

Company: Noble Energy, Inc.

Well: Benelli Federal LC22-760

Field: Wildcat

County: Weld State: Colorado

UltraSonic Summary Print

County:	Weld				
Field:	Wildcat				
Location:	NENW Sec 22 T9N R59W				
Well:	Benelli Federal LC22-760				
Company:	Noble Energy, Inc.				
<div>Location:</div> <div>Permanent Datum: Log Measured From: Drilling Measured From:</div> <div>API Serial No. 05-123-42977</div>		NENW Sec 22 T9N R59W	Elev.:	K.B.	4945.00 ft
		SHL: 400 FNL 1649 FWL		G.L.	4915.00 ft
		Latitude: 40.74234 Longitude: -103.96768		D.F.	4944.00 ft
		Ground Level	Elev.:	4915.00 f	
		Kelly Bushing	30.00 ft	above Perm.Datum	
		Kelly Bushing			
Section:	Township:	Range:			
22	9N	59W			

Logging Date	30-Mar-2017			
Run Number	One			
Depth Driller	11022.00 ft			
Schlumberger Depth	11022.00 ft			
Bottom Log Interval	6315.00 ft			
Top Log Interval	0.00 ft			
Casing Fluid Type	Brine			
Salinity				
Density	9.4 lbm/gal			
Fluid Level	8.00 ft			
BIT/CASING/TUBING STRING				
Bit Size	8.50 in			
From	1922.00 ft			
To	11022.00 ft			
Casing/Tubing Size	5.5 in			
Weight	20 lbm/ft			
Grade	N/A			
From	0.00 ft			
To	11007.00 ft			
Max Recorded Temperatures	215 degF			
Logger on Bottom	Time	30-Mar-2017	09:10:00	
Unit Number	Location:	9115	Fort Morgan	
Recorded By	Stephen Tang			
Witnessed By	Bill Mansfield			

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.

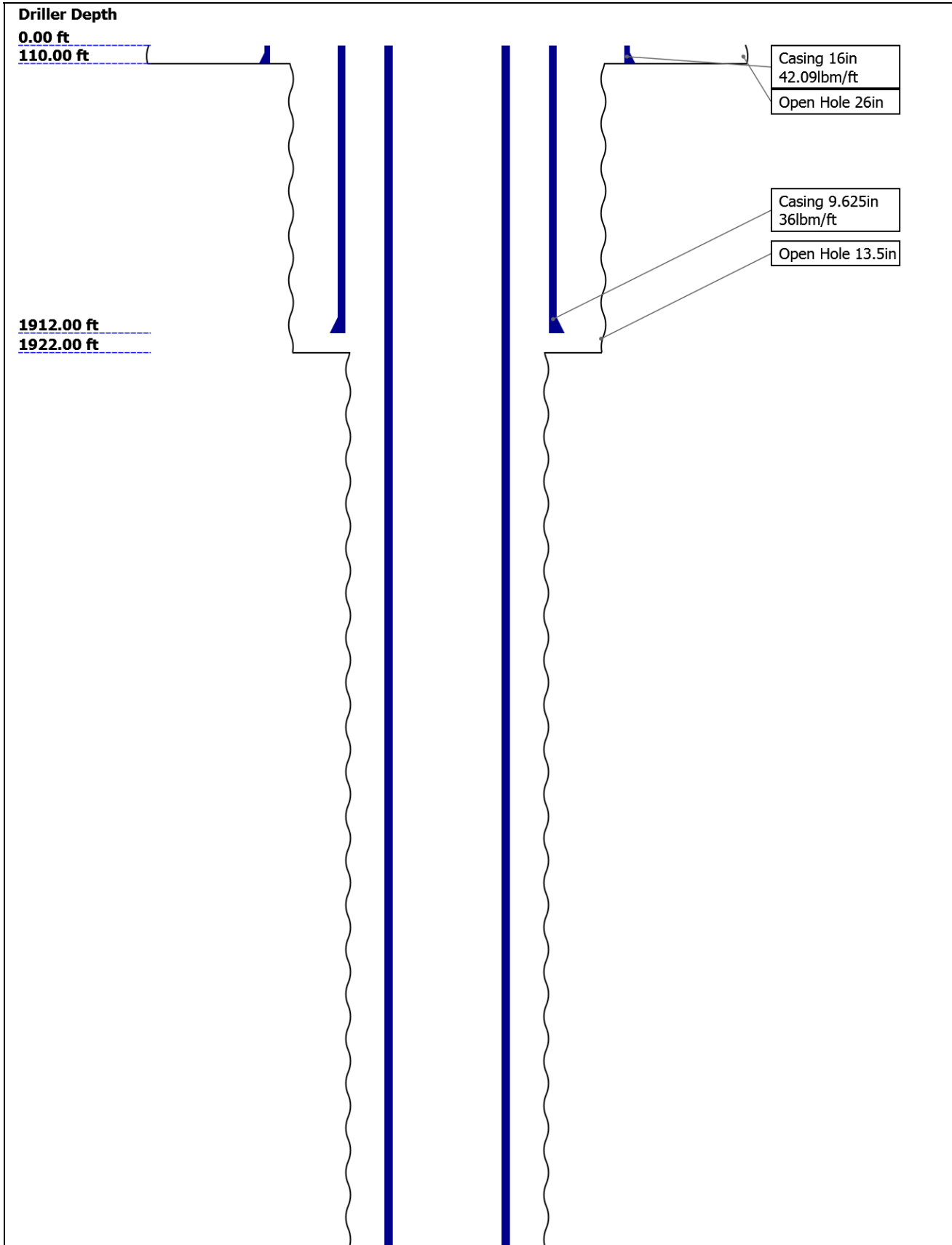
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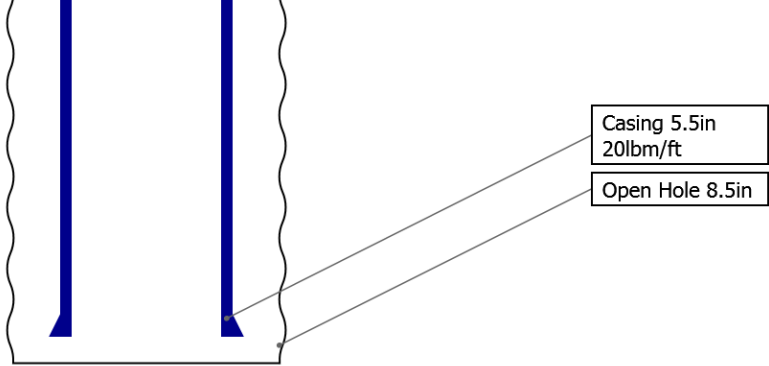
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Well Sketch



11007.00 ft

11022.00 ft



Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	0	110	1922			
Top Logger (ft)	0	110	1922			
Bottom Driller (ft)	110	1922	11022			
Bottom Logger (ft)	110	1922	11022			
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	N/A			
Top Driller (ft)	0	0	0			
Top Logger (ft)	0	0	0			
Bottom Driller (ft)	110	1912	11007			
Bottom Logger (ft)	110	1912	11007			

Remarks and Equipment Summary

One: Toolstring			One: Remarks
<div><div><div>Equip nameLength</div><div>LEH-QT30.97</div><div>LEH-QT</div></div><div><div>DTC-H:9128.06</div><div>70</div><div>ECH-KC:9579</div><div>DTC-H:9170</div><div>SGT-N:1025.06</div><div>386</div><div>SGH-K:3164</div><div>SGC-TB:10386</div><div>SGD-TAA:21892</div></div><div><div>AH-184[2]19.56</div><div>AH-184[1]17.56</div><div>SGT-N:1025.06</div></div></div> <div></div> <div><div>MP nameOffset</div><div>CTEM27.16</div><div>HV0.00</div><div>TelStatu25.06</div><div>s</div><div>ToolSta25.06</div><div>tus</div><div>GR24.14</div></div>	<div>Toolstring ran as per tool sketch.</div> <div>Well logged at 10 degree 6 inch.</div> <div>Main pass logged with 2500 psi.</div> <div>Repeat pass logged with 0 psi.</div> <div>Crew: Gary Lapp</div> <div>Thank you for choosing Schlumberger!</div>		

Toolstring ran as per tool sketch.

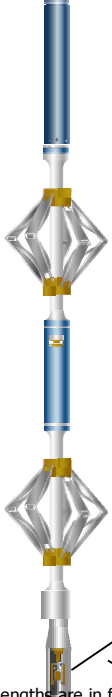
Well logged at 10 degree 6 inch.

Main pass logged with 2500 psi.

Repeat pass logged with 0 psi.

Crew: Gary Lapp

Thank you for choosing Schlumberger!

<div> <div>USIT-E:93 15.56</div> <div>0</div> <div> ECH-MFA: 1924 USAC-A:9 30 USIS-A:28 00 USSC-B:76 7 USRS-A:84 0 USI-SENS OR:3248 </div> </div>  <div> USI Sen 0.37 sor TOOL_ZERO Head Fe nsion </div> <div> Lengths are in ft Maximum Outer Diameter = 3.560 in Line: Sensor Location, Value: Gating Offset All measurements are relative to TOOL_ZERO </div>		
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Depth Summary			
	One		
Depth Measuring Device			
Type Serial Number Calibration Date Calibrator Serial Number Calibration Cable Type Wheel Correction 1 Wheel Correction 2	IDW-B 0 0		
Tension Device			
Type Serial Number Calibration Date Calibrator Serial Number Number of Calibration Points	CMTD-B/A 0		
Logging Cable			
Type Serial Number Length Conveyance Type Rig Type	7-46NT-XS 24000.00 ft Wireline		
One:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well	All Schlumberger depth procedures followed. IDW used as primary depth device. Z-Chart used as secondary depth device.	
Rig Up Length At Surface			
Rig Up Length At Bottom			
Rig Up Length Correction			

One

2500 PSI Main Pass

Software Version	
Acquisition System	Version
Maxwell 2016 SP2	6.2.68624.3100

Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[4]:Up	Up	65.48 ft	6323.78 ft	30-Mar-2017 9:13:07 AM	30-Mar-2017 9:56:29 AM	ON	6.25 ft	Yes
All depths are referenced to toolstring zero									

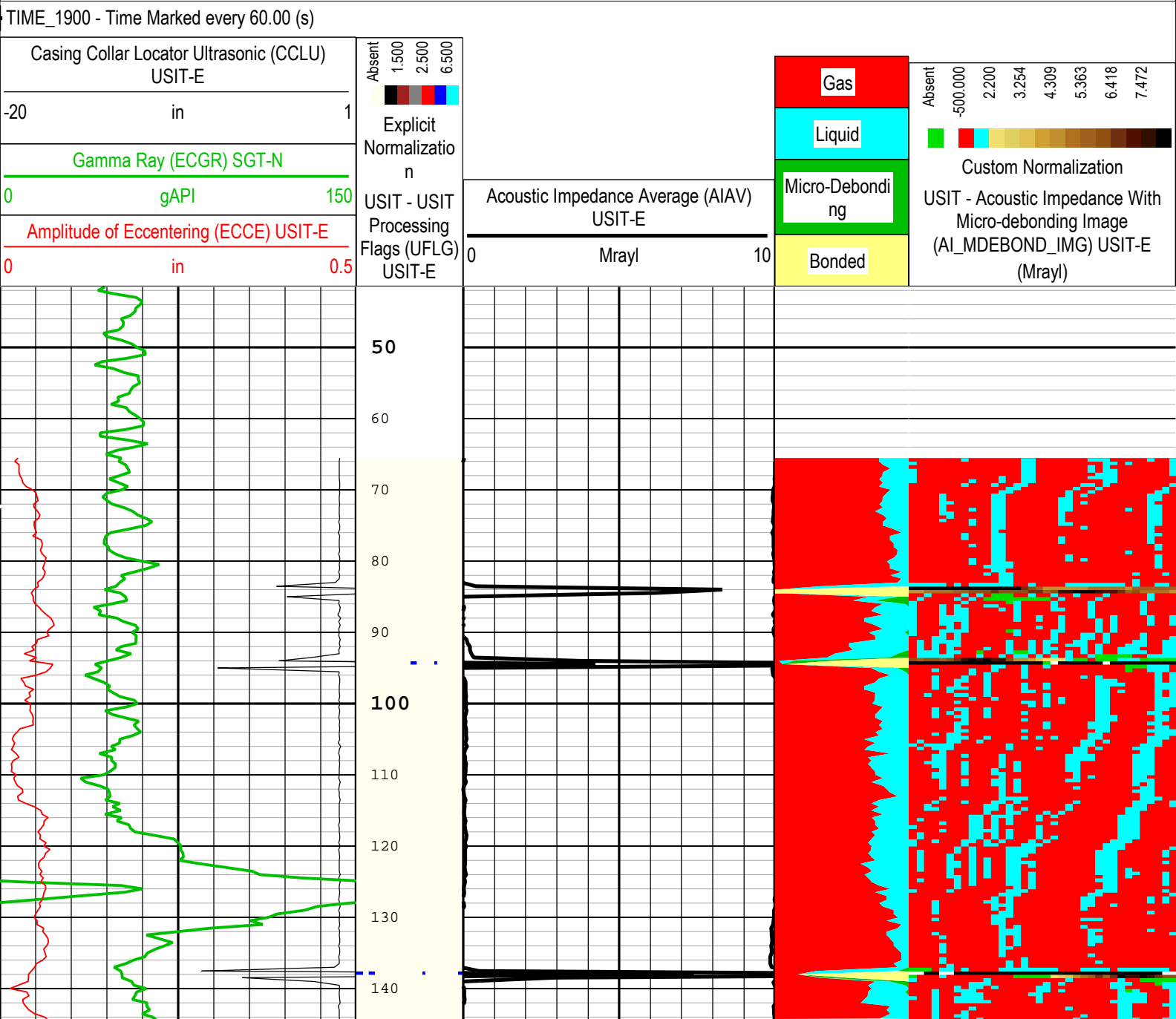
Log

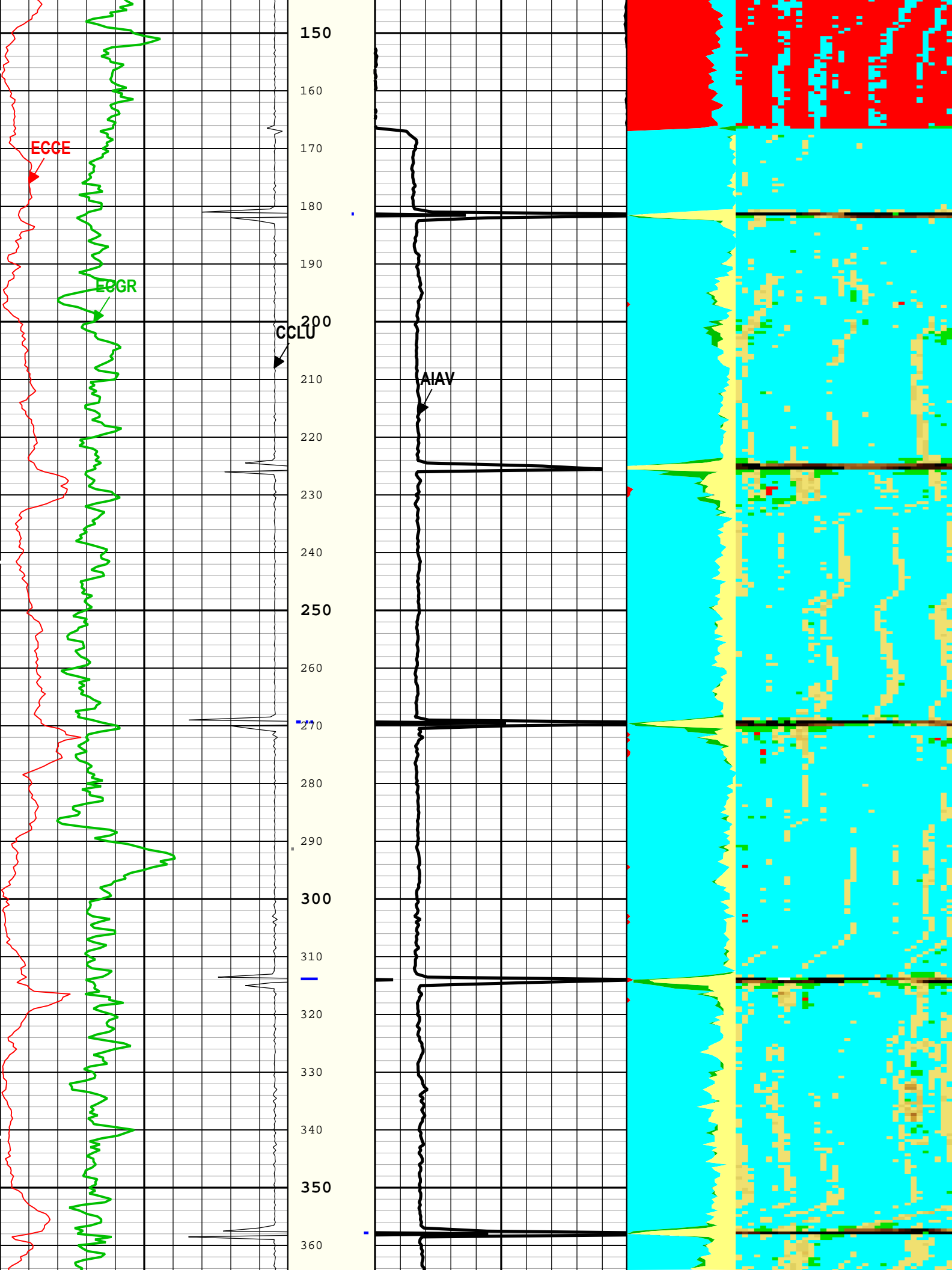
Company:Noble Energy, Inc. Well:Benelli Federal LC22-760

