

Company: Noble Energy Inc.

Well: Shadow A26-663

Field: Wattenberg

County: Weld State: Colorado

UltraSonic Summary Print

County: Weld  
Field: Wattenberg  
Location: SWNE Sec 30 T6 R63W  
Well: Shadow A26-663  
Company: Noble Energy Inc.

Location:		SWNE Sec 30 T6 R63W 2261 FNL 2335 FEL Latitude: 40.45856 Longitude: -104.47861	Elev.: K.B. 4680.00 ft G.L. 4650.00 ft D.F. 4679.00 ft
Permanent Datum:	Ground Level	Kelly Bushing	Elev.: 30.00 ft
Log Measured From:	Kelly Bushing		
Drilling Measured From:	Kelly Bushing		
API Serial No.	Section:	Township:	Range:
05-123-42885	30	6N	63W

Logging Date 29-Jun-2016

Run Number One

Depth Driller 17466.00 ft

Schlumberger Depth 17466.00 ft

Bottom Log Interval 6650.00 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 1928.00 ft

To 17466.00 ft

Casing/Tubing Size 5.5 in

Weight 20 lbm/ft

Grade P110

From 30.00 ft

To 17450.90 ft

Max Recorded Temperatures 220 degF

Logger on Bottom 29-Jun-2016 08:05:00

Unit Number 2161 Location: Fort Morgan

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.

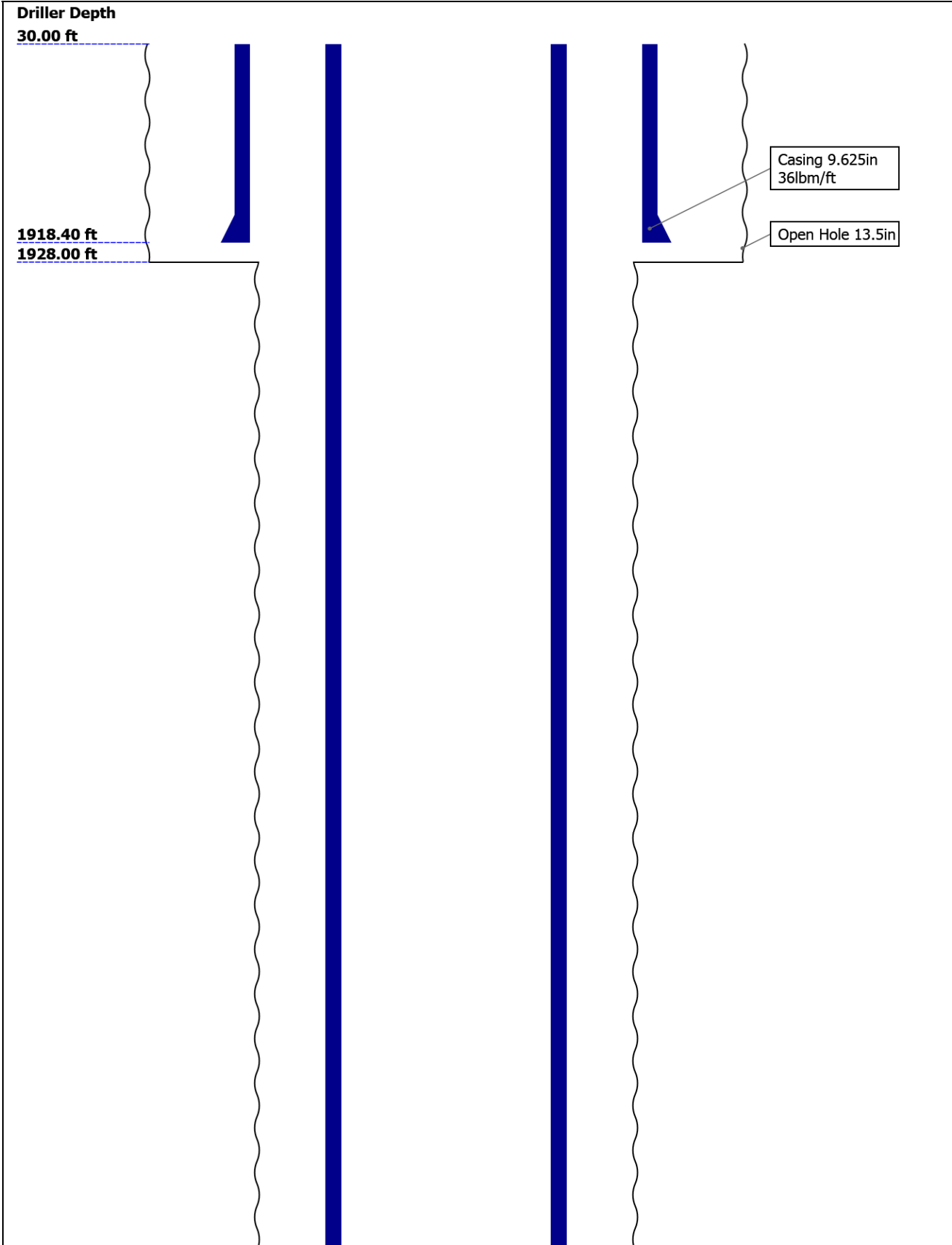
Contents

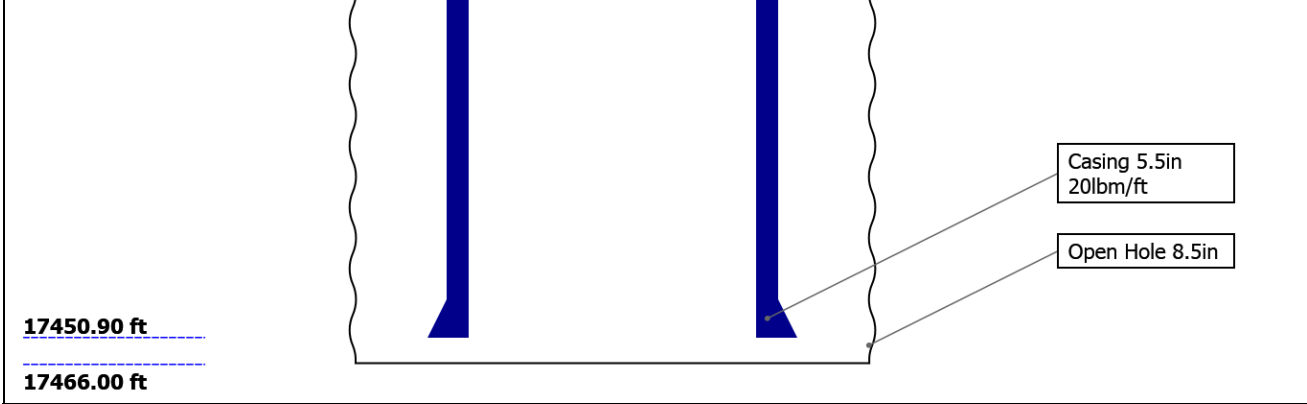
- Header
- Disclaimer
- Contents
- Well Sketch
- Borehole Size/Casing/Tubing Record
- Remarks and Equipment Summary
- Depth Summary
- USI Fluid Properties Measurement\_1
- One 2500 PSI Main Pass
  - Integration Summary
  - Software Version
  - Composite Summary
  - Log ( DJ Basin Ultrasonic Cement Summary Report )
  - Parameter Listing
- One 0 PSI Repeat Pass
  - Integration Summary

- in )  
13. Tail

- 10.2 Software Version
- 10.3 Composite Summary
- 10.4 Log ( DJ Basin Ultrasonic Cement Summary Report )
- 10.5 Parameter Listing
- 11. XYZ ( USI Fluid Acoustic Slowness vs Depth 3.0 in )
- 12. XYZ ( USI Acoustic Impedance of Mud vs Depth 3.0

Well Sketch



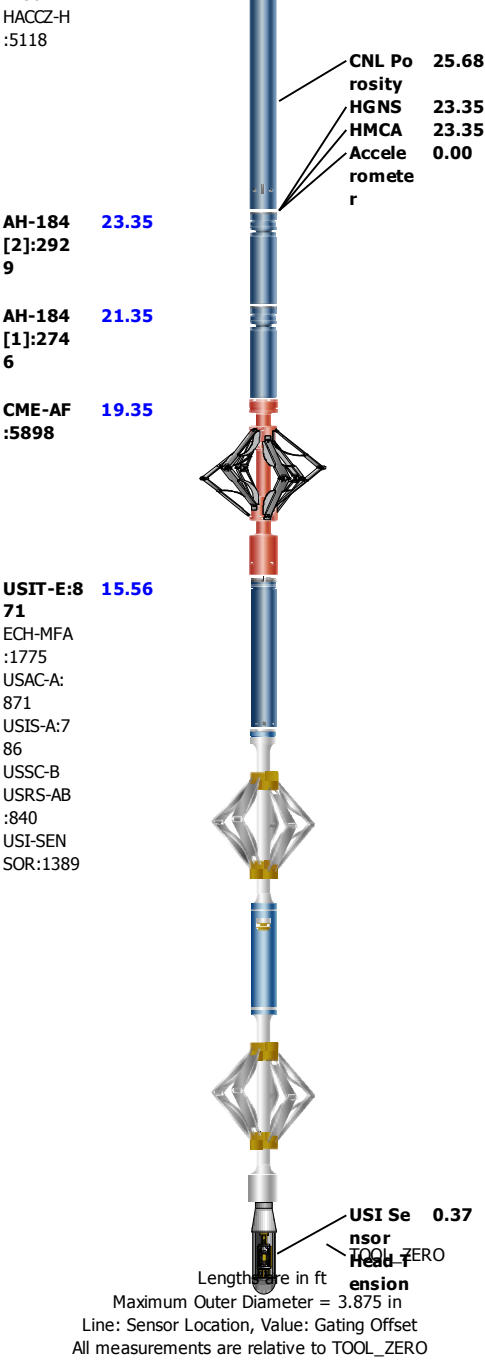


Borehole Size/Casing/Tubing Record

Bit						
Bit Size ( in )	13.5	8.5				
Top Driller ( ft )	30	1928				
Top Logger ( ft )	30	1928				
Bottom Driller ( ft )	1928	17466				
Bottom Logger ( ft )	1928	17466				
Casing						
Size ( in )	9.625	5.5				
Weight ( lbm/ft )	36	20				
Inner Diameter ( in )	8.921	4.778				
Grade	N/A	P110				
Top Driller ( ft )	30	30				
Top Logger ( ft )	30	30				
Bottom Driller ( ft )	1918.4	17450.9				
Bottom Logger ( ft )	1918.4	17450.9				

Remarks and Equipment Summary

One: Toolstring			One: Remarks		
<div><div>Equip nameLengthMP nameOffset</div><div>LEH-QT43.53LEH-QT</div><div>SAH-F40.61</div><div>1817</div><div><div>DTC-H:835.76803</div><div>ECH-KC:10354</div><div>DTC-H:8803</div><div>HGNS-H4736</div><div>HGNH:2987</div><div>NPV-N</div><div>NSR-F:5069</div><div>HMCA-H</div><div>HGNS-H:4736</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 well.				
	Tool string ran as per tool sketch.				
	CSG: 5.5" 20 lb/ft				
	No cement data provided by client.				
	Logs recoded at 10 deg 6"				
	Main pass recorded at 2500psi, repeat pass at 0psi.				



Depth Summary			
		One	
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		

Number of Calibration Points	10		
Calibration Root Mean Square Error	10		
Calibration Peak Error	17		

Logging Cable			
Type	7-39P-LXS		
Serial Number			
Length	15000.00 ft		
Conveyance Type	Wireline		
Rig Type			

One:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well		
Rig Up Length At Surface			
Rig Up Length At Bottom			
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[8]:Up	6559.22	67.94

Fluid Velocity = "Automatic".  
CFVL equals DFSL channel

Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)
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Mud Impedance = "FreePipe Norm."  
Free Pipe normalization zone is : 220.32m(722.84ft) to 226.94m(744.54ft)  
MUD\_N\_FRP = 1.16  
DFD = 1.01g/cm3(8.40lbm/gal)  
CZMD median computed in free pipe normalization interval = 1.74 MRayl

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

2500 PSI Main 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
One	Log[8]:Up	Up	67.94 ft	6559.23 ft	29-Jun-2016 7:32:21 AM	29-Jun-2016 8:53:02 AM	ON	5.73 ft	Yes

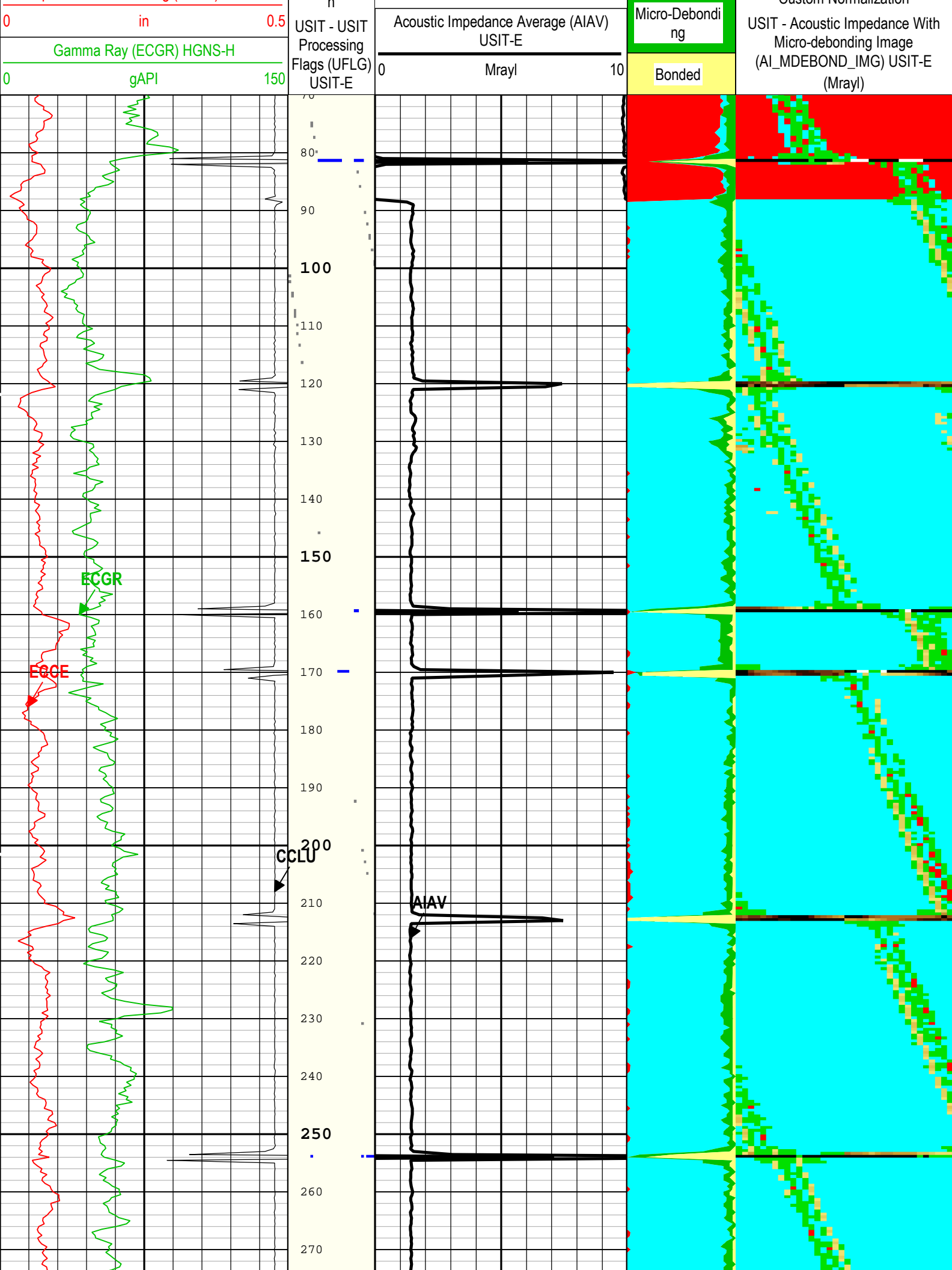
All depths are referenced to toolstring zero

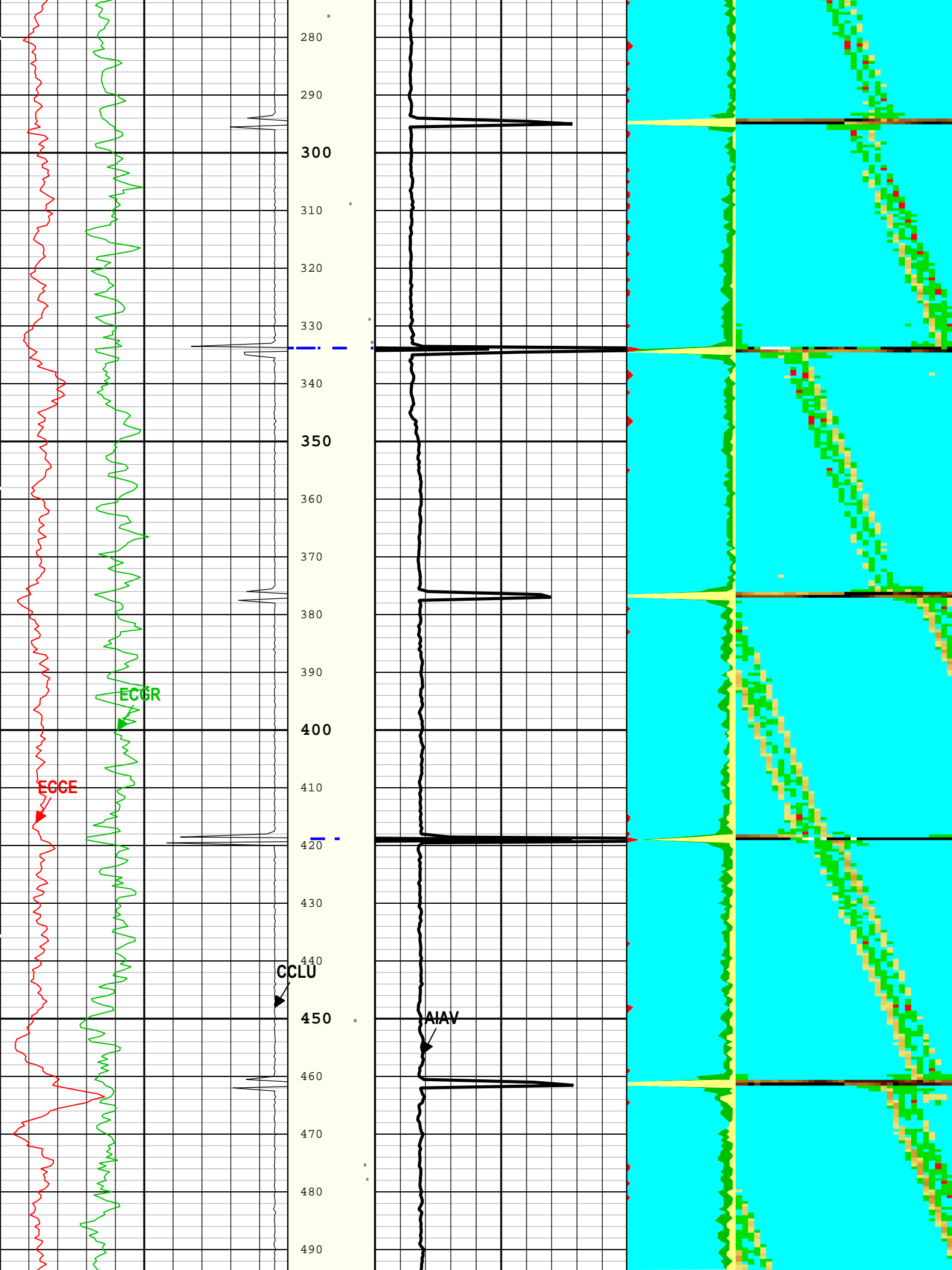
Log	Company:Noble Energy Inc.	Well:Shadow A26-663
		One: Log[8]:Up:S012

