

Company: Occidental Petroleum

Well: Morton 37-1

Field: Wattenberg

County: Weld State: Colorado

Isolation Scanner
Cement Bond Log
Gamma Ray - CCL

County: Weld
Field: Wattenberg
Location:
Well: Morton 37-1
Company: Occidental Petroleum

Location:		Elev.:	K.B.	4913.00 ft
Permanent Datum:	Ground Level		G.L.	4898.00 ft
Log Measured From:	Kelly Bushing	15.00 ft	D.F.	
Drilling Measured From:	Kelly Bushing			above Perm.Datum
API Serial No.	Section:	Township:	Range:	
05-123-34061	1	1N	67W	

Logging Date: 28-Oct-2021

Run Number: One

Depth Driller: 8243.00 ft

Schlumberger Depth: 6609.00 ft

Bottom Log Interval: 6609.00 ft

Top Log Interval: 300.00 ft

Casing Fluid Type: Water

Salinity:

Density: 9 lbm/gal

Fluid Level: 8.00 ft

BIT/CASING/TUBING STRING

Bit Size: 7.88 in

From: 878.00 ft

To: 6609.00 ft

Casing/Tubing Size: 4.5 in

Weight: 11.6 lbm/ft

Grade: N/A

From: 0.00 ft

To: 8243.00 ft

Max Recorded Temperatures: 189 degF

Logger on Bottom: 28-Oct-2021 08:53:00

Unit Number: 9108 Location: Fort Morgan

Recorded By: M.Oloyede/T.Mozena

Witnessed By: David Almaraz

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 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.

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10.4 Log (IBC SLG CBL DCBL-VDL)

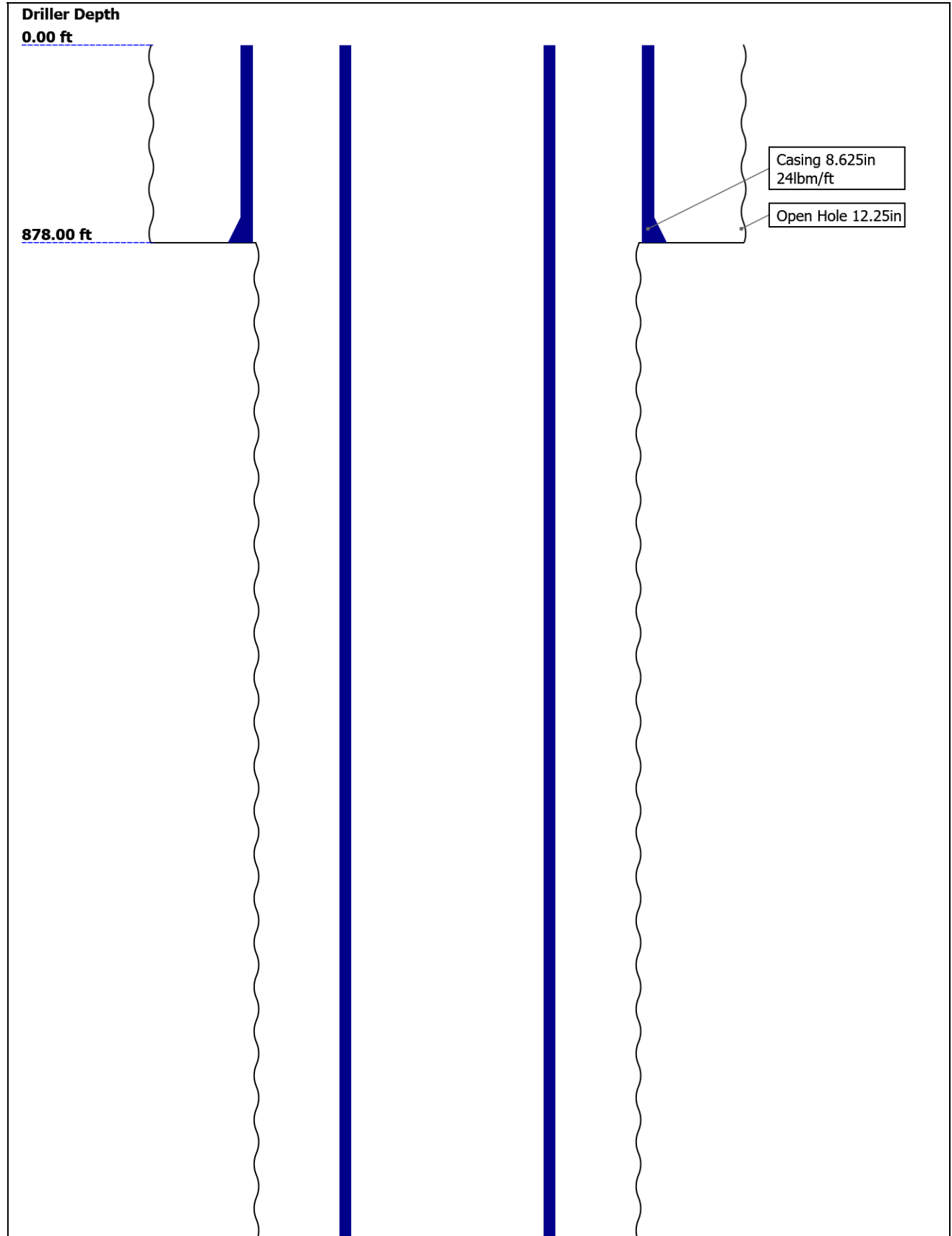
10.5 Parameter Listing

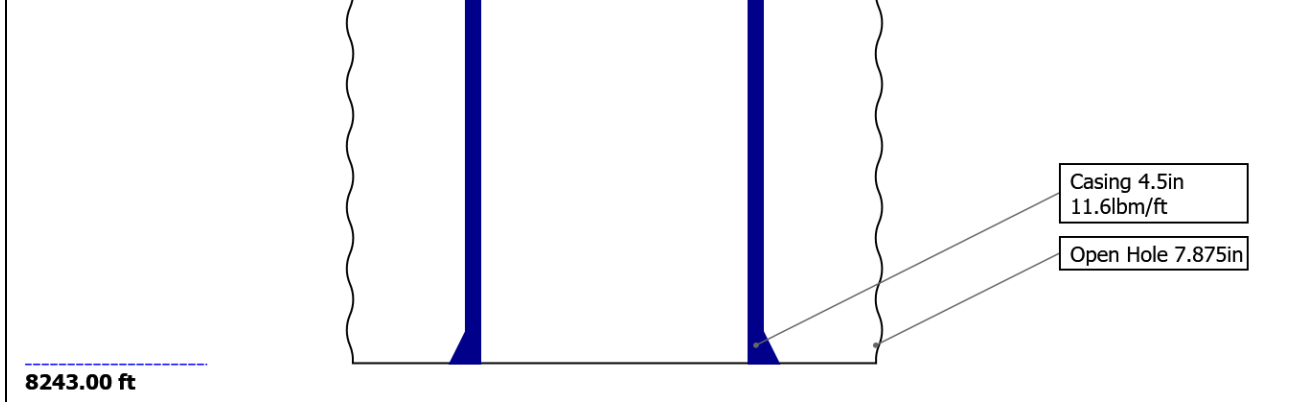
11. XYZ (IBC Fluid Acoustic Slowness vs Depth 6.0 in)

12. XYZ (IBC Acoustic Impedance of Mud vs Depth 6.0 in)

13. Tail

Well Sketch





Borehole Size/Casing/Tubing Record

Bit					
Bit Size (in)	12.25	7.875			
Top Driller (ft)	0	878			
Top Logger (ft)	0	878			
Bottom Driller (ft)	878	8243			
Bottom Logger (ft)	878	6609			
Casing					
Size (in)	8.625	4.5			
Weight (lbm/ft)	24	11.6			
Inner Diameter (in)	8.097	4			
Grade	N/A	N/A			
Top Driller (ft)	0	0			
Top Logger (ft)	0	0			
Bottom Driller (ft)	878	8243			
Bottom Logger (ft)	878	8243			

Remarks and Equipment Summary

One: Toolstring		One: Remarks
Equip name&length LEH-QT 54.87 LEH-QT	MP nameOffset CTEM 47.88 ACCZ 0.00 HV 0.00 Gamma Ray 46.01 TelStat 44.88	Tool was run as per tool sketch All logging intervals as per client request All passes recorded at 10 deg 6 inch resolution Main pass recorded at 500 PSI, surfaced induced Repeat pass recorded at 0 PSI
EDTC-B: 51.38 9301 EDTH-B: 8442 EDTG-A EDTC-B: 9301		
AH-184 44.88 [2]		
CME-AF 42.88 [2]:3308		
ASLT-B: 39.08 8073 ASI T-BR		



Lengths are in ft
 Maximum Outer Diameter = 3.800 in
 Line: Sensor Location, Value: Gating Offset
 All measurements are relative to TOOL_ZERO

Depth Summary			
	One		
Depth Measuring Device			
Type	IDW-B		
Serial Number	5744		

Calibration Date	22-Sep-2021		
Calibrator Serial Number	57		
Calibration Cable Type	7-46A-XS		
Wheel Correction 1	-9		
Wheel Correction 2	-7		

Tension Device			
Type	CMTD-B/A		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0		

Logging Cable			
Type	7-46A-XS		
Serial Number	1234		
Length	30000.00 ft		
Conveyance Type	Wireline		
Rig Type			

One:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well	Schlumberger depth control procedures followed	
Rig Up Length At Surface		IDW used as primary depth control system	
Rig Up Length At Bottom		Z-Chart used as secondary depth control system	
Rig Up Length Correction			
Stretch Correction			
Tool Zero Check At Surface			

USIT - Fluid Properties Measurement

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[6]:Up	6610.38	32.35

**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 = "Theoretical".
CZMD uses theoretical results.
MUD_N_THE=1.05
DFD=1.08g/cm3(9.00lbm/gal)**

Start Depth(ft)	Stop Depth(ft)	Start Value(Mrayl)	End Value(Mrayl)
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One

Main Pass @ 500 PSI

Software Version

Acquisition System	Version
Maxwell 2021.1	11.1.211946.3100
Application Patch	Wireline_NPD-ThruBit-2021.1_11.1.214024

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[6]:Up	Up	32.35 ft	6610.38 ft	28-Oct-2021 8:53:21 AM	28-Oct-2021 10:46:06 AM	ON	9.11 ft	Yes

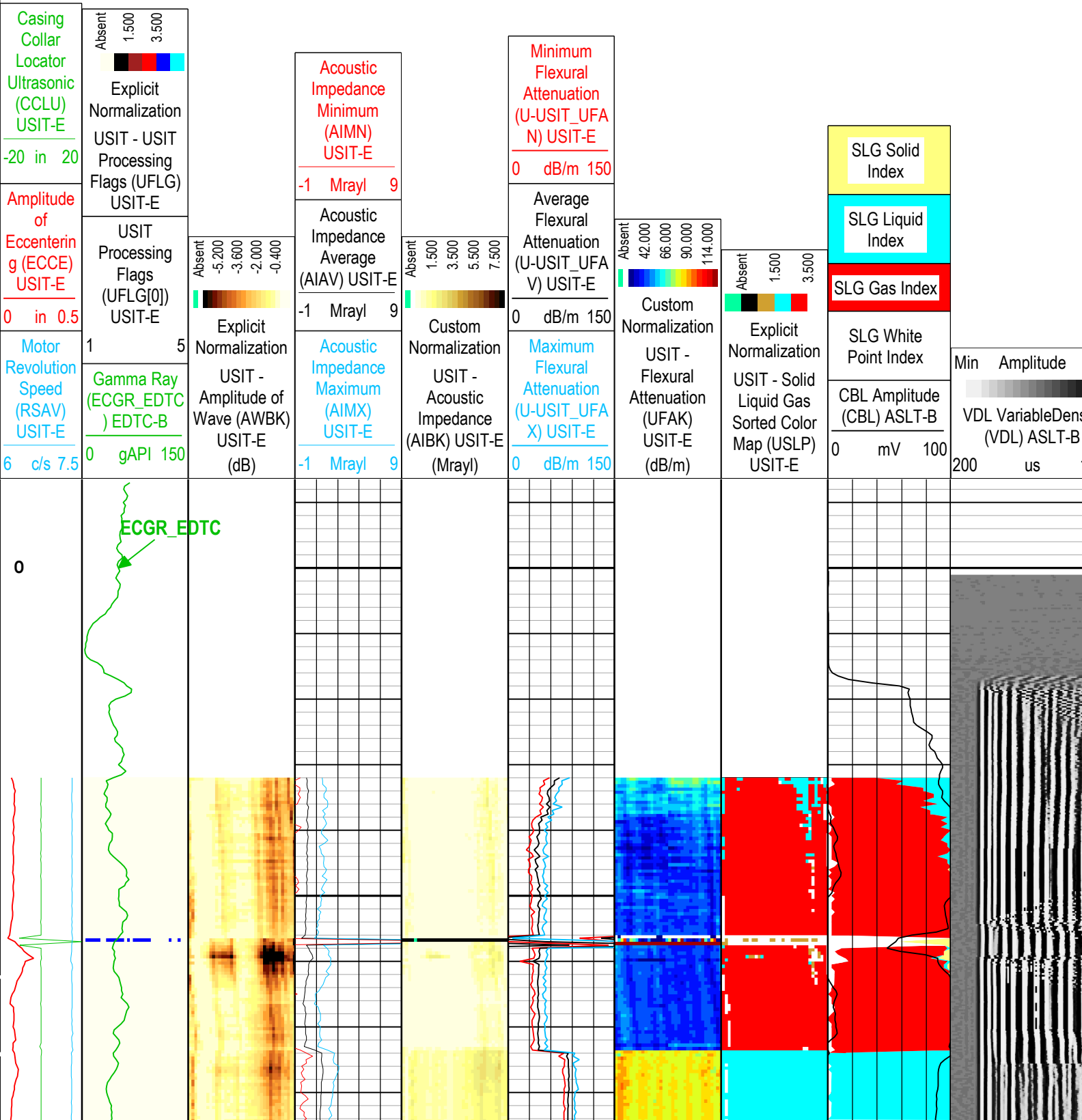
All depths are referenced to toolstring zero

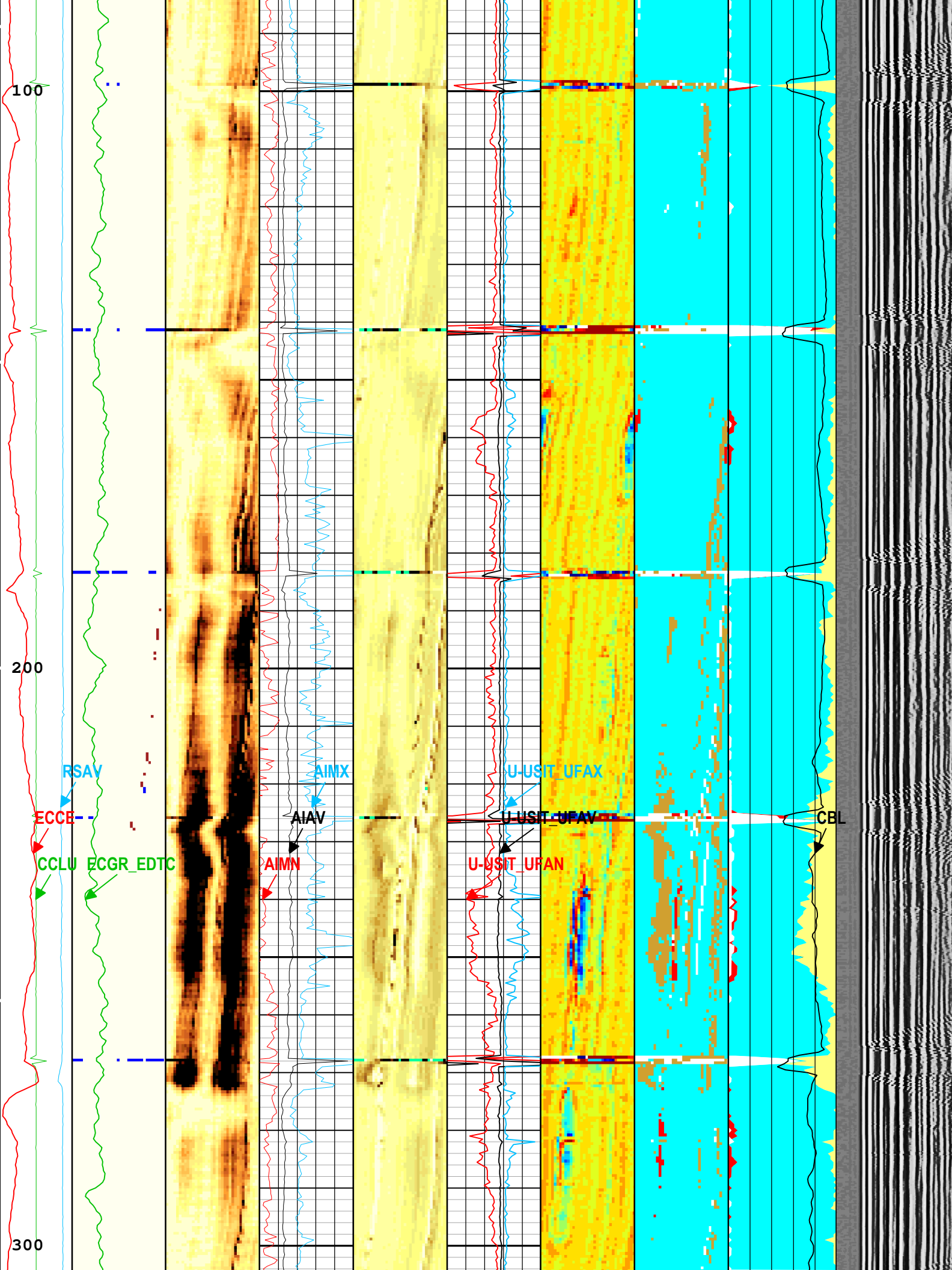
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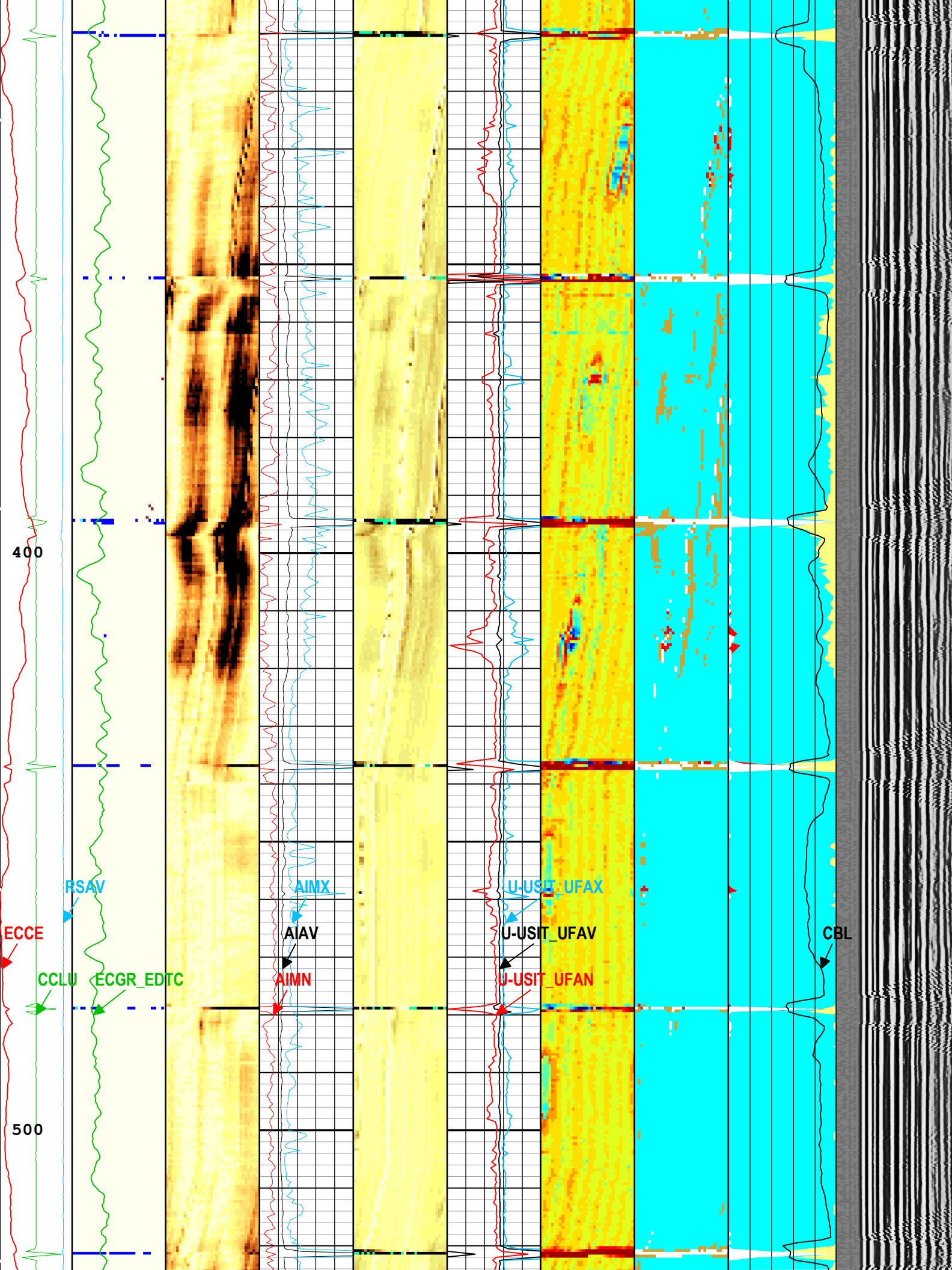
USIT Processing Flags (UFLG[0]) USIT-E

