



# RADIAL CEMENT BOND LOG

FILE NO:

COMPANY

LARAMIE ENERGY LLC

WELL

NICHOLS 0994-24-08E

FIELD

VEGA

API NO:  
05077104120000

COUNTY

MESA

STATE COLORADO

Ver. 4.10

LOCATION:

SHL: 39.264465 N; 107.830720 W  
BHL: 39.264737 N; 107.826024 W

OTHER SERVICES  
RPM

SEC 24 TWP 9 S RGE 94 W

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

ELEVATIONS:  
KB 7161 FT  
DF 7160 FT  
GL 7137 FT

DATE 22-Jan-2018

RUN 1 TRIP 1

SERVICE ORDER US132013

DEPTH DRILLER 7636 FT

DEPTH LOGGER 7450 FT

BOTTOM LOGGED INTERVAL 7450 FT

TOP LOGGED INTERVAL 24 FT

TIME STARTED 16:30

TIME FINISHED 19:30

OPERATOR RIG TIME 3 HRS

TYPE OF FLUID IN HOLE FRESH WATER

FLUID DENSITY NA

FLUID SALINITY NA

FLUID LEVEL 48 FT

LOGGED CEMENT TOP 2257 FT

WELLHEAD PRESSURE 0 PSI

MAXIMUM HOLE DEVIATION NA

NOMINAL LOGGING SPEED 90 FMIN

MAX. RECORDED TEMP. 237 DEGF

REFERENCE LOG NA

REFERENCE LOG DATE NA

EQUIP. NO. LOCATION ML-4291 GRAND JUNCT

RECORDED BY M.MENTZER

WITNESSED BY MR. MATT SETTLES

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: \*2 OPERATIONS IN WELLBORE\*

\*\*OPERATION 1: RAL/GR/CCL RUN CENTRALIZED\*\*

LOGGED WITH 0 PSI ON WELLHEAD

SJ: 5701' - 5723'

SJ: 6620' - 6640'

CREW: C. GOLOBY J. PENA, A. SHAHNOOSHI

## EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	RAL	1426 XA	10417452	CENTRALIZED
1	1	GR/CCL	1355 XA	11871507	CENTRALIZED

# MAIN PASS 0 PSI

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017  
Patches: 2

Plotted: Wed Jan 24 16:47:17 2018

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_NICHOLS\_0994\_24\_08E/p012gR01.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 160.000 ft BOTTOM DEPTH: 987.500 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	0.00		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*)	160	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	6	mV	TOP	976.000
		8	mV	976.000	BOTTOM
RAL CASING PARAMETERS	PPT NEAR	200.391	us	TOP	BOTTOM
RAL TOOL DELAY	TOOL DELAY (str1*)	-62	us	"	"
	TOOL DELAY (str2*)	-62	us	"	"
	TOOL DELAY (str3*)	-62	us	"	"
	TOOL DELAY (str4*)	-62	us	"	"
	TOOL DELAY (str5*)	-62	us	"	"
	TOOL DELAY (str6*)	-62	us	"	"
	TOOL DELAY (str7*)	-62	us	"	"
	TOOL DELAY (str8*)	-62	us	"	"
	TOOL DELAY (strn*)	-62	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 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

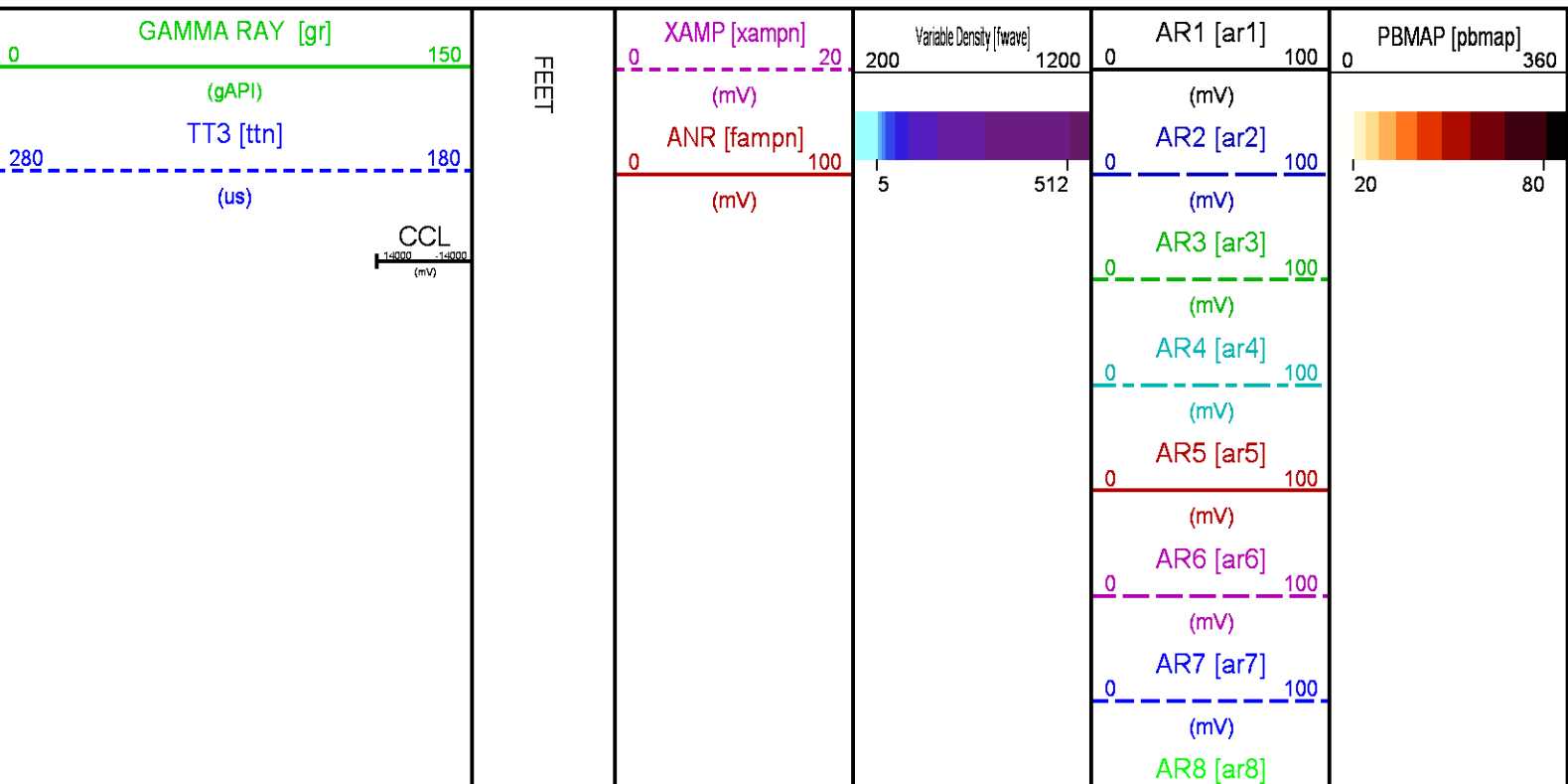
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	FIXED GATE AMPLITUDE T-R7
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

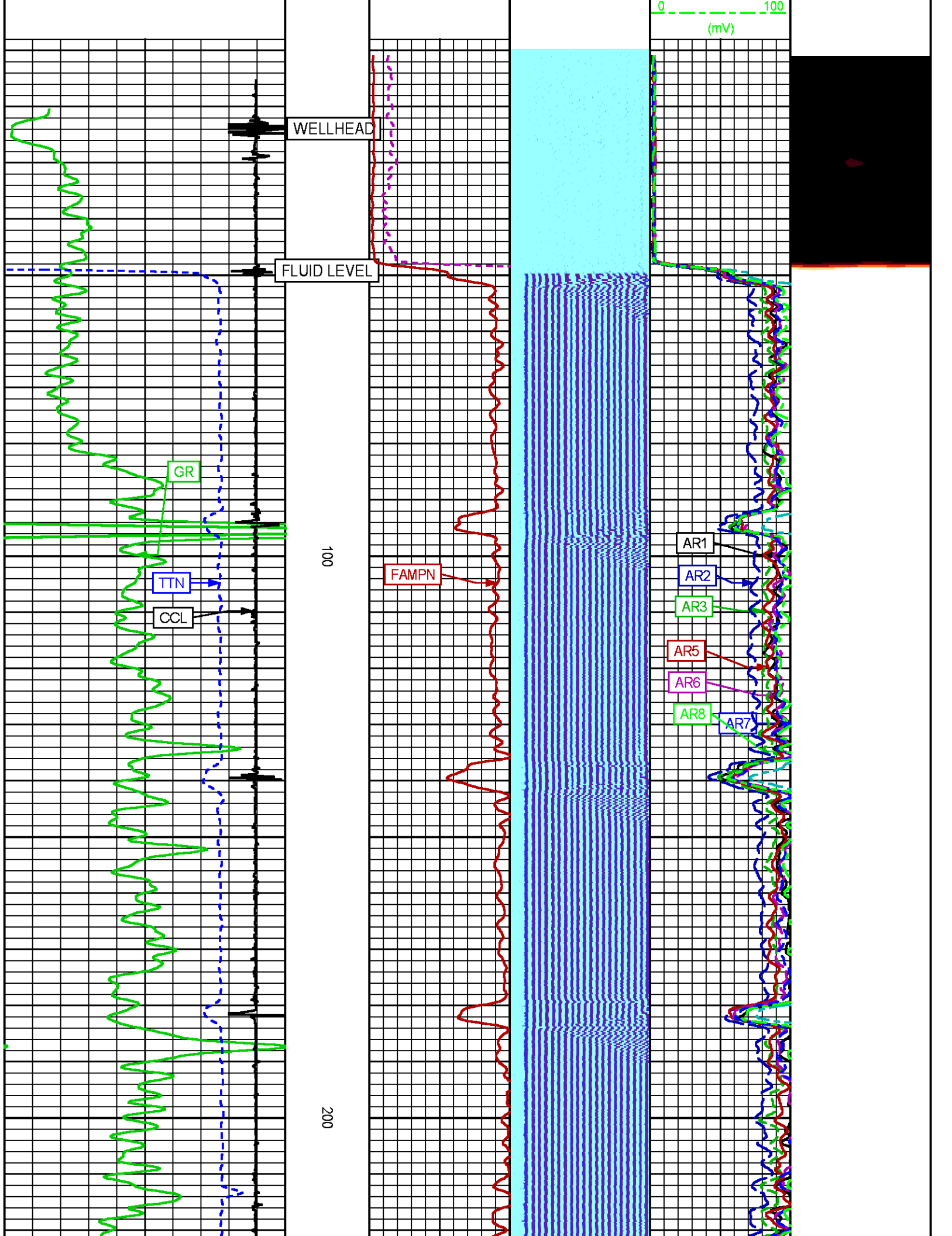
## CURVE MEASURE POINT OFFSET

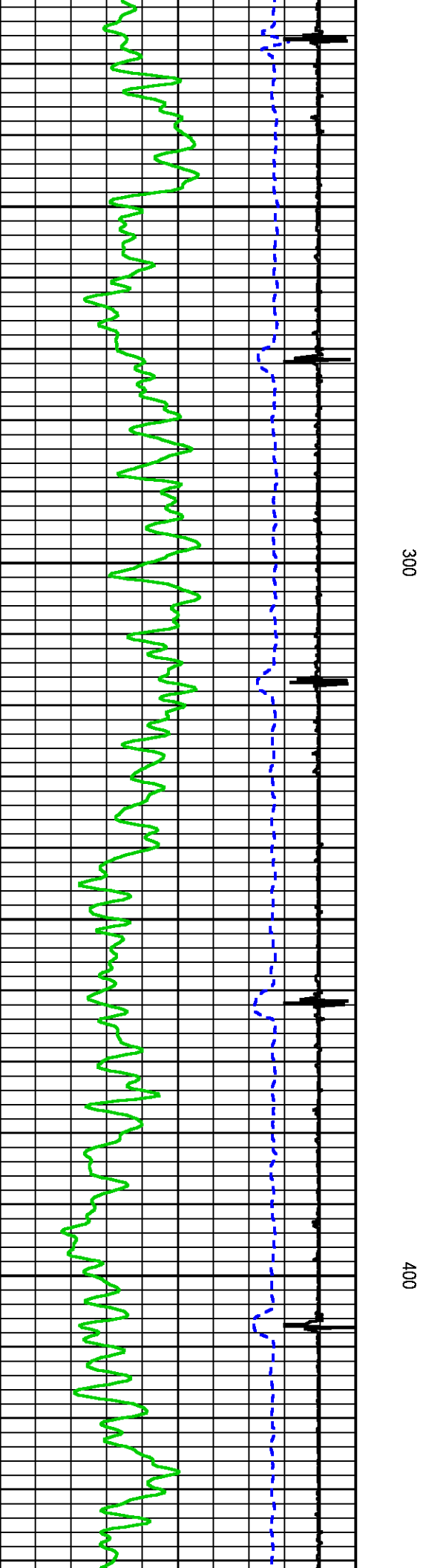
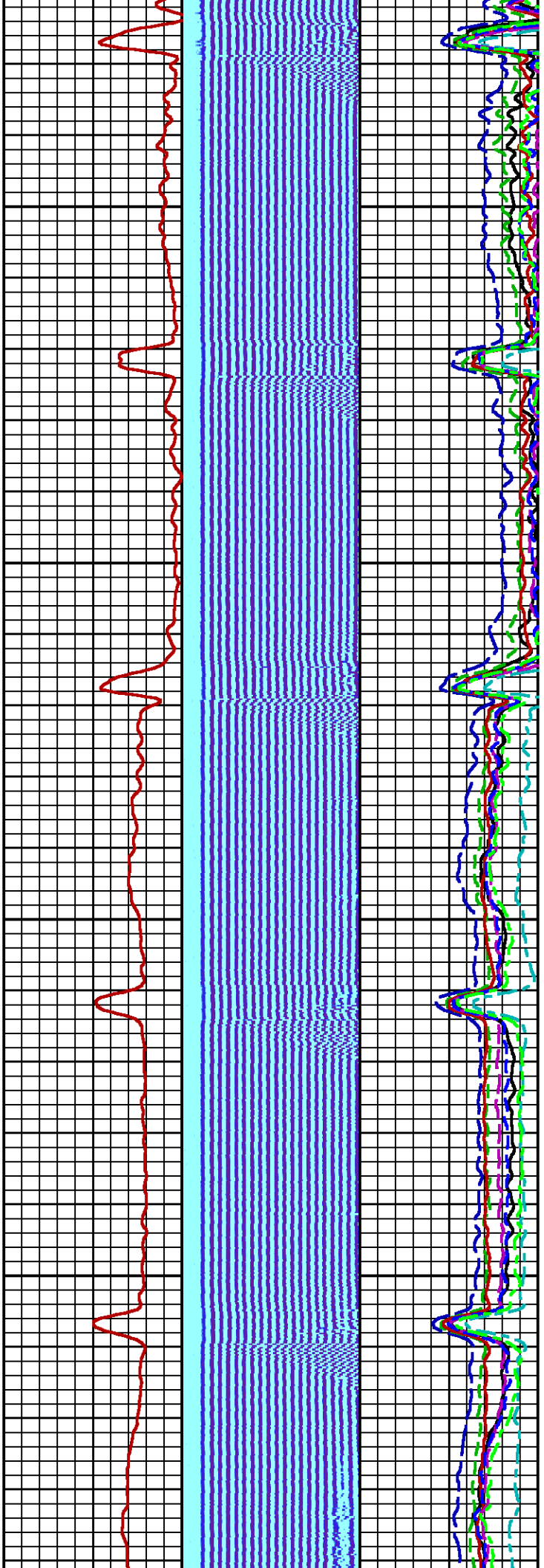
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
AR1	-11.25	AR5	-11.25	CCL	-5.75	XAMPN	-11.25
AR2	-11.25	AR6	-11.25	FAMPN	-11.25		
AR3	-11.25	AR7	-11.25	GR	-1.75		
AR4	-11.25	AR8	-11.25	TTN	-11.25		

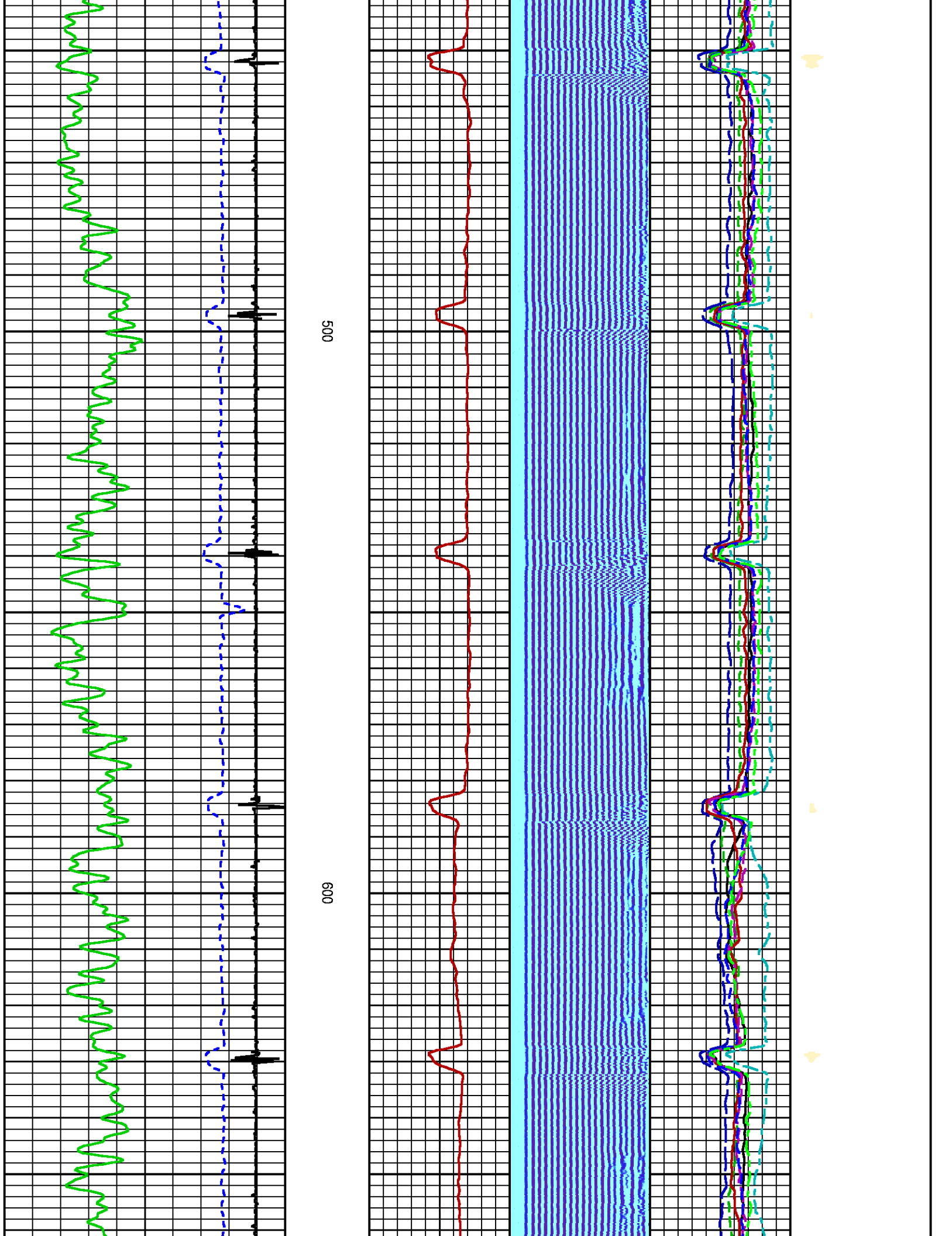
**Presentation** : SysA:/dat1a/LARAMIE\_NICHOLS\_0994\_24\_08E/LARAMIE\_RAL+01-MAIN-RAL\_MN\_08E-5.fvpdf [5"/100' Scale]  
**Plot Interval** : 9.75 - 7465 Feet

