

Company: Noble Energy Inc

Well: Shadow A26-637

Field: Wattenberg

County: Weld Country: US

County: Weld

Field: Wattenberg

Location: NWSE Sec 30 T6N R63W

Well: Shadow A26-637

Company: Noble Energy Inc

UltraSonic Summary Print

Location:		NWSE Sec 30 T6N R63W		Elev.: K.B. 4673.00 ft	
		2234 FSL 1698 FEL		G.L. 4643.00 ft	
		Latitude: 40.45631 Longitude: -104.47633		D.F. 4672.00 ft	
Permanent Datum:		Ground Level		Elev.: 4643.00 f	
Log Measured From:		Kelly Bushing		30.00 ft above Perm.Datum	
Drilling Measured From:		Kelly Bushing			
API Serial No.	Max.Hole Deviation	Longitude:	Latitude:		
05-123-42884		-104.47633 degrees	40.456539 degrees		

Logging Date	16-Jun-2016
Run Number	USI
Depth Driller	17626.00 ft
Schlumberger Depth	17626.00 ft
Bottom Log Interval	6620.00 ft
Top Log Interval	0.00 ft
Casing Fluid Type	Brine
Salinity	
Density	8.4 lbm/gal
Fluid Level	8.00 ft
BIT/CASING/TUBING STRING	
Bit Size	8.50 in
From	1927.00 ft
To	17626.00 ft
Casing/Tubing Size	5.5 in
Weight	20 lbm/ft
Grade	P110
From	30.00 ft
To	17605.20 ft
Max Recorded Temperatures	222 degF
Logger on Bottom	16-Jun-2016 11:10:00
Unit Number	2161
Recorded By	Avery Becker / Stephen Tang
Witnessed By	

Disclaimer

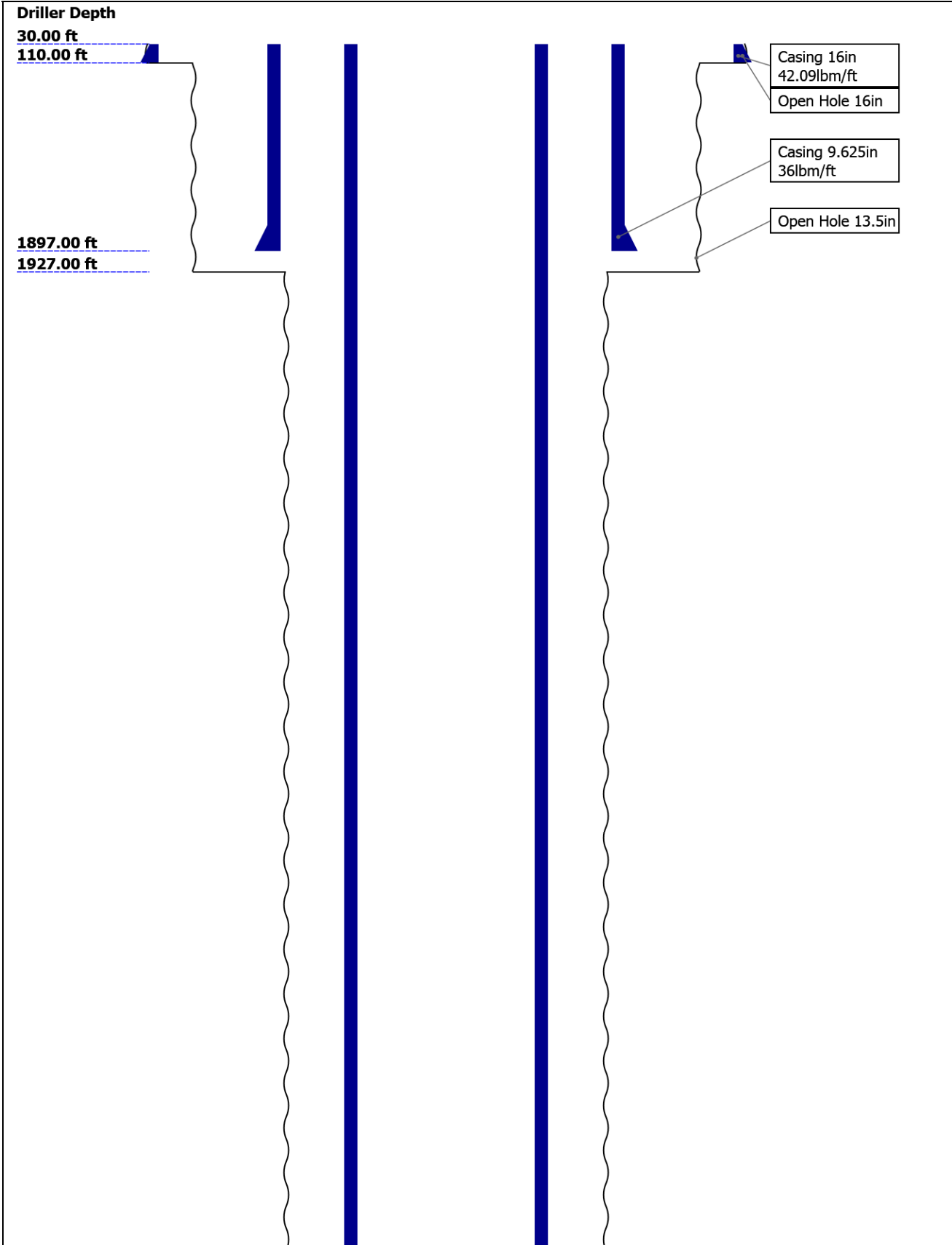
THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (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.

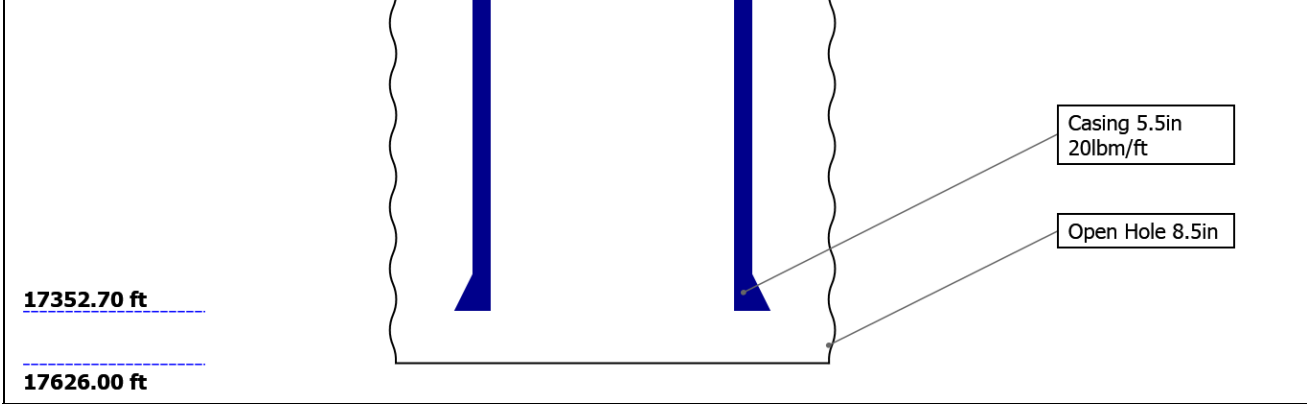
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Well Sketch




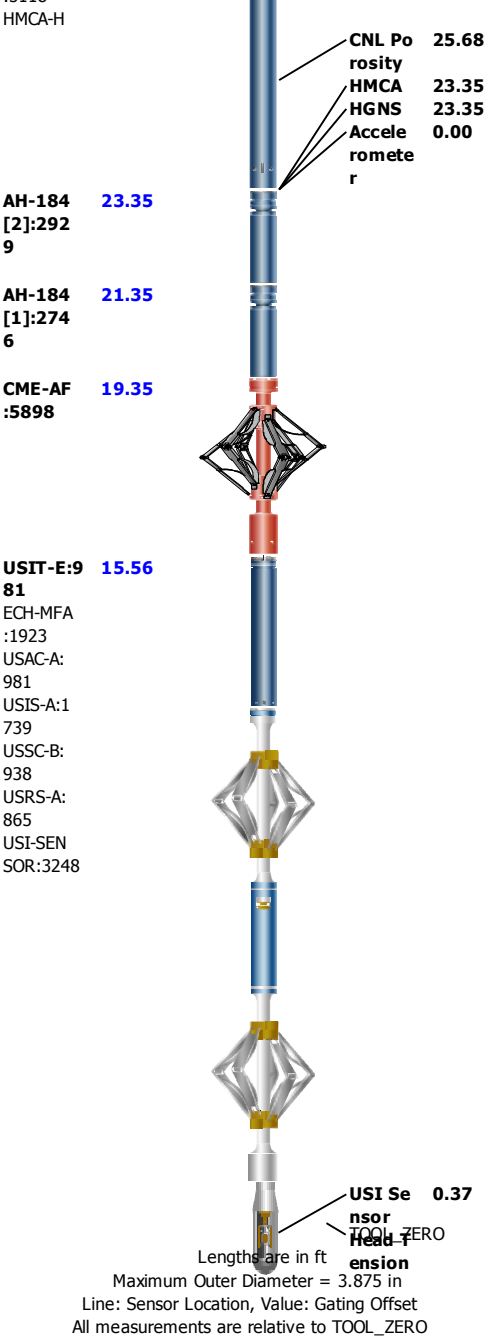


Borehole Size/Casing/Tubing Record

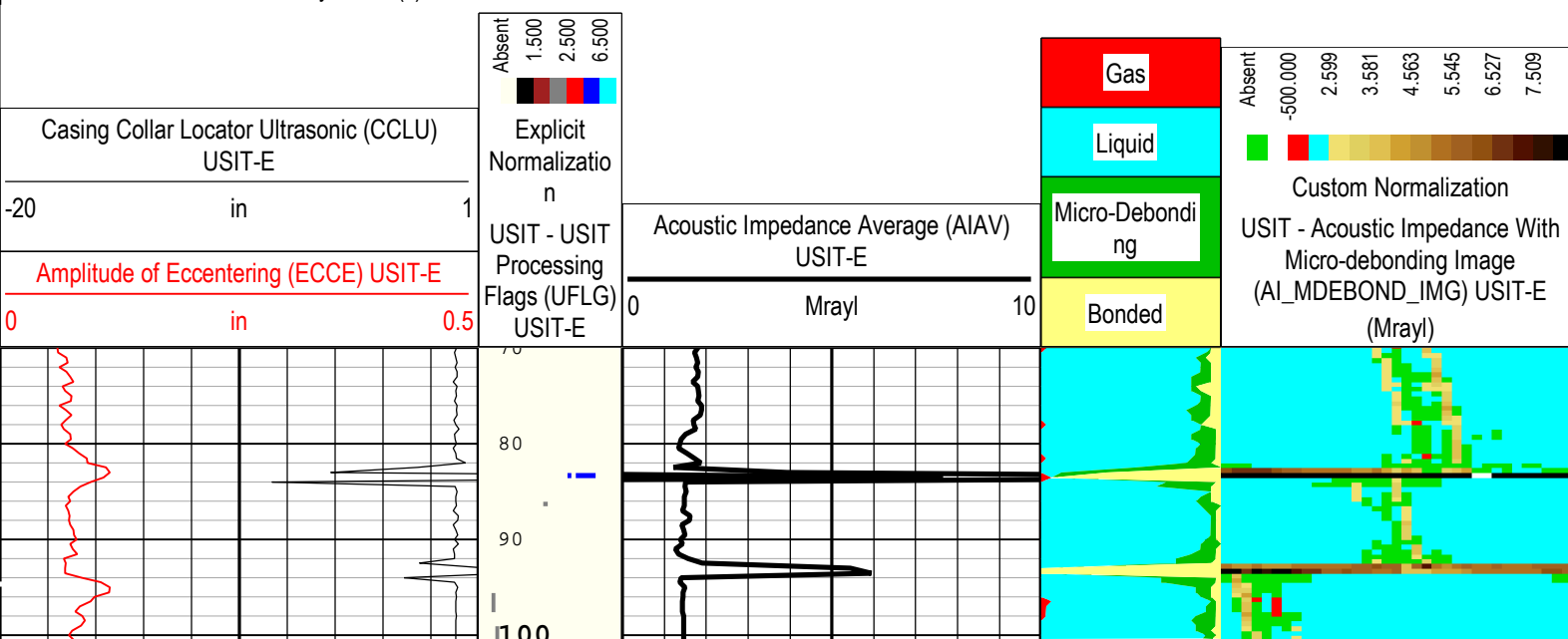
Bit						
Bit Size (in)	16	13.5	8.5			
Top Driller (ft)	30	110	1927			
Top Logger (ft)	30	110	1927			
Bottom Driller (ft)	110	1927	17626			
Bottom Logger (ft)	110	1927	17626			
Casing						
Size (in)	16	9.625	5.5			
Weight (lbm/ft)	42.09	36	20			
Inner Diameter (in)	15.511	8.921	4.778			
Grade	N/A	N/A	P110			
Top Driller (ft)	30	30	30			
Top Logger (ft)	30	30	30			
Bottom Driller (ft)	110	1897	17352.7			
Bottom Logger (ft)	110	1913.3	17605.2			

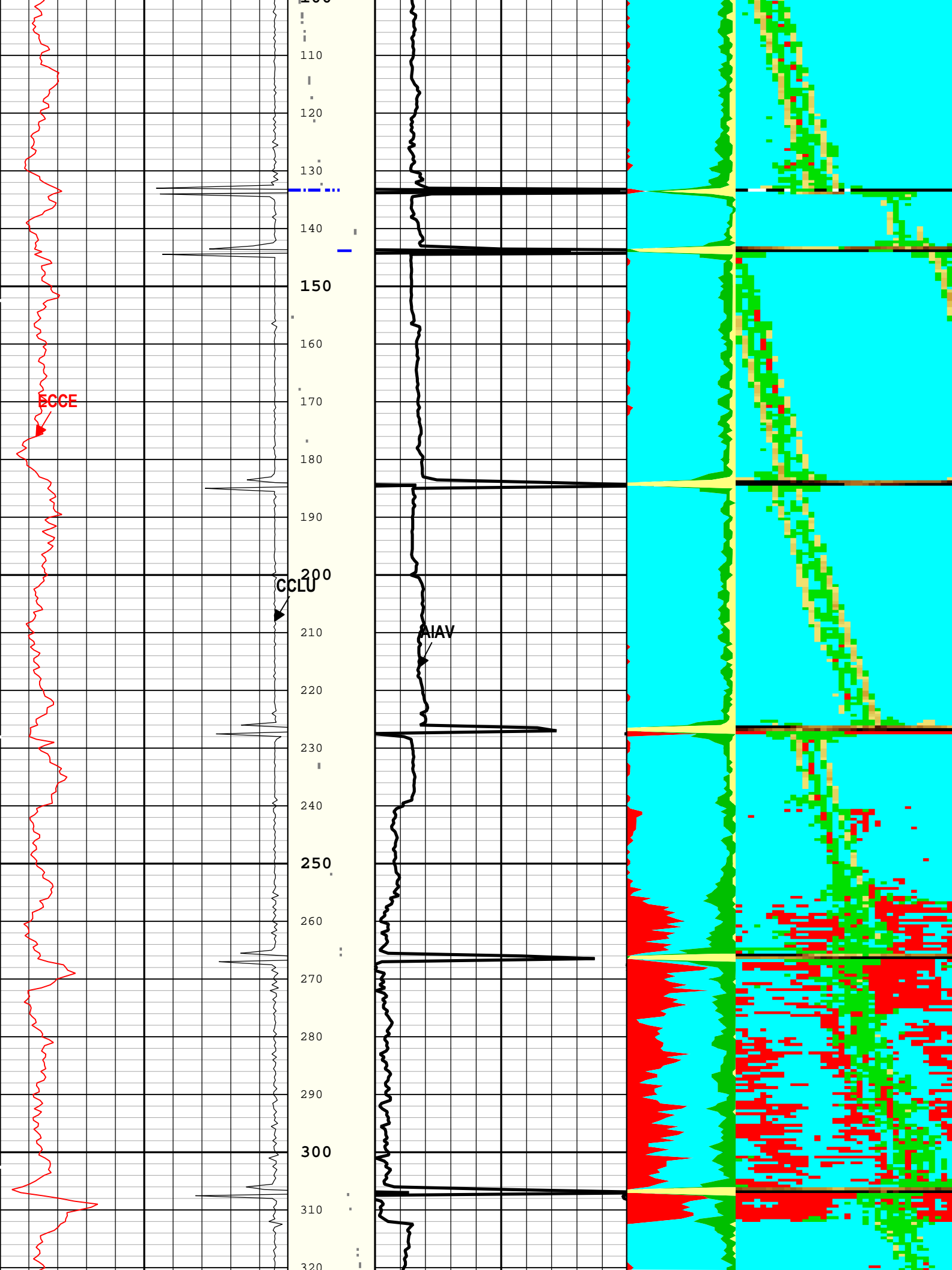
Remarks and Equipment Summary

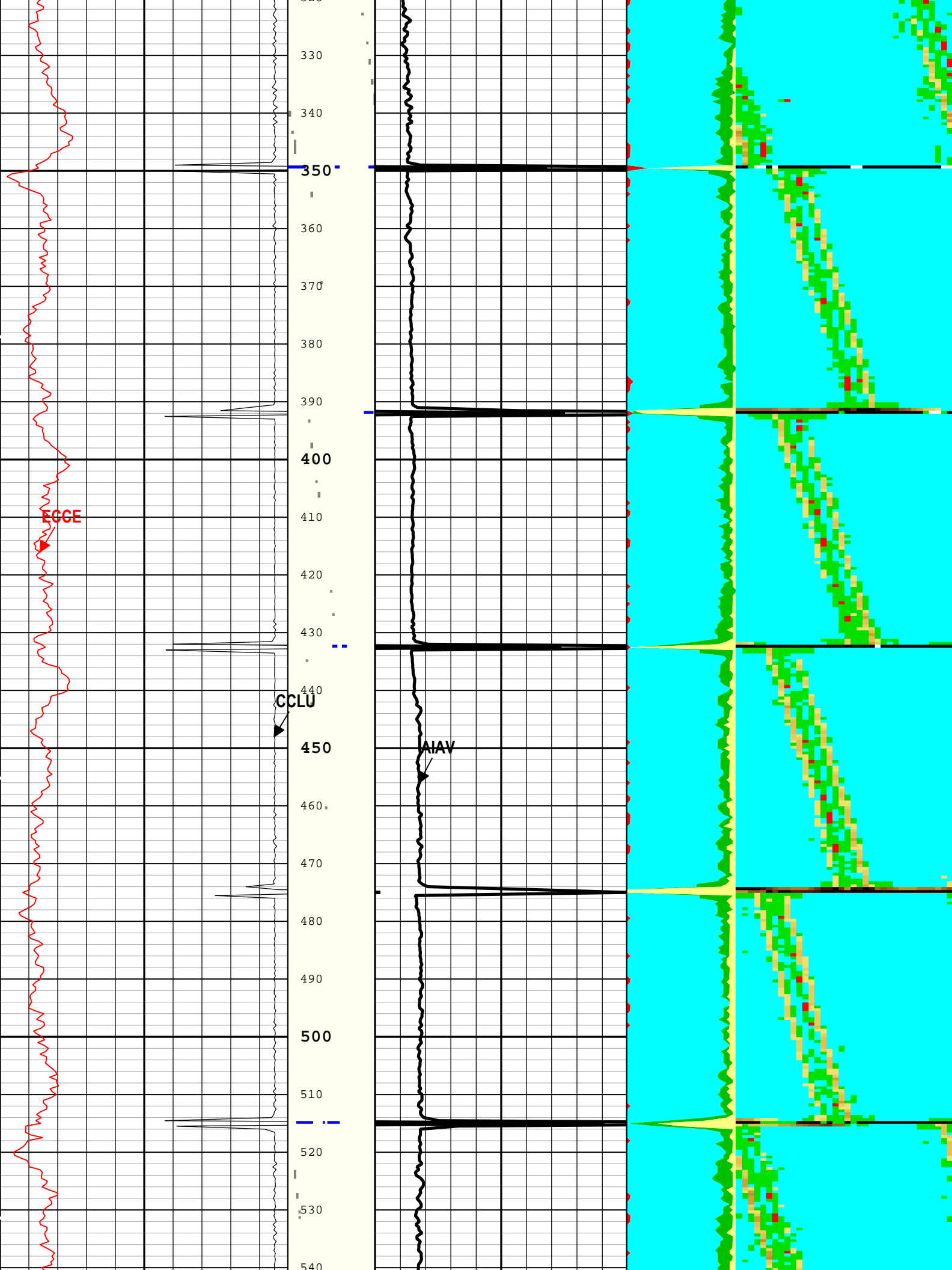
USI: Toolstring			USI: Remarks		
<div><div><div>Equip nameLengthMP nameOffset</div><div>LEH-QT43.53LEH-QT</div><div>SAH-F:140.61817</div><div>DTC-H:835.76803</div><div>ECH-KC:10354</div><div>DTC-H:8803</div><div>HGNS-H:2987</div><div>HGNH:4736</div><div>NPV-N</div><div>NSR-F:5069</div><div>HGNS-H:2987</div><div>HACCZ-H</div></div><div></div><div><div>CTEM34.86</div><div>HV0.00</div><div>TelStatus32.76</div><div>ToolStatus32.76</div><div>Temperature32.73</div><div>GR32.02</div></div></div>	This is the first run in the well.				
	Tool ran as per tool sketch.				
	CSG: 5.5" 20lb/ft				
	Cement: no cement data from client.				
	Logs recorded for cement at 10 deg 6"				
	Main pass recorded at 2500psi, repeat pass at 0psi.				

