



RADIAL CEMENT BOND LOG

FILE NO: CH145369	COMPANY LARAMIE ENERGY LLC
API NO: 05077105230000	WELL BUZZARD CREEK
	FIELD MESA
	COUNTY STATE COLORADO

Ver. 4.11	LOCATION: SHL: 381.0' FNL & 1321.0' FWL	OTHER SERVICES RPM
SEC 21.0	TWP 9.0S	RGE 93.0 W

PERMANENT DATUM	GL	ELEVATION	7257 FT
LOG MEASURED FROM	KB	30 FT	ABOVE P.D.
DRILL. MEAS. FROM	KB		

ELEVATIONS:
KB 7287 FT
DF
GL 7257 FT

DATE	TRIP	29-NOV-2018
RUN	1	1
SERVICE ORDER	US145369J	
DEPTH DRILLER	7710.0 FT	
DEPTH LOGGER	7636.0 FT	
BOTTOM LOGGED INTERVAL	7636.0 FT	
TOP LOGGED INTERVAL	30.0 FT	
TIME STARTED	09:00	
TIME FINISHED	12:00	
OPERATOR RIG TIME	3.0 HOURS	
TYPE OF FLUID IN HOLE	WATER	
FLUID DENSITY	NA	
FLUID SALINITY	NA	
FLUID LEVEL	72.0 FT	
LOGGED CEMENT TOP	450.0 FT	
WELLHEAD PRESSURE	0 PSI	
MAXIMUM HOLE DEVIATION	NA	
NOMINAL LOGGING SPEED	100.0 F/MIN	
MAX. RECORDED TEMP.	251.0 DEGF	
REFERENCE LOG	NA	
REFERENCE LOG DATE	NA	
EQUIP. NO.	ML-4268	GRAND JCT.
RECORDED BY	ATUL GUPTA	
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.

BOREHOLE RECORD		
BIT SIZE	FROM	TO

CASING RECORD				
SIZE	WEIGHT	GRADE	FROM	TO
4.5 IN	11.6 LB/F		30.0 FT	7805.0 FT

REMARKS

RUN 1 TRIP 1: SJ: 5795.0' - 5816.0'
SJ: 6859.0' - 6879.0'

EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	RAL	1426XA	10222301	CENTRALIZED
1	1	GR/CCL	1355XA	12568545	CENTRALIZED

RAL MAIN PASS 0 PSI

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

Updates: 1

Plotted: Thu Nov 29 13:35:15 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE_BCU_0993_21_02W/p012g03.prm
 LOGGING MODE: DEPTH DIRECTION: UP
 TOP DEPTH: 15.500 ft BOTTOM DEPTH: 7636.000 ft

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
GR	FILTER ()	medium (1)		TOP	BOTTOM
AMPLITUDE	FILTER ()	light (2a)		"	"
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*)	184	us	TOP	BOTTOM
	AMP WINDOW START (fgp2*)	184	us	"	"
	AMP WINDOW START (fgp3*)	184	us	"	"
	AMP WINDOW START (fgp4*)	184	us	"	"
	AMP WINDOW START (fgp5*)	184	us	"	"
	AMP WINDOW START (fgp6*)	184	us	"	"
	AMP WINDOW START (fgp7*)	184	us	"	"
	AMP WINDOW START (fgp8*)	184	us	"	"
	AMP WINDOW START (fgpn*)	184	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*)	4	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	200.391	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-74	us	"	"
	TOOL DELAY (str2*)	-74	us	"	"
	TOOL DELAY (str3*)	-74	us	"	"
	TOOL DELAY (str4*)	-74	us	"	"
	TOOL DELAY (str5*)	-74	us	"	"
	TOOL DELAY (str6*)	-74	us	"	"
	TOOL DELAY (str7*)	-74	us	"	"
	TOOL DELAY (str8*)	-74	us	"	"
	TOOL DELAY (strn*)	-74	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 5	2	mV	"	"
	FULL BOND AMP REC 6	2	mV	"	"
	FULL BOND AMP REC 7	2	mV	"	"
	FULL BOND AMP REC 8	2	mV	"	"

PARAMETER AND FILTER SUMMARY REPORT					
<div> <div>FILE: /dat1a/LARAMIE_BCU_0993_21_02W/p012g01.prm</div> <div> <div>LOGGING MODE: DEPTH</div> <div>DIRECTION: UP</div> </div> <div> <div>TOP DEPTH: 7272.250 ft</div> <div>BOTTOM DEPTH: 7667.000 ft</div> </div> </div>					
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	TOOL DELAY (str5*)	-73	us	"	"
	TOOL DELAY (str6*)	-73	us	"	"
	TOOL DELAY (str7*)	-73	us	"	"
	TOOL DELAY (str8*)	-73	us	"	"
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	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	"	"

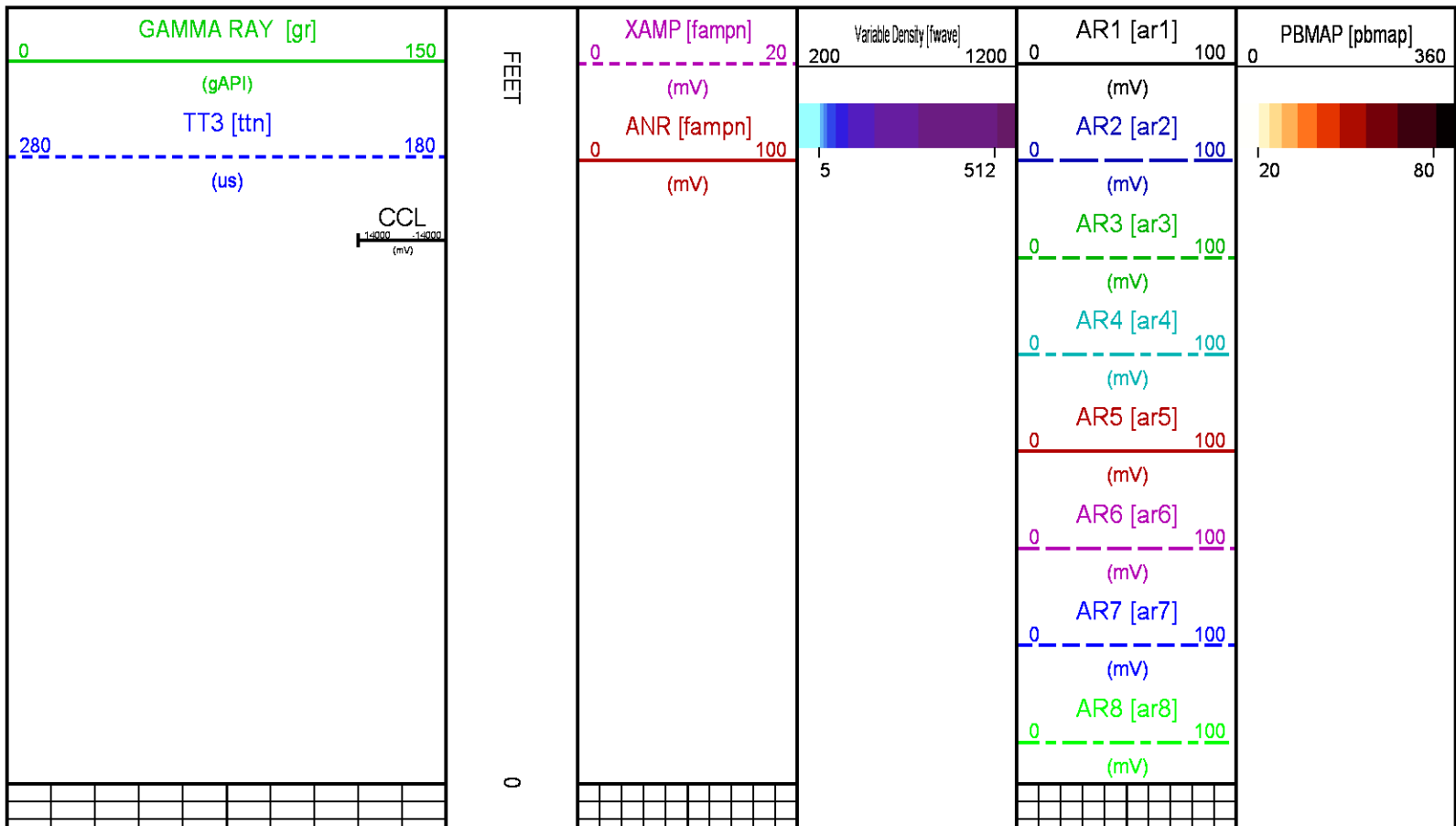
CURVE DESCRIPTION REPORT					
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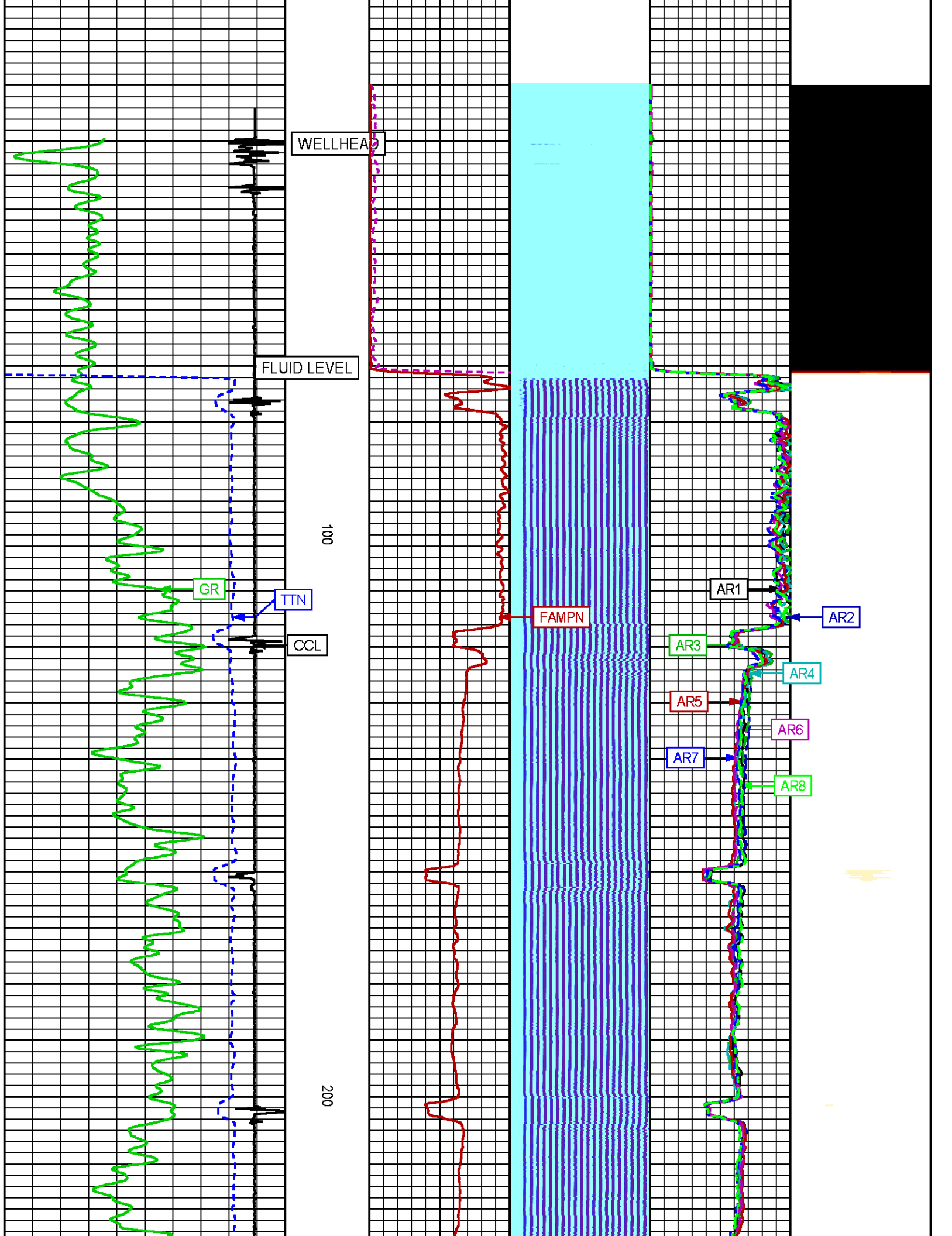
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
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F1:AR2	Nov 29 10:39:35 2018	FIXED GATE AMPLITUDE T-R2
F1:AR3	Nov 29 10:39:35 2018	FIXED GATE AMPLITUDE T-R3
F1:AR4	Nov 29 10:39:35 2018	FIXED GATE AMPLITUDE T-R4
F1:AR5	Nov 29 10:39:35 2018	FIXED GATE AMPLITUDE T-R5
F1:AR6	Nov 29 10:39:35 2018	FIXED GATE AMPLITUDE T-R6
F1:AR7	Nov 29 10:39:35 2018	FIXED GATE AMPLITUDE T-R7
F1:AR8	Nov 29 10:39:35 2018	FIXED GATE AMPLITUDE T-R8
F1:CCL	Nov 29 10:39:35 2018	CASING COLLAR LOCATOR
F1:FAMPN	Nov 29 10:39:35 2018	FIXED GATE AMPLITUDE NEAR RECEIVER
F1:FWAVE	Nov 29 10:39:35 2018	FAR WAVE FORM
F1:GR	Nov 29 10:39:35 2018	GAMMA RAY
F1:PBMAP	Nov 29 10:39:35 2018	PERCENT BOND CEMENT MAP
F1:TTN	Nov 29 10:39:35 2018	TRAVELTIME FROM NEAR TRANSMITTER-RECEIVER

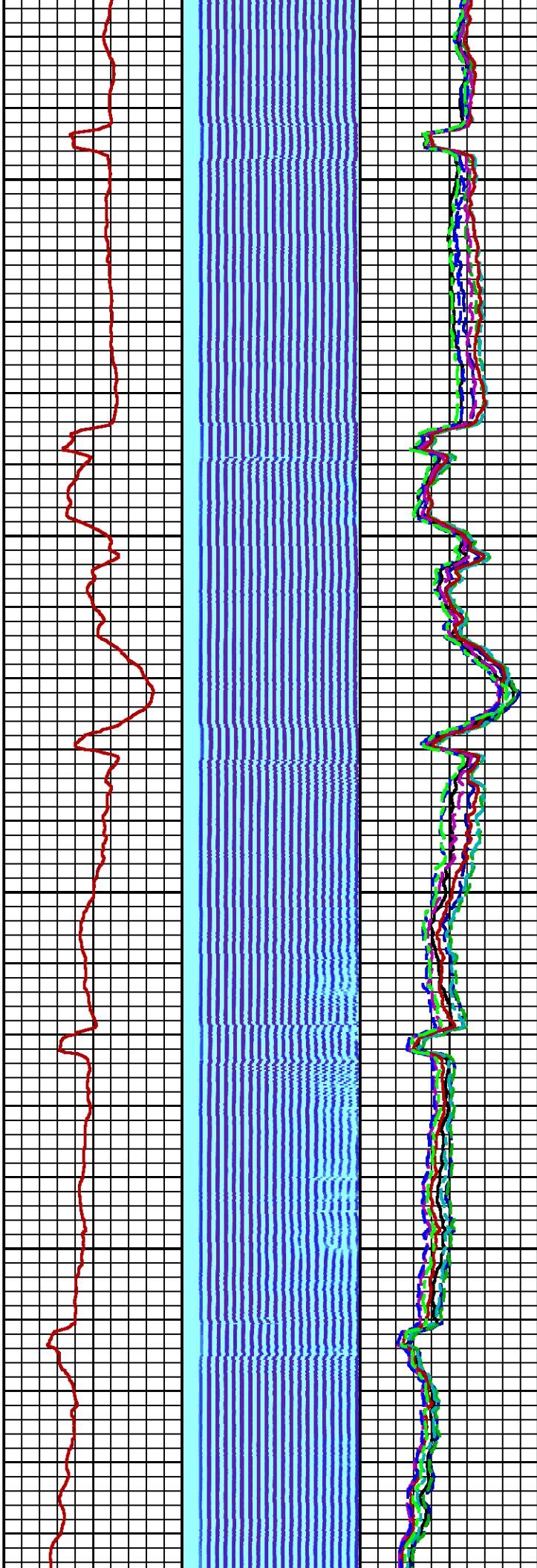
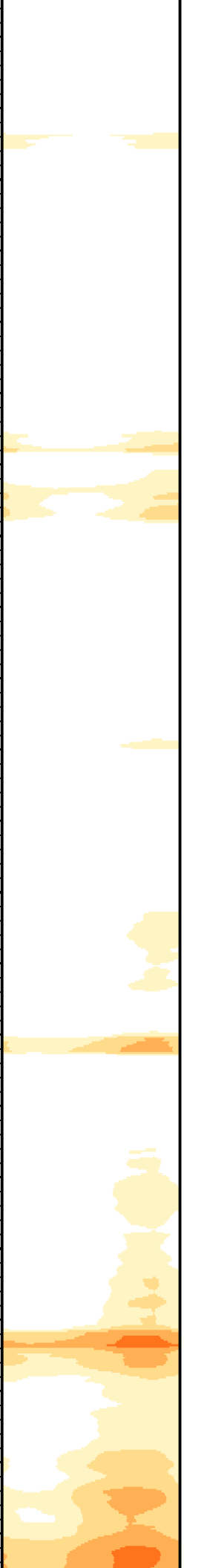
CURVE MEASURE POINT OFFSET

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

Presentation	: SysA:/dat1a/LARAMIE_BCU_0993_21_02W/02W_RAL_MAIN.fvpdf [5"/100' Scale]
Plot Interval	: 0 - 7674.75 Feet
Data File 1	: F1 : SysA:/dat1a/LARAMIE_BCU_0993_21_02W/RAL_MAIN.xtf
Created On	: Nov 29 10:39:35 2018
Company	: LARAMIE ENERGY LLC
Well	: BCU 0993-21-02W
Field	: BUZZARD CREEK
File Interval	: 15.5 - 7650.5 Feet
OCT	: p012g
Data File 2	: F2 : SysA:/dat1a/LARAMIE_BCU_0993_21_02W/RAL_REPEAT.xtf
Created On	: Nov 29 09:57:01 2018
Company	: LARAMIE ENERGY LLC
Well	: BCU 0993-21-02W
Field	: BUZZARD CREEK
File Interval	: 7270.75 - 7677.75 Feet
OCT	: p012g

