

Company: ExxonMobil Production Corp

Well: PCU 297-11C9

Field: Piceance Creek

County: Rio Blanco

State: Colorado

Field: Piceance Creek
Location: 1021' FNL & 894' FWL
Well: PCU 297-11C9
Company: ExxonMobil Production Corp

IMAGING BEHIND CASING
ULTRASONIC TOOL
CCL / GAMMA RAY

LOCATION		Elev.: K.B. 6993.20 ft G.L. 6960.00 ft D.F. 6992.20 ft	
1021' FNL & 894' FWL			
Permanent Datum:	GROUND LEVEL	Elev.: 6960.00 ft	
Log Measured From:	KELLY BUSHING	33.20 ft above Perm. Datum	
Drilling Measured From:	KELLY BUSHING		
API Serial No. 05-103-11471-0C	Section 11	Township 2S	Range 97W

PVT DATA				Run 1	Run 2	Run 3
Oil Density						
Water Salinity				250 ppm		
Gas Gravity						
Bo						
Bw						
1/Bg						
Bubble Point Pressure						
Bubble Point Temperature						
Solution GOR						
Maximum Deviation						
CEMENTING DATA						
Primary/Squeeze			Primary			
Casing String No						
Lead Cement Type						
Volume						
Density			11 lbm/gal			
Water Loss						
Additives						
Tail Cement Type						
Volume						
Density						
Water Loss						
Additives						
Expected Cement Top						

Logging Date 28-Apr-2010

Run Number 1

Depth Driller 8692 ft

Schlumberger Depth 8460 ft

Bottom Log Interval 8410 ft

Top Log Interval 4000 ft

Casing Fluid Type FRESH WATER

Salinity 250 ppm

Density 8.4 lbm/gal

Fluid Level 15 ft

BIT/CASING/TUBING STRING

Bit Size 9.875 in

From 0 ft

To 8692 ft

Casing/Tubing Size 7.000 in

Weight 26 lbm/ft

Grade

From 0 ft

To 8692 ft

Maximum Recorded Temperatures 206 degF

Logger On Bottom 28-Apr-2010 13:12

Unit Number 2276 VERNAL

Recorded By KATIE WALSH

Witnessed By JOHN WOOD

DEPTH SUMMARY LISTING

Date Created: 28-APR-2010 14:35:56

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW-B	Type:	CMTD-B/A	Type:	7-46A XS
Serial Number:	6195	Serial Number:	2527	Serial Number:	7232
Calibration Date:	12-APR-2010	Calibration Date:	11-APR-201	Length:	20090 FT
Calibrator Serial Number:	33	Calibrator Serial Number:	100518	Conveyance Method:	Wireline
Calibration Cable Type:	7-46P	Number of Calibration Points:	10		
Wheel Correction 1:	-9	Calibration RMS:	18		
Wheel Correction 2:	-8	Calibration Peak Error:	27	Rig Type:	LAND

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	105.90 FT
Rig Up Length At Bottom:	105.60 FT
Rig Up Length Correction:	0.30 FT
Stretch Correction:	4.00 FT
Tool Zero Check At Surface:	0.30 FT

Depth Control Remarks

1. This is the first run in hole and therefore the reference for all subsequent logs
2. IDW used as primary depth control; Z-chart used as secondary
3. All Schlumberger depth control policies followed
4.
5.
6.

DISCLAIMER

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE OF AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

OTHER SERVICES1 OS1: None OS2: OS3: OS4: OS5:	OTHER SERVICES2 OS1: OS2: OS3: OS4: OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
Tool run as per tool sketch	
Tool run centralized using 2x GEMCO's and 2x in-line centralizers	
Neutron run for GR only	
UFAO = -1	
Logged at 1800'/hr max	
Expected casing thickness = 0.362" / Observed = 0.366"	
Expected internal radius = 3.13" / Observed = 3.16"	
Expected flexural attenuation in free pipe = 55dB / Observed = 57.8 dB	
Tool joint flexural attenuation at 600'	

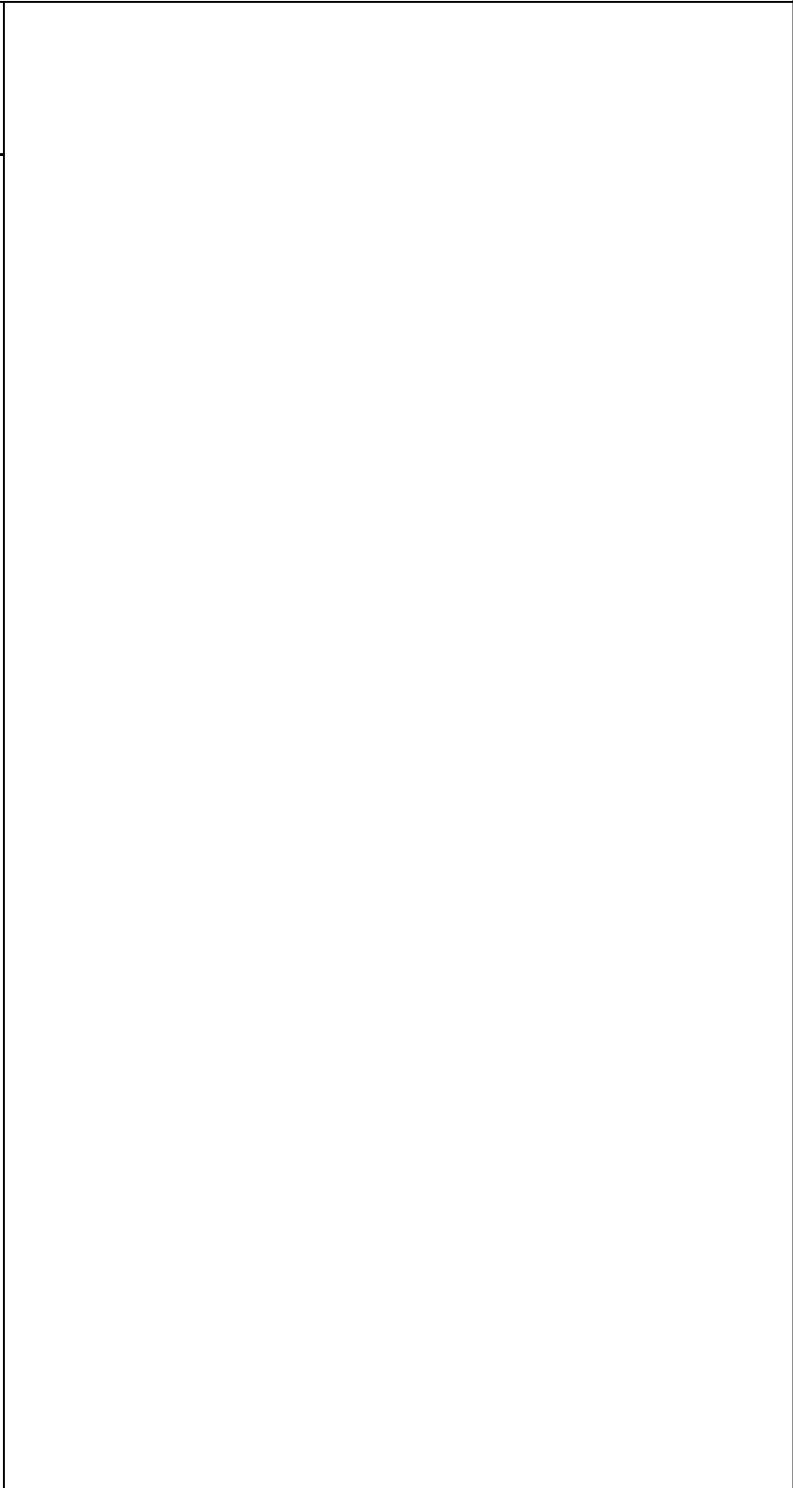
Log monitored by real-time virtual SQC	
Anomaly observed at 7250'	

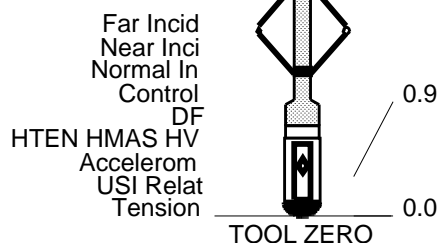
RUN 1			RUN 2		
SERVICE ORDER #:			SERVICE ORDER #:		
PROGRAM VERSION:			PROGRAM VERSION:		
FLUID LEVEL:			FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION					
RUN 1			RUN 2		

SURFACE EQUIPMENT	
WITM (DTS)-A	
GSR-U/Y	
NCT-B	
CNB-AB	
NCS-VB	

DOWNHOLE EQUIPMENT	
LEH-QT	37.0
LEH-QT	
DTC-H	
ECH-KC	
DTCH0-A	
DTCH1-A	
HILTH-FTB	
HGNSD-H	
HMCA-H	
HGNH	
NLS-KL	
NSR-F	
HACCZ-H	
HCNT-H	
HGR	
NPV-N	
USIT-D	
ECH-MRA	
USIC-D	
USIS-A	
USSC-B	
IBCS_B-100158202	
Top Transducer	
Middle Top Transducer	
Middle Bottom Transducer	
Bottom Transducer	





MAXIMUM STRING DIAMETER 7.50 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Schlumberger

IBC SLG COMPOSITE

MAXIS Field Log

Company: Well:

Input DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_017LUP	FN:16	PRODUCER	28-Apr-2010 12:12	8419.0 FT	3308.0 FT
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Output DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_006PUP	FN:5	PRODUCER	28-Apr-2010 15:31	8423.0 FT	3312.0 FT
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OP System Version: 17C0-154

USIT-D DTC-H	SRPC-3870_Q3_2009_OP17_V3 17C0-154	HILTH-FTB	SRPC-3870_Q3_2009_OP17_V3
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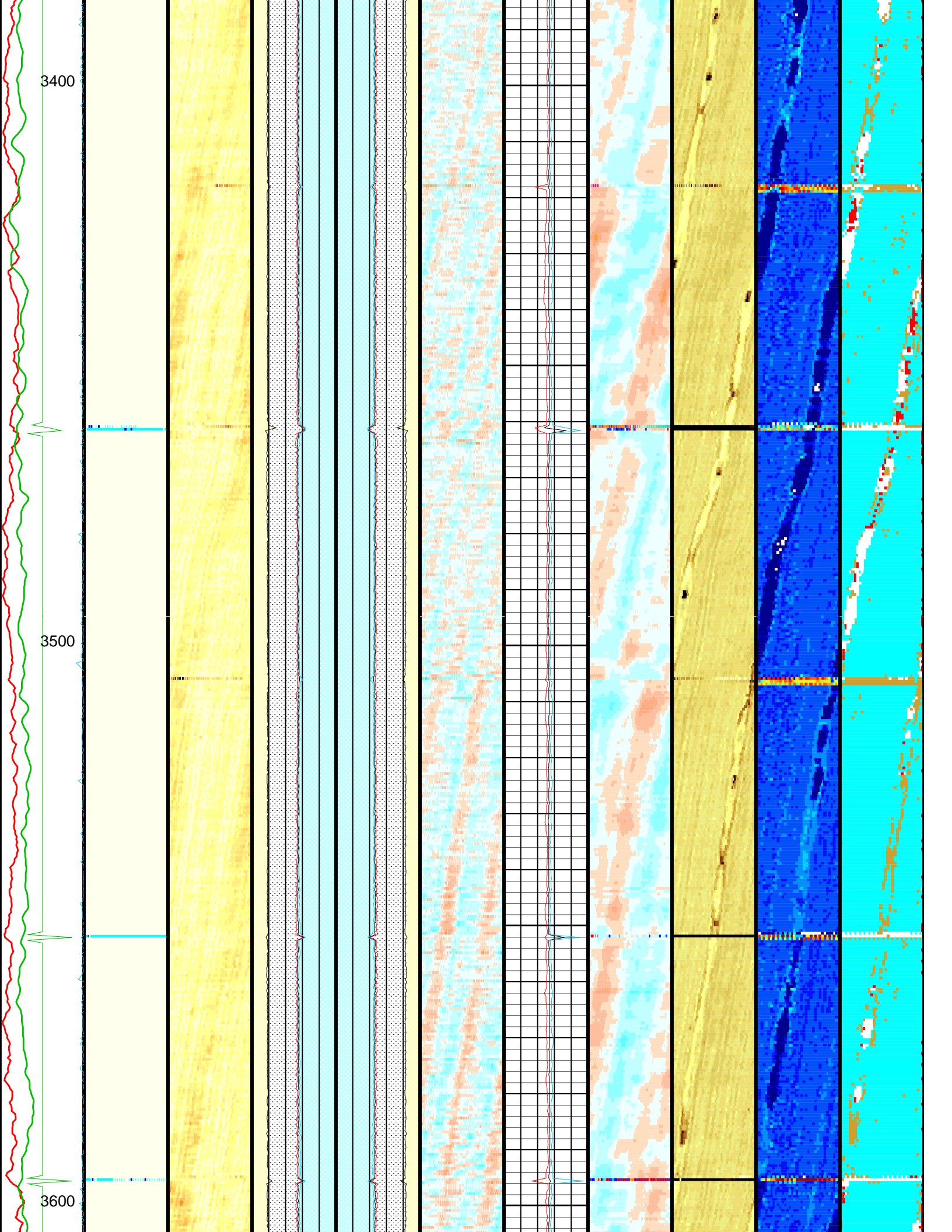
Image
rotation
(UCAZ)
(DEG)

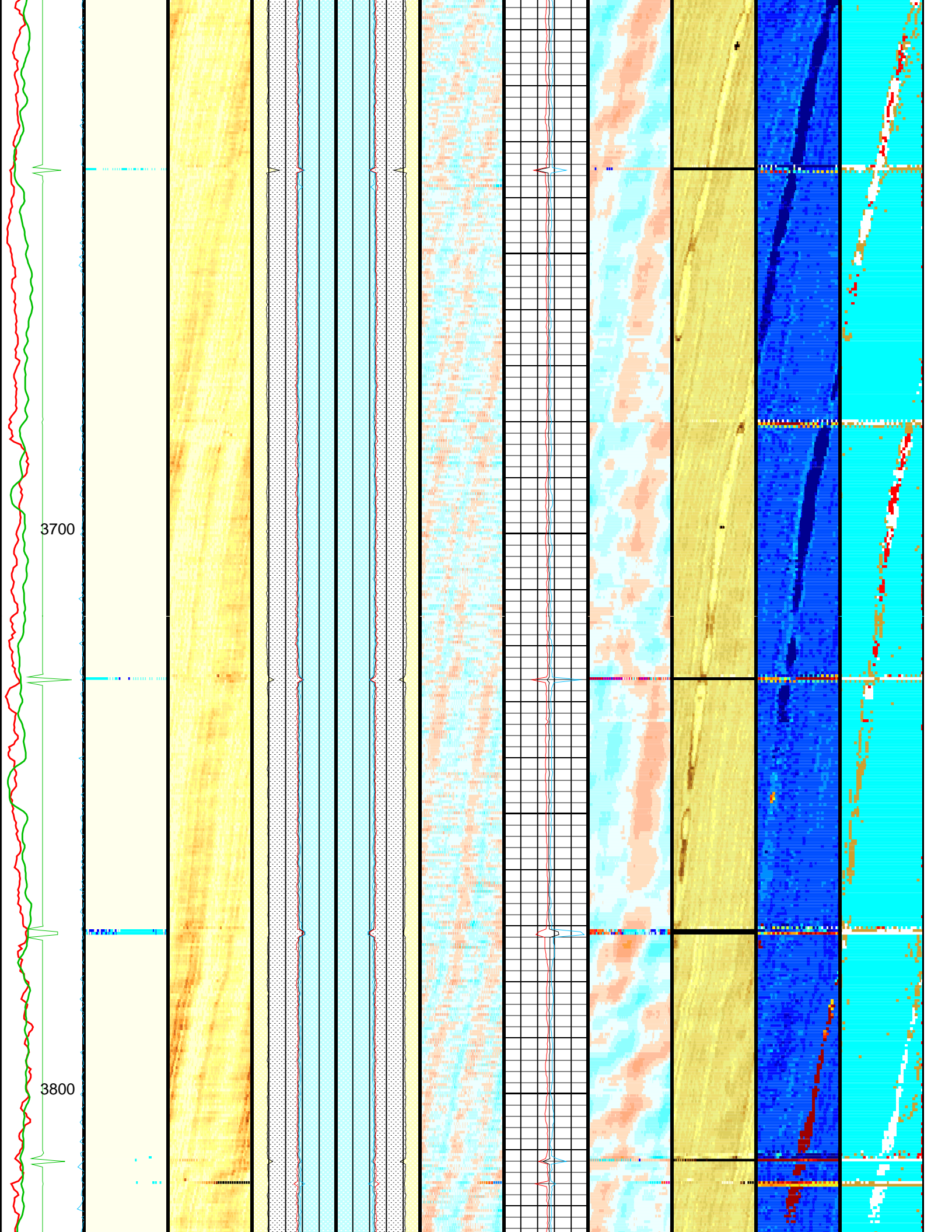
0 360

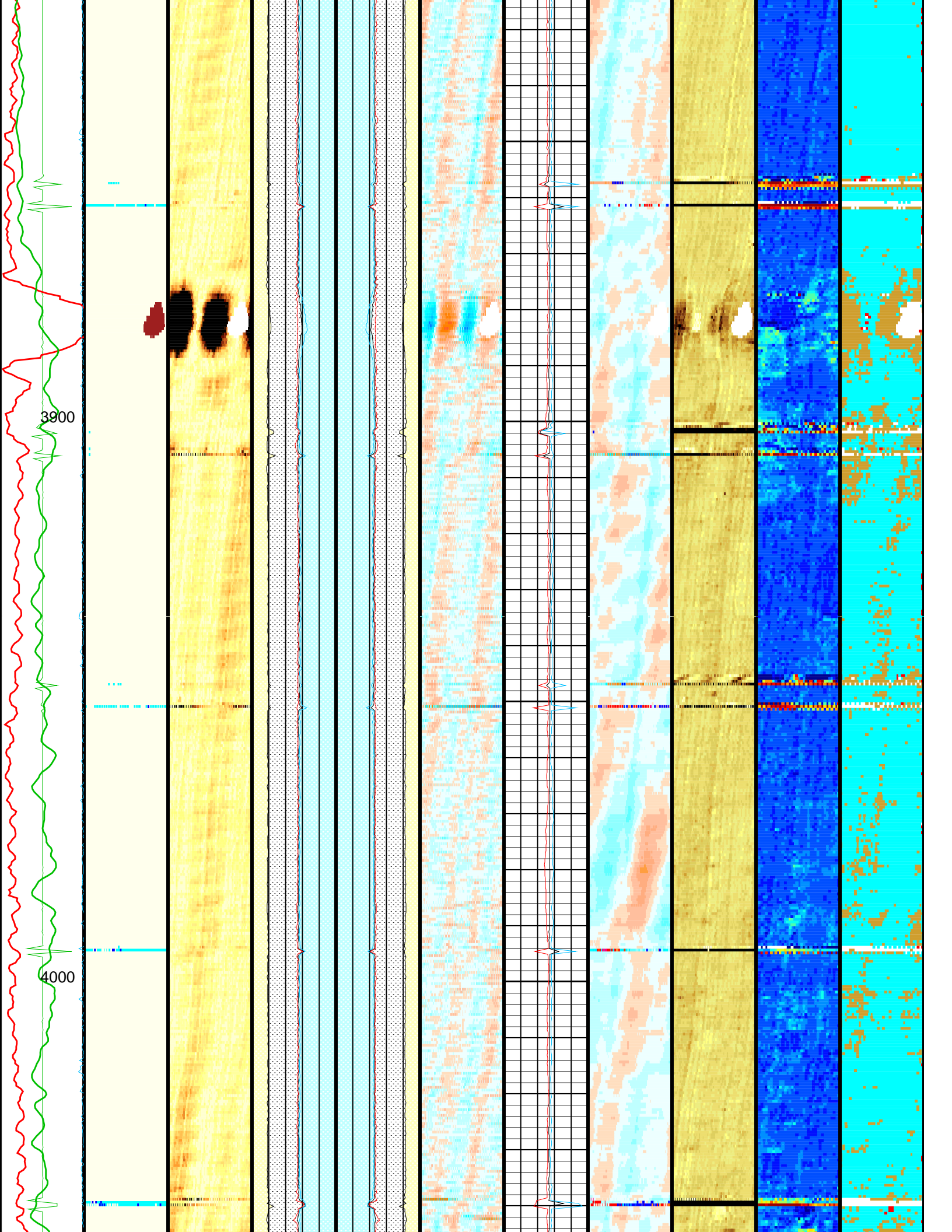
Tool/Tot.
Drag
From D4T
to STIA

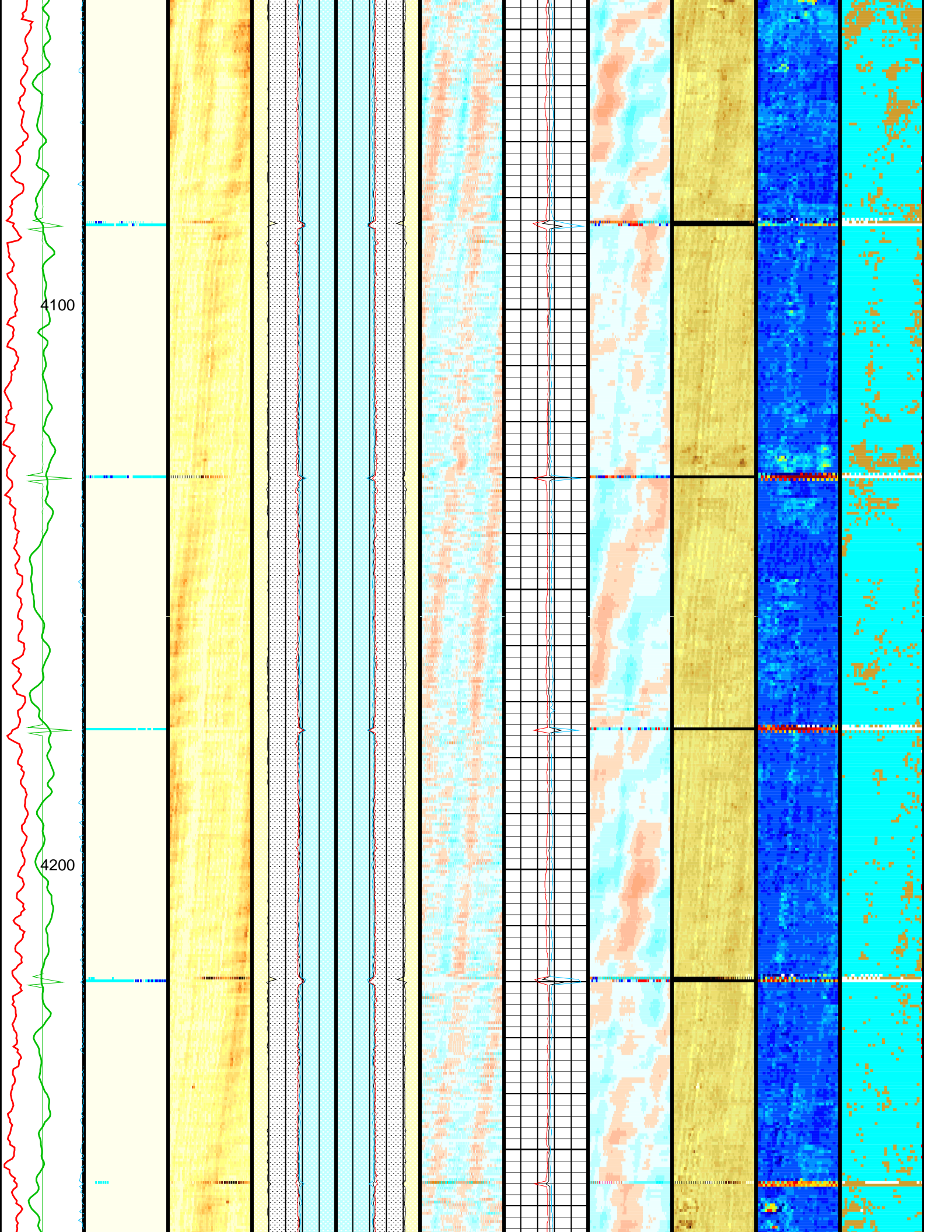
Cable
Drag
From D4T

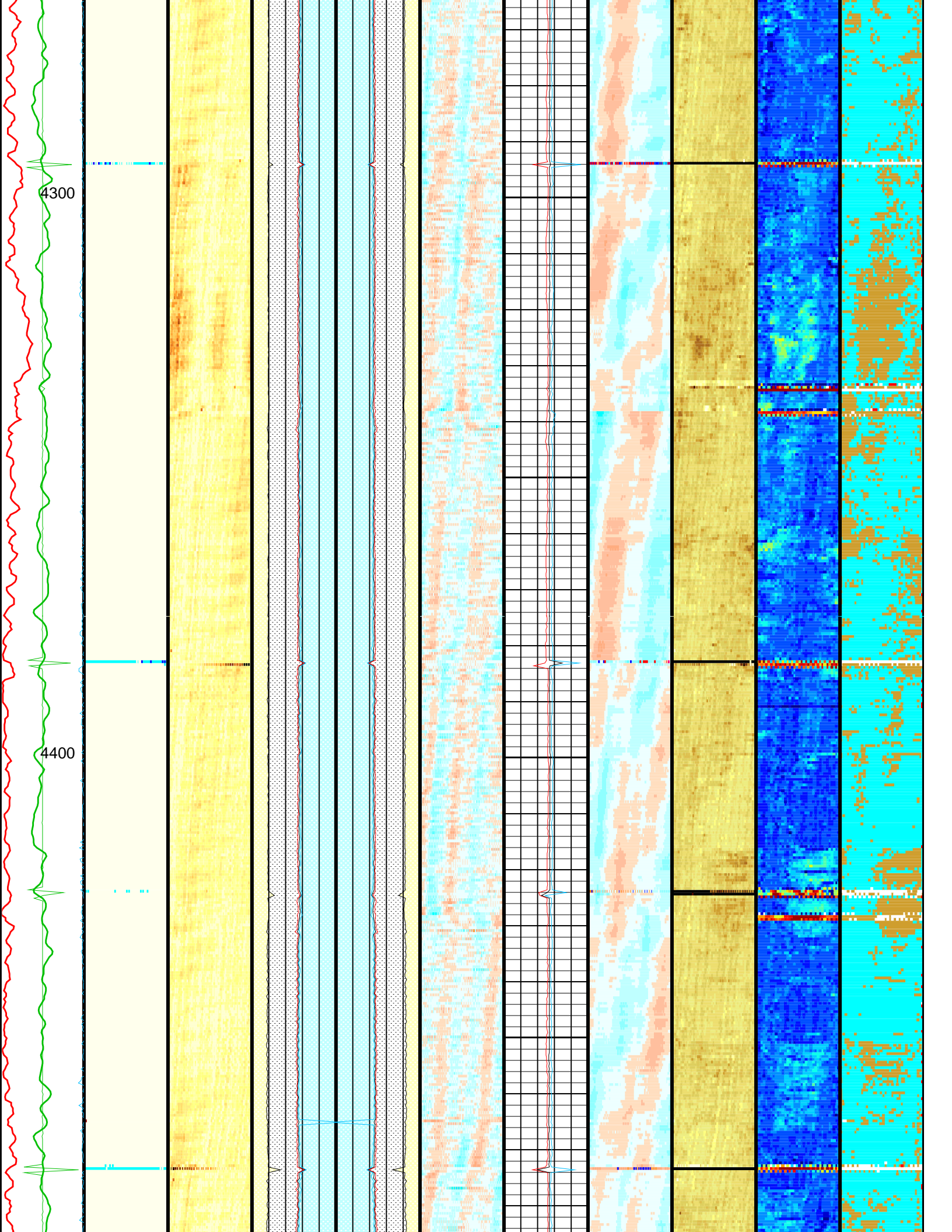
A horizontal strip of 12 small images, each showing a different pattern or texture. From left to right: 1. A green wavy line on a white background. 2. A solid light blue background. 3. A solid yellow background. 4. A solid light blue background. 5. A solid light blue background. 6. A solid light blue background. 7. A solid light blue background. 8. A solid light blue background. 9. A solid light blue background. 10. A solid light blue background. 11. A solid light blue background. 12. A solid light blue background.

