



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

Company	Antero Resources	Location:	API #: 47-095-027260	Other Services
Well	Blizzard Whitmore 1H	SEC	TWP	RGE
Field	Rabbit Ears	Ground Level	Elevation	
County	Tyler	Log Measured From	Kelly Bushing 25.5'	K.B.
State	WV	Drilling Measured From	Kelly Bushing	D.F.
				G.L.

Date	26-Jul-2021			
Run Number	One			
Depth Driller	23,682'			
Depth Logger	6,748'			
Bottom Logged Interval	6,772'			
Top Log Interval	Surface			
Open Hole Size	N/A			
Type Fluid	Water			
Density / Viscosity	N/A			
Max. Recorded Temp.	143 Deg. F.			
Estimated Cement Top	6,448'			
Time Well Ready	8:30			
Time Logger on Bottom	8:50			
Equipment Number	116 (P4) (G1)			
Location	Charleroi, PA			
Recorded By	Matt McNally			
Witnessed By	Redgie Taylor			

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To

Casing Record			
Surface String	Size	Wgt/Ft	Top
Production String	5.5"	23#	Surface
Liner			
Marker			

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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

Primary Log on Well

Log Correlated to Marker Joint at 5,347' - 5,357'
Depth Correction +9

Main Pass 1,500 PSI
Repeat 0 PSI

Thank You for Choosing Nine Energy Service Wireline. Charleroi, PA

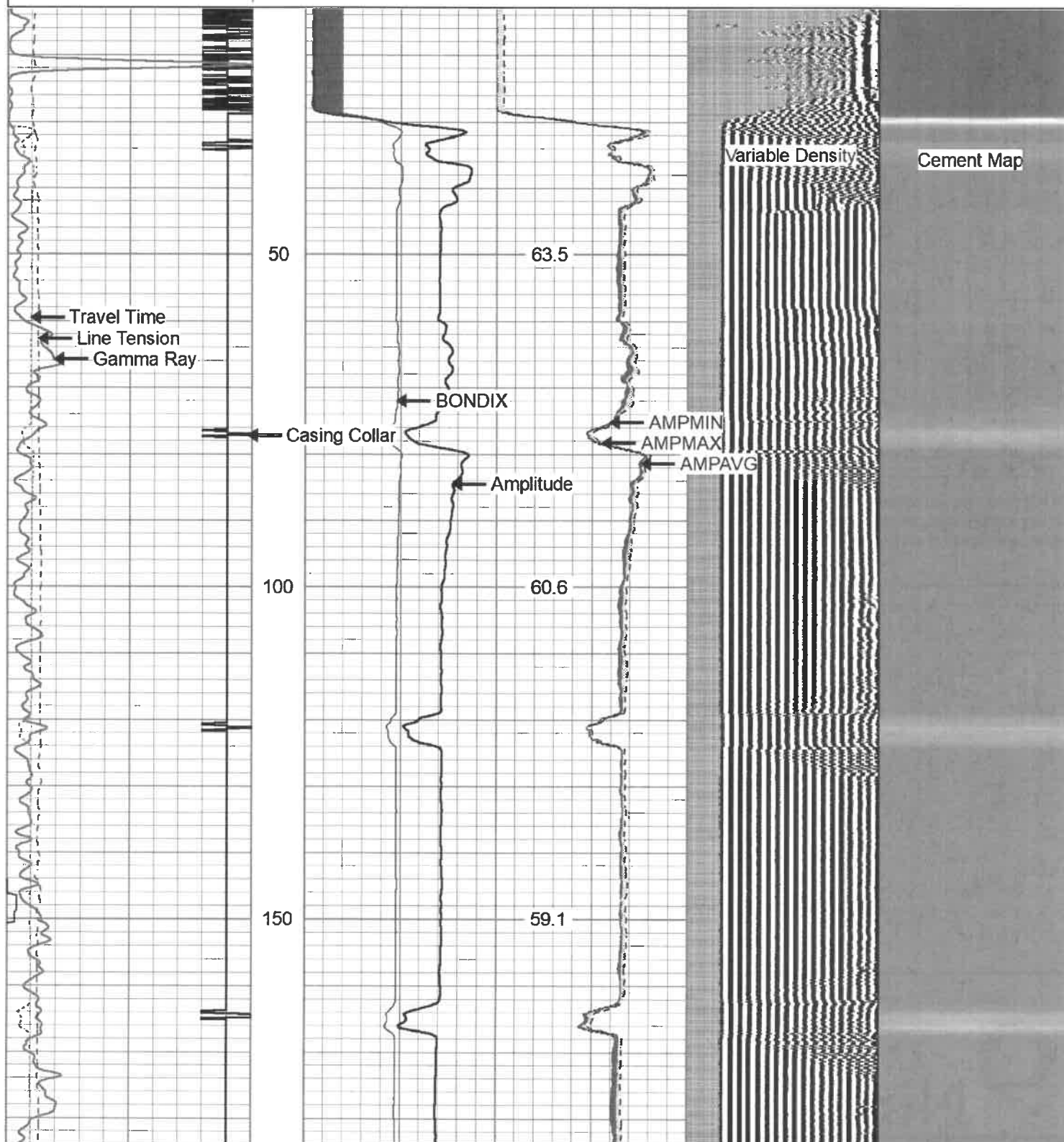


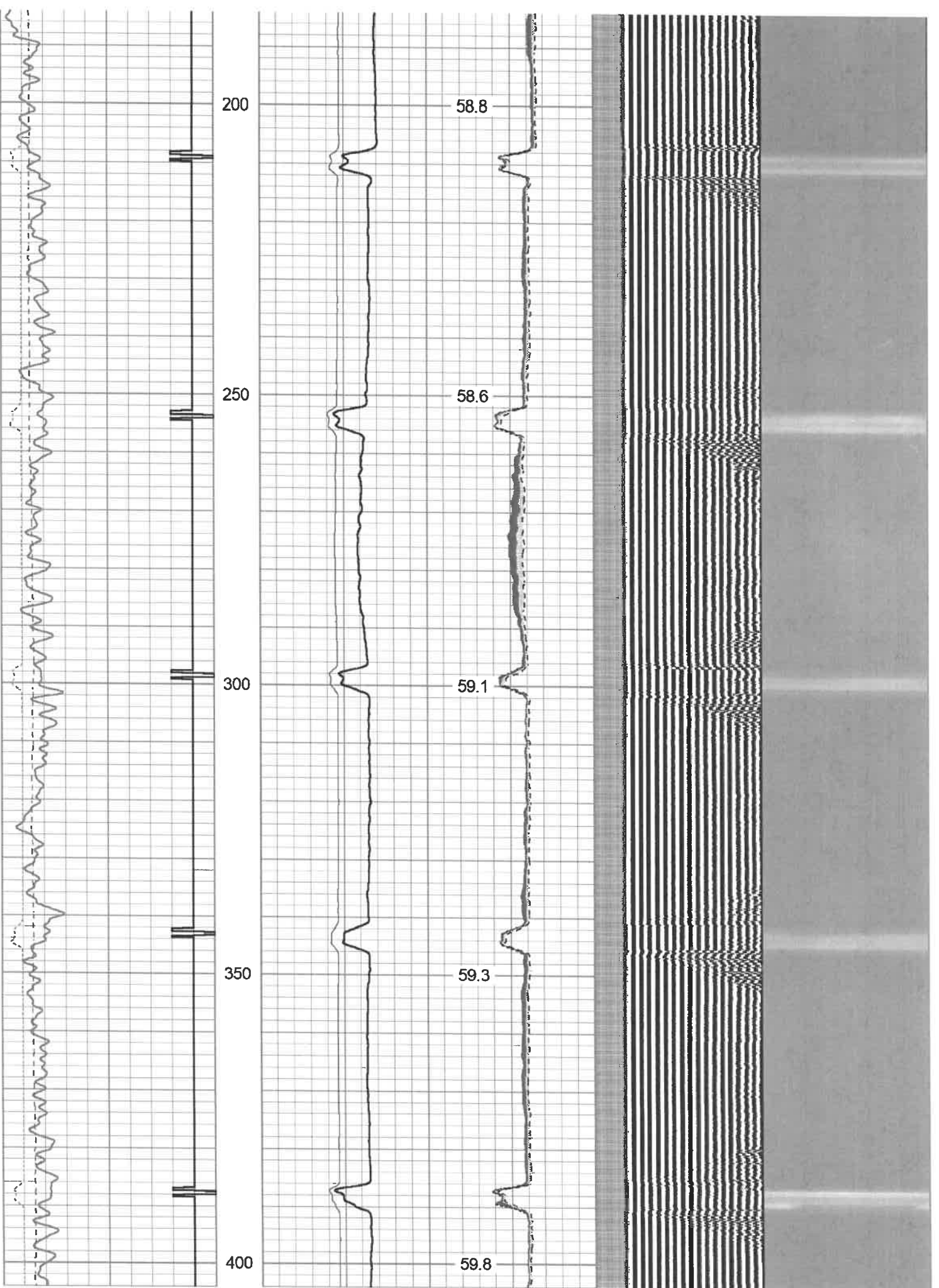
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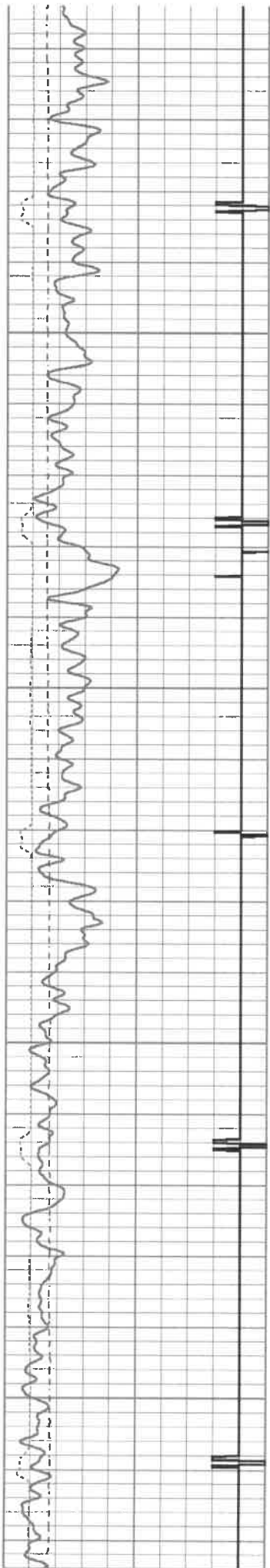
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Database File antero_blizzard_whitmore_1h_rcbl_26_jul_2021.db
 Dataset Pathname rabbit_ears/whitmore_1h/run1/pass5
 Presentation Format rcbl-bond index for antero 1020
 Dataset Creation Mon Jul 26 08:47:27 2021
 Charted by Depth in Feet scaled 1:240

270	Travel Time (usec)	160	0	Amplitude (mV)	100	0	AMP	MIN	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	1	BONDIX	0	0	AMP	MAX	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											





