

Company: Crestone Peak Resources Operating LLC

Well: Herren #1C-33H-H367

Field: Wattenberg

County: Weld State: Colorado

Isolation Scanner
Cement Evaluation
Gamma Ray - CCL Log

County:	Weld
Field:	Wattenberg
Location:	SENE
Well:	Herren #1C-33H-H367
Company:	Crestone Peak Resources Operating LLC
Location:	
SENE	Elev.: K.B. 4870.00 ft
2264 FNL 376 FEL	G.L. 4847.00 ft
	D.F. 4870.00 ft
Permanent Datum:	Ground Level
Log Measured From:	Kelly Bushing
Drilling Measured From:	Kelly Bushing
API Serial No.	Section:
05-123-47733	33
	Township:
	3N
	Range:
	67W

Logging Date	20-Jan-2019
Run Number	Isolation scanner
Depth Driller	12301.00 ft
Schlumberger Depth	6236.00 ft
Bottom Log Interval	6236.00 ft
Top Log Interval	743.00 ft
Casing Fluid Type	Water
Salinity	
Density	8.4 lbm/gal
Fluid Level	8.00 ft
BIT/CASING/TUBING STRING	
Bit Size	8.50 in
From	2008.00 ft
To	12301.00 ft
Casing/Tubing Size	5.5 in
Weight	20 lbm/ft
Grade	N/A
From	0.00 ft
To	12283.00 ft
Max Recorded Temperatures	186 degF
Logger on Bottom	20-Jan-2019
Unit Number	2143
Recorded By	A. Voyage / L. Awalt
Witnessed By	Keith K.

Disclaimer

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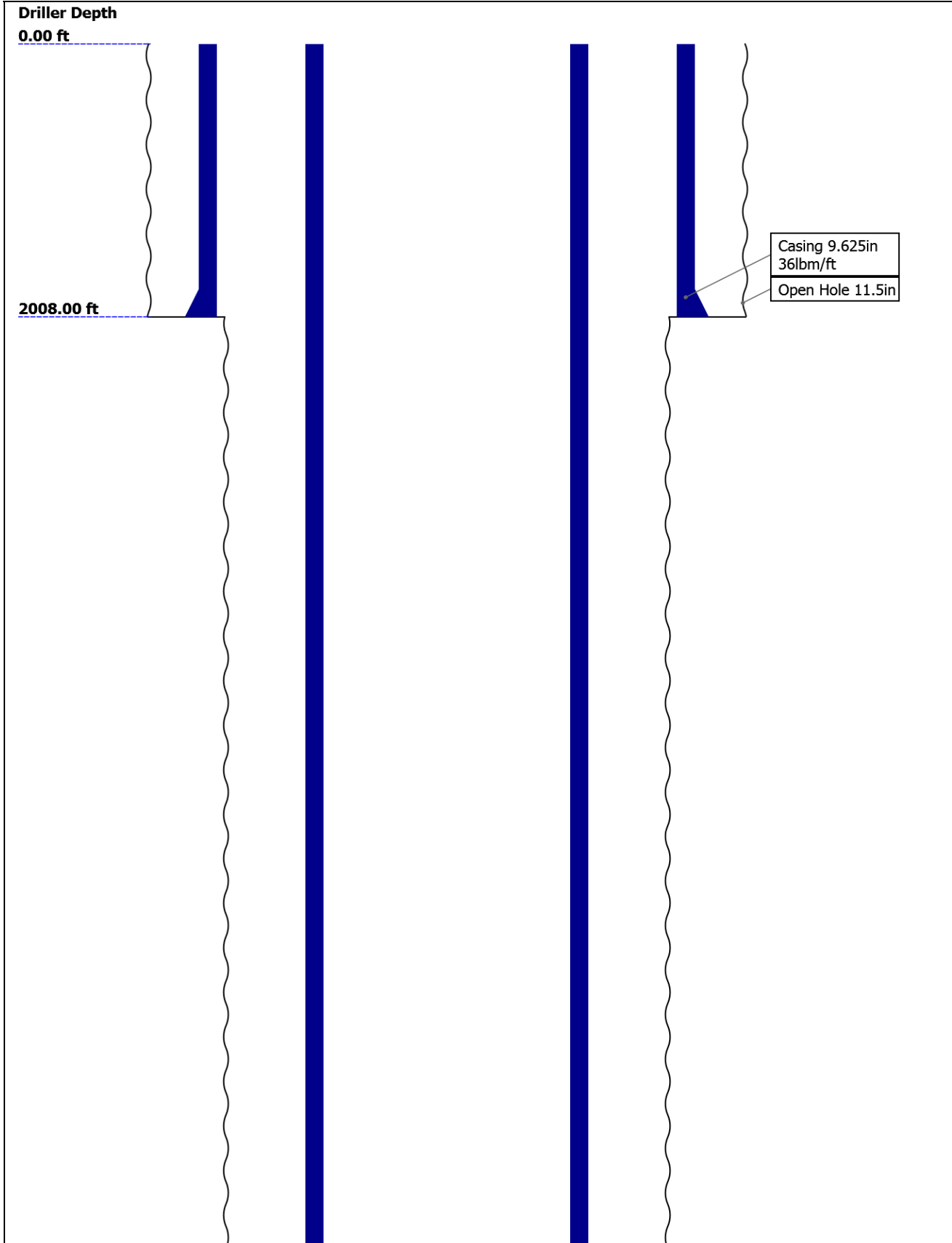
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Well Sketch



12283.00 ft

12301.00 ft

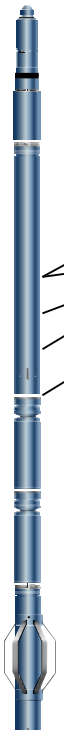
Casing 5.5in
20lbm/ft

Open Hole 8.5in

Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	11.5	8.5				
Top Driller (ft)	0	2008				
Top Logger (ft)	0	2008				
Bottom Driller (ft)	2008	12301				
Bottom Logger (ft)	2008	12301				
Casing						
Size (in)	9.625	5.5				
Weight (lbm/ft)	36	20				
Inner Diameter (in)	8.921	4.778				
Grade	N/A	N/A				
Top Driller (ft)	0	0				
Top Logger (ft)	0	0				
Bottom Driller (ft)	2008	12283				
Bottom Logger (ft) (ft)	2008	12283				

Remarks and Equipment Summary

Isolation scanner: Toolstring			Isolation scanner: Remarks	
<div><div><div>Equip name</div><div>Length</div></div><div>LEH-QT</div><div>30.73</div><div>LEH-QT</div></div> <div><div><div>MP name</div><div>Offset</div></div><div>CTEM</div><div>23.74</div><div>ACCZ</div><div>0.00</div><div>HV</div><div>0.00</div><div>Gamma</div><div>21.87</div><div>Ray</div><div>TelStatu</div><div>s</div><div>20.74</div></div>		<div>Thank you for choosing Schlumberger Wireline!</div> <div>Log objective: cement evaluation.</div> <div>Toolstring run as per tool sketch.</div> <div>Toolstring centralized with 5.25" GEMCOs on EDTC and USAC and small hole booster kit.</div> <div>Lead: 12.5 ppg Tail: 13.5 ppg Spacer: 12.0 ppg</div> <div>Crew: F. Maldonado, K. Howington</div>		
<div><div><div>EDTC-B:8</div><div>27.24</div></div><div>962</div><div>EDTH-B:92</div><div>93</div><div>EDTG-A:7</div><div>9146</div><div>EDTC-B:89</div><div>62</div></div> <div><div><div>AH-184[2]:2765</div><div>20.74</div></div></div> <div><div><div>AH-184[1]:2826</div><div>18.74</div></div></div> <div><div><div>USIT-E:90</div><div>16.74</div></div><div>0</div><div>ECH-MFA:</div><div>1818</div><div>USAC-A:9</div><div>00</div><div>USIT-A:00</div></div>				

AH-184[

2]:2765

20.74

AH-184[

1]:2826

18.74

USIT-E:90

0

16.74

ECH-MFA:

1818

USAC-A:9

00

USIT-A:00

Thank you for choosing Schlumberger Wireline!

Log objective: cement evaluation.

Toolstring run as per tool sketch.

Toolstring centralized with 5.25" GEMCOs on EDTC and USAC and small hole booster kit.

Lead: 12.5 ppg
Tail: 13.5 ppg
Spacer: 12.0 ppg

Crew: F. Maldonado, K. Howington

USIS-A:98
8
USSC-B:77
7
IBCS-A:78
3
FAR-SENS
OR:4626
IBC-TX
NEAR-SEN
SOR:4624
IBC-TX
USI-SENS
OR:2005
IBC-TX
EMITTER-
SENSOR:4
625
IBC-TX

USI Sensor Head Tension
0.84
TOOL_ZERO

Lengths are in ft
Maximum Outer Diameter = 6.250 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary			
Isolation scanner			
Depth Measuring Device			
Type	IDW-B		
Serial Number	225		
Calibration Date	24-OCT-2017		
Calibrator Serial Number	57		
Calibration Cable Type	IDWC-C		
Wheel Correction 1	-4		
Wheel Correction 2	-4		
Tension Device			
Type	CMTD-B/A		
Serial Number	151		
Calibration Date	13-aug-2018		
Calibrator Serial Number	1018		
Number of Calibration Points	10		
Calibration Root Mean Square Error	11		
Calibration Peak Error	21		
Logging Cable			
Type	7-46P-XS		
Serial Number	7072		
Length	24000.00 ft		
Conveyance Type	Wireline		
Rig Type			
Isolation scanner:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well	All standard Schlumberger depth controls and procedures followed. IDW used as primary depth control device. Z-chart used as secondary depth control device. All passes correlated to down log.	
Rig Up Length At Surface			
Rig Up Length At Bottom			
Rig Up Length Correction			

Stretch Correction 5.87 ft

Tool Zero Check At Surface

USIT - Fluid Properties Measurement

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[4]:Up	6238.58	704.39

Fluid Velocity = "Automatic".
CFVL equals DFSL channel

Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)
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Mud Impedance = "FreePipe Norm."
Free Pipe normalization zone is : 607.12m(1991.86ft) to 612.92m(2010.91ft)
MUD_N_FRP = 1.46
DFD = 1.01g/cm3(8.40lbm/gal)
CZMD median computed in free pipe normalization interval = 2.09 MRayl

Start Depth(ft)	Stop Depth(ft)	Start Value(Mrayl)	End Value(Mrayl)
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Isolation scanner

IBC SLG Main

Software Version

Acquisition System	Version
Maxwell 2018 SP2	8.2.104493.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Isolation scanner	Log[4]:Up	Up	704.39 ft	6238.58 ft	20-Jan-2019 12:03:15 PM	20-Jan-2019 1:19:25 PM	ON	5.87 ft	Yes

All depths are referenced to toolstring zero

Log	Company:Crestone Peak Resources Operating LLC Well:Herren #1C-33H-H367 Isolation scanner: Log[4]:Up:S005
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Description: USI IBC SLG Format: Log (IBC SLG) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 21-Jan-2019 07:51:54

TIME_1900 - Time Marked every 60.00 (s)

USIT Processing Flags (UFLG[0]) USIT-E

1 - UFLG 1 Value within [0.0 - 1.5] - :

2 - UFLG 2 Value within [1.5 - 2.5] - :

3 - UFLG 3 Value within [2.5 - 3.5] - :

4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :

5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :

UTIM Error

Pulse Origin Not Detected

WINLEN Error

Casing Thickness Error

Loop Processing Error

Casing Collar Locator Ultrasonic (CCLU) USIT-E

-20 in 20

Amplitude of Eccentering (ECCE) USIT-E

0 in 0.5

Motor Revolution Speed (RSAV) USIT-E

Absent 1.500 3.500

Explicit Normalization

USIT - USIT

Processing Flags (UFLG) USIT-E

USIT Processing Flags (UFLG[0]) USIT-E

1 5

Gamma Ray (ECGR_EDTC) EDTC-B

Absent 0.750 1.750 2.750 3.750

Custom Normalization

USIT - Amplitude of Wave (AWBK) USIT-E

USIT - Acoustic Impedance (AIBK) USIT-E

Absent 0.500 1.500 2.500 3.500

Explicit Normalization

USIT - Solid Liquid Gas Sorted Color Map (USLP)

Acoustic Impedance Minimum (AIMN) USIT-E

-1 Mrayl 9

Acoustic Impedance Average (AIAV) USIT-E

-1 Mrayl 9

Acoustic Impedance Maximum (AIMX) USIT-E

Minimum Flexural Attenuation (U-USIT_UFAN) USIT-E

0 dB/m 150

Average Flexural Attenuation (U-USIT_UFAV) USIT-E

0 dB/m 150

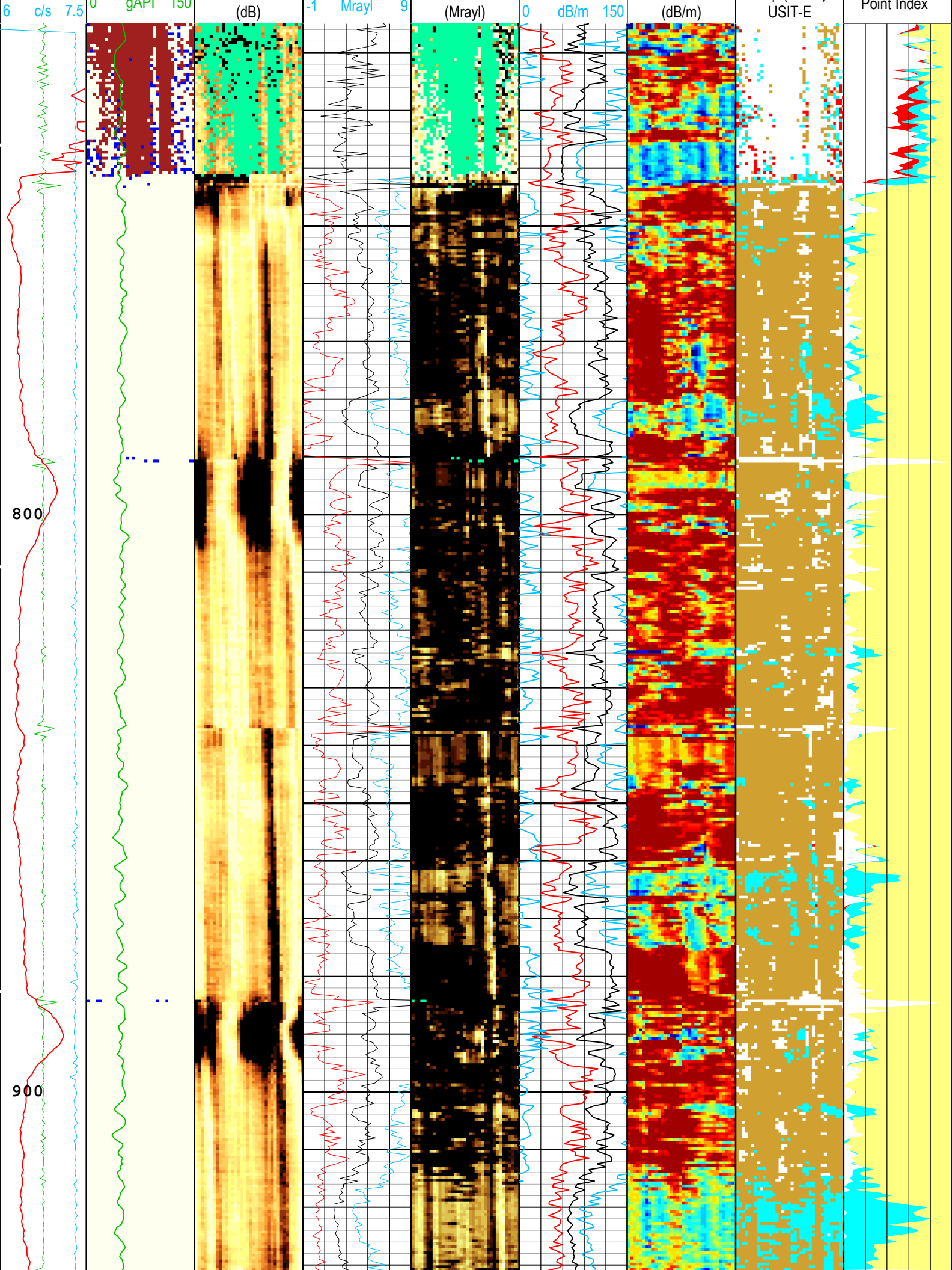
Maximum Flexural Attenuation (U-USIT_UFAX) USIT-E