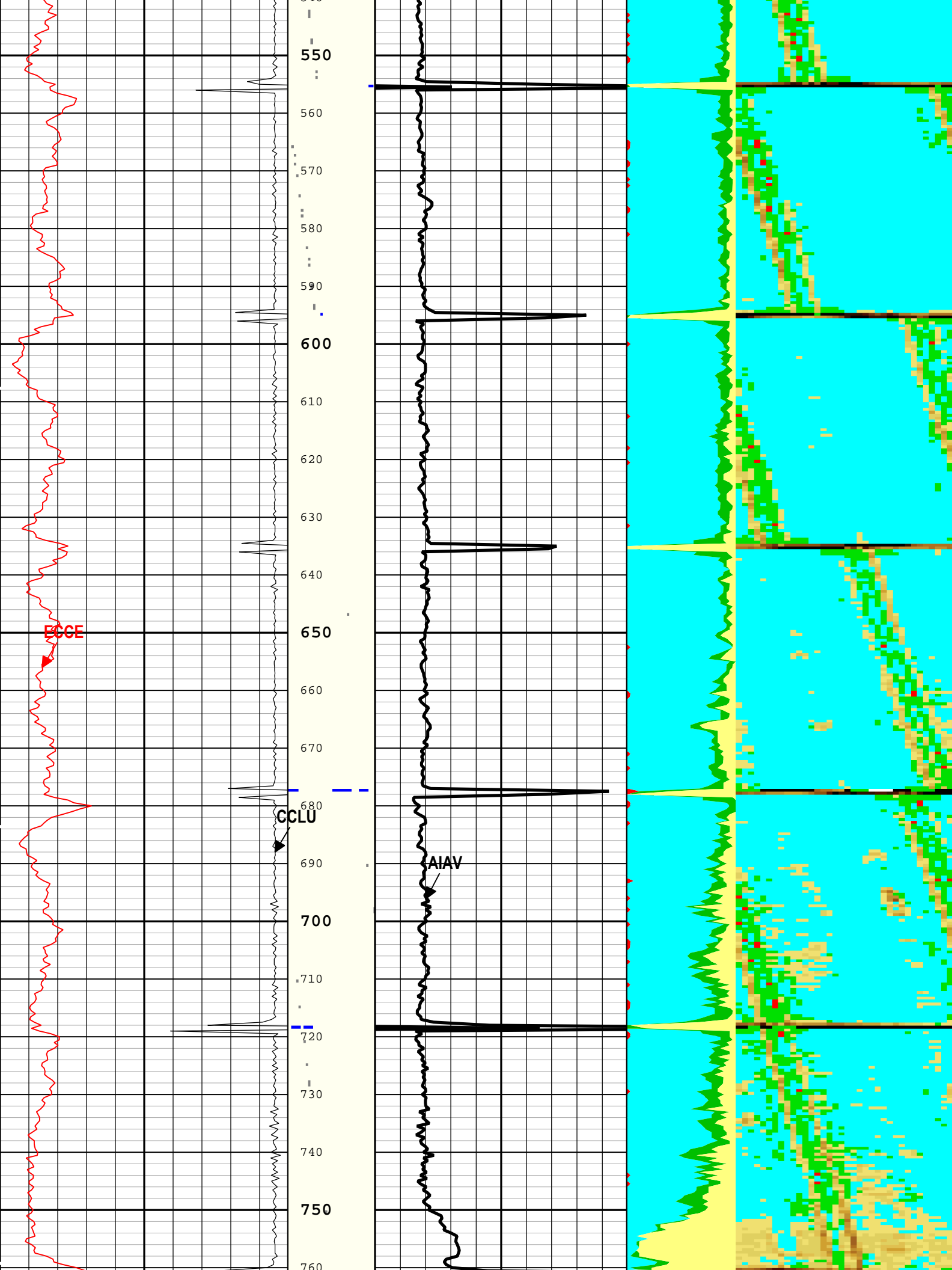


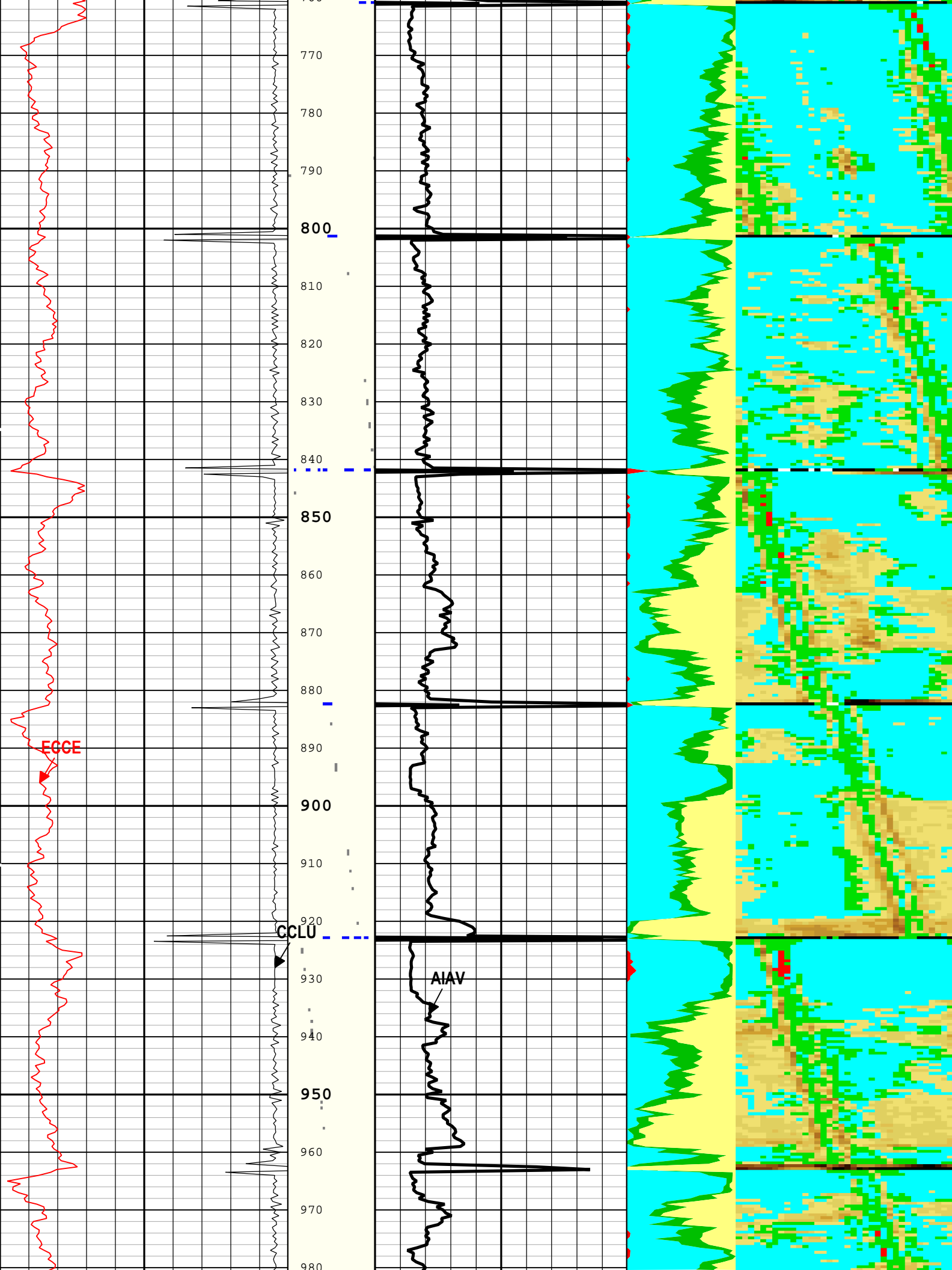
Depth Summary			
		USI	
Depth Measuring Device			
Type	IDW-JA		
Serial Number	5896		
Calibration Date			
Calibrator Serial Number	16		
Calibration Cable Type	7-46 PLX		
Wheel Correction 1	-1		
Wheel Correction 2	-3		
Tension Device			
Type	CMTD-B/A		
Serial Number	1109		
Calibration Date	13-Apr-2016		
Calibrator Serial Number	441435A		