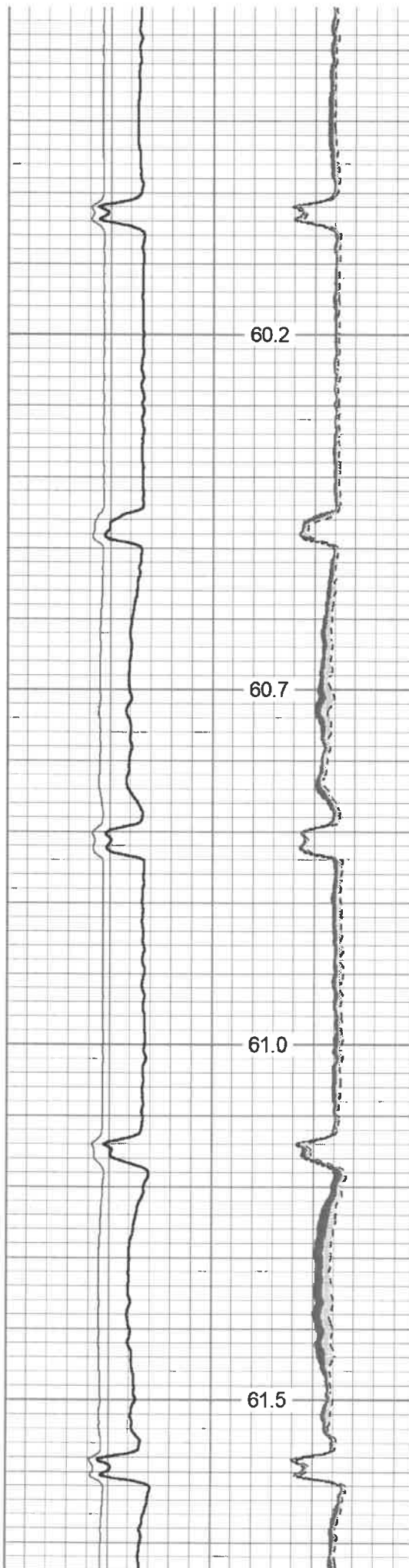


450

500

550

600

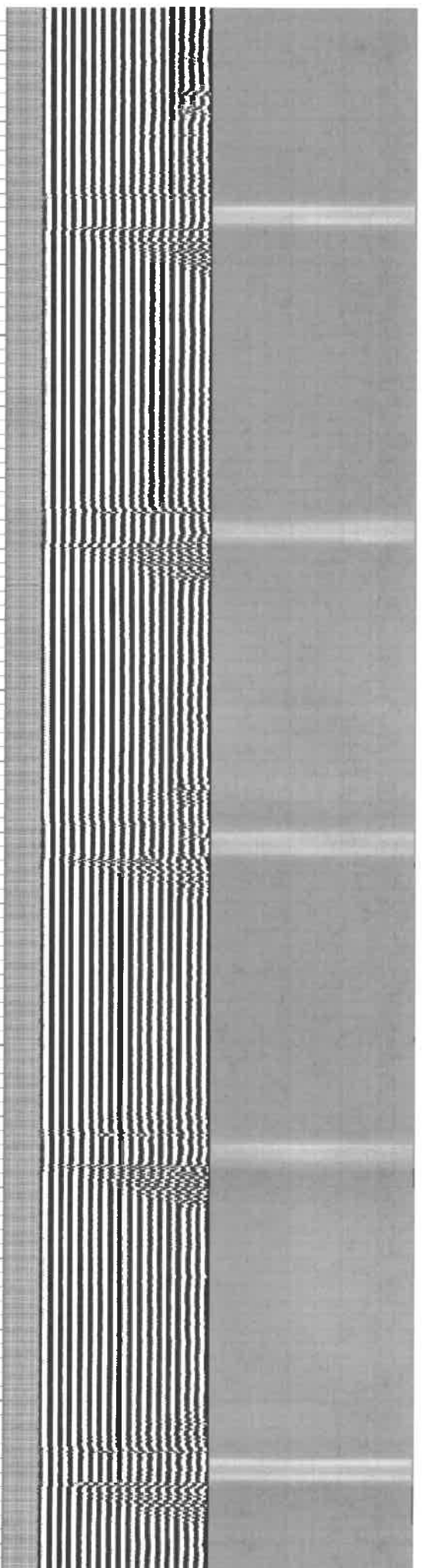


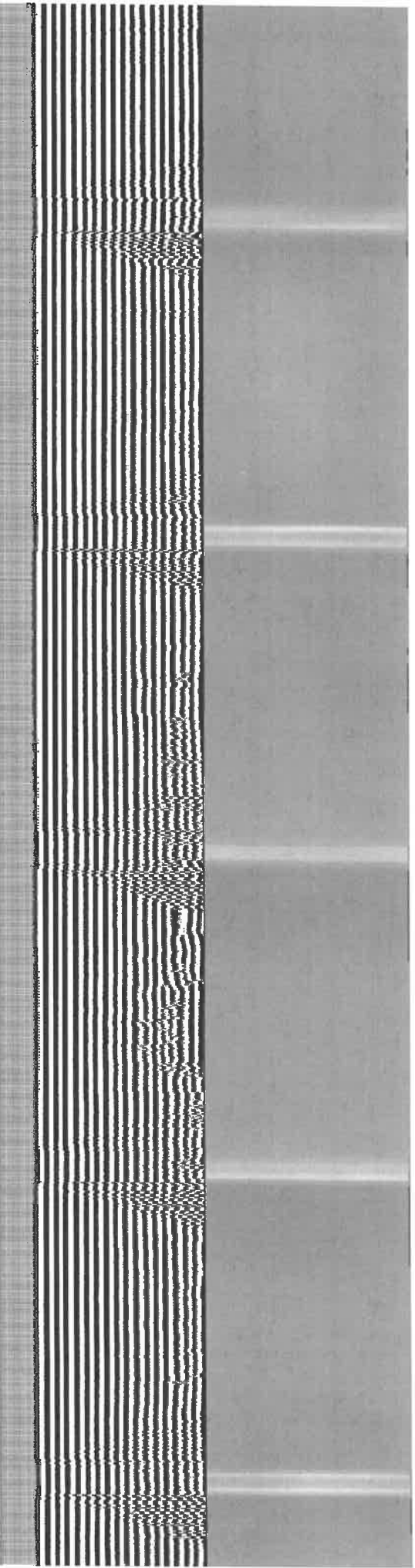
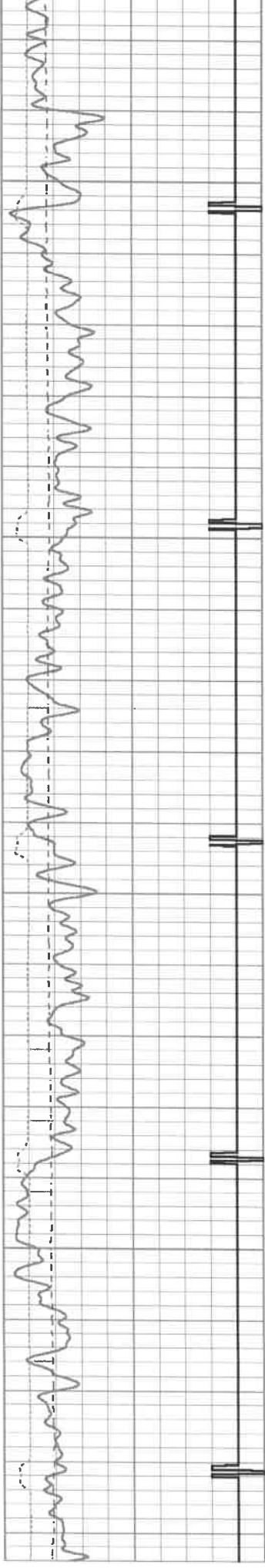
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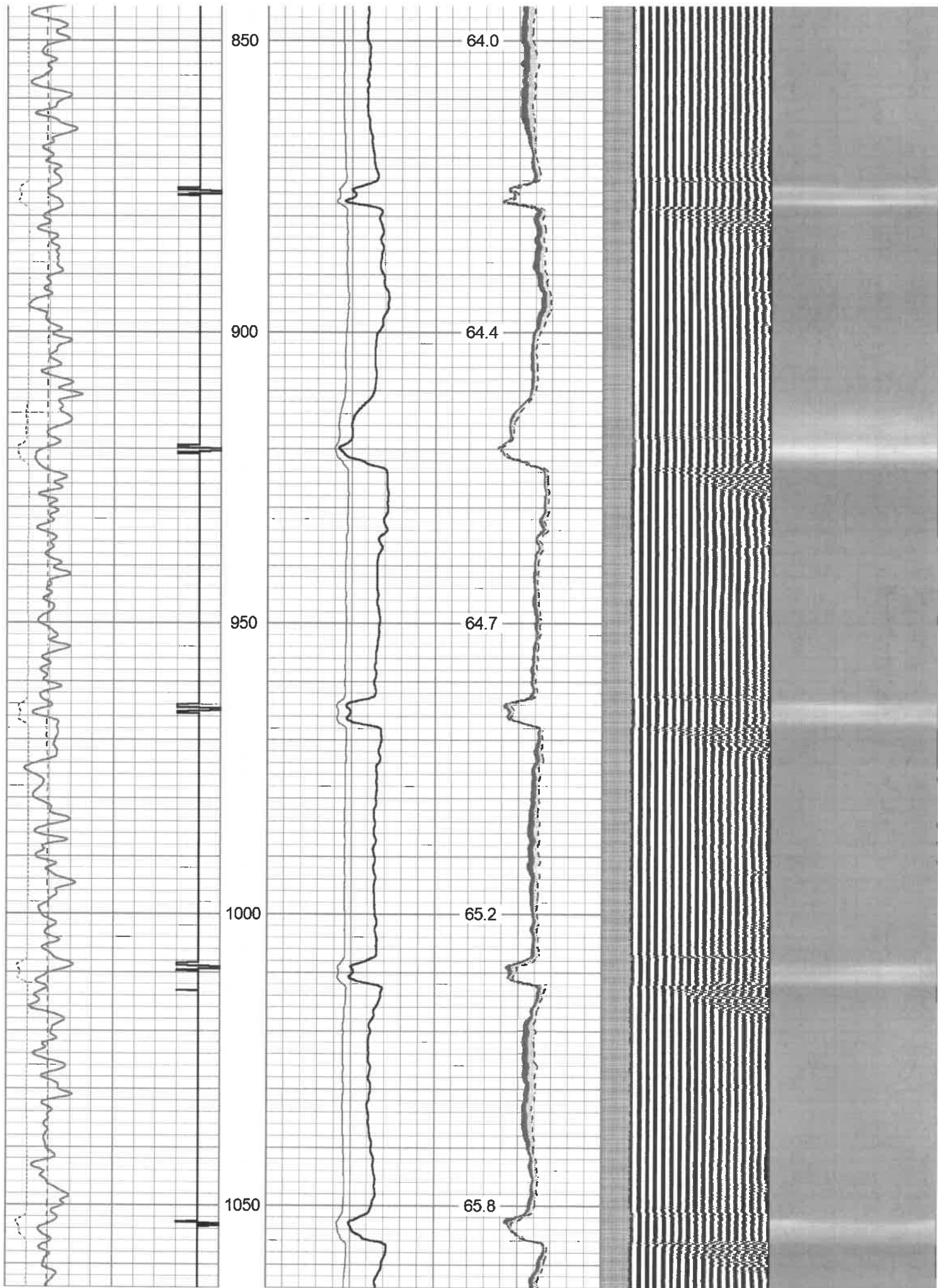
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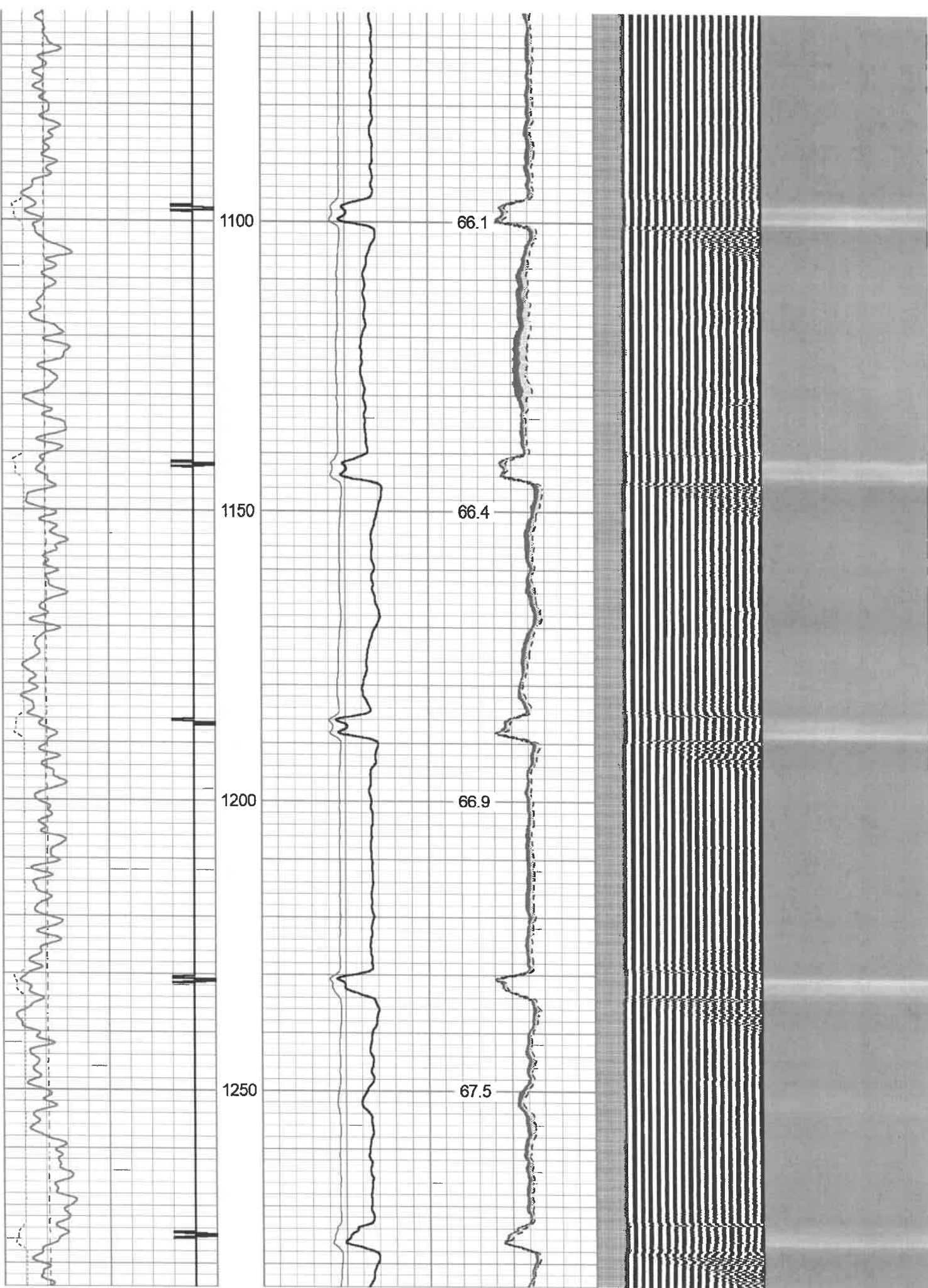
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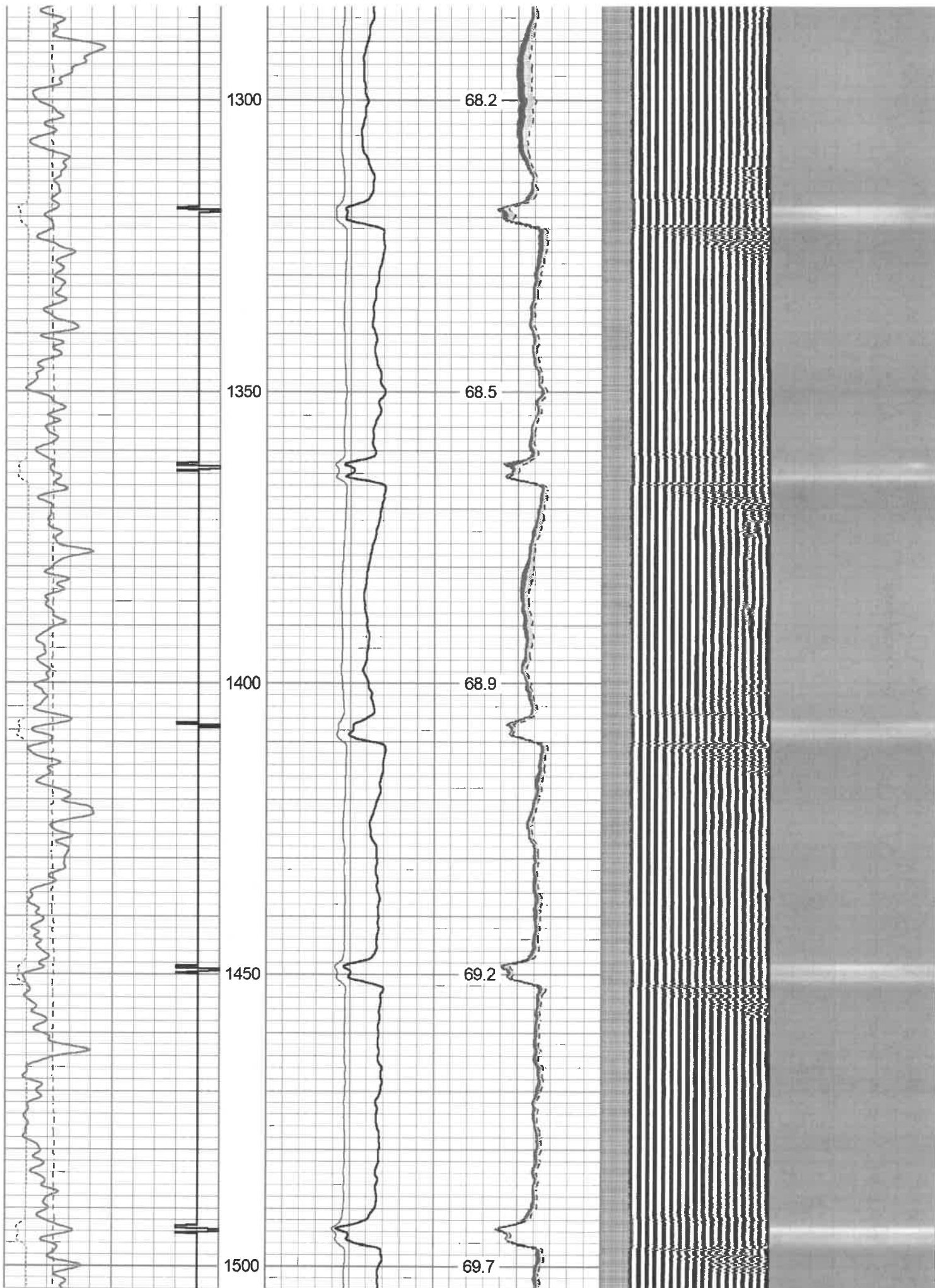
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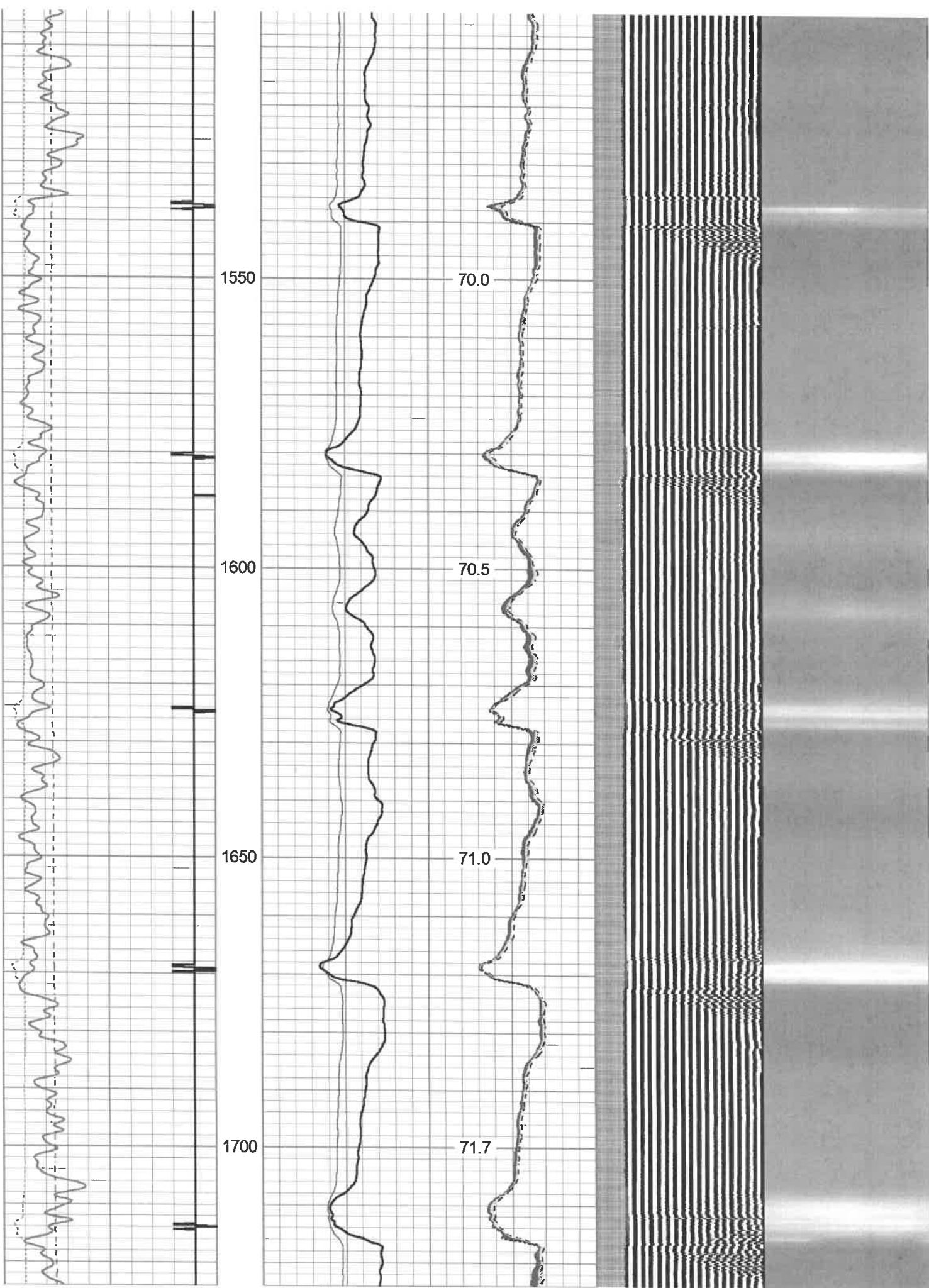


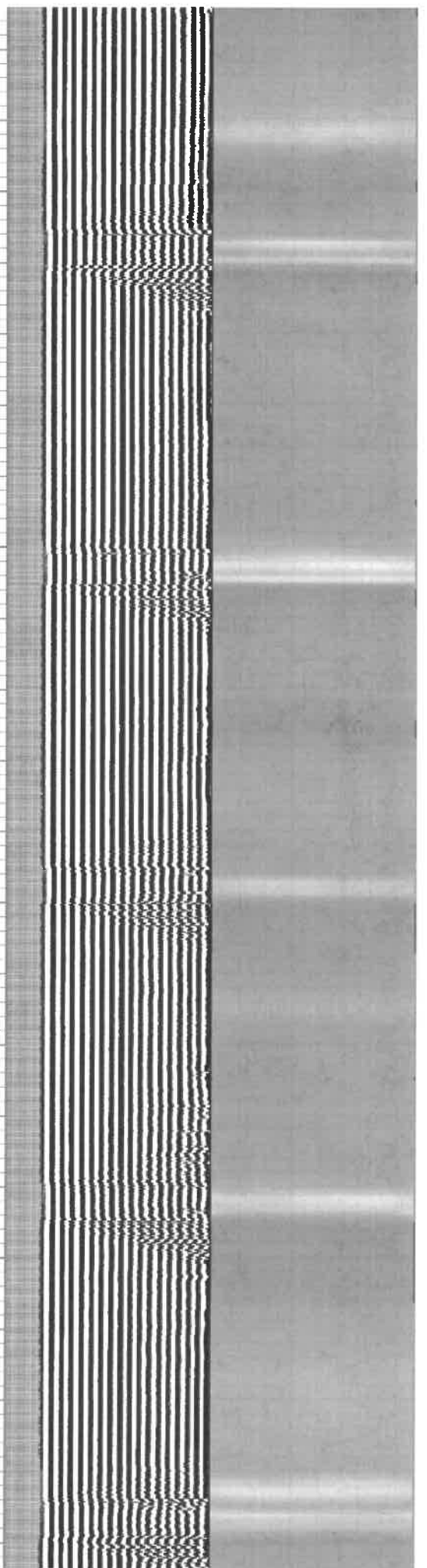
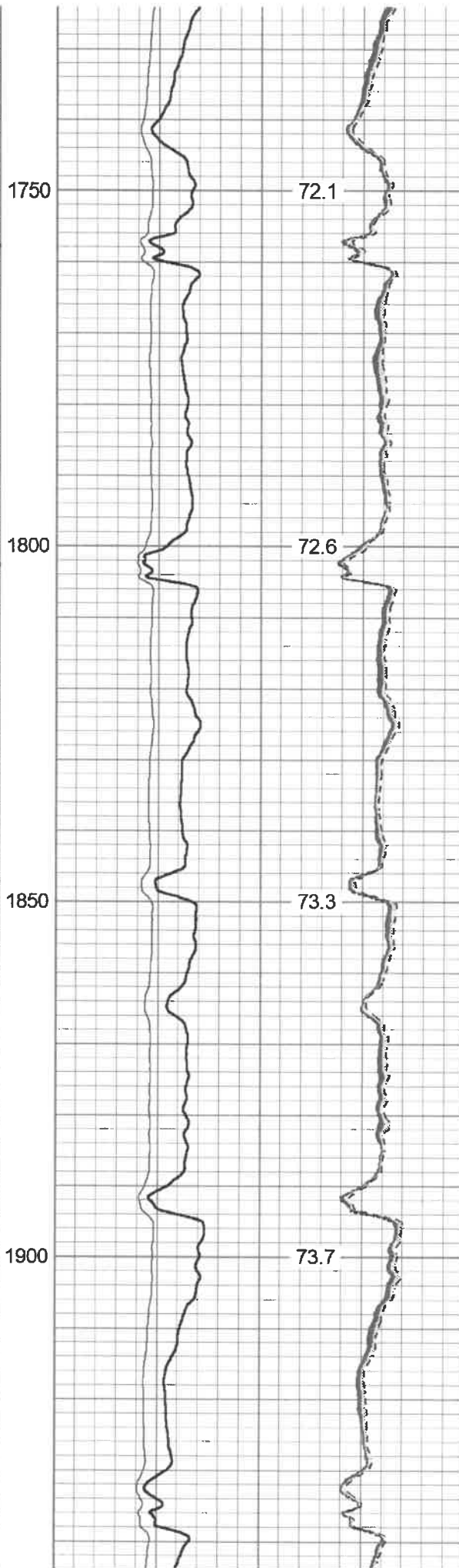
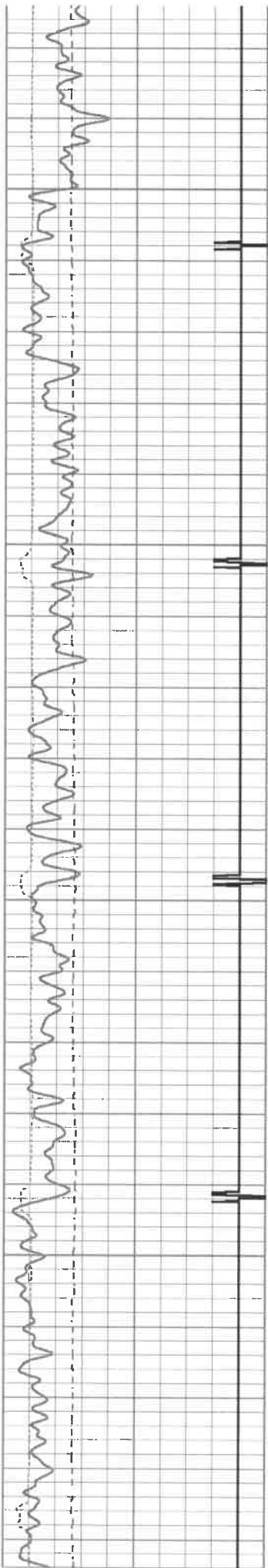