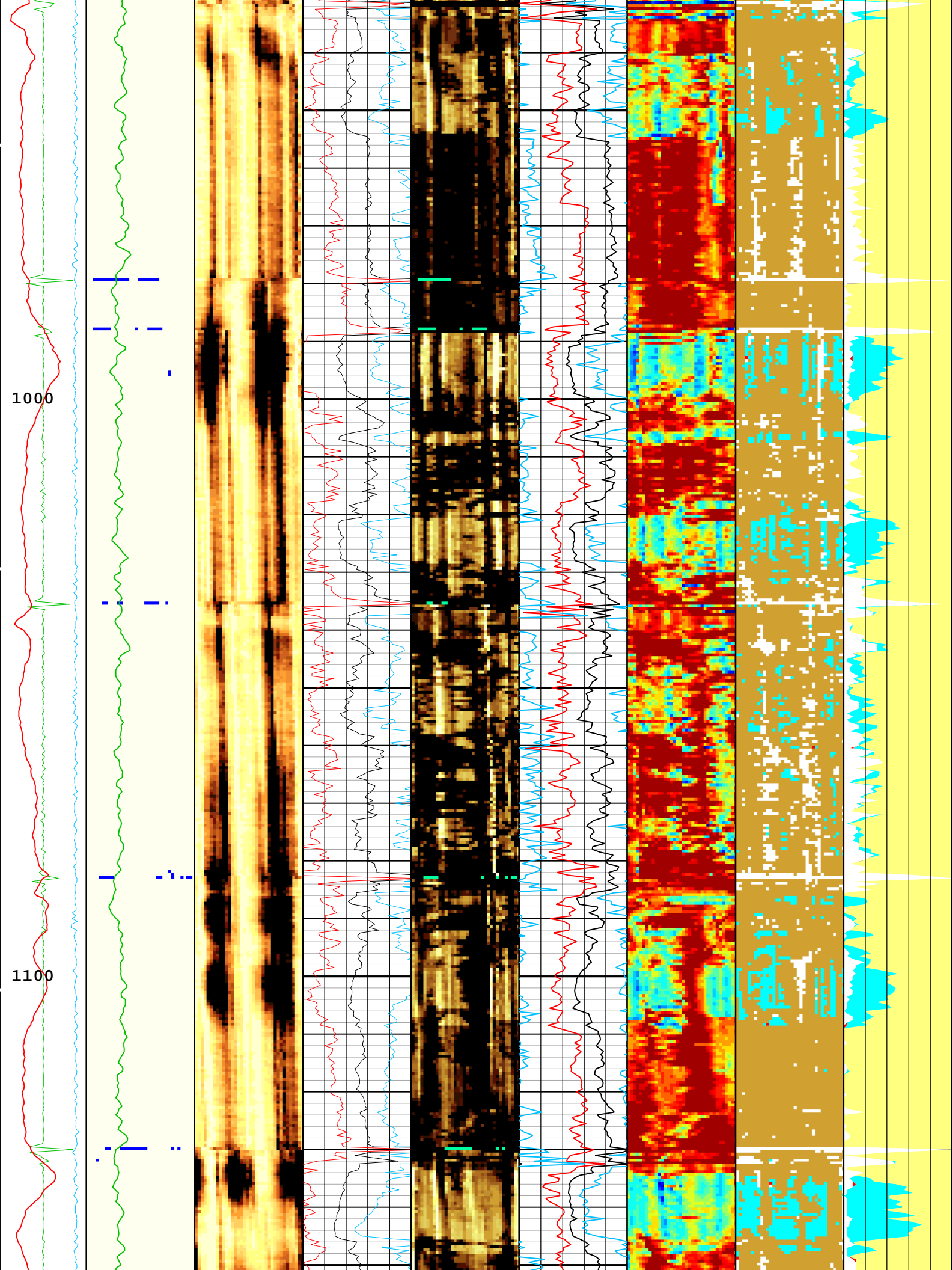
SLG Solid Index

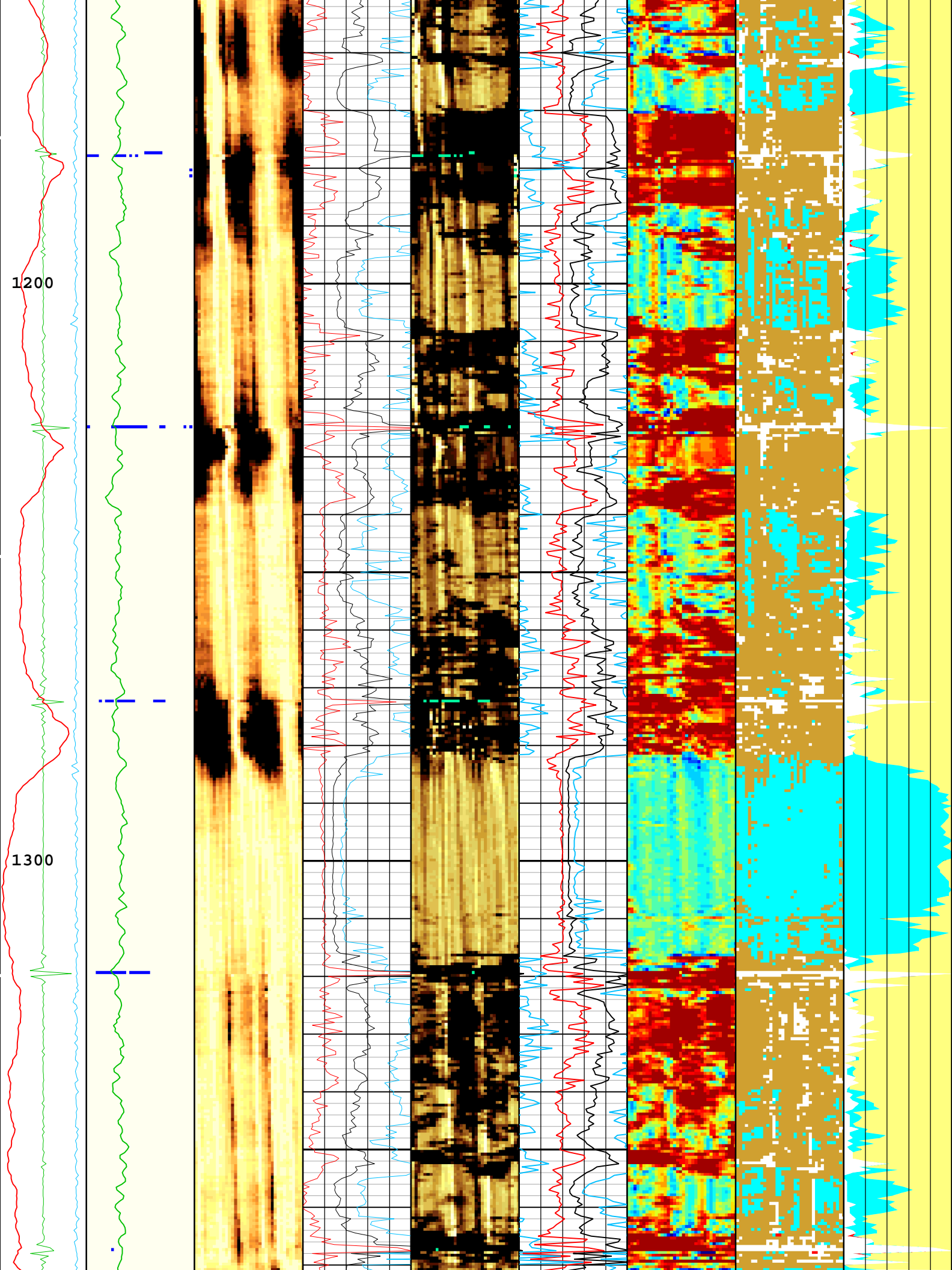
SLG Liquid Index

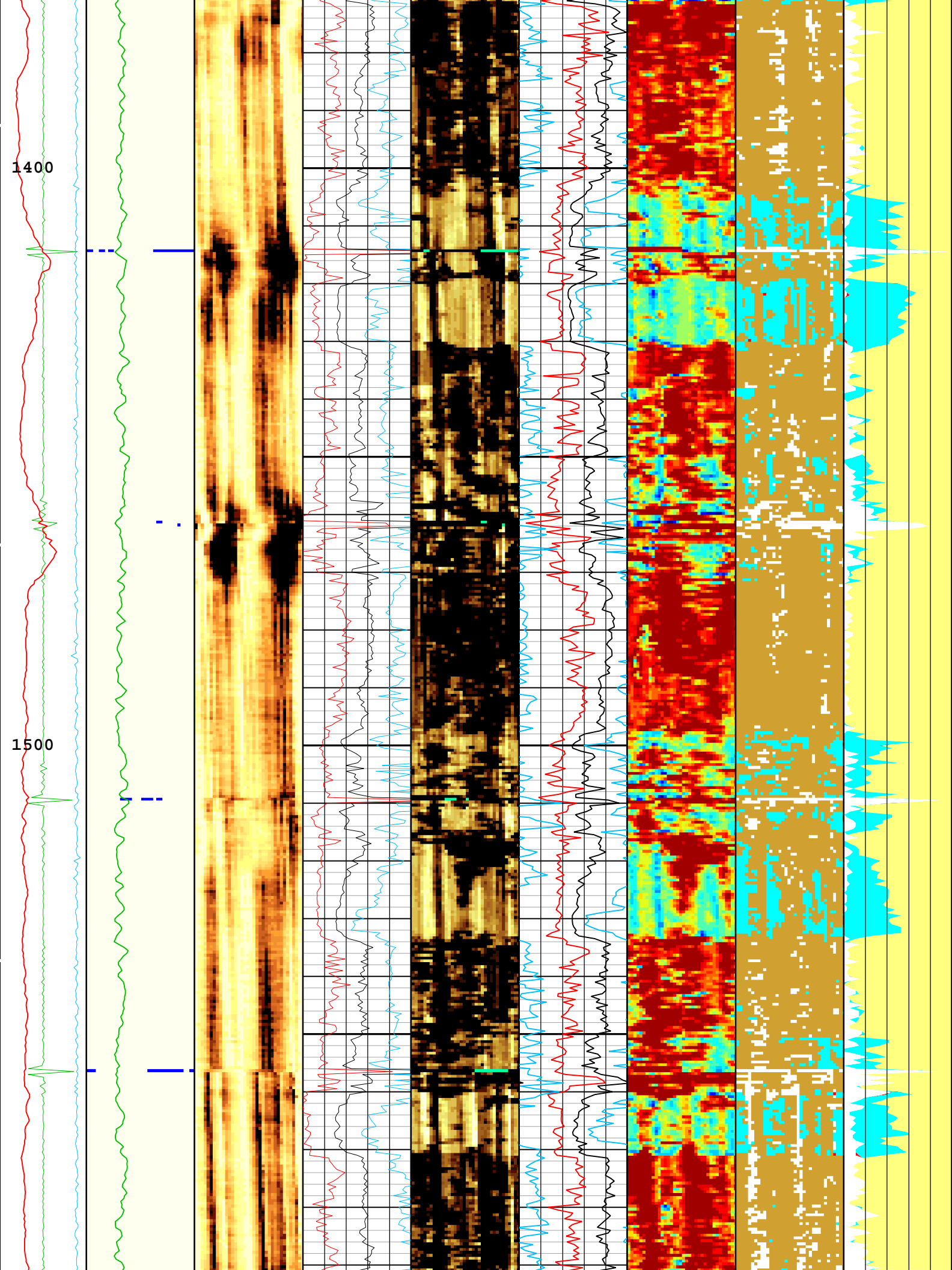
SLG Gas Index

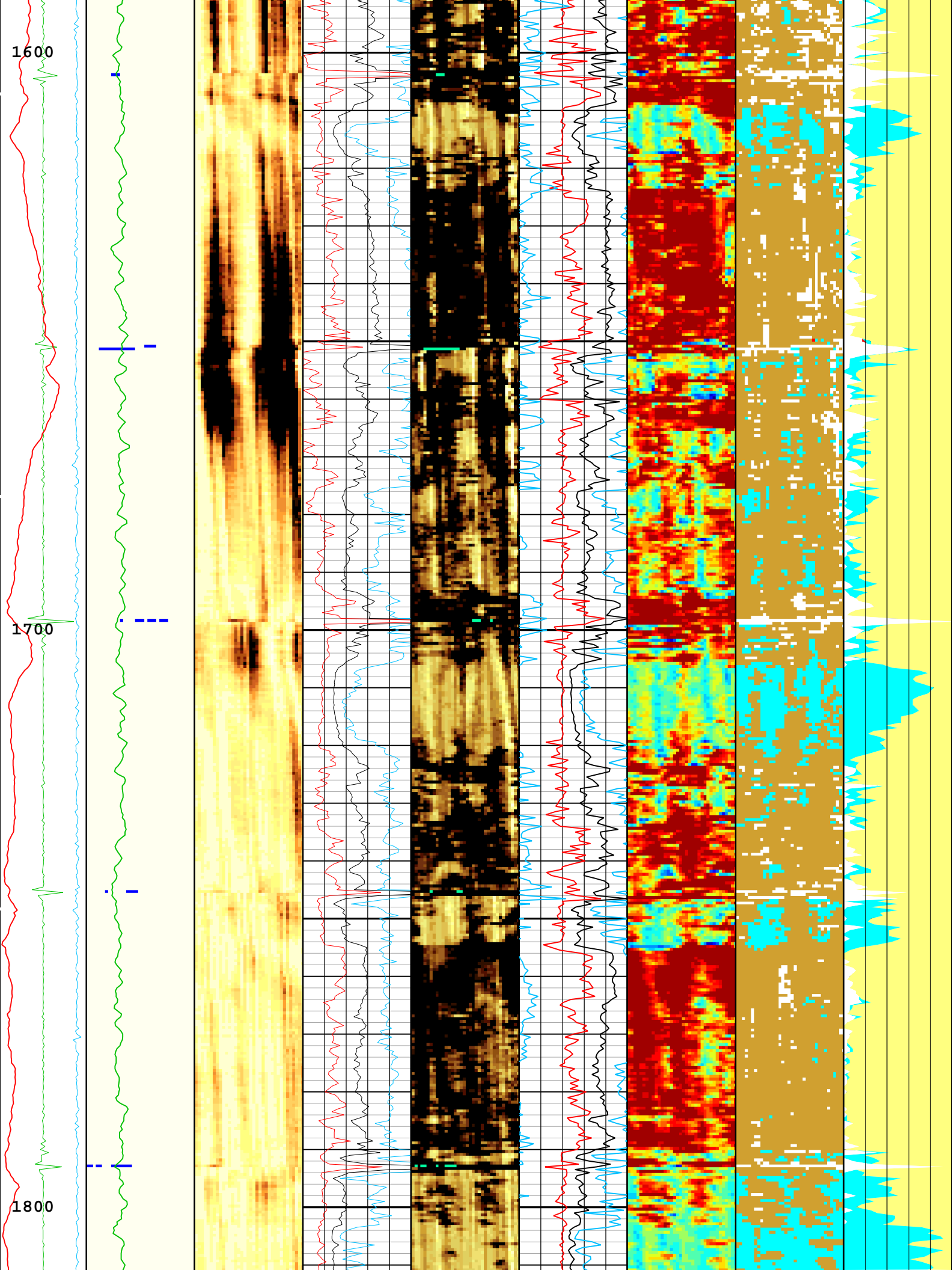
SLG White

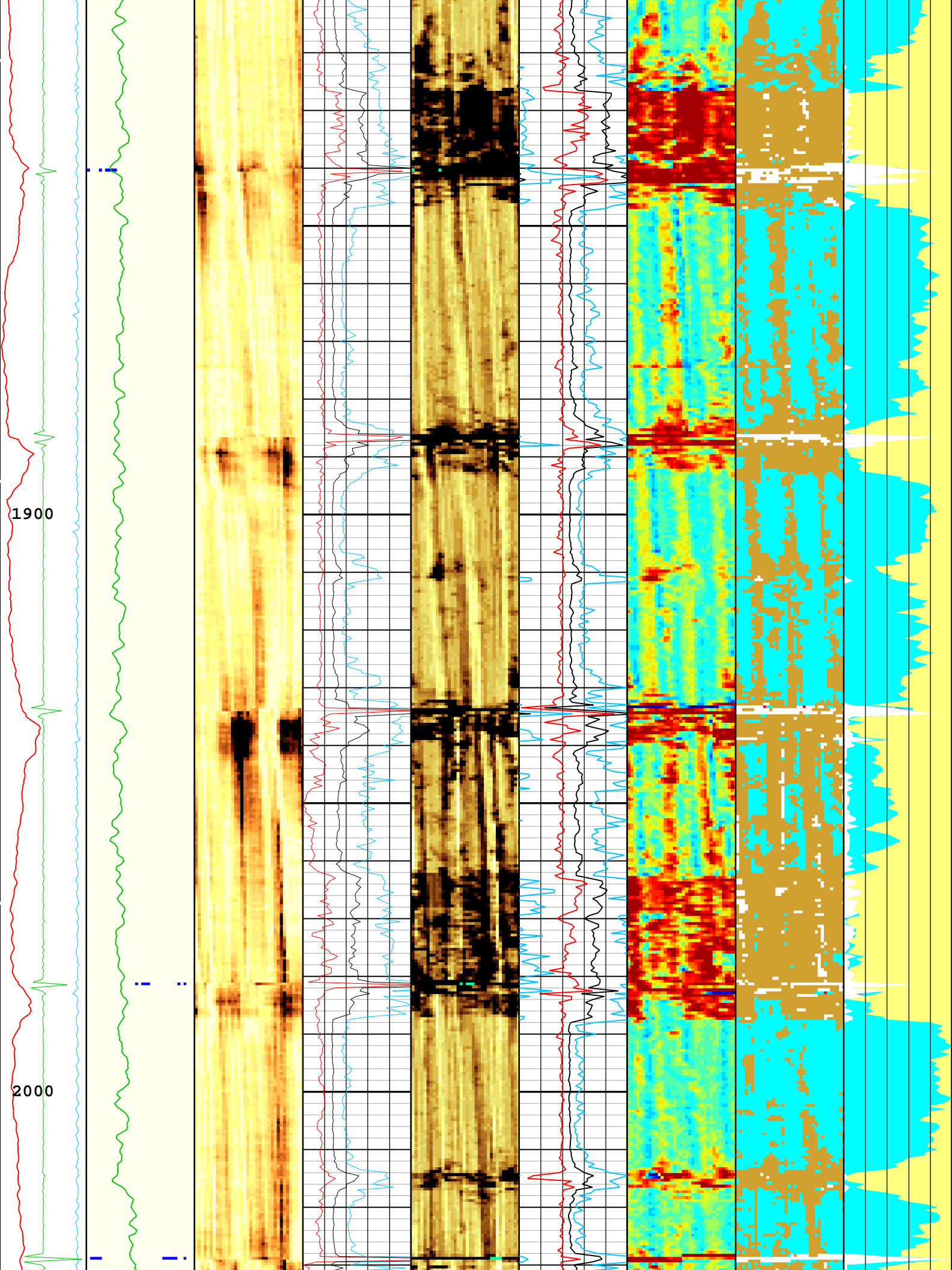


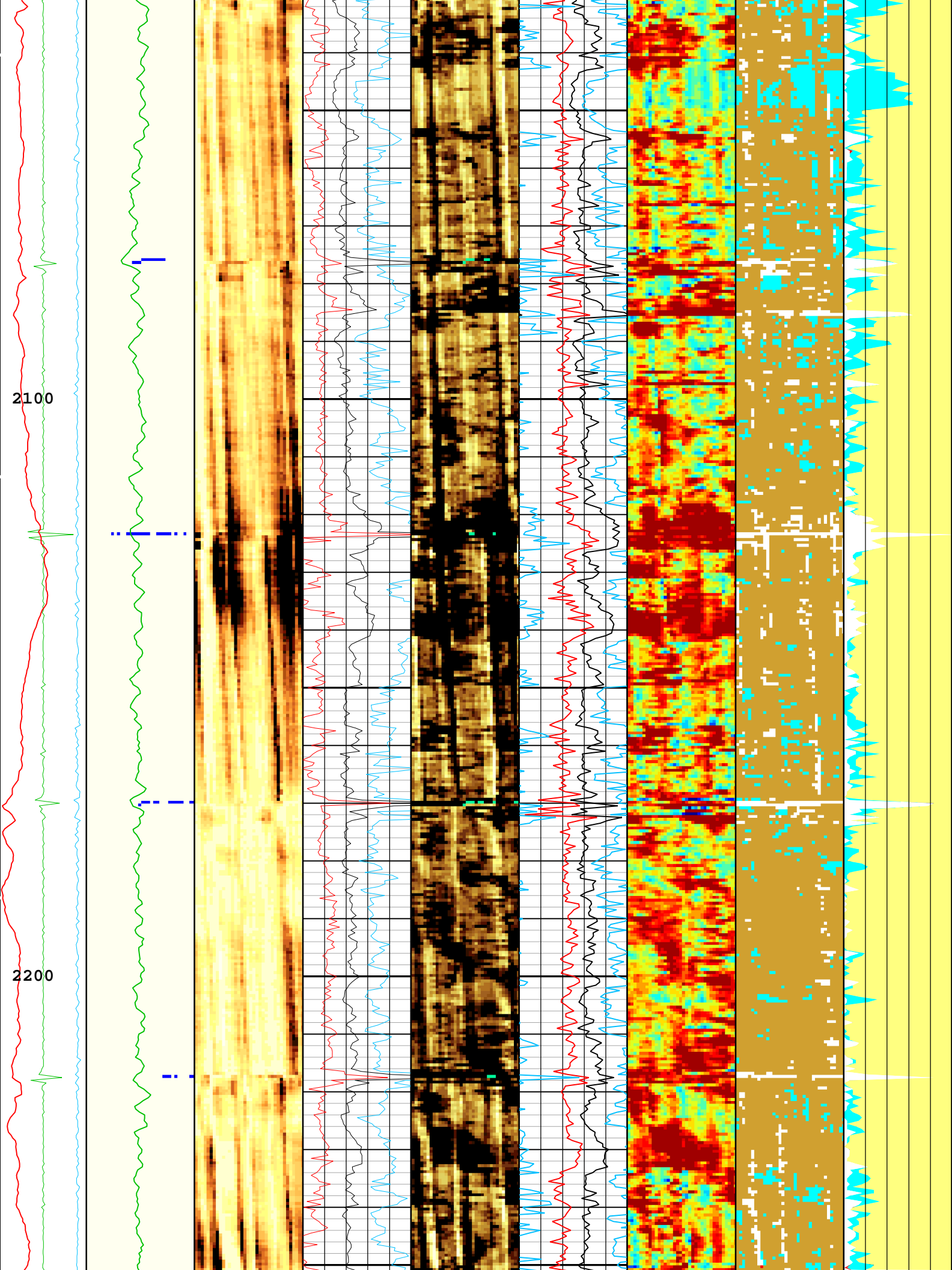


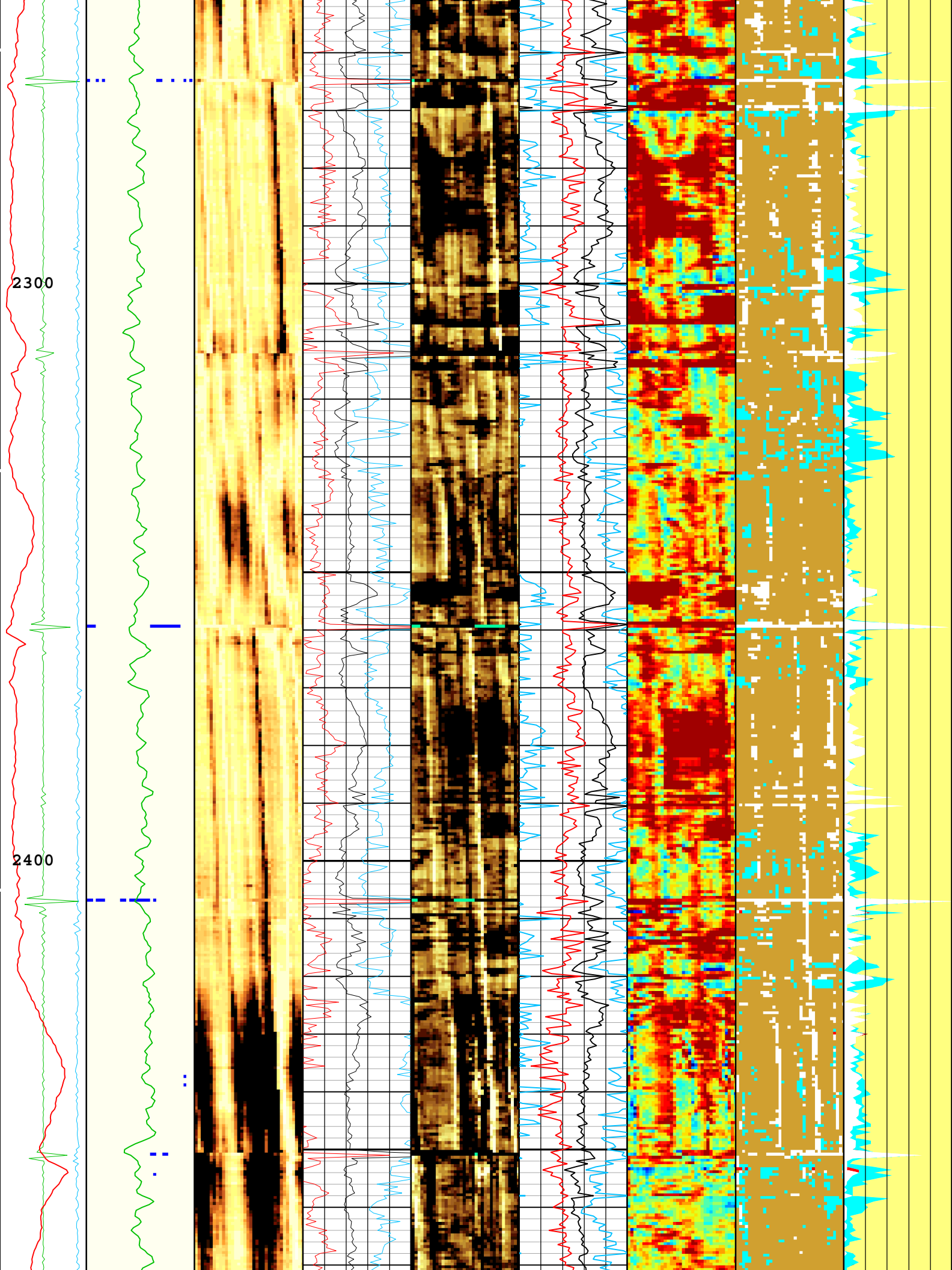


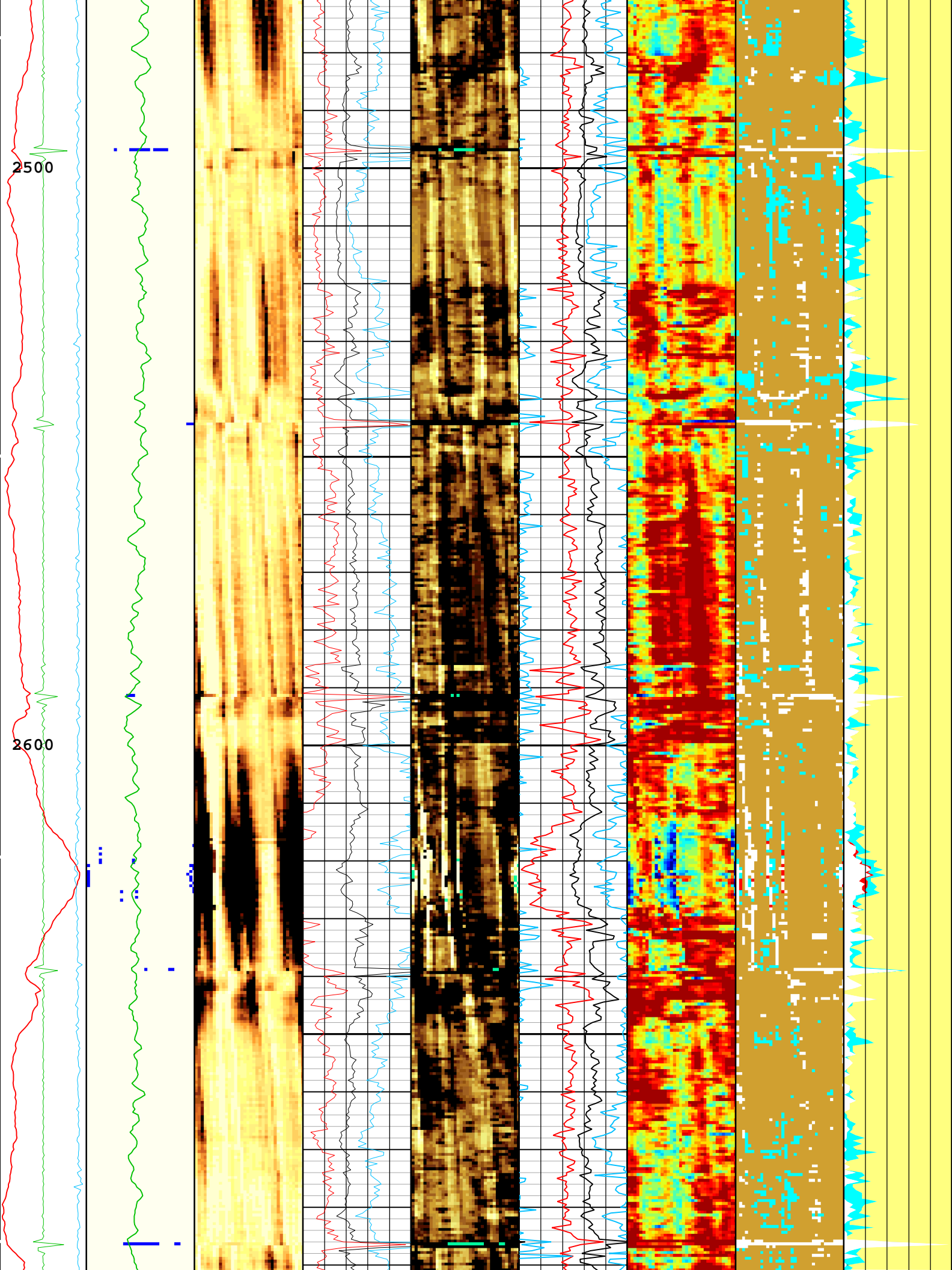


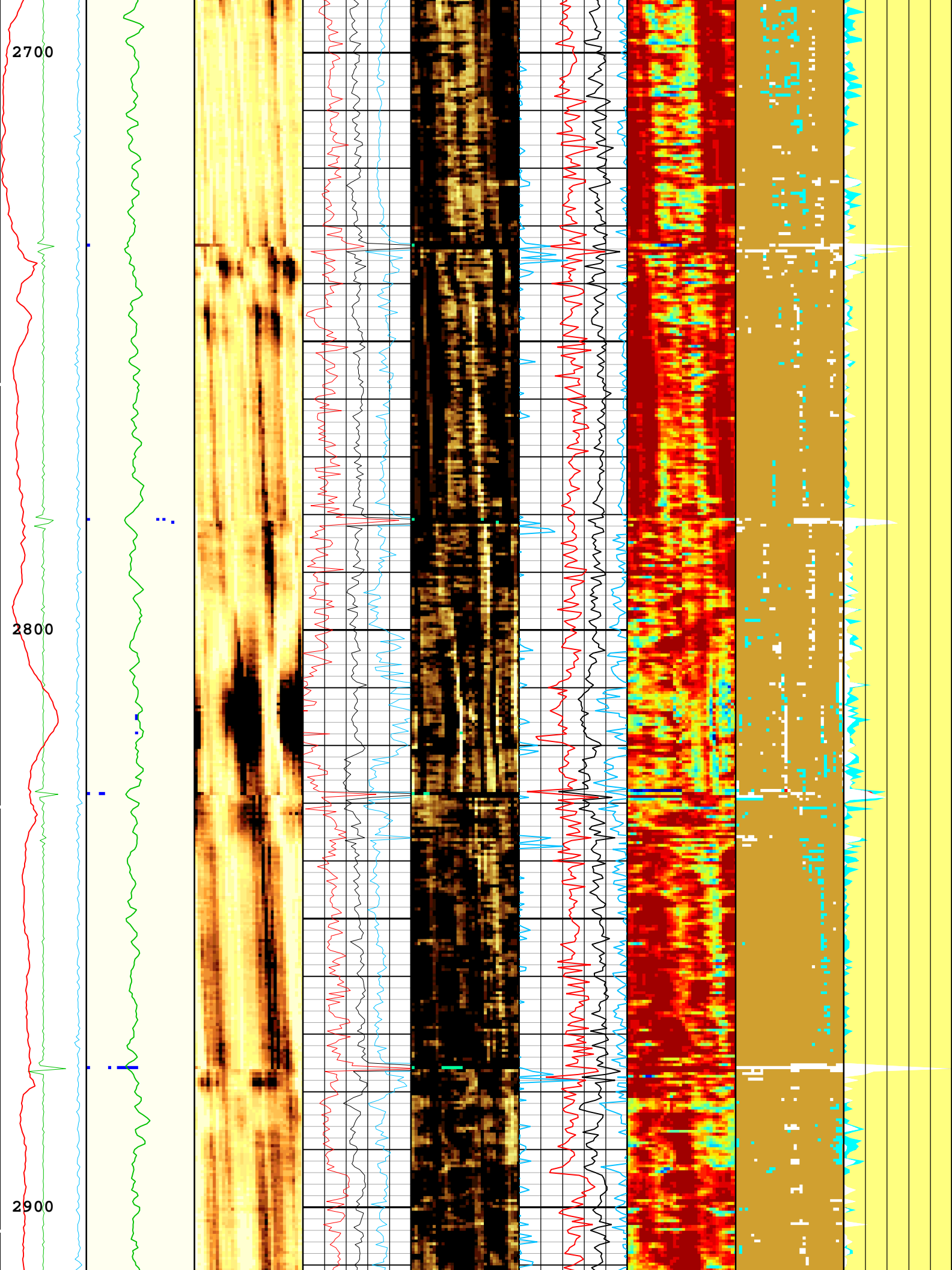


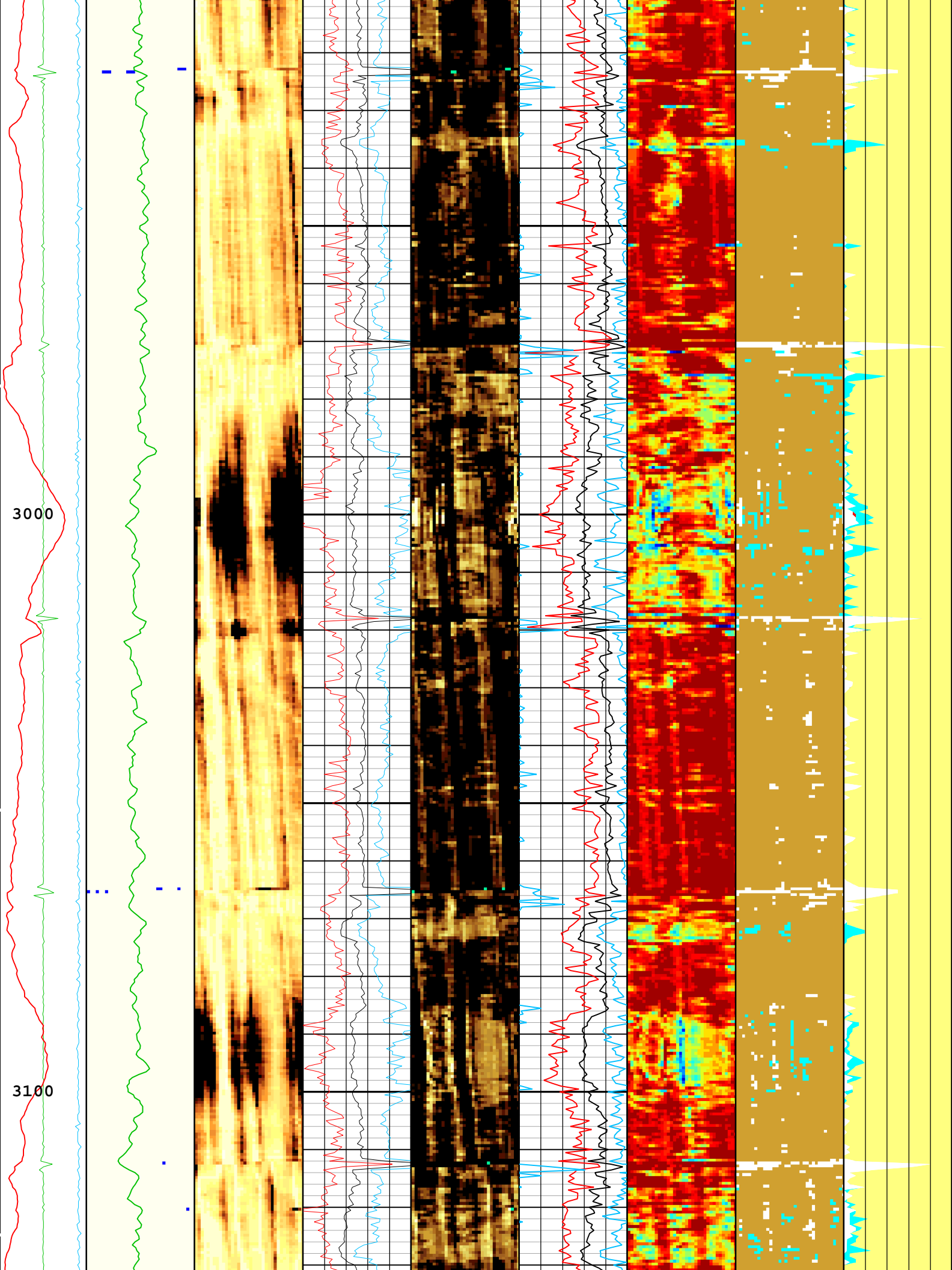


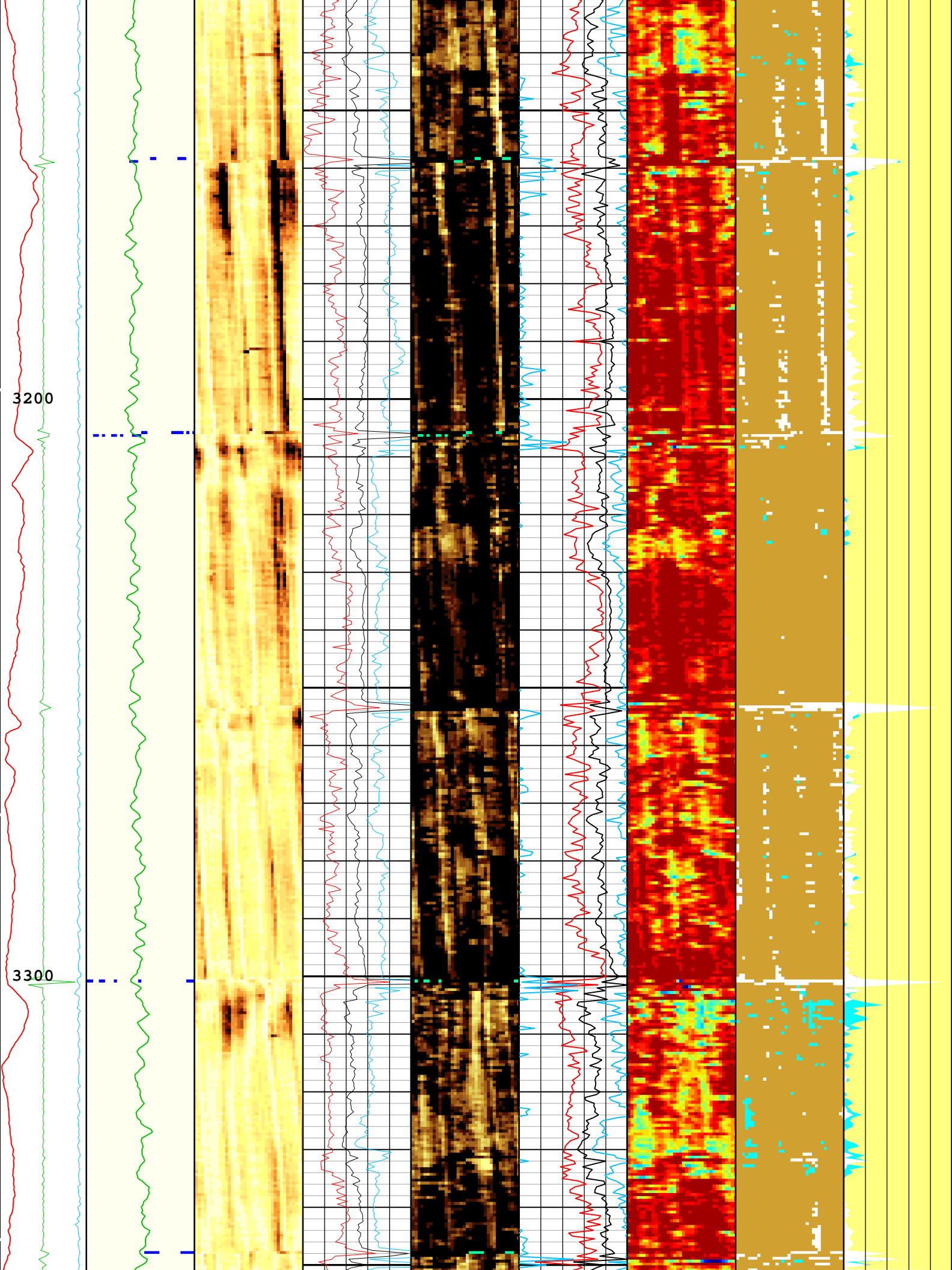


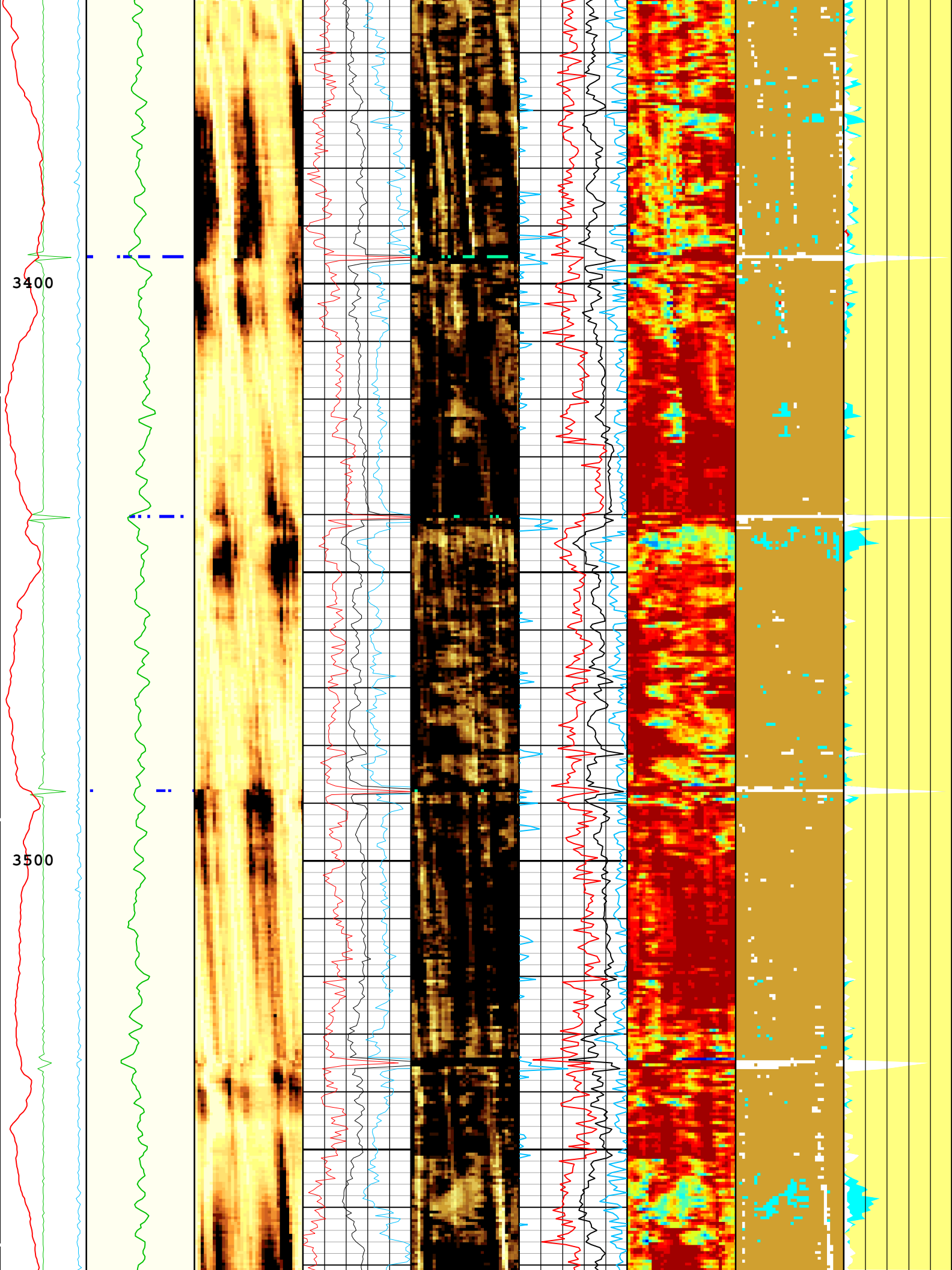


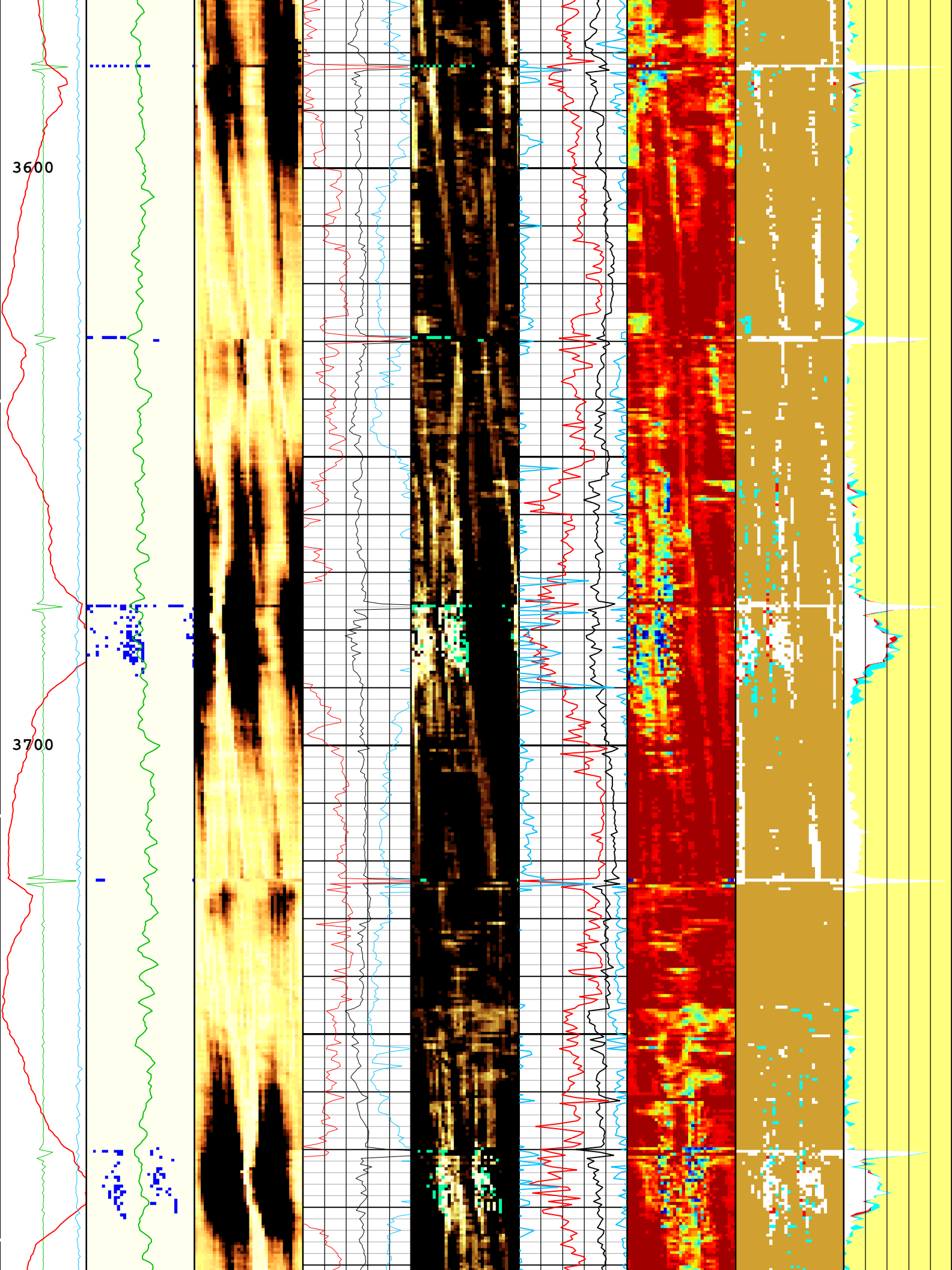


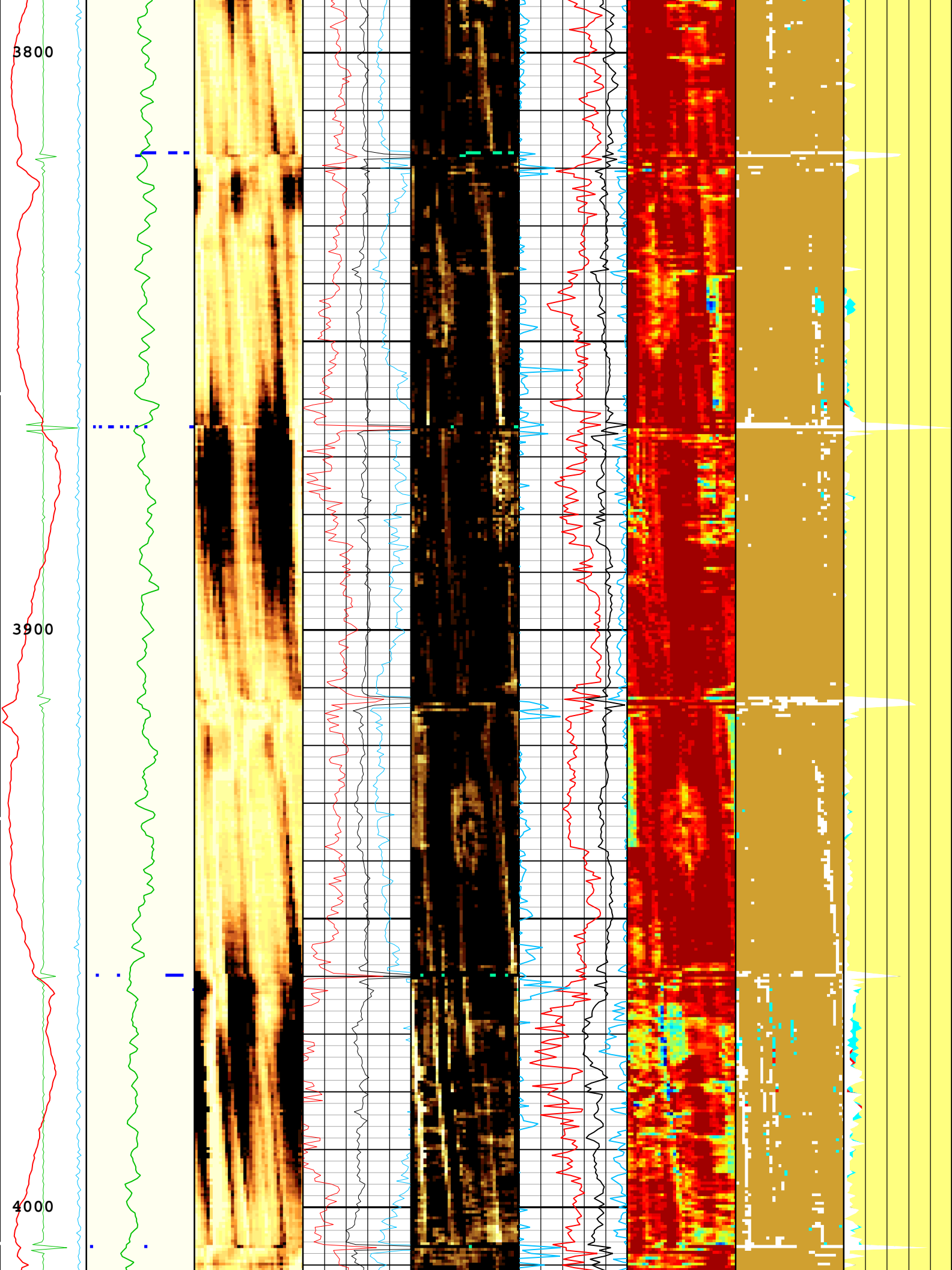


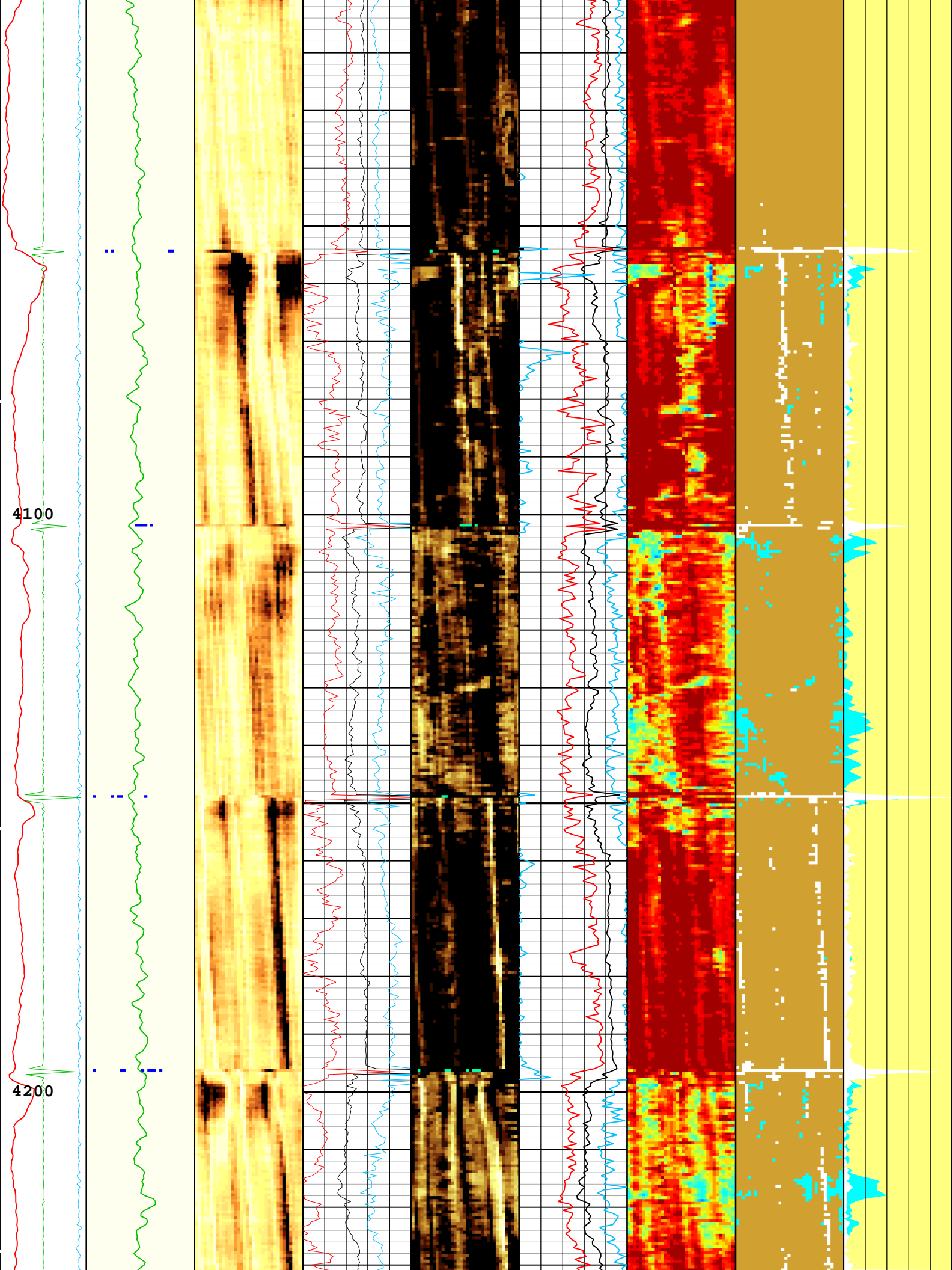


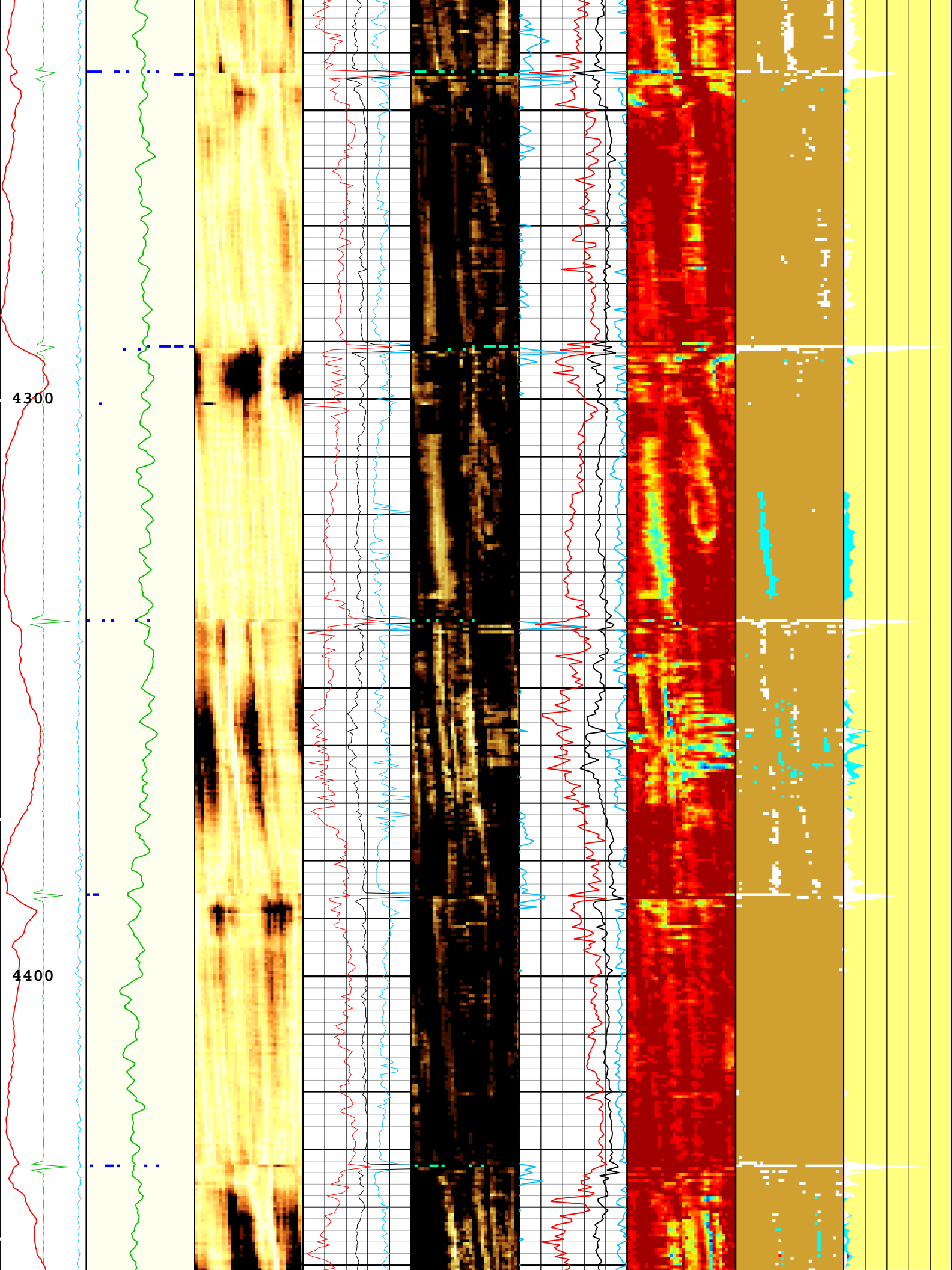


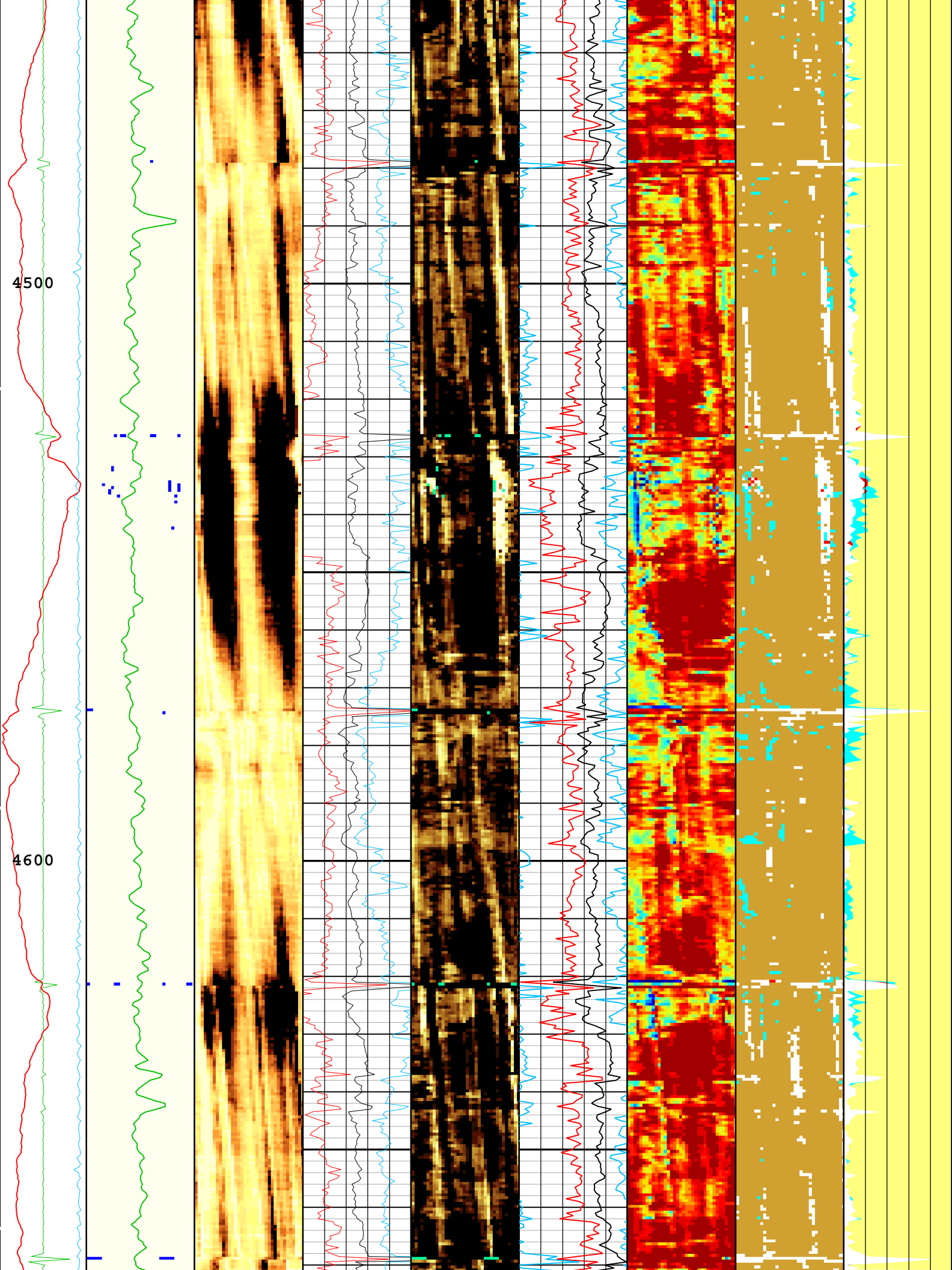


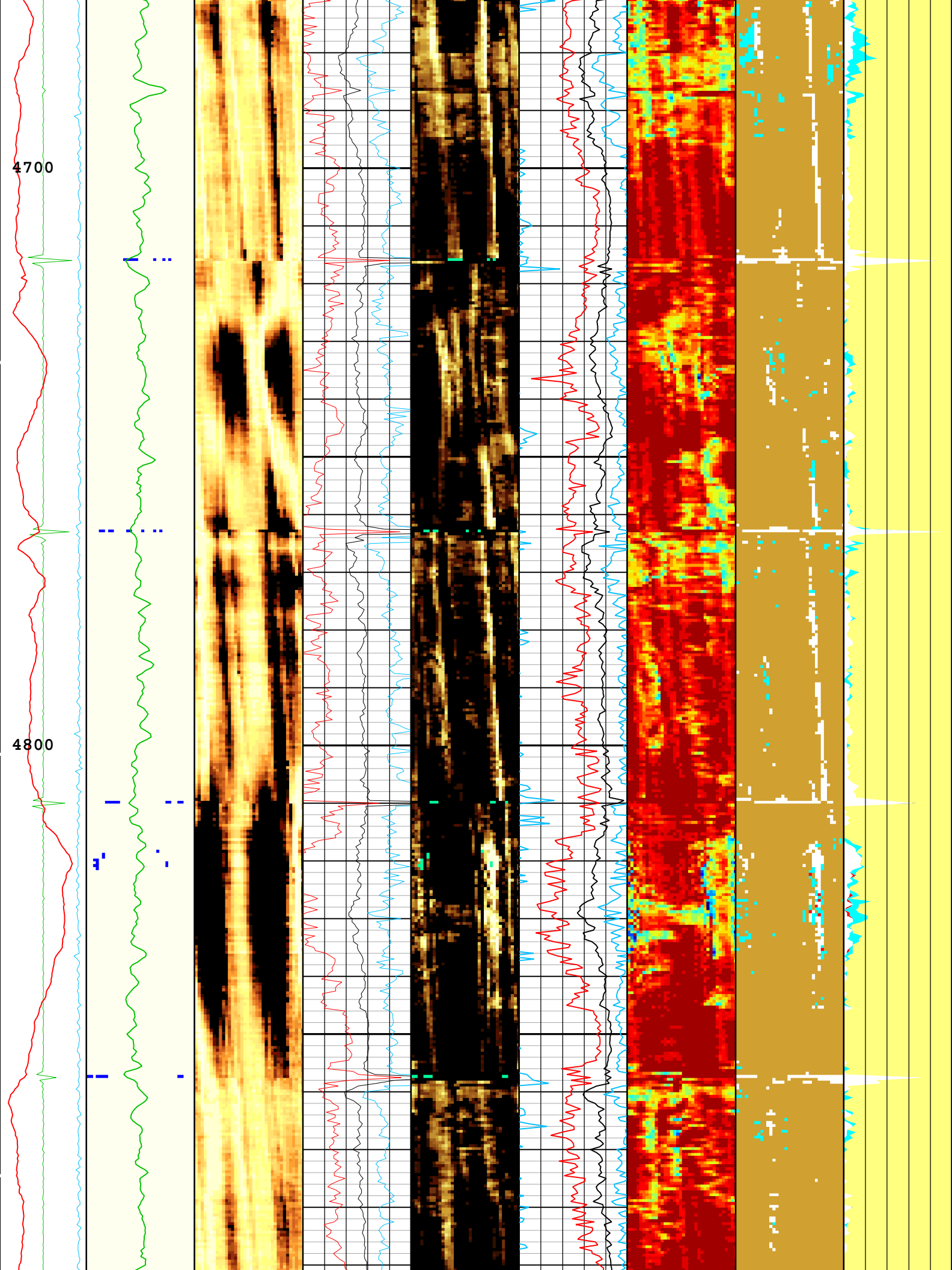


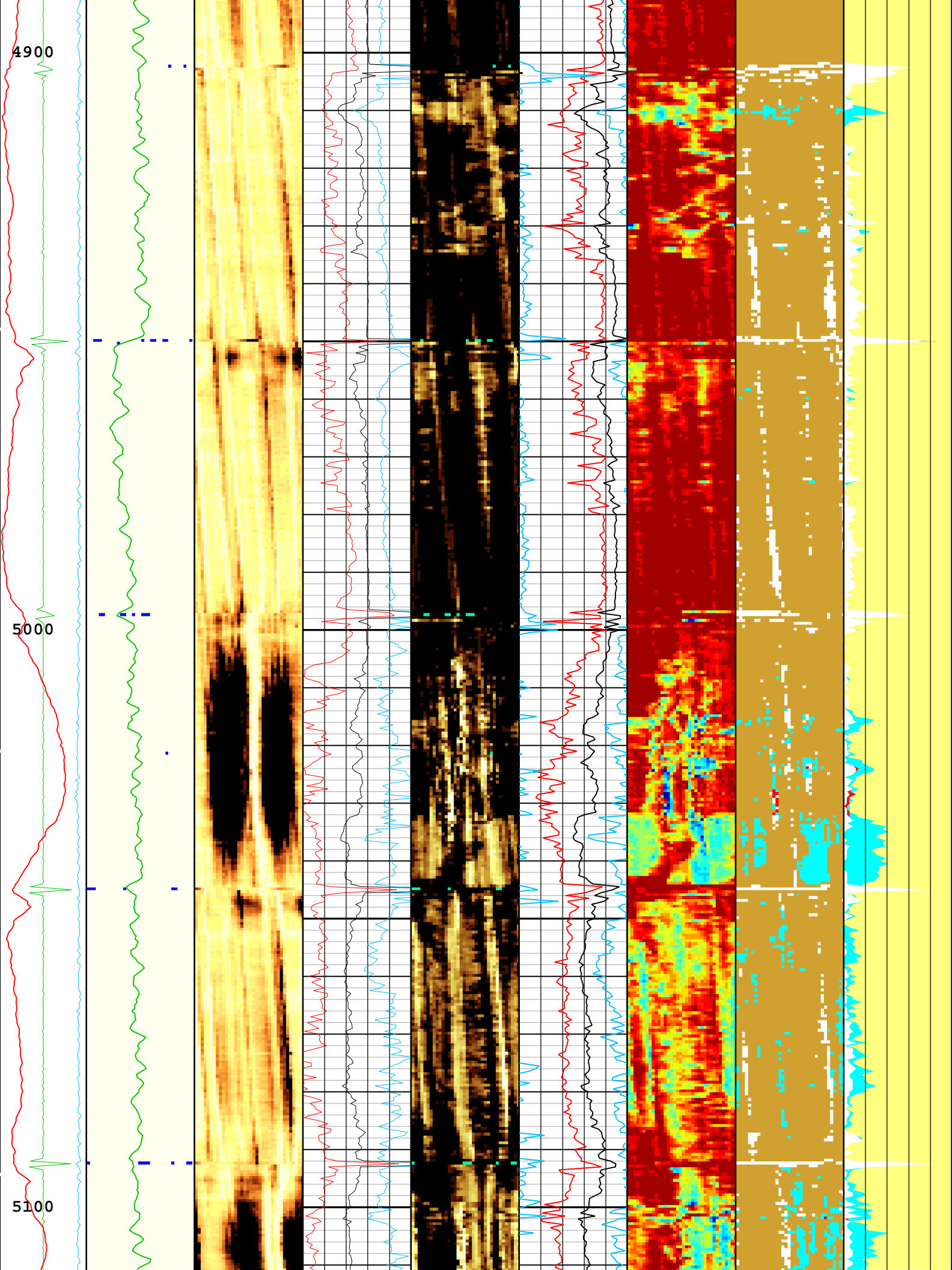


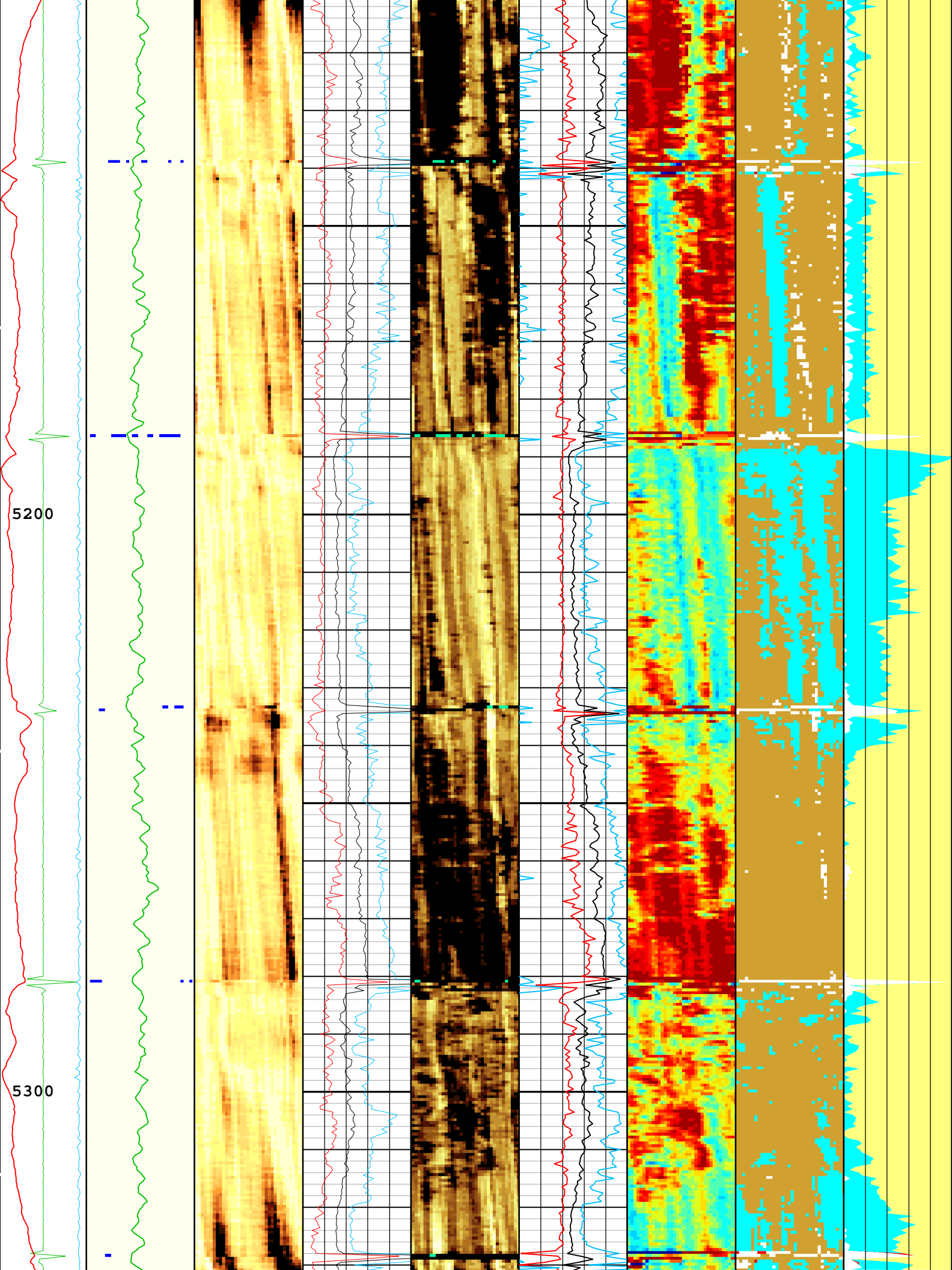


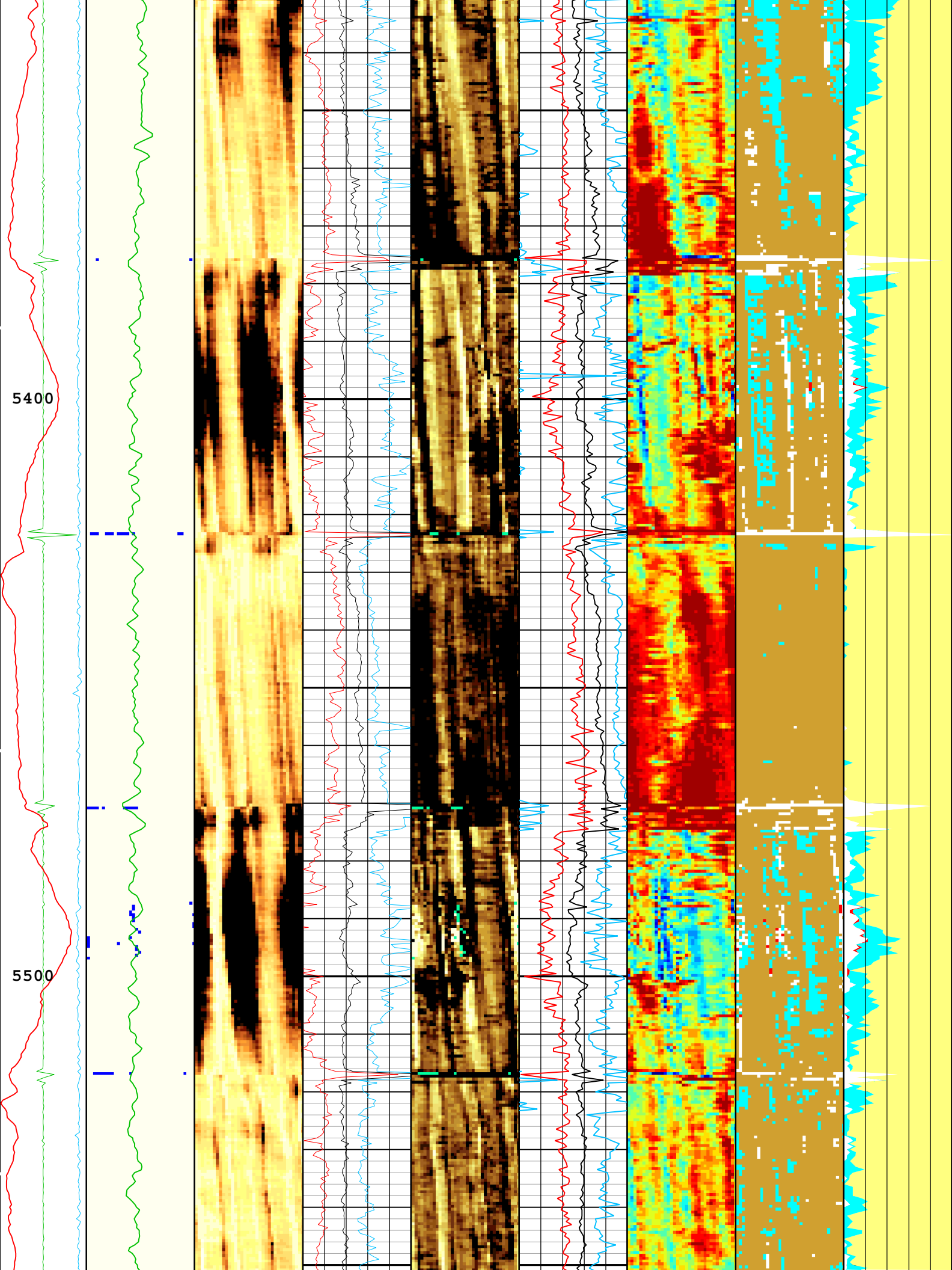


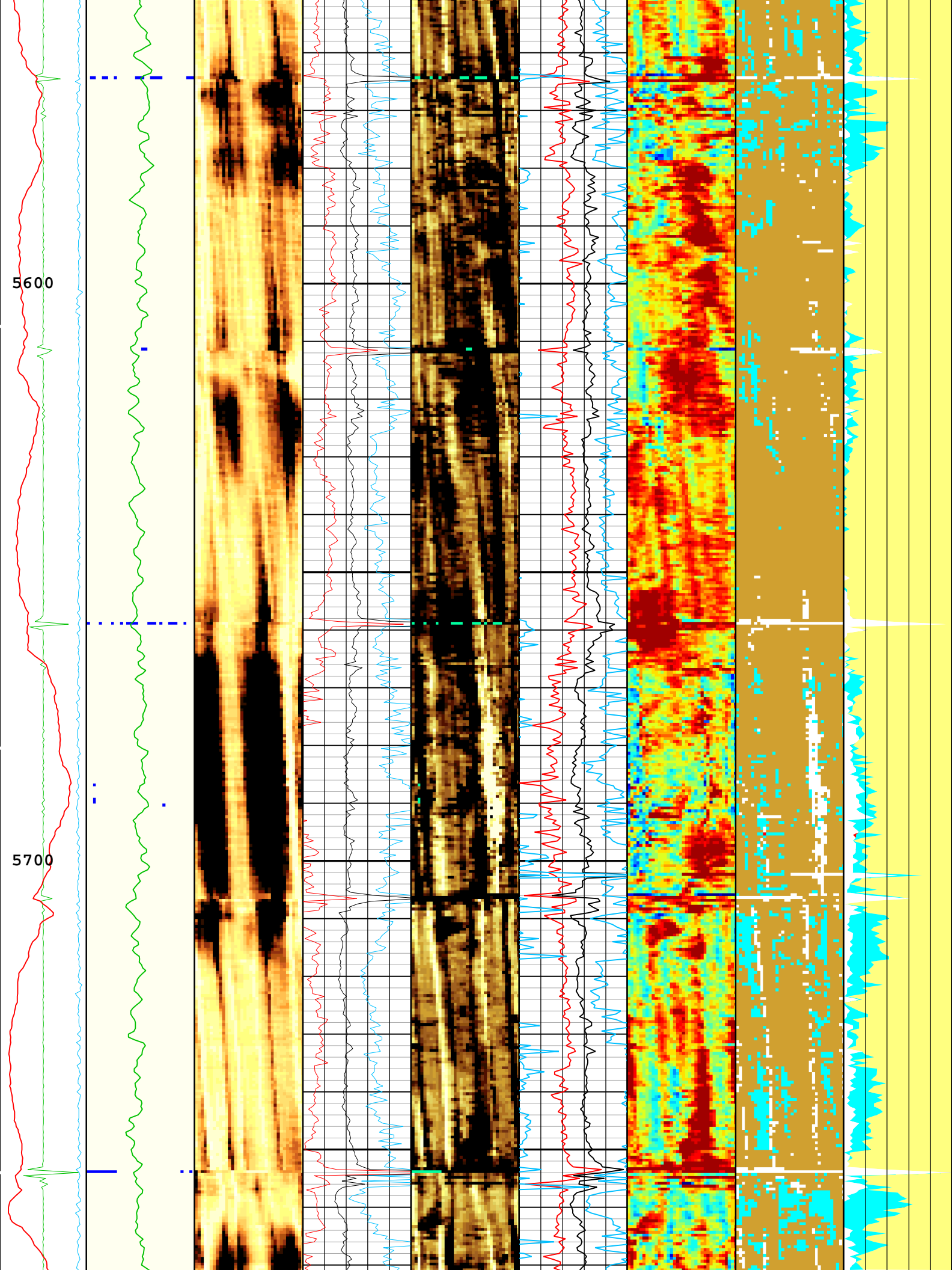


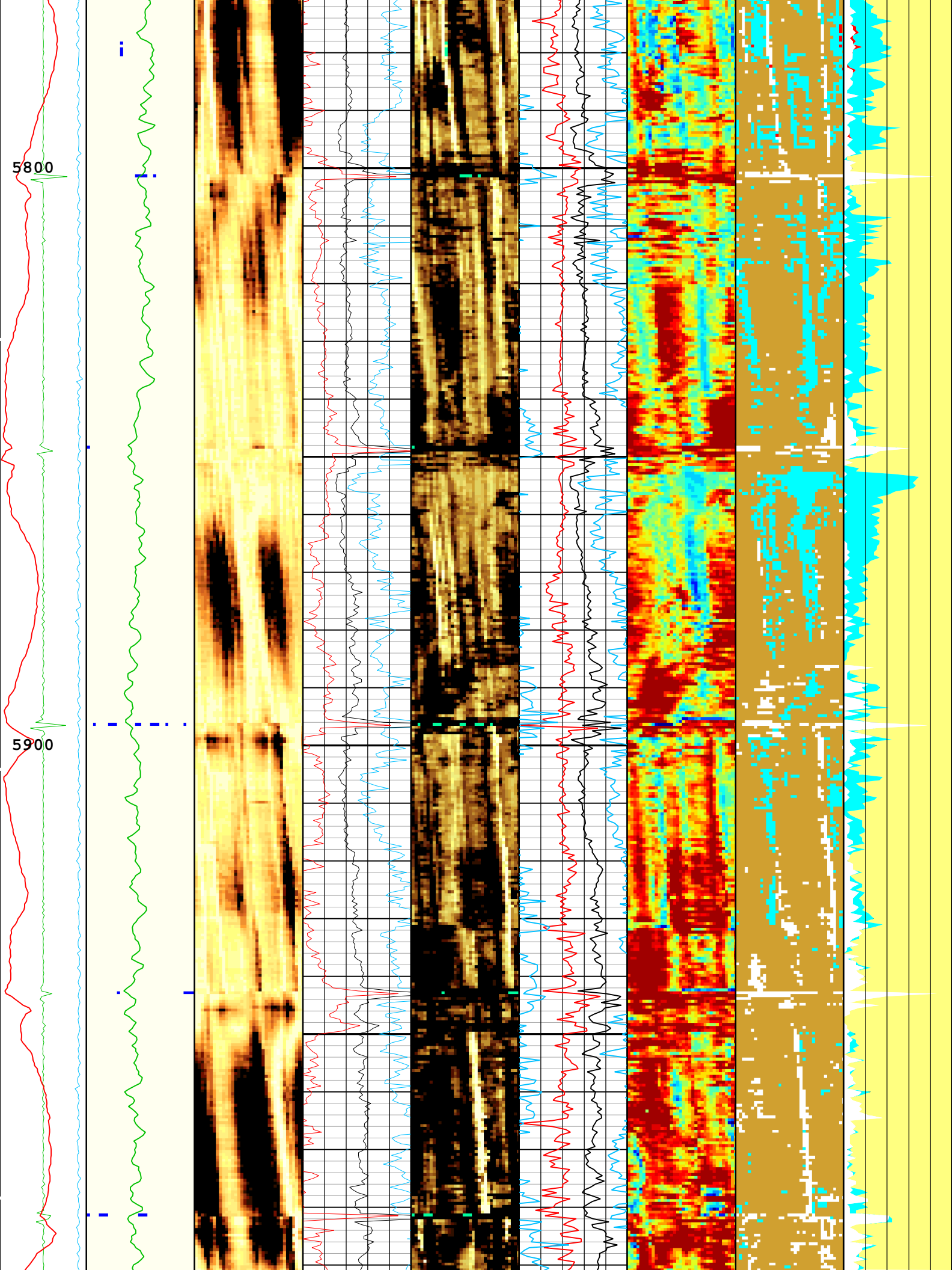


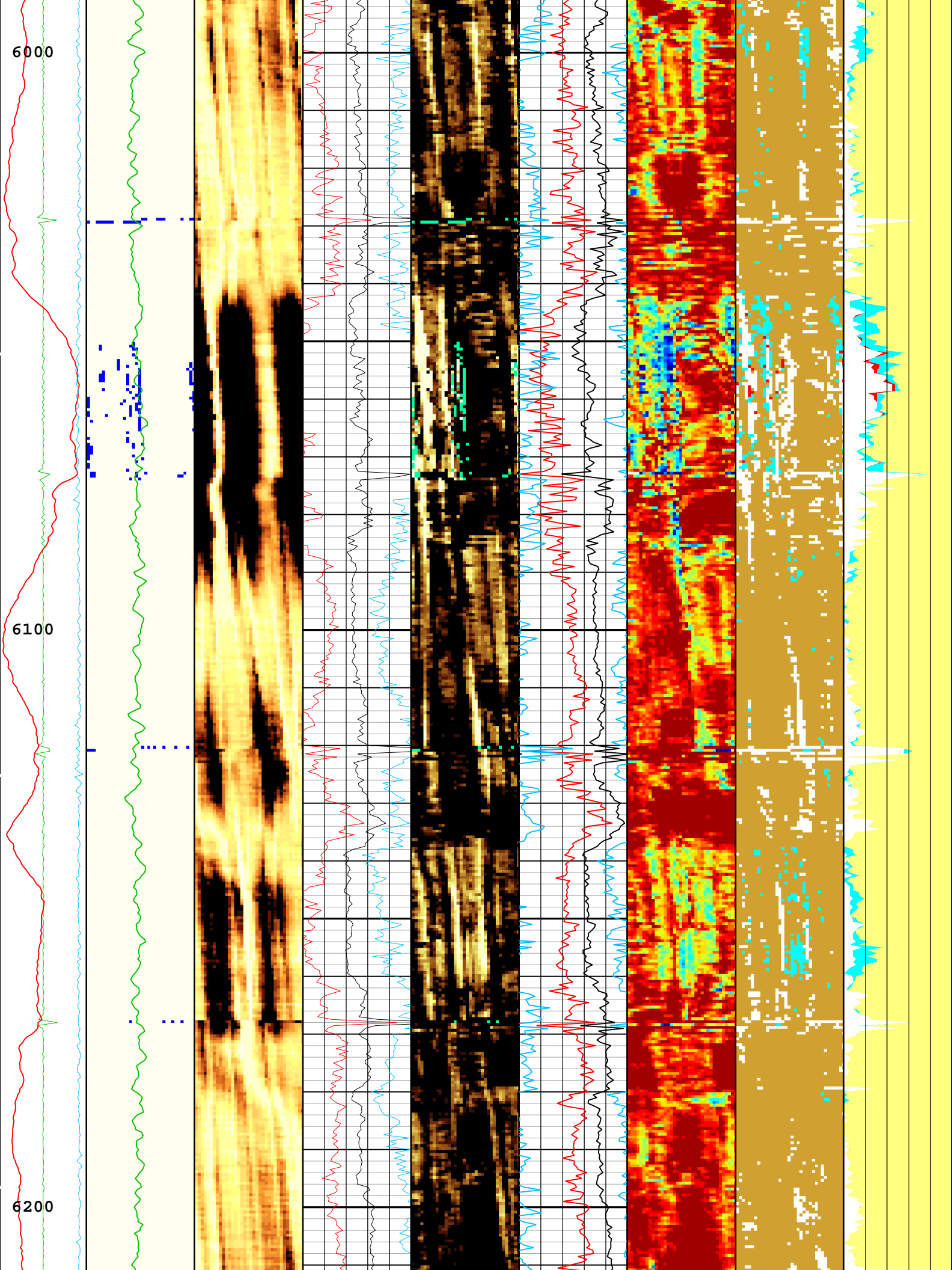


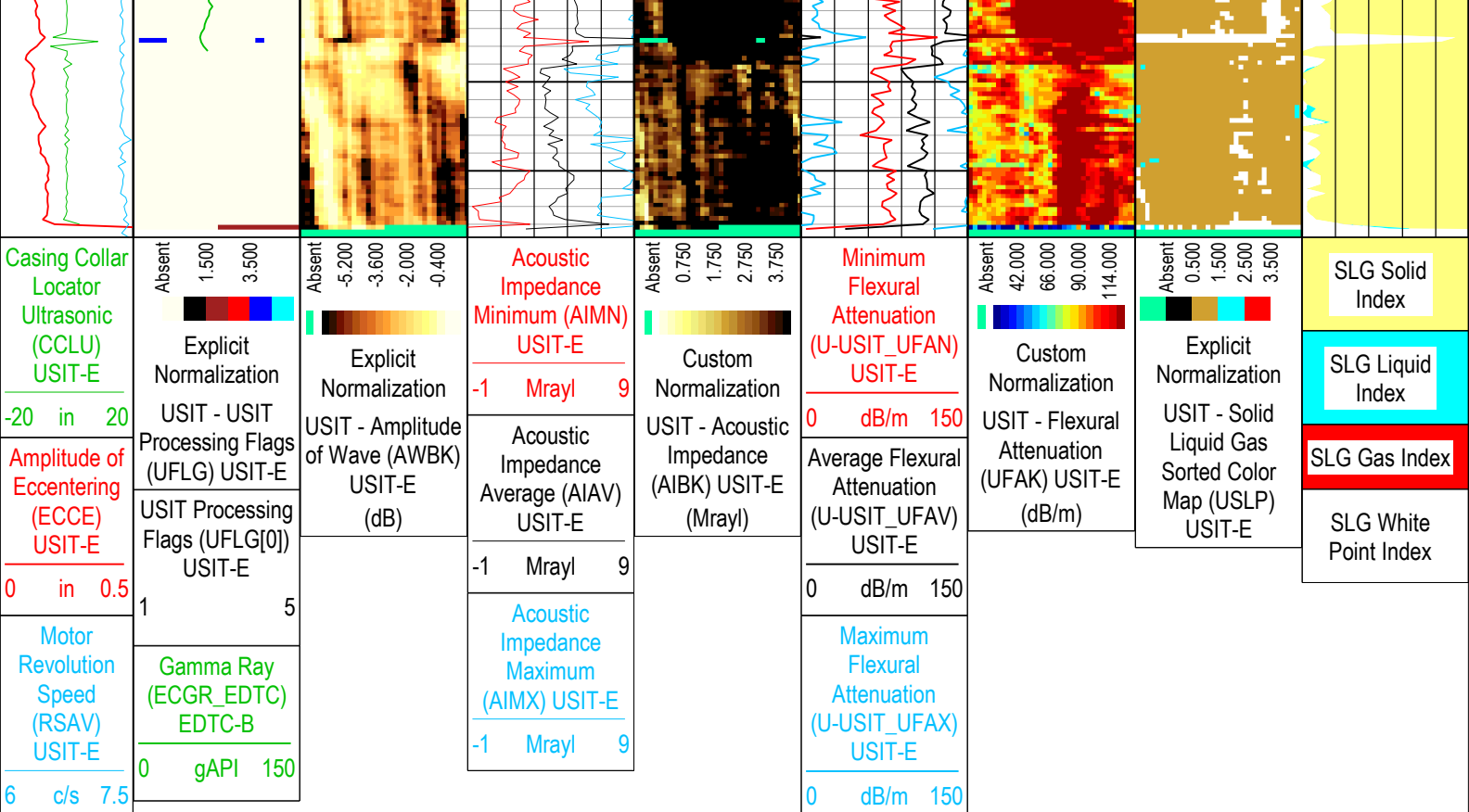

















USIT Processing Flags (UFLG[0]) USIT-E

1 - UFLG 1 Value within [0.0 - 1.5] - :  UTIM Error

2 - UFLG 2 Value within [1.5 - 2.5] - :  Pulse Origin Not Detected

3 - UFLG 3 Value within [2.5 - 3.5] - :  WINLEN Error

4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :  Casing Thickness Error

5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :  Loop Processing Error

TIME_1900 - Time Marked every 60.00 (s)

Description: USI IBC SLG Format: Log (IBC SLG) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 21-Jan-2019 07:51:54