**Data File 1** : F1 : SysA:/dat1a/LARAMIE\_NICHOLS\_0994\_24\_08E/RALMN.xtf  
**Created On** : N/A  
**Company** : LARAMIE ENERGY LLC  
**Well** : NICHOLS 0994-24-07E  
**Field** : VEGA  
**File Interval** : 9.75 - 7465 Feet  
**OCT** : p012g

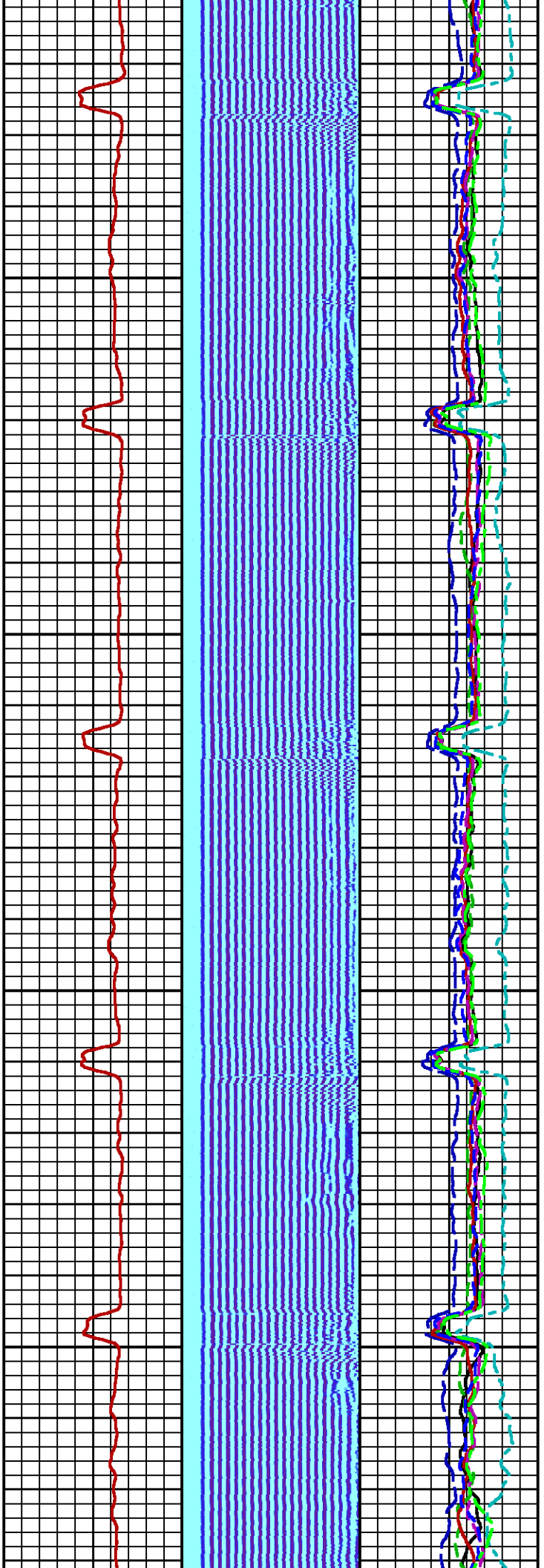






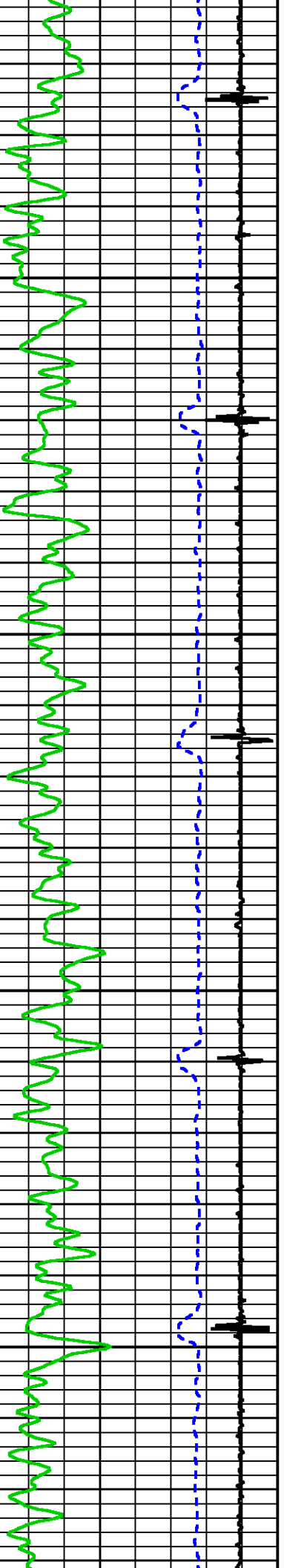


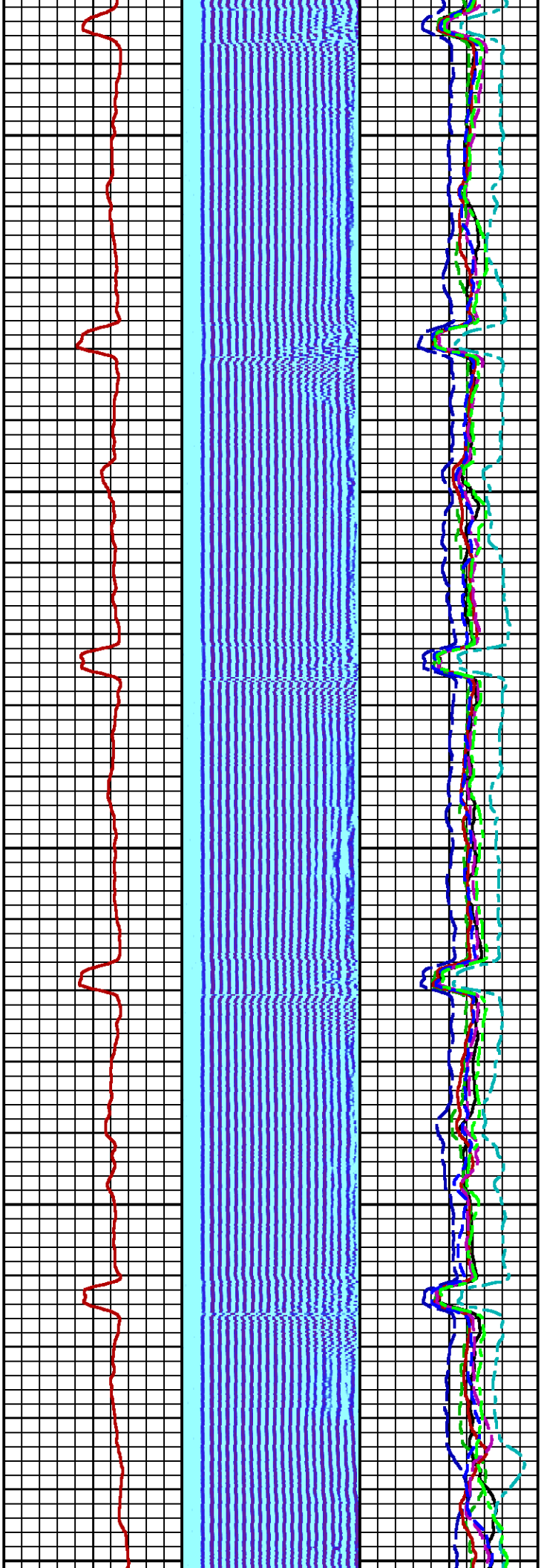




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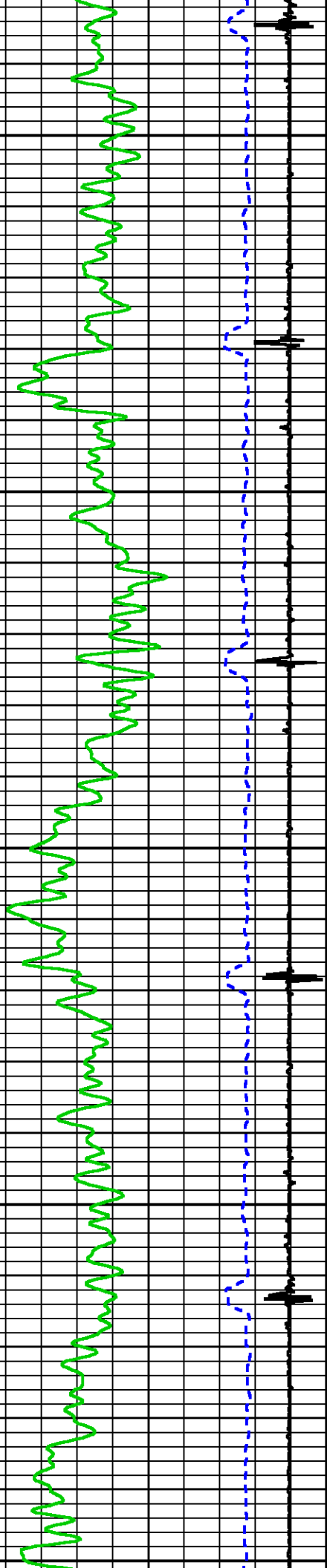




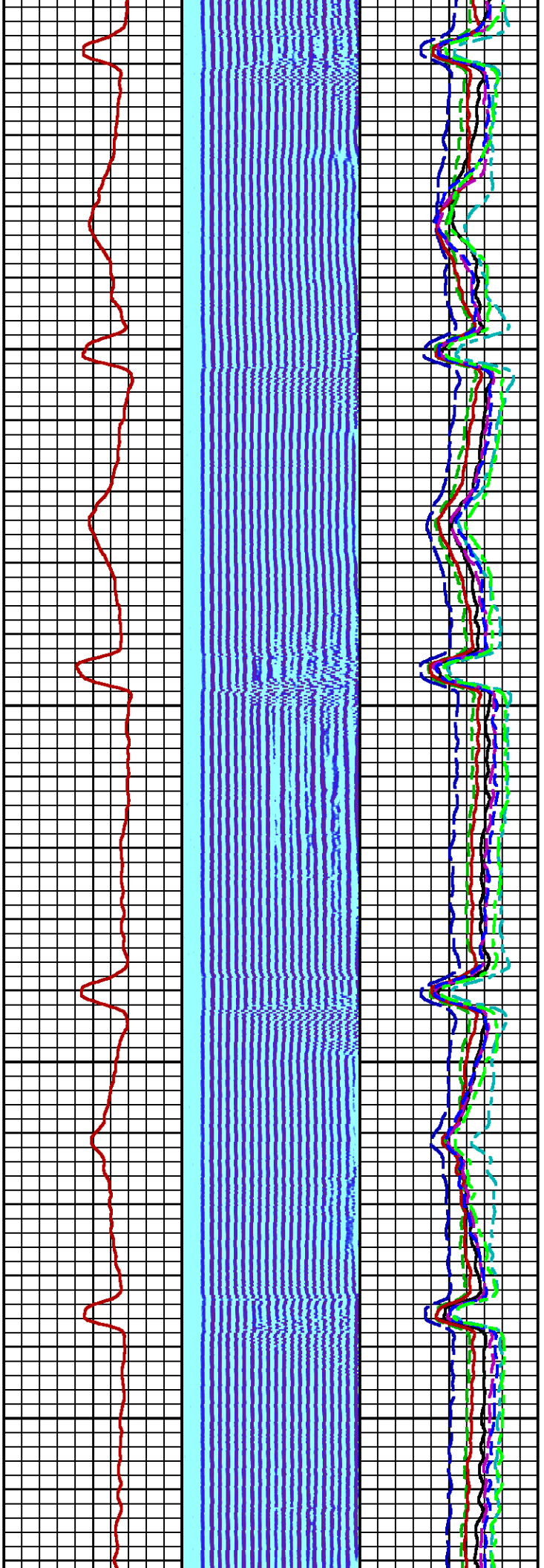
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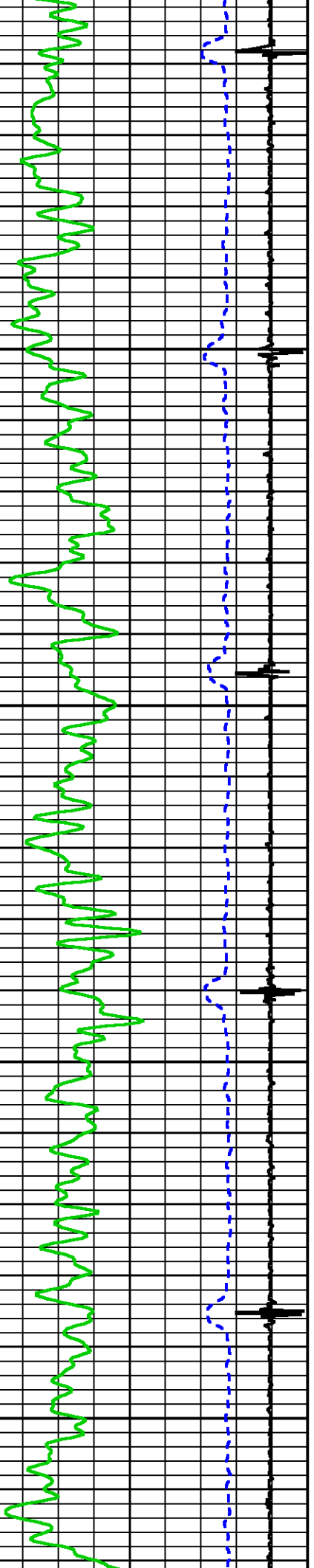
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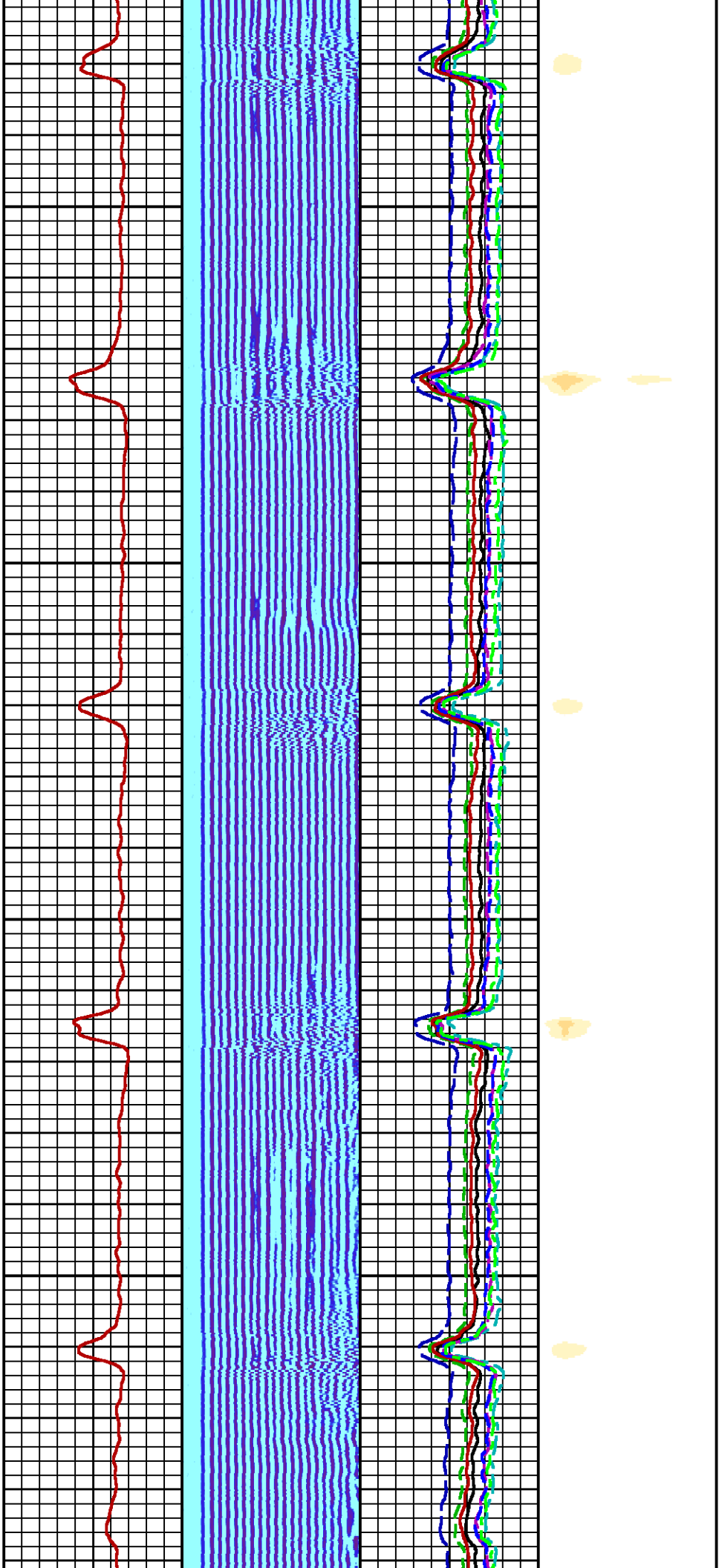






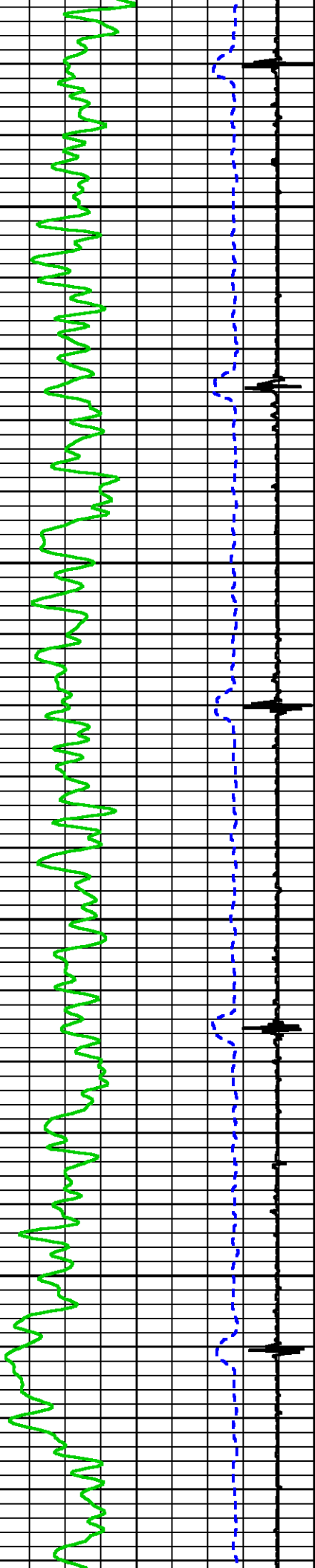
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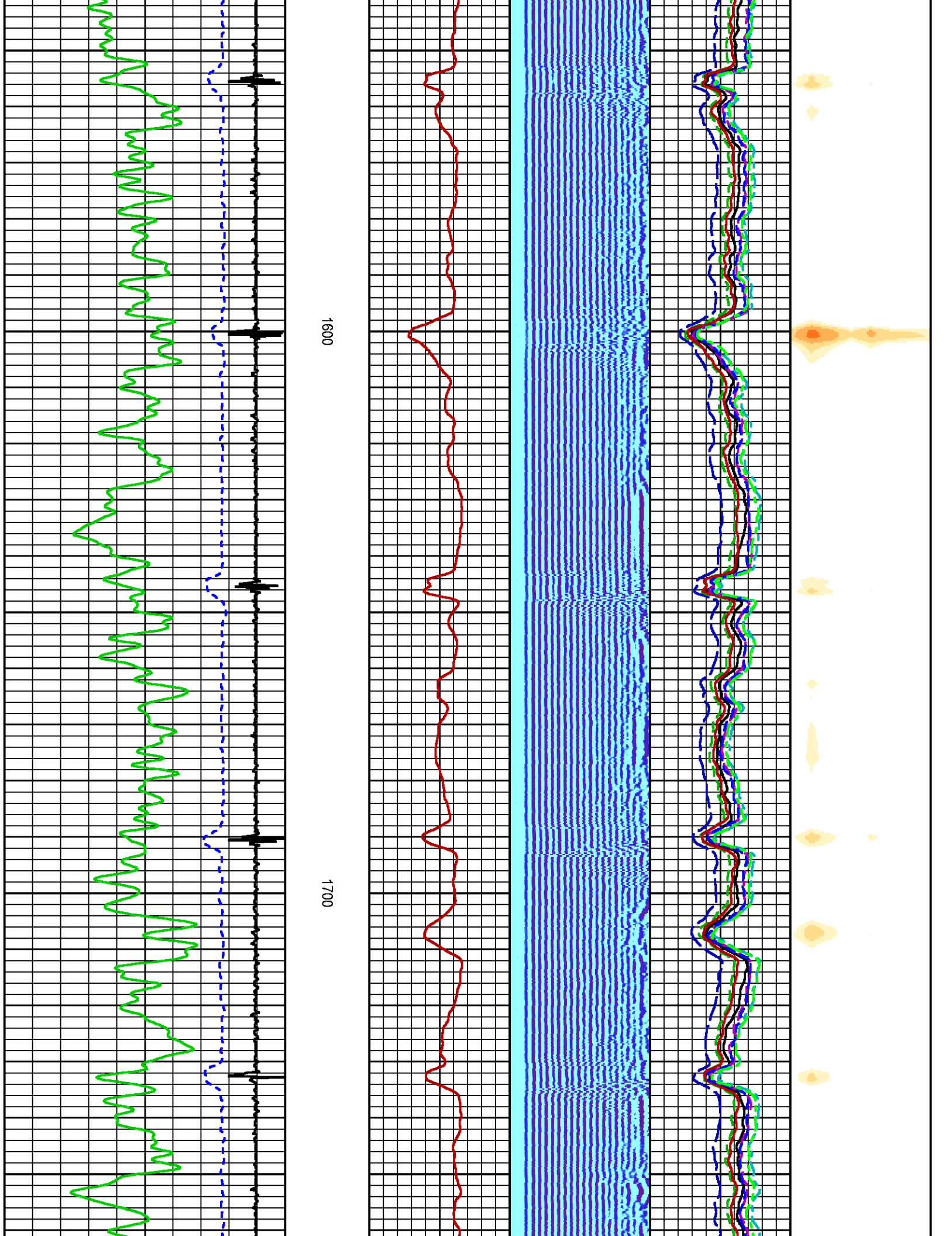


