



**RADIAL CEMENT BOND  
GAMMA RAY/CCL/VDL**

Company ANTERO RESOURCES CORPORATION  
 Well HUGHES RIVER UNIT 2H  
 Field MARCELLUS  
 County RITCHIE  
 State W.V.

Company ANTERO RESOURCES CORPORATION  
 Well HUGHES RIVER UNIT 2H  
 Field MARCELLUS  
 County RITCHIE State W.V.

Location: API #: 47085102140000 Other Services

SEC	TWP	RGE	Elevation
Permanent Datum	G.L.		N/A
Log Measured From	K.B.		N/A
Drilling Measured From	K.B. OF 30'		N/A

Date	4/2/19
Run Number	ONE
Depth Driller	19214'
Depth Logger	6792'
Bottom Logged Interval	6792'
Top Log Interval	SURFACE
Open Hole Size	N/A
Type Fluid	H2O
Density / Viscosity	N/A
Max. Recorded Temp.	143 DEG
Estimated Cement Top	150'
Time Well Ready	N/A
Time Logger on Bottom	N/A
Equipment Number	340
Location	BRIDGEPORT, WV
Recorded By	J. BOGGS
Witnessed By	MR. BOB REED

<<< Fold Here >>>

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**

**THANK YOU FOR USING KLX ENERGY SERVICES**

**LOG WAS RAN ON 5 1/2" CASING WITH 1500PSI ON CASING**  
**TOP OF CEMENT- 150'**  
**BOTTOM HOLE TEMP- 143 DEG**  
**MARKER JOINT ON LOG @ 5572'-5582'**  
**CORRECTED UP HOLE 22' TO PUT MARKER ON DEPTH WITH PIPE TALLY**

RECEIVED  
 GRI... and Gas  
 FEB 18 2020

W.V. Dept. of Environment and Natural Resources



**MAIN LOG 5"/100'**

Database File: c:\warrrior\data\2019 antero\antero-hughes river 3h.db  
 Dataset Pathname: pass3  
 Presentation Format: antero f  
 Dataset Creation: Tue Apr 02 15:53:05 2019 by Log 7.0 B1  
 Charted by: Depth in Feet scaled 1:240

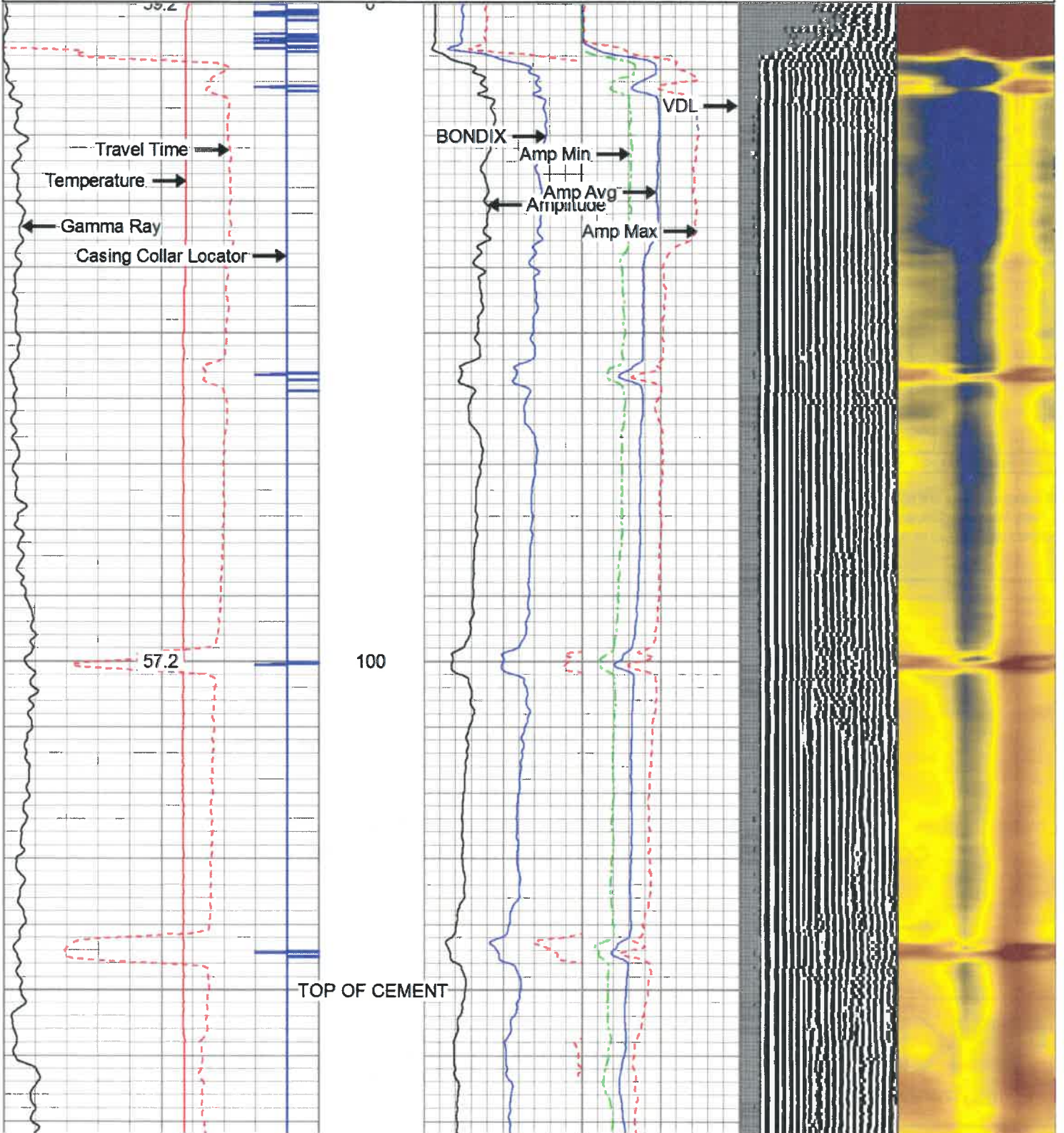
280	Travel Time (usec)	180
9	Casing Collars	-1
0	Gamma Ray	180
0	TEMP (degF)	100

Amplitude	0	Amp Avg	150
(mV)	100	Amp Max	150
AmpX5 (mV)	20	Amp Min	150
BONDIX	0		

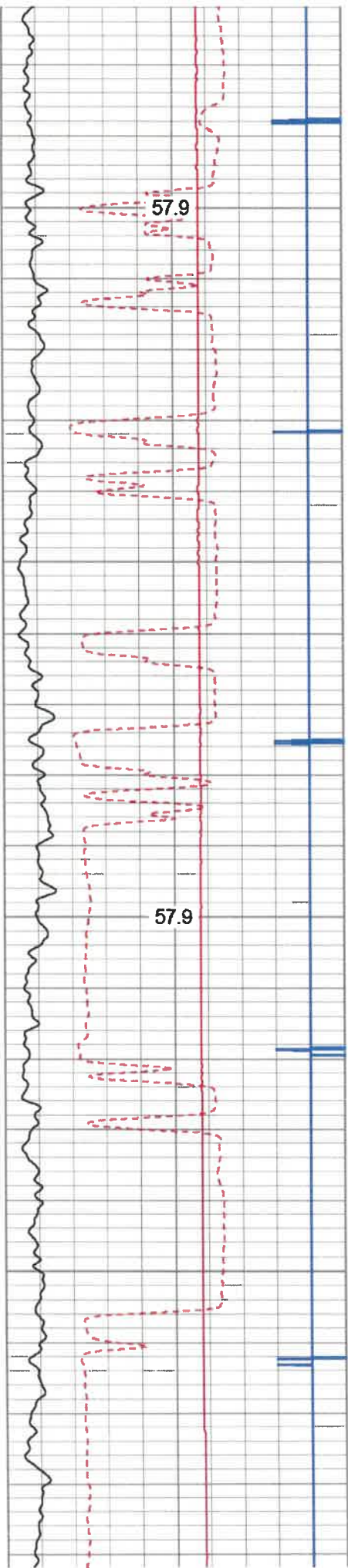
200	VDL	1200	1	Sector Map	12
				20	80



TEMP (degF)

