Schlumberger

Company: Great Western Operating Company LLC

Well: Postle IC 09-099HC

Field: Wattenberg

County: Weld State: Colorado

UltraSonic Summary Print

Correlated to Deep Marker Joint

County: Weld
Field: Wattenberg
Location: SWNW Sec 11, T3N, R68W
Well: Postle IC 09-099HC
Company: Great Western Operating Company LLC

Location:				
SWNW Sec 11, T3N, R68W		Elev.:	K.B.	4997.00 ft
SHL: 1453' FNL X 566' FWL			G.L.	4977.00 ft
Lat/Long: 40.24398300 / -104.97775600			D.F.	4996.00 ft
Permanent Datum:	Ground Level	Elev.:		4977.00 f
Log Measured From:	Kelly Bushing	20.00 ft		above Perm.Datum
Drilling Measured From:	Kelly Bushing			

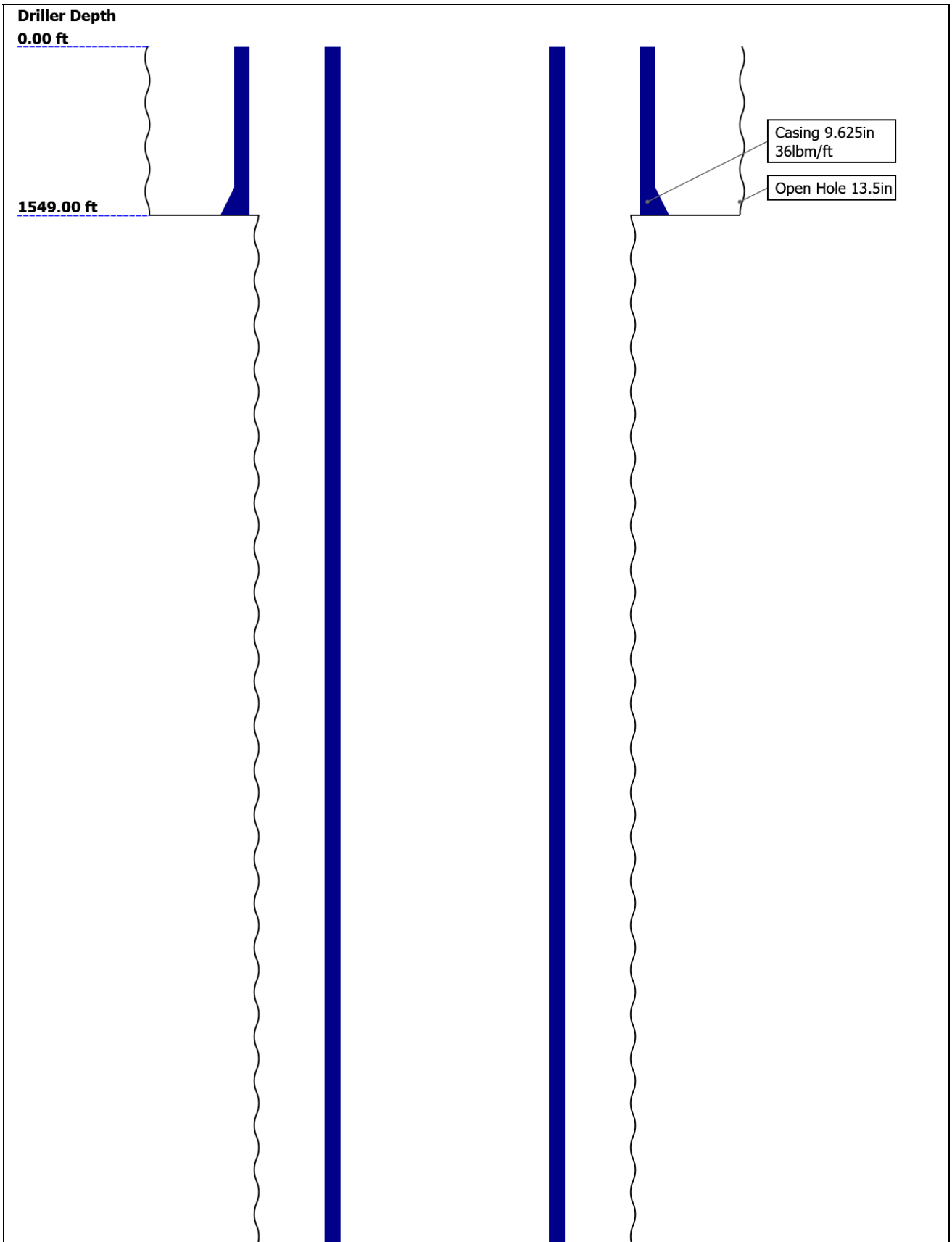
API Serial No.	Section:	Township:	Range:
05-123-47384	11	3N	68W

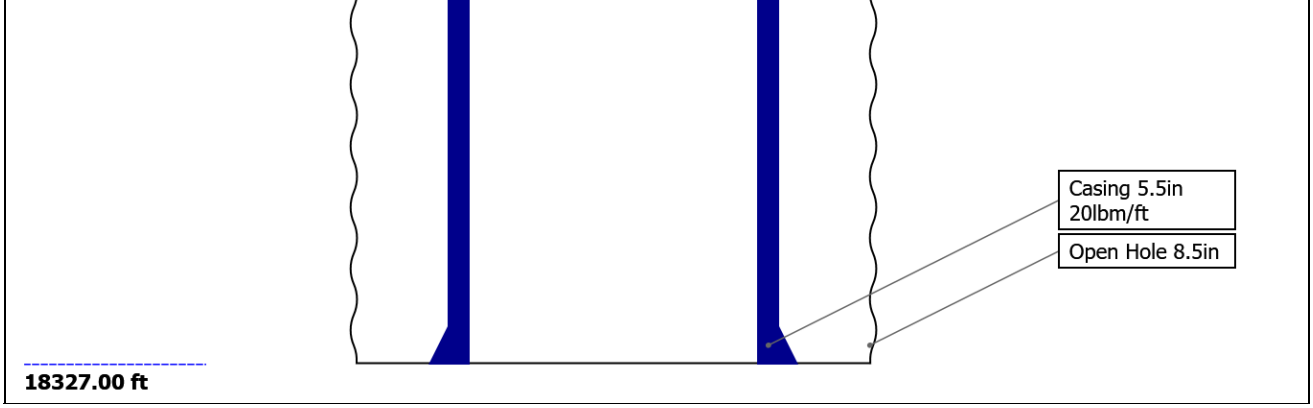
Logging Date		18-Jun-2020		
Run Number		USI		
Depth Driller		18327.00 ft		
Schlumberger Depth		18327.00 ft		
Bottom Log Interval		18080.00 ft		
Top Log Interval		125.00 ft		
Casing Fluid Type		Water		
Salinity				
Density		8.5 lbm/gal		
Fluid Level		8.00 ft		
BIT/CASING/TUBING STRING				
Bit Size		8.50 in		
From		1549.00 ft		
To		18327.00 ft		
Casing/Tubing Size		5.5 in		
Weight		20 lbm/ft		
Grade		P110		
From		0.00 ft		
To		18327.00 ft		
Max Recorded Temperatures		230 degF		
Logger on Bottom	Time	19-Jun-2020	01:50:00	
Unit Number	Location:	9103	Ft Morgan, CO	
Recorded By		Avery Becker		
Witnessed By		David Pozas		

Disclaimer

Contents

Well Sketch



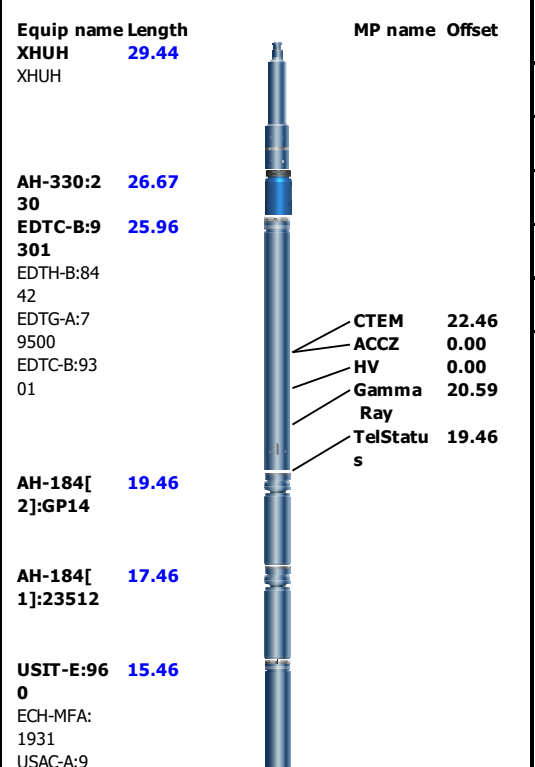


Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	13.5	8.5				
Top Driller (ft)	0	1549				
Top Logger (ft)	0	1549				
Bottom Driller (ft)	1549	18327				
Bottom Logger (ft)	1549	18327				
Casing						
Size (in)	9.625	5.5				
Weight (lbm/ft)	36	20				
Inner Diameter (in)	8.921	4.778				
Grade	J55	P110				
Top Driller (ft)	0	0				
Top Logger (ft)	0	0				
Bottom Driller (ft)	1549	18327				
Bottom Logger (ft)	1549	18327				

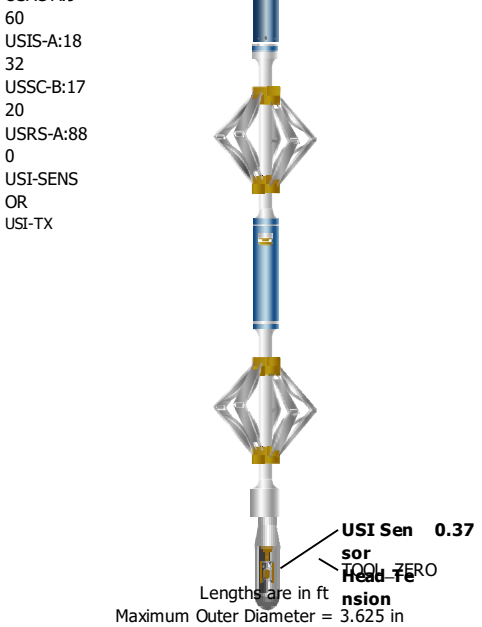
Remarks and Equipment Summary

USI: Toolstring



USI: Remarks

Tool was run with small hole and booster kit on USI and GEMCO on USAC
All logging intervals as per client request
Log recorded in 10 deg, 6 inch resolution
Well cemented 5/25/2020
Lead: 14.5 ppg, spacer: 12.5 ppg
Log recorded with 0 PSI surface pressure



Depth Summary

	USI		
Depth Measuring Device			
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		
Tension Device			
Type	CMTD-B/A		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0		
Logging Cable			
Type	7-32AS-XS		
Serial Number			
Length	25000.00 ft		
Conveyance Type	Wireline		
Rig Type			

USI: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		Log correlated to marker joint at 16705 ft
Stretch Correction		
Tool Zero Check At Surface		

USIT - Fluid Properties Measurement

USIT - Fluid Properties Measurement

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[3]:Up	18084.08	118.43

Fluid Velocity = "Automatic".
CFVL equals DFSL channel

Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)

Mud Impedance = "FreePipe Norm.".
Free Pipe normalization zone is : 1026.59m(3368.08ft) to 1028.55m(3374.50ft)
MUD_N_FRP = 1.18
DFD = 1.02g/cm3(8.50lbm/gal)
CZMD median computed in free pipe normalization interval = 1.89 MRayl

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

USI

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
USI	Log[3]:Up	Up	118.43 ft	18084.08 ft	19-Jun-2020 1:51:53 AM	19-Jun-2020 3:32:08 AM	OFF	-25.70 ft	Yes

All depths are referenced to toolstring zero

Log

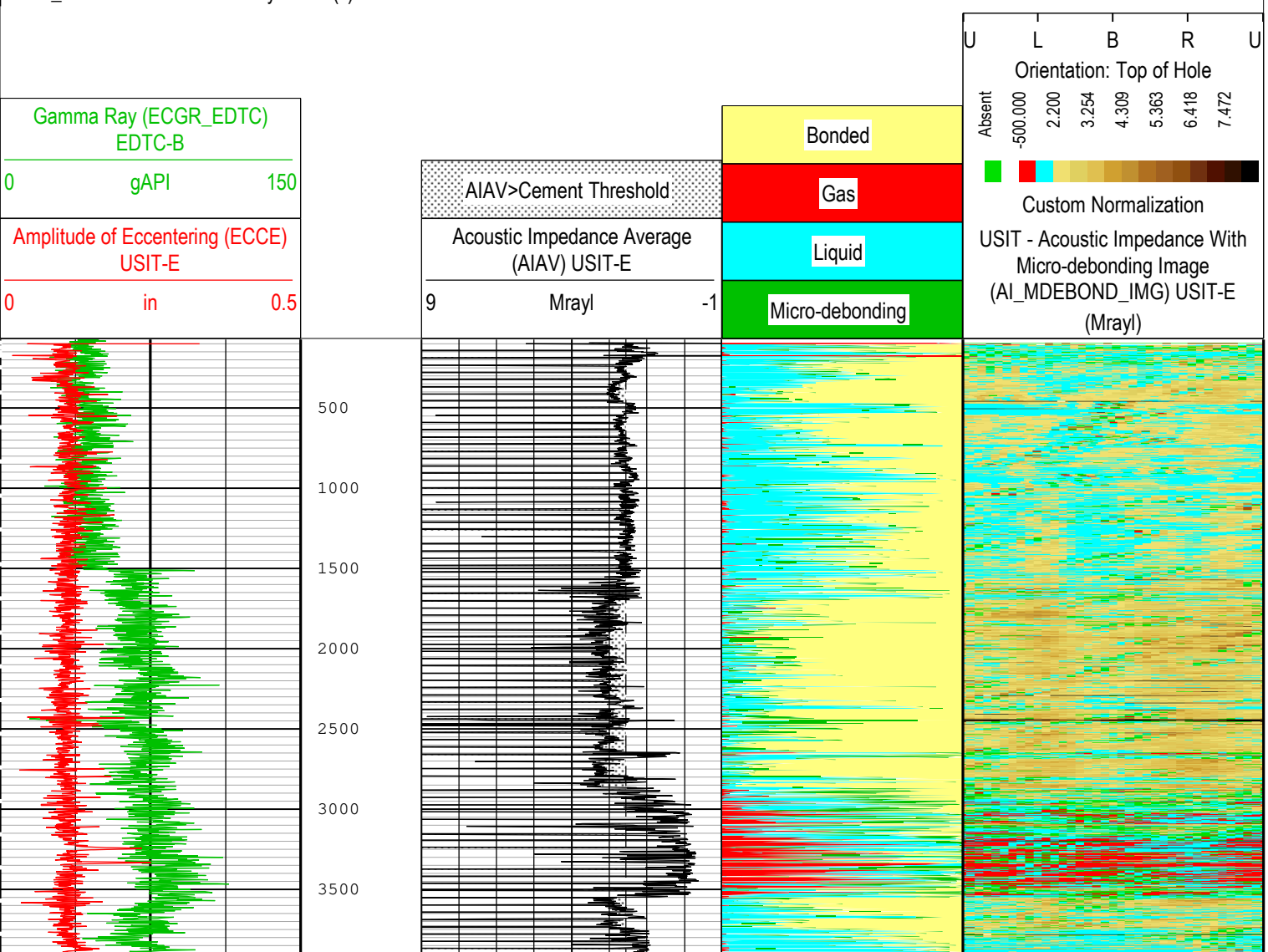
Company:Great Western Operating Company LLC Well:Postle IC 09-099HC

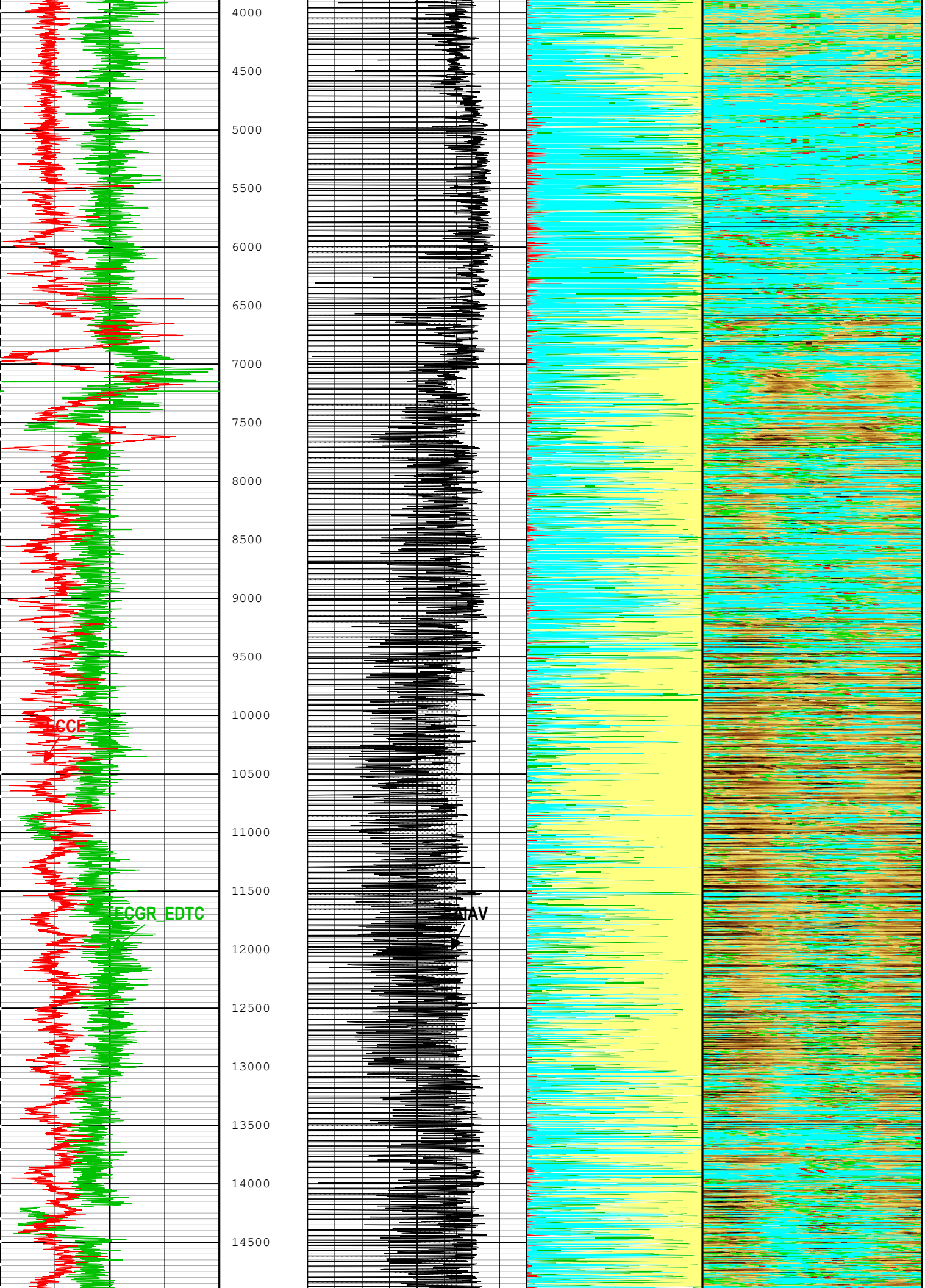
USI: Log[3]:Up:S006

Description: USI Cement Format: Log (USI Lvl 1 Compressed) Index Scale: 0.1 in per 100 ft Index Unit: ft Index Type: Measured Depth

Creation Date: 19-Jun-2020 04:13:47

TIME_1900 - Time Marked every 60.00 (s)

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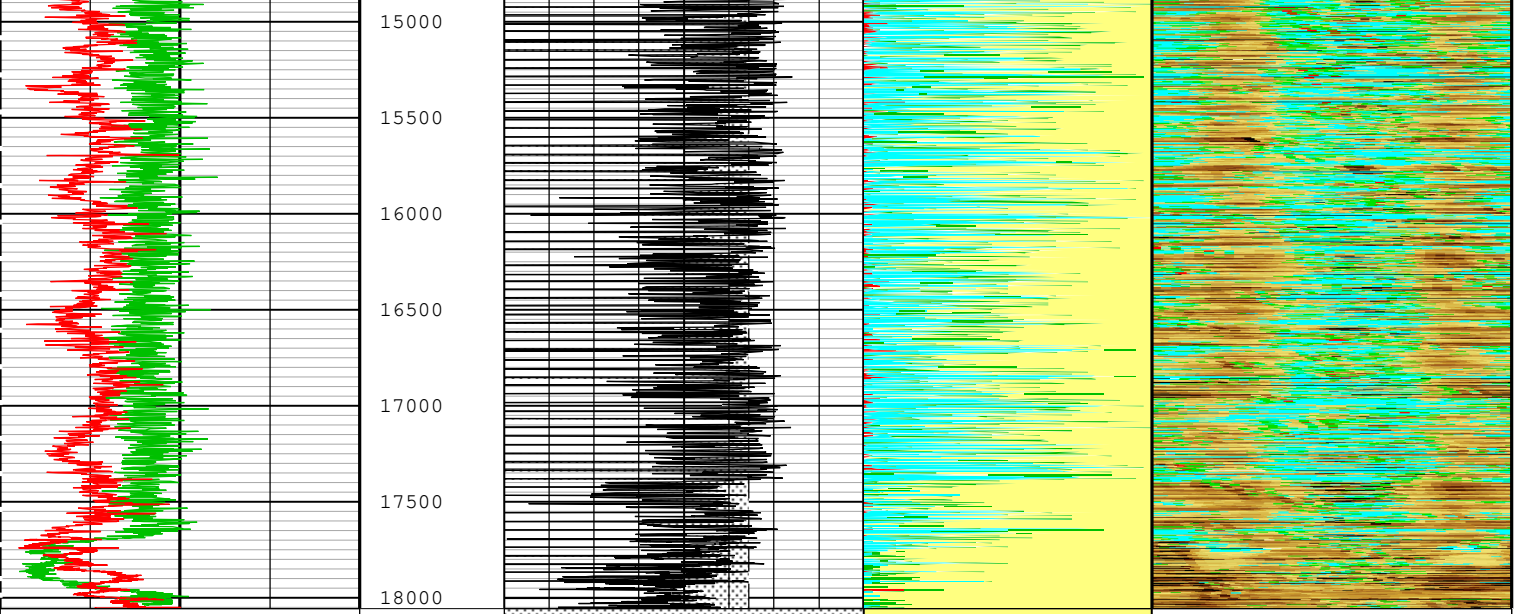
ECGR_EDTC
AIAV



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Description: USI Cement Format: Log (USI Lvl 1 Compressed) Index Scale: 0.1 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 19-Jun-2020 04:13:47

USI

Main Pass: 0 PSI

Software Version

Acquisition System	Version
Maxwell 2020.0	10.0.202864.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
USI	Log[3]:Up	Up	118.43 ft	18084.08 ft	19-Jun-2020 1:51:53 AM	19-Jun-2020 3:32:08 AM	OFF	-25.70 ft	Yes

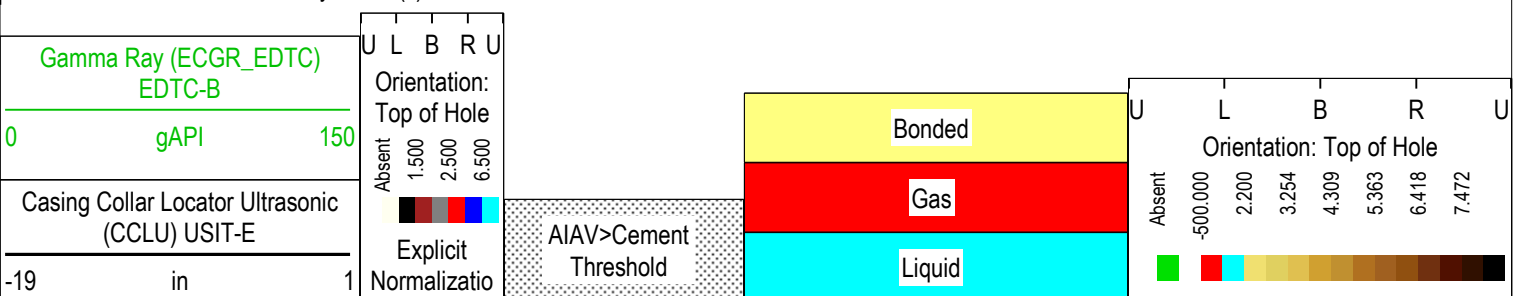
All depths are referenced to toolstring zero

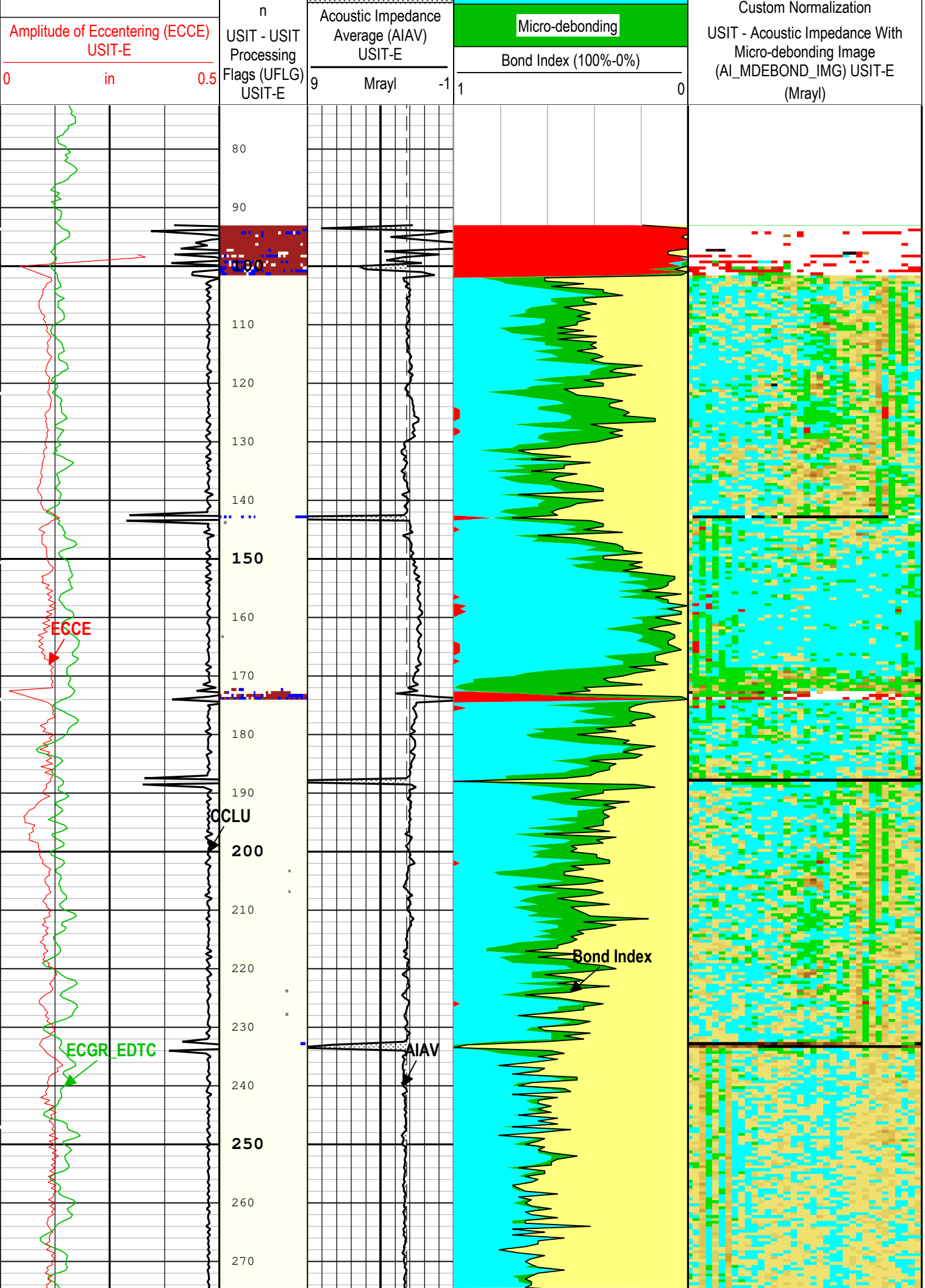
Log

Company:Great Western Operating Company LLC Well:Postle IC 09-099HC
USI: Log[3]:Up:S006

Description: USI Cement Format: Log (USI Lvl 1) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 19-Jun-2020 04:13:51

TIME_1900 - Time Marked every 60.00 (s)




