

Company: Noble Energy Inc.

Well: Hurley H26-736

Field: Wattenberg

County: Weld State: Colorado

UltraSonic Summary Print

County:	Weld
Field:	Wattenberg
Location:	SENE Sec. 26, T3N, R65W
Well:	Hurley H26-736
Company:	Noble Energy Inc.
Location:	
SENE Sec. 26, T3N, R65W	Elev.: K.B. 4884.00 ft
SHL: 2234' FNL & 1042' FEL	G.L. 4854.00 ft
Lat/Long: 40.1974 / -104.62492	D.F. 4884.00 ft
Permanent Datum:	Ground Level
Log Measured From:	Kelly Bushing
Drilling Measured From:	Kelly Bushing
API Serial No.	Section: 26
05-123-46762	Township: 3N
	Range: 65W

Logging Date	06-Sep-2018
Run Number	1
Depth Driller	16075.00 ft
Schlumberger Depth	16075.00 ft
Bottom Log Interval	6670.00 ft
Top Log Interval	100.00 ft
Casing Fluid Type	Water
Salinity	
Density	8.4 lbm/gal
Fluid Level	0.00 ft
BIT/CASING/TUBING STRING	
Bit Size	8.50 in
From	1940.00 ft
To	16075.00 ft
Casing/Tubing Size	5.5 in
Weight	20 lbm/ft
Grade	P110
From	0.00 ft
To	16064.30 ft
Max Recorded Temperatures	205 degF
Logger on Bottom	06-Sep-2018
Unit Number	9108
Recorded By	Ali AlRamadhan
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.

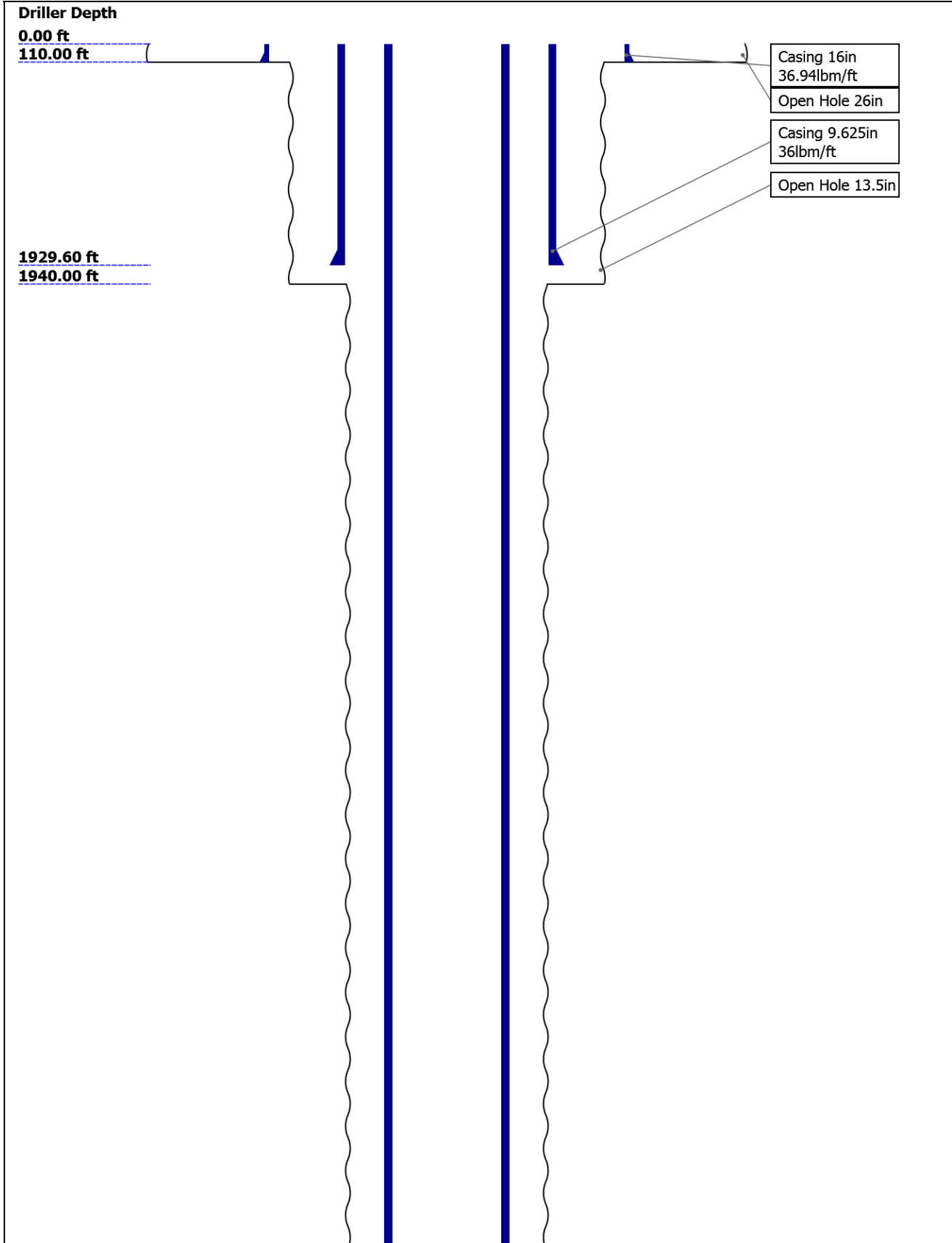
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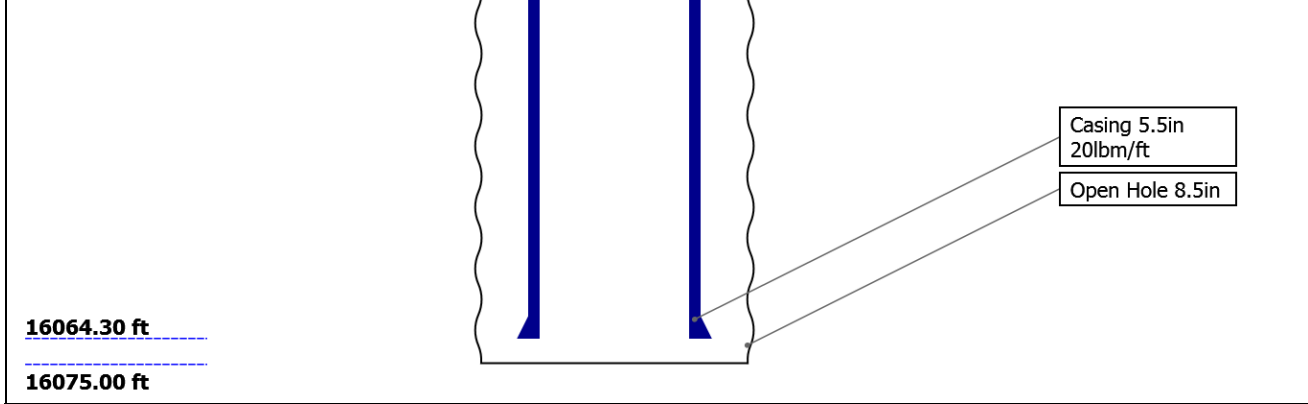
- 1. Header
- 2. Disclaimer
- 3. Contents
- 4. Well Sketch
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- 6. Remarks and Equipment Summary
- 7. Depth Summary
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- 9. 1 2500 PSI Main Pass
 - 9.1 Integration Summary
 - 9.2 Software Version
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- 10. 1 0 PSI Repeat Pass
 - 10.1 Integration Summary