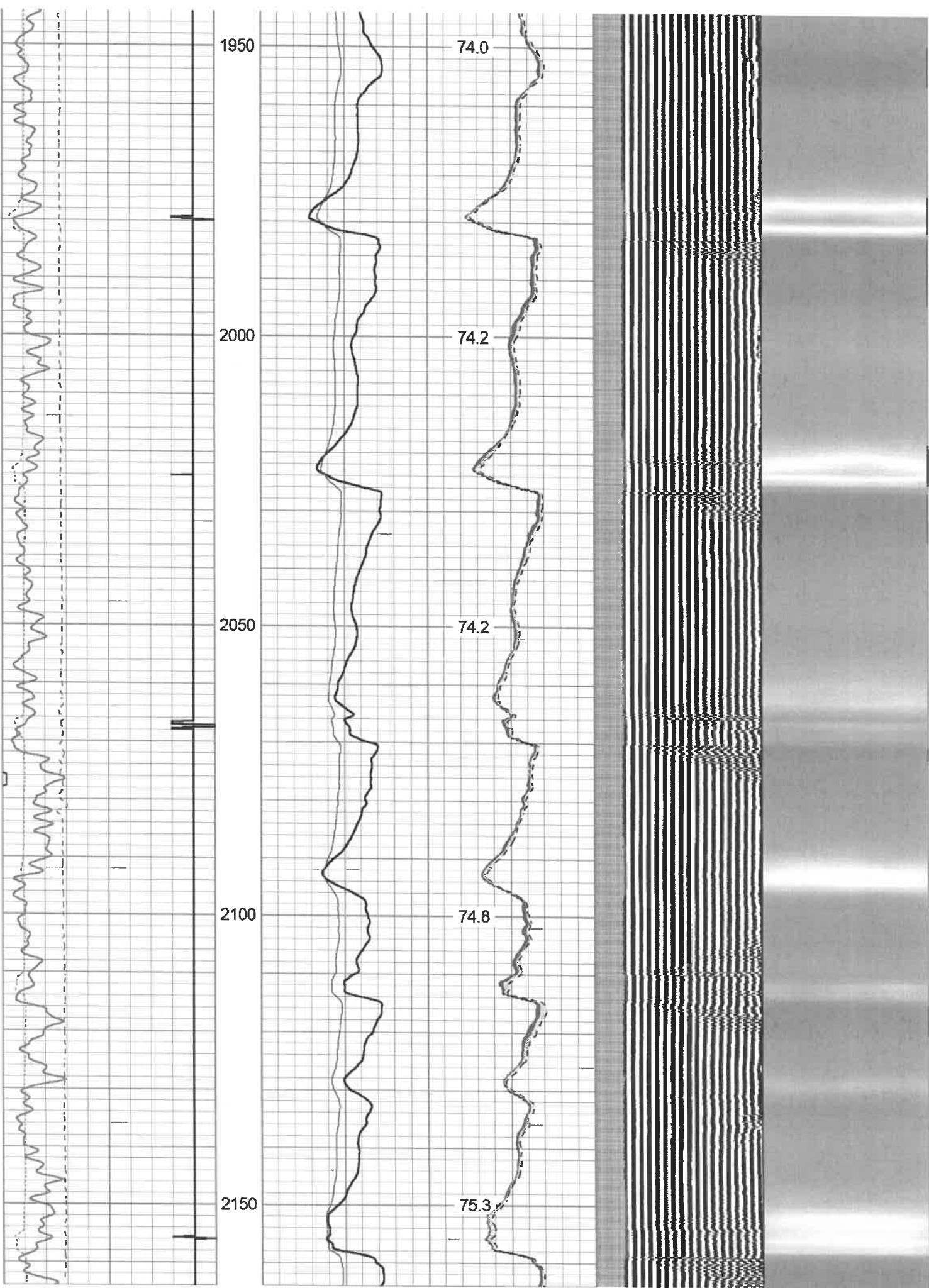


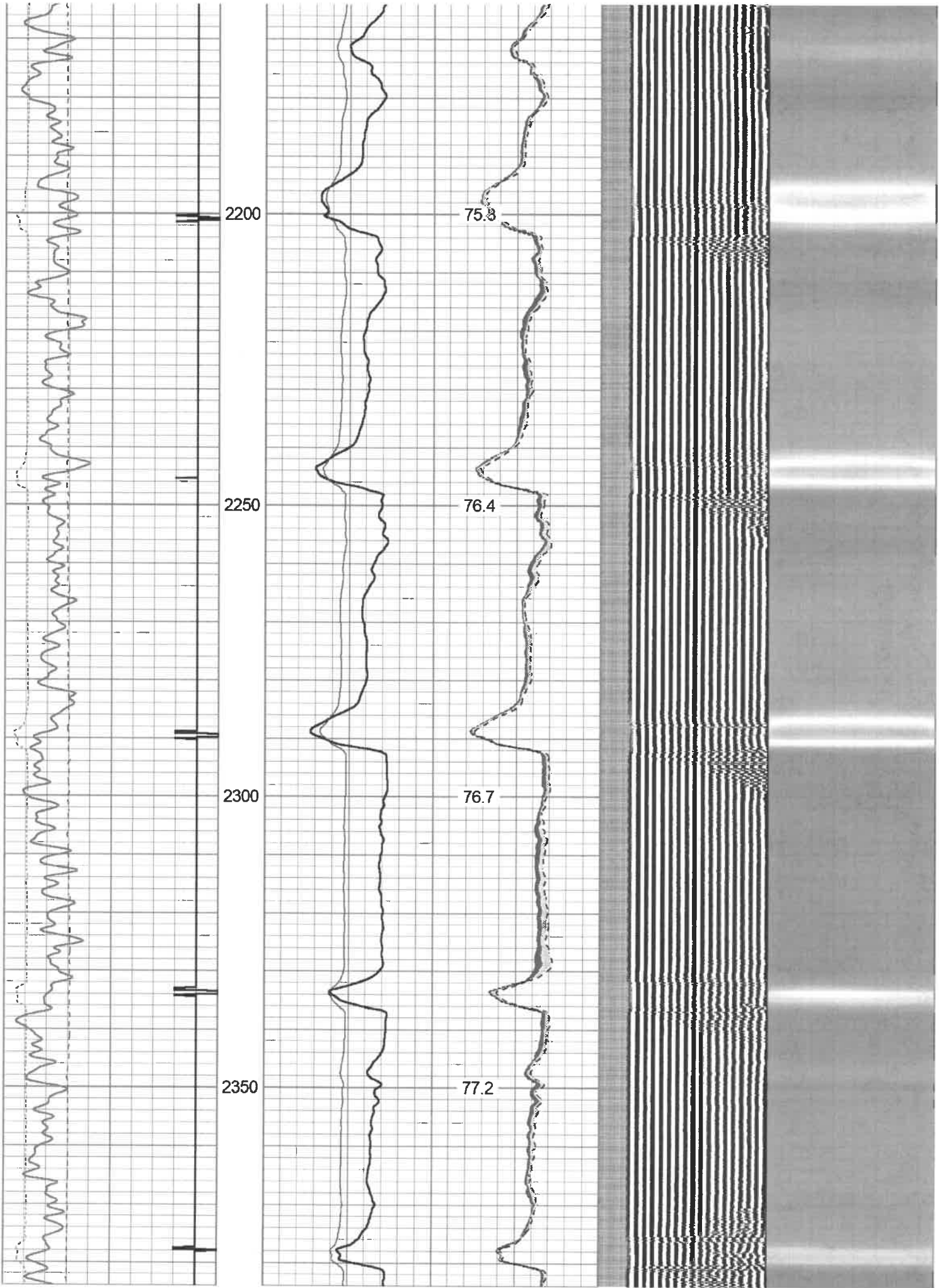


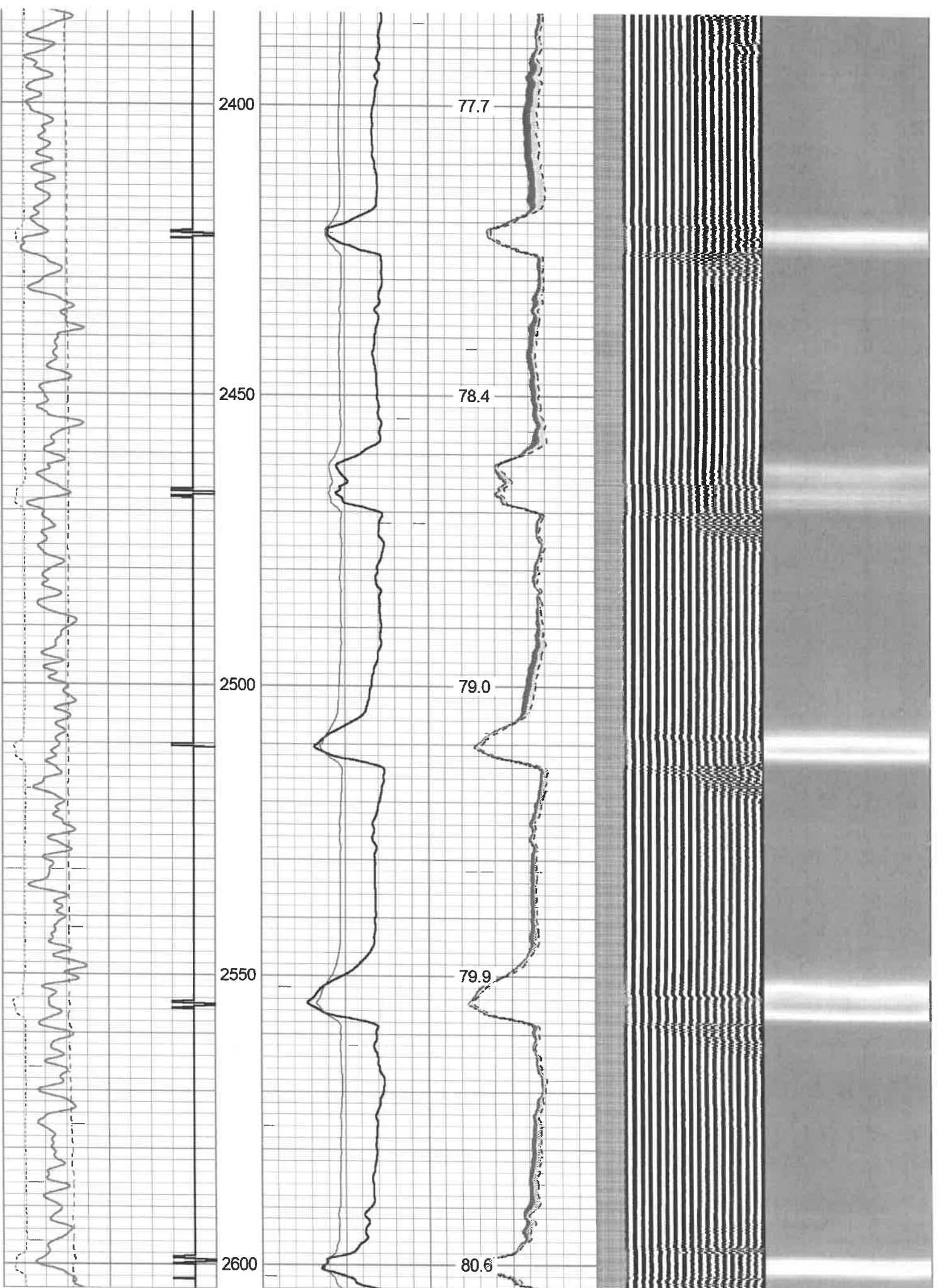


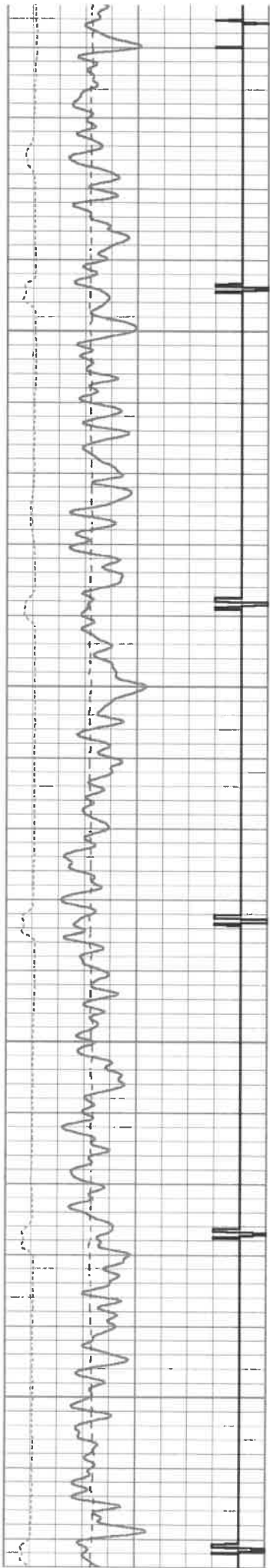










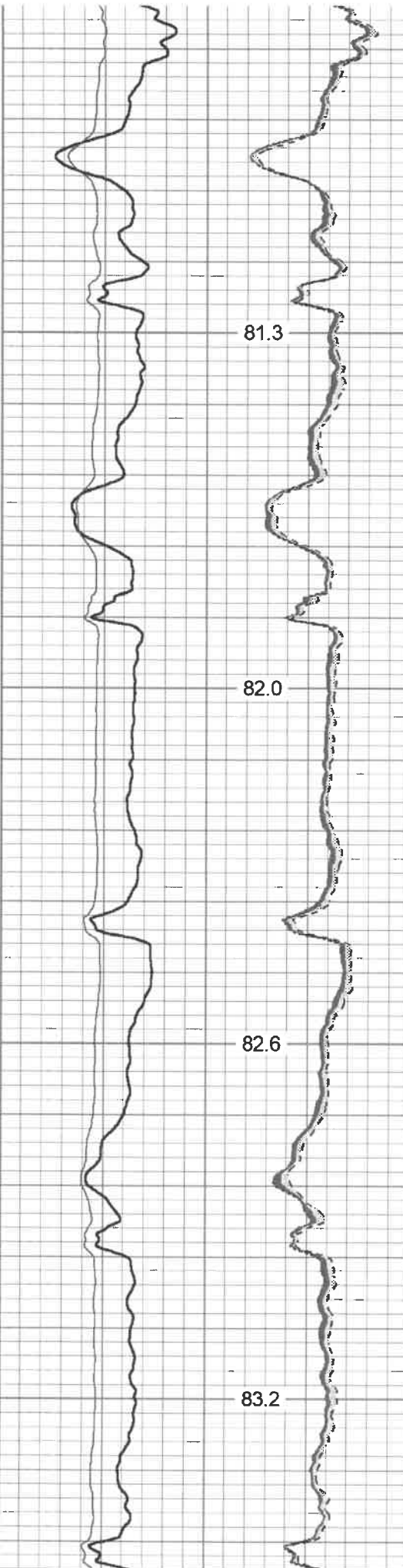


2650

2700

2750

2800

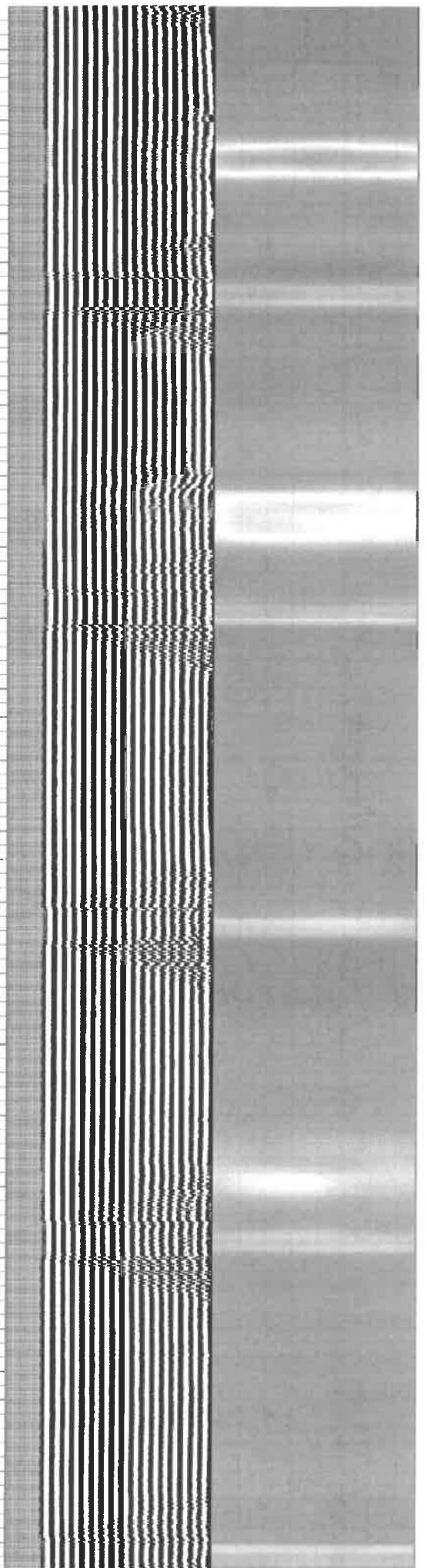


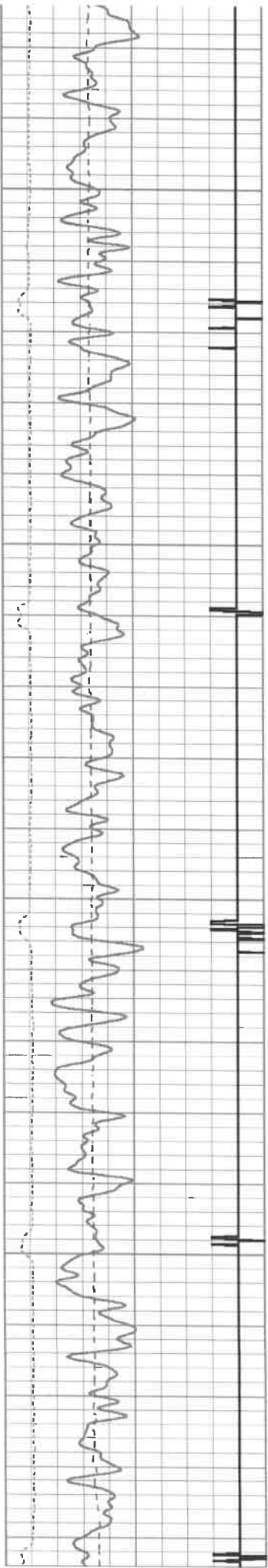
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82.0