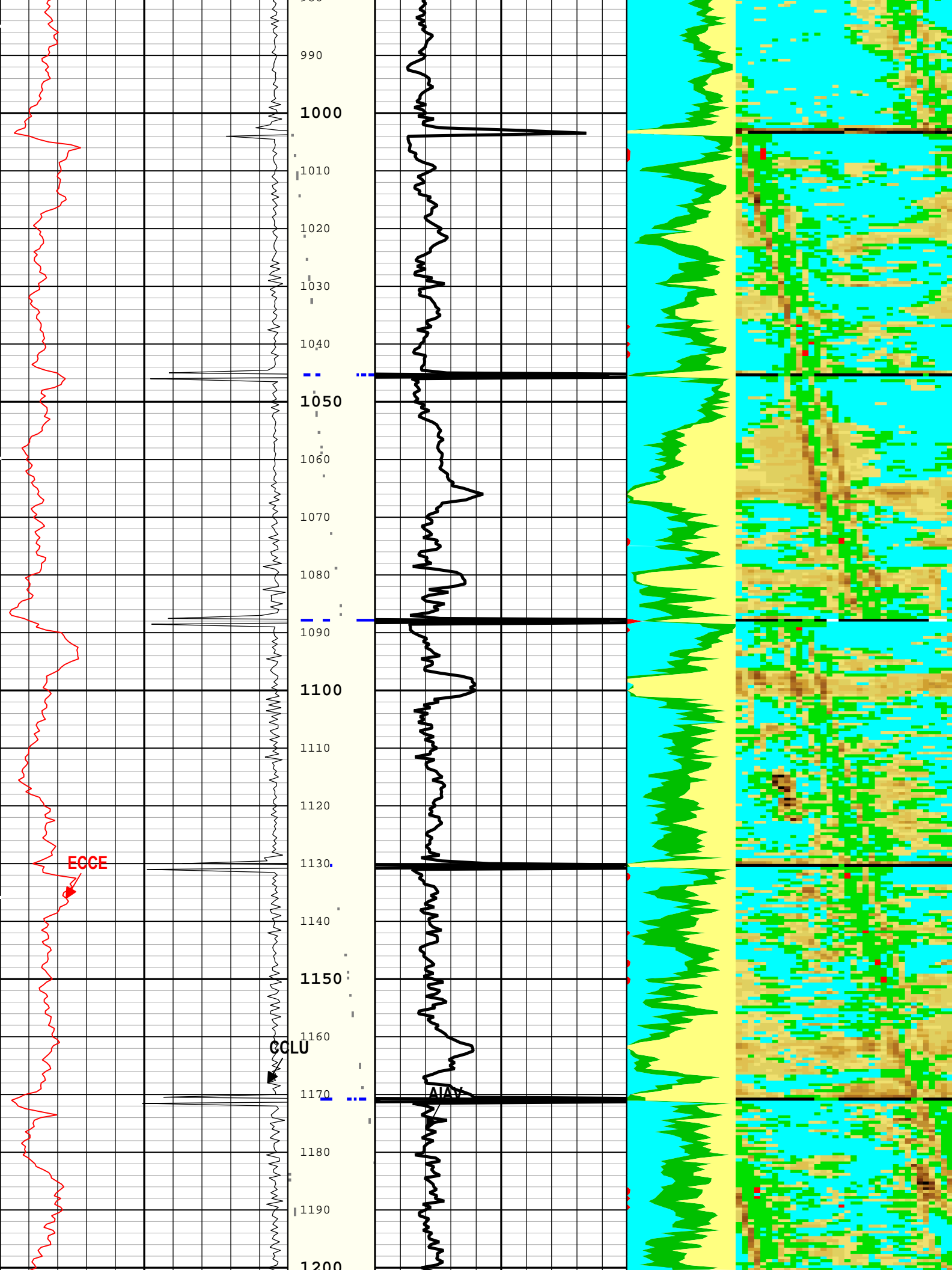


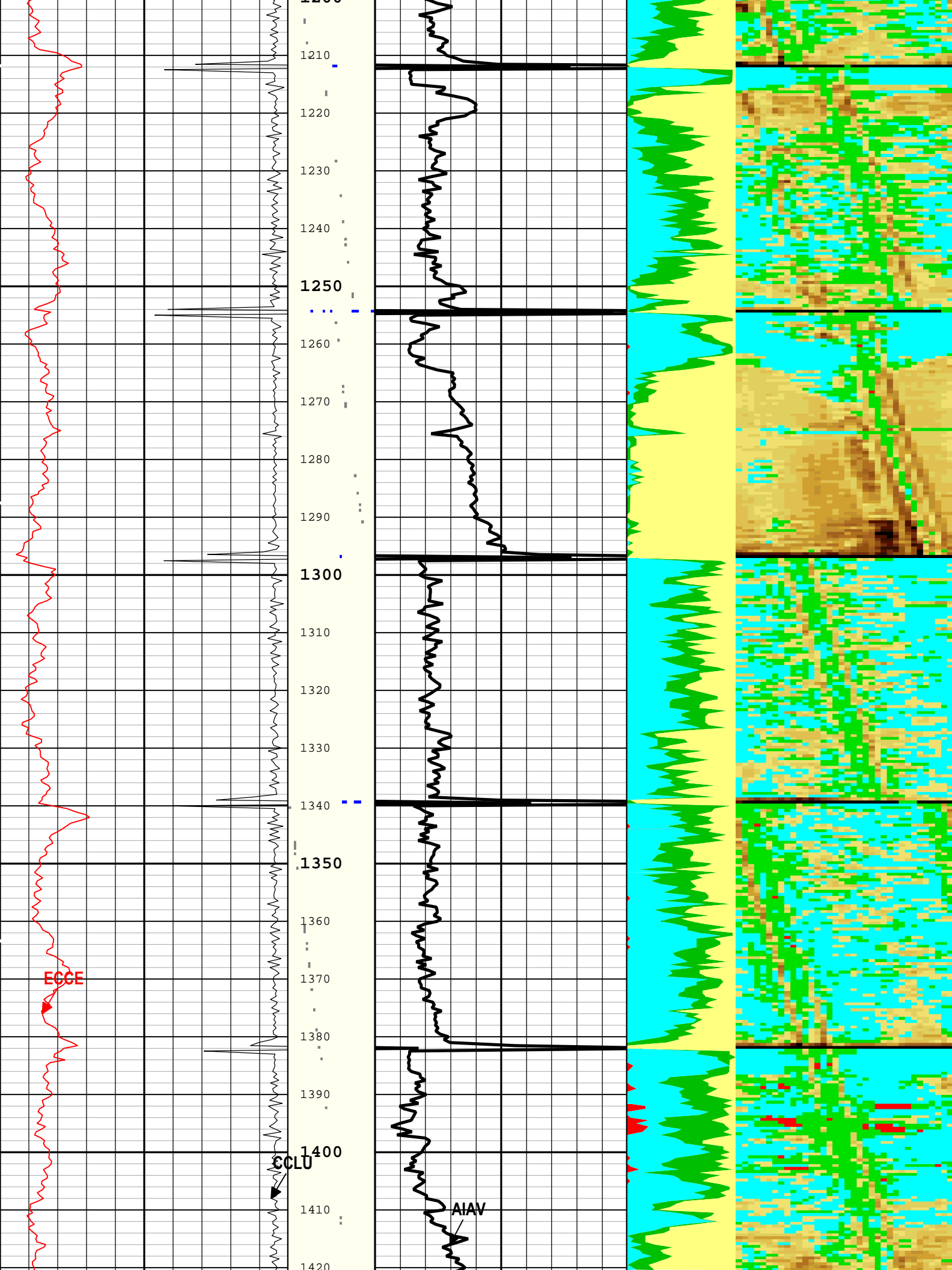


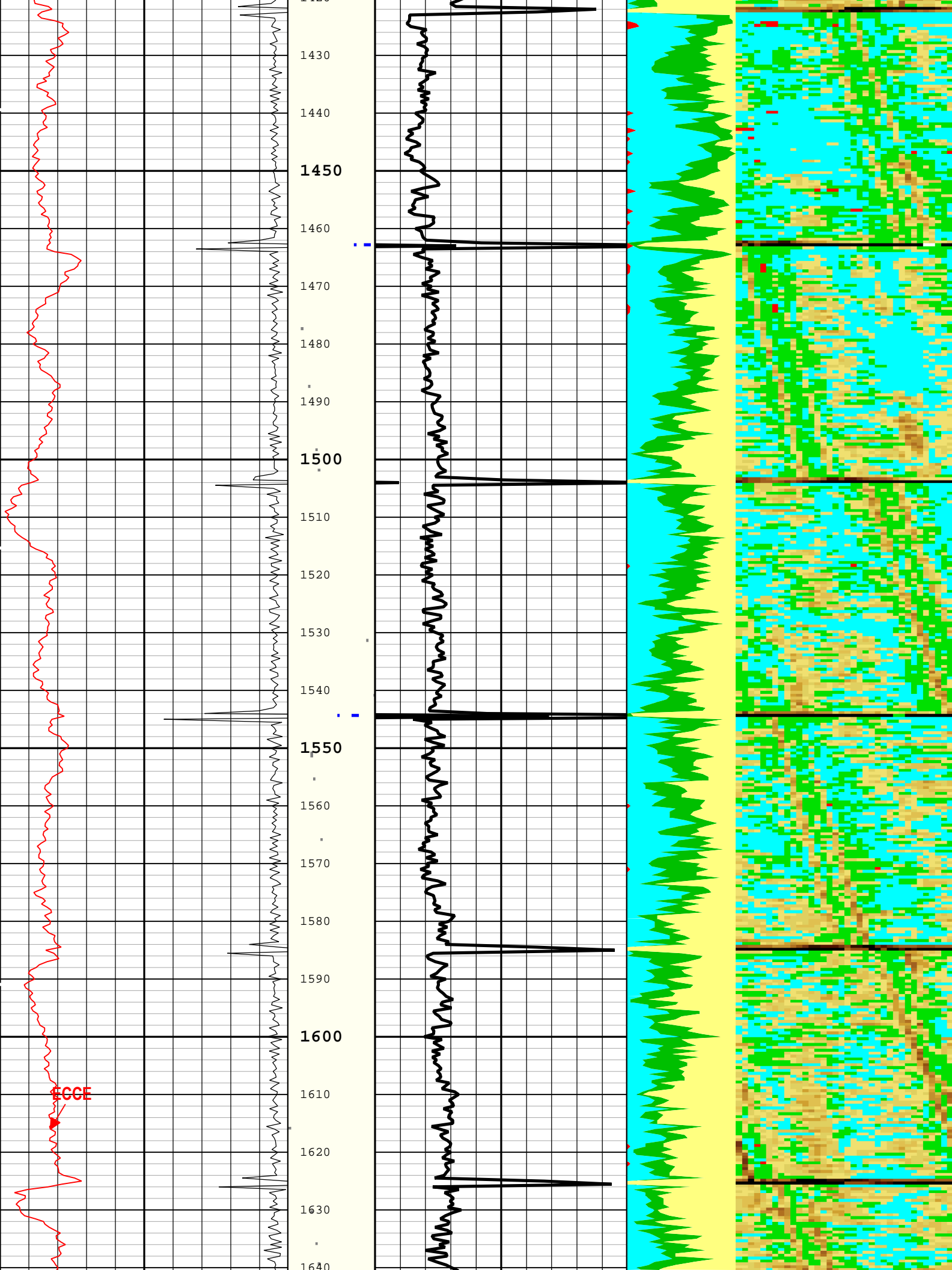


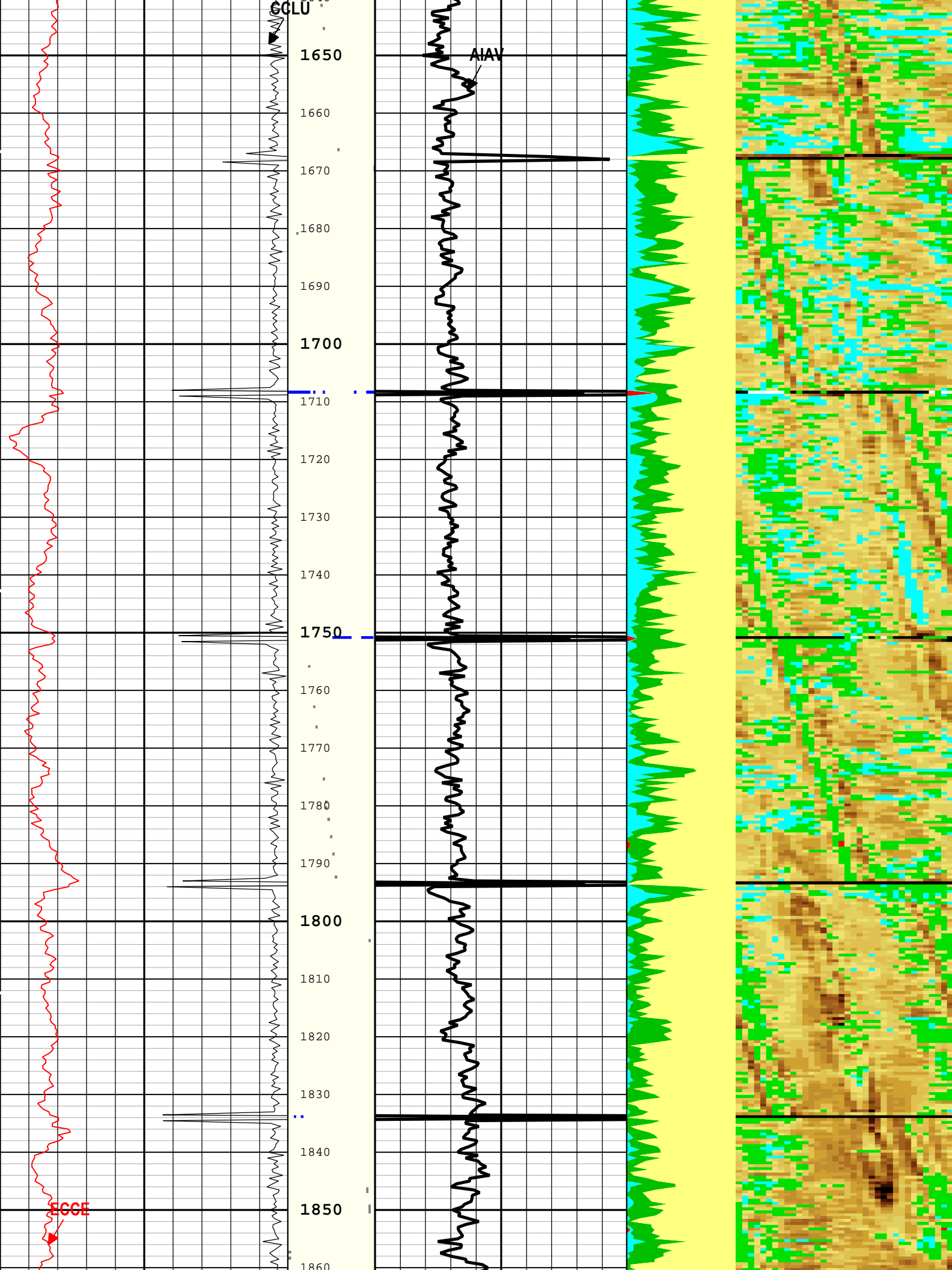


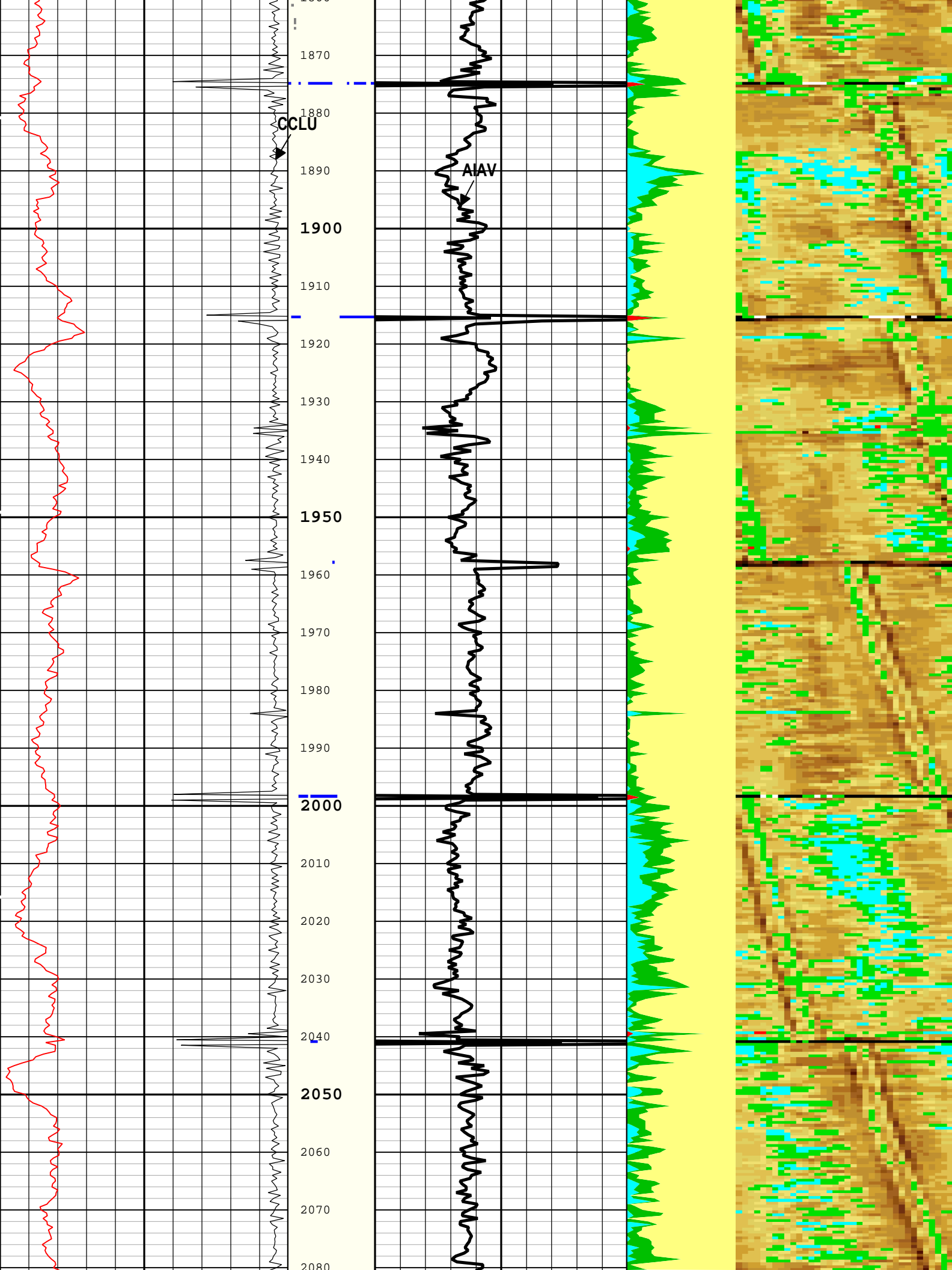


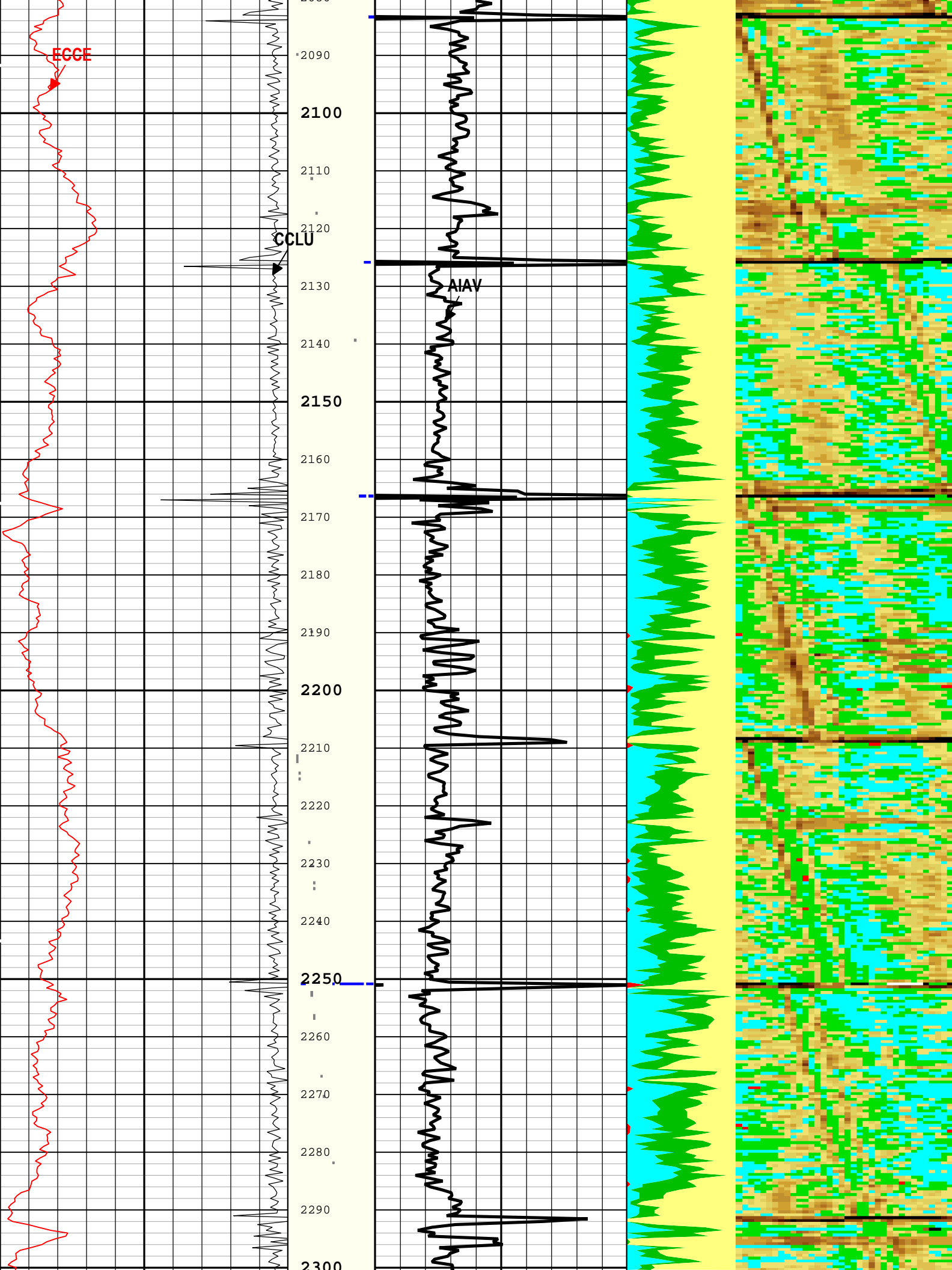


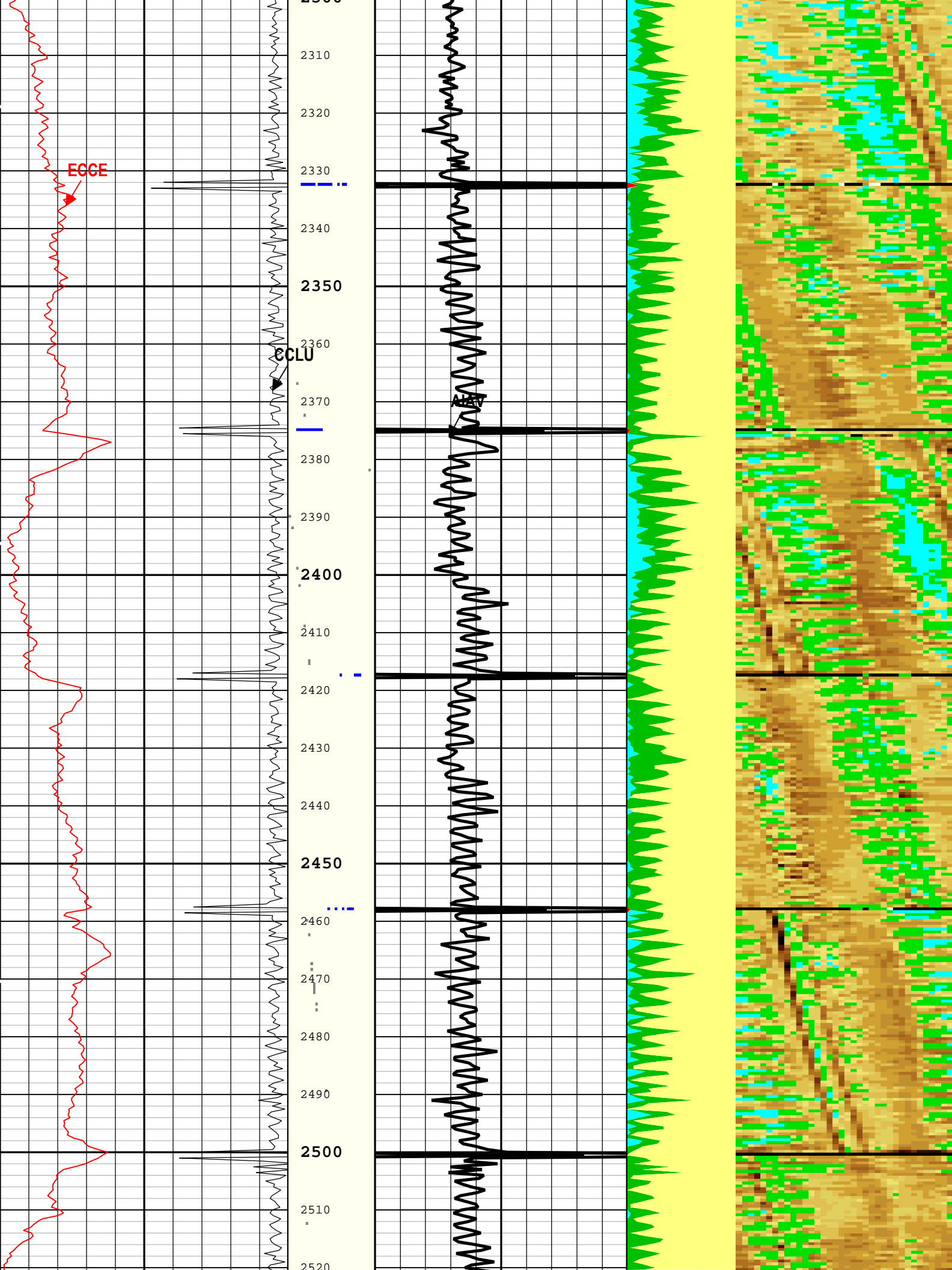


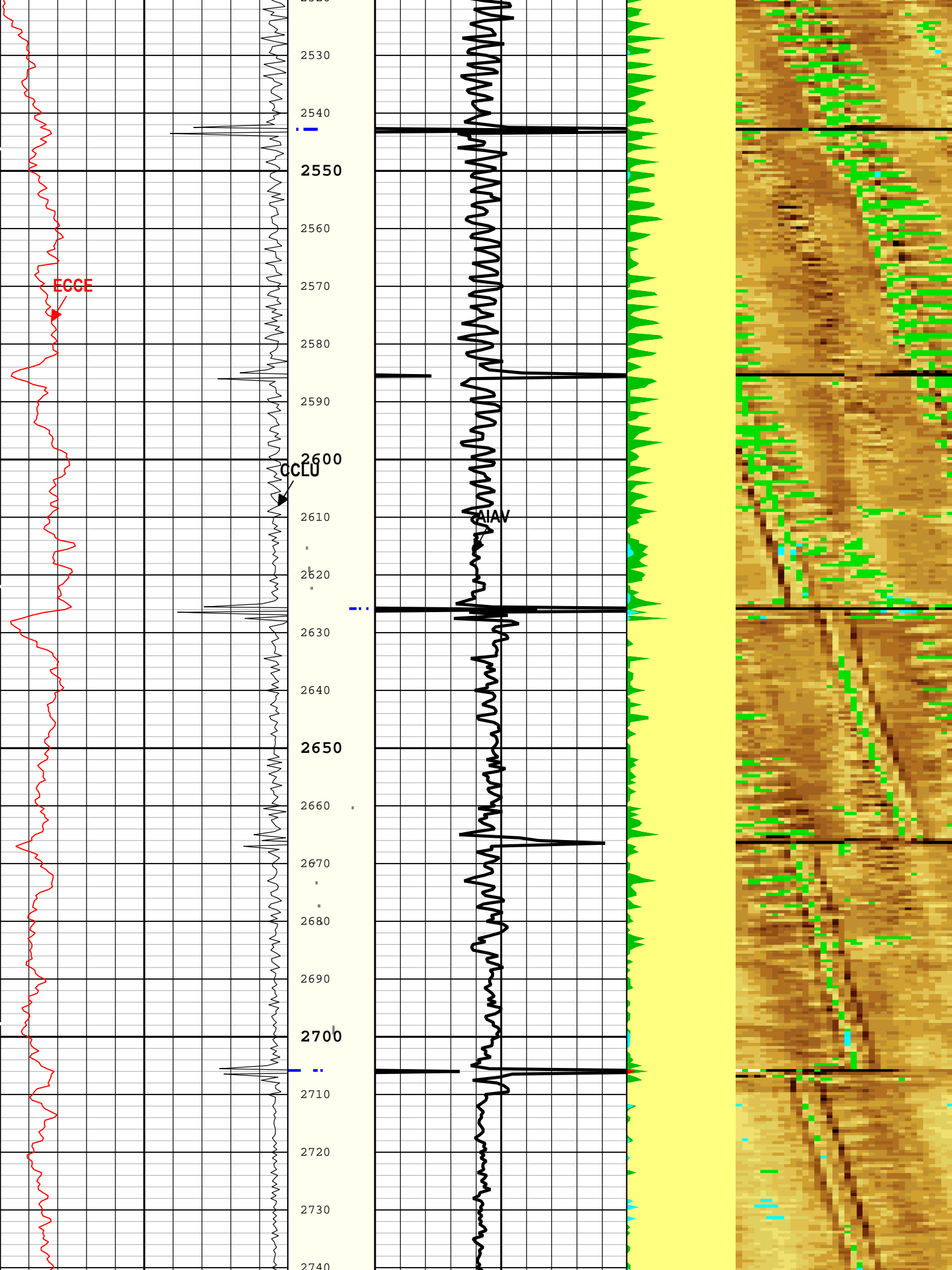


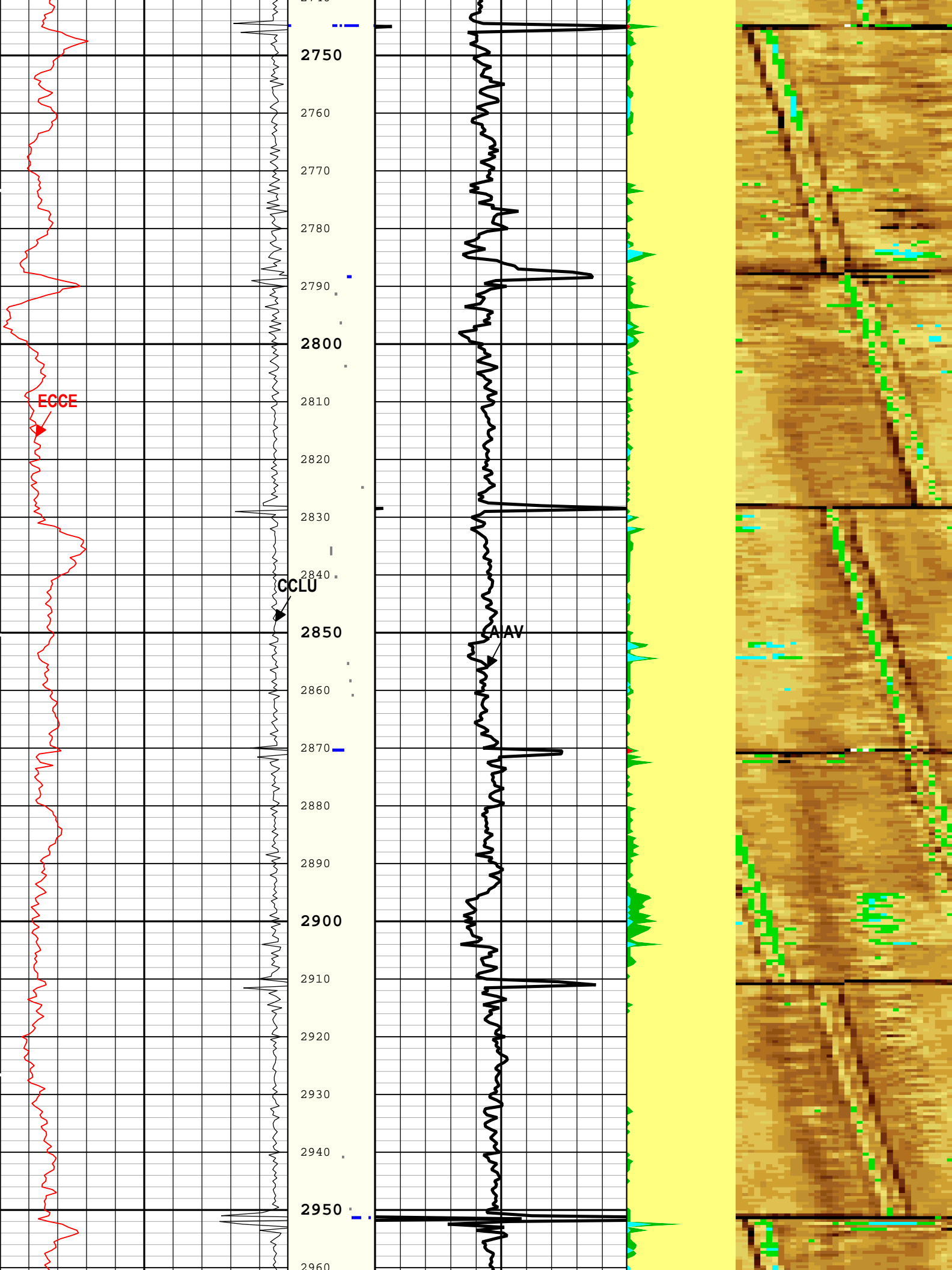


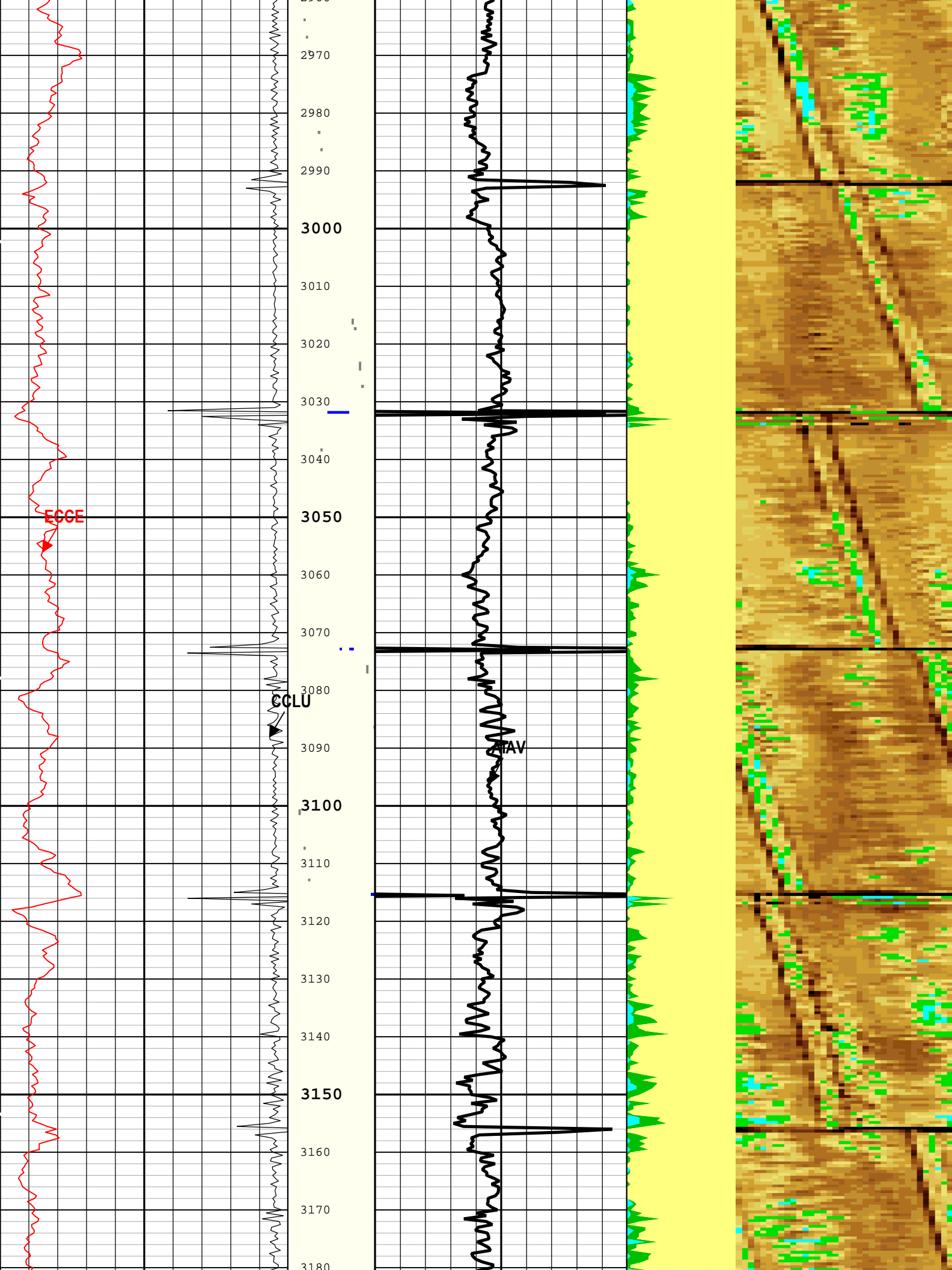


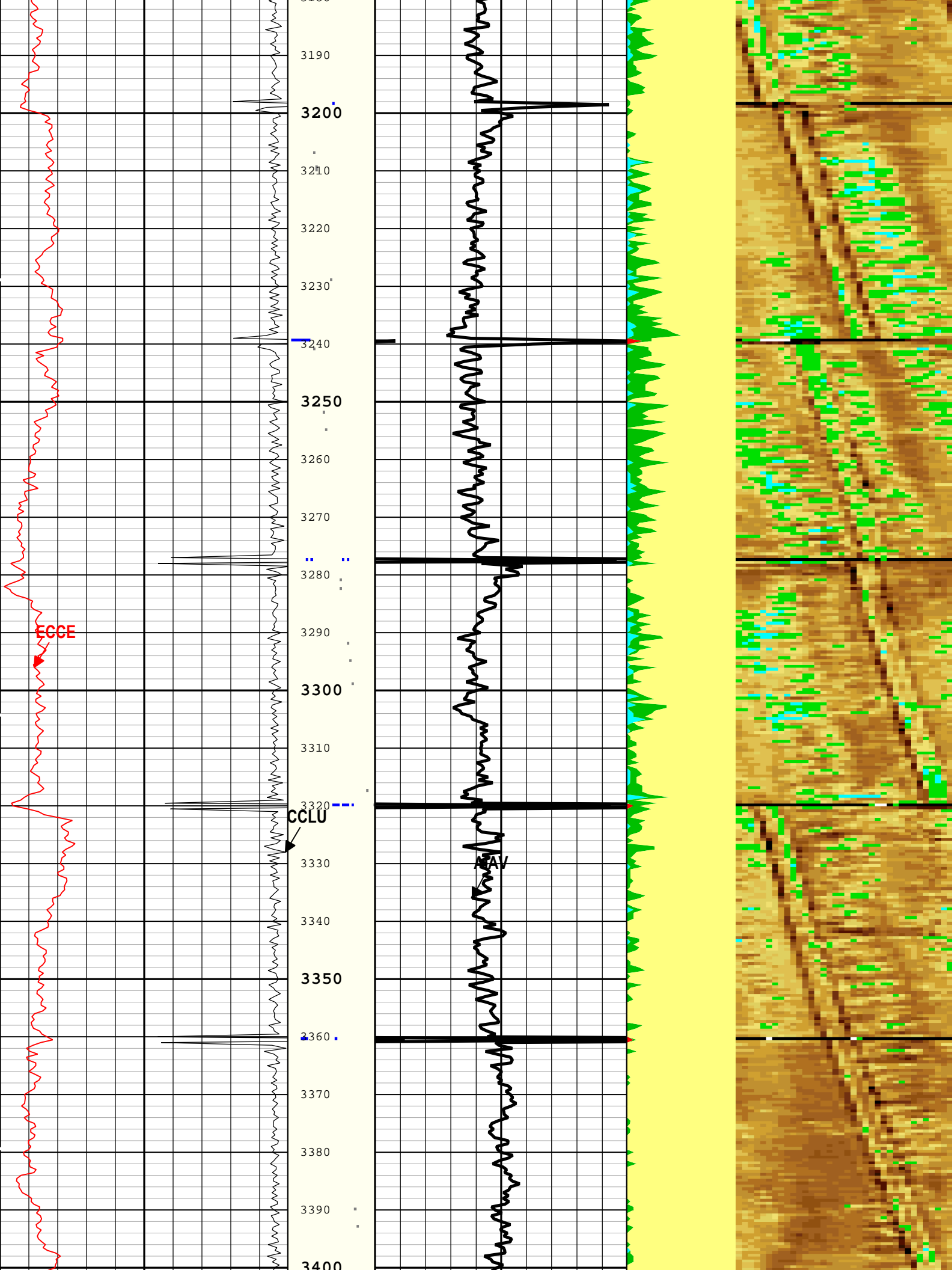


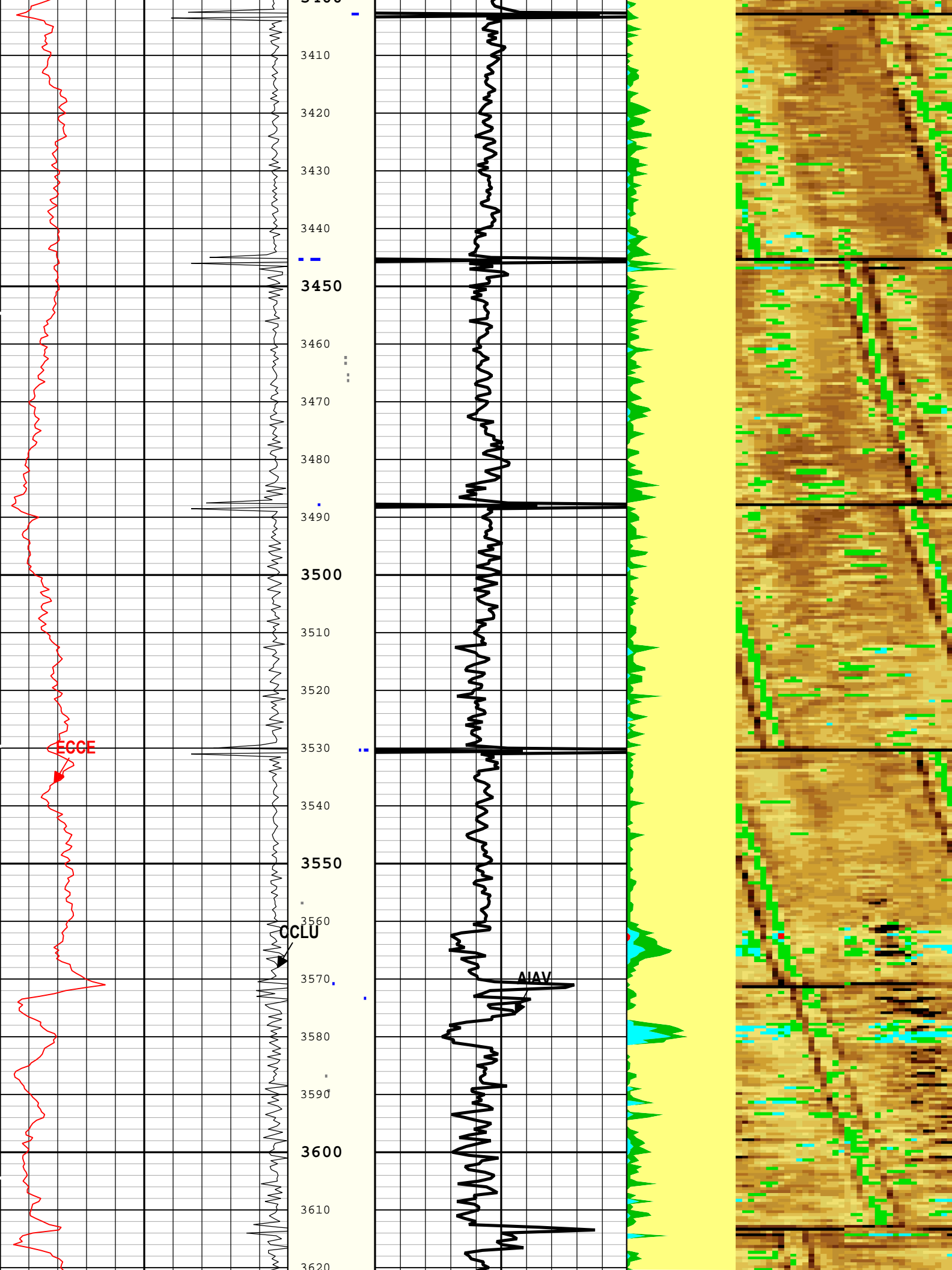


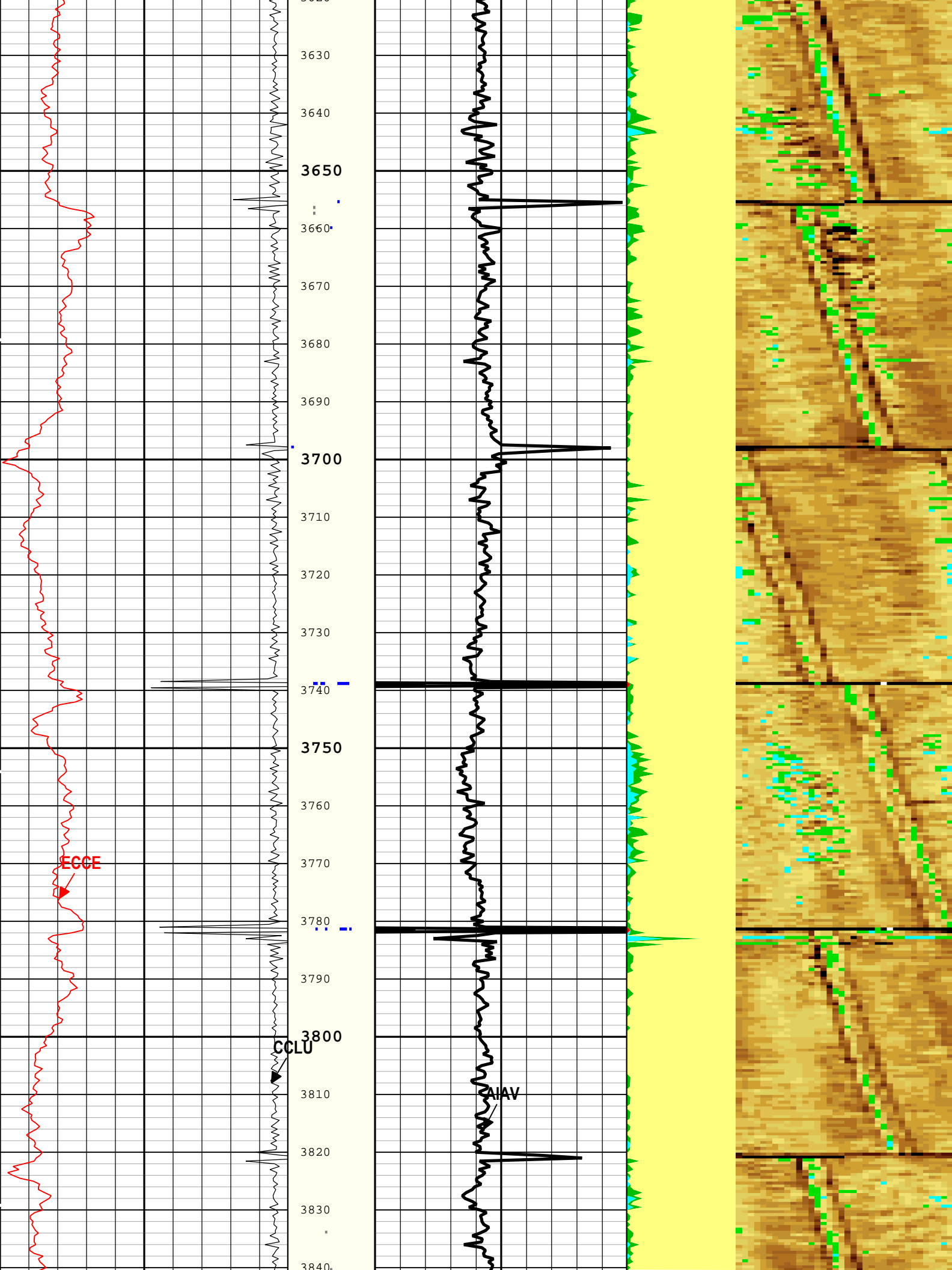


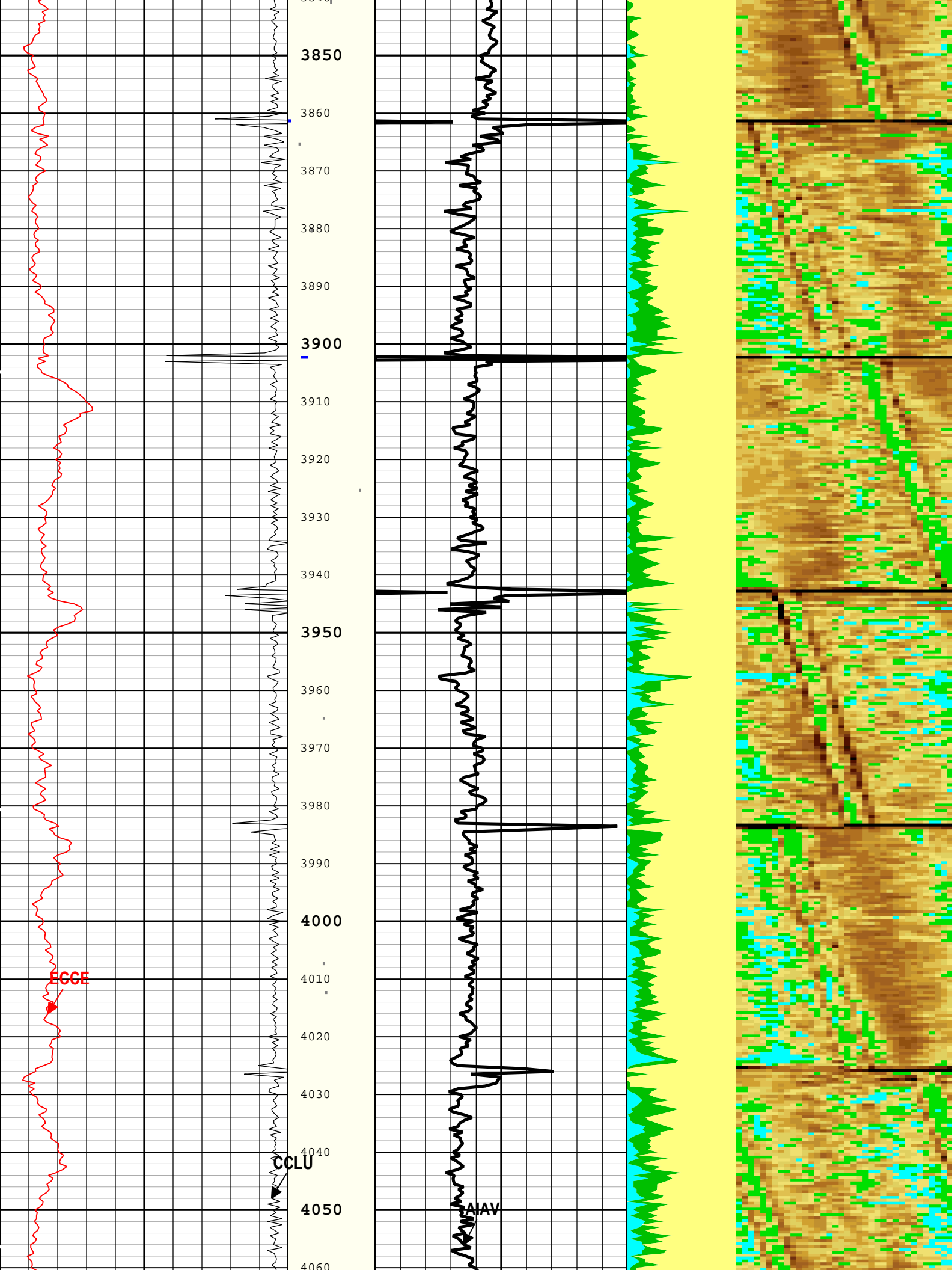