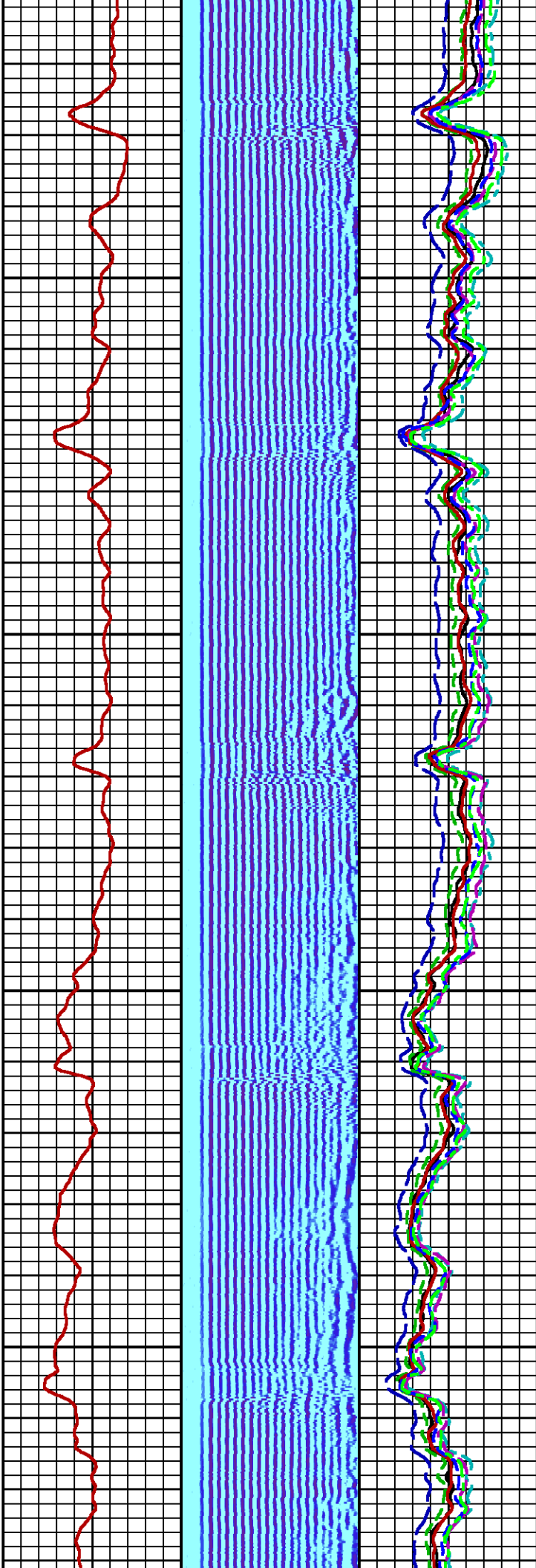


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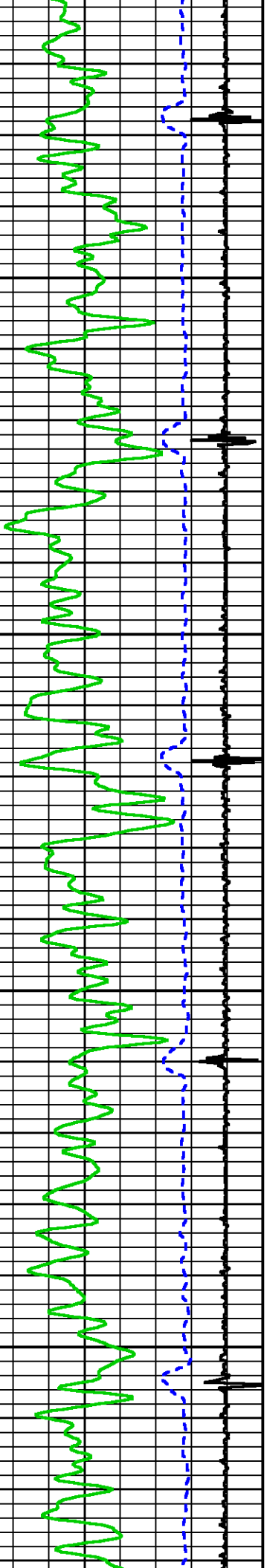




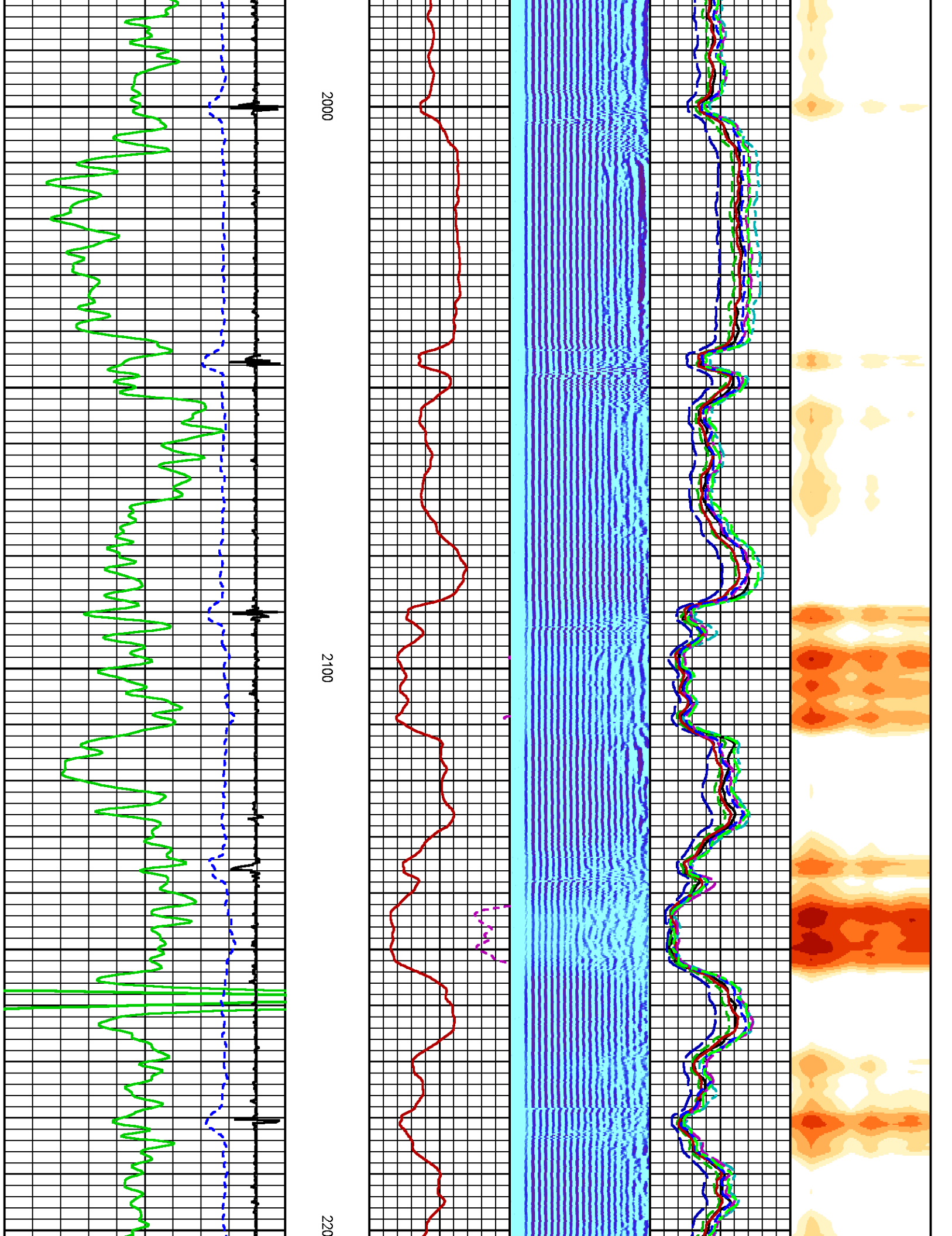


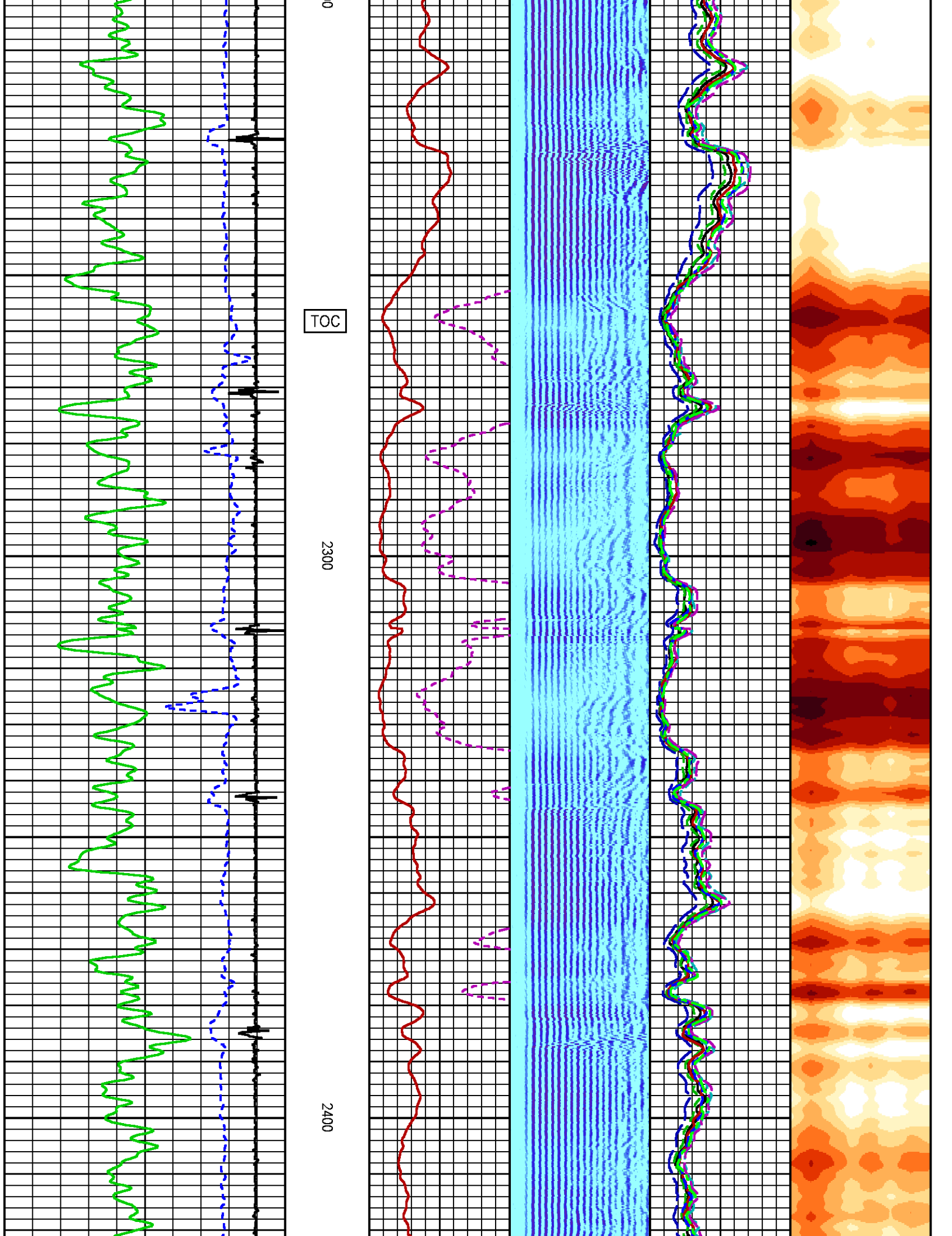
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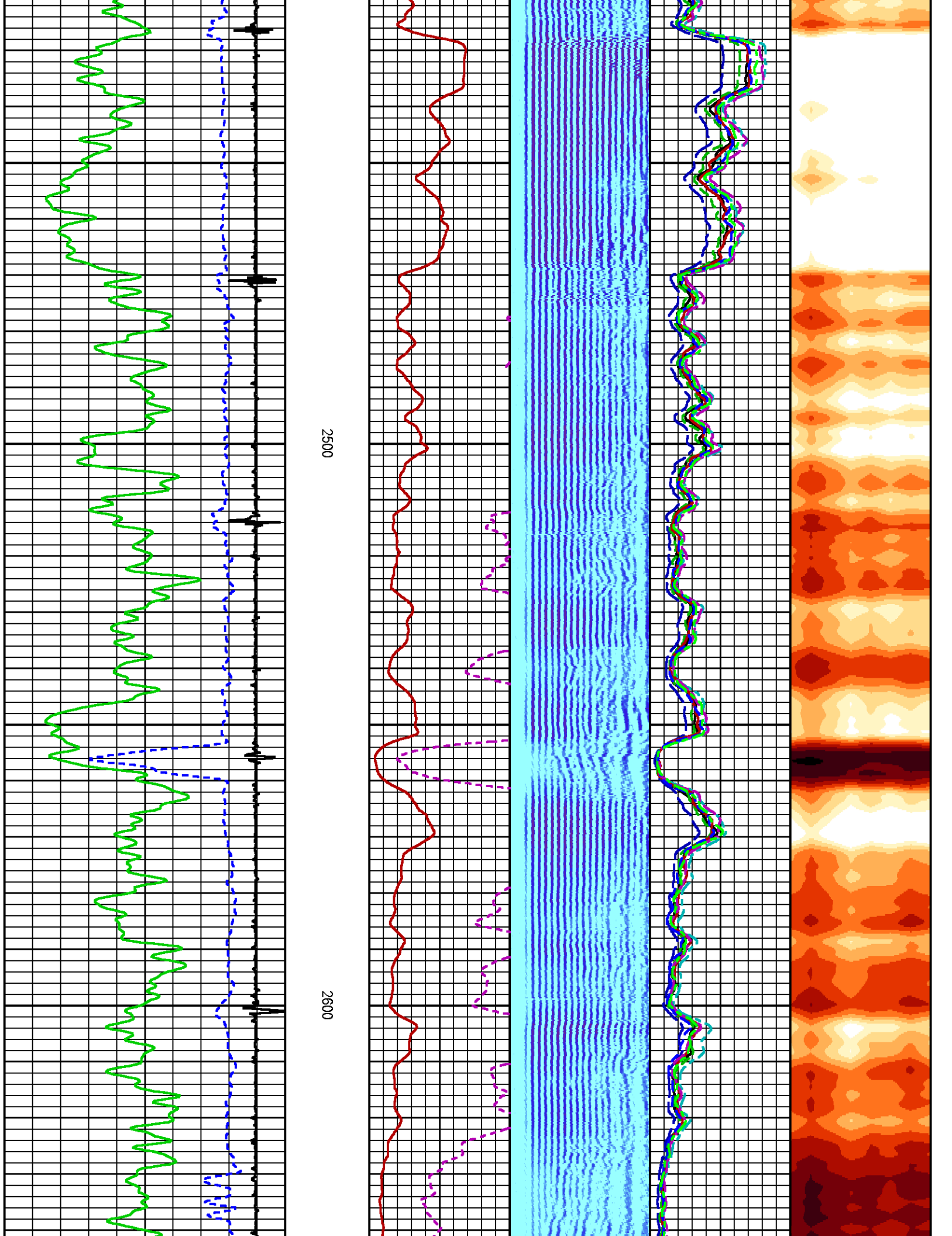