82.6

83.2



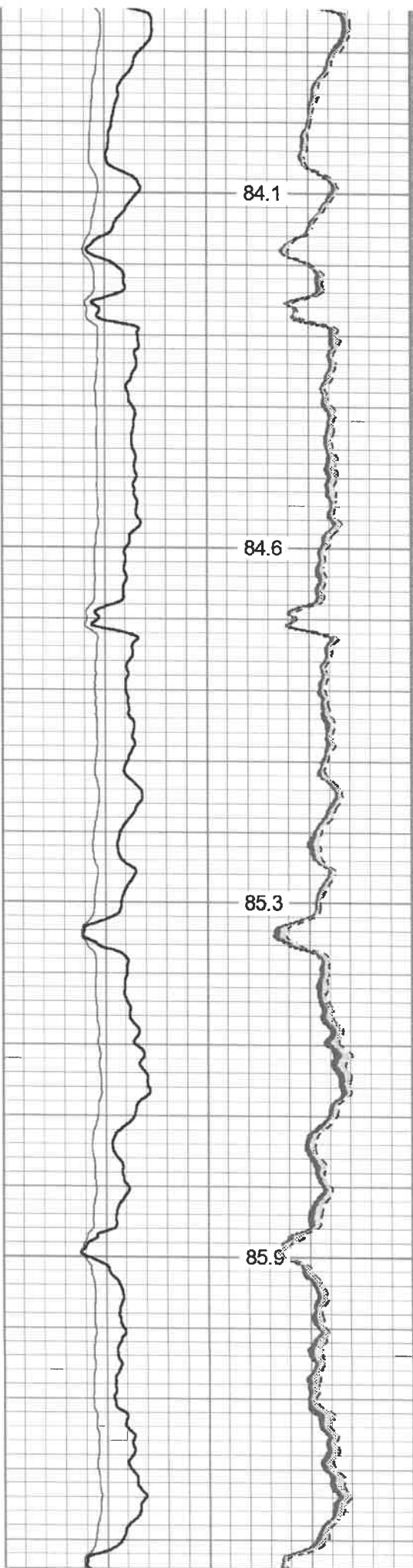


2850

2900

2950

3000

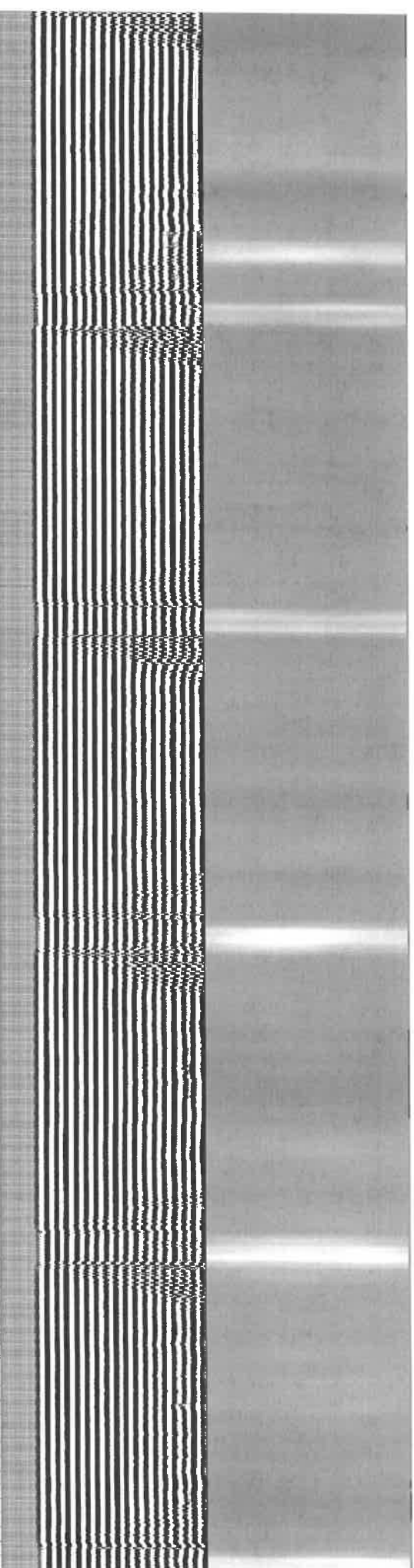


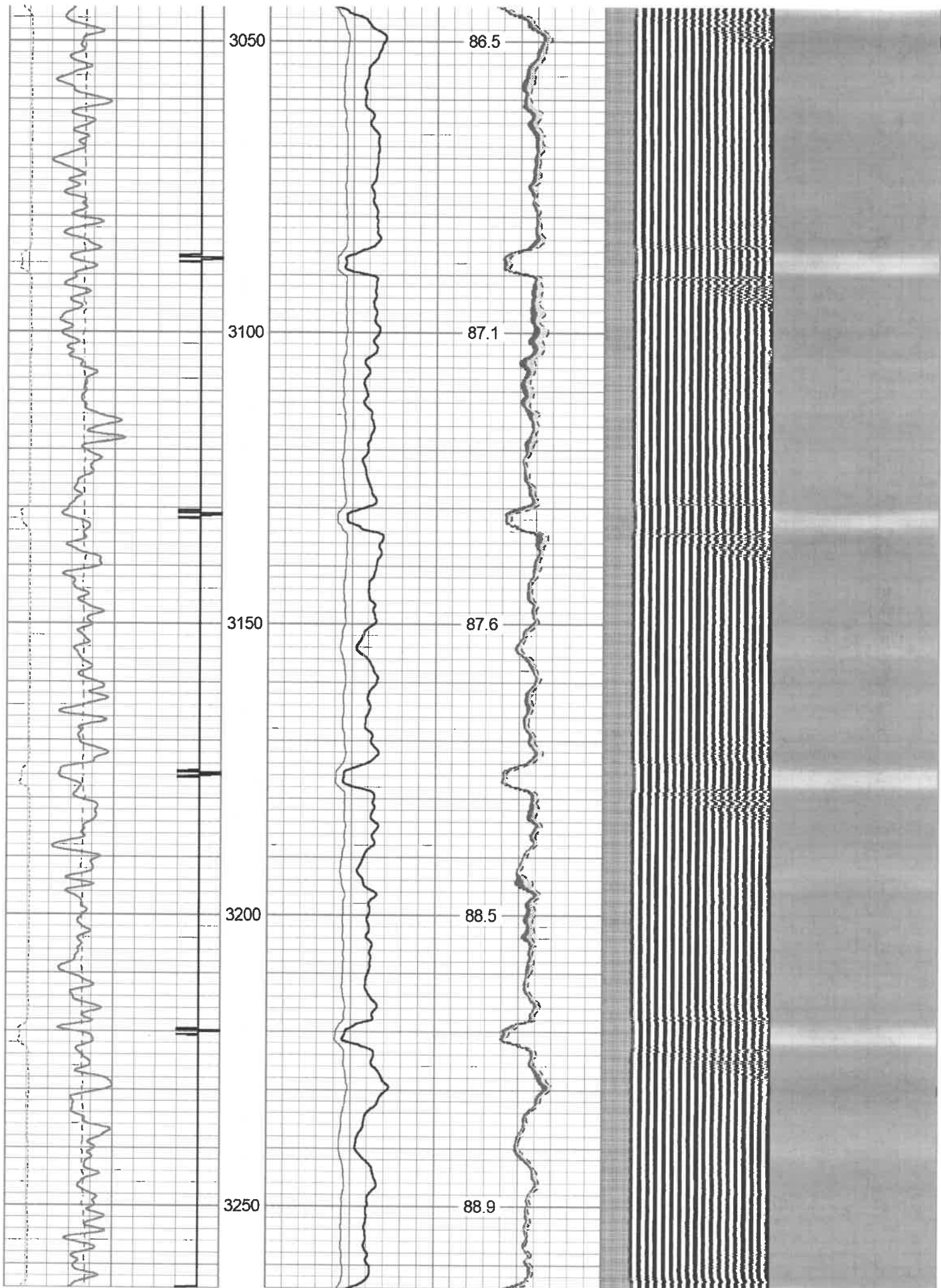
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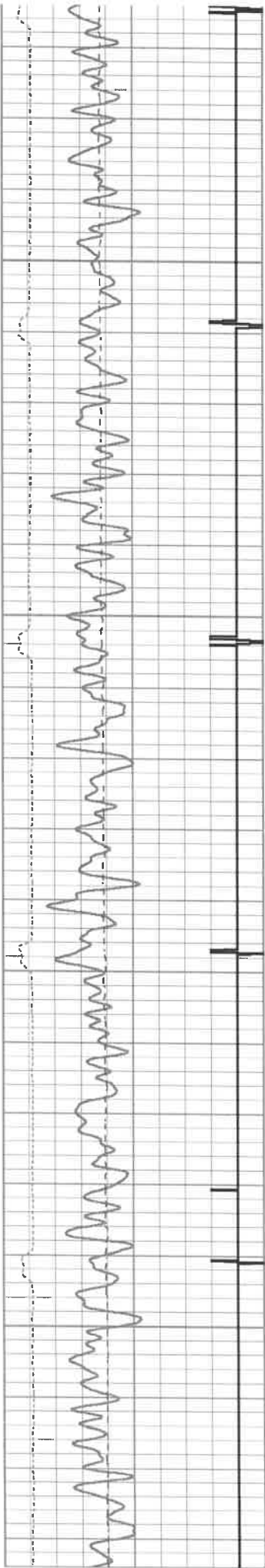
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85.3