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- 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





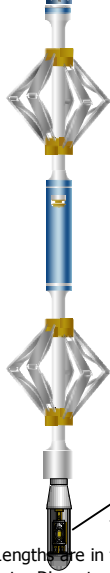
Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	0	110	1940			
Top Logger (ft)	0	110	1940			
Bottom Driller (ft)	110	1940	16075			
Bottom Logger (ft)	110	1940	16075			
Casing						
Size (in)	16	9.625	5.5			
Weight (lbm/ft)	36.94	36	20			
Inner Diameter (in)	15.572	8.921	4.778			
Grade	N/A	K55	P110			
Top Driller (ft)	0	0	0			
Top Logger (ft)	0	0	0			
Bottom Driller (ft)	110	1929.6	16064.3			
Bottom Logger (ft)	110	1929.6	16064.3			

Remarks and Equipment Summary

1: Toolstring				1: Remarks	
<div><div><div>Equip nameLength</div><div>LEH-QT29.54</div><div>LEH-QT</div></div><div><div>EDTC-B:826.06</div><div>473M</div><div>EDTH-B:8624</div><div>EDTG-B:77434</div><div>EDTC-B:8473M</div></div><div><div>AH-184[2]:5941</div><div>19.56</div></div><div><div>AH-184[1]:5965</div><div>17.56</div></div><div><div>USIT-E:900</div><div>15.56</div></div><div><div>ECH-MFA:1818</div><div>USAC-A:900</div><div>USAC-A:10</div></div></div> <div><div><div>CTEM22.56</div><div>ACCZ0.00</div><div>HV0.00</div><div>Gamma20.69</div><div>Ray</div><div>TelStatu s19.56</div></div></div>	Thank you for choosing Schlumberger!				
	Toolstring run as per tool sketch and client logging program.				
	5" gemcos run on EDTC and USAC for centralization.				
	This is the first log in well.				
	Main pass logged at 2500 PSI. Repeat pass logged at 0 PSI.				
	BHT: 205 degF				

