



RADIAL CEMENT BOND LOG

FILE NO: CH136902	COMPANY LARAMIE ENERGY LLC
API NO: 05077105300000	WELL GUNDERSON 0994-14-17E
	FIELD VEGA
	COUNTY MESA STATE COLORADO

Ver. 4.10	LOCATION: SHL: 1076' FSL & 1146' FEL BHL: 1076' FSL & 1146' FEL SEC 14 TWP 9S RGE 94W	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 7272 FT	ELEVATIONS: KB 7302 FT DF GL 7272 FT
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DATE	20-Jun-2018
RUN	1
SERVICE ORDER	US136902
DEPTH DRILLER	8217 FT
DEPTH LOGGER	8181 FT
BOTTOM LOGGED INTERVAL	8181 FT
TOP LOGGED INTERVAL	30 FT
TIME STARTED	10:00
TIME FINISHED	12:30
OPERATOR RIG TIME	2.5 HOURS
TYPE OF FLUID IN HOLE	WATER
FLUID DENSITY	NA
FLUID SALINITY	NA
FLUID LEVEL	69 FT
LOGGED CEMENT TOP	1542 FT
WELLHEAD PRESSURE	0 PSI
MAXIMUM HOLE DEVIATION	NA
NOMINAL LOGGING SPEED	100 F/MIN
MAX. RECORDED TEMP.	237 DEGF
REFERENCE LOG	NA
REFERENCE LOG DATE	NA
EQUIP. NO.	ML-4268
LOCATION	GRAND JCT.
RECORDED BY	T. NEWELL
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 RUN IN THE WELL

OPERATION 1: RAL/GR/CCL RUN CENTRALIZED

OPERATION 2: RPM/GR/CCL RUN IN PNC-3D MODE

SJ: 6395' - 6416'

SJ: 7616' - 7636'

EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	RAL	1426XA	10124114	CENTRALIZED
1	1	GR/CCL	1355XA	12568544	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 20 15:23:36 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE_GUNDERSON_0994-14-17E/p012g02.prm
 LOGGING MODE: DEPTH DIRECTION: UP
 TOP DEPTH: 2.000 ft BOTTOM DEPTH: 8175.153 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*)	189	us	TOP	BOTTOM
	AMP WINDOW START (fgp2*)	189	us	"	"
	AMP WINDOW START (fgp3*)	189	us	"	"
	AMP WINDOW START (fgp4*)	189	us	"	"
	AMP WINDOW START (fgp5*)	189	us	"	"
	AMP WINDOW START (fgp6*)	189	us	"	"
	AMP WINDOW START (fgp7*)	189	us	"	"
	AMP WINDOW START (fgp8*)	189	us	"	"
	AMP WINDOW START (fgpn*)	189	us	"	"
	AMP WINDOW LENGTH	30	us	"	"
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	198	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	4	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	215.678	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-71	us	"	"
	TOOL DELAY (str2*)	-71	us	"	"
	TOOL DELAY (str3*)	-71	us	"	"
	TOOL DELAY (str4*)	-71	us	"	"
	TOOL DELAY (str5*)	-71	us	"	"
	TOOL DELAY (str6*)	-71	us	"	"
	TOOL DELAY (str7*)	-71	us	"	"
	TOOL DELAY (str8*)	-71	us	"	"
	TOOL DELAY (strn*)	-71	us	"	"
BASELINE NOISE (NEAR)	NOISE WINDOW START	140	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	"	"

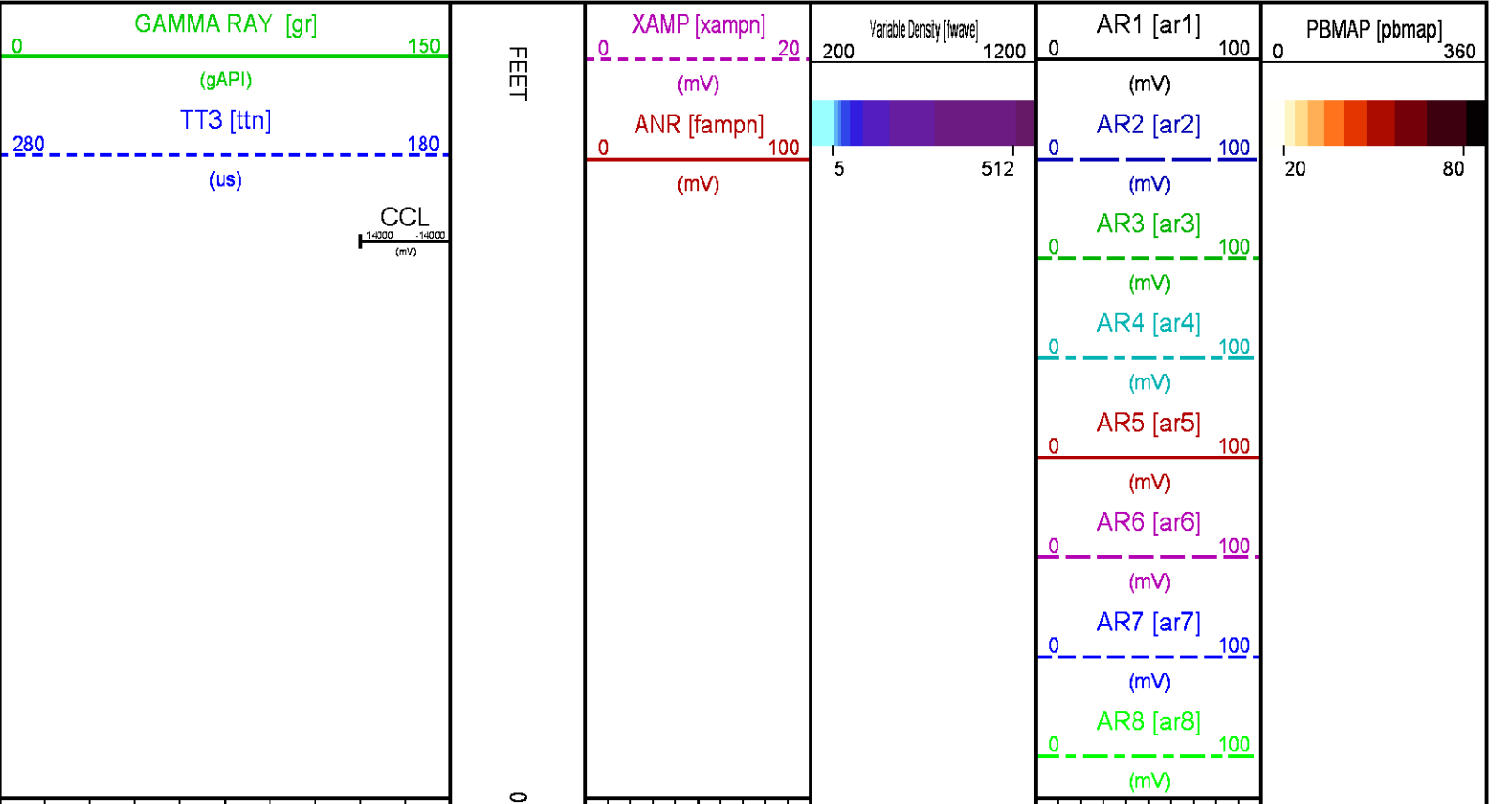
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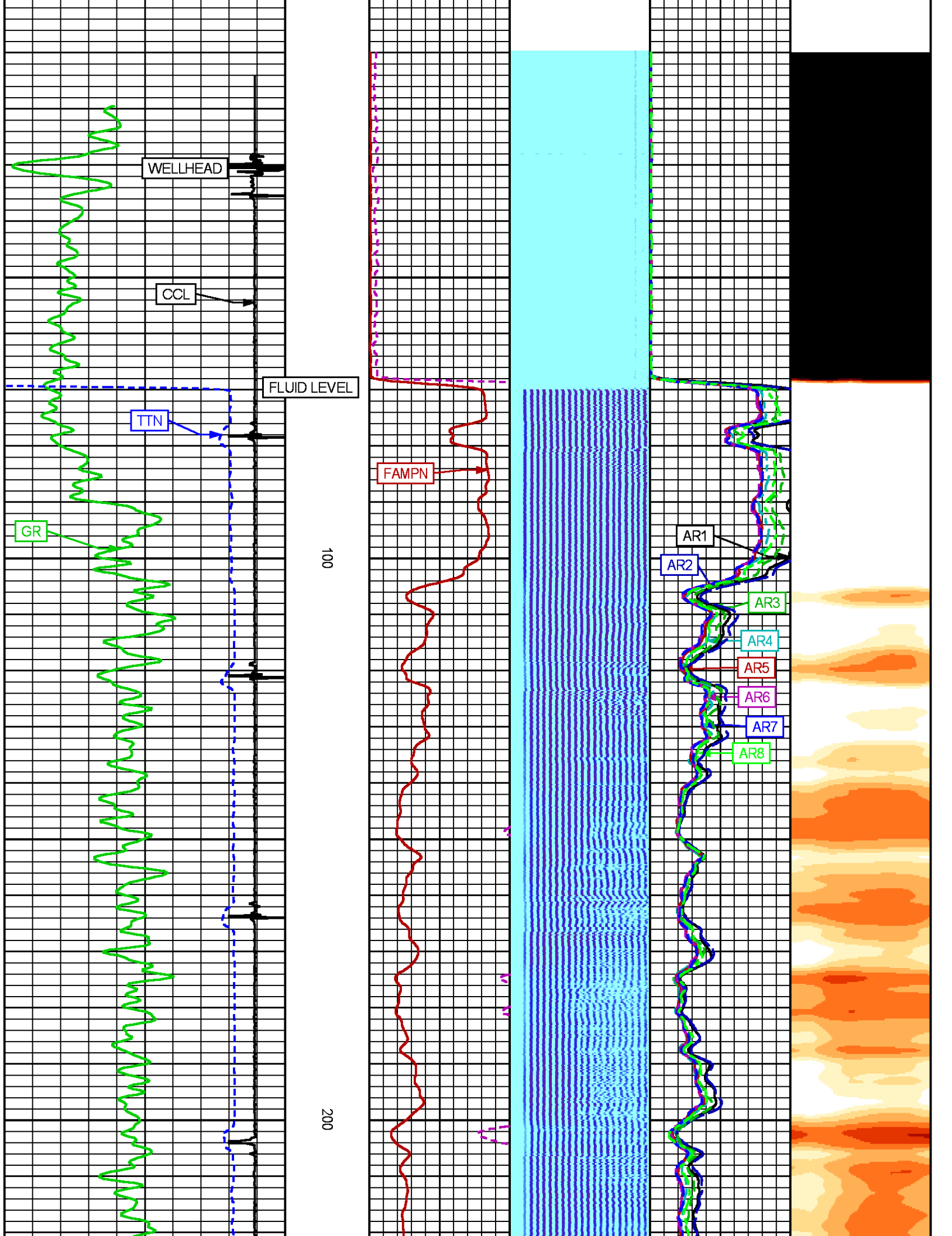
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	N/A	FIXED GATE AMPLITUDE T-R1
F1:AR2	N/A	FIXED GATE AMPLITUDE T-R2
F1:AR3	N/A	FIXED GATE AMPLITUDE T-R3
F1:AR4	N/A	FIXED GATE AMPLITUDE T-R4
F1:AR5	N/A	FIXED GATE AMPLITUDE T-R5
F1:AR6	N/A	FIXED GATE AMPLITUDE T-R6
F1:AR7	N/A	FIXED GATE AMPLITUDE T-R7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

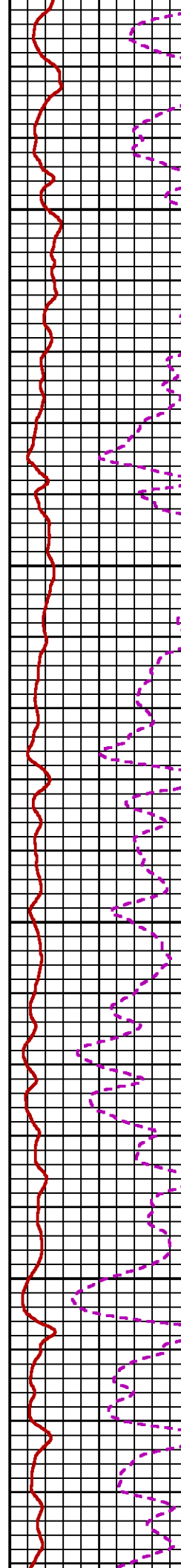
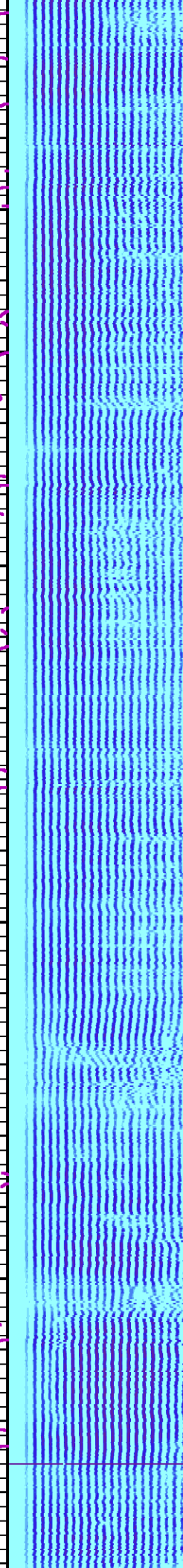
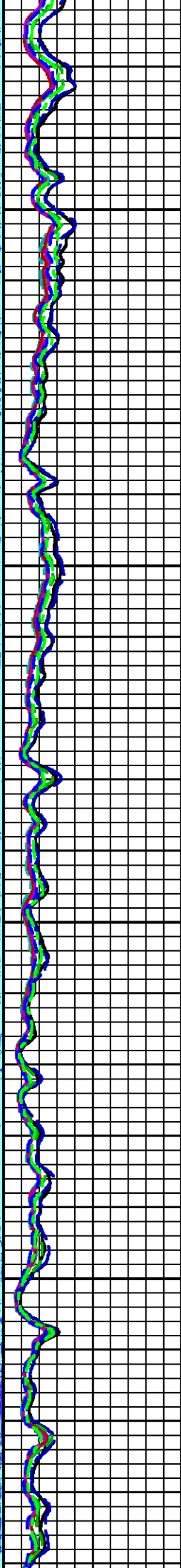
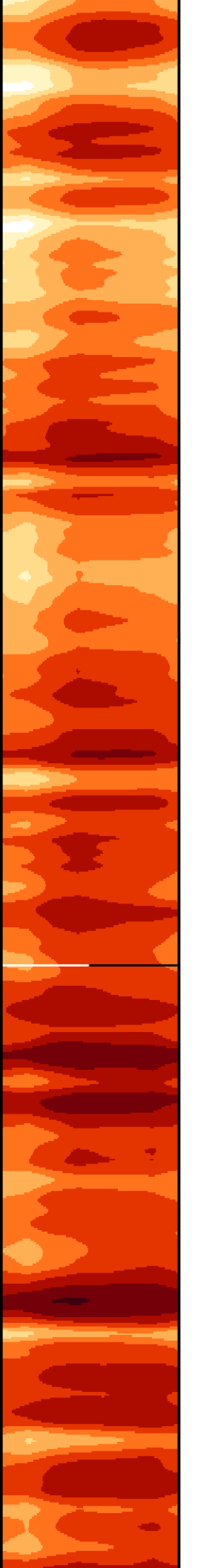
CURVE MEASURE POINT OFFSET

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		

Presentation	: SysA:/dat1a/LARAMIE_GUNDERSON_0994-14-17E/17E_RAL_MAIN.fvpdf [5"/100' Scale]
Plot Interval	: 0 - 8189.25 Feet
Data File 1	: F1 : SysA:/dat1a/LARAMIE_GUNDERSON_0994-14-17E/17E_RAL_MAIN.xtf
Created On	: N/A
Company	: LARAMIE ENERGY LLC
Well	: GUNDERSON 0994-14-17E
Field	: VEGA
File Interval	: 2 - 8190.5 Feet
OCT	: p012g