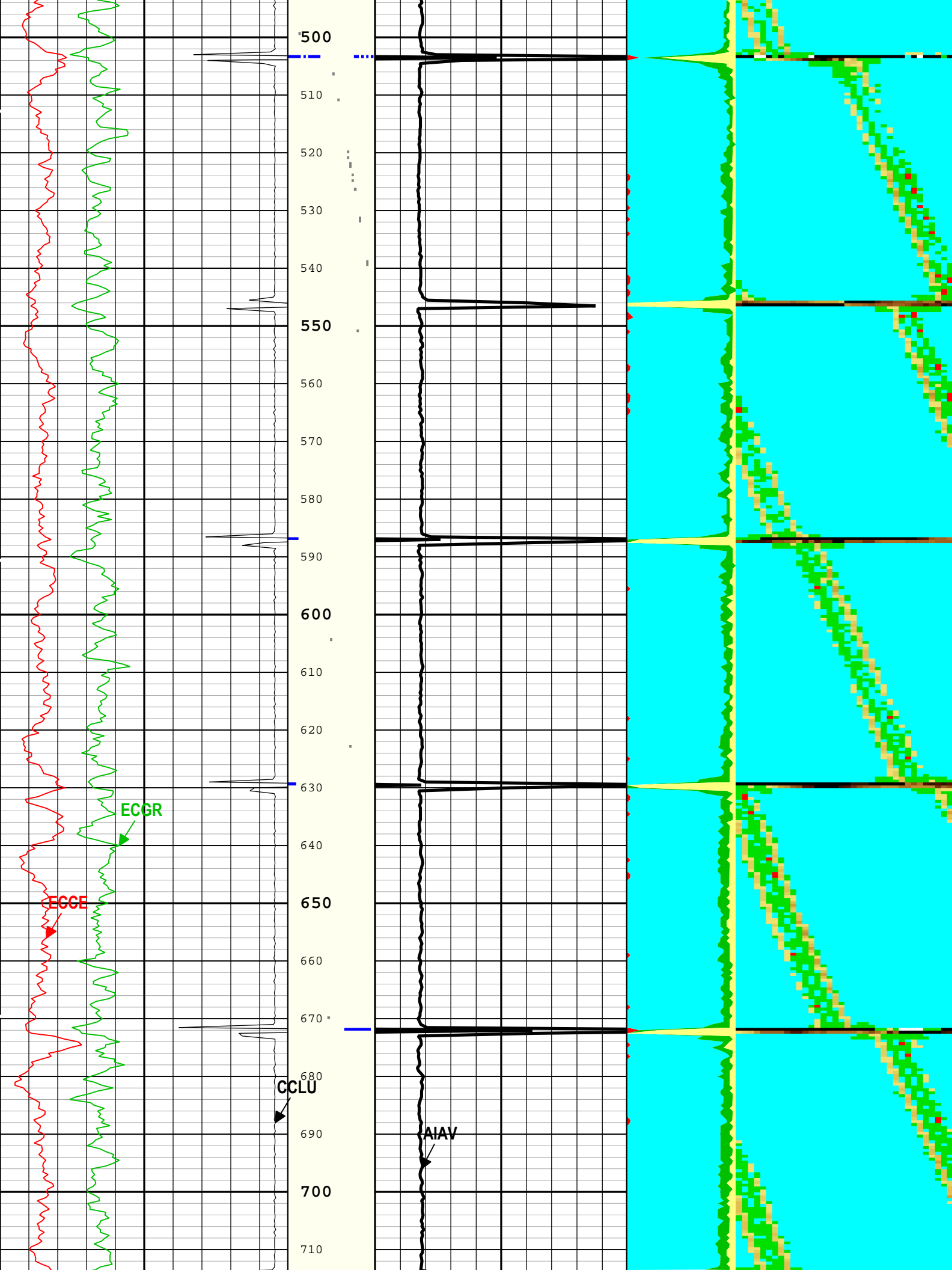
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Creation Date: 30-Jun-2016 08:47:10

TIME\_1900 - Time Marked every 60.00 (s)

