

County: Weld State: Colorado

UltraSonic Summary Print

County:	Weld		
Field:	Wattenberg		
Location:	NENE Sec 16, T2N, R64W		
Well:	Hullabaloo State Y21-746		
Company:	Noble Energy Inc		
	Location:		
	NENE Sec 16, T2N, R64W	Elev.:	K.B. 4974.00 ft
	SHL: 100' FSL & 2395' FEL		G.L. 4944.00 ft
	Lat/Long: 40.14452 / -104.55058		D.F. 4974.00 ft
	Permanent Datum:	Ground Level	Elev.: 4944.00 f
	Log Measured From:	Kelly Bushing	30.00 ft
	Drilling Measured From:	Kelly Bushing	above Perm. Datum
	API Serial No.	Section:	Township:
	15-123-45235	16	2N
			Range:
		64W	

Logging Date	08-Nov-2017			
Run Number	ONE			
Depth Driller	17204.00 ft			
Schlumberger Depth	17204.00 ft			
Bottom Log Interval	6950.00 ft			
Top Log Interval	50.00 ft			
Casing Fluid Type	Brine			
Salinity				
Density	8.4 lbm/gal			
Fluid Level	0.00 ft			
BIT/CASING/TUBING STRING				
Bit Size	8.50 in			
From	2033.00 ft			
To	17204.00 ft			
Casing/Tubing Size	5.5 in			
Weight	20 lbm/ft			
Grade	P110			
From	0.00 ft			
To	17194.20 ft			
Max Recorded Temperatures	216 degF			
Logger on Bottom	Time		11:18:00	
Unit Number	Location:			
Recorded By	A.BLOCHOWICZ		Fort Morgan, CO	
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.

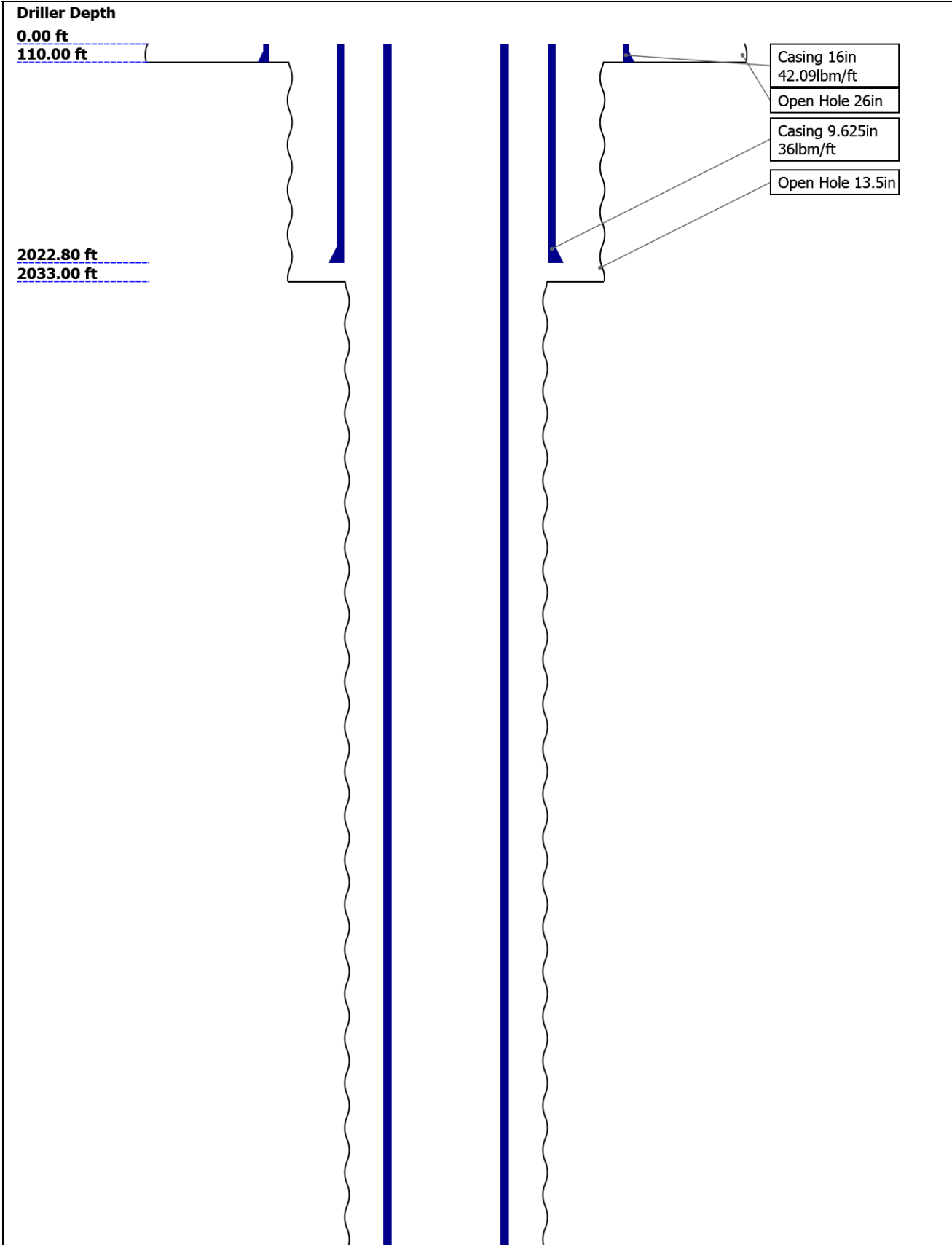
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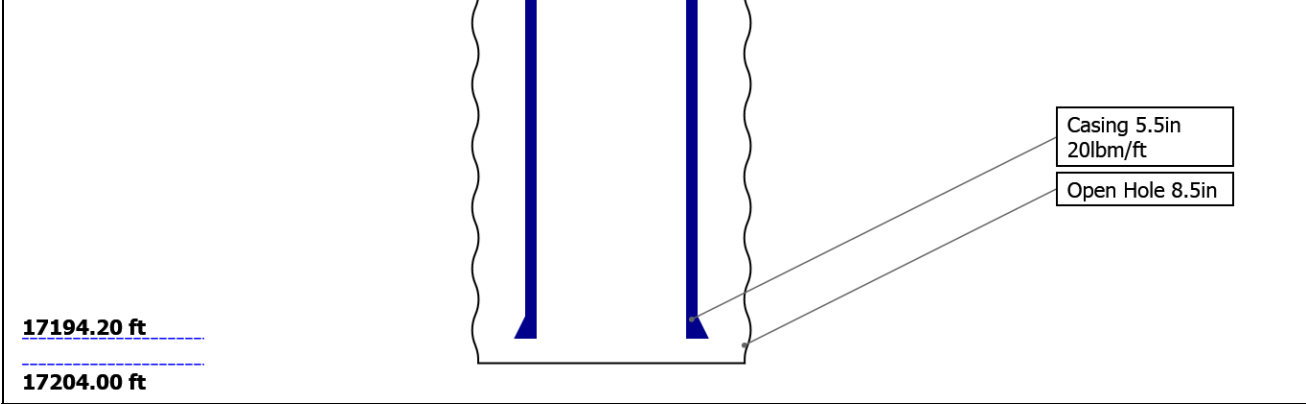
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Well Sketch





Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	0	110	2033			
Top Logger (ft)	0	110	2033			
Bottom Driller (ft)	110	2033	17204			
Bottom Logger (ft)	110	2033	17204			
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	J55	P110			
Top Driller (ft)	0	0	0			
Top Logger (ft)	0	0	0			
Bottom Driller (ft)	110	2022.8	17194.2			
Bottom Logger (ft)	110	2022.8	17194.2			

Operational Run Summary

Parameter (unit)	ONE					
Date Log Started	08-Nov-2017					
Time Log Started	10:17:05					
Date Log Finished	08-Nov-2017					
Time Log Finished	12:24:27					
Top Log Interval (ft)	50.00					
Bottom Log Interval (ft)	6950.00					
Total Depth (ft)						
Max Hole Deviation (deg)	0.00					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	8.500					
Logging Unit Number	2161					
Logging Unit Location	Fort Morgan, CO					
Recorded By	A.BLOCHOWICZ					

Witnessed By	BILL MANSFIELD					
Service Order Number	DXCR-00016					

Remarks and Equipment Summary

[illegible]

Depth Summary

	ONE		
Depth Measuring Device			
Type	IDW-JA		
Serial Number	6483		
Calibration Date	28-SEP-2017		
Calibrator Serial Number	IDWC-C-57		
Calibration Cable Type	7-39PL XS		
Wheel Correction 1	-4		
Wheel Correction 2	-5		
Tension Device			
Type	CMTD-B/A		

Serial Number	1109		
Calibration Date	12-Sep-2017		
Calibrator Serial Number	441345a		
Number of Calibration Points	10		
Calibration Root Mean Square Error	7		
Calibration Peak Error	11		

Logging Cable			
Type	7-39PI-XXS		
Serial Number	F716045		
Length	22000.00 ft		
Conveyance Type	Wireline		
Rig Type	Crane USA		

ONE:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well	All Schlumberger depth control policies followed.	
Rig Up Length At Surface		IDW used as primary depth reference.	
Rig Up Length At Bottom		Z-chart used as secondary depth reference.	
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[4]:Up	6965.51	39.83

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 : 295.19m(968.48ft) to 303.80m(996.73ft)
MUD_N_FRP = 1.09
DFD = 1.01g/cm3(8.40lbm/gal)
CZMD median computed in free pipe normalization interval = 1.61 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 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[4]:Up	Up	39.83 ft	6965.51 ft	08-Nov-2017 11:18:14 AM	08-Nov-2017 12:24:12 PM	ON	5.52 ft	Yes

All depths are referenced to toolstring zero

Log	Company:Noble Energy Inc	Well:Hullabaloo State Y21-746
		ONE: Log[4]:Up:S005

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: 08-Nov-2017 13:26:34

TIME: 1900 Time Marked every 60.00 (s)

TIME_1900 - Time Marked every 00.00 (s)