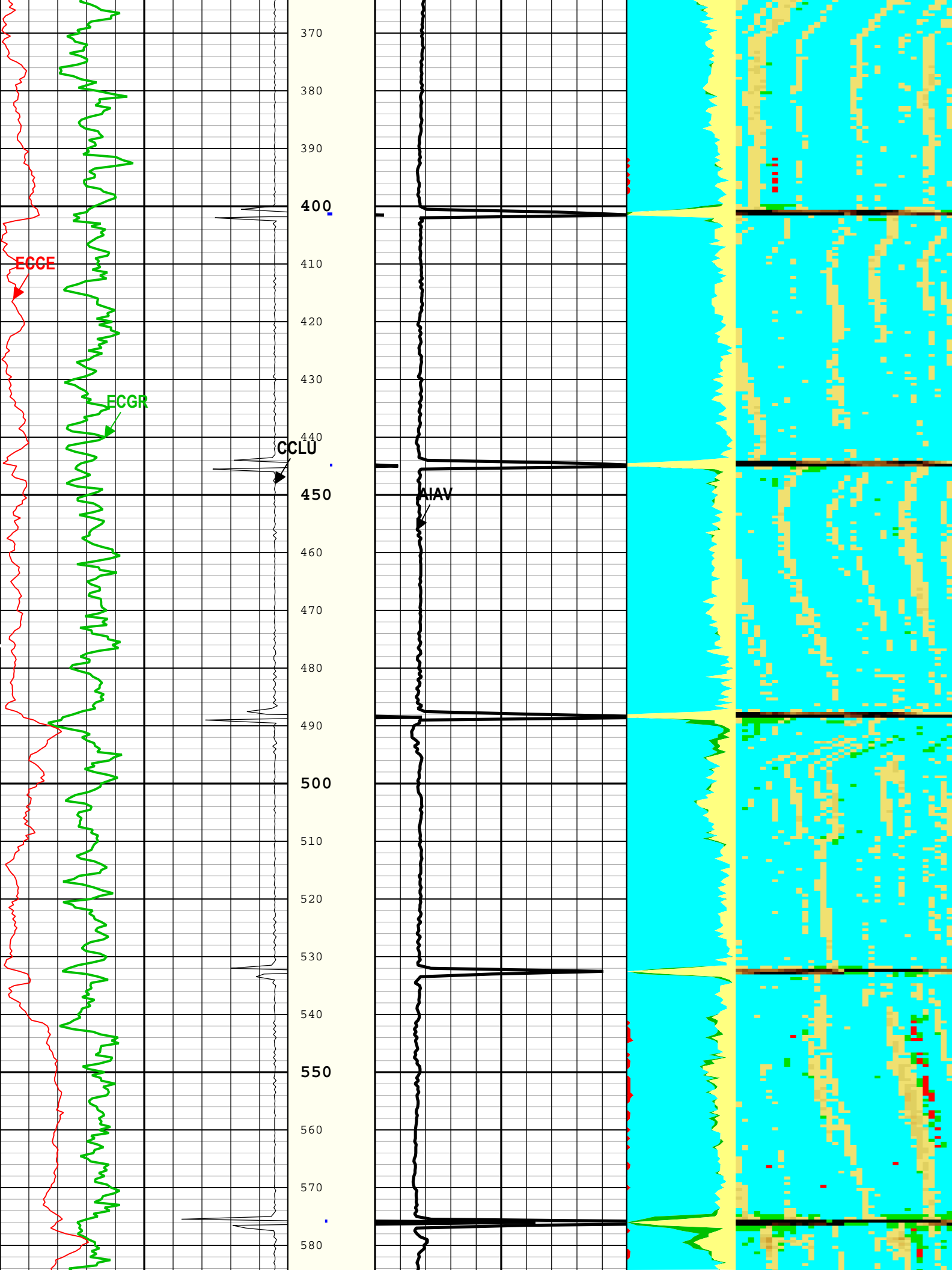
One: Log[4]:Up:S003

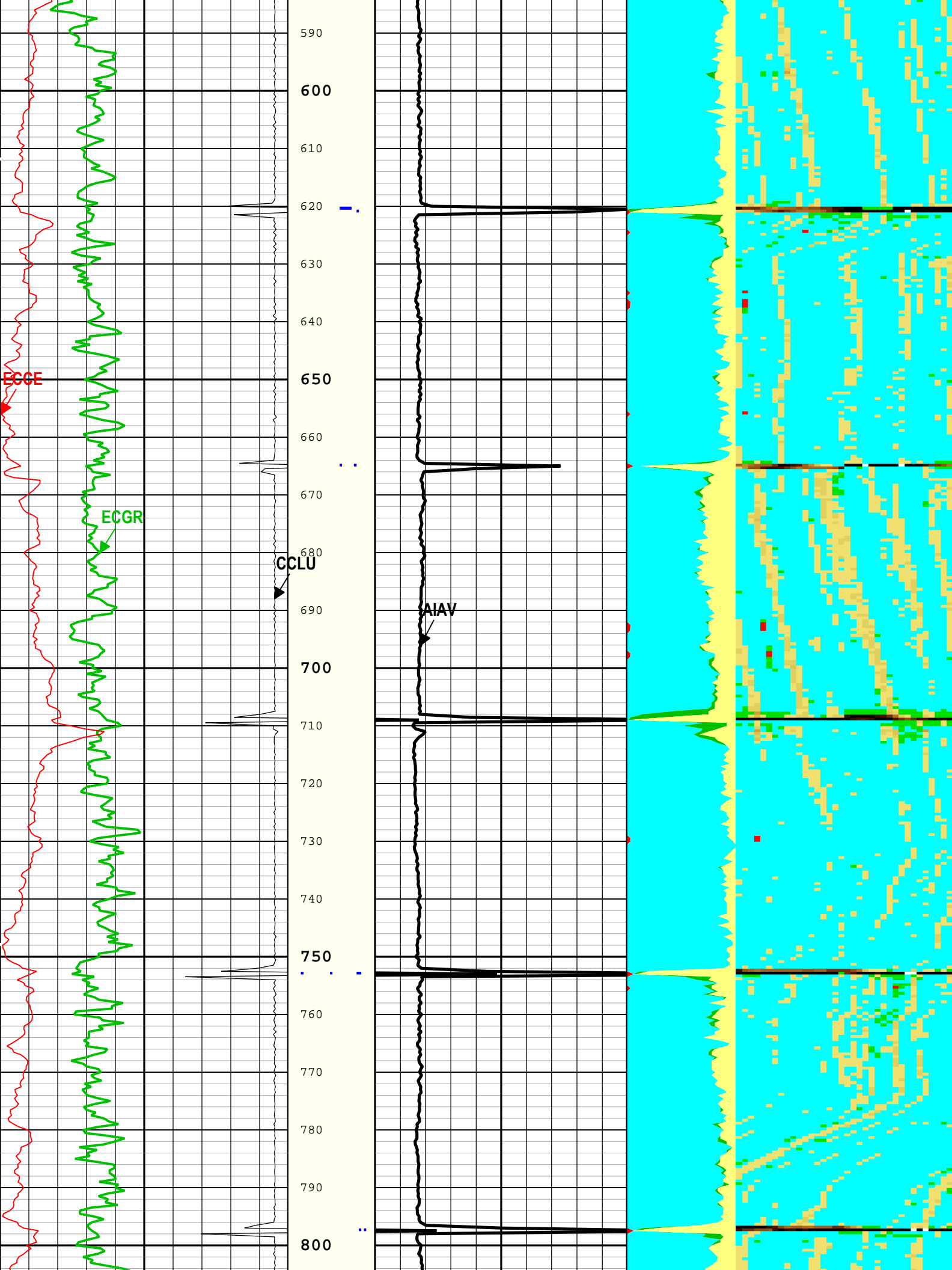
Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth

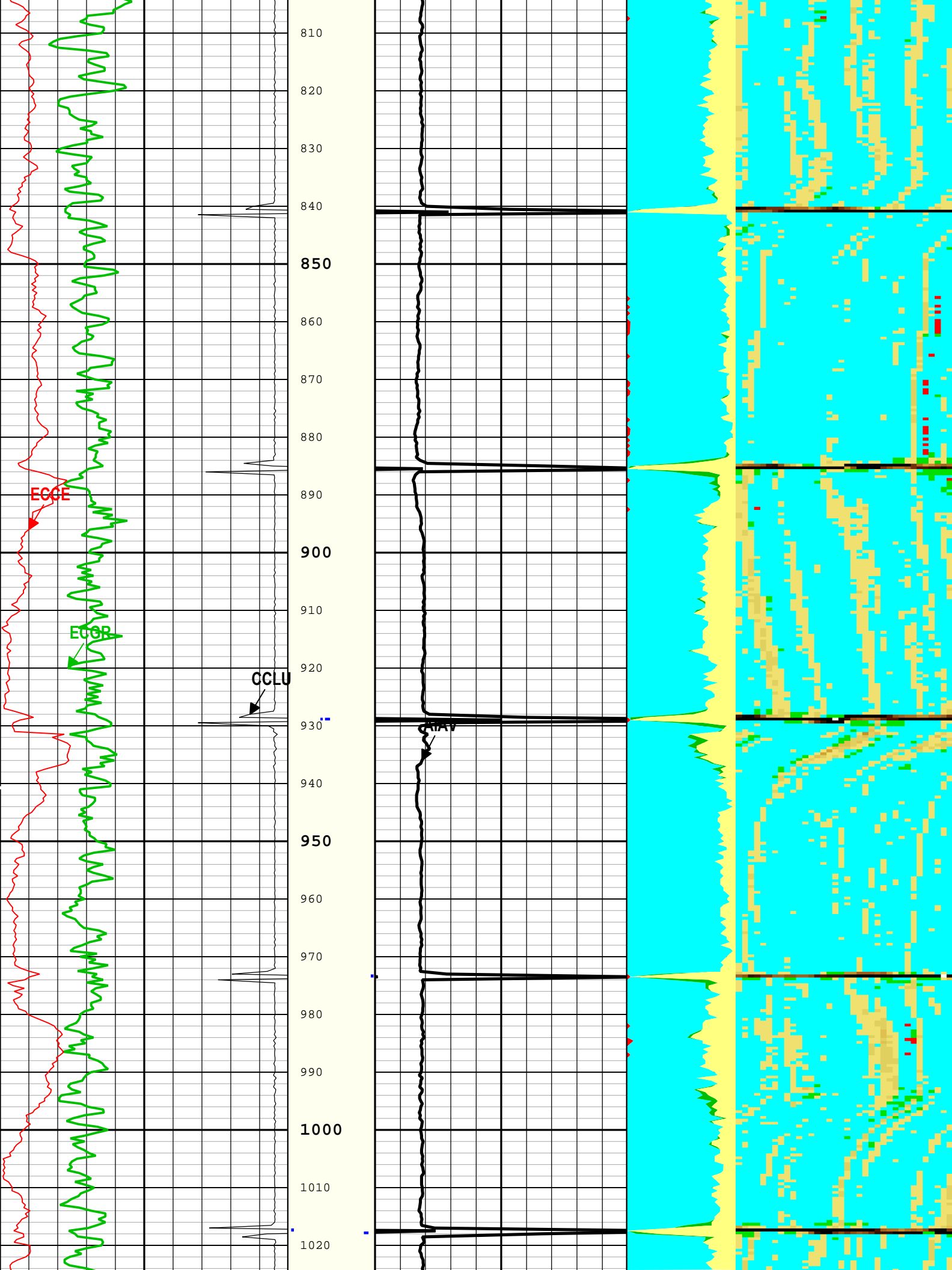
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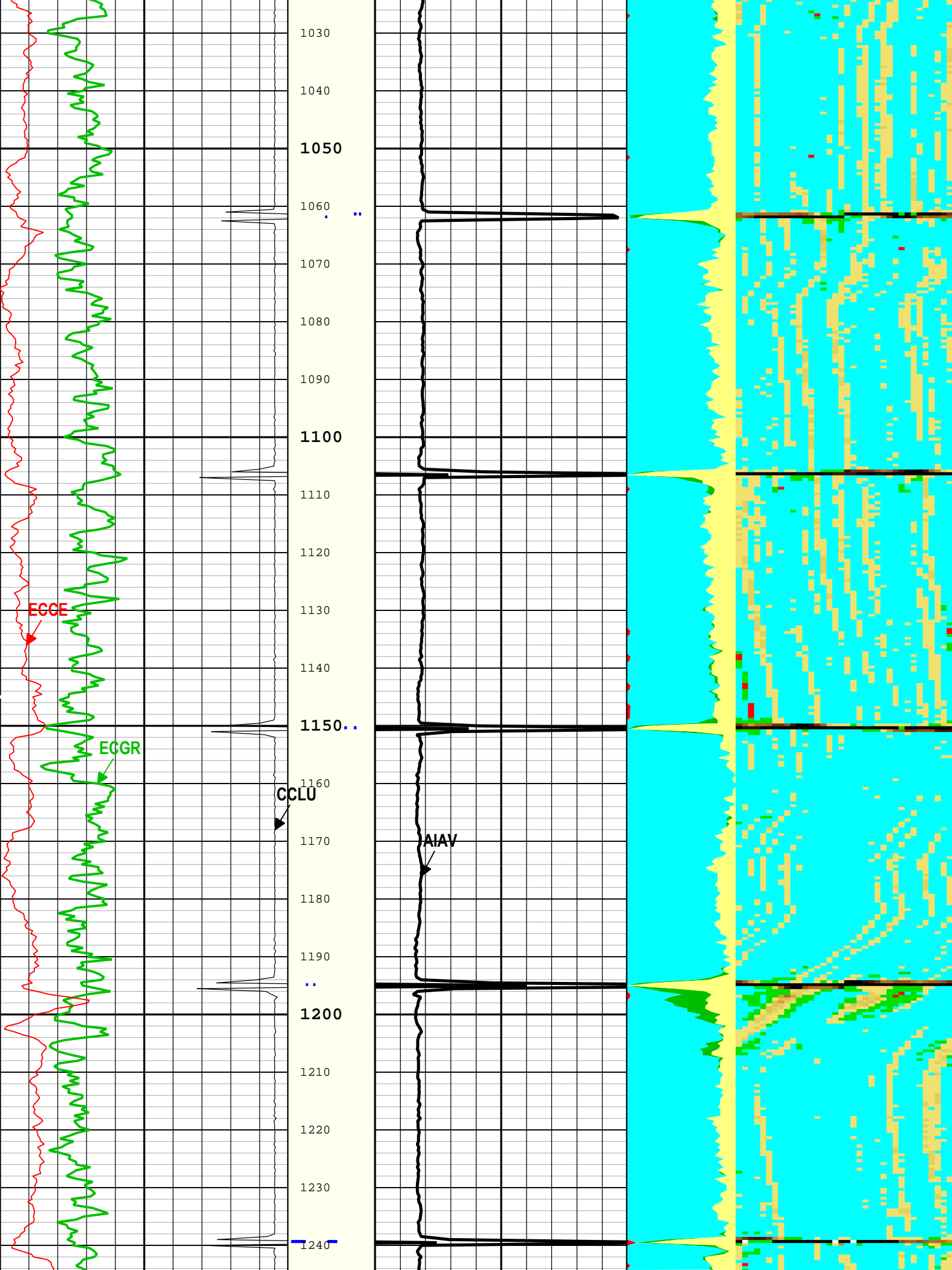