85.9





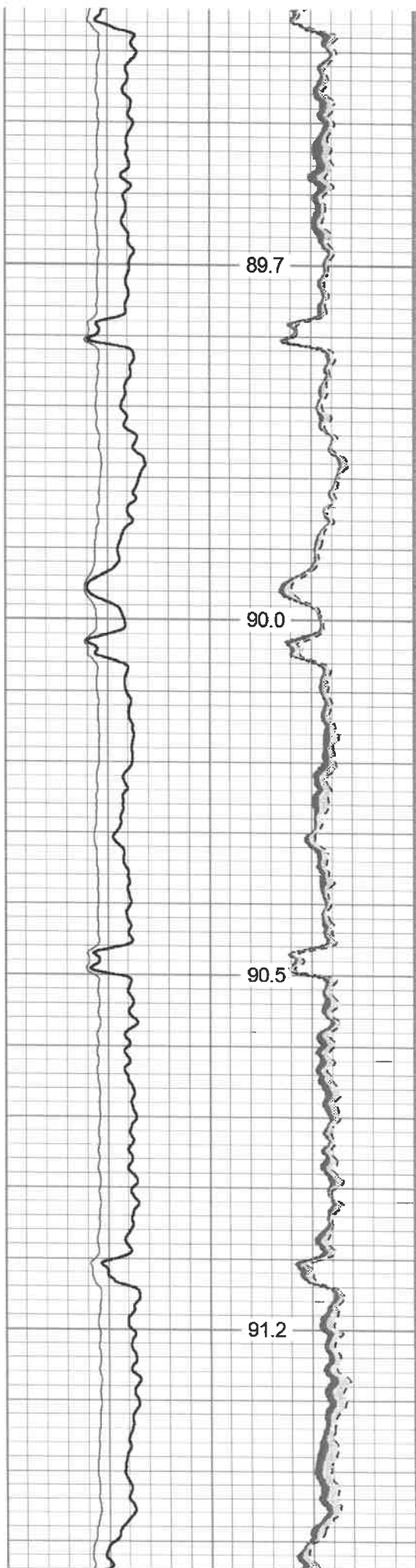


3300

3350

3400

3450

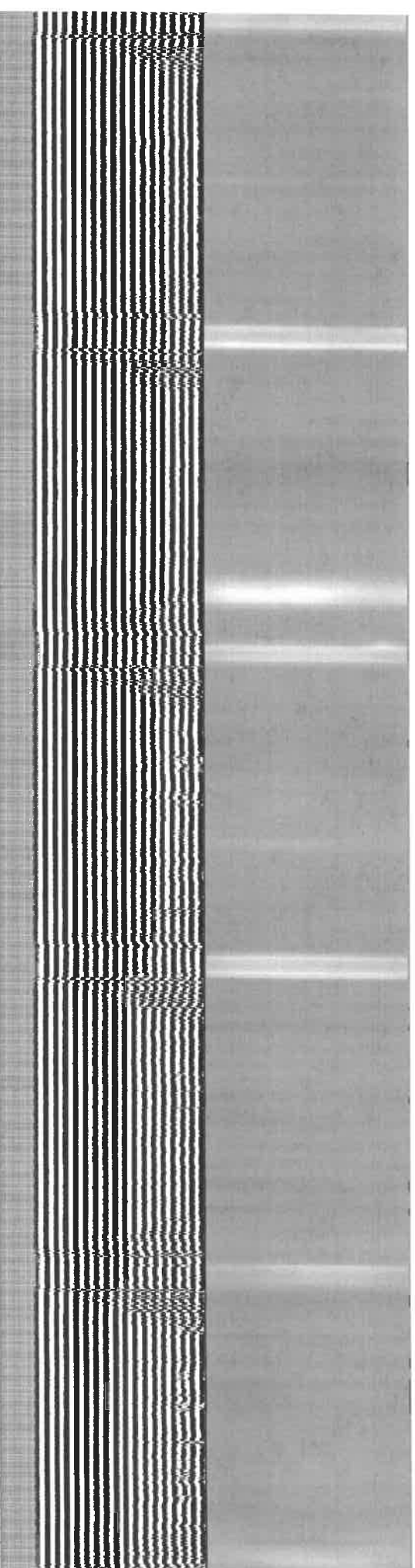


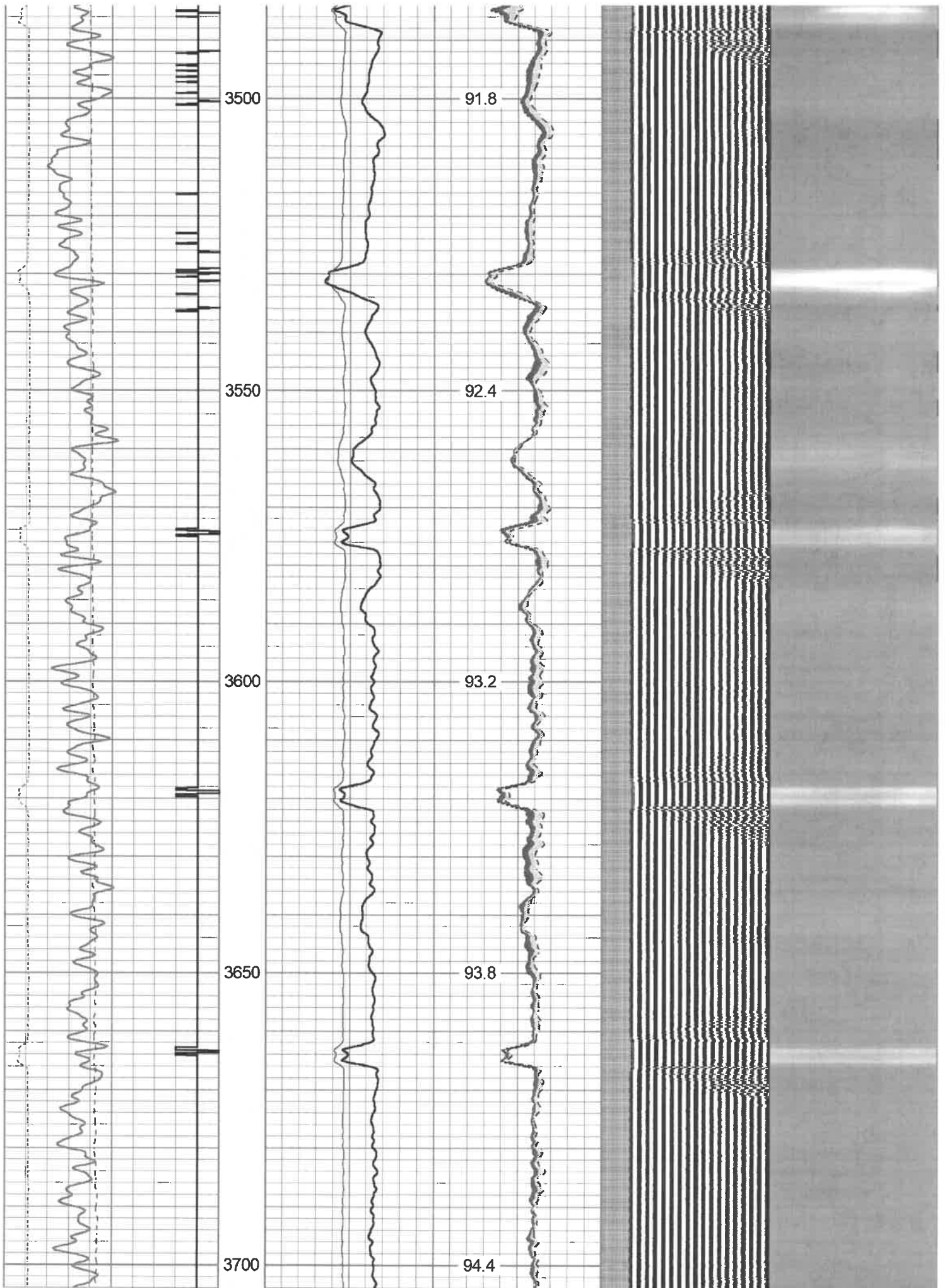
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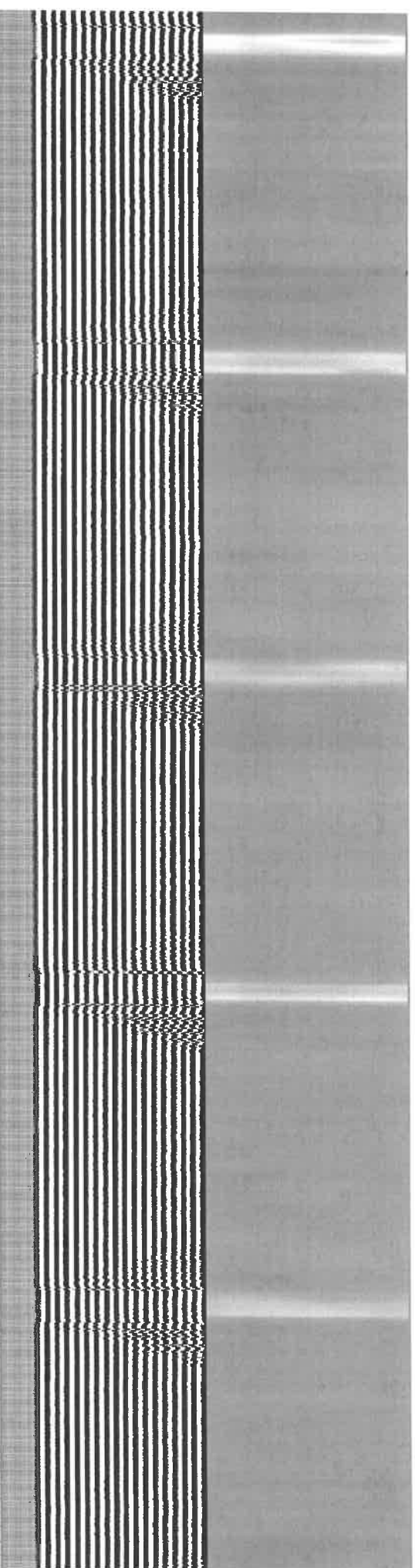
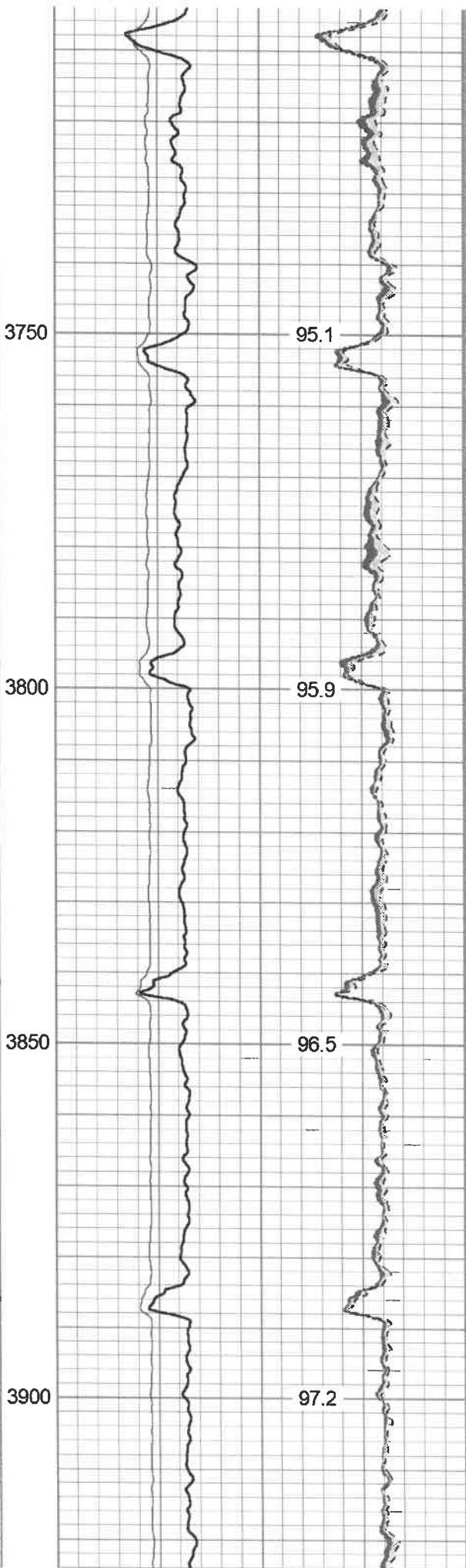
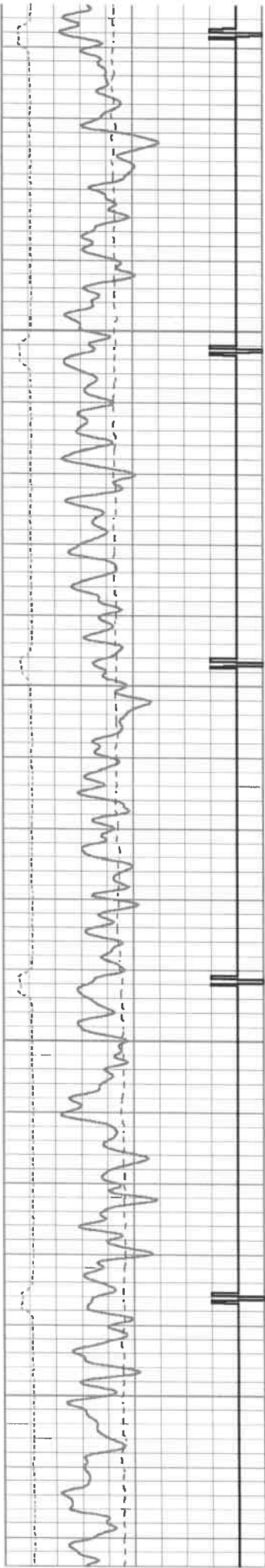
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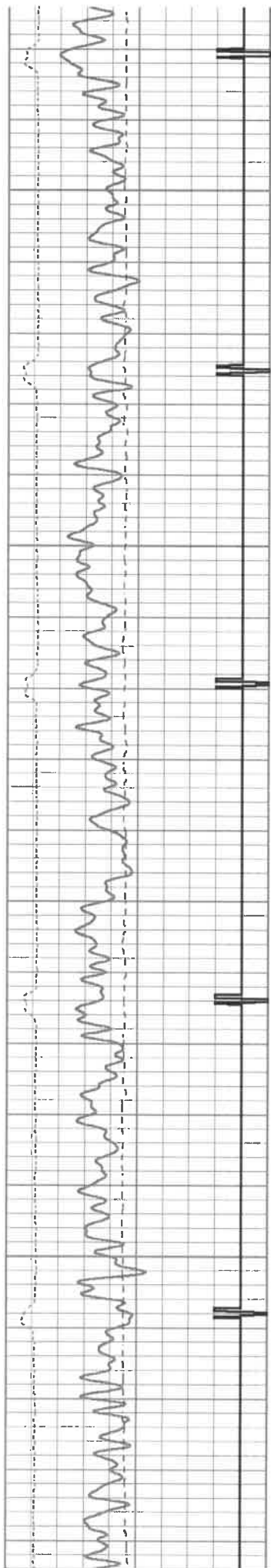
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91.2