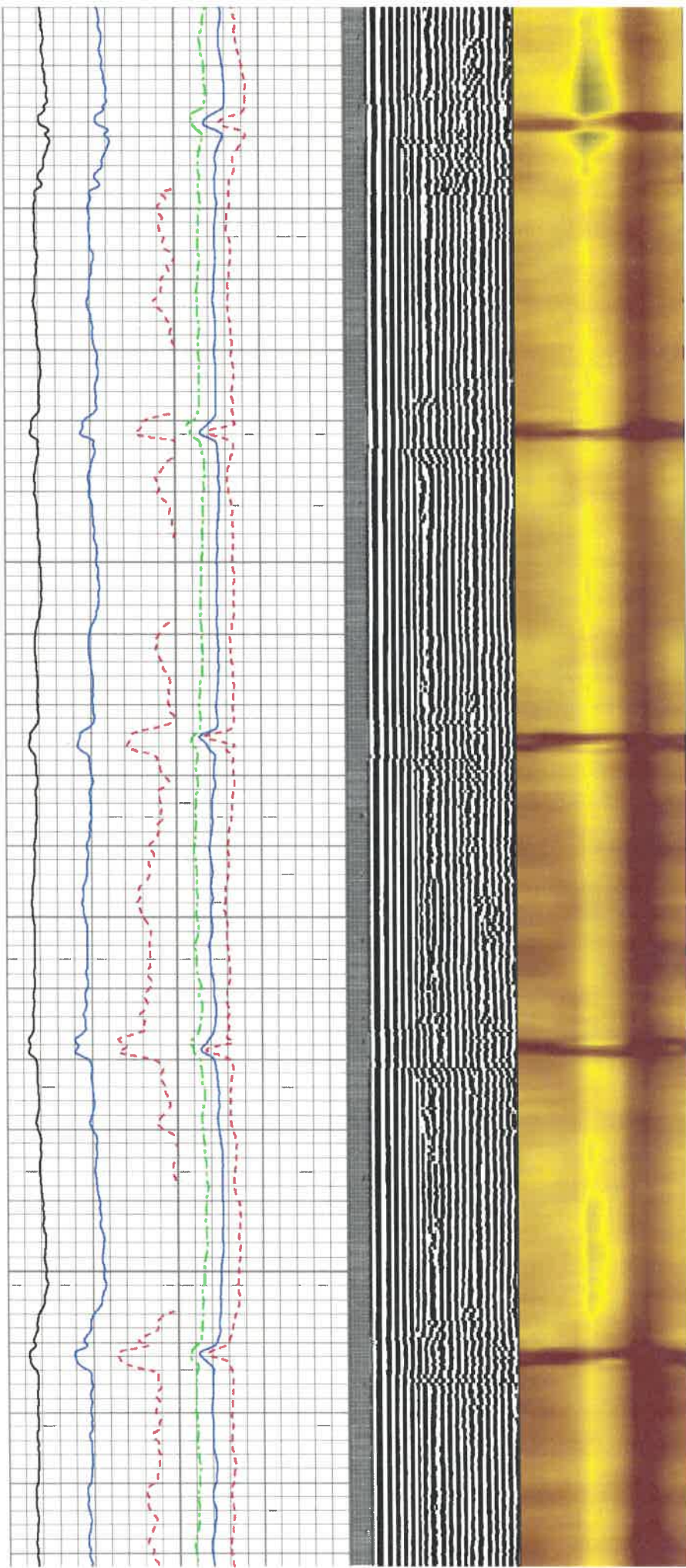




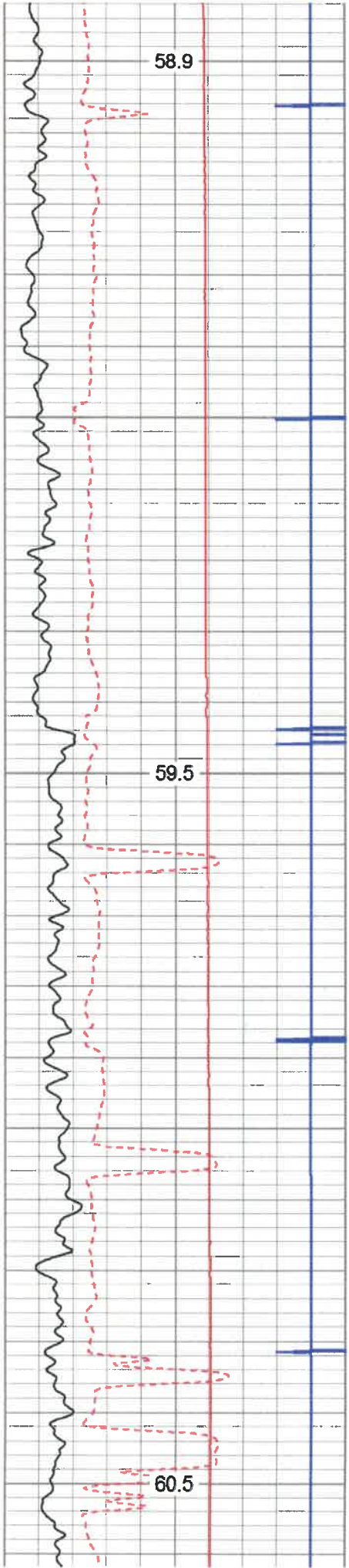


200

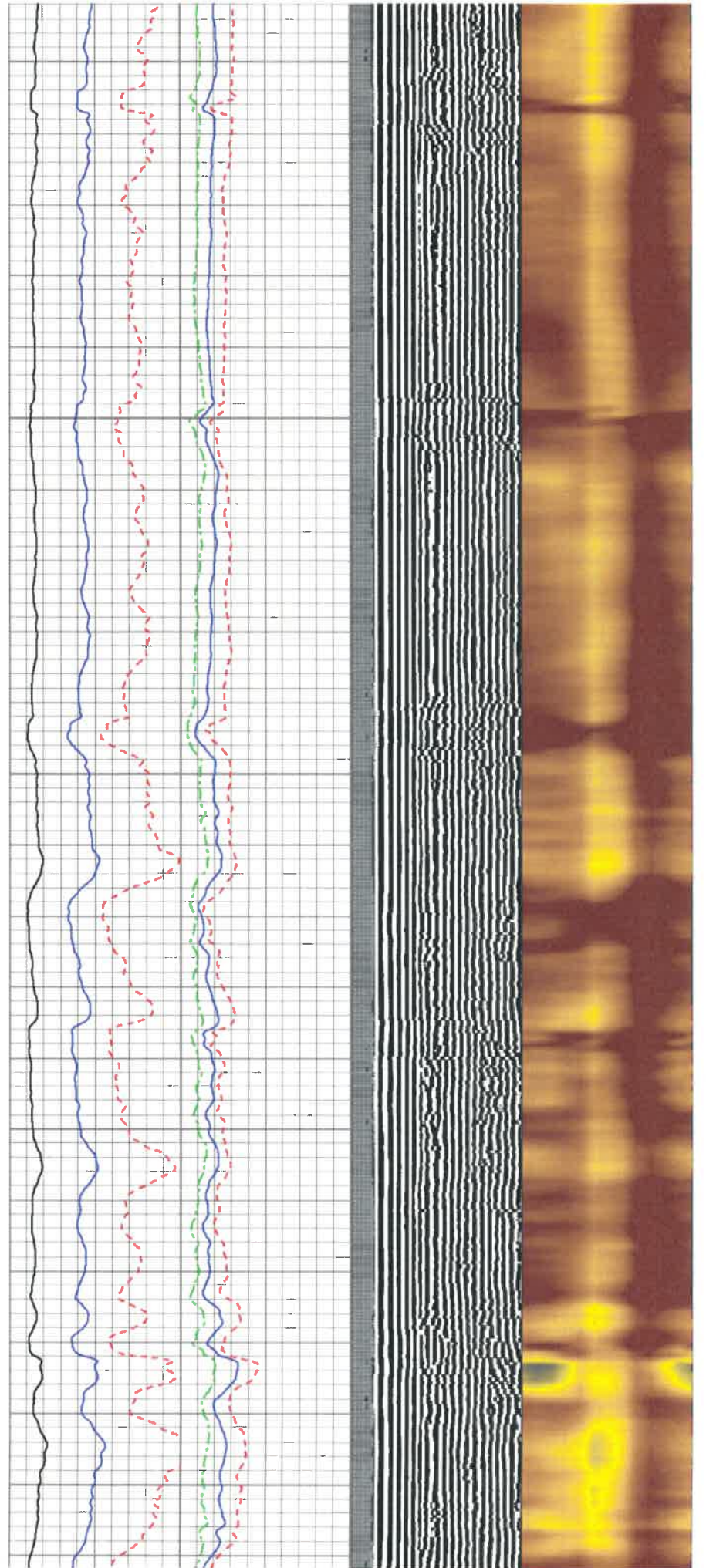
300



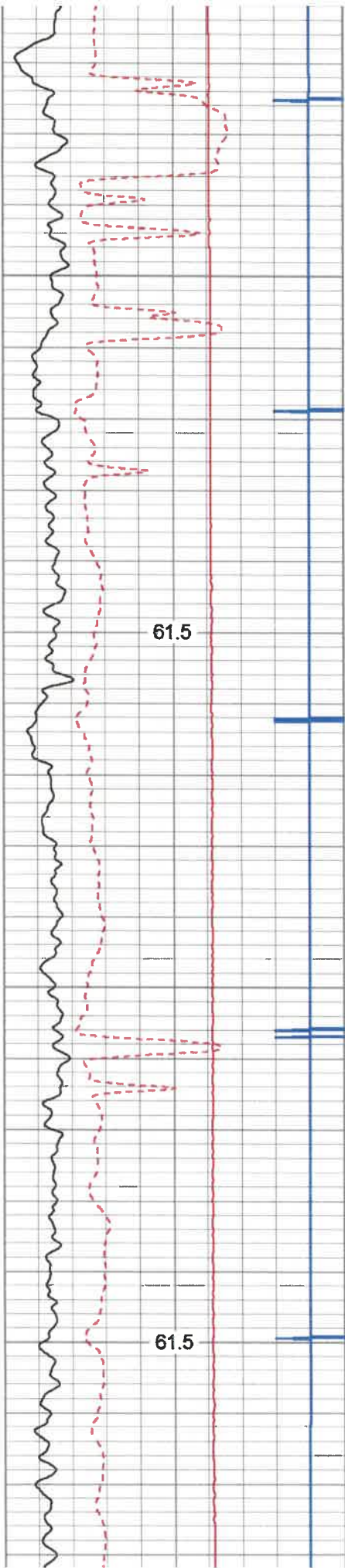




400  
500  
600

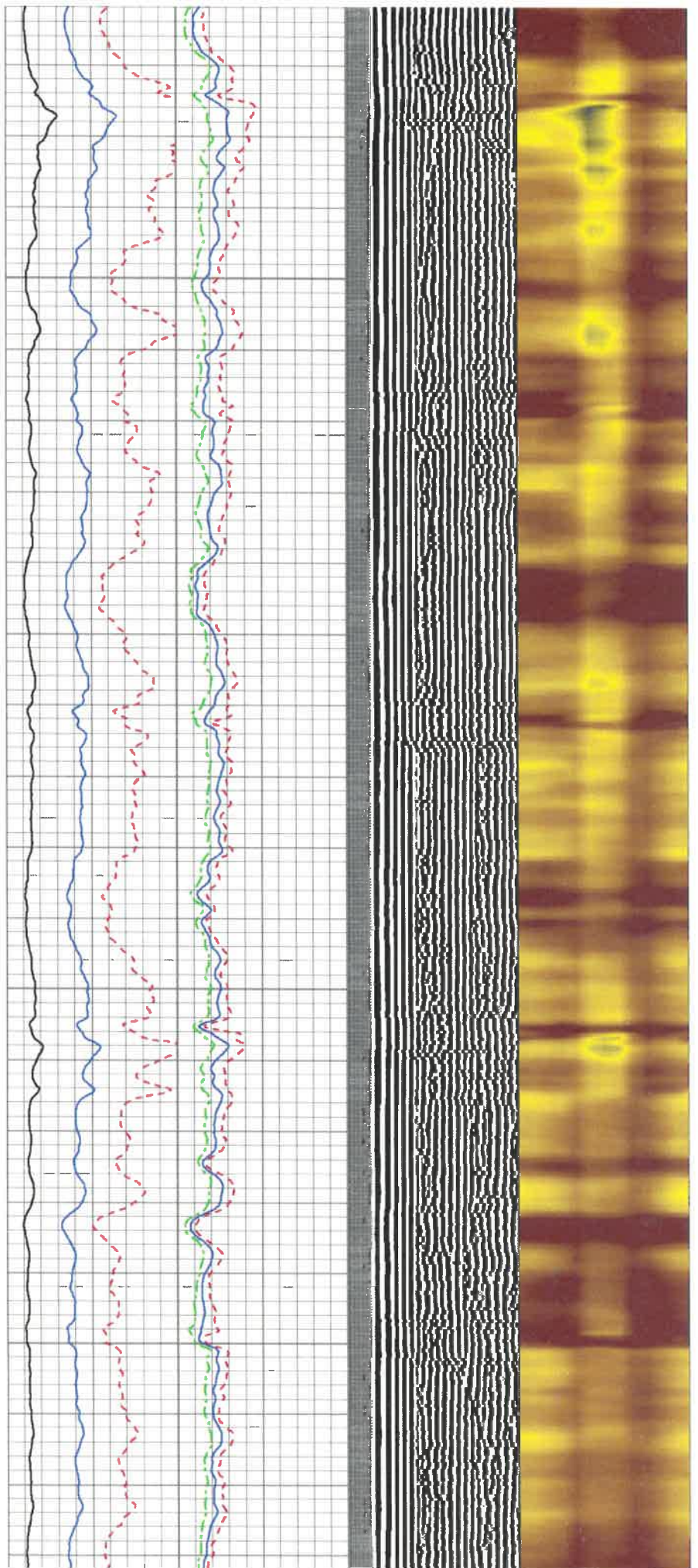




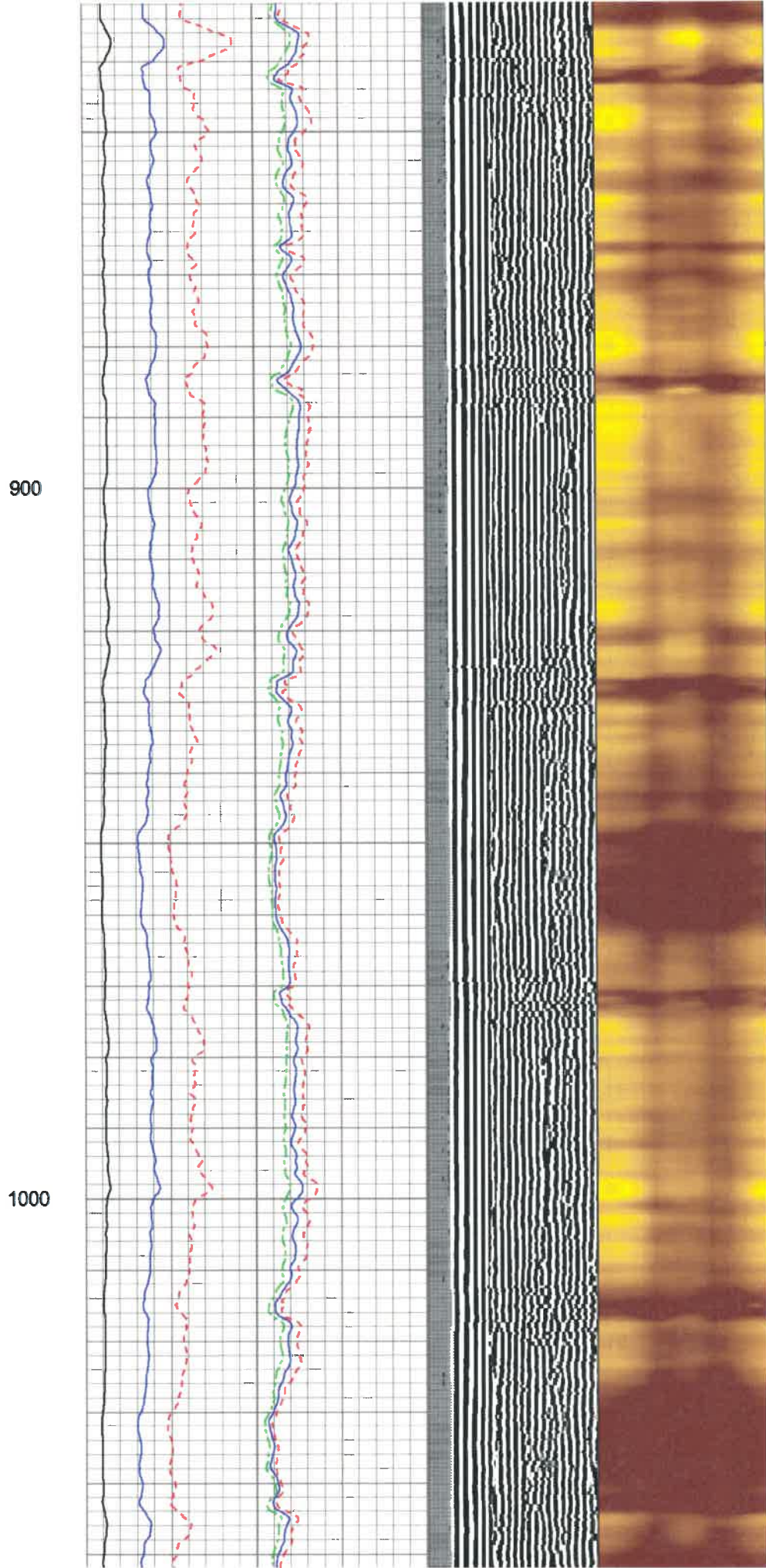
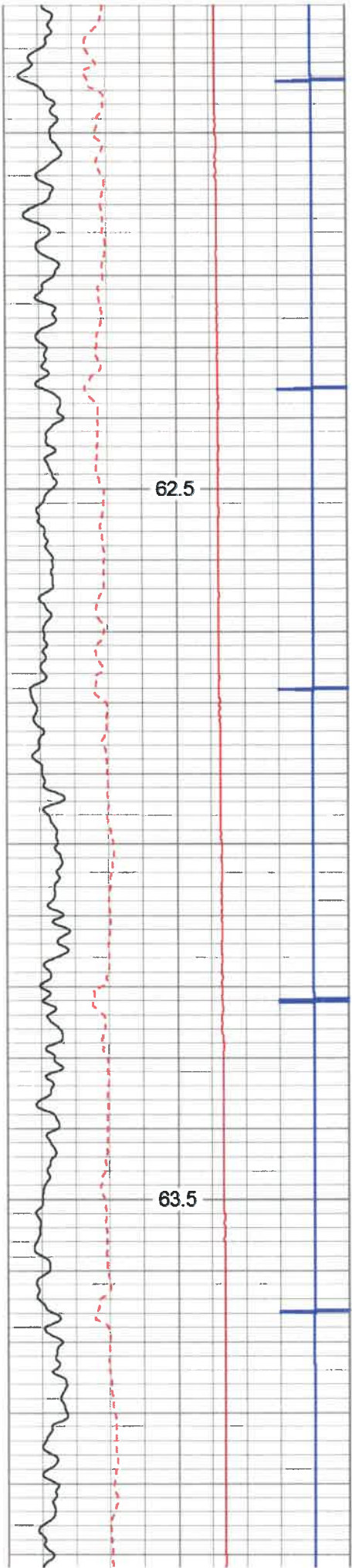