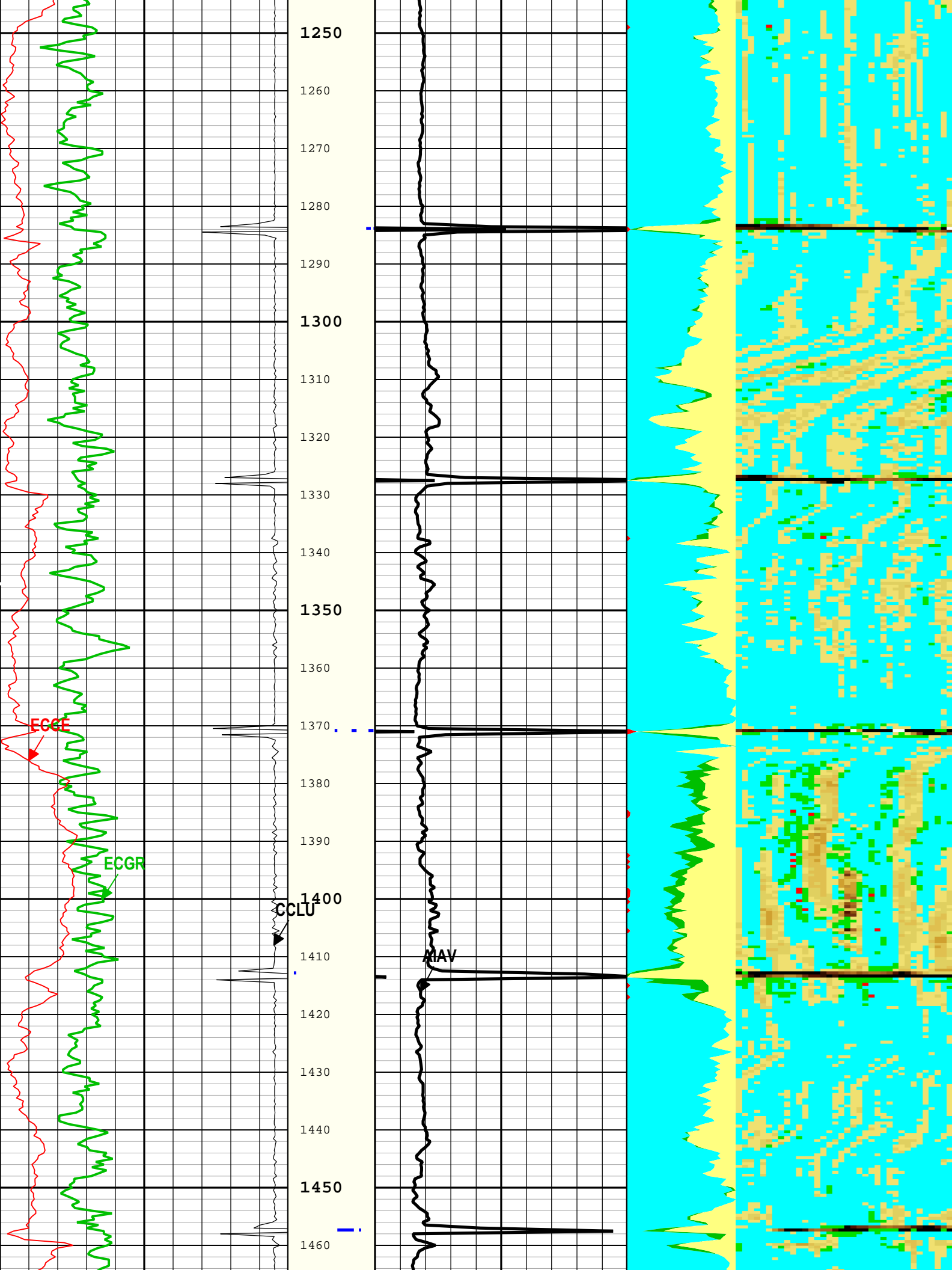


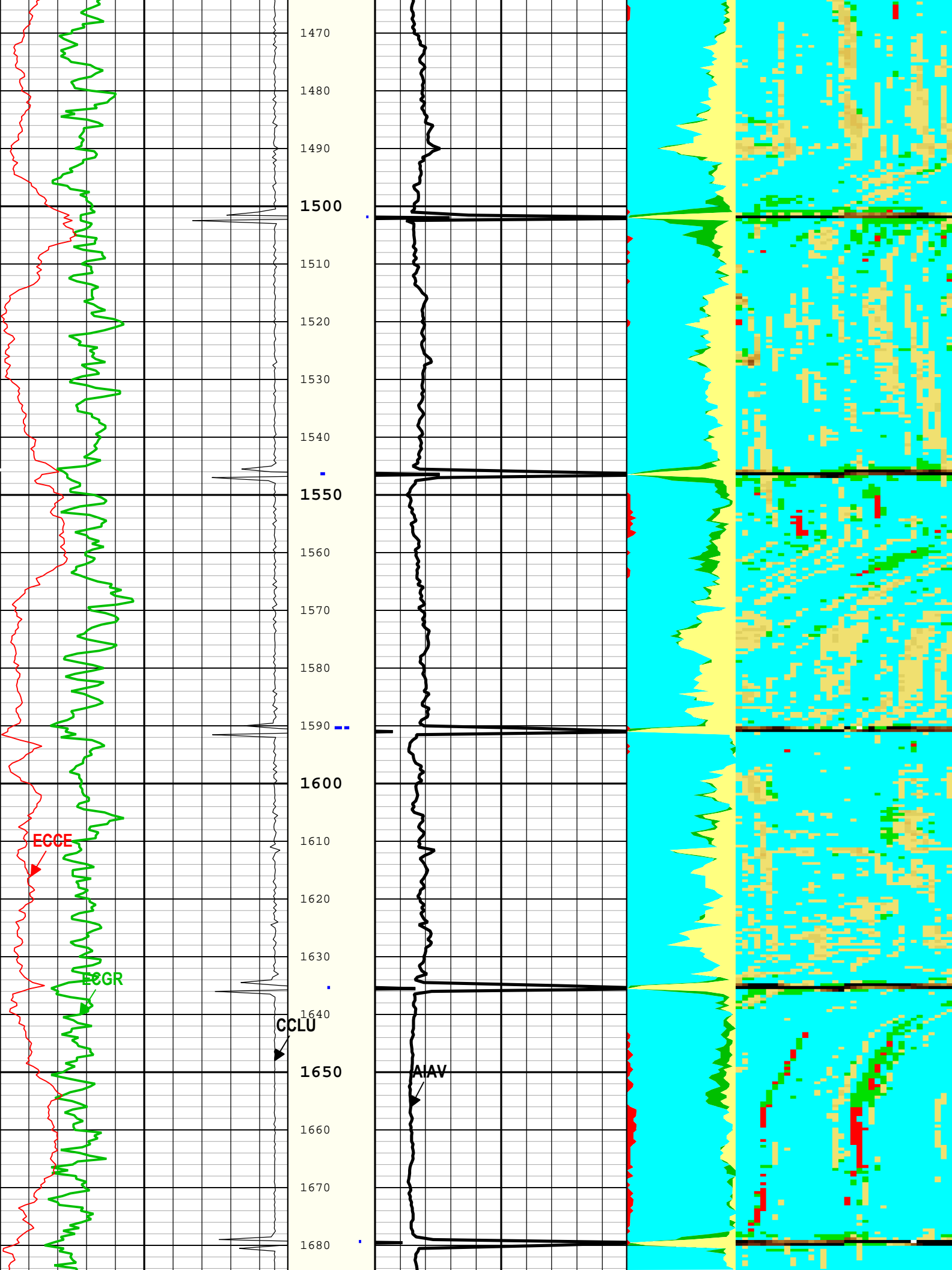


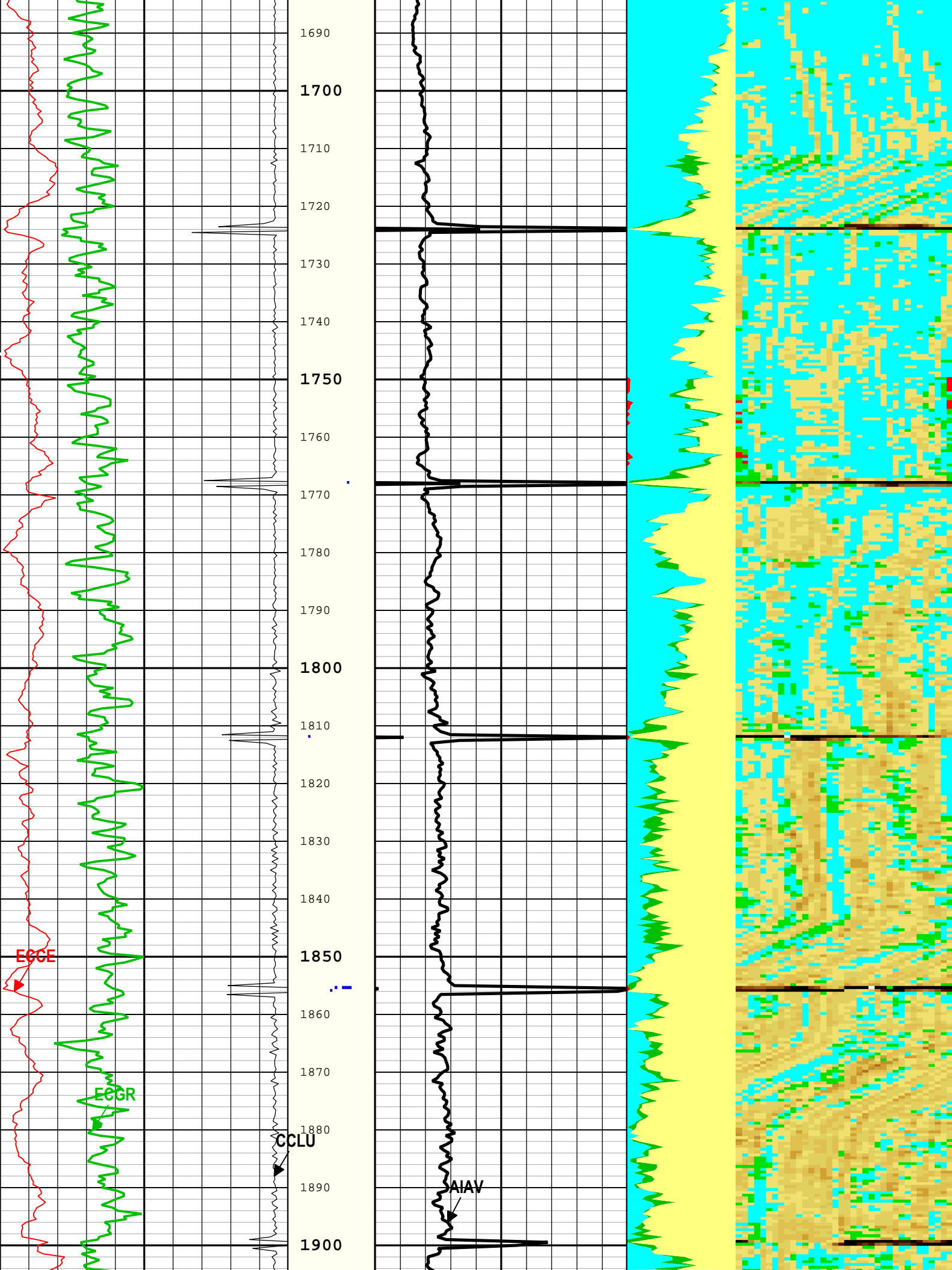


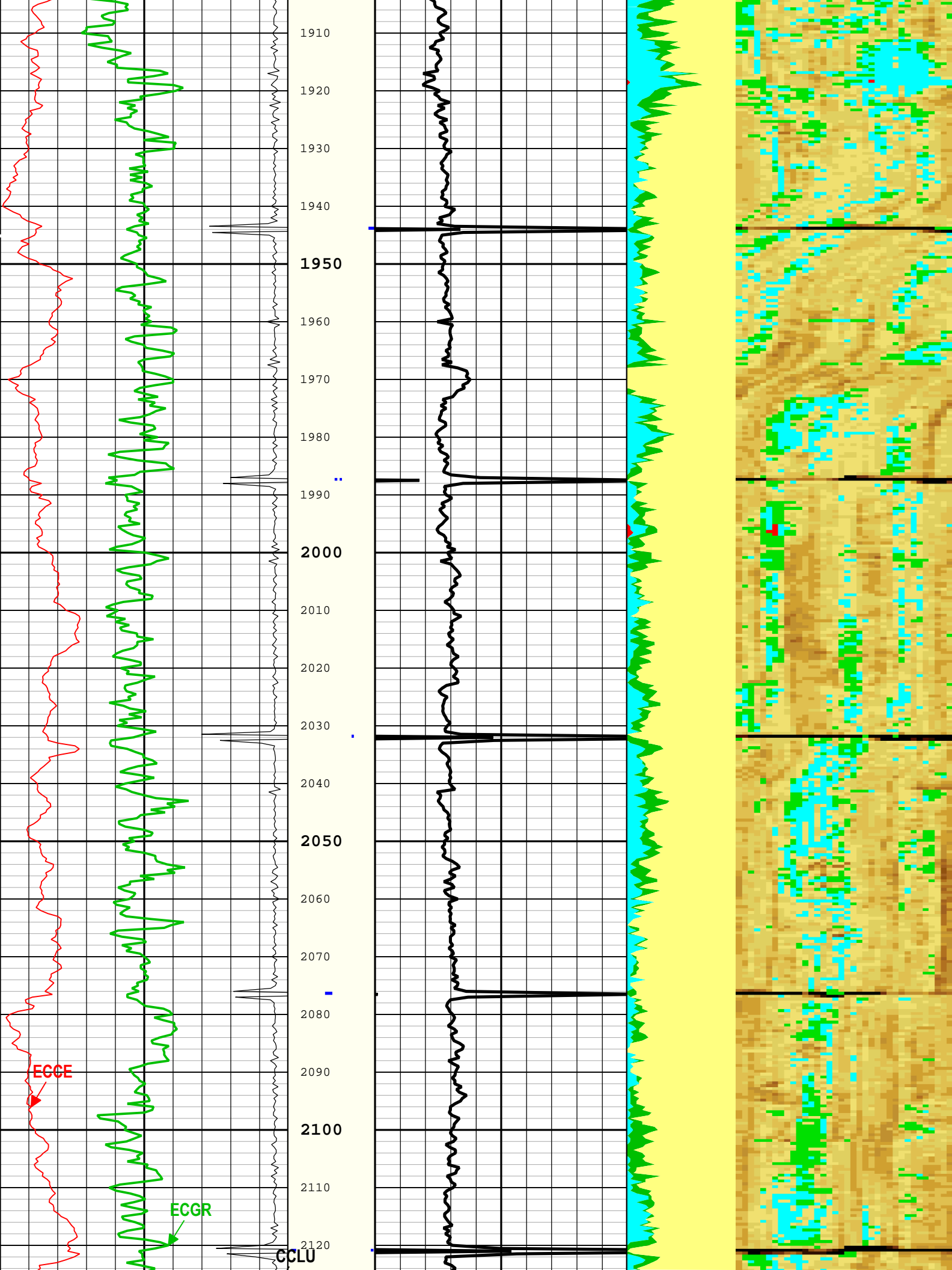


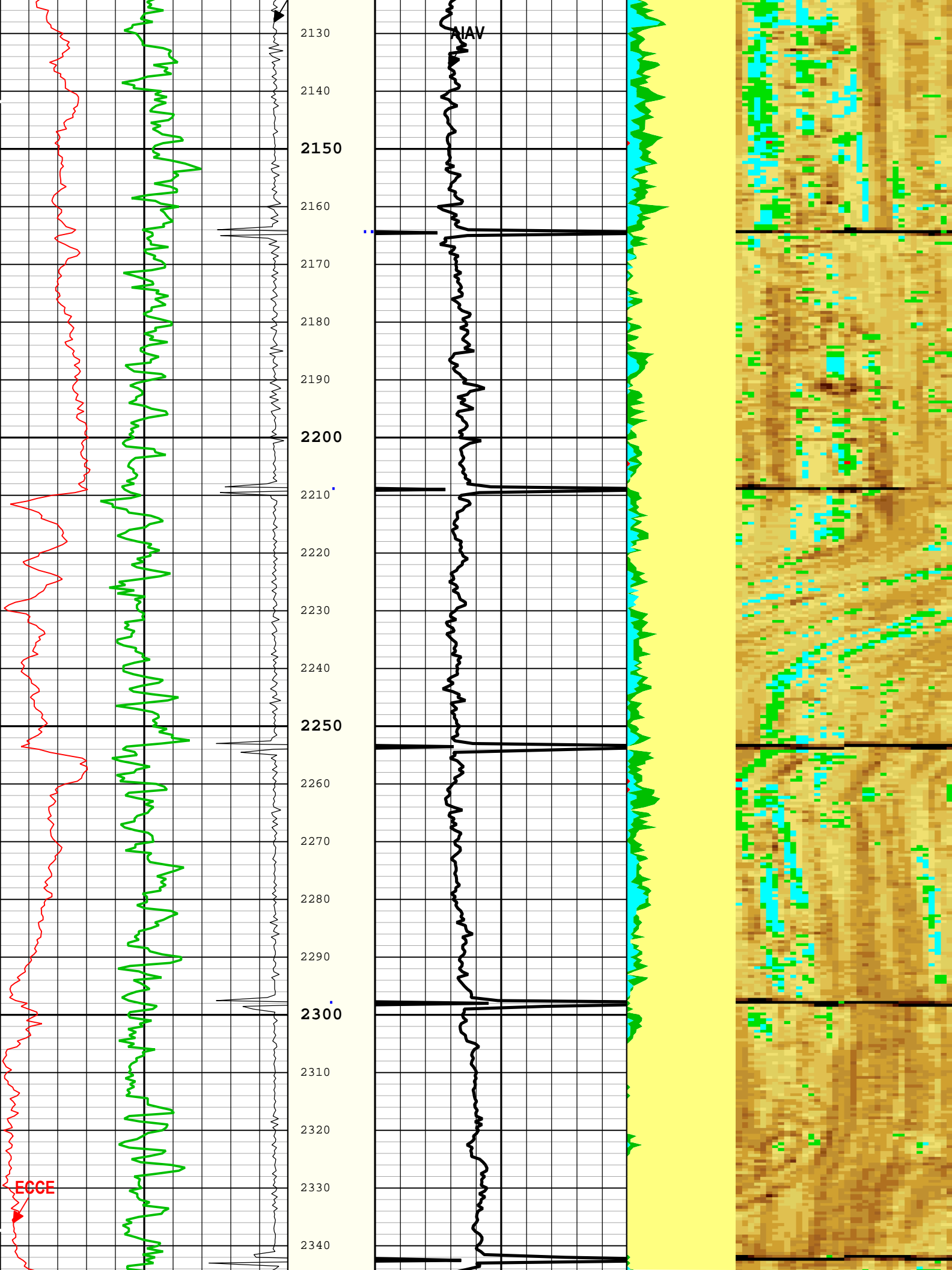


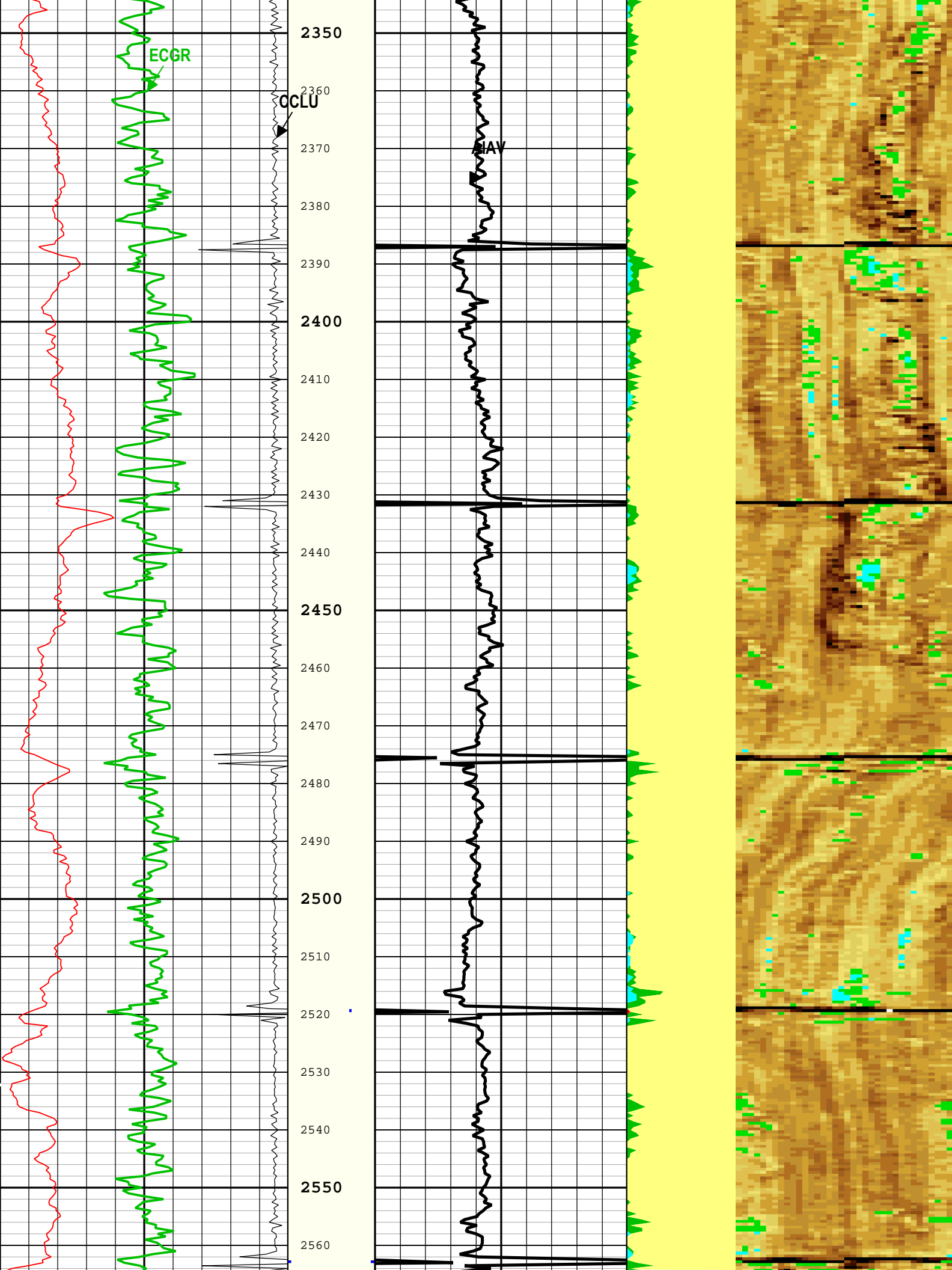


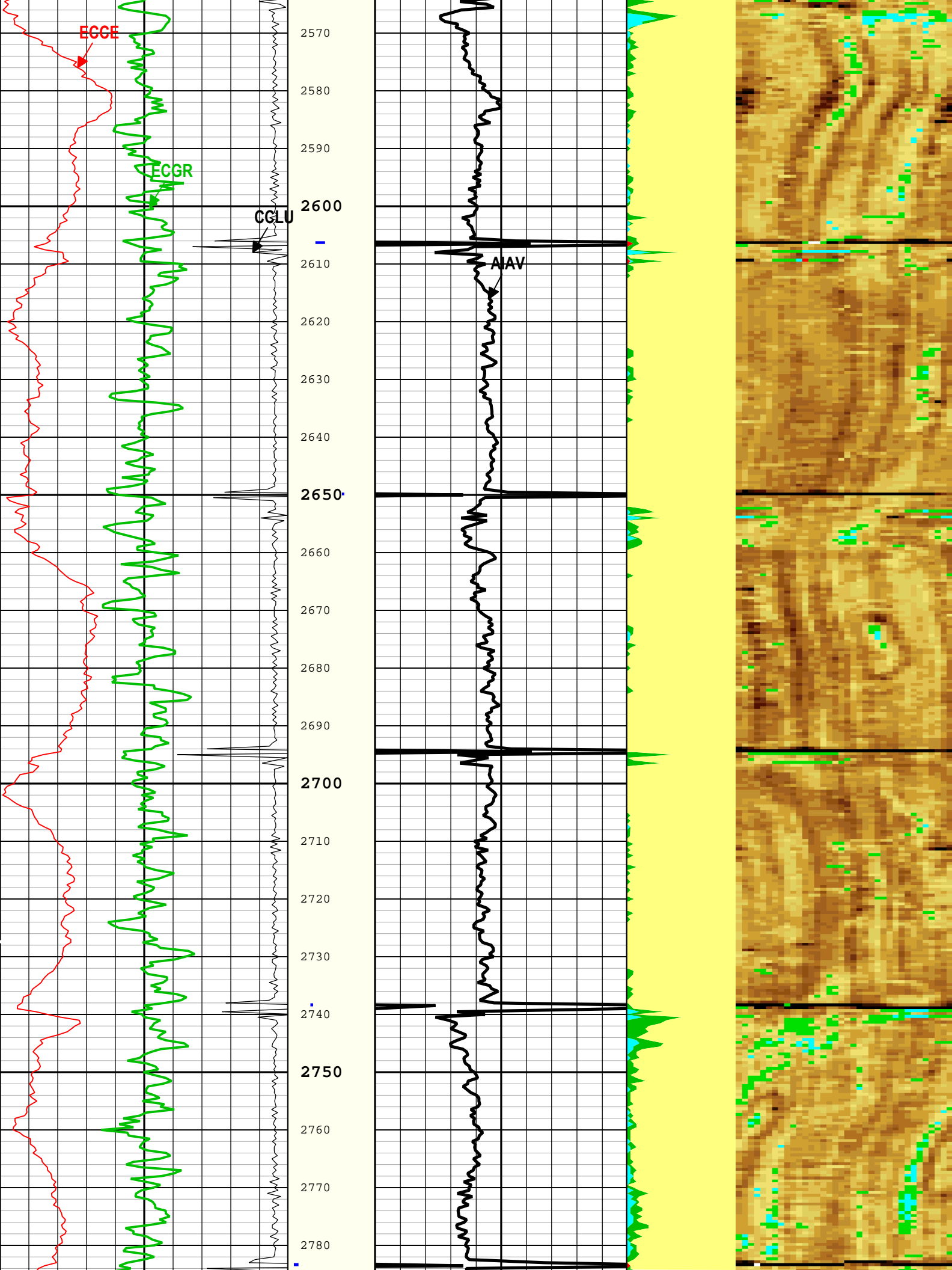


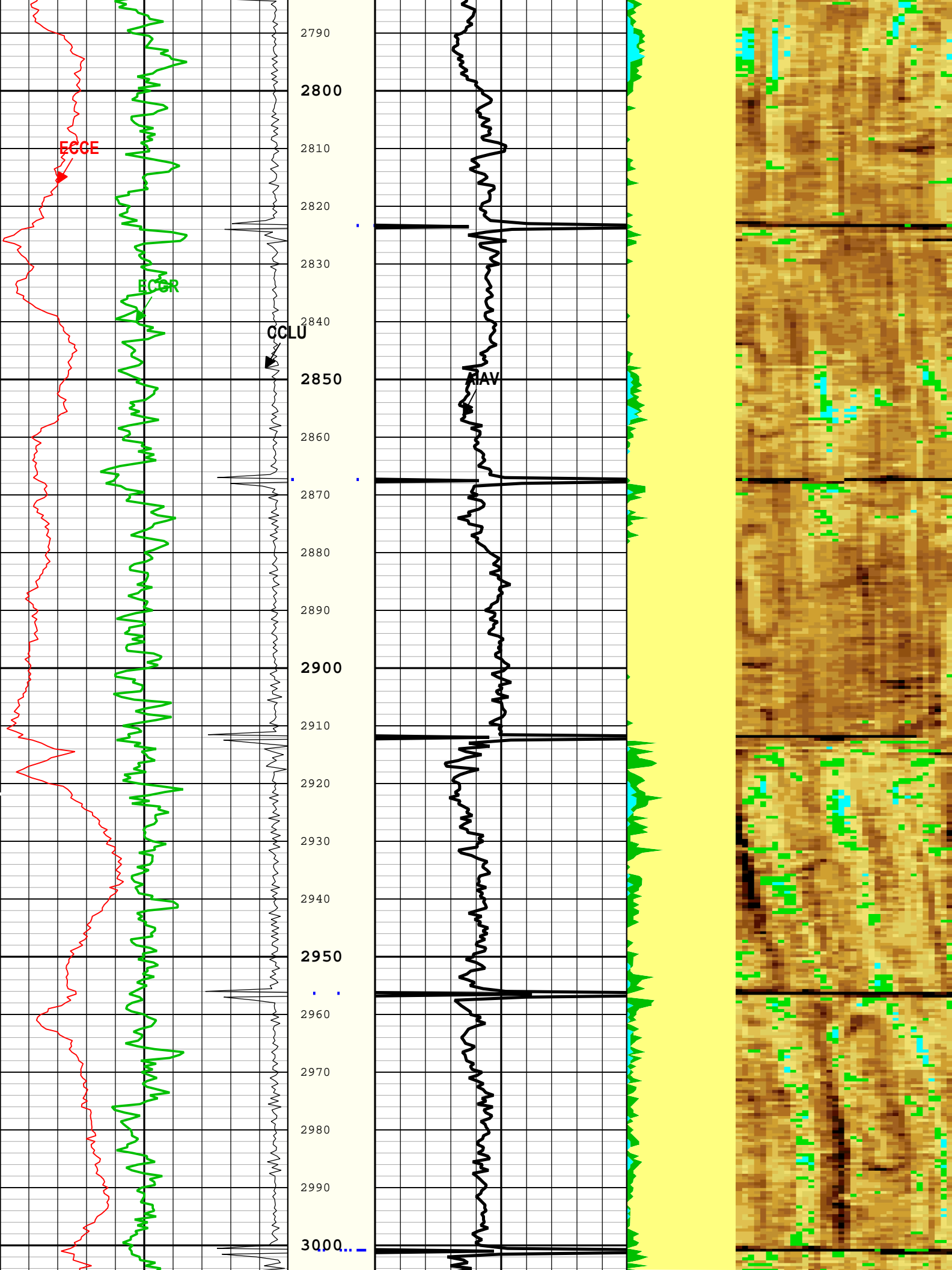


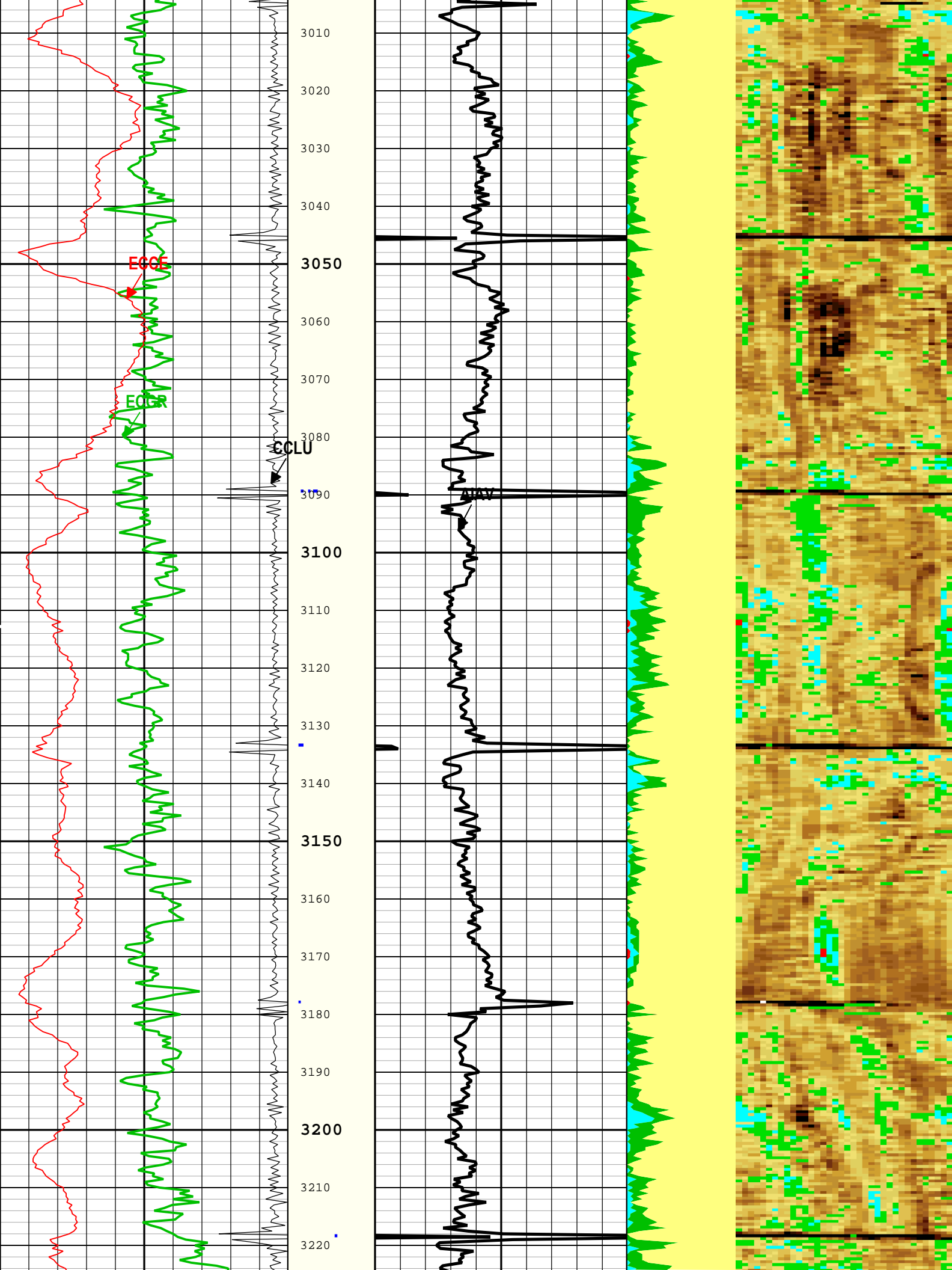


