



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

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

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Location: API #: 47-095-02720
Lat: 39.539881
Long: -80.887809

Permanent Datum SEC
Log Measured From TWP
Drilling Measured From RGE

Ground Level Elevation 25'
Kelly Bushing 25.5' A.P.D.
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	22.321'						
Depth Logger	6.736'						
Bottom Logged Interval	6.791'						
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	4.836'						
Time Well Ready	9.15						
Time Logger on Bottom	10:00						
Equipment Number	TK-104 / P1 G2						
Location	CHARLEROI, PA						
Recorded By	Matt McNally						
Witnessed By	Chris Young						
Run Number	Borehole Record		Tubing Record				
	Bit	From	To	Size	Weight	From	To
Casing Record	Size	Wgt/Ft	Top	Bottom			
Surface String							
Prot. String							
Production String	5 1/2"	23#	SURFACE	22.321'			
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 @ 5,663' -5,673'
Depth Correction -23'

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

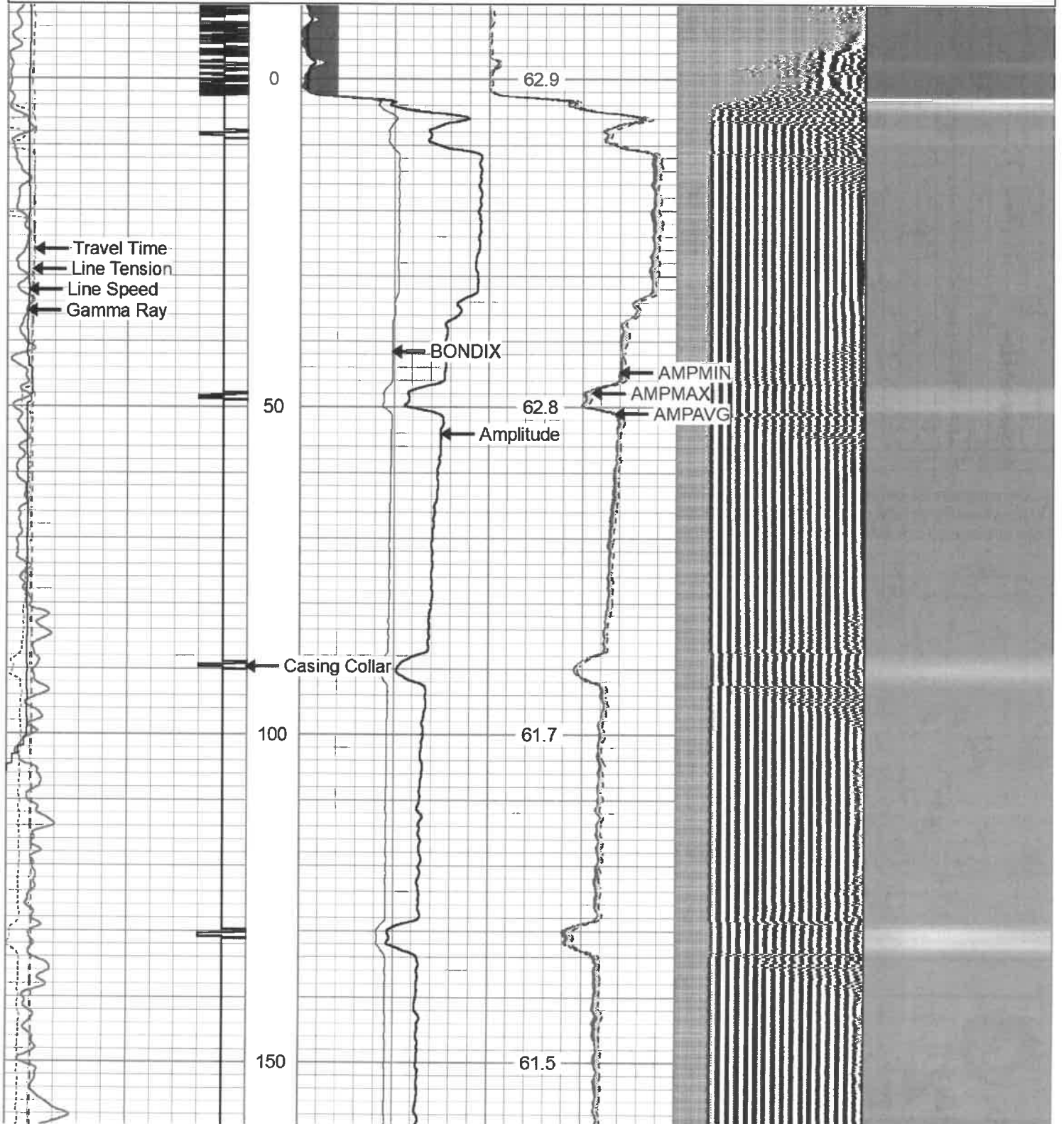
Thank You for Choosing Nine Energy Service.Charleroi, PA

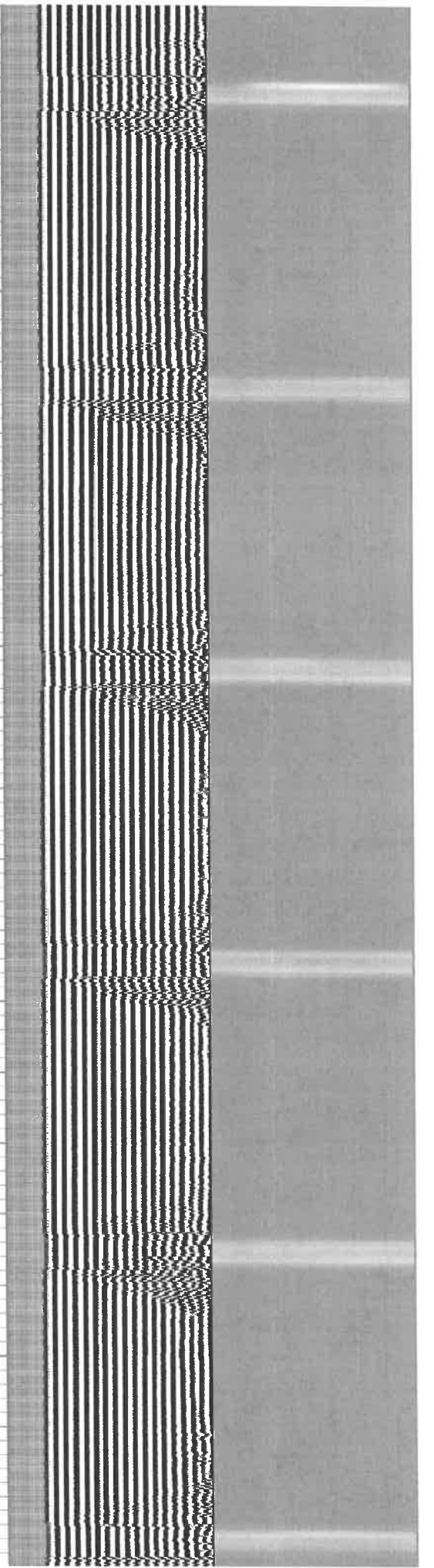
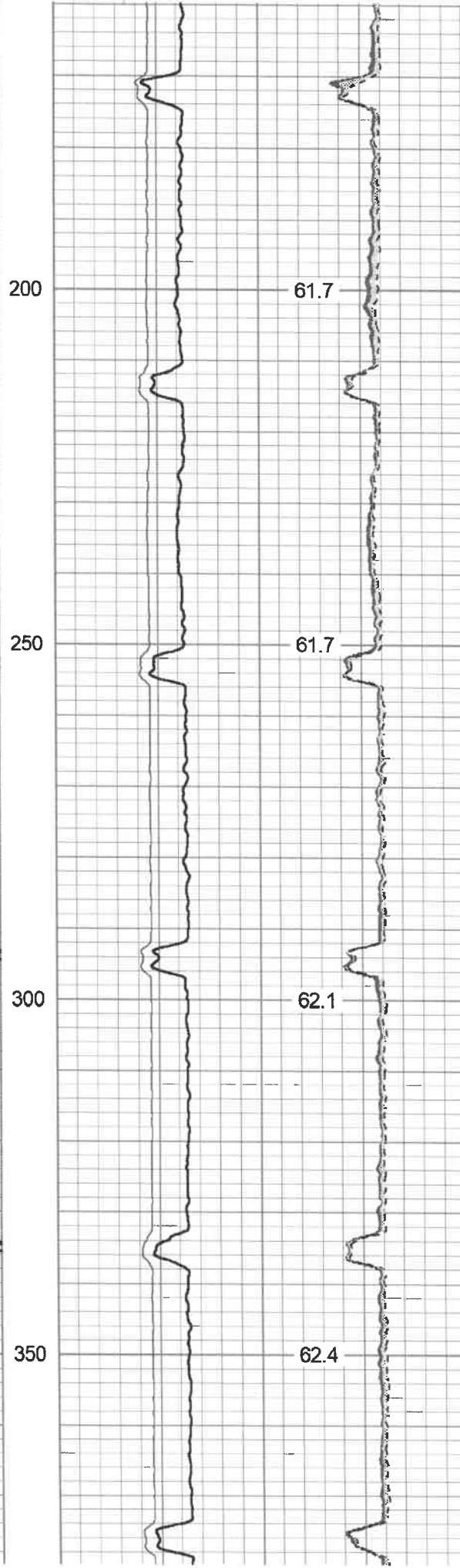
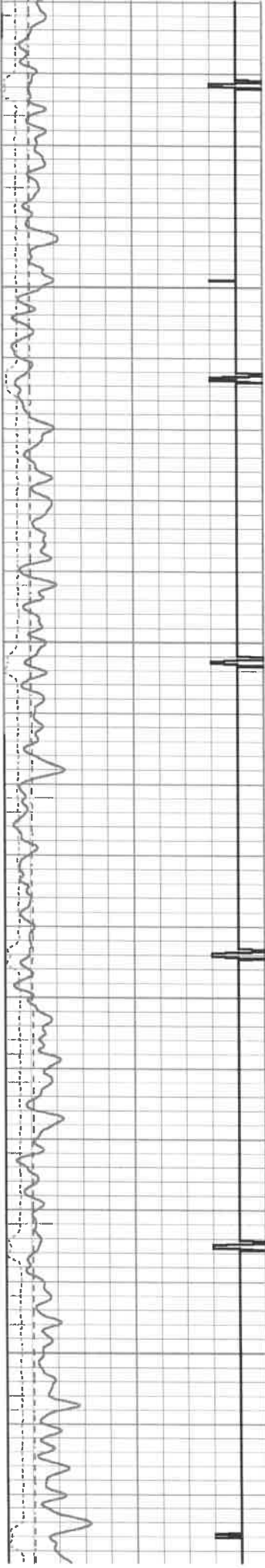


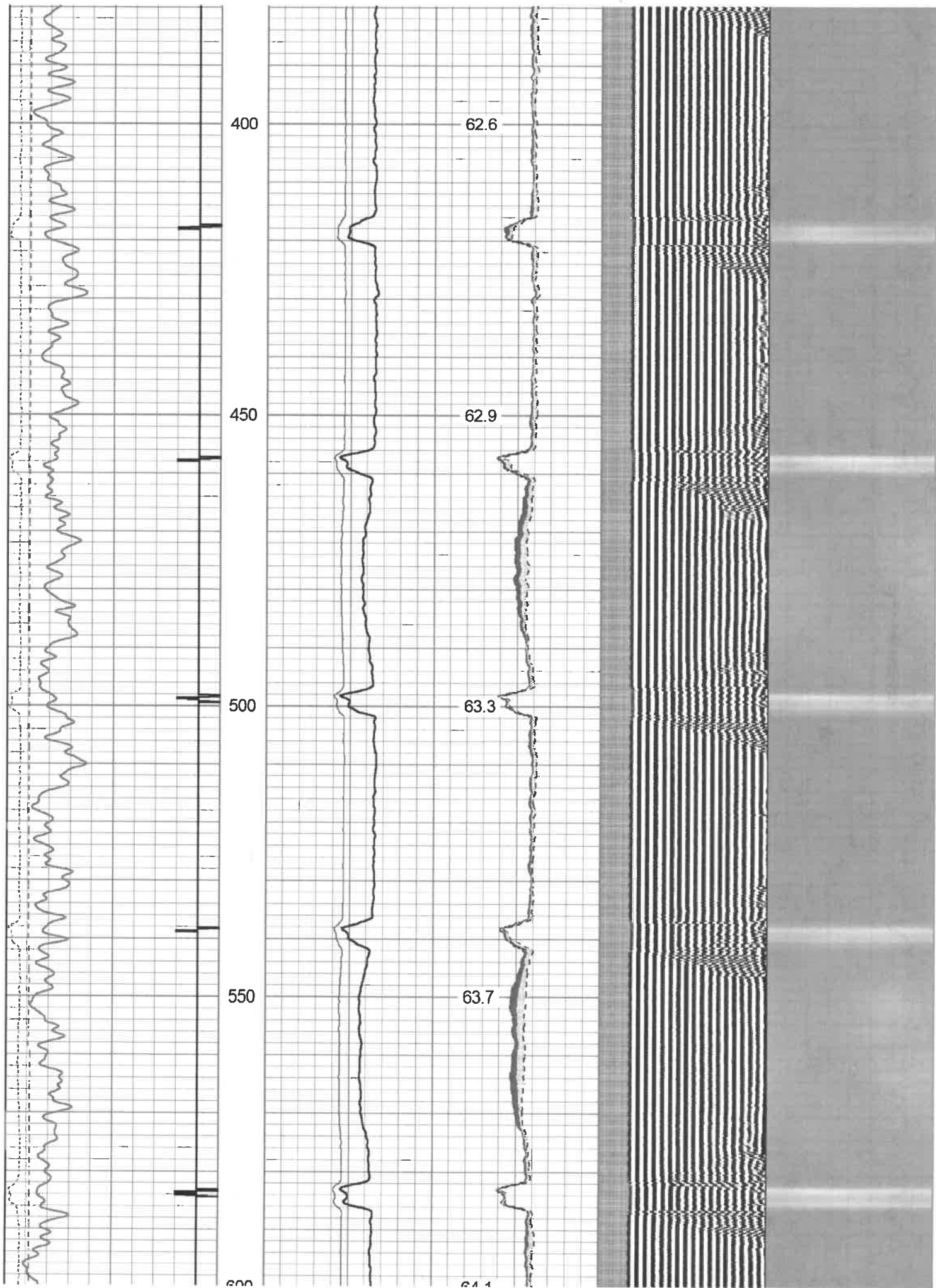
Main Pass 1,500 PSI

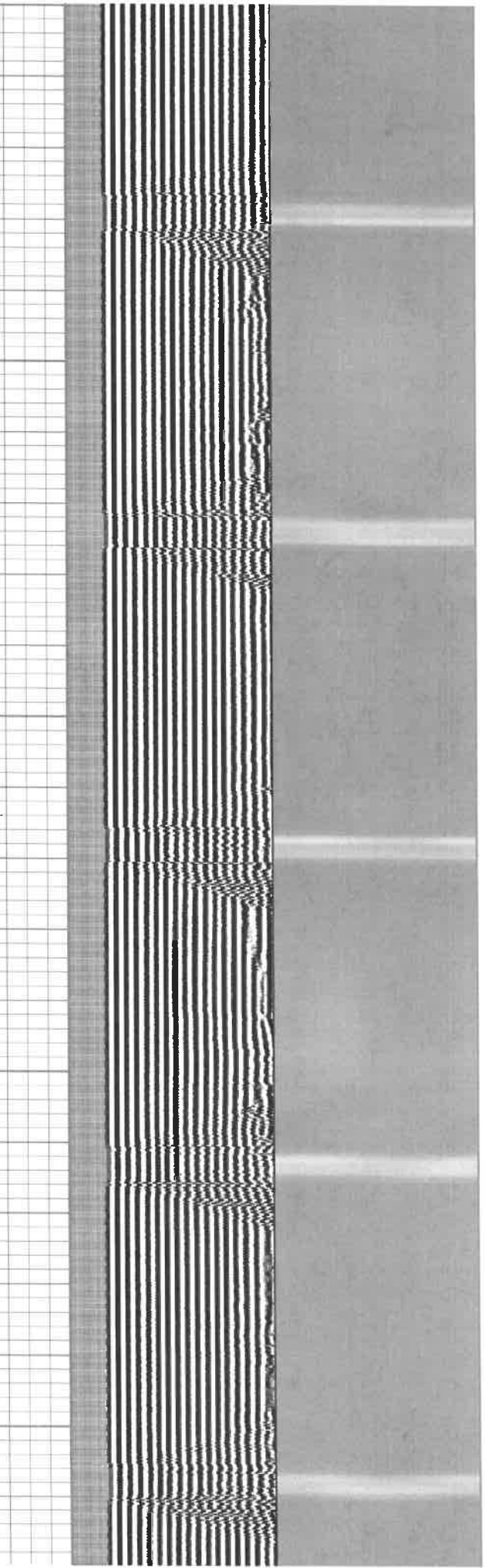
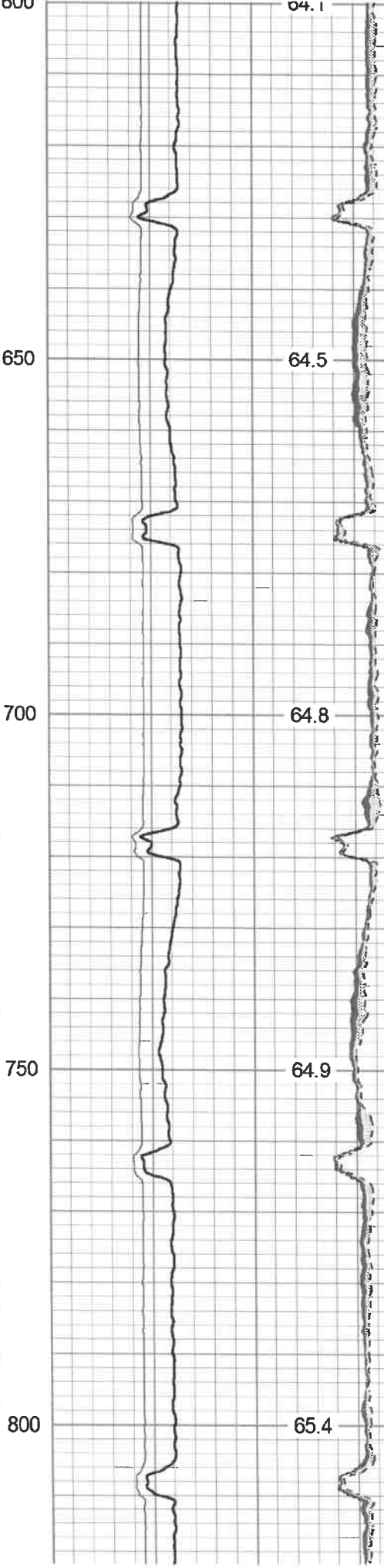
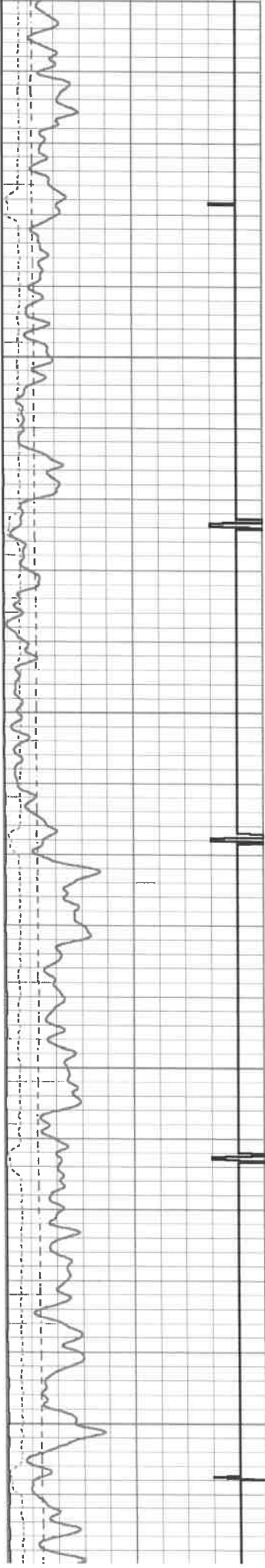
Database File antero_elk_fork_cheat_2h_rcbl_18_mar_2021.db
 Dataset Pathname rabbit_ears/cheat_2h/run1/pass6
 Presentation Format rcbl-bond index for antero 1020
 Dataset Creation Thu Mar 18 09:46:41 2021
 Charted by Depth in Feet scaled 1:240

