

Company: Noble Energy Inc

Well: Bison Ridge Y22-749

Field: Wattenberg

County: Weld Country: US

UltraSonic Summary Print

County:	Weld				
Field:	Wattenberg				
Location:	SHL: NWSE Sec. 10, T2N, R64W				
Well:	Bison Ridge Y22-749				
Company:	Noble Energy Inc				
		SHL: NWSE Sec. 10, T2N, R64W			
		2640' FSL & 2565' FEL			
		Lat: 40.15182 / Long: -104.53573			
		Permanent Datum:	Ground Level	Elev.:	K.B. 4955.00 ft
		Log Measured From:	Kelly Bushing	30.00 ft	G.L. 4925.00 ft
		Drilling Measured From:	Kelly Bushing		D.F. 4955.00 ft
		API Serial No.	Max.Hole Deviation	Longitude:	Latitude:
		05-123-45379	0 deg	-104.53573 degrees	40.151820 degrees

Logging Date	24-Jan-2018		
Run Number	One		
Depth Driller	17034.00 ft		
Schlumberger Depth	17034.00 ft		
Bottom Log Interval	6100.00 ft		
Top Log Interval	60.00 ft		
Casing Fluid Type	Water		
Salinity			
Density	10 lbm/gal		
Fluid Level	8.00 ft		
BIT/CASING/TUBING STRING			
Bit Size	8.50 in		
From	2070.00 ft		
To	17034.00 ft		
Casing/Tubing Size	5.5 in		
Weight	20 lbm/ft		
Grade	N/A		
From	0.00 ft		
To	17024.20 ft		
Max Recorded Temperatures			
Logger on Bottom	Time		
Unit Number	Location:		
Recorded By			
Witnessed By			

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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12.1 Integration Summary

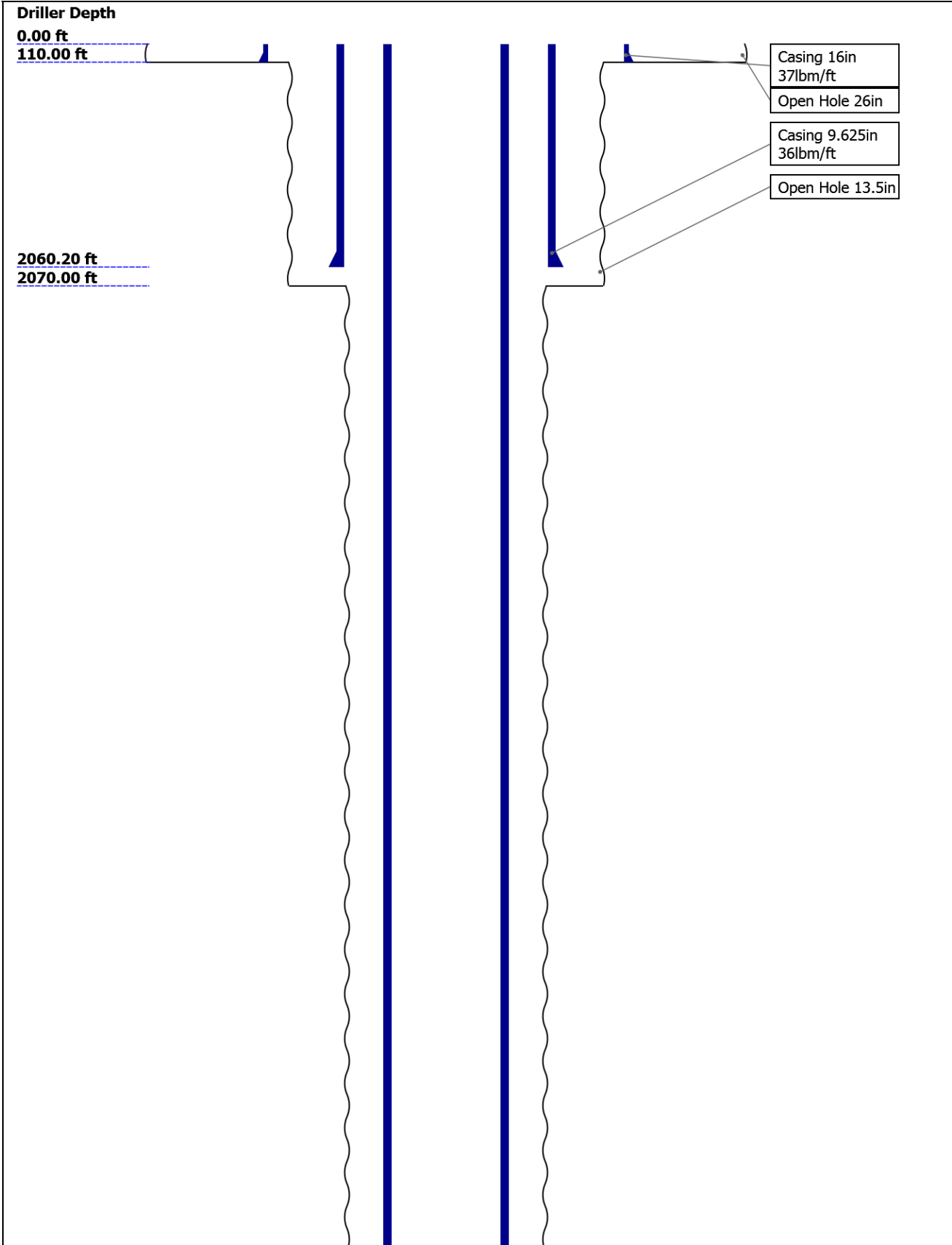
12.2 Software Version

12.3 Composite Summary

12.4 Log (DJ Basin Ultrasonic Cement Summary Report)

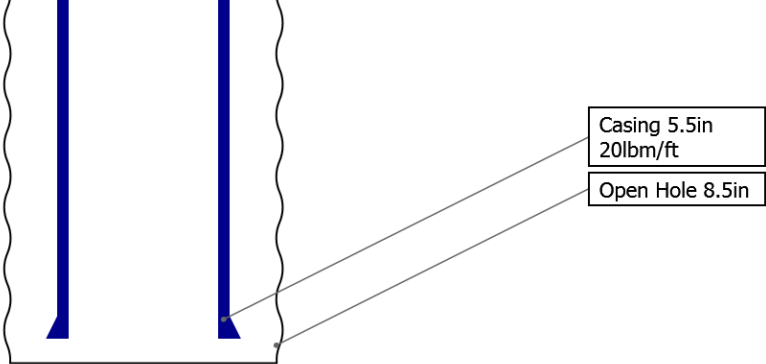
12.5 Parameter Listing

Well Sketch



17024.20 ft

17034.00 ft



Borehole Size/Casing/Tubing Record


Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	0	110	2070			
Top Logger (ft)	0	110	2070			
Bottom Driller (ft)	110	2070	17034			
Bottom Logger (ft)	110	2070	17034			
Casing						
Size (in)	16	9.625	5.5			
Weight (lbm/ft)	37	36	20			
Inner Diameter (in)	15.571	8.921	4.778			
Grade	N/A	N/A	N/A			
Top Driller (ft)	0	0	0			
Top Logger (ft)	0	0	0			
Bottom Driller (ft)	110	2060.2	17024.2			
Bottom Logger (ft)	110	2060.2	17024.2			

Operational Run Summary

Parameter (unit)	One					
Date Log Started	24-Jan-2018					
Time Log Started	12:42:24					
Date Log Finished	24-Jan-2018					
Time Log Finished	14:11:38					
Top Log Interval (ft)	60.00					
Bottom Log Interval (ft)	6100.00					
Total Depth (ft)						
Max Hole Deviation (deg)	0.00					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	8.500					
Logging Unit Number	9108					
Logging Unit Location	Fort Morgan, CO					
Recorded By	Benjamin Marmon					

Witnessed By	Bill Mansfield					
Service Order Number	DX2A-00006					
Borehole Fluids						
Parameter(unit)	One					
Fluid Type	Water					
Max Recorded Temperatures (degF)	181					
Source of Sample	Active Tank					
Salinity (ppm)	0					
Density (lbm/gal)	10					
Funnel Viscosity (s)	26					
Fluid Loss (cm3)						
PH						
Date/Time Circulation Stopped	NaN					
Date Logger on Bottom	24-Jan-2018					
Time Logger on Bottom	13:04:00					
Source RMF						
RMC	Pressed					
RM @ Meas Temp (ohm.m@degF)	0.2 @ 68					
RMF @ Meas Temp (ohm.m@degF)	0.15 @ 68					
RMC @ Meas Temp (ohm.m@degF)						
RM @ BHT (ohm.m@degF)	0.07 @ 212					
RMF @ BHT (ohm.m@degF)	0.05 @ 212					
RMC @ BHT (ohm.m@degF)	NaN @ 212					
Total Solid (%)						
High Gravity Solids (%)						

Remarks and Equipment Summary

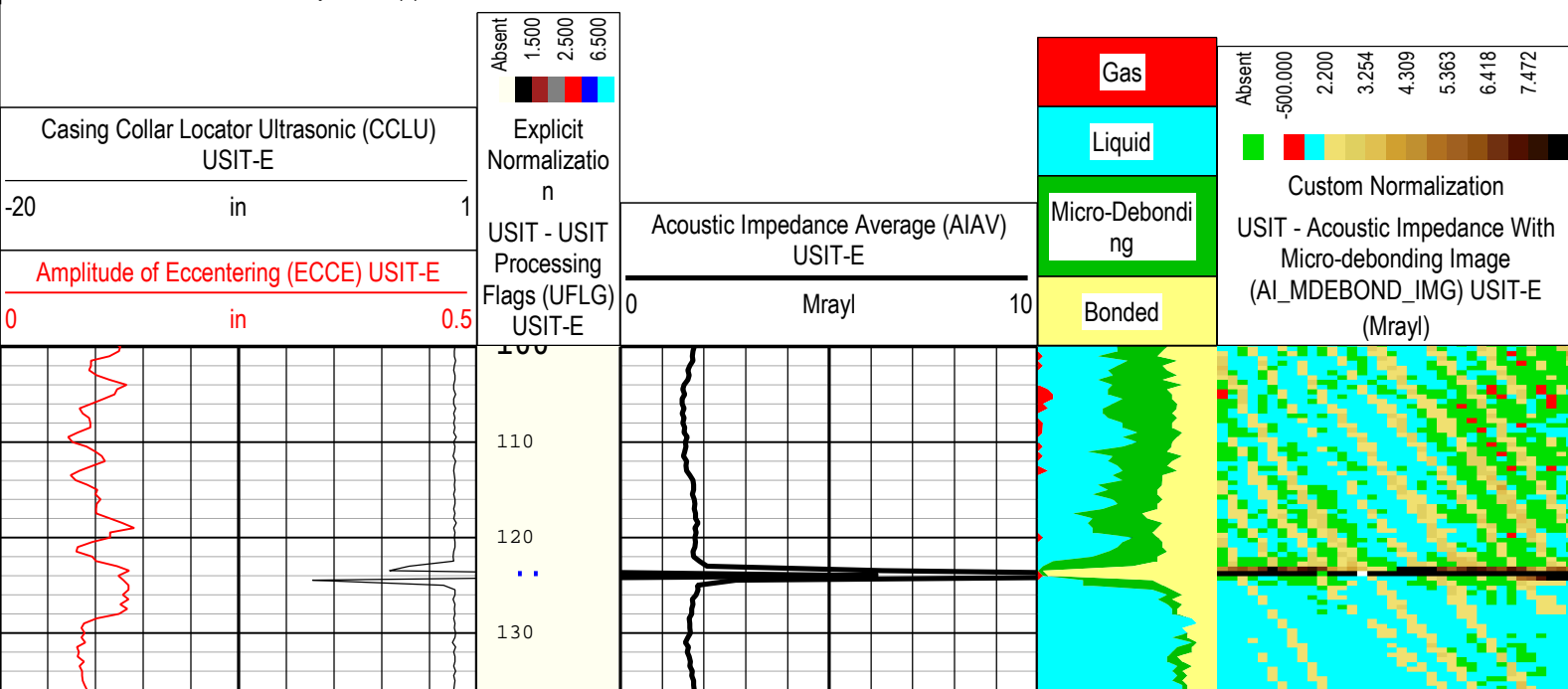
One: Toolstring				One: Remarks	
Equip name LEH-QT:2 353 LEH-QT:23 53	Length 33.83		MP name	Offset	This is the first log in the well.
					Toolstring ran as per tool sketch
					Log up correlated to log down.
SAH-F:18 17	30.91				Main pass recorded at 2500 PSI.
					Repeat pass recorded at 0 PSI.
EDTC-B:8 424 EDTH-B:84 32 EDTG-A:7 7303 EDTC-B:84 24	26.06		CTEM ACCZ HV Gamma Ray TelStatu s	22.56 0.00 0.00 20.69 19.56	
AH-184[2]	19.56				
AH-184[1]	17.56				

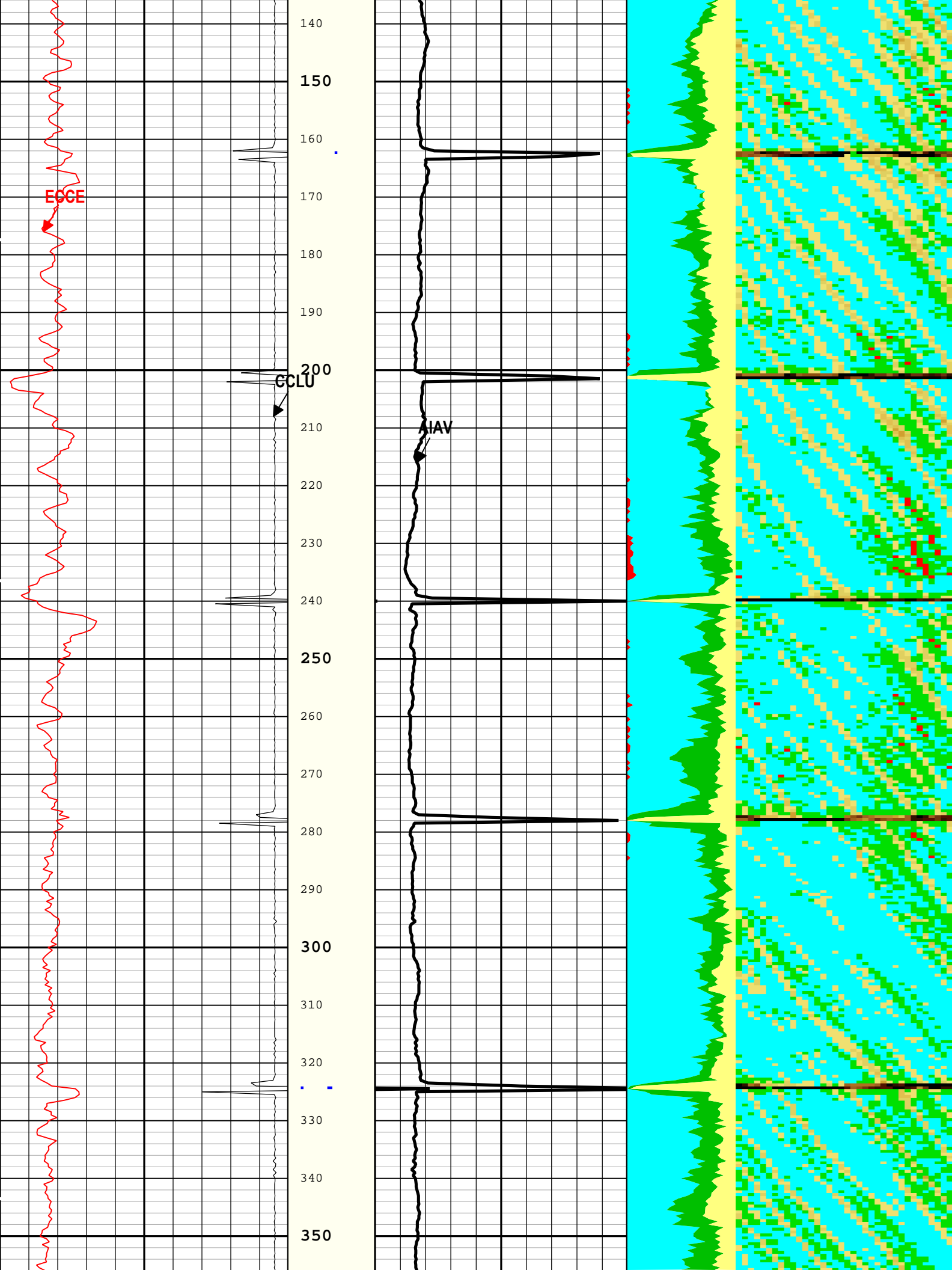
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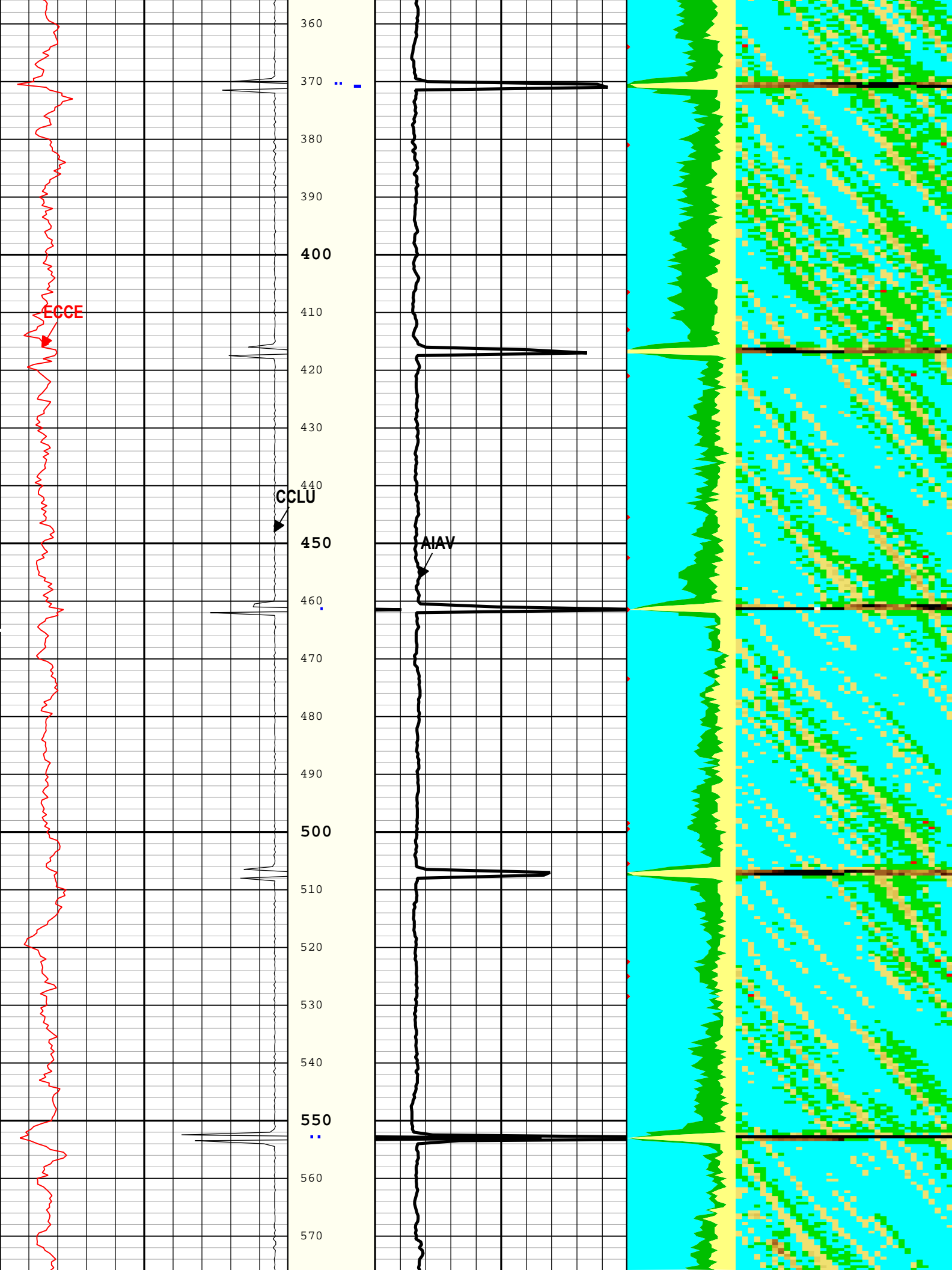
Depth Summary			
	One		
Depth Measuring Device			
Type	IDW-B		
Serial Number	993		
Calibration Date	28-Sep-2017		
Calibrator Serial Number	57		
Calibration Cable Type	7-39 AIXXS		
Wheel Correction 1	-4		
Wheel Correction 2	0		
Tension Device			
Type	CMTD-B/A		
Serial Number	171		
Calibration Date	22-Jan-2018		
Calibrator Serial Number	78796A		
Number of Calibration Points	10		
Calibration Root Mean Square Error	42		
Calibration Peak Error	78		
Logging Cable			
Type	7-39AI-XXS		
Serial Number	F714037		
Length	24000.00 ft		
Conveyance Type	Wireline		
Rig Type	Crane		
One:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well	All Schlumberger depth control procedures followed during logging operations.	