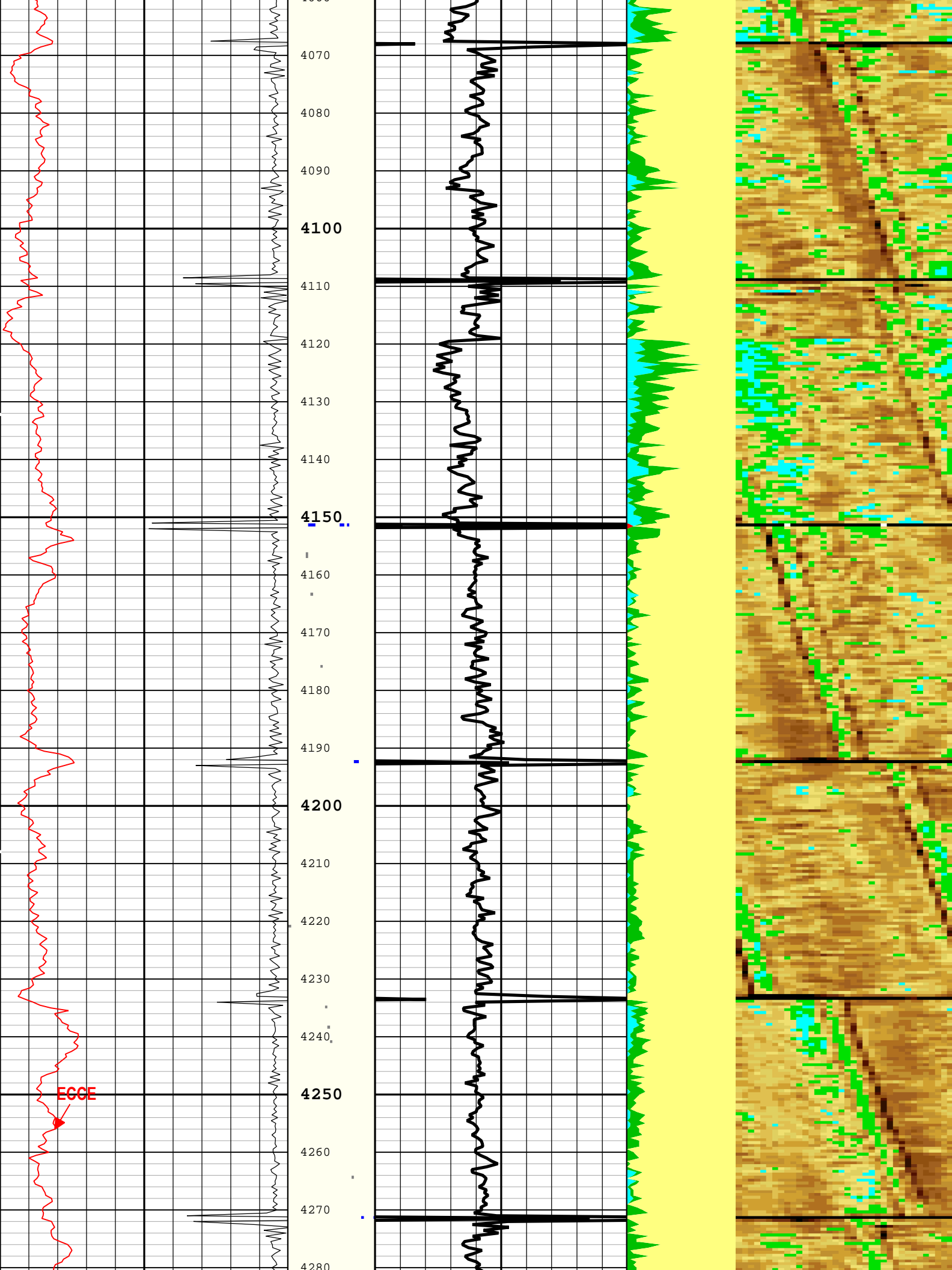


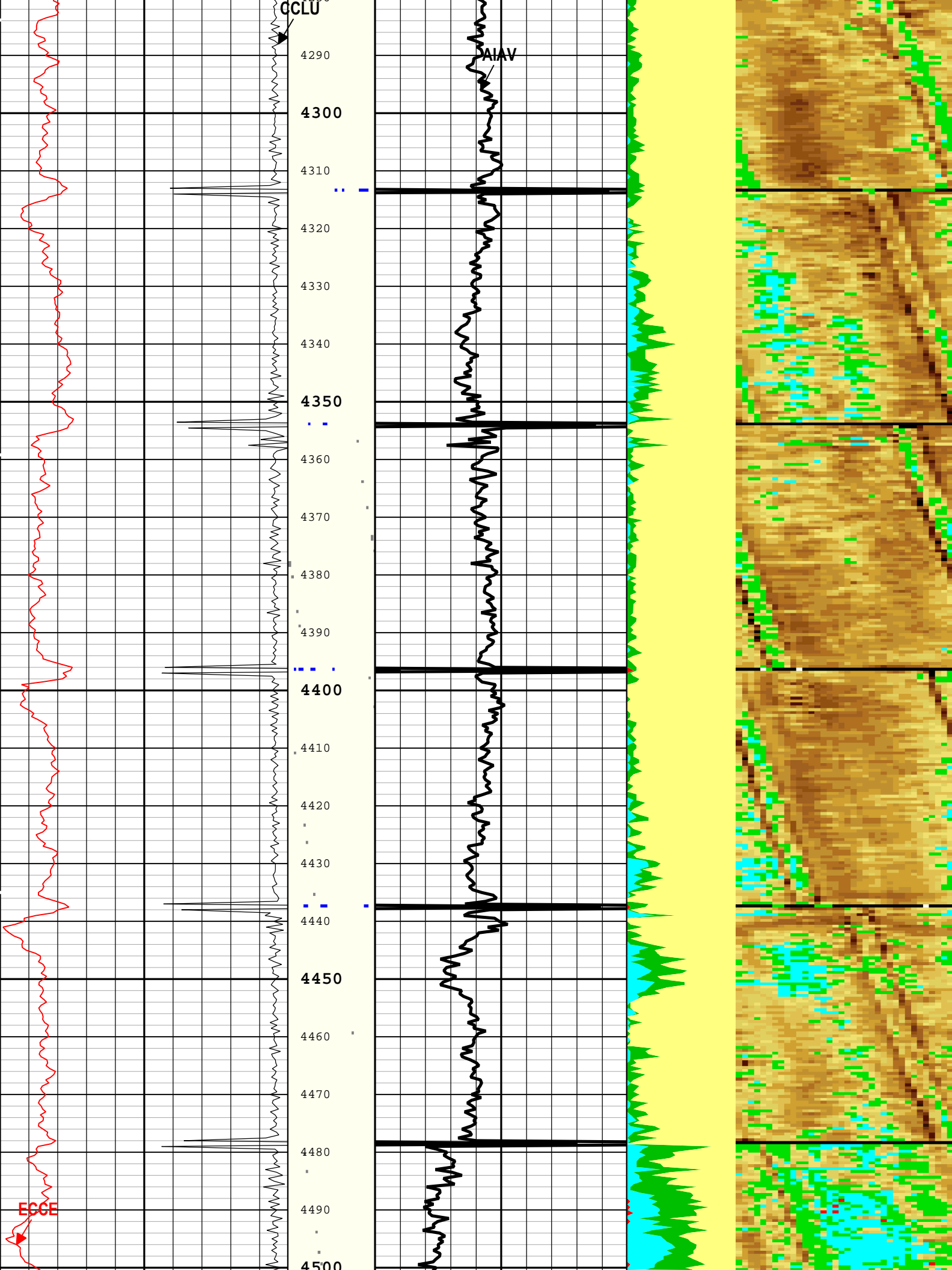


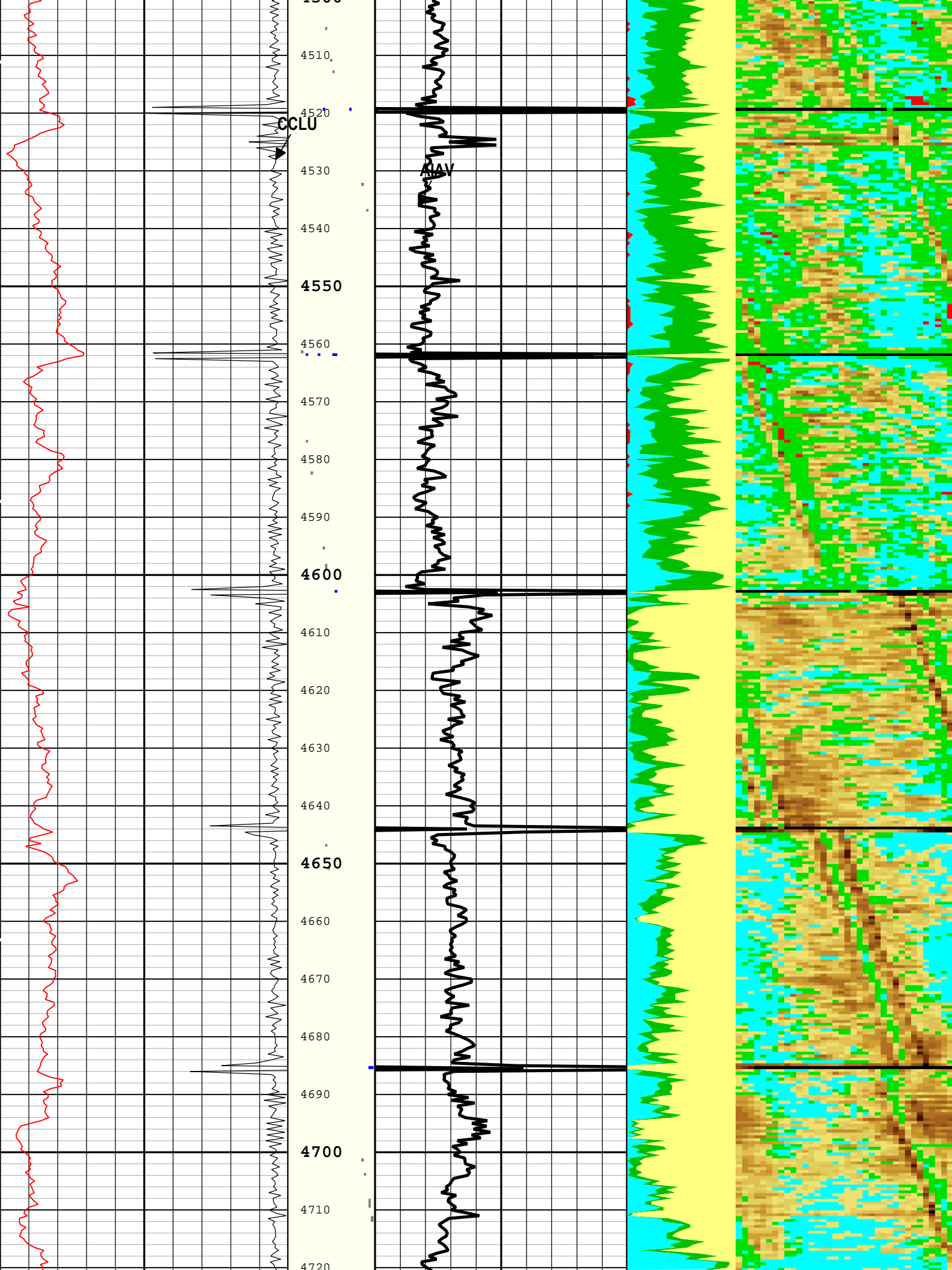


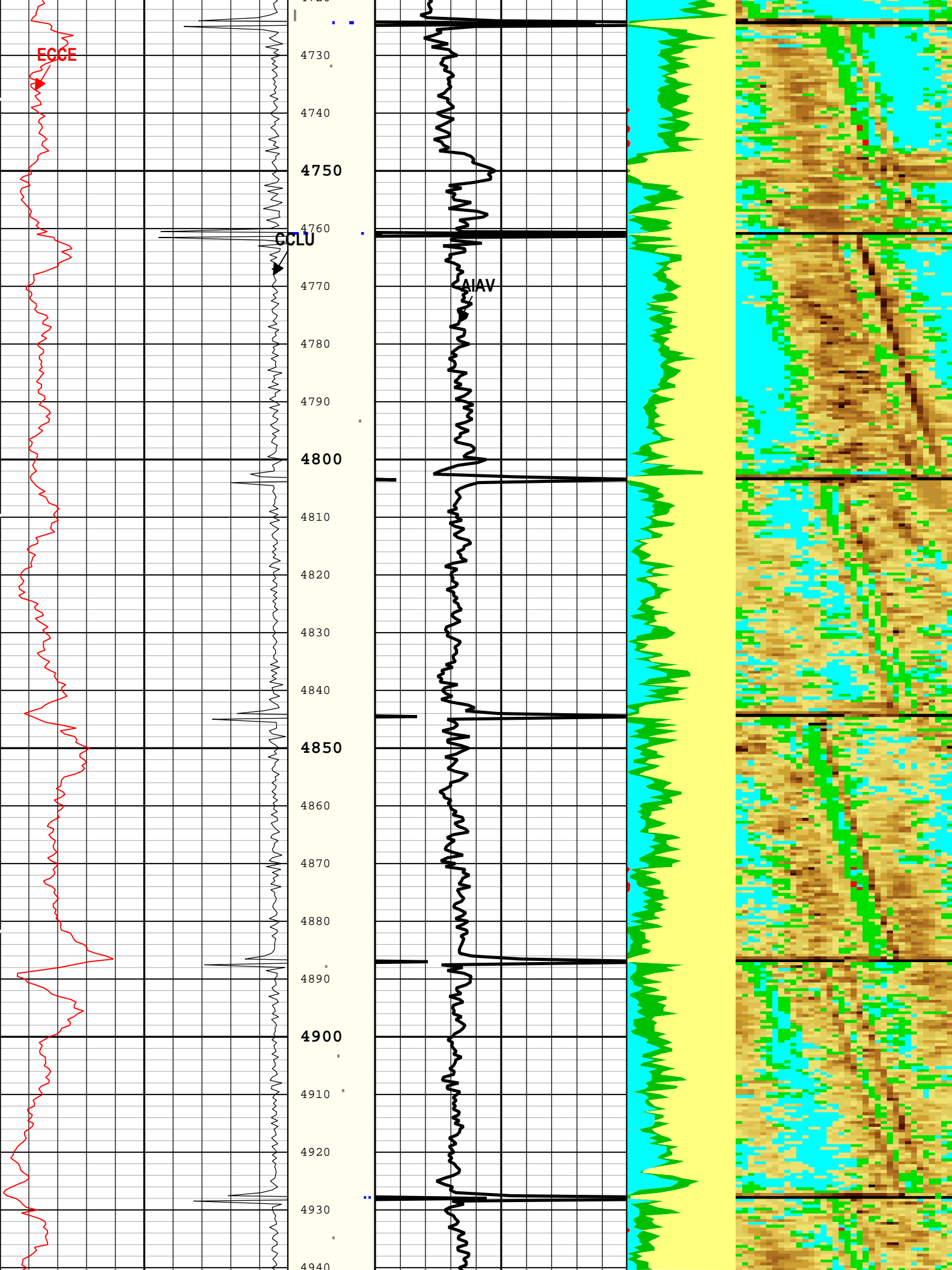


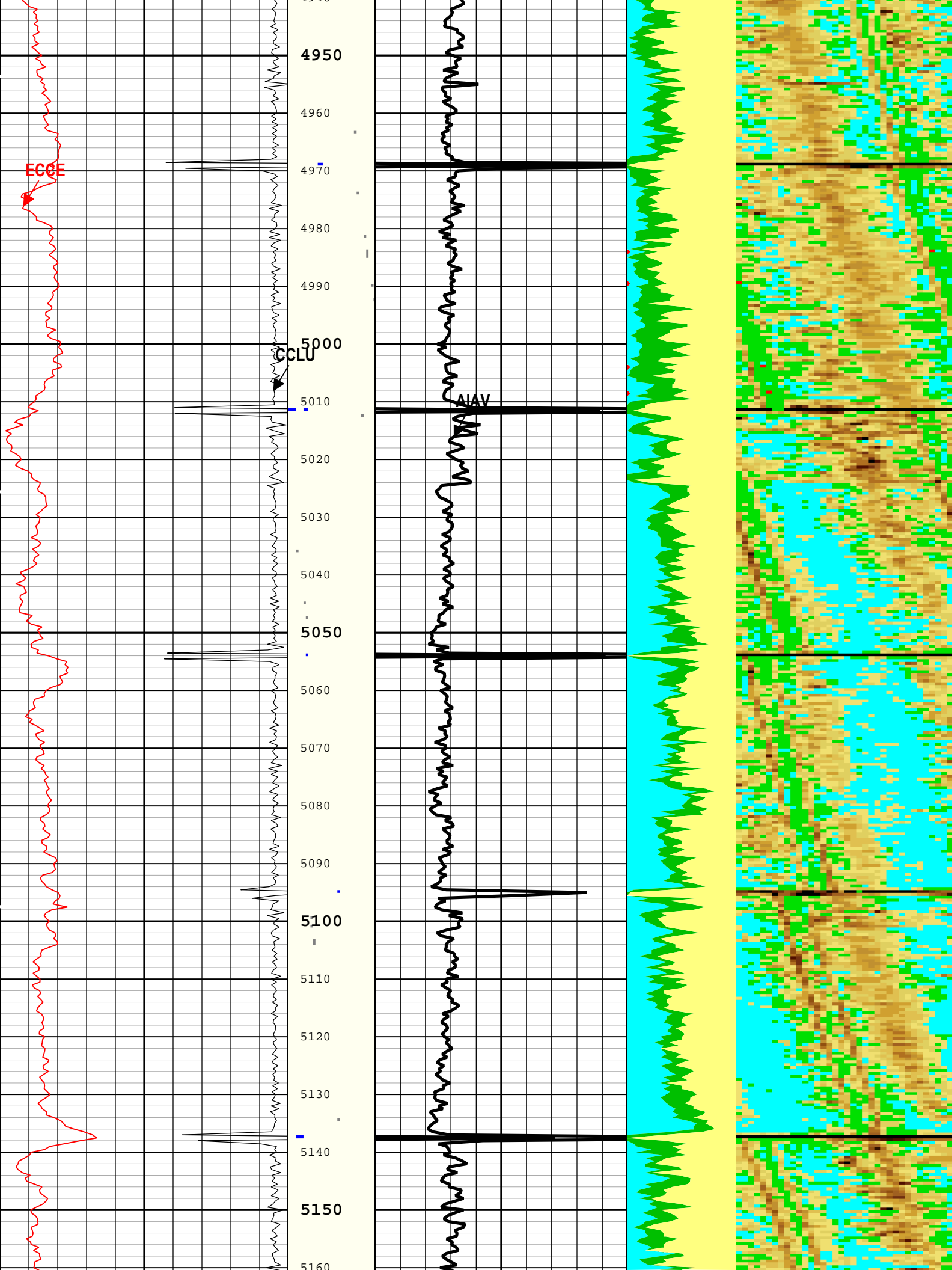


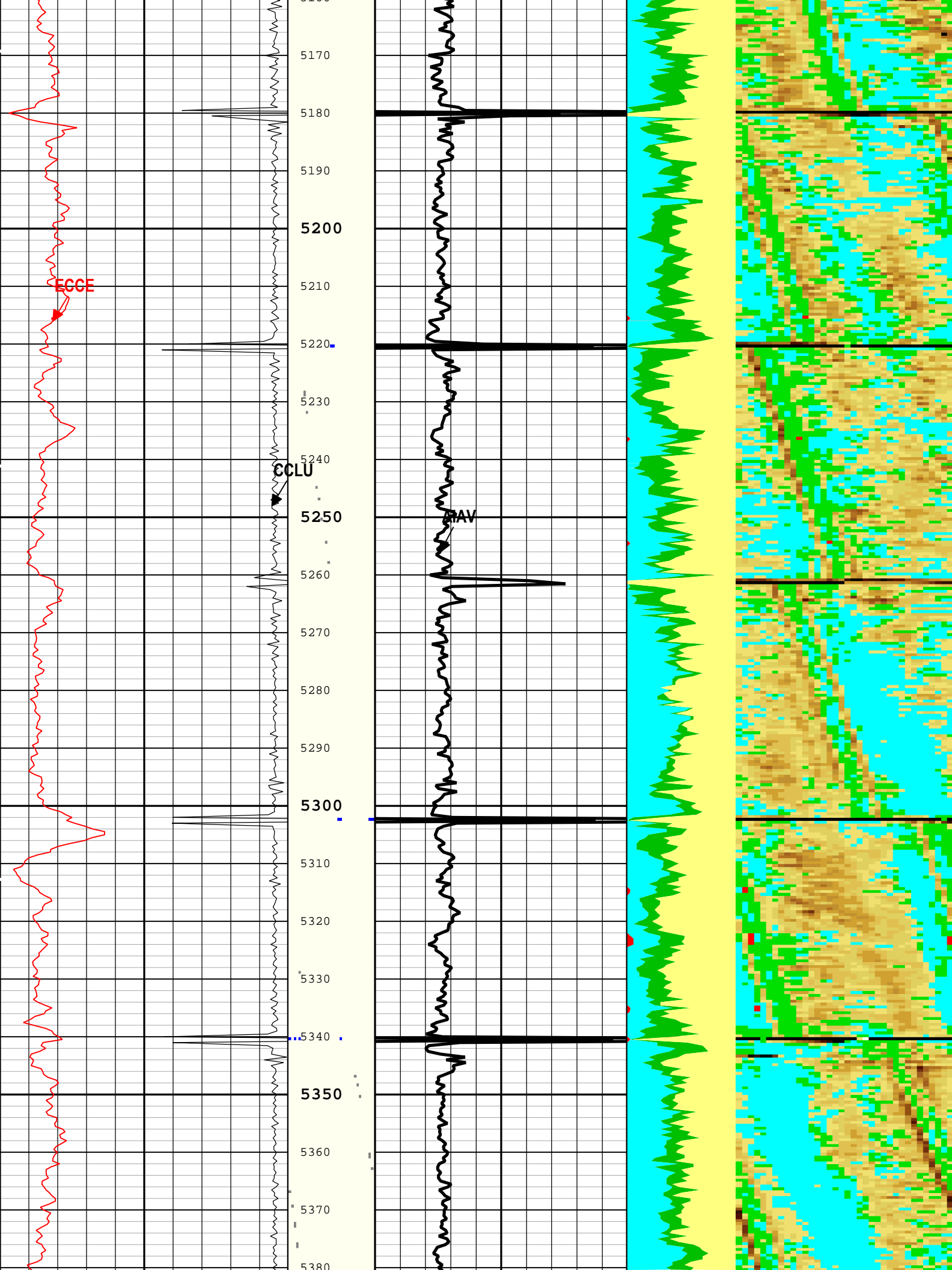


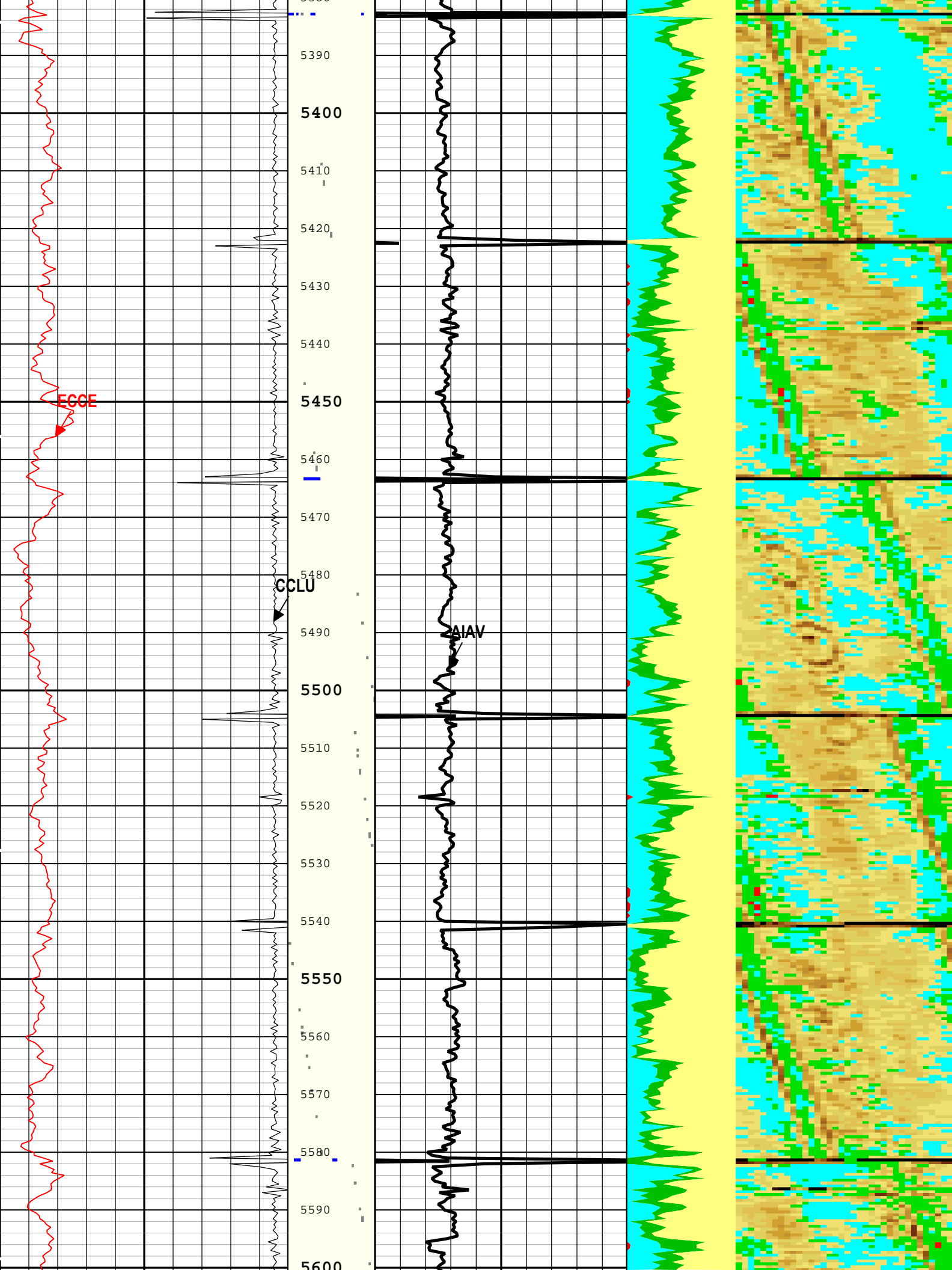


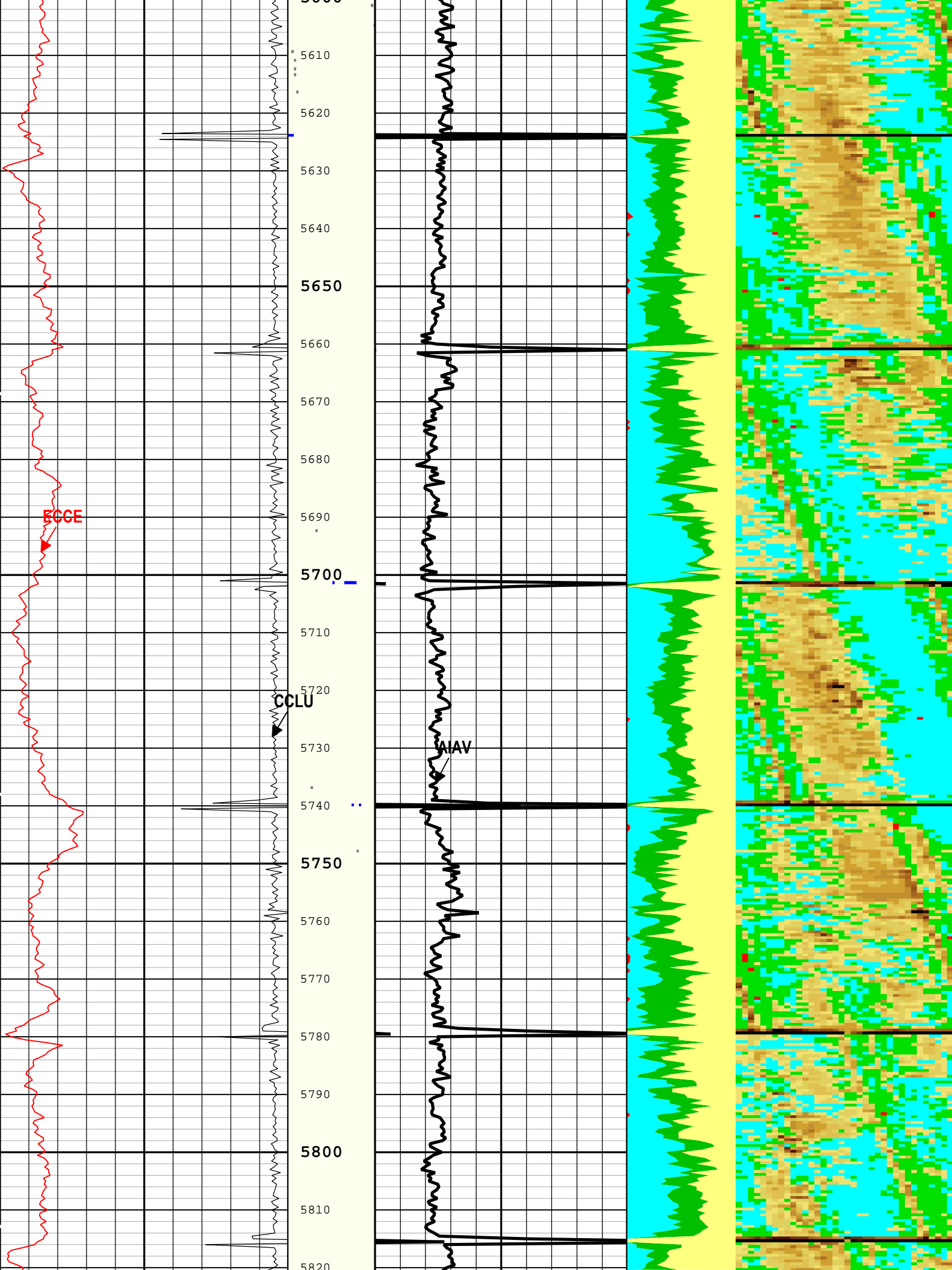


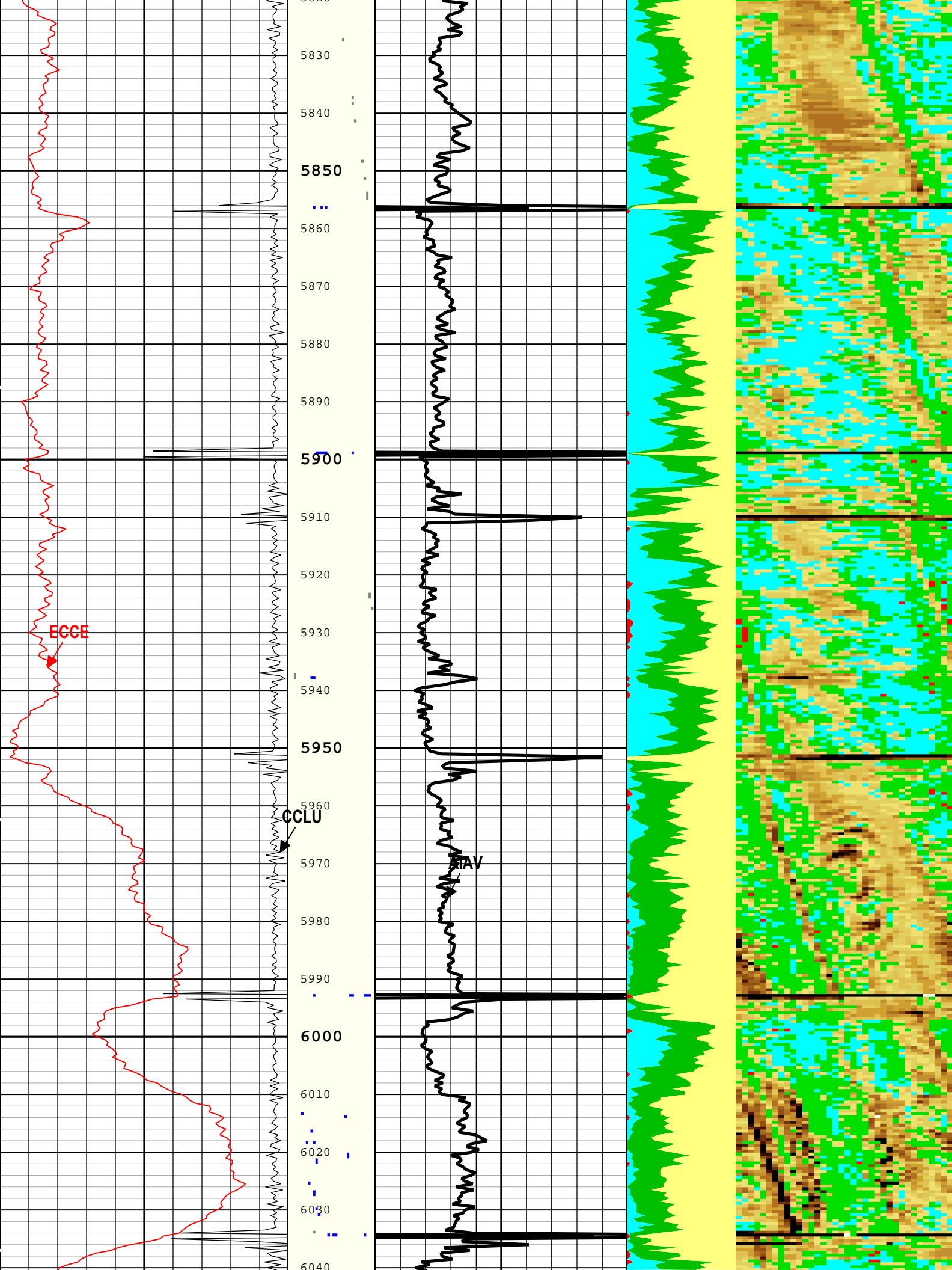


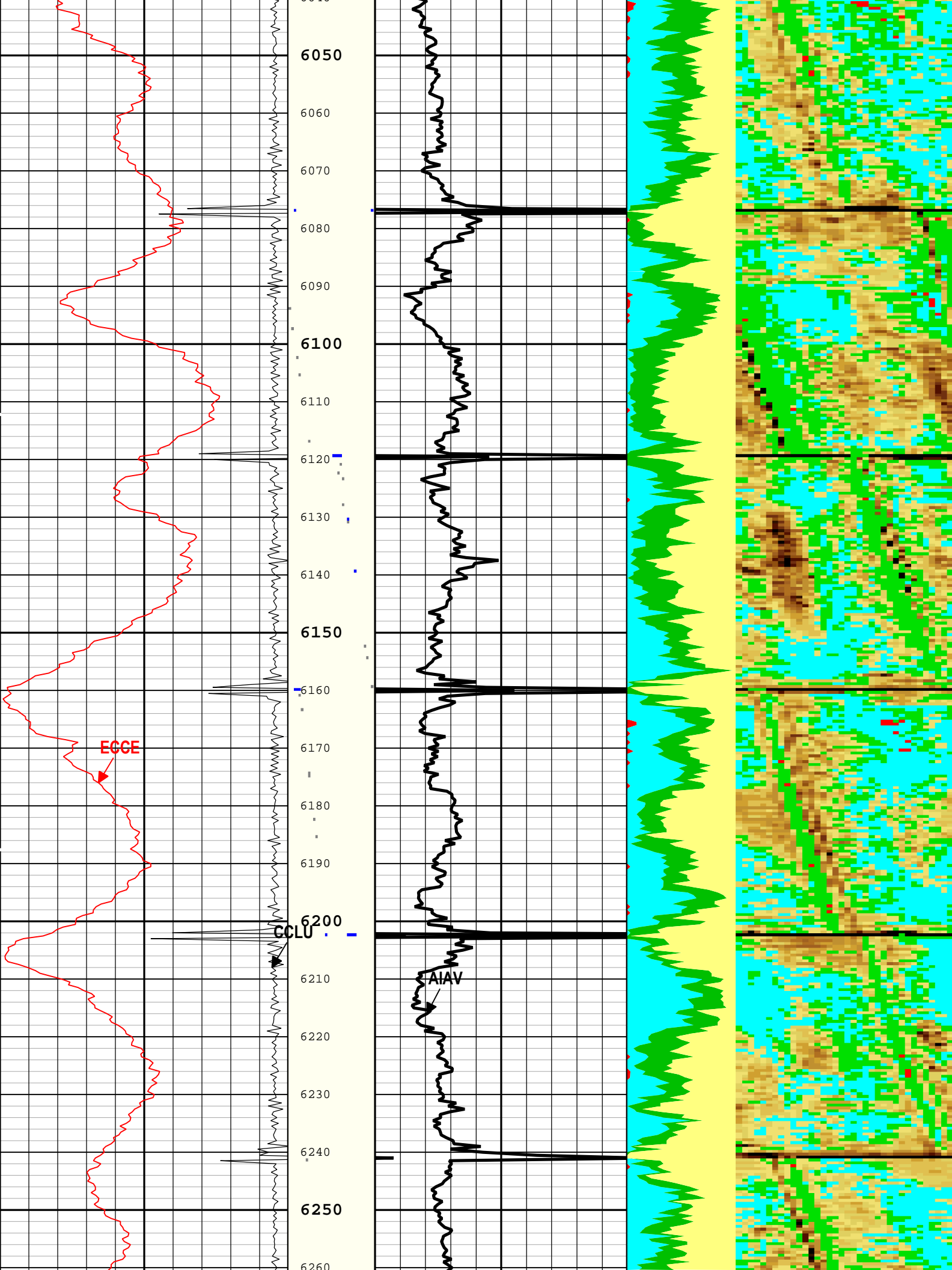


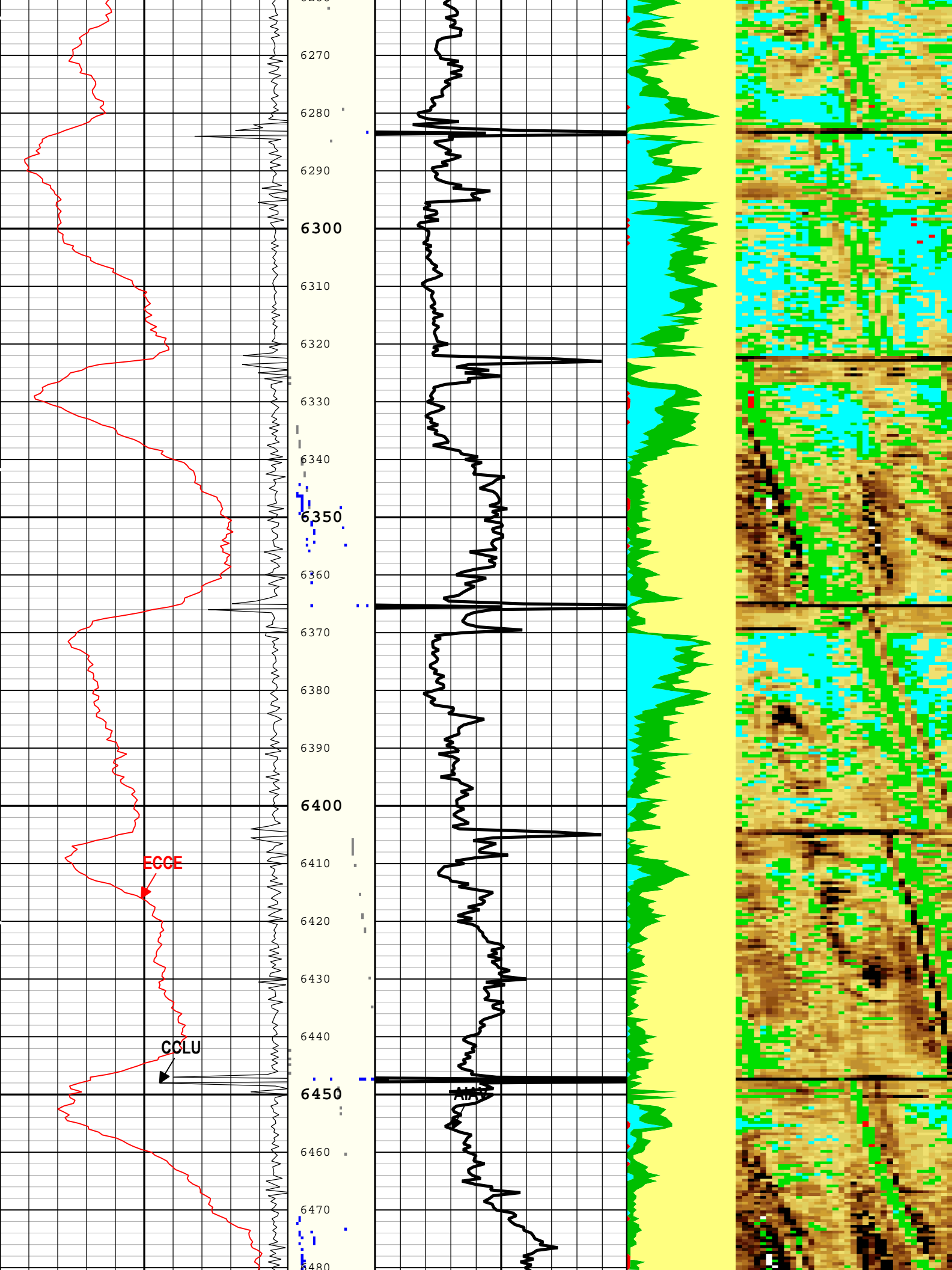


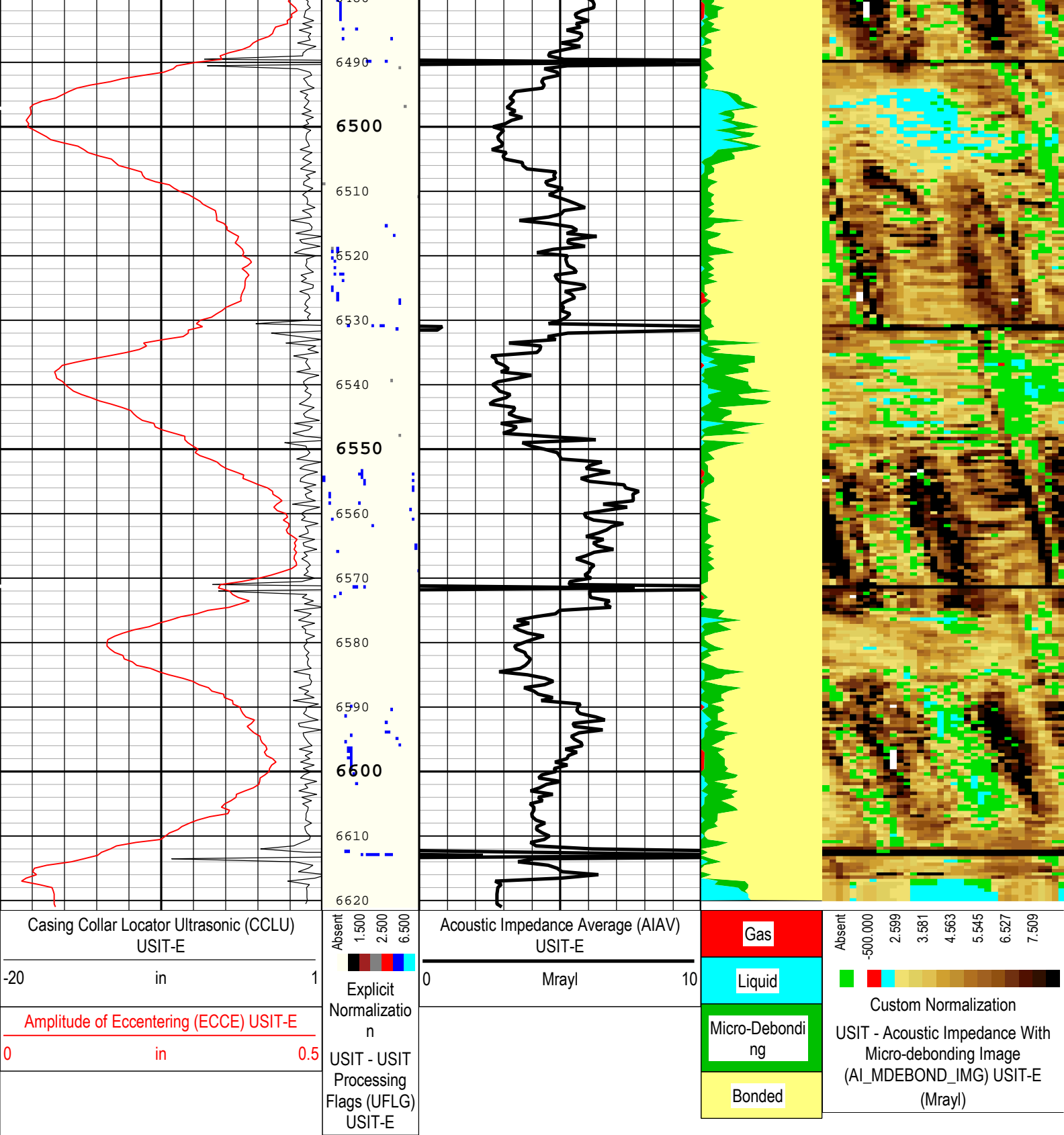












TIME_1900 - Time Marked every 60.00 (s)