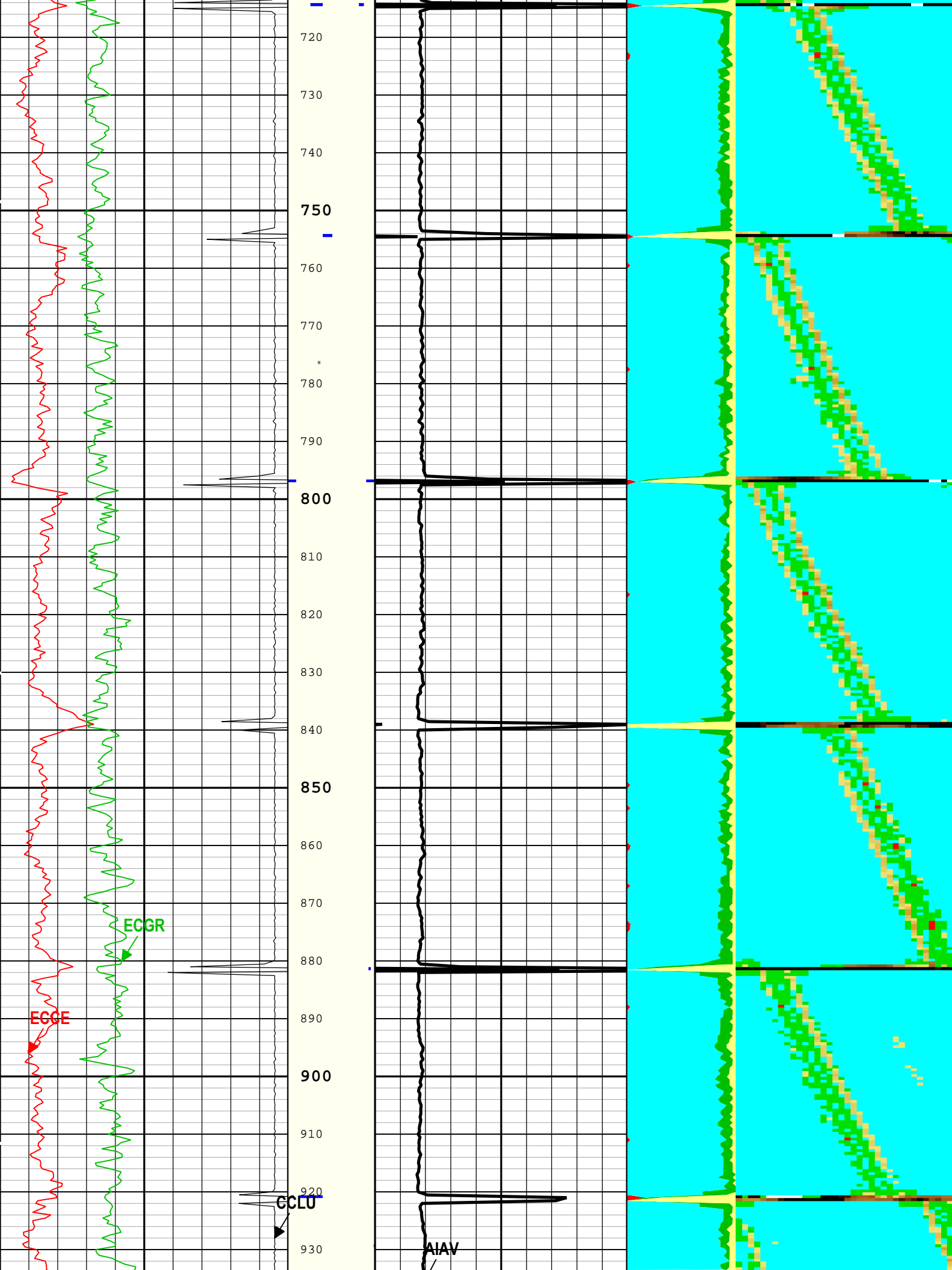


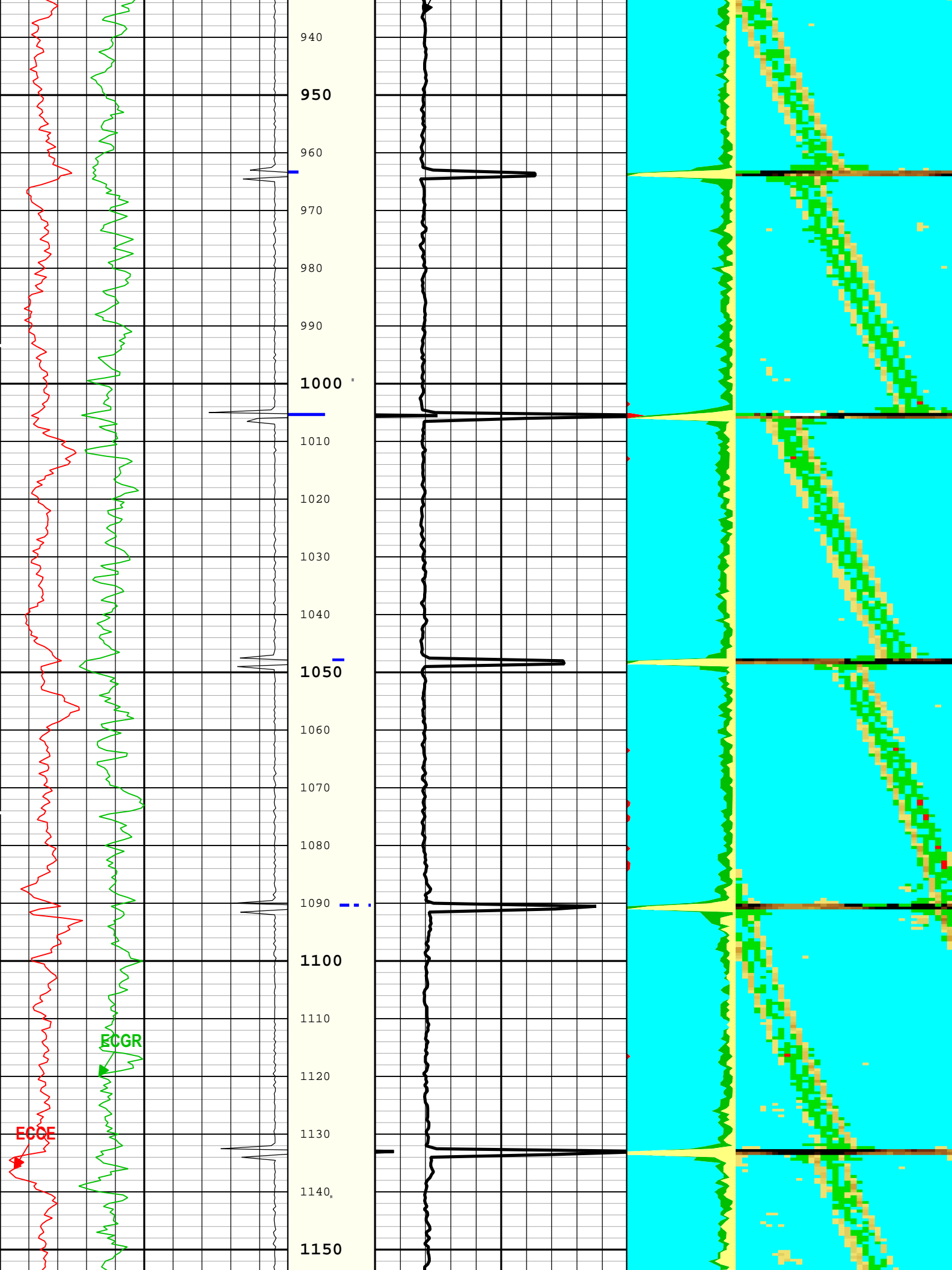


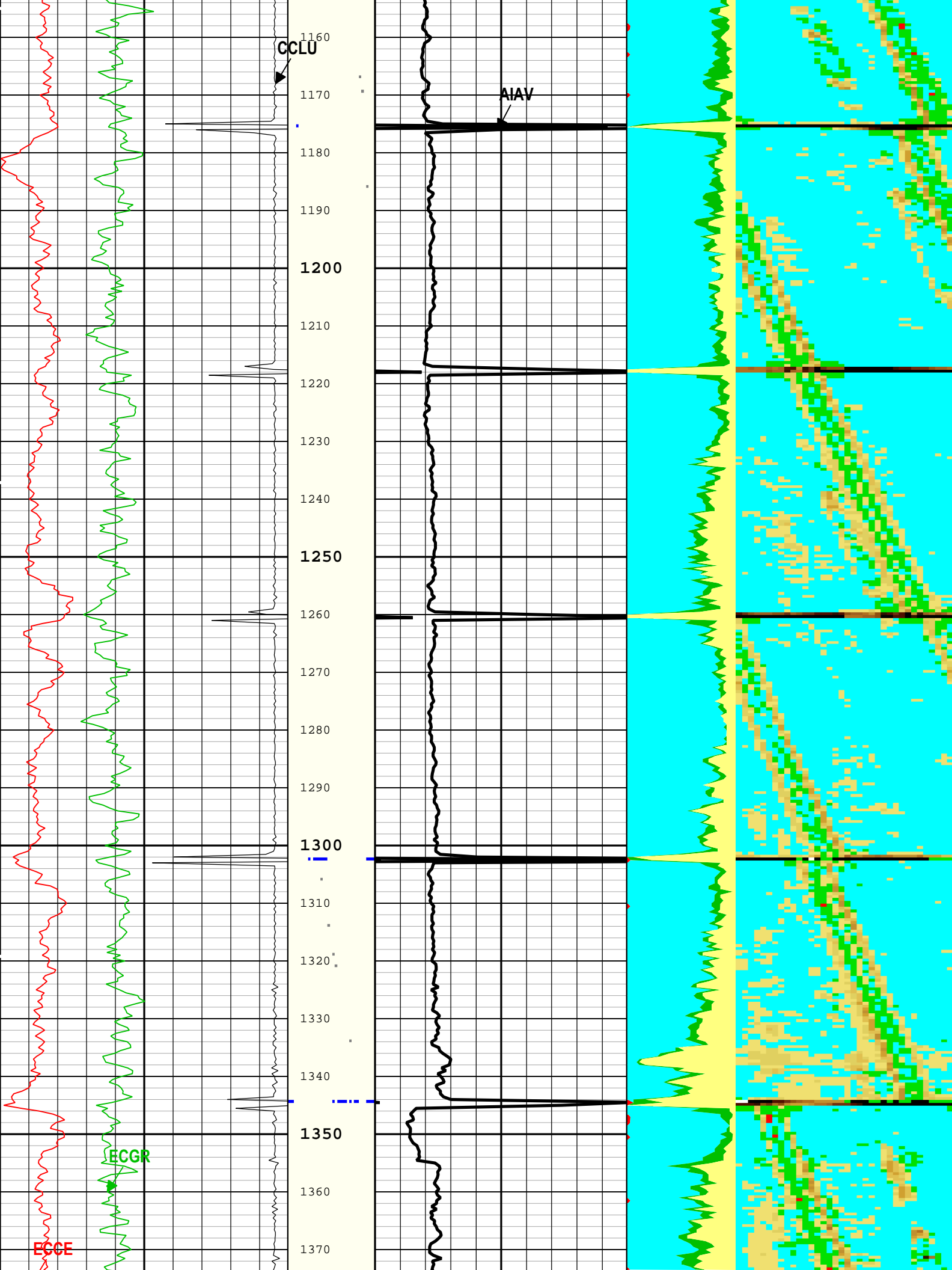


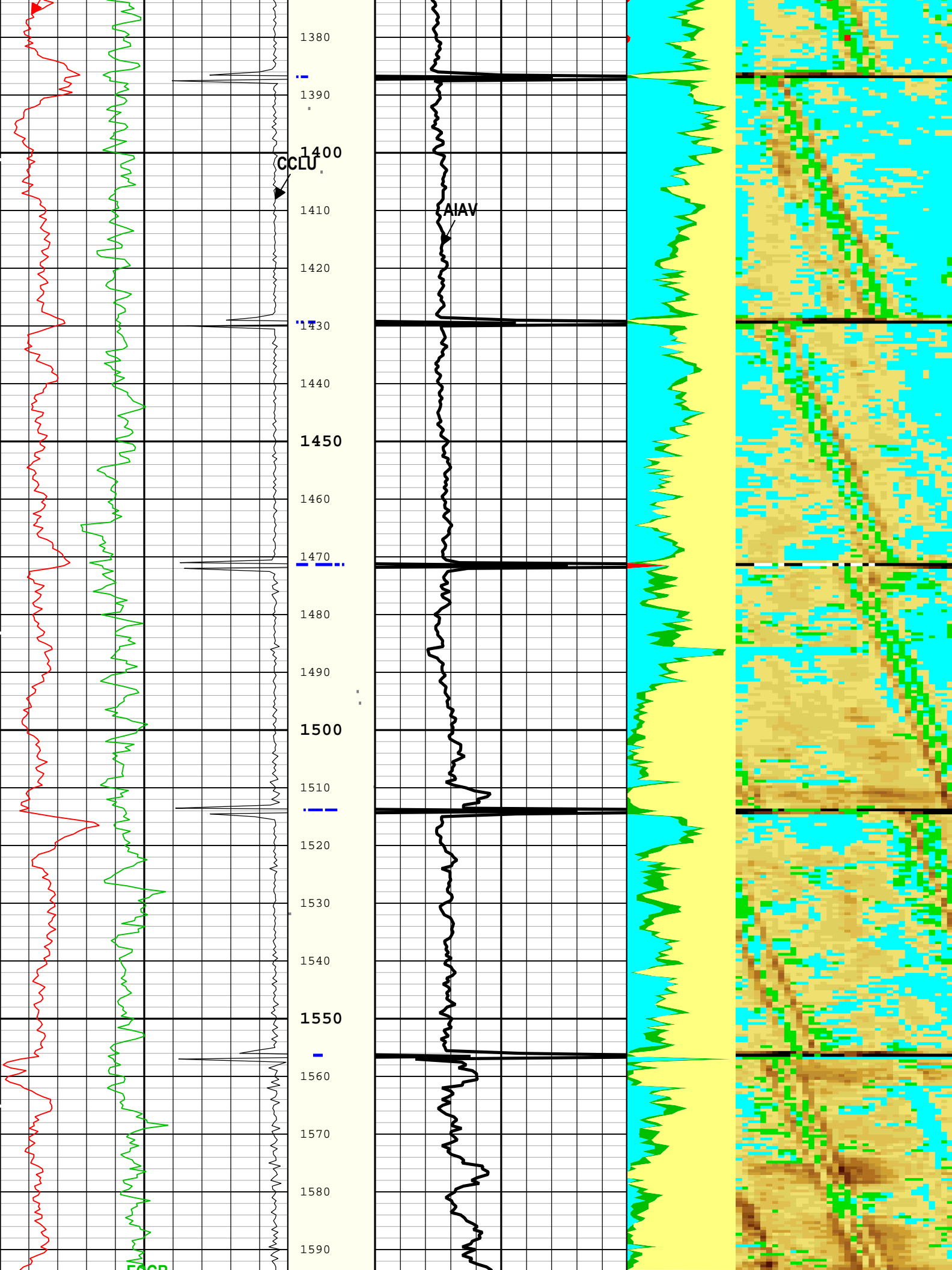


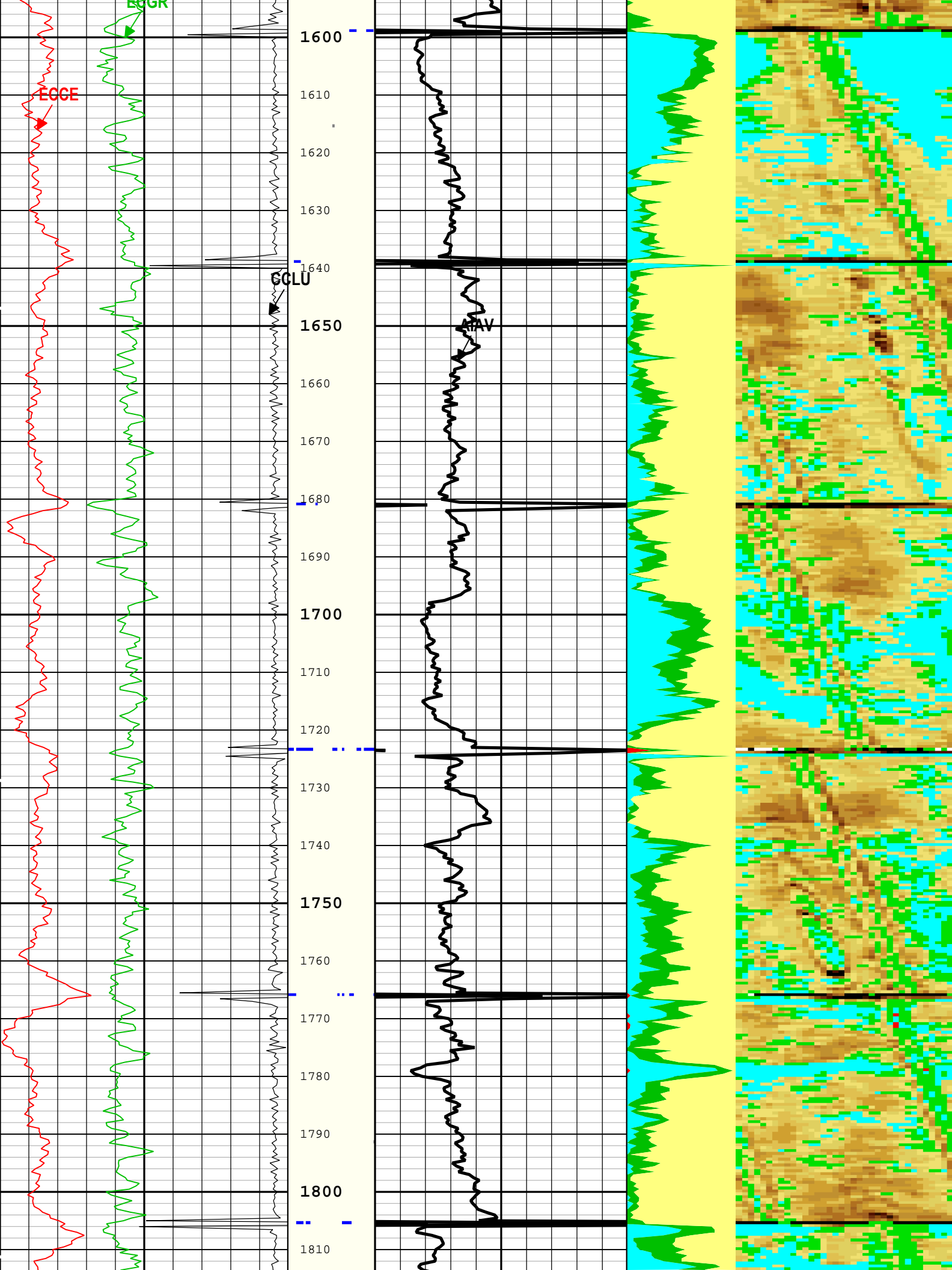


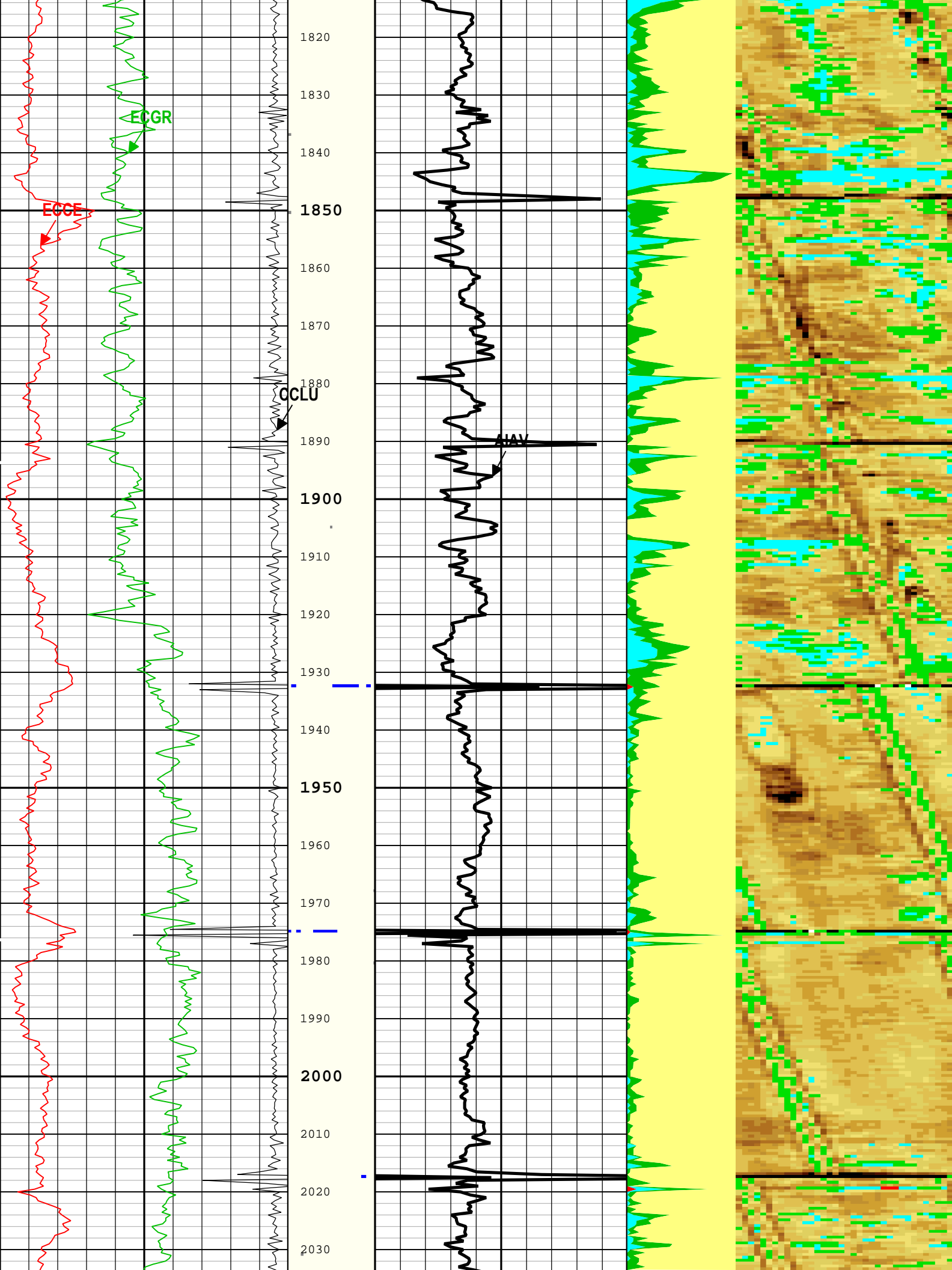


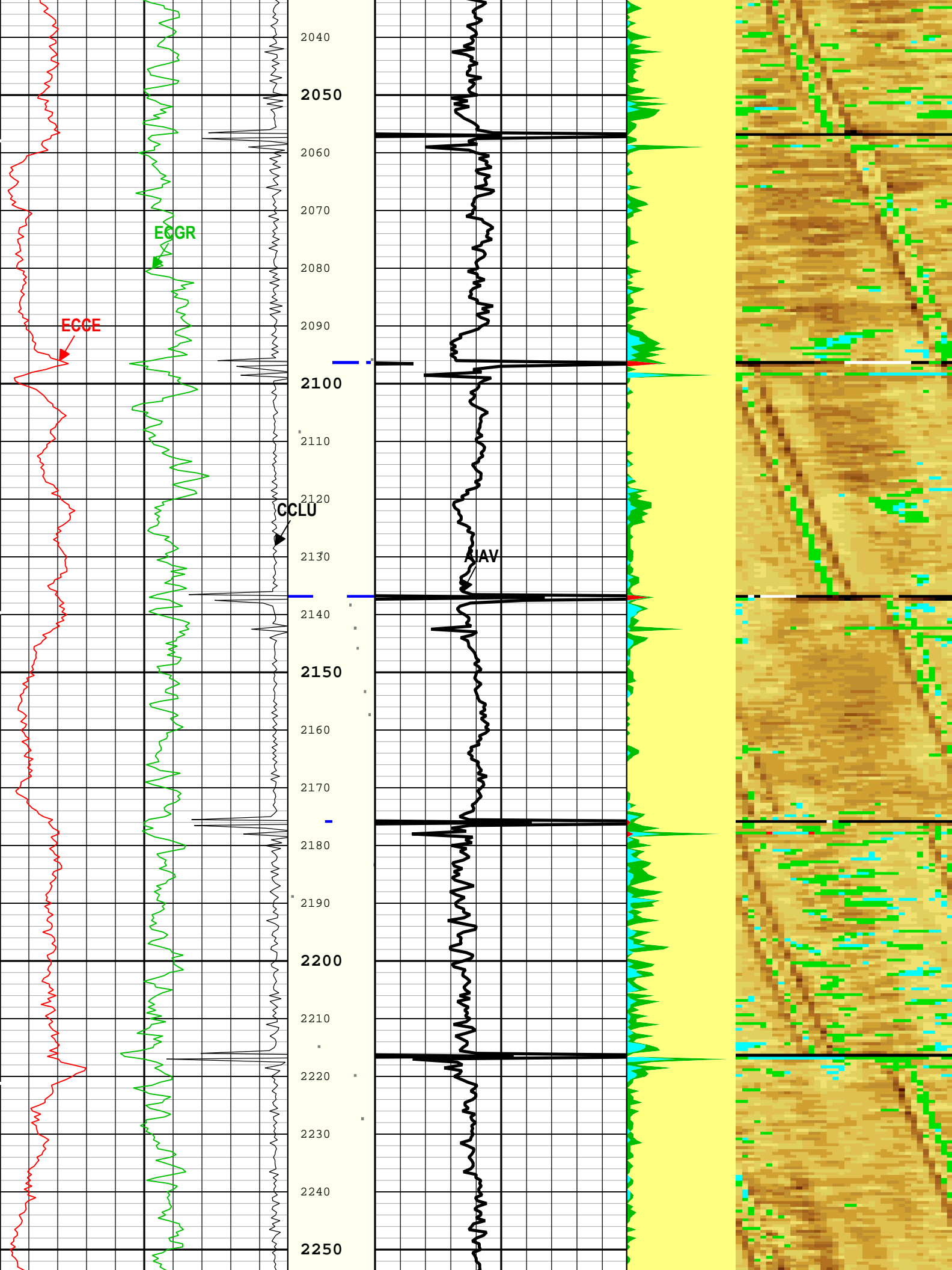


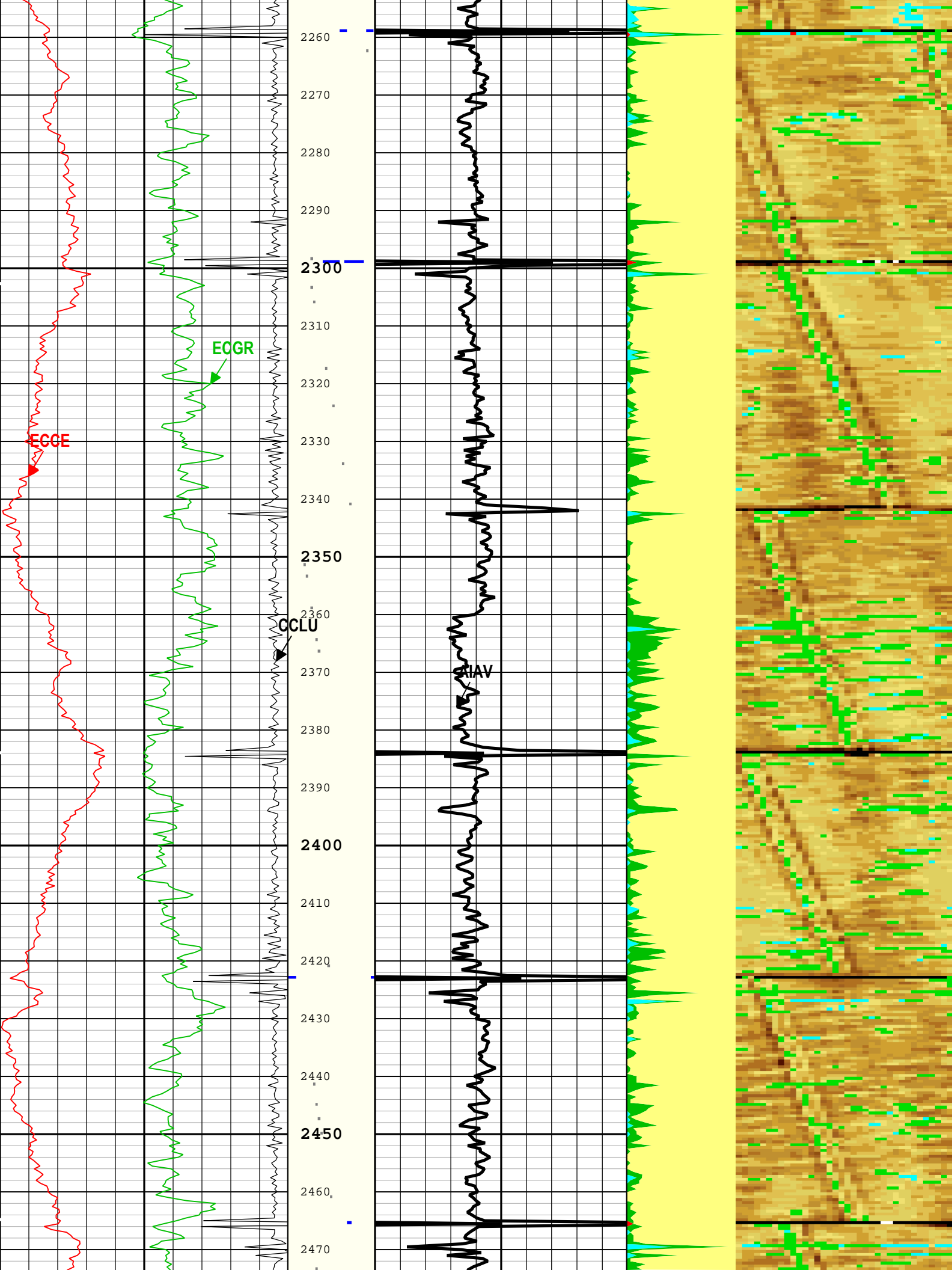




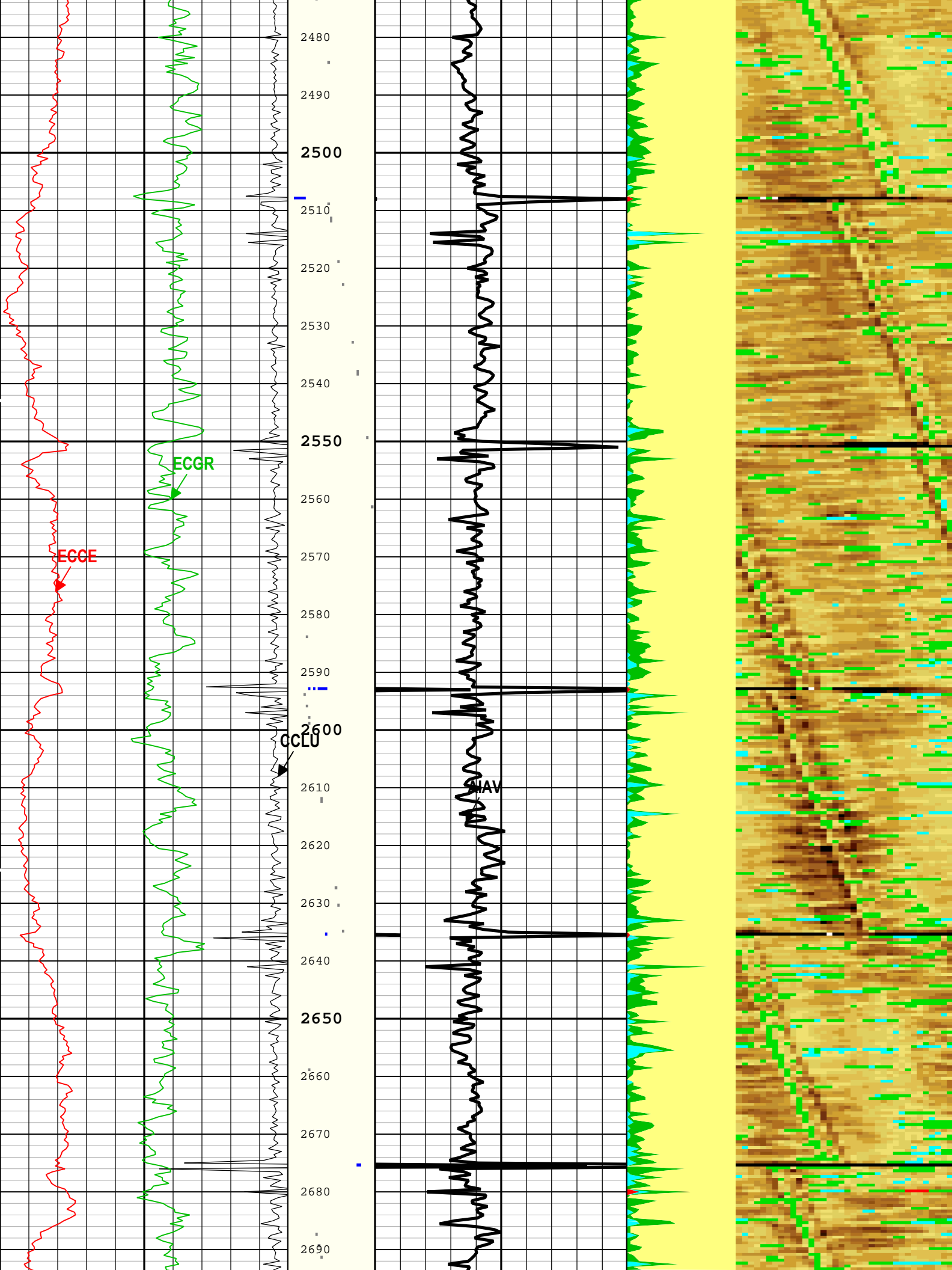


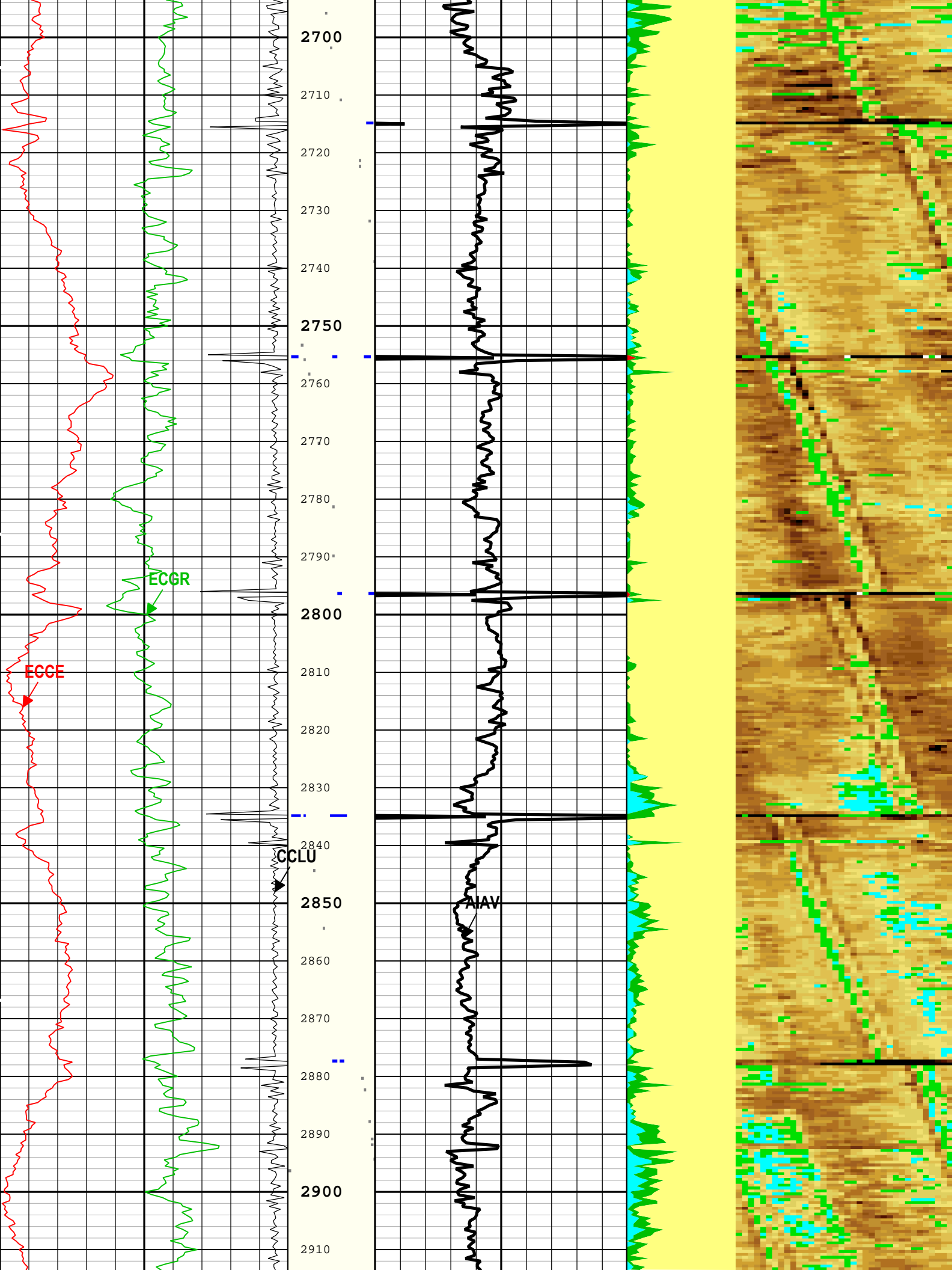