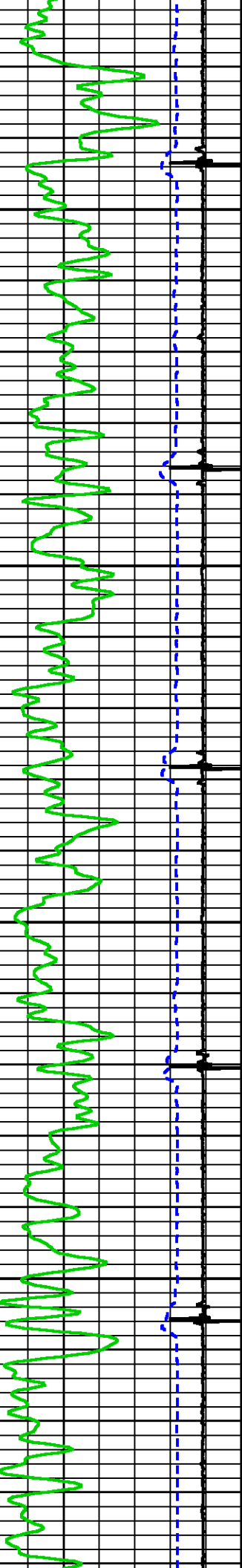


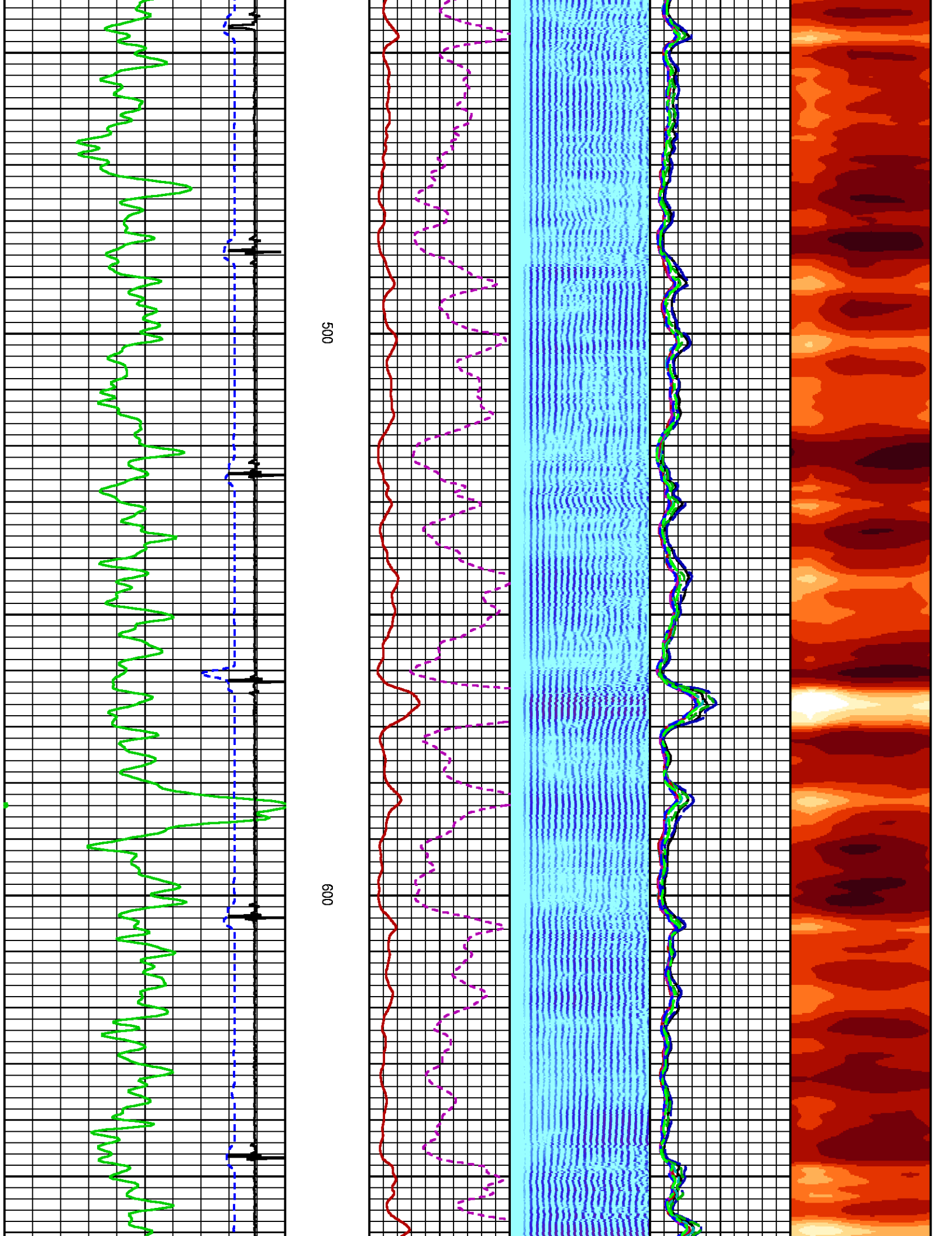


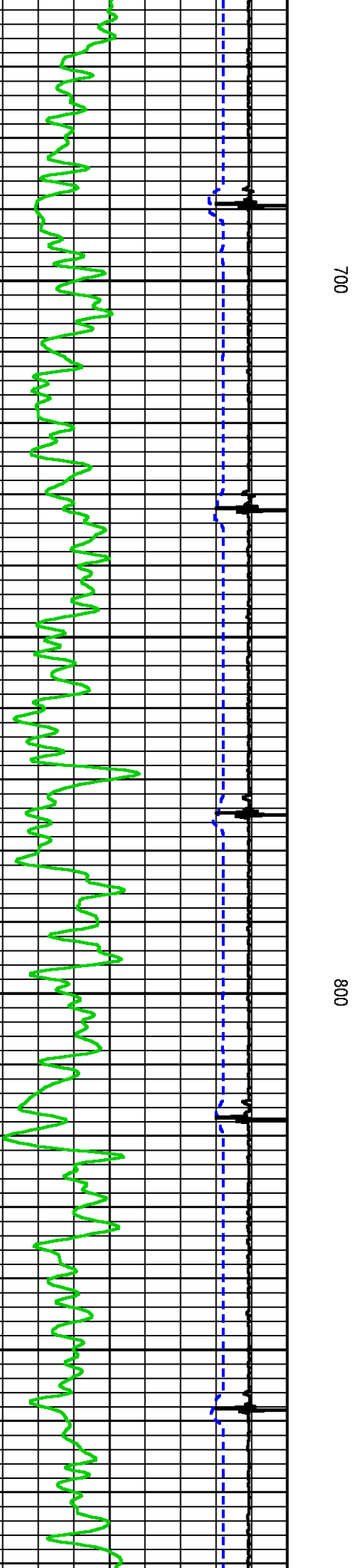
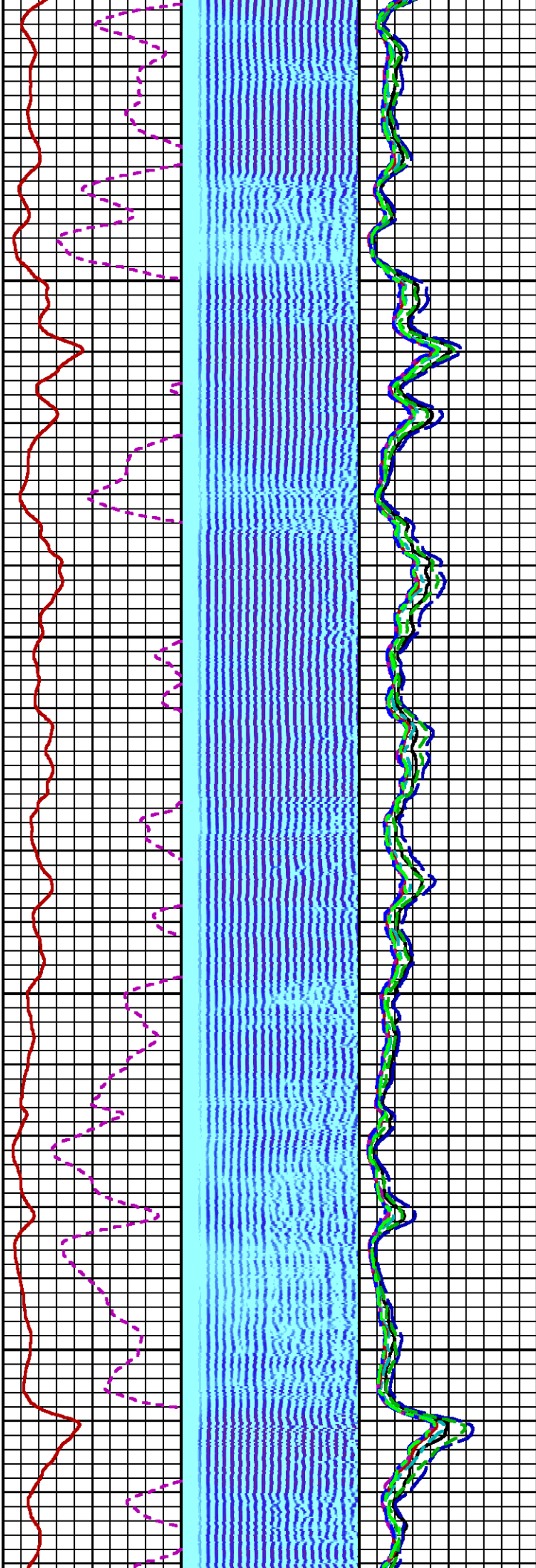
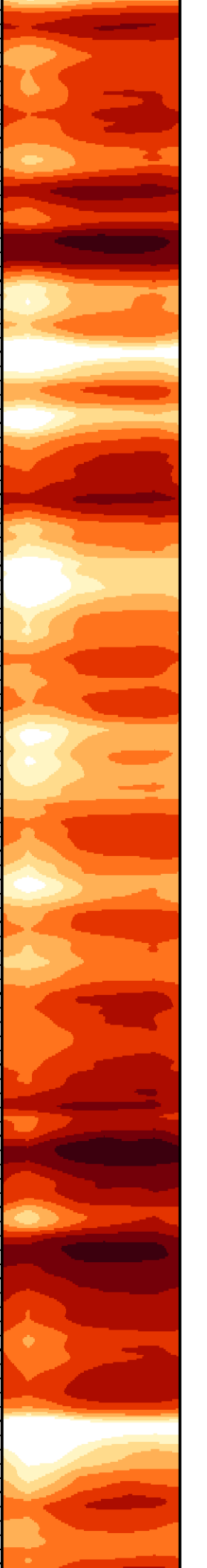


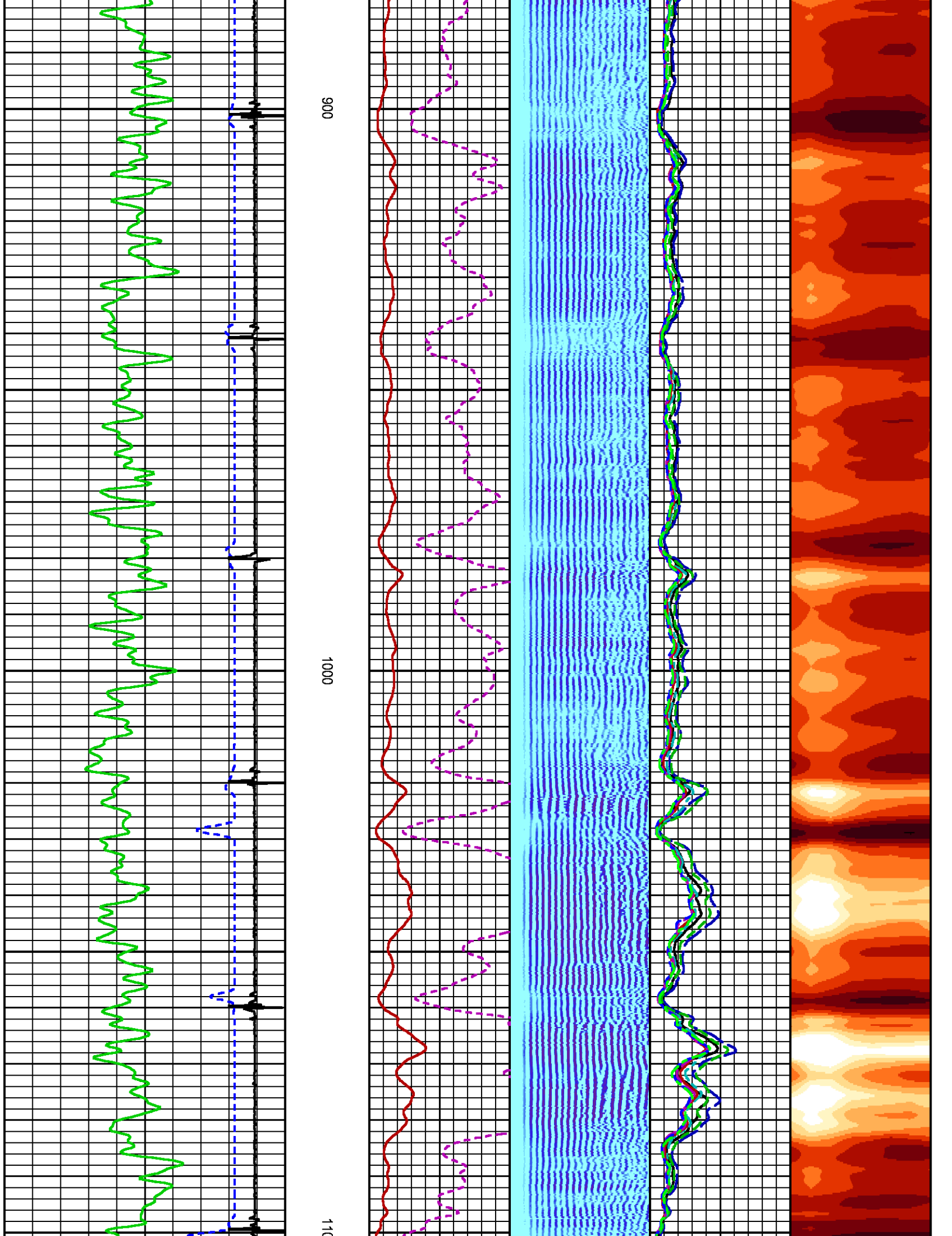
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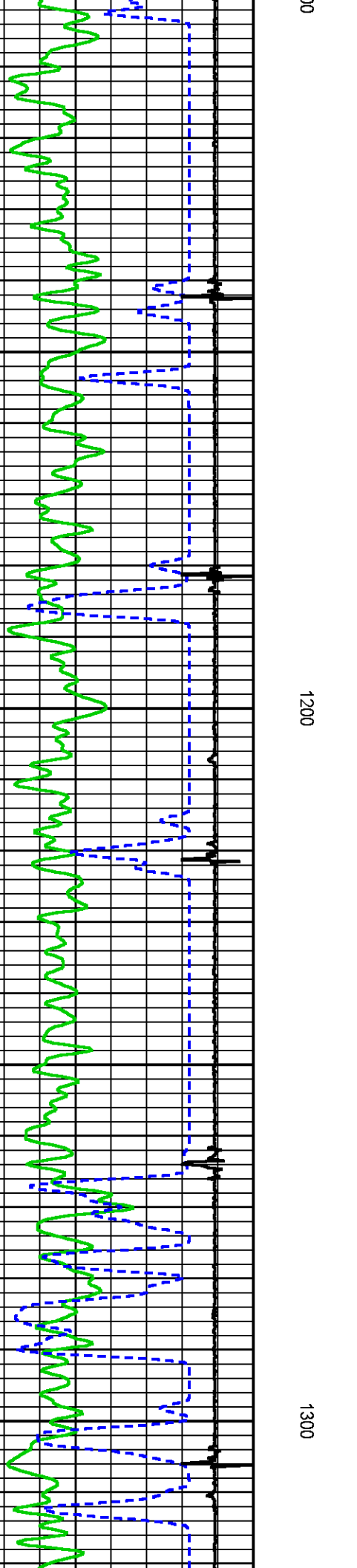
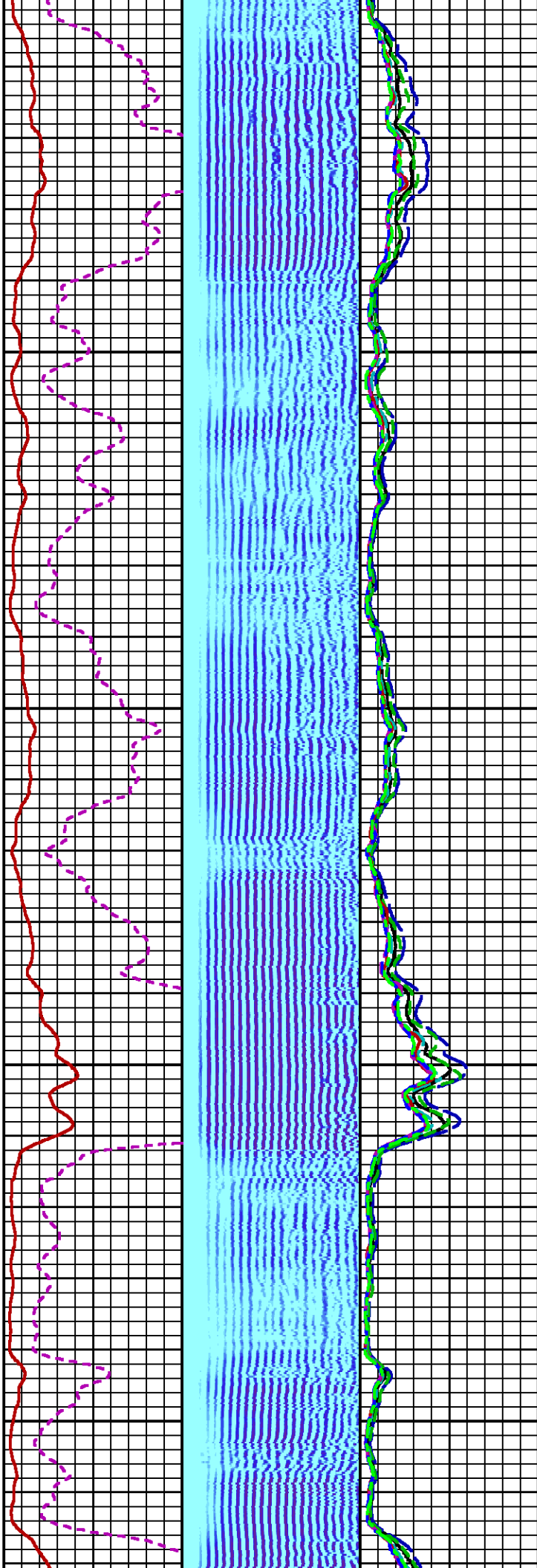
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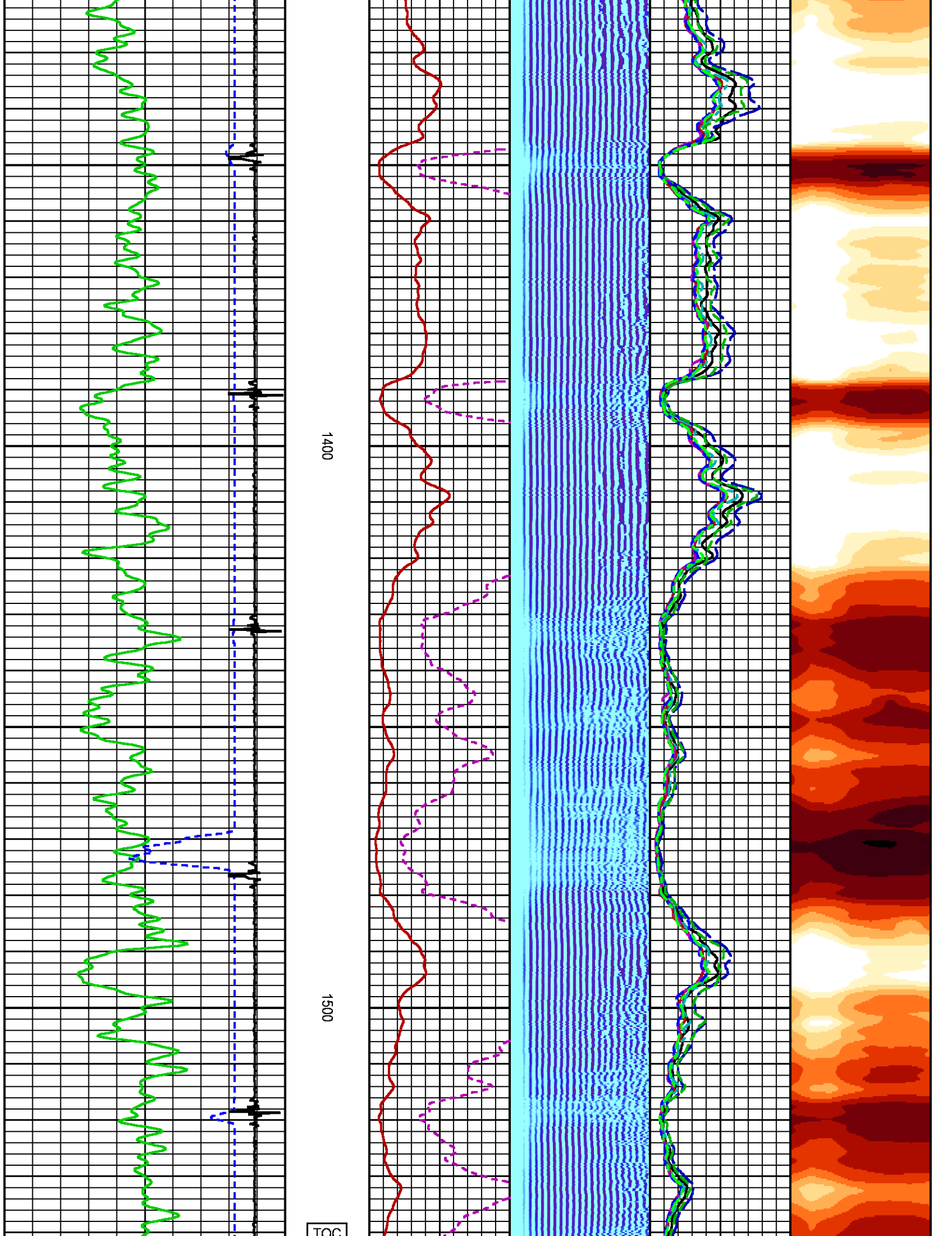


