



RADIAL CEMENT BOND LOG

FILE NO: CH145362	COMPANY LARAMIE ENERGY LLC
API NO: 05077105240000	WELL BUZZARD CREEK
	FIELD MESA
	COUNTY STATE COLORADO

Ver. 4.11	LOCATION: BHL: 1361 FNL 1280.0 FWL SEC <u>21</u> TWP <u>09 S</u> RGE <u>93W</u>	OTHER SERVICES RPM
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PERMANENT DATUM LOG MEASURED FROM DRILL. MEAS. FROM	GL ELEVATION 7263 FT 30 FT ABOVE P.D. KB GL 7263 FT	ELEVATIONS: KB 7293 FT DF GL 7263 FT
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DATE	RUN	TRIP	15-NOV-18	1	
SERVICE ORDER			US145362		
DEPTH DRILLER			7608 FT		
DEPTH LOGGER			7532 FT		
BOTTOM LOGGED INTERVAL			7532 FT		
TOP LOGGED INTERVAL			0 FT		
TIME STARTED			09:30		
TIME FINISHED			12:00		
OPERATOR RIG TIME			2.5 HRS		
TYPE OF FLUID IN HOLE			WATER		
FLUID DENSITY			NA		
FLUID SALINITY			NA		
FLUID LEVEL			72 FT		
LOGGED CEMENT TOP			1040 FT		
WELLHEAD PRESSURE			0 PSI		
MAXIMUM HOLE DEVIATION			N/A		
NOMINAL LOGGING SPEED			100 F/MN		
MAX. RECORDED TEMP.			253 DEGF		
REFERENCE LOG			NA		
REFERENCE LOG DATE			NA		
EQUIP. NO.		LOCATION	HL 4268	GRAND JCT.	
RECORDED BY			P. JOHNSTON		
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	N/A	30 FT	

REMARKS
RUN 1 TRIP 1: RAL RECORDED CENTRALIZED DEPTH REFERENCE IS KB (30' ABOVE GL) TOP OF WELLHEAD TO GL = 4' SJ: 5652' - 5673' SJ: 6700' - 6721'

EQUIPMENT DATA				
RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.
1	1	RAL	1426XA	10222301
1	1	GR	1355XA	12568545

POSITION
CENTRALIZED
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: Sat Nov 17 10:23:02 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE_BCU_0993_21_06W/p012g02.prm
 LOGGING MODE: DEPTH DIRECTION: UP
 TOP DEPTH: 22.250 ft BOTTOM DEPTH: 7526.250 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*)	187	us	TOP	BOTTOM
	AMP WINDOW START (fgp2*)	187	us	"	"
	AMP WINDOW START (fgp3*)	187	us	"	"
	AMP WINDOW START (fgp4*)	187	us	"	"
	AMP WINDOW START (fgp5*)	187	us	"	"
	AMP WINDOW START (fgp6*)	187	us	"	"
	AMP WINDOW START (fgp7*)	187	us	"	"
	AMP WINDOW START (fgp8*)	187	us	"	"
	AMP WINDOW START (fgpn*)	187	us	"	"
	AMP WINDOW LENGTH	25	us	"	"
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	195	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*)	-72	us	"	"
	TOOL DELAY (str2*)	-72	us	"	"
	TOOL DELAY (str3*)	-72	us	"	"
	TOOL DELAY (str4*)	-72	us	"	"
	TOOL DELAY (str5*)	-72	us	"	"
	TOOL DELAY (str6*)	-72	us	"	"
	TOOL DELAY (str7*)	-72	us	"	"
	TOOL DELAY (str8*)	-72	us	"	"
	TOOL DELAY (strn*)	-72	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	0	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	"	"

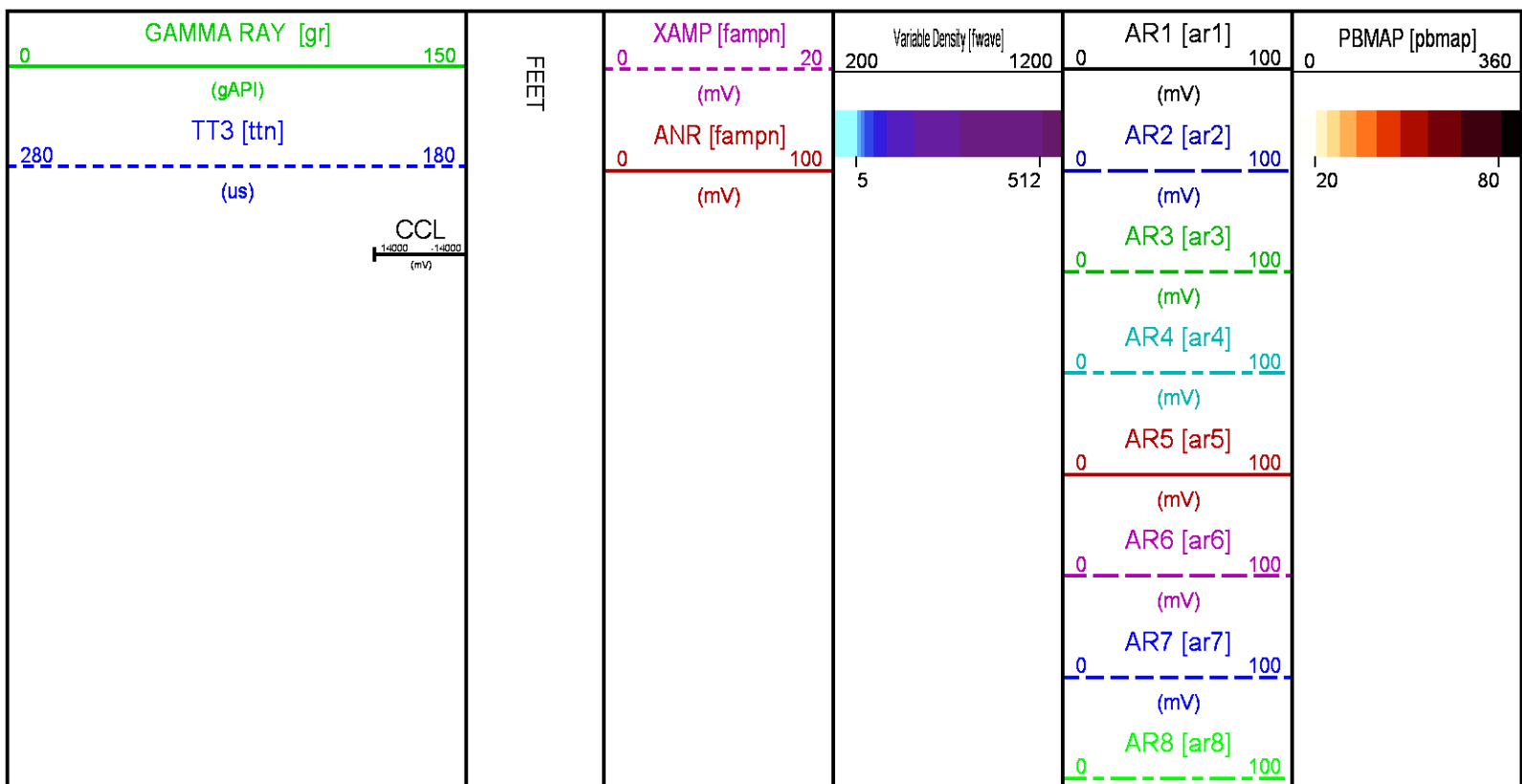
CURVE DESCRIPTION REPORT

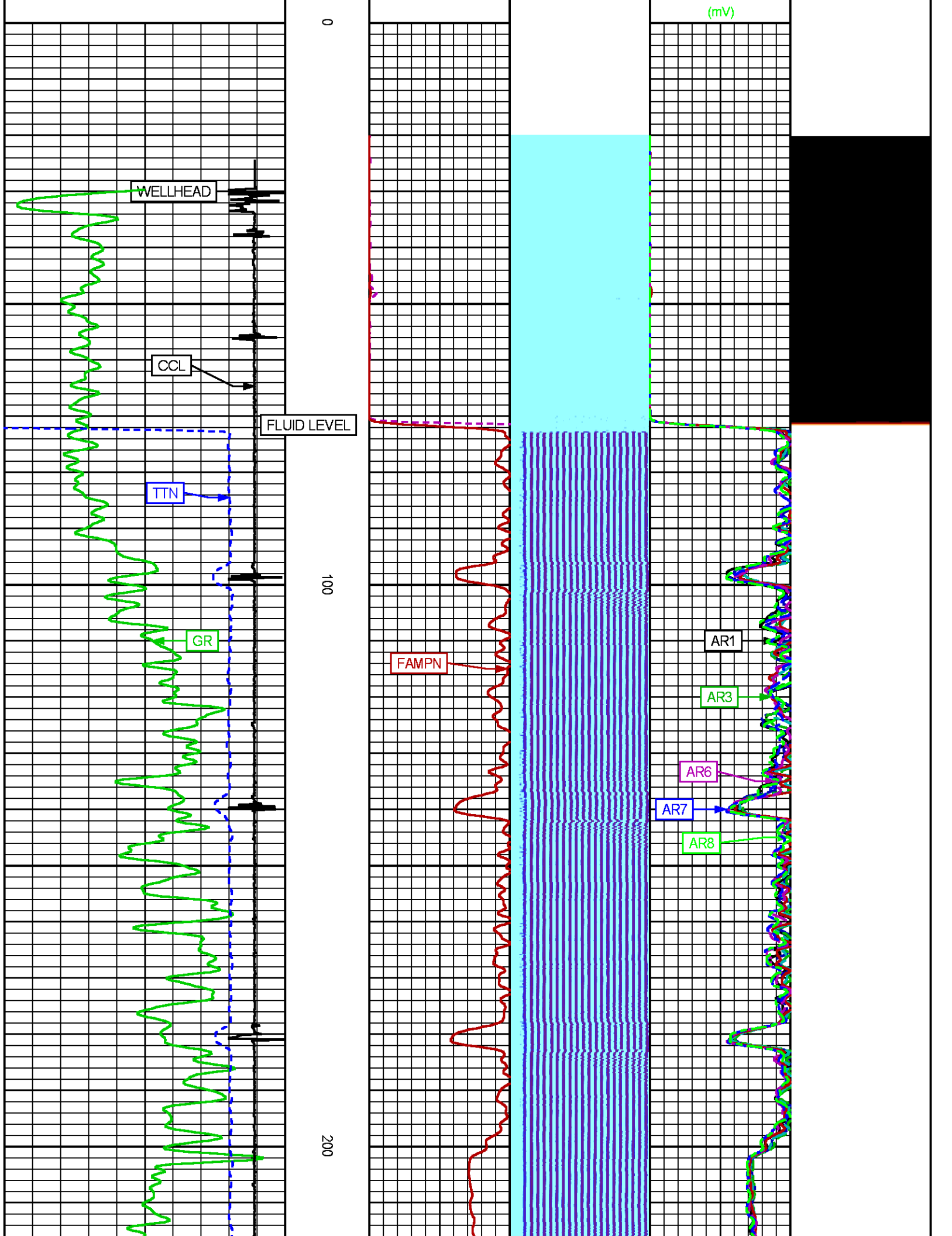
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
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F1:AR2	Nov 15 10:25:57 2018	FIXED GATE AMPLITUDE T-R2
F1:AR3	Nov 15 10:25:57 2018	FIXED GATE AMPLITUDE T-R3
F1:AR4	Nov 15 10:25:57 2018	FIXED GATE AMPLITUDE T-R4
F1:AR5	Nov 15 10:25:57 2018	FIXED GATE AMPLITUDE T-R5
F1:AR6	Nov 15 10:25:57 2018	FIXED GATE AMPLITUDE T-R6
F1:AR7	Nov 15 10:25:57 2018	FIXED GATE AMPLITUDE T-R7
F1:AR8	Nov 15 10:25:57 2018	FIXED GATE AMPLITUDE T-R8
F1:CCL	Nov 15 10:25:57 2018	CASING COLLAR LOCATOR
F1:FAMPN	Nov 15 10:25:57 2018	FIXED GATE AMPLITUDE NEAR RECEIVER
F1:FWAVE	Nov 15 10:25:57 2018	FAR WAVE FORM
F1:GR	Nov 15 10:25:57 2018	GAMMA RAY
F1:PBMAP	Nov 15 10:25:57 2018	PERCENT BOND CEMENT MAP
F1:TTN	Nov 15 10:25:57 2018	TRAVELTIME FROM NEAR TRANSMITTER-RECEIVER

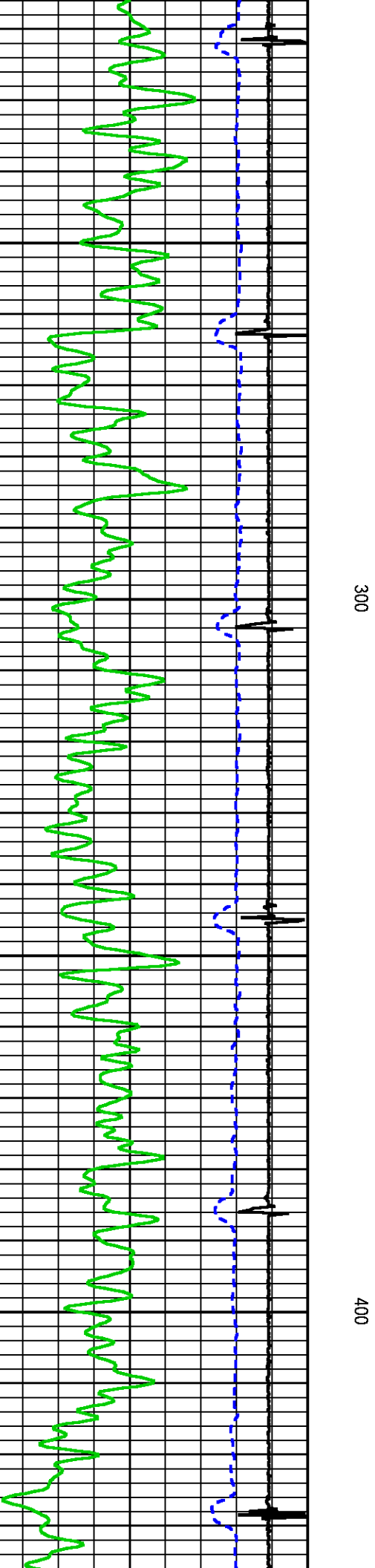
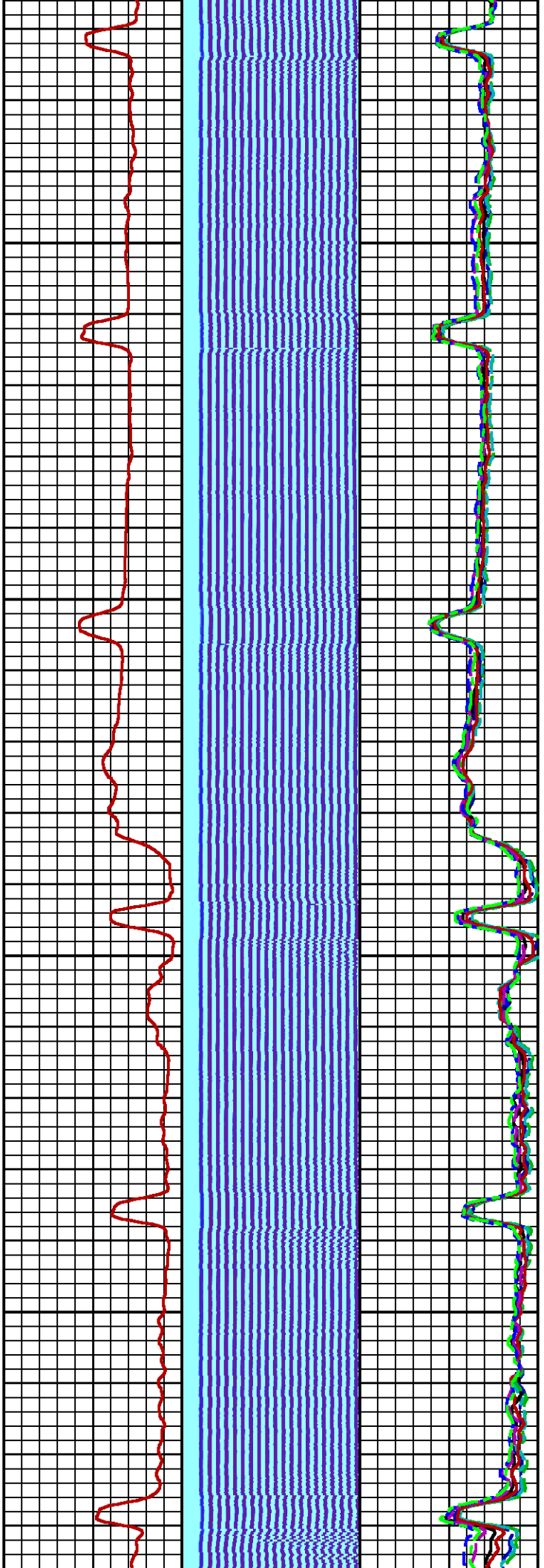
CURVE MEASURE POINT OFFSET

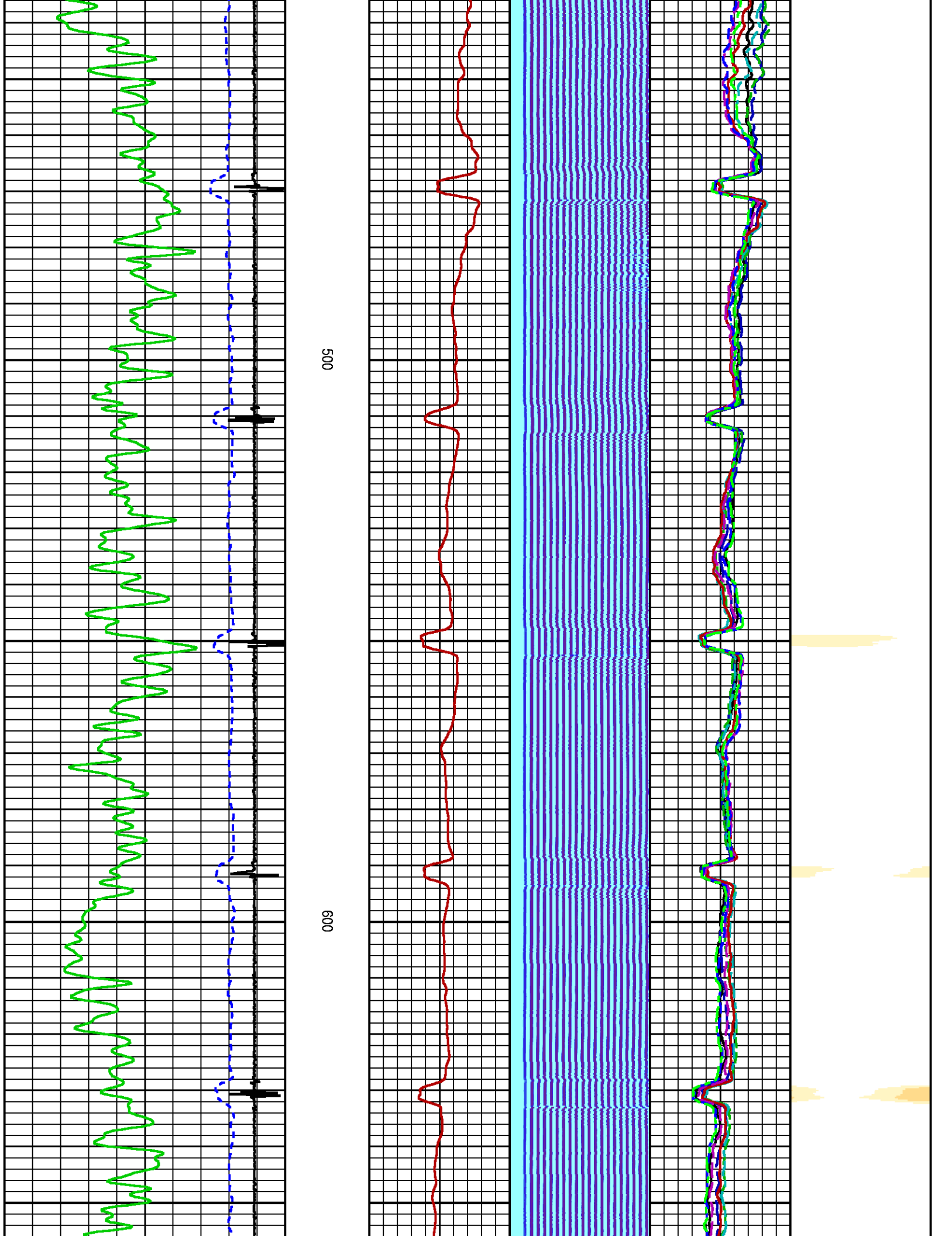
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AR2	-11.25	AR5	-11.25	AR8	-11.25	GR	-1.75
AR3	-11.25	AR6	-11.25	CCL	-5.75	TTN	-11.25