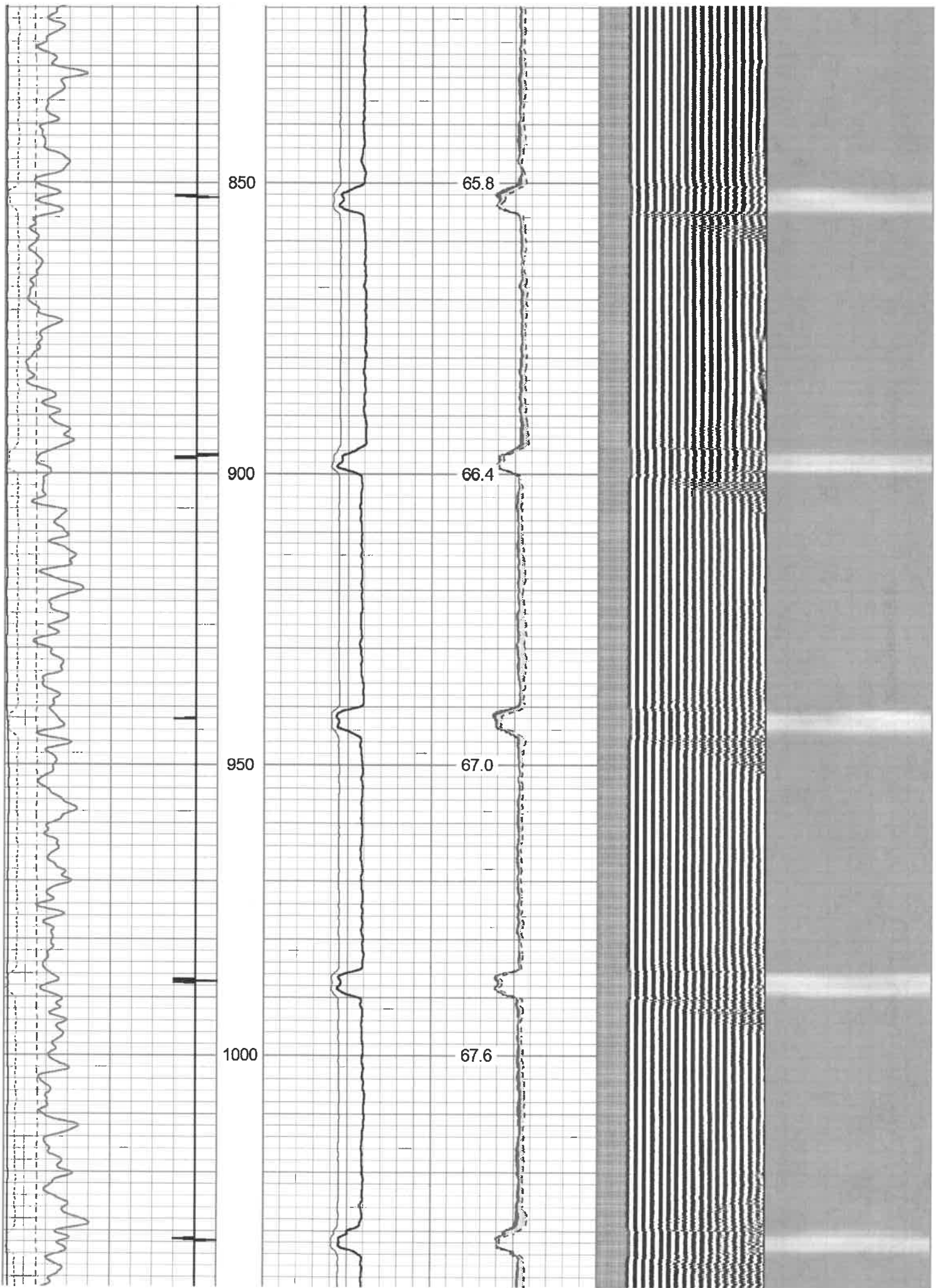
265	Travel Time (usec)	165	0	Amplitude (mV)	100	0	AMP	MIN	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	1	BONDIX	0	0	AMP	MAX	150	200 (usec)	1200		
0	Gamma Ray (GAPI)	150	0			0	AMP	AVG	150				
	Line Speed						TEMP						
-100	(ft/min)	100					(degF)						
0	Line Tension (lb)	2000											

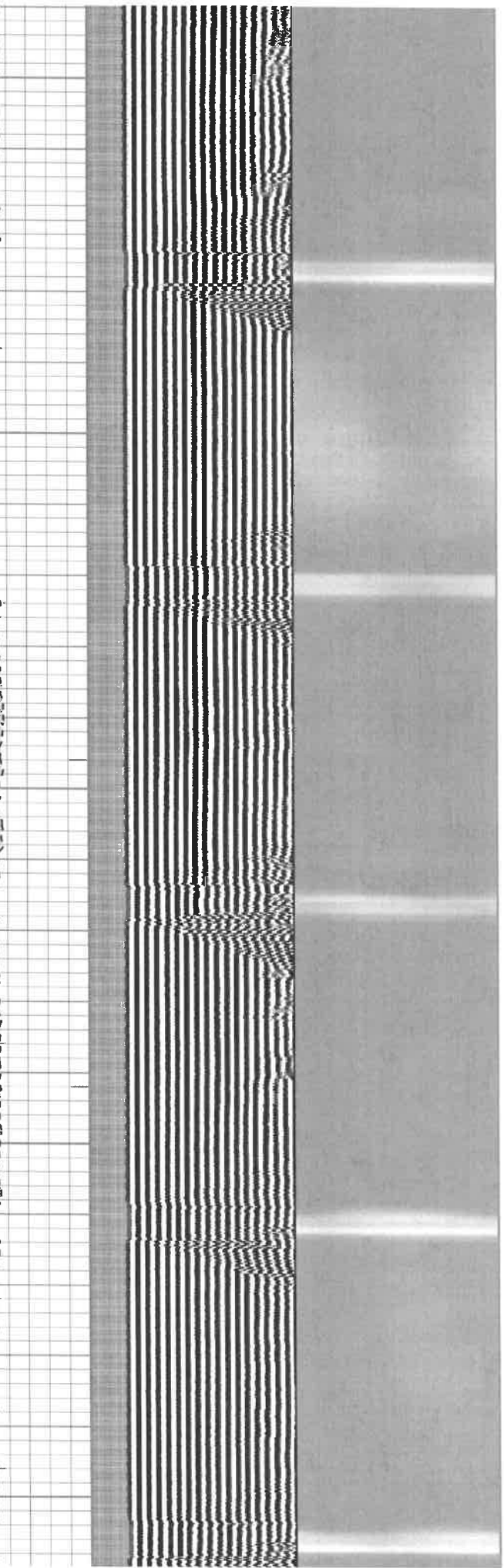
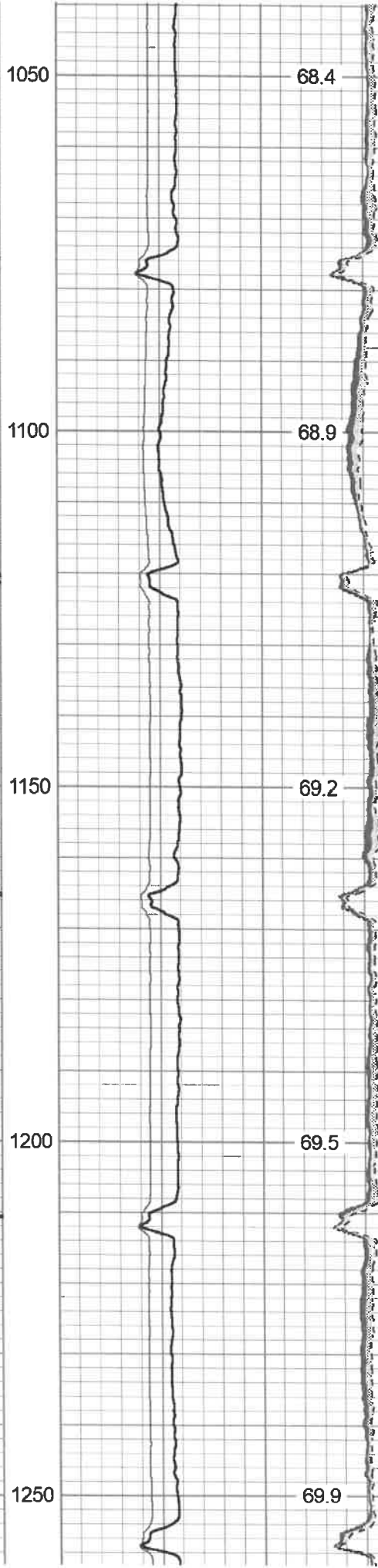
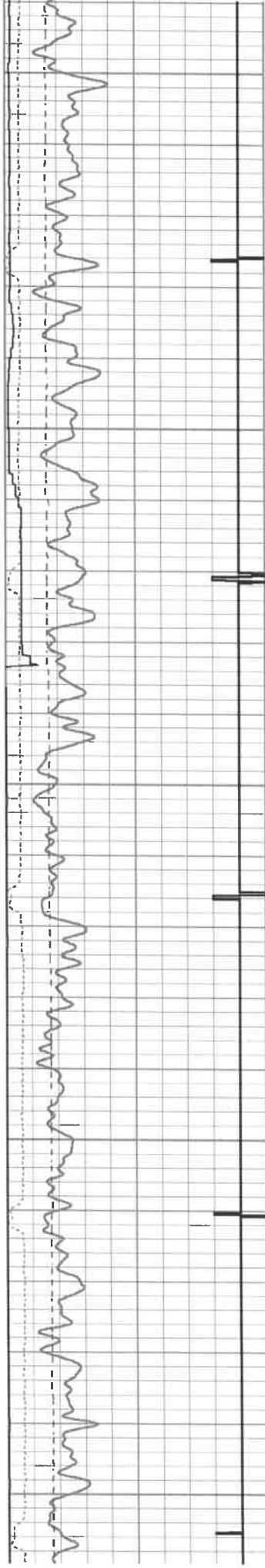


