



# RADIAL CEMENT BOND LOG

FILE NO: CH136724	COMPANY <b>LARAMIE ENERGY LLC</b>
API NO: 05077105370000	WELL <b>GUNDERSON 0994-13-05W</b>
	FIELD <b>VEGA</b>
	COUNTY <b>MESA</b> STATE <b>COLORADO</b>

Ver. 4.10	LOCATION: LAT: 39.273929 N LONG: 107.834809 W SEC <u>13</u> TWP <u>9 S</u> RGE <u>94 W</u>	OTHER SERVICES RPM
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PERMANENT DATUM LOG MEASURED FROM DRILL. MEAS. FROM	GL ELEVATION 7272 FT KB 30 FT ABOVE P.D. KB GL 7272 FT	ELEVATIONS: KB 7302 FT DF GL 7272 FT
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DATE	RUN	TRIP		
06-Jun-2018	1	1		
SERVICE ORDER		US136724		
DEPTH DRILLER		8123 FT		
DEPTH LOGGER		8096 FT		
BOTTOM LOGGED INTERVAL		8096 FT		
TOP LOGGED INTERVAL		30 FT		
TIME STARTED		11:00		
TIME FINISHED		14:30		
OPERATOR RIG TIME		3.5 HRS		
TYPE OF FLUID IN HOLE		WATER		
FLUID DENSITY		NA		
FLUID SALINITY		NA		
FLUID LEVEL		56 FT		
LOGGED CEMENT TOP		1560 FT		
WELLHEAD PRESSURE		0 PSI		
MAXIMUM HOLE DEVIATION		NA		
NOMINAL LOGGING SPEED		95 FMIN		
MAX. RECORDED TEMP.		232 DEGF		
REFERENCE LOG		NA		
REFERENCE LOG DATE		NA		
EQUIP. NO.	LOCATION	ML-4291	GRAND JCT.	
RECORDED BY		M. BAUKA		
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: \*2 OPERATIONS IN WELLBORE\*

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

LOGGED WITH 0 PSI ON WELLHEAD

SJ: 6380' - 6400'  
SJ: 7534' - 7604'

## EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	RAL	1426XA	11871500	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: 4

Plotted: Wed Jun 6 19:06:12 2018

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_GUNDERSON\_0994-13-05W/p012g03.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 19.500 ft BOTTOM DEPTH: 5610.250 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	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	25	us	"	"
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	160	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	4	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	200.465	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-67	us	"	"
	TOOL DELAY (str2*)	-67	us	"	"
	TOOL DELAY (str3*)	-67	us	"	"
	TOOL DELAY (str4*)	-67	us	"	"
	TOOL DELAY (str5*)	-67	us	"	"
	TOOL DELAY (str6*)	-67	us	"	"
	TOOL DELAY (str7*)	-67	us	"	"
	TOOL DELAY (str8*)	-67	us	"	"
	TOOL DELAY (strn*)	-67	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	"	"

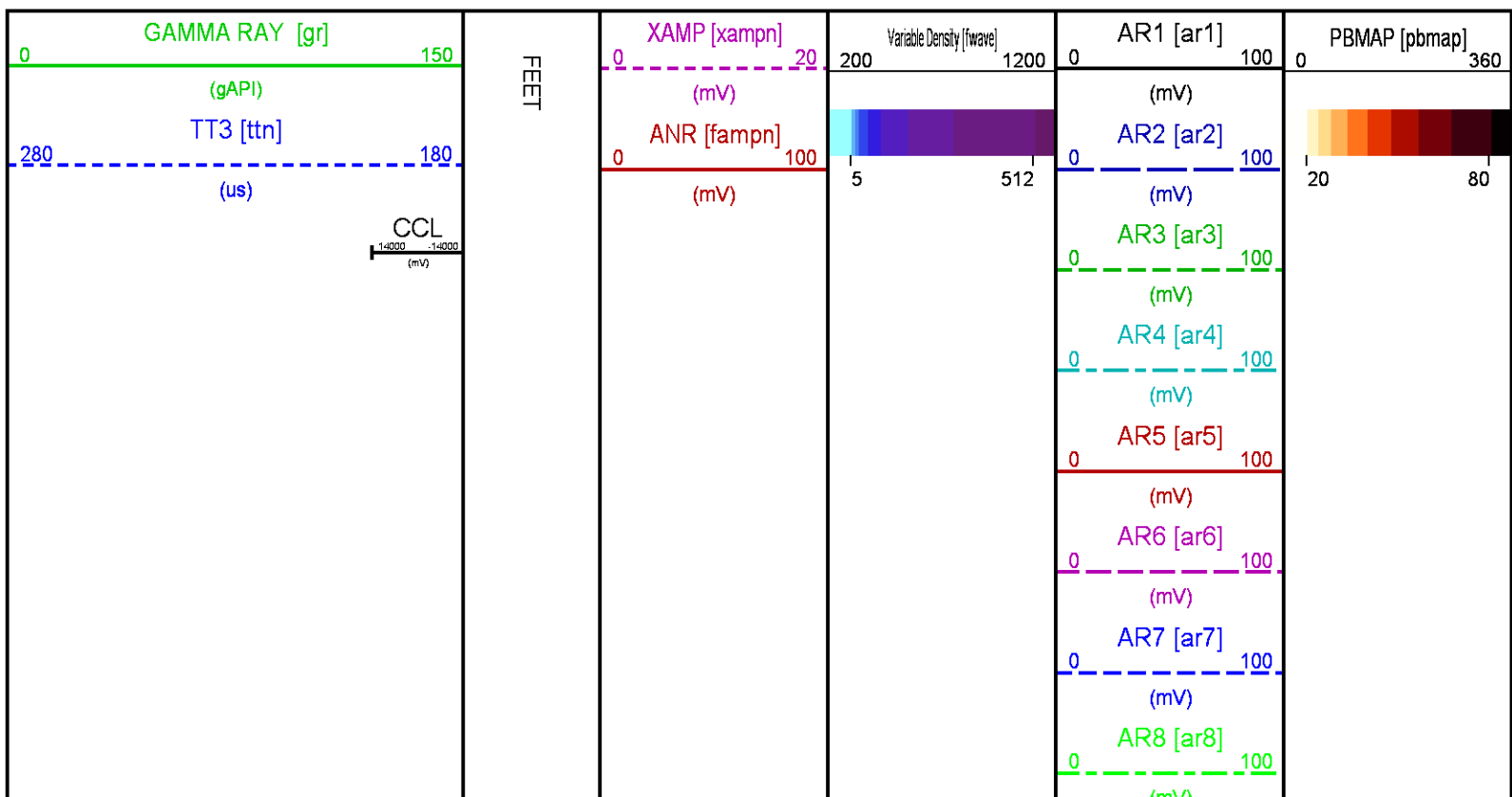
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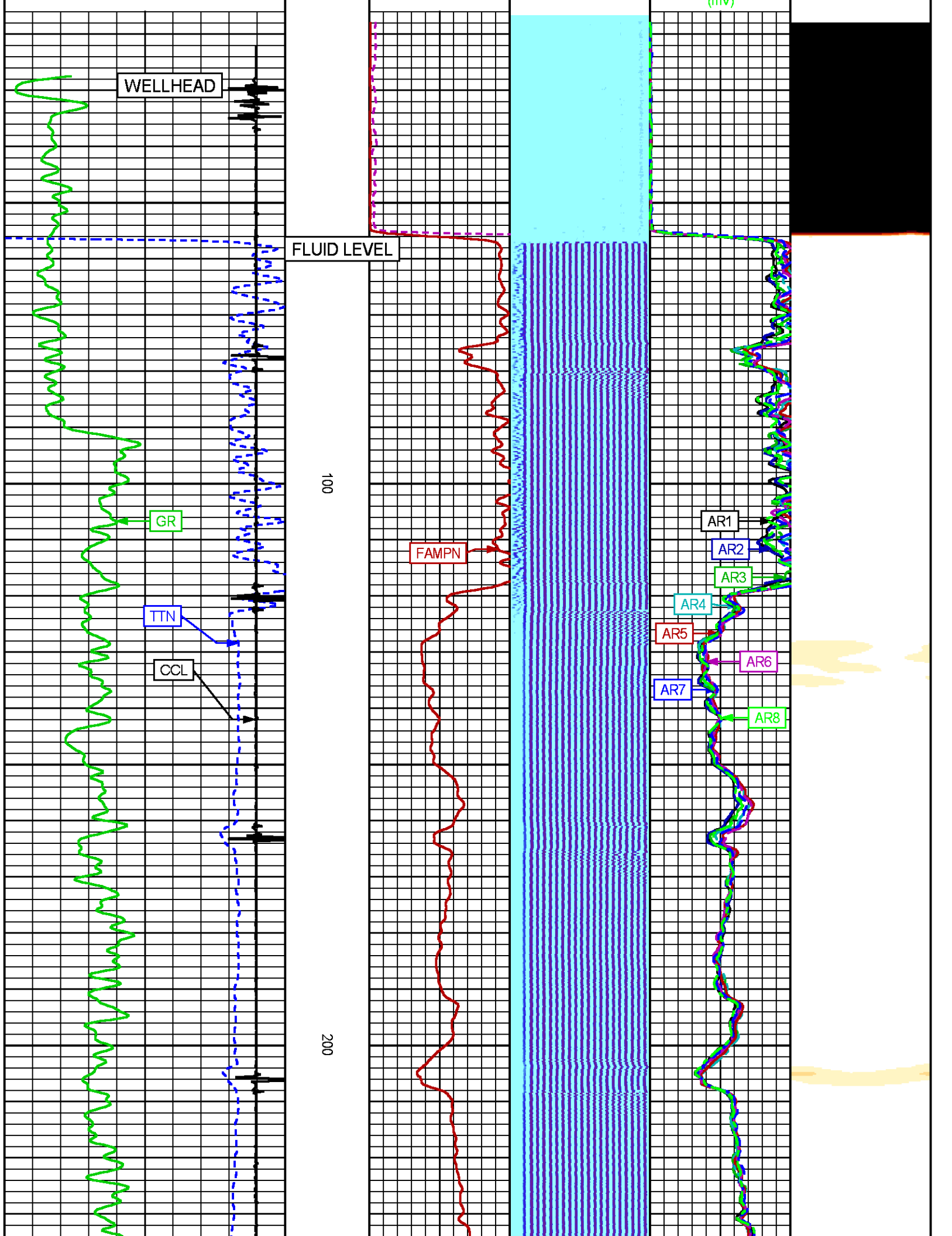
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	FIXED GATE AMPLITUDE T-R7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

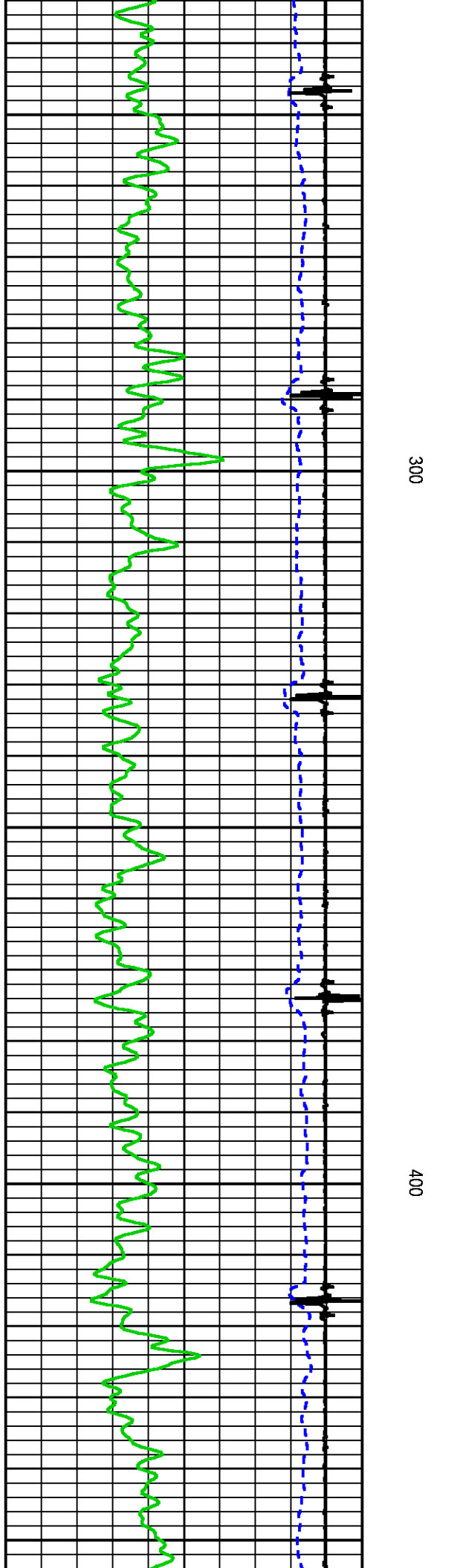
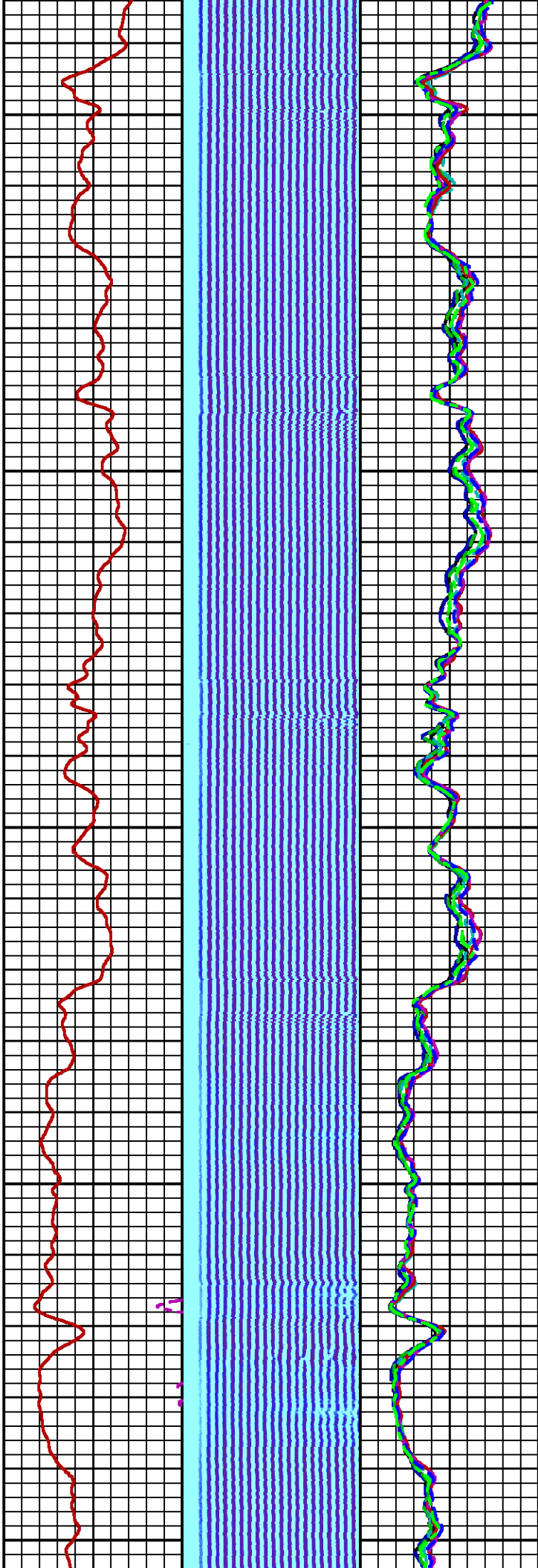
## CURVE MEASURE POINT OFFSET

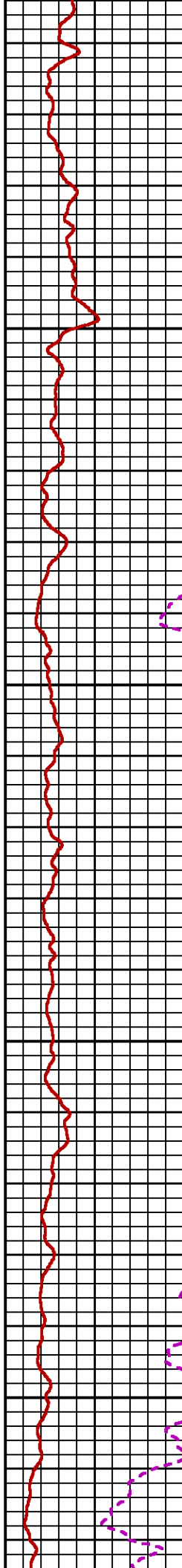
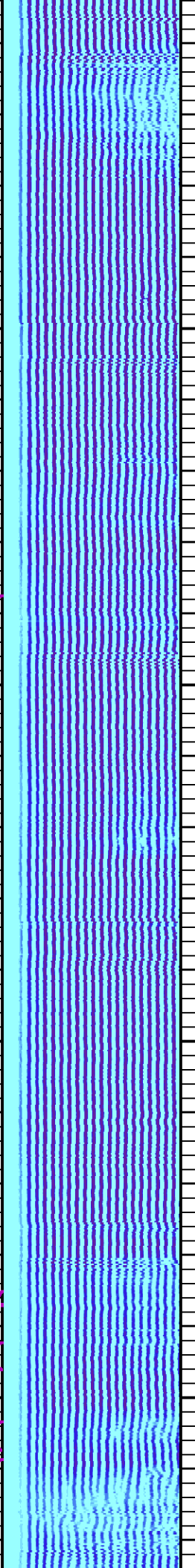
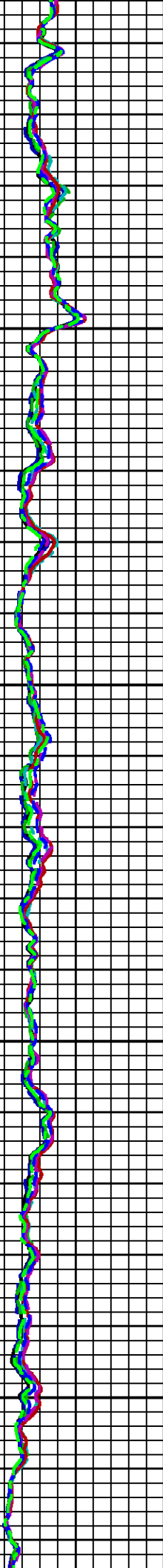
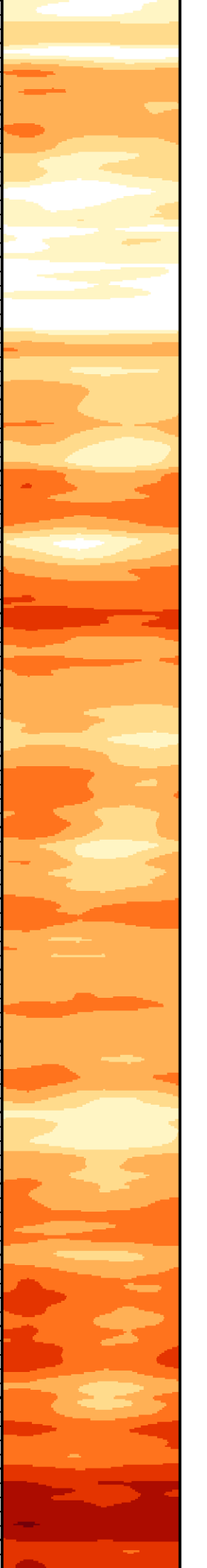
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
AR1	-11.25	AR5	-11.25	CCL	-5.75	XAMPN	-11.25
AR2	-11.25	AR6	-11.25	FAMPN	-11.25		
AR3	-11.25	AR7	-11.25	GR	-1.75		
AR4	-11.25	AR8	-11.25	TTN	-11.25		

<b>Presentation</b>	: SysA:/dat1a/LARAMIE_GUNDERSON_0994-13-05W/LARAMIE_0994-13-05W_RAL_MAIN.fvpdf [5"/100' Scale]
<b>Plot Interval</b>	: 16.75 - 8109.5 Feet
<b>Data File 1</b>	: F1 : SysA:/dat1a/LARAMIE_GUNDERSON_0994-13-05W/LARAMIE_GUNDERSON_0994-13-05W_RAL_MAIN.xtf
<b>Created On</b>	: N/A
<b>Company</b>	: LARAMIE ENERGY LLC
<b>Well</b>	: GUNDERSON 0994-013-05W
<b>Field</b>	: VEGA
<b>File Interval</b>	: 8.25 - 8109.5 Feet
<b>OCT</b>	: p012g



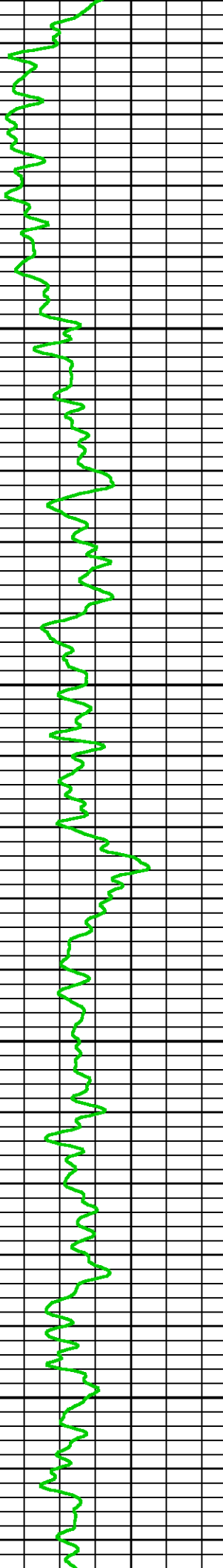
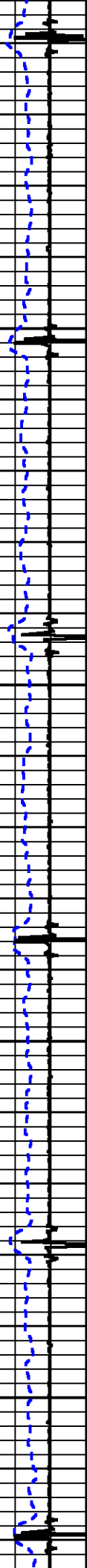