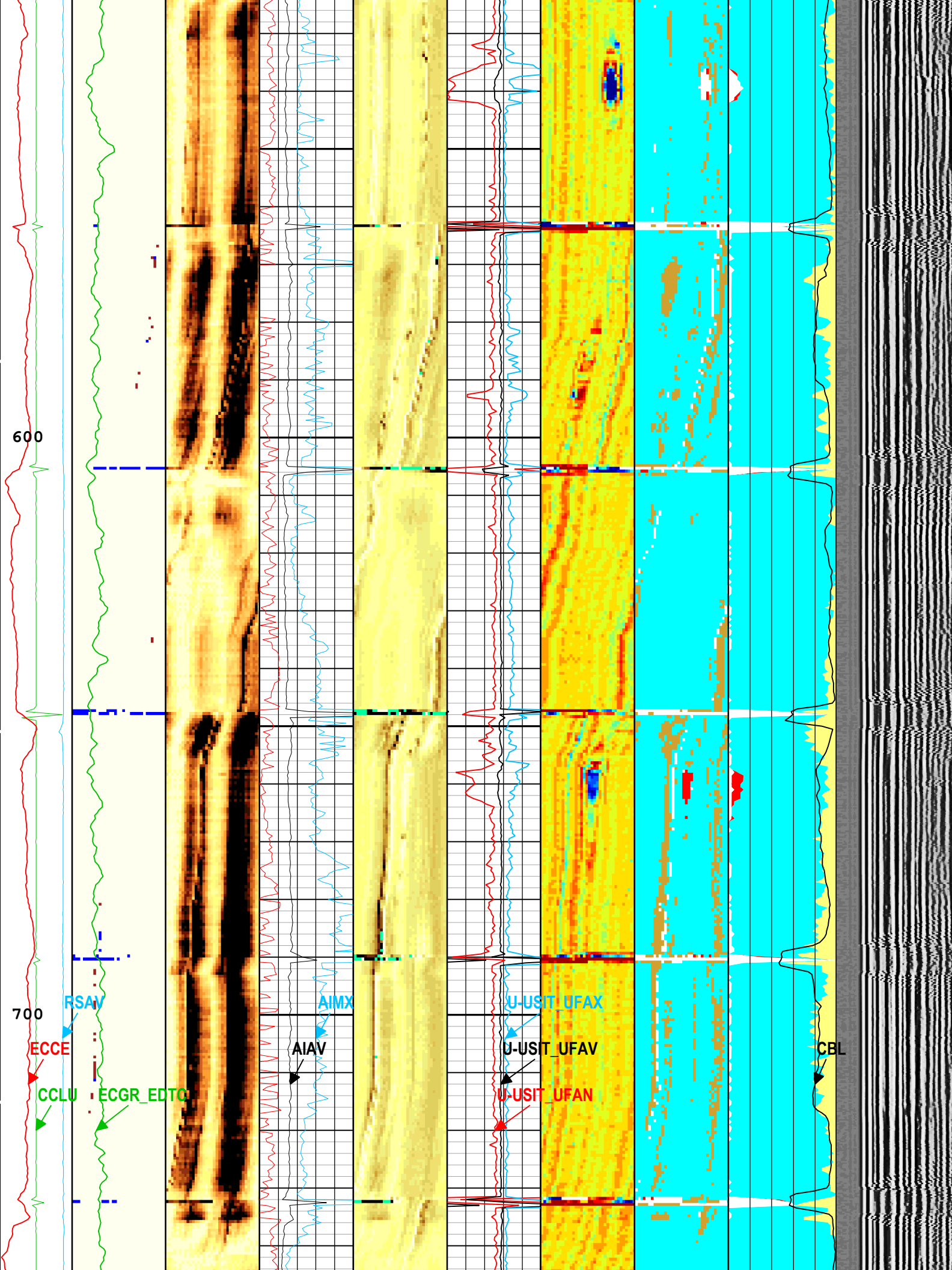
- 1 - UFLG 1 Value within [0.0 - 1.5] - : UTIM Error
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- 4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - : Casing Thickness Error
- 5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - : Loop Processing Error

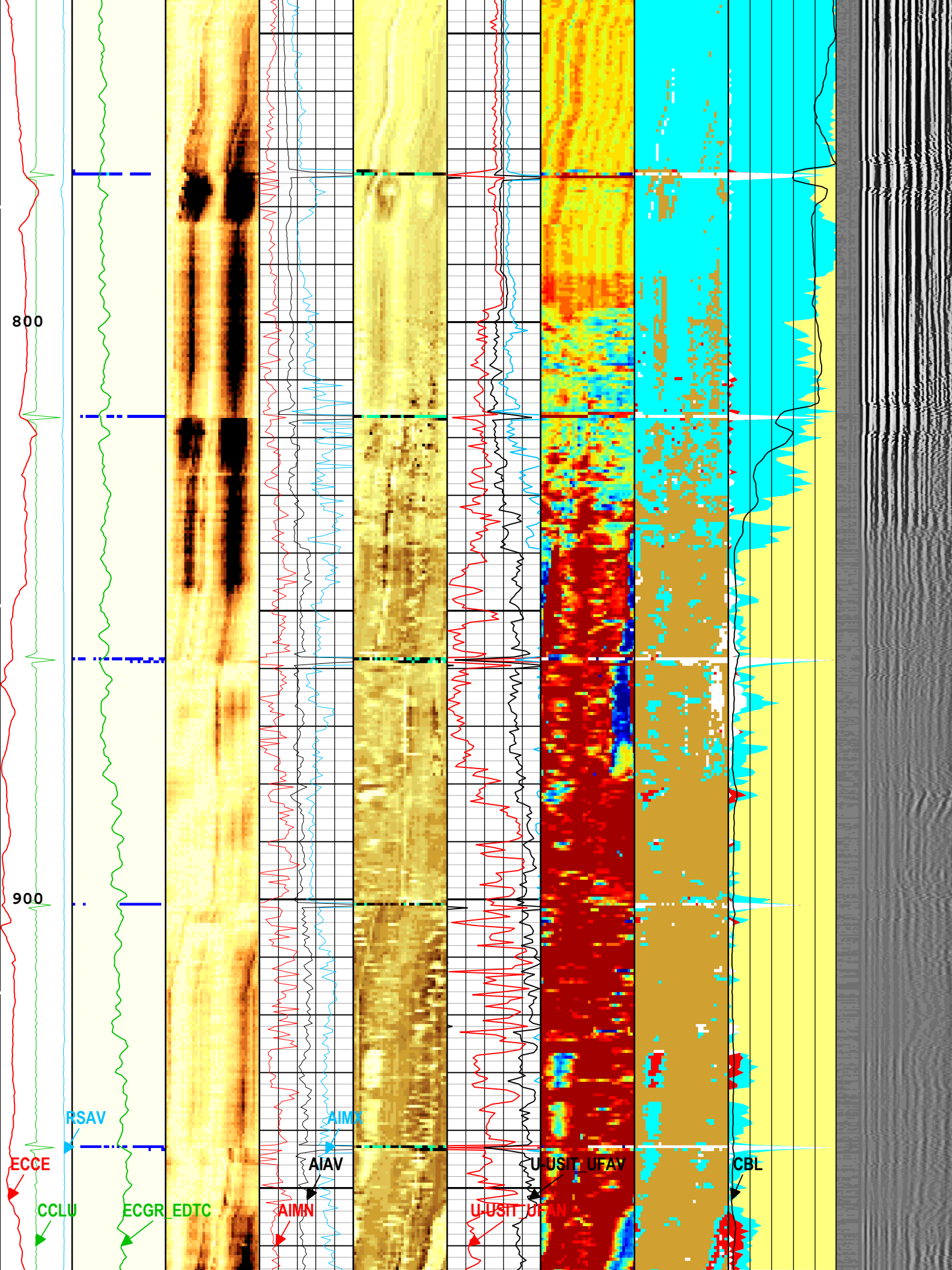
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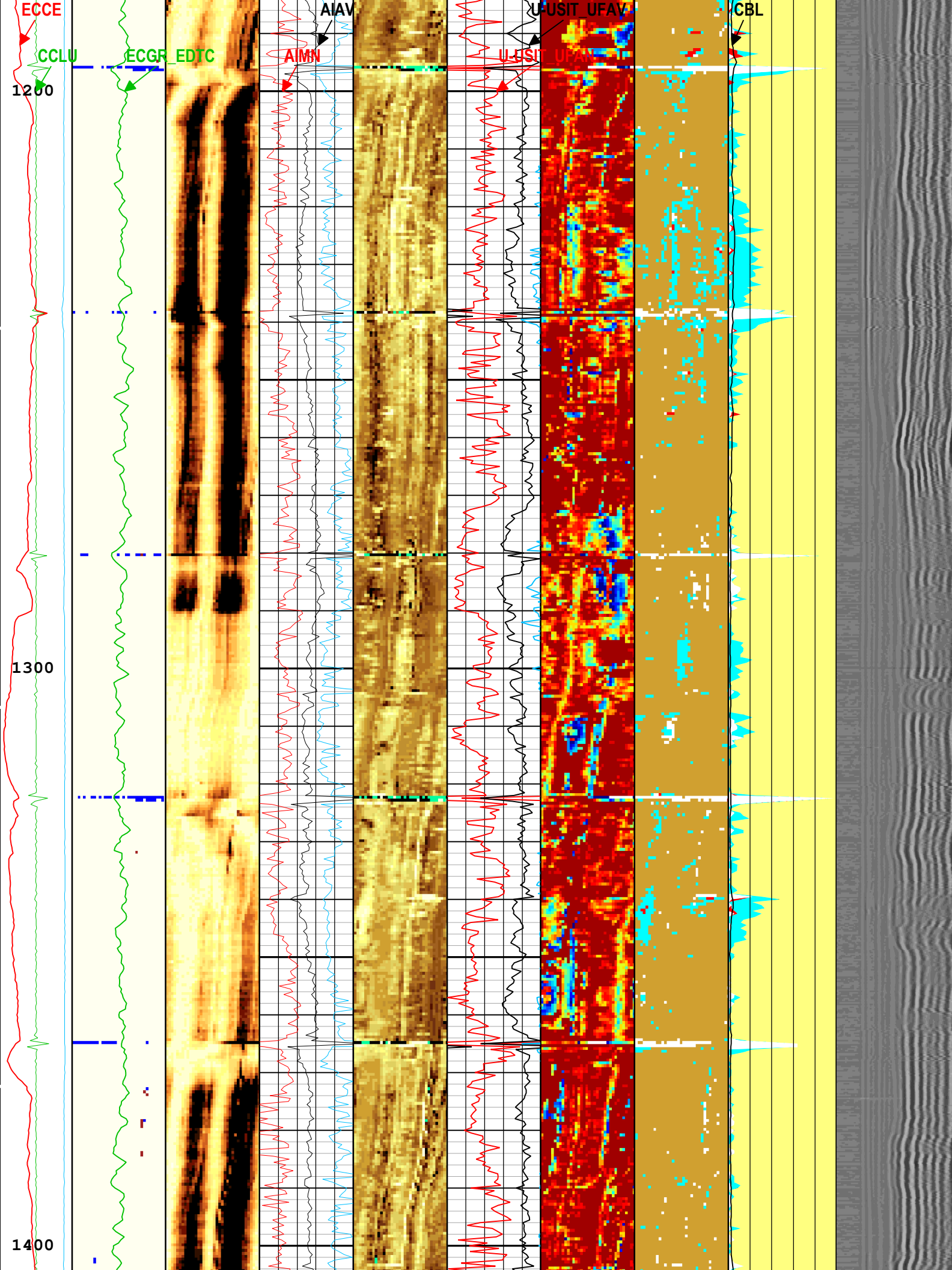


