



# RADIAL CEMENT BOND LOG

FILE NO:	COMPANY	LARAMIE ENERGY II LLC
API NO:	WELL	NICHOLS 0994-13-21E
05077104160000	FIELD	VEGA
	COUNTY	MESA
	STATE	COLORADO

Ver. 4.10	LOCATION:	OTHER SERVICES
	SHL 1783 FNL 2777 FEL	RPM
	BHL 112 FNL 1494 FEL	
	SEC 24 TWP 9S RGE 94W	

PERMANENT DATUM	GL	ELEVATION	7137 FT	ELEVATIONS:
LOG MEASURED FROM	KB	24 FT	ABOVE P.D.	KB 7161 FT
DRILL. MEAS. FROM	KB			DF
				GL 7137 FT

DATE	16-Mar-2018
RUN	1
SERVICE ORDER	US133008J
DEPTH DRILLER	7920 FT
DEPTH LOGGER	7837 FT
BOTTOM LOGGED INTERVAL	7836 FT
TOP LOGGED INTERVAL	24 FT
TIME STARTED	12:30
TIME FINISHED	15:00
OPERATOR RIG TIME	LOGGER
TYPE OF FLUID IN HOLE	WATER
FLUID DENSITY	NA
FLUID SALINITY	NA
FLUID LEVEL	50 FT
LOGGED CEMENT TOP	2034 FT
WELLHEAD PRESSURE	0 PSI
MAXIMUM HOLE DEVIATION	NA
NOMINAL LOGGING SPEED	90 FMIN
MAX. RECORDED TEMP.	230 DEGF
REFERENCE LOG	NA
REFERENCE LOG DATE	NA
EQUIP. NO.	4291
LOCATION	R. ZUNIGA
RECORDED BY	NA
WITNESSED BY	NA

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE THE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT. BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

## REMARKS

RUN 1 TRIP 1: RAL/GR/CCL RUN CENTRALIZED

LOGGED WITH 0 PSI AT WELLHEAD

SJ: 6092-6110  
SJ: 7000-7018

CREW: R. ZUNIGA, J. PENA, A. SHAHNOOSHI

## EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	RAL	1426XA	10404539a	CENTRALIZED
1	1	GR/CCL	1355XA	12670180	CENTRALIZED

# MAIN PASS 0 PSI

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017

Patches: 3

Plotted: Sun Mar 18 09:31:48 2018

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_NICHOLS\_0994-13-21E/p012g02.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 8.750 ft BOTTOM DEPTH: 7838.000 ft

### SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
GR	FILTER ()	medium (1)		TOP	BOTTOM
AMPLITUDE	FILTER ()	medium (1)		"	"
TRAVEL TIME	FILTER ()	medium (1)		"	"

### RAL CCL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CCL FLOOR	CCL FLOOR	4000.00		TOP	BOTTOM

### ANALOG RAL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
AMPLITUDE WINDOW (NEAR)	AMP WINDOW START (fgp1*)	185	us	TOP	BOTTOM
	AMP WINDOW START (fgp2*)	185	us	"	"
	AMP WINDOW START (fgp3*)	185	us	"	"
	AMP WINDOW START (fgp4*)	185	us	"	"
	AMP WINDOW START (fgp5*)	185	us	"	"
	AMP WINDOW START (fgp6*)	185	us	"	"
	AMP WINDOW START (fgp7*)	185	us	"	"
	AMP WINDOW START (fgp8*)	185	us	"	"
	AMP WINDOW START (fgpn*)	185	us	"	"
	AMP WINDOW LENGTH	30	us	"	"
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	175	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	4	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	200.391	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-73	us	"	"
	TOOL DELAY (str2*)	-73	us	"	"
	TOOL DELAY (str3*)	-73	us	"	"
	TOOL DELAY (str4*)	-73	us	"	"
	TOOL DELAY (str5*)	-73	us	"	"
	TOOL DELAY (str6*)	-73	us	"	"
	TOOL DELAY (str7*)	-73	us	"	"
	TOOL DELAY (str8*)	-73	us	"	"
	TOOL DELAY (strn*)	-73	us	"	"
BASELINE NOISE (NEAR)	NOISE WINDOW START	125	us	"	"
	NOISE WINDOW LENGTH	25	us	"	"

### PERCENT BOND CEMENT MAP

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
RAL FREE PIPE AMPLITUDE	FREE AMP REC 1	80	mV	TOP	BOTTOM
	FREE AMP REC 2	80	mV	"	"
	FREE AMP REC 3	80	mV	"	"
	FREE AMP REC 4	80	mV	"	"
	FREE AMP REC 5	80	mV	"	"
	FREE AMP REC 6	80	mV	"	"
	FREE AMP REC 7	80	mV	"	"
	FREE AMP REC 8	80	mV	"	"
RAL FULL BOND AMPLITUDE	FULL BOND AMP REC 1	2	mV	"	"
	FULL BOND AMP REC 2	2	mV	"	"
	FULL BOND AMP REC 3	2	mV	"	"
	FULL BOND AMP REC 4	2	mV	"	"

FULL BOND AMP REC 5	2	mV	"	"
FULL BOND AMP REC 6	2	mV	"	"
FULL BOND AMP REC 7	2	mV	"	"
FULL BOND AMP REC 8	2	mV	"	"

## CURVE DESCRIPTION REPORT

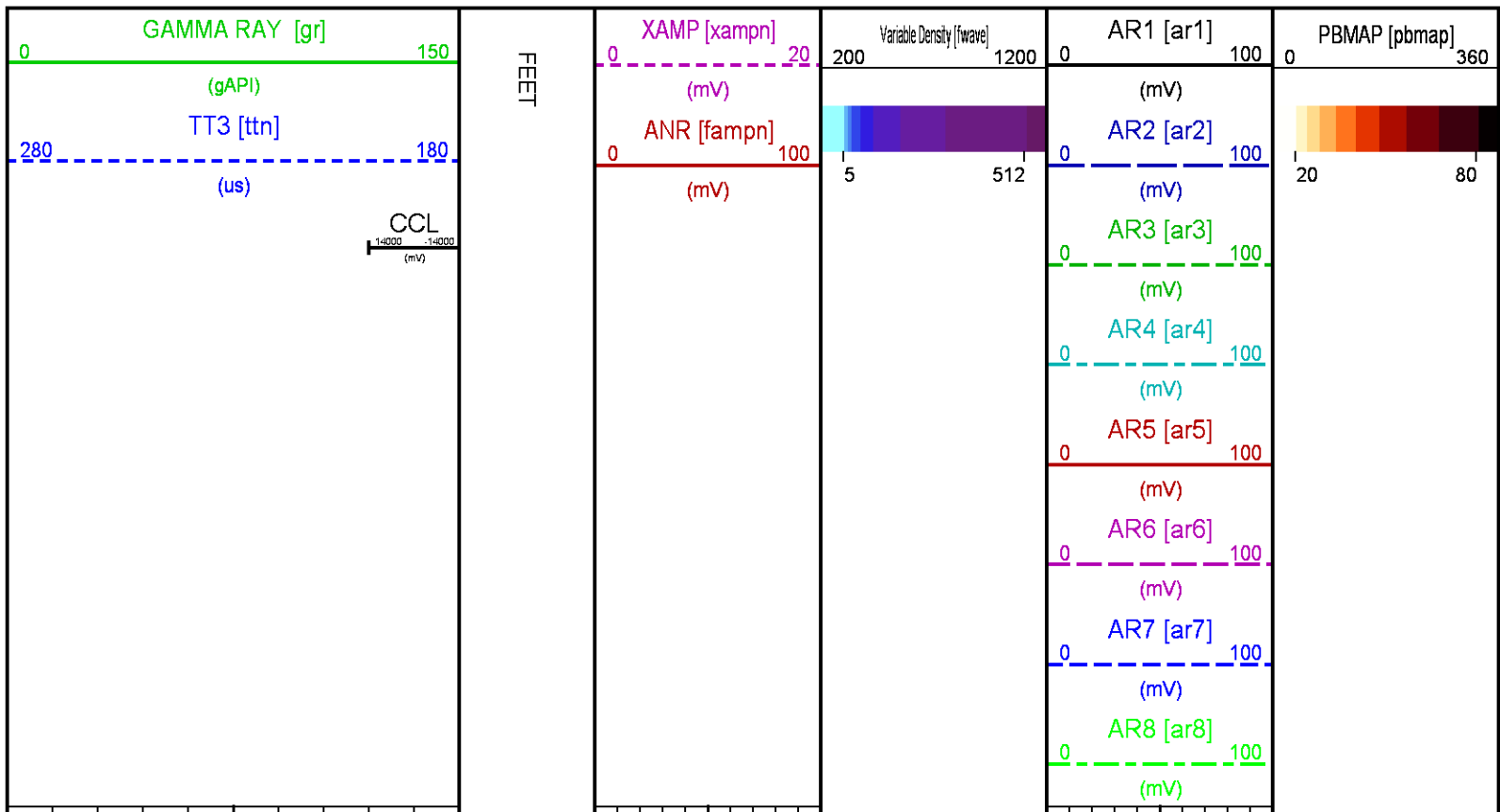
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	FIXED GATE AMPLITUDE T-R7
F1:AR8	N/A	FIXED GATE AMPLITUDE T-R8
F1:CCL	N/A	CASING COLLAR LOCATOR
F1:FAMPN	N/A	FIXED GATE AMPLITUDE NEAR RECEIVER
F1:FWAVE	N/A	FAR WAVE FORM
F1:GR	N/A	GAMMA RAY
F1:PBMAP	N/A	PERCENT BOND CEMENT MAP
F1:TTN	N/A	TRAVELTIME FROM NEAR TRANSMITTER-RECEIVER
F1:XAMPN	N/A	FIXED GATE AMPLITUDE NEAR RECEIVER TIMES FIVE

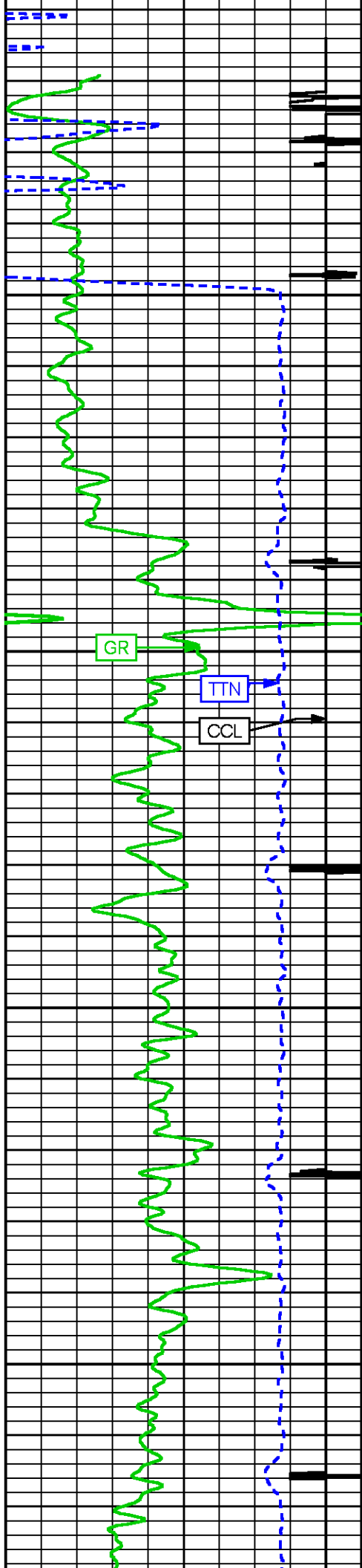
## CURVE MEASURE POINT OFFSET

CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
AR1	-11.25	AR5	-11.25	CCL	-5.75	XAMPN	-11.25
AR2	-11.25	AR6	-11.25	FAMPN	-11.25		
AR3	-11.25	AR7	-11.25	GR	-1.75		
AR4	-11.25	AR8	-11.25	TTN	-11.25		

**Presentation** : SysA:LARAMIE\_RAL\_MAIN.fvpdf [5"/100' Scale]  
**Plot Interval** : 9.5 - 7847.75 Feet

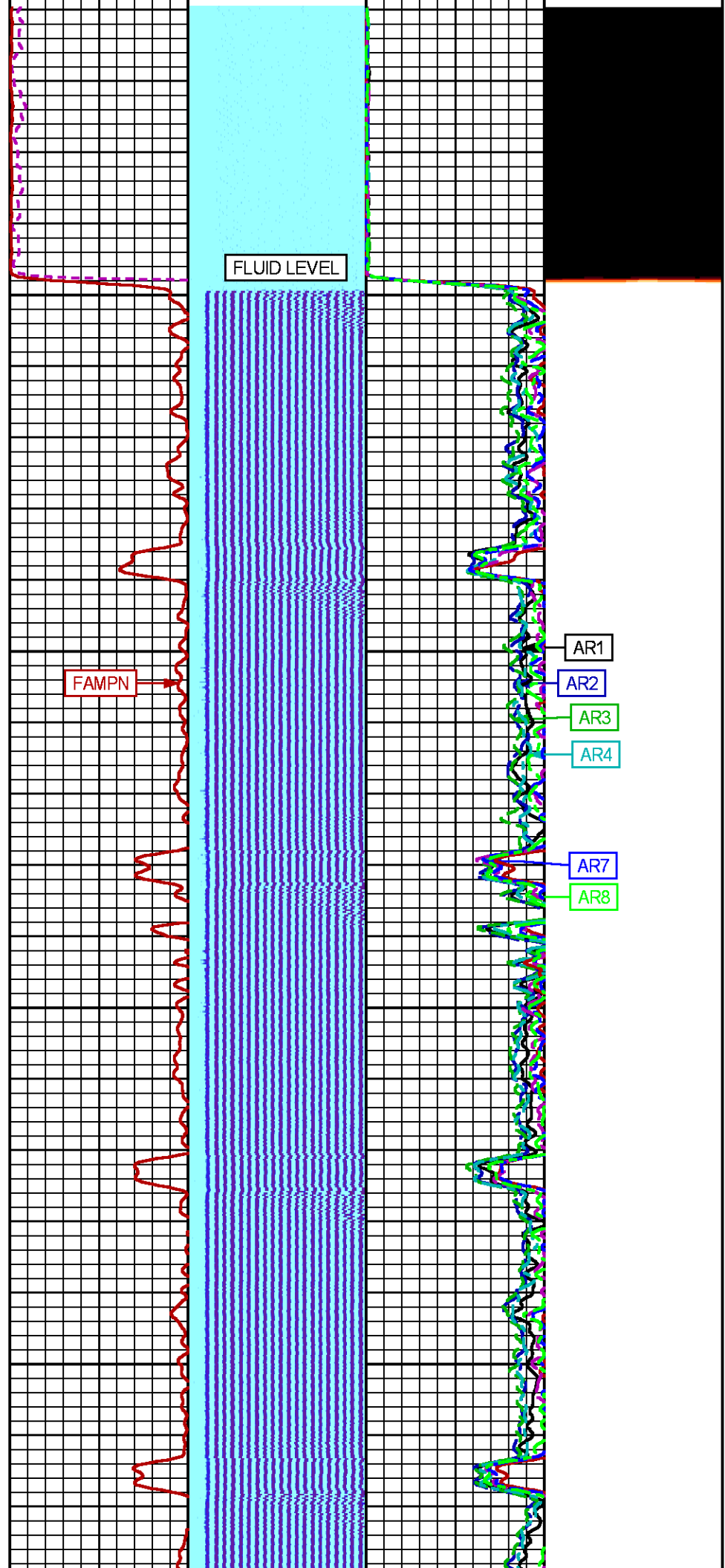
**Data File 1** : F1 : SysA:/dat1a/LARAMIE\_NICHOLS\_0994-13-21E/RAL\_MAIN.xtf  
**Created On** : N/A  
**Company** : LARAMIE ENERGY II LLC  
**Well** : NICHOLS 0994-13-21E  
**Field** : VEGA  
**File Interval** : 8.5 - 7849 Feet  
**OCT** : p012g

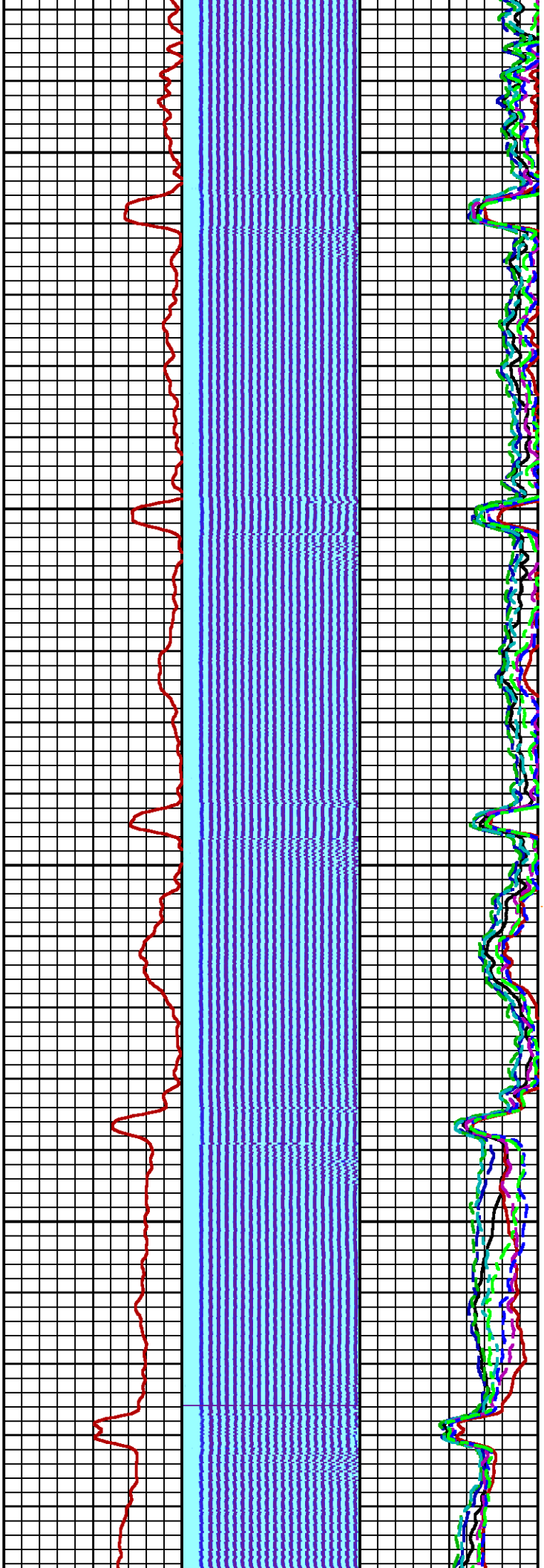




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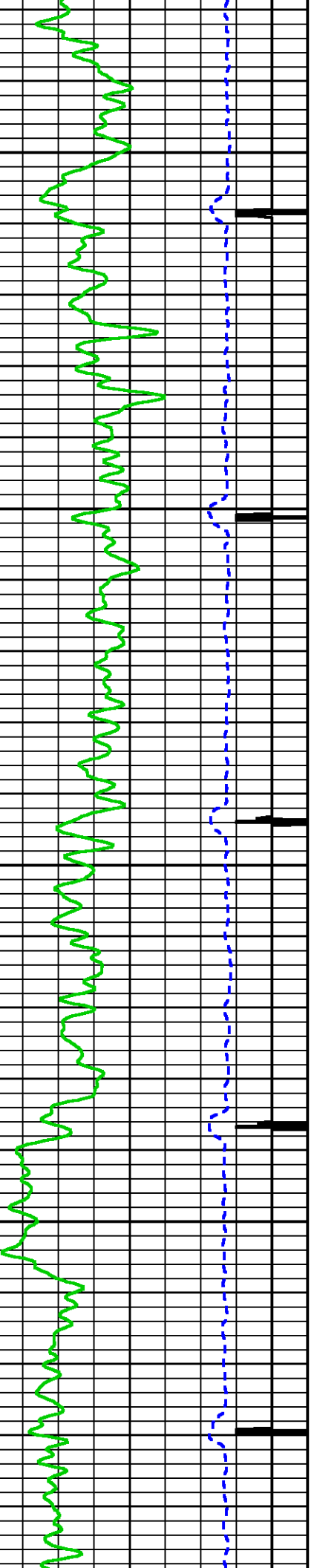
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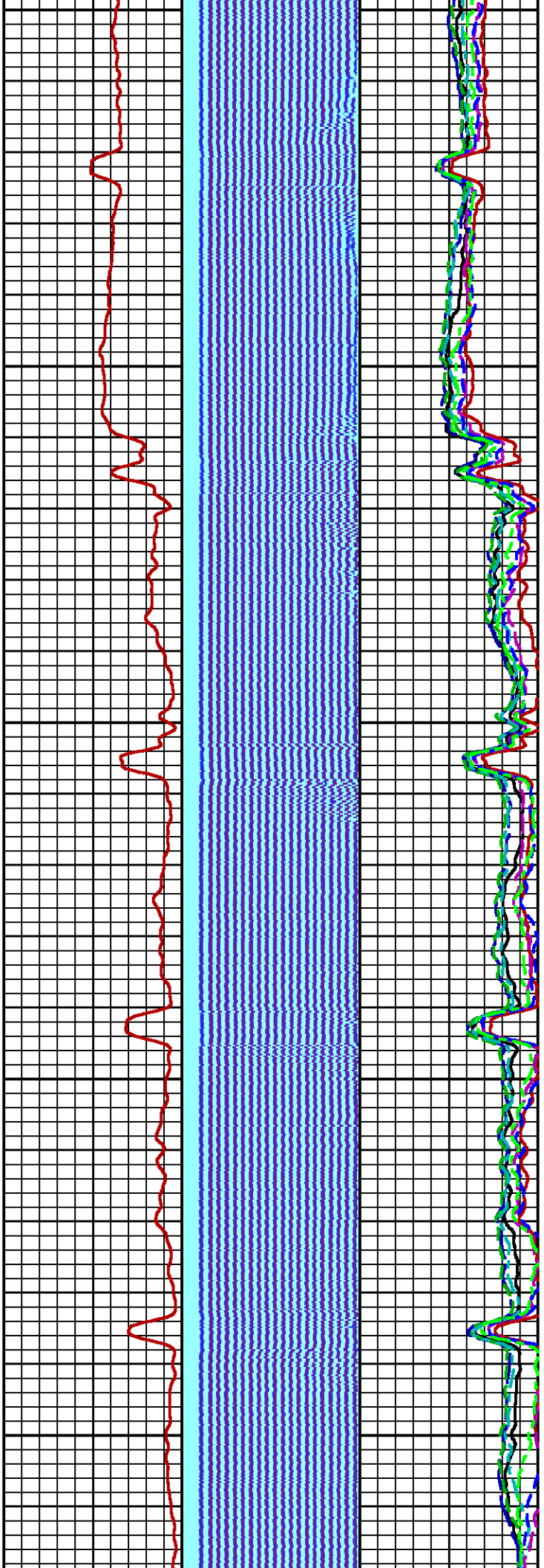