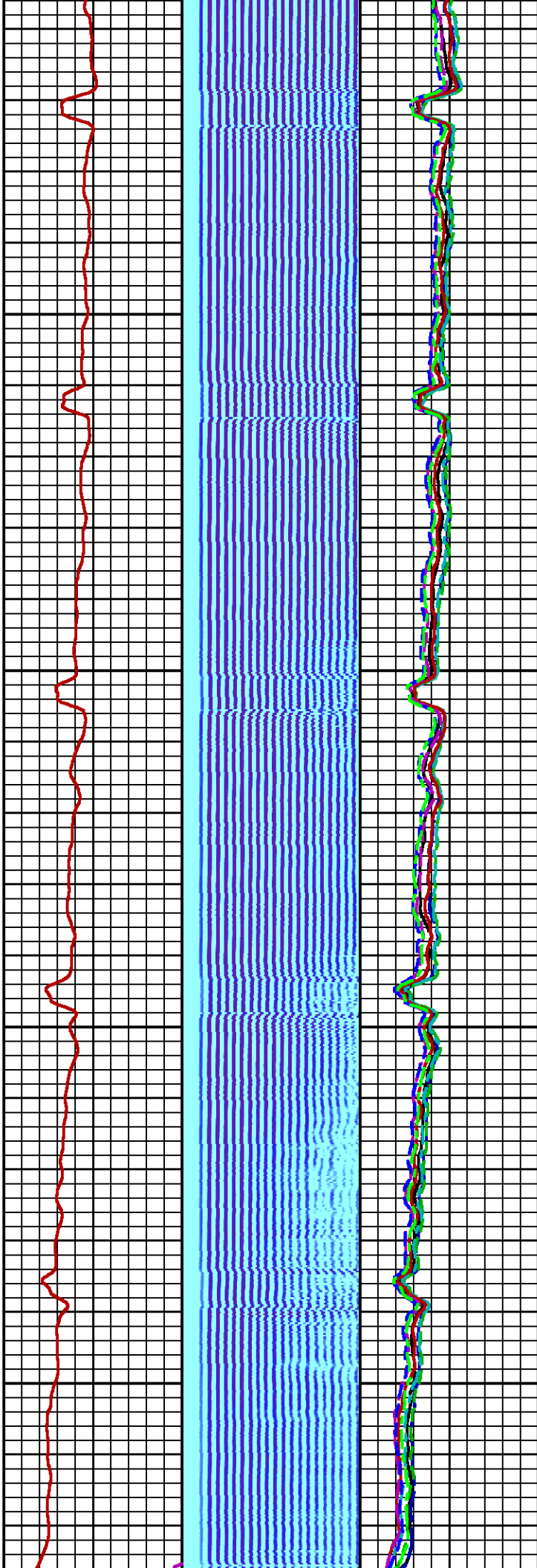
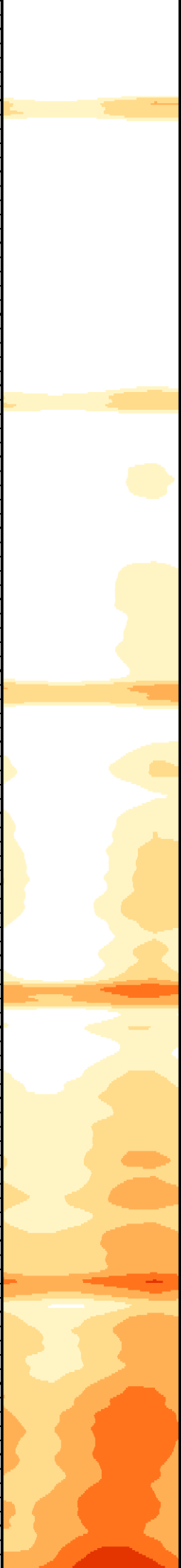
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Created On	: Nov 15 10:25:57 2018
Company	: LARAMIE ENERGY LLC
Well	: BCU-0993-021-06W
Field	: BUZZARD CREEK
File Interval	: 19 - 7534.25 Feet
OCT	: p012g





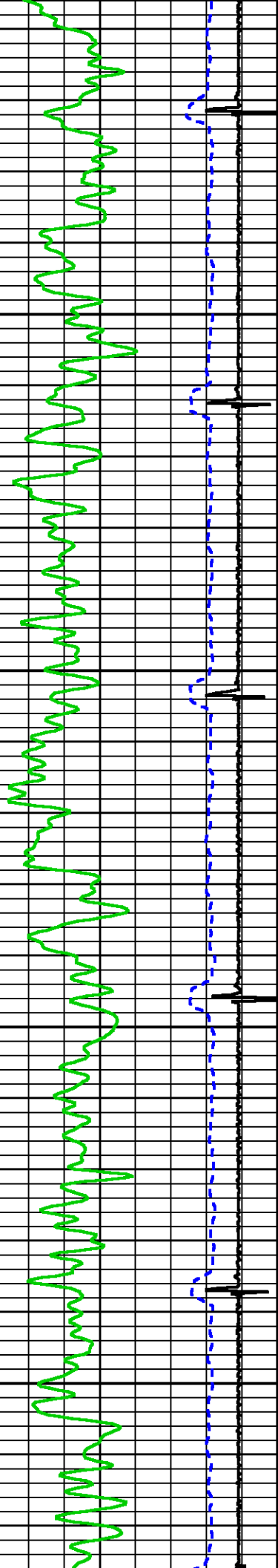


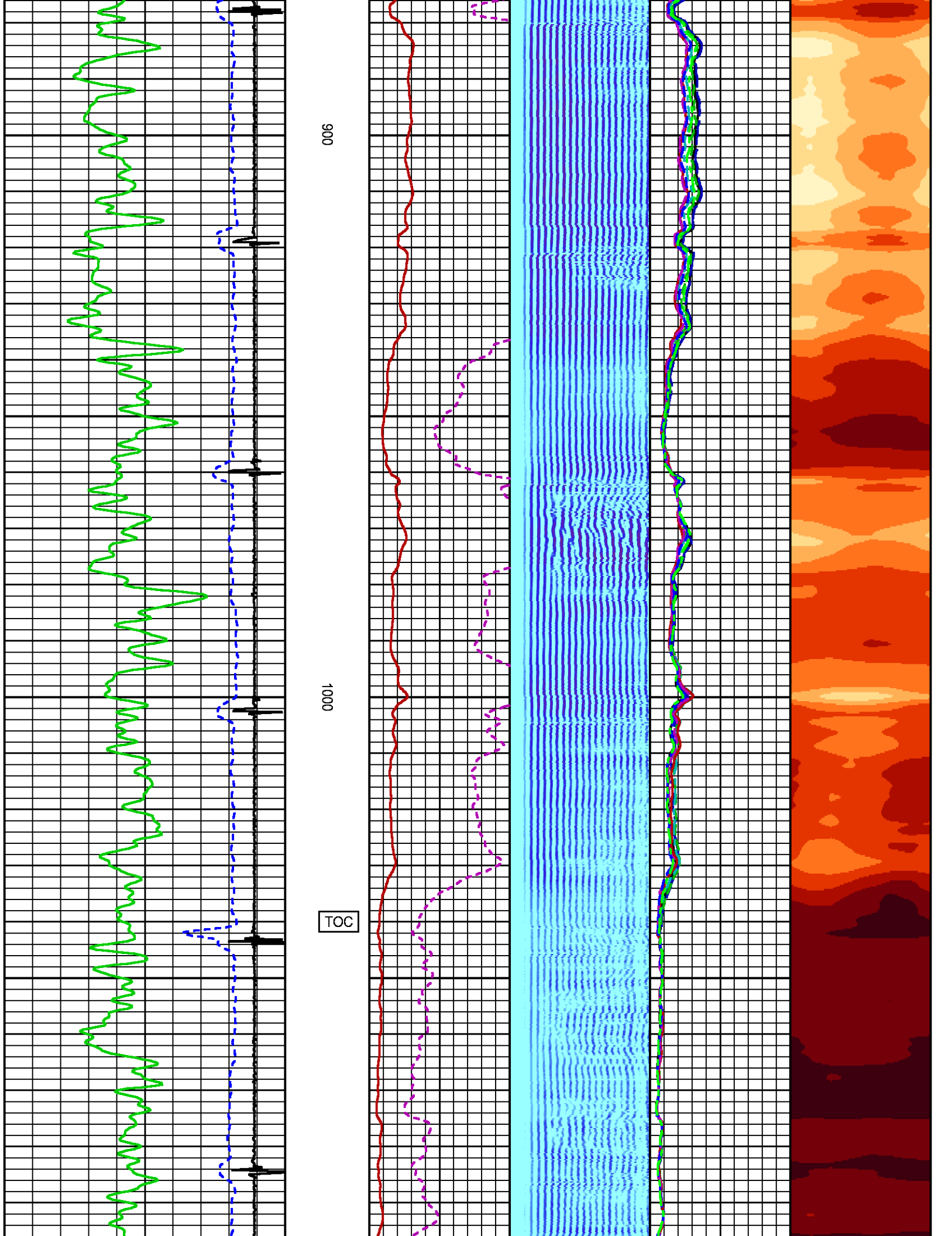


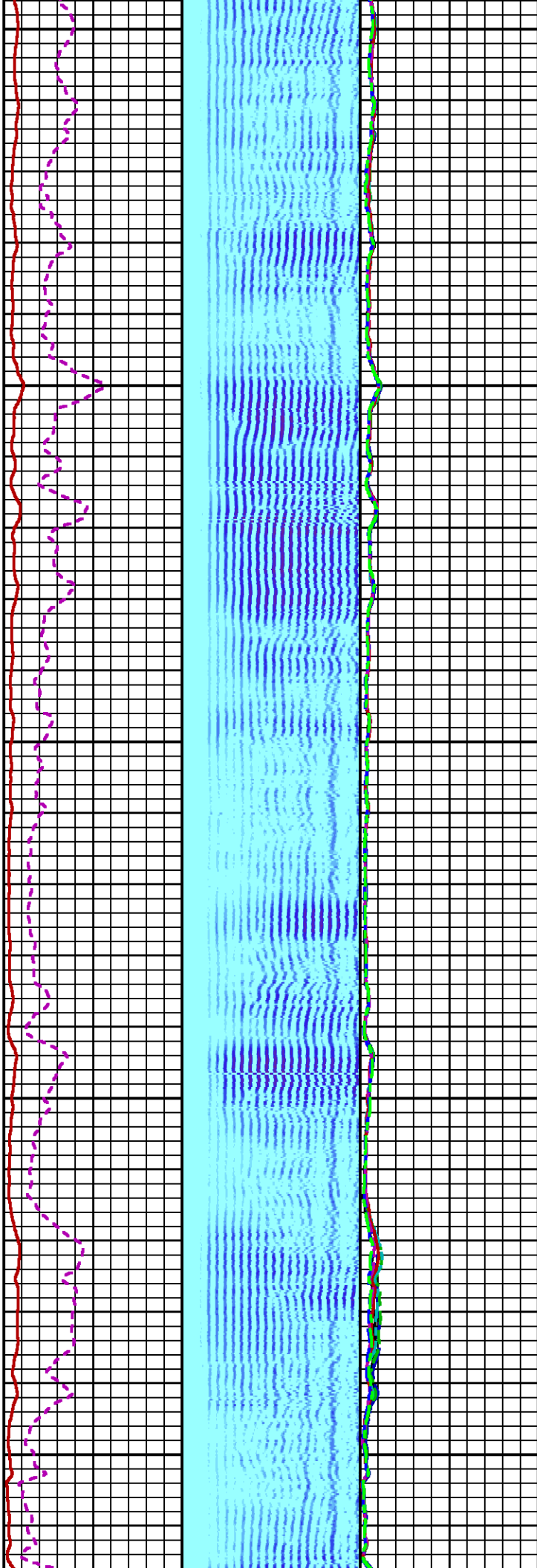
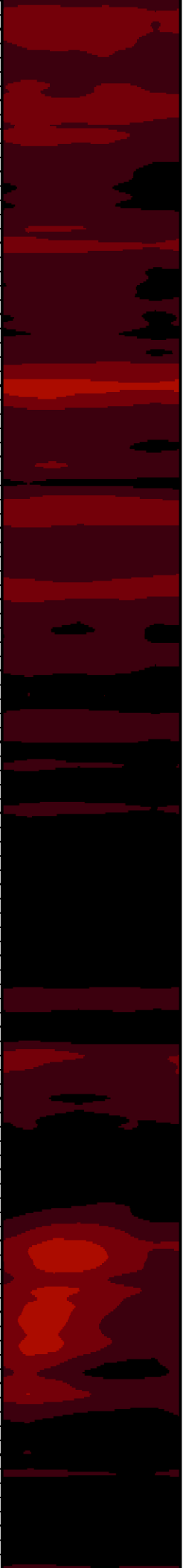


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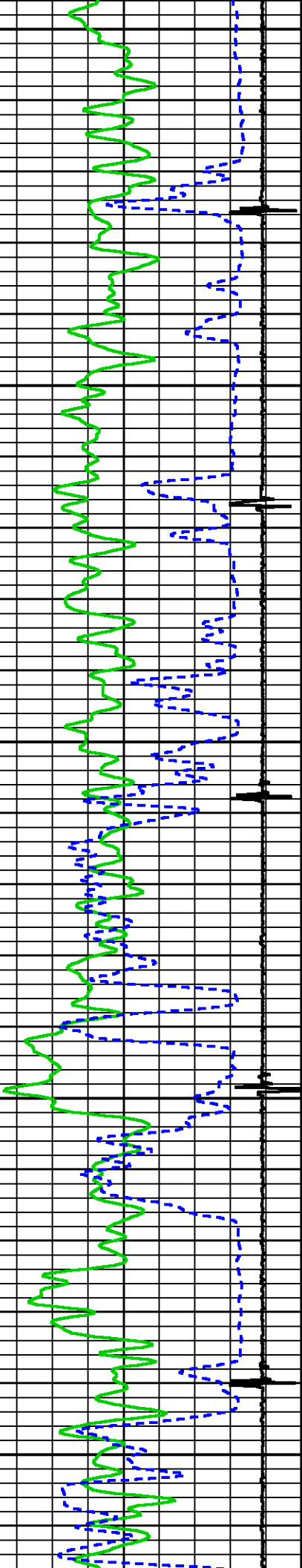


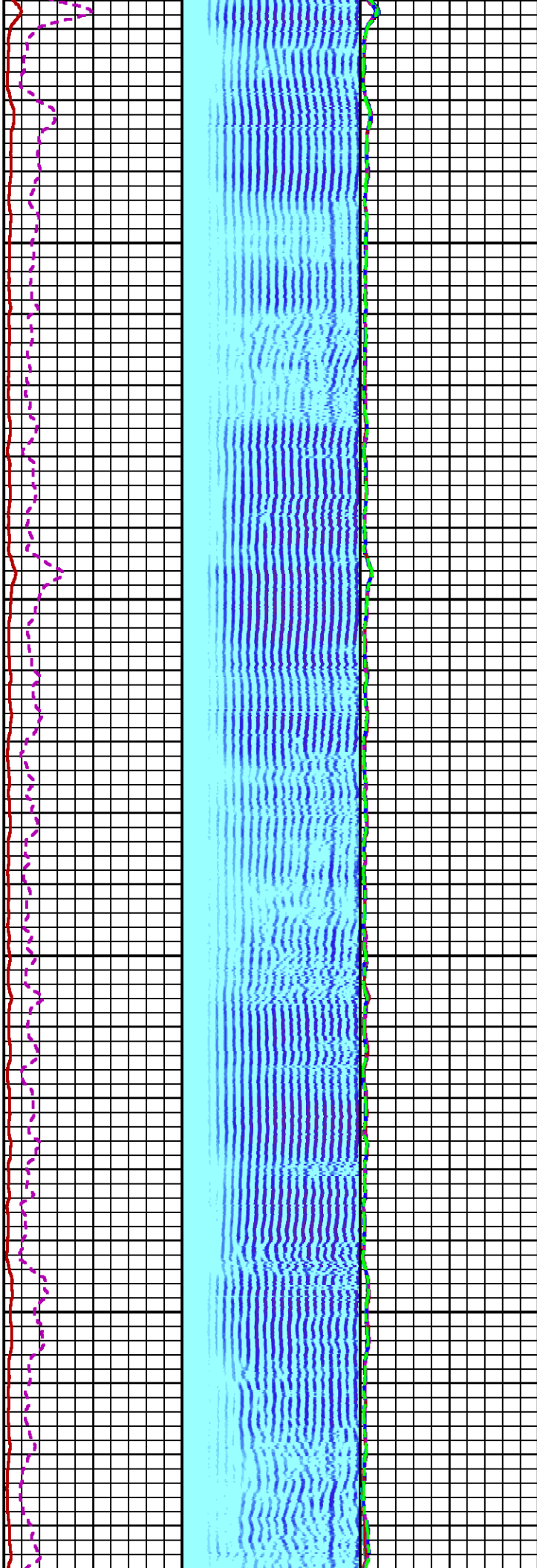


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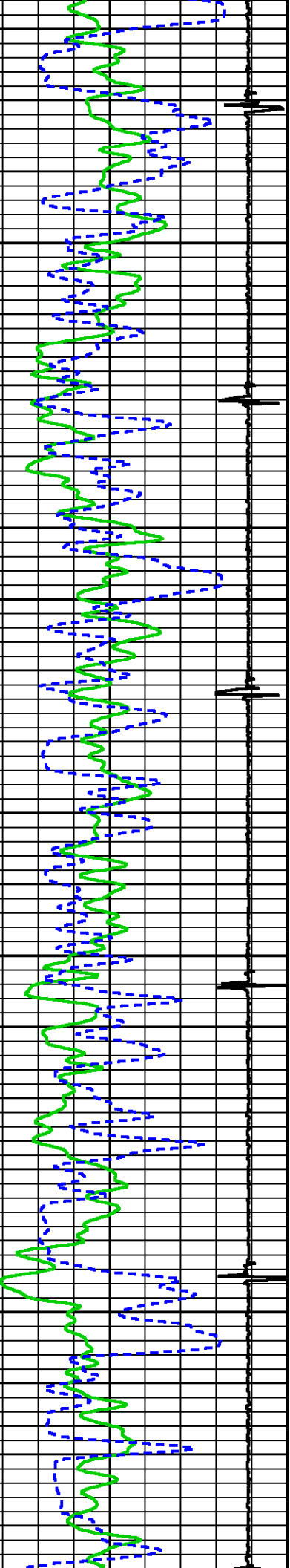
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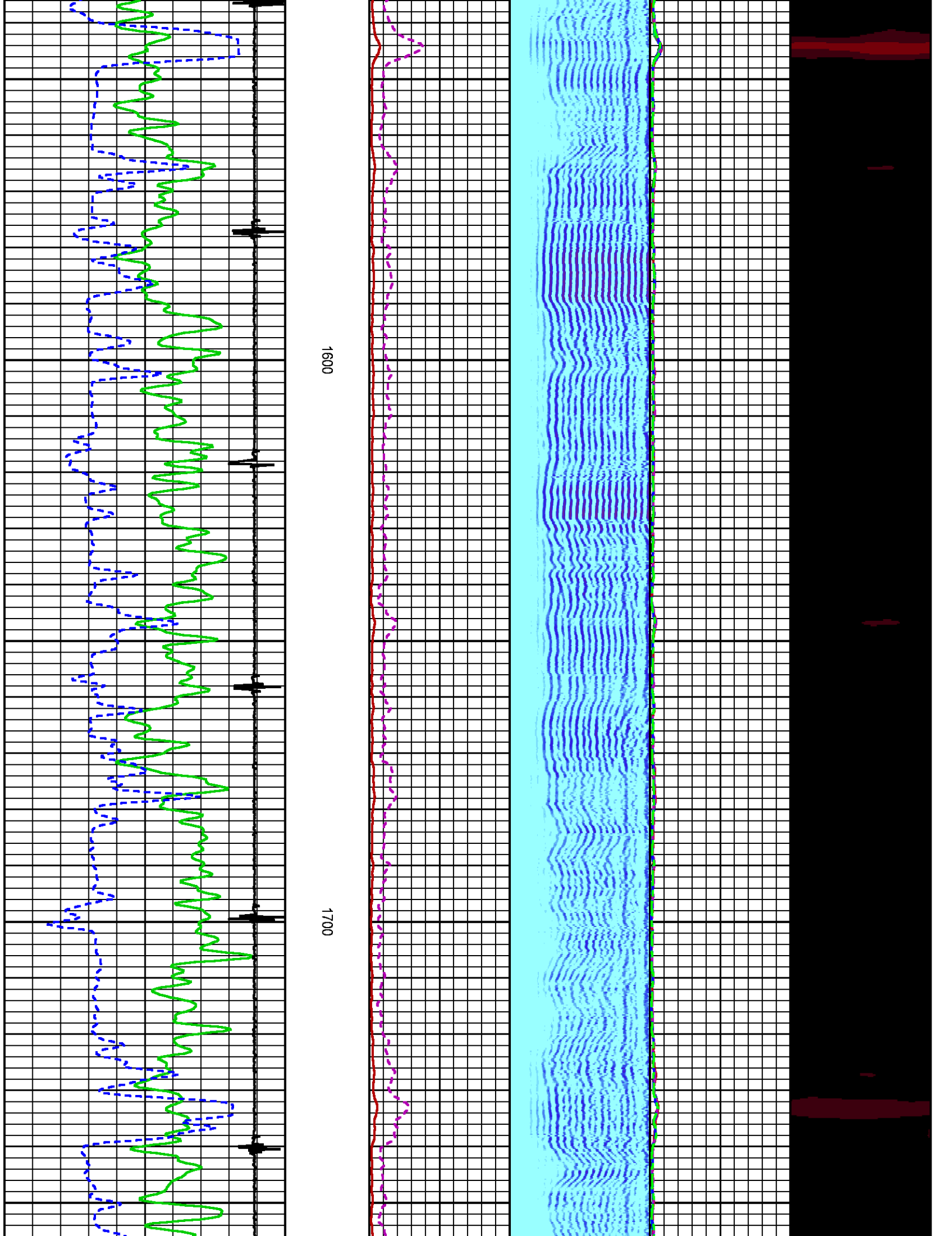