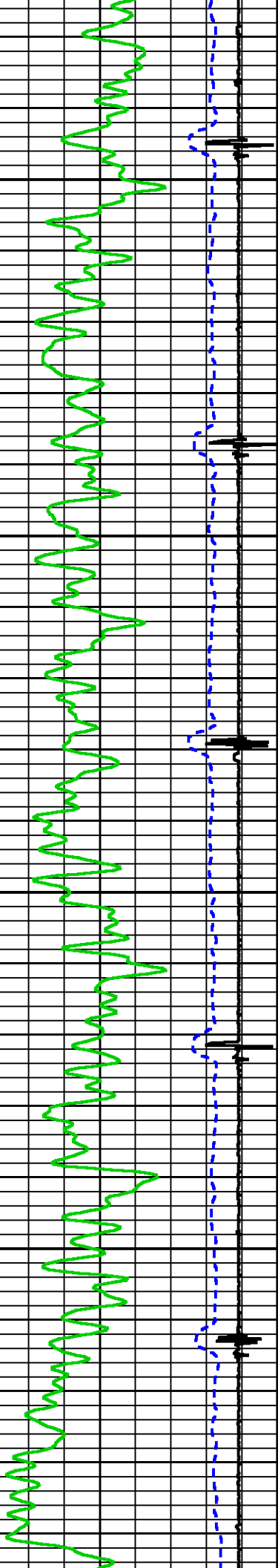


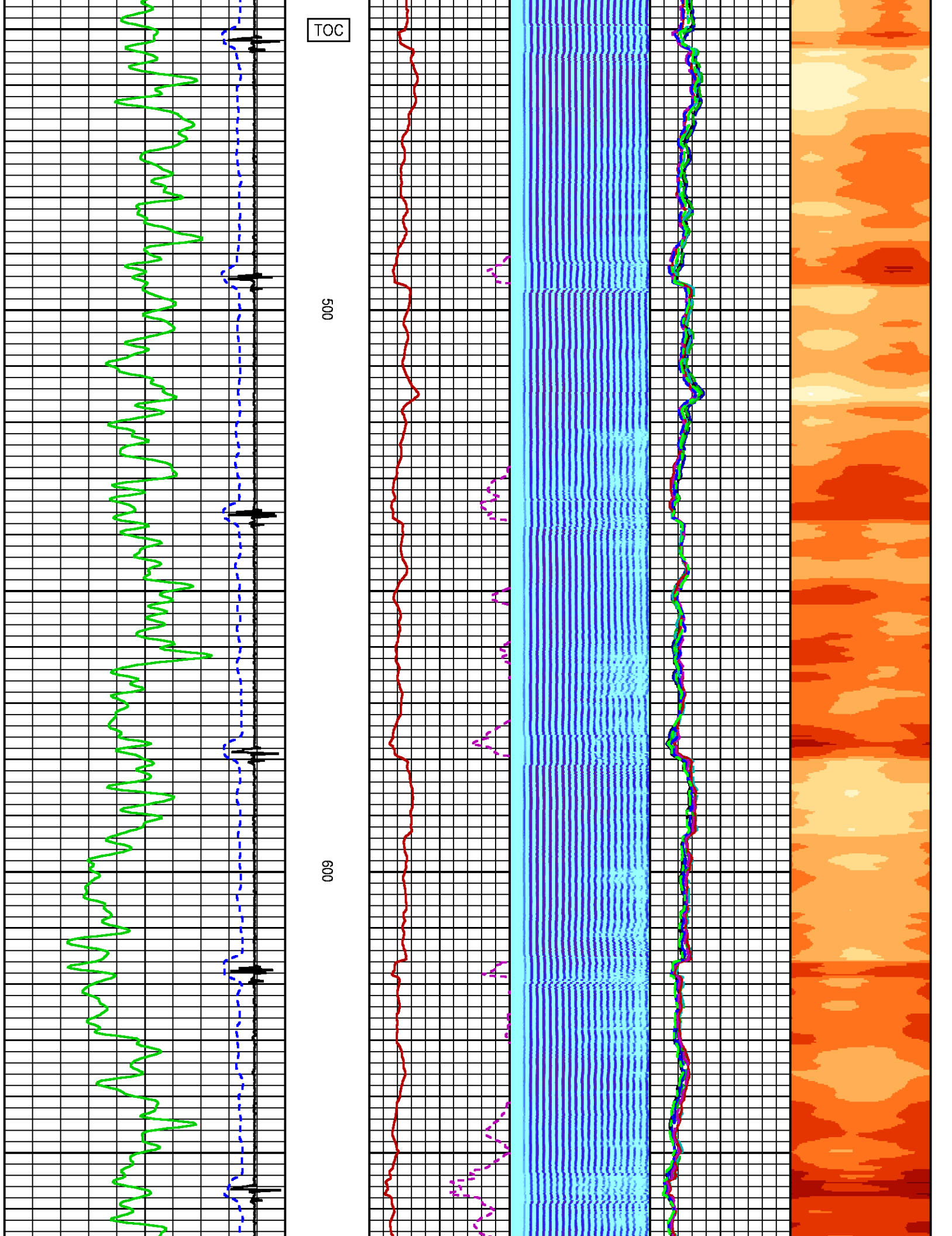


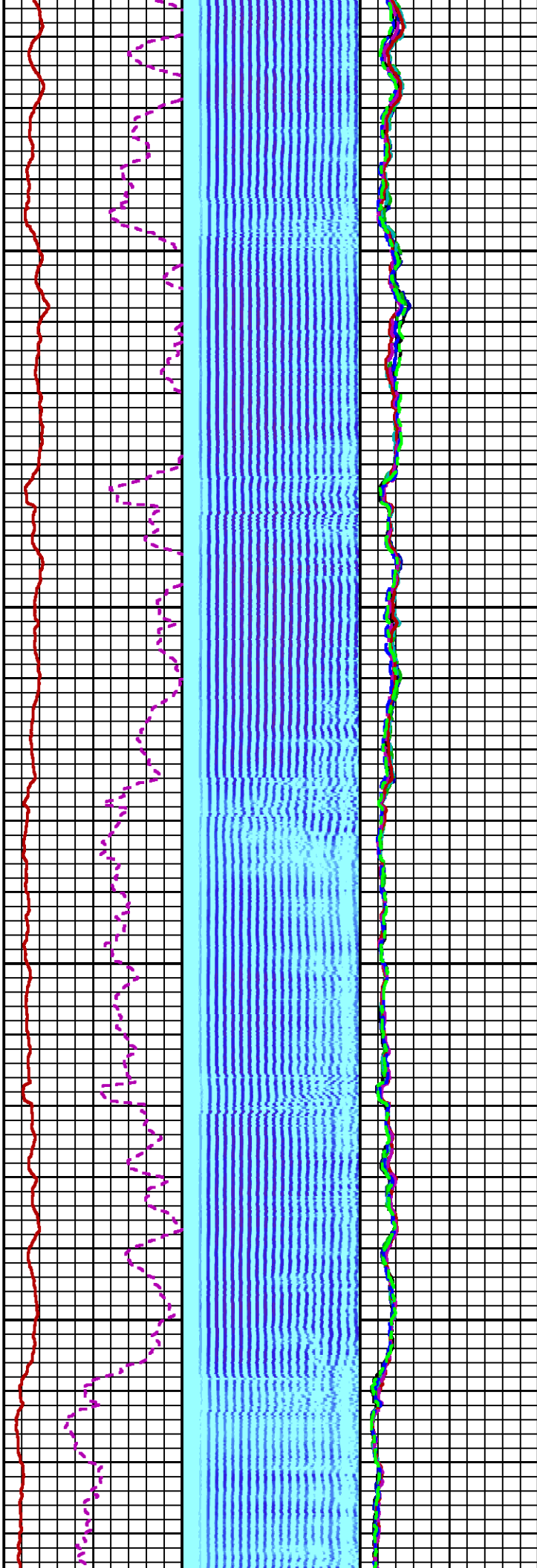


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400

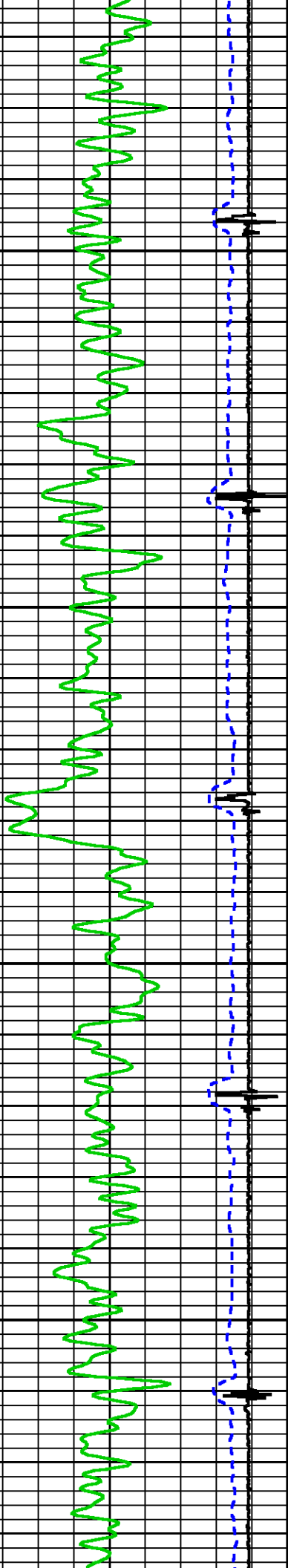


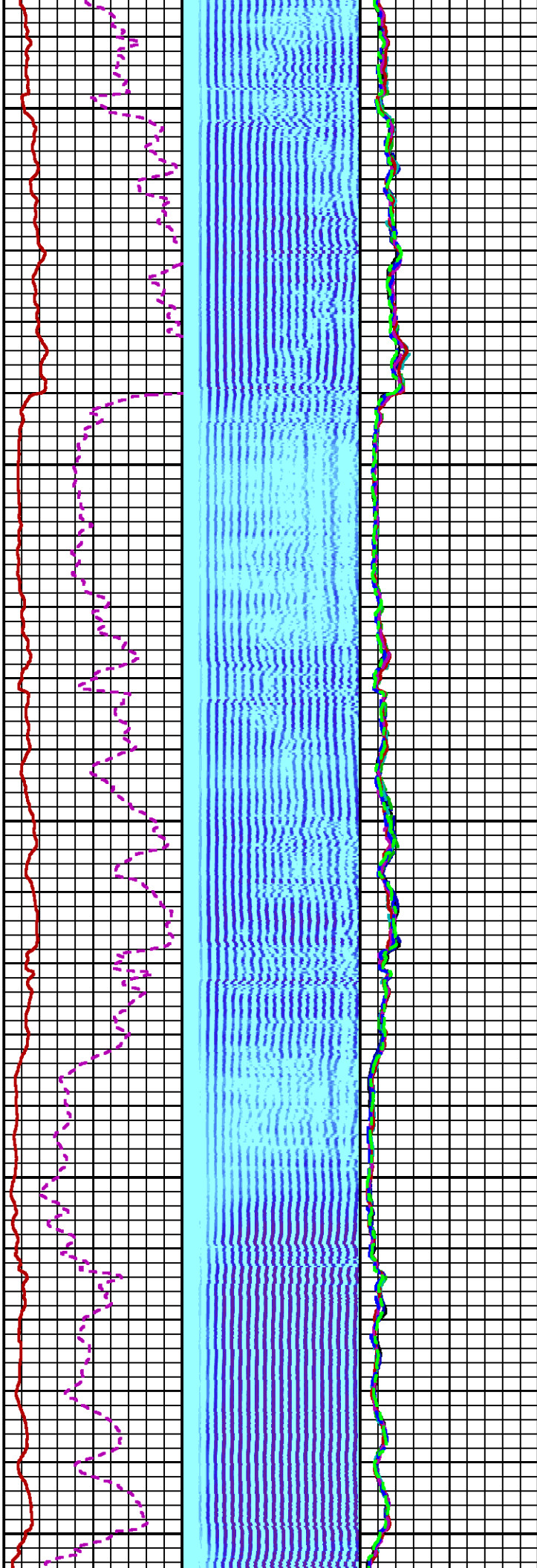
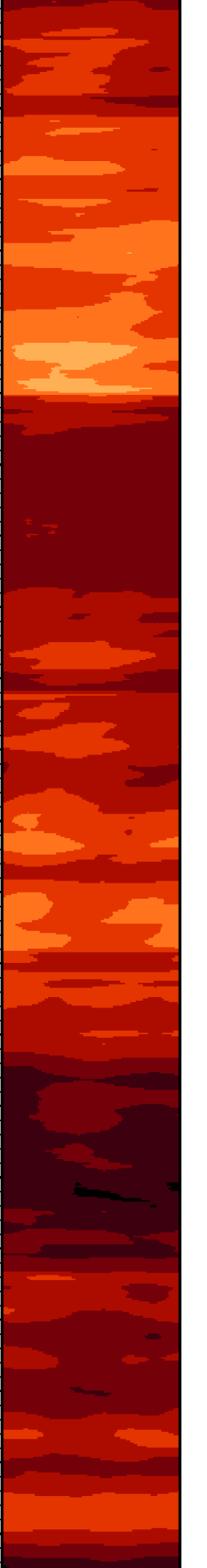




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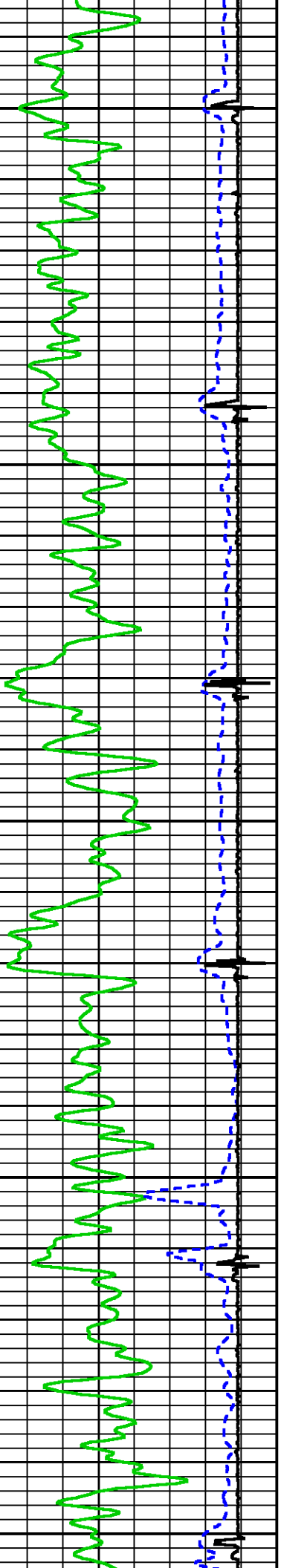


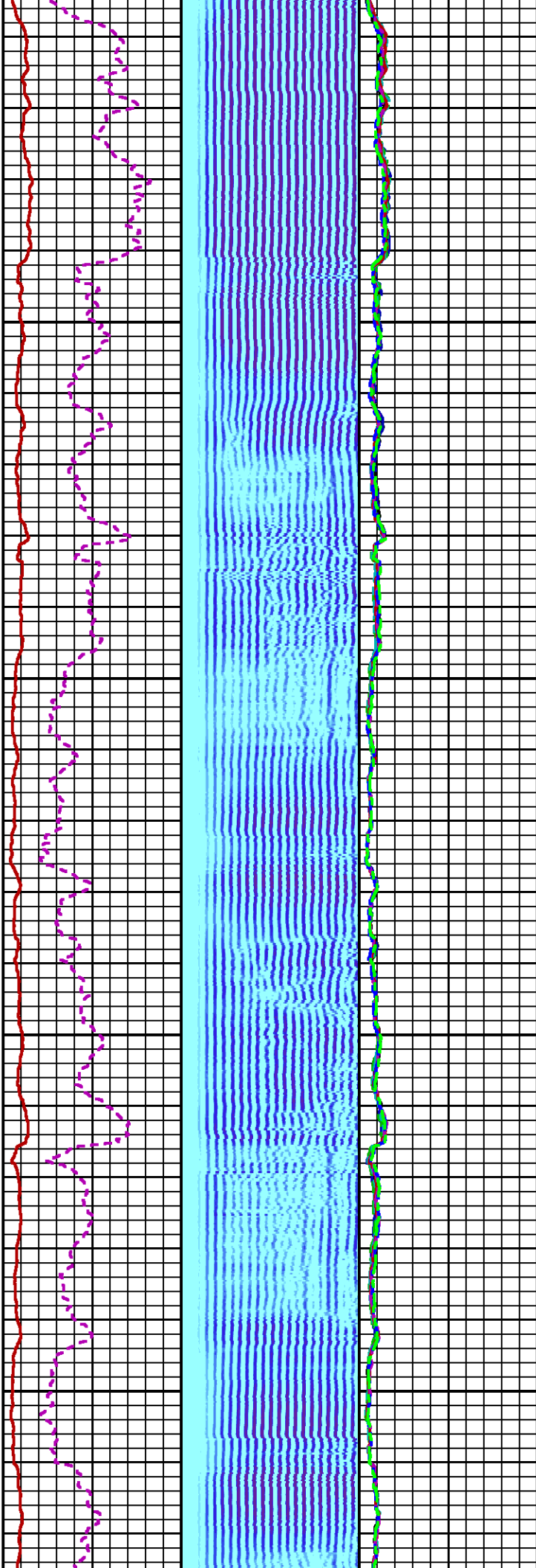


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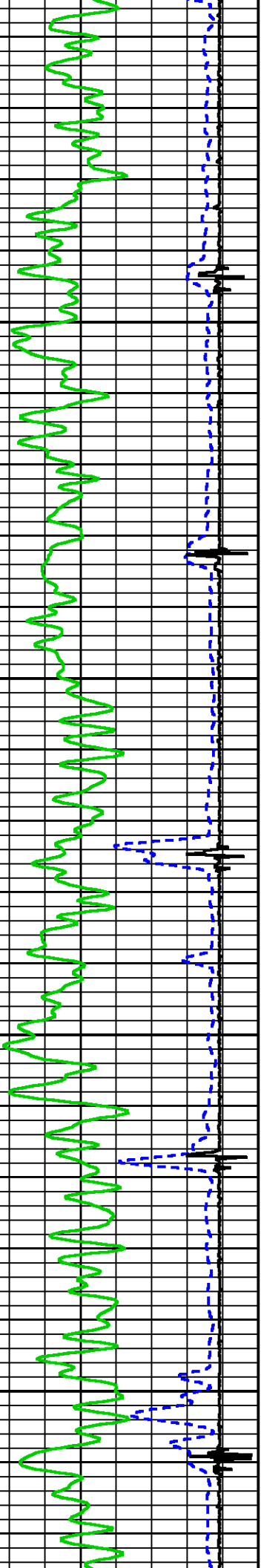
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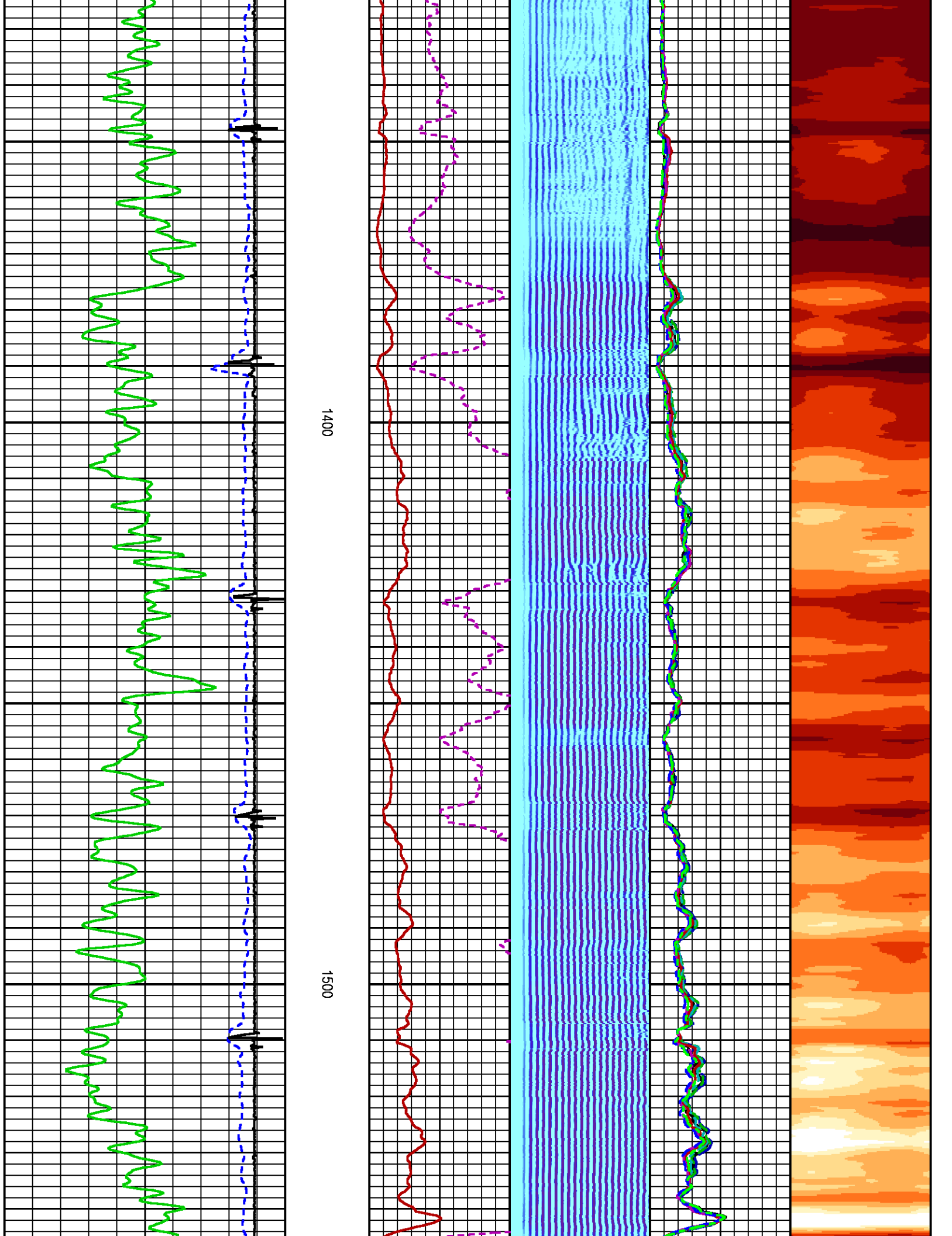