Amplitude of Eccentering (ECCE) USIT-E
0
in
0.5
n
USIT - USIT Processing Flags (UFLG) USIT-E
Acoustic Impedance Average (AIAV) USIT-E
9
Mrayl
-1
Micro-debonding
Bond Index (100%-0%)
1
0
Custom Normalization
USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E
(Mrayl)
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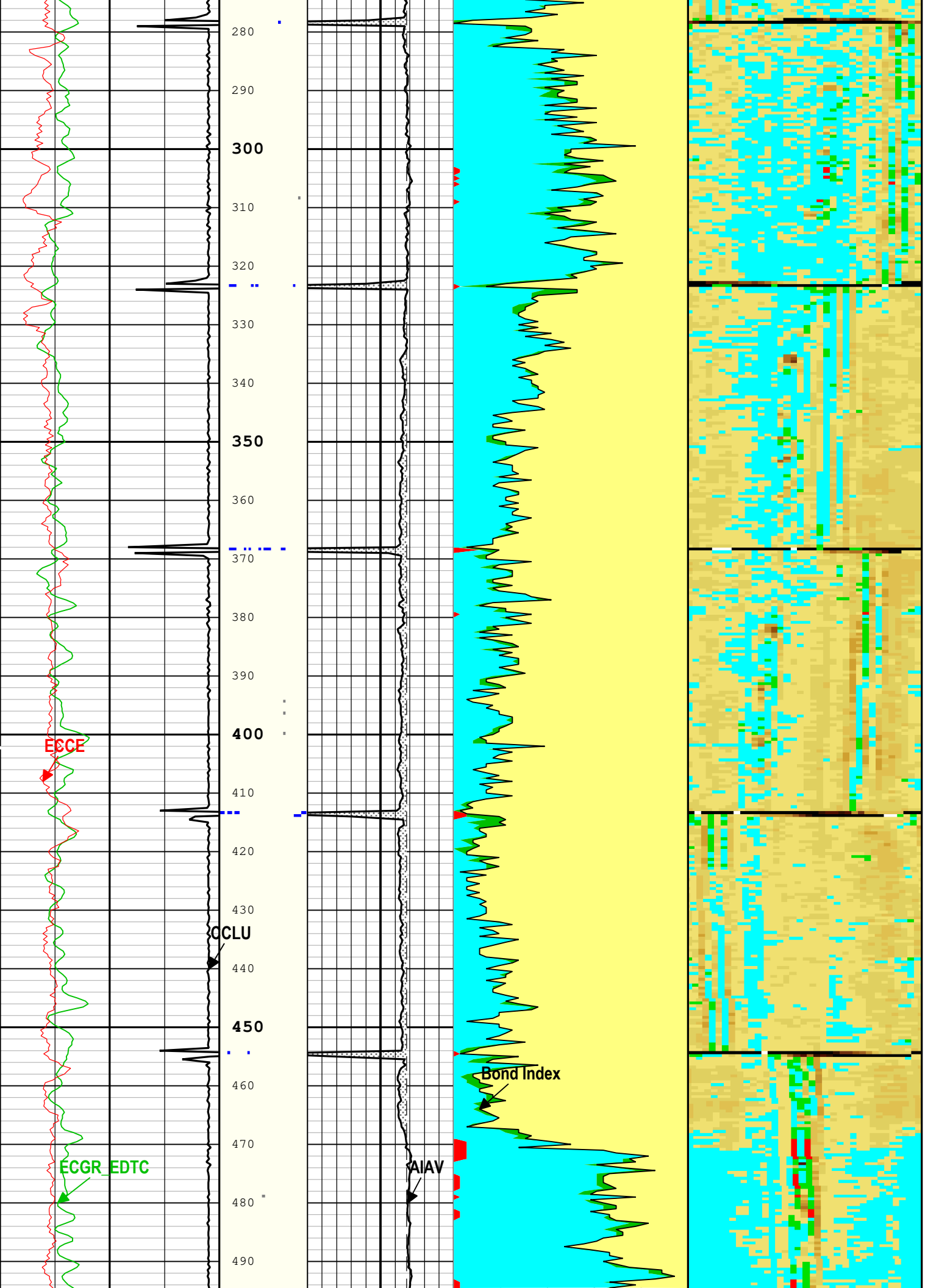
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CCLU
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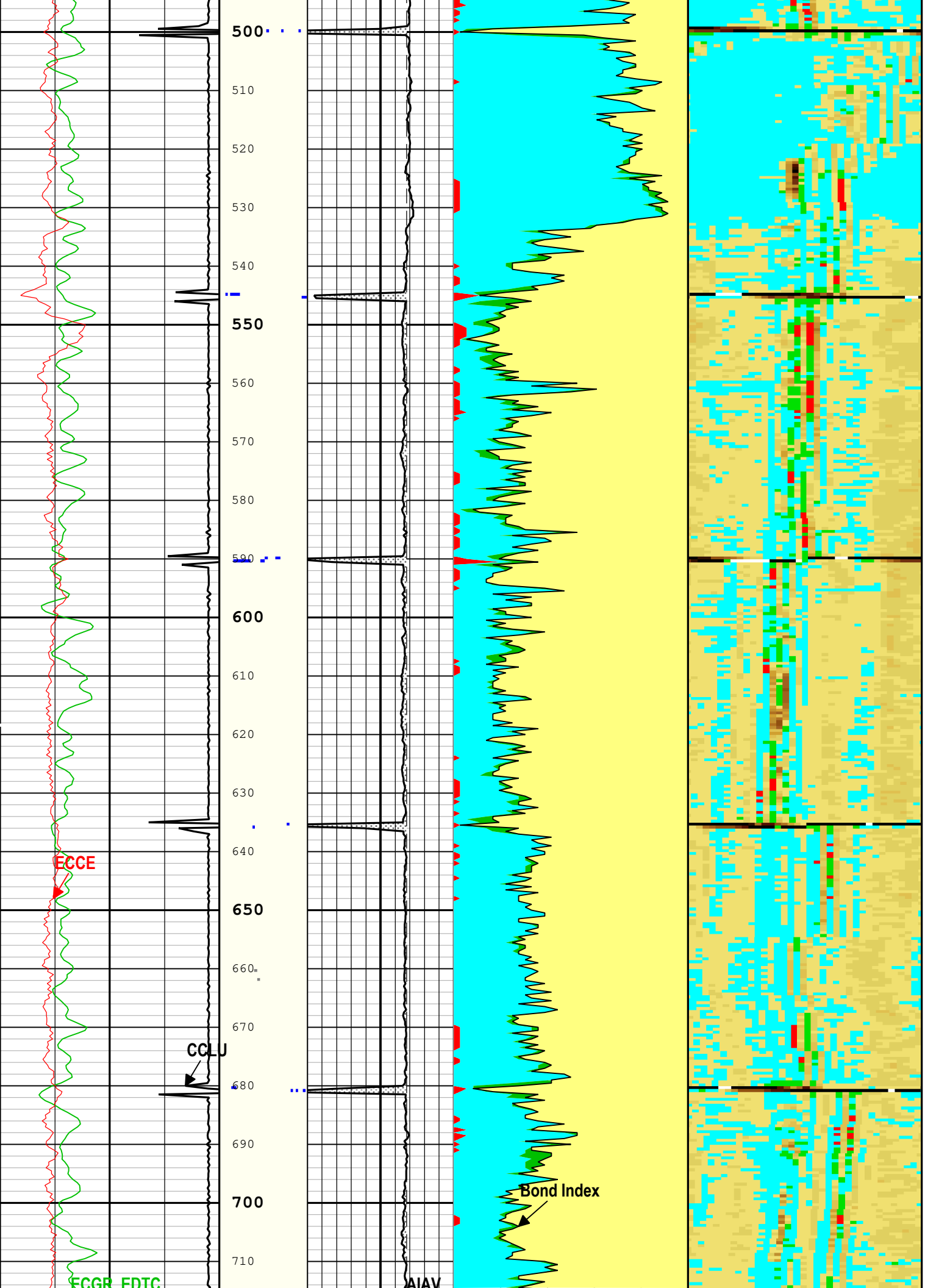
Bond Index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Bond Index
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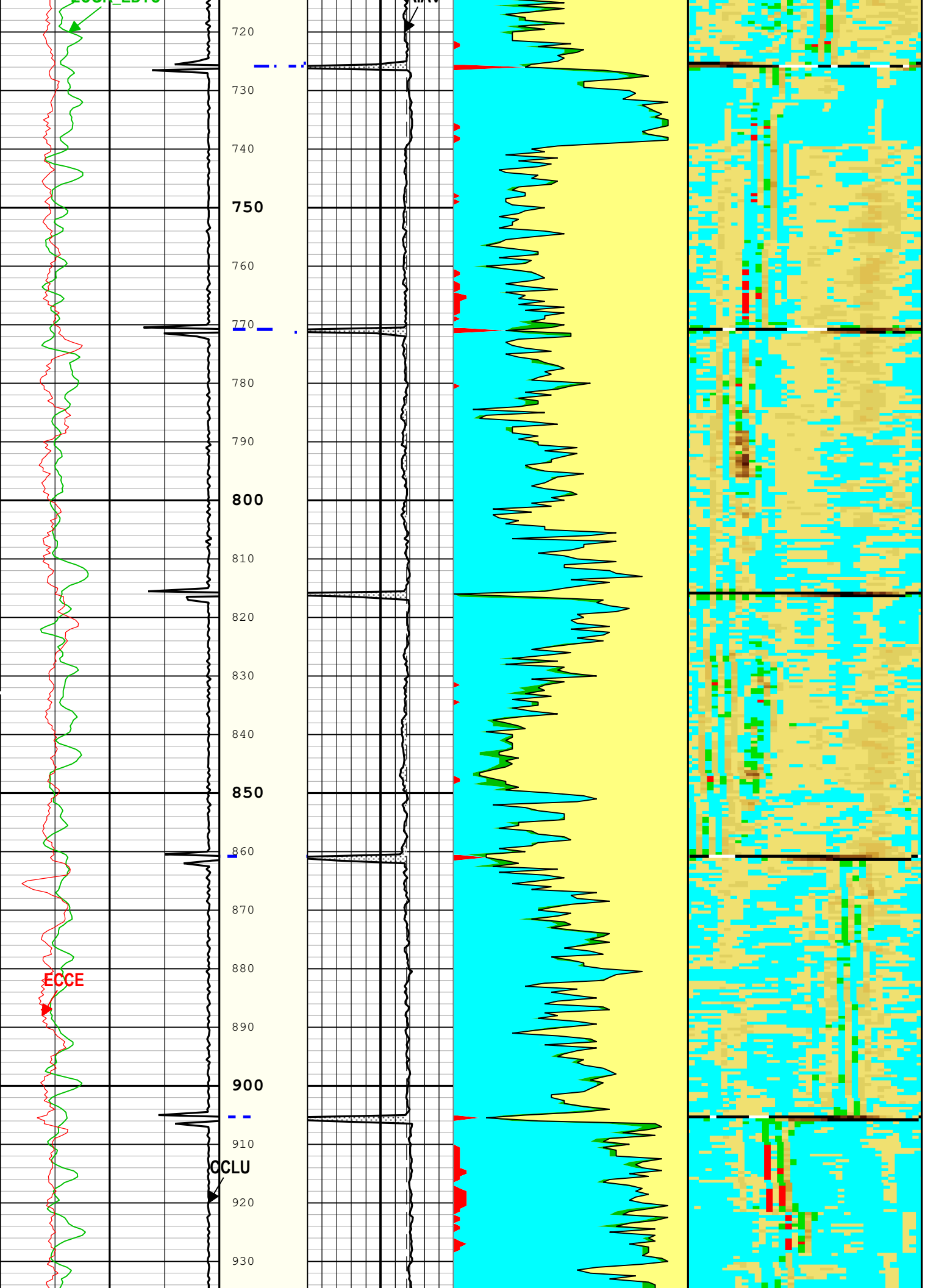
AIAV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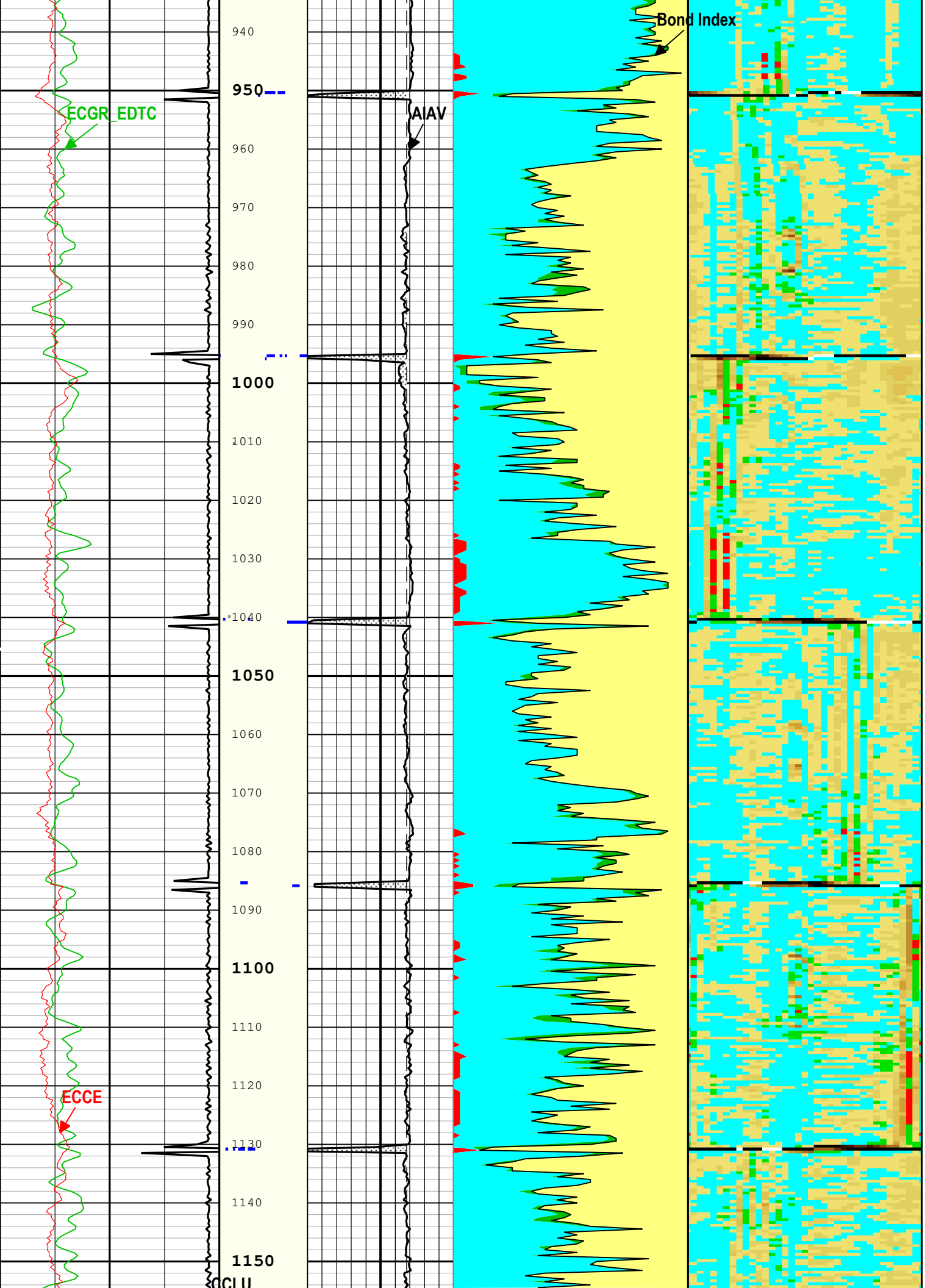
CCLU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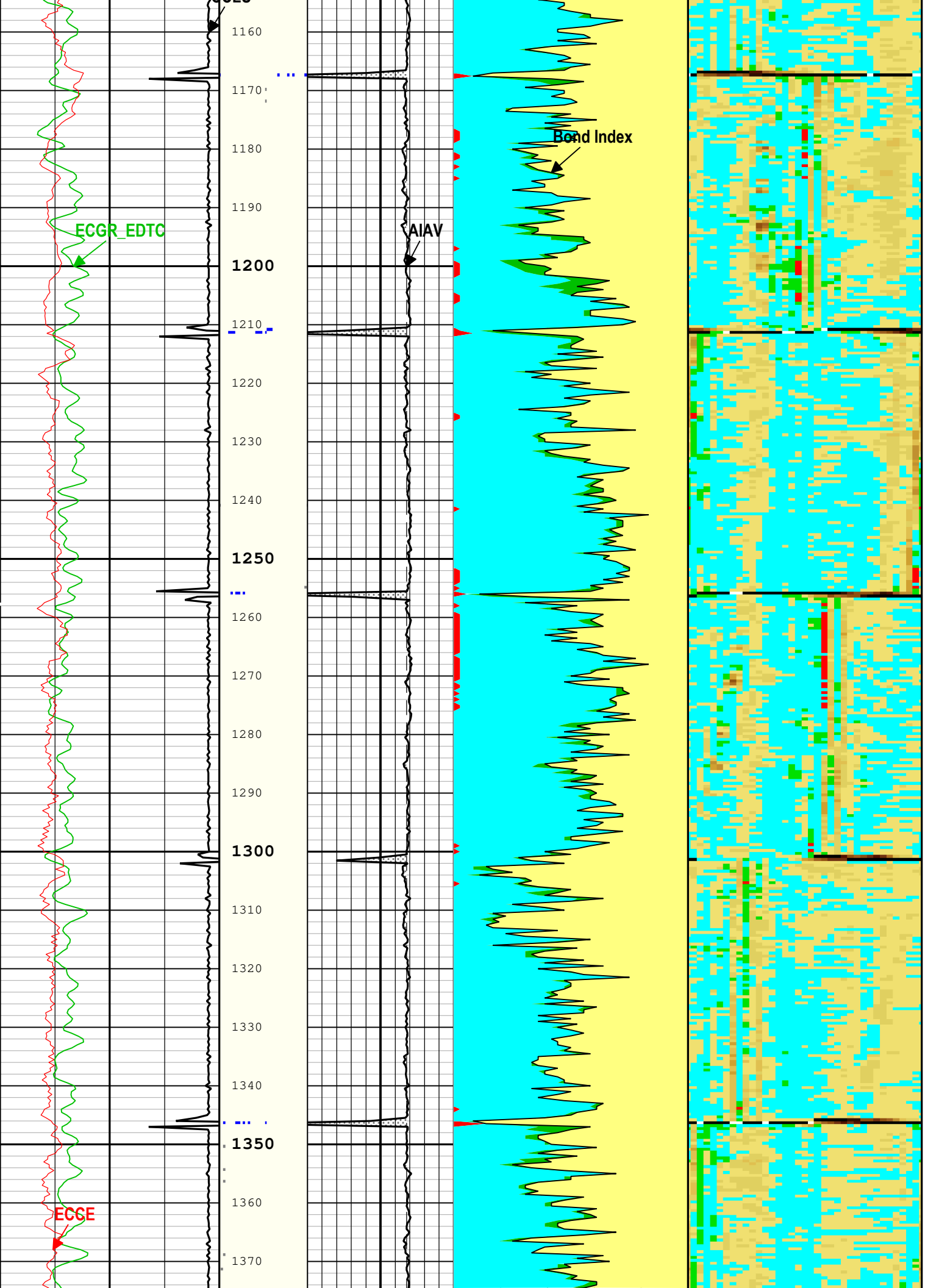
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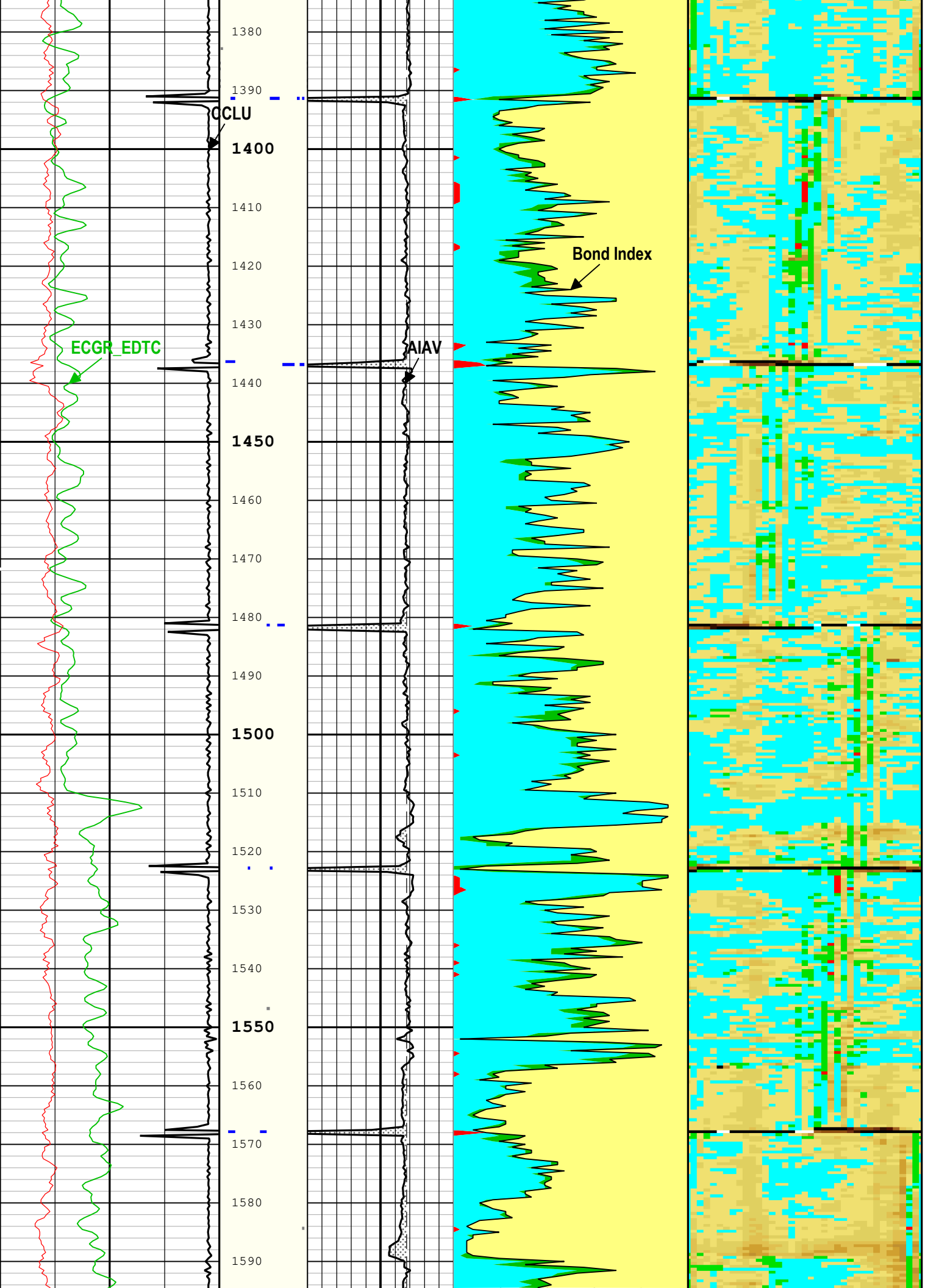
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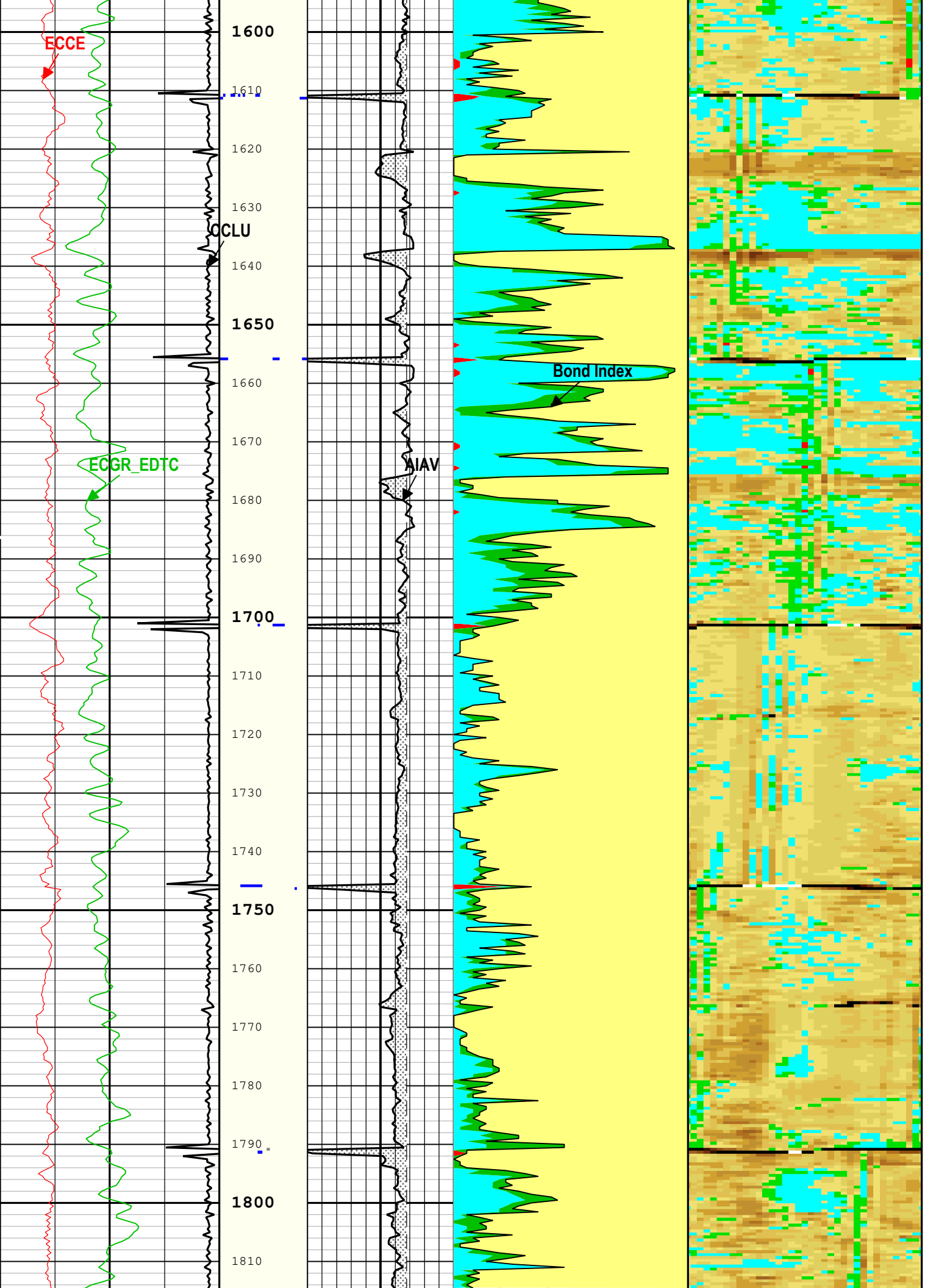
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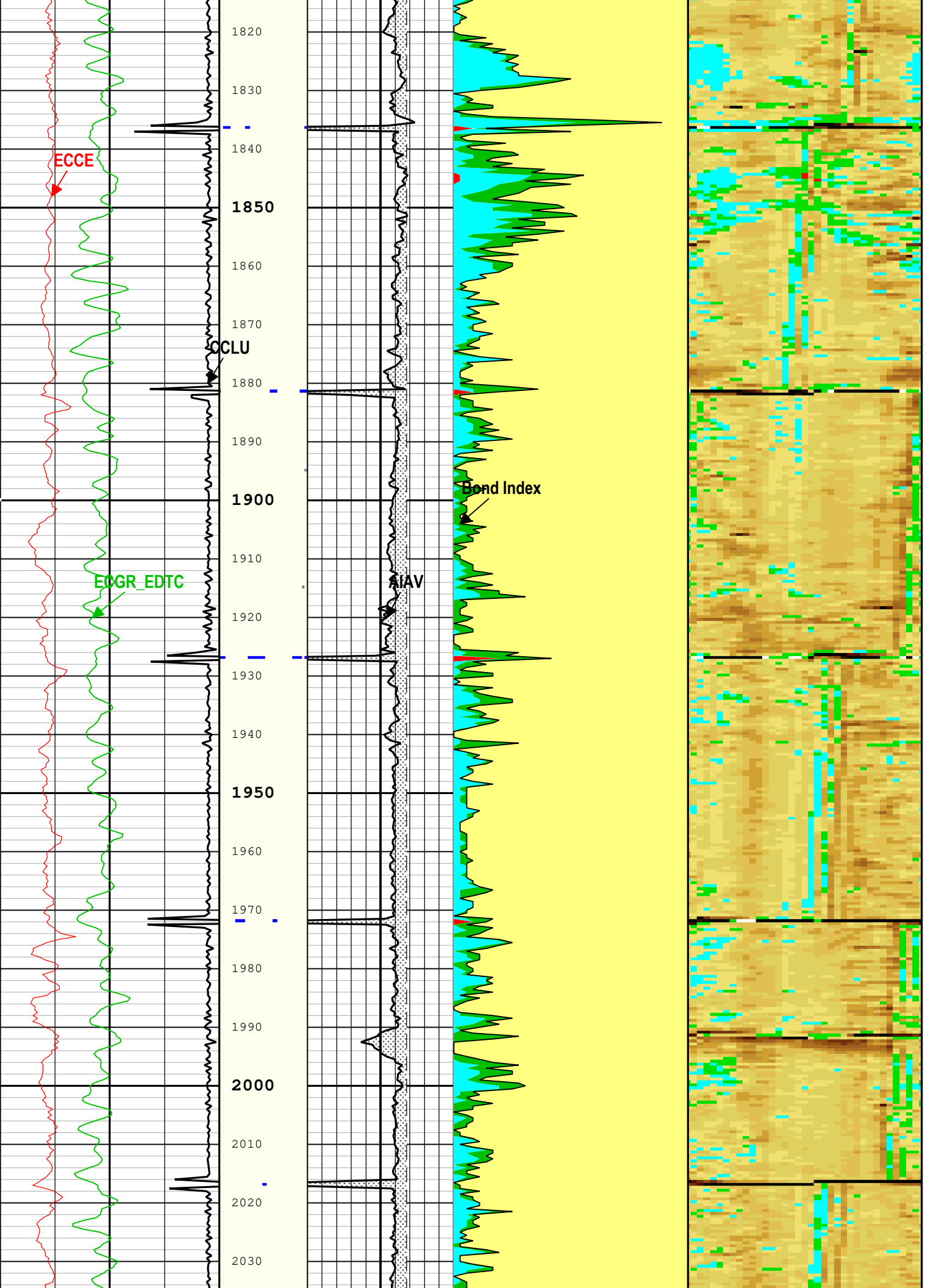
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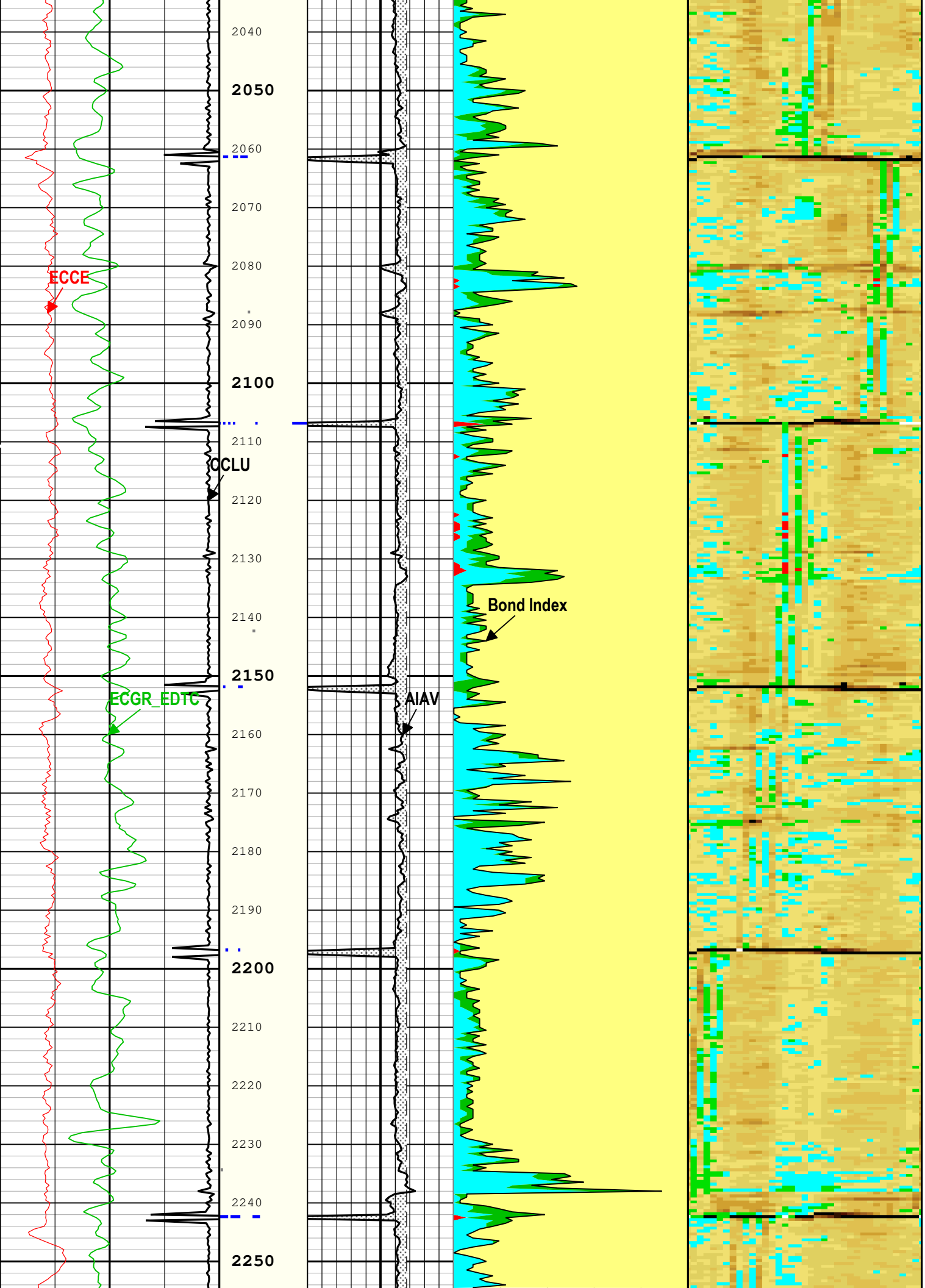
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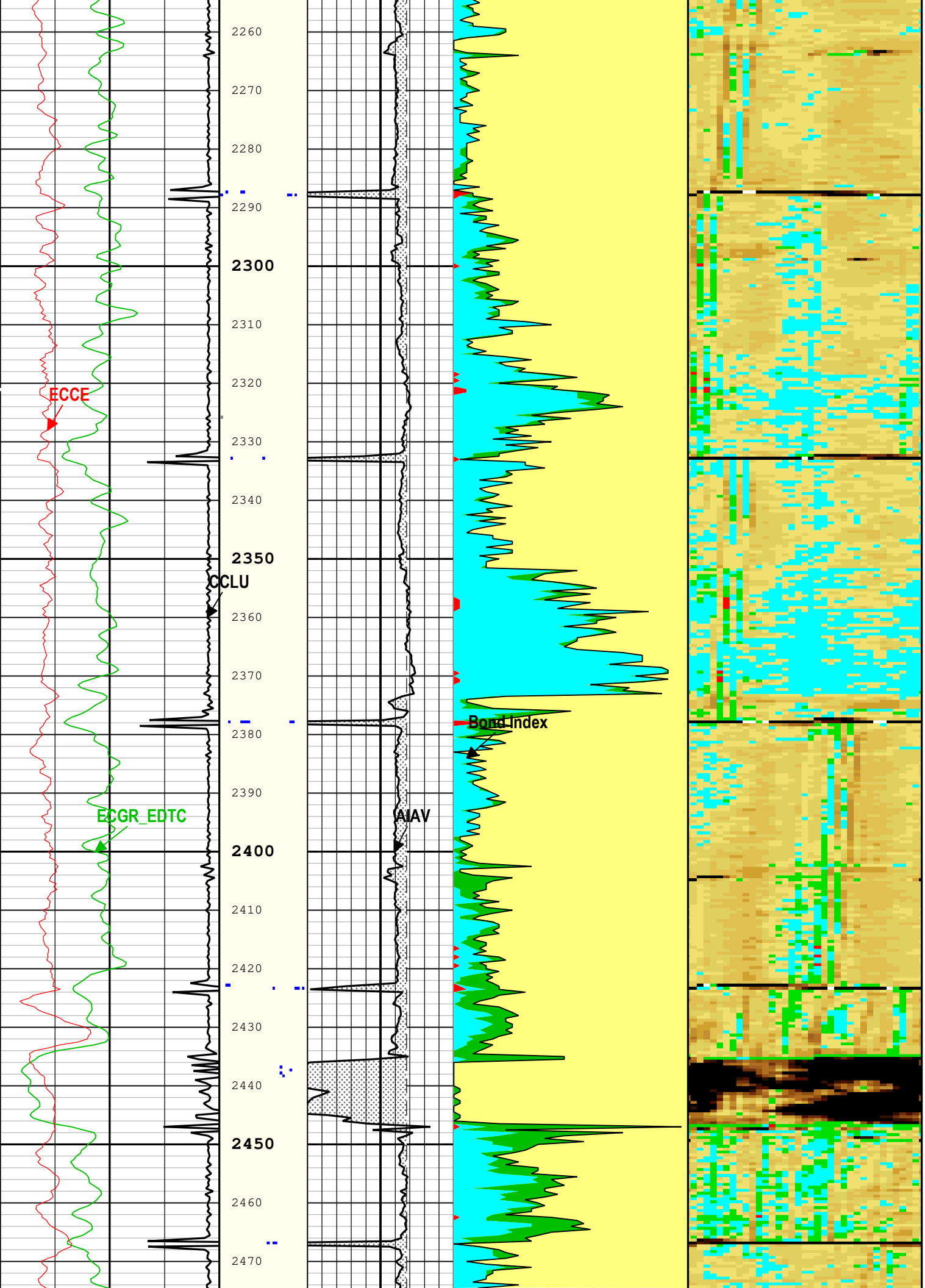