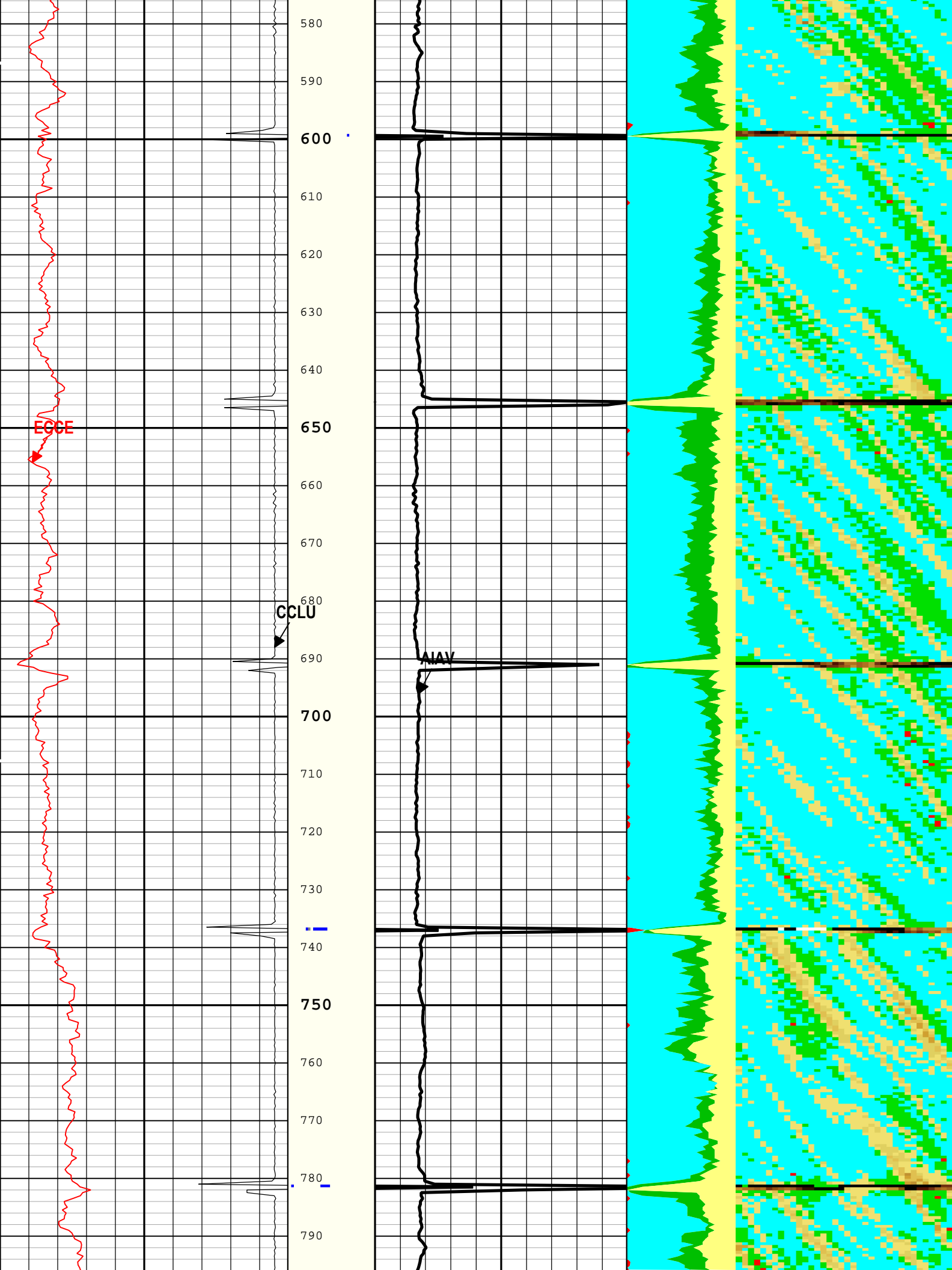
IDW used as primary depth control device.

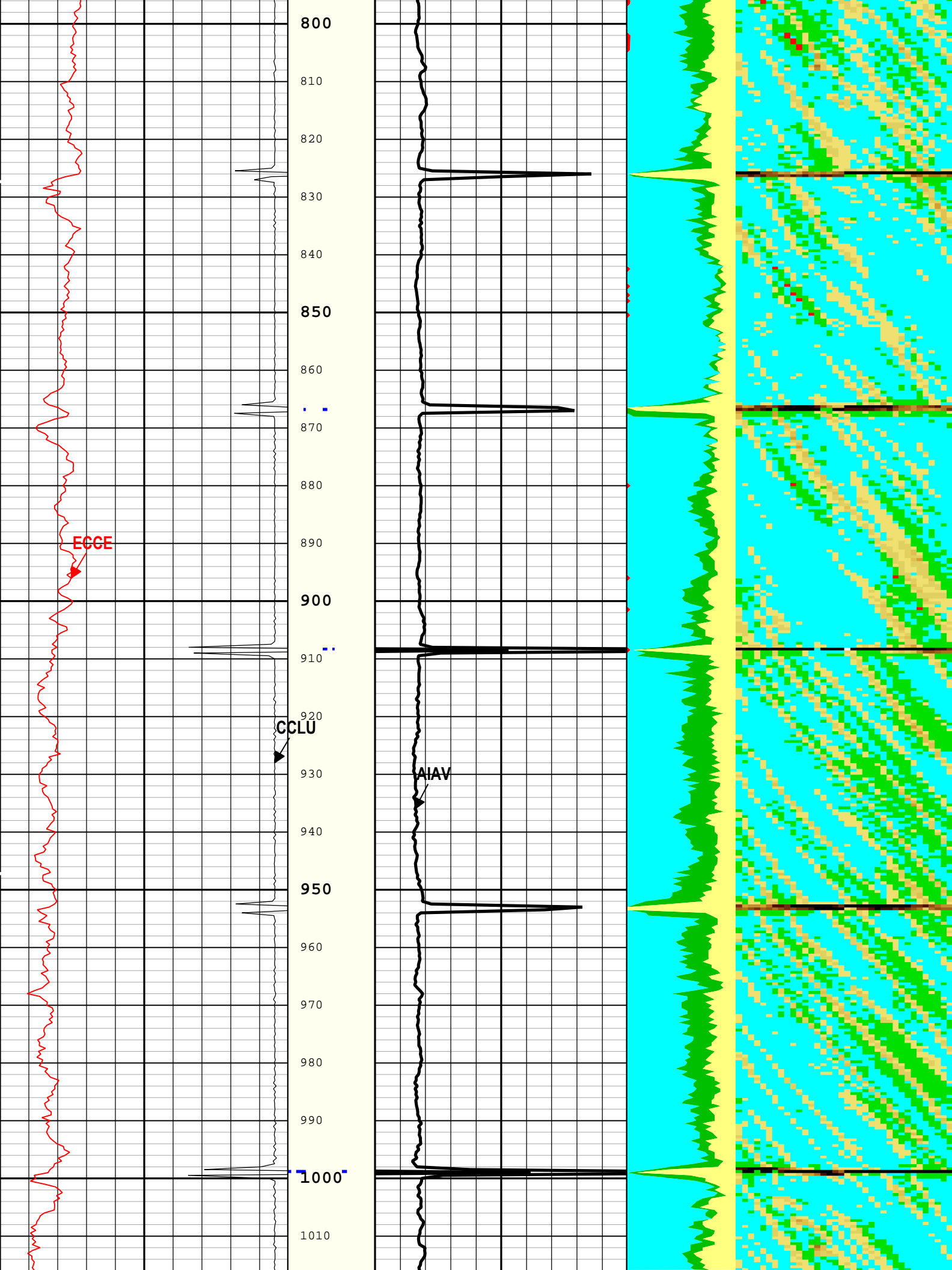
ZChart used as secondary depth control device.