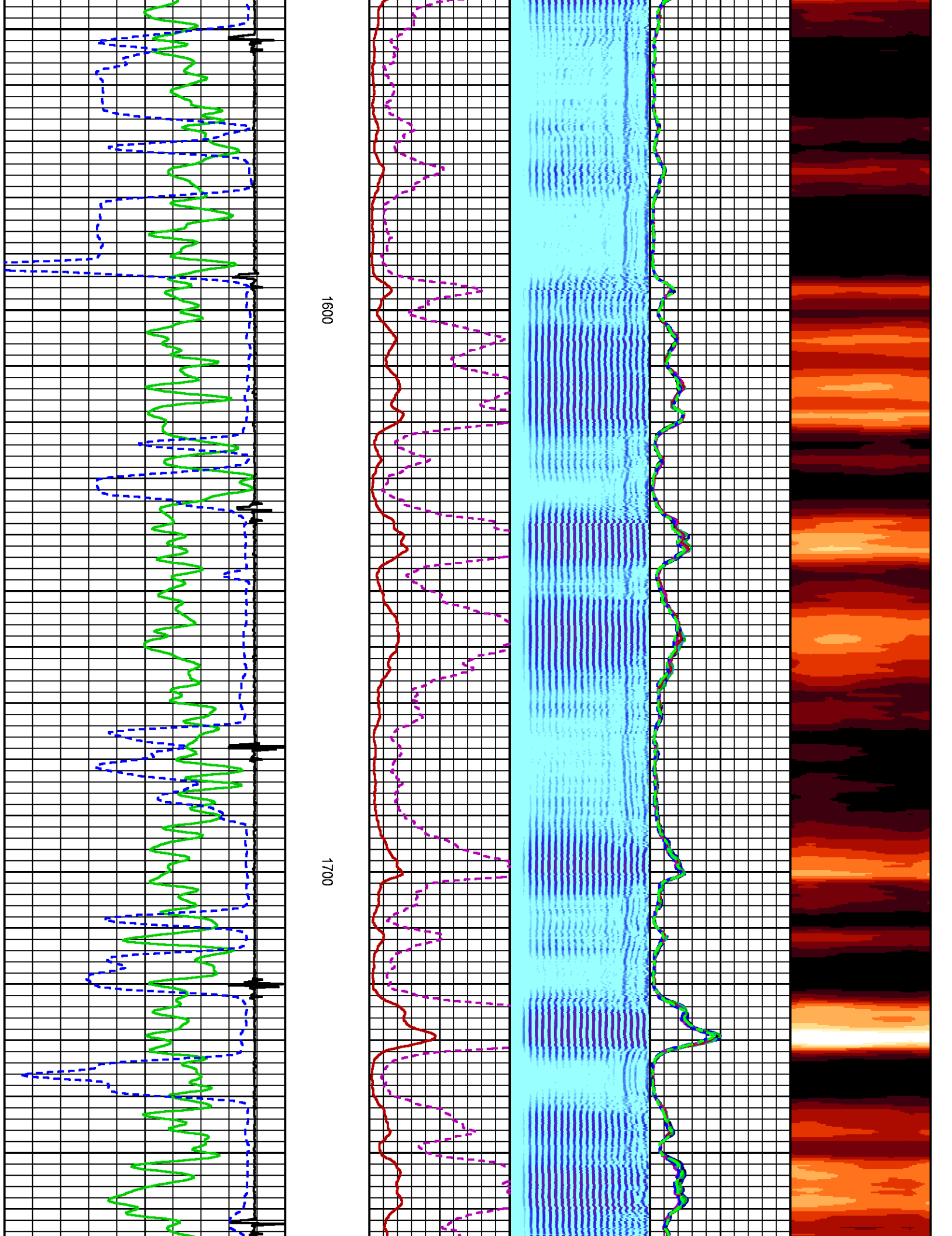


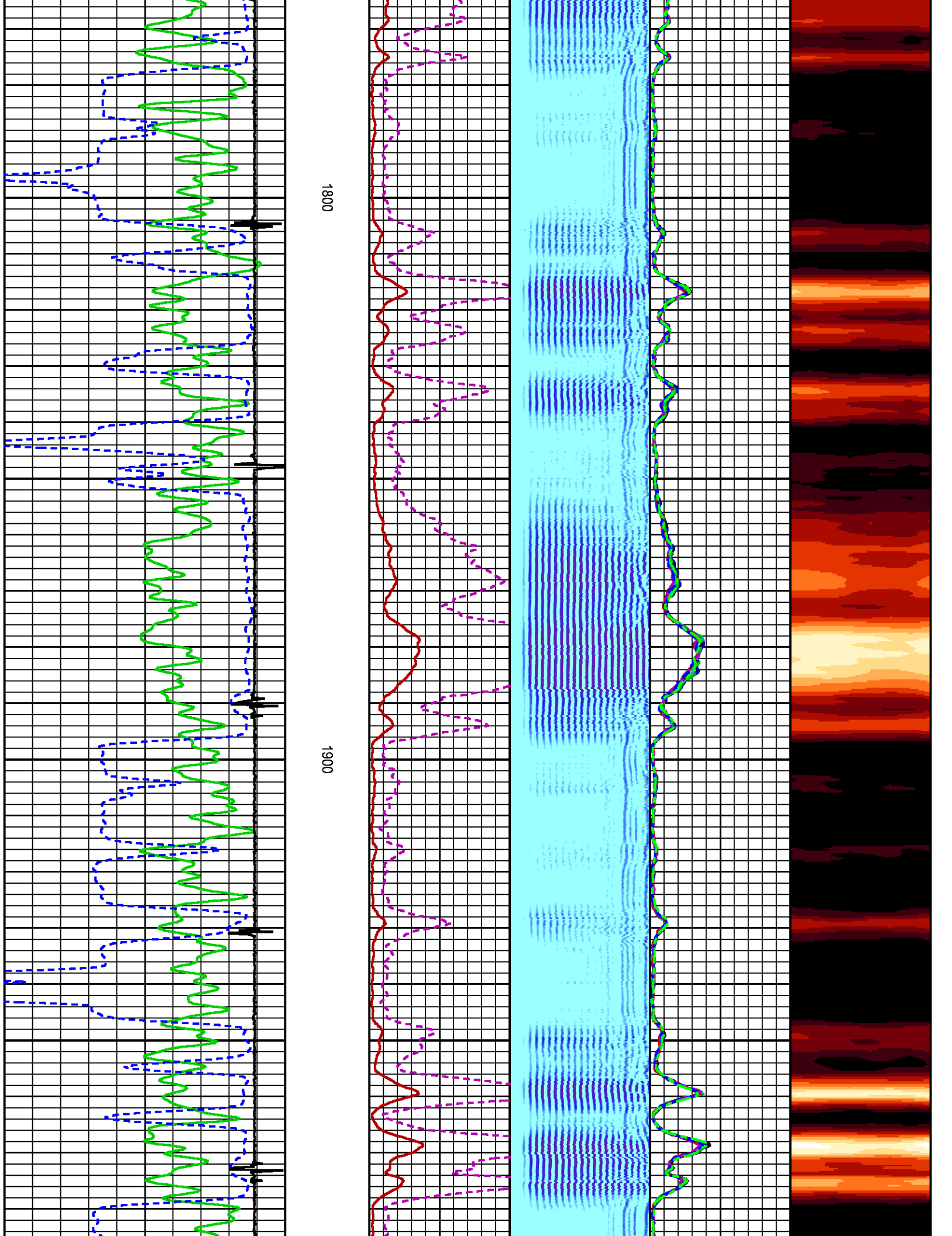
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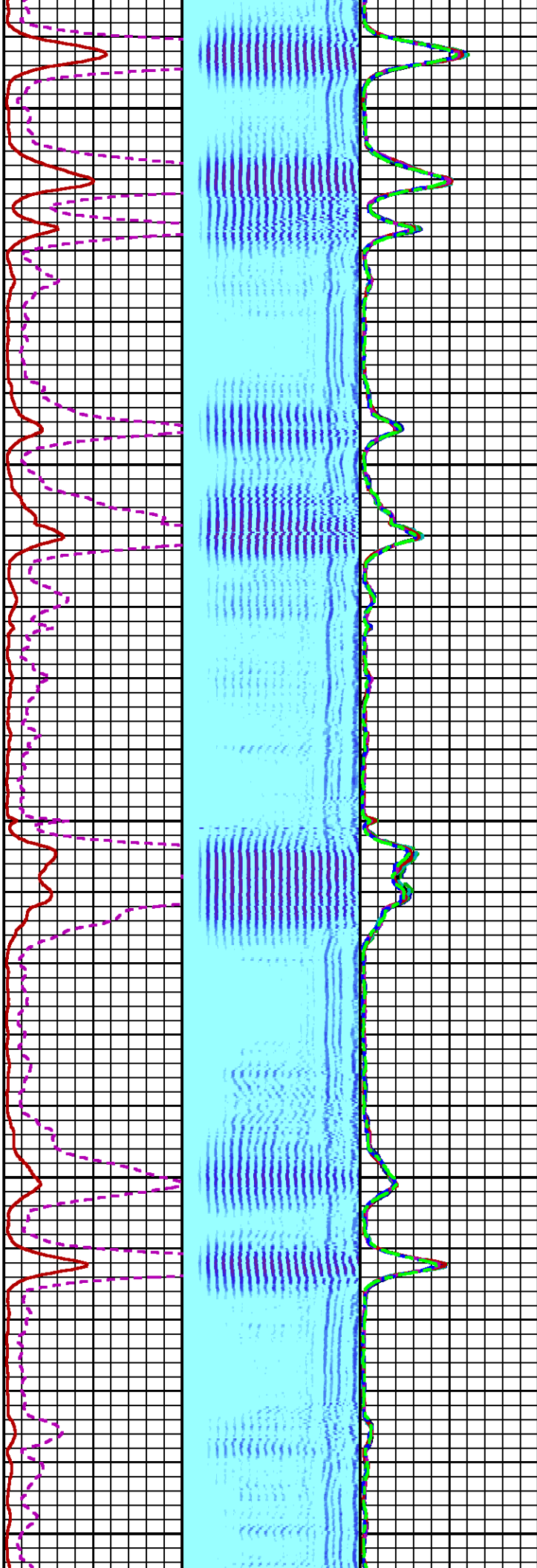
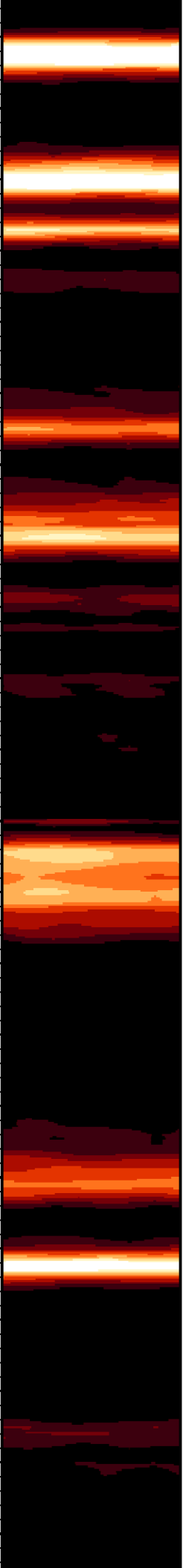
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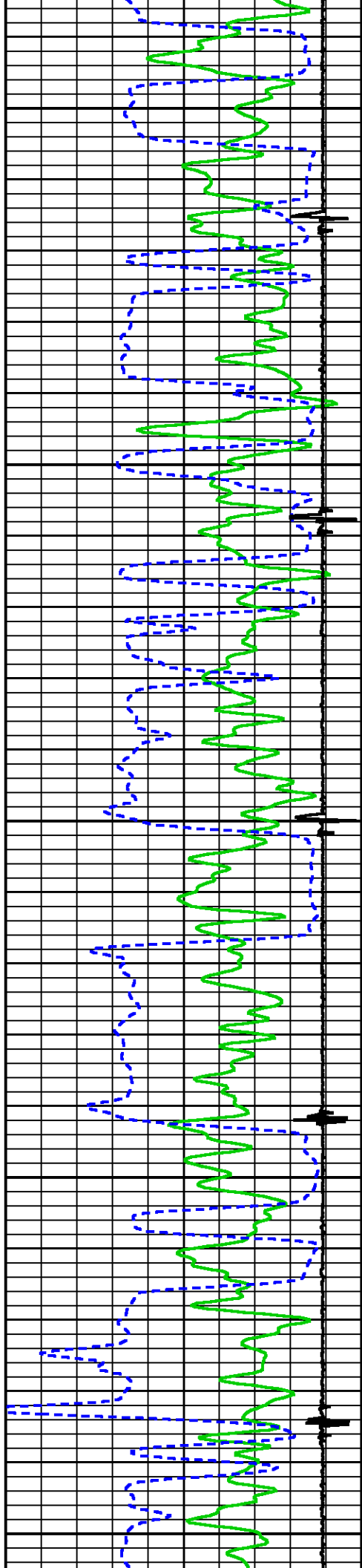