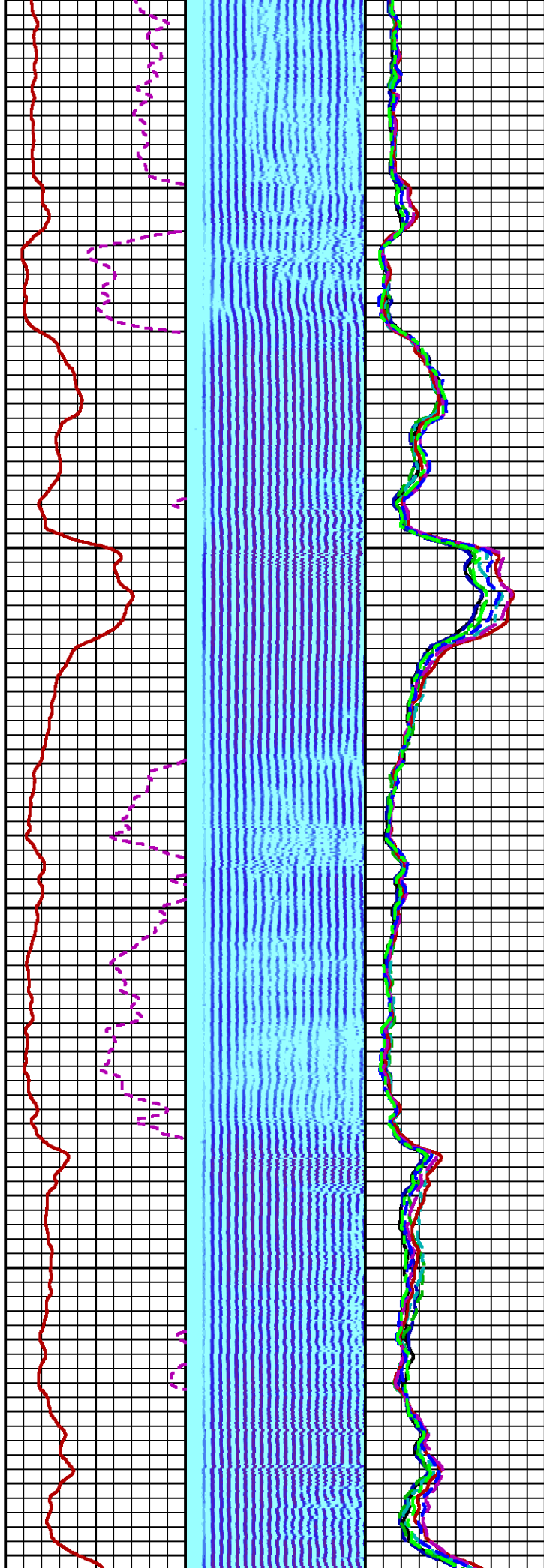


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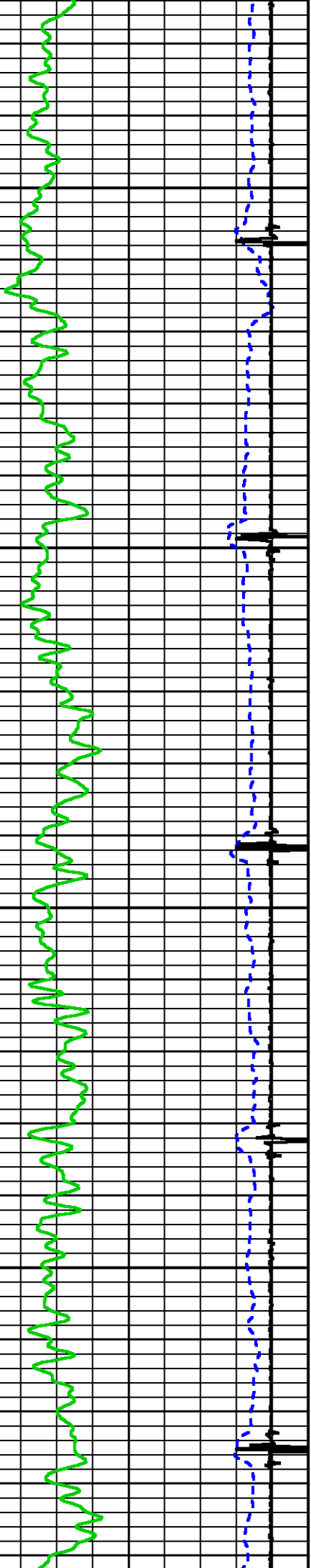


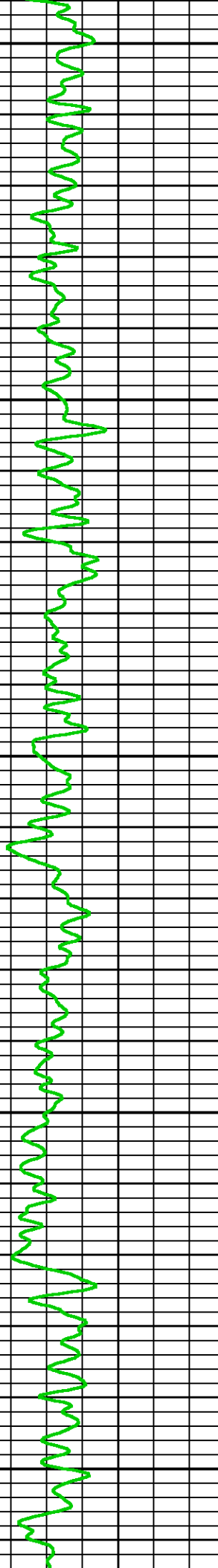
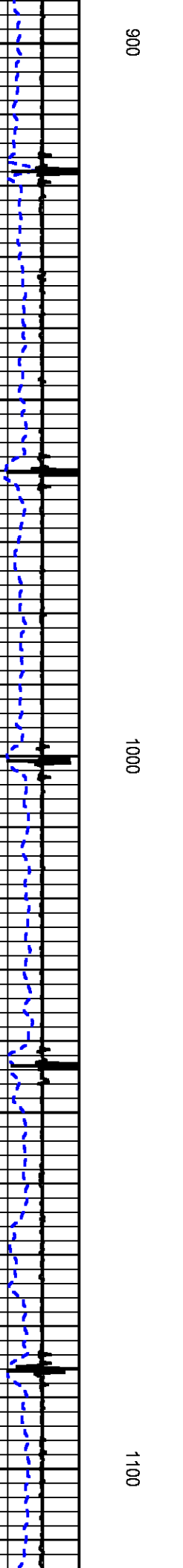
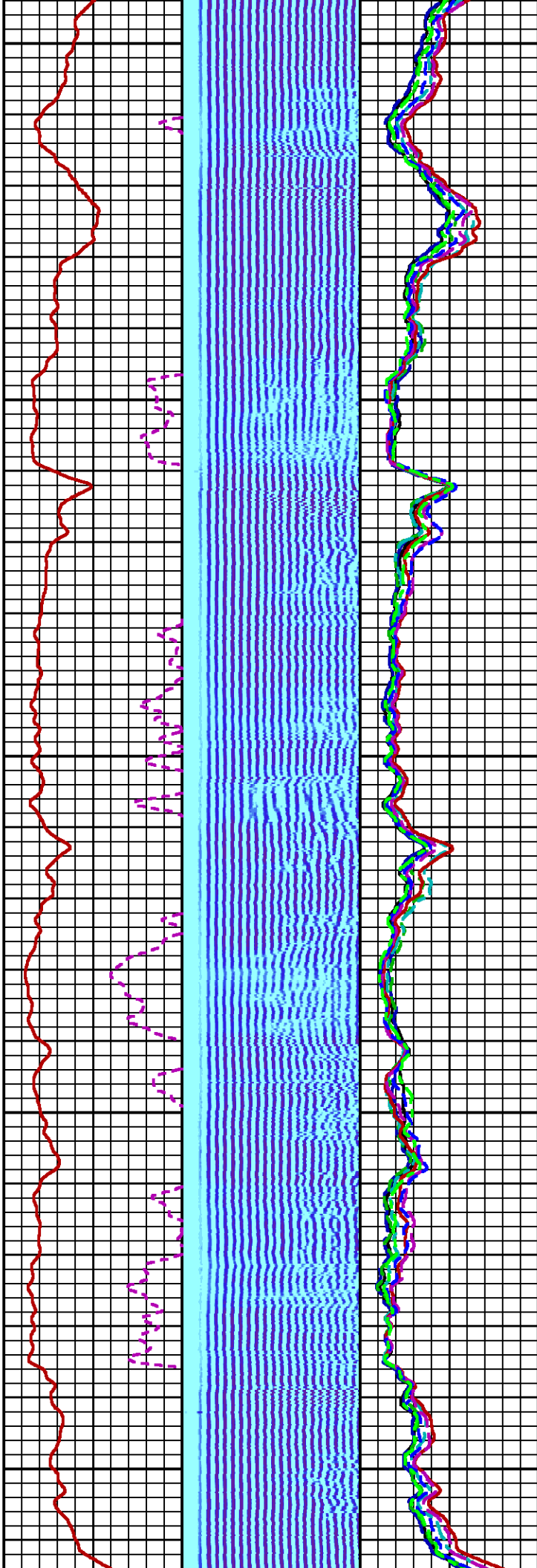
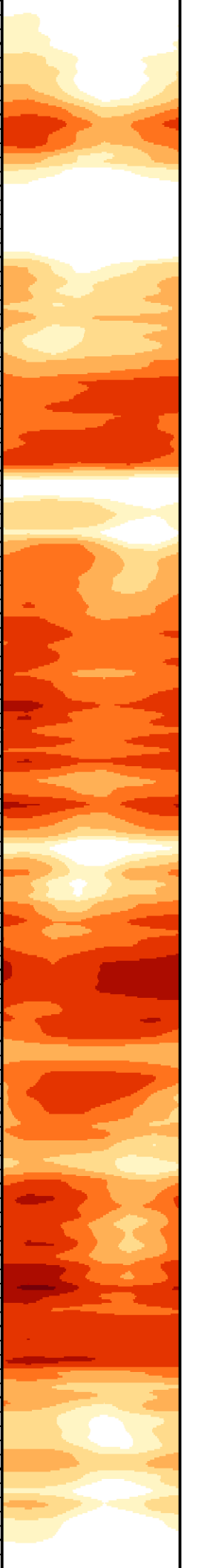




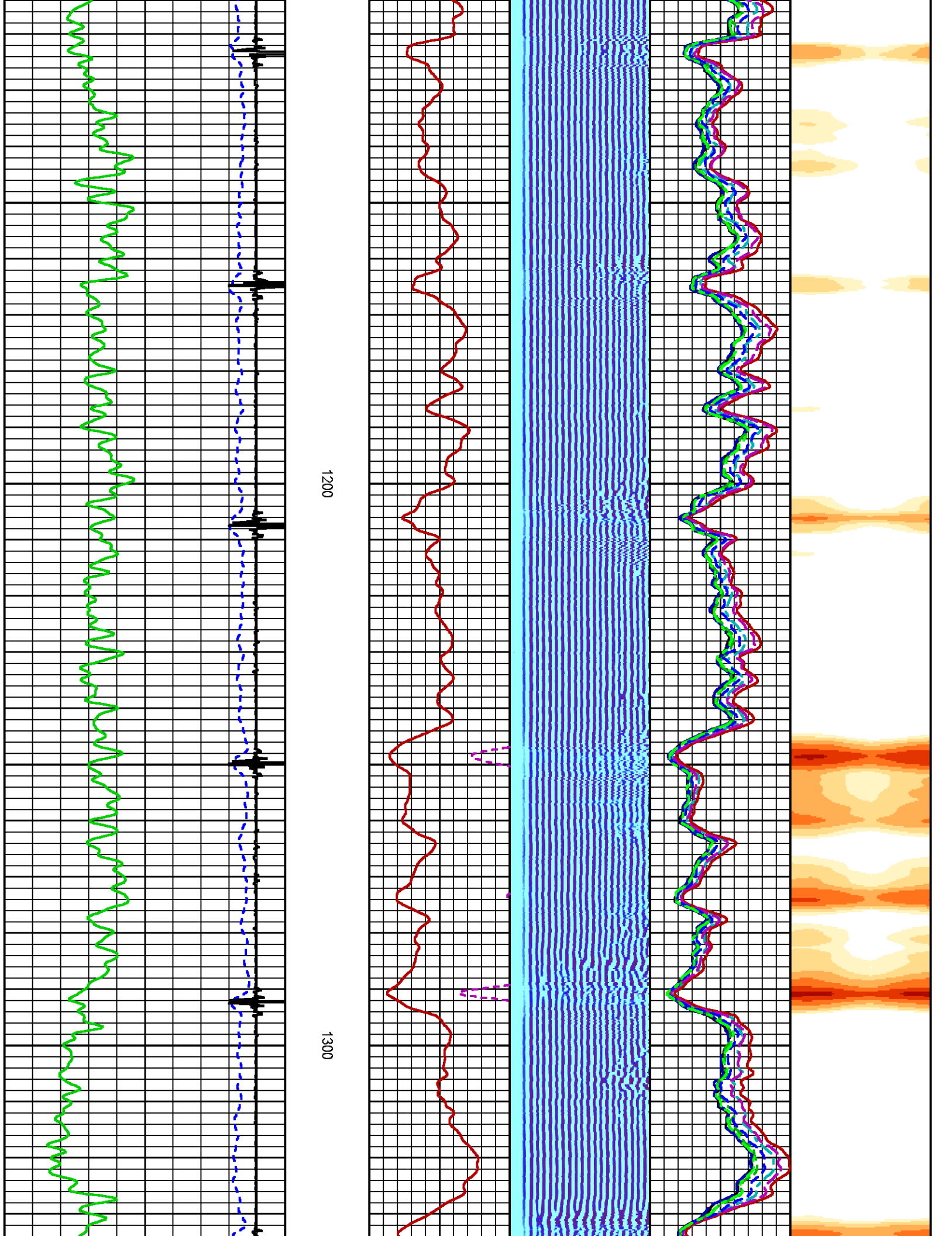
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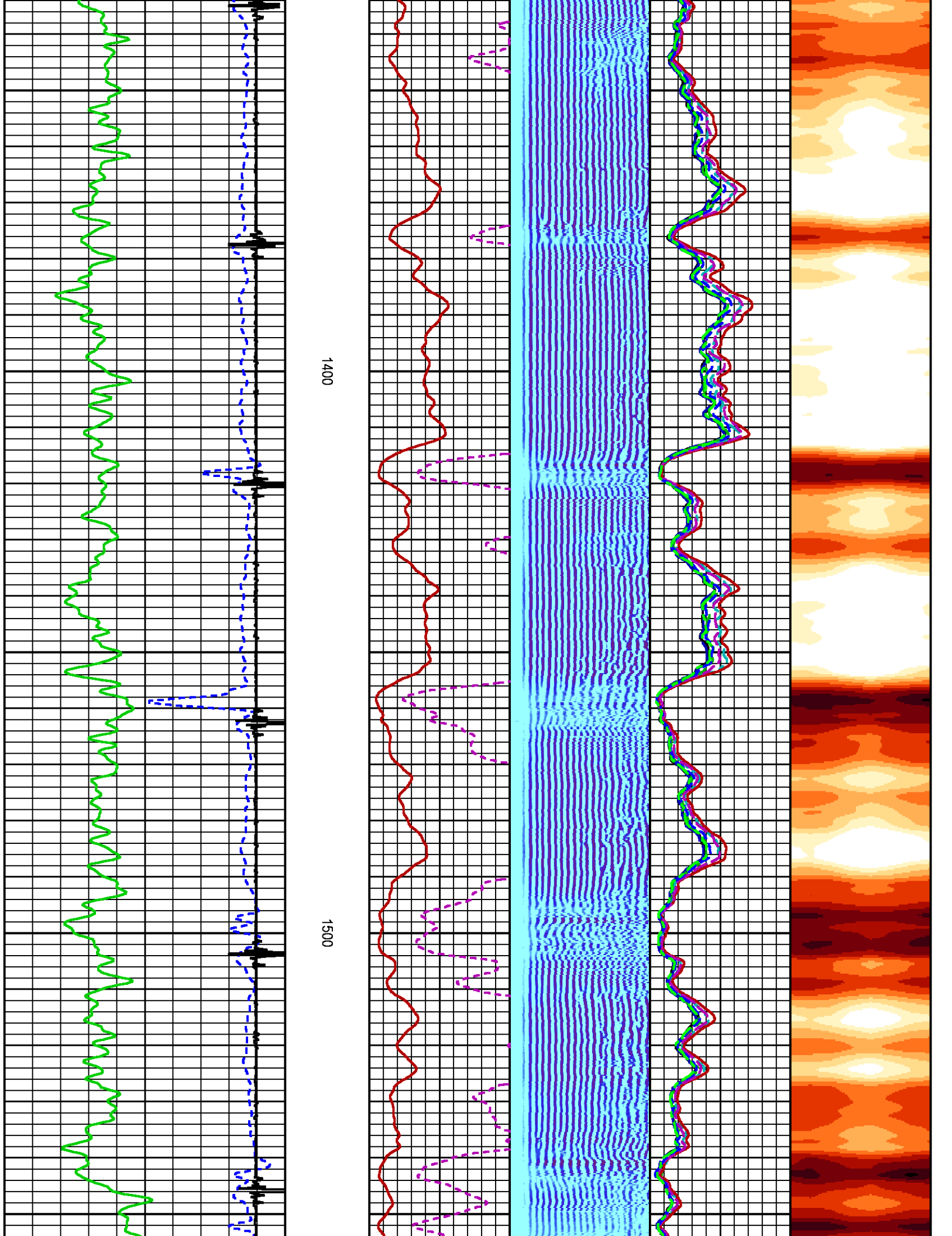
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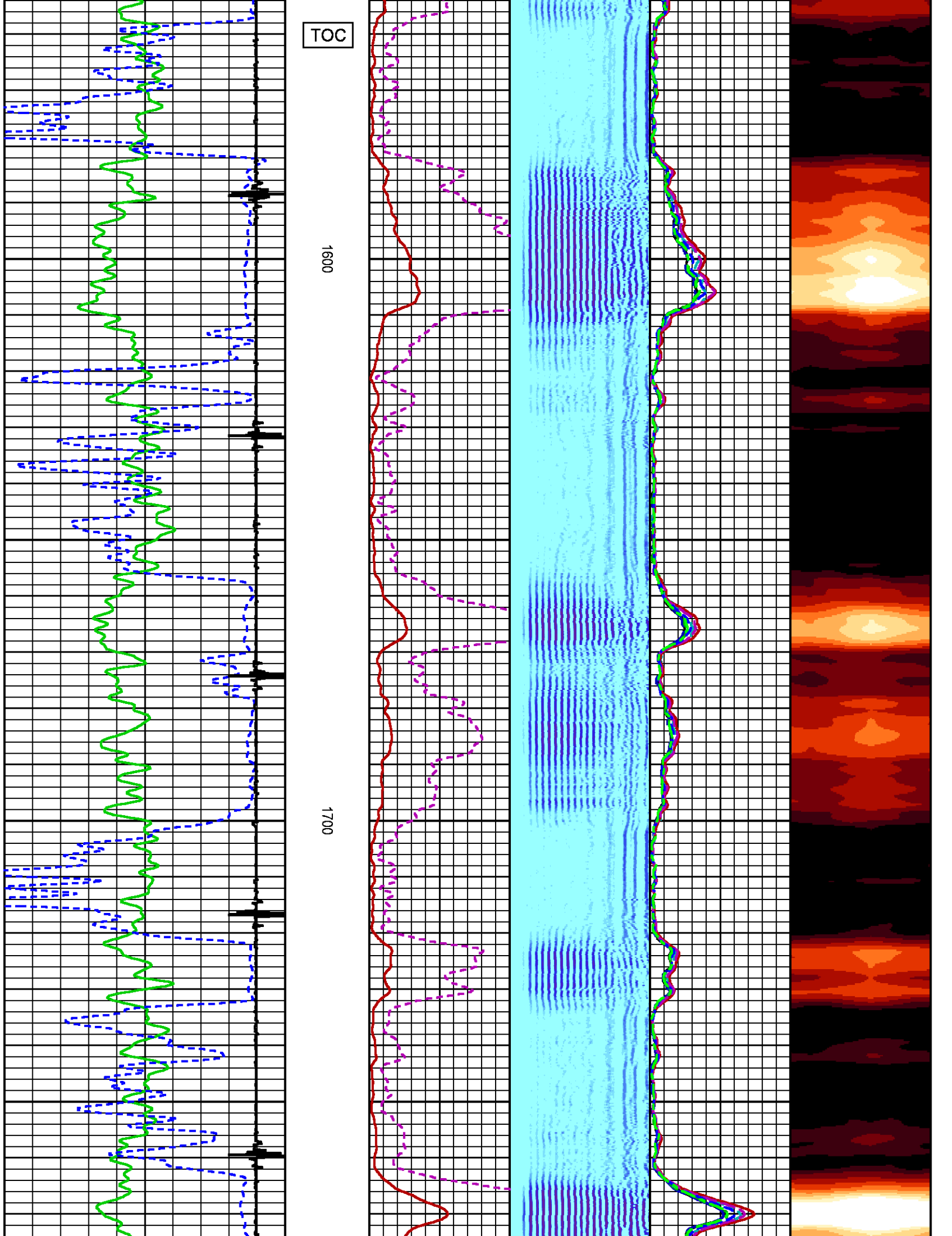


