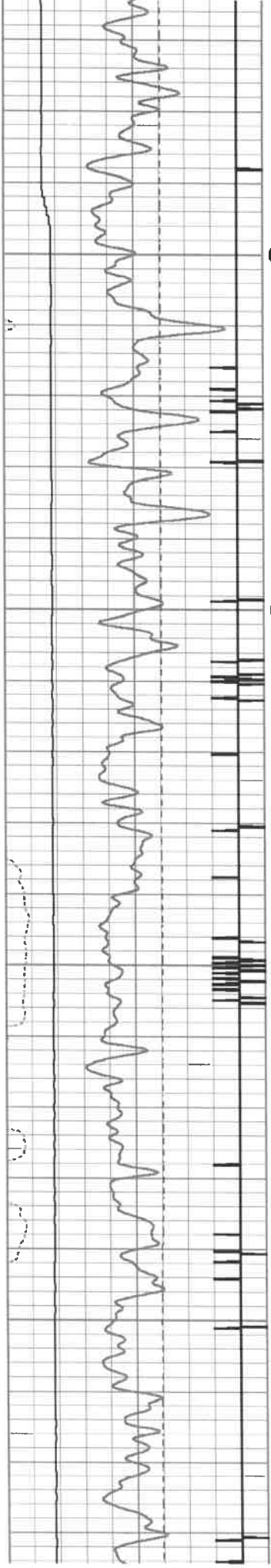


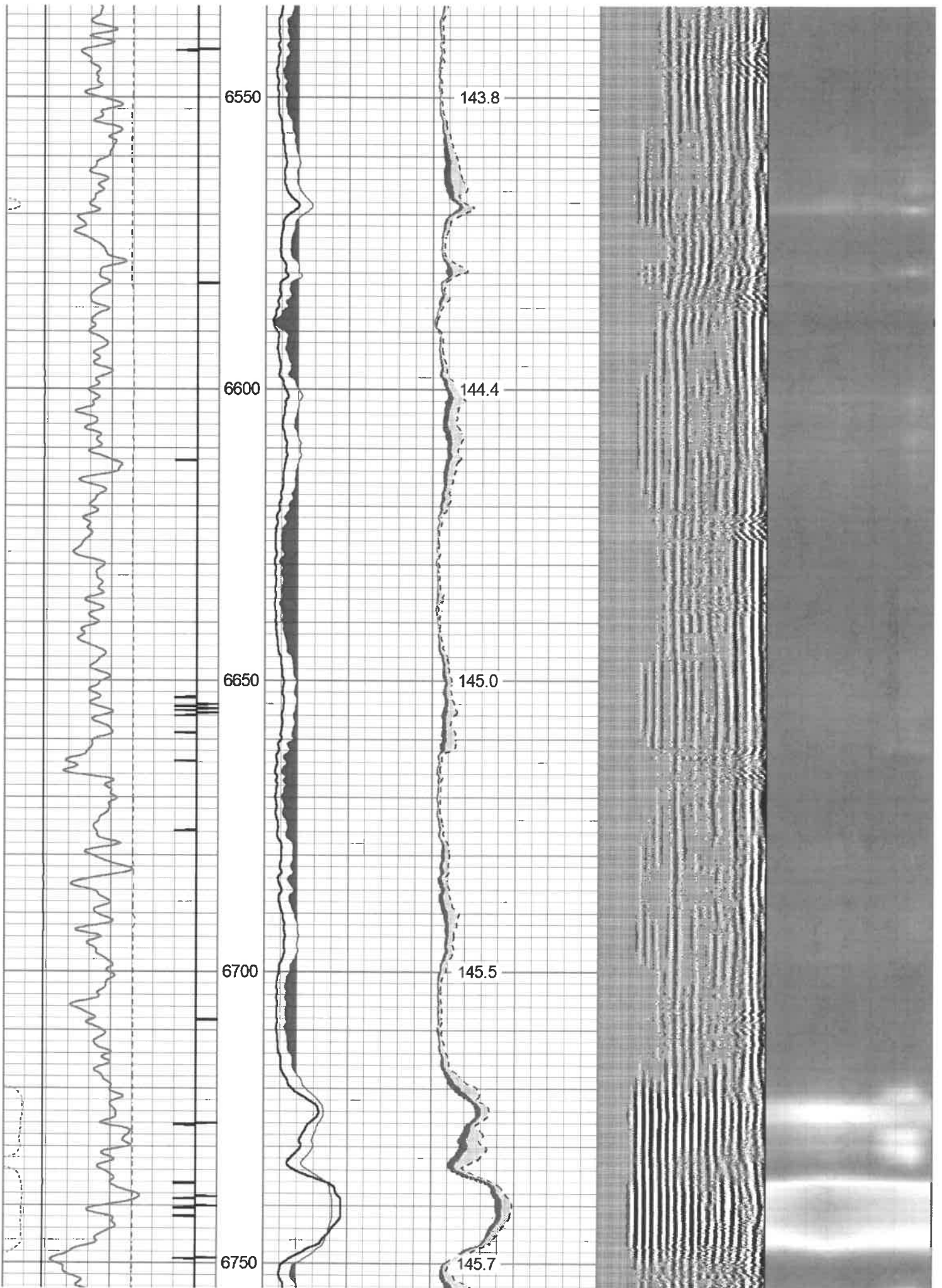