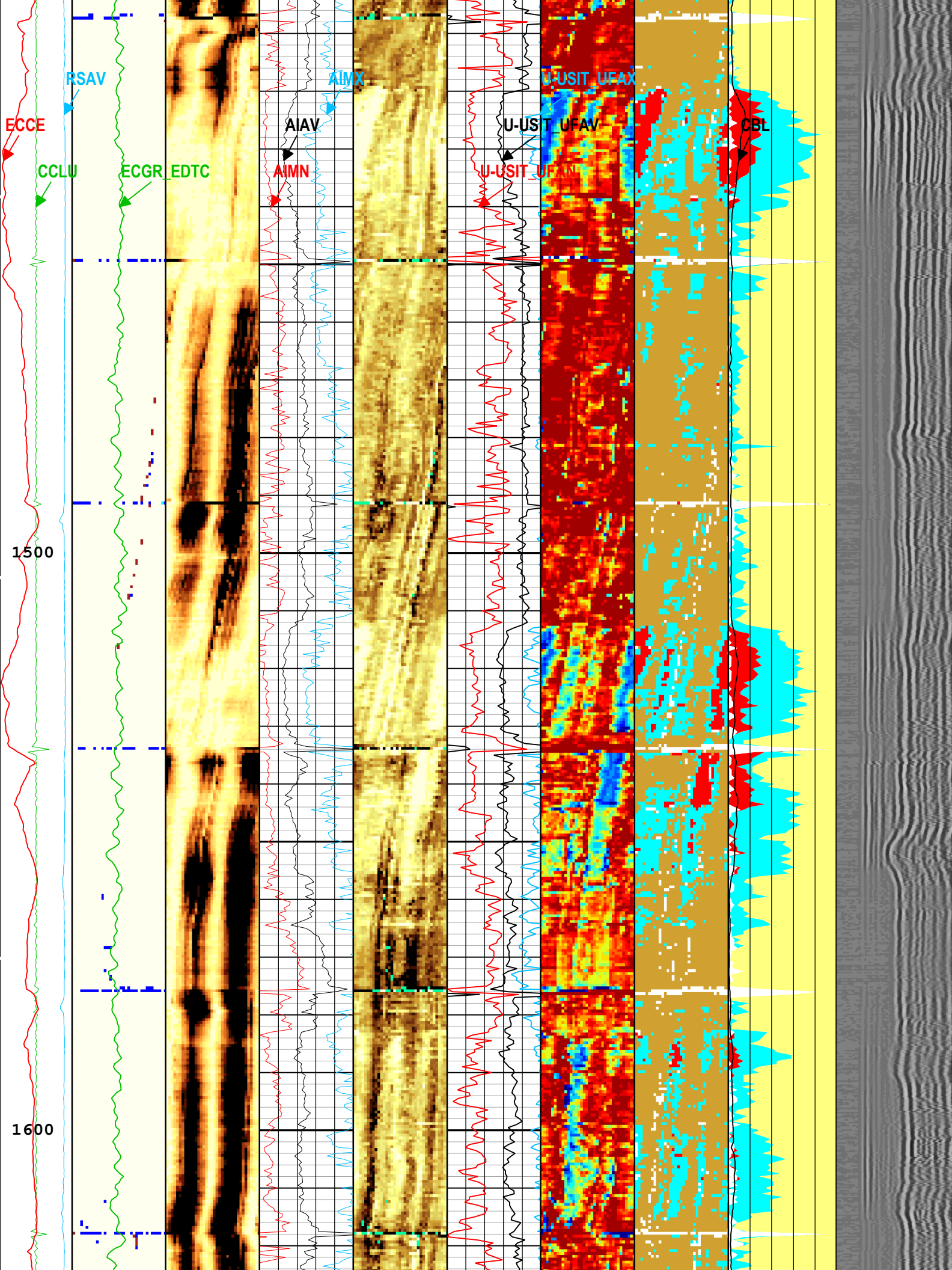


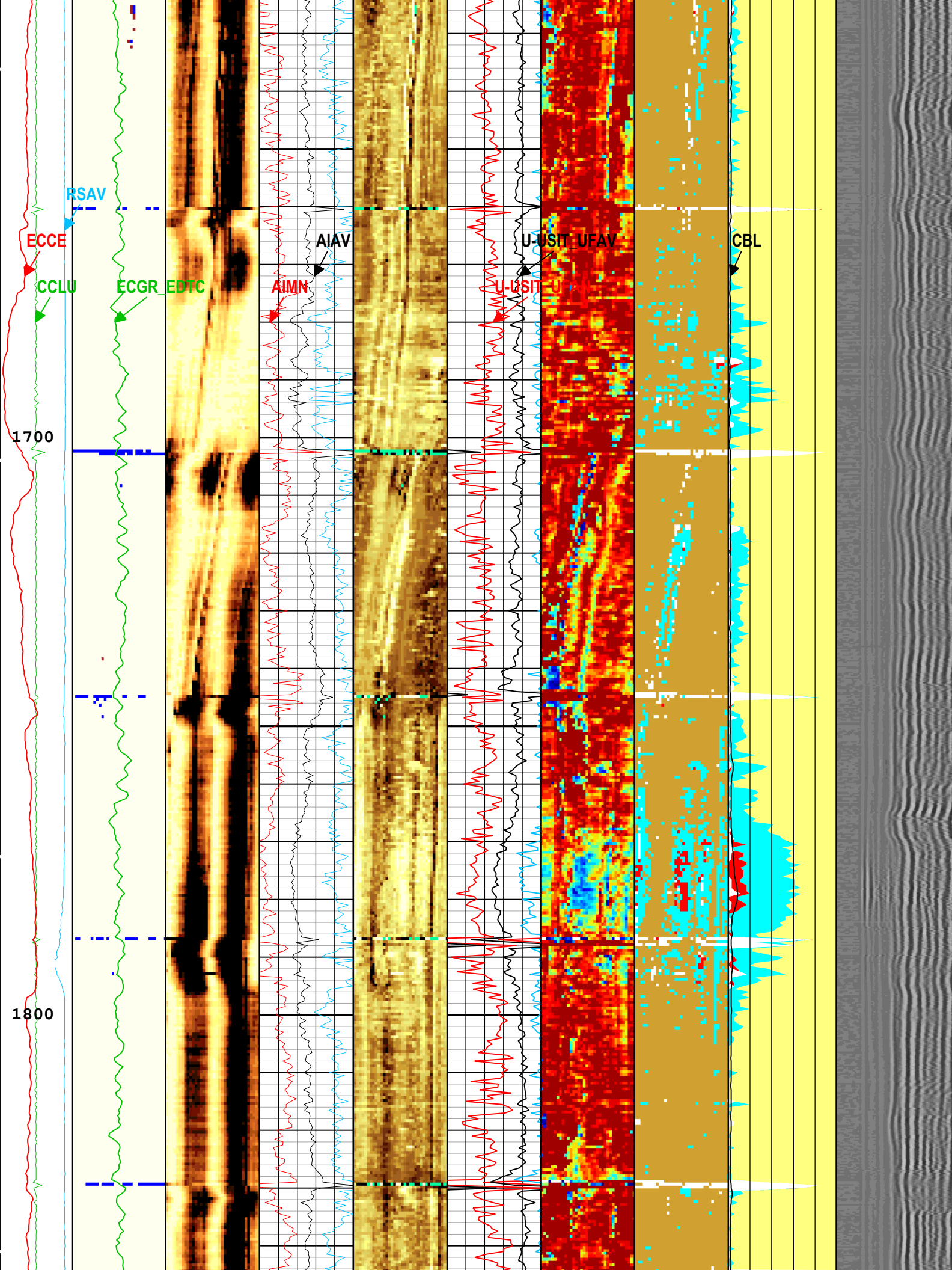


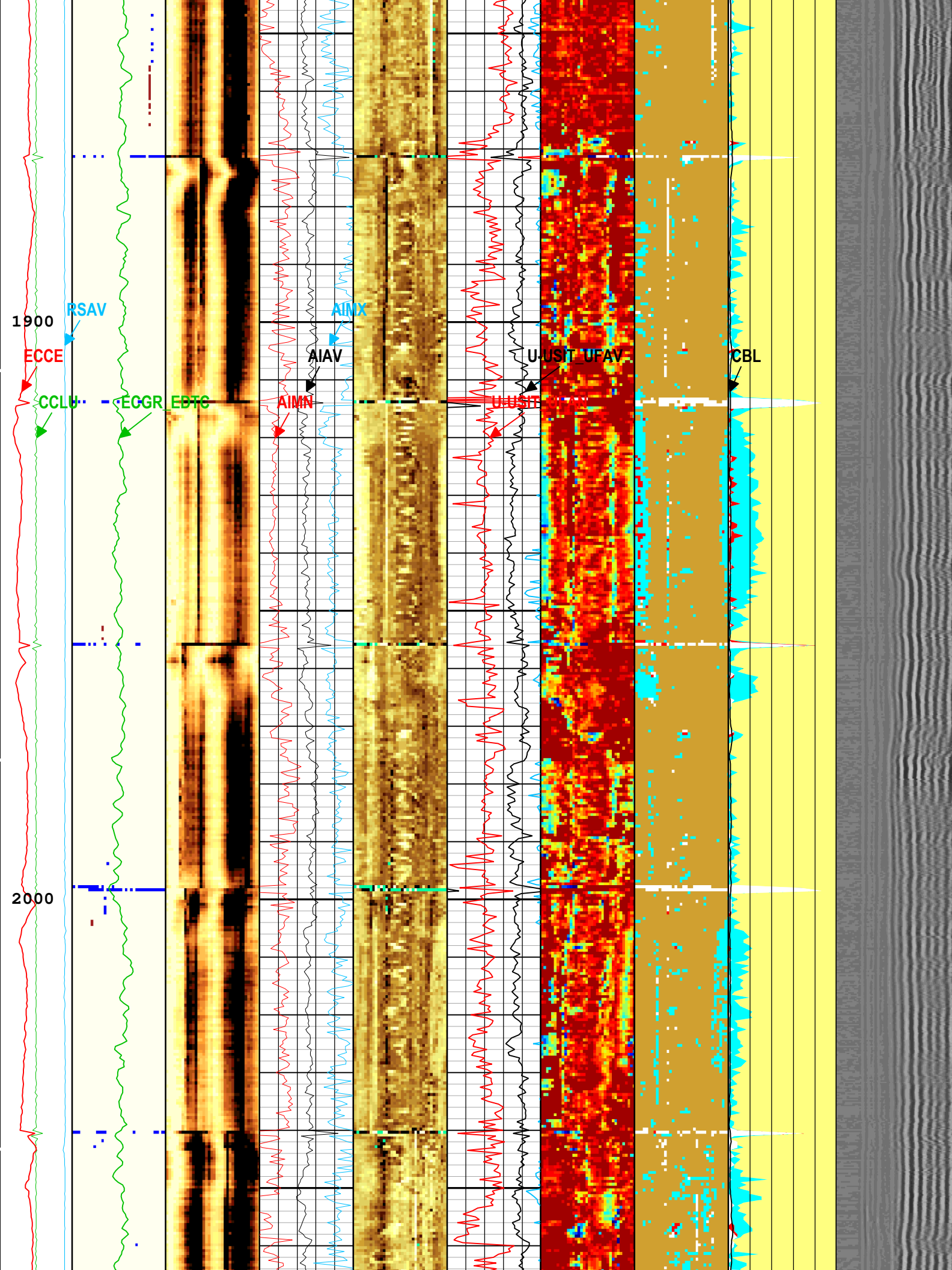


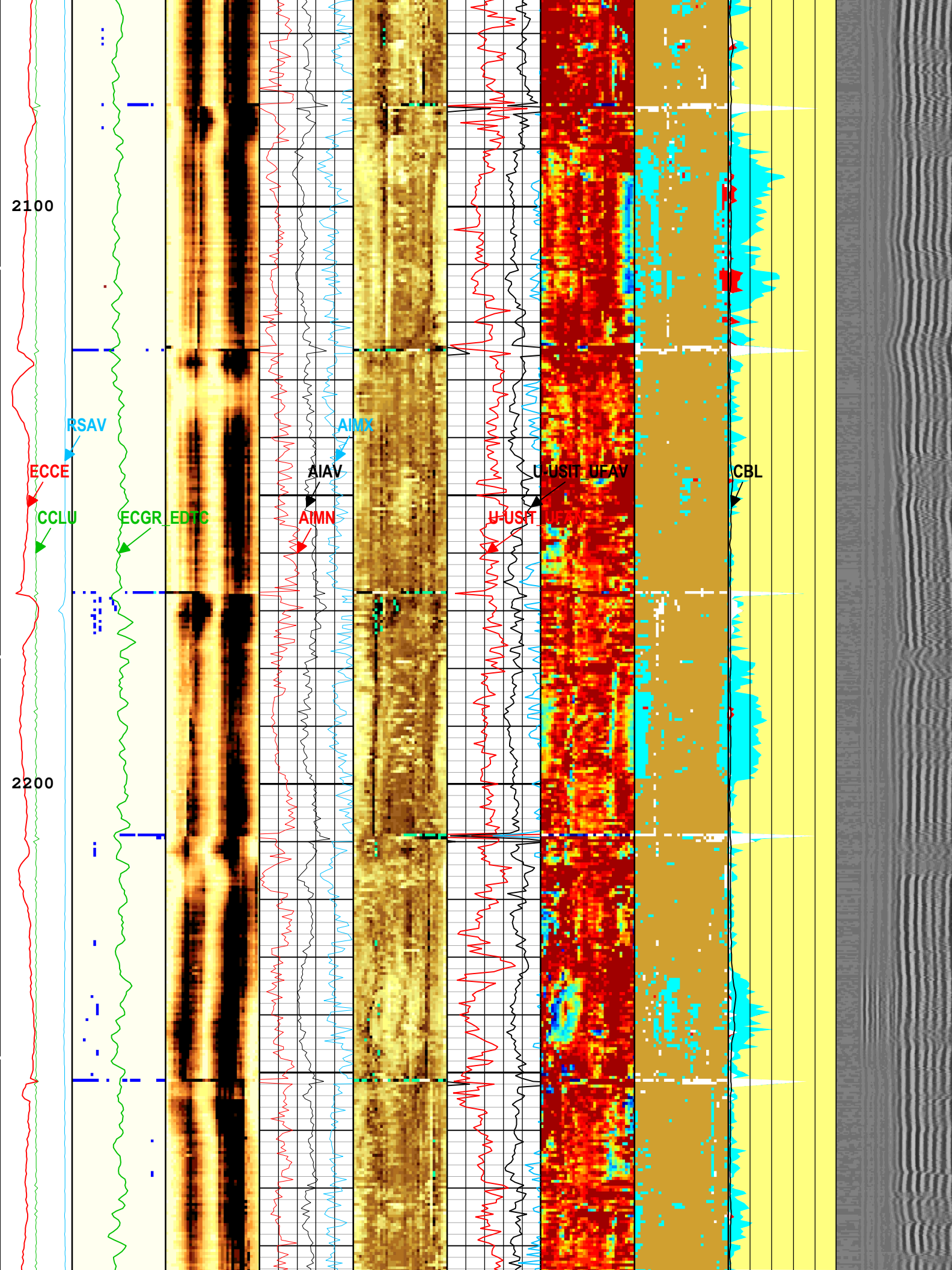


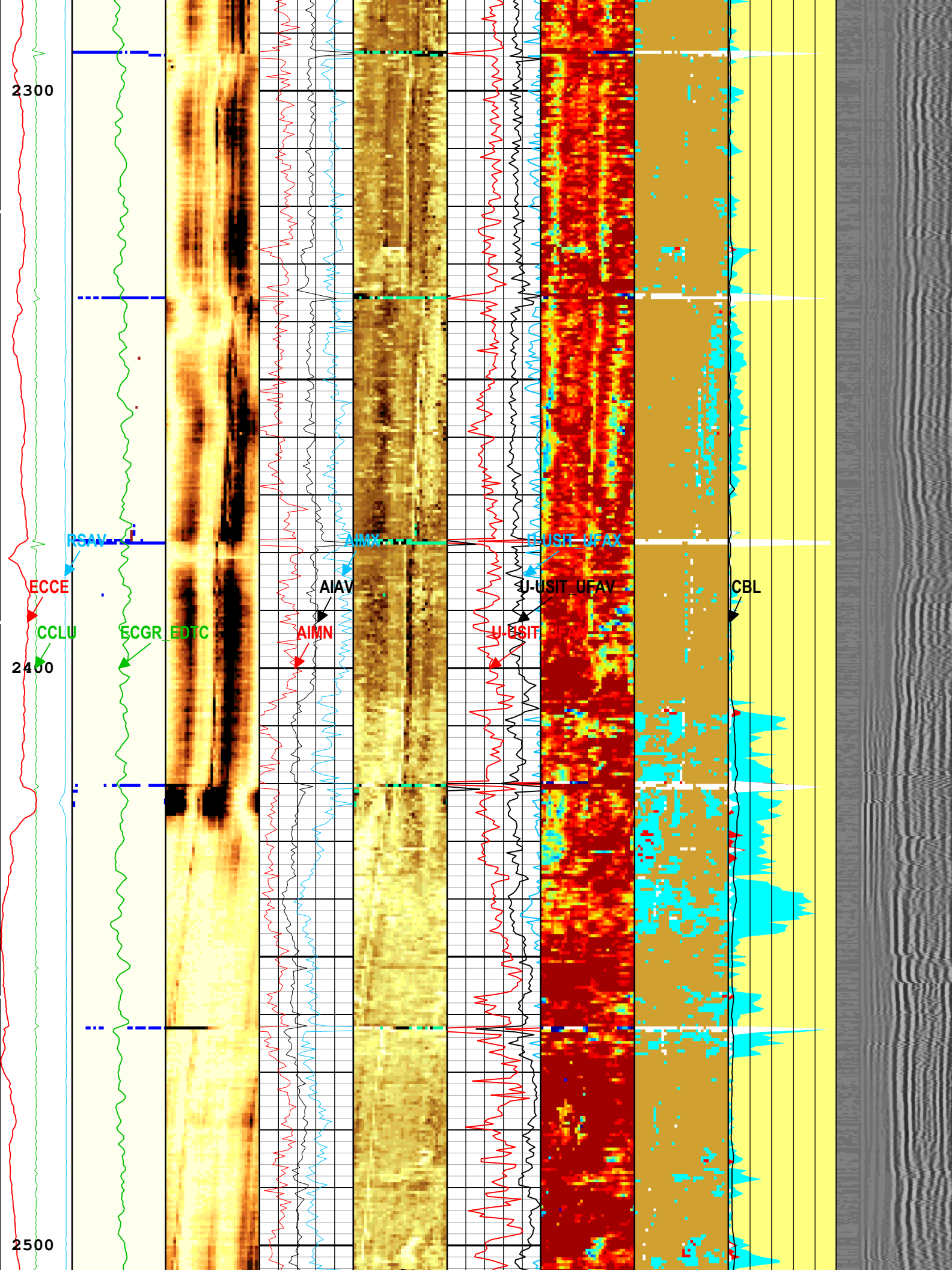


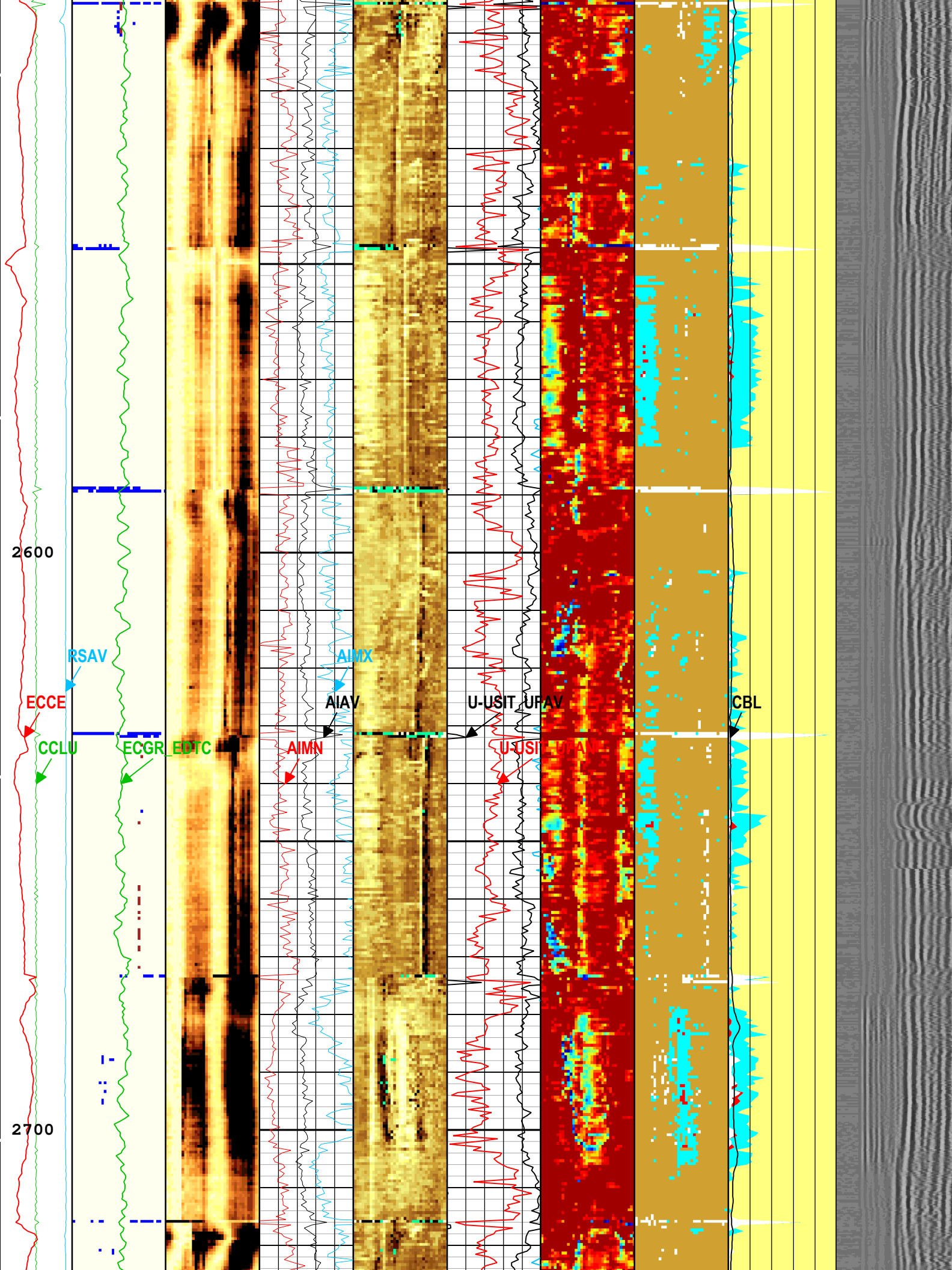


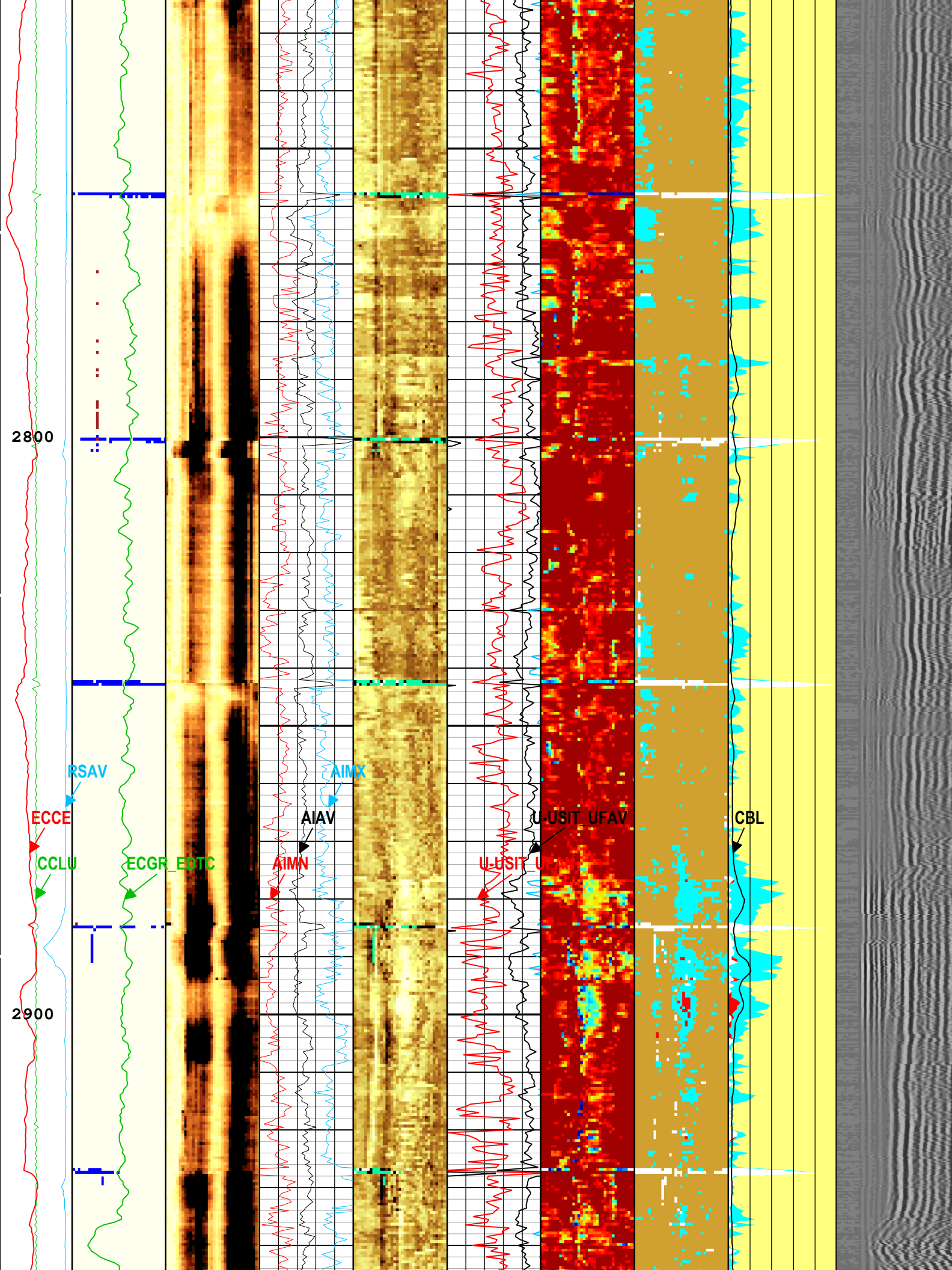


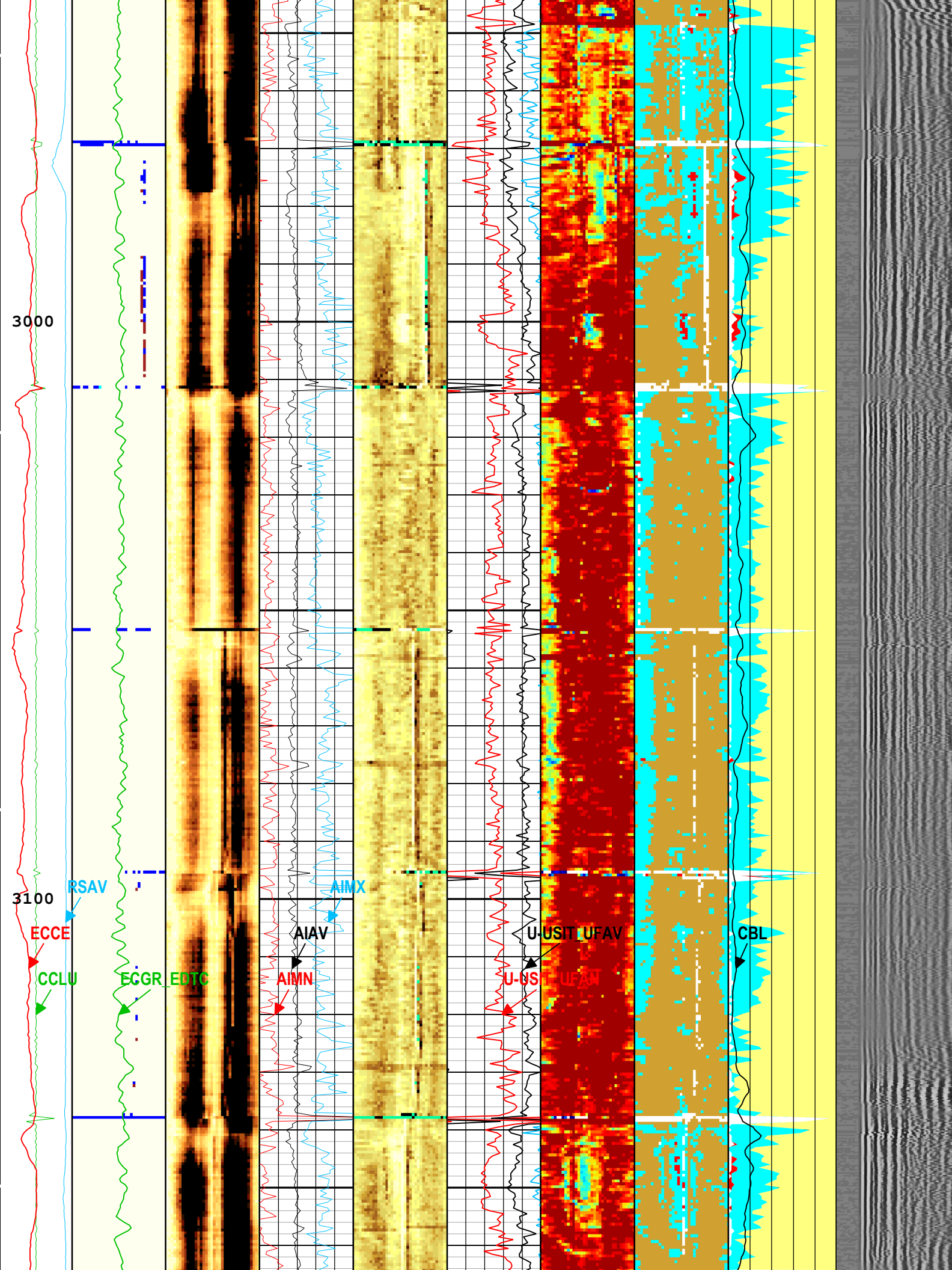


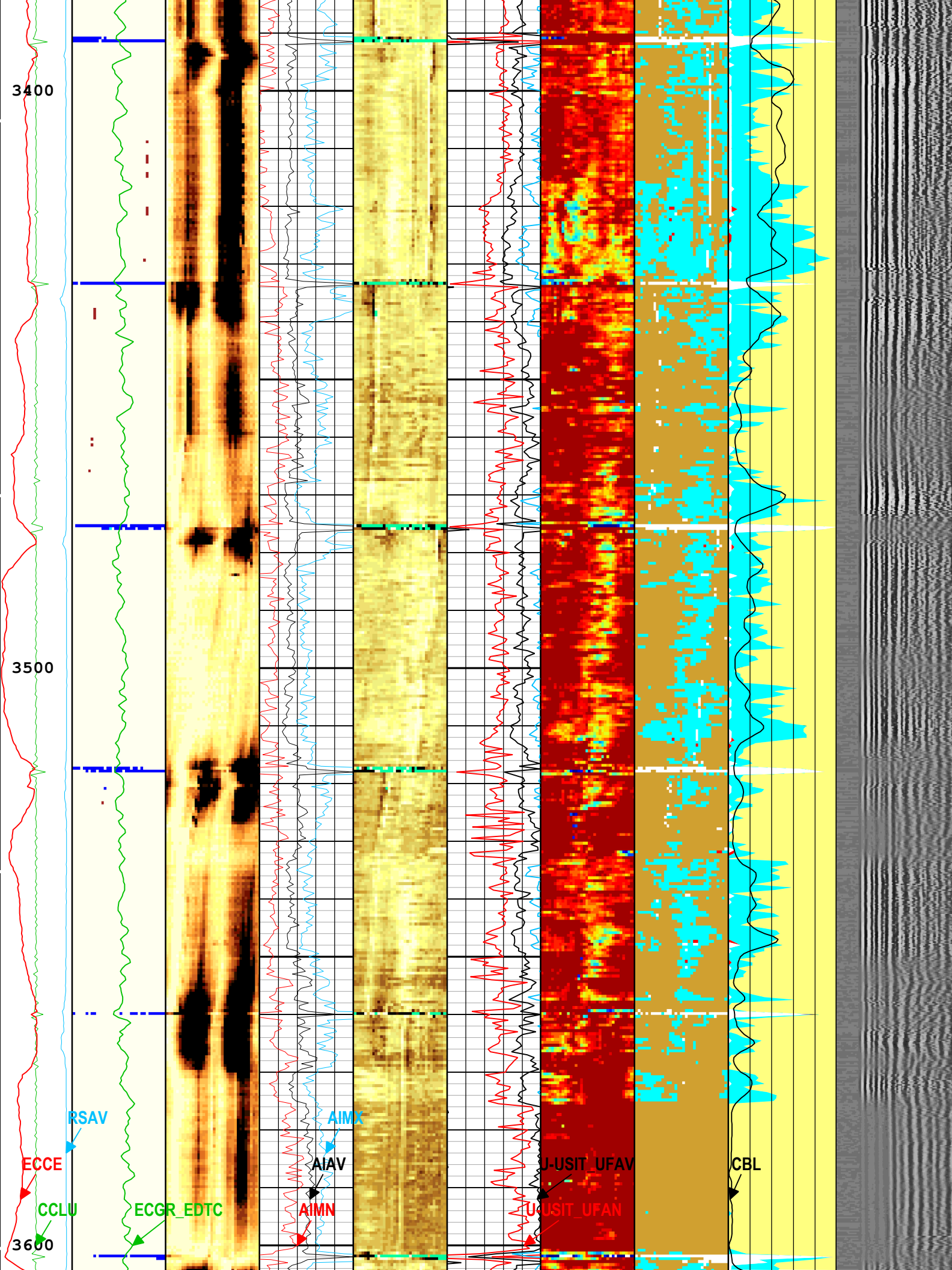


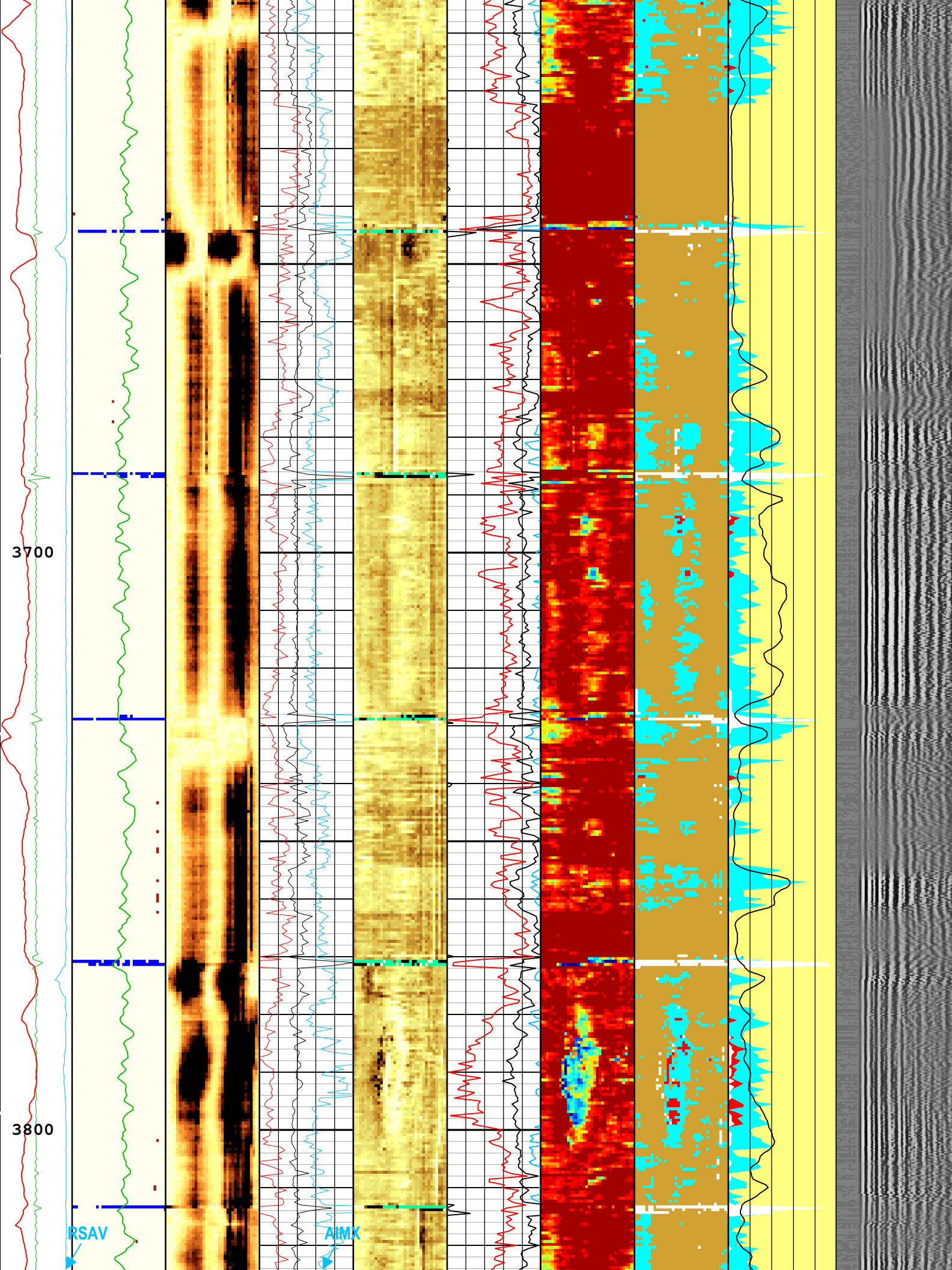


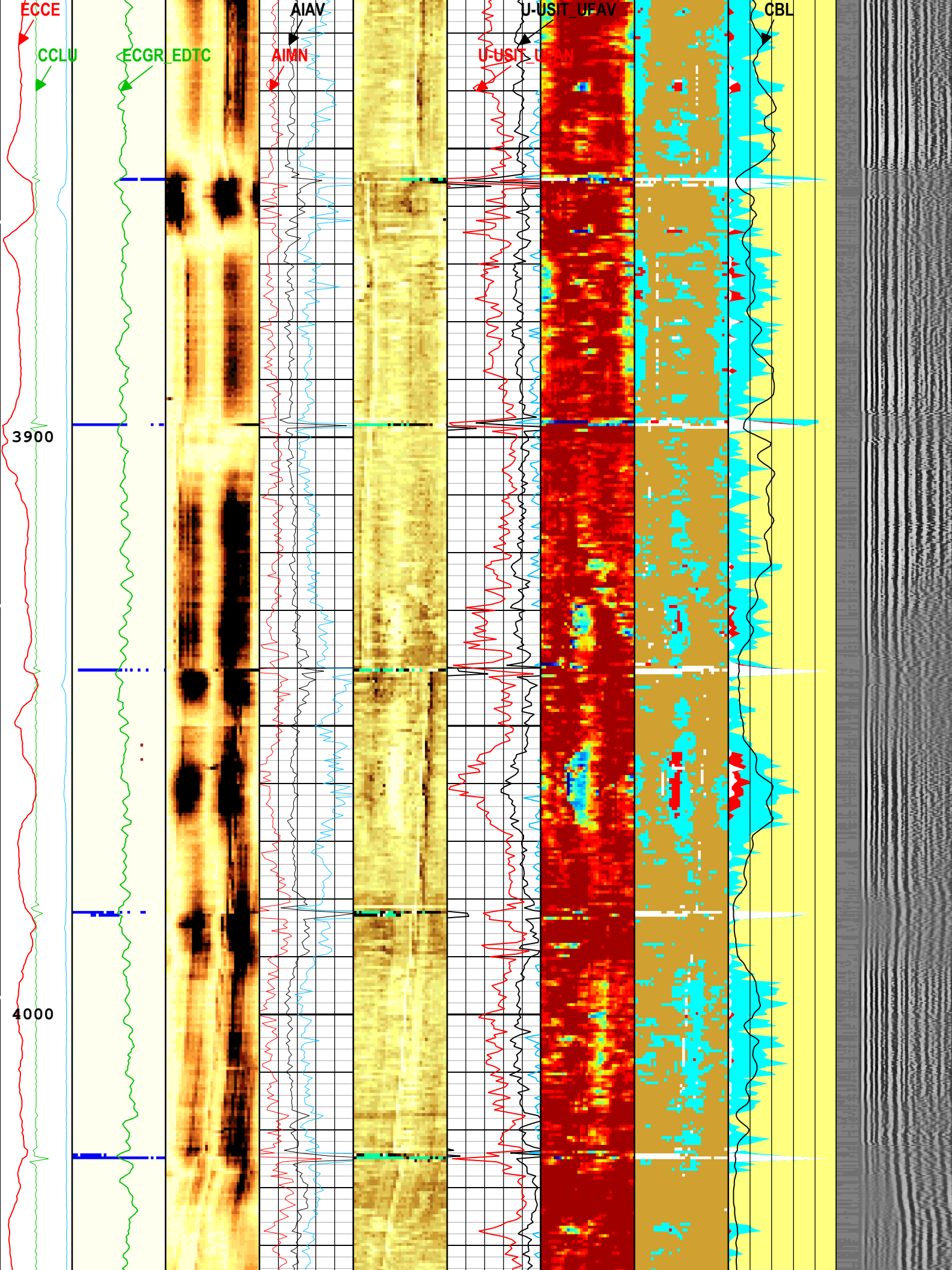


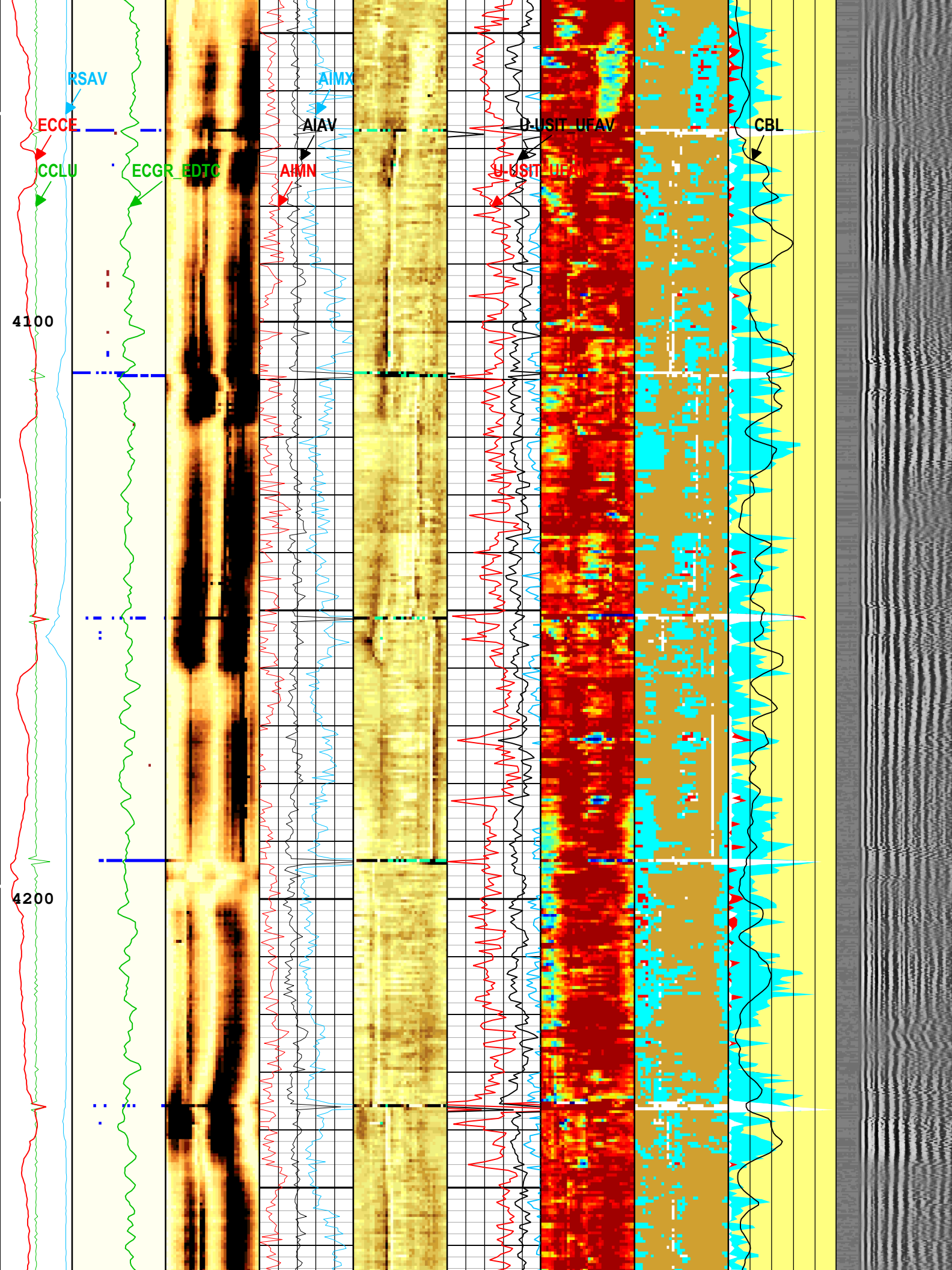


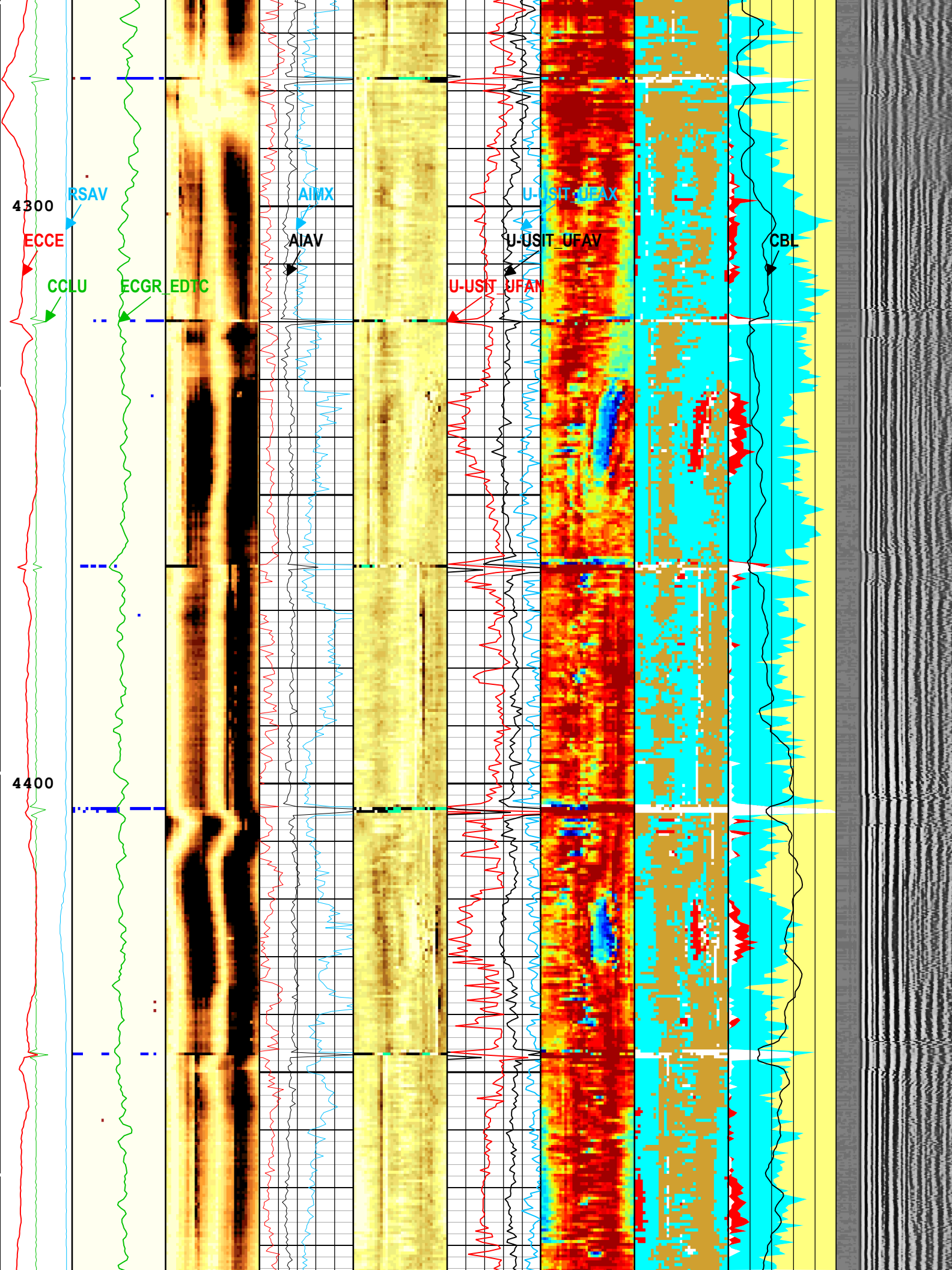


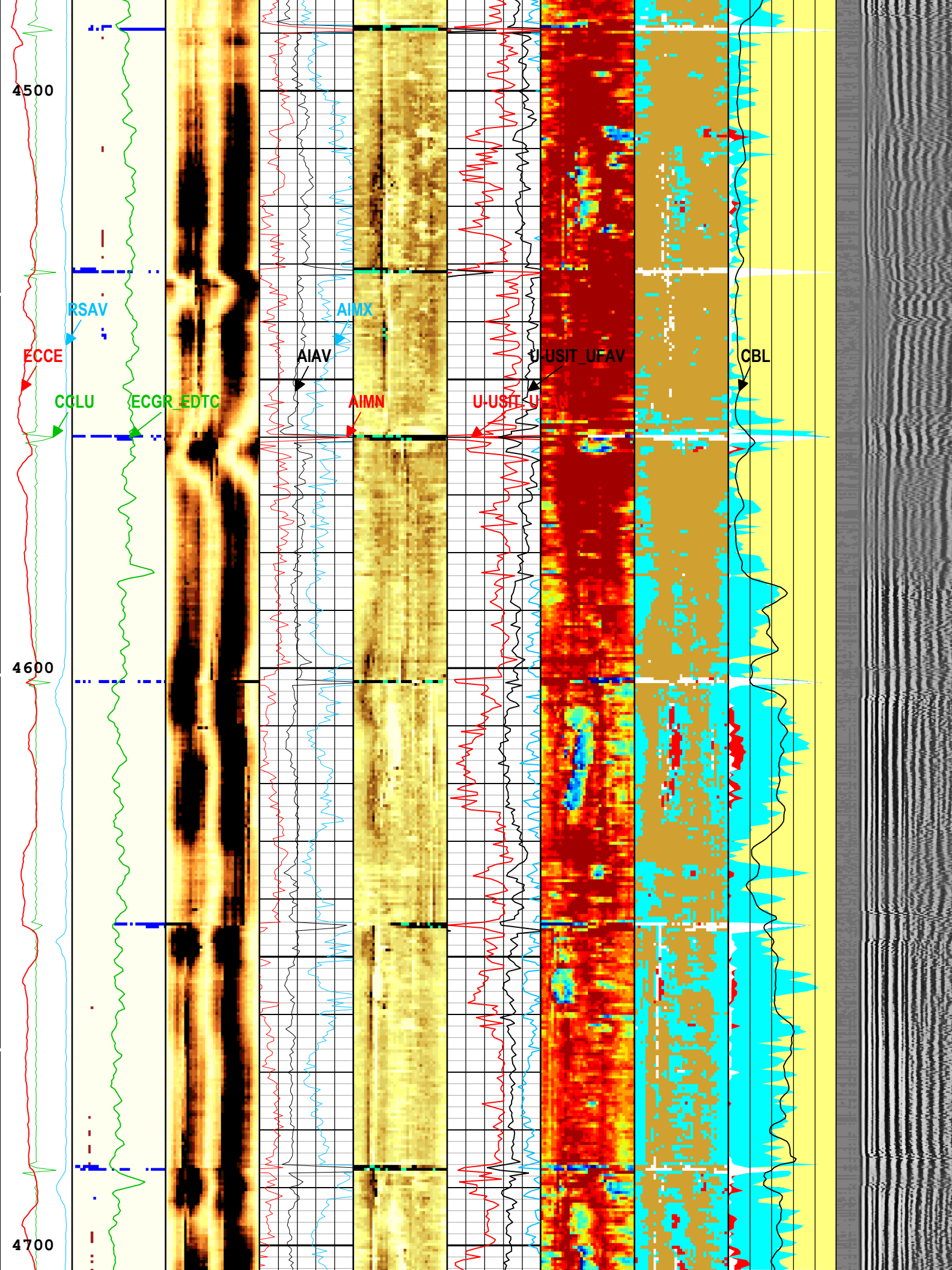


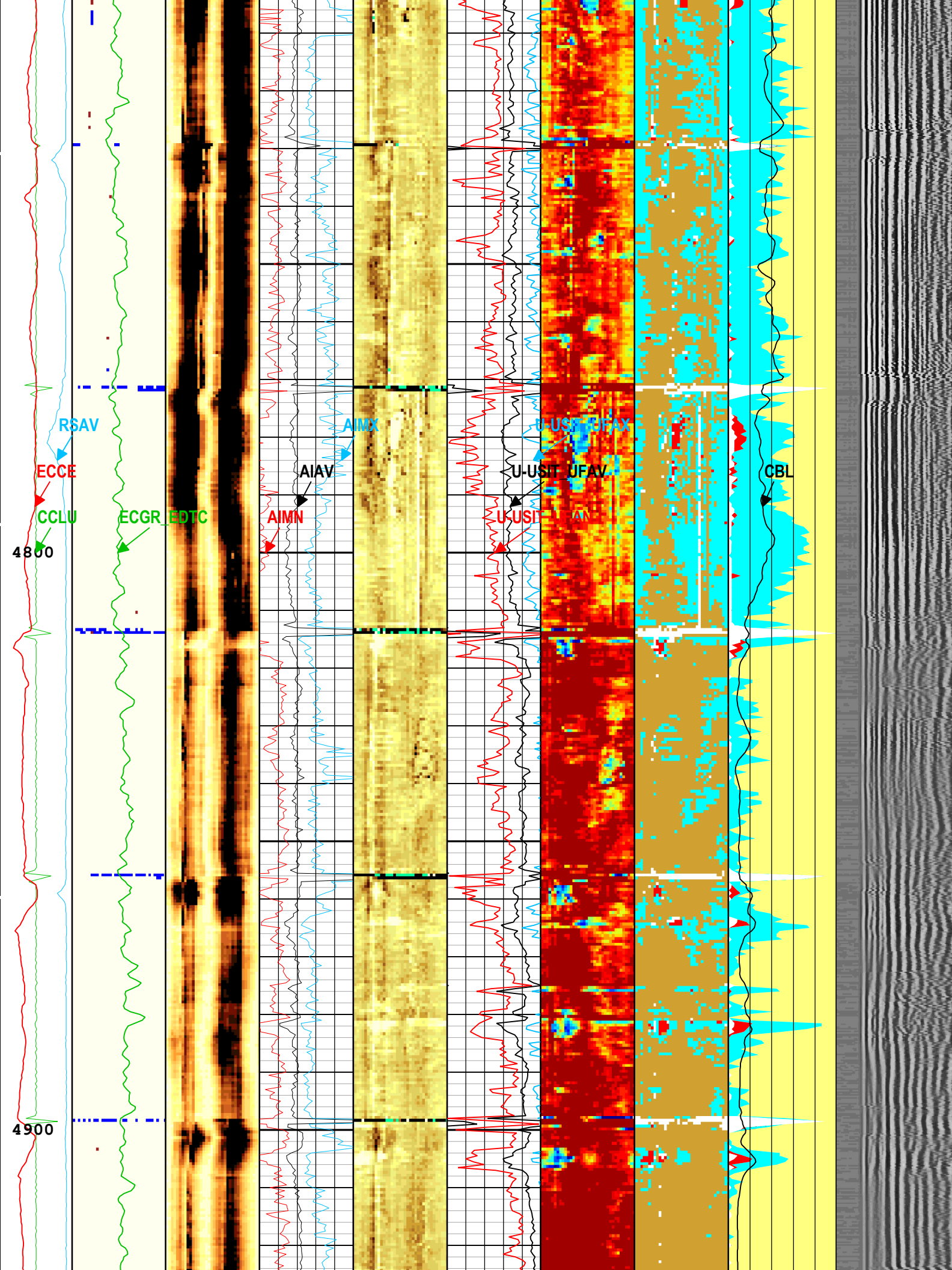


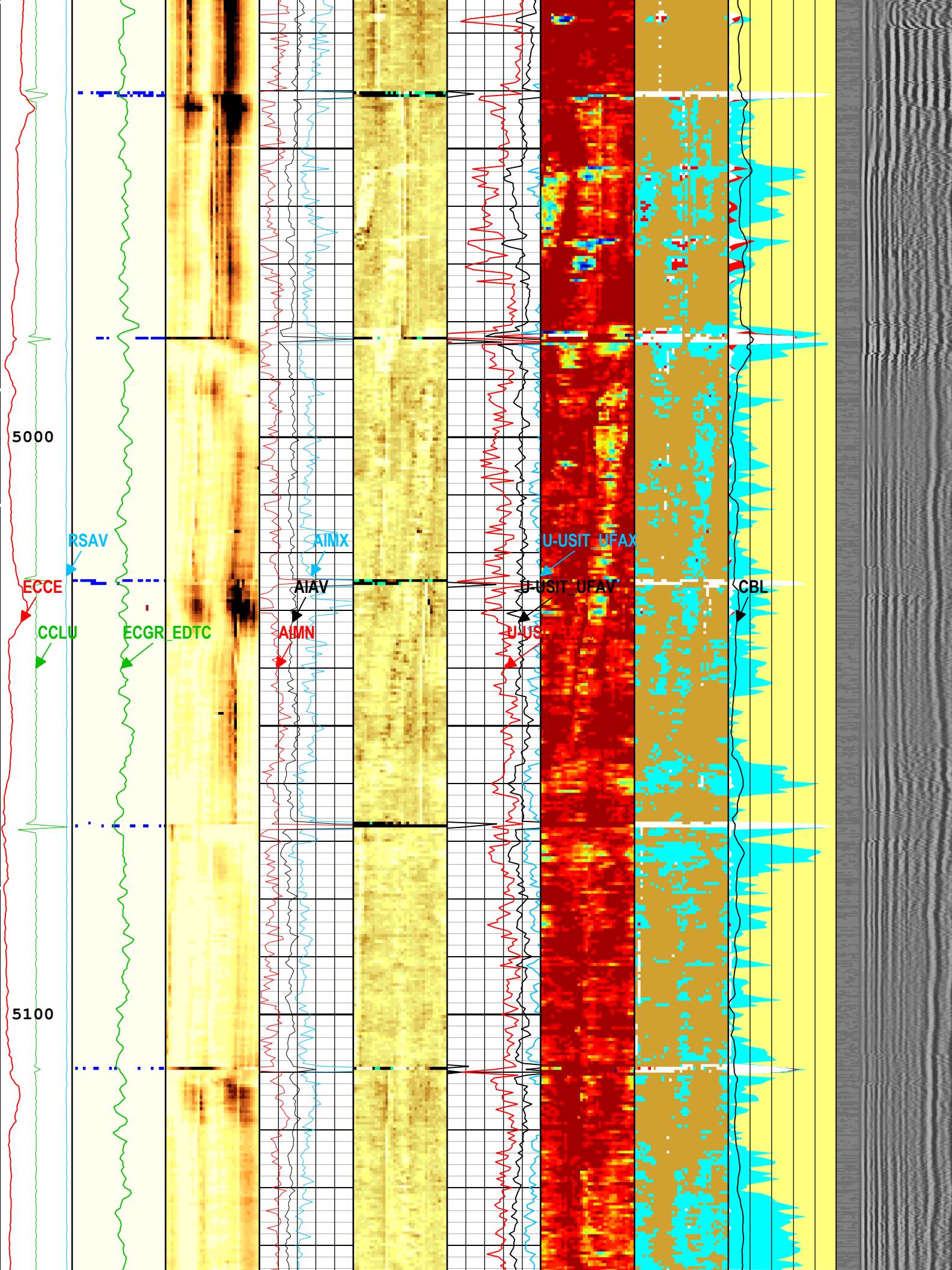