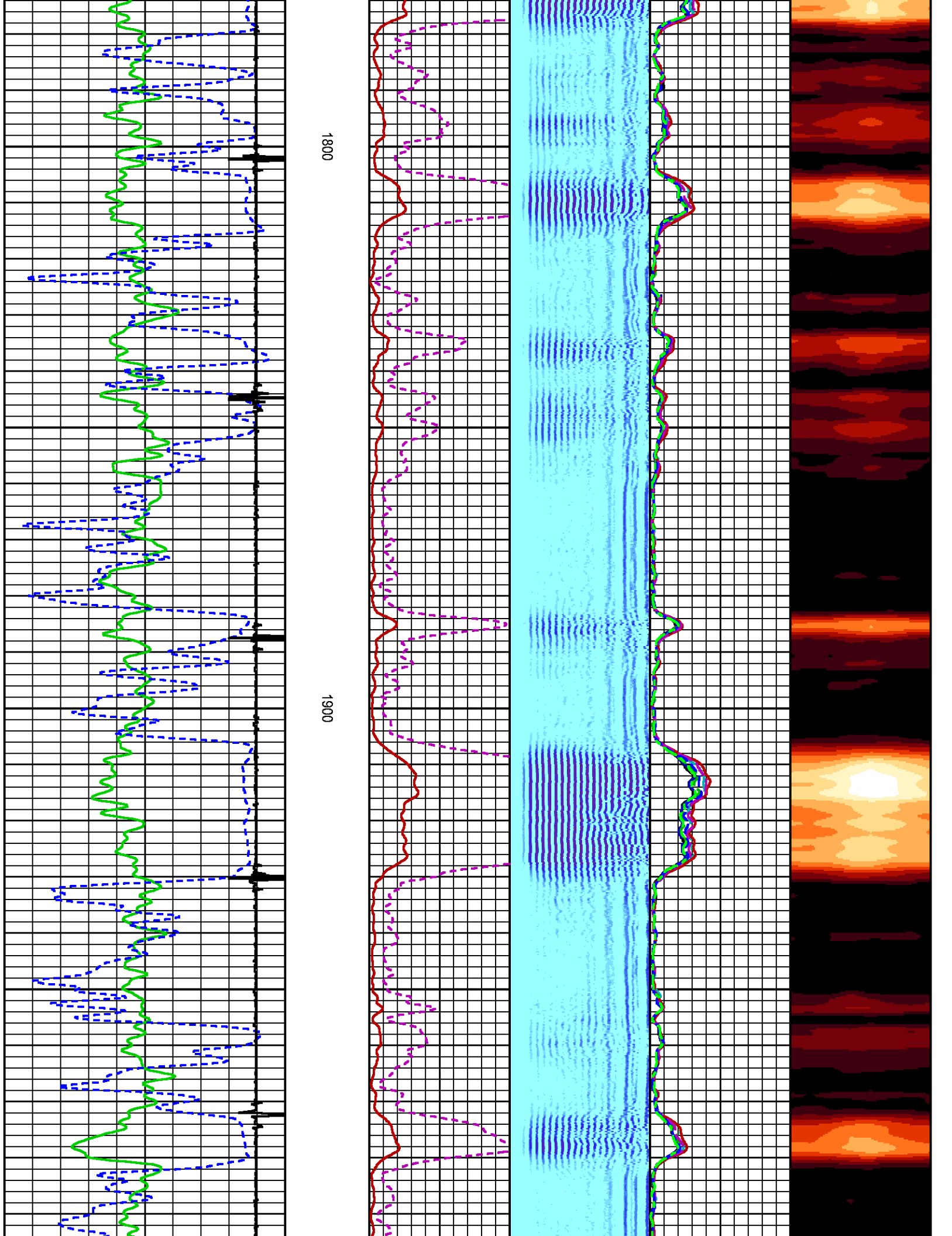


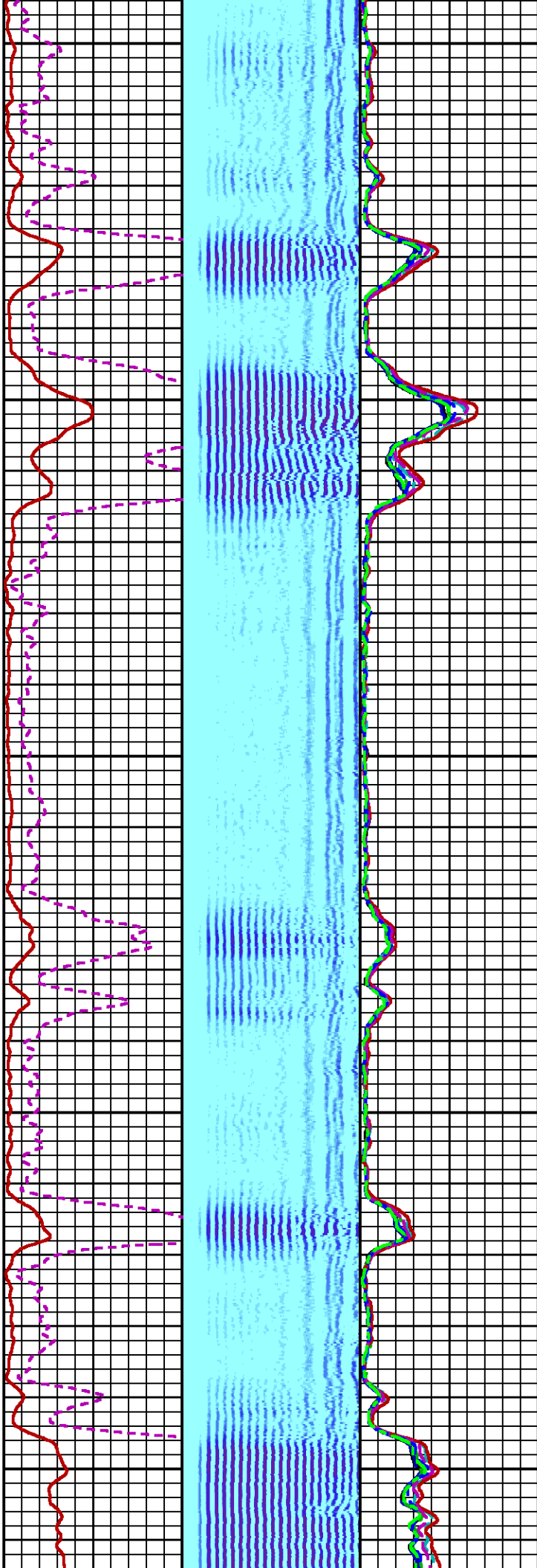








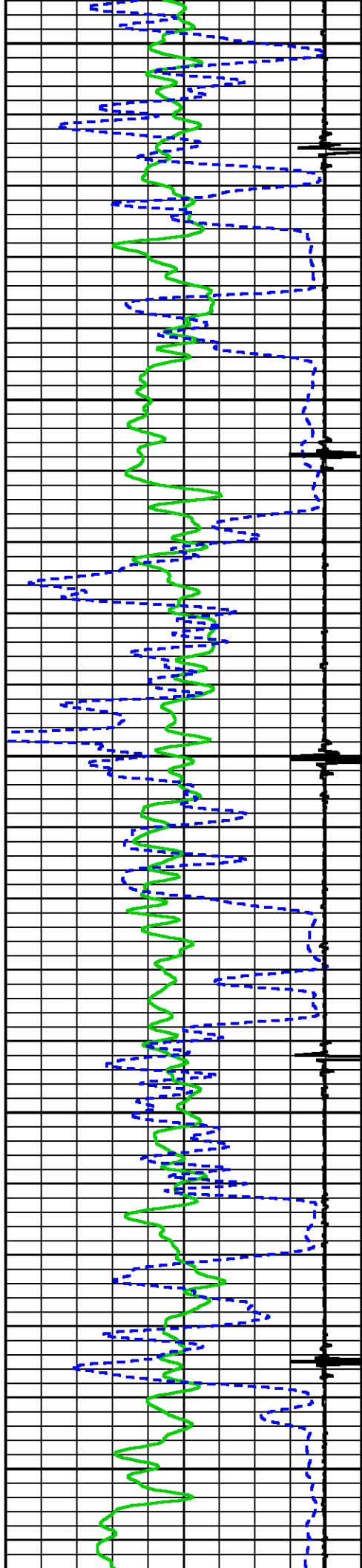




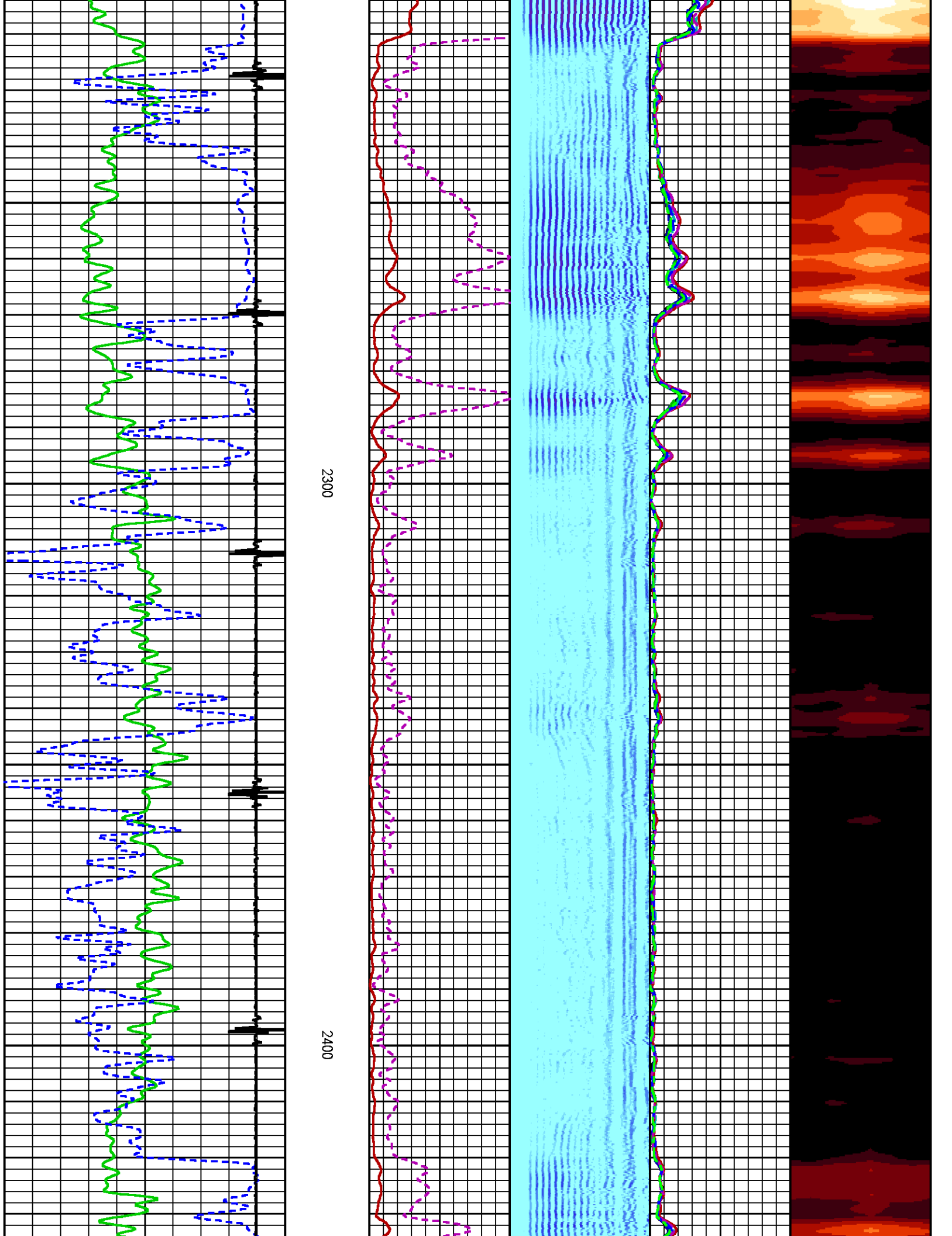
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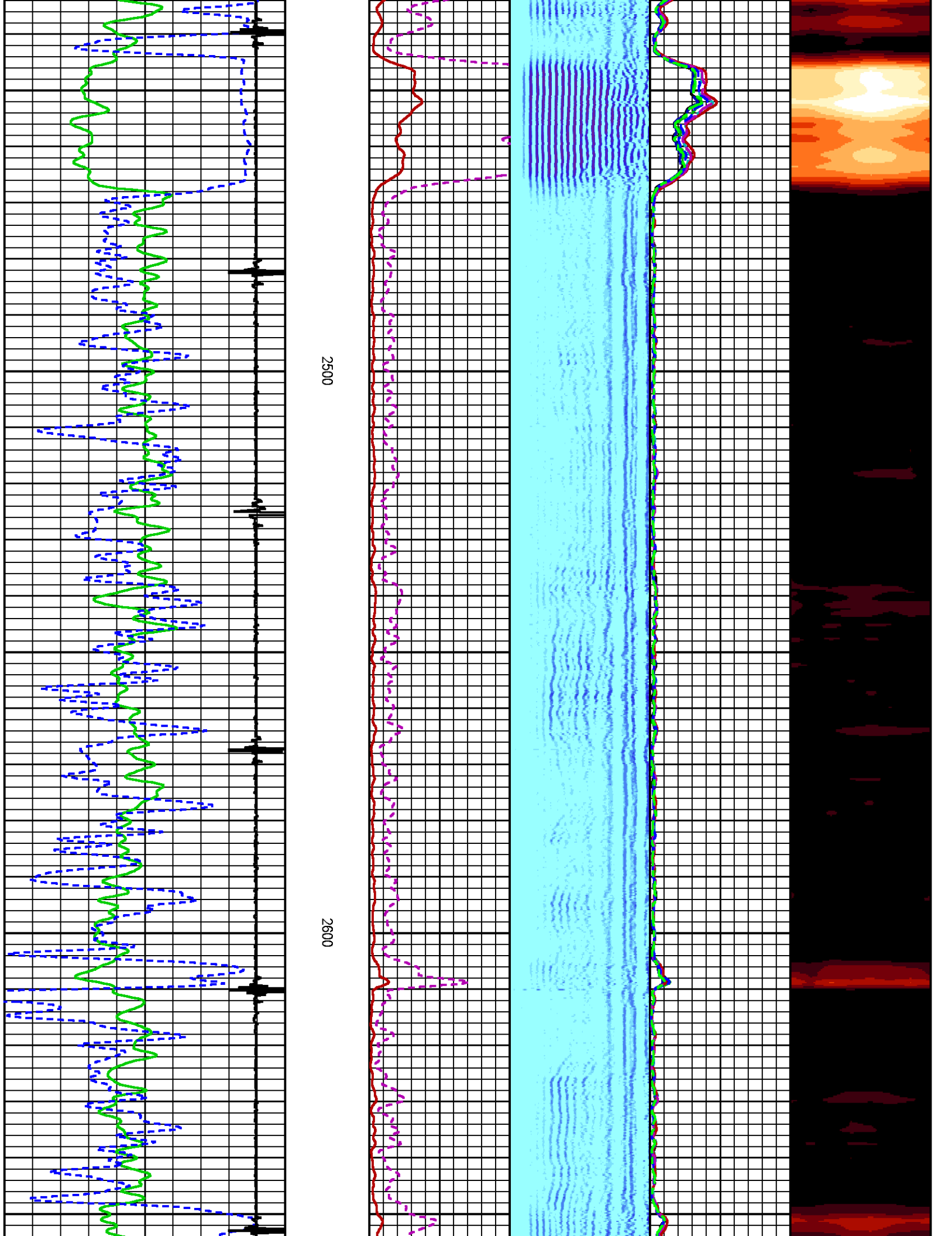
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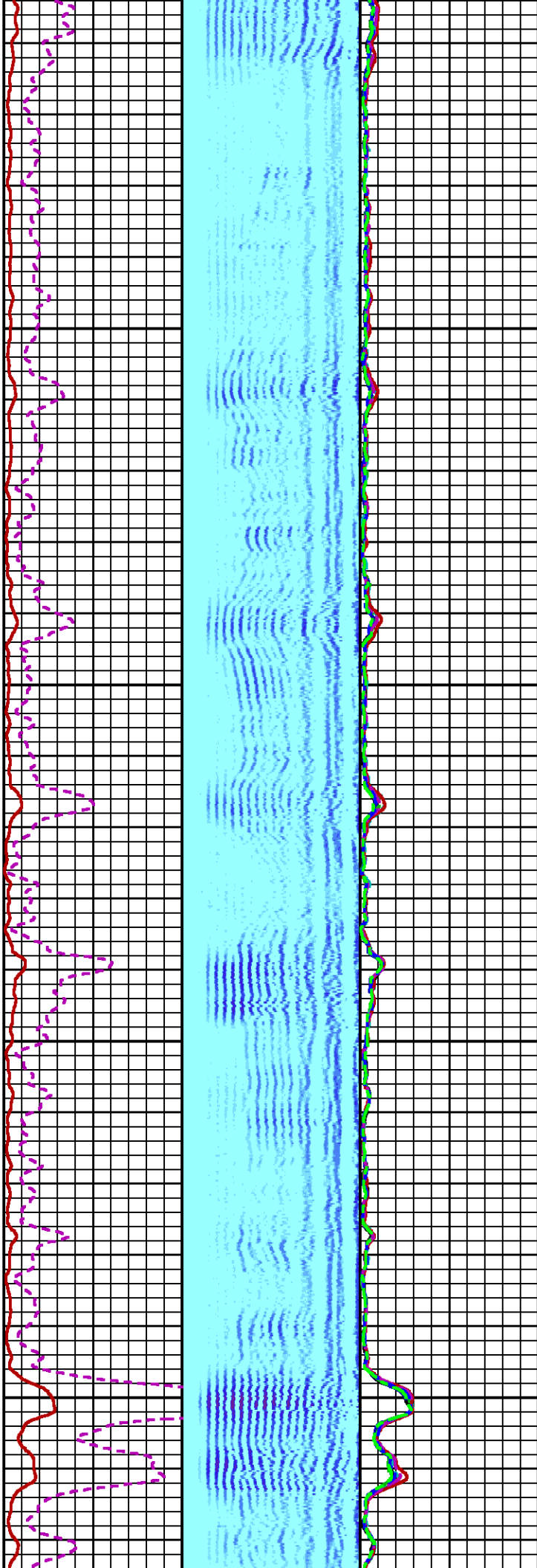
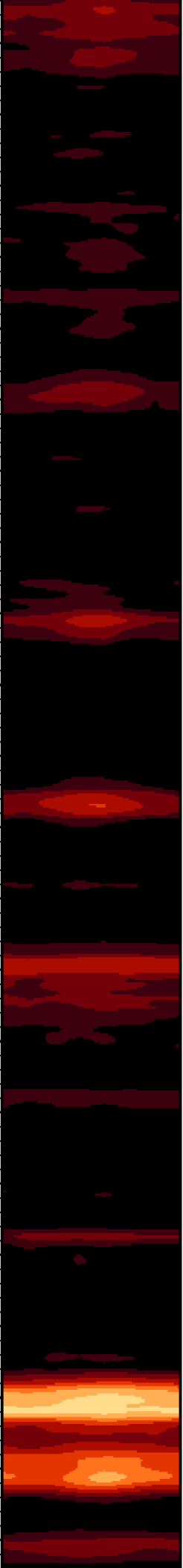






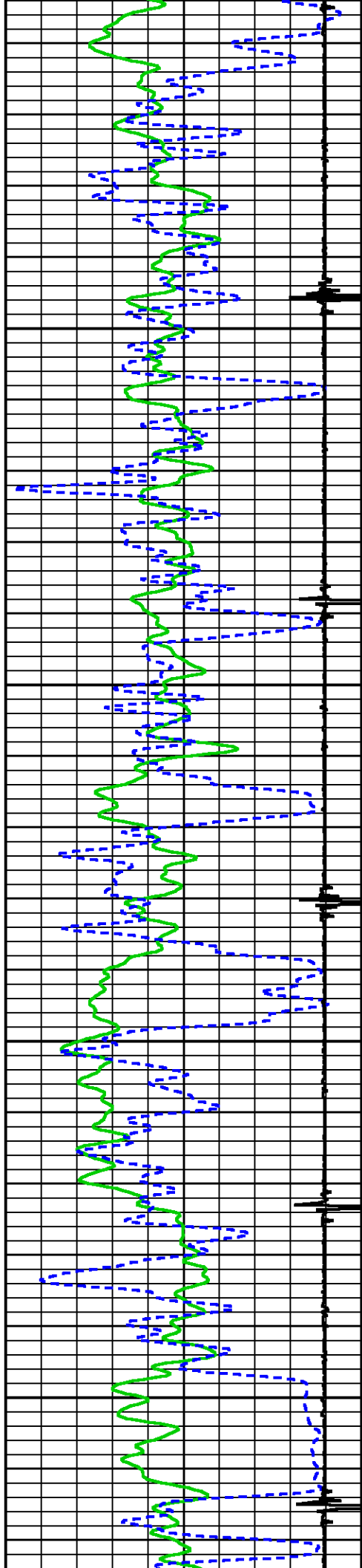


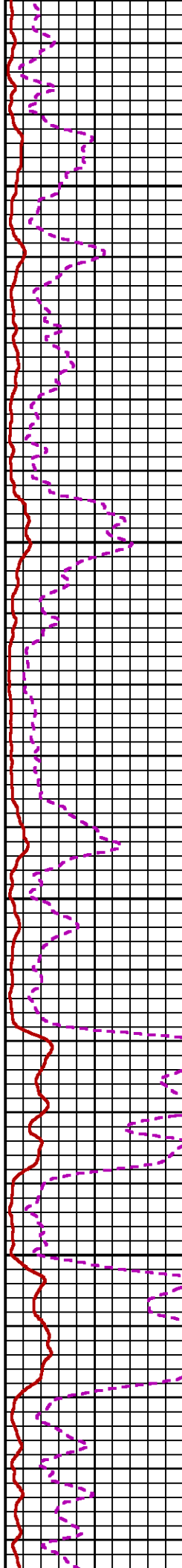
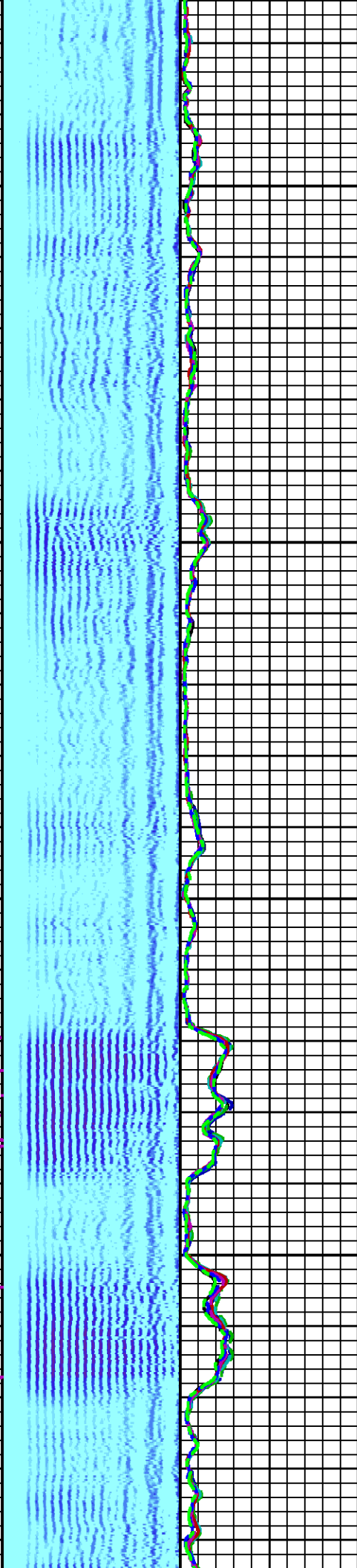
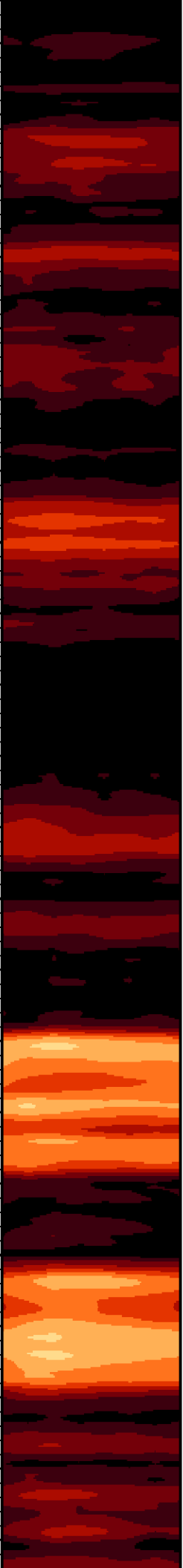