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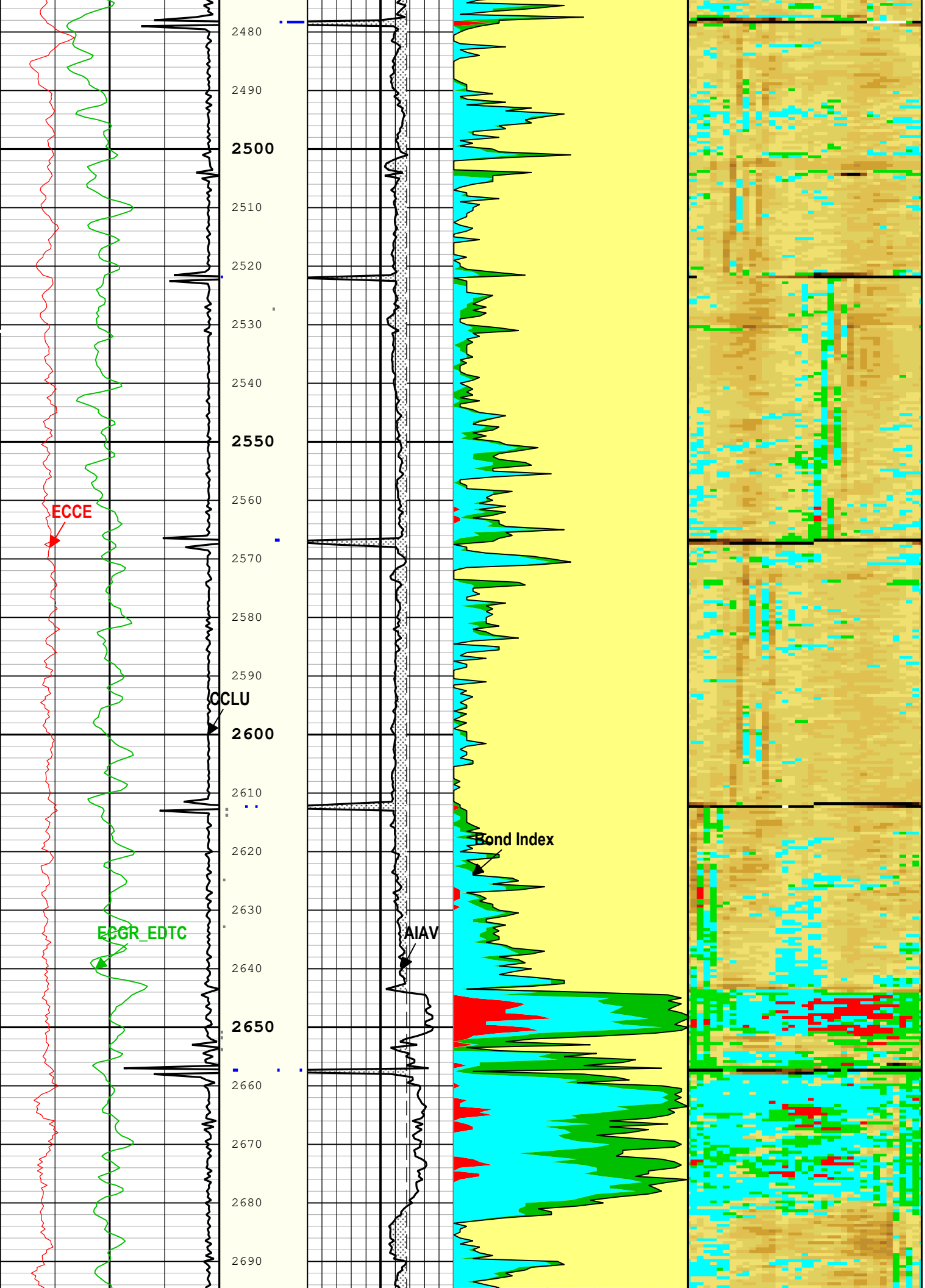
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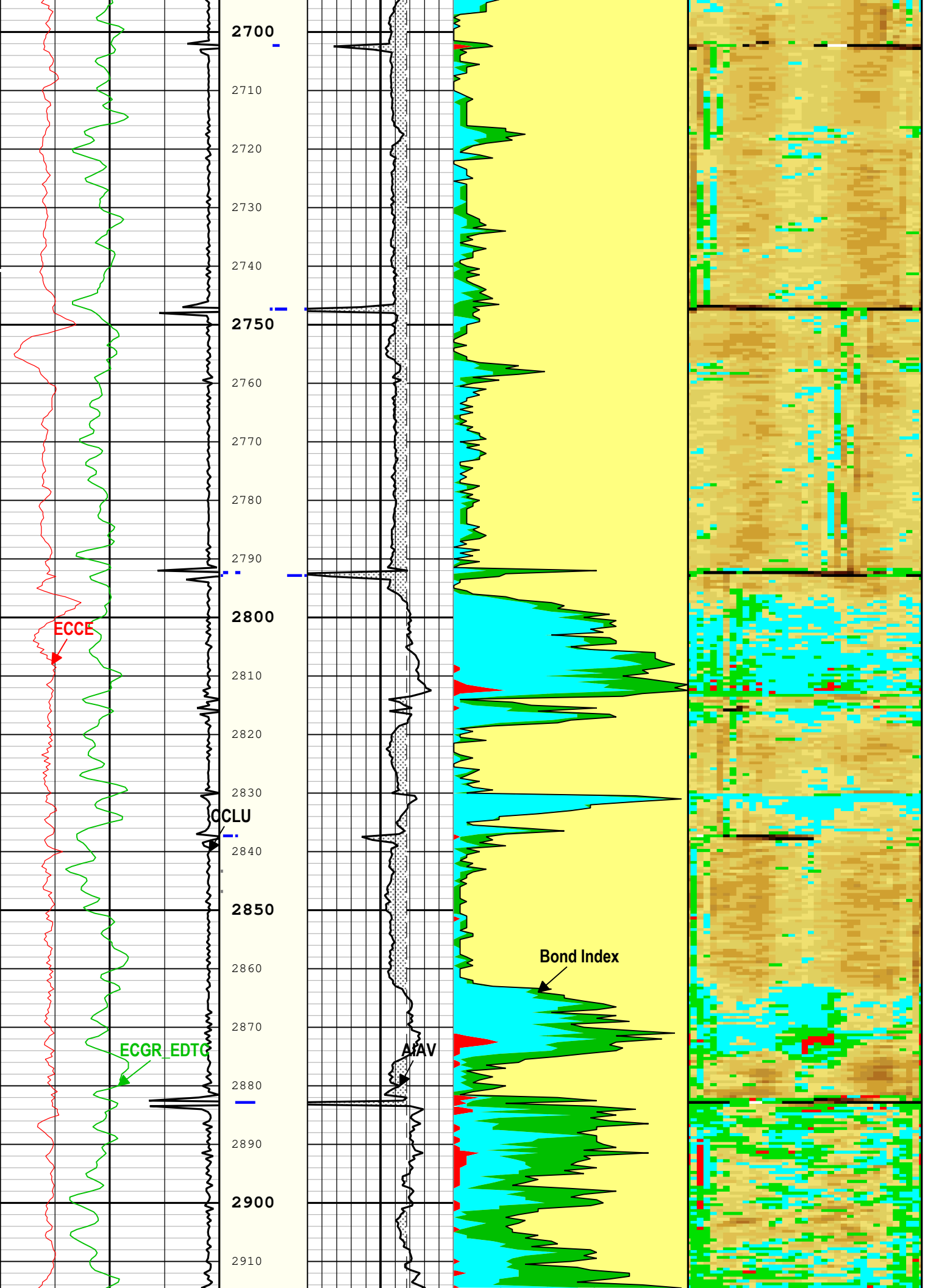
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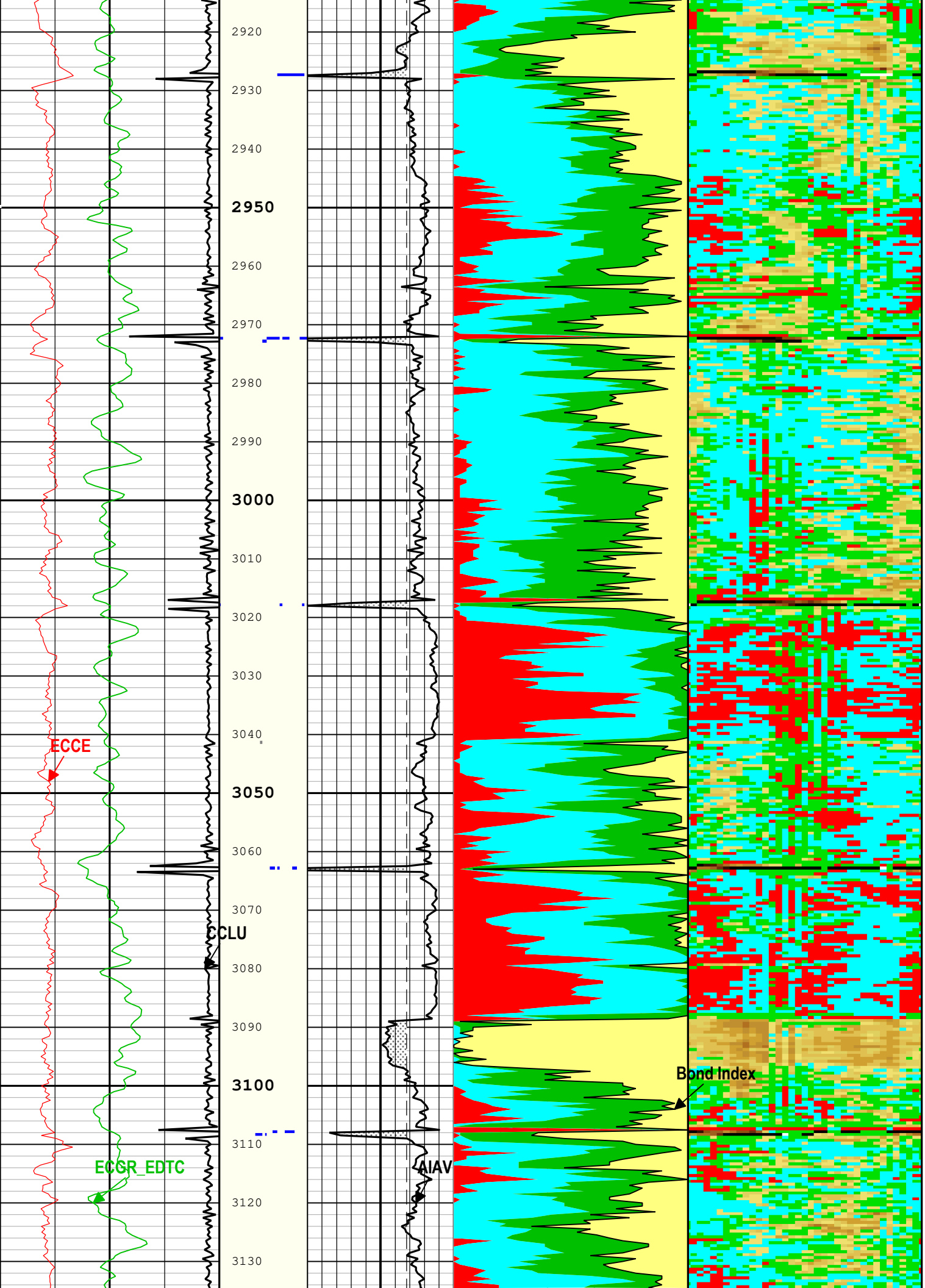
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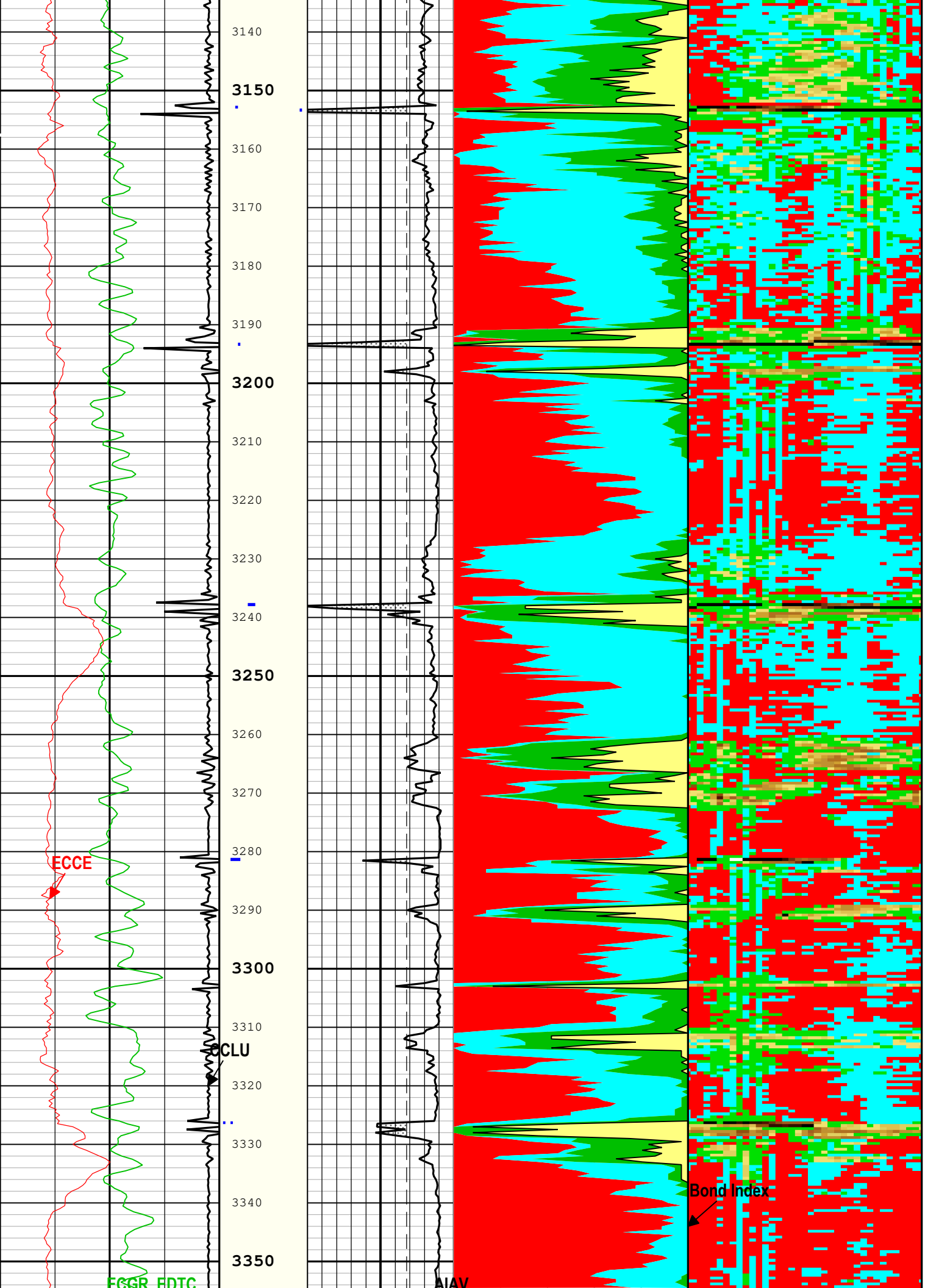
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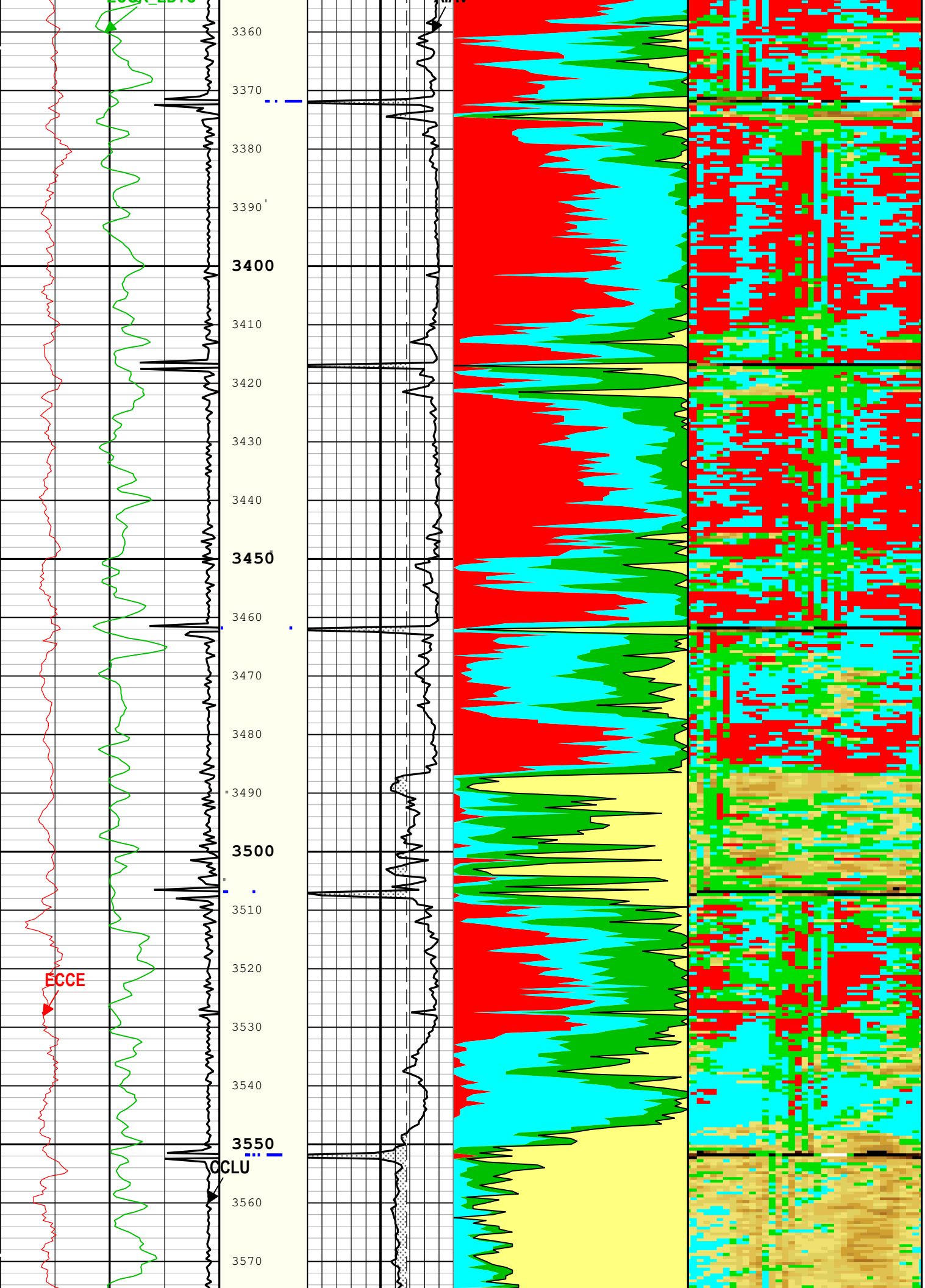
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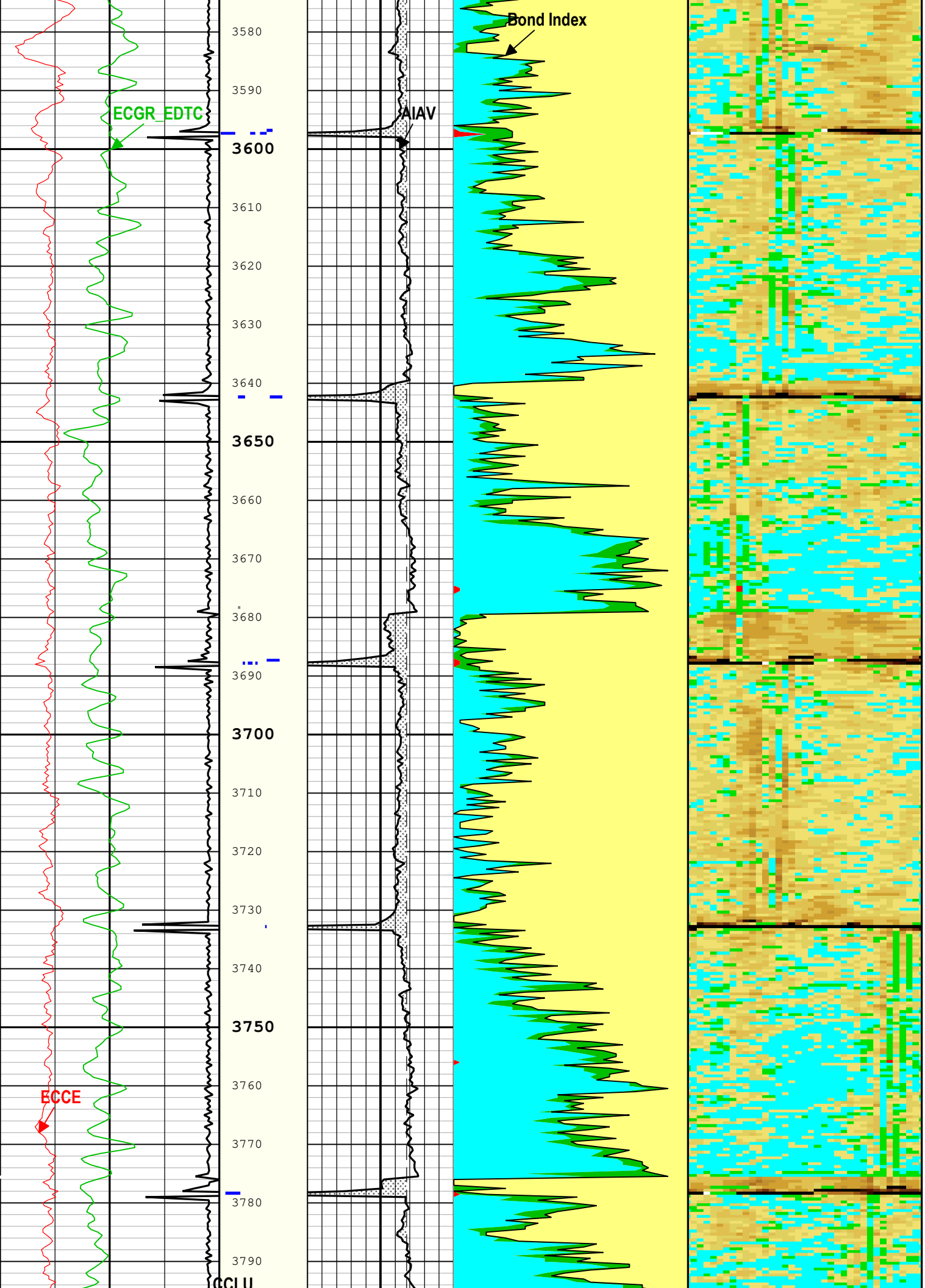
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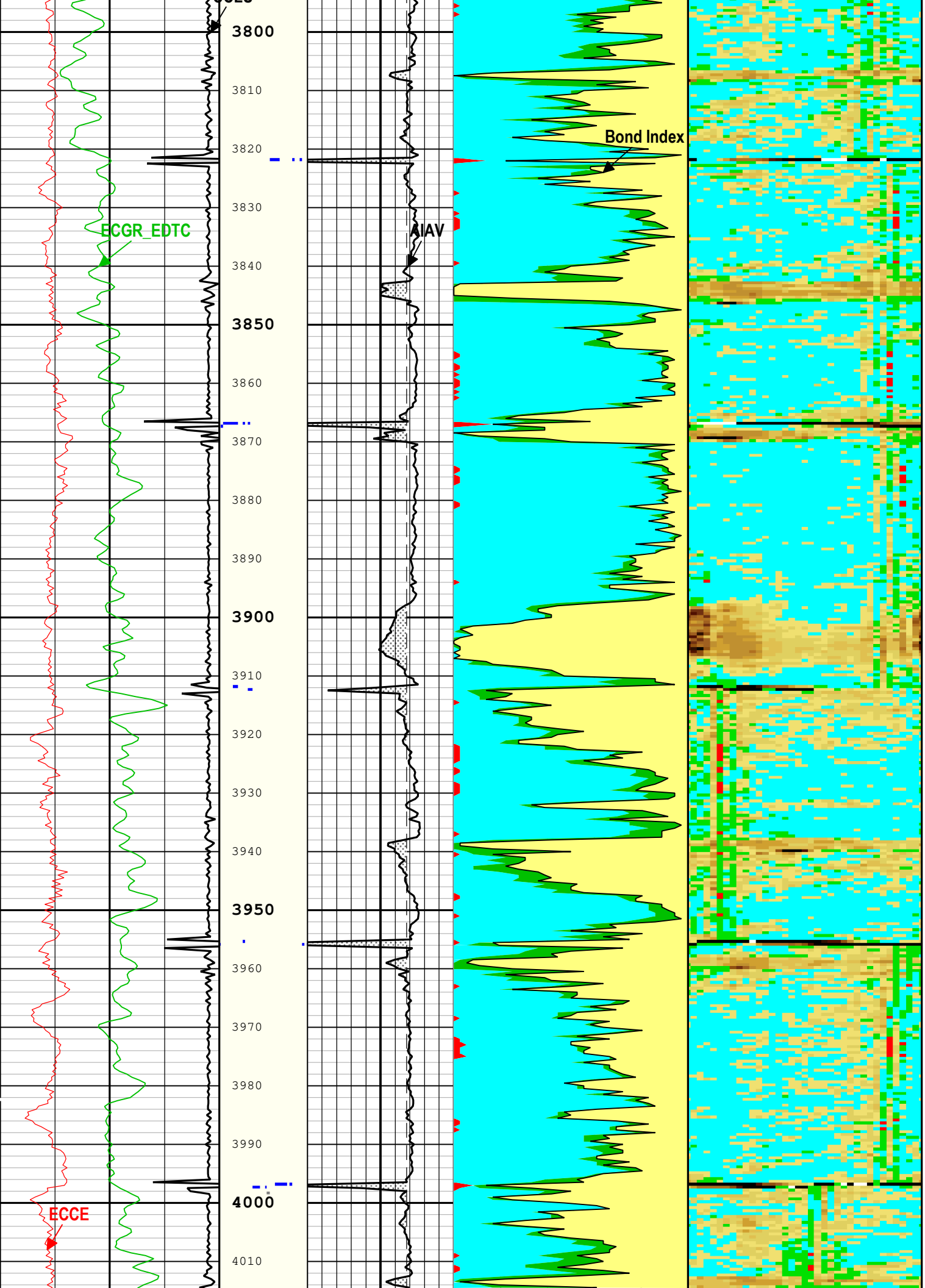
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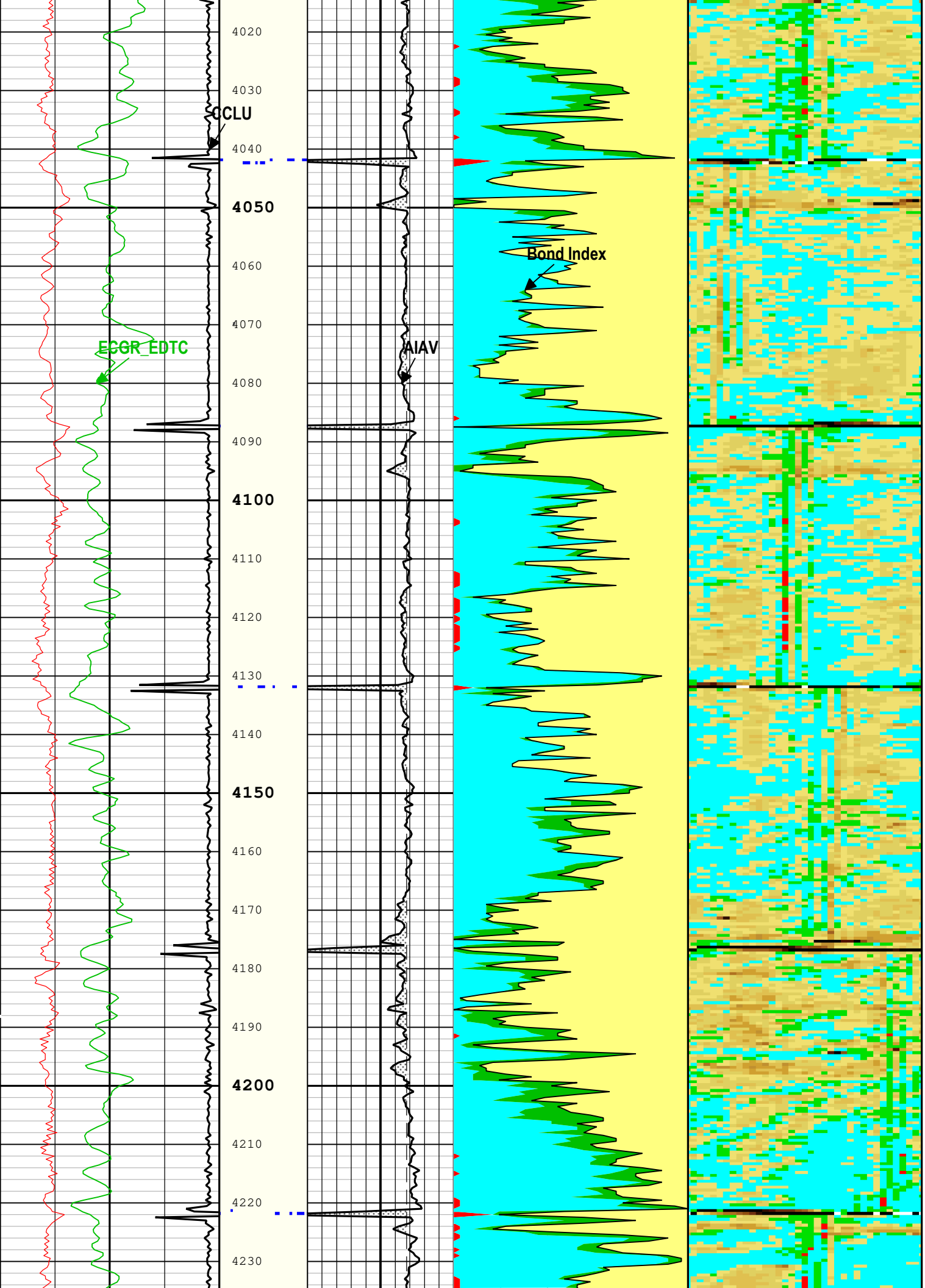
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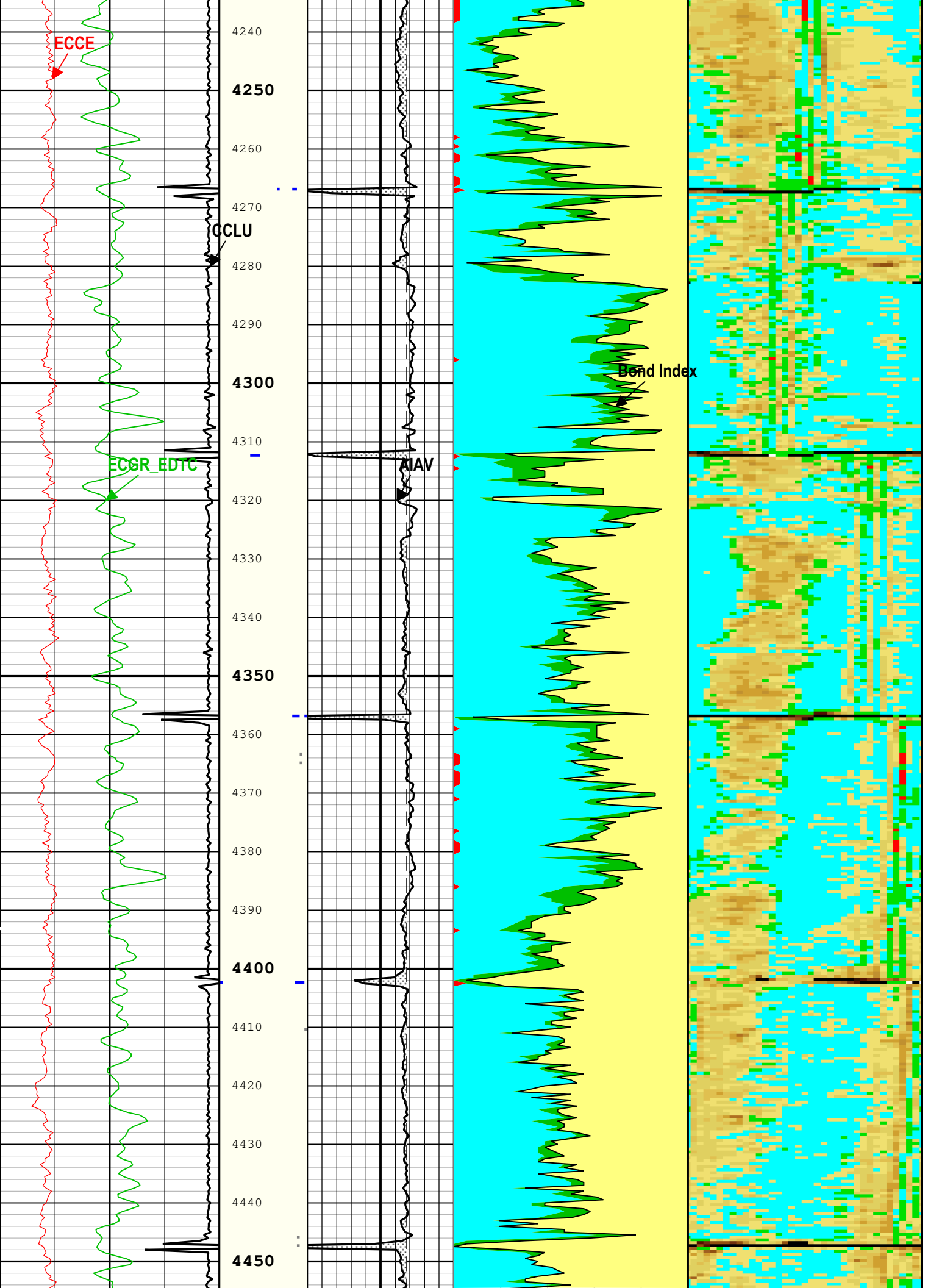
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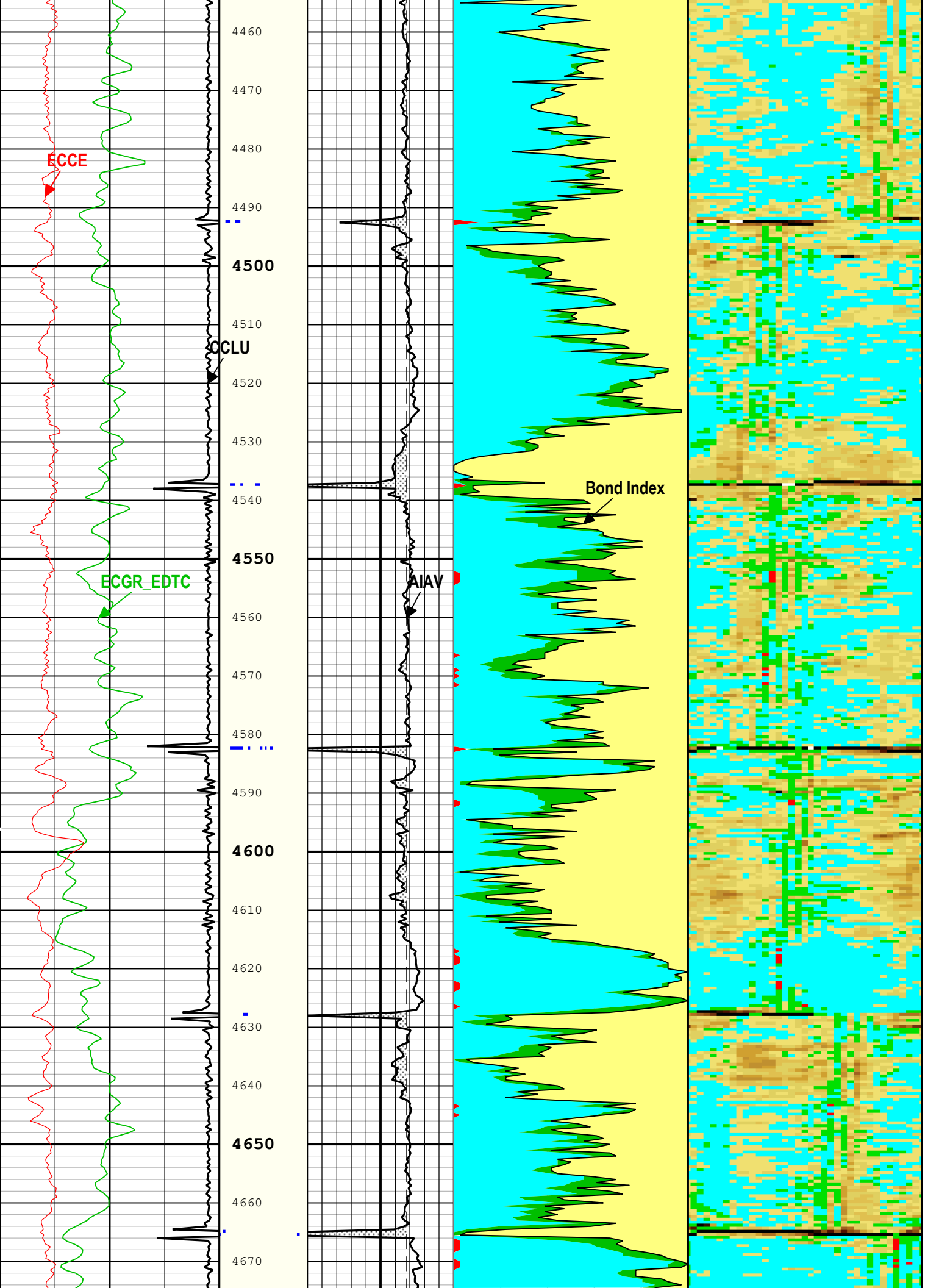
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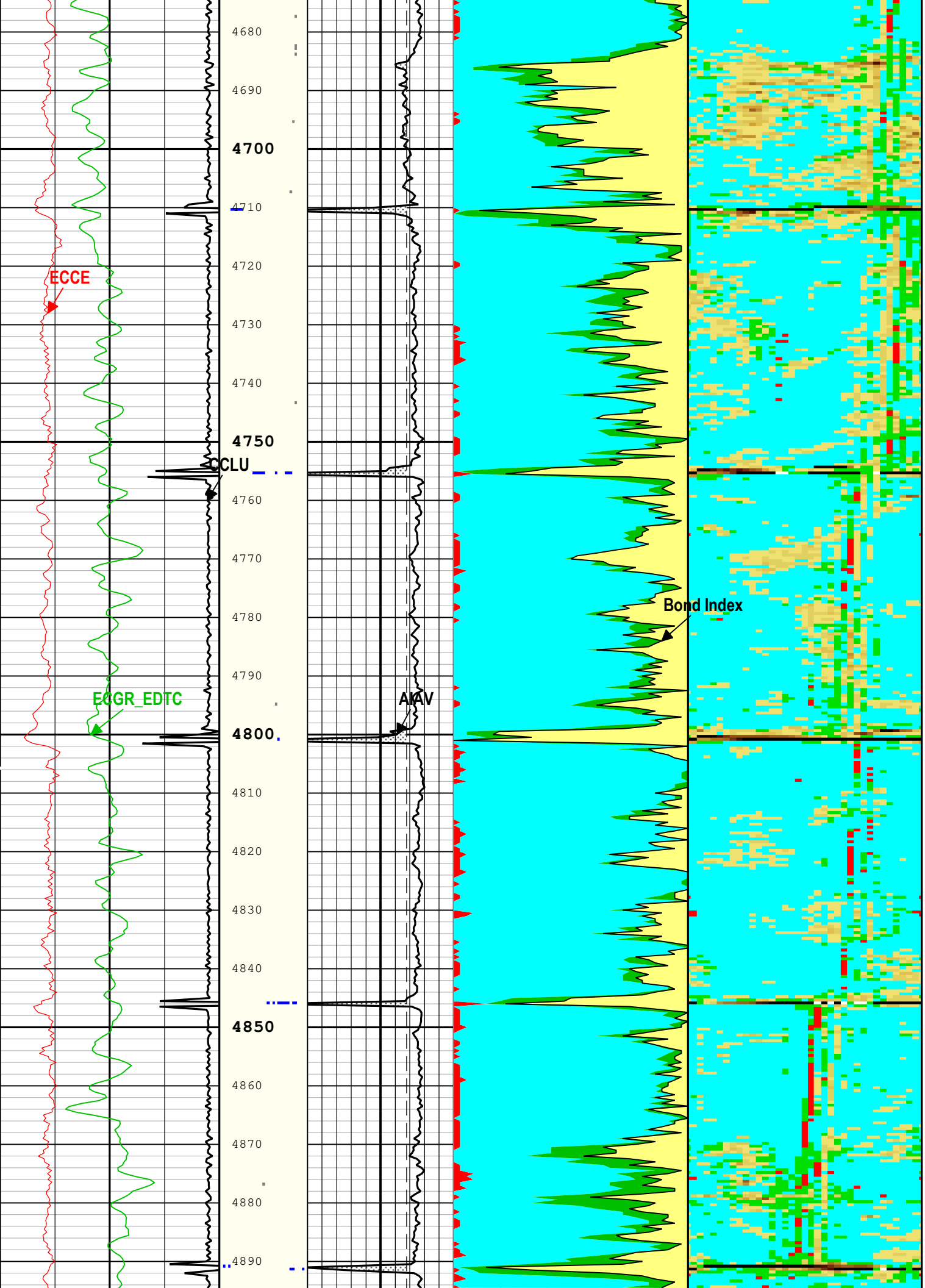
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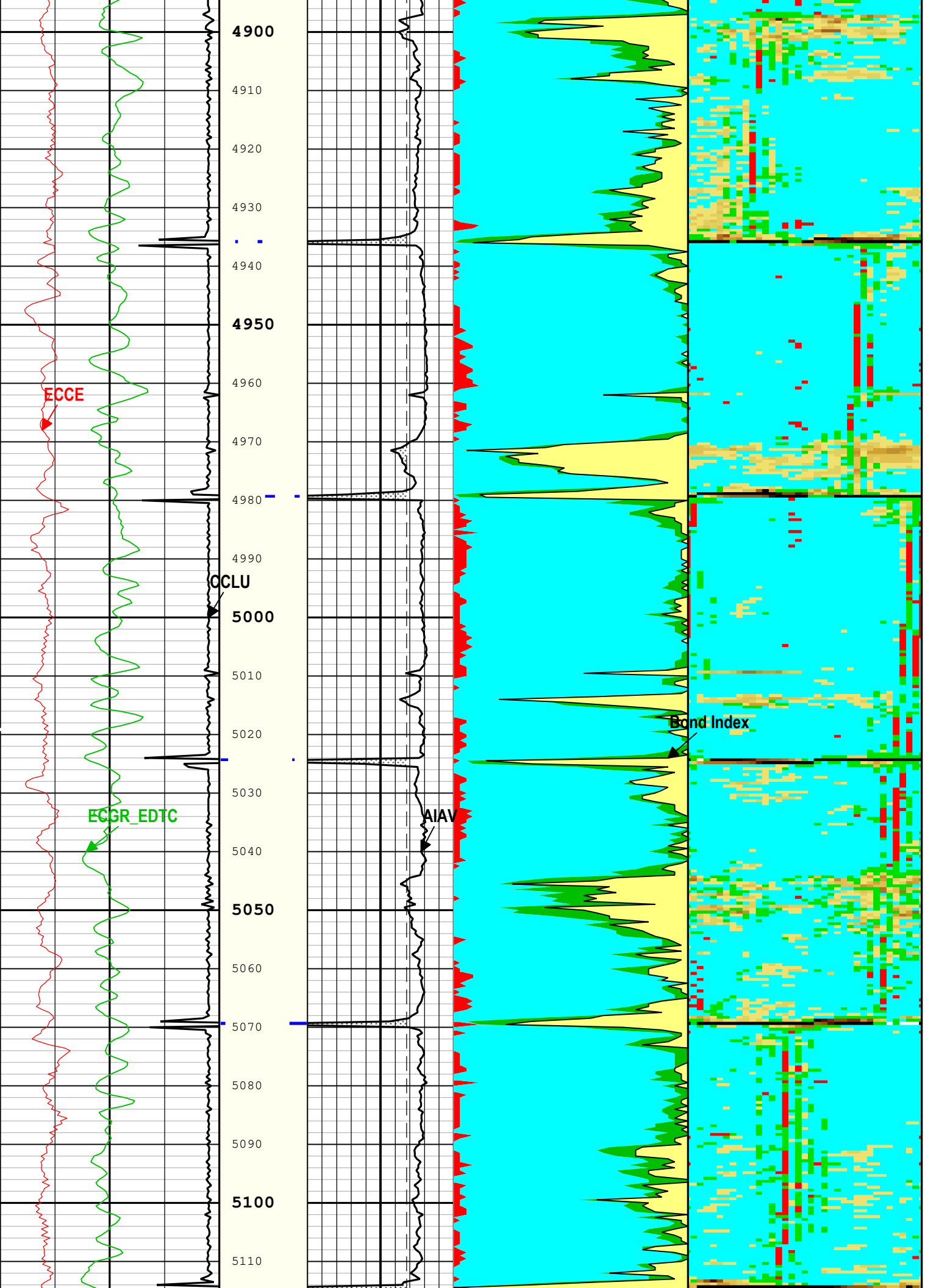
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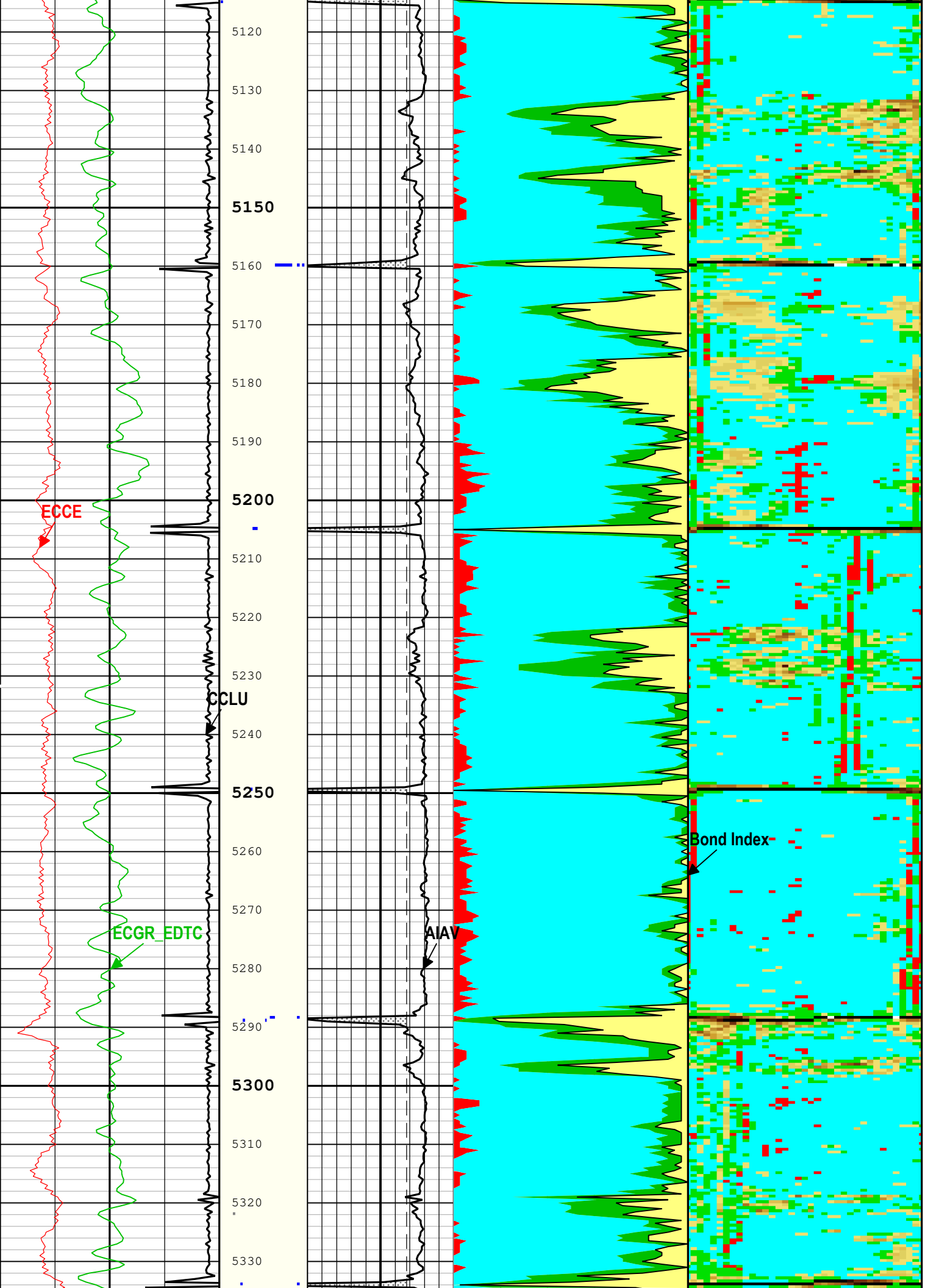
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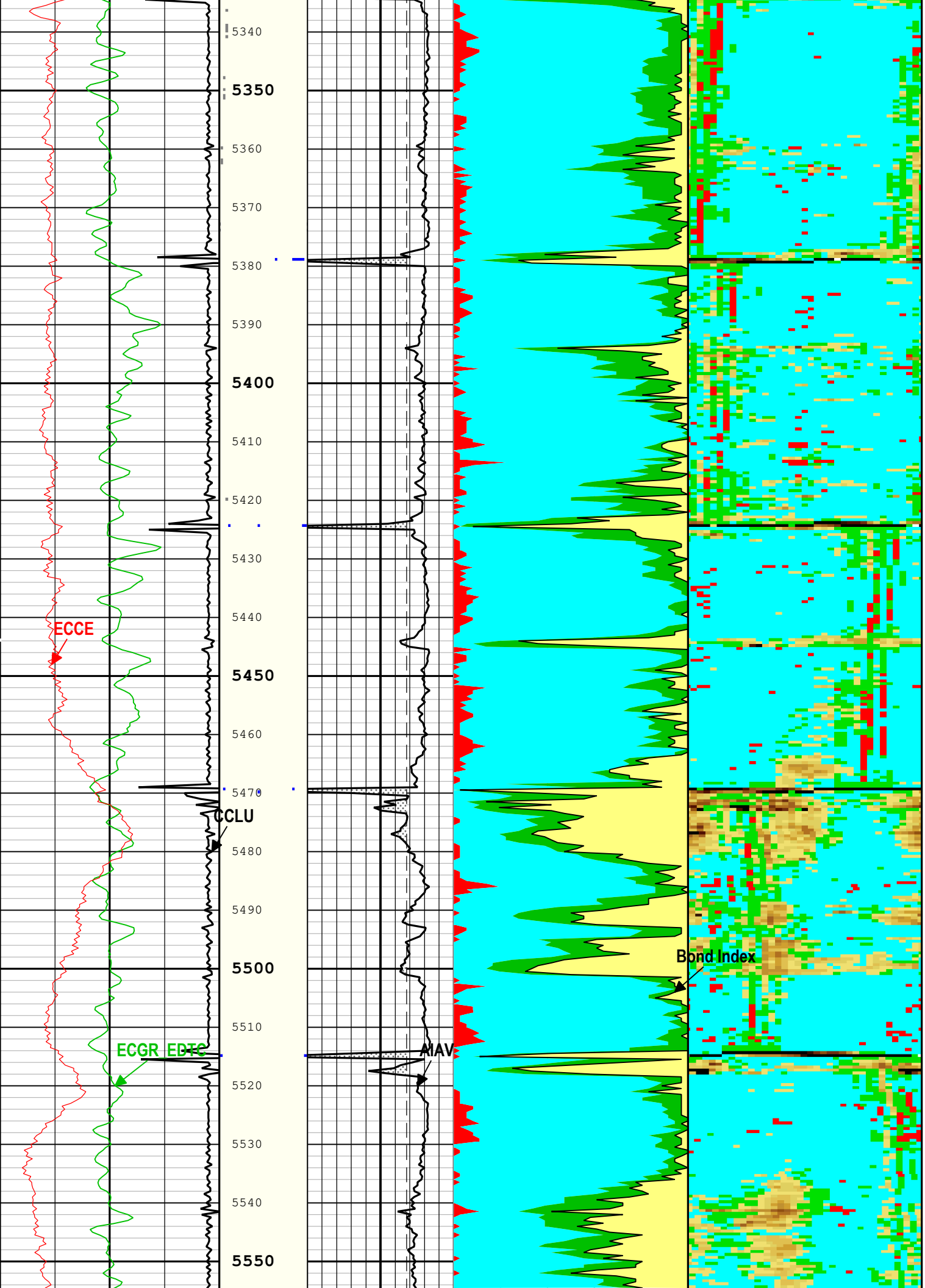