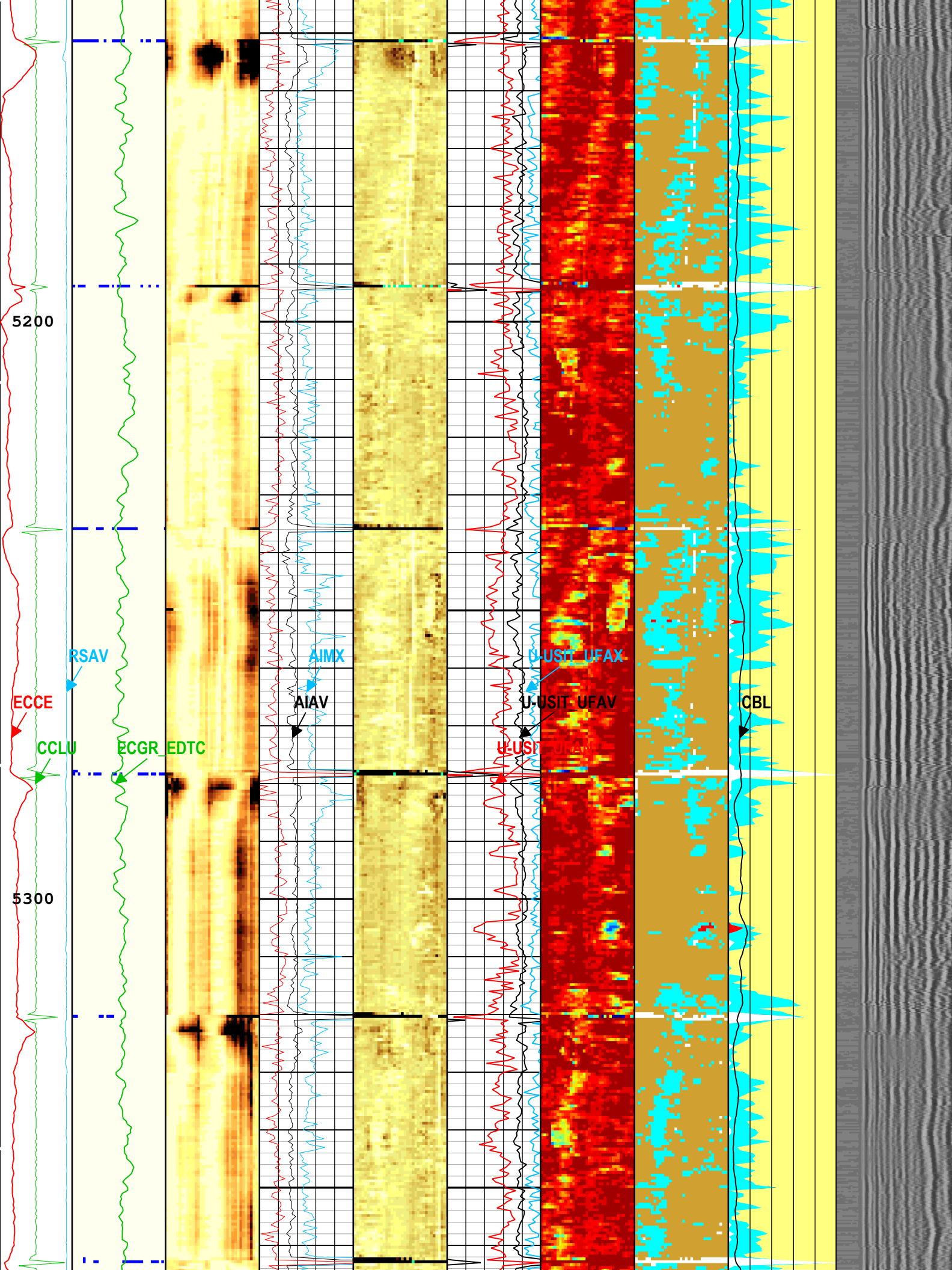


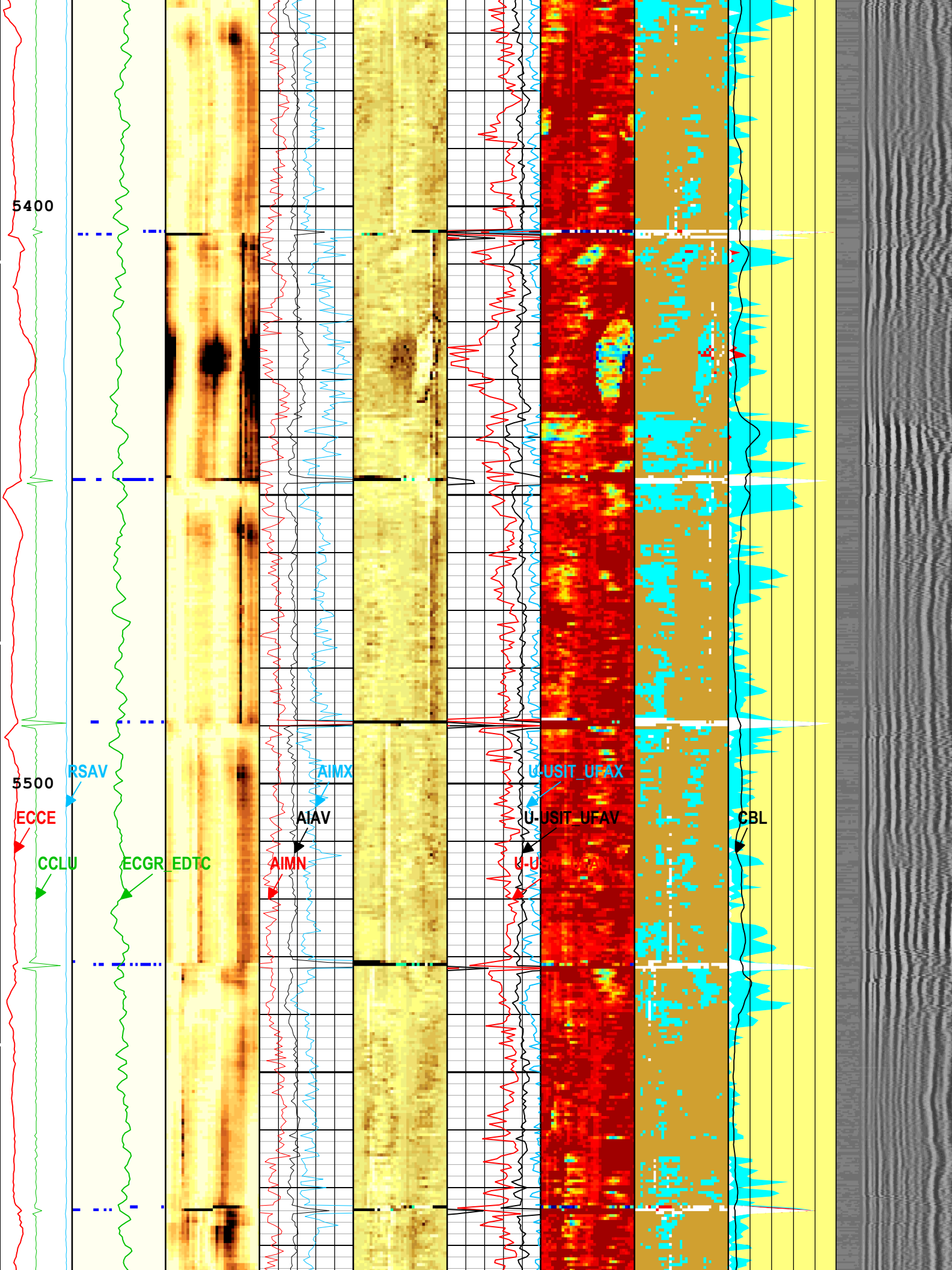


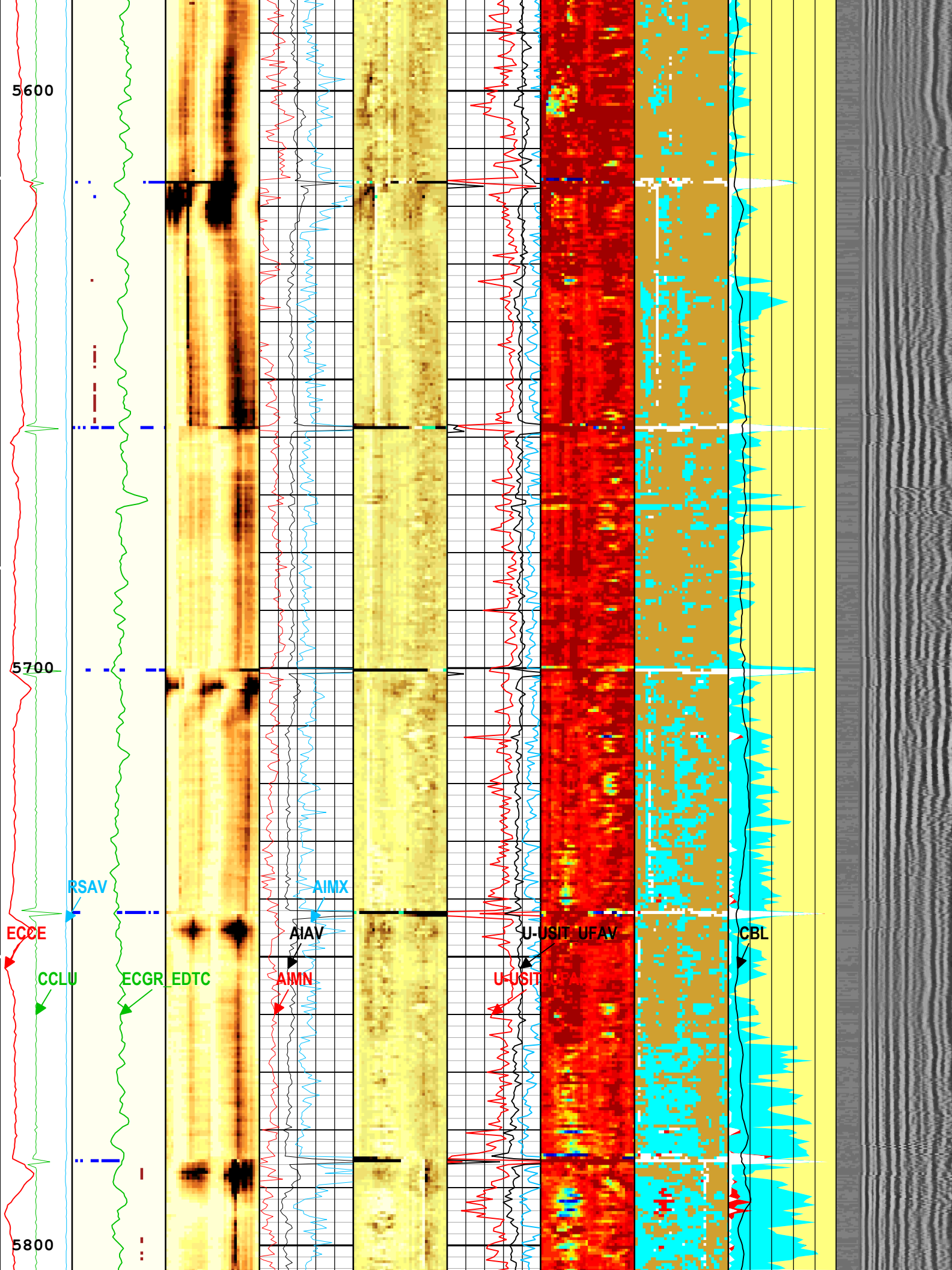


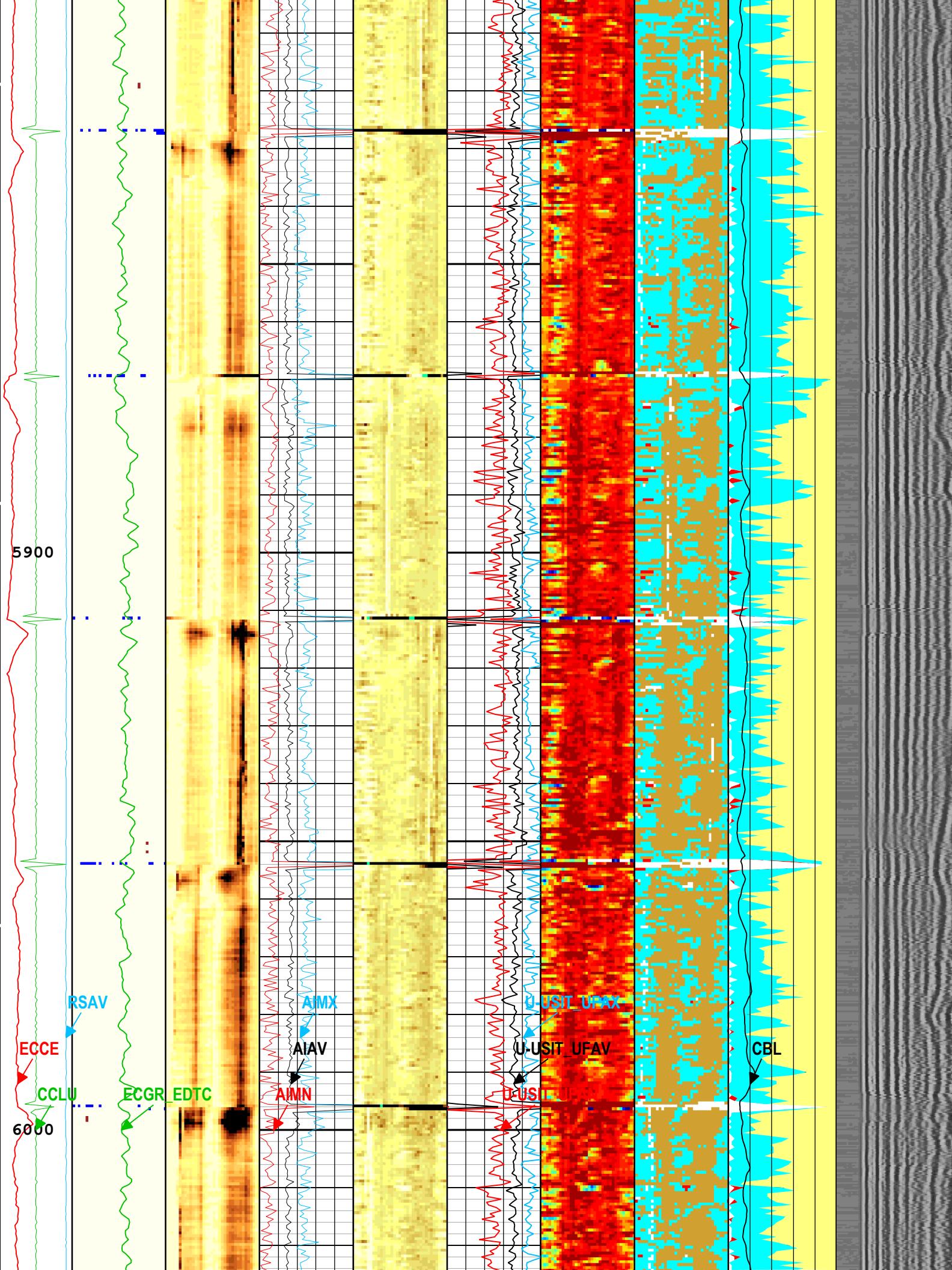


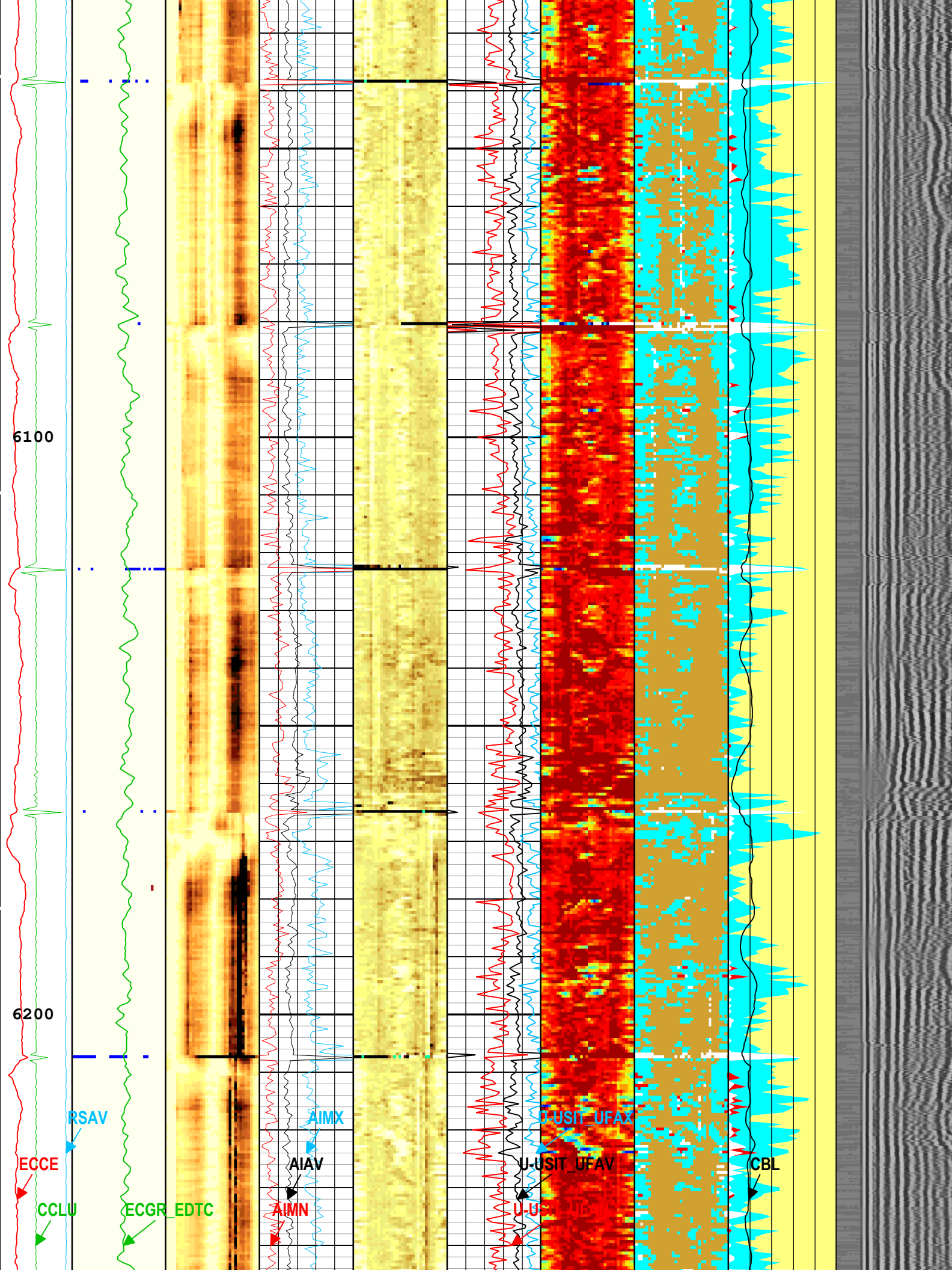












6100

6200

ECCE

CCLU

ECGR EDTC

RSAV

AIMN

AIMV

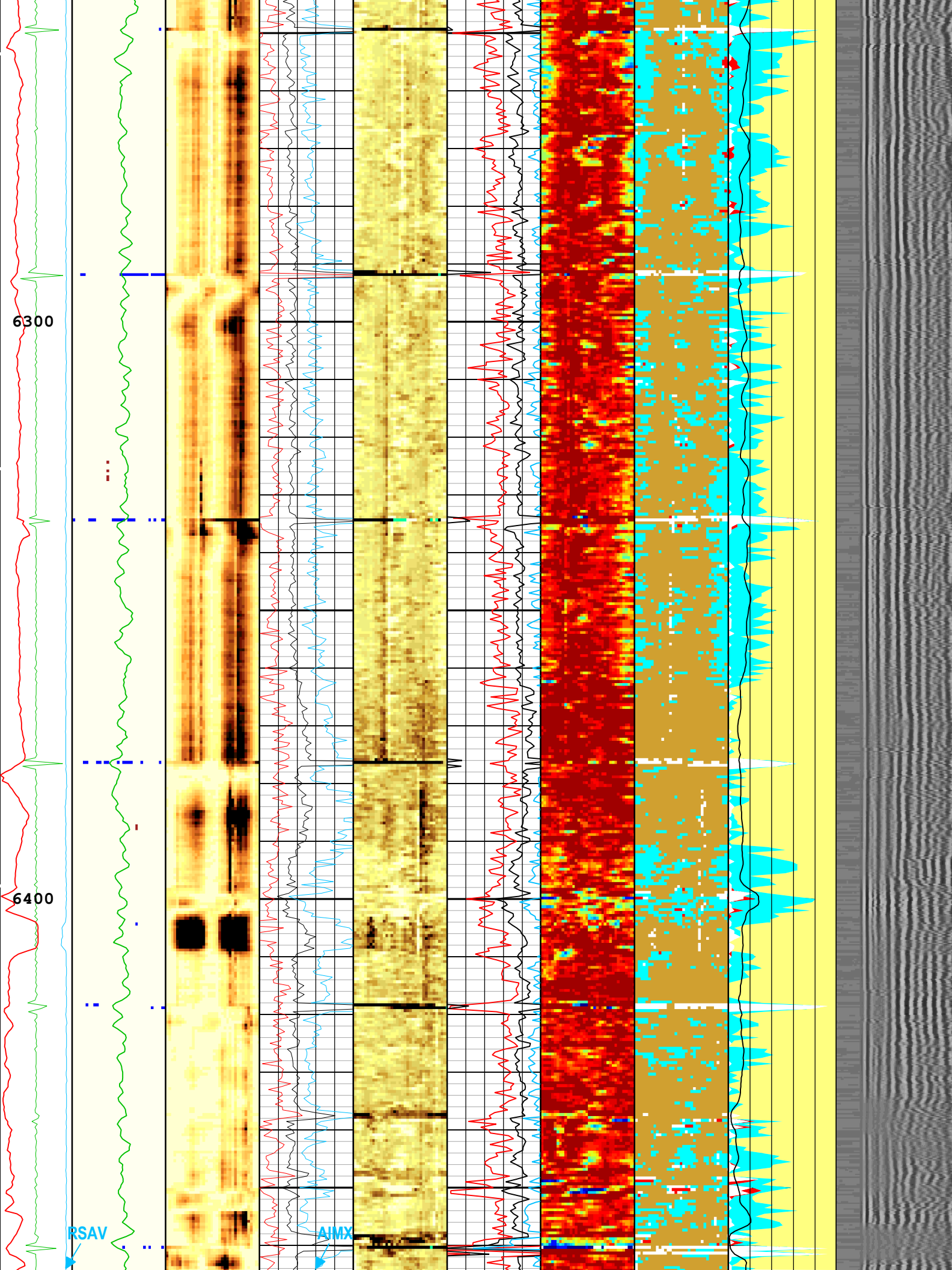
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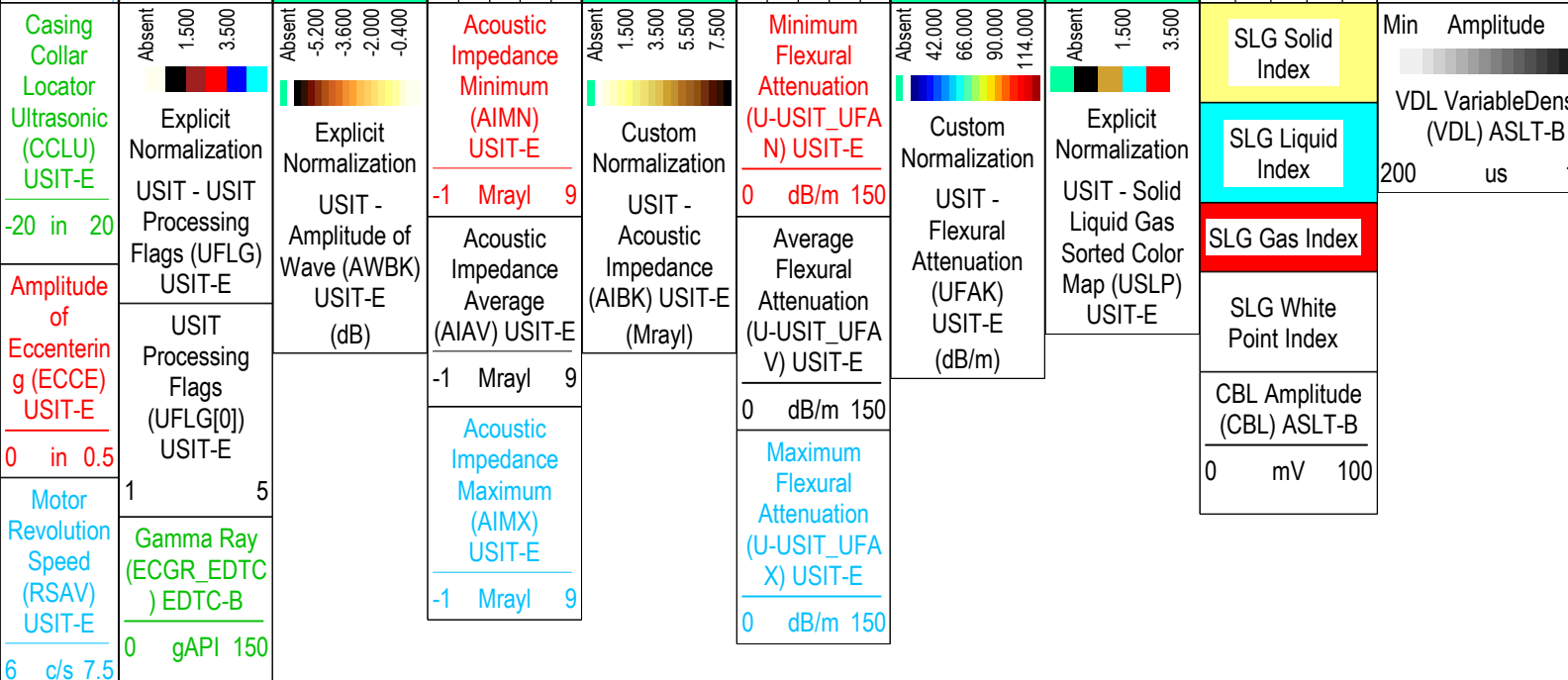
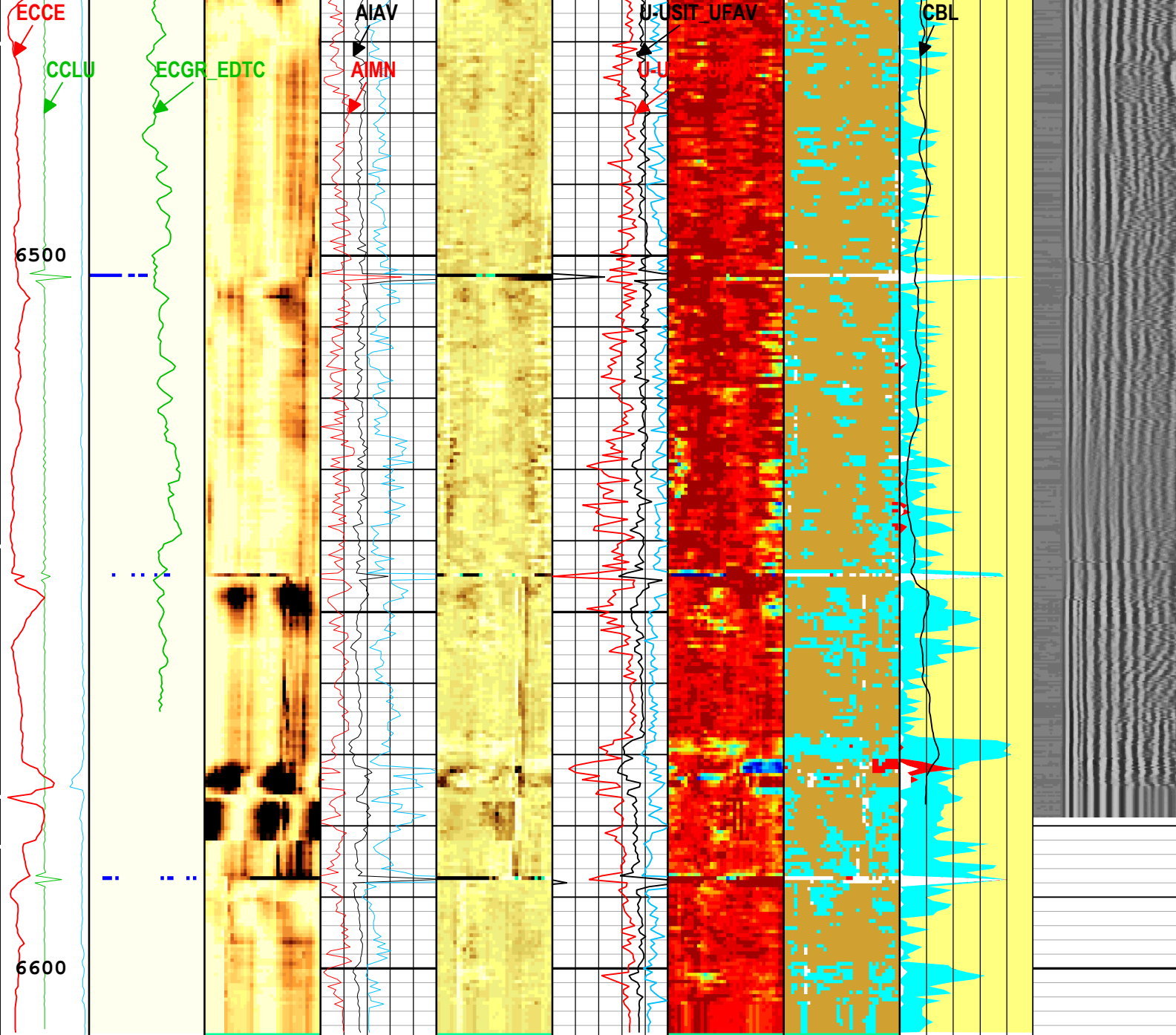
U-USIT UFAV

U-USIT UFAV

U-USIT UFAV






CBL





TIME: 1000 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
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Description: USI IBC SLG Format: Log (IBC SLG CBL DCBL-VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Oct-2021 19:13:39