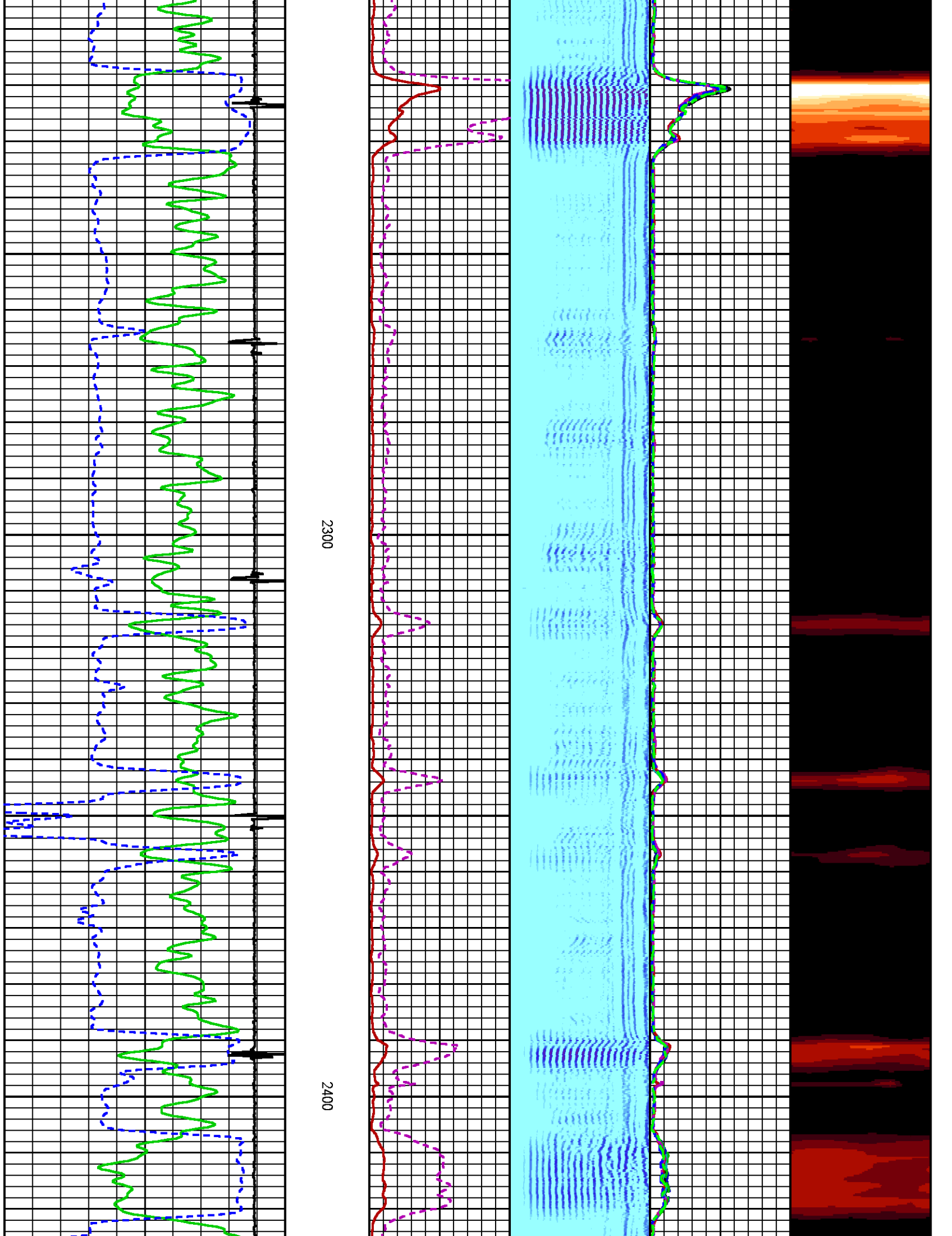


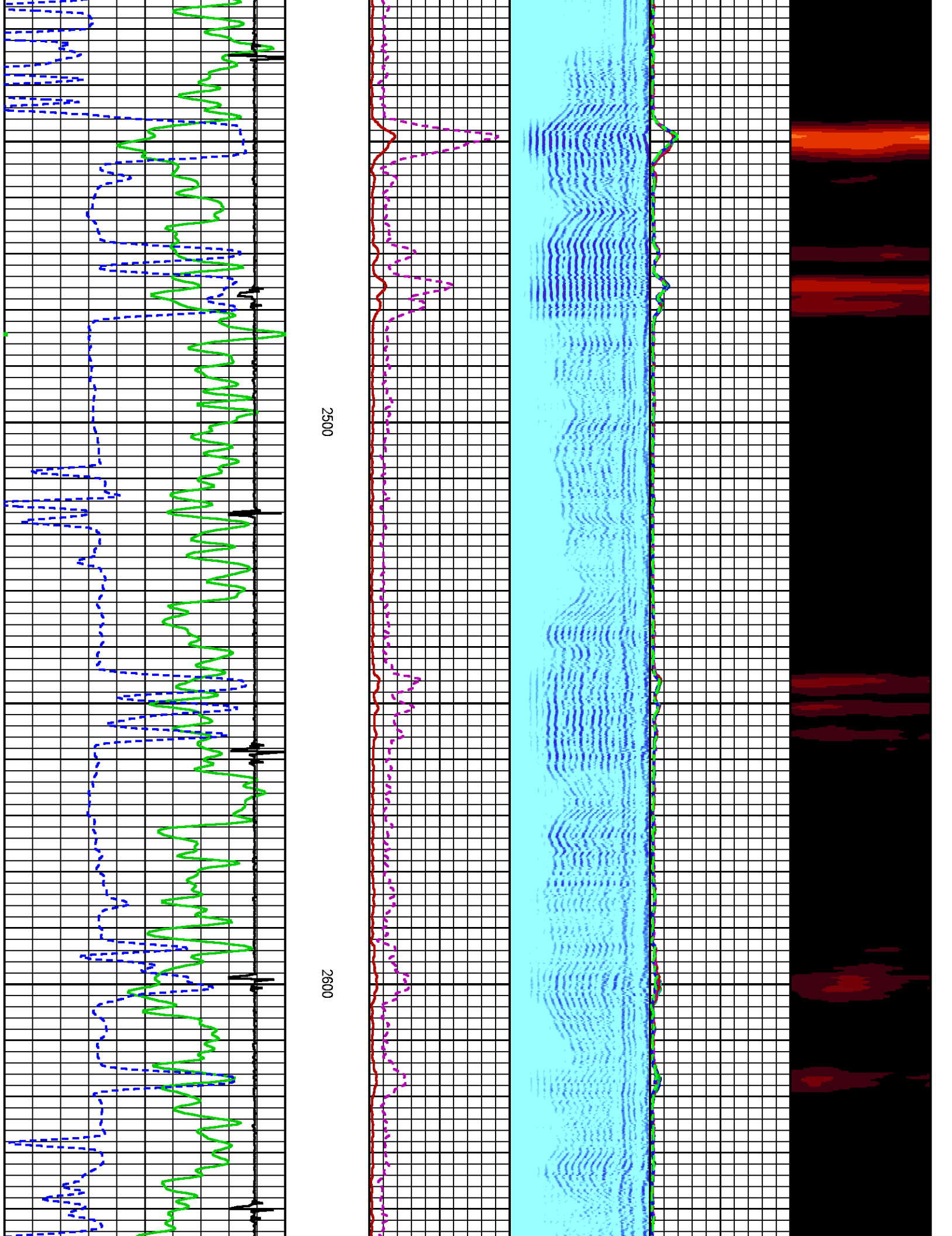
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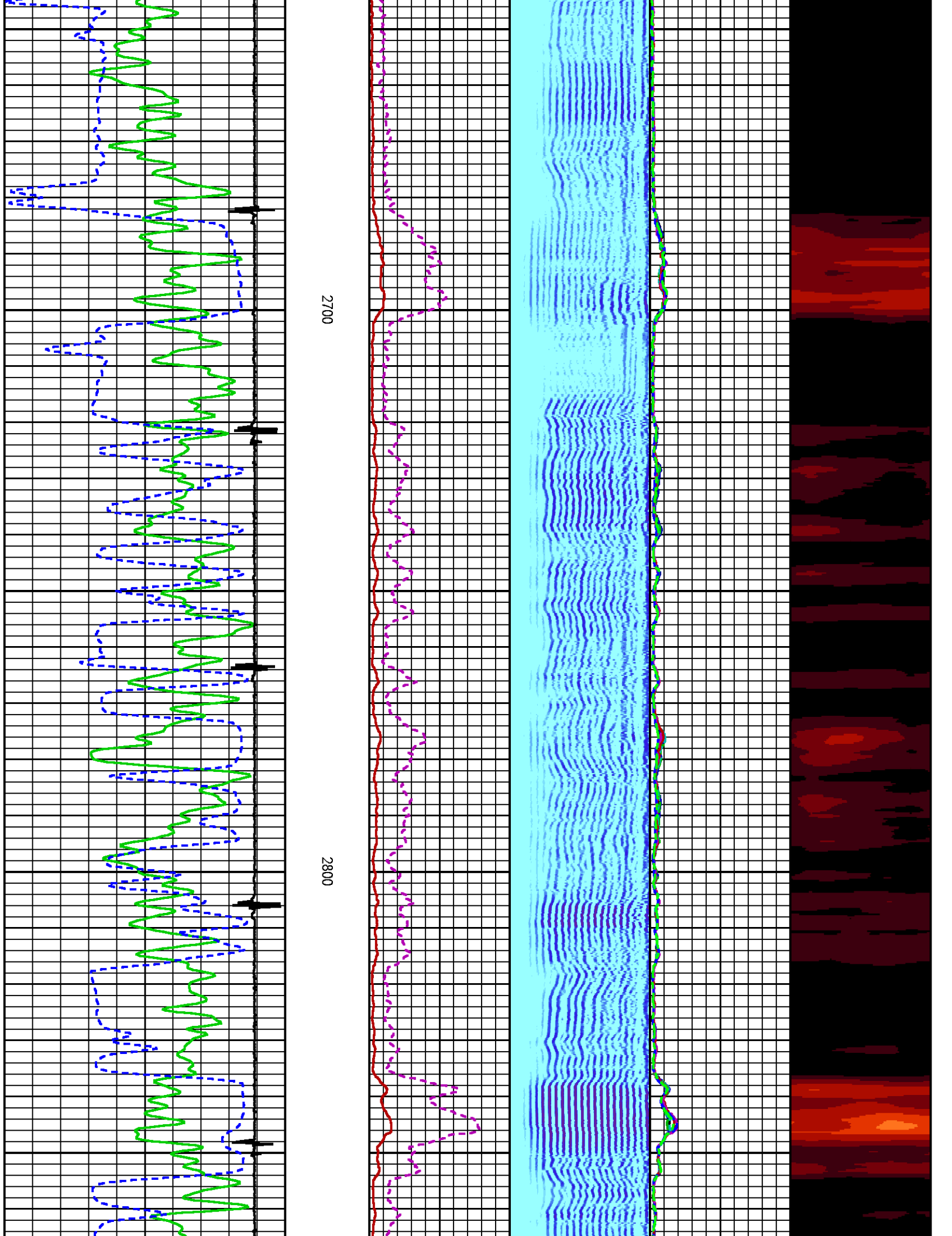
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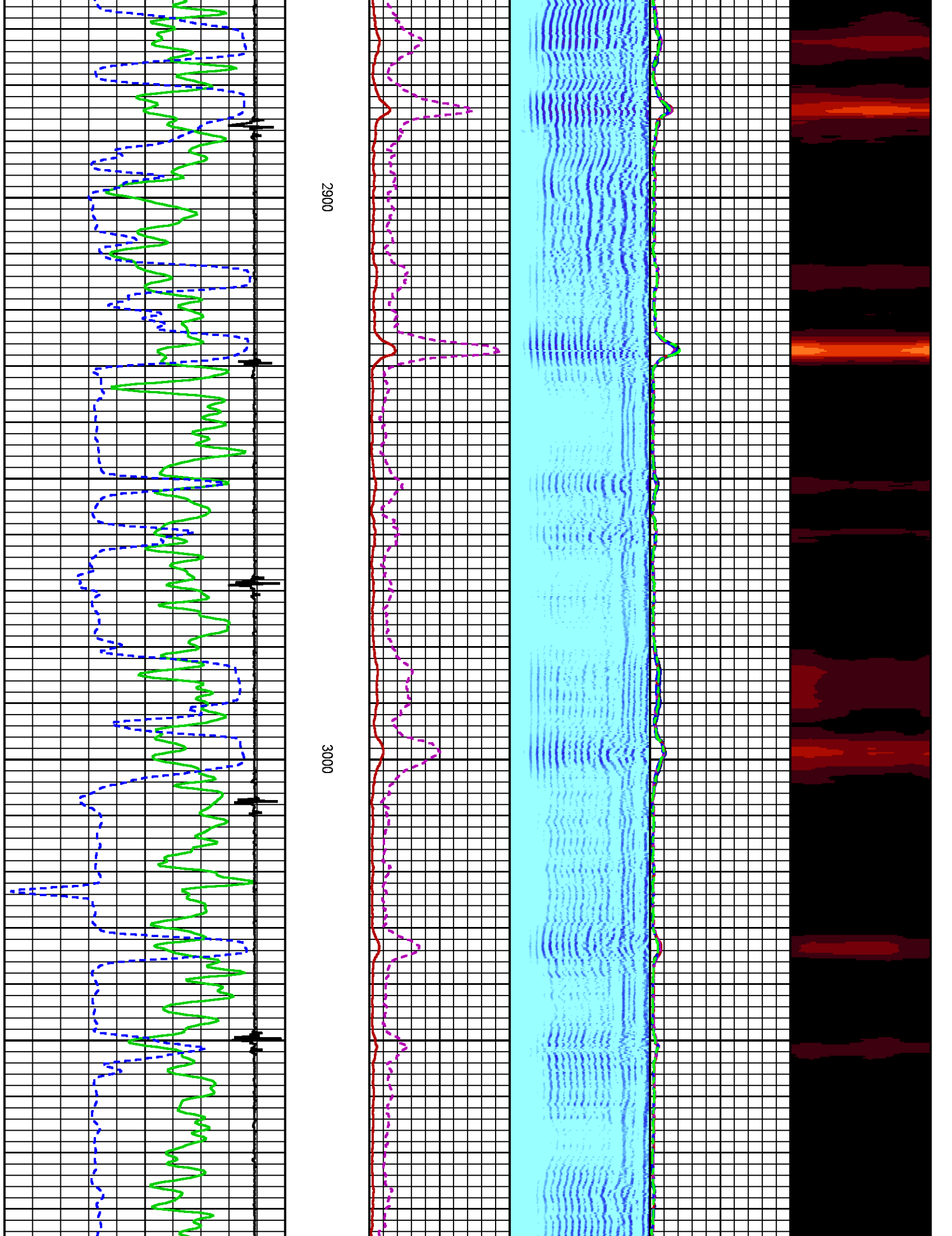
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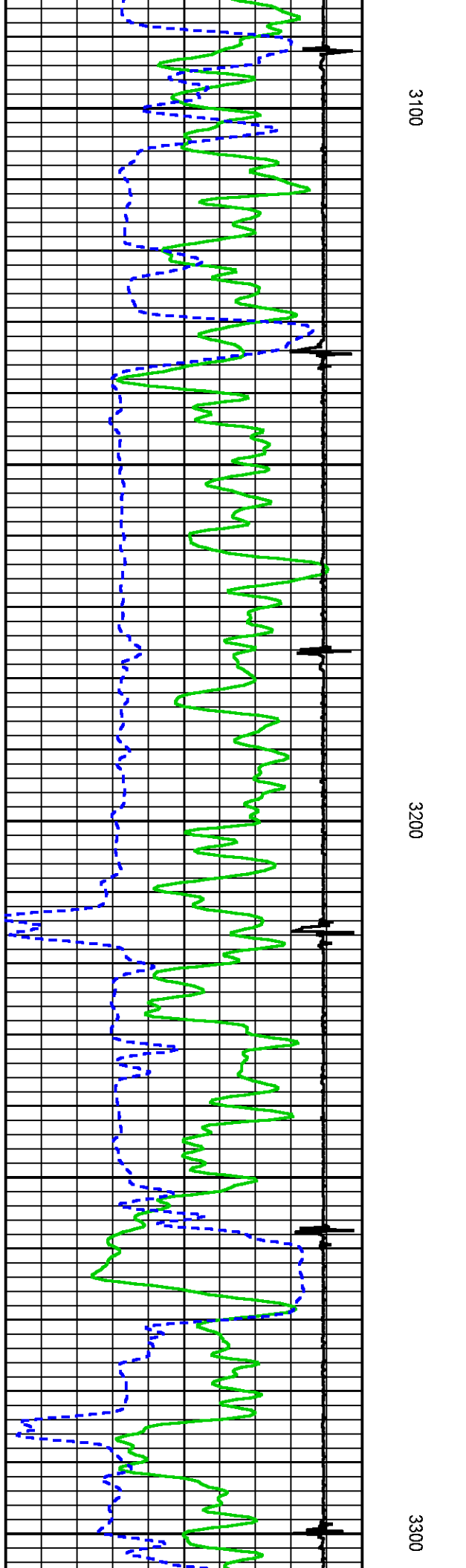
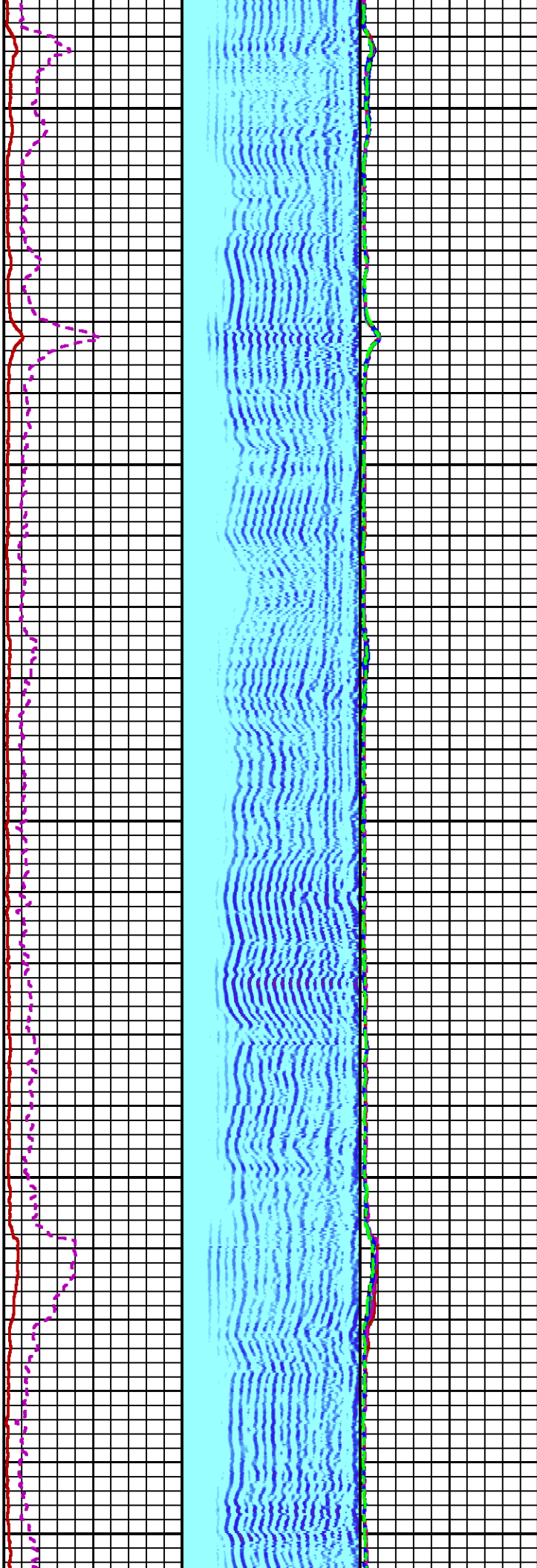


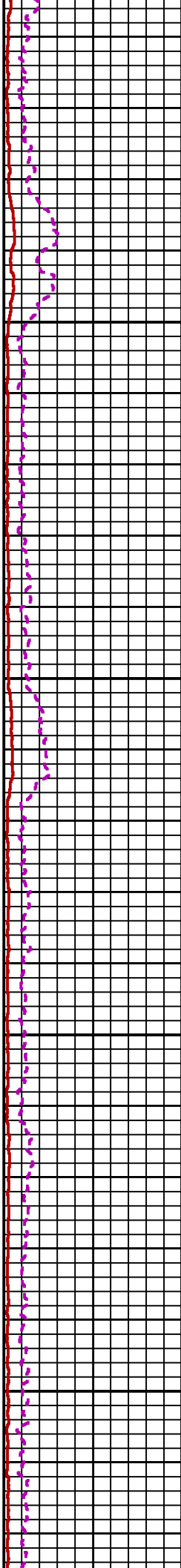
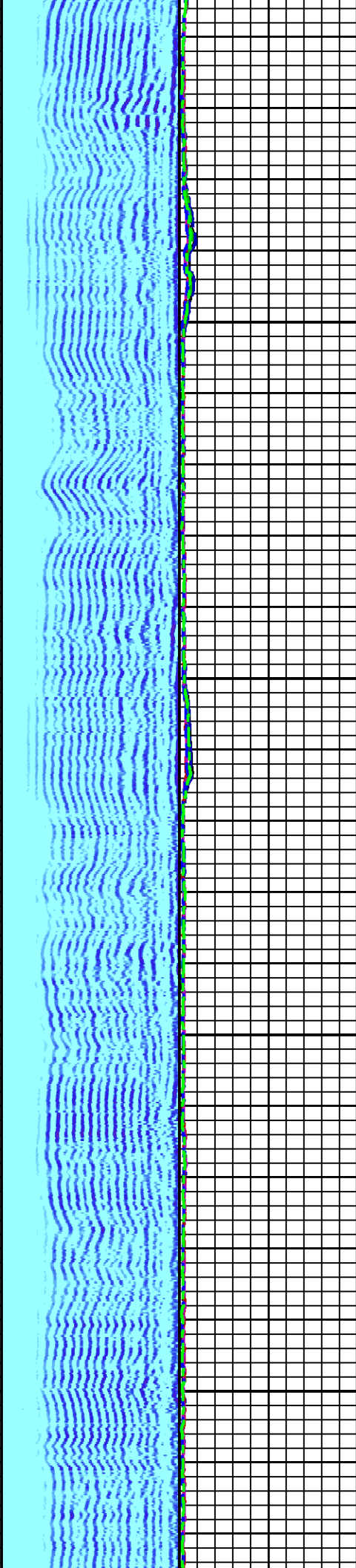






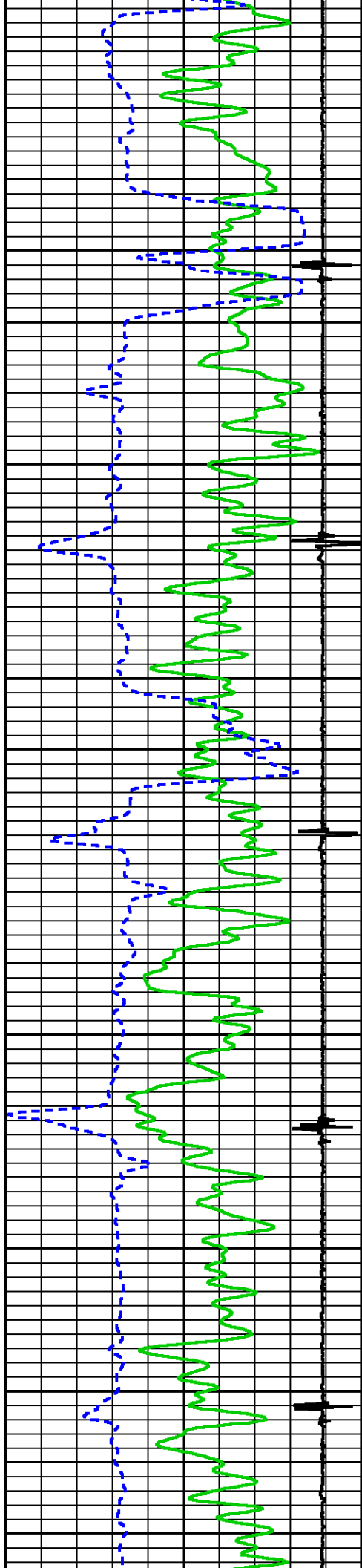


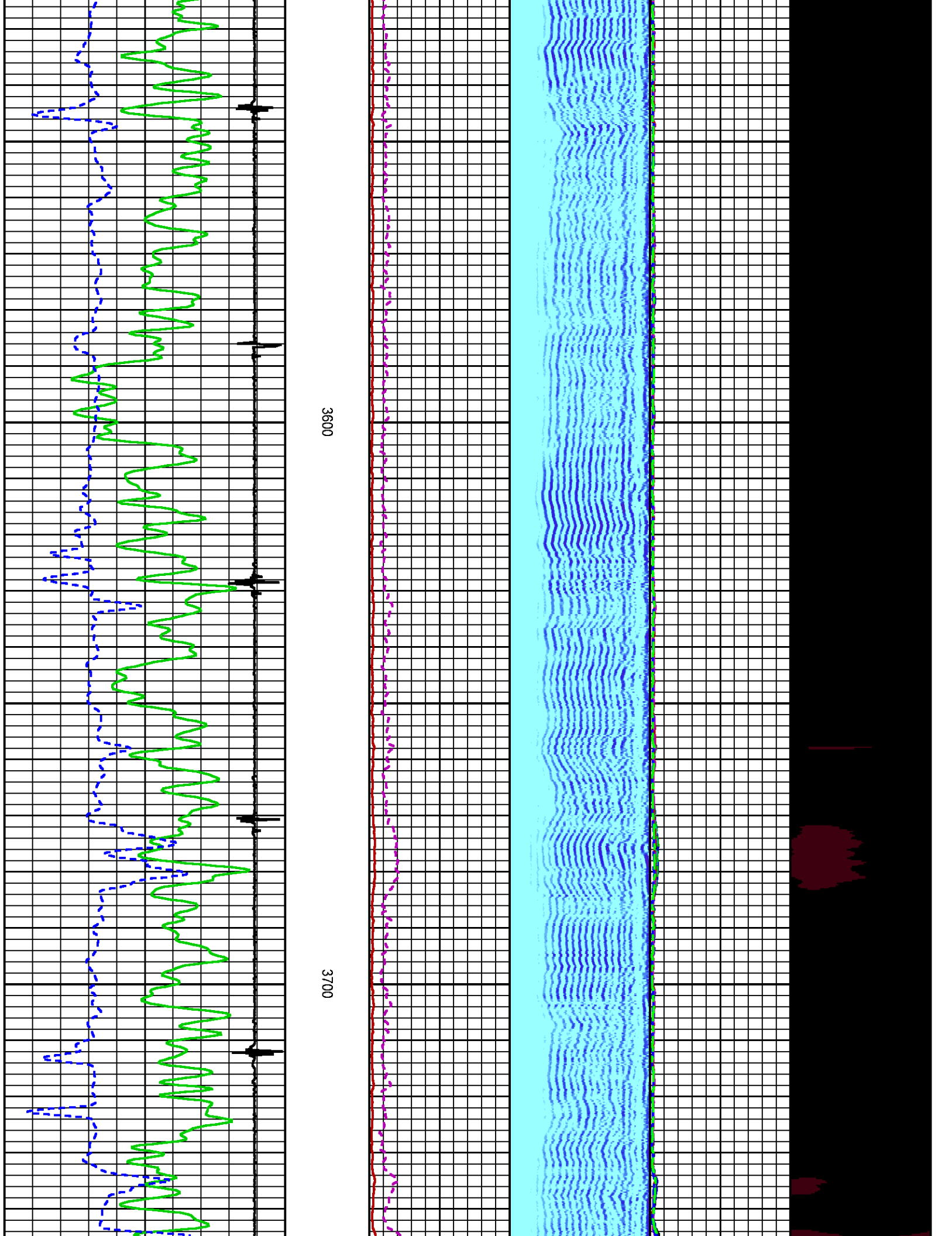


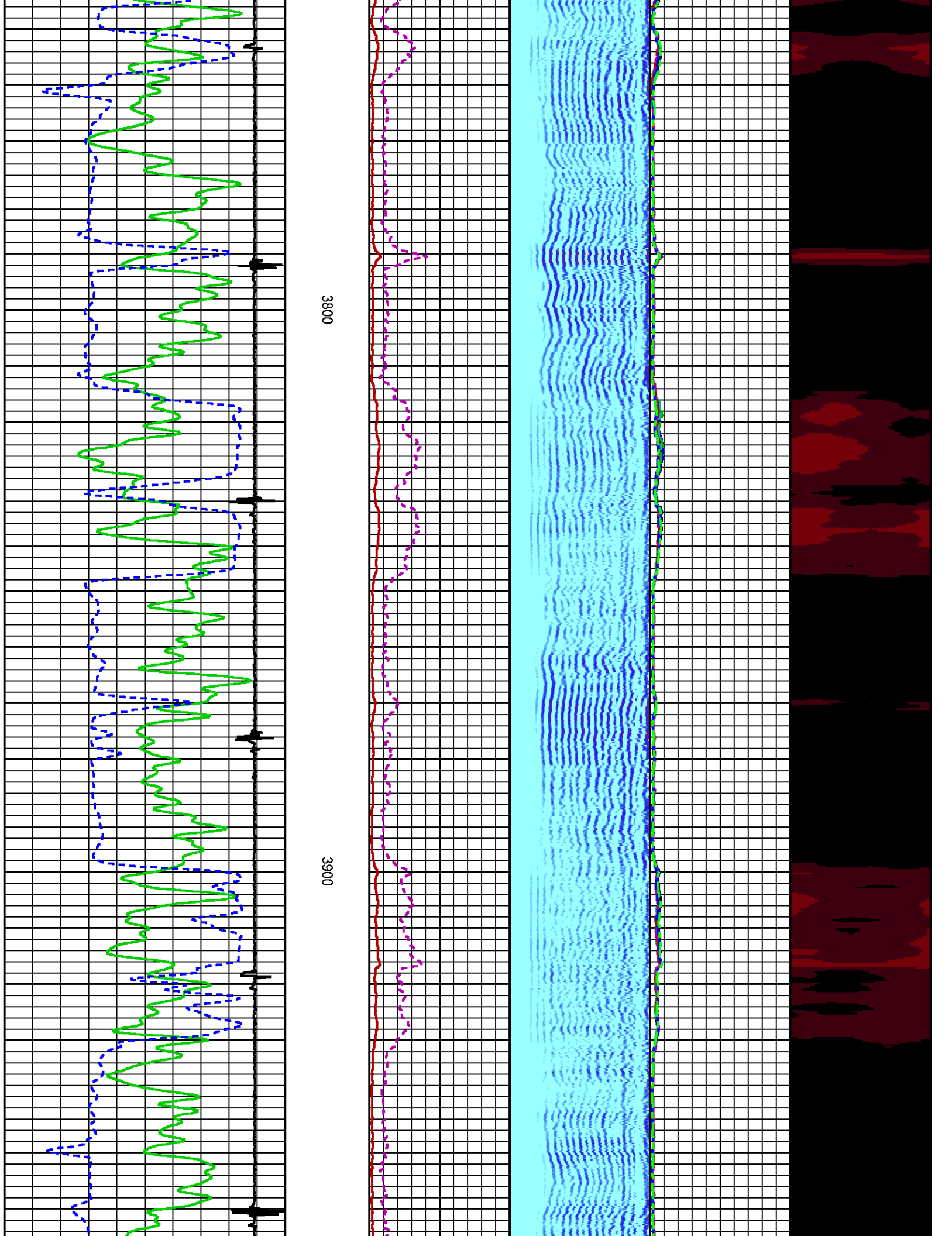


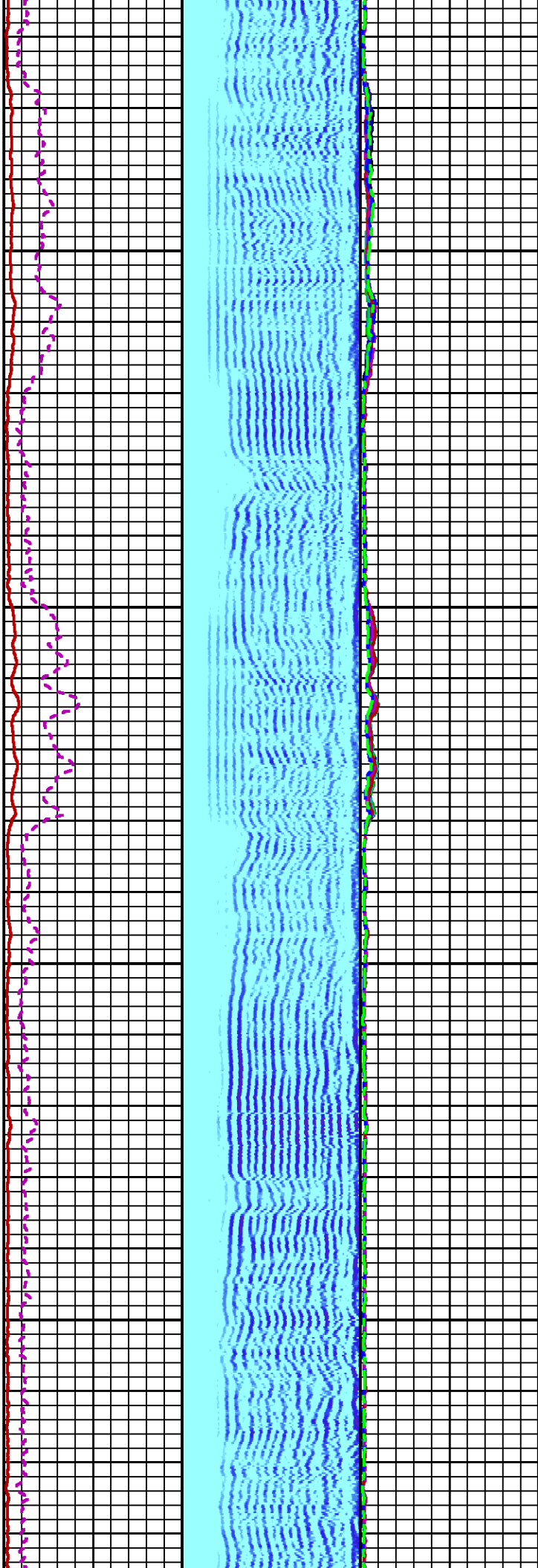
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3500



