



# RADIAL CEMENT BOND LOG

FILE NO: CH146841	COMPANY <b>LARAMIE ENERGY LLC</b>
API NO: 05077105710000	WELL <b>SUP &amp; SHEP 0993-25-08W</b>
	FIELD <b>BUZZARD CREEK</b>
	COUNTY <b>MESA</b> STATE <b>COLORADO</b>

Ver. 4.12	LOCATION: SHL LAT: 39.244824 N LONG: 107.723428 W SEC 25 TWP 9S RGE 93W	OTHER SERVICES RPM
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PERMANENT DATUM LOG MEASURED FROM DRILL. MEAS. FROM	GL ELEVATION 8078 FT KB 30 FT ABOVE P.D. KB 8078 FT	ELEVATIONS: KB 8108 FT DF GL 8078 FT
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DATE	23-Jan-2019
RUN	1
TRIP	1
SERVICE ORDER	US146841
DEPTH DRILLER	8586 FT
DEPTH LOGGER	8586 FT
BOTTOM LOGGED INTERVAL	8518 FT
TOP LOGGED INTERVAL	0 FT
TIME STARTED	15:00
TIME FINISHED	17:30
OPERATOR RIG TIME	2.5 HOURS
TYPE OF FLUID IN HOLE	WATER
FLUID DENSITY	NA
FLUID SALINITY	NA
FLUID LEVEL	56 FT
LOGGED CEMENT TOP	1710 FT
WELLHEAD PRESSURE	0 PSI
MAXIMUM HOLE DEVIATION	NA
NOMINAL LOGGING SPEED	100 F/MN
MAX. RECORDED TEMP.	261 DEGF
REFERENCE LOG	NA
REFERENCE LOG DATE	NA
EQUIP. NO.	ML-4291
LOCATION	GRAND JCT.
RECORDED BY	TIM 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
<p>RUN 1 TRIP 1: *2 OPERATIONS IN WELLBORE*</p> <p>**OPERATION 1: RAL/GR/CCL RUN CENTRALIZED**</p> <p>**OPERATION 2: RPM/GR/CCL RUN IN PNC-3D**</p> <p>LOGGED WITH 0 PSI ON WELLHEAD</p> <p>SJ: 6781' - 6802'</p> <p>SJ: 7641' - 7662'</p>

EQUIPMENT DATA				
RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.
1	1	RAL	1426XA	10222301
1	1	GR/CCL	1355XA	11871507

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 Patches: 1

Plotted: Fri Jan 25 09:16:48 2019

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_SS\_08W/p012g02.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 26.500 ft BOTTOM DEPTH: 8543.000 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*)	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*)	200	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*)	-68	us	"	"
	TOOL DELAY (str2*)	-68	us	"	"
	TOOL DELAY (str3*)	-68	us	"	"
	TOOL DELAY (str4*)	-68	us	"	"
	TOOL DELAY (str5*)	-68	us	"	"
	TOOL DELAY (str6*)	-68	us	"	"
	TOOL DELAY (str7*)	-68	us	"	"
	TOOL DELAY (str8*)	-68	us	"	"
	TOOL DELAY (strn*)	-68	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	"	"

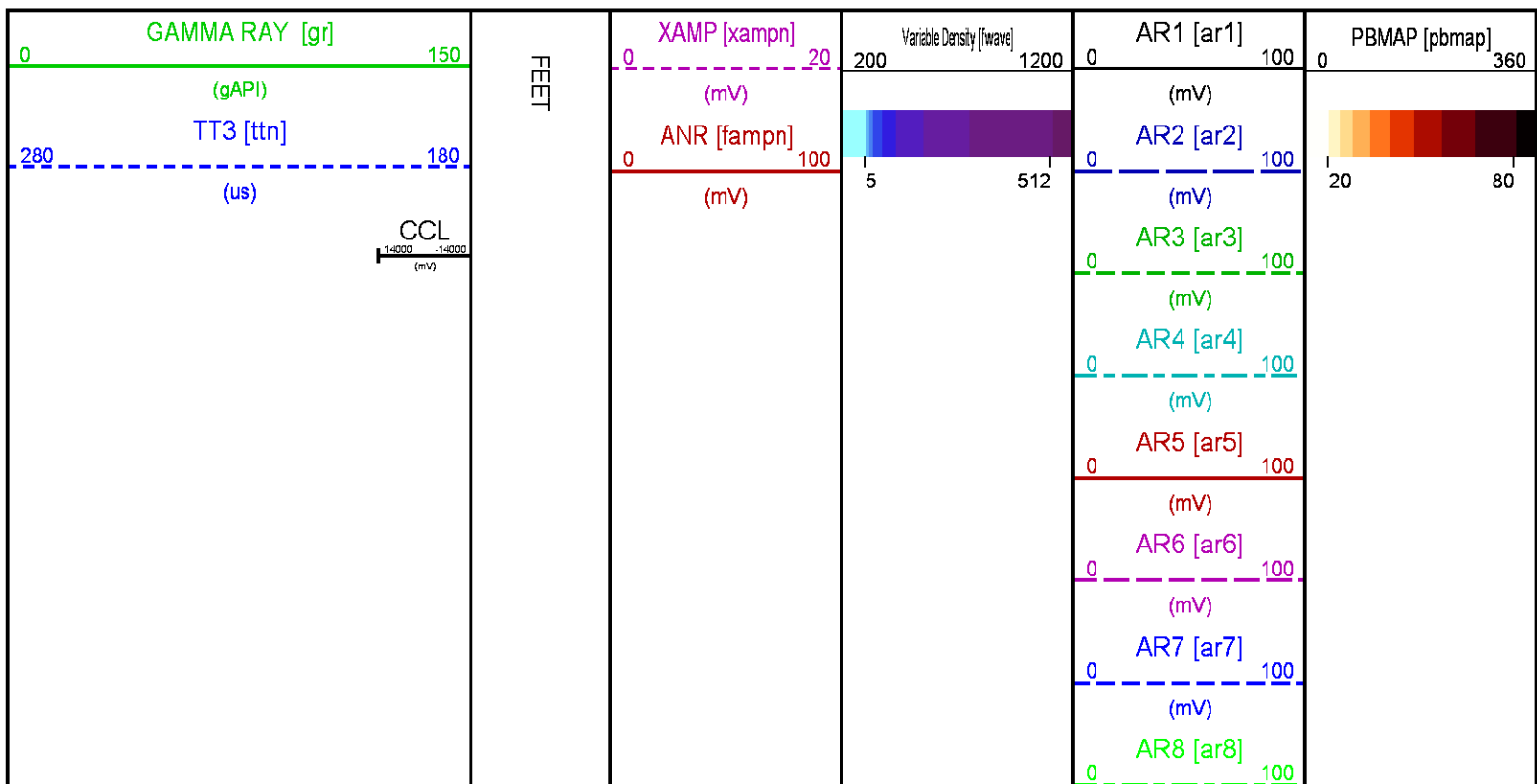
## CURVE DESCRIPTION REPORT

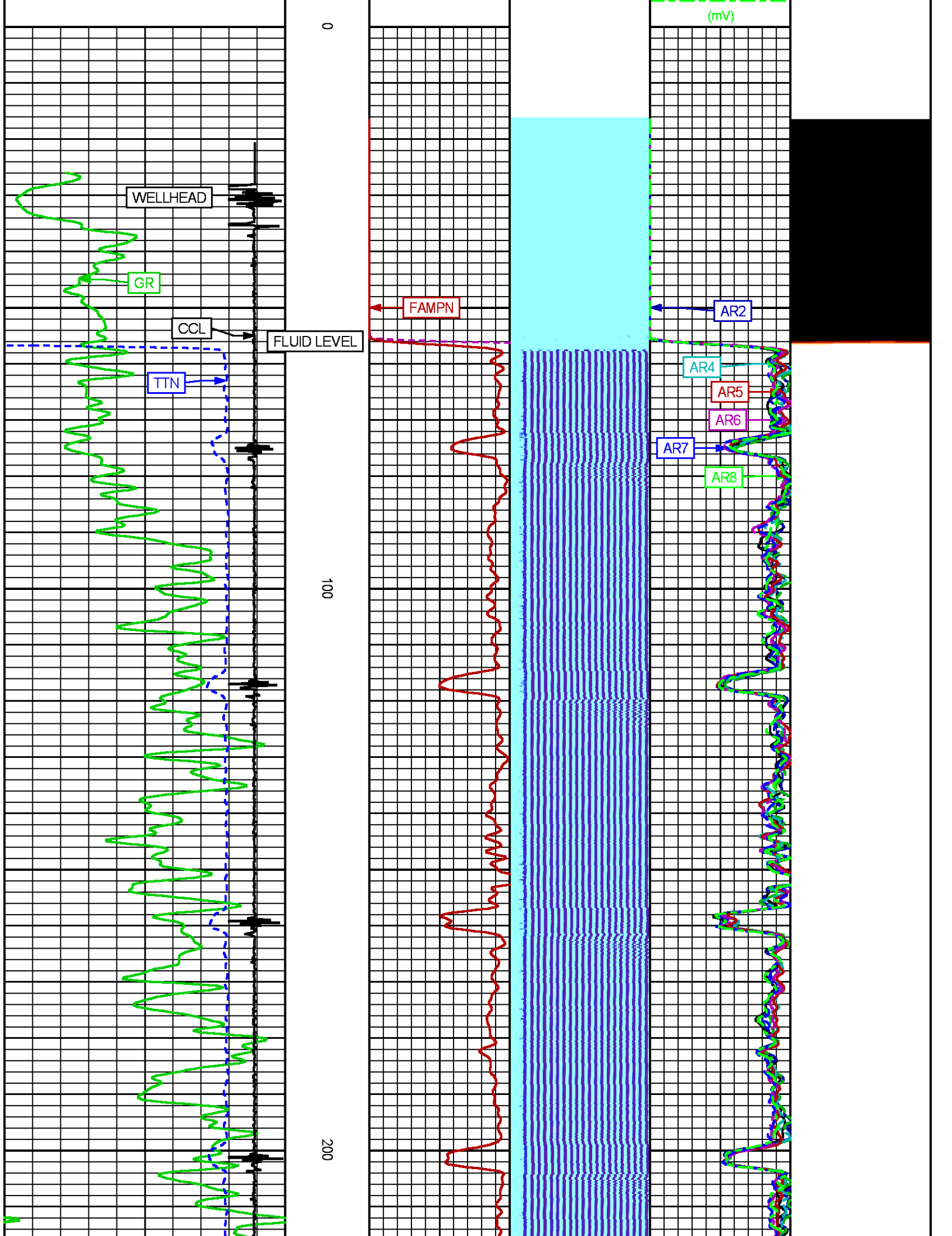
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	Jan 23 16:00:58 2019	FIXED GATE AMPLITUDE T-R1
F1:AR2	Jan 23 16:00:58 2019	FIXED GATE AMPLITUDE T-R2
F1:AR3	Jan 23 16:00:58 2019	FIXED GATE AMPLITUDE T-R3
F1:AR4	Jan 23 16:00:58 2019	FIXED GATE AMPLITUDE T-R4
F1:AR5	Jan 23 16:00:58 2019	FIXED GATE AMPLITUDE T-R5
F1:AR6	Jan 23 16:00:58 2019	FIXED GATE AMPLITUDE T-R6
F1:AR7	Jan 23 16:00:58 2019	FIXED GATE AMPLITUDE T-R7
F1:AR8	Jan 23 16:00:58 2019	FIXED GATE AMPLITUDE T-R8
F1:CCL	Jan 23 16:00:58 2019	CASING COLLAR LOCATOR
F1:FAMPN	Jan 23 16:00:58 2019	FIXED GATE AMPLITUDE NEAR RECEIVER
F1:FWAVE	Jan 23 16:00:58 2019	FAR WAVE FORM
F1:GR	Jan 23 16:00:58 2019	GAMMA RAY
F1:PBMAP	Jan 23 16:00:58 2019	PERCENT BOND CEMENT MAP
F1:TTN	Jan 23 16:00:58 2019	TRAVELTIME FROM NEAR TRANSMITTER-RECEIVER
F1:XAMPN	Jan 23 16:00:58 2019	FIXED GATE AMPLITUDE NEAR RECEIVER TIMES FIVE

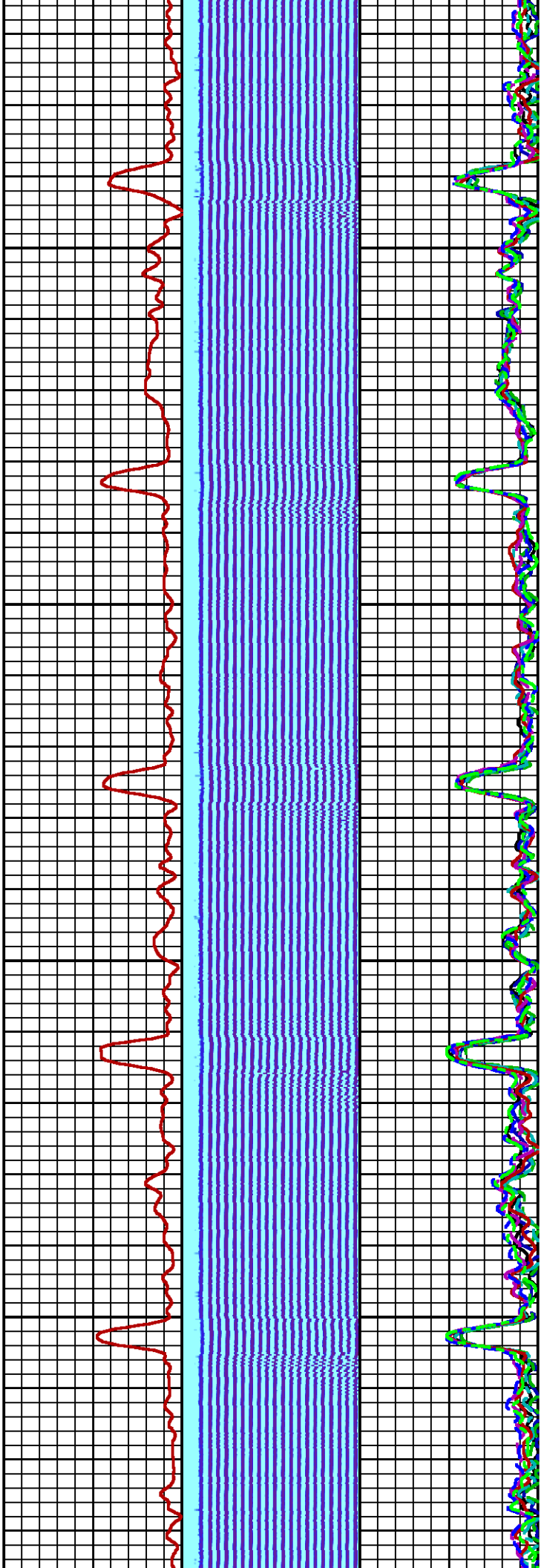
## CURVE MEASURE POINT OFFSET

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_SS_08W/08W_RAL_,MAIN.fvpdf [5"/100' Scale]
<b>Plot Interval</b>	: 0 - 8530 Feet
<b>Data File 1</b>	: F1 : SysA:/dat1a/LARAMIE_SS_08W/08W_RAL_MAIN.xtf
<b>Created On</b>	: Jan 23 16:00:58 2019
<b>Company</b>	: LARAMIE ENERGY LLC
<b>Well</b>	: SUP & SHEP 0993-25-08W
<b>Field</b>	: BUZZARD CREEK
<b>File Interval</b>	: 15.25 - 8543.25 Feet
<b>OCT</b>	: p012g

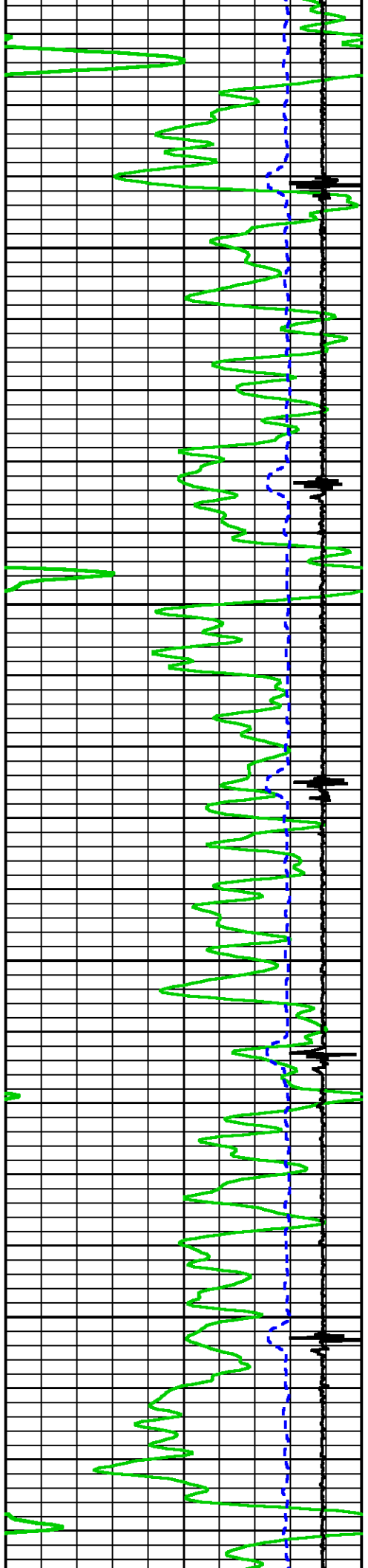


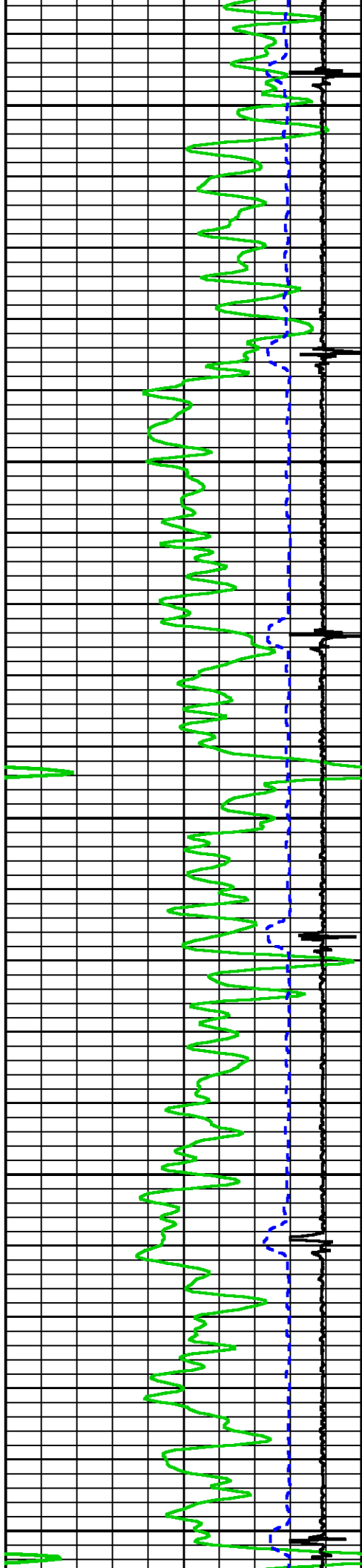




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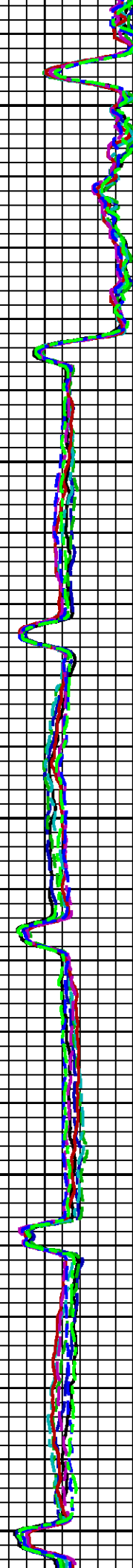
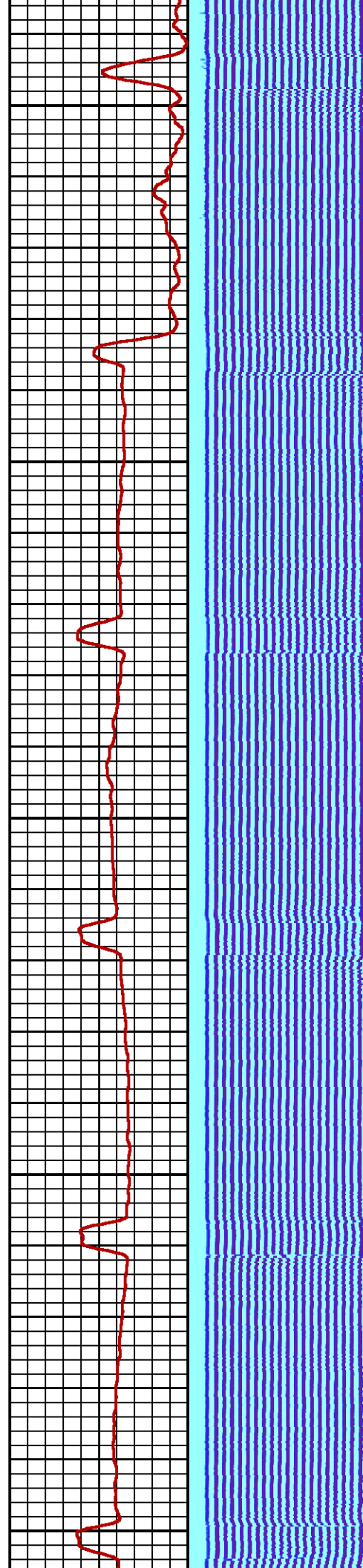
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500