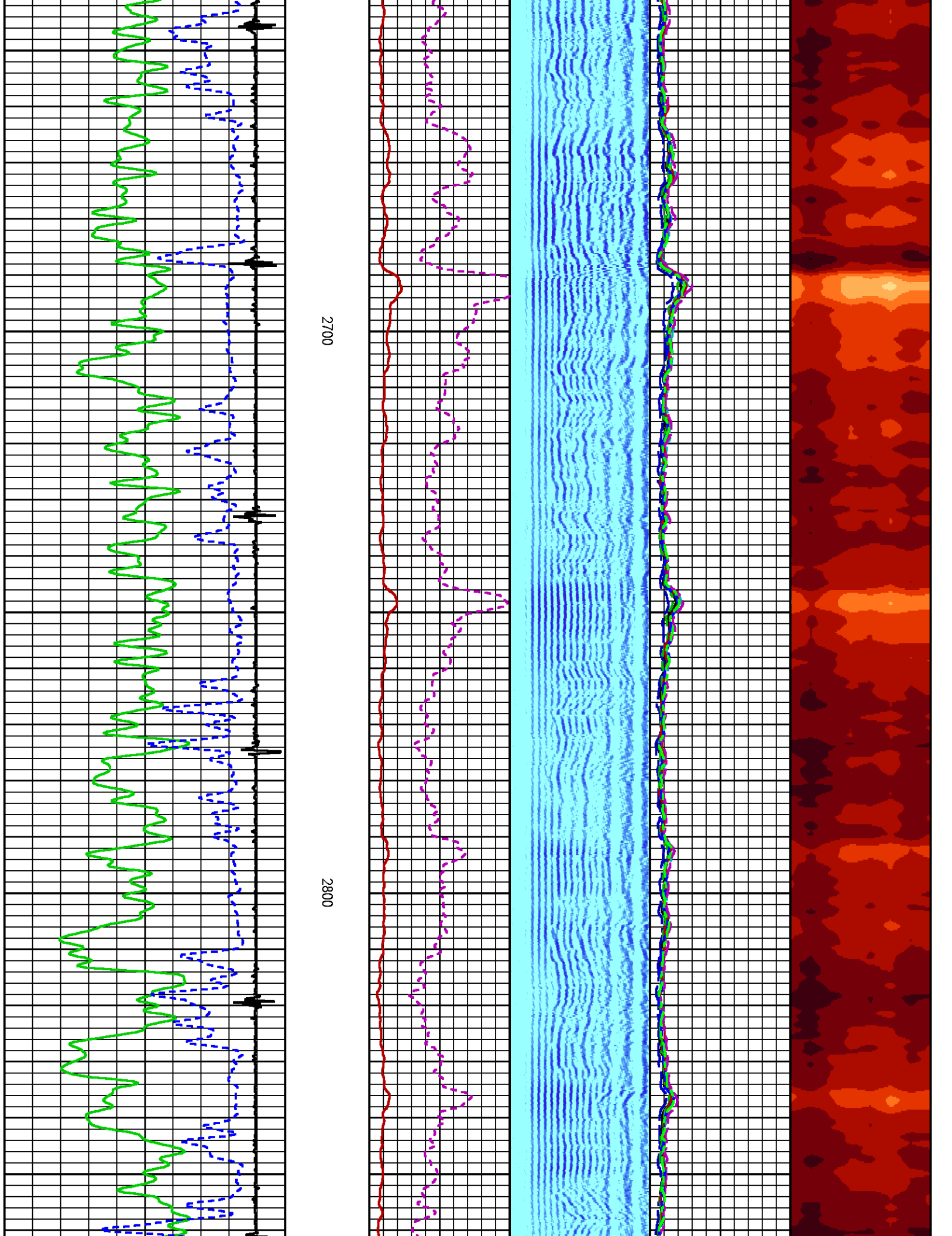


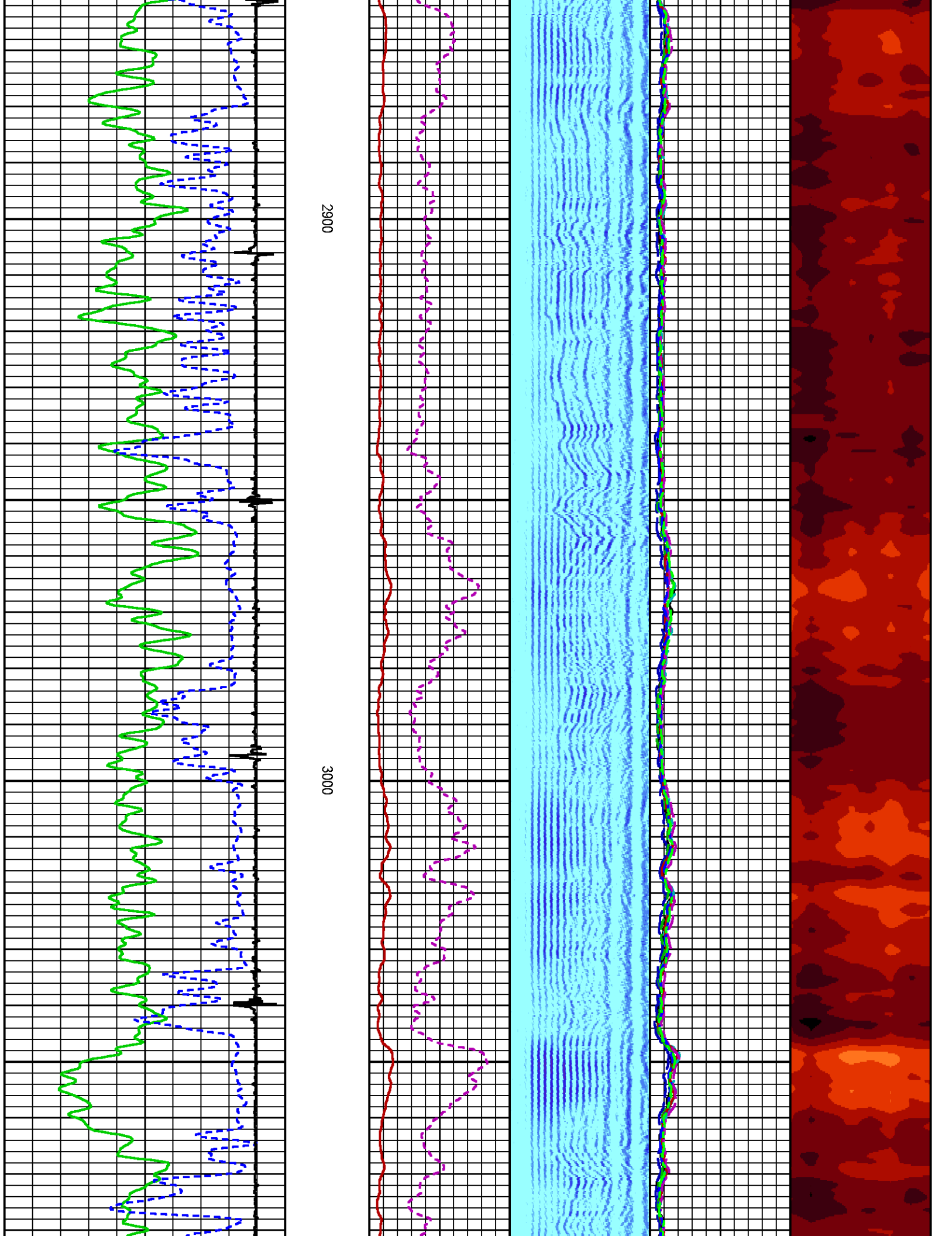


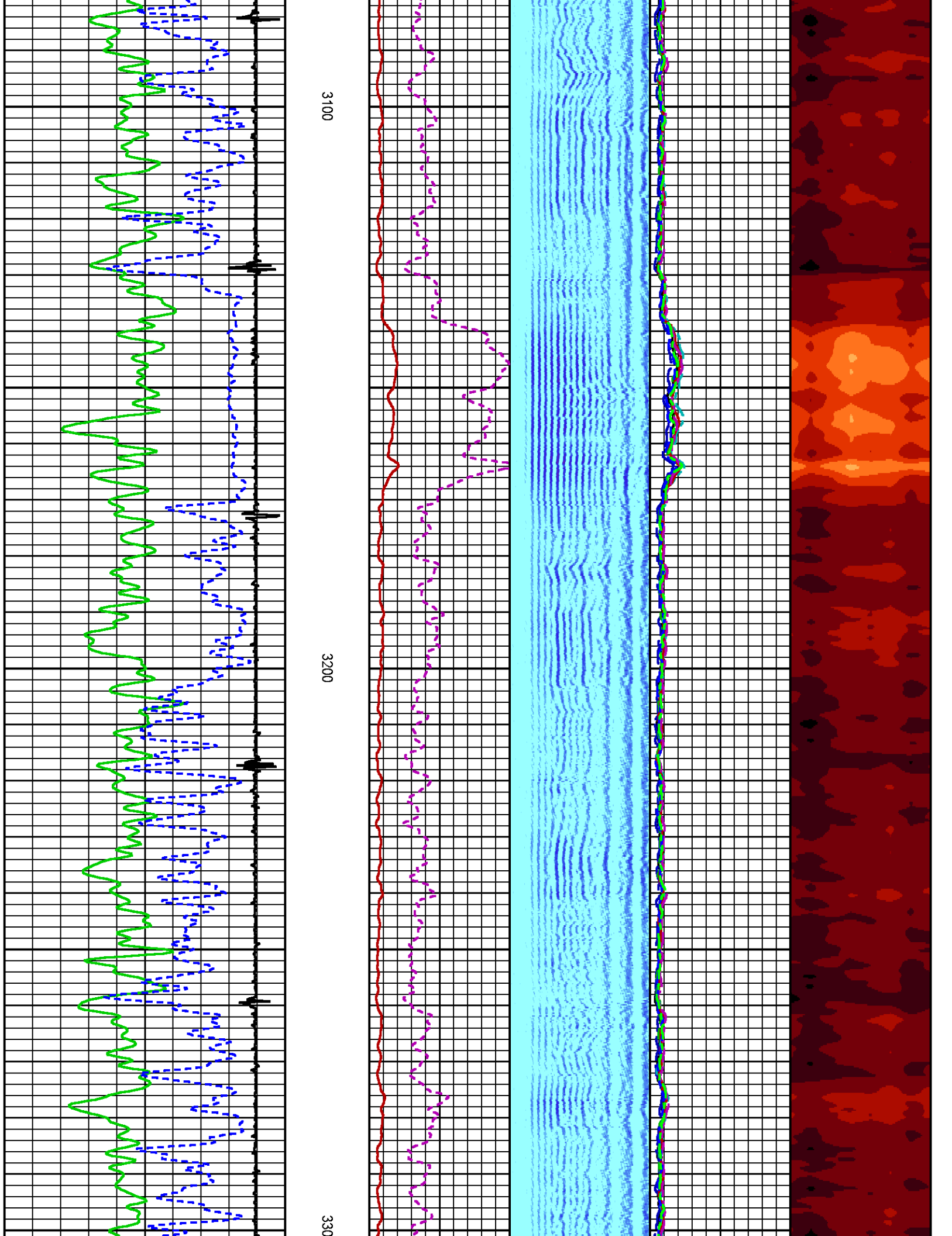




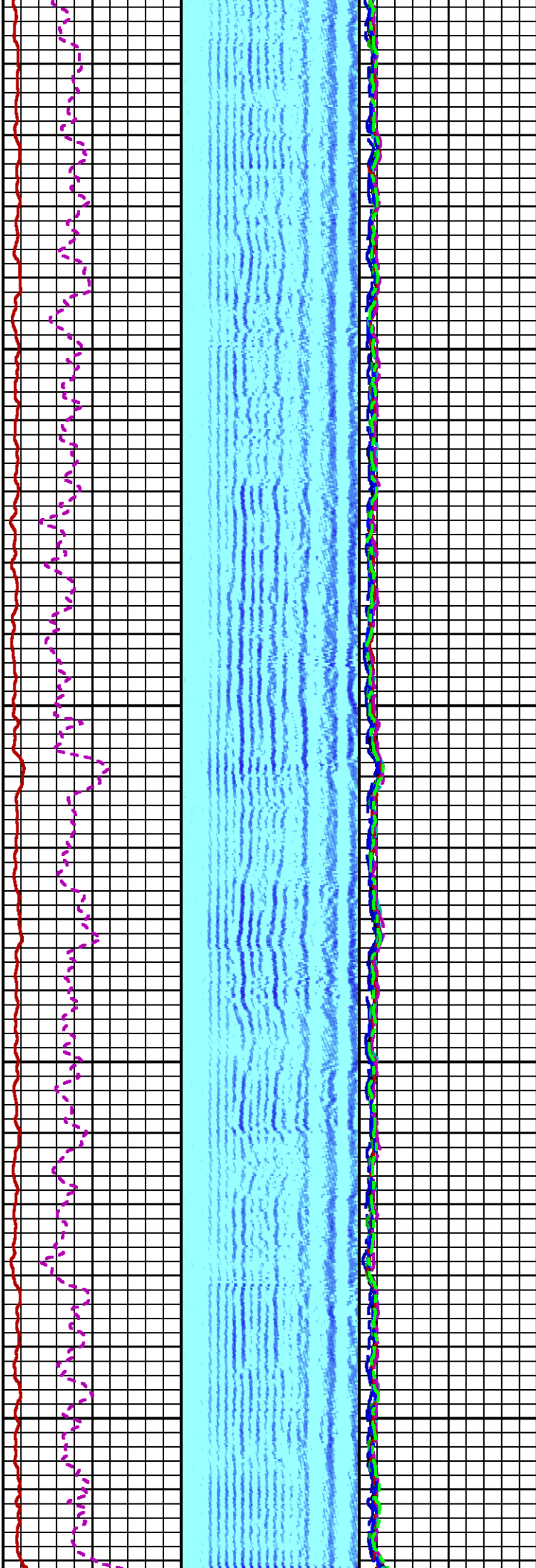




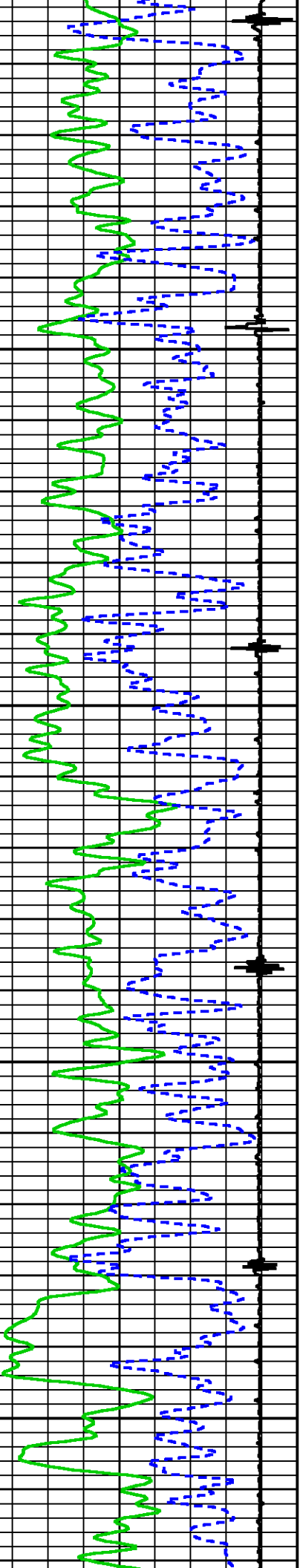


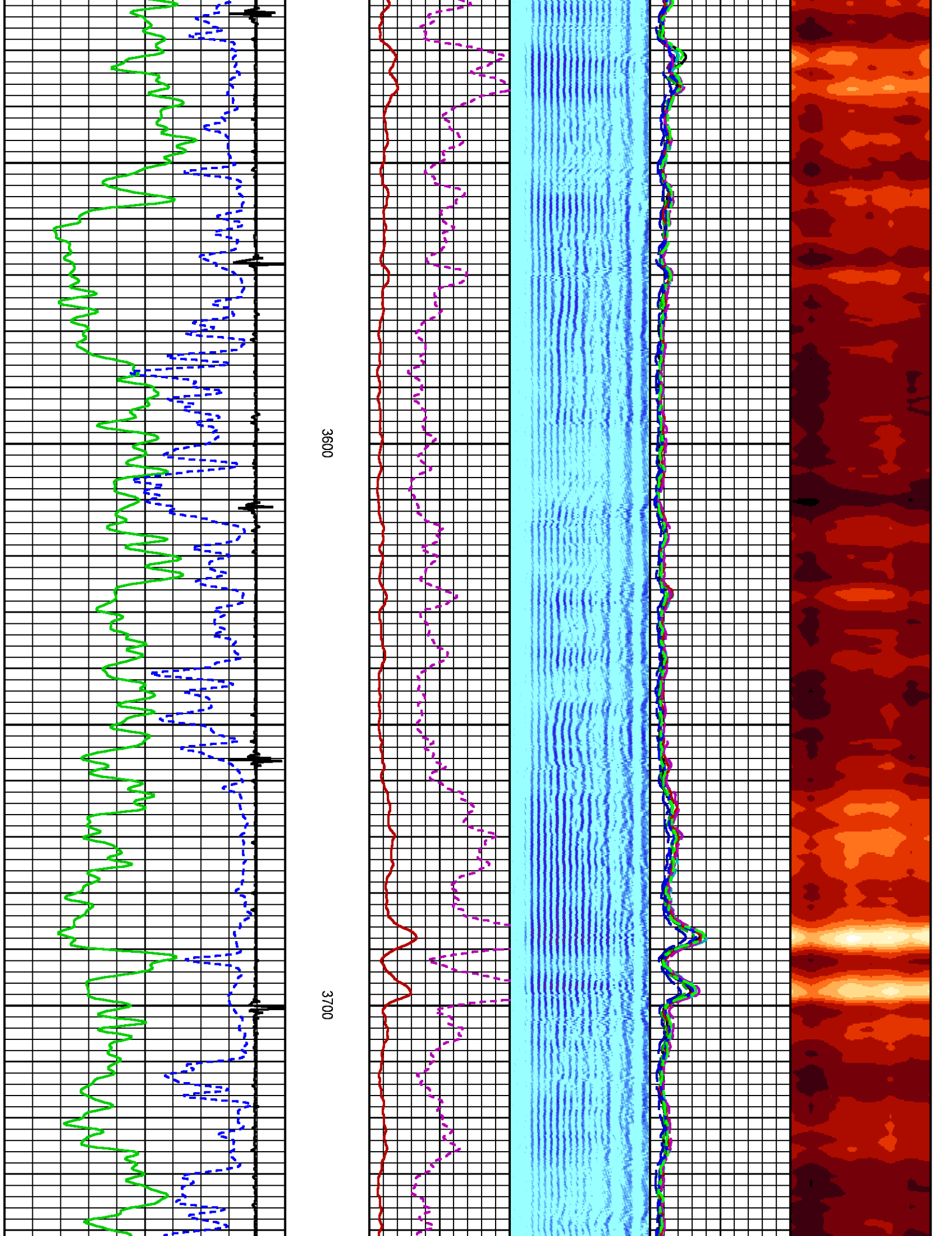




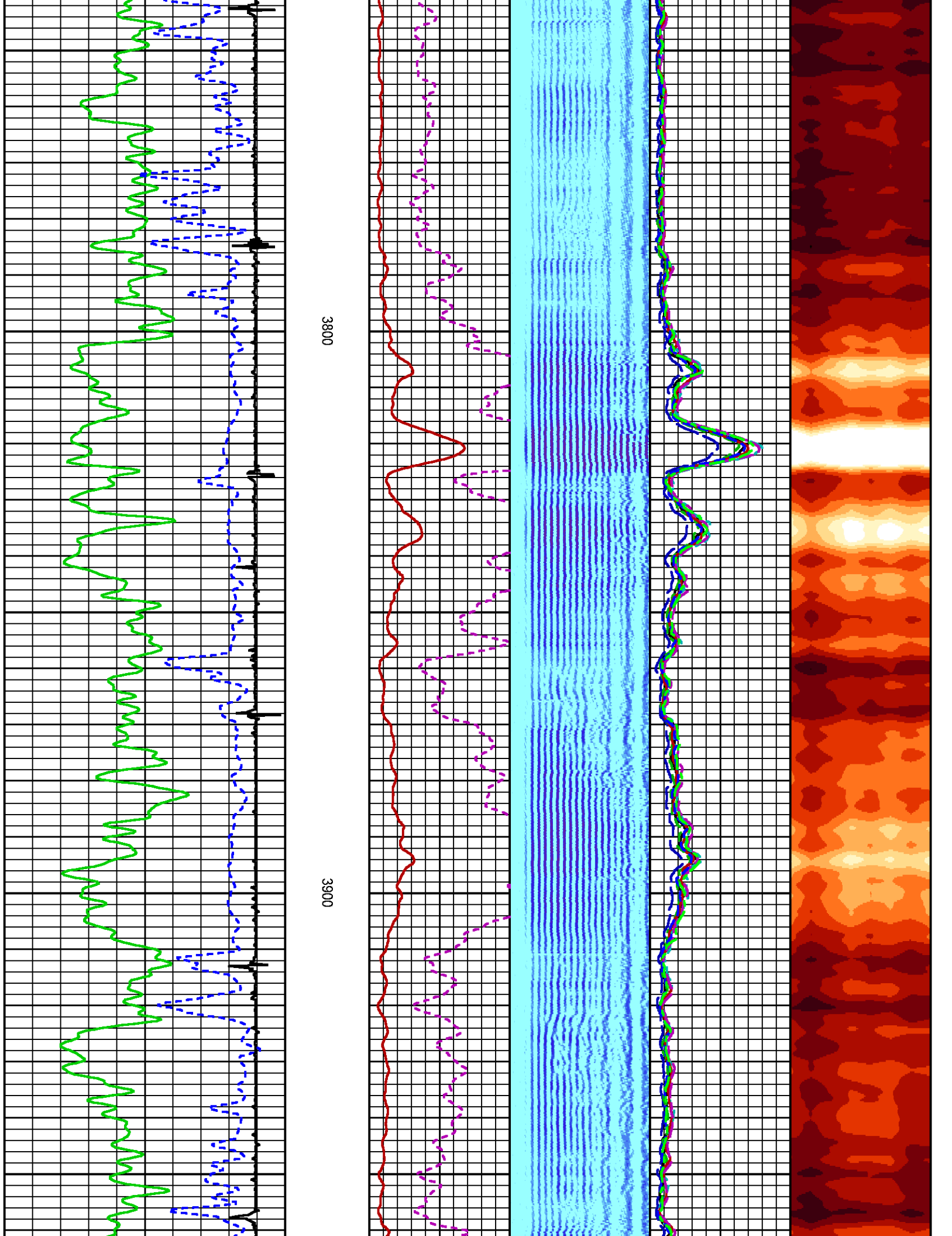