USIS-A:19
94
USSC-B:92
5
USRS-AB:
857
USI-SENS
OR:888
USI-TX



Depth Summary

1

Depth Measuring Device

Type	IDW-B
Serial Number	
Calibration Date	
Calibrator Serial Number	
Calibration Cable Type	
Wheel Correction 1	0
Wheel Correction 2	0

Tension Device

Type	CMTD-B/A
Serial Number	
Calibration Date	
Calibrator Serial Number	
Number of Calibration Points	0

Logging Cable

Type	7-46NT-XS
Serial Number	
Length	24000.00 ft
Conveyance Type	Wireline
Rig Type	Land

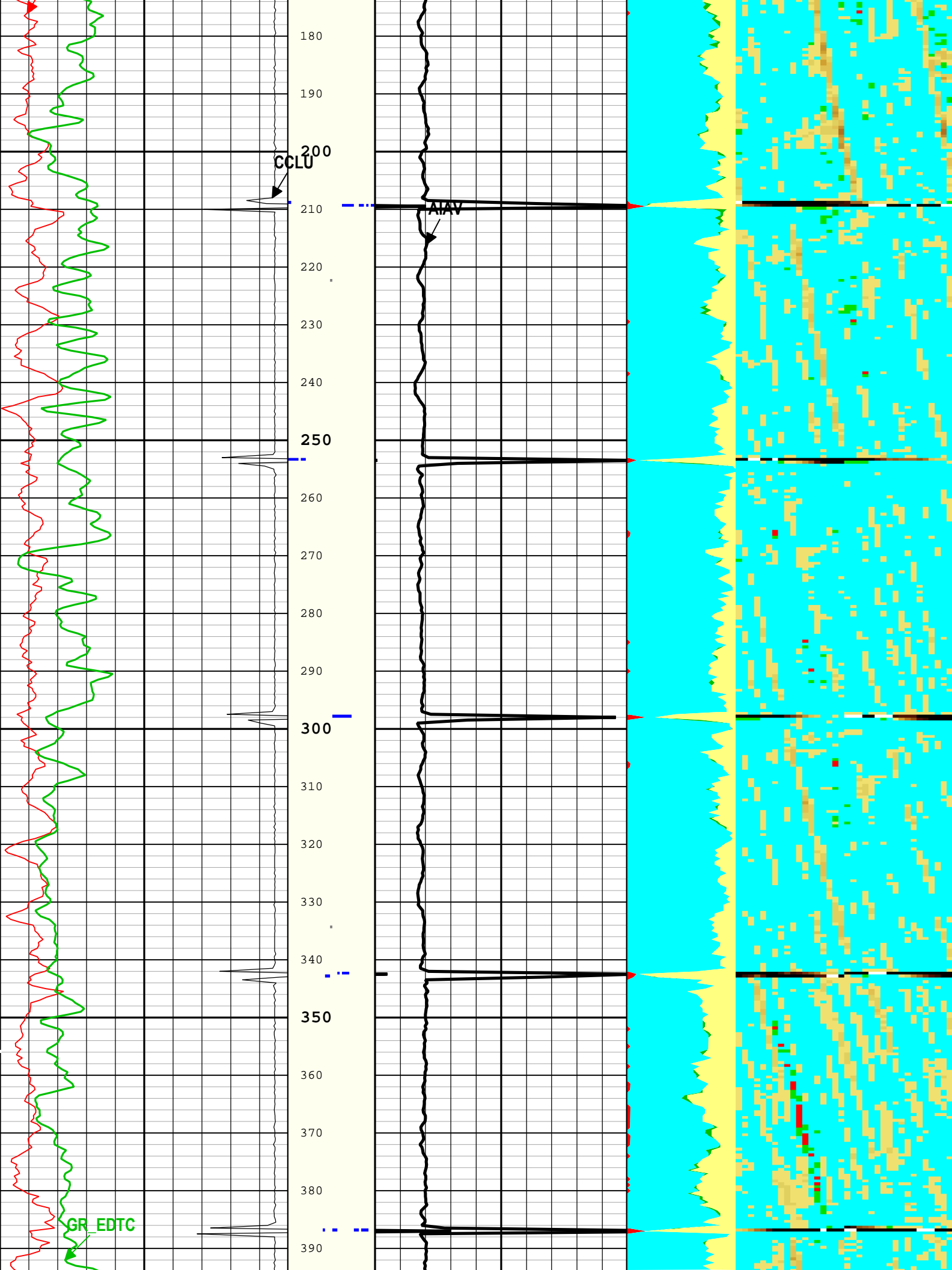
1:Depth Control Parameters

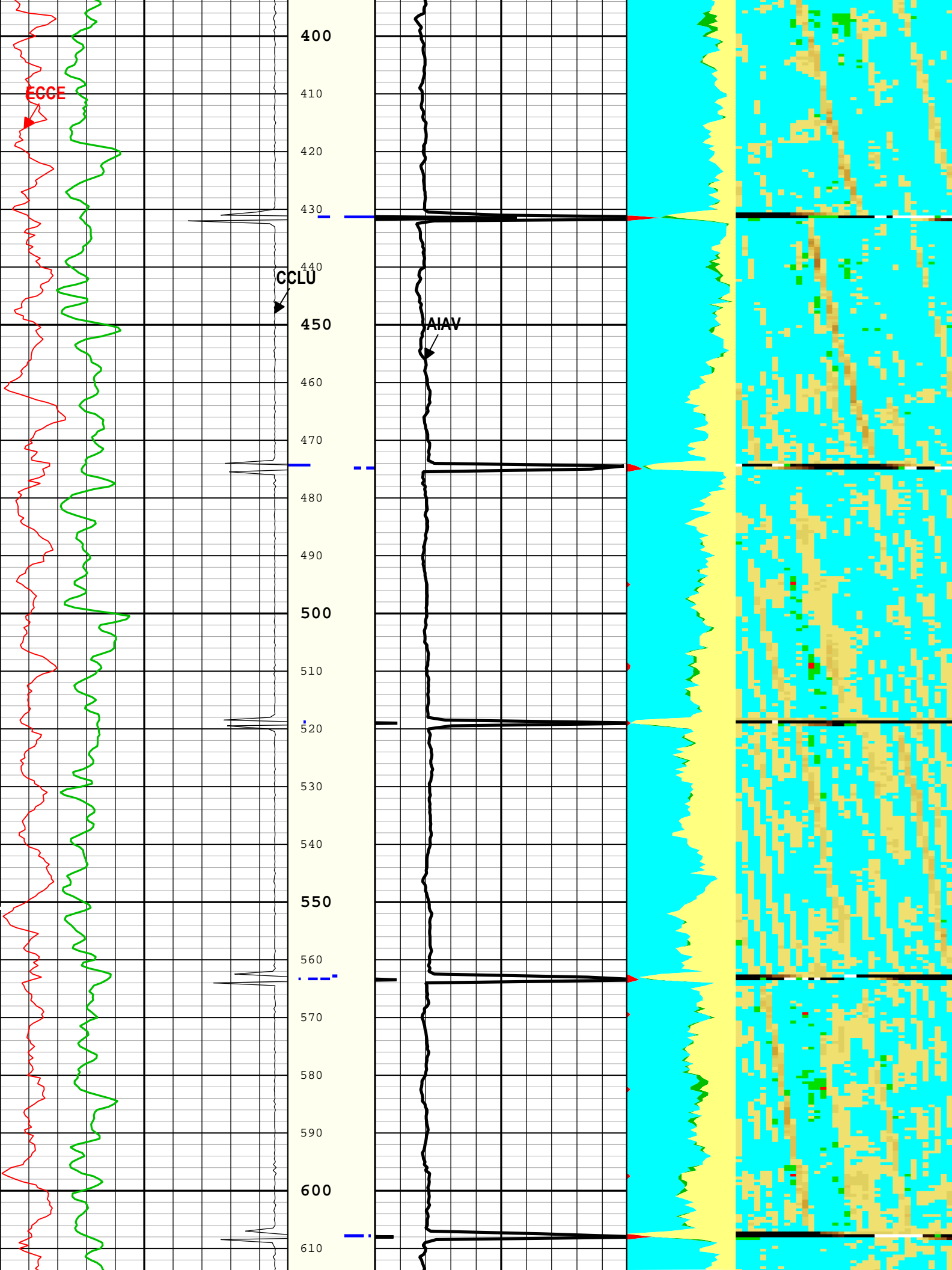
Log Sequence	First Log In the Well
Rig Up Length At Surface	
Rig Up Length At Bottom	
Rig Up Length Correction	
Stretch Correction	
Tool Zero Check At Surface	