Casing Collar Locator Ultrasonic (CCLU)
USIT-E

-20 in 1

Amplitude of Eccentering (ECCE) USIT-E

0 in 0.5

Gamma Ray (ECGR_EDTC) EDTC-B

0 gAPI 150

Absent
1.500
2.500
6.500

Explicit
Normalization

USIT - USIT
Processing
Flags (UFLG)
USIT-E

Acoustic Impedance Average (AIAV)
USIT-E

0 Mrayl 10

Gas

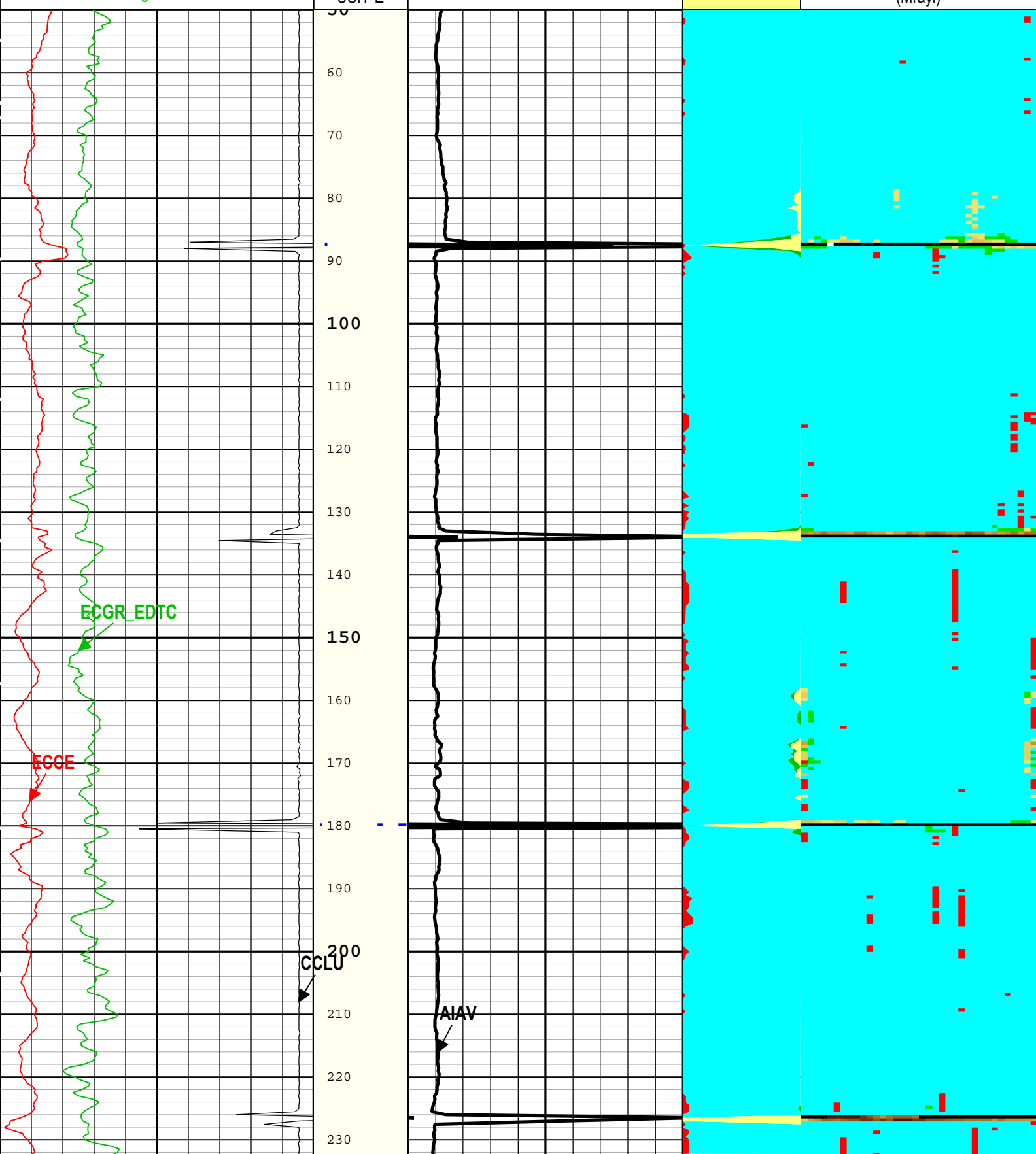
Liquid

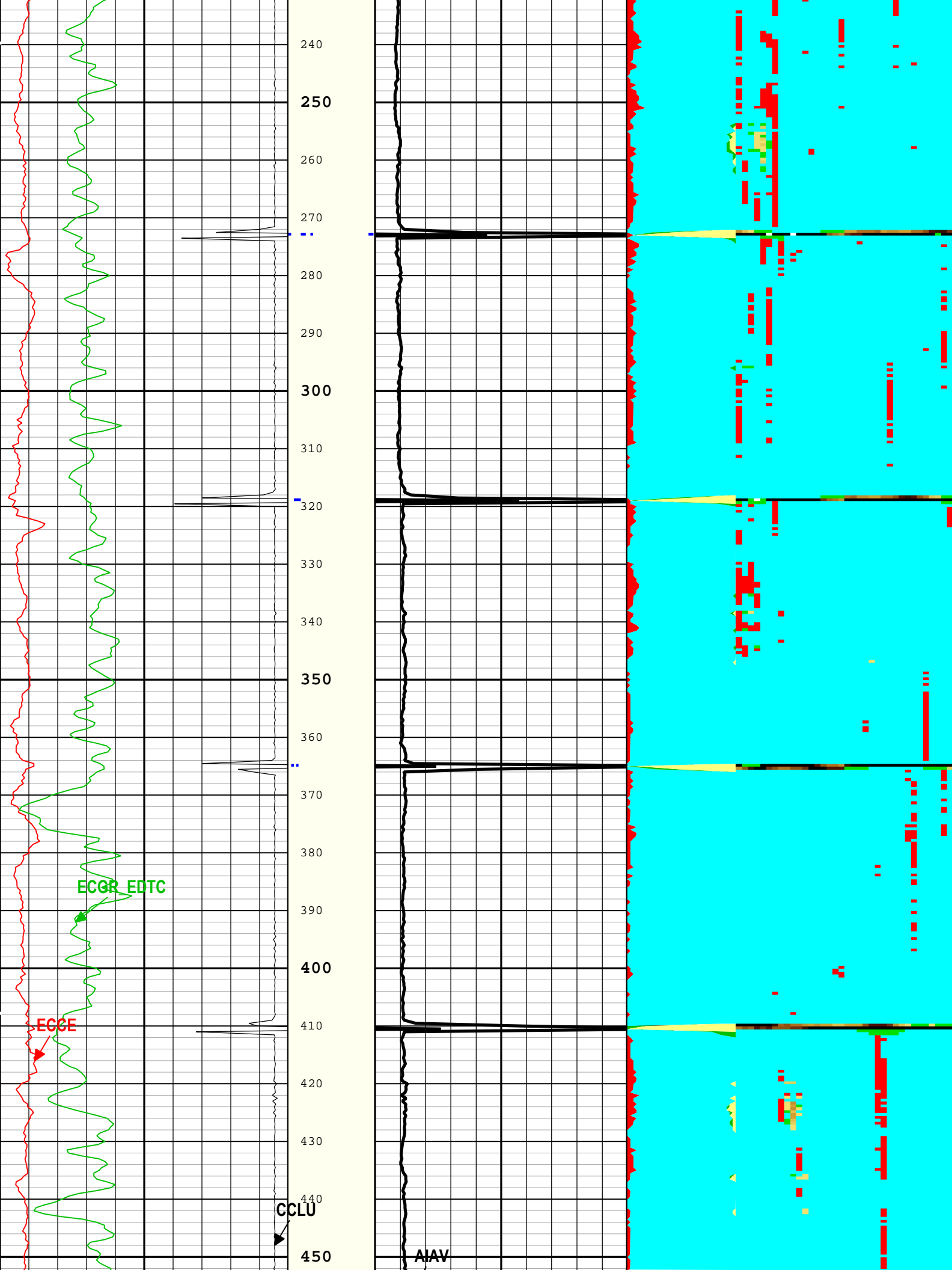
Micro-Debonding

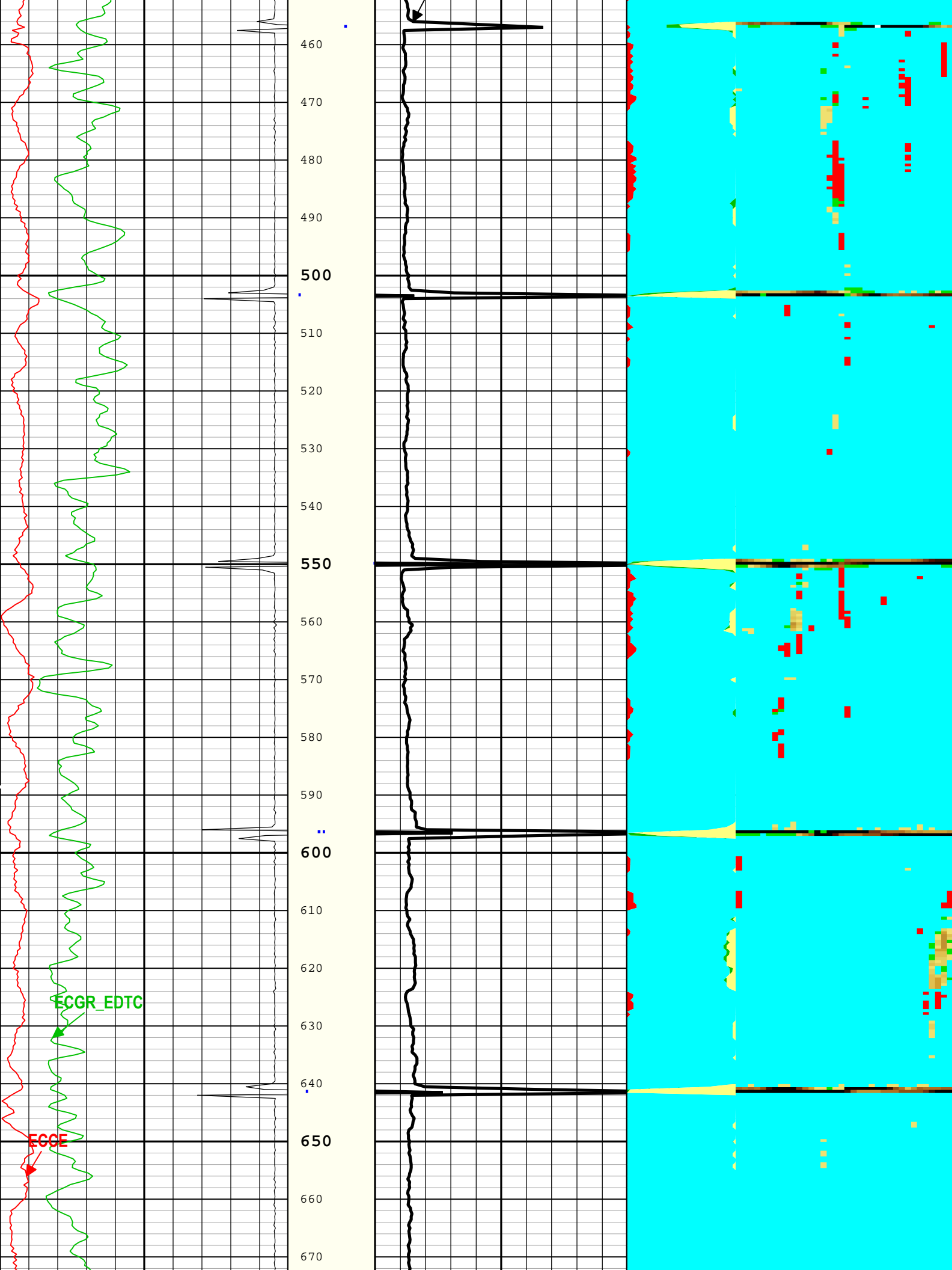
Bonded

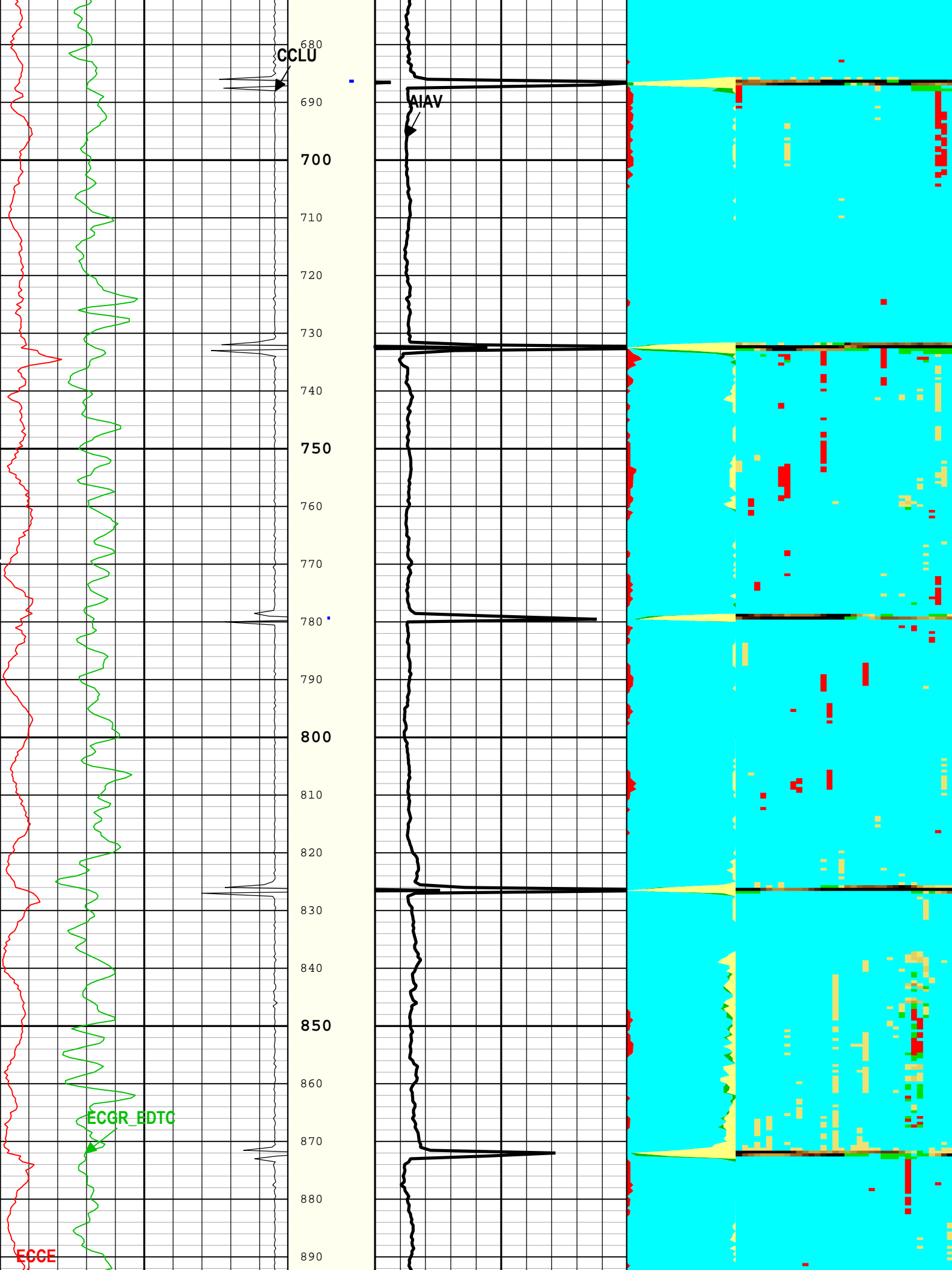
Absent
-500.000
2.200
3.254
4.309
5.363
6.418
7.472

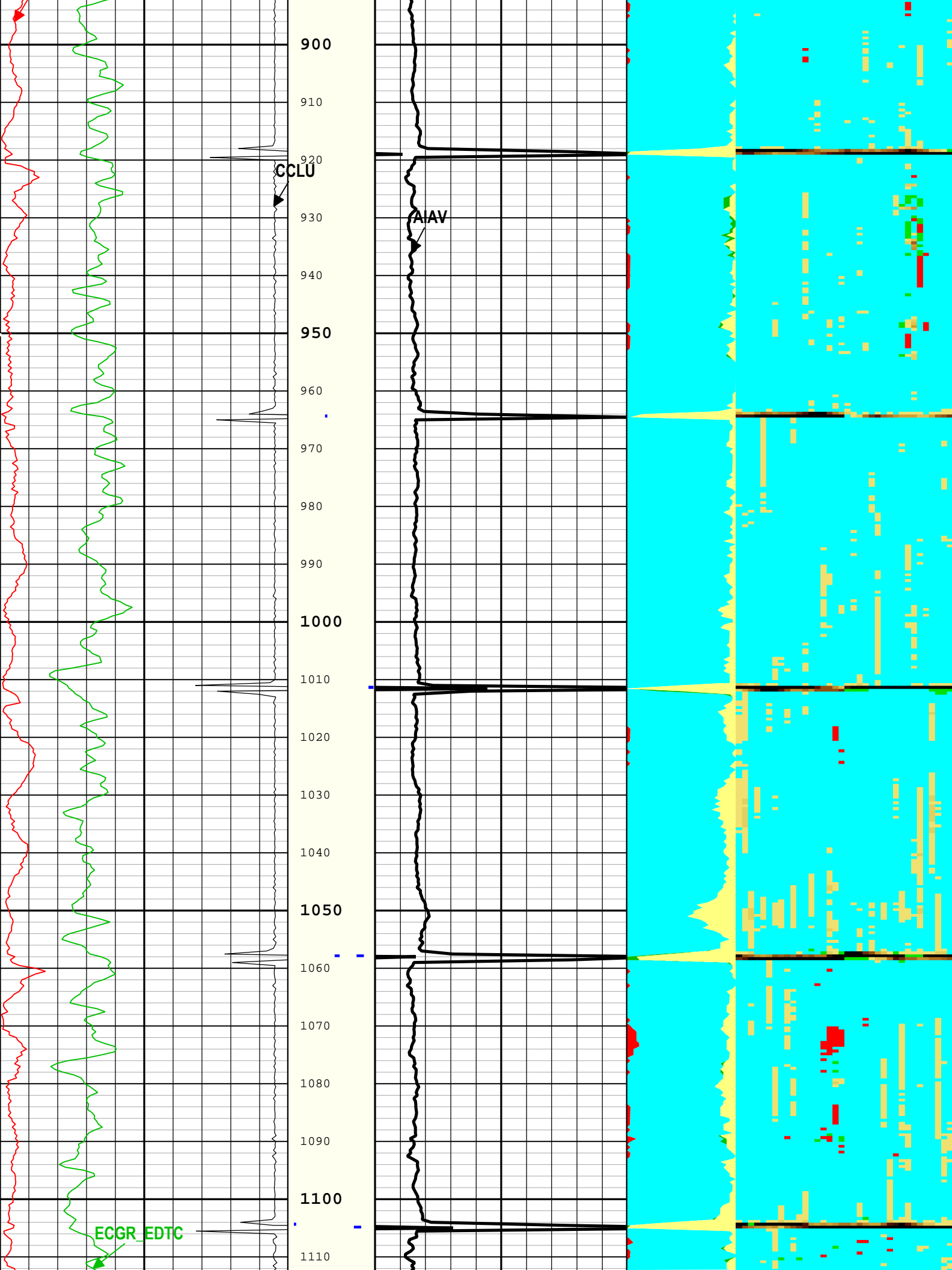
Custom Normalization
USIT - Acoustic Impedance With
Micro-debonding Image
(AI_MDEBOND_IMG) USIT-E
(Mrayl)