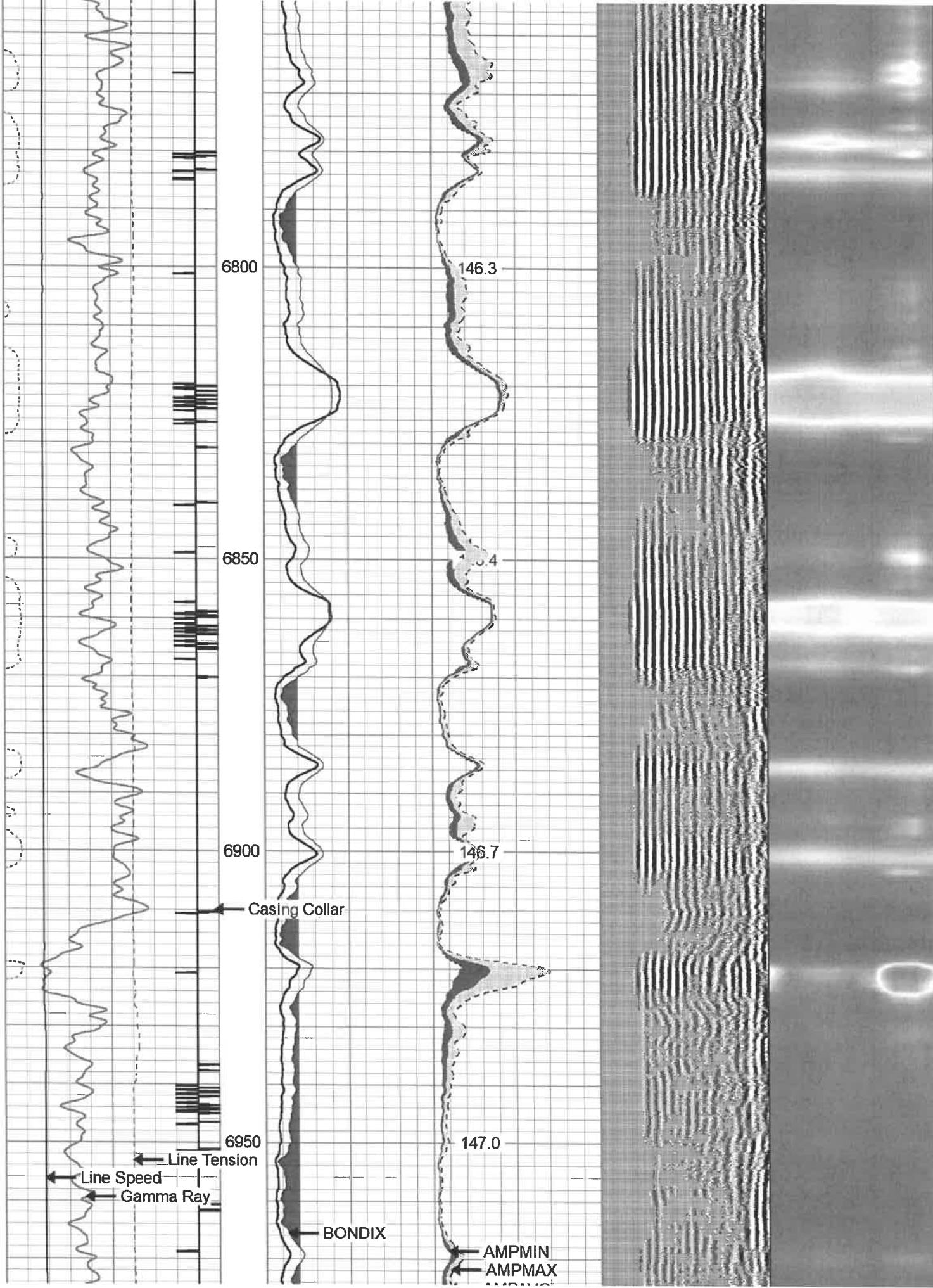