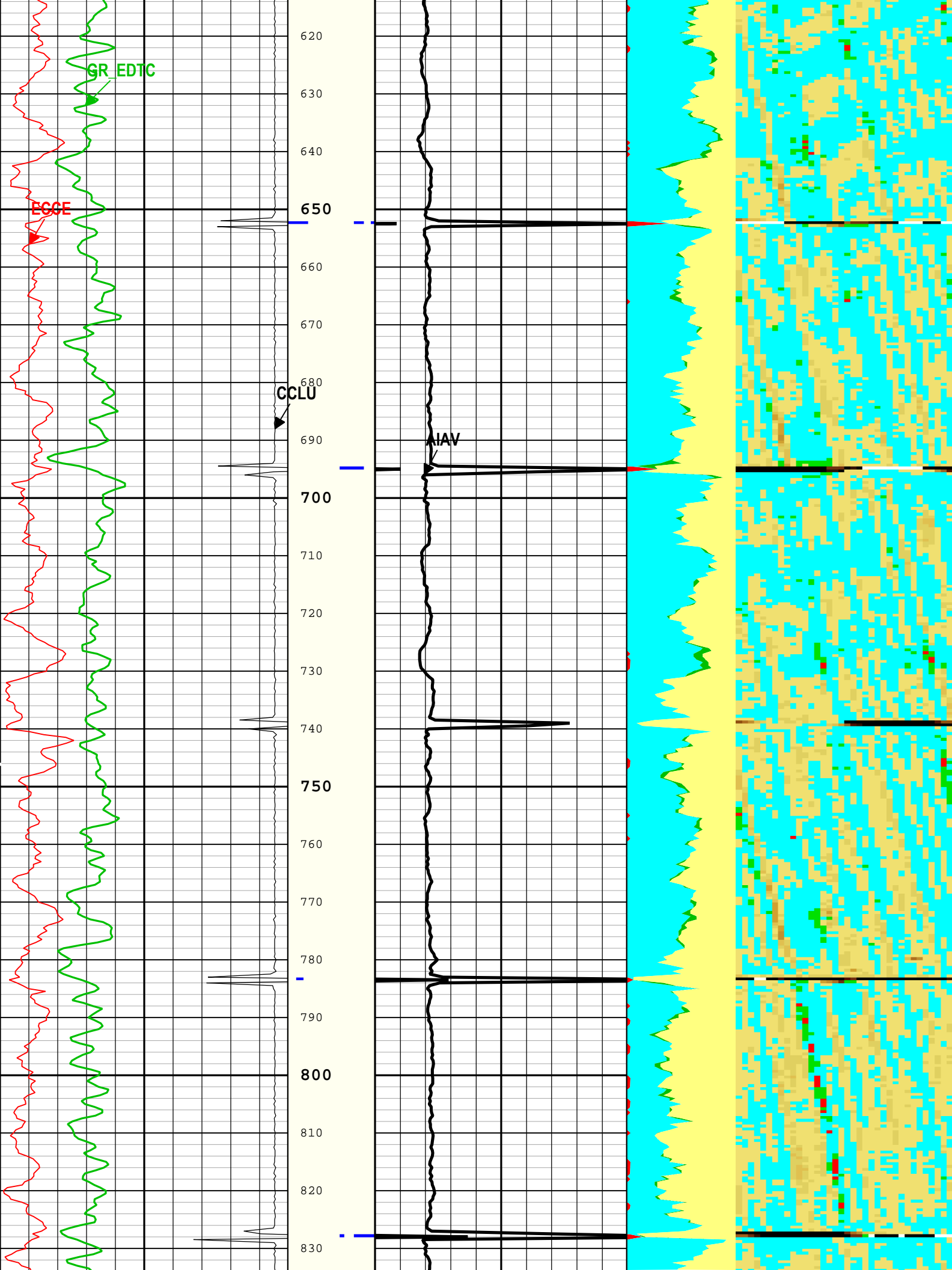
Depth Control Remarks

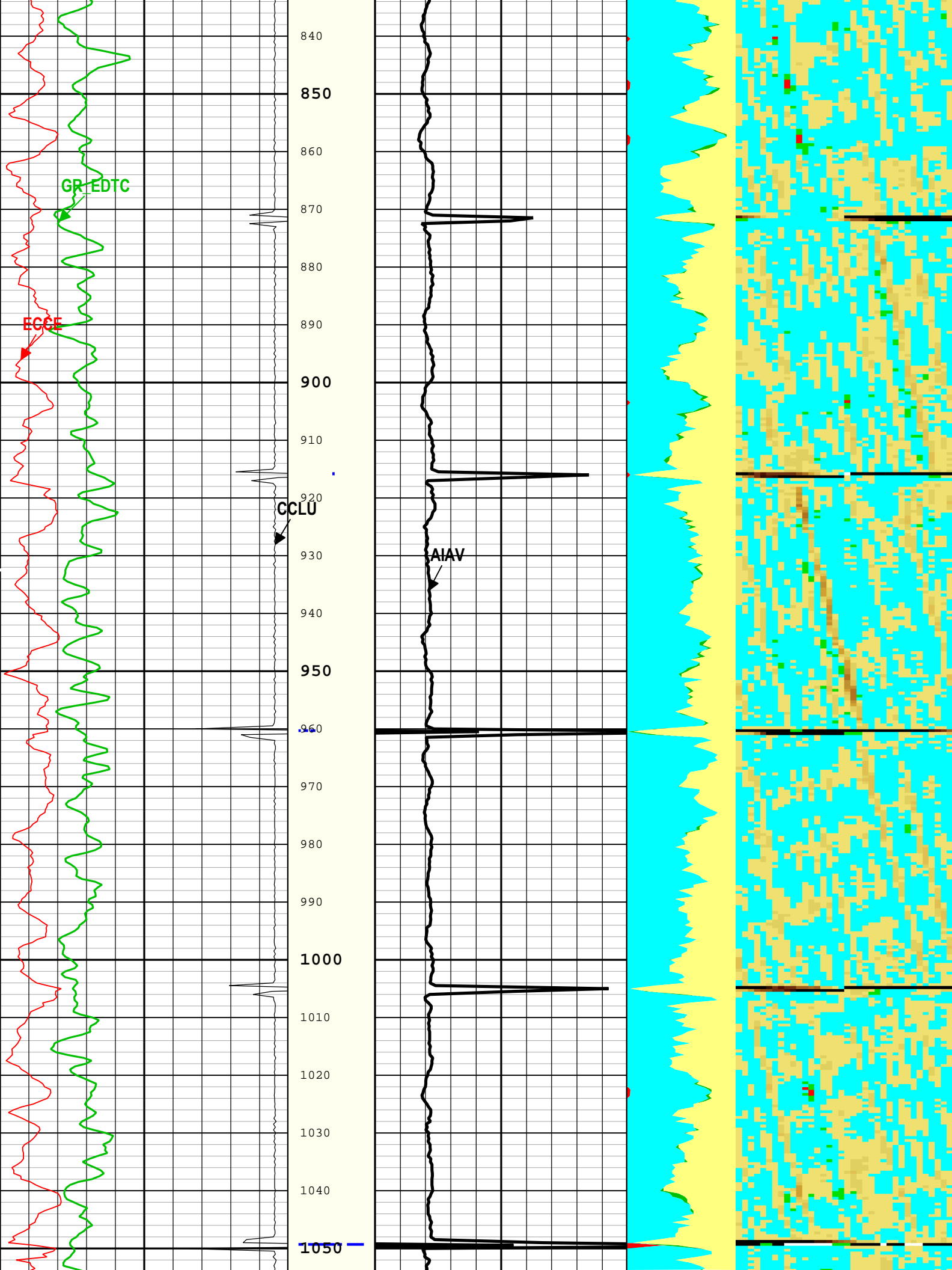
All Schlumberger depth control policies followed.
IDW used as primary depth reference.
Z-Chart used as secondary depth reference.
Log depth shifted to marker joint at 6368.1 ft.