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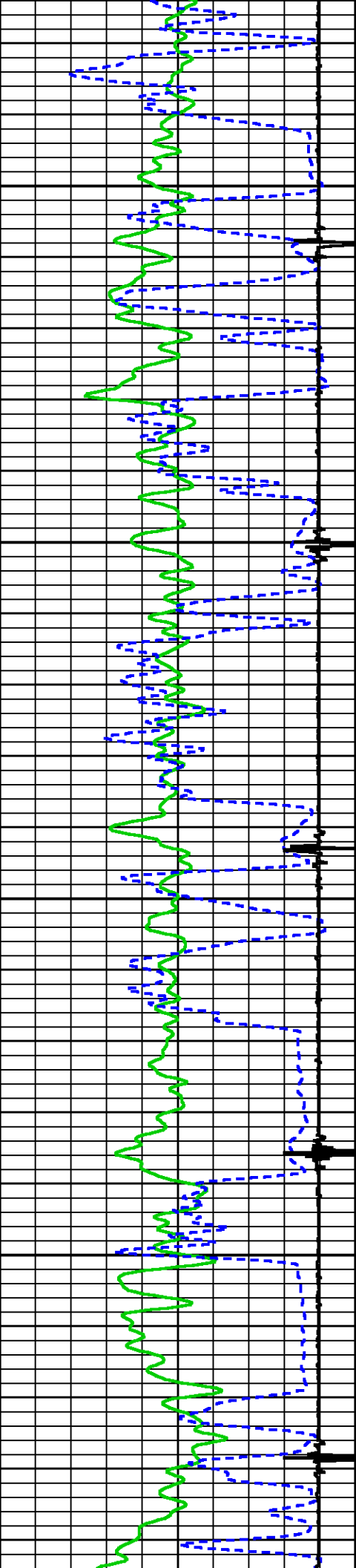
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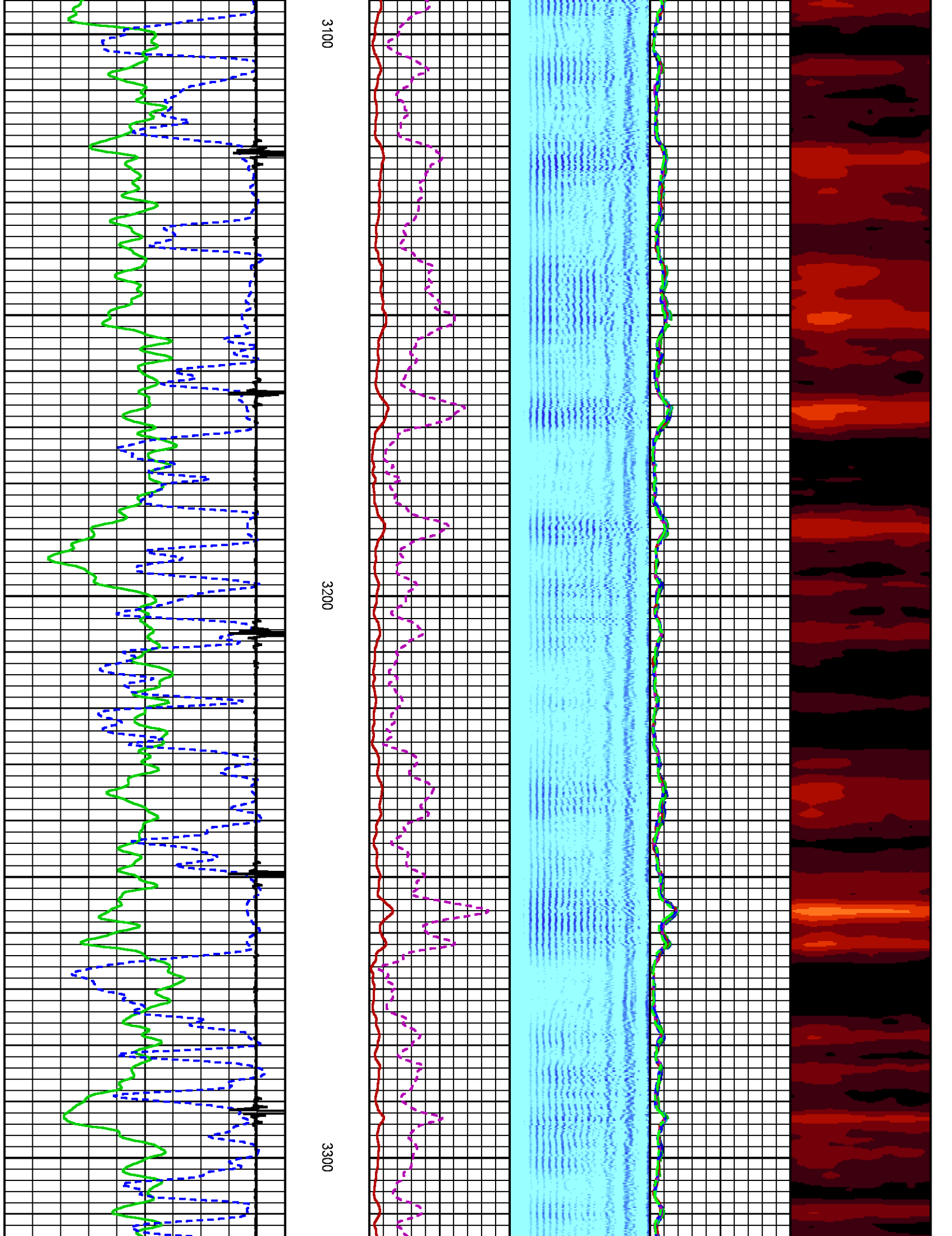


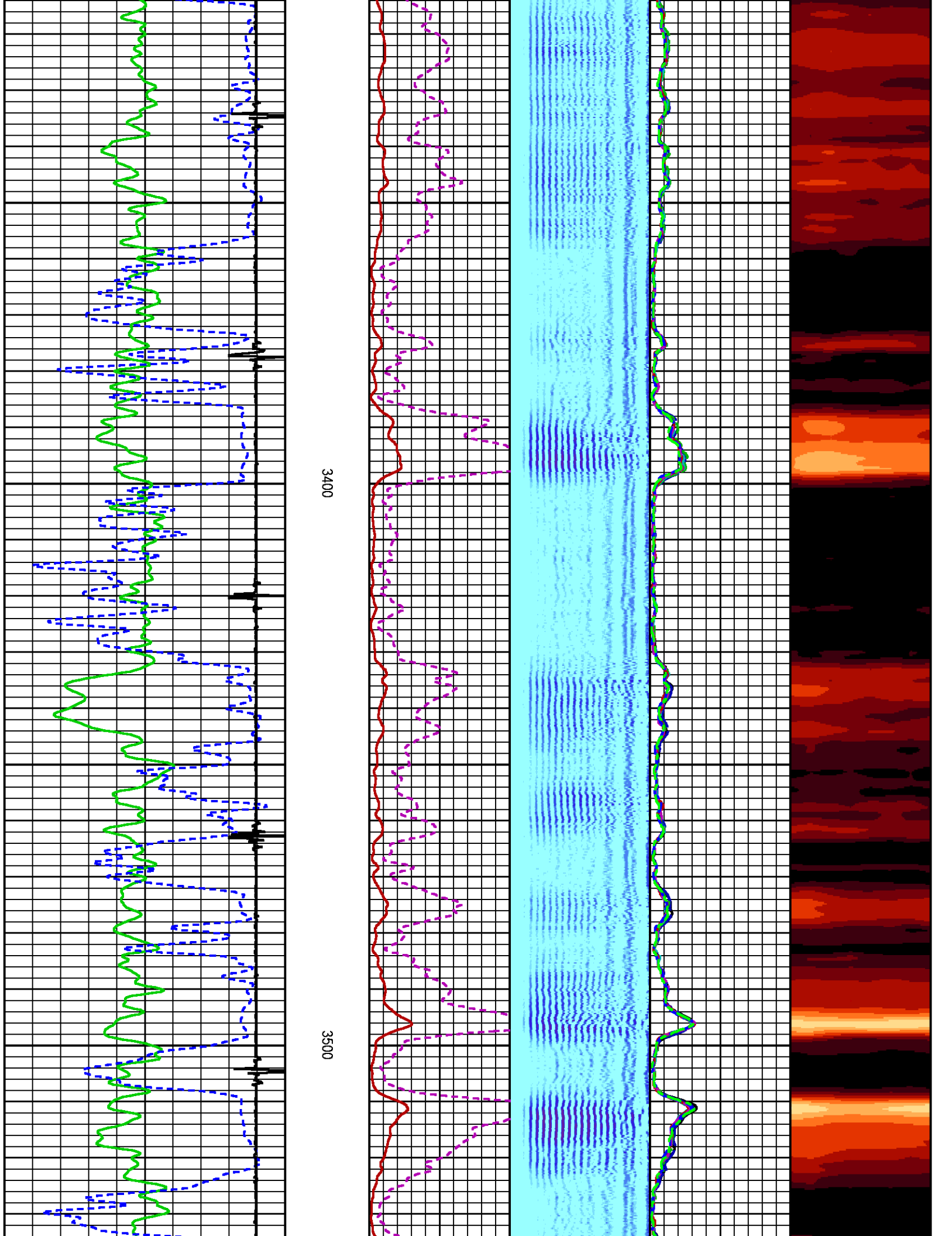


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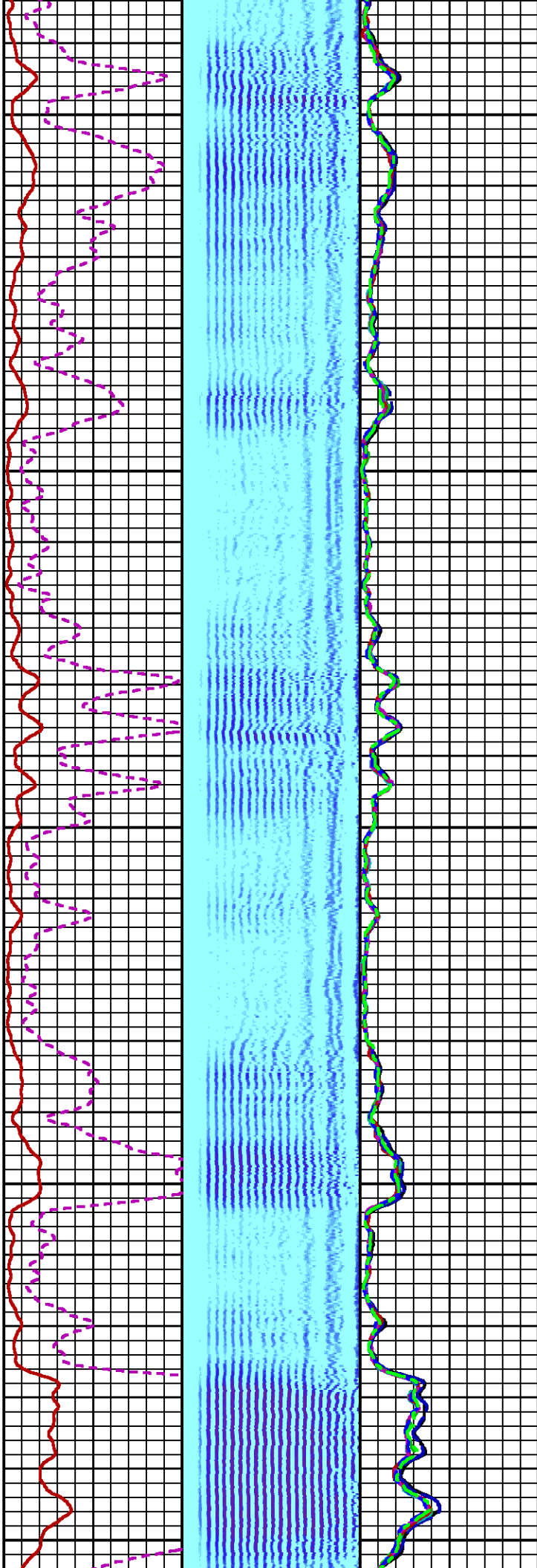
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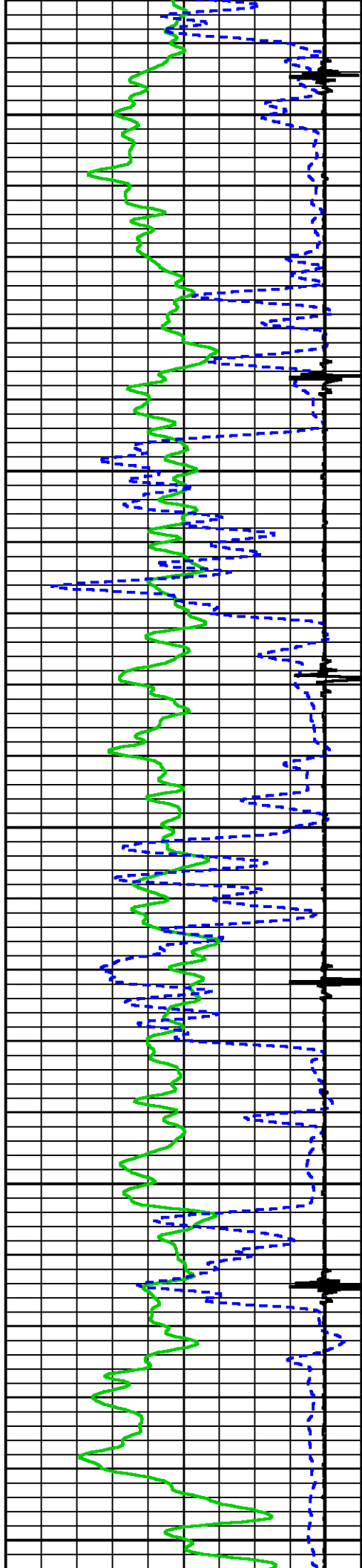