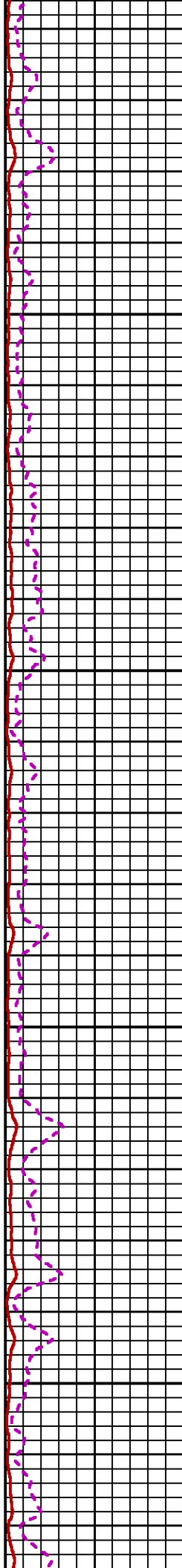
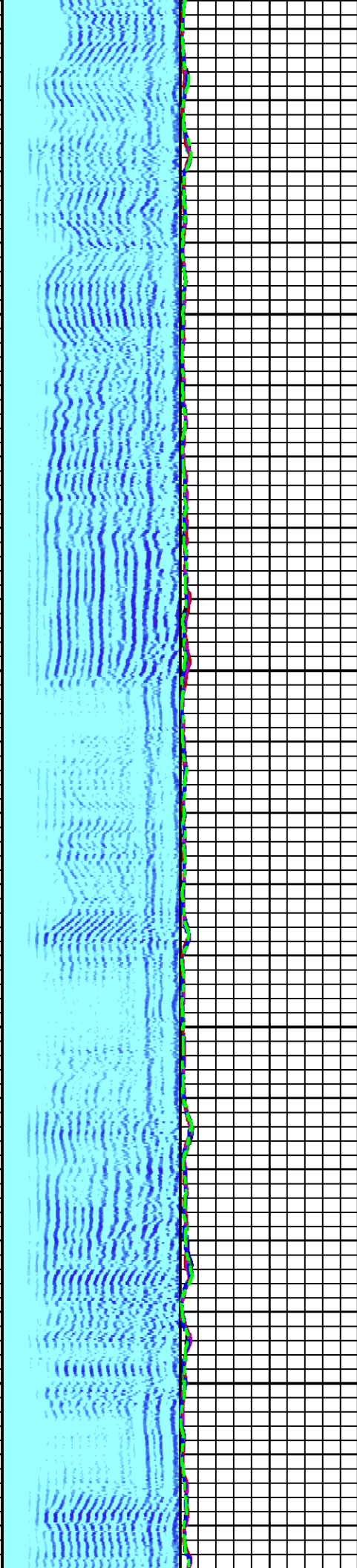


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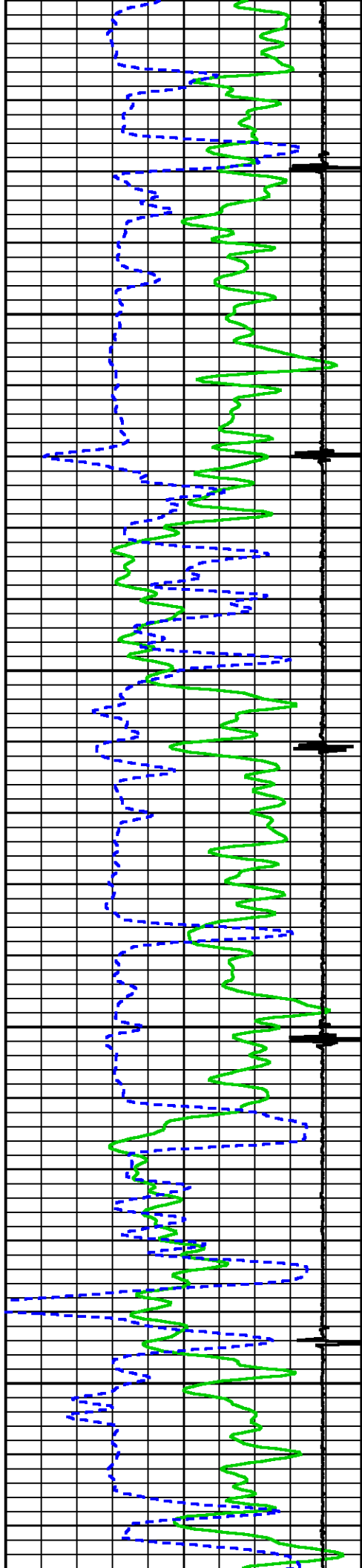


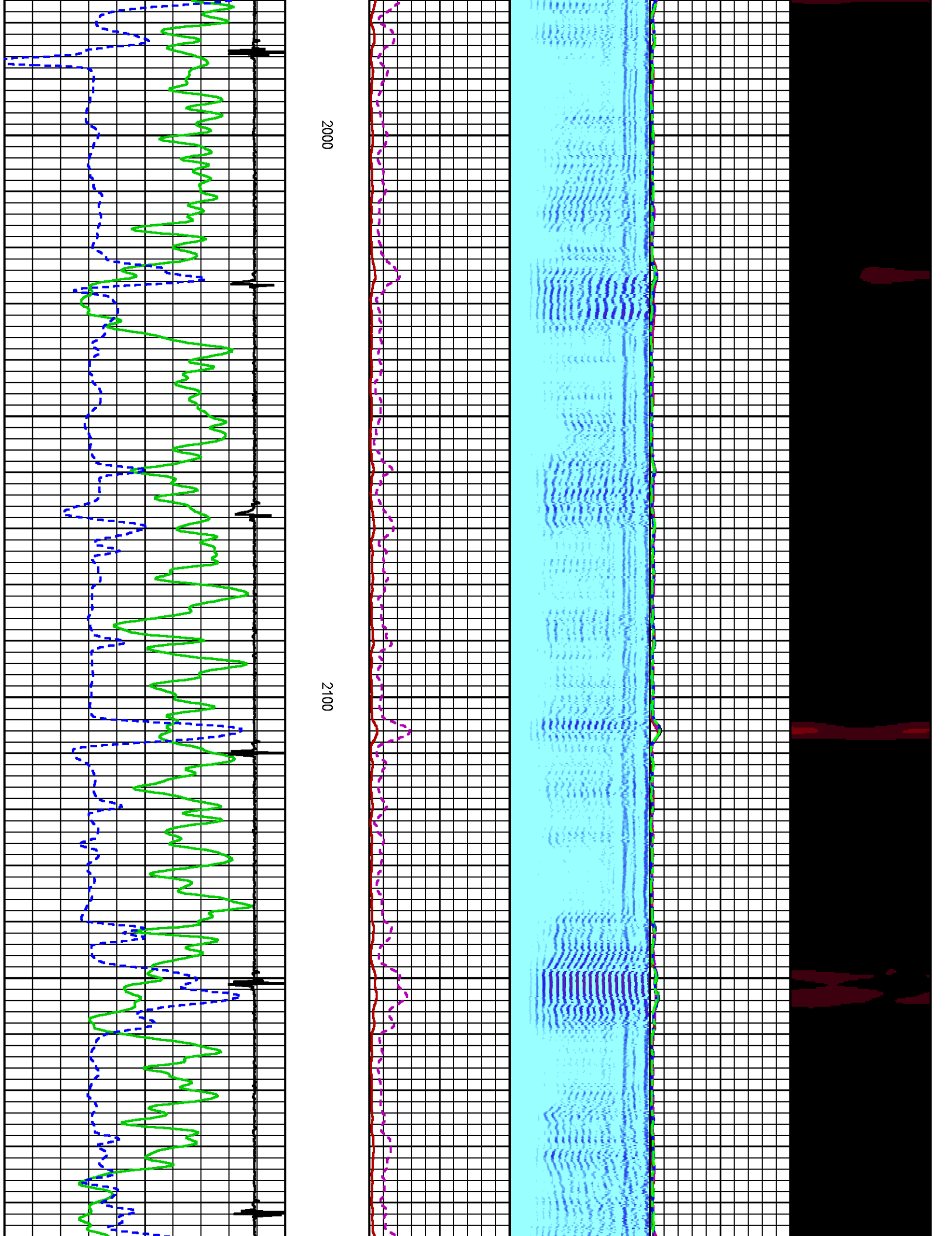


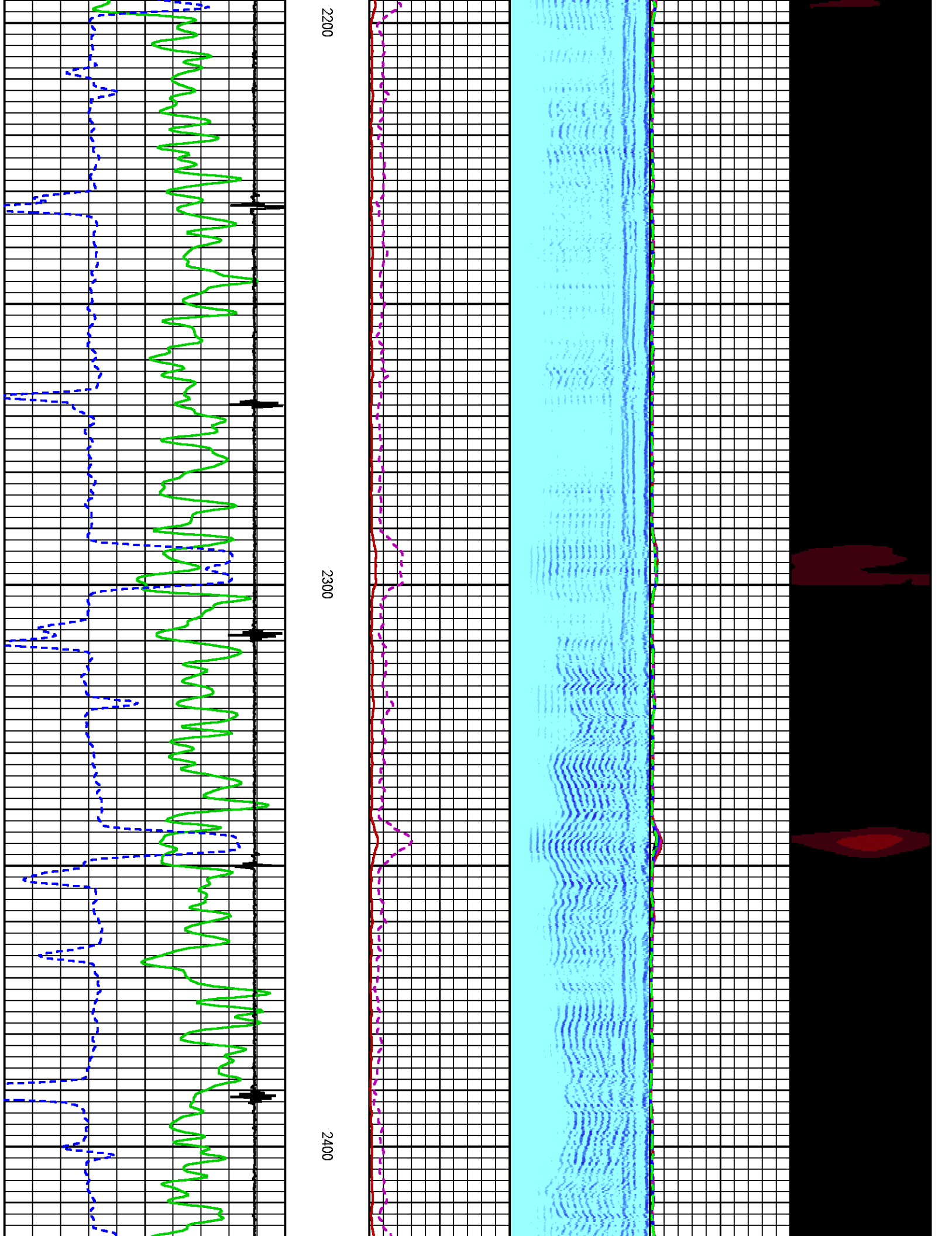


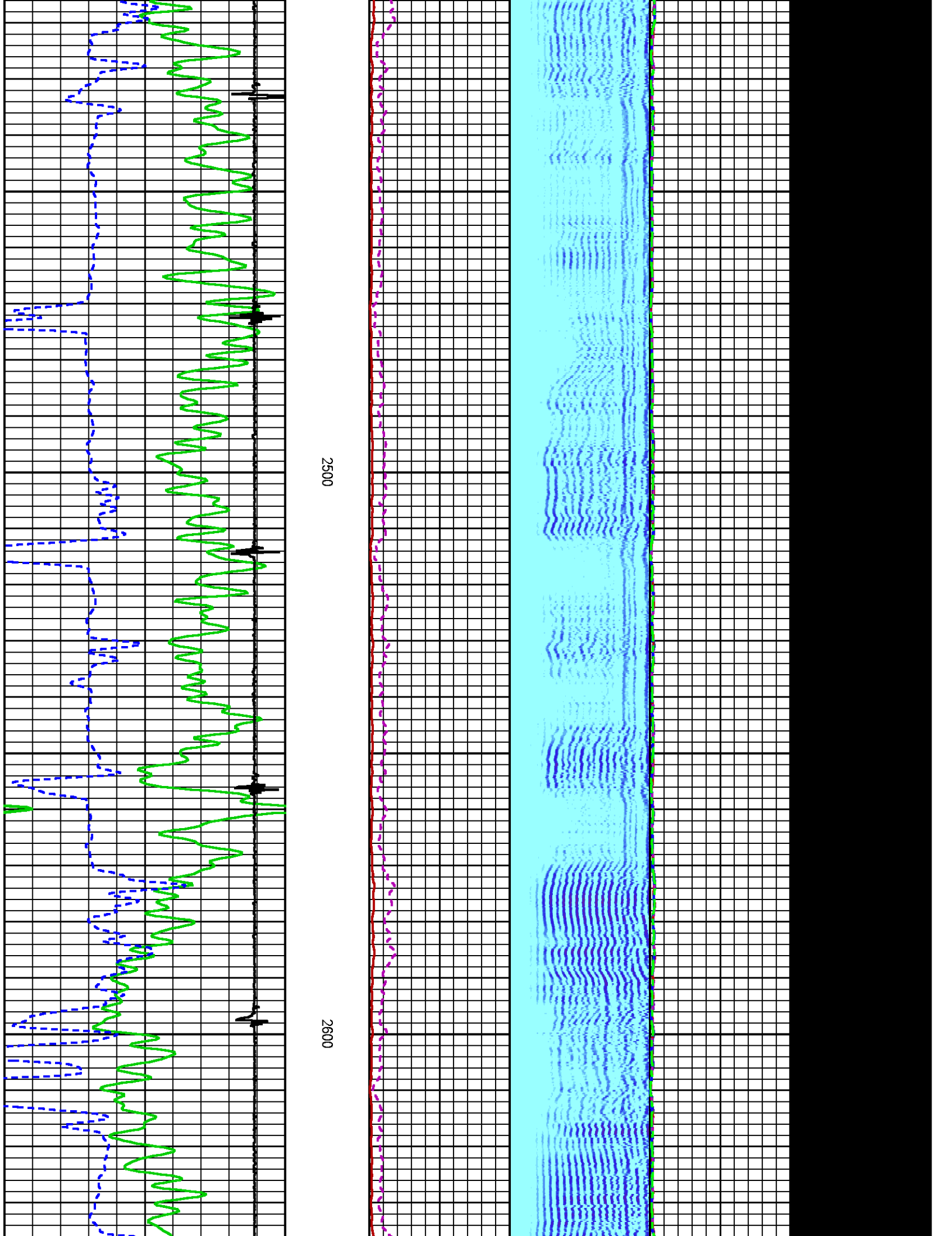
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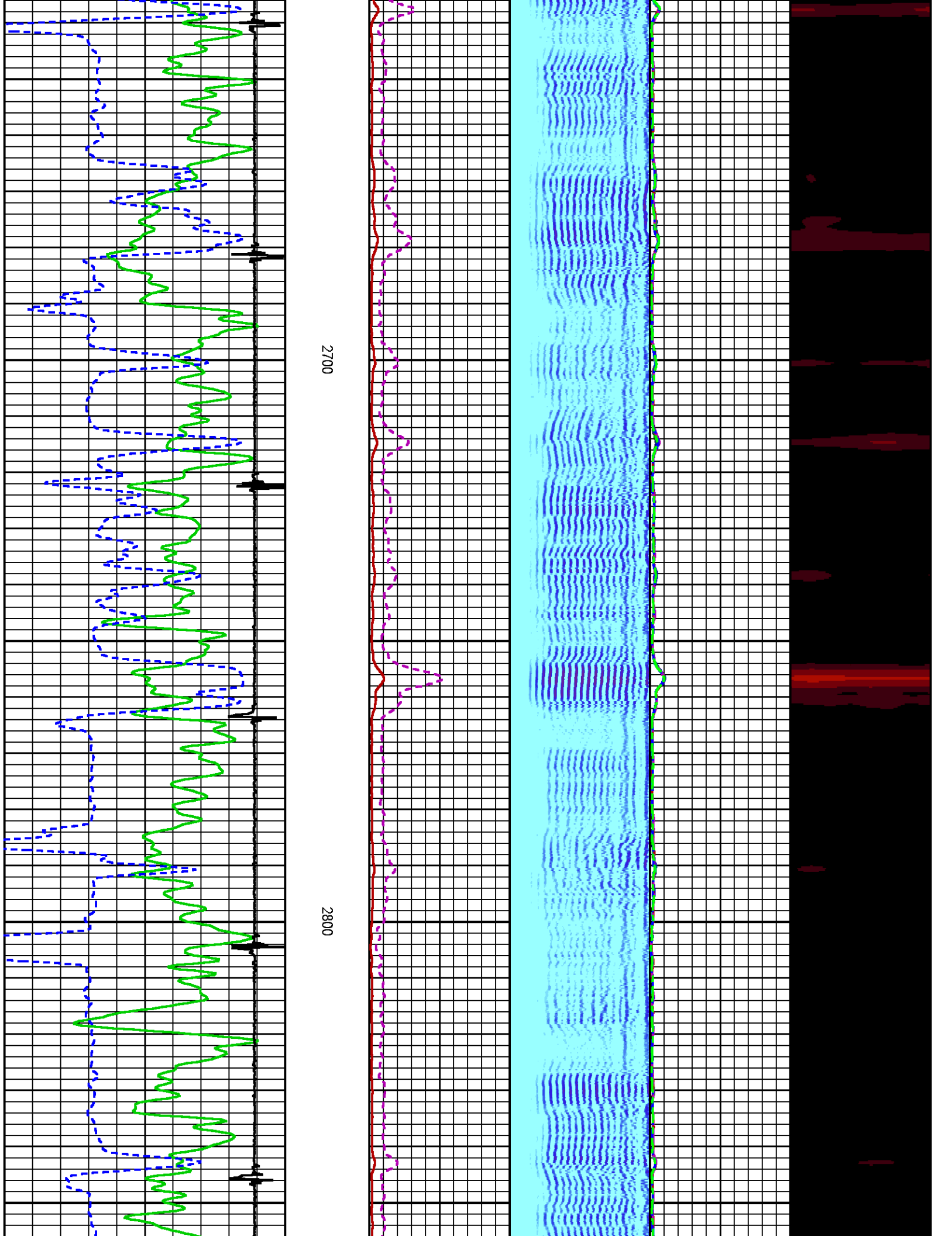
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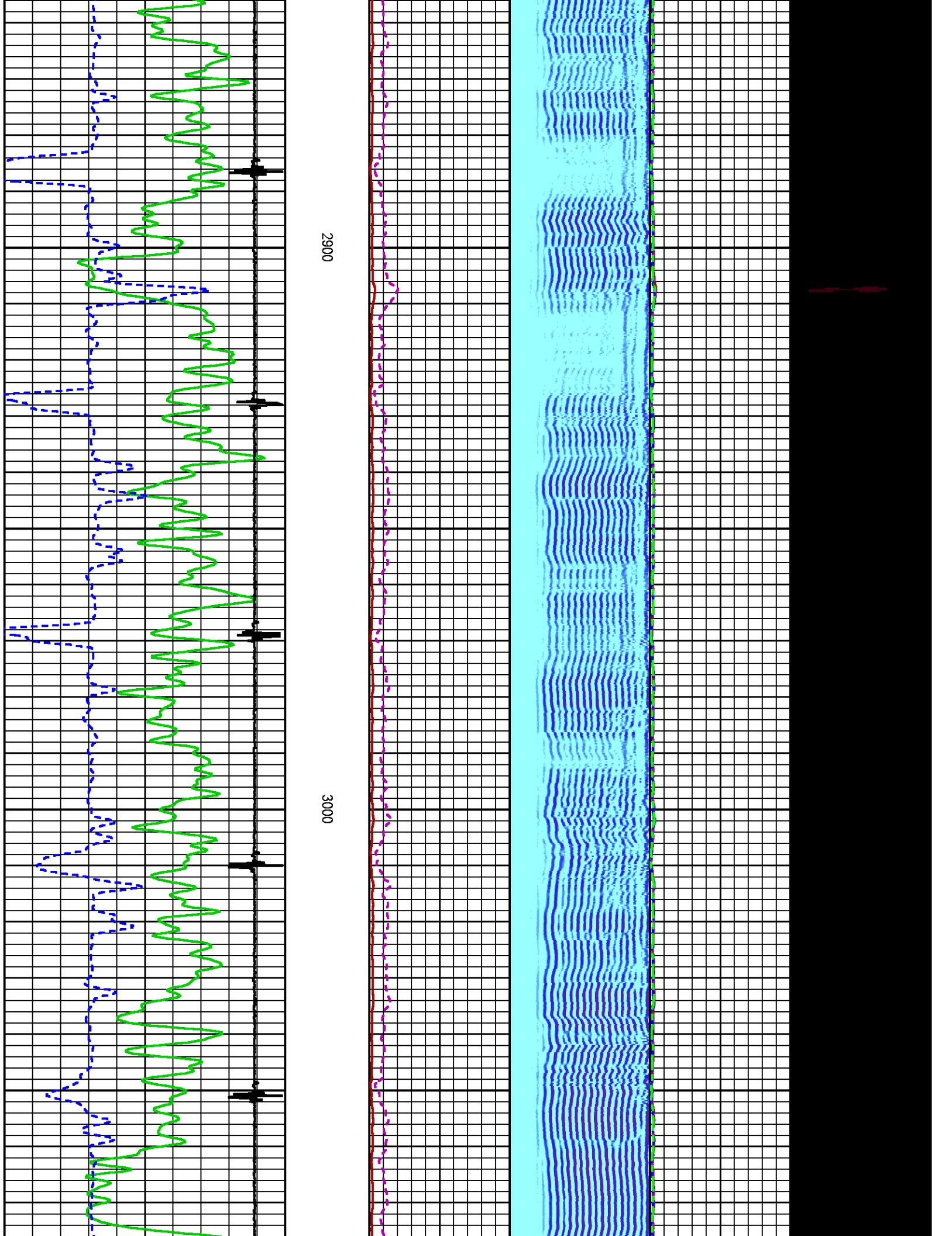