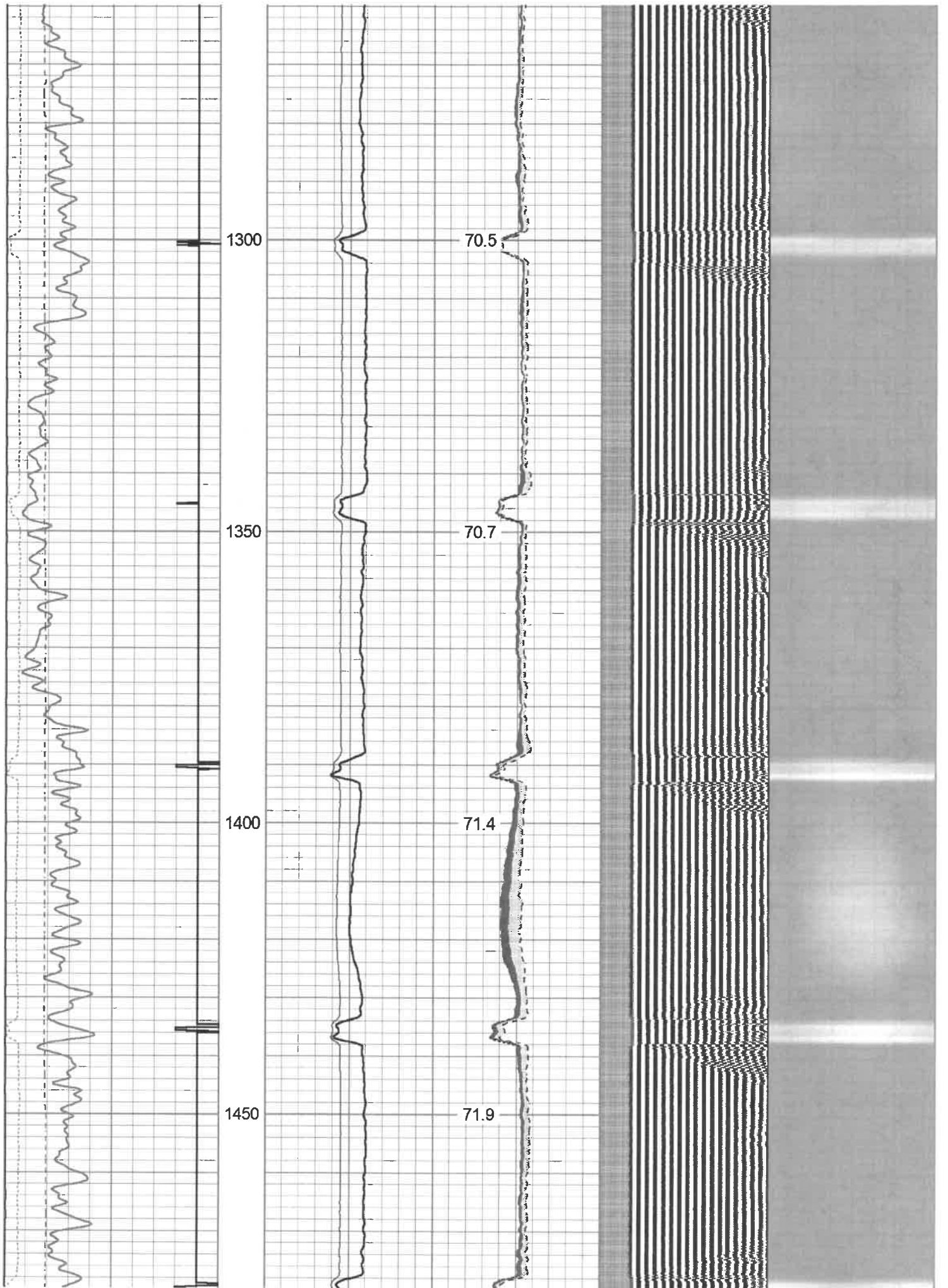


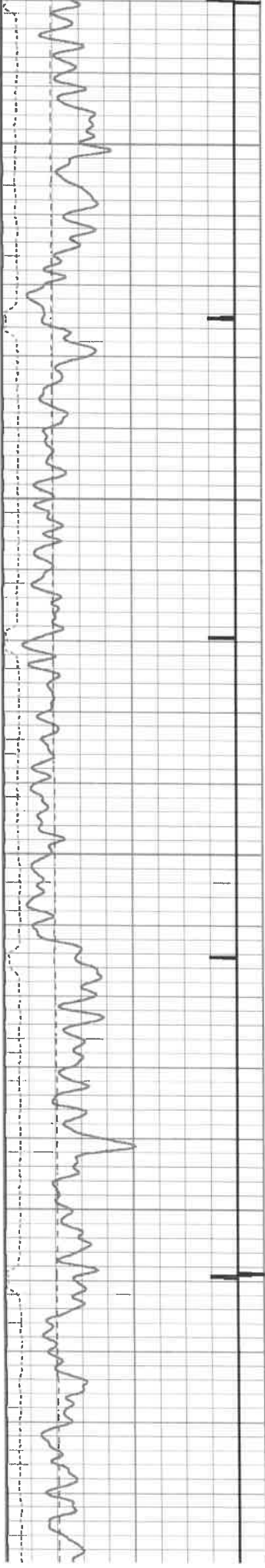












1500

1550

1600

1650

1700



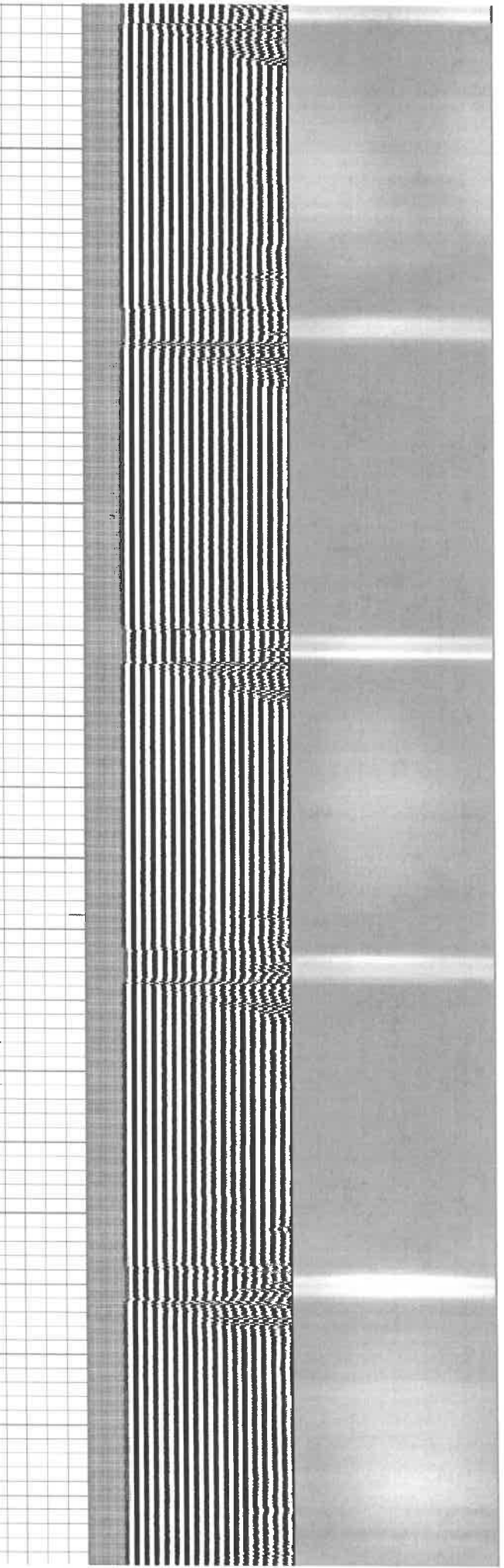
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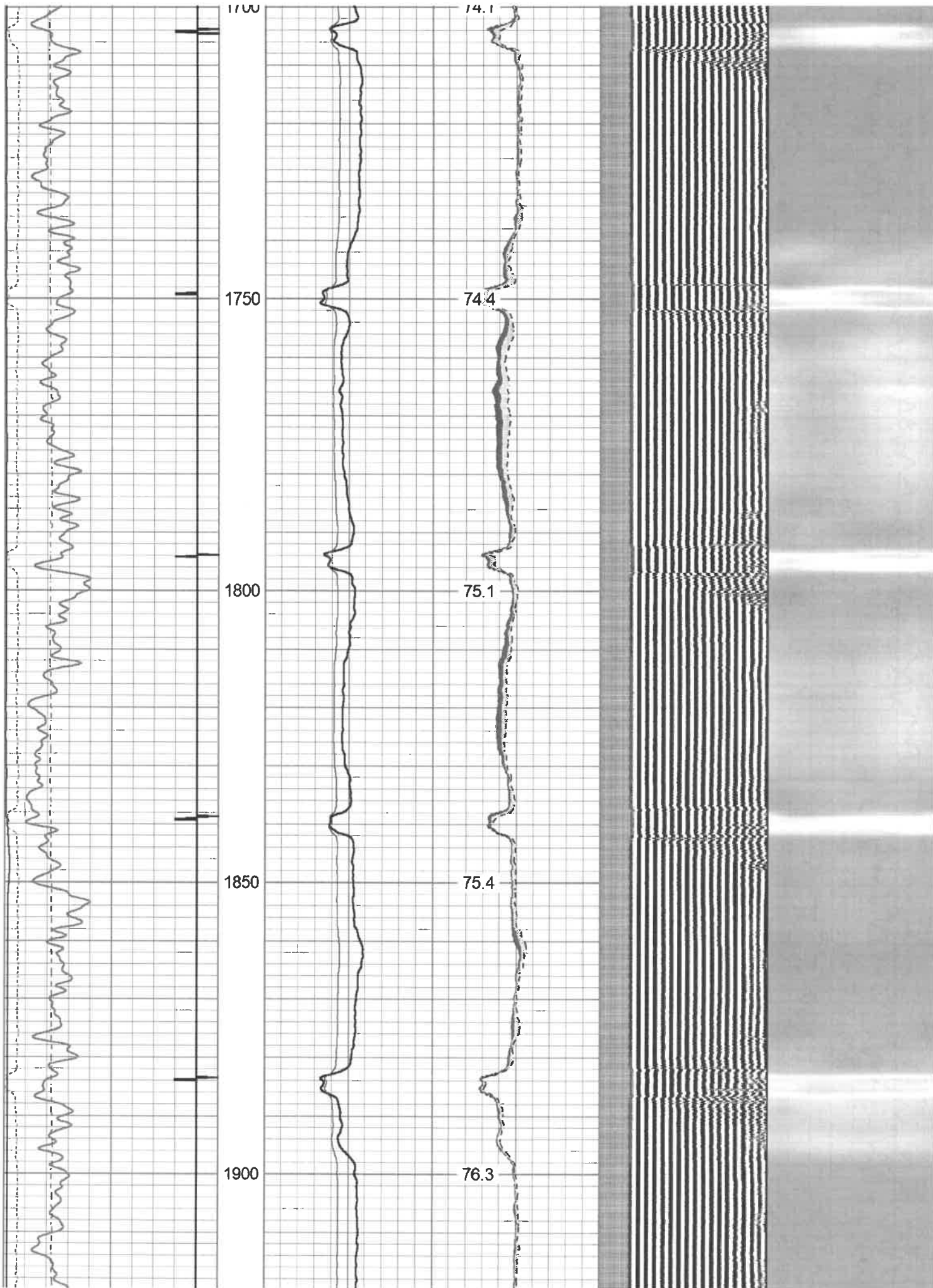
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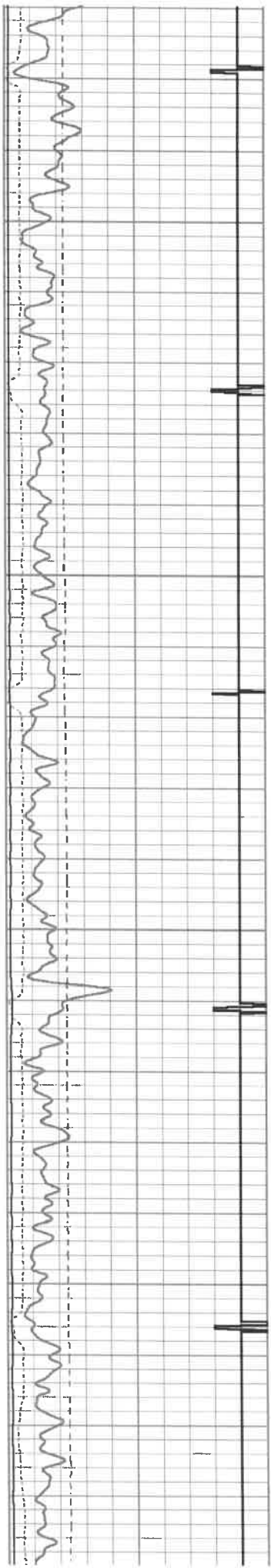
73.4

73.7

74.1







1950

2000

2050

2100

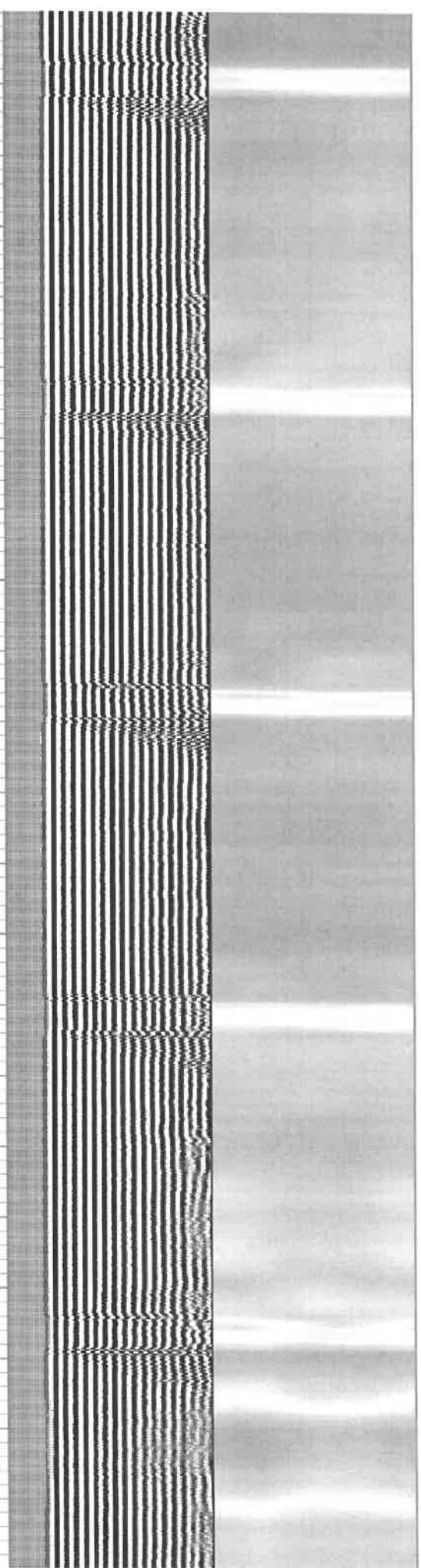


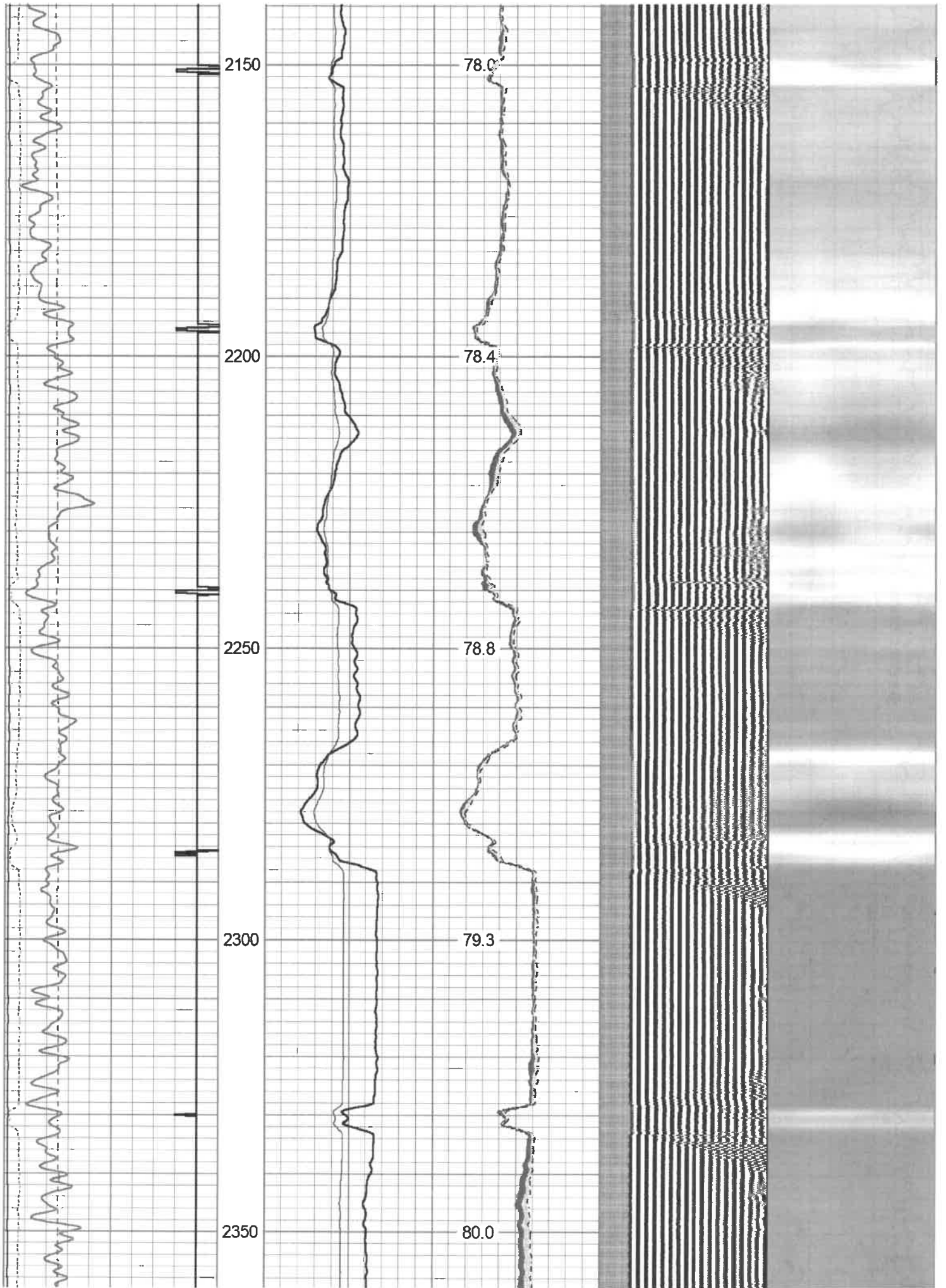