Channel Processing Parameters				
Isolation scanner: Parameters				
Parameter	Description	Tool	Value	Unit
BARI(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BERJ	Bad Echo Rejection	USIT-E	On	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	Depth Zoned	in
CASING_PRATIO	Casing Poisson Ratio	USIT-E	Standard Poisson Ratio	
CBLO	Casing Bottom (Logger)	WLSESSION	12283	ft
CDEN	Cement Density	USIT-E	0	lbm/gal
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Light Cement	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FD	Fluid Density	USIT-E	10	lbm/gal
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
GR_MULTIPLIER	Gamma Ray Multiplier	EDTC-B	1	

GR_MULTIPLIER	Gamma Ray Multiplier	EDTC-B	1	
HEMA	Hematite Presence Flag	Borehole	No	
IBC_FRP_OFFSET	IBC Flexural Offset from Free Pipe	USIT-E	30.32	dB/m
IBC_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	IBC_FRP_OFFSET	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	FreePipe Norm.	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.46	
MUD_N_INV	IBC Inversion Mud Normalization Factor	USIT-E	1.21	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.15	
RCOD	Reference Calibrator Outer Diameter	USIT-E	4.5	in
RCSO	Reference Calibrator Standoff	USIT-E	0.842	in
RCTH	Reference Calibrator Thickness	USIT-E	0.216	in
SOCN	Standoff Distance	EDTC-B	0.125	in
SOCO	Standoff Correction Option	EDTC-B	No	
THDH	Maximum Search Thickness (percentage of nominal)	USIT-E	130	%
THDL	Minimum Search Thickness (percentage of nominal)	USIT-E	70	%
TPOS_EDTC	Tool Position: Centered or Eccentered	EDTC-B	Eccentered	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.8	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	30.17	dB/m