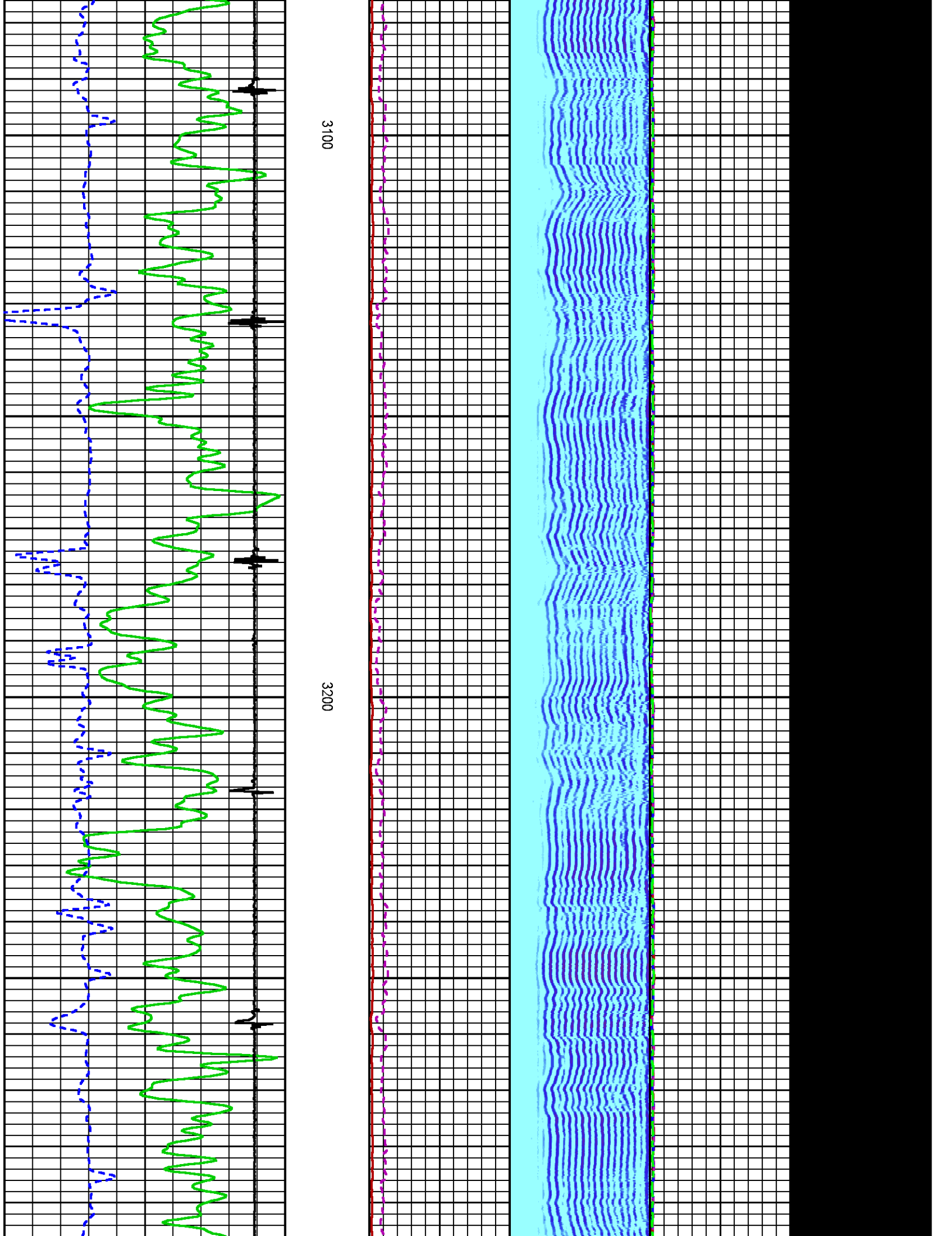


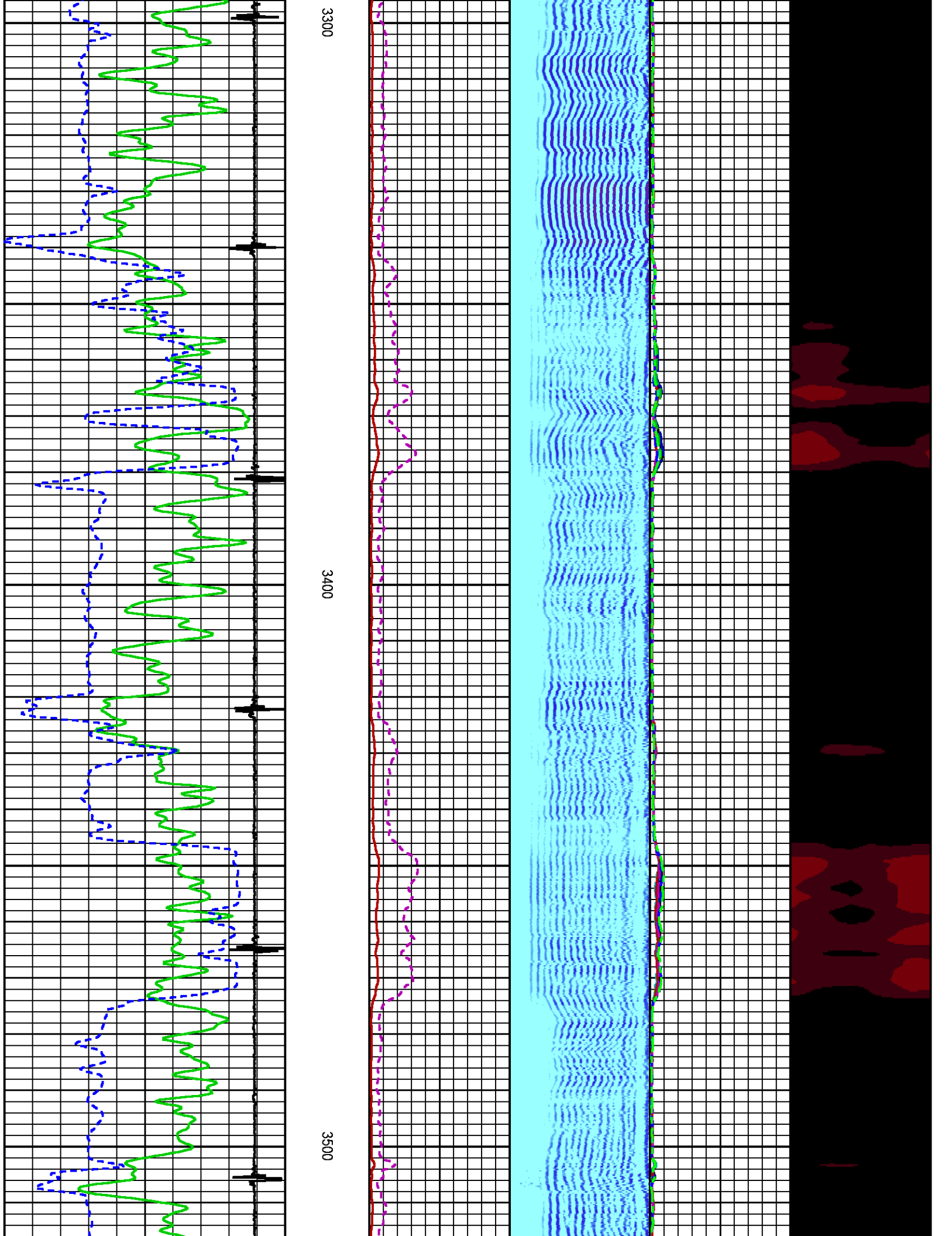


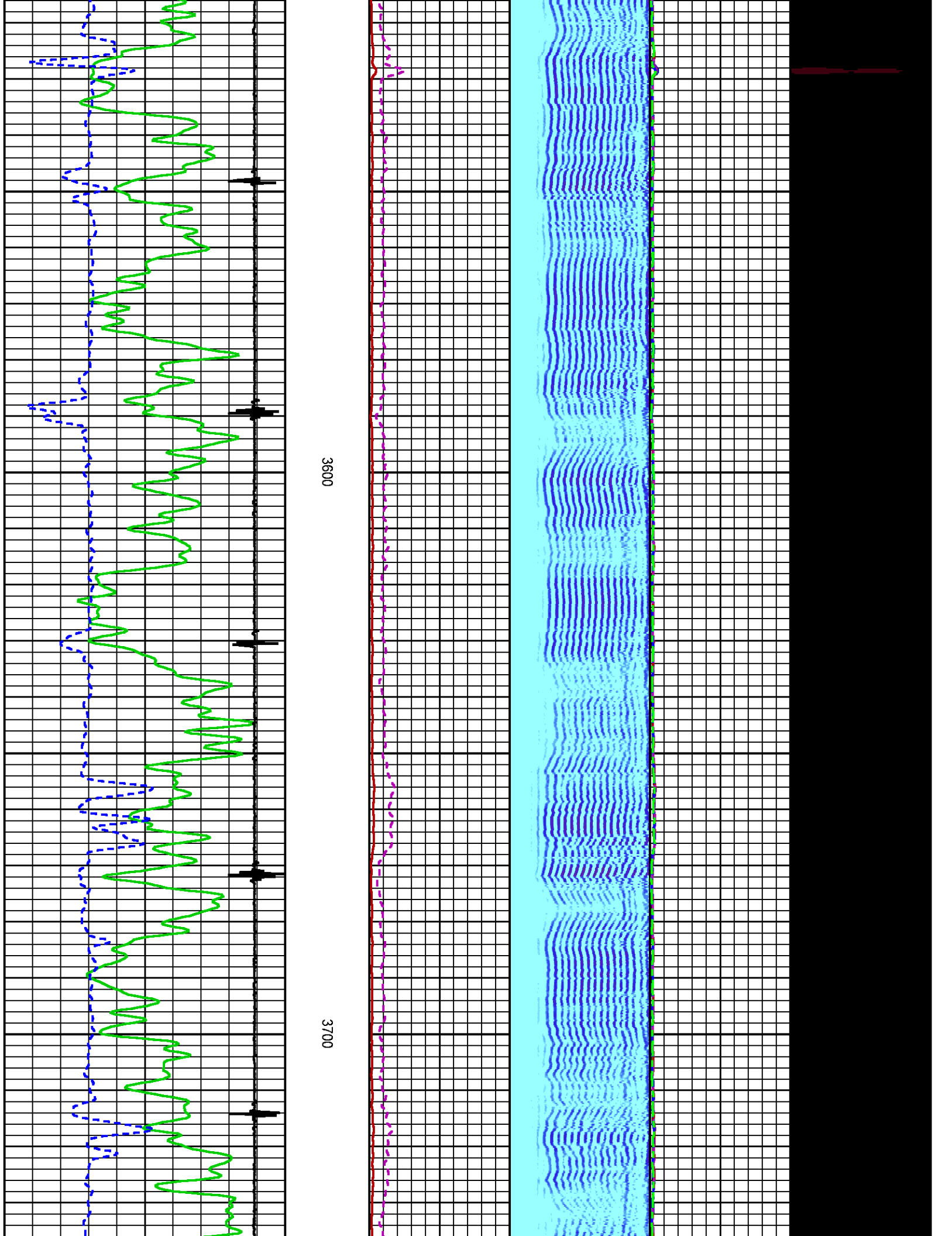


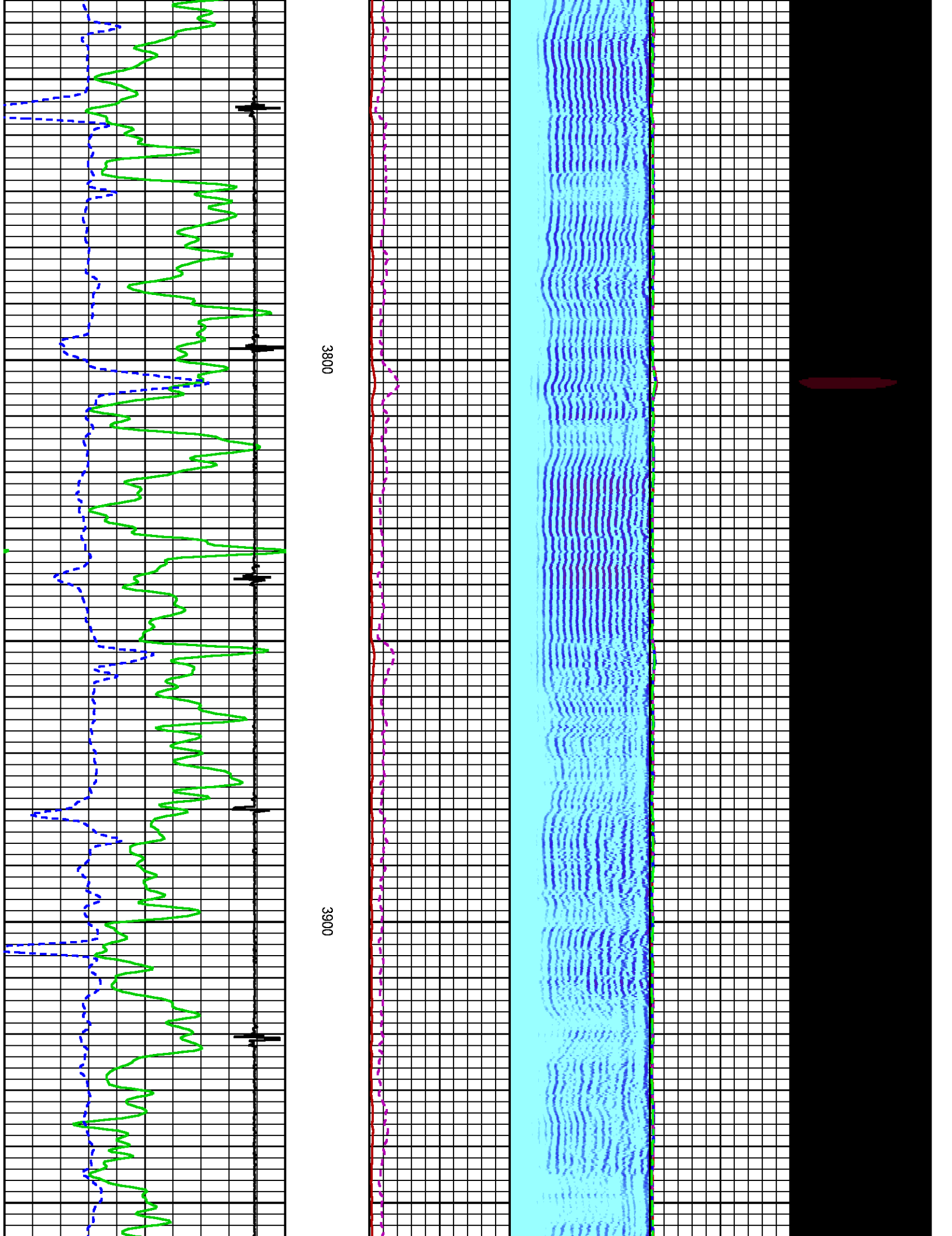




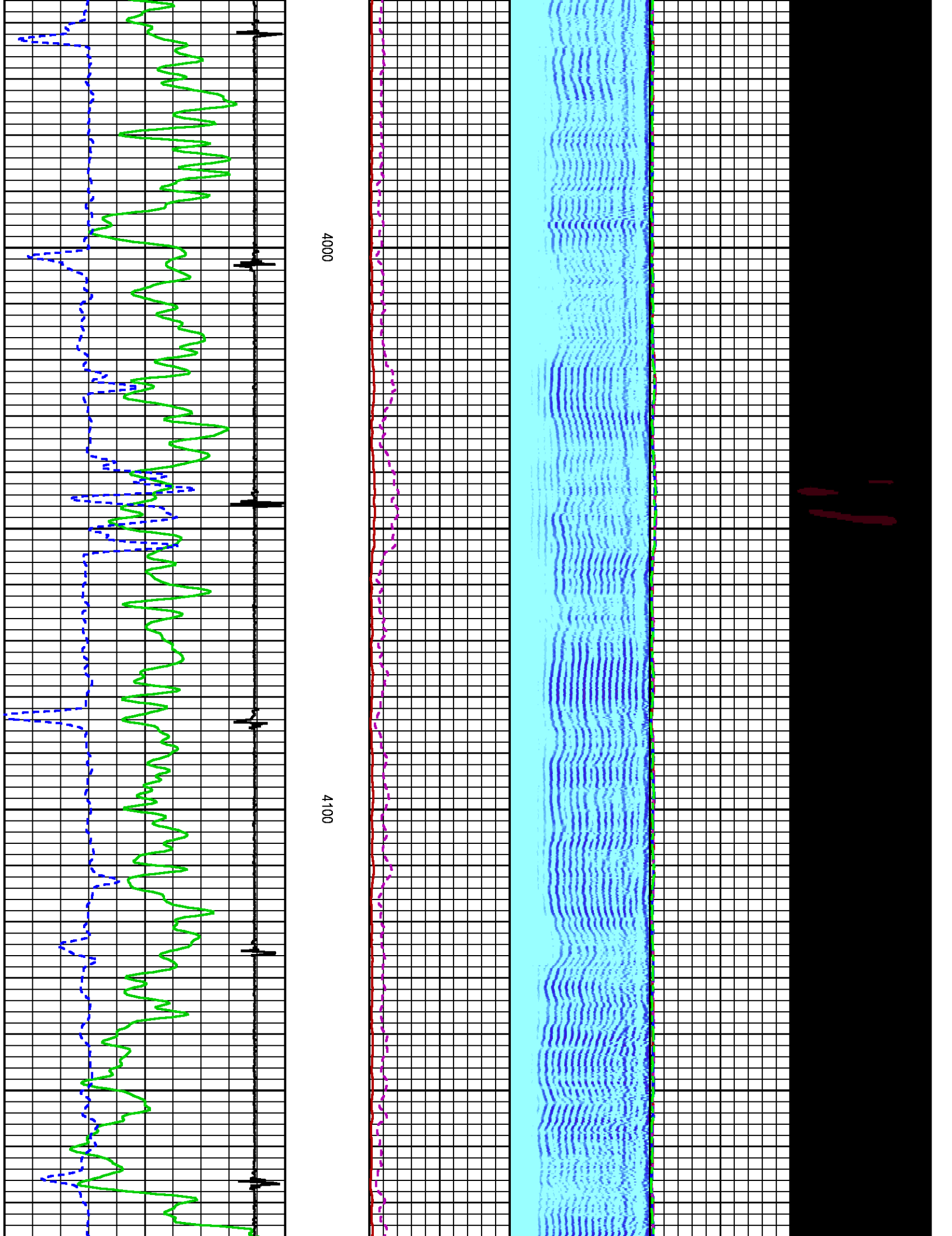


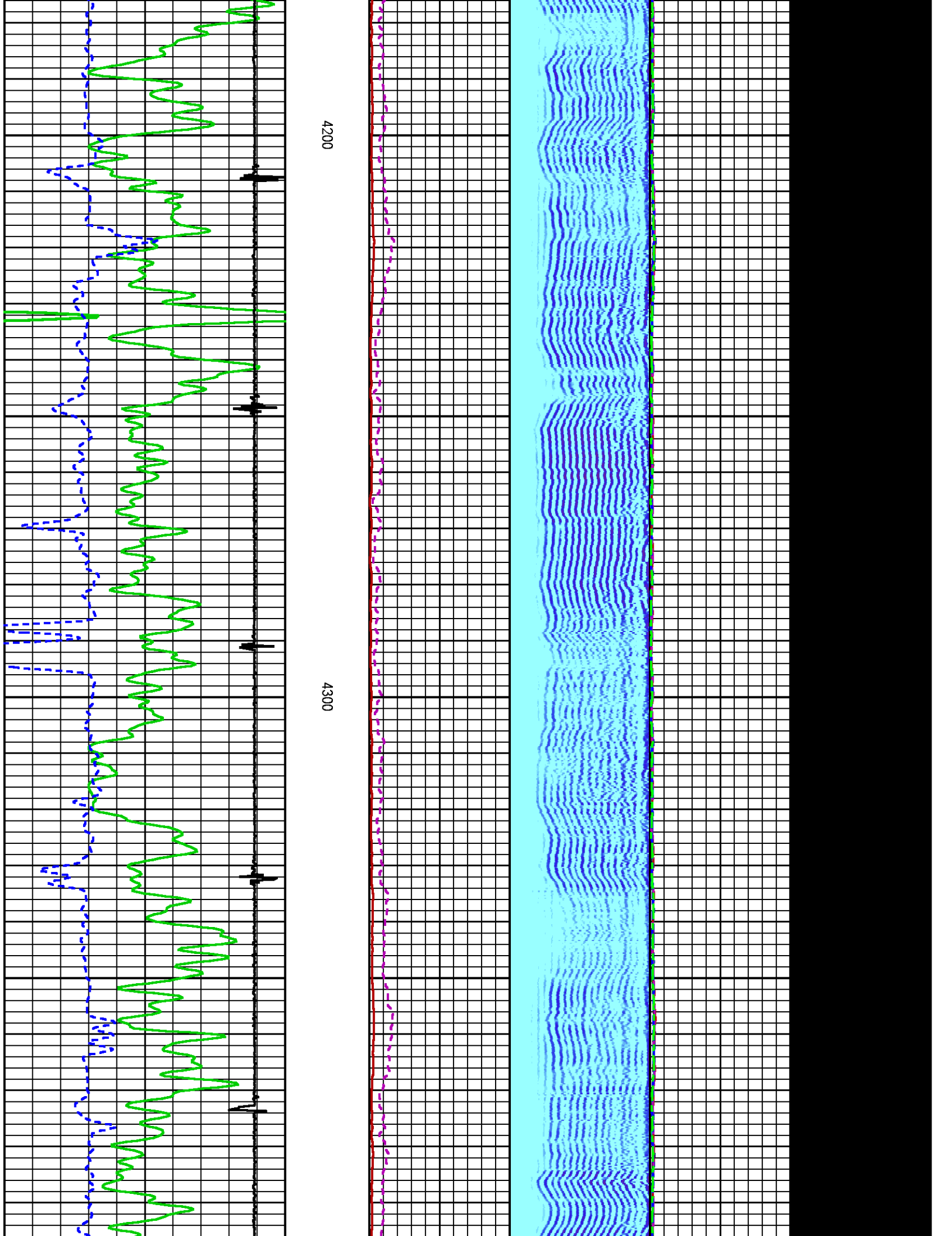