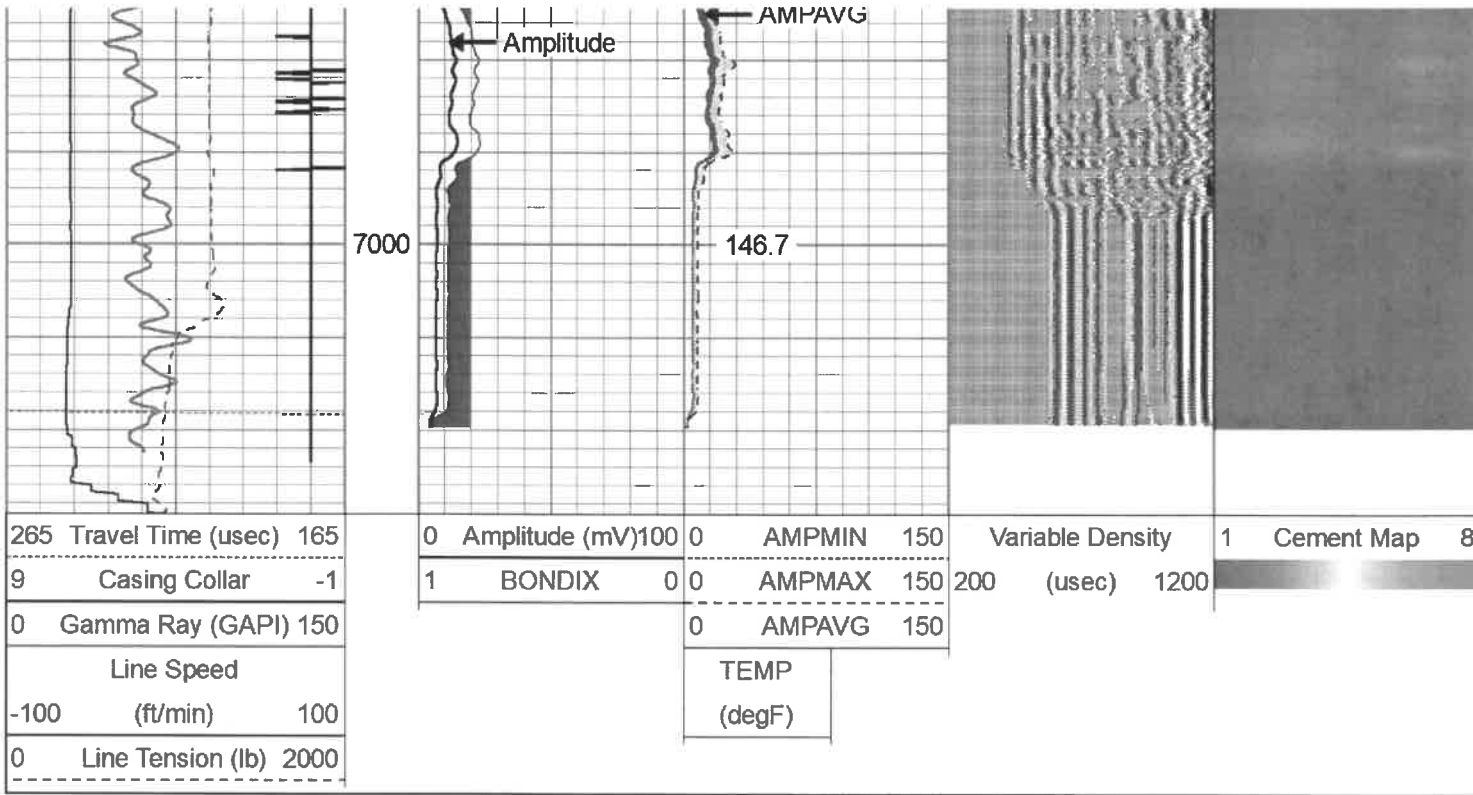