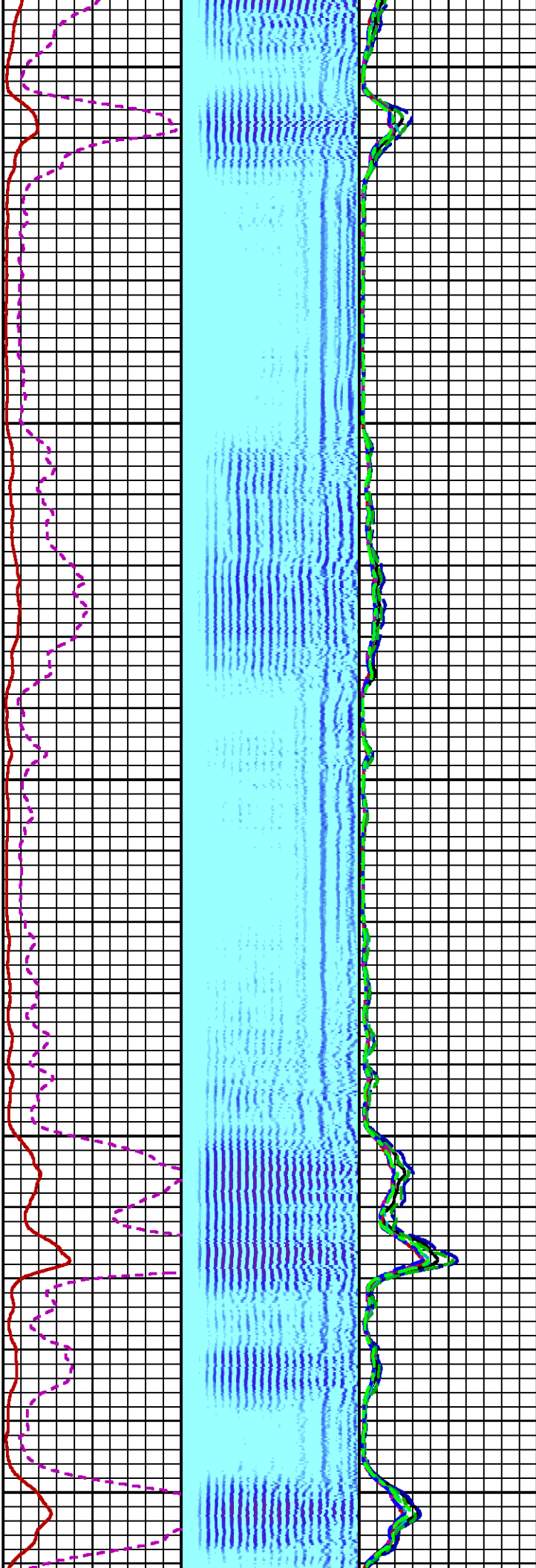






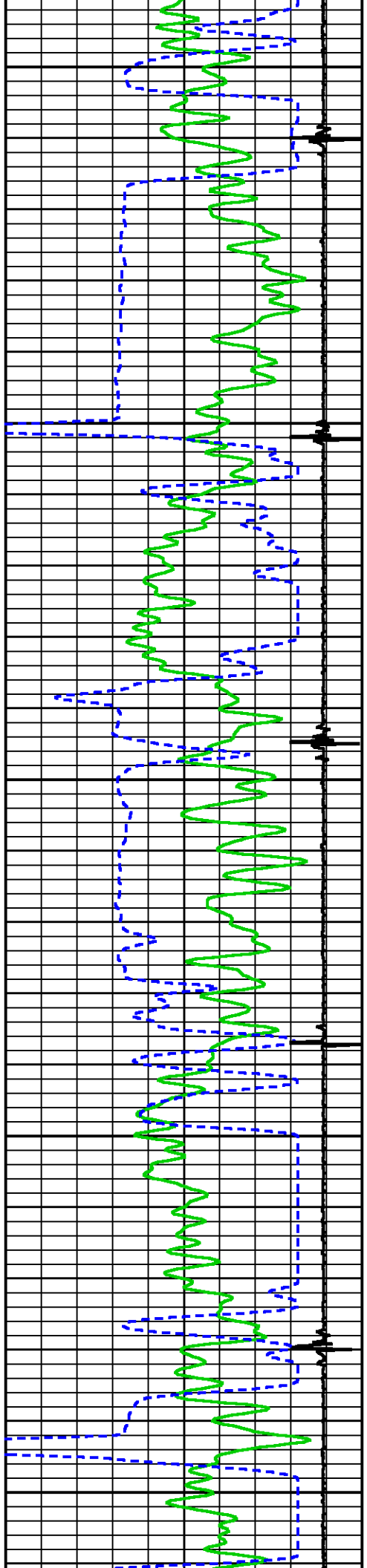


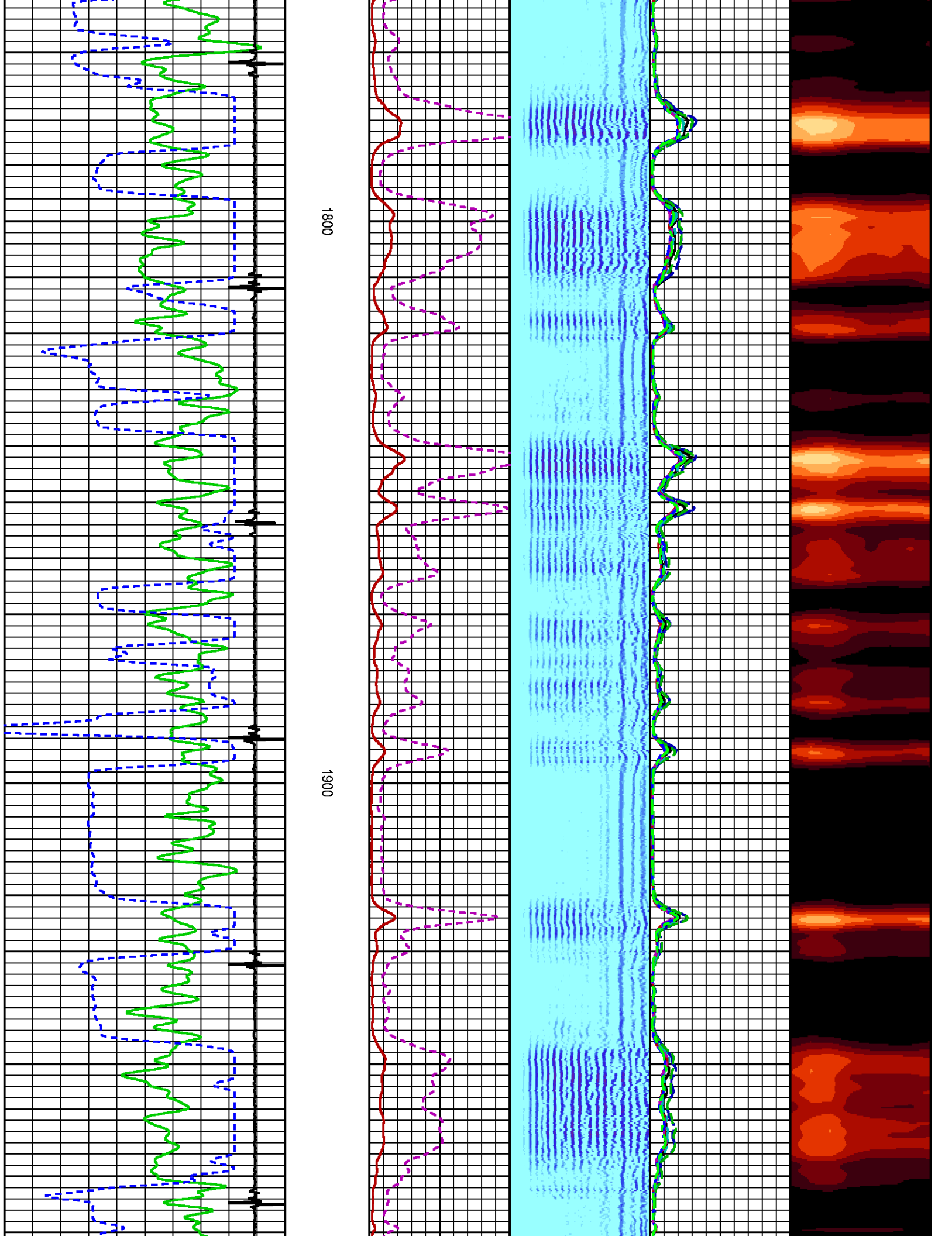


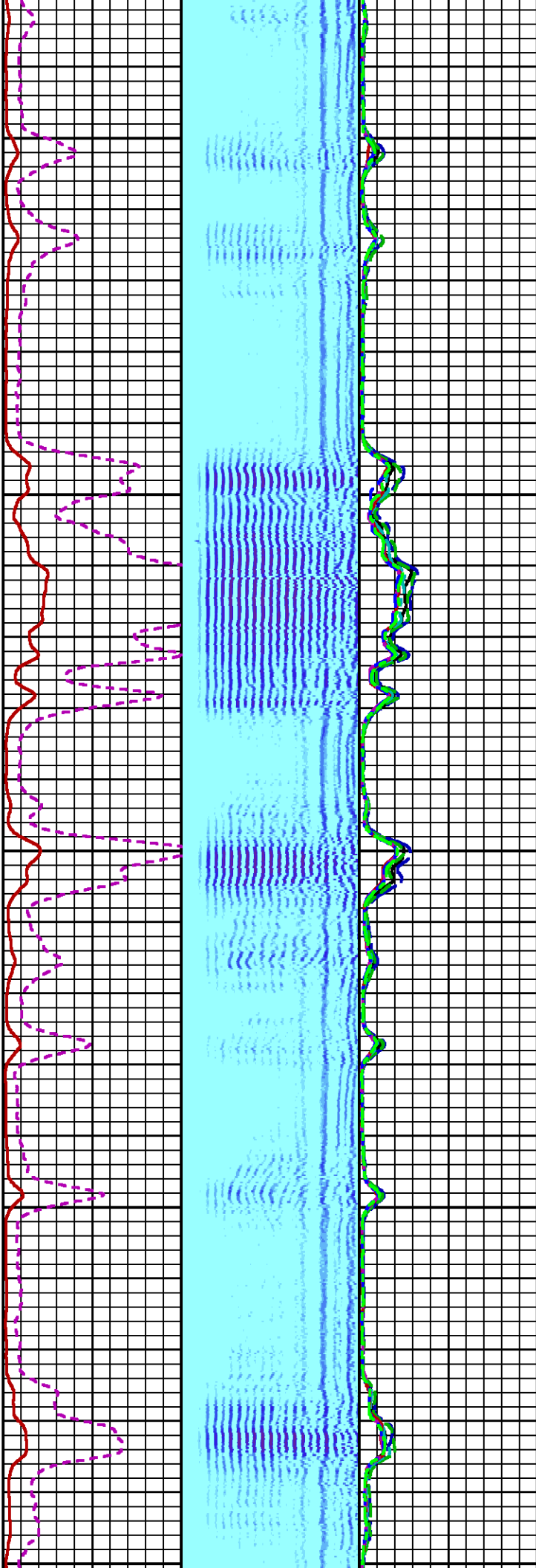
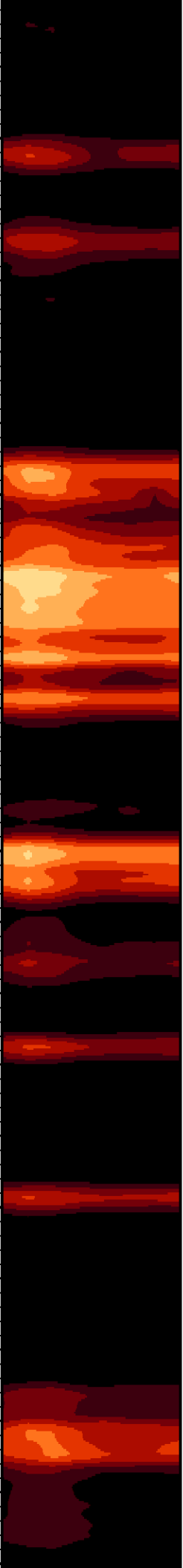