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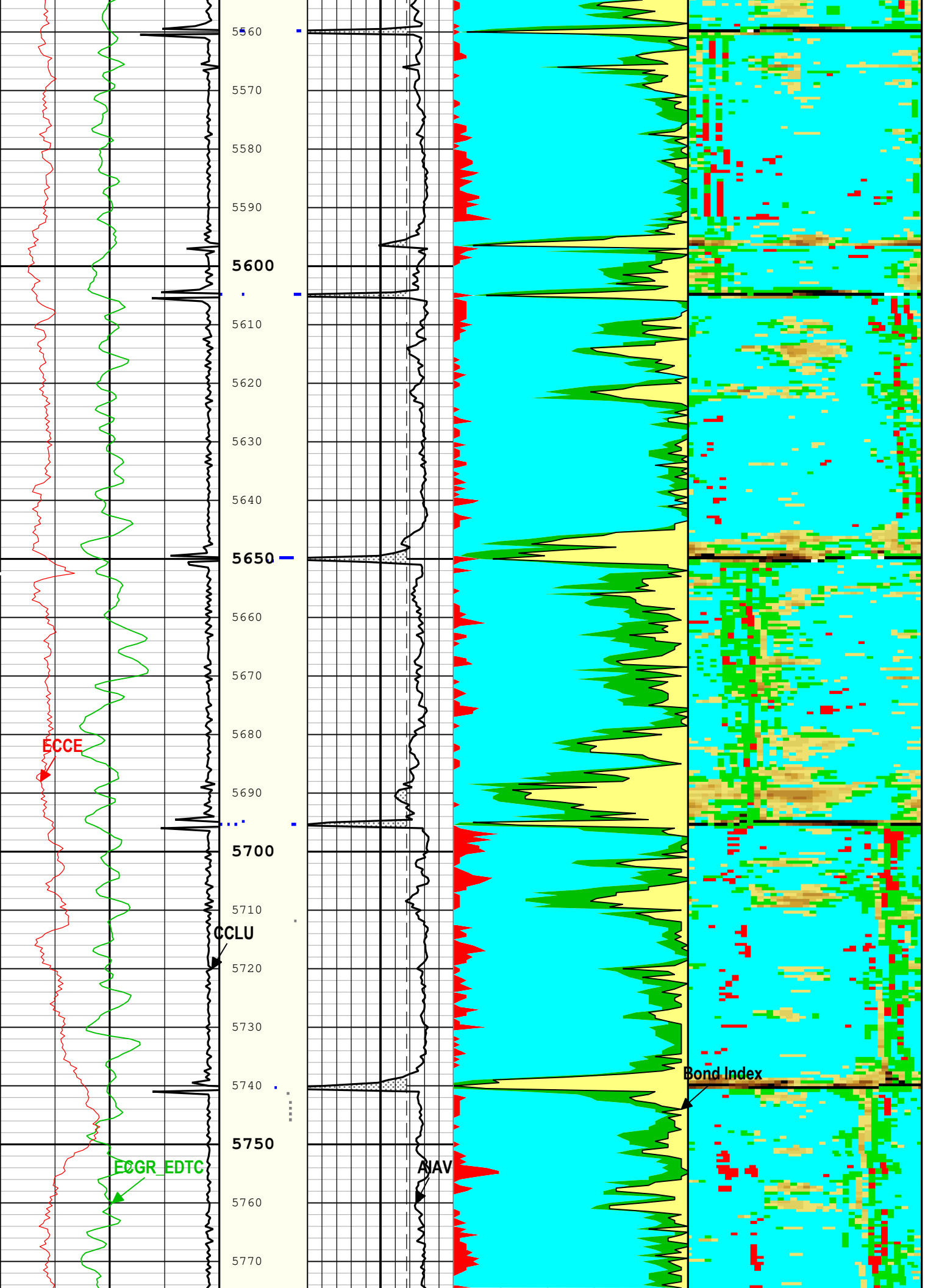
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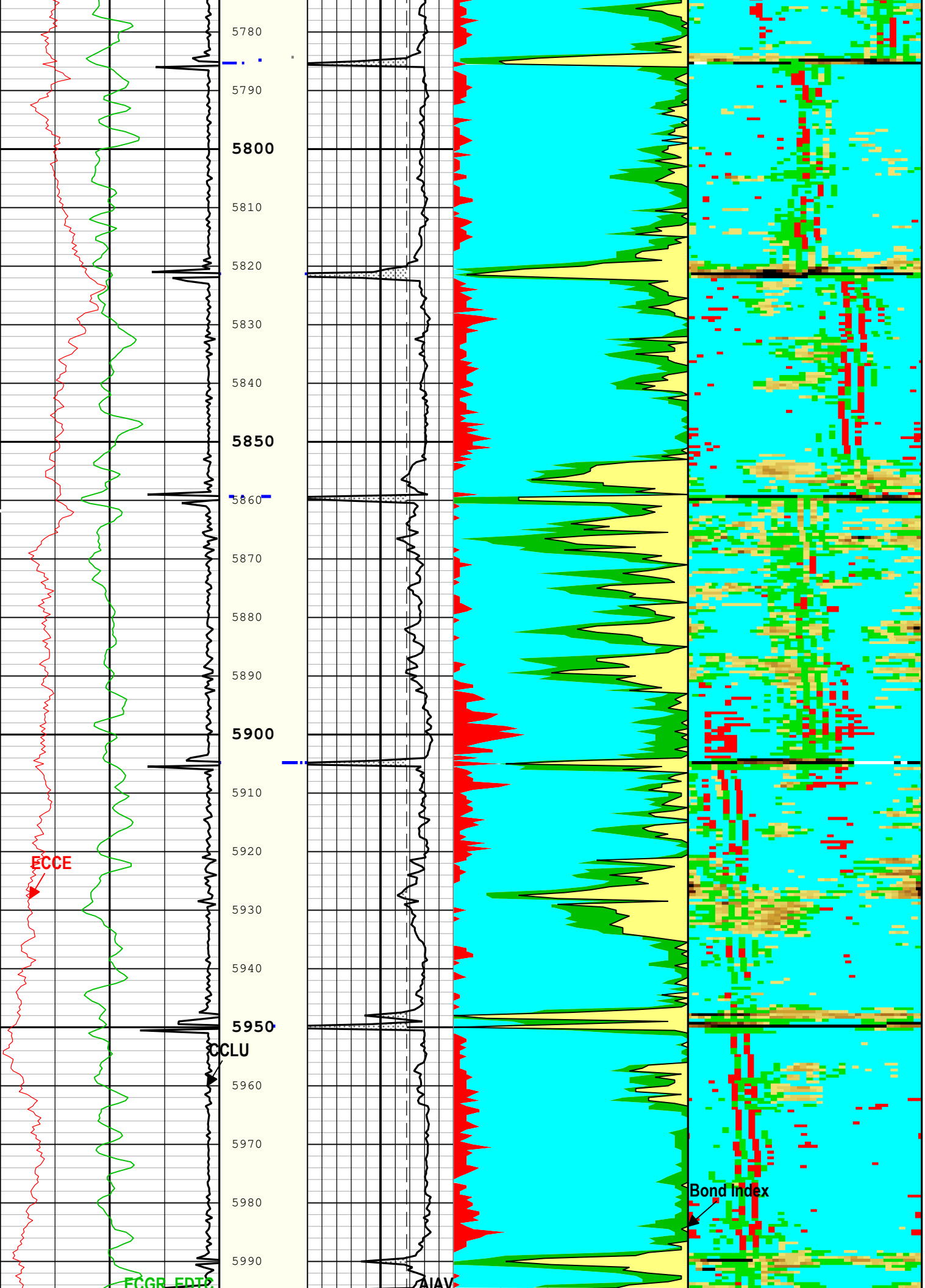
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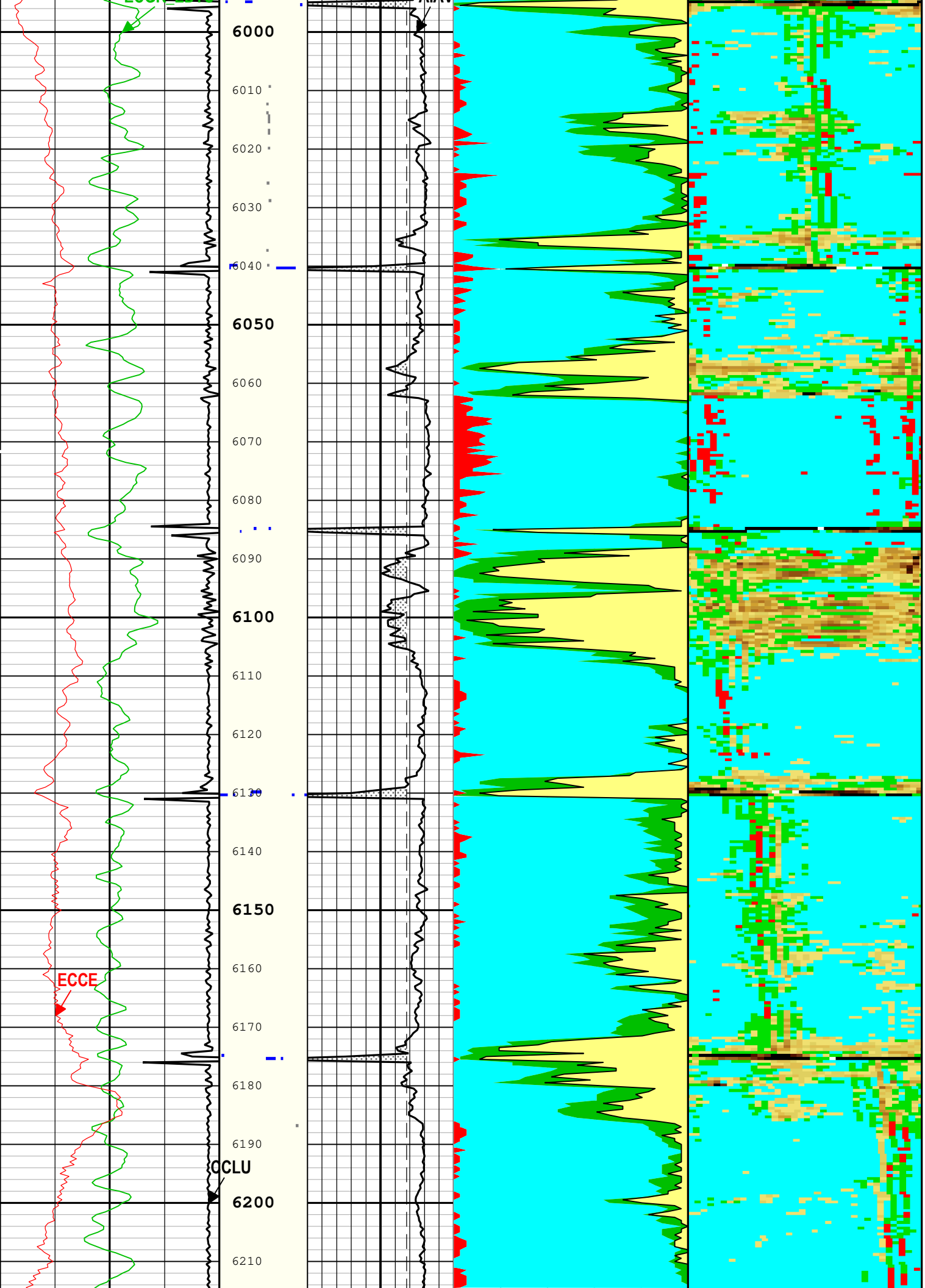
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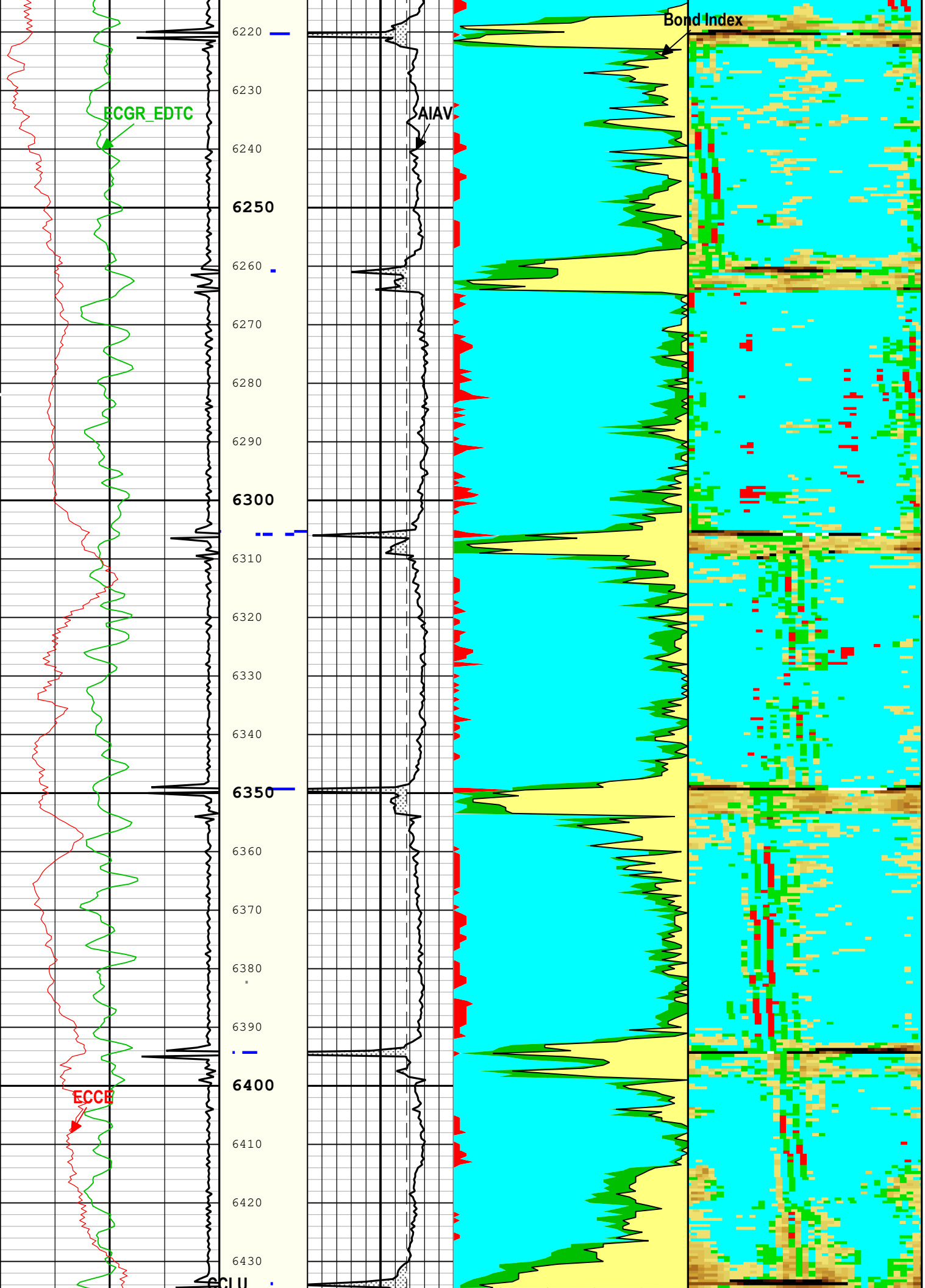
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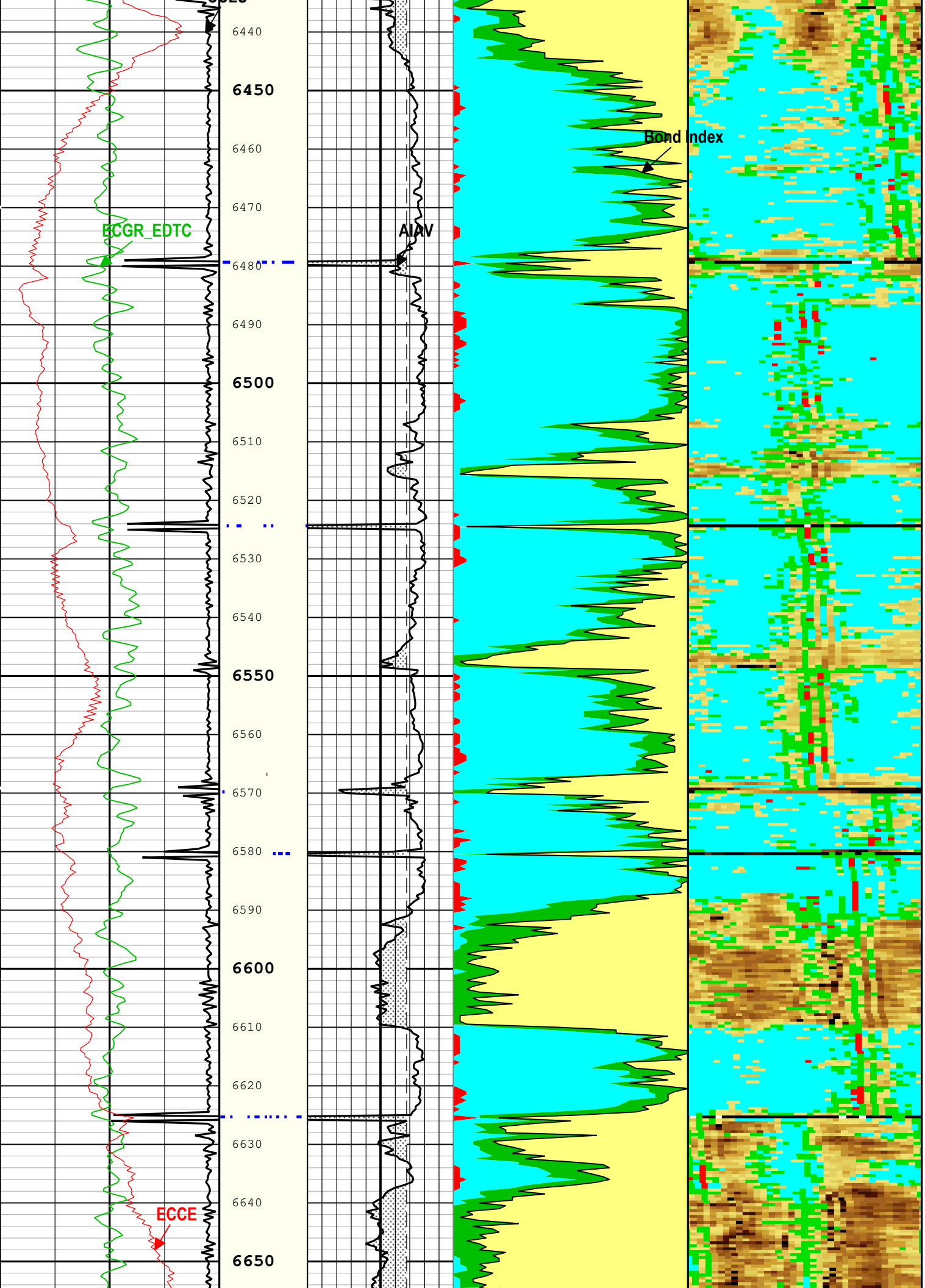
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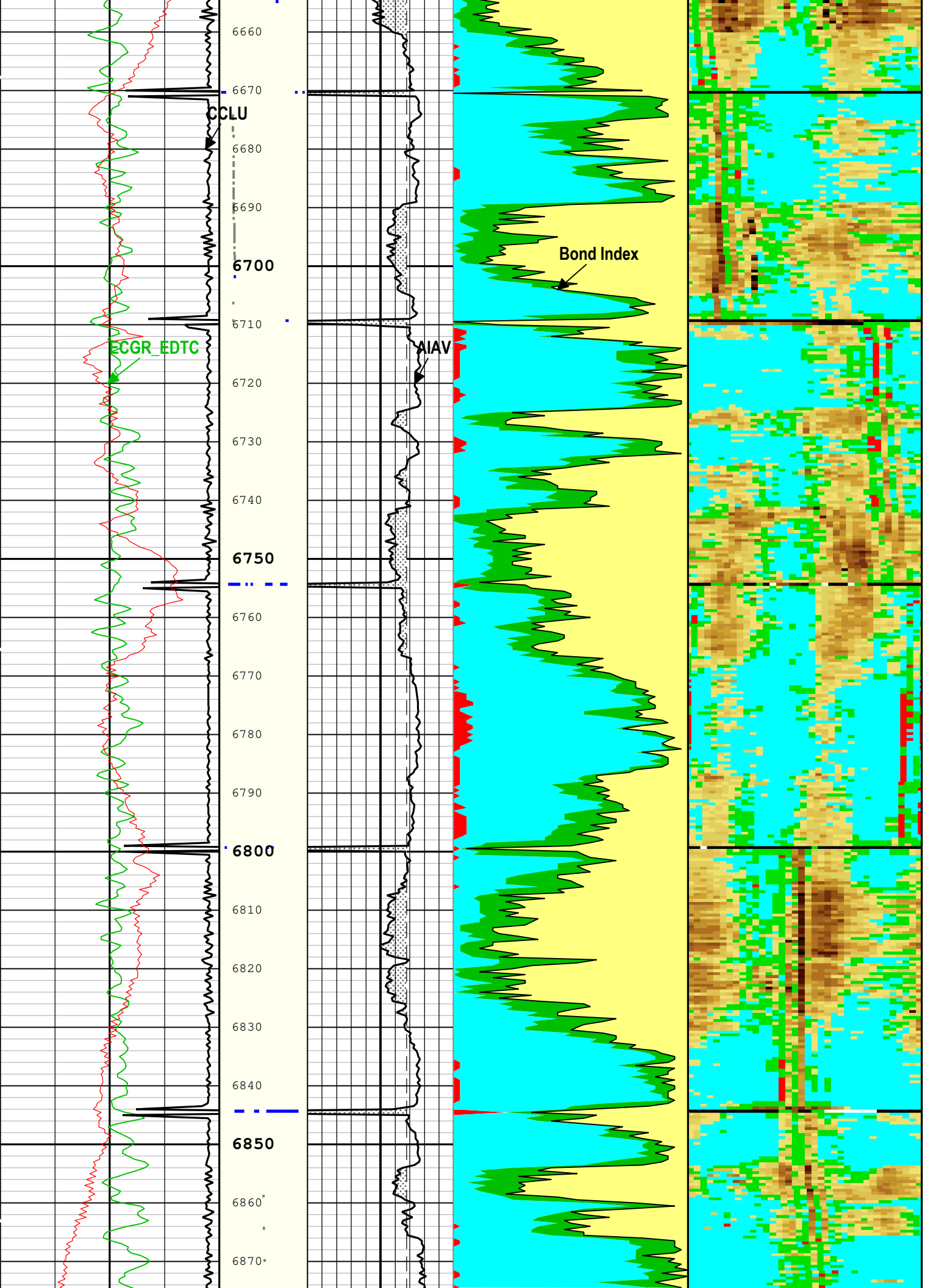
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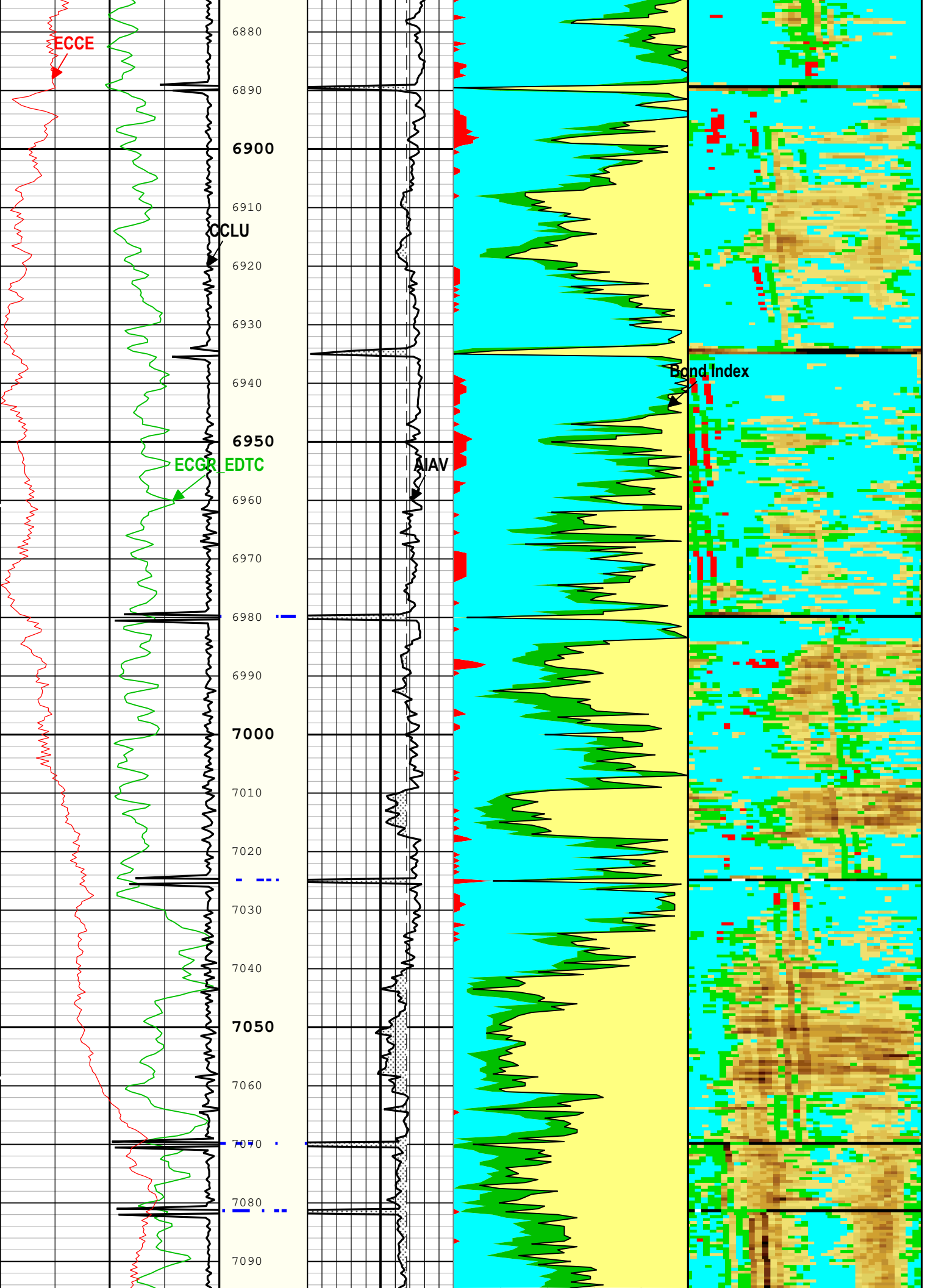
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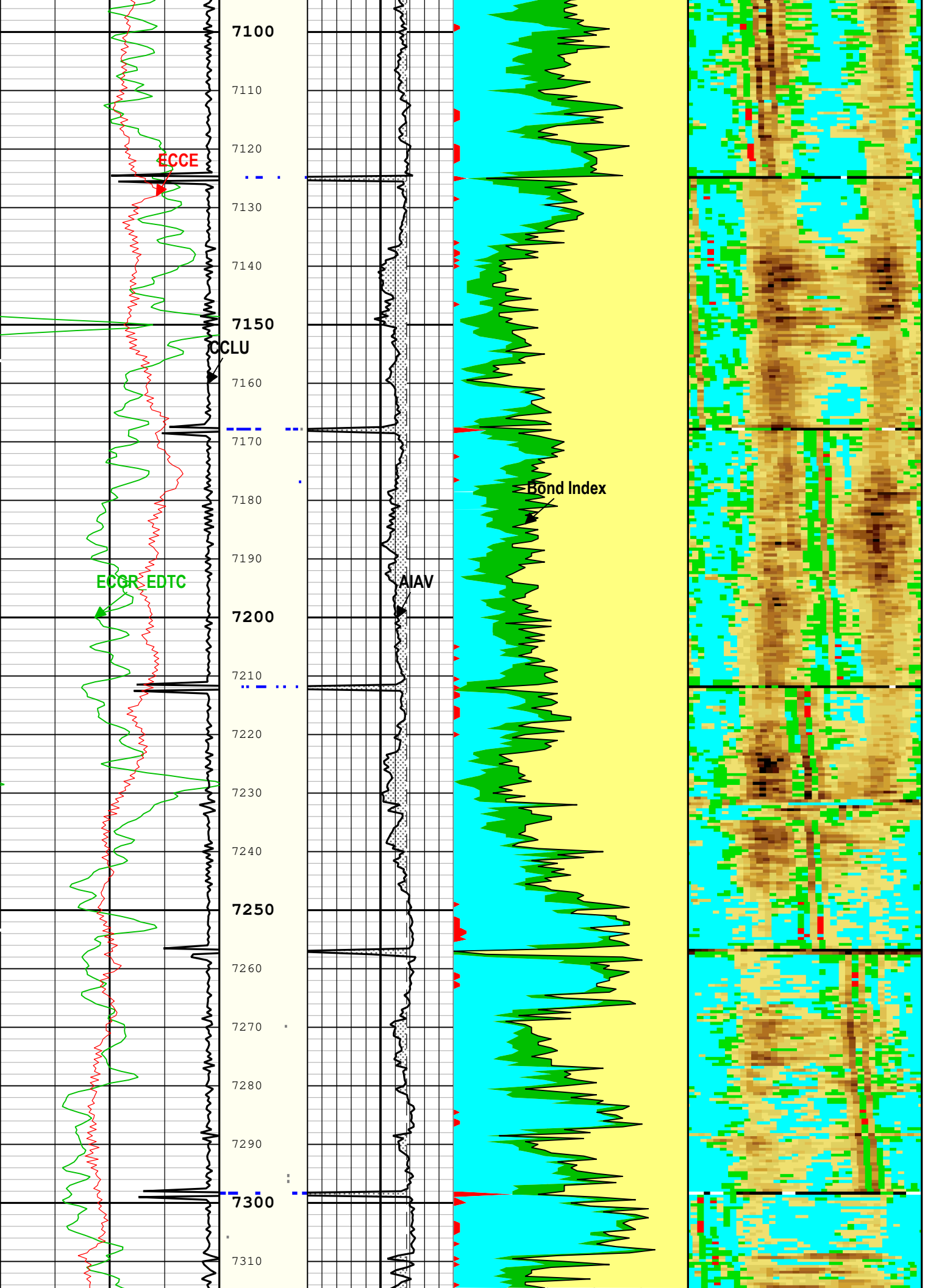
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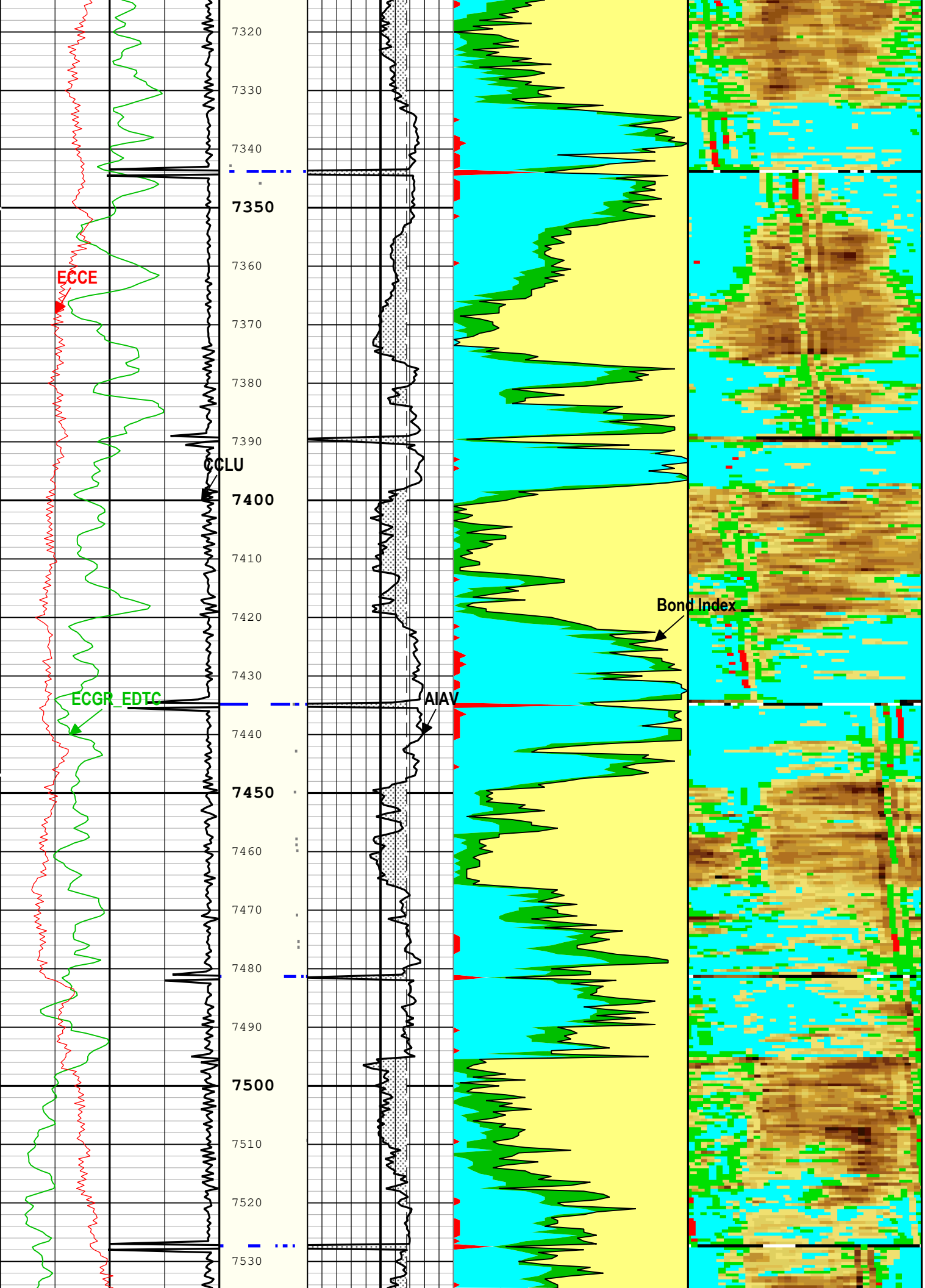
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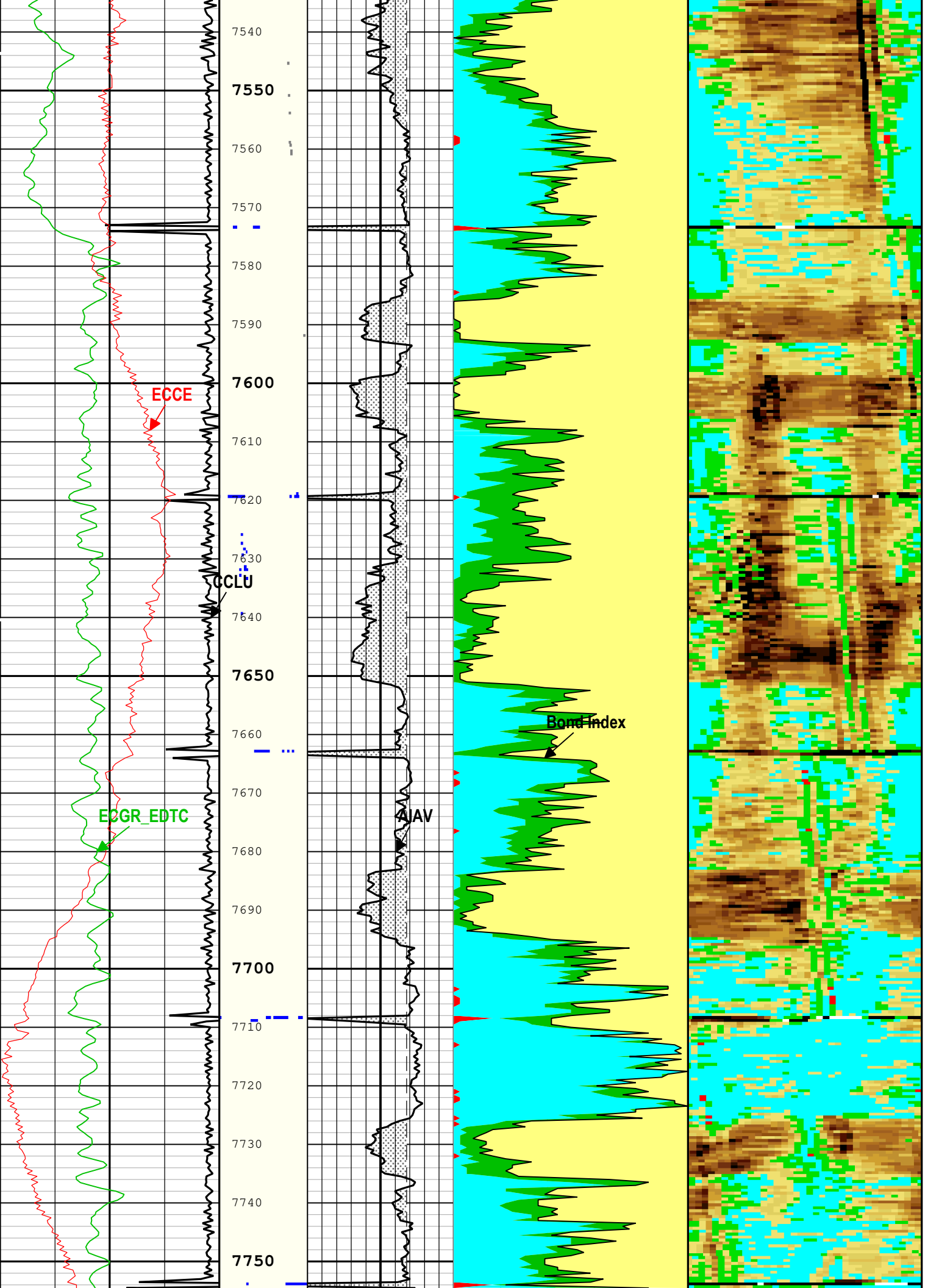
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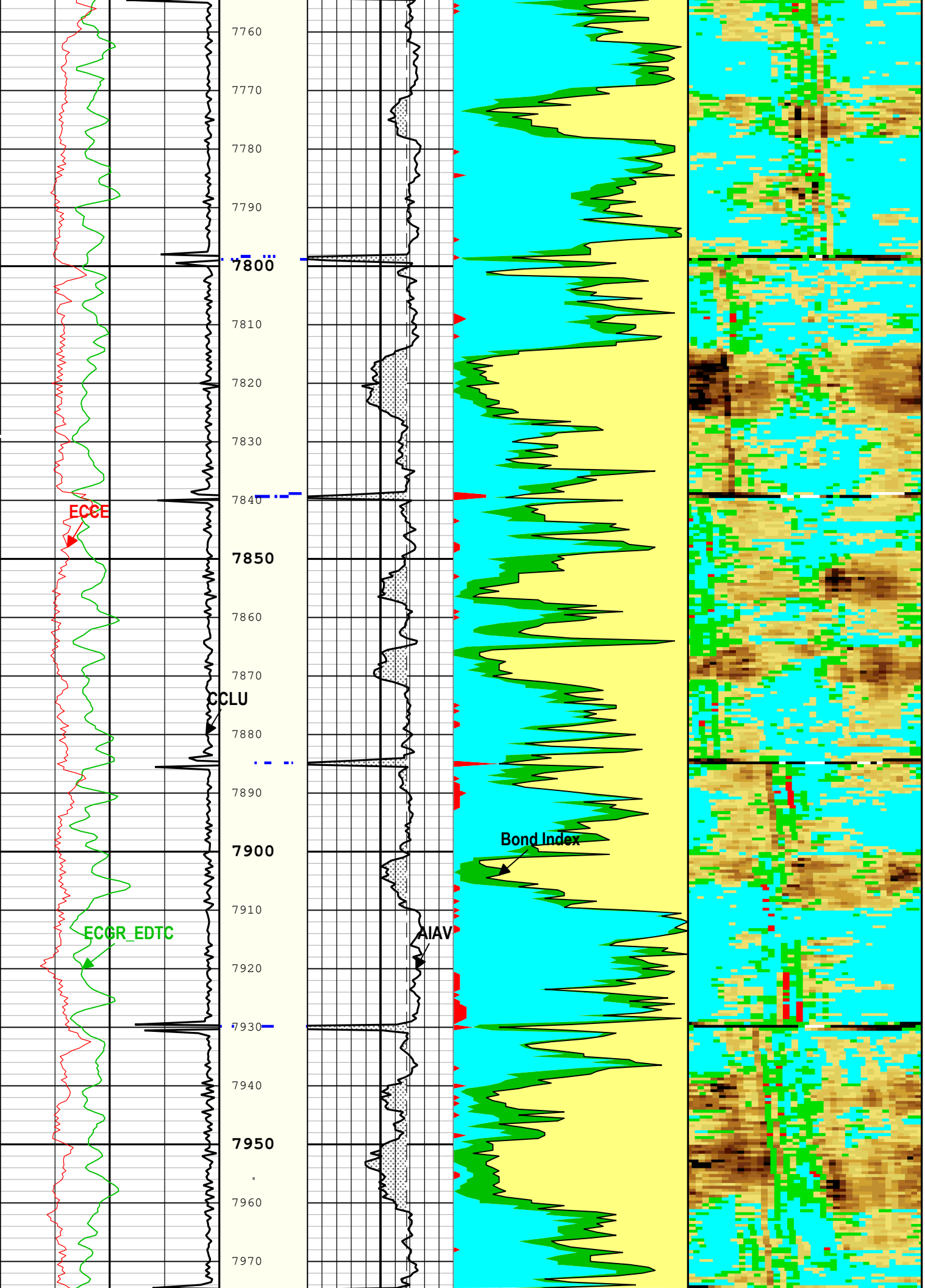
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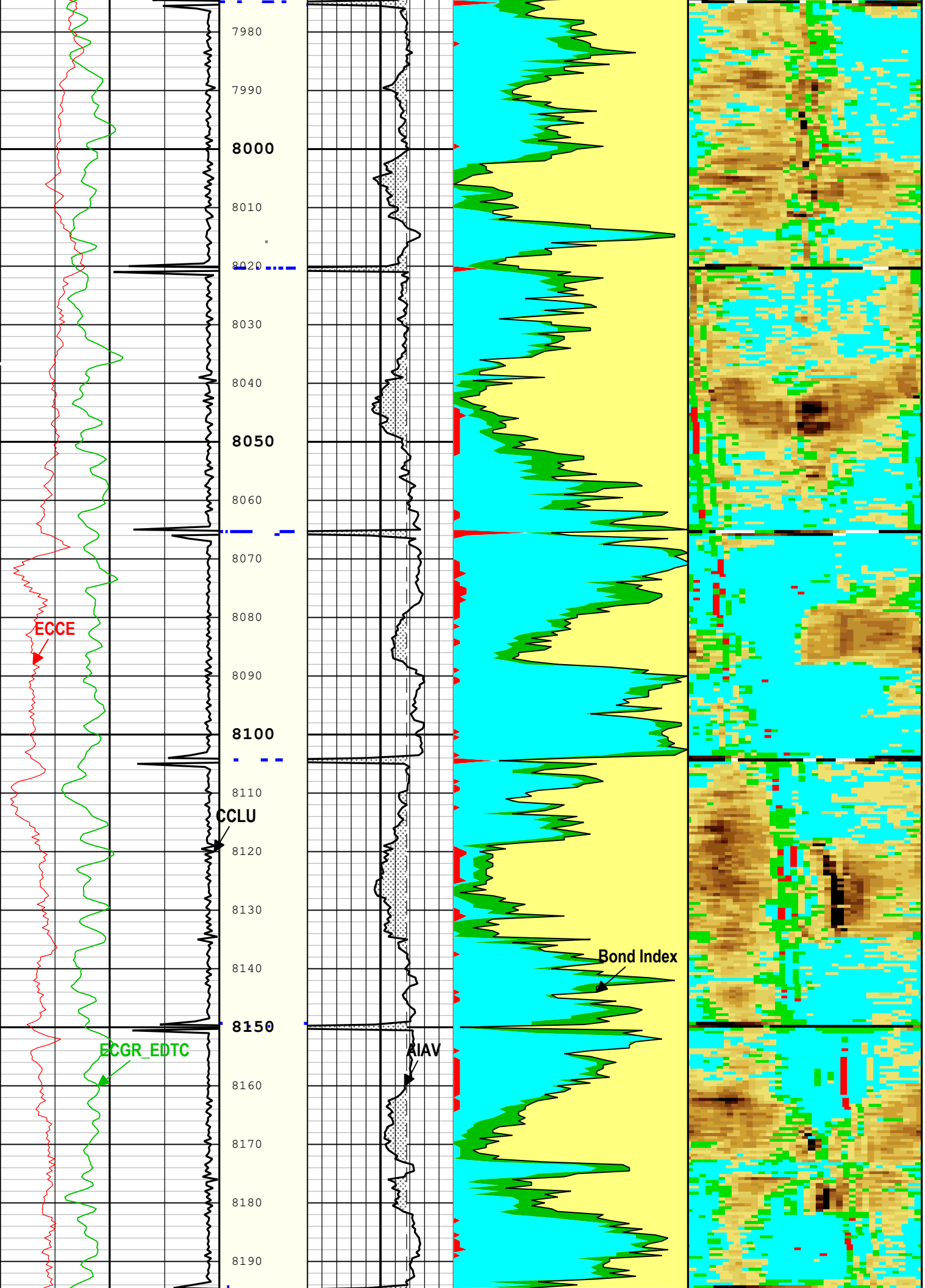
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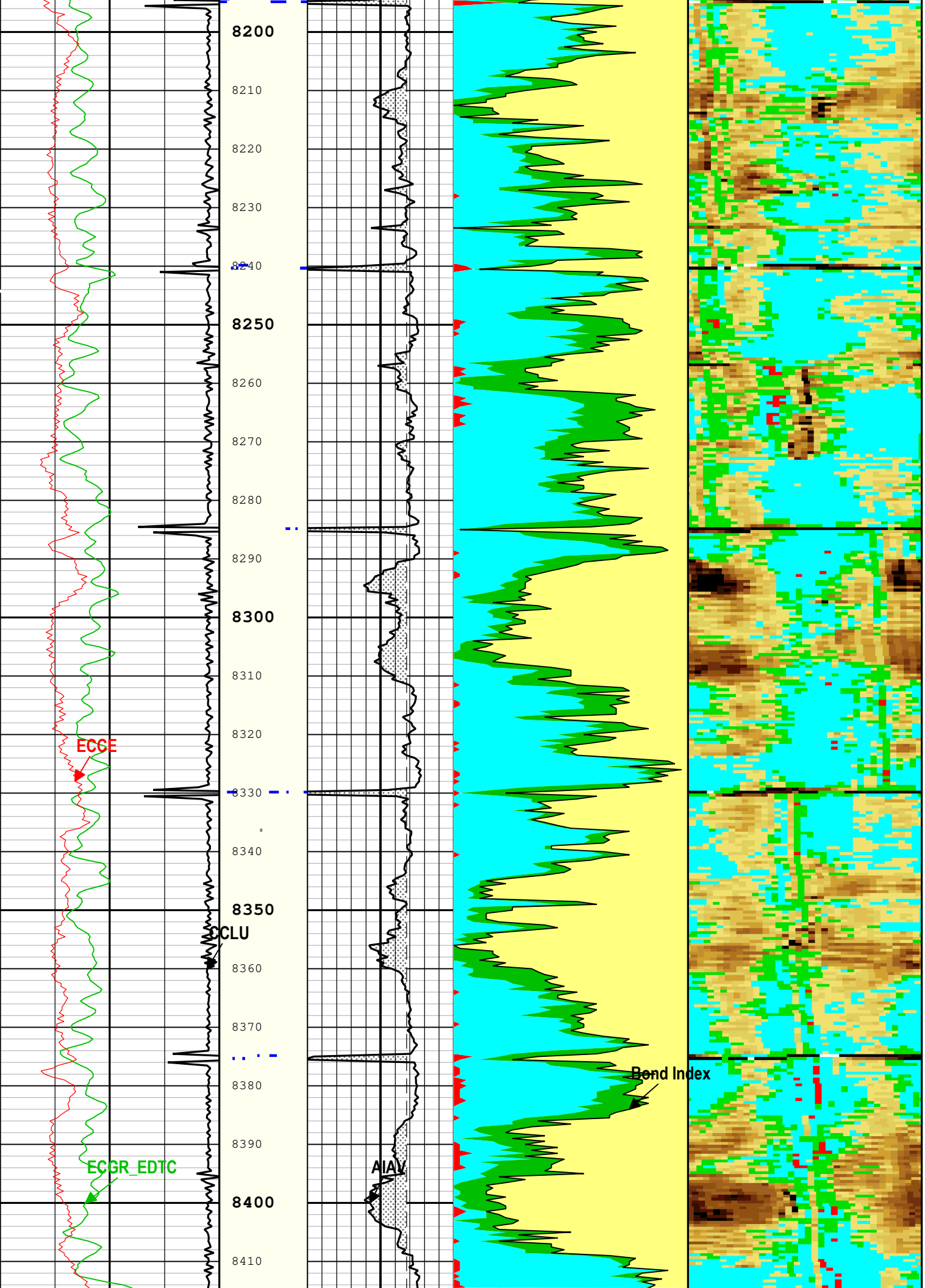
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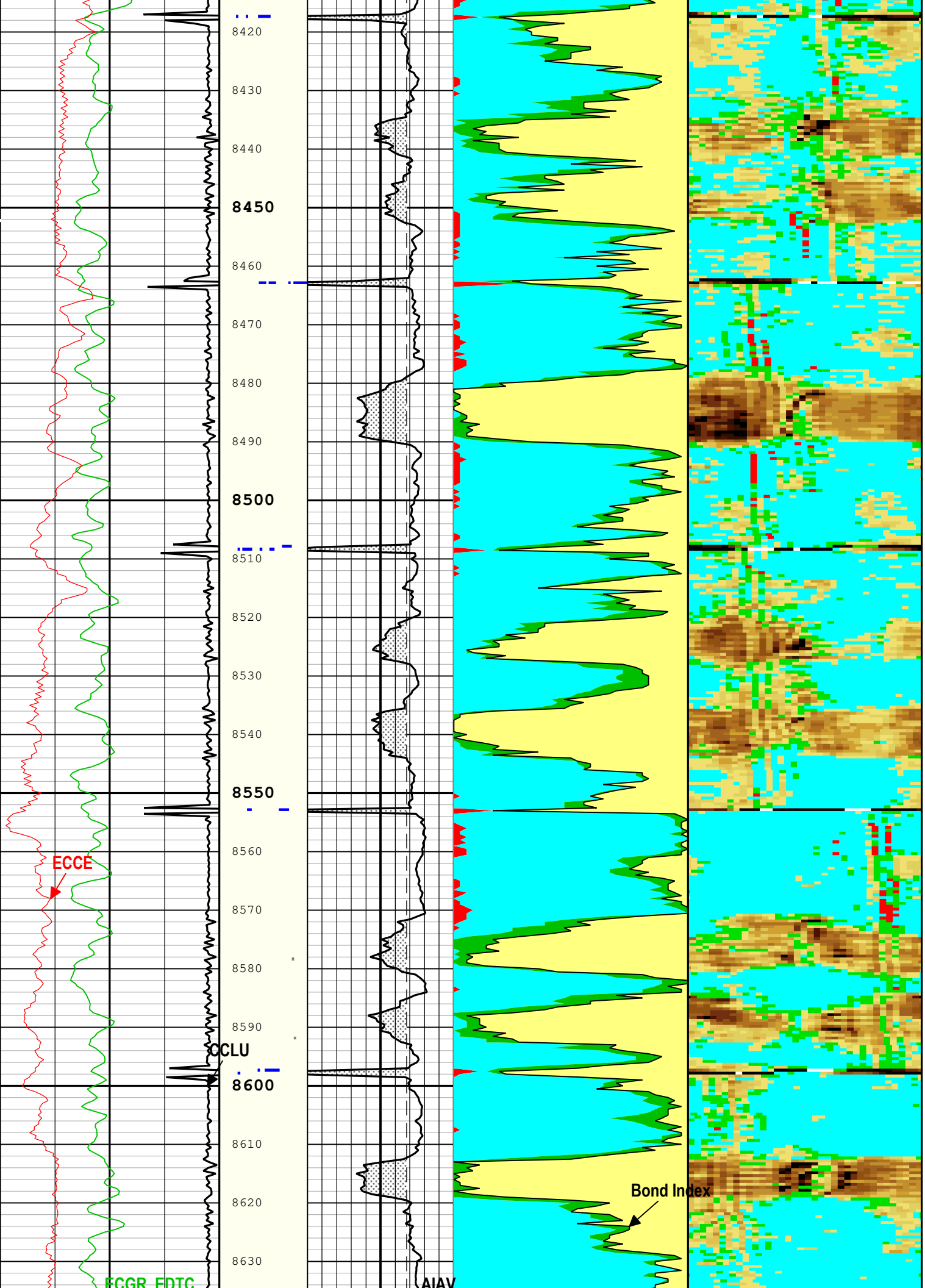