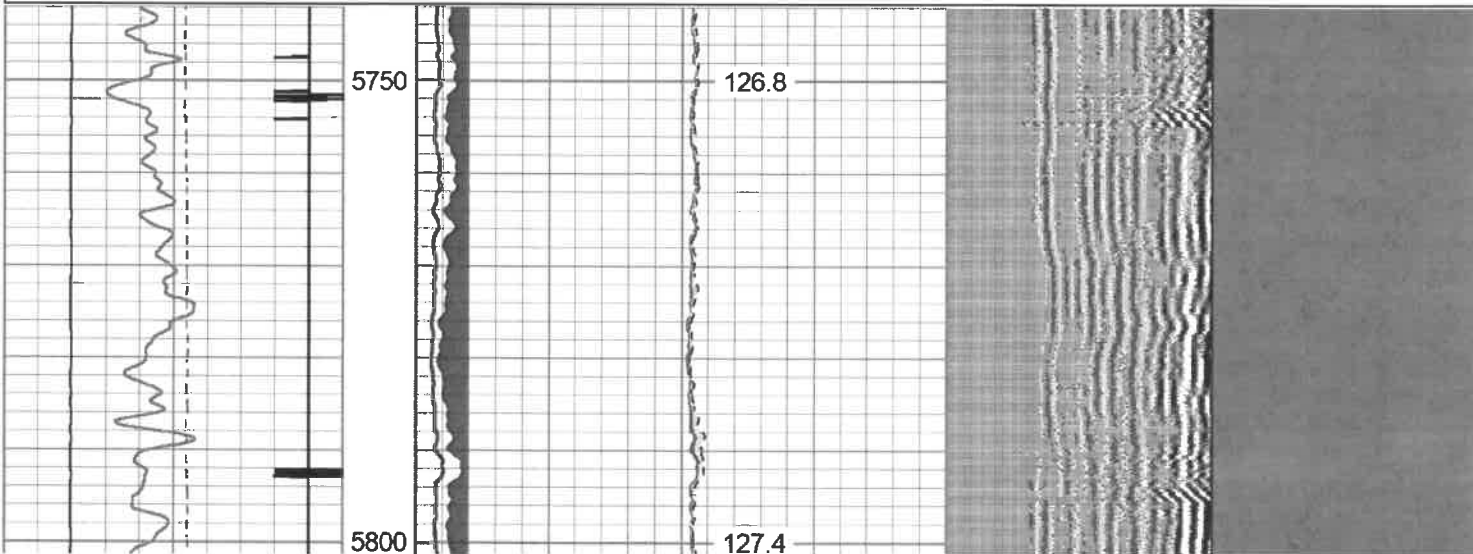
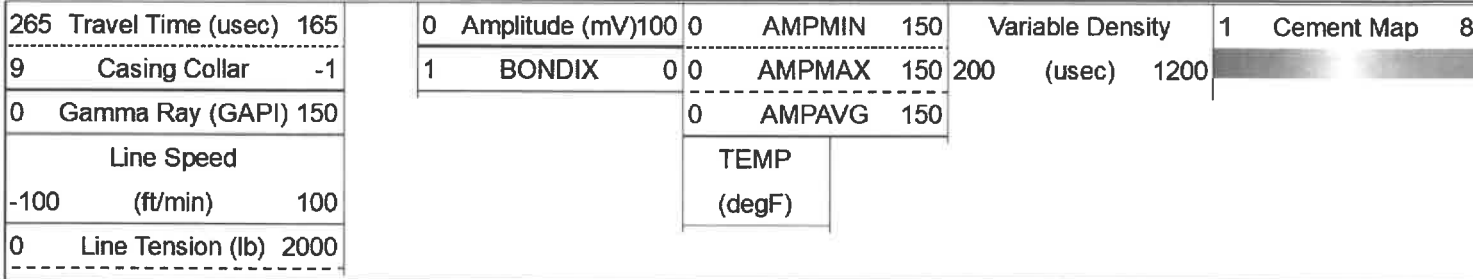