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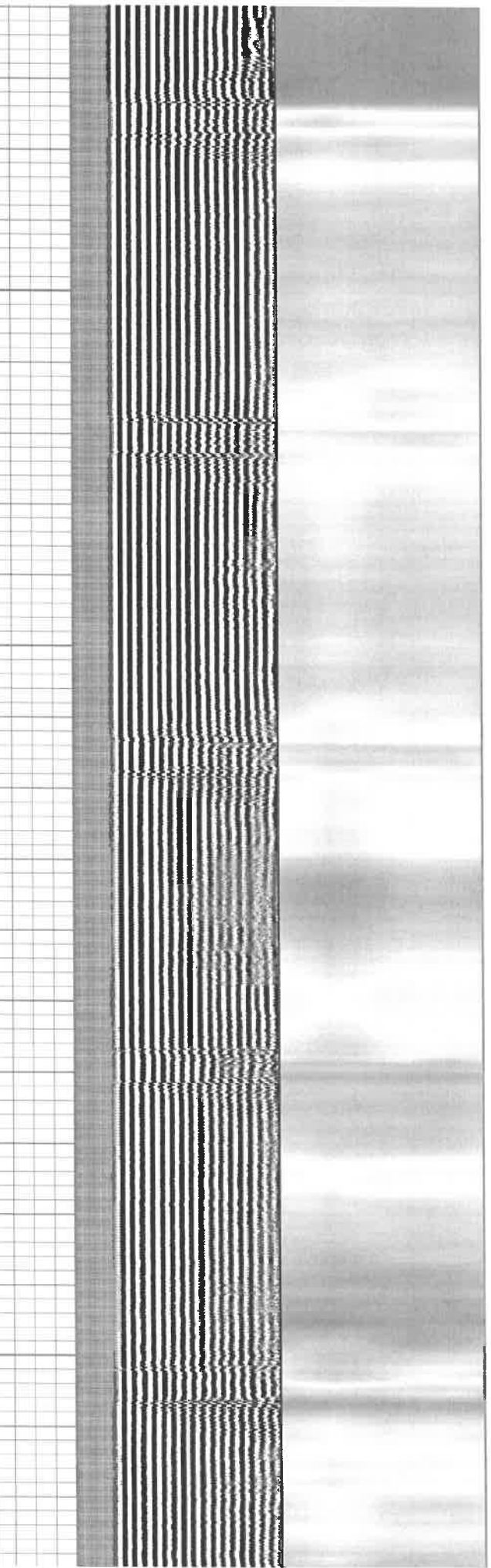
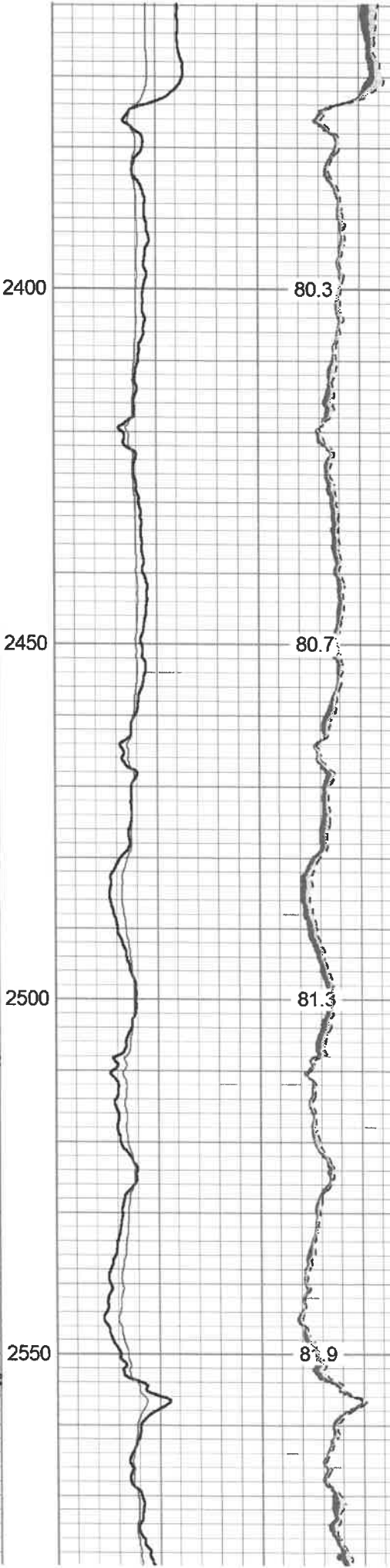
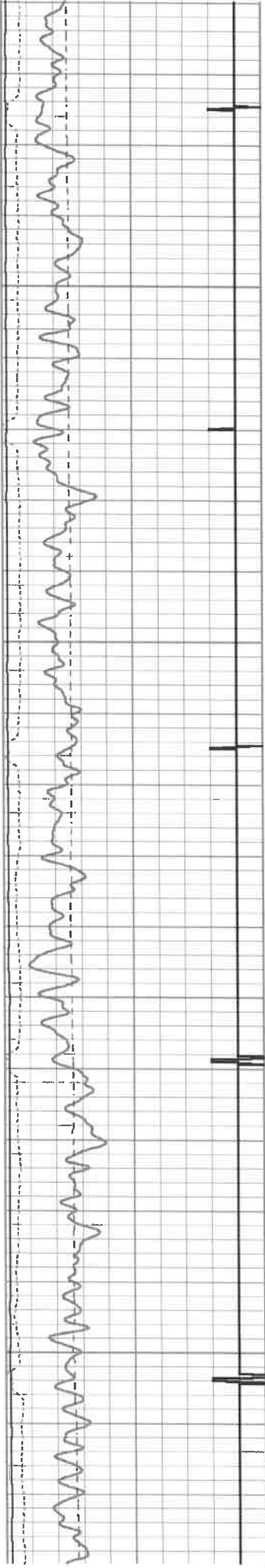
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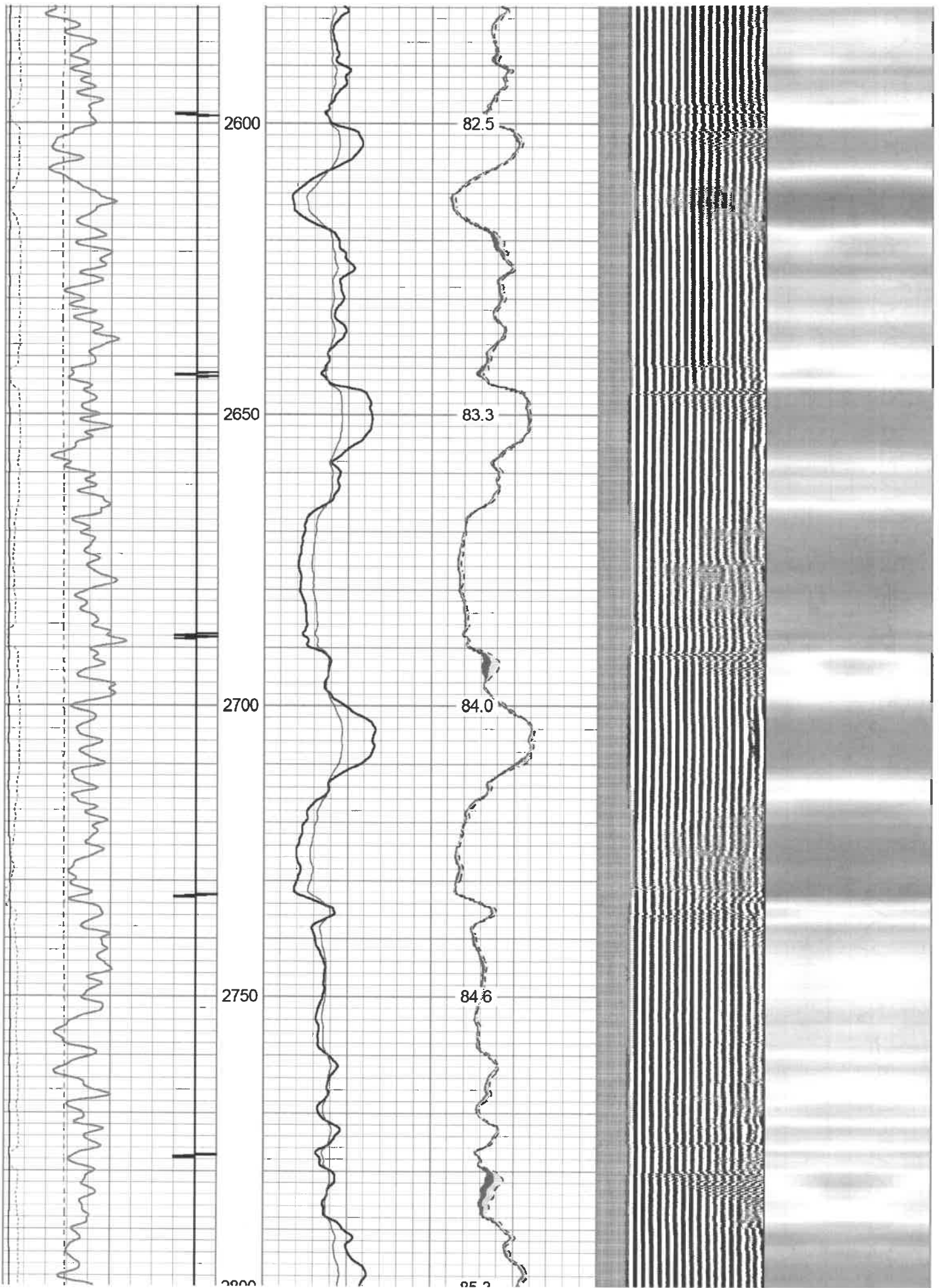
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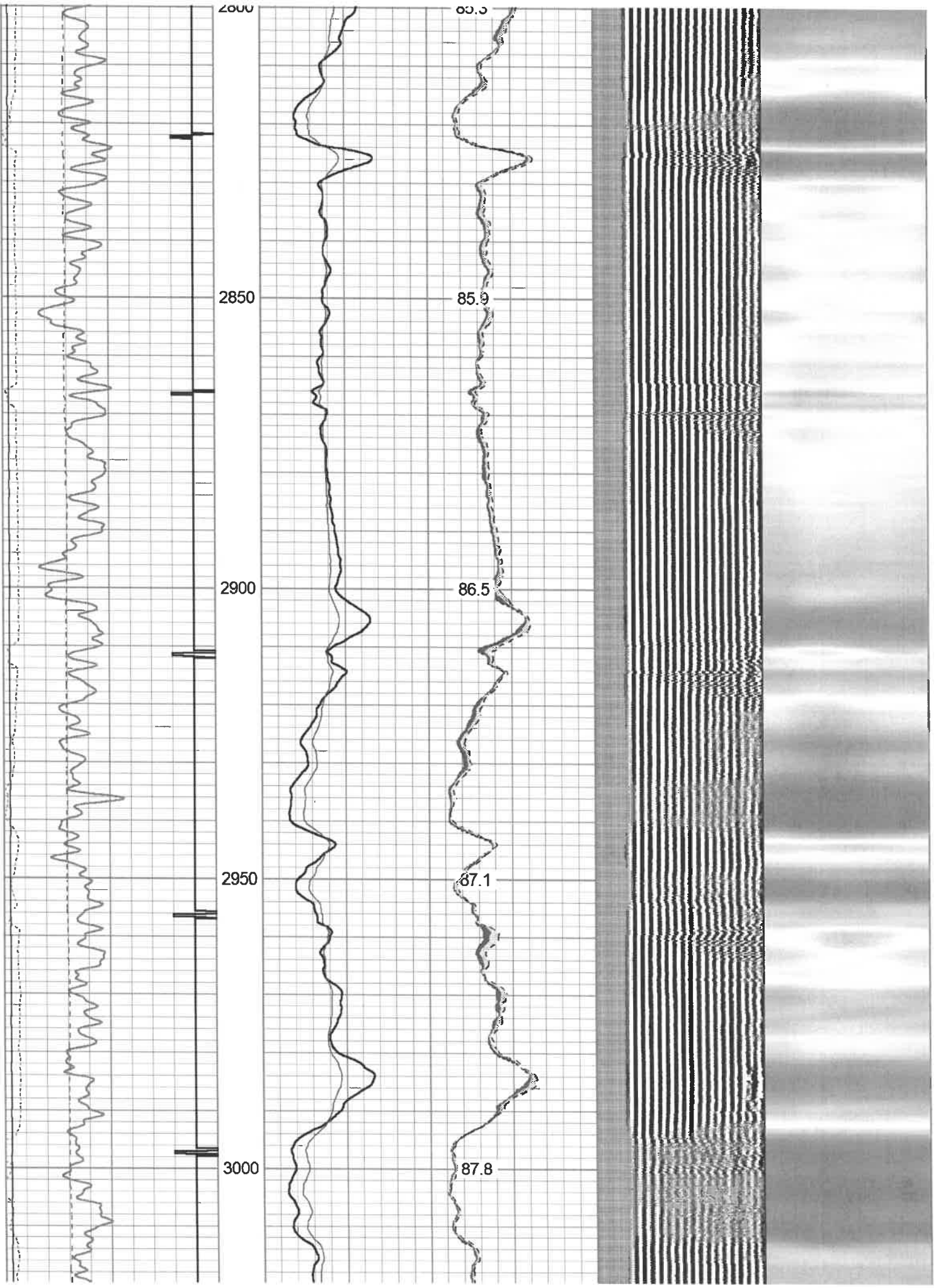
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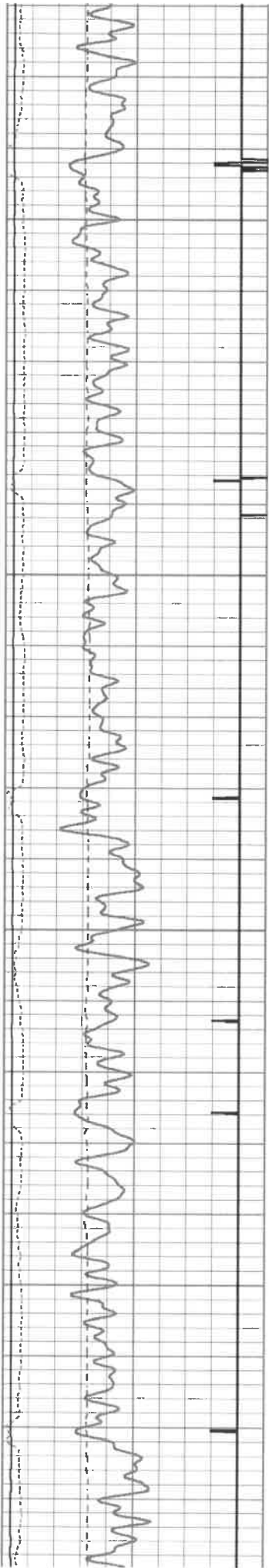