600

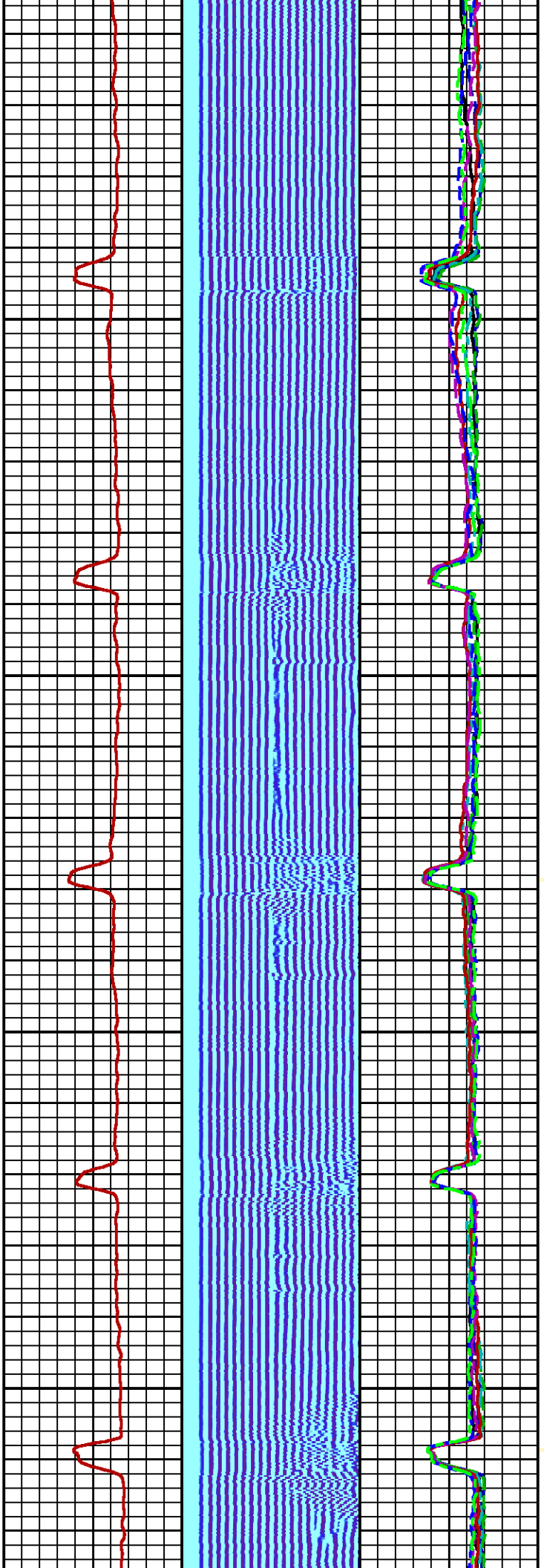




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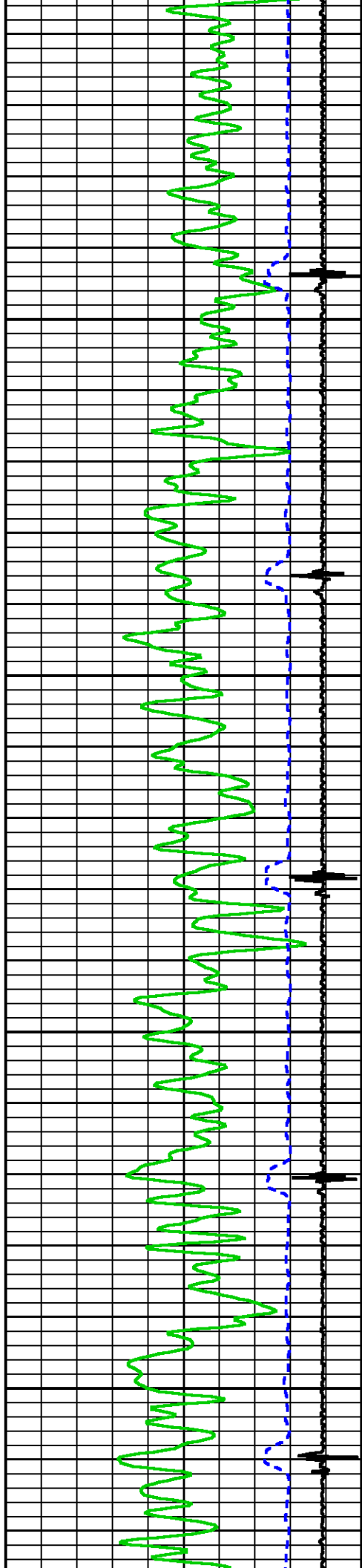
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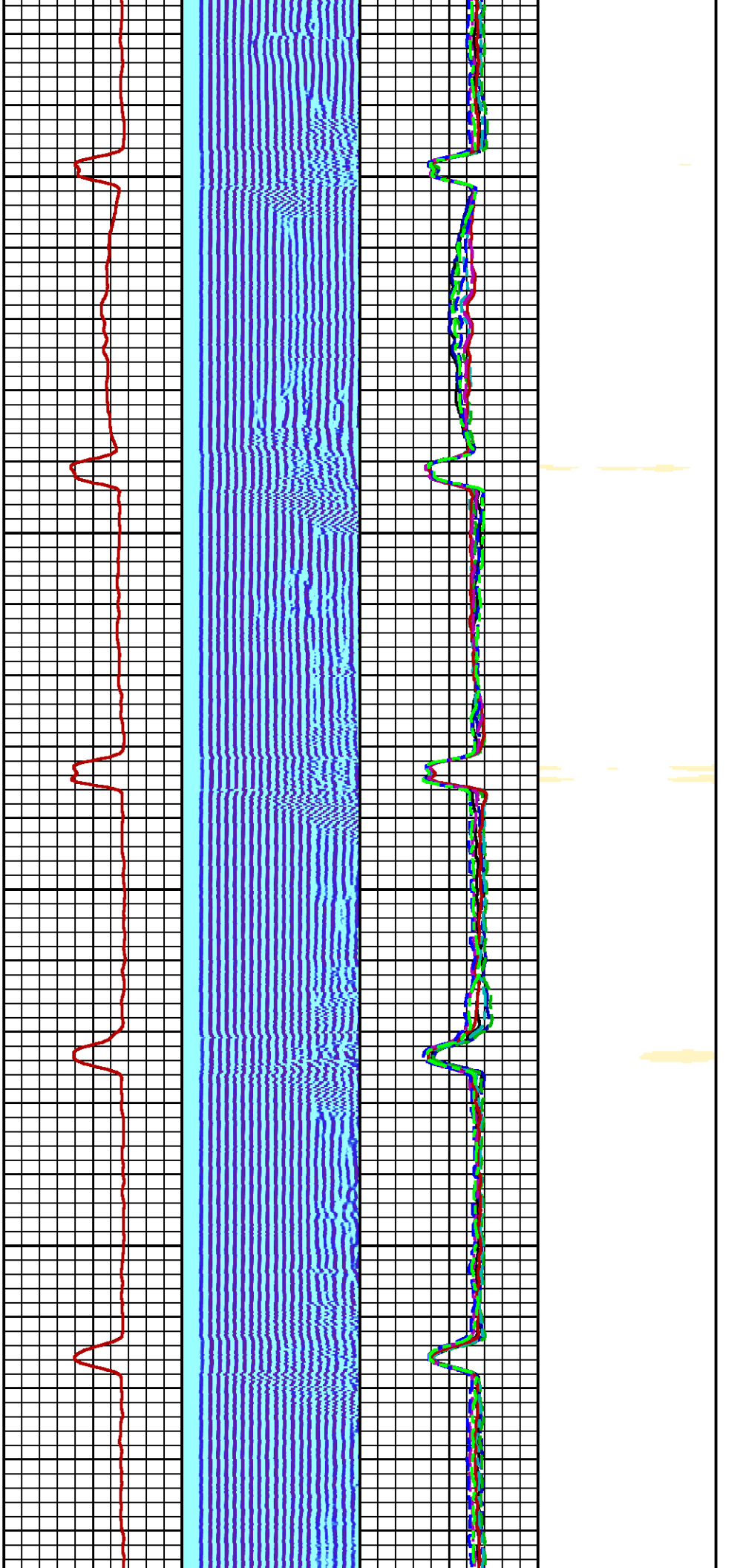
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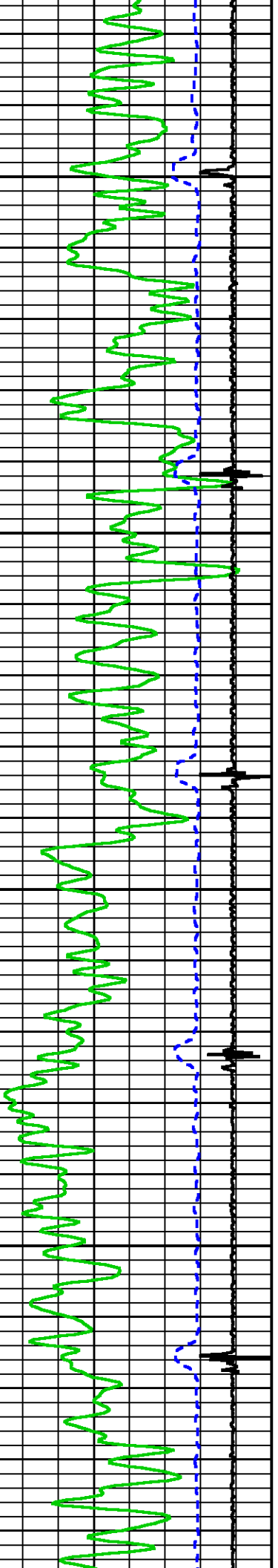
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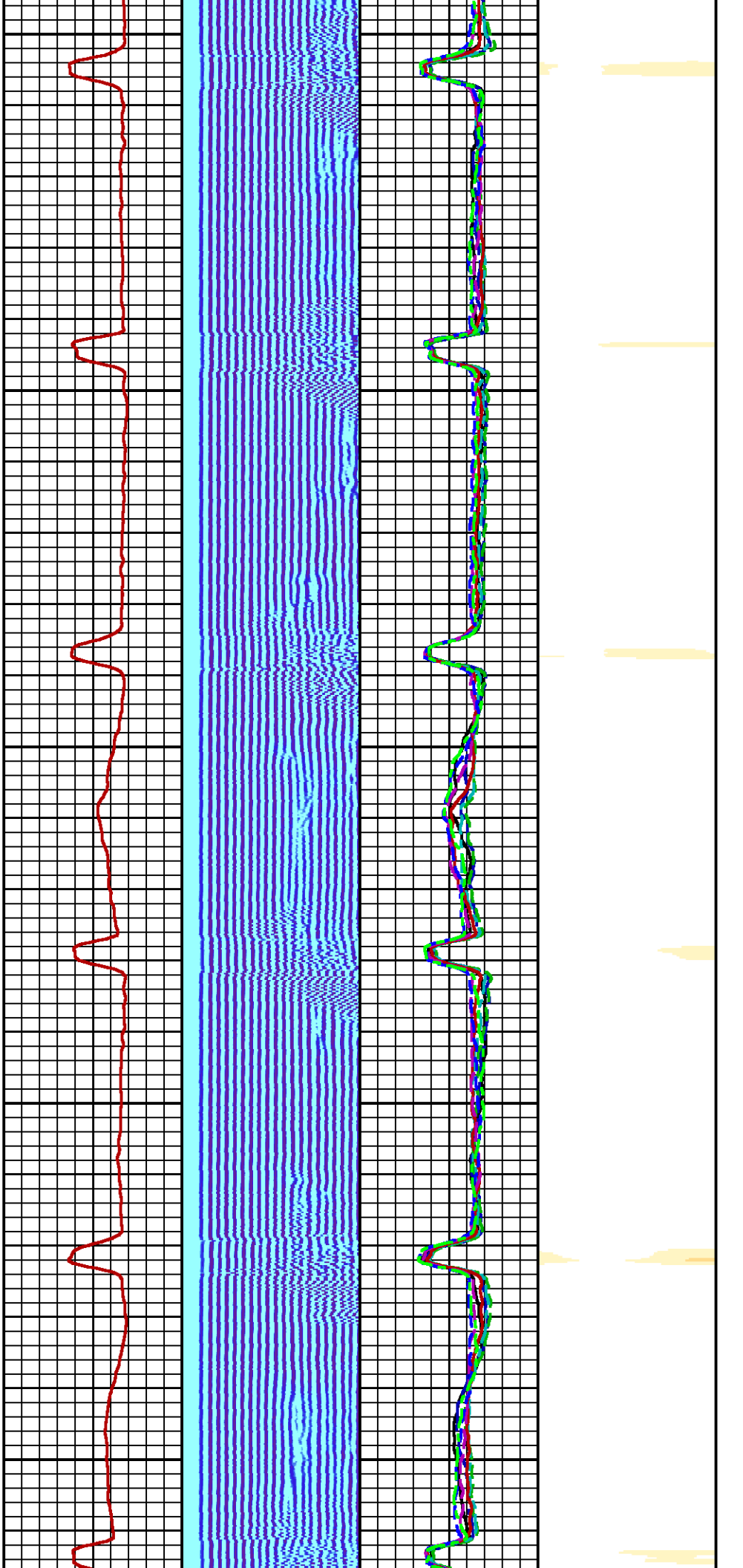


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1000



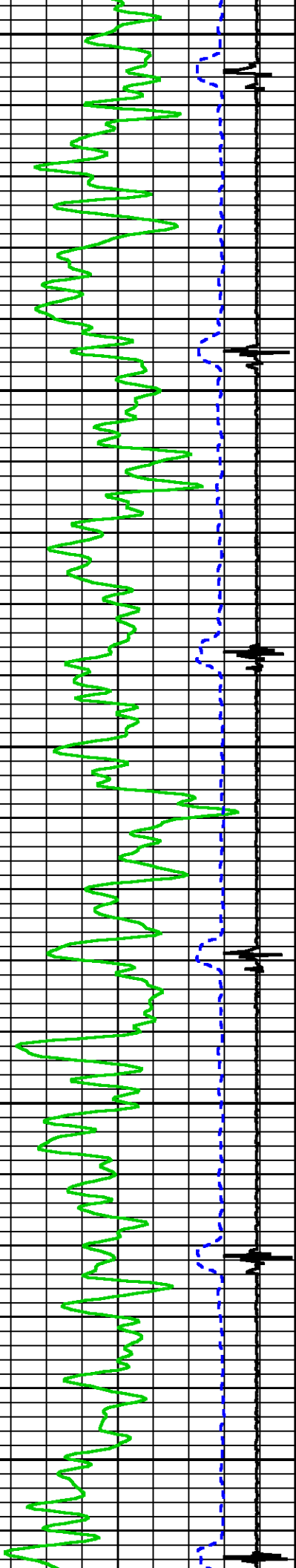


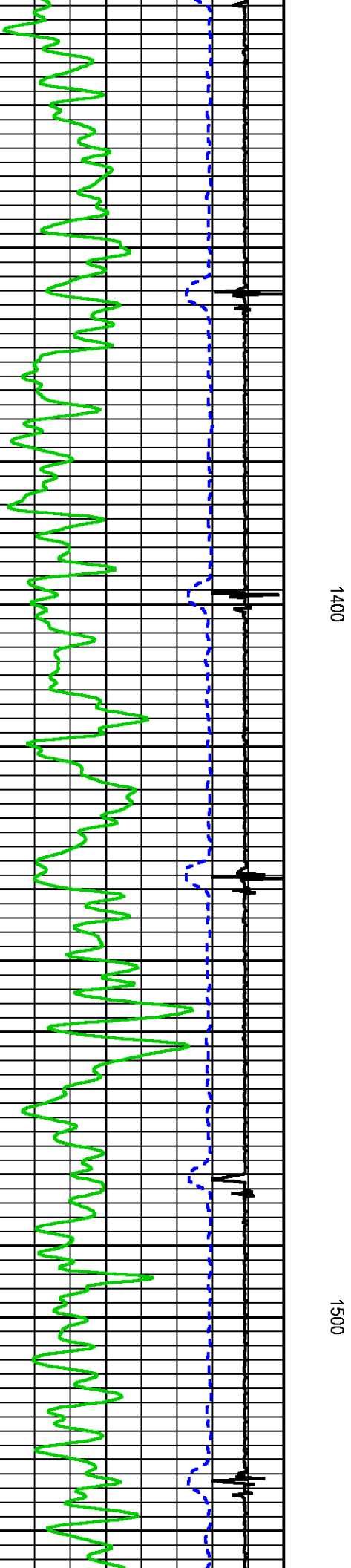
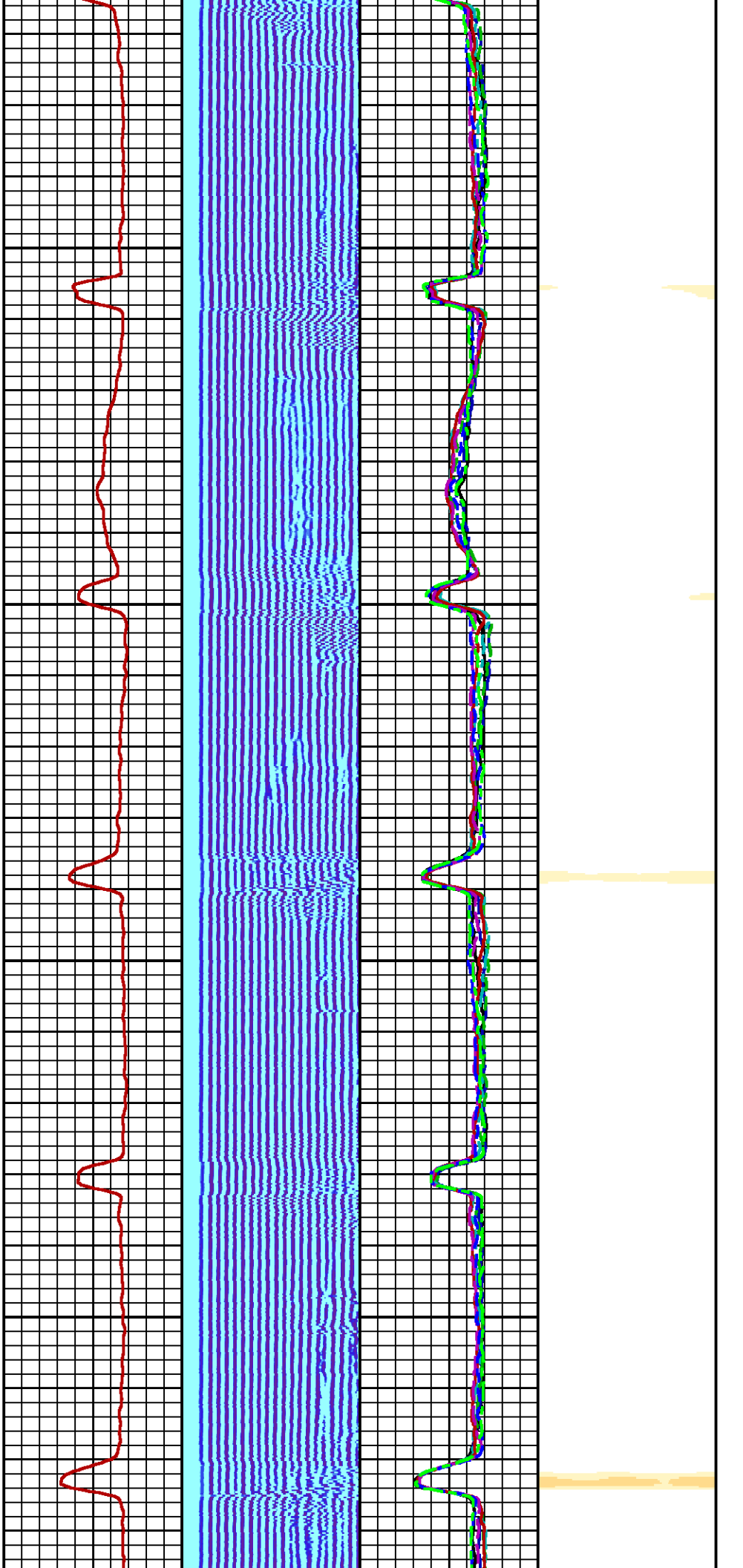