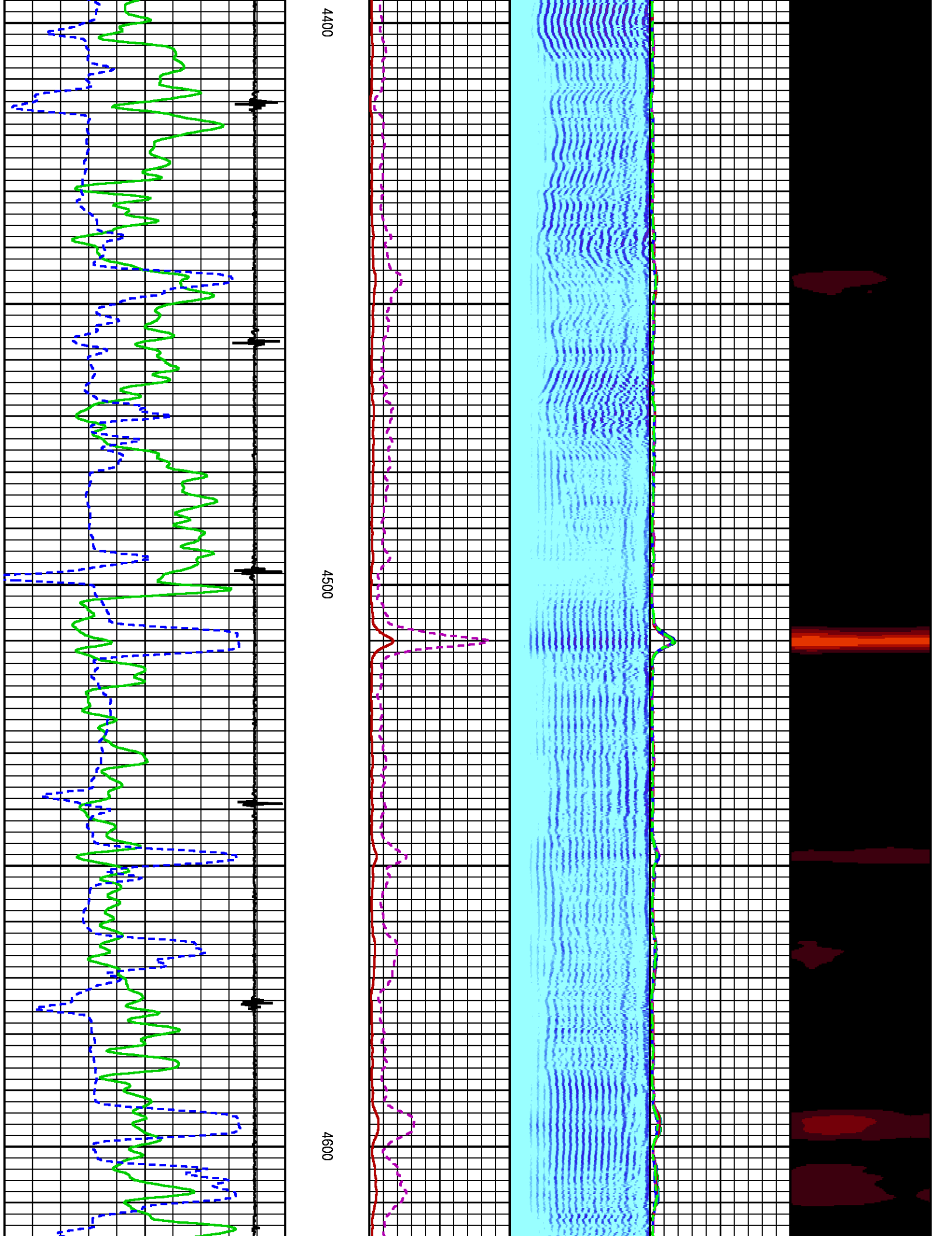


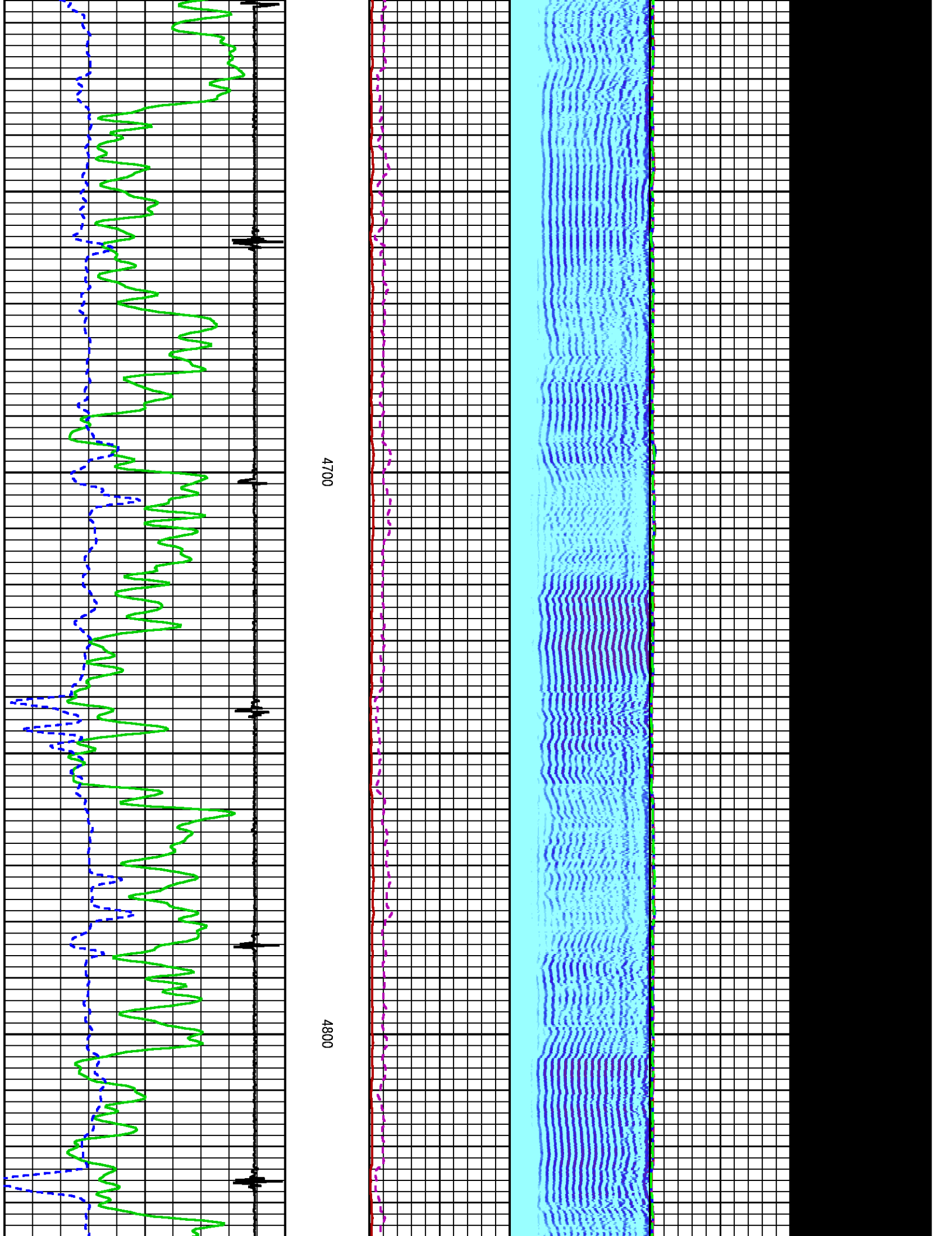


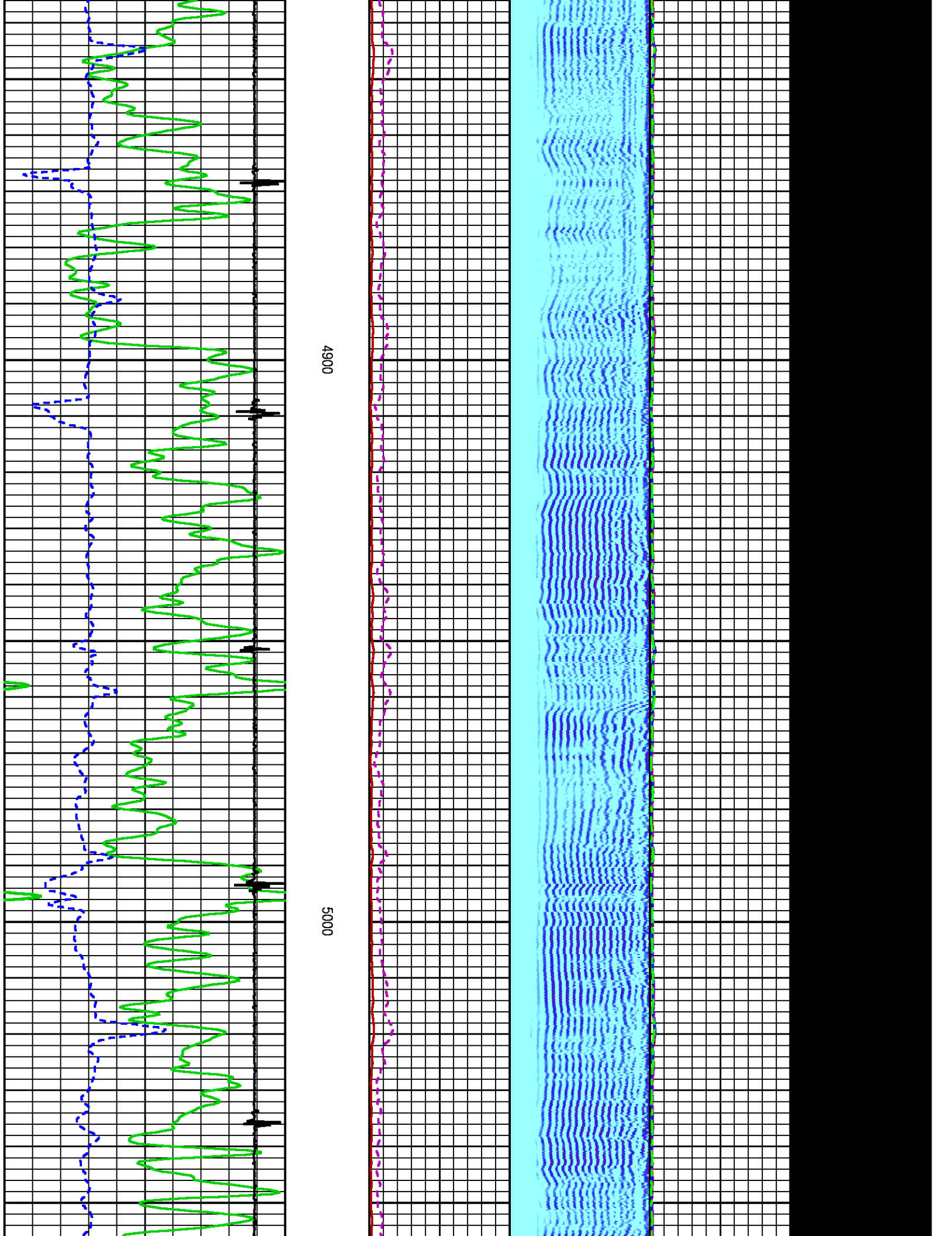
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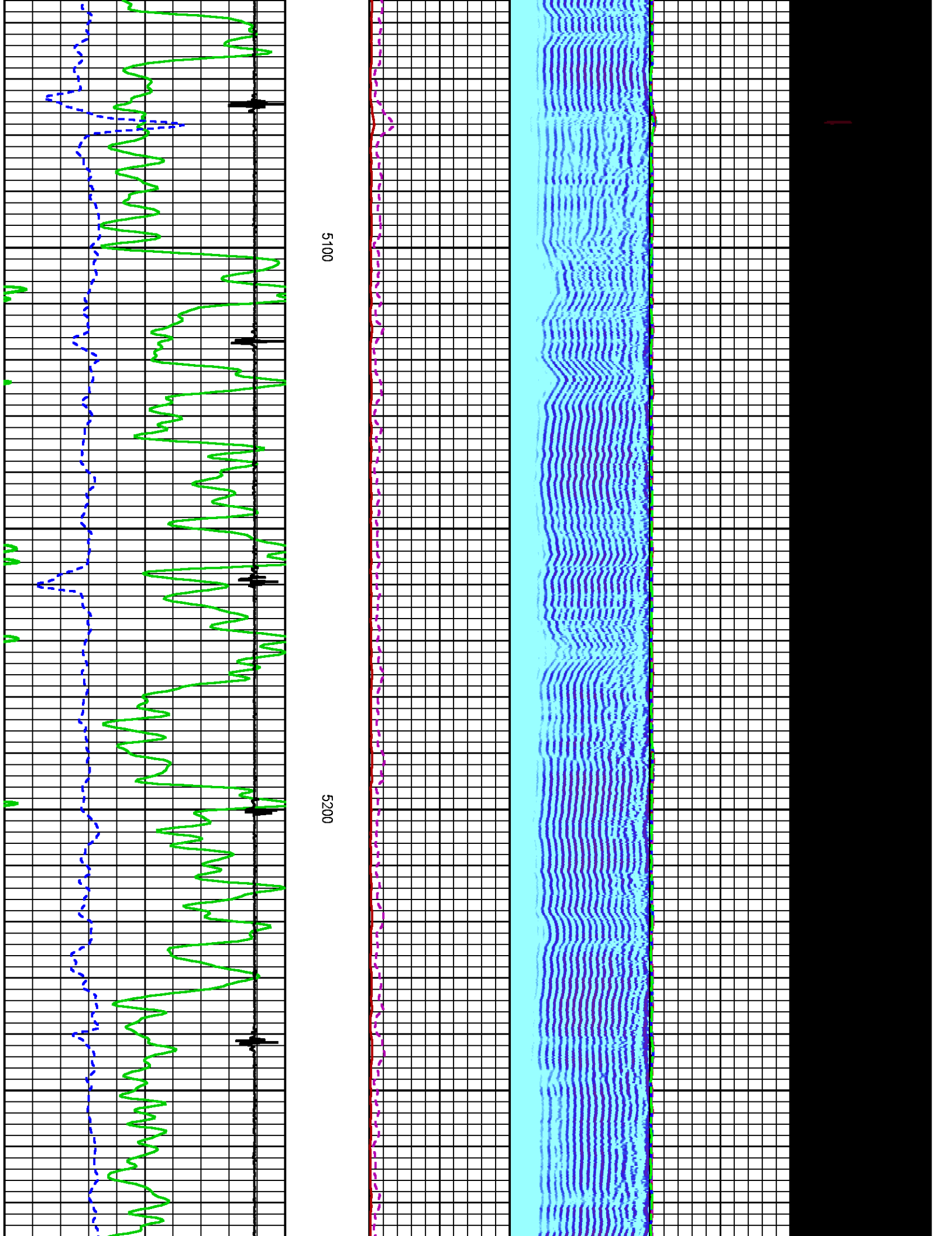