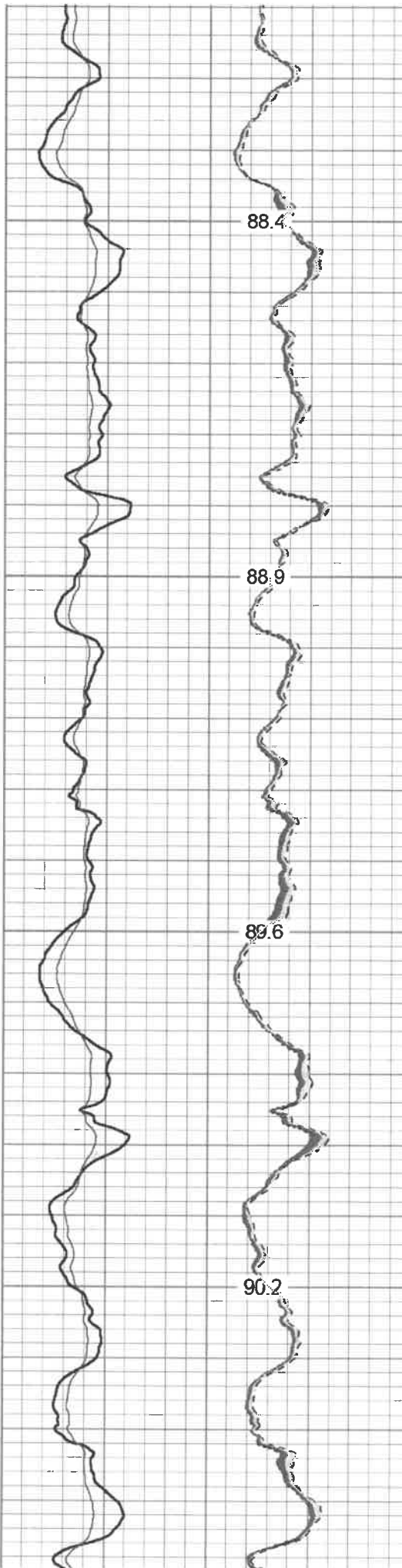


3050

3100

3150

3200

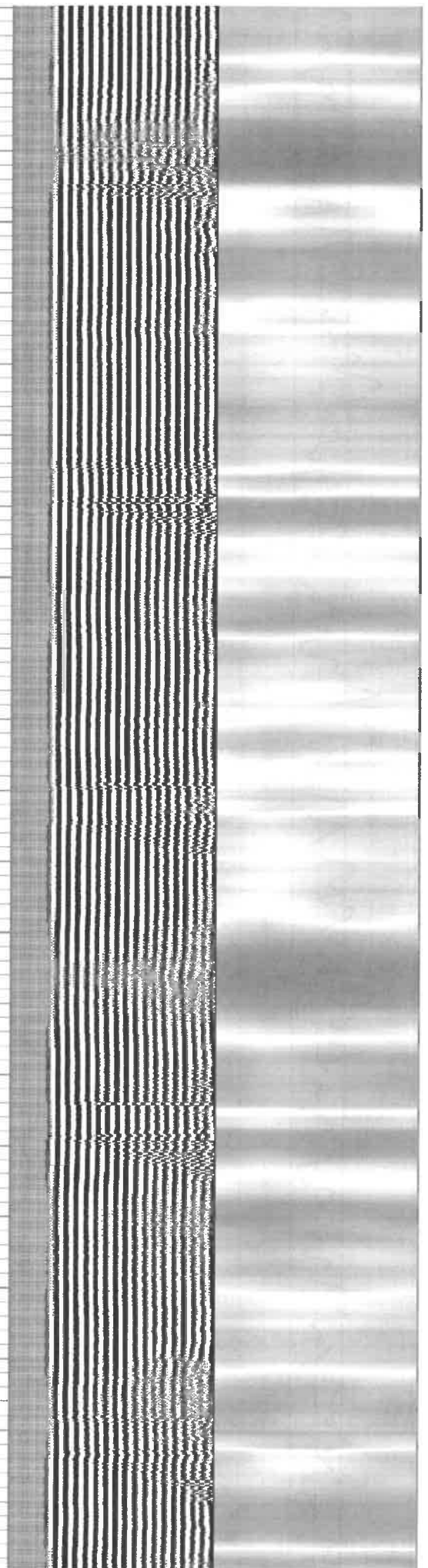


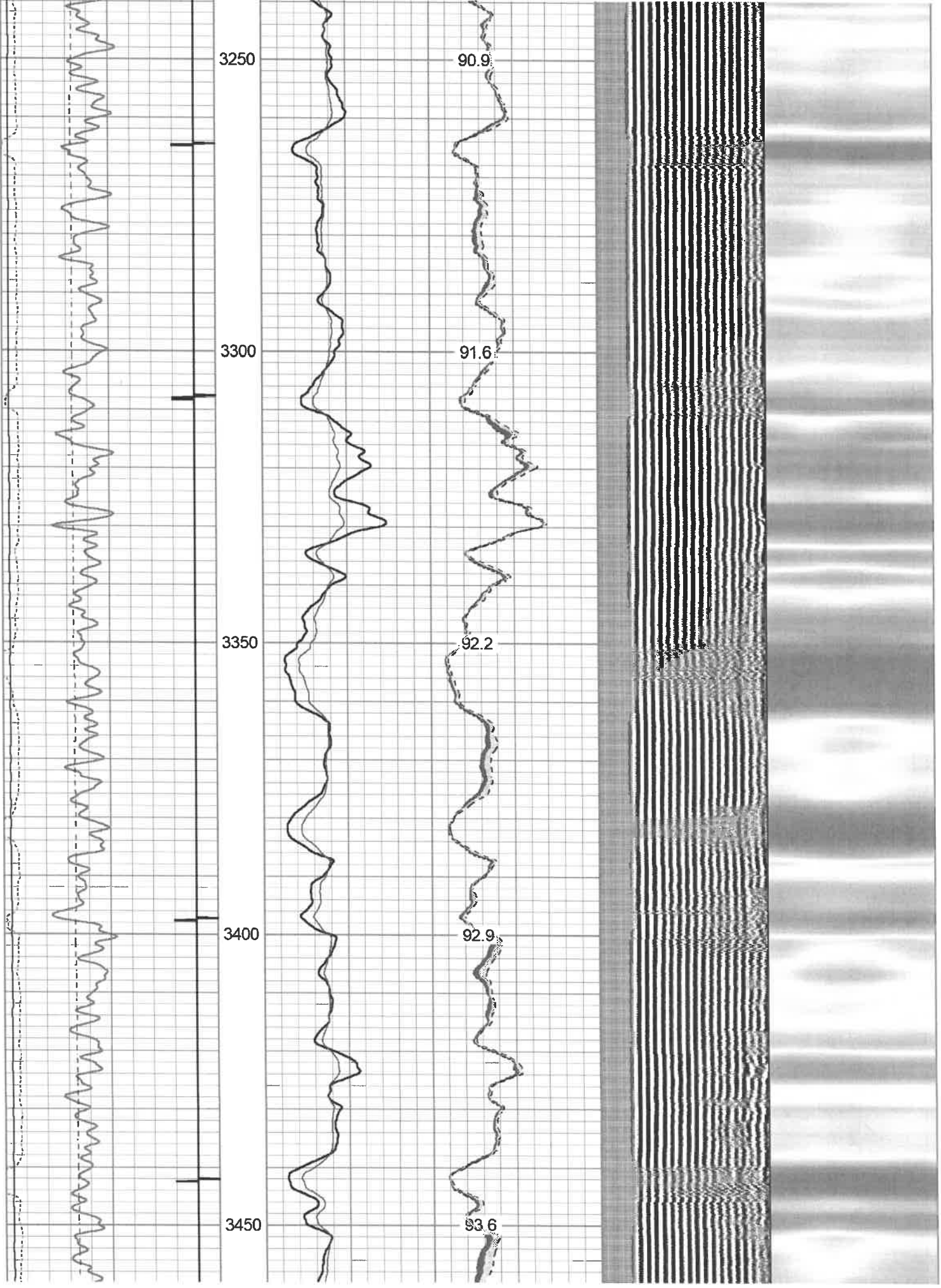
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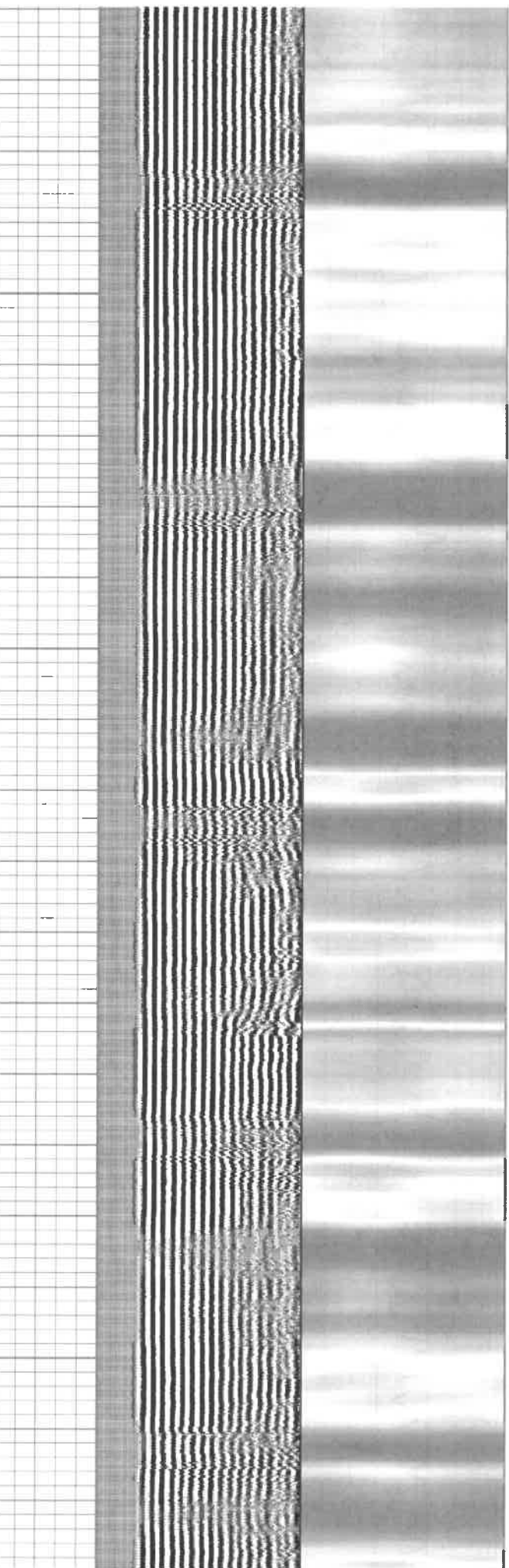
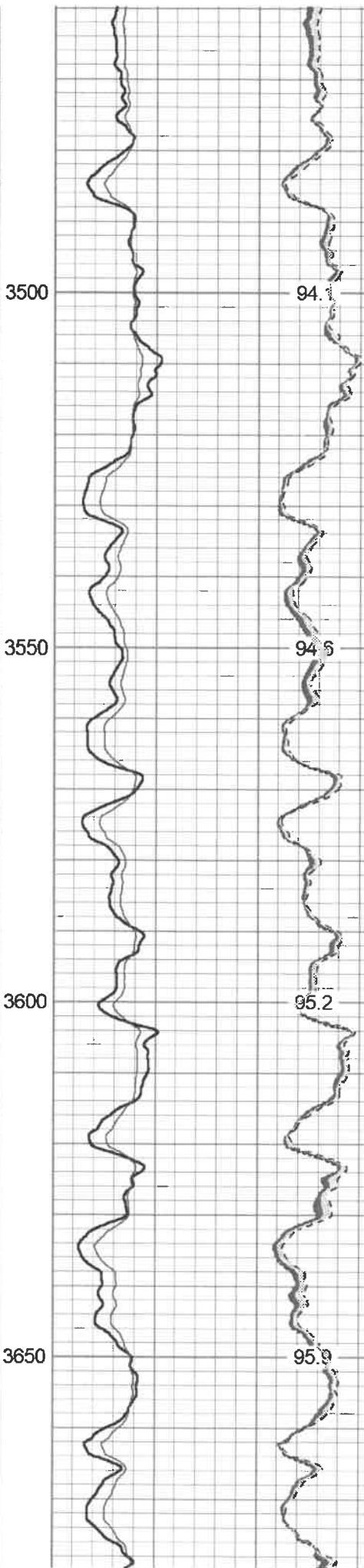
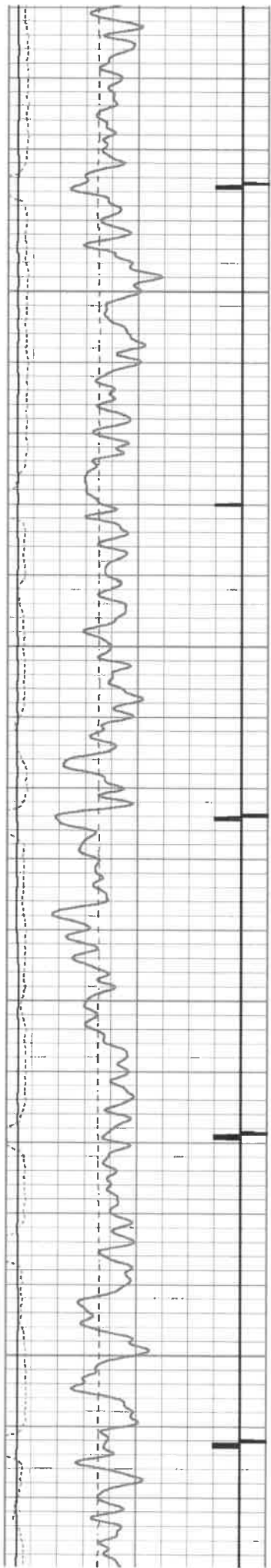
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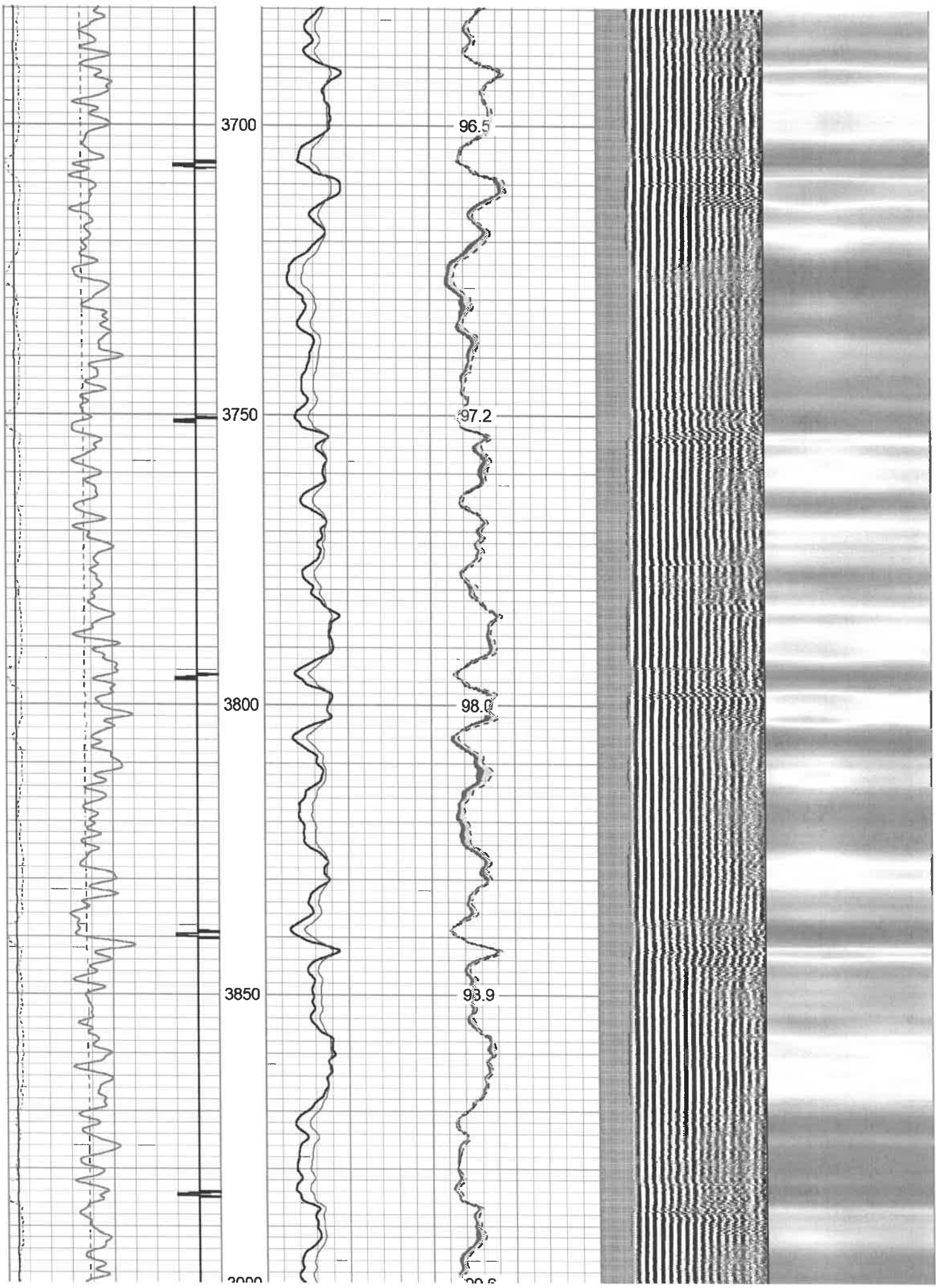
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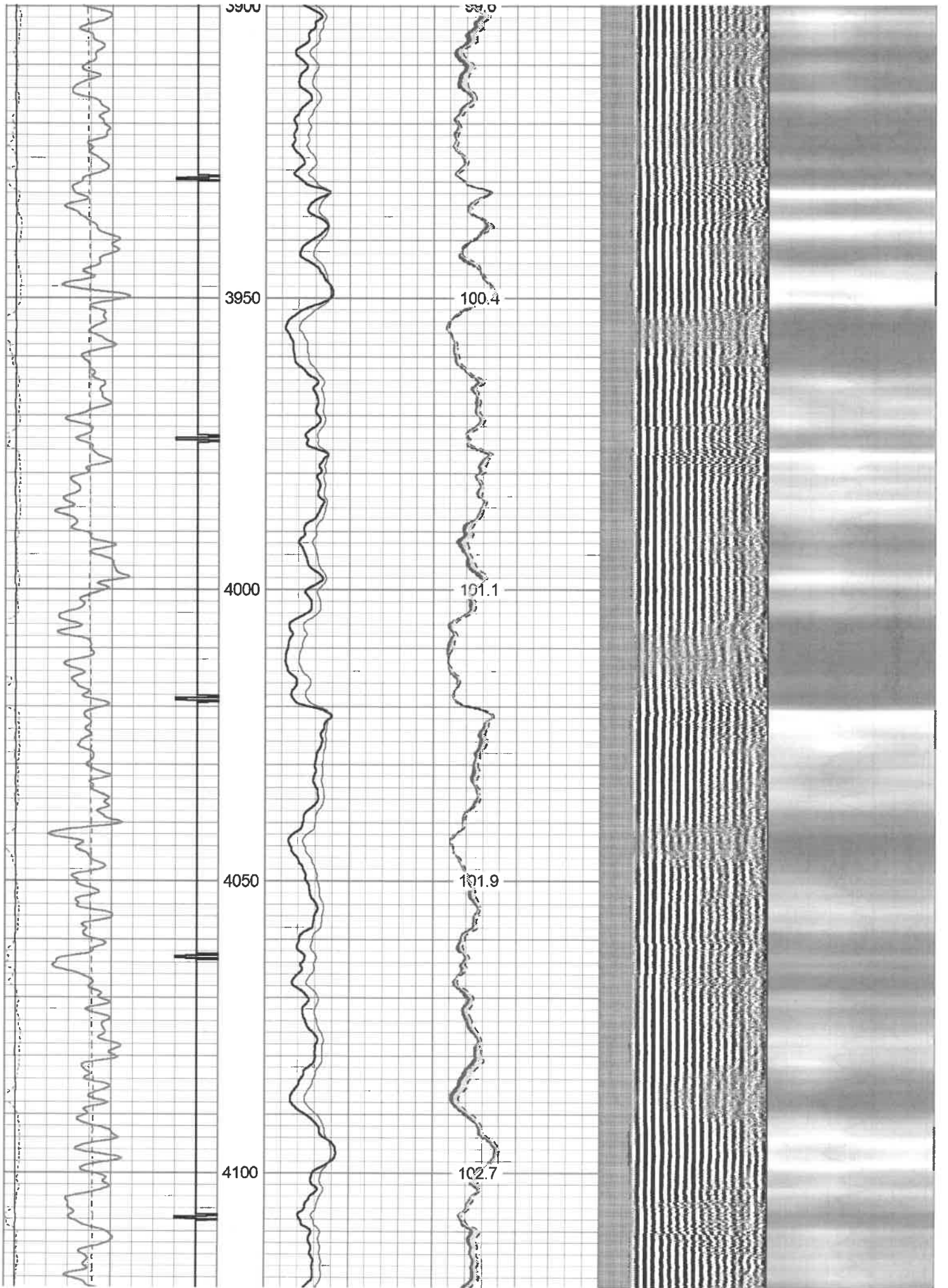
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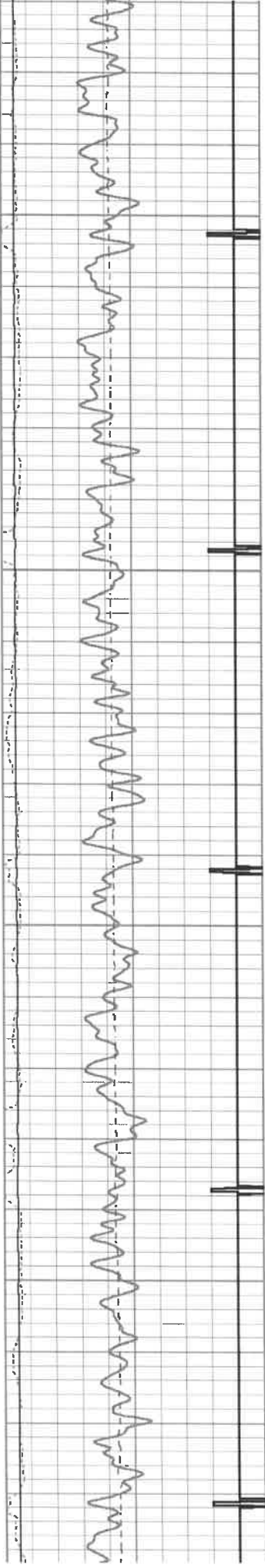