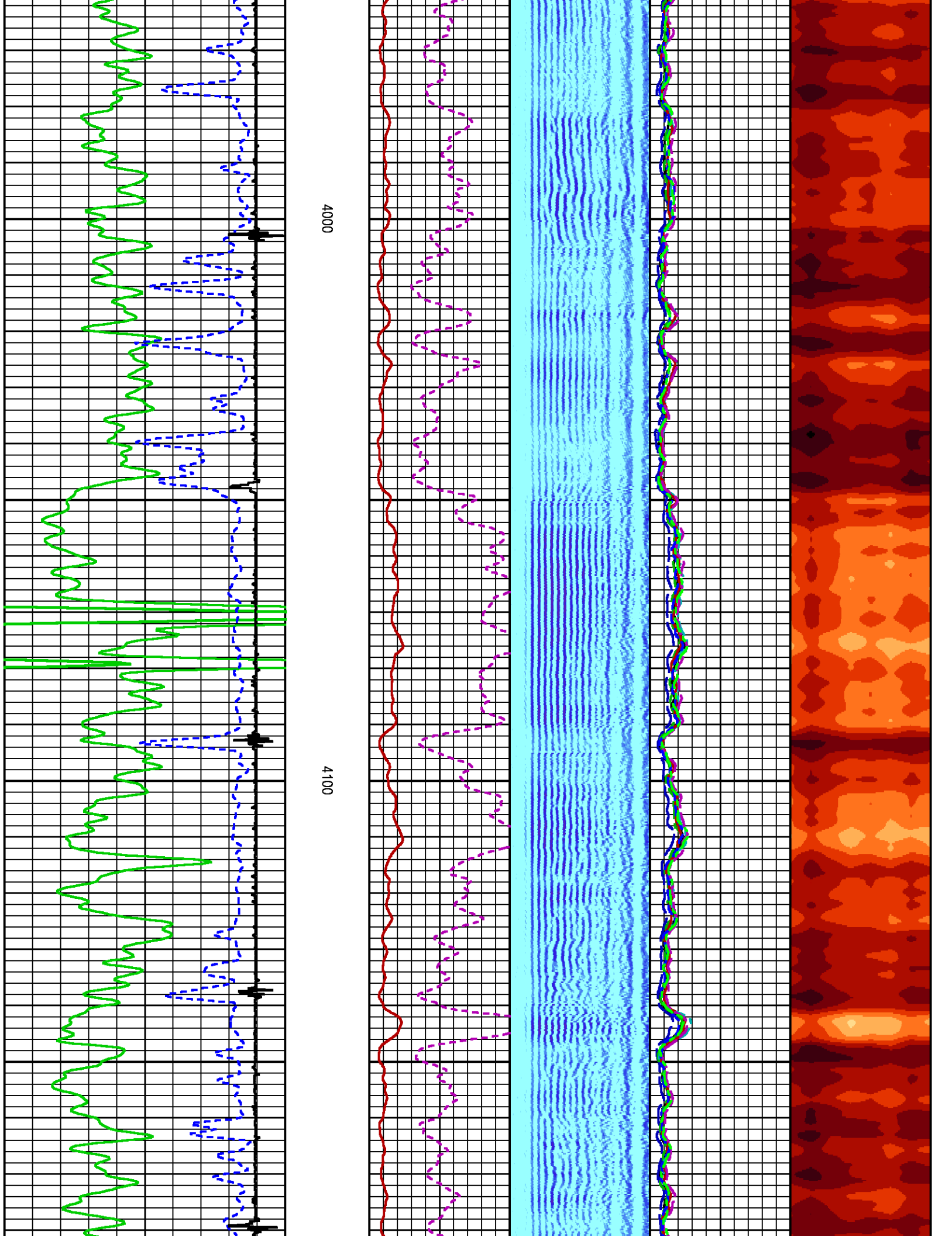
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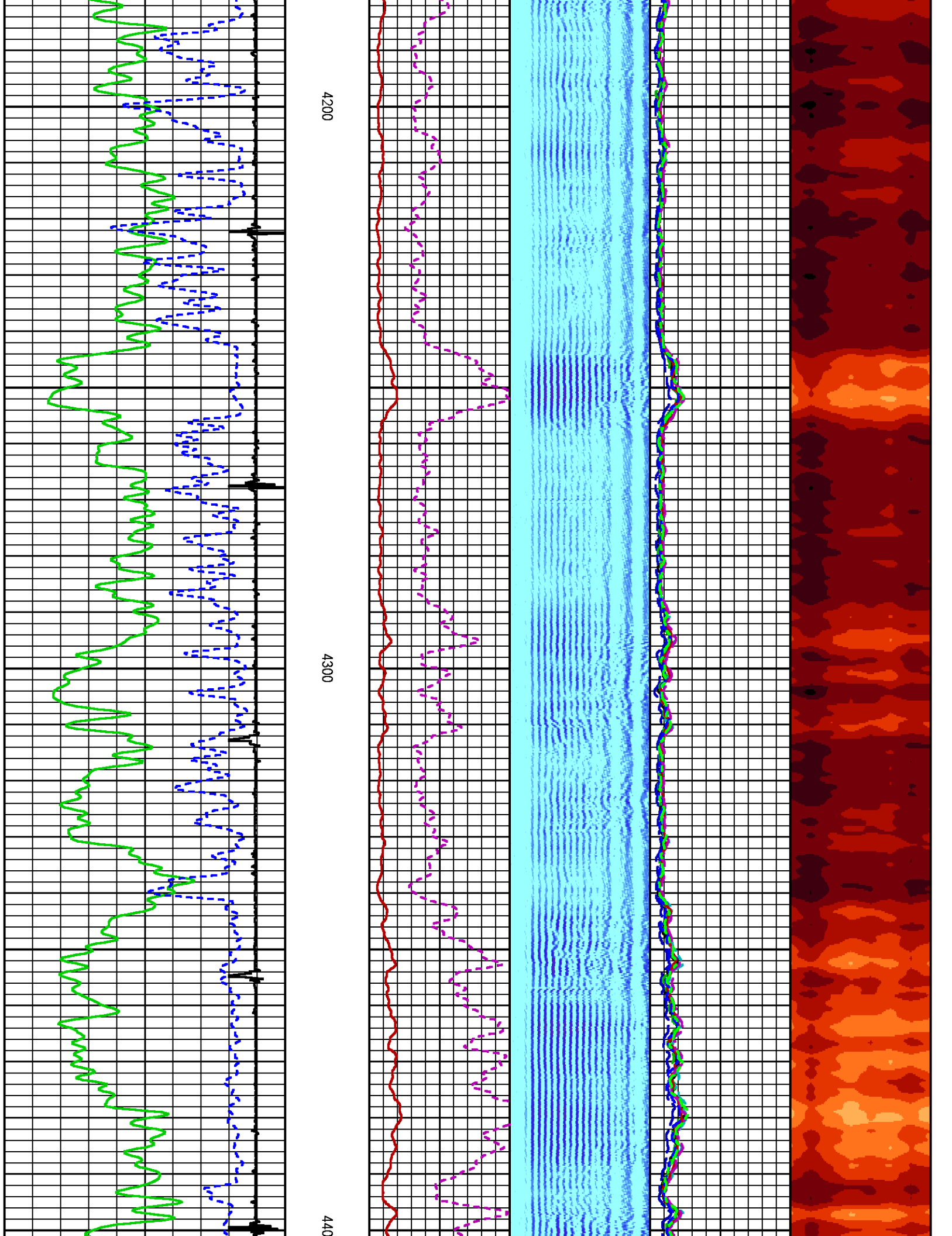


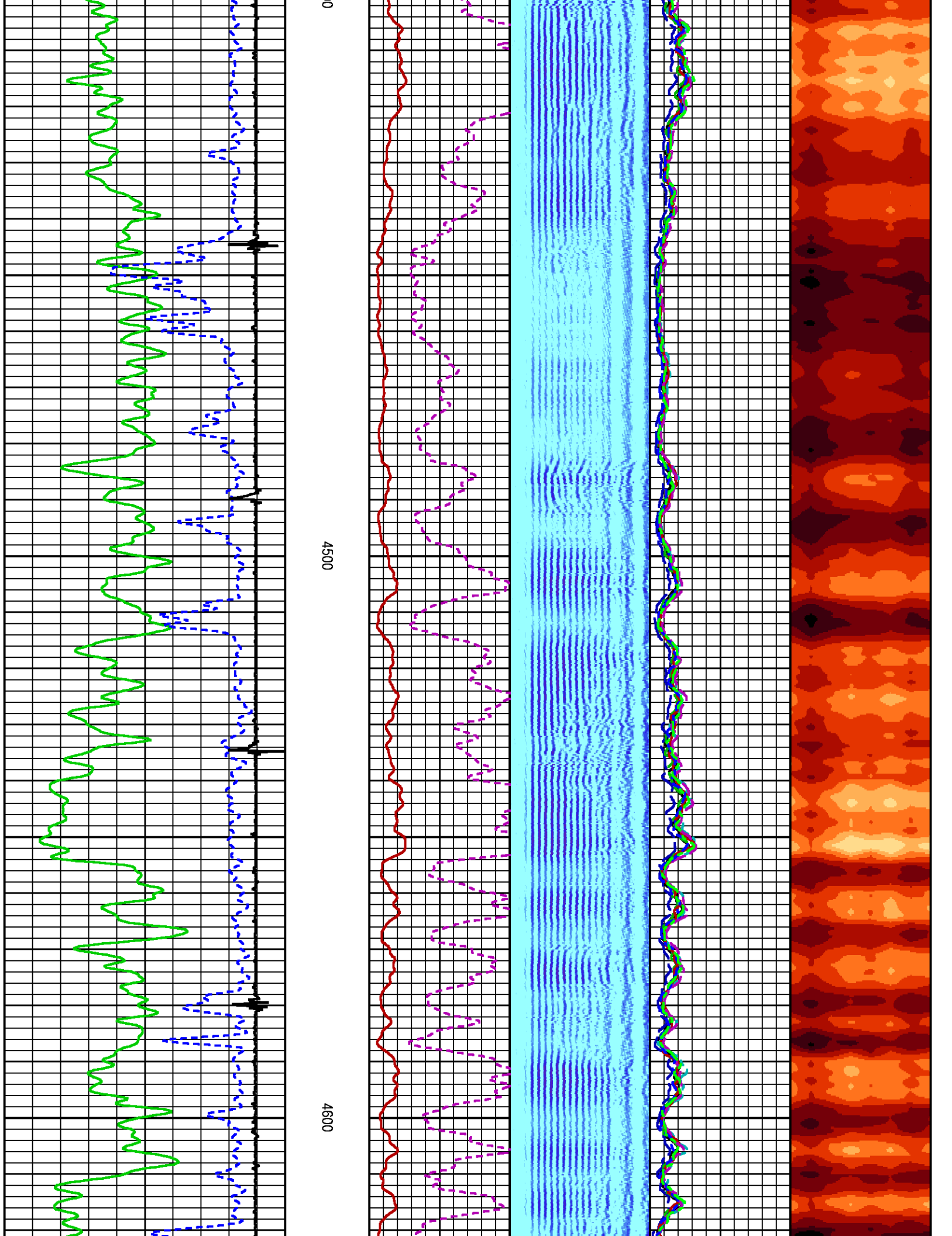




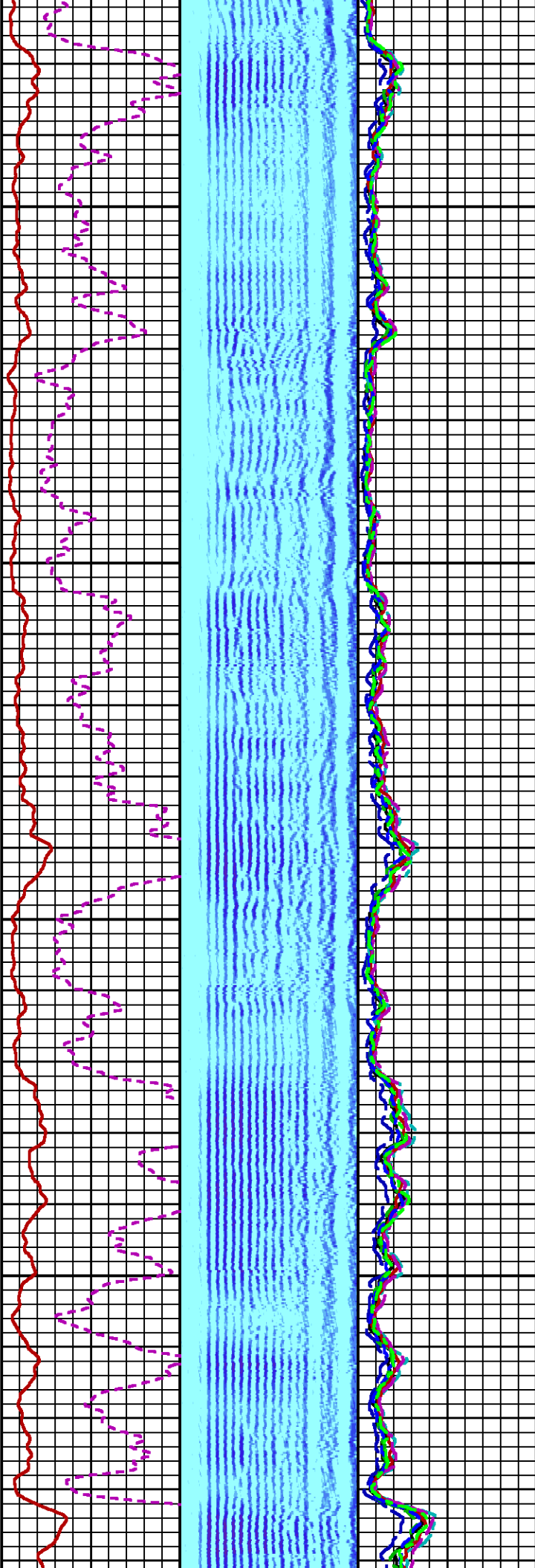
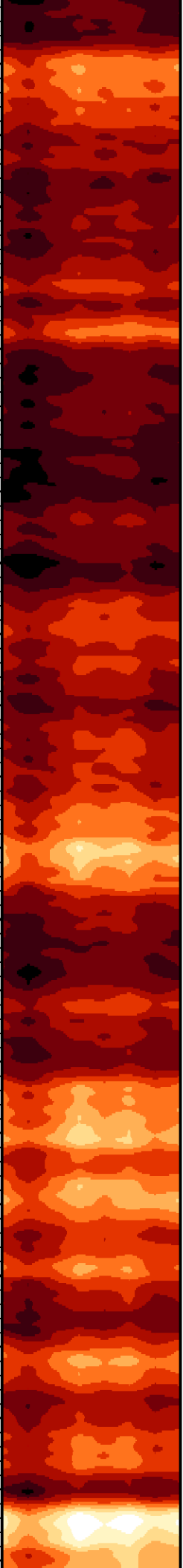