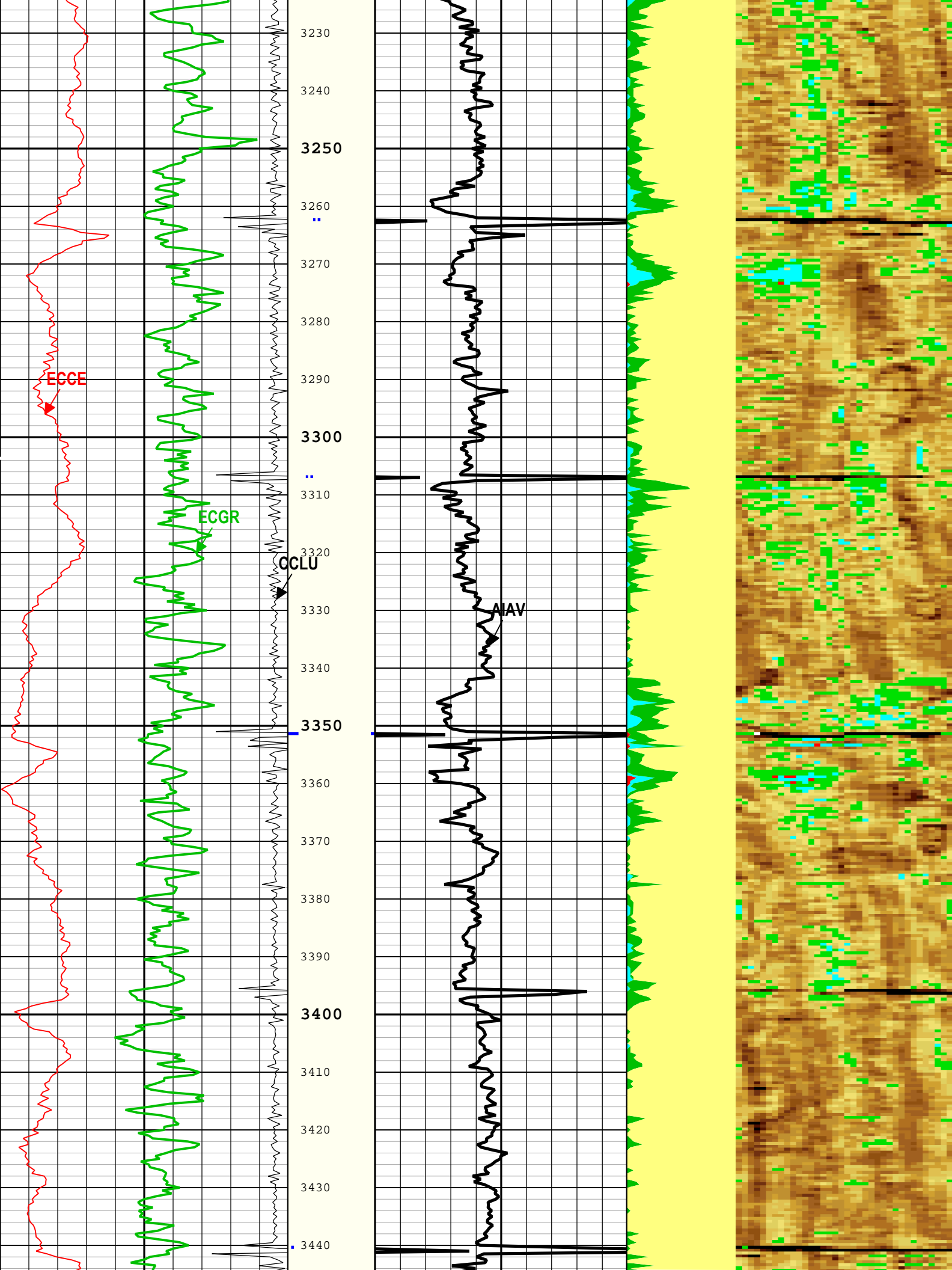


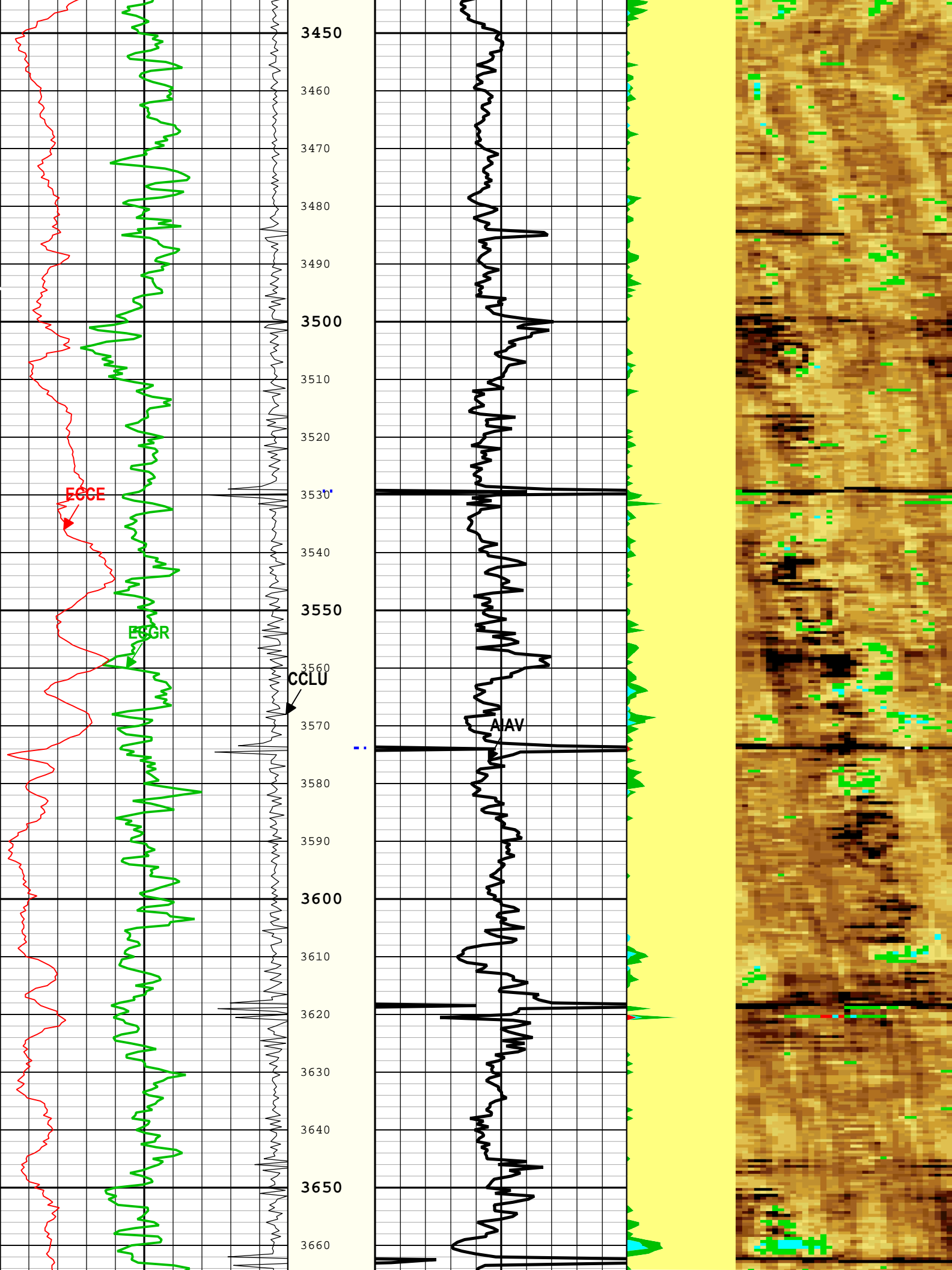


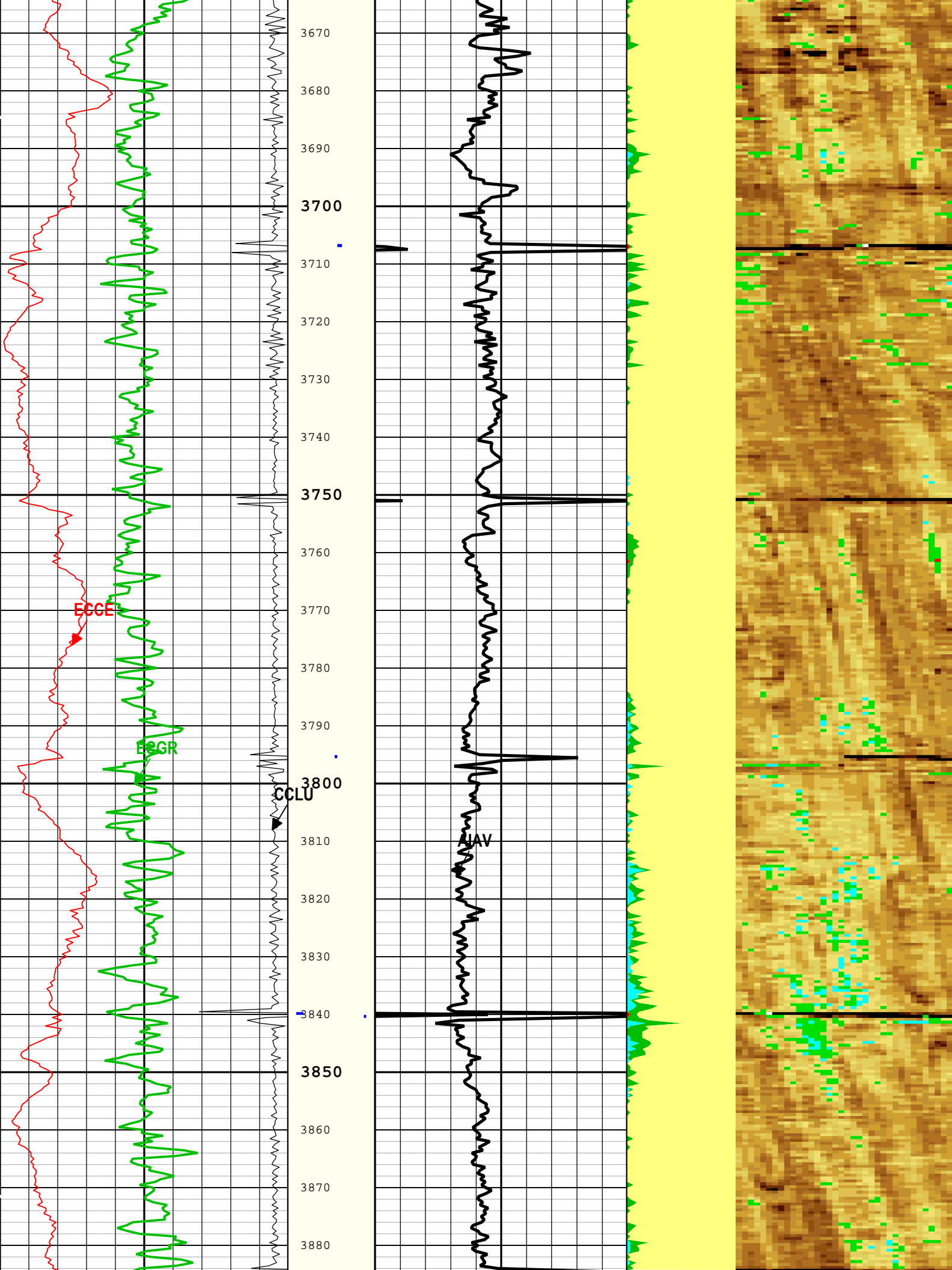


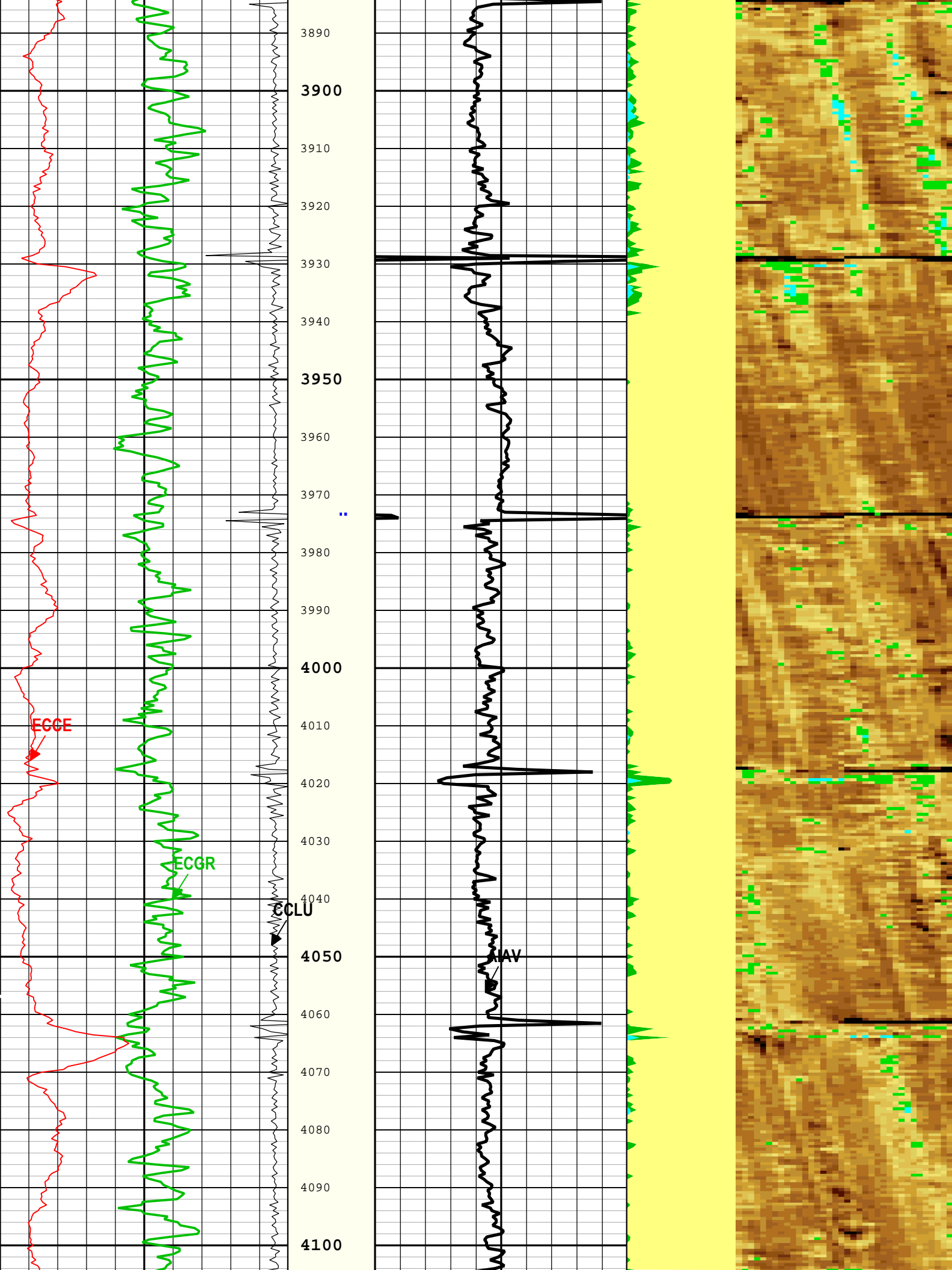


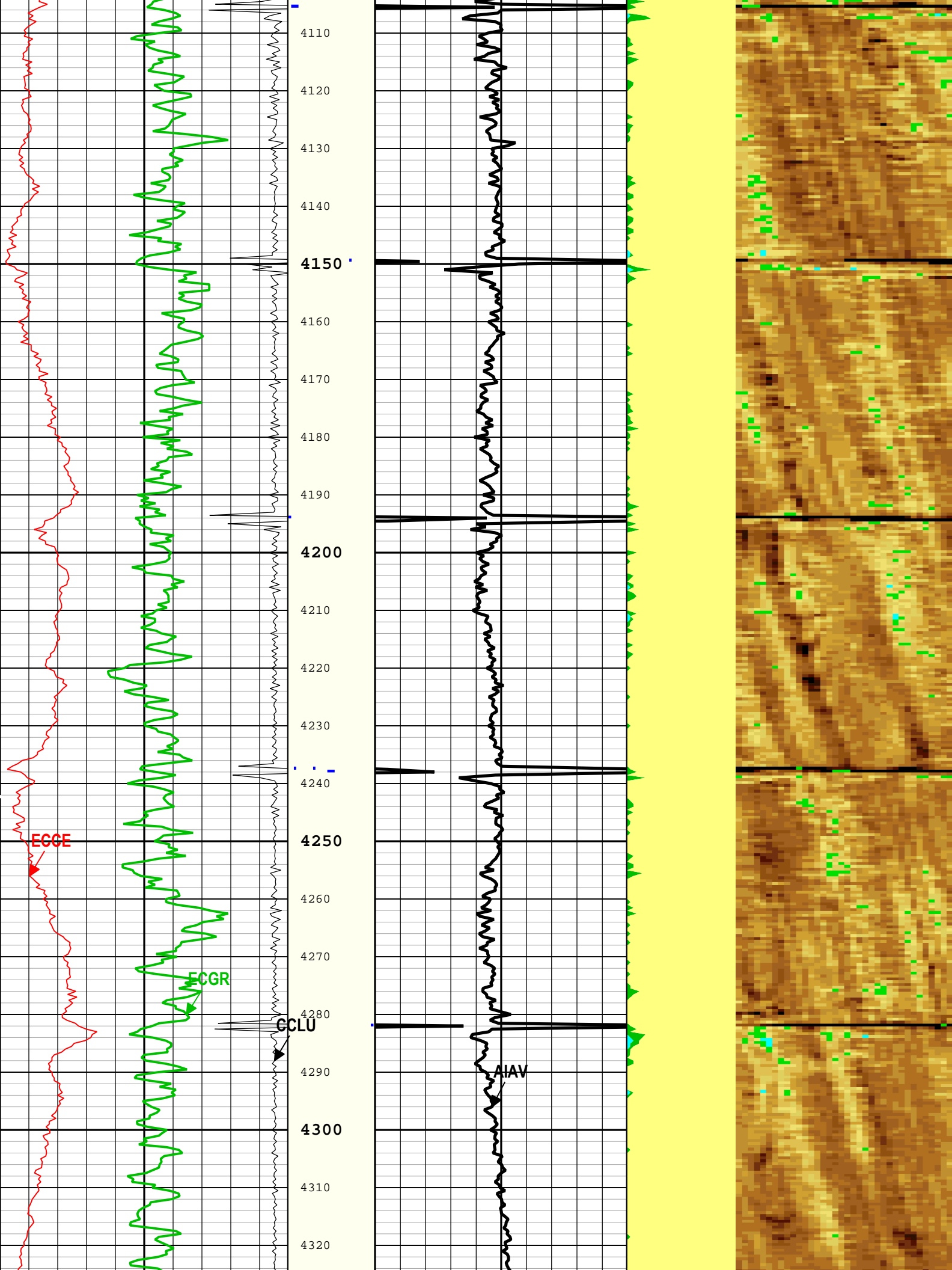


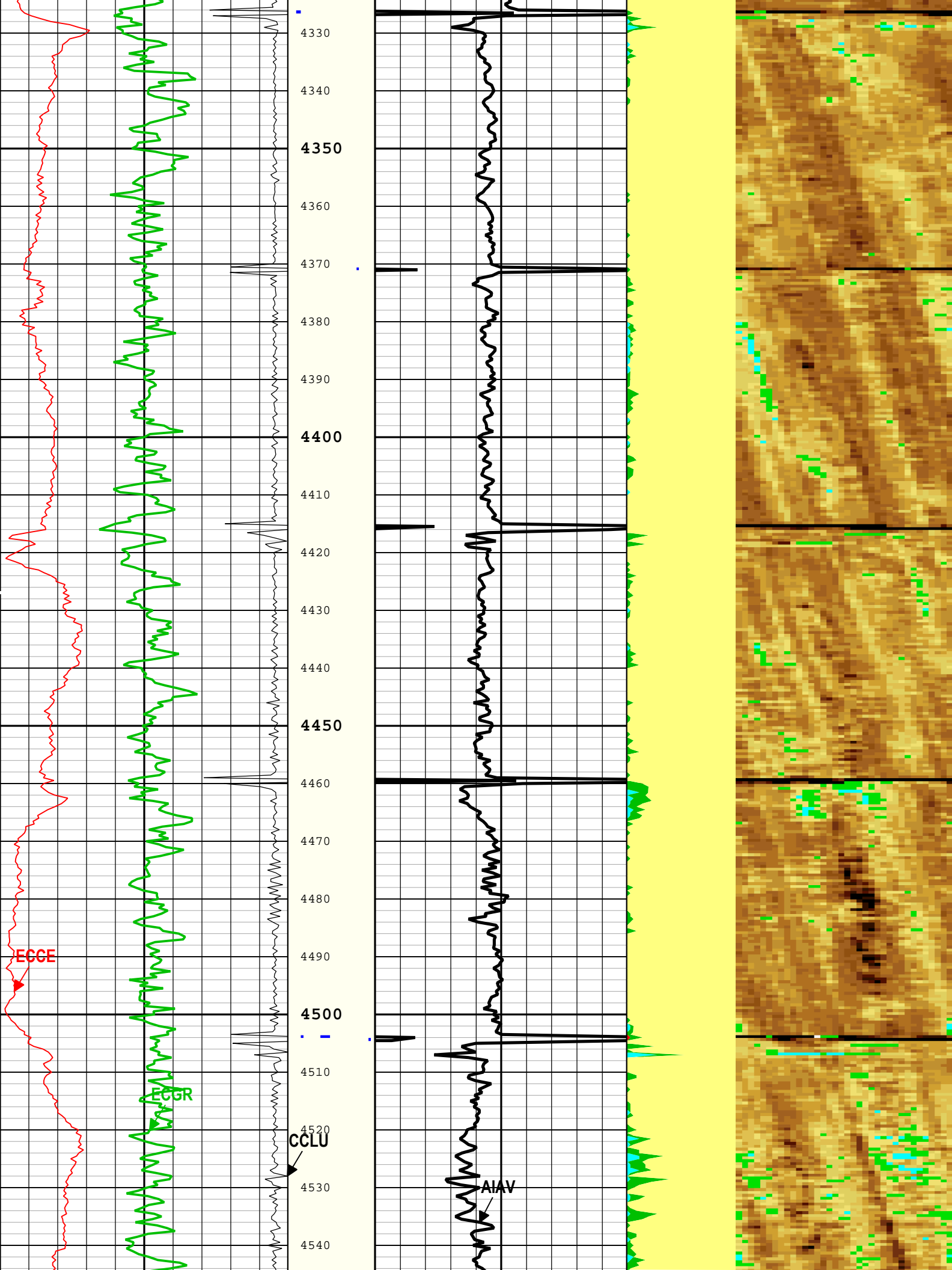


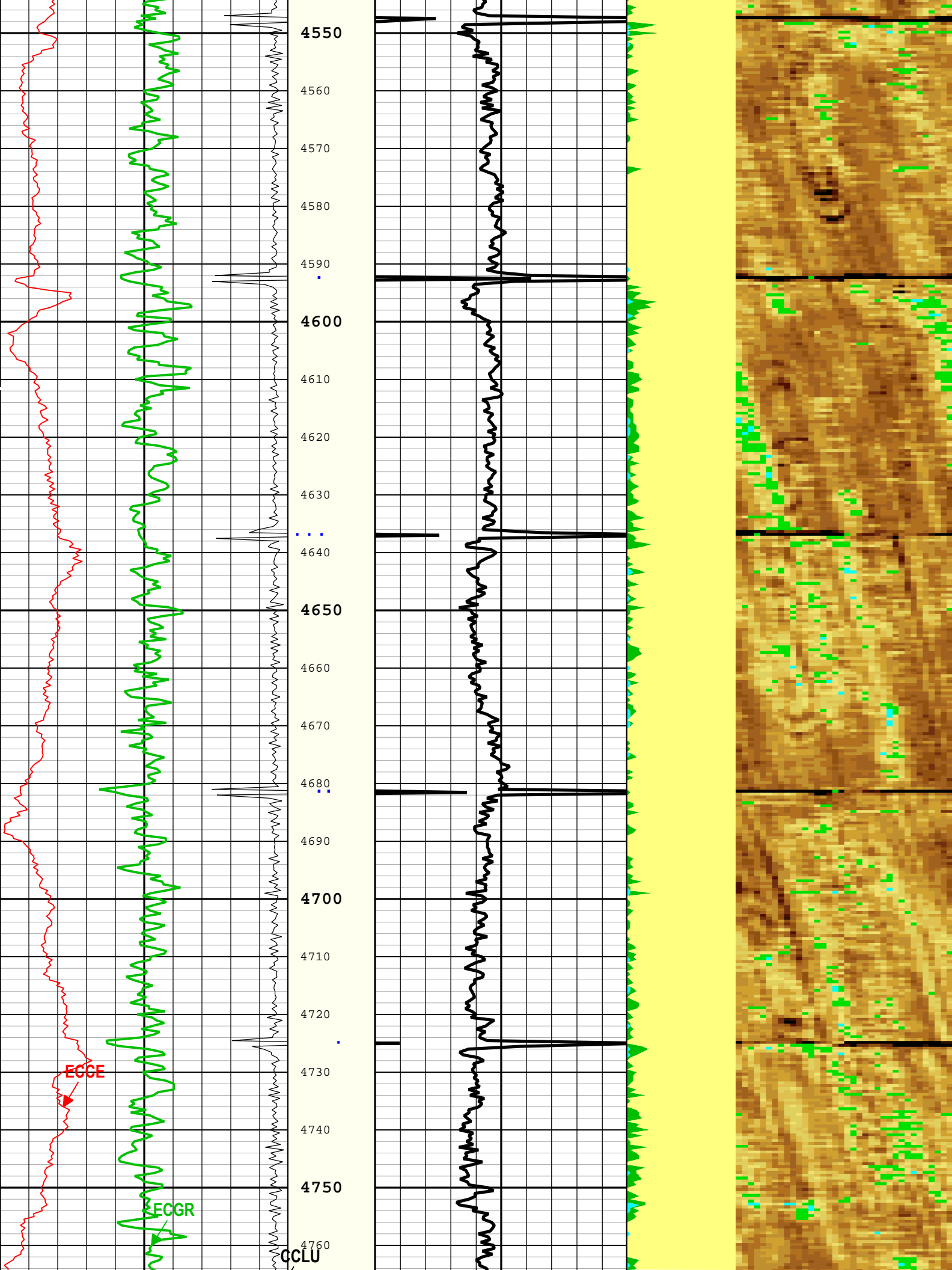


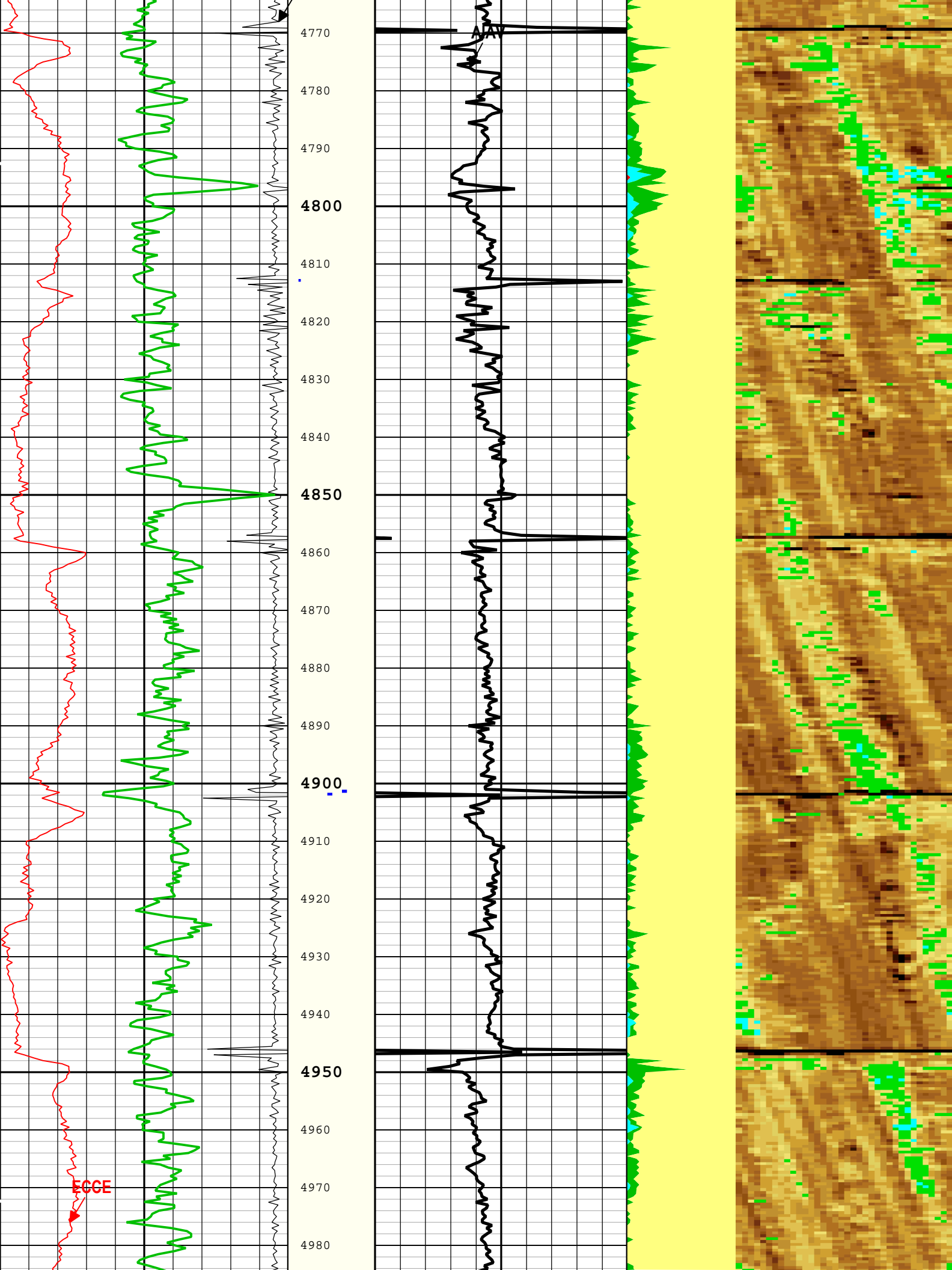


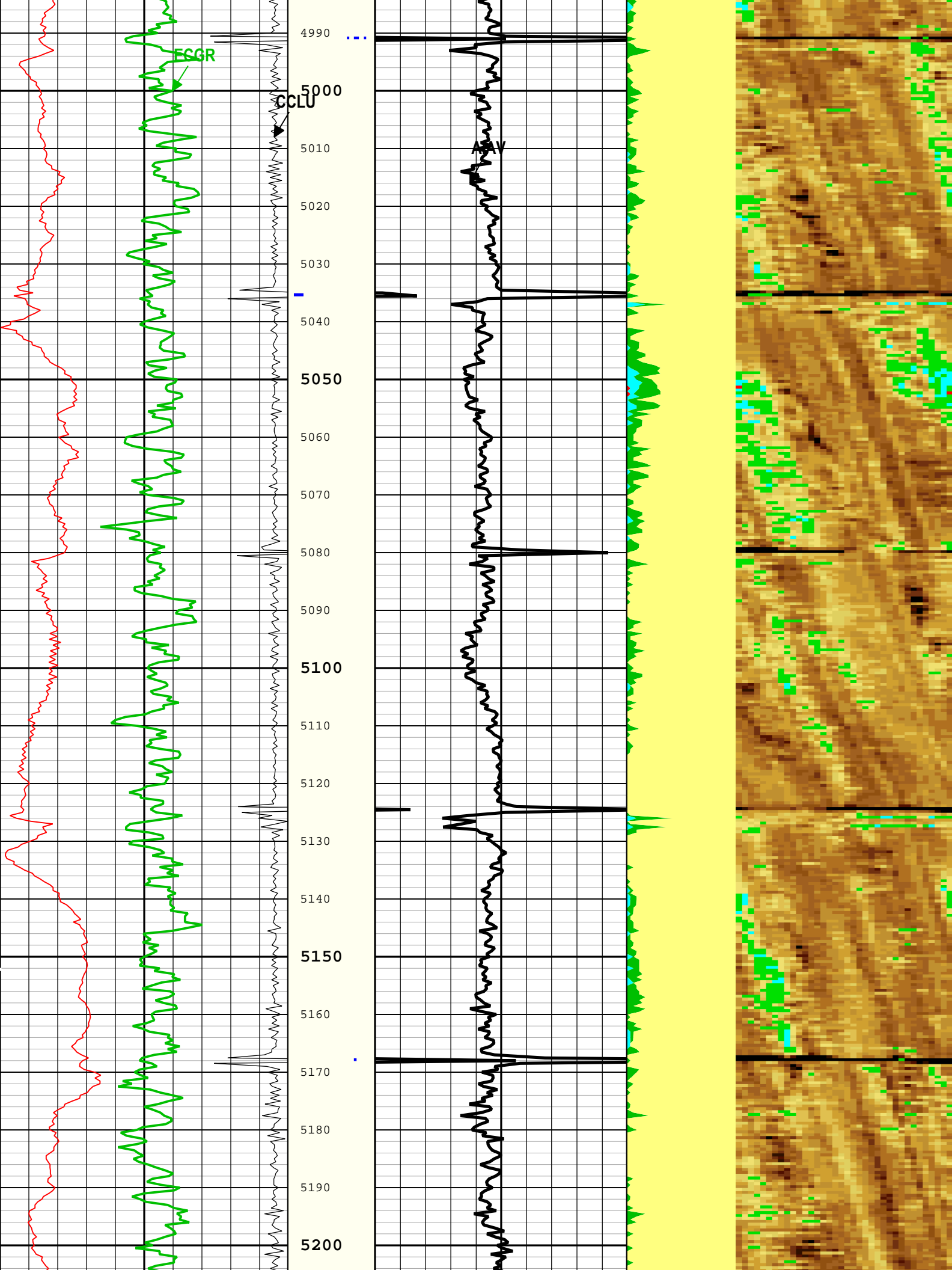


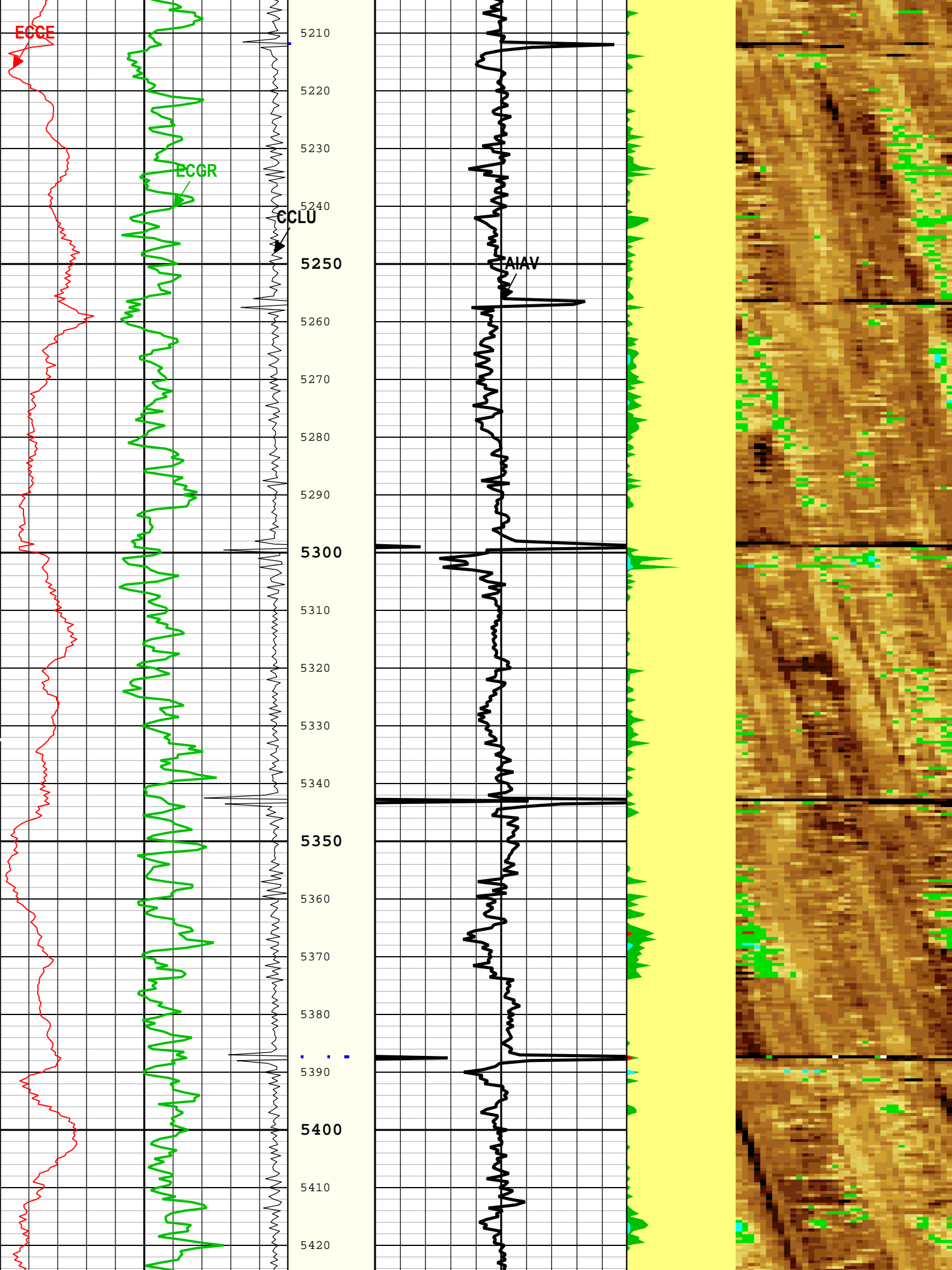