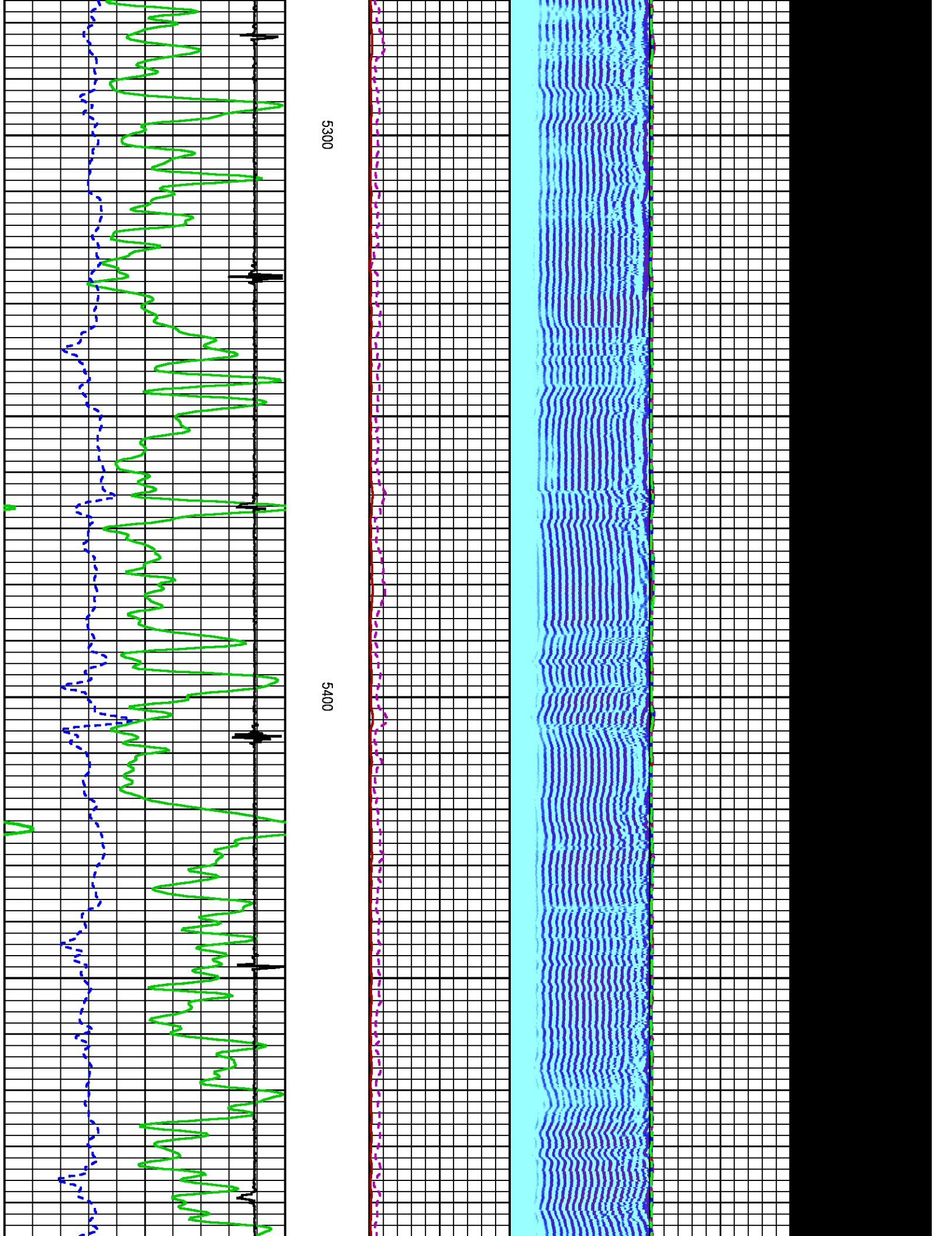




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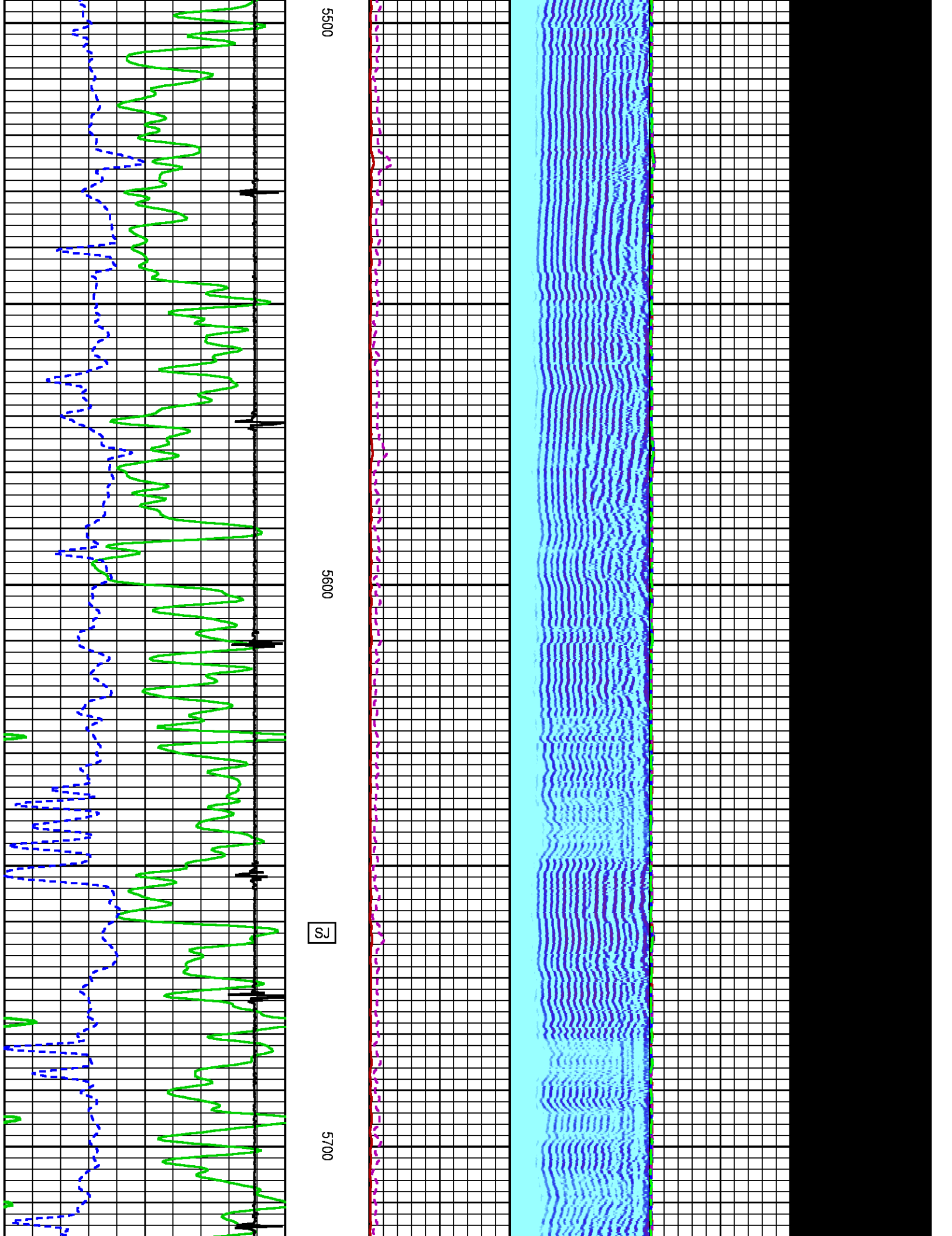
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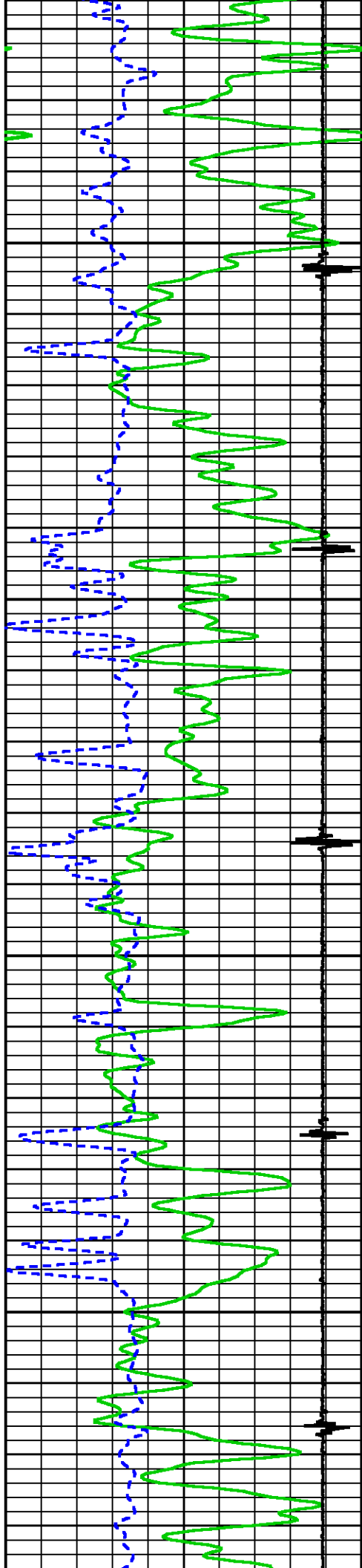




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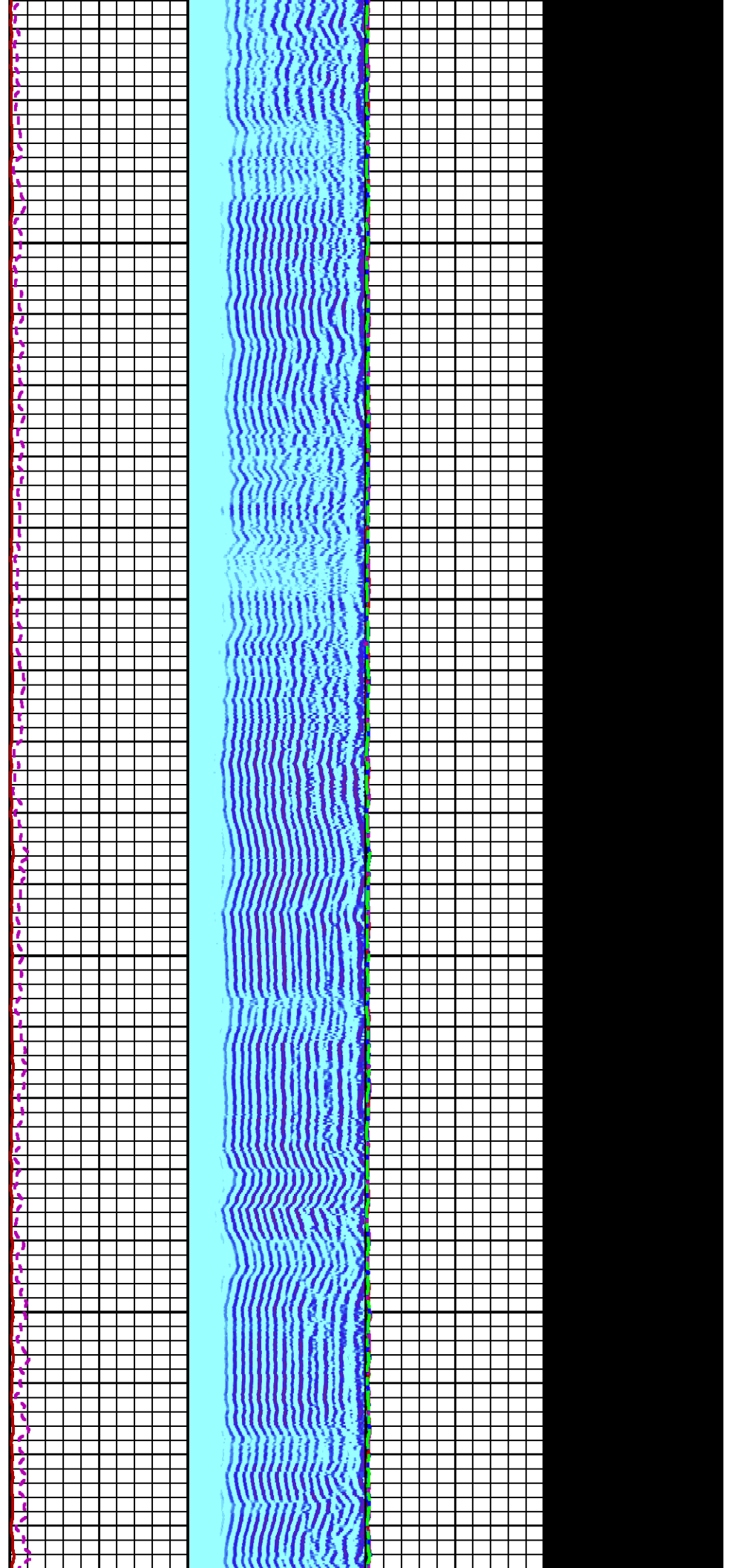
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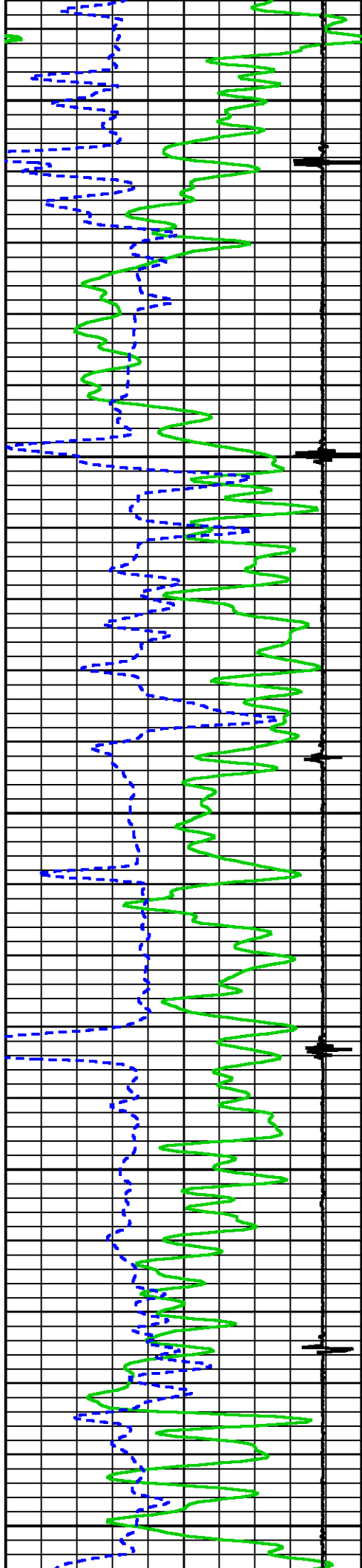




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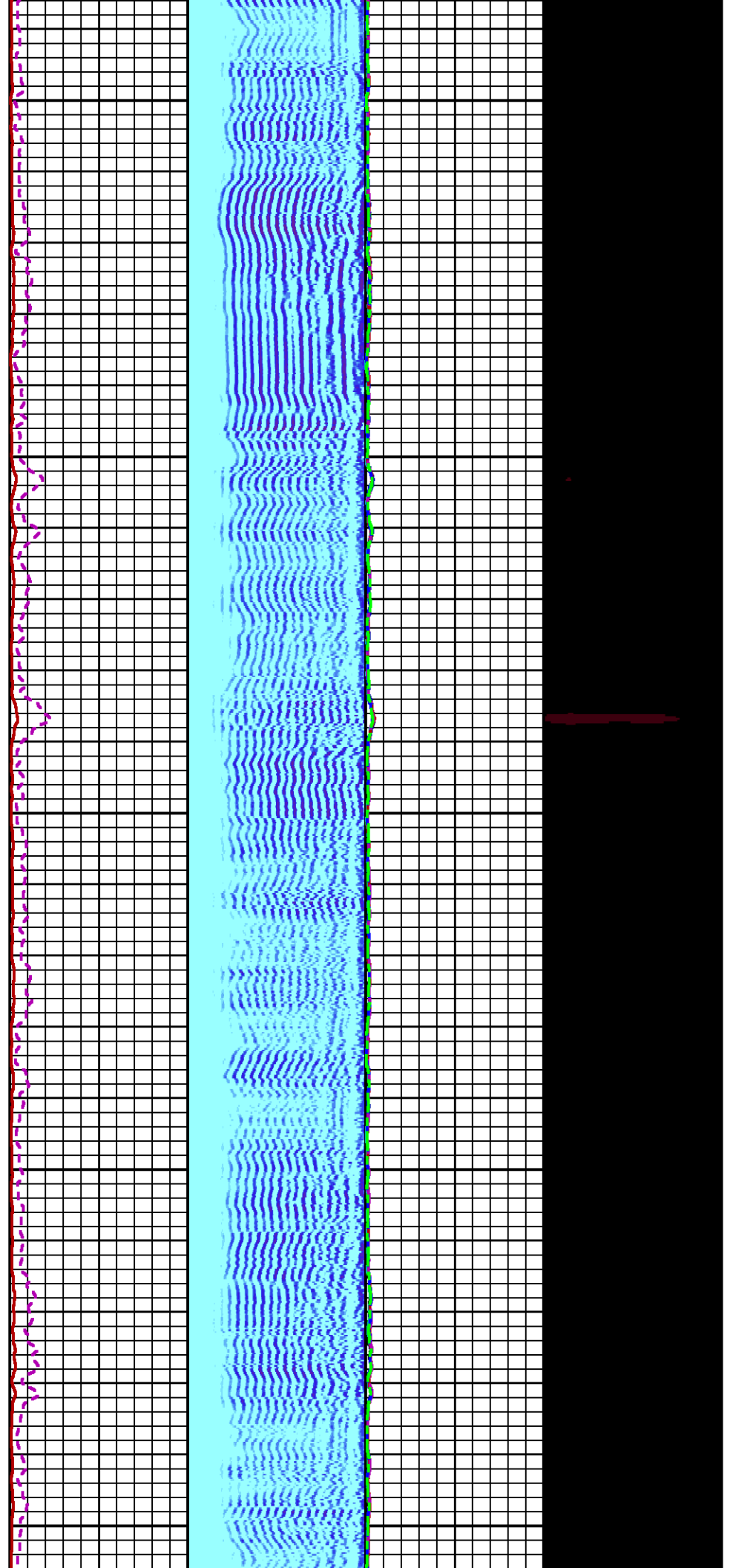
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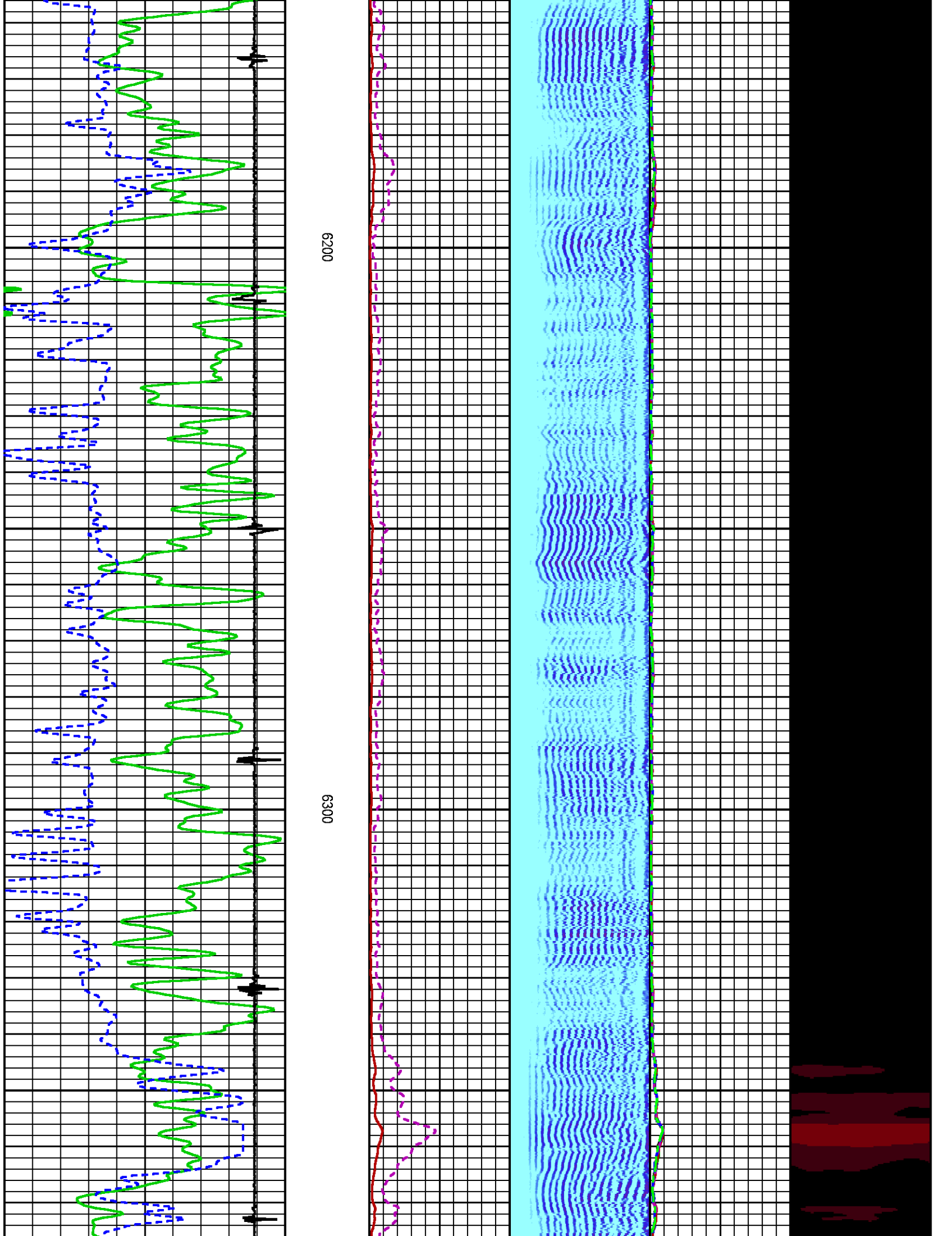