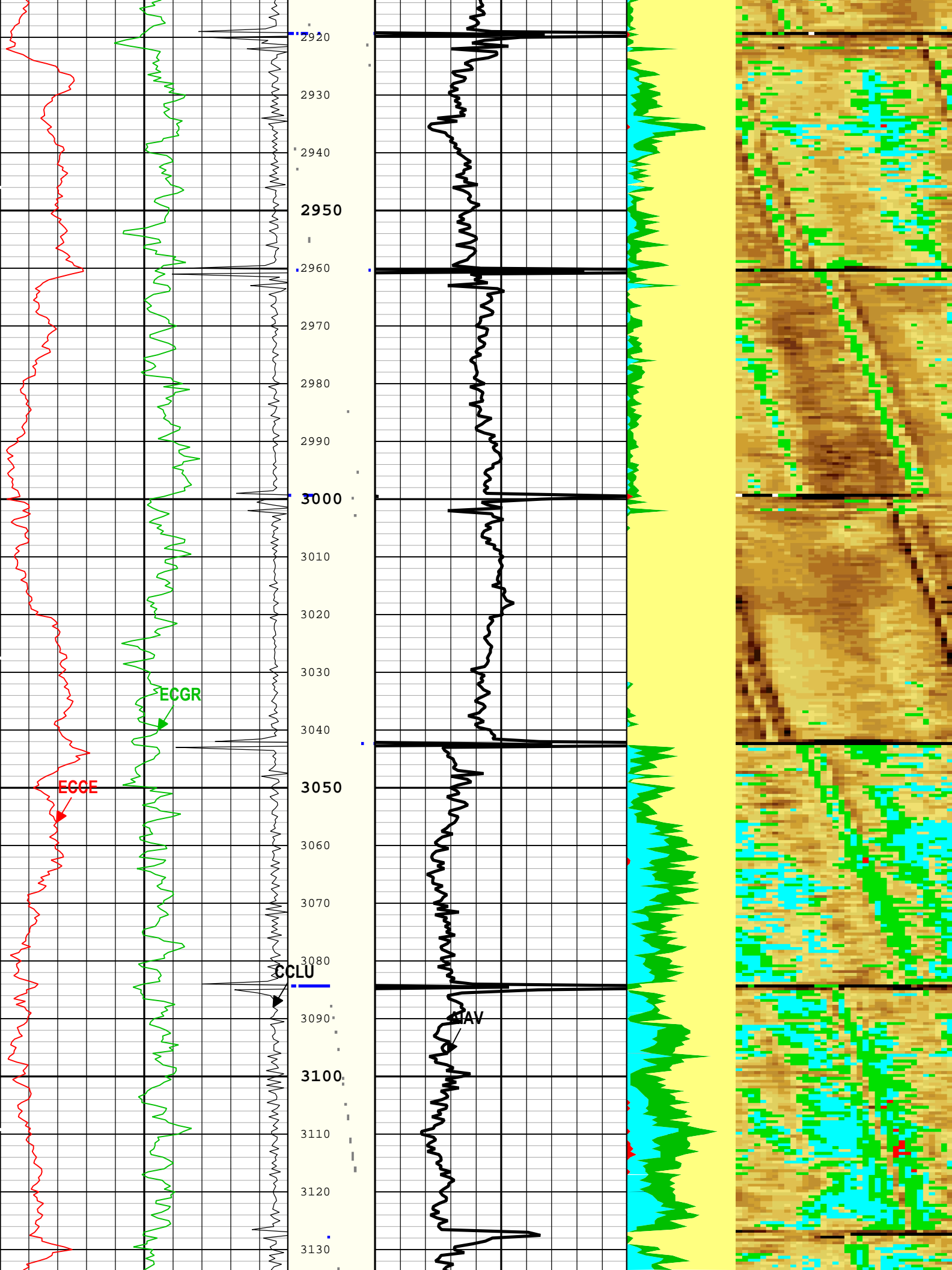


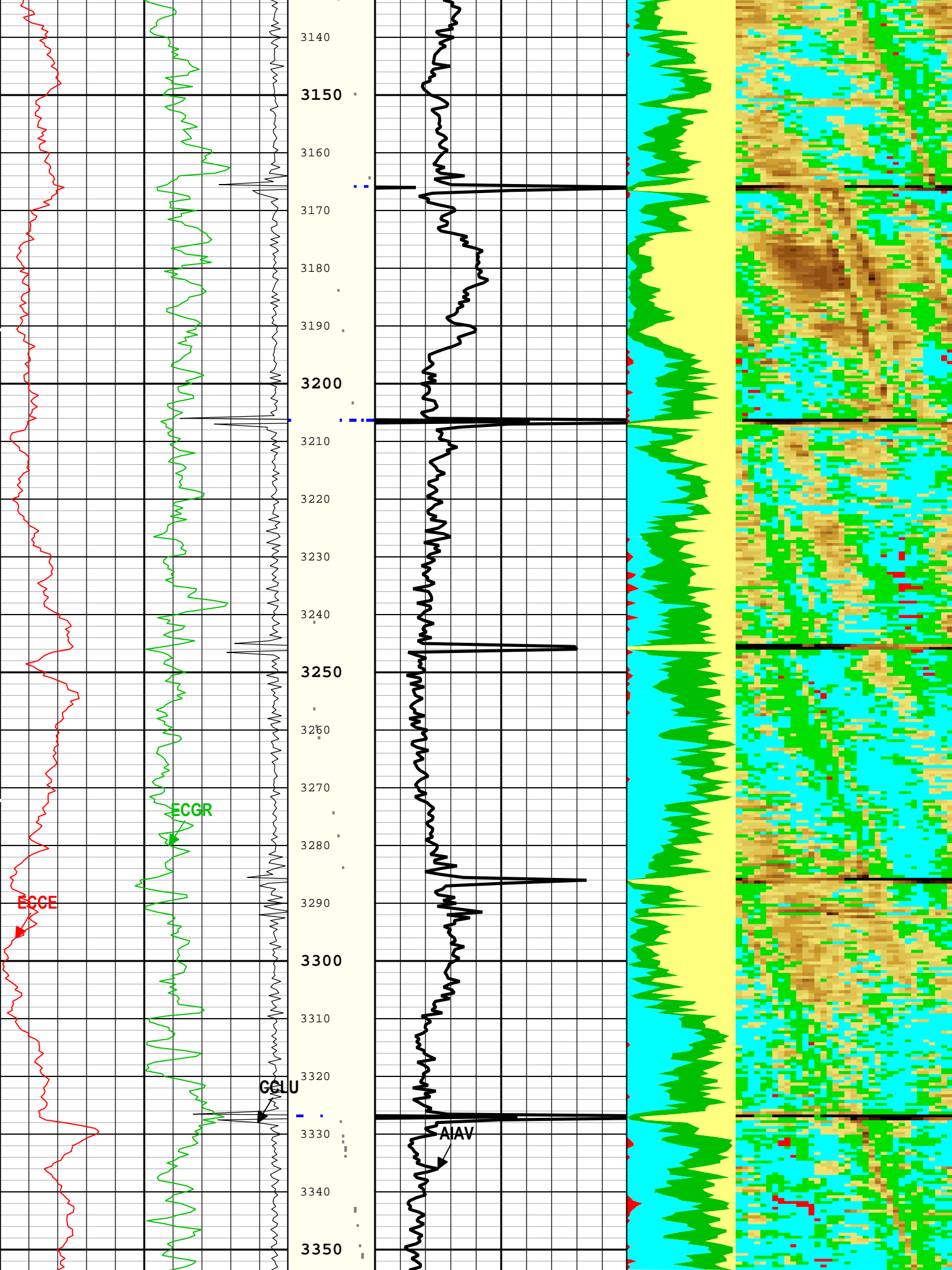


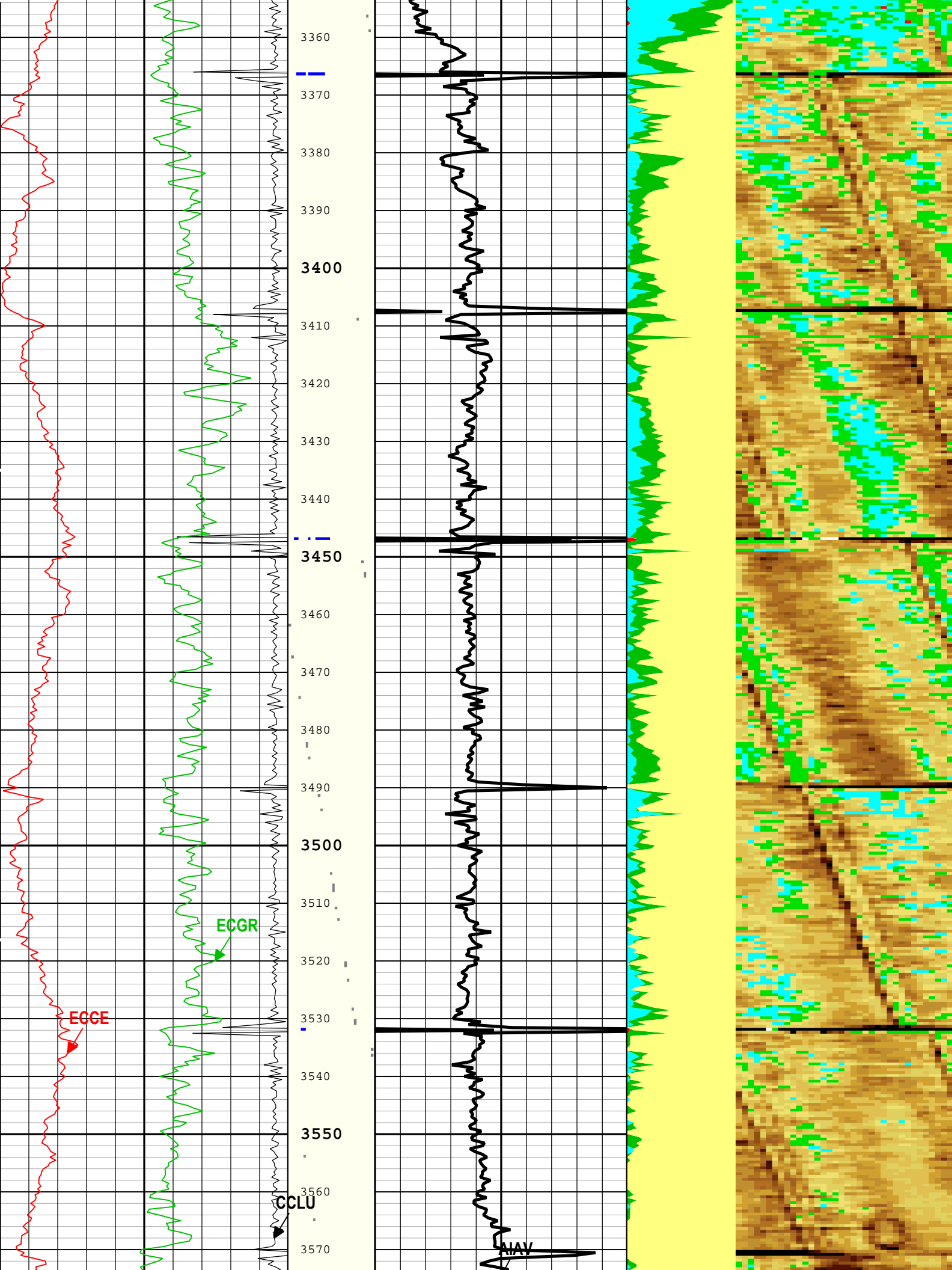


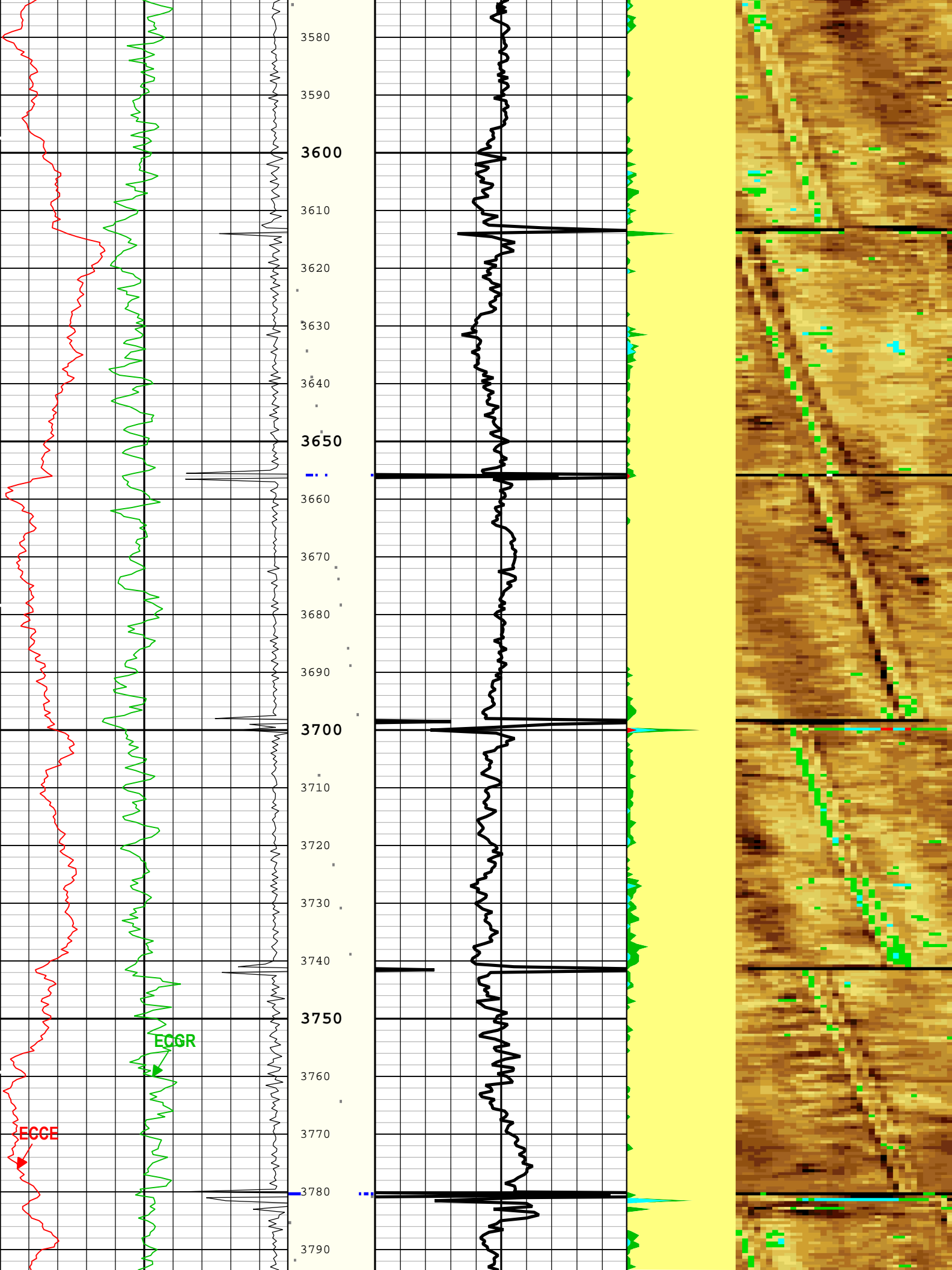


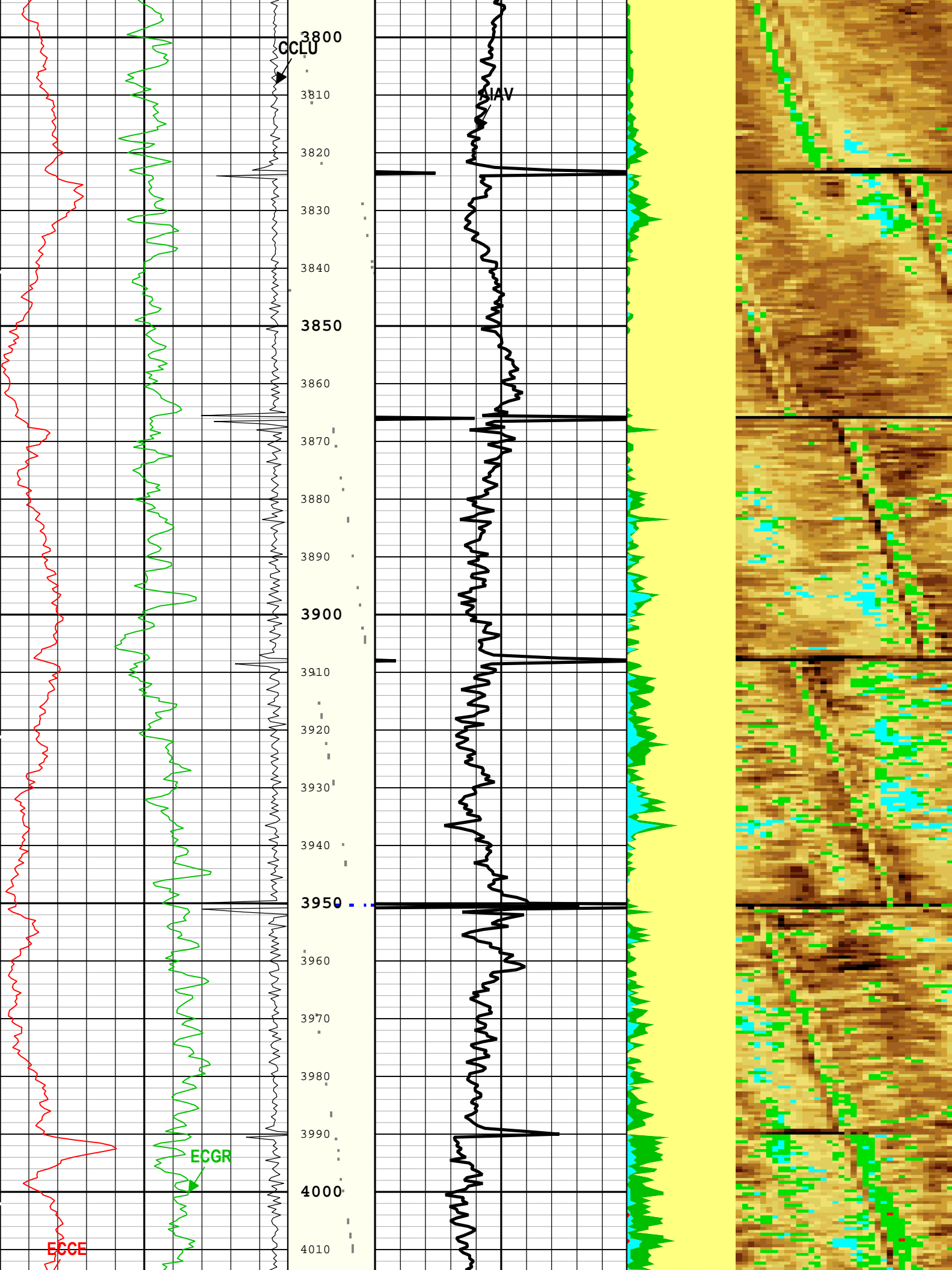


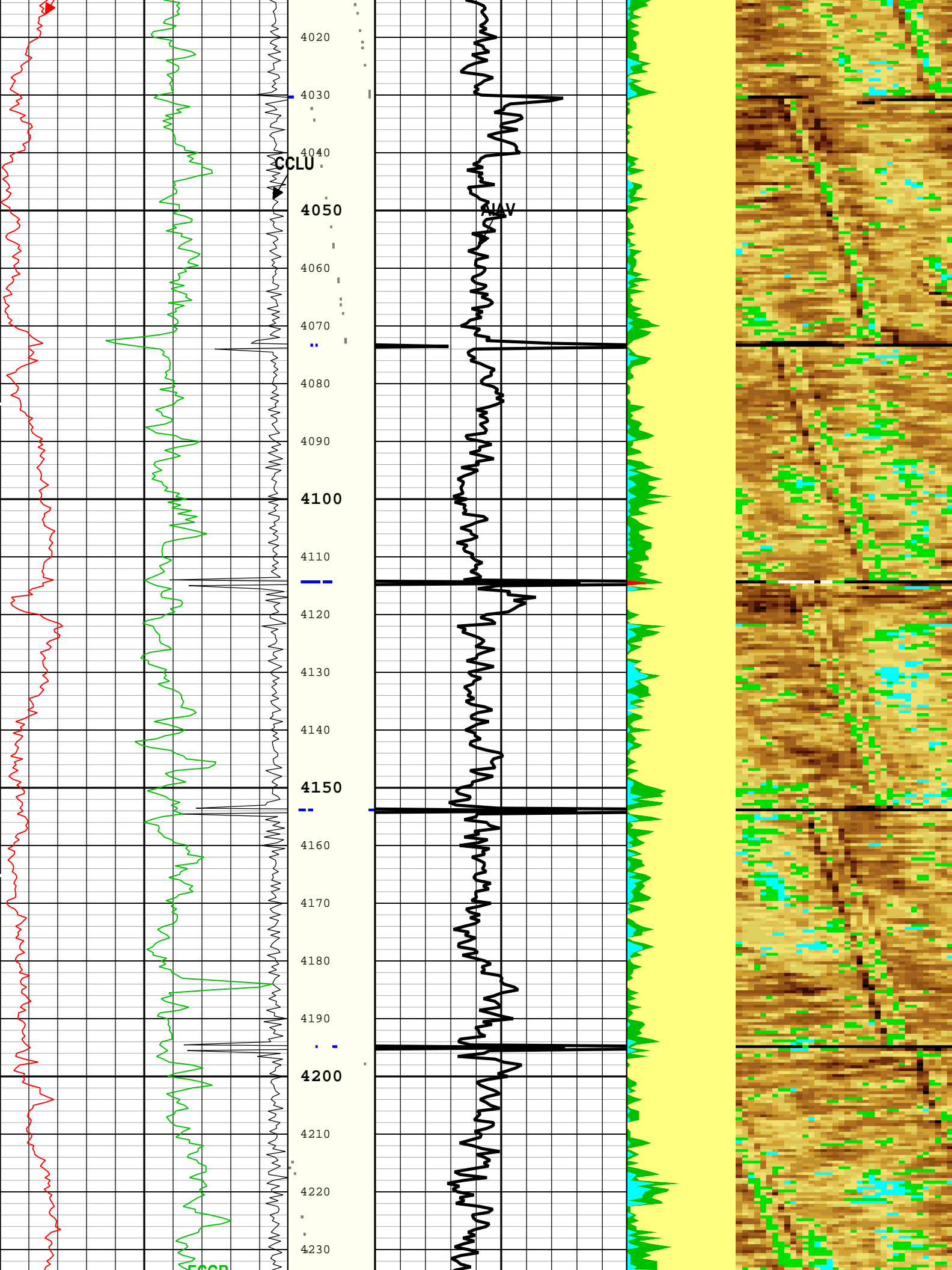




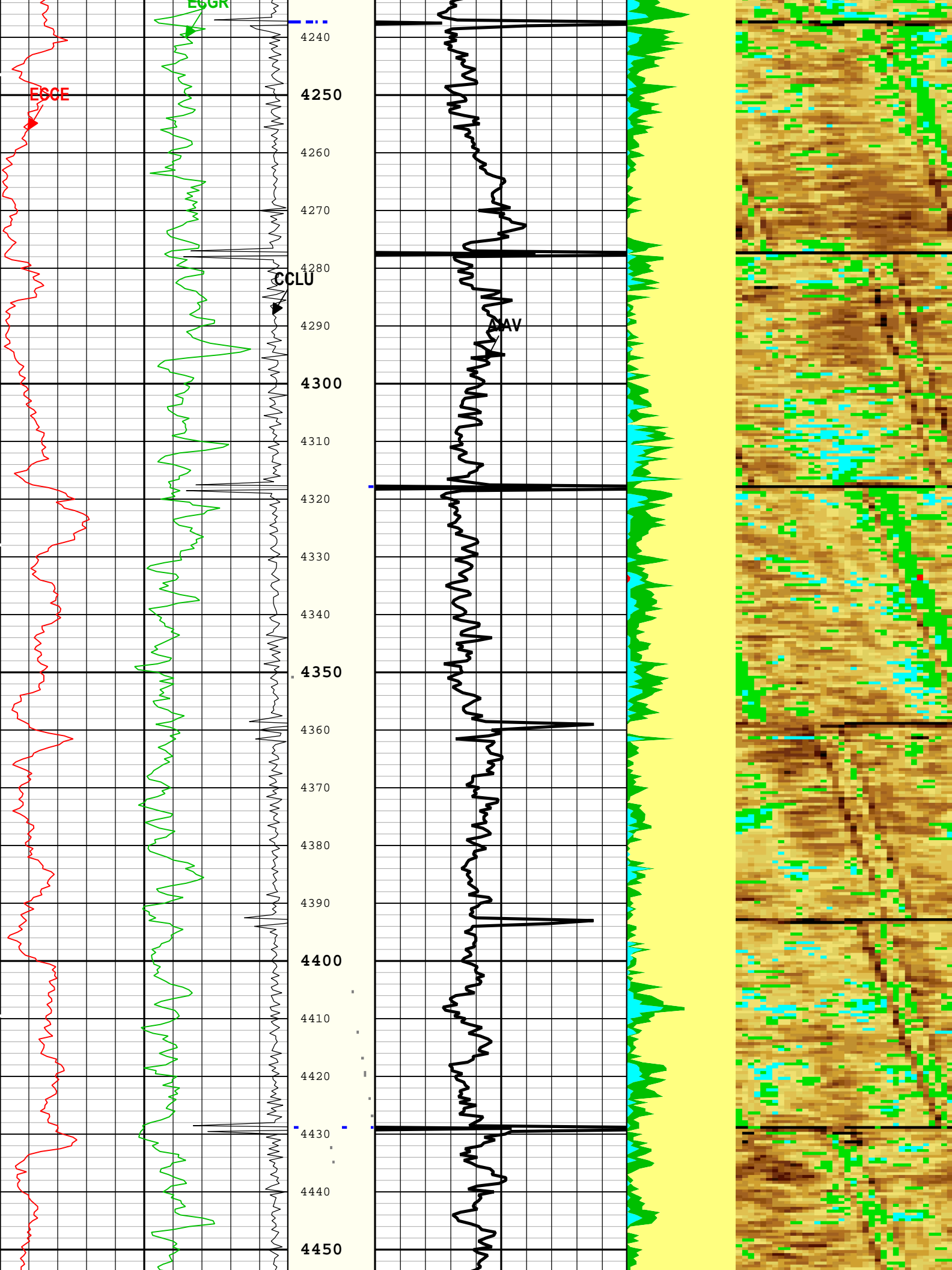


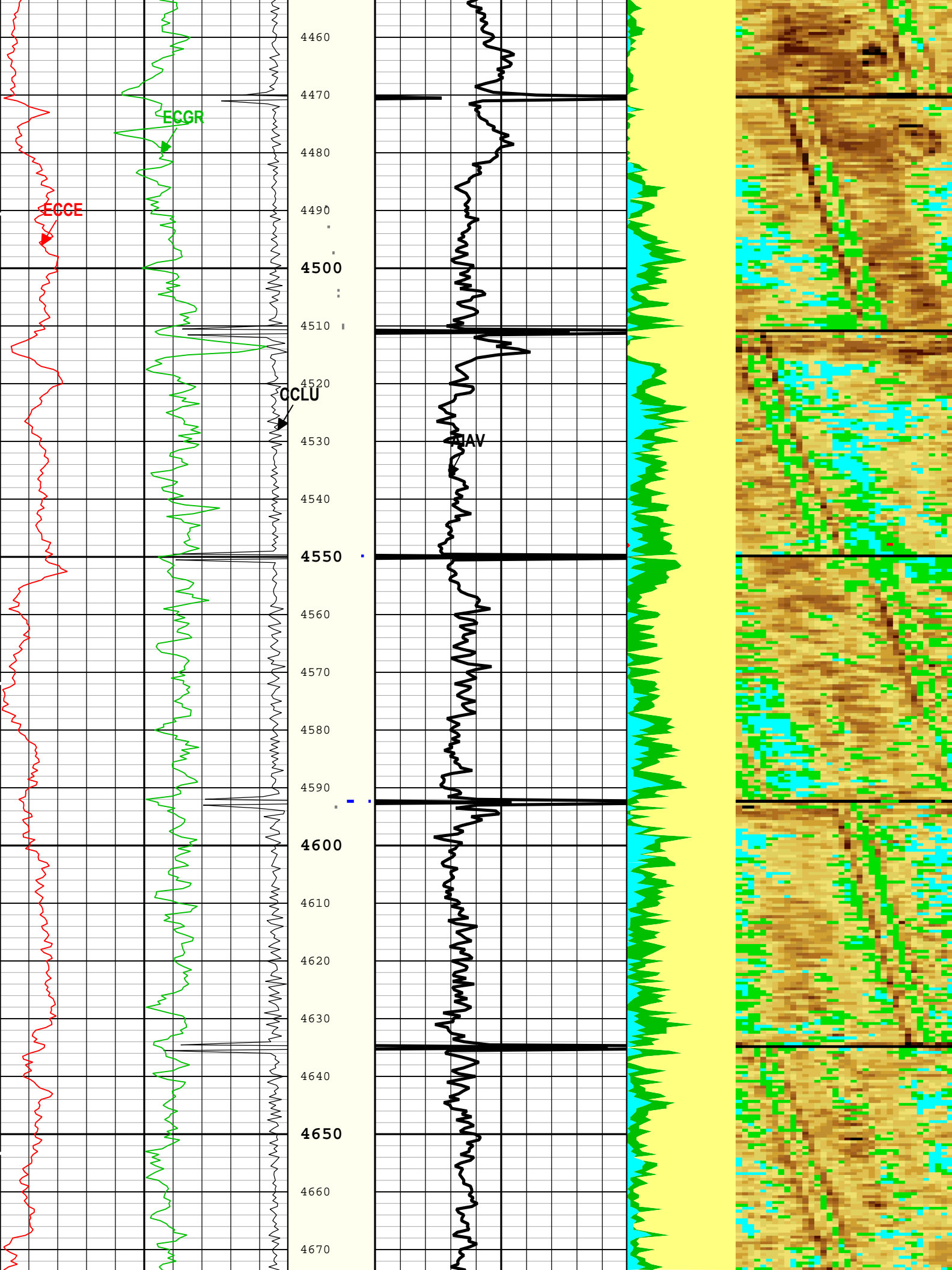


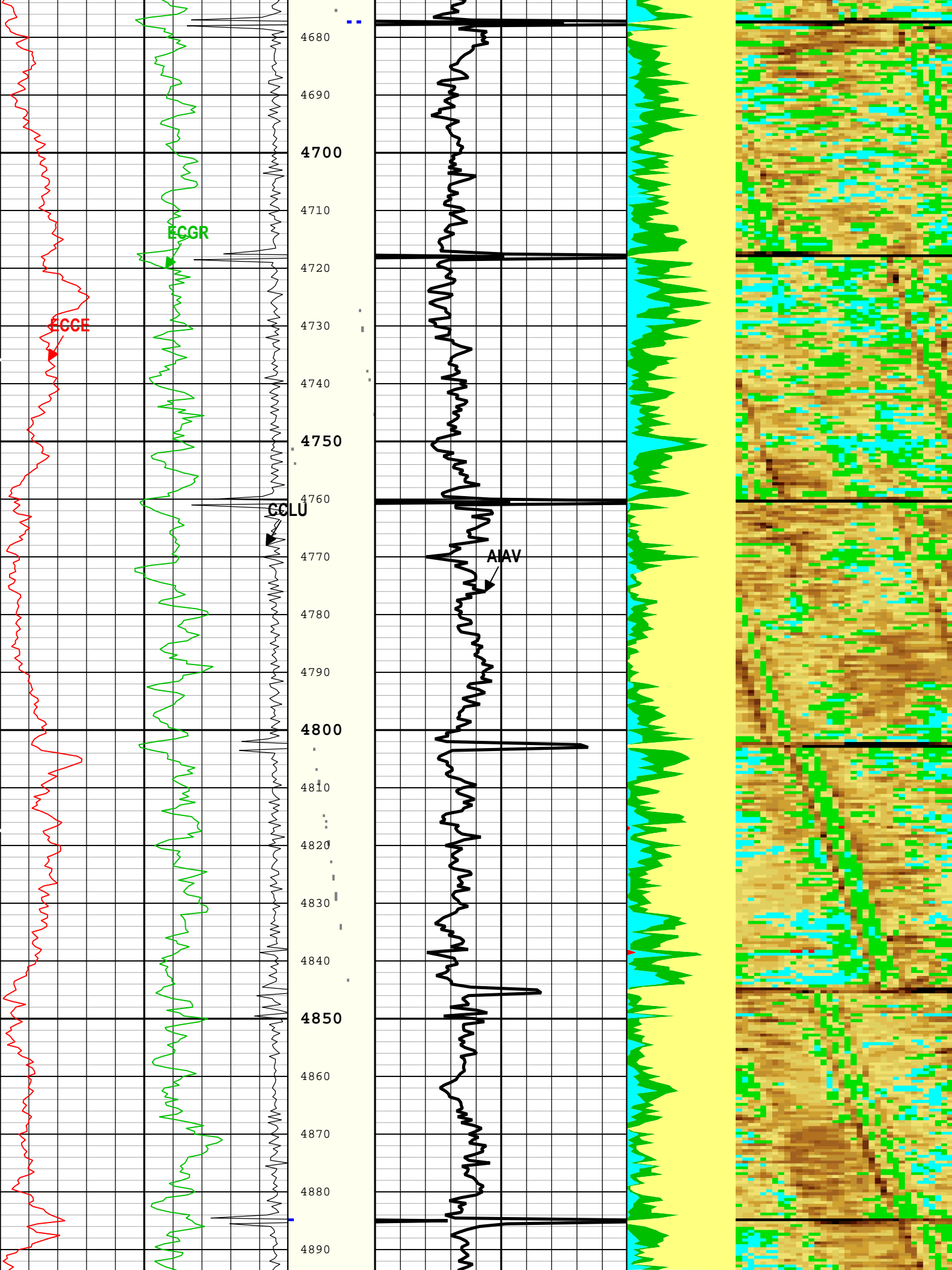


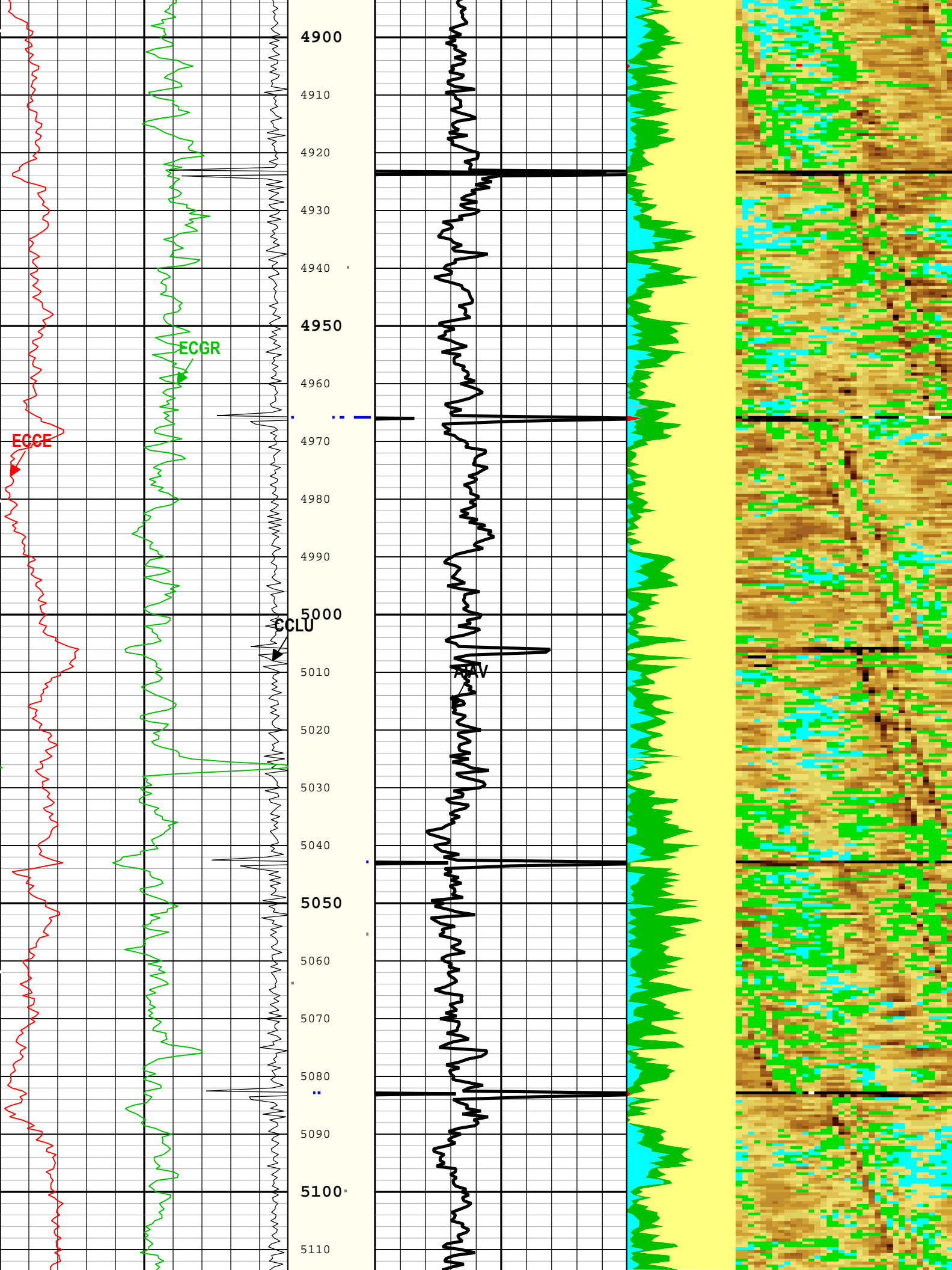