700

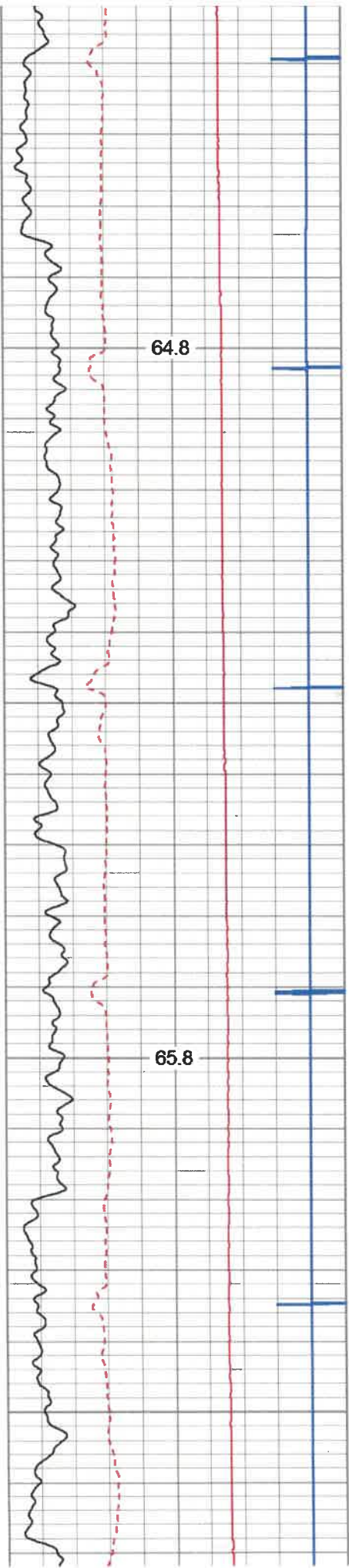
800





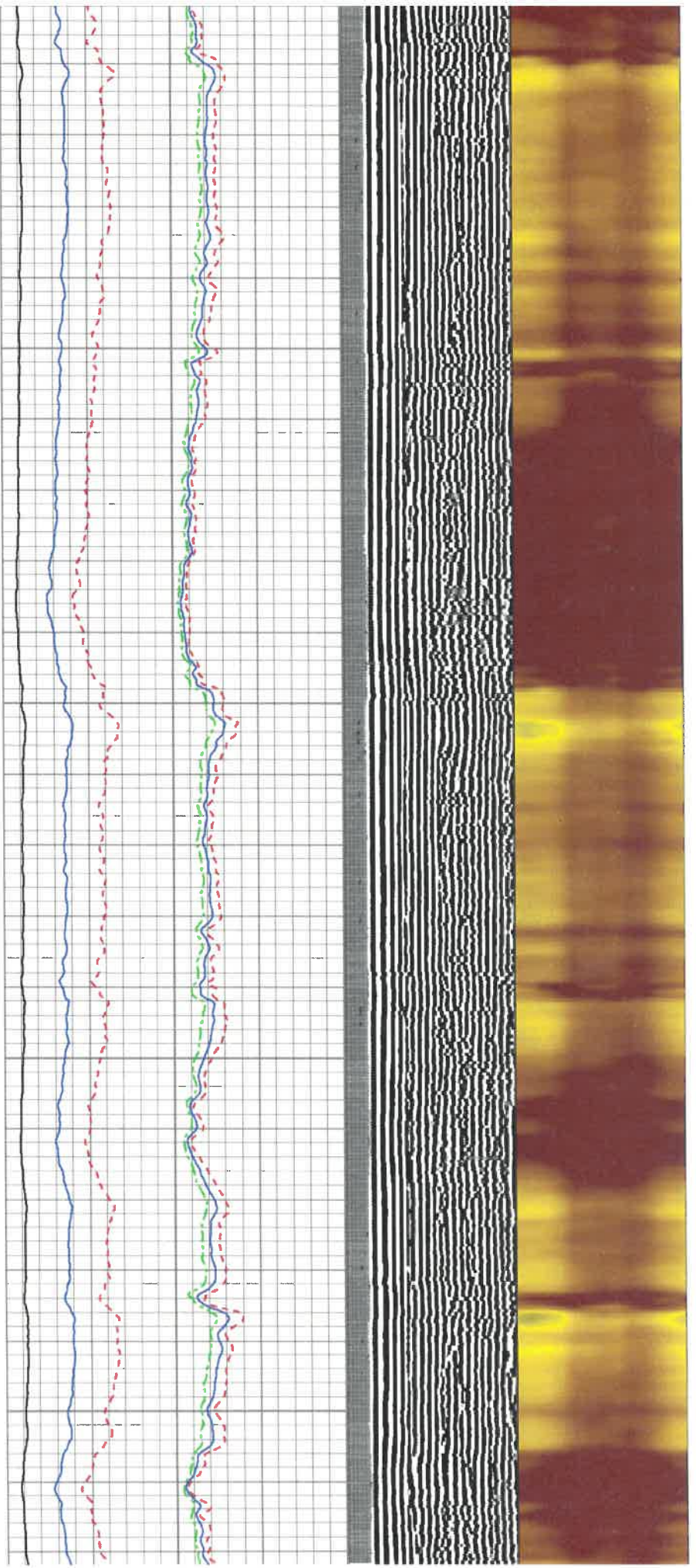




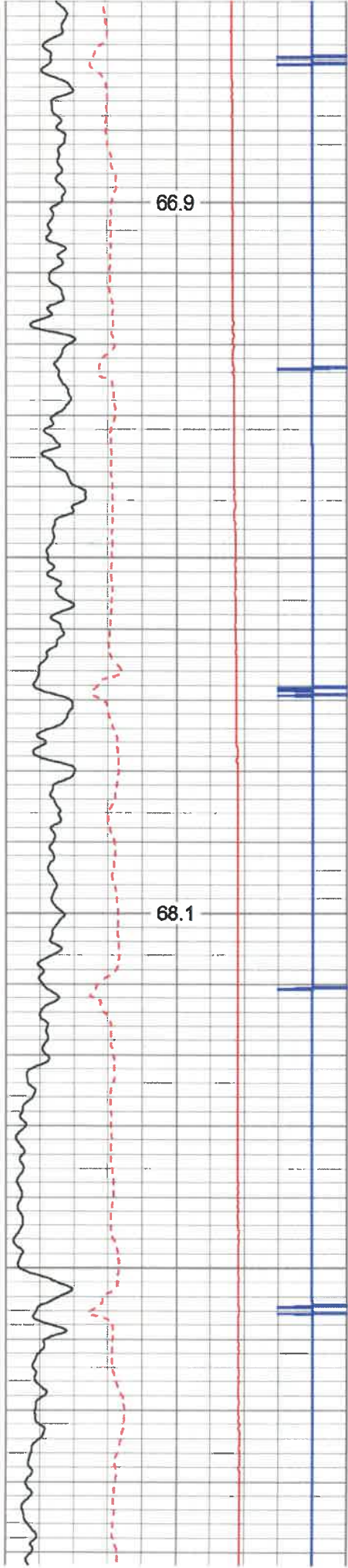


1100

1200

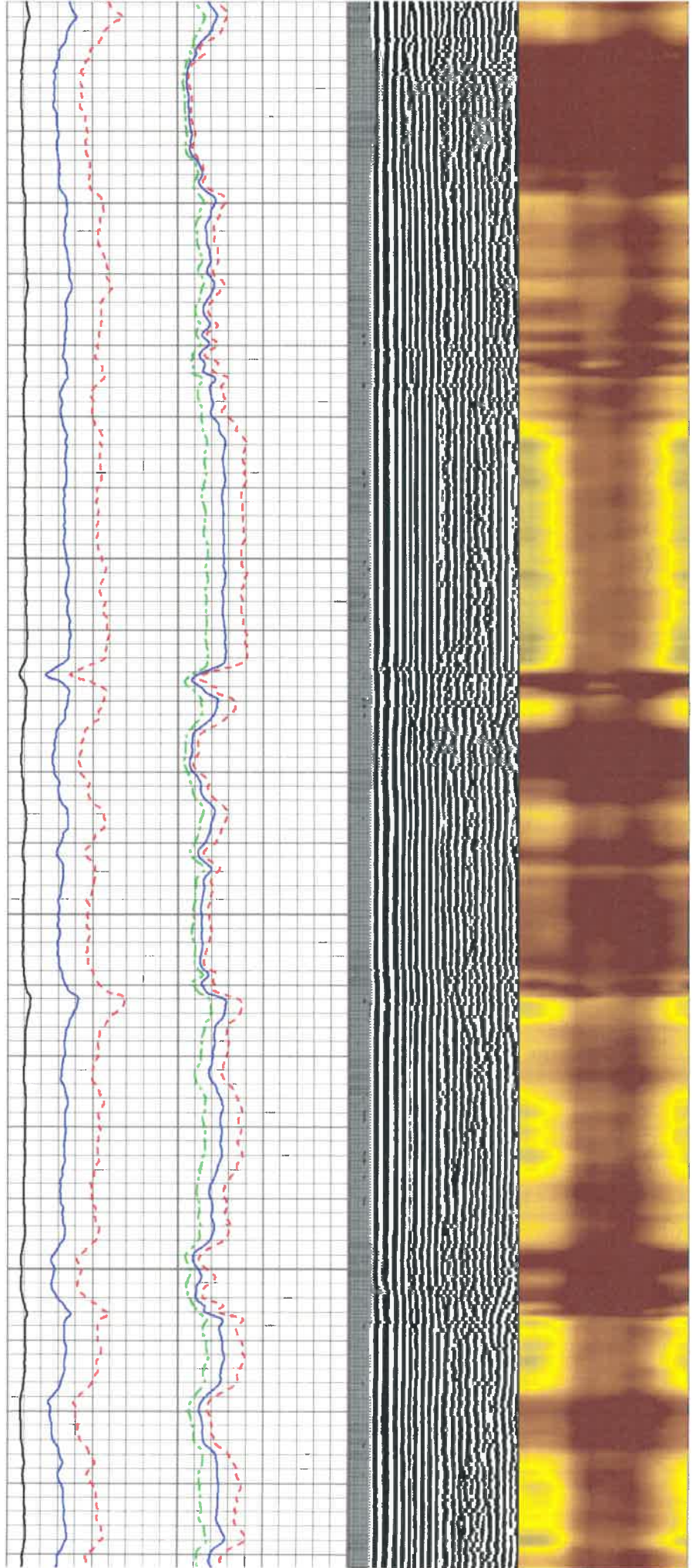




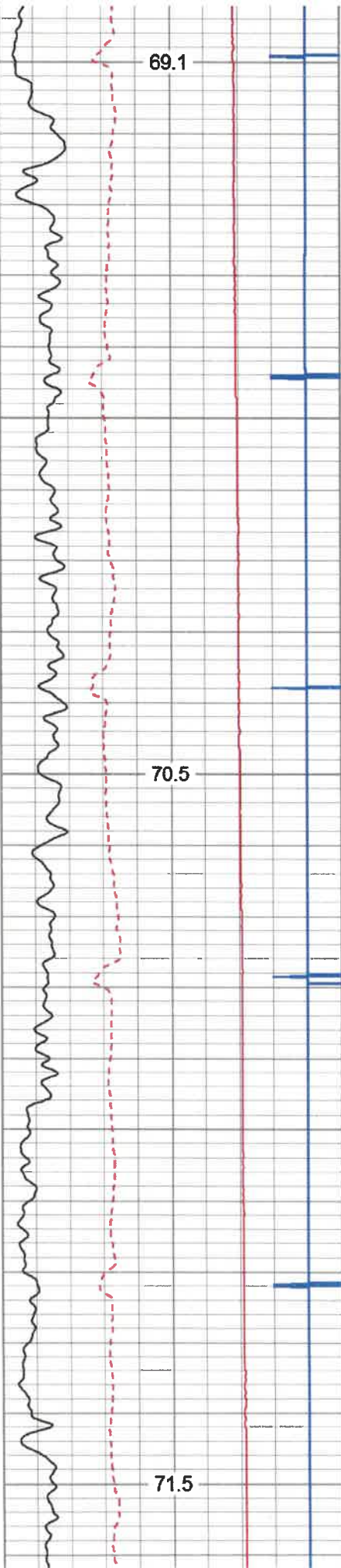


1300

1400



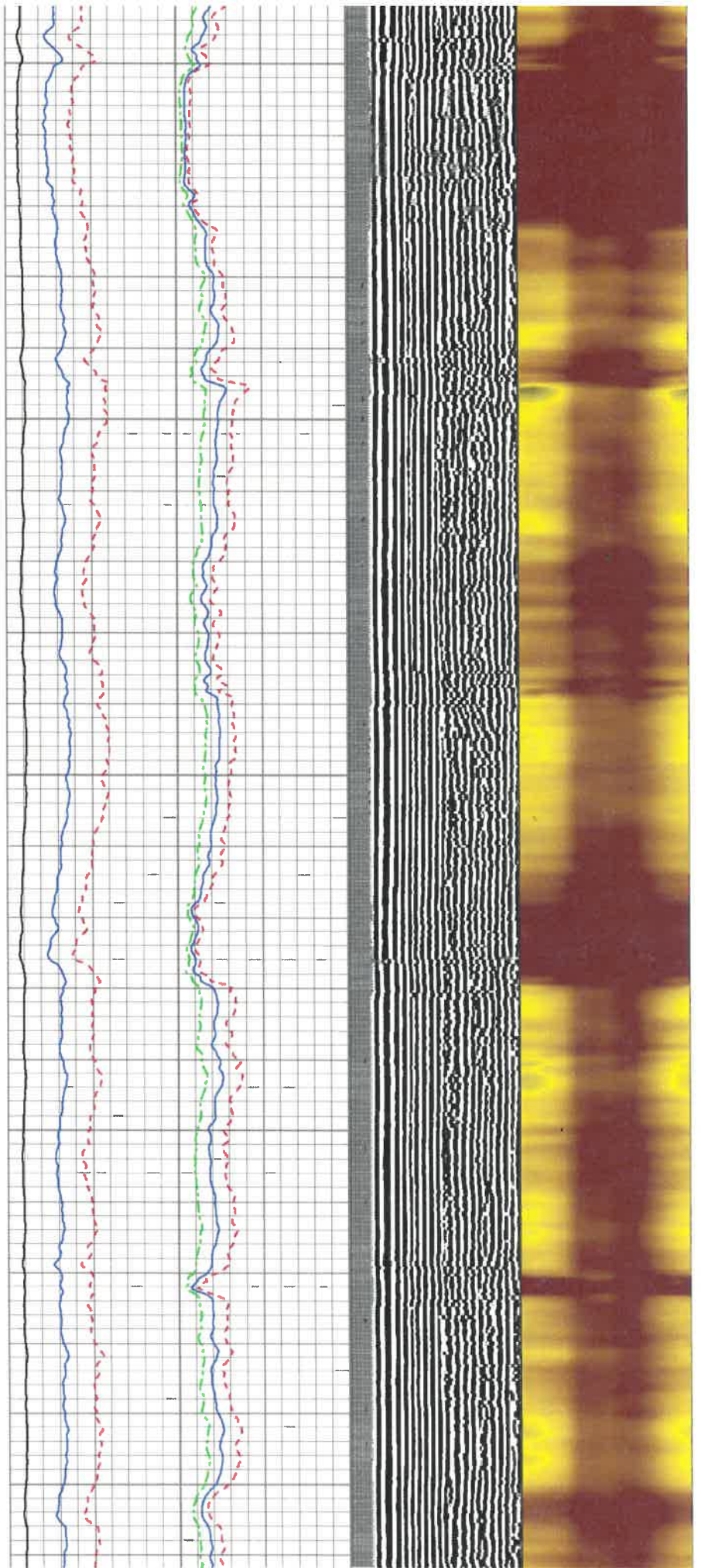




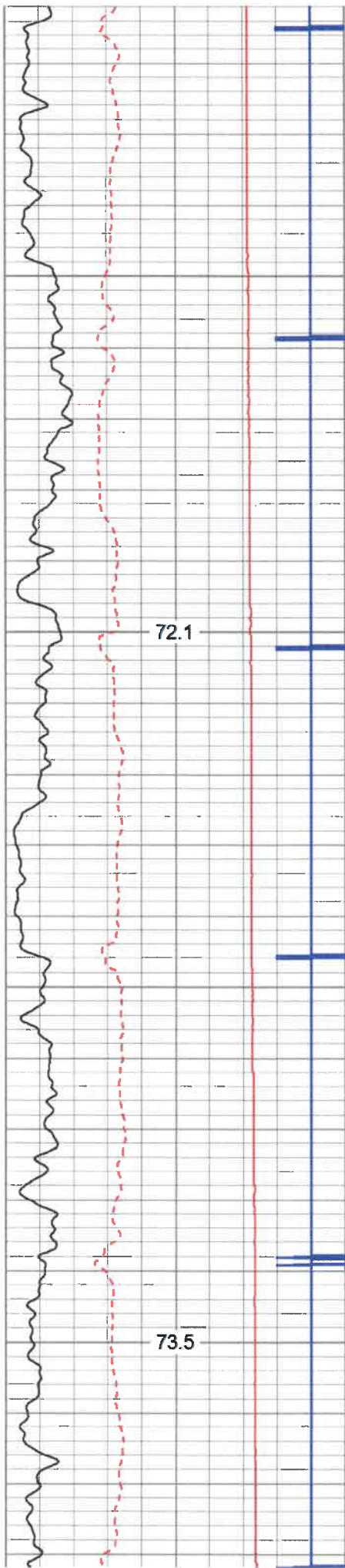
1500

1600

1700

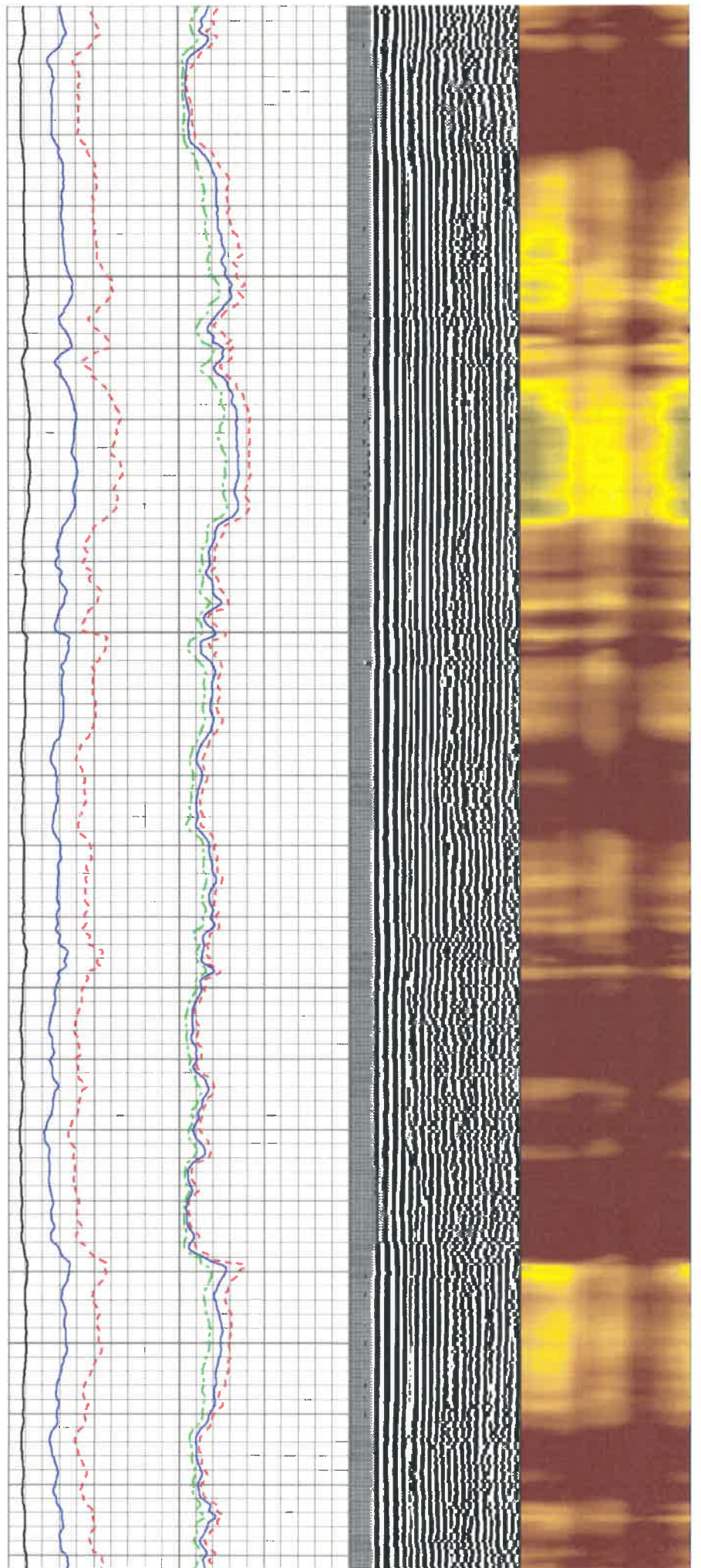




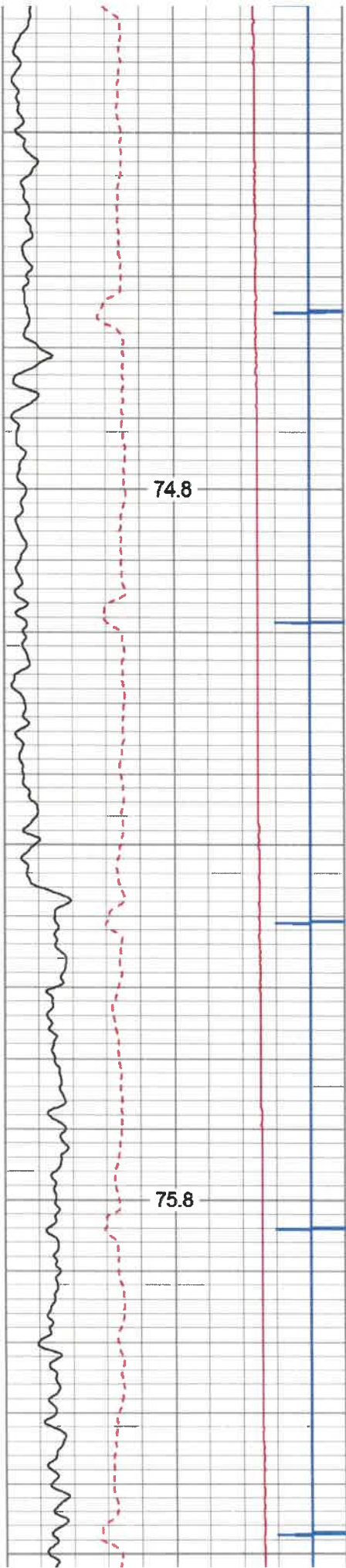


1800

1900

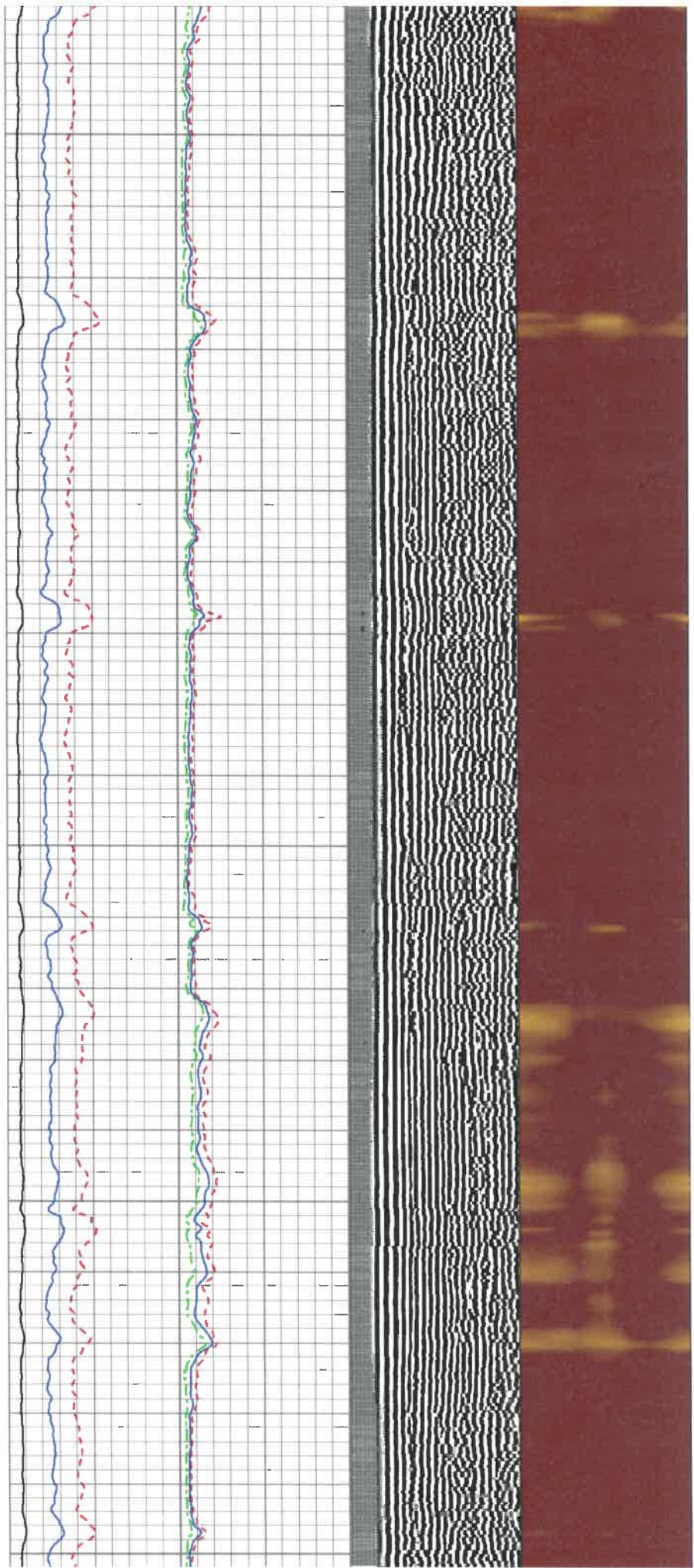




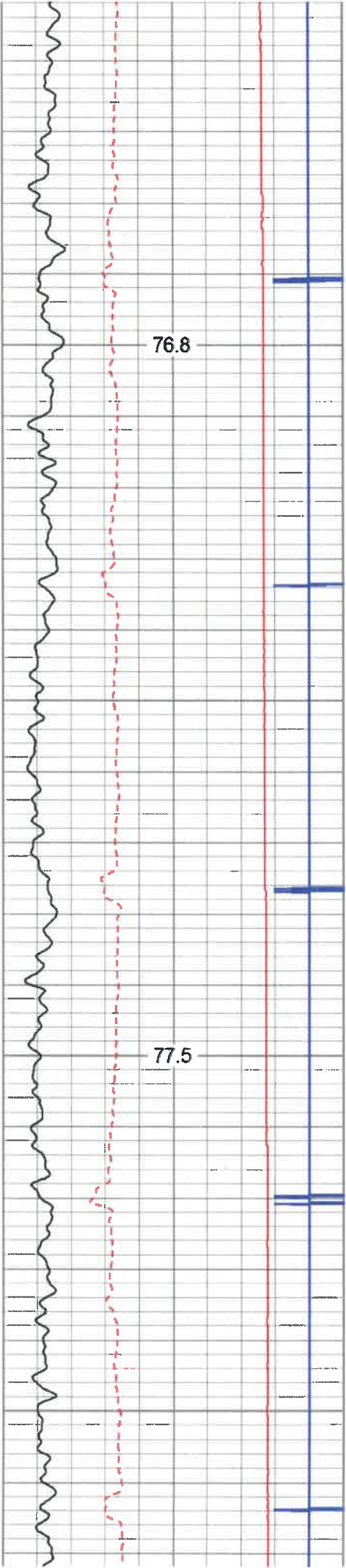


2000

2100

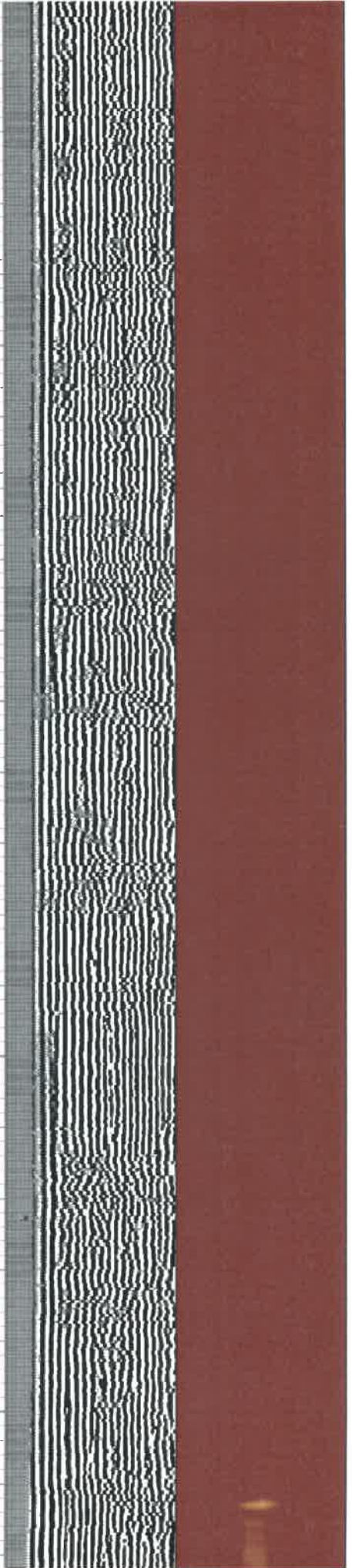
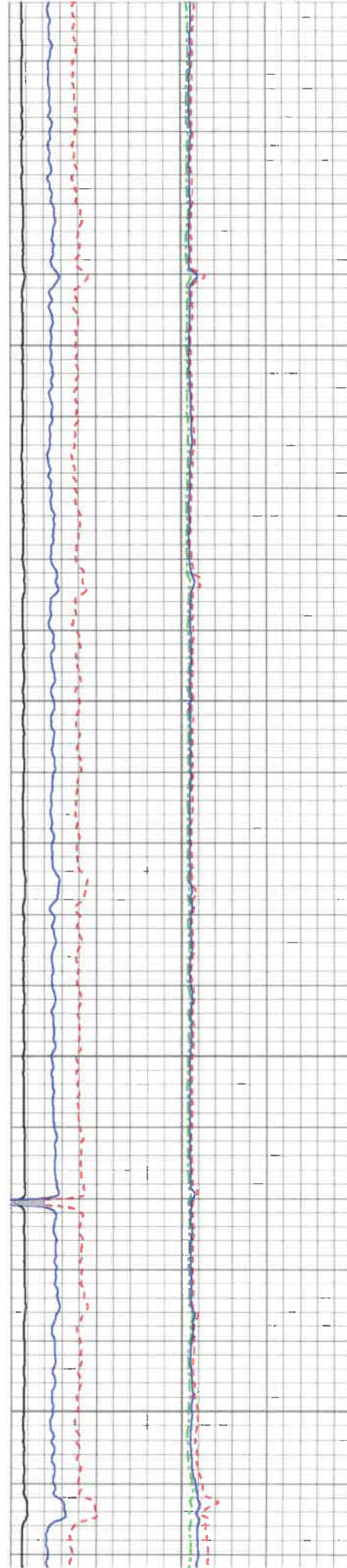




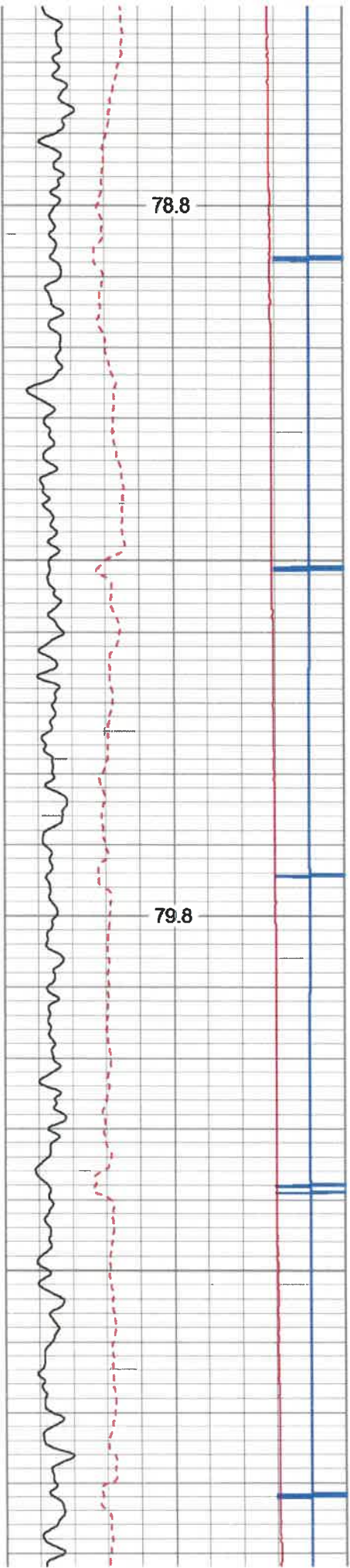


2200

2300

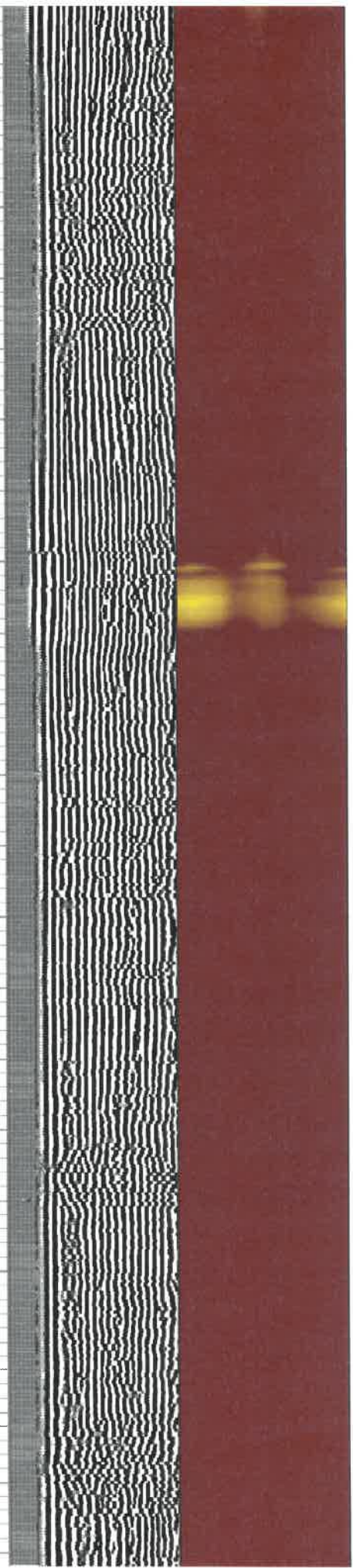
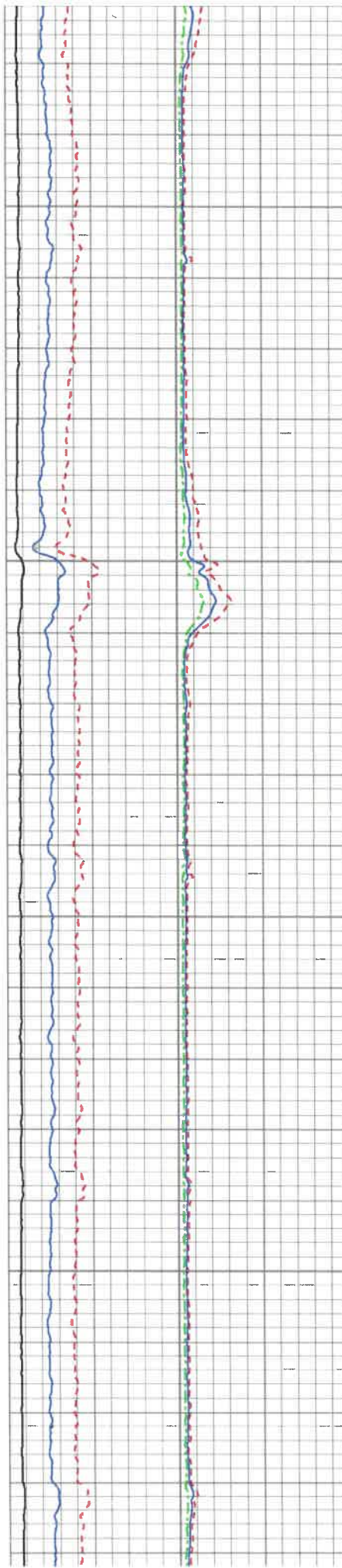