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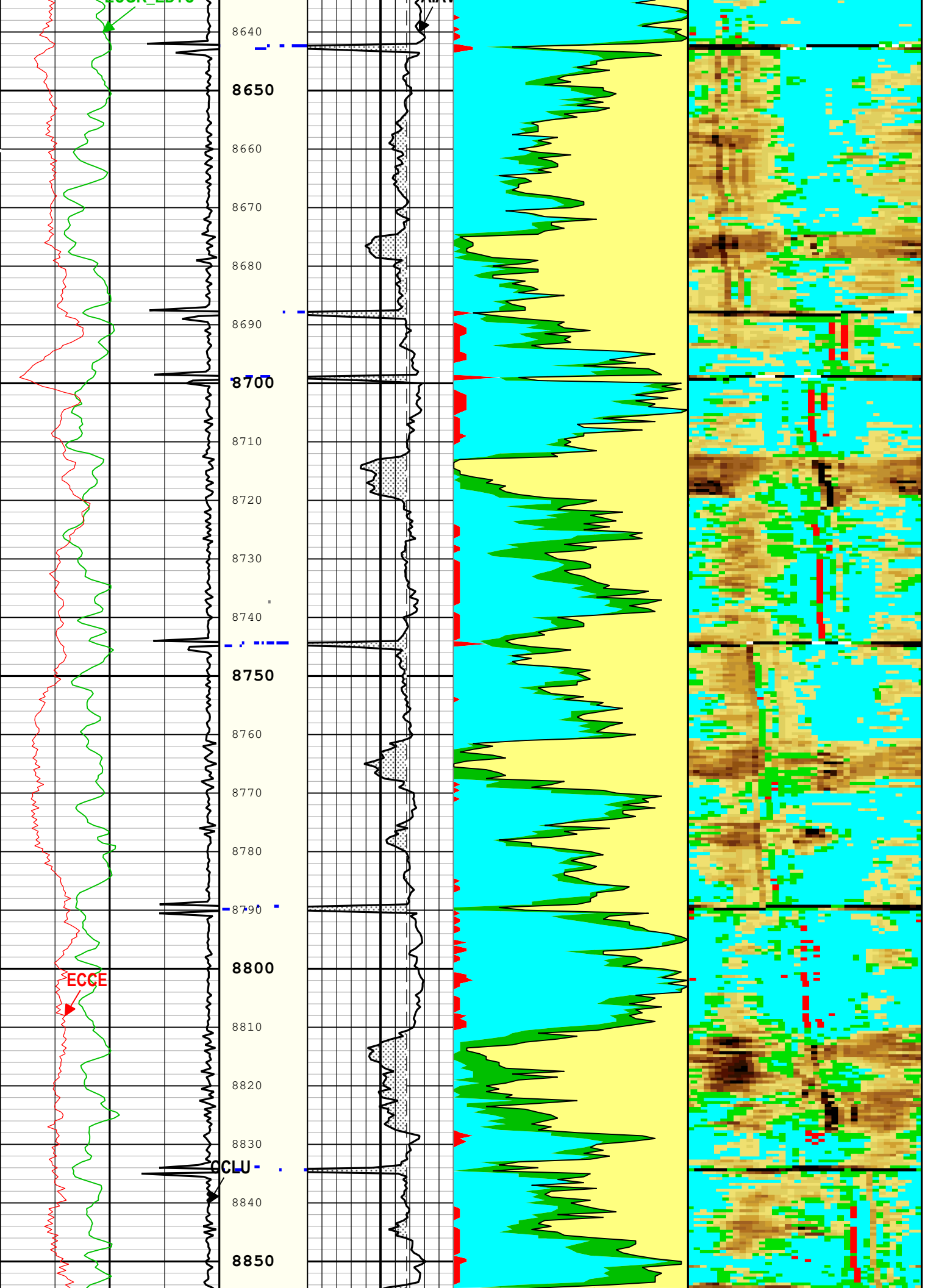
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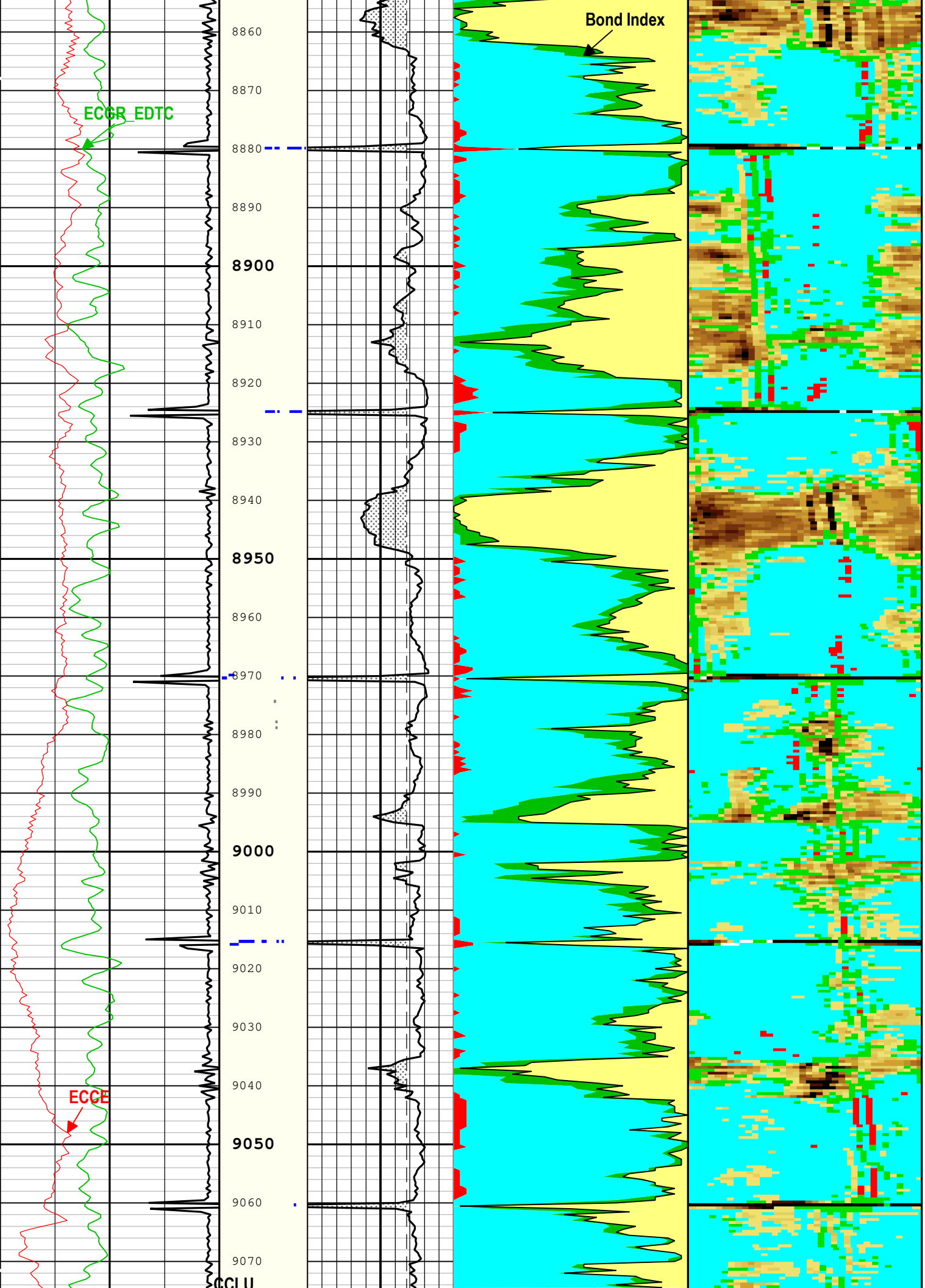
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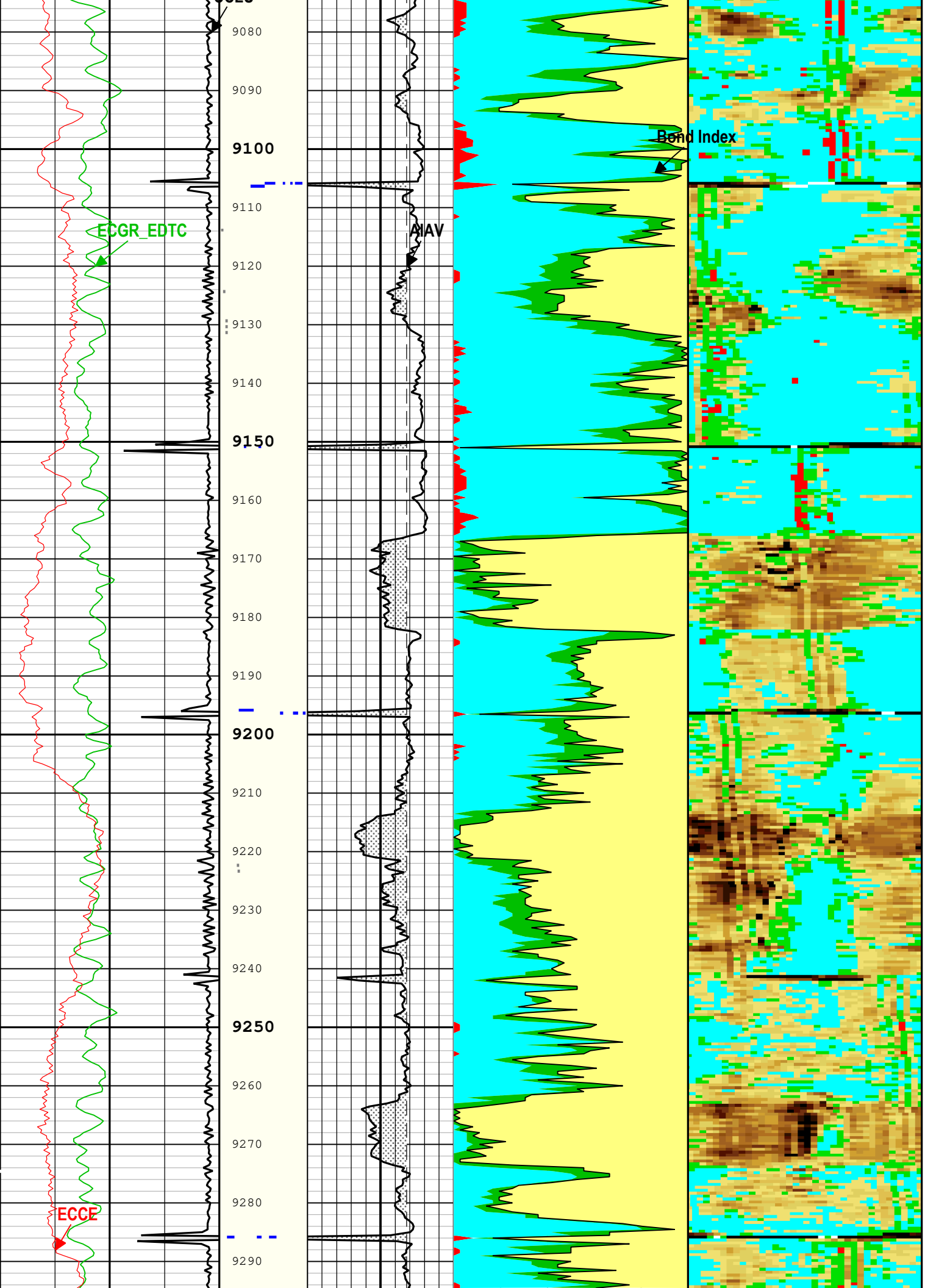
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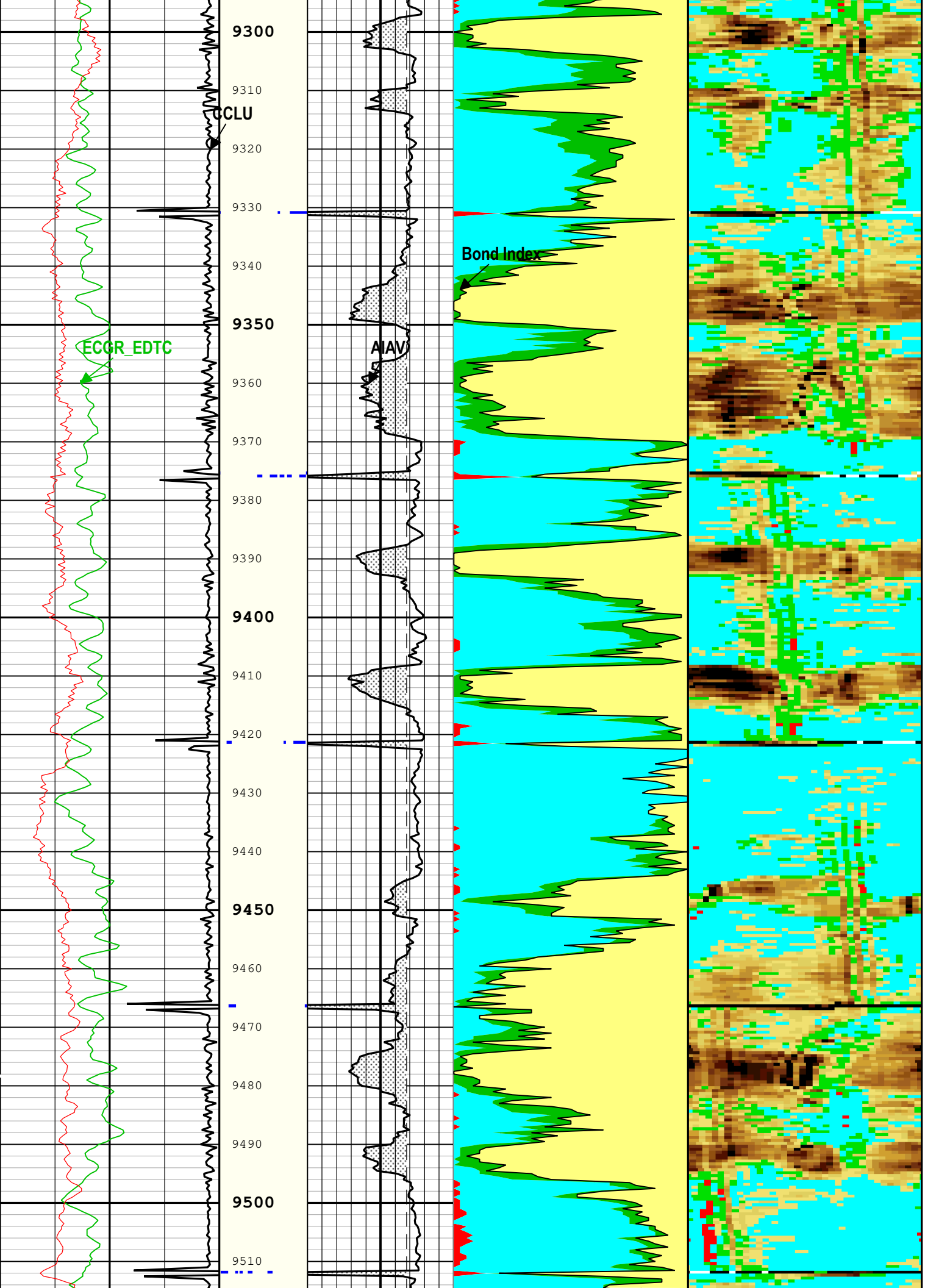
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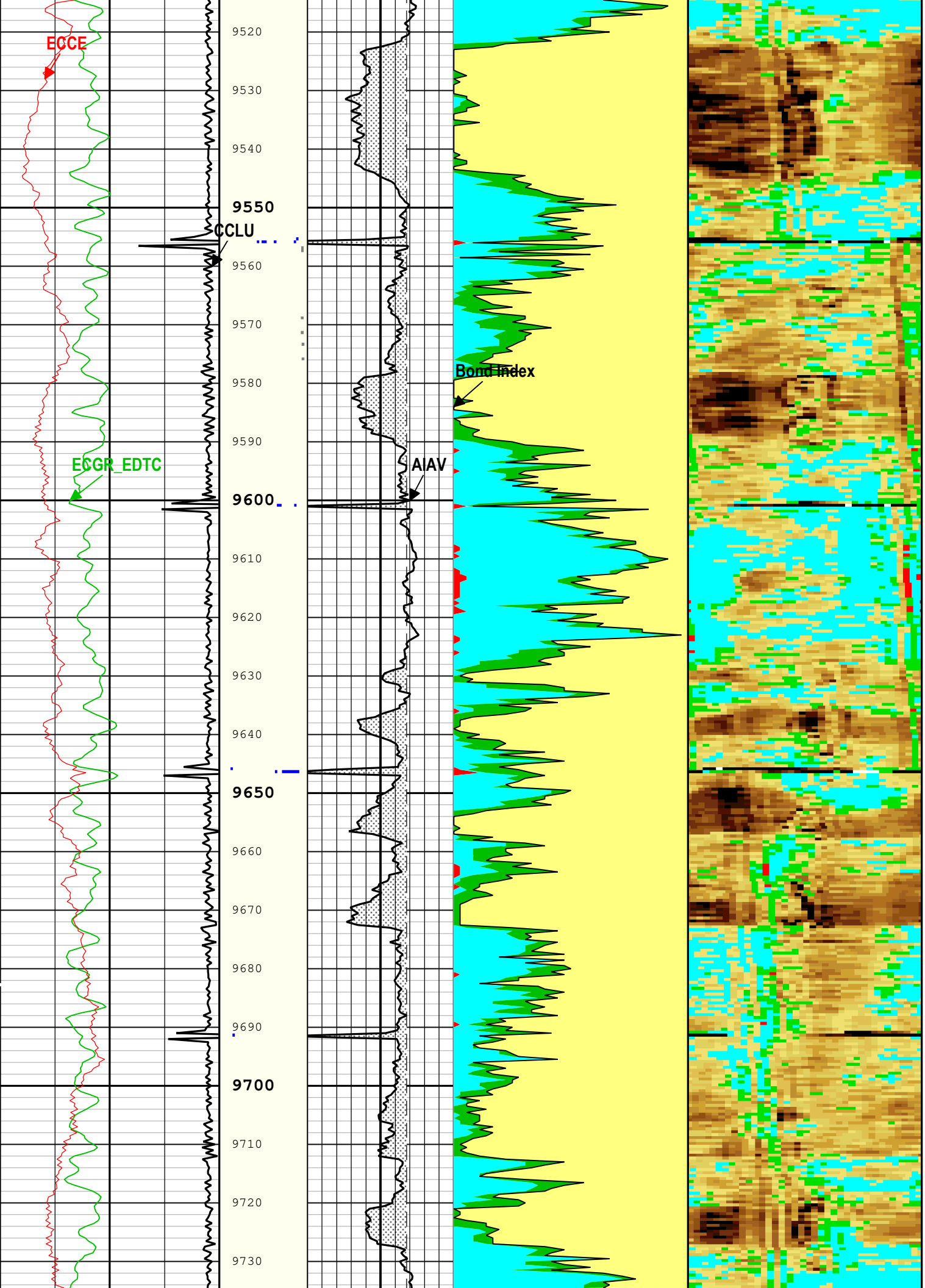
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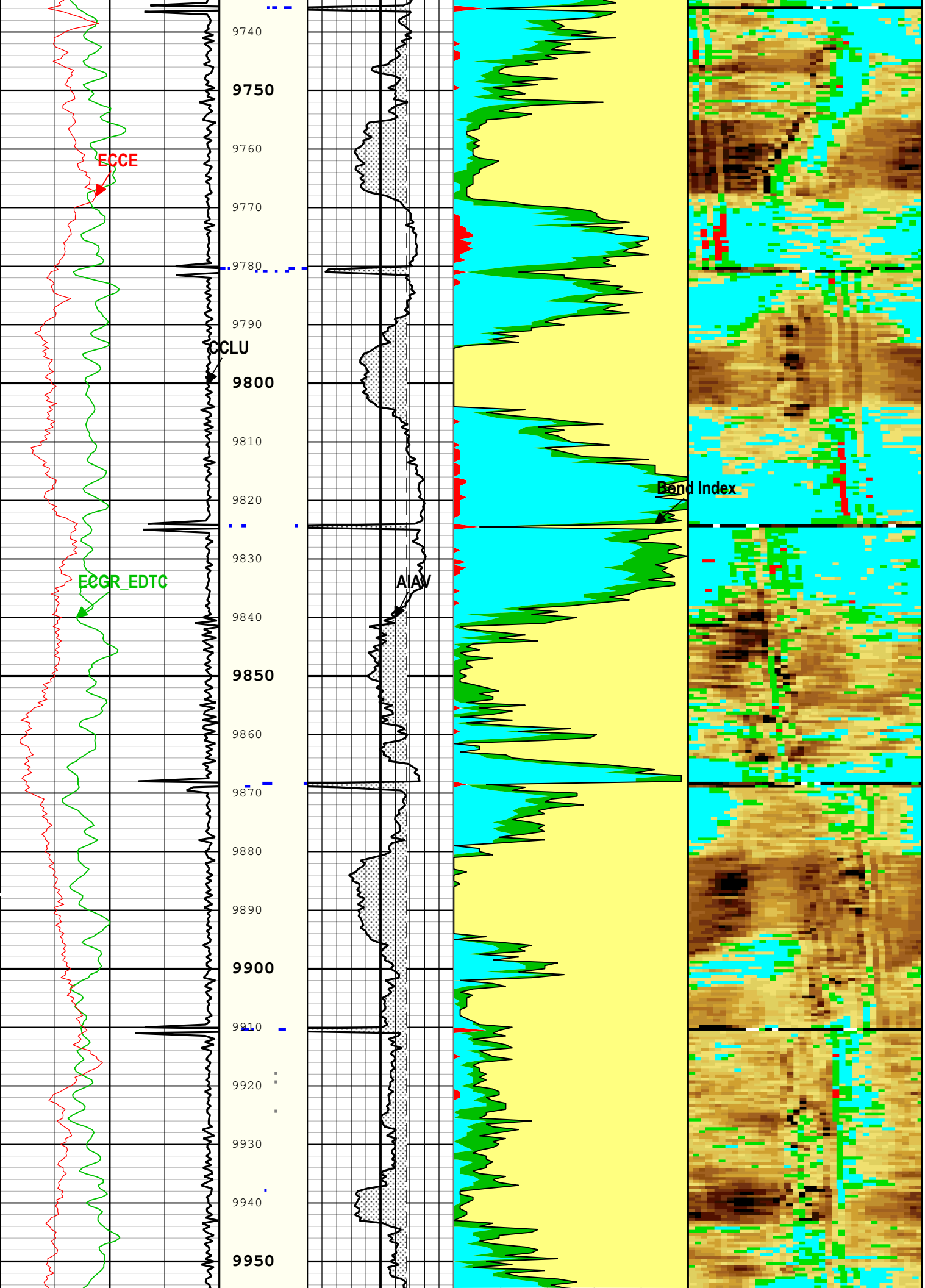
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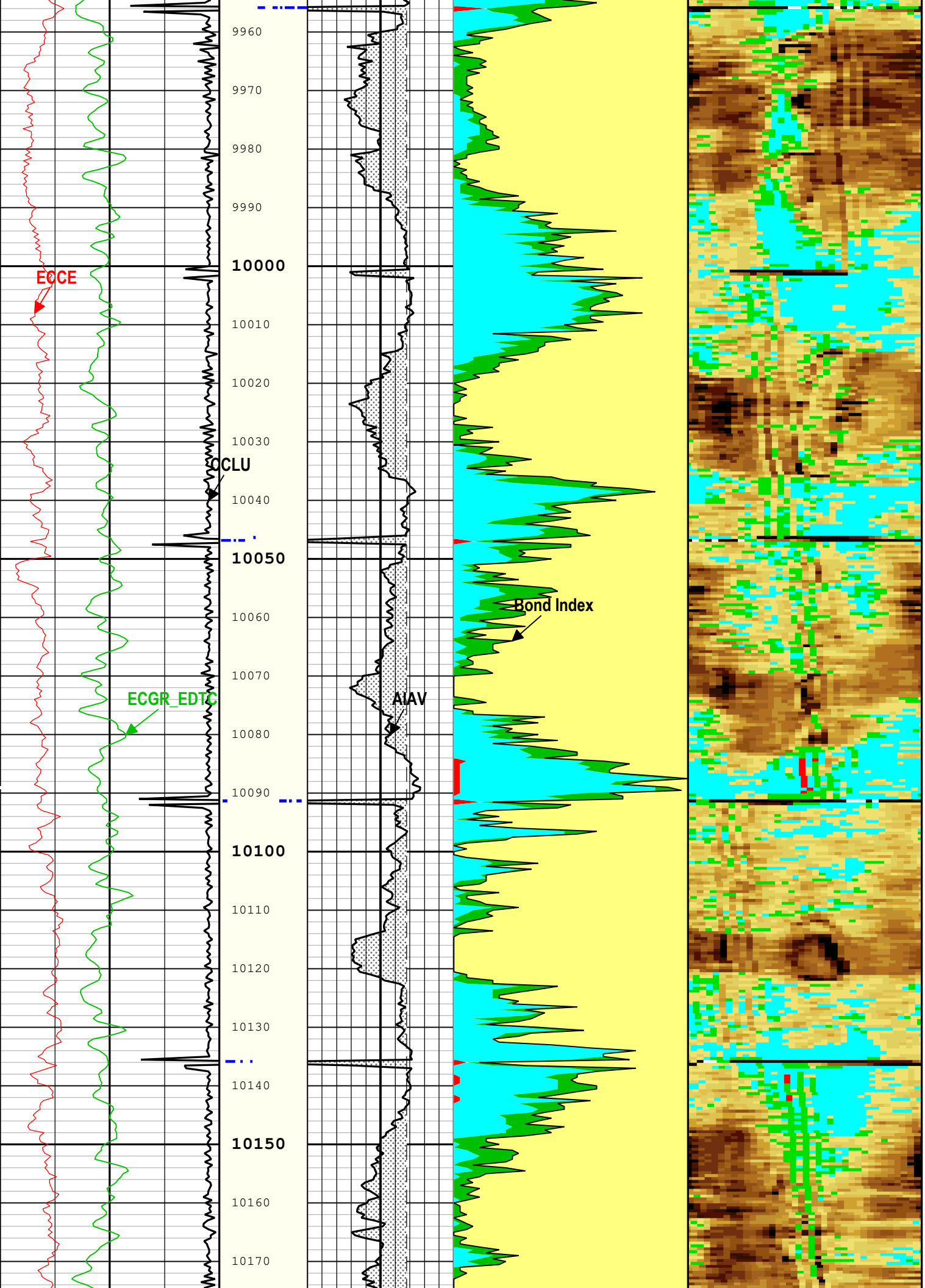
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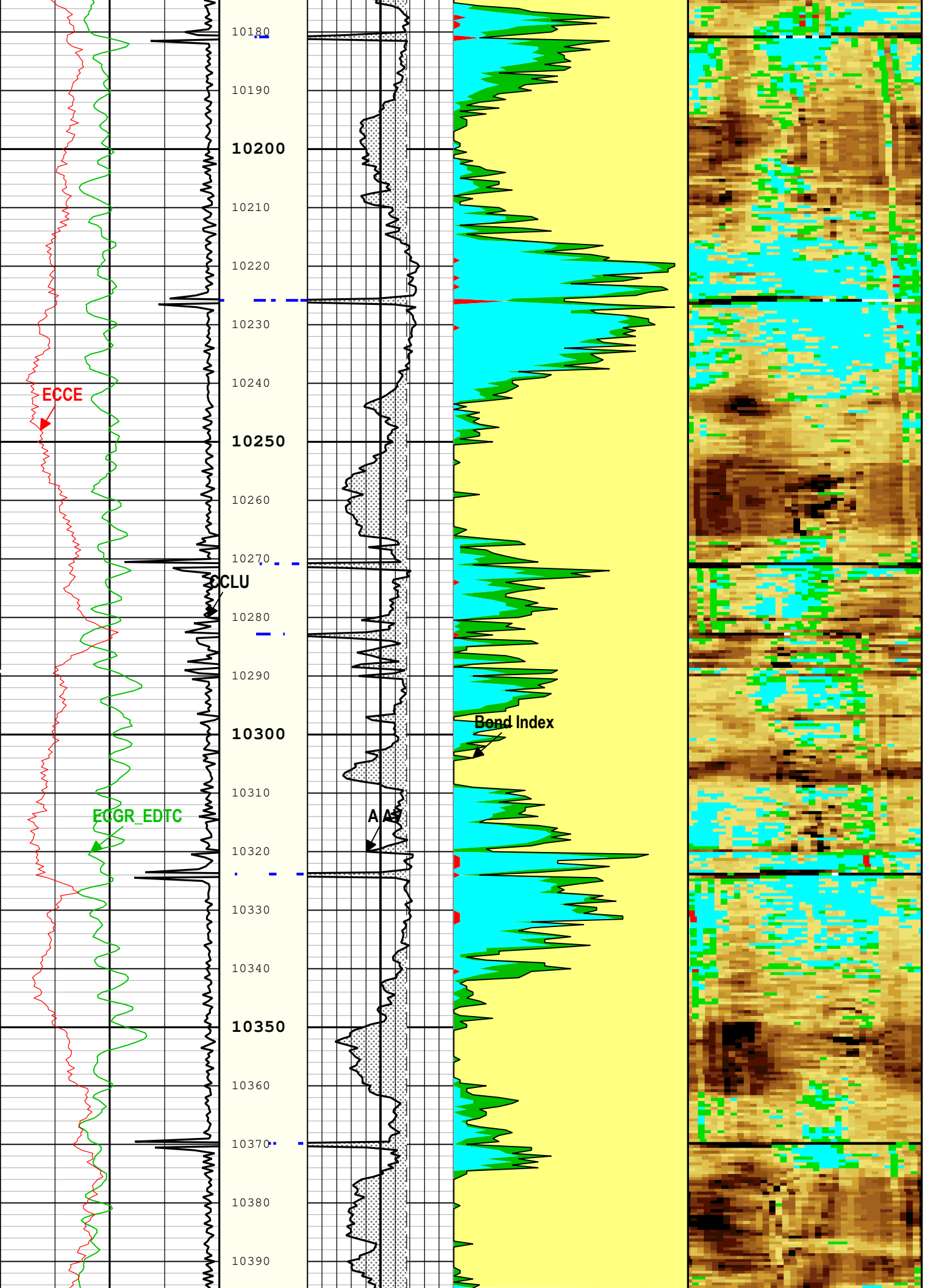
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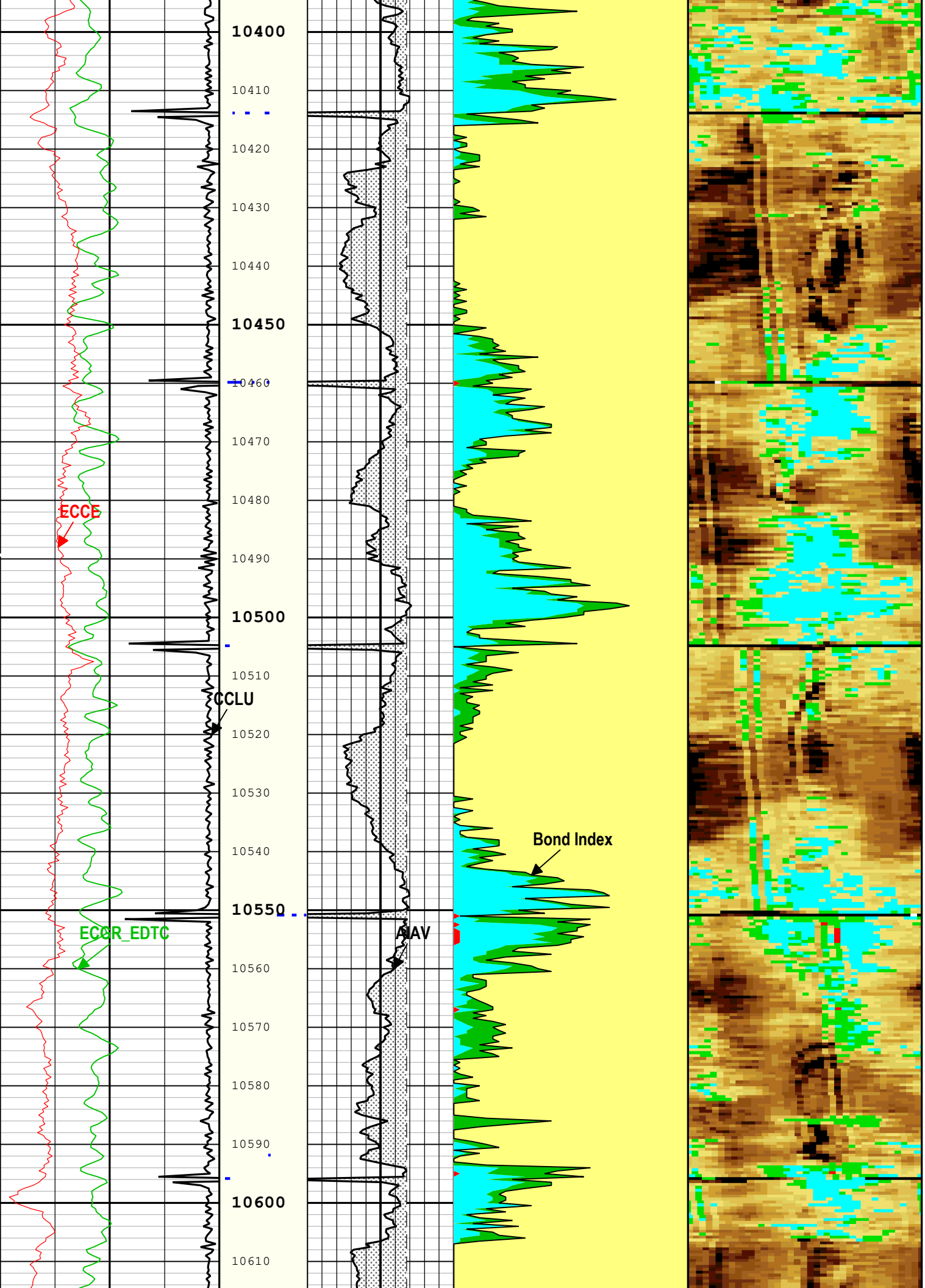
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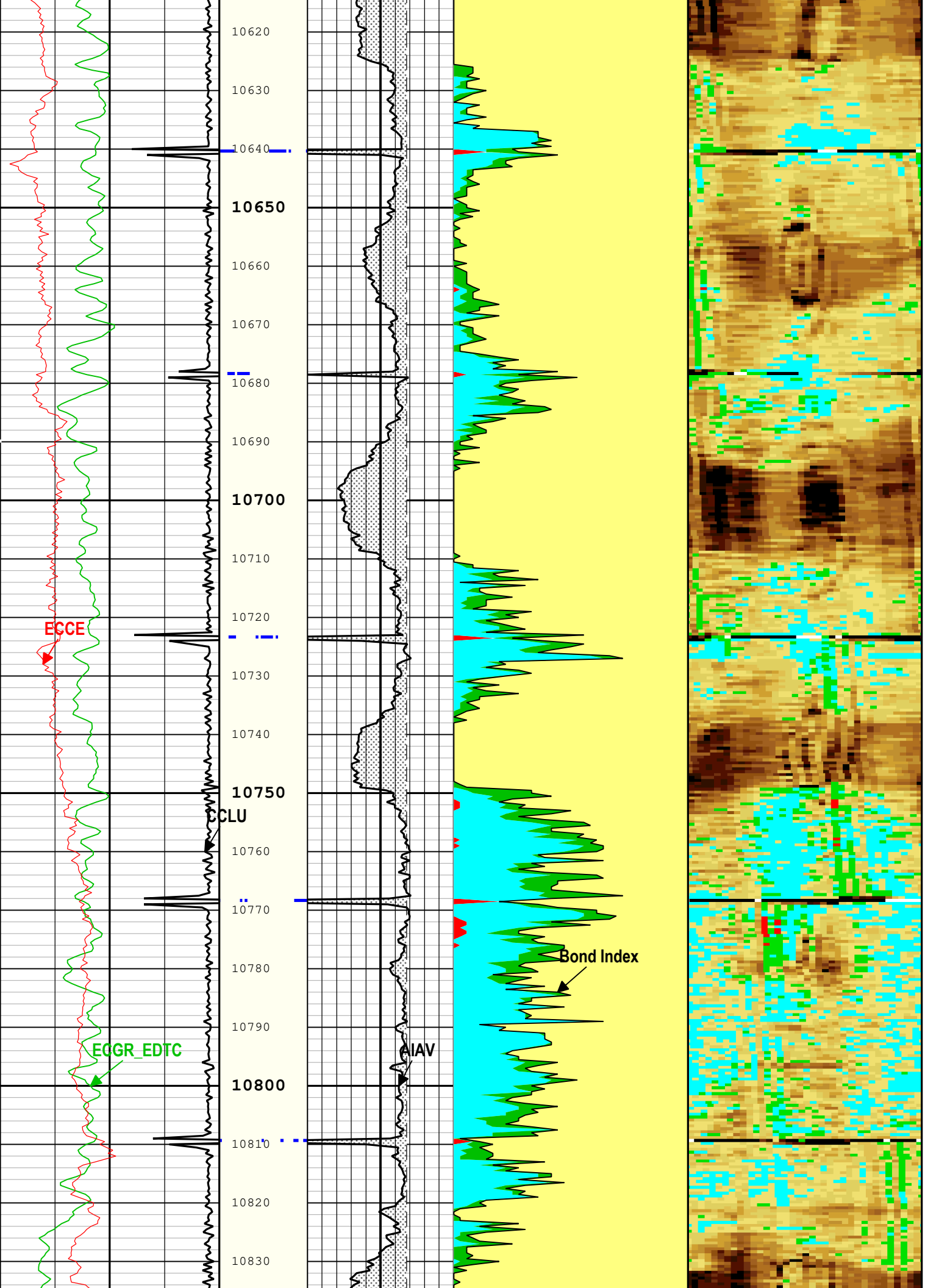
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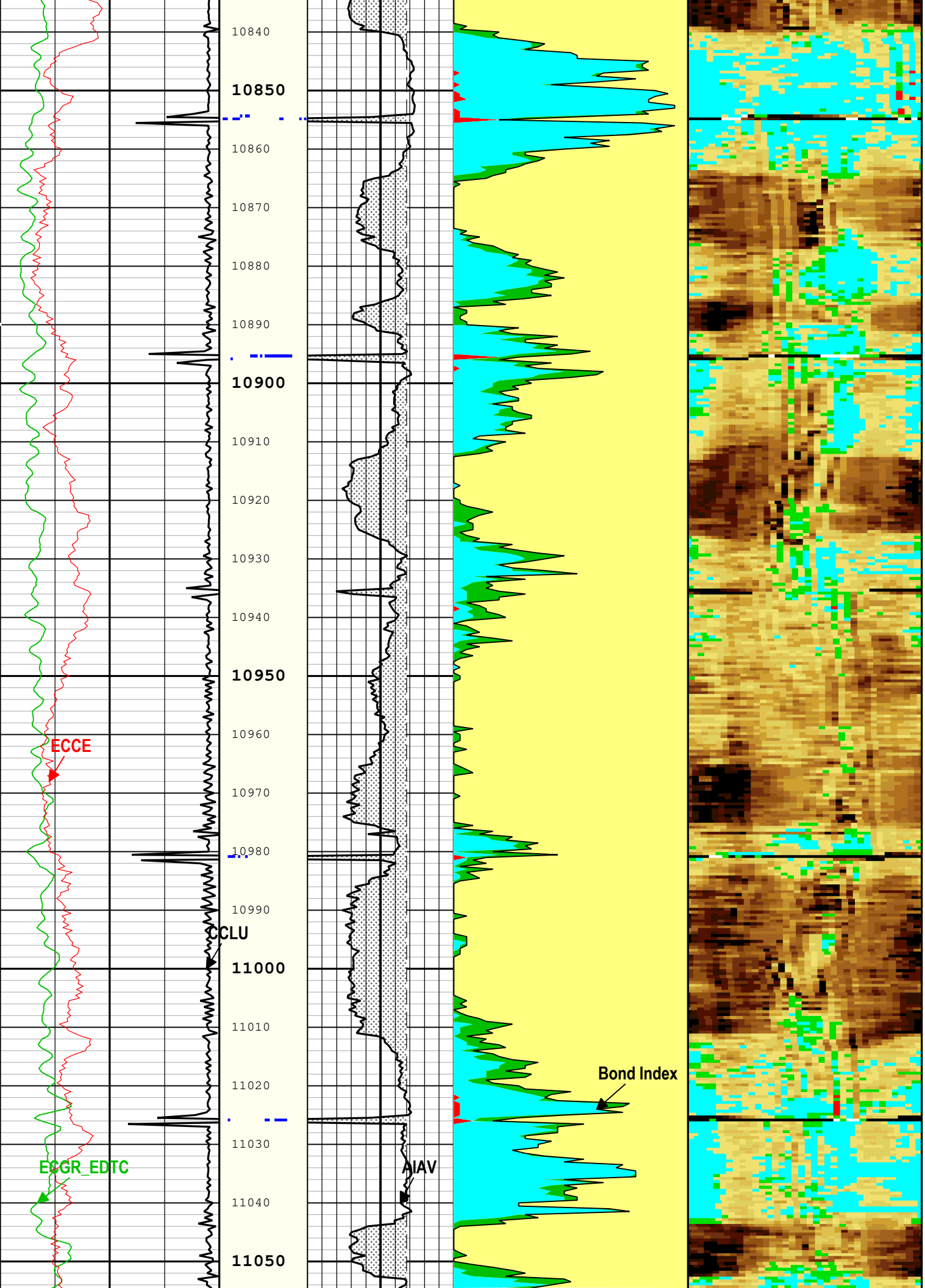
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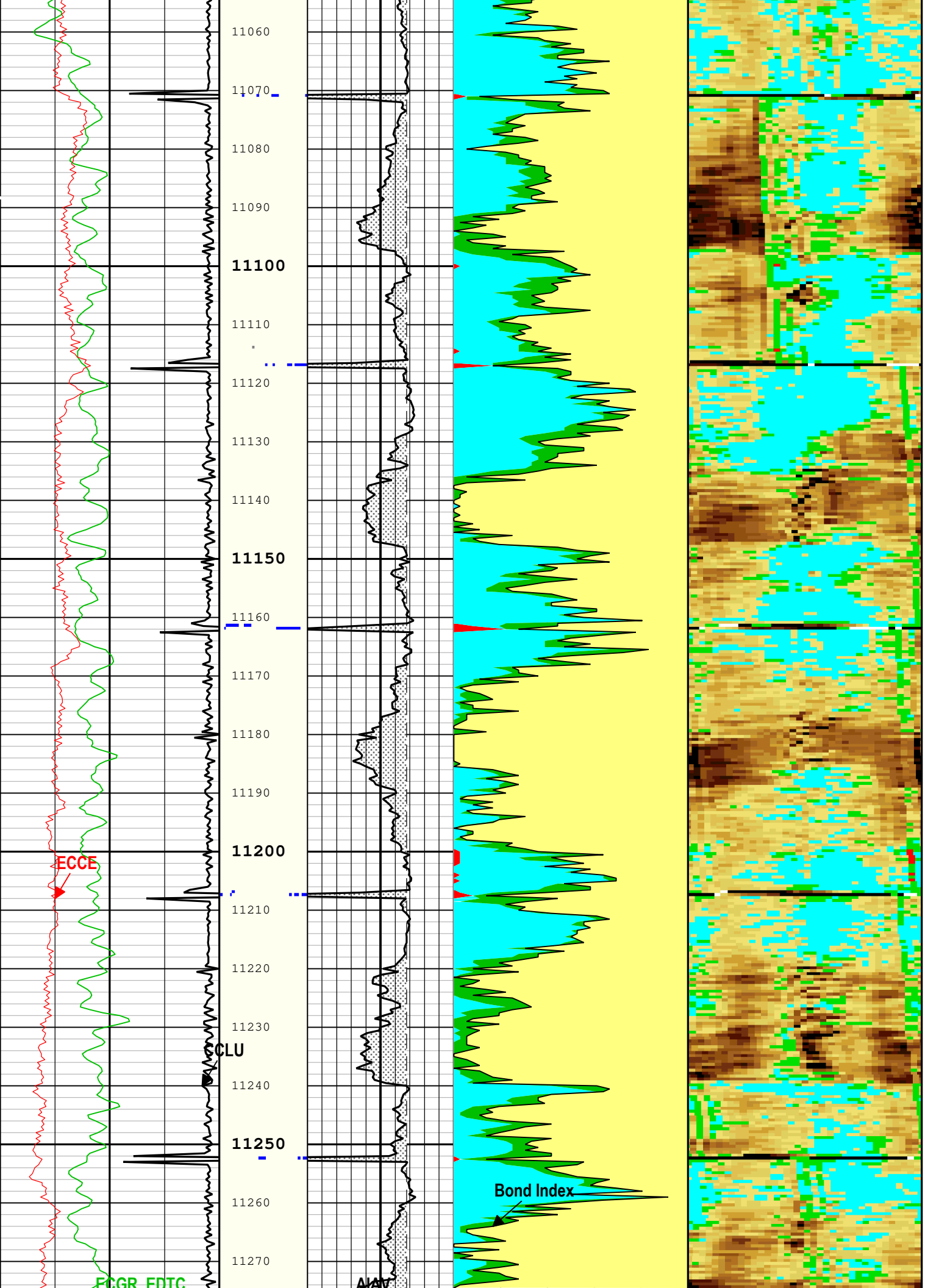
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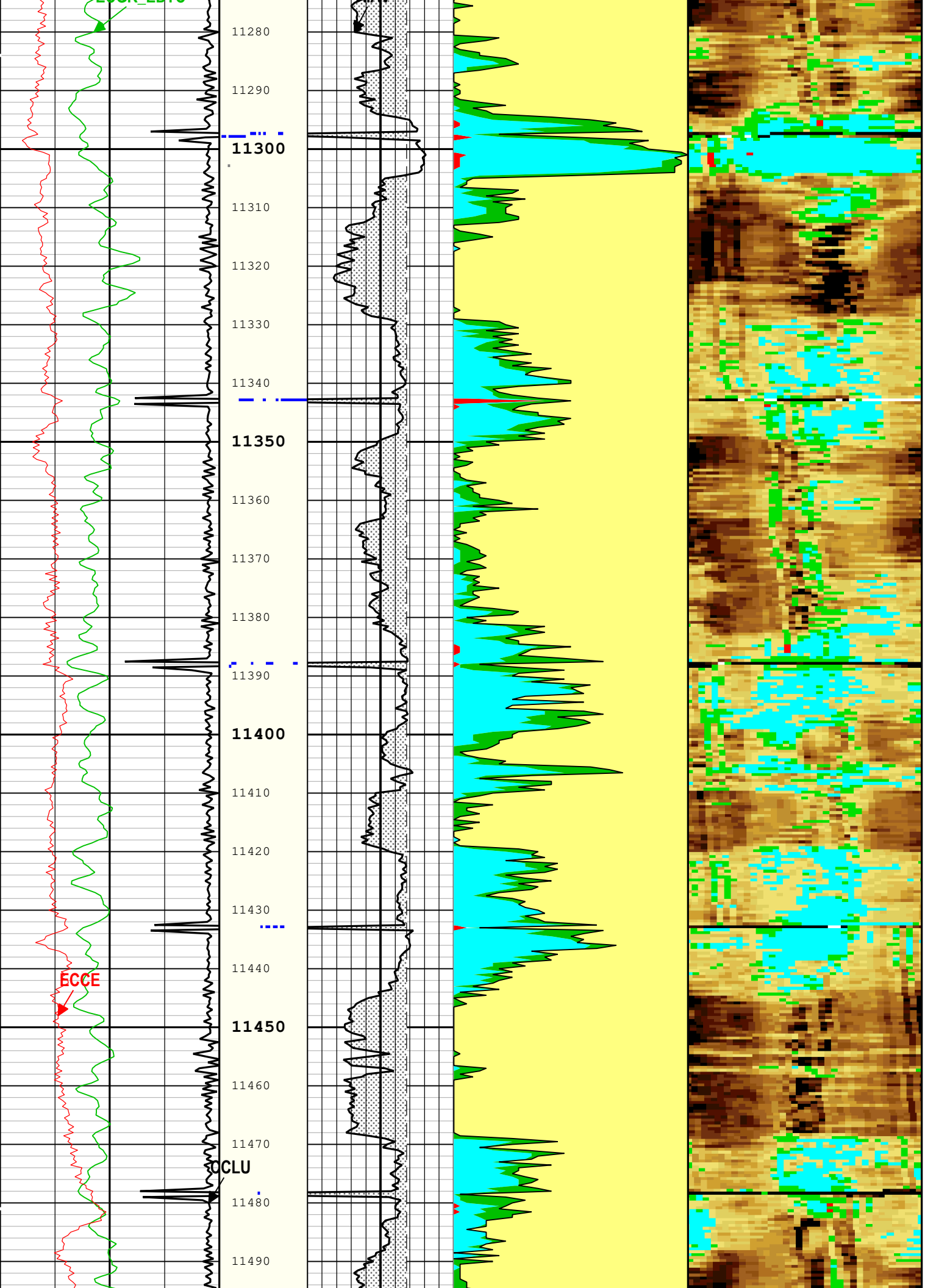
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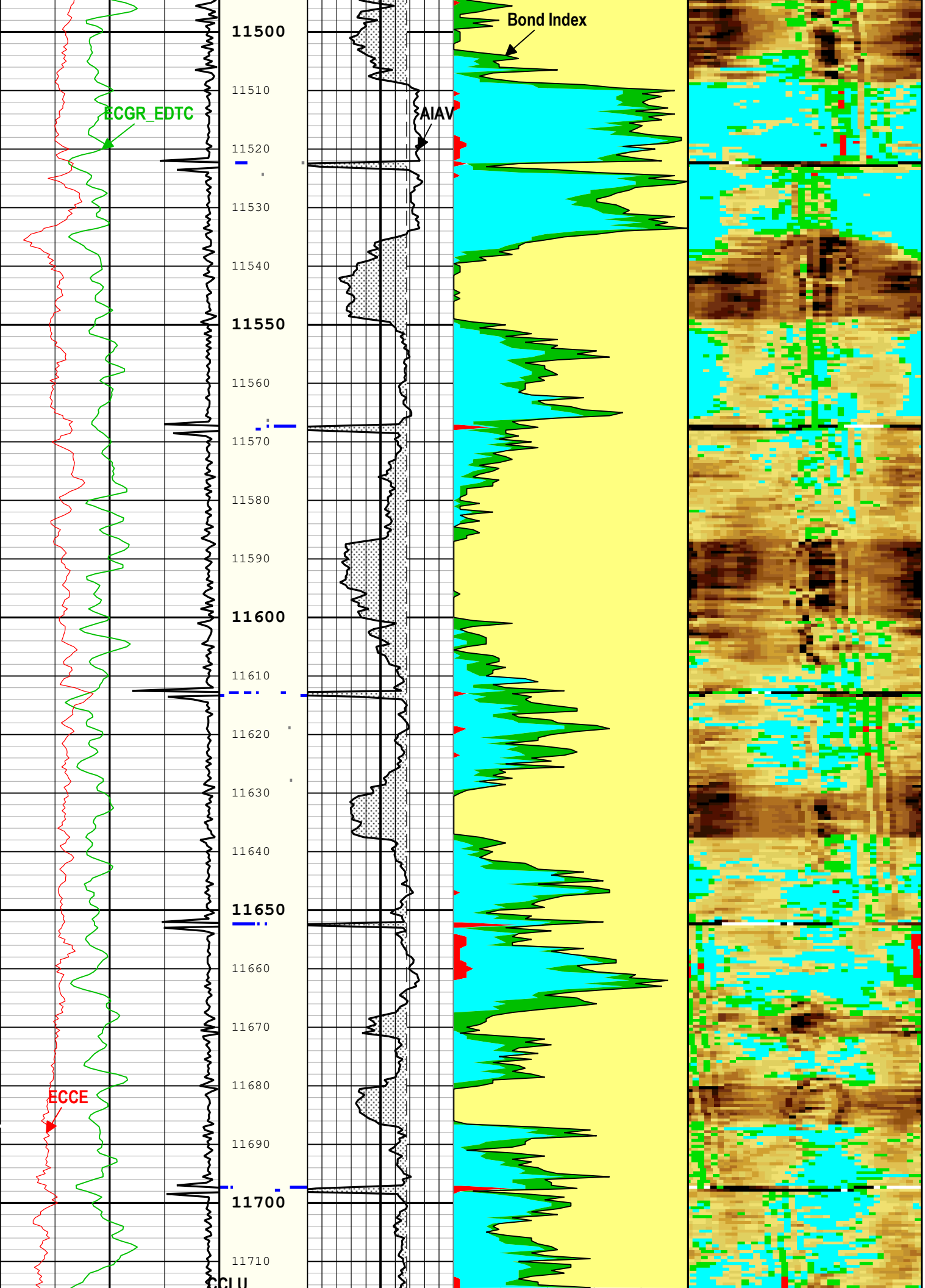
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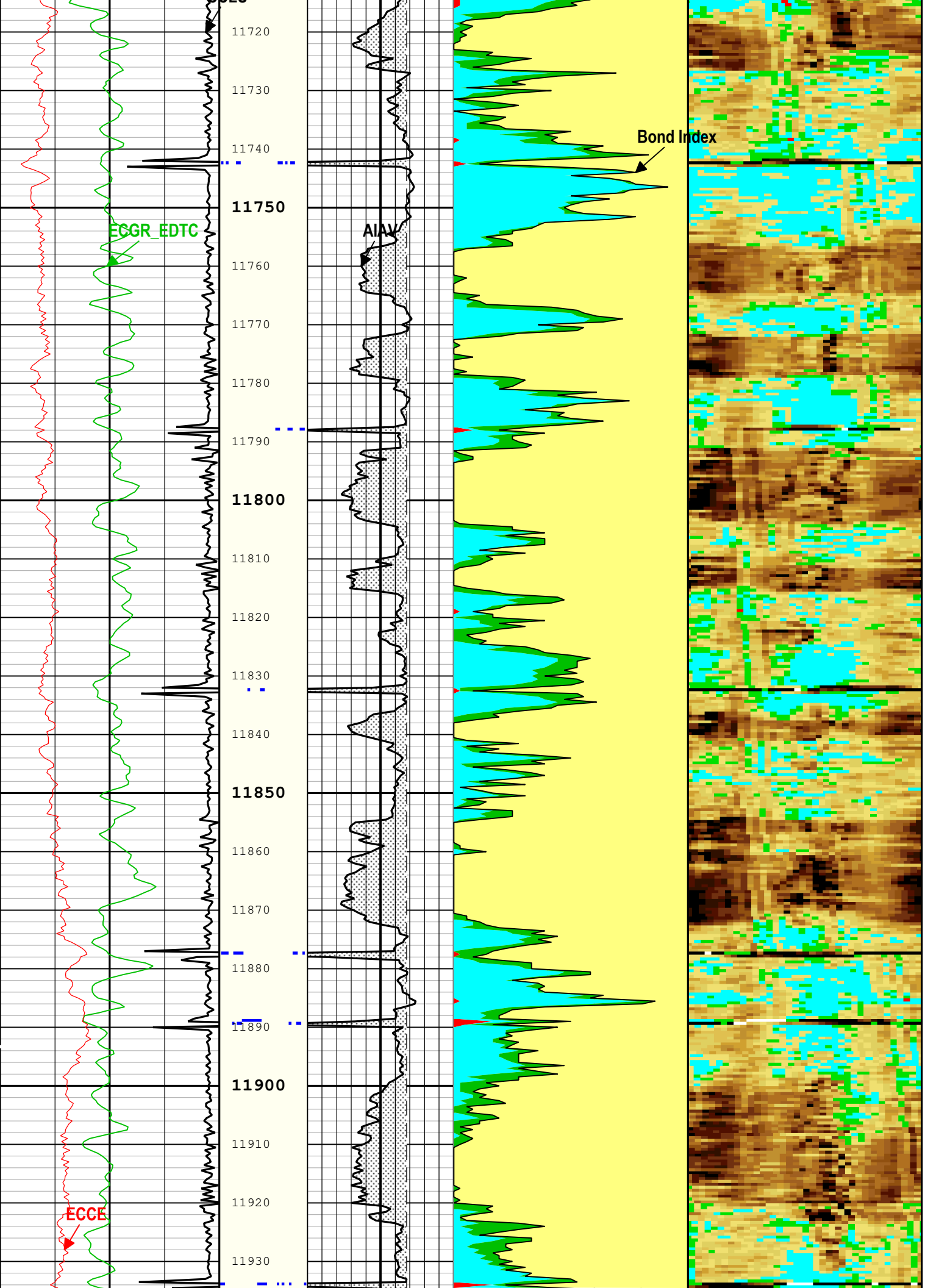