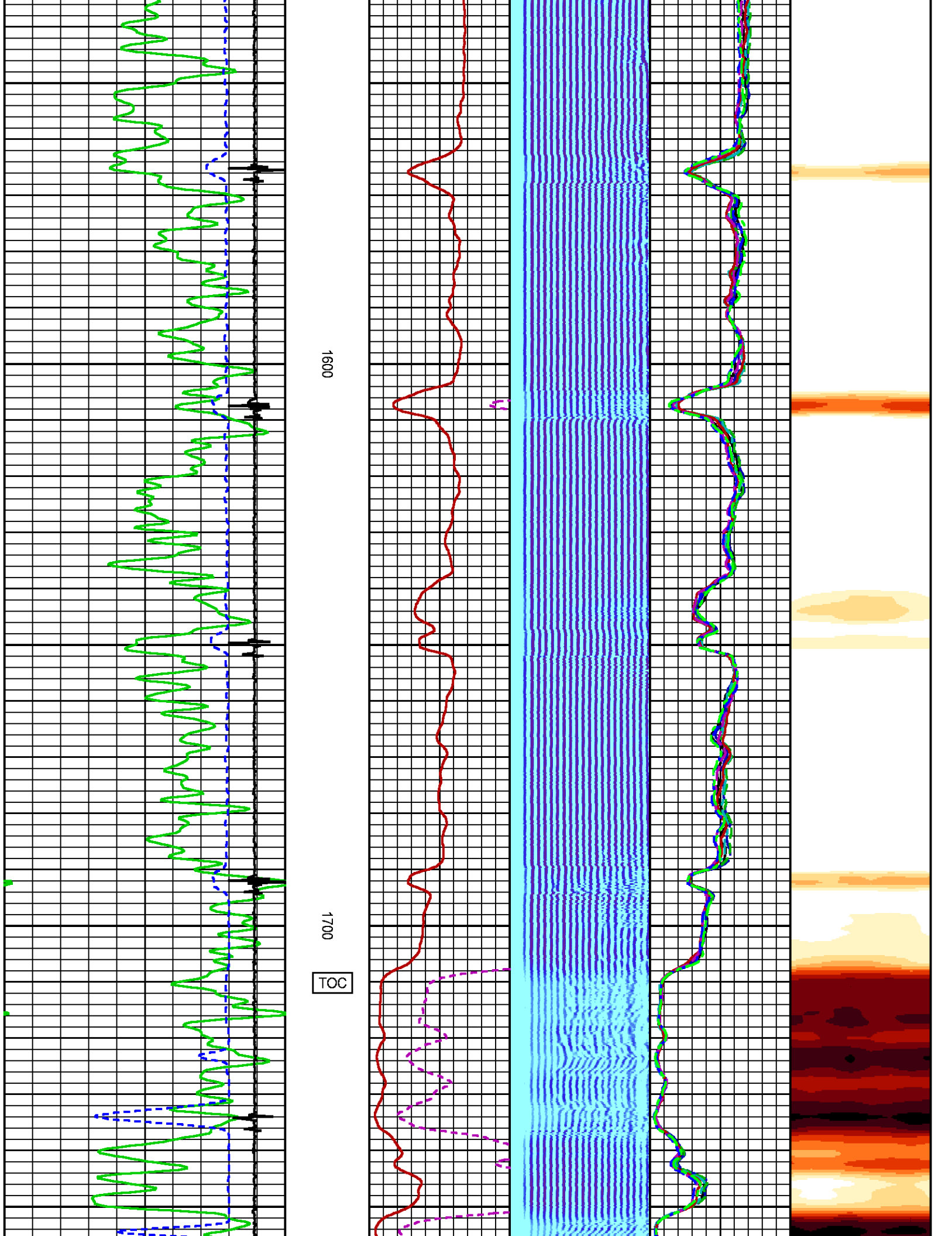
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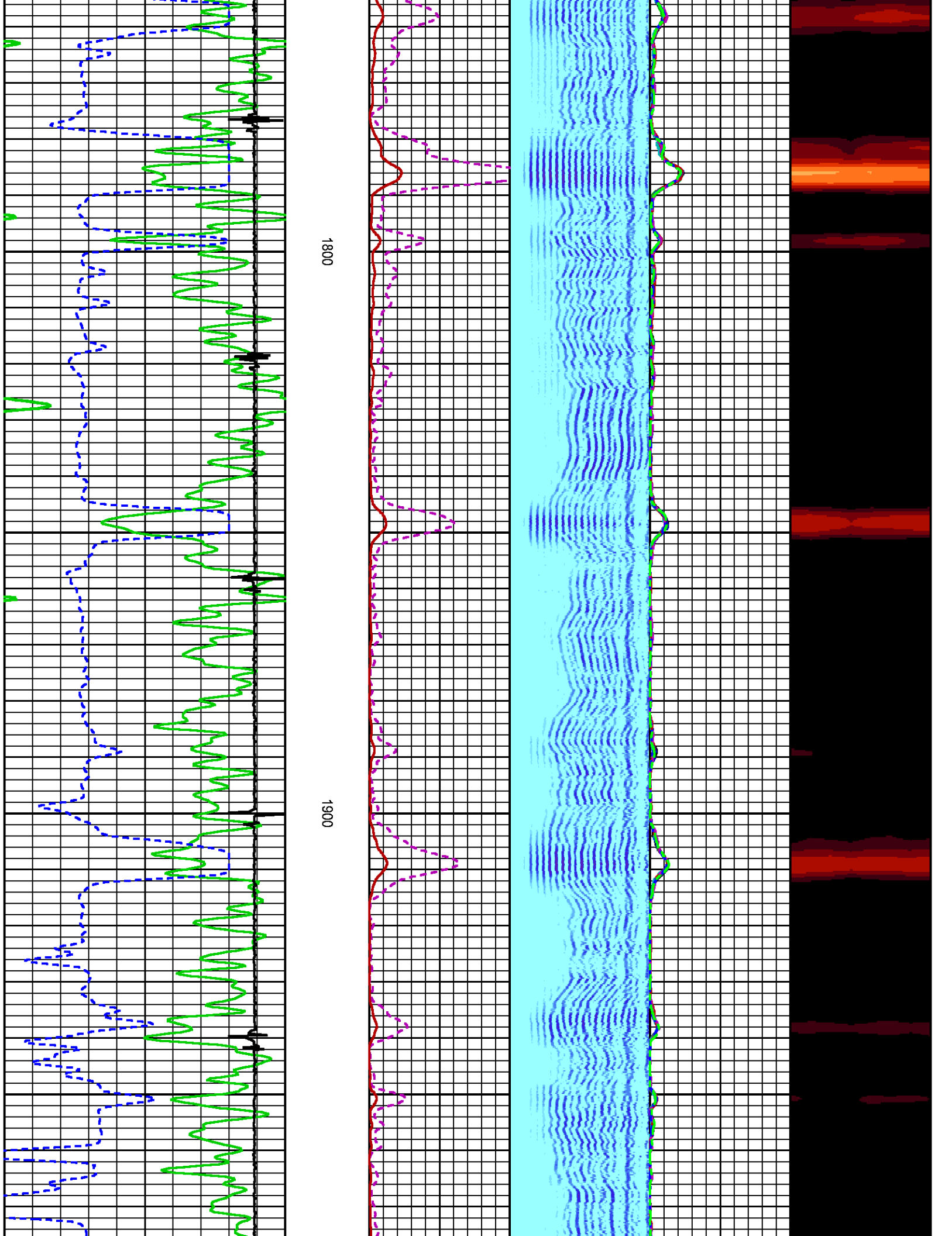
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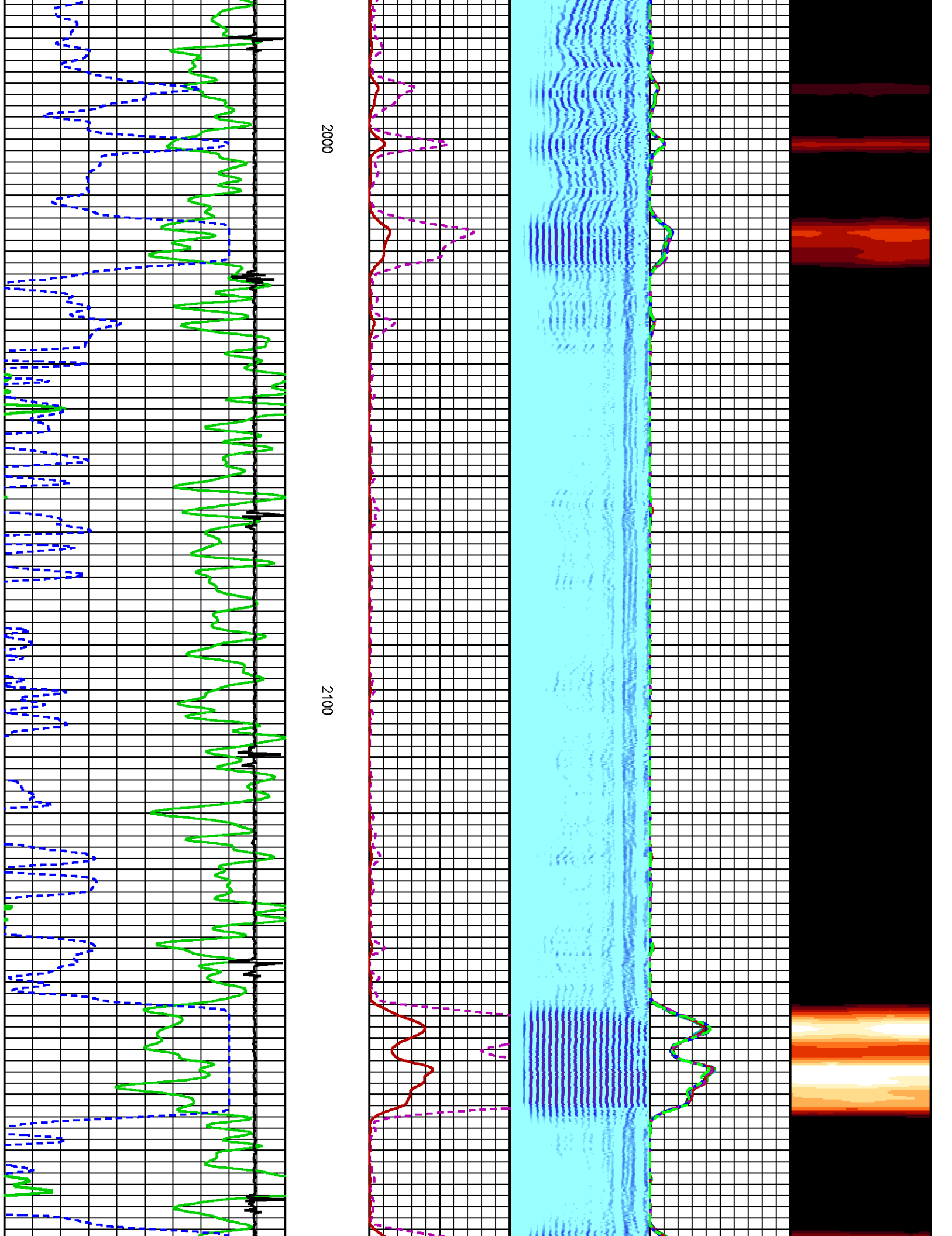
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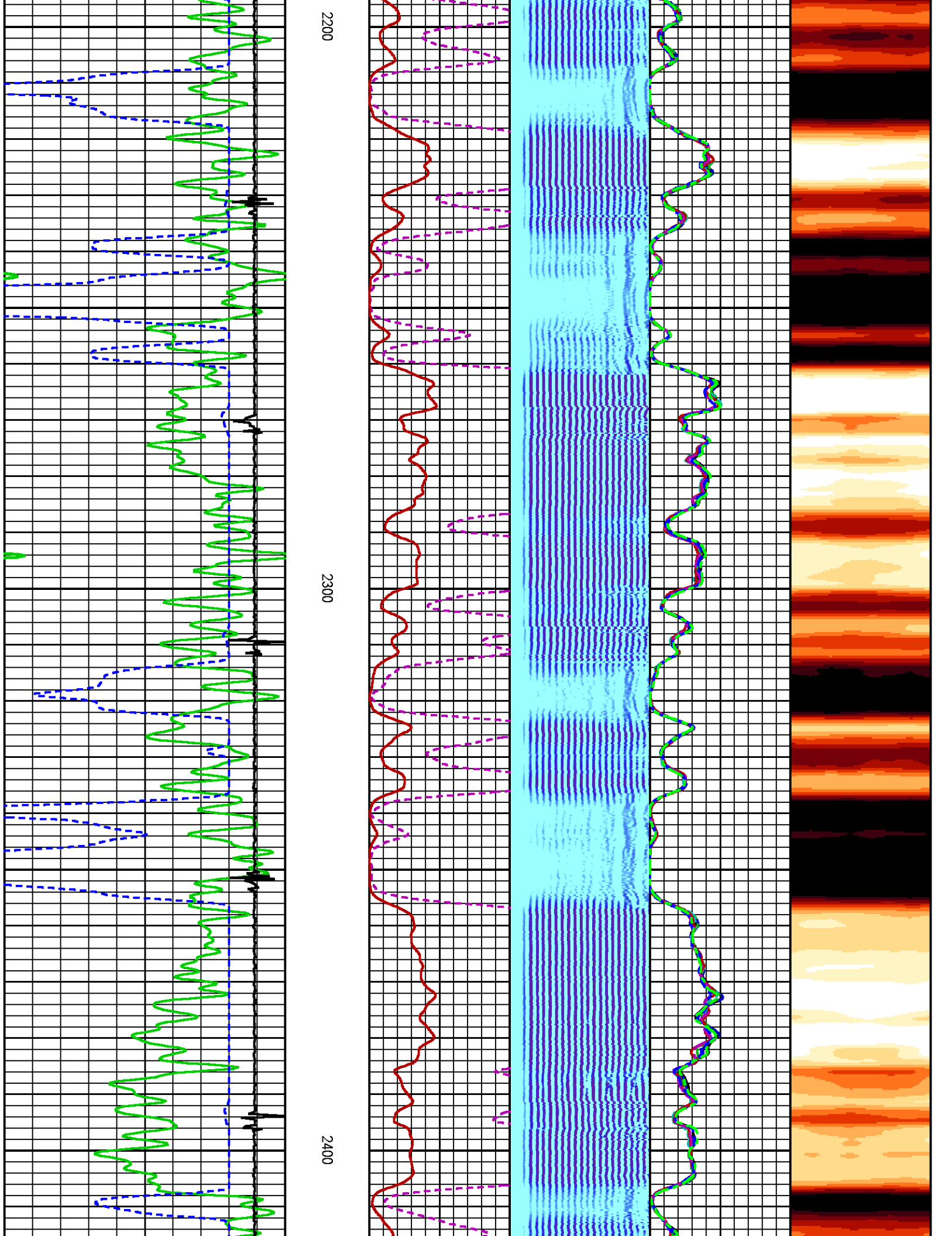