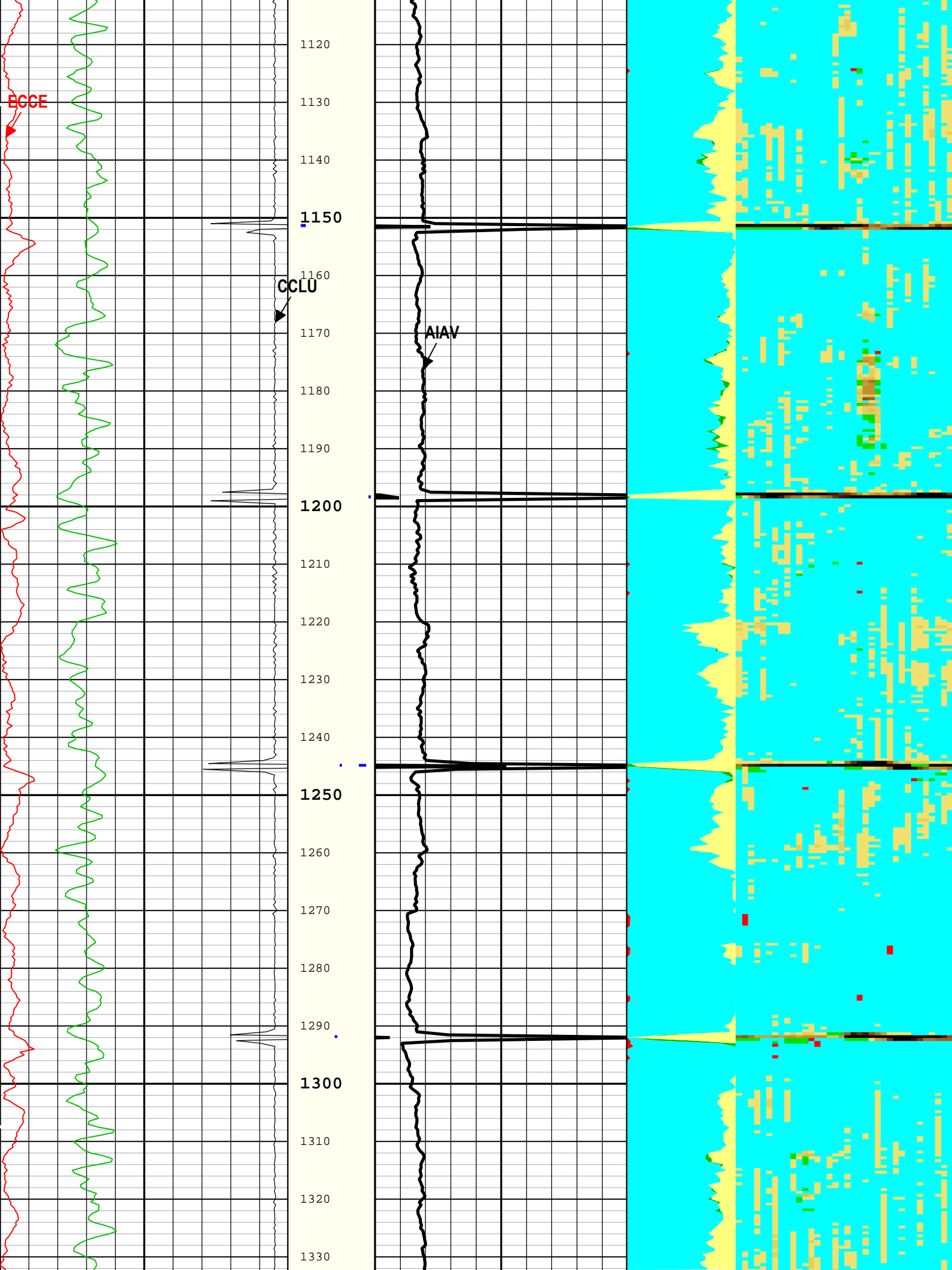


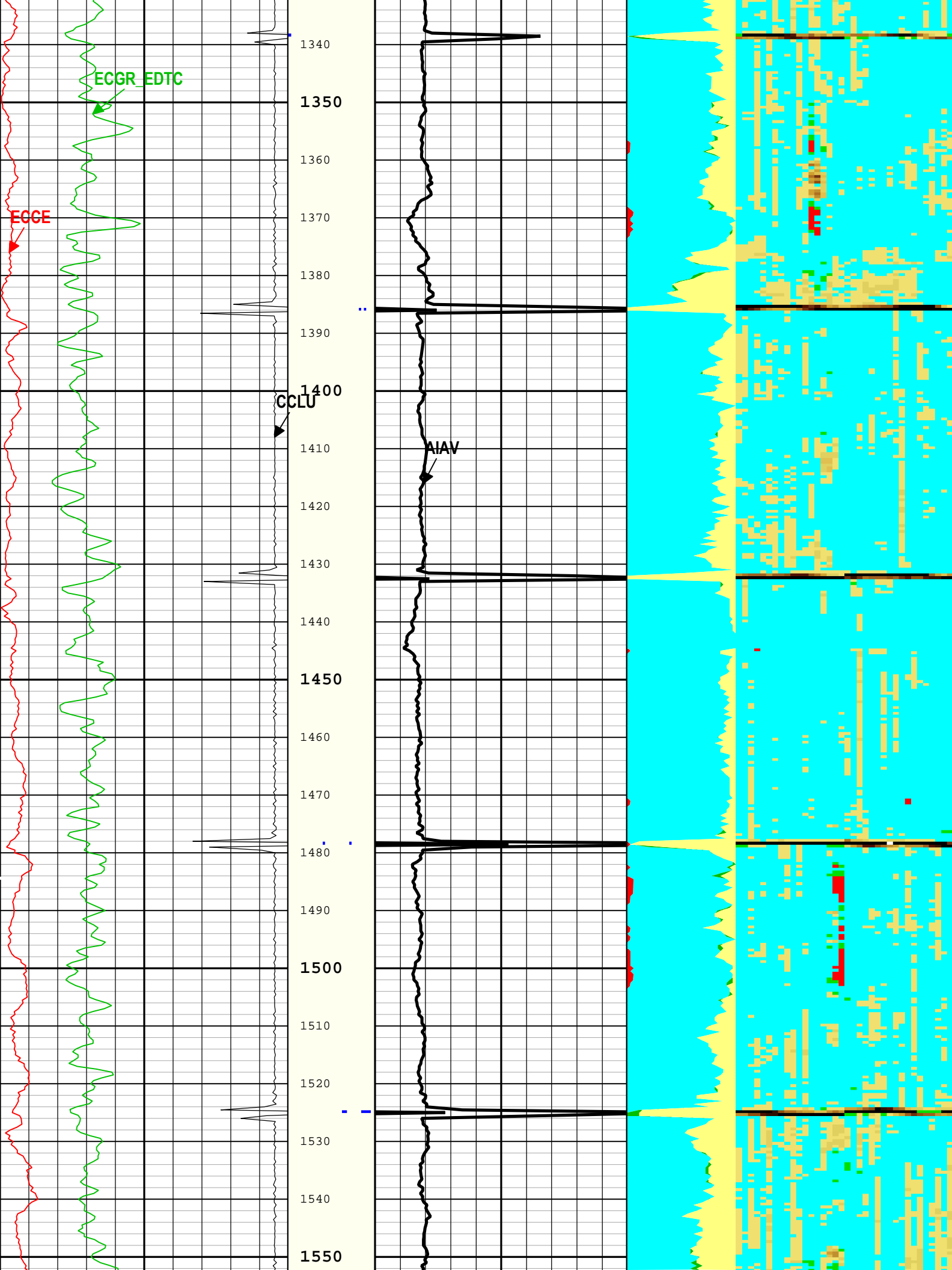


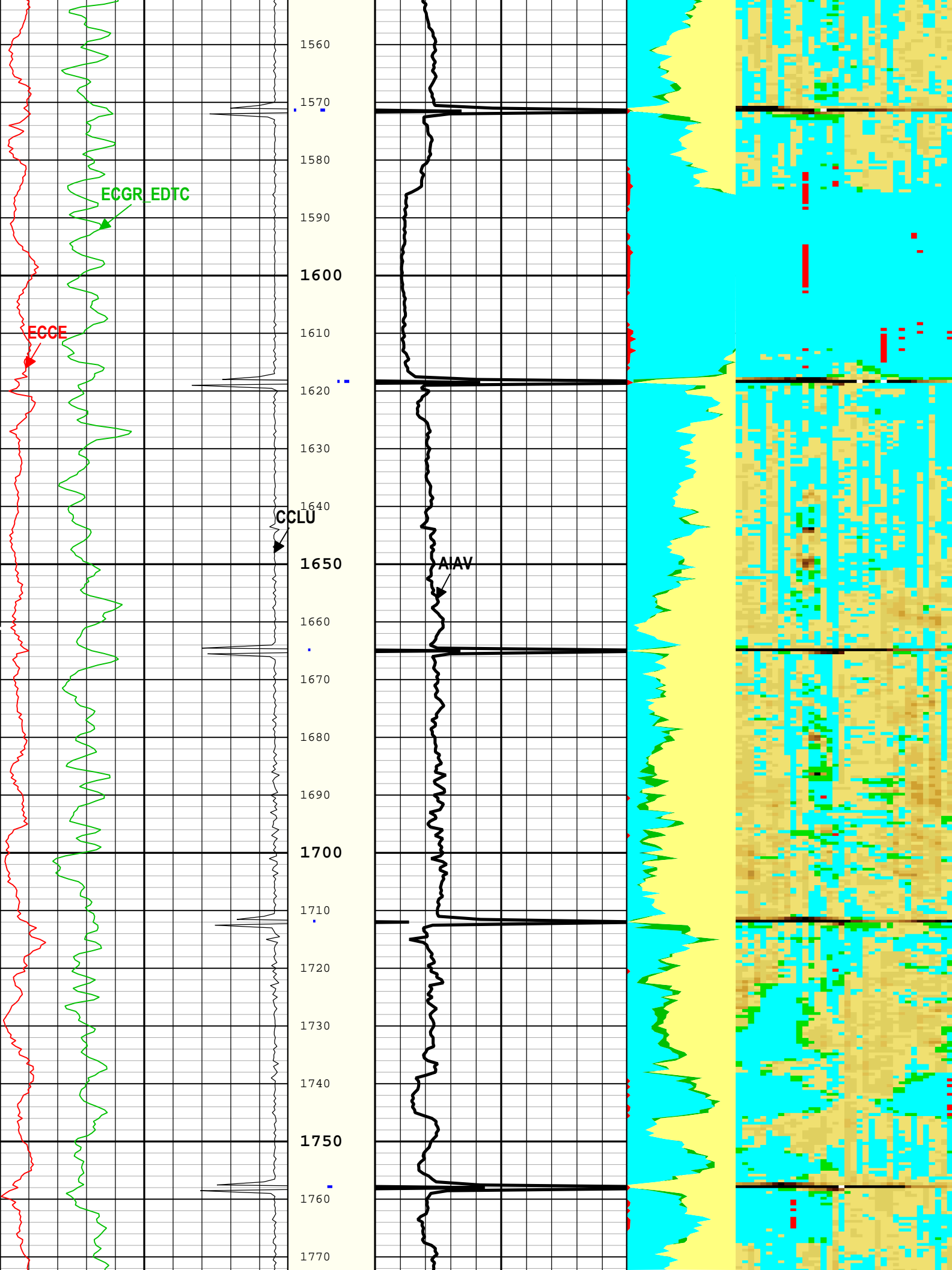


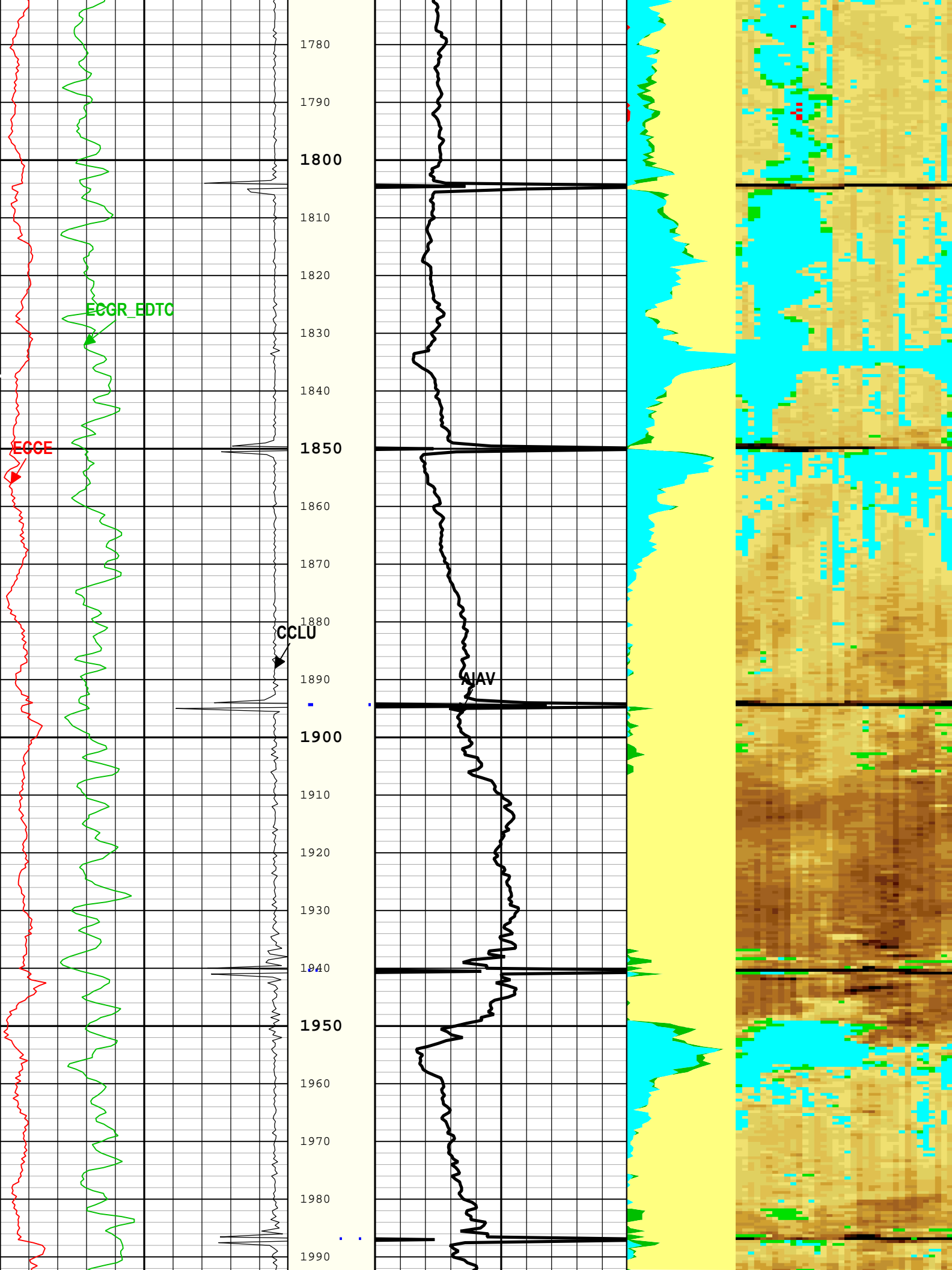


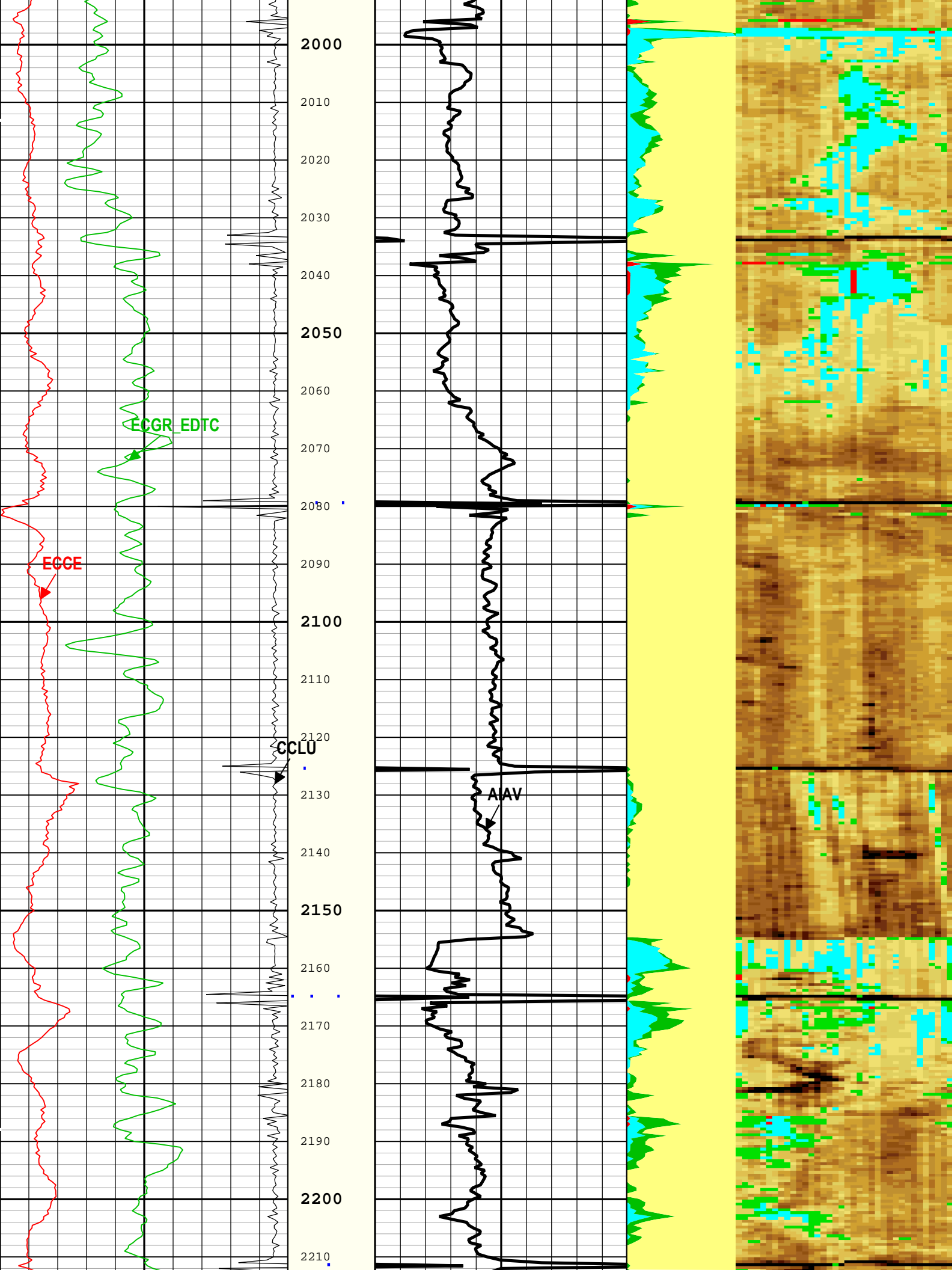


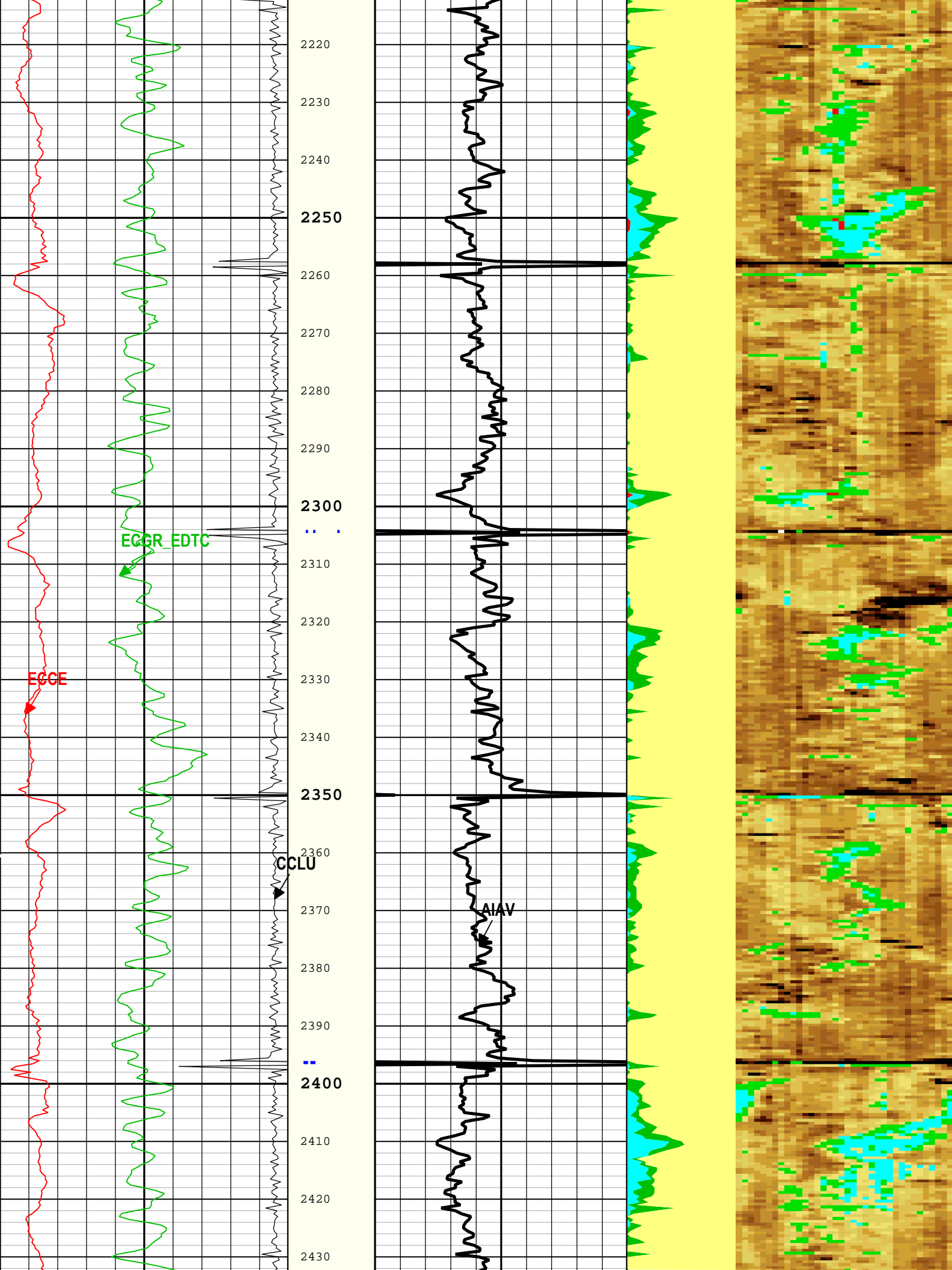


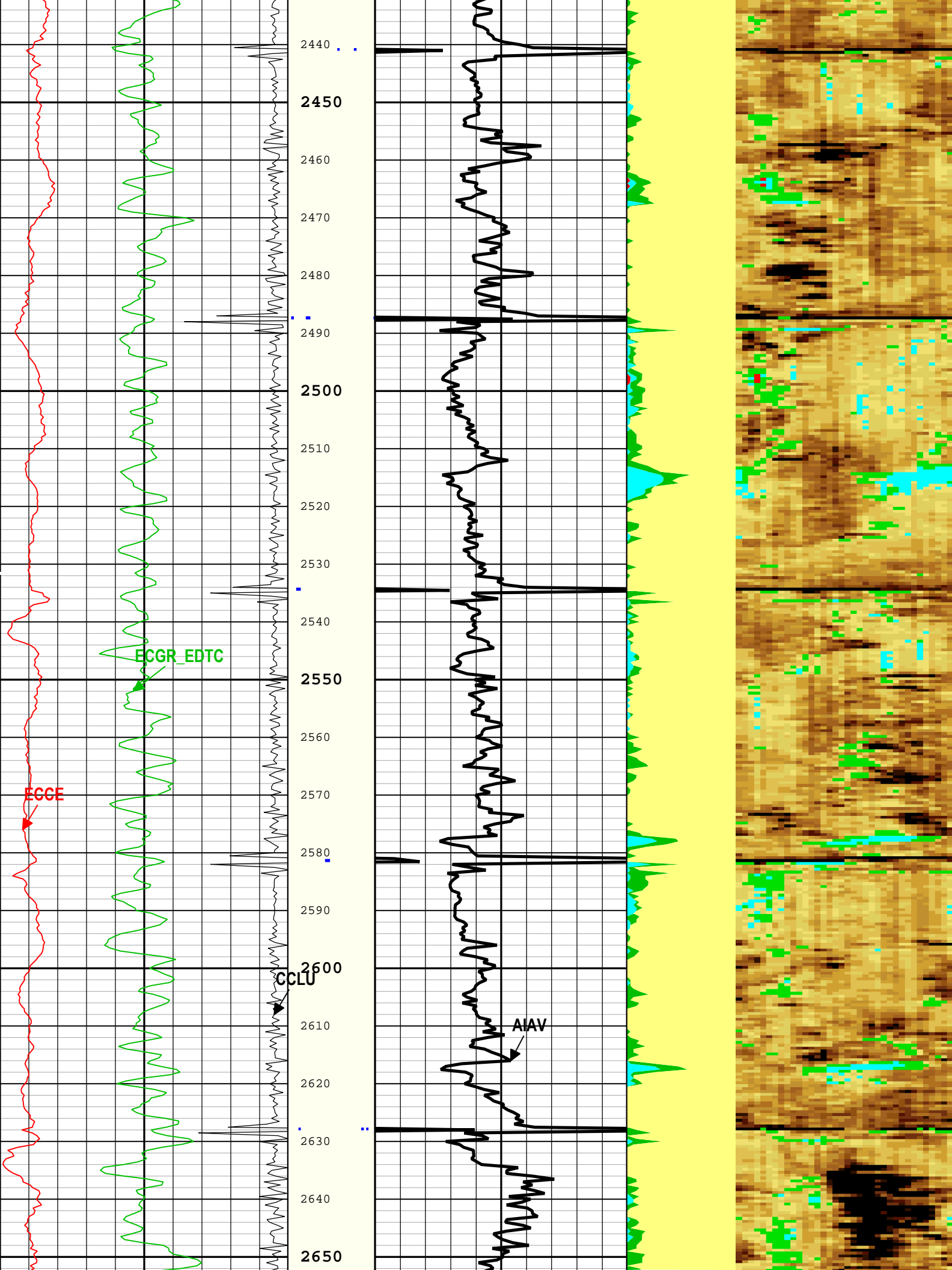


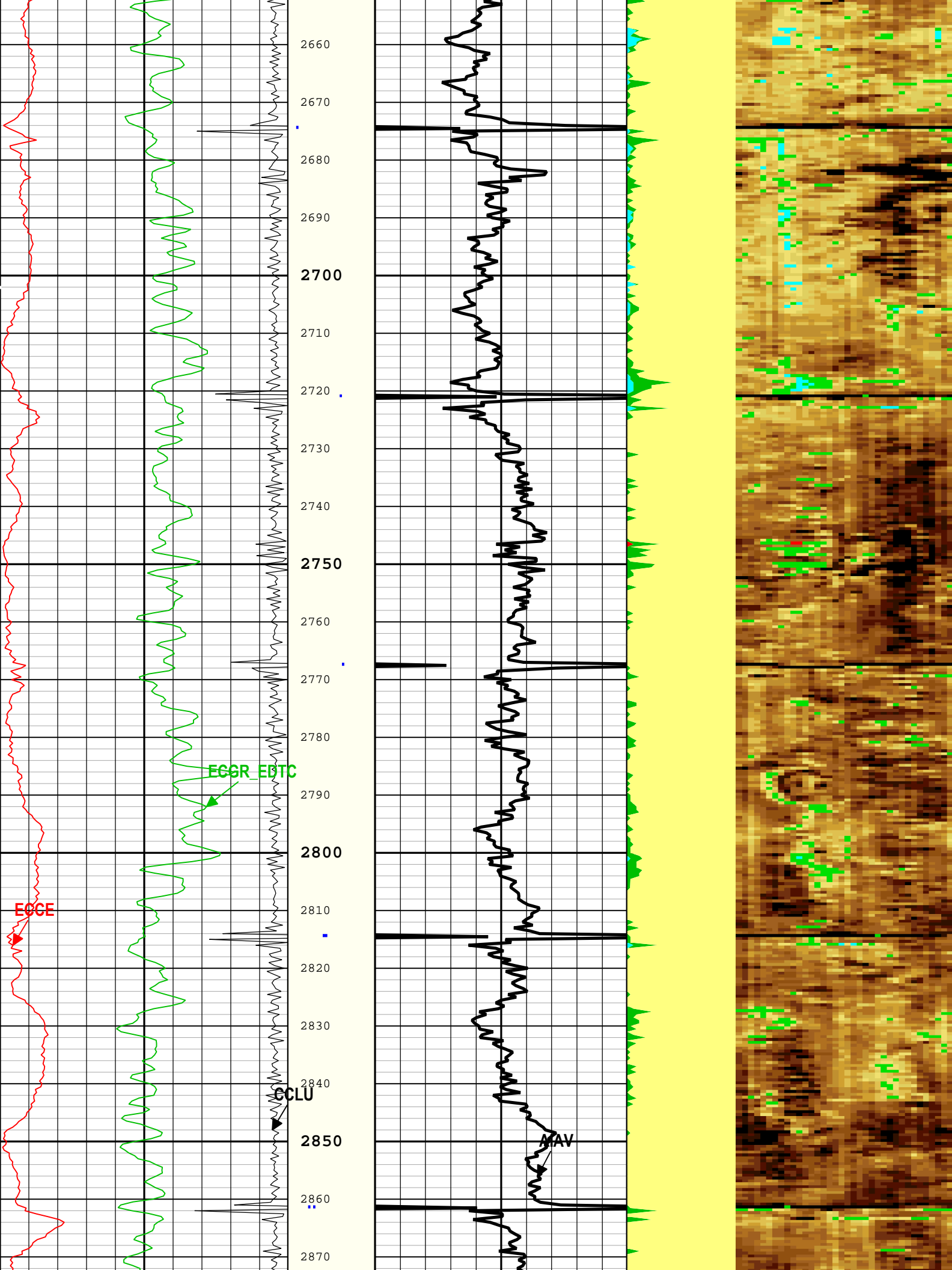


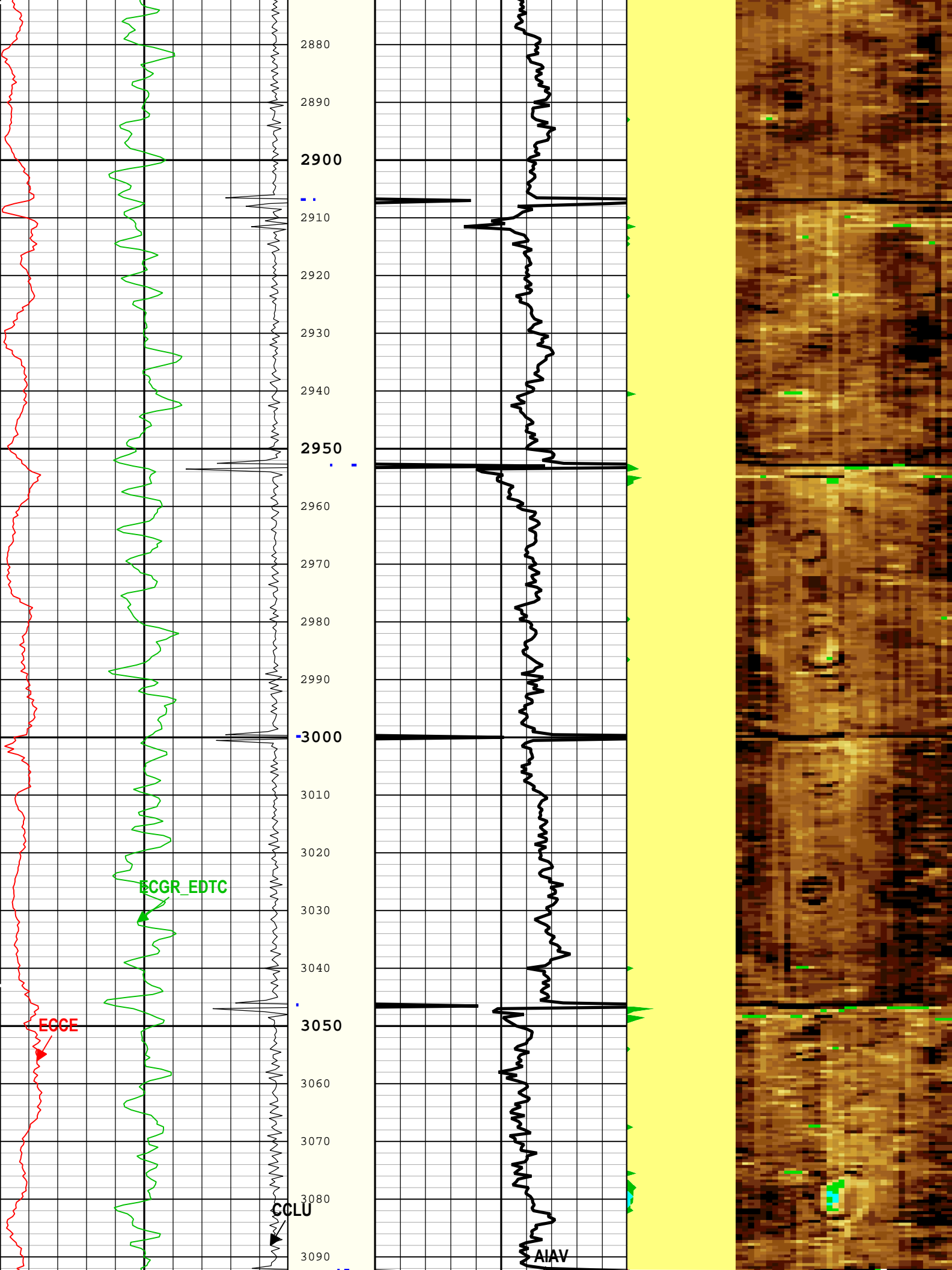


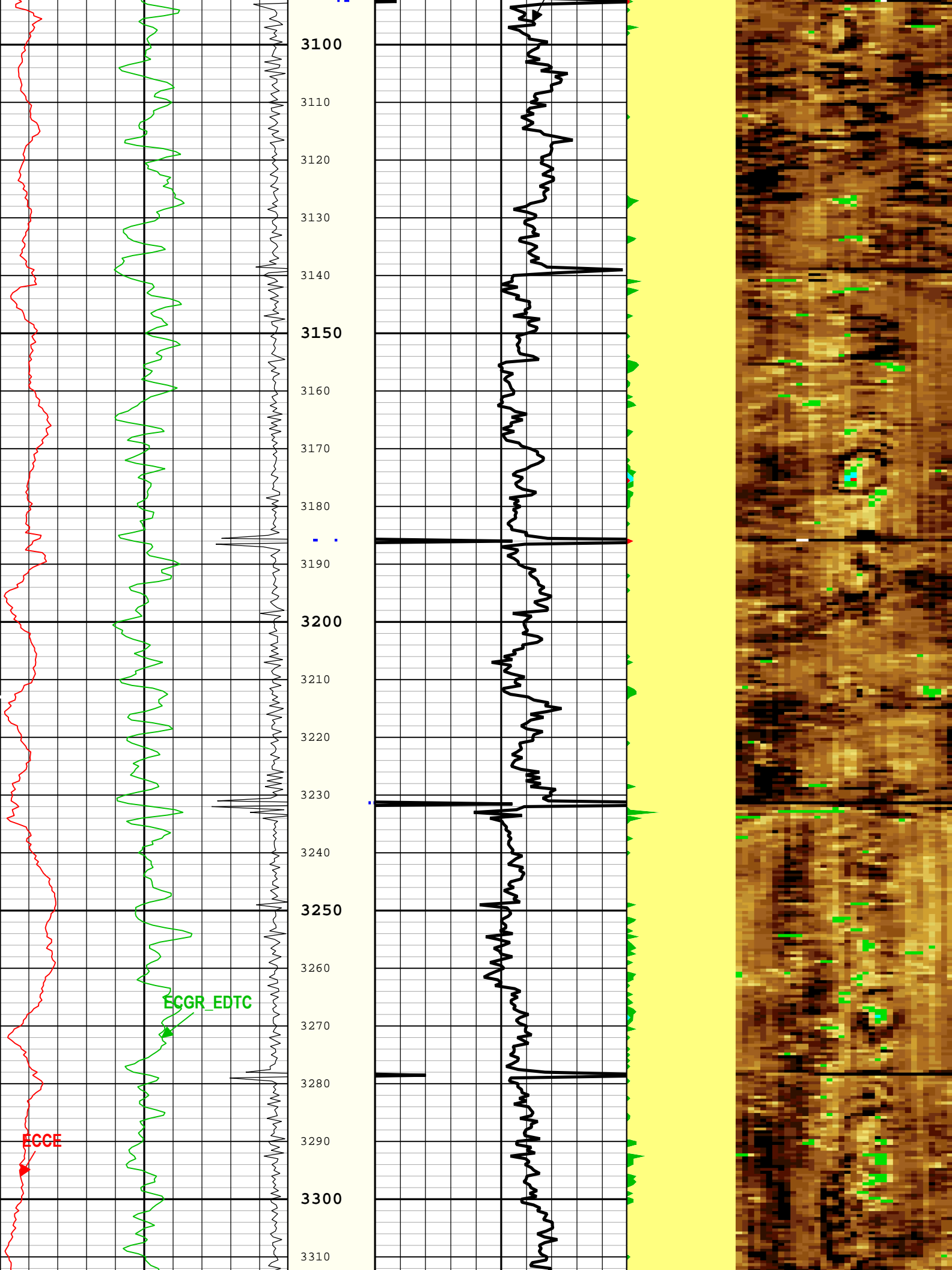