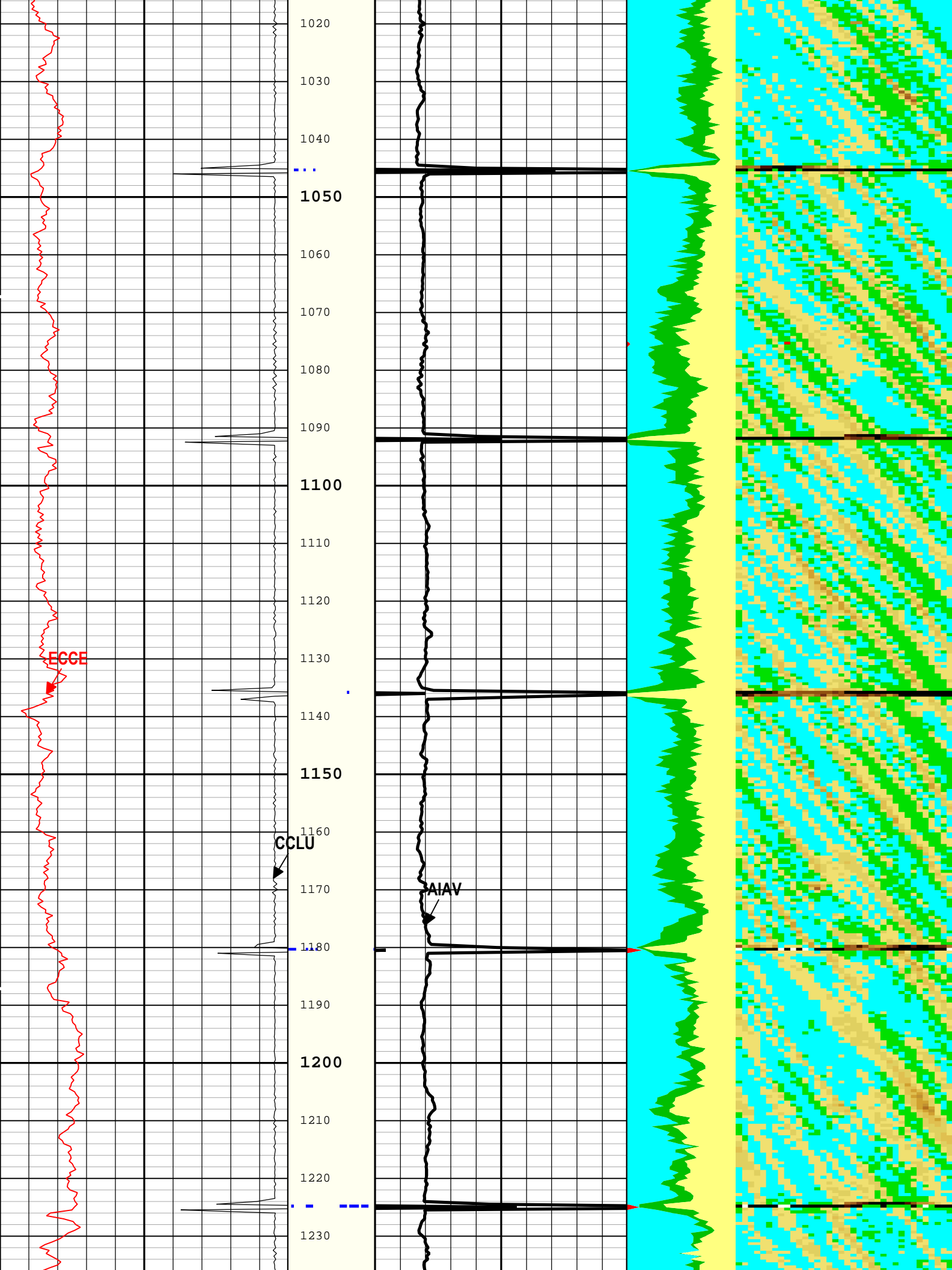


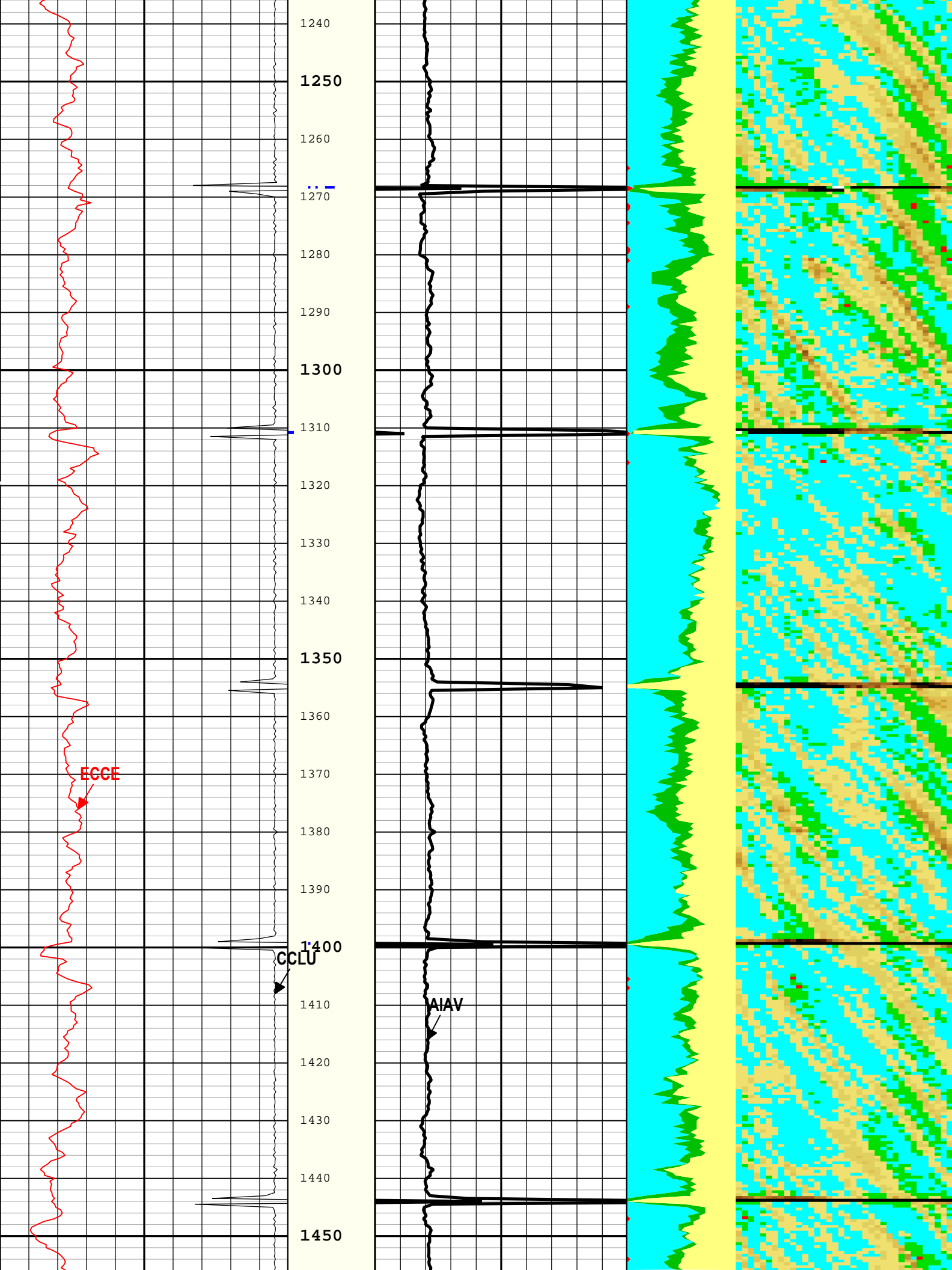


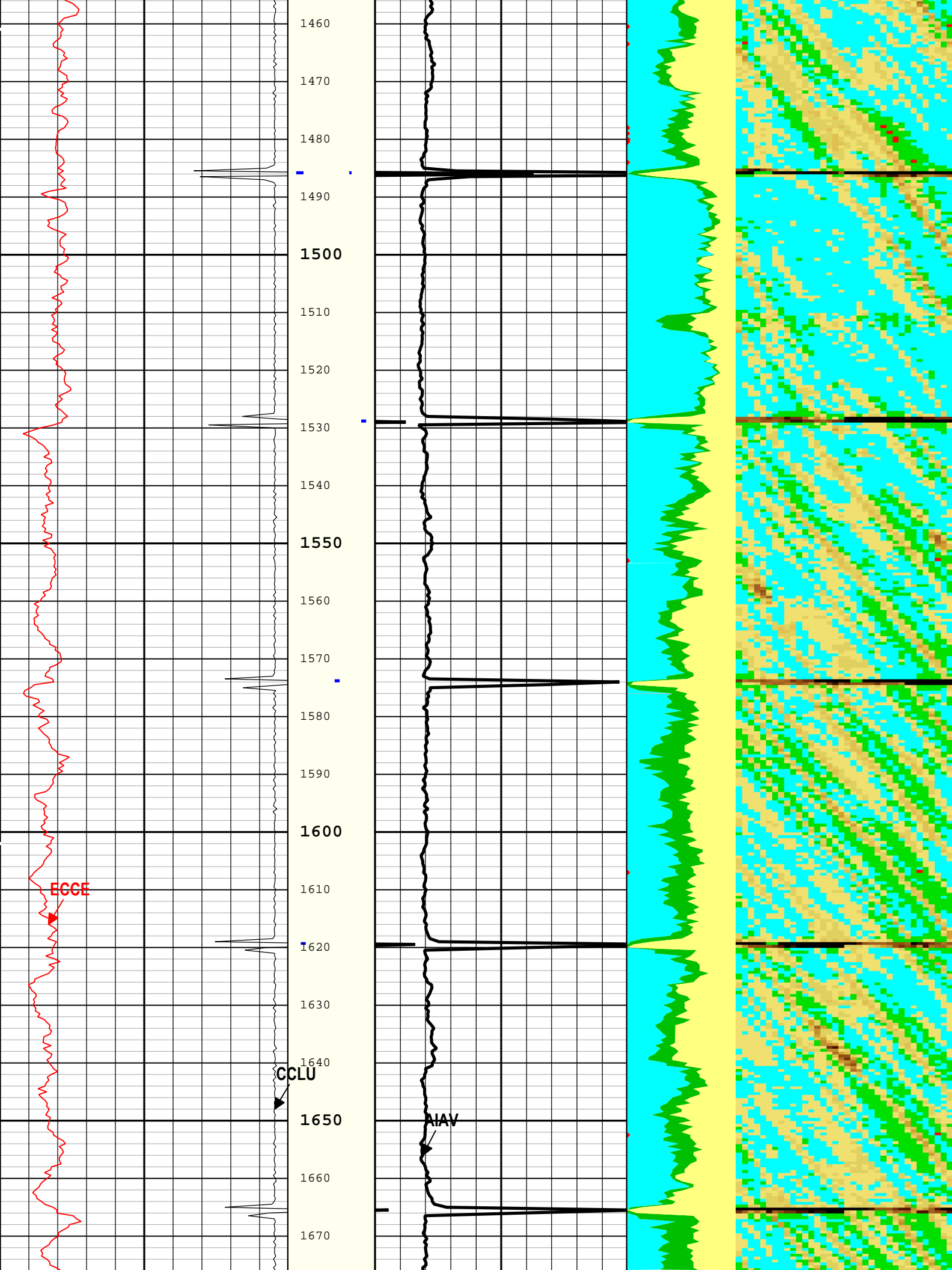


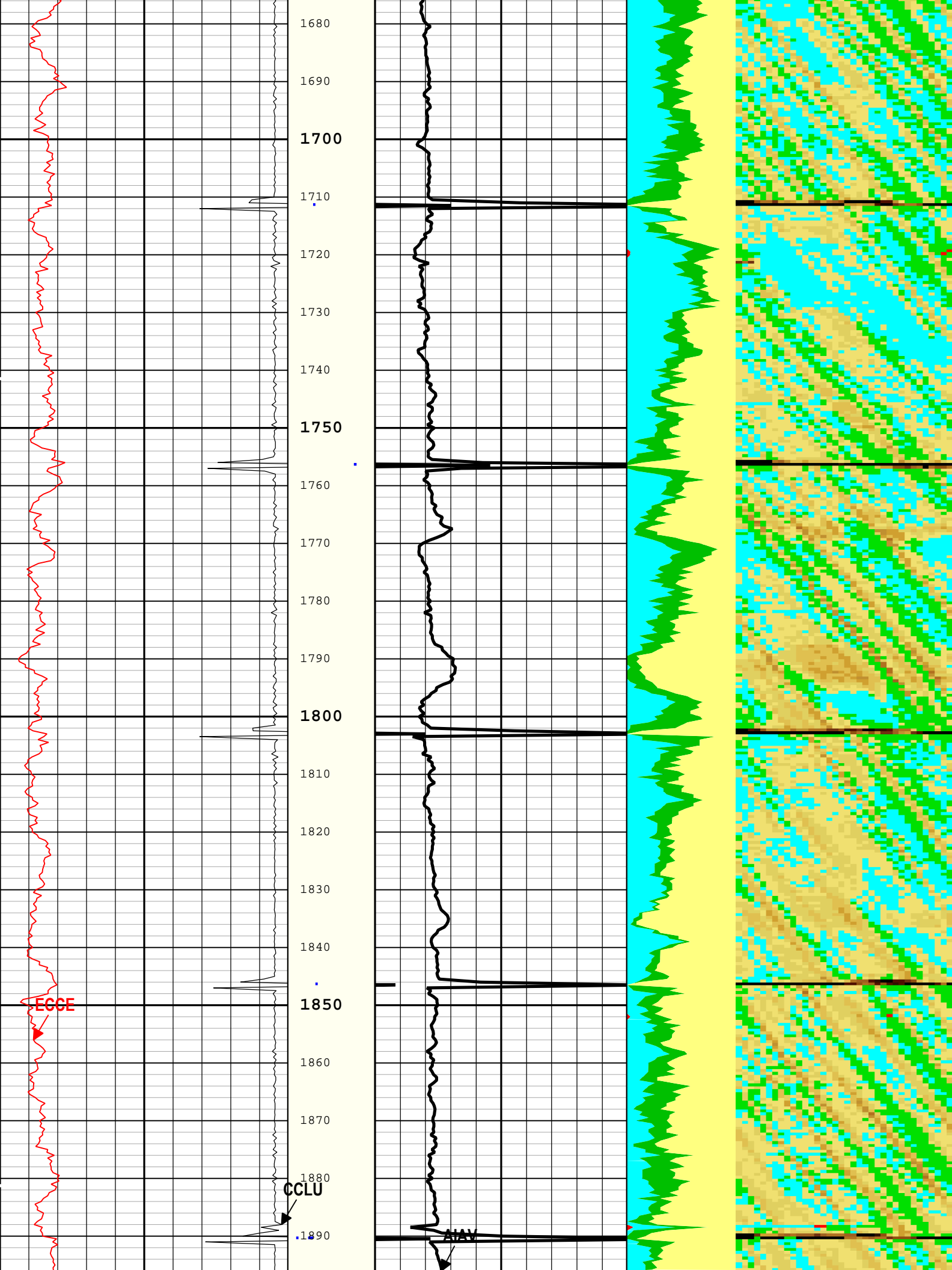


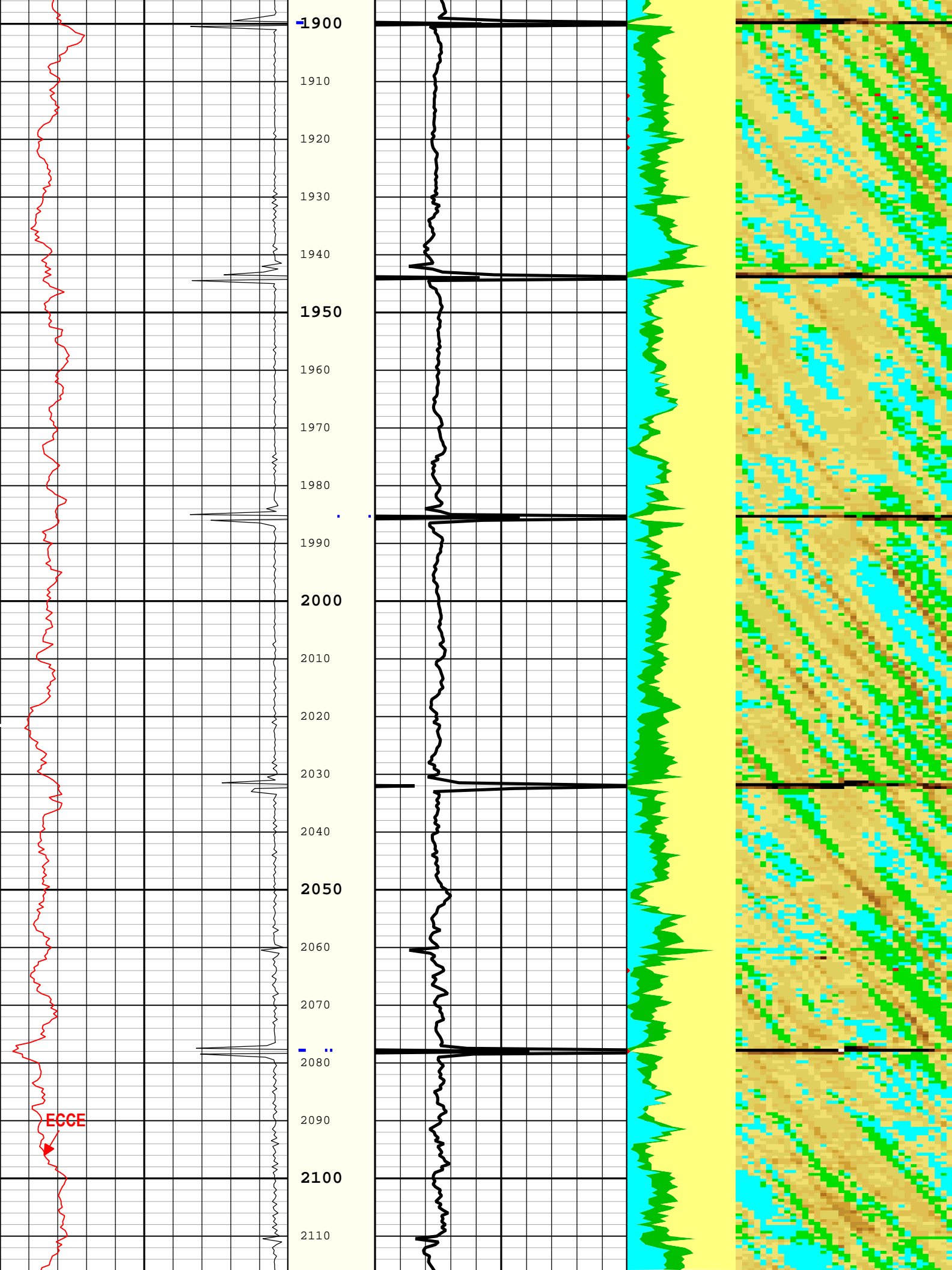


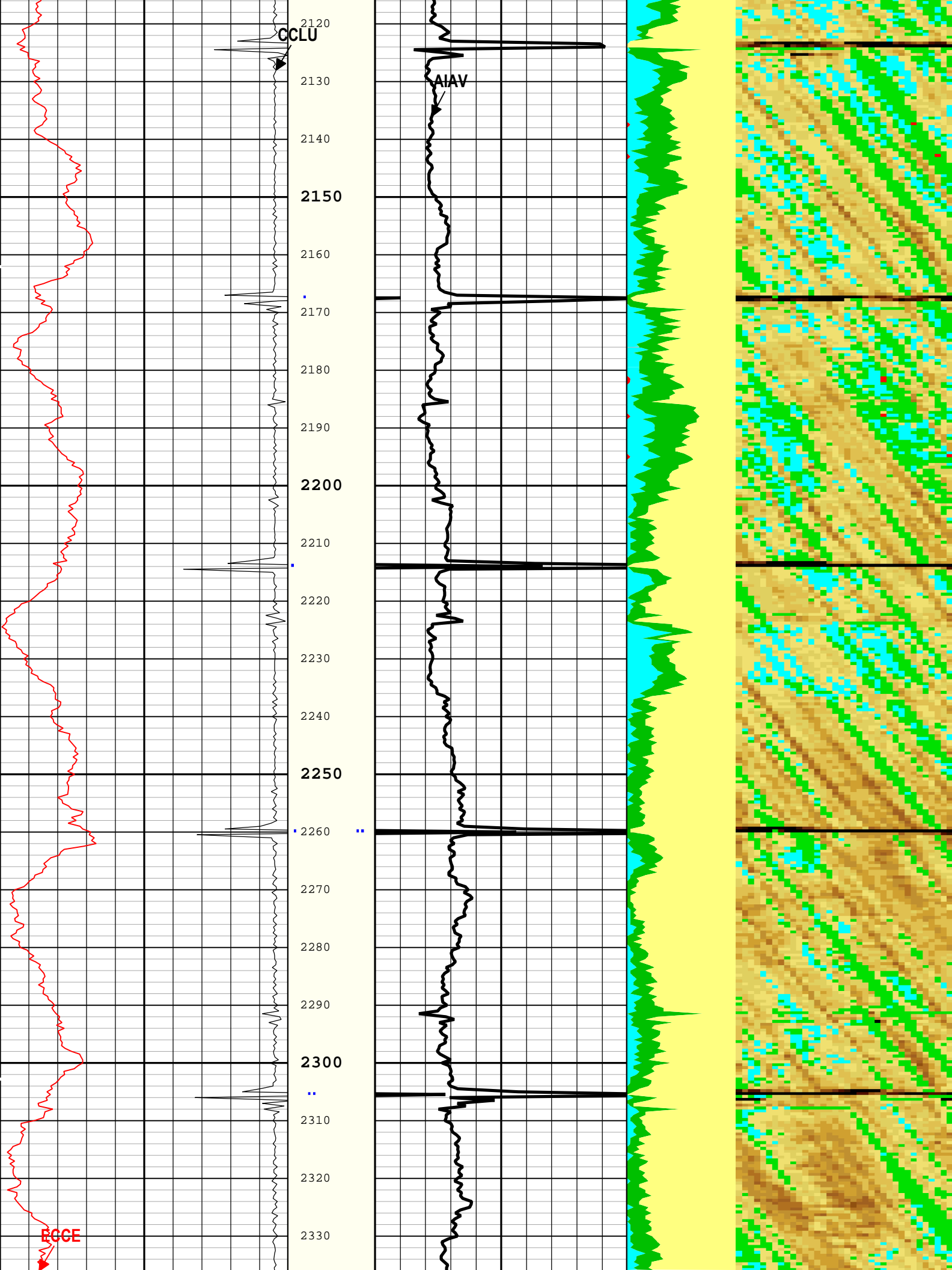


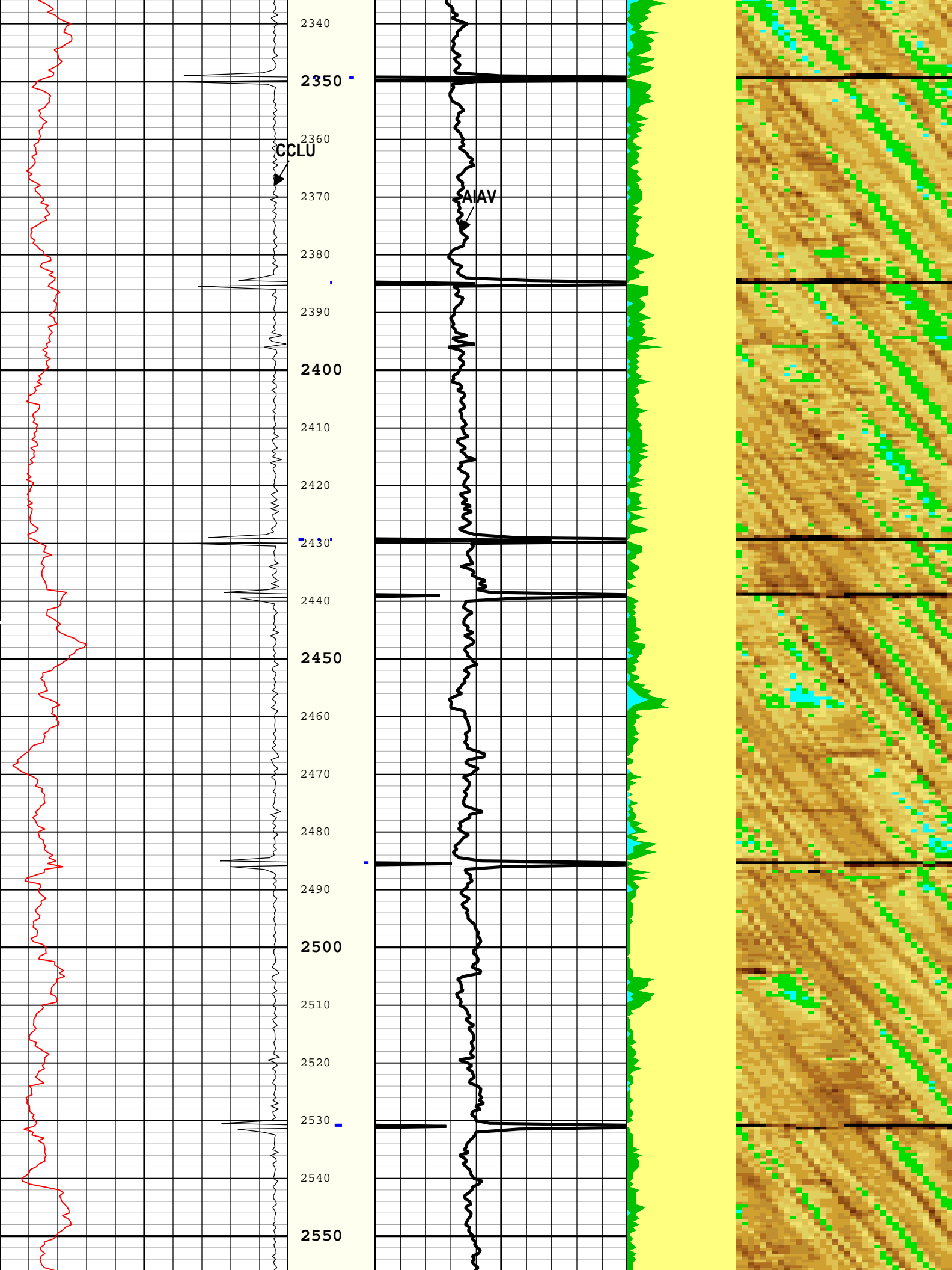


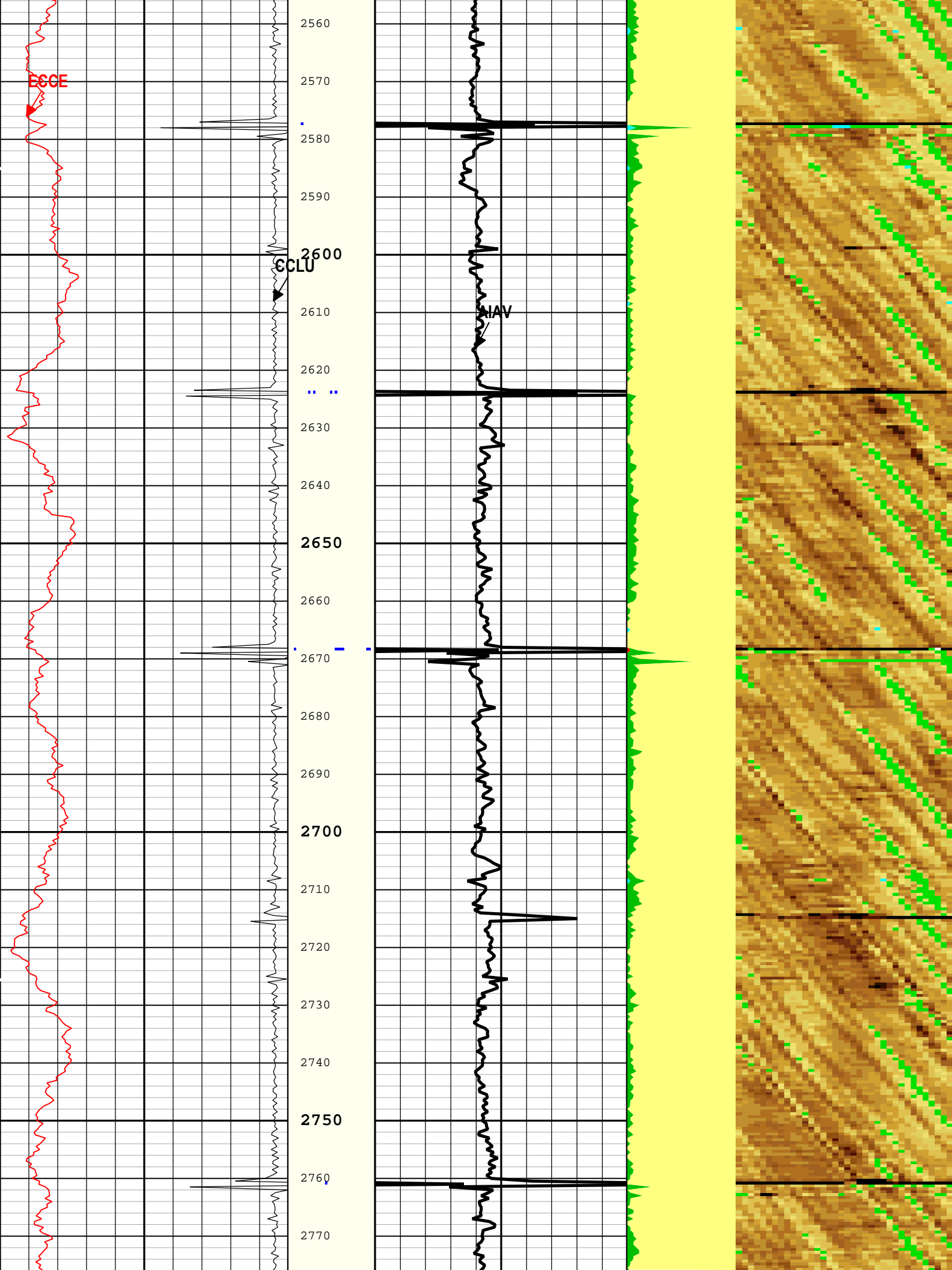


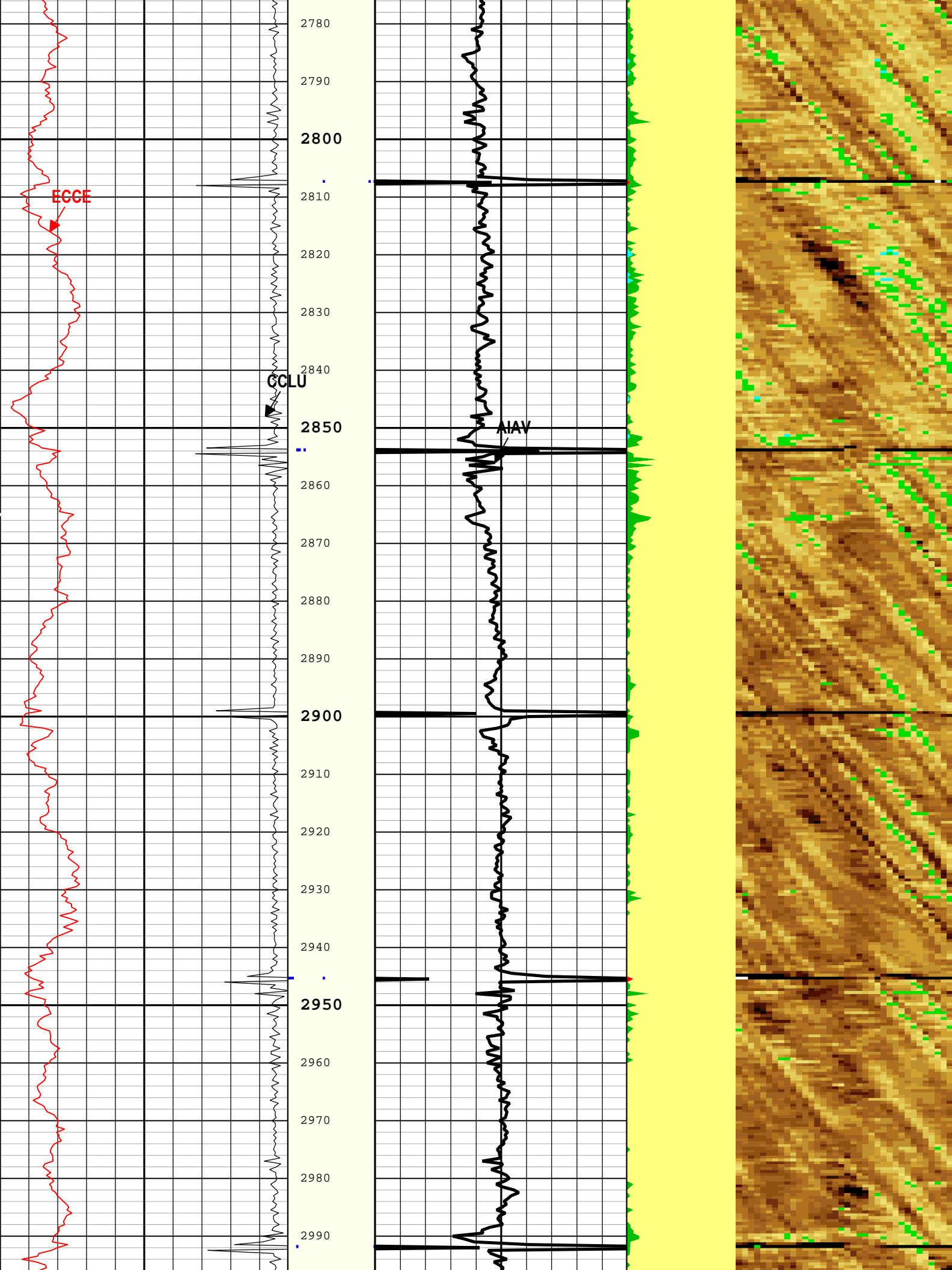


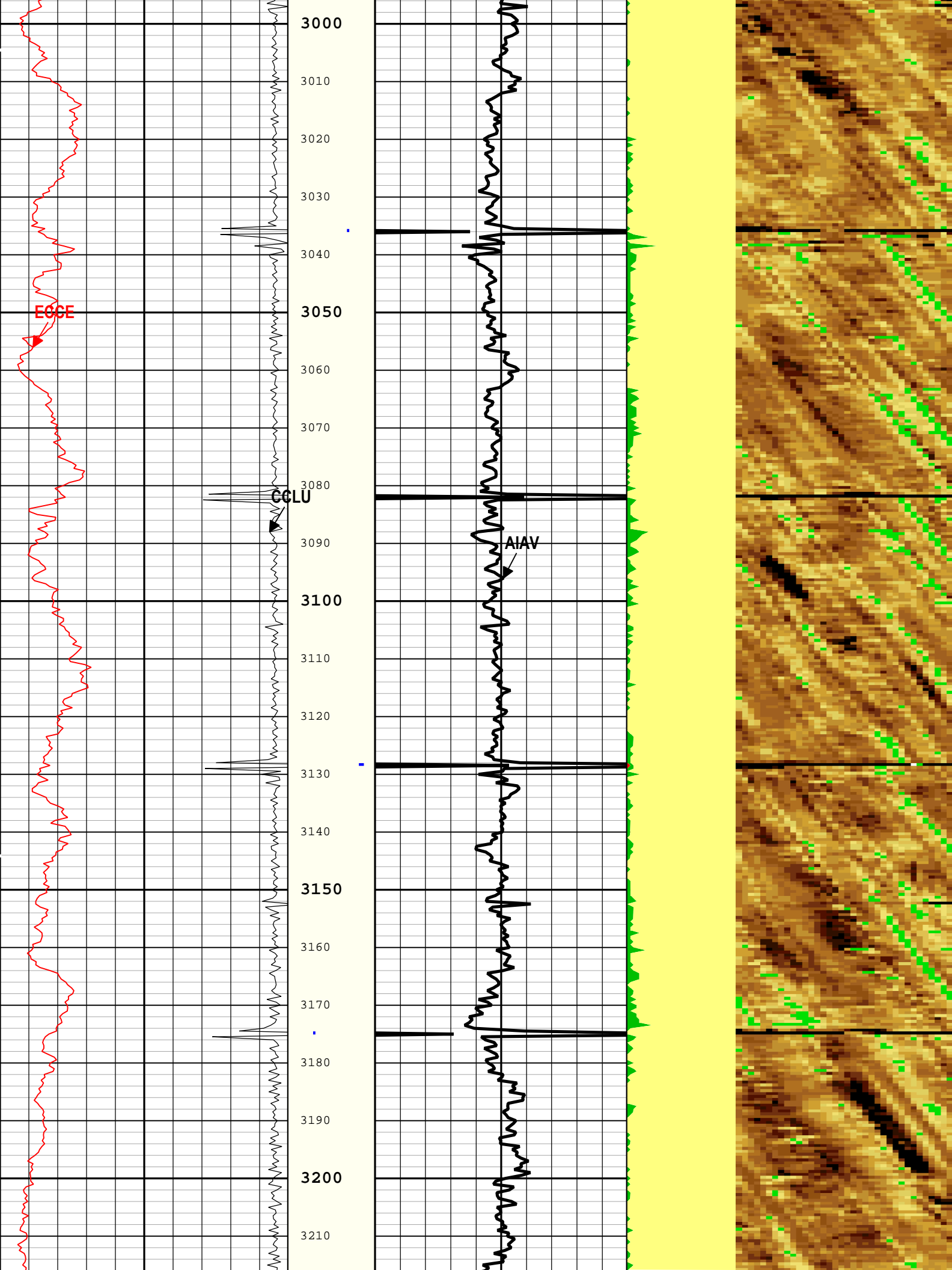


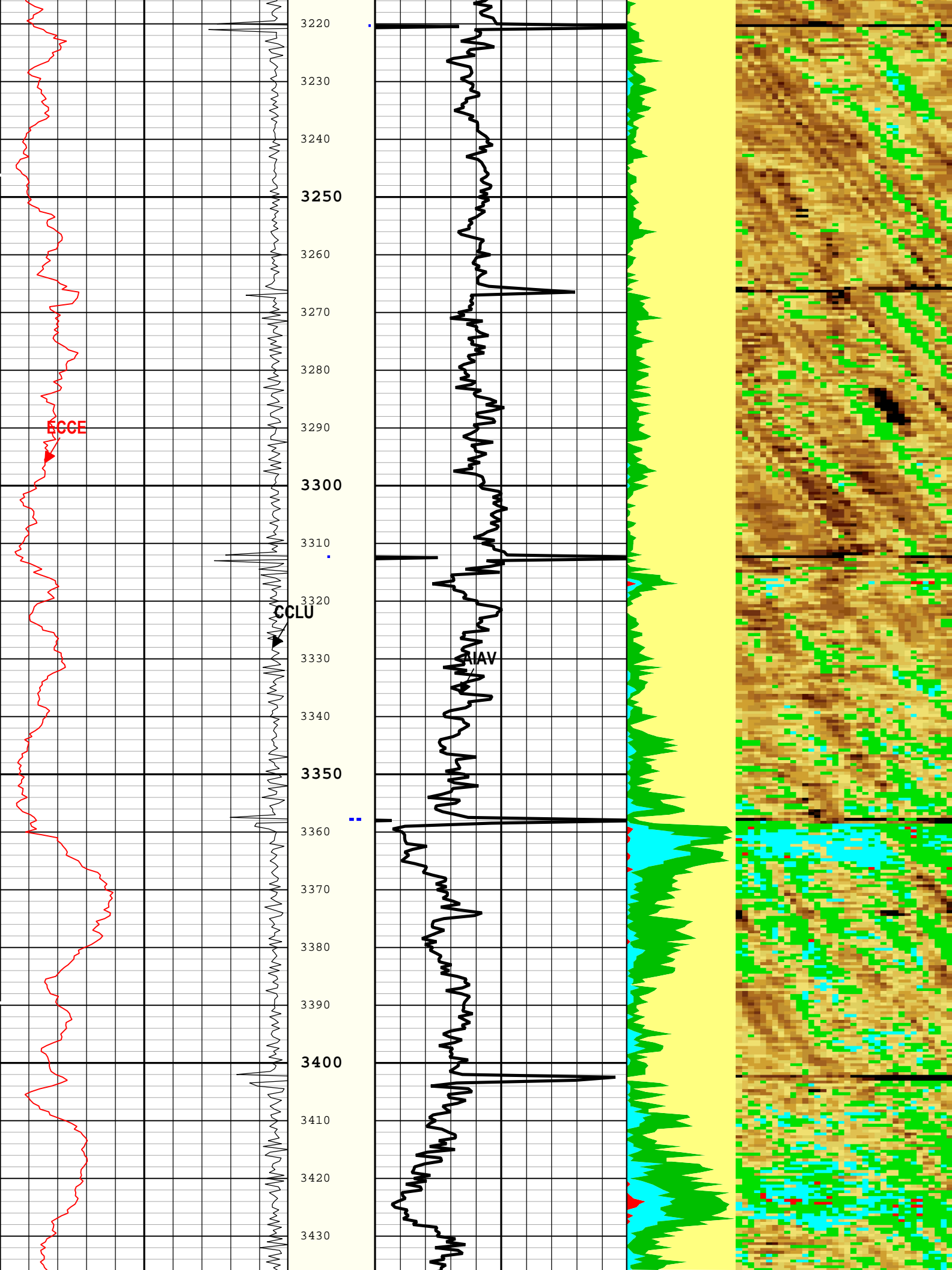


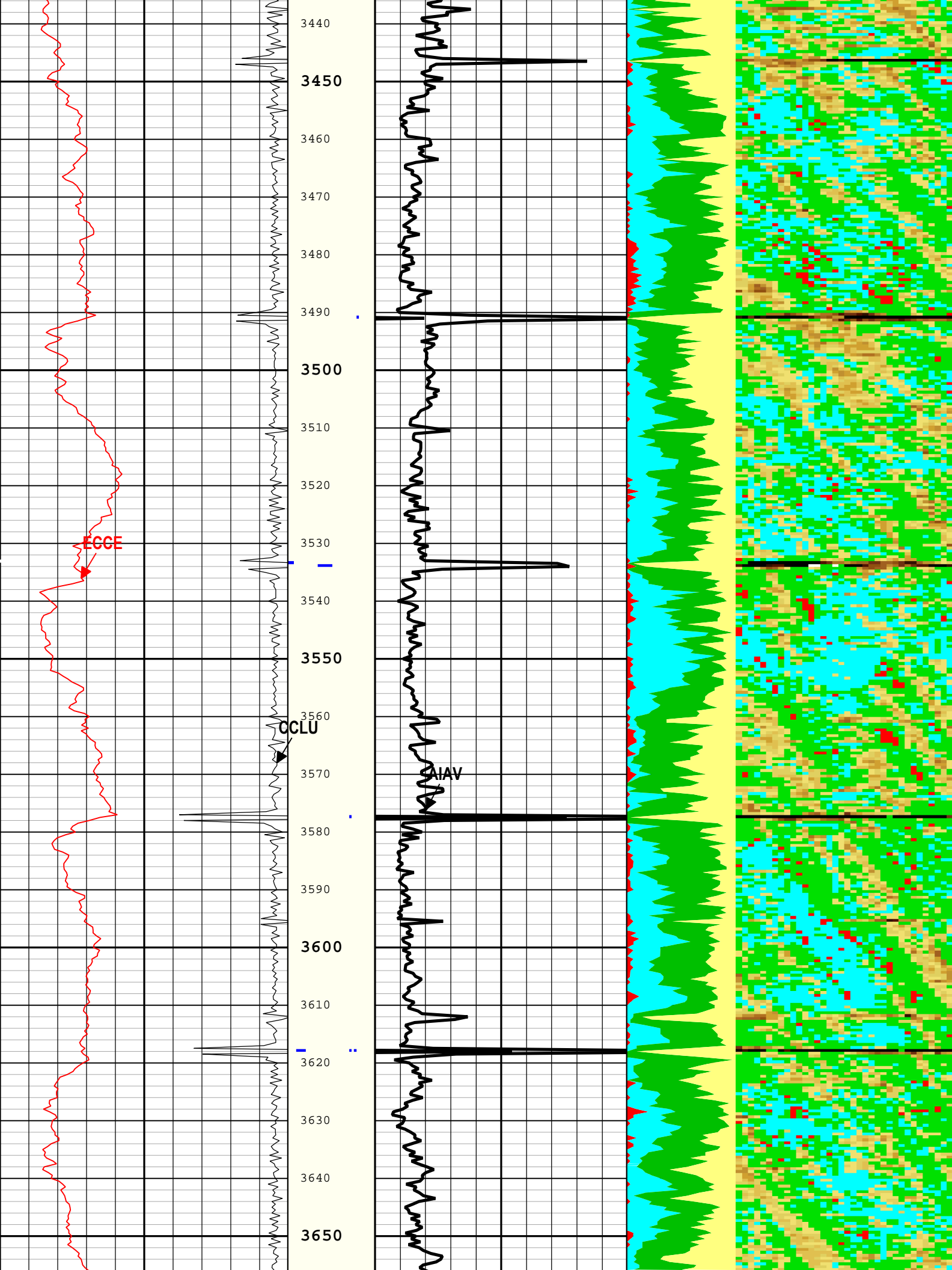


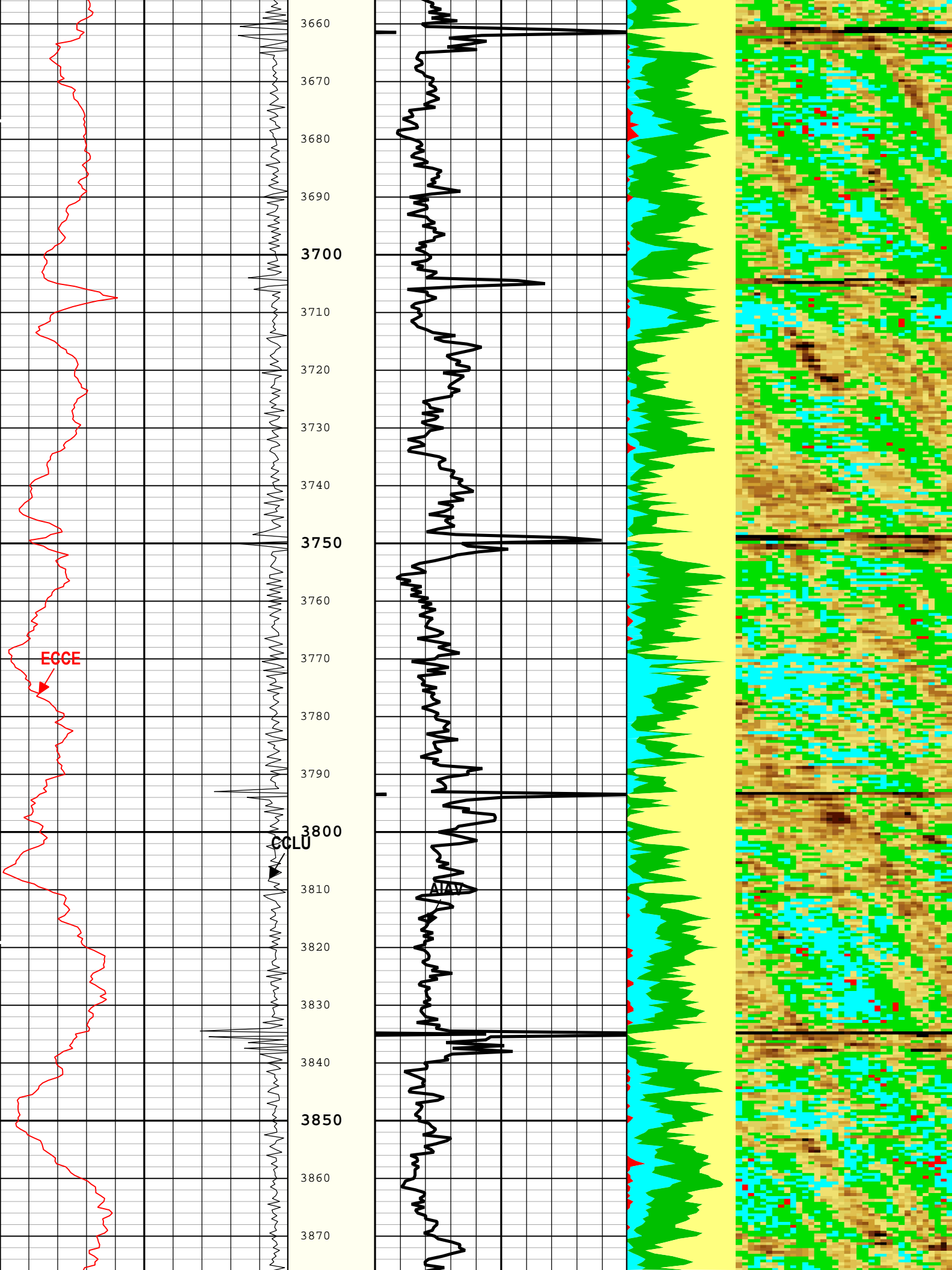