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SolidLiquidGasMap	
USI_RPLUS	Ultrasonic R+ Processing	USIT-E	No	
THDP	Thickness Detection Policy	USIT-E	Fundamental	
VCAS	Ultrasonic Transversal Velocity in Casing	USIT-E	51.4	us/ft
ZCAS	Acoustic Impedance of Casing	USIT-E	46.25	Mrayl
ZINI	Initial Estimate of Cement Impedance	USIT-E	-1	Mrayl
ZMUD	Acoustic Impedance of Mud	Borehole	1.8	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.6	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Depth Zone Parameters			
Parameter	Value	Start (ft)	Stop (ft)
BS	11.5	715	2008
BS	8.5	2008	6237.5
All depth are actual.			

Tool Control Parameters	
-------------------------	--

Isolation scanner: Parameters				
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	48	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
DOT(DOS)	Distance between Opposite Transducer Faces	USIT-E	1.756	in
EMXV	EMEX Voltage	USIT-E	Time Zoned	V
HRES	Horizontal Resolution	USIT-E	10 deg	
IBC_ACQTYPE	IBC Acquisition type	USIT-E	1 MHz	
IBC_FLEXDBP	IBC Flex Duration Before Peak	USIT-E	30	us
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
MOTOR_PROTECT	Motor Protection	USIT-E	On	

UACLV_PERM	Ultrasonic ACLV Permanent	USIT-E	Yes	
U-USIT_UFWB	Far Receiver Window Begin Time	USIT-E	Time Zoned	us
U-USIT_UFWE	Far Receiver Window End Time	USIT-E	177	us
U-USIT_UNWB	Near Receiver Window Begin Time	USIT-E	106	us
U-USIT_UNWE	Near Receiver Window End Time	USIT-E	Time Zoned	us
USFR	Ultrasonic Sampling Frequency	USIT-E	666667	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 6.0 in	
USSP	Ultrasonic Service	USIT-E	IBC	