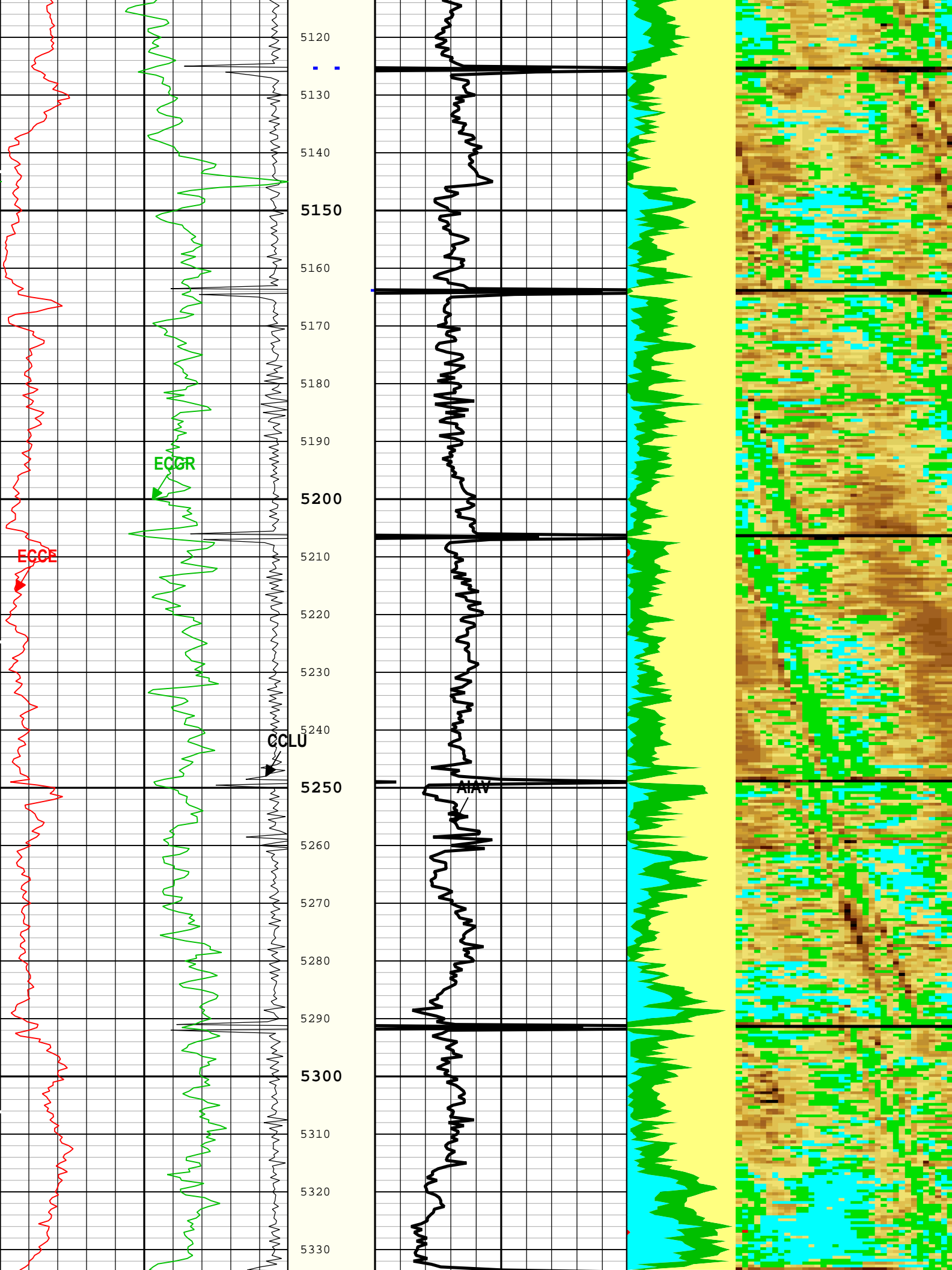


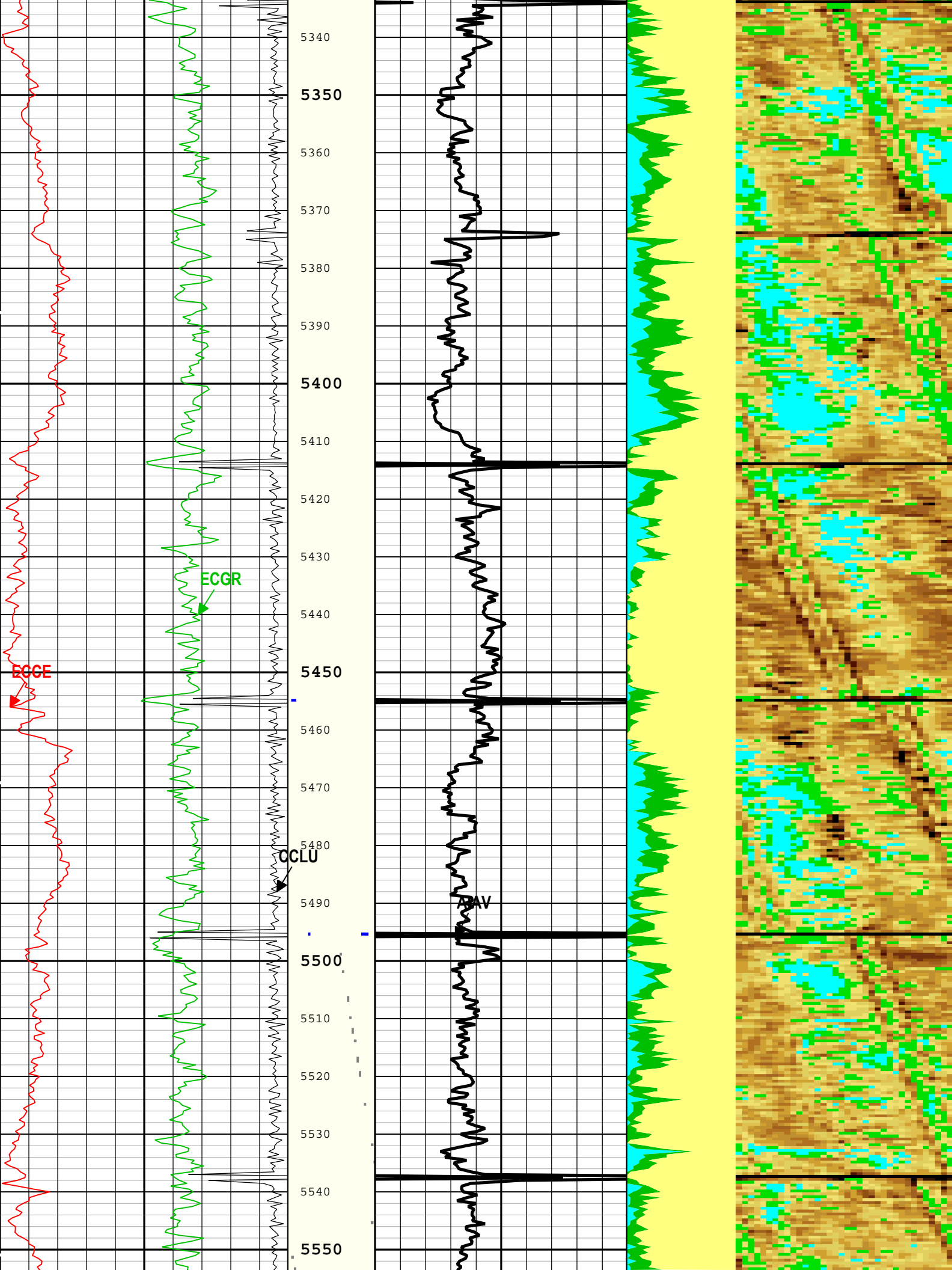


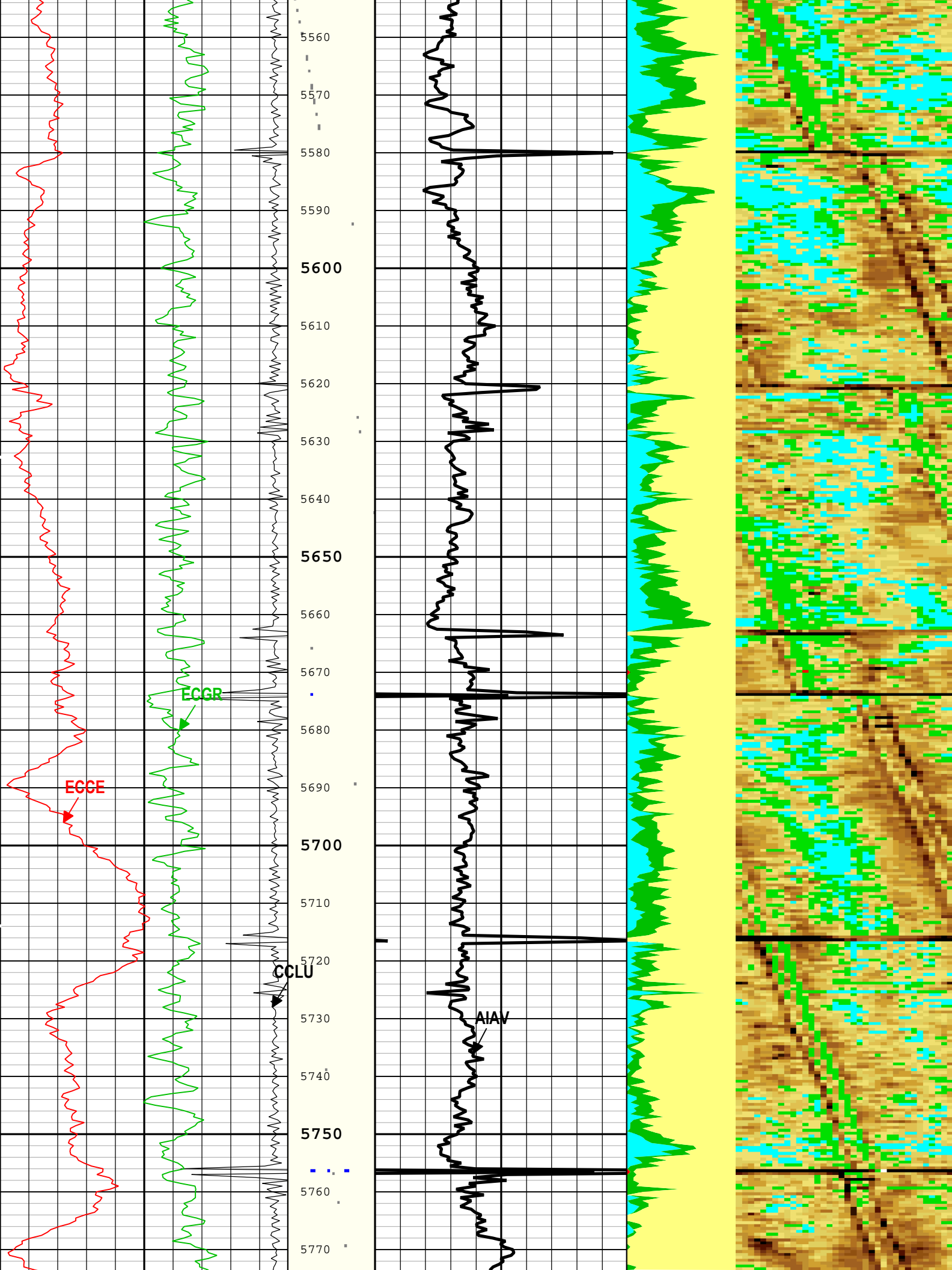




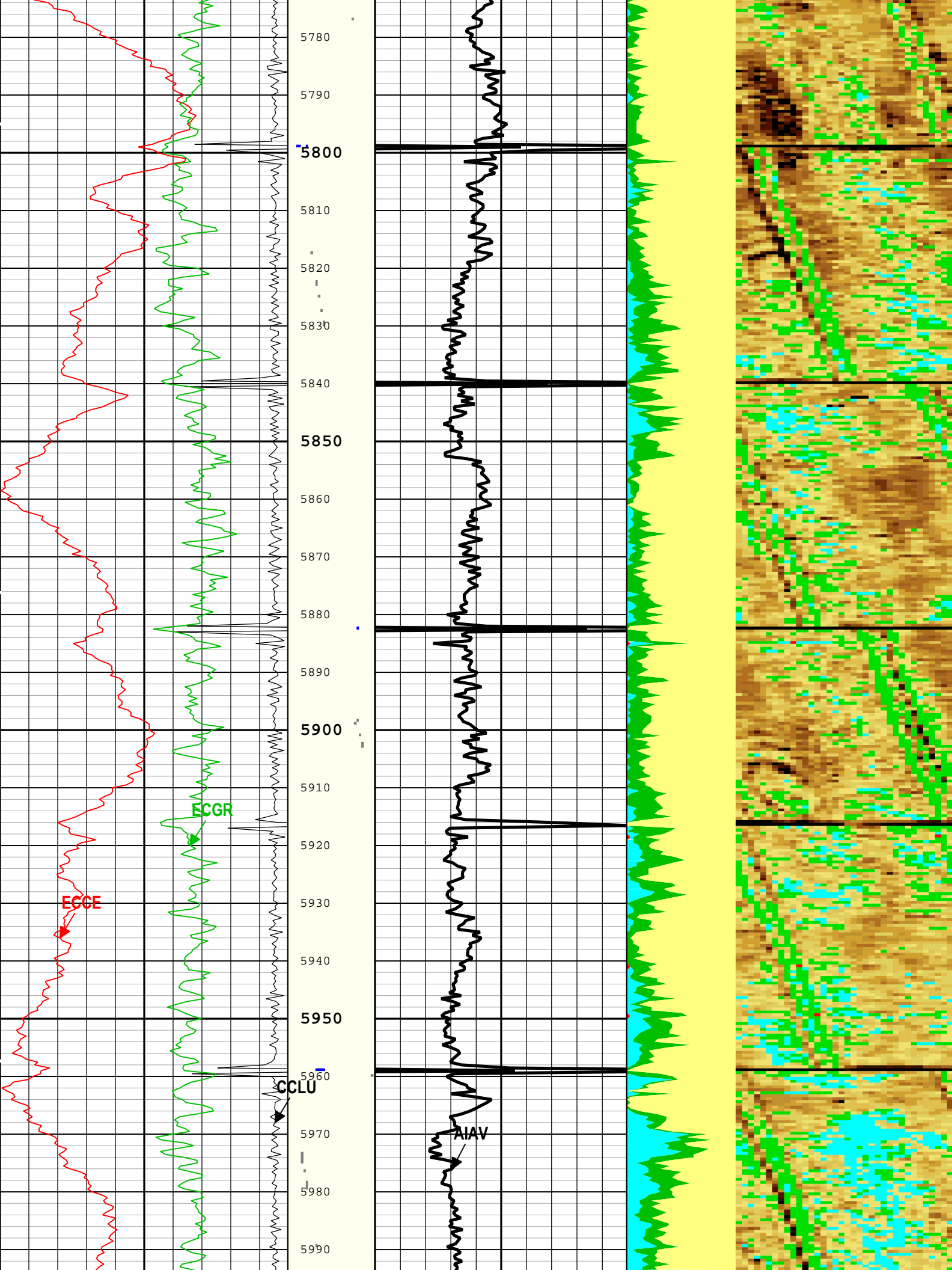




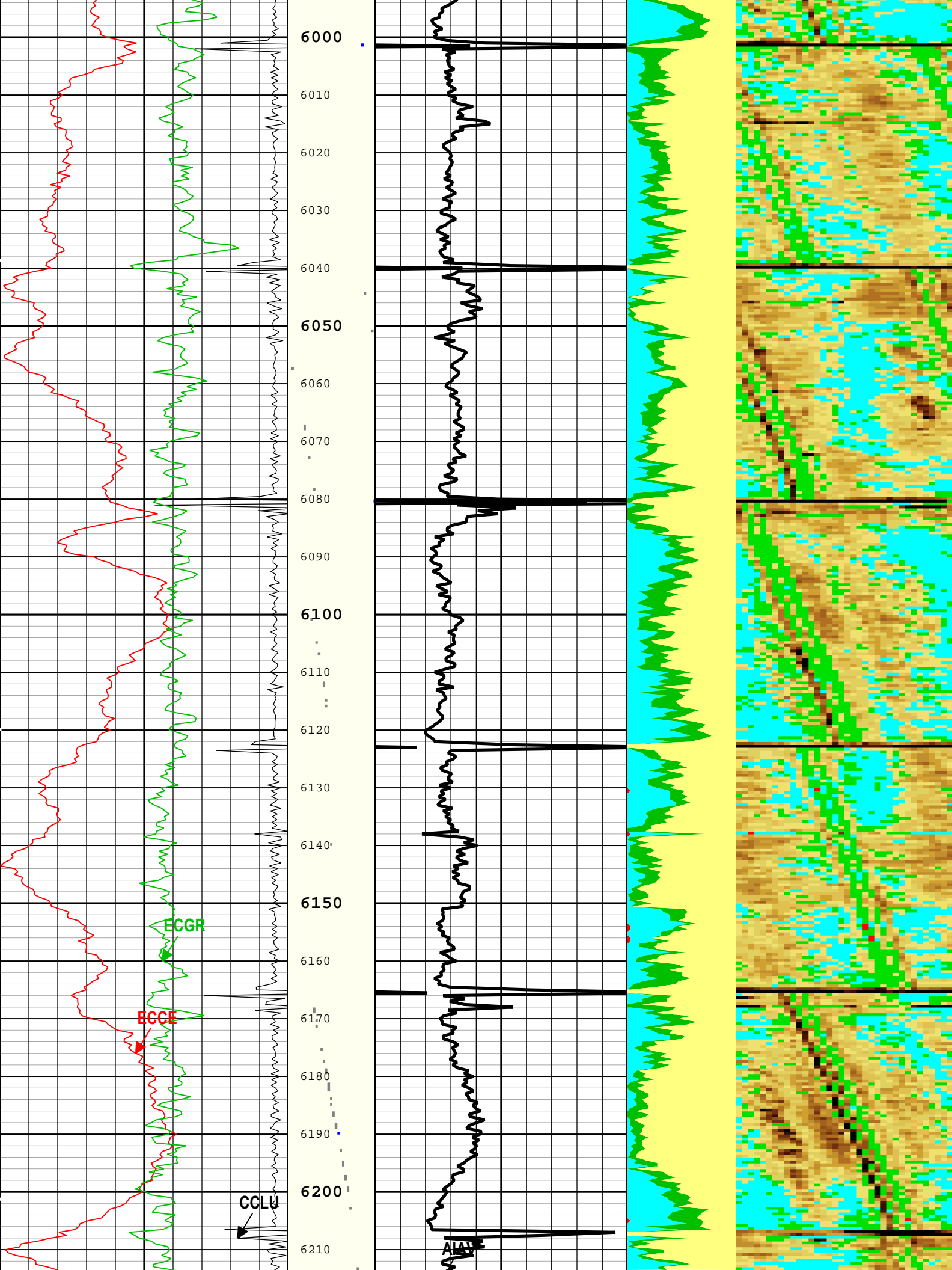


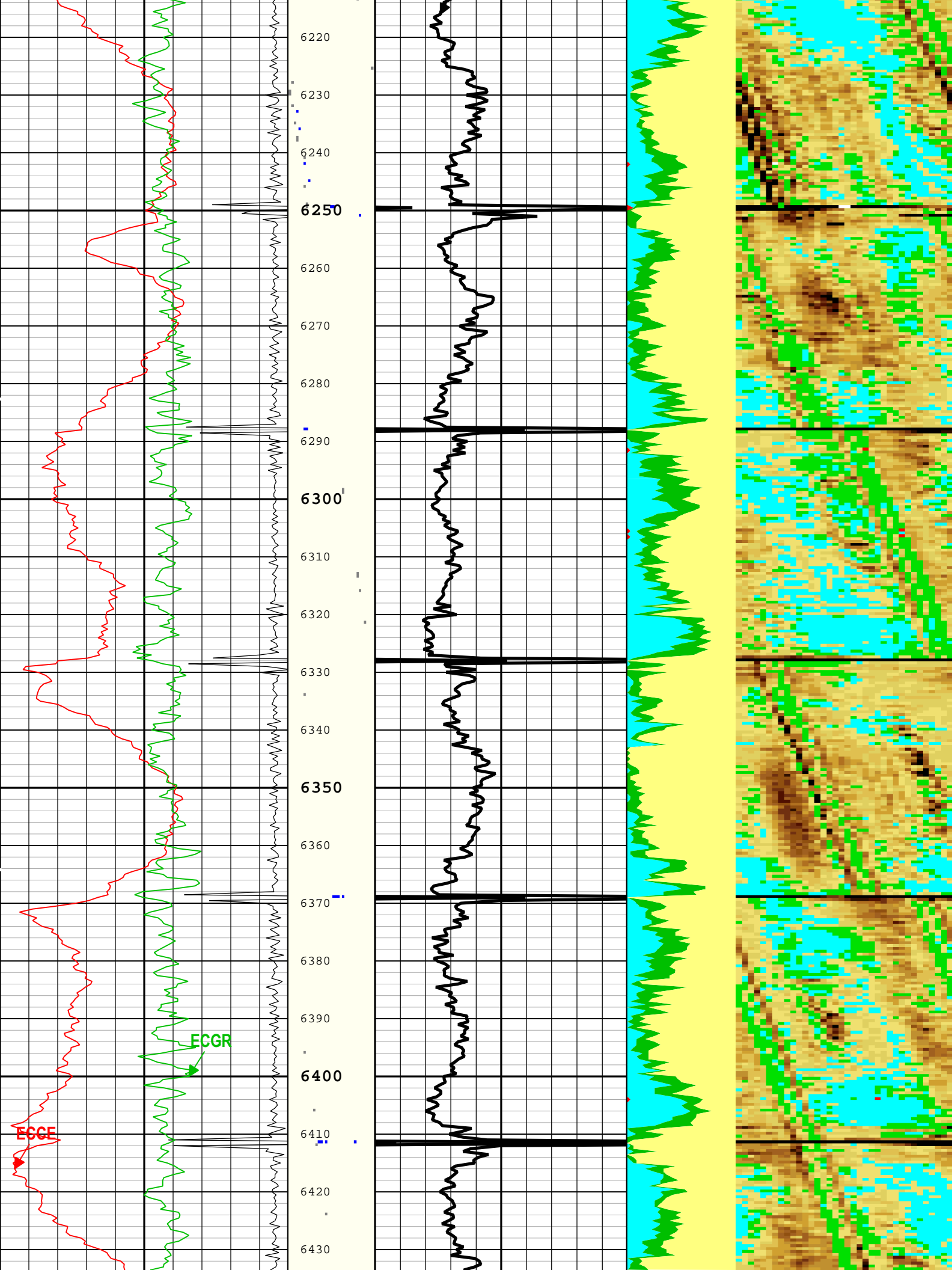


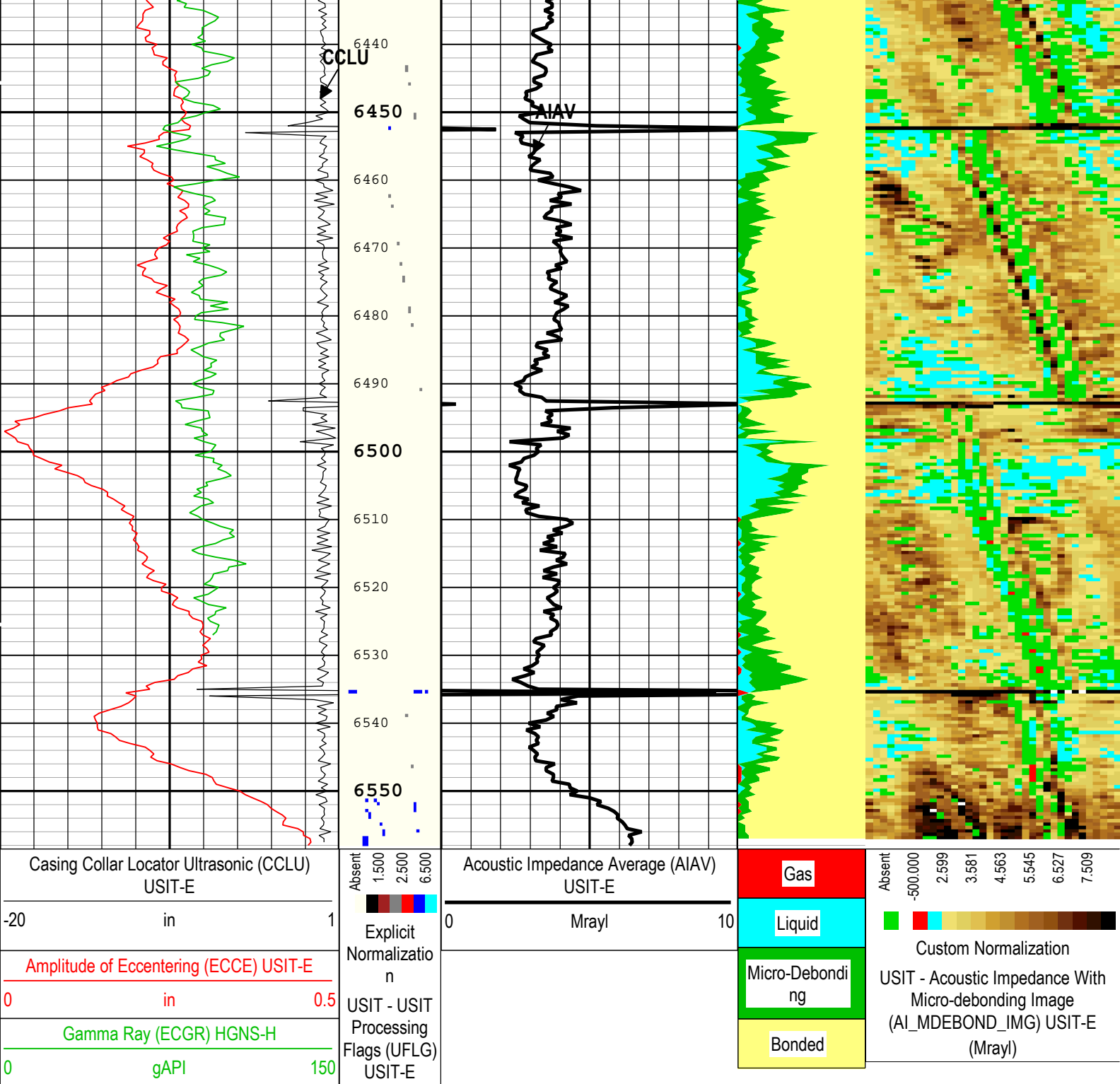












Description: Format: Log ( DJ Basin Ultrasonic Cement Summary Report ) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth  