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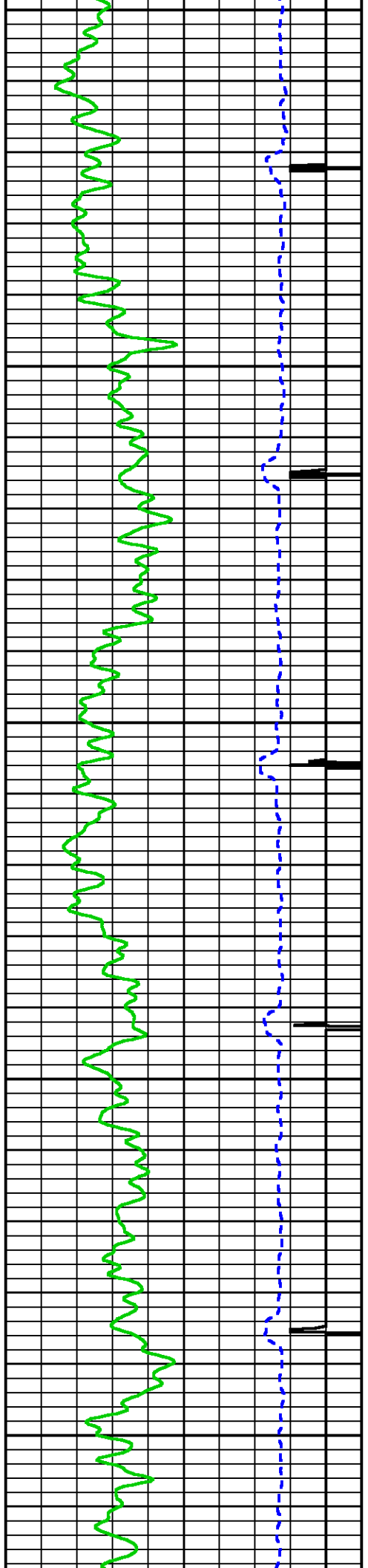
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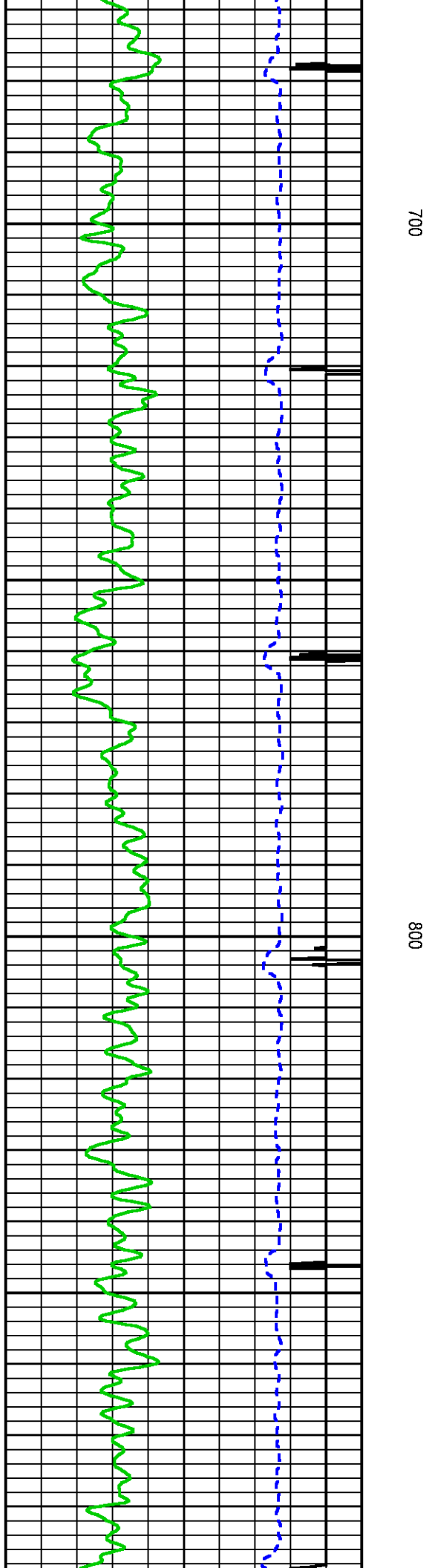
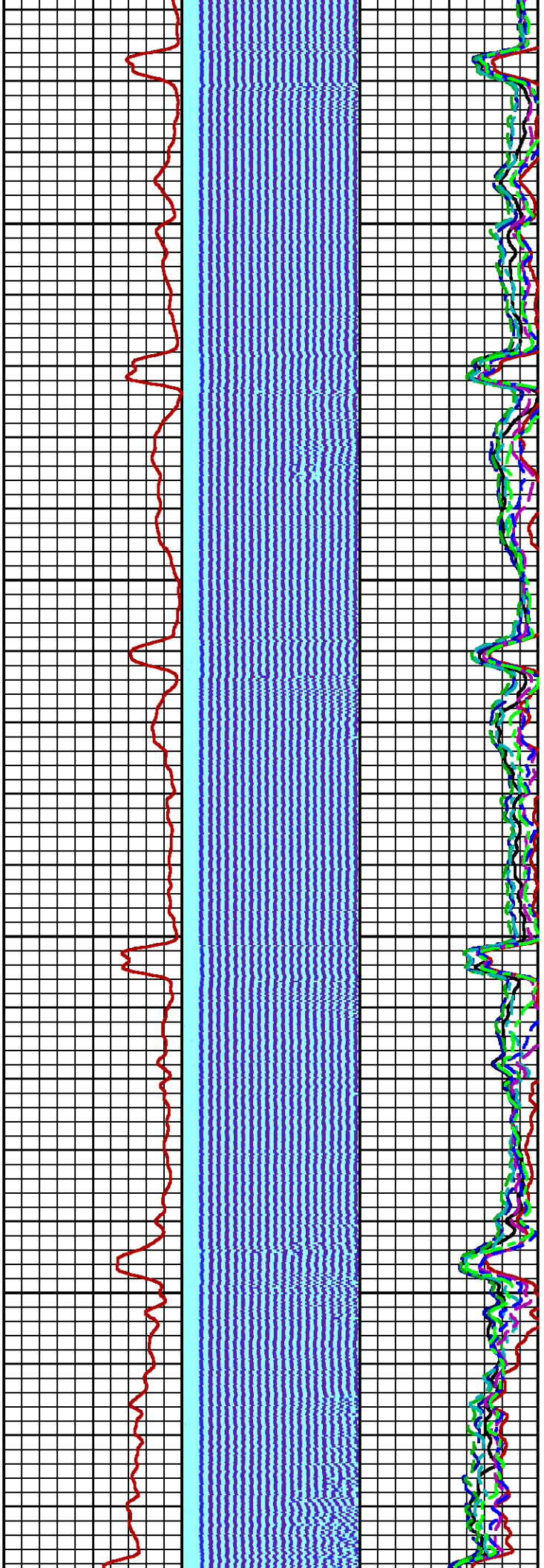


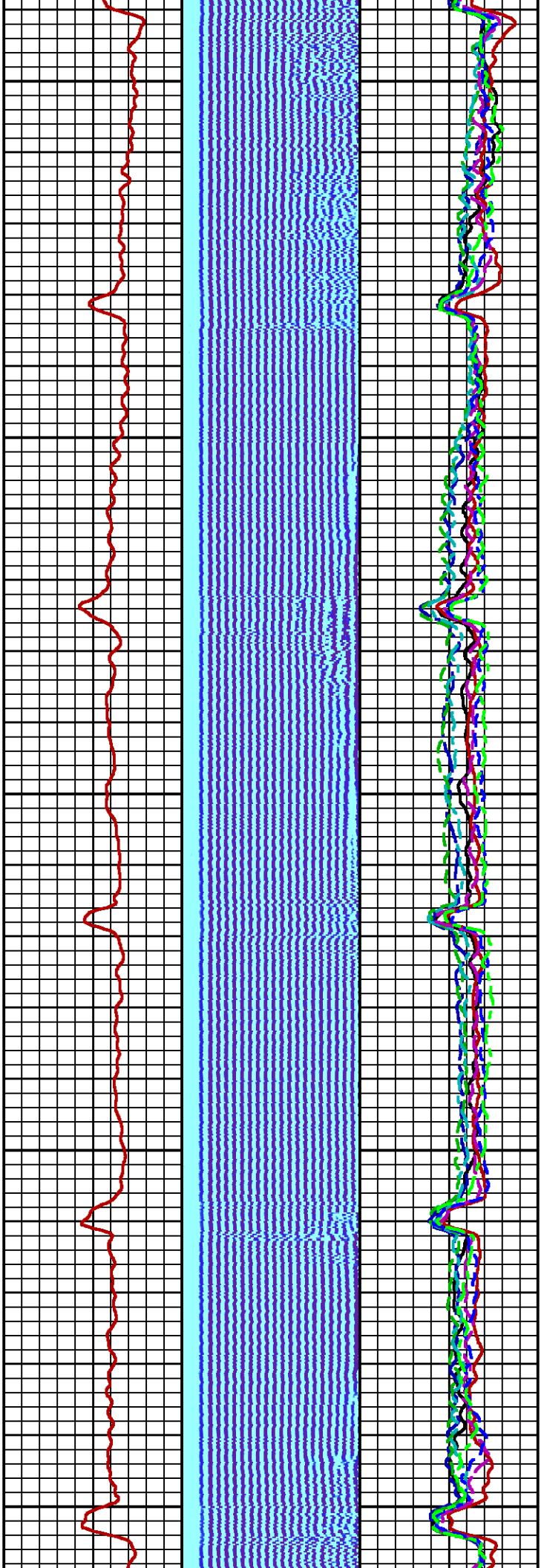
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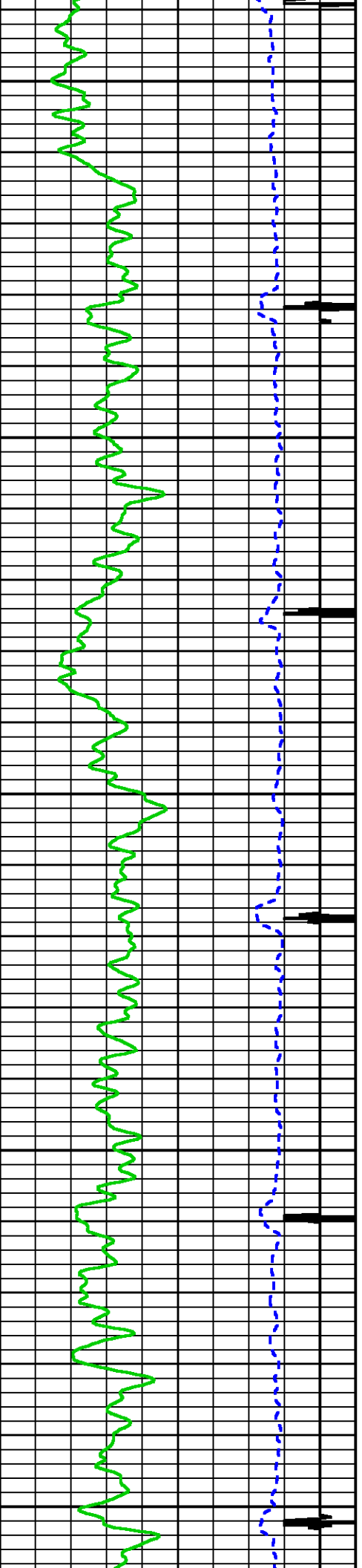




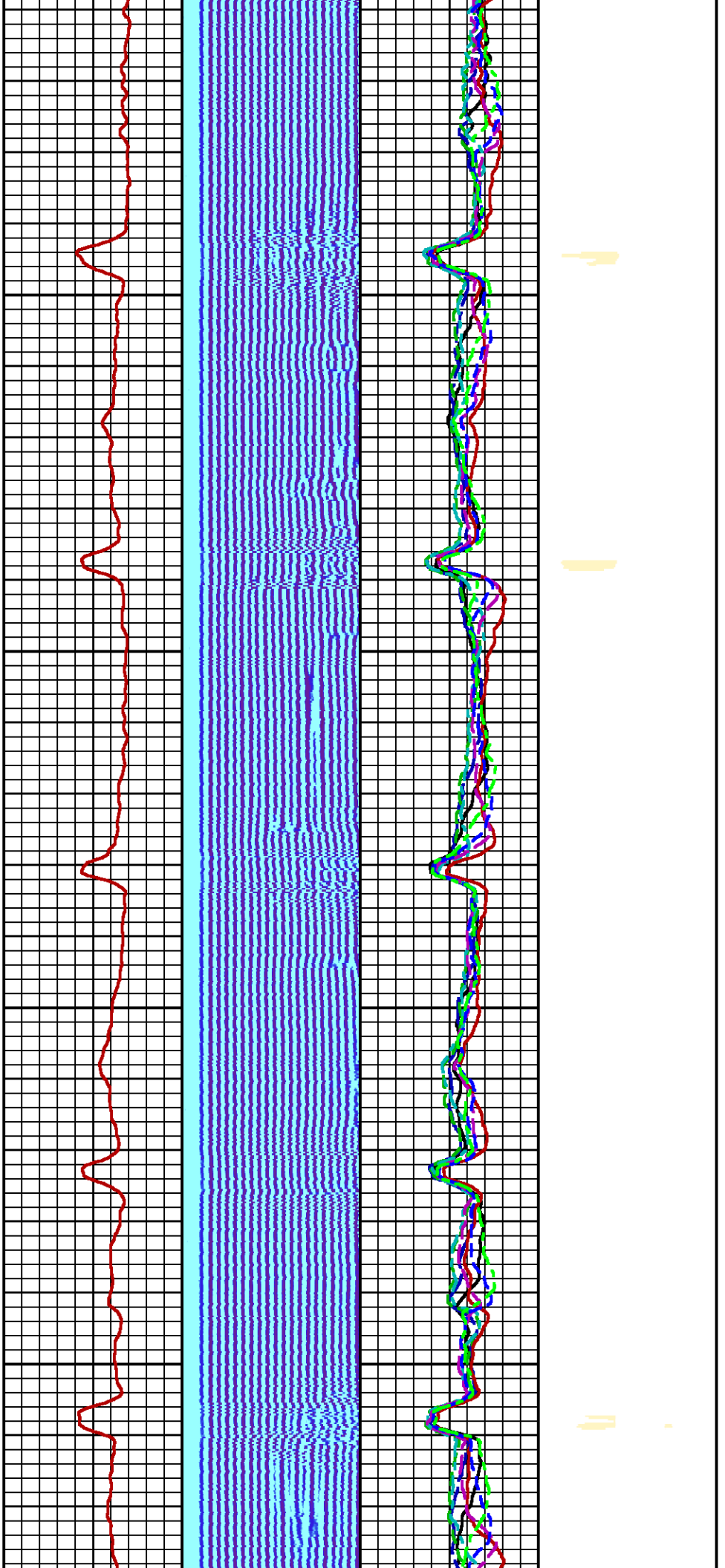
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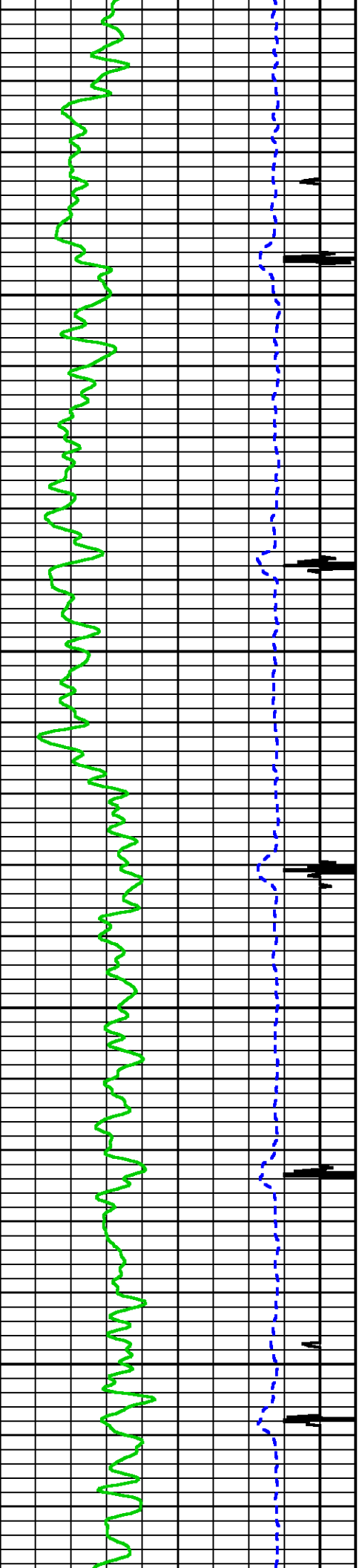


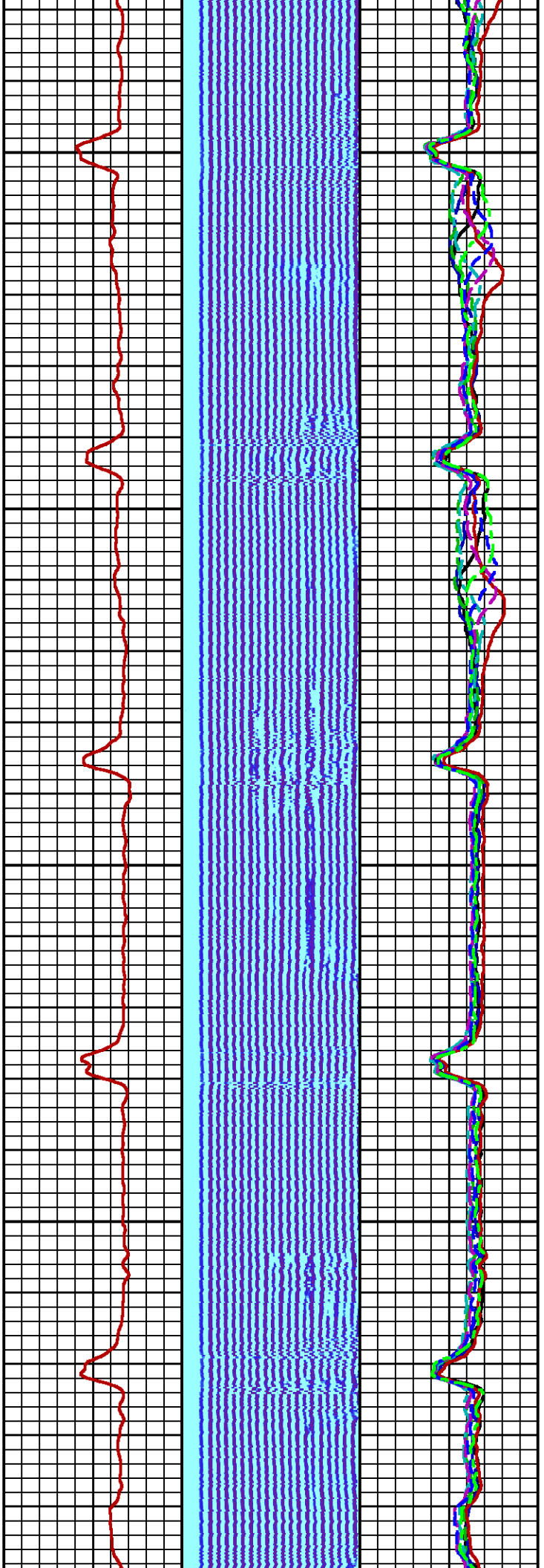




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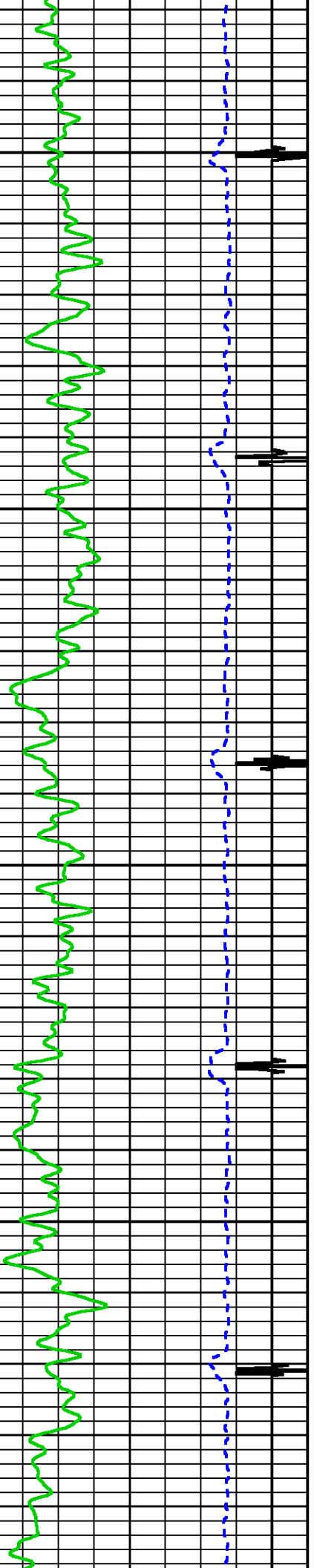
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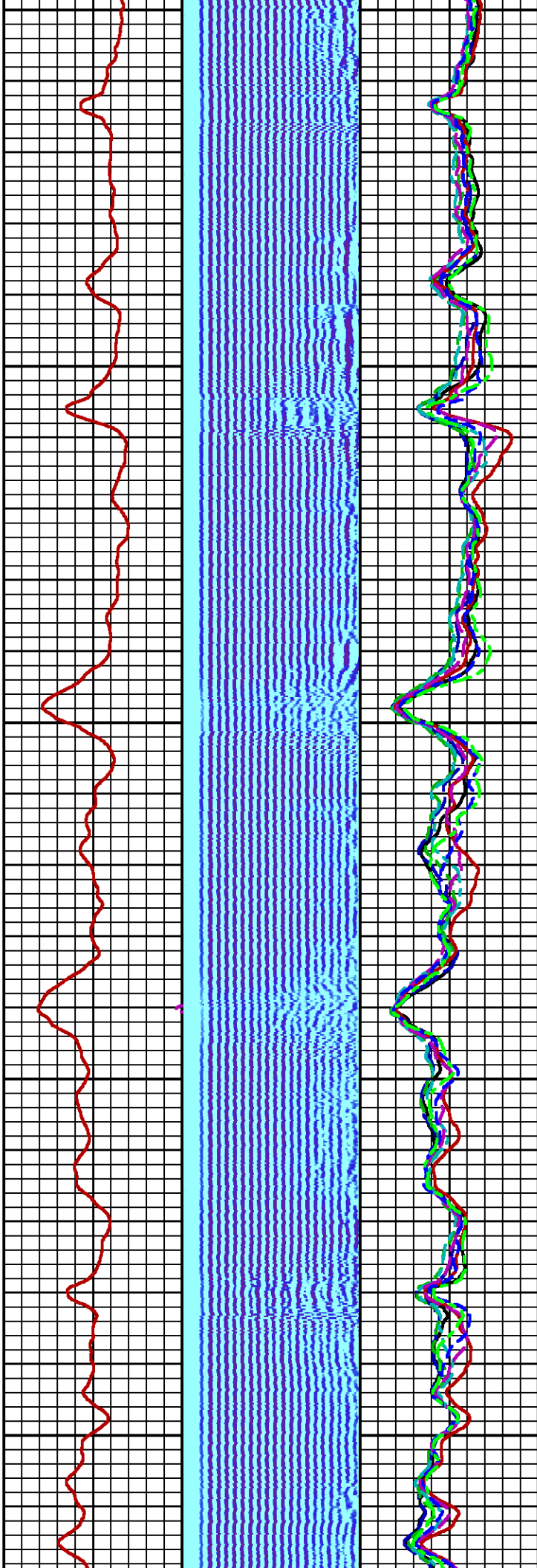
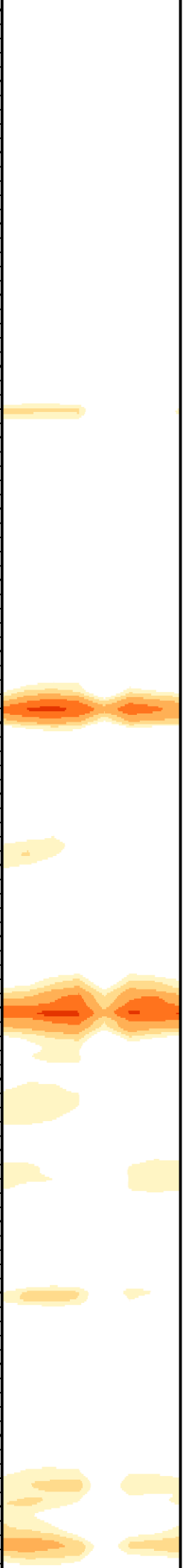