U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VRES	Vertical Resolution	USIT-E	6.0 in	
WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	Time Zoned	us

Time Zone Parameters					
Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	20	20-Jan-2019 12:03:15	20-Jan-2019 13:03:15	6238.58	1875.95
EMXV	45	20-Jan-2019 13:03:15	20-Jan-2019 13:03:26	1875.95	1861.71
EMXV	40	20-Jan-2019 13:03:26	20-Jan-2019 13:19:25	1861.71	704.39
U-USIT_UFWB	137	20-Jan-2019 12:03:15	20-Jan-2019 12:03:47	6238.58	6210.24
U-USIT_UFWB	133.74	20-Jan-2019 12:03:47	20-Jan-2019 12:03:55	6210.24	6201.03
U-USIT_UFWB	136.69	20-Jan-2019 12:03:55	20-Jan-2019 13:19:25	6201.03	704.39
U-USIT_UNWE	146	20-Jan-2019 12:03:15	20-Jan-2019 12:04:02	6238.58	6193.7
U-USIT_UNWE	142.25	20-Jan-2019 12:04:02	20-Jan-2019 13:19:25	6193.7	704.39
WINE	71.88	20-Jan-2019 12:03:15	20-Jan-2019 12:10:40	6238.58	5704.38
WINE	73.84	20-Jan-2019 12:10:40	20-Jan-2019 13:19:25	5704.38	704.39

All depth are at tool zero.

Isolation scanner

IBC SLG Composite Main

Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Isolation scanner	Log[4]:Up	Up	704.39 ft	6238.58 ft	20-Jan-2019 12:03:15 PM	20-Jan-2019 1:19:25 PM	ON	5.87 ft	Yes

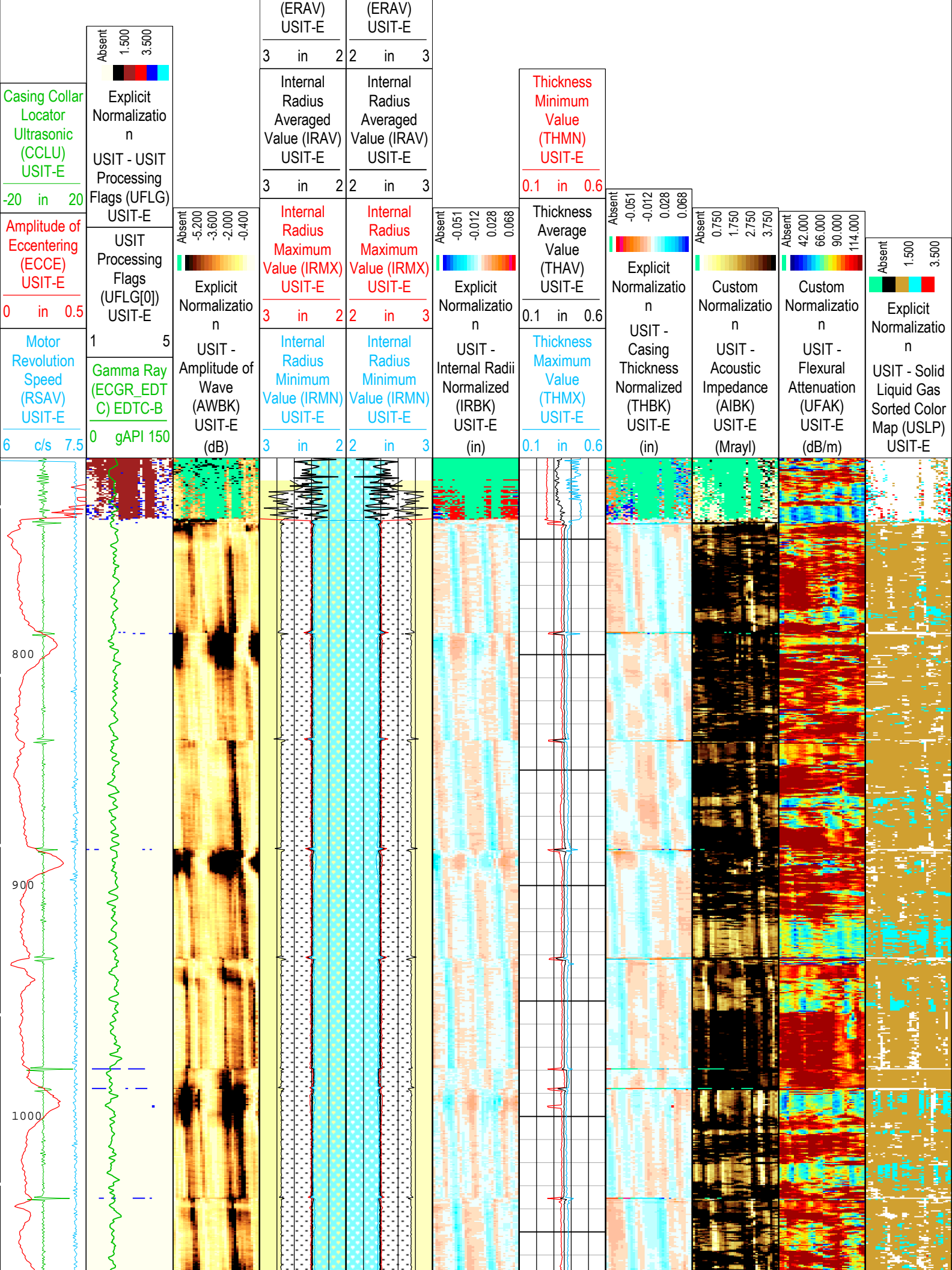
All depths are referenced to toolstring zero

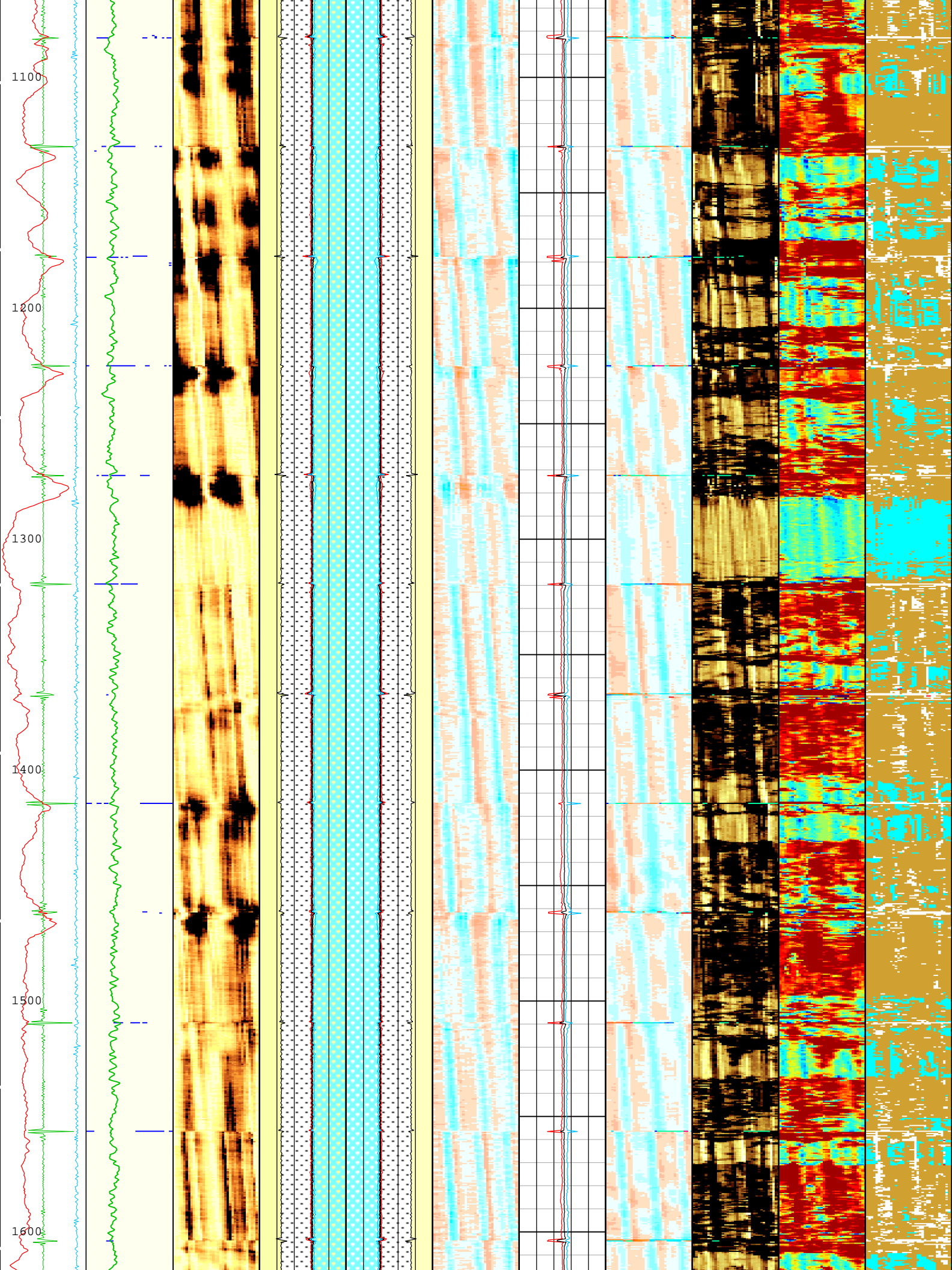
Log	Company:Crestone Peak Resources Operating LLC Well:Herren #1C-33H-H367 Isolation scanner: Log[4]:Up:S005
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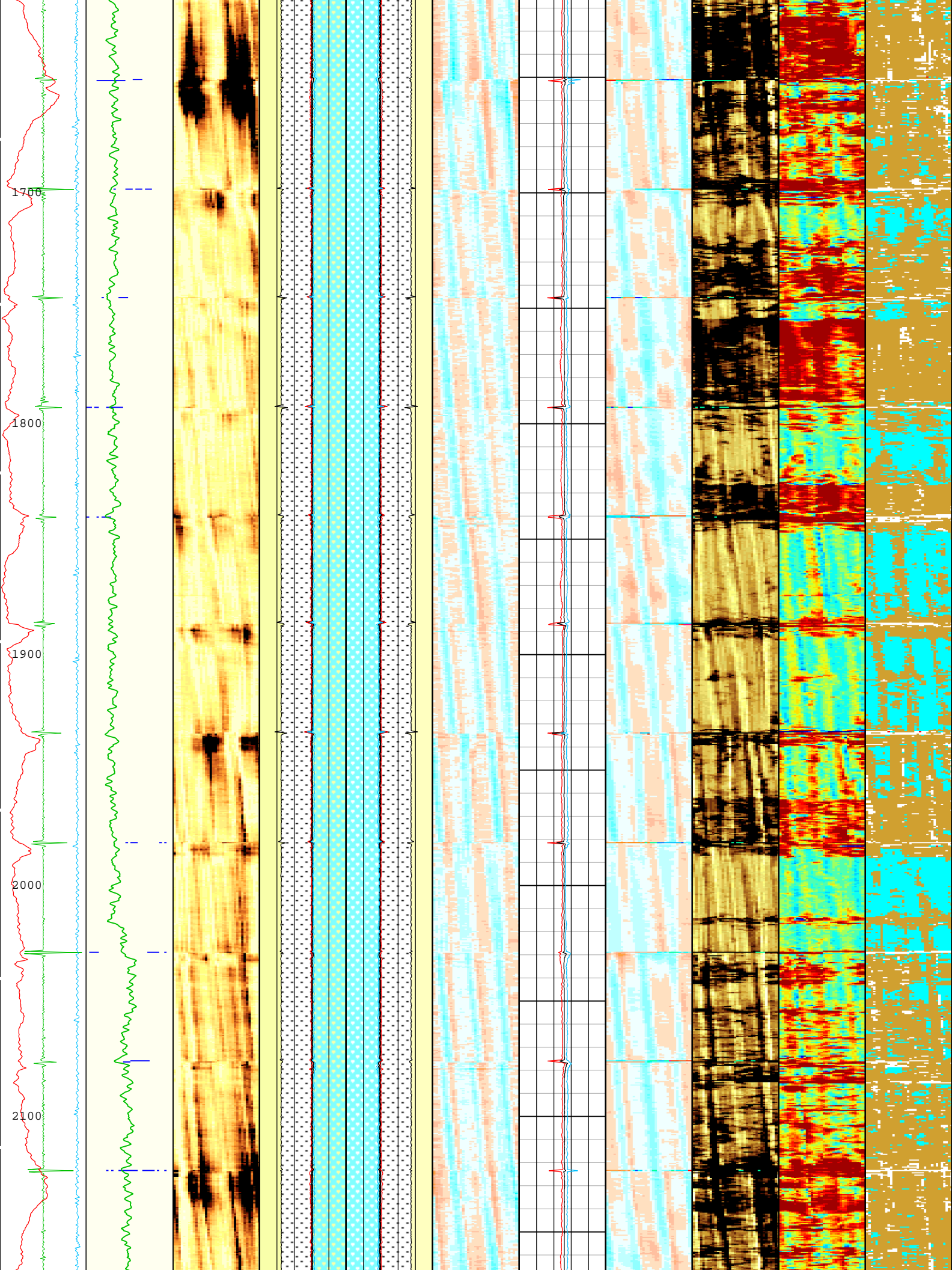
Description: USI IBC SLG Composite Format: Log (IBC SLG Composite) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 21-Jan-2019 07:52:35