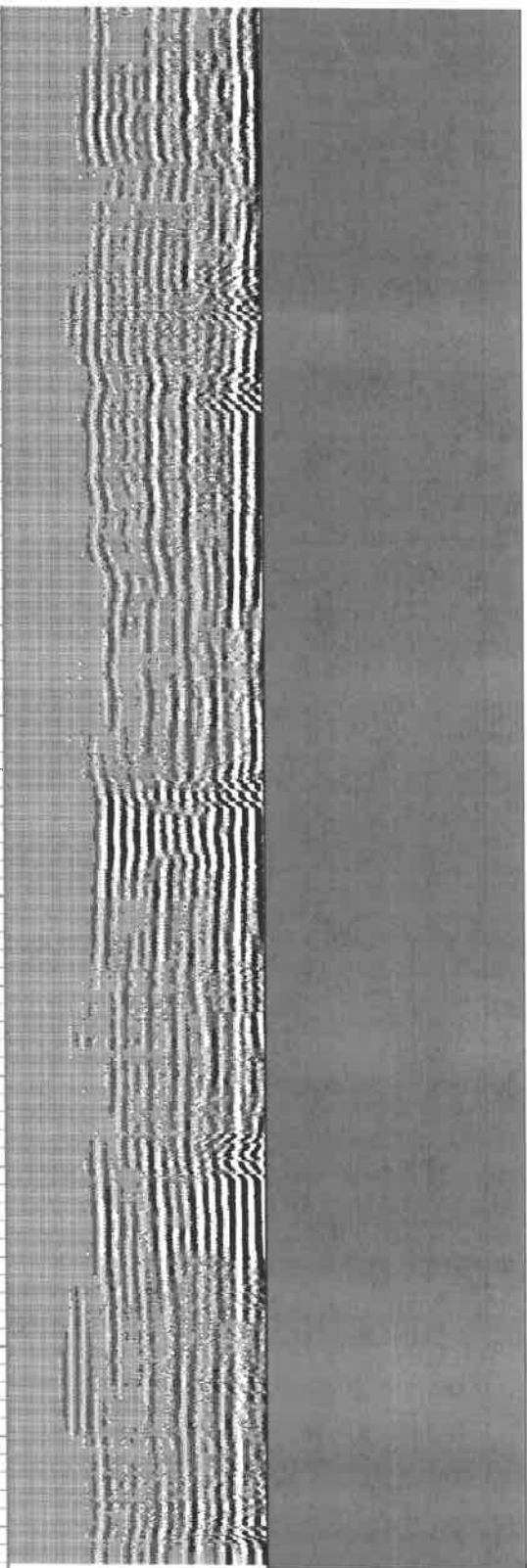
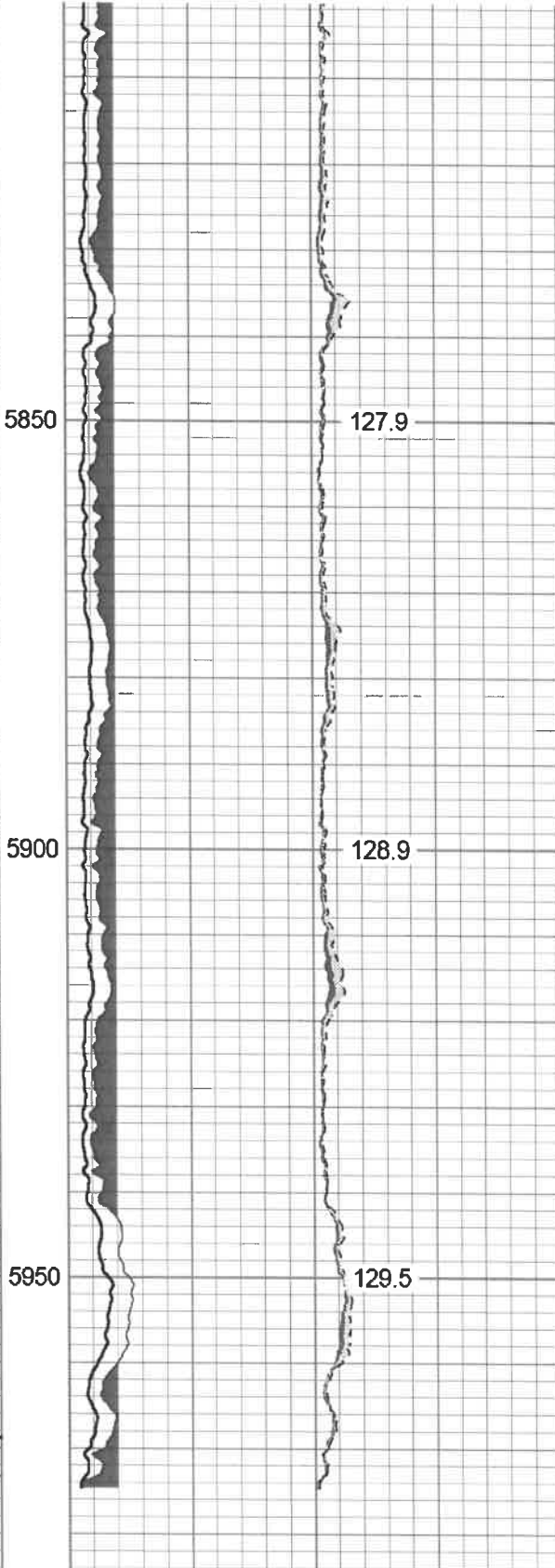
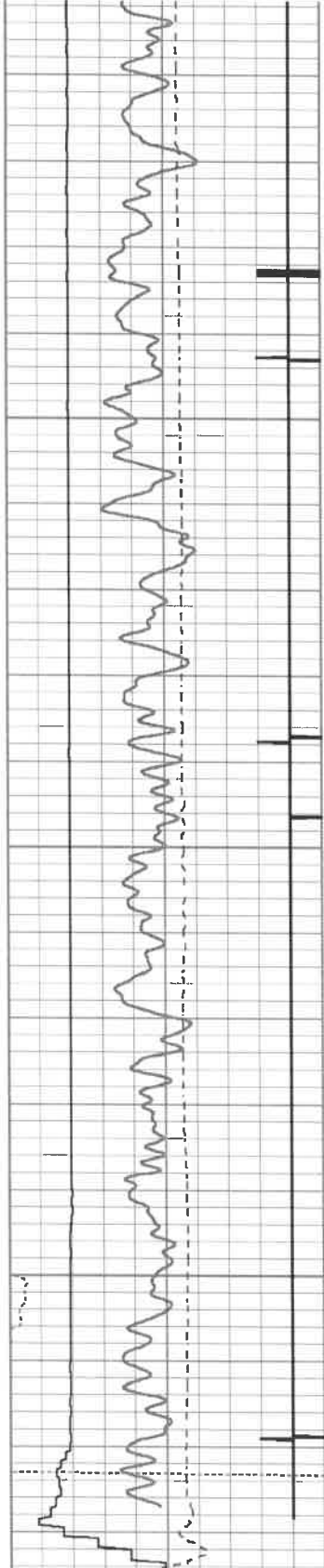