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: 16-Jun-2016 14:23:13

Channel Processing Parameters

USI: 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	8.4	lbm/gal

DFT	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	190	us/ft
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
HEMA	Hematite Presence Flag	Borehole	No	
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	1.16	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.05	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.75	Mrayl
UFGDE	Fiberglass Density	USIT-E	16.27	lbm/gal
UFGPS	Fiberglass Processing Selection	USIT-E	No	
UFGVL	Fiberglass Velocity	USIT-E	9678.48	ft/s
USI_FSOD	USIT USI Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF	
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	1.8	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	16	70	110
BS	13.5	110	1927
BS	8.5	1927	6621.5

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	18	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
EMXV	EMEX Voltage	USIT-E	55	V
HRES	Horizontal Resolution	USIT-E	10 deg	
TMUC	Type of Mud	USIT-E	BRI	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UMFR	Modulation Frequency	USIT-E	333333	Hz
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 6.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	5000	ft
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	27.85	16-Jun-2016 11:59:06	16-Jun-2016 12:02:04	6622.08	6565.69
WINB	26	16-Jun-2016 12:02:04	16-Jun-2016 12:02:15	6565.69	6554.15
WINB	25	16-Jun-2016 12:02:15	16-Jun-2016 13:31:40	6554.15	69.59

WINE	67.85	16-Jun-2016 11:59:06	16-Jun-2016 12:01:37	6622.08	6592.62
WINE	75	16-Jun-2016 12:01:37	16-Jun-2016 13:31:40	6592.62	69.59
All depth are at tool zero.					