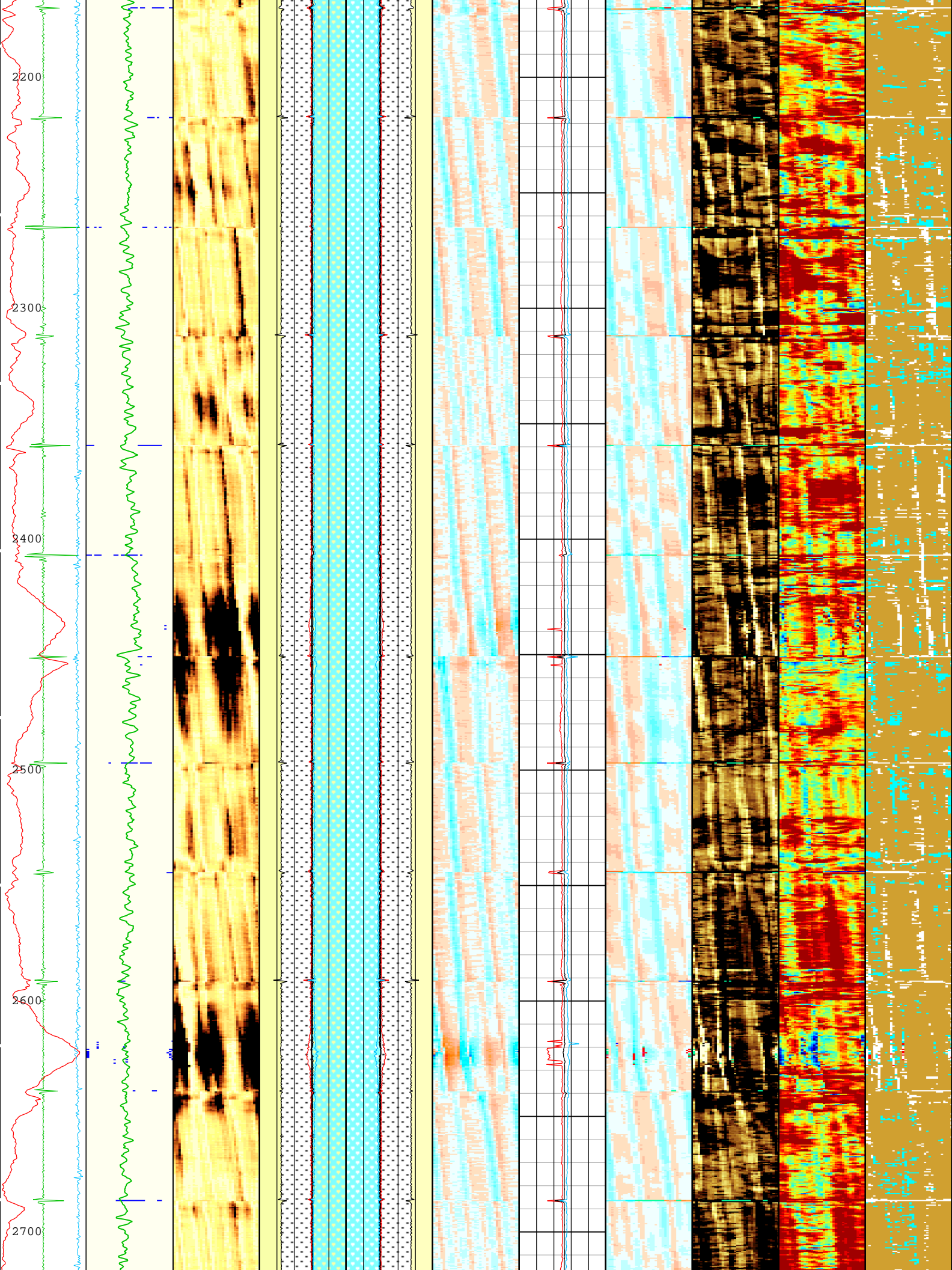
USIT Processing Flags (UFLG[0]) USIT-E	
1 - UFLG 1 Value within [0.0 - 1.5] - :	<div></div> UTIM Error
2 - UFLG 2 Value within [1.5 - 2.5] - :	<div></div> Pulse Origin Not Detected
3 - UFLG 3 Value within [2.5 - 3.5] - :	<div></div> WINLEN Error
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :	<div></div> Casing Thickness Error
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :	<div></div> Loop Processing Error

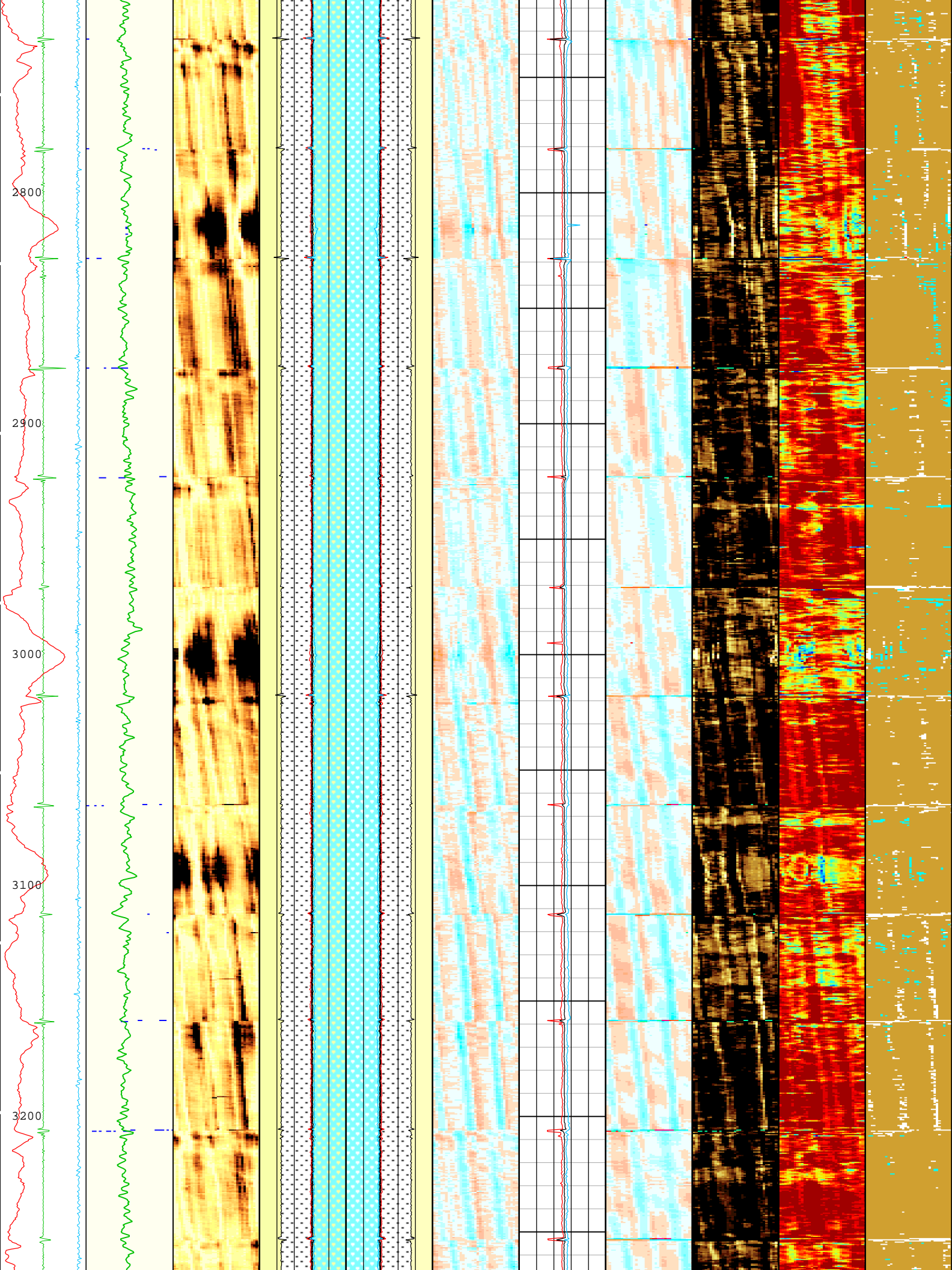
TIME_1900 - Time Marked every 60.00 (s)	
	<div>External Radii Average</div> <div>External Radii Average</div>

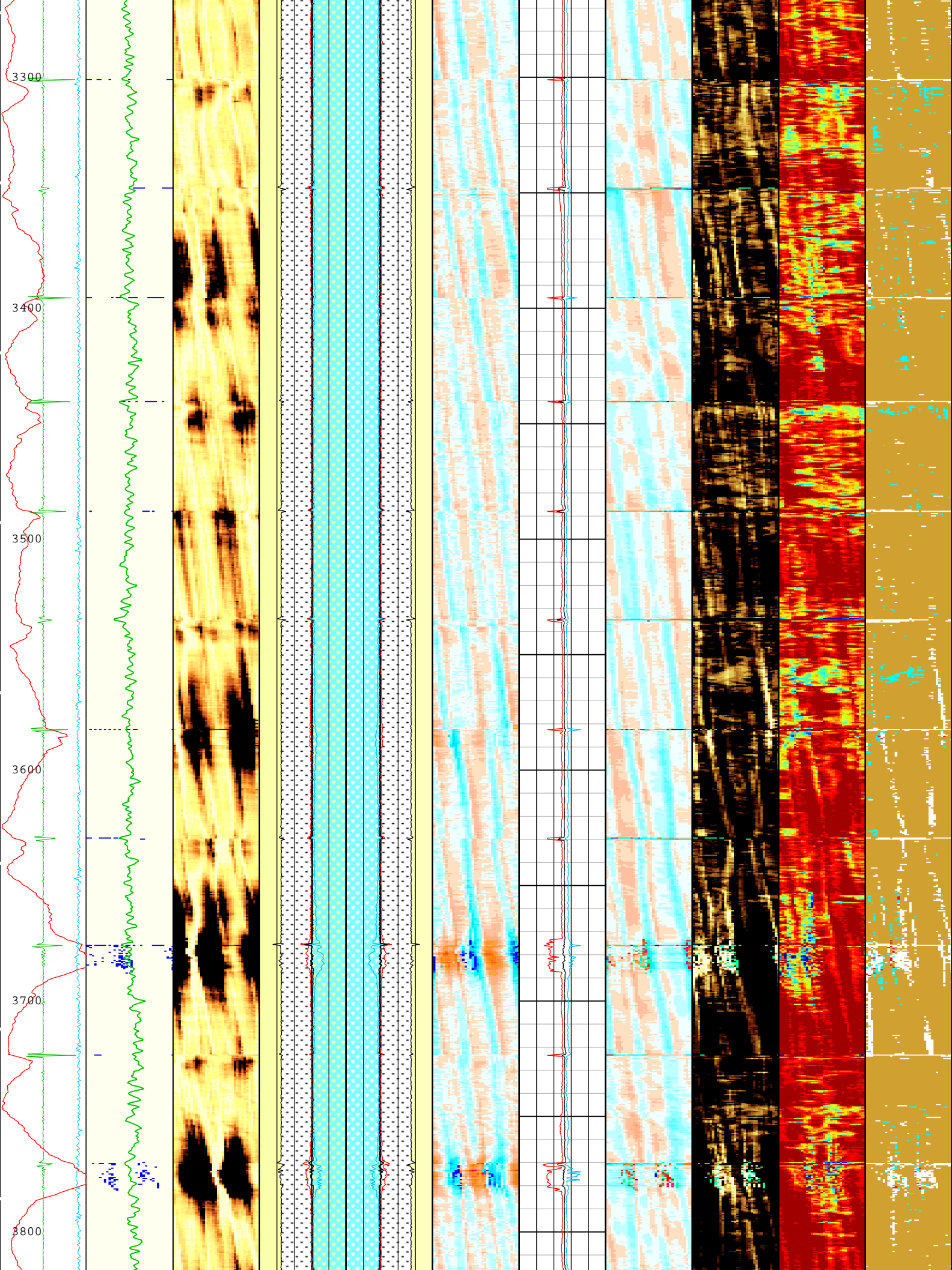


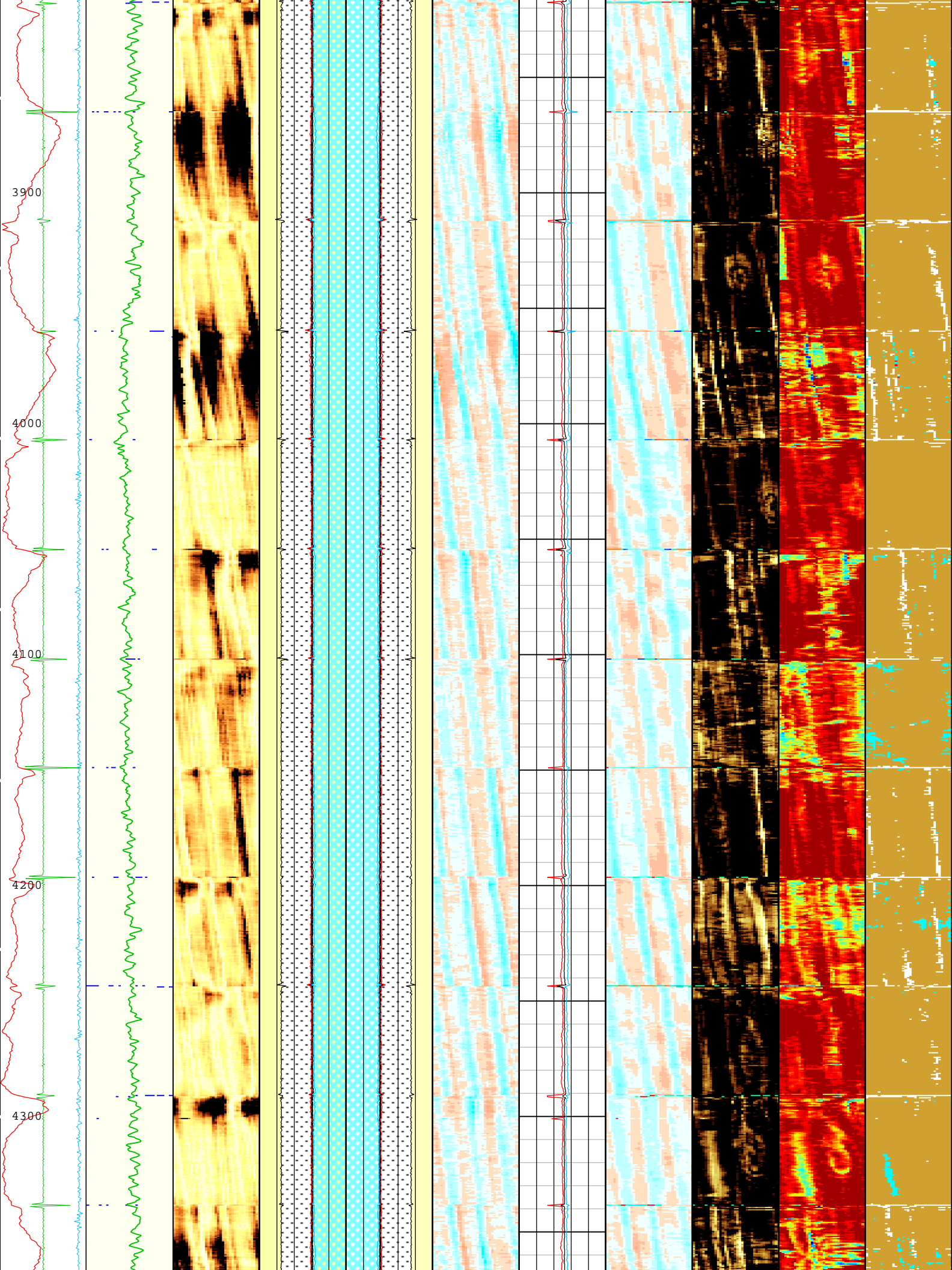


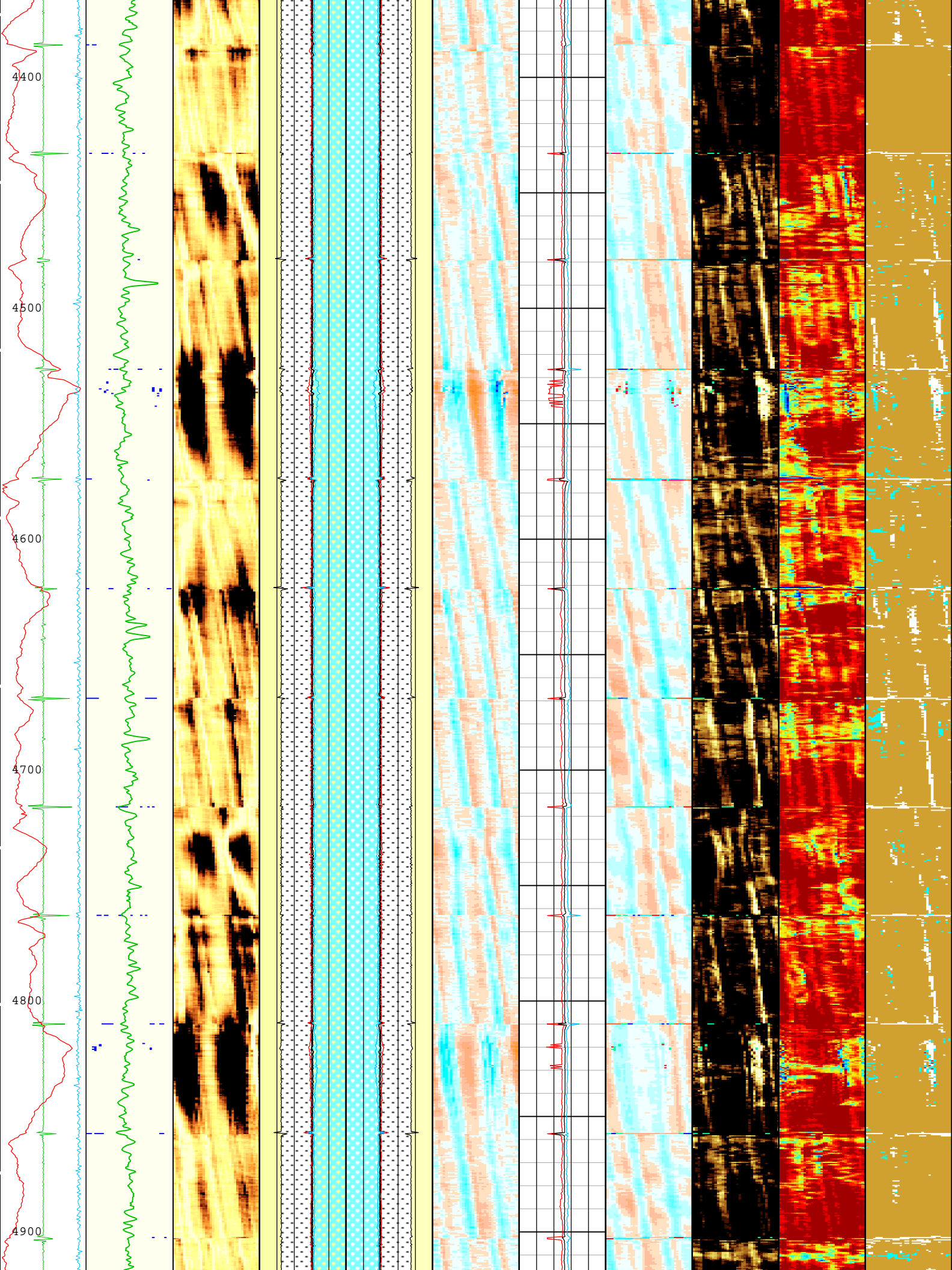


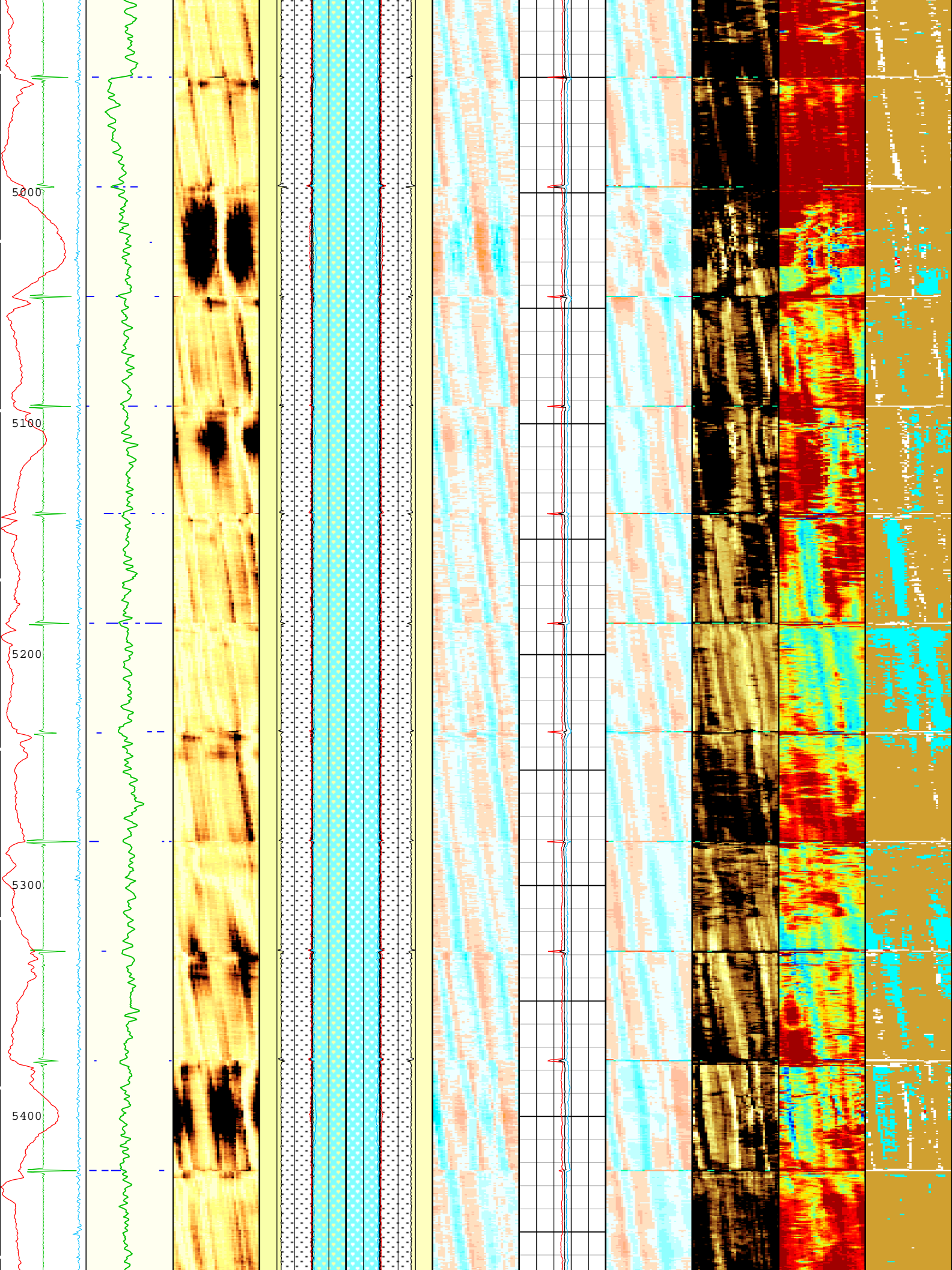


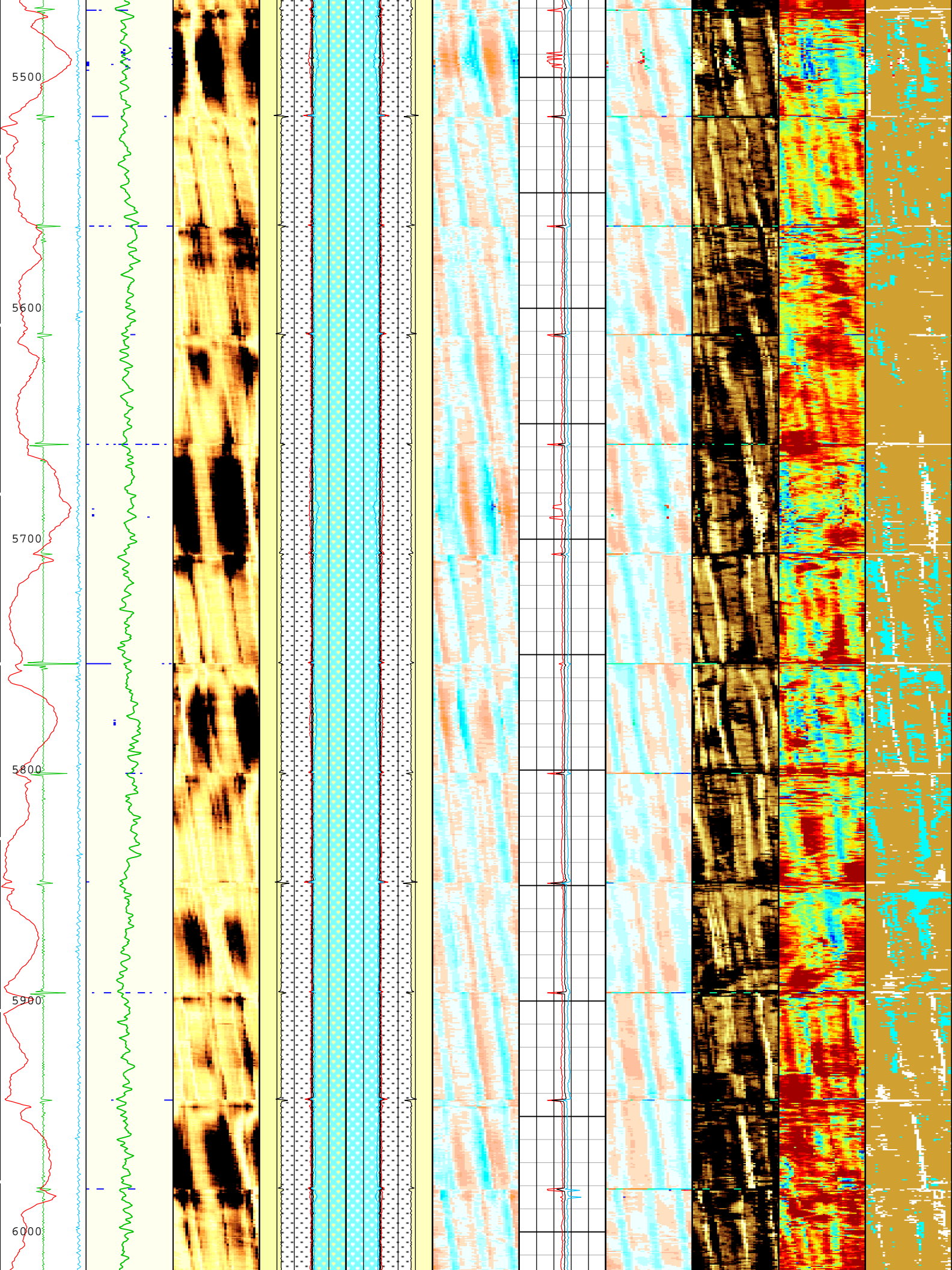


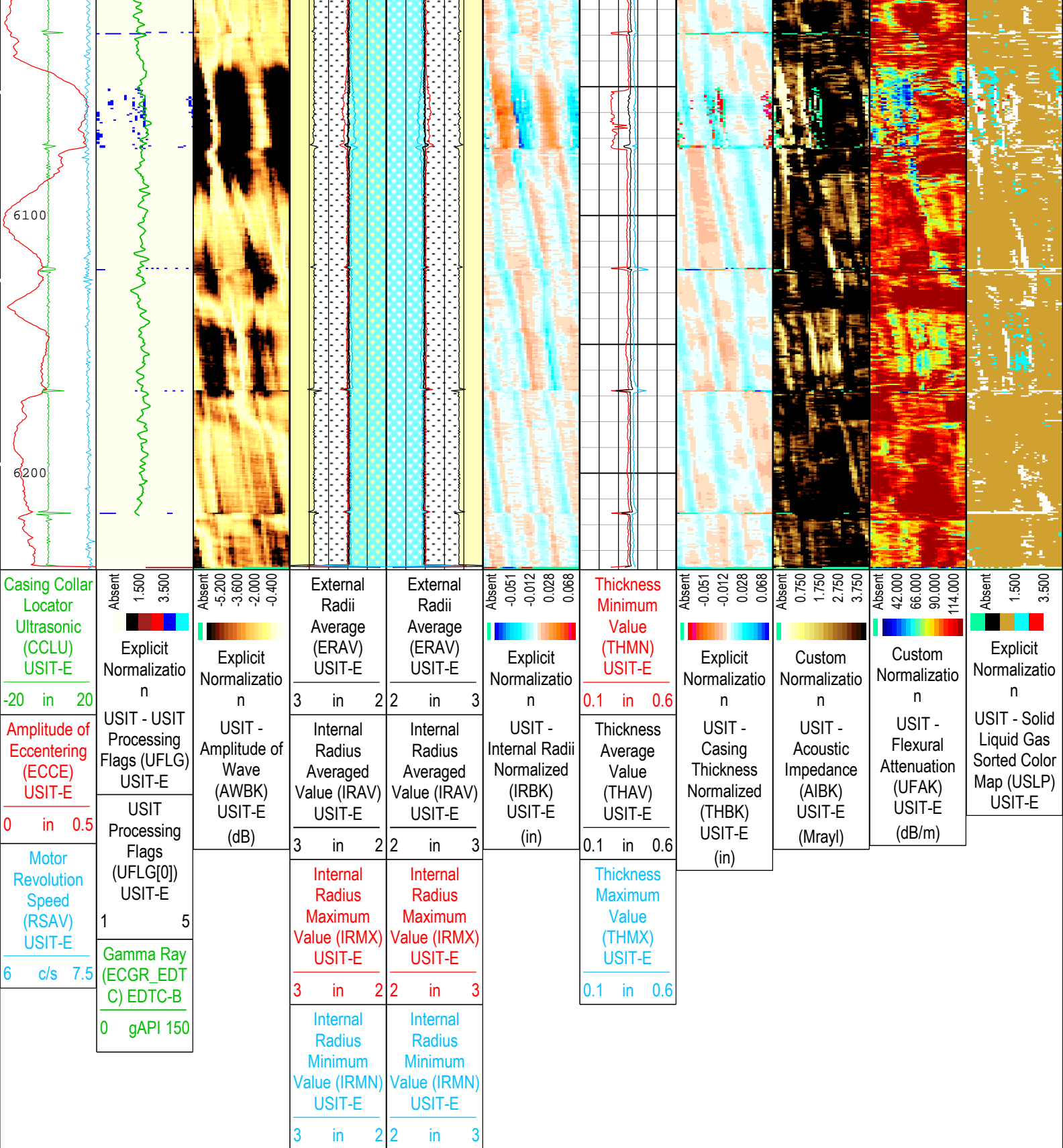












TIME_1900 - Time Marked every 60.00 (s)