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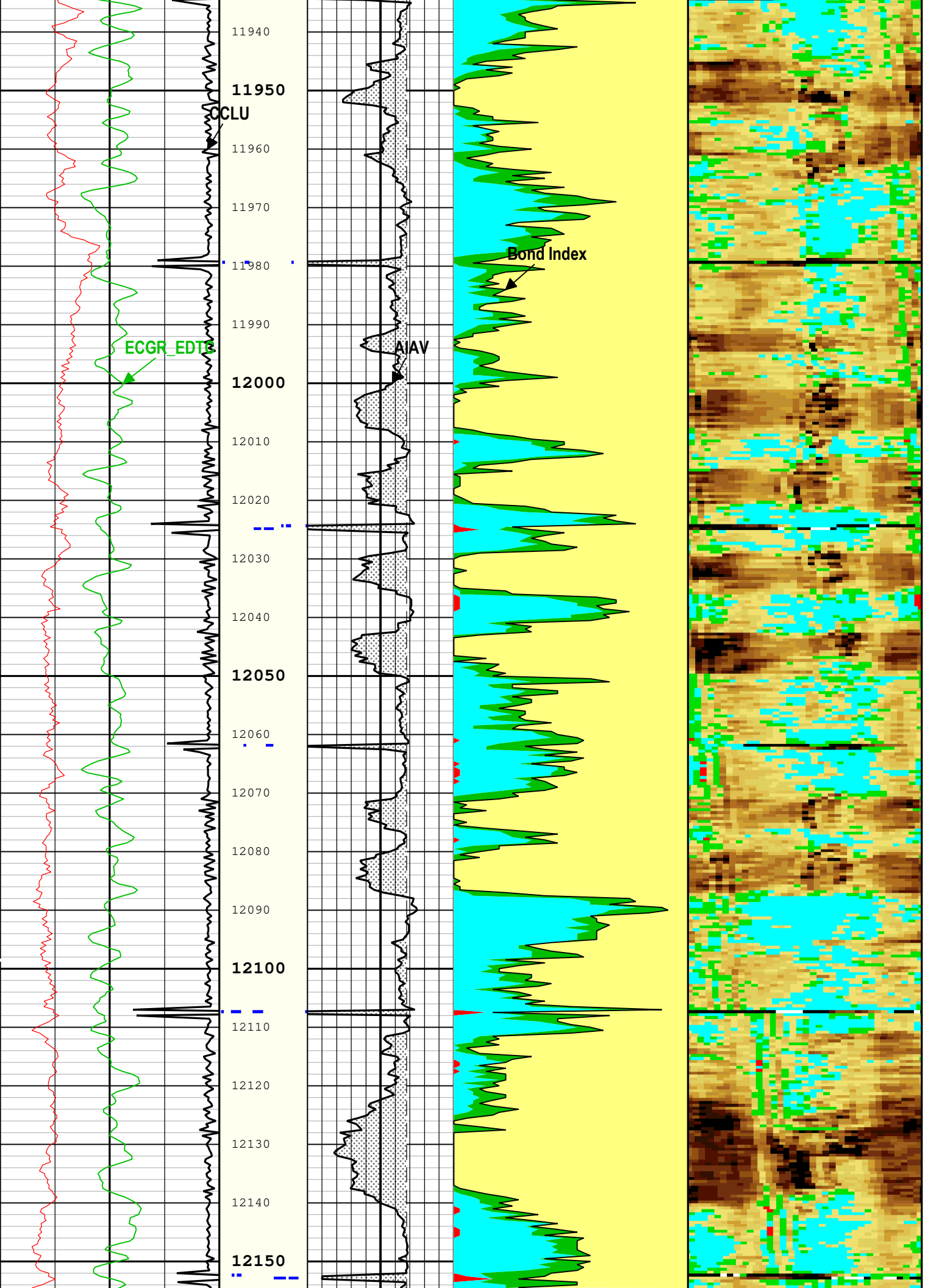
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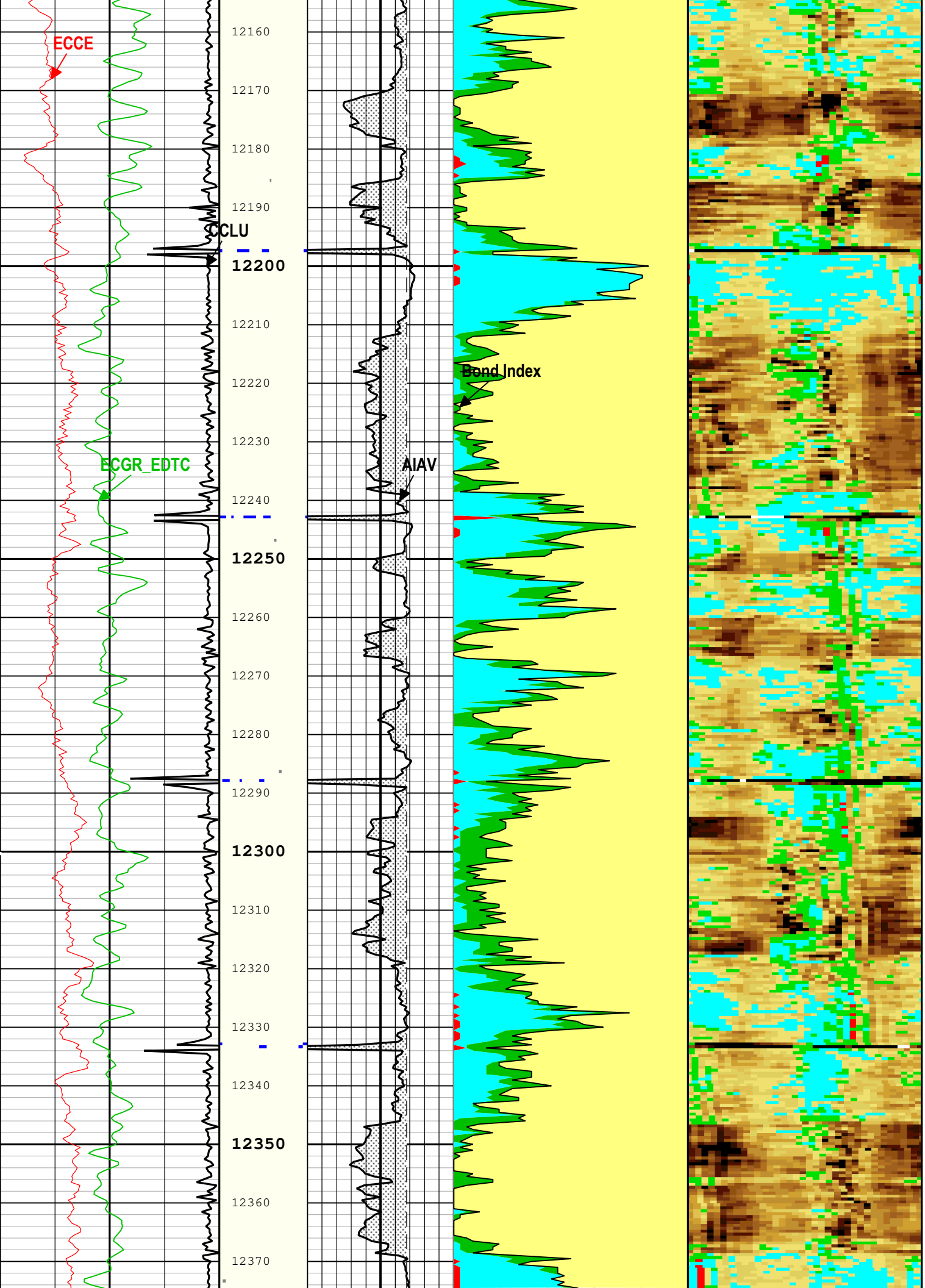
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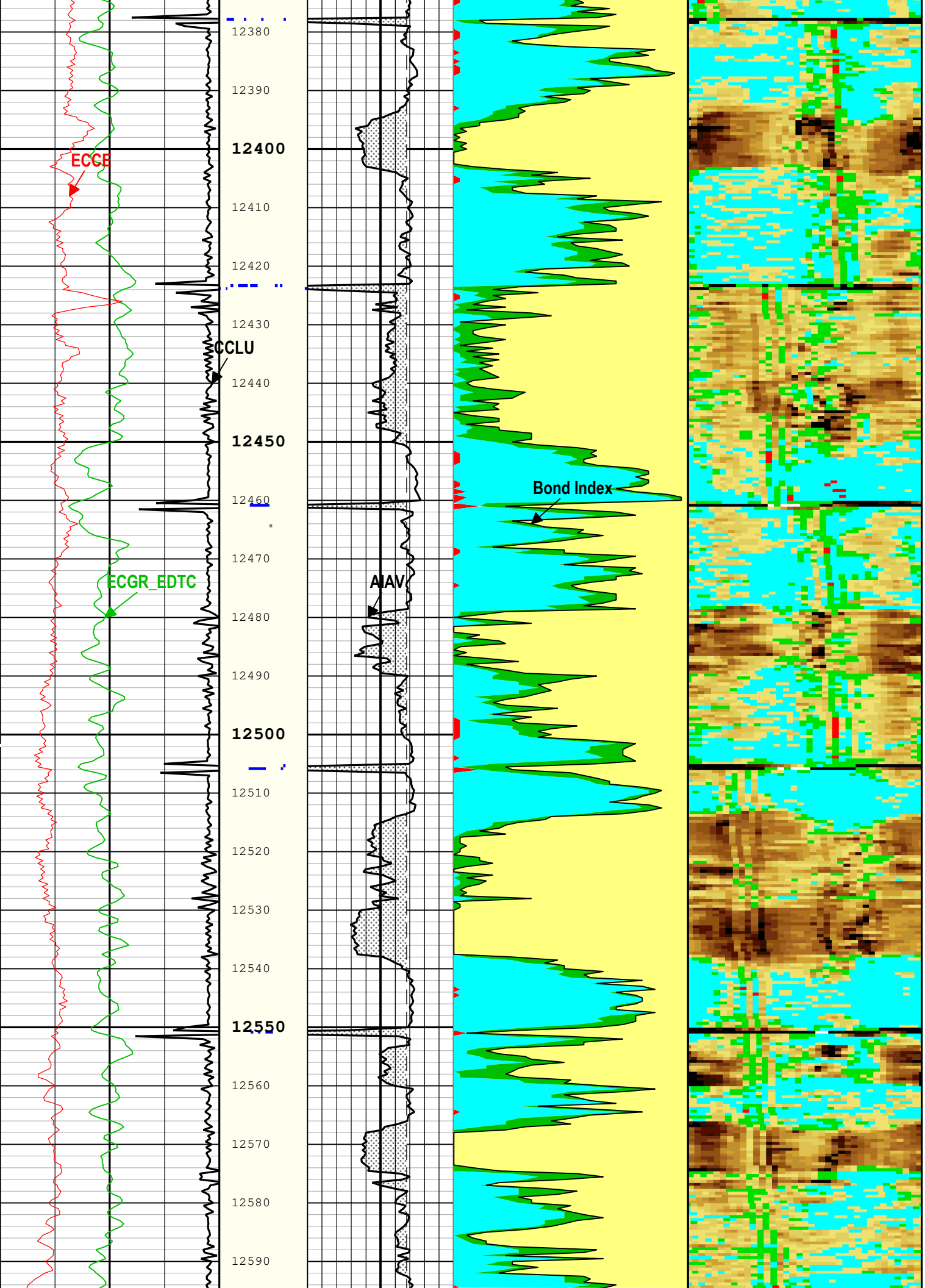
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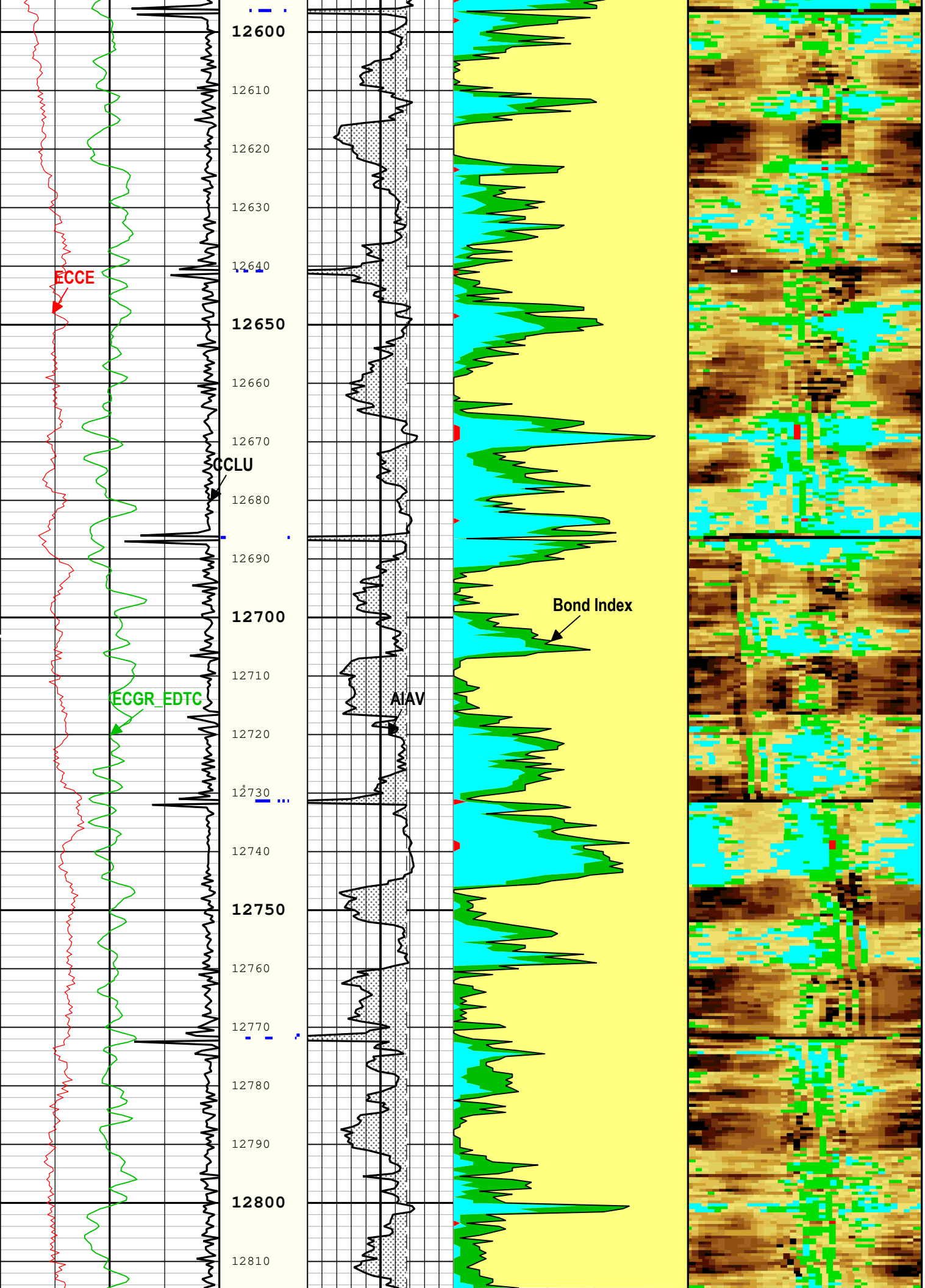
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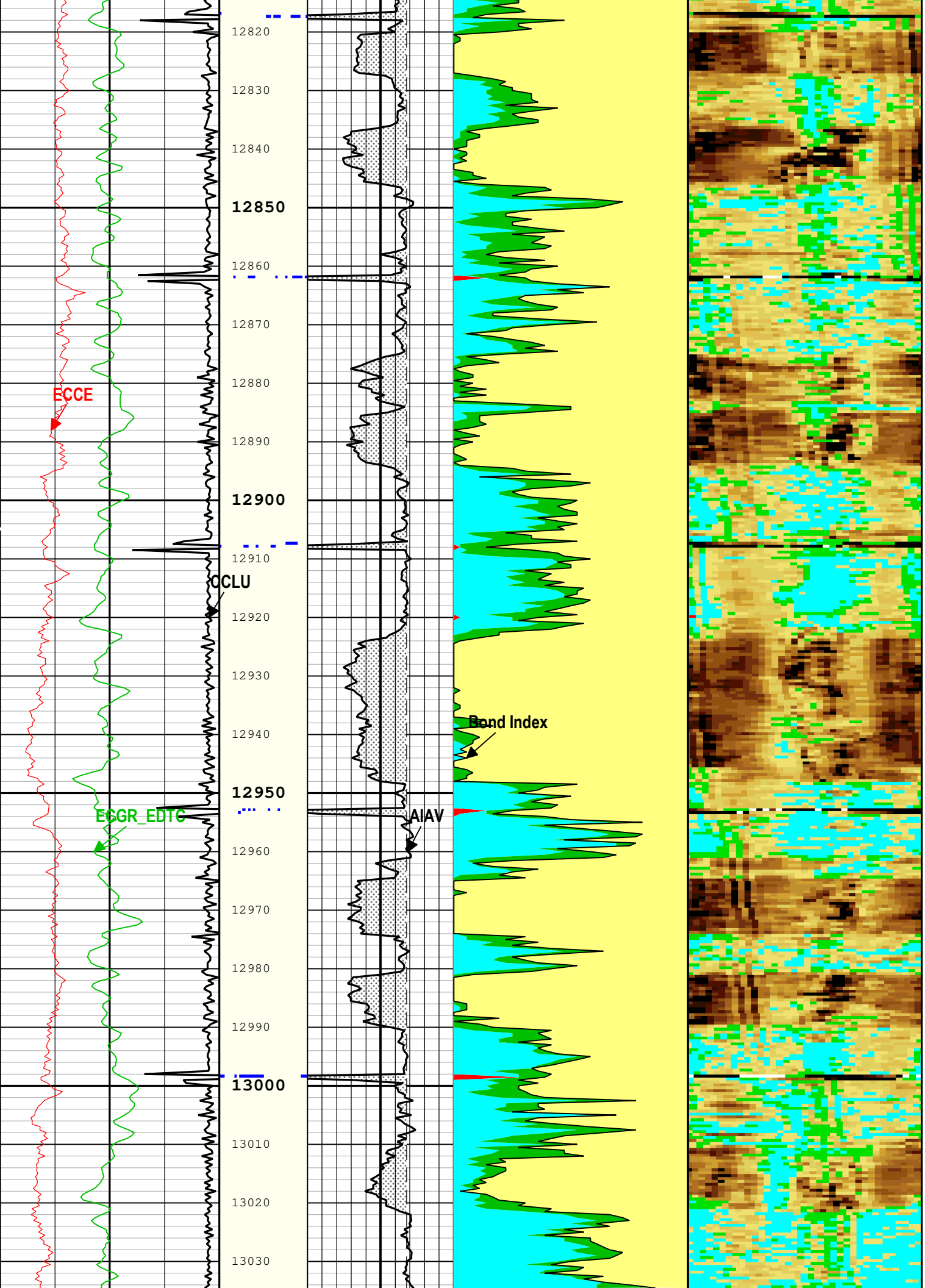
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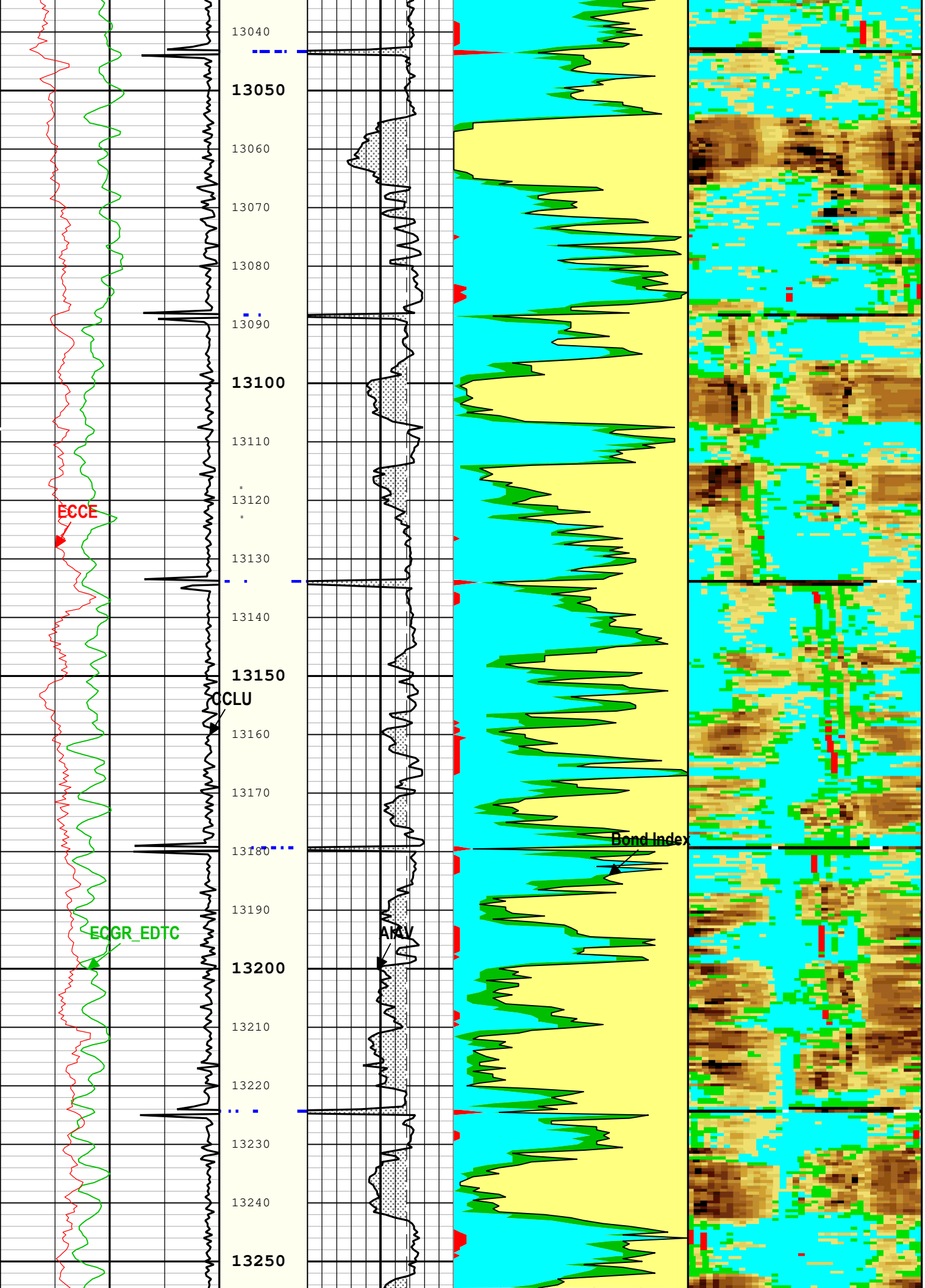
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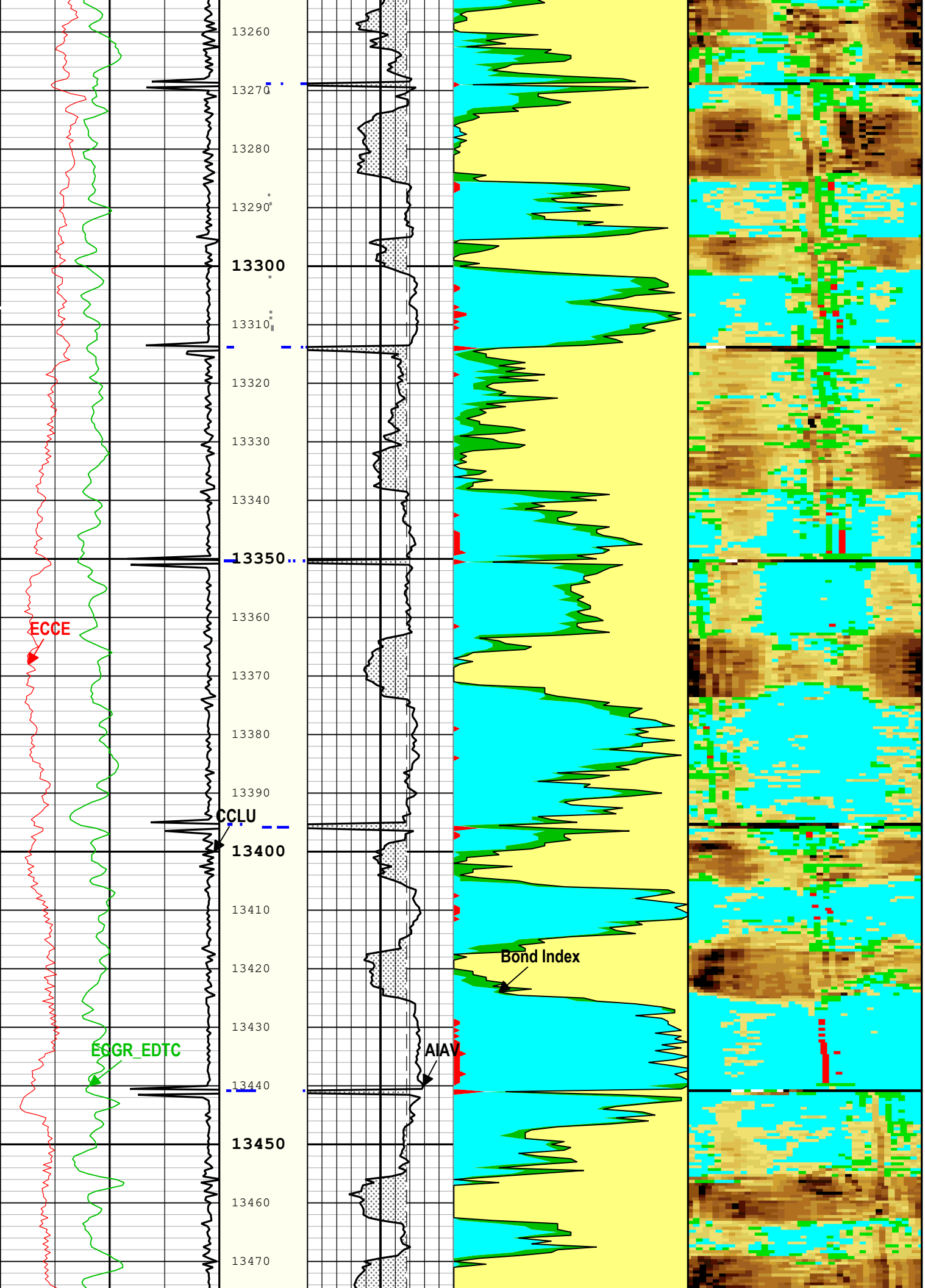
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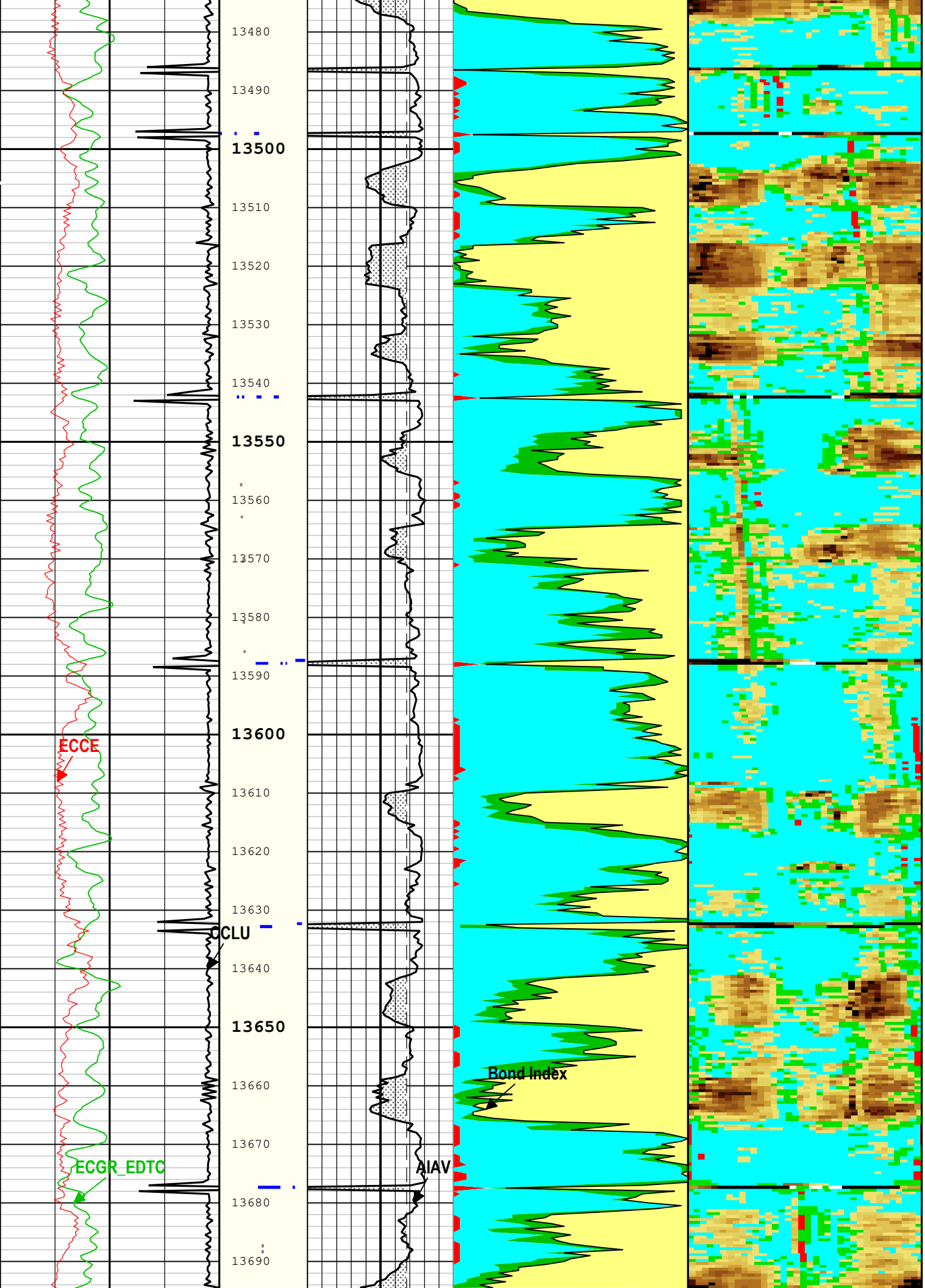
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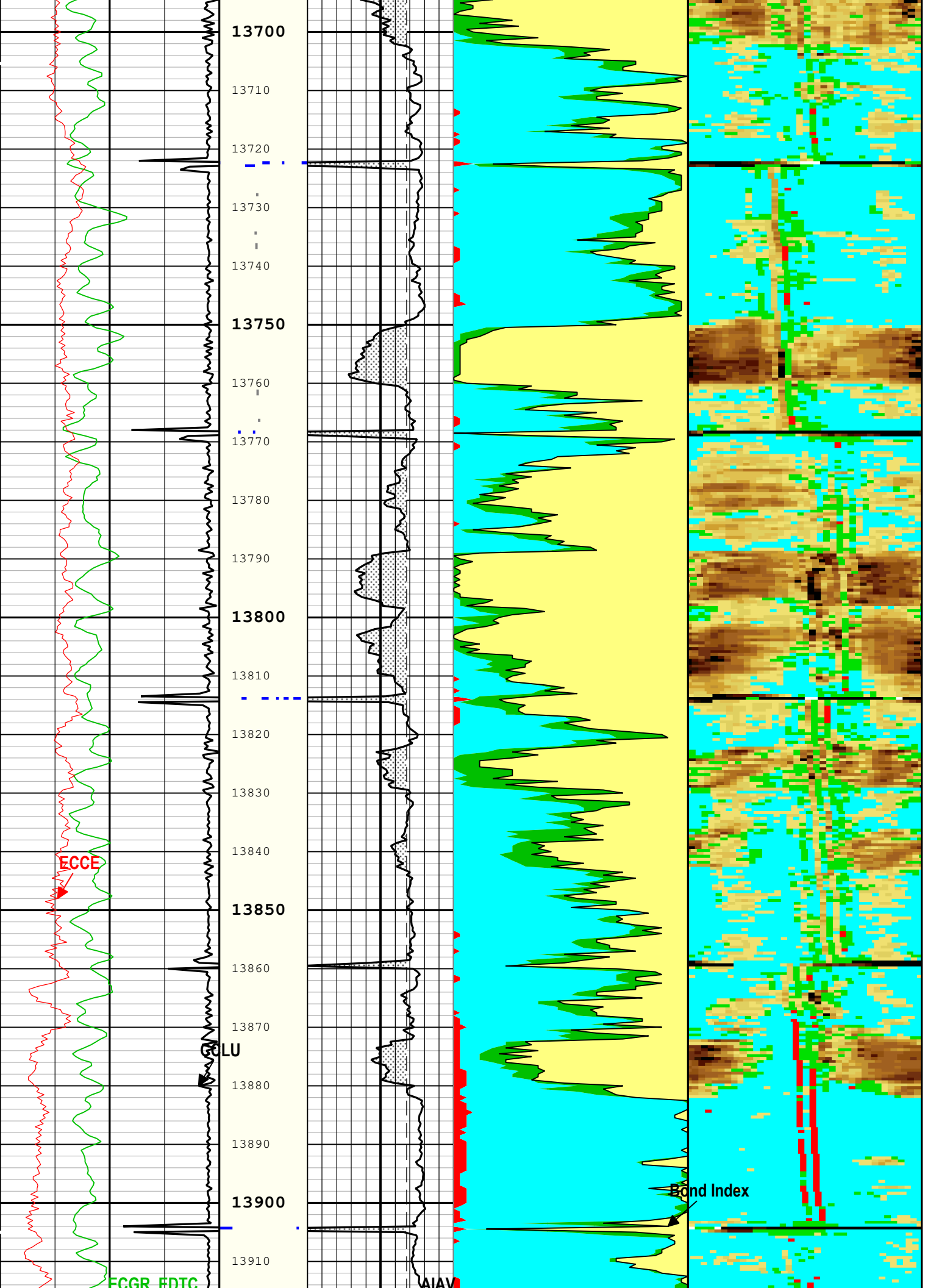
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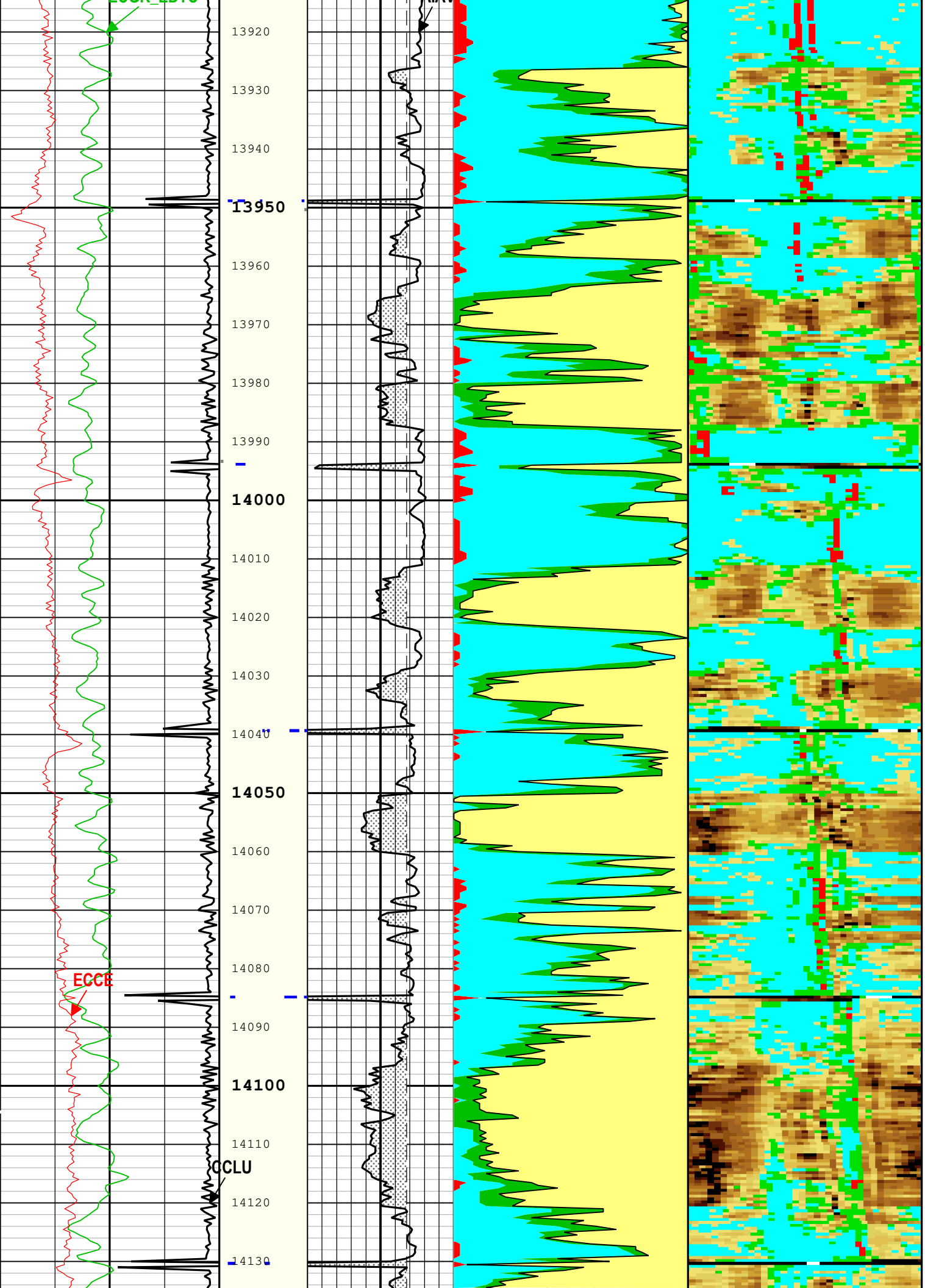
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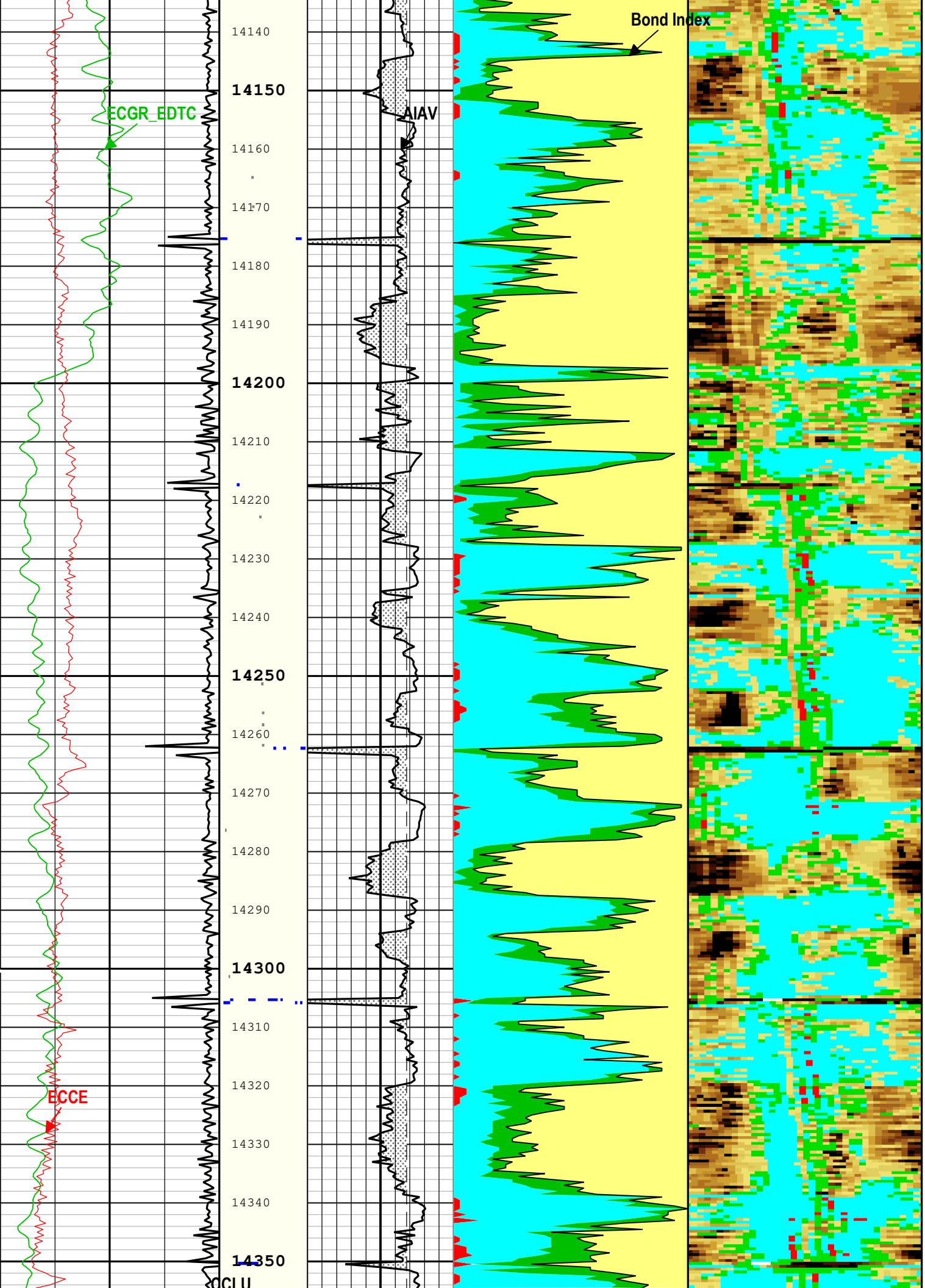
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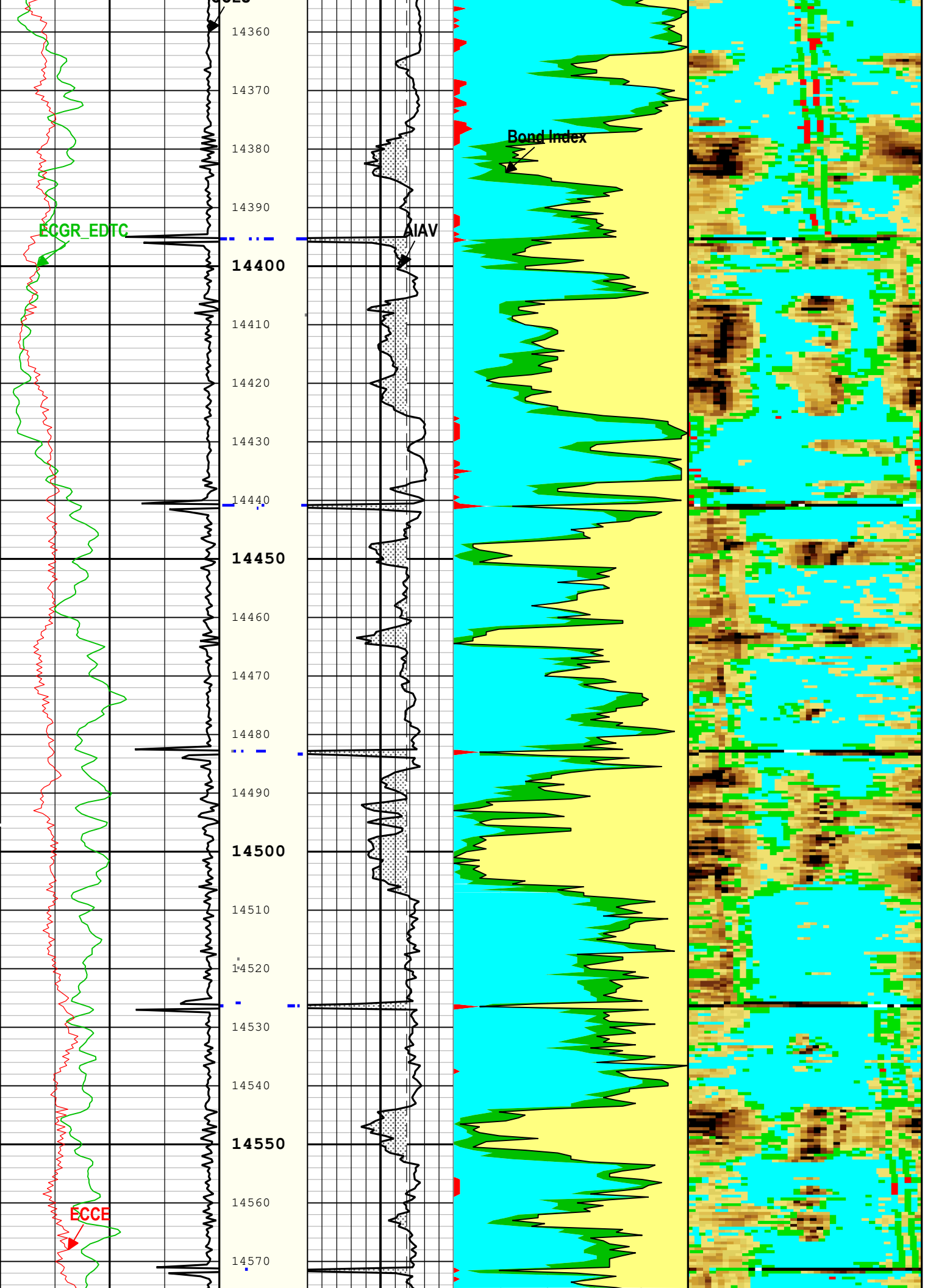
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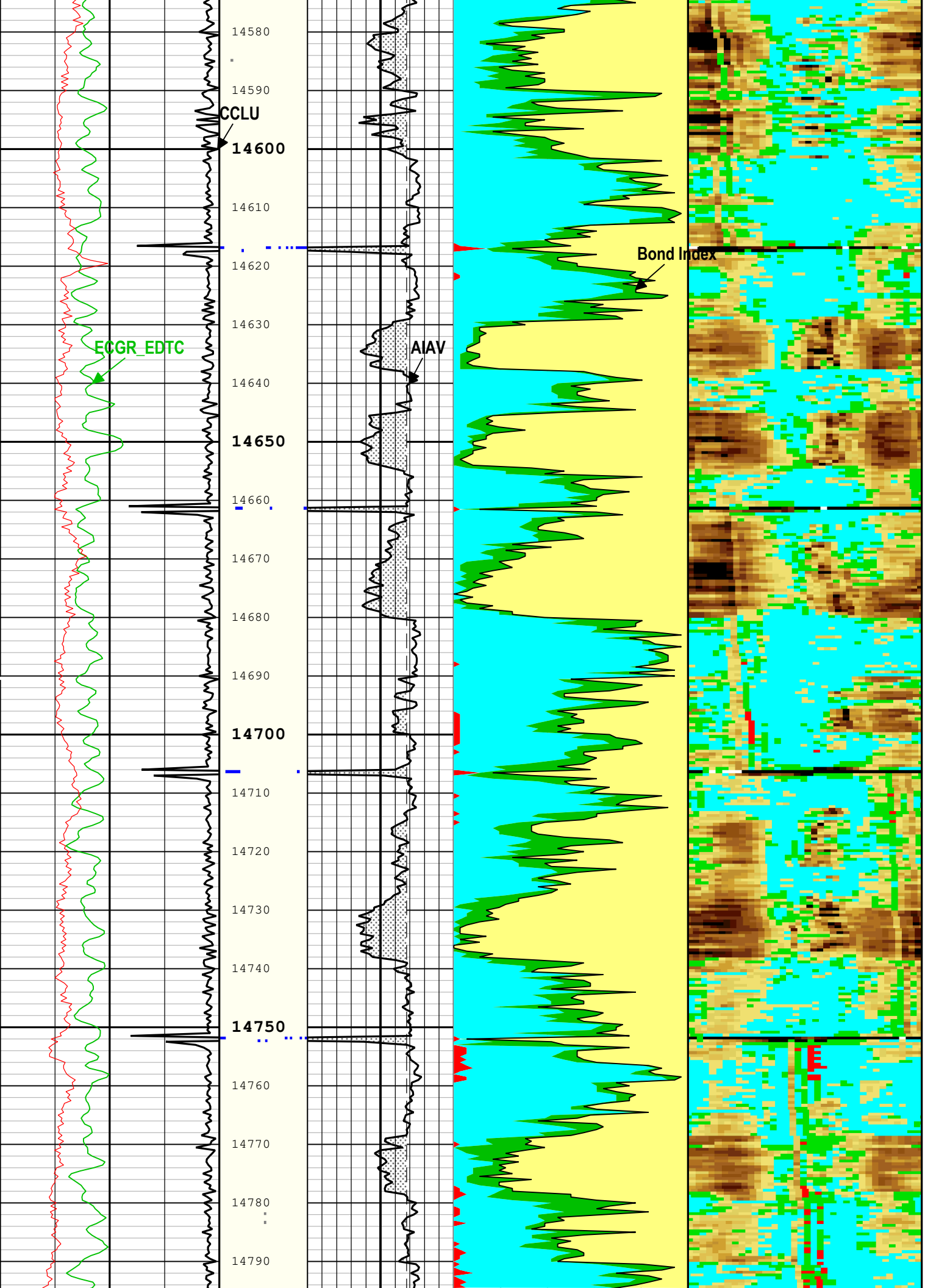
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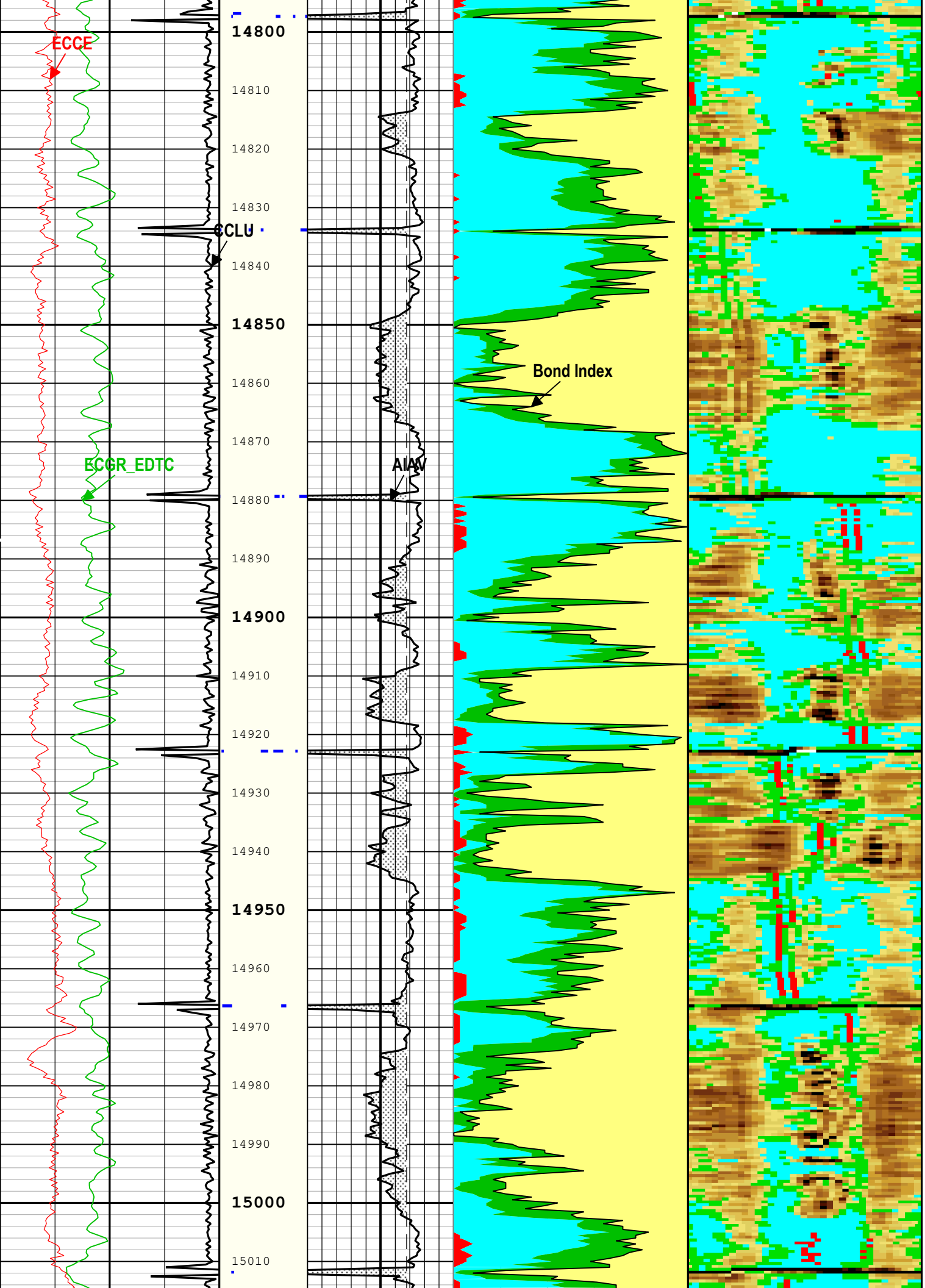