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1700



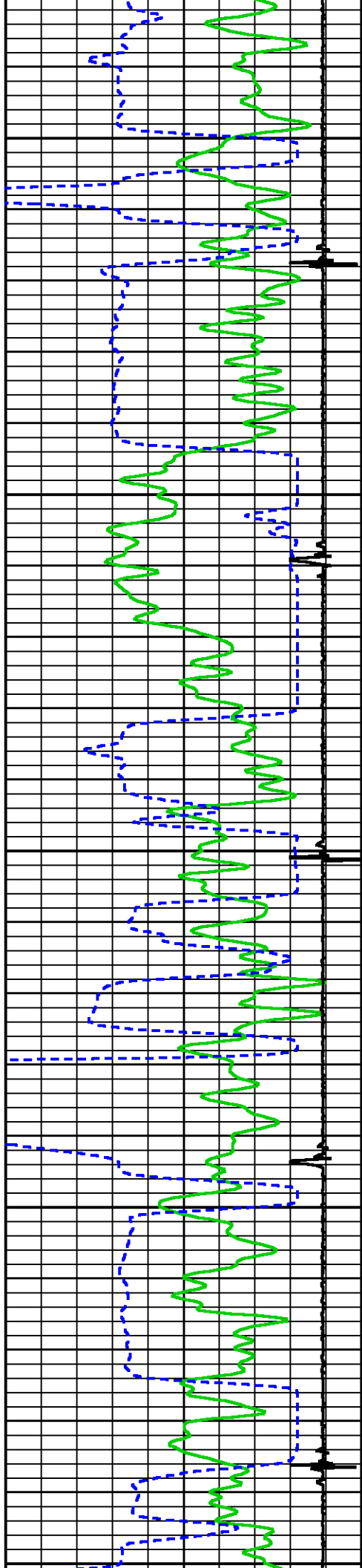


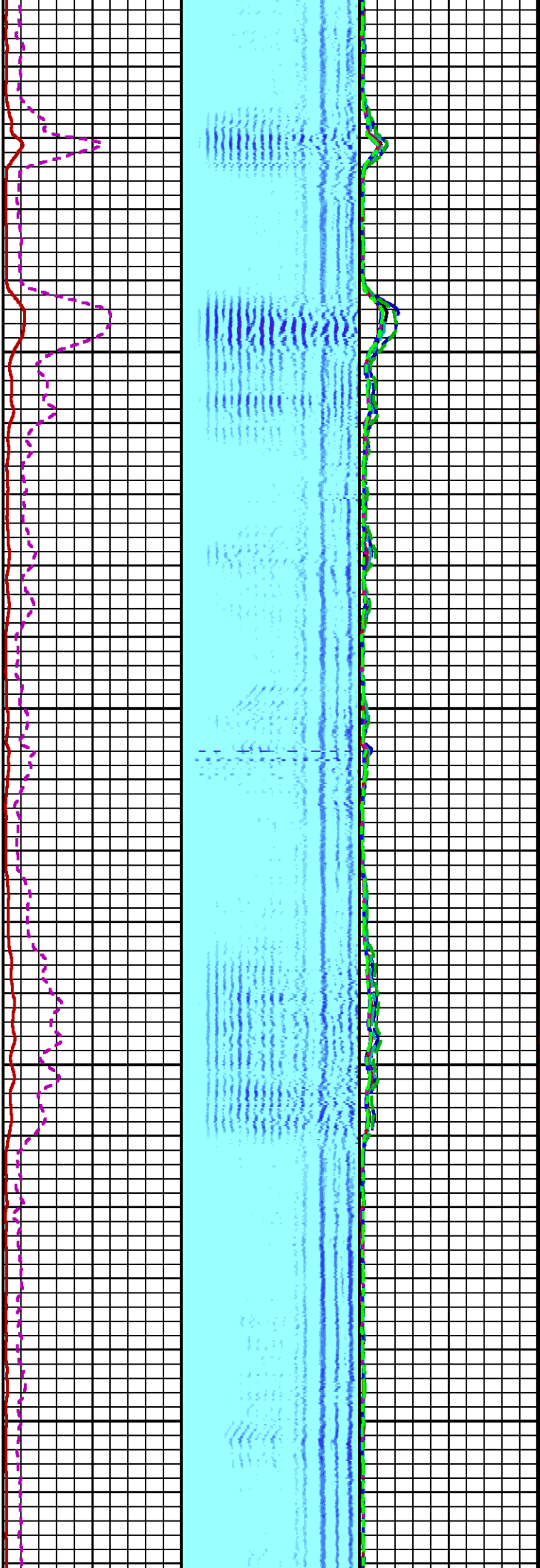


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2200

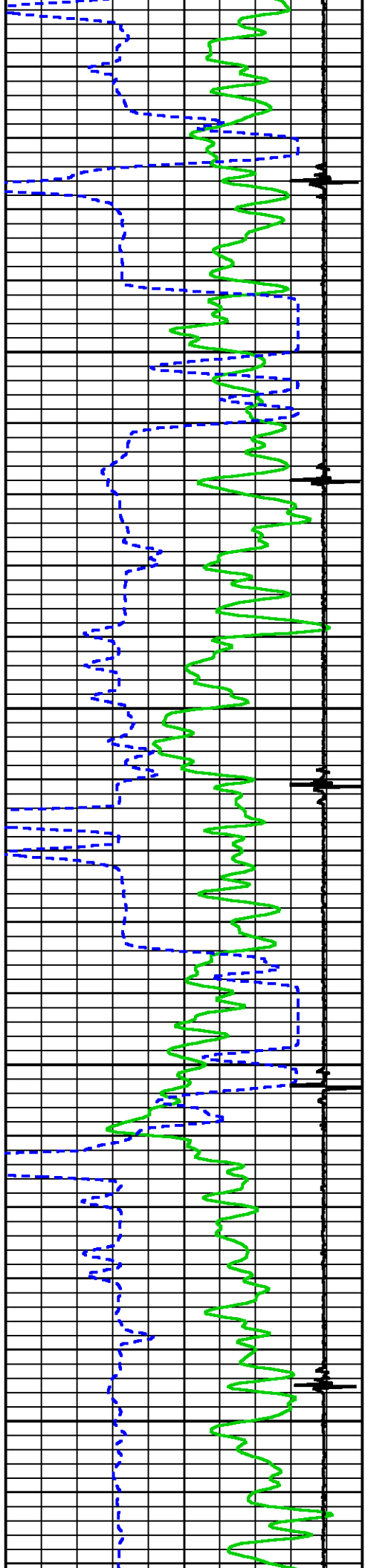


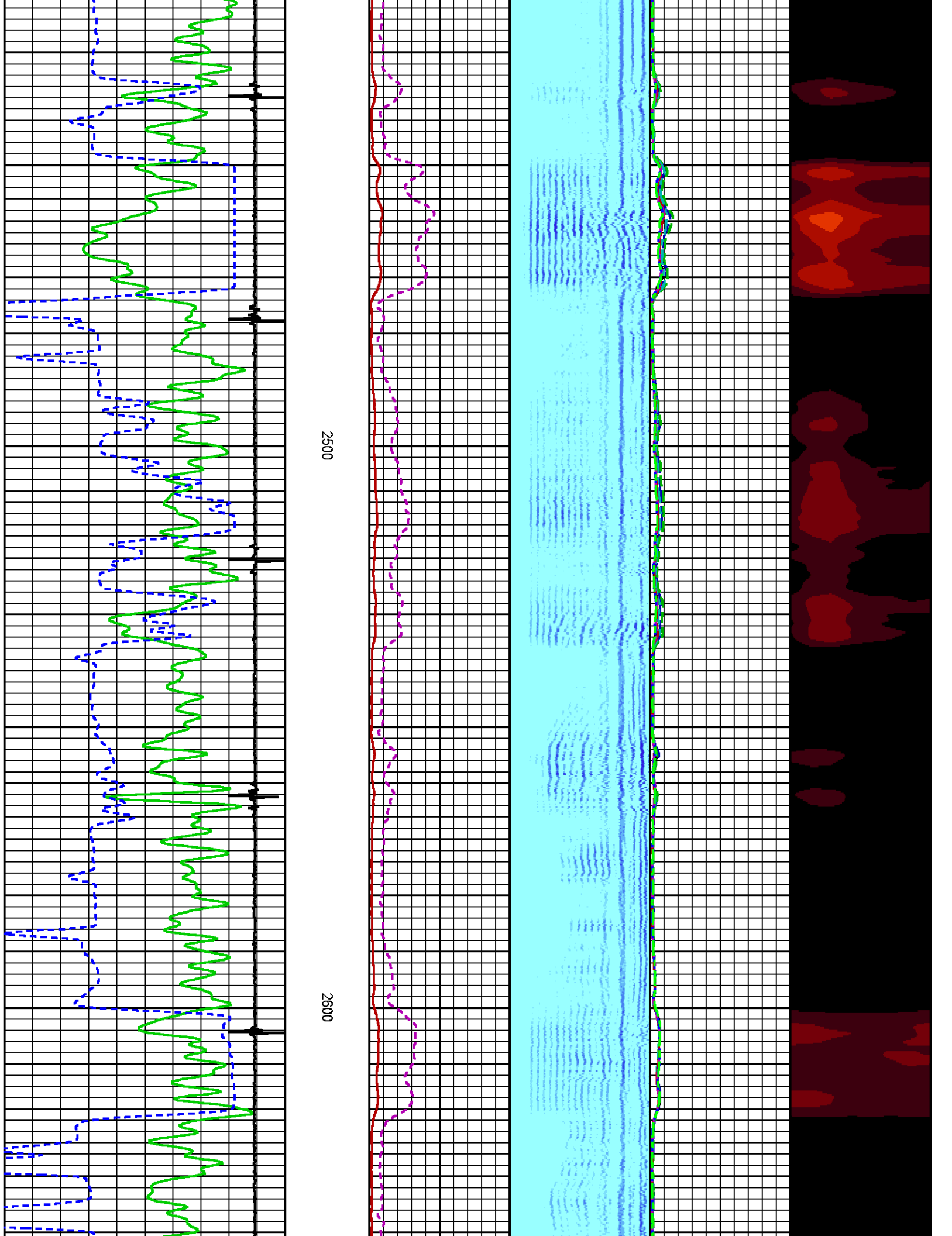


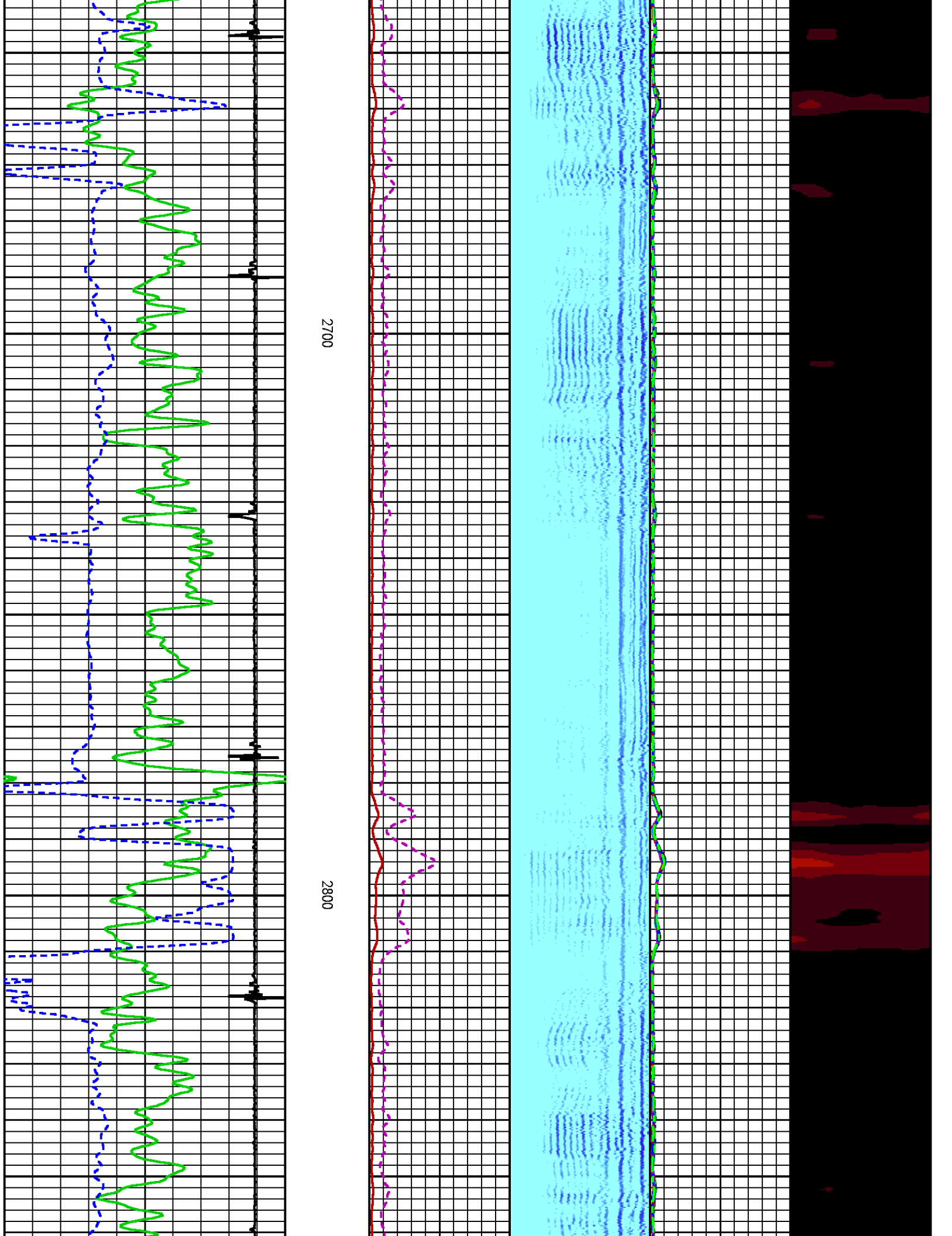
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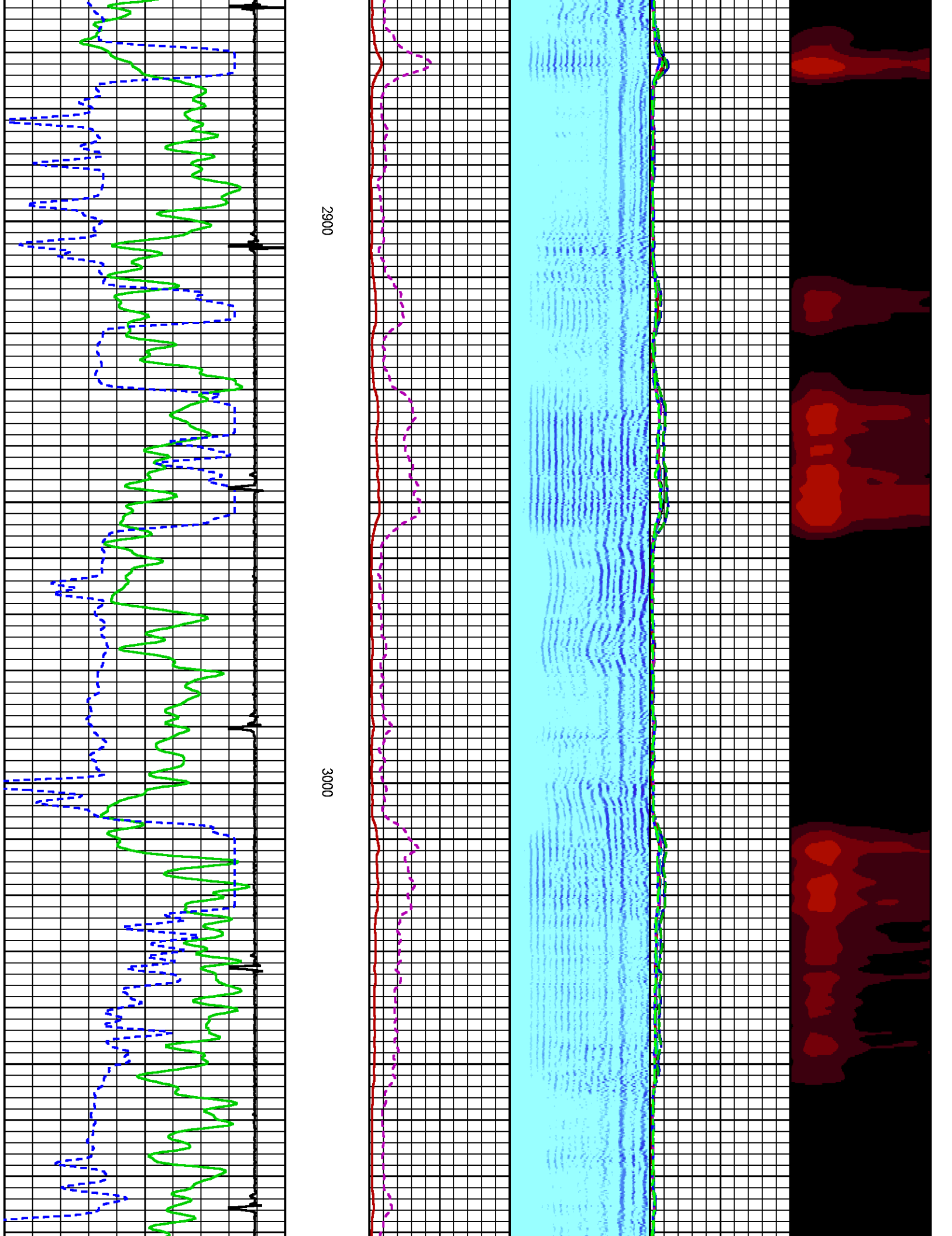
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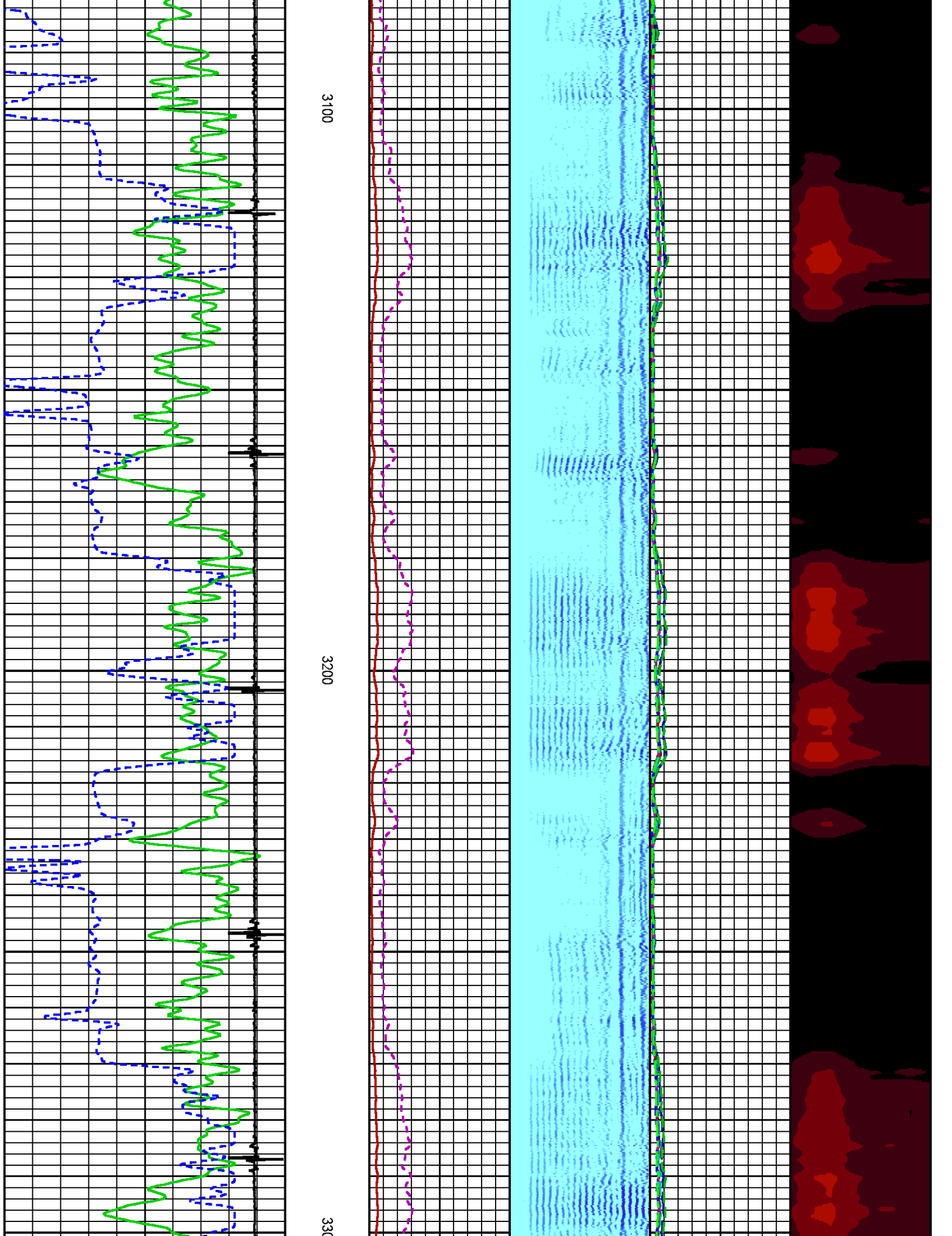
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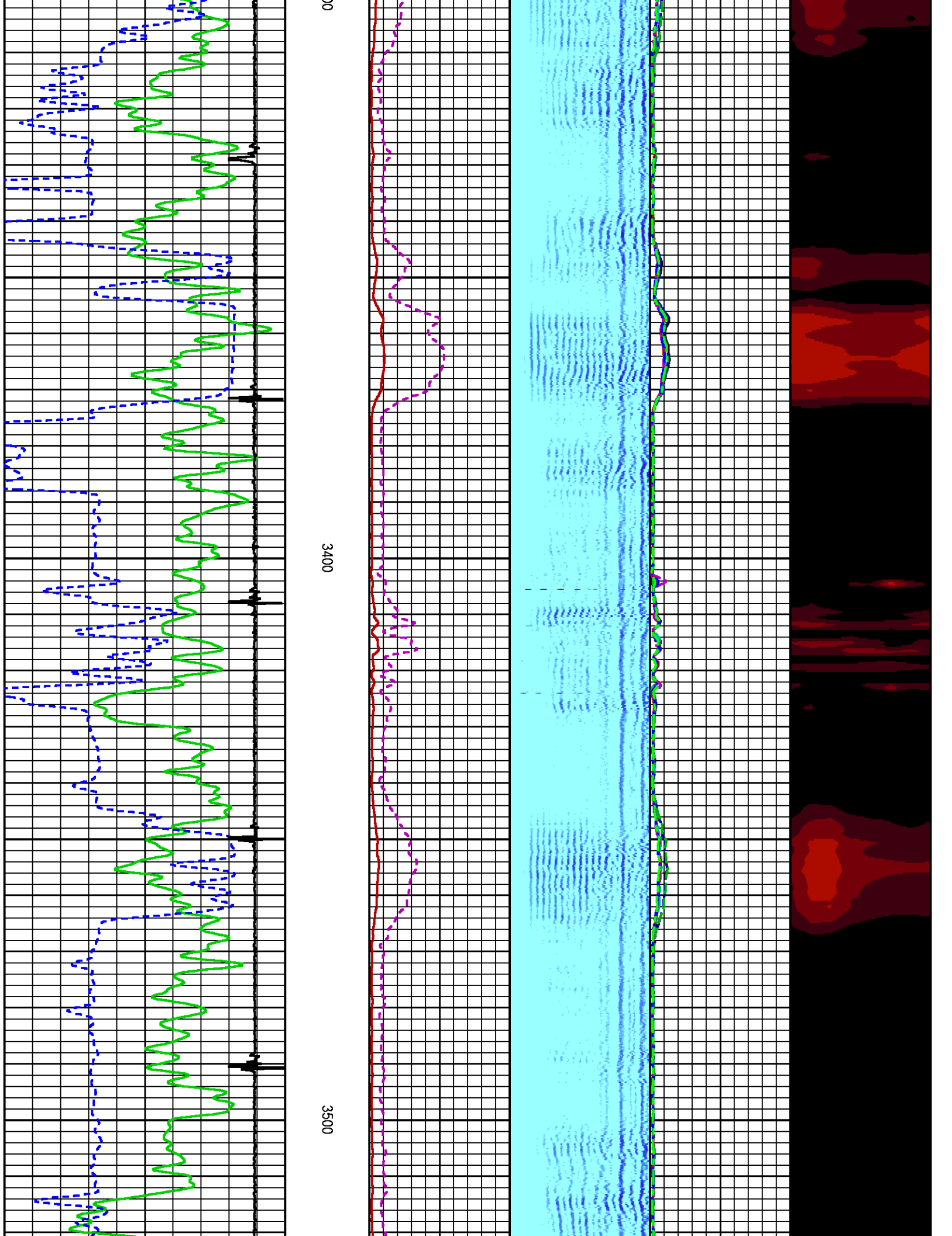


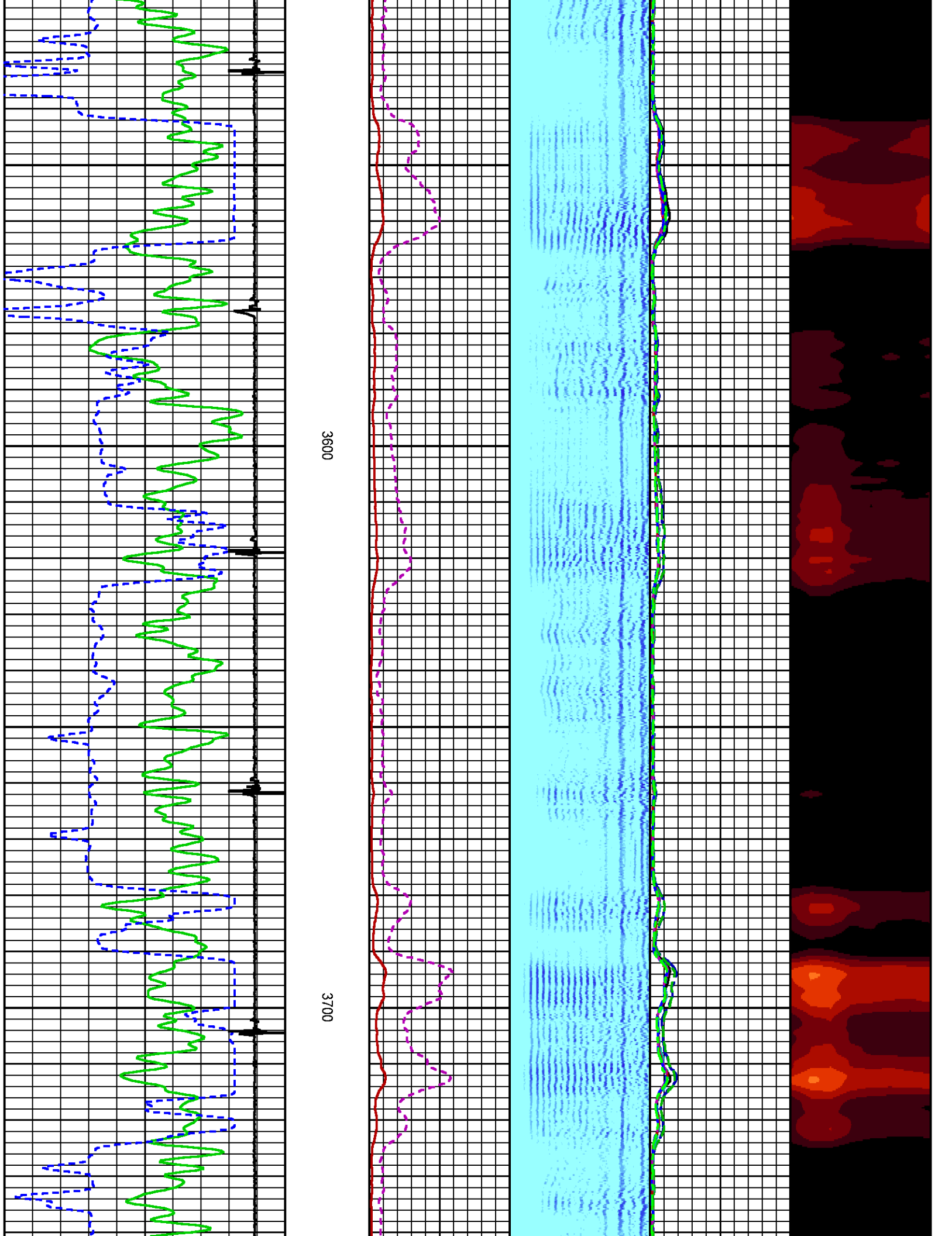


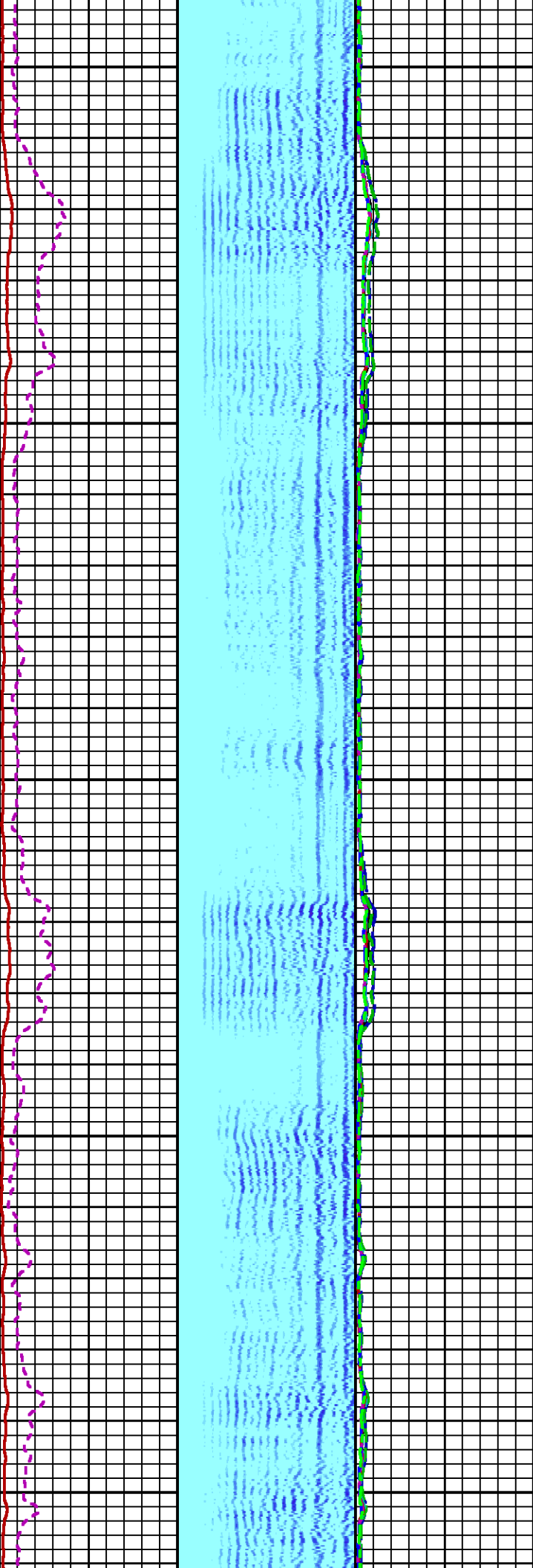






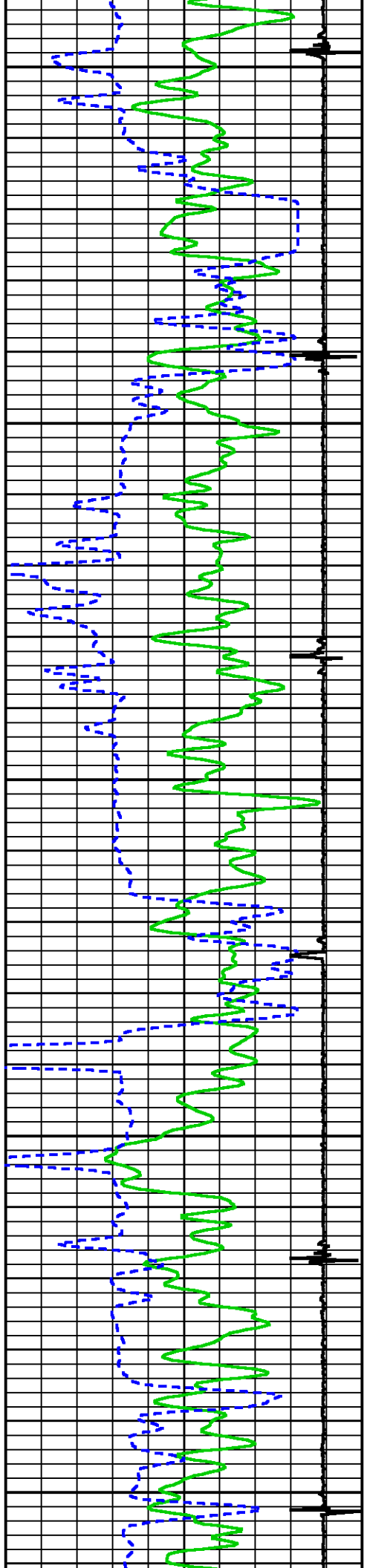


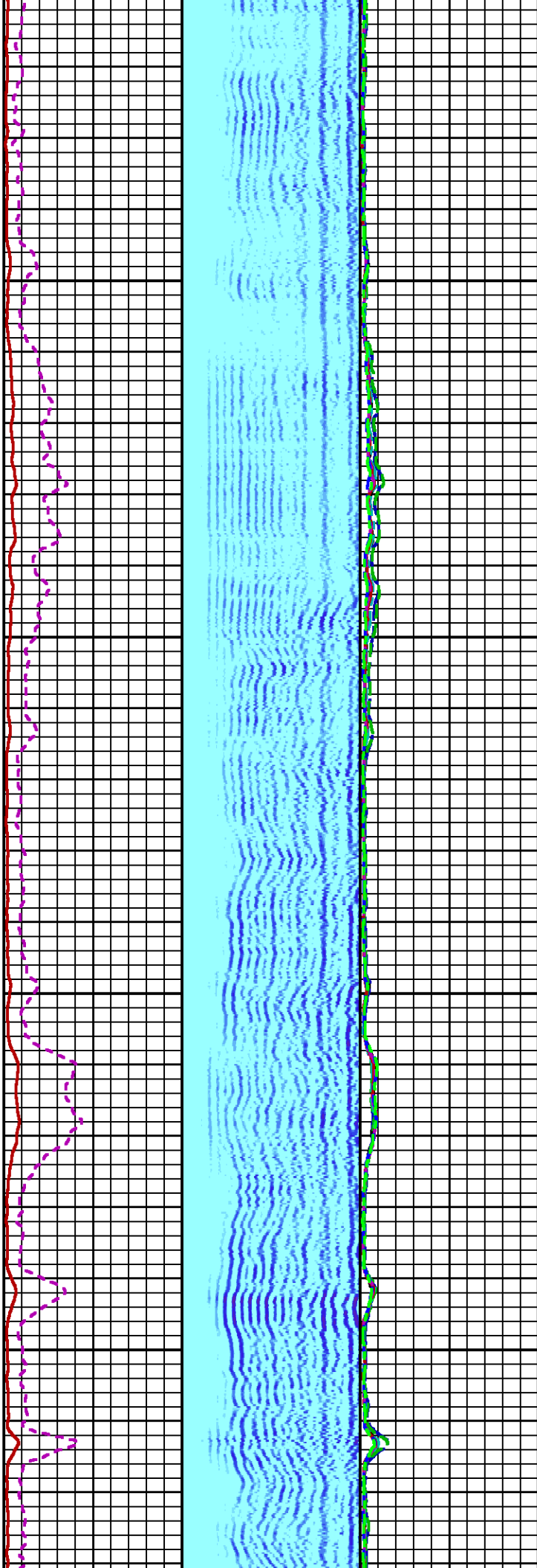




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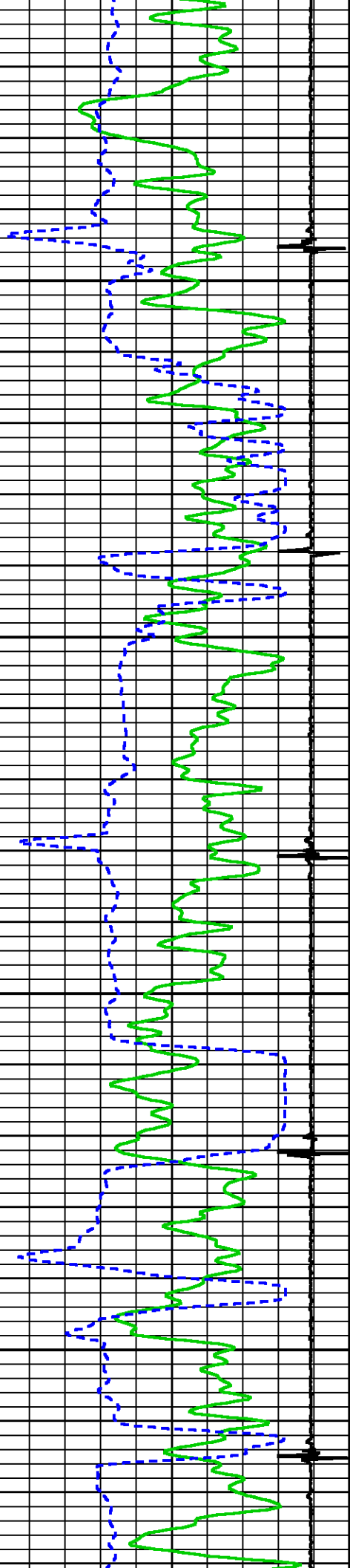
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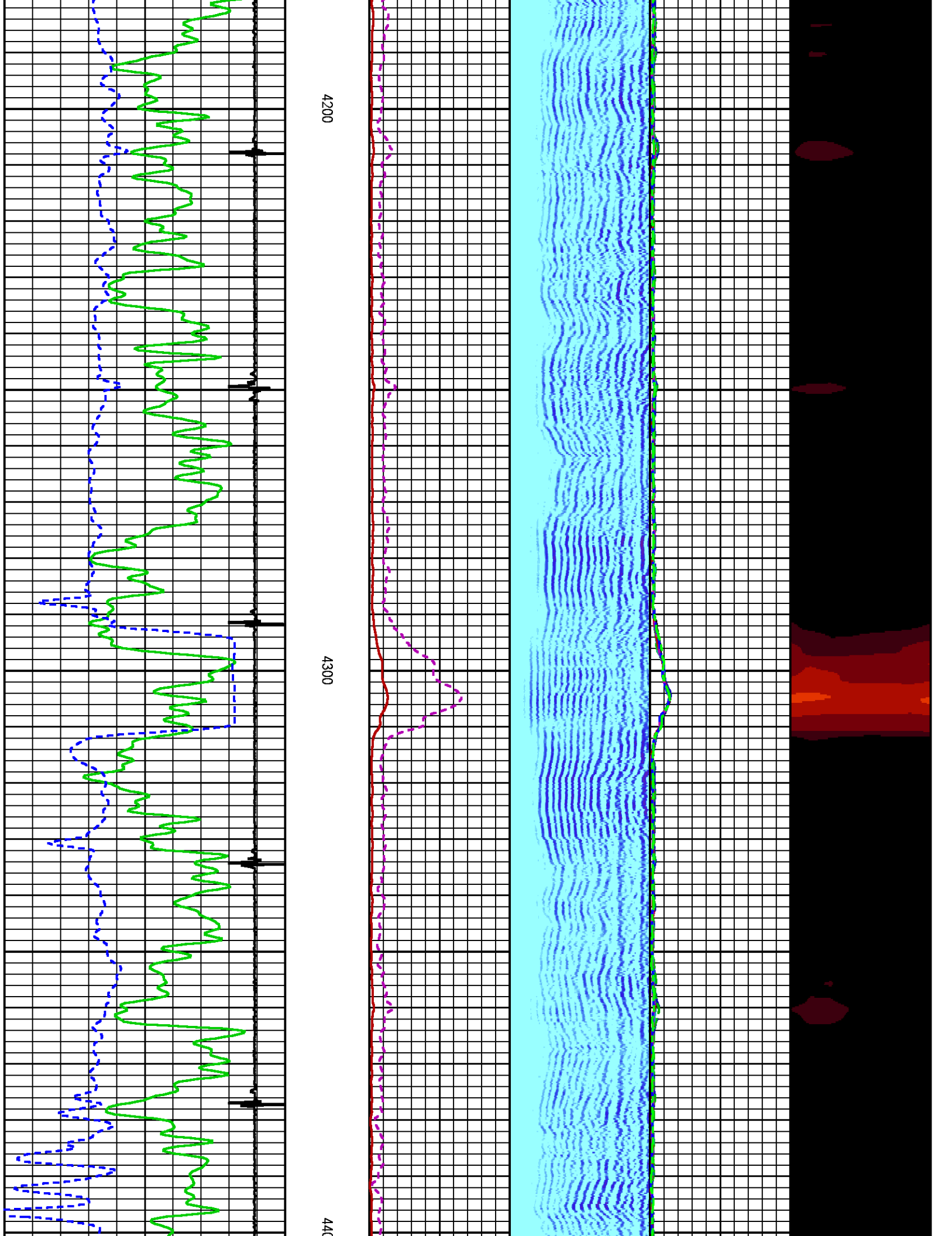