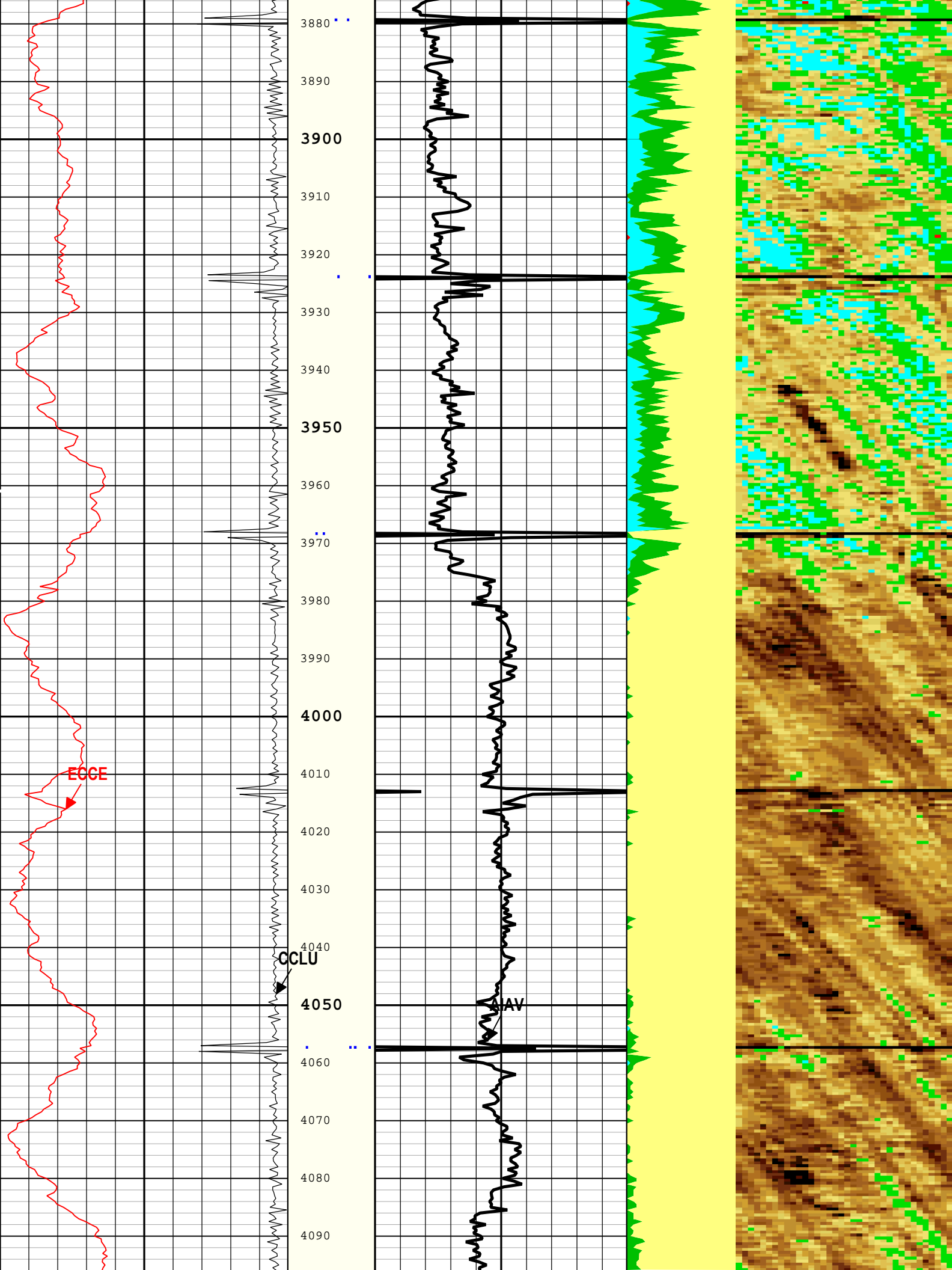


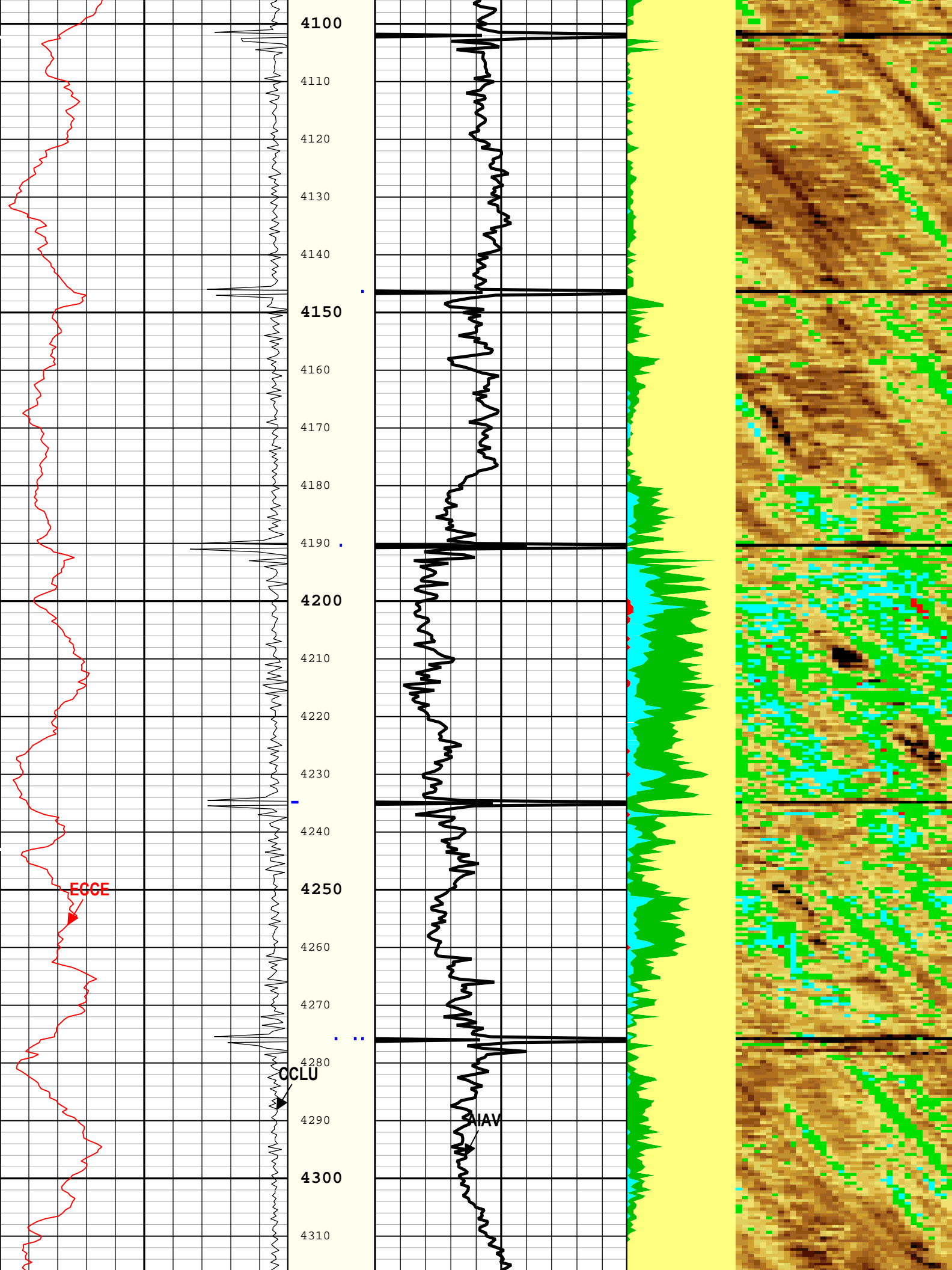


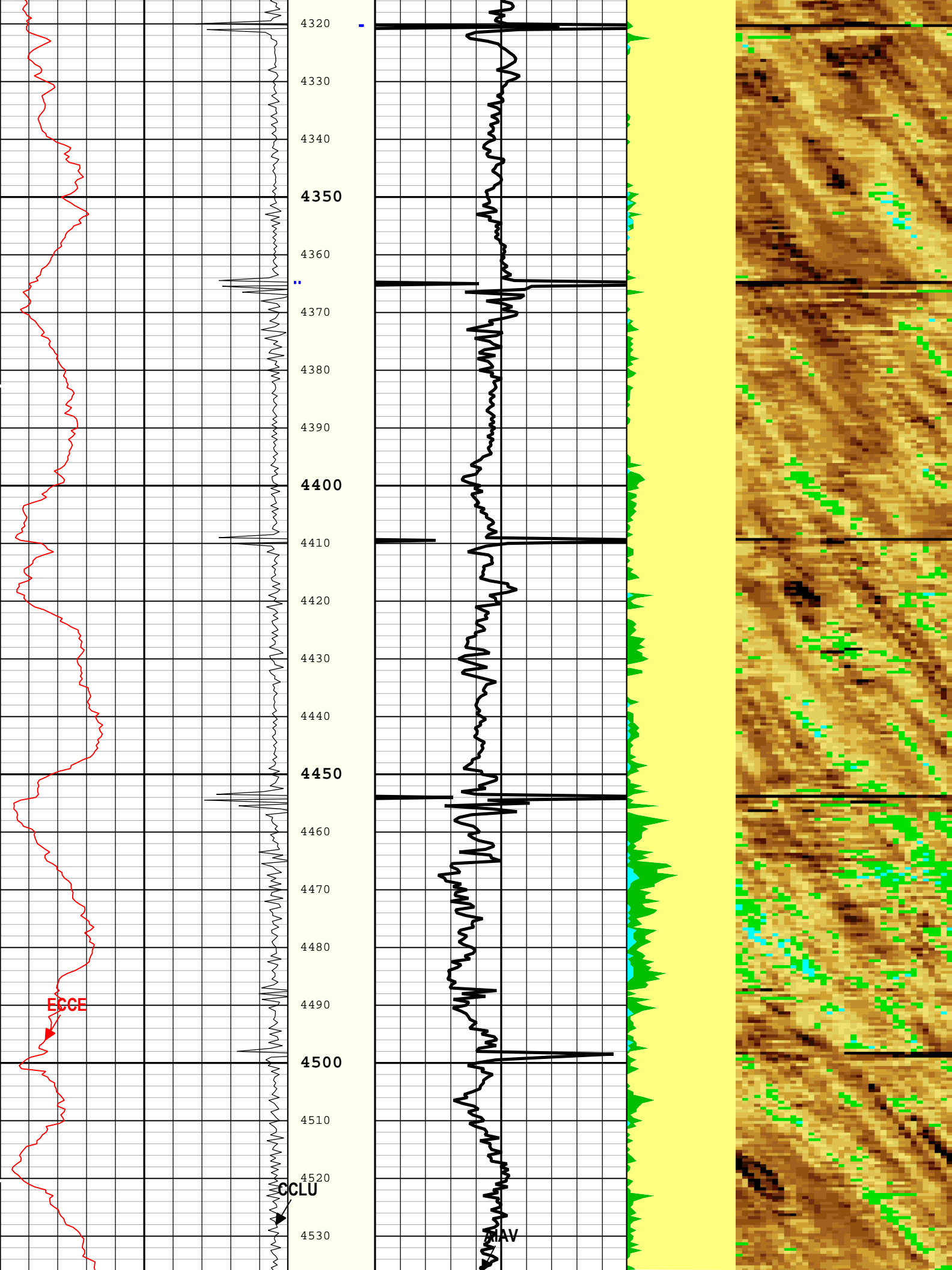


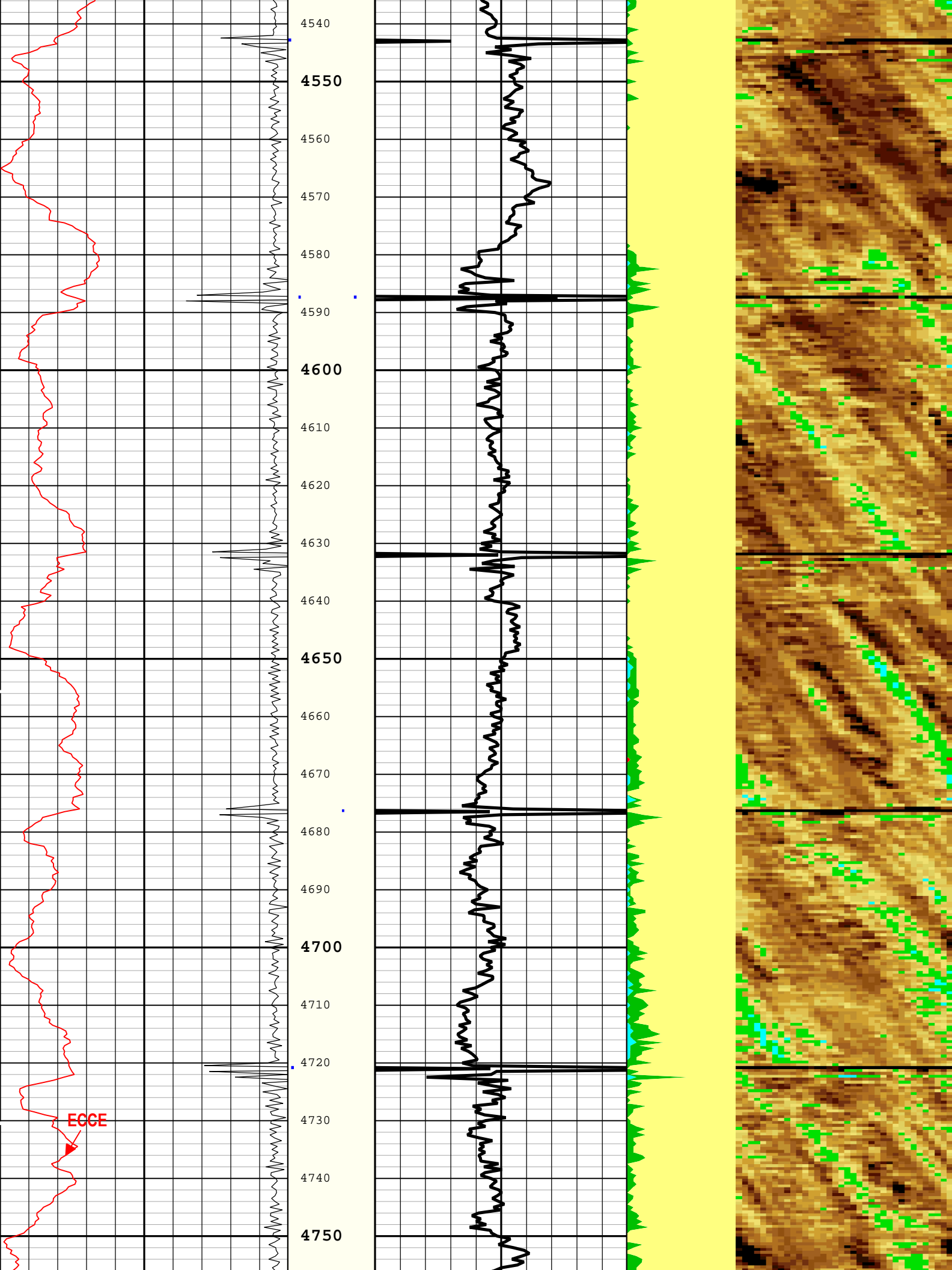


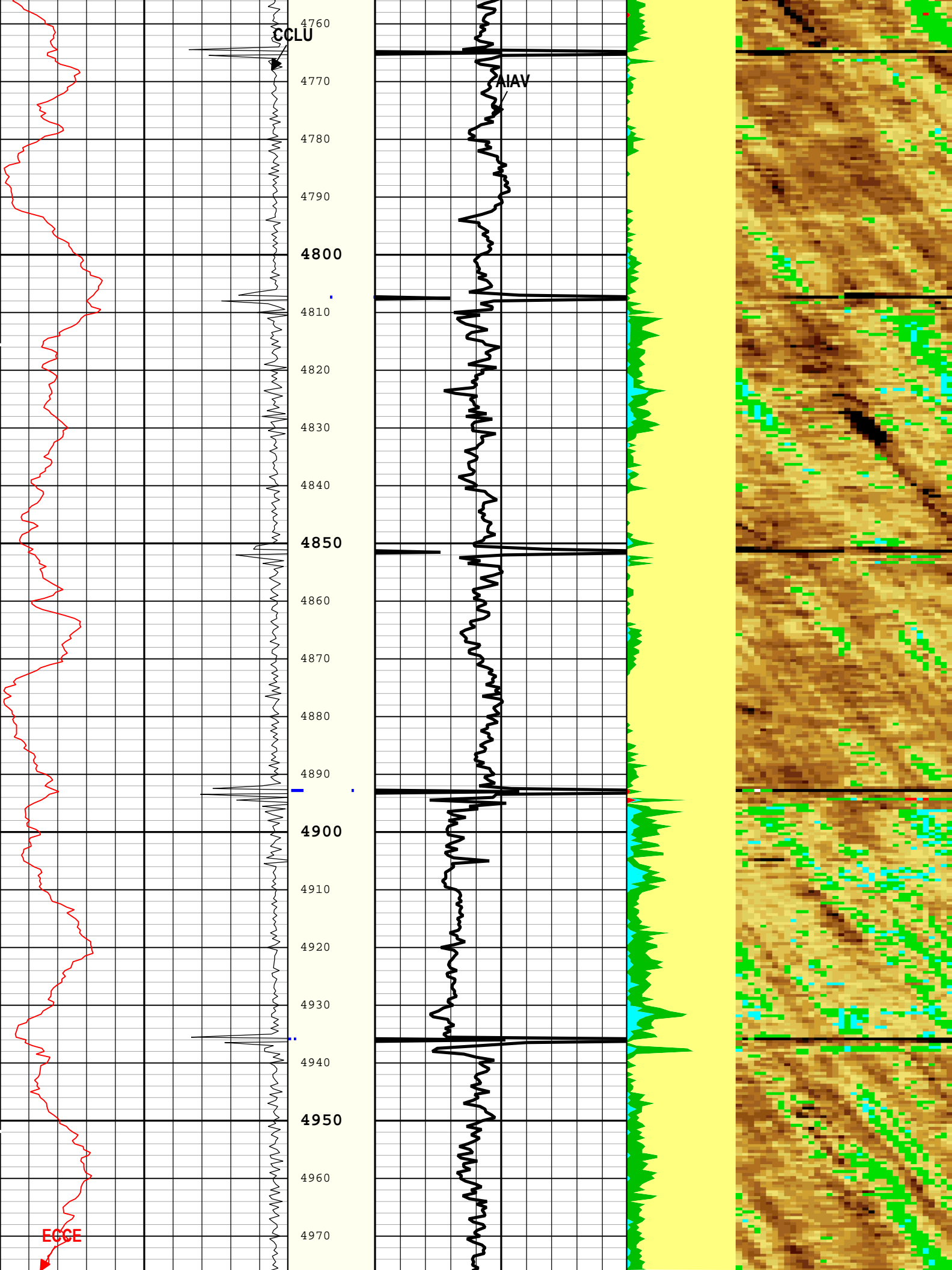


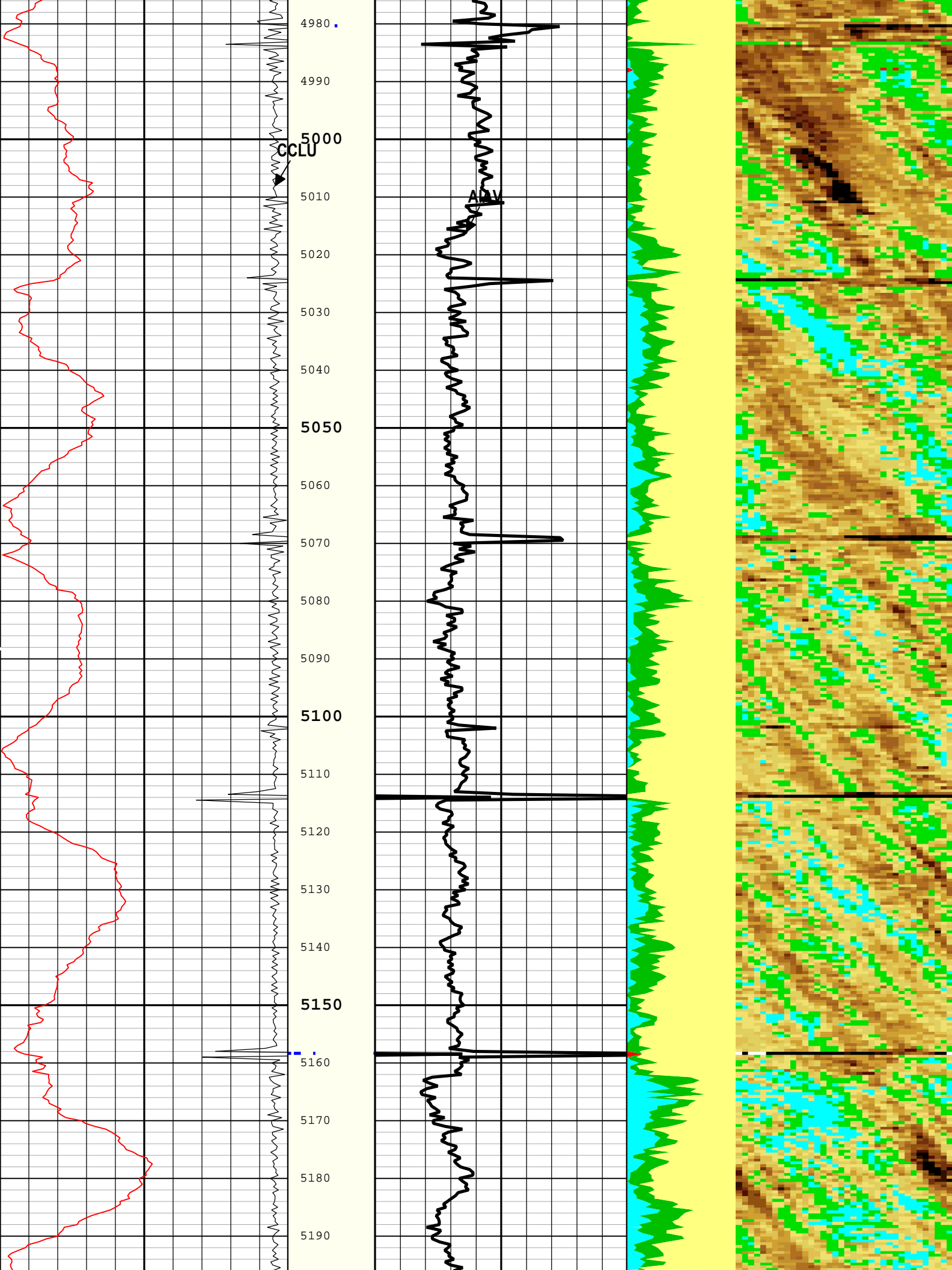


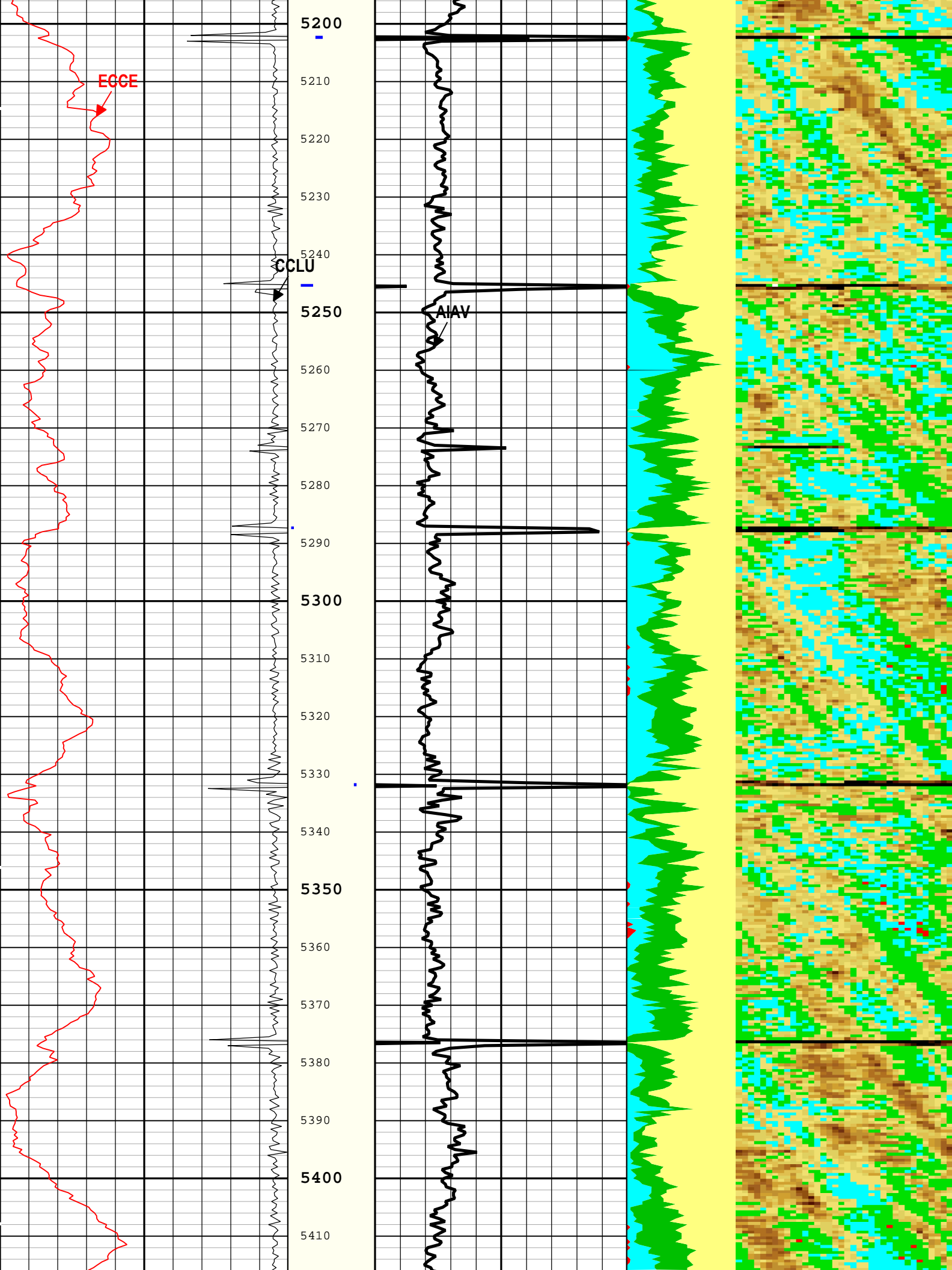


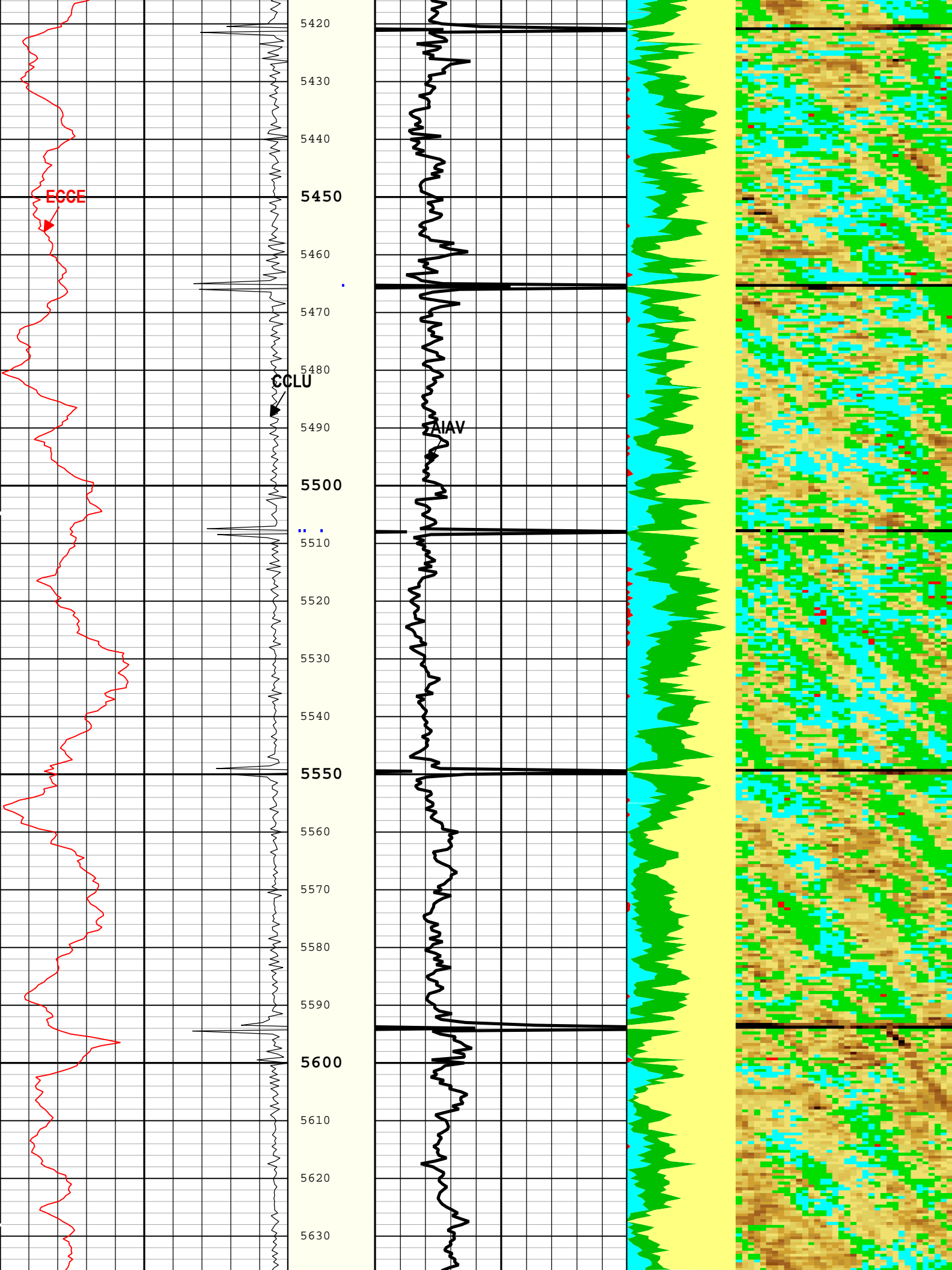


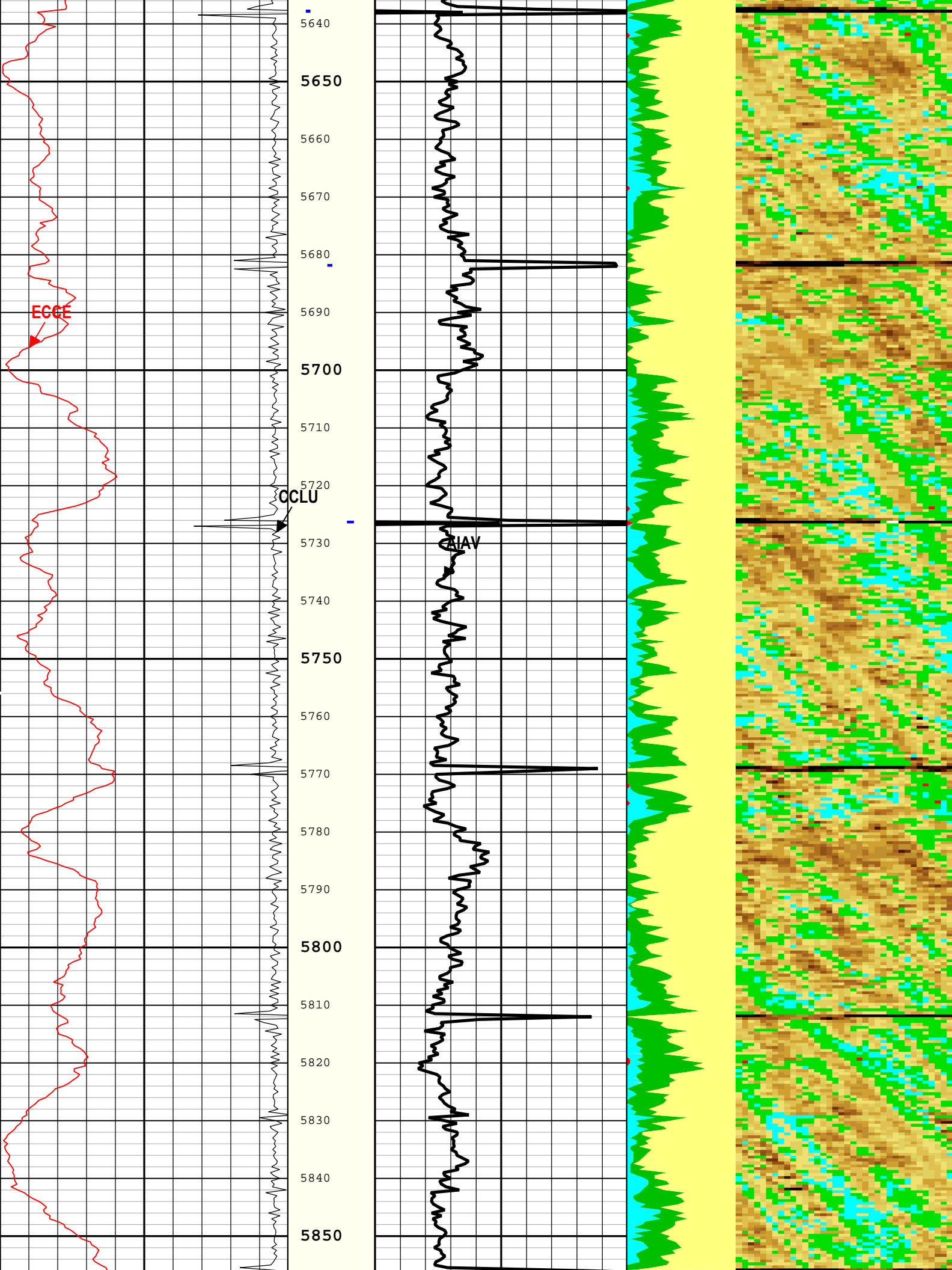


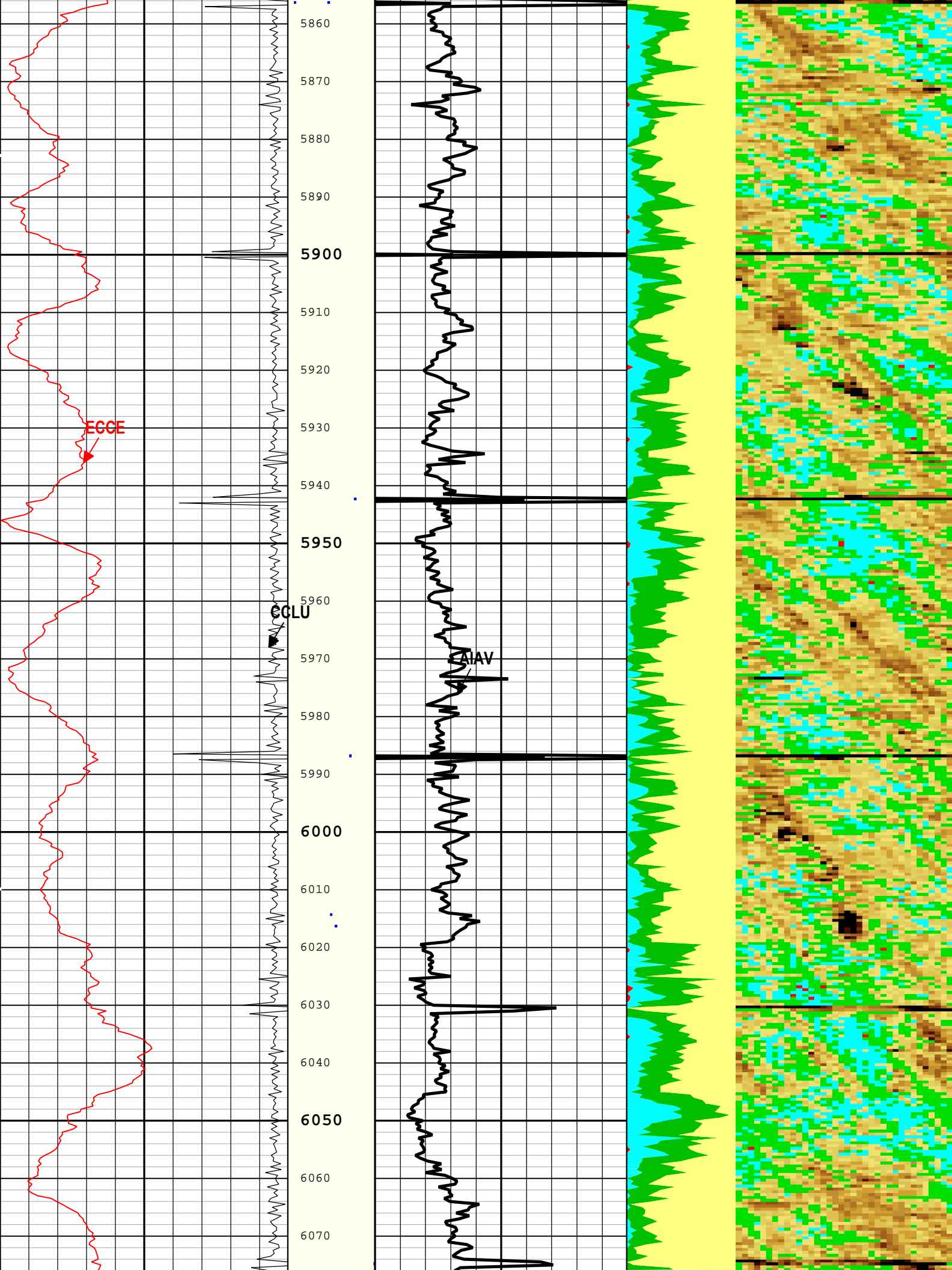


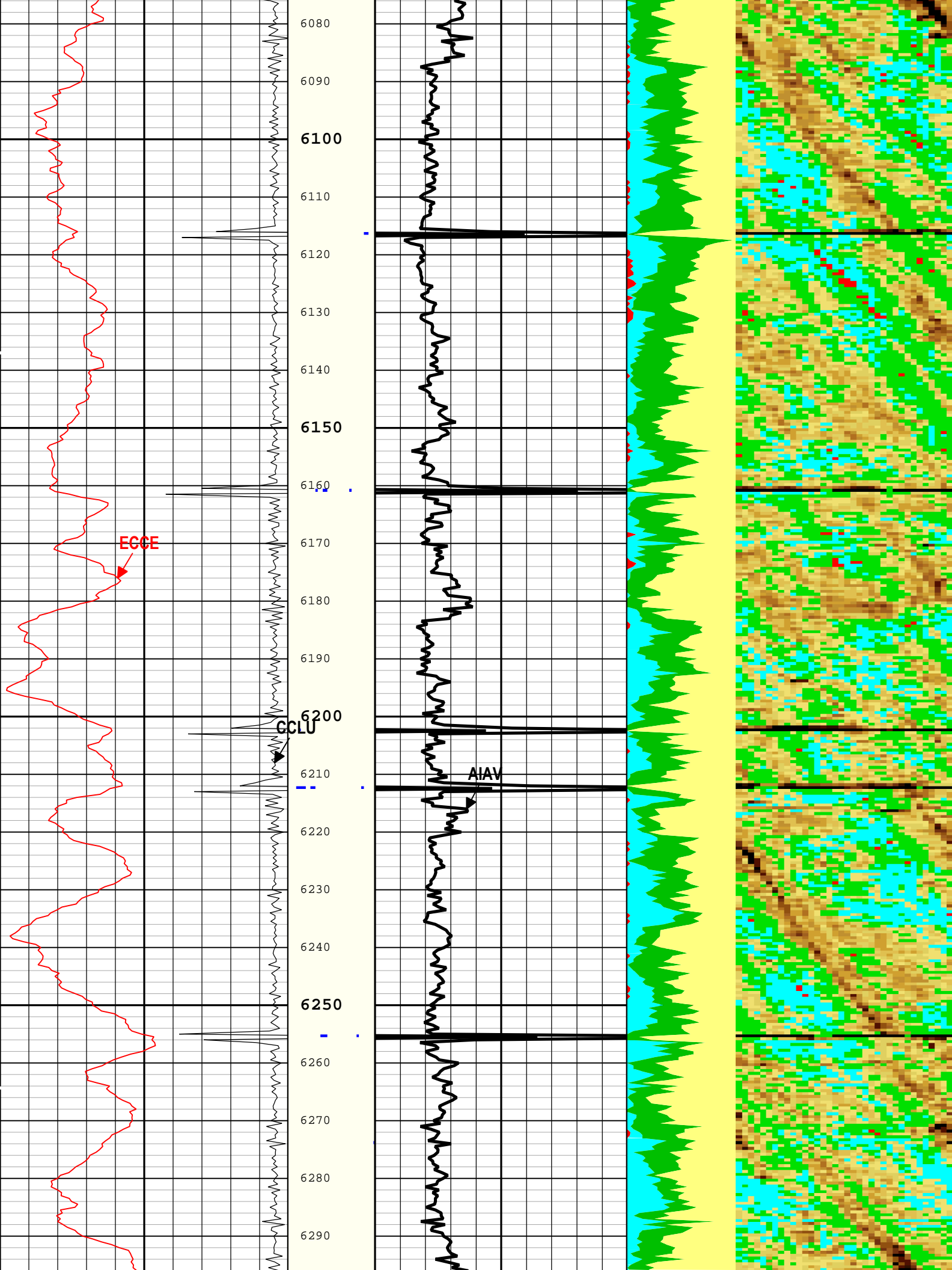


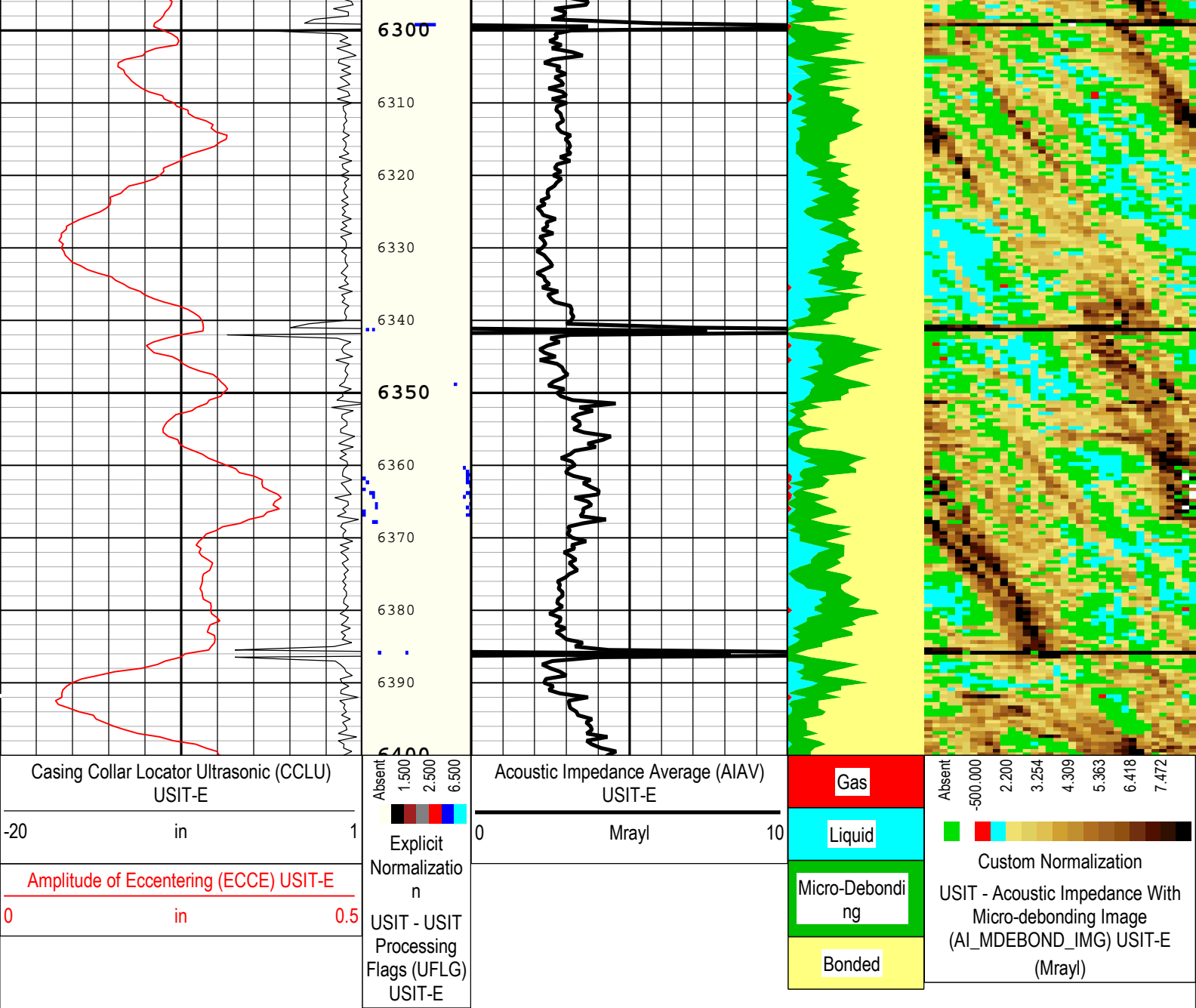