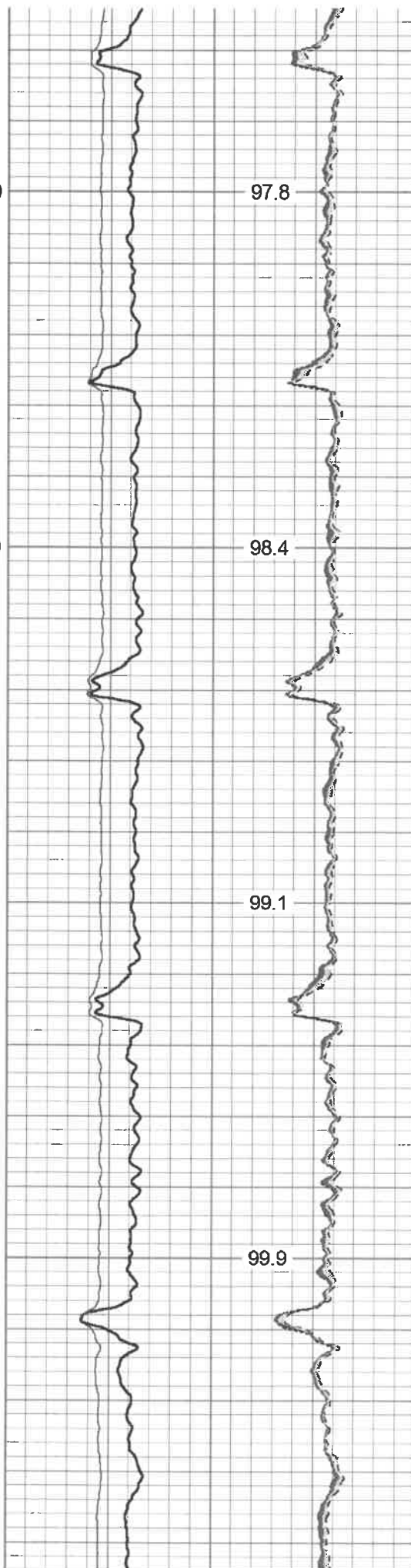


3950

4000

4050

4100

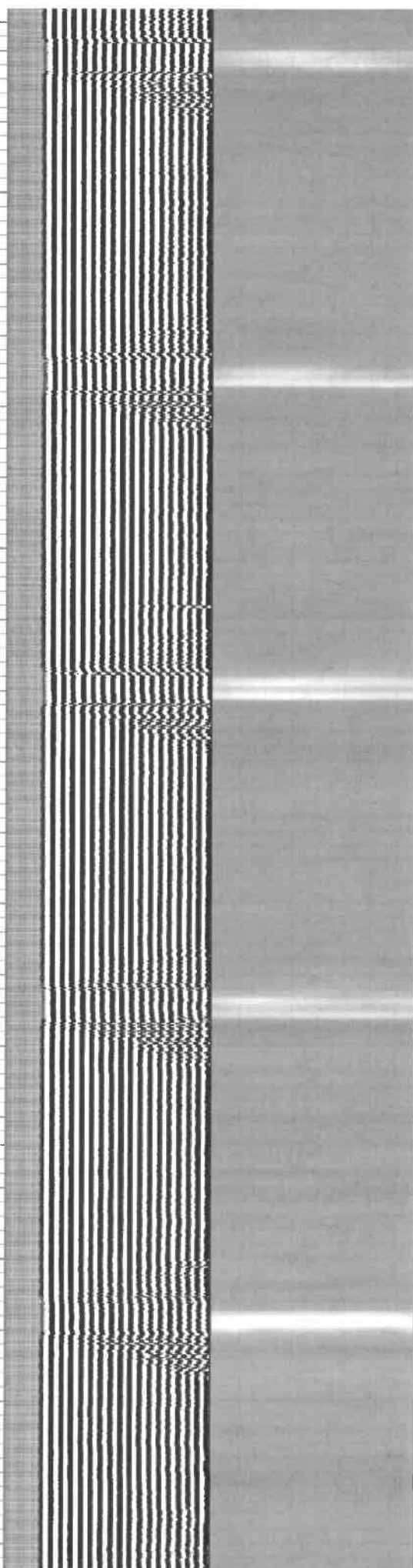


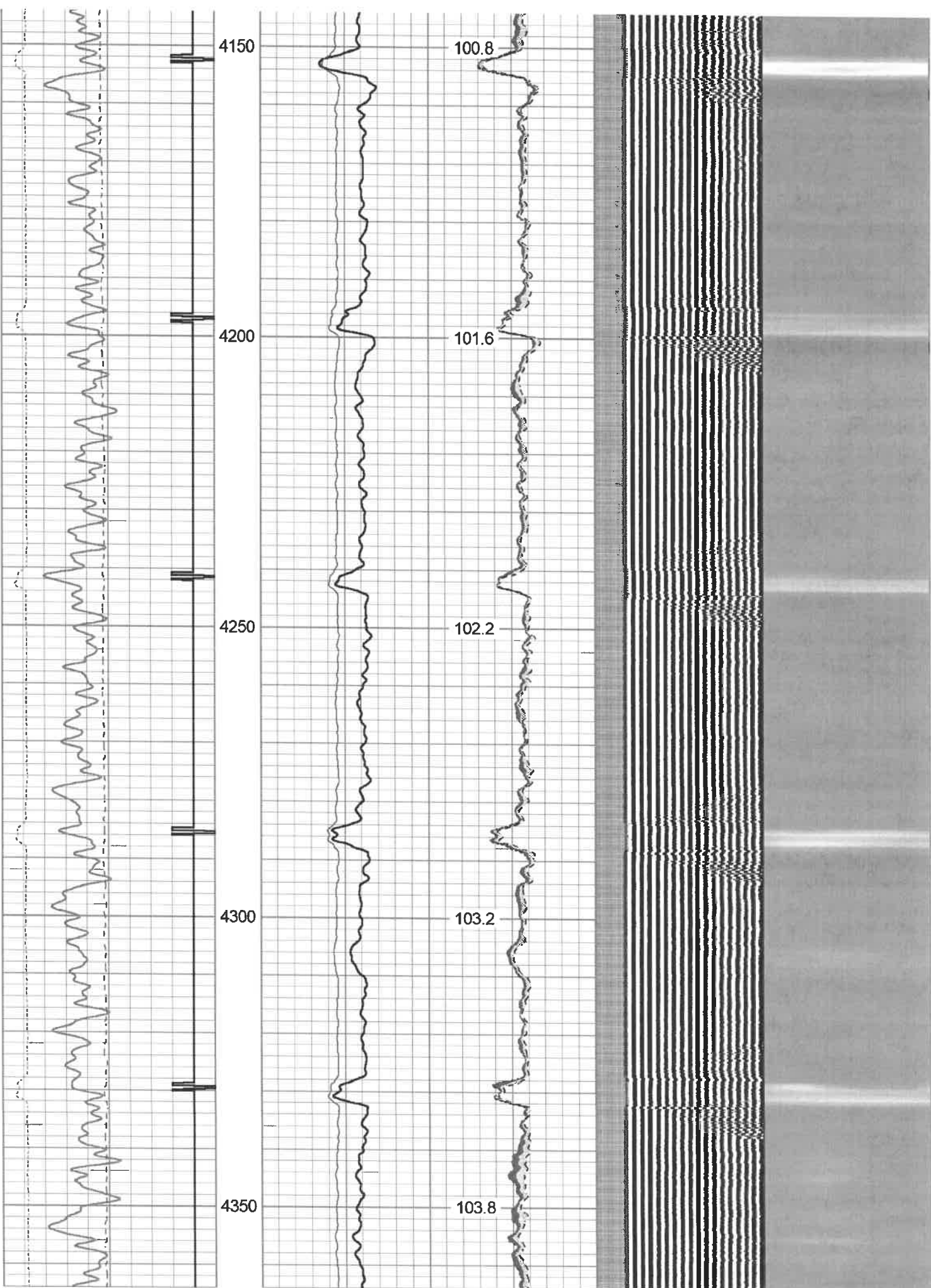
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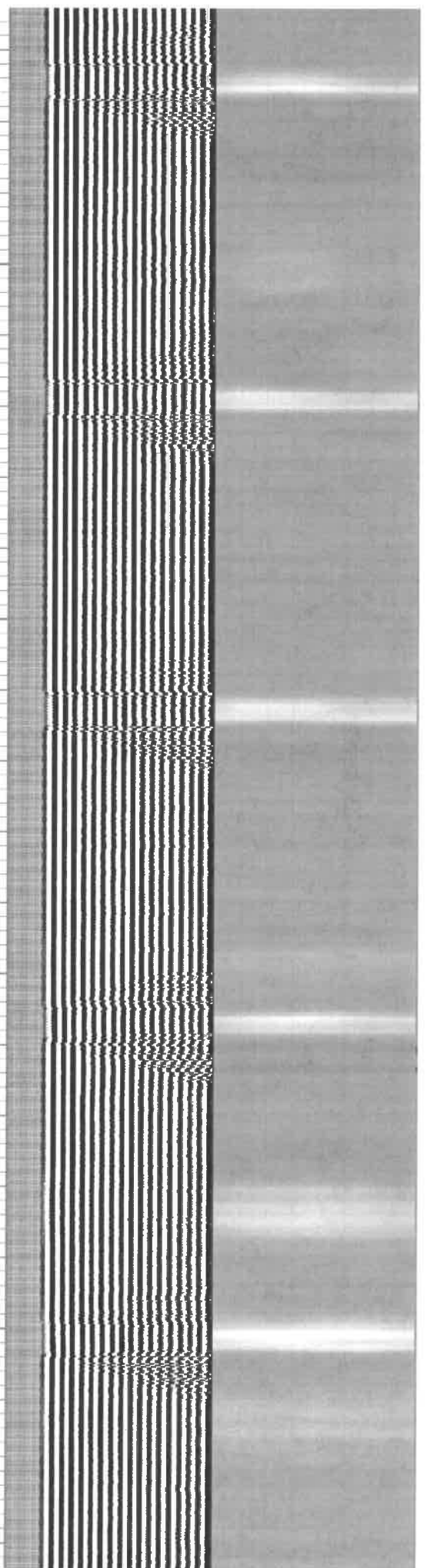
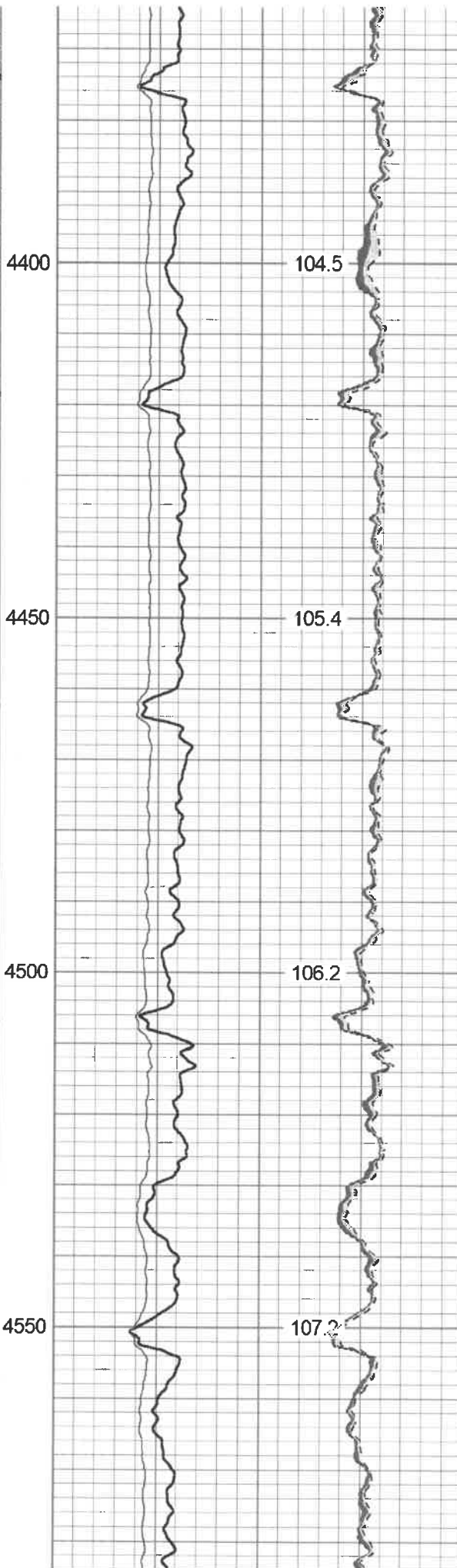
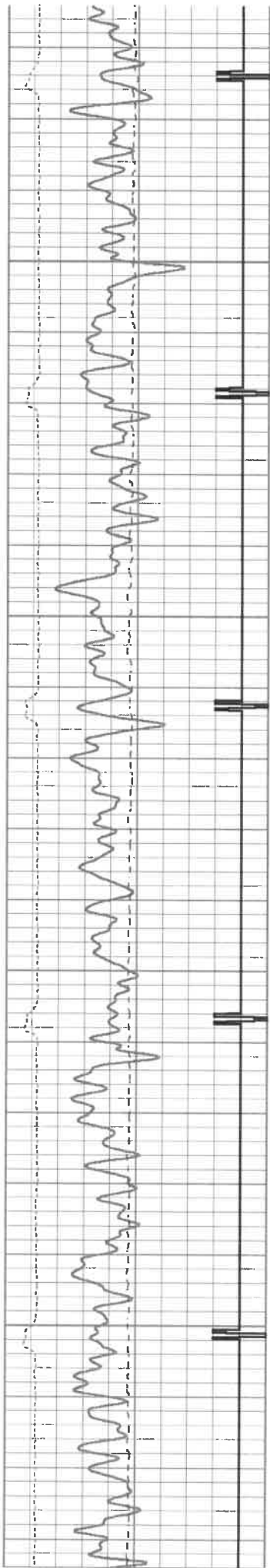
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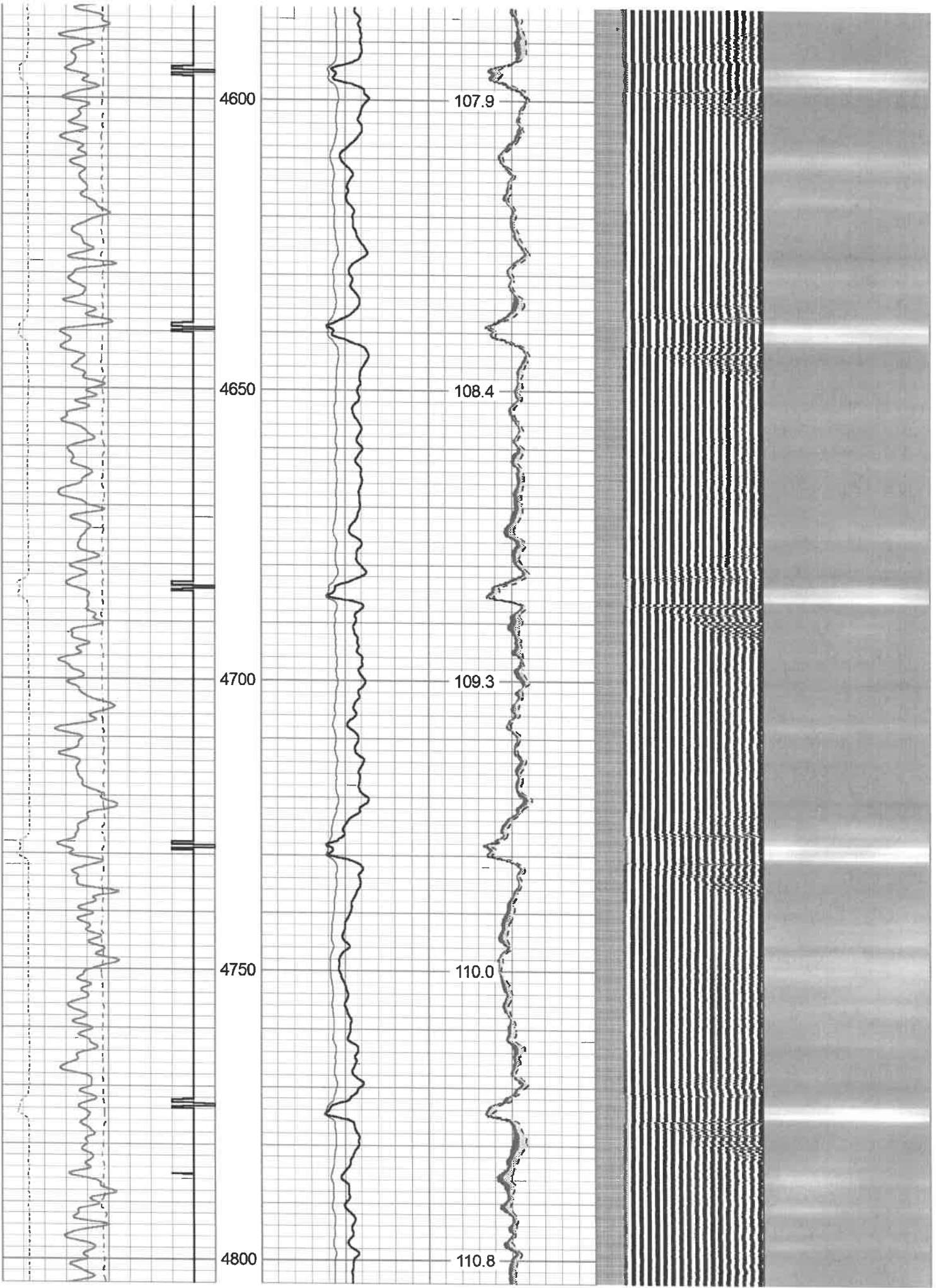
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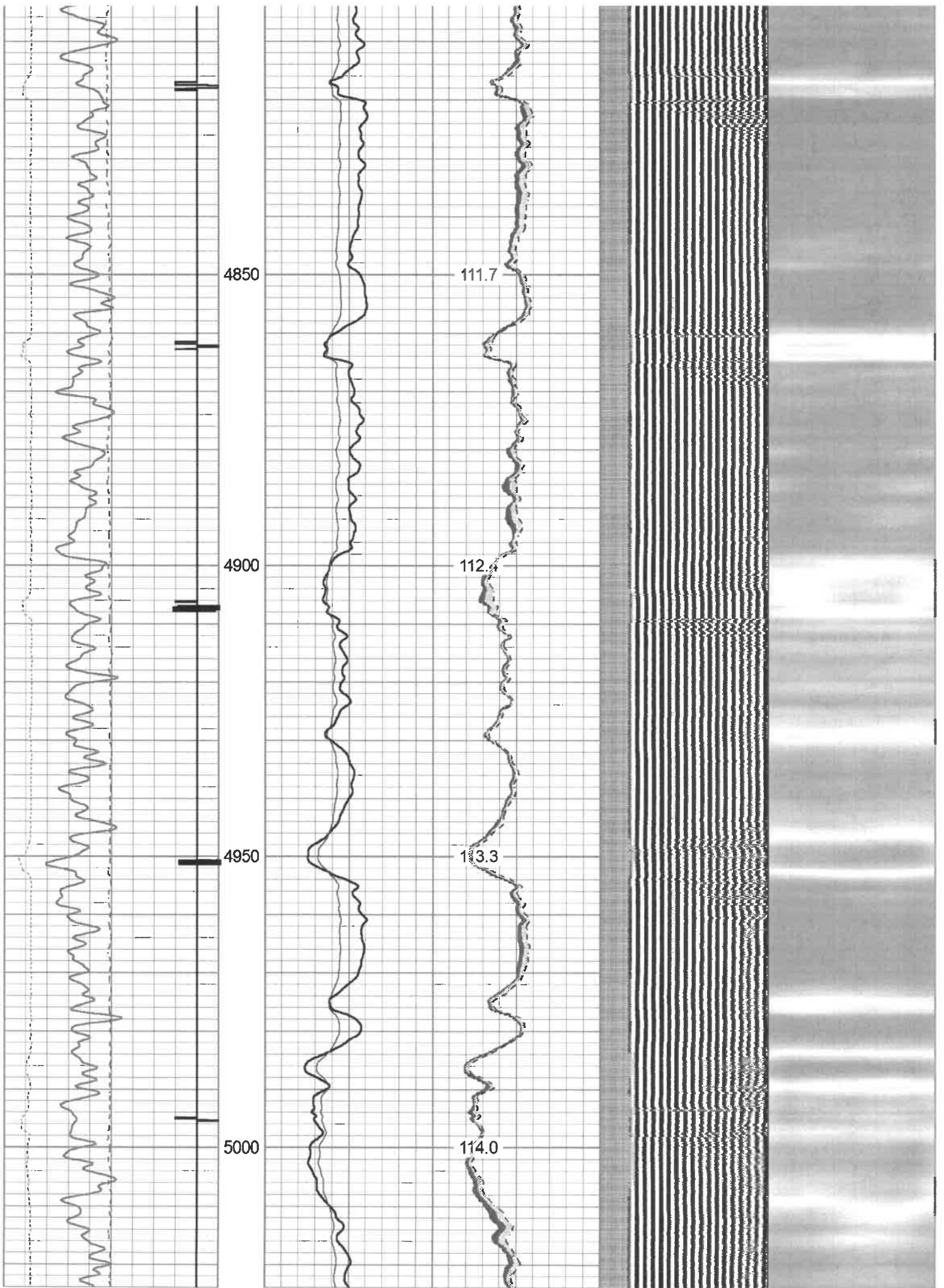
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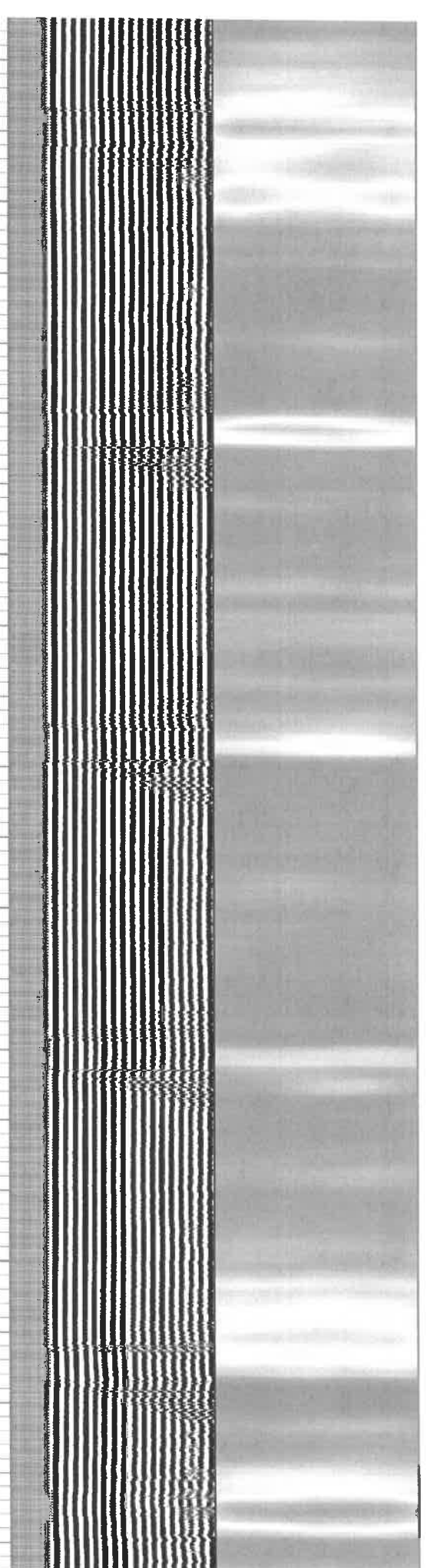
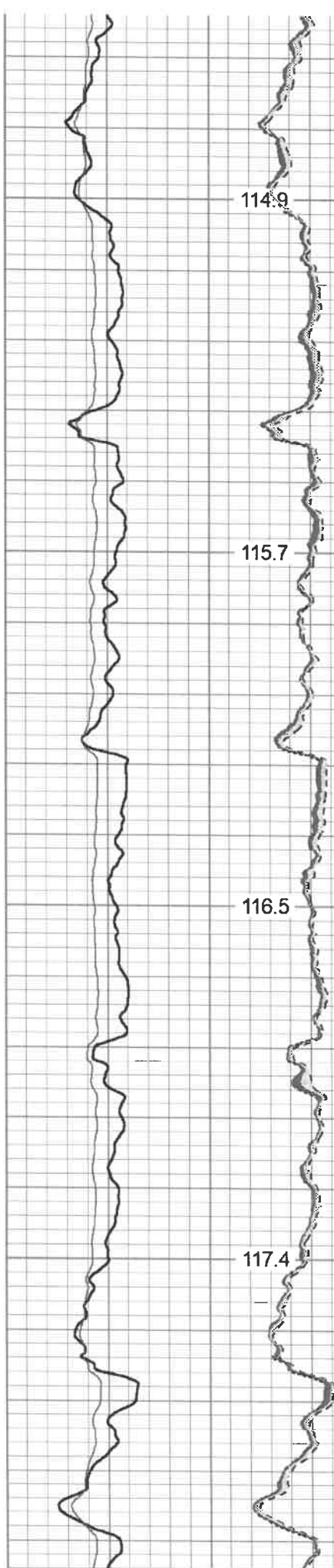
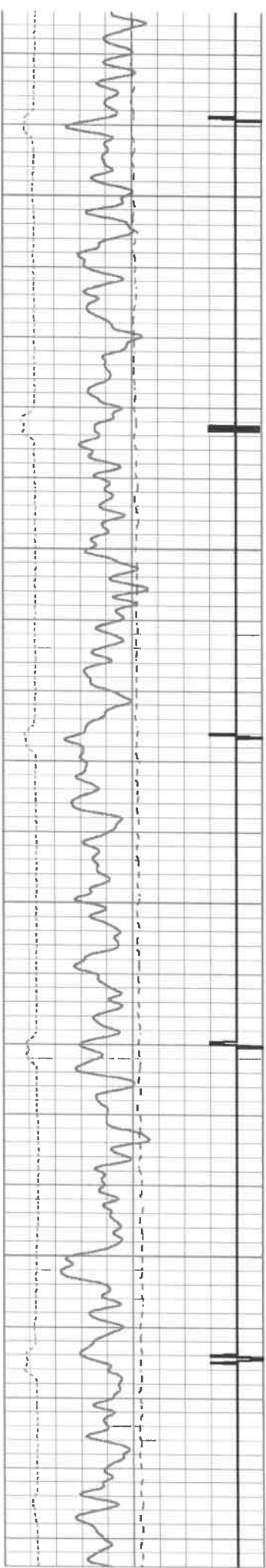