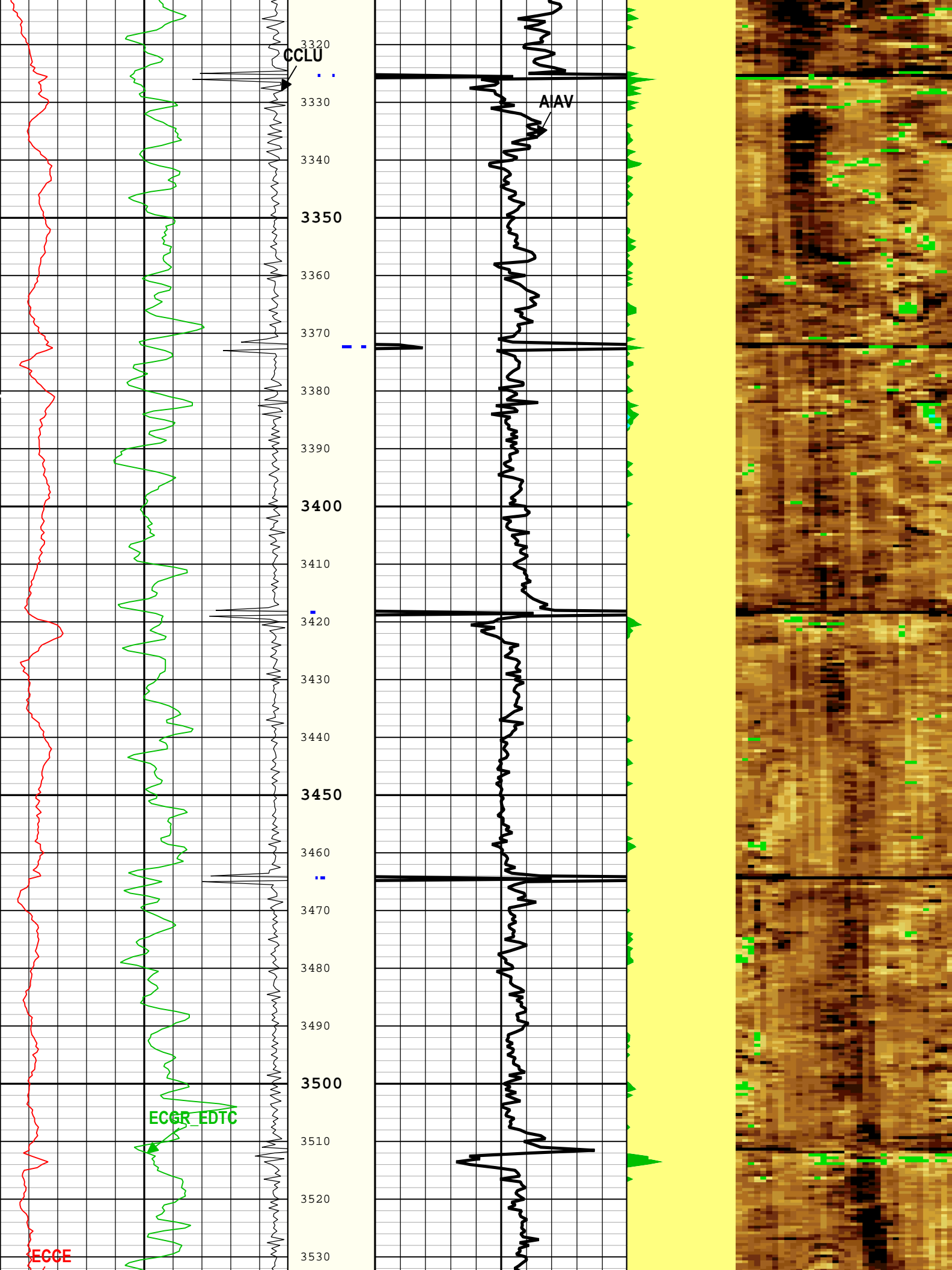


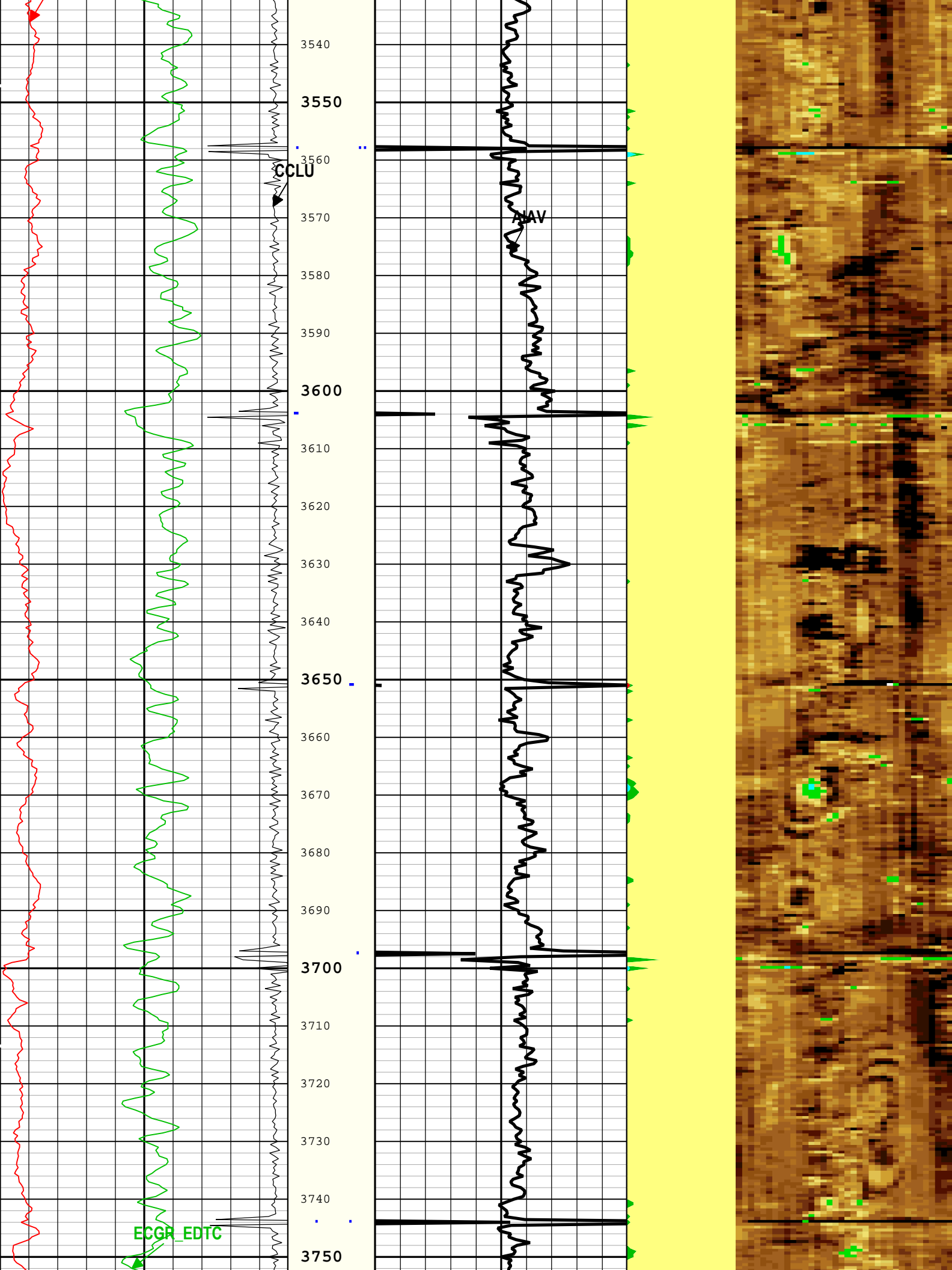


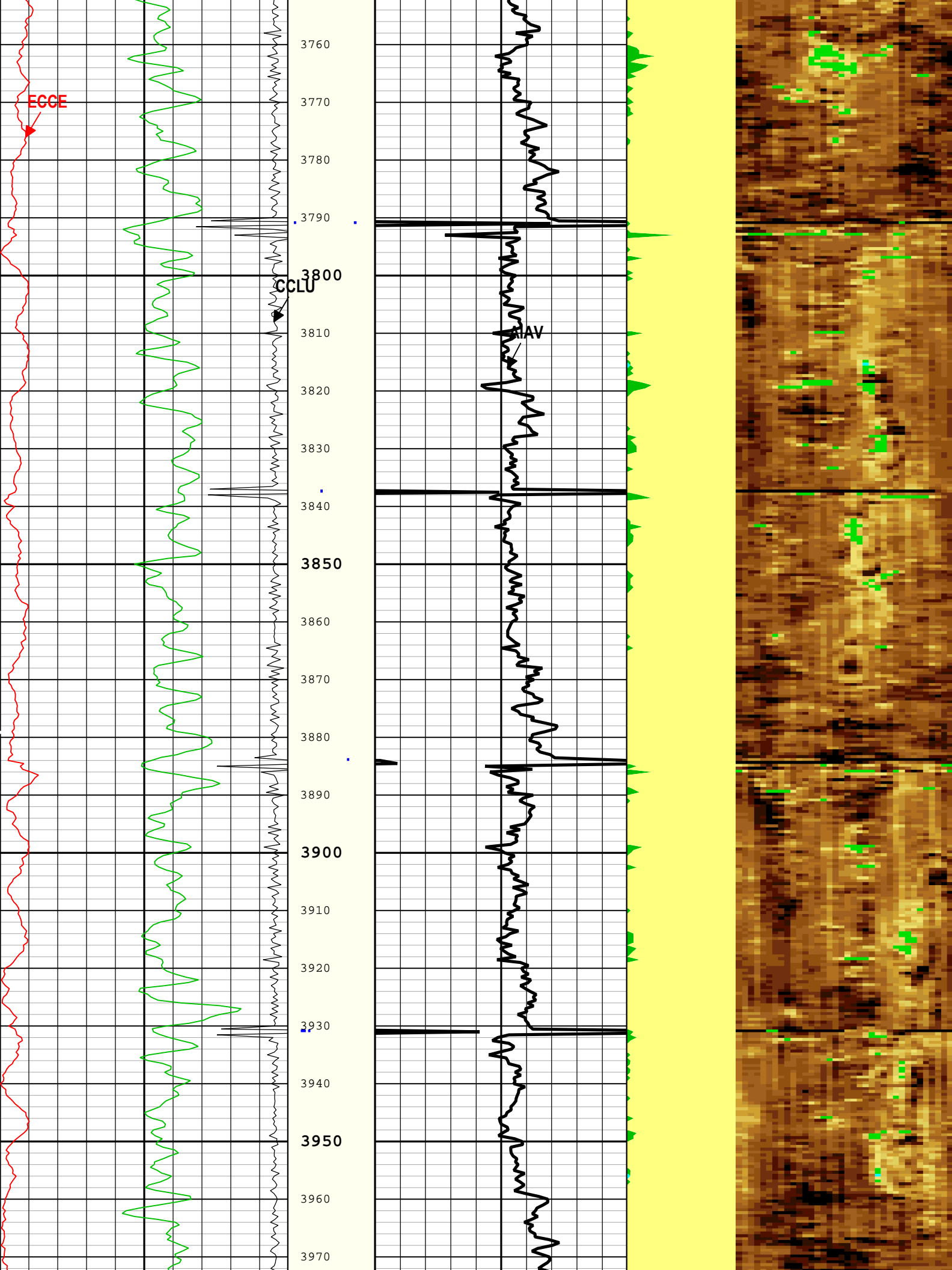


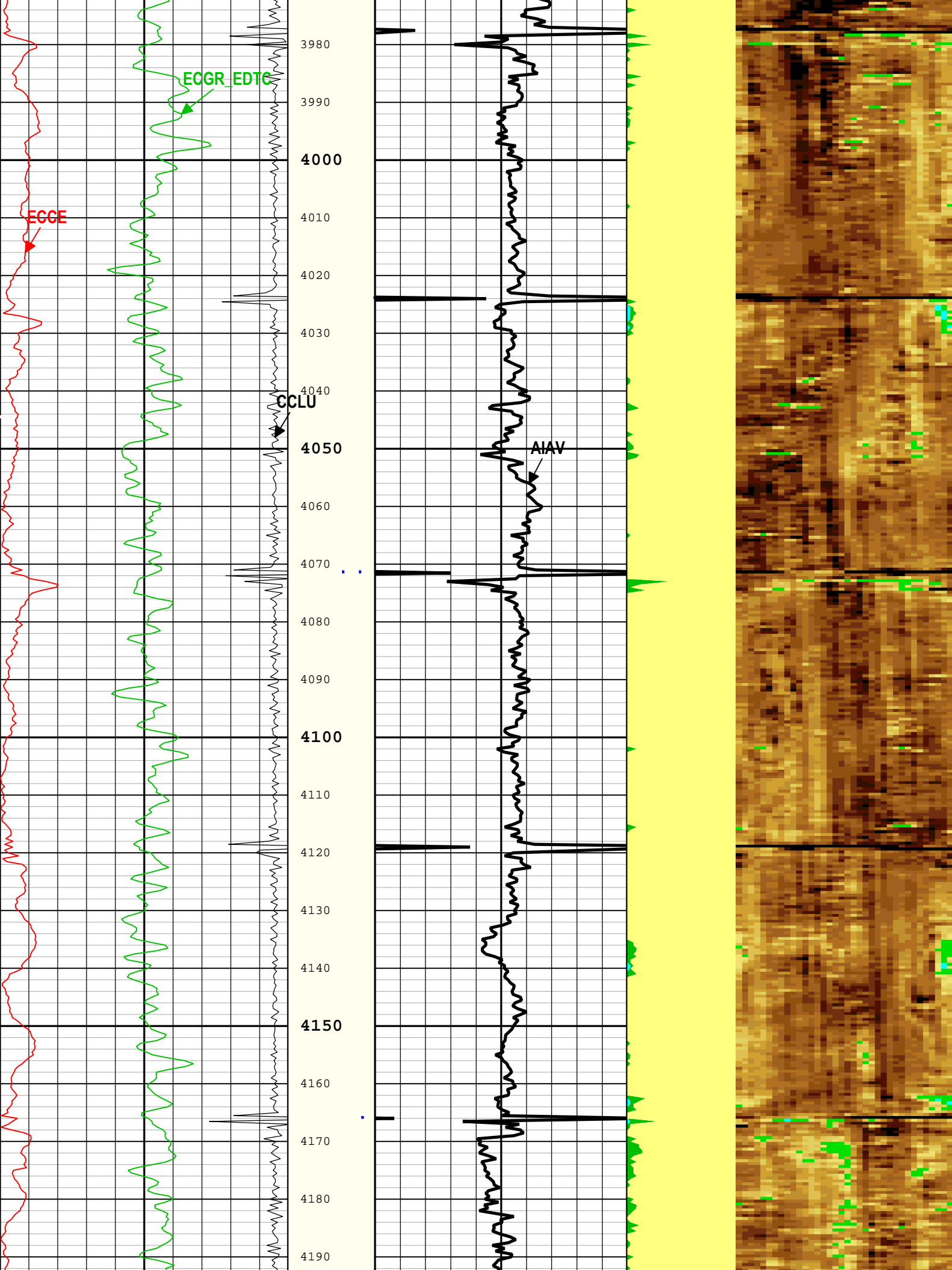


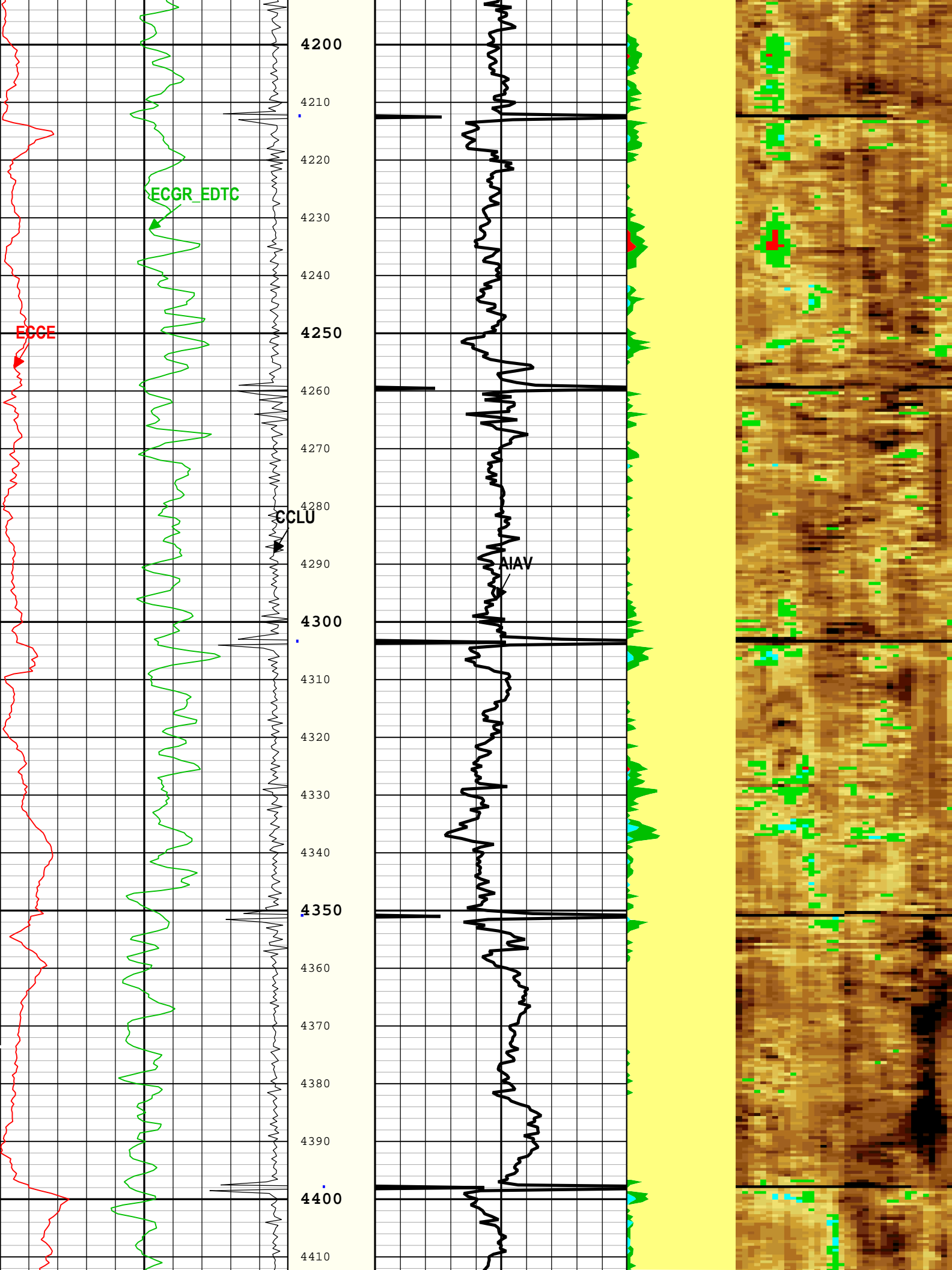


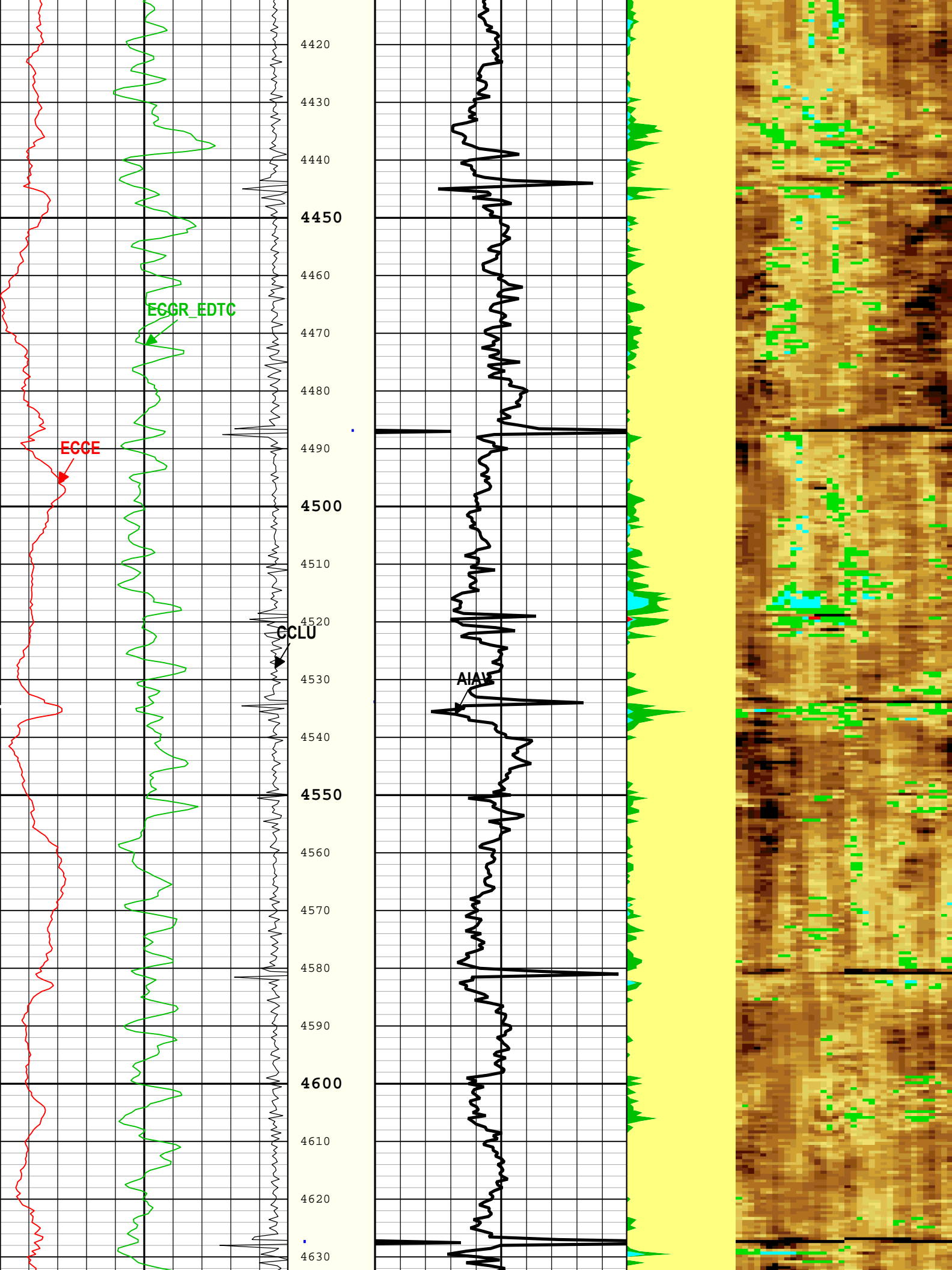


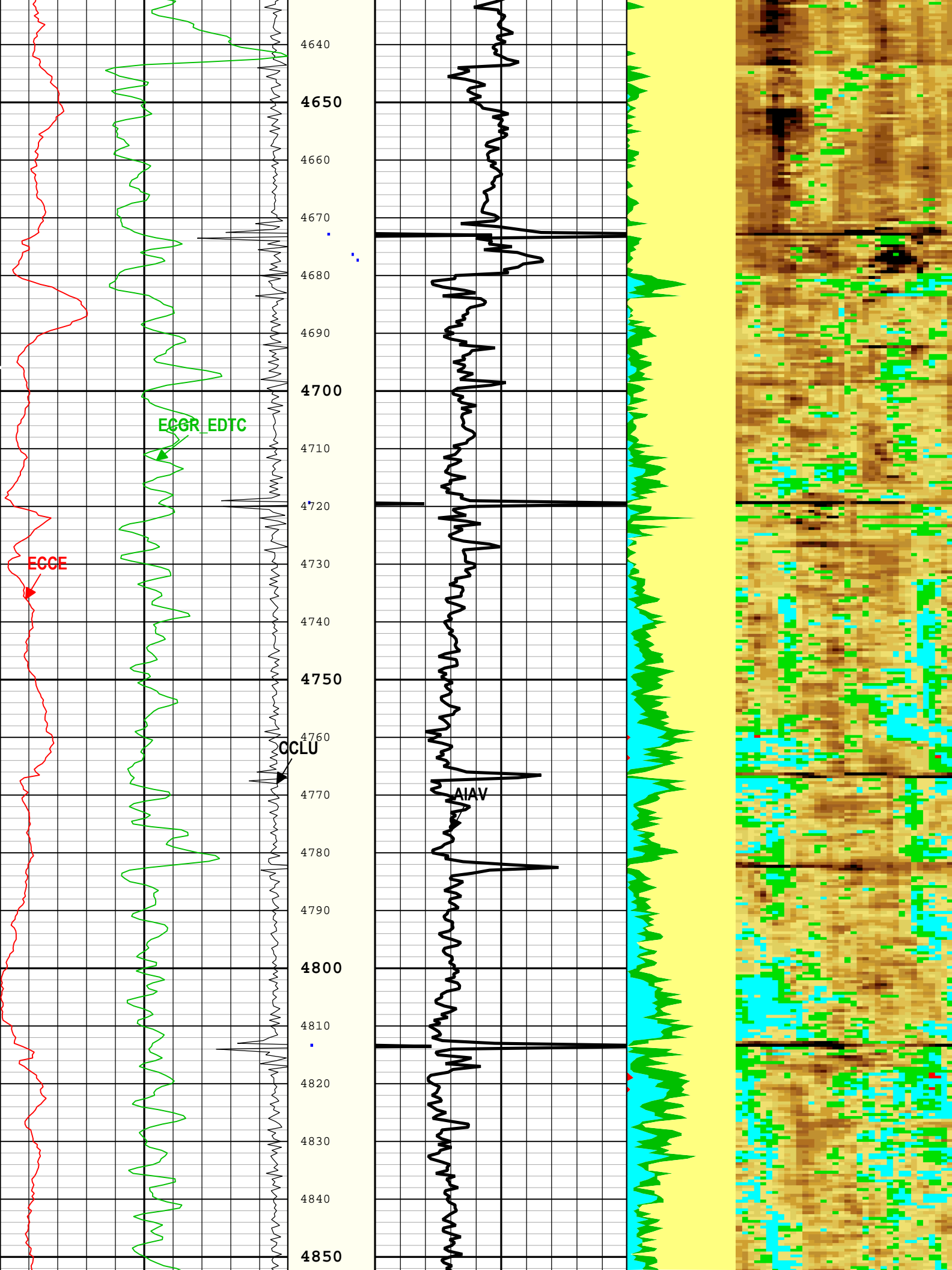


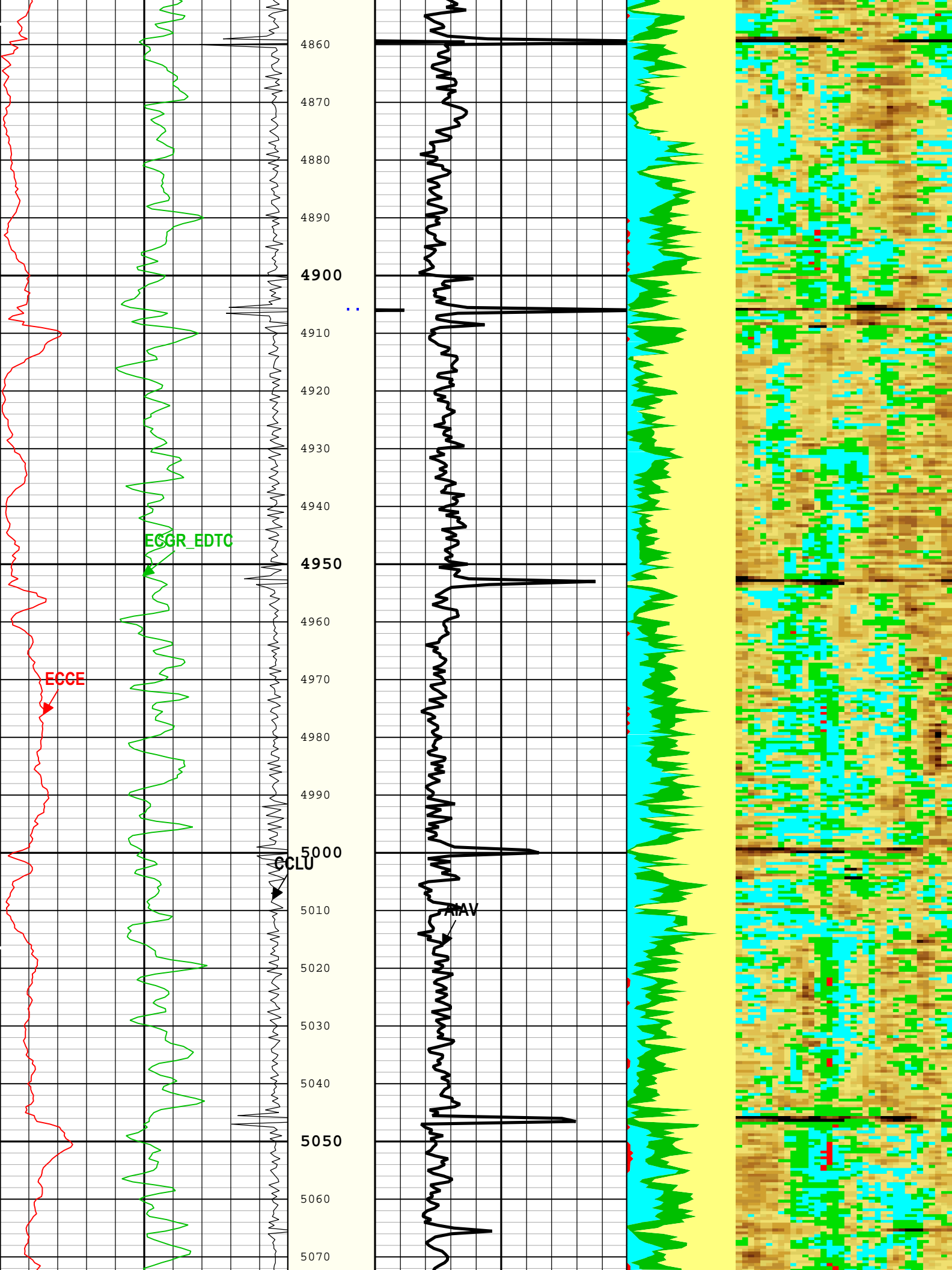


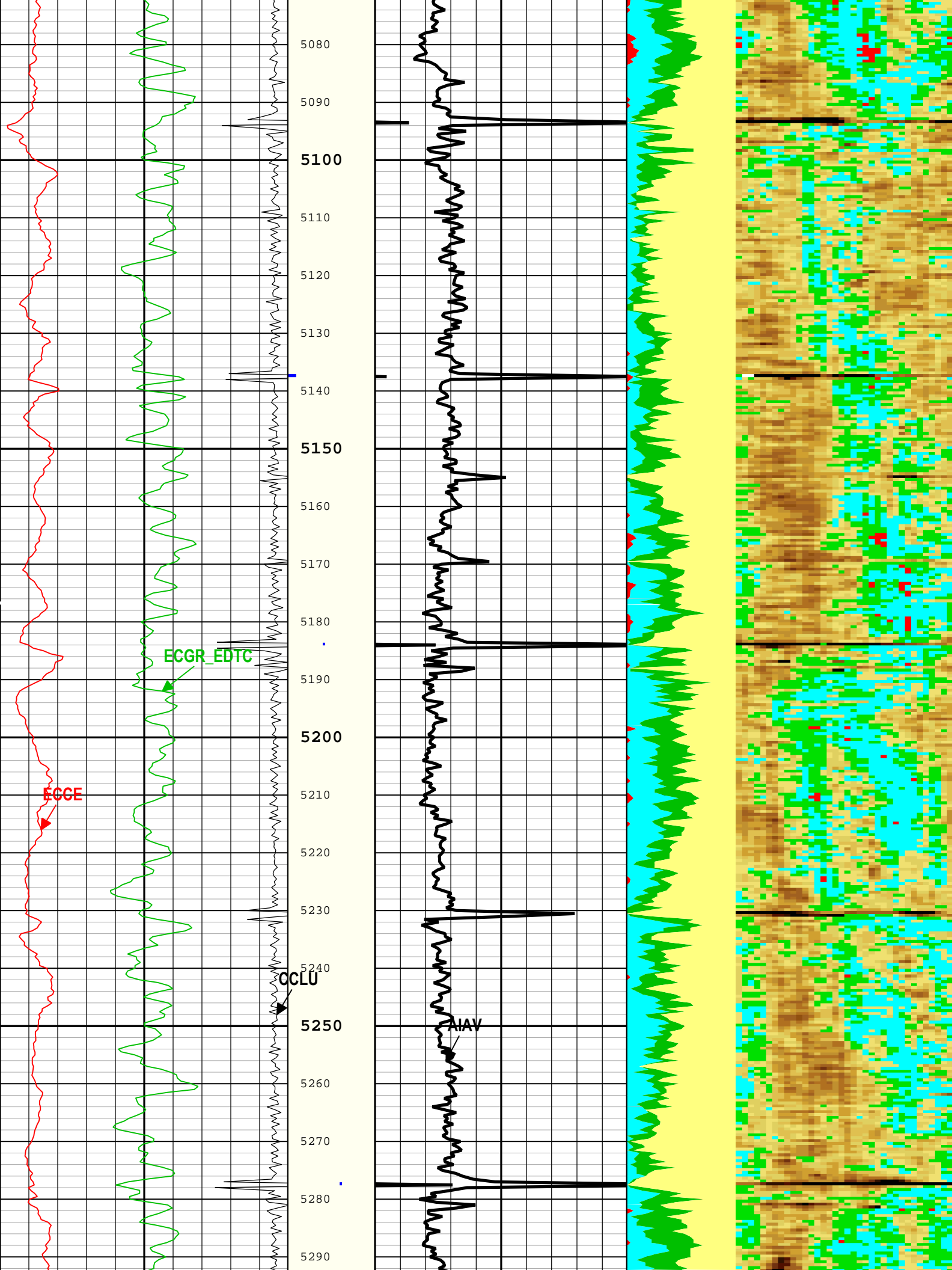


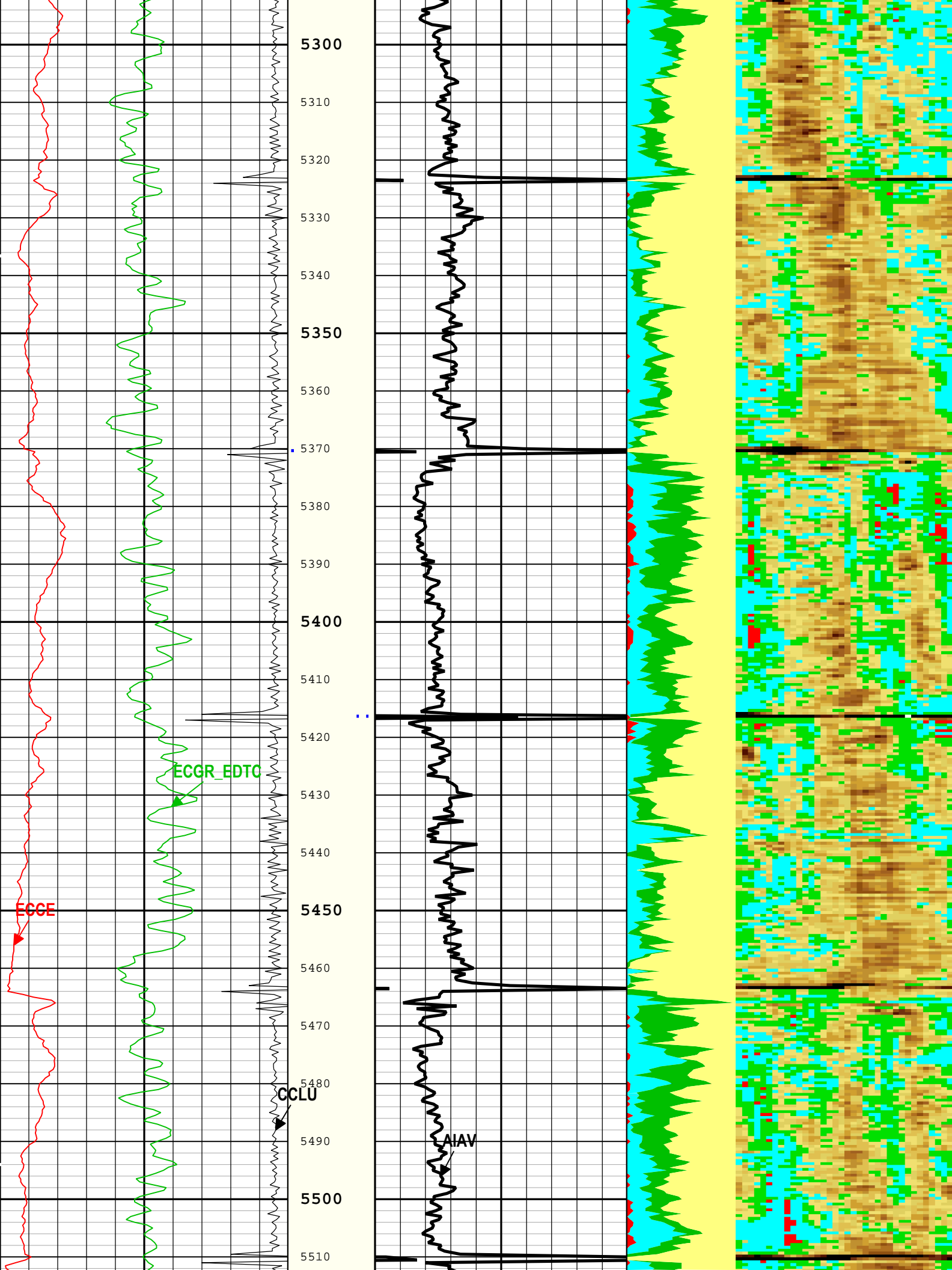