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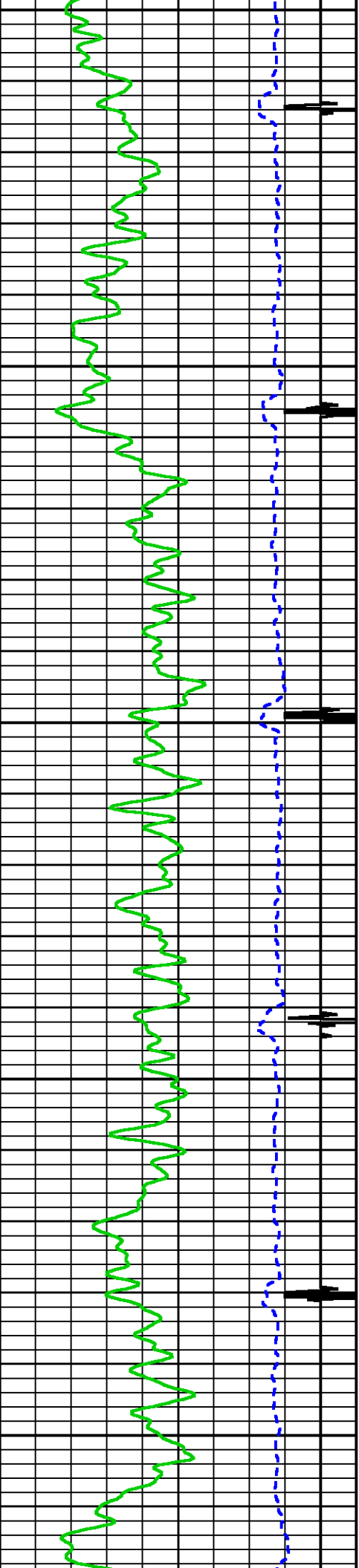
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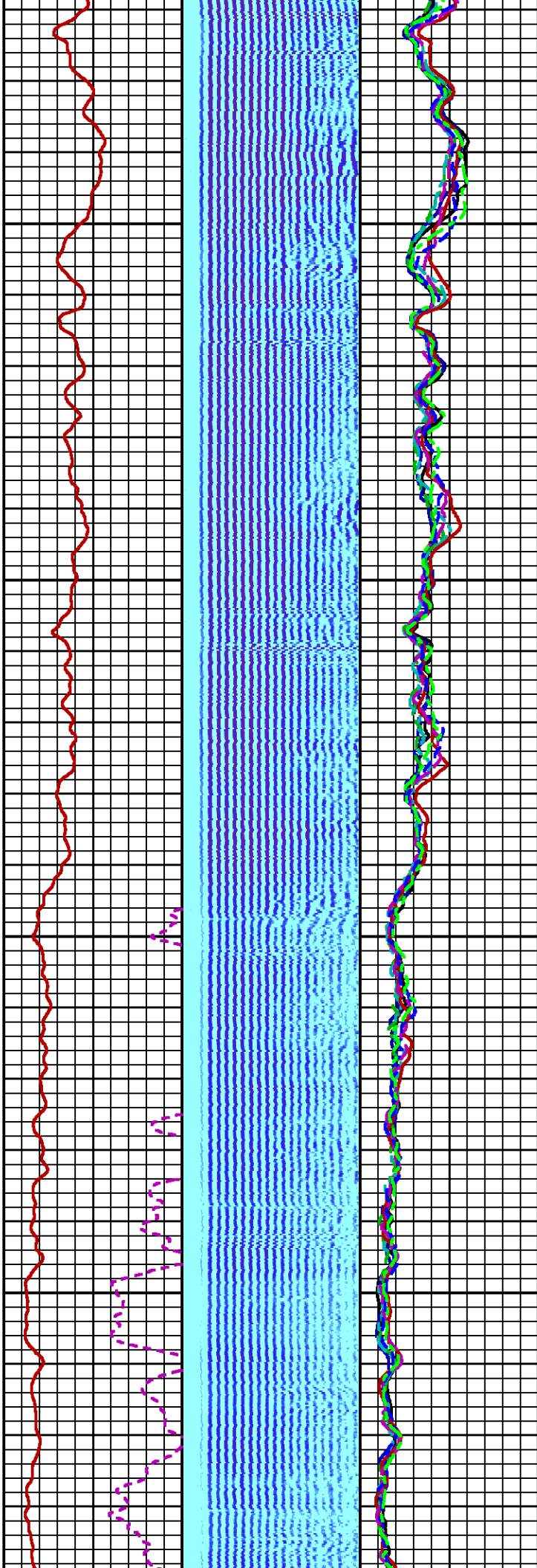
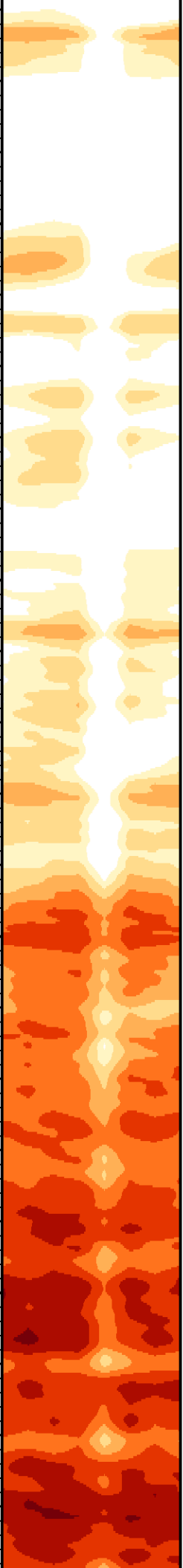




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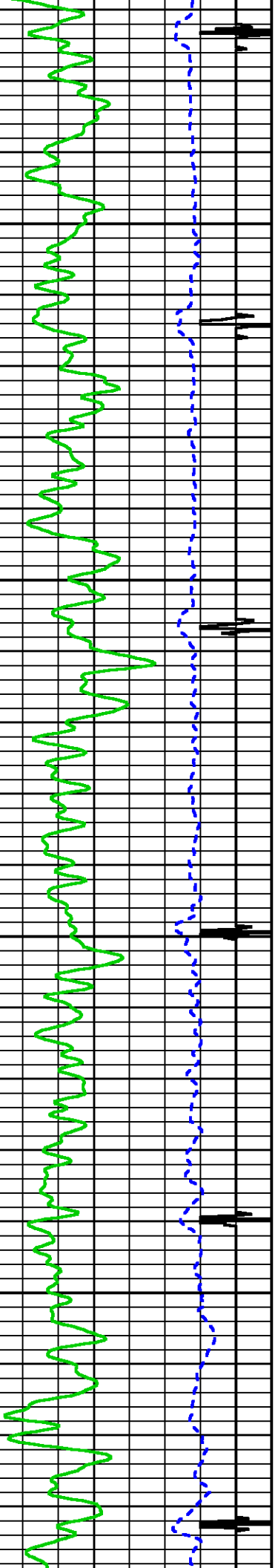
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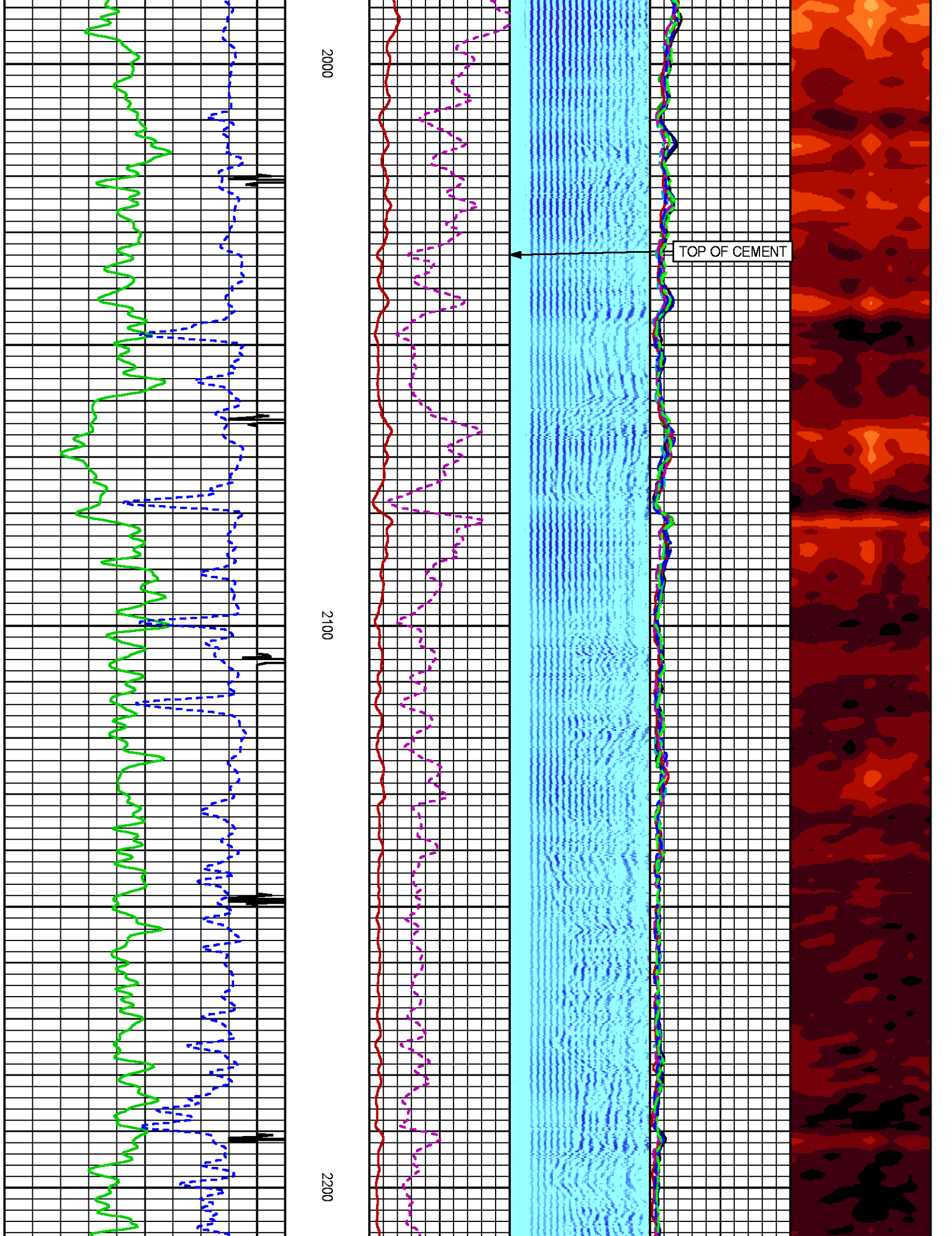


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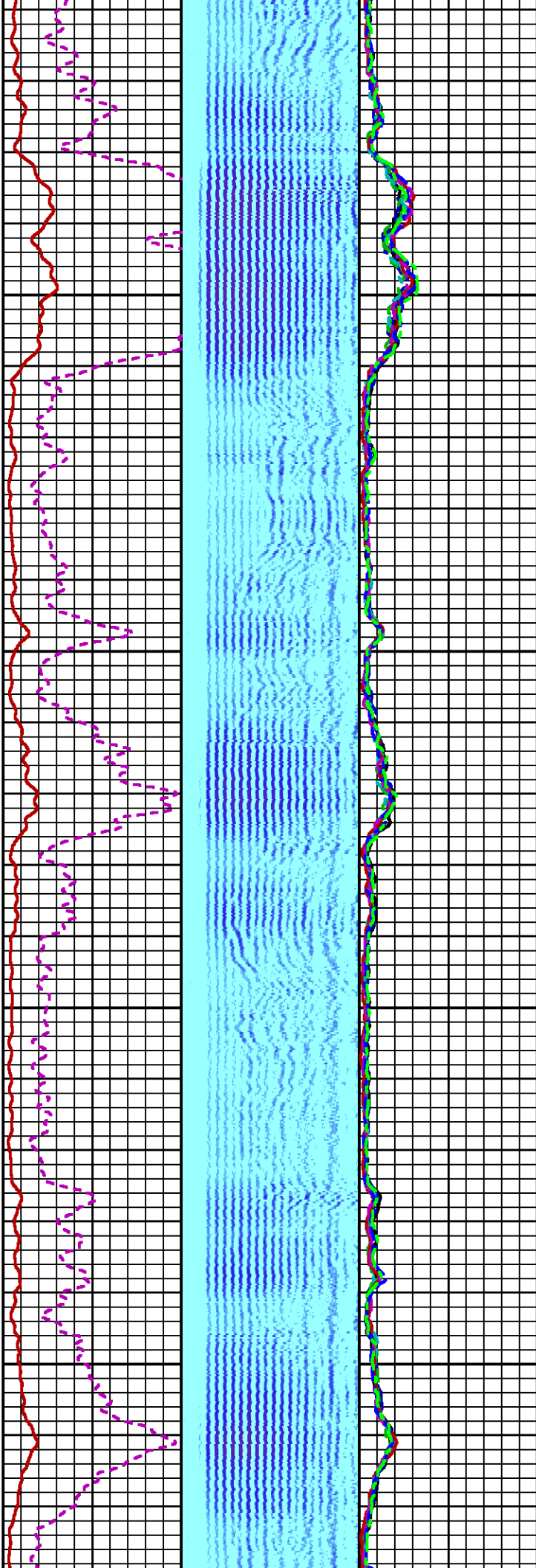
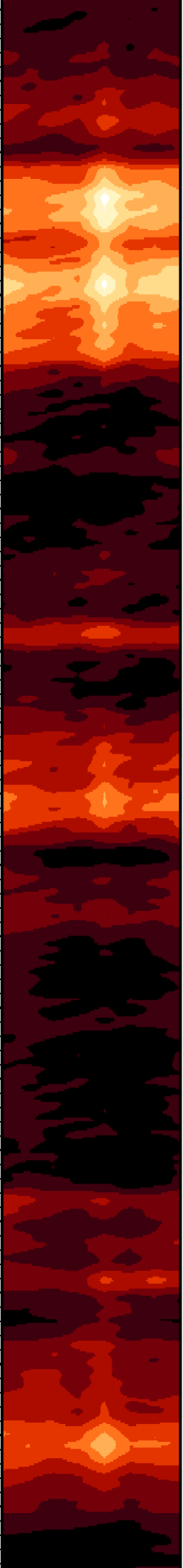
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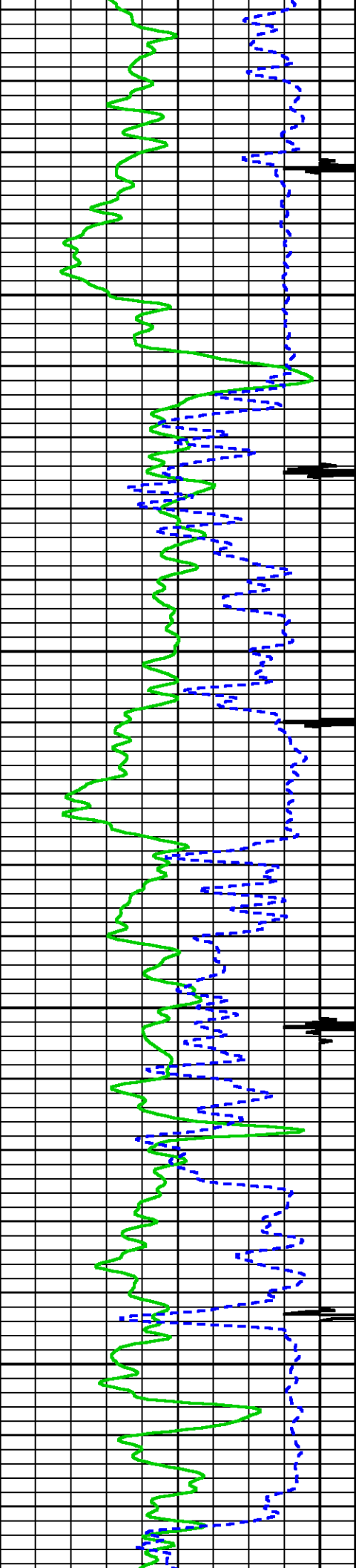


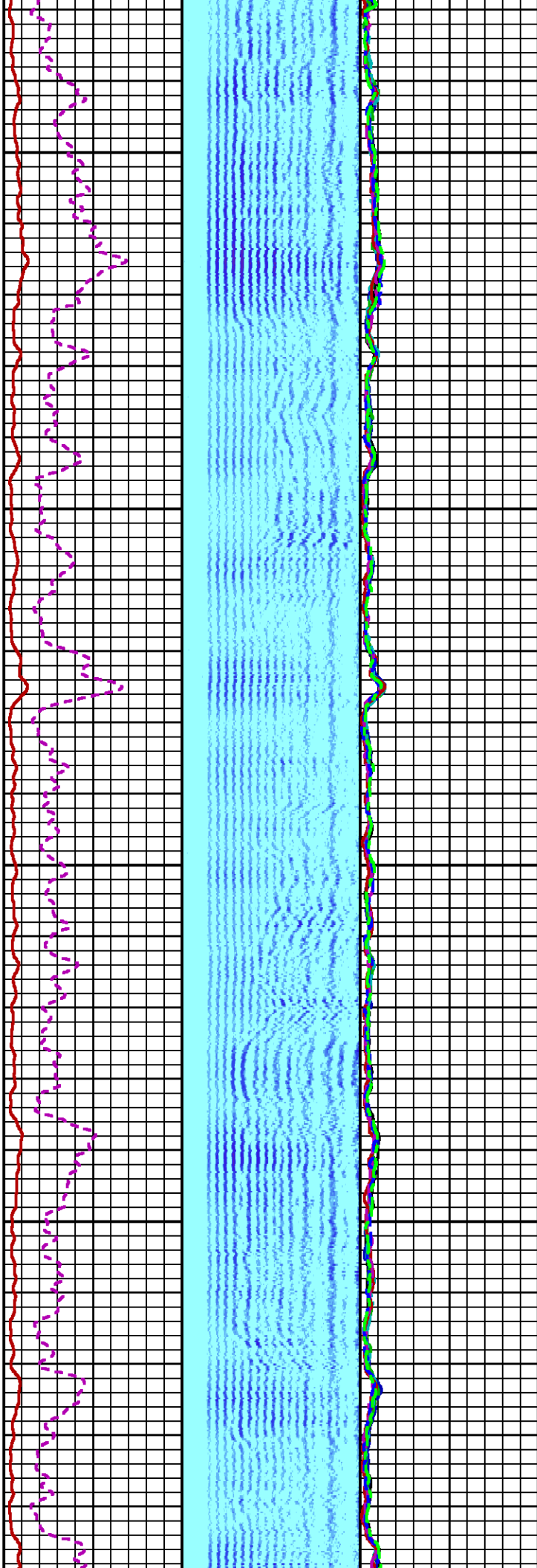
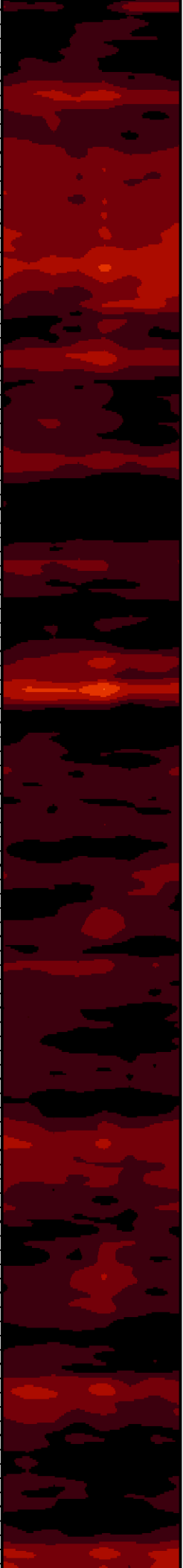




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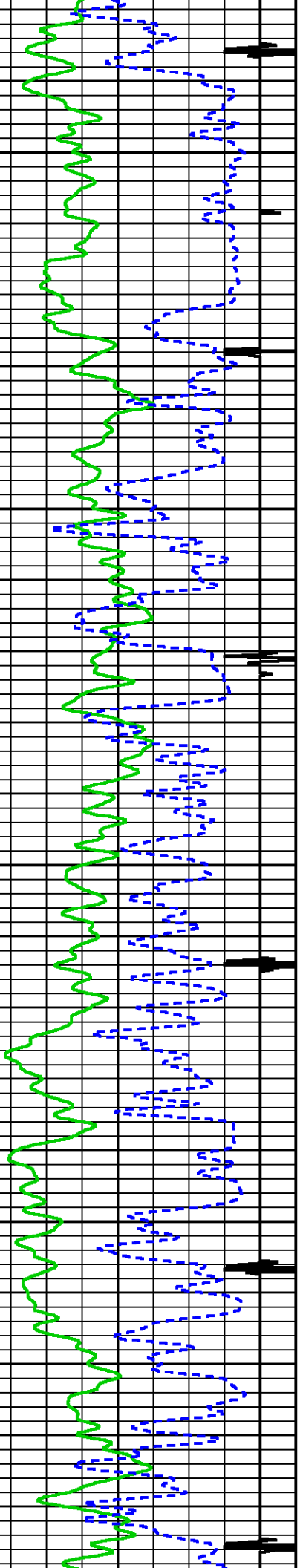
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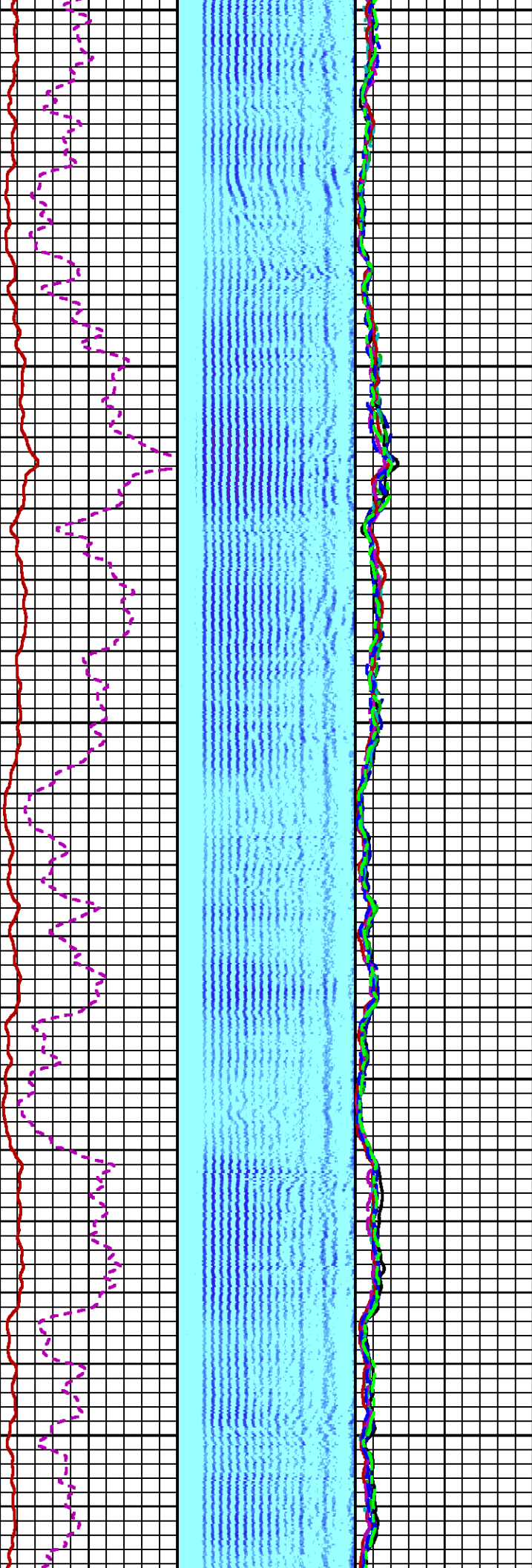