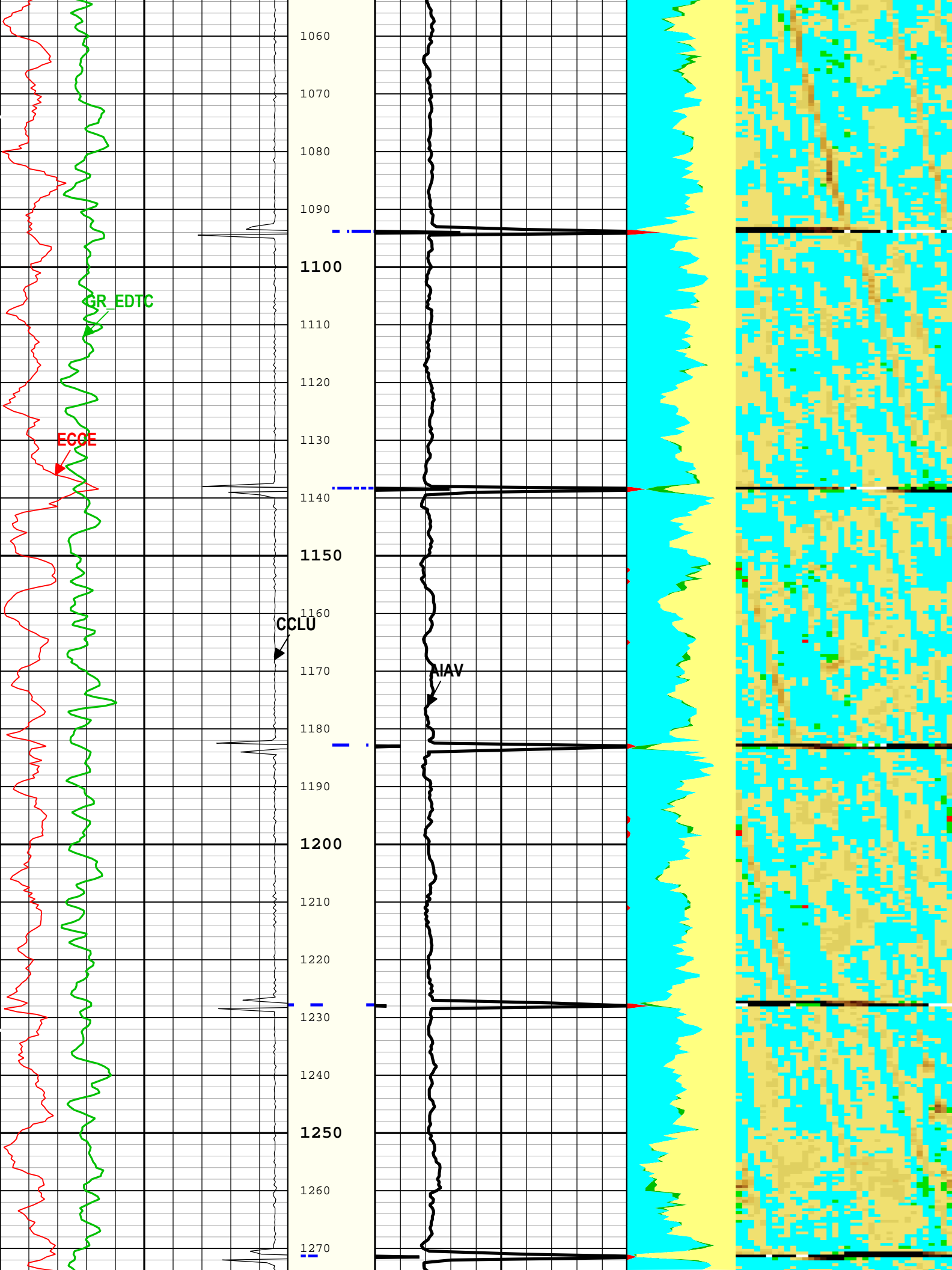
USIT - Fluid Properties Measurement