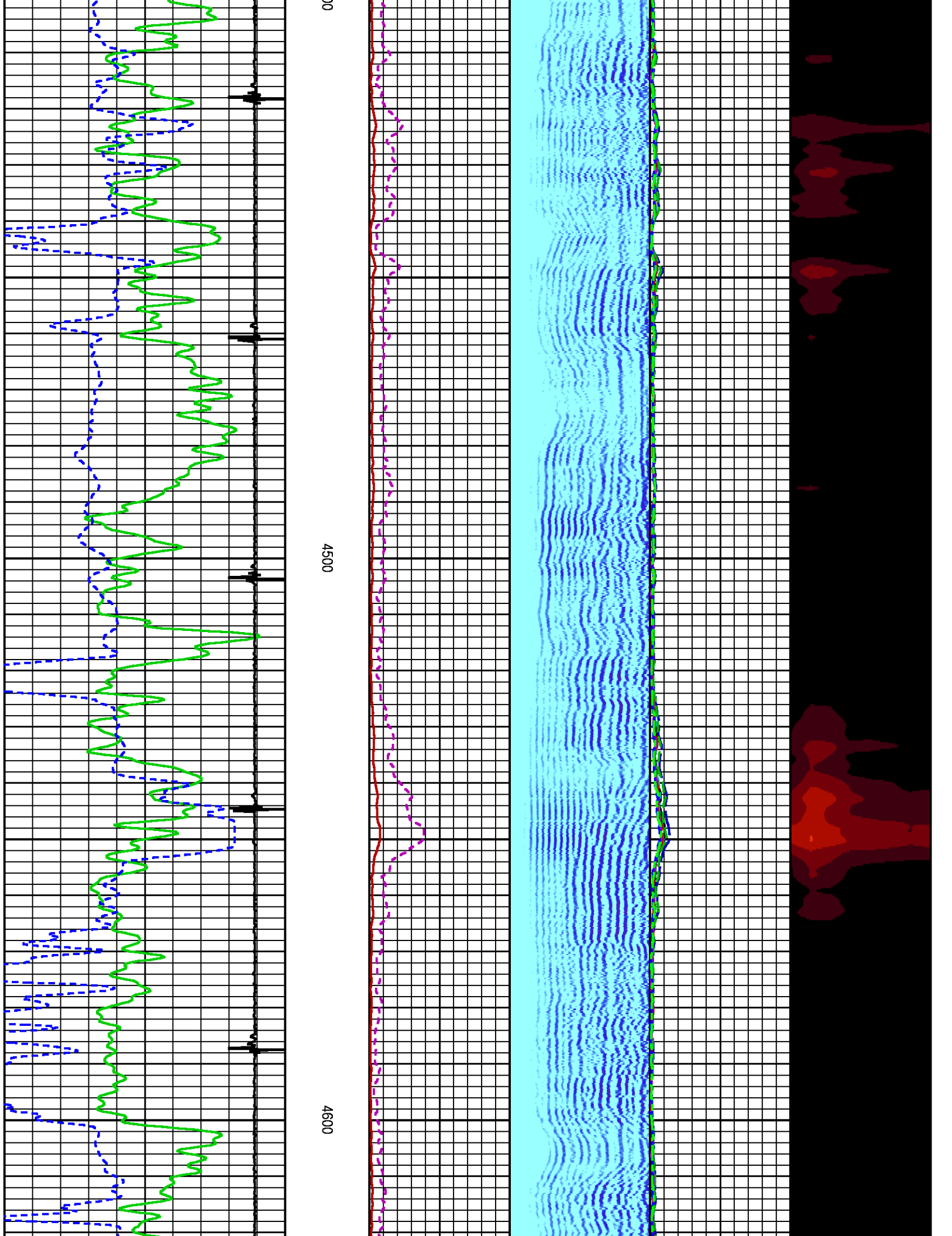


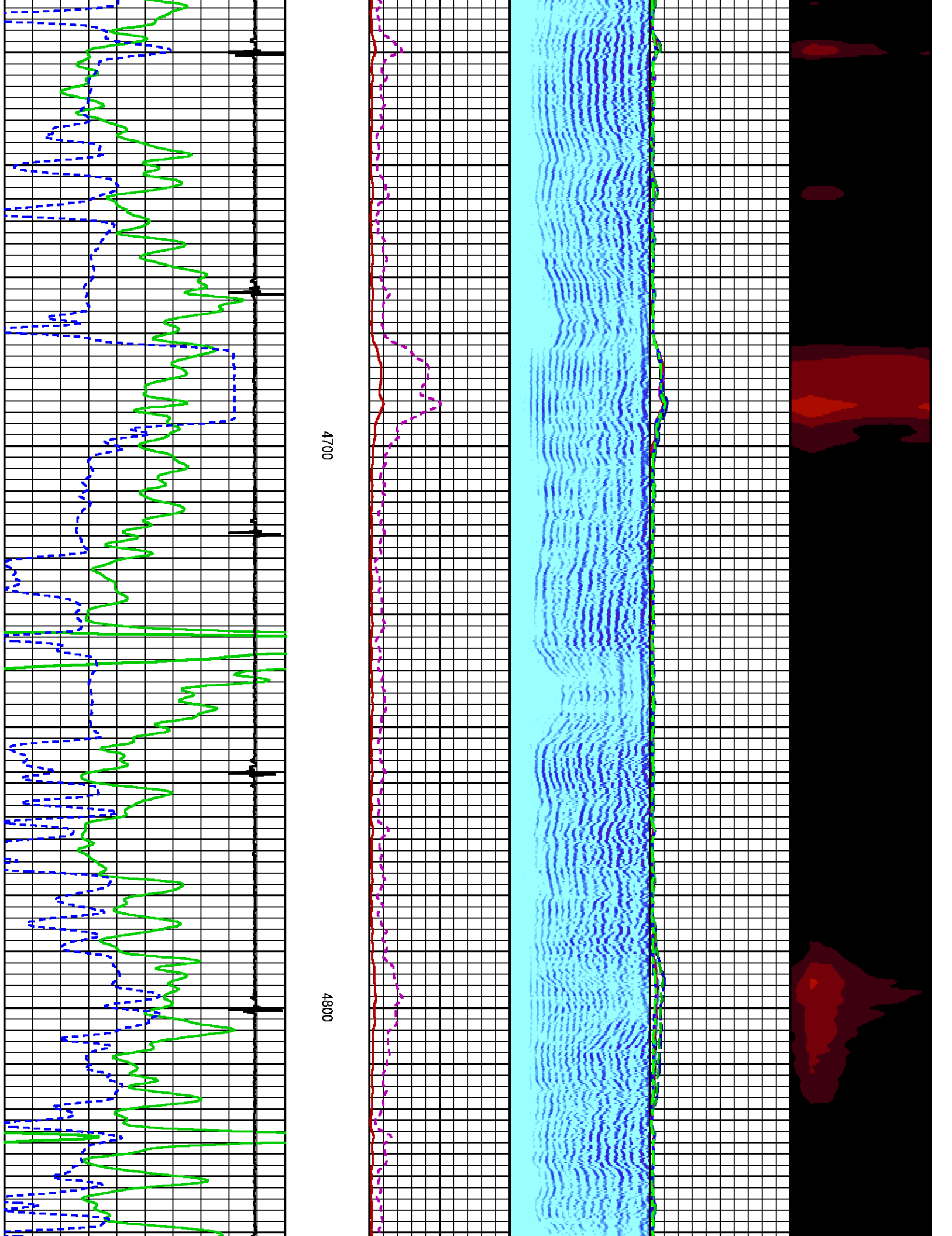
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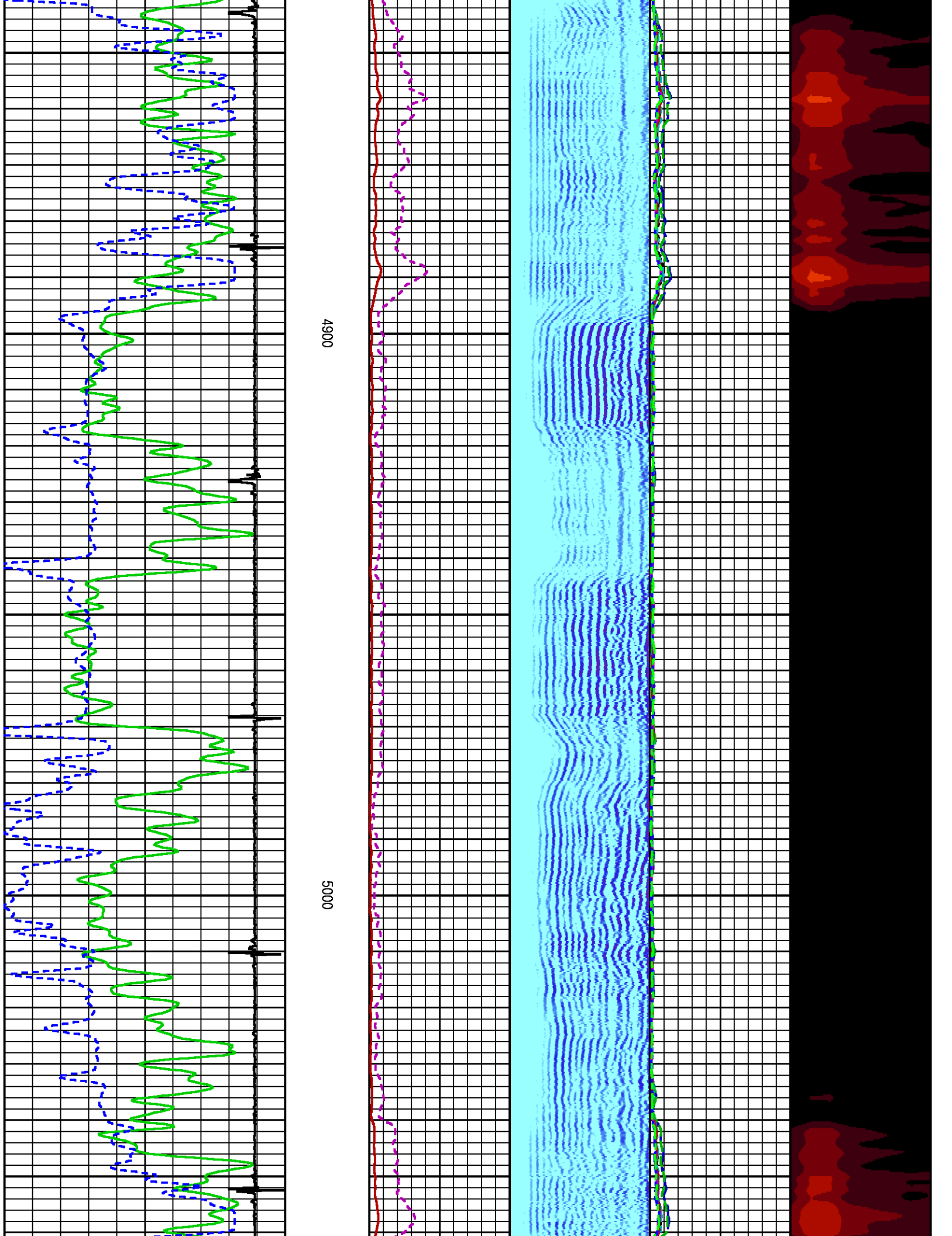
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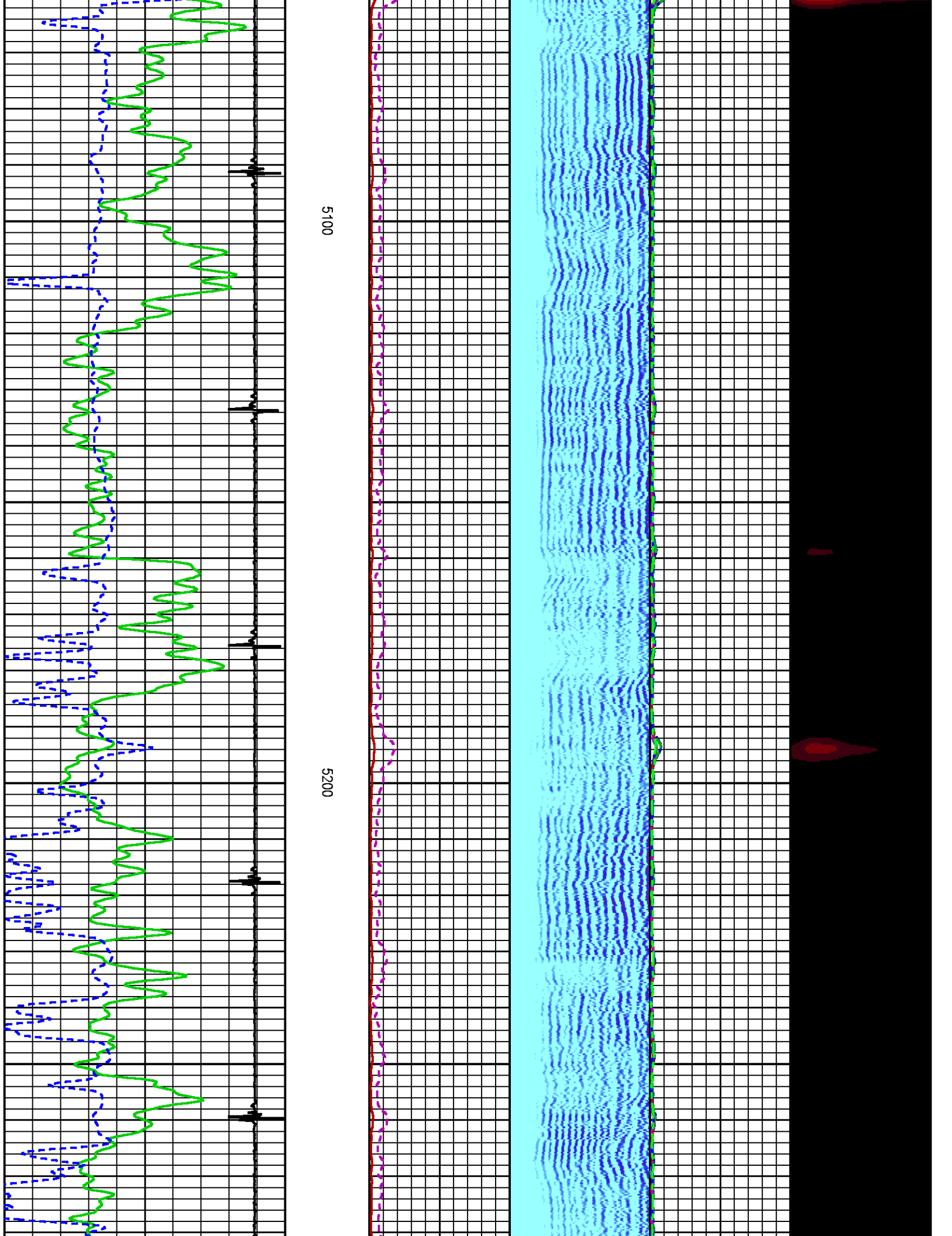