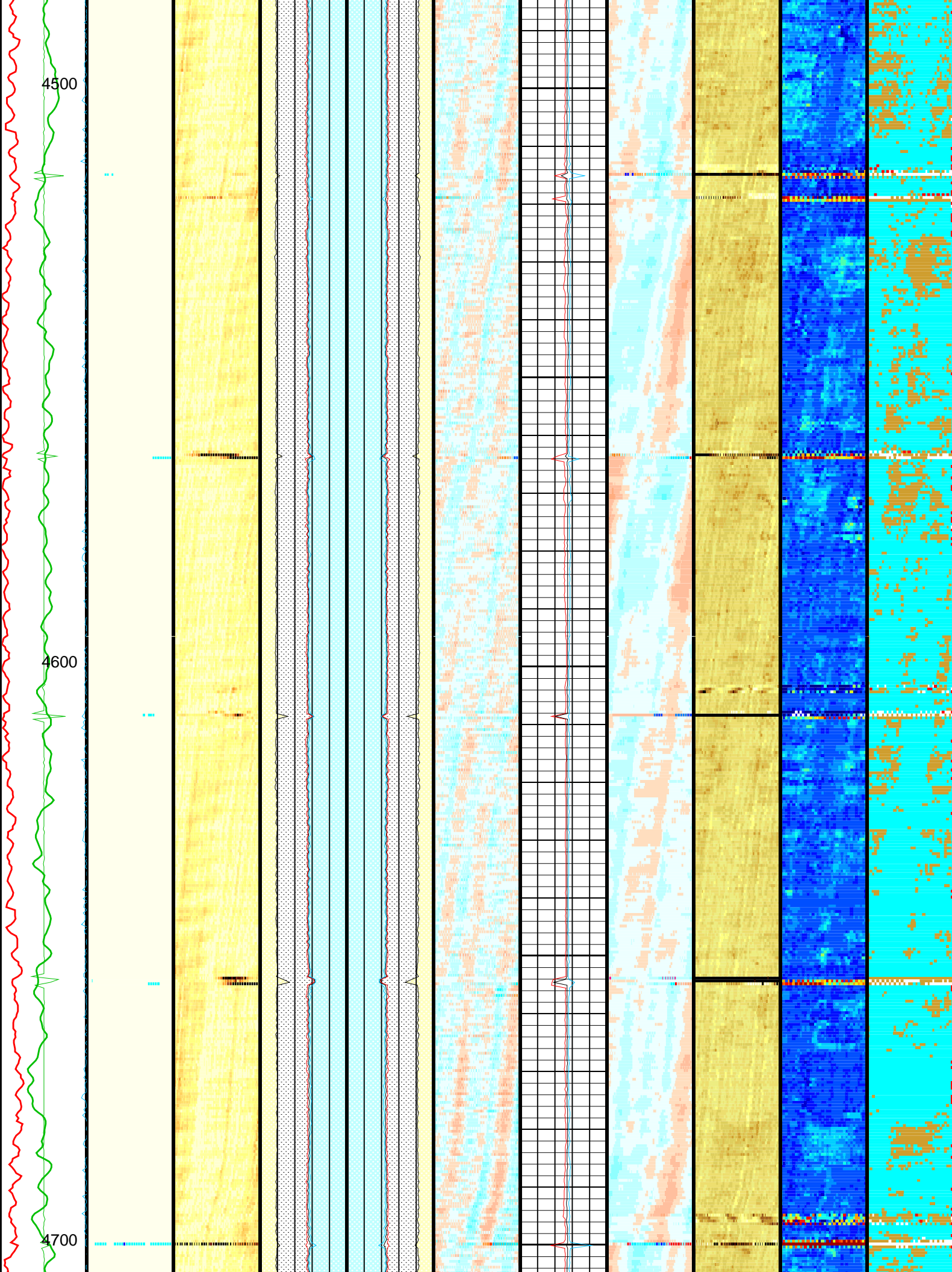


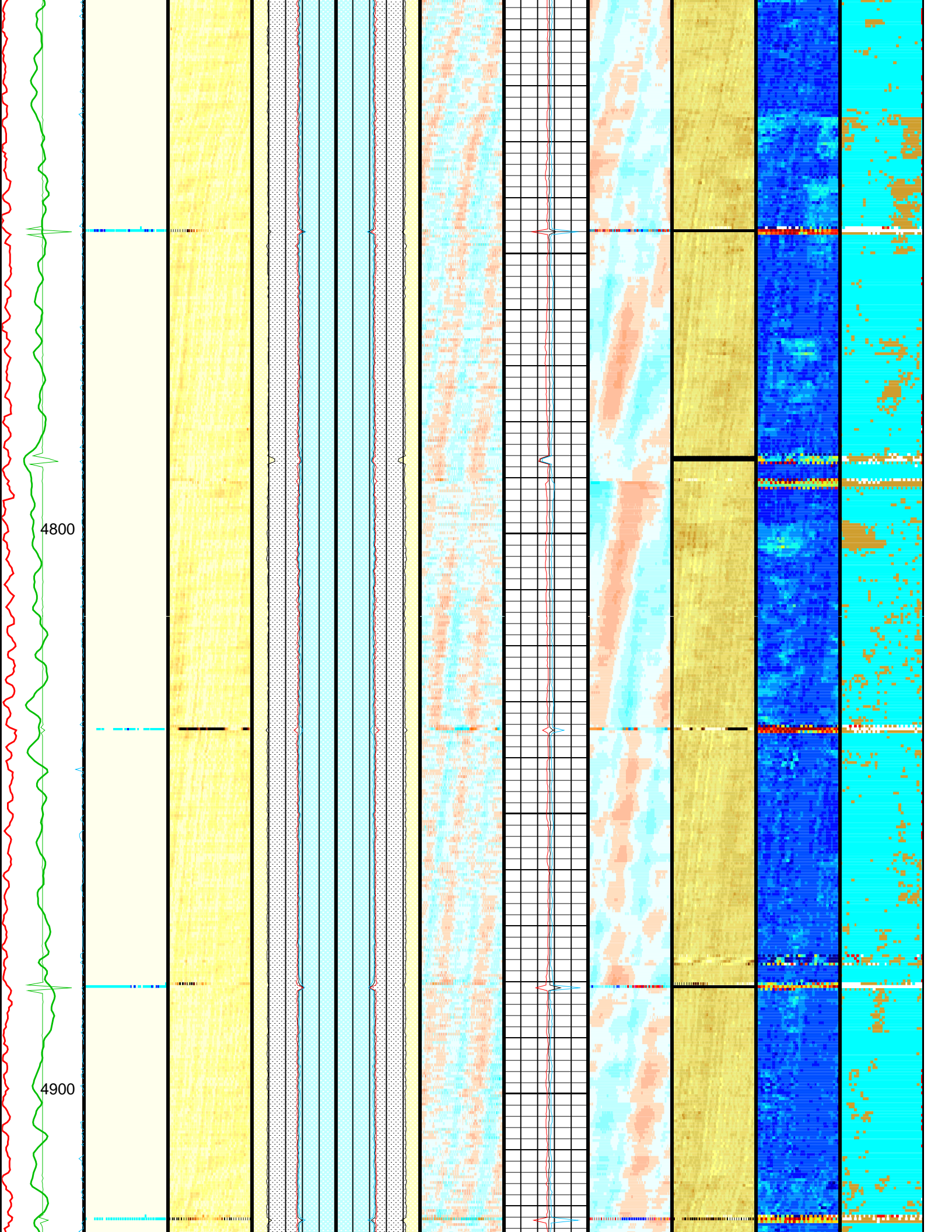


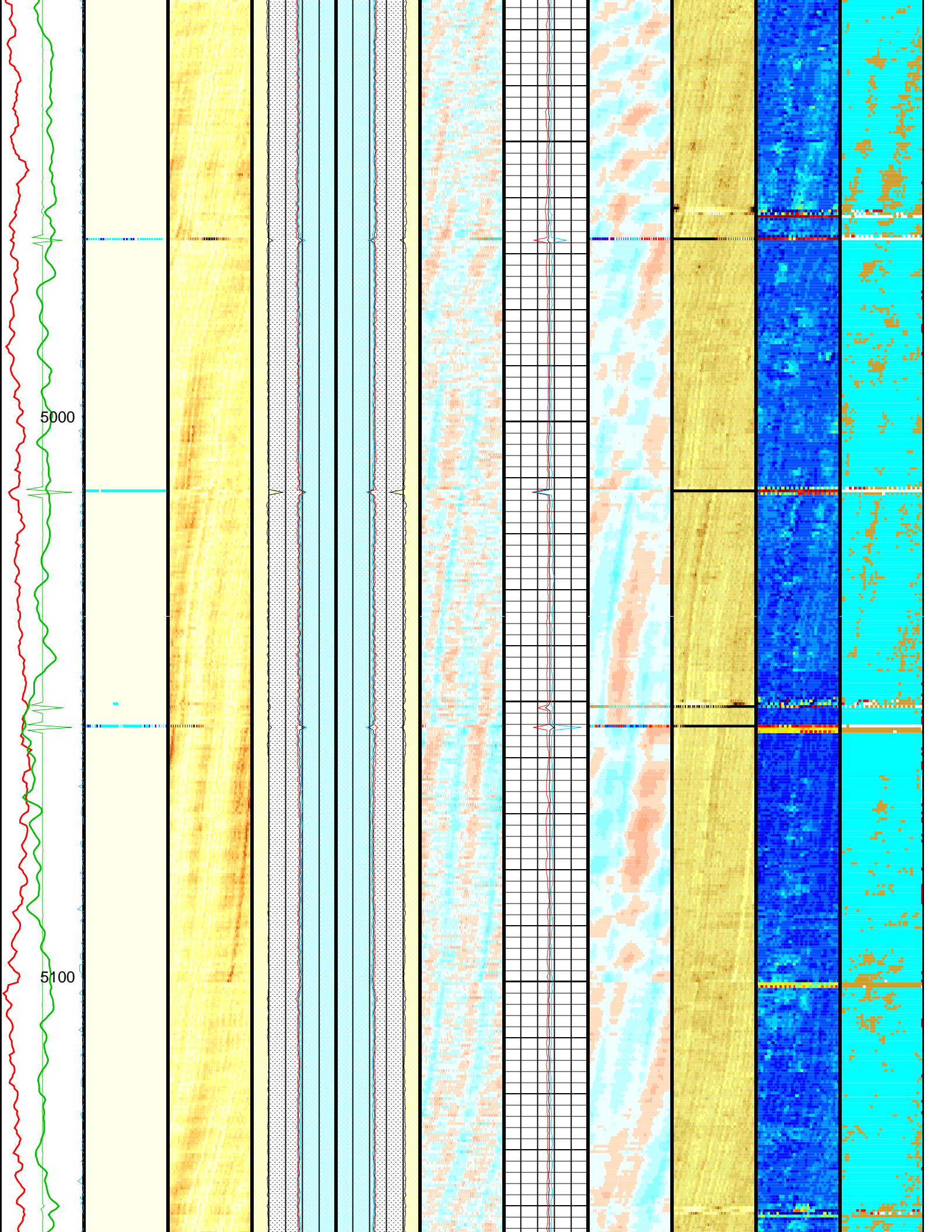


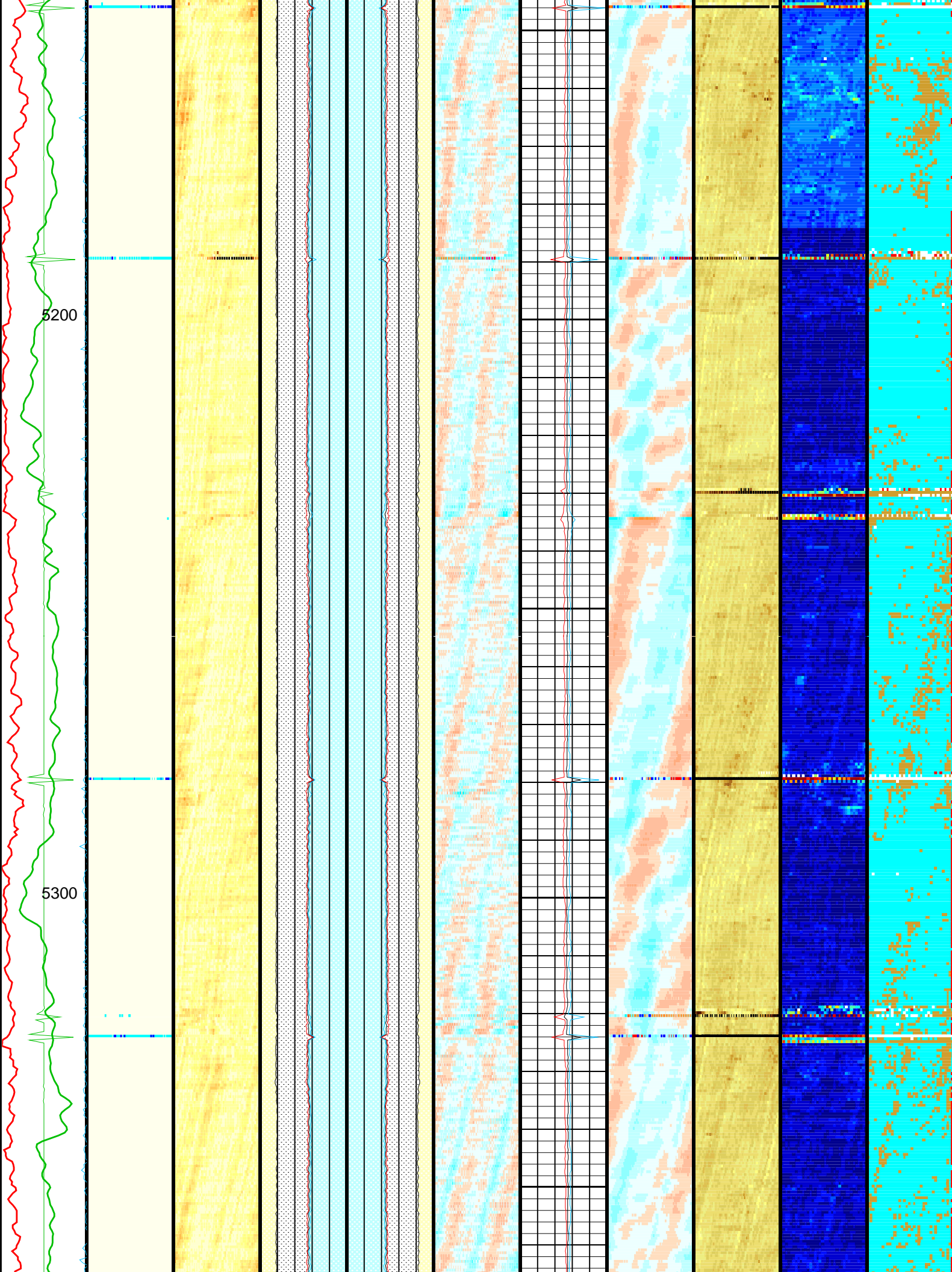


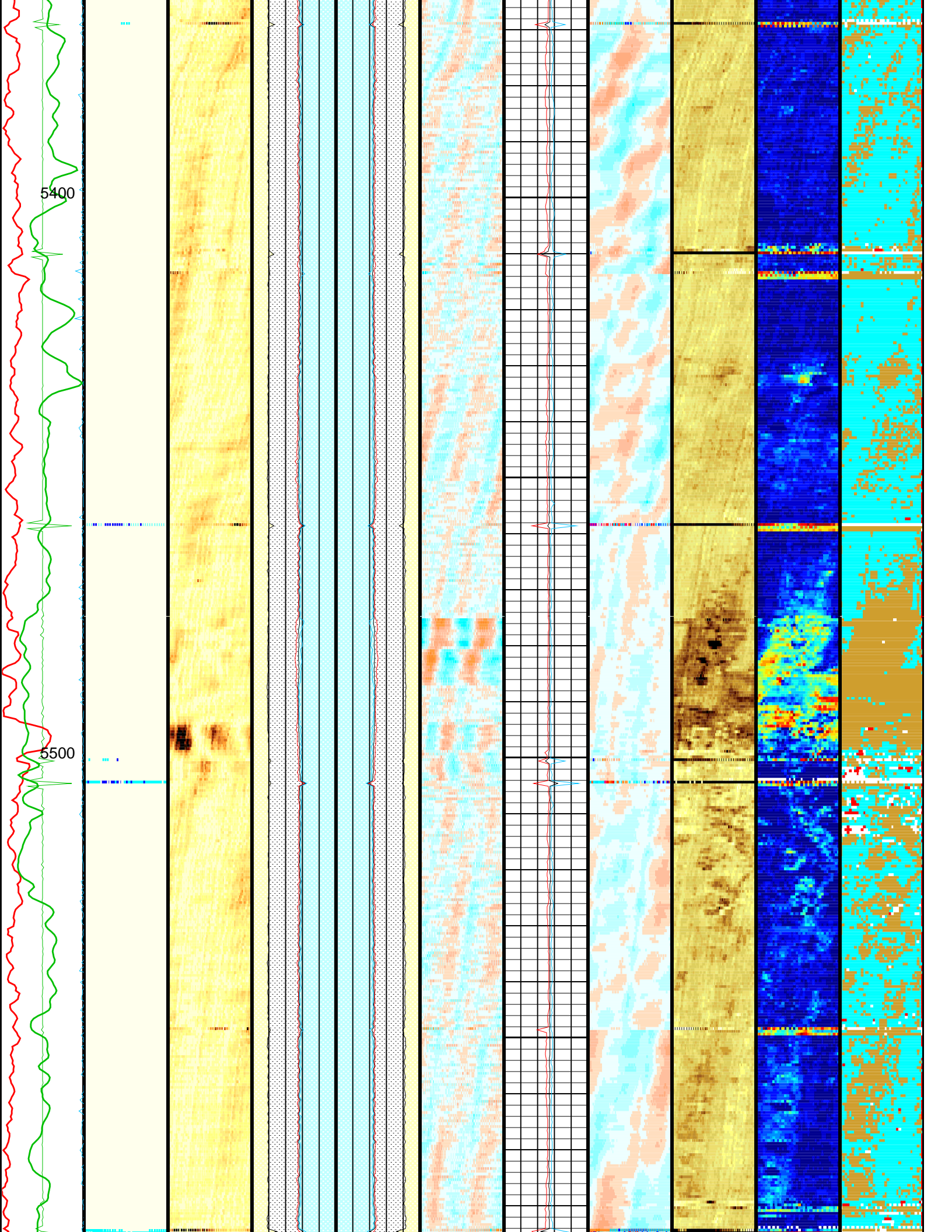


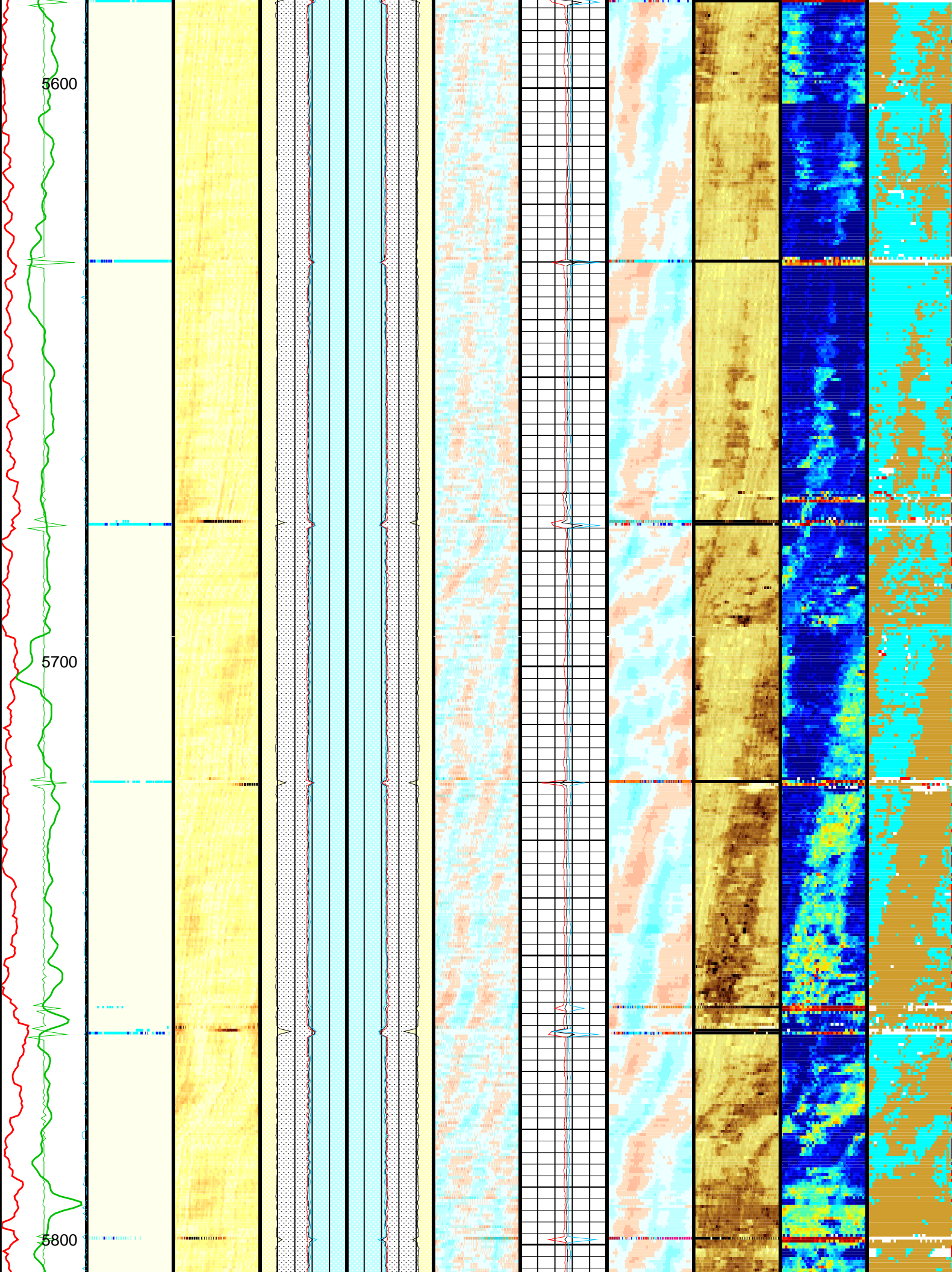


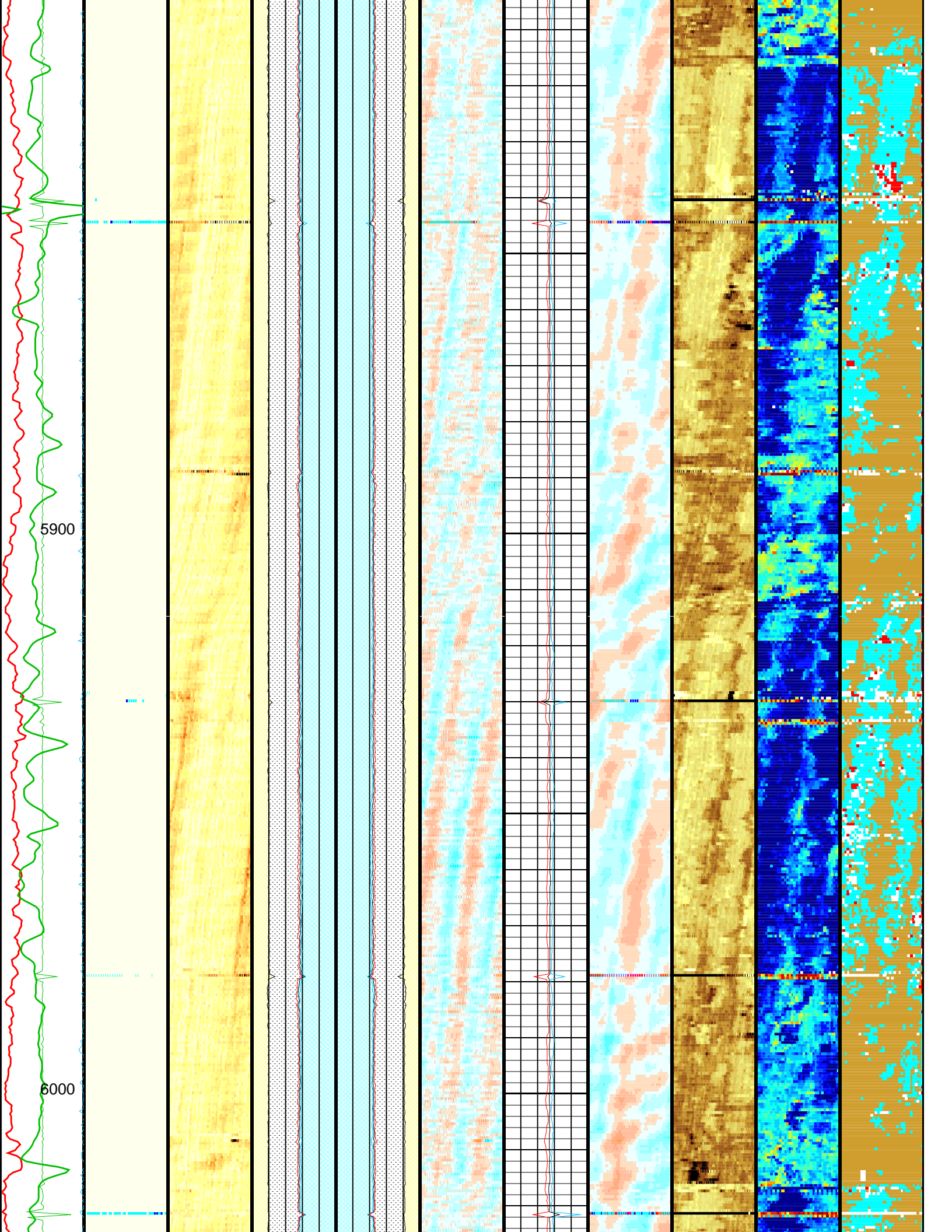


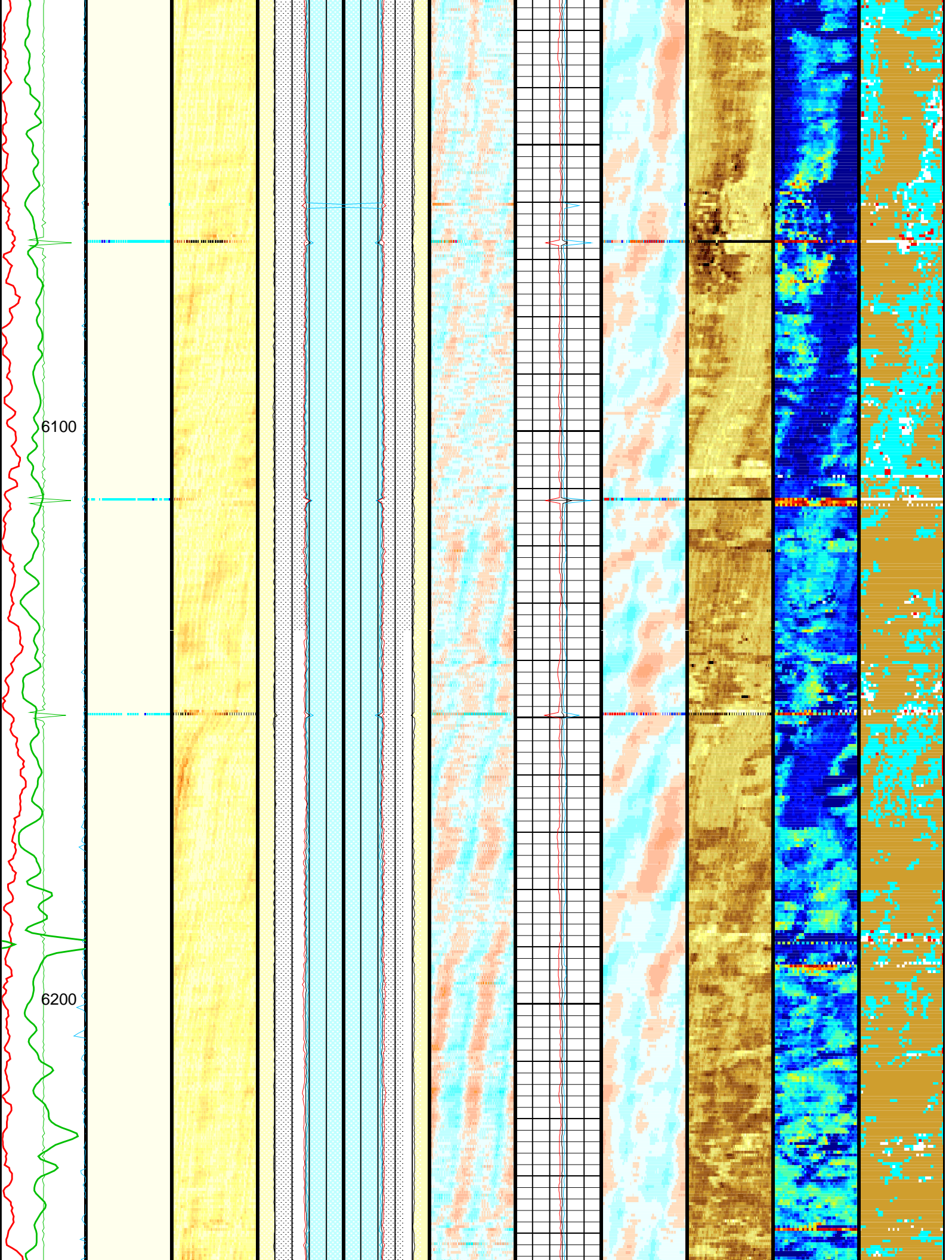


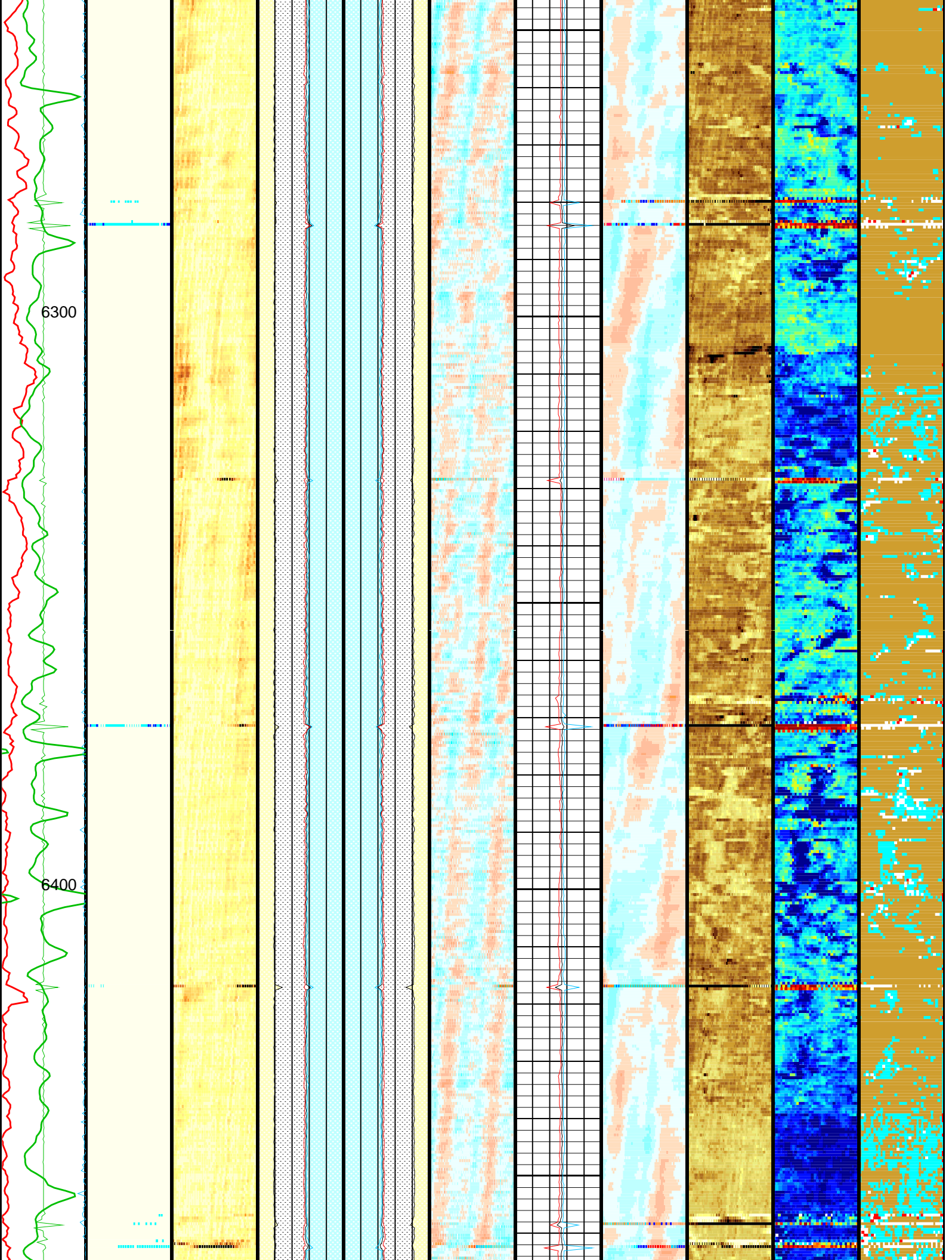


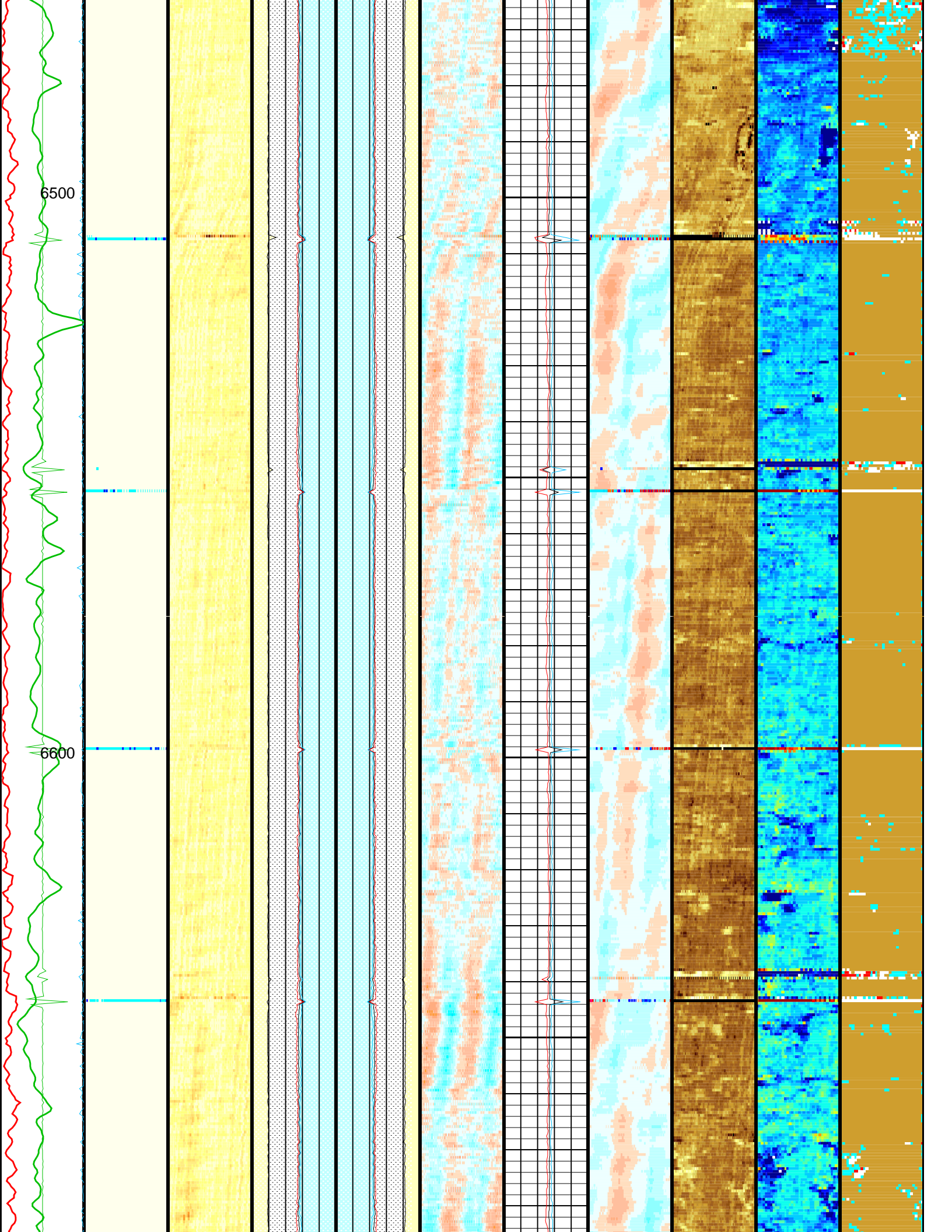


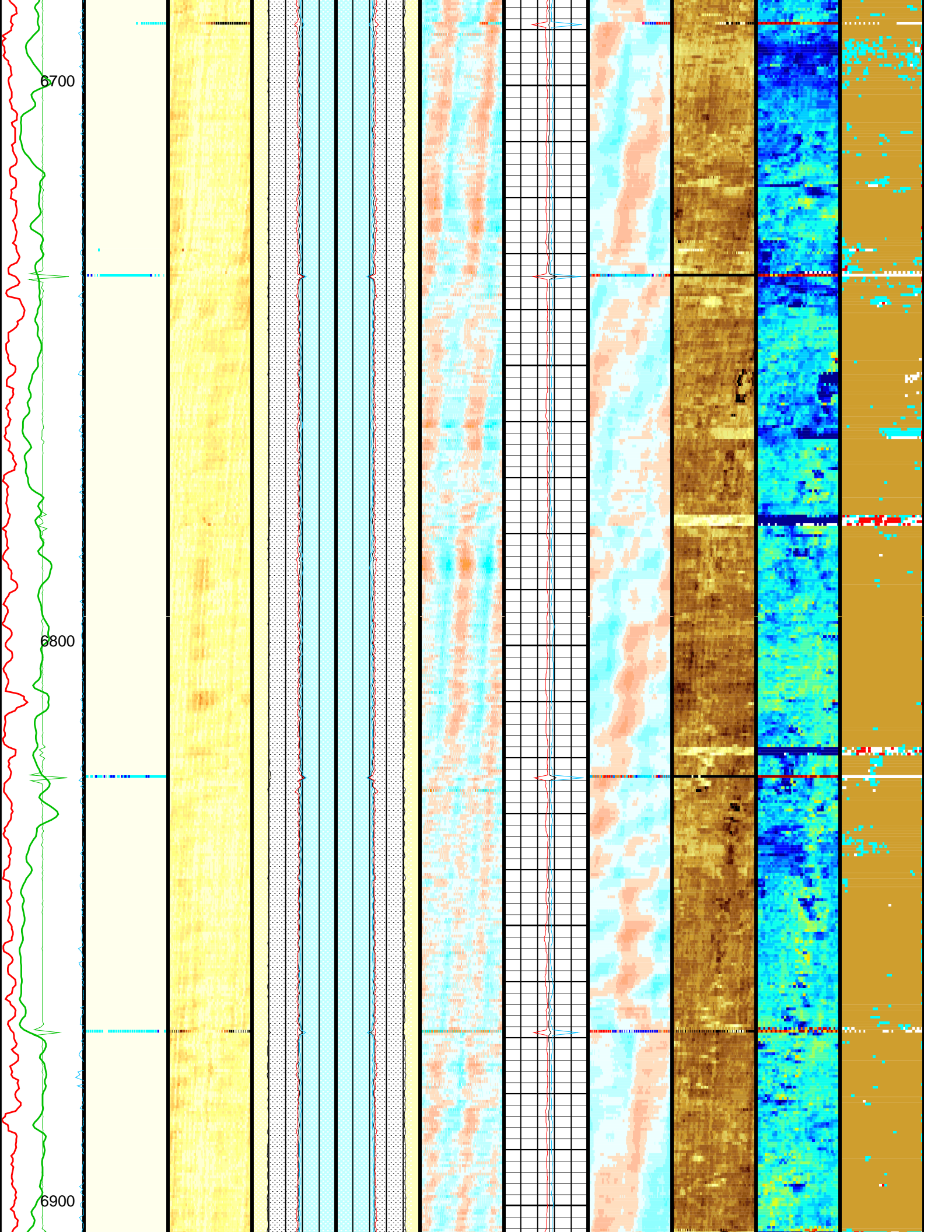


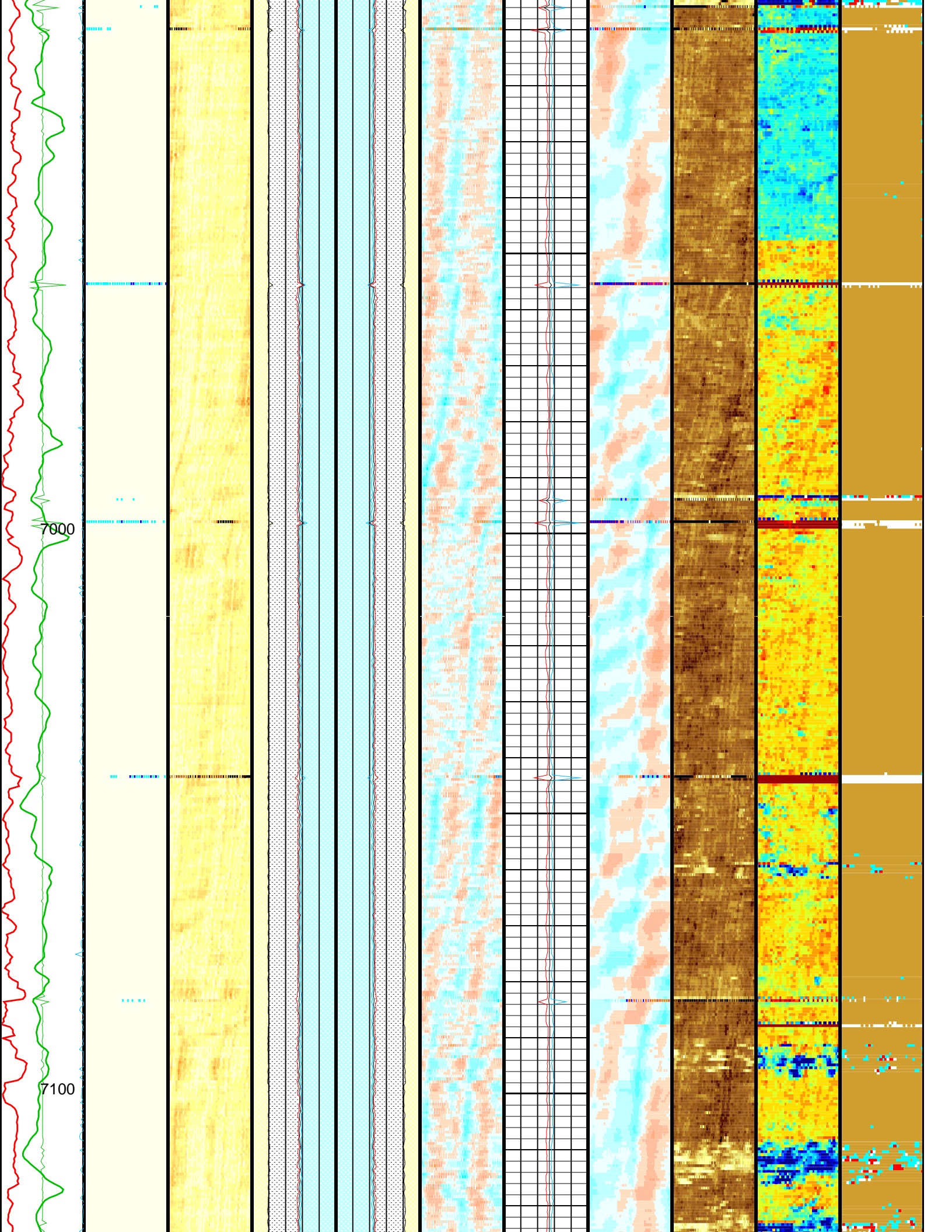


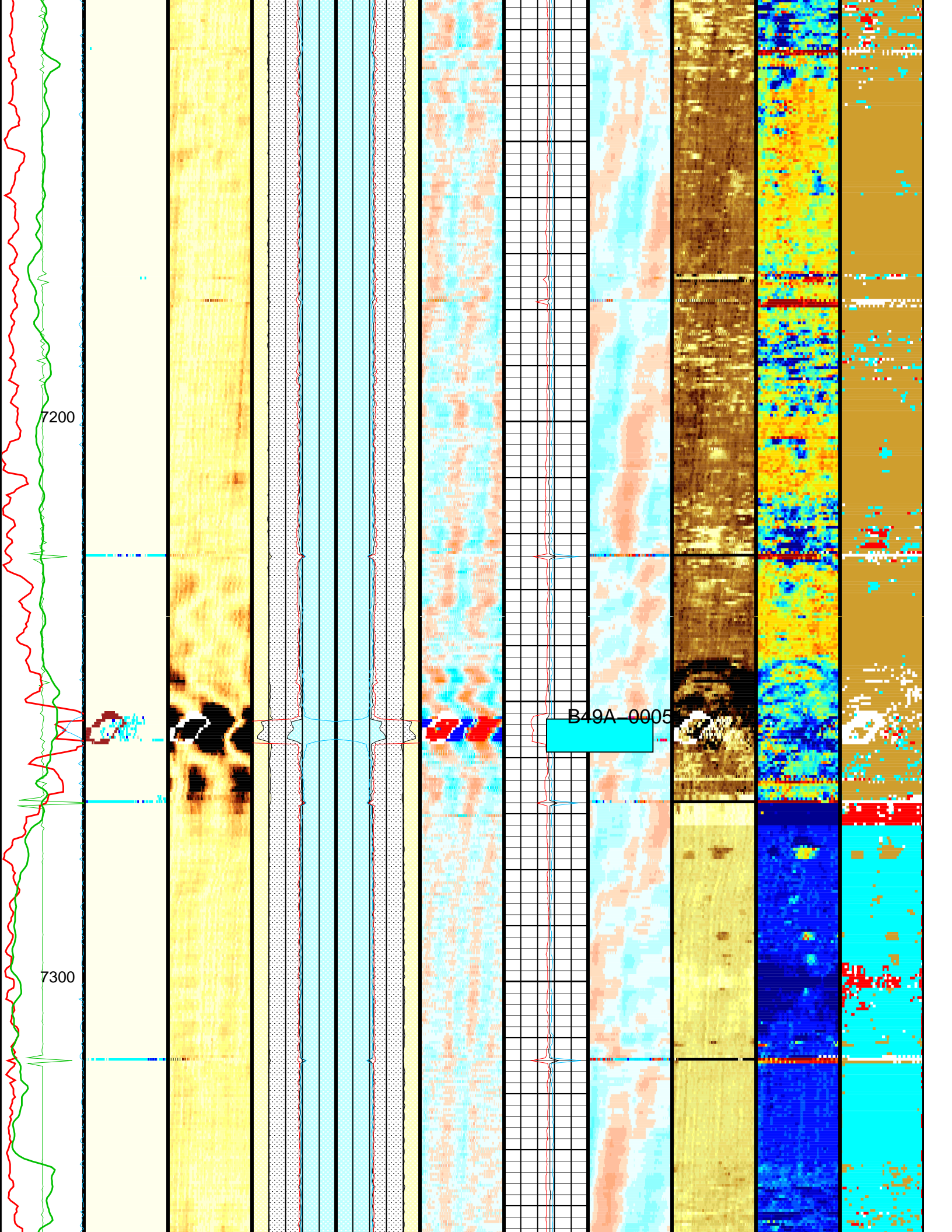


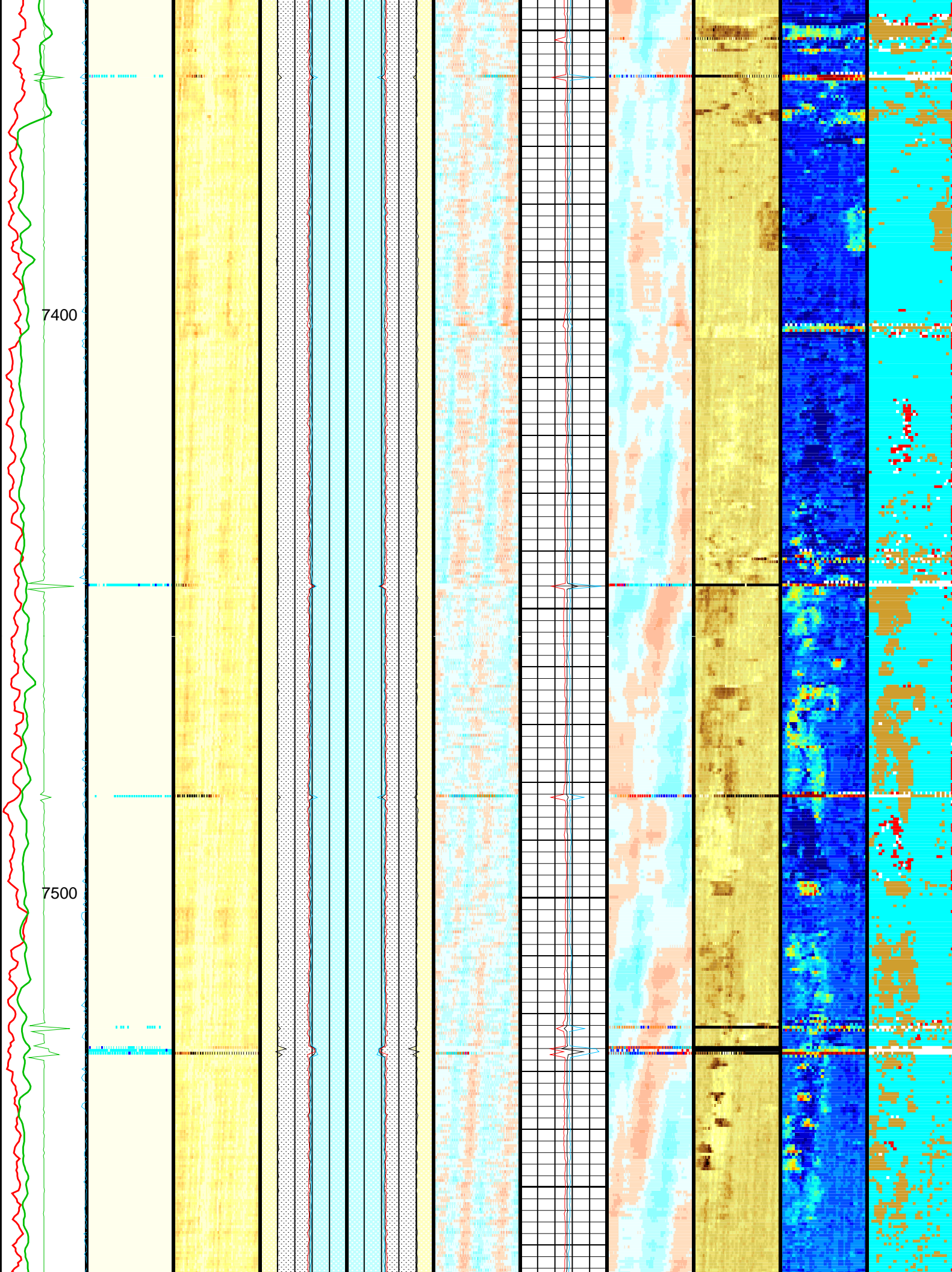


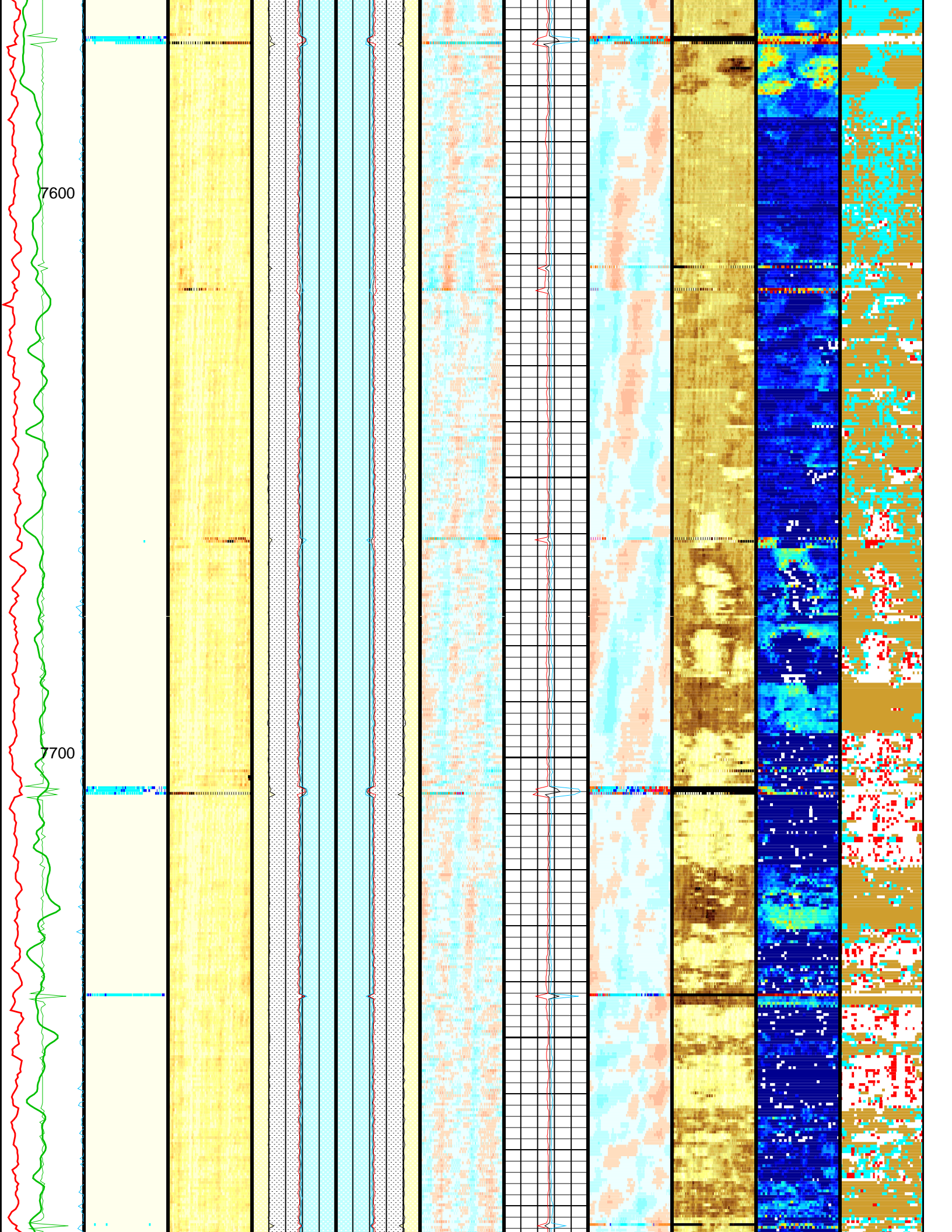


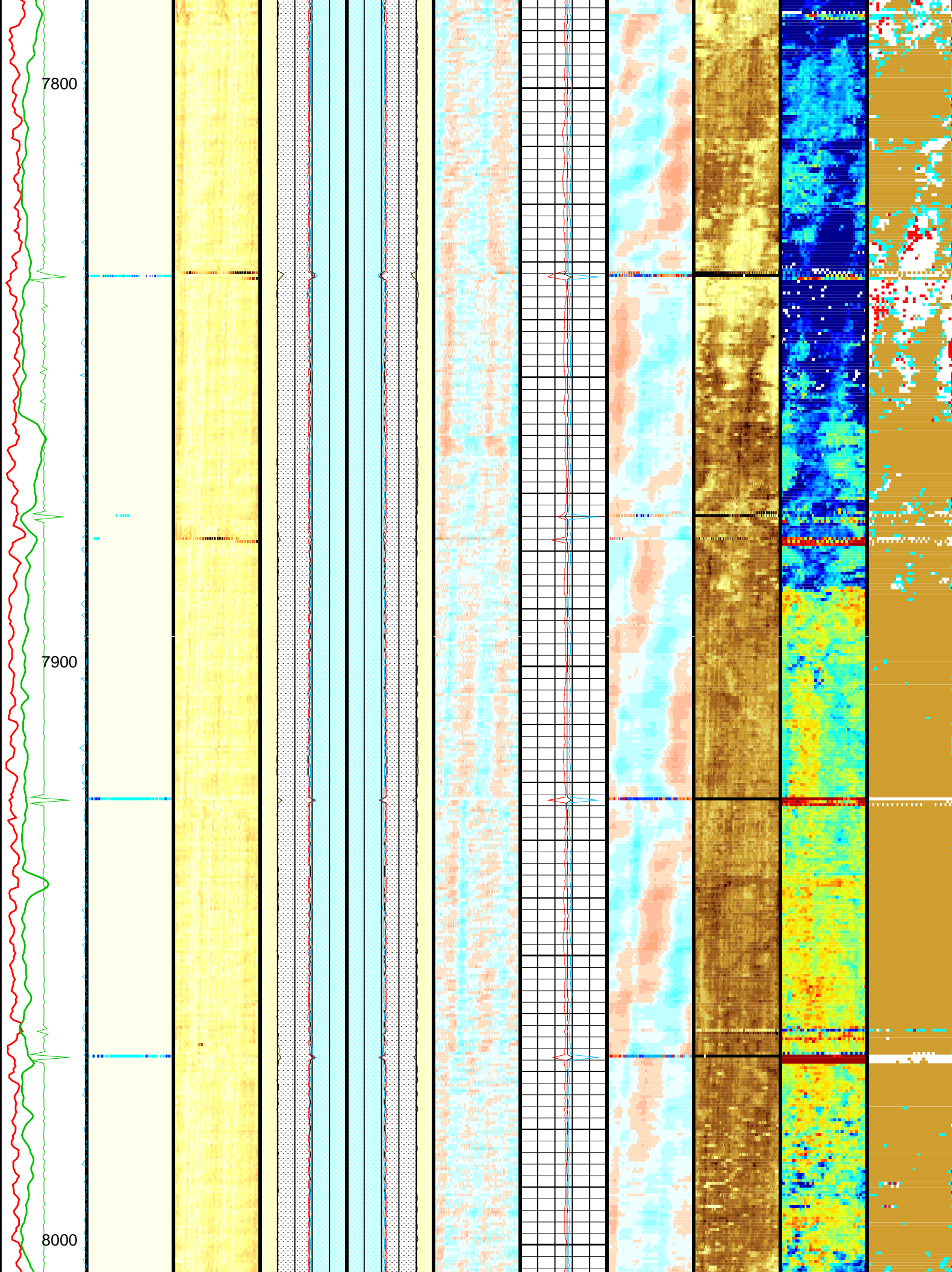


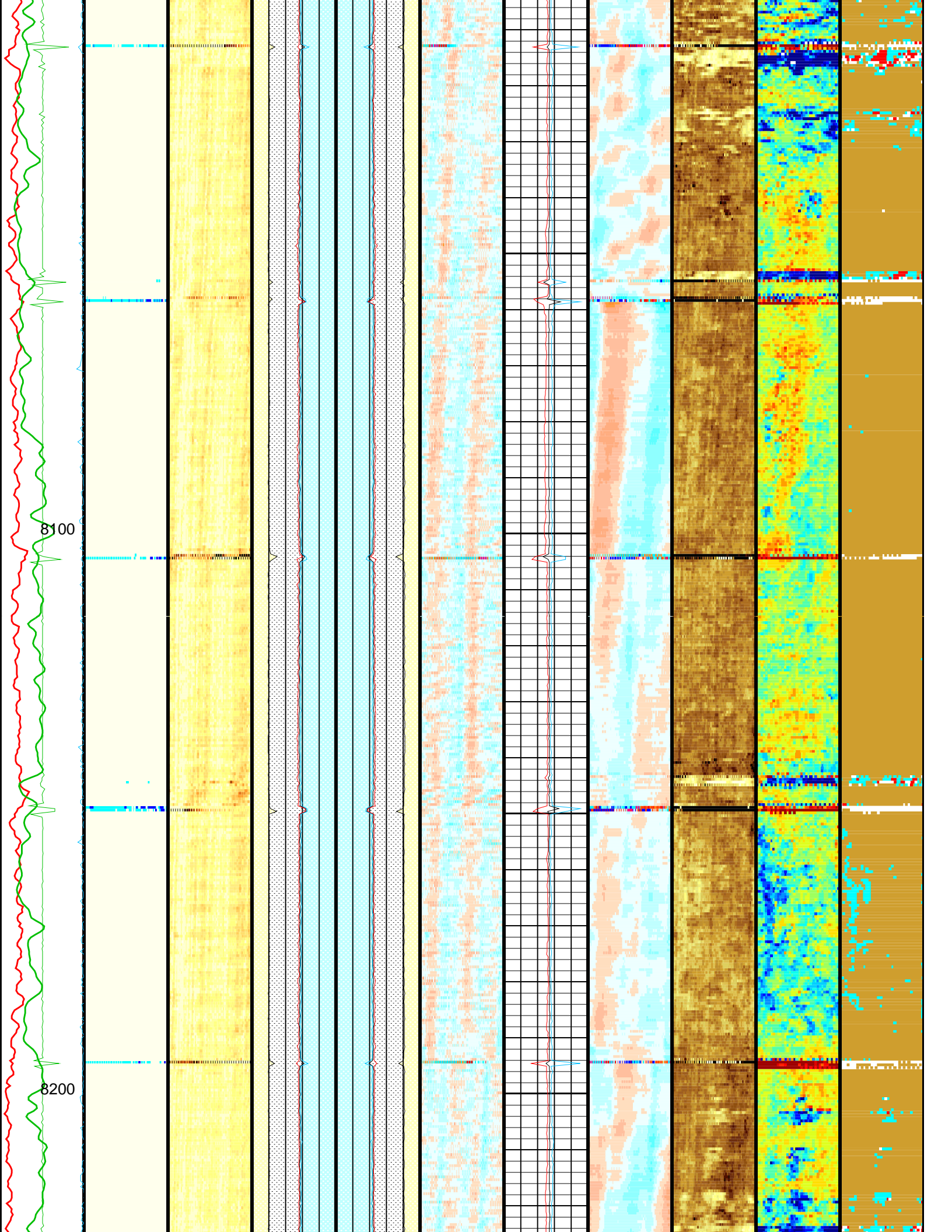


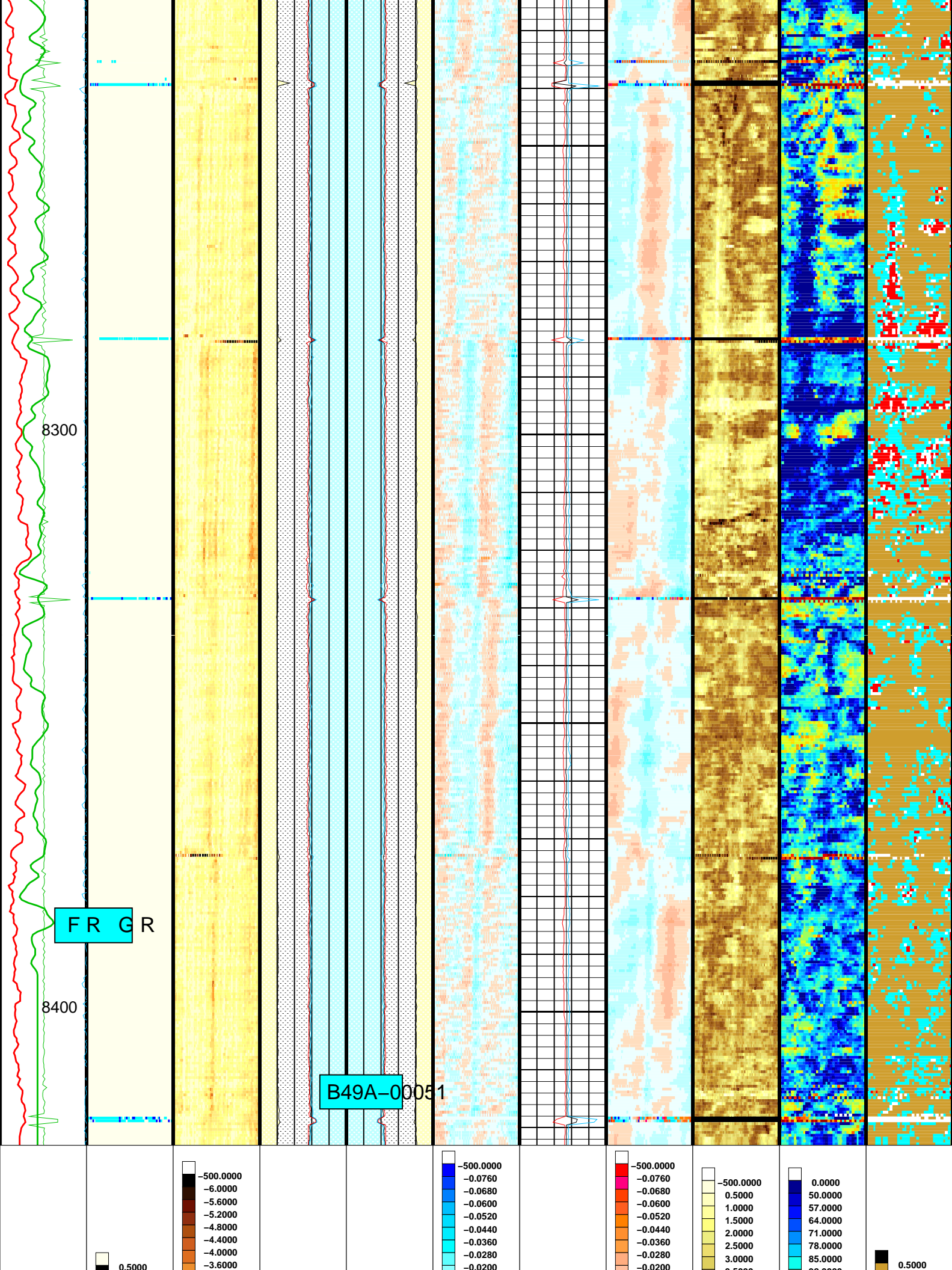












MAXIS Field Log

Company: Well:

Input DLIS Files