TIME_1900 - Time Marked every 60.00 (s)

Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 26-Jan-2018 18:30:28

Channel Processing Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BS	Bit Size	WLSESSION	Depth Zoned	in
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	10	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
HEMA	Hematite Presence Flag	Borehole	No	
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	1.01	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.6	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	1.48	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	26	100	110
BS	13.5	110	2070
BS	8.5	2070	6400

Tool Control Parameters	
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One: Parameters				
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
EMXV	EMEX Voltage	USIT-E	85	V
HRES	Horizontal Resolution	USIT-E	10 deg	
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	Time Zoned	us

Time Zone Parameters					
Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
WINB	31.88	24-Jan-2018 13:04:15	24-Jan-2018 13:04:27	6751.9	6747.45
WINB	20.46	24-Jan-2018 13:04:27	24-Jan-2018 14:11:20	6747.45	64.39
WINE	71.88	24-Jan-2018 13:04:15	24-Jan-2018 13:04:33	6751.9	6744.08
WINE	75.71	24-Jan-2018 13:04:33	24-Jan-2018 13:04:39	6744.08	6740.82
WINE	78.02	24-Jan-2018 13:04:39	24-Jan-2018 14:11:20	6740.82	64.39
All depth are at tool zero.					

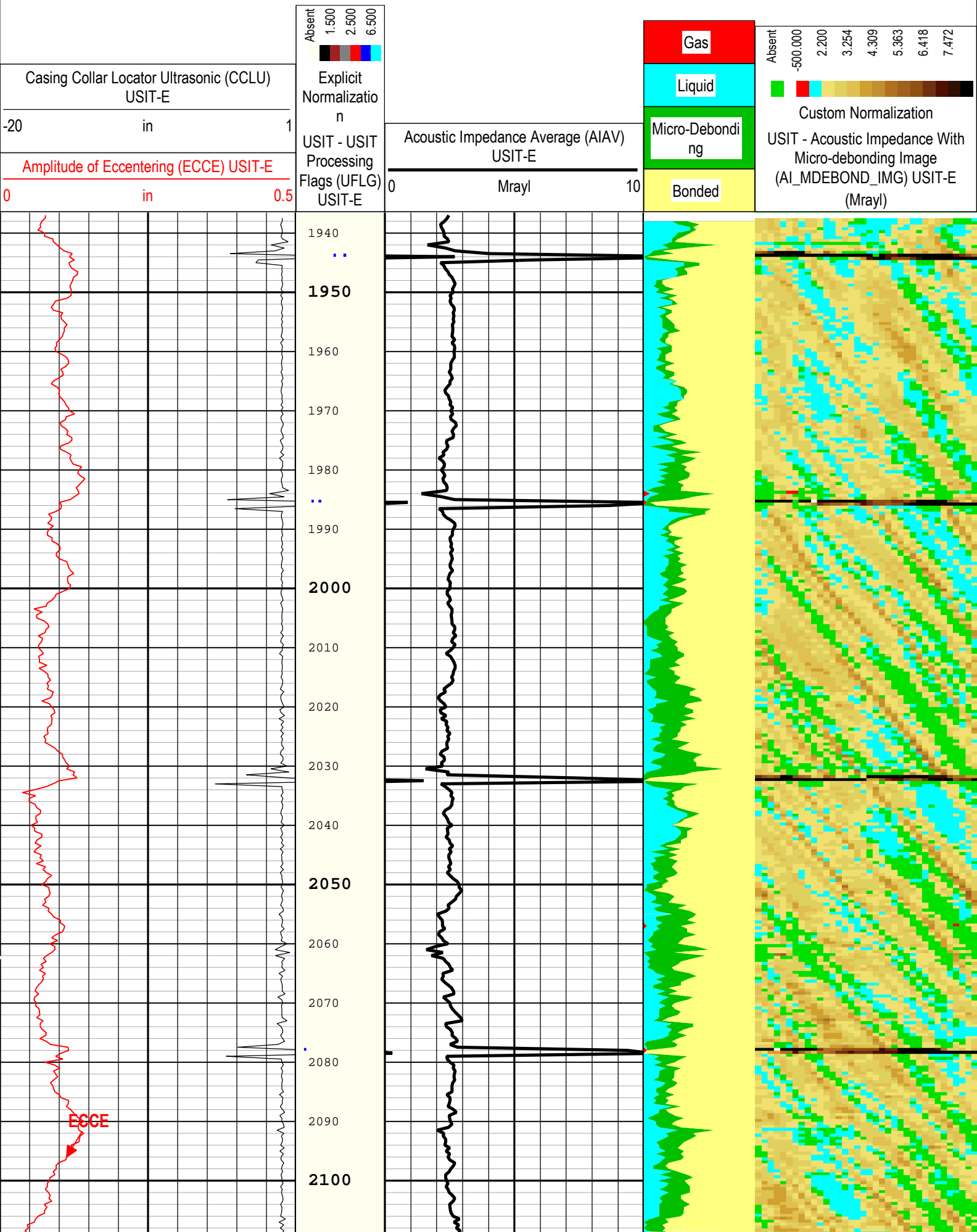
One					
0 PSI Repeat Pass					

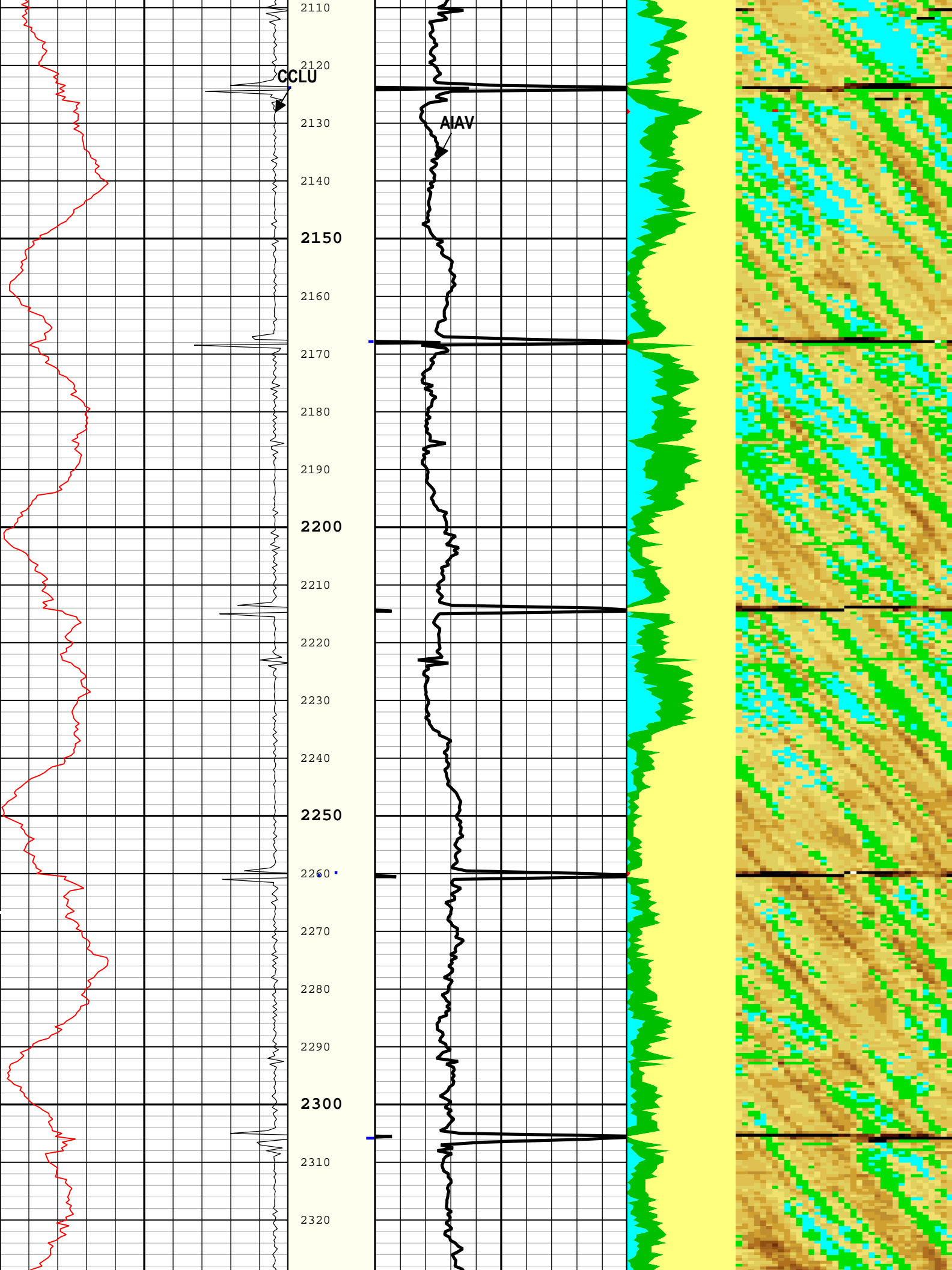
Software Version	
Acquisition System	Version
Maxwell 2017 SP3	7.3.92069.3100
Application Patch	Wireline_NPD-ICE2-2017SP3_7.3.93033