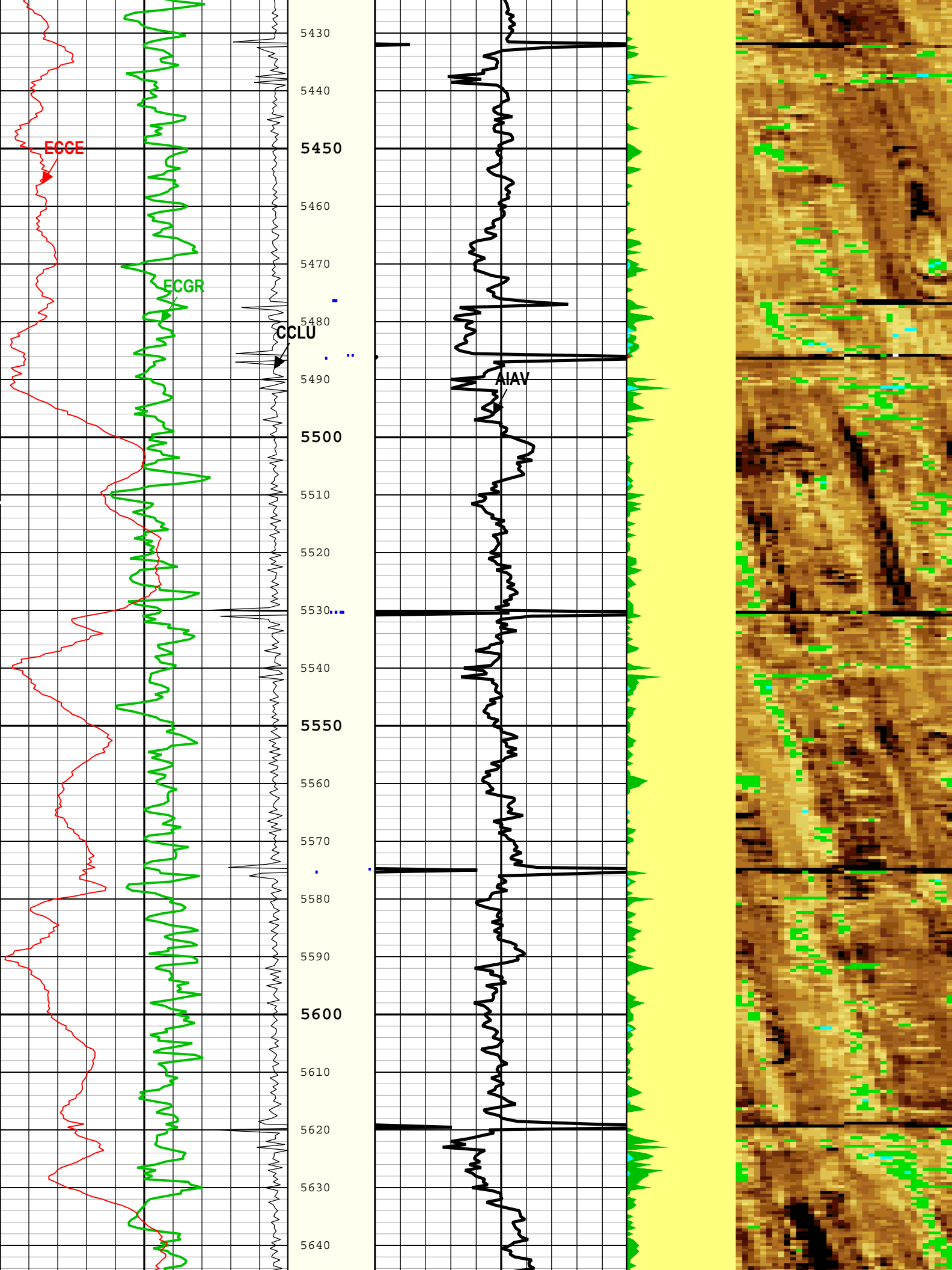


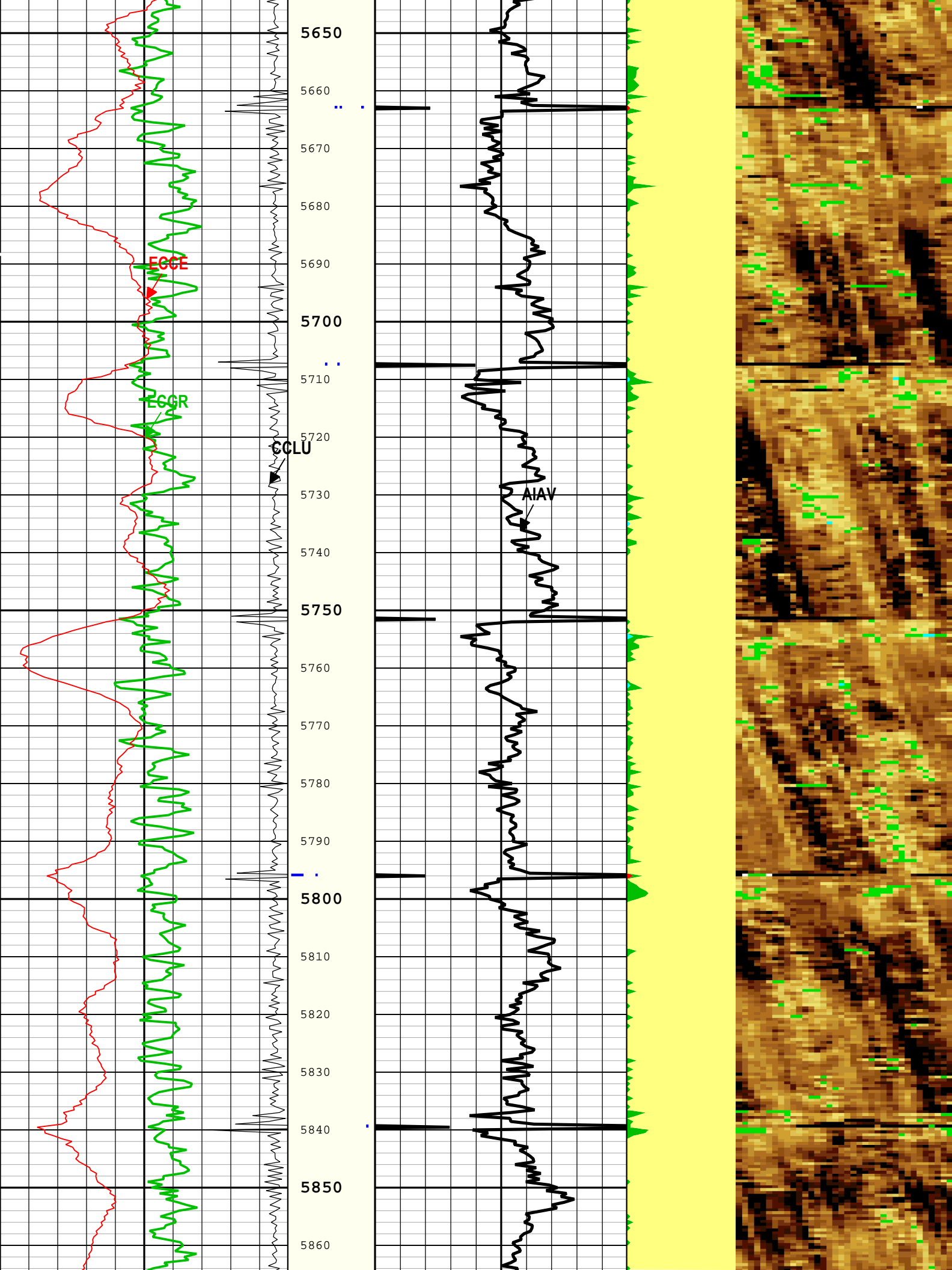


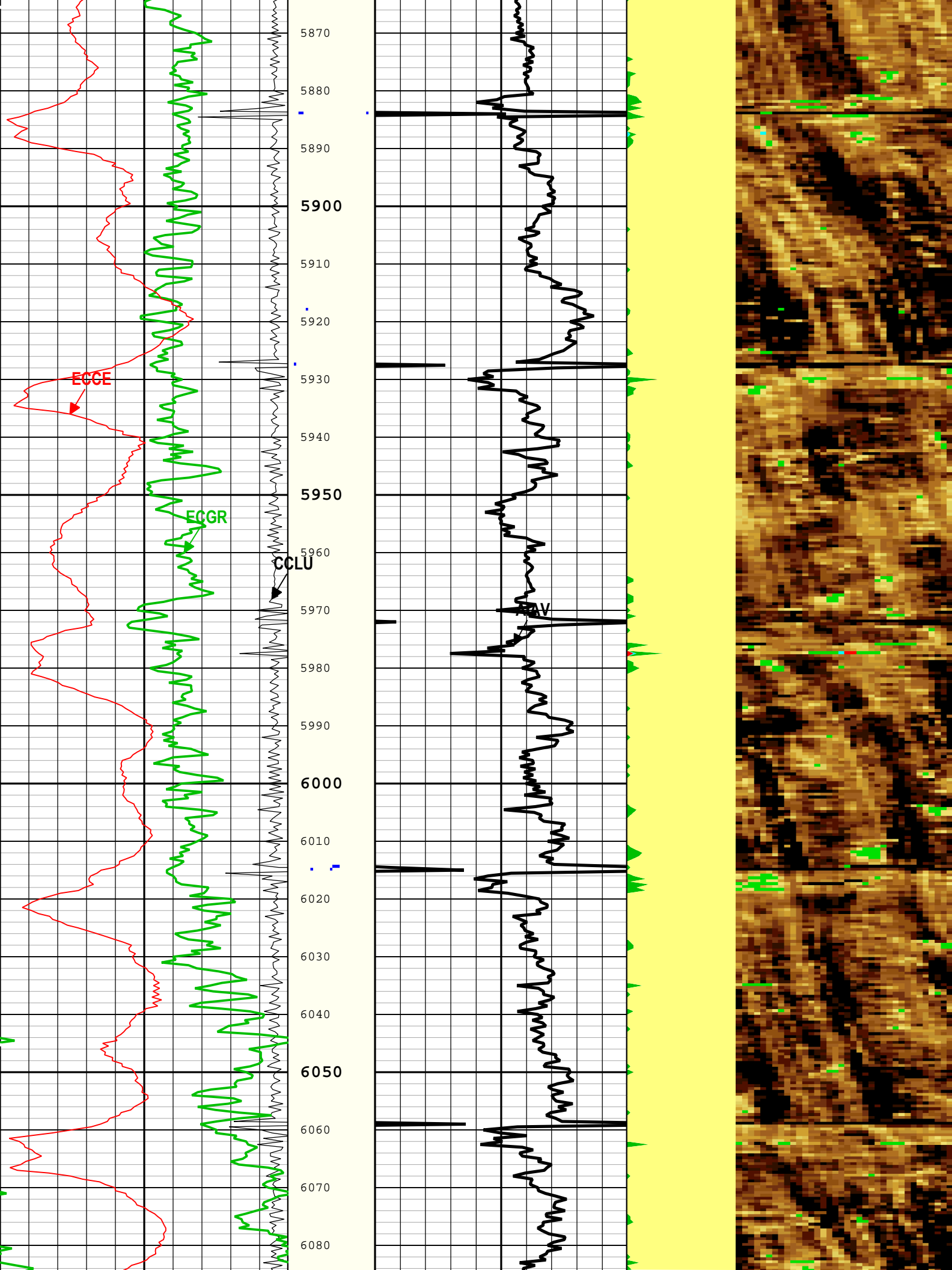


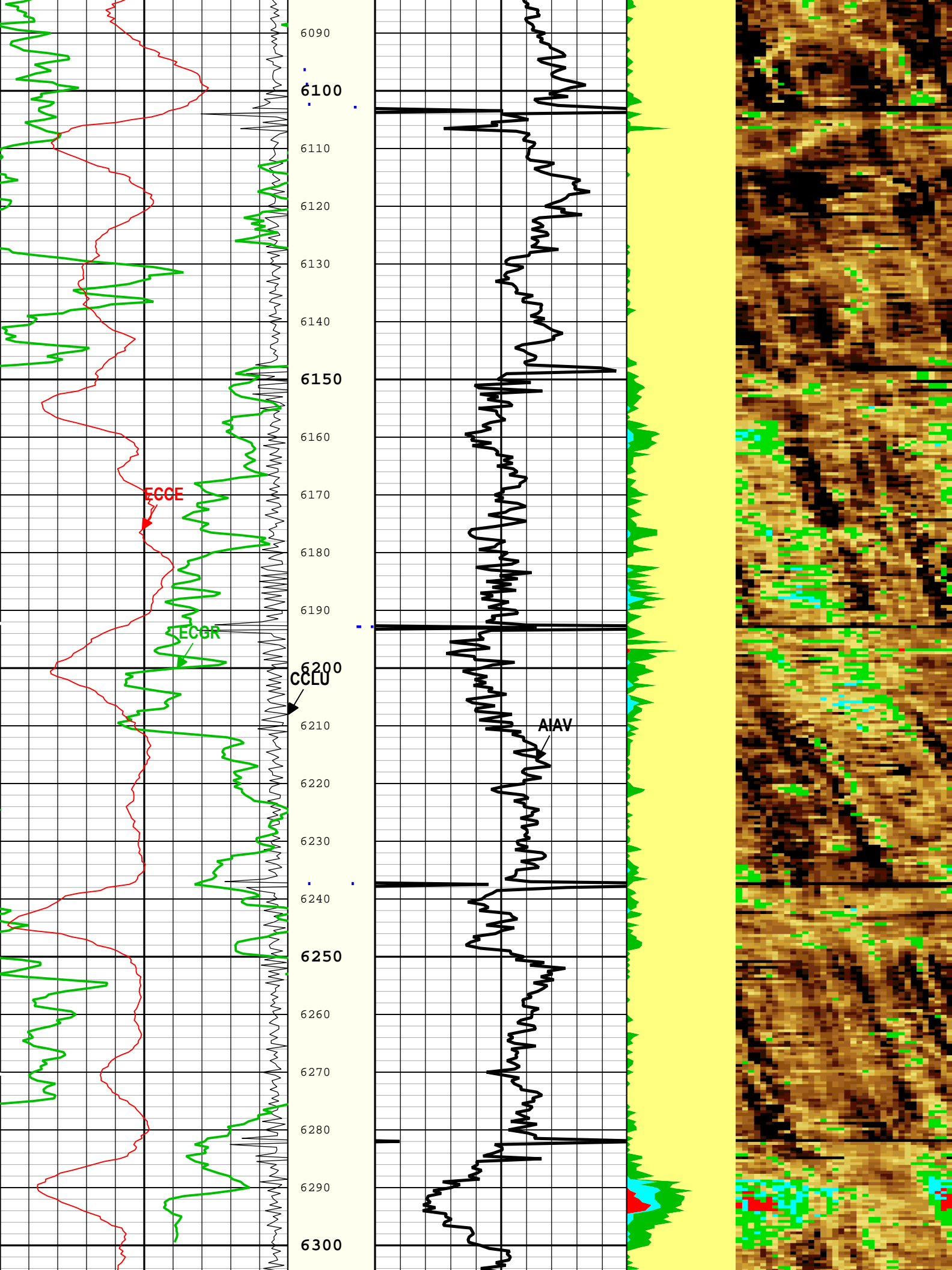












BS	8.5	1922	6323
MEAS_WLEN	20	41.5	1912
MEAS_WLEN	22.44	1912	6323

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
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
EMXV	EMEX Voltage	USIT-E	Time Zoned	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	6317	ft
WINB	Window Begin Time	USIT-E	31.88	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)
EMXV	40	30-Mar-2017 09:13:07	30-Mar-2017 09:23:21	6323.78	5625.02
EMXV	45	30-Mar-2017 09:23:21	30-Mar-2017 09:56:29	5625.02	65.47

All depth are at tool zero.

One

0 PSI Repeat Pass

Software Version

Acquisition System	Version
Maxwell 2016 SP2	6.2.68624.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[2]:Up	Up	2934.04 ft	3692.88 ft	30-Mar-2017 8:51:39 AM	30-Mar-2017 8:56:20 AM	ON	3.52 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Noble Energy, Inc. Well:Benelli Federal LC22-760
One: Log[2]:Up:S003

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-Mar-2017 10:20:23

TIME_1900 - Time Marked every 60.00 (s)