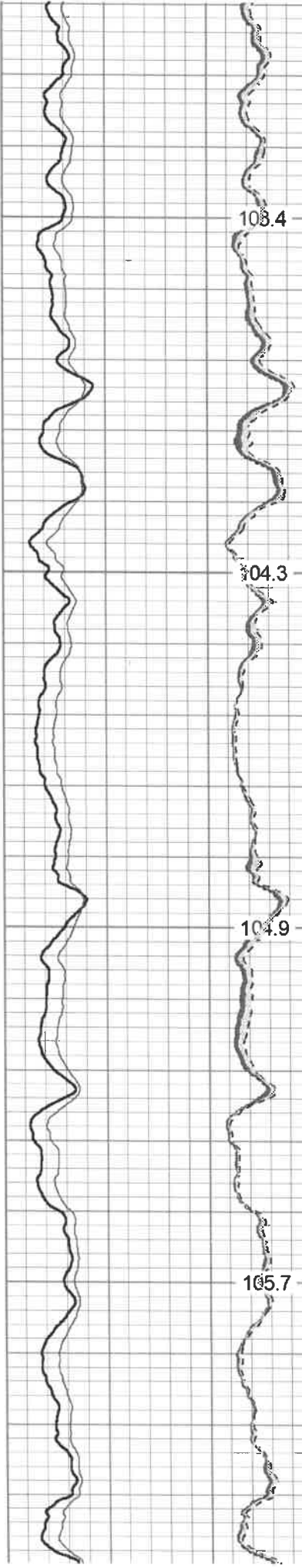


4150

4200

4250

4300

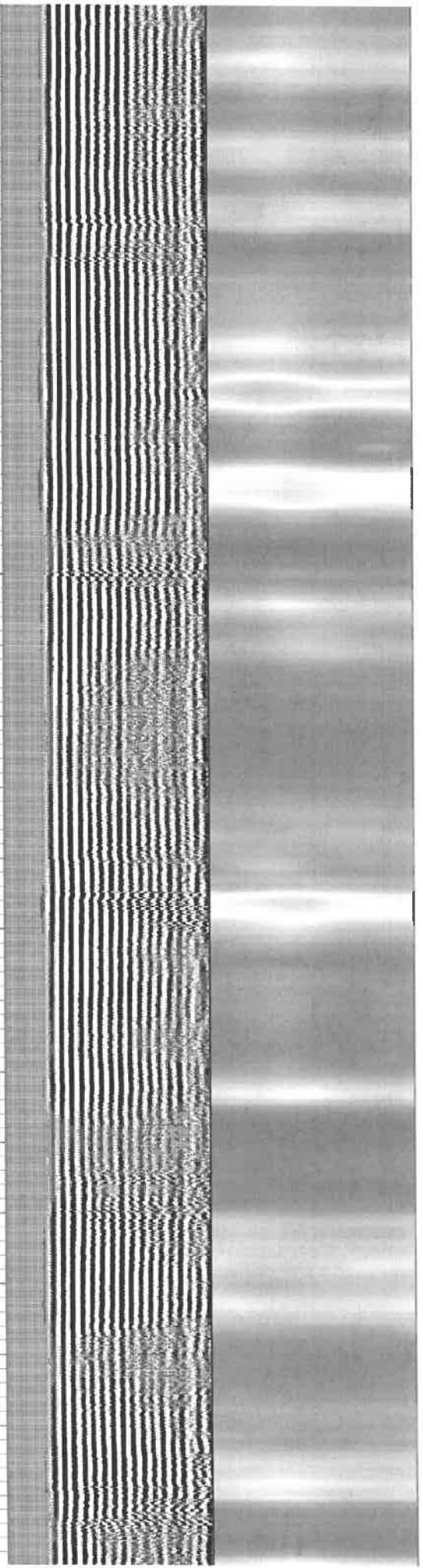


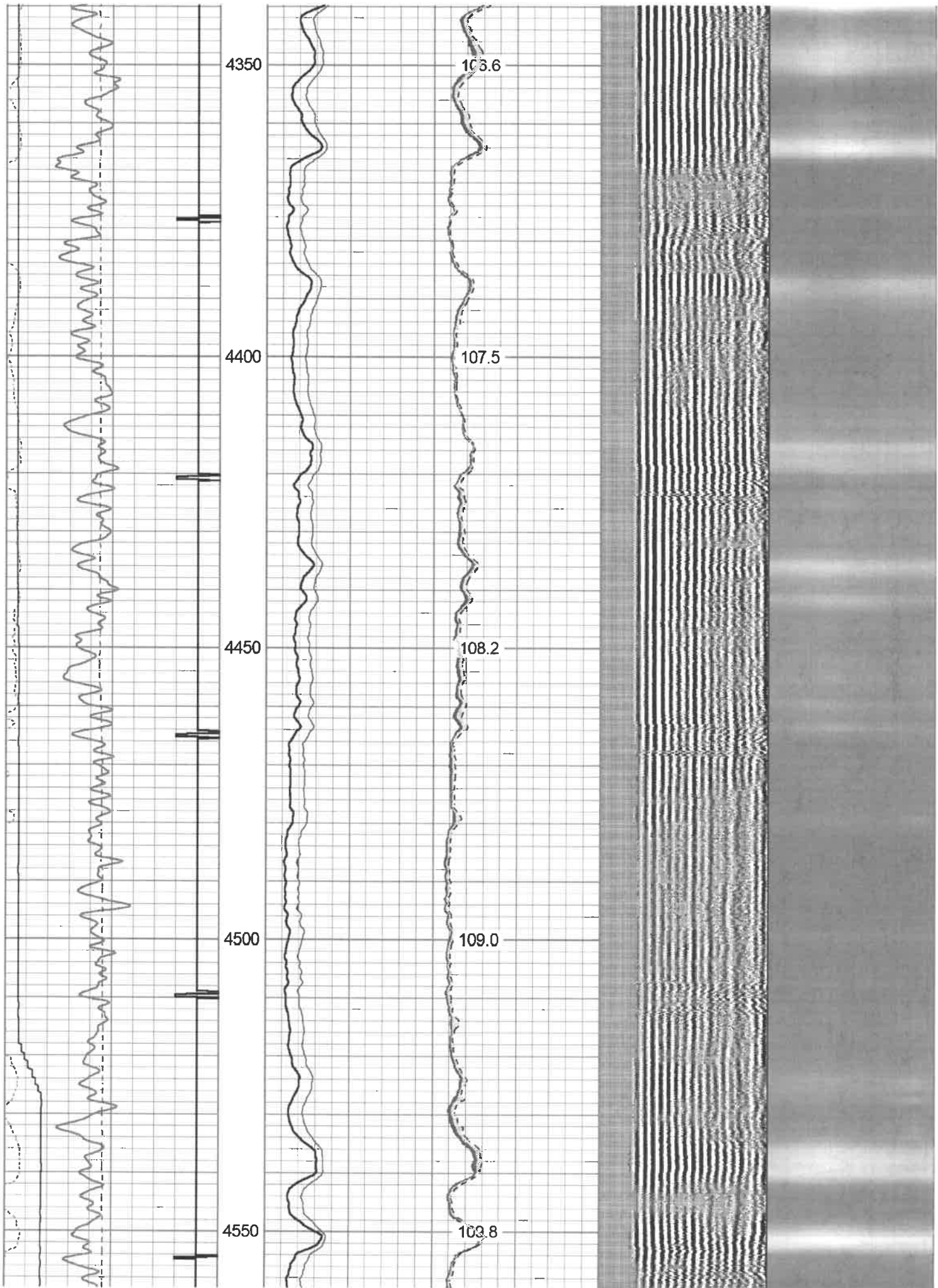
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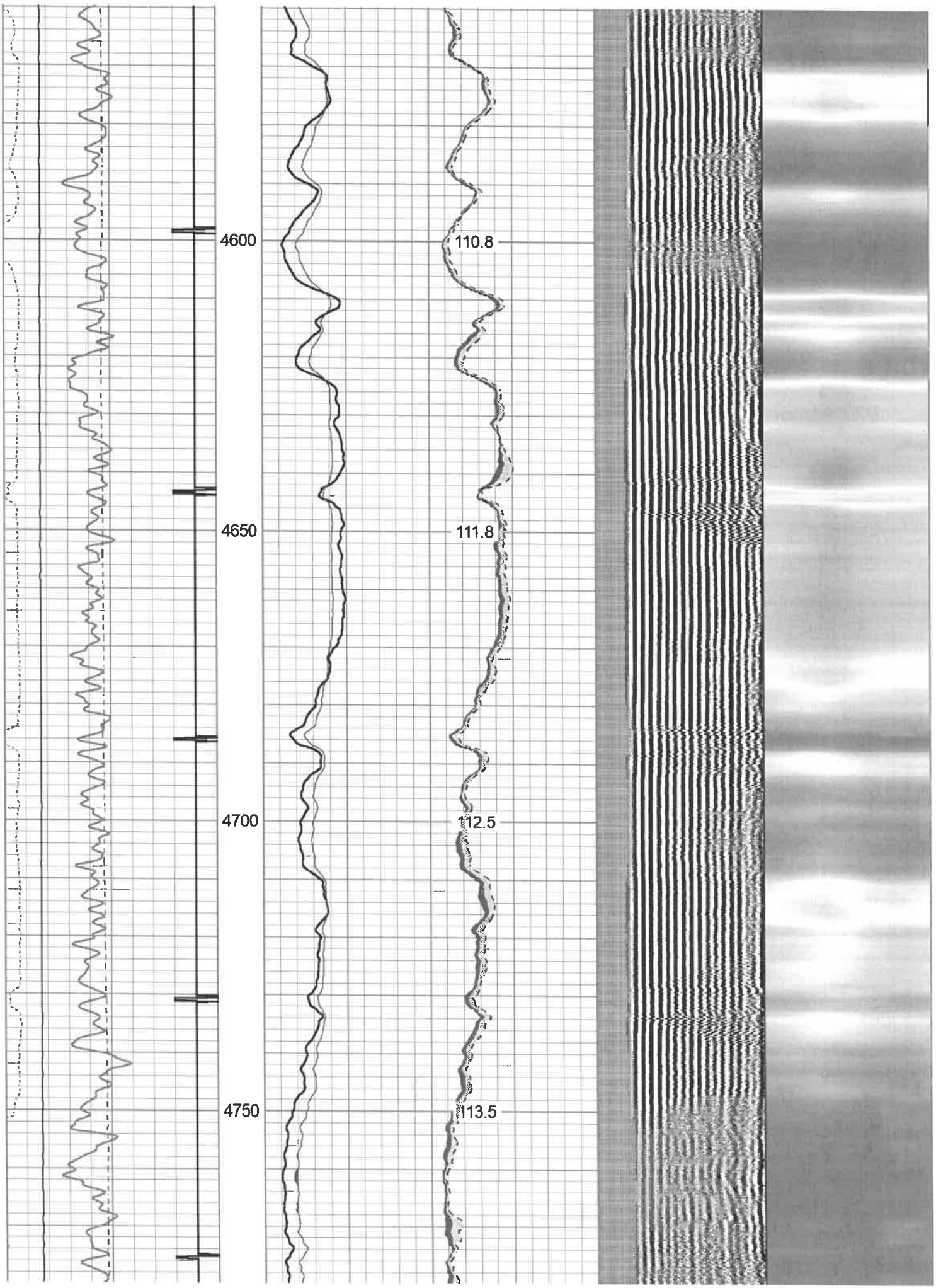
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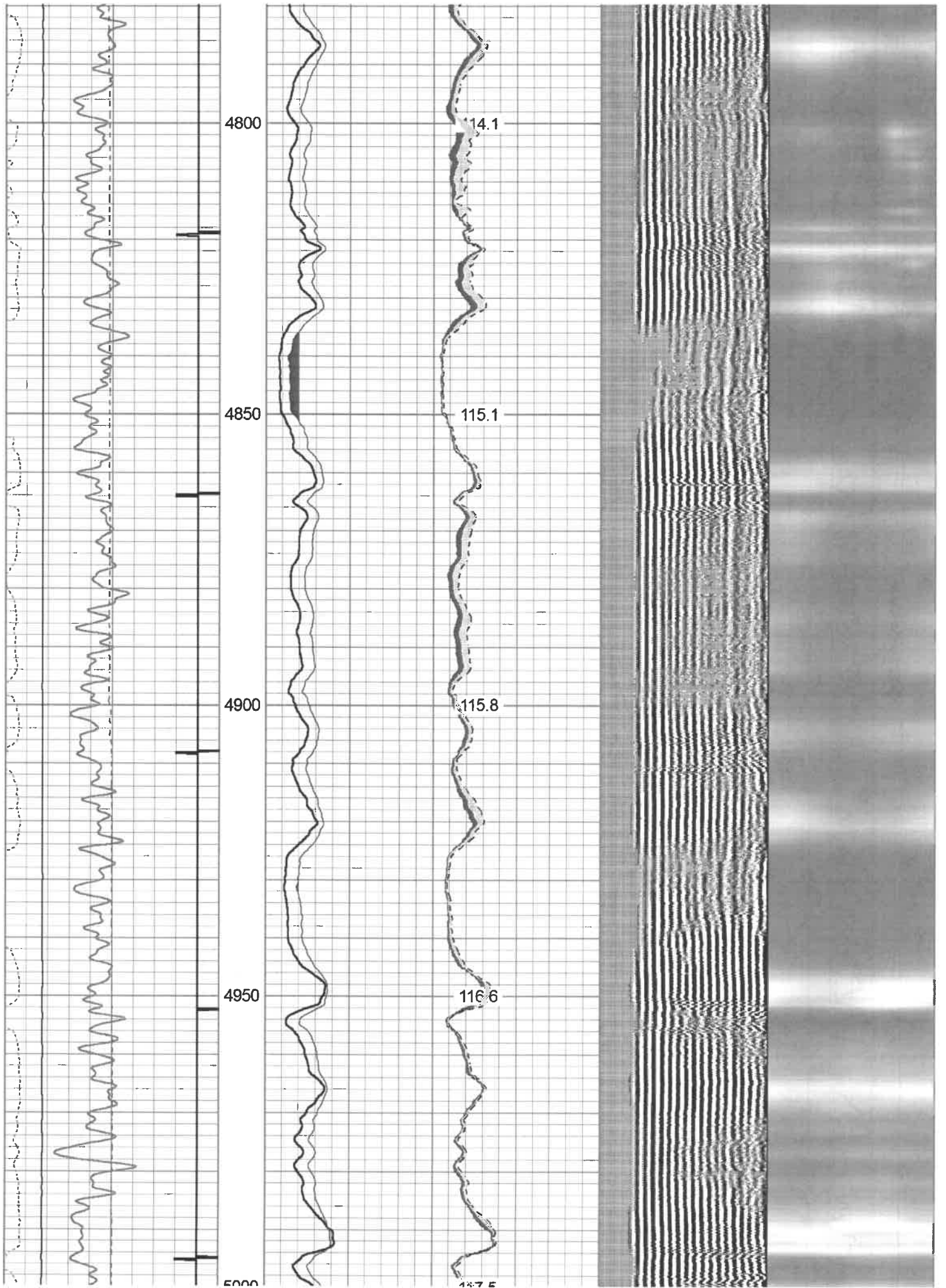
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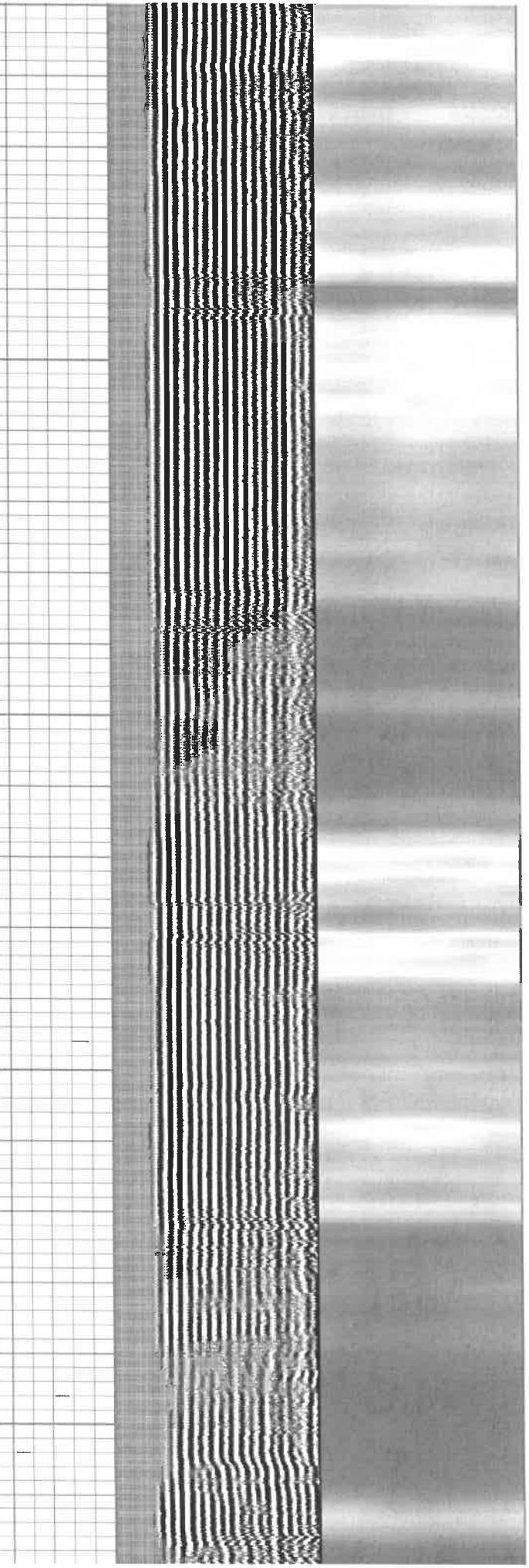
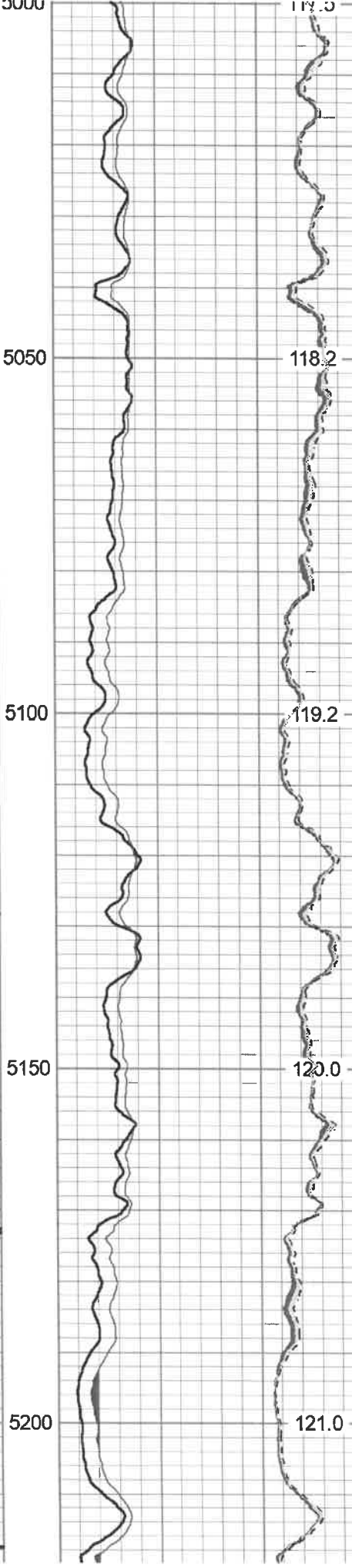
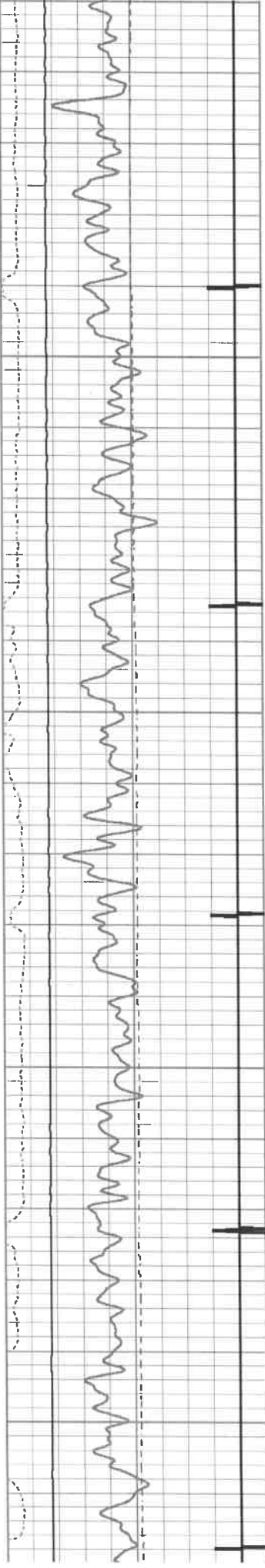
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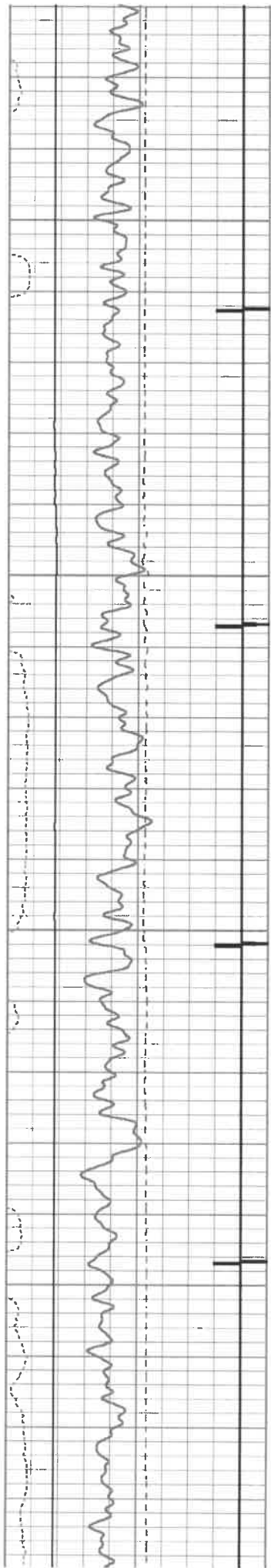