USIT Processing Flags (UFLG[0]) USIT-E

- | | |
|---|---------------------------|
| 1 - UFLG 1 Value within [0.0 - 1.5] - : | UTIM Error |
| 2 - UFLG 2 Value within [1.5 - 2.5] - : | Pulse Origin Not Detected |
| 3 - UFLG 3 Value within [2.5 - 3.5] - : | WINLEN Error |
| 4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - : | Casing Thickness Error |
| 5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - : | Loop Processing Error |

Channel Processing Parameters

Isolation scanner: Parameters

Parameter	Description	Tool	Value	Unit
BARI(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	Depth Zoned	in
CBLO	Casing Bottom (Logger)	WLSESSION	12283	ft
CDEN	Cement Density	USIT-E	0	lbm/gal
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Light Cement	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FD	Fluid Density	USIT-E	10	lbm/gal
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
HEMA	Hematite Presence Flag	Borehole	No	
IBC_FRP_OFFSET	IBC Flexural Offset from Free Pipe	USIT-E	30.32	dB/m
IBC_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	IBC_FRP_OFFSET	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	FreePipe Norm.	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.46	
MUD_N_INV	IBC Inversion Mud Normalization Factor	USIT-E	1.21	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.15	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.8	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	30.17	dB/m
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SolidLiquidGasMap	
ZMUD	Acoustic Impedance of Mud	Borehole	1.8	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.6	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	11.5	715	2008
BS	8.5	2008	6237.5

All depth are actual.

Tool Control Parameters

Isolation scanner: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	48	dB
EMXV	EMEX Voltage	USIT-E	Time Zoned	V
IBC_ACQTYPE	IBC Acquisition type	USIT-E	1 MHz	
IBC_FLEXDBP	IBC Flex Duration Before Peak	USIT-E	30	us
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
U-USIT_UFWB	Far Receiver Window Begin Time	USIT-E	Time Zoned	us

U-USIT_UFWE	Far Receiver Window End Time	USIT-E	177	us
U-USIT_UNWB	Near Receiver Window Begin Time	USIT-E	106	us
U-USIT_UNWE	Near Receiver Window End Time	USIT-E	Time Zoned	us
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 6.0 in	
U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VRES	Vertical Resolution	USIT-E	6.0 in	
WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	Time Zoned	us

Time Zone Parameters					
Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	20	20-Jan-2019 12:03:15	20-Jan-2019 13:03:15	6238.58	1875.95
EMXV	45	20-Jan-2019 13:03:15	20-Jan-2019 13:03:26	1875.95	1861.71
EMXV	40	20-Jan-2019 13:03:26	20-Jan-2019 13:19:25	1861.71	704.39
U-USIT_UFWB	137	20-Jan-2019 12:03:15	20-Jan-2019 12:03:47	6238.58	6210.24
U-USIT_UFWB	133.74	20-Jan-2019 12:03:47	20-Jan-2019 12:03:55	6210.24	6201.03
U-USIT_UFWB	136.69	20-Jan-2019 12:03:55	20-Jan-2019 13:19:25	6201.03	704.39
U-USIT_UNWE	146	20-Jan-2019 12:03:15	20-Jan-2019 12:04:02	6238.58	6193.7
U-USIT_UNWE	142.25	20-Jan-2019 12:04:02	20-Jan-2019 13:19:25	6193.7	704.39
WINE	71.88	20-Jan-2019 12:03:15	20-Jan-2019 12:10:40	6238.58	5704.38
WINE	73.84	20-Jan-2019 12:10:40	20-Jan-2019 13:19:25	5704.38	704.39

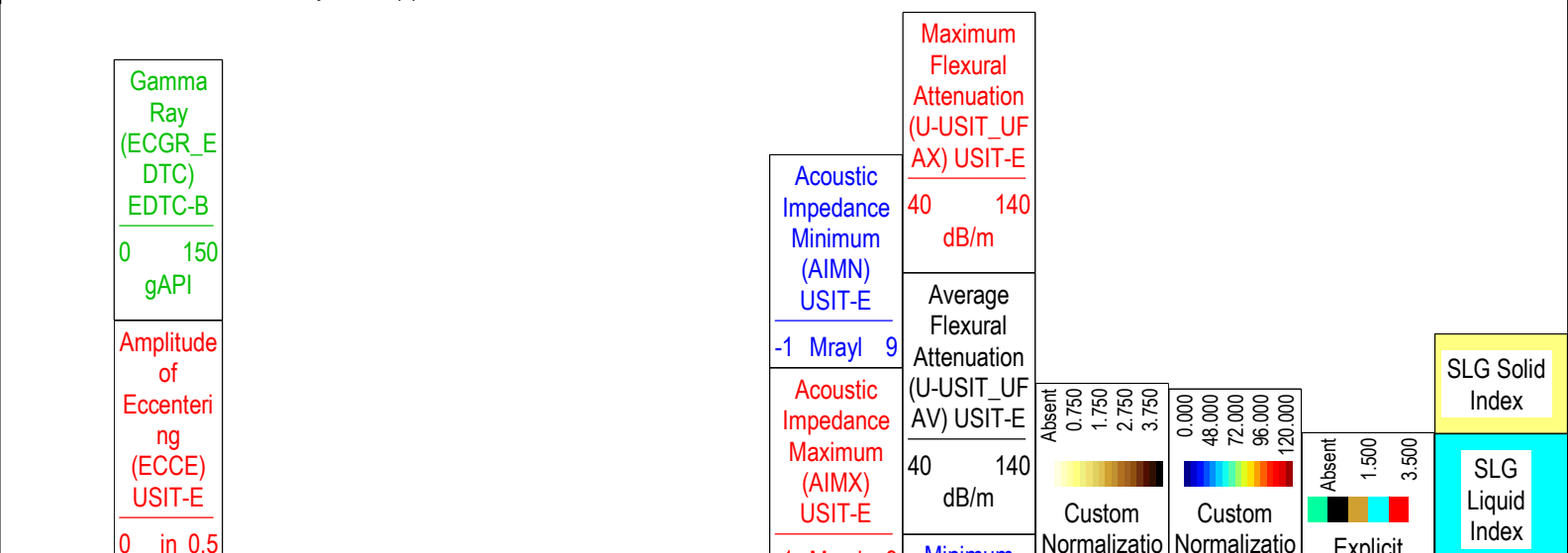
All depth are at tool zero.									
Isolation scanner									
IBC Goodwin Compressed									

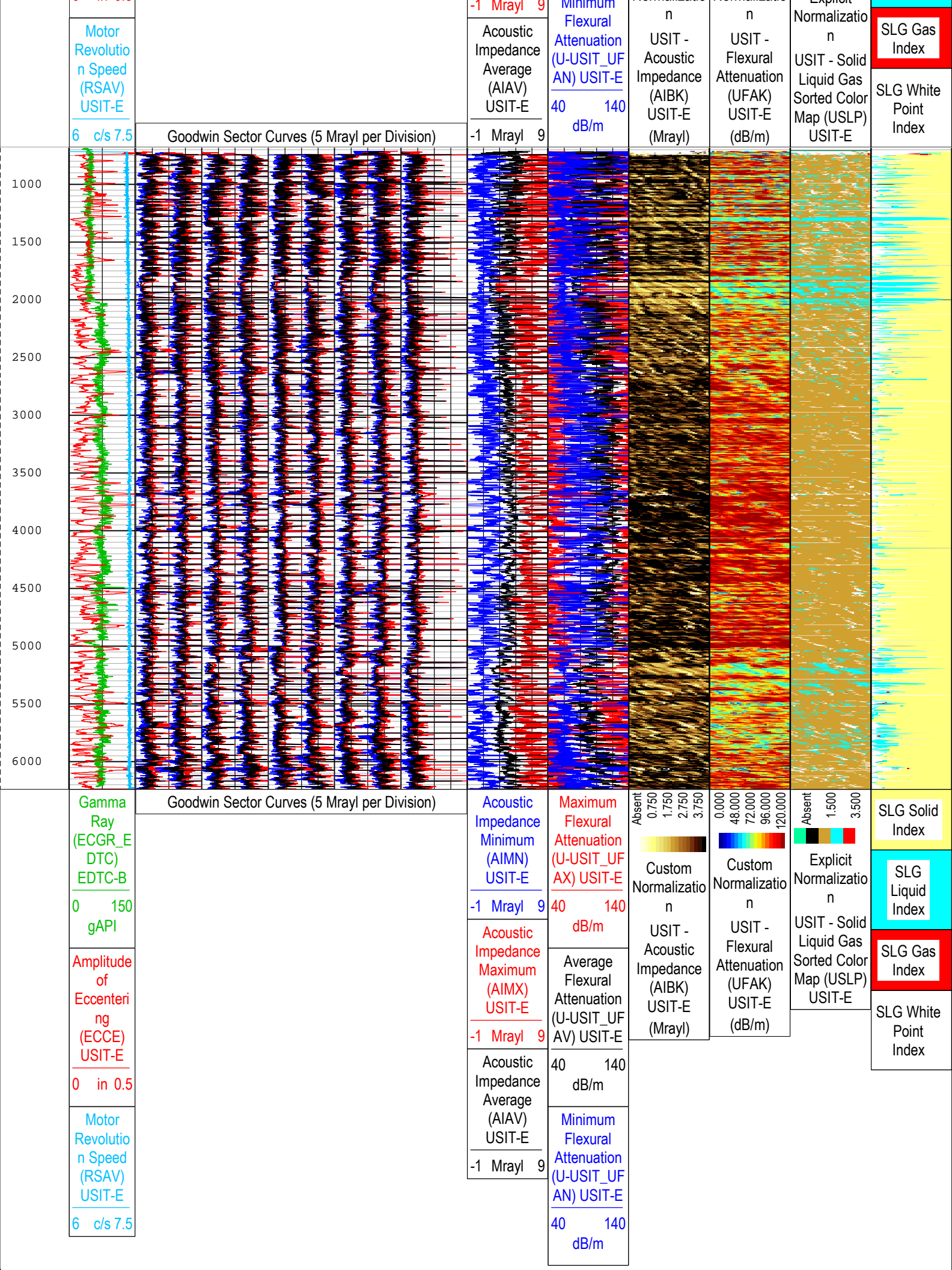
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Isolation scanner	Log[4]:Up	Up	704.39 ft	6238.58 ft	20-Jan-2019 12:03:15 PM	20-Jan-2019 1:19:25 PM	ON	5.87 ft	Yes

All depths are referenced to toolstring zero									
Log	<div>Company:Crestone Peak Resources Operating LLC Well:Herren #1C-33H-H367</div> <div>Isolation scanner: Log[4]:Up:S005</div>								

Description: USI Goodwin Format: Log (IBC Goodwin) Index Scale: 0.1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 21-Jan-2019 07:53:00

TIME_1900 - Time Marked every 60.00 (s)





TIME_1900 - Time Marked every 60.00 (s)

Description: USI Goodwin Format: Log (IBC Goodwin) Index Scale: 0.1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 21-Jan-2019 07:53:00

Isolation scanner

IBC SLG Repeat

Software Version

Acquisition System	Version
Maxwell 2018 SP2	8.2.104493.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Isolation scanner	Log[1]:Up	Up	2146.05 ft	2503.62 ft	20-Jan-2019 11:22:31 AM	20-Jan-2019 11:27:47 AM	ON	2.00 ft	Yes

All depths are referenced to toolstring zero

Log






Company:Crestone Peak Resources Operating LLC Well:Herren #1C-33H-H367

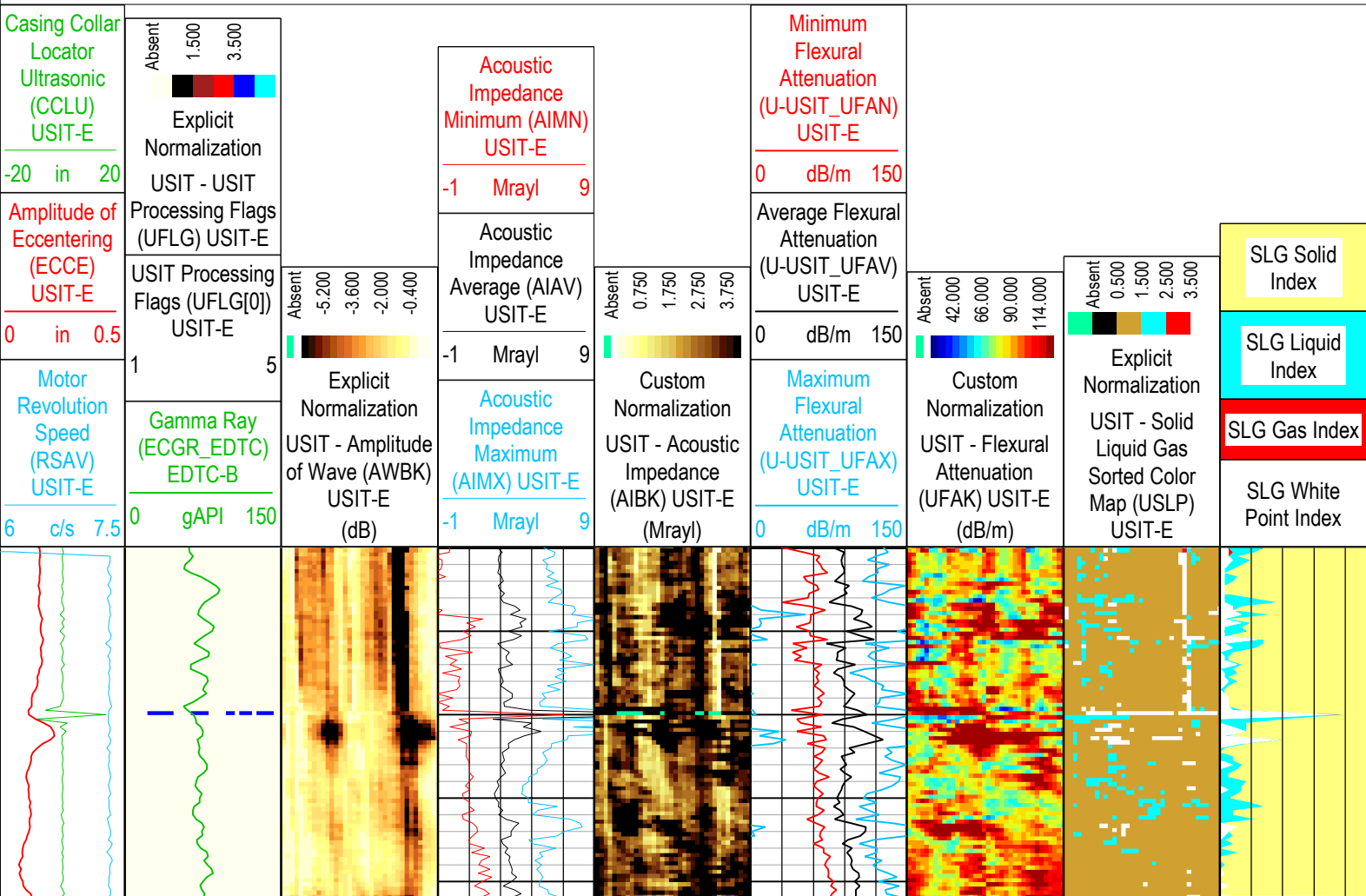
Isolation scanner: Log[1]:Up:S005

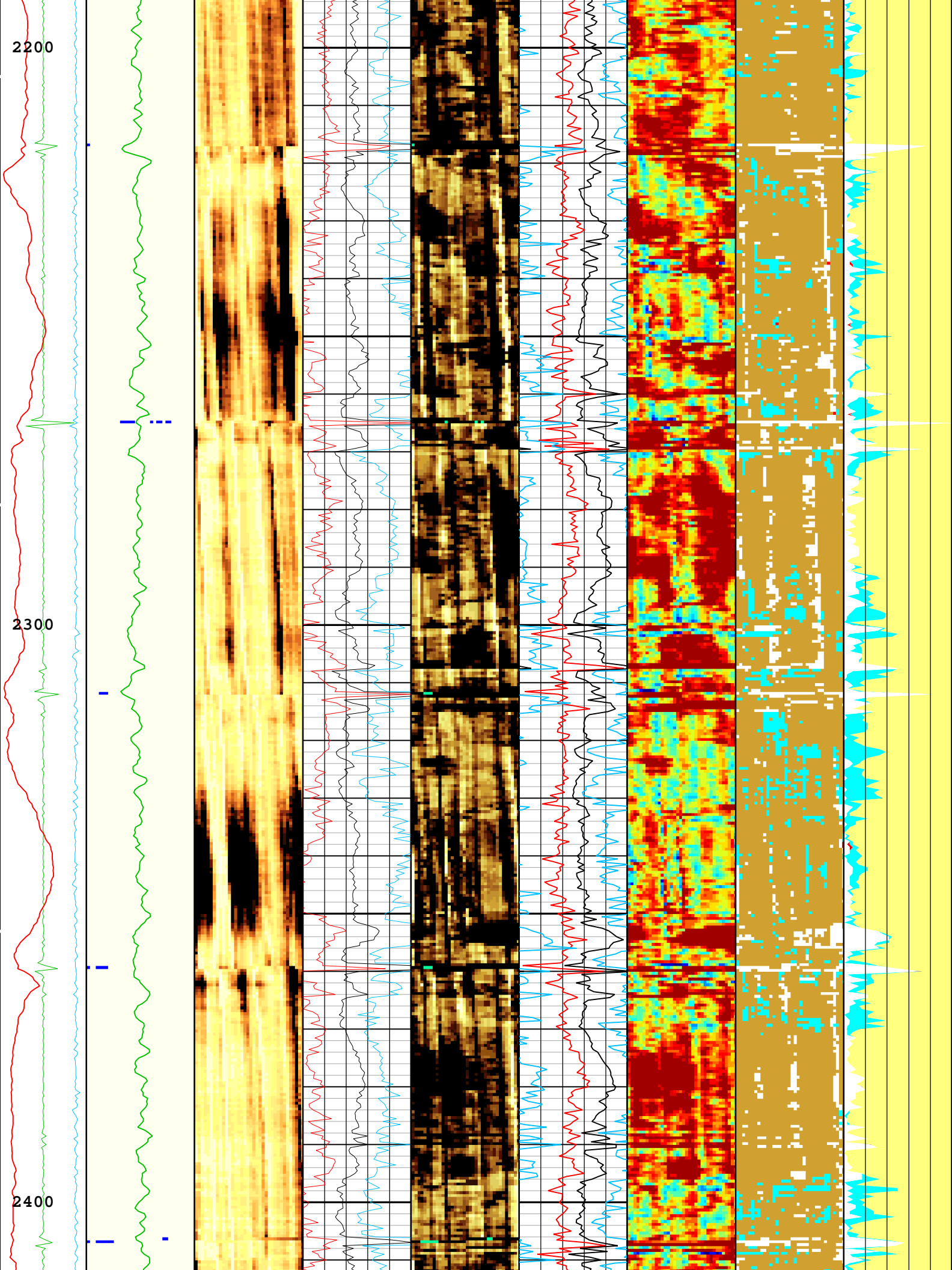
Description: USI IBC SLG Format: Log (IBC SLG) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 21-Jan-2019 07:53:10

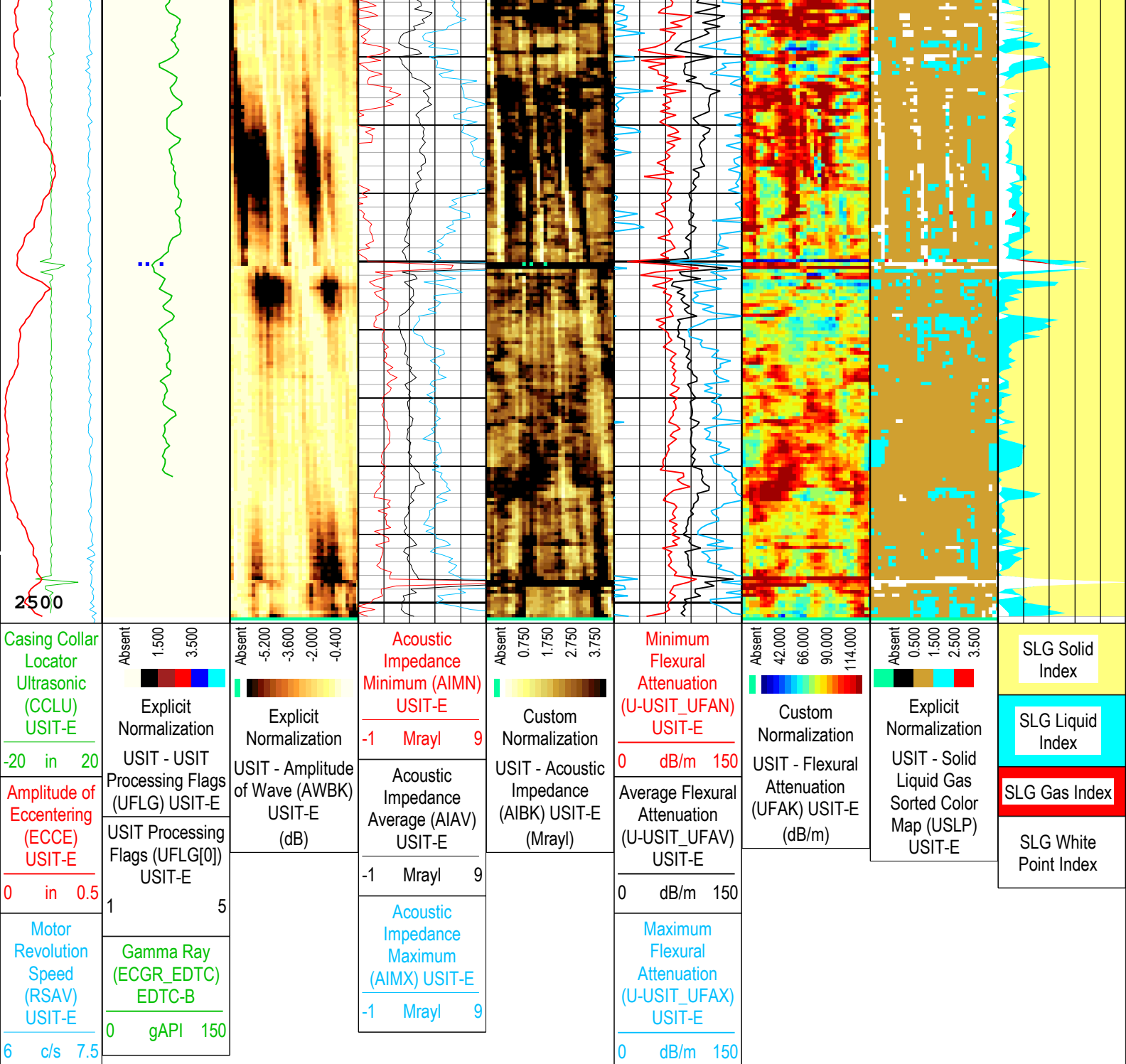
TIME_1900 - Time Marked every 60.00 (s)