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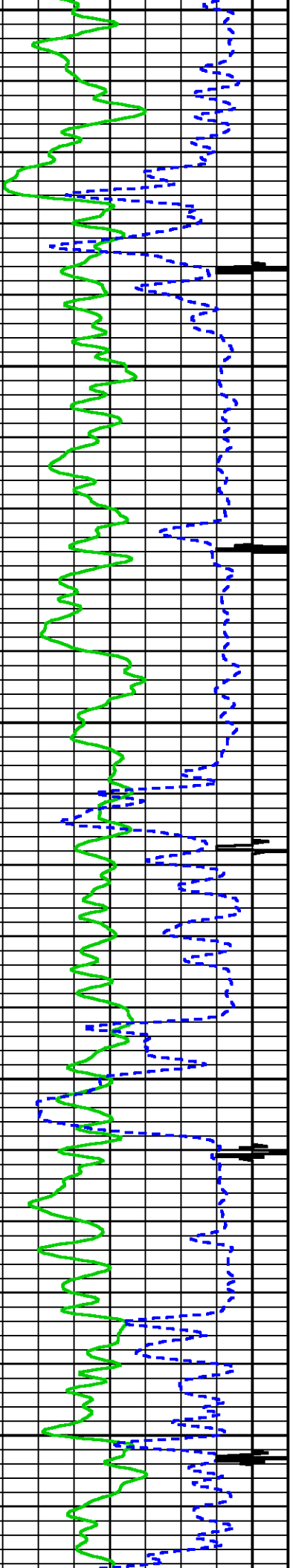
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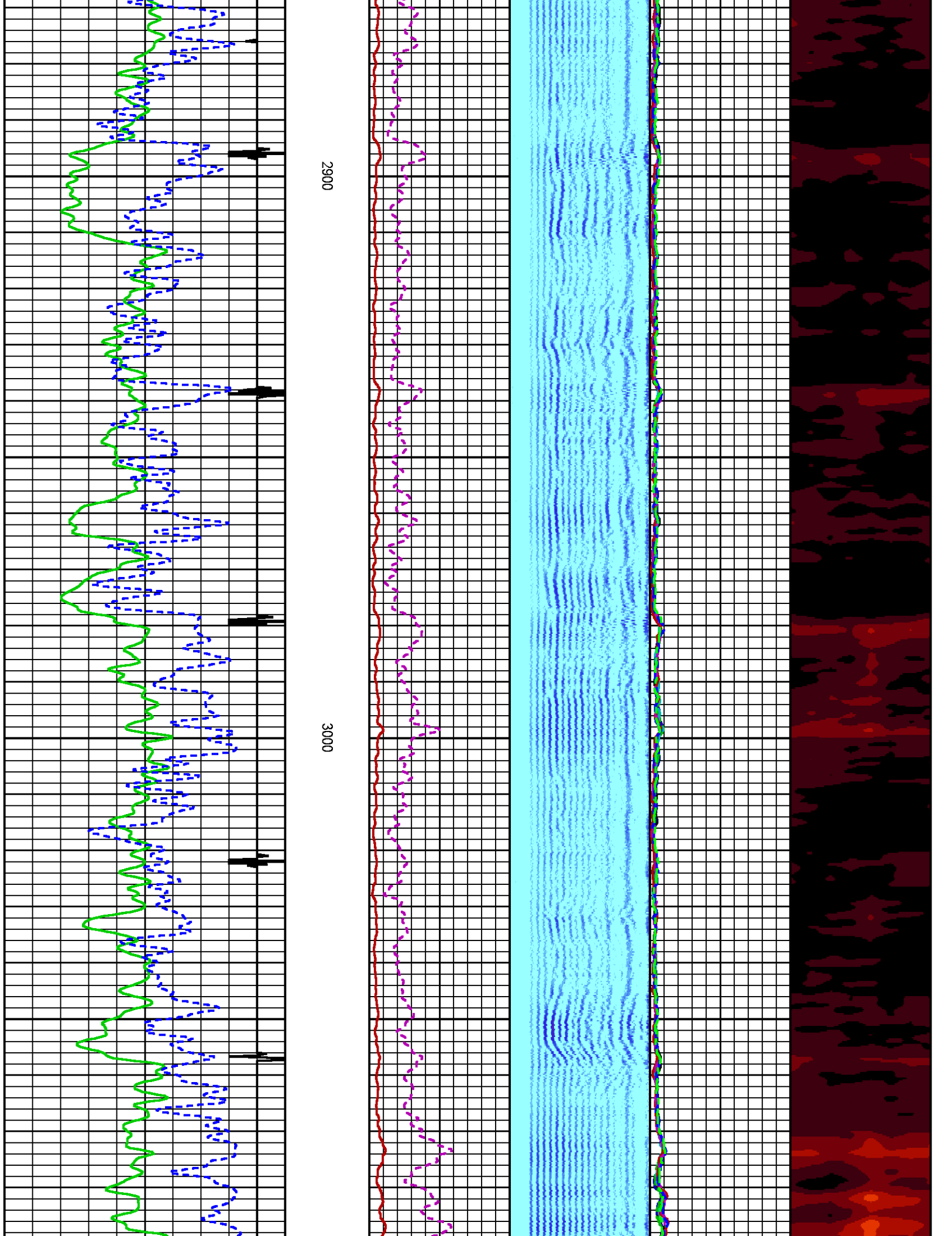




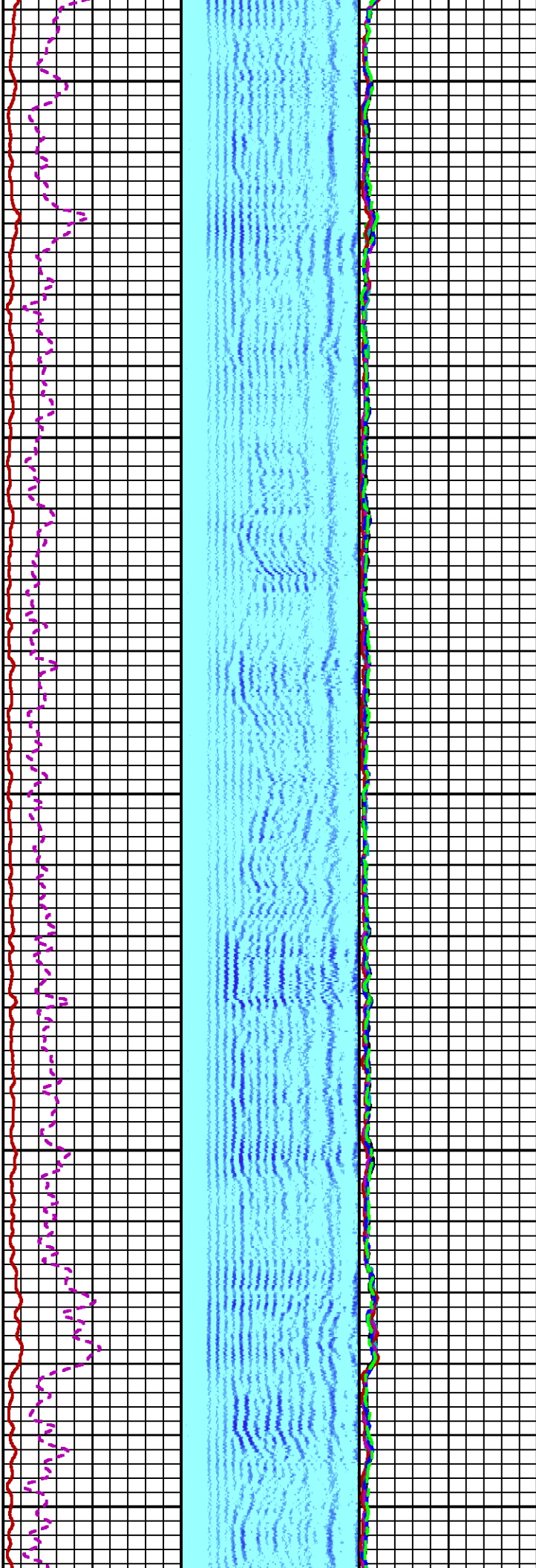
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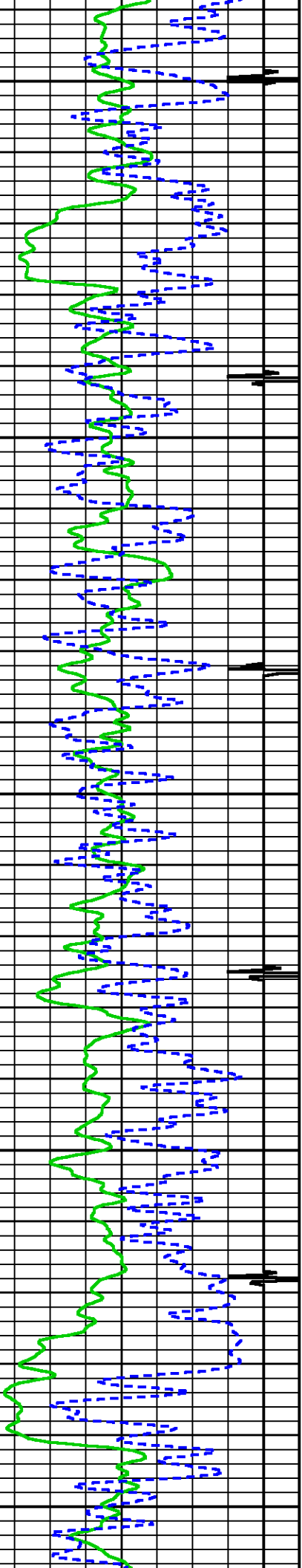




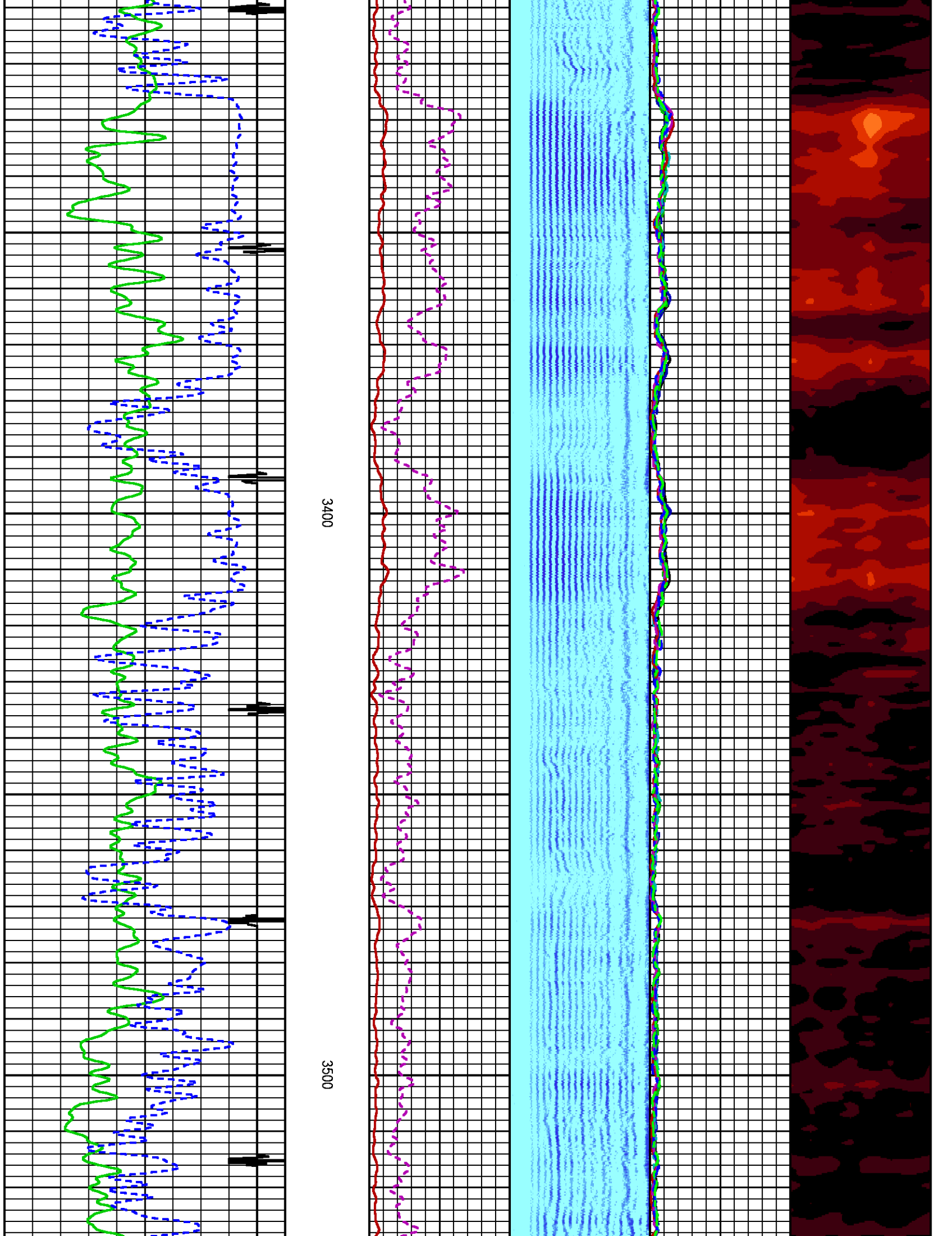
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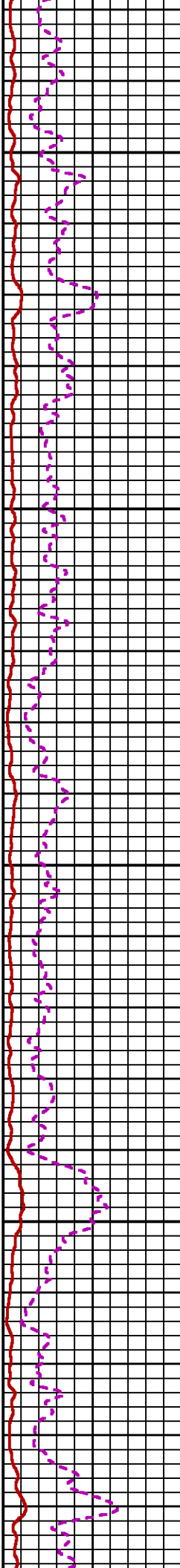
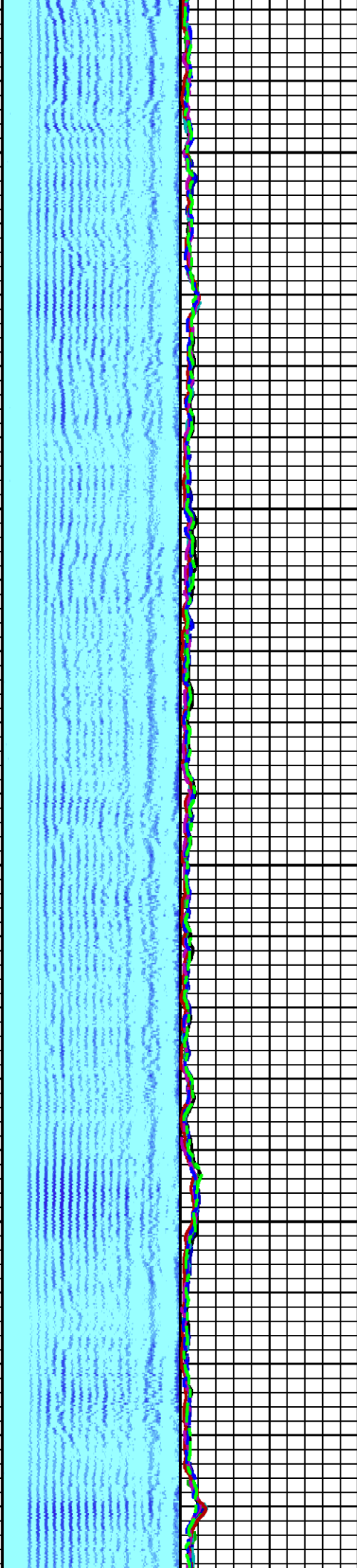
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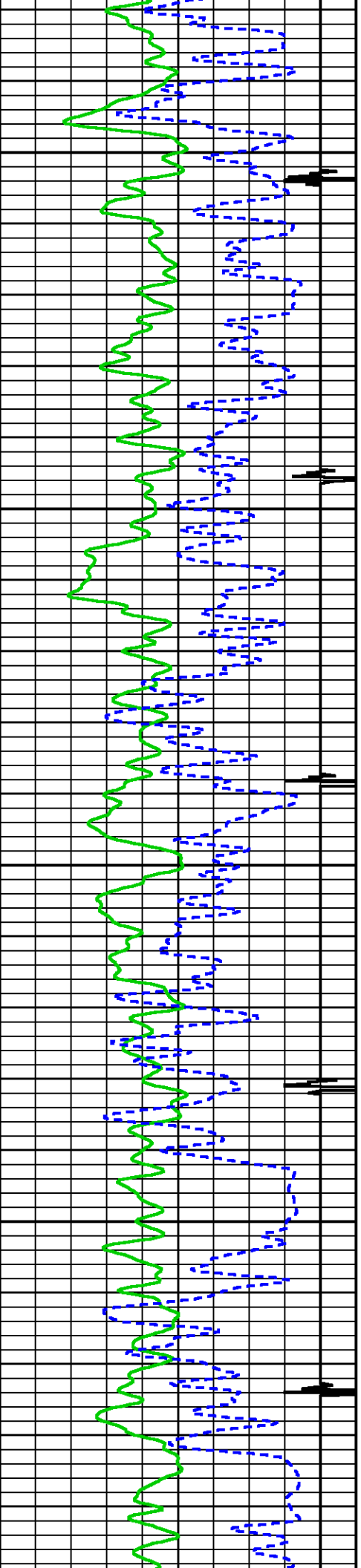


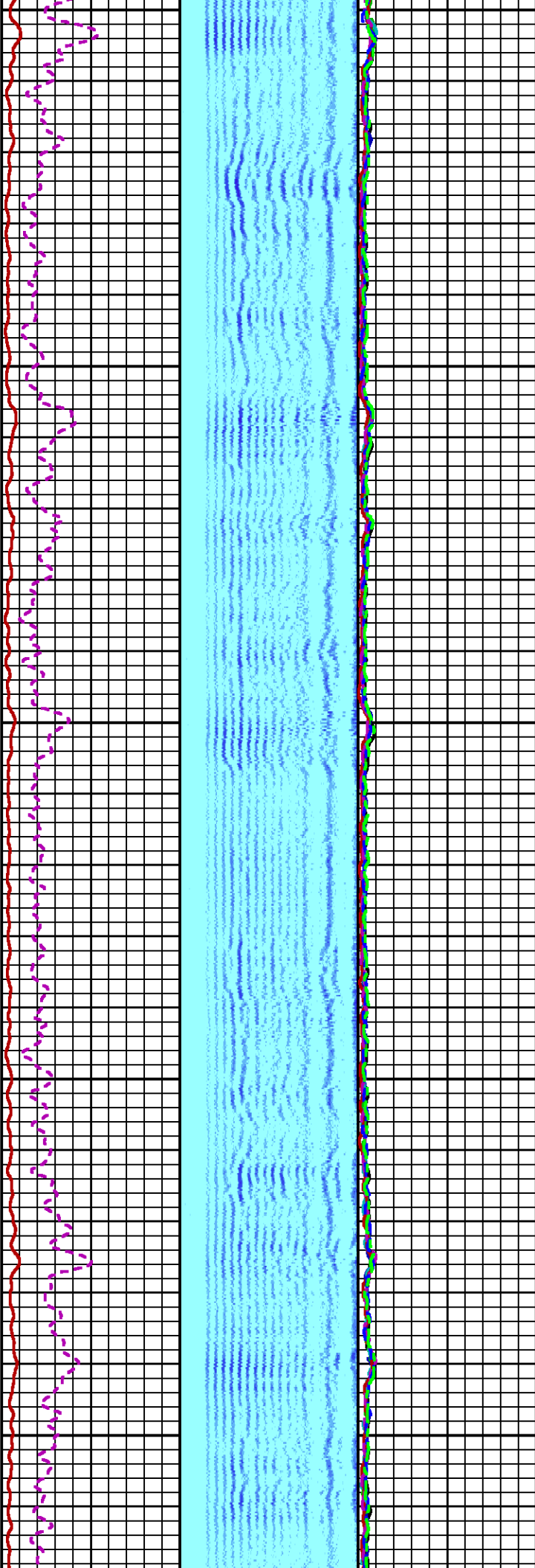




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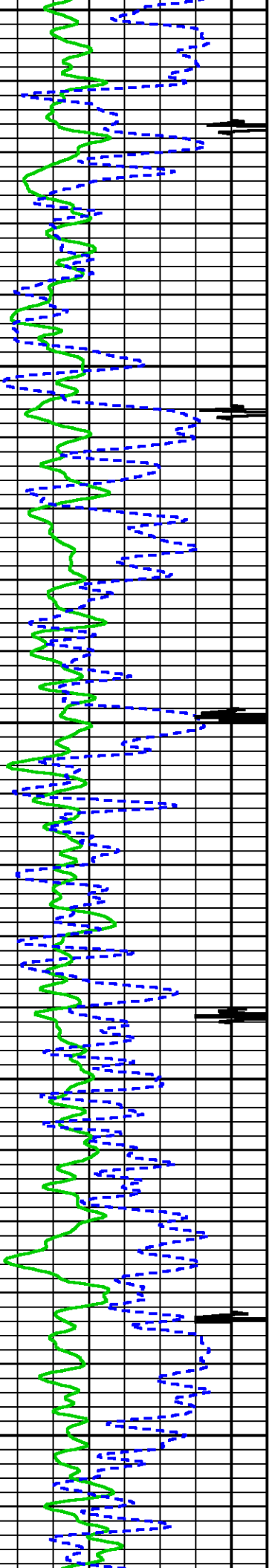
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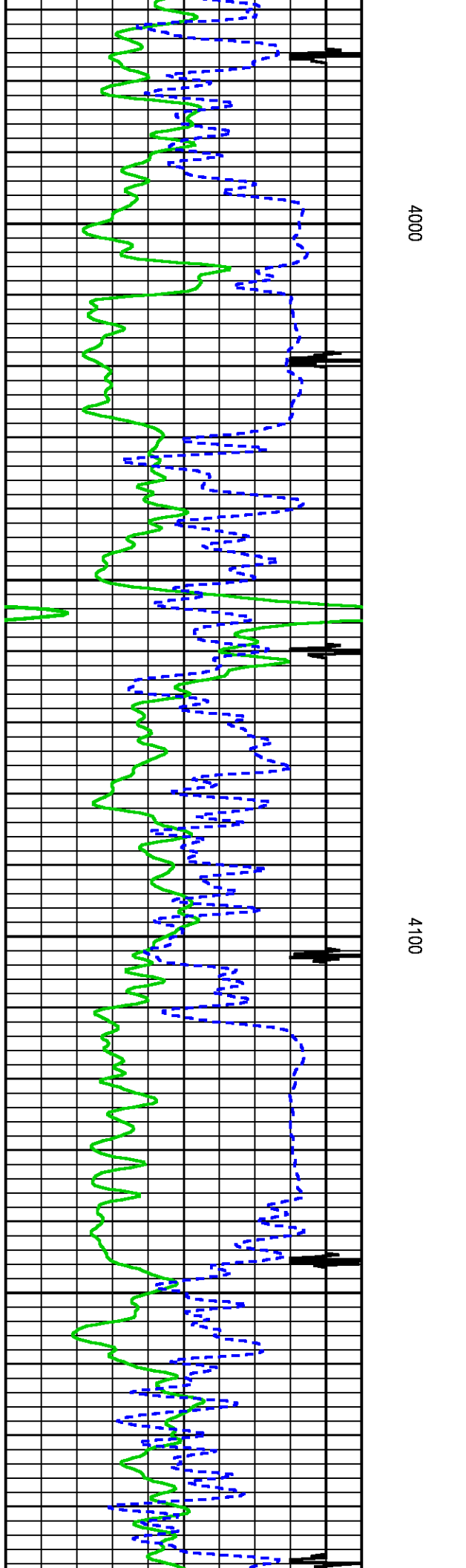
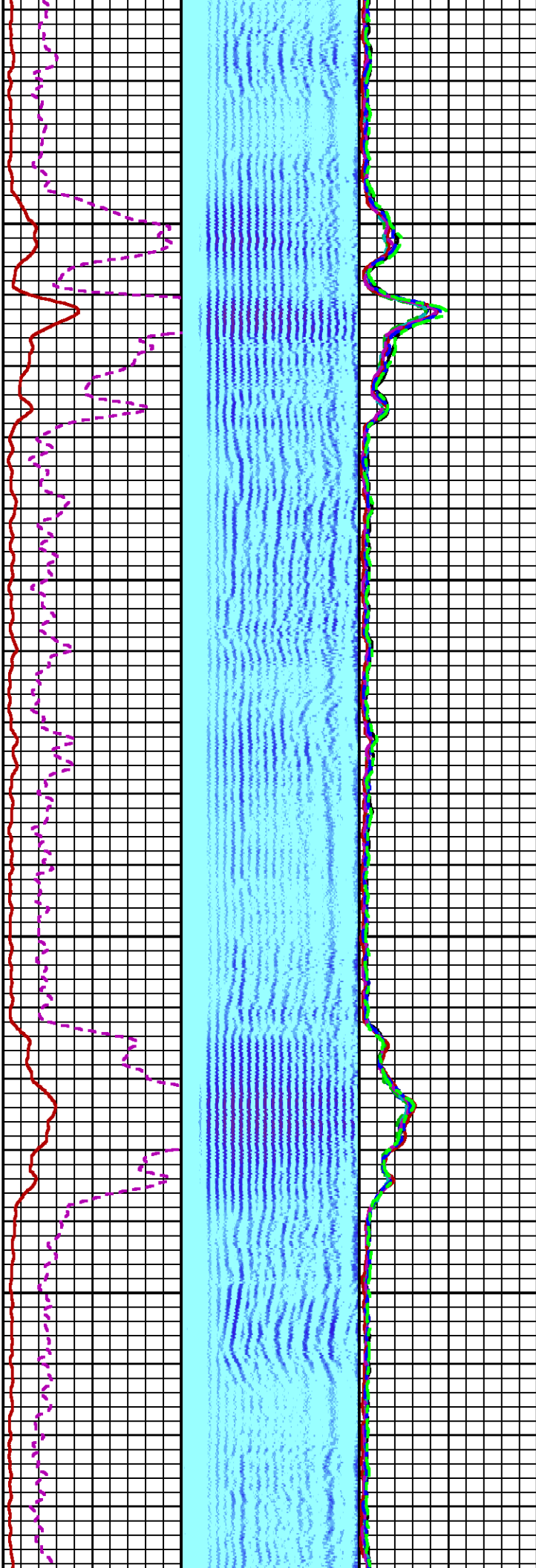