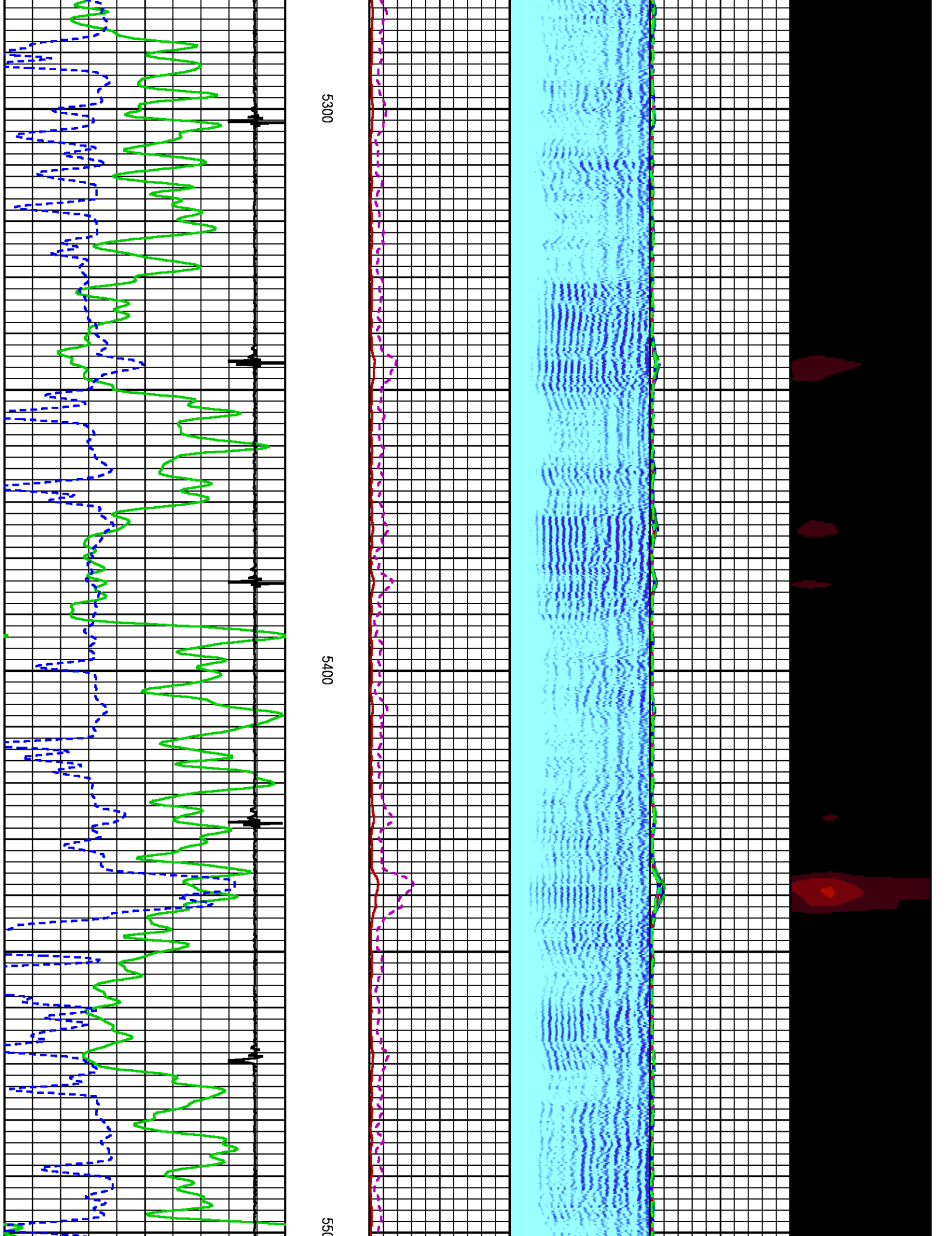


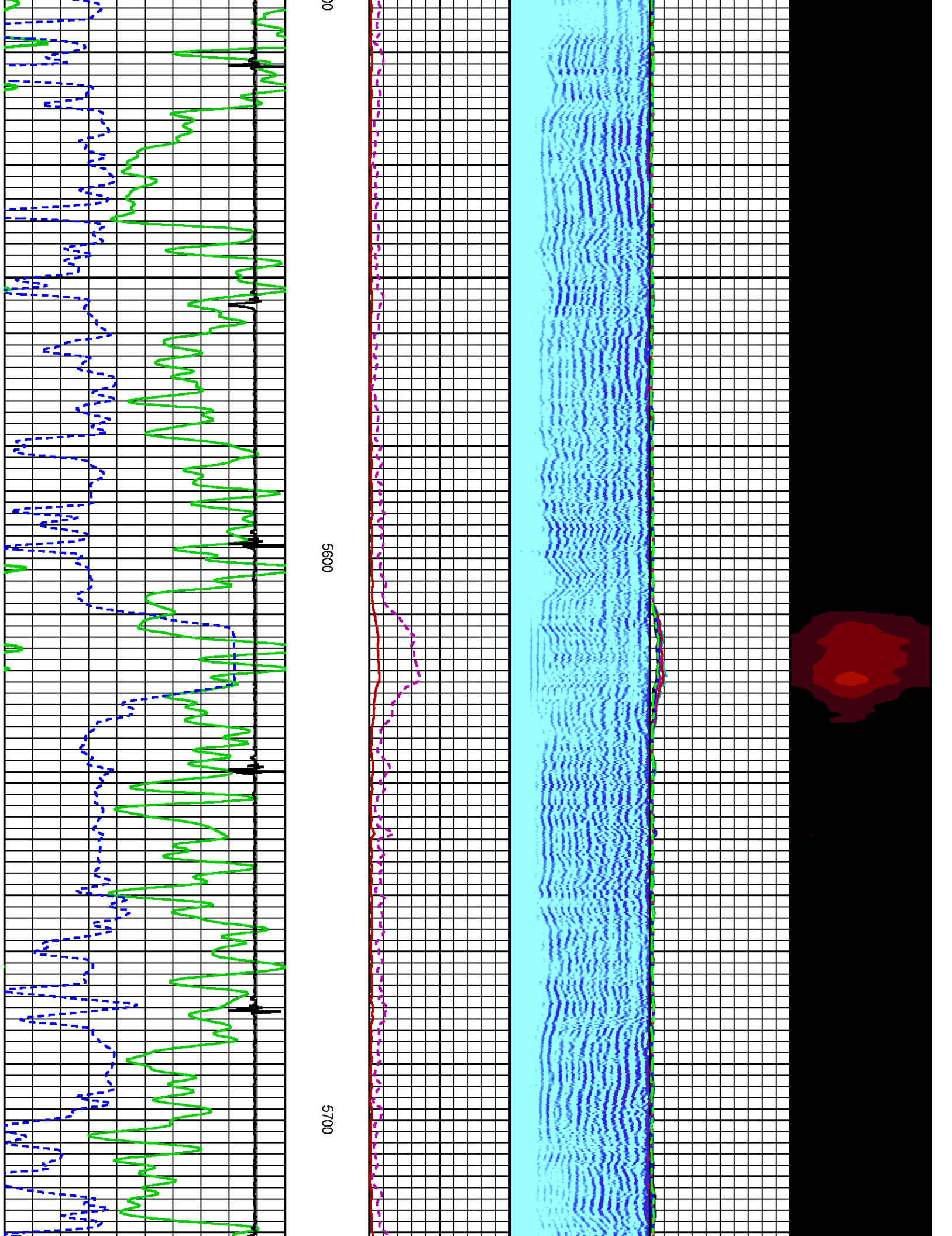


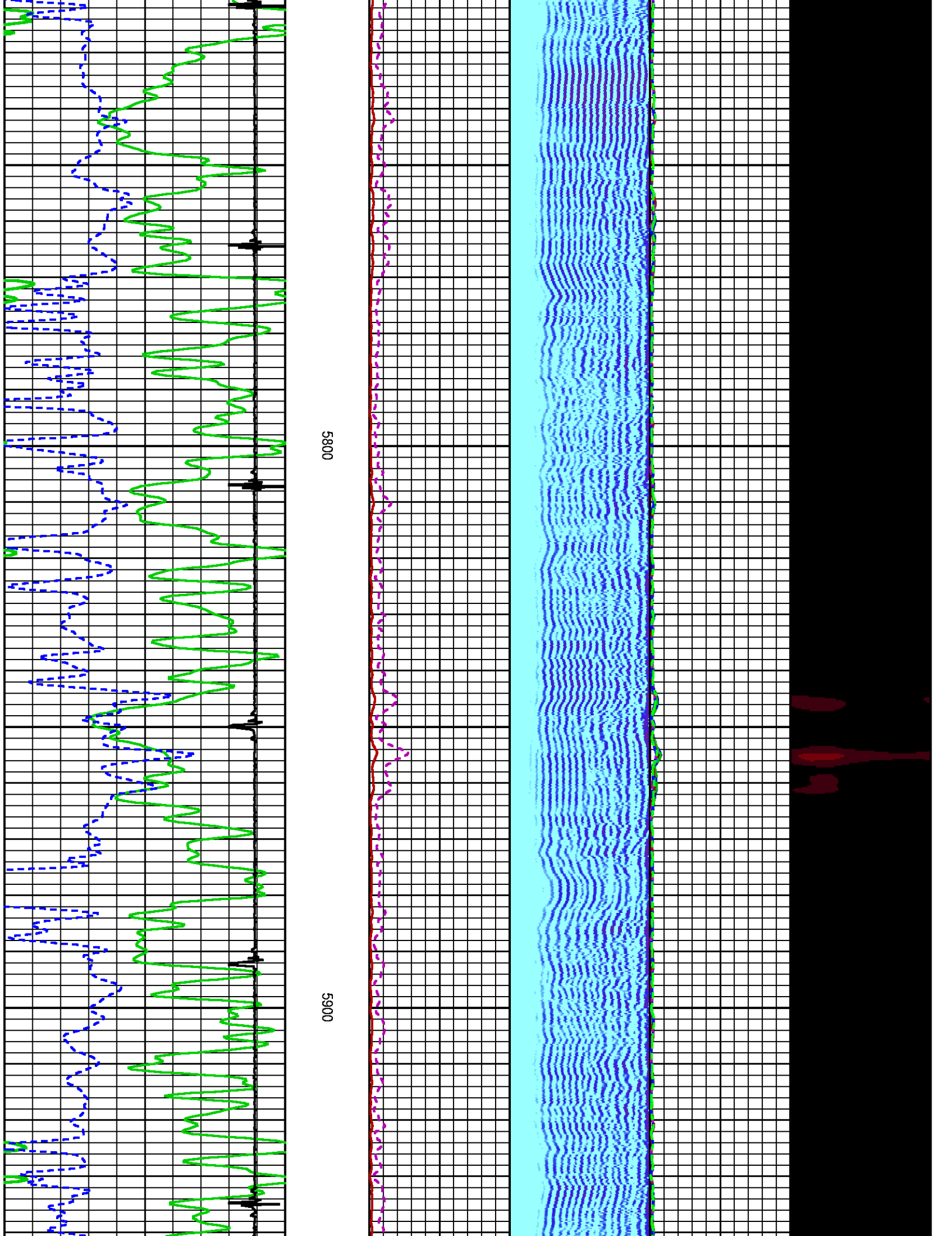


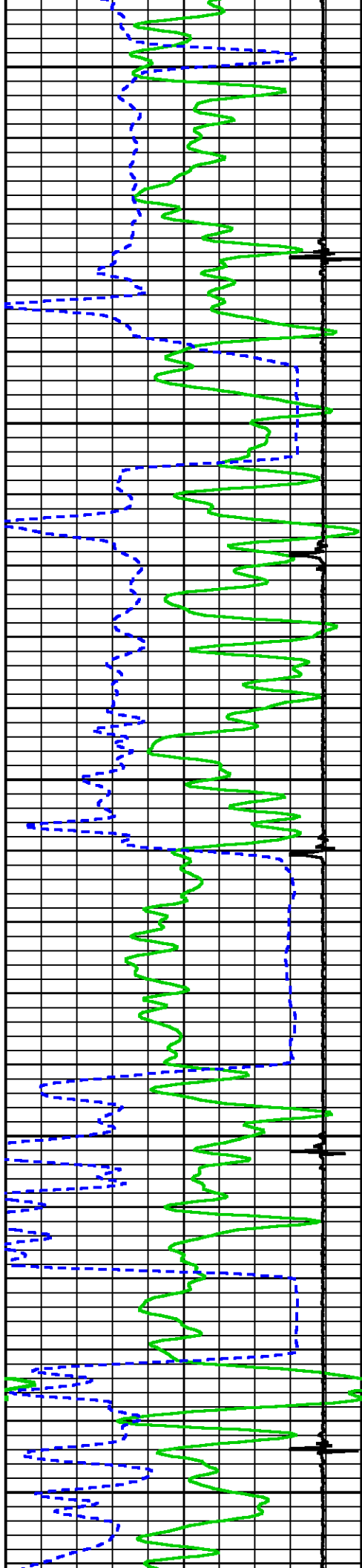






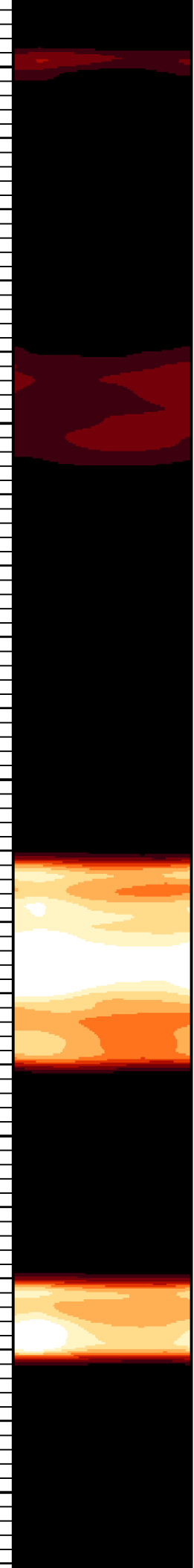
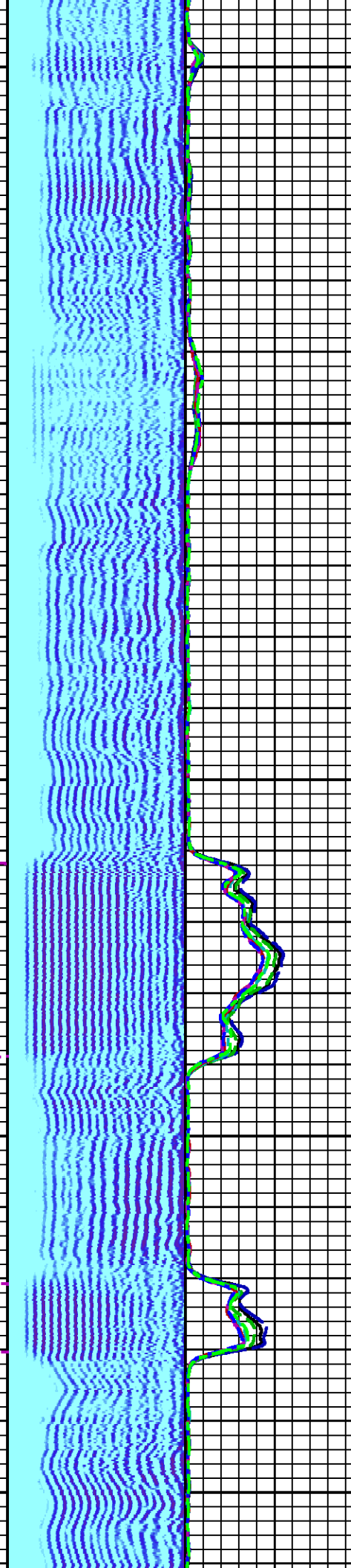
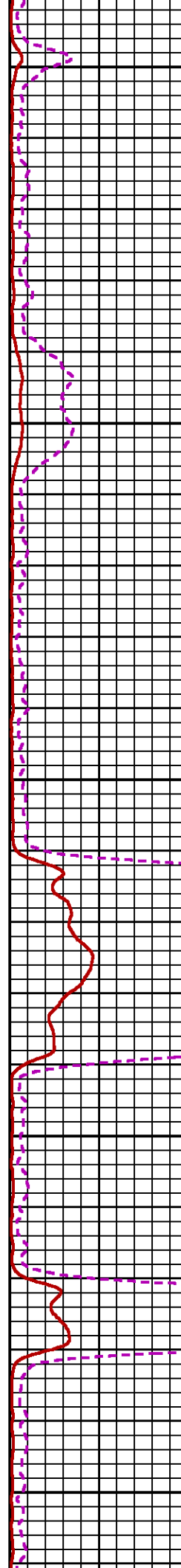


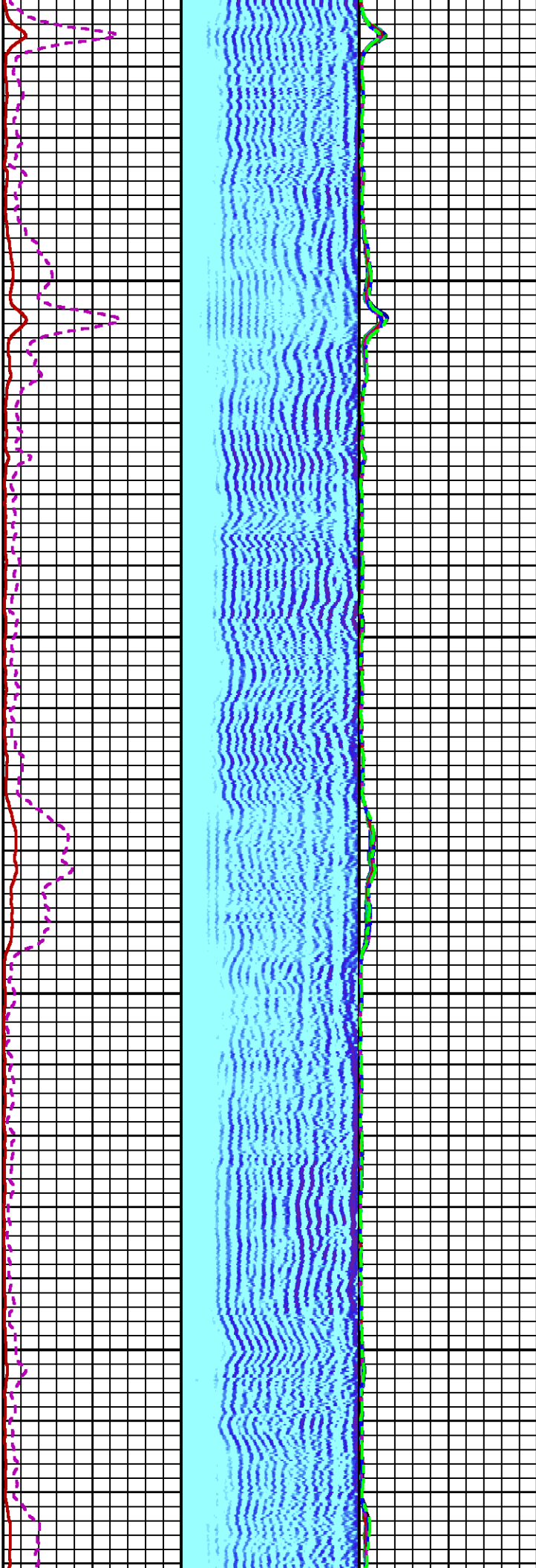




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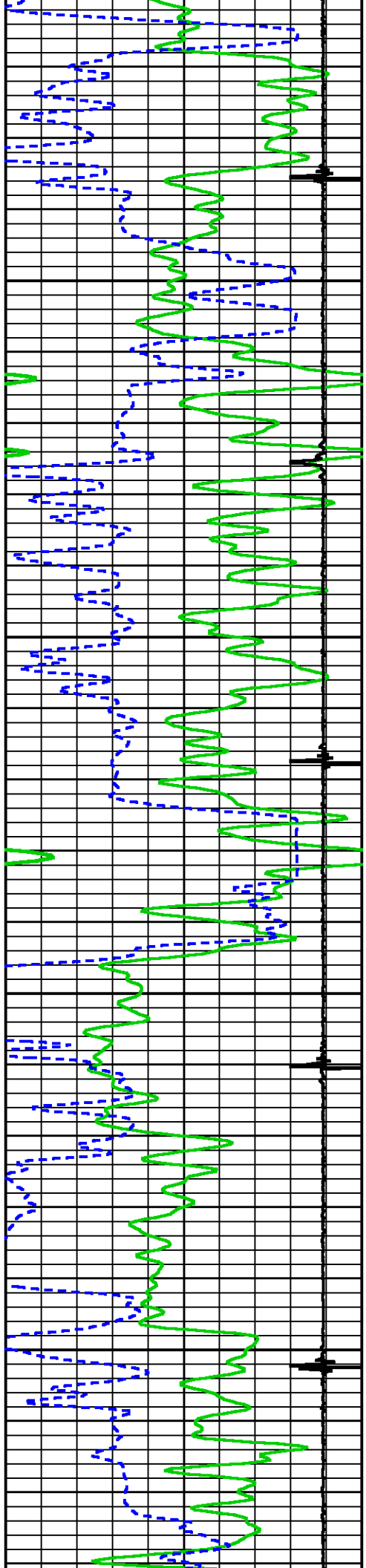
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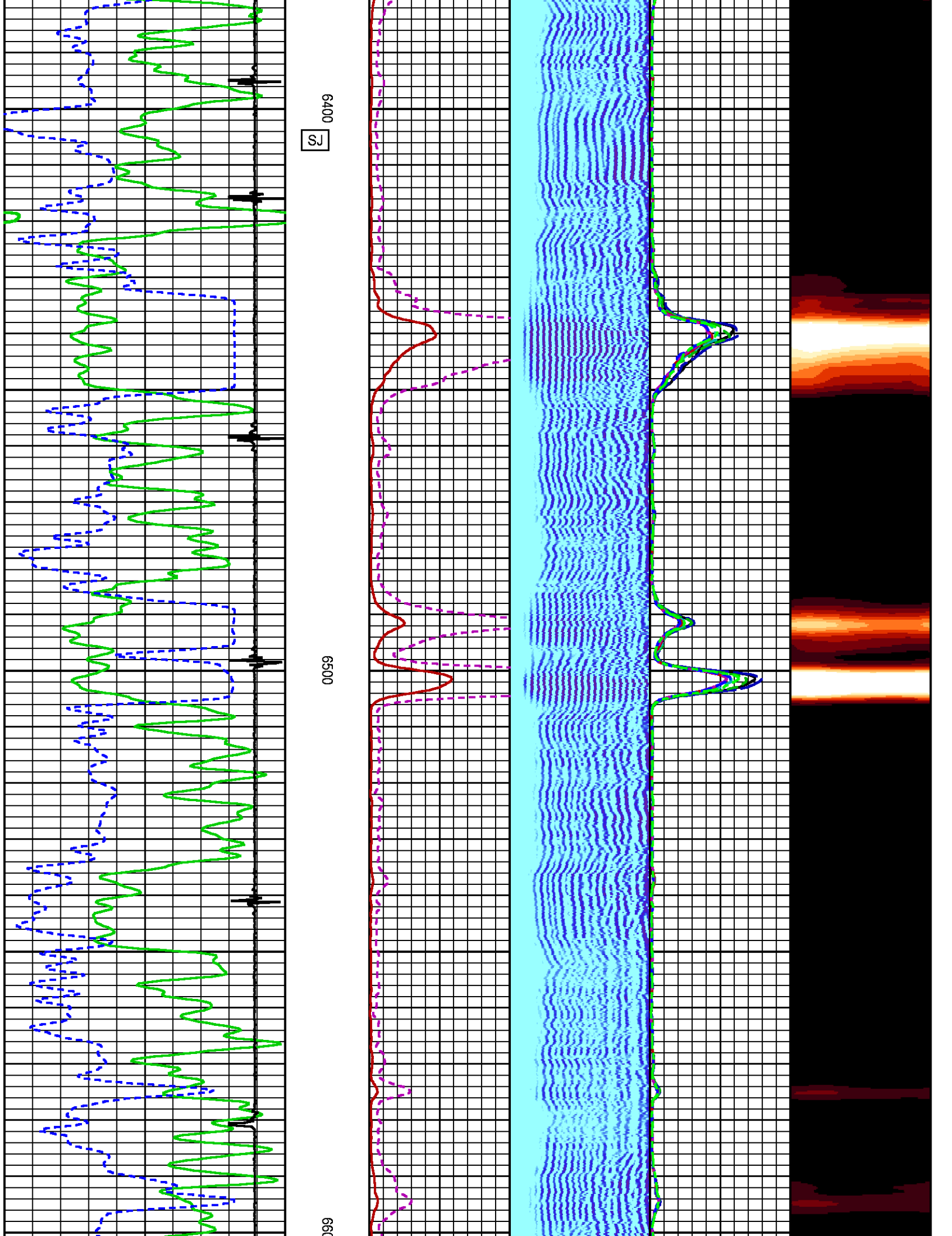


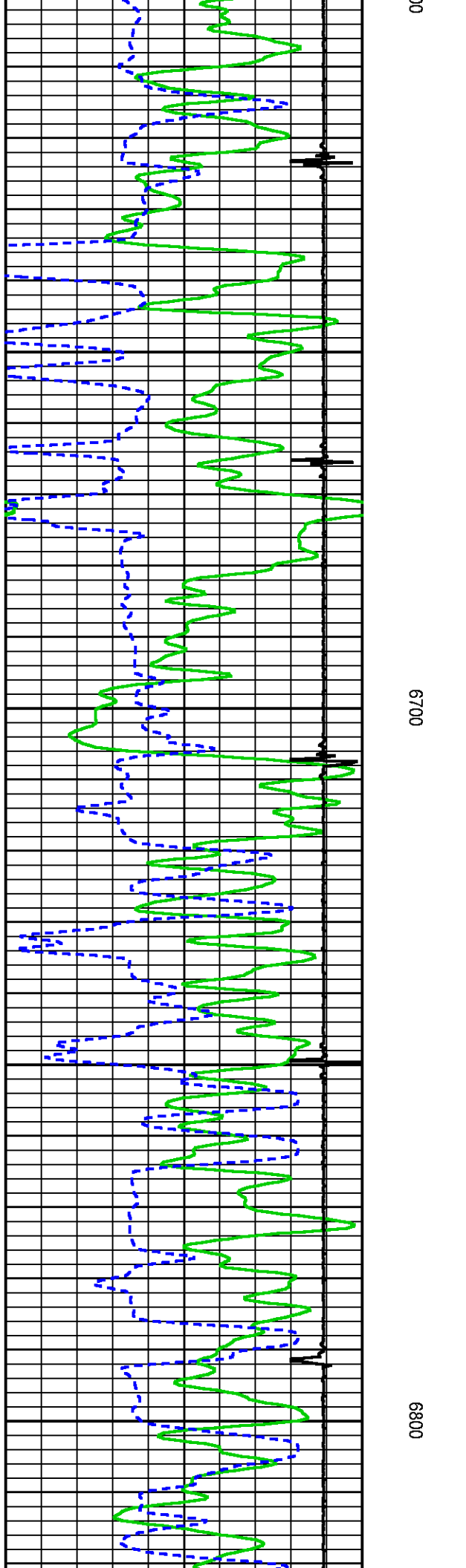
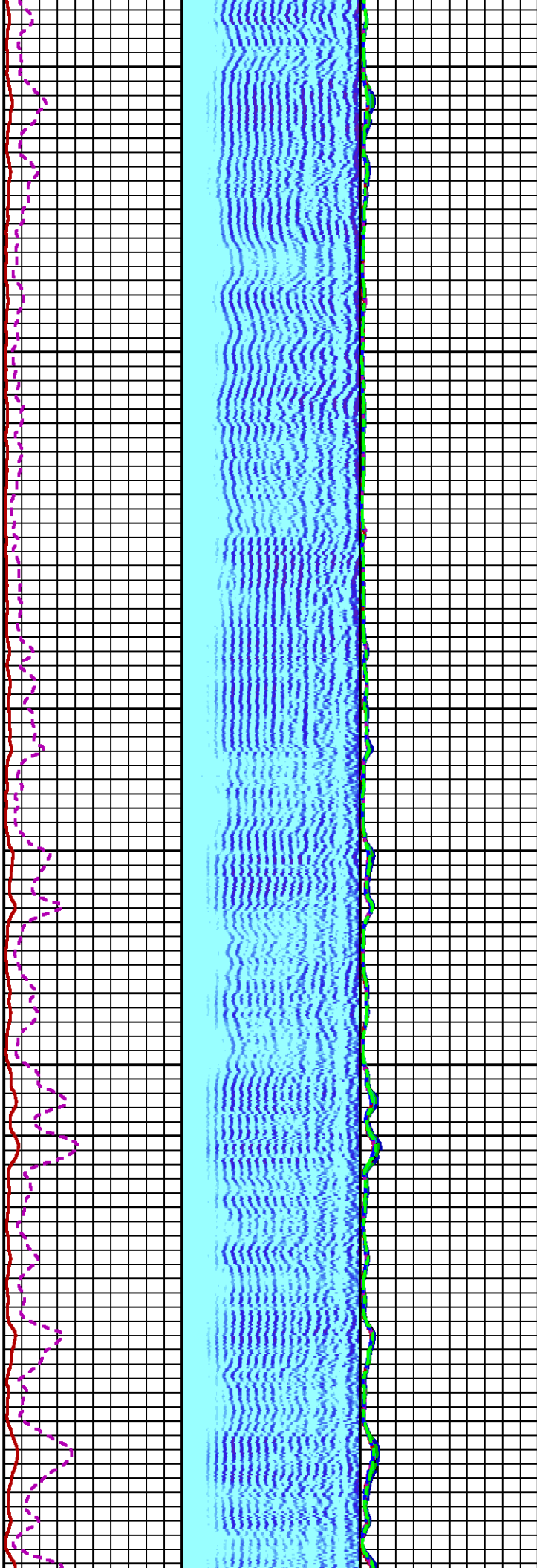