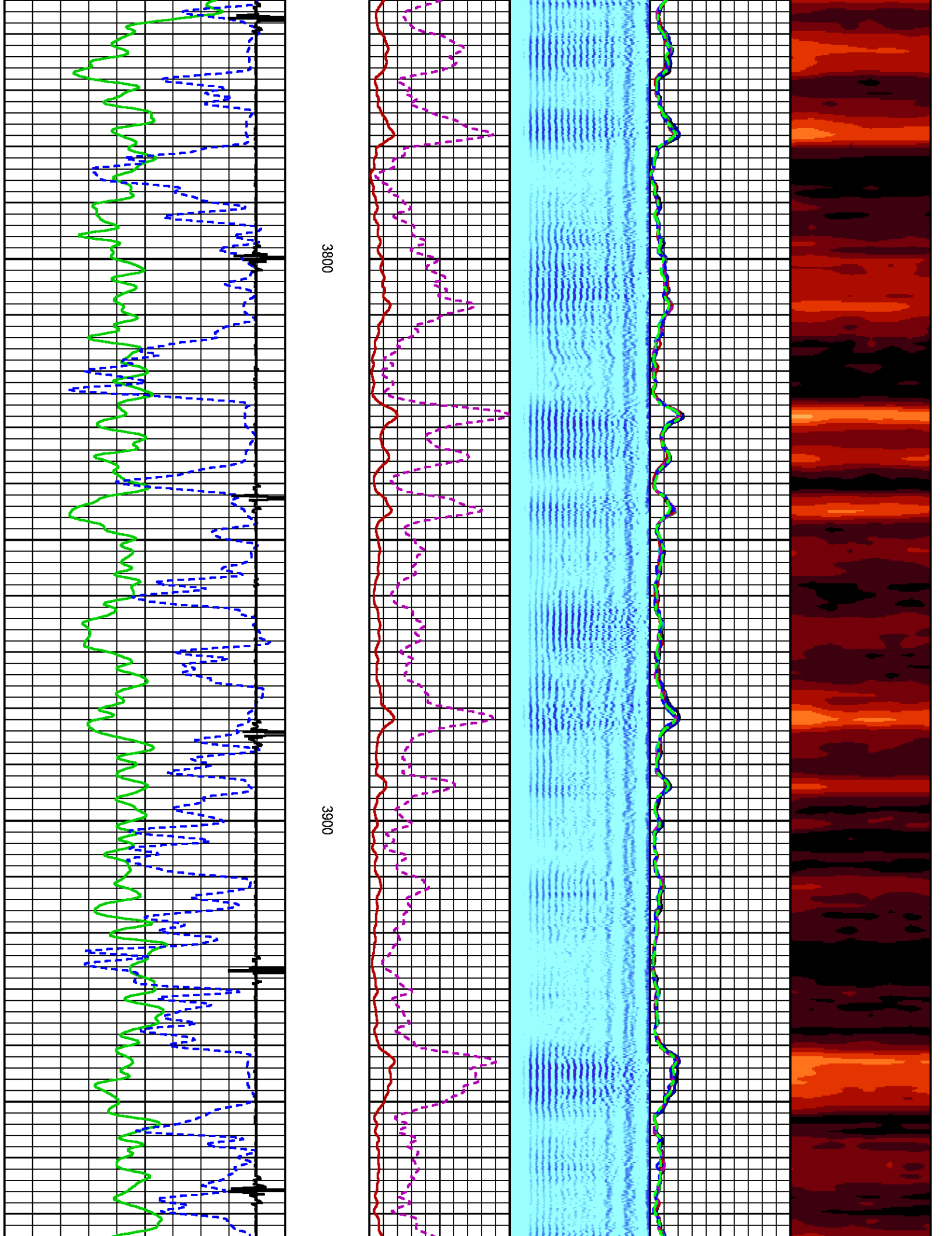


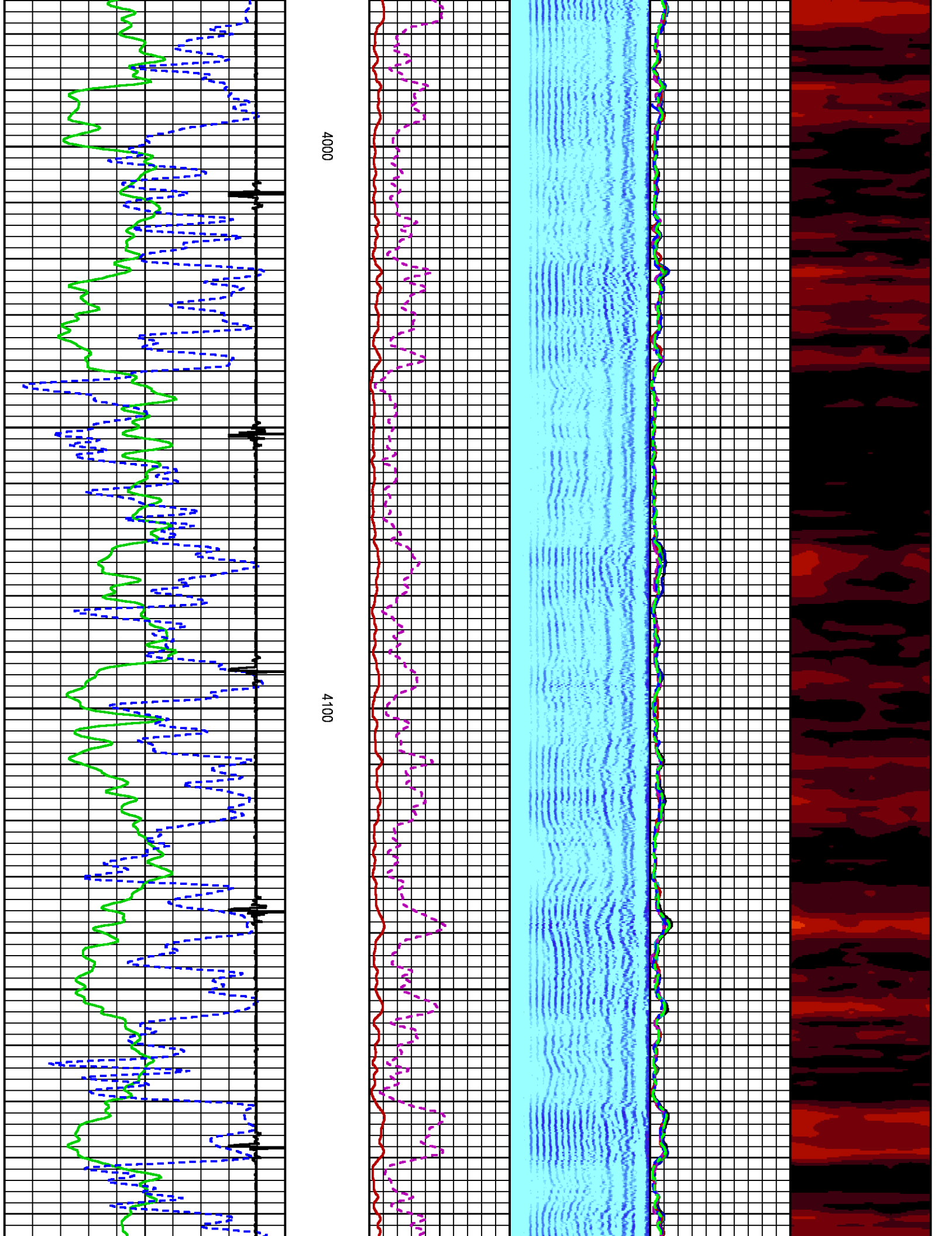
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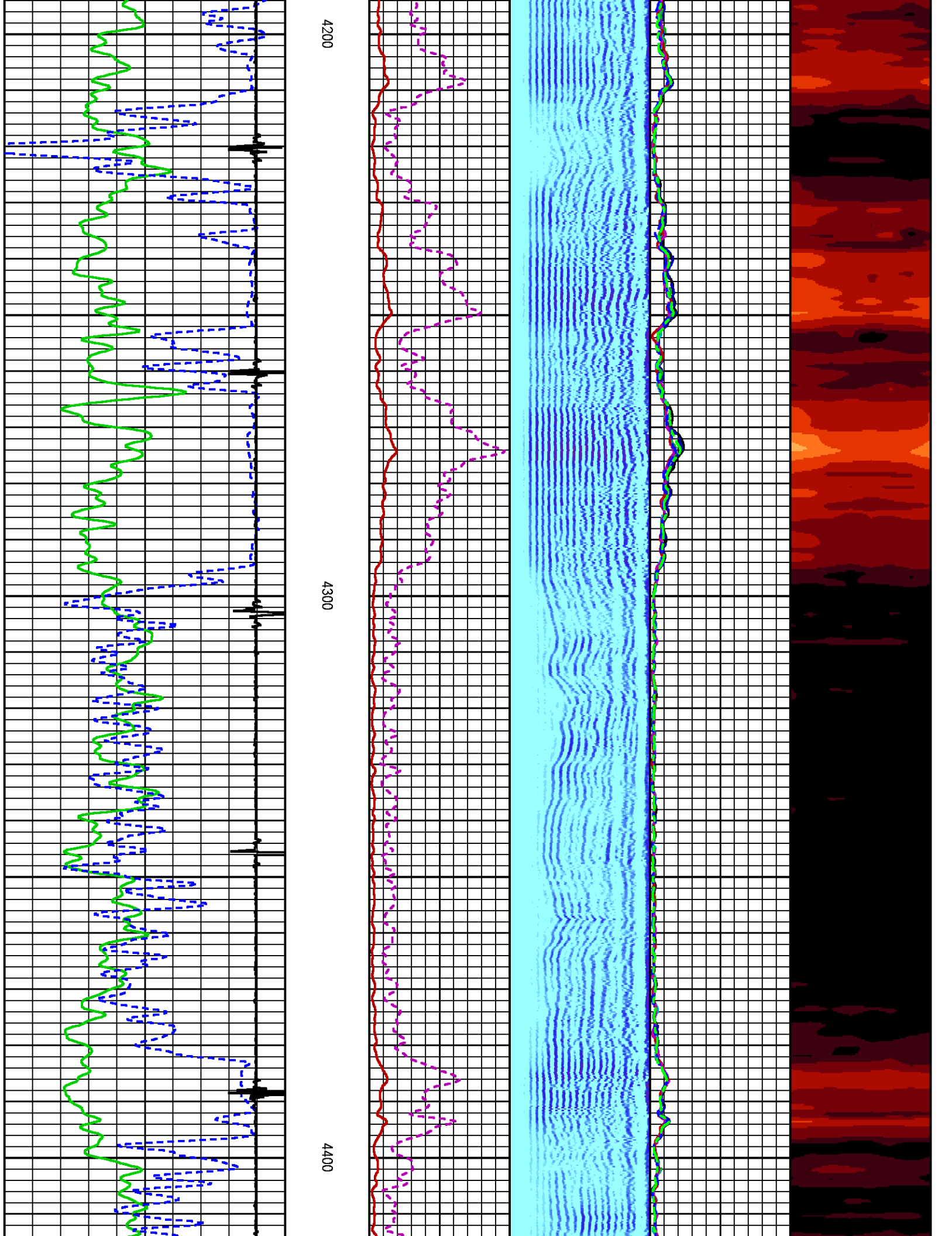
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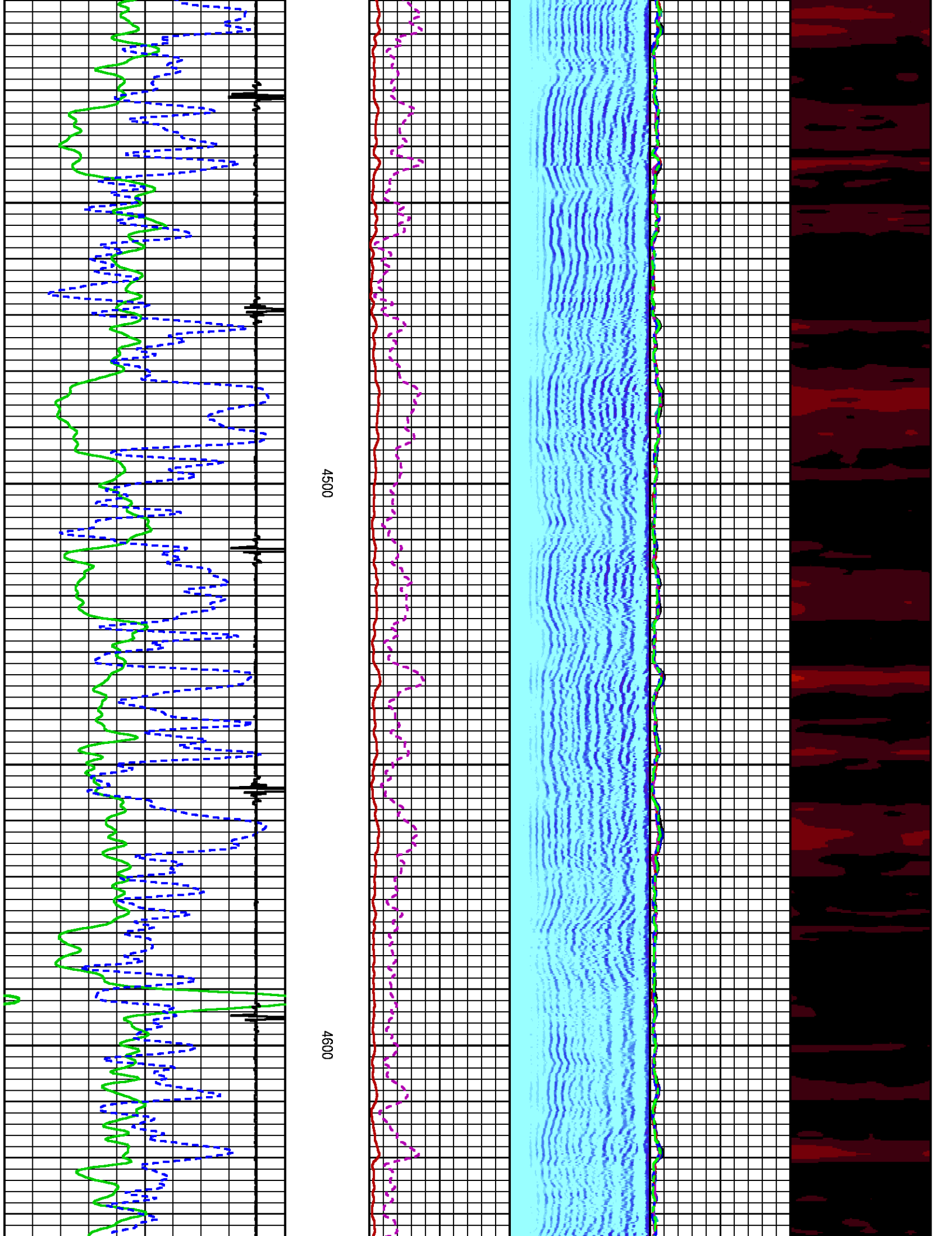