Channel Processing Parameters

One: 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	8243	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	ASLT-B	80	mV
CDEN	Cement Density	USIT-E	14.6	lbm/gal
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.25	in
DFD	Drilling Fluid Density	Borehole	9	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FD	Fluid Density	USIT-E	9.01	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	-8.35	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	Theoretical	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	15.37	us
MSA	Minimum Sonic Amplitude	ASLT-B	0.49	mV
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.05	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.05	
RUN_SNUM	Run Sequence Number	WSDRUN	1	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.6	Mrayl
U-USIT_UFAO	USIT Flexural Attenuation Offset	USIT-E	-10.29	dB/m
UFSFILT	Ultrasonic Flexural Surface Filter	USIT-E	LPF 250k	
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	ThirdInterfaceEcho	
ZMUD	Acoustic Impedance of Mud	Borehole	1.75	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	12.25	0	878
BS	7.875	878	6609

All depth are actual.

Tool Control Parameters

One: 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	100	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	
MODE	SSLT Firing Mode	ASLT-B	Attenuation	
UPAT	USIT Emission Pattern	USIT-E	Pattern 750 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 6.0 in	
U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VDM	SSLT VDL Display Mode	ASLT-B	R5	
VRES	Vertical Resolution	USIT-E	6.0 in	

One

Repeat Pass @ 0 PSI

Software Version

Acquisition System	Version
Maxwell 2021.1	11.1.211946.3100
Application Patch	Wireline_NPD-ThruBit-2021.1_11.1.214024

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[5]:Up	Up	6298.00 ft	6610.06 ft	28-Oct-2021 8:45:41 AM	28-Oct-2021 8:50:35 AM	ON	8.07 ft	Yes

All depths are referenced to toolstring zero

Log

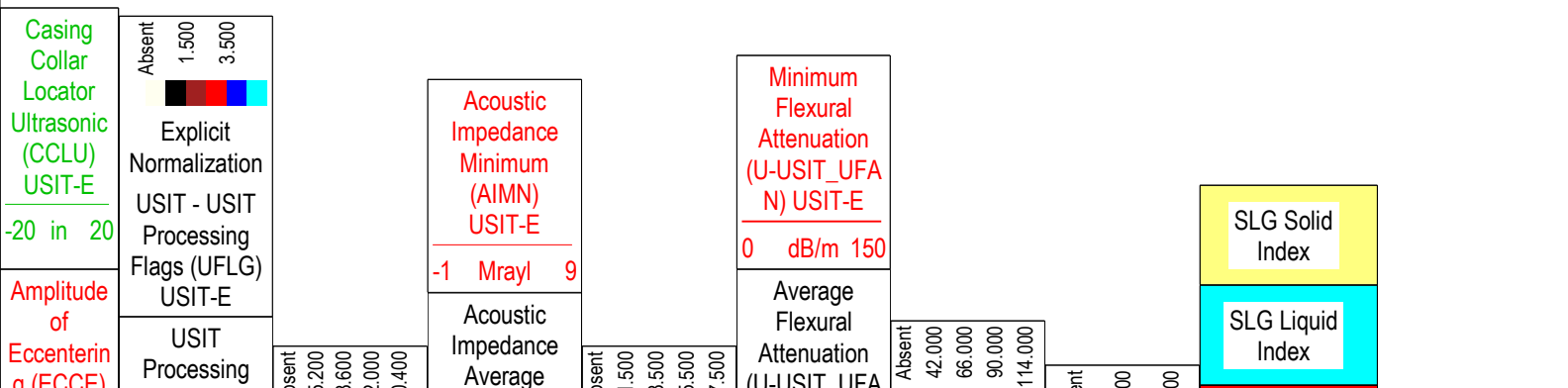
Company:Occidental Petroleum Well:Morton 37-1
One: Log[5]:Up:S009