DEFAULT USI_TLD_MCFL_CNL_017LUP FN:16 PRODUCER 28-Apr-2010 12:12 8419.0 FT 3308.0 FT

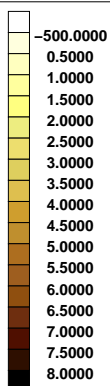
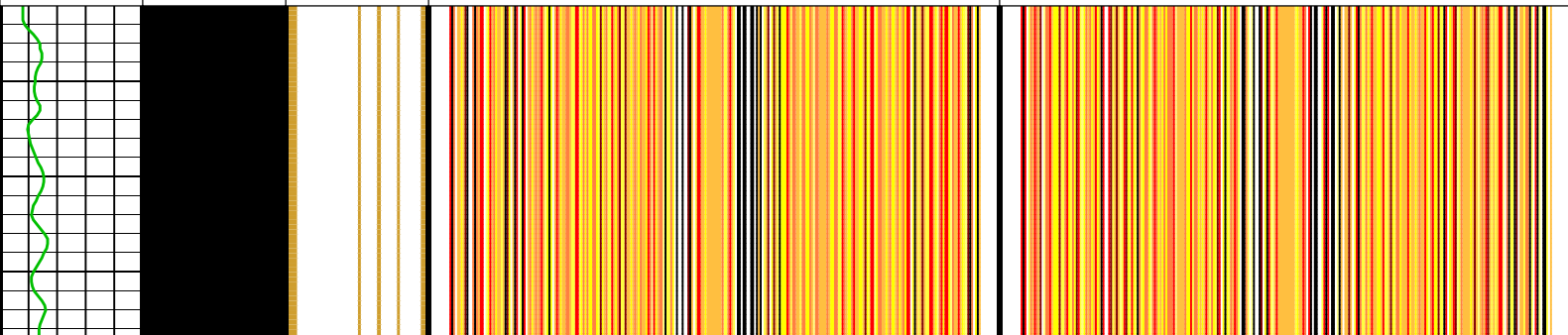
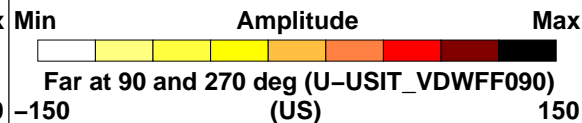
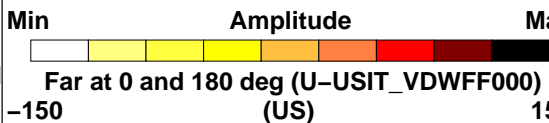
Output DLIS Files

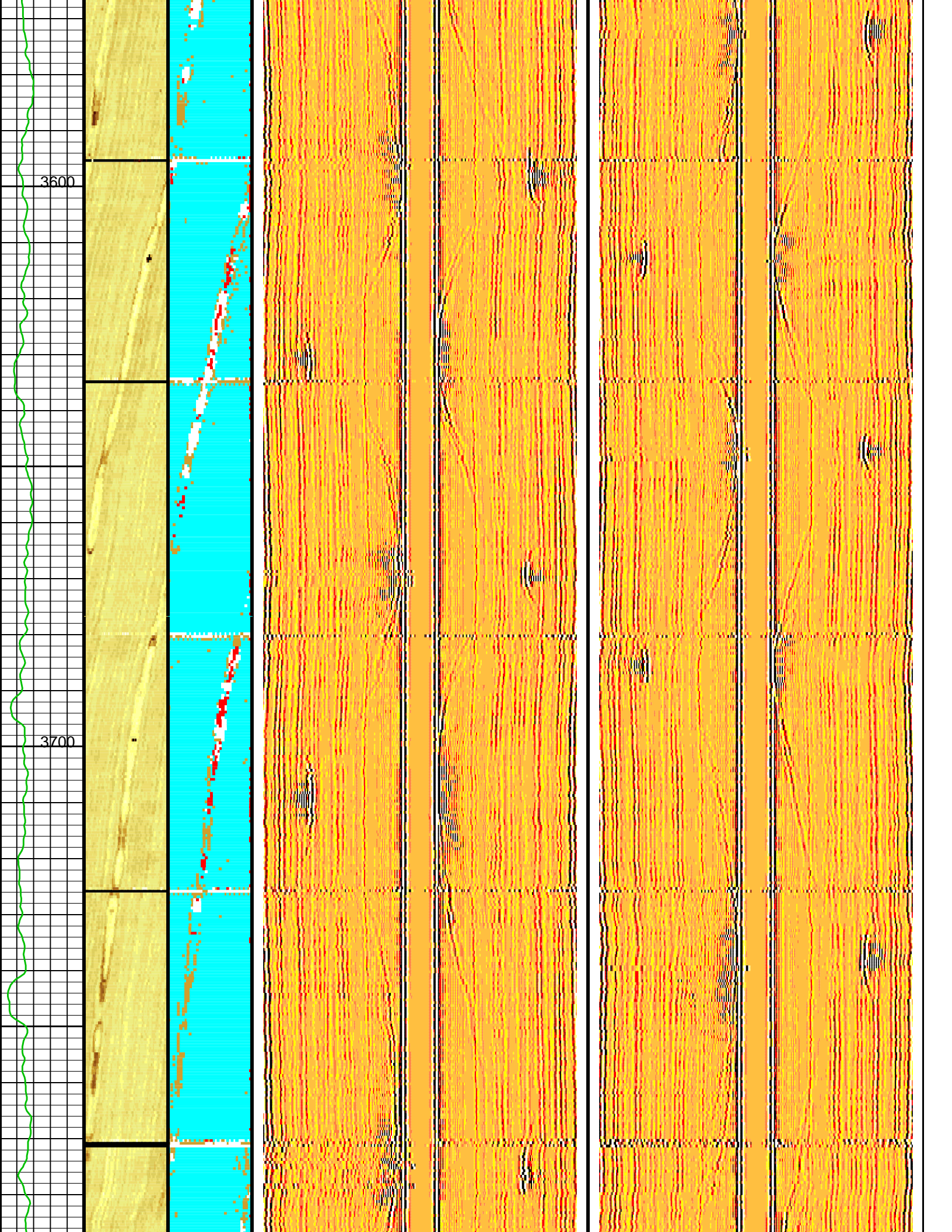
DEFAULT USI_TLD_MCFL_CNL_006PUP FN:5 PRODUCER 28-Apr-2010 15:31 8423.0 FT 3312.0 FT

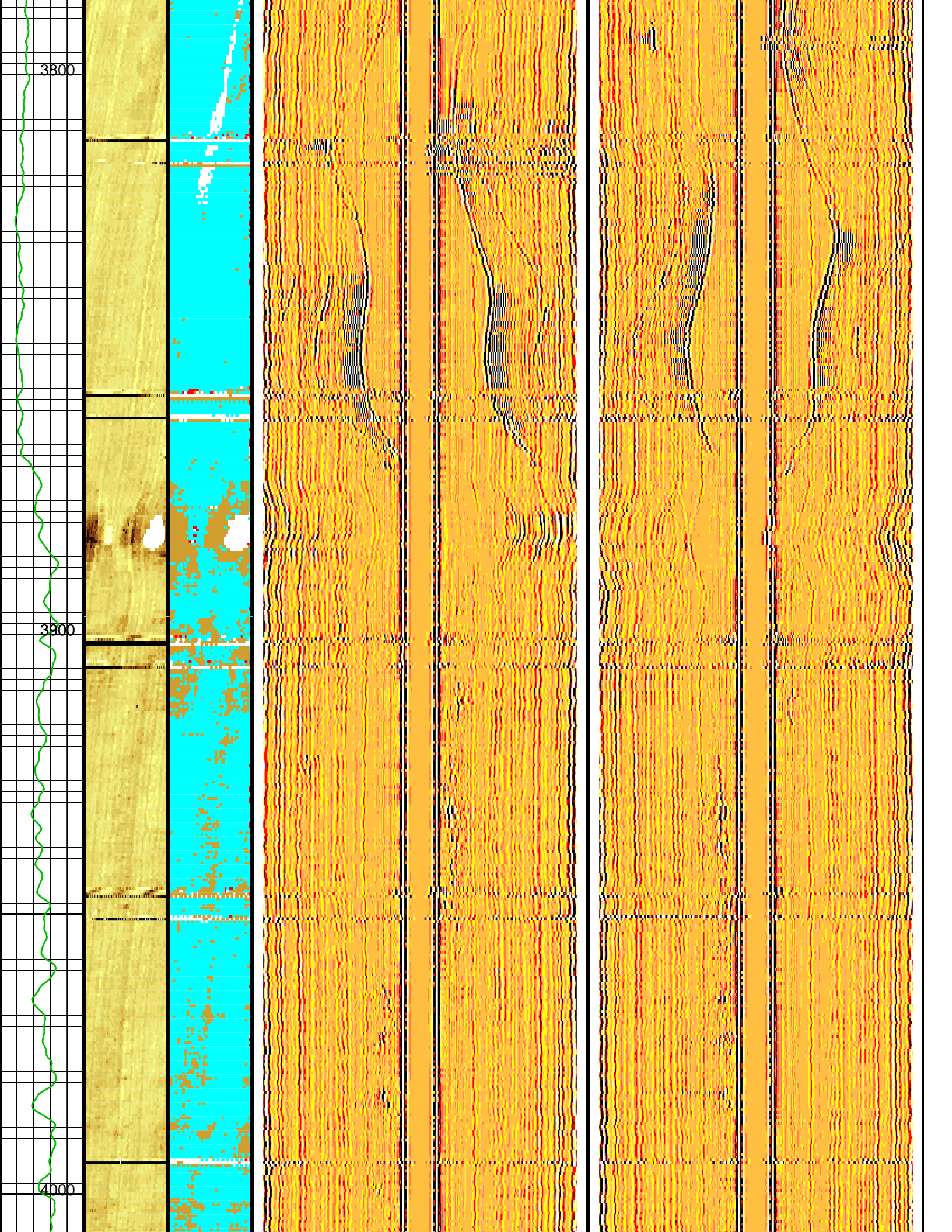
OP System Version: 17C0-154

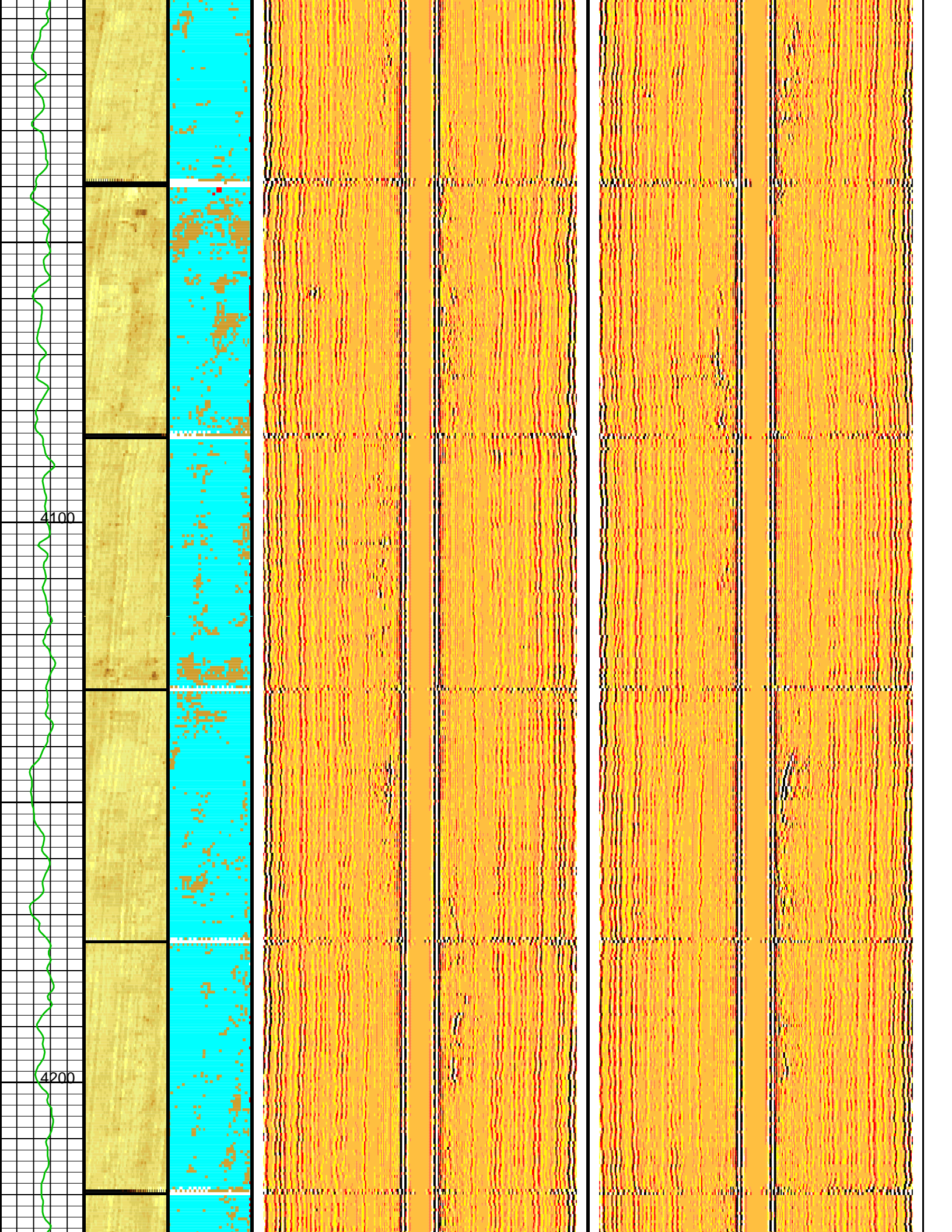
USIT-D SRPC-3870_Q3_2009_OP17_V3 HILTH-FTB SRPC-3870_Q3_2009_OP17_V3
DTC-H 17C0-154Tool/Tot.
Drag
From D4T
to STIACable
Drag
From D4T
to STITStuck
Stretch
(STIT)

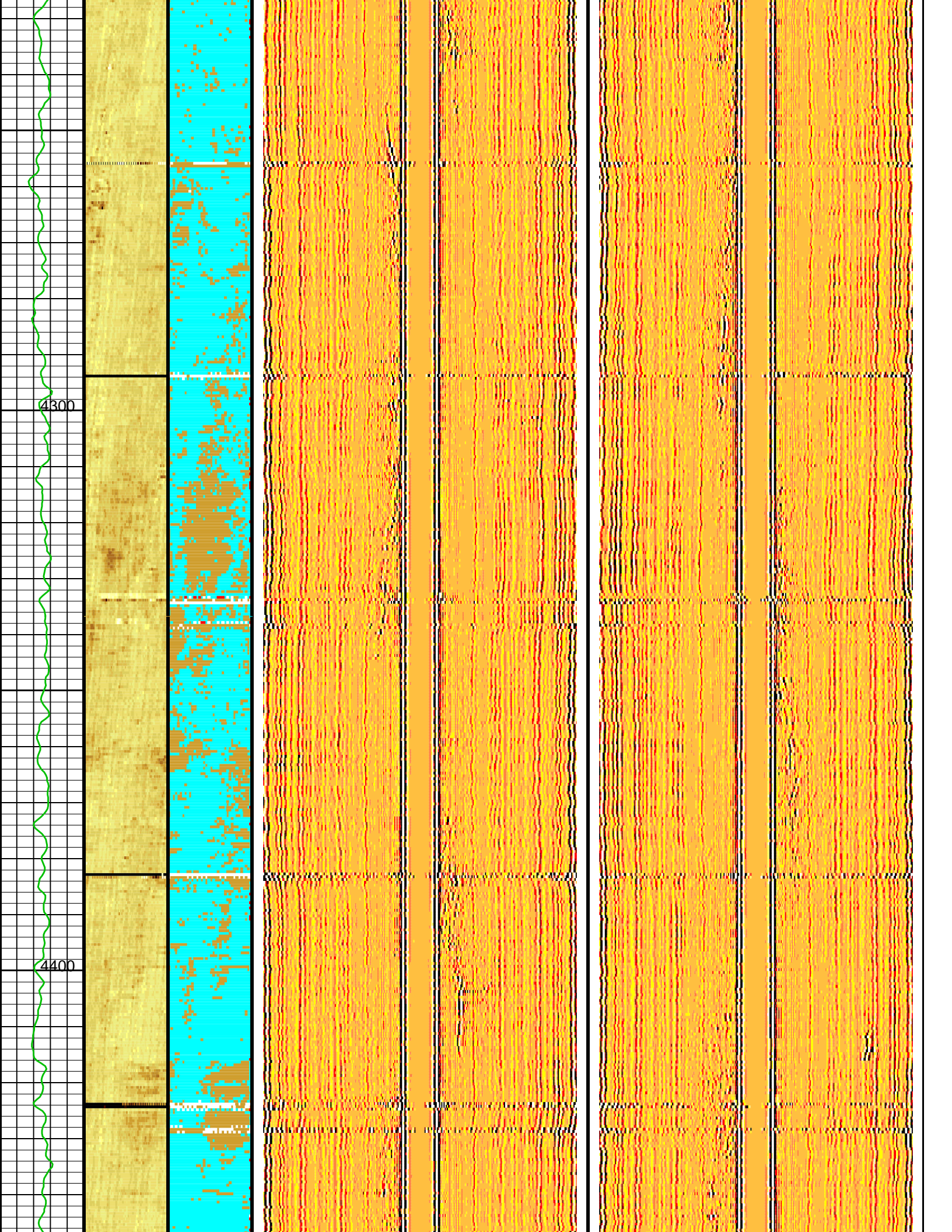
0 (F) 50

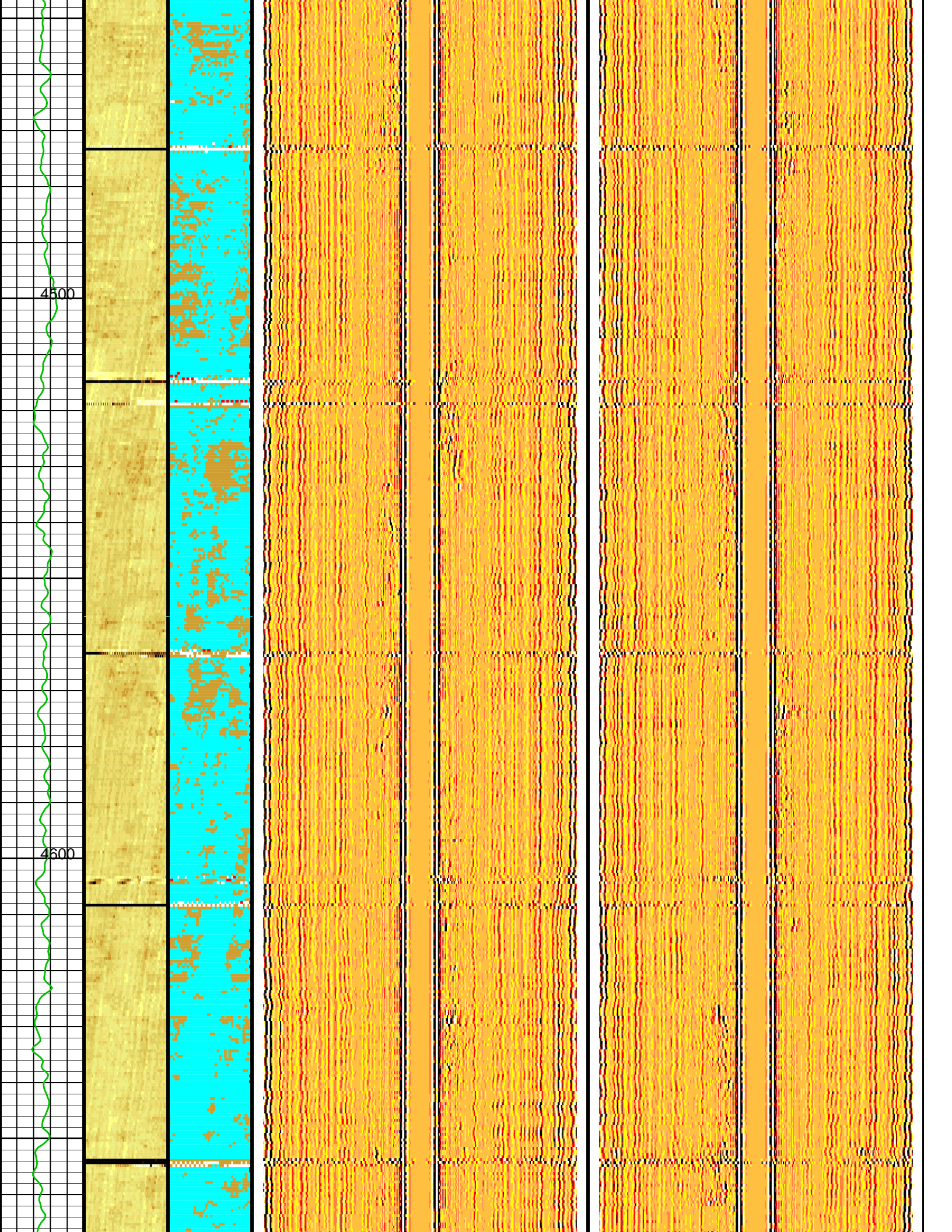
Gamma
Ray (GR)
(GAPI)
0 150Raw
Acoustic
Imped.
(AIBK)
(MRAY)Solid Liquid
Gas Map
(U-USIT_
USLP)
(----