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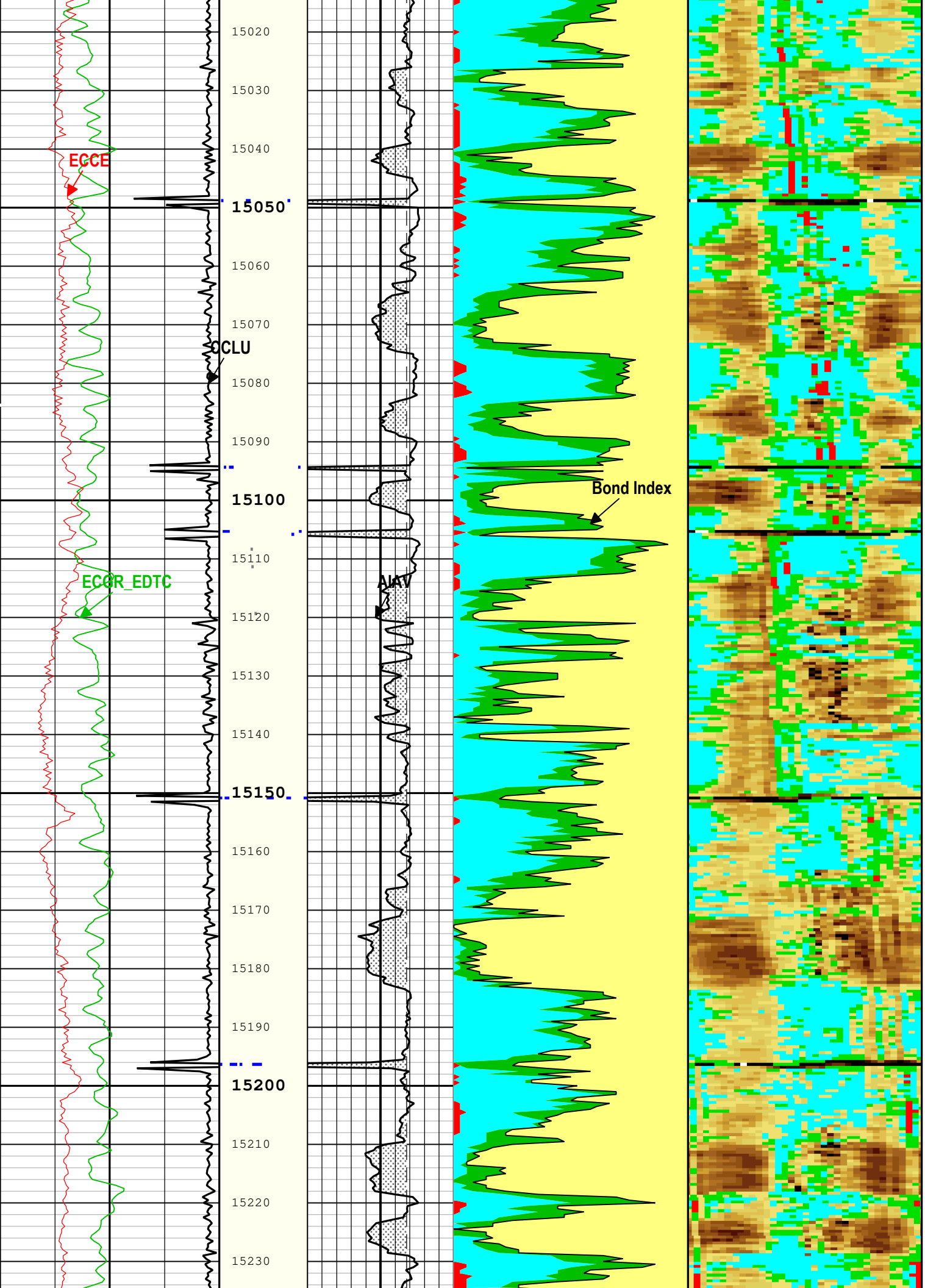
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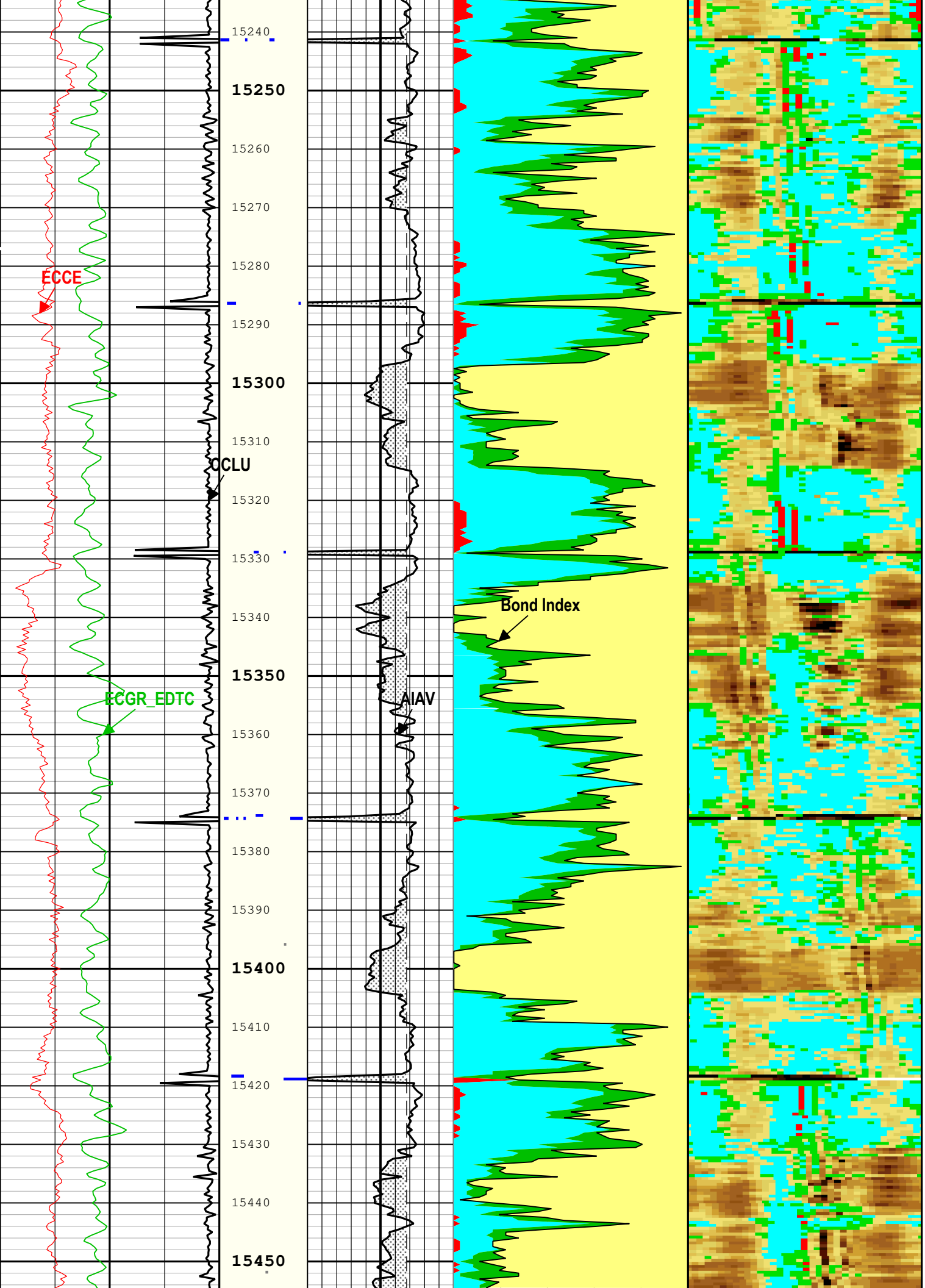
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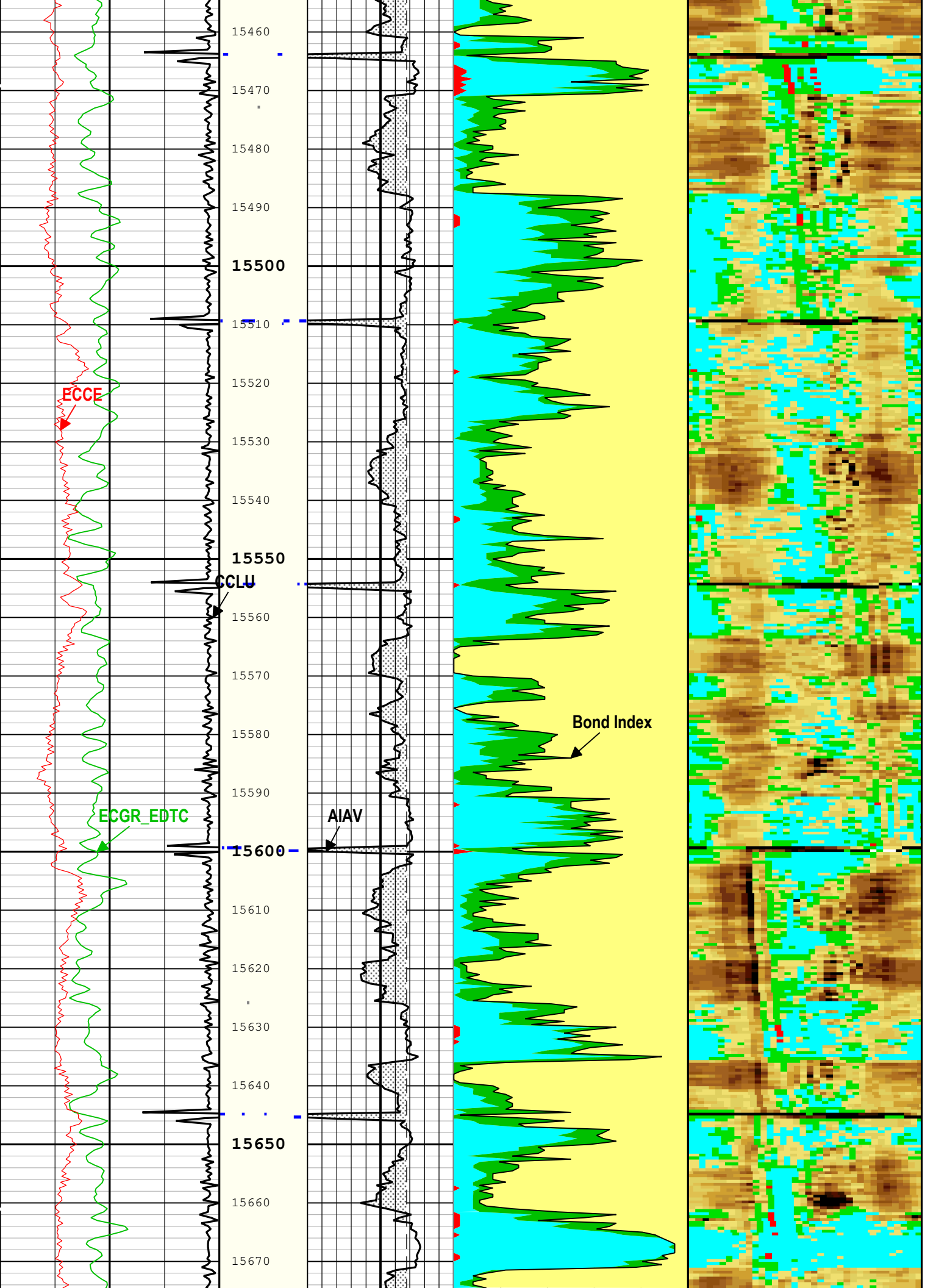
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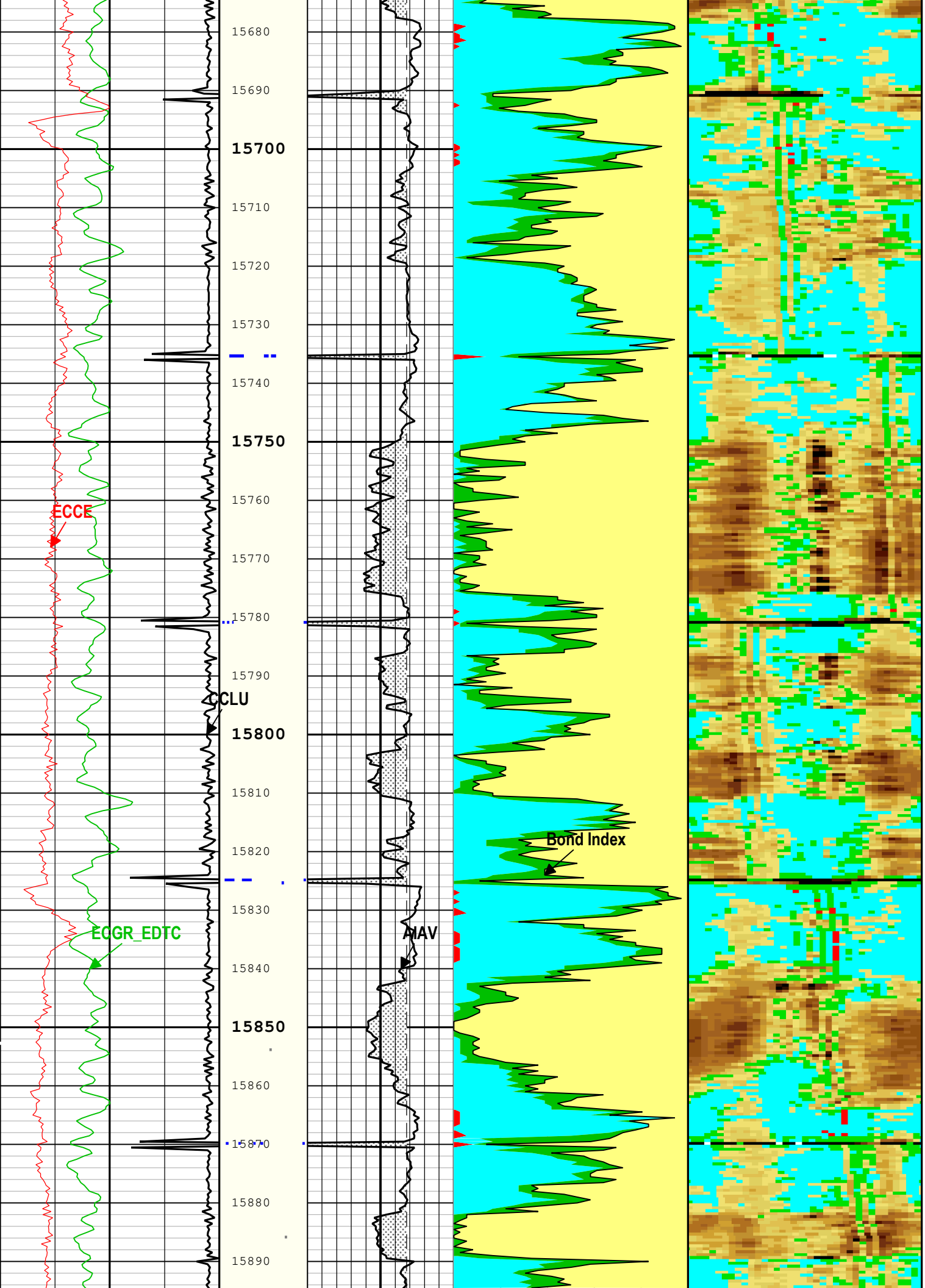
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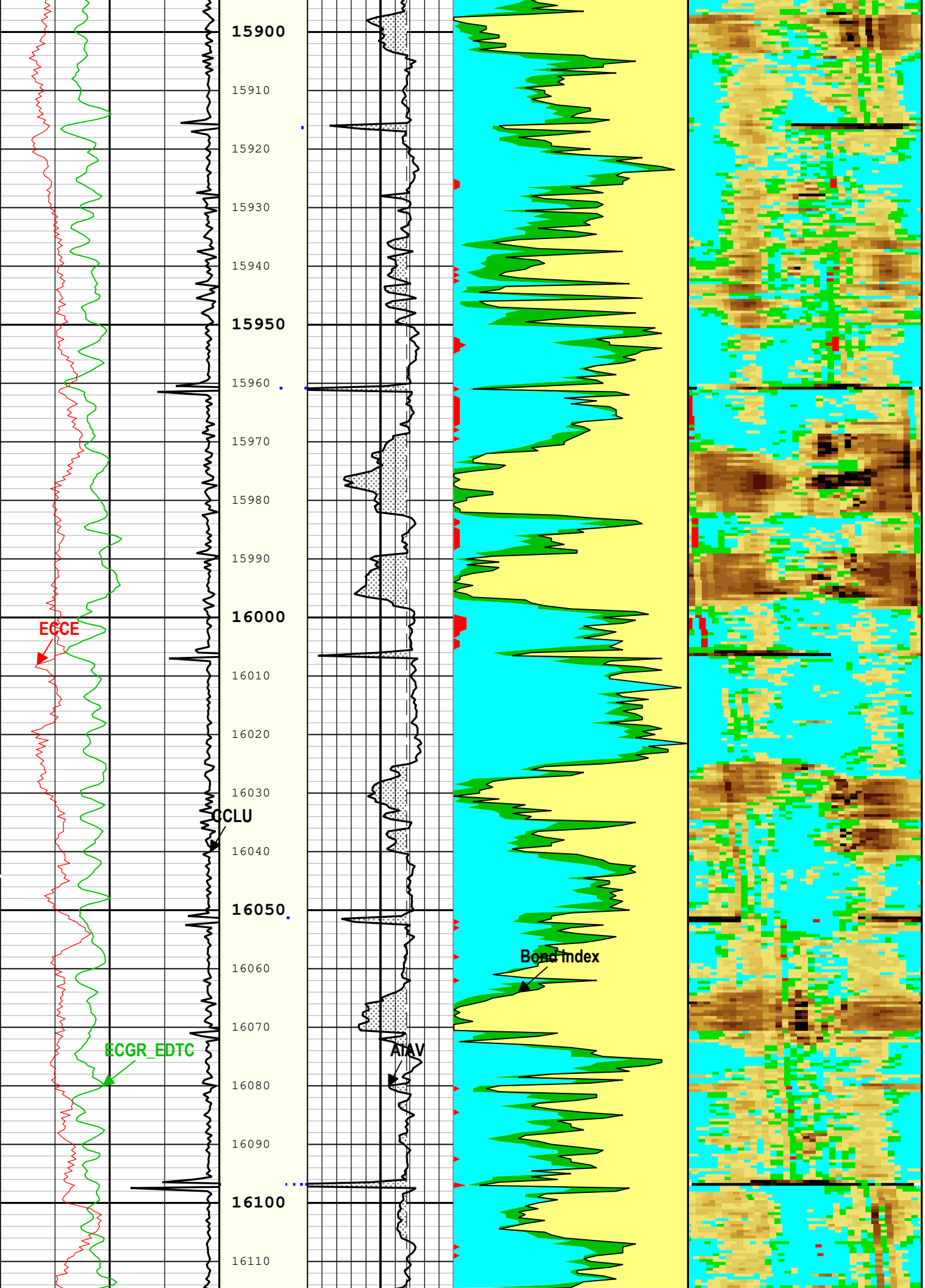
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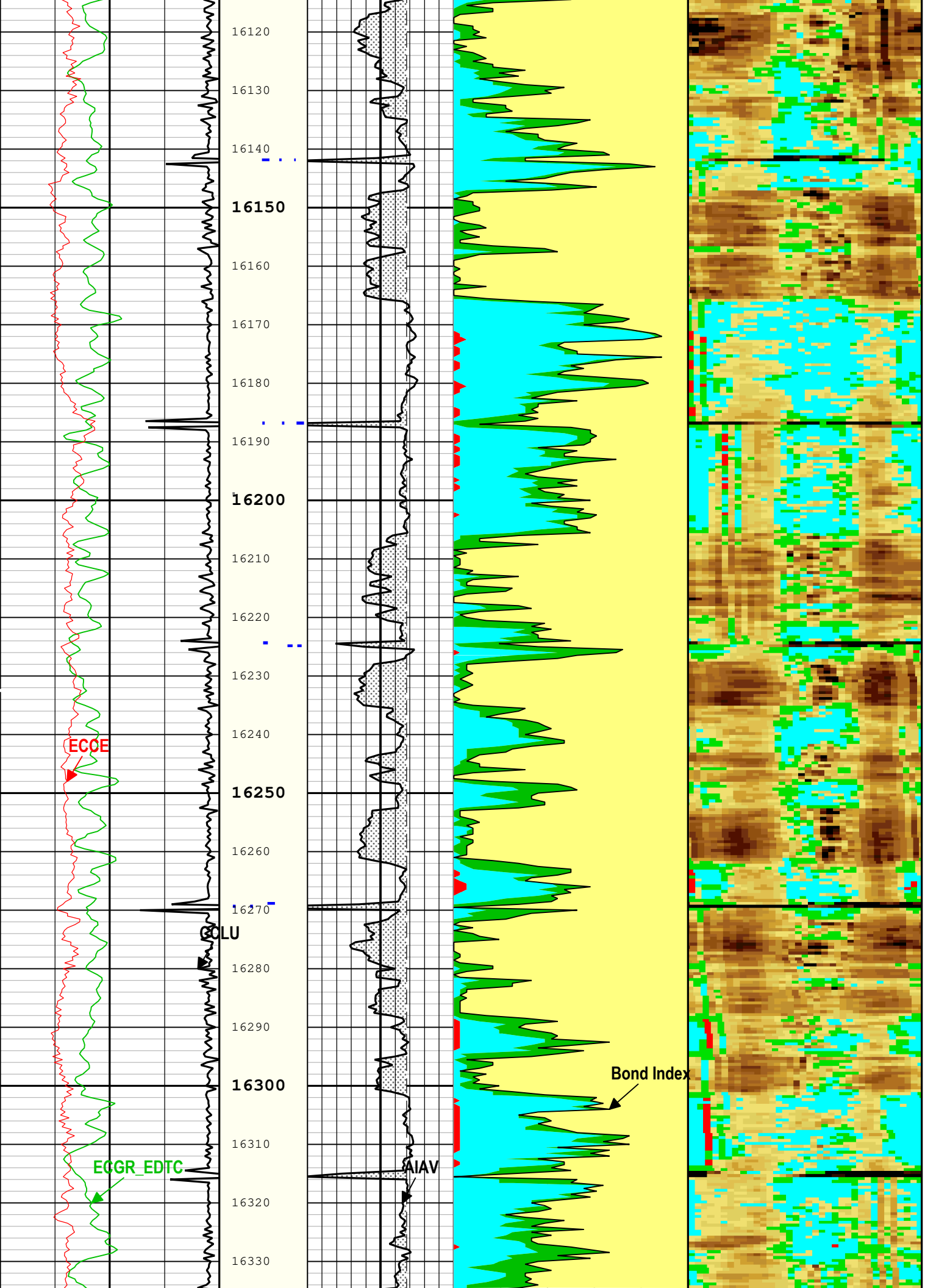
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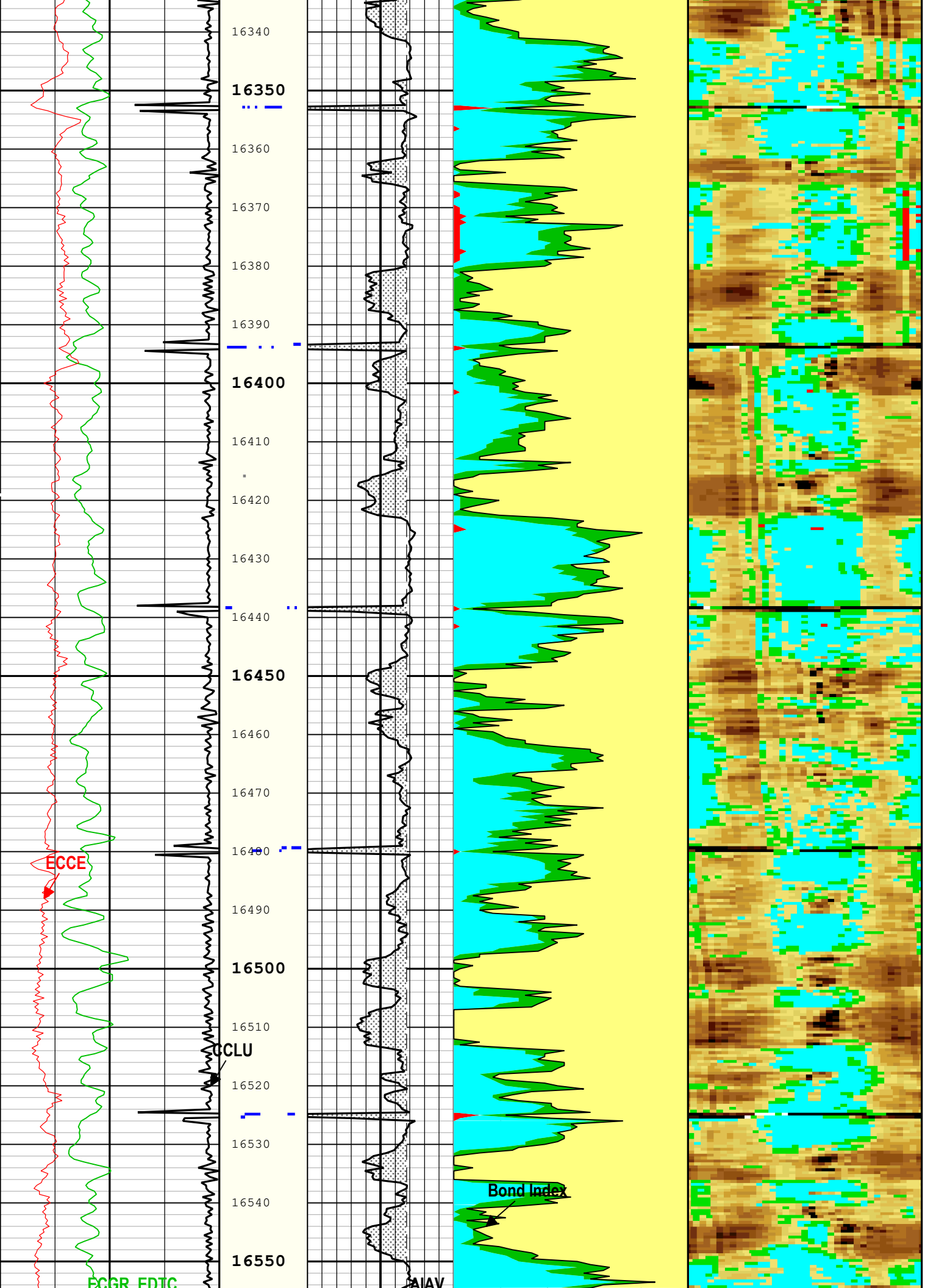
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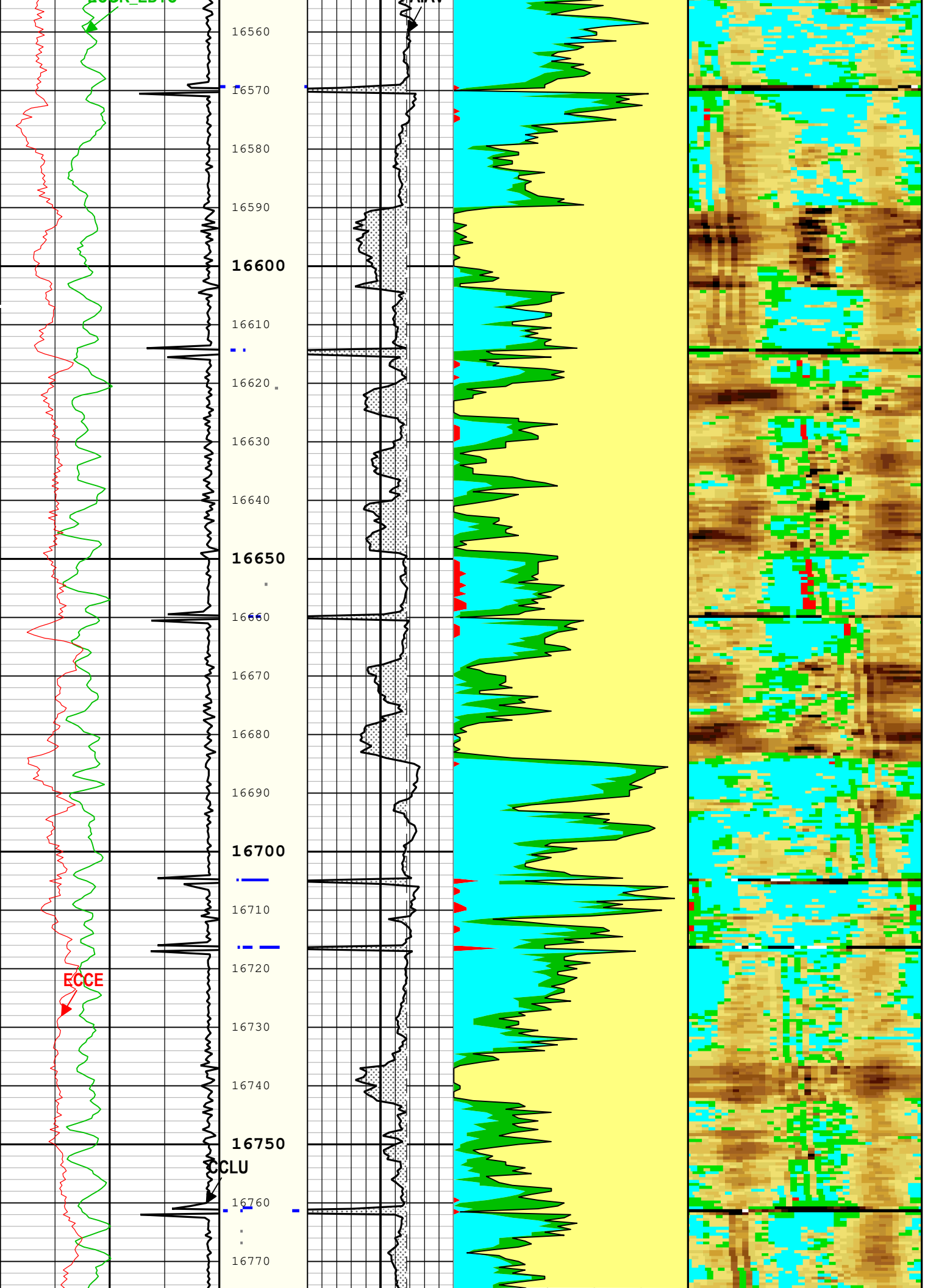
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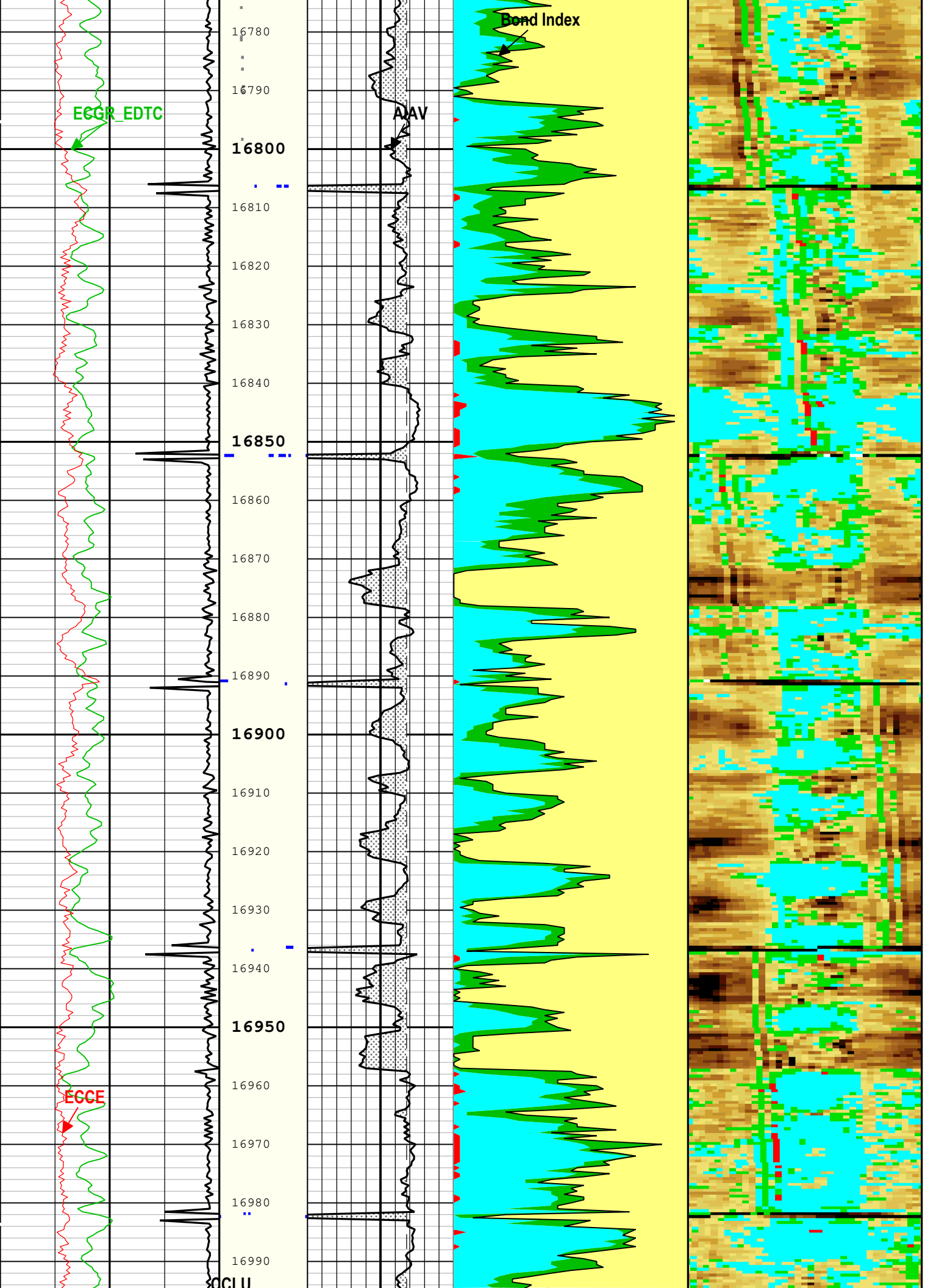
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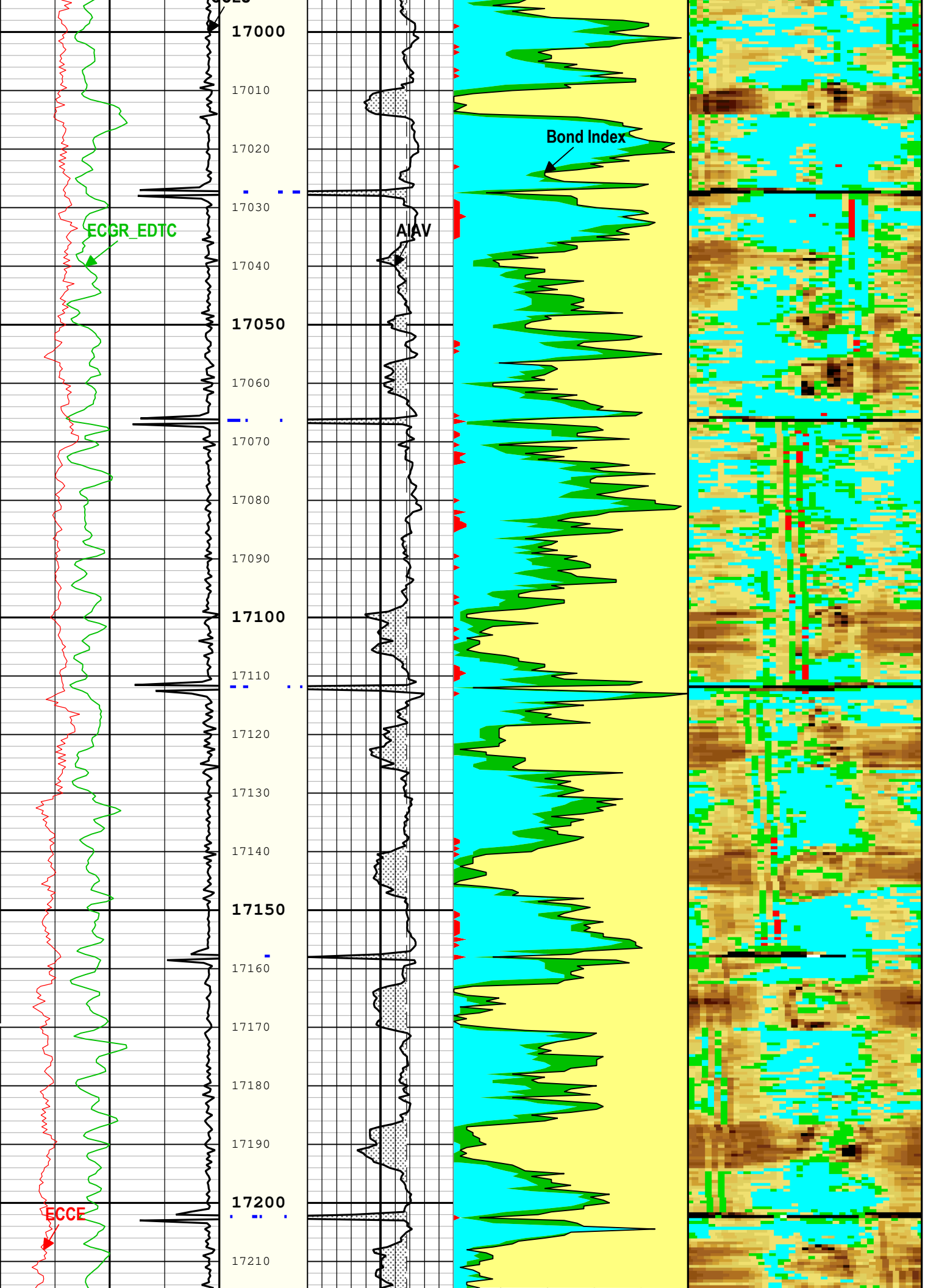
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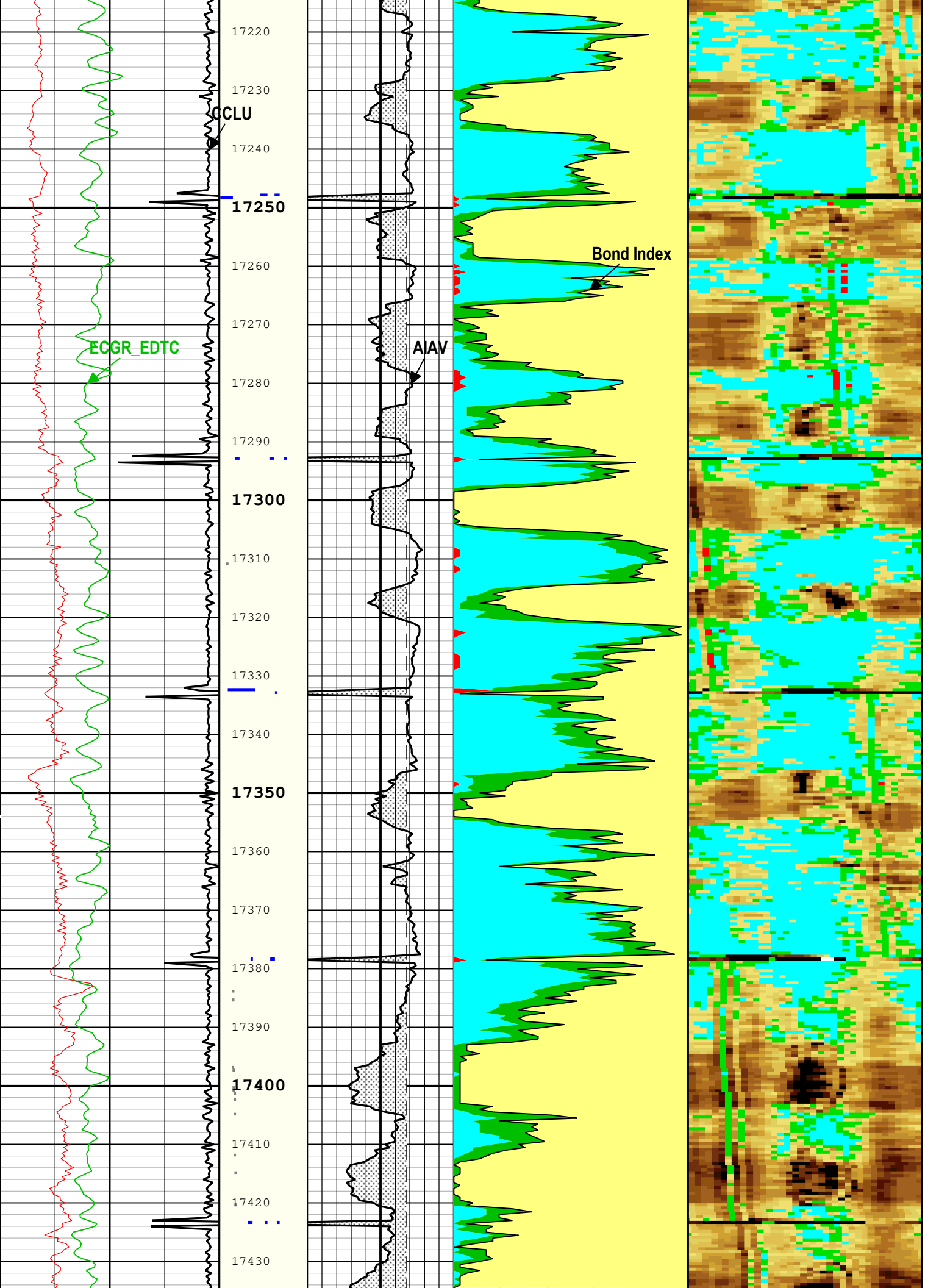
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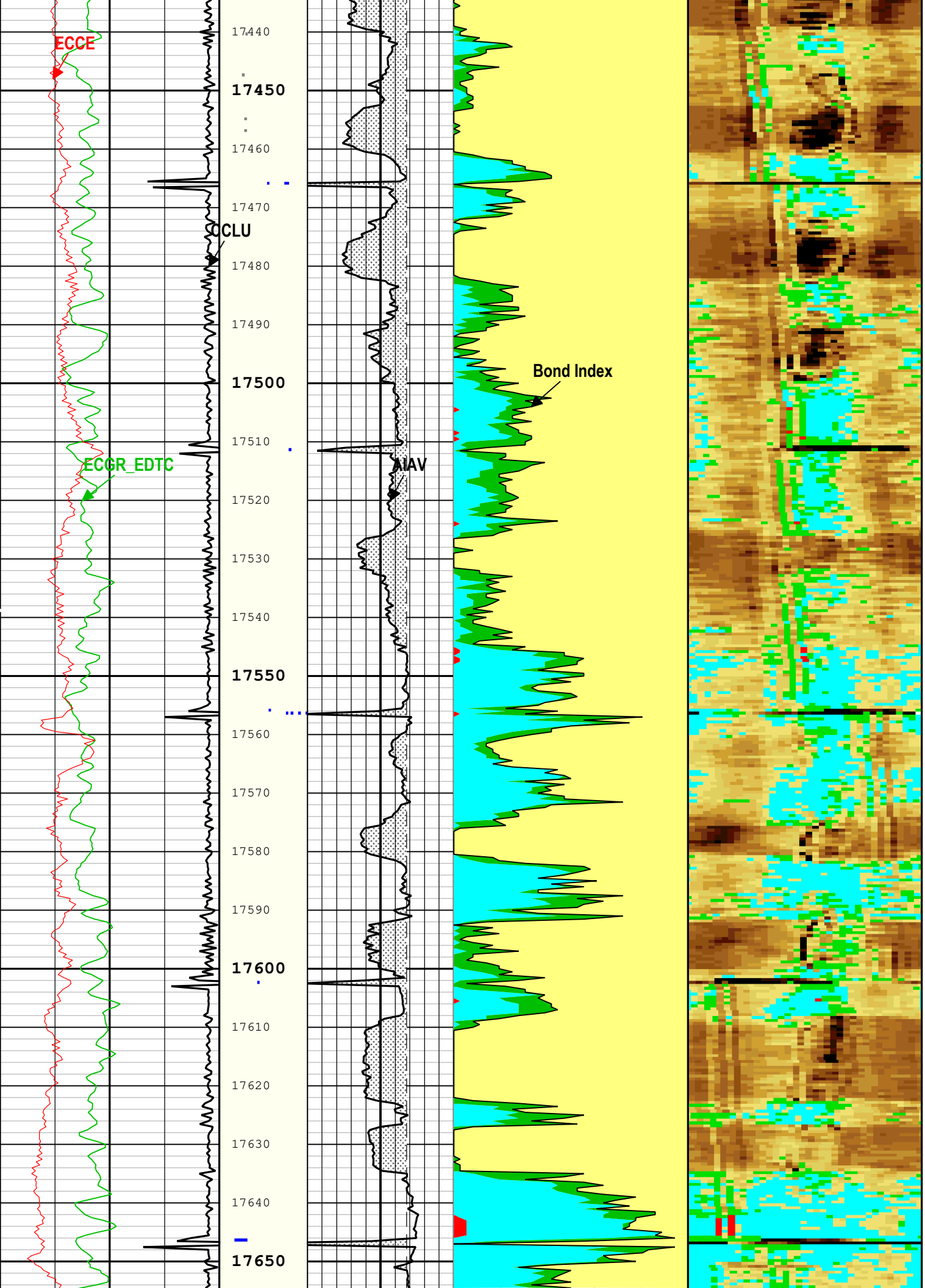
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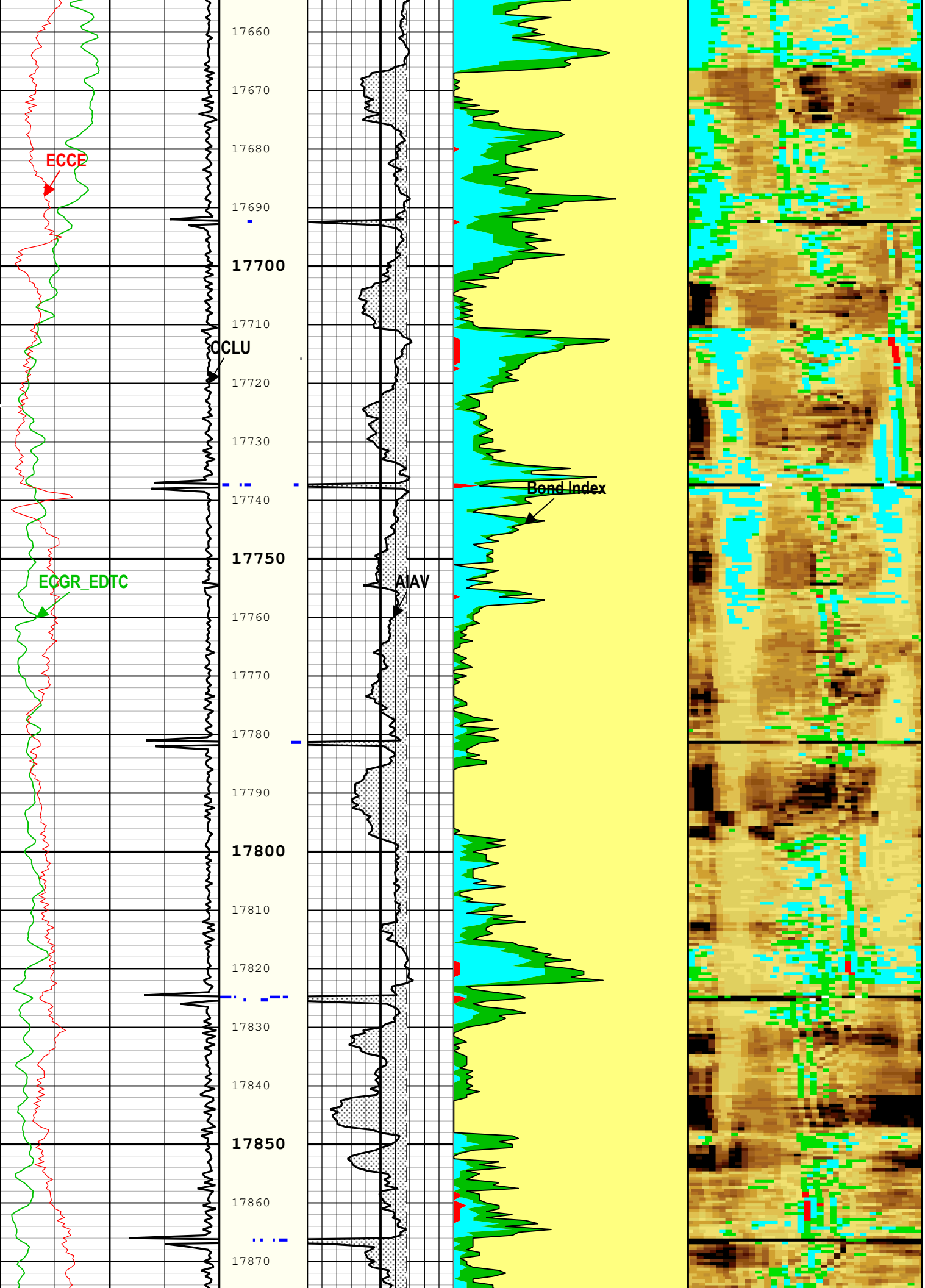
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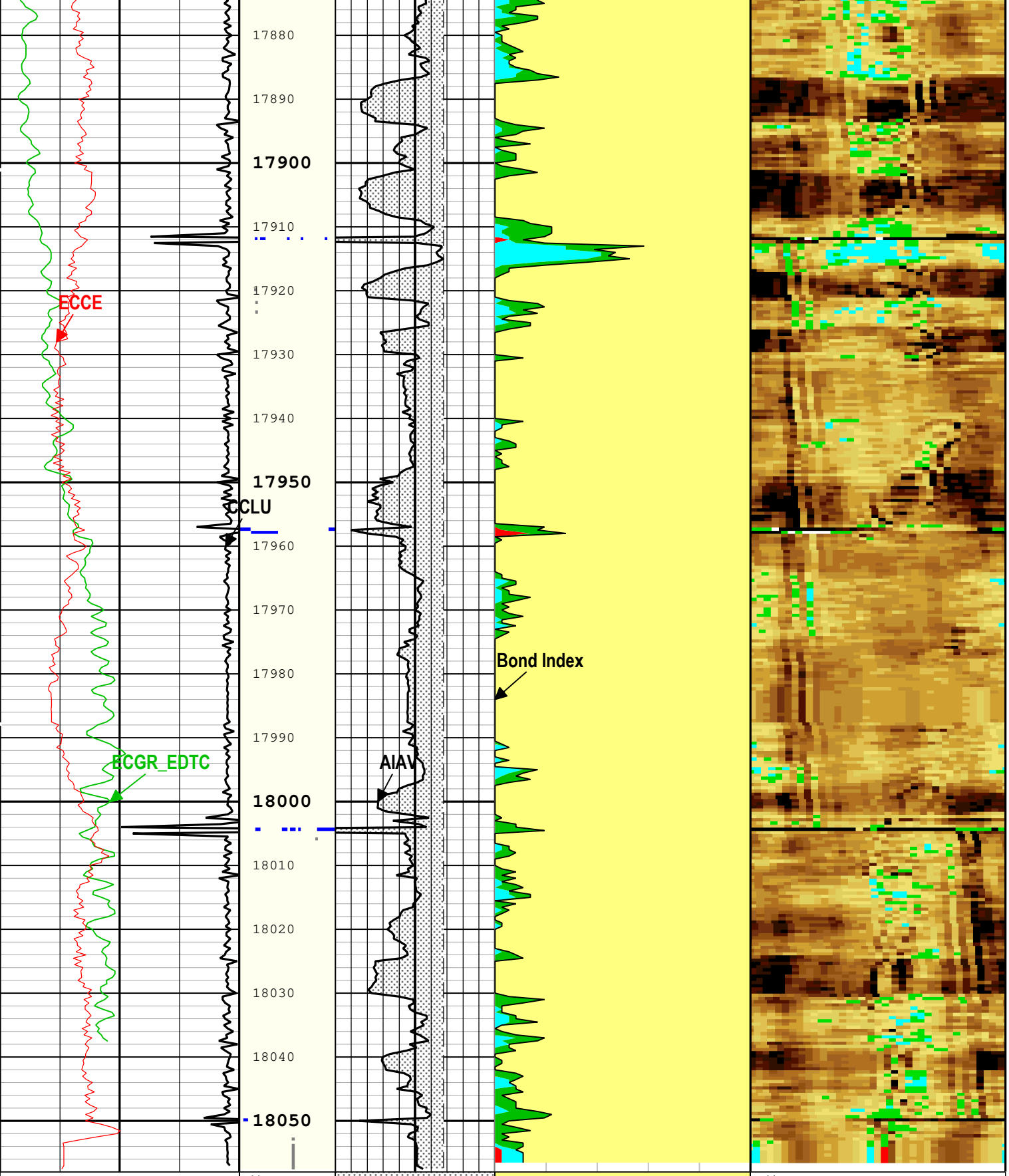