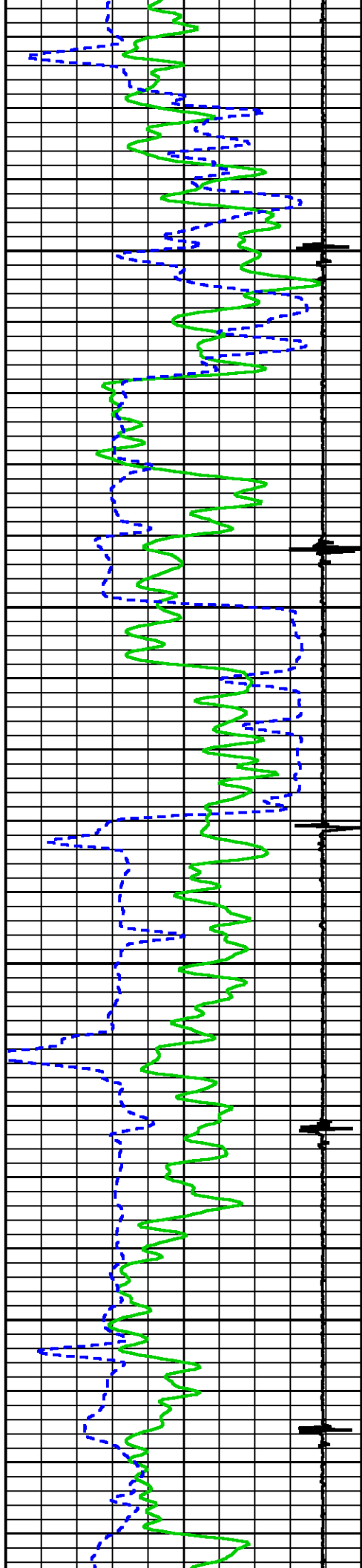


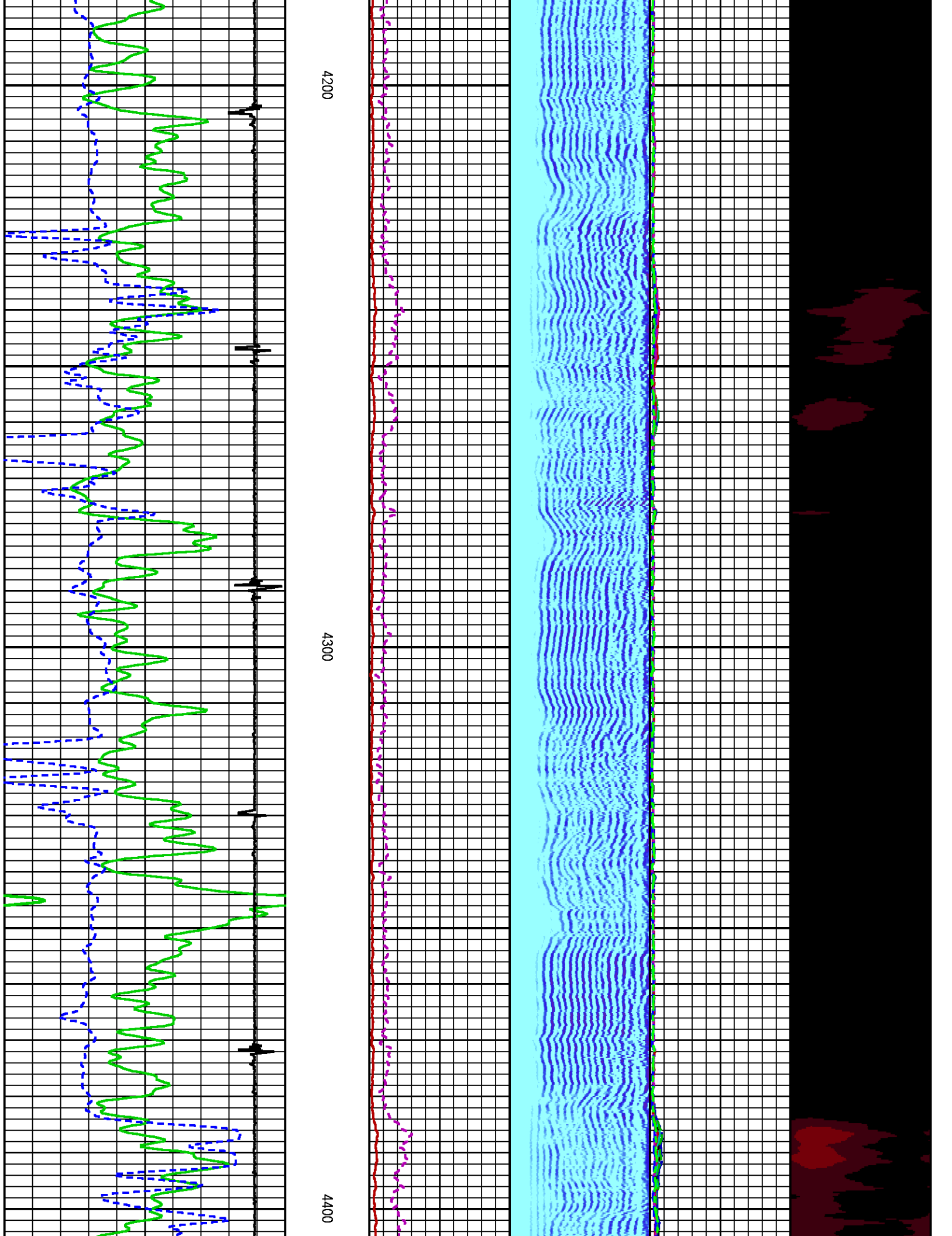


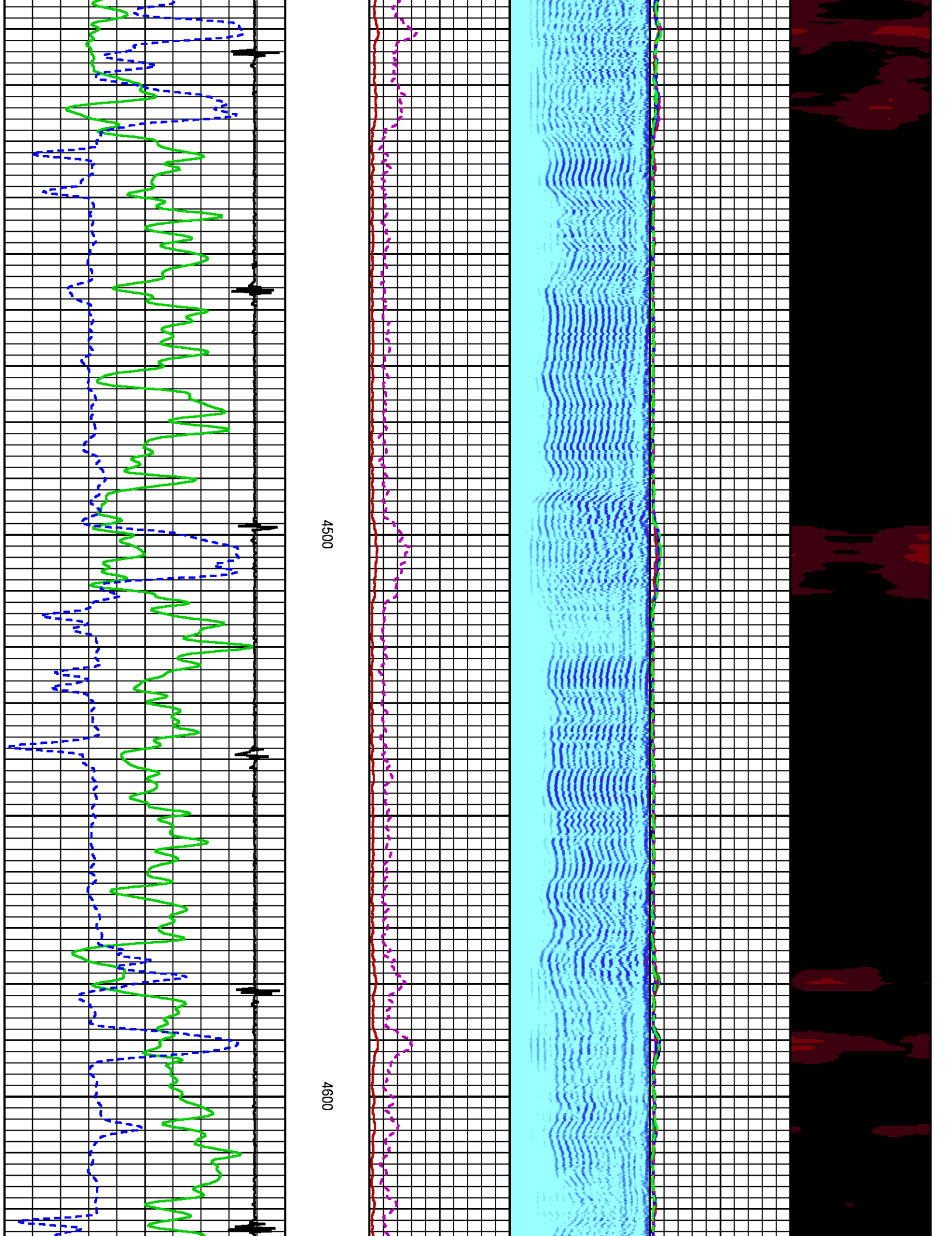


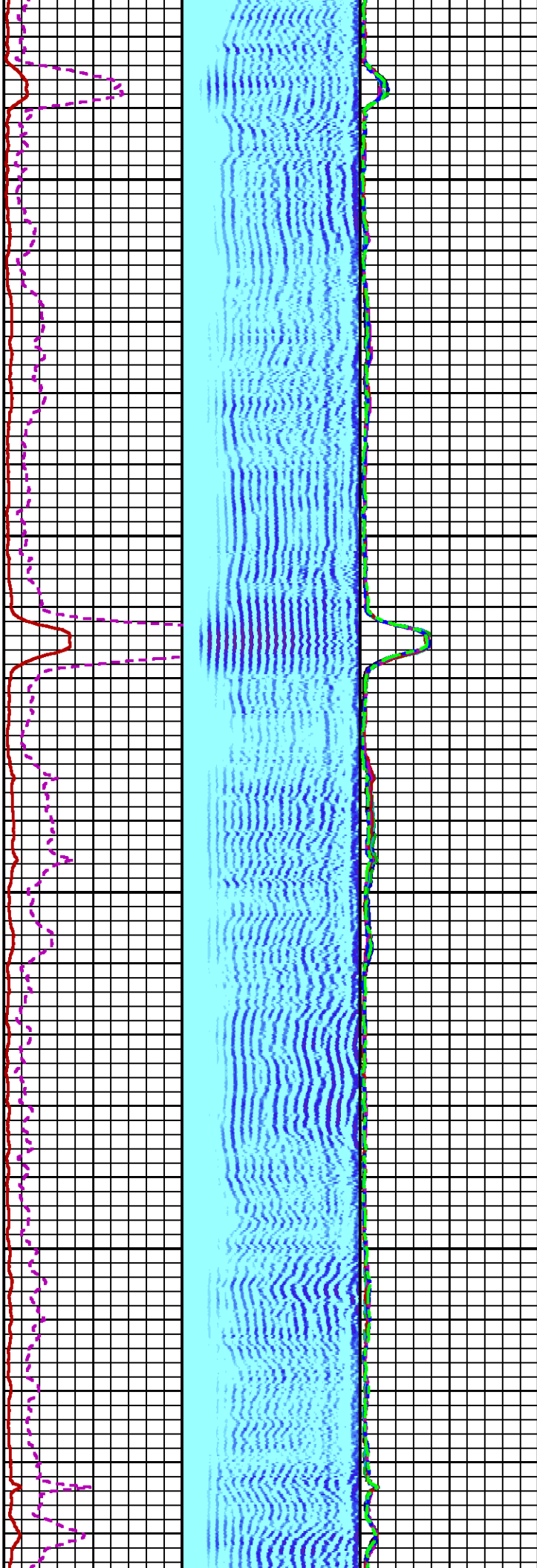
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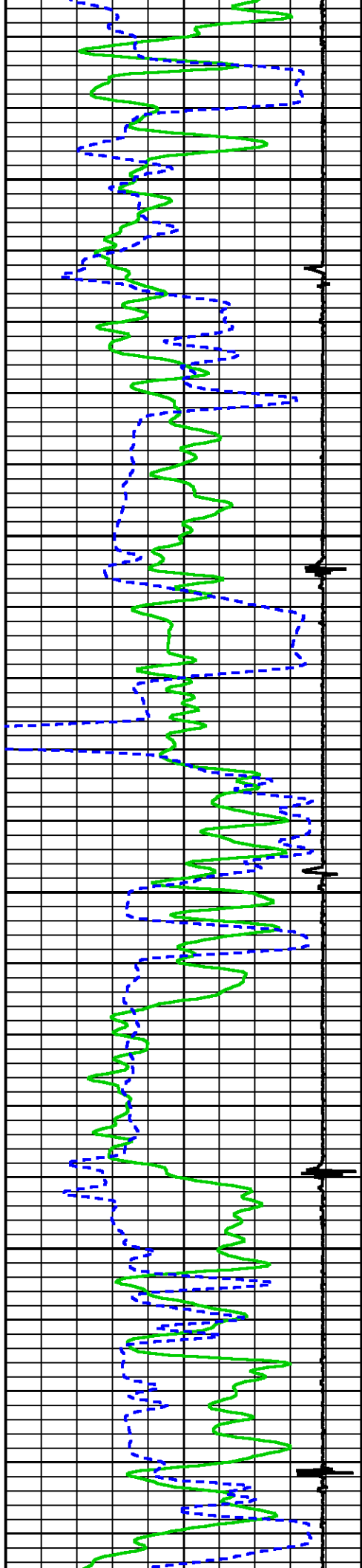


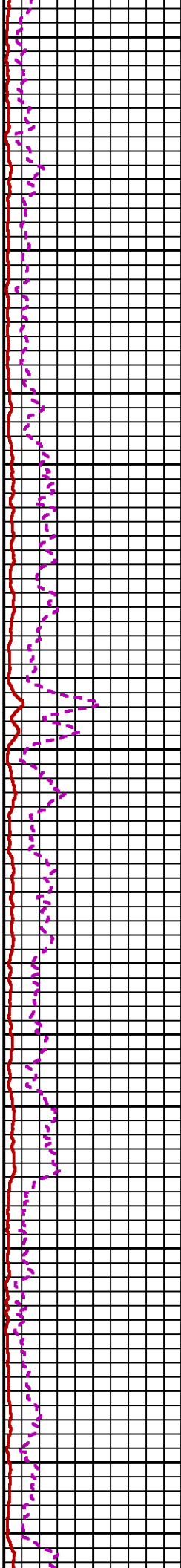
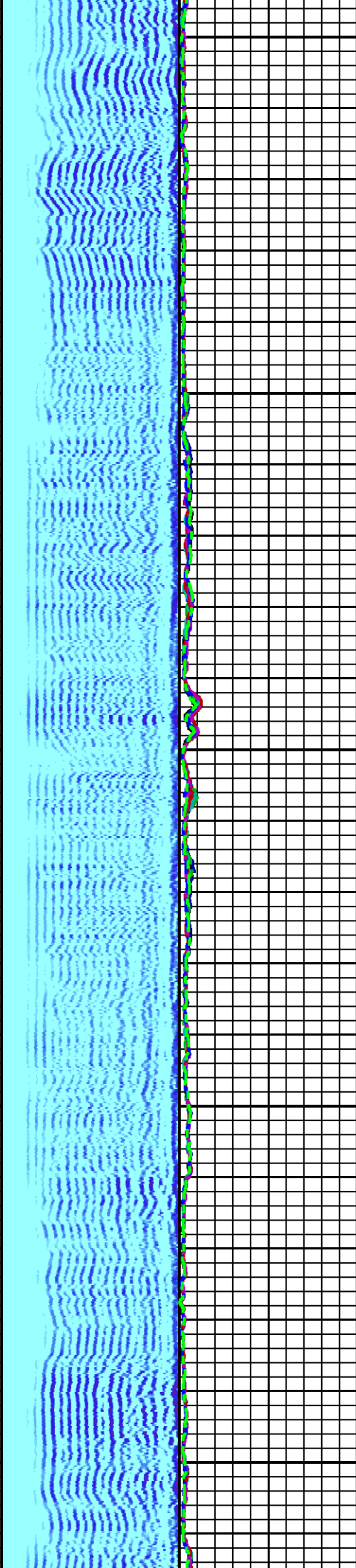
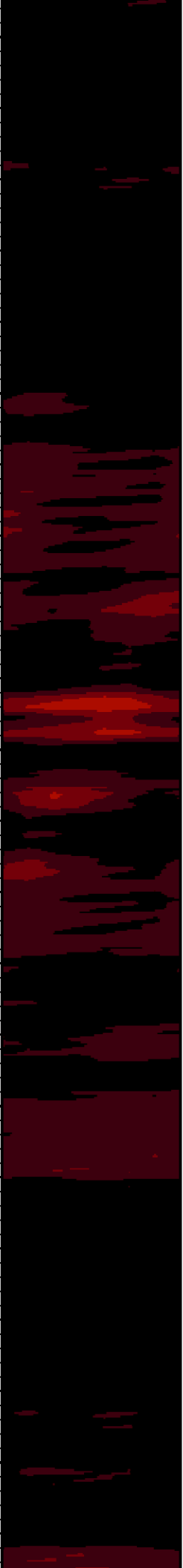