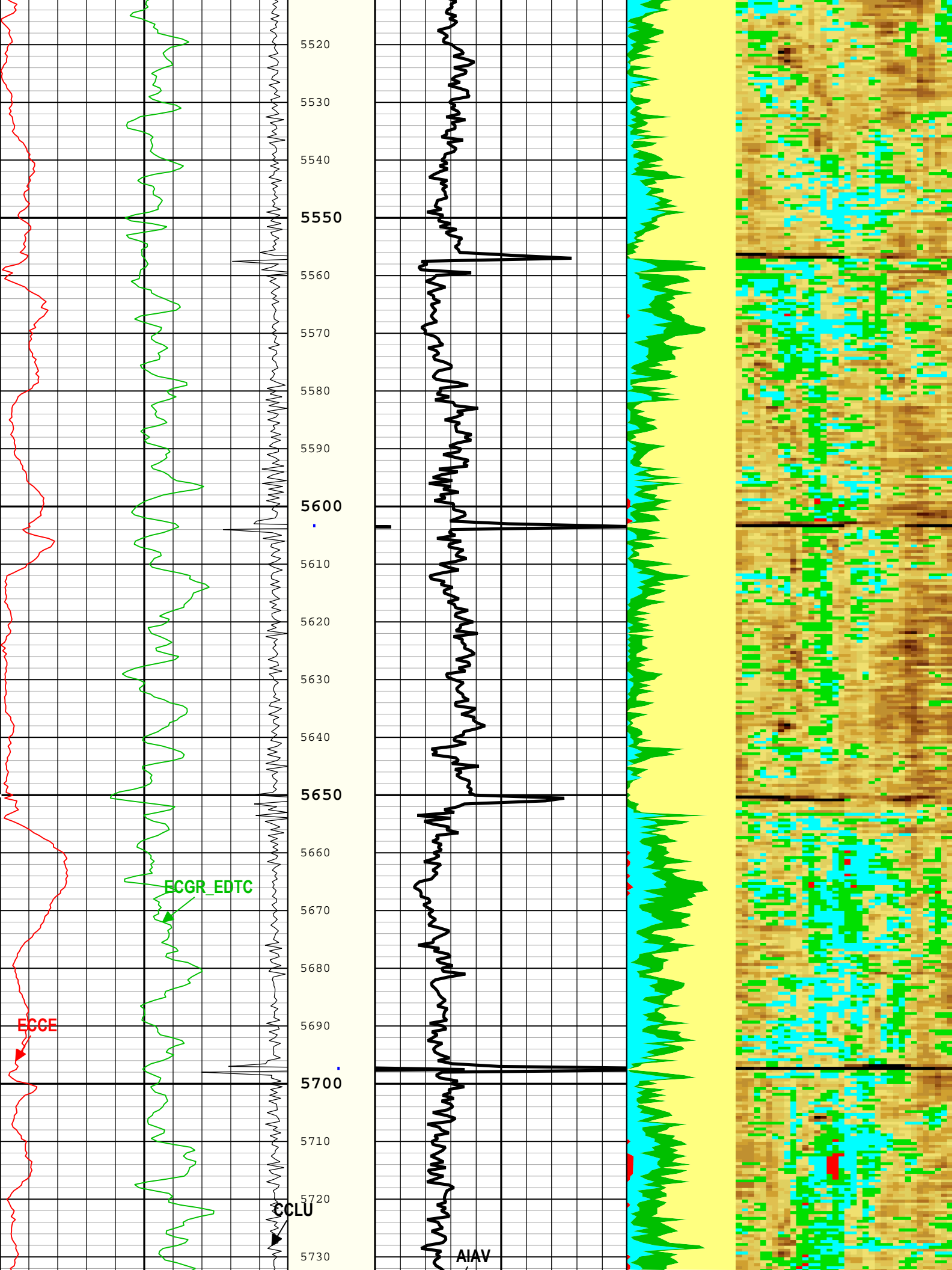


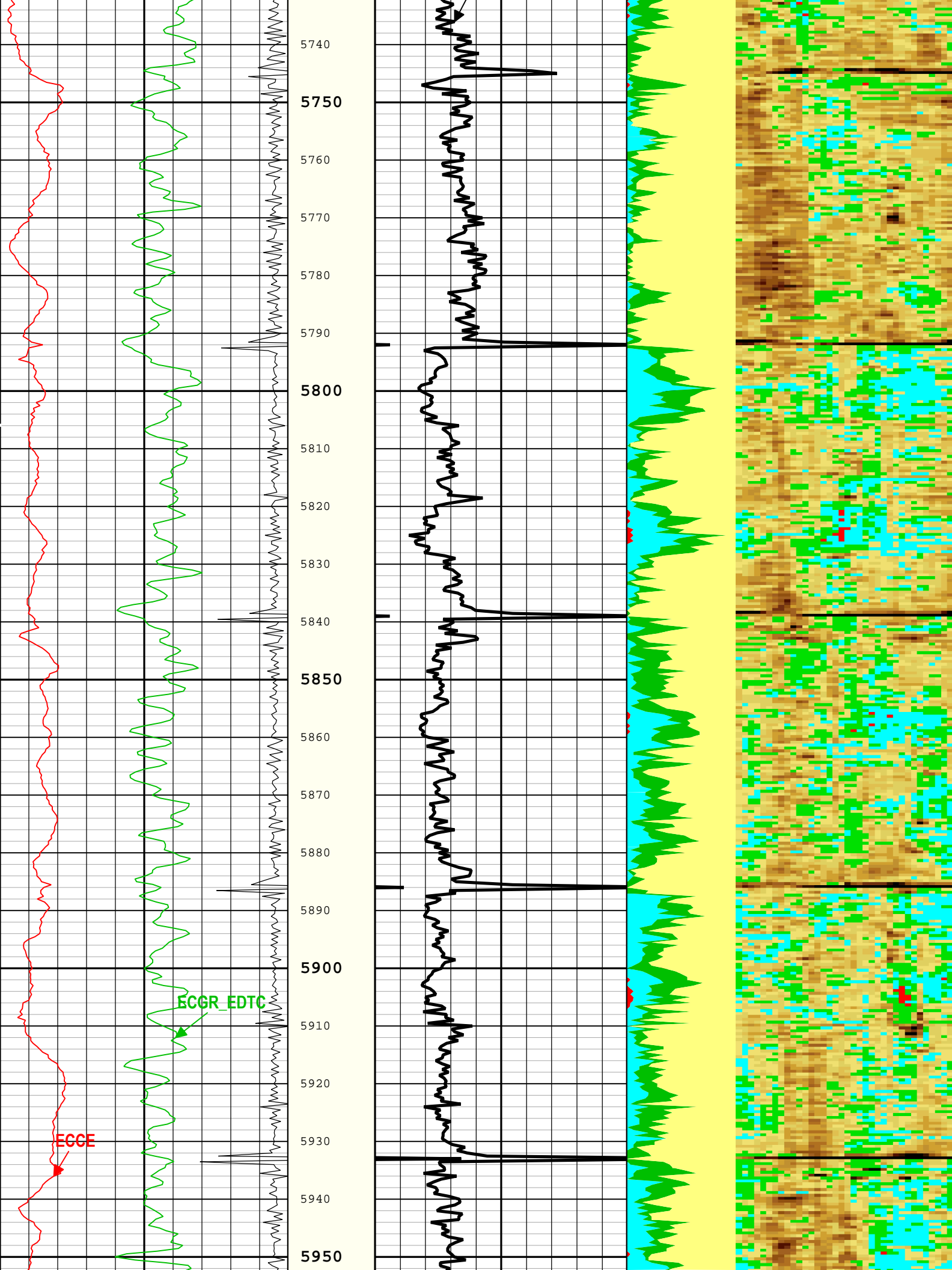


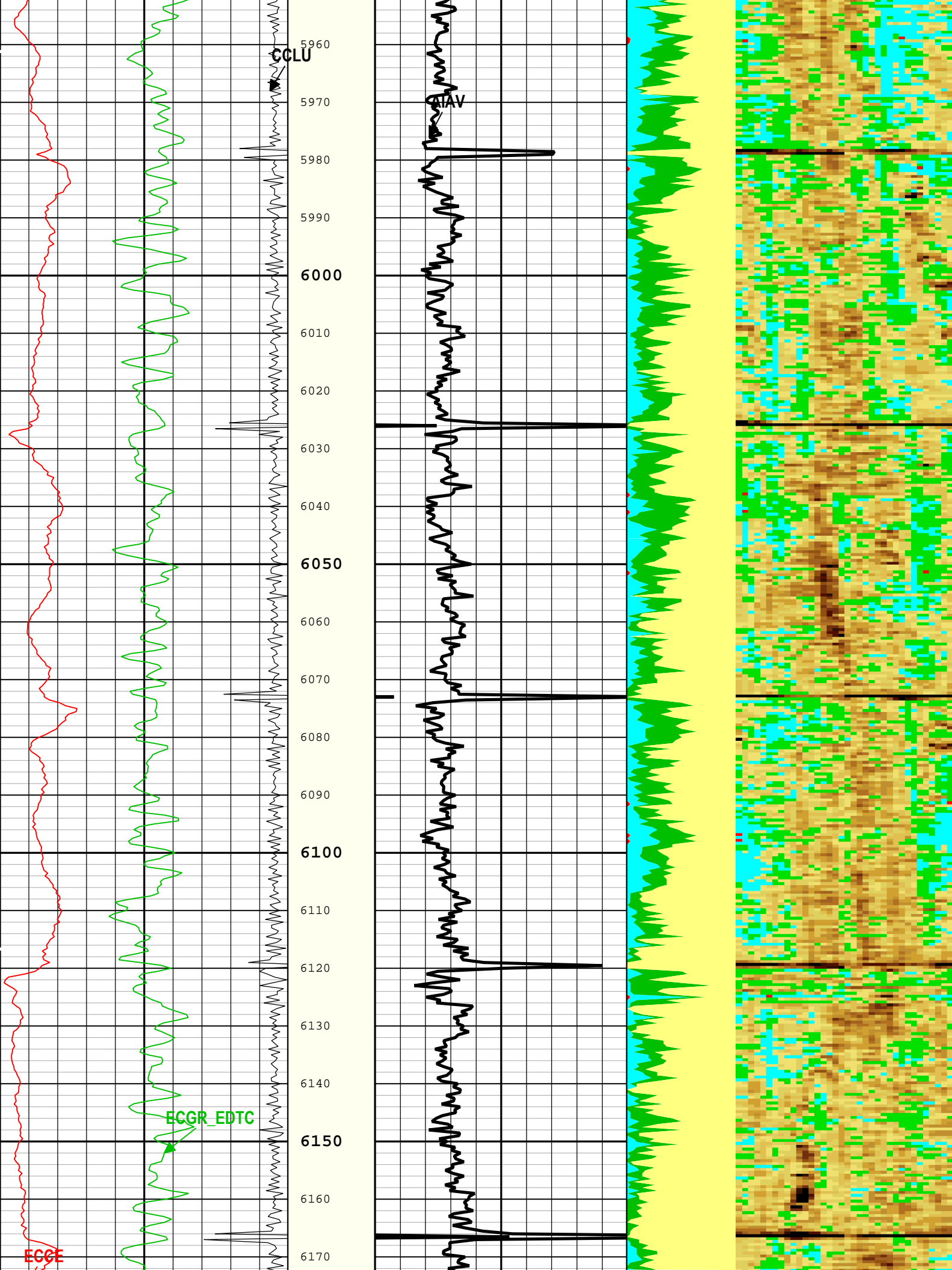


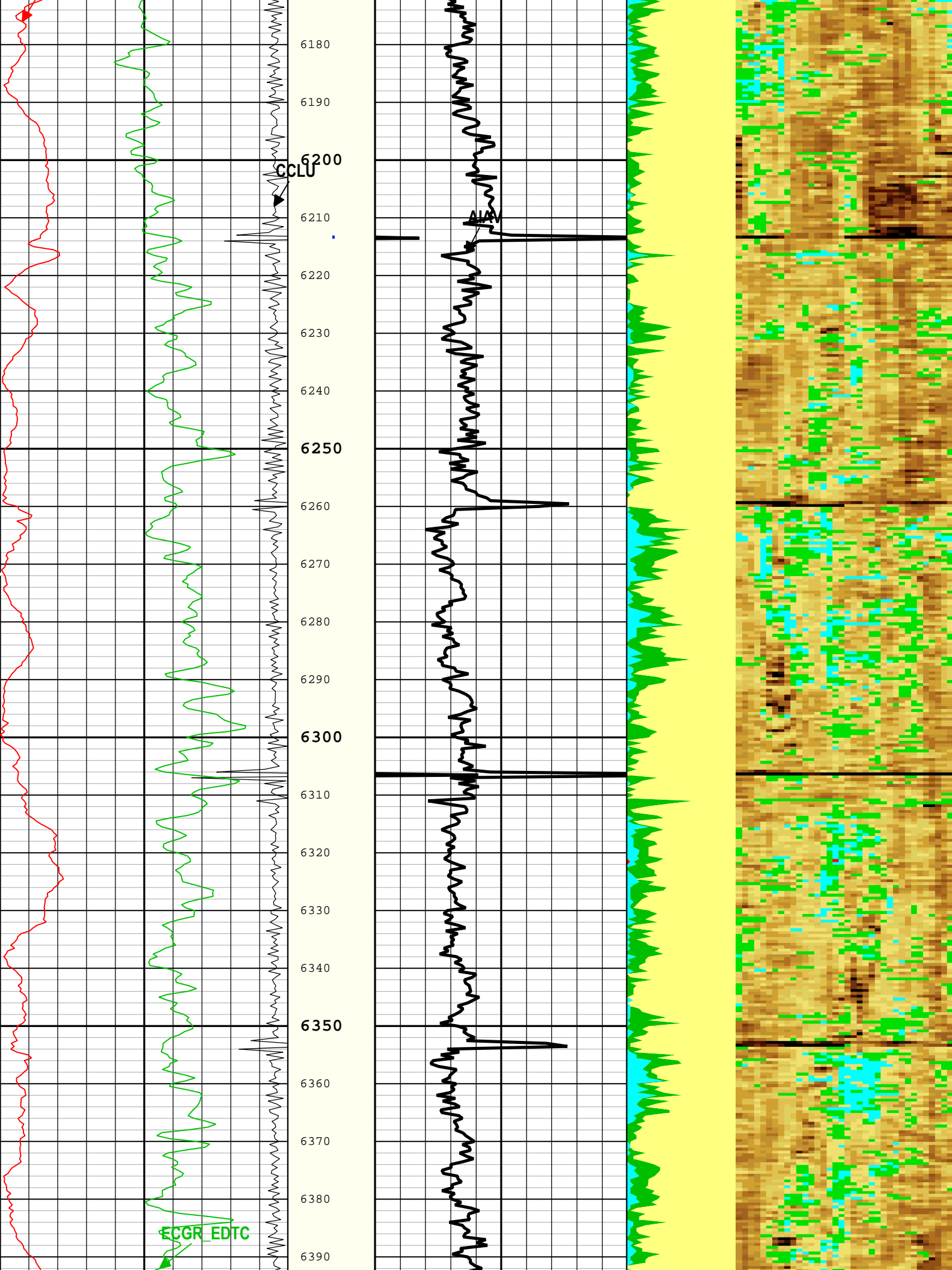


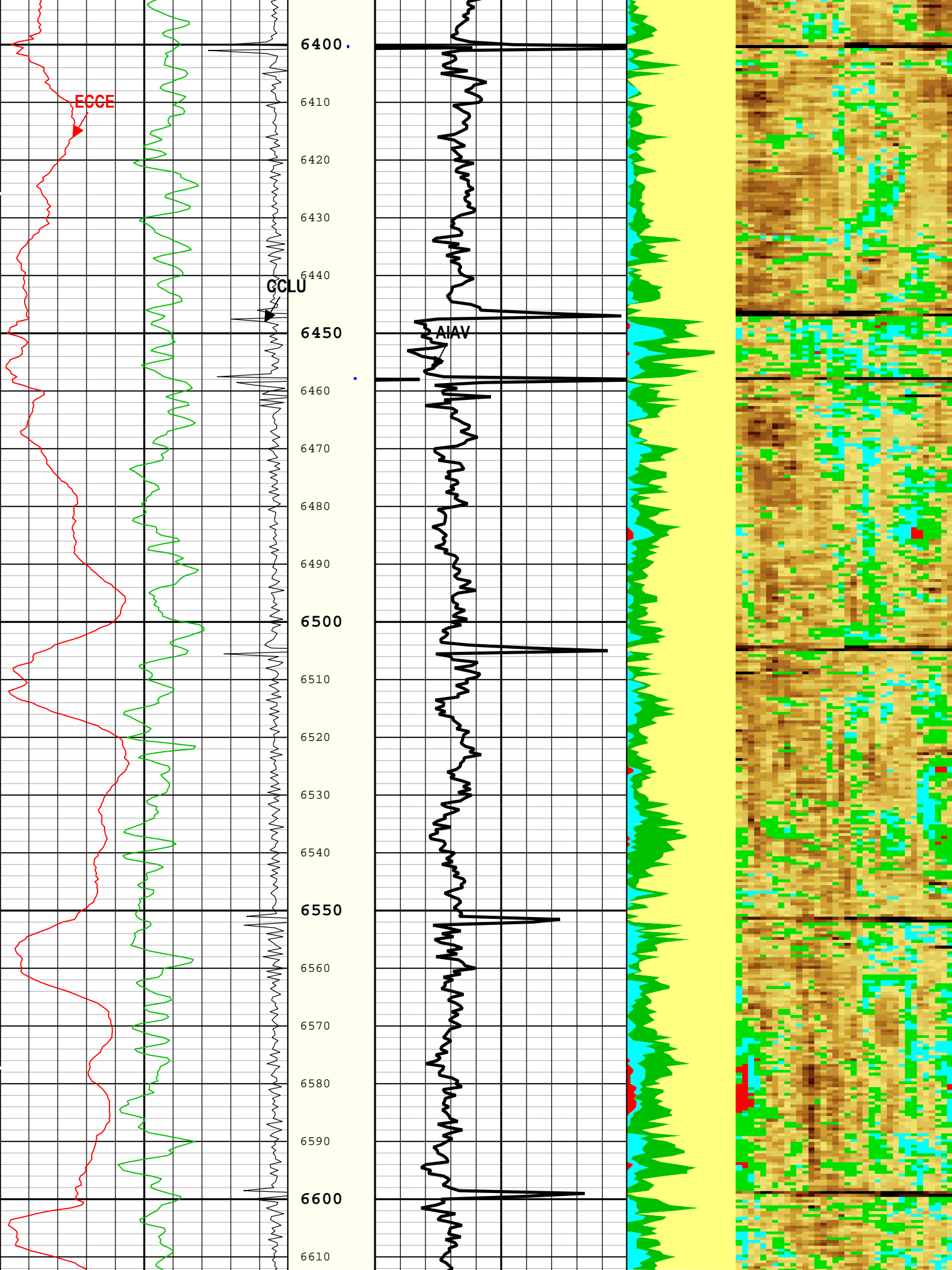


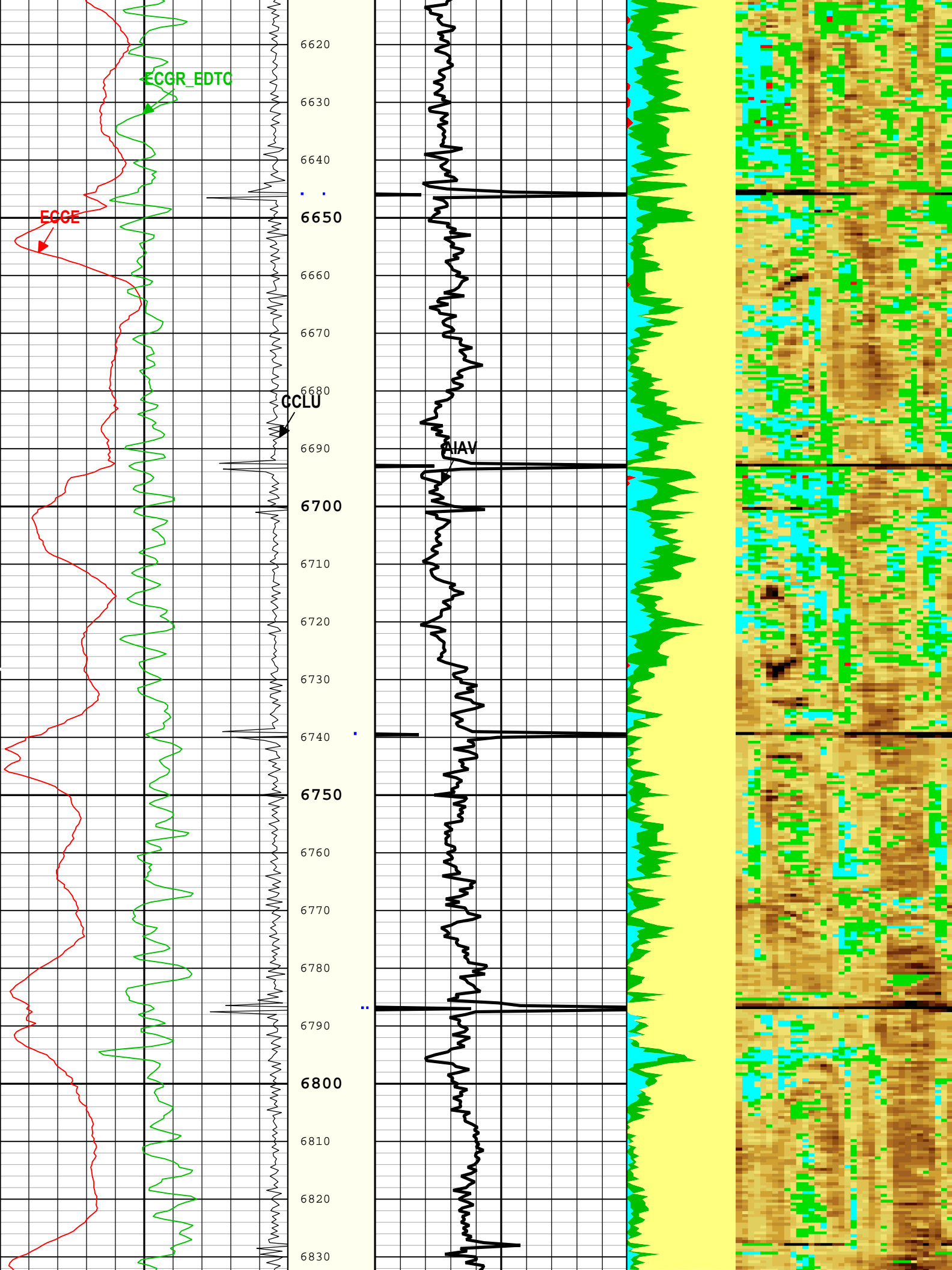


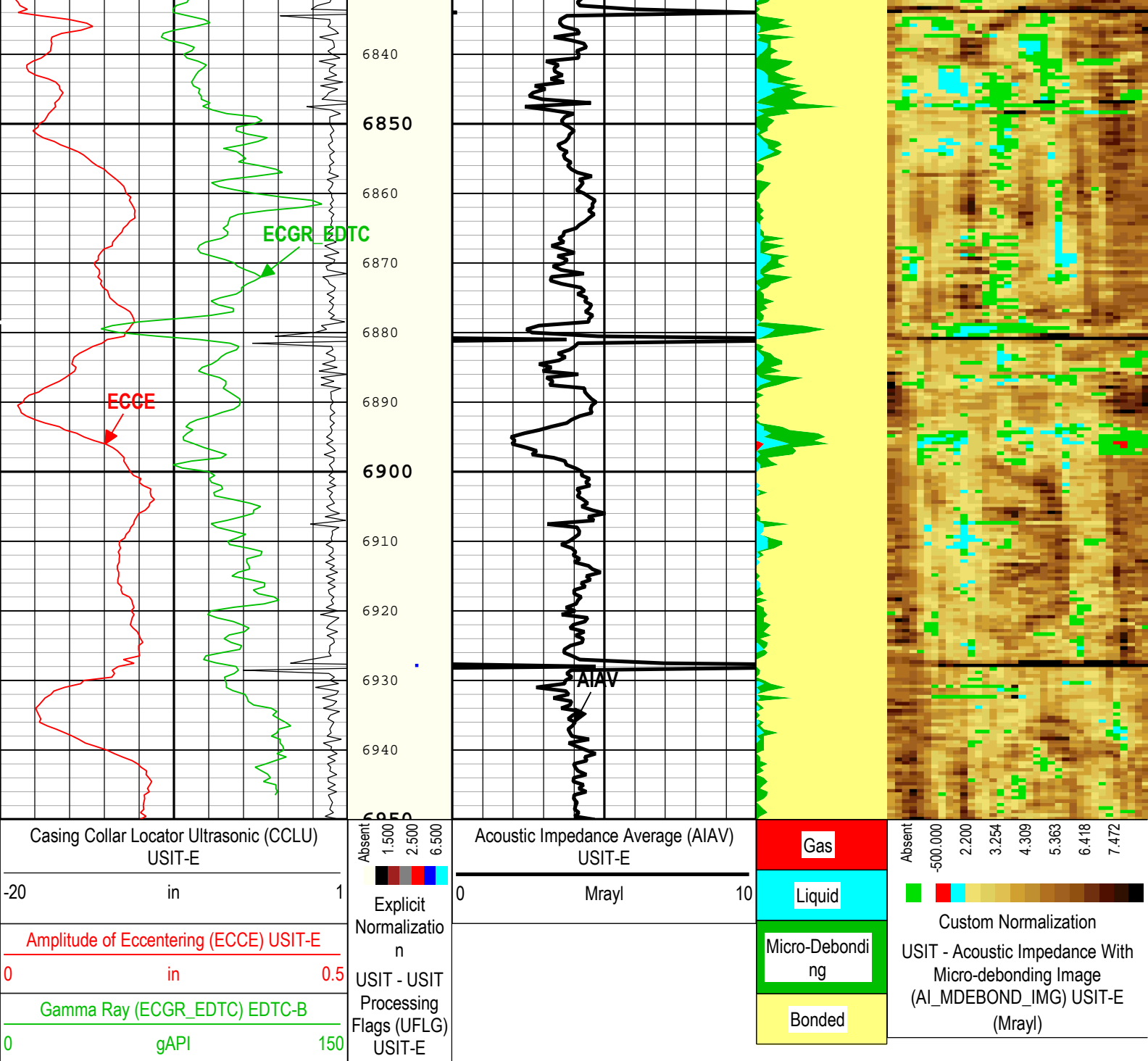












TIME_1900 - Time Marked every 60.00 (s)

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: 08-Nov-2017 13:26:34