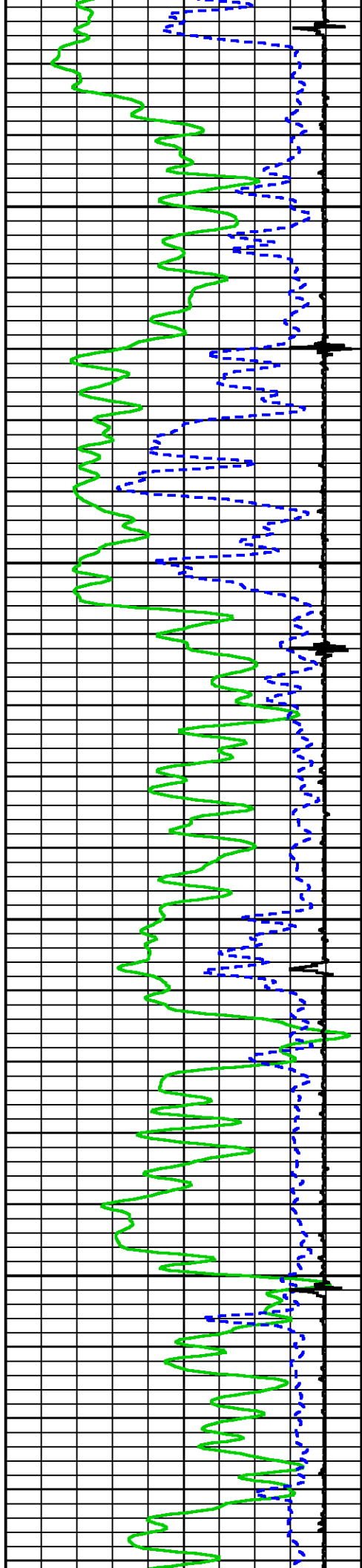


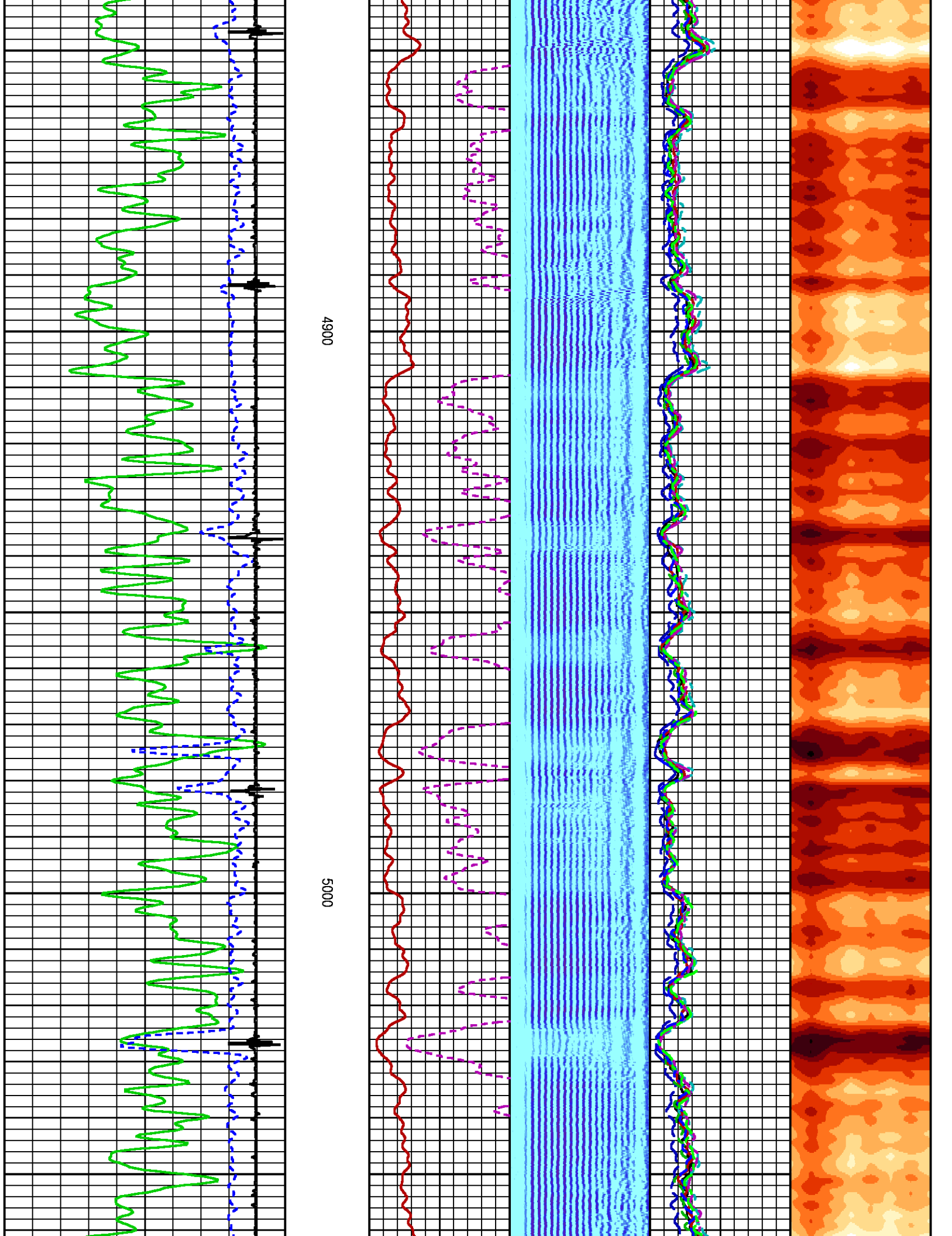




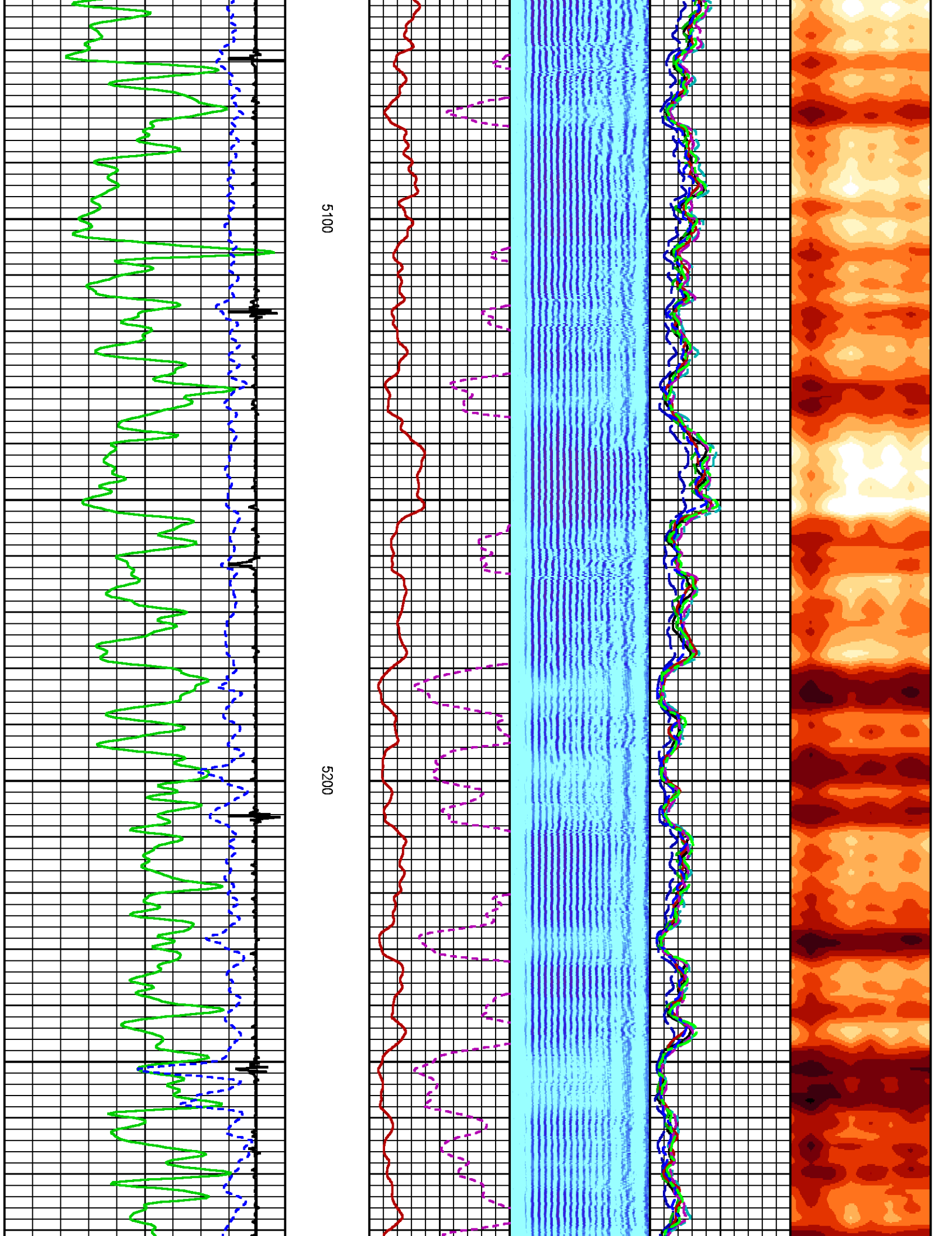
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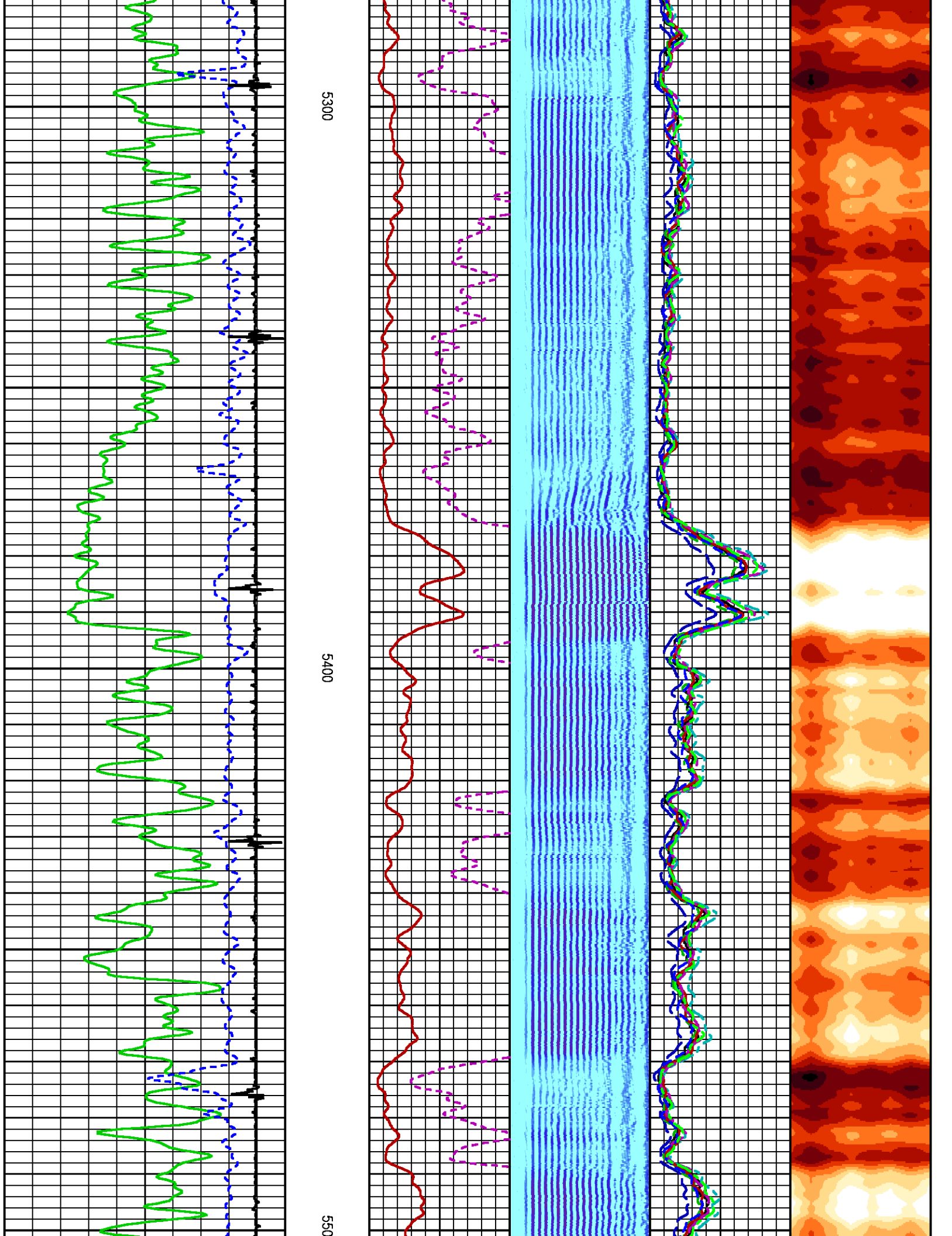
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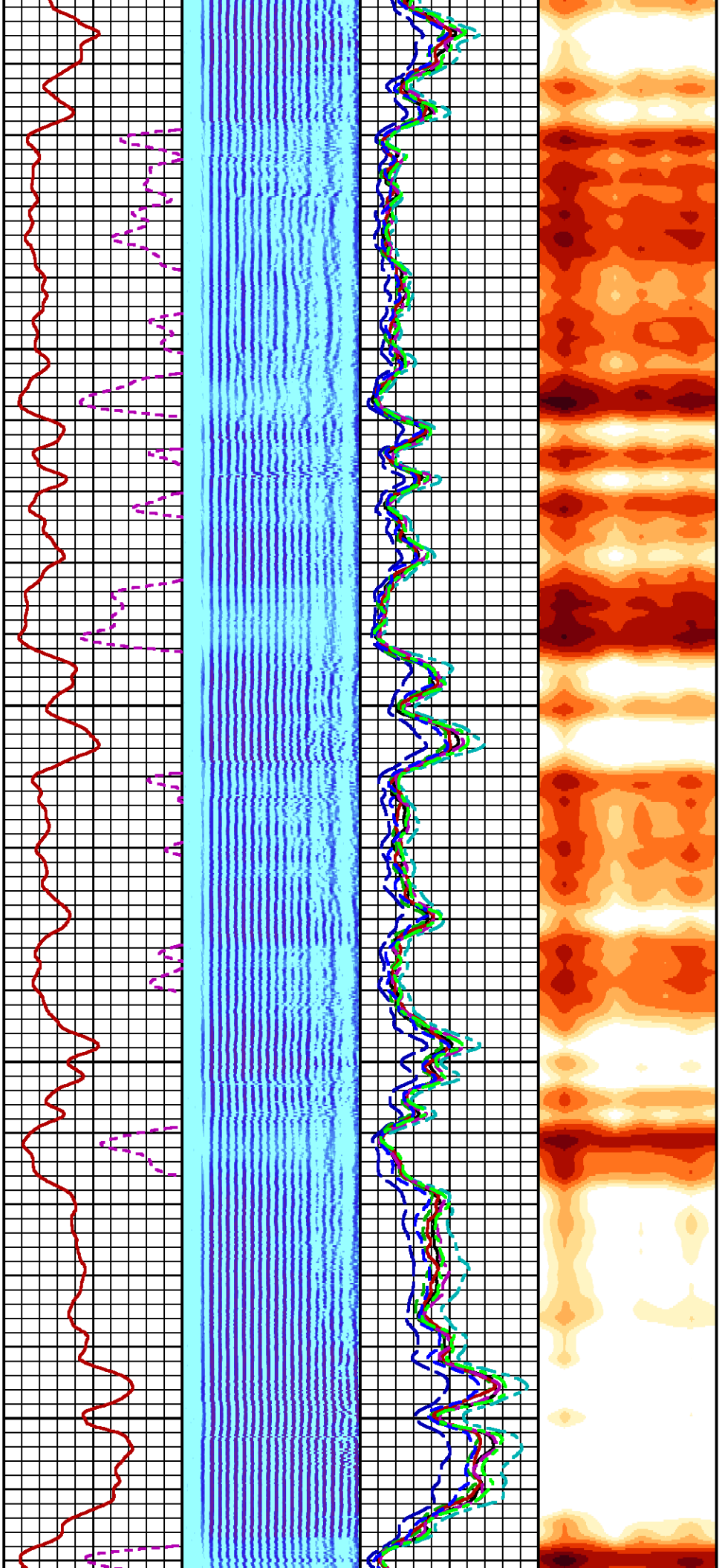








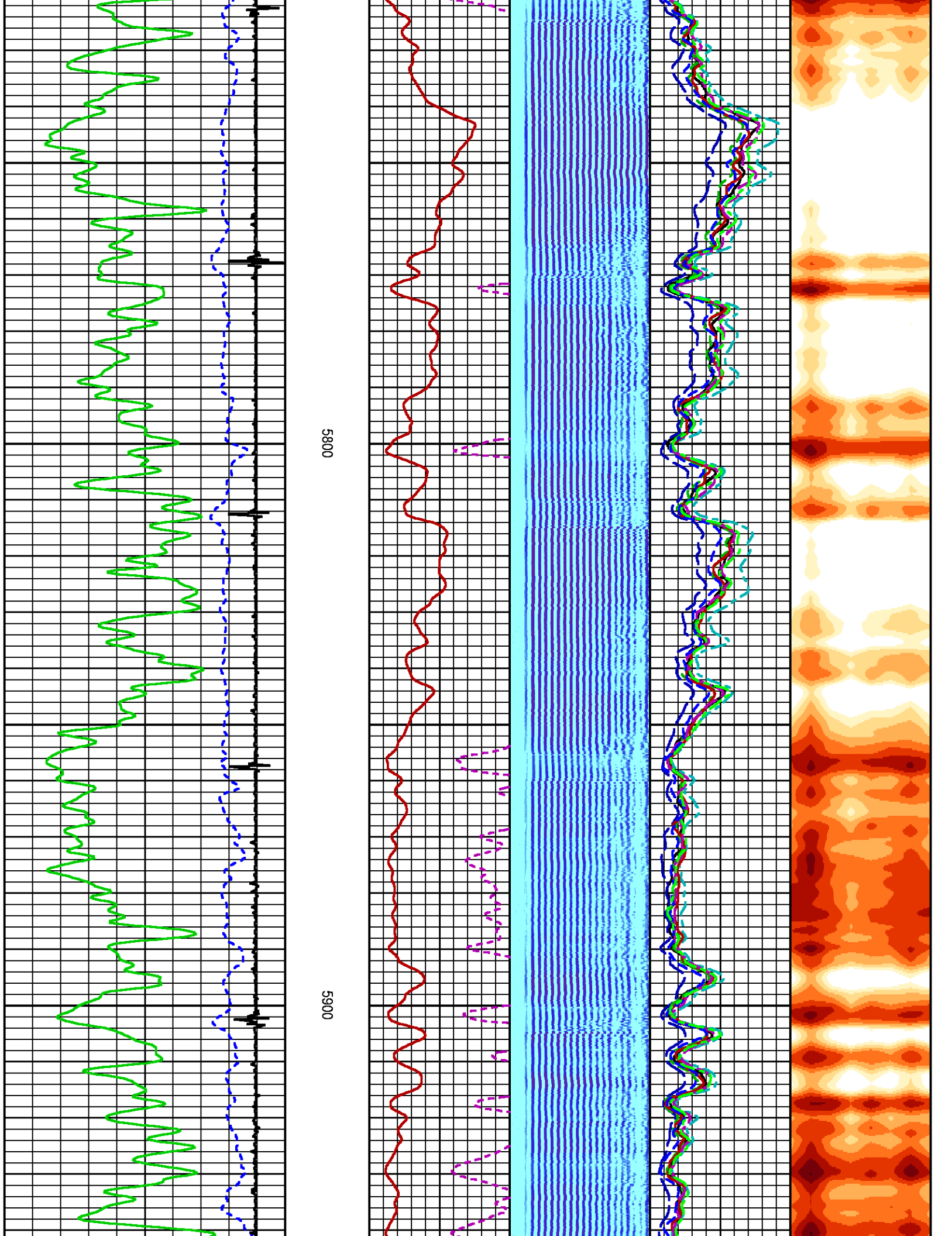




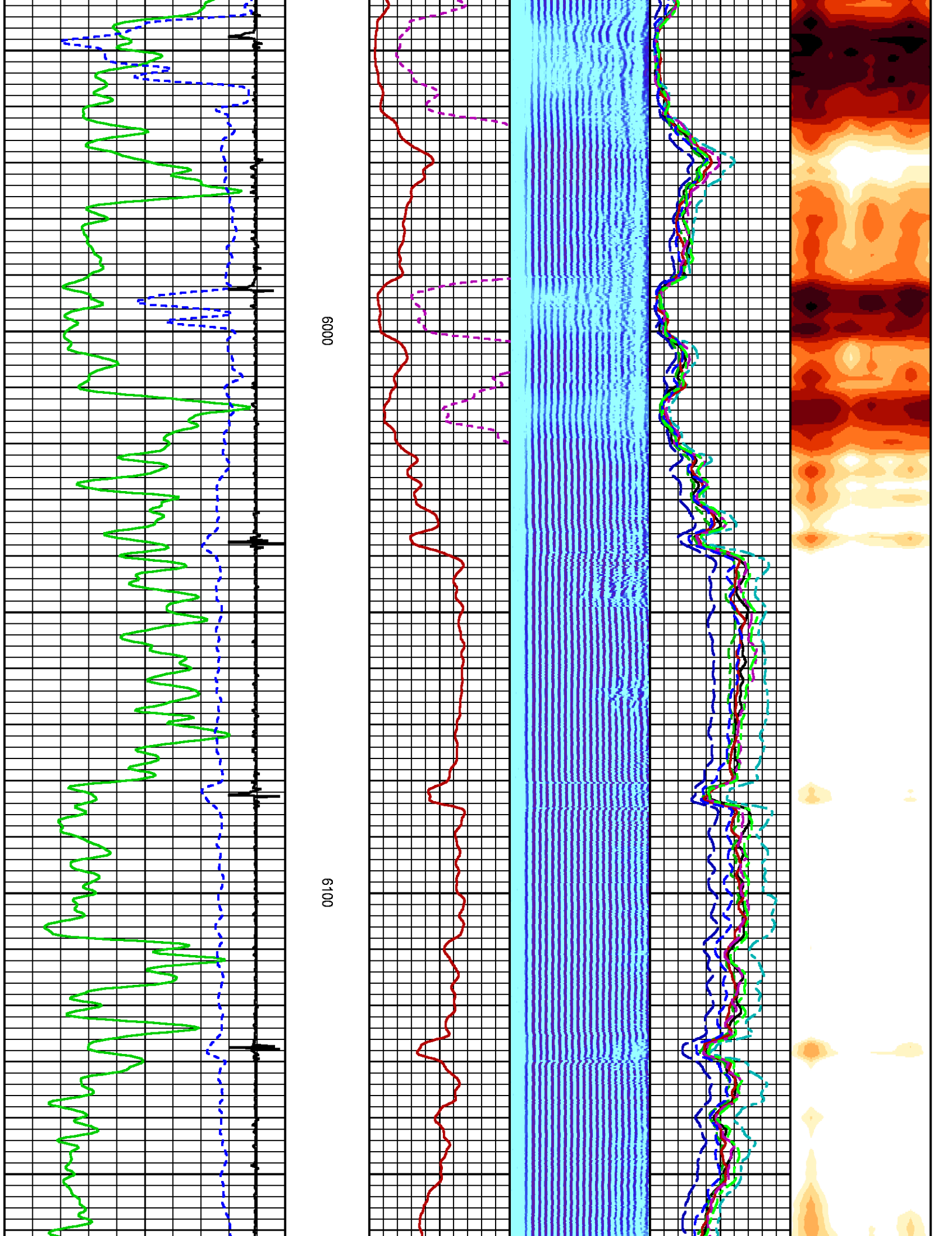
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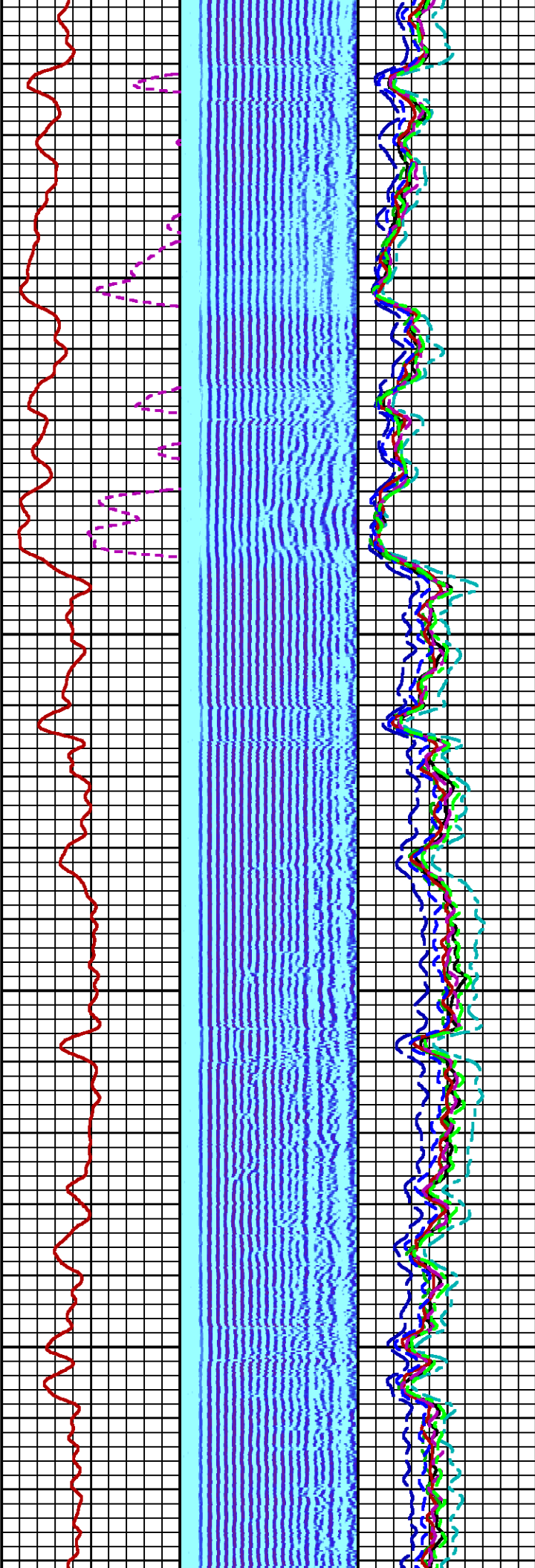
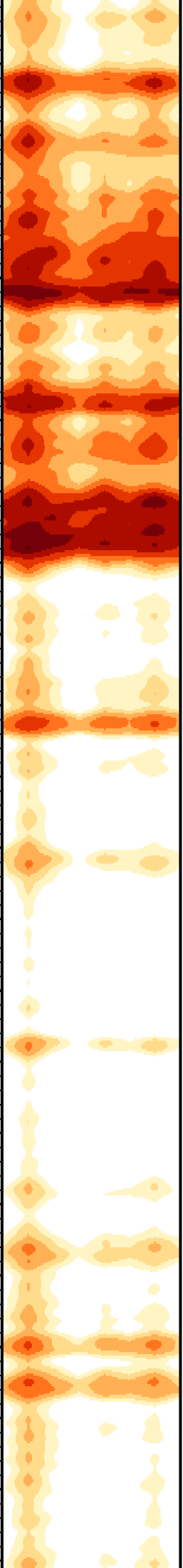
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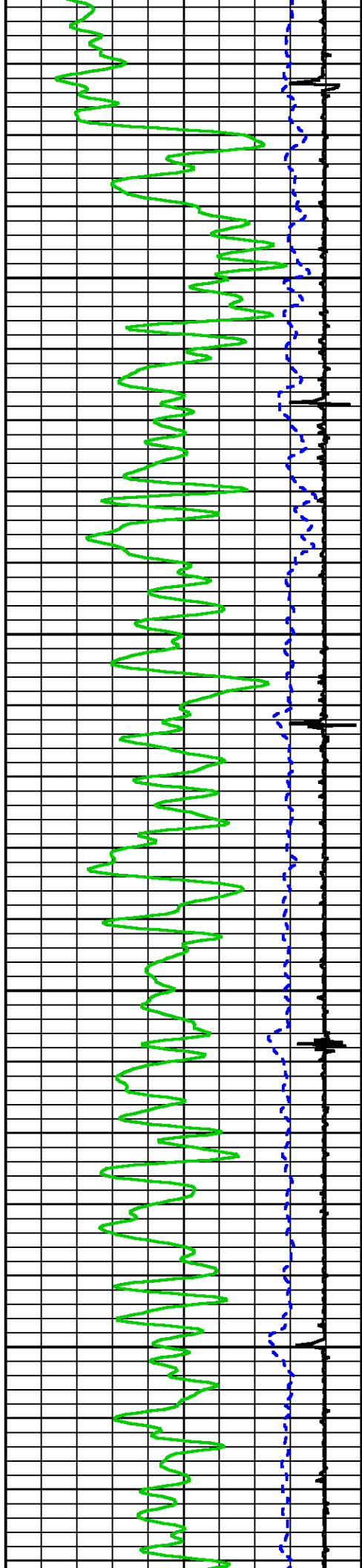