Casing Collar Locator Ultrasonic (CCLU)
USIT-E

-20 in 1

Gamma Ray (ECGR) SGT-N

Absent
1.500
2.500
6.500

Explicit Normalization

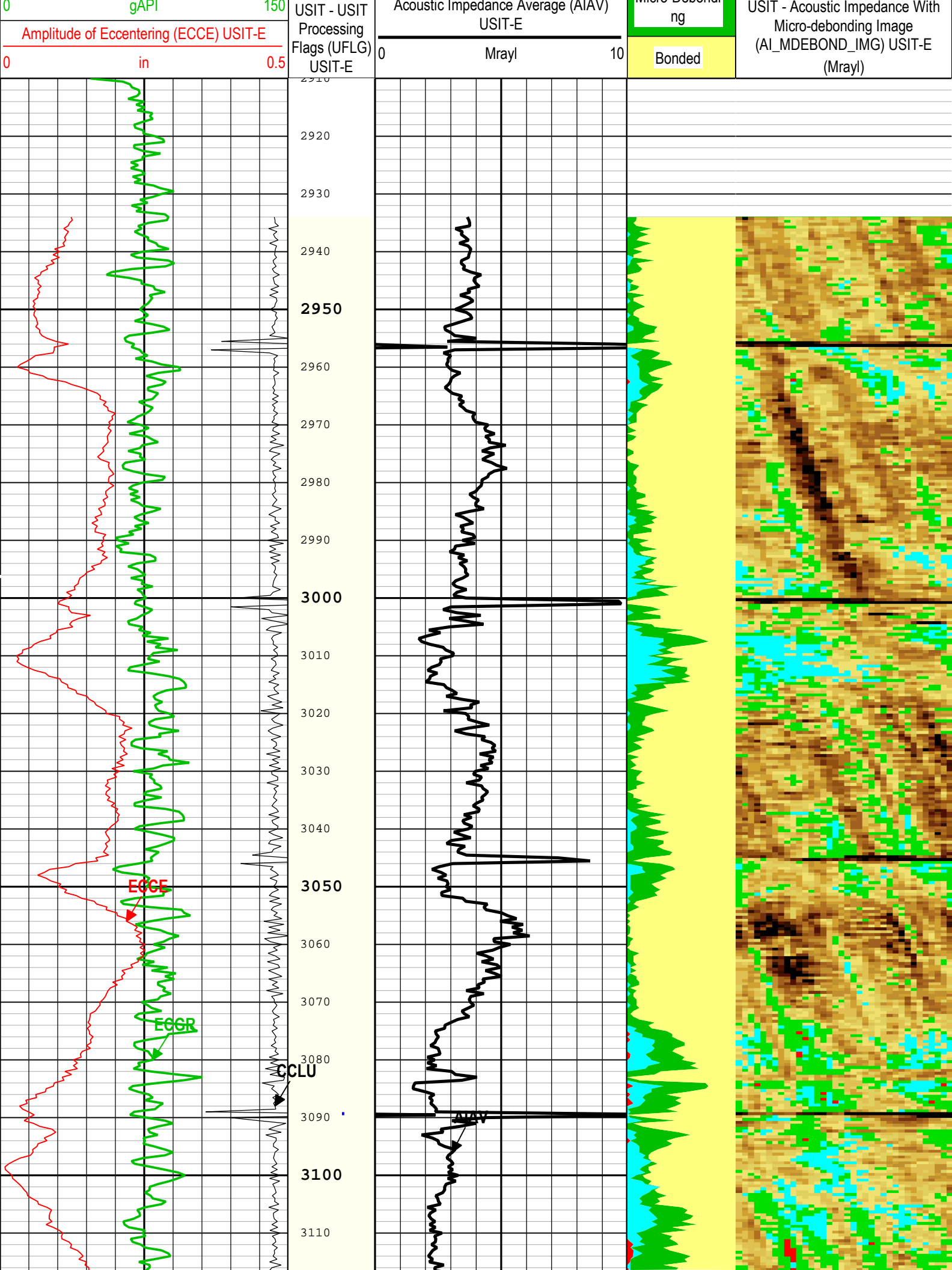
Gas

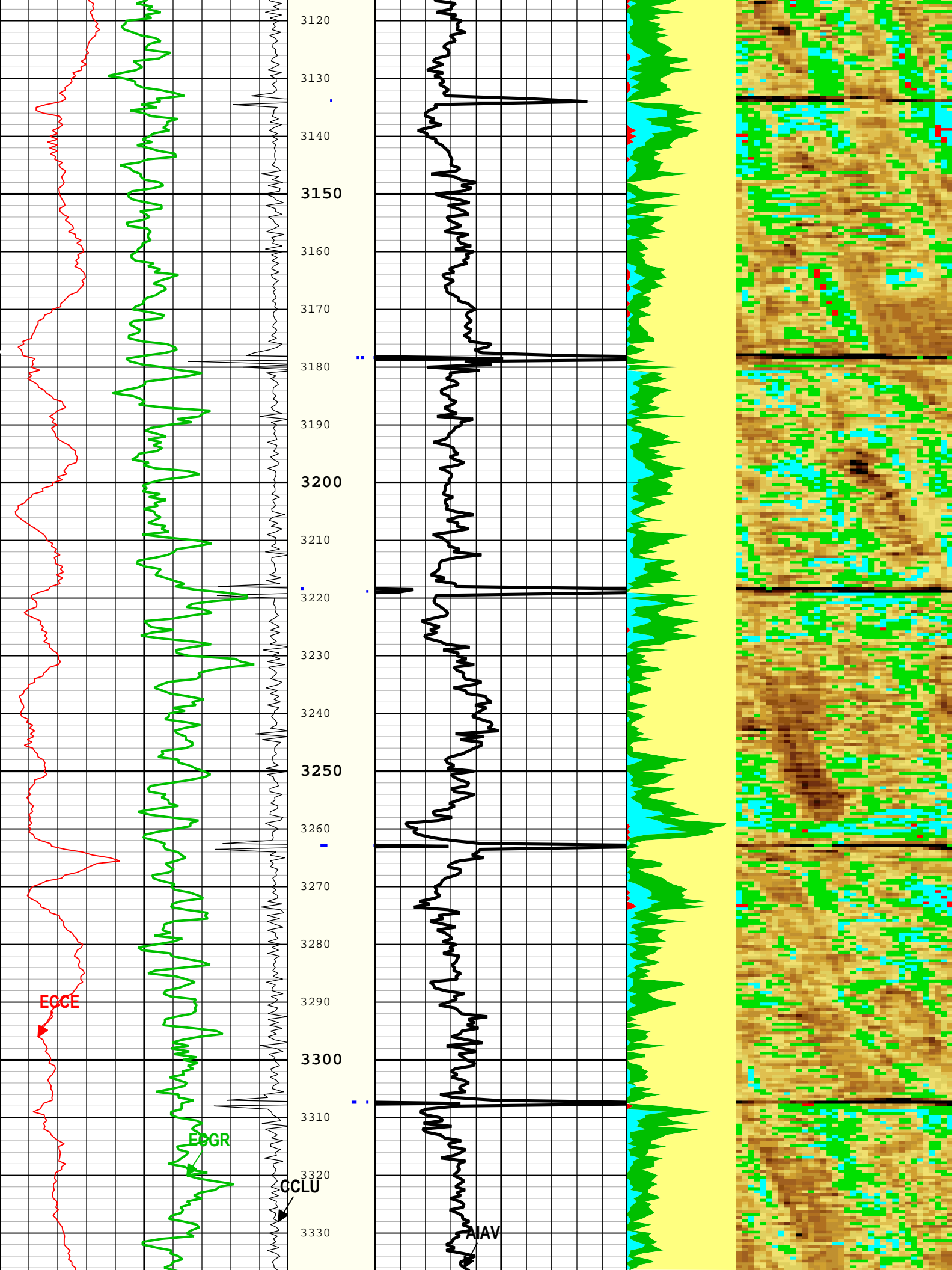
Liquid

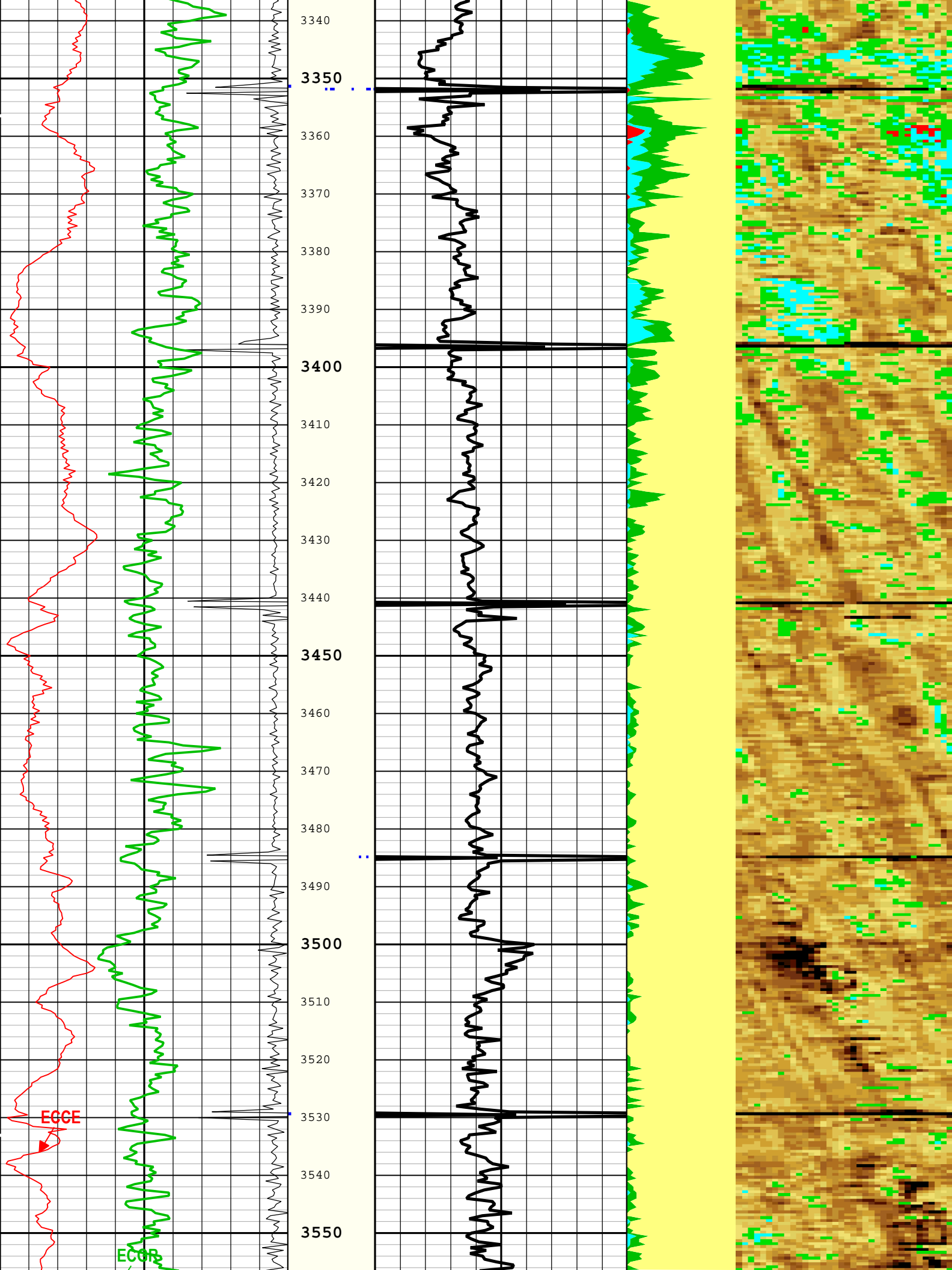
Micro-Debond

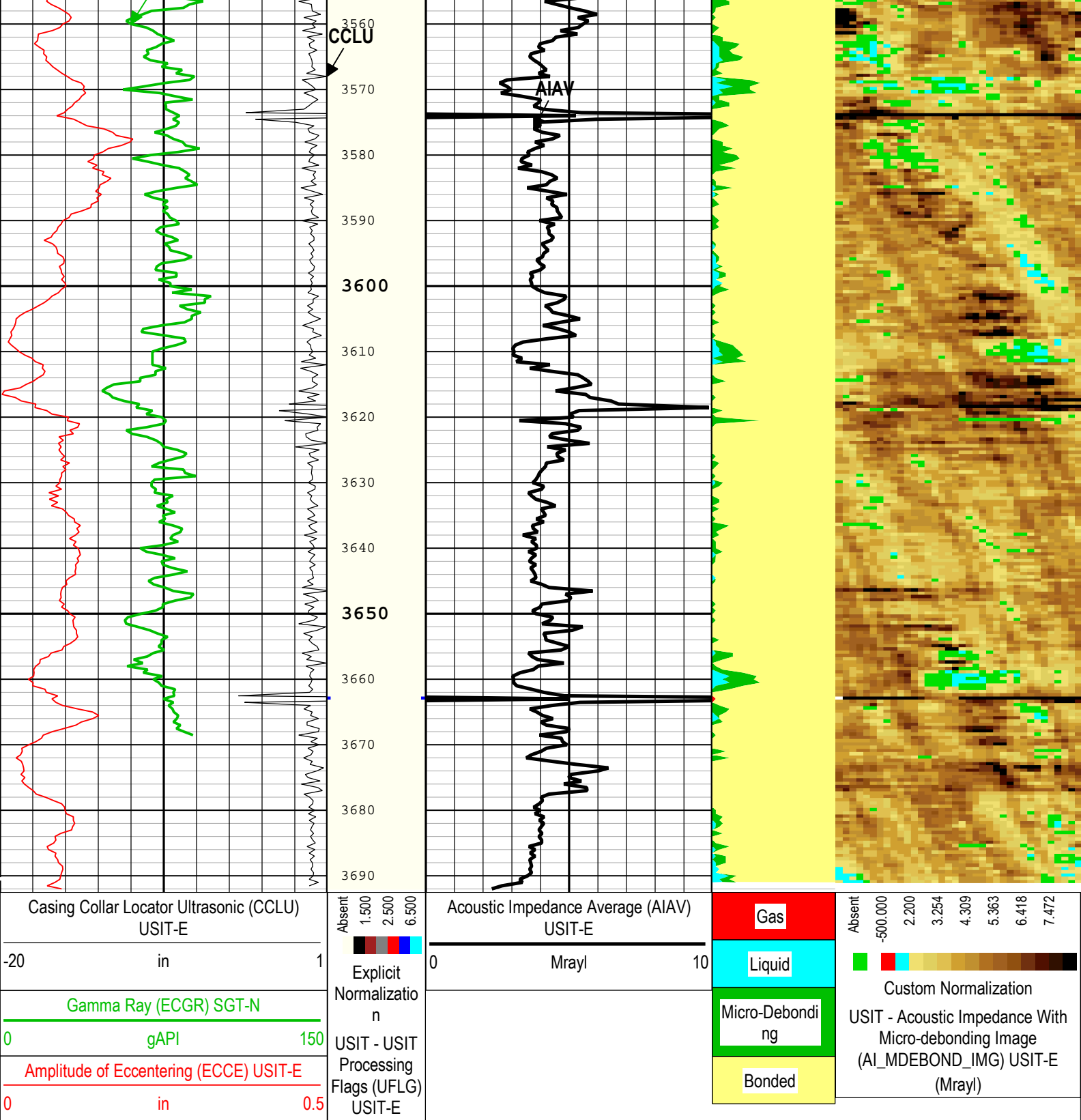
Absent
-500.000
2.200
3.254
4.309
5.363
6.418
7.472

Custom Normalization









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-Mar-2017 10:20:23

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	Open	
BS	Bit Size	WLSESSION	8.5	in
CBLO	Casing Bottom (Logger)	WLSESSION	11007	ft
CDEN	Cement Density	SGT-N	16.69	lbm/gal

CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	9.4	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	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	1.01	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0.1	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	1.48	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

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	40	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	3689	ft
WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	71.88	us

XYZ

Company:Noble Energy, Inc. Well:Benelli Federal LC22-760

One: Log[4]:Up:S003

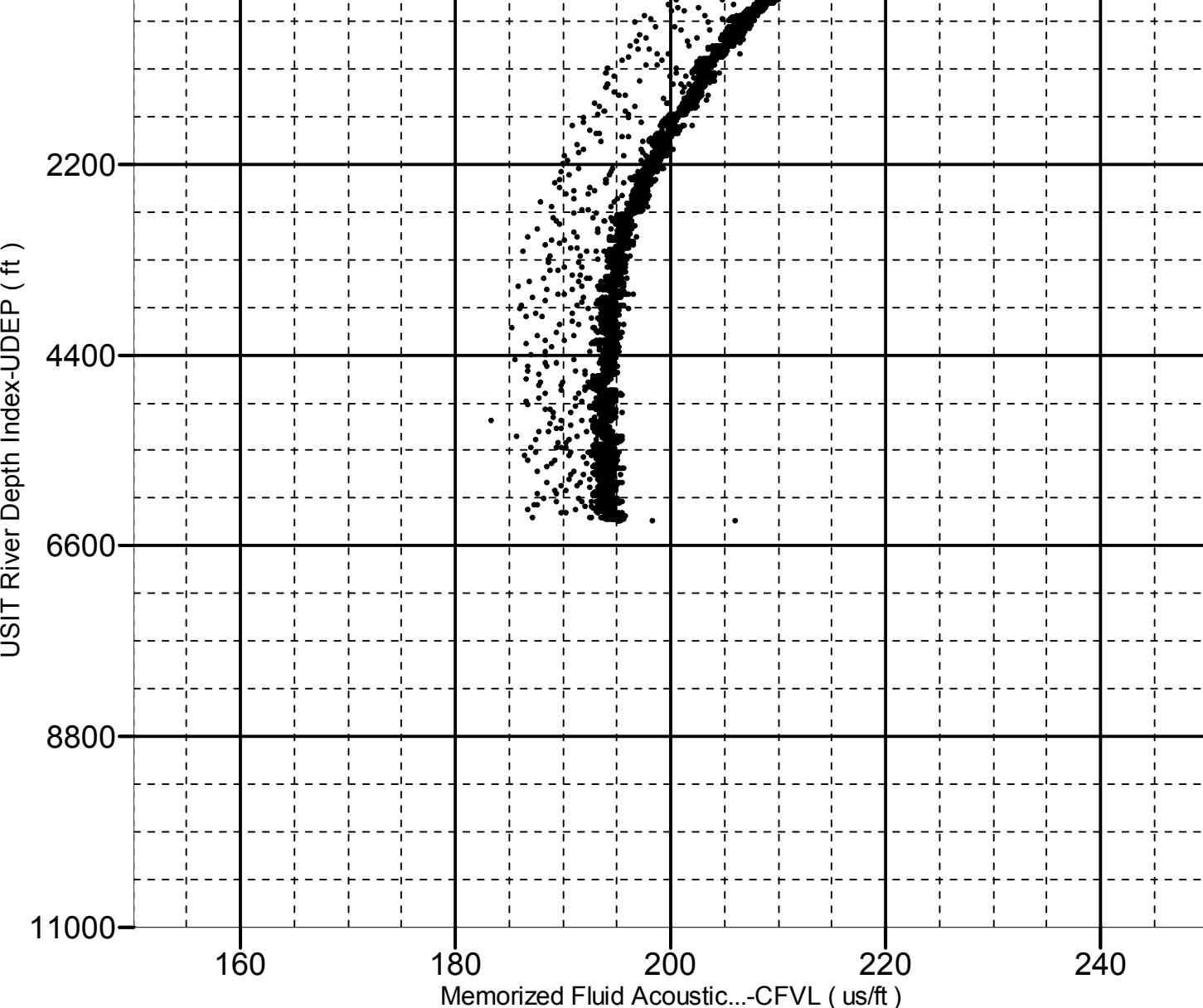
Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6323.50 to 65.50 ft

● CFVL-UDEP

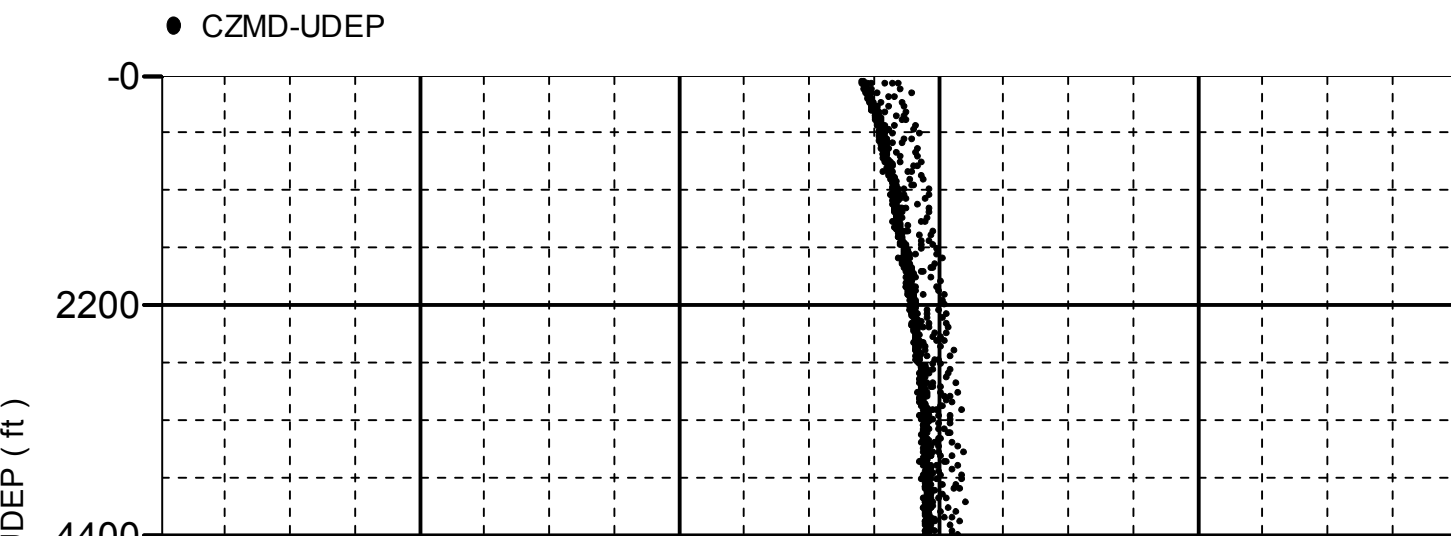


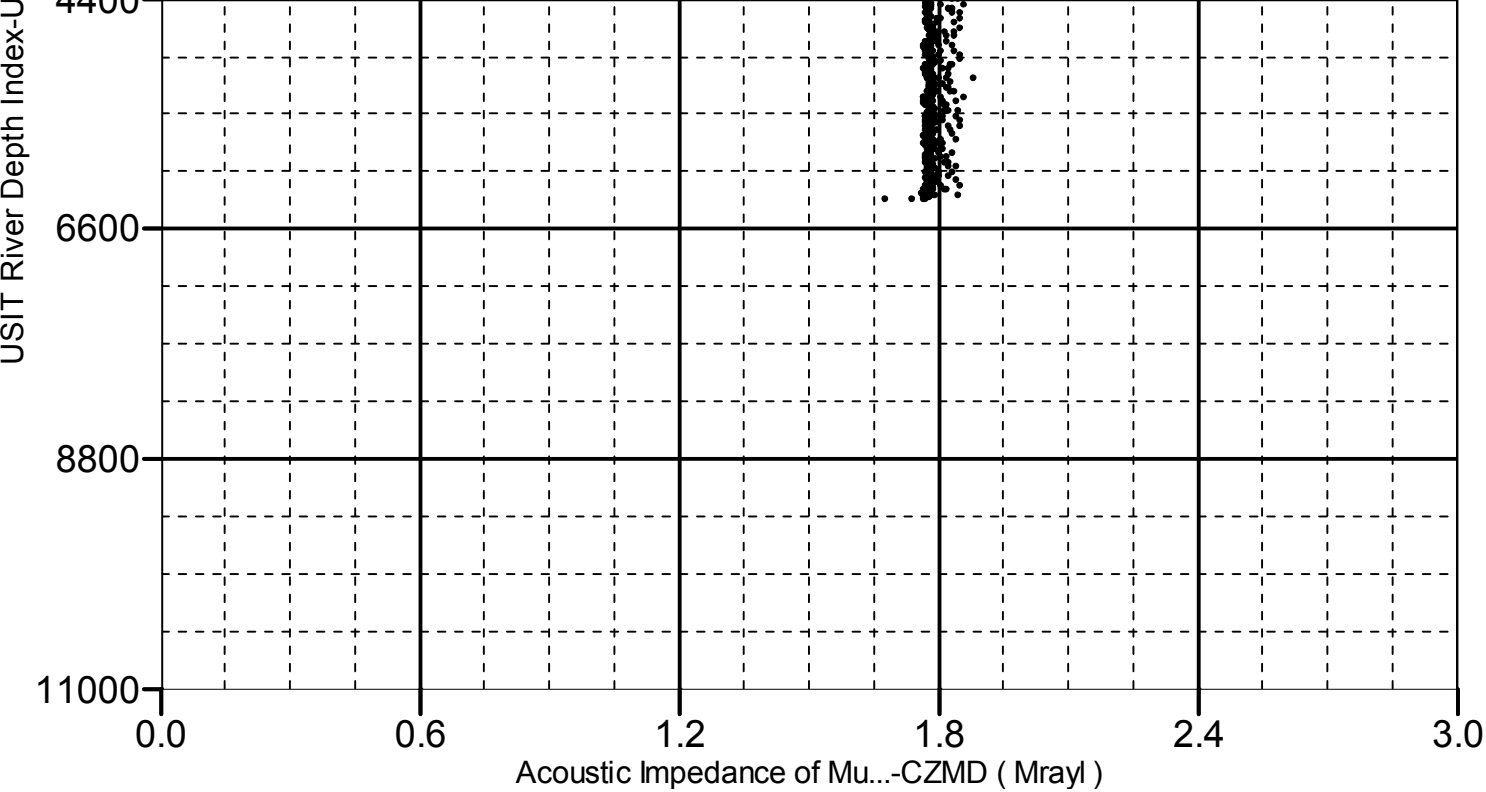


Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6323.50 to 65.50 ft





Company: Noble Energy, Inc.

Well: Benelli Federal LC22-760

Field: Wildcat

County: Weld

State: Colorado

Schlumberger

UltraSonic Summary Print