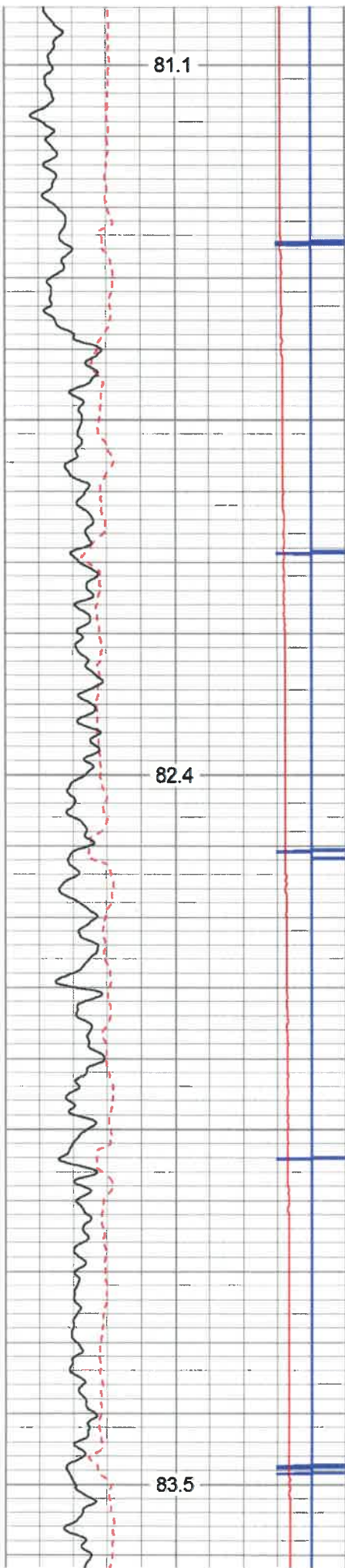


2400

2500



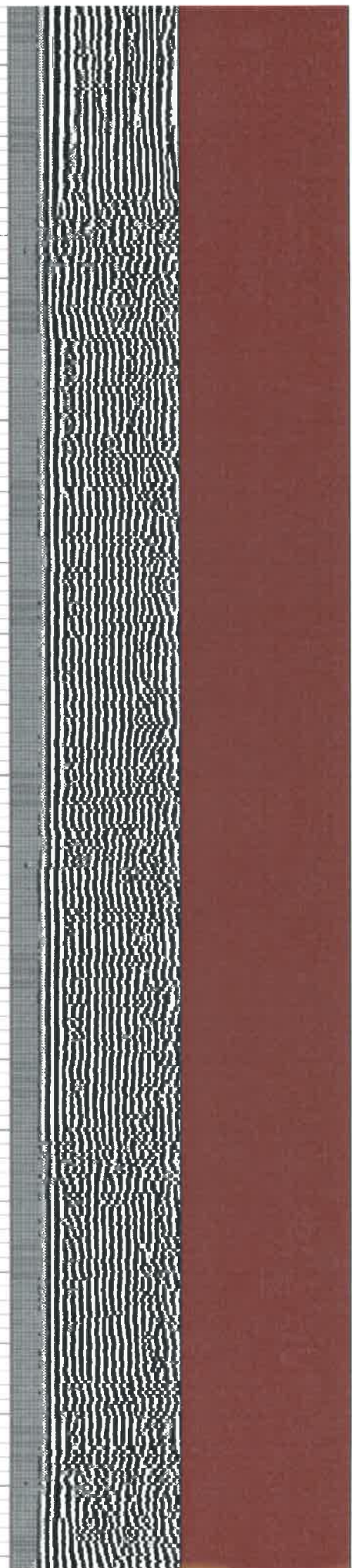
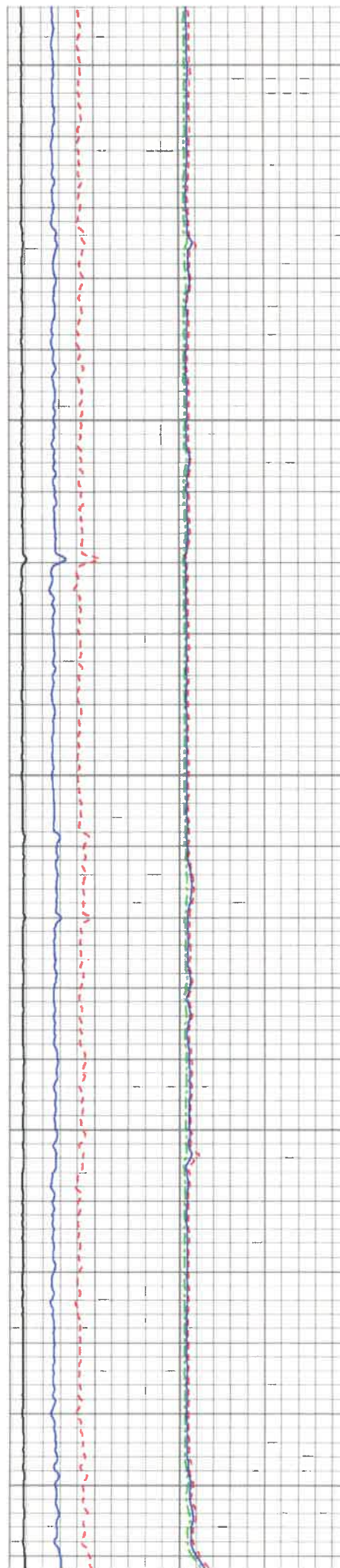




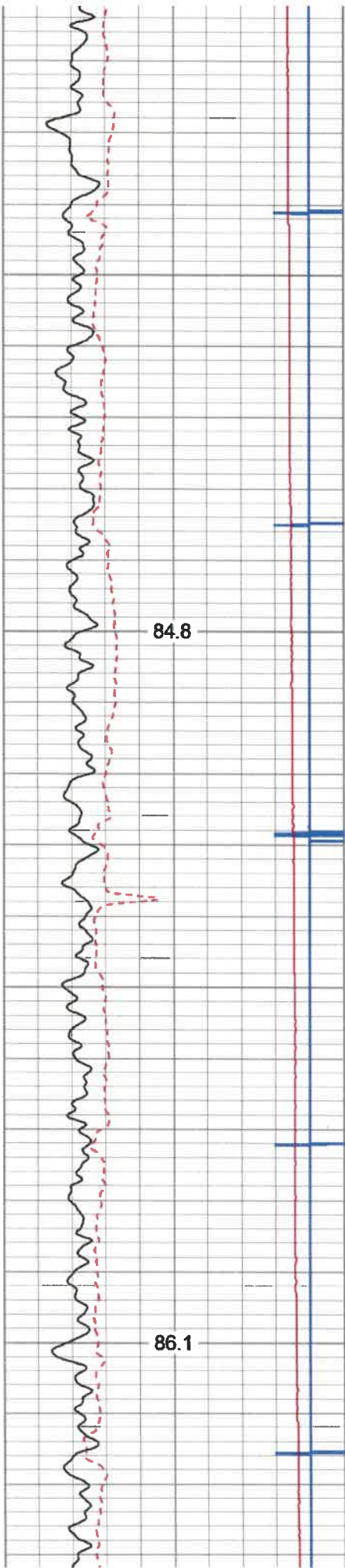
2600

2700

2800

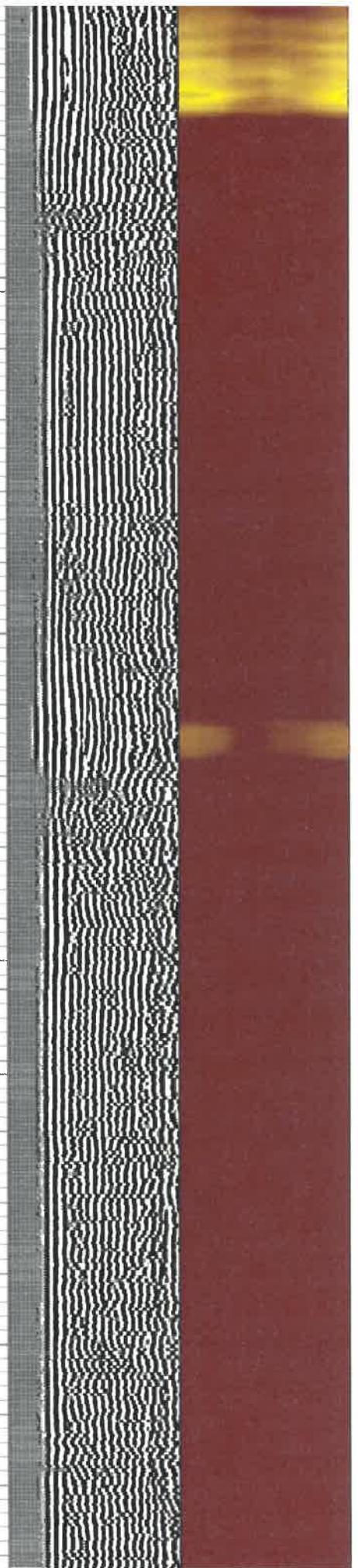
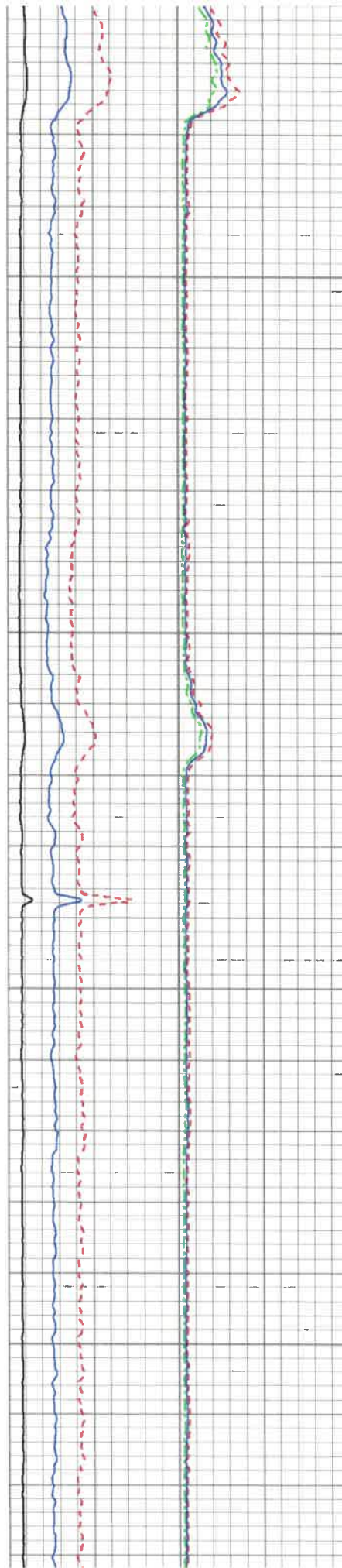




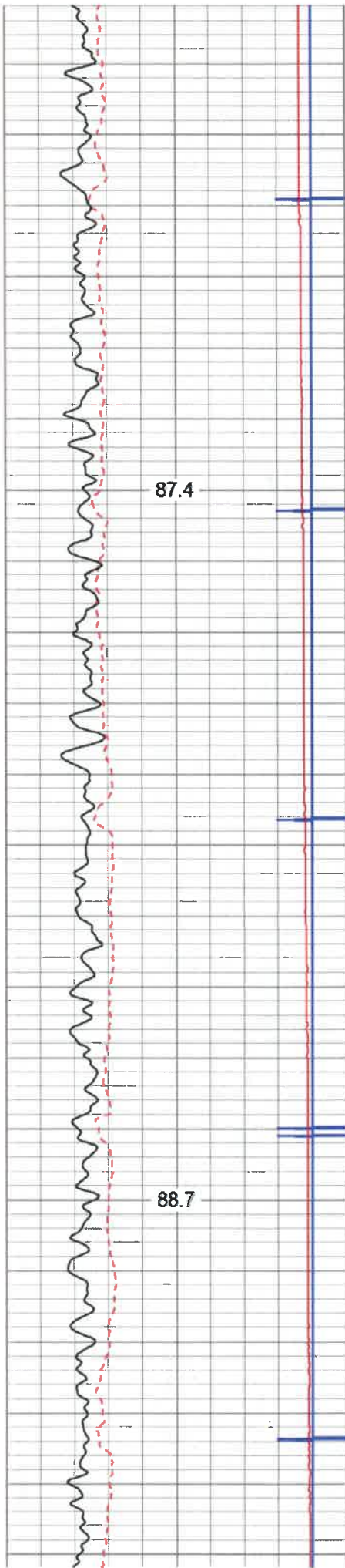


2900

3000

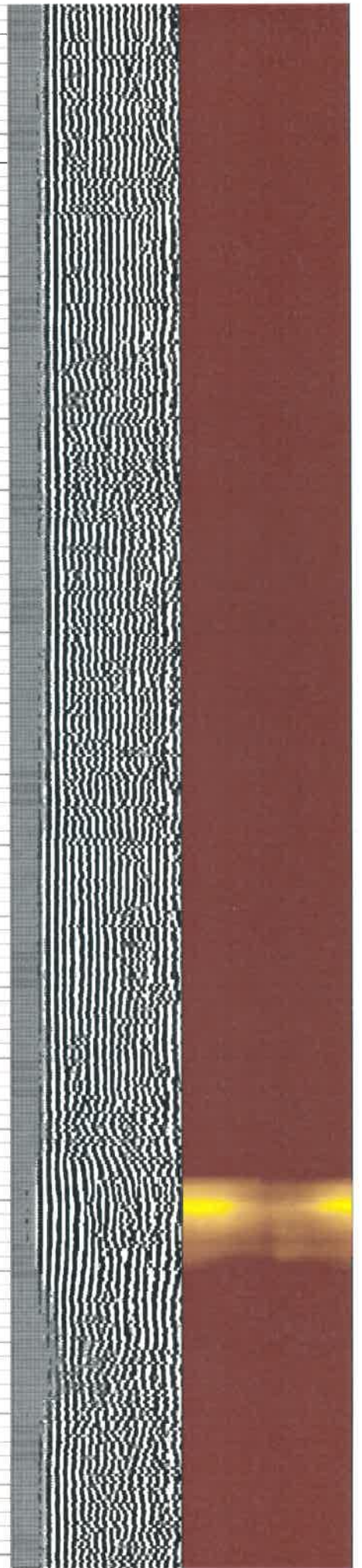




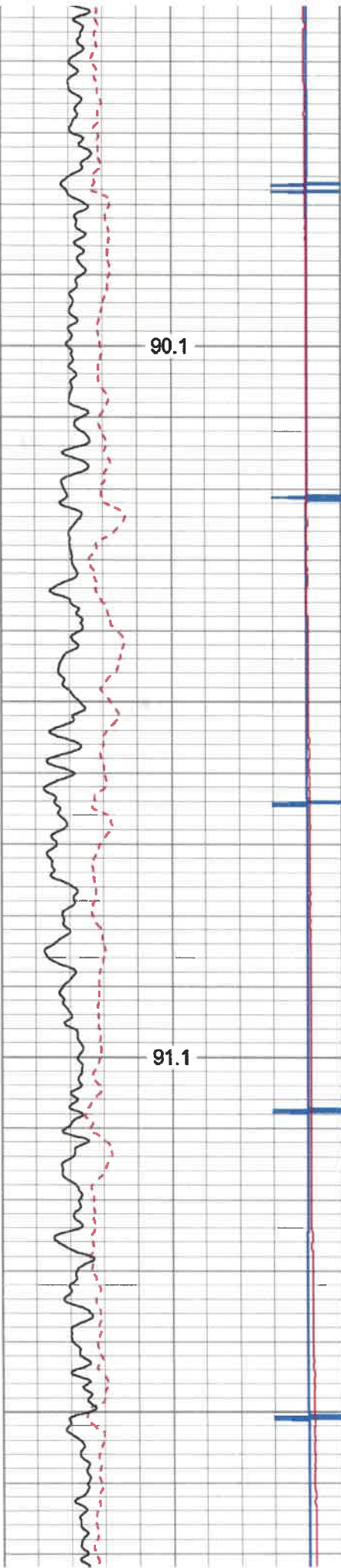


3100

3200

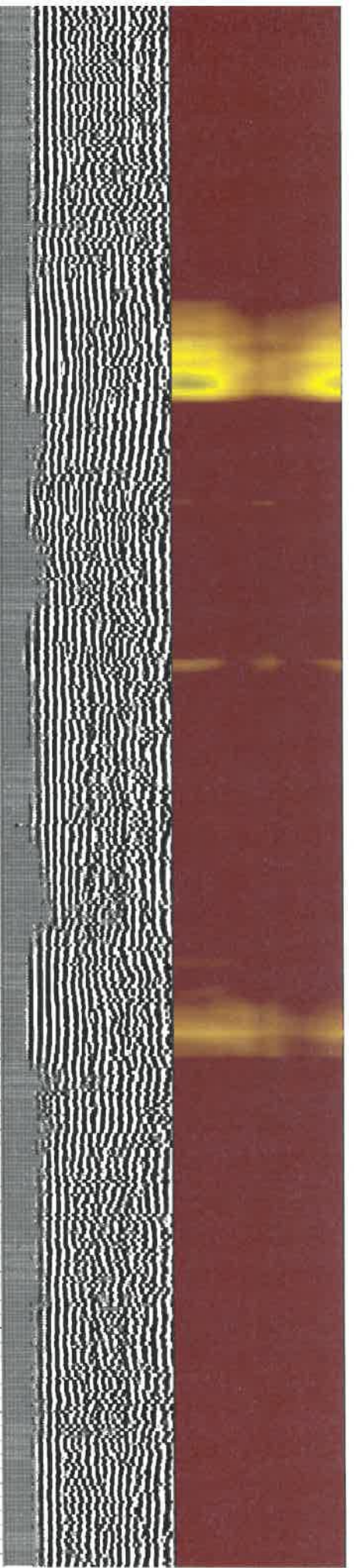
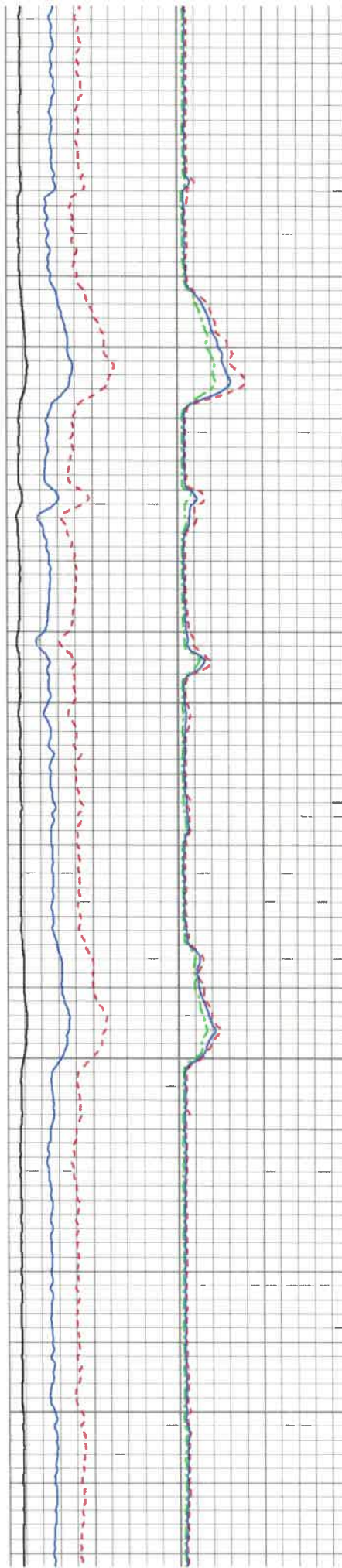