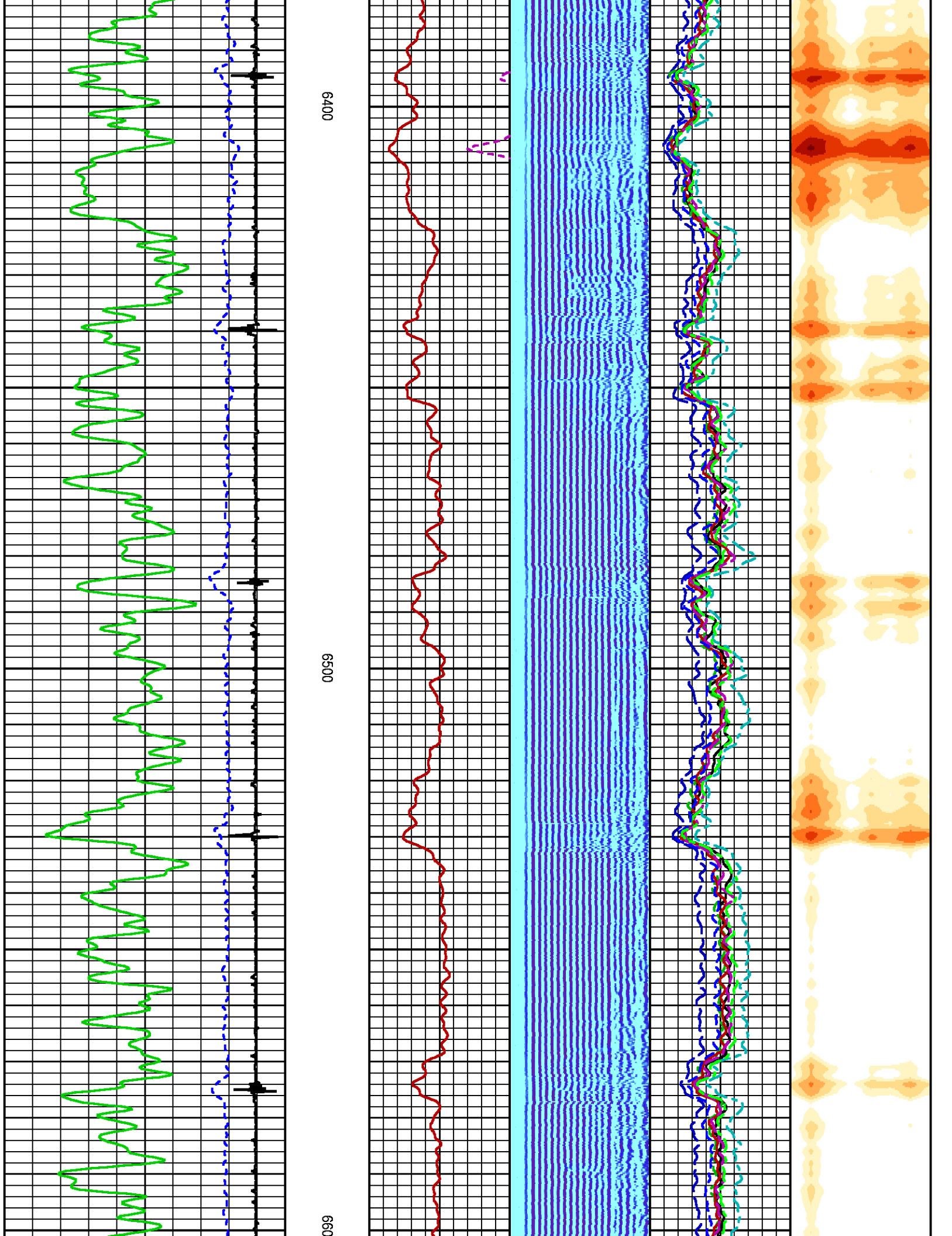


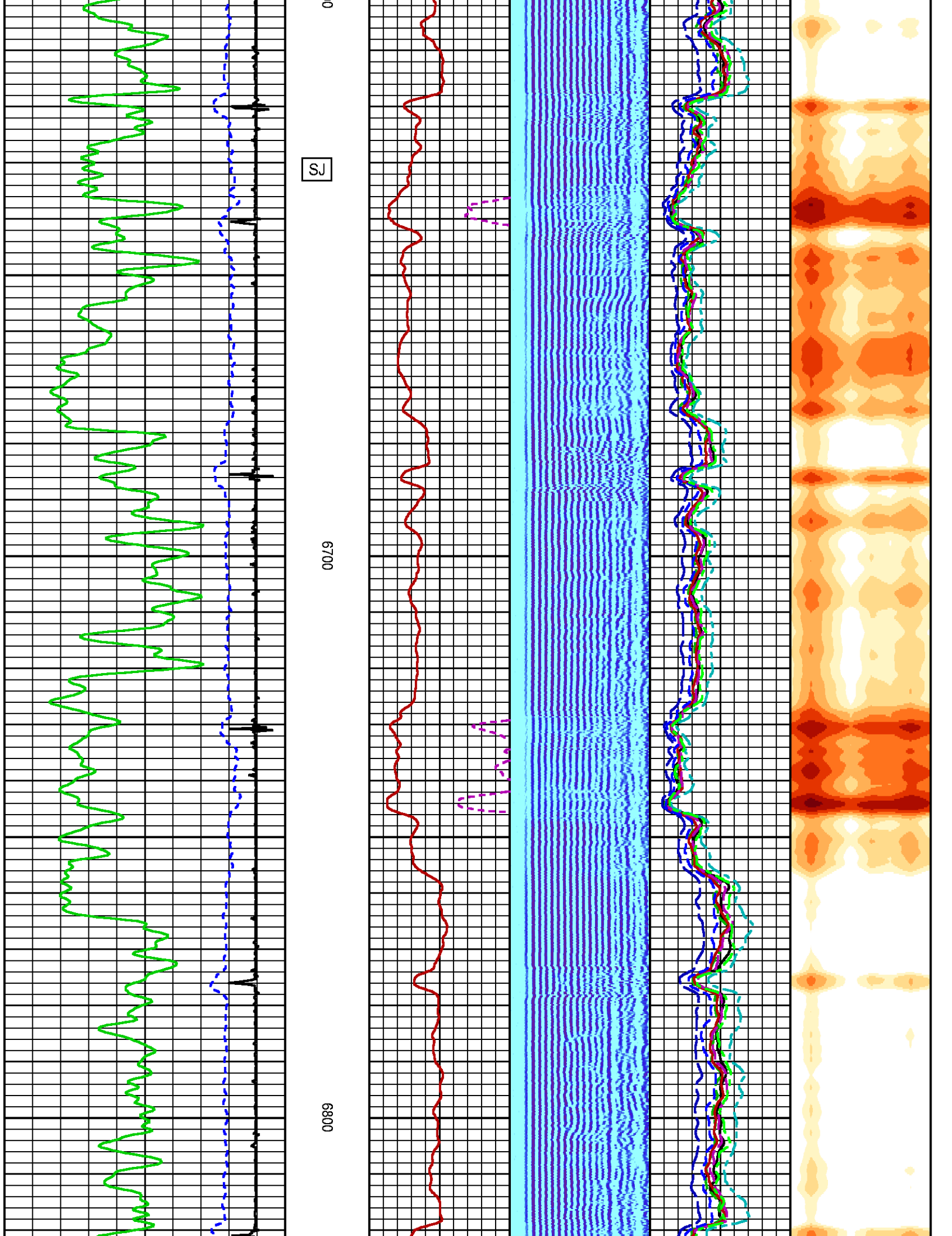
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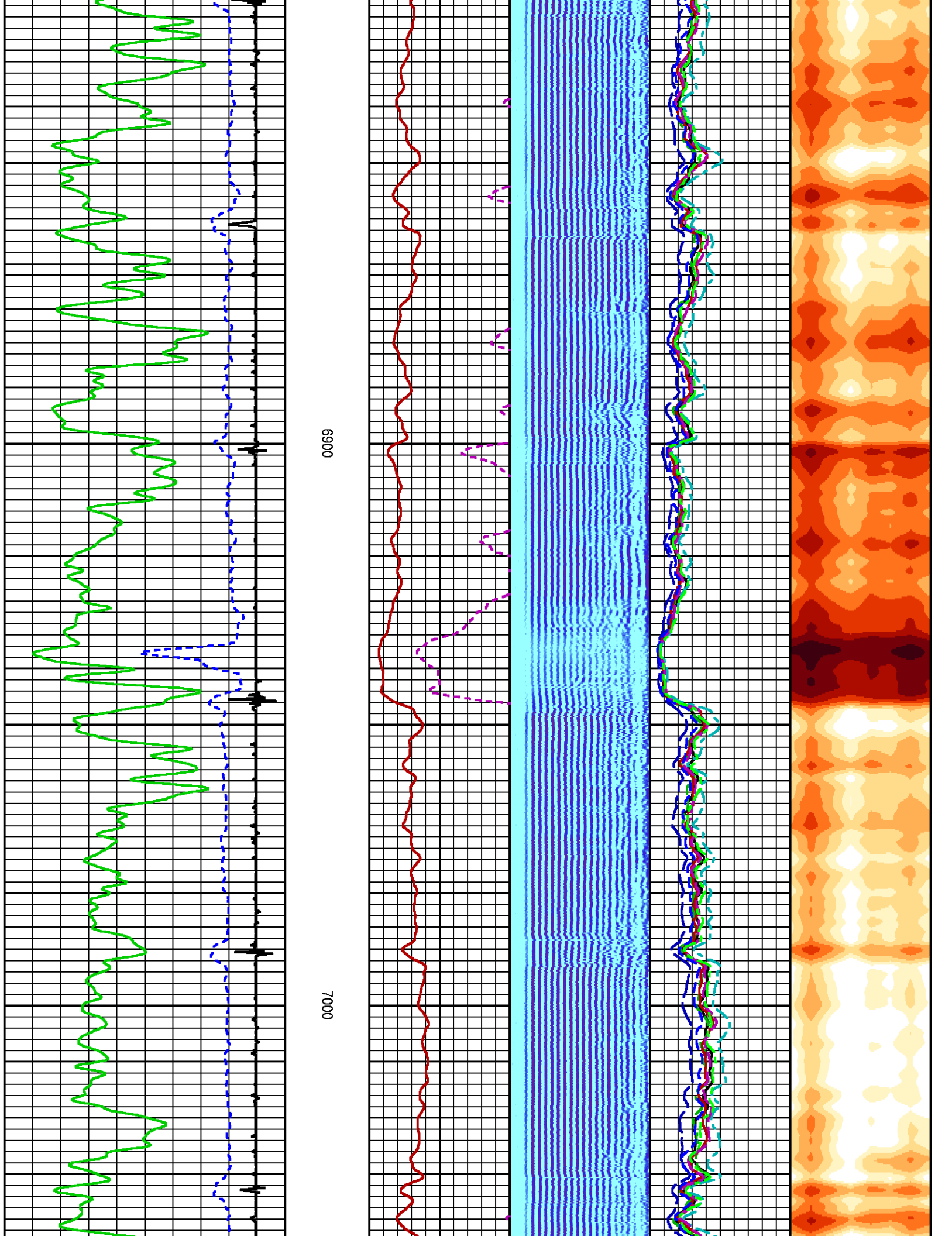
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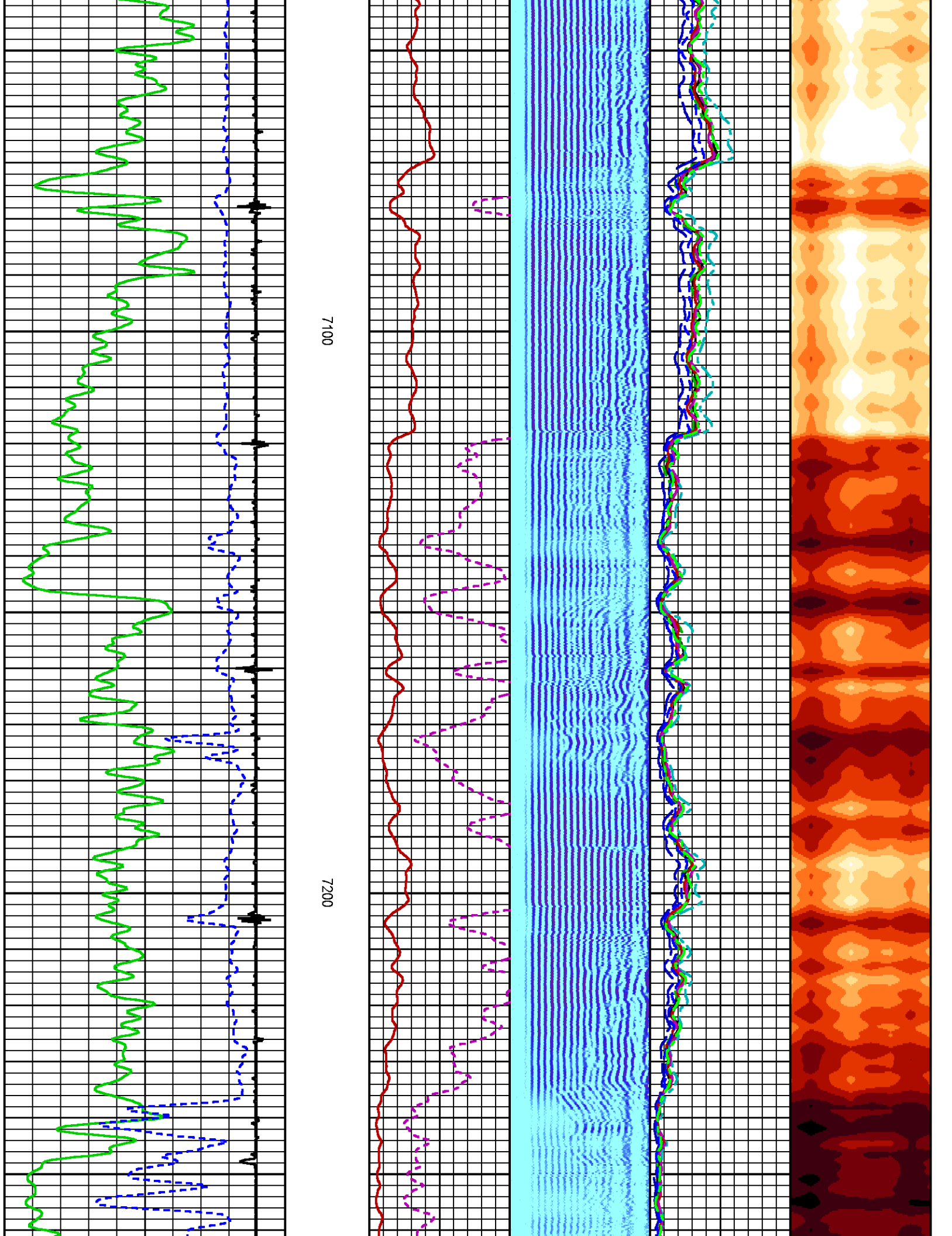