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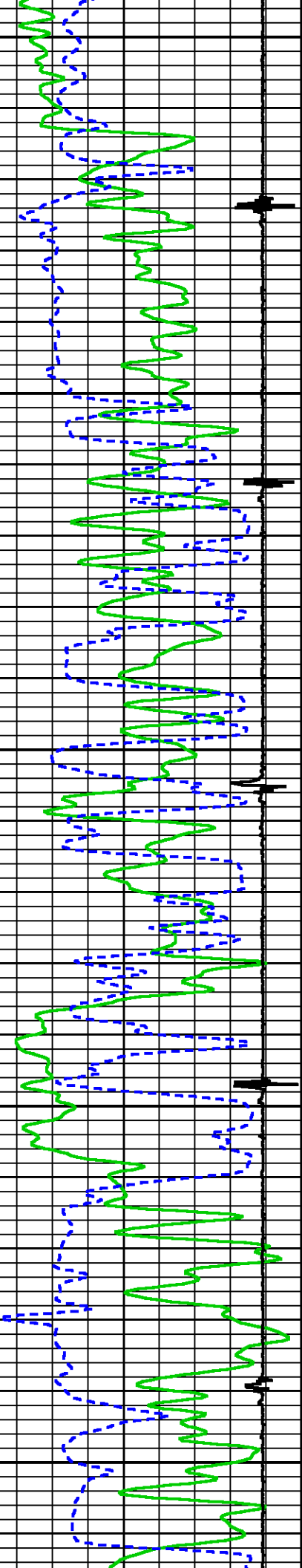
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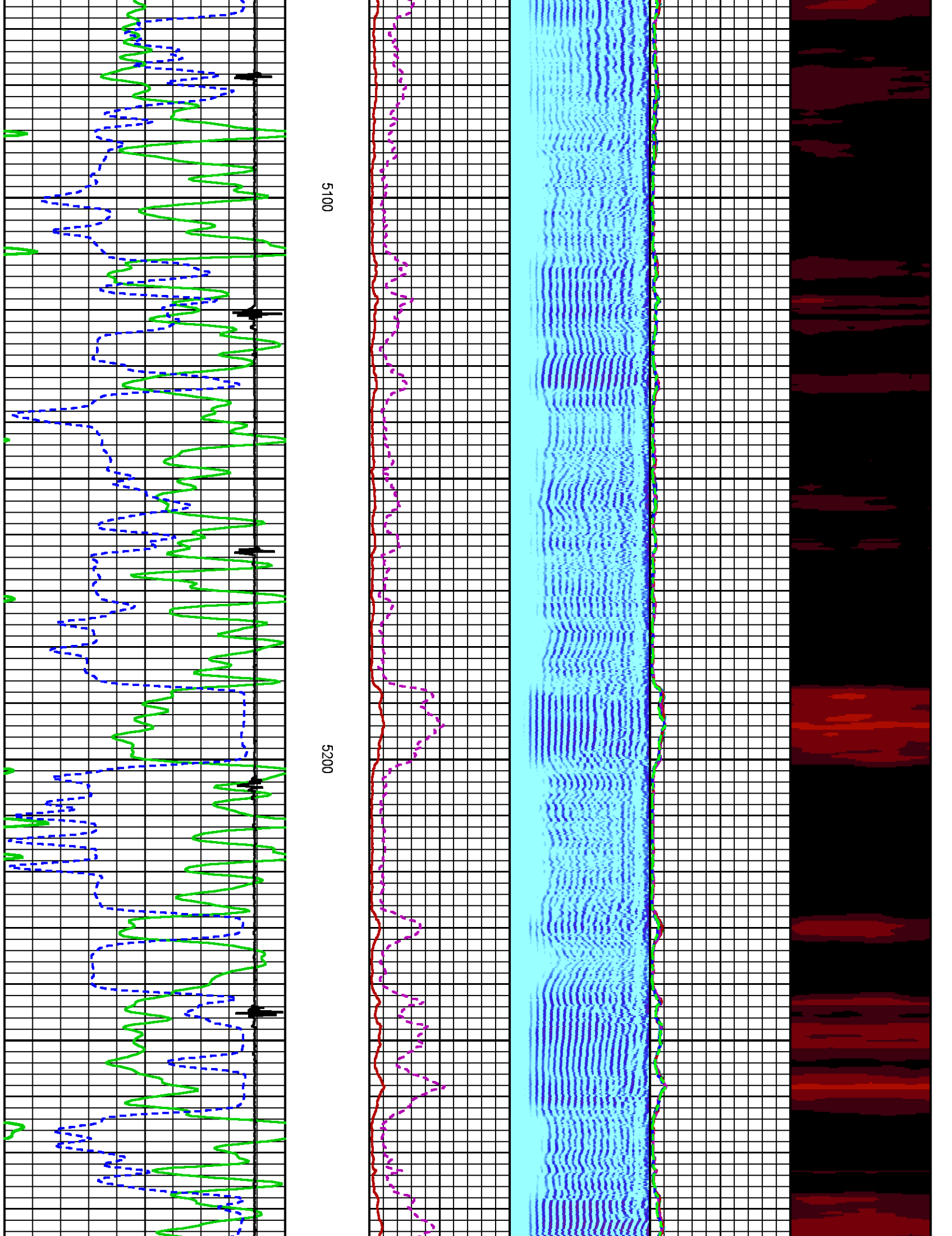


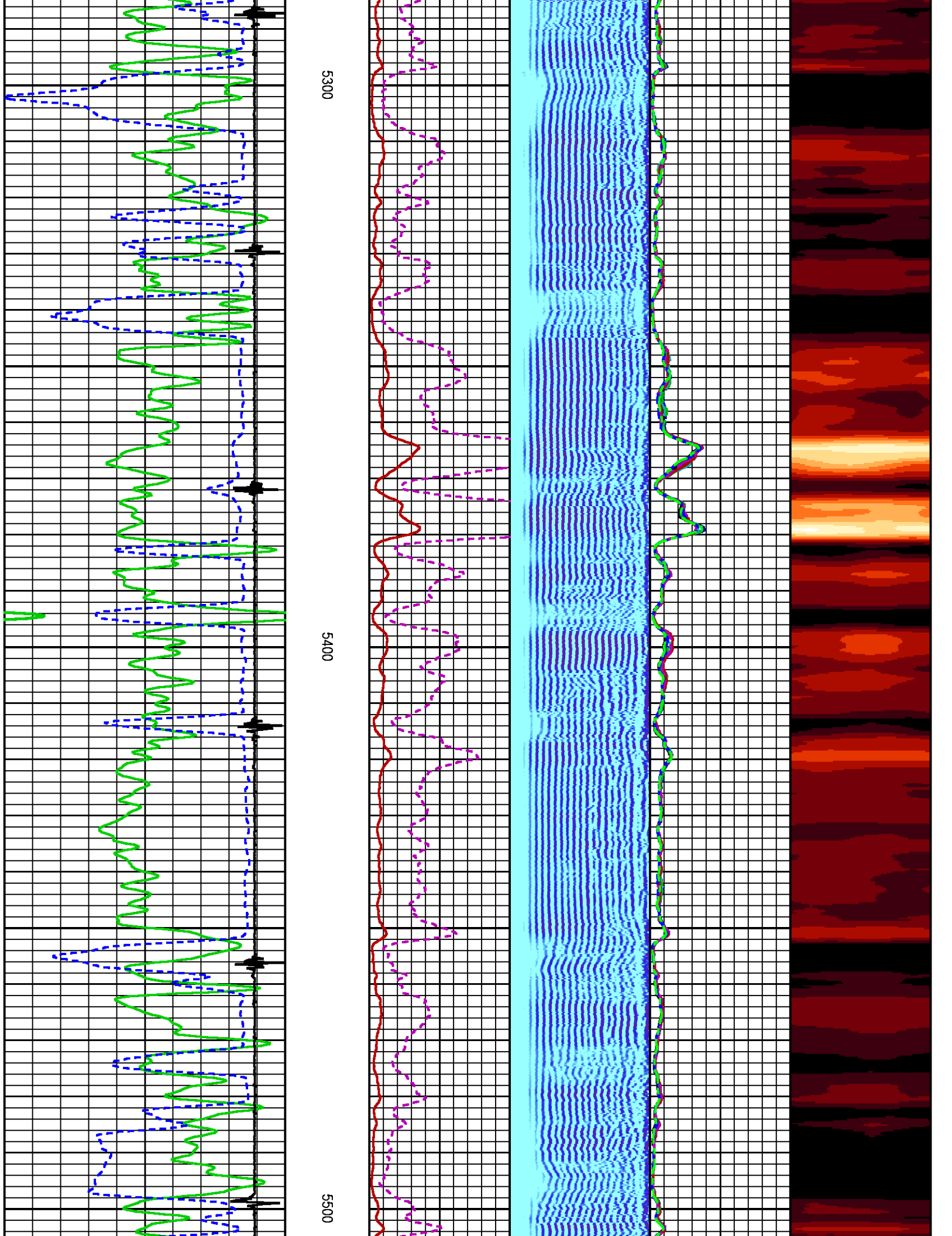


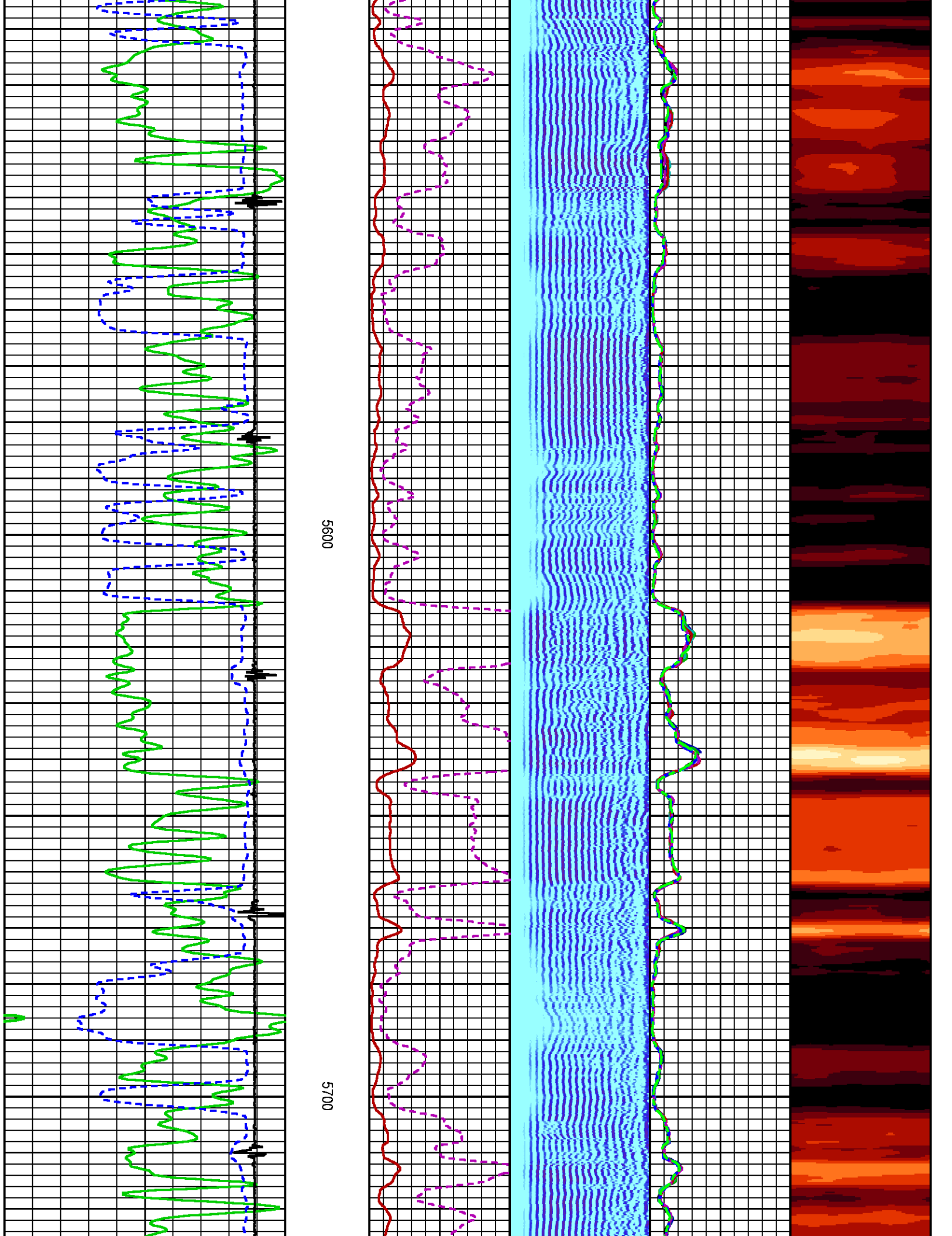
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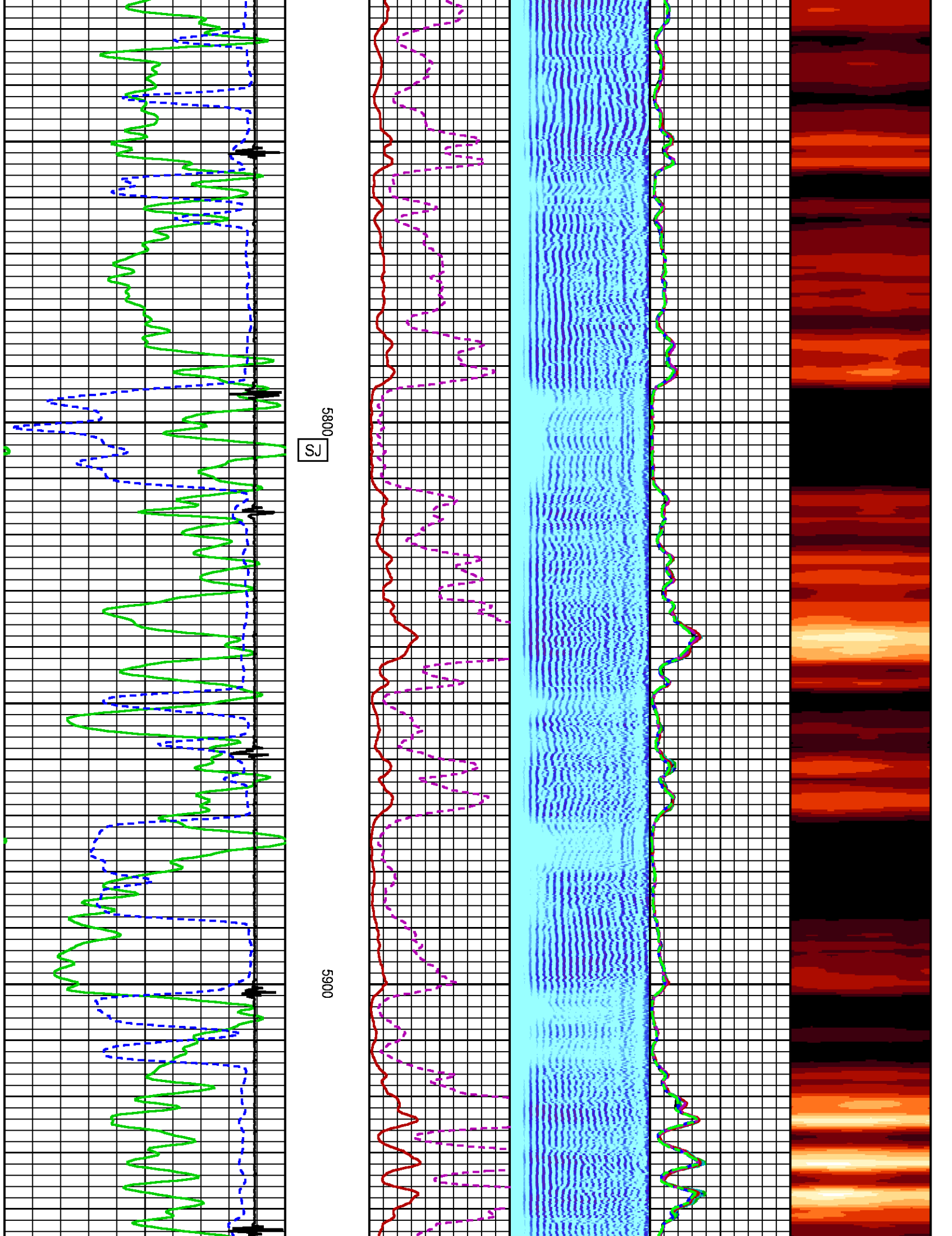
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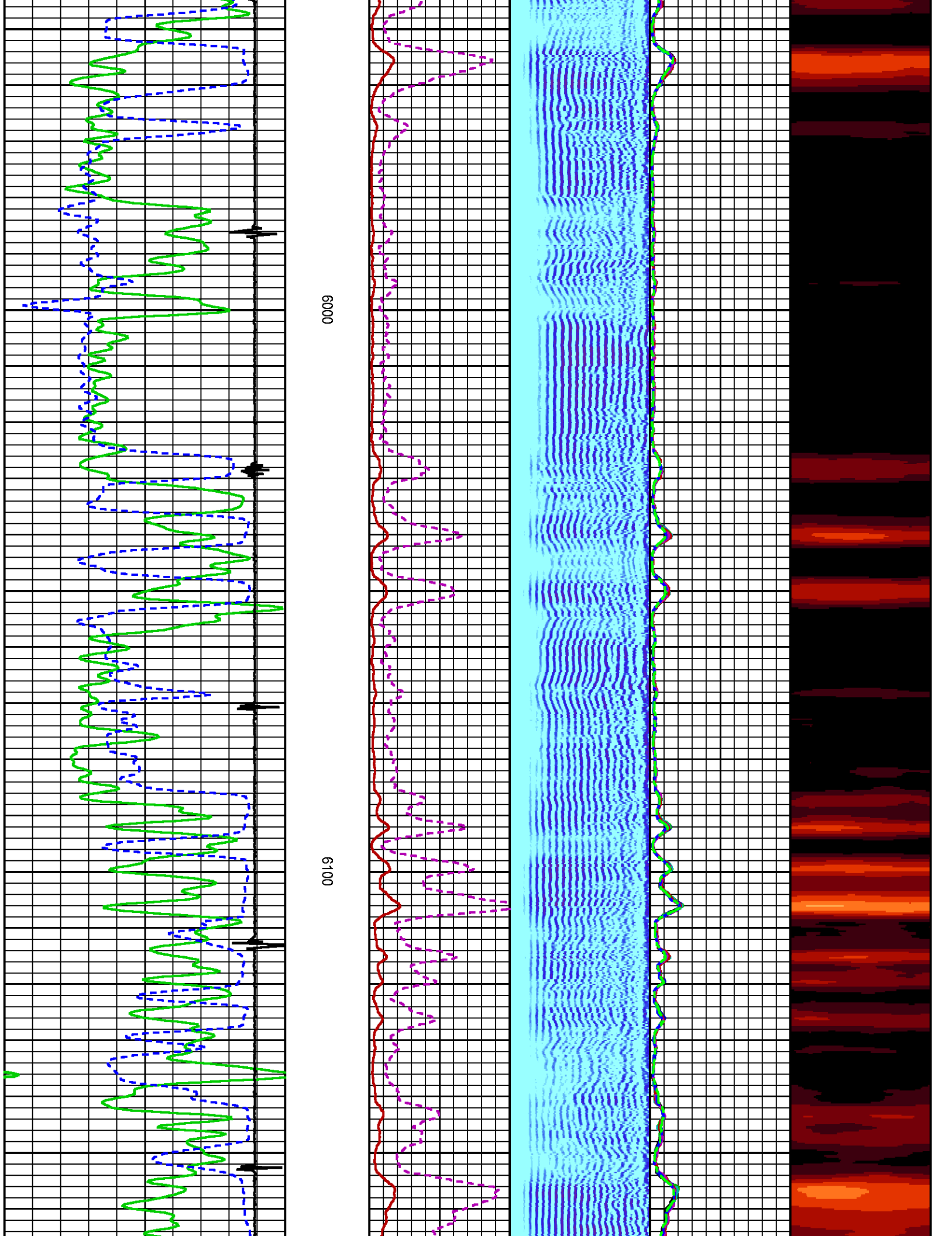