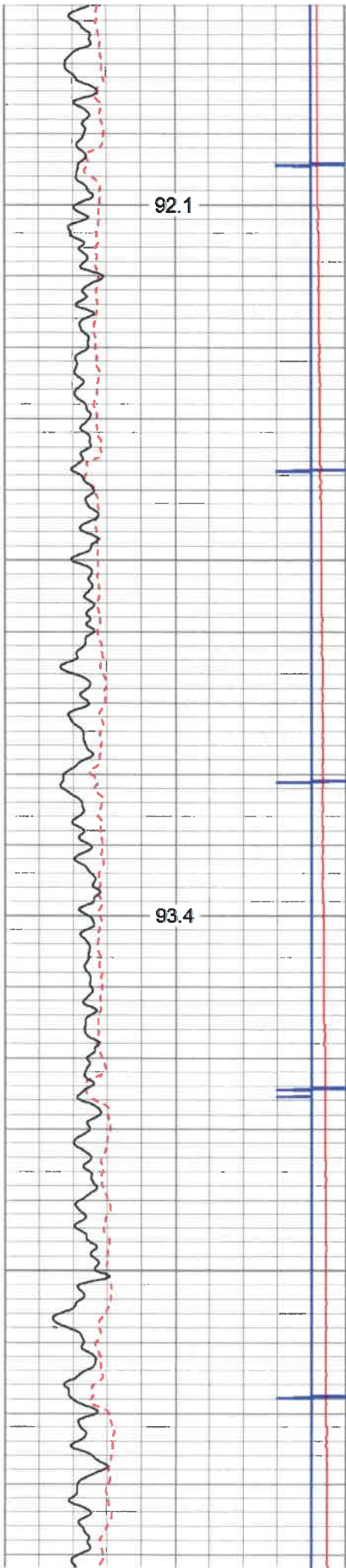


3300

3400

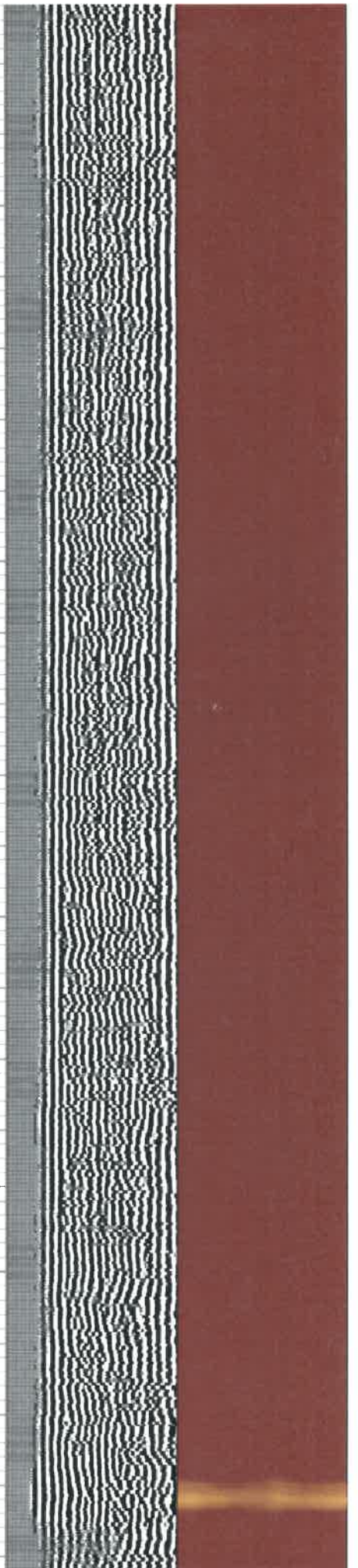
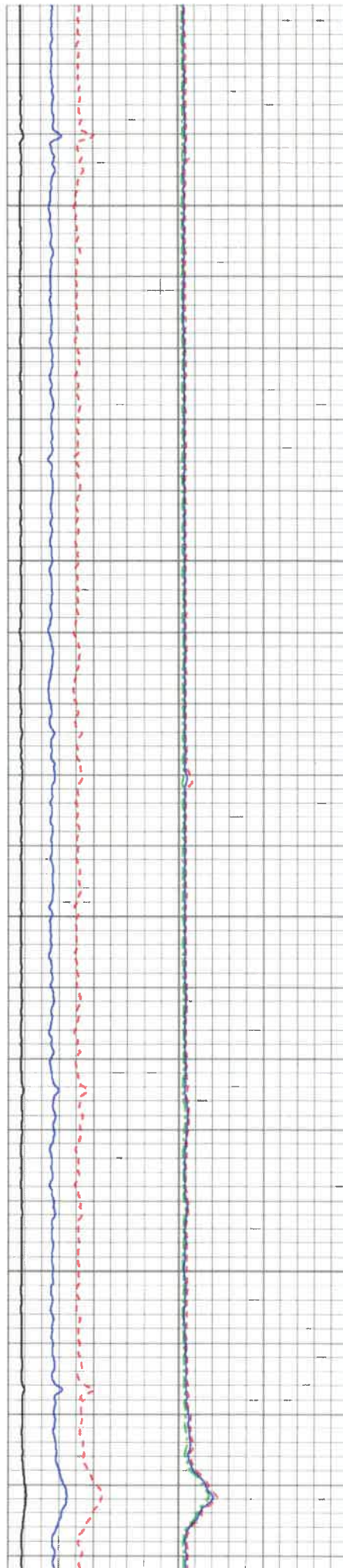




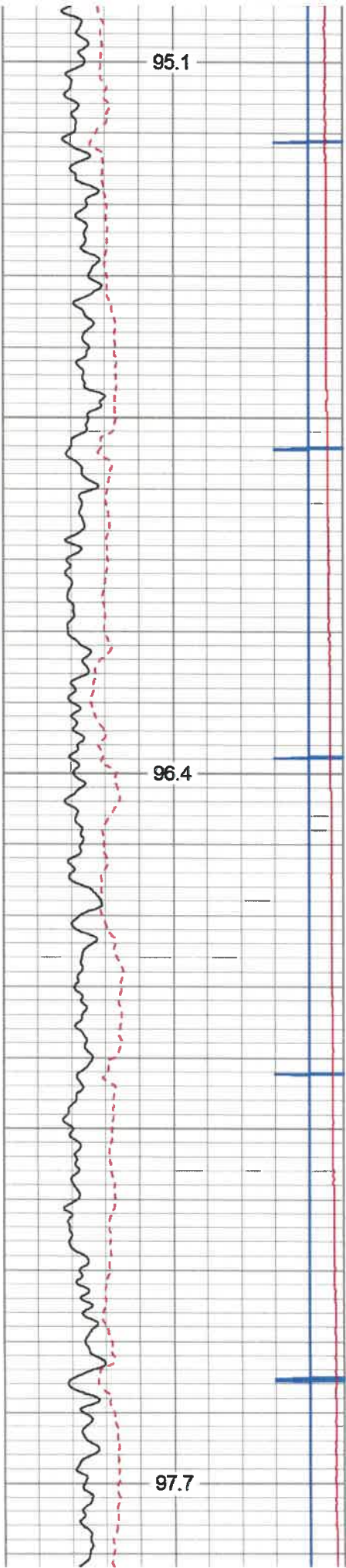


3500

3600



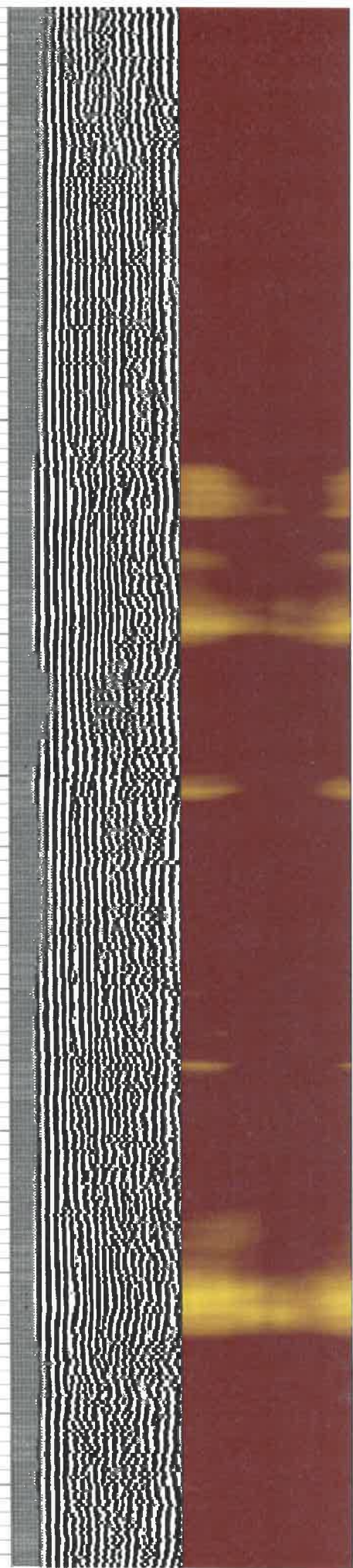
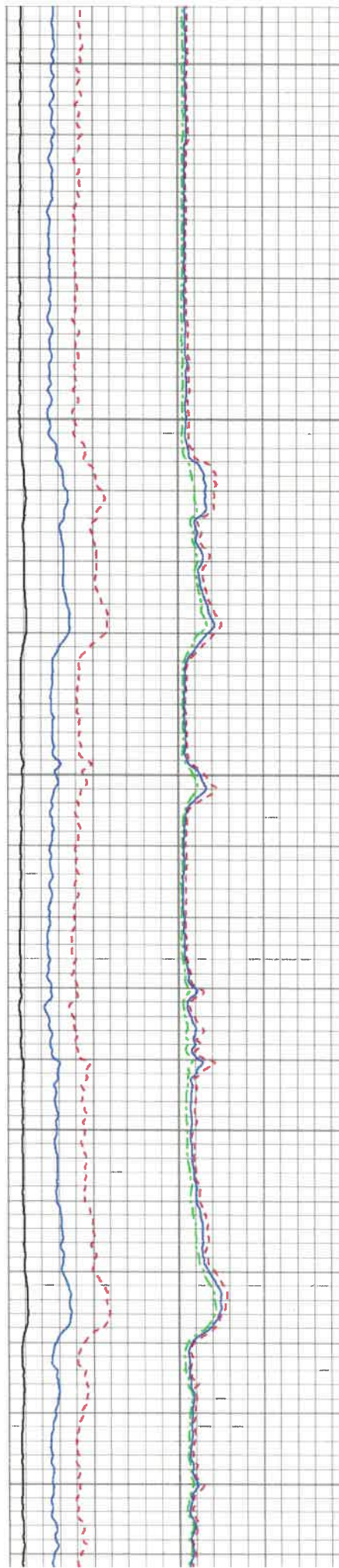




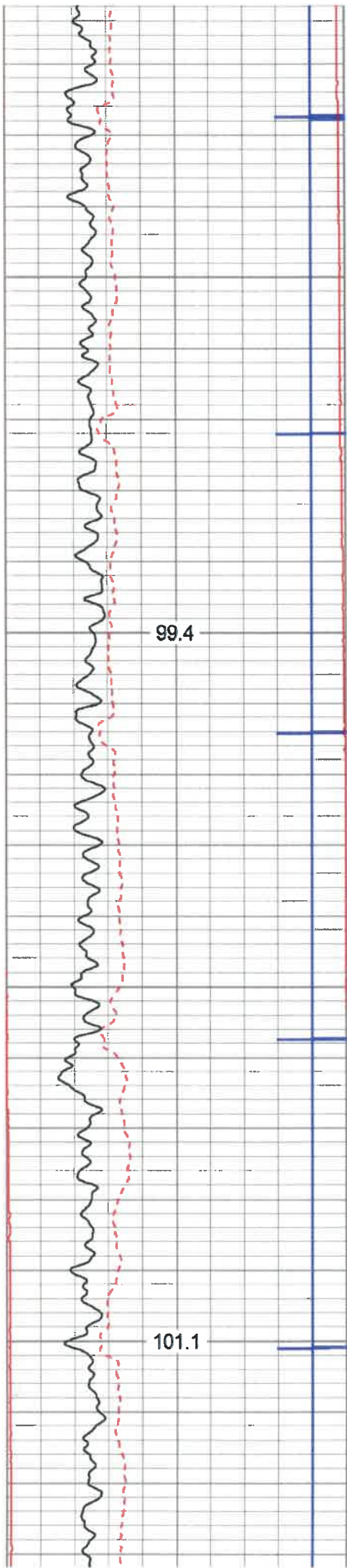
3700

3800

3900

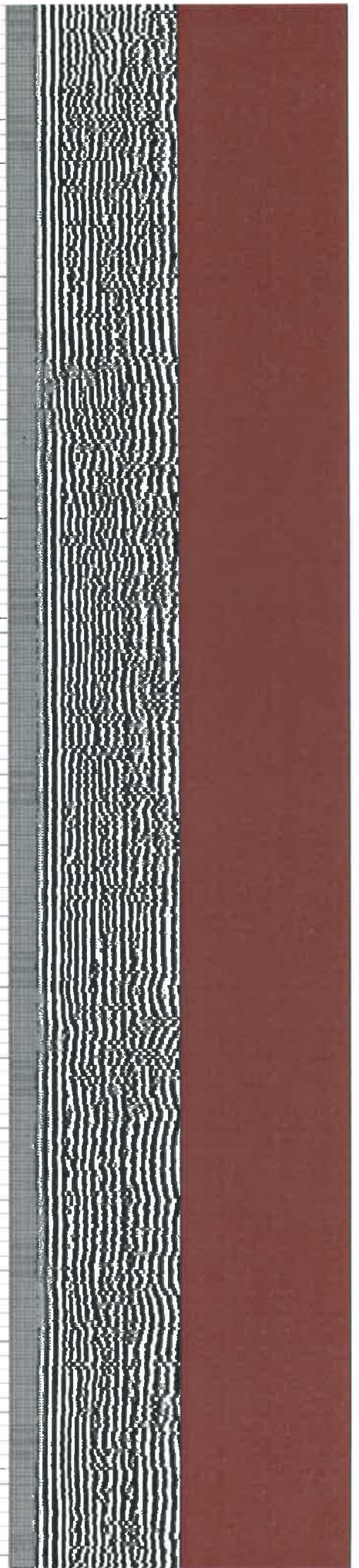
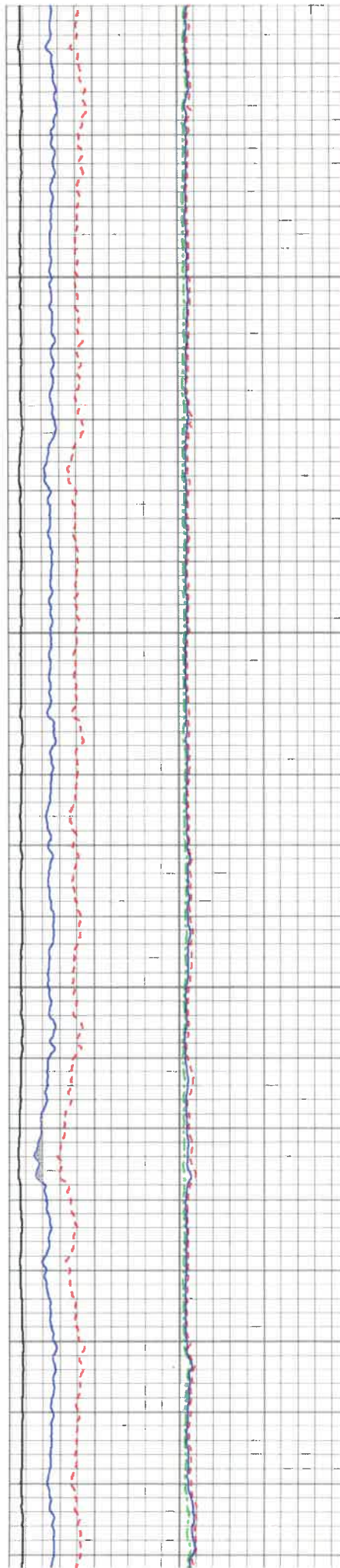




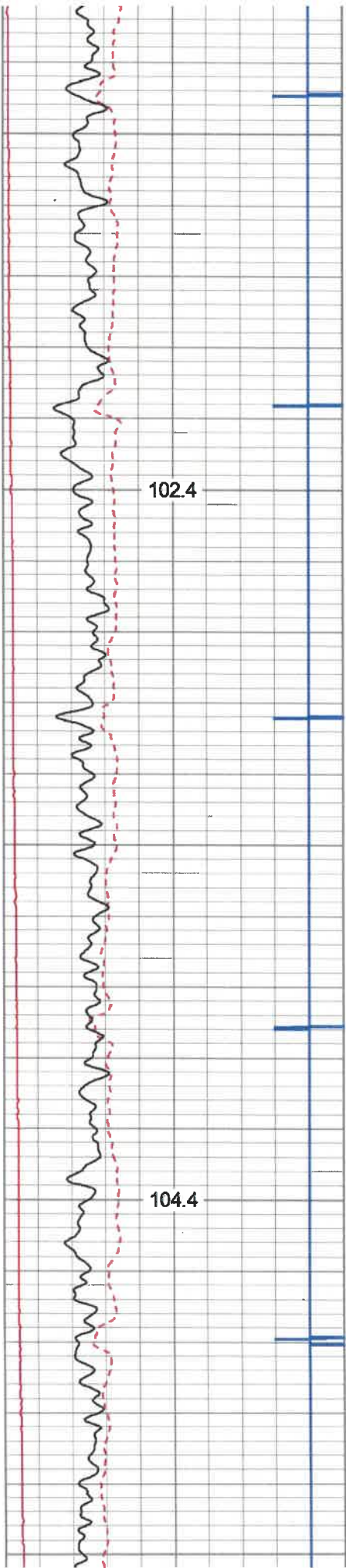


4000

4100

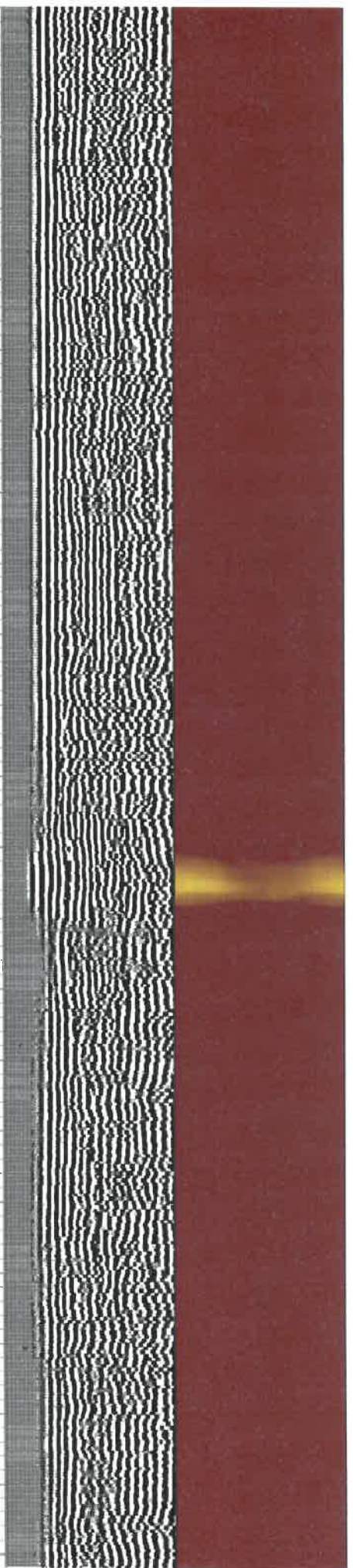
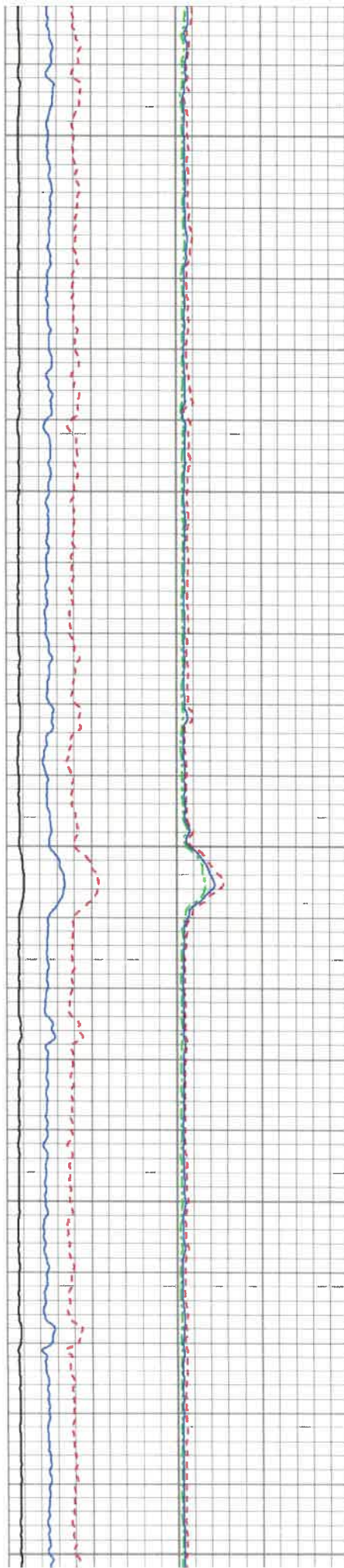