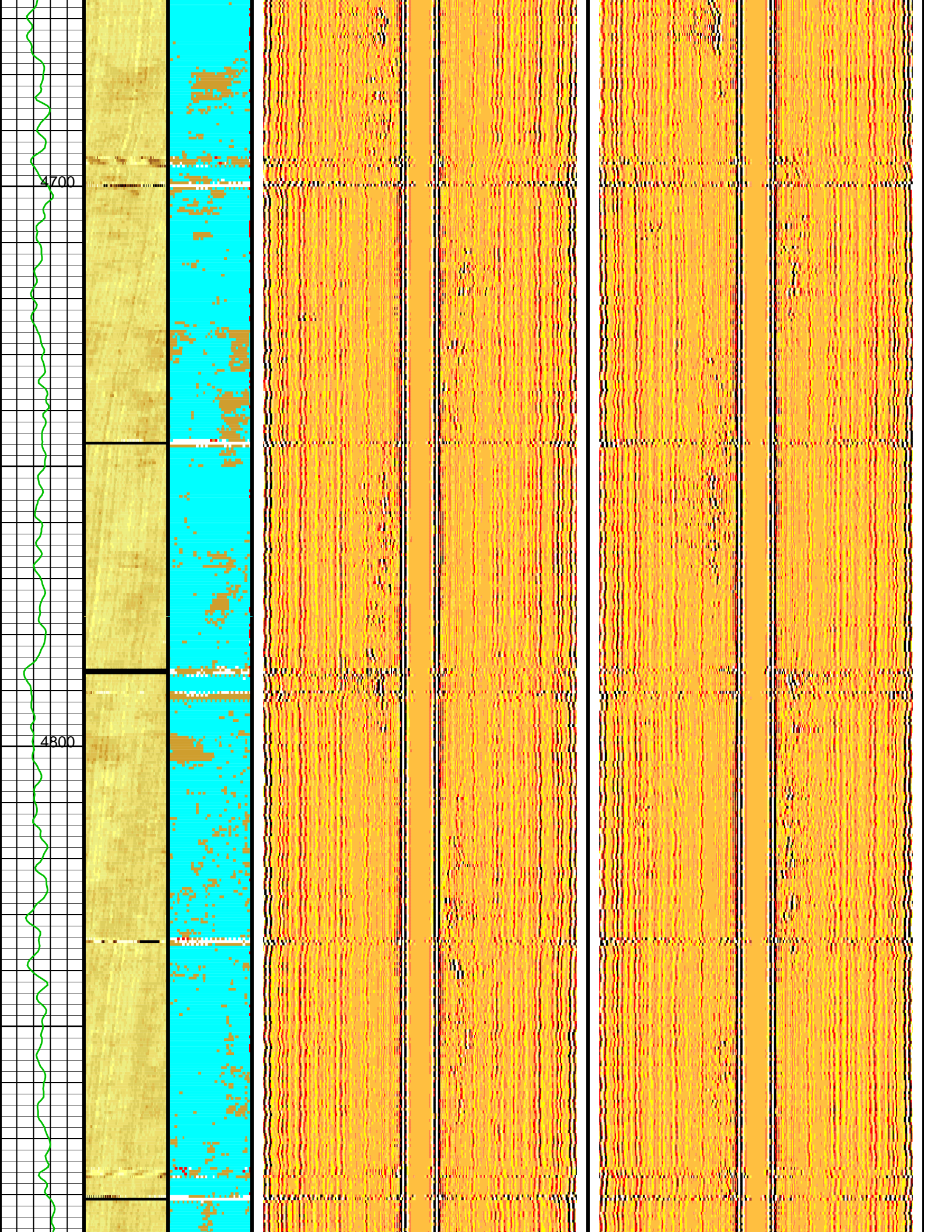


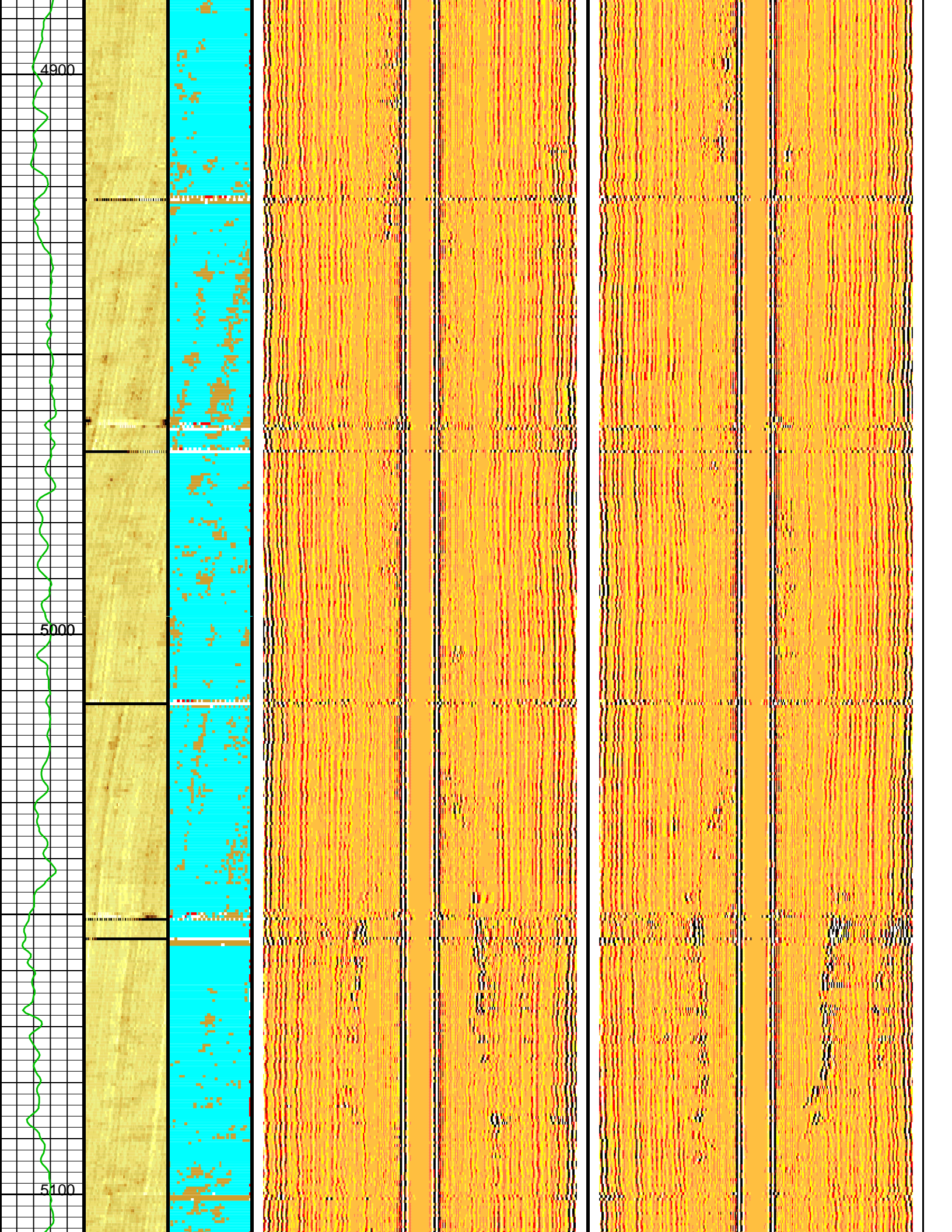


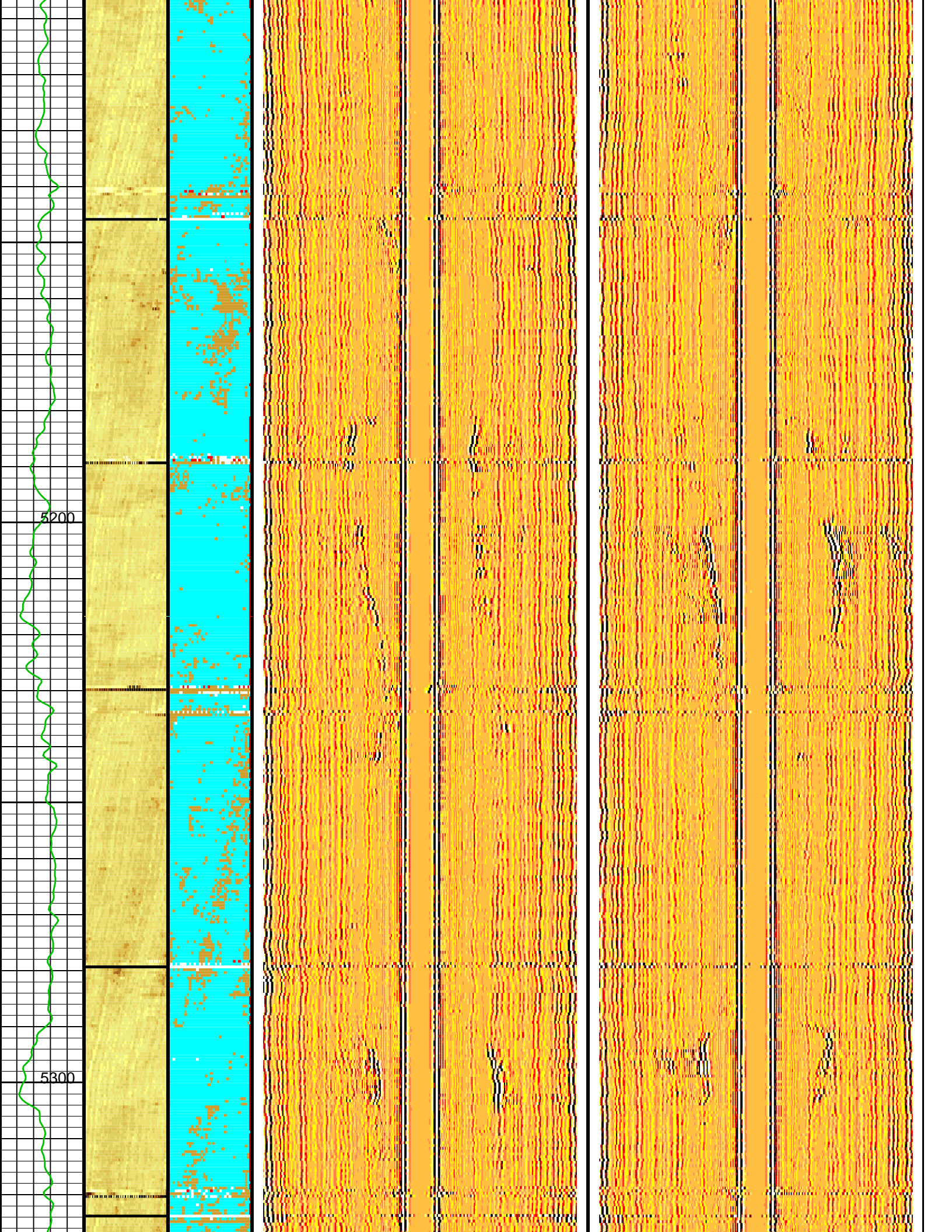


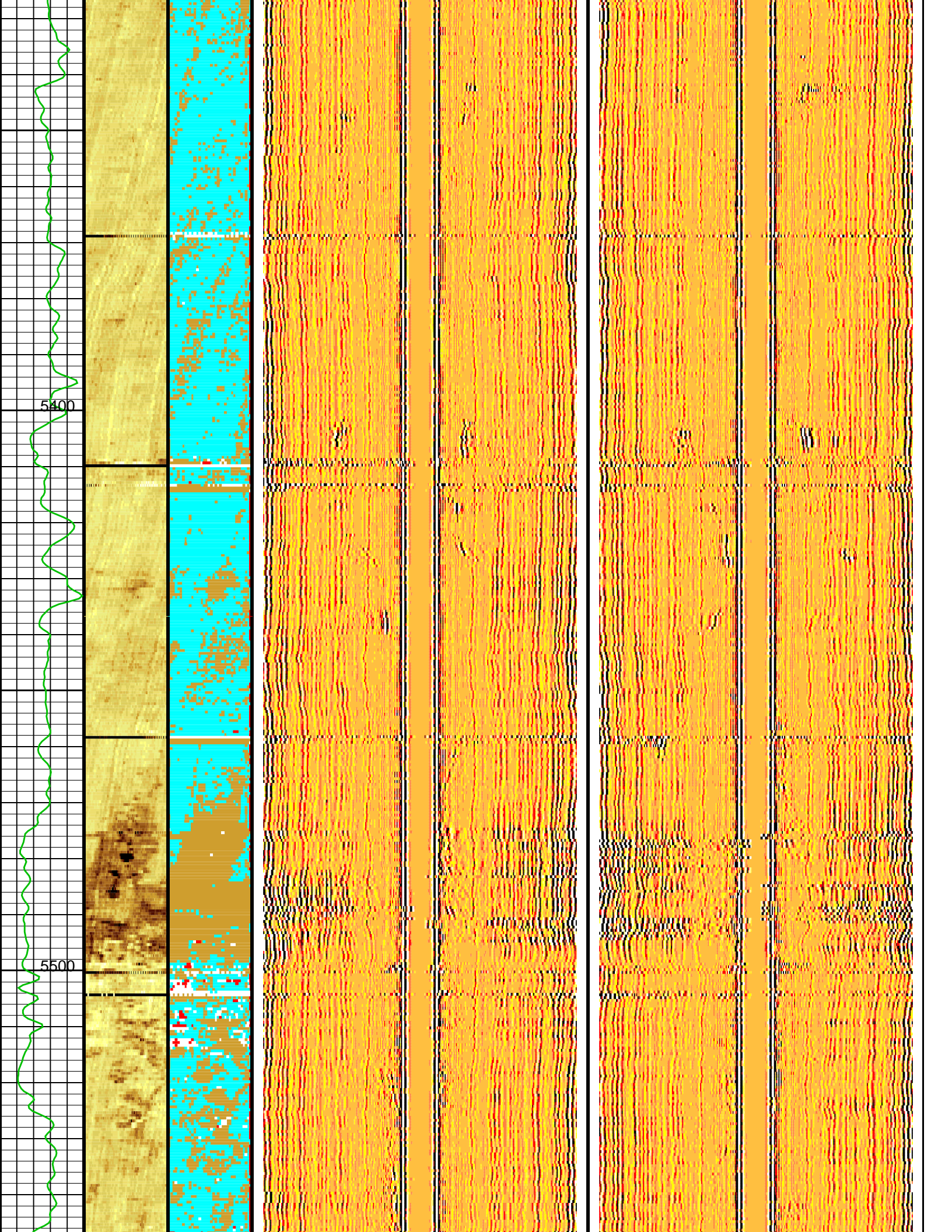


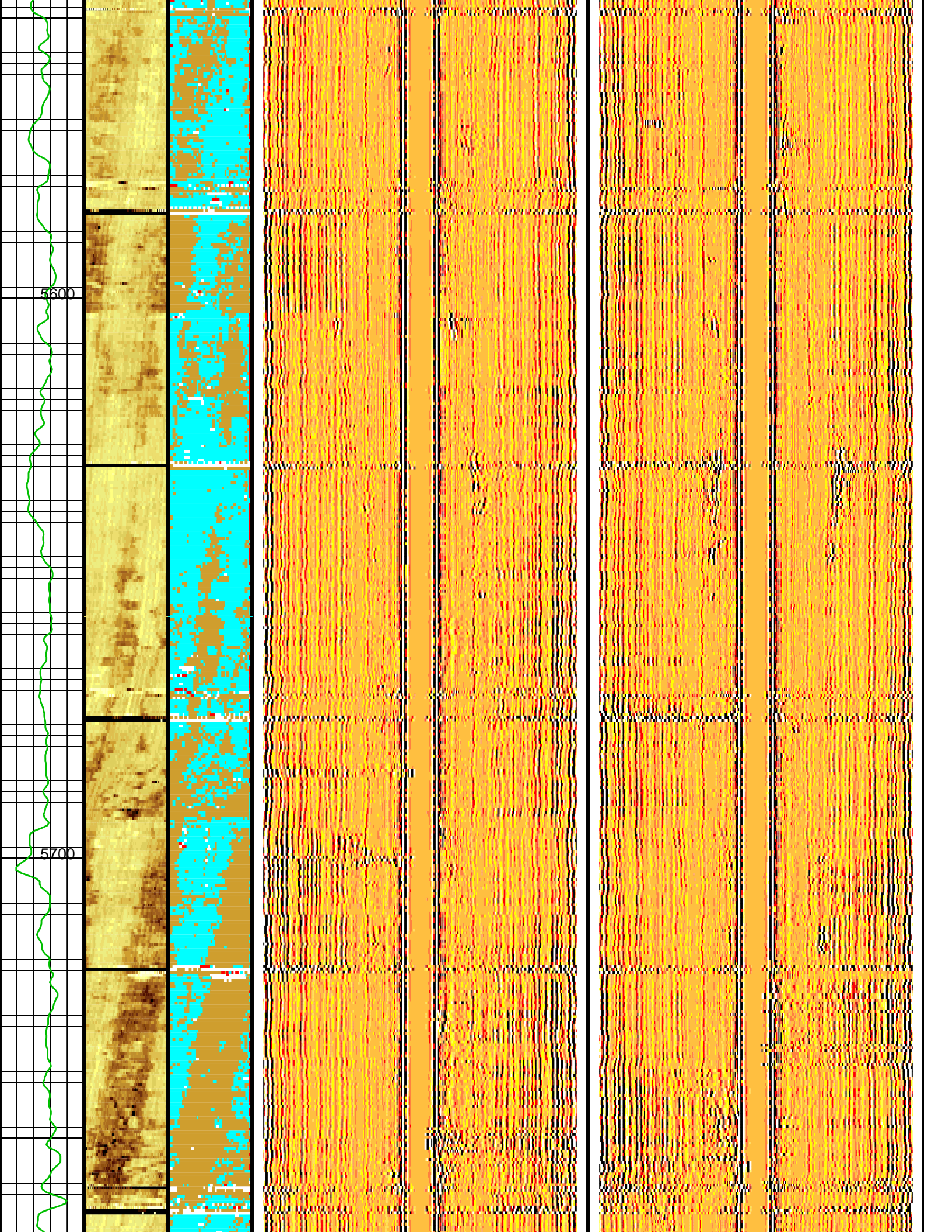


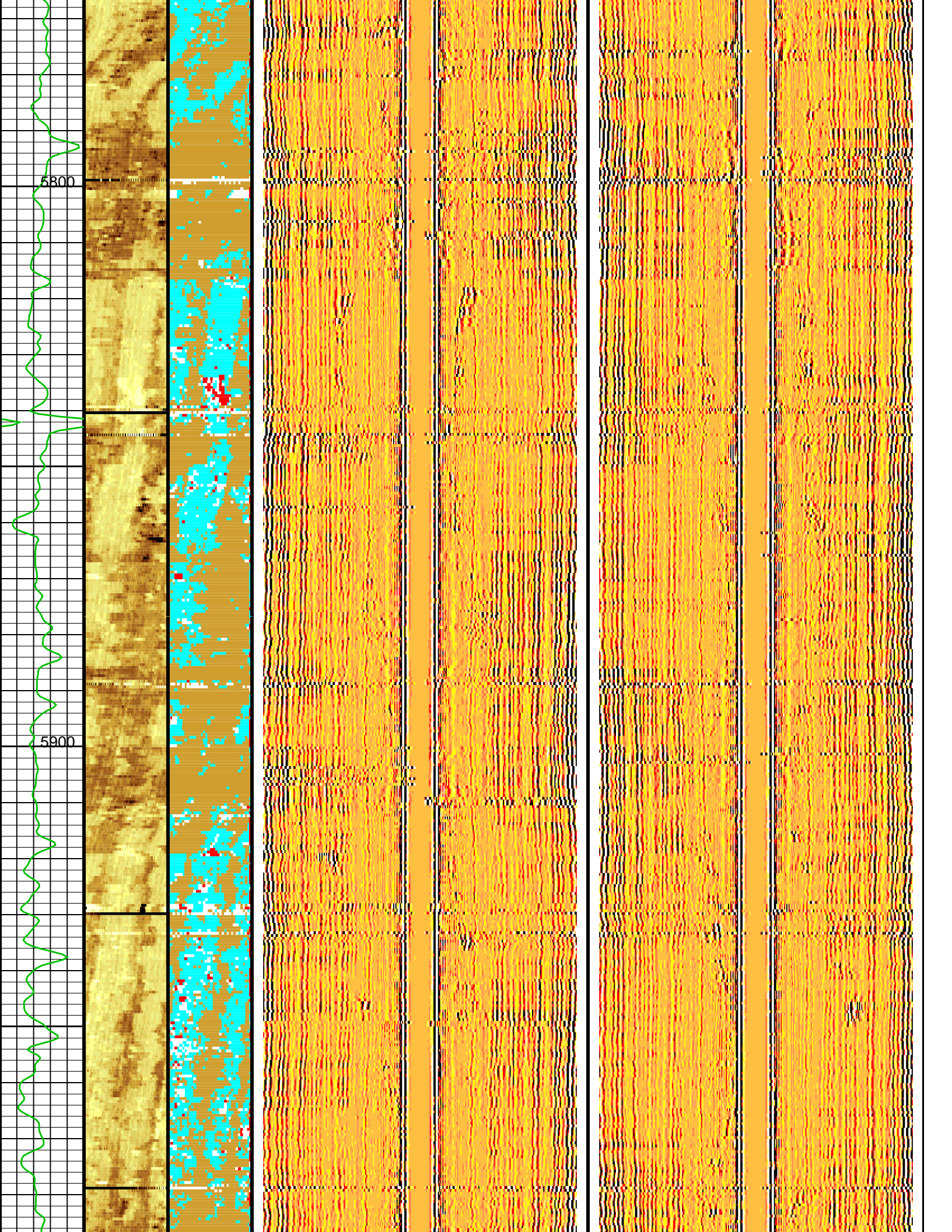


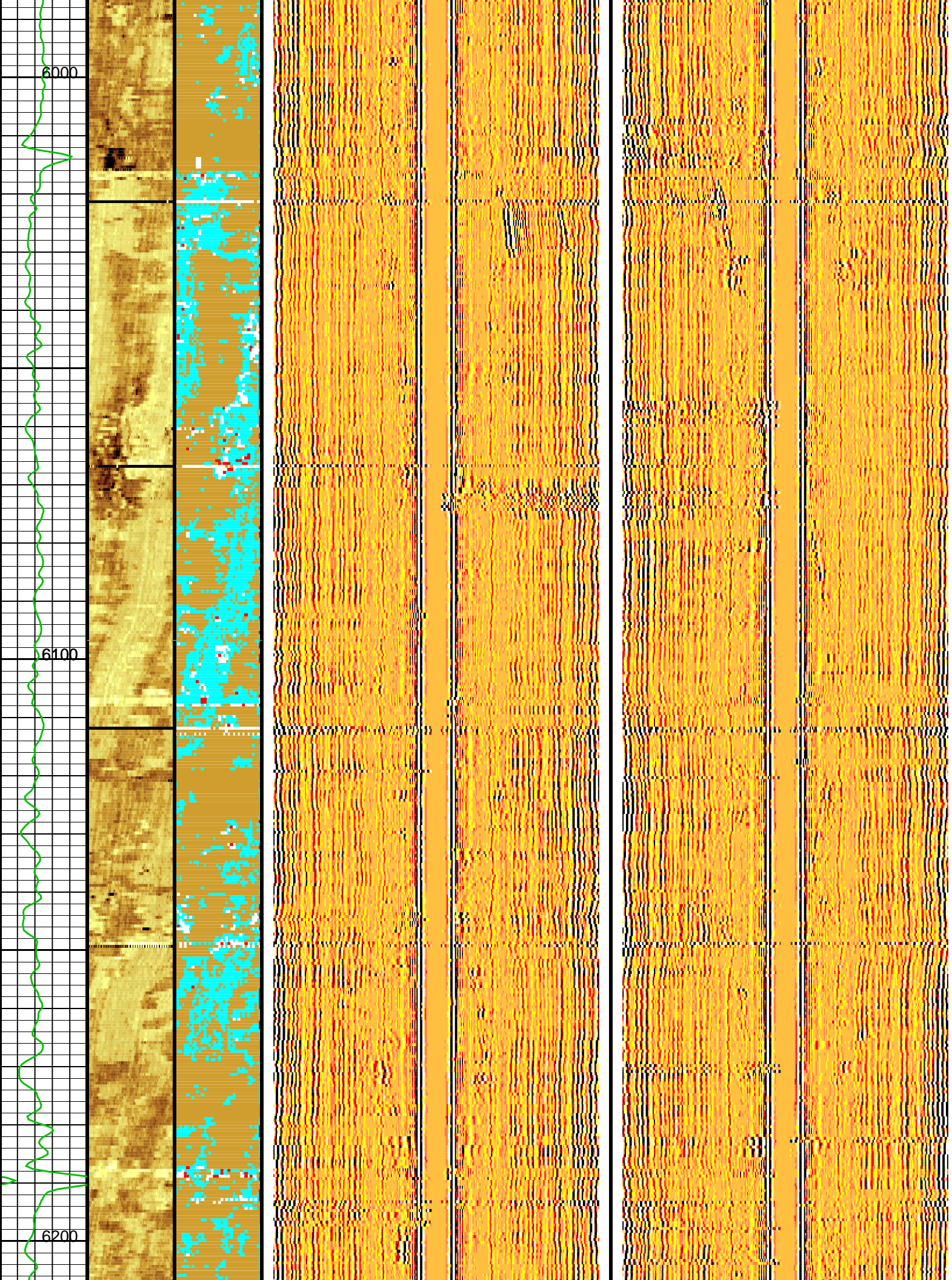


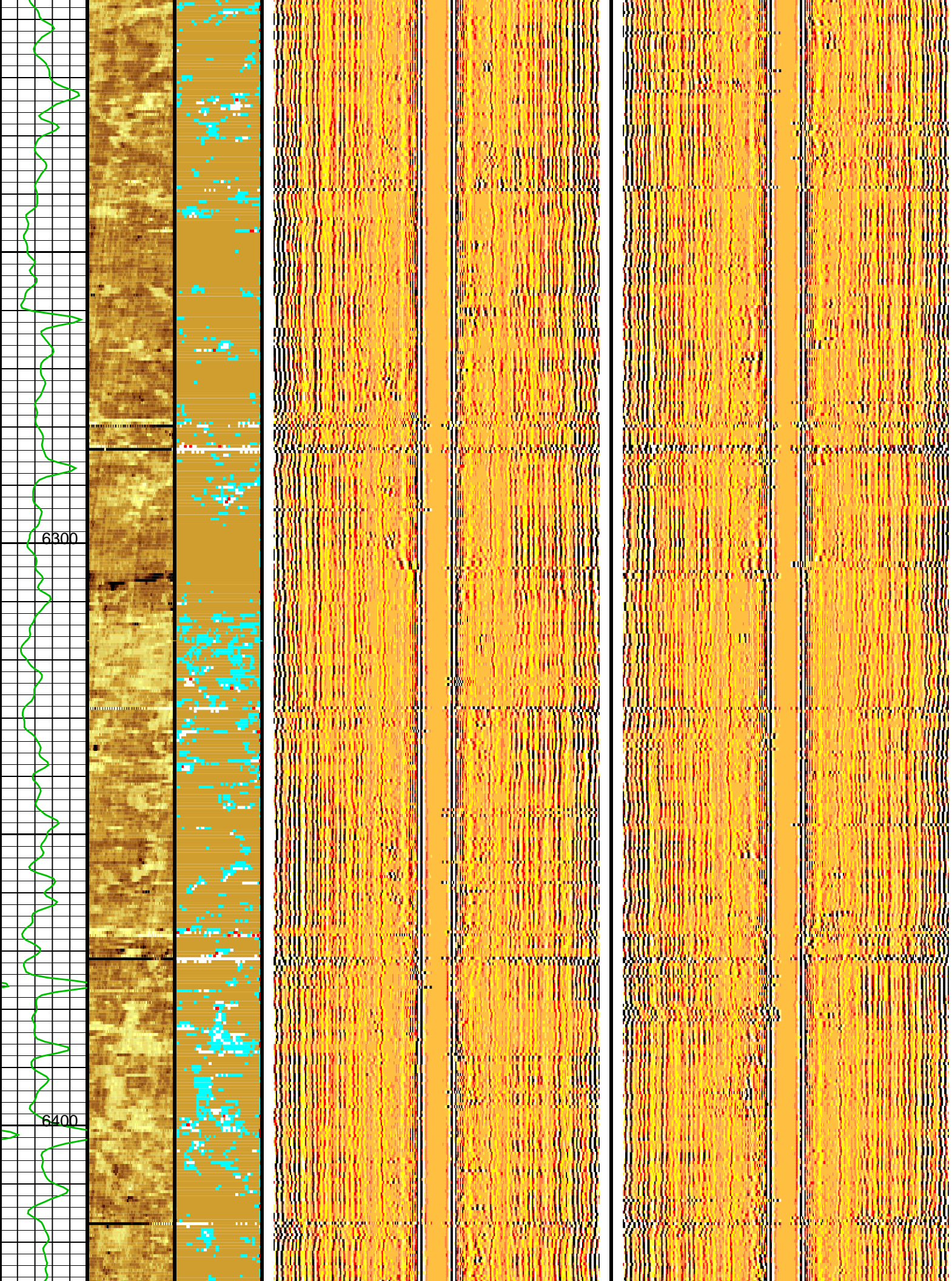


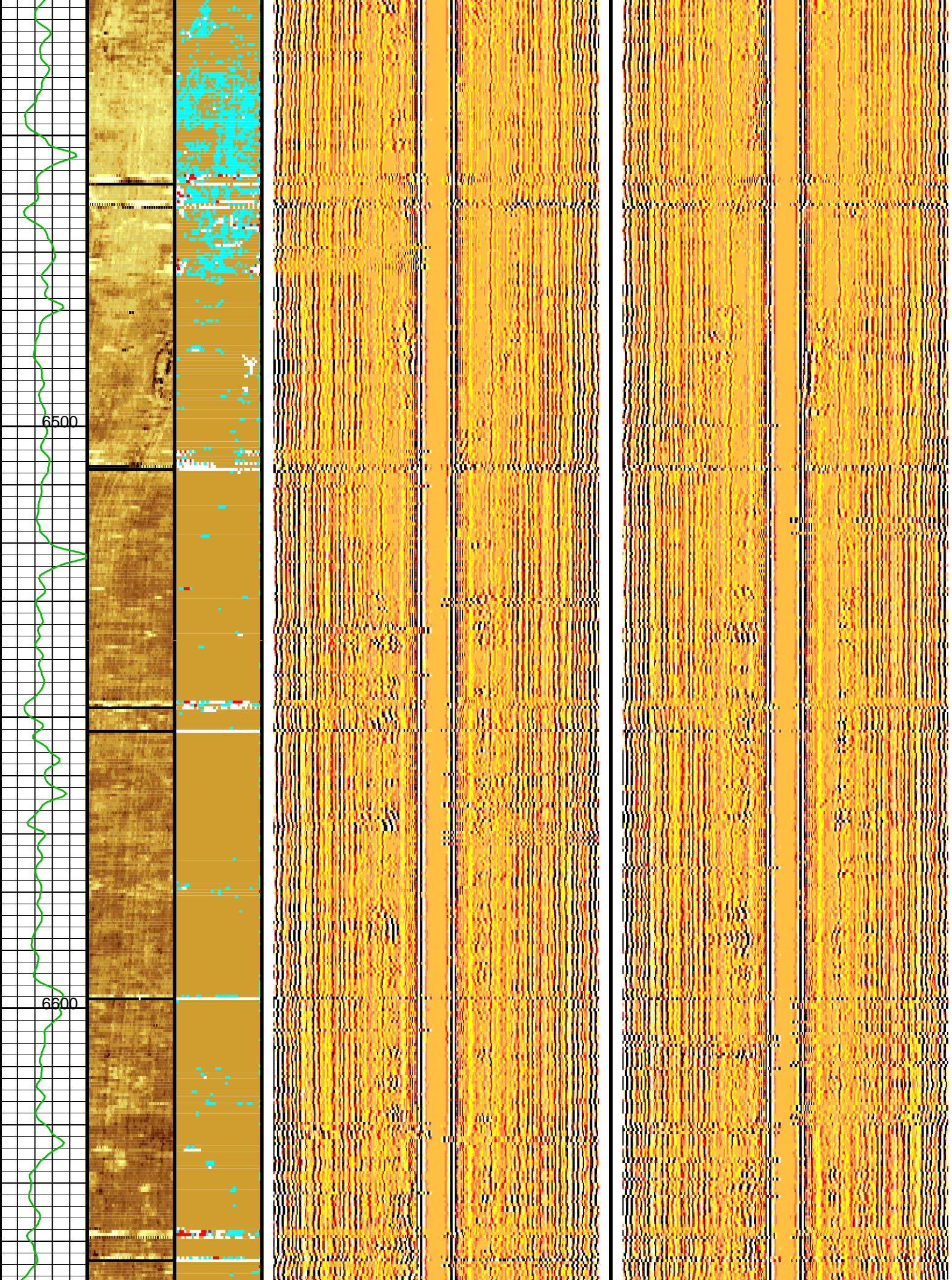


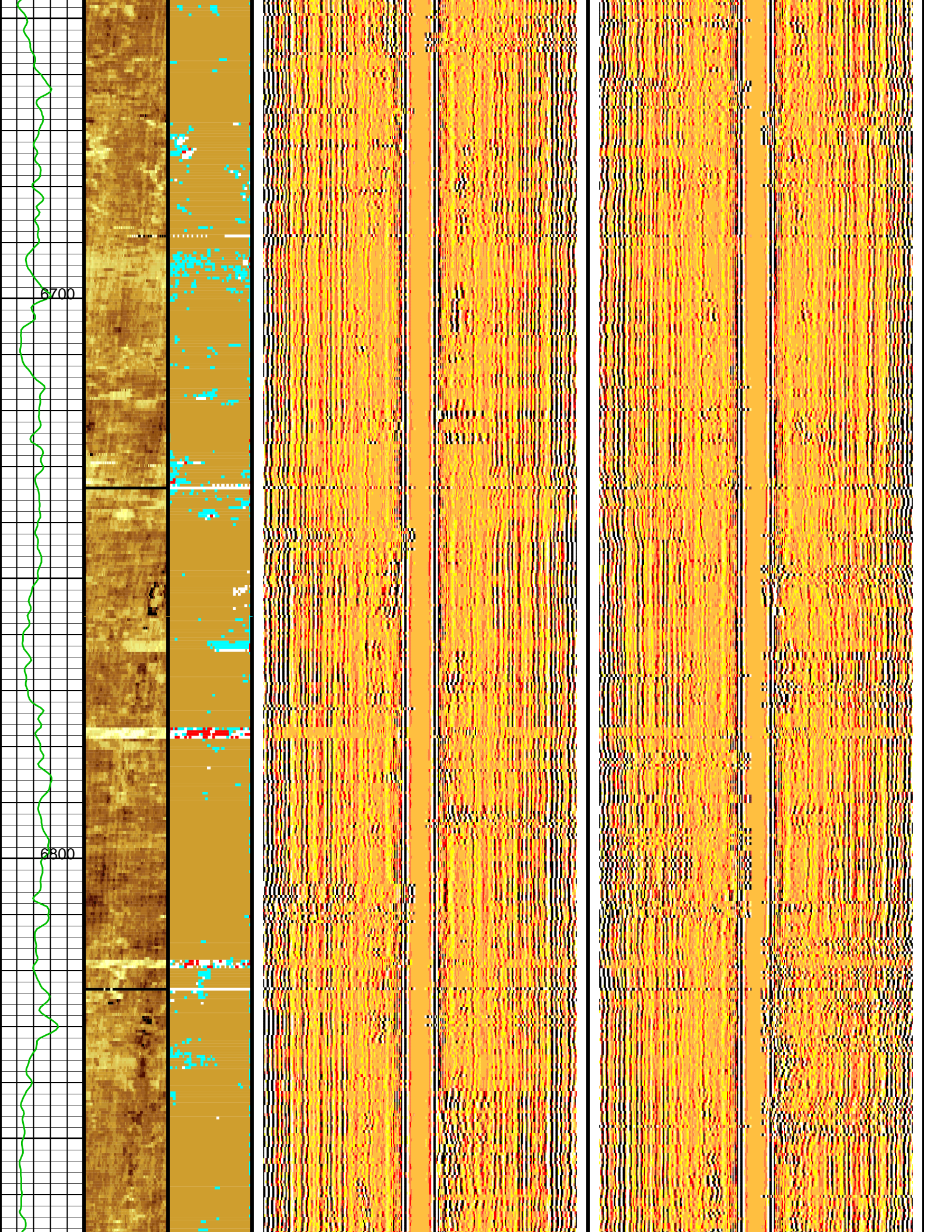


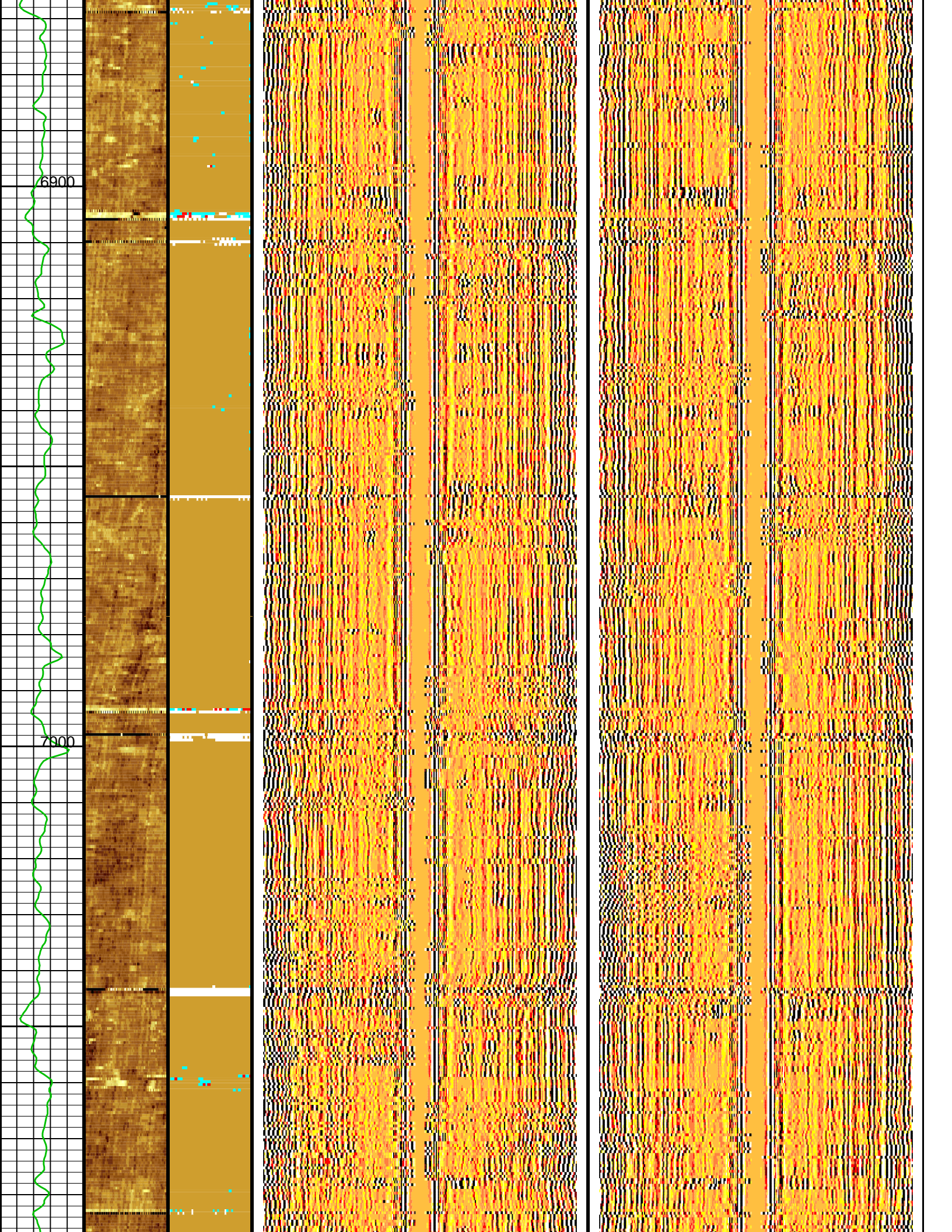


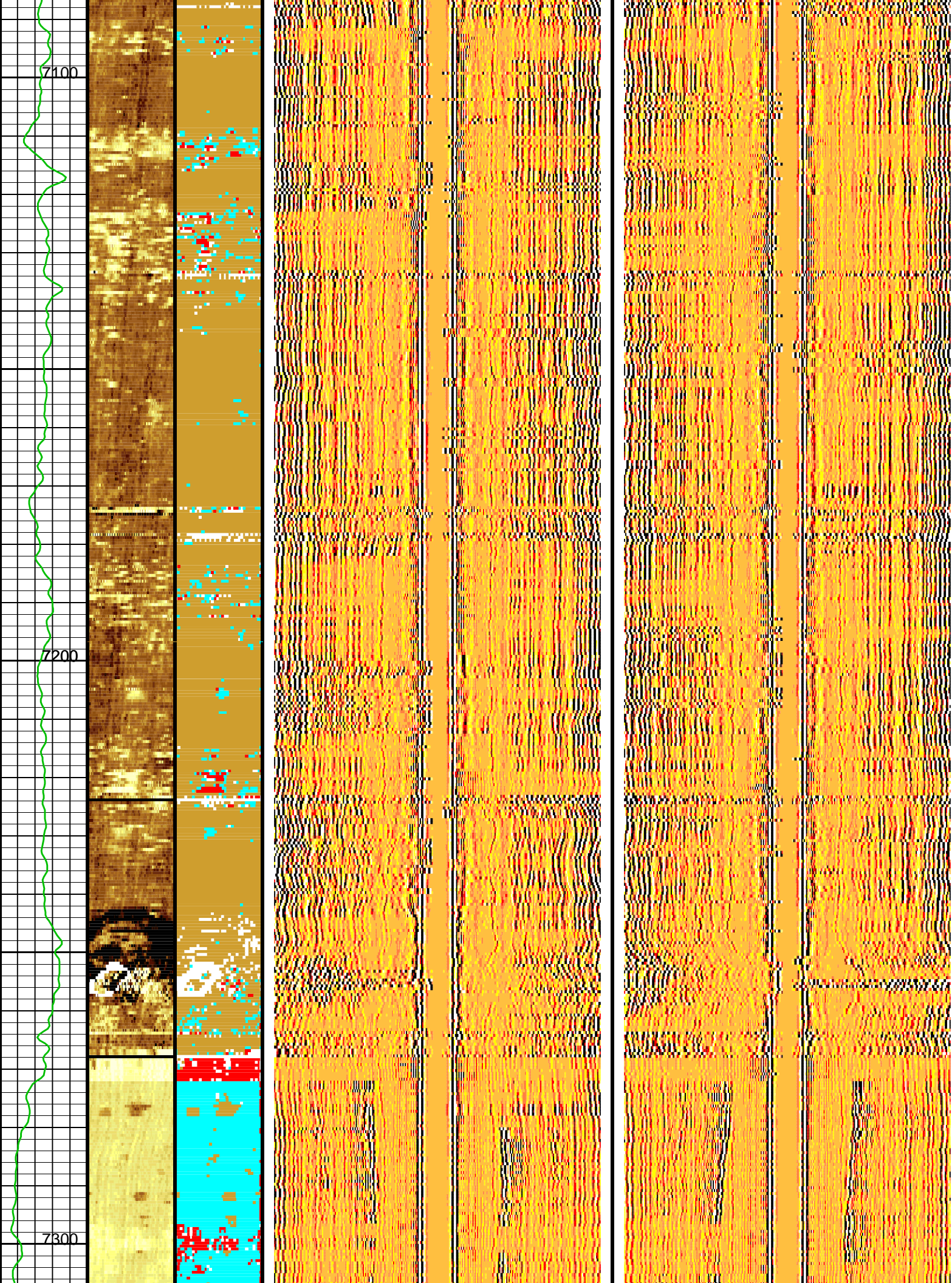


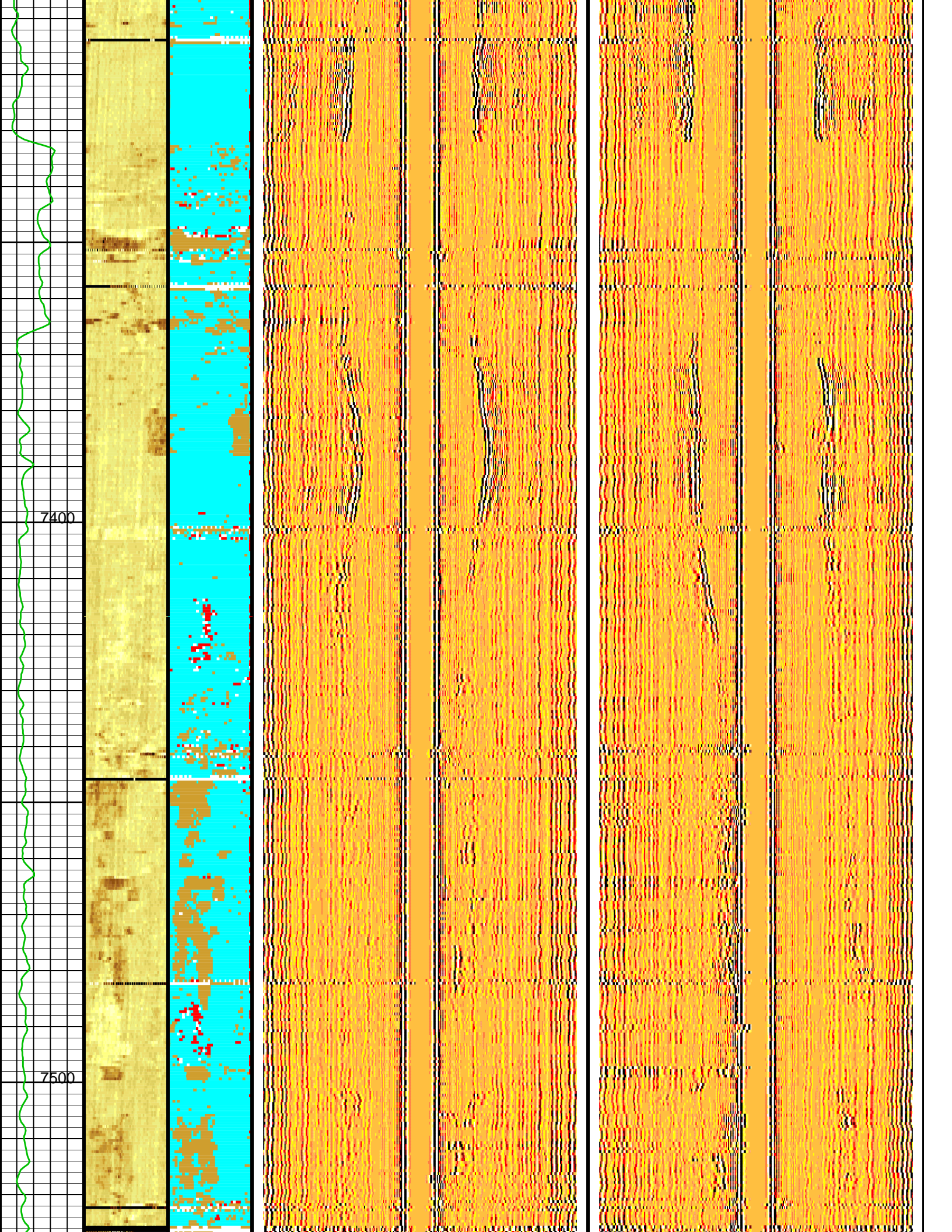


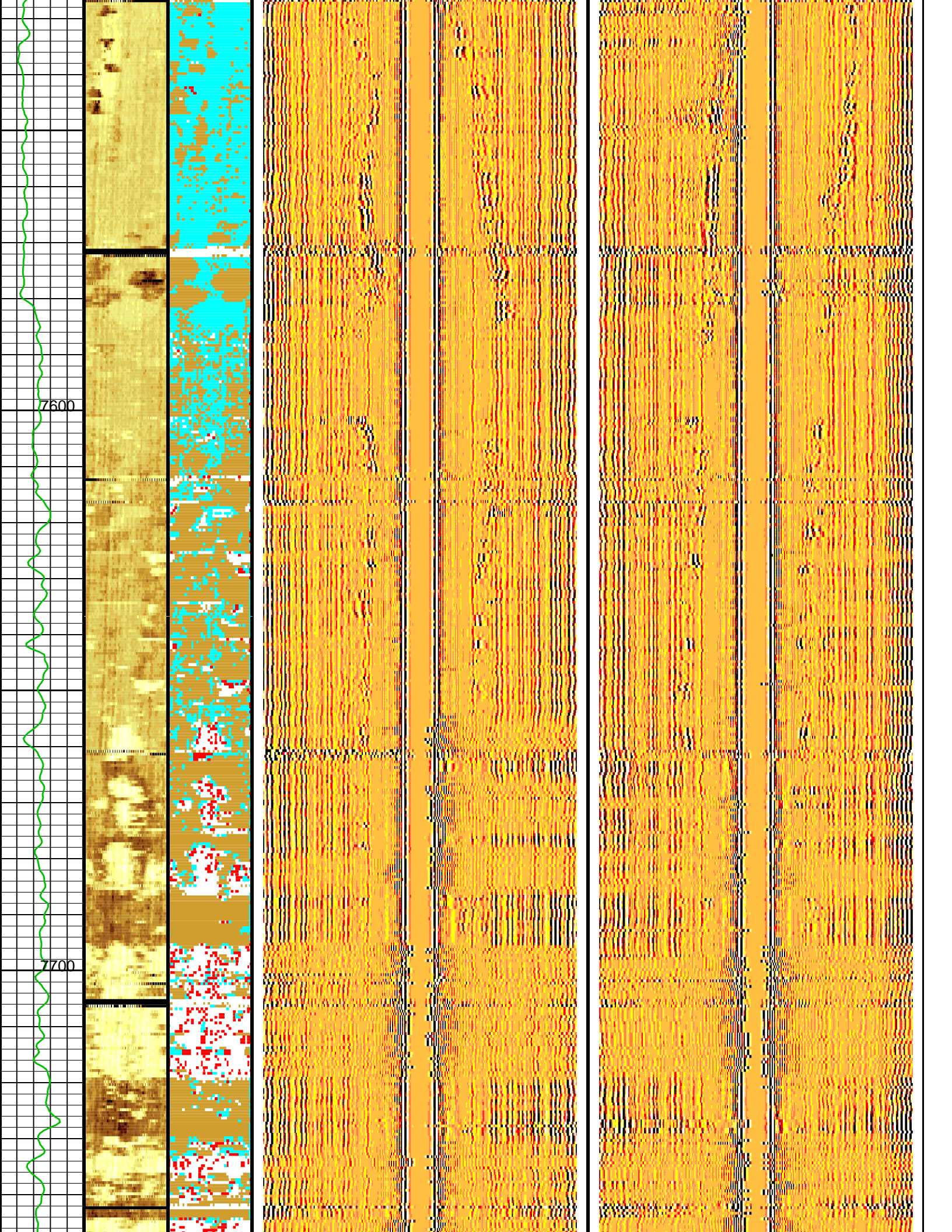


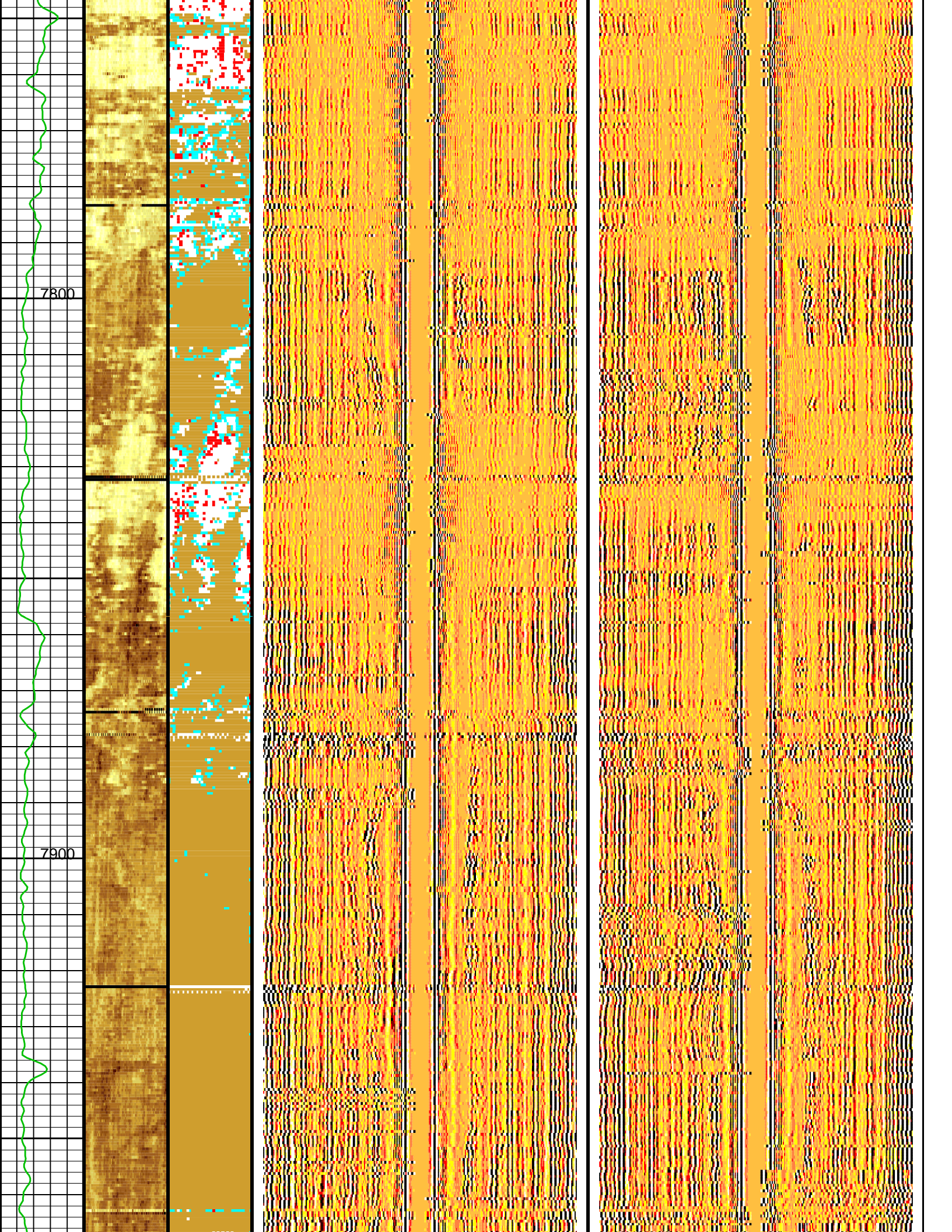


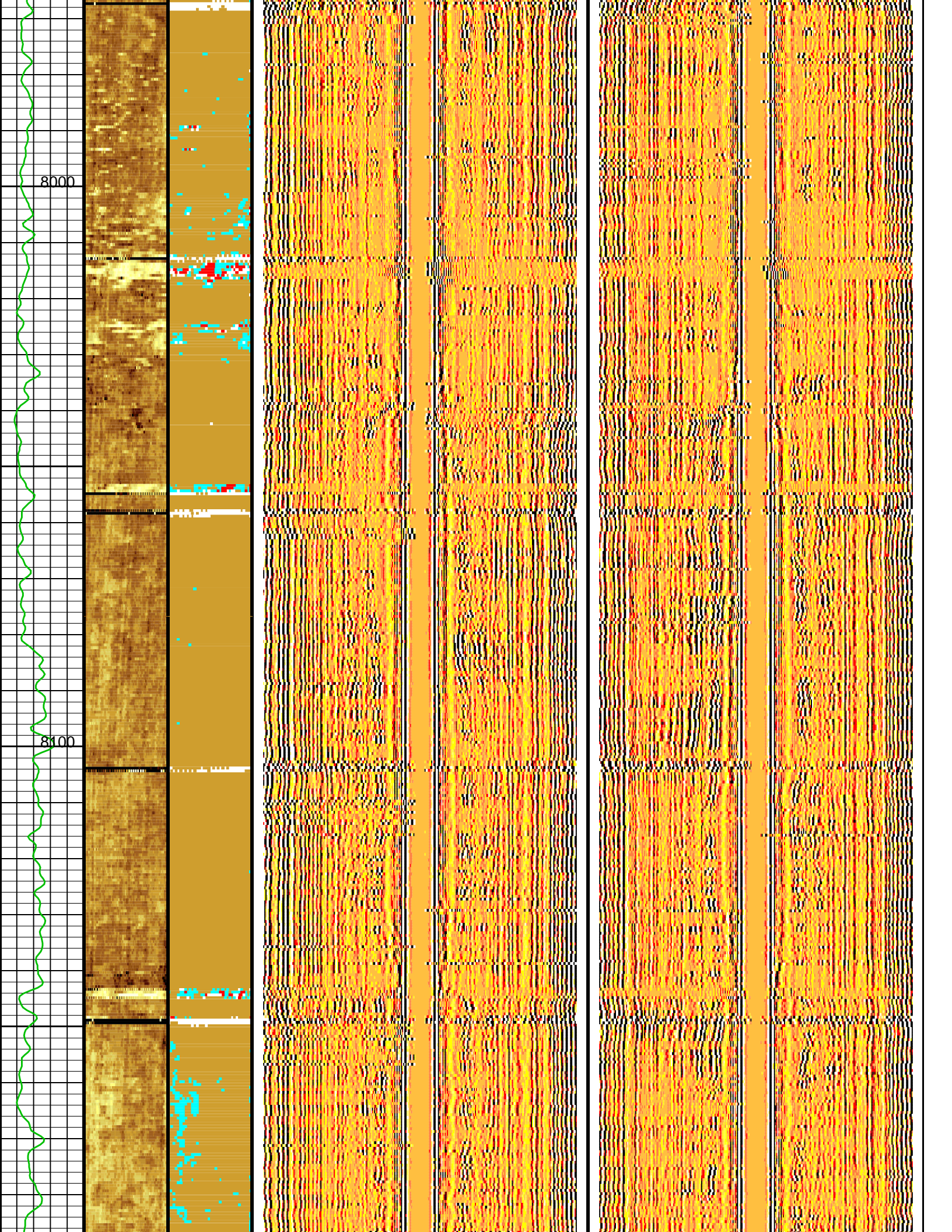


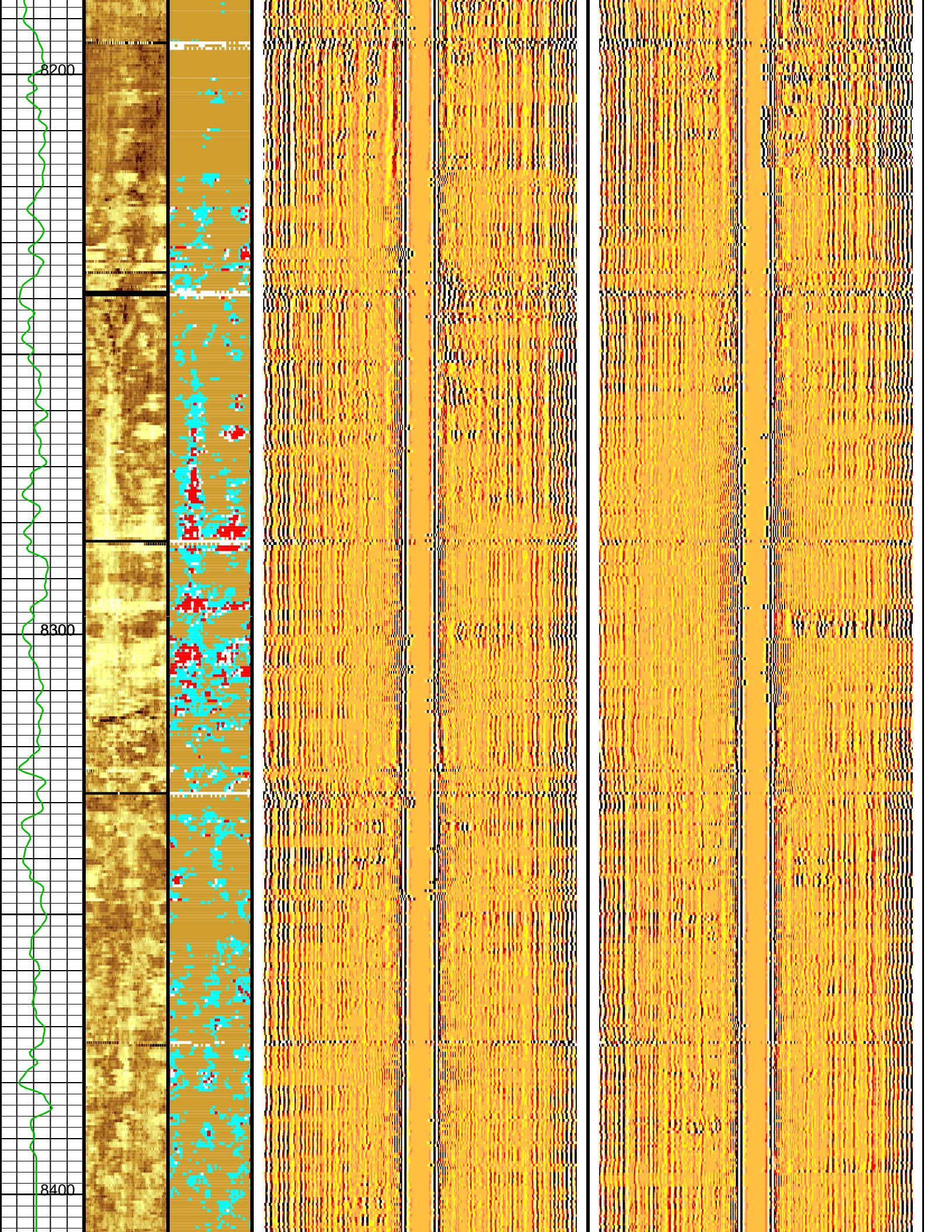


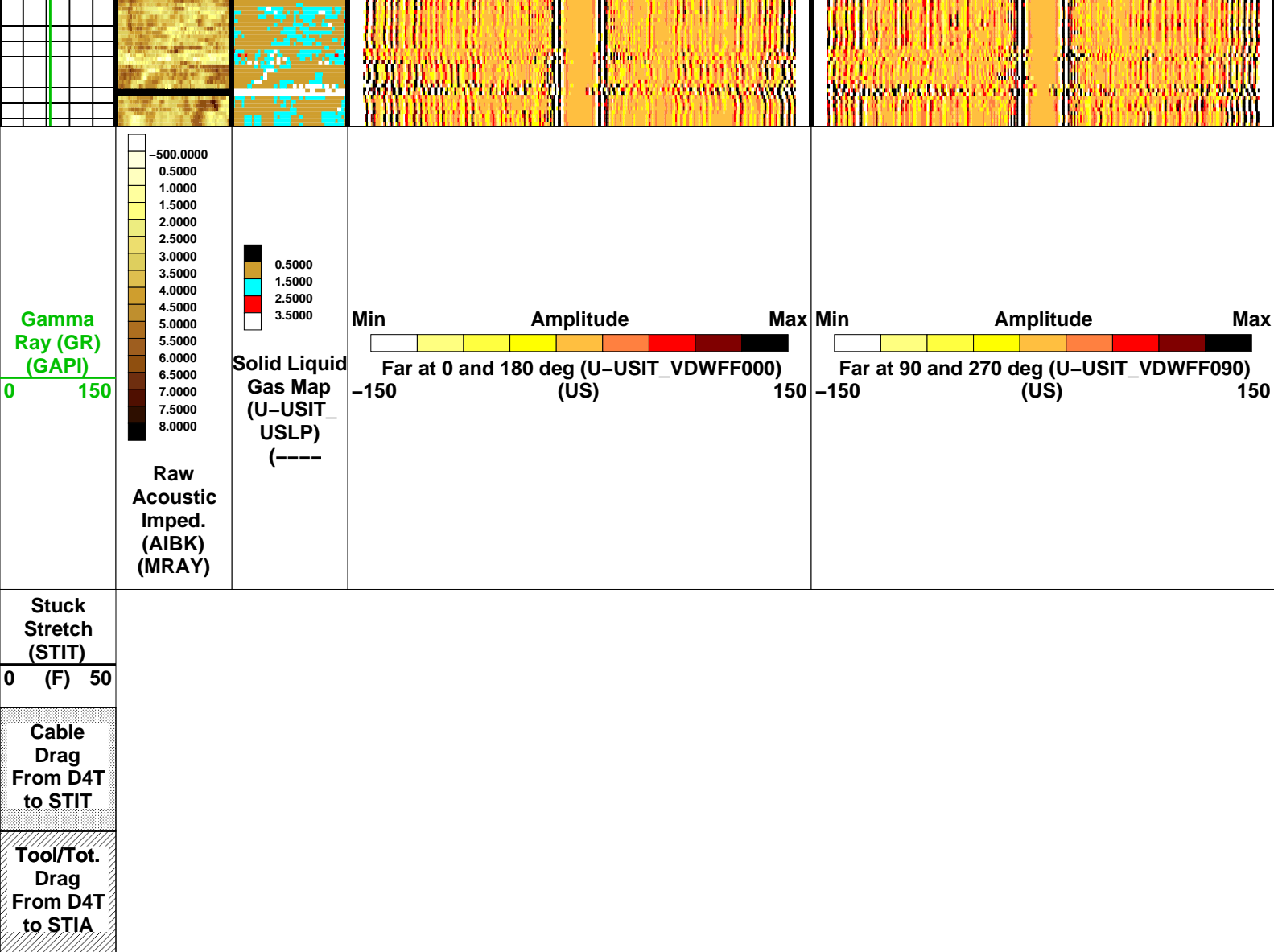












Parameters

DLIS Name	Description	Value	
USIT-D: Ultrasonic Imaging – D			
AGMN	Minimum Gain of Cartridge	–4	DB
AGMX	Maximum Gain of Cartridge	20	DB
BERJ	Bad Echo Rejection	ON	
CDIA	Casing Outer Diameter	7	IN
CSDE	Casing Density	486.94	LBCF
CSID	Casing Inner Diameter	6.276	IN
DFVL	Default Fluid Velocity	195	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	50	V
FSOD	Fluid Slowness Fits Casing Outer Diameter	5_UFSL_N_ZMUD	
IMAR	Image Rotation	OFF	
MW	Mud Weight	8.4	LB/G
RCOD	Reference Calibrator Outer Diameter	7	IN
RCSO	Reference Calibrator Standoff	1.1811	IN
RCTH	Reference Calibrator Thickness	0.2952	IN
TCUB	T^3 Processing Level	Vax_Loop	
THDH	Maximum Search Thickness (percentage of nominal)	130	
THDL	Minimum Search Thickness (percentage of nominal)	70	
THDP	Thickness Detection Policy	Fundamental	
THNO	Nominal Thickness of Casing	0.362	IN
U-USIT_CENT	USIT Cement Type	ULTRA_LIGHT	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	0	MRAY
U-USIT_IISR	USIT IBC Inverted Fluid Slowness Resolution	1.0_US_P_FT	
U-USIT_IIZR	USIT IBC Inverted ZMUD Resolution	0.050_MRAY	
U-USIT_OCDI	USIT Outer Casing Diameter	0	IN
U-USIT_OCSH	USIT Outer Casing Shoe	0	FT
U-USIT_OCWE	USIT Outer Casing Weight	0	LB/F
U-USIT_TIEB	IBC Third Interface Echo Bin Processing	YES	
U-USIT_TIEC	IBC Third Interface Echo Cleaning	NONE	
U-USIT_TIEM	IBC Third Interface Echo Multi Tracking	NO	
U-USIT_TIER	IBC Third Interface Echo Reliance	YES	