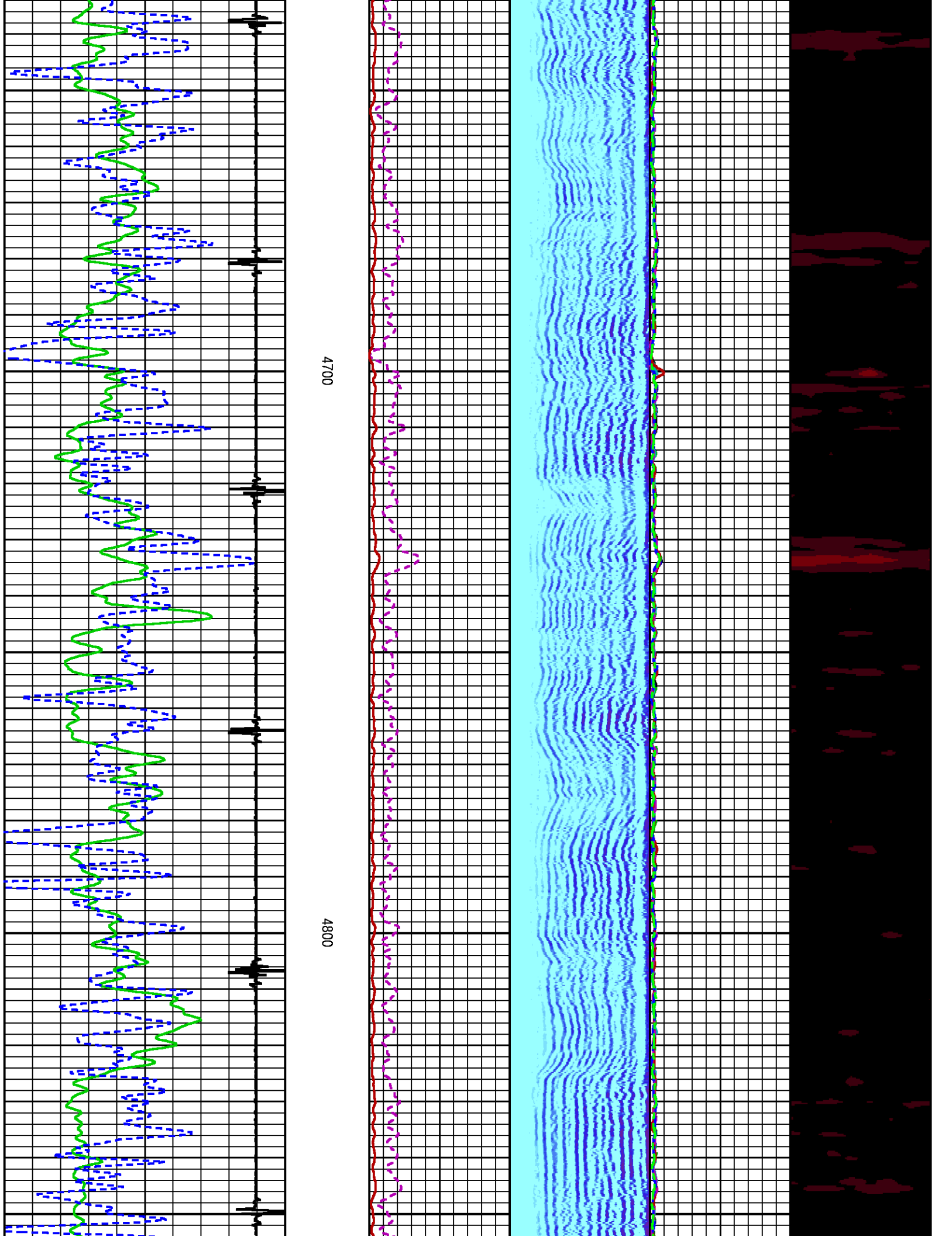




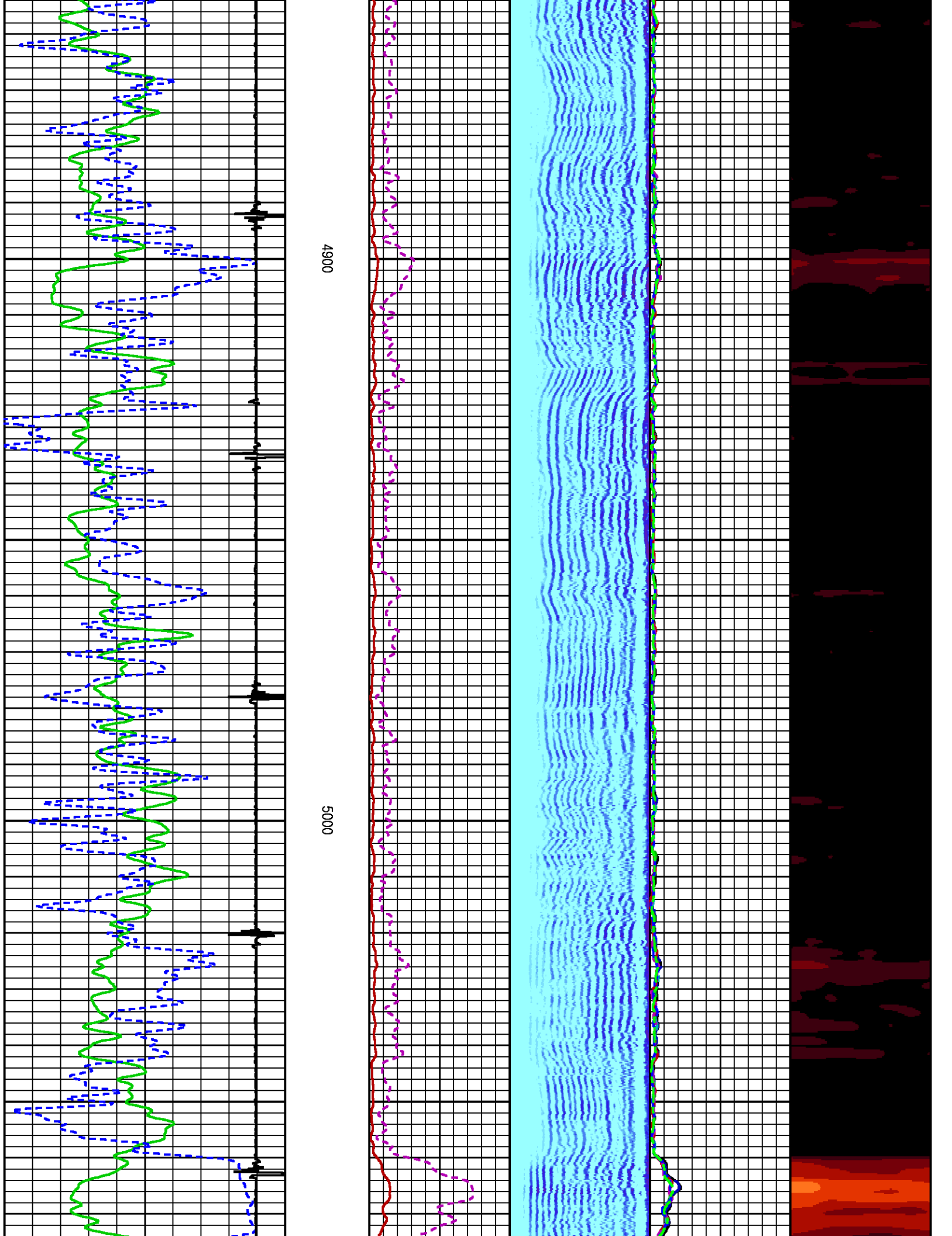




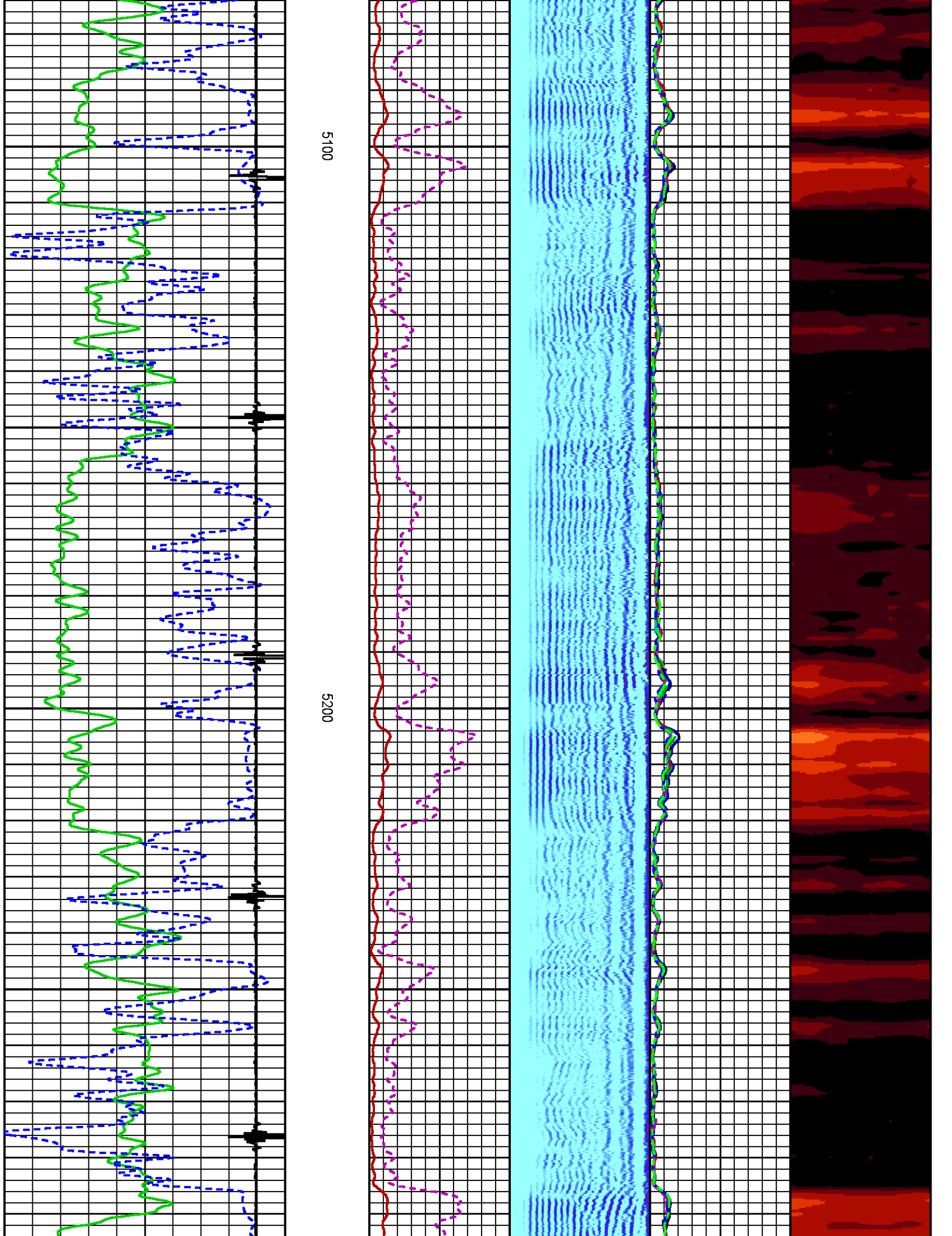


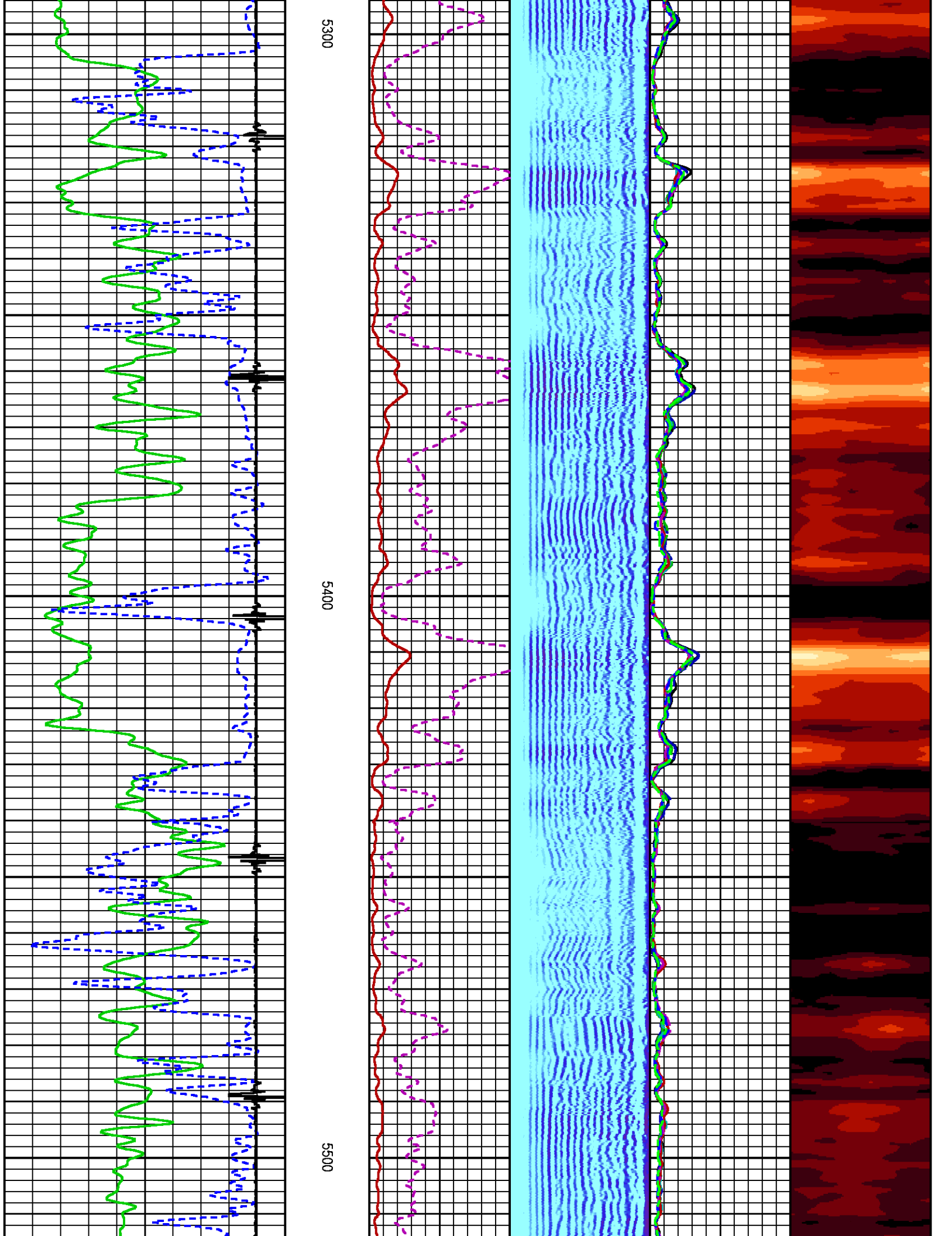


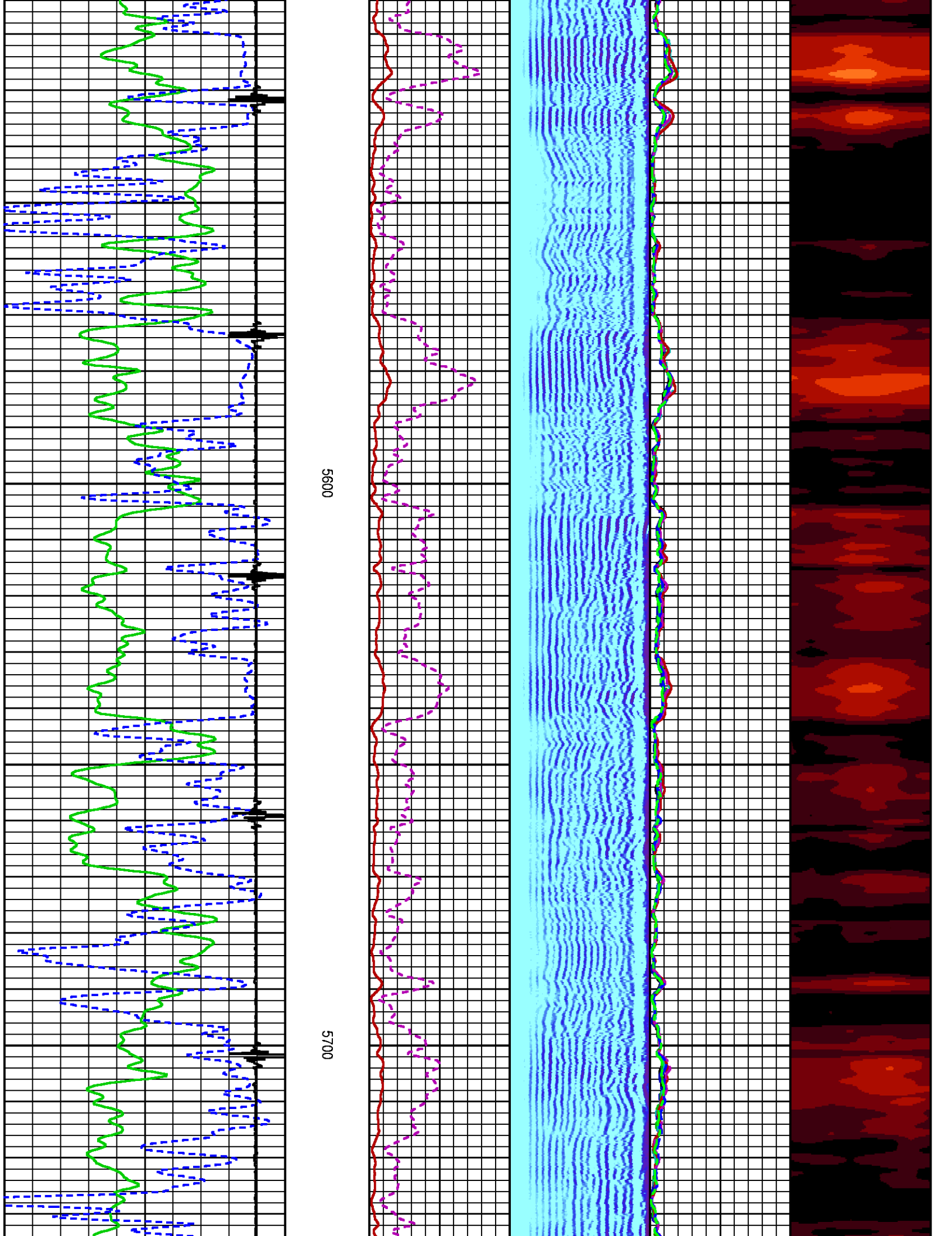


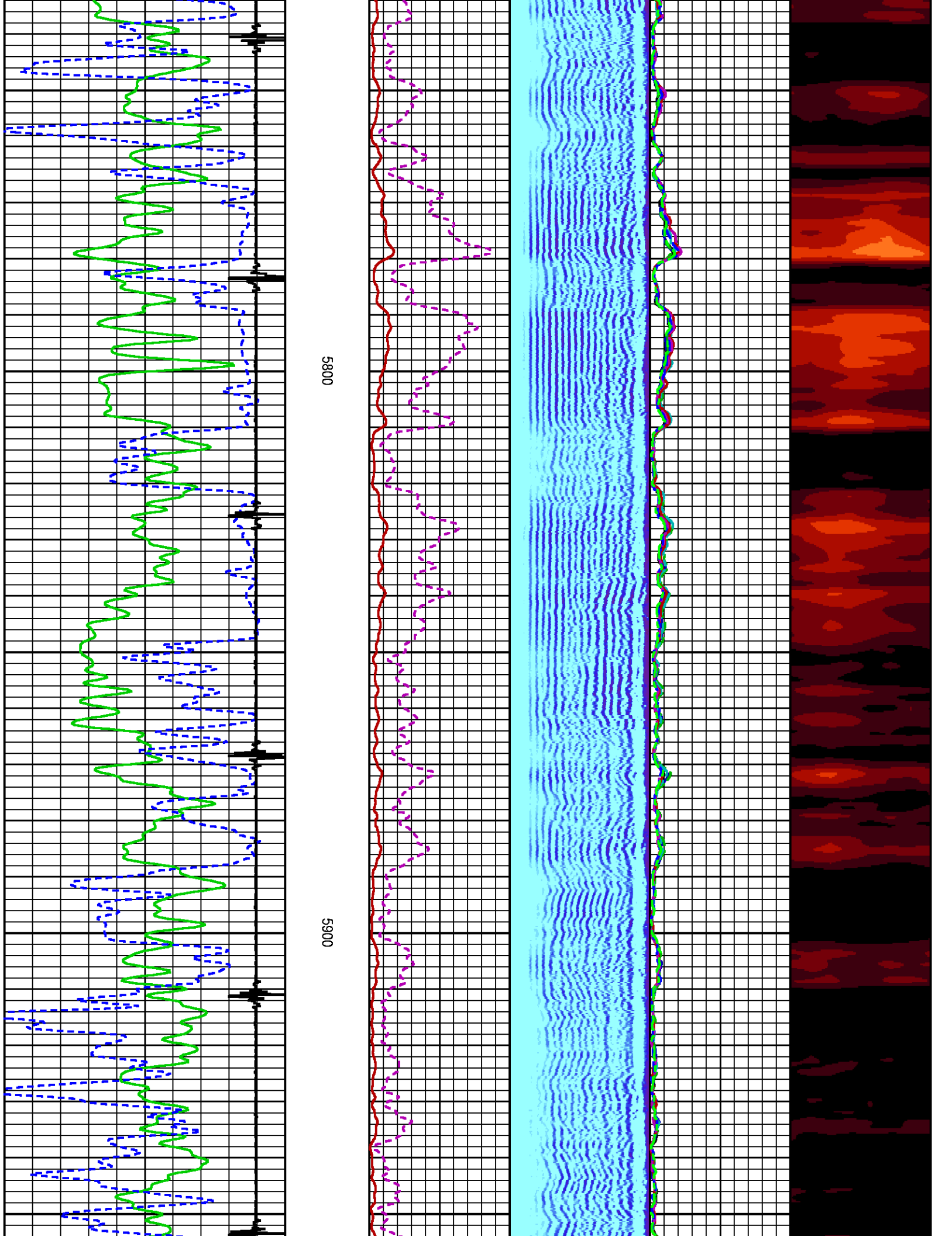




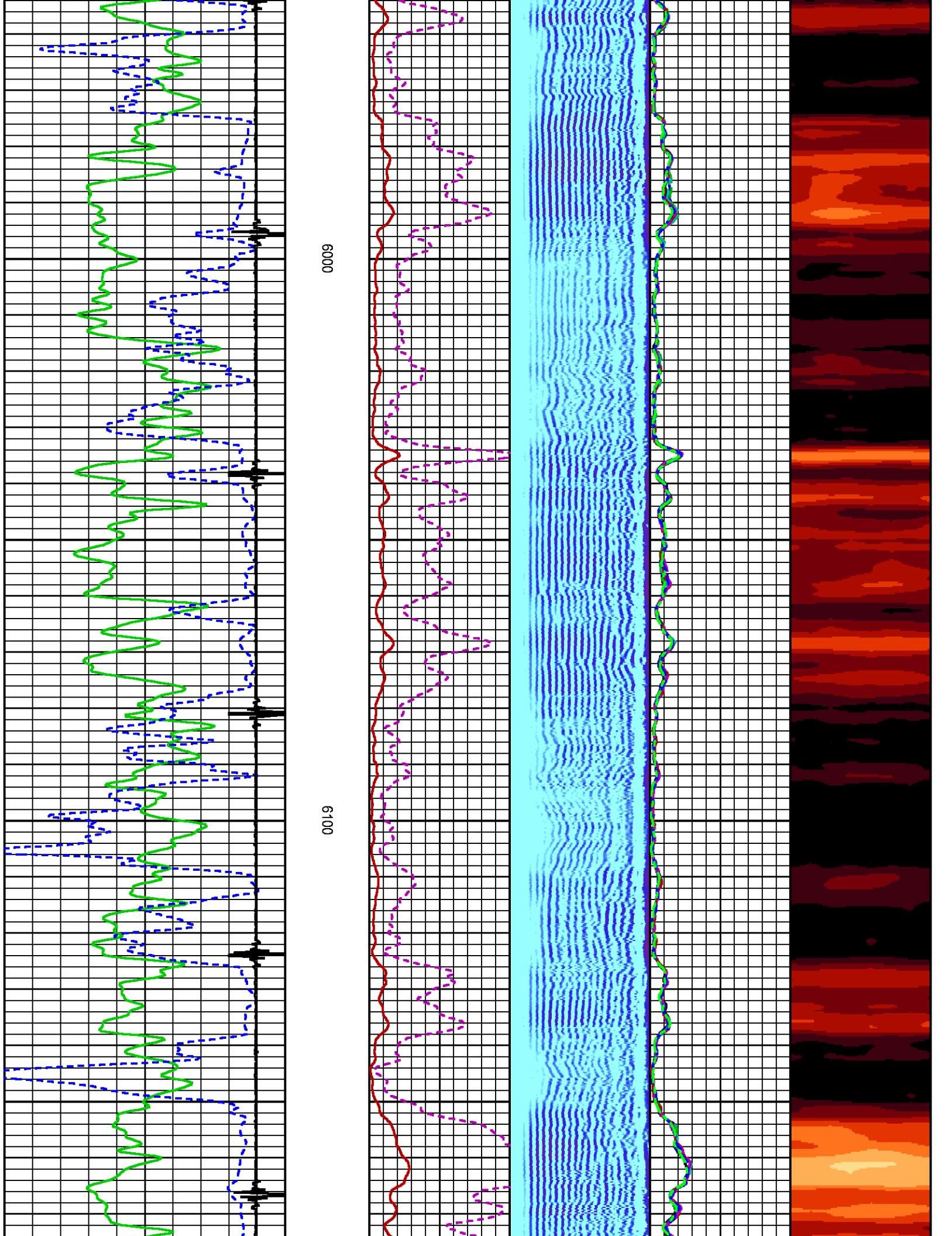


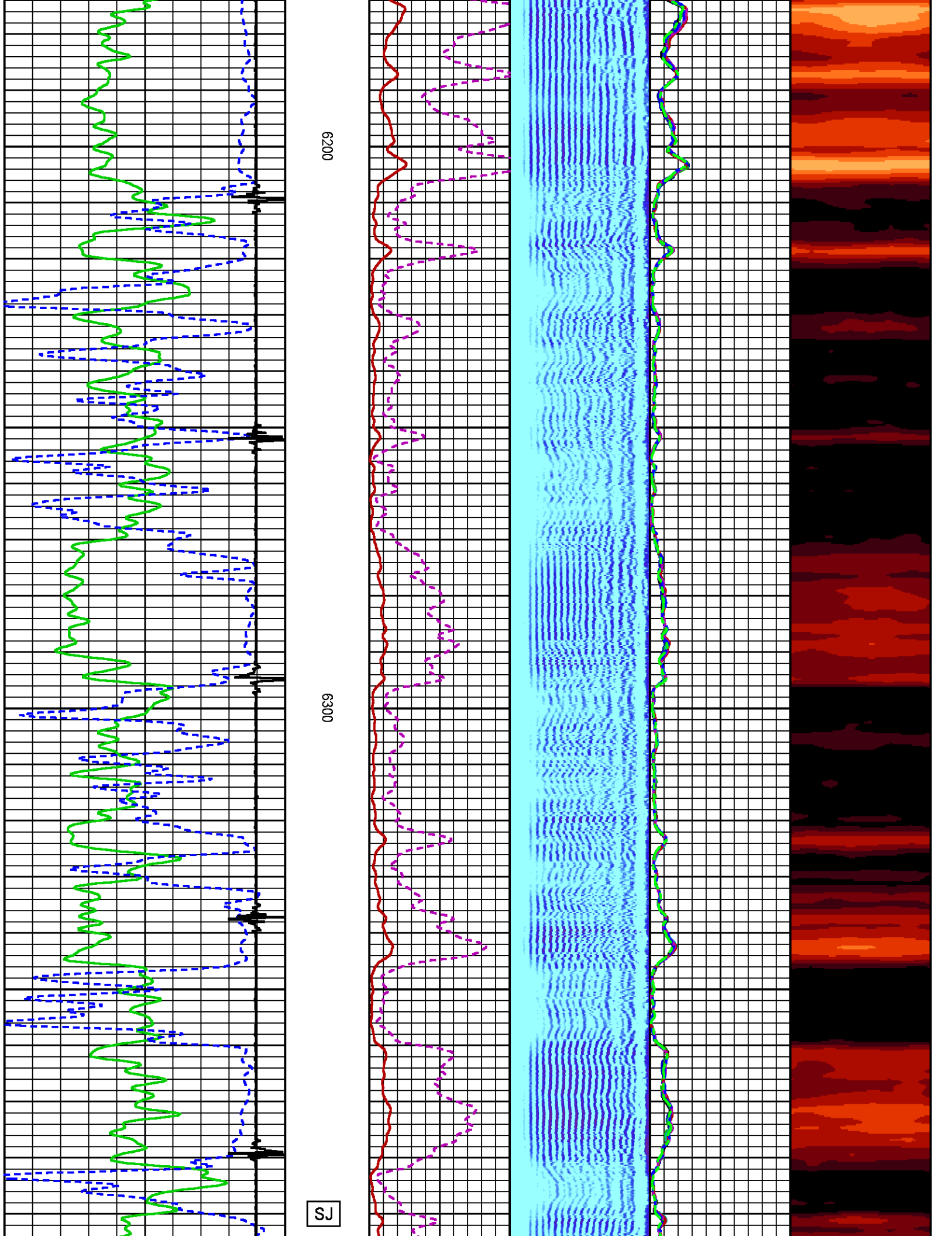




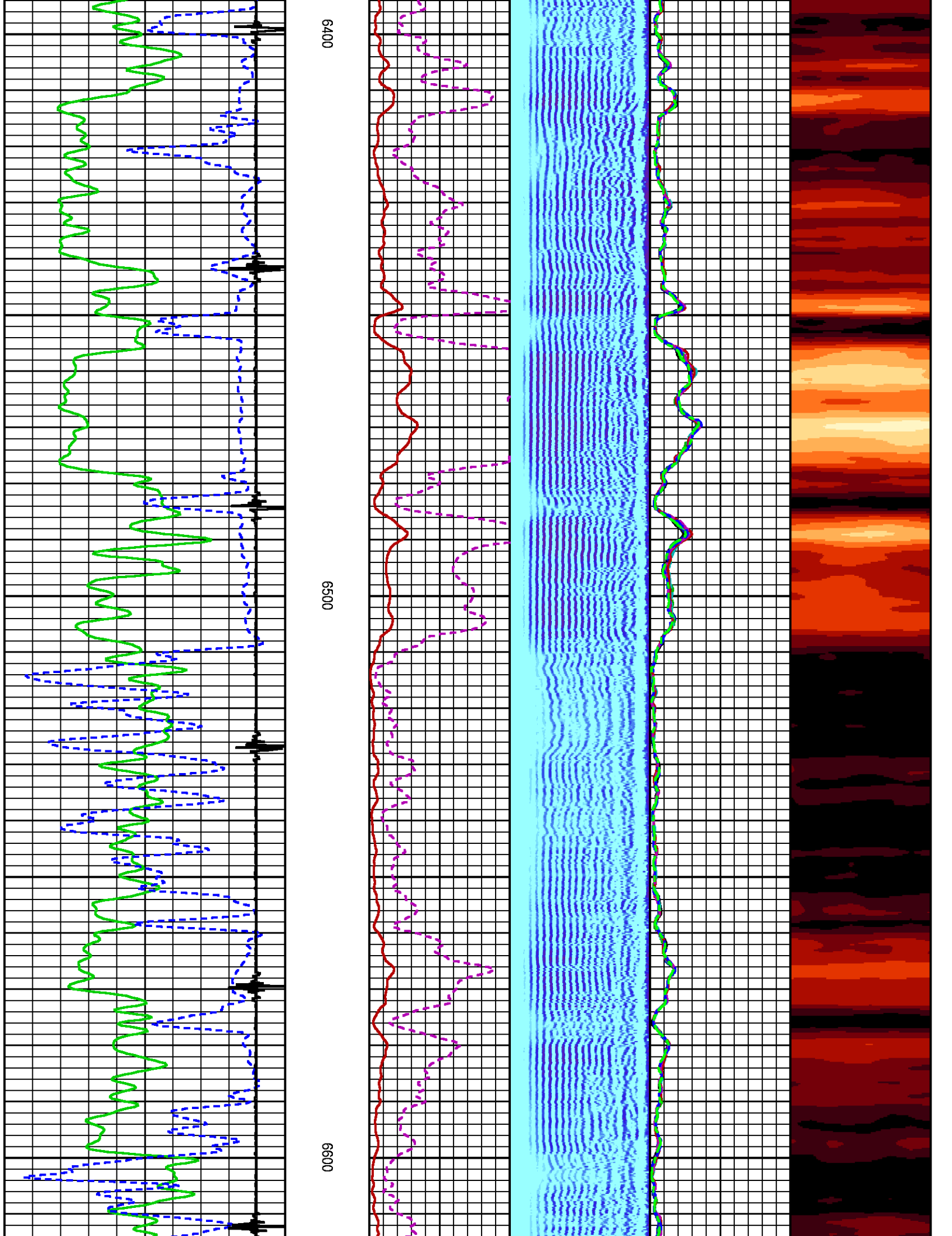


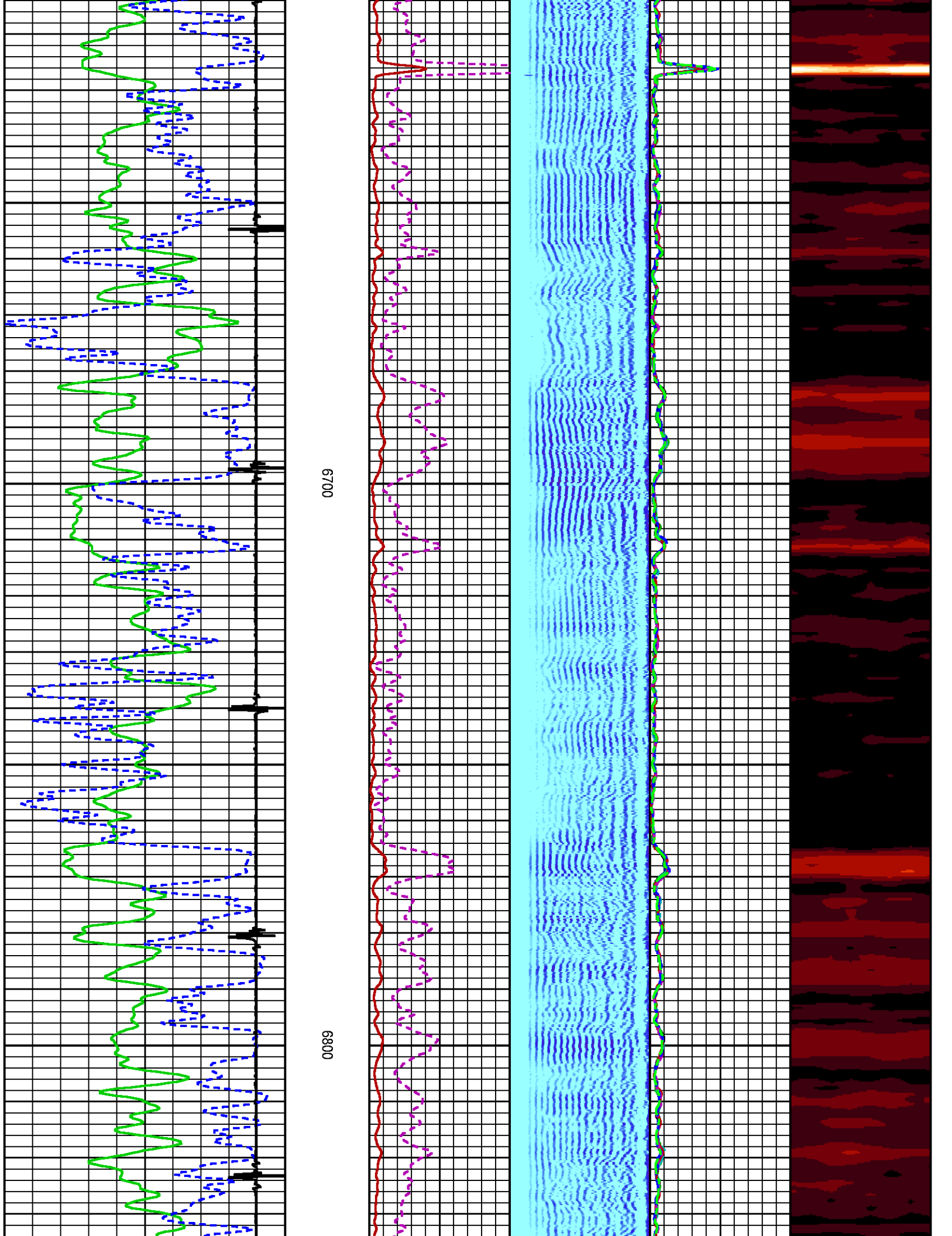