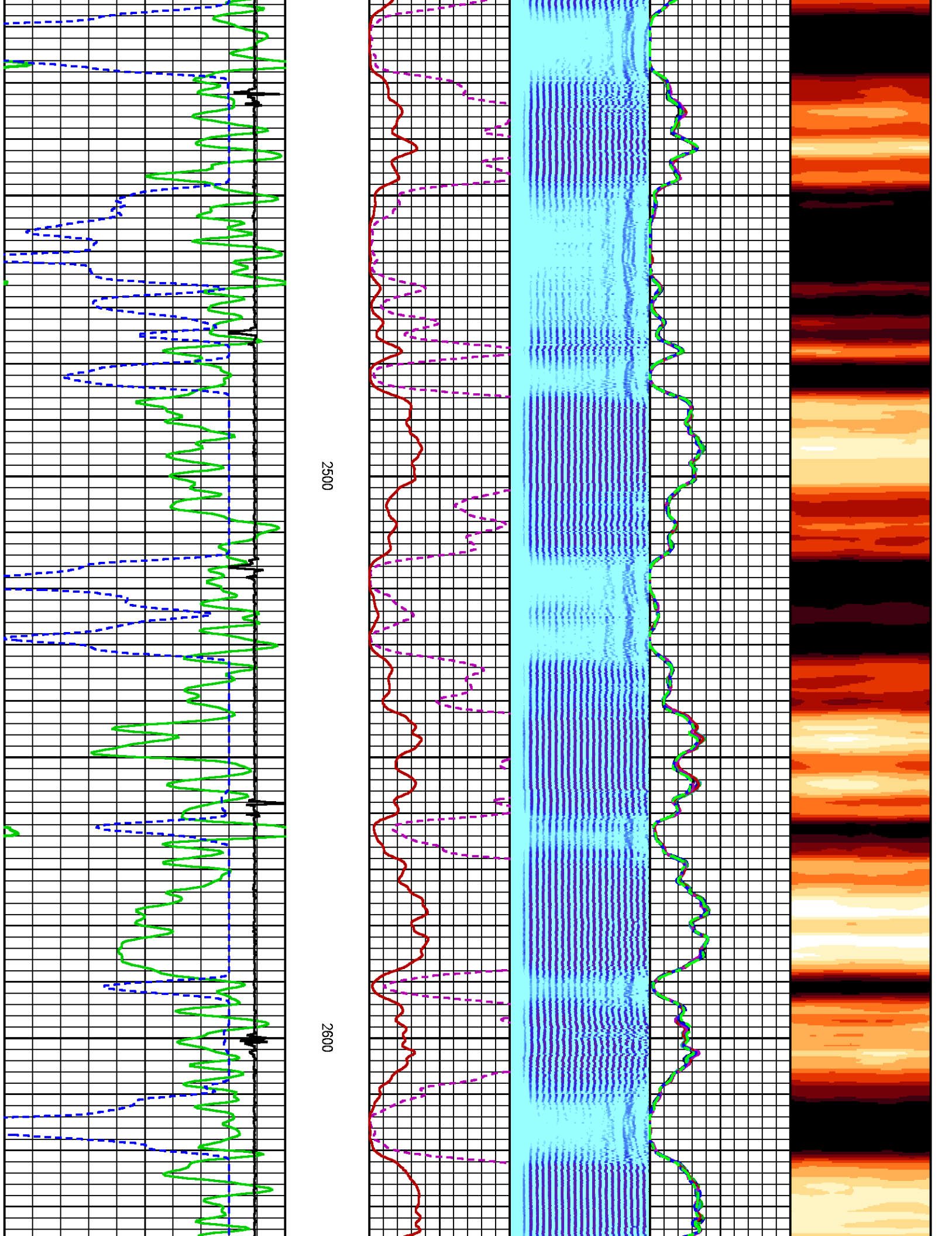


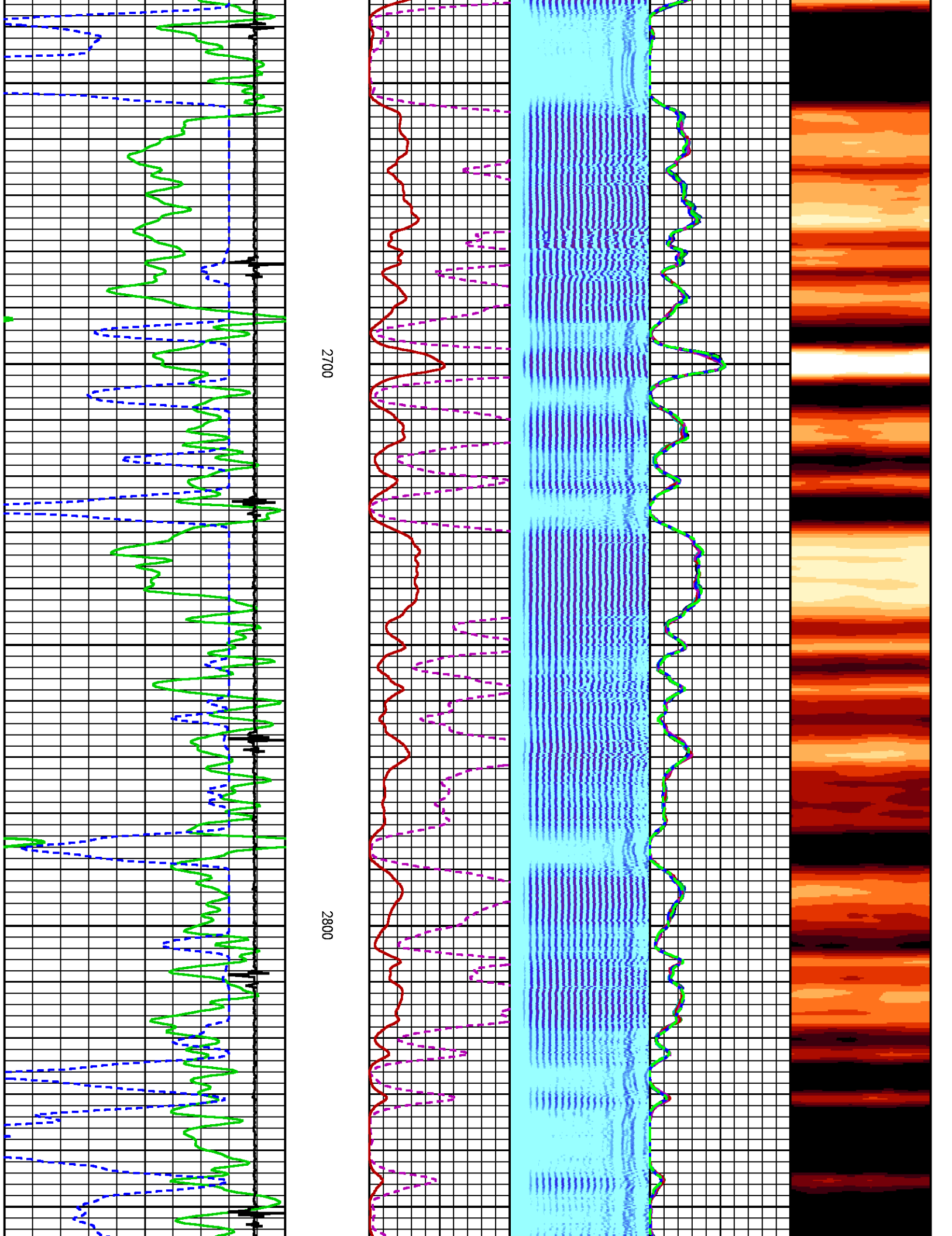


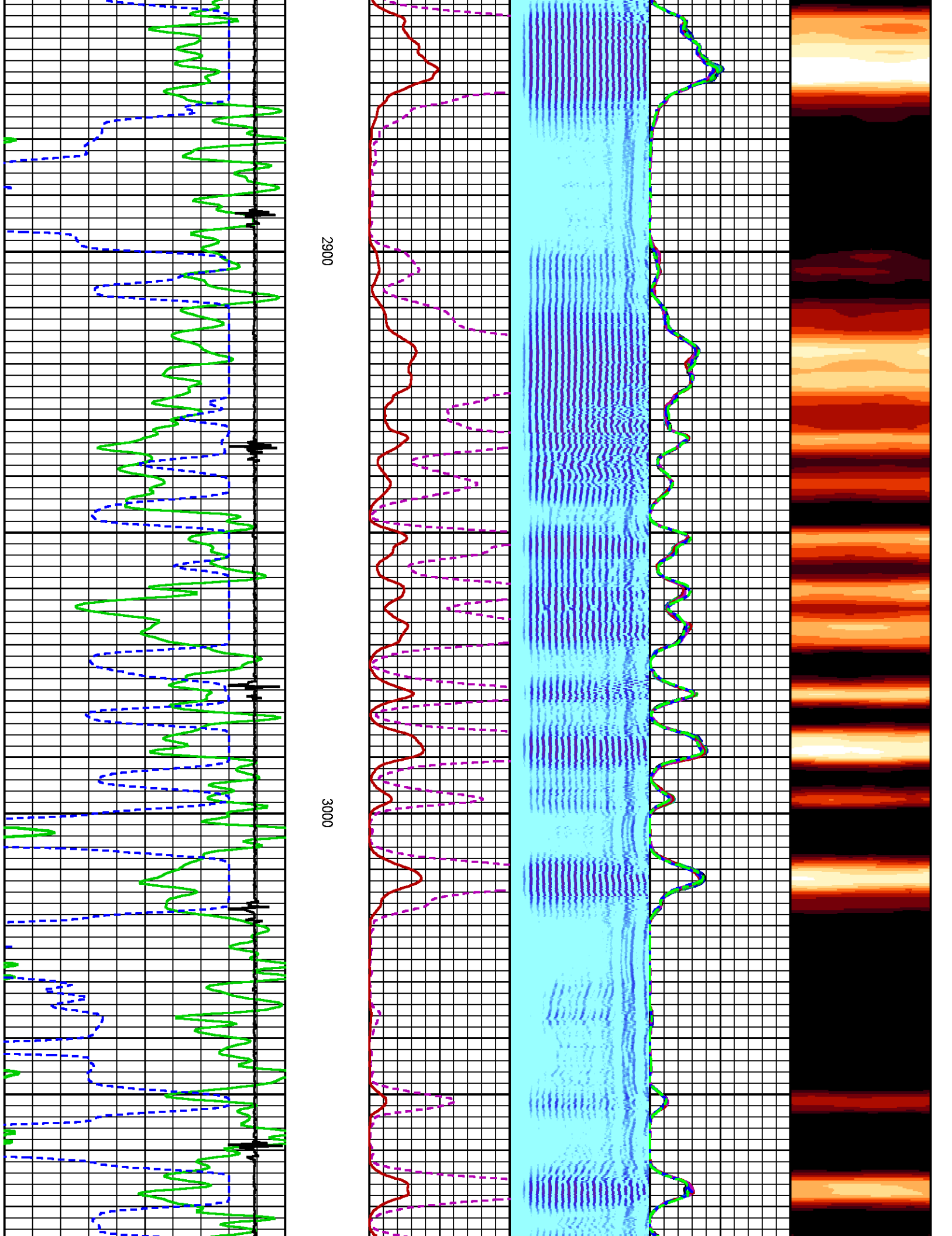


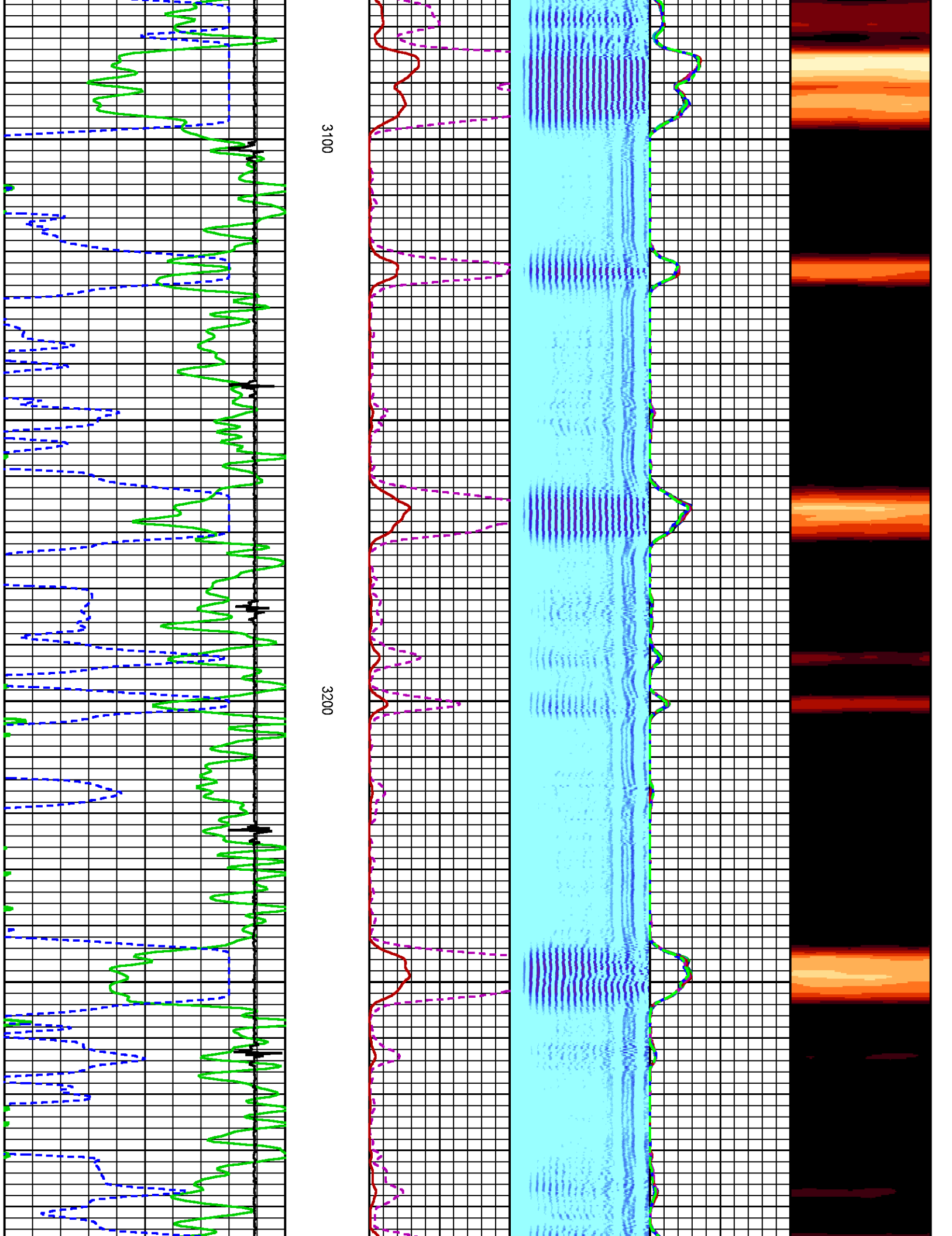


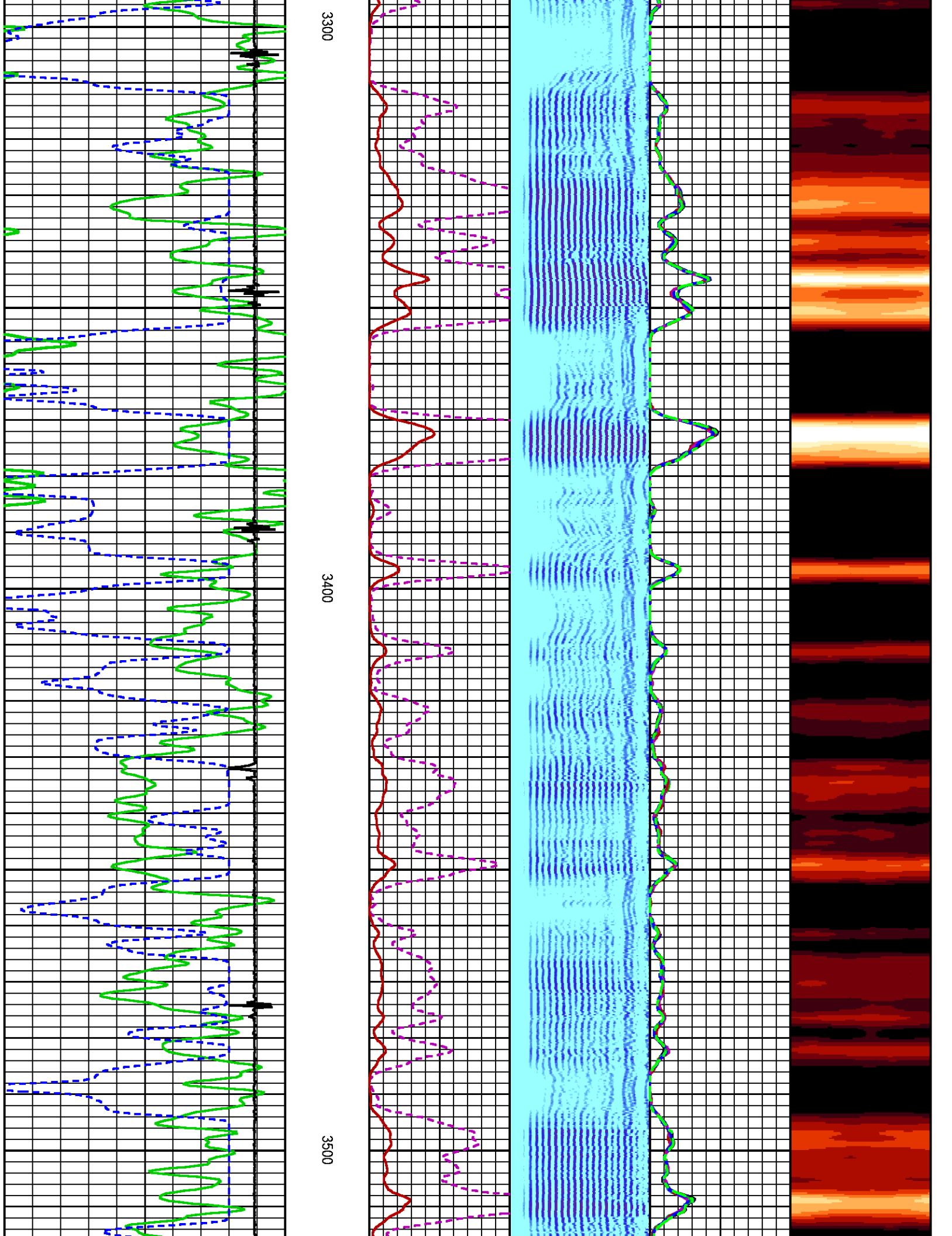




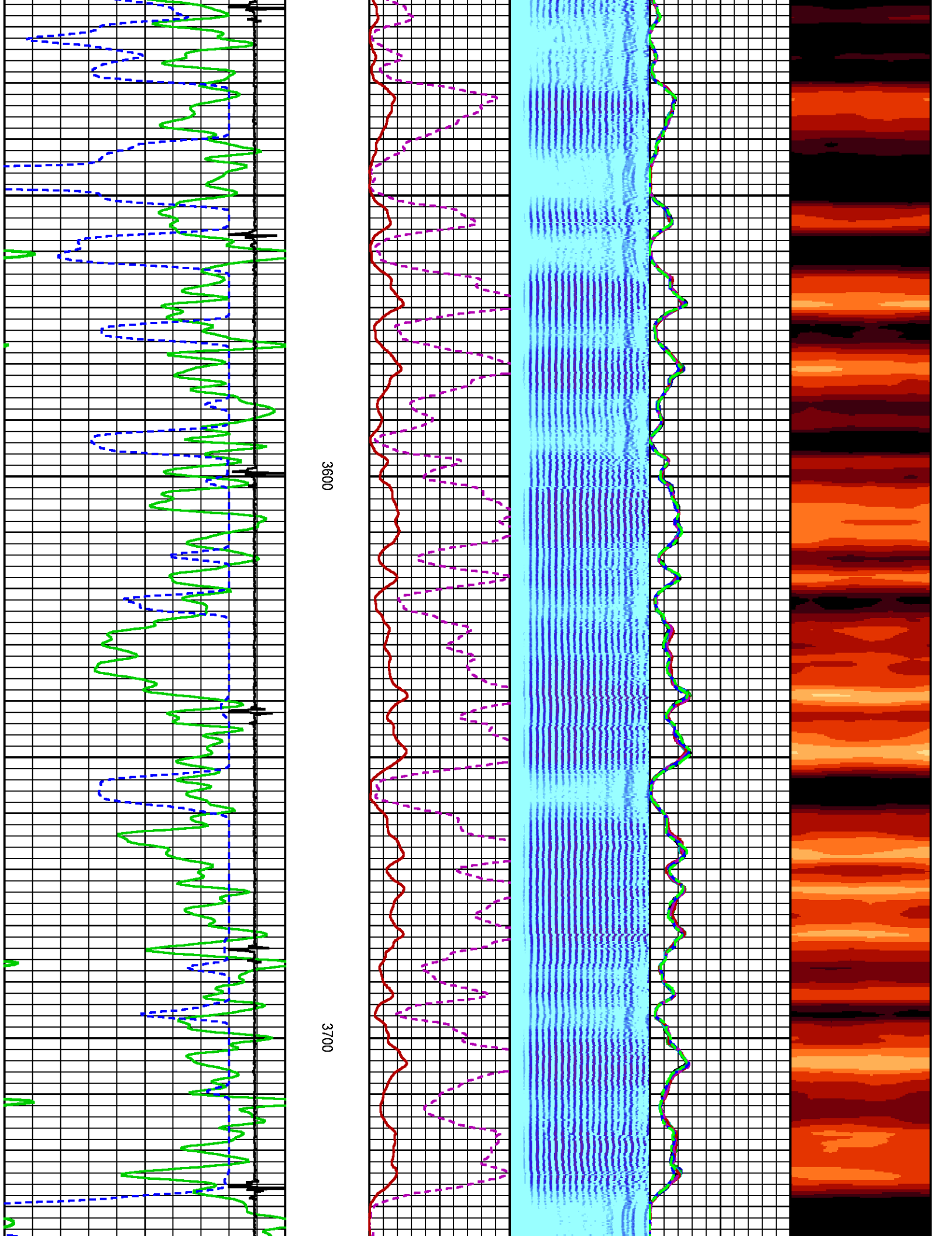




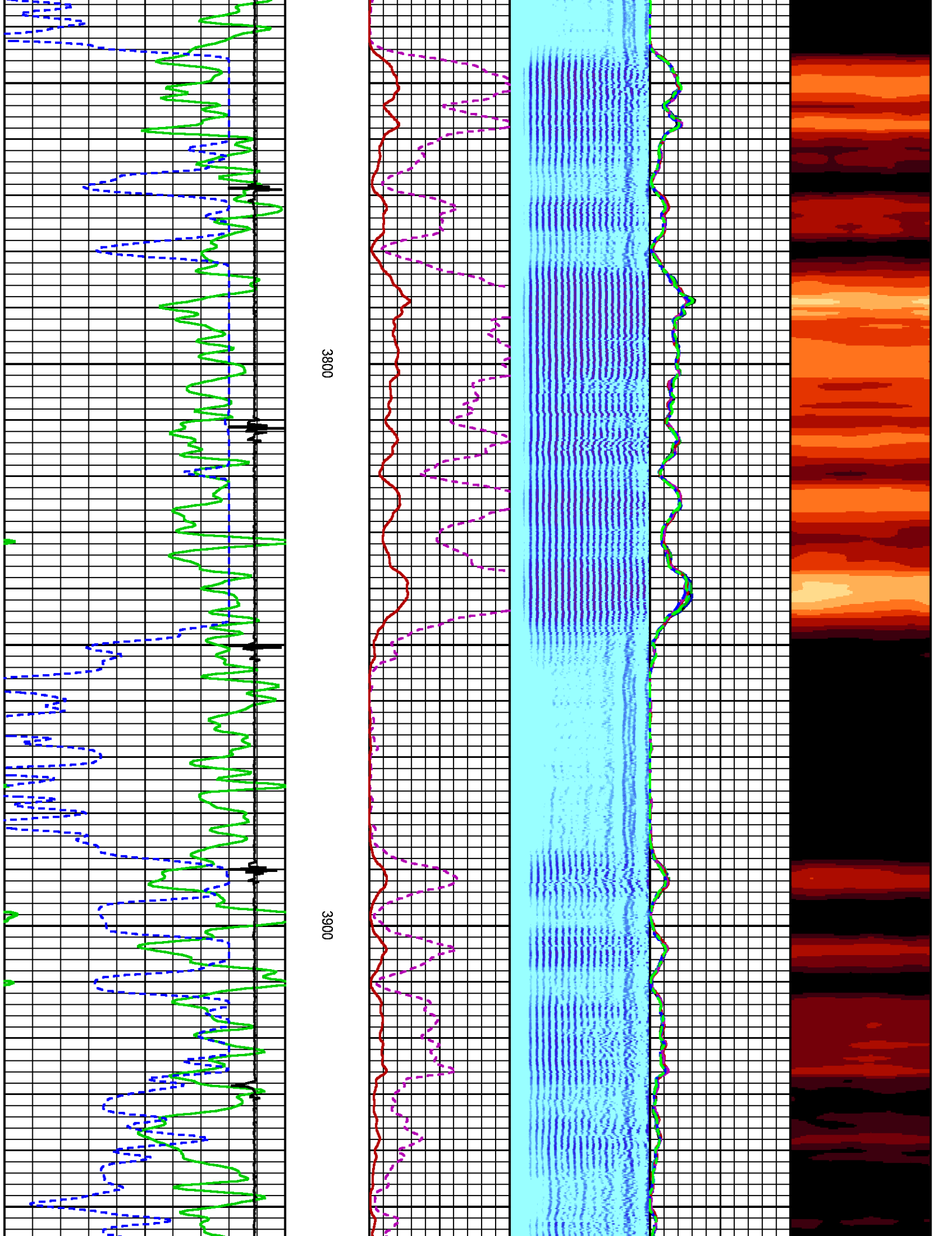


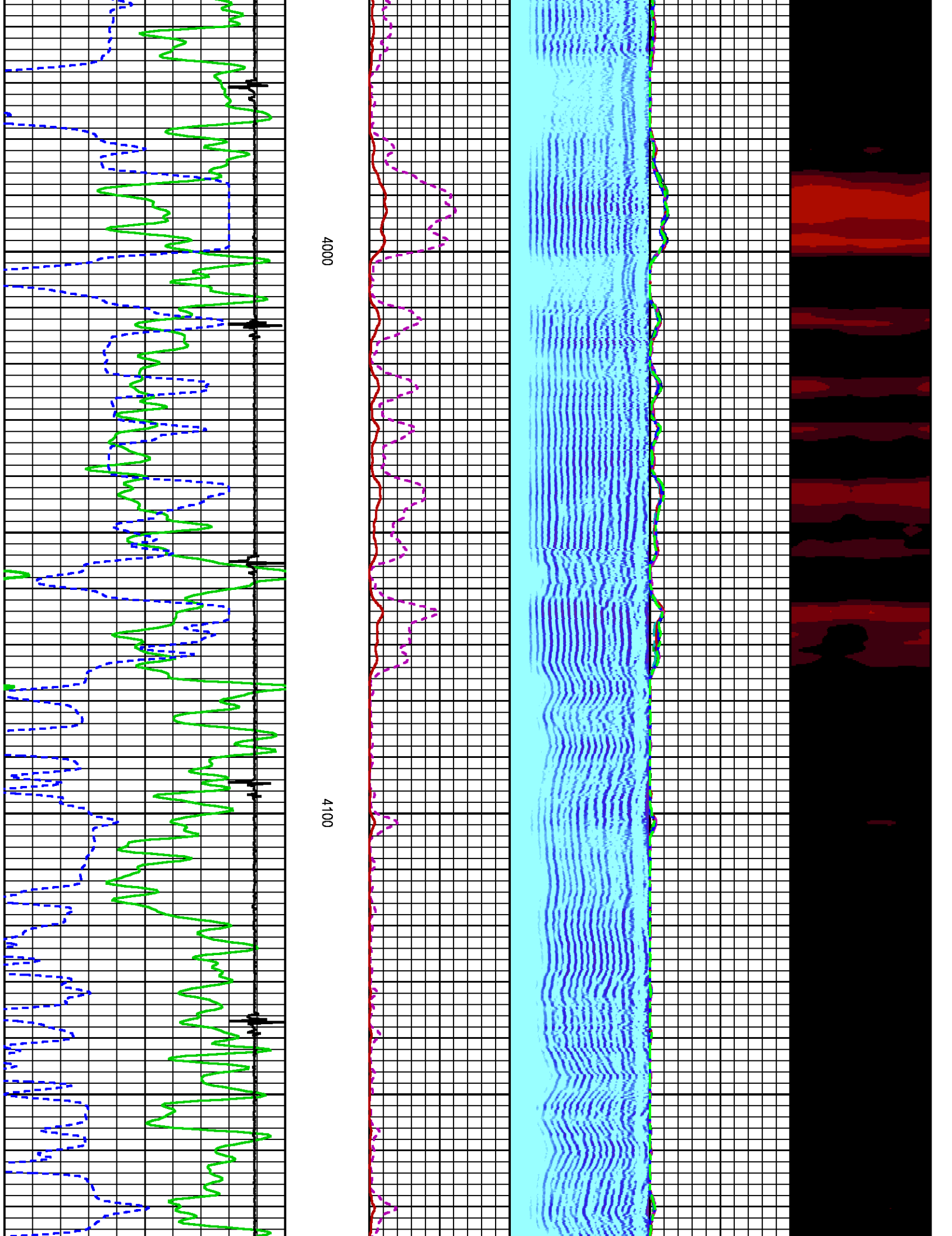


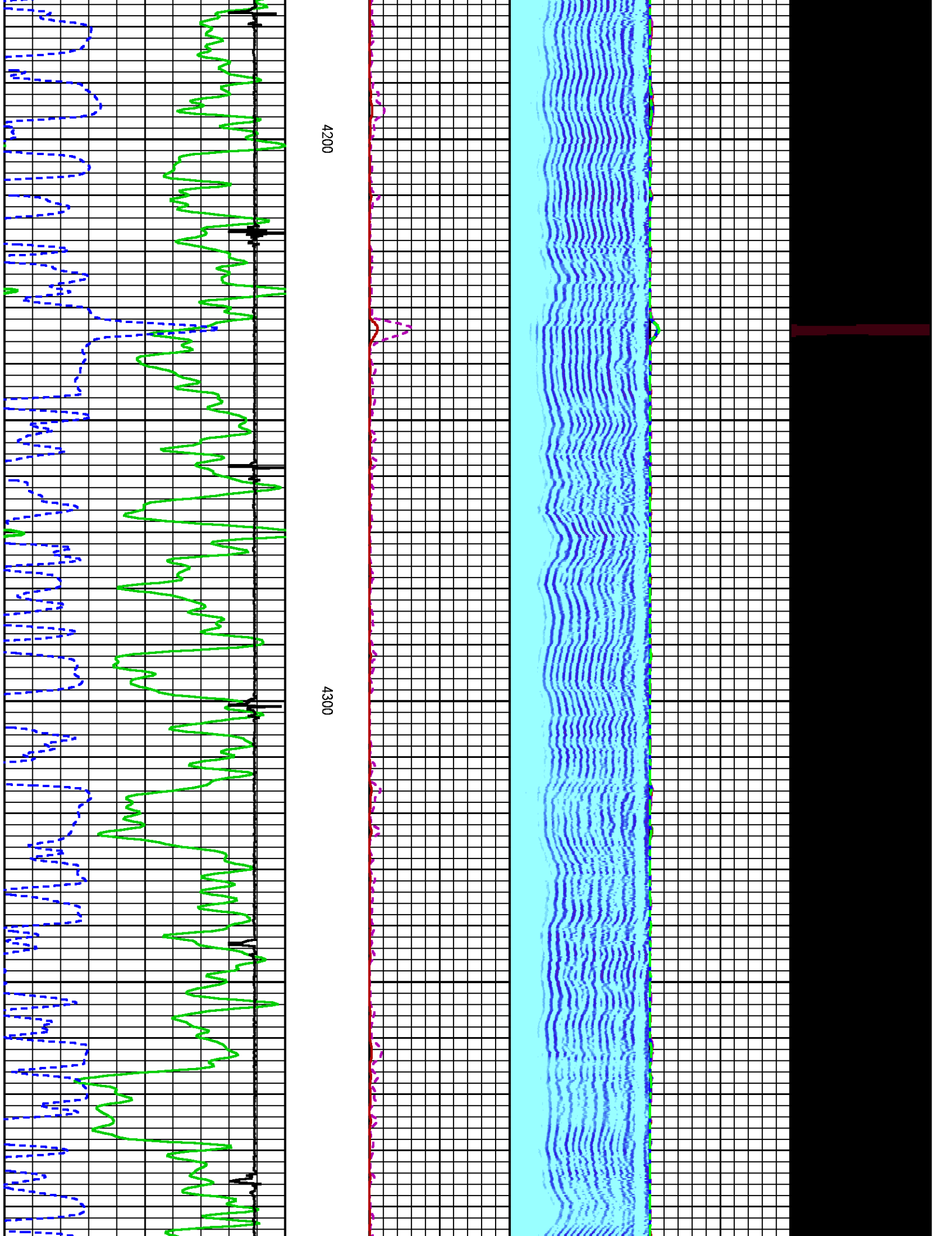


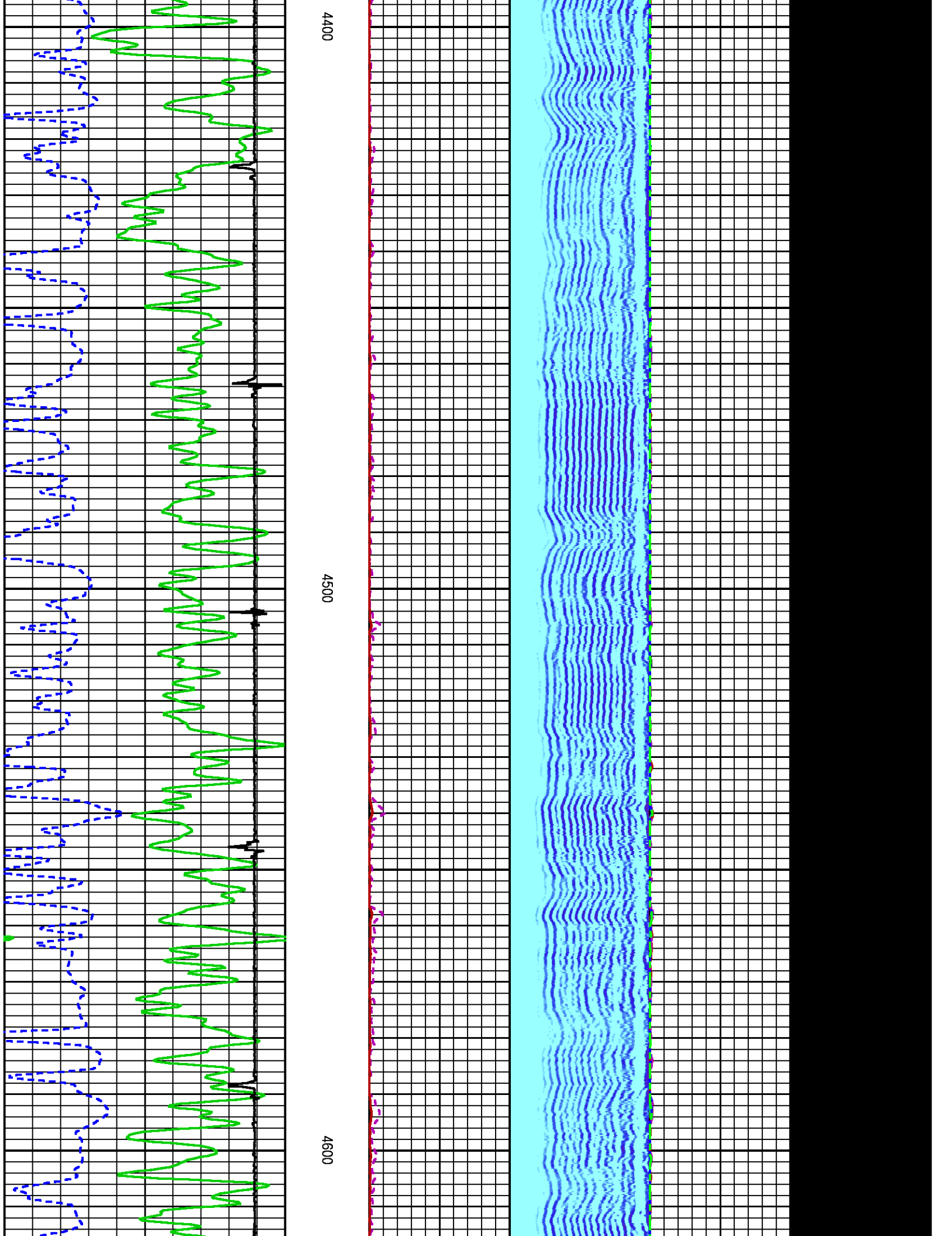


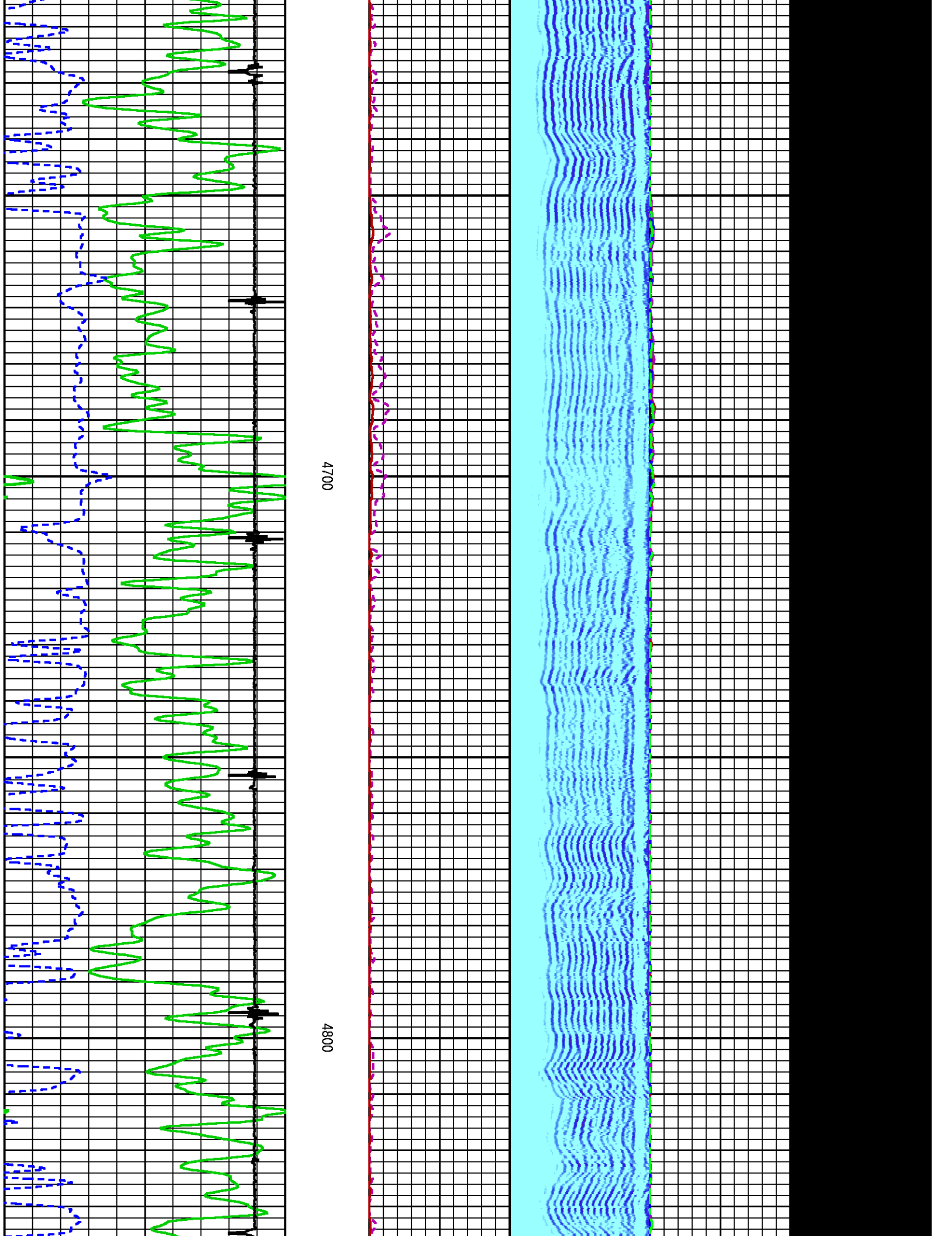




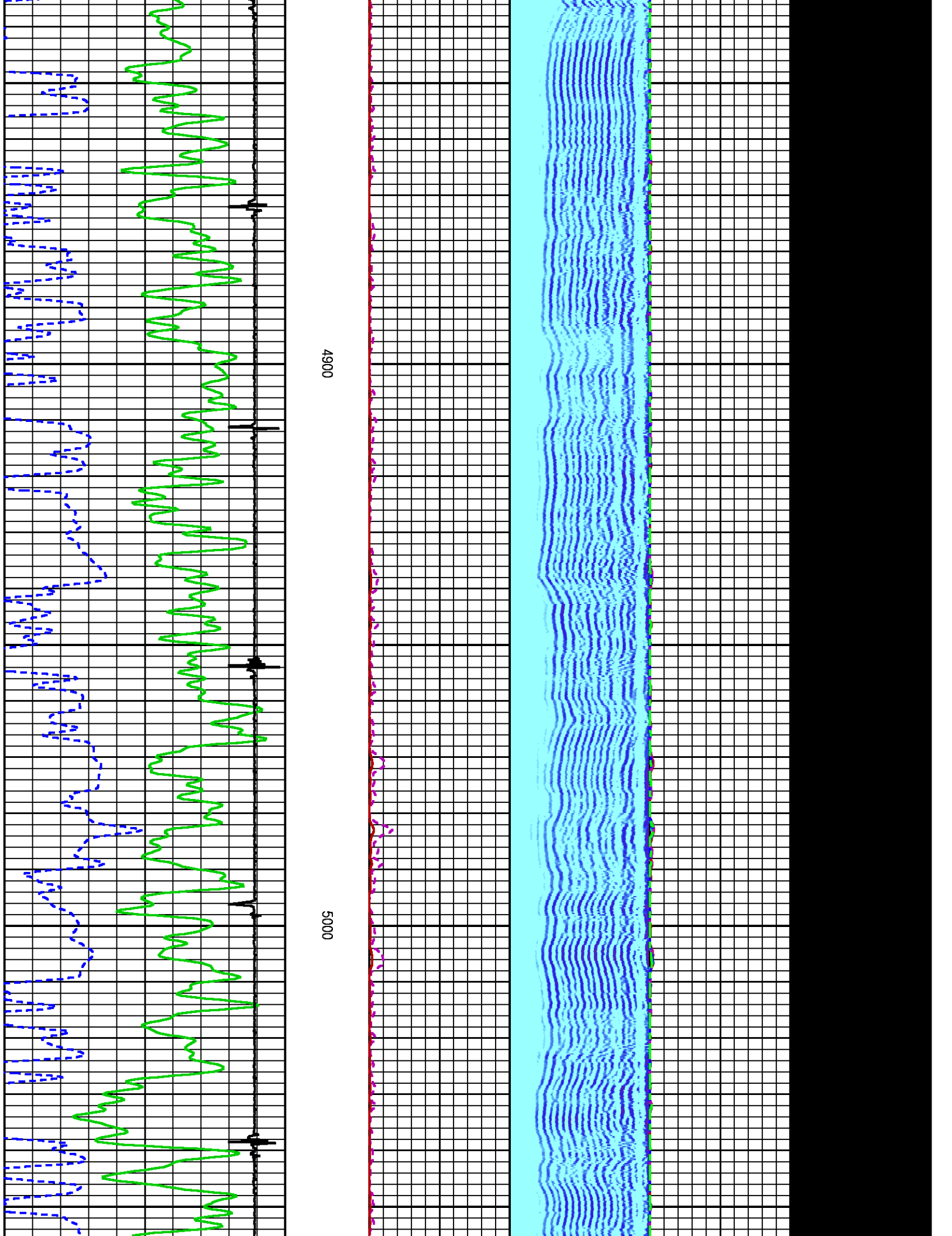




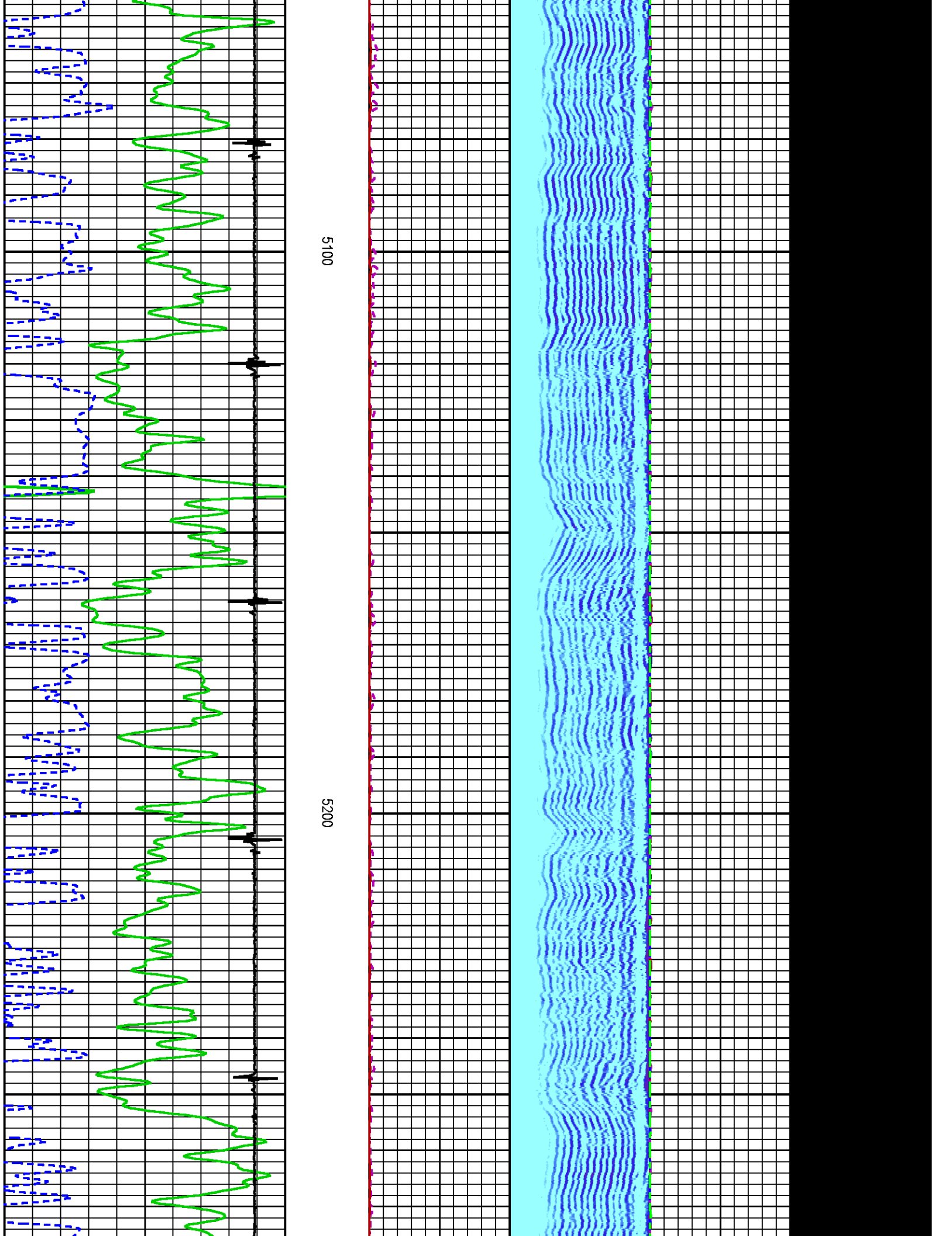


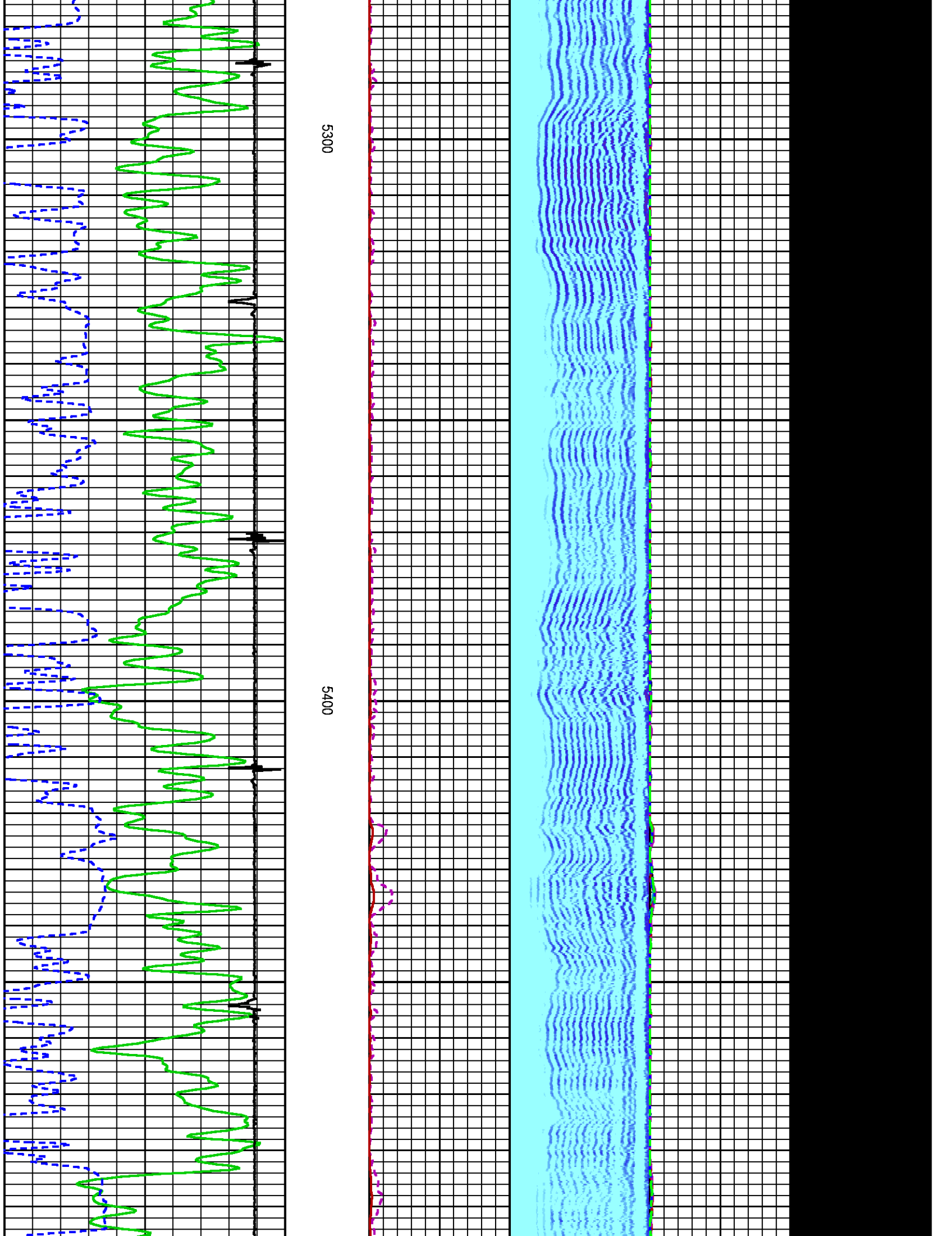


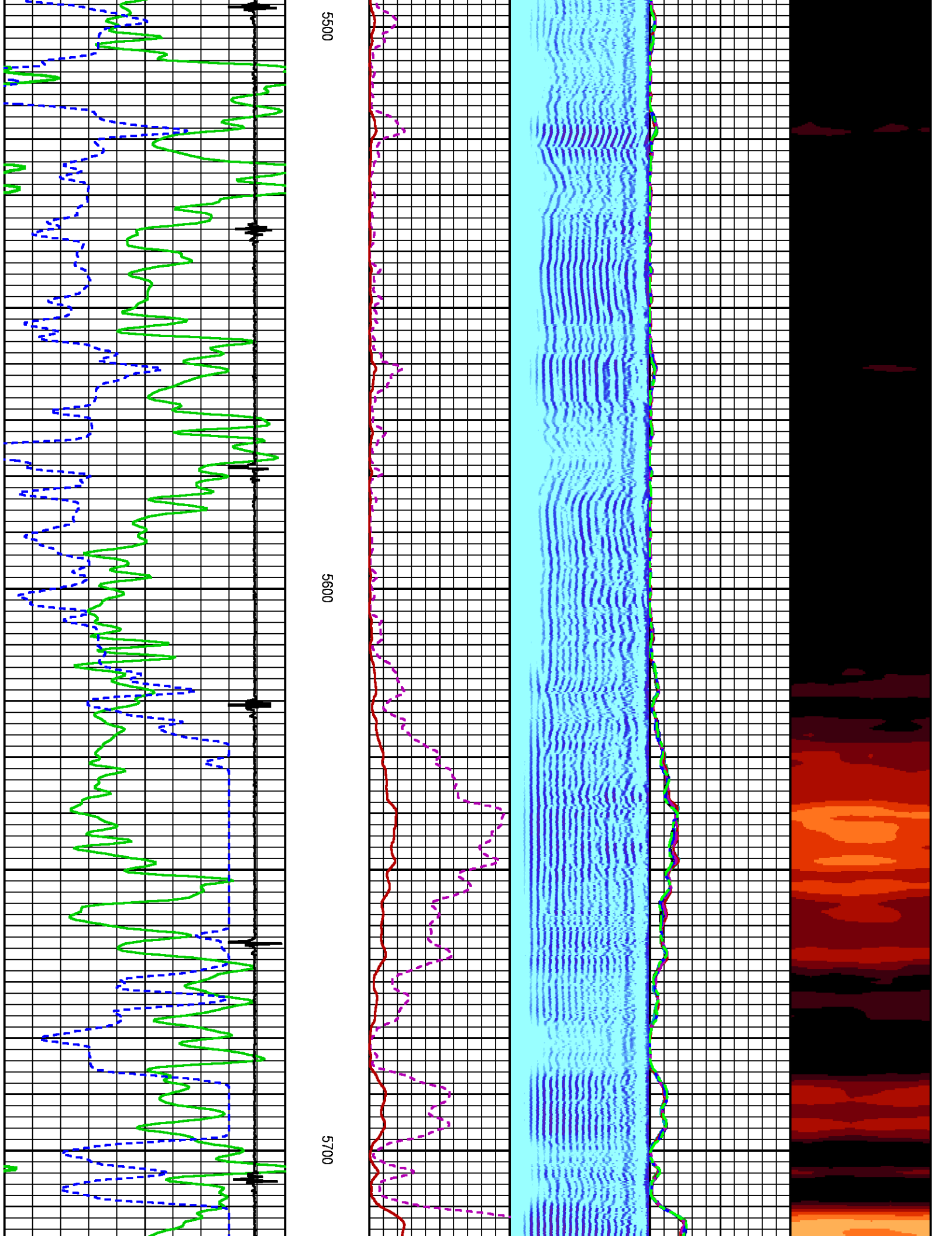


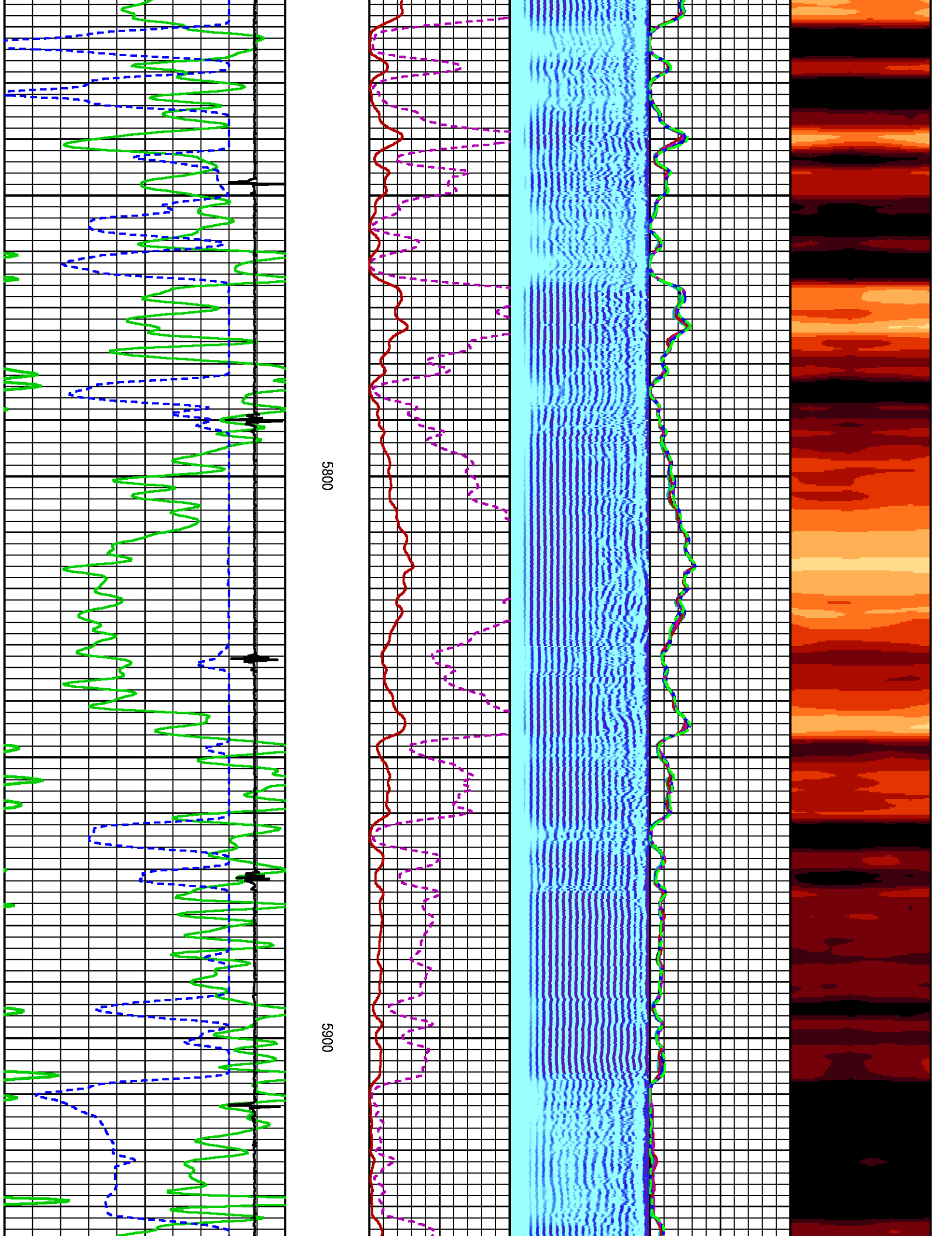


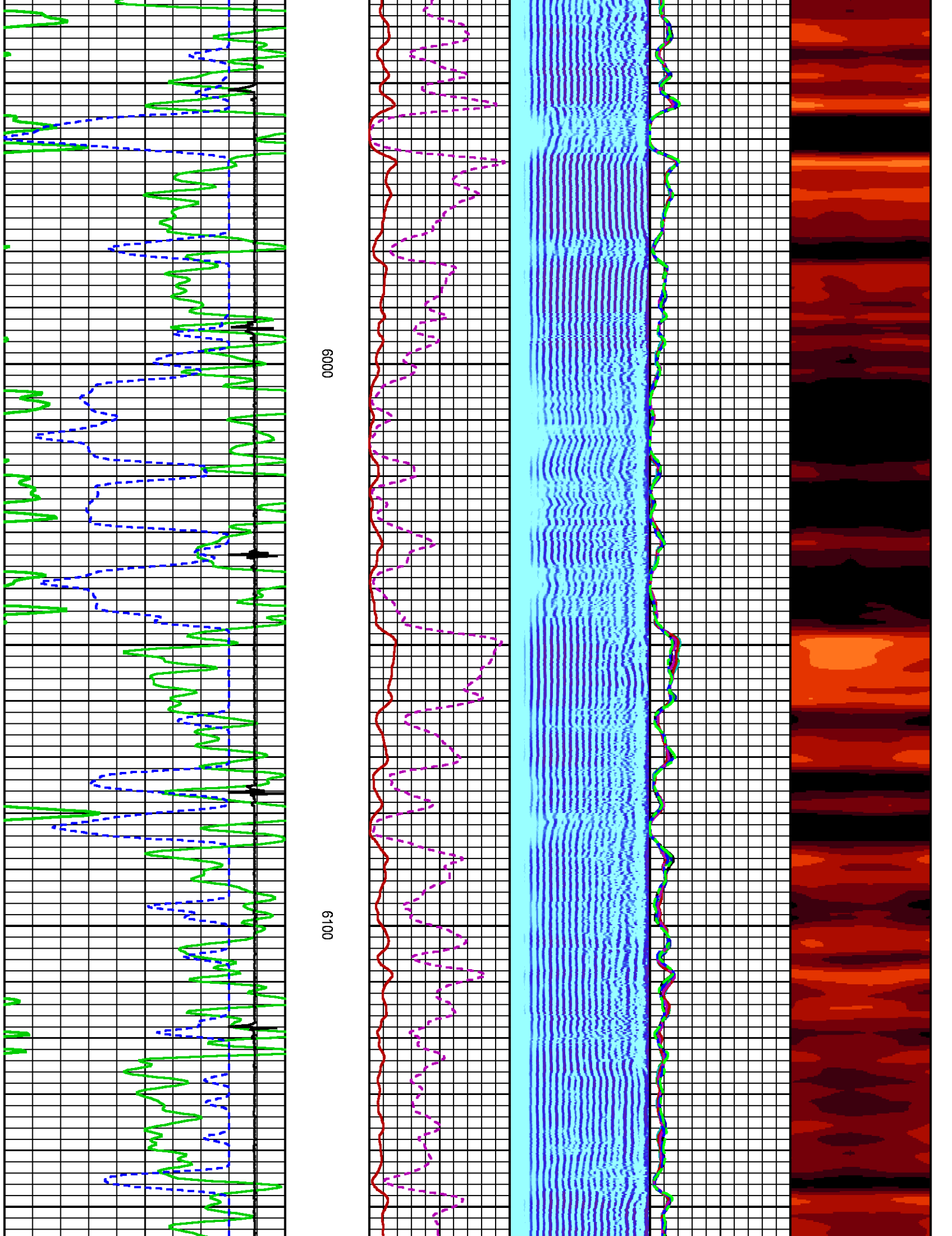




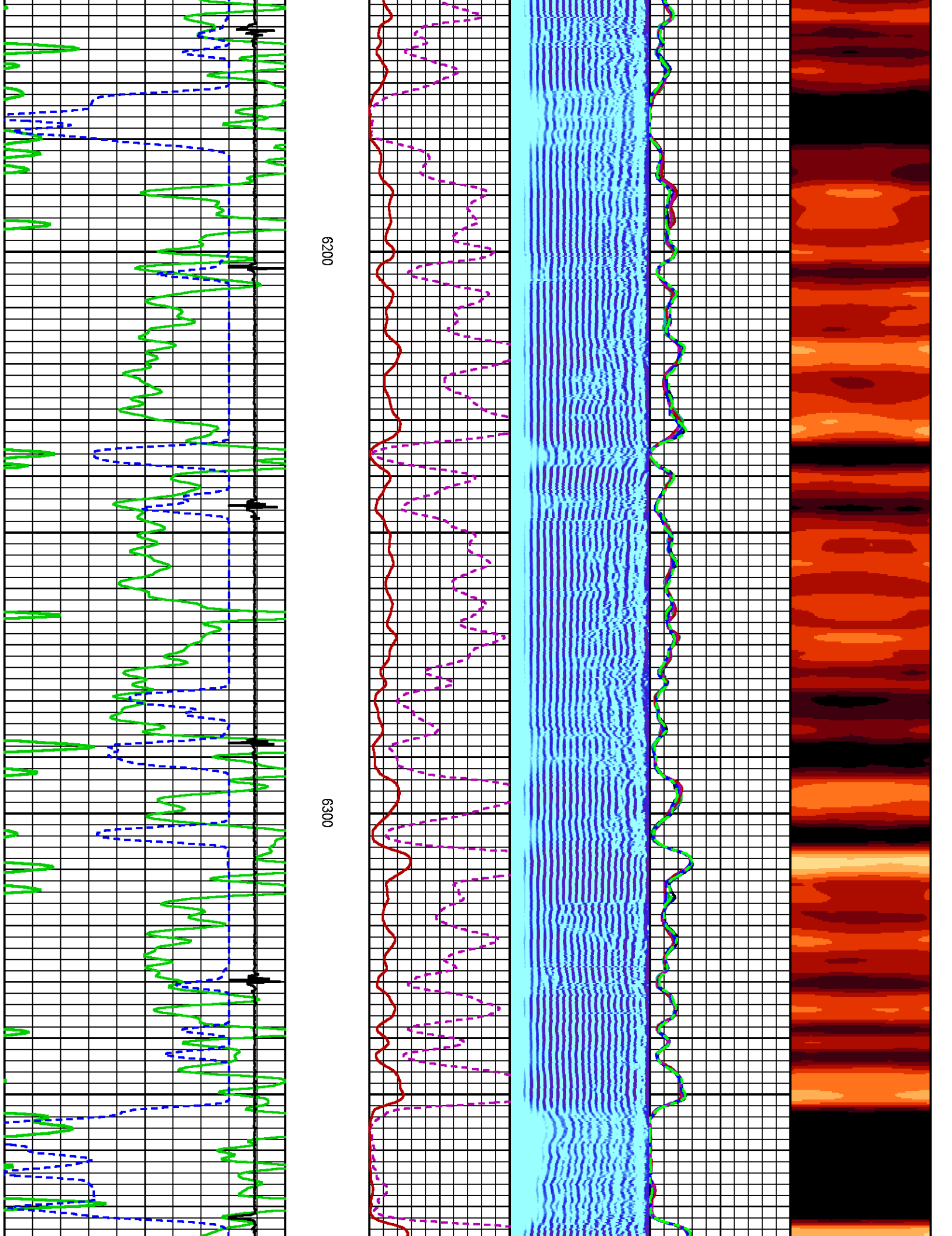




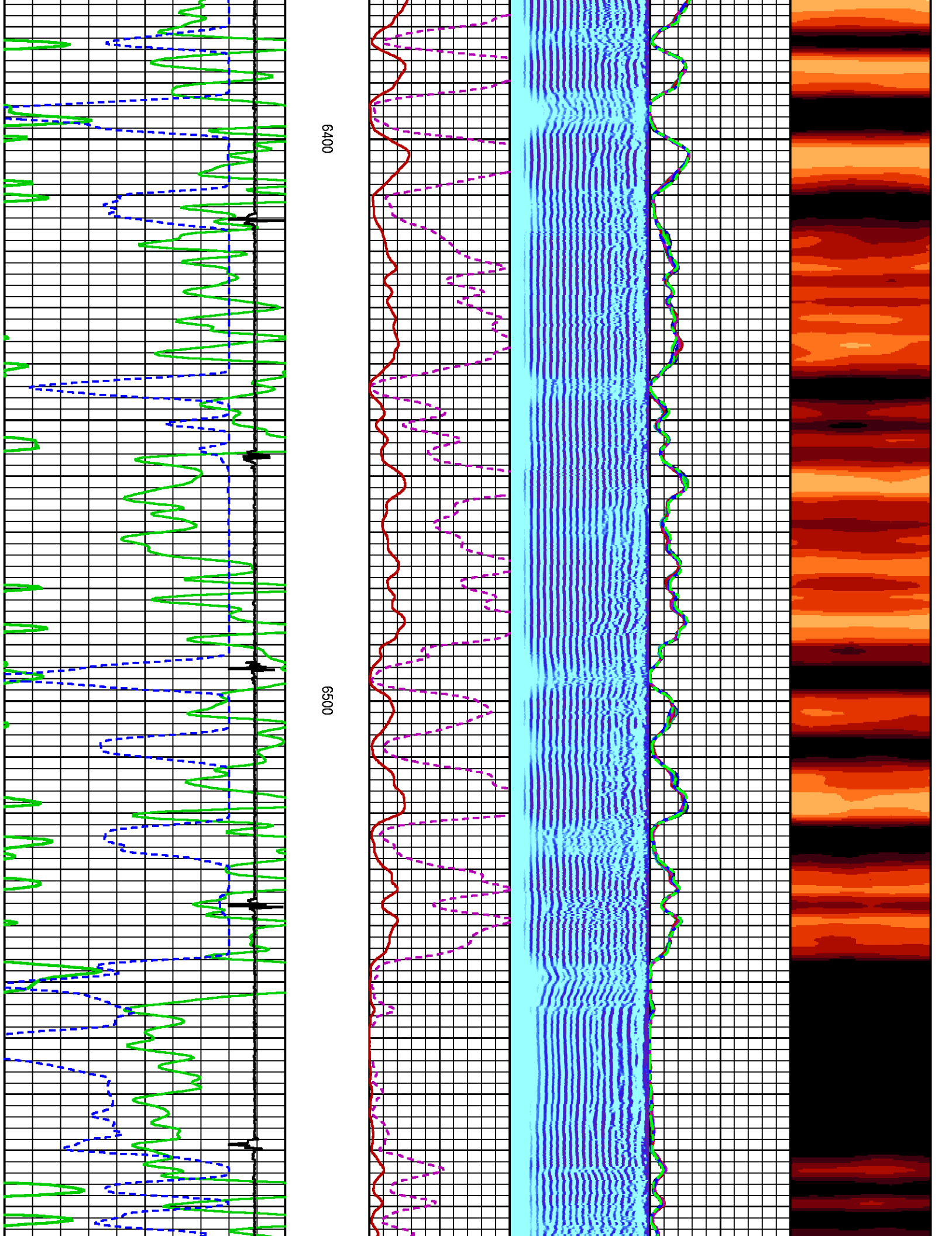


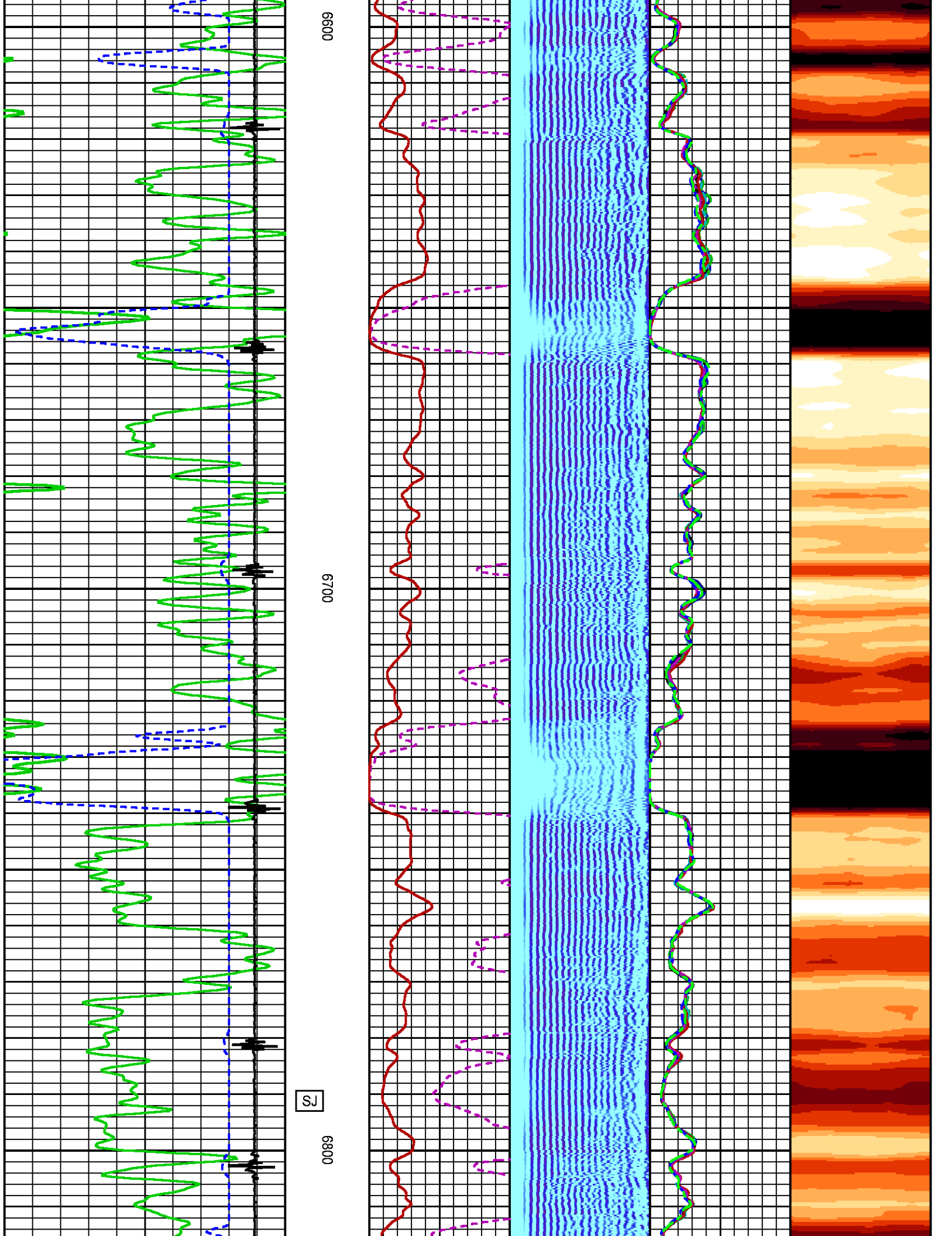


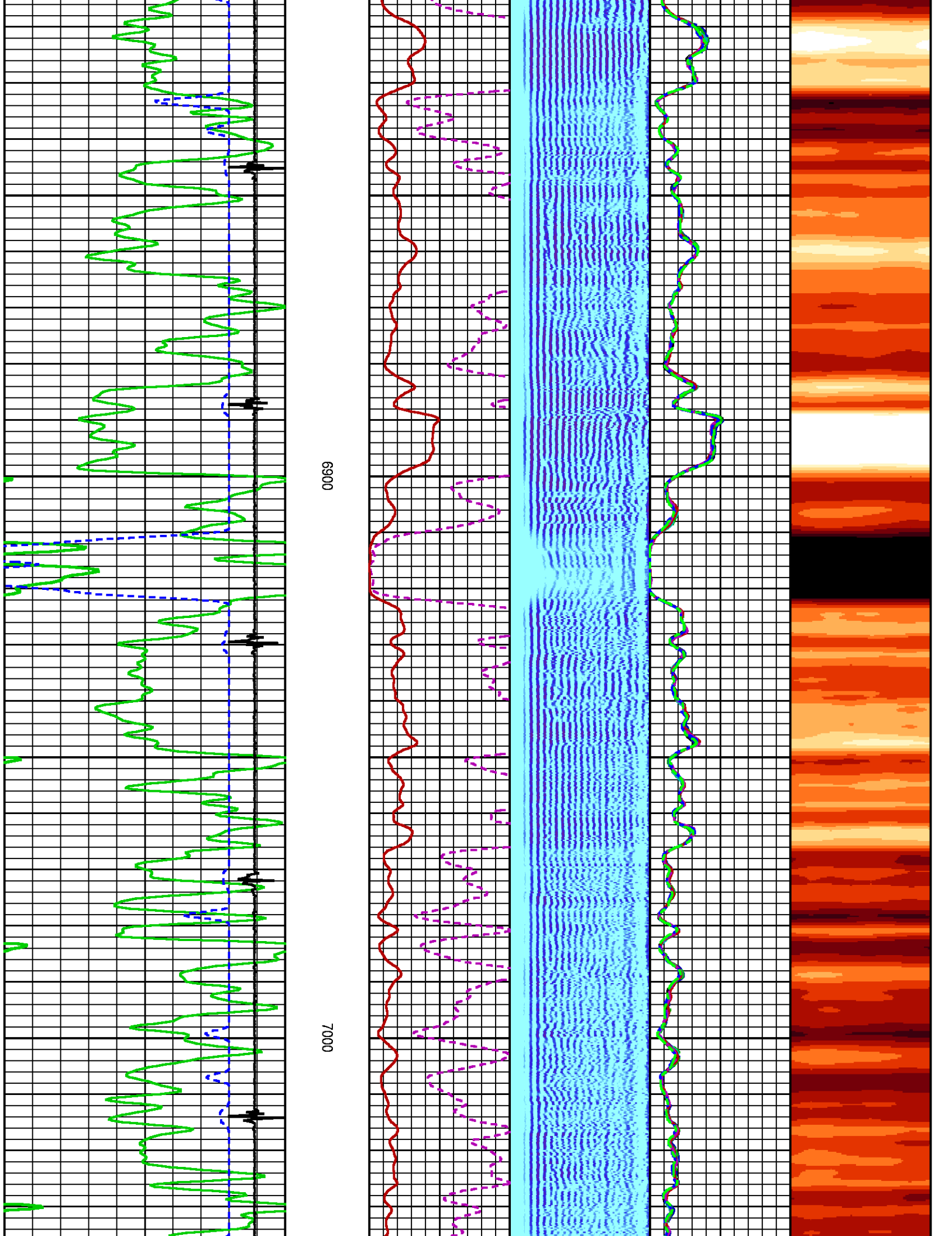


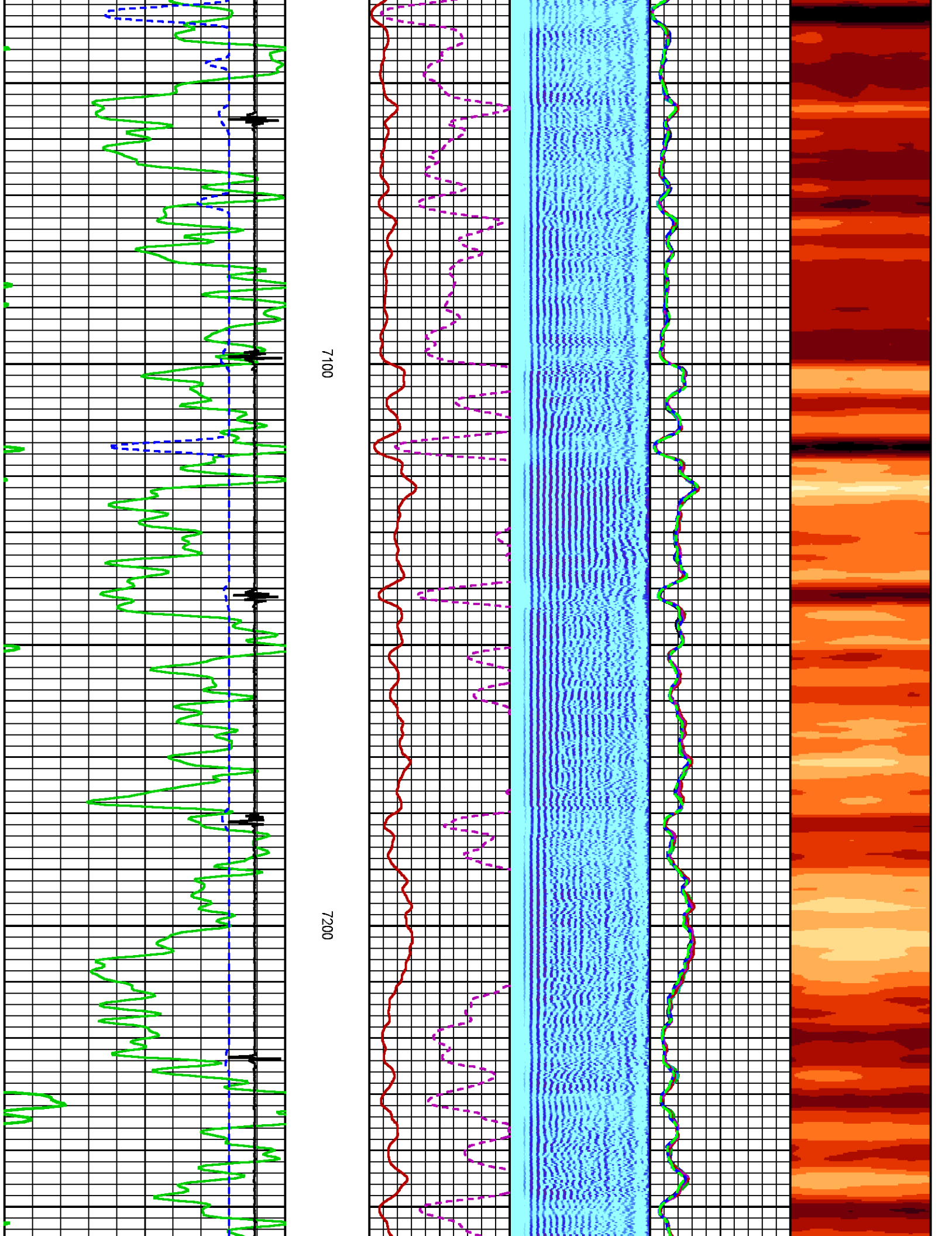




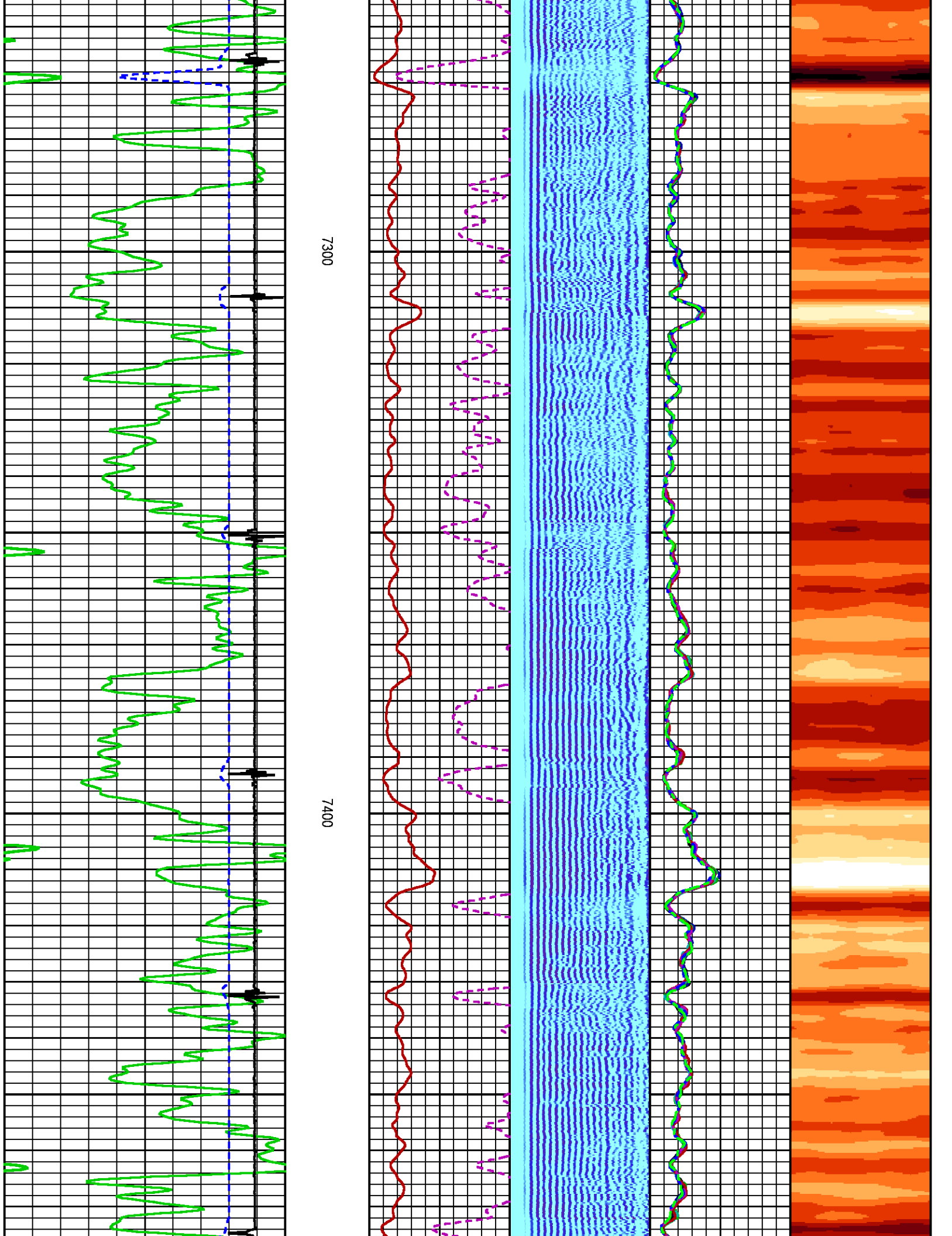




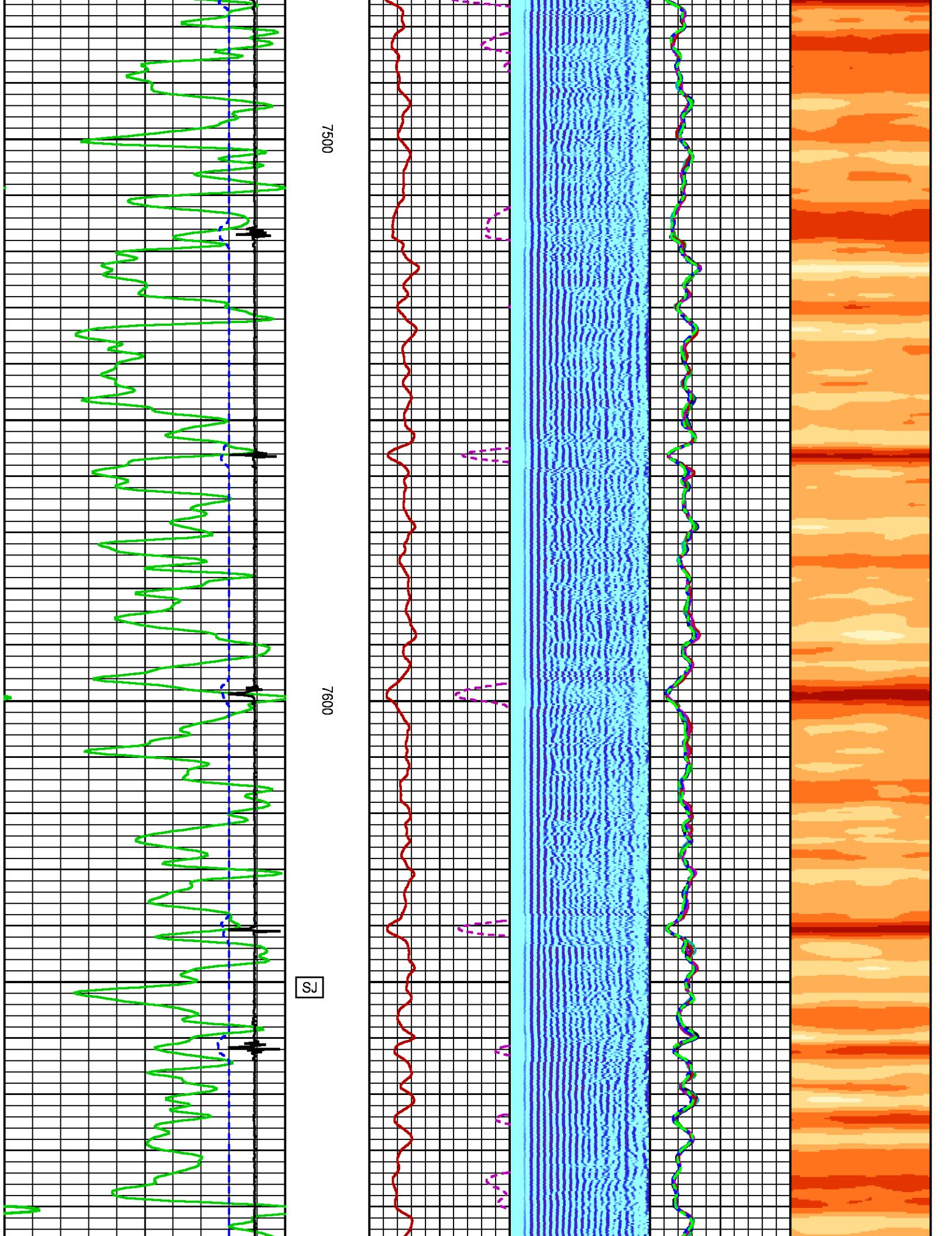


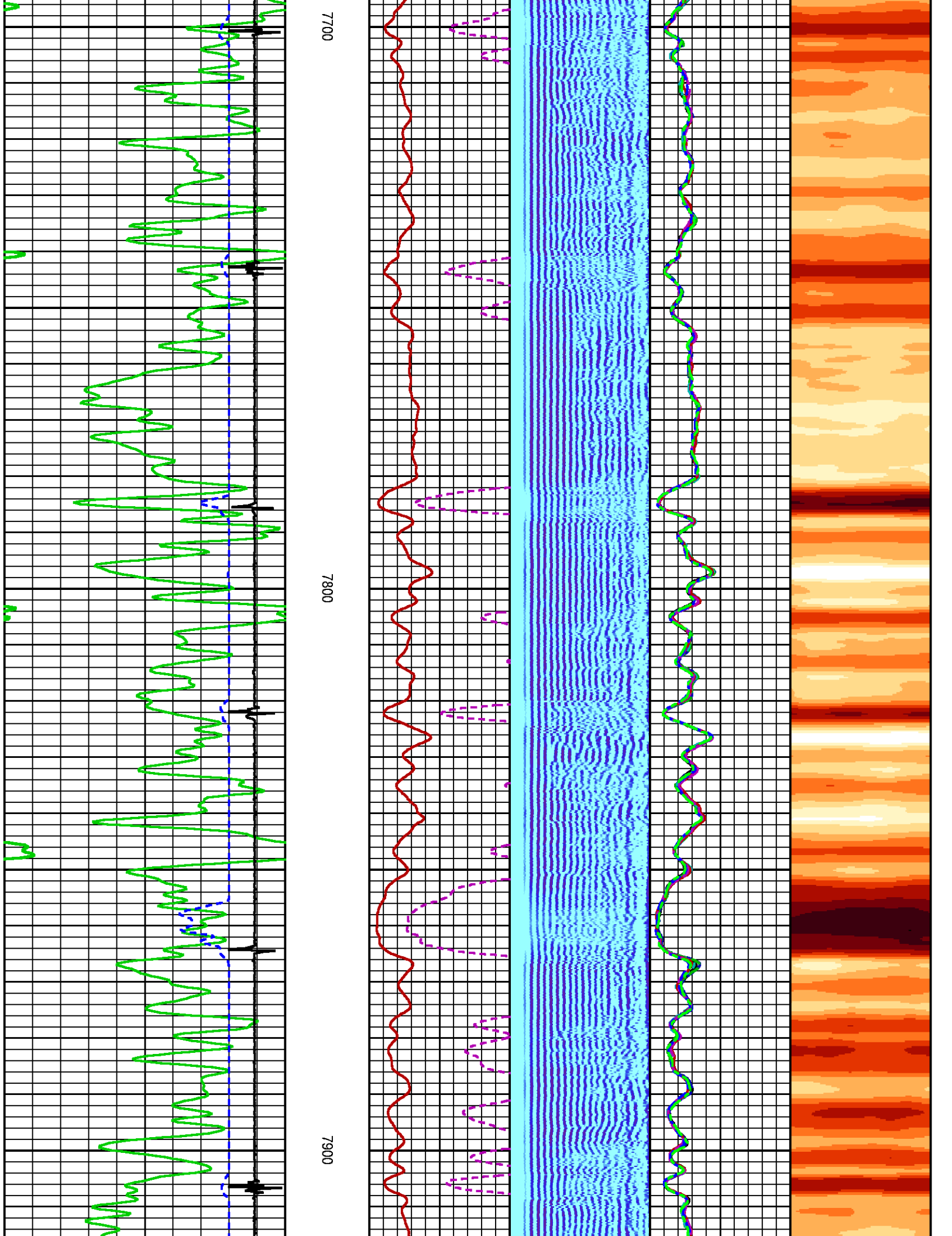


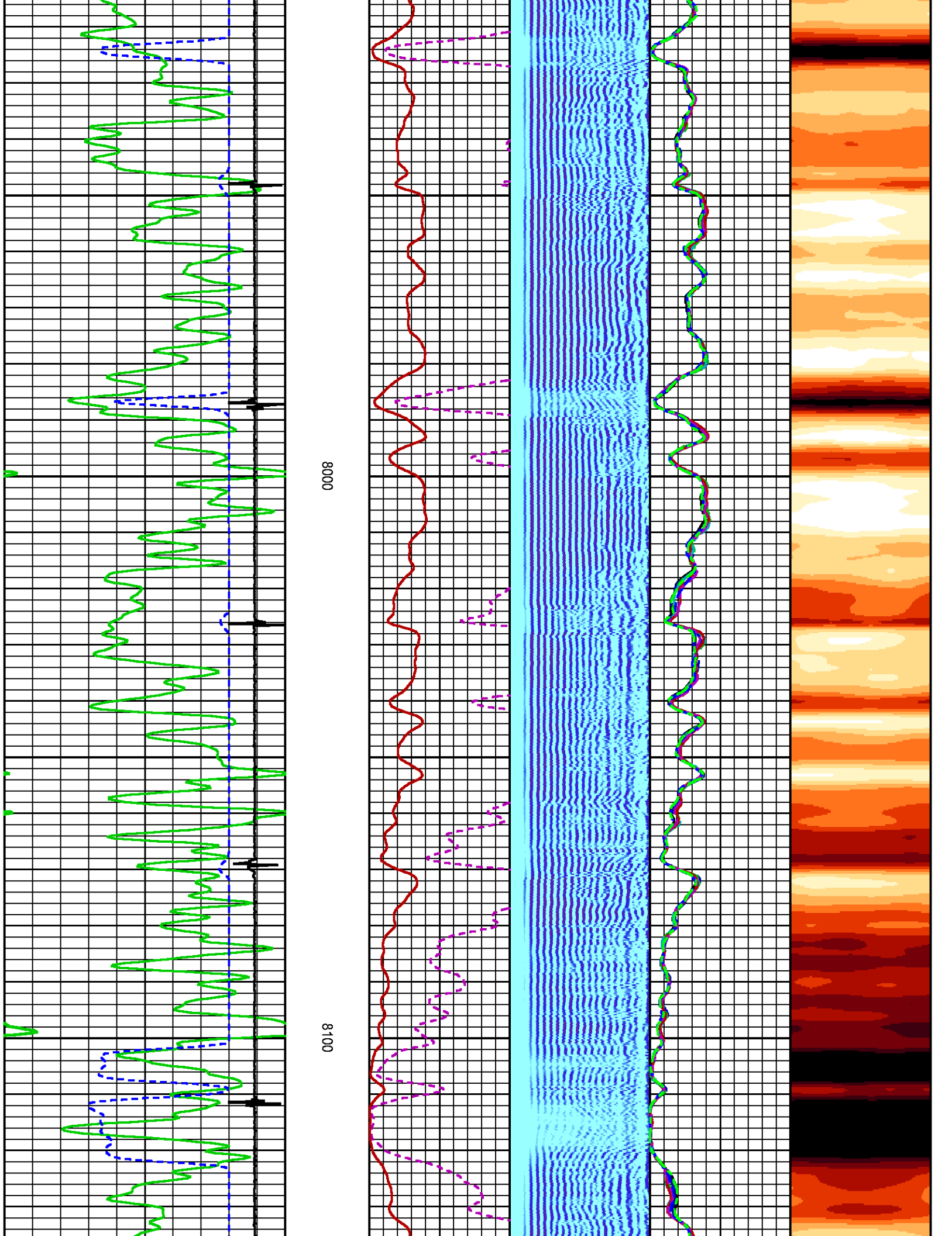


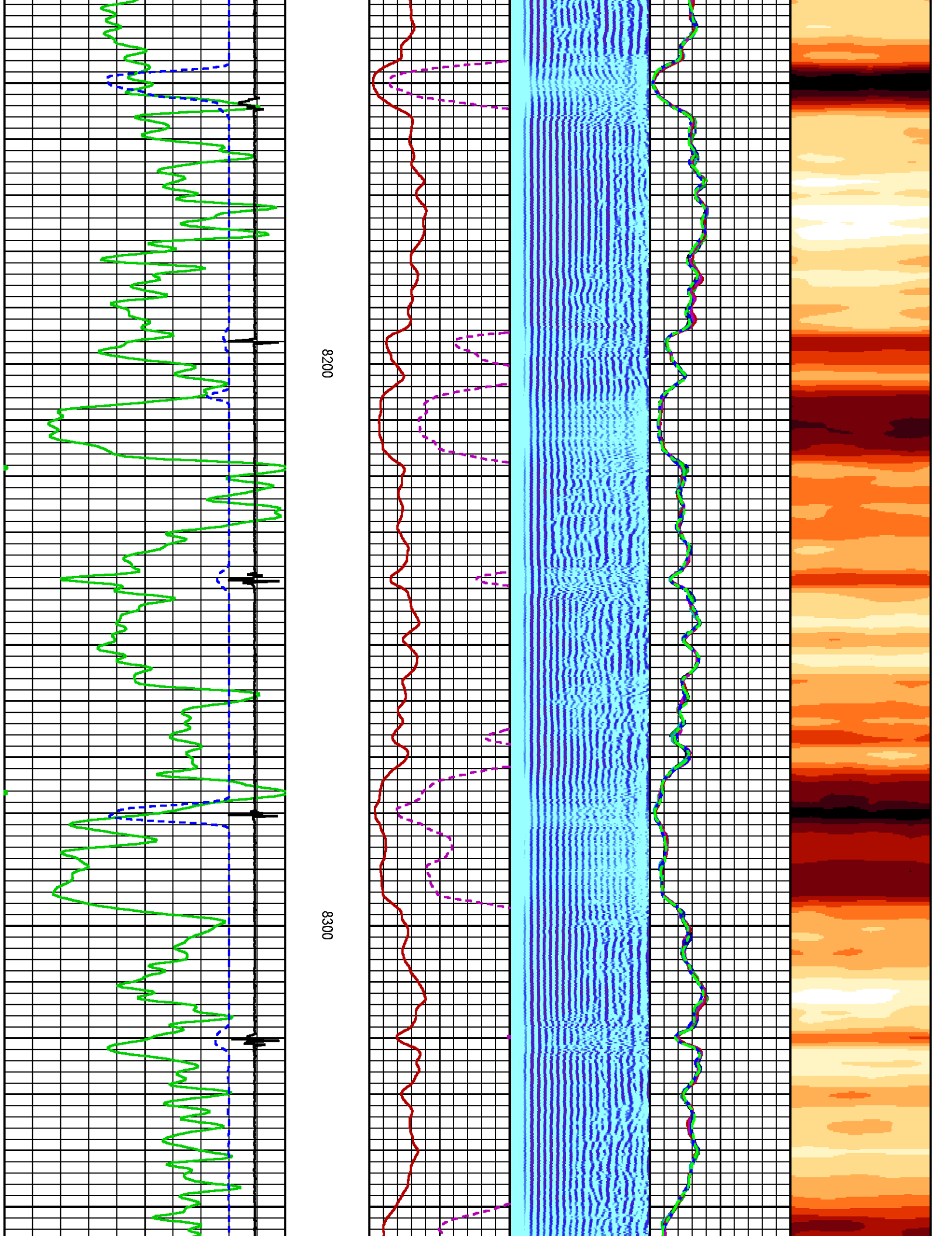