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	17194.2	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	8.4	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
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	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	1.09	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.61	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	50	110
BS	13.5	110	2033
BS	8.5	2033	6950
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
EMXV	EMEX Voltage	USIT-E	90	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

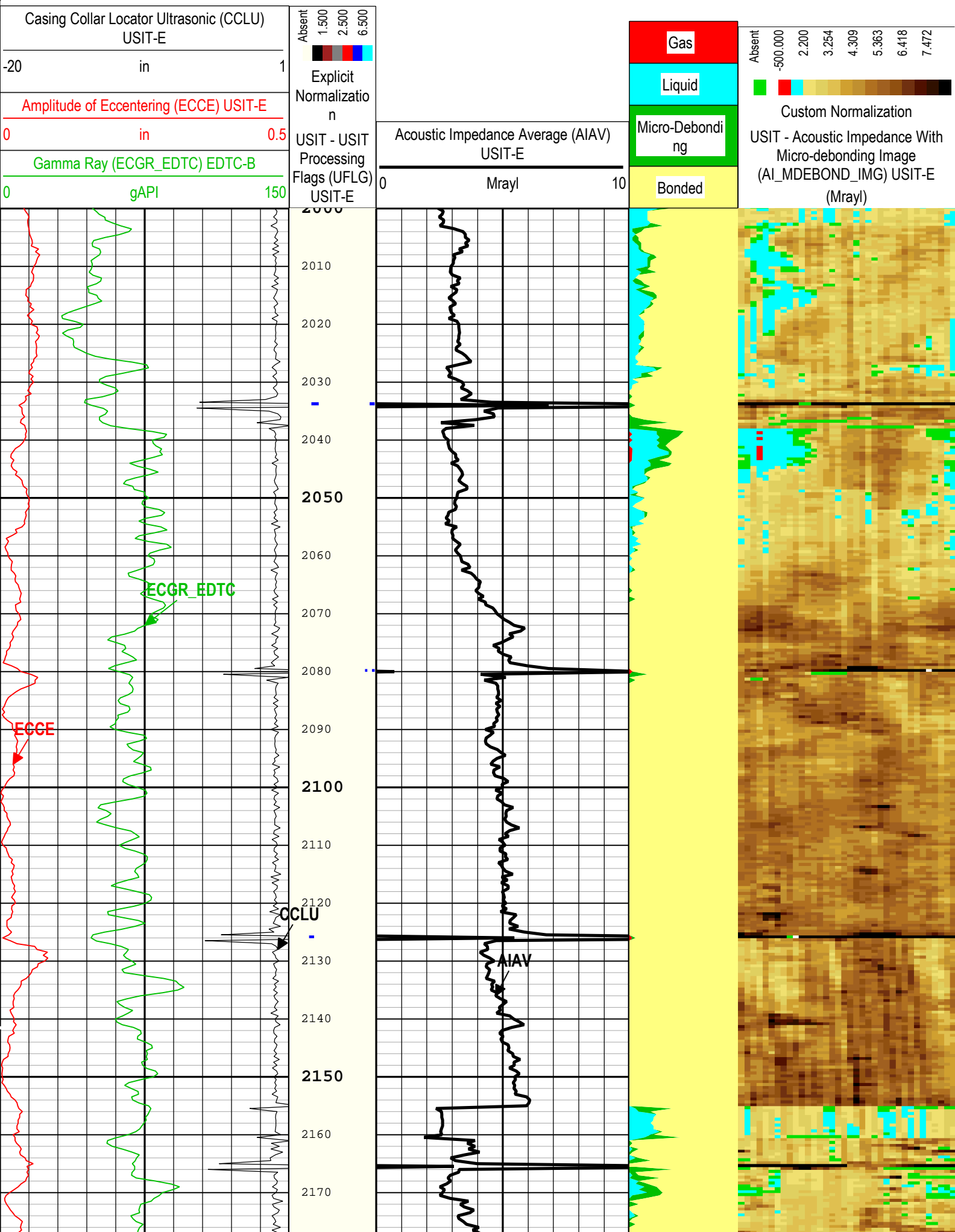
ONE	
0 PSI Repeat Pass	

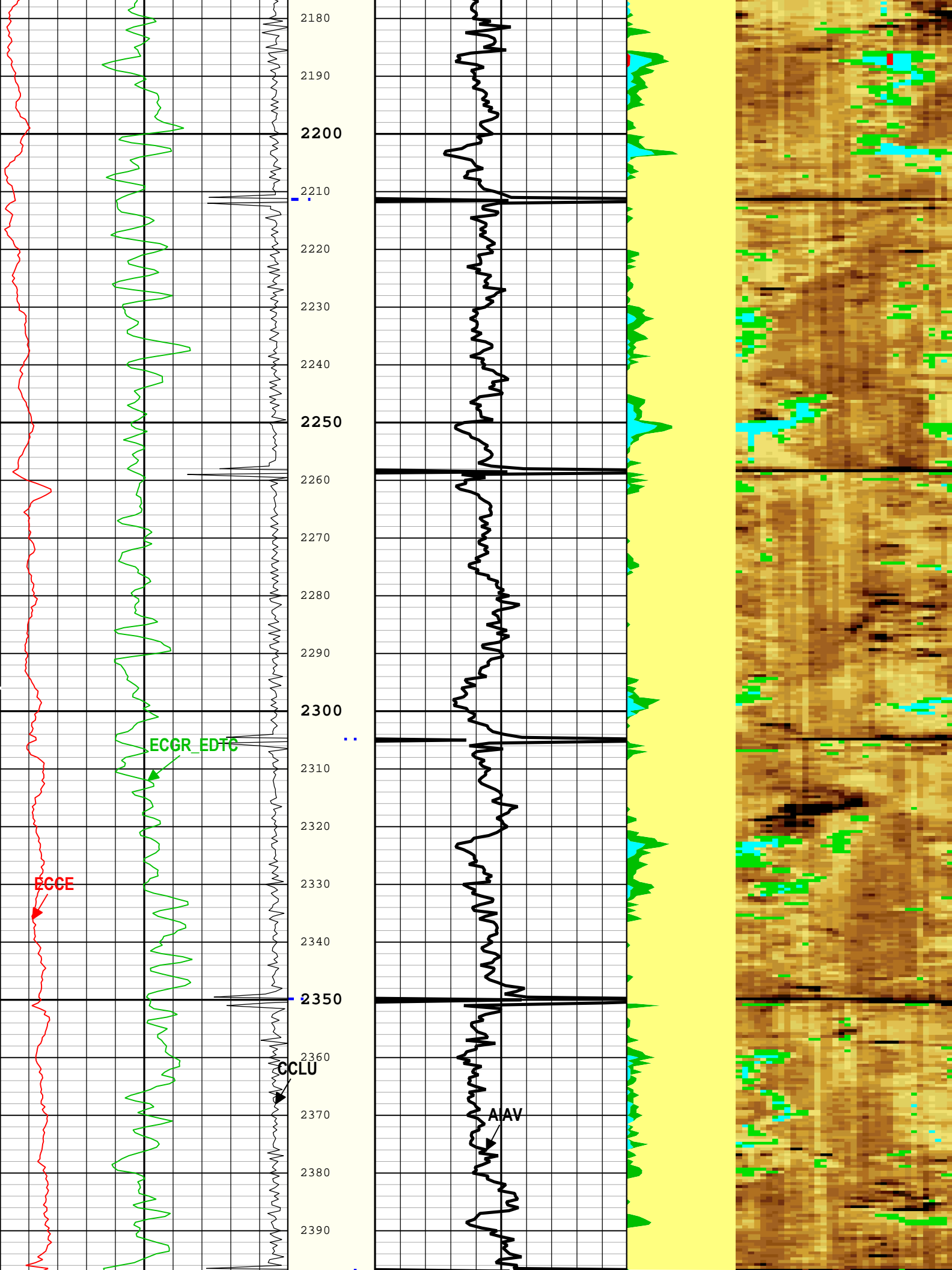
Software Version	
Acquisition System	Version
Maxwell 2017 SP3	7.3.92069.3100
Application Patch	Wireline_NPD-ICE2-2017SP3_7.3.93033