 Creation Date: 30-Jun-2016 08:47:10

Channel Processing Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
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	17450.9	ft
CDEN	Cement Density	HGNS-H	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal

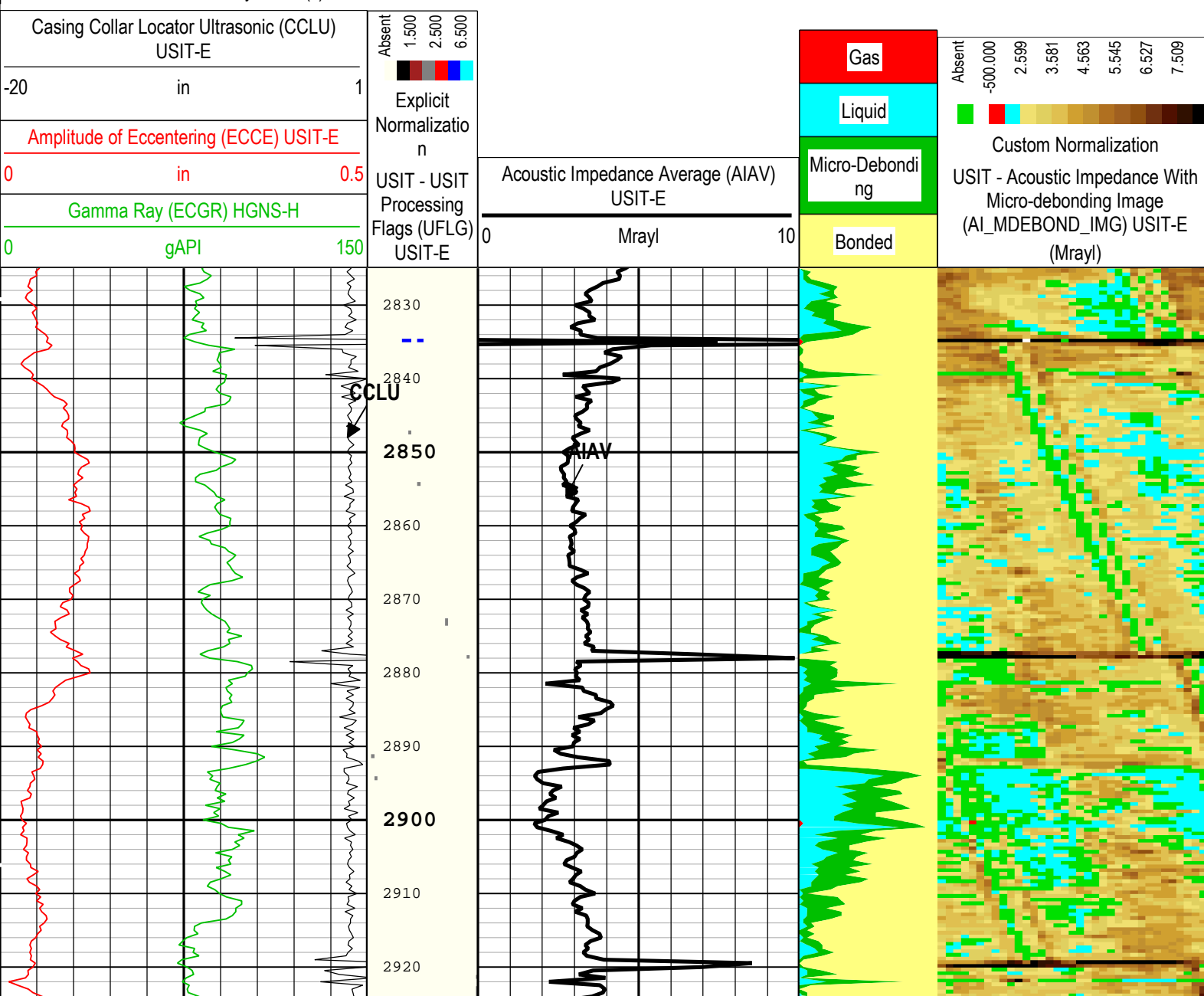
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	190	us/ft
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