U-USIT_TIEP	IBC Third Interface Echo Policy	BFEF	
U-USIT_TIER	IBC Third Interface Echo Receivers	BOTH	
U-USIT_U3WE	Third Interface Echo Window End	110	US
U-USIT_UBTP	USIT Bottom Transducer Position	UNKNOWN	
U-USIT_UFAO	USIT Flexural Attenuation Offset	-1	DB/M
U-USIT_UIAP	USIT IBC Answer Product Enabled	SolidLiquidGasMap	
U-USIT_UIST	Ultrasonic IBC Sonde Type	Sub_ibcs_B	
U-USIT_UTAN	USIT Transducer Angles	33_DEG	
UMAO	USIT Measurement Angular Offset	-10	DEG
USTO	Ultrasonic Time Offset	-2	US
USUB	Ultrasonic Subassembly Identifier	Sub_7_inch	
UWKM	Ultrasonic Working Mode	5DEG_6IN_136UNF_LF	
VCAS	Ultrasonic Transversal Velocity in Casing	51.4	US/F
WLEN	T^3 Processing Length	21.7078	US
ZCAS	Acoustic Impedance of Casing	46.25	MRAY
ZINI	Initial Estimate of Cement Impedance	-1	MRAY
ZMUD	Acoustic Impedance of Mud	1.95	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.6	MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3	MRAY
STI: Stuck Tool Indicator			
LBFR	Trigger for MAXIS First Reading Label	TDL	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth - Driller	8692.00	FT
TDL	Total Depth - Logger	8692.00	FT
System and Miscellaneous			
BS	Bit Size	9.875	IN
CWEI	Casing Weight	26.00	LB/F
DO	Depth Offset for Playback	4.0	FT
PP	Playback Processing	RECOMPUTE	

Format: USI_IBC_VDL_WIDE

Vertical Scale: 5" per 100'

Graphics File Created: 28-Apr-2010 15:31

OP System Version: 17C0-154						
USIT-D	SRPC-3870_Q3_2009_OP17_V3	HILTH-FTB	SRPC-3870_Q3_2009_OP17_V3			
DTC-H	17C0-154					
Input DLIS Files						
DEFAULT	USI_TLD_MCFL_CNL_017LUP	FN:16	PRODUCER	28-Apr-2010 12:12	8419.0 FT	3308.0 FT
Output DLIS Files						
DEFAULT	USI_TLD_MCFL_CNL_006PUP	FN:5	PRODUCER	28-Apr-2010 15:31		



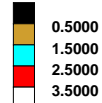
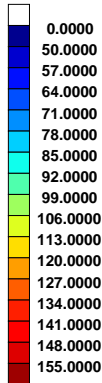
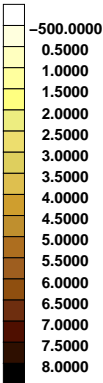
GOODWIN 5 INCH

MAXIS Field Log

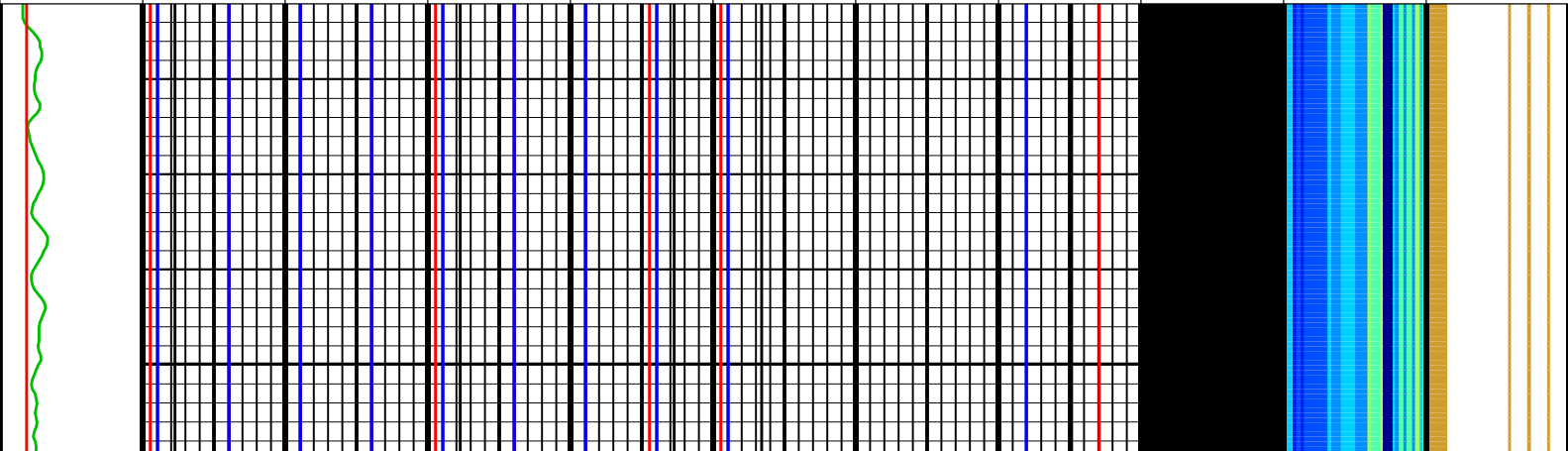
Company:				Well:		
Input DLIS Files						
DEFAULT	USI_TLD_MCFL_CNL_017LUP	FN:16	PRODUCER	28-Apr-2010 12:12	8419.0 FT	3308.0 FT
Output DLIS Files						
DEFAULT	USI_TLD_MCFL_CNL_006PUP	FN:5	PRODUCER	28-Apr-2010 15:31	8423.0 FT	3312.0 FT
OP System Version: 17C0-154						
USIT-D	SRPC-3870_Q3_2009_OP17_V3		HILTH-FTB	SRPC-3870_Q3_2009_OP17_V3		
DTC-H	17C0-154					