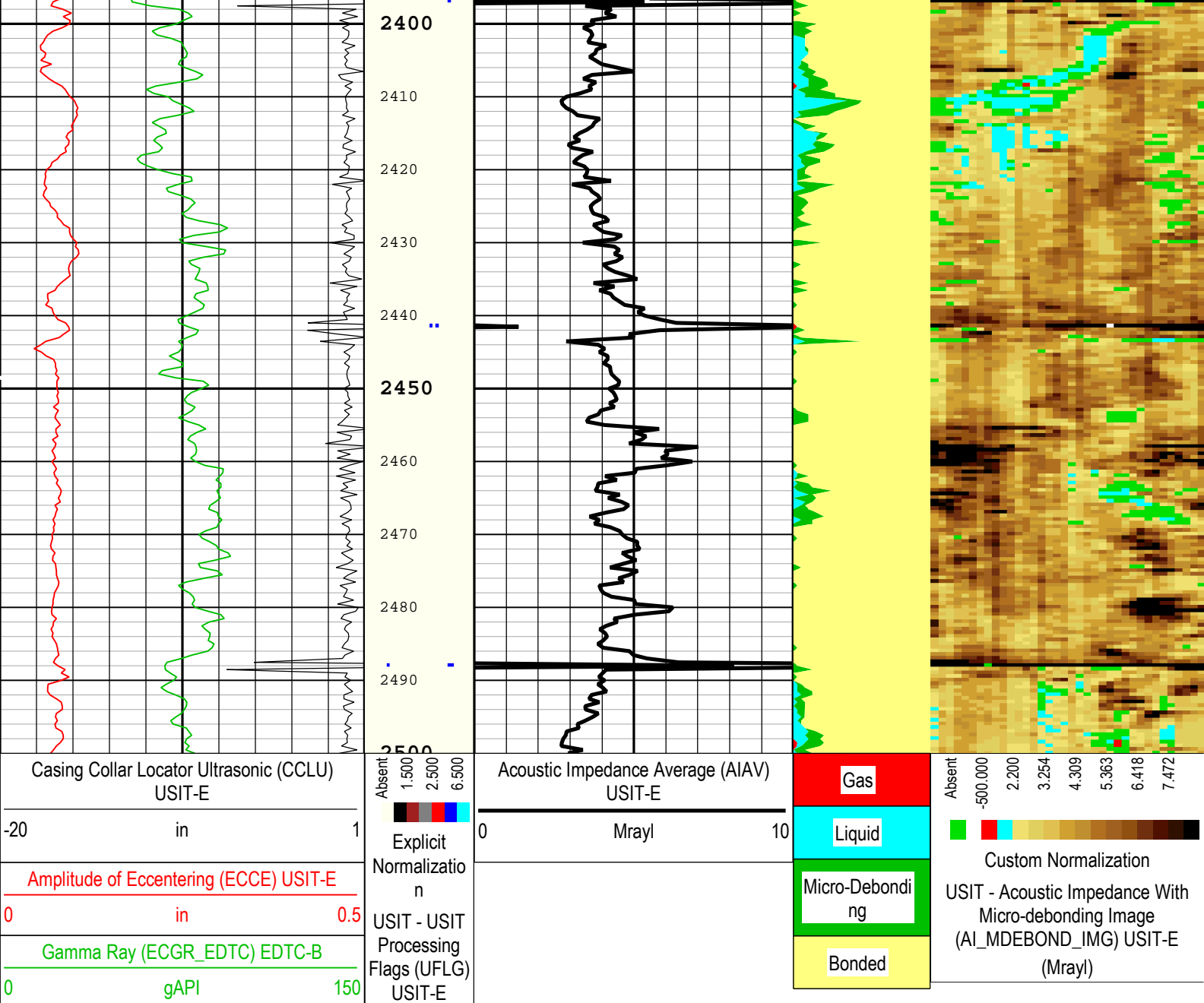
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[2]:Up	Up	1881.15 ft	2520.49 ft	08-Nov-2017 10:43:19 AM	08-Nov-2017 10:47:46 AM	ON	5.21 ft	Yes
All depths are referenced to toolstring zero									
Log	<div> <div>Company:Noble Energy Inc</div> <div>Well:Hullabaloo State Y21-746</div> <div>ONE: Log[2]:Up:S005</div> </div>								

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

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: 08-Nov-2017 13:26:41

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	17194.2	ft
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CENT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	8.4	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
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)	

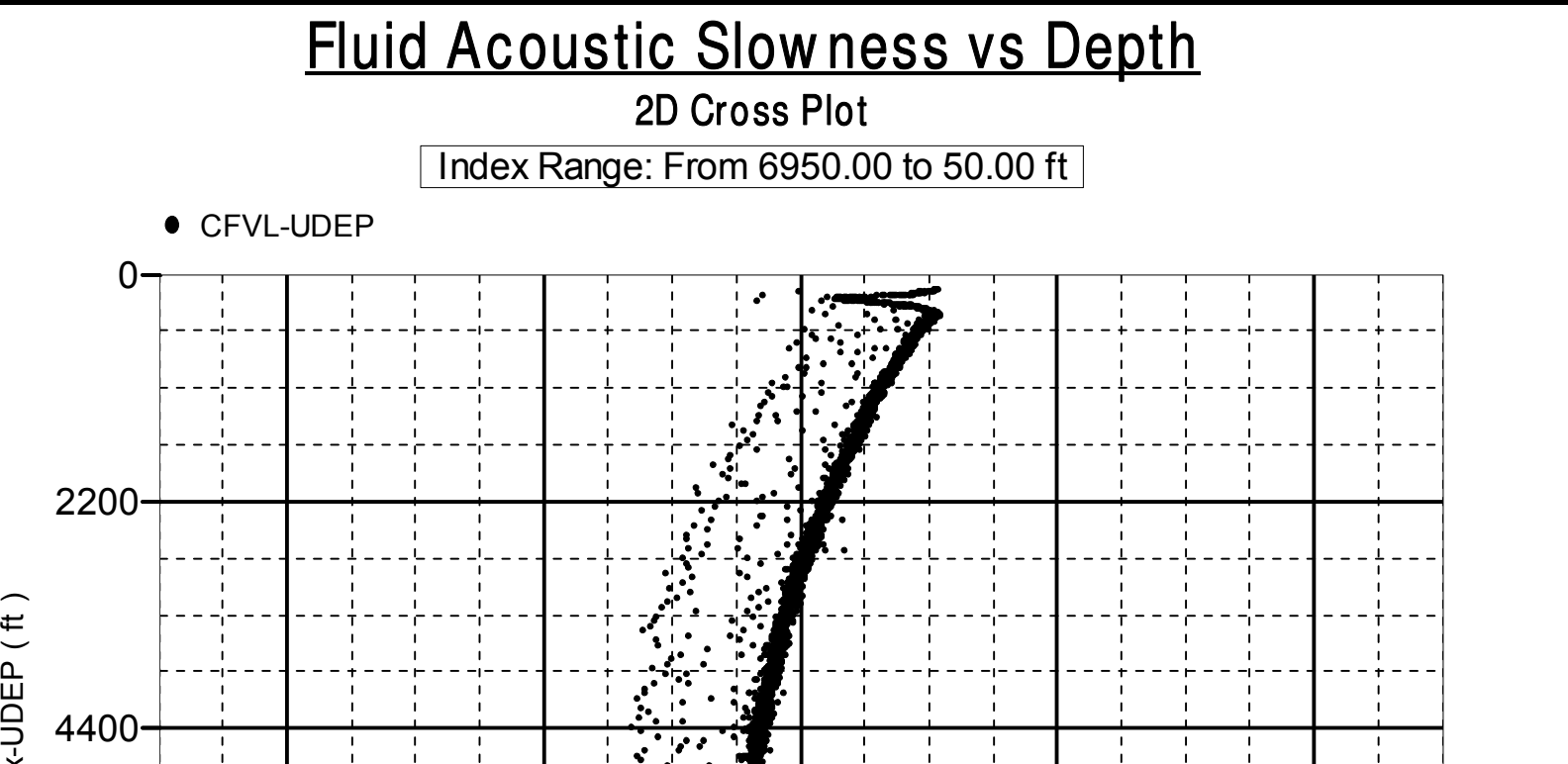
HEMA	Hematite Presence Flag	Borehole	No	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.09	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.61	Mrayl
USI_FVEL_SEL	USI Fluid 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

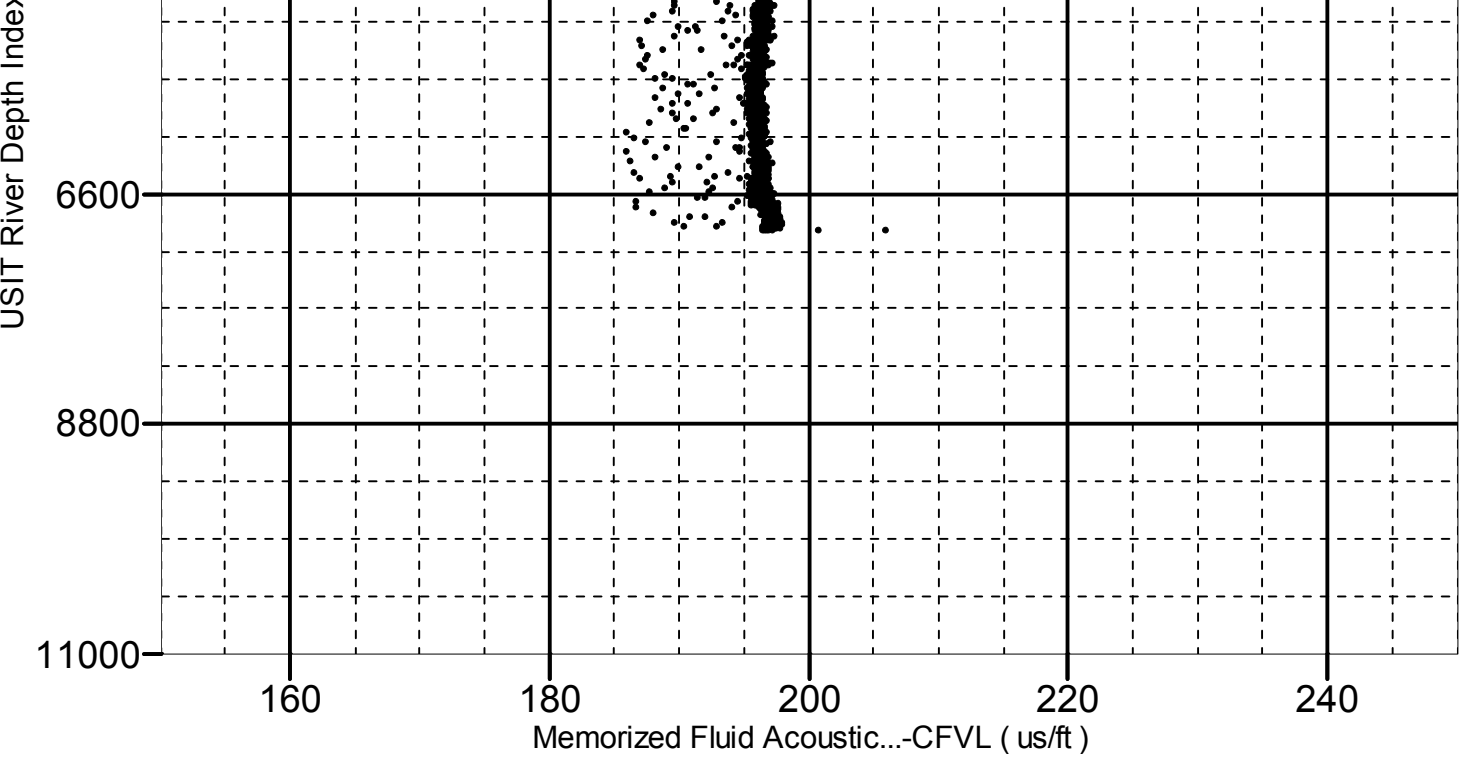
Depth Zone Parameters			
Parameter	Value	Start (ft)	Stop (ft)
BS	13.5	2000	2033
BS	8.5	2033	2500
All depth are actual.			

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
EMXV	EMEX Voltage	USIT-E	60	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:Hullabaloo State Y21-746 ONE: Log[4]:Up:S005
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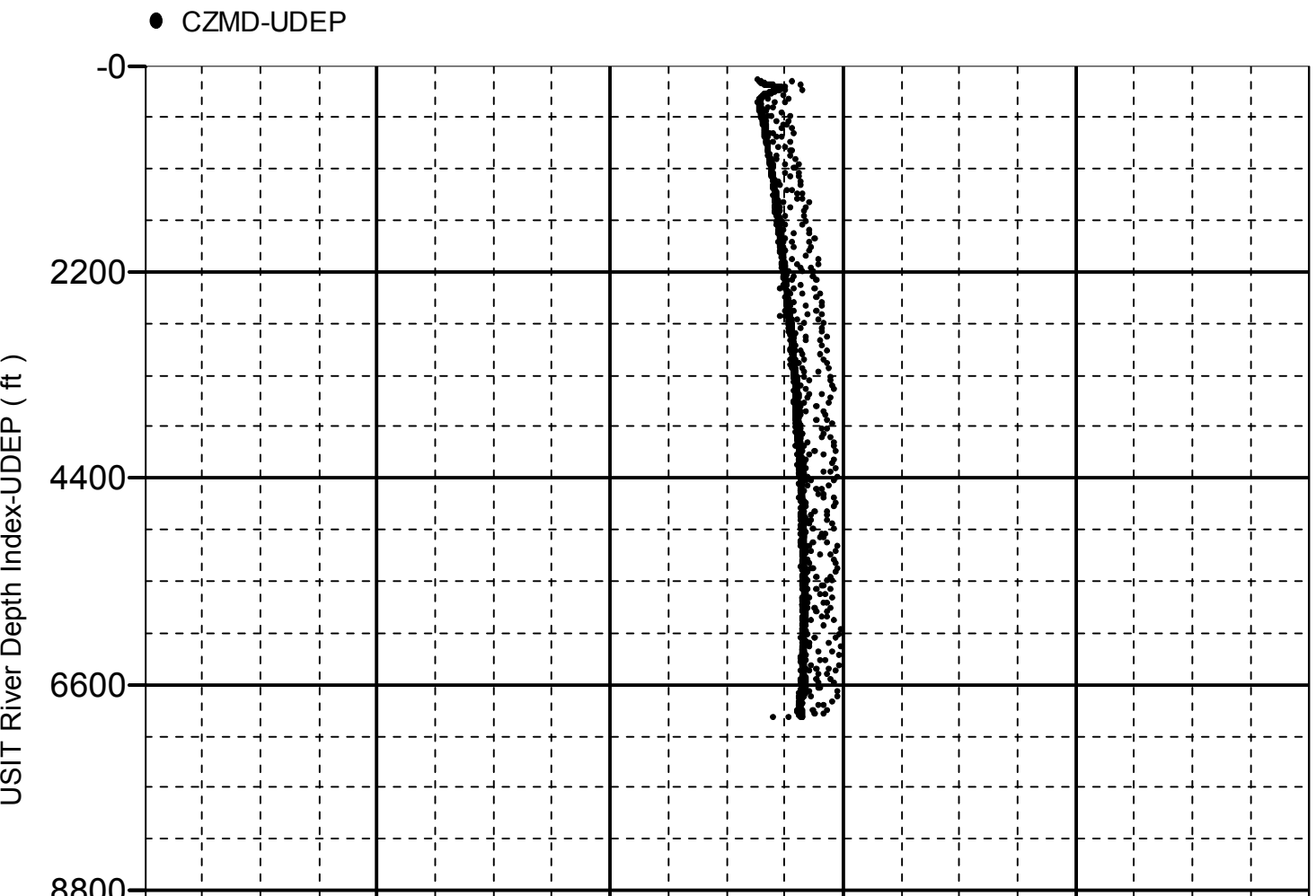


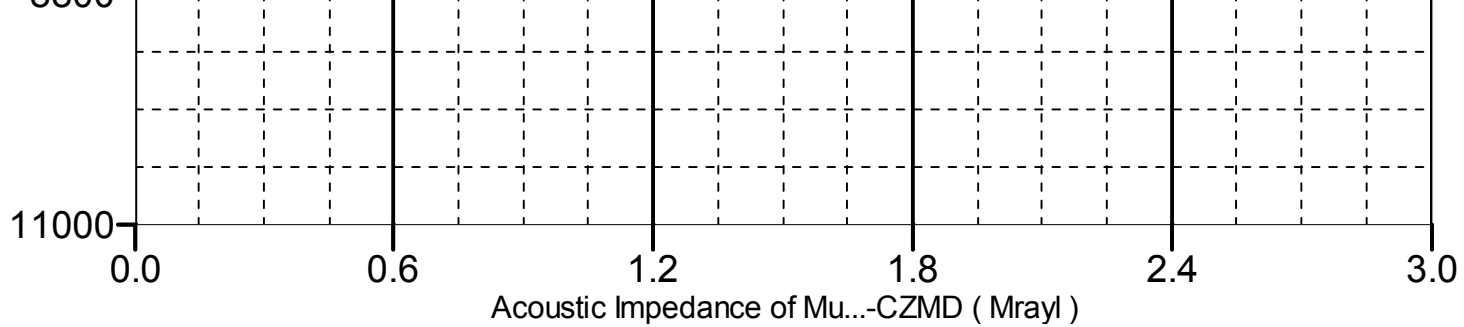


Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6950.00 to 50.00 ft





Company:	Noble Energy Inc	Schlumberger
Well:	Hullabaloo State Y21-746	
Field:	Wattenberg	
County:	Weld	
State:	Colorado	

UltraSonic Summary Print