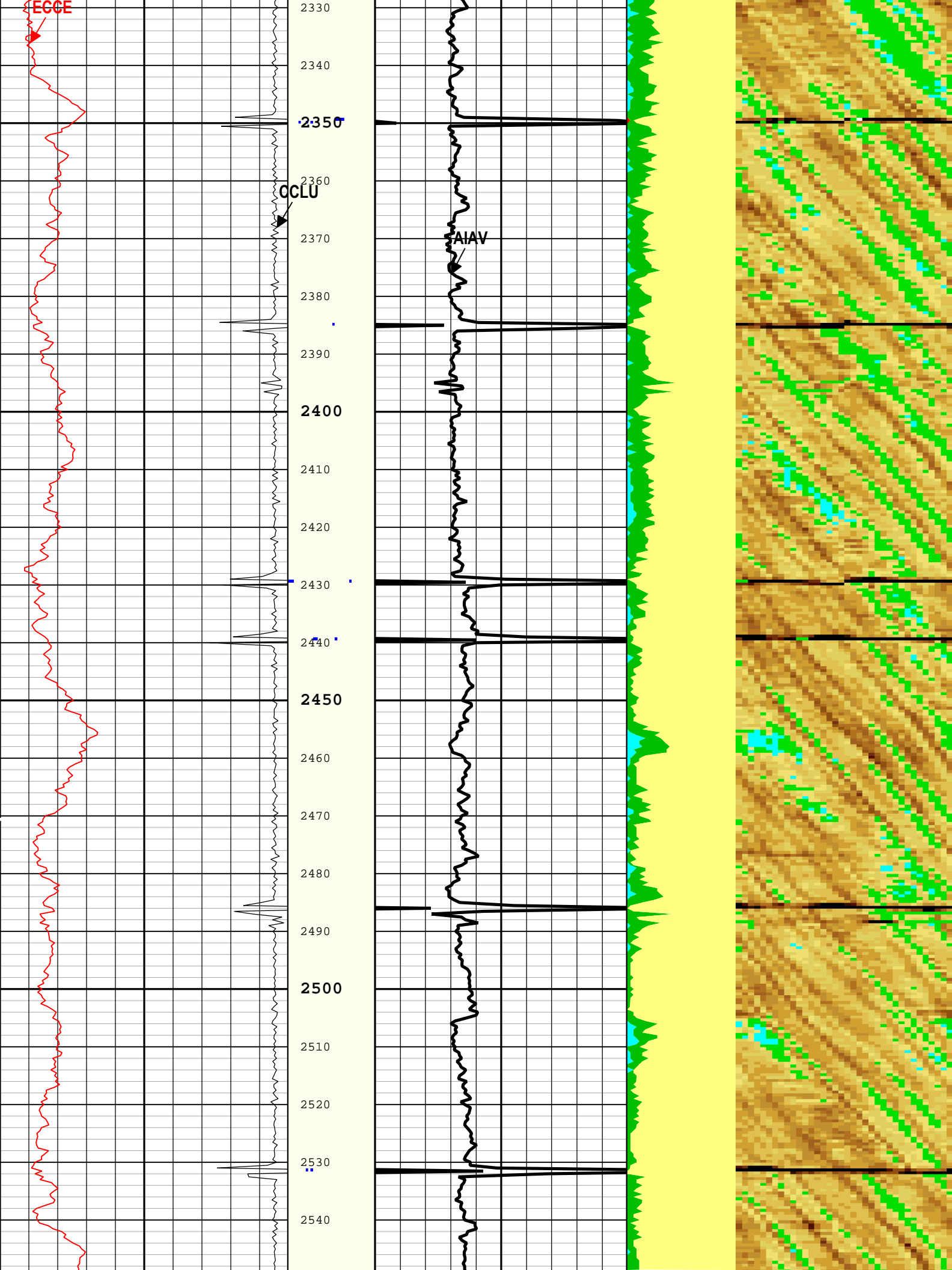
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[1]:Up	Up	1936.85 ft	2585.72 ft	24-Jan-2018 12:49:14 PM	24-Jan-2018 12:52:42 PM	ON	2.39 ft	No
All depths are referenced to toolstring zero									

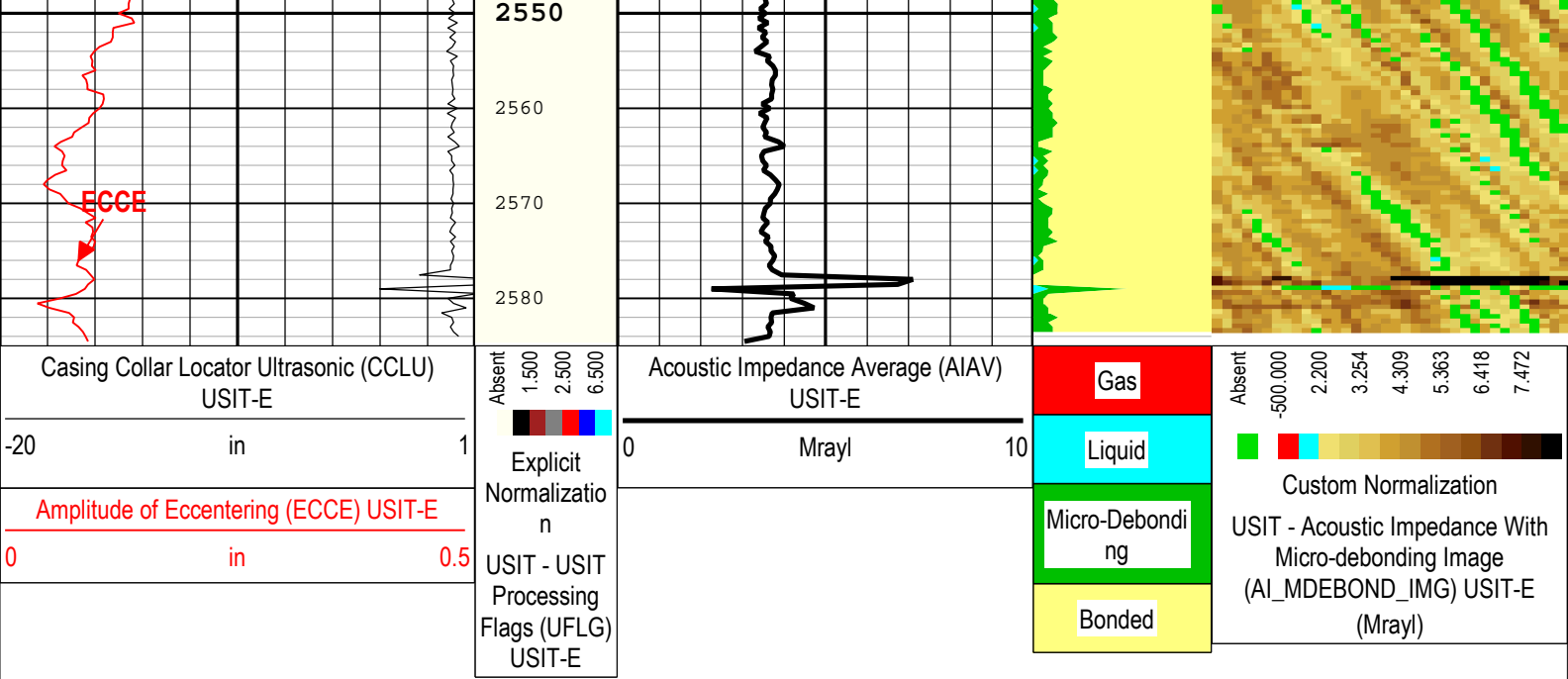
Log	Company:Noble Energy Inc	Well:Bison Ridge Y22-749
		One: Log[1]:Up:S005

TIME_1900 - Time Marked every 60.00 (s)









TIME_1900 - Time Marked every 60.00 (s)

Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth

Creation Date: 26-Jan-2018 18:30:32

Channel Processing Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BS	Bit Size	WLSESSION	Depth Zoned	in
CMTY(U-USIT_CENT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	10	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
HEMA	Hematite Presence Flag	Borehole	No	
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	1.01	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.6	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	1.48	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	1936.5	2070
BS	8.5	2070	2585

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	18	dB
EMXV	EMEX Voltage	USIT-E	85	V
HRES	Horizontal Resolution	USIT-E	10 deg	
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	31.88	us
WINE	Window End Time	USIT-E	71.88	us

XYZ

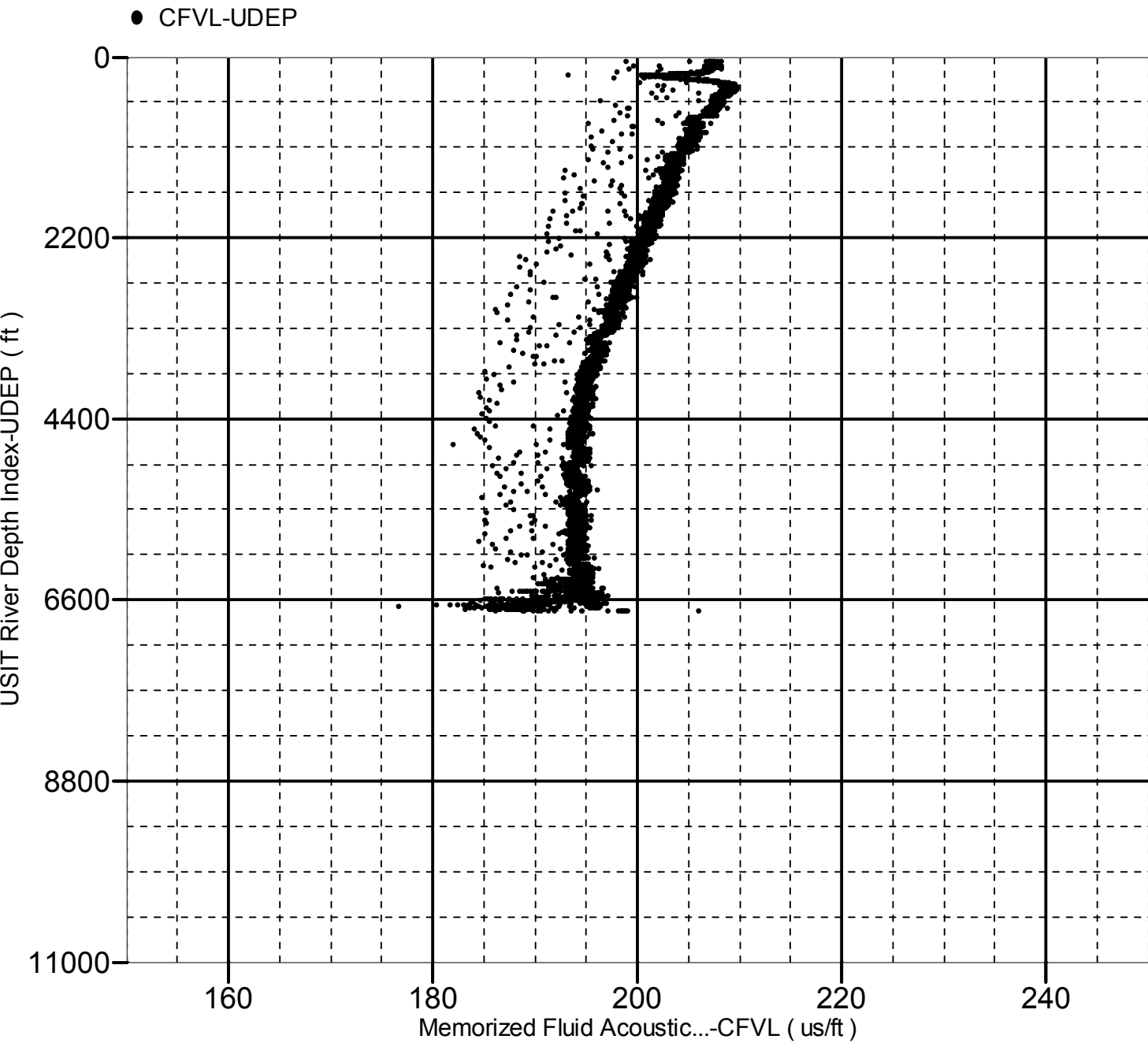
Company:Noble Energy Inc Well:Bison Ridge Y22-749

One: Log[3]:Up:S005

Fluid Acoustic Slowness vs Depth

2D Cross Plot

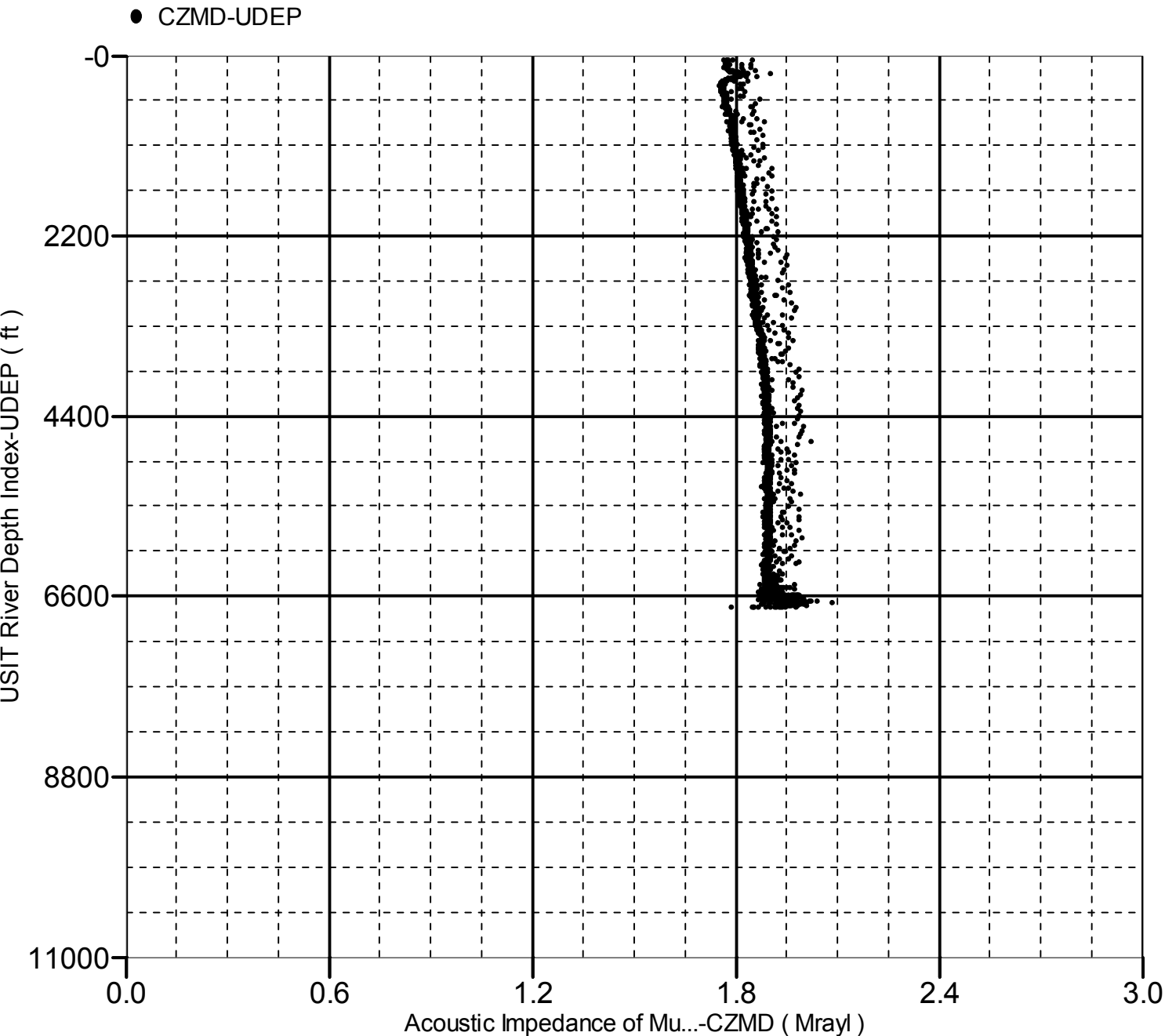
Index Range: From 6751.50 to 64.50 ft



Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6751.50 to 64.50 ft



Company: Noble Energy Inc

Schlumberger

Well: Bison Ridge Y22-749

Field: Wattenberg

County:	Weld
Country:	US
UltraSonic Summary Print	