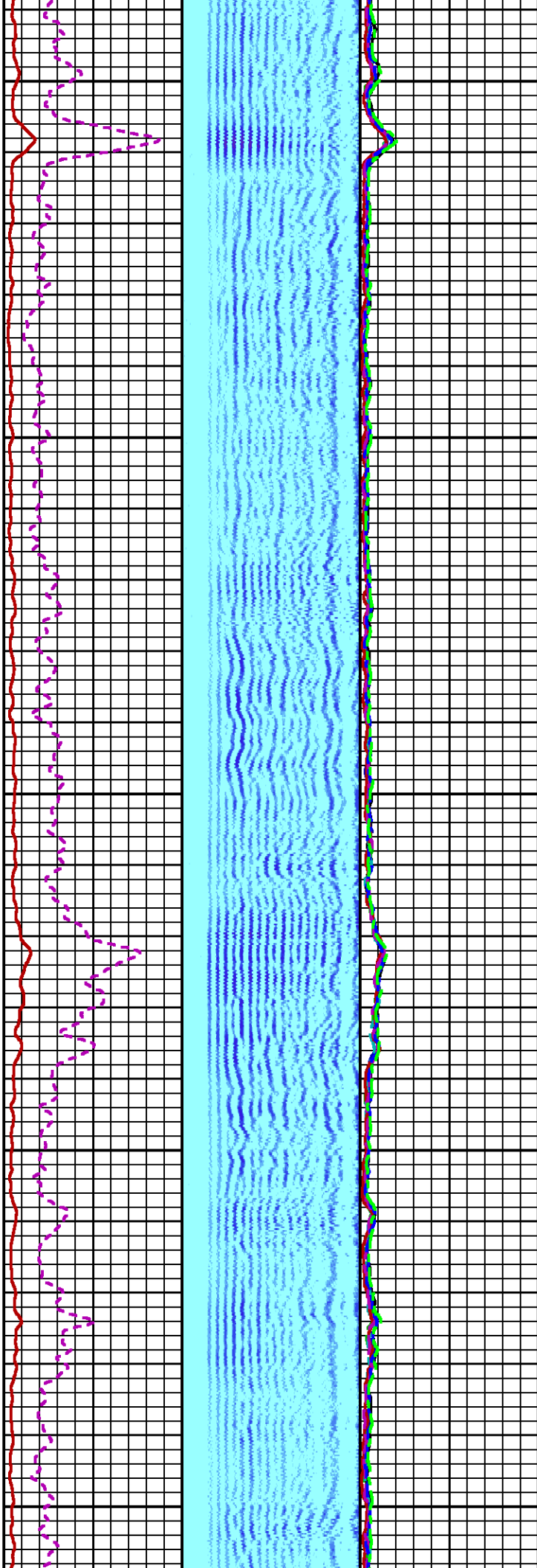
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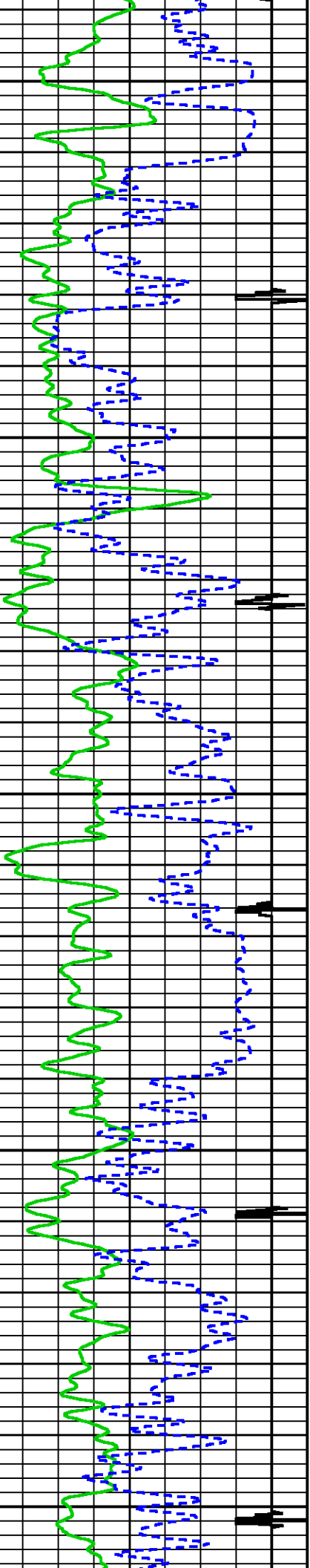




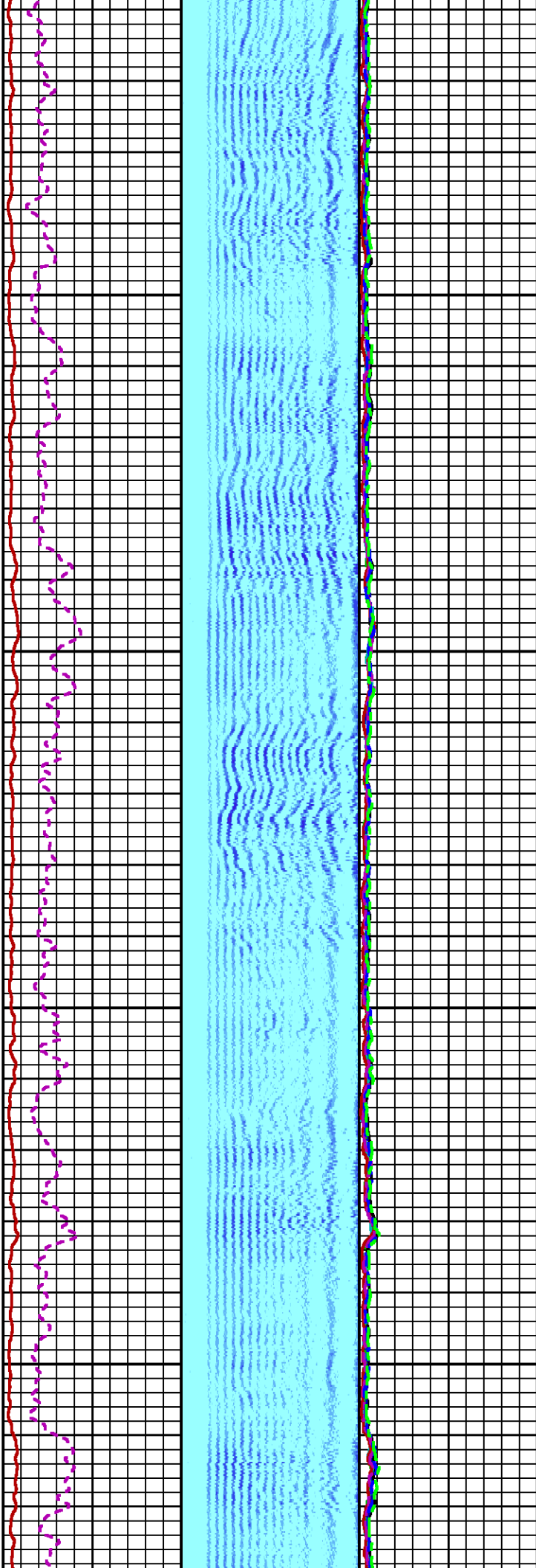
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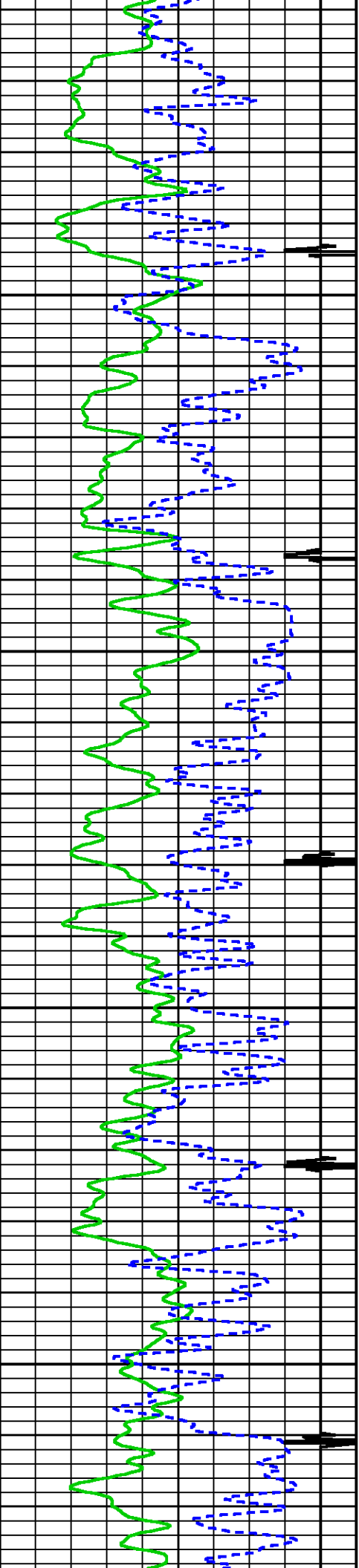


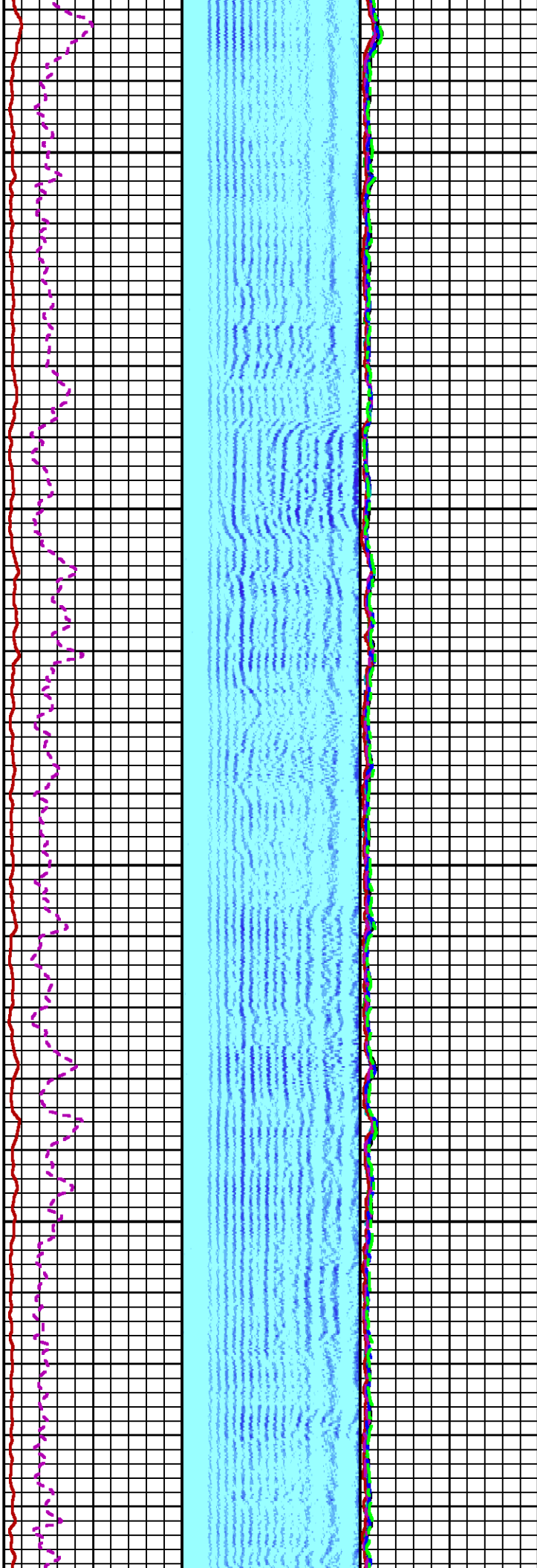




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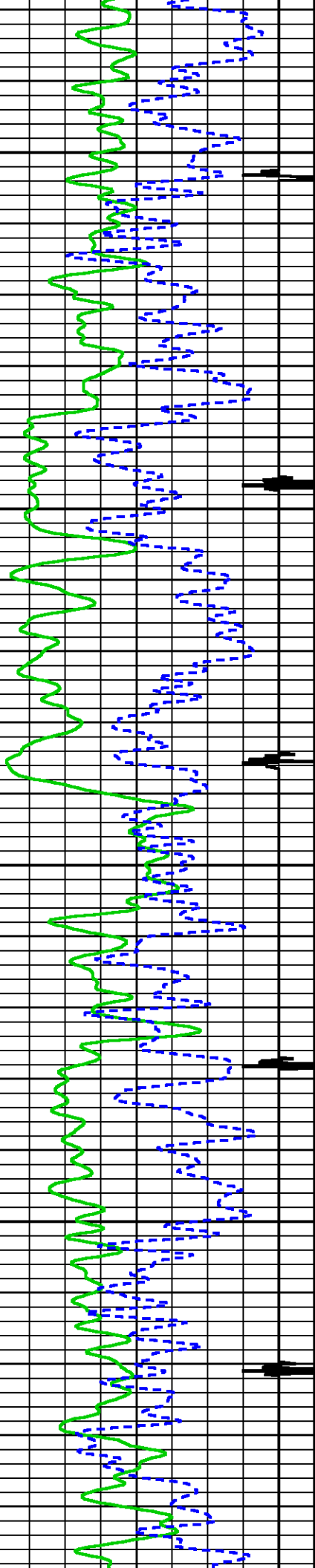
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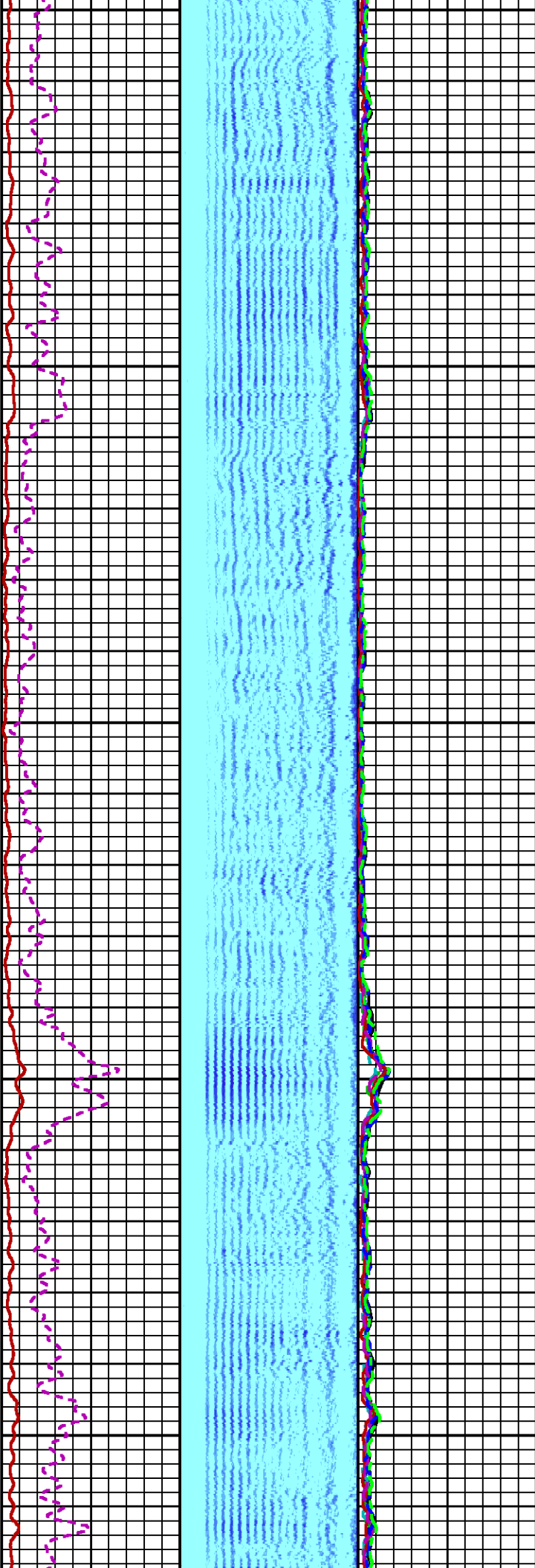




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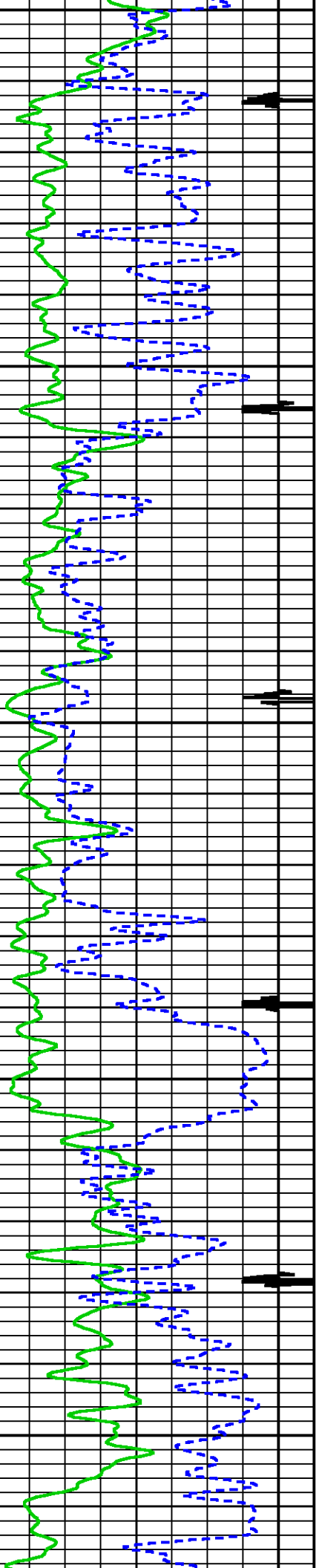
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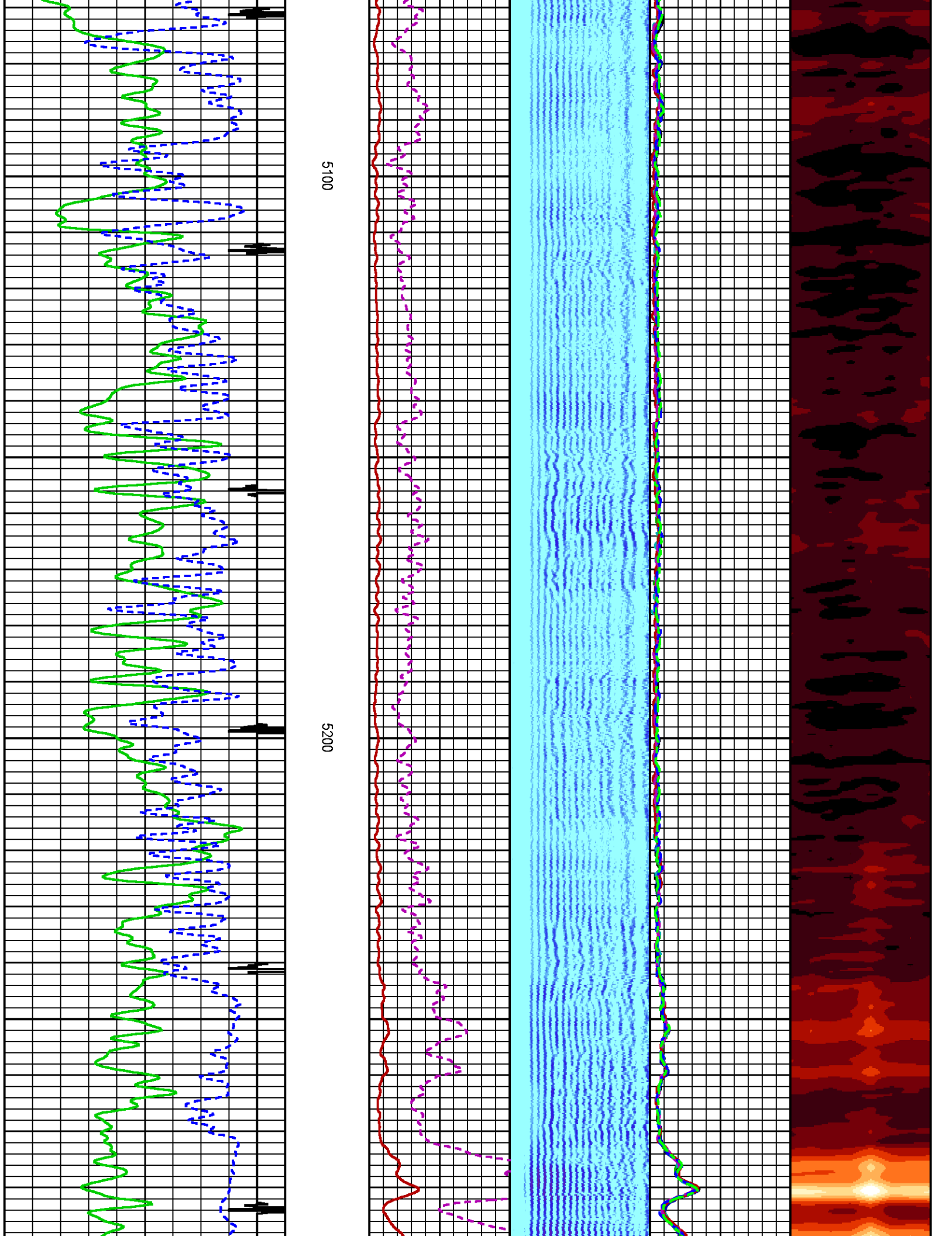




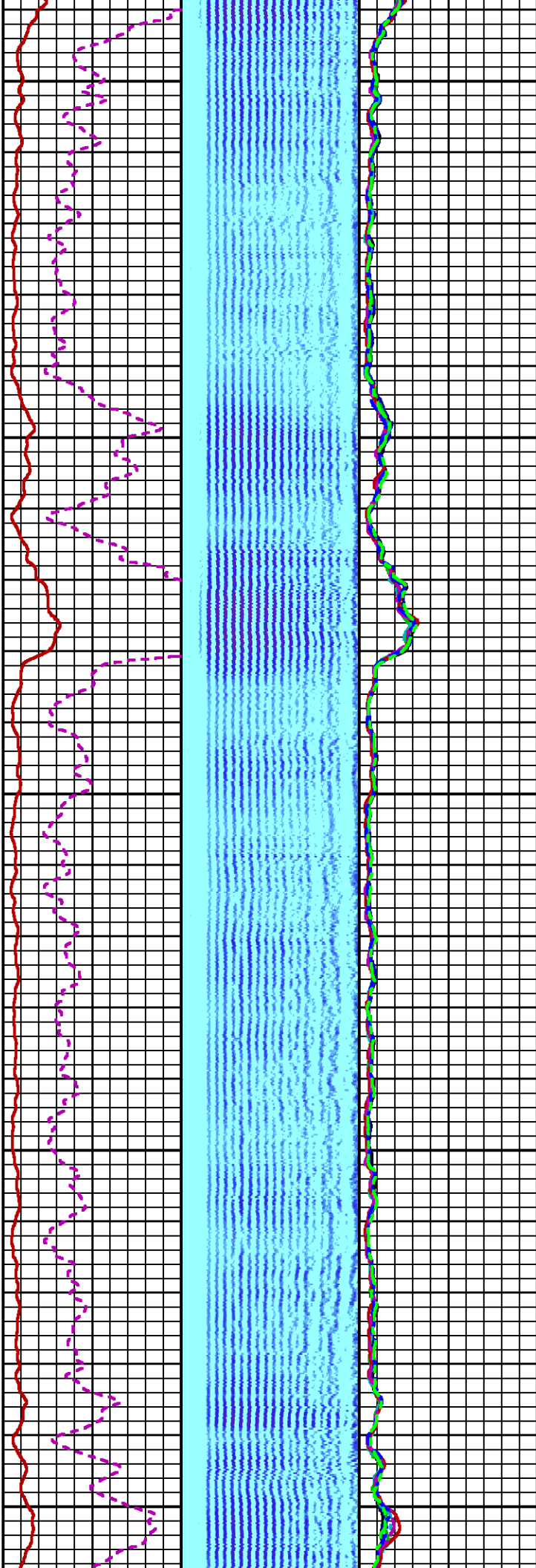
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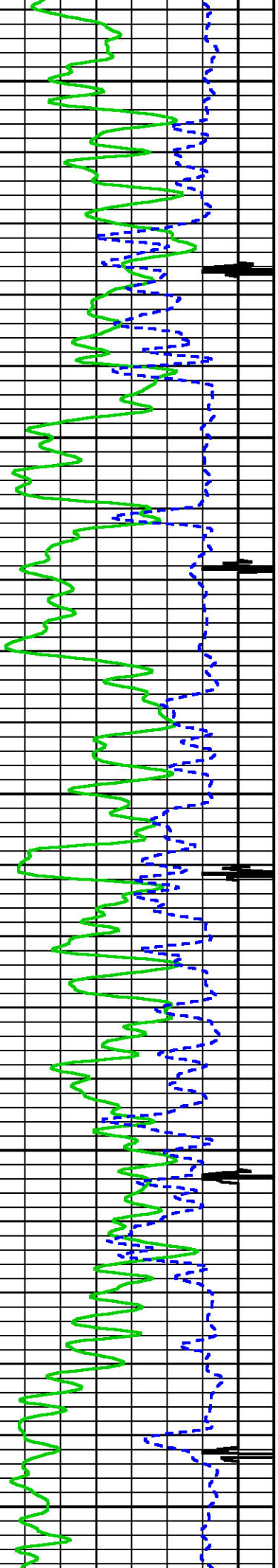