USIT Processing Flags (UFLG[0]) USIT-E

- 1 - UFLG 1 Value within [0.0 - 1.5] - :  UTIM Error
- 2 - UFLG 2 Value within [1.5 - 2.5] - :  Pulse Origin Not Detected
- 3 - UFLG 3 Value within [2.5 - 3.5] - :  WINLEN Error
- 4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :  Casing Thickness Error
- 5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :  Loop Processing Error







USIT Processing Flags (UFLG[0]) USIT-E

- | | |
|---|-----------------------------|
| 1 - UFLG 1 Value within [0.0 - 1.5] - : | ■ UTIM Error |
| 2 - UFLG 2 Value within [1.5 - 2.5] - : | ■ Pulse Origin Not Detected |
| 3 - UFLG 3 Value within [2.5 - 3.5] - : | ■ WINLEN Error |
| 4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - : | ■ Casing Thickness Error |
| 5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - : | ■ Loop Processing Error |

TIME_1900 - Time Marked every 60.00 (s)

Description: USI IBC SLG Format: Log (IBC SLG) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 21-Jan-2019 07:53:10

Channel Processing Parameters				
Isolation scanner: Parameters				
Parameter	Description	Tool	Value	Unit
BARI(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BERJ	Bad Echo Rejection	USIT-E	On	

BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	8.5	in
CASING_PRATIO	Casing Poisson Ratio	USIT-E	Standard Poisson Ratio	
CBLO	Casing Bottom (Logger)	WLSESSION	12283	ft
CDEN	Cement Density	USIT-E	0	lbm/gal
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Light Cement	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FD	Fluid Density	USIT-E	10	lbm/gal
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
GR_MULTIPLIER	Gamma Ray Multiplier	EDTC-B	1	
HEMA	Hematite Presence Flag	Borehole	No	
IBC_FRP_OFFSET	IBC Flexural Offset from Free Pipe	USIT-E	30.32	dB/m
IBC_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	IBC_FRP_OFFSET	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	FreePipe Norm.	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.46	
MUD_N_INV	IBC Inversion Mud Normalization Factor	USIT-E	1.21	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.15	
RCOD	Reference Calibrator Outer Diameter	USIT-E	4.5	in
RCSO	Reference Calibrator Standoff	USIT-E	0.842	in
RCTH	Reference Calibrator Thickness	USIT-E	0.216	in
SOCN	Standoff Distance	EDTC-B	0.125	in
SOCO	Standoff Correction Option	EDTC-B	No	
THDH	Maximum Search Thickness (percentage of nominal)	USIT-E	130	%
THDL	Minimum Search Thickness (percentage of nominal)	USIT-E	70	%
TPOS_EDTC	Tool Position: Centered or Eccentered	EDTC-B	Eccentered	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.8	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	30.17	dB/m
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SolidLiquidGasMap	
USI_RPLUS	Ultrasonic R+ Processing	USIT-E	No	
THDP	Thickness Detection Policy	USIT-E	Fundamental	
VCAS	Ultrasonic Transversal Velocity in Casing	USIT-E	51.4	us/ft
ZCAS	Acoustic Impedance of Casing	USIT-E	46.25	Mrayl
ZINI	Initial Estimate of Cement Impedance	USIT-E	-1	Mrayl
ZMUD	Acoustic Impedance of Mud	Borehole	1.8	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.6	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Tool Control Parameters

Isolation scanner: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB

AGMX	Maximum Gain of Cartridge	USIT-E	48	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
DOT(DOS)	Distance between Opposite Transducer Faces	USIT-E	1.756	in
EMXV	EMEX Voltage	USIT-E	20	V
HRES	Horizontal Resolution	USIT-E	10 deg	
IBC_ACQTYPE	IBC Acquisition type	USIT-E	1 MHz	
IBC_FLEXDBP	IBC Flex Duration Before Peak	USIT-E	30	us
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
MOTOR_PROTECT	Motor Protection	USIT-E	On	
UACLV_PERM	Ultrasonic ACLV Permanent	USIT-E	Yes	
U-USIT_UFWB	Far Receiver Window Begin Time	USIT-E	137	us
U-USIT_UFWE	Far Receiver Window End Time	USIT-E	177	us
U-USIT_UNWB	Near Receiver Window Begin Time	USIT-E	106	us
U-USIT_UNWE	Near Receiver Window End Time	USIT-E	146	us
USFR	Ultrasonic Sampling Frequency	USIT-E	666667	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 6.0 in	
USSP	Ultrasonic Service	USIT-E	IBC	
U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VRES	Vertical Resolution	USIT-E	6.0 in	
WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	Time Zoned	us

Time Zone Parameters					
Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
WINE	71.88	20-Jan-2019 11:22:31	20-Jan-2019 11:24:21	2503.62	2400.13
WINE	74.8	20-Jan-2019 11:24:21	20-Jan-2019 11:27:47	2400.13	2146.05

All depths are at tool zero.

Isolation scanner

IBC SLG Composite Repeat






Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Isolation scanner	Log[1]:Up	Up	2146.05 ft	2503.62 ft	20-Jan-2019 11:22:31 AM	20-Jan-2019 11:27:47 AM	ON	2.00 ft	Yes

All depths are referenced to toolstring zero

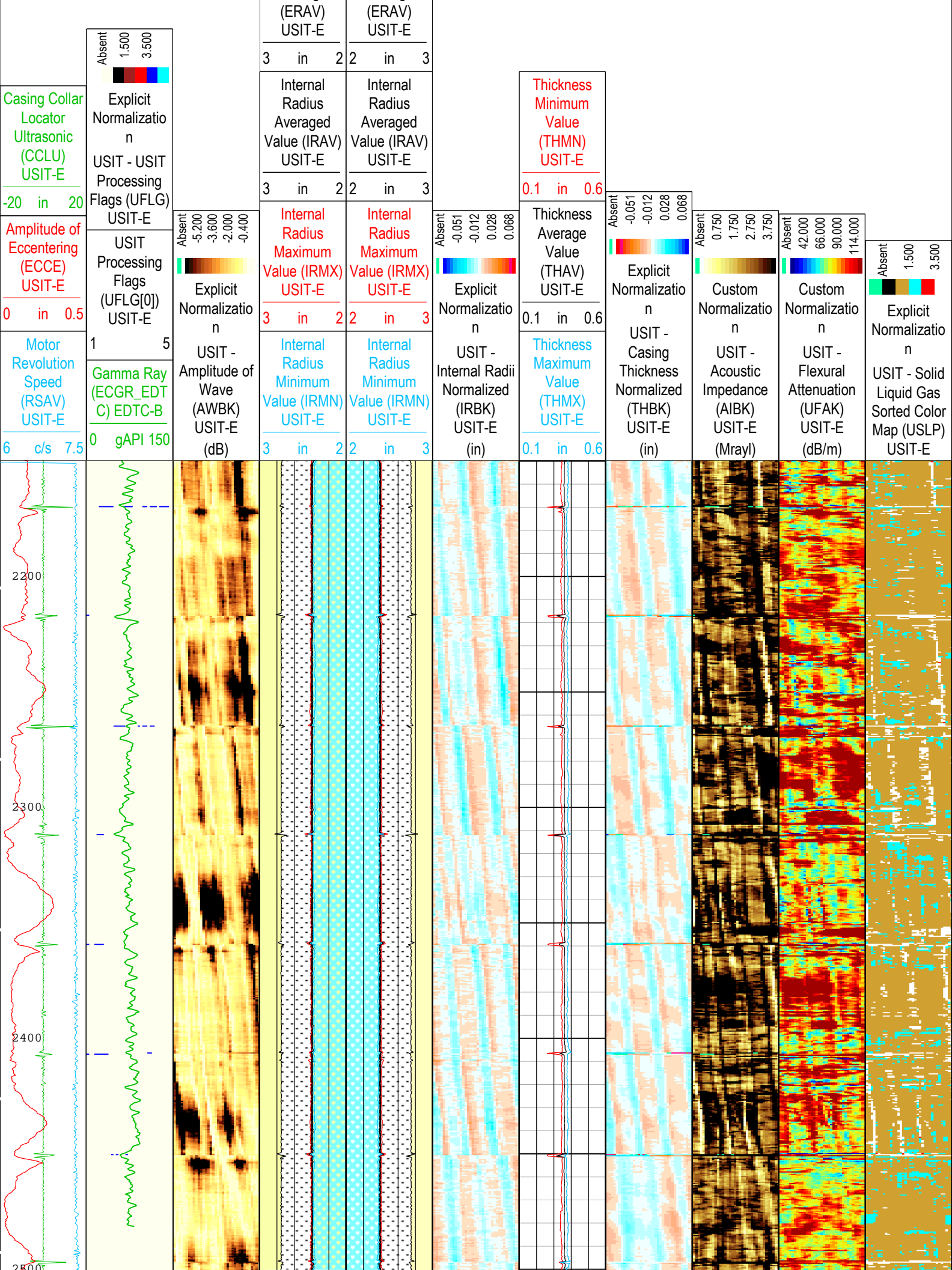
Log	Company:Crestone Peak Resources Operating LLC Well:Herren #1C-33H-H367 Isolation scanner: Log[11]:Up:S005
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Description: USI IBC SLG Composite Format: Log (IBC SLG Composite) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 21-Jan-2019 07:53:19

TIME_1900 - Time Marked every 60.00 (s)






USIT Processing Flags (UFLG[0]) USIT-E			
1 - UFLG 1 Value within [0.0 - 1.5] - :		UTIM Error	
2 - UFLG 2 Value within [1.5 - 2.5] - :		Pulse Origin Not Detected	
3 - UFLG 3 Value within [2.5 - 3.5] - :		WINLEN Error	
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :		Casing Thickness Error	
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :		Loop Processing Error	

		External Radii Average	External Radii Average	
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2.500	Casing Collar Locator Ultrasonic (CCLU) USIT-E	Absent 1.500 3.500 Explicit Normalization n	Absent 5.200 -3.600 -2.000 -0.400 Explicit Normalization n	External Radii Average (ERAV) USIT-E	External Radii Average (ERAV) USIT-E	Absent -0.051 -0.012 0.028 0.068 Explicit Normalization n	Thickness Minimum Value (THMN) USIT-E	Absent -0.051 -0.012 0.028 0.068 Explicit Normalization n	Absent 0.750 1.750 2.750 3.750 Custom Normalization n	Absent 42.000 66.000 90.000 114.000 Custom Normalization n	Absent 1.500 3.500 Explicit Normalization n
-20 in 20	Amplitude of Eccentering (ECCE) USIT-E	USIT - USIT Processing Flags (UFLG) USIT-E	USIT - Amplitude of Wave (AWBK) USIT-E (dB)	3 in 2	2 in 3	USIT - Internal Radii Normalized (IRBK) USIT-E (in)	0.1 in 0.6	USIT - Casing Thickness Normalized (THBK) USIT-E (in)	USIT - Acoustic Impedance (AIBK) USIT-E (Mrayl)	USIT - Flexural Attenuation (UFAK) USIT-E (dB/m)	USIT - Solid Liquid Gas Sorted Color Map (USLP) USIT-E
0 in 0.5	Motor Revolution Speed (RSAV) USIT-E	USIT Processing Flags (UFLG[0]) USIT-E		3 in 2	2 in 3		Thickness Average Value (THAV) USIT-E				
6 c/s 7.5		1 5		Internal Radius Maximum Value (IRMX) USIT-E	Internal Radius Maximum Value (IRMX) USIT-E		Thickness Maximum Value (THMX) USIT-E				
	Gamma Ray (ECGR_EDT C) EDTC-B			3 in 2	2 in 3		0.1 in 0.6				
	0 gAPI 150			Internal Radius Minimum Value (IRMN) USIT-E	Internal Radius Minimum Value (IRMN) USIT-E						
				3 in 2	2 in 3						

USIT Processing Flags (UFLG[0]) USIT-E

- 1 - UFLG 1 Value within [0.0 - 1.5] - :
2 - UFLG 2 Value within [1.5 - 2.5] - :
3 - UFLG 3 Value within [2.5 - 3.5] - :
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :
-  UTIM Error
 Pulse Origin Not Detected
 WINLEN Error
 Casing Thickness Error
 Loop Processing Error

TIME_1900 - Time Marked every 60.00 (s)

Description: USI IBC SLG Composite Format: Log (IBC SLG Composite) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 21-Jan-2019 07:53:19

Channel Processing Parameters				
Isolation scanner: Parameters				
Parameter	Description	Tool	Value	Unit
BARI(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	8.5	in
CBLO	Casing Bottom (Logger)	WLSESSION	12283	ft
CDEN	Cement Density	USIT-E	0	lbm/gal
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Light Cement	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FD	Fluid Density	USIT-E	10	lbm/gal
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
HEMA	Hematite Presence Flag	Borehole	No	
IBC_FRP_OFFSET	IBC Flexural Offset from Free Pipe	USIT-E	30.32	dB/m
IBC_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	IBC_FRP_OFFSET	

IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	FreePipe Norm.	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.46	
MUD_N_INV	IBC Inversion Mud Normalization Factor	USIT-E	1.21	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.15	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.8	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	30.17	dB/m
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SolidLiquidGasMap	
ZMUD	Acoustic Impedance of Mud	Borehole	1.8	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.6	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Tool Control Parameters

Isolation scanner: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	48	dB
EMXV	EMEX Voltage	USIT-E	20	V
IBC_ACQTYPE	IBC Acquisition type	USIT-E	1 MHz	
IBC_FLEXDBP	IBC Flex Duration Before Peak	USIT-E	30	us
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
U-USIT_UFWB	Far Receiver Window Begin Time	USIT-E	137	us
U-USIT_UFWE	Far Receiver Window End Time	USIT-E	177	us
U-USIT_UNWB	Near Receiver Window Begin Time	USIT-E	106	us
U-USIT_UNWE	Near Receiver Window End Time	USIT-E	146	us
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 6.0 in	
U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VRES	Vertical Resolution	USIT-E	6.0 in	
WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	Time Zoned	us

Time Zone Parameters

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
WINE	71.88	20-Jan-2019 11:22:31	20-Jan-2019 11:24:21	2503.62	2400.13
WINE	74.8	20-Jan-2019 11:24:21	20-Jan-2019 11:27:47	2400.13	2146.05

All depth are at tool zero.

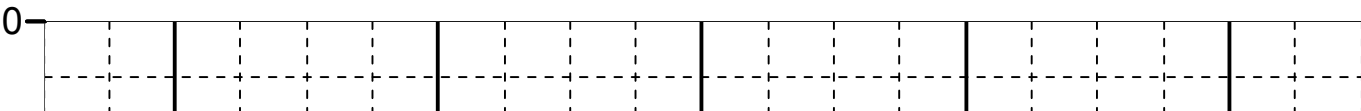
XYZ	Company:Crestone Peak Resources Operating LLC Well:Herren #1C-33H-H367 Isolation scanner: Log[4]:Up:S005
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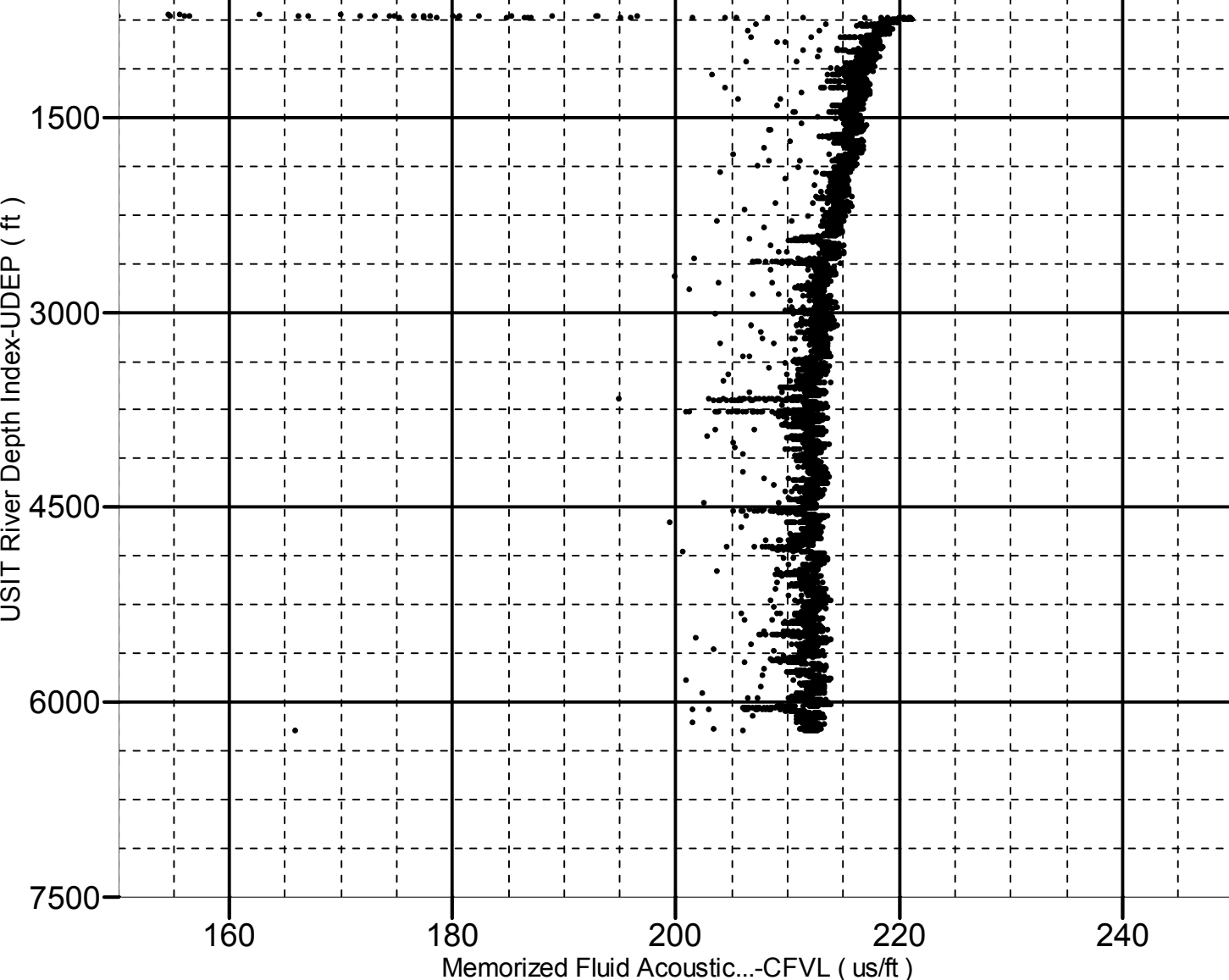
Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6237.50 to 704.00 ft

● CFVL-UDEP





XYZ

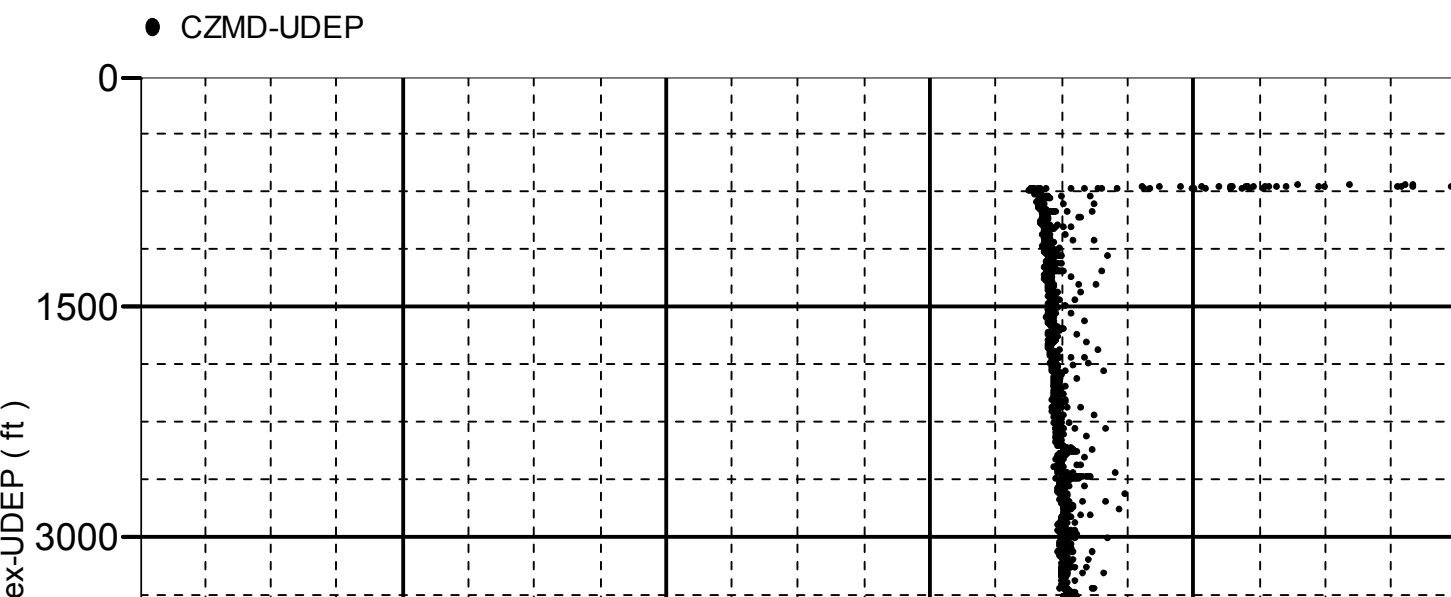
Company:Crestone Peak Resources Operating LLC Well:Herren #1C-33H-H367

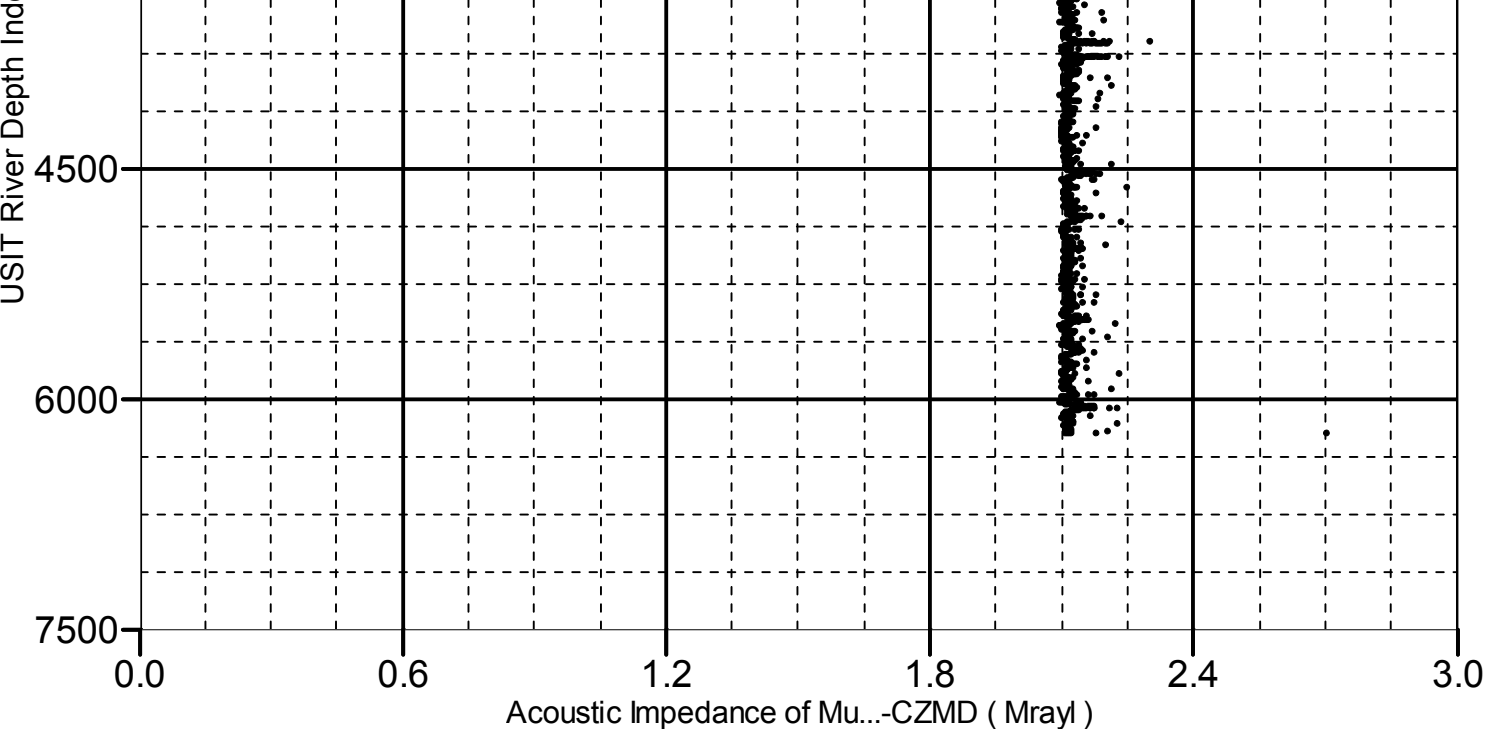
Isolation scanner: Log[4]:Up:S005

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6237.50 to 704.00 ft





Company: Crestone Peak Resources Operating LLC

Schlumberger

Well: Herren #1C-33H-H367

Field: Wattenberg

County: Weld

State: Colorado

Isolation Scanner

Cement Evaluation

Gamma Ray - CCL Log