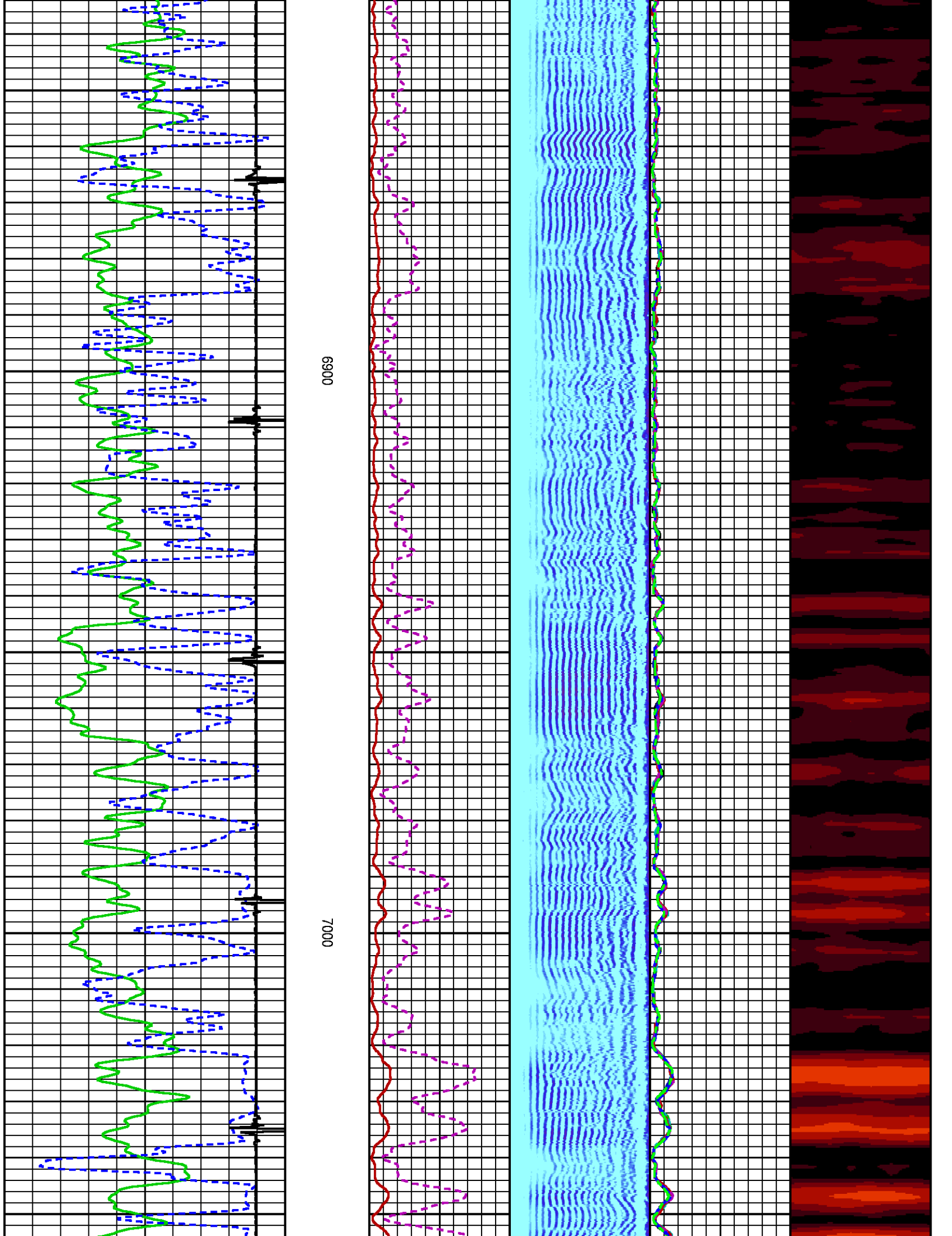


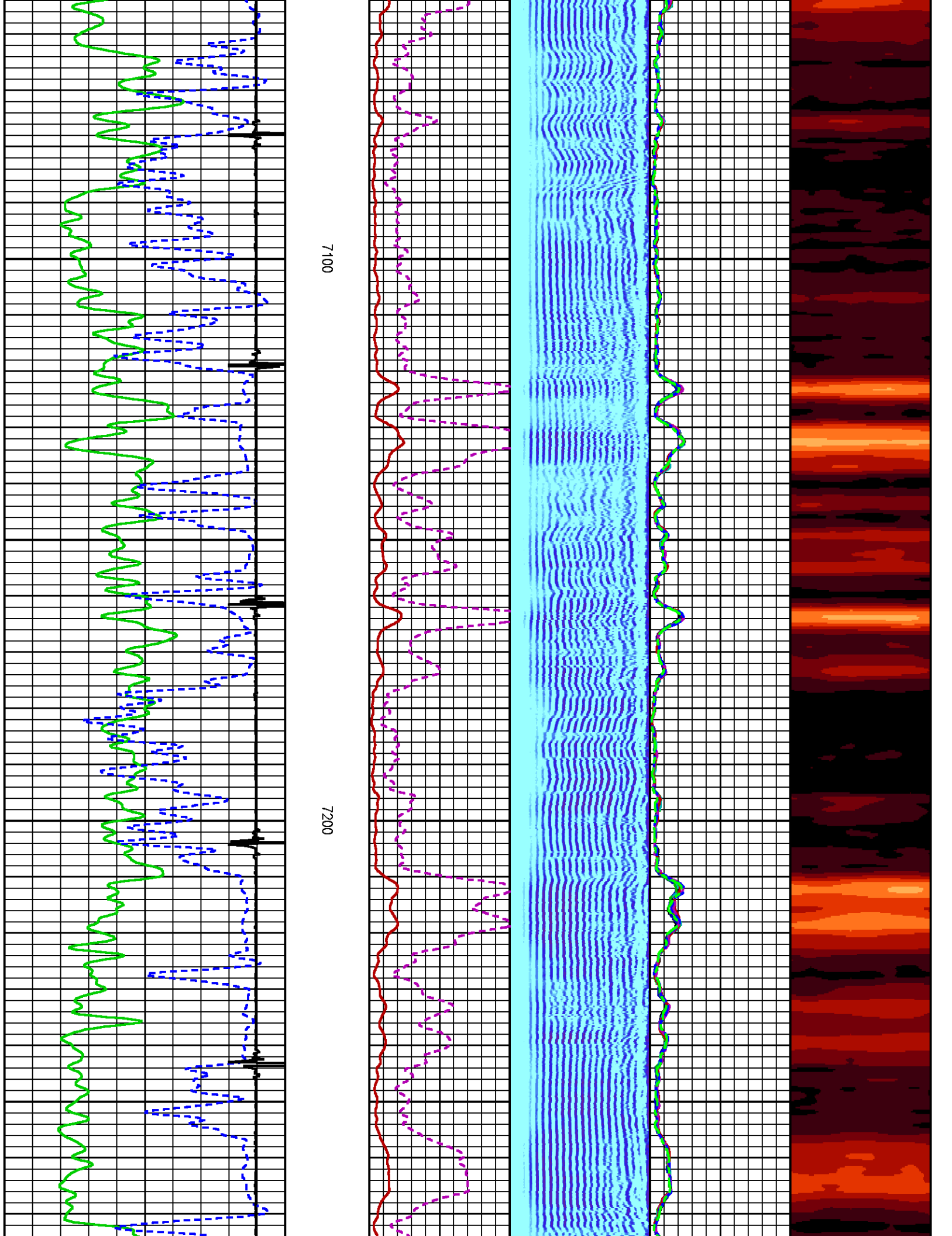




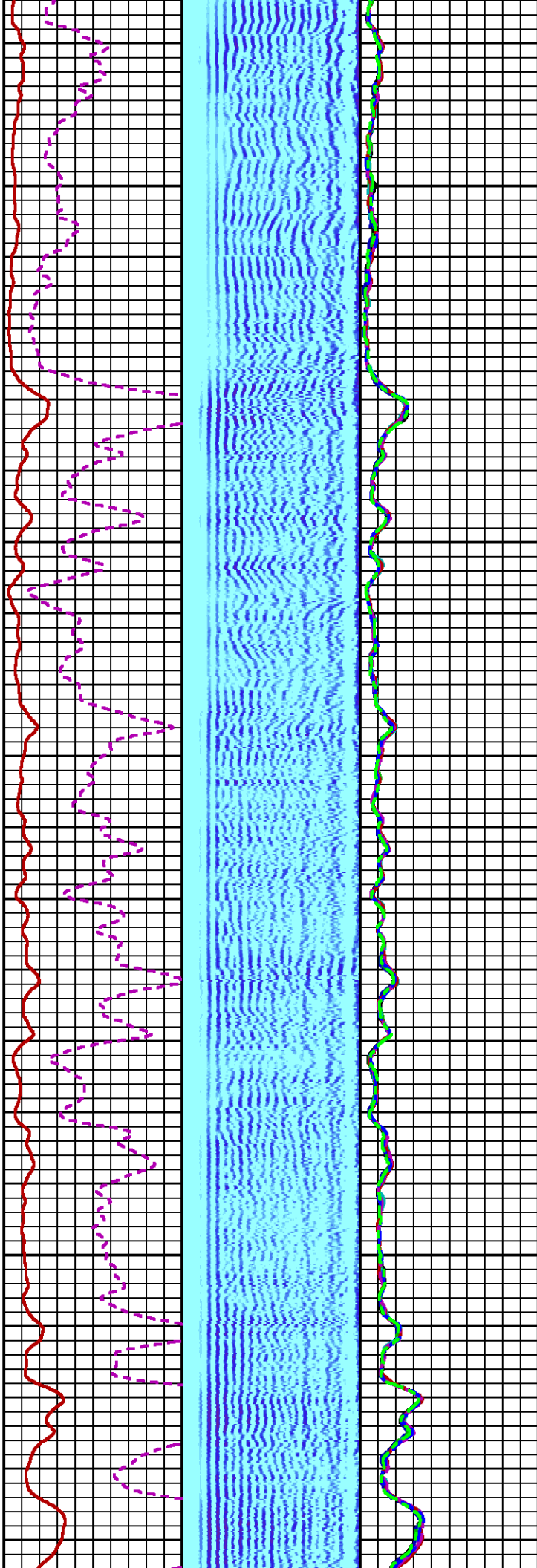
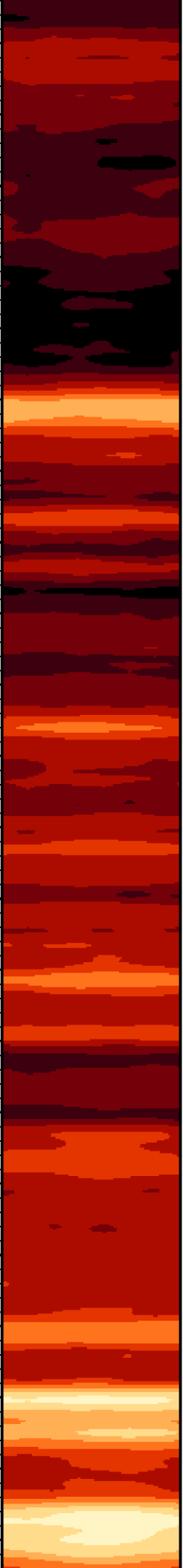






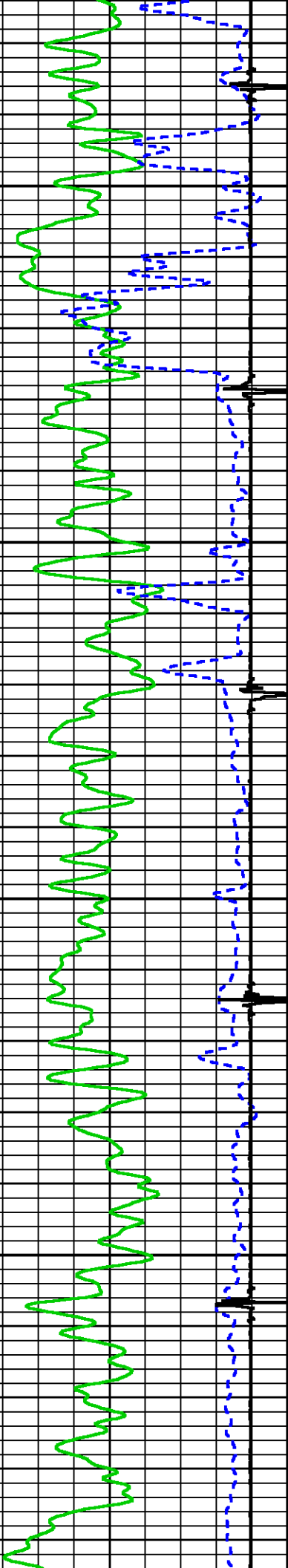




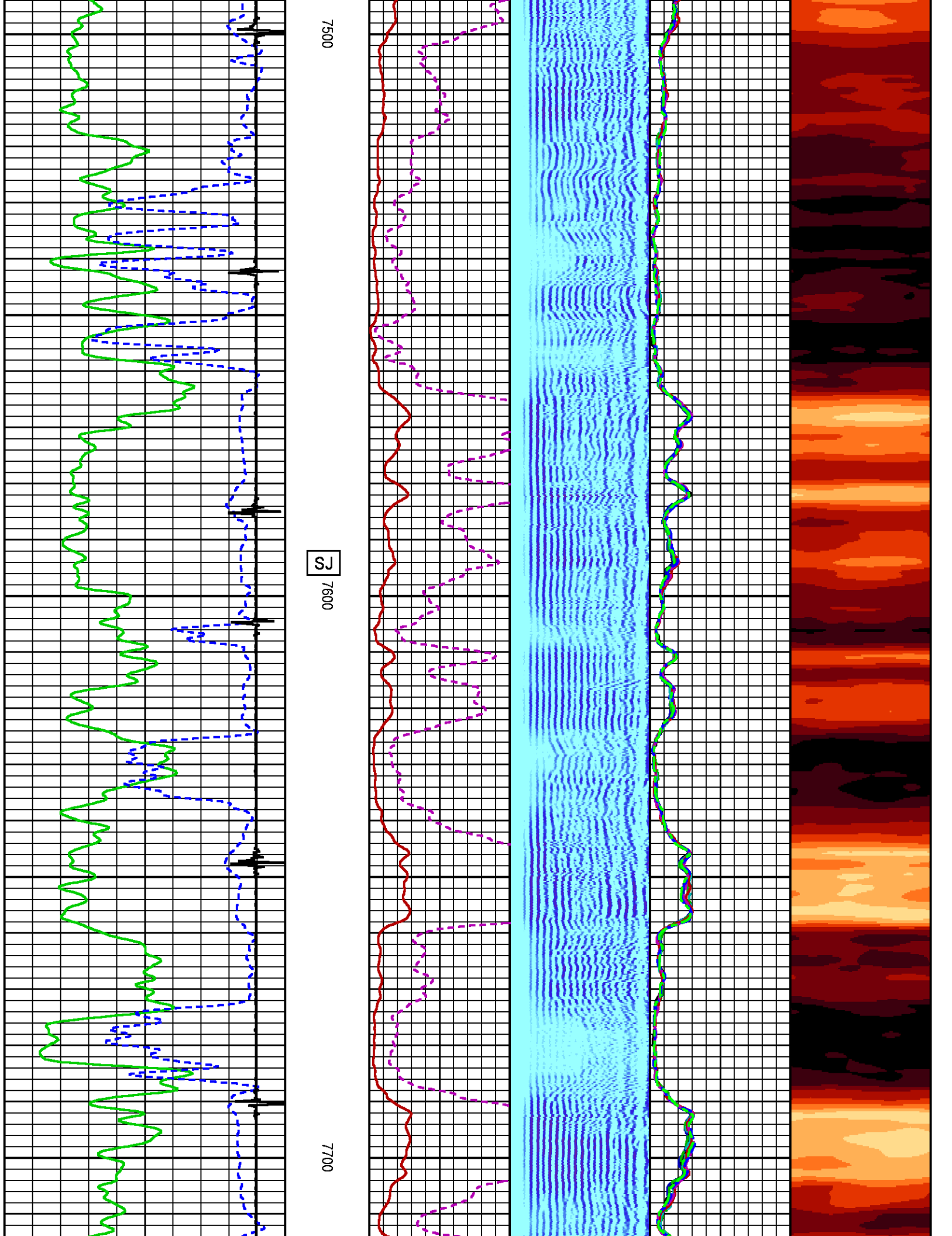


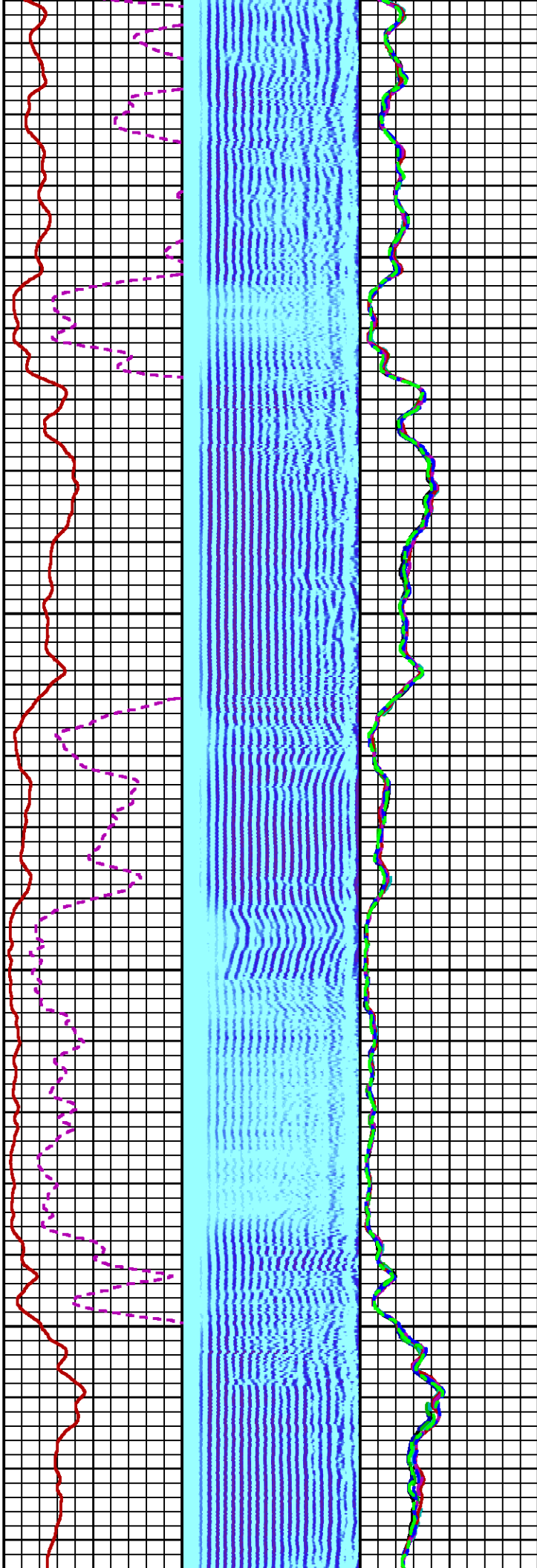
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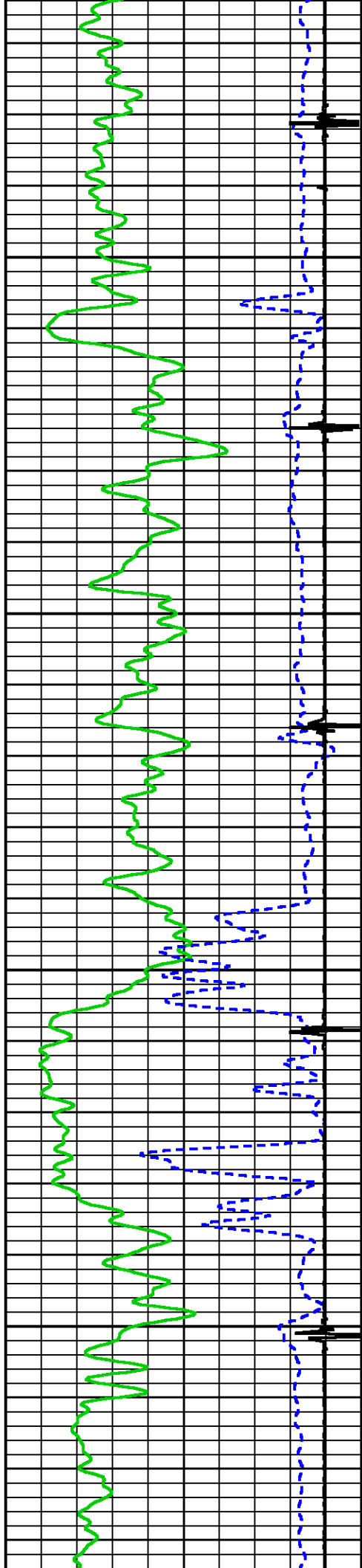