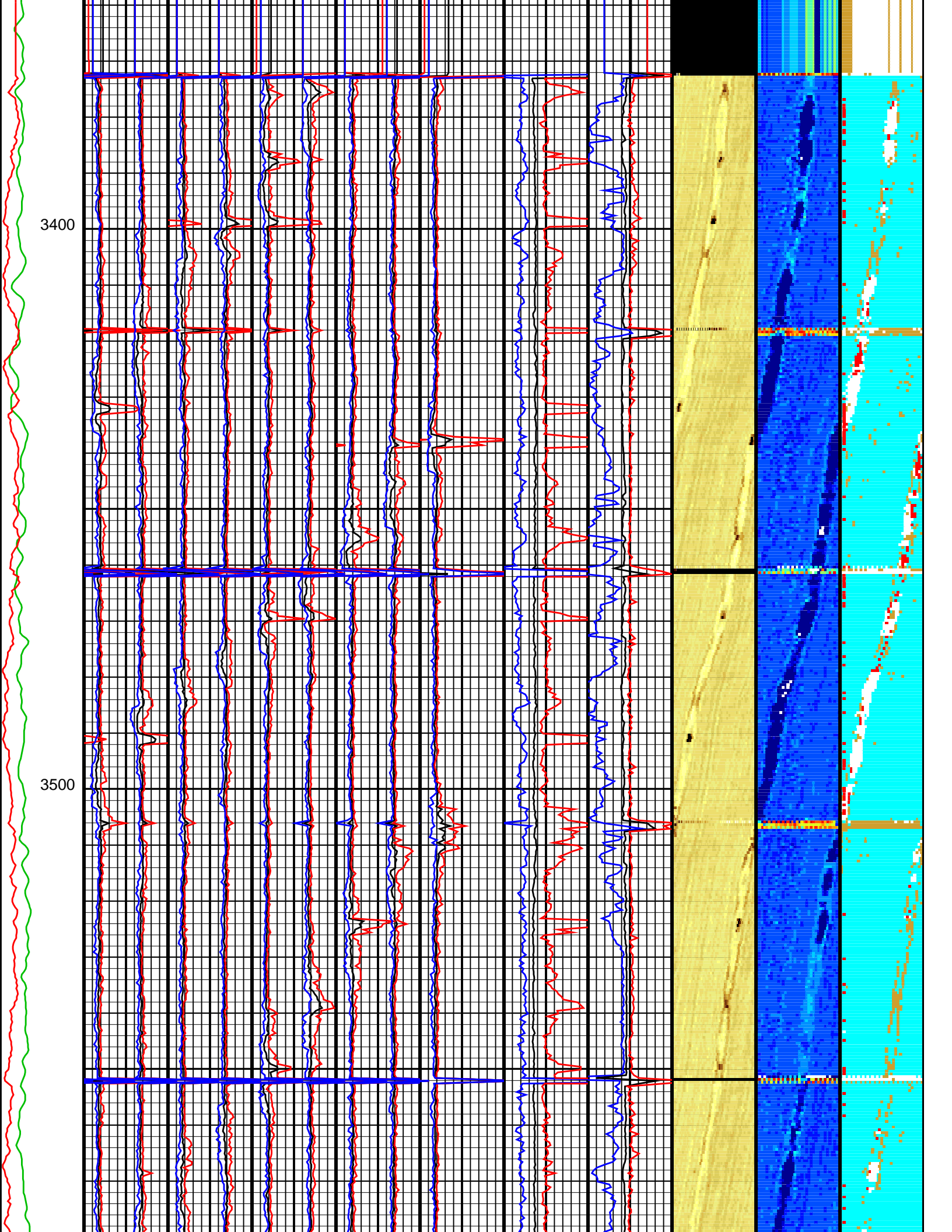
	Minimum	Minimum	Minimum	Minimum
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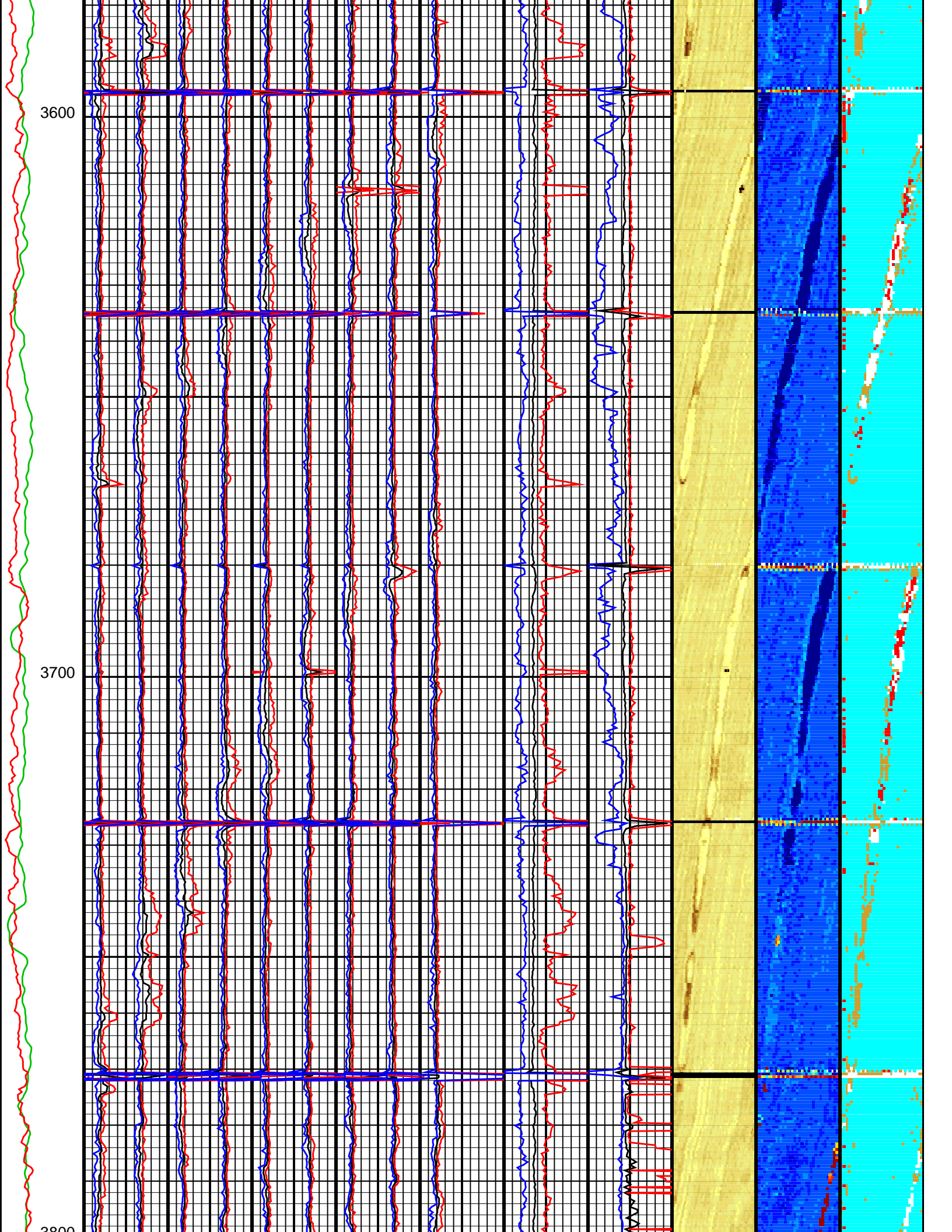
	Acoustic Impedance #2 (MIN_AI2) (MRAY)	Acoustic Impedance #4 (MIN_AI4) (MRAY)	Acoustic Impedance #6 (MIN_AI6) (MRAY)	Acoustic Impedance #8 (MIN_AI8) (MRAY)			
	-7.5 7.5	-7.5 7.5	-7.5 7.5	-7.5 7.5			
	Minimum Acoustic Impedance #1 (MIN_AI1) (MRAY)	Minimum Acoustic Impedance #3 (MIN_AI3) (MRAY)	Minimum Acoustic Impedance #5 (MIN_AI5) (MRAY)	Minimum Acoustic Impedance #7 (MIN_AI7) (MRAY)			
	0 15	0 15	0 15	0 15			
	Maximum Acoustic Impedance #2 (MAX_AI2) (MRAY)	Maximum Acoustic Impedance #4 (MAX_AI4) (MRAY)	Maximum Acoustic Impedance #6 (MAX_AI6) (MRAY)	Maximum Acoustic Impedance #8 (MAX_AI8) (MRAY)			
	-7.5 7.5	-7.5 7.5	-7.5 7.5	-7.5 7.5			
	Maximum Acoustic Impedance #1 (MAX_AI1) (MRAY)	Maximum Acoustic Impedance #3 (MAX_AI3) (MRAY)	Maximum Acoustic Impedance #5 (MAX_AI5) (MRAY)	Maximum Acoustic Impedance #7 (MAX_AI7) (MRAY)	Minimum Acoustic Impedance #9 (MIN_AI9) (MRAY)	Maximum of AI (AIMX) (MRAY)	Maximum Flexural Attenuation (U-USIT_UFAX) (DB/M)
	0 15	0 15	0 15	0 15	0 15	0 7.5	0 150
Gamma Ray (GR) (GAPI)	Average Acoustic Impedance #2 (AV_AI2) (MRAY)	Average Acoustic Impedance #4 (AV_AI4) (MRAY)	Average Acoustic Impedance #6 (AV_AI6) (MRAY)	Average Acoustic Impedance #8 (AV_AI8) (MRAY)	Maximum Acoustic Impedance #9 (MAX_AI9) (MRAY)	Minimum of AI (AIMN) (MRAY)	Average Flexural Attenuation (U-USIT_UFAV) (DB/M)
0 150	-7.5 7.5	-7.5 7.5	-7.5 7.5	-7.5 7.5	0 15	0 7.5	0 150
Eccent. (ECCE)	Average Acoustic Impedance #1 (AV_AI1) (MRAY)	Average Acoustic Impedance #3 (AV_AI3) (MRAY)	Average Acoustic Impedance #5 (AV_AI5) (MRAY)	Average Acoustic Impedance #7 (AV_AI7) (MRAY)	Average Acoustic Impedance #9 (AV_AI9) (MRAY)	Average of AI (AIAV) (MRAY)	Minimum Flexural Attenuation (U-USIT_UFAN) (DB/M)
0 (IN) 0.5	0 15	0 15	0 15	0 15	0 15	0 7.5	0 150

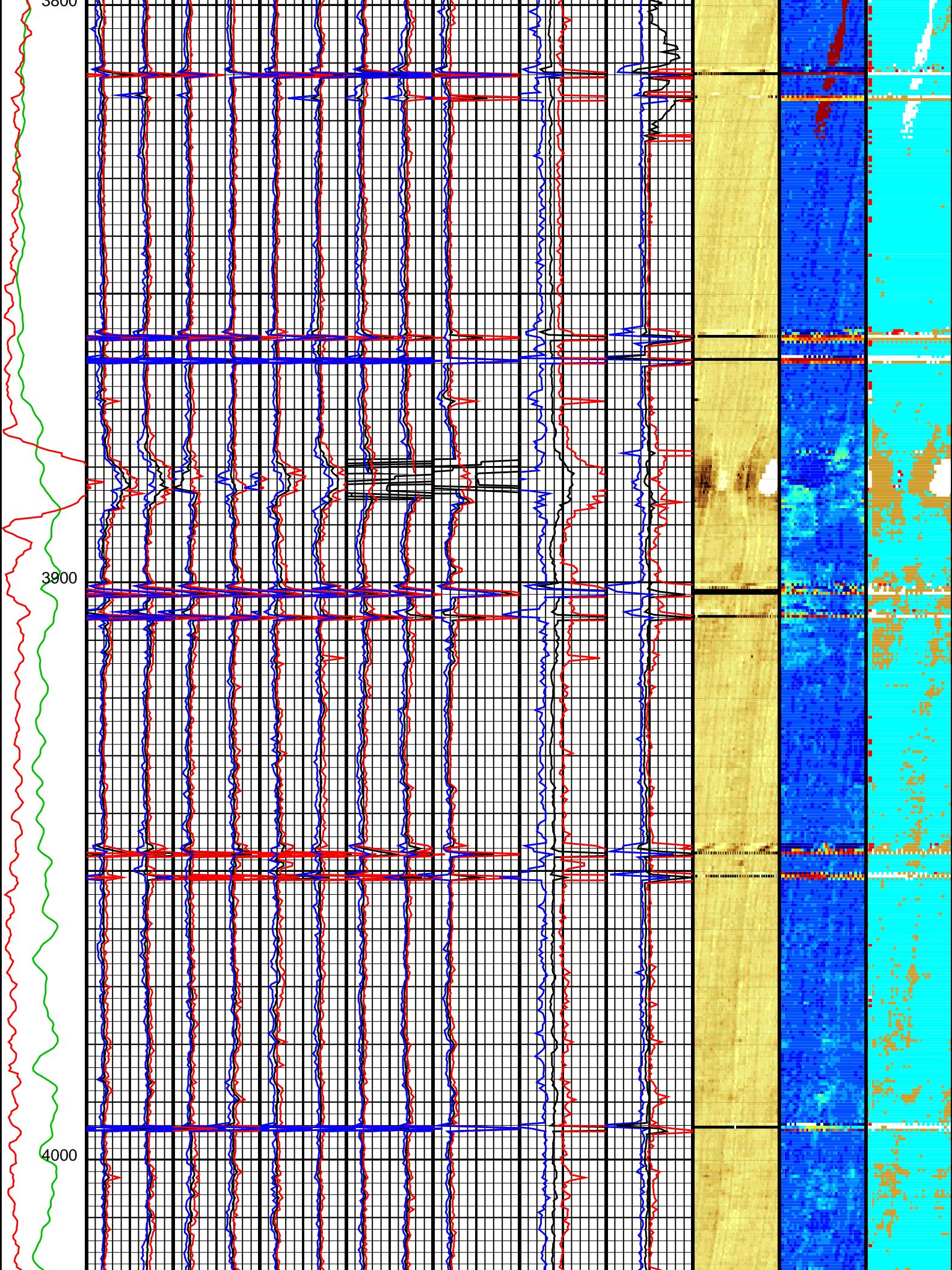


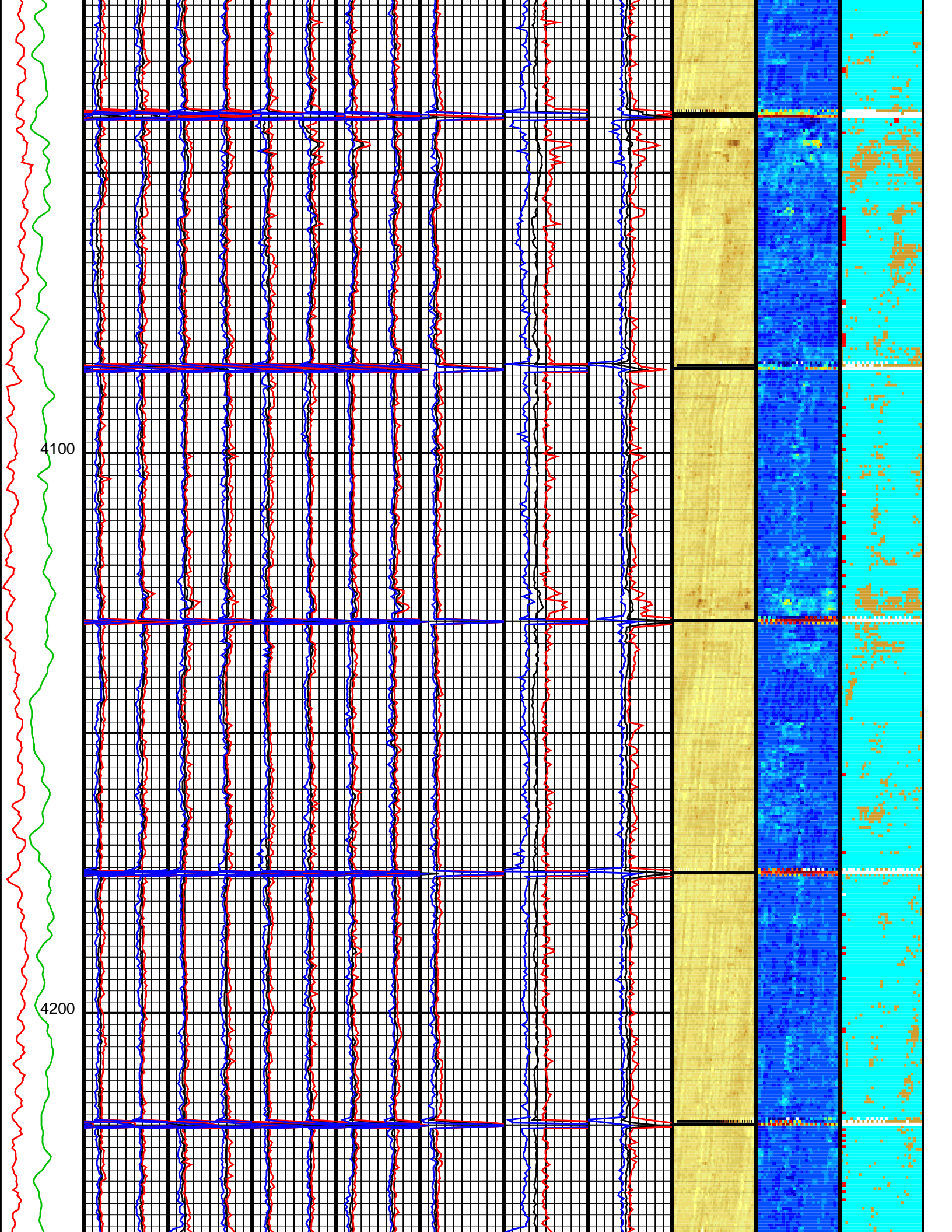
Solid Liquid Gas Map (U-USIT_USLP) (----