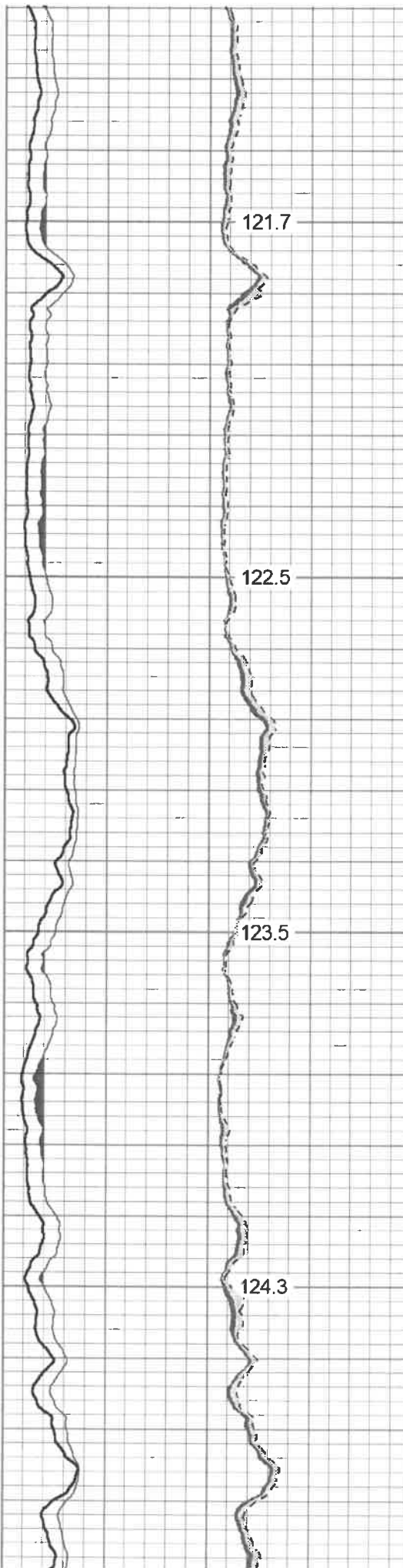


5250

5300

5350

5400

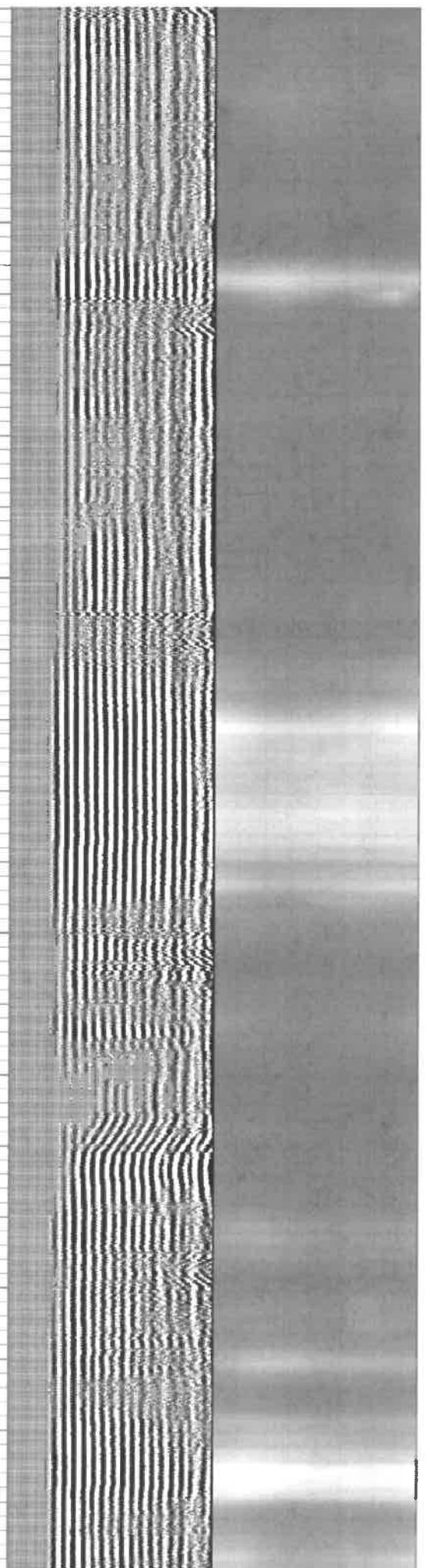


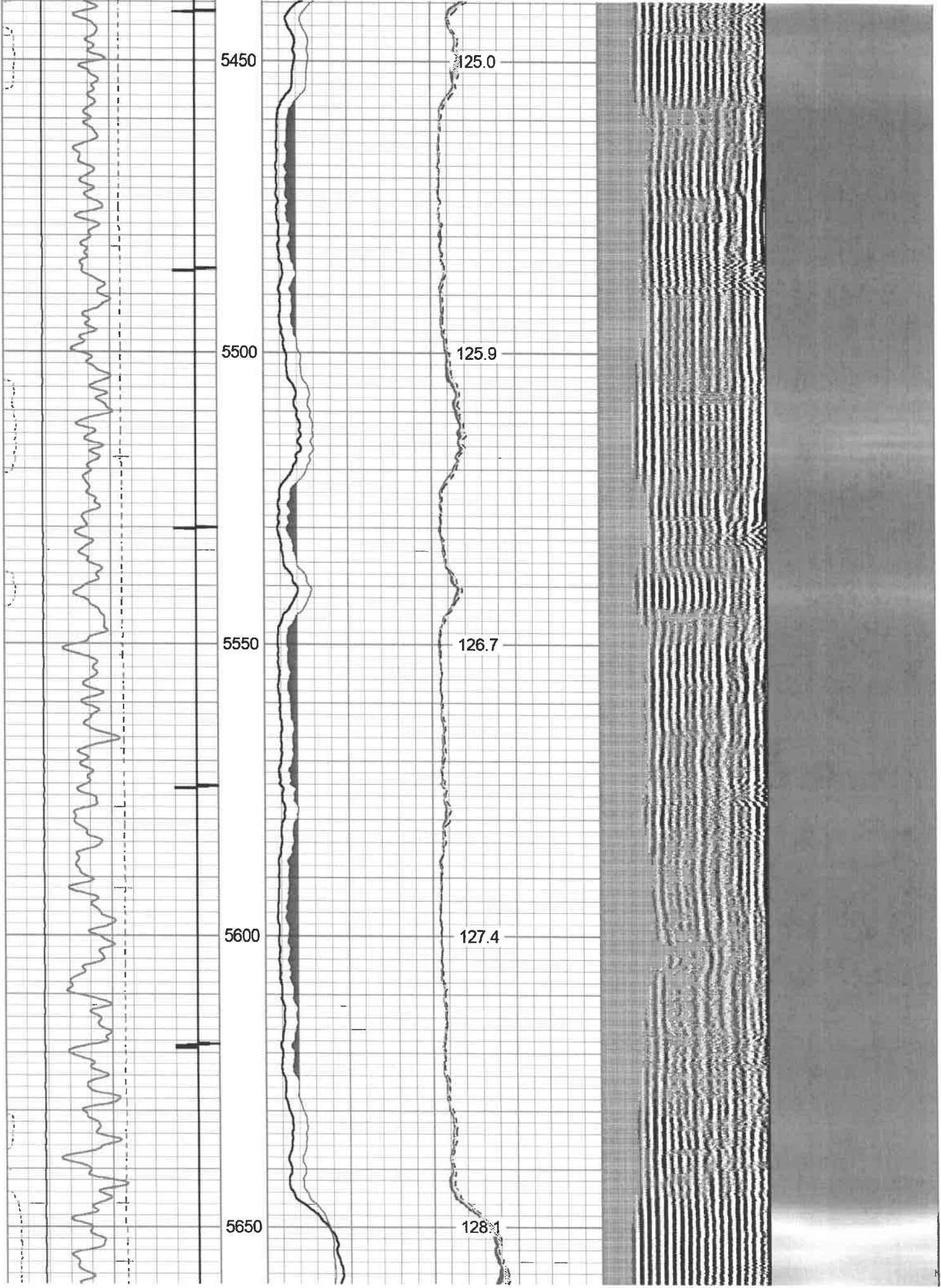
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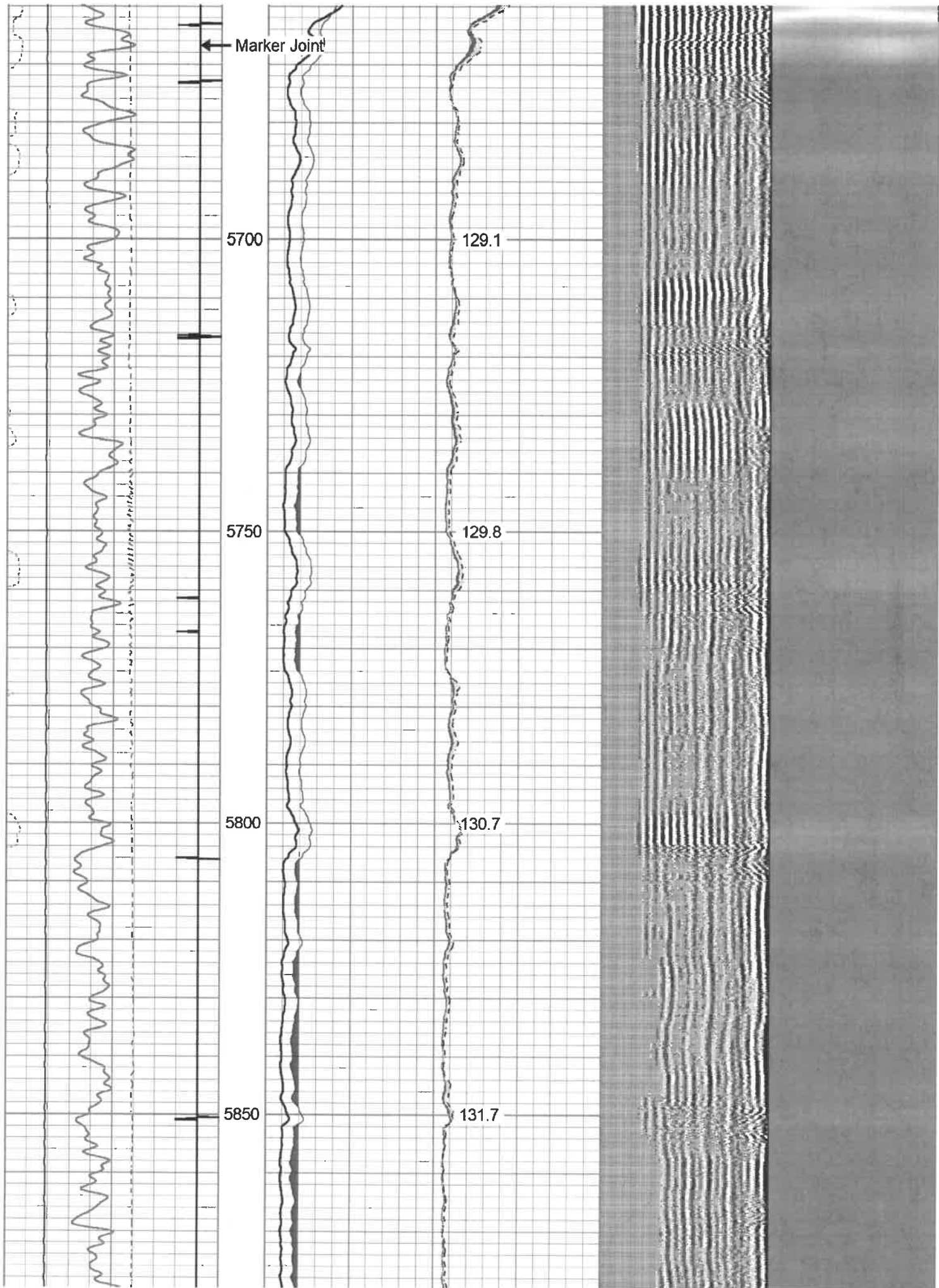
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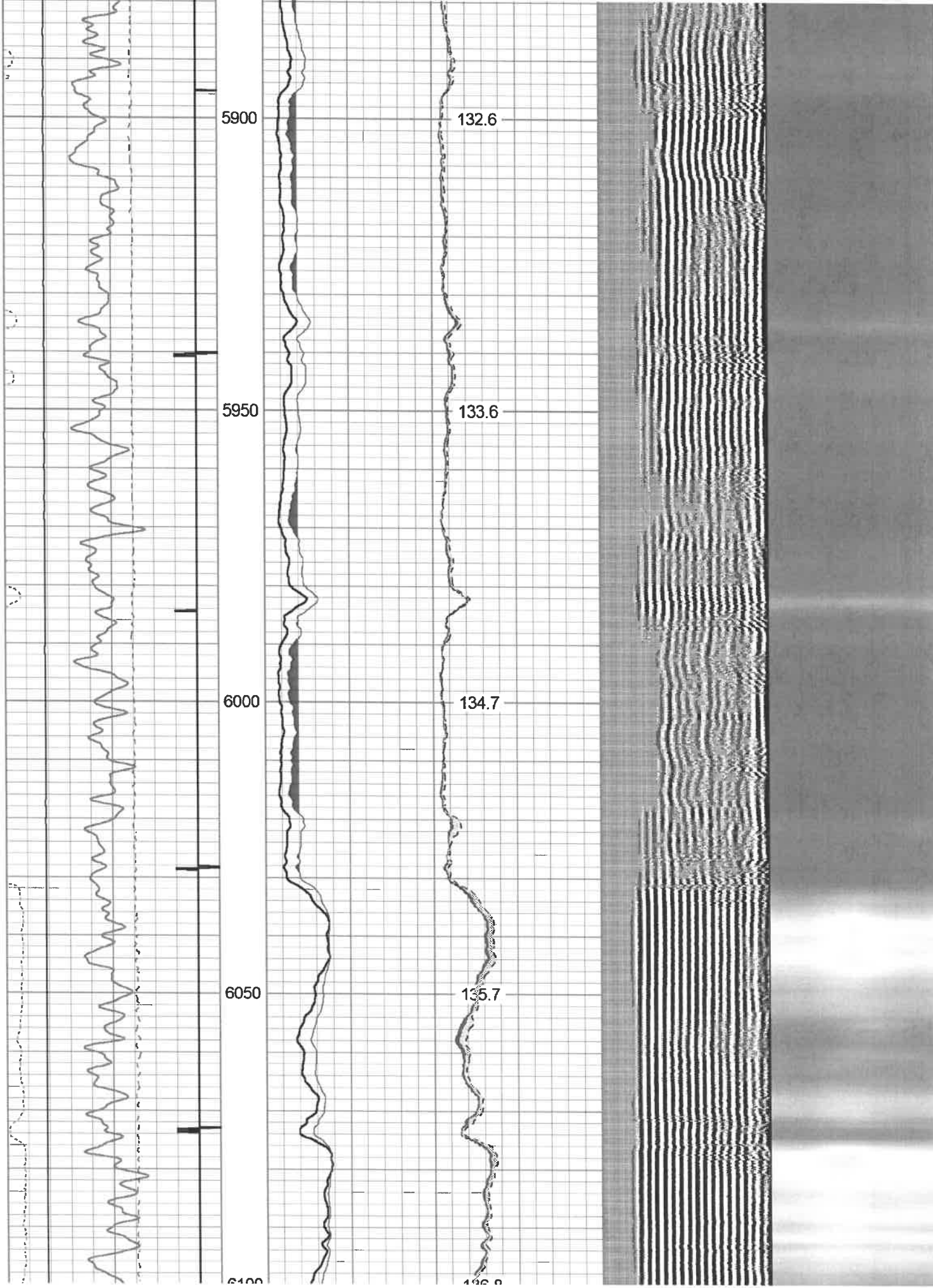
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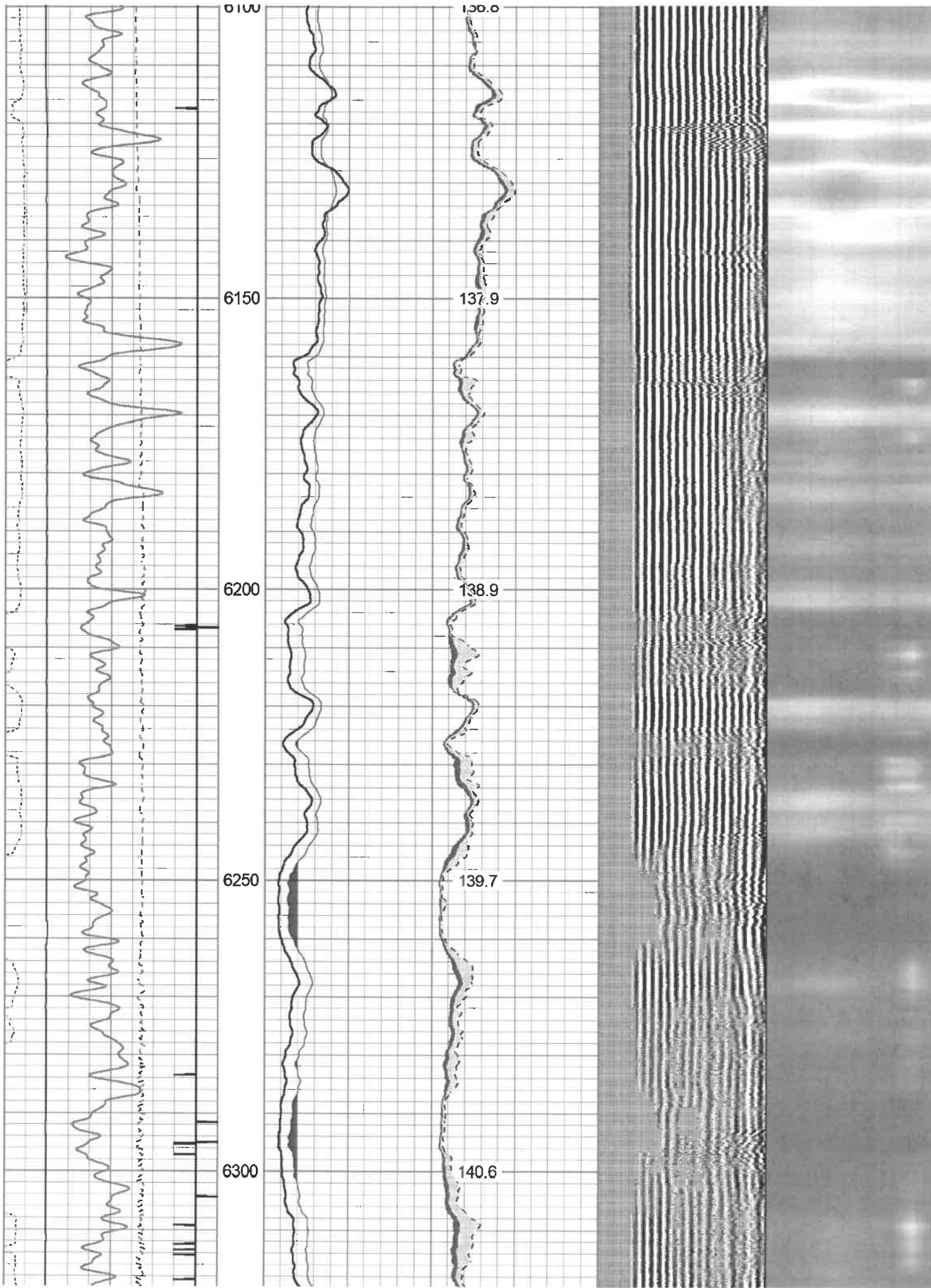
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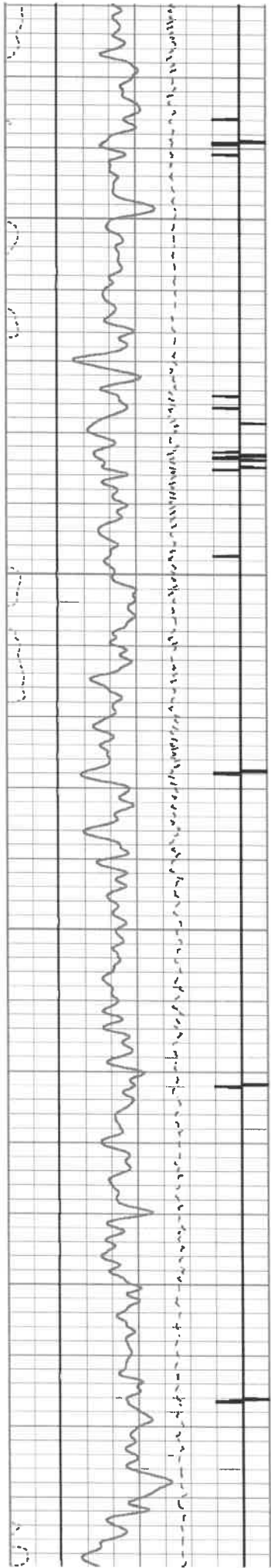