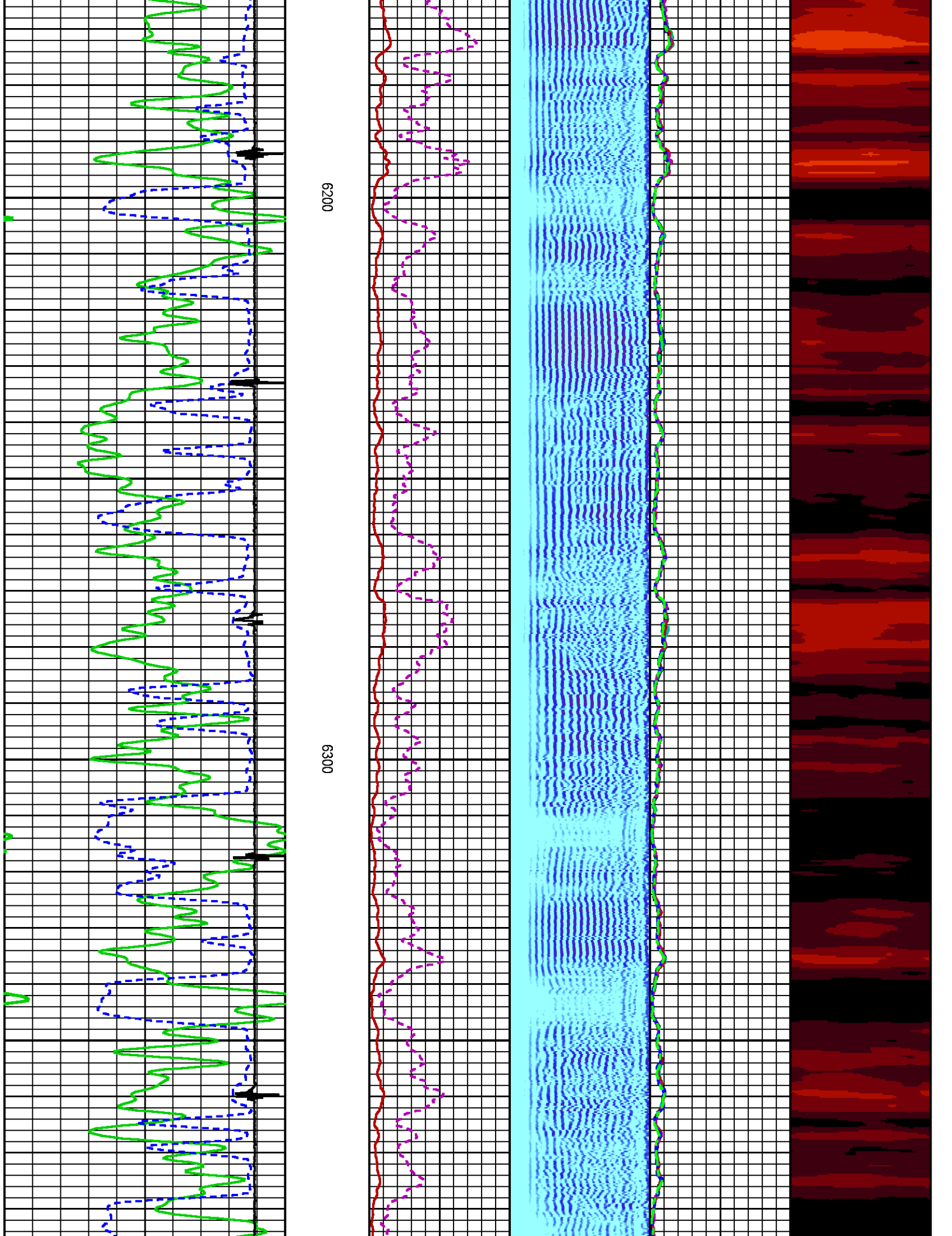


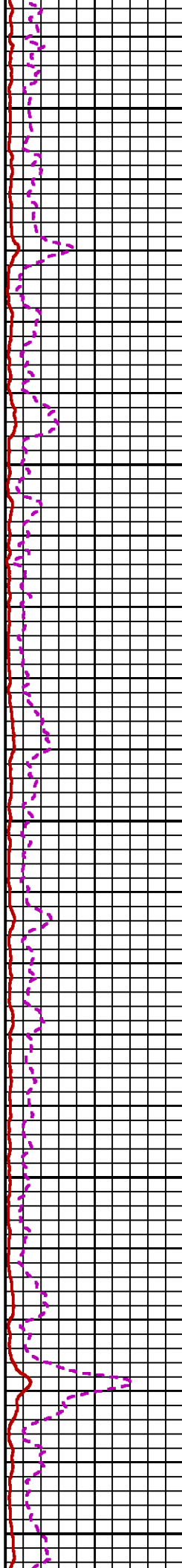
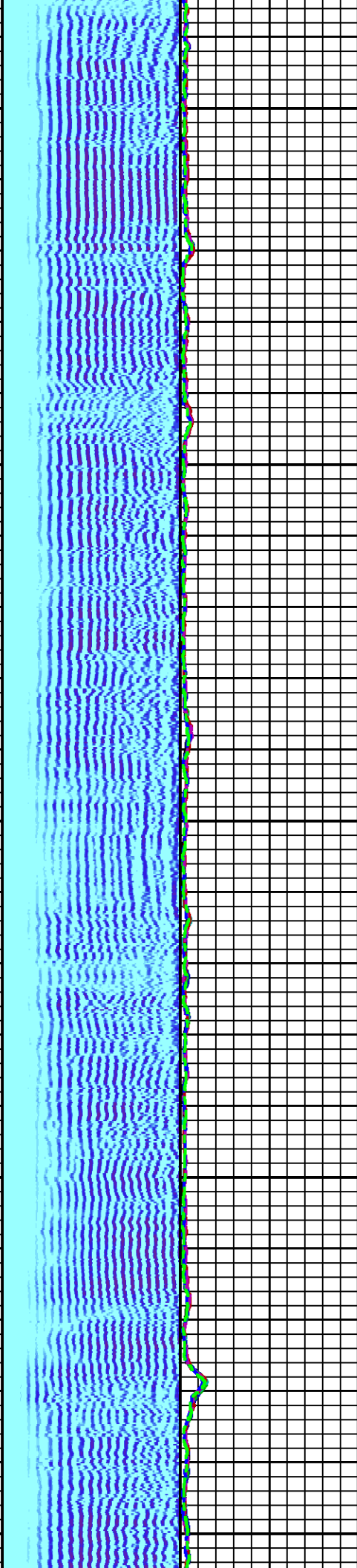








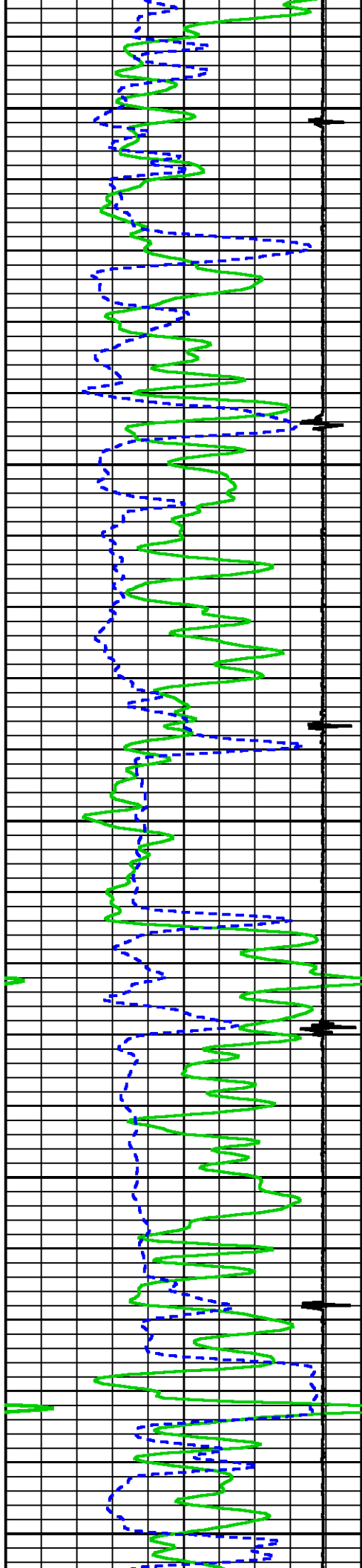


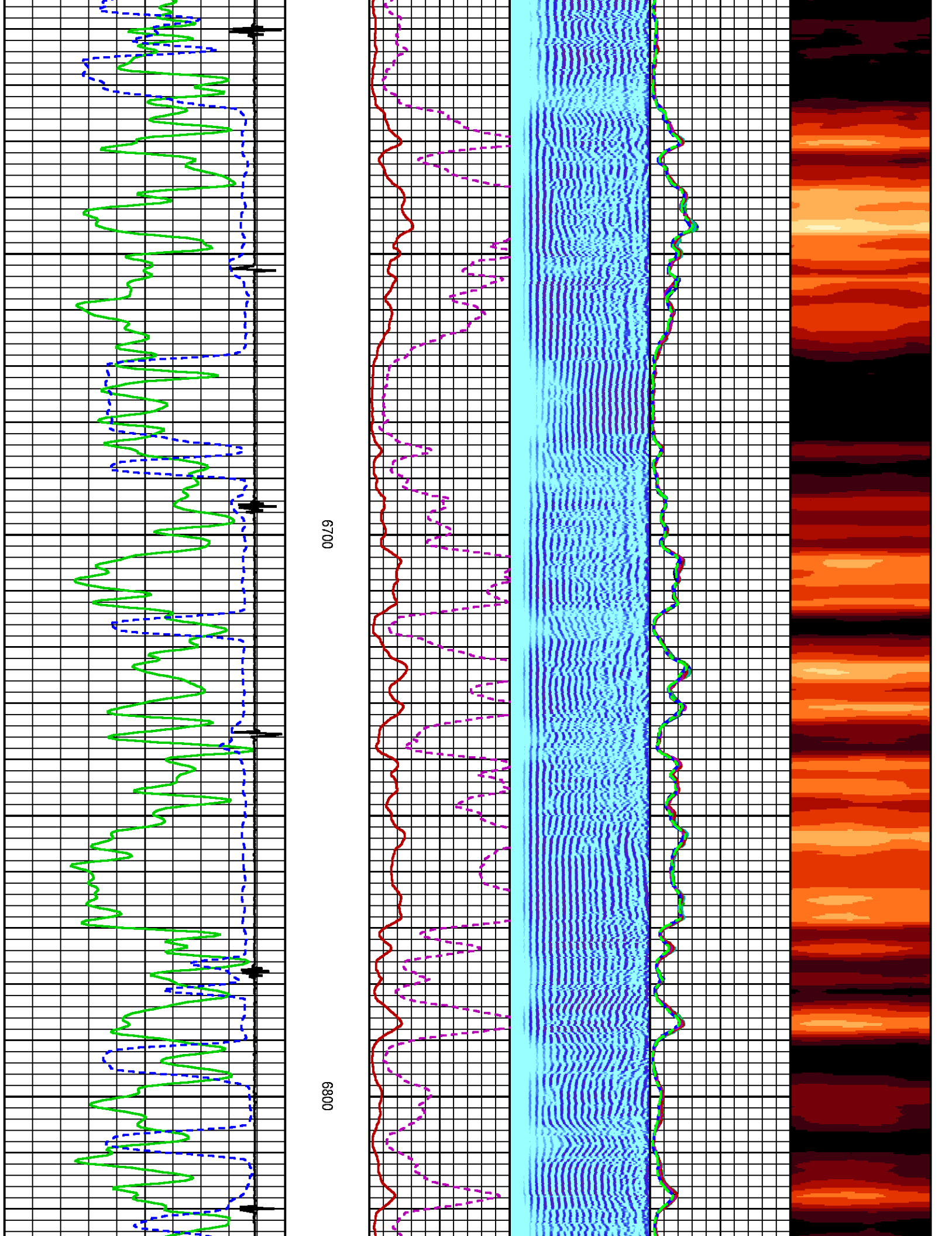


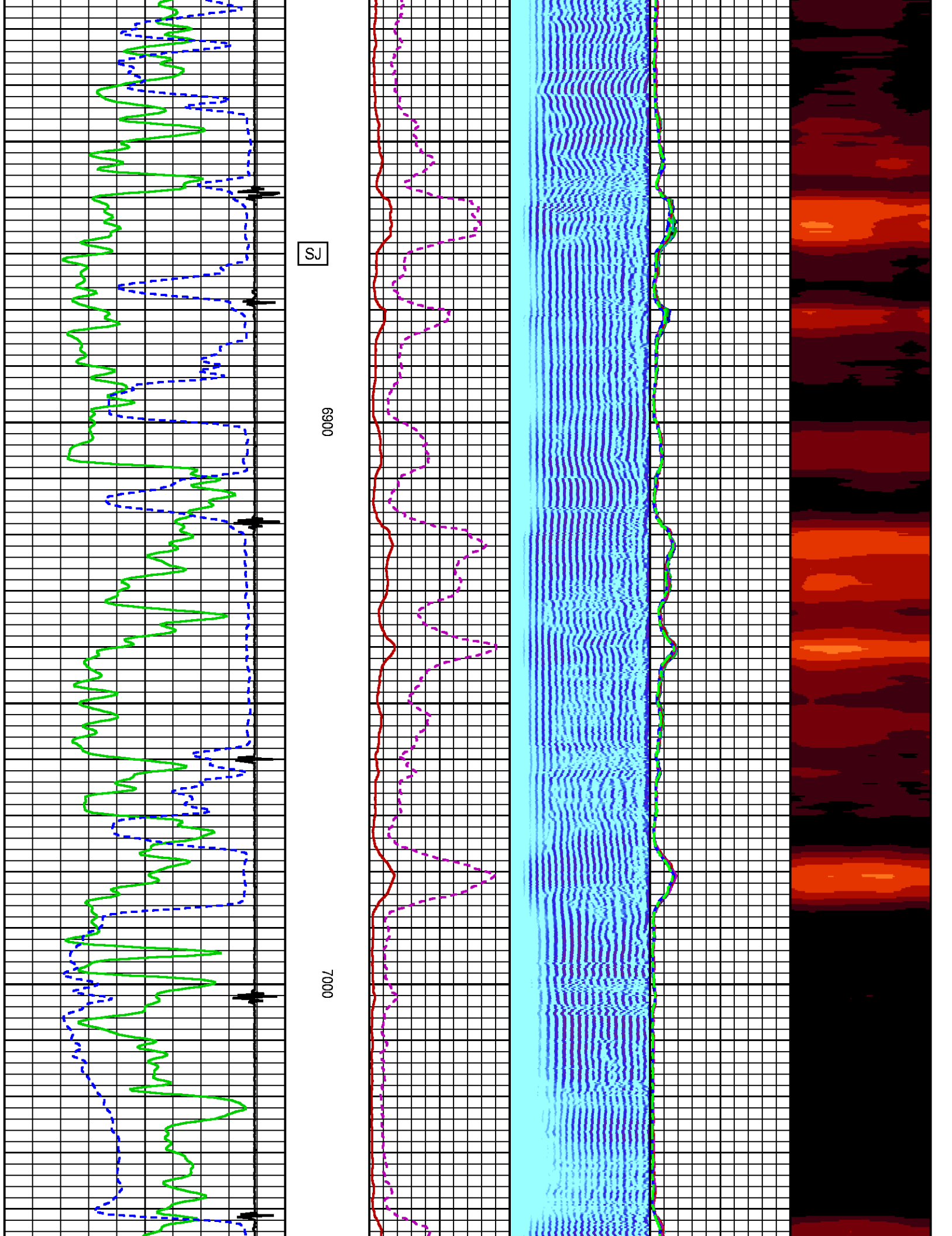
6400

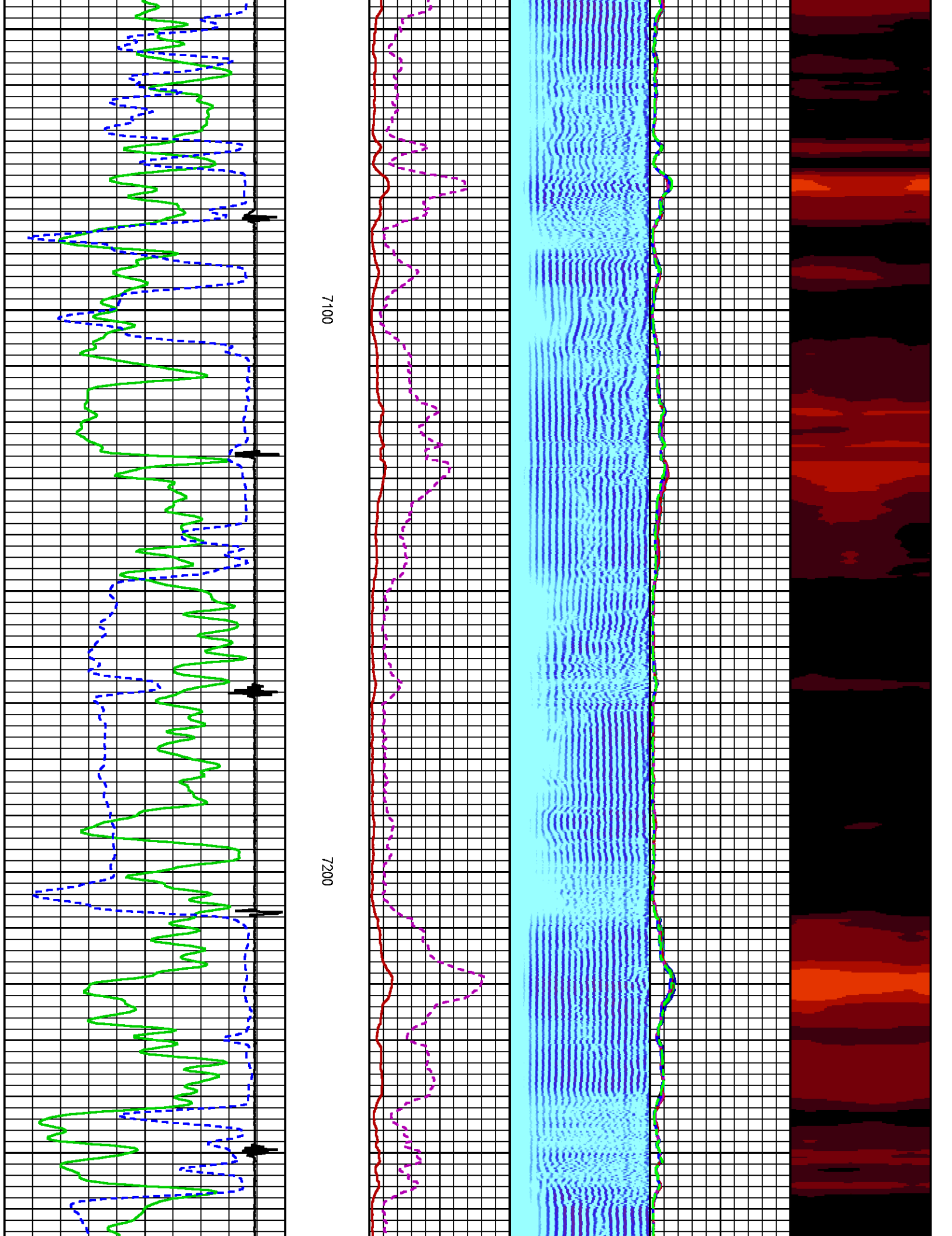
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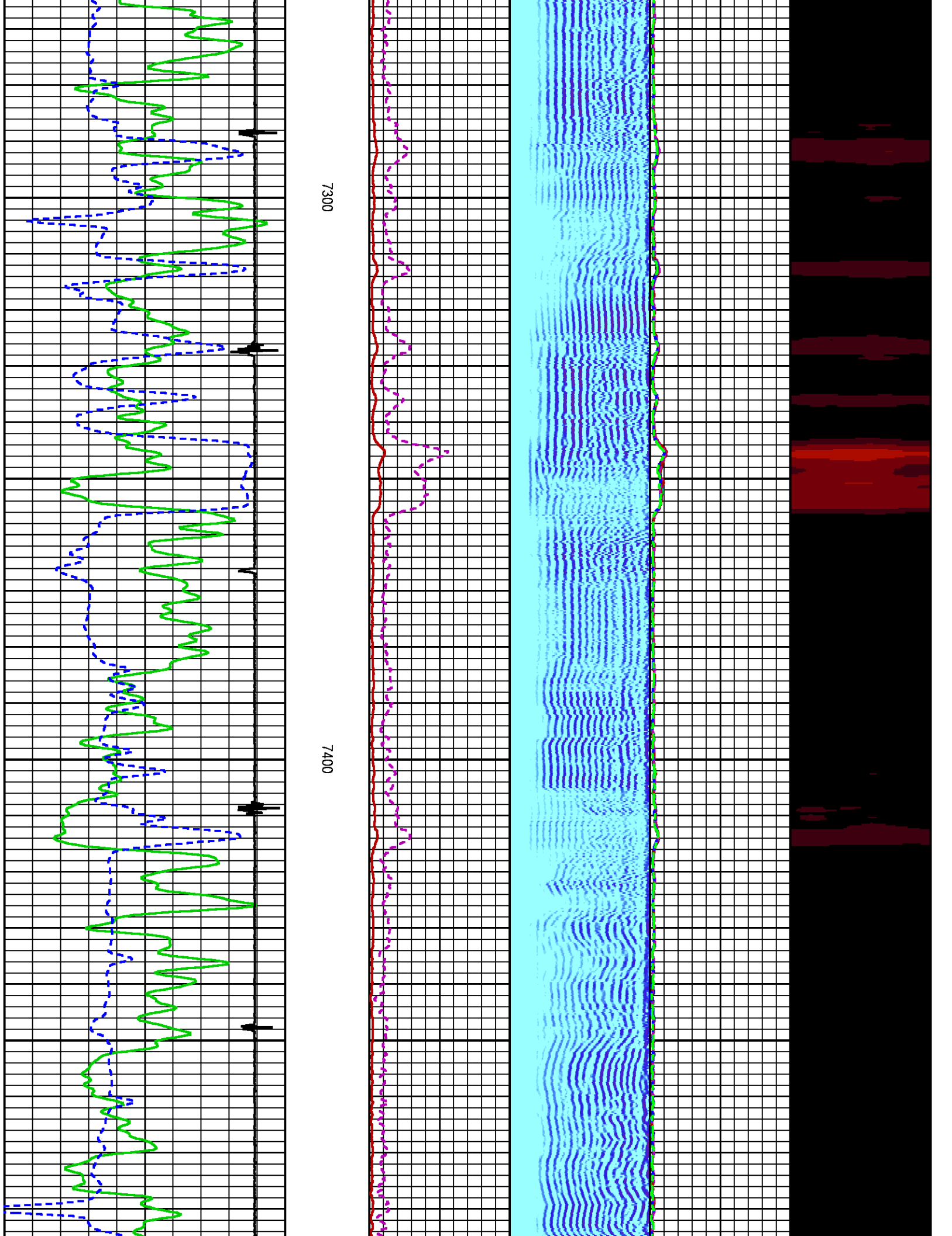
6600