Gamma Ray (ECGR_EDTC) EDTC-B

0 gAPI 150

Casing Collar Locator Ultrasonic (CCLU) USIT-E

-19 in 1

Amplitude of Eccentering (ECCE) USIT-E

Absent 1.500 2.500 6.500

Explicit Normalization

USIT - USIT Processing Flags (UFLG) USIT-E

AIAV>Cement Threshold

Acoustic Impedance Average (AIAV) USIT-E

9 Mrayl -1

Bonded

Gas

Liquid

Micro-debonding

Bond Index (100%-0%)

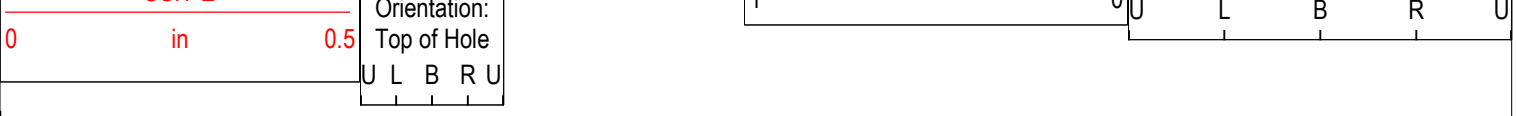
1 0

Absent -500.000 2.200 3.254 4.309 5.363 6.418 7.472

Custom Normalization

USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E (Mrayl)

Orientation: Top of Hole



TIME_1900 - Time Marked every 60.00 (s)

Description: USI Cement Format: Log (USI Lvl 1) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 19-Jun-2020 04:13:51

Channel Processing Parameters

USI: 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	18327	ft
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	8.5	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/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)	
HEMA	Hematite Presence Flag	Borehole	No	
IMAR	Image Rotation	USIT-E	RB	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.18	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.15	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0.01	Mrayl
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-E	Automatic	
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	FreePipe Norm.	
ZMUD	Acoustic Impedance of Mud	Borehole	1.75	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	13.5	72.5	1549
BS	8.5	1549	18058

All depth are actual.

Tool Control Parameters

USI: 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	60	V
HRES	Horizontal Resolution	USIT-E	10 deg	
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
USFR	Ultrasonic Sampling Frequency	USIT-E	666667	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 6.0 in	
WINR	Window Begin Time	USIT-E	Time Zoned	us

WINB	Window Begin Time	USIT-E	Time Zoned	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)
WINB	28.6	19-Jun-2020 01:51:53	19-Jun-2020 02:45:58	18084.08	7643.53
WINB	27.37	19-Jun-2020 02:45:58	19-Jun-2020 03:32:08	7643.53	118.42
WINE	71.88	19-Jun-2020 01:51:53	19-Jun-2020 02:46:02	18084.08	7636.56
WINE	73.62	19-Jun-2020 02:46:02	19-Jun-2020 03:32:08	7636.56	118.42

All depth are at tool zero.

USI

Repeat Pass: 0 PSI

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
USI	Log[2]:Up	Up	6259.72 ft	6703.45 ft	18-Jun-2020 6:29:51 PM	18-Jun-2020 6:32:57 PM	OFF	-28.73 ft	Yes

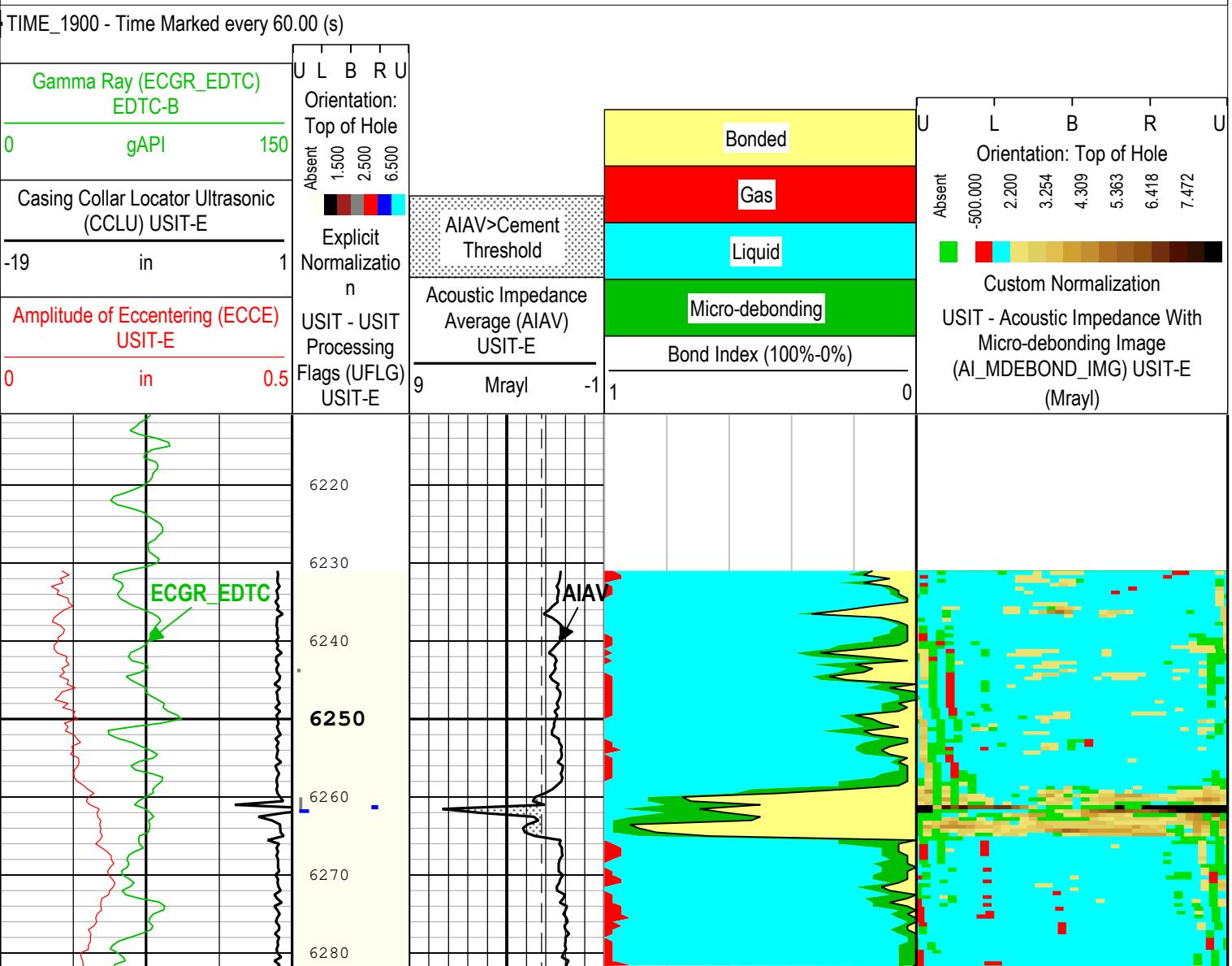
All depths are referenced to toolstring zero

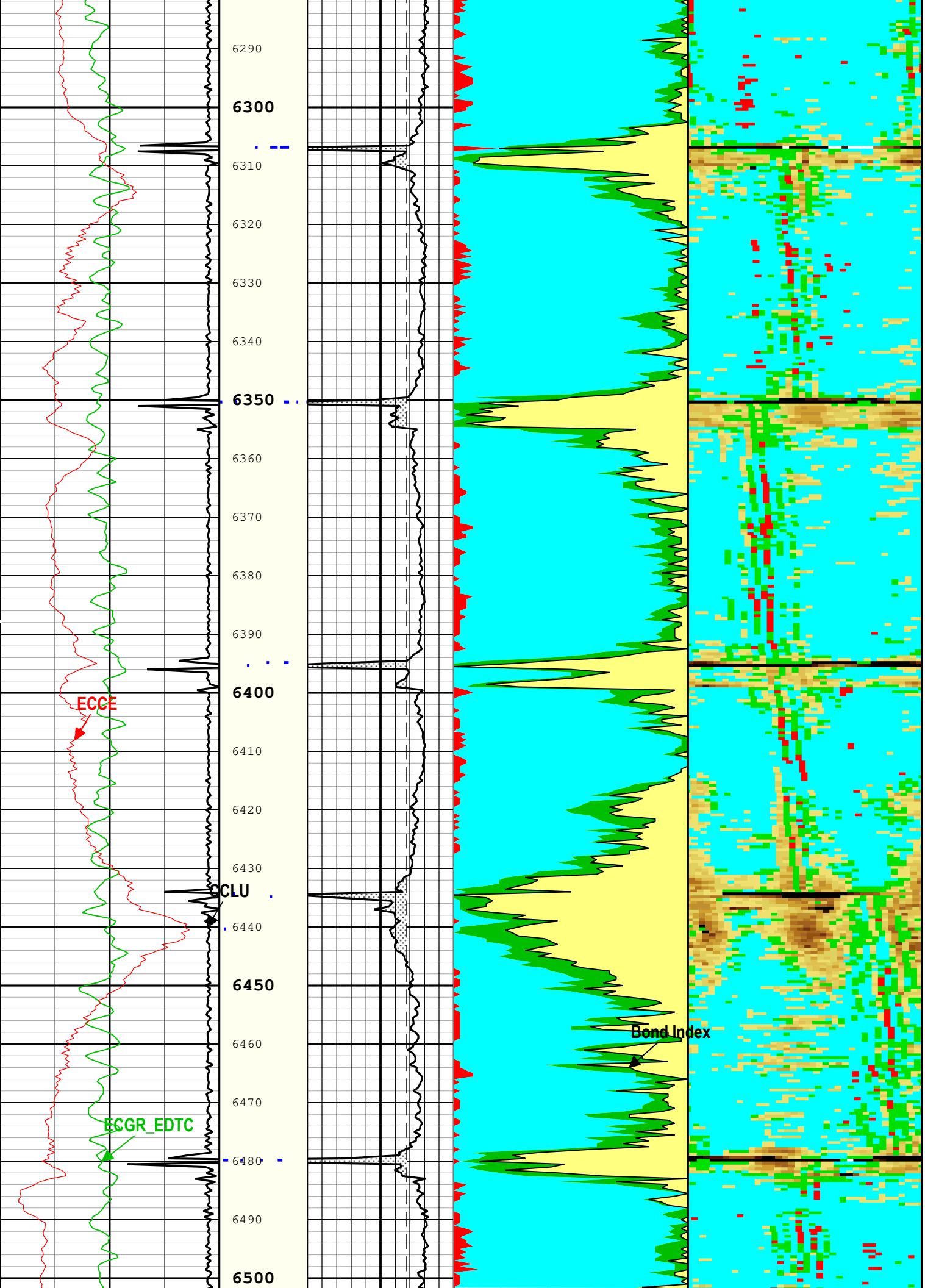
Log

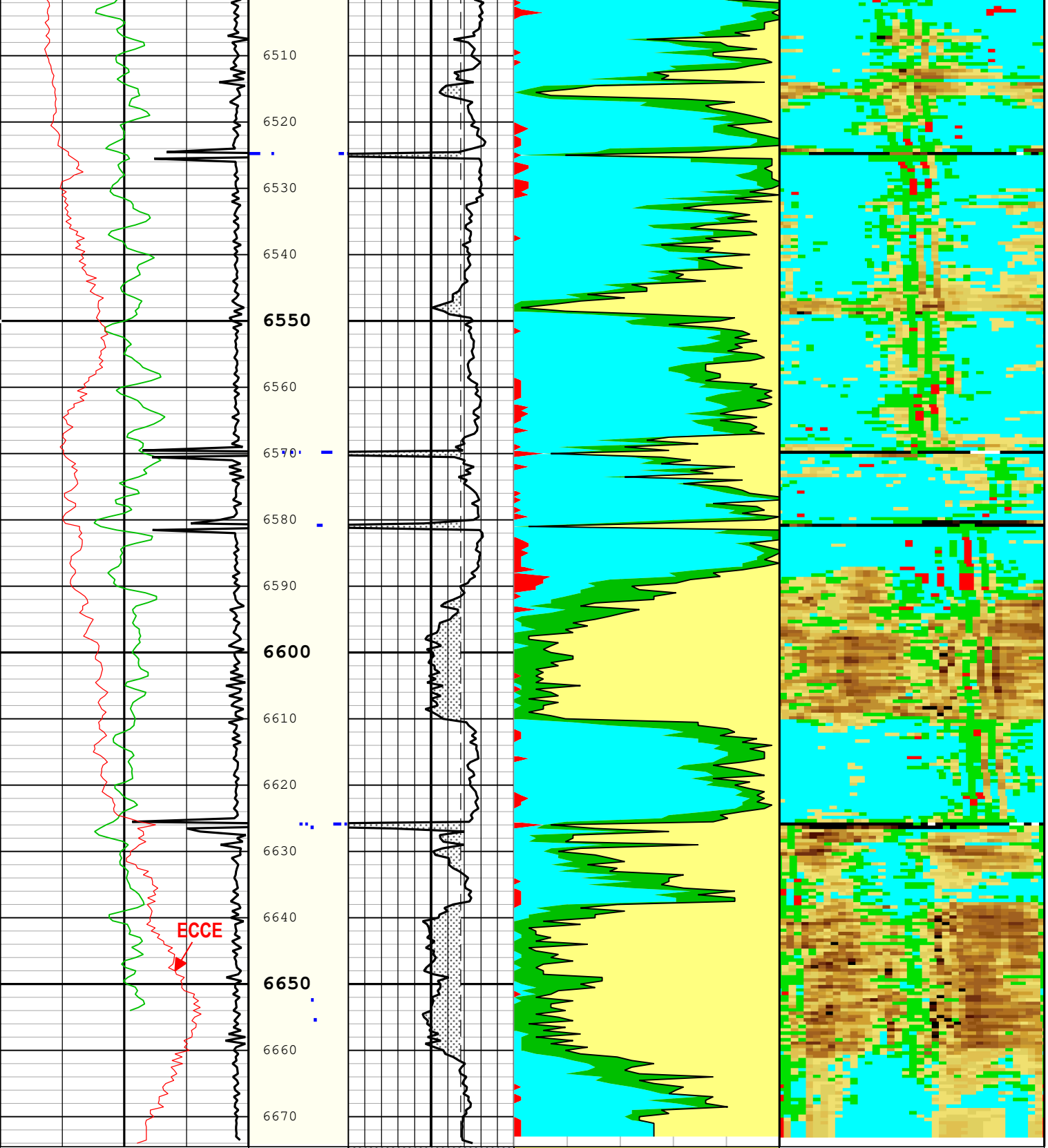
Company:Great Western Operating Company LLC Well:Postle IC 09-099HC

USI: Log[2]:Up:S006

Description: USI Cement Format: Log (USI Lvl 1) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 19-Jun-2020 04:14:16




6290
6300
6310
6320
6330
6340
6350
6360
6370
6380
6390
6400
6410
6420
6430
6440
6450
6460
6470
6480
6490
6500
ECCE
CCLU
ECGR_EDTC
Bond Index



Gamma Ray (ECGR_EDTC) EDTC-B

0 gAPI 150

Casing Collar Locator Ultrasonic (CCLU) USIT-E

-19 in 1

Amplitude of Eccentering (ECCE) USIT-E

0 in 0.5

Absent 1.500 2.500 6.500

Explicit Normalization

USIT - USIT Processing Flags (UFLG) USIT-E

Orientation: Top of Hole

U L B R U

AIAV>Cement Threshold

Acoustic Impedance Average (AIAV) USIT-E

9 Mrayl -1

Bonded

Gas

Liquid

Micro-debonding

Bond Index (100%-0%)

1 0

Absent -500.000 2.200 3.254 4.309 5.363 6.418 7.472

Custom Normalization

USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E (Mrayl)

Orientation: Top of Hole

U L B R U

TIME_1900 - Time Marked every 60.00 (s)

Description: USI Cement Format: Log (USI Lvl 1) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 19-Jun-2020 04:14:16

Channel Processing Parameters

USI: 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	18327	ft
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	8.5	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/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)	
HEMA	Hematite Presence Flag	Borehole	No	
IMAR	Image Rotation	USIT-E	RB	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.18	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.15	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0.01	Mrayl
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-E	Automatic	
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	FreePipe Norm.	
ZMUD	Acoustic Impedance of Mud	Borehole	1.75	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Tool Control Parameters

USI: 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	60	V
HRES	Horizontal Resolution	USIT-E	10 deg	
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
USFR	Ultrasonic Sampling Frequency	USIT-E	666667	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 6.0 in	
WINB	Window Begin Time	USIT-E	Time Zoned	us
WINE	Window End Time	USIT-E	71.88	us

Time Zone Parameters

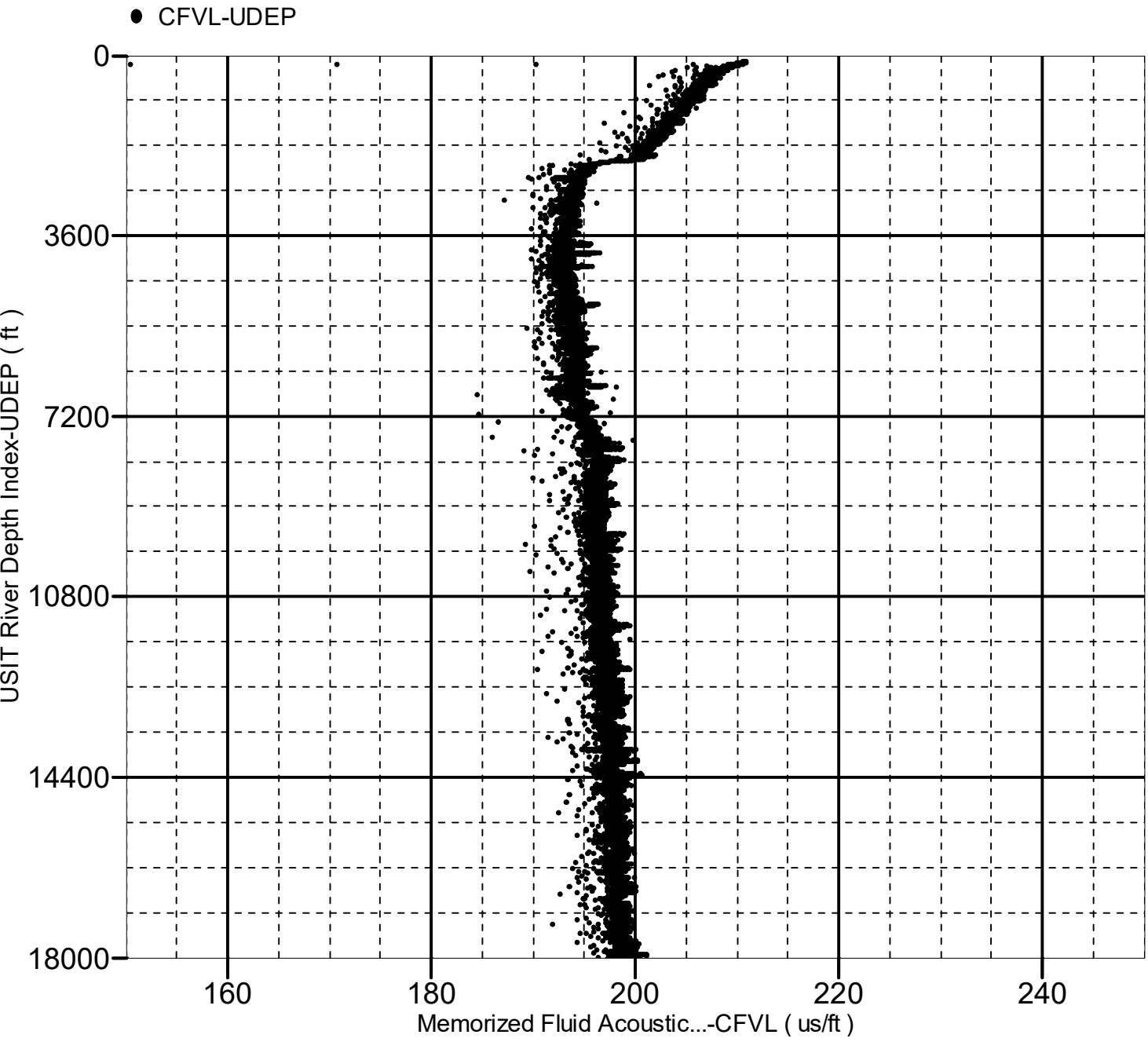
Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
WINB	31.88	18-Jun-2020 18:29:51	18-Jun-2020 18:30:32	6703.45	6624.08
WINB	28.6	18-Jun-2020 18:30:32	18-Jun-2020 18:32:57	6624.08	6259.72

All depth are at tool zero.

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 18058.00 to 93.00 ft

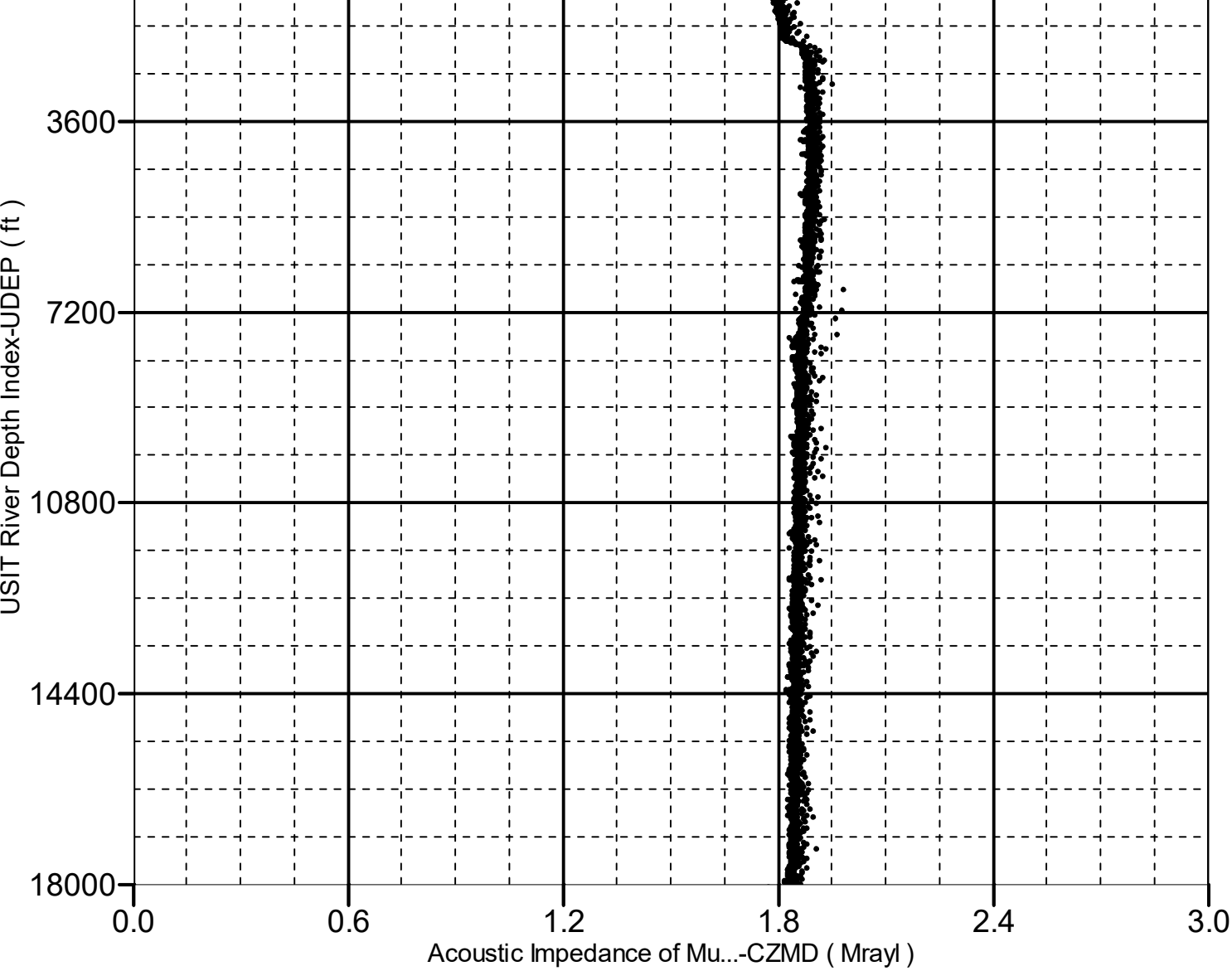


XYZ
Company:Great Western Operating Company LLC Well:Postle IC 09-099HC
USI: Log[3]:Up:S006

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 18058.00 to 93.00 ft


3600
7200
10800
14400
18000
USIT River Depth Index-UDEP (ft)
0.0
0.6
1.2
1.8
2.4
3.0
Acoustic Impedance of Mu...-CZMD (Mrayl)

Company:	Great Western Operating Company LLC
Well:	Postle IC 09-099HC
Field:	Wattenberg
County:	Weld
State:	Colorado

Schlumberger

UltraSonic Summary Print

Correlated to Deep Marker Joint