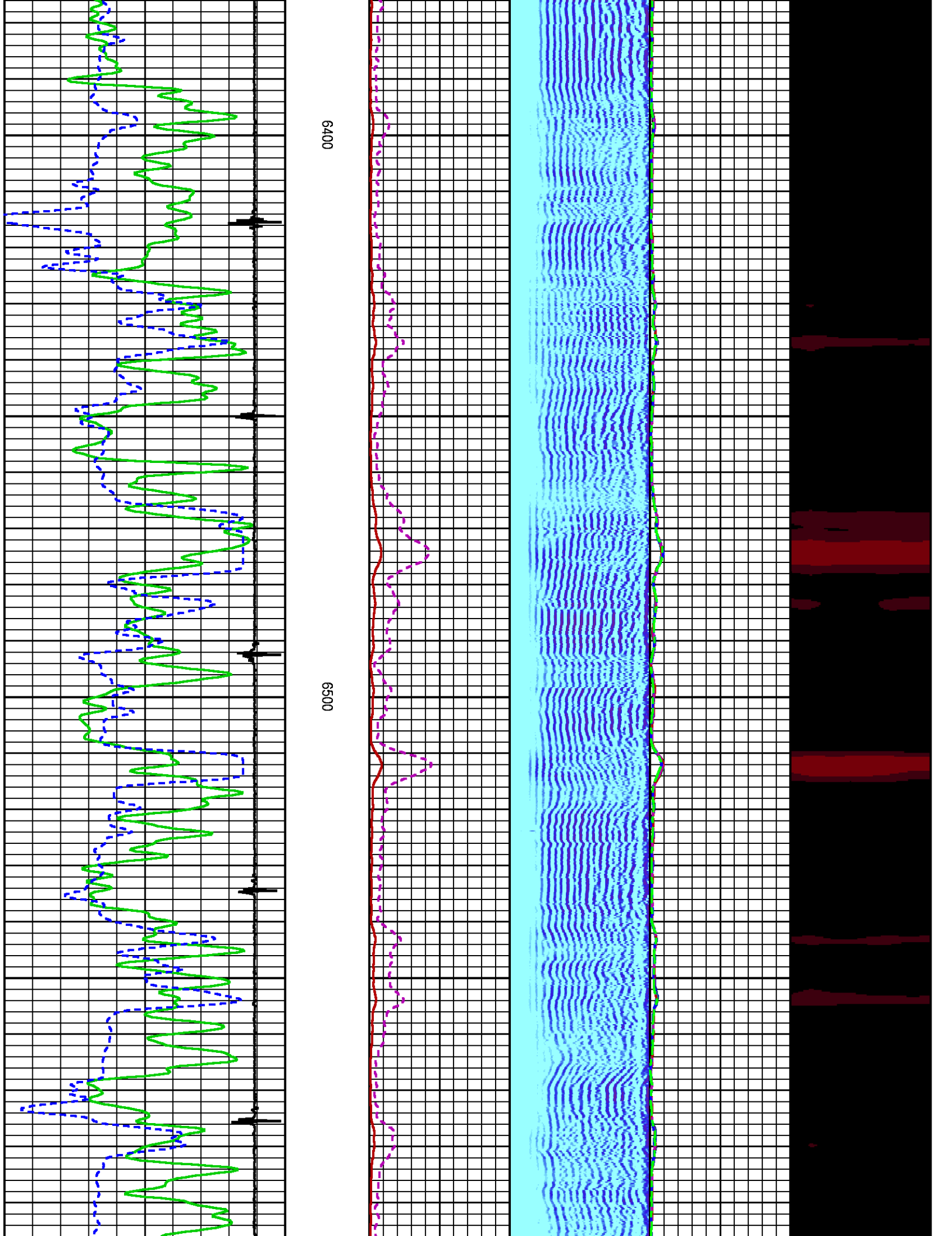


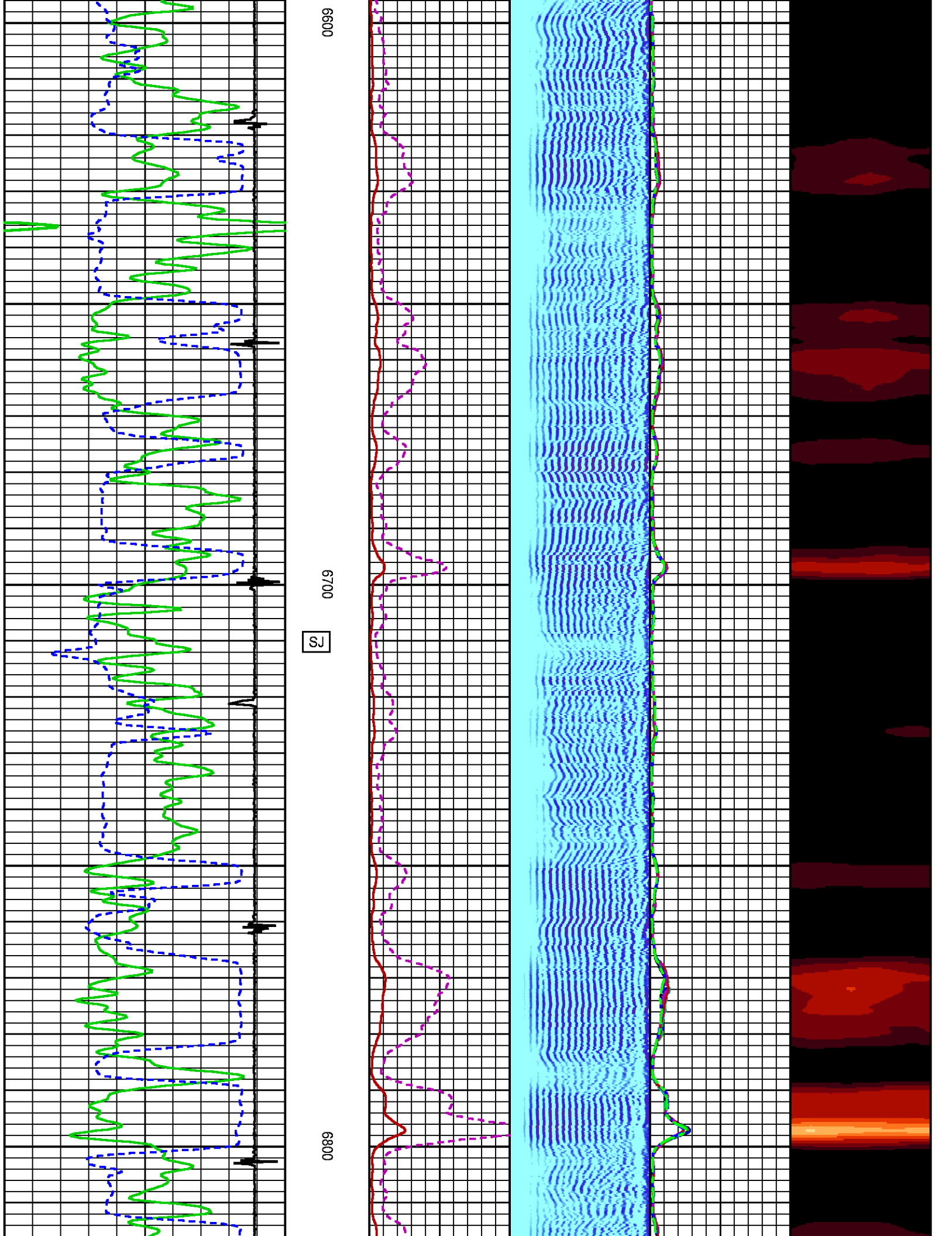
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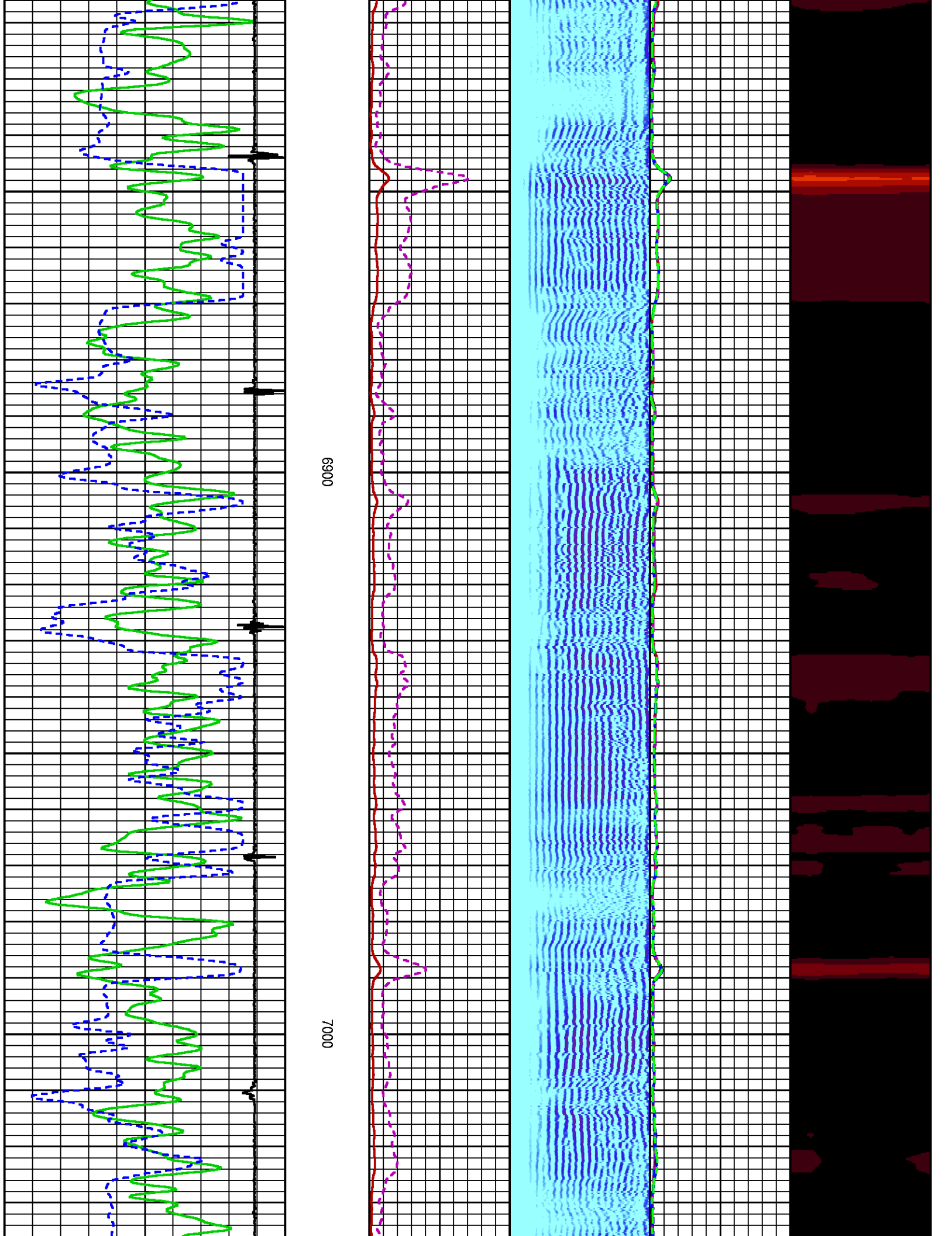
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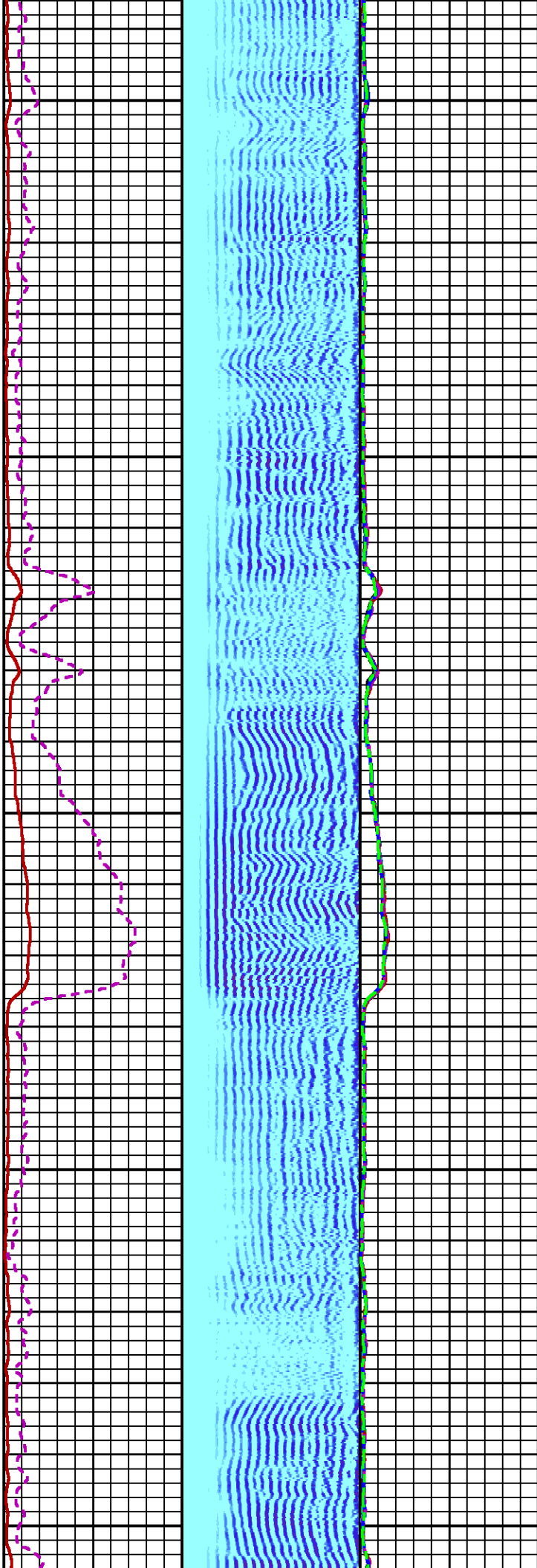
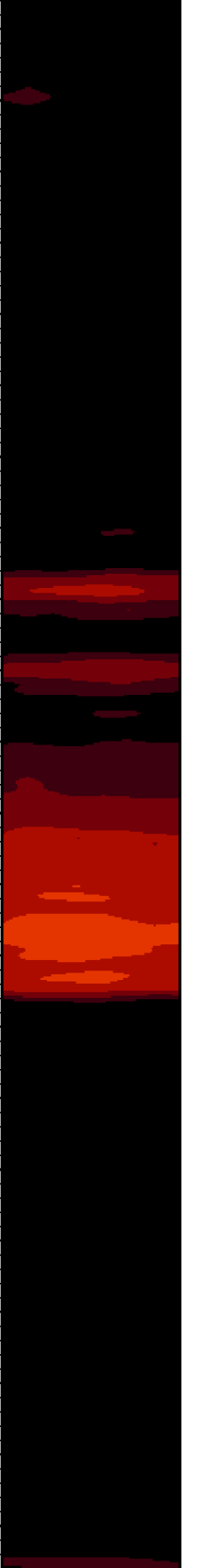