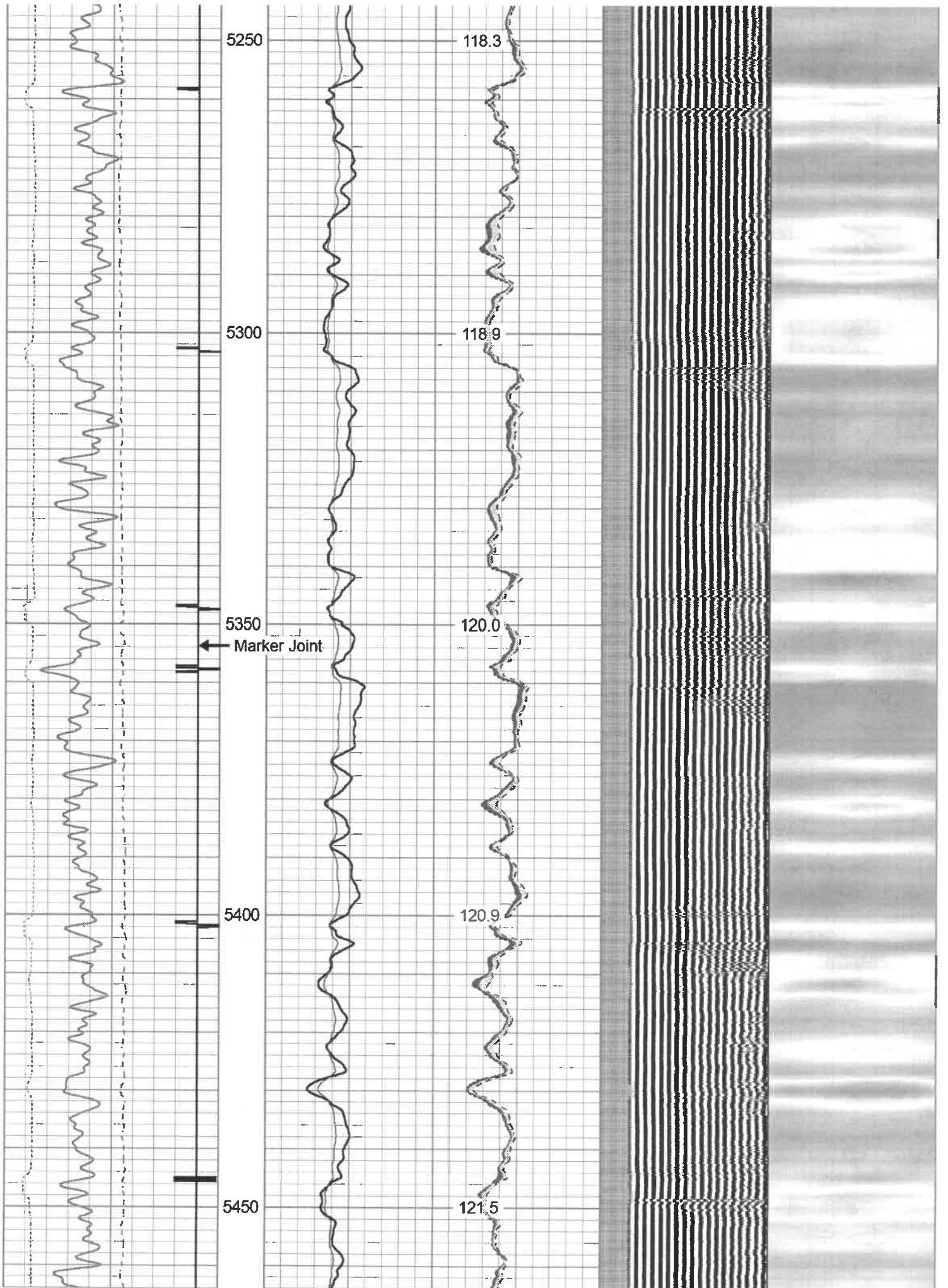


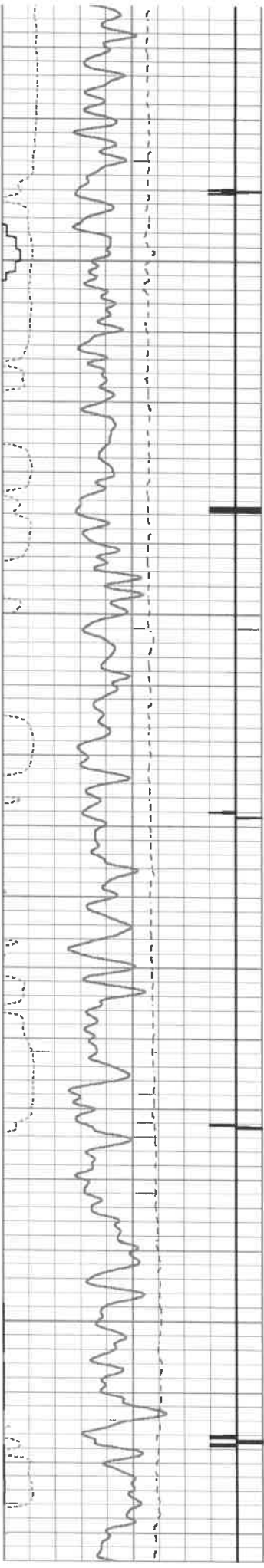










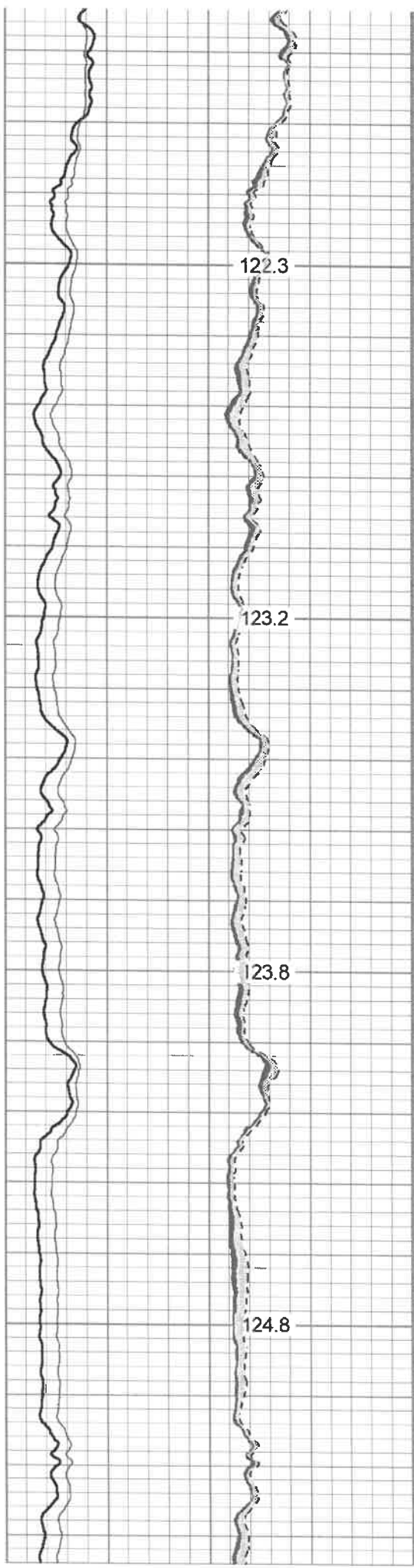


5500

5550

5600

5650

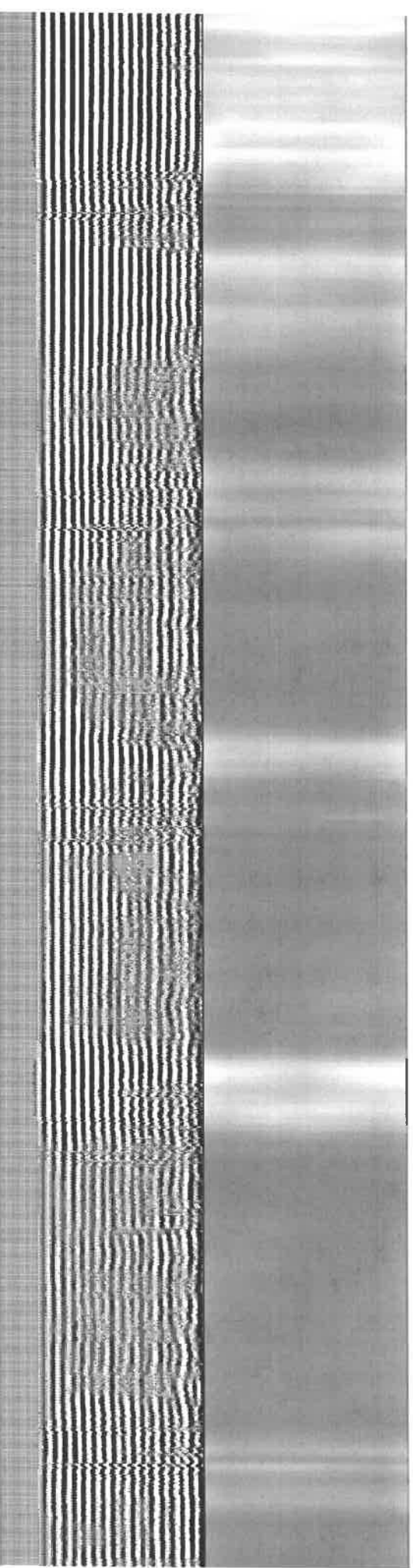


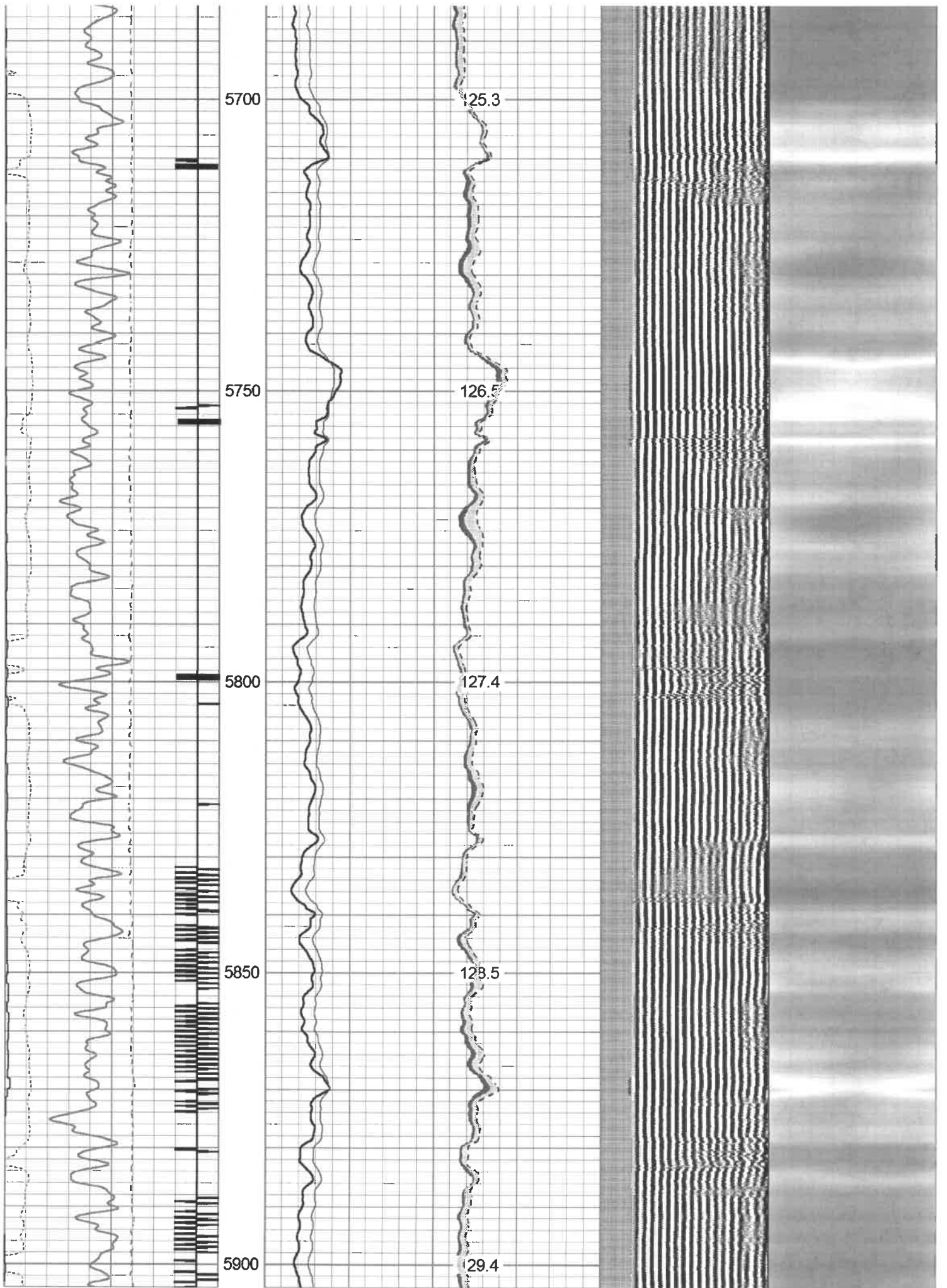
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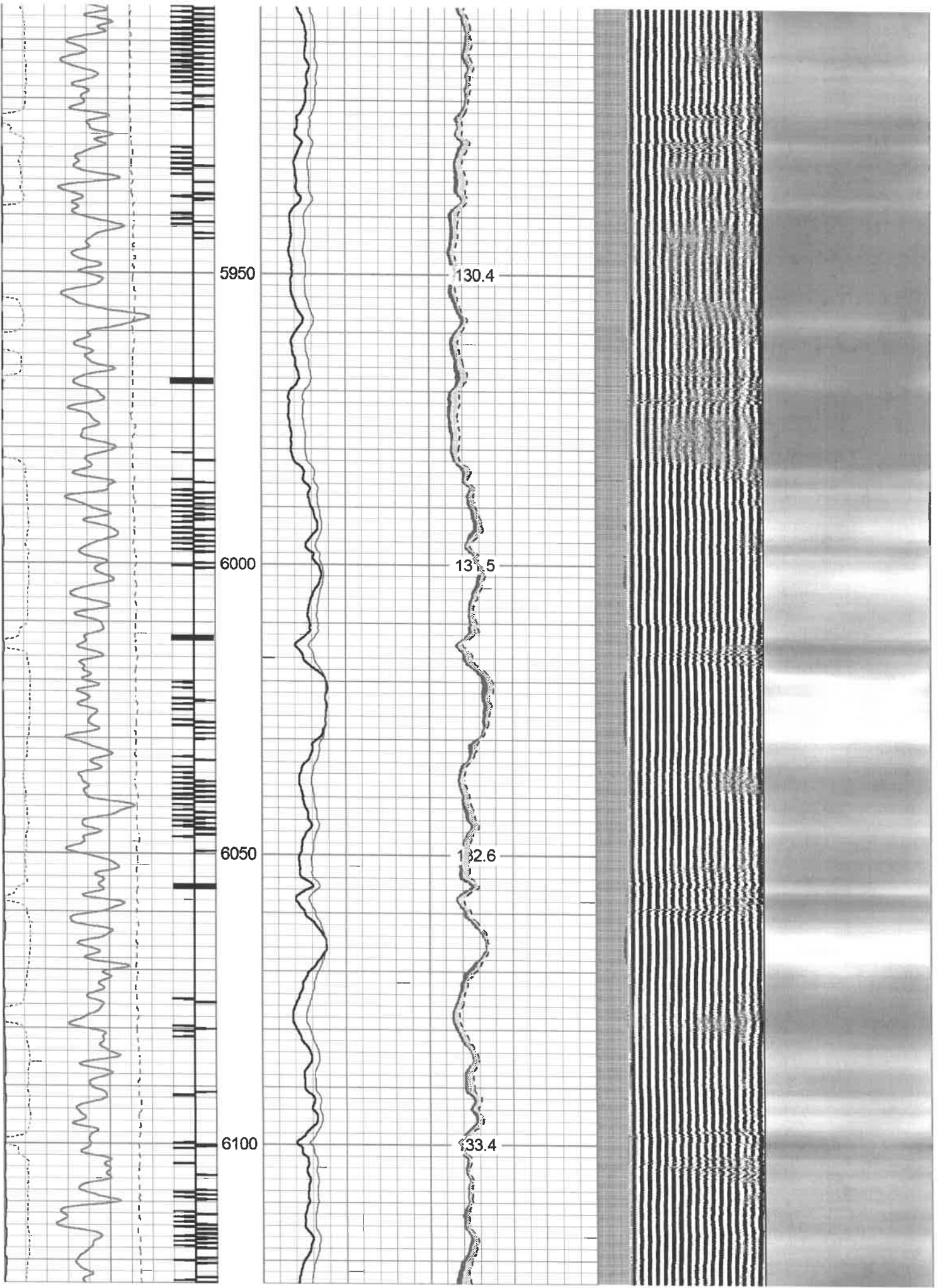
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123.8