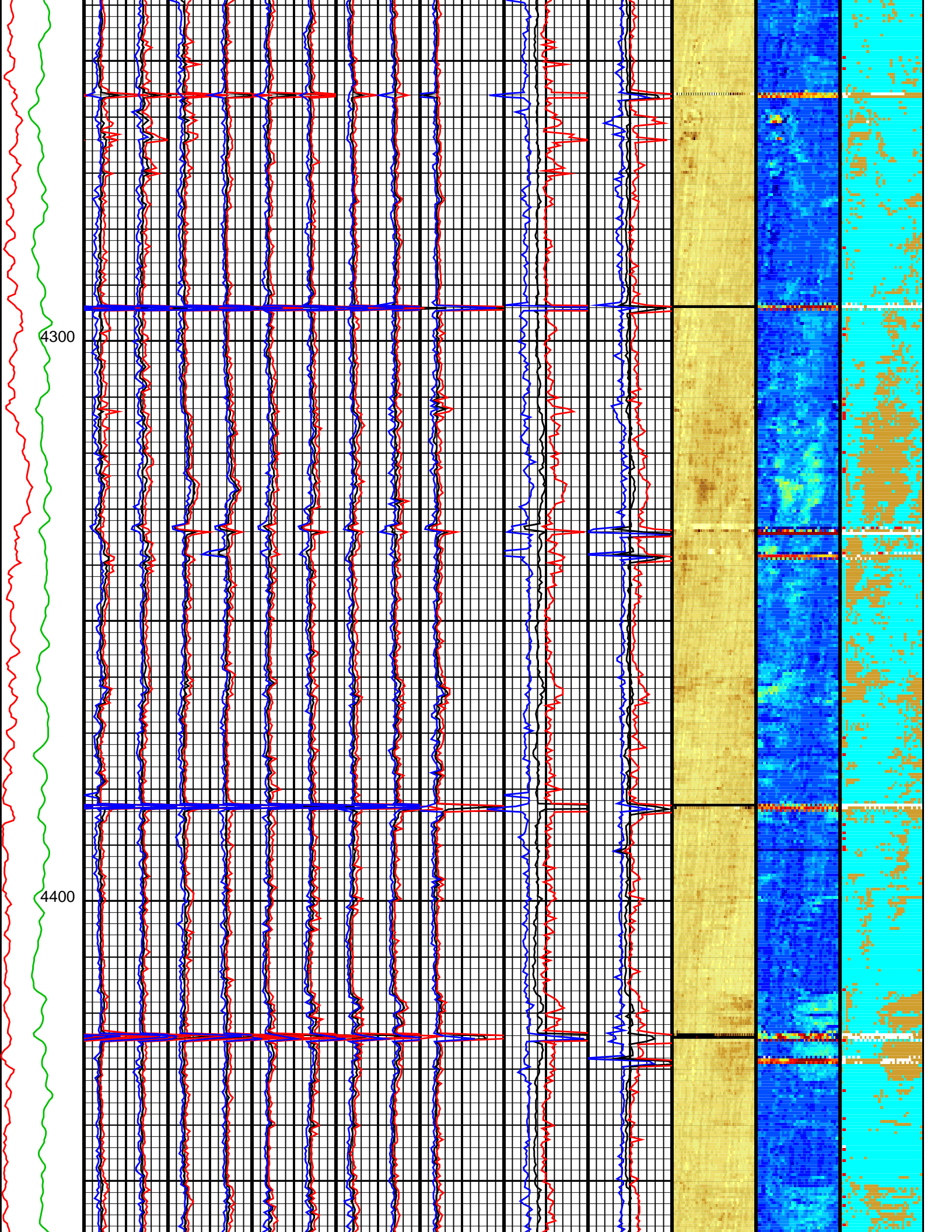


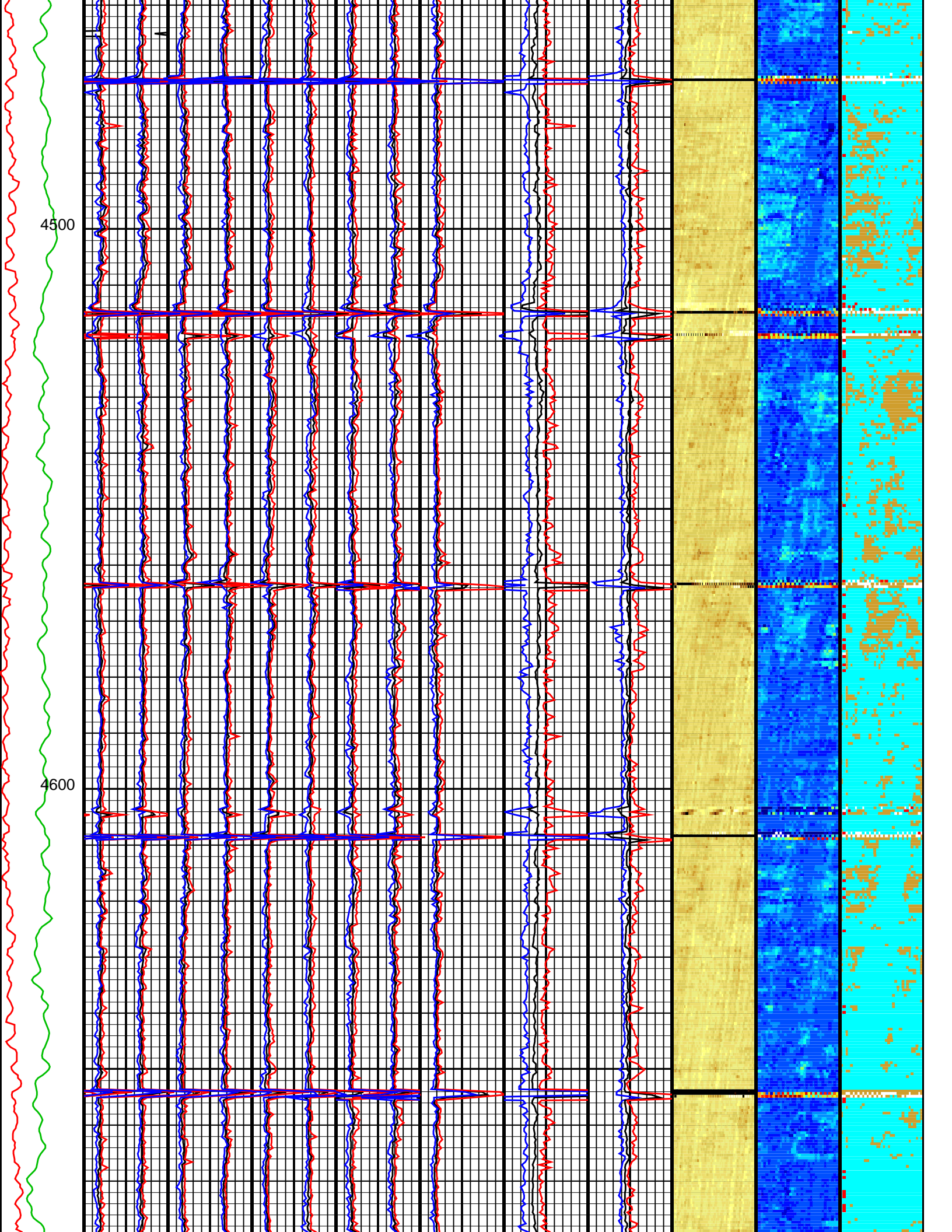


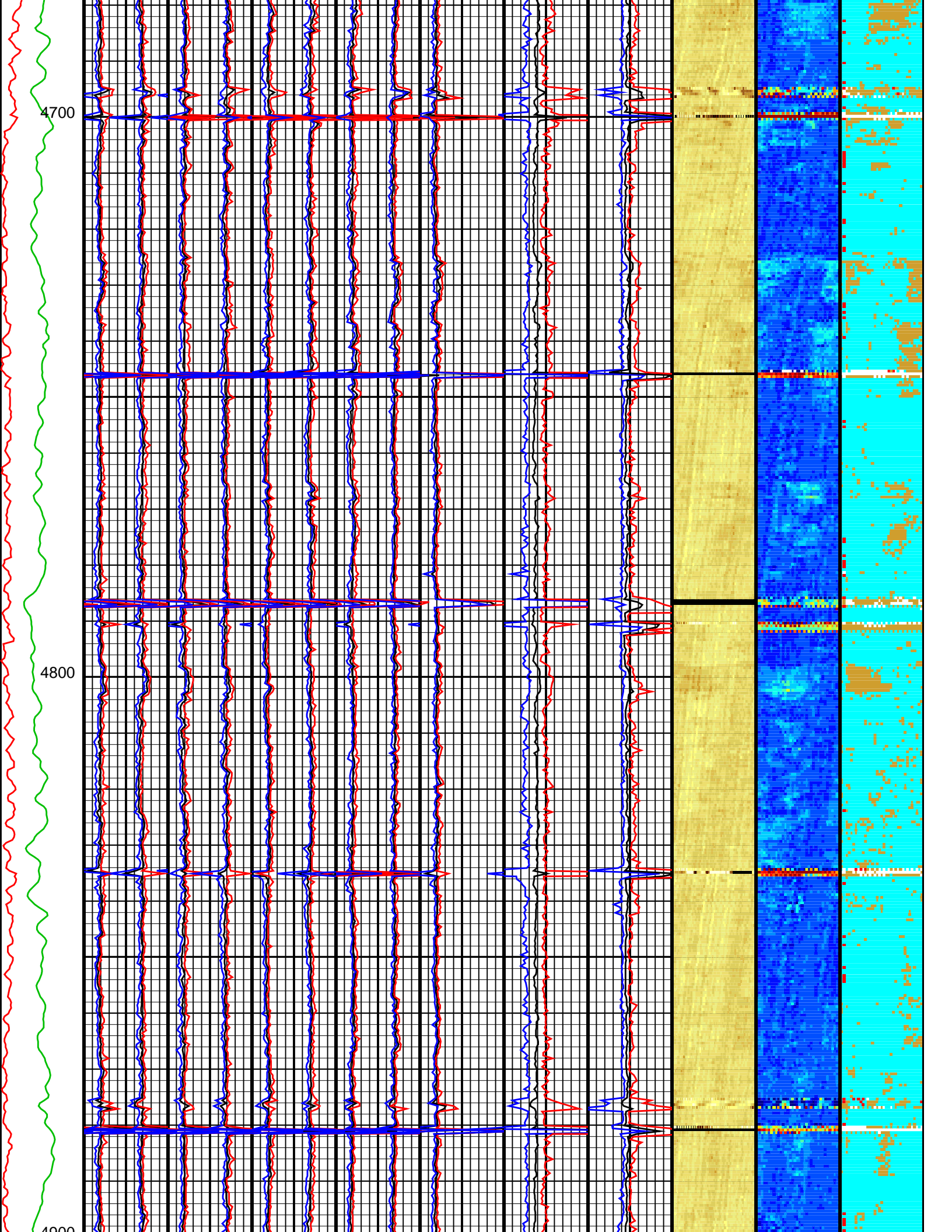


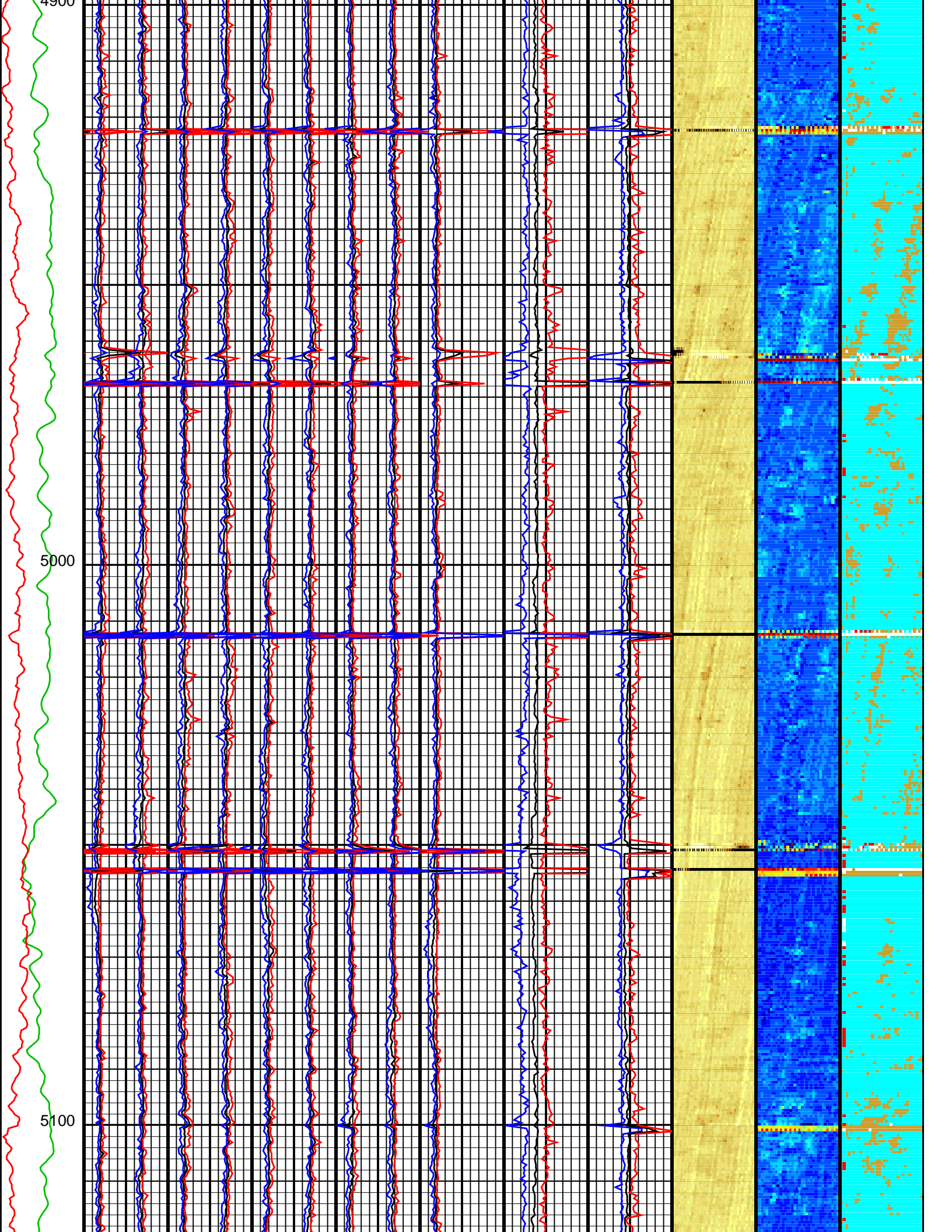


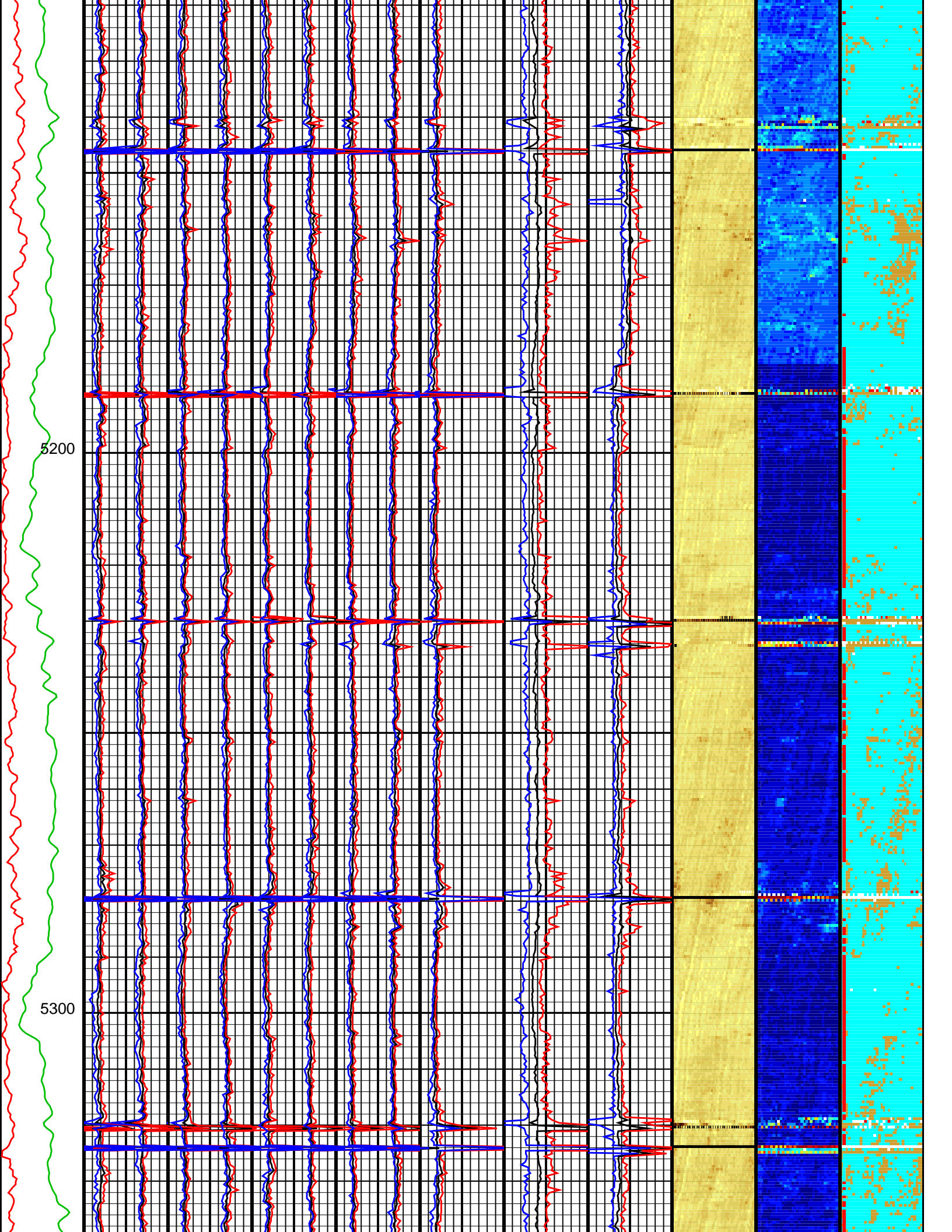


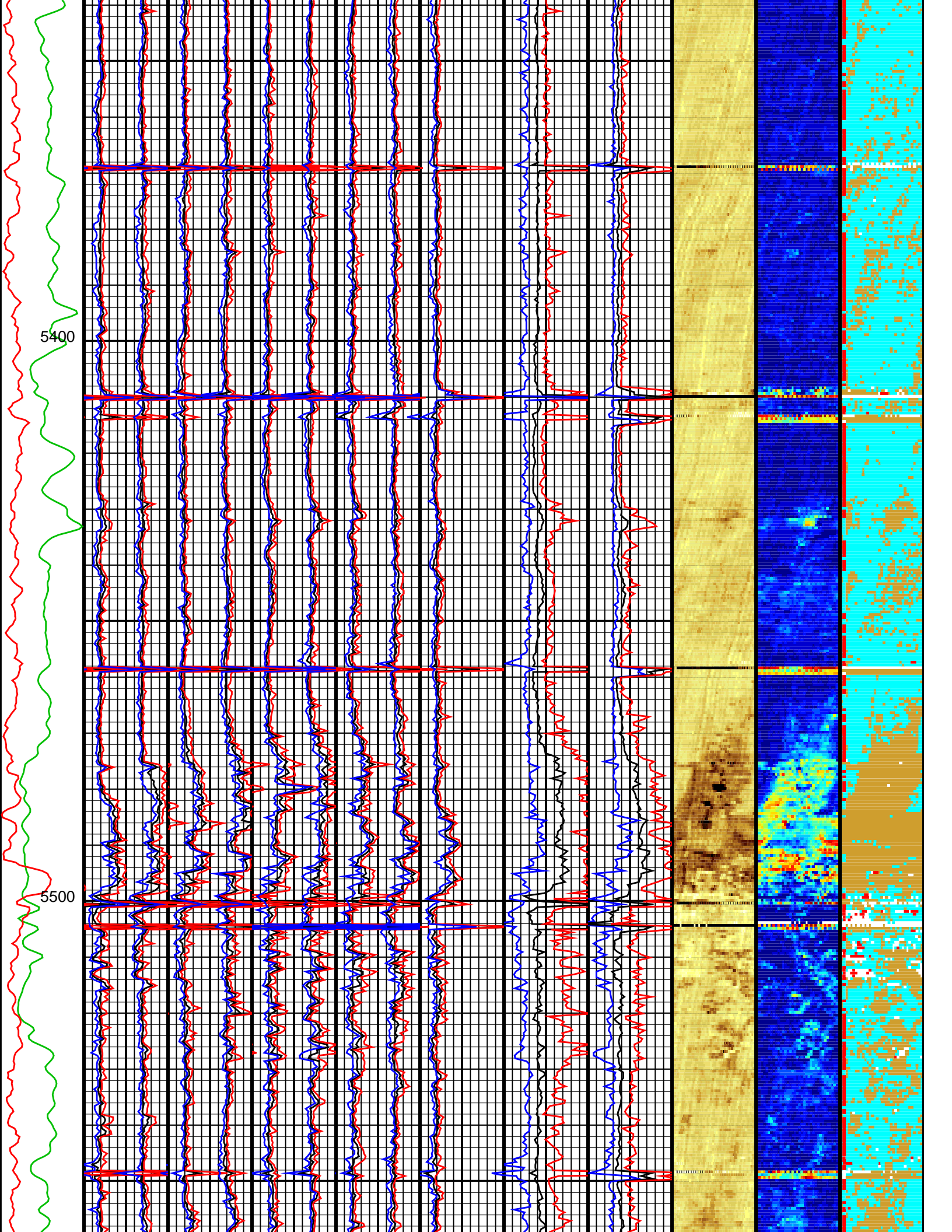


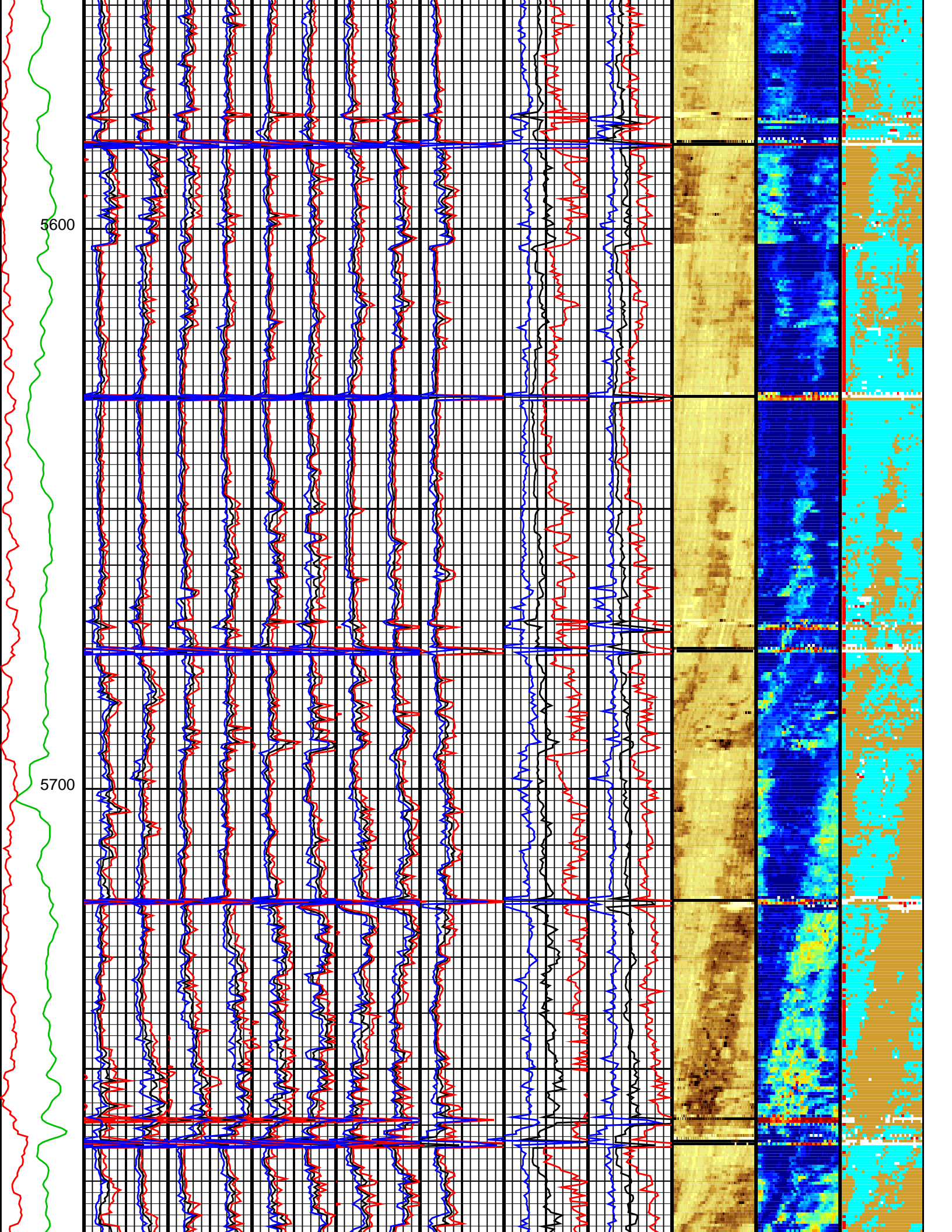


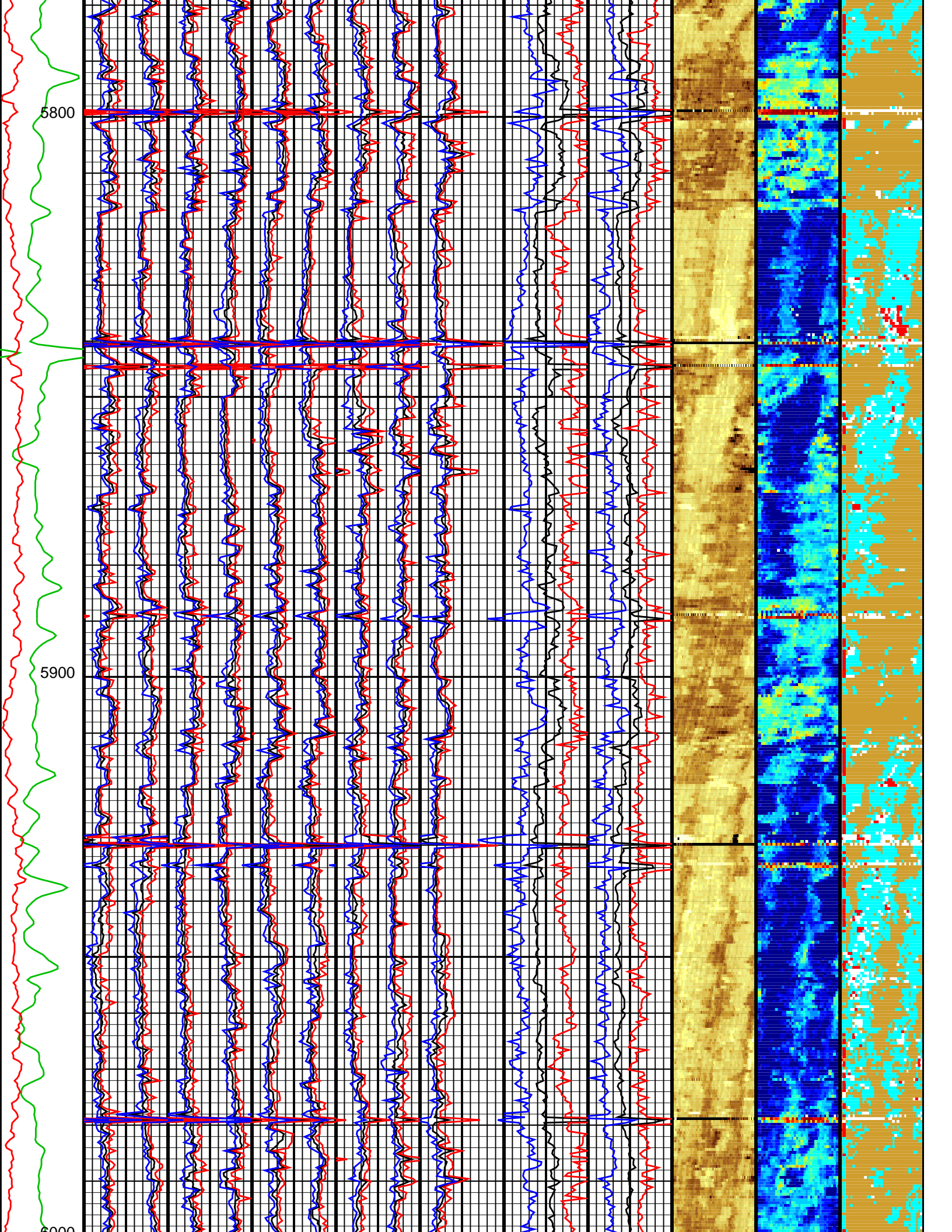


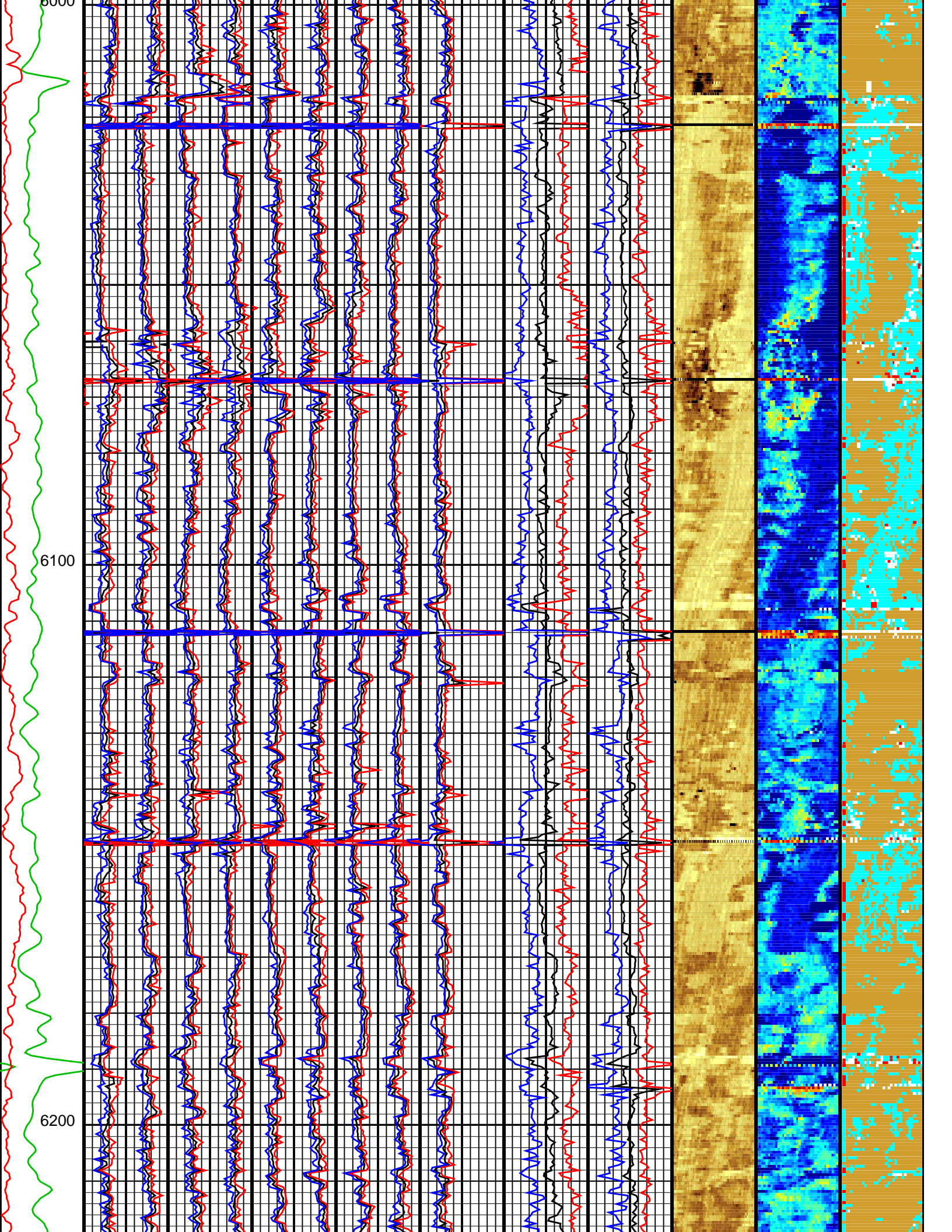


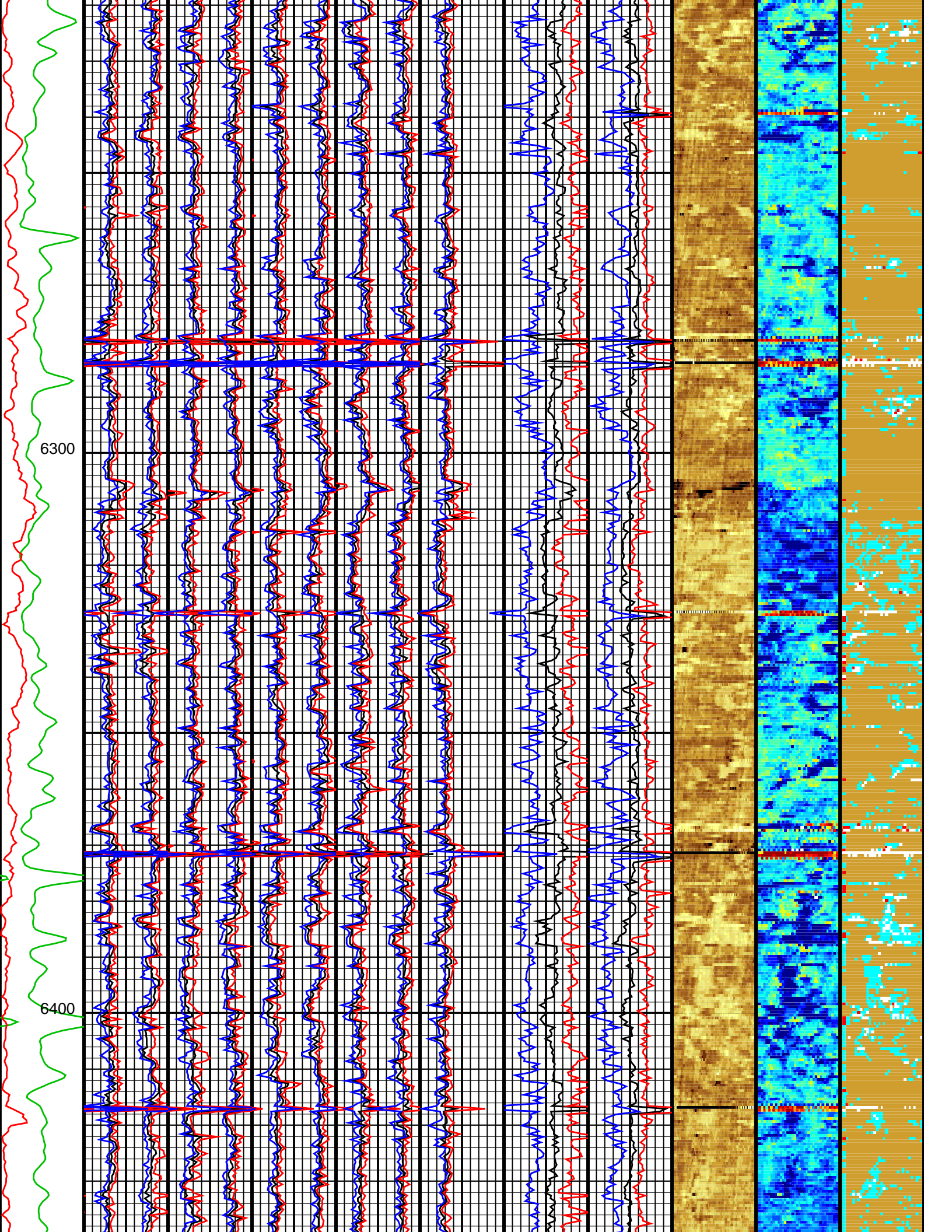


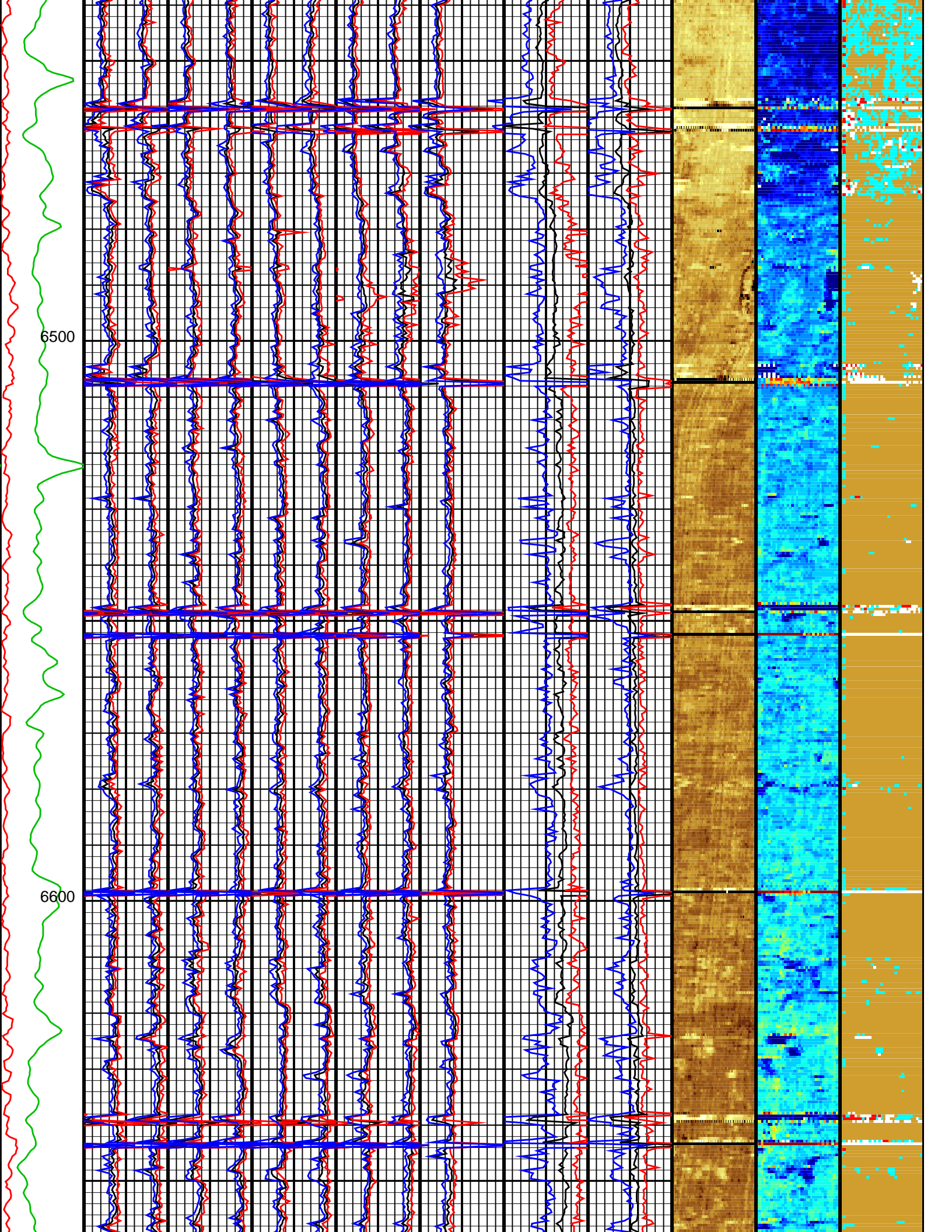


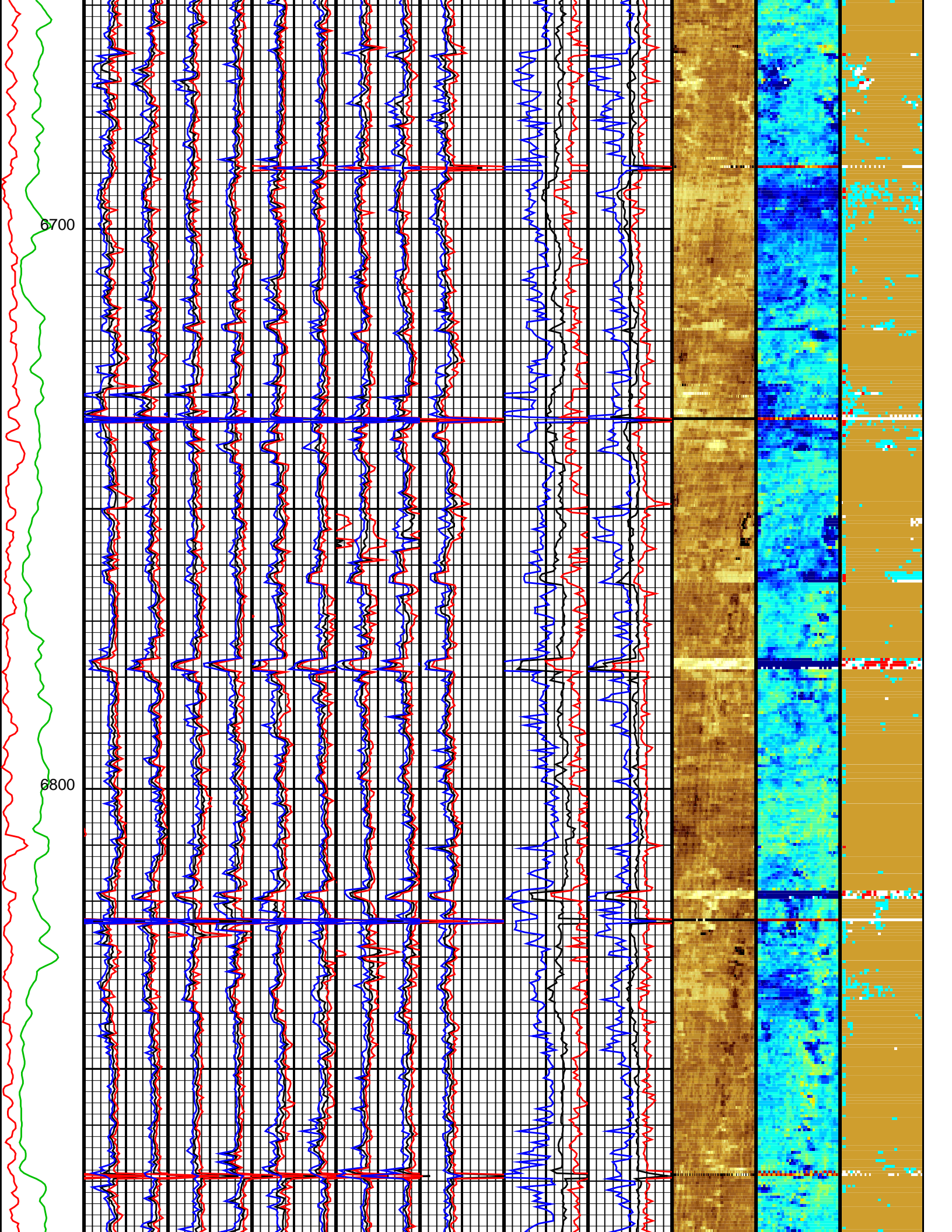


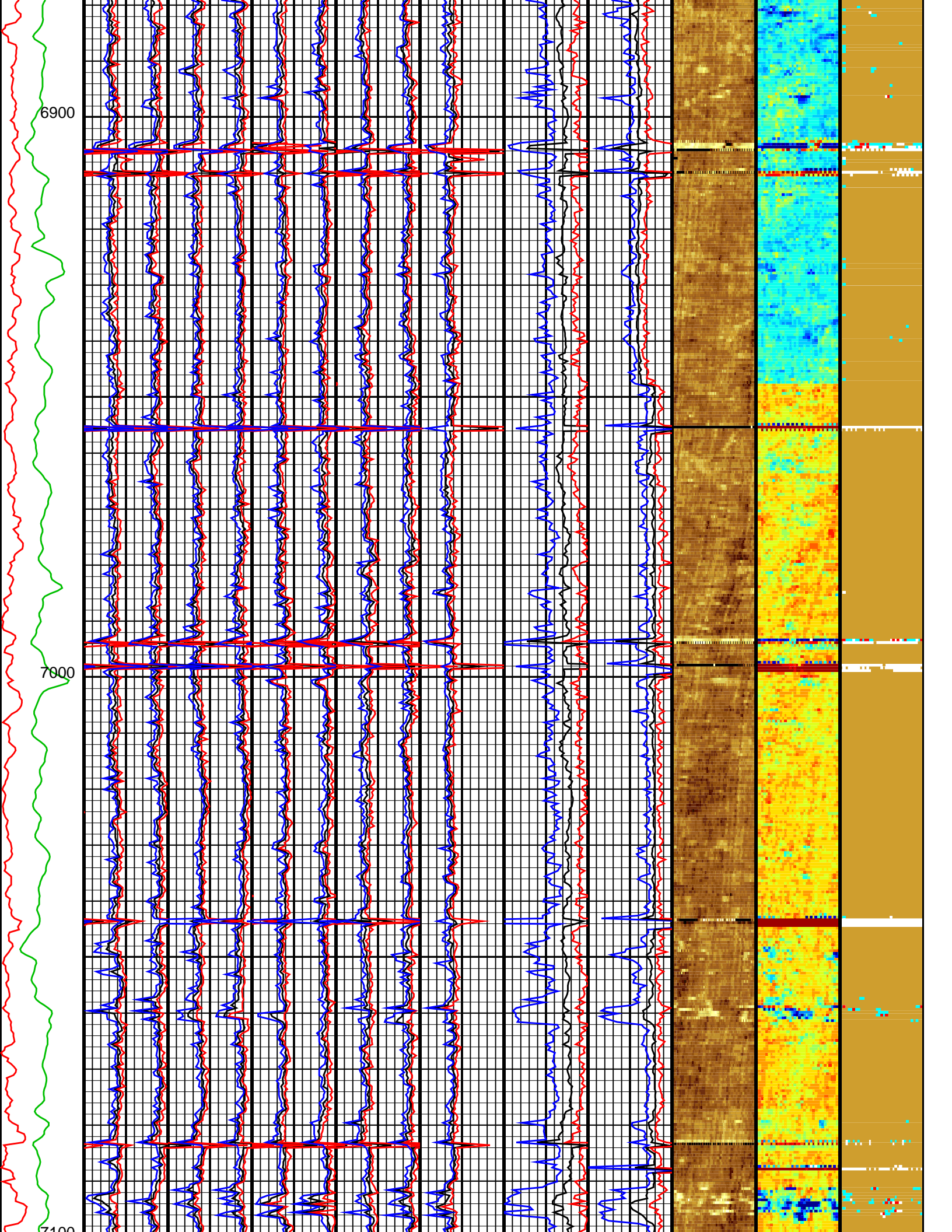


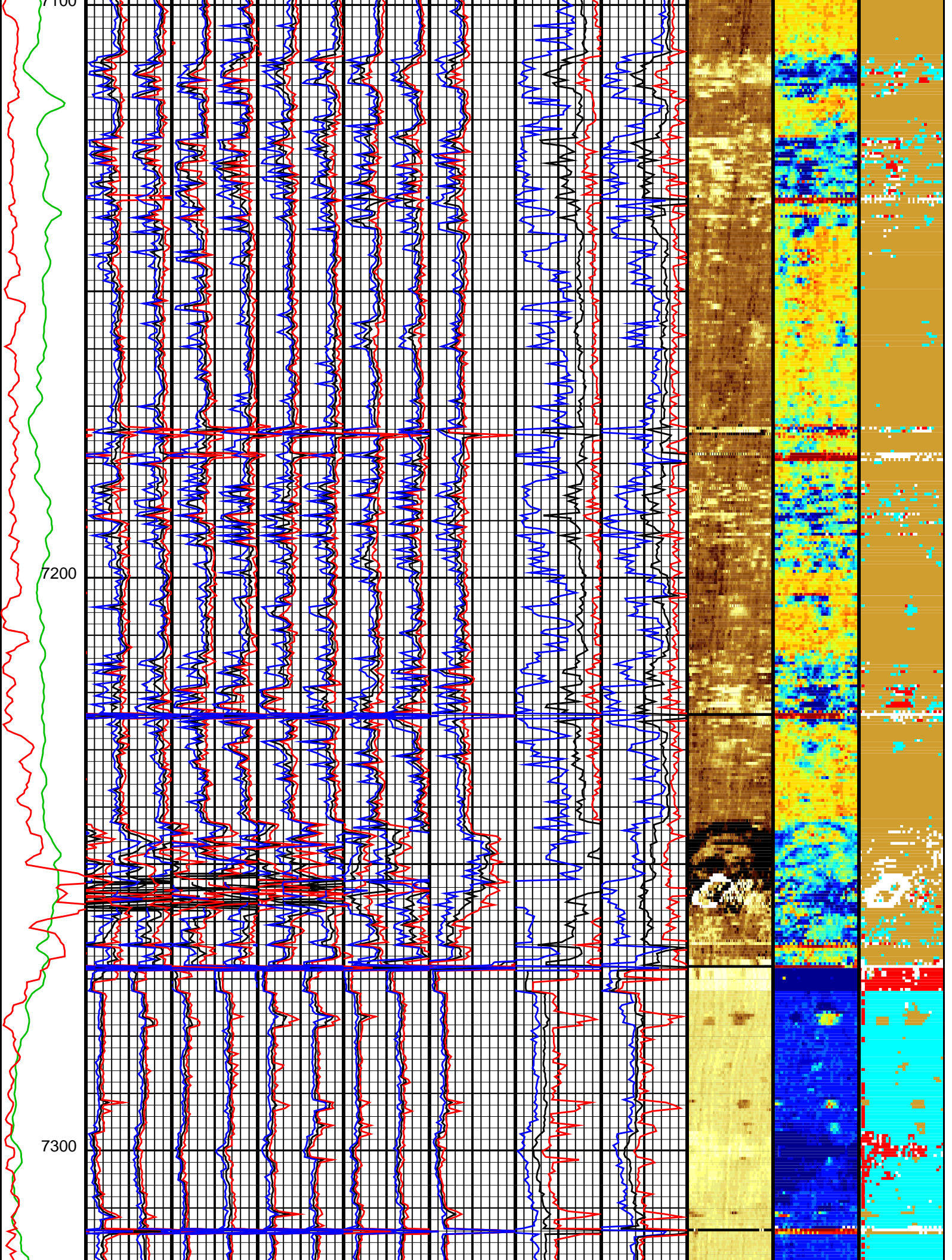


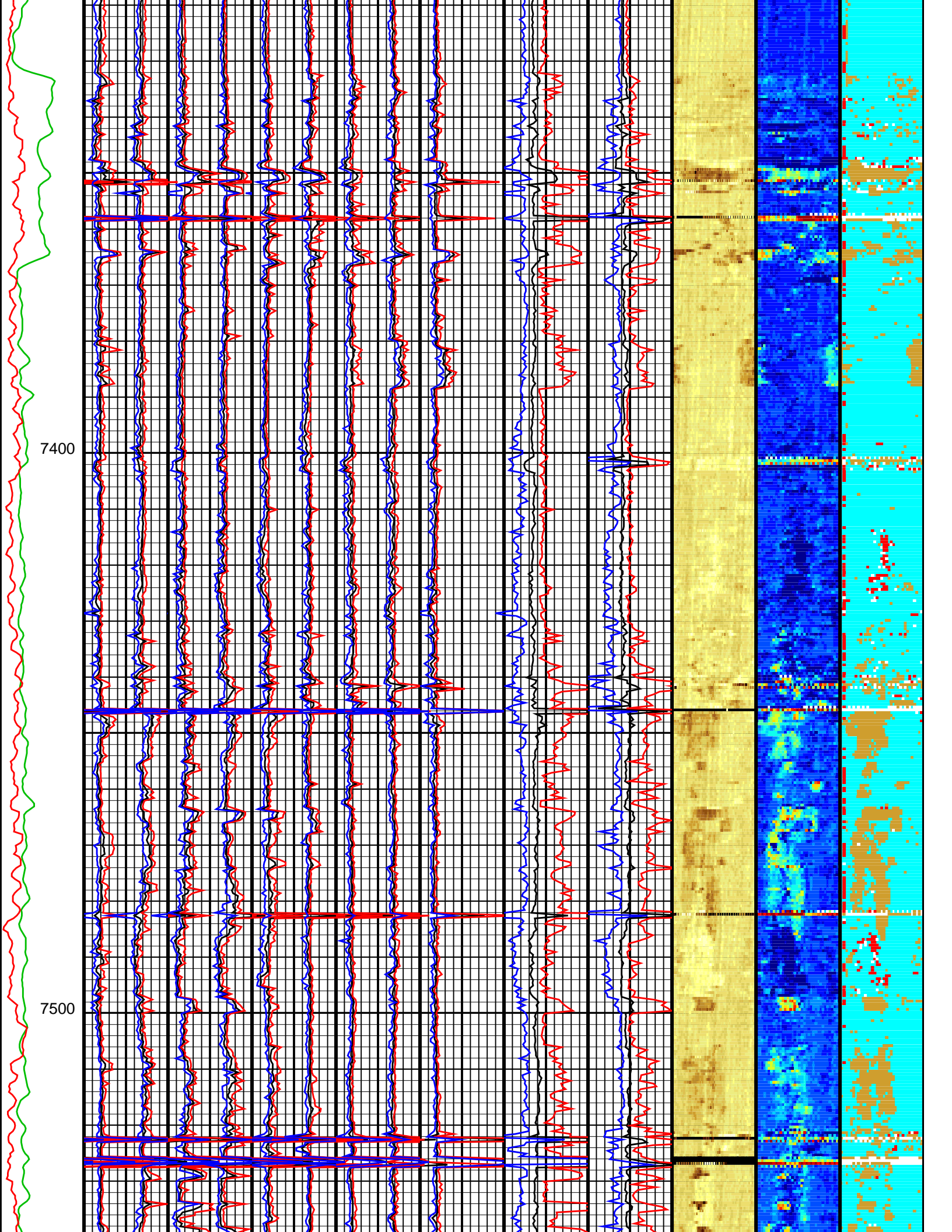


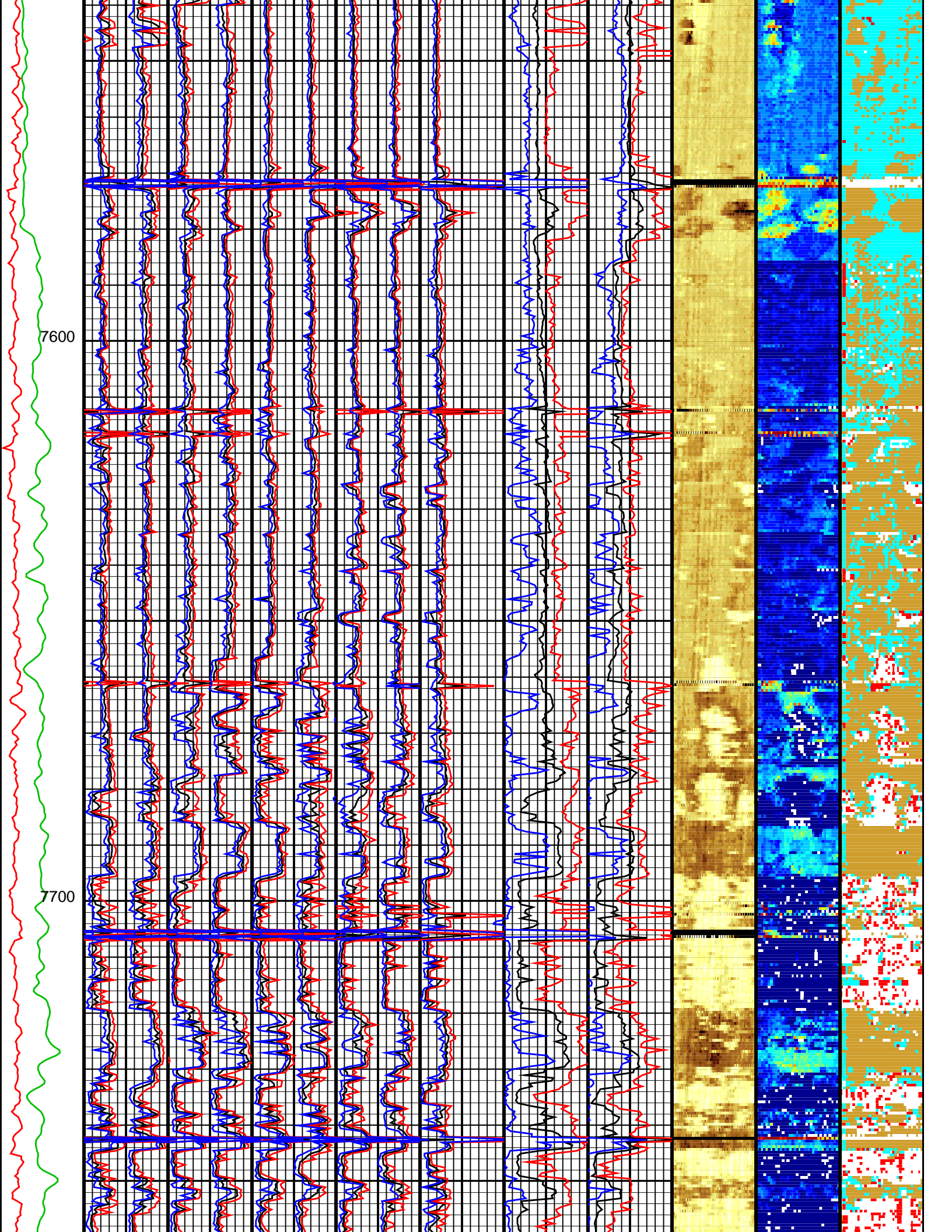


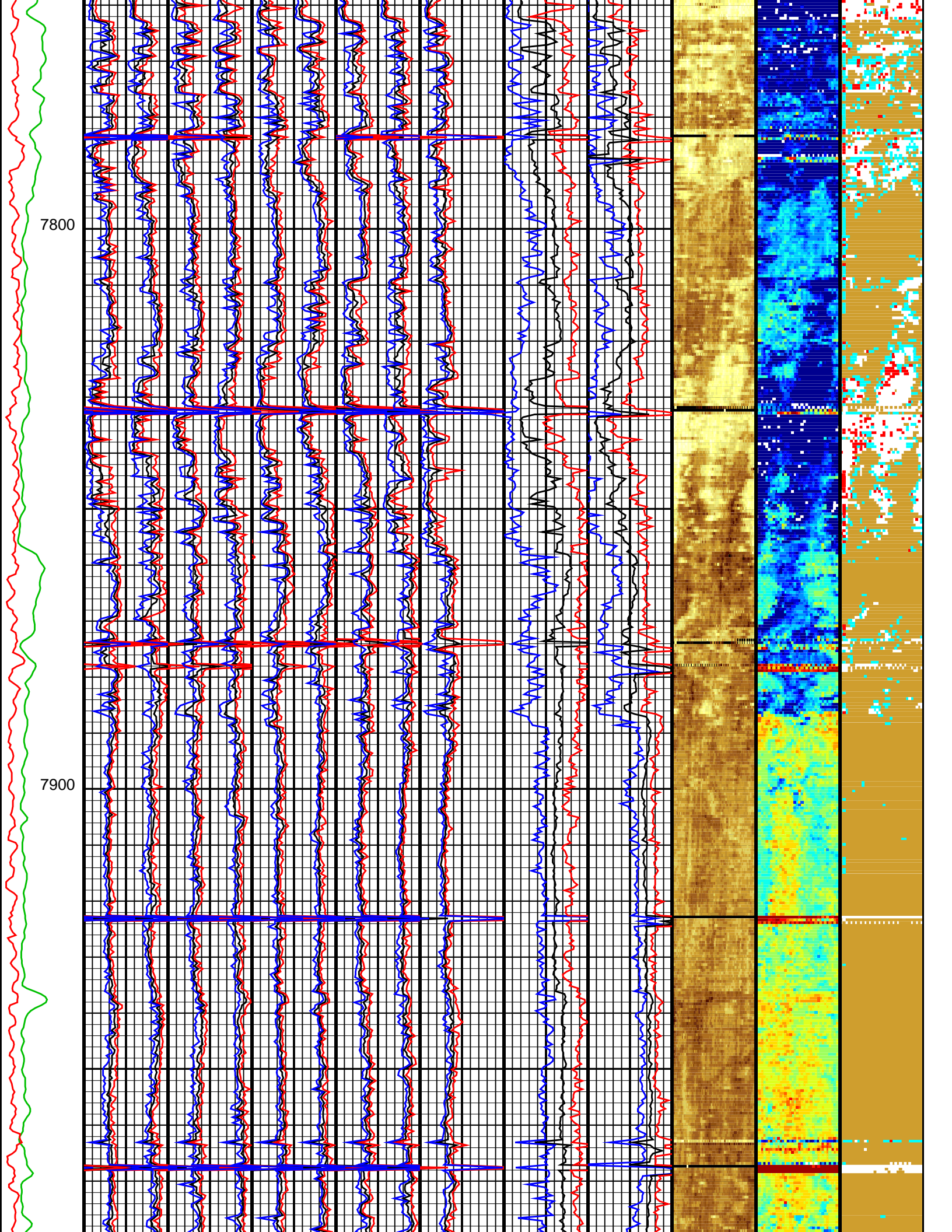


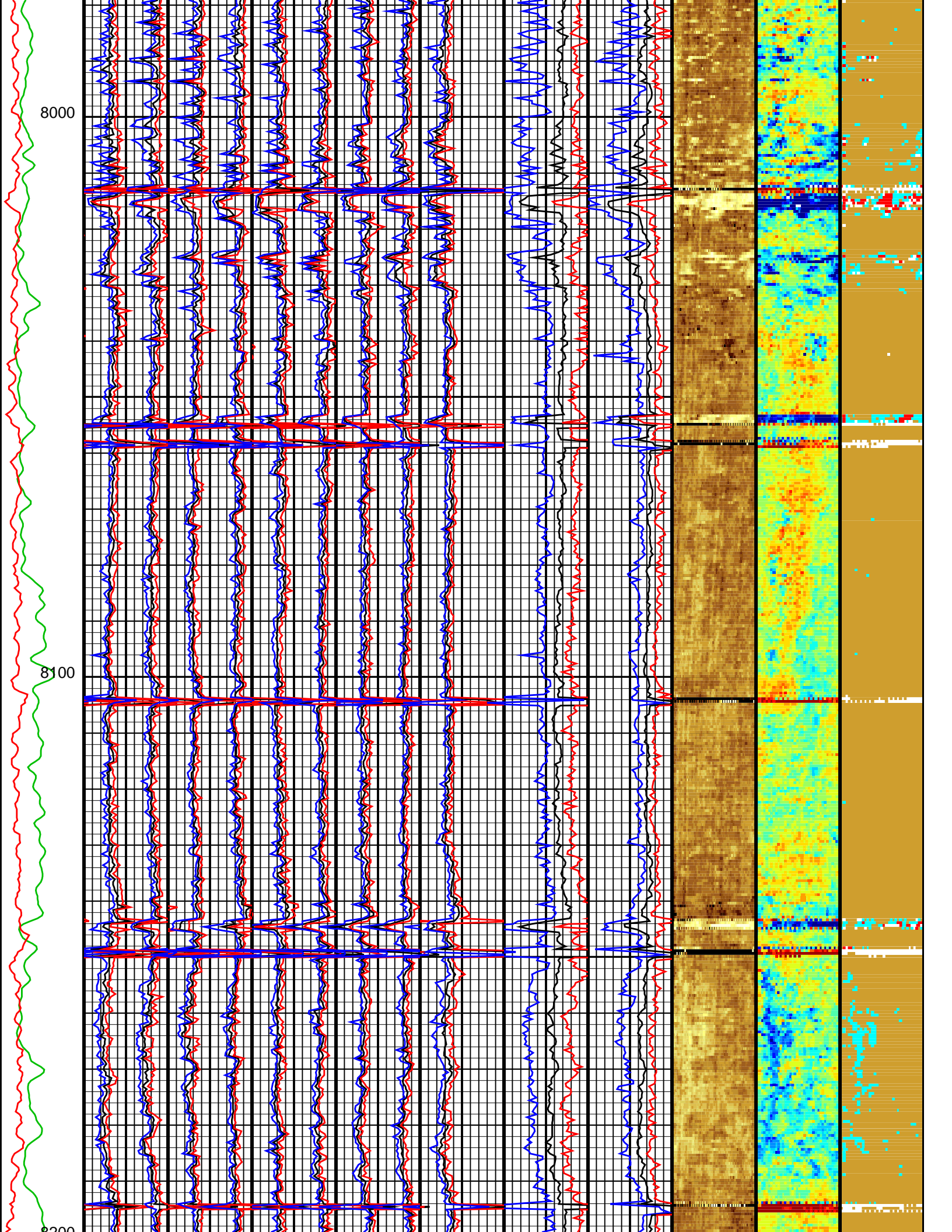


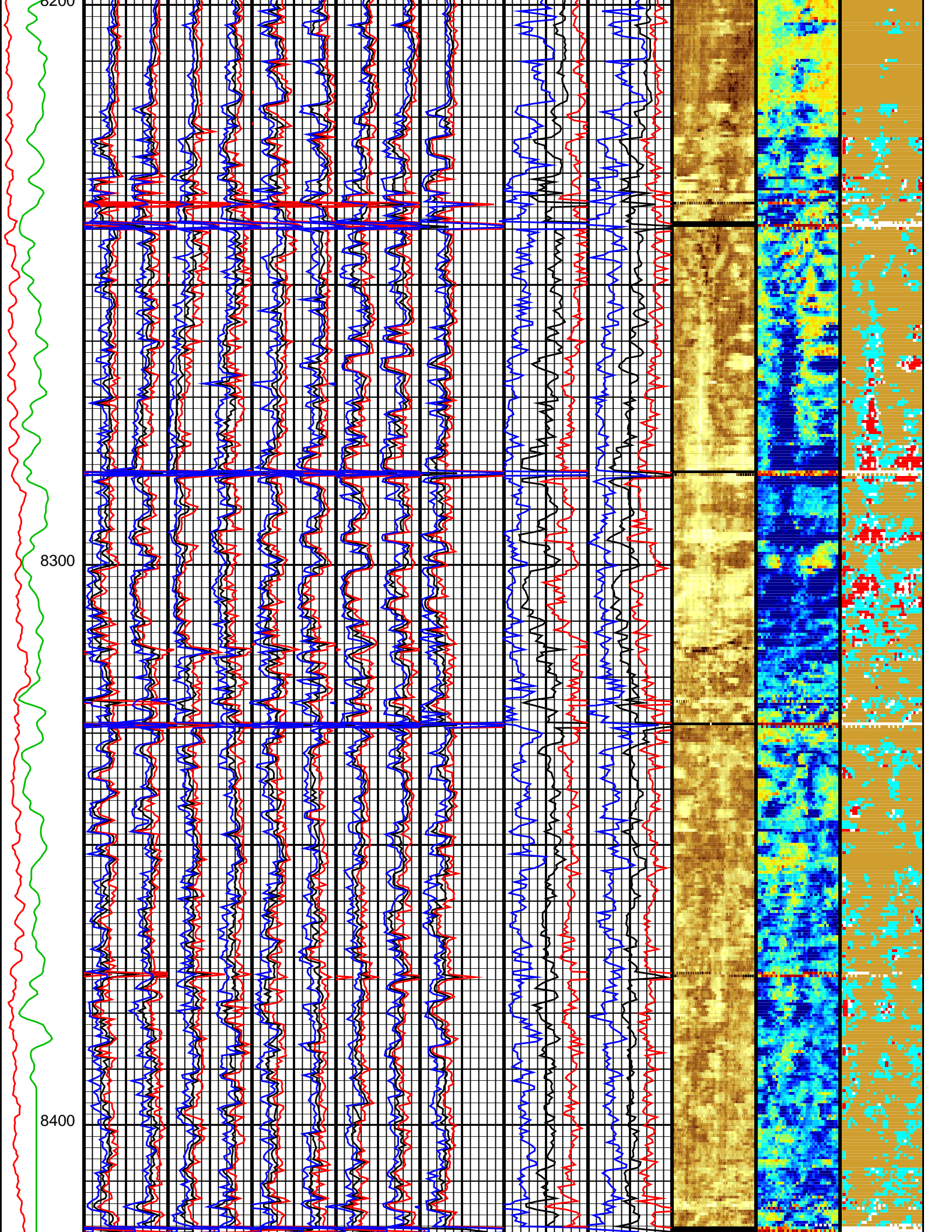


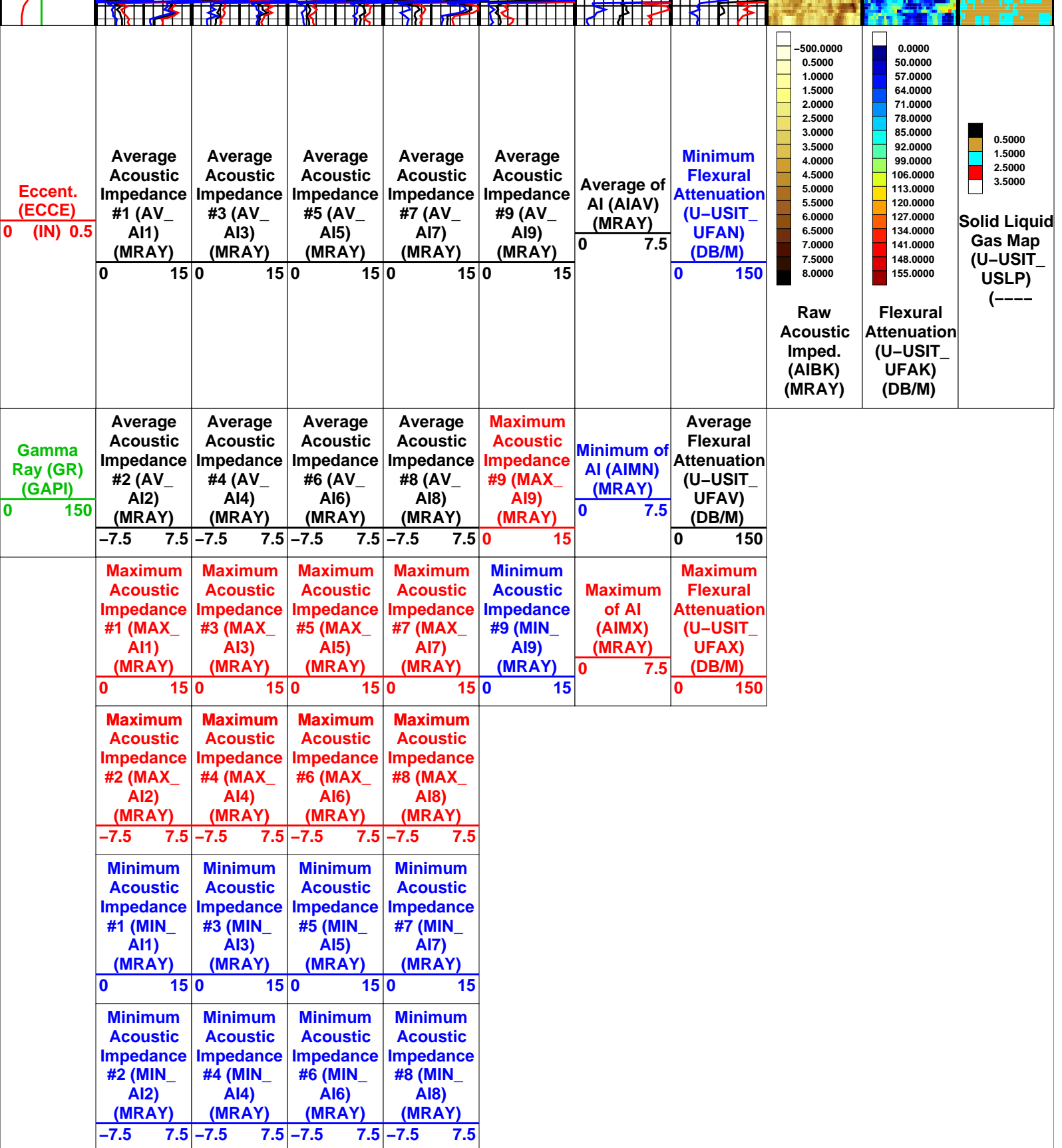












All USI Images are outside views

USI : LOW Frequency Compression Mode Used For Logging.
 Recommended casing thickness range for optimum cement impedance measurement : 0.27 to 0.6 IN.

Input DLIS Files

DEFAULT USI_TLD_MCFL_CNL_017LUP FN:16 PRODUCER 28-Apr-2010 12:12 8419.0 FT 3308.0 FT

Output DLIS Files

DEFAULT USI_TLD_MCFL_CNL_006PUP FN:5 PRODUCER 28-Apr-2010 15:31



GOODWIN 0.1 INCH

MAXIS Field Log

Company: Well:

Input DLIS Files

DEFAULT USI_TLD_MCFL_CNL_017LUP FN:16 PRODUCER 28-Apr-2010 12:12 8419.0 FT 3308.0 FT

Output DLIS Files

DEFAULT USI_TLD_MCFL_CNL_006PUP FN:5 PRODUCER 28-Apr-2010 15:31 8423.0 FT 3312.0 FT

OP System Version: 17C0-154

USIT-D SRPC-3870_Q3_2009_OP17_V3 HILTH-FTB SRPC-3870_Q3_2009_OP17_V3
 DTC-H 17C0-154

Minimum Acoustic Impedance #2 (MIN_ AI2) (MRAY)	Minimum Acoustic Impedance #4 (MIN_ AI4) (MRAY)	Minimum Acoustic Impedance #6 (MIN_ AI6) (MRAY)	Minimum Acoustic Impedance #8 (MIN_ AI8) (MRAY)
-7.5 7.5	-7.5 7.5	-7.5 7.5	-7.5 7.5
Minimum Acoustic Impedance #1 (MIN_ AI1) (MRAY)	Minimum Acoustic Impedance #3 (MIN_ AI3) (MRAY)	Minimum Acoustic Impedance #5 (MIN_ AI5) (MRAY)	Minimum Acoustic Impedance #7 (MIN_ AI7) (MRAY)
0 15	0 15	0 15	0 15
Maximum Acoustic Impedance #2 (MAX_ AI2) (MRAY)	Maximum Acoustic Impedance #4 (MAX_ AI4) (MRAY)	Maximum Acoustic Impedance #6 (MAX_ AI6) (MRAY)	Maximum Acoustic Impedance #8 (MAX_ AI8) (MRAY)
-7.5 7.5	-7.5 7.5	-7.5 7.5	-7.5 7.5
Maximum Acoustic Impedance #1 (MAX_ AI1) (MRAY)	Maximum Acoustic Impedance #3 (MAX_ AI3) (MRAY)	Maximum Acoustic Impedance #5 (MAX_ AI5) (MRAY)	Maximum Acoustic Impedance #7 (MAX_ AI7) (MRAY)

Minimum Acoustic Impedance #9 (MIN_ AI9) (MRAY)	Maximum of AI (AIMX)	Maximum Flexural Attenuation (U-USIT_
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[illegible]

Eccent. (ECCE) 0 (IN) 0.5	Acoustic Impedance #1 (AV_ AI1) (MRAY)	Acoustic Impedance #3 (AV_ AI3) (MRAY)	Acoustic Impedance #5 (AV_ AI5) (MRAY)	Acoustic Impedance #7 (AV_ AI7) (MRAY)	Acoustic Impedance #9 (AV_ AI9) (MRAY)	Average of AI (AIAV) (MRAY)	Flexural Attenuation (U-USIT_ UFAN) (DB/M)	<div> <div> 5.0000 5.5000 6.0000 6.5000 7.0000 7.5000 8.0000 </div> <div> 113.0000 120.0000 127.0000 134.0000 141.0000 148.0000 155.0000 </div> </div>	<div> <div> 3.5000 </div> <div> Solid Liquid Gas Map (U-USIT_ USLP) (----) </div> </div>
	0 15	0 15	0 15	0 15	0 15	0 7.5	0 150	Raw Acoustic Imped. (AIBK) (MRAY)	Flexural Attenuation (U-USIT_ UFAK) (DB/M)

Gamma Ray (GR) (GAPI) 0 150	Average Acoustic Impedance #2 (AV_ AI2) (MRAY)	Average Acoustic Impedance #4 (AV_ AI4) (MRAY)	Average Acoustic Impedance #6 (AV_ AI6) (MRAY)	Average Acoustic Impedance #8 (AV_ AI8) (MRAY)	Maximum Acoustic Impedance #9 (MAX_ AI9) (MRAY)	Minimum of AI (AIMN) (MRAY)	Average Flexural Attenuation (U-USIT_ UFAV) (DB/M)
	-7.5 7.5	-7.5 7.5	-7.5 7.5	-7.5 7.5	0 15	0 7.5	0 150
	Maximum Acoustic Impedance #1 (MAX_ AI1) (MRAY)	Maximum Acoustic Impedance #3 (MAX_ AI3) (MRAY)	Maximum Acoustic Impedance #5 (MAX_ AI5) (MRAY)	Maximum Acoustic Impedance #7 (MAX_ AI7) (MRAY)	Minimum Acoustic Impedance #9 (MIN_ AI9) (MRAY)	Maximum of AI (AIMX) (MRAY)	Maximum Flexural Attenuation (U-USIT_ UFAX) (DB/M)
	0 15	0 15	0 15	0 15	0 15	0 7.5	0 150
	Maximum Acoustic Impedance #2 (MAX_ AI2) (MRAY)	Maximum Acoustic Impedance #4 (MAX_ AI4) (MRAY)	Maximum Acoustic Impedance #6 (MAX_ AI6) (MRAY)	Maximum Acoustic Impedance #8 (MAX_ AI8) (MRAY)			
	-7.5 7.5	-7.5 7.5	-7.5 7.5	-7.5 7.5			
	Minimum Acoustic Impedance #1 (MIN_ AI1) (MRAY)	Minimum Acoustic Impedance #3 (MIN_ AI3) (MRAY)	Minimum Acoustic Impedance #5 (MIN_ AI5) (MRAY)	Minimum Acoustic Impedance #7 (MIN_ AI7) (MRAY)			
	0 15	0 15	0 15	0 15			
	Minimum Acoustic Impedance #2 (MIN_ AI2) (MRAY)	Minimum Acoustic Impedance #4 (MIN_ AI4) (MRAY)	Minimum Acoustic Impedance #6 (MIN_ AI6) (MRAY)	Minimum Acoustic Impedance #8 (MIN_ AI8) (MRAY)			
	-7.5 7.5	-7.5 7.5	-7.5 7.5	-7.5 7.5			

Format: M_Goodwin_Compressed		Vertical Scale: 0.1" per 100'		Graphics File Created: 28-Apr-2010 15:31	
OP System Version: 17C0-154					
USIT-D DTC-H	SRPC-3870_Q3_2009_OP17_V3 17C0-154		HILTH-FTB	SRPC-3870_Q3_2009_OP17_V3	
All USI Images are outside views					
USI : LOW Frequency Compression Mode Used For Logging. Recommended casing thickness range for optimum cement impedance measurement : 0.27 to 0.6 IN.					

Input DLIS Files					
DEFAULT	USI.TLD	MCEI	CNL_0171.LIB	EN-16	PRODUCER
				28 Apr 2010 12:12	8419.0 FT
					2308.0 FT

Schlumberger

FVEL

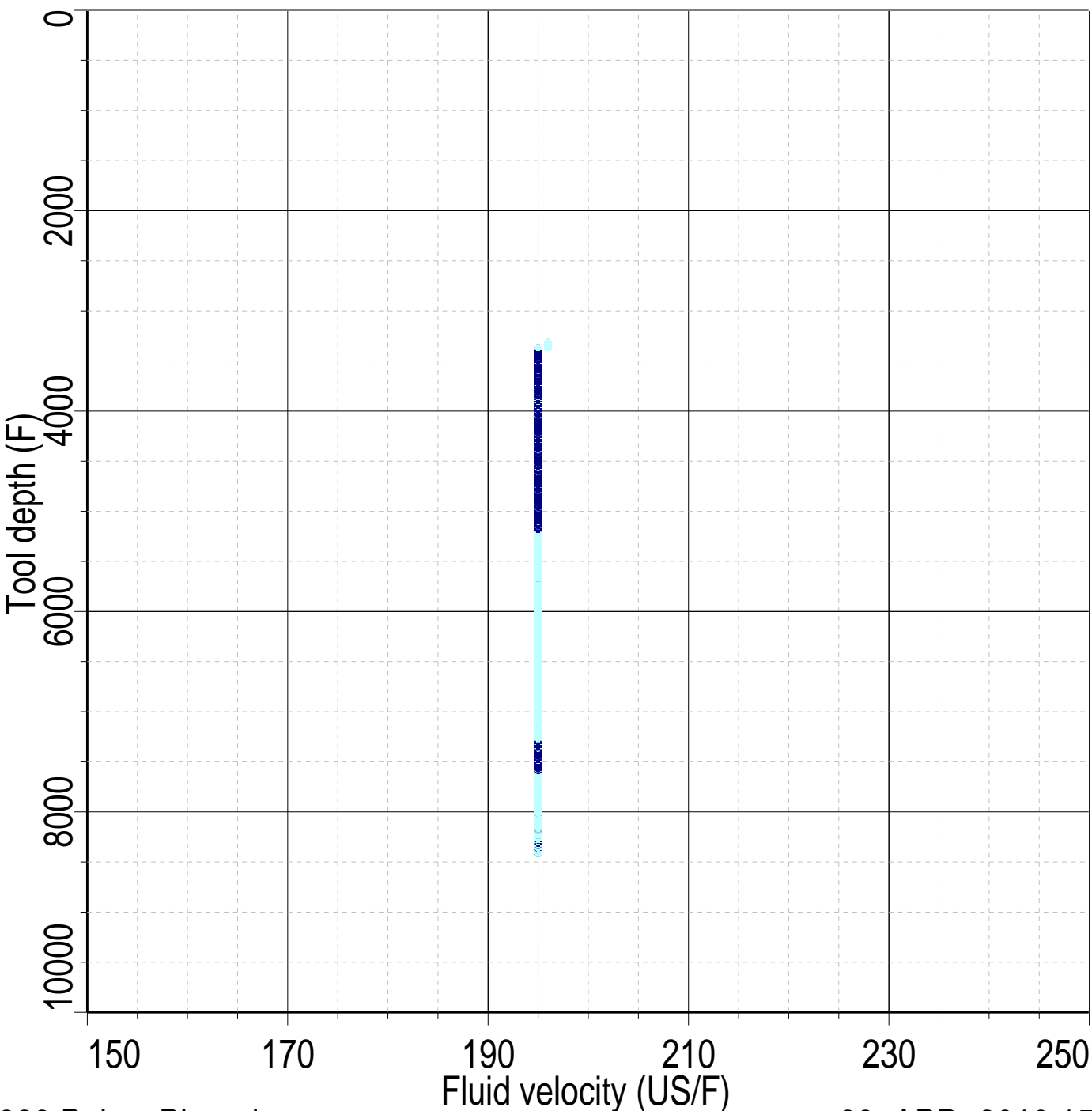
MAXIS Field Log

Index: 8423.0 – 3312.0 FT

IBC Inv. Fluid Z QC (----)

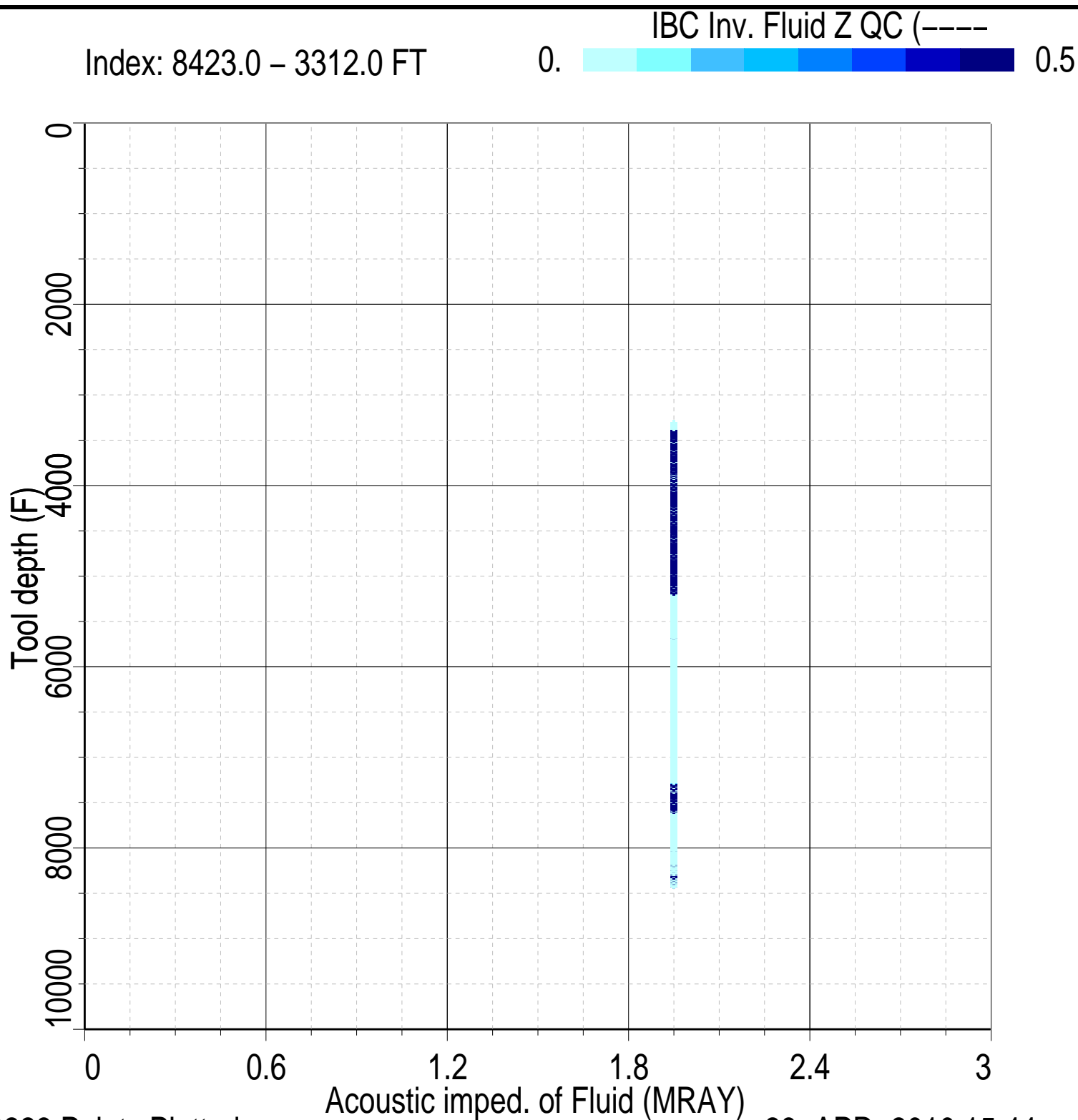
0.

0.5



Schlumberger**ZMUD**

MAXIS Field Log



MAXIS Field Log

Company:

Well:

Input DLIS Files

DEFAULT

USI_TLD_MCFL_CNL_015LUP

FN:14

PRODUCER

28-Apr-2010 11:38

5975.0 FT

5792.5 FT

Output DLIS Files

DEFAULT

USI_TLD_MCFL_CNL_007PUP

FN:6

PRODUCER

28-Apr-2010 15:55

5977.0 FT

5794.5 FT

OP System Version: 17C0-154

USIT-D

SRPC-3870_Q3_2009_OP17_V3

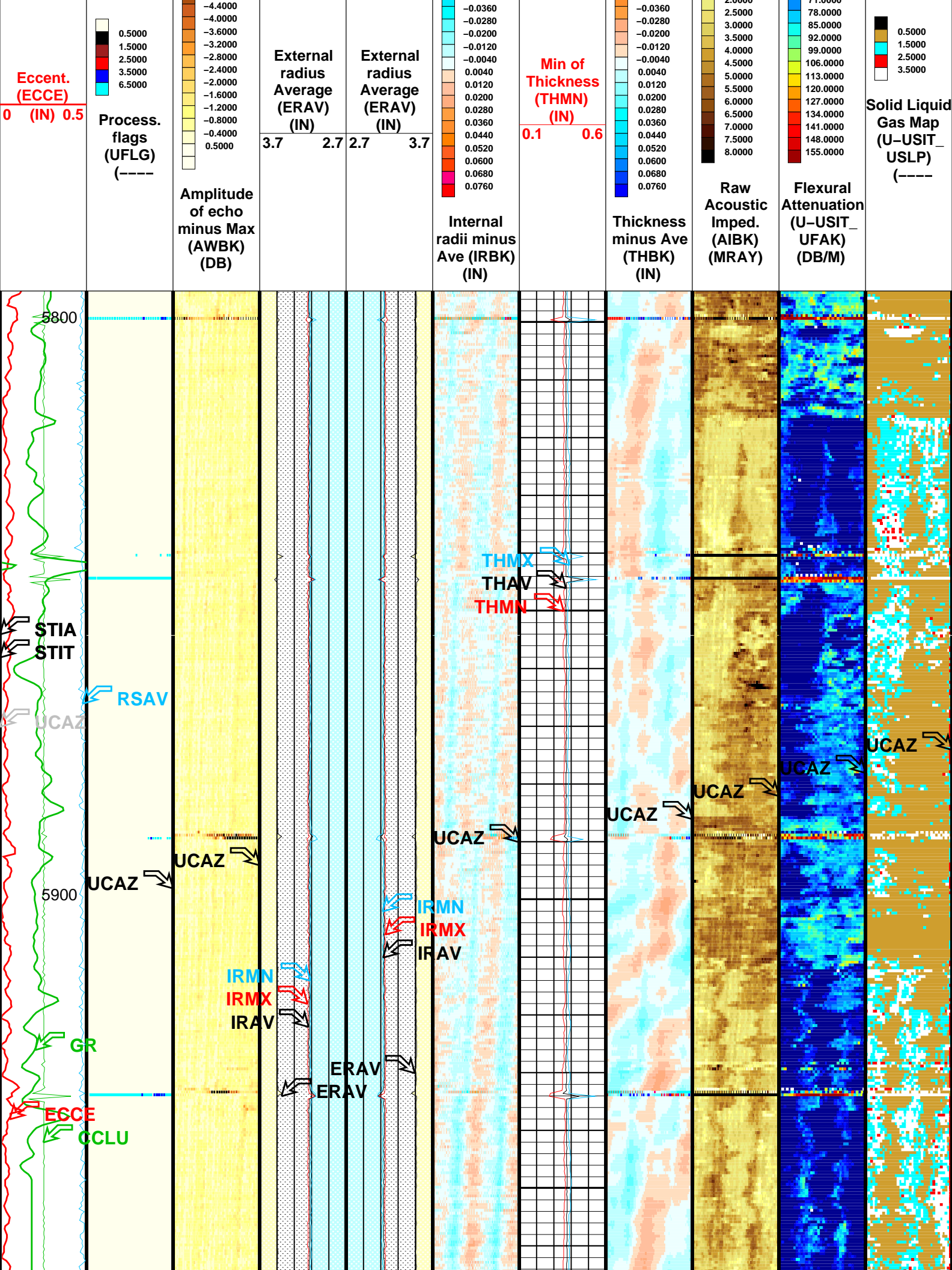