6350

6400

6450

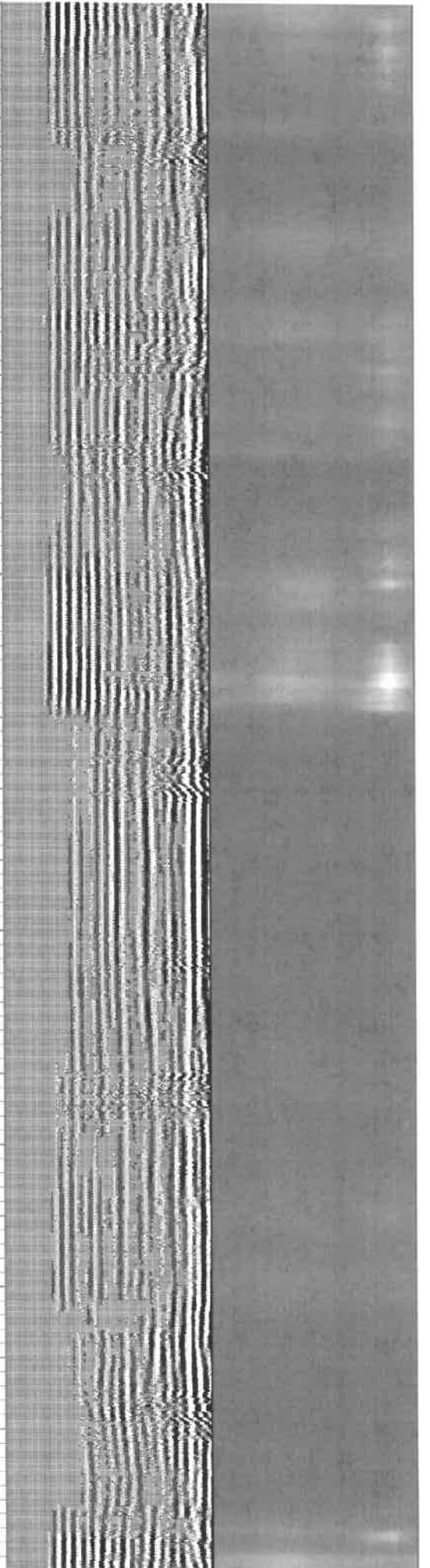
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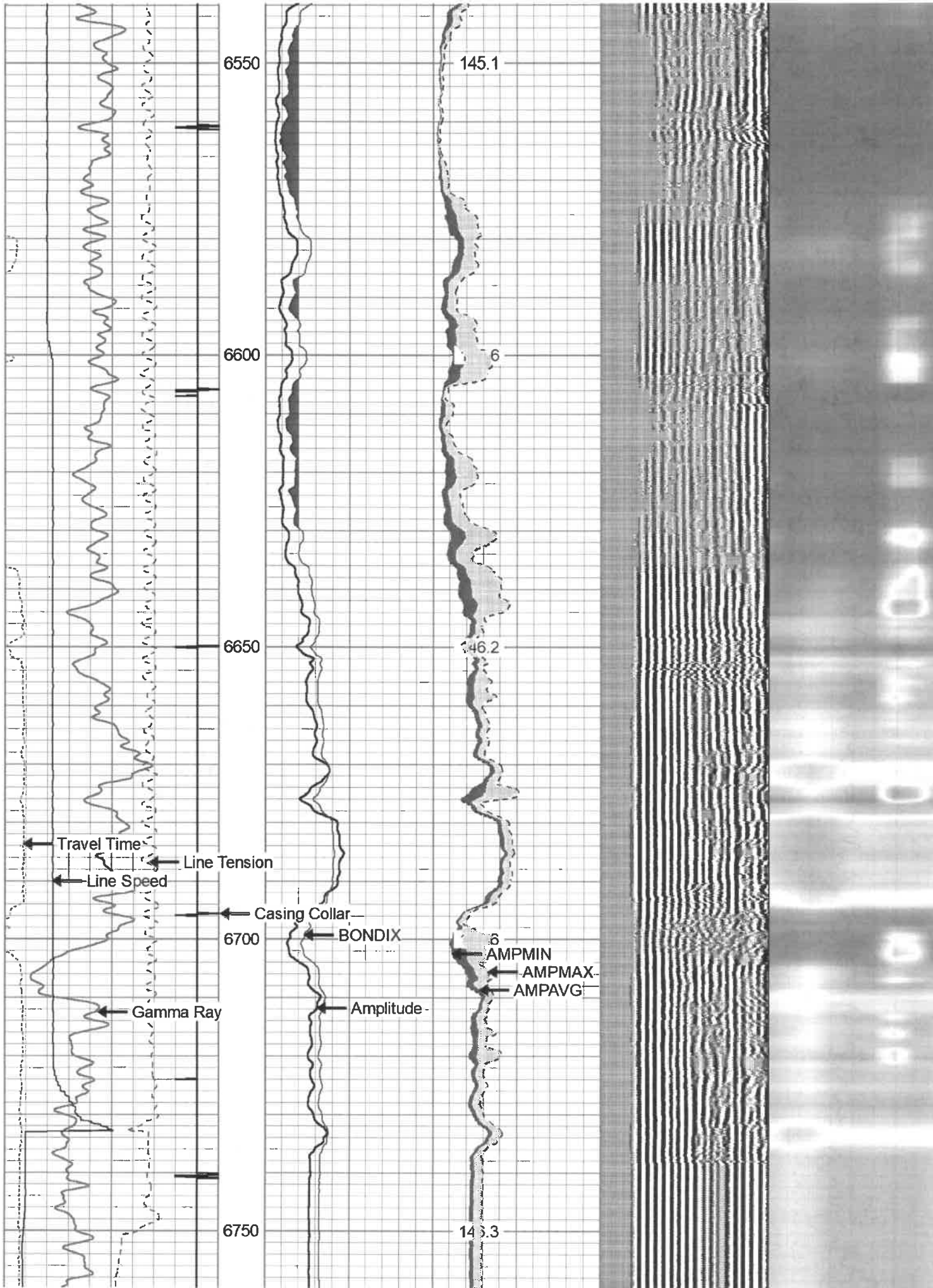
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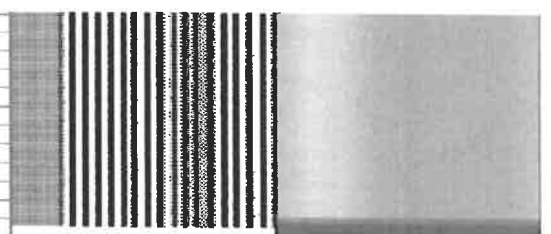
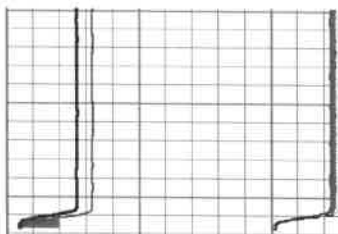
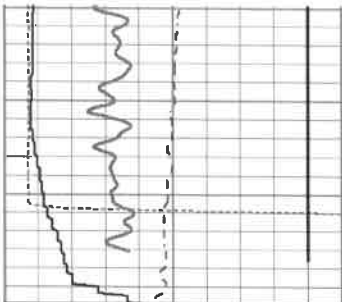
142.7

143.4

144.4







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
200 (usec)			
1200			



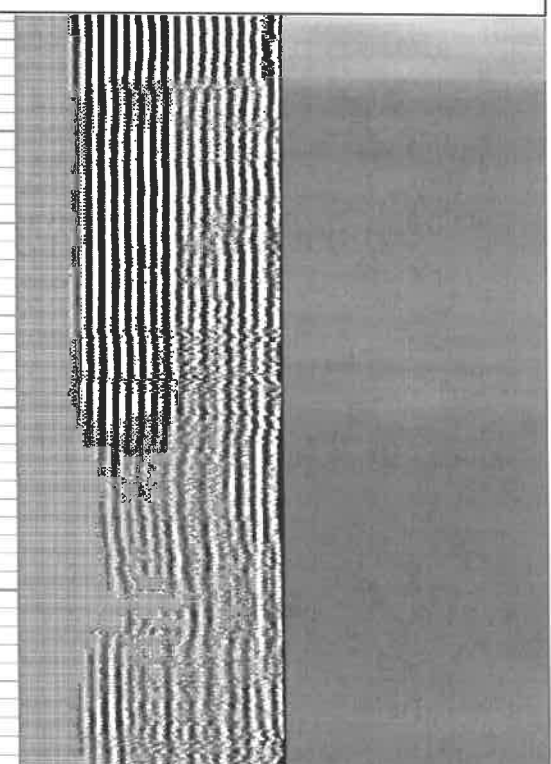
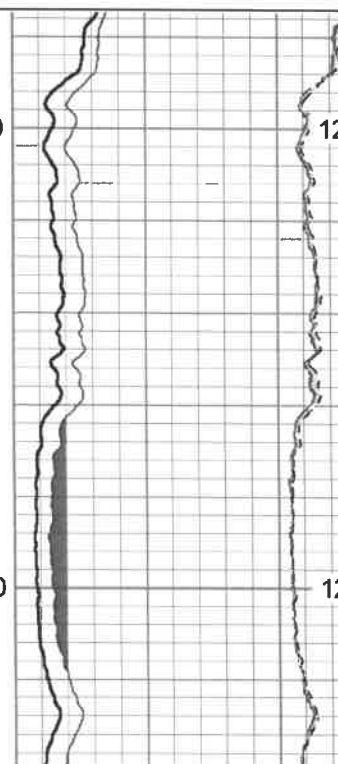
Repeat Pass 0 PSI

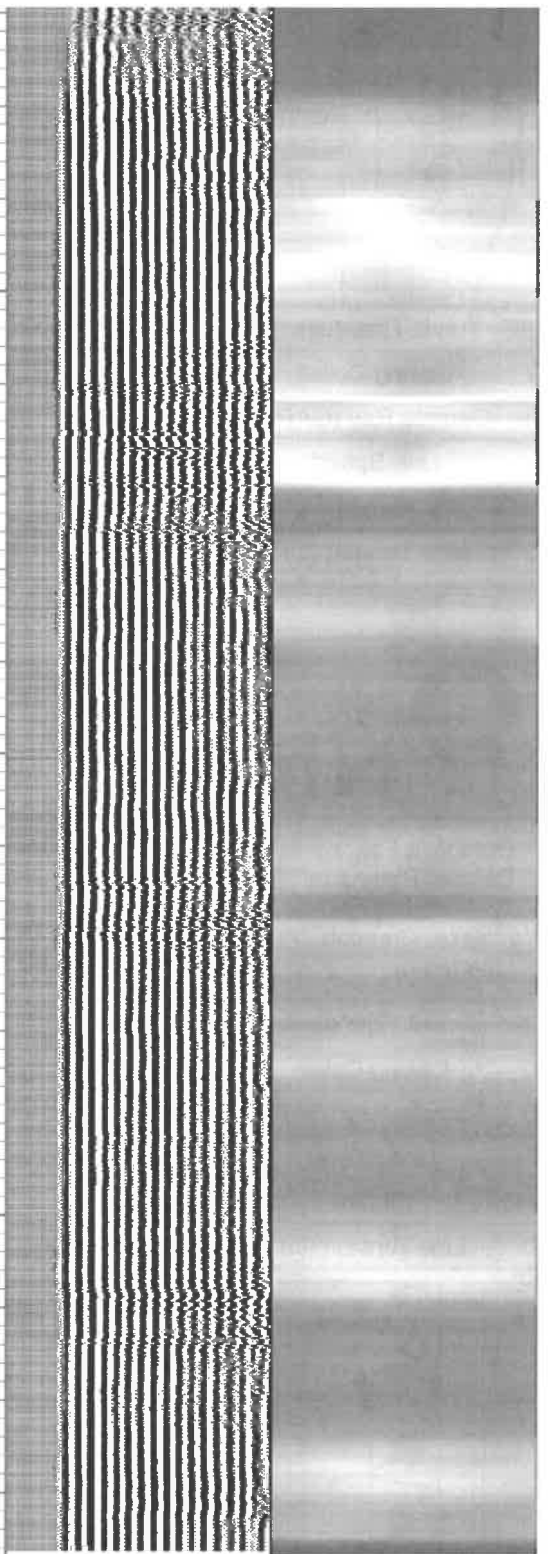
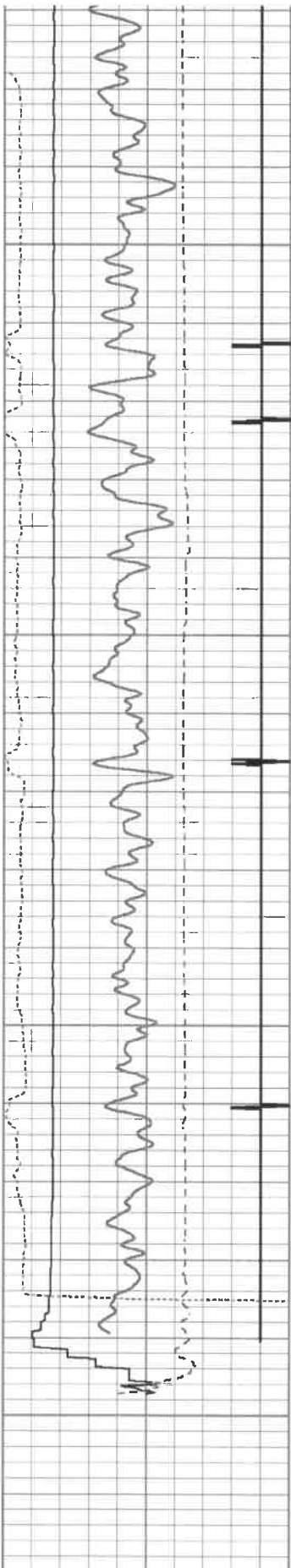
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 Dataset Pathname rabbit_ears/cheat_2h/run1/pass4
 Presentation Format rcbl-bond index for antero 1020
 Dataset Creation Thu Mar 18 09:36:43 2021
 Charted by Depth in Feet scaled 1:240

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
200 (usec)			
1200			





265	Travel Time (usec)	165
9	Casing Collar	-1
0	Gamma Ray (GAPI)	150
Line Speed		

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

Variable Density	1	Cement Map	8
200 (usec)	1200		

-100 (ft/min) 100
 0 Line Tension (lb) 2000

(degF)

Log Variables

DatabaseC:\ProgramData\Warrior\Data\antero_elk_fork_cheat_2h_rcbl_18_mar_2021.db
 Dataset rabbit_ears/cheat_2h/run1/pass6/_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 6736			

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_cheat_2h_rcbl_18_mar_2021.db
 Dataset Pathname rabbit_ears/cheat_2h/run1/pass6
 Dataset Creation Thu Mar 18 09:46:41 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	1.020	0.000	100.000	05.201	1.025

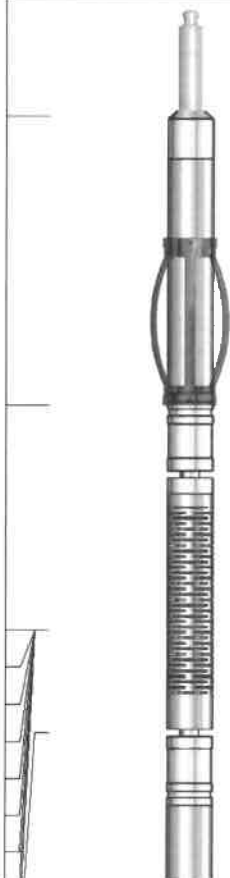
S1	-0.011	1.038	0.000	100.000	90.301	1.020
S2	-0.019	1.065	0.000	100.000	92.192	1.788
S3	-0.020	1.088	0.000	100.000	90.251	1.842
S4	-0.020	1.046	0.000	100.000	93.843	1.880
S5	-0.021	0.976	0.000	100.000	100.350	2.059
S6	-0.021	0.917	0.000	100.000	106.626	2.235
S7	-0.021	0.890	0.000	100.000	109.737	2.285
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		GENT-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-Titm275Adj Titan 2 3/4" Adjustable Centralizer	2.75	2.75	35.00

Dataset: antero_elk_fork_cheat_2h_rcbl_18_mar_2021.db: rabbit_ears/cheat_2h/run1/pass6
 Total length: 17.92 ft
 Total weight: 197.00 lb
 O.D.: 4.88 in

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