124.8







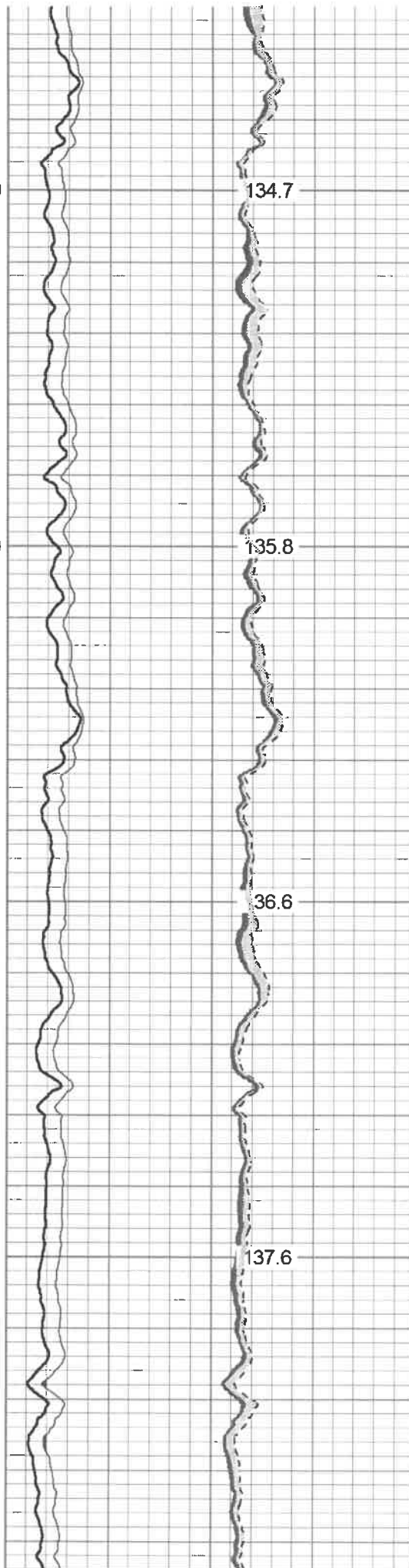


6150

6200

6250

6300

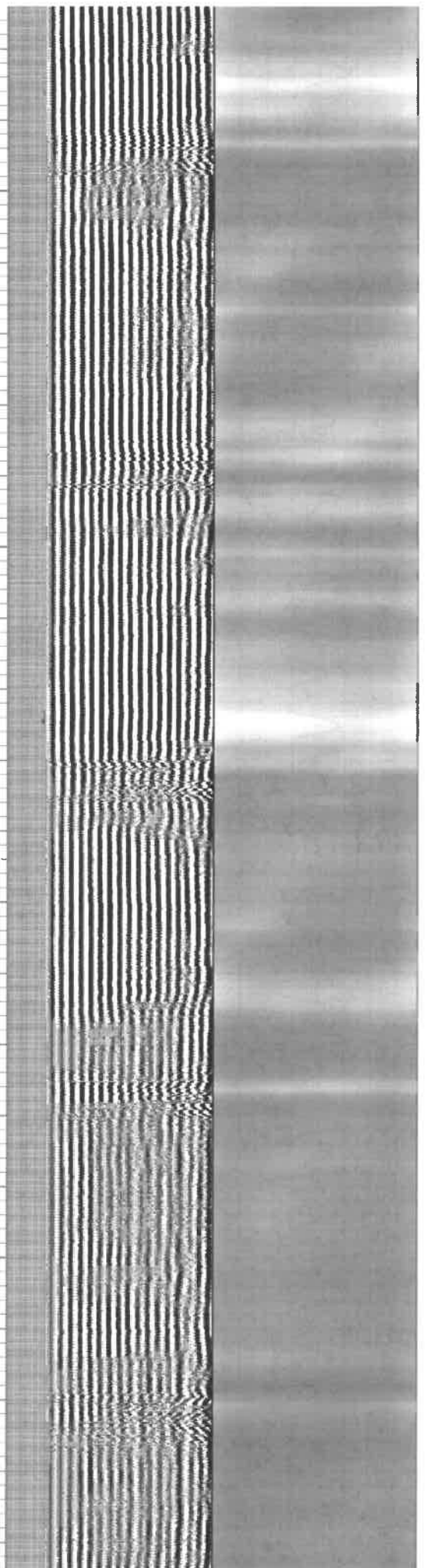


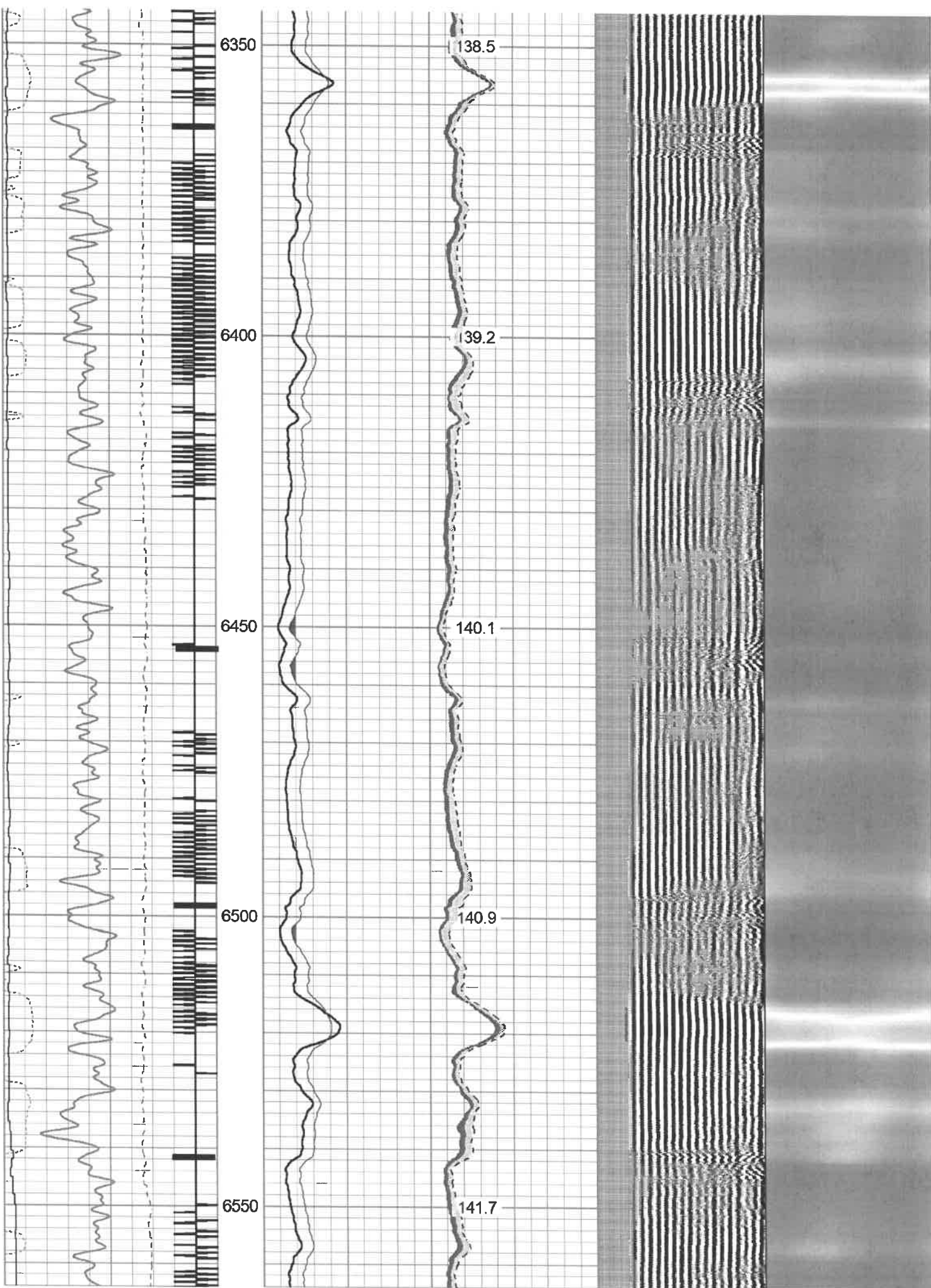
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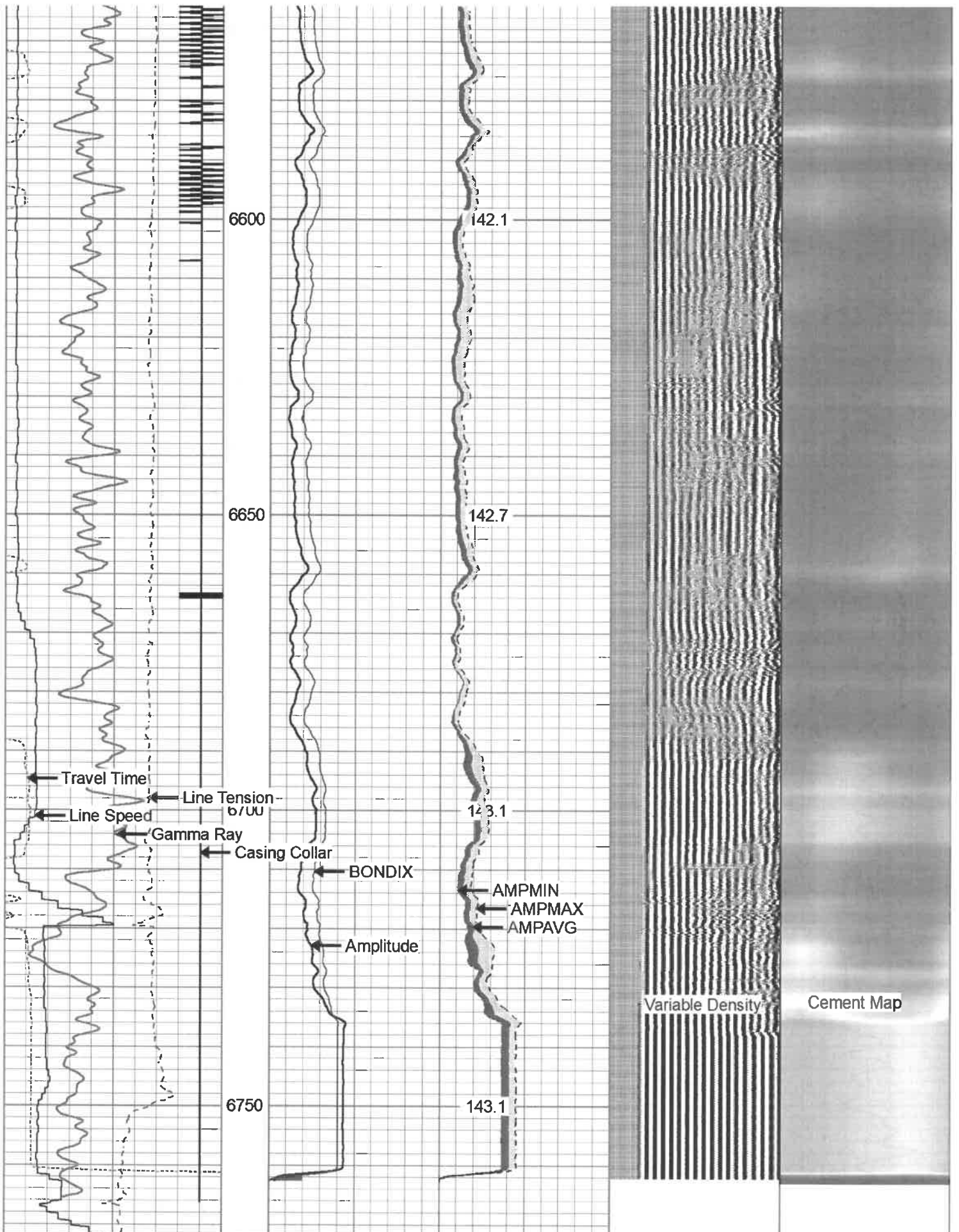
135.8

36.6

137.6







270	Travel Time (usec)	160	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 (API)	150	0	AMPAVG	150							

0	Gamma Ray (GAPI)	150
Line Speed		
-100	(ft/min)	100
0	Line Tension (lb)	2000

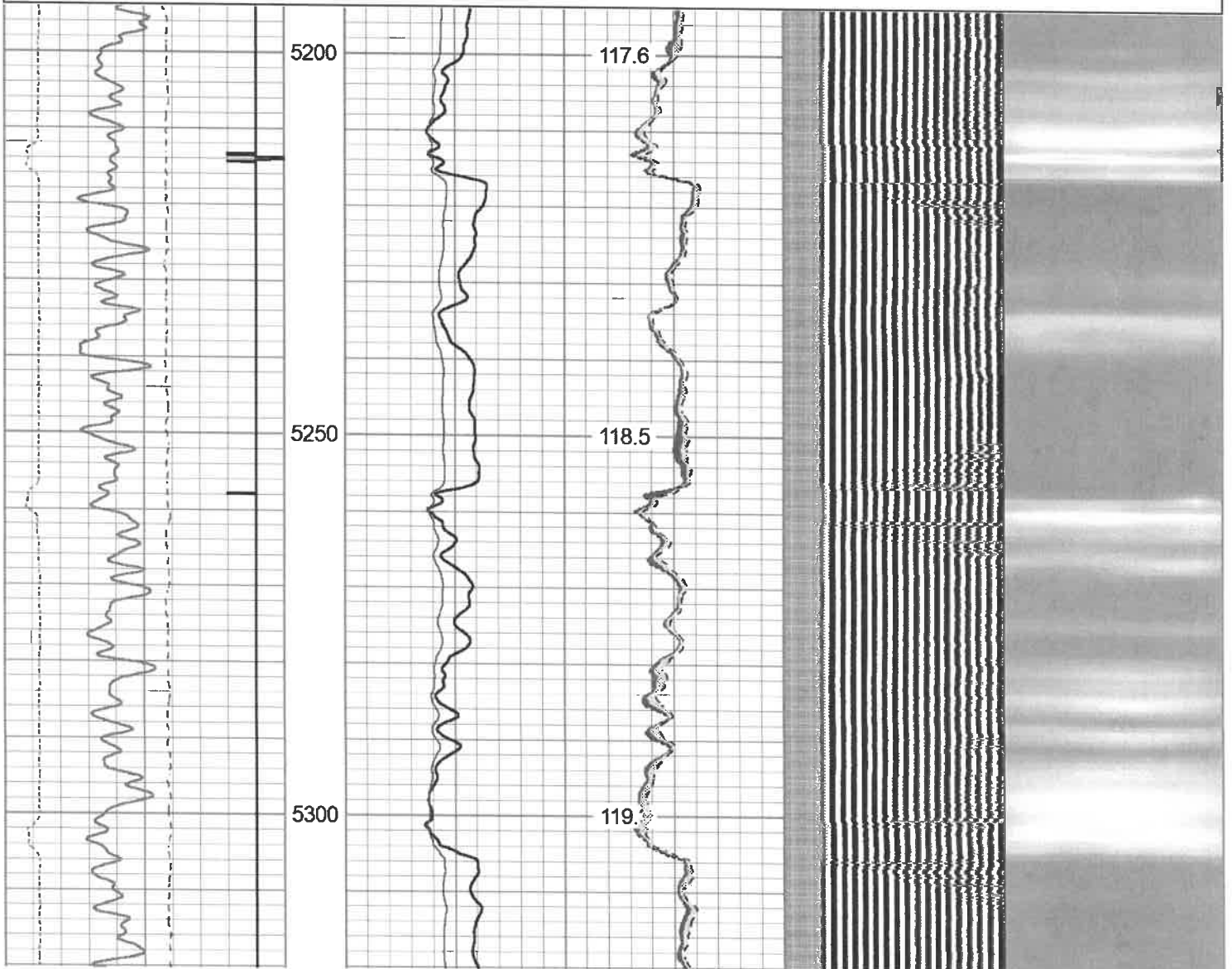
0	AMPAVG	150
TEMP		
(degF)		

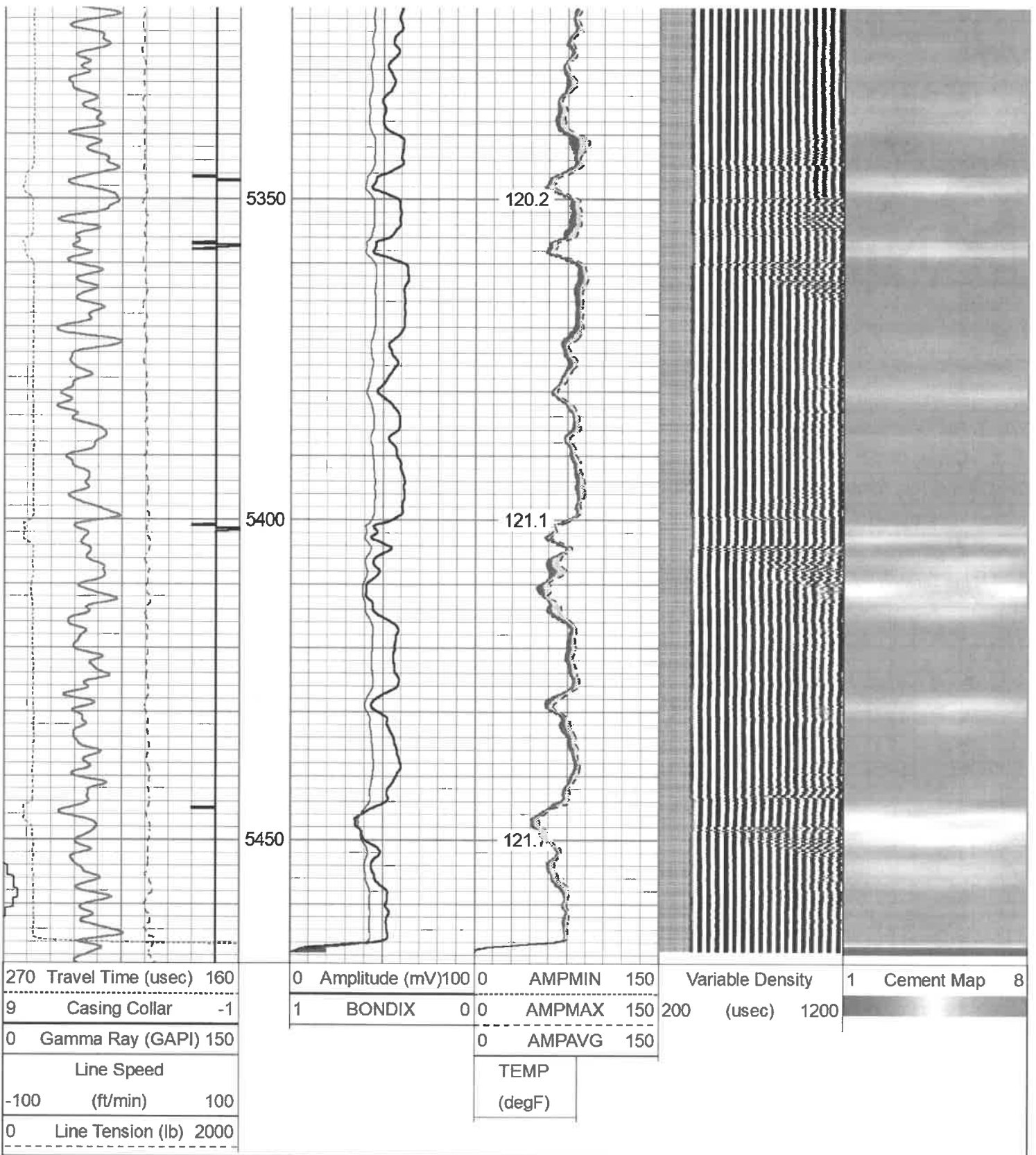


Repeat Pass 0 PSI

Database File antero_blizzard_whitmore_1h_rcbl_26_jul_2021.db
 Dataset Pathname rabbit_ears/whitmore_1h/run1/pass3
 Presentation Format rcbl-bond index for antero 1020
 Dataset Creation Mon Jul 26 08:39:51 2021
 Charted by Depth in Feet scaled 1:240

270	Travel Time (usec)	160	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

Database: C:\ProgramData\Warrior\Data\antero_blizzard_whitmore_1h_rcbl_26_jul_2021.db
 Dataset: rabbit_ears/whitmore_1h/run1/pass5/_vars_

Top - Bottom

BHTEMP_Src	BOREID	BOTTEMP	CASEOD	CASETHCK	CASEWGHT	MAXAMPL	MINAMPL
TEMP	in 7.875	degF 143	in 5.5	in 0.415	lb/ft 23	mV 71.9	mV 3.4
MINATTN	PERFS	PPT	SRFTEMP	TDEPTH			
dh/ft		usec	degF	ft			

9.6	No	260	80	6800
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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_blizzard_whitmore_1h_rcbl_26_jul_2021.db
Dataset Pathname rabbit_ears/whitmore_1h/run1/pass5
Dataset Creation Mon Jul 26 08:47:27 2021

Gamma Ray Calibration Report

Serial Number: FW1211-86
Tool Model: Probe
Performed: Sun Jul 25 14:29:09 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: 180.275 ft

Master Calibration, performed Sun Jul 25 18:06:02 2021:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.001	0.993	3.400	71.921	68.884	3.490
CAL	-0.027	1.462				
5'	0.003	0.940	3.400	71.921	73.139	3.183
SUM						
S1	0.025	1.079	0.000	100.000	94.950	-2.414
S2	-0.001	0.937	0.000	100.000	106.618	0.083
S3	0.001	0.920	0.000	100.000	108.846	-0.133
S4	0.000	0.942	0.000	100.000	106.147	-0.009
S5	0.000	1.000	0.000	100.000	100.045	-0.009
S6	0.000	1.031	0.000	100.000	97.006	-0.006
S7	0.001	1.058	0.000	100.000	94.603	-0.066
S8	0.000	1.053	0.000	100.000	94.969	-0.015

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	-0.027	1.462	1.000	0.000

Air Zero Calibration, performed Sun Jul 25 13:23:14 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	16.99		CHD-Titan Standard 1 7/16" Cable Head	1.02	1.44	1.00
Temp	14.14		CENT-Overbody Antelope (SP-919-0233)	1.67	4.88	5.00
WVFS8	11.91		RBT-Probe275T (FW1312-32) Probe 2.75" Radial with Integral Temperature Sub	9.39	2.75	90.00
WVFS7	11.91					
WVFS6	11.91					
WVFS5	11.91					
WVFS4	11.91					
WVFS3	11.91					
WVFS2	11.91					
WVFS1	11.91					
WVF3FT	11.91					
WVF5FT	10.91					
WVFCAL	7.66					
HEADVOLT	7.66					
CCL	6.75					
GR	5.42		CENT-Overbody Antelope (SP-919-0233)	1.67	4.88	5.00
			GR-Probe (FW1211-86) Probe 2 3/4" Logging Cable Head	4.78	2.75	57.00

Probe 2 3/4 Logging Gamma Ray



CENT-Probe275
2.75" Centralizer

2.88

2.75

20.00

Dataset: antero_blizzard_whitmore_1h_rcbl_26_jul_2021.db: rabbit_ears/whitmore_1h/run1/pass5
Total length: 18.07 ft
Total weight: 178.00 lb
O.D.: 4.88 in



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