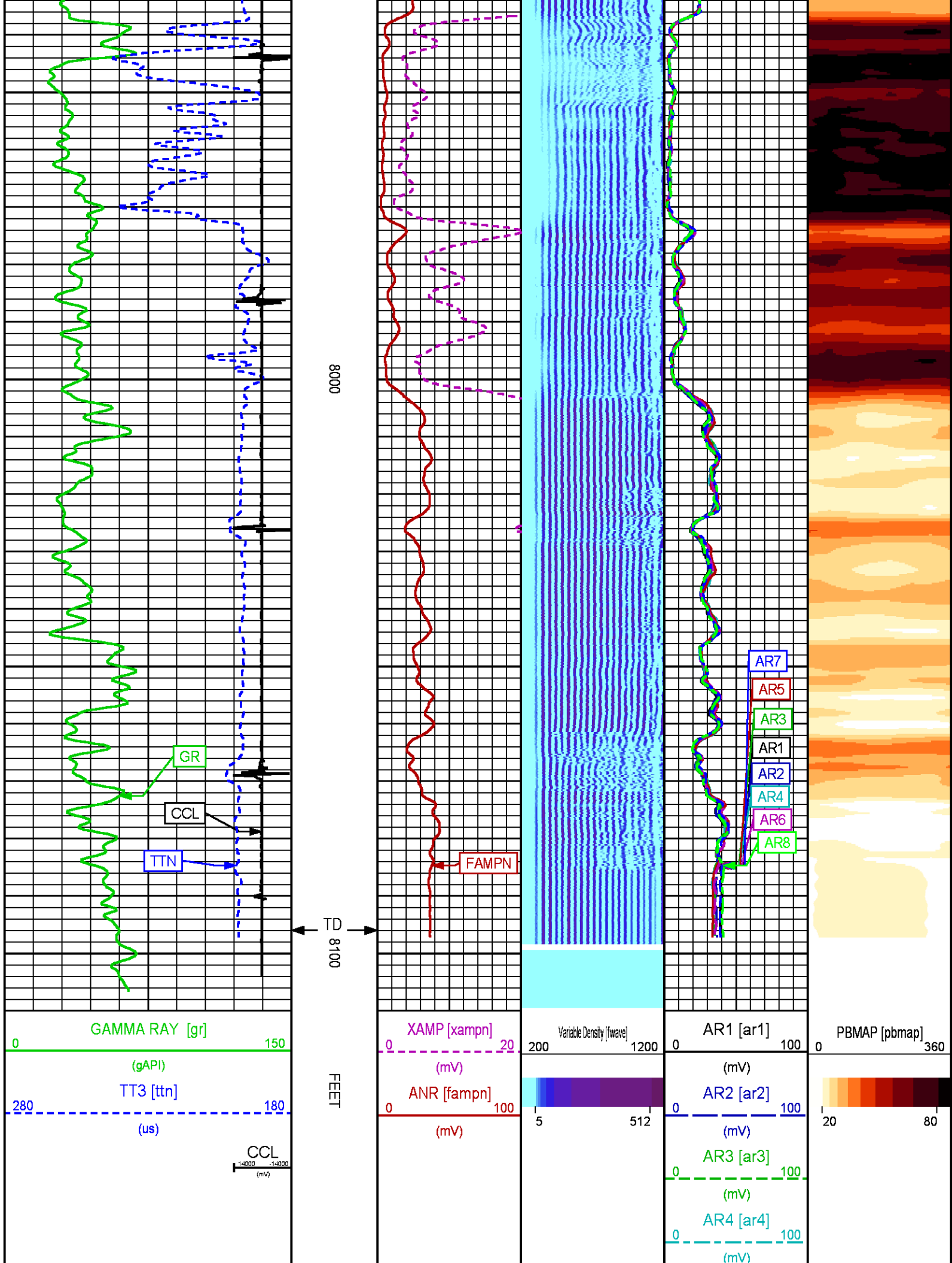


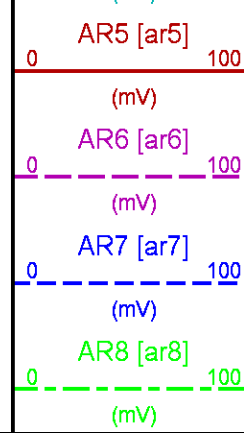


7800

7900







REPEAT PASS 0 PSI

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017  
Patches: 4

Plotted: Wed Jun 6 18:49:15 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_GUNDERSON\_0994-13-05W/p012g01.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 7745.750 ft BOTTOM DEPTH: 8097.000 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	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	"	"
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	AMP WINDOW START (fgp7*)	185	us	"	"
	AMP WINDOW START (fgp8*)	185	us	"	"
	AMP WINDOW START (fgpn*)	185	us	"	"
	AMP WINDOW LENGTH	25	us	"	"
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	160	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	4	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	200.465	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-67	us	"	"
	TOOL DELAY (str2*)	-67	us	"	"
	TOOL DELAY (str3*)	-67	us	"	"
	TOOL DELAY (str4*)	-67	us	"	"
	TOOL DELAY (str5*)	-67	us	"	"
	TOOL DELAY (str6*)	-67	us	"	"

	TOOL DELAY (str7*)	-67	us	"	"
	TOOL DELAY (str8*)	-67	us	"	"
	TOOL DELAY (strn*)	-67	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	"	"

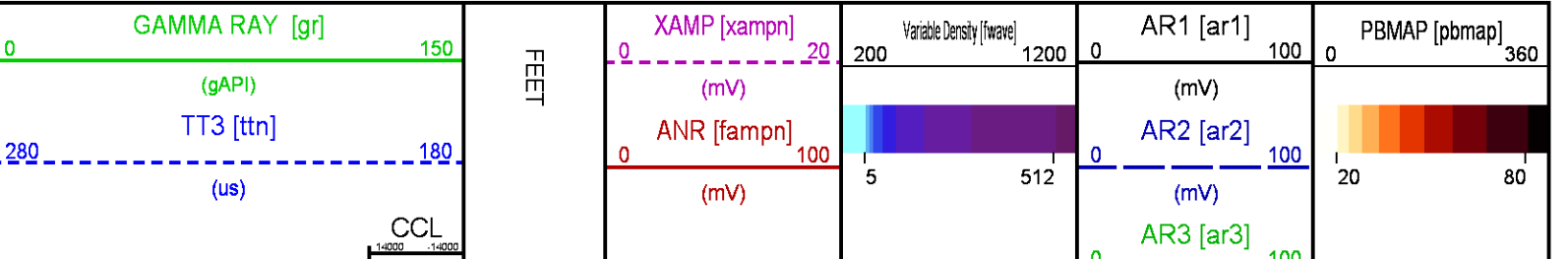
CURVE DESCRIPTION REPORT

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

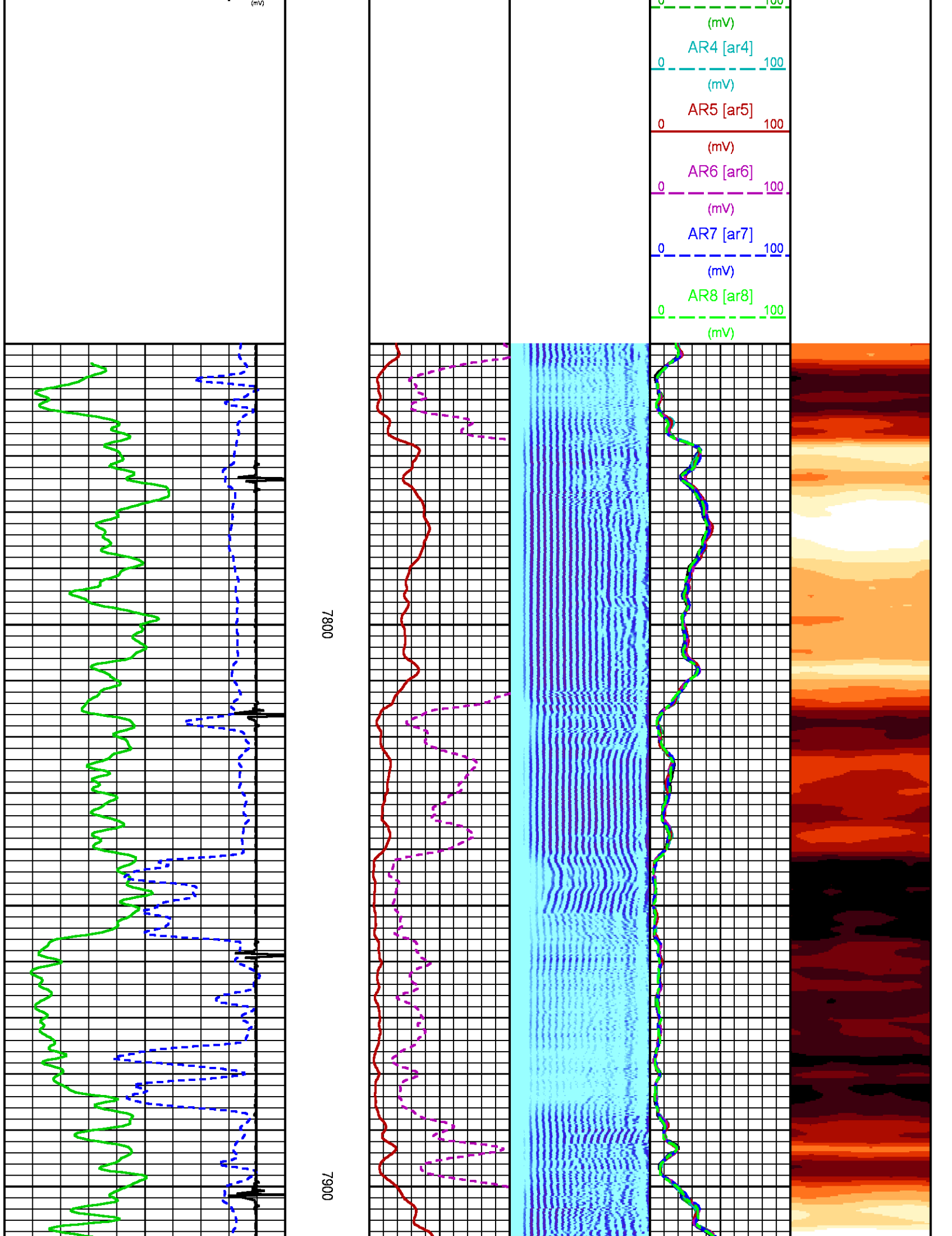
CURVE MEASURE POINT OFFSET

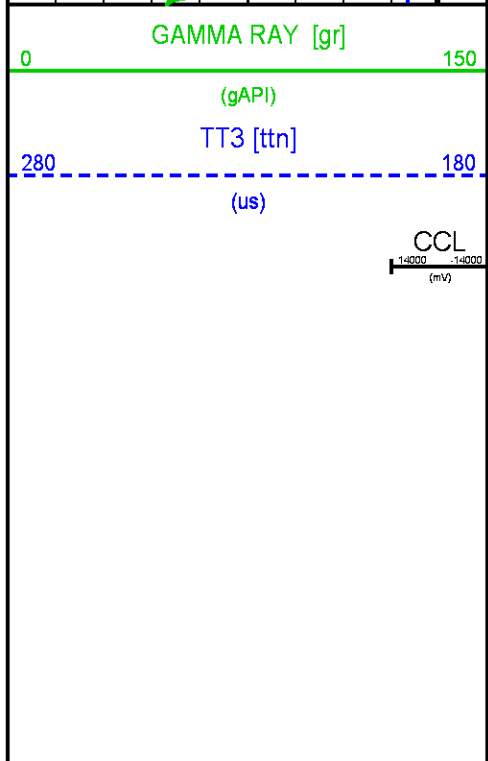
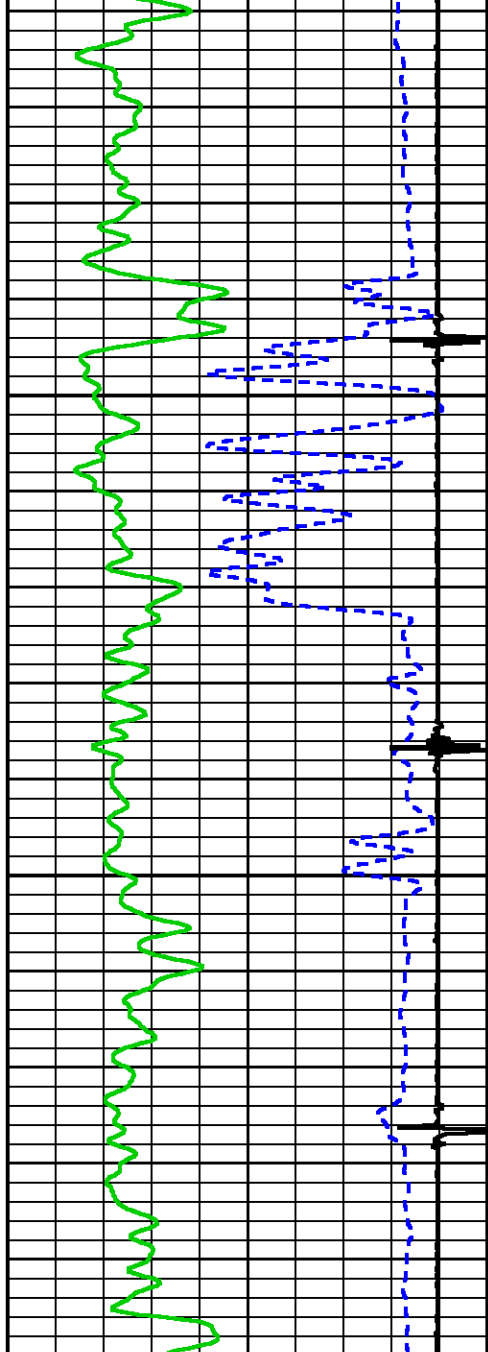
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
AR1	-11.25	AR5	-11.25	CCL	-5.75	XAMPN	-11.25
AR2	-11.25	AR6	-11.25	FAMPN	-11.25		
AR3	-11.25	AR7	-11.25	GR	-1.75		
AR4	-11.25	AR8	-11.25	TTN	-11.25		

Presentation	: SysA:/dat1a/LARAMIE_GUNDERSON_0994-13-05W/LARAMIE_RAL_0994-13-05W_REPEAT.fvpdf [5"/100' Scale]
Plot Interval	: 7750 - 8050 Feet
Data File 1	: F1 : SysA:/dat1a/LARAMIE_GUNDERSON_0994-13-05W/LARAMIE_GUNDERSON_0994-13-05W_RAL_REPEAT.xtf
Created On	: N/A
Company	: LARAMIE ENERGY LLC
Well	: GUNDERSON 0994-013-05W
Field	: VEGA
File Interval	: 7734.25 - 8097 Feet
OCT	: p012g



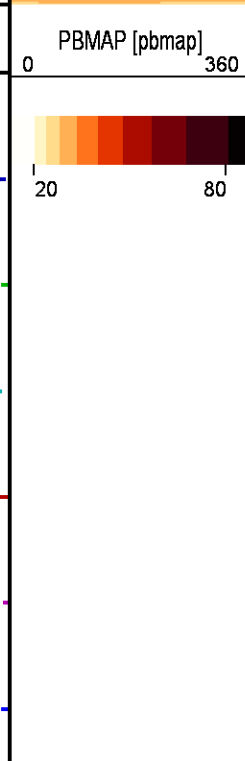
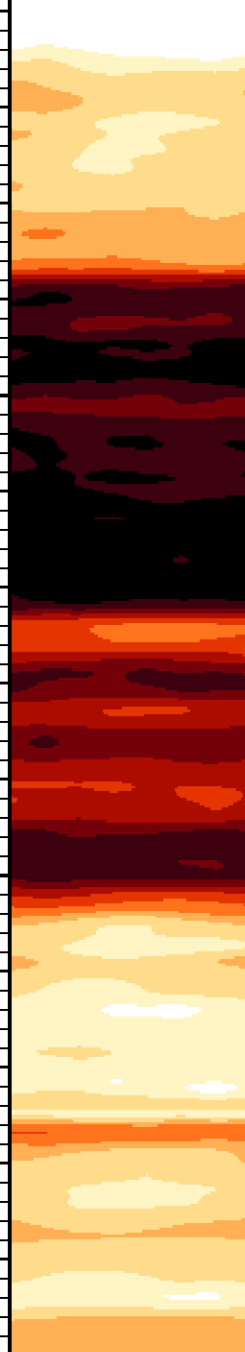
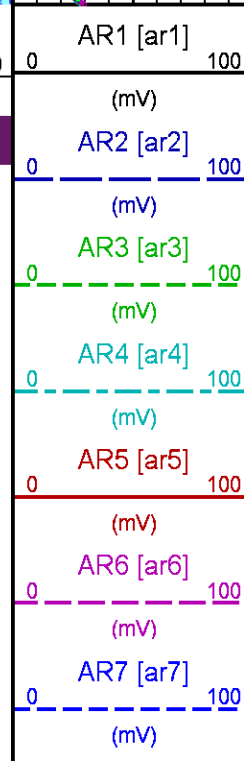
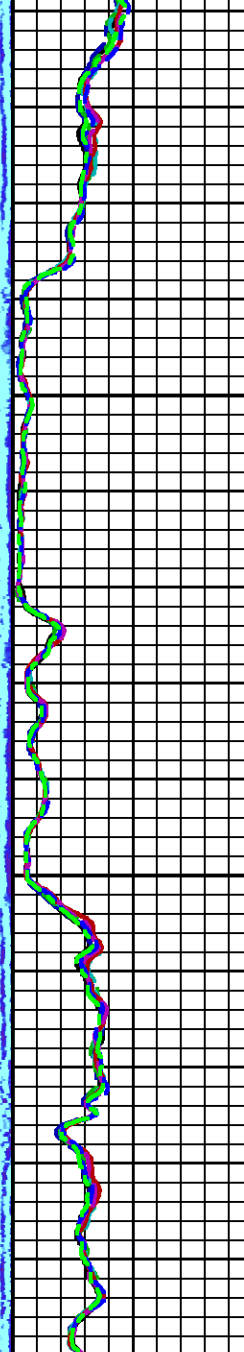
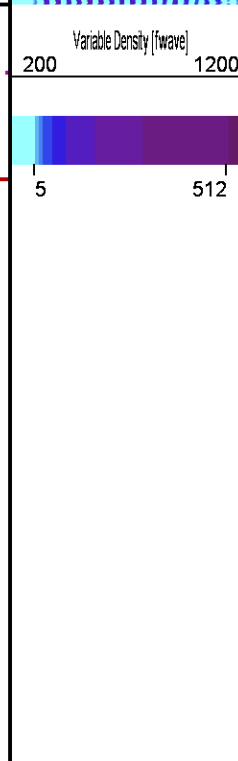
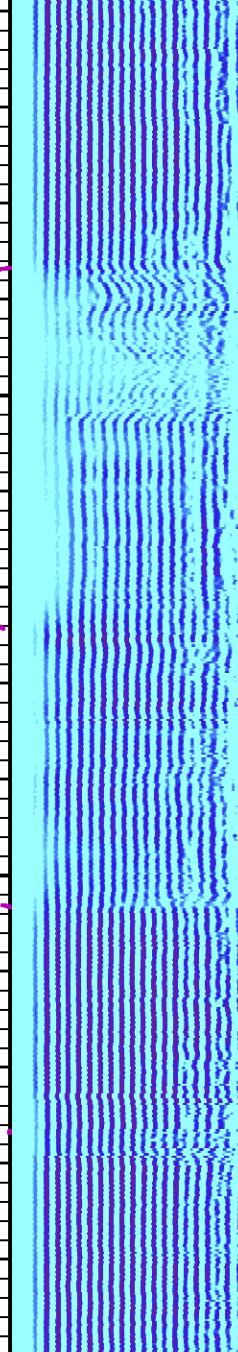
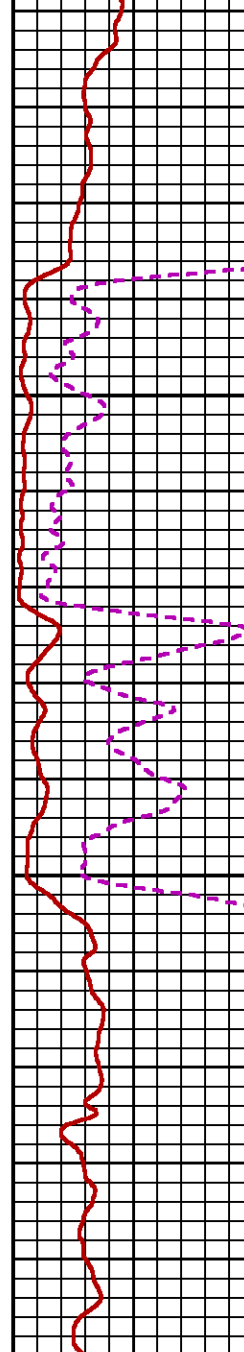






8000

FEET



AR8 [ar8]  
0 --- 100  
(mV)

## CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/LARAMIE\_GUNDERSON\_0994-13-05W/p012g.tp1

### RAL PRIMARY CALIBRATION SUMMARY

TOOL #: 1426XA 11871500

DATE/TIME PERFORMED: Wed Jun 6 09:25:52 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)	-0.29	-0.15	0.00	-0.28	-0.14	-0.06	-0.07	0.26	-0.00	-0.48	0.00
AMP FLUID (mV)	41	40	40	40	41	41	41	40	40	55	39
TT (us)	217	218	217	217	217	216	216	216	218	325	218
M FACTOR	2.43	2.50	2.51	2.46	2.44	2.44	2.44	2.53	2.52	2.73	2.54

### RAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1426XA 11871500

DATE/TIME PERFORMED: Wed Jun 6 12:40:36 2018

DAYS SINCE CAL: 0

UNIT #: 5753XD 111111

CABLE #: ML4291 SMALL1

	NEAR (mV)	R1 (mV)	R2 (mV)	R3 (mV)	R4 (mV)	R5 (mV)	R6 (mV)	R7 (mV)	R8 (mV)	FAR (mV)	CAL (mV)
ZERO	-0.89	-0.84	-0.35	-1.12	-0.99	-0.56	-0.57	-0.08	-0.26	-1.21	-0.02
AMP AIR	0.98	0.93	0.51	1.13	0.99	1.07	0.75	0.96	0.74	1.17	98.43

SHOP M FACTOR	SHOP A FACTOR	WIRELINE FACTOR
2.54	0.00	1.02

### GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1355XA 12670180

DATE/TIME PERFORMED: Thu Mar 29 16:39:27 2018

UNIT #: 4352 ML4352

CALB JIG #: 4702NK DA\_228

	BACKGROUND (cts)	CALBRTR ON (cts)	CR DIFF (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	CALBRTR (gAPI)
GR	41.51	221.16	179.6	0.557	23.11	123.11	100

### GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1355XA 12670180

DATE/TIME PERFORMED: Thu Mar 29 16:50:56 2018

UNIT #: 4352 ML4352

VERI JIG #: 4702NK DA\_228

BACKGROUND CALBRTR ON

MULT

BACKGROUND CALBRTR ON

DIFF.

	(cts)	(cts)		(gAPI)	(gAPI)	(gAPI)
GR	40.09	214.13	0.557	22.32	119.20	96.88
						90.00 110.00

## INSTRUMENT CONFIGURATION

Source File: /dat1a/LARAMIE\_GUNDERSON\_0994-13-05W/p012g~RAL-tdg

### A3 CABLEHEAD

Diameter : 1.37"

### 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

18.85'

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'

TOTAL LENGTH: 18.85'

TOTAL LENGTH: 18.85  
TOTAL WEIGHT: 227 lbs  
MAX DIAMETER: 0'4.00"

**BAKER  
HUGHES**  
a GE company



**ECLIPS**

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

**LARAMIE ENERGY LLC**  
**GUNDERSON 0994-13-05W**  
**VEGA**  
**MESA**

**STATE** **COLORADO**

**FILE NO:**  
**CH136724**

**API NO:**  
**05077105370000**

**LOCATION:**

**LAT:** 39.273929 N  
**LONG:** 107.834809 W

**SEC** **13** **TWP** **9 S** **RGE** **94 W**

**ELEVATIONS:**

**KB** 7302 FT  
**DF**  
**GL** 7272 FT

**DATE** 06-Jun-2018