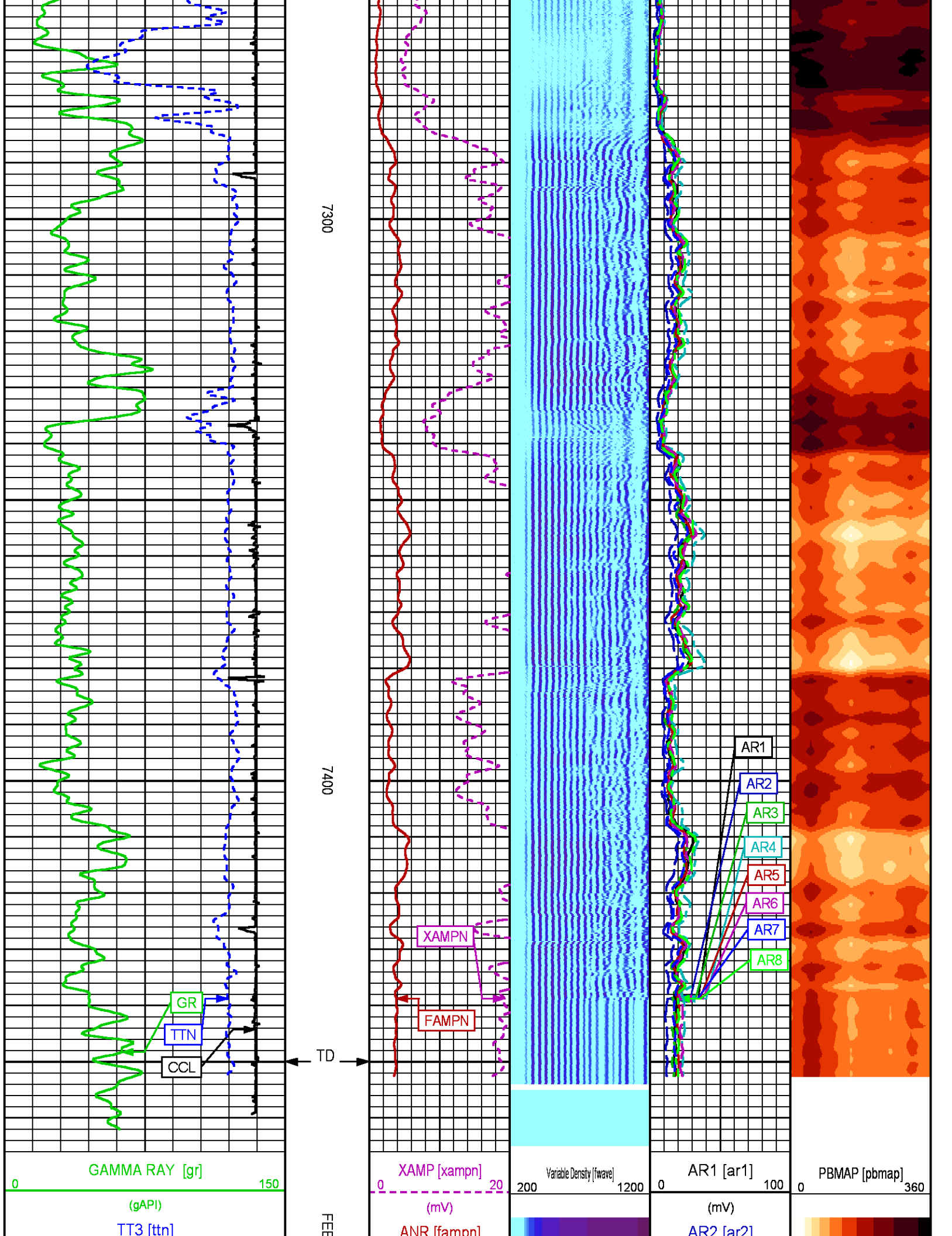


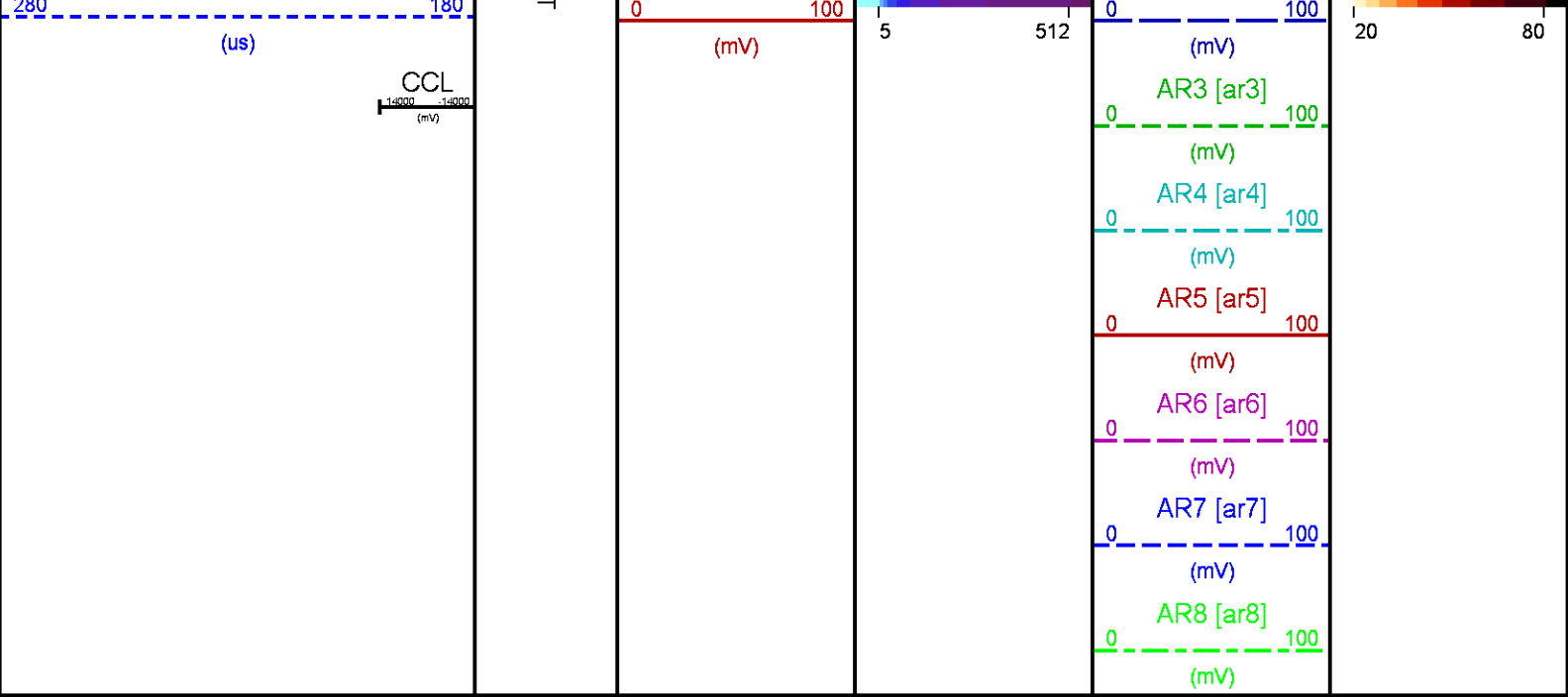












REPEAT PASS 0 PSI

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017  
Patches: 2

Plotted: Wed Jan 24 16:48:37 2018

PARAMETER AND FILTER SUMMARY REPORT					
FILE: /dat1a/LARAMIE_NICHOLS_0994_24_08E/p012gR04.prm LOGGING MODE: DEPTH DIRECTION: UP TOP DEPTH: 7232.250 ft BOTTOM DEPTH: 7463.750 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	0.00		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	"	"

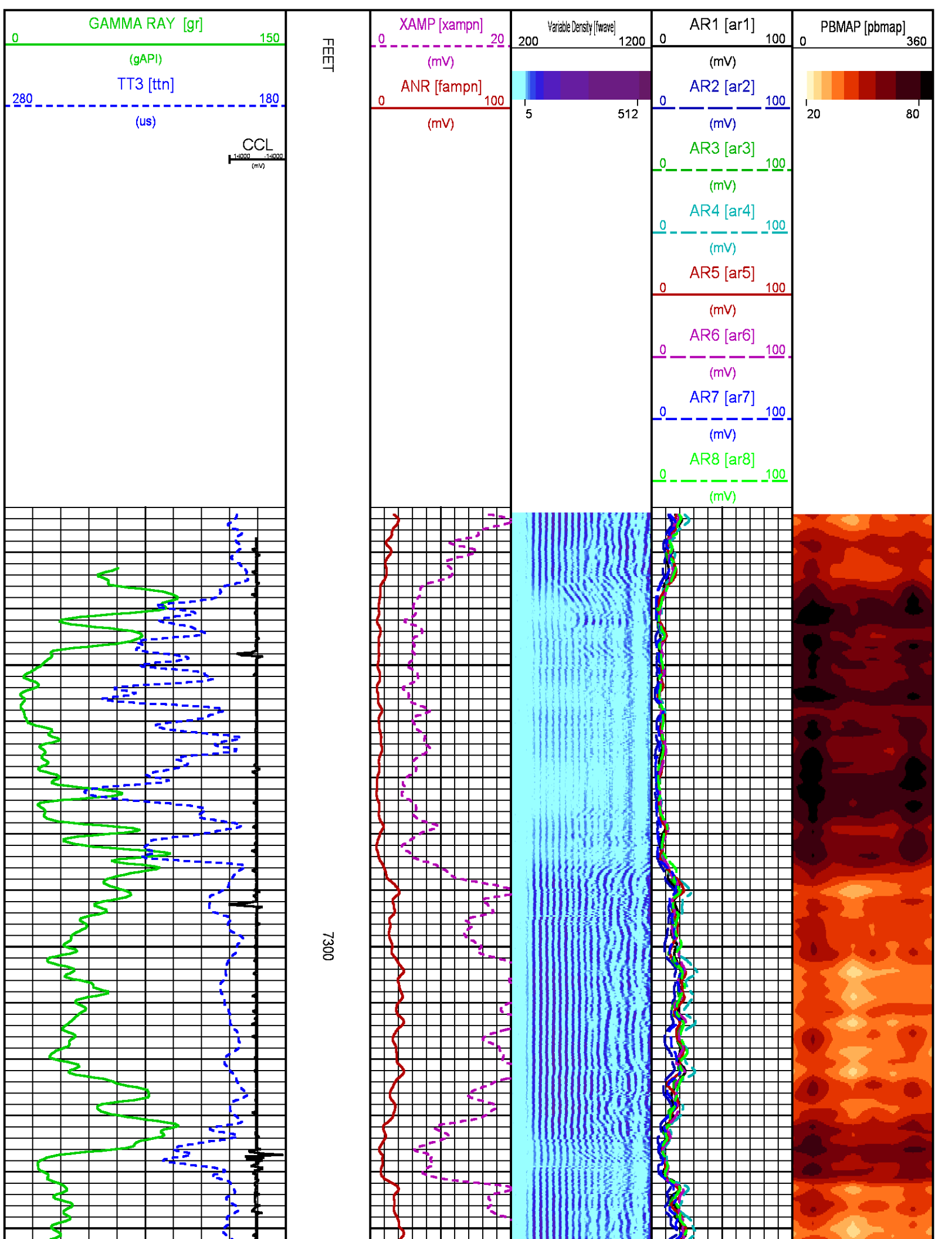
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	160	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	6	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	200.391	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-62	us	"	"
	TOOL DELAY (str2*)	-62	us	"	"
	TOOL DELAY (str3*)	-62	us	"	"
	TOOL DELAY (str4*)	-62	us	"	"
	TOOL DELAY (str5*)	-62	us	"	"
	TOOL DELAY (str6*)	-62	us	"	"
	TOOL DELAY (str7*)	-62	us	"	"
	TOOL DELAY (str8*)	-62	us	"	"
BASELINE NOISE (NEAR)	TOOL DELAY (strn*)	-62	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	"	"

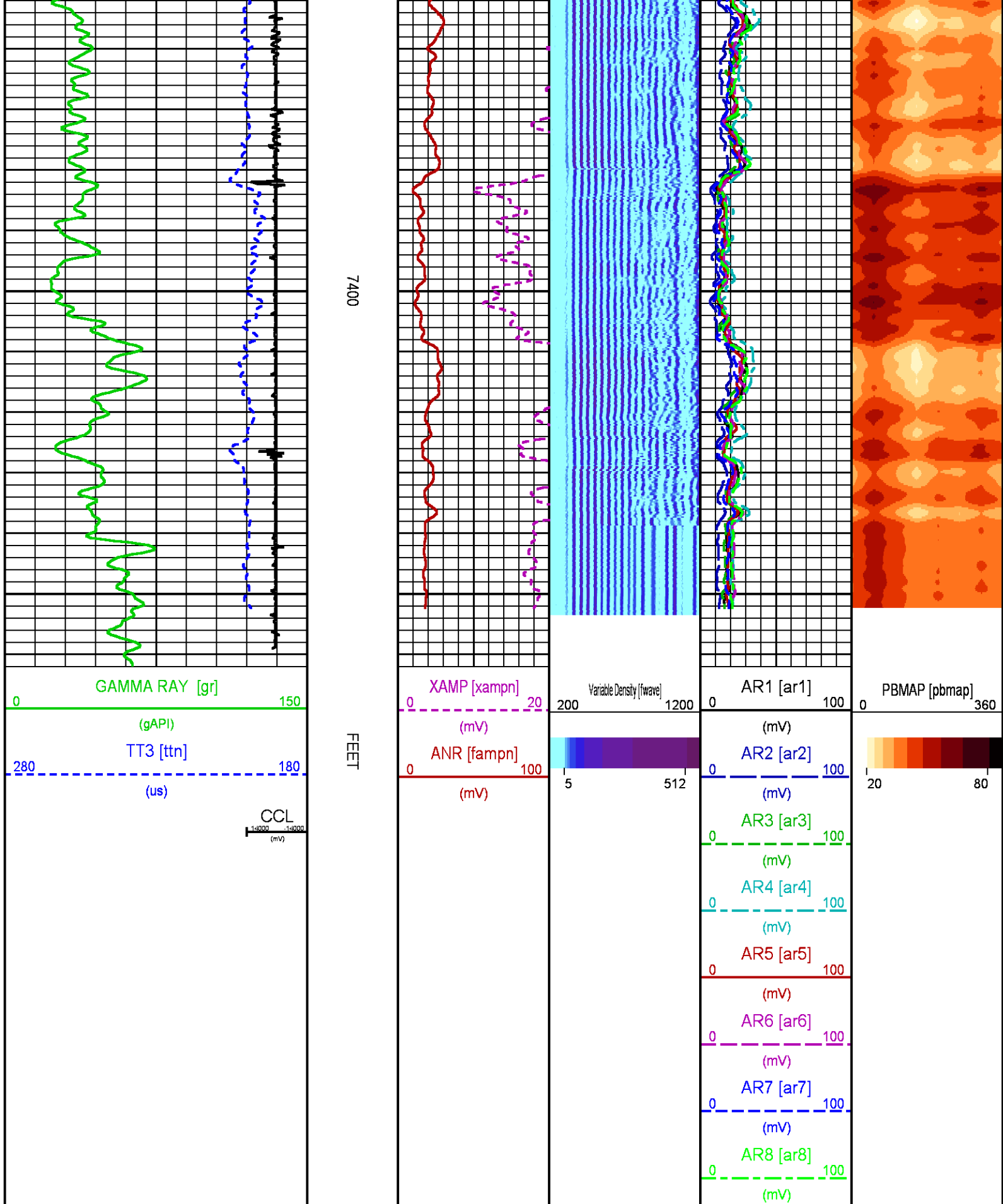
CURVE DESCRIPTION REPORT		
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	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		

Presentation	: SysA:/dat1a/LARAMIE_NICHOLS_0994_24_08E/LARAMIE_RAL+01-REPEAT-RAL_RPT_08E-5.fvpdf [5"/100' Scale]
Plot Interval	: 7223 - 7463.5 Feet
Data File 1	: F1 : SysA:/dat1a/LARAMIE_NICHOLS_0994_24_08E/RPT.xtf
Created On	: N/A
Company	: LARAMIE ENERGY LLC
Well	: NICHOLS 0994-24-07E
Field	: VEGA
File Interval	: 7222 - 7464.75 Feet
OCT	: p012g







## RAL PRIMARY CALIBRATION SUMMARY

TOOL #: 1426XA10417452

DATE/TIME PERFORMED: Mon Jan 22 15:28:23 2018

UNIT #: 5753XD111111

	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)	-0.03	0.00	-0.02
AMP FLUID (mV)	50	50	50
TT (us)	200	197	199
M FACTOR	1.99	1.99	1.99

## RAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1426XA10417452

DATE/TIME PERFORMED: Mon Jan 22 18:08:36 2018

DAYS SINCE CAL: 0

UNIT #: 5753XD111111

CABLE #: 4291CH SMALLLINE

	NEAR (mV)	R1 (mV)	R2 (mV)	R3 (mV)	R4 (mV)	R5 (mV)	R6 (mV)	R7 (mV)	R8 (mV)	FAR (mV)	CAL (mV)
ZERO	0.08	-0.00	-0.06	-0.10	-0.04	-0.02	0.02	0.05	0.08	0.15	0.07
AMP AIR	2.97	2.51	1.95	3.40	3.08	3.65	3.46	2.28	2.71	2.64	99.67
SHOP M FACTOR	2.00										
SHOP A FACTOR	0.00										
WIRELINE FACTOR	1.00										

## GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1355XA11871507

DATE/TIME PERFORMED: Fri Nov 17 14:10:53 2017

UNIT #: 3882TD HLG728

CALB JIG #: 4702NK DA\_228

	BACKGROUND (cts)	CALBTR ON (cts)	CR DIFF (cts/fs)	MULT	BACKGROUND (gAPI)	CALBTR ON (gAPI)	CALBTR (gAPI)
GR	59.07	162.98	103.9	0.962	56.84	156.84	100

## GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1355XA11871507

DATE/TIME PERFORMED: Fri Nov 17 14:12:49 2017

UNIT #: 3882TD HLG728

VERI JIG #: 4702NK DA\_228

	BACKGROUND (cts)	CALBTR ON (cts)	MULT	BACKGROUND (gAPI)	CALBTR ON (gAPI)	DIFF. (gAPI)
GR	59.73	170.53	0.962	57.49	164.11	106.63
						100.00 110.00

## INSTRUMENT CONFIGURATION

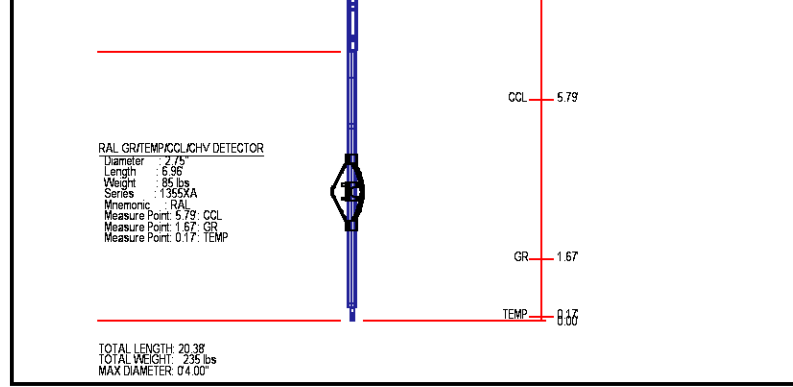
Source File: kdat1a1.ARAMIE\_NICHOLAS\_0994\_24\_09ERAL55-1dg

CABLE HEAD  
Diameter : 2.75"  
Length : 2.25'  
Weight : 10 lbs  
Series : CBL234  
Mnemonic : CBLH

RADIAL BOND TOOL  
Diameter : 2.75"  
Length : 11.17'  
Weight : 126 lbs  
Series : 1426XA  
Mnemonic : RAL  
Measure Point: 4.21' NEAR RCVR  
Measure Point: 3.25' FAR RCVR

NEAR RCVR: 11.17'

FAR RCVR: 10.21'



**BAKER  
HUGHES**  
a GE company



**ECLIPS**

**COMPANY**

**LARAMIE ENERGY LLC**

**WELL**

**NICHOLS 0994-24-08E**

**FIELD**

**VEGA**

**COUNTY**

**MESA**

**STATE**

**COLORADO**

**FILE NO:**

**API NO:**

**05077104120000**

**LOCATION:**

**SHL: 39.264465 N; 107.830720 W**

**BHL: 39.264737 N; 107.826024 W**

**ELEVATIONS:**

**KB 7161 FT**

**DF 7160 FT**

**GL 7137 FT**

**SEC**

**24**

**TWP**

**9 S**

**RGE**

**94 W**

**DATE**

**22-Jan-2018**