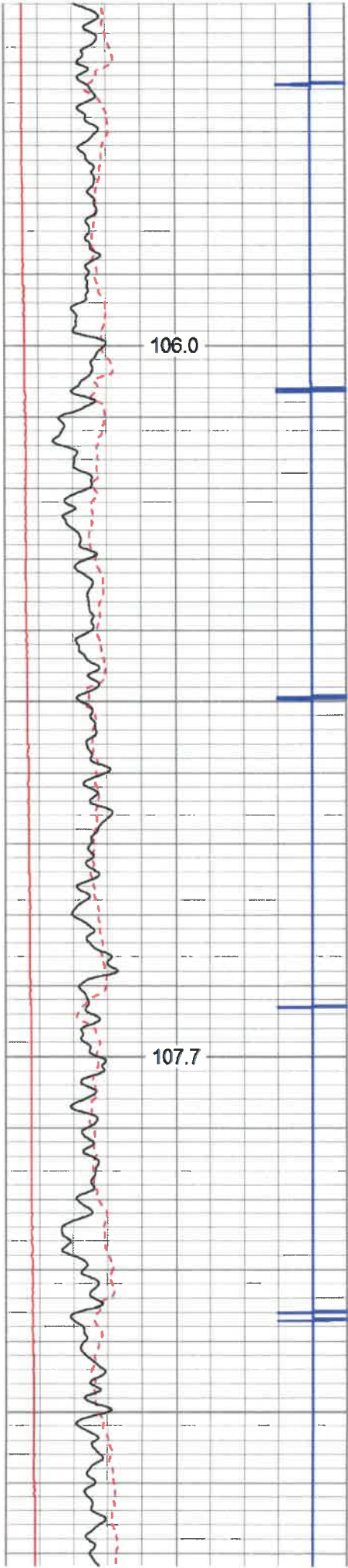


4200

4300

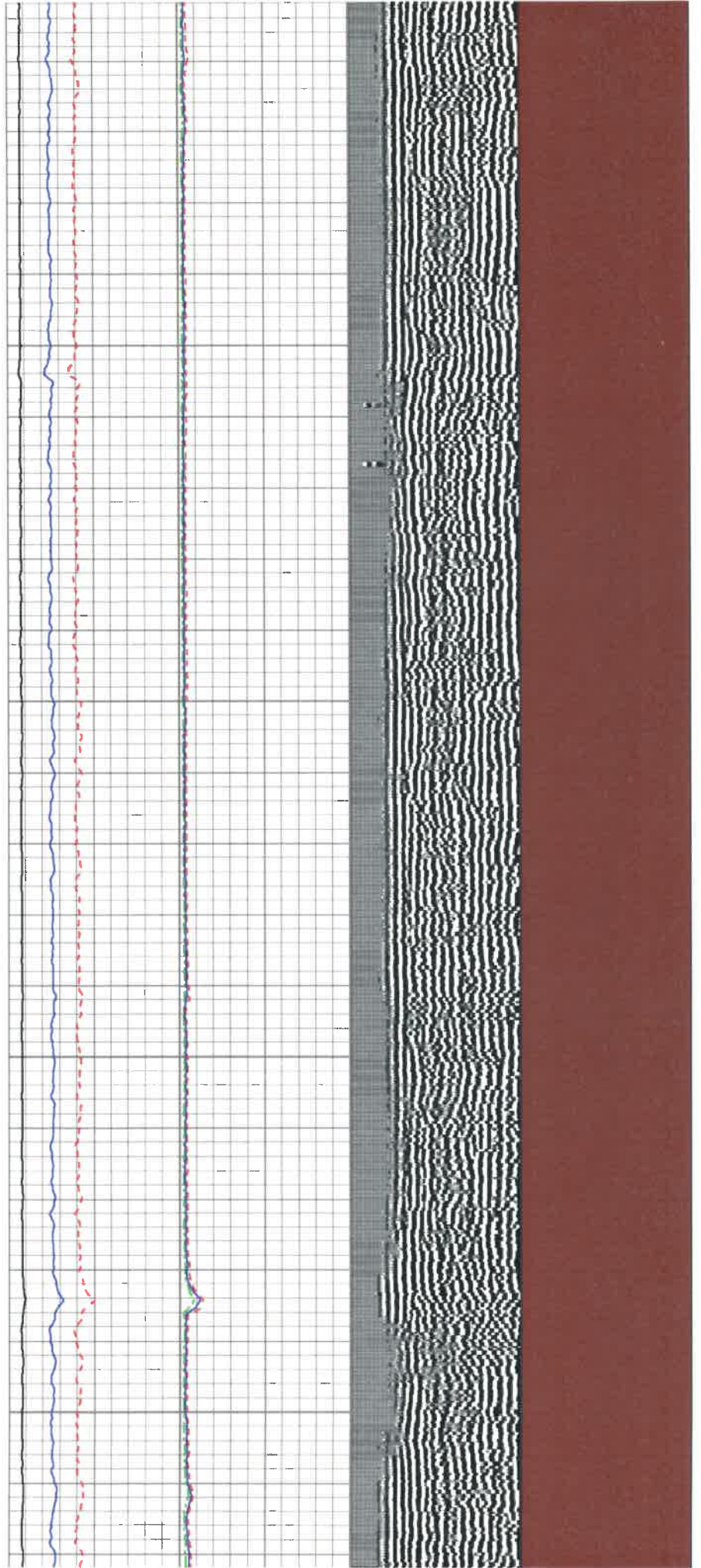




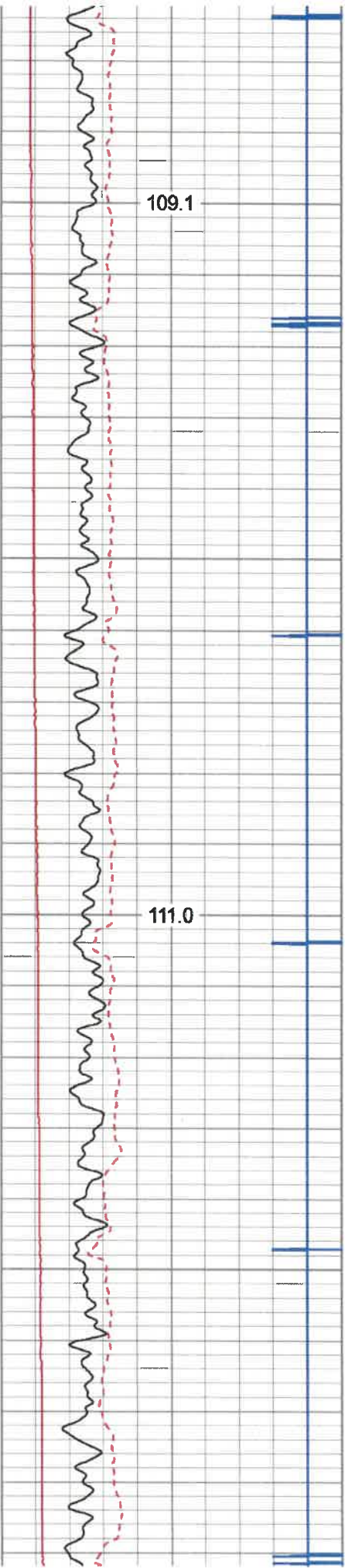


4400

4500

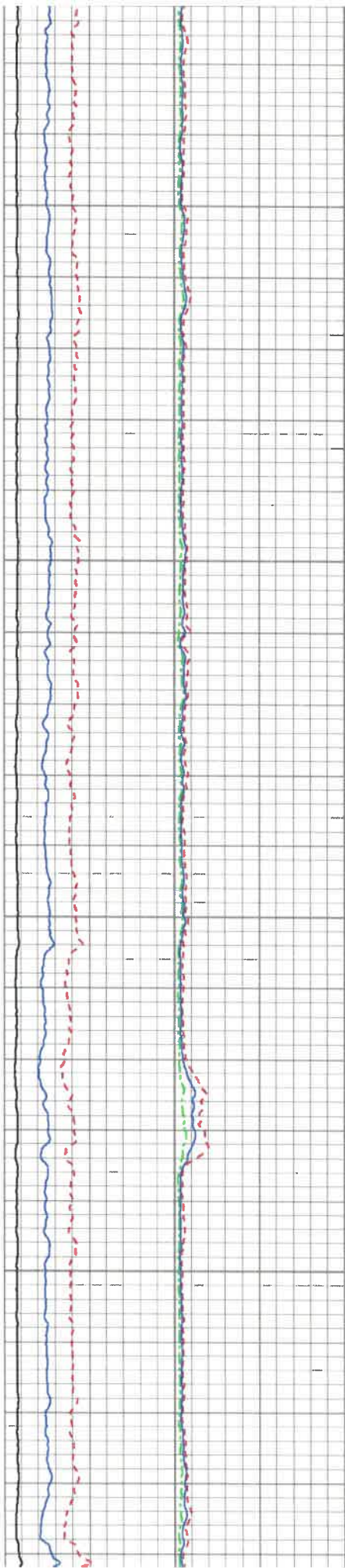




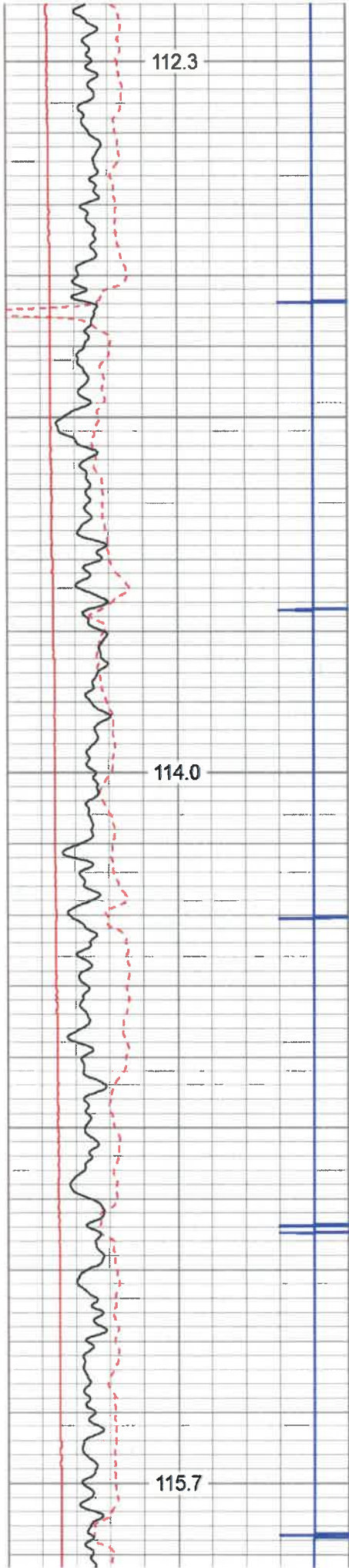


4600

4700



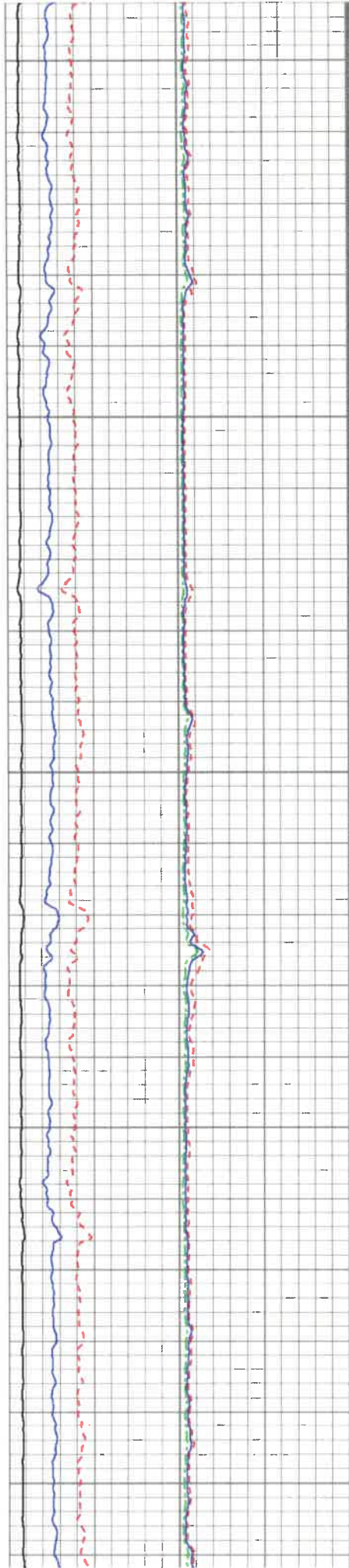




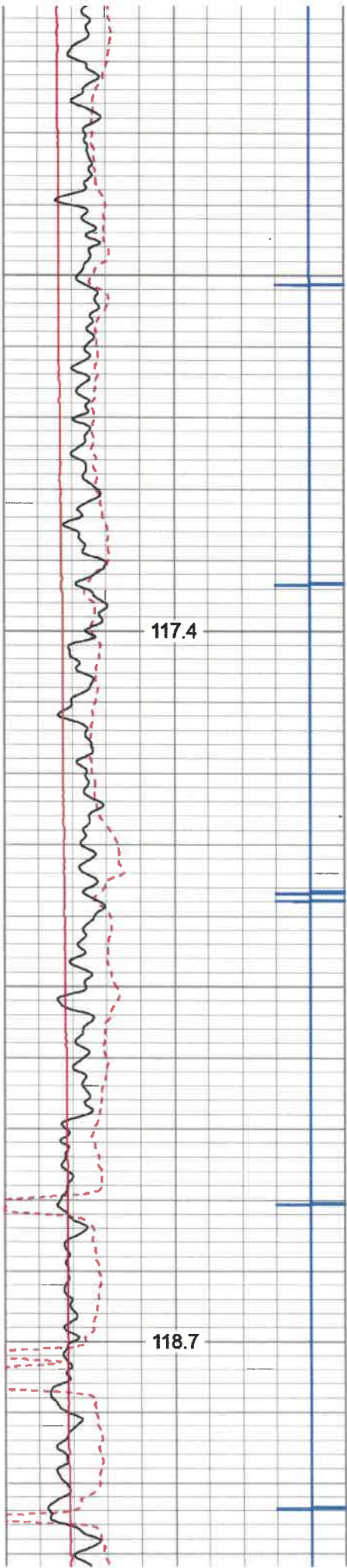
4800

4900

5000

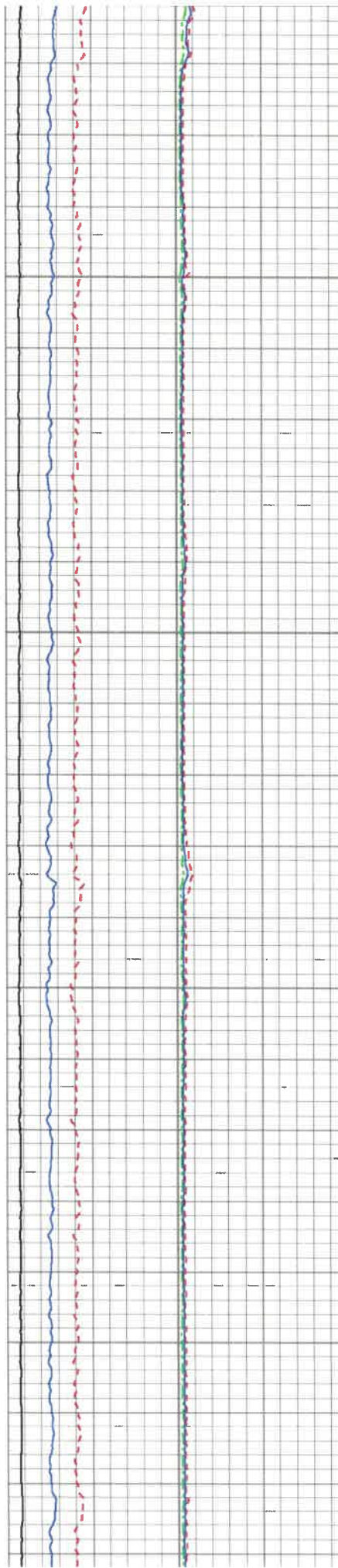




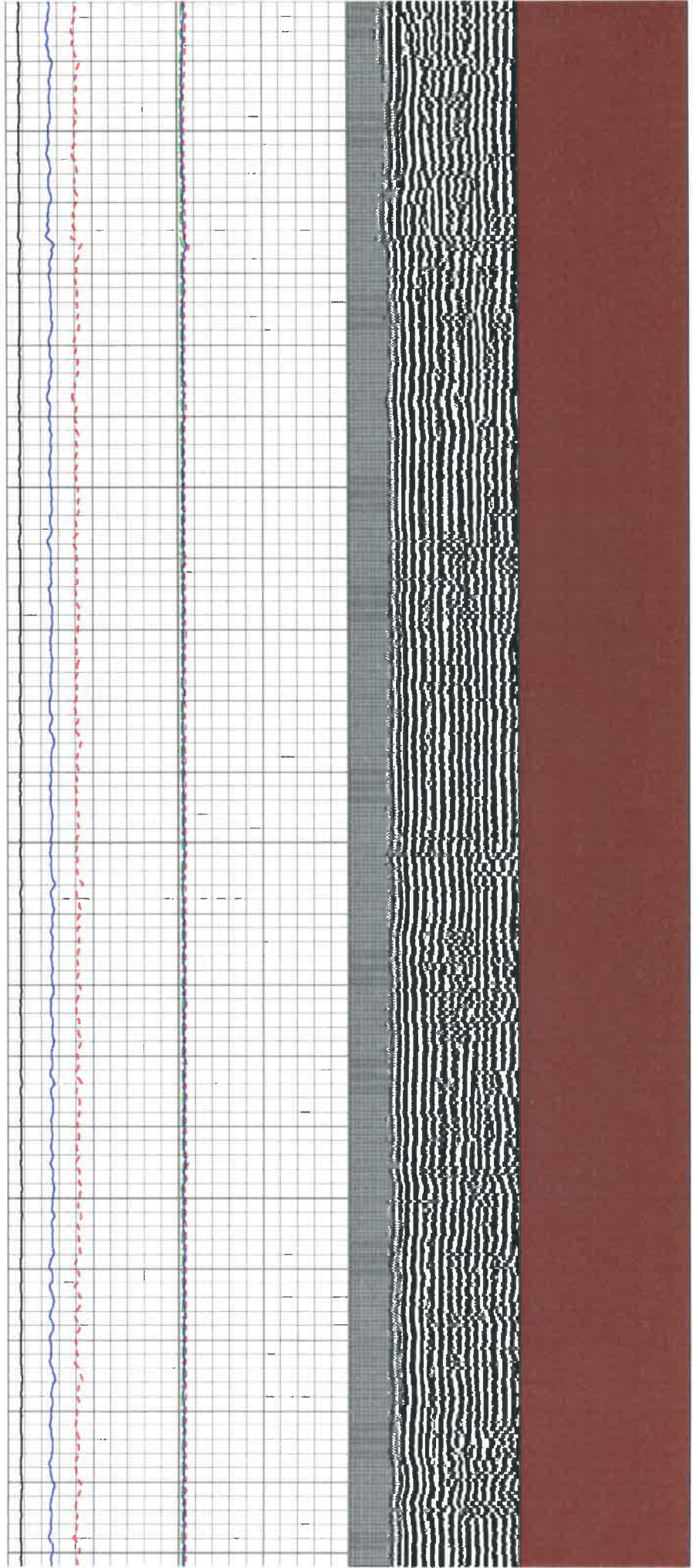
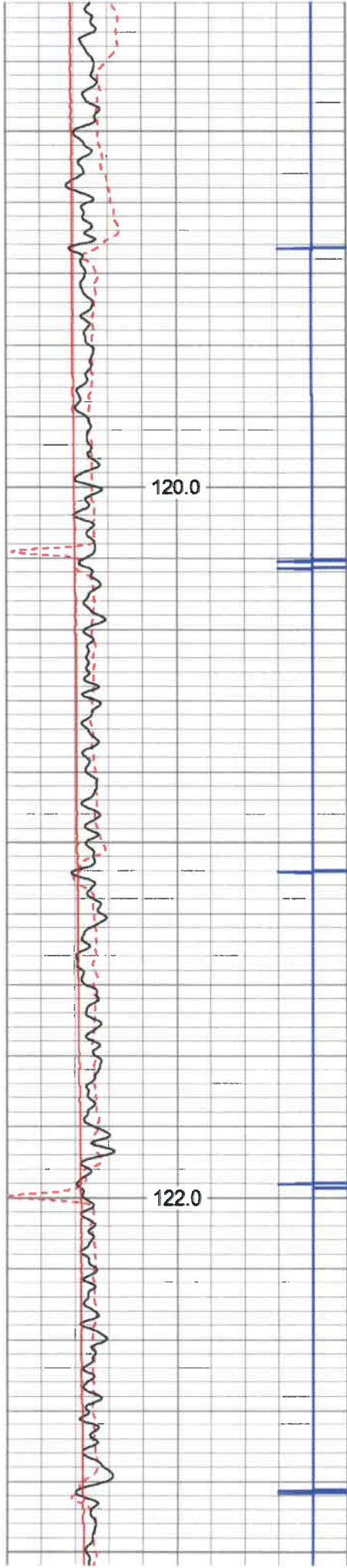