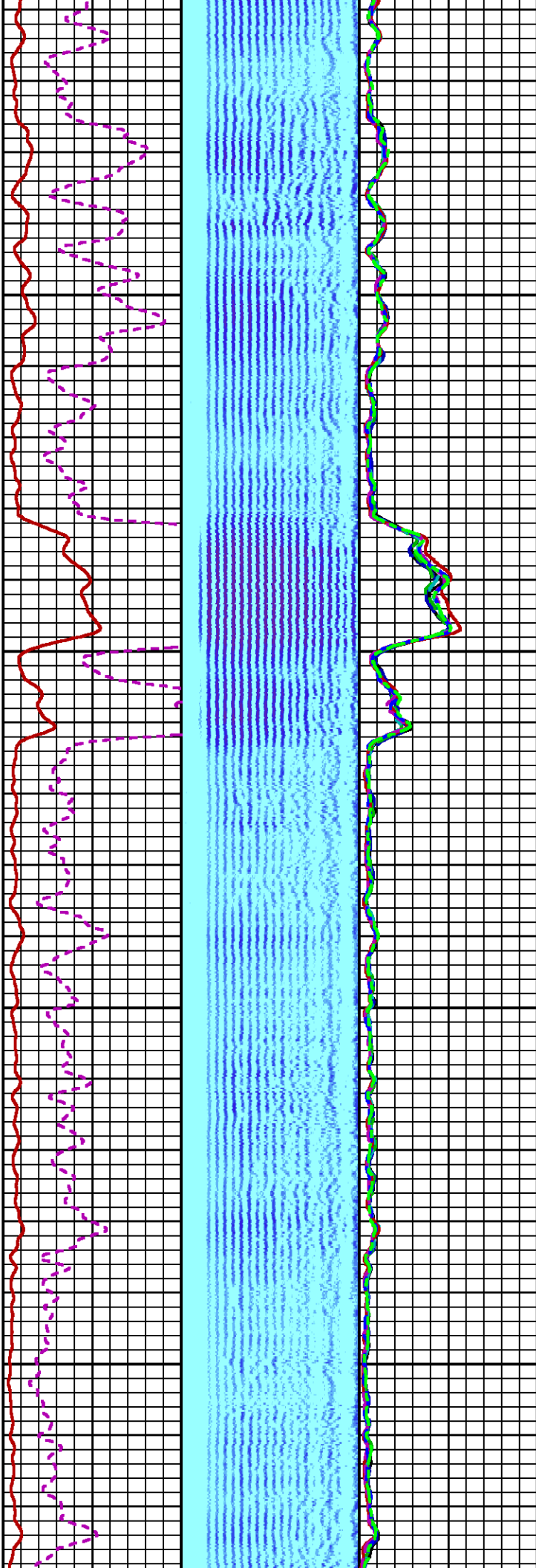
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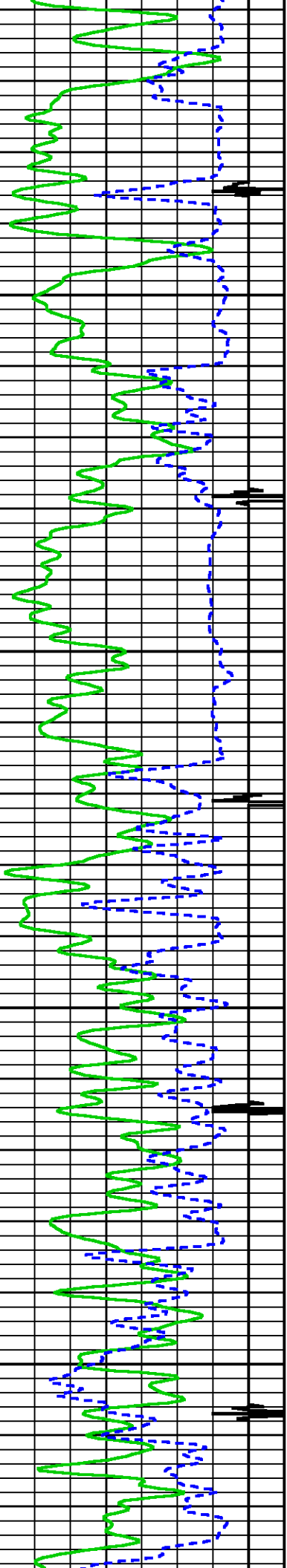


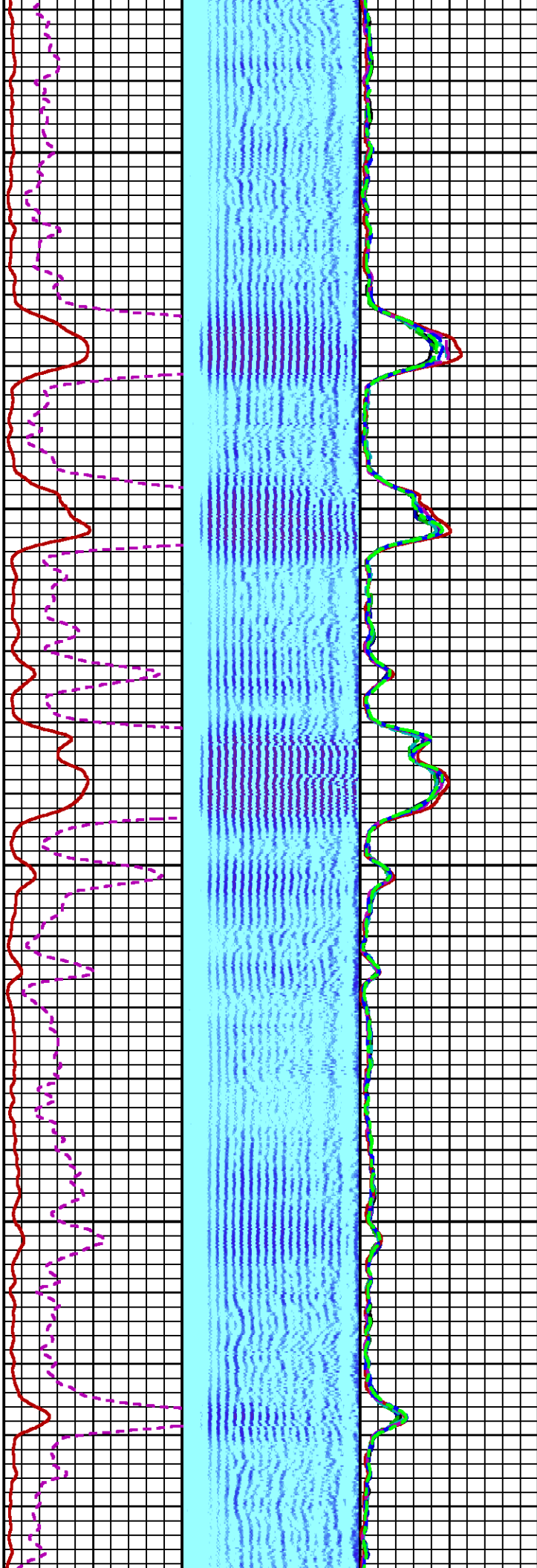
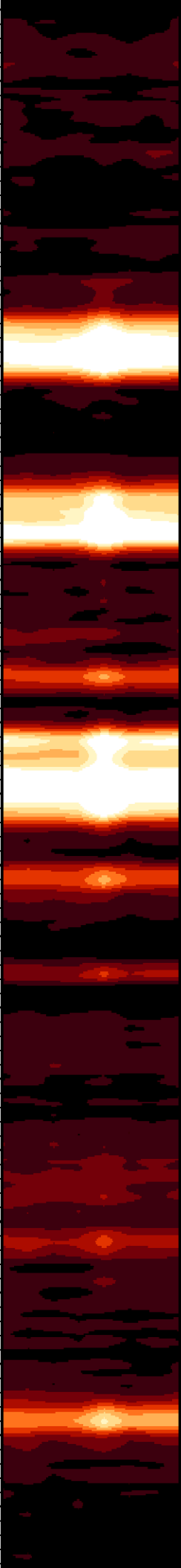




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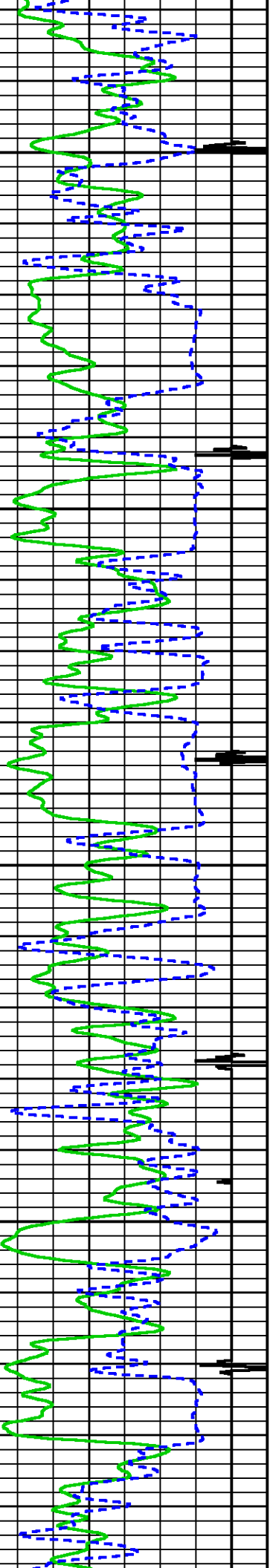
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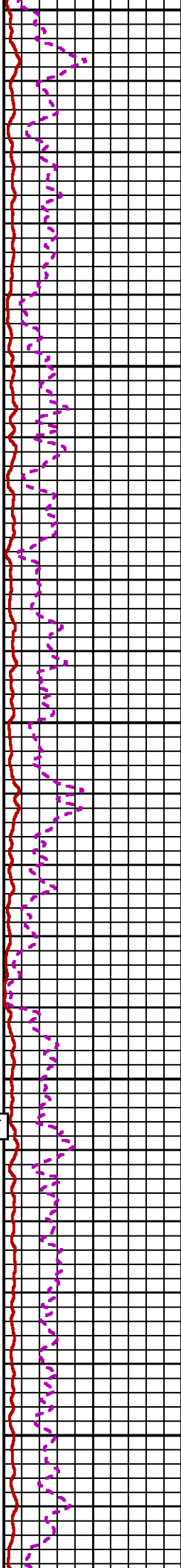
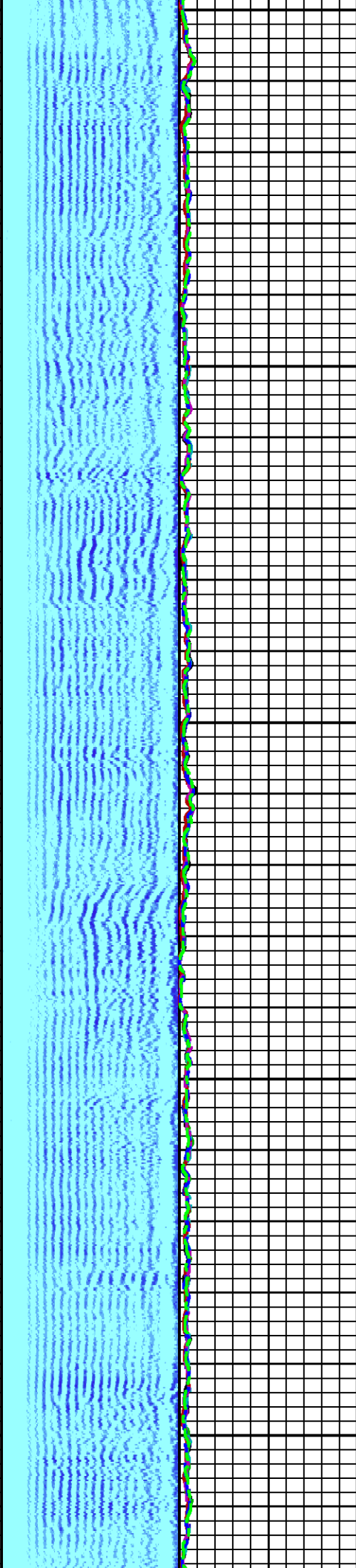
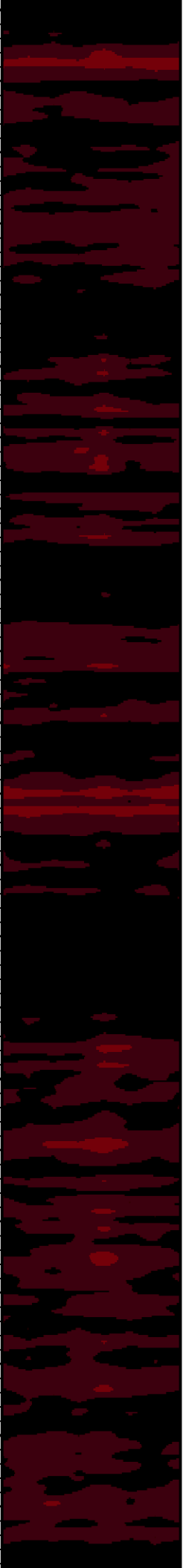




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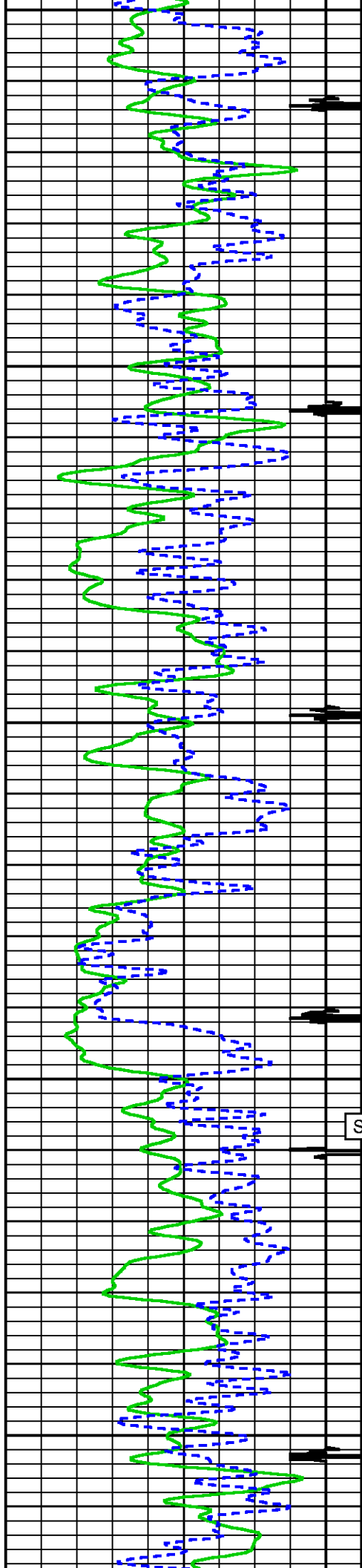


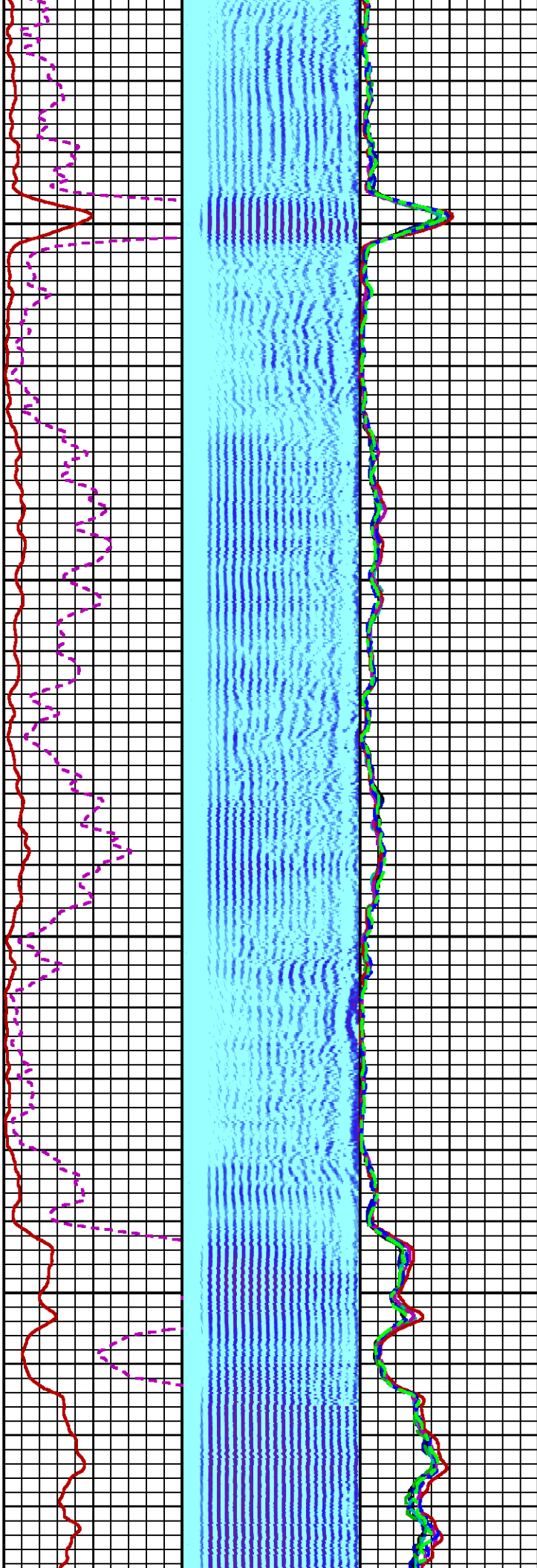
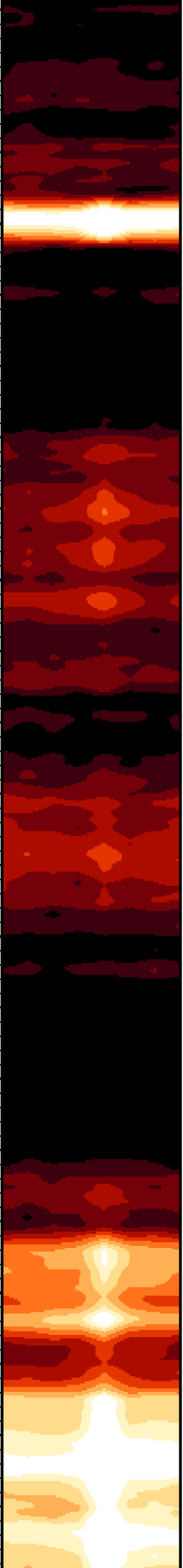


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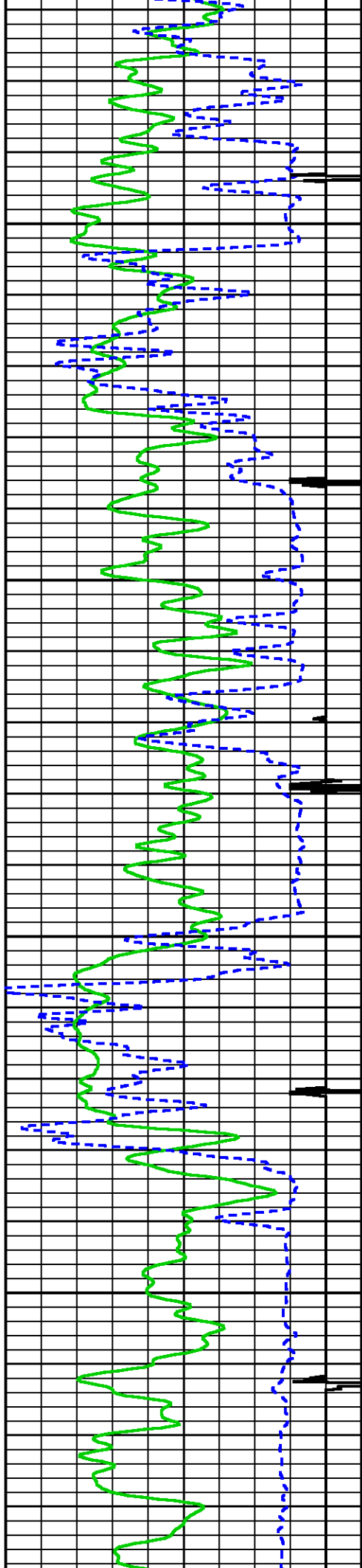
SHORT JOINT