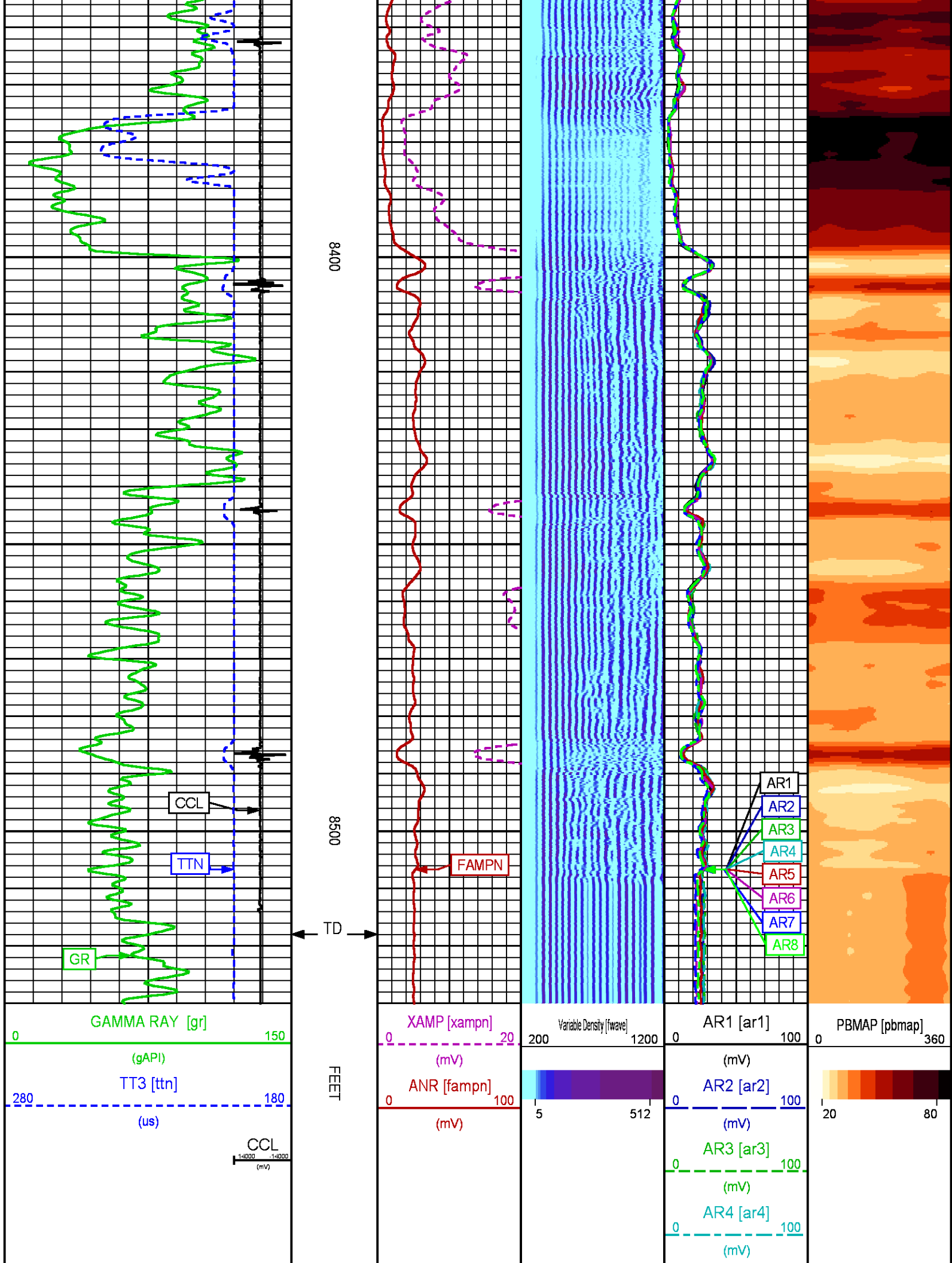
















## REPEAT LOG

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

Updates: 1 Patches: 1

Plotted: Fri Jan 25 14:40:32 2019

### PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/LARAMIE\_SS\_08W/p012g01.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 8277.750 ft BOTTOM DEPTH: 8513.750 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*)	187	us	TOP	BOTTOM
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	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*)	200	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*)	-68	us	"	"
	TOOL DELAY (str2*)	-68	us	"	"
	TOOL DELAY (str3*)	-68	us	"	"
	TOOL DELAY (str4*)	-68	us	"	"
	TOOL DELAY (str5*)	-68	us	"	"
	TOOL DELAY (str6*)	-68	us	"	"
	TOOL DELAY (str7*)	-68	us	"	"

	TOOL DELAY (str7*)	-68	us	"	"
	TOOL DELAY (str8*)	-68	us	"	"
	TOOL DELAY (strn*)	-68	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)	
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	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	"	"

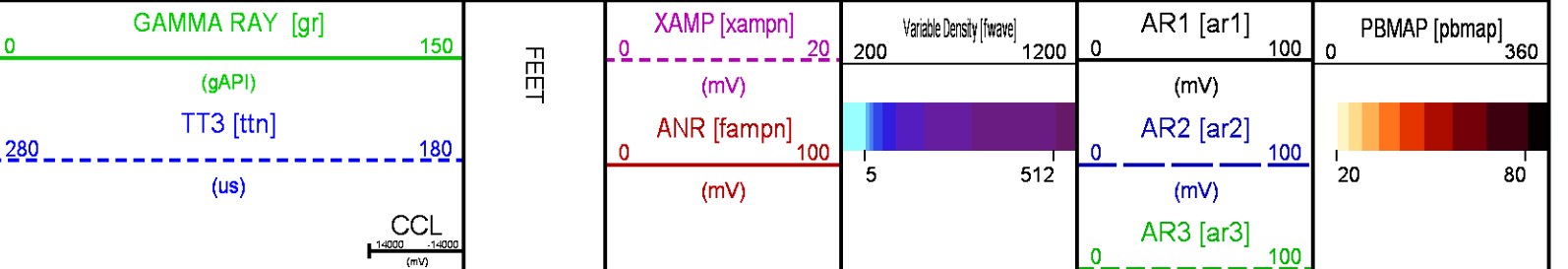
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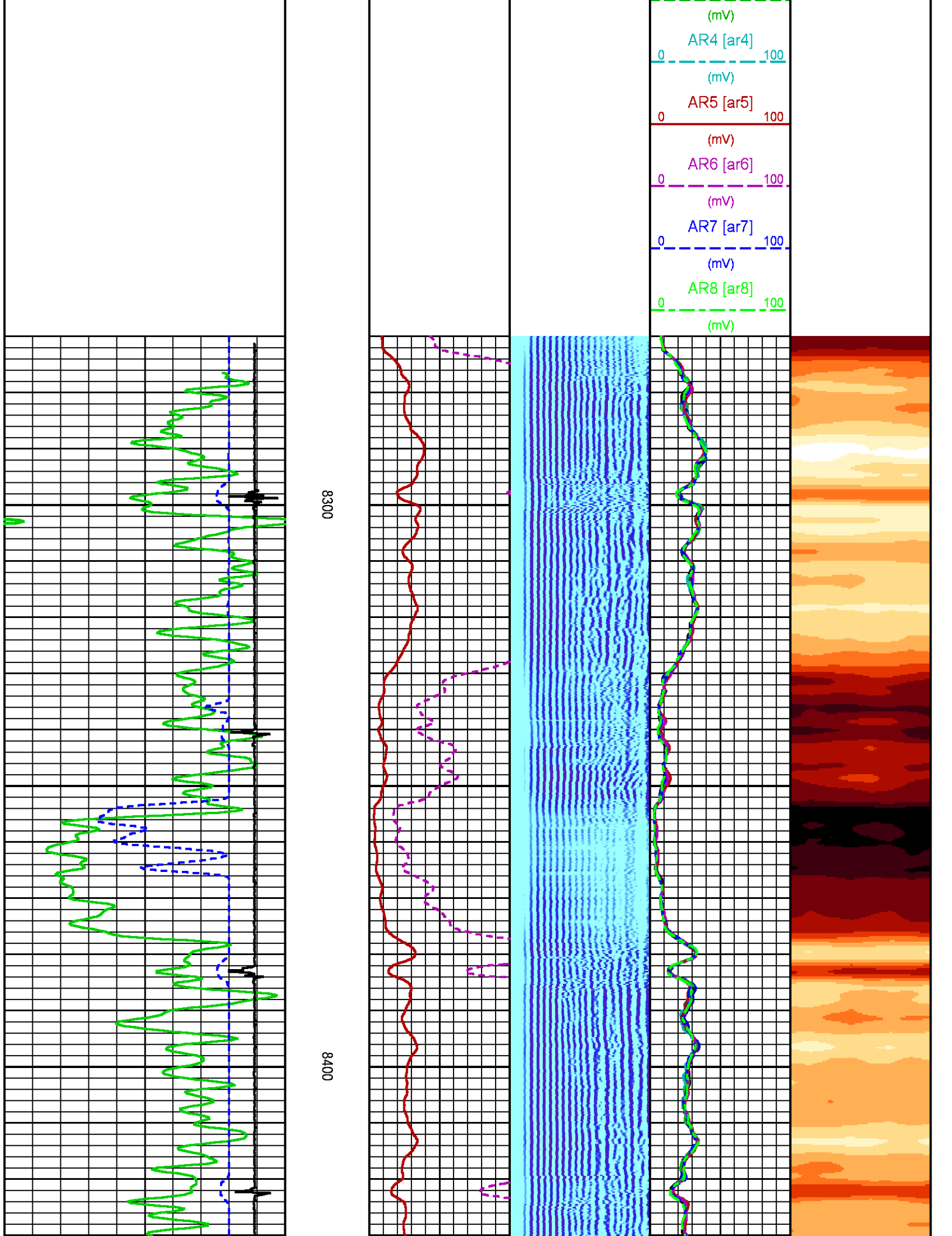