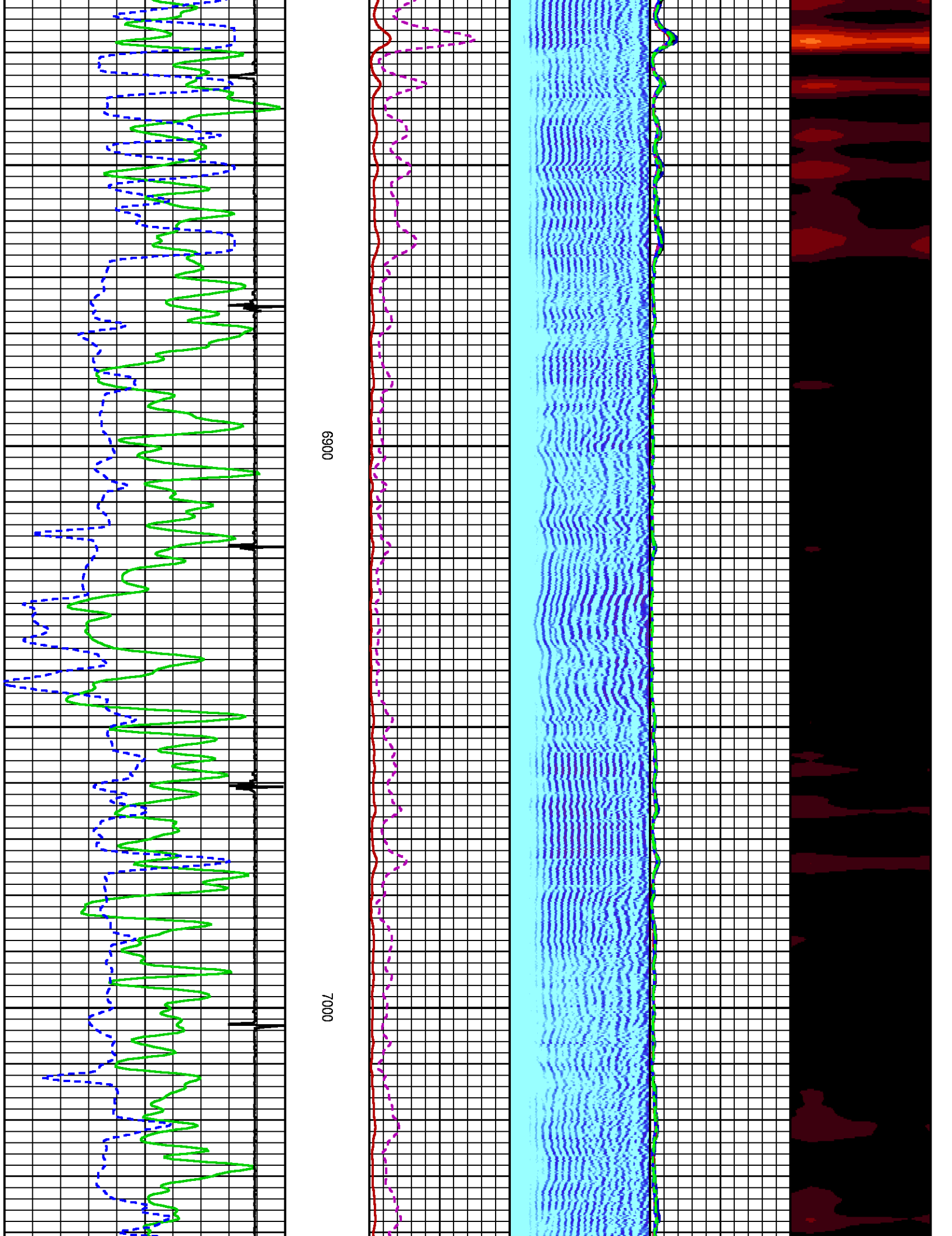
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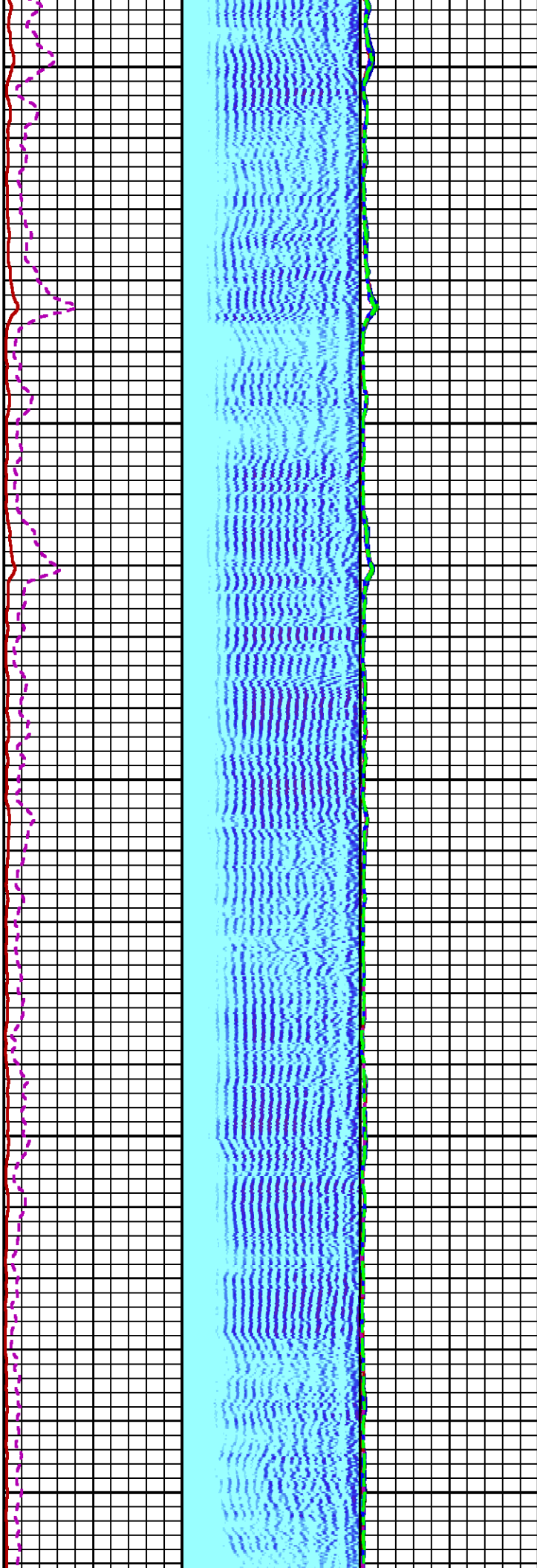
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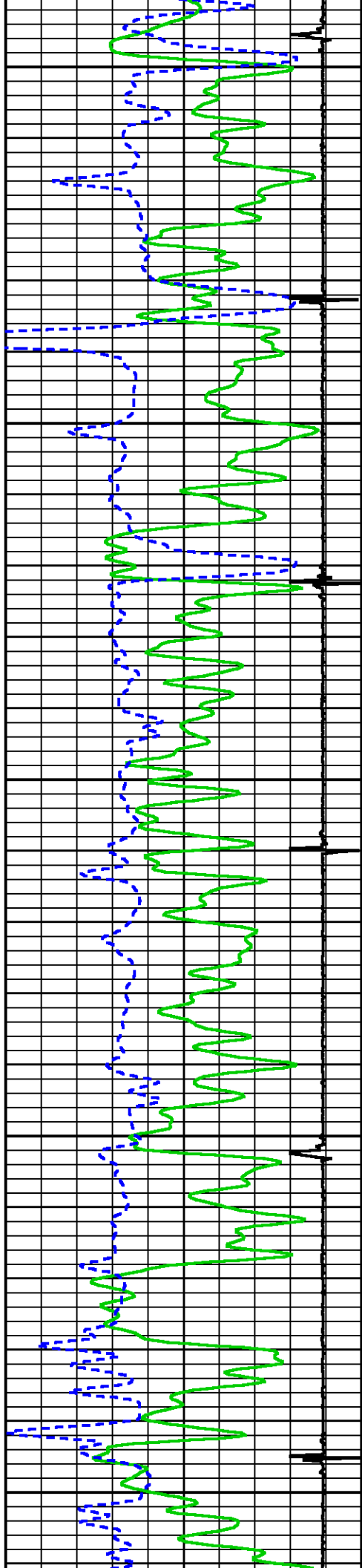