# Repeat Pass 1,500 PSI

Database File antero\_elk\_fork\_yough\_1h\_rcbl\_18\_mar\_2021.db  
 Dataset Pathname rabbit\_ears/yough\_1h/run1/pass2  
 Presentation Format rcbl-bond index for antero 1020  
 Dataset Creation Thu Mar 18 13:16:04 2021  
 Charted by Depth in Feet scaled 1:240





265	Travel Time (usec)	165
9	Casing Collar	-1
0	Gamma Ray (GAPI)	150
Line Speed		
-100	(ft/min)	100
0	Line Tension (lb)	2000

0	Amplitude (mV)	100	0	AMPMIN	150
1	BONDIX	0	0	AMPMAX	150
			0	AMPAVG	150
TEMP					
(degF)					

Variable Density	1	Cement Map	8
(usec)	200		1200

# Log Variables

DatabaseC:\ProgramData\Warrrior\Data\antero\_elk\_fork\_yough\_1h\_rcbl\_18\_mar\_2021.db  
 Dataset rabbit\_ears/yough\_1h/run1/pass6.1/\_vars\_

## Top - Bottom

BHTEMP_Src TEMP	BOREID in 8.5	BOTTEMP degF 146.6	CASEOD in 5.5	CASETHCK in 0.415	CASEWGHT lb/ft 23	MAXAMPL mV 71.9	MINAMPL mV 3.4
MINATTN db/ft 9.6	PERFS No	PPT usec 260	SRFTEMP degF 58	TDEPTH ft 6990			

## 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\_elk\_fork\_yough\_1h\_rcbl\_18\_mar\_2021.db  
 Dataset Pathname rabbit\_ears/yough\_1h/run1/pass6  
 Dataset Creation Thu Mar 18 13:29:24 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
WVFS8	11.78		RBT-Probe275T (FW1312-32) Probe 2.75" Radial with Integral Temperature Sub	9.39	2.75	90.00
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\_yough\_1h\_rcbl\_18\_mar\_2021.db: rabbit\_ears/yough\_1h/run1/pass6  
 Total length: 17.92 ft  
 Total weight: 197.00 lb  
 O.D.: 4.88 in

	Company	ANTERO	
	Well	Elk Fork Yough 1H	
	Field	RABBIT EARS	
	County	TYLER	
	State	WEST VIRGINIA	Country