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AR1	Jan 23 15:42:24 2019	FIXED GATE AMPLITUDE T-R1
F1:AR2	Jan 23 15:42:24 2019	FIXED GATE AMPLITUDE T-R2
F1:AR3	Jan 23 15:42:24 2019	FIXED GATE AMPLITUDE T-R3
F1:AR4	Jan 23 15:42:24 2019	FIXED GATE AMPLITUDE T-R4
F1:AR5	Jan 23 15:42:24 2019	FIXED GATE AMPLITUDE T-R5
F1:AR6	Jan 23 15:42:24 2019	FIXED GATE AMPLITUDE T-R6
F1:AR7	Jan 23 15:42:24 2019	FIXED GATE AMPLITUDE T-R7
F1:AR8	Jan 23 15:42:24 2019	FIXED GATE AMPLITUDE T-R8
F1:CCL	Jan 23 15:42:24 2019	CASING COLLAR LOCATOR
F1:FAMPN	Jan 23 15:42:24 2019	FIXED GATE AMPLITUDE NEAR RECEIVER
F1:FWAVE	Jan 23 15:42:24 2019	FAR WAVE FORM
F1:GR	Jan 23 15:42:24 2019	GAMMA RAY
F1:PBMAP	Jan 23 15:42:24 2019	PERCENT BOND CEMENT MAP
F1:TTN	Jan 23 15:42:24 2019	TRAVELTIME FROM NEAR TRANSMITTER-RECEIVER
F1:XAMPN	Jan 23 15:42:24 2019	FIXED GATE AMPLITUDE NEAR RECEIVER TIMES FIVE

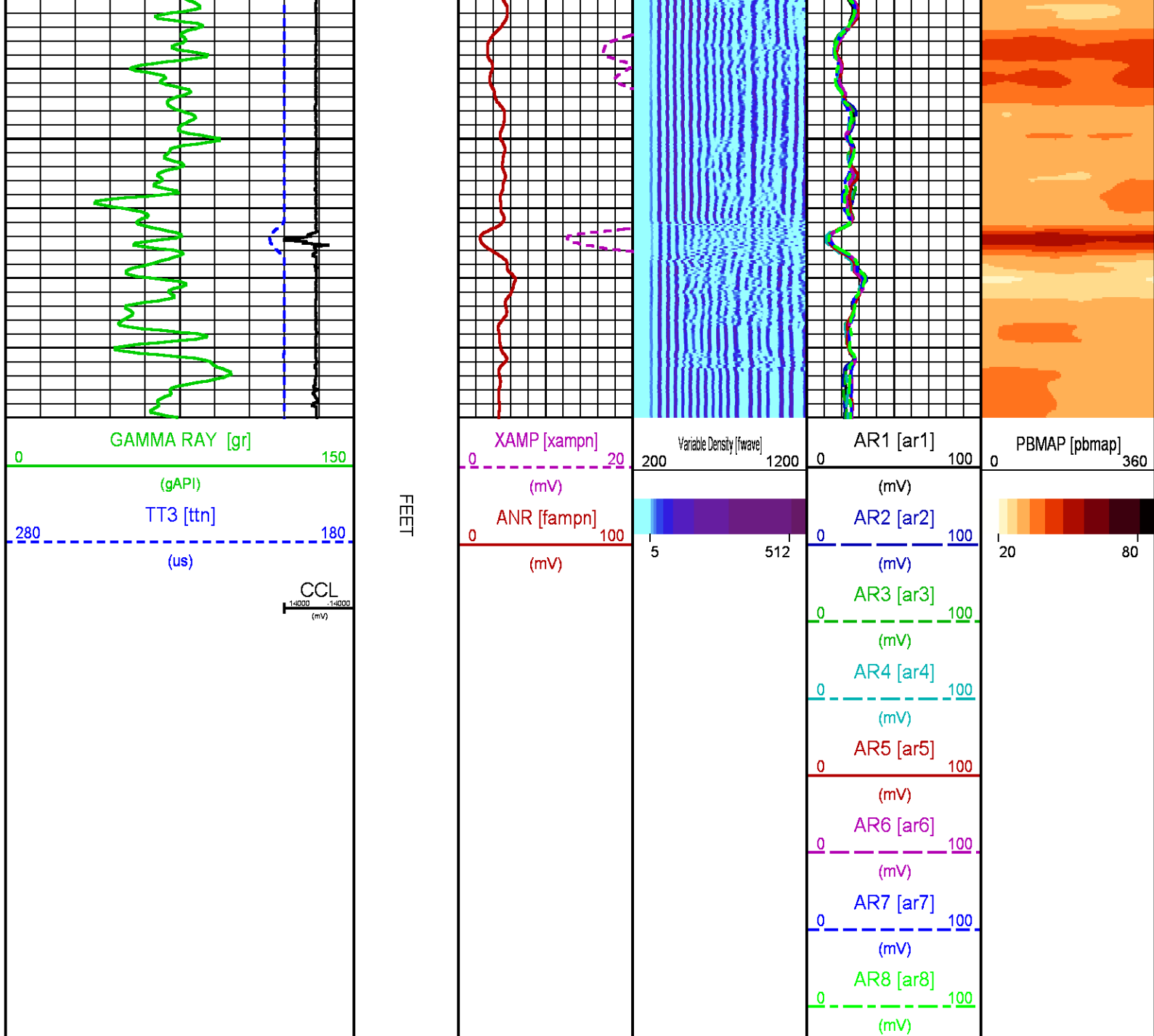
CURVE MEASURE POINT OFFSET

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_SS_08W/08W_RAL_,REPEAT.fvpdf [5"/100' Scale]
Plot Interval	: 8270 - 8490 Feet
Data File 1	: F1 : SysA:/dat1a/LARAMIE_SS_08W/08W_RAL_REPEAT.xtf
Created On	: Jan 23 15:42:24 2019
Company	: LARAMIE ENERGY LLC