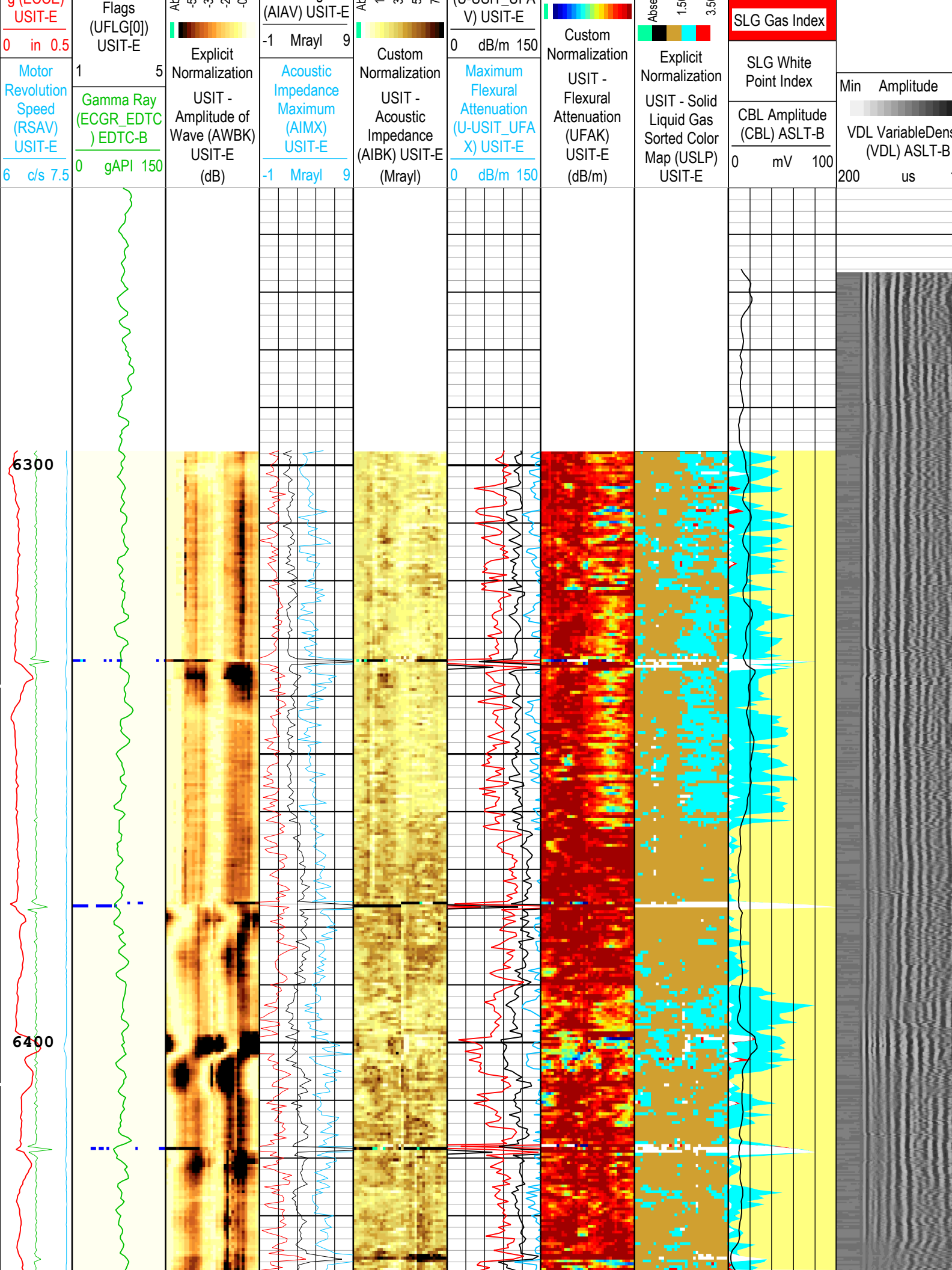
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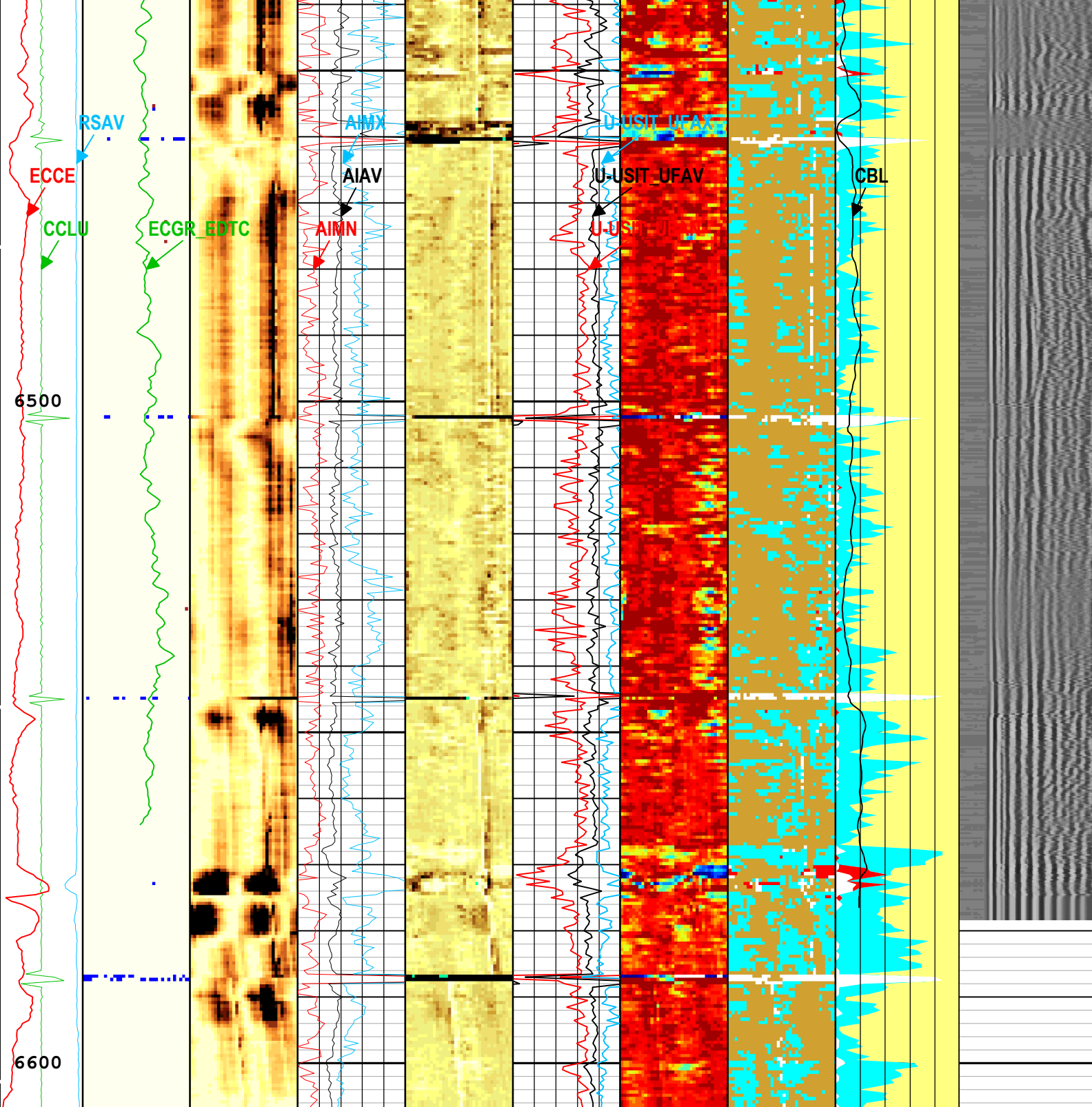
USIT Processing Flags (UFLG[0]) USIT-E

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

TIME_1900 - Time Marked every 60.00 (s)







Casing Collar Locator Ultrasonic (CCLU) USIT-E -20 in 20	Explicit Normalization USIT - USIT Processing Flags (UFLG) USIT-E	Explicit Normalization USIT - Amplitude of Wave (AWBK) USIT-E (dB)	Acoustic Impedance Minimum (AIMN) USIT-E -1 Mrayl 9	Custom Normalization USIT - Acoustic Impedance (AIBK) USIT-E (Mrayl)	Minimum Flexural Attenuation (U-USIT_UFA N) USIT-E 0 dB/m 150	Custom Normalization USIT - Flexural Attenuation (UFAK) USIT-E (dB/m)	SLG Solid Index	Min Amplitude
Amplitude of Eccentering (ECCE) USIT-E 0 in 0.5	USIT Processing Flags (UFLG[0]) USIT-E		Acoustic Impedance Average (AIAV) USIT-E -1 Mrayl 9		Average Flexural Attenuation (U-USIT_UFA V) USIT-E 0 dB/m 150	USIT - Solid Liquid Gas Sorted Color Map (USLP) USIT-E	SLG Liquid Index	VDL VariableDensity (VDL) ASLT-B 200 us
			Acoustic Impedance		Maximum Flexural		SLG Gas Index	
							SLG White Point Index	
							CBL Amplitude (CBL) ASLT-B 0 mV 100	

Motor
Revolution
Speed
(RSAV)
USIT-E
6 c/s 7.5

Gamma Ray
(ECGR_EDTC
) EDTC-B
0 gAPI 150

Maximum
(AIMX)
USIT-E
-1 Mrayl 9

Flexural
Attenuation
(U-USIT_UFA
X) USIT-E
0 dB/m 150

TIME_1900 - Time Marked every 60.00 (s)

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

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Channel Processing Parameters

One: 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	7.875	in
CBLO	Casing Bottom (Logger)	WLSESSION	8243	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	ASLT-B	80	mV
CDEN	Cement Density	USIT-E	14.6	lbm/gal
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.25	in
DFD	Drilling Fluid Density	Borehole	9	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FD	Fluid Density	USIT-E	9.01	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	-8.35	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	Theoretical	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	15.37	us
MSA	Minimum Sonic Amplitude	ASLT-B	0.49	mV
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.05	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.05	
RUN_SNUM	Run Sequence Number	WSDRUN	1	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.6	Mrayl
U-USIT_UFAO	USIT Flexural Attenuation Offset	USIT-E	-10.29	dB/m
UFSFILT	Ultrasonic Flexural Surface Filter	USIT-E	LPF 250k	
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	ThirdInterfaceEcho	
ZMUD	Acoustic Impedance of Mud	Borehole	1.75	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.6	Mrayl

Tool Control Parameters

One: 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	100	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	
MODE	SSLT Firing Mode	ASLT-B	Attenuation	
UPAT	USIT Emission Pattern	USIT-E	Pattern 750 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 6.0 in	
U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VDM	SSLT VDL Display Mode	ASLT-B	R5	
VRES	Vertical Resolution	USIT-E	6.0 in	

XYZ

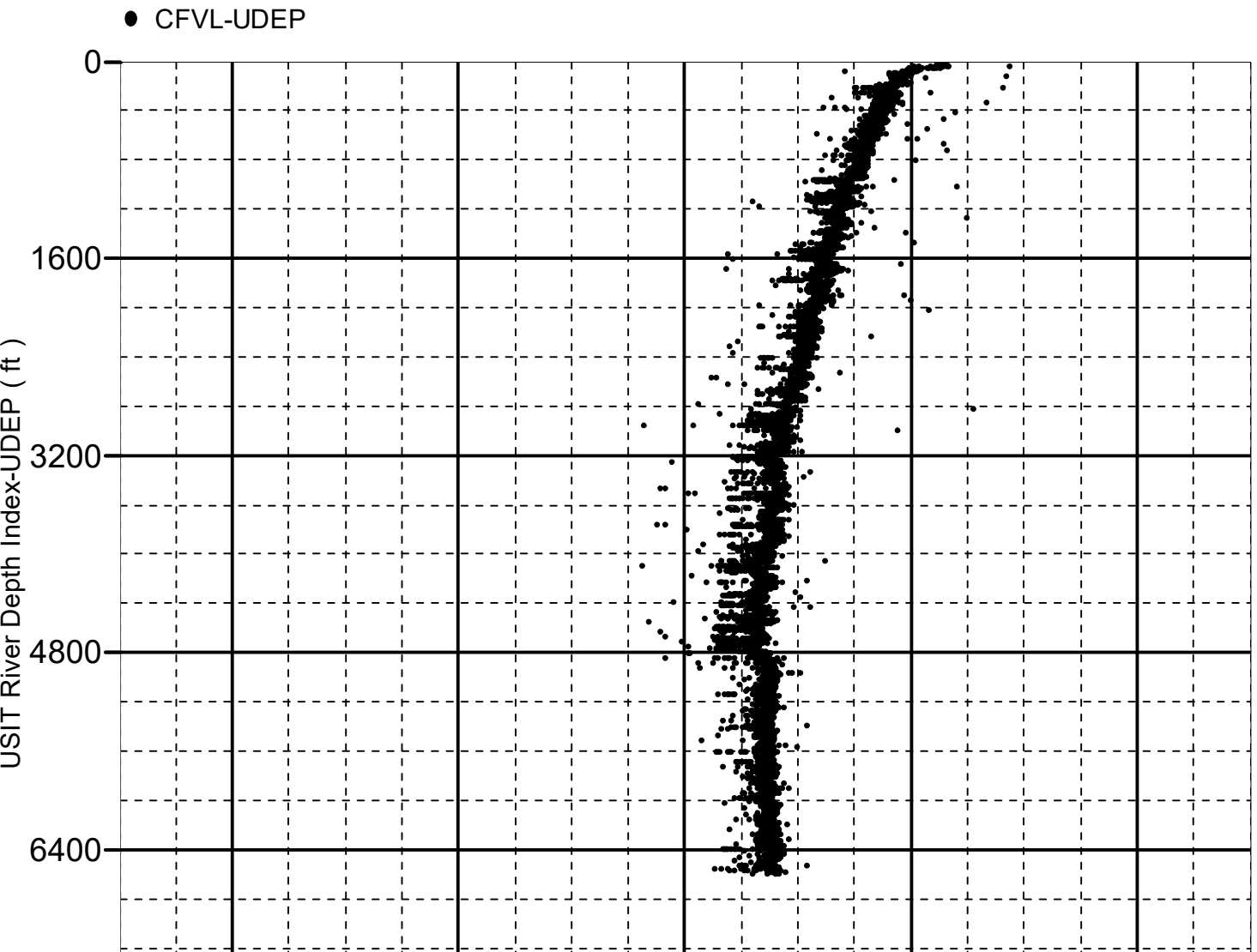
Company:Occidental Petroleum Well:Morton 37-1

One: Log[6]:Up:S009

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6609.50 to 32.00 ft



8000

160

180

200

220

240

Memorized Fluid Acoustic...-CFVL (us/ft)

XYZ

Company:Occidental Petroleum Well:Morton 37-1

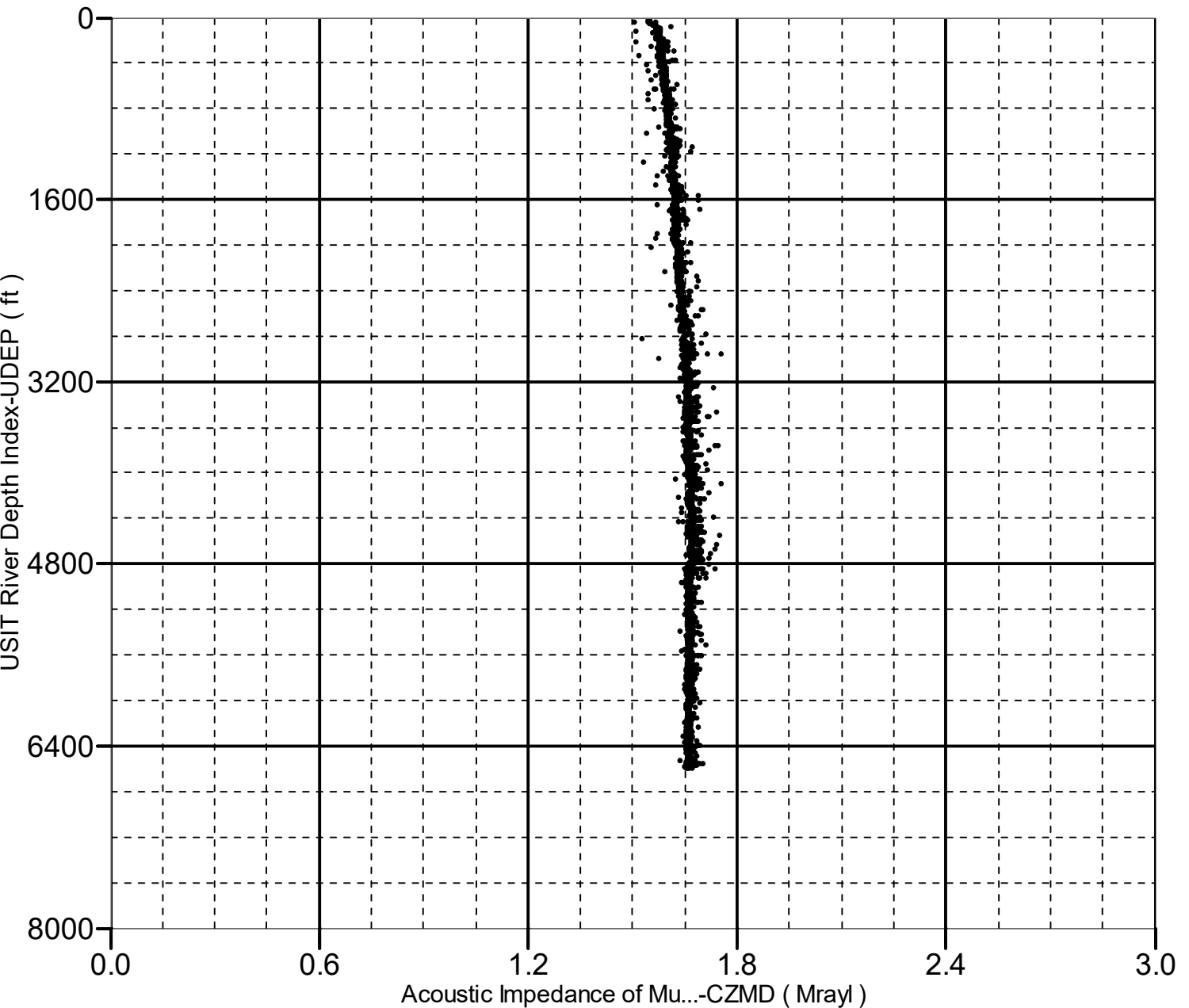
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Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6609.50 to 32.00 ft

● CZMD-UDEP





Company: Occidental Petroleum

Schlumberger

Well: Morton 37-1

Field: Wattenberg

County: Weld

State: Colorado

Isolation Scanner

Cement Bond Log

Gamma Ray - CCL