HEMA	Hematite Presence Flag	Borehole	No	
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	1.85	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	1.82	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.6	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

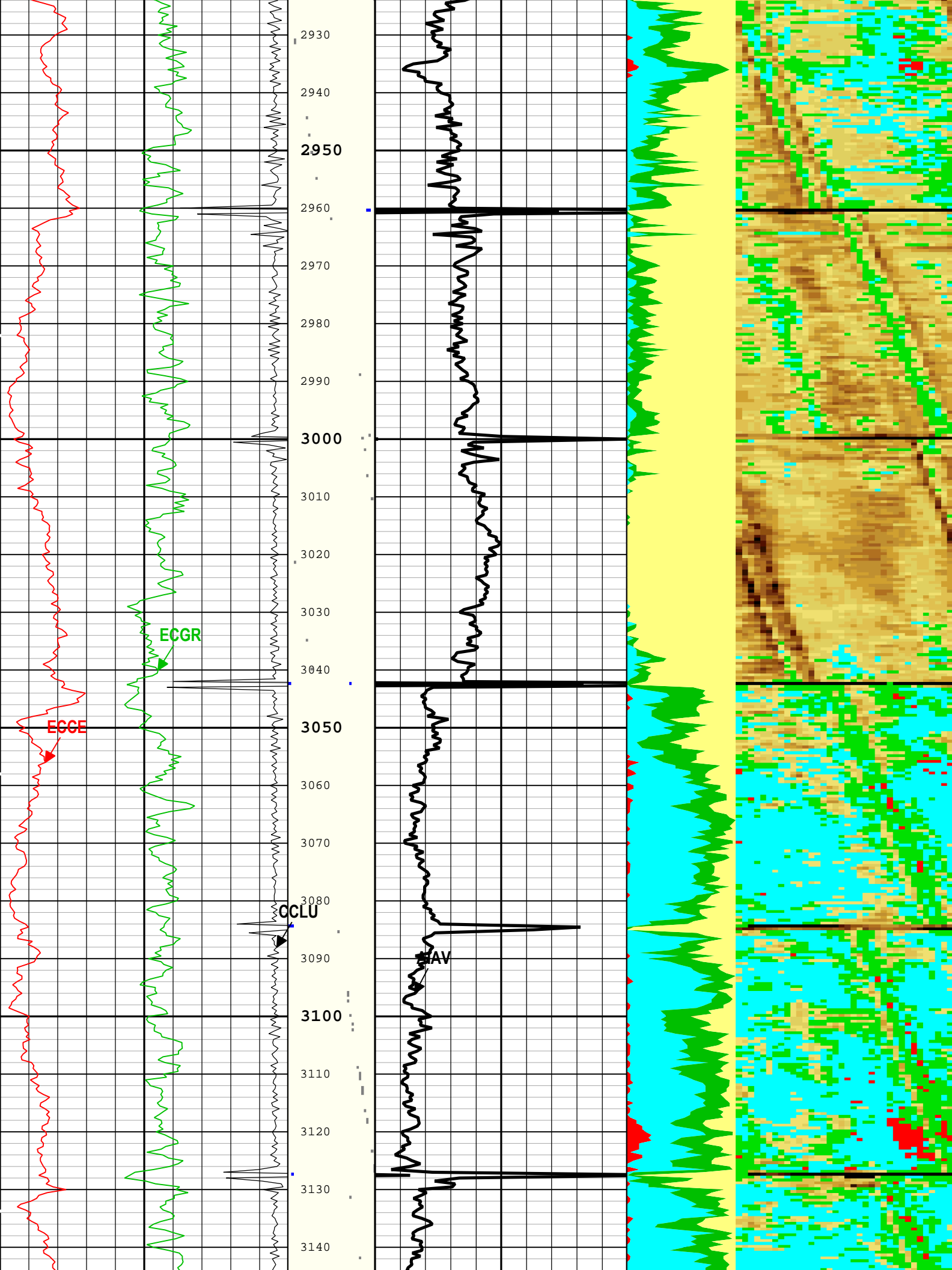
Depth Zone Parameters			
Parameter	Value	Start ( ft )	Stop ( ft )
BS	13.5	70	1928
BS	8.5	1928	6558.5
All depth are actual.			