USI

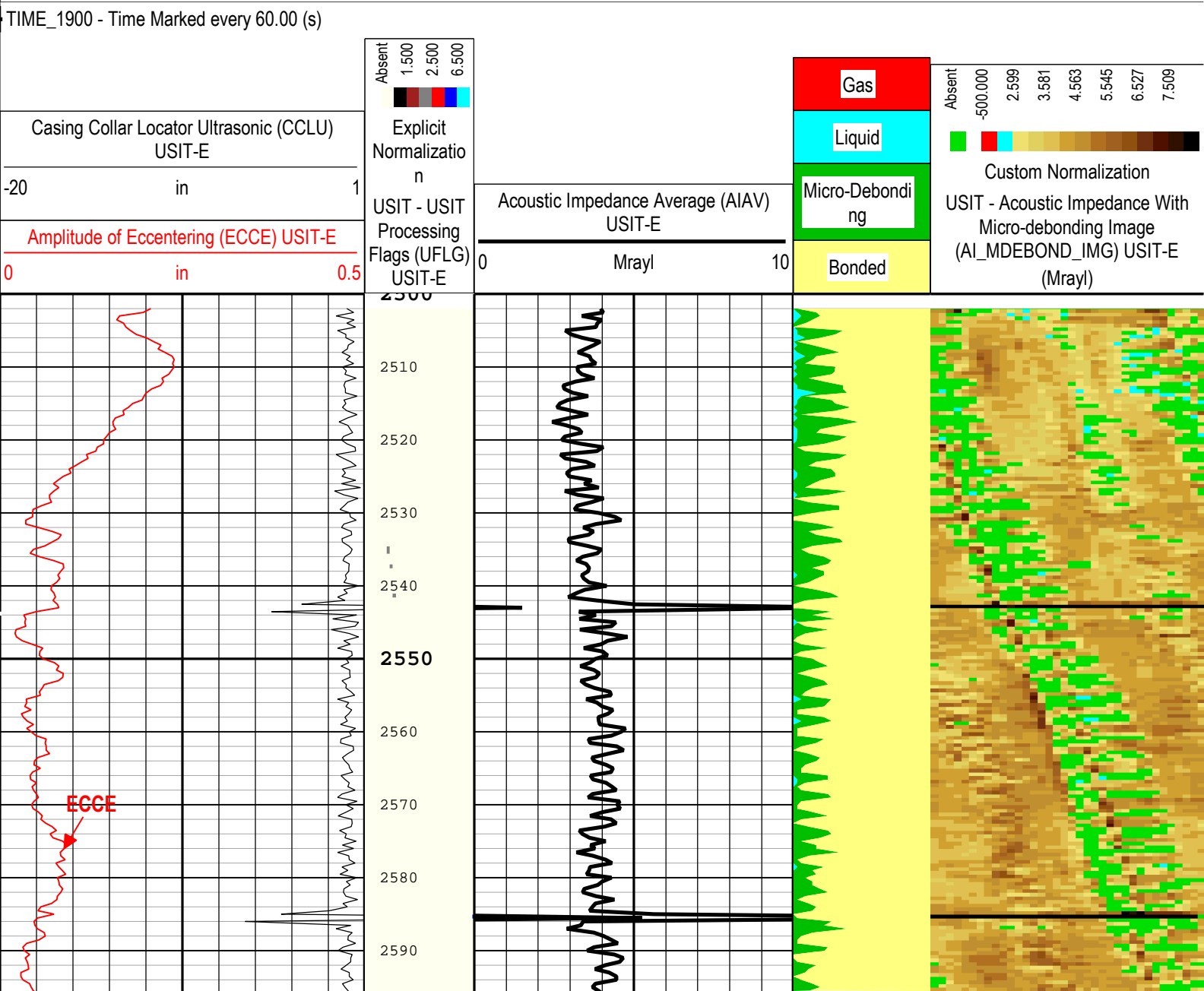
0 PSI Repeat Pass

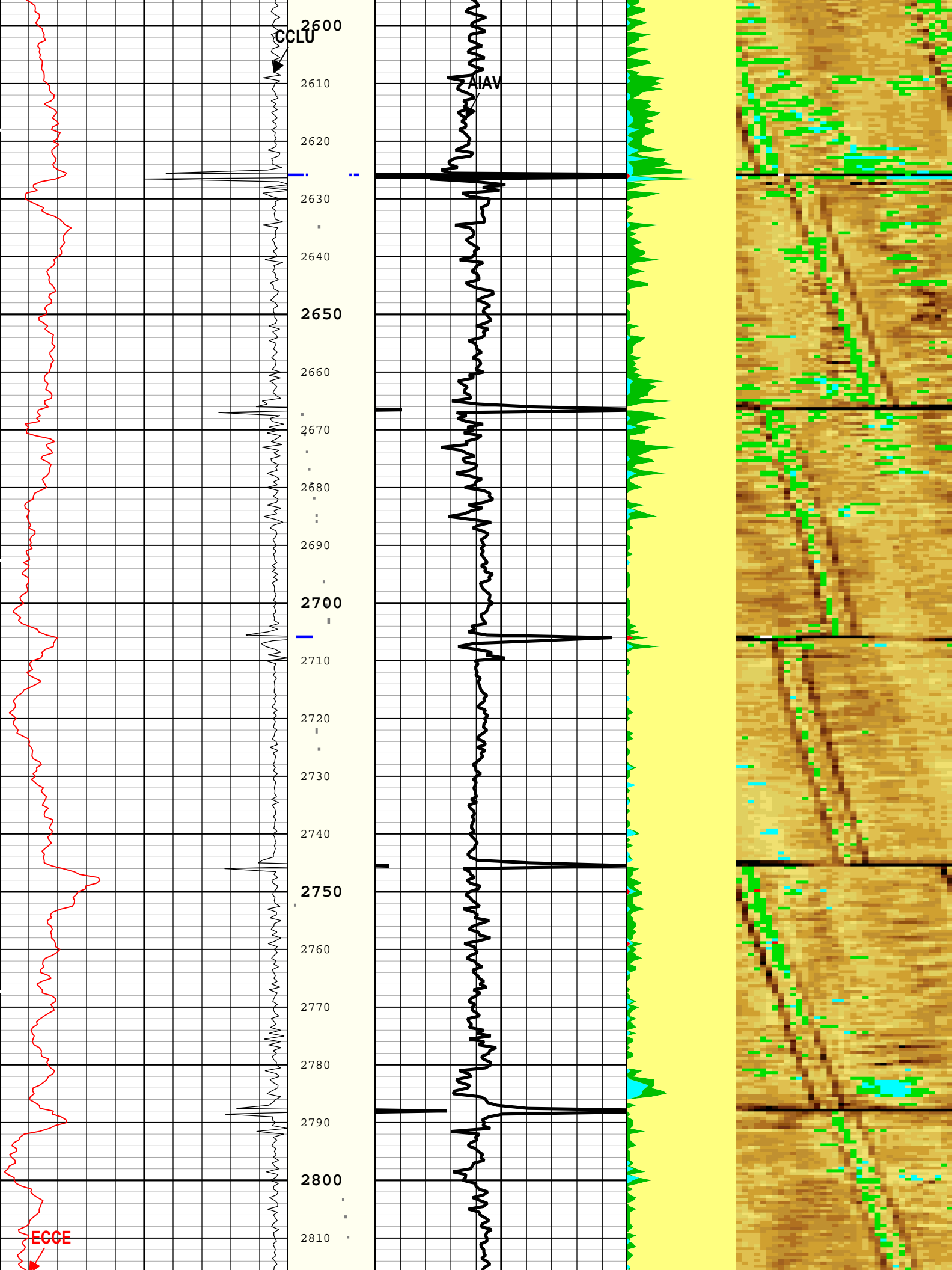
Software Version	
Acquisition System	Version
Maxwell 2016 SP2	6.2.64464.3100

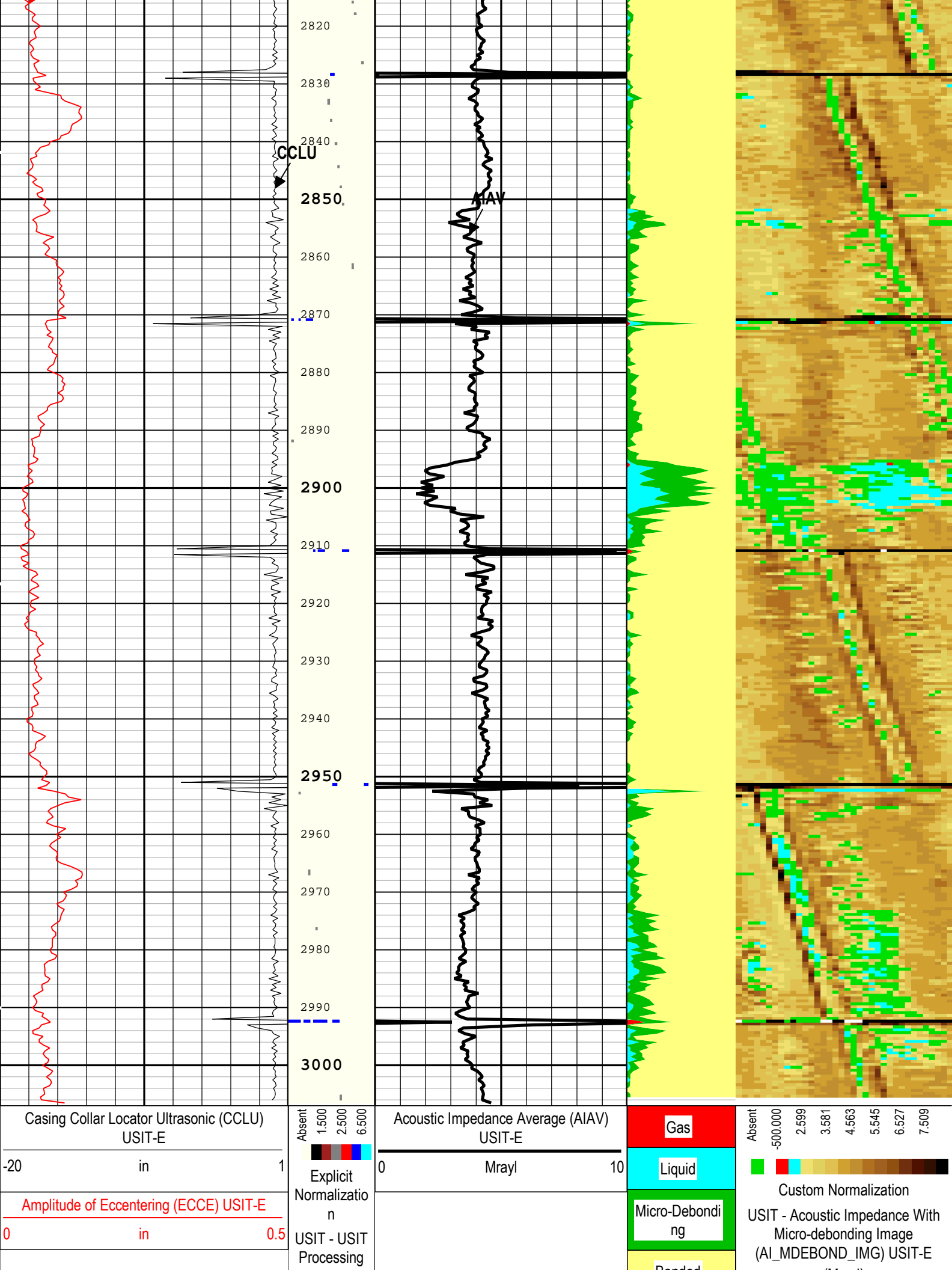
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
USI	Log[4]:Up	Up	2502.15 ft	3007.54 ft	16-Jun-2016 1:50:32 PM	16-Jun-2016 1:57:33 PM	ON	3.58 ft	No
All depths are referenced to toolstring zero									

Log	Company:Noble Energy Inc	Well:Shadow A26-637
		USI: Log[4]:Up:S006

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: 16-Jun-2016 14:23:20







Flags (UFLG)
USIT-E

Bonded

(Mrayl)

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: 16-Jun-2016 14:23:20

Channel Processing Parameters

USI: Parameters

Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BS	Bit Size	WLSESSION	8.5	in
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	190	us/ft
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
HEMA	Hematite Presence Flag	Borehole	No	
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
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MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.05	
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UFGPS	Fiberglass Processing Selection	USIT-E	No	
UFGVL	Fiberglass Velocity	USIT-E	9678.48	ft/s
USI_FSOD	USIT USI Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF	
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-E	Automatic	
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	FreePipe Norm.	
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TMUC	Type of Mud	USIT-E	BRI	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UMFR	Modulation Frequency	USIT-E	333333	Hz
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
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USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	5000	ft
WINB	Window Begin Time	USIT-E	25	us
WINE	Window End Time	USIT-E	75	us

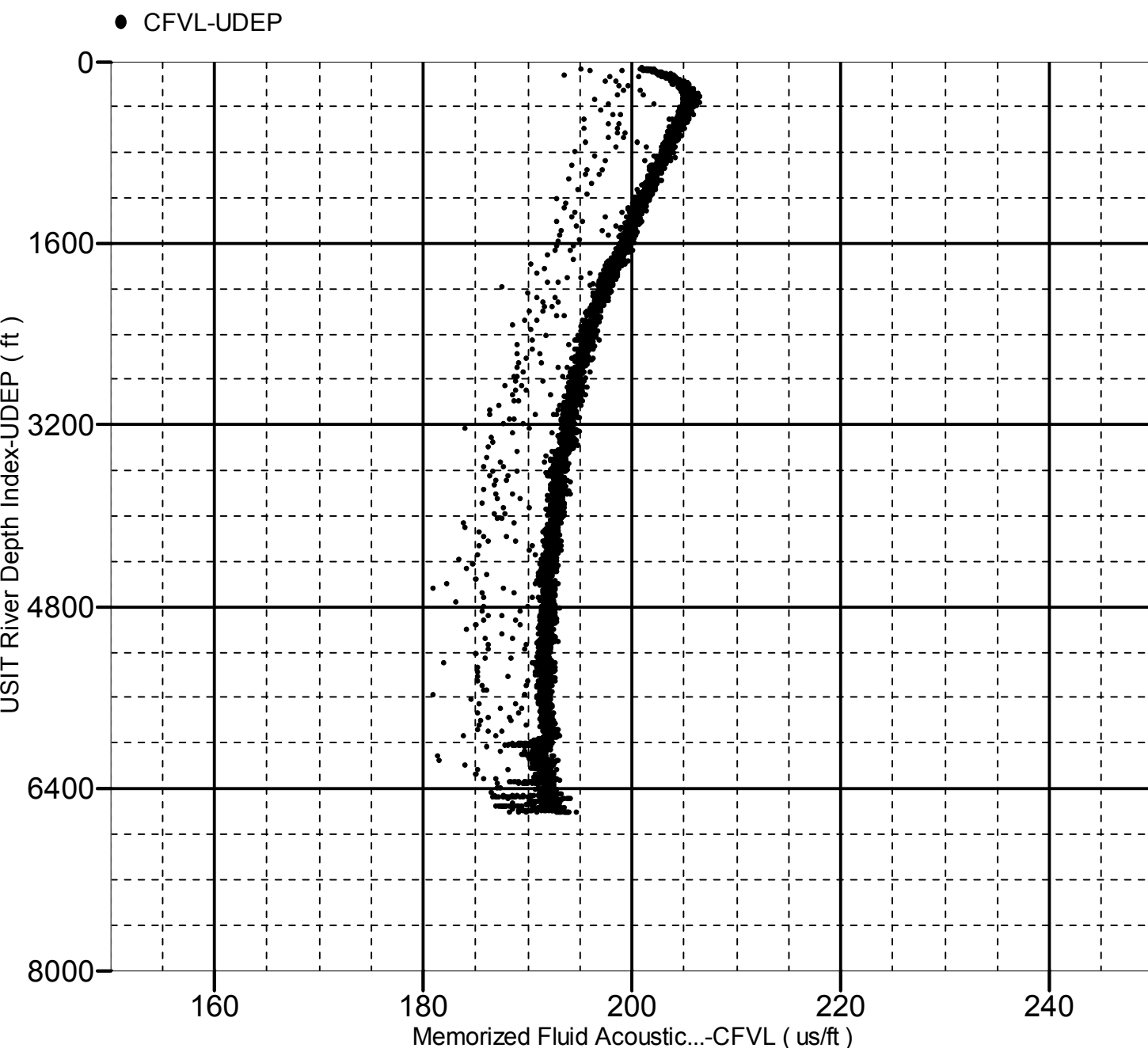
12/5

Company:Noble Energy Inc Well:Shadow A26-637

Fluid Acoustic Slowness vs Depth

2D Cross Plot

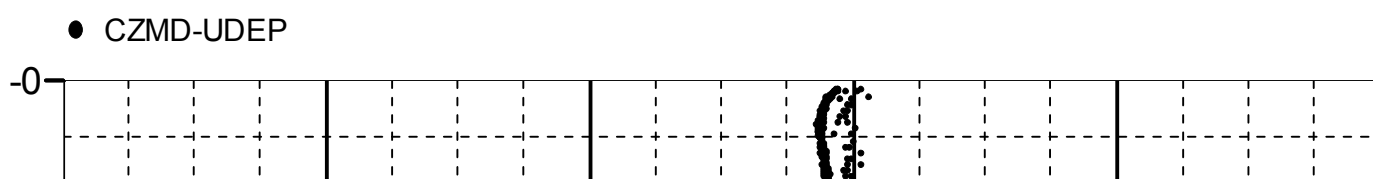
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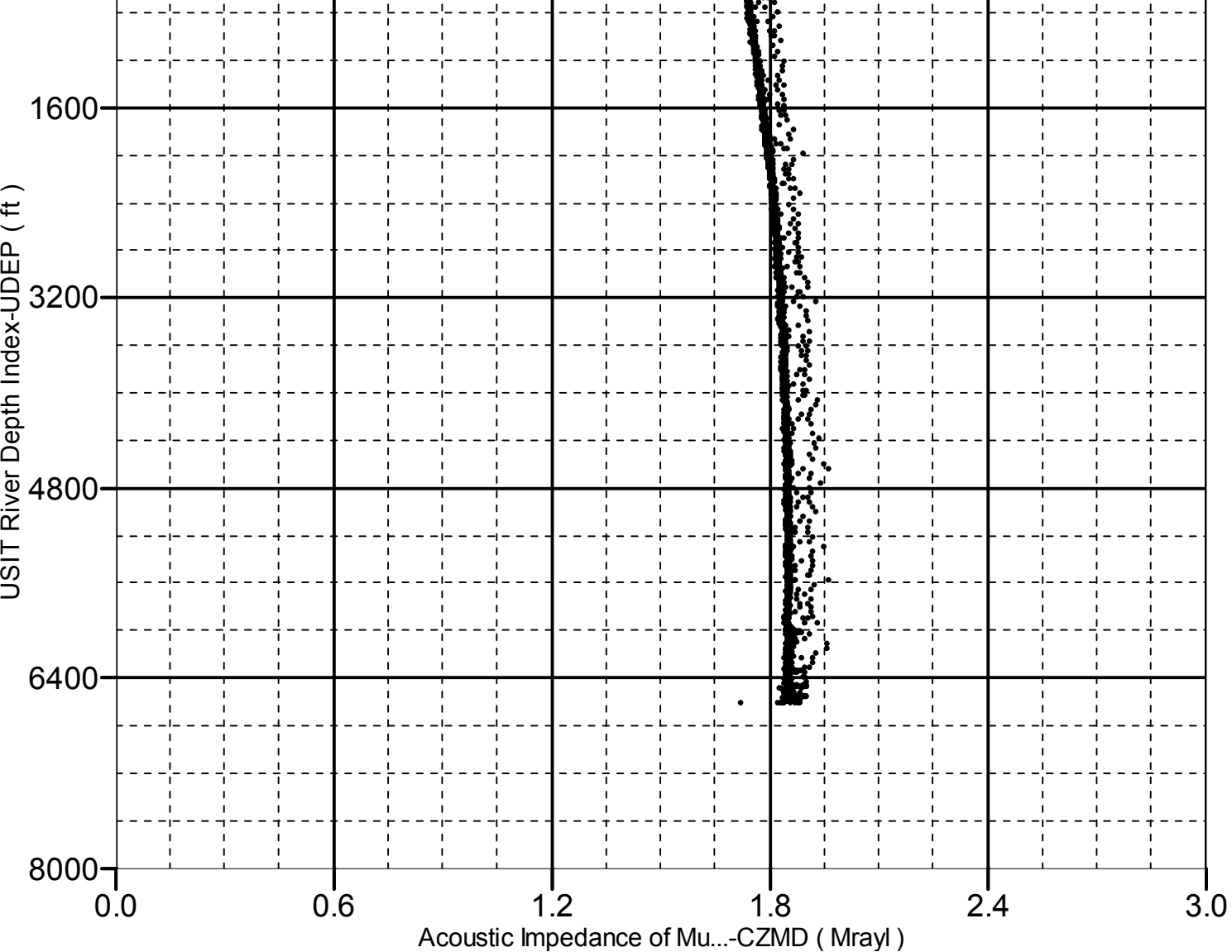


Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6621.50 to 69.50 ft





Company: Noble Energy Inc

Schlumberger

Well: Shadow A26-637

Field: Wattenberg

County: Weld

Country: US

UltraSonic Summary Print