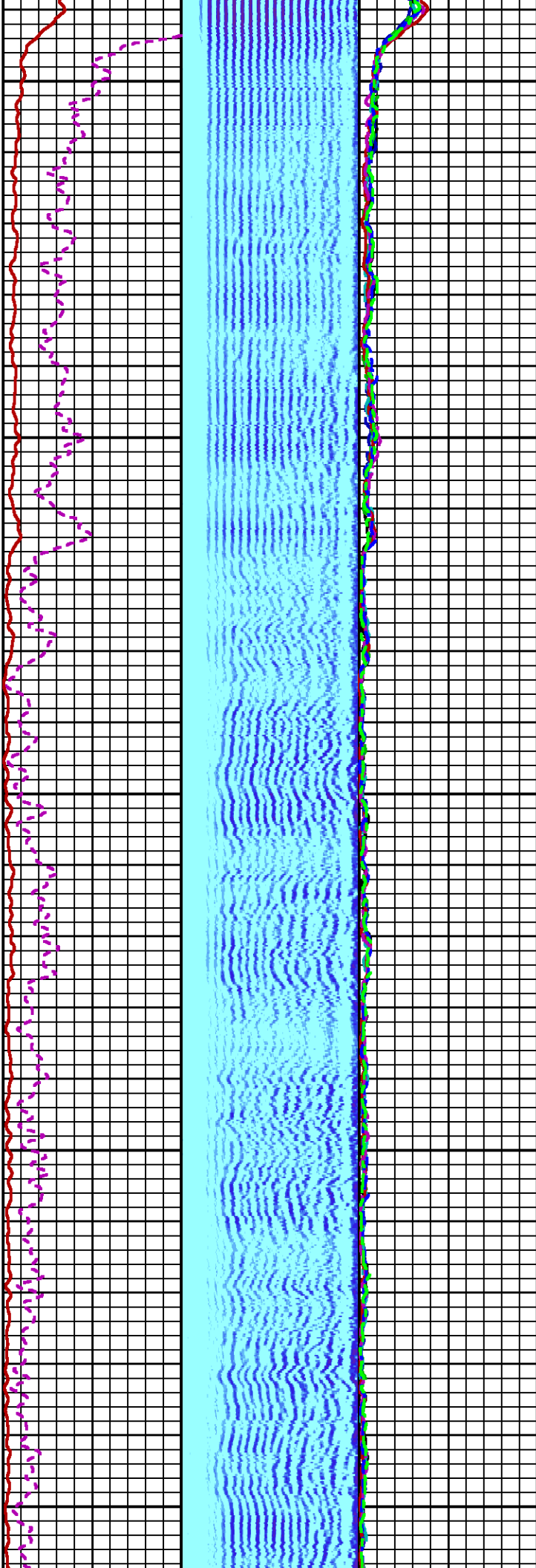


6200

6300



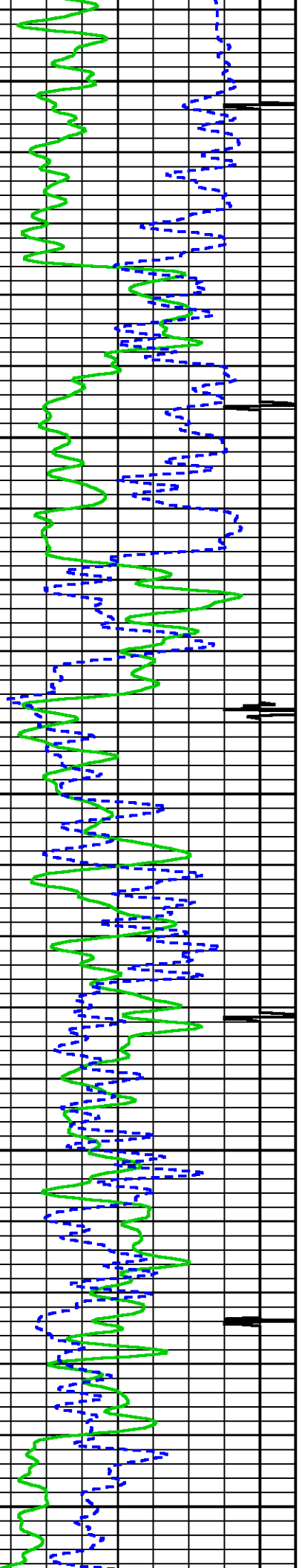




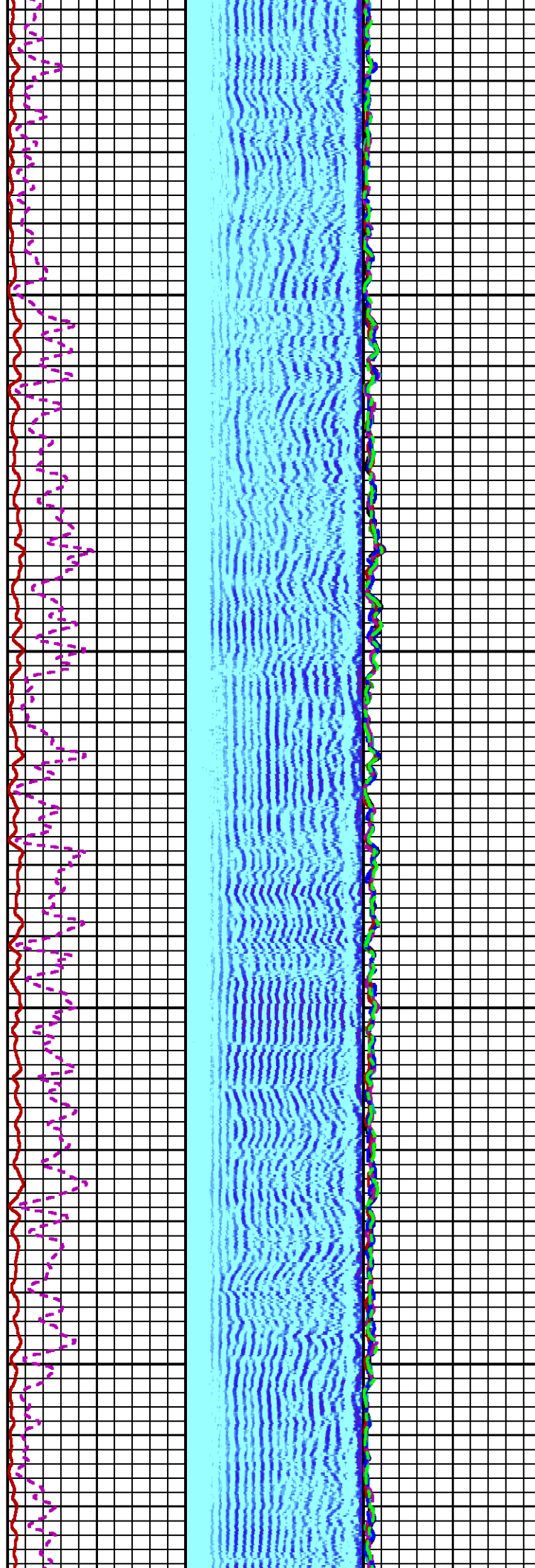
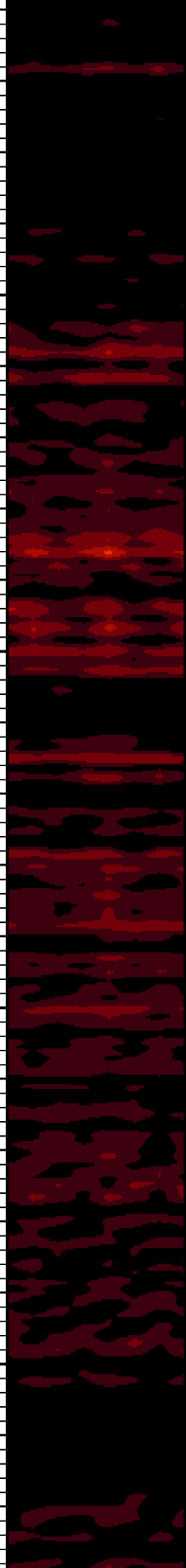
6400

6500

6600

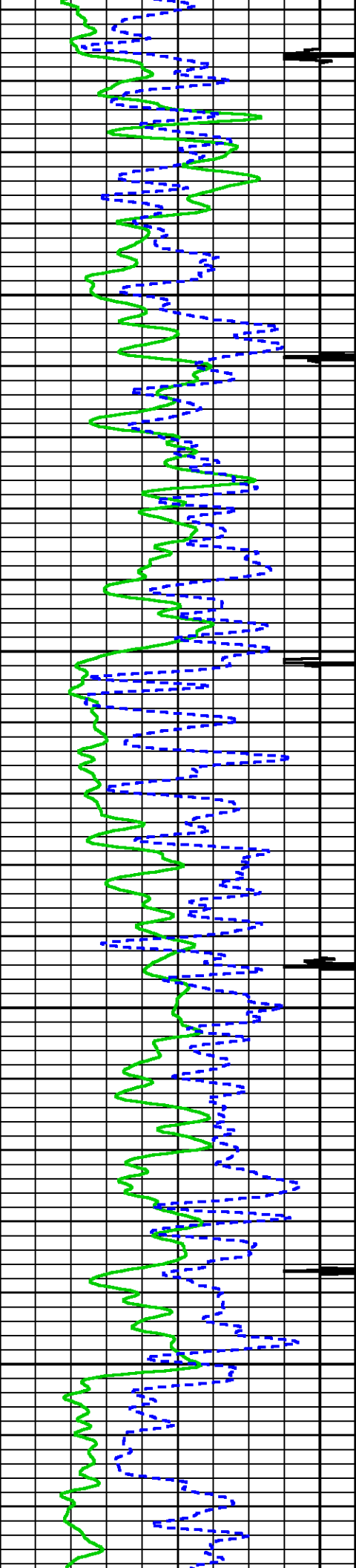


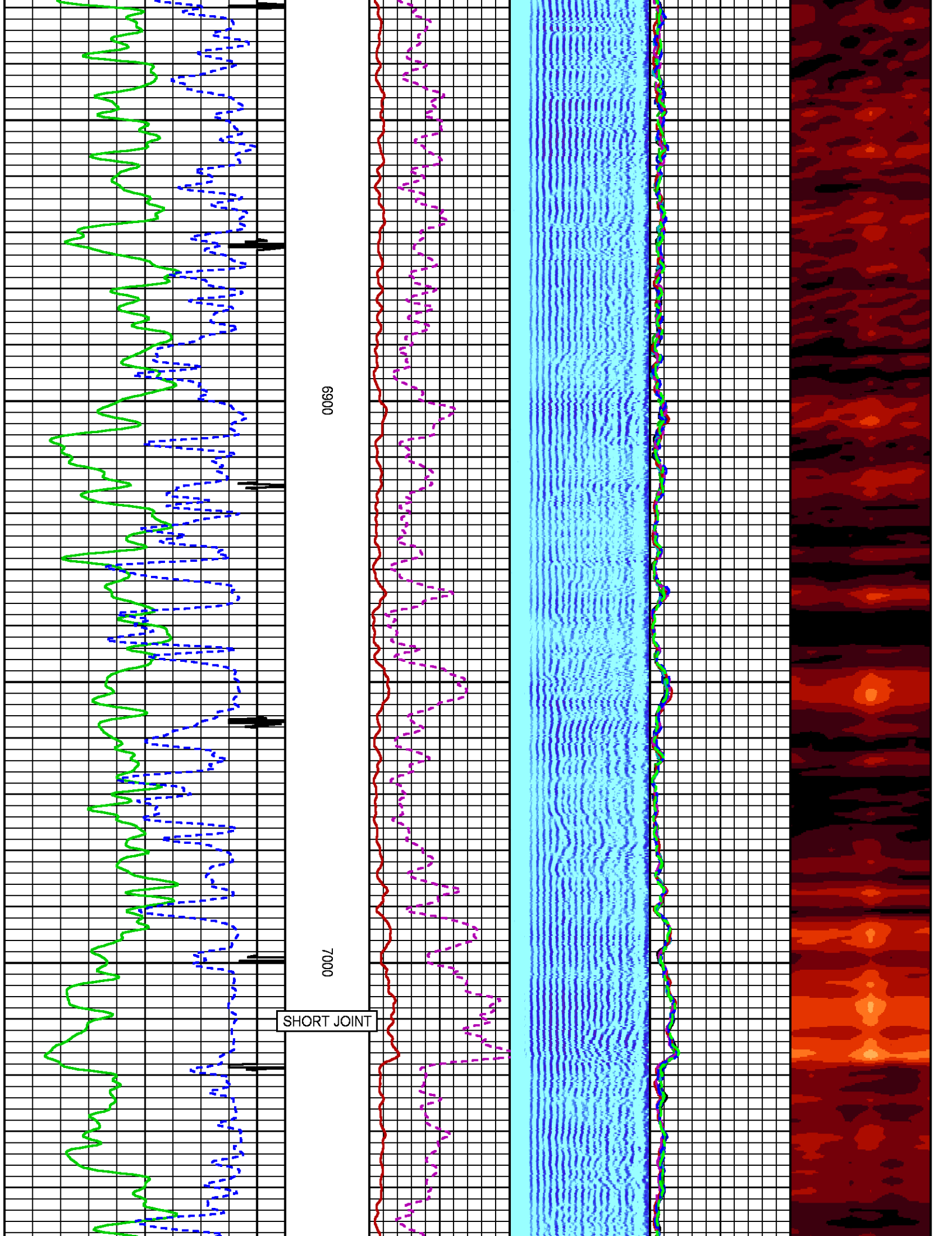


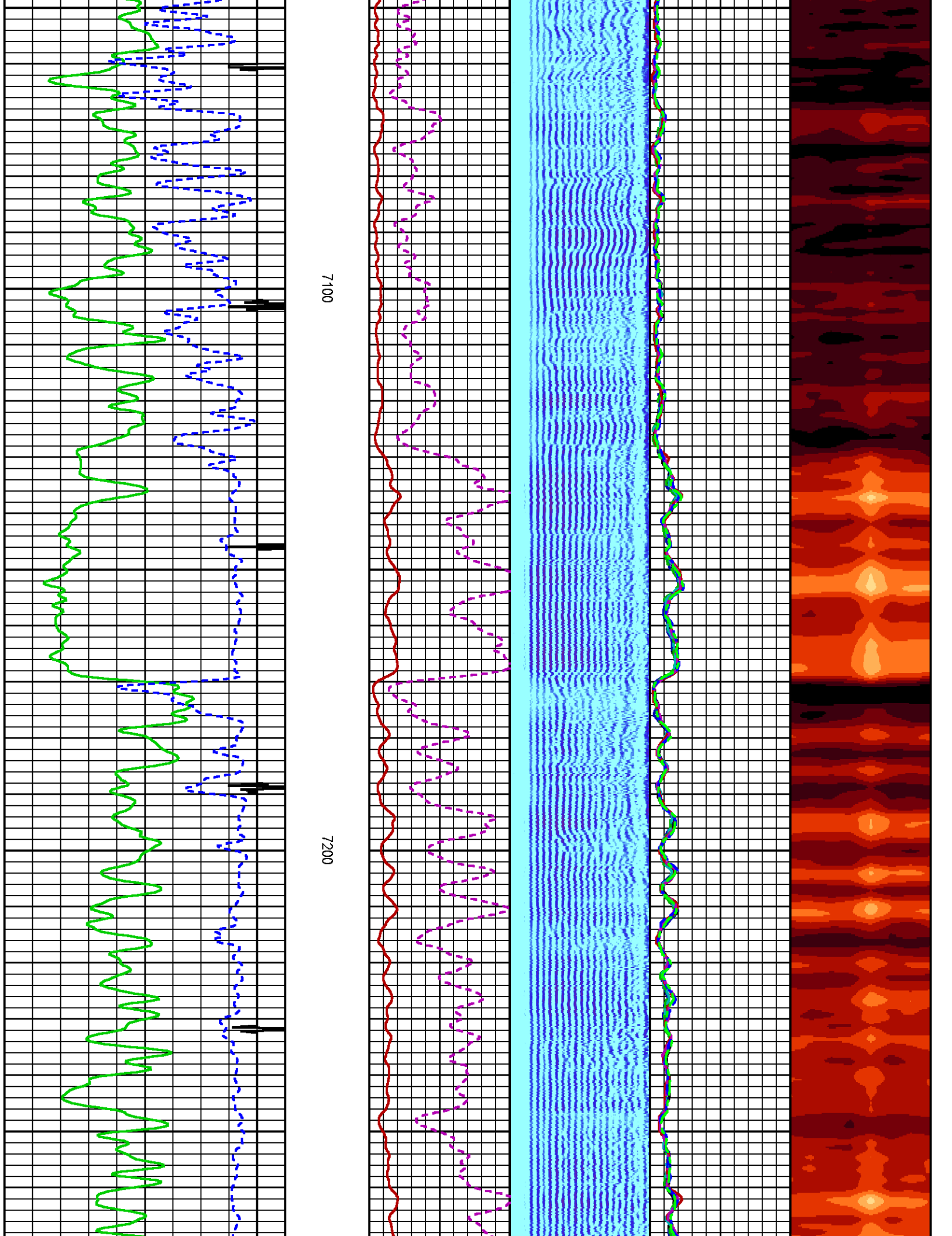


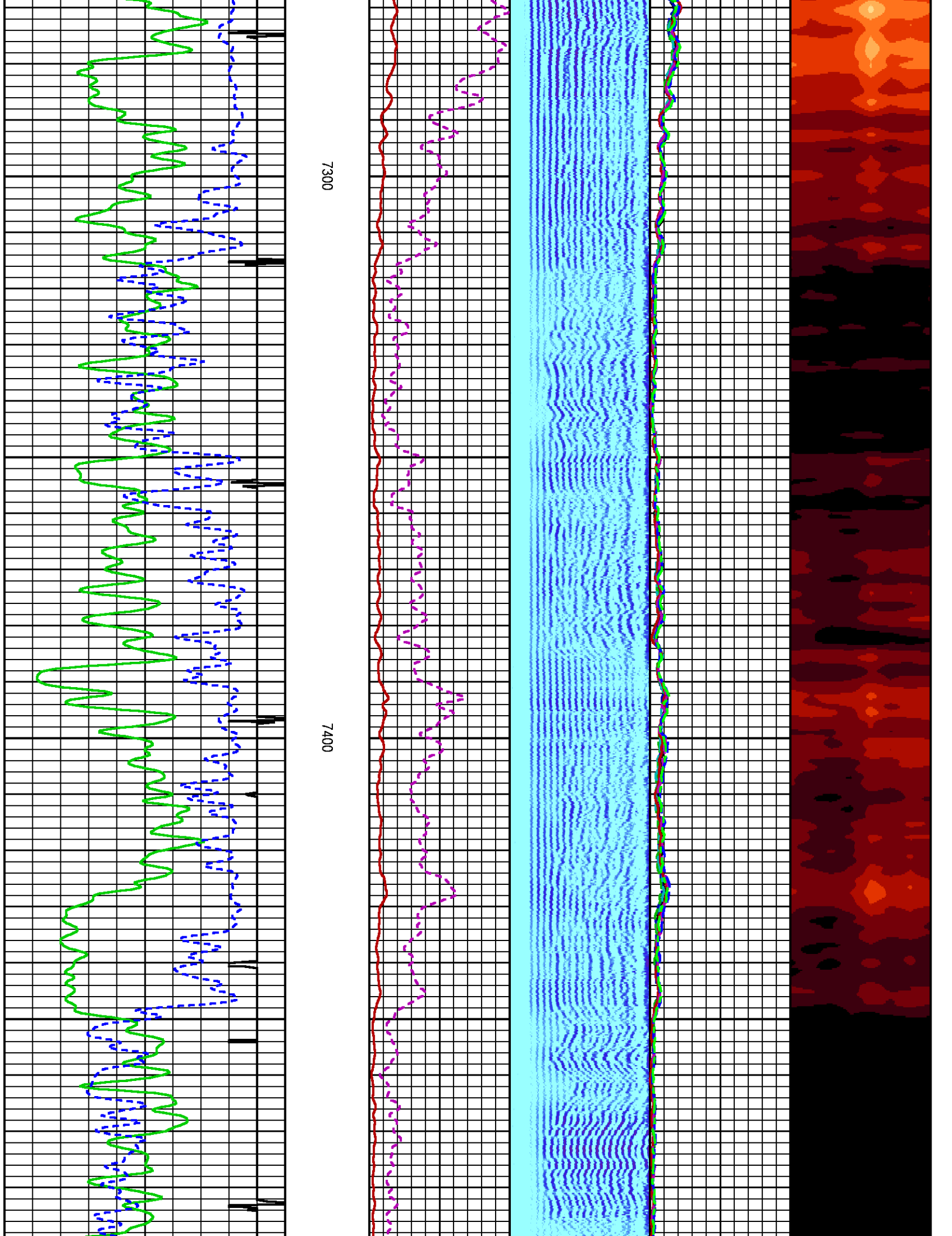
6700

6800

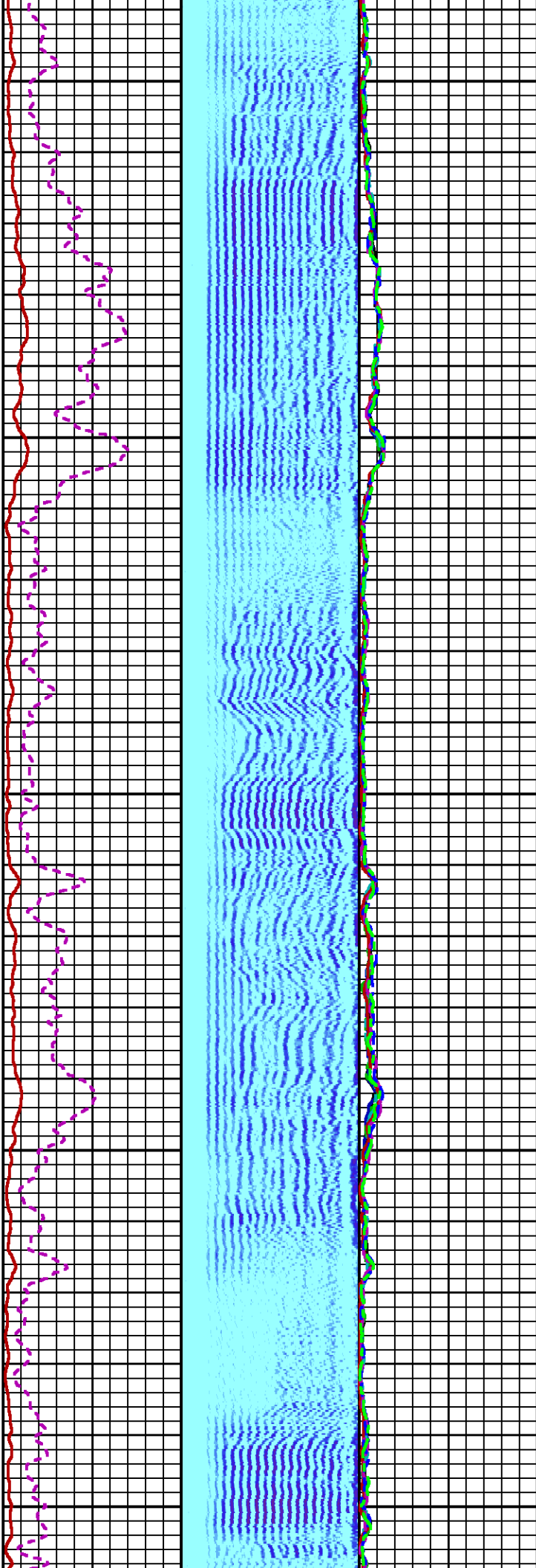








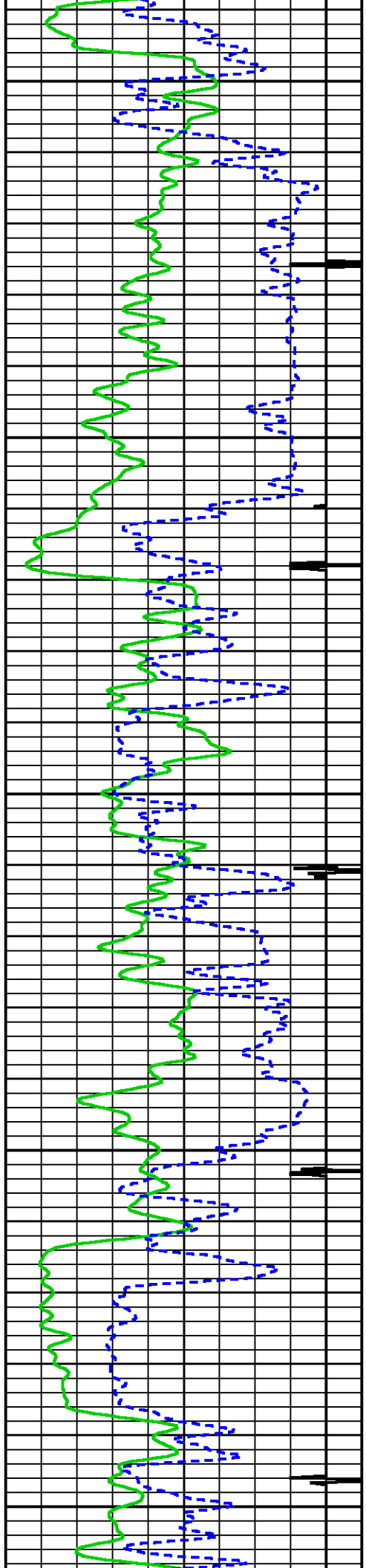




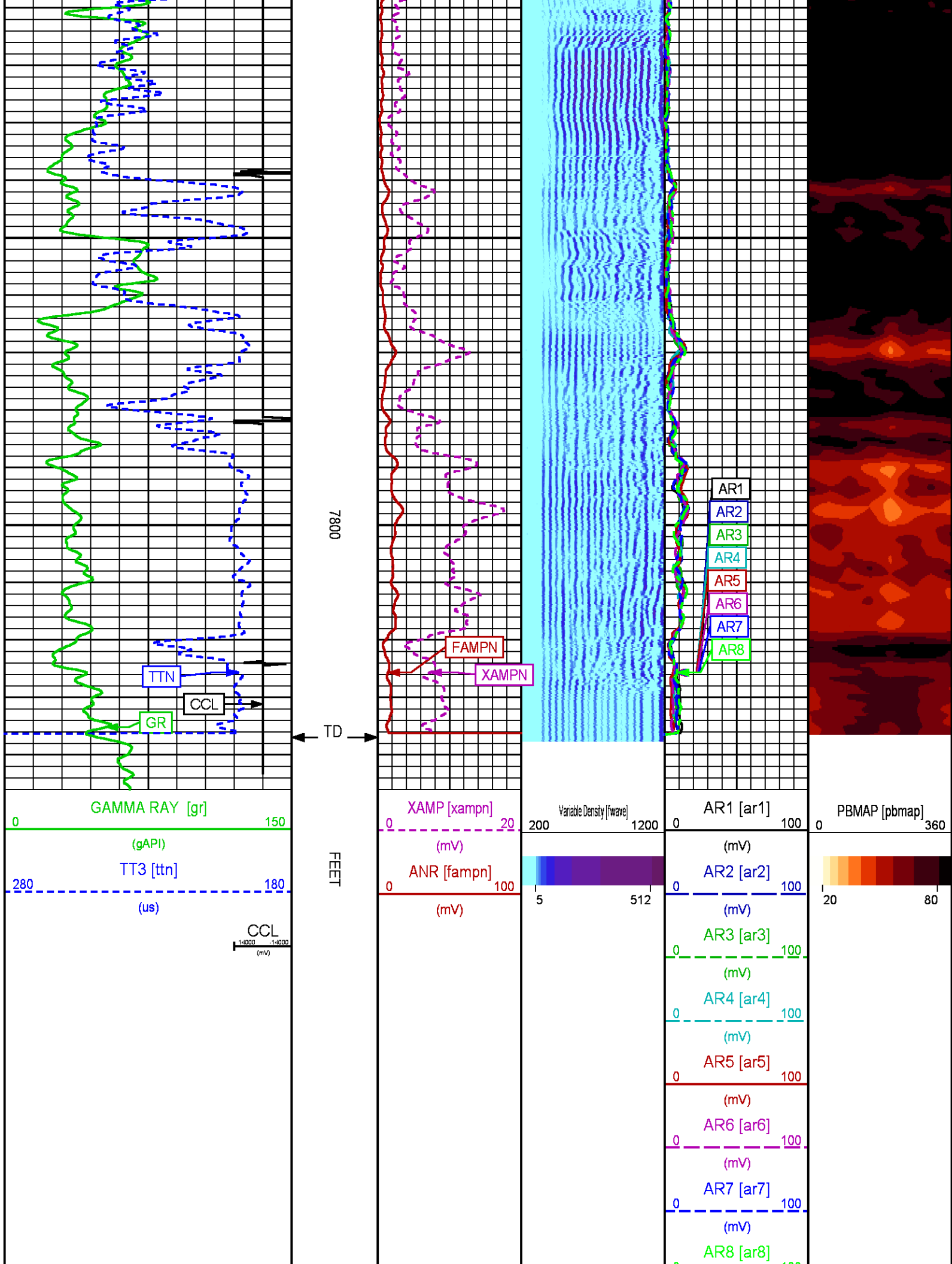
7500

7600

7700







0 100  
(mV)