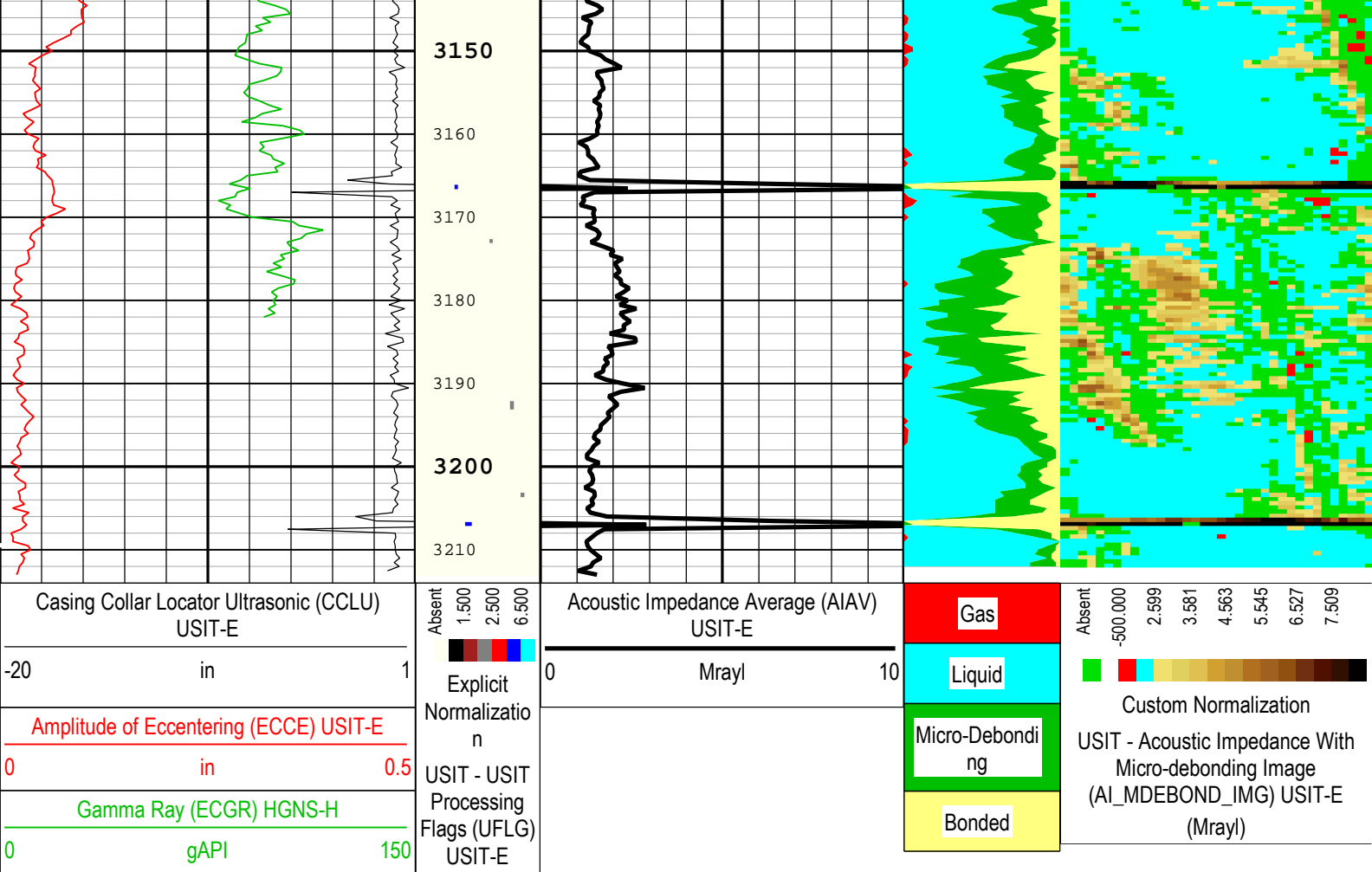
Tool Control Parameters	
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One: Parameters				
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
EMXV	EMEX Voltage	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	29-Jun-2016 07:32:21	29-Jun-2016 07:32:52	6559.22	6535.78
WINB	25	29-Jun-2016 07:32:52	29-Jun-2016 08:53:02	6535.78	67.94
WINE	67.85	29-Jun-2016 07:32:21	29-Jun-2016 07:32:48	6559.22	6542.27







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: 30-Jun-2016 08:47:16

Channel Processing Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
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	17450.9	ft
CDEN	Cement Density	HGNS-H	16.69	lbm/gal
CMTY(U-USIT_CENT)	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
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	
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	1.85	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	1.82	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.6	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Tool Control Parameters

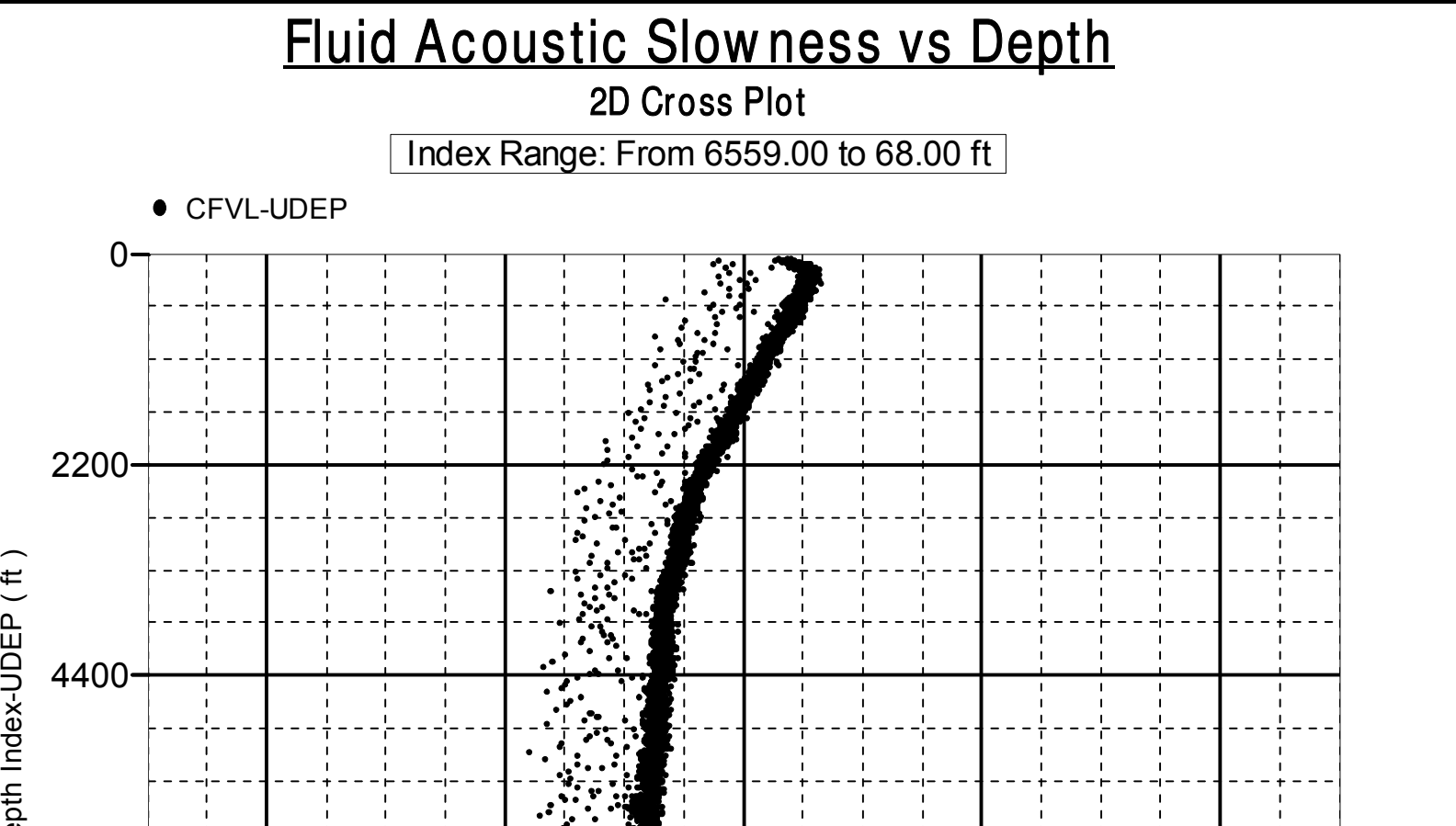
One: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
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	25	us
WINE	Window End Time	USIT-E	70	us

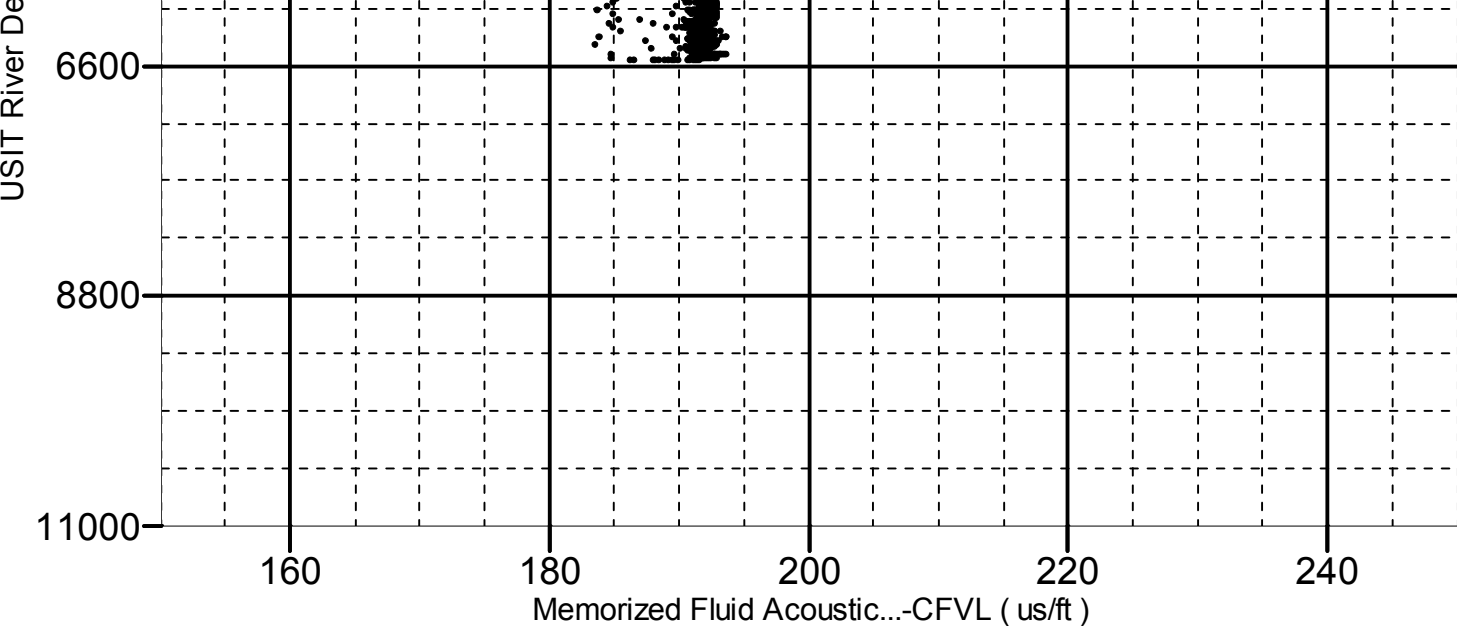
XYZ

Company:Noble Energy Inc. Well:Shadow A26-663

One: Log[8]:Up:S012



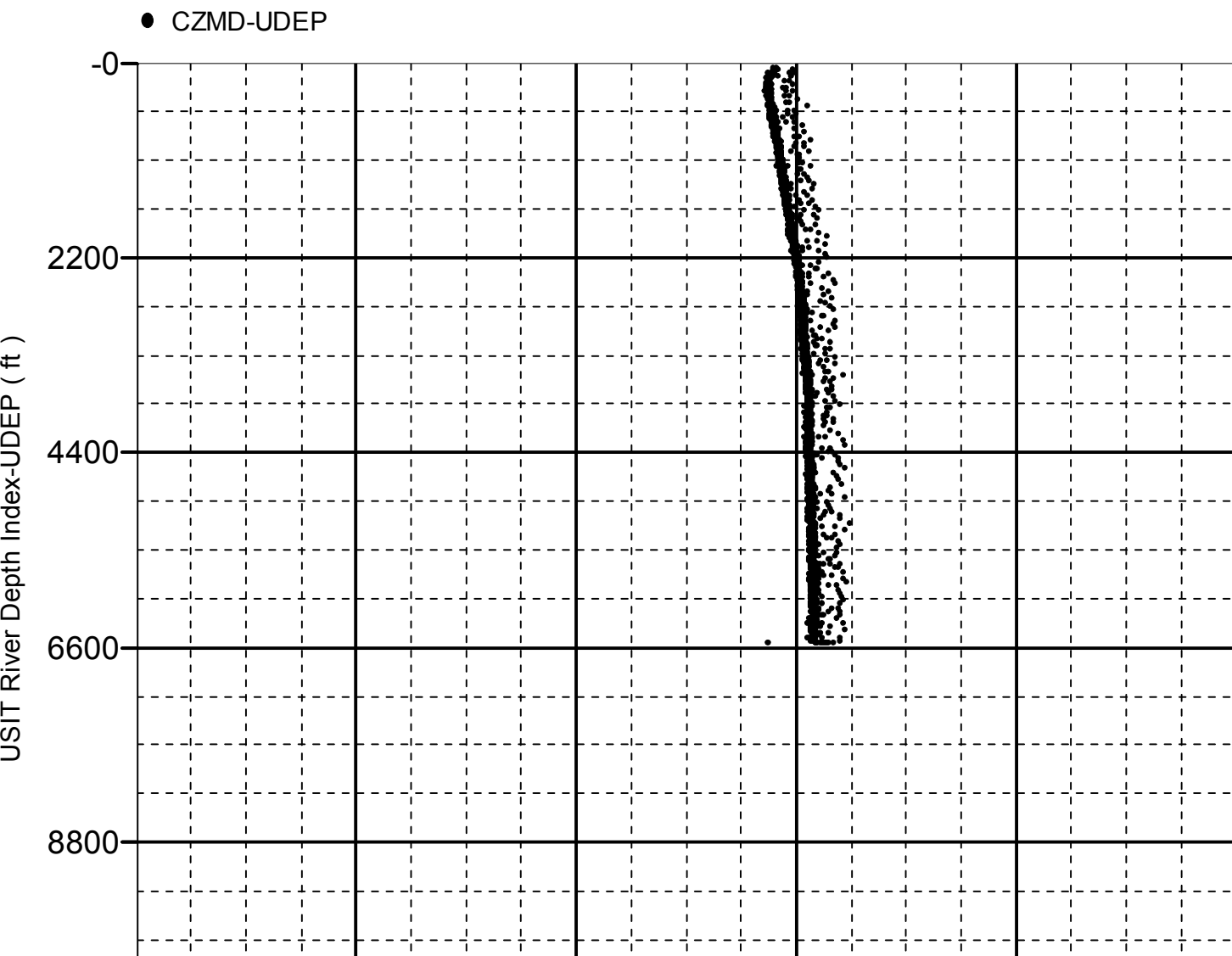


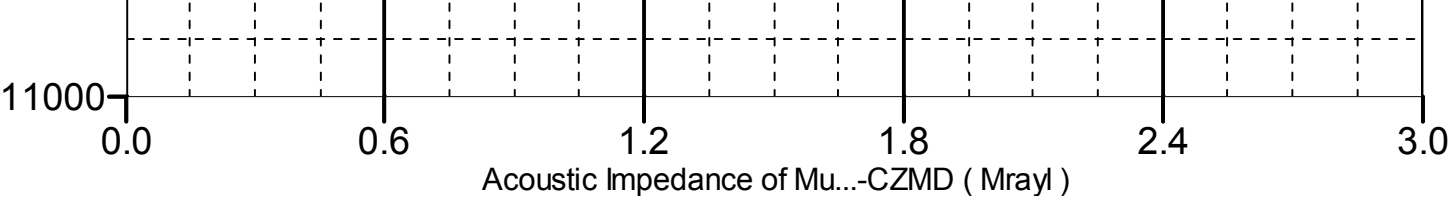


## Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6559.00 to 68.00 ft





Company: Noble Energy Inc.

Well: Shadow A26-663

Field: Wattenberg

County: Weld

State: Colorado