5100

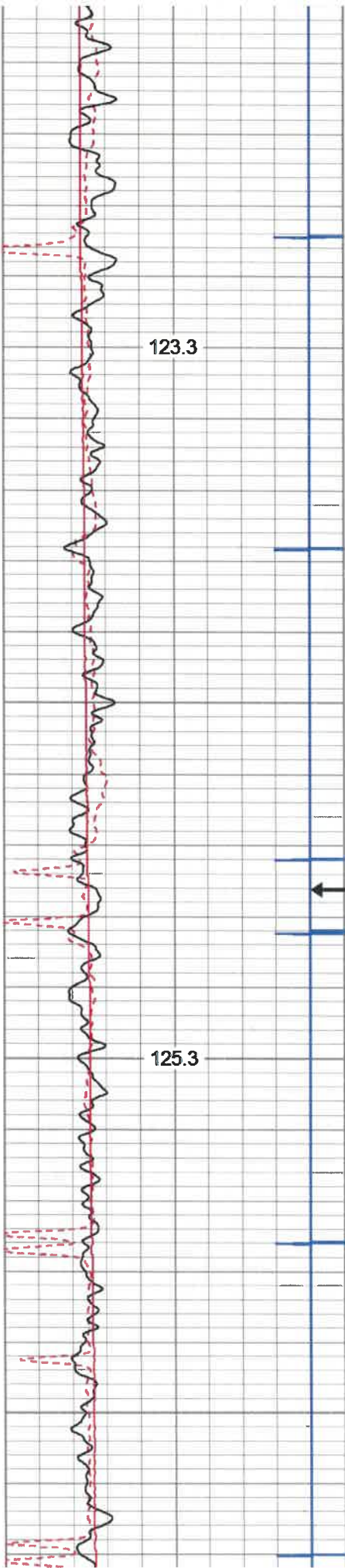
5200







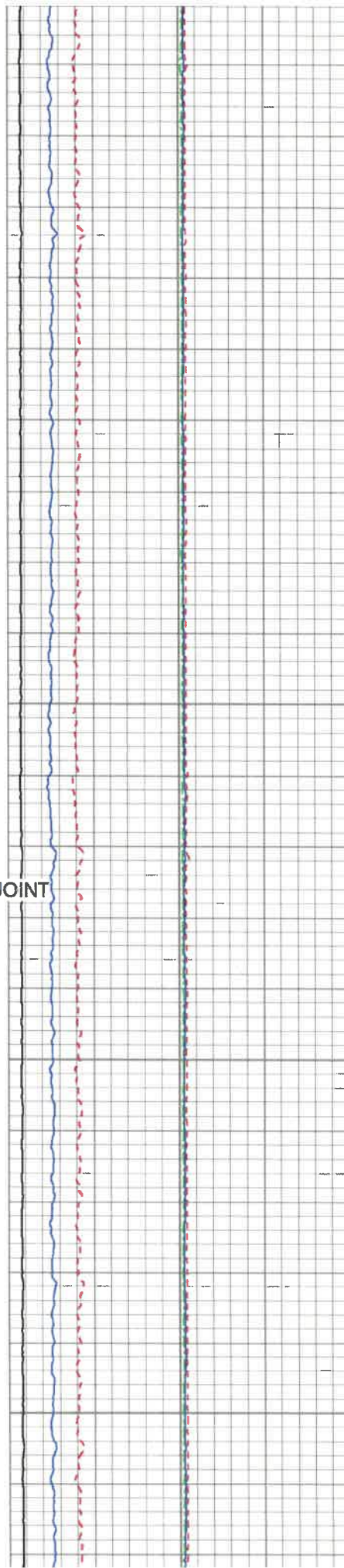




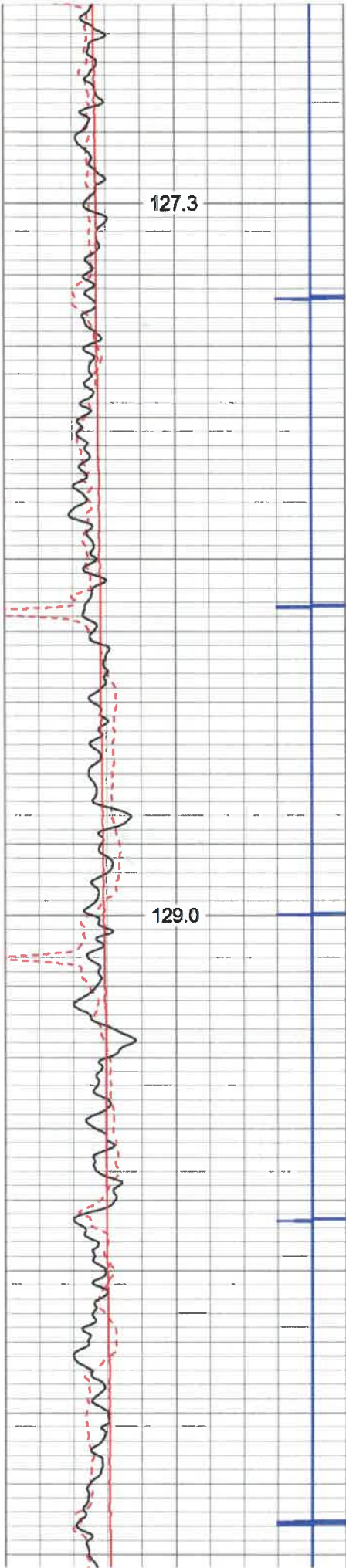
5500

← MARKER JOINT

5600

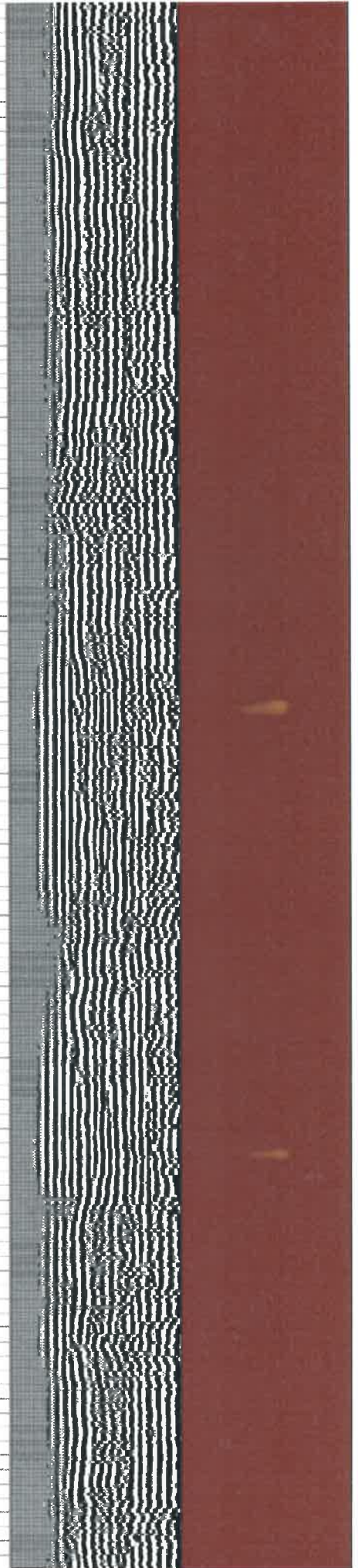
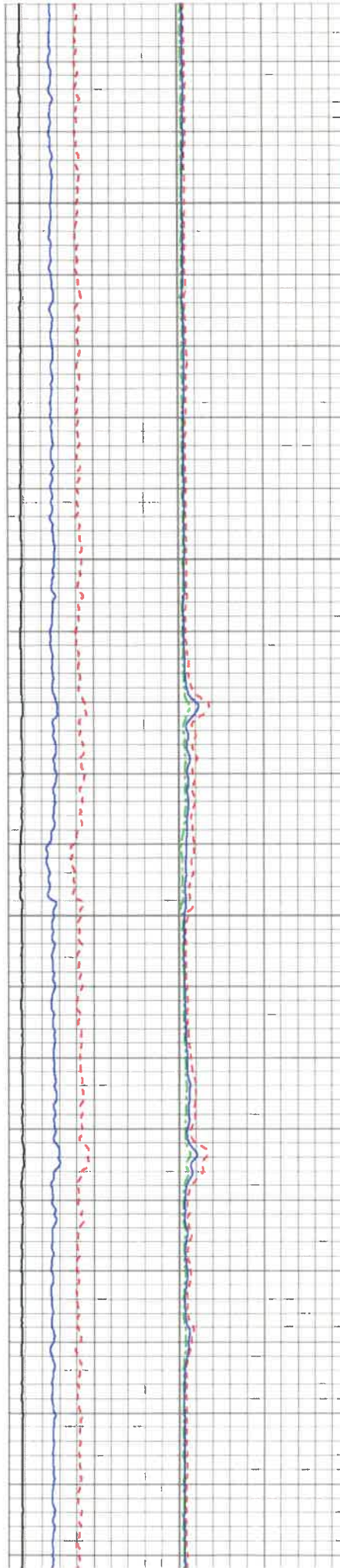




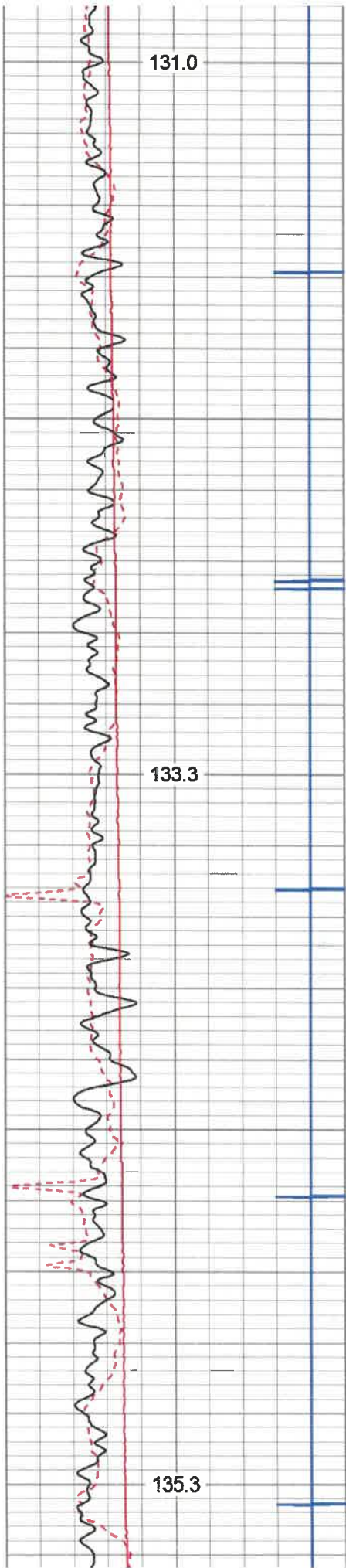


5700

5800



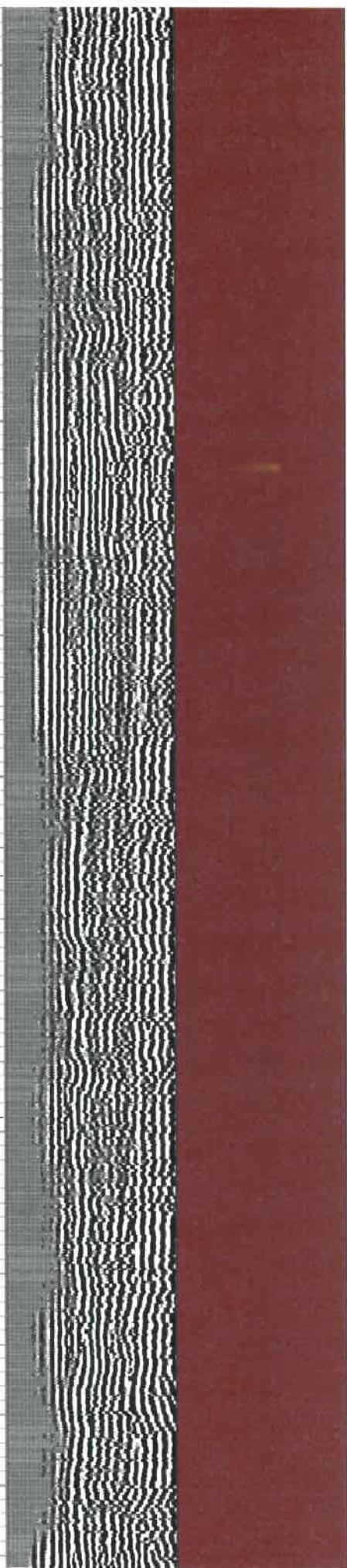
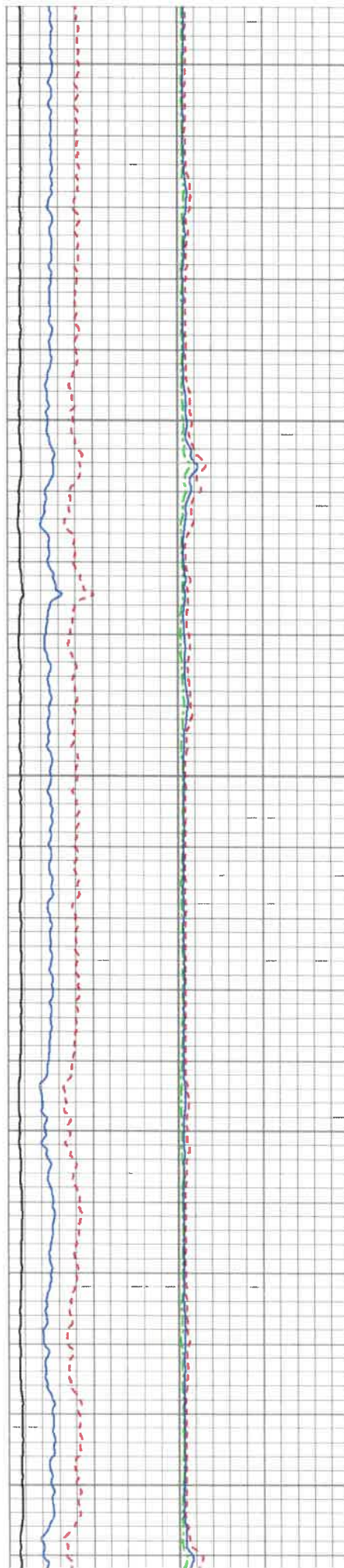