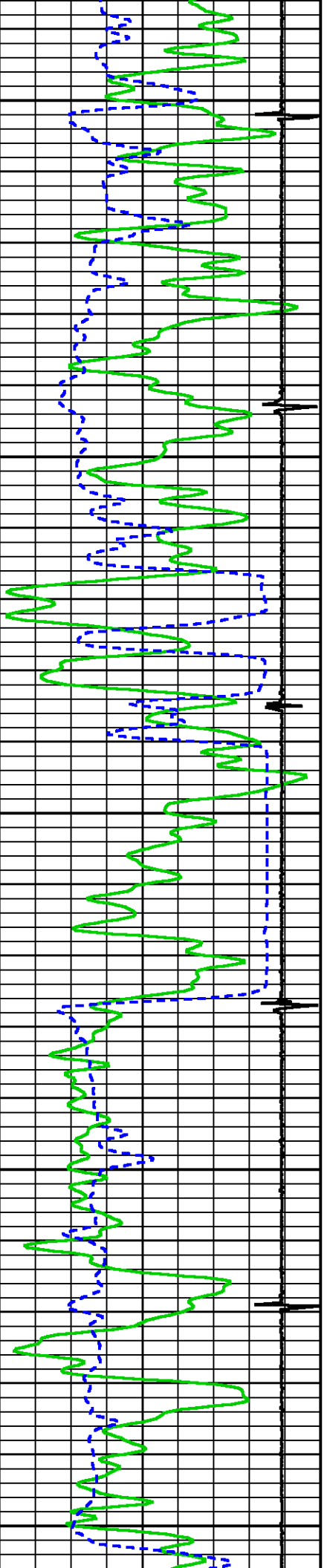


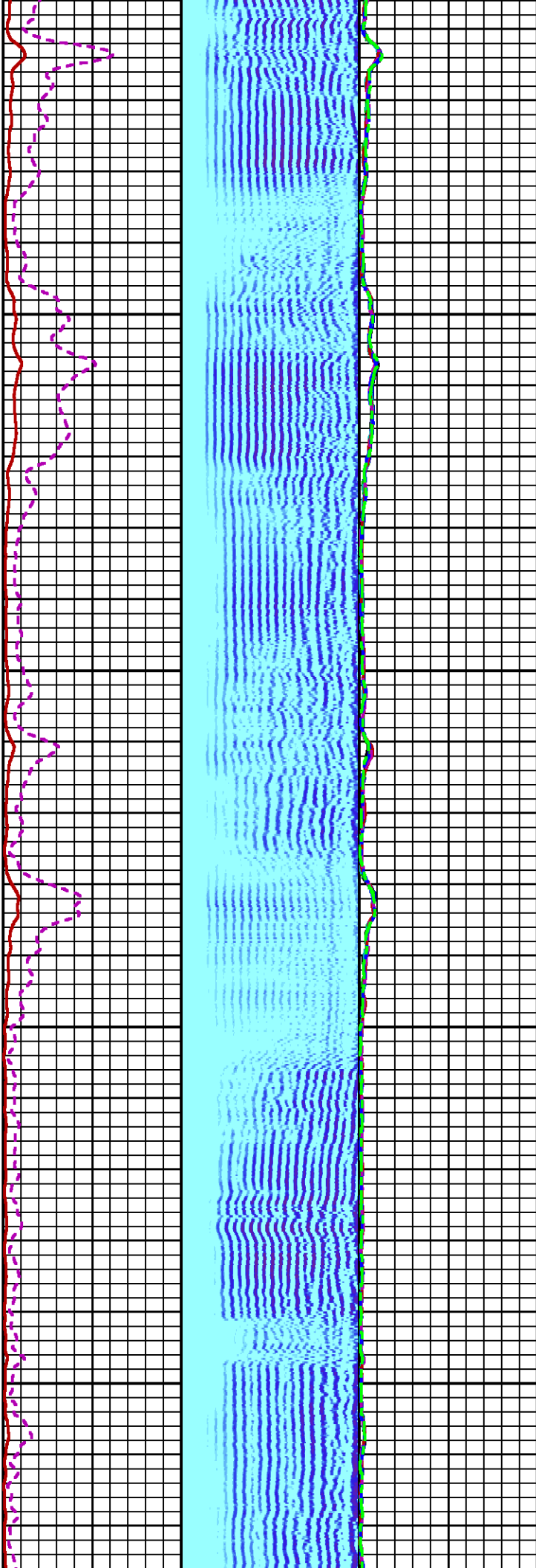




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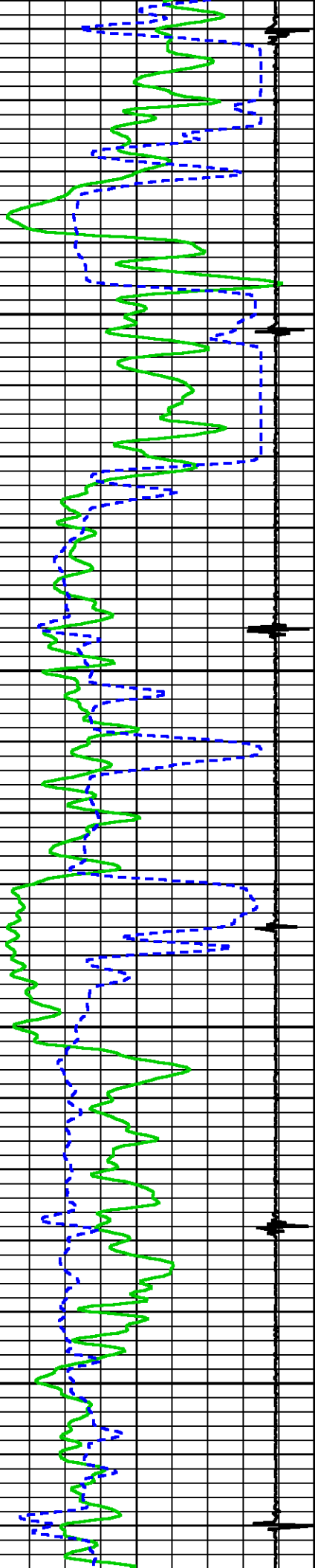
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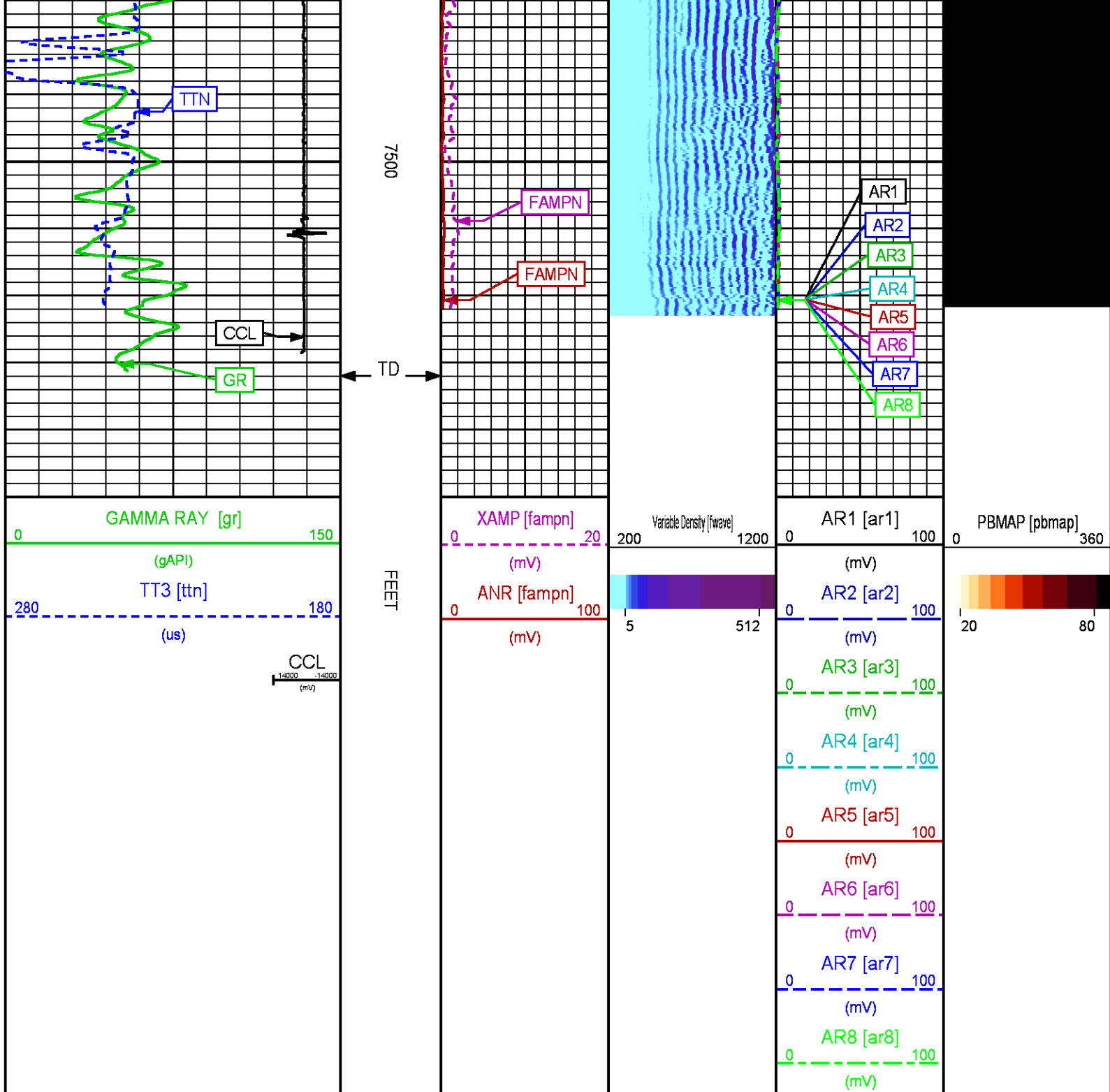




7300

7400





REPEAT PASS

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*)	187	us	TOP	BOTTOM
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	AMP WINDOW START (fgp3*)	187	us	"	"
	AMP WINDOW START (fgp4*)	187	us	"	"
	AMP WINDOW START (fgp5*)	187	us	"	"
	AMP WINDOW START (fgp6*)	187	us	"	"
	AMP WINDOW START (fgp7*)	187	us	"	"
	AMP WINDOW START (fgp8*)	187	us	"	"
	AMP WINDOW START (fgpn*)	187	us	"	"
	AMP WINDOW LENGTH	25	us	"	"
TRAVEL TIME WINDOW (NEAR)	TT WINDOW START (ttn*)	195	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*)	-72	us	"	"
	TOOL DELAY (str2*)	-72	us	"	"
	TOOL DELAY (str3*)	-72	us	"	"
	TOOL DELAY (str4*)	-72	us	"	"
	TOOL DELAY (str5*)	-72	us	"	"
	TOOL DELAY (str6*)	-72	us	"	"
	TOOL DELAY (str7*)	-72	us	"	"
	TOOL DELAY (str8*)	-72	us	"	"
	TOOL DELAY (strn*)	-72	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	Nov 15 10:20:00 2018	FIXED GATE AMPLITUDE T-R1
F1:AR2	Nov 15 10:20:00 2018	FIXED GATE AMPLITUDE T-R2
F1:AR3	Nov 15 10:20:00 2018	FIXED GATE AMPLITUDE T-R3
F1:AR4	Nov 15 10:20:00 2018	FIXED GATE AMPLITUDE T-R4
F1:AR5	Nov 15 10:20:00 2018	FIXED GATE AMPLITUDE T-R5

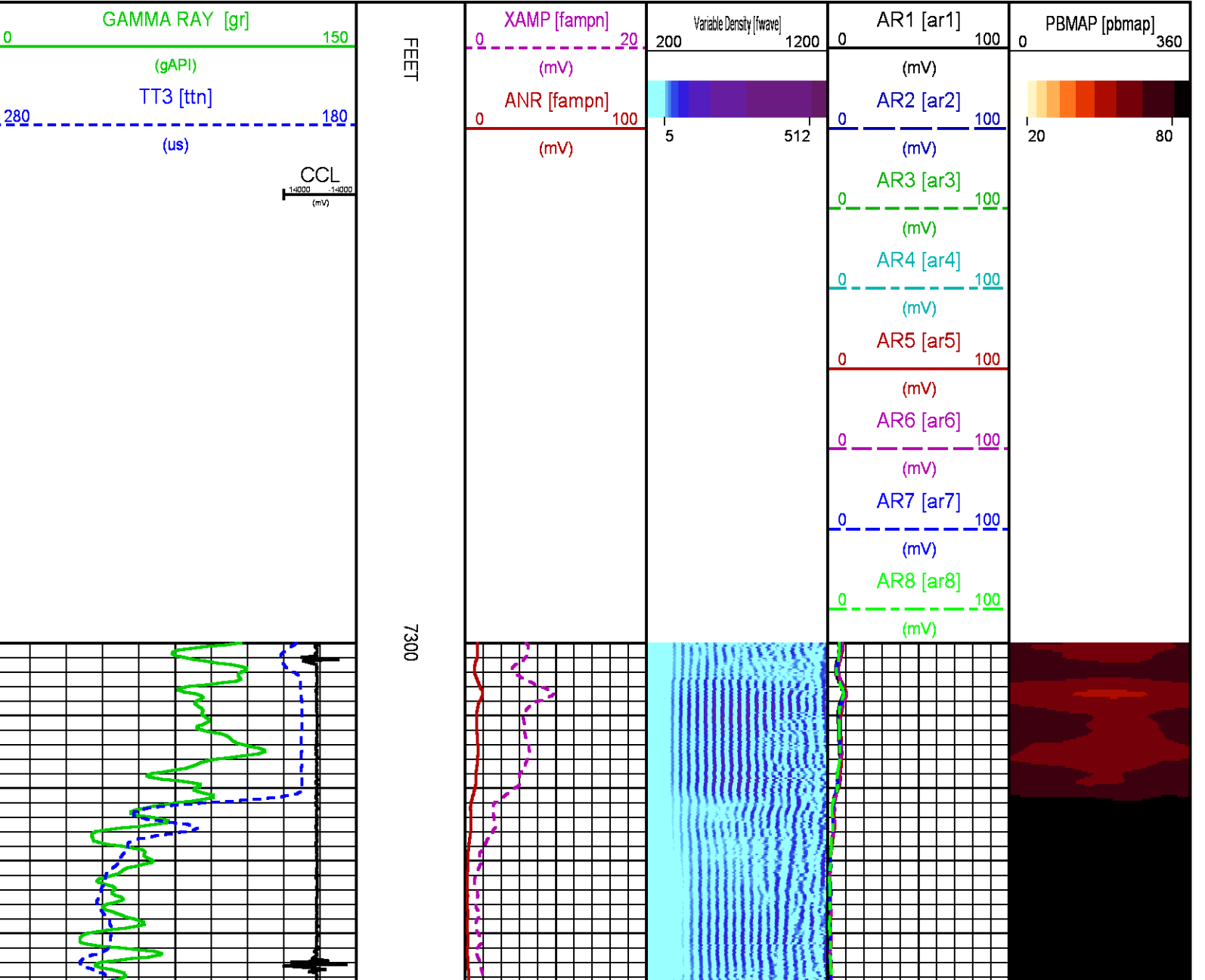
F1:AR3	Nov 15 10:20:00 2018	FIXED GATE AMPLITUDE T-R3
F1:AR6	Nov 15 10:20:00 2018	FIXED GATE AMPLITUDE T-R6
F1:AR7	Nov 15 10:20:00 2018	FIXED GATE AMPLITUDE T-R7
F1:AR8	Nov 15 10:20:00 2018	FIXED GATE AMPLITUDE T-R8
F1:CCL	Nov 15 10:20:00 2018	CASING COLLAR LOCATOR
F1:FAMPN	Nov 15 10:20:00 2018	FIXED GATE AMPLITUDE NEAR RECEIVER
F1:FWAVE	Nov 15 10:20:00 2018	FAR WAVE FORM
F1:GR	Nov 15 10:20:00 2018	GAMMA RAY
F1:PBMAP	Nov 15 10:20:00 2018	PERCENT BOND CEMENT MAP
F1:TTN	Nov 15 10:20:00 2018	TRAVELTIME FROM NEAR TRANSMITTER-RECEIVER

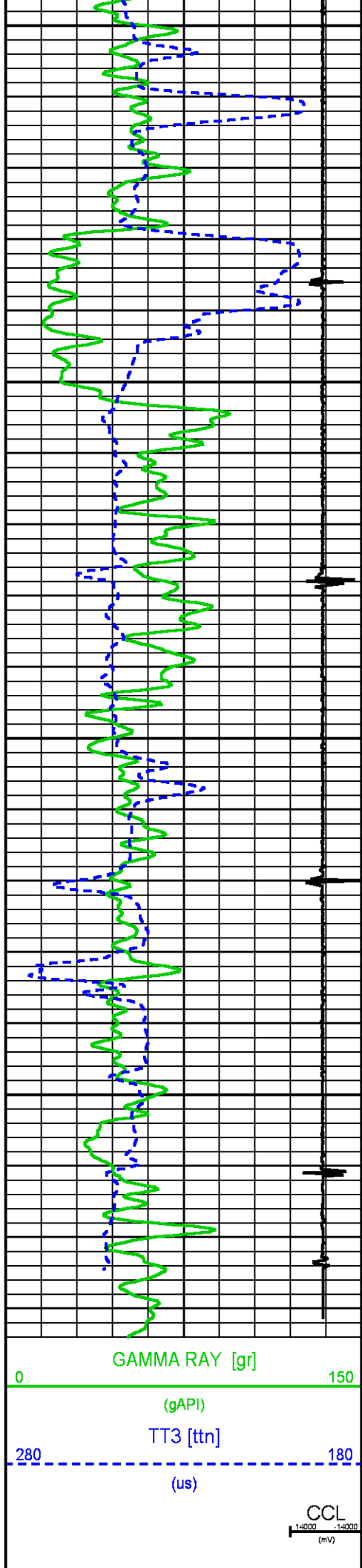
CURVE MEASURE POINT OFFSET

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_06W/LARAMIE_RAL.fvpdf [5"/100" Scale]
Plot Interval : 7300 - 7535.75 Feet

Data File 1 : F1 : SysA:/dat1a/LARAMIE_BCU_0993_21_06W/p012g01.xtf
Created On : Nov 15 10:20:00 2018
Company : LARAMIE ENERGY LLC
Well : BCU-0993-021-06W
Field : BUZZARD CREEK
File Interval : 7264.25 - 7537 Feet
OCT : p012g

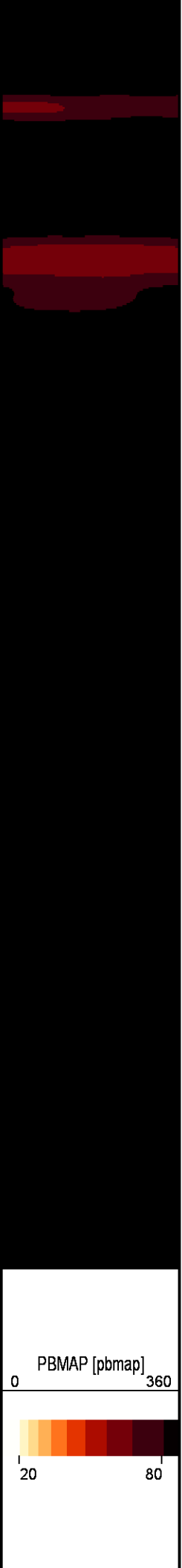
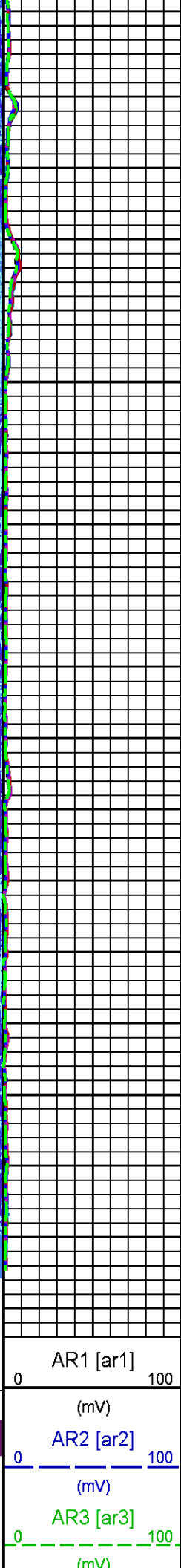
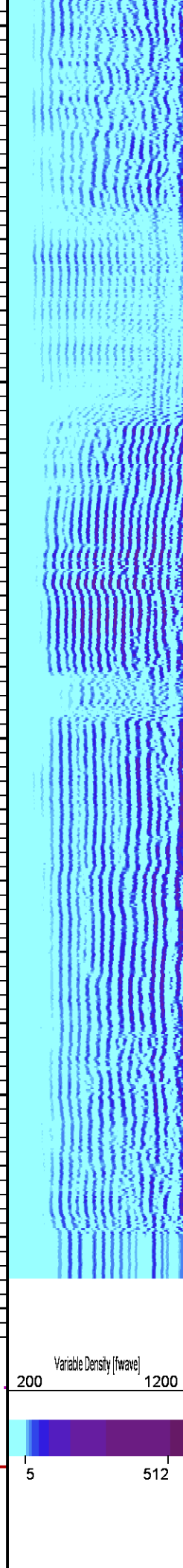
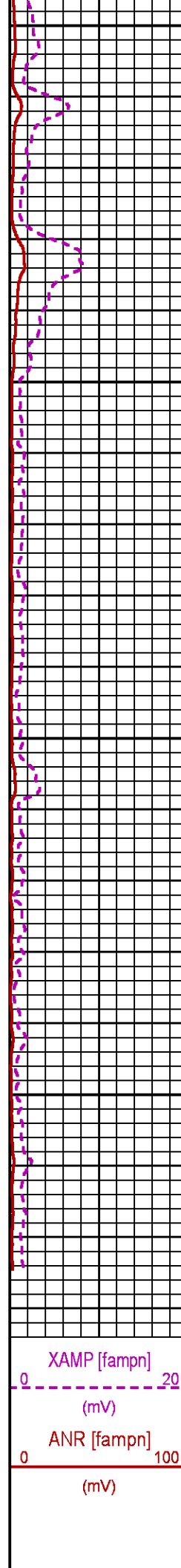


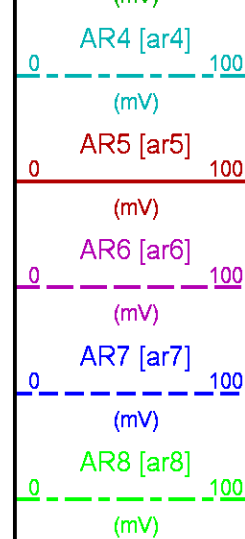


7400

7500

FEET





CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/LARAMIE_BCU_0993_21_06W/p012g.tp1

RAL PRIMARY CALIBRATION SUMMARY

TOOL #: 1426XA 10222301

DATE/TIME PERFORMED: Mon Nov 12 16:51:59 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)	-0.08	-0.11	-0.07	0.00	-0.01	-0.03	-0.08	-0.02	-0.07	0.04	0.02
AMP FLUID (mV)	218	216	219	221	221	217	215	214	215	300	213
TT (us)	216	217	216	216	216	216	216	216	218	324	216
M FACTOR	0.46	0.46	0.46	0.45	0.45	0.46	0.46	0.47	0.46	0.50	0.47

RAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1426XA 10222301

DATE/TIME PERFORMED: Thu Nov 15 09:47:14 2018

DAYS SINCE CAL: 2

UNIT #: 5753XD 10412898

CABLE #: ml4268 small1

	NEAR (mV)	R1 (mV)	R2 (mV)	R3 (mV)	R4 (mV)	R5 (mV)	R6 (mV)	R7 (mV)	R8 (mV)	FAR (mV)	CAL (mV)
ZERO	-0.08	-0.11	-0.07	0.00	-0.01	-0.03	-0.08	-0.02	-0.07	0.04	0.02
AMP AIR	0.54	0.61	0.51	0.56	0.53	0.60	0.59	0.43	0.55	1.08	101.85

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 CALIBRATION GR DIFF MULT BACKGROUND CALIBRATION CALIBRATION

	BACKGROUND (cts)	CALBRTR ON (cts)	GR 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_05W/RAL-tdg

A3 CABLEHEAD

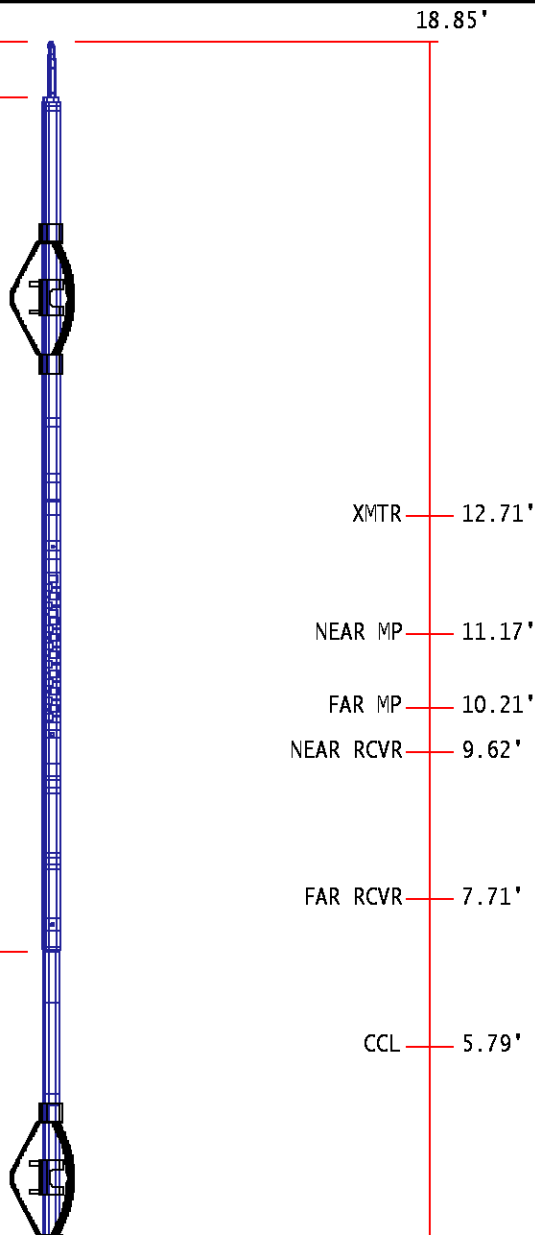
Diameter : 1.37"

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



Series : 1555XA
Mnemonic : RAL
Measure Point: 5.79': CCL
Measure Point: 1.67': GR
Measure Point: 0.17': TEMP



GR 1.67'

TEMP 0.17'

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

**BAKER
HUGHES**
a GE company



ECLIPS

COMPANY LARAMIE ENERGY LLC

WELL BCU-0993-21-06W

FIELD BUZZARD CREEK

COUNTY MESA **STATE** COLORADO

FILE NO:

CH145362

API NO:

05077105240000

LOCATION:

BHL: 1361 FNL 1280.0 FWL

SEC 21 TWP 09 S RGE 93W

ELEVATIONS:

KB 7293 FT

DF

GL 7263 FT

DATE 15-NOV-18