REPEAT PASS 0 PSI

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017

Patches: 3

Plotted: Sun Mar 18 09:33:43 2018

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_NICHOLS\_0994-13-21E/p012g01.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 7559.500 ft BOTTOM DEPTH: 7854.250 ft

### SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
GR	FILTER ()	medium (1)		TOP	BOTTOM
AMPLITUDE	FILTER ()	medium (1)		"	"
TRAVEL TIME	FILTER ()	medium (1)		"	"

### RAL CCL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CCL FLOOR	CCL FLOOR	4000.00		TOP	BOTTOM

### ANALOG RAL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
AMPLITUDE WINDOW (NEAR)	AMP WINDOW START (fgp1*)	185	us	TOP	BOTTOM
	AMP WINDOW START (fgp2*)	185	us	"	"
	AMP WINDOW START (fgp3*)	185	us	"	"
	AMP WINDOW START (fgp4*)	185	us	"	"
	AMP WINDOW START (fgp5*)	185	us	"	"
	AMP WINDOW START (fgp6*)	185	us	"	"
	AMP WINDOW START (fgp7*)	185	us	"	"
	AMP WINDOW START (fgp8*)	185	us	"	"
	AMP WINDOW START (fgpn*)	185	us	"	"
TRAVEL TIME WINDOW (NEAR)	AMP WINDOW LENGTH	30	us	"	"
	TT WINDOW START (ttn*)	175	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	4	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	200.391	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-73	us	"	"
	TOOL DELAY (str2*)	-73	us	"	"
	TOOL DELAY (str3*)	-73	us	"	"
	TOOL DELAY (str4*)	-73	us	"	"
	TOOL DELAY (str5*)	-73	us	"	"
	TOOL DELAY (str6*)	-73	us	"	"
	TOOL DELAY (str7*)	-73	us	"	"
	TOOL DELAY (str8*)	-73	us	"	"
BASELINE NOISE (NEAR)	TOOL DELAY (strn*)	-73	us	"	"
	NOISE WINDOW START	125	us	"	"
	NOISE WINDOW LENGTH	25	us	"	"

### PERCENT BOND CEMENT MAP

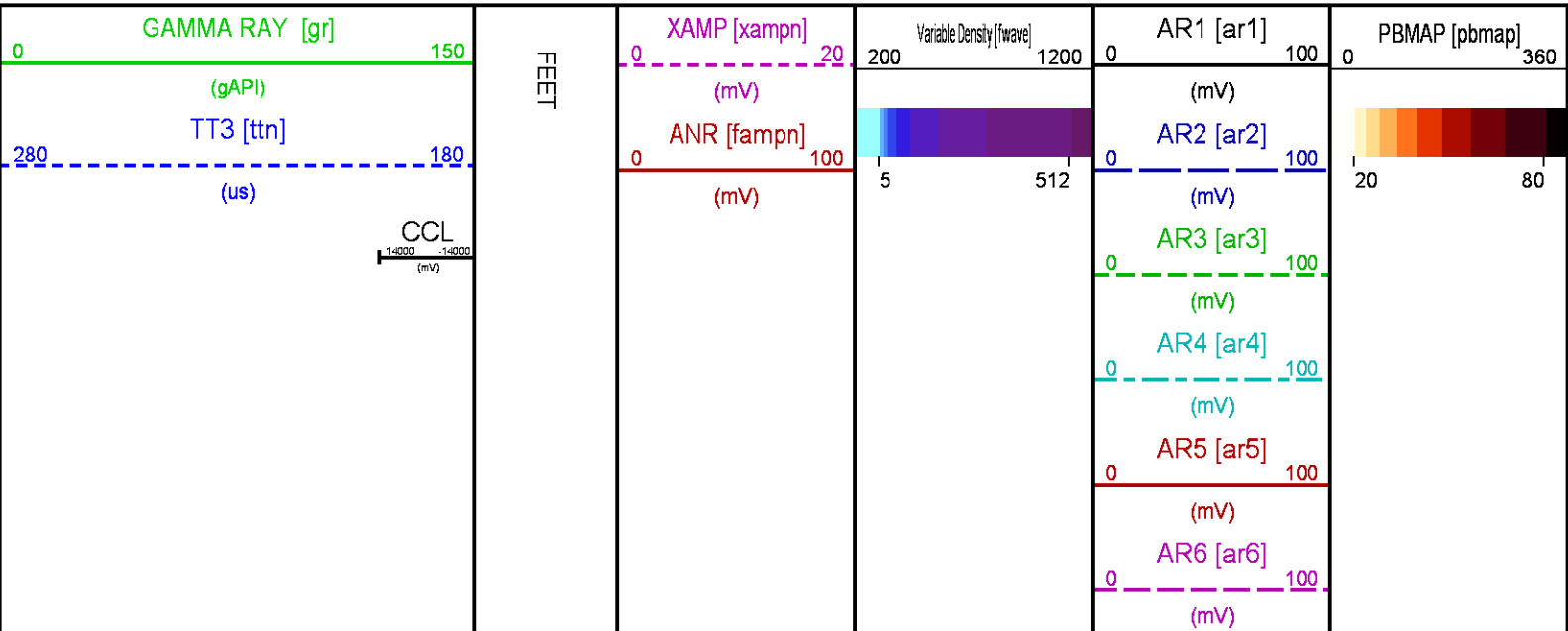
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
RAL FREE PIPE AMPLITUDE	FREE AMP REC 1	80	mV	TOP	BOTTOM
	FREE AMP REC 2	80	mV	"	"
	FREE AMP REC 3	80	mV	"	"
	FREE AMP REC 4	80	mV	"	"

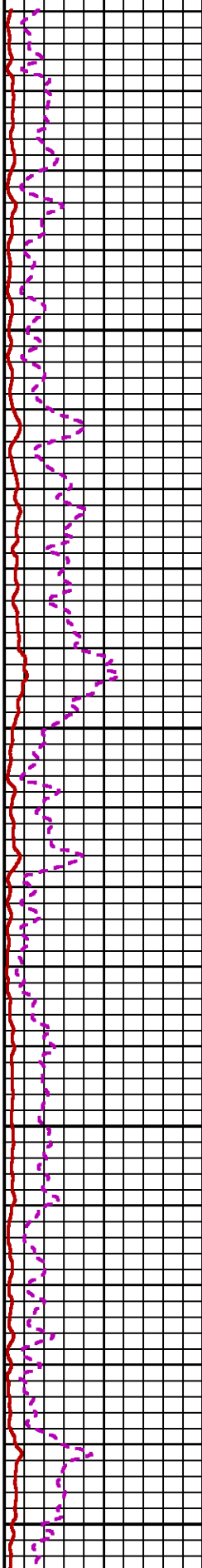
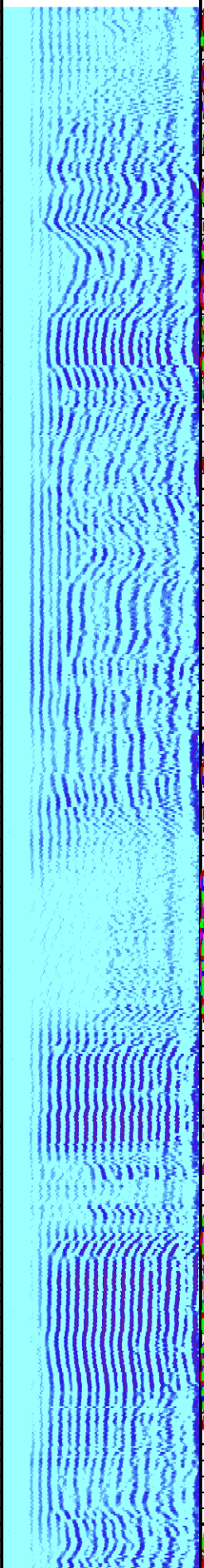
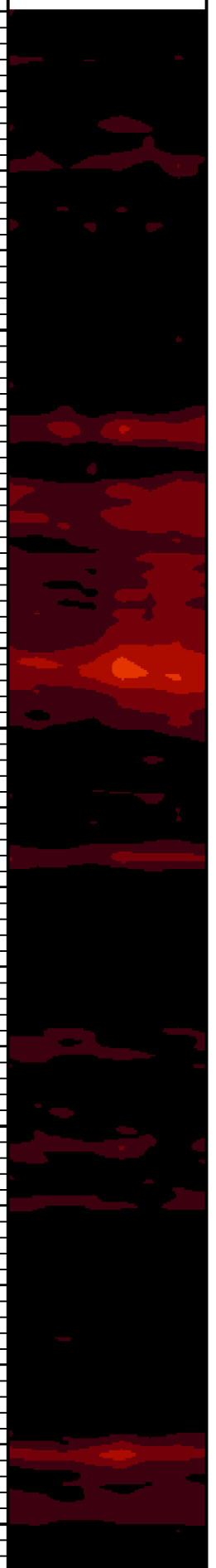
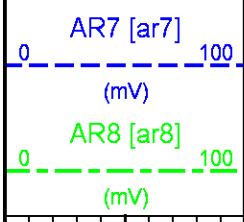
	FREE AMP REC 5	80	mV	"	"
	FREE AMP REC 6	80	mV	"	"
	FREE AMP REC 7	80	mV	"	"
	FREE AMP REC 8	80	mV	"	"
RAL FULL BOND AMPLITUDE	FULL BOND AMP REC 1	2	mV	"	"
	FULL BOND AMP REC 2	2	mV	"	"
	FULL BOND AMP REC 3	2	mV	"	"
	FULL BOND AMP REC 4	2	mV	"	"
	FULL BOND AMP REC 5	2	mV	"	"
	FULL BOND AMP REC 6	2	mV	"	"
	FULL BOND AMP REC 7	2	mV	"	"
	FULL BOND AMP REC 8	2	mV	"	"

CURVE DESCRIPTION REPORT		
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	FIXED GATE AMPLITUDE T-R7
F1:AR8	N/A	FIXED GATE AMPLITUDE T-R8
F1:CCL	N/A	CASING COLLAR LOCATOR
F1:FAMPN	N/A	FIXED GATE AMPLITUDE NEAR RECEIVER
F1:FWAVE	N/A	FAR WAVE FORM
F1:GR	N/A	GAMMA RAY
F1:PBMAP	N/A	PERCENT BOND CEMENT MAP
F1:TTN	N/A	TRAVELTIME FROM NEAR TRANSMITTER-RECEIVER
F1:XAMPN	N/A	FIXED GATE AMPLITUDE NEAR RECEIVER TIMES FIVE

CURVE MEASURE POINT OFFSET							
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
AR1	-11.25	AR5	-11.25	CCL	-5.75	XAMPN	-11.25
AR2	-11.25	AR6	-11.25	FAMPN	-11.25		
AR3	-11.25	AR7	-11.25	GR	-1.75		
AR4	-11.25	AR8	-11.25	TTN	-11.25		

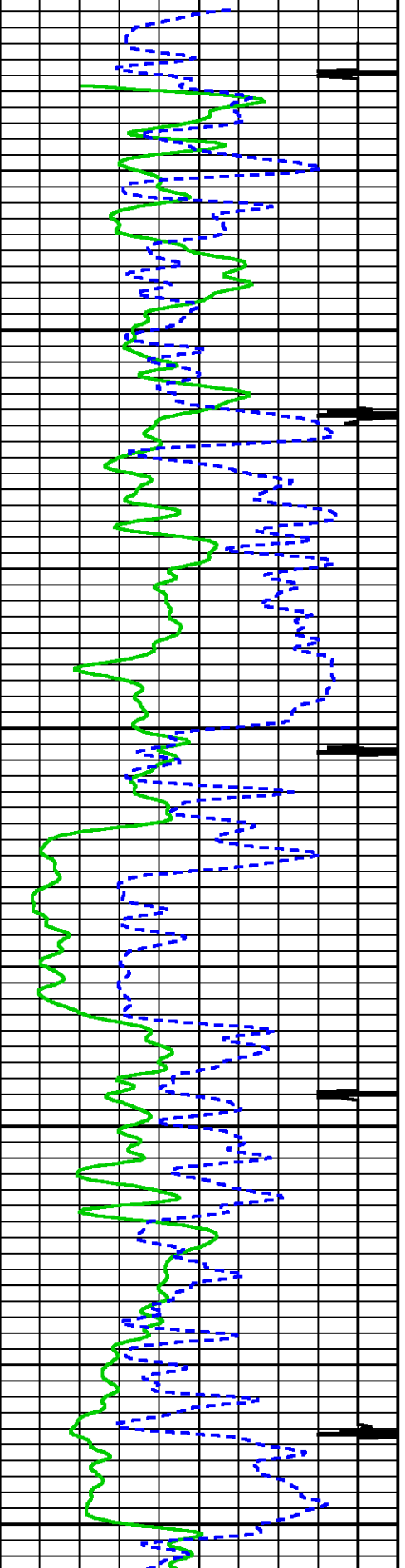
<b>Presentation</b>	: SysA:LARAMIE_RALRPT.fvpdf [5"/100' Scale]
<b>Plot Interval</b>	: 7559.5 - 7863.5 Feet
<b>Data File 1</b>	: F1 : SysA:/dat1a/LARAMIE_NICHOLS_0994-13-21E/RAL_REPEAT.xtf
<b>Created On</b>	: N/A
<b>Company</b>	: LARAMIE ENERGY II LLC
<b>Well</b>	: NICHOLS 0994-13-21E
<b>Field</b>	: VEGA
<b>File Interval</b>	: 7558.5 - 7864.75 Feet
<b>OCT</b>	: p012g

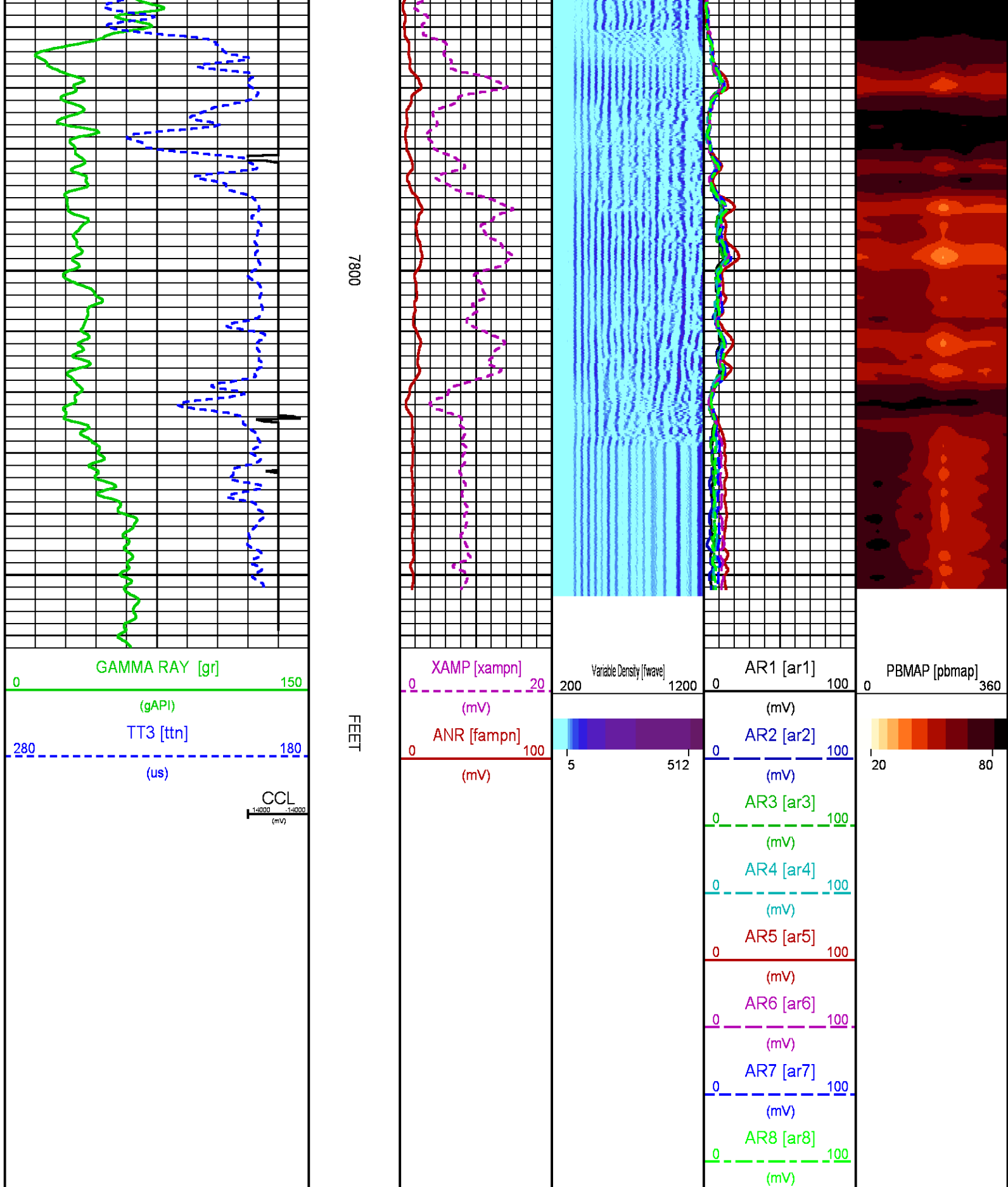




7600

7700





CALIBRATION / VERIFICATION SUMMARY



### RAL PRIMARY CALIBRATION SUMMARY

TOOL #: 1426XA 10404539a

DATE/TIME PERFORMED: Fri Mar 16 13:36:17 2018

UNIT #: 5753XD 111111

	NEAR (mV)	RADIAL (mV)	FAR (mV)
TARGETS	100.00	100.00	150.00

	NEAR	R1	R2	R3	R4	R5	R6	R7	R8	FAR	CAL
ZERO (mV)	-0.26	-0.10	-0.12	-0.29	-0.30	-0.27	-0.15	-0.16	-0.25	-1.23	-0.08
AMP FLUID (mV)	47	47	47	47	46	46	47	47	47	65	48
TT (us)	216	216	216	216	215	215	215	214	216	322	218
M FACTOR	2.13	2.12	2.12	2.13	2.16	2.14	2.11	2.10	2.11	2.26	2.10

### RAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1426XA 10404539a

DATE/TIME PERFORMED: Fri Mar 16 13:37:49 2018

DAYS SINCE CAL: 0

UNIT #: 5753XD 111111

CABLE #: ml4291 smallline

	NEAR (mV)	R1 (mV)	R2 (mV)	R3 (mV)	R4 (mV)	R5 (mV)	R6 (mV)	R7 (mV)	R8 (mV)	FAR (mV)	CAL (mV)
ZERO	-0.12	-0.12	0.05	-0.20	-0.25	-0.06	-0.11	-0.20	-0.15	-0.21	-0.21
AMP AIR	2.22	0.84	0.99	1.40	0.95	-0.41	0.79	0.87	0.41	1.34	99.57

	SHOP M FACTOR	SHOP A FACTOR	WIREFINE FACTOR
	2.10	0.00	1.00

### GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1355XA 12670180

DATE/TIME PERFORMED: Wed Feb 7 16:57:59 2018

UNIT #: 3882TD HL6741

CALB JIG #: 4702NK DA\_228

	BACKGROUND (cts)	CALBRTR ON (cts)	CR DIFF (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	CALBRTR (gAPI)
GR	48.98	223.16	174.2	0.574	28.12	128.12	100

### GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1355XA 12670180

DATE/TIME PERFORMED: Wed Feb 7 16:59:44 2018

UNIT #: 3882TD HL6741

VERI JIG #: 4702NK DA\_228

	BACKGROUND (cts)	CALBRTR ON (cts)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	49.82	213.56	0.574	28.60	122.61	94.00
						90.00 110.00

## INSTRUMENT CONFIGURATION

CABLEHEAD  
Diameter : 2.75"  
Length : 2.25'  
Weight : 10 lbs  
Series : CABL234  
Mnemonic : CBLH

RADIAL BOND TOOL

Diameter : 2.75"  
Length : 11.17'  
Weight : 126 lbs  
Series : 1426XA  
Mnemonic : RAL  
Measure Point: 5.75': XMTR  
Measure Point: 4.21': NEAR MP  
Measure Point: 3.25': FAR MP  
Measure Point: 2.67': NEAR RCVR  
Measure Point: 0.75': FAR RCVR

RAL GR/TEMP/CCL/CHV DETECTOR

Diameter : 2.75"  
Length : 6.96'  
Weight : 85 lbs  
Series : 1355XA  
Mnemonic : RAL  
Measure Point: 5.79': CCL  
Measure Point: 1.67': GR  
Measure Point: 0.17': TEMP

TOTAL LENGTH: 20.38'  
TOTAL WEIGHT: 235 lbs  
MAX DIAMETER: 0'4.00"



XMTR 12.71'  
NEAR MP 11.17'  
FAR MP 10.21'  
NEAR RCVR 9.62'  
FAR RCVR 7.71'  
CCL 5.79'  
GR 1.67'  
TEMP 0.17'  
0.00'

**BAKER  
HUGHES**  
a GE company



**COMPANY**  
**WELL**  
**FIELD**  
**COUNTY**

**LARAMIE ENERGY II LLC**  
**NICHOLS 0994-13-21E**  
**VEGA**  
**MESA**

**STATE** **COLORADO**

**FILE NO:**

**API NO:**

**05077104160000**

**LOCATION:**

**SHL 1783 FNL 2777 FEL**  
**BHL 112 FNL 1494 FEL**

**ELEVATIONS:**

**KB 7161 FT**  
**DF**  
**GL 7137 FT**

**SEC 24 TWP 9S RGE 94W**

**DATE 16 Mar 2018**