HILTH-FTB

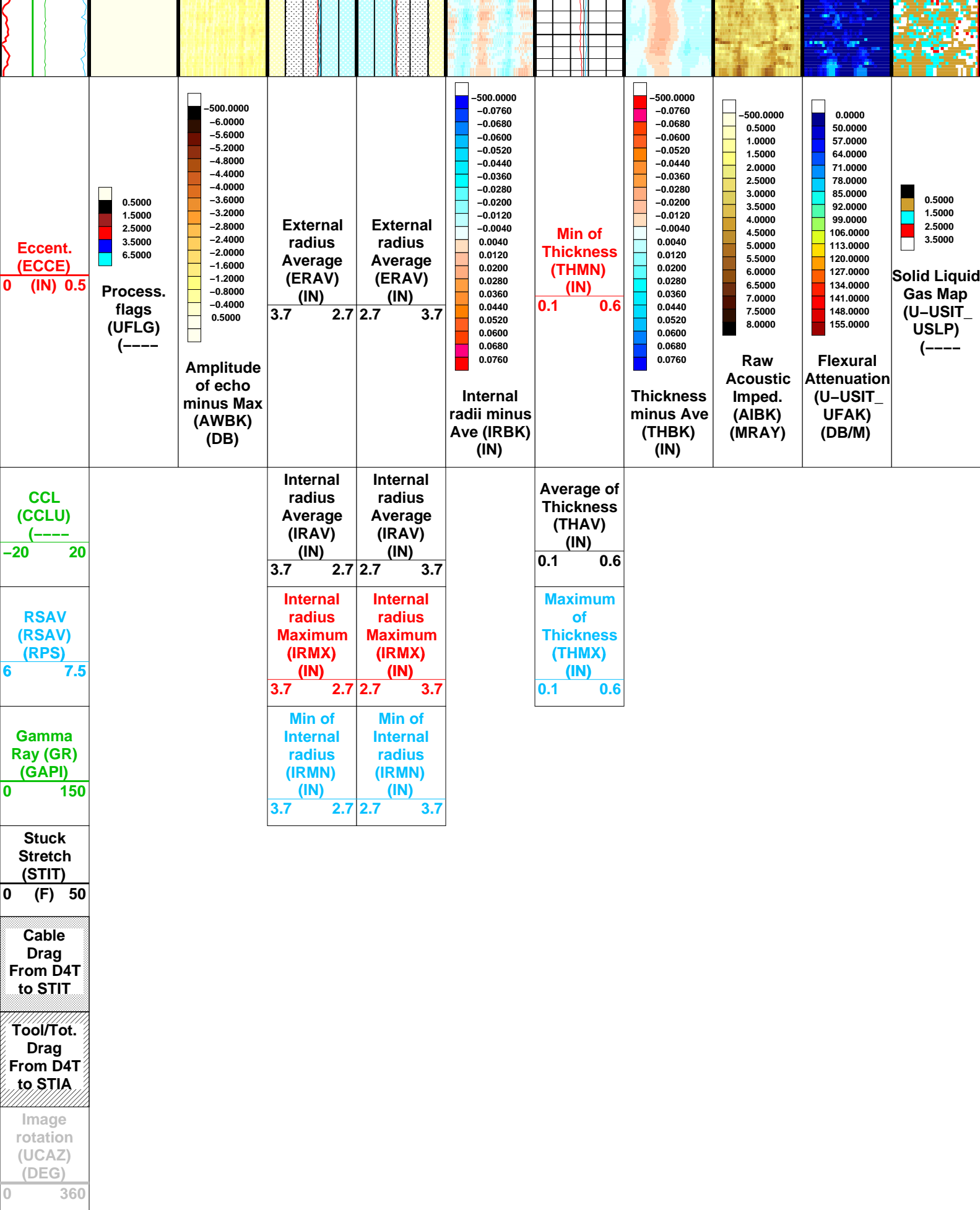
SRPC-3870_Q3_2009_OP17_V3

DTC-H

17C0-154

Image rotation (UCAZ) (DEG)										
0360										
Tool/Tot. Drag From D4T to STIA										
Cable Drag From D4T to STIT										
Stuck Stretch (STIT)										
0(F)50										
Gamma Ray (GR) (GAPI)			Min of Internal radius (IRMN) (IN)				Min of Internal radius (IRMN) (IN)			
0150			3.72.7				2.73.7			
RSAV (RSAV) (RPS)			Internal radius Maximum (IRMX) (IN)				Internal radius Maximum (IRMX) (IN)		Maximum of Thickness (THMX) (IN)	
67.5			3.72.7				2.73.7		0.10.6	
CCL (CCLU) (-----)			Internal radius Average (IRAV) (IN)				Internal radius Average (IRAV) (IN)		Average of Thickness (THAV) (IN)	
-2020			3.72.7				2.73.7		0.10.6	





All USI Images are outside views

USI : LOW Frequency Compression Mode Used For Logging.

Recommended casing thickness range for optimum cement impedance measurement : 0.27 to 0.6 IN.

Parameters

DLIS Name	Description	Value	
USIT-D: Ultrasonic Imaging – D			
AGMN	Minimum Gain of Cartridge	–4	DB
AGMX	Maximum Gain of Cartridge	20	DB
BERJ	Bad Echo Rejection	ON	
CDIA	Casing Outer Diameter	7	IN
CSDE	Casing Density	486.94	LBCF
CSID	Casing Inner Diameter	6.276	IN
DFVL	Default Fluid Velocity	195	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	50	V
FSOD	Fluid Slowness Fits Casing Outer Diameter	5_UFSL_N_ZMUD	
IMAR	Image Rotation	OFF	
MW	Mud Weight	8.4	LB/G
RCOD	Reference Calibrator Outer Diameter	7	IN
RCSO	Reference Calibrator Standoff	1.1811	IN
RCTH	Reference Calibrator Thickness	0.2952	IN
TCUB	T^3 Processing Level	Vax_Loop	
THDH	Maximum Search Thickness (percentage of nominal)	130	
THDL	Minimum Search Thickness (percentage of nominal)	70	
THDP	Thickness Detection Policy	Fundamental	
THNO	Nominal Thickness of Casing	0.362	IN
U-USIT_CEMT	USIT Cement Type	ULTRA_LIGHT	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	0	MRAY
U-USIT_IISR	USIT IBC Inverted Fluid Slowness Resolution	1.0_US_P_FT	
U-USIT_IIZR	USIT IBC Inverted ZMUD Resolution	0.050_MRAY	
U-USIT_OCDI	USIT Outer Casing Diameter	0	IN
U-USIT_OCSH	USIT Outer Casing Shoe	0	FT
U-USIT_OCWE	USIT Outer Casing Weight	0	LB/F
U-USIT_TIEB	IBC Third Interface Echo Bin Processing	YES	
U-USIT_TIEC	IBC Third Interface Echo Cleaning	NONE	
U-USIT_TIEM	IBC Third Interface Echo Multi Tracking	NO	
U-USIT_TIEP	IBC Third Interface Echo Policy	BFEP	
U-USIT_TIER	IBC Third Interface Echo Receivers	BOTH	
U-USIT_U3WE	Third Interface Echo Window End	110	US
U-USIT_UBTP	USIT Bottom Transducer Position	UNKNOWN	
U-USIT_UFAO	USIT Flexural Attenuation Offset	–1	DB/M
U-USIT_UIAP	USIT IBC Answer Product Enabled	SolidLiquidGasMap	
U-USIT_UIST	Ultrasonic IBC Sonde Type	Sub_ibcs_B	
U-USIT_UTAN	USIT Transducer Angles	33_DEG	
UMAO	USIT Measurement Angular Offset	–10	DEG
USTO	Ultrasonic Time Offset	–2	US
USUB	Ultrasonic Subassembly Identifier	Sub_7_inch	
UWKM	Ultrasonic Working Mode	5DEG_6IN_136UNF_LF	
VCAS	Ultrasonic Transversal Velocity in Casing	51.4	US/F
WLEN	T^3 Processing Length	21.7078	US
ZCAS	Acoustic Impedance of Casing	46.25	MRAY
ZINI	Initial Estimate of Cement Impedance	–1	MRAY
ZMUD	Acoustic Impedance of Mud	1.95	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.6	MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3	MRAY
STI: Stuck Tool Indicator			
LBFR	Trigger for MAXIS First Reading Label	TDL	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth – Driller	8692.00	FT
TDL	Total Depth – Logger	8692.00	FT
System and Miscellaneous			
BS	Bit Size	9.875	IN
CWEI	Casing Weight	26.00	LB/F
DO	Depth Offset for Playback	2.0	FT
PP	Playback Processing	RECOMPUTE	

Input DLIS Files

Output DLIS Files

Calibration and Check Summary							
Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool-DTS Wellsite Calibration – Detector Calibration							
Before: 28-Apr-2010 5:57							
Gamma Ray Background	30.00	N/A	34.48	N/A	N/A	N/A	GAPI
Gamma Ray (Jig – Bkg)	165.1	N/A	165.1	N/A	N/A	0.09091	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI
High resolution Integrated Logging Tool-DTS Wellsite Calibration – Zero Measurement							
Master: 19-Feb-2010 16:58 Before: Calibration not done							
CNTC Background	26.67	26.67	N/A	N/A	N/A	0.1500	CPS
CFTC Background	29.55	29.55	N/A	N/A	N/A	0.1500	CPS
High resolution Integrated Logging Tool-DTS Wellsite Calibration – Ratio Measurement							
Master: 19-Feb-2010 16:58							
Thermal Near Corr. (Tank)	5800	5258	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	2175	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.417	N/A	N/A	N/A	N/A	
High resolution Integrated Logging Tool-DTS Wellsite Calibration – Accelerometer Calibration							
Before: 28-Apr-2010 11:45							
Z-Axis Acceleration	32.19	N/A	32.15	N/A	N/A	N/A	F/S2
The HGNS Neutron Master Calibration was done with the following parameters :							
NCT-B Water Temperature	59.4	DEGF.					
Thermal Housing Size	3.374	IN.					
NSR-F serial number	0						

High resolution Integrated Logging Tool-DTS / Equipment Identification			
Primary Equipment:			
HILT Gamma-Ray Neutron Sonde-DTS		HGNS – H	
HGNS Gamma-Ray Device		HGR –	
HGNS Neutron Detector with Alpha Source		HCNT – H	
Z-Axis Accelerometer		HACC – H	3577
Neutron Logging Source		NLS – KL	
Neutron Source Radioactive		NSR – F	
Compensated Neutron Box		CNB – AB	
HTBC Communication Assembly DTS Mode		HMCA – H	
Auxiliary Equipment:			
Neutron Calibration Tank		NCT – B	
Gamma Source Radioactive		GSR – U/Y	
HGNS Housing		HGNH –	

DTS Telemetry Tool / Equipment Identification	
Primary Equipment:	
DTC-H Auxiliary Cartridge	DTCH – A
DTC-H Telemetry Cartridge	DTCH – A
Auxiliary Equipment:	
DTCH Telemetry Cartridge Housing	ECH – KC

Schlumberger

CALIBRATIONS

MAXIS Field Log

Company: **ExxonMobil Production Corp**

Schlumberger

Well: **PCU 297–11C9**
Field: **Piceance Creek**
County: **Rio Blanco**
State: **Colorado**

IMAGING BEHIND CASING
ULTRASONIC TOOL
CCL / GAMMA RAY