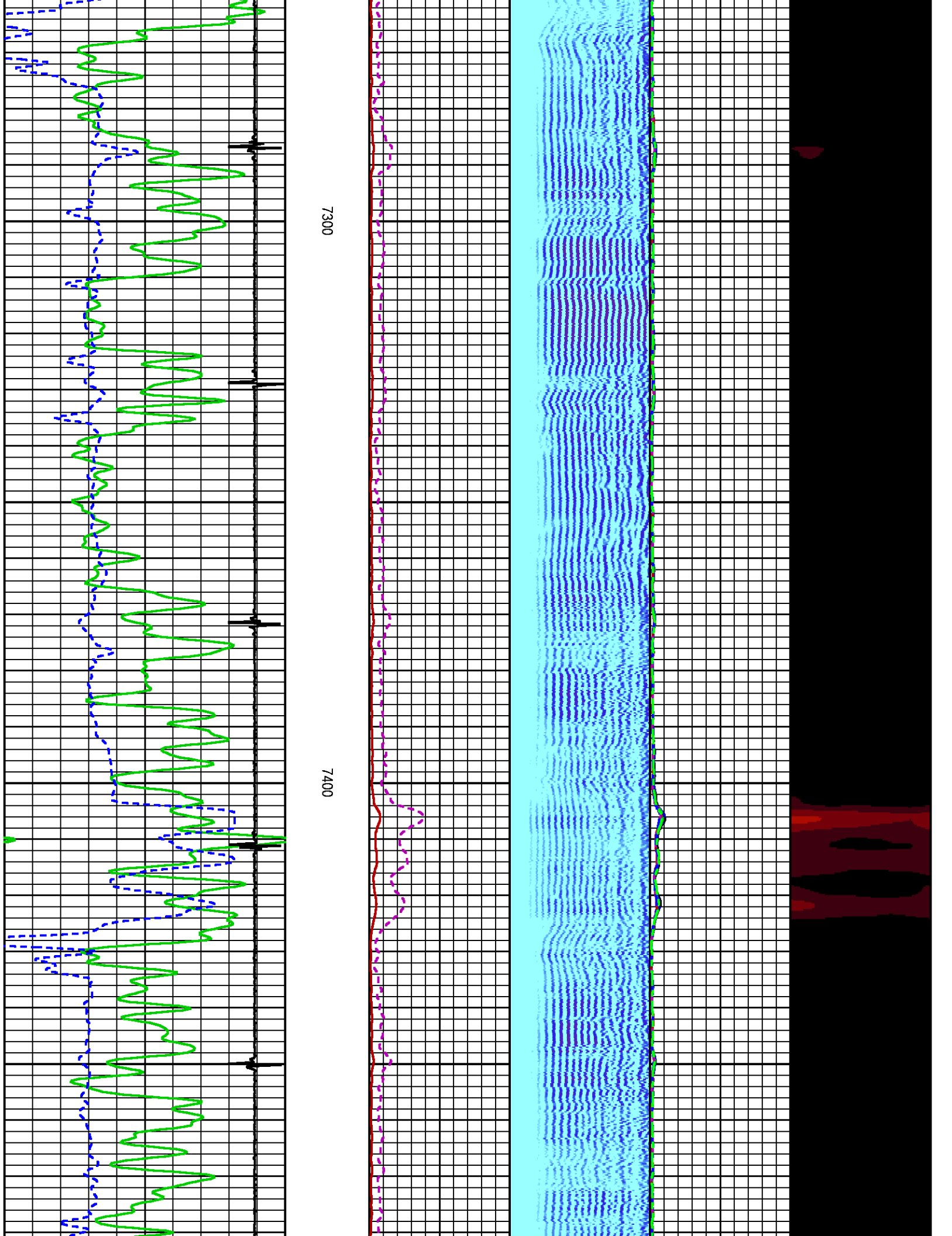


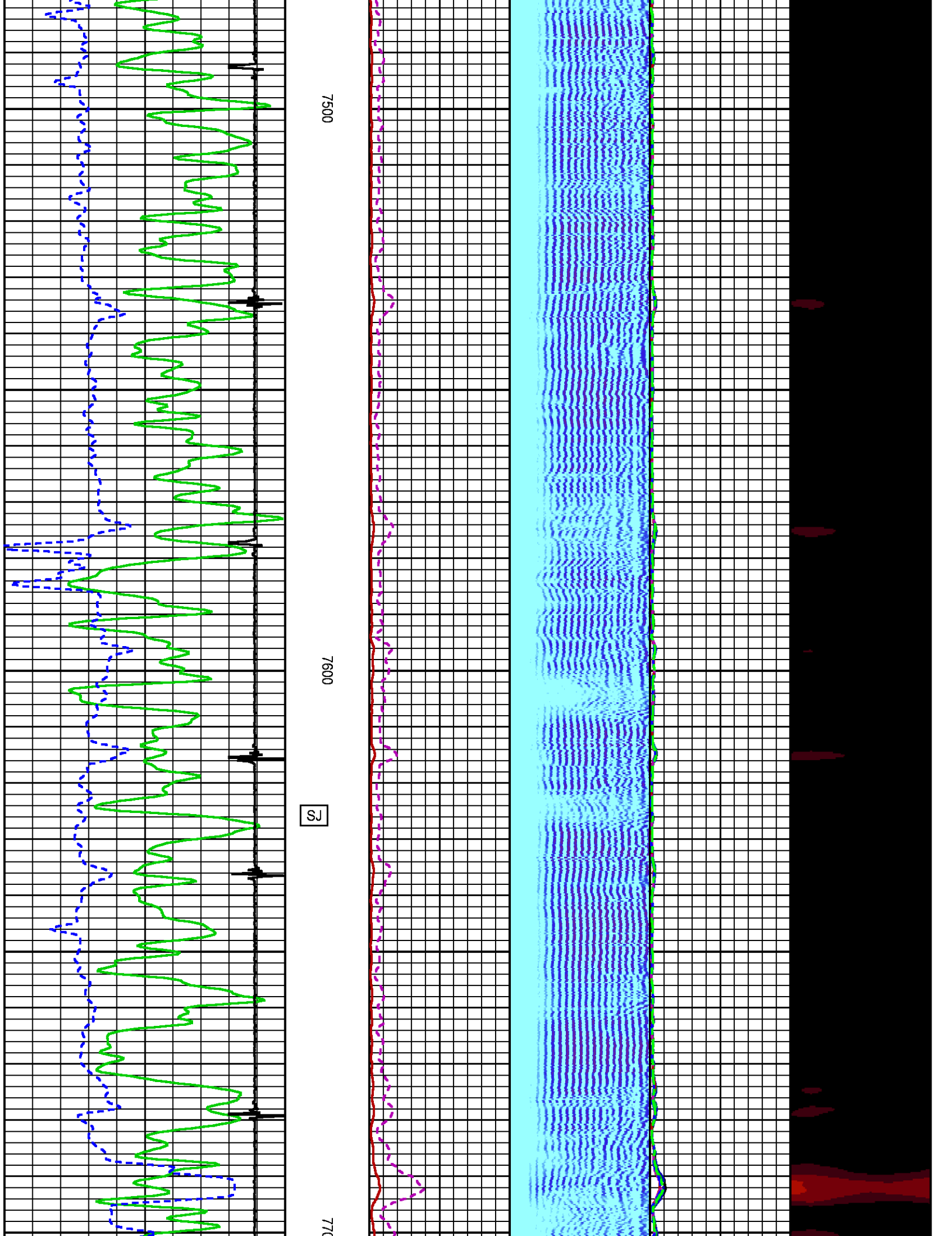


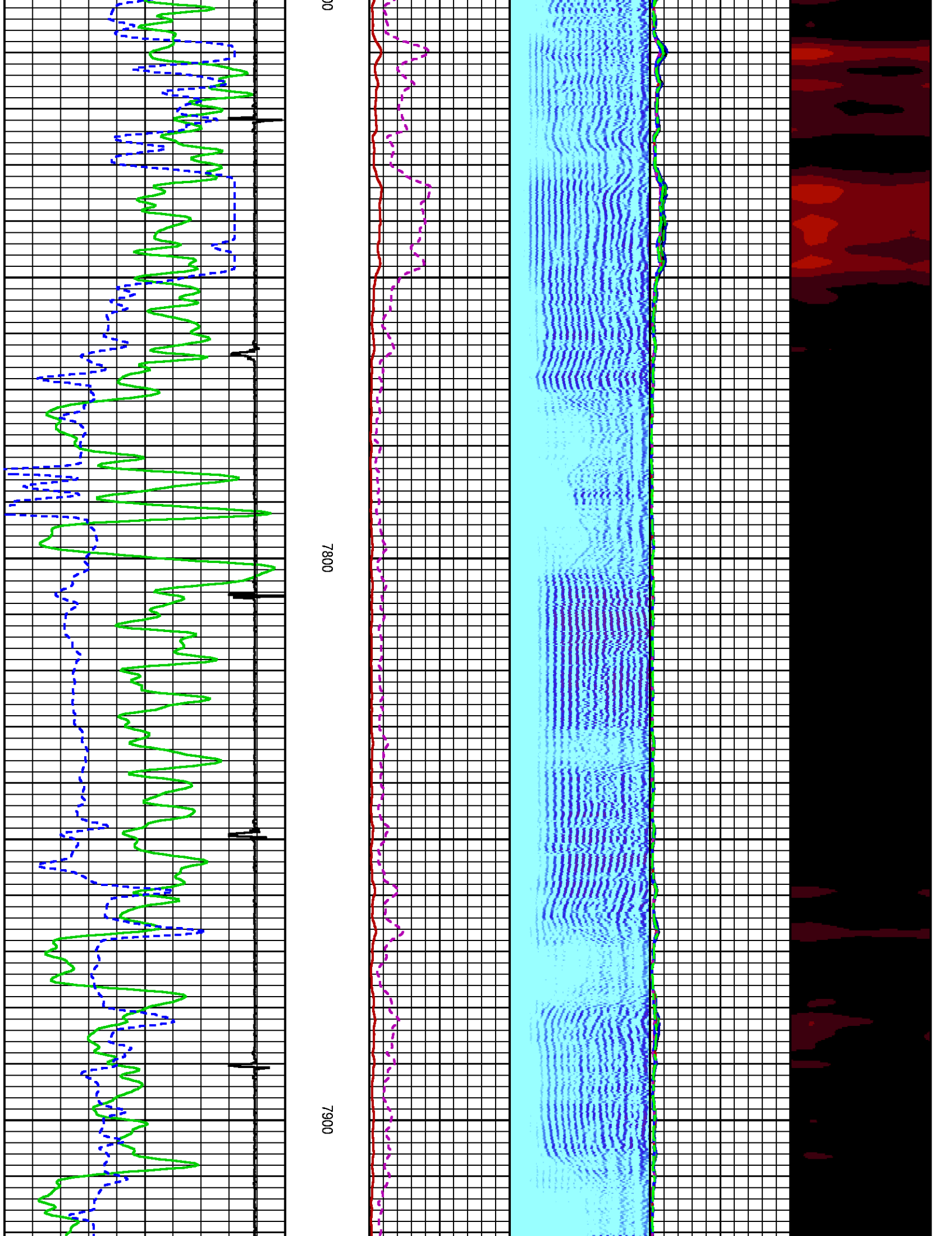
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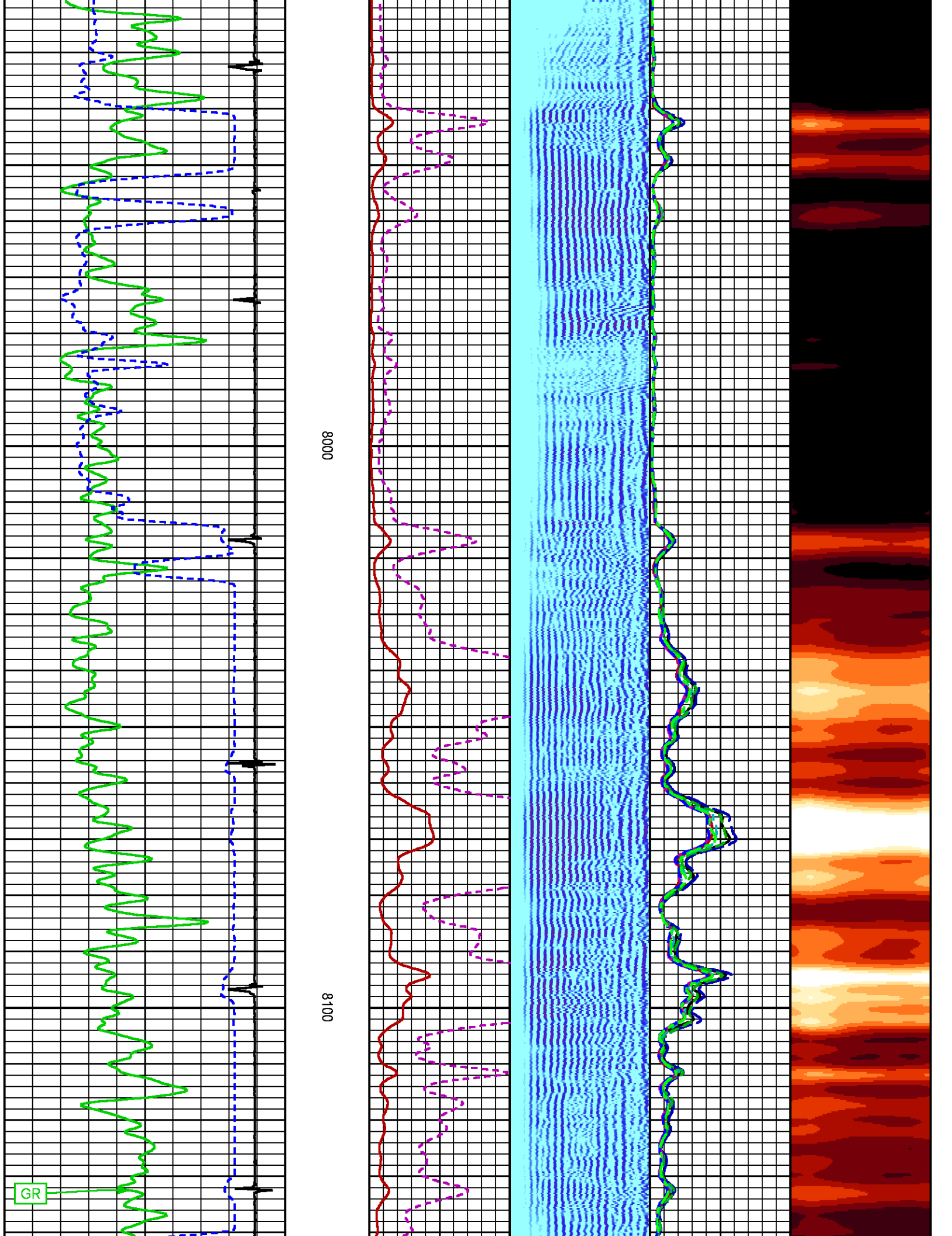
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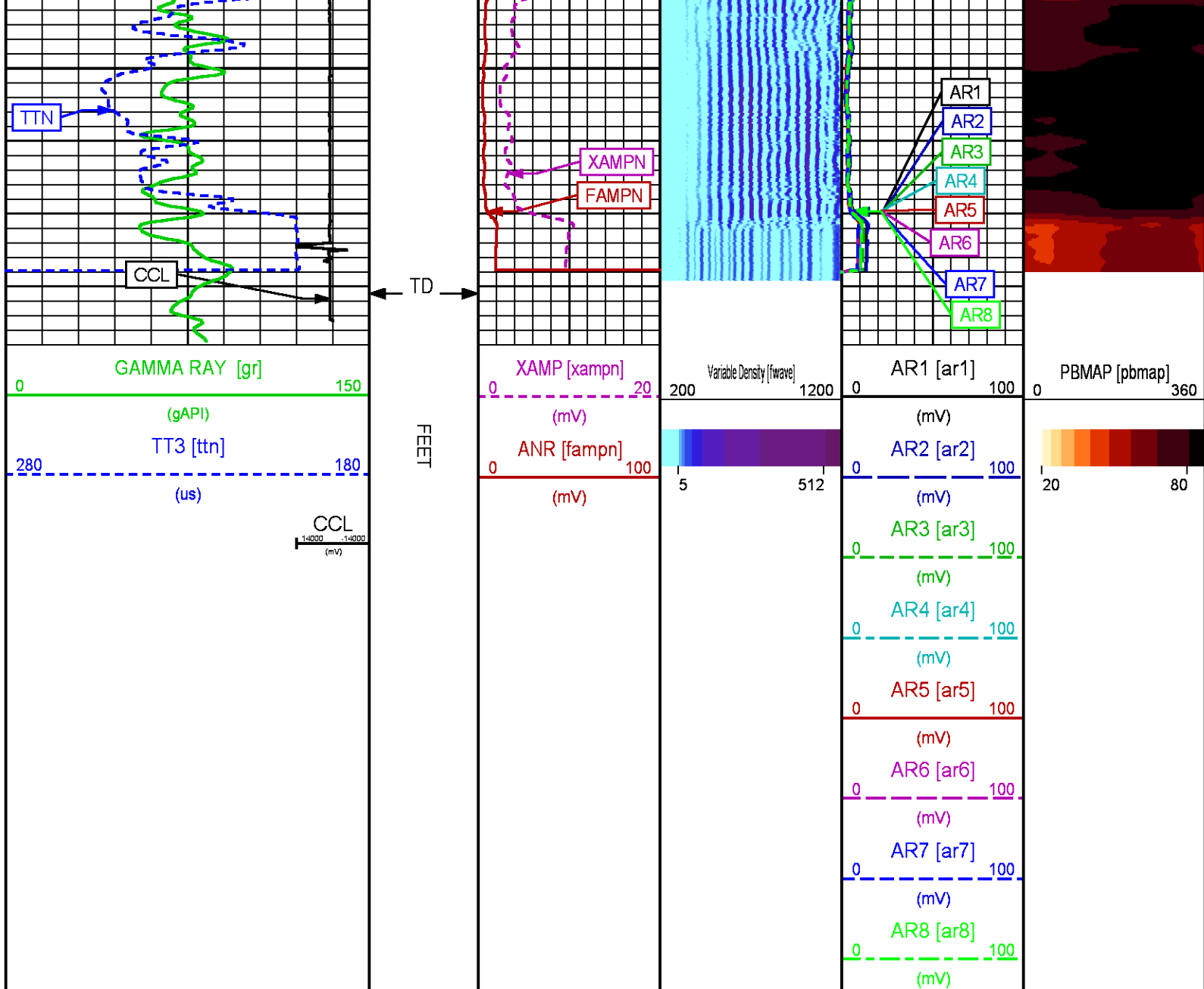












REPEAT PASS

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

Plotted: Wed Jun 20 15:22:36 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE_GUNDERSON_0994-14-17E/p012g01.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 7944.250 ft BOTTOM DEPTH: 8175.750 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*)	189	us	TOP	BOTTOM
	AMP WINDOW START (fgp2*)	189	us	"	"
	AMP WINDOW START (fgp3*)	189	us	"	"
	AMP WINDOW START (fgp4*)	189	us	"	"
	AMP WINDOW START (fgp5*)	189	us	"	"
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	AMP WINDOW START (fgp7*)	189	us	"	"
	AMP WINDOW START (fgp8*)	189	us	"	"
	AMP WINDOW START (fgpn*)	189	us	"	"
	AMP WINDOW LENGTH	30	us	"	"
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	198	us	"	"
	TT WINDOW LENGTH	500	us	"	"
	FIRST BRK THRESHOLD (ttn*)	4	mV	"	"
RAL CASING PARAMETERS	PPT NEAR	215.678	us	"	"
RAL TOOL DELAY	TOOL DELAY (str1*)	-71	us	"	"
	TOOL DELAY (str2*)	-71	us	"	"
	TOOL DELAY (str3*)	-71	us	"	"
	TOOL DELAY (str4*)	-71	us	"	"
	TOOL DELAY (str5*)	-71	us	"	"
	TOOL DELAY (str6*)	-71	us	"	"
	TOOL DELAY (str7*)	-71	us	"	"
	TOOL DELAY (str8*)	-71	us	"	"
	TOOL DELAY (strn*)	-71	us	"	"
BASELINE NOISE (NEAR)	NOISE WINDOW START	140	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

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

Plot Interval

: SysA:/dat1a/LARAMIE_GUNDERSON_0994-14-17E/17E_RAL_REPEAT.fvpdf [5"/100' Scale]

: 7951.75 - 8192.5 Feet

Data File 1

Created On

Company

Well

Field

File Interval

OCT

: F1 : SysA:/dat1a/LARAMIE_GUNDERSON_0994-14-17E/17E_RAL_REPEAT.xtf

: N/A

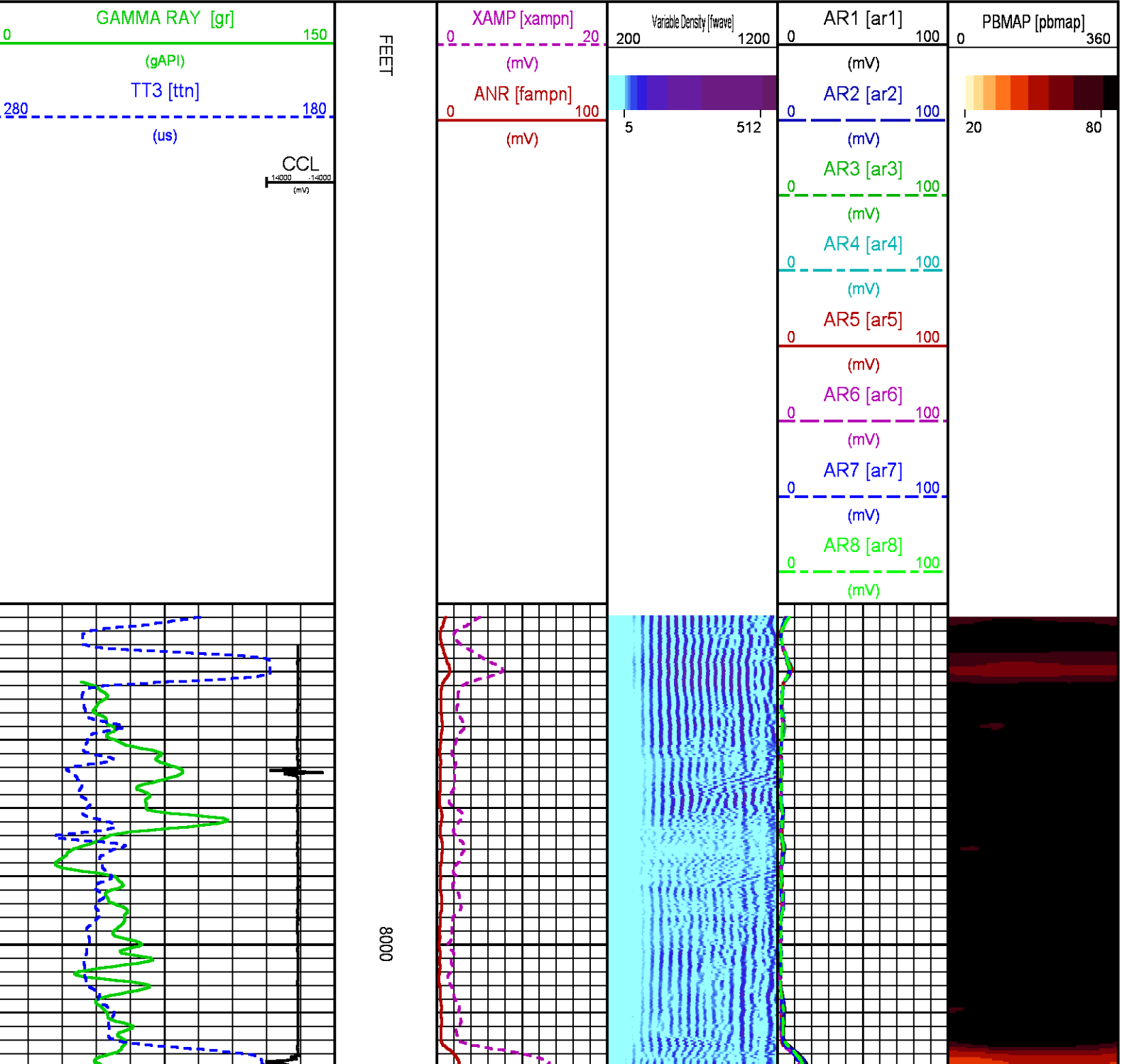
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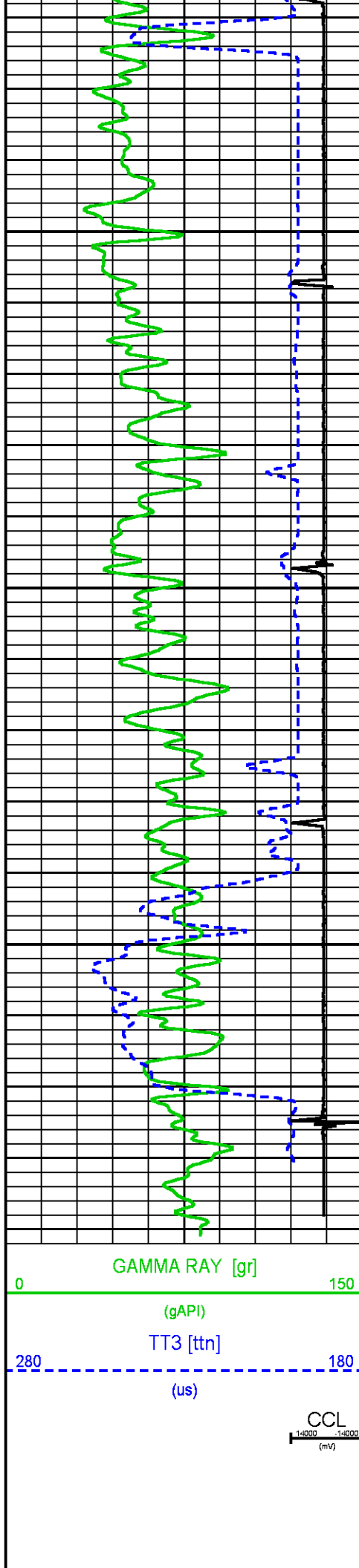
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: VEGA

: 7944 - 8193.75 Feet

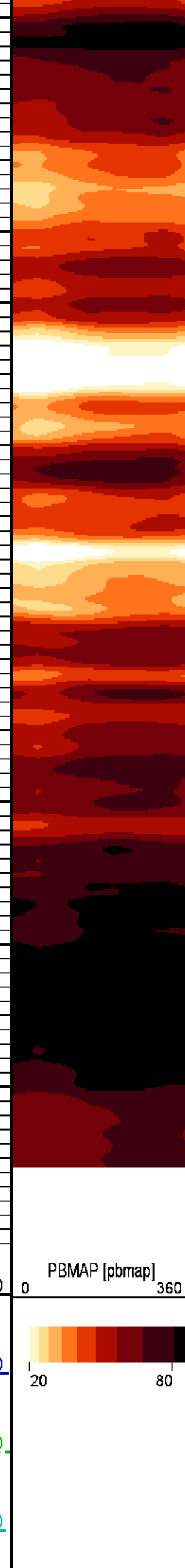
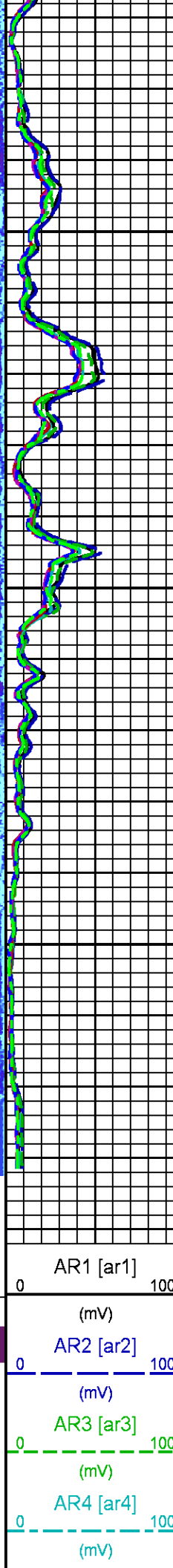
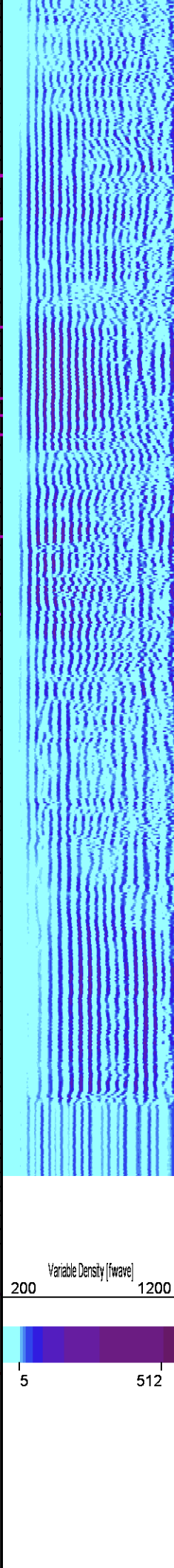
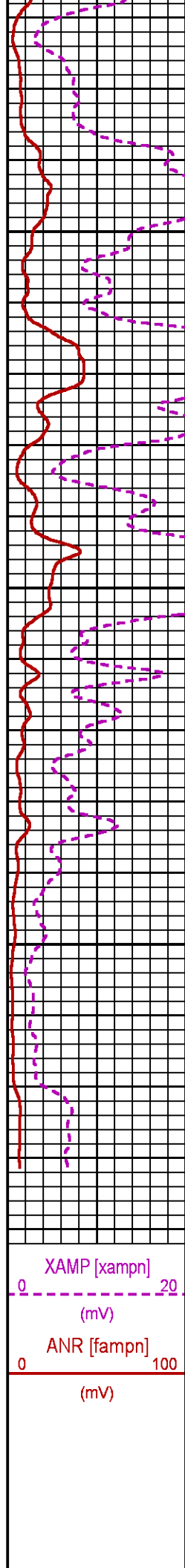
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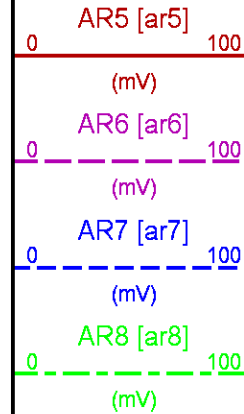




8100

FEET





CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/LARAMIE_GUNDERSON_0994-14-17E/p012g.tp1

RAL PRIMARY CALIBRATION SUMMARY

TOOL #: 1426XA 10124114

DATE/TIME PERFORMED: Wed Jun 20 12:21:38 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)	-0.06	-0.01	-0.05	-0.07	-0.06	0.01	0.09	0.07	-0.04	0.62	-0.08
AMP FLUID (mV)	292	296	296	294	293	292	291	293	292	407	292
TT (us)	218	217	217	217	217	218	217	217	218	327	217
M FACTOR	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.37	0.34

RAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1426XA 10124114

DATE/TIME PERFORMED: Wed Jun 20 12:22:33 2018

DAYS SINCE CAL: 0

UNIT #: 5753XD 10412898

CABLE #: 4268SM SMALL1

	NEAR (mV)	R1 (mV)	R2 (mV)	R3 (mV)	R4 (mV)	R5 (mV)	R6 (mV)	R7 (mV)	R8 (mV)	FAR (mV)	CAL (mV)
ZERO	0.01	0.01	0.03	-0.00	-0.04	-0.04	-0.02	0.02	0.02	0.38	-0.02
AMP AIR	0.76	0.61	0.58	0.81	0.68	0.70	0.68	0.70	0.81	1.06	100.06

SHOP M FACTOR	SHOP A FACTOR	WIRELINE FACTOR
0.34	0.00	1.00

GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1355XA 11871507

DATE/TIME PERFORMED: Thu Mar 29 16:58:14 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	26.49	135.56	109.1	0.917	24.29	124.29	100

GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1355XA 11871507

DATE/TIME PERFORMED: Thu Mar 29 17:00:00 2018

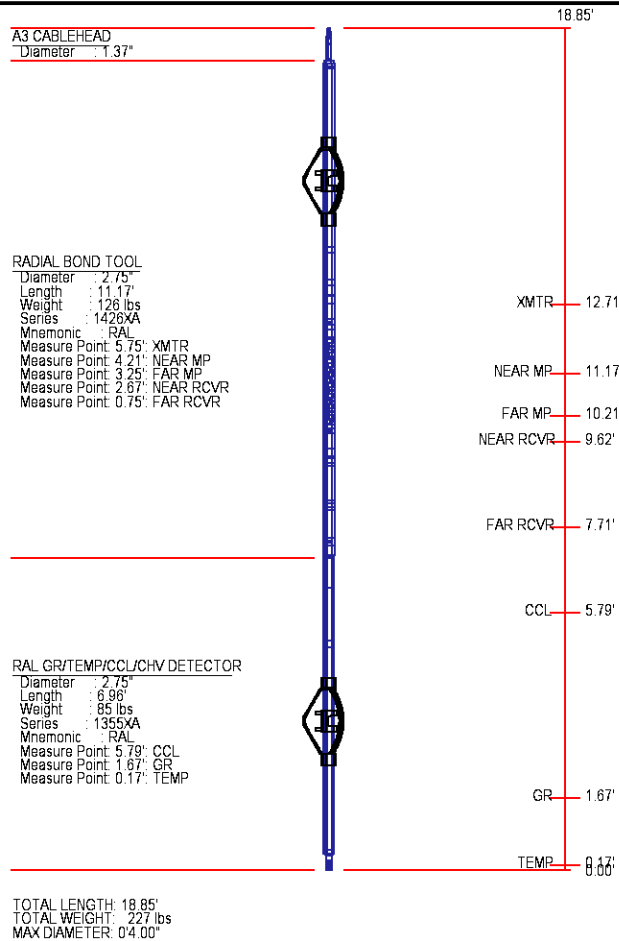
UNIT #: 4352 ML4352

VERI JIG #: 4702NK DA_228

	BACKGROUND (cts)	CALBRTR ON (cts)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	26.53	135.96	0.917	24.33	124.65	100.33
						90.00 110.00

INSTRUMENT CONFIGURATION

Source File: /dat1a/LARAMIE_GUNDERSON_0994-14-17E/RAL-tdg



**BAKER
HUGHES**
a GE company



ECLIPS

COMPANY

LARAMIE ENERGY LLC

WELL

GUNDERSON 0994-14-17E

FIELD

VEGA

COUNTY

MESA

STATE COLORADO

FILE NO:

CH136902

API NO:

05077105300000

LOCATION:

SHL: 1076' FSL & 1146' FEL

BHL: 1076' FSL & 1146' FEL

ELEVATIONS:

KB 7302 FT

DF

GL 7272 FT

SEC 14 **TWP** 9S **RGE** 94W

DATE 20-Jun-2018