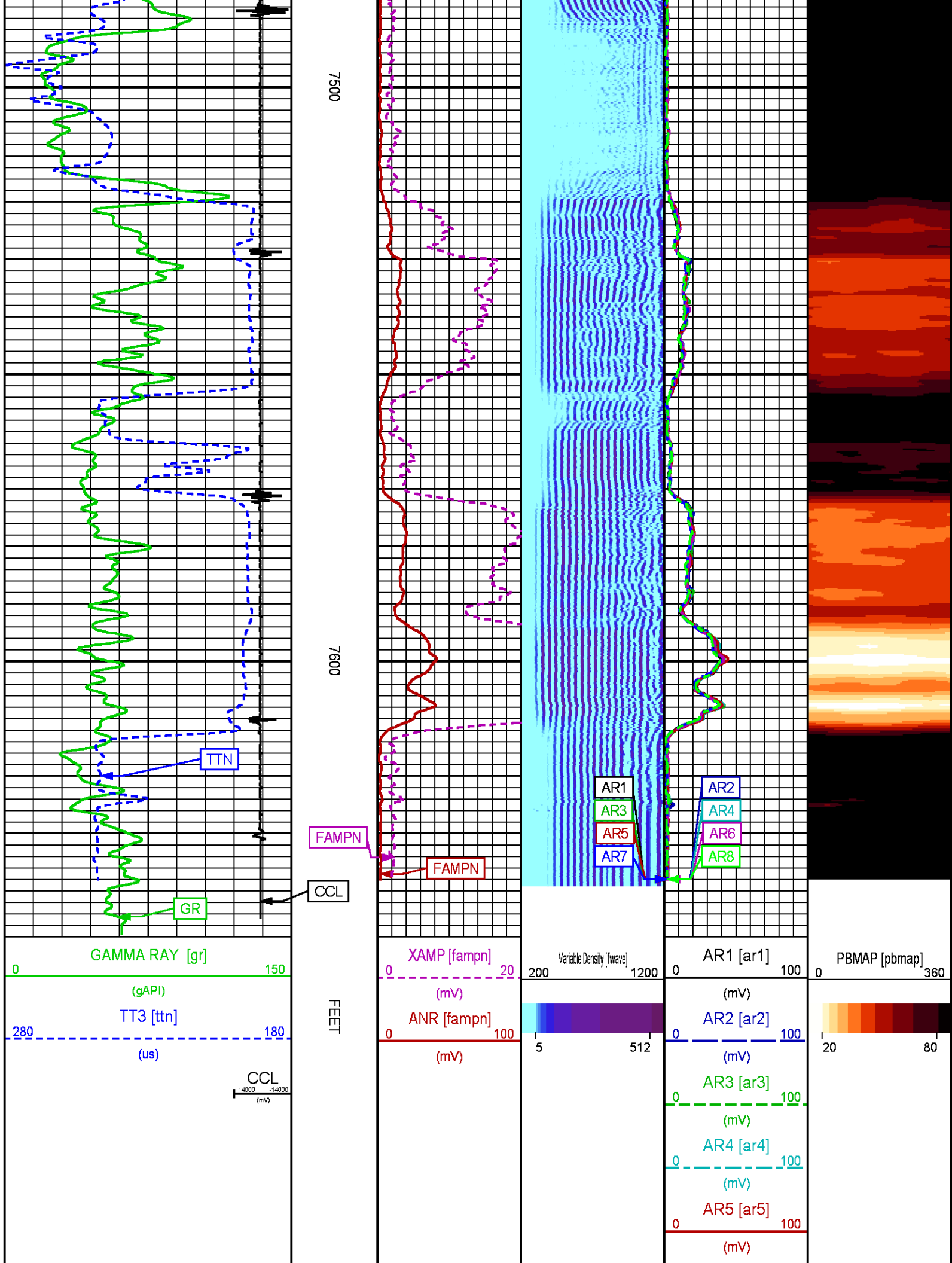


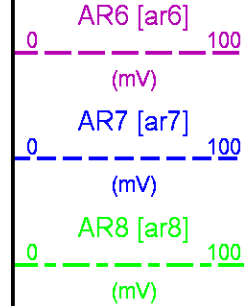












RAL REPEAT PASS 0 PSI

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017
Updates: 1

Plotted: Thu Nov 29 13:30:10 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE_BCU_0993_21_02W/p012g01.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 7272.250 ft BOTTOM DEPTH: 7667.000 ft

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
GR	FILTER ()	medium (1)		TOP	BOTTOM
AMPLITUDE	FILTER ()	light (2a)		"	"
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*)	184	us	TOP	BOTTOM
	AMP WINDOW START (fgp2*)	184	us	"	"
	AMP WINDOW START (fgp3*)	184	us	"	"
	AMP WINDOW START (fgp4*)	184	us	"	"
	AMP WINDOW START (fgp5*)	184	us	"	"
	AMP WINDOW START (fgp6*)	184	us	"	"
	AMP WINDOW START (fgp7*)	184	us	"	"
	AMP WINDOW START (fgp8*)	184	us	"	"
	AMP WINDOW START (fgpn*)	184	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*)	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	"	"

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

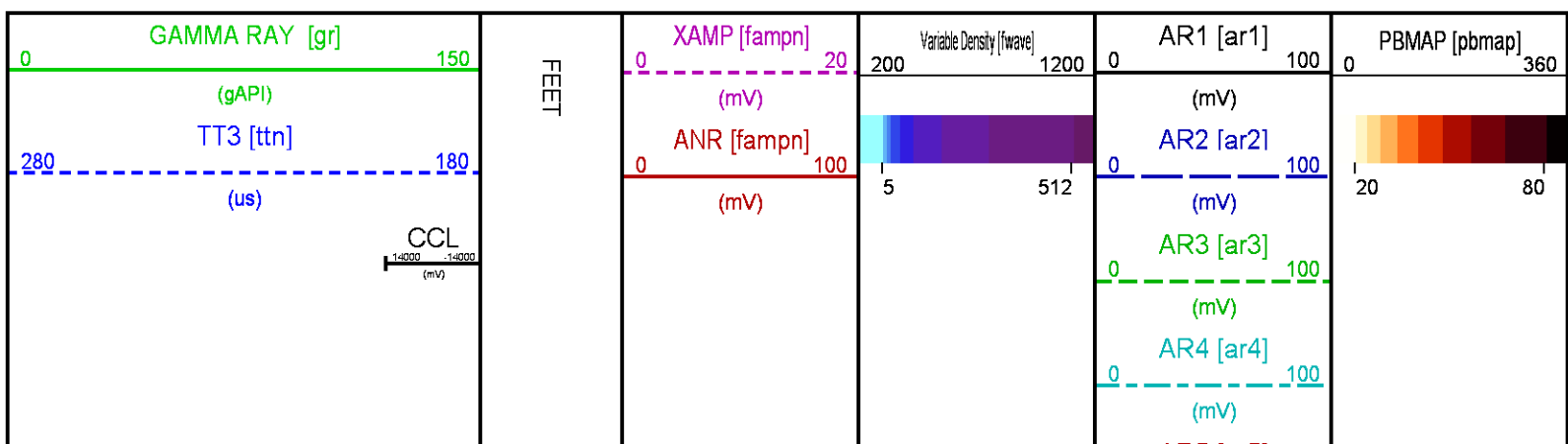
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	Nov 29 09:57:01 2018	FIXED GATE AMPLITUDE T-R1
F1:AR2	Nov 29 09:57:01 2018	FIXED GATE AMPLITUDE T-R2
F1:AR3	Nov 29 09:57:01 2018	FIXED GATE AMPLITUDE T-R3
F1:AR4	Nov 29 09:57:01 2018	FIXED GATE AMPLITUDE T-R4
F1:AR5	Nov 29 09:57:01 2018	FIXED GATE AMPLITUDE T-R5
F1:AR6	Nov 29 09:57:01 2018	FIXED GATE AMPLITUDE T-R6
F1:AR7	Nov 29 09:57:01 2018	FIXED GATE AMPLITUDE T-R7
F1:AR8	Nov 29 09:57:01 2018	FIXED GATE AMPLITUDE T-R8
F1:CCL	Nov 29 09:57:01 2018	CASING COLLAR LOCATOR
F1:FAMPN	Nov 29 09:57:01 2018	FIXED GATE AMPLITUDE NEAR RECEIVER
F1:FWAVE	Nov 29 09:57:01 2018	FAR WAVE FORM
F1:GR	Nov 29 09:57:01 2018	GAMMA RAY
F1:PBMAP	Nov 29 09:57:01 2018	PERCENT BOND CEMENT MAP
F1:TTN	Nov 29 09:57:01 2018	TRAVELTIME FROM NEAR TRANSMITTER-RECEIVER

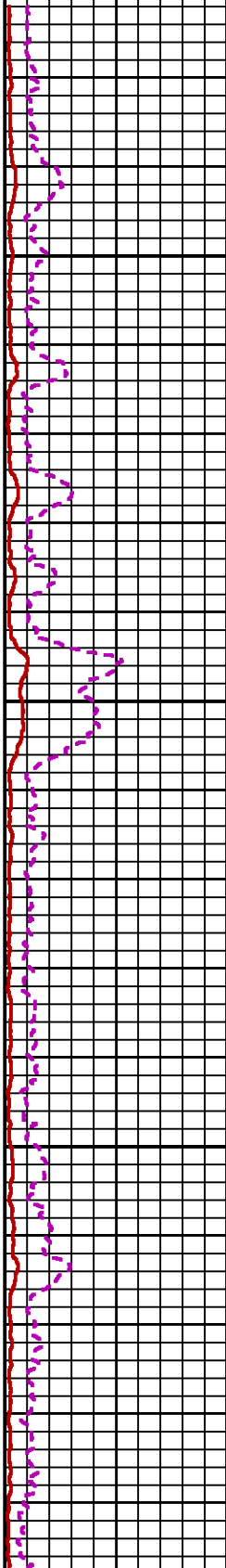
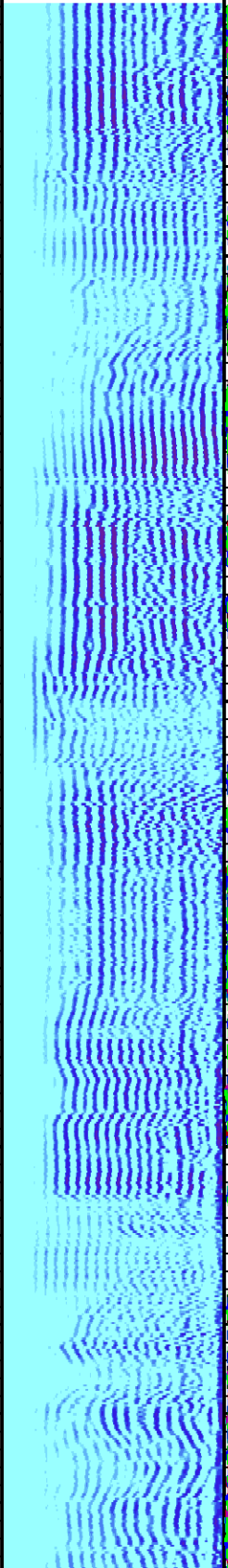
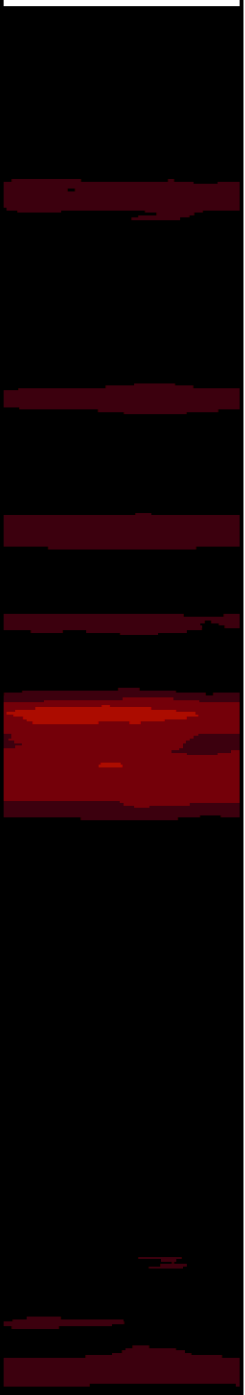
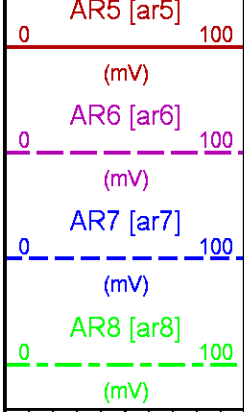
CURVE MEASURE POINT OFFSET

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

Presentation : SysA:/dat1a/LARAMIE_BCU_0993_21_02W/02W_RAL_REPEAT.fvpdf [5"/100' Scale]
Plot Interval : 7271.75 - 7640 Feet

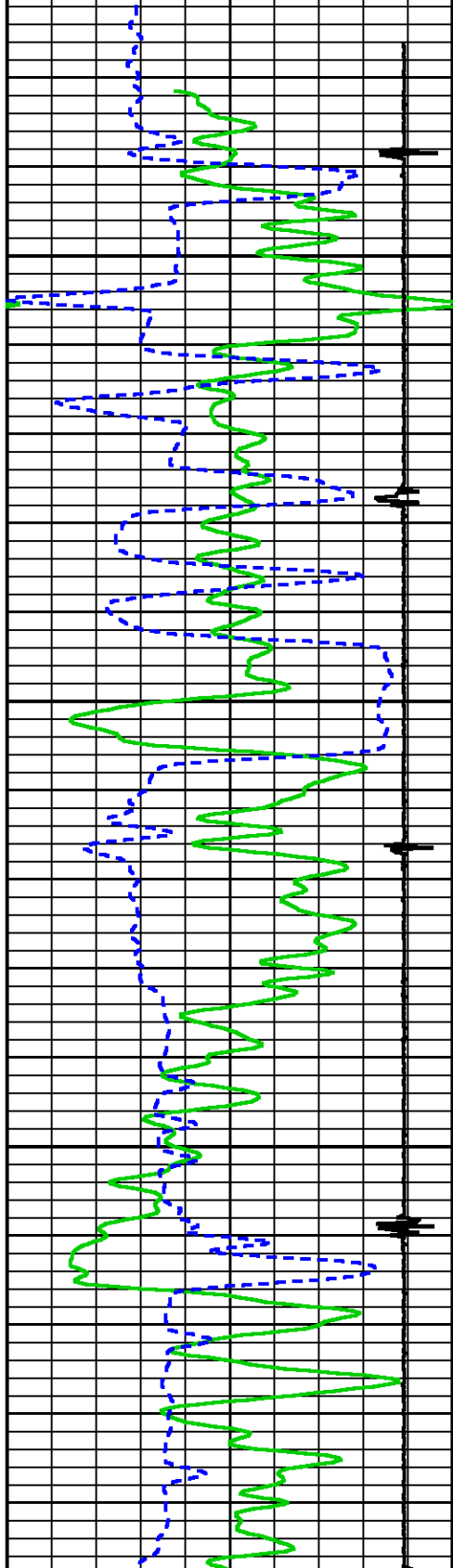
Data File 1 : F1 : SysA:/dat1a/LARAMIE_BCU_0993_21_02W/RAL_REPEAT.xtf
Created On : Nov 29 09:57:01 2018
Company : LARAMIE ENERGY LLC
Well : BCU 0993-21-02W
Field : BUZZARD CREEK
File Interval : 7270.75 - 7677.75 Feet
OCT : p012g

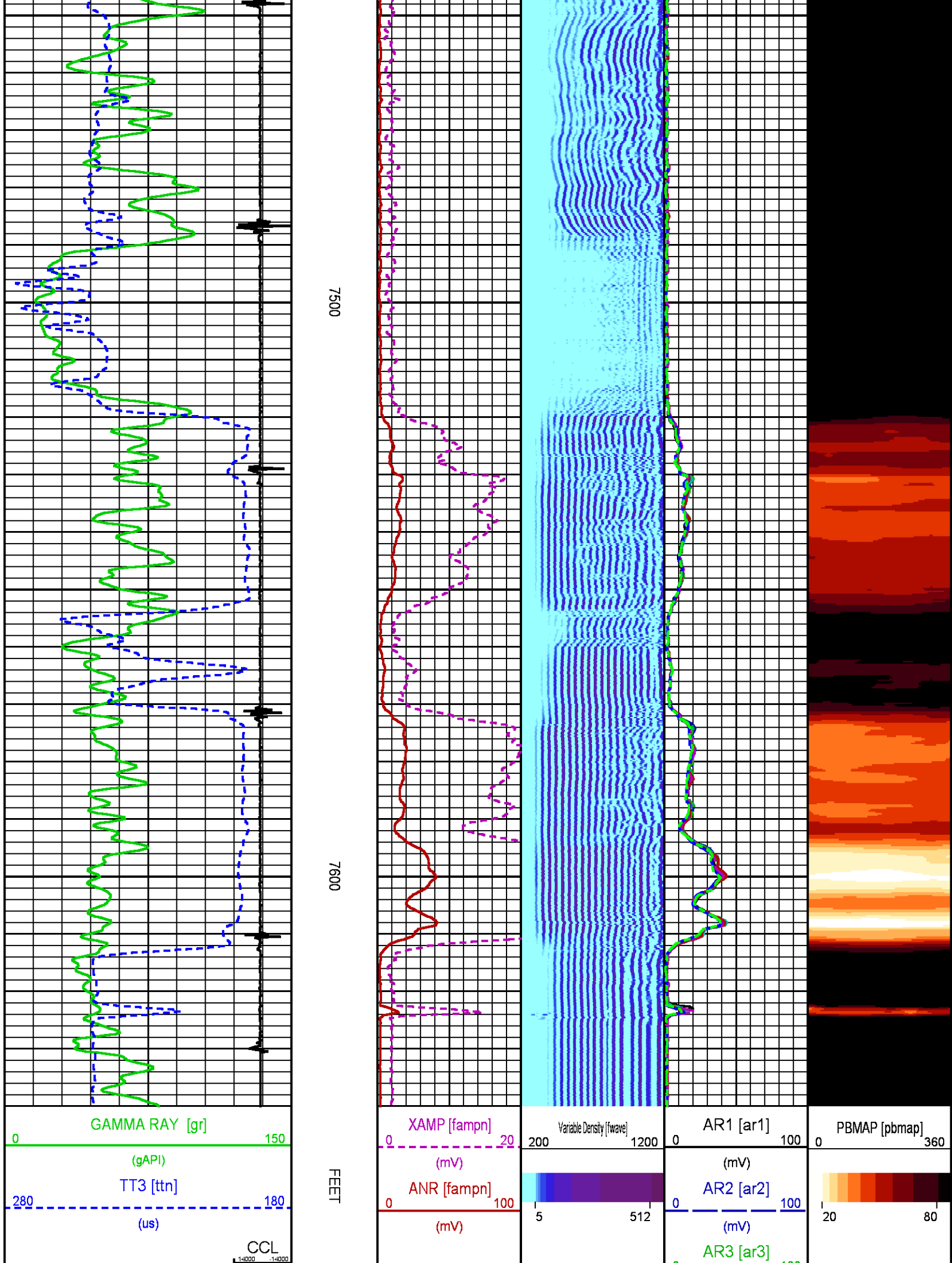




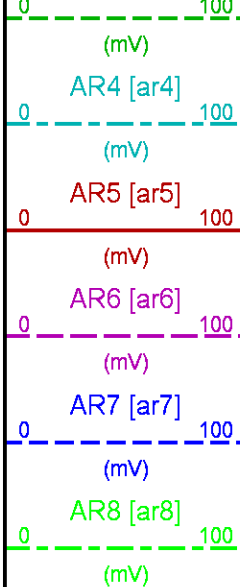
7300

7400





(mV)



CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/LARAMIE_BCU_0993_21_02W/p012g.tp1

RAL PRIMARY CALIBRATION SUMMARY

TOOL #: 1426XA 10222301

DATE/TIME PERFORMED: Thu Nov 29 09:14:04 2018

UNIT #: 5753XD 10412898

	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)	-0.01	-0.09	0.02	0.01	-0.00	0.02	0.00	0.00	0.03	-0.13	-0.01
AMP FLUID (mV)	218	217	219	220	220	218	217	216	217	296	214
TT (us)	216	216	216	215	215	215	216	215	217	323	216
M FACTOR	0.46	0.46	0.46	0.45	0.45	0.46	0.46	0.46	0.46	0.51	0.47

RAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1426XA 10222301

DATE/TIME PERFORMED: Thu Nov 29 09:19:59 2018

DAYS SINCE CAL: 0

UNIT #: 5753XD 10412898

CABLE #: 4268SM SMA111

	NEAR (mV)	R1 (mV)	R2 (mV)	R3 (mV)	R4 (mV)	R5 (mV)	R6 (mV)	R7 (mV)	R8 (mV)	FAR (mV)	CAL (mV)
ZERO	-0.11	-0.07	0.08	-0.06	-0.05	0.06	-0.09	-0.06	0.05	0.02	-0.06
AMP AIR	0.61	0.51	0.56	0.52	0.38	0.73	0.78	0.44	0.45	1.35	100.47

GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1355XA 12568545 DATE/TIME PERFORMED: Mon Nov 12 16:42:42 2018

UNIT #: 5753XD 10412898 CALB JIG #: 4702NK VBA-917

	BACKGROUND (cts)	CALBRTR ON (cts)	CR DIFF (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	CALBRTR (gAPI)
GR	151.47	498.84	347.4	0.576	87.21	287.21	200

GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1355XA 12568545 DATE/TIME PERFORMED: Mon Nov 12 16:45:14 2018

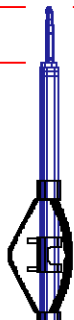
UNIT #: 5753XD 10412898 VERI JIG #: 4702NK VBA-917

	BACKGROUND (cts)	CALBRTR ON (cts)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	163.42	497.64	0.576	94.09	286.51	192.43
						190.00 210.00

INSTRUMENT CONFIGURATION

Source File: /dat1a/LARAMIE_BCU_0993_21_02W/RAL-tdg

A3 CABLEHEAD
Diameter : 1.37"



18.85'

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

XMTR 12.71'
 NEAR MP 11.17'
 FAR MP 10.21'
 NEAR RCVR 9.62'
 FAR RCVR 7.71'

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

CCL 5.79'
 GR 1.67'
 TEMP 0.17'

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

**BAKER
HUGHES**
a GE company



COMPANY LARAMIE ENERGY LLC

WELL BCU 0993-21-02W

FIELD BUZZARD CREEK

COUNTY MESA **STATE** COLORADO

FILE NO:

CH145369

API NO:

05077105230000

LOCATION:

SHL: 381.0' FNL & 1321.0' FWL

ELEVATIONS:

KB 7287 FT

DF

GL 7257 FT

SEC 21.0 **TWP** 9.0S **RGE** 93.0 W

DATE 29-NOV-2018

ECLIPS