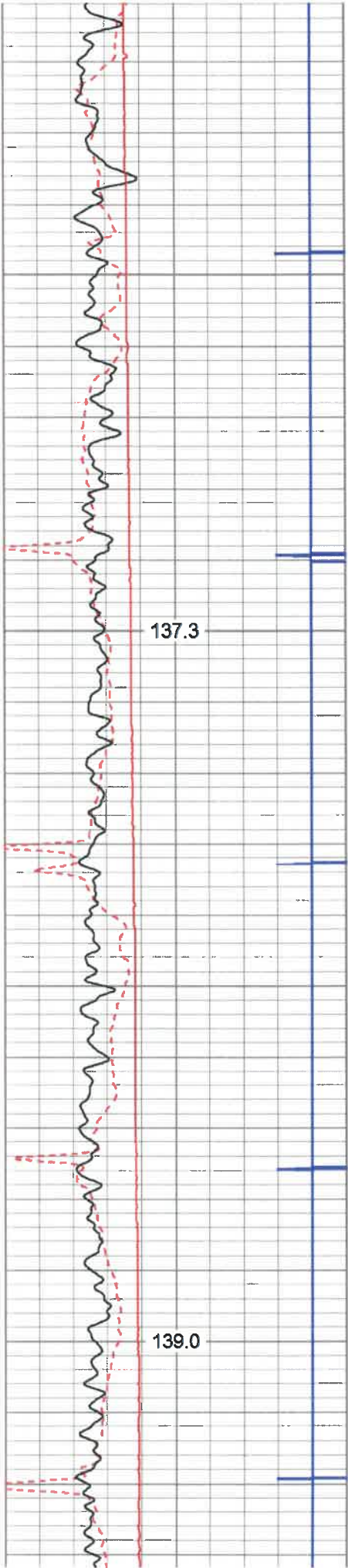
5900

6000

6100

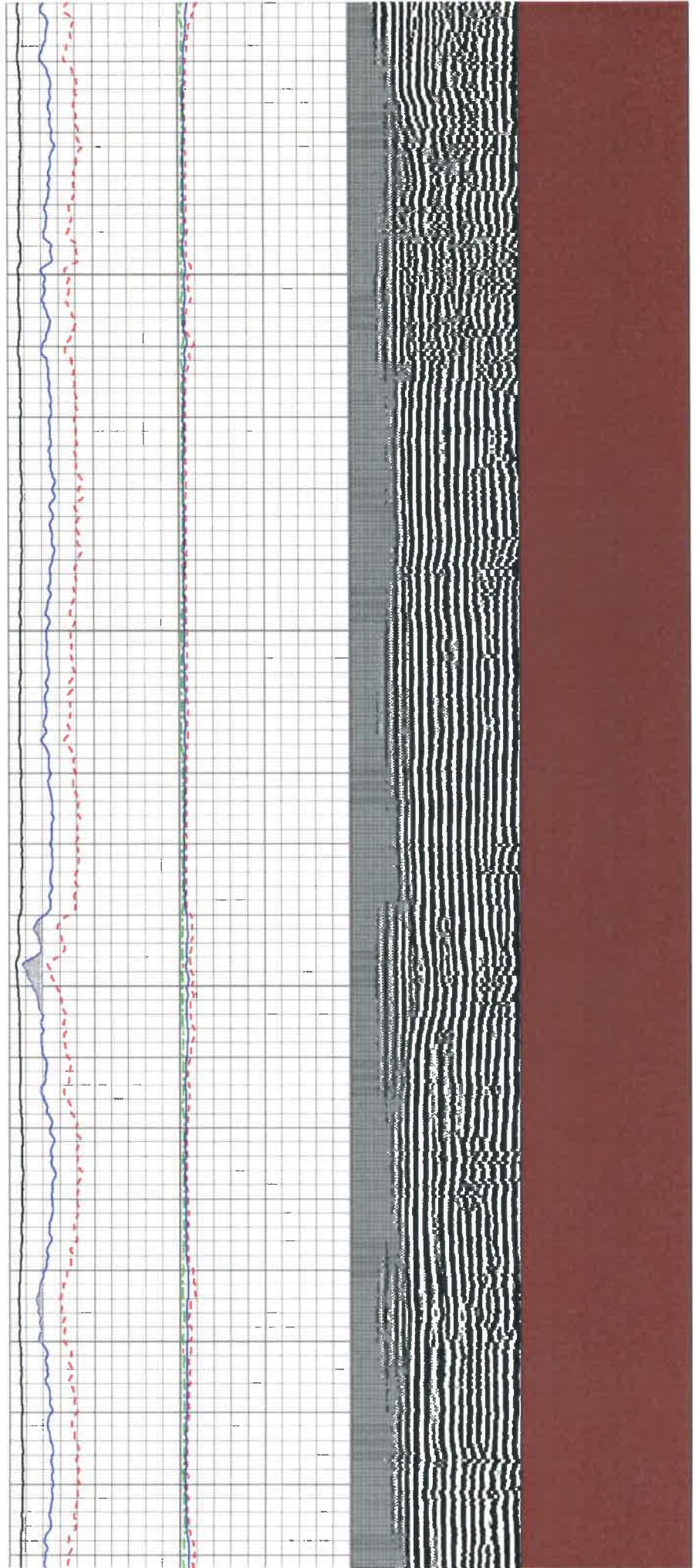




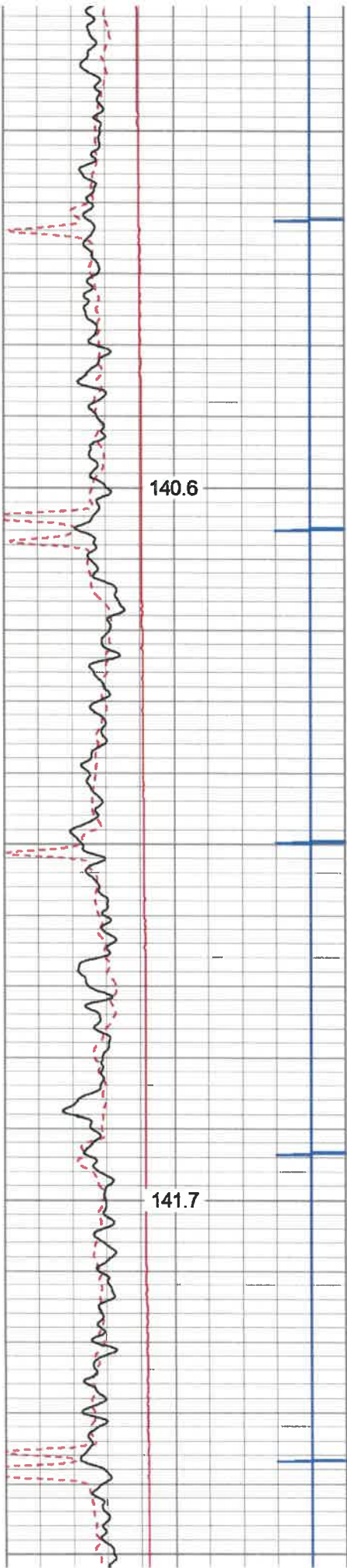


6200

6300

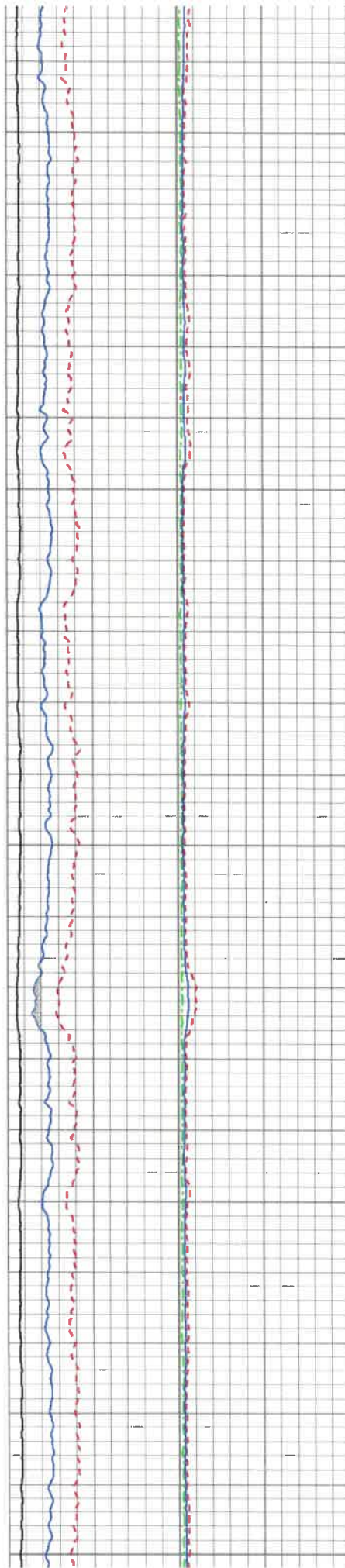




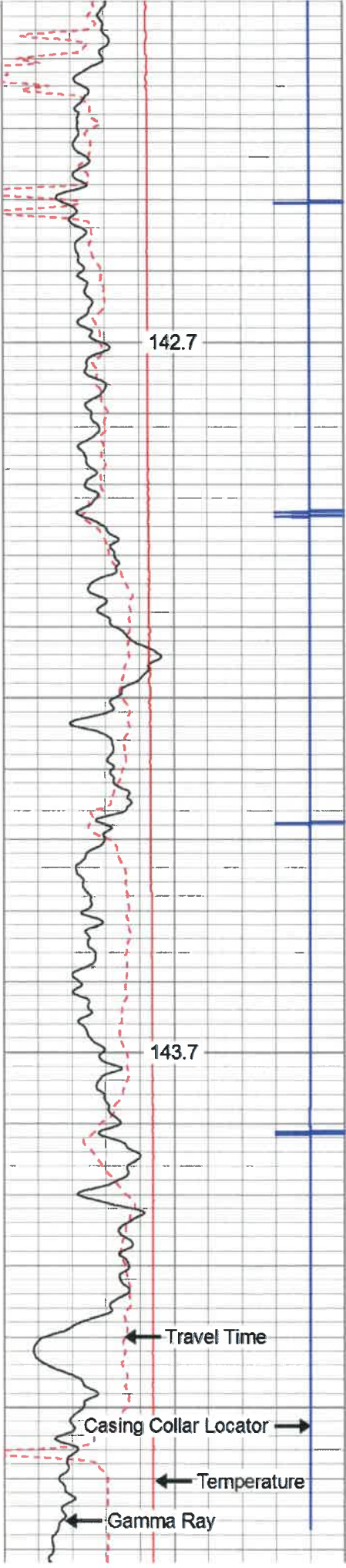


6400

6500

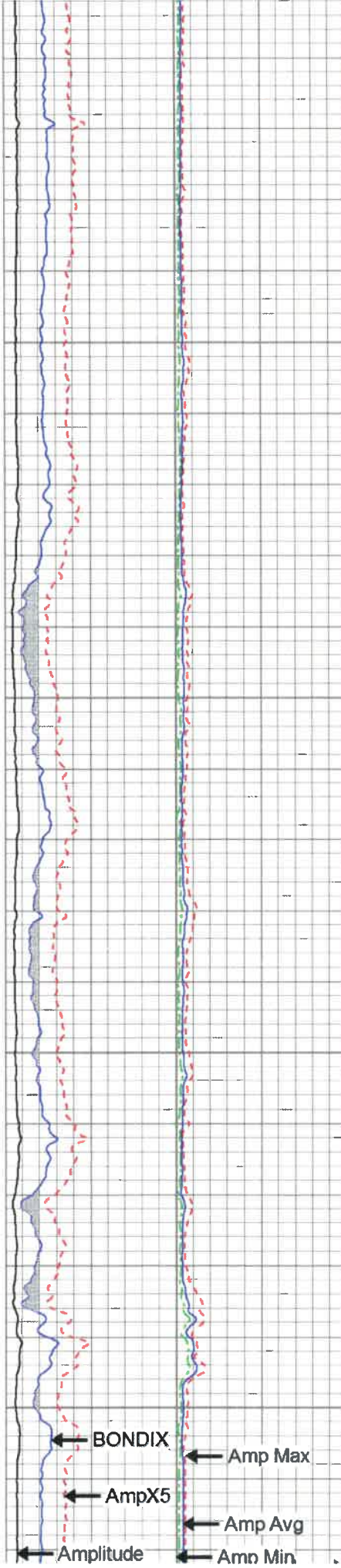




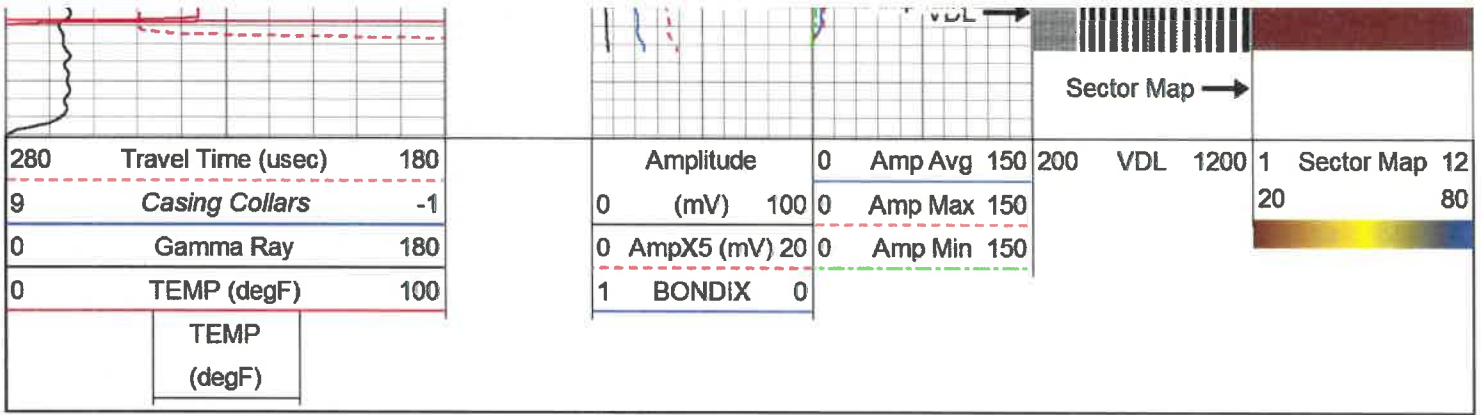


6600

6700

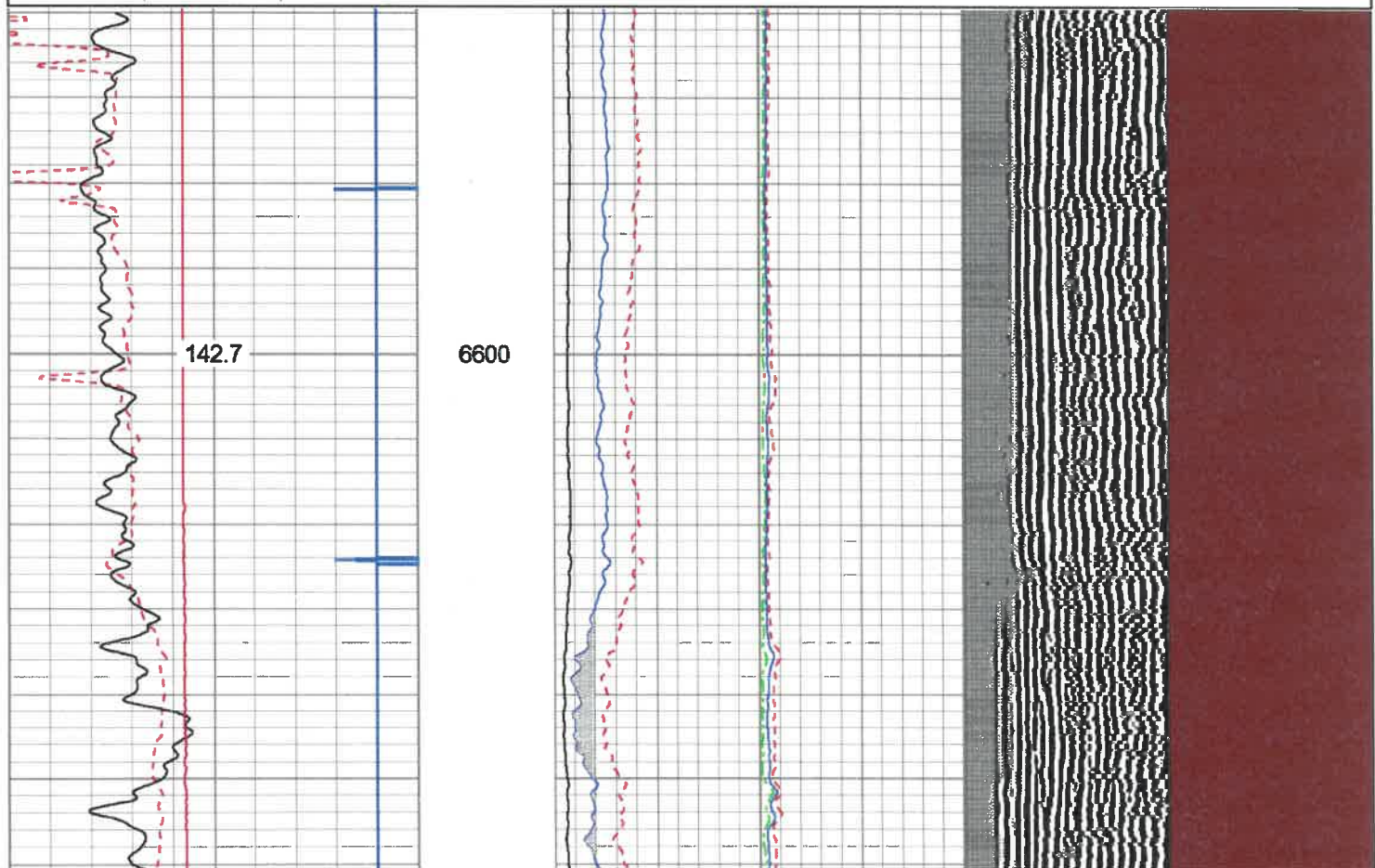
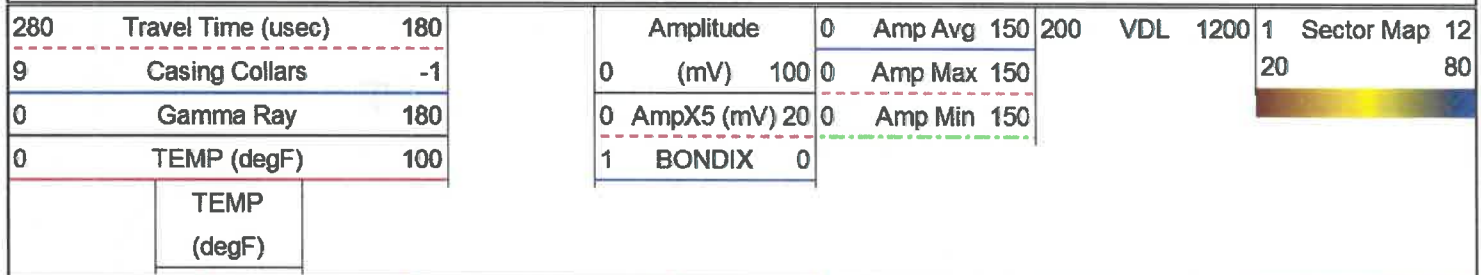




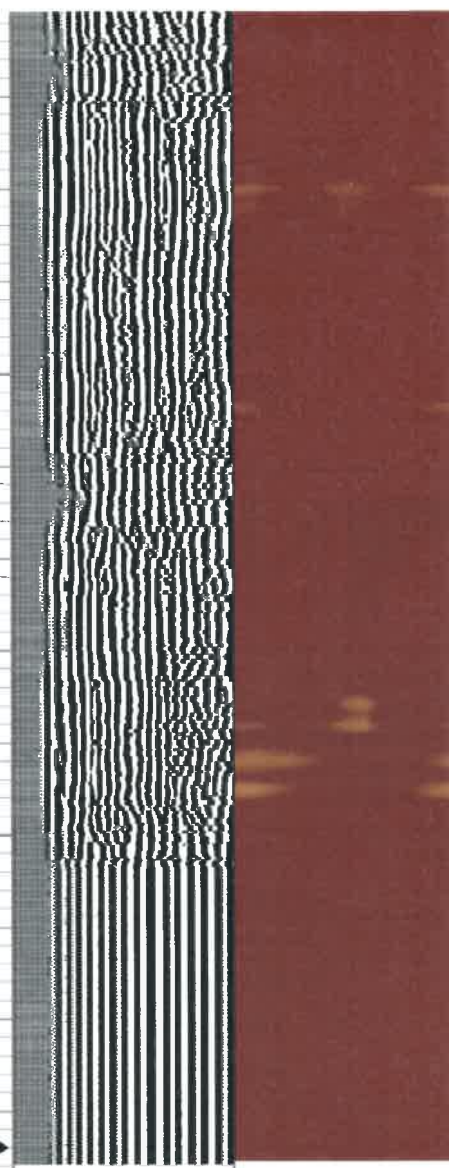
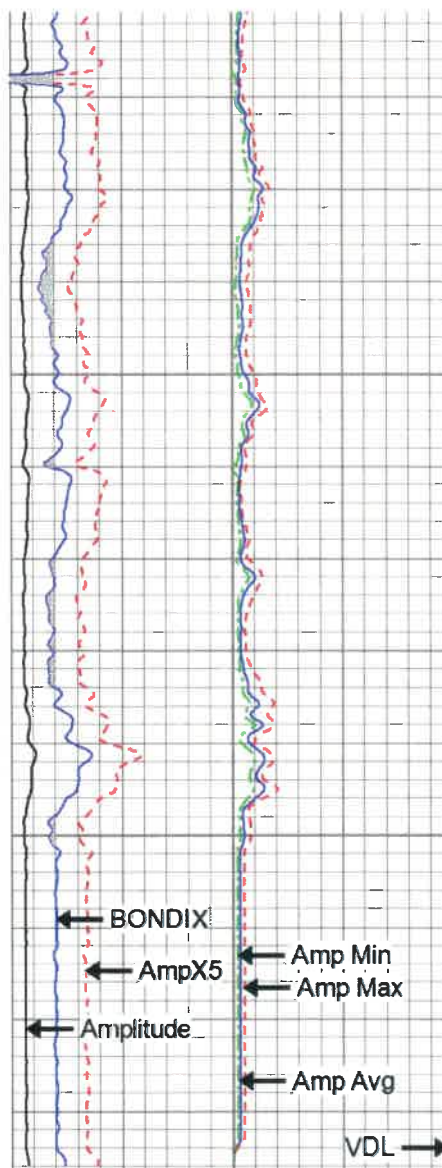
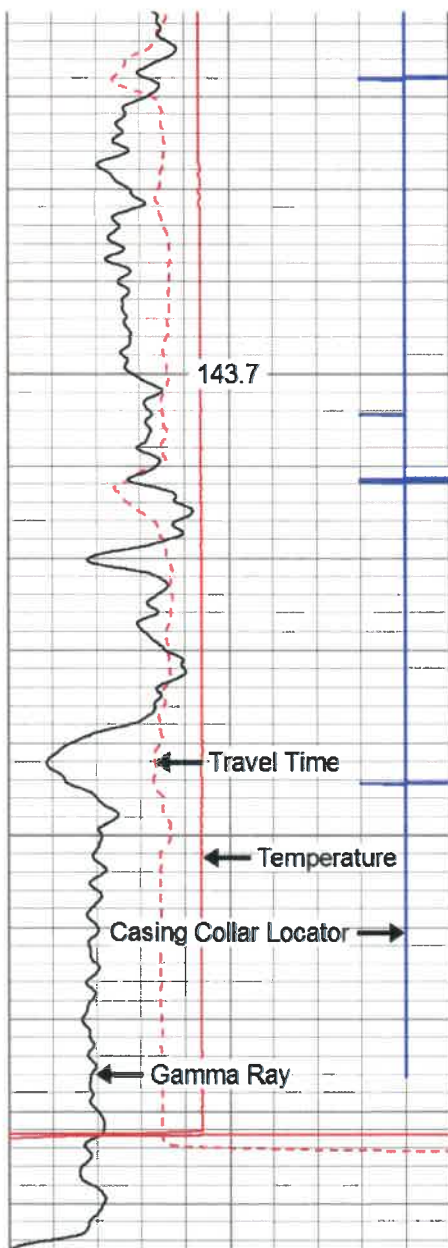


# REPEAT SECTION

Database File: c:\warrior\data\2019 antero\antero-hughes river 3h.db  
 Dataset Pathname: pass2  
 Presentation Format: antero f  
 Dataset Creation: Tue Apr 02 15:47:09 2019 by Log 7.0 B1  
 Charted by: Depth in Feet scaled 1:240







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

Amplitude	0	Amp Avg	150
(mV)	100	Amp Max	150
AmpX5 (mV)	20	Amp Min	150
BONDIX	0		

200	VDL	1200	1	Sector Map	12
			20		80



Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
CCL	18.93		CCL-312tekco (3.12TEKCO) Tekco 3 1/8" 450 Deg. "F" SmCo Logging CCL	1.82	3.12	25.00
			2.75 2 3/4" Tekco Adjustable Centralizer	2.73	2.75	25.00



TEMP	12.77					
WVFS1	11.48		SCBL-Tek12 (IOL40-05) Tekco 400 Deg F 12 Sector RIB with Temp	9.13	3.25	135.00
WVFS2	11.48					
WVFS3	11.48					
WVFS4	11.48					
WVFS5	11.48					
WVFS6	11.48					
WVFS7	11.48					
WVFS8	11.48					
WVFS9	11.48					
WVFS10	11.48					
WVFS11	11.48					
WVFS12	11.48					
WV3FT	10.73					
WVFCAL	10.73					
WV5FT	9.73					
WVTEMP	6.40					
WVFSYNC	6.40					
			2.75 2 3/4" Tekco Adjustable Centralizer	2.73	2.75	25.00
			GR-Tek-Co 2 3/4 (IPSNO-03) Tekco 2 3/4" 400 Deg. F Logging Gamma Ray	3.67	2.75	40.00
GR	1.04					

Dataset: antero-hughes river 3h.db: field/well/run1/pass3  
 Total Length: 20.07 ft  
 Total Weight: 250.00 lb  
 O.D.: 3.25 in

Calibration Report

Database File: C:\Warrior\Data\2019 antero\antero-hughes river 3h.db  
 Dataset Pathname: pass3  
 Dataset Creation: Tue Apr 02 15:53:05 2019 by Log 7.0 B1

RECEIVED  
Office of Oil and Gas

FEB 18 2020

Mississippi Department of  
Environmental Protection

Gamma Ray Calibration Report

Serial Number: IPSNO-03  
 Tool Model: Tek-Co 2 3/4  
 Performed: Mon Nov 07 10:23:17 2016  
 Calibrator Value: 1.0  
 Background Reading: 0.0

CDS



Calibrator Reading:	1.0	cps
Sensitivity:	0.3000	/cps

Temperature Calibration Report

Serial Number: IOL40-05  
Tool Model: Tek12  
Performed: Wed Jul 31 10:53:14 2013

	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			



Company	ANTERO RESOURCES CORPORATION	
Well	HUGHES RIVER UNIT 2H	
Field	MARCELLUS	
County	RITCHIE	
State	W.V.	Country