Well	: SUP & SHEP 0993-25-08W
Field	: BUZZARD CREEK
File Interval	: 8265.75 - 8513.75 Feet
OCT	: p012g







## CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/LARAMIE\_SS\_08W/p012g.tp1

### RAL PRIMARY CALIBRATION SUMMARY

TOOL #: 1426XA 10222301

DATE/TIME PERFORMED: Wed Jan 23 15:15:25 2019

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)	0.03	0.02	-0.02	-0.06	-0.07	-0.05	0.03	0.01	-0.00	-0.03	0.01
AMP FLUID (mV)	59	58	59	60	60	59	58	57	57	80	58
TT (us)	218	218	218	217	217	217	218	217	219	325	218
M FACTOR	1.70	1.72	1.69	1.68	1.67	1.70	1.72	1.74	1.74	1.88	1.74

### RAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1426XA 10222301      DATE/TIME PERFORMED: Wed Jan 23 15:16:25 2019      DAYS SINCE CAL: 0

UNIT #: 5753XD 111111      CABLE #: 4291SM SMALL1

	NEAR (mV)	R1 (mV)	R2 (mV)	R3 (mV)	R4 (mV)	R5 (mV)	R6 (mV)	R7 (mV)	R8 (mV)	FAR (mV)	CAL (mV)
ZERO	-0.03	0.00	0.05	-0.08	-0.06	0.15	0.00	-0.06	0.04	-0.13	-0.07
AMP AIR	-1.10	-1.66	-1.71	-1.52	-1.75	-1.77	-1.24	-1.63	-1.71	-0.08	99.81

### GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1355XA 11871507      DATE/TIME PERFORMED: Sun Jul 22 17:33:05 2018

UNIT #: 5753XD 10412898      CALB JIG #: 4702NK DA-438