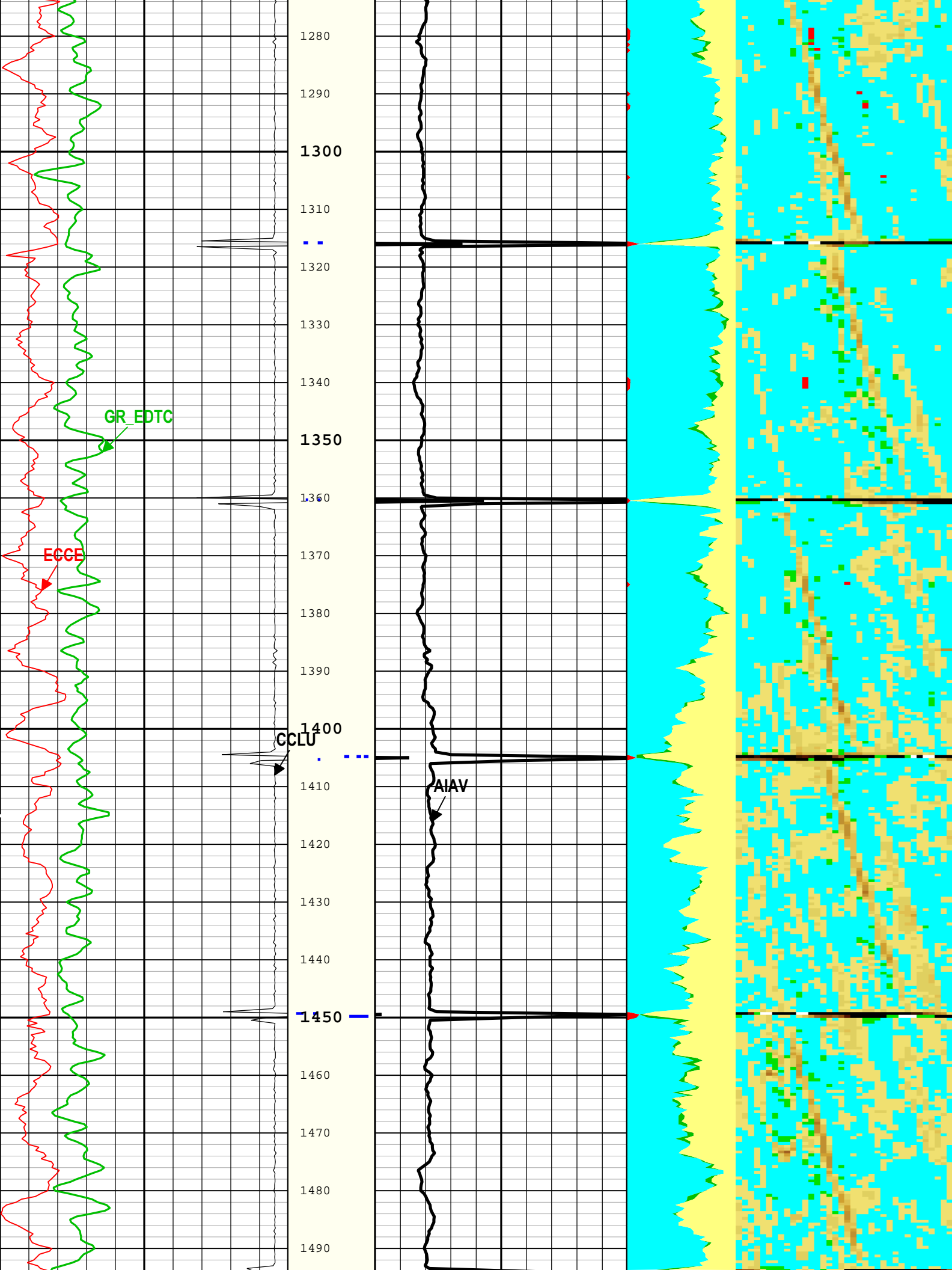


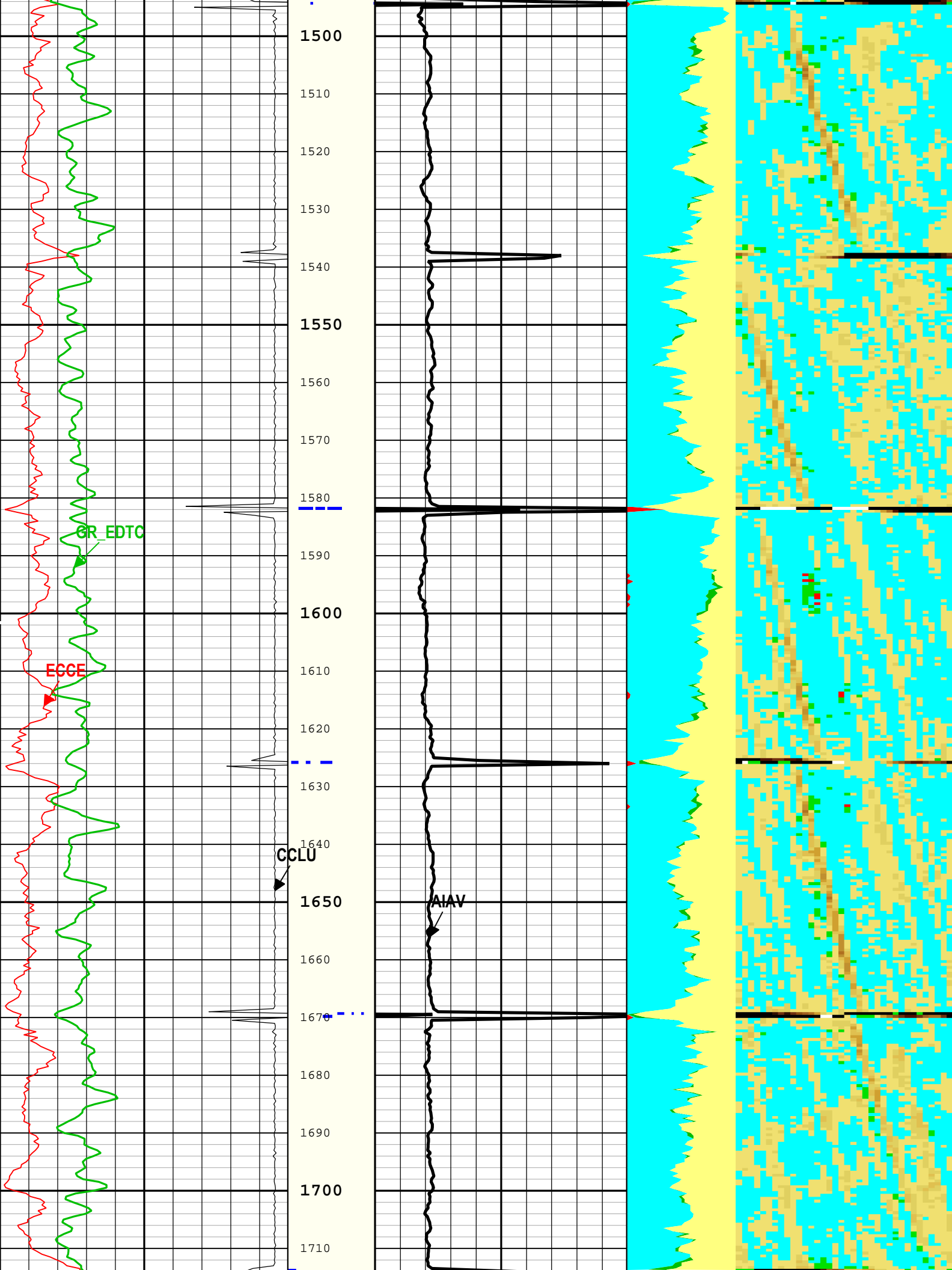