	BACKGROUND (cts)	CALBRTR ON (cts)	CR DIFF (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	CALBRTR (gAPI)
GR	145.29	316.44	171.2	0.876	127.33	277.33	150

### GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1355XA 11871507      DATE/TIME PERFORMED: Sun Jul 22 17:34:29 2018

UNIT #: 5753XD 10412898      VERI JIG #: 4702NK DA-438

	BACKGROUND (cts)	CALBRTR ON (cts)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	148.04	317.09	0.876	129.75	277.90	148.16
						140.00    160.00

## INSTRUMENT CONFIGURATION

Source File: /dat1a/LARAMIE\_SS\_09W/RAL-tdg

CABLEHEAD  
 Diameter : 2.75"  
 Length : 2.25'  
 Weight : 10 lbs  
 Series : CABL234  
 Mnemonic : CBLH



20.38'



**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: 20.38'  
TOTAL WEIGHT: 235 lbs  
MAX DIAMETER: 0'4.00"



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

**LARAMIE ENERGY LLC**  
**SUP & SHEP 0993-25-08W**  
**BUZZARD CREEK**  
**MESA** **STATE** **COLORADO**

**FILE NO:**  
**CH146841**  
**API NO:**  
**05077105710000**

**LOCATION:**

SHL  
LAT: 39.244824 N  
LONG: 107.723428 W  
SEC 25 TWP 9S RGE 93W

**ELEVATIONS:**

KB 8108 FT  
DF  
GL 8078 FT

**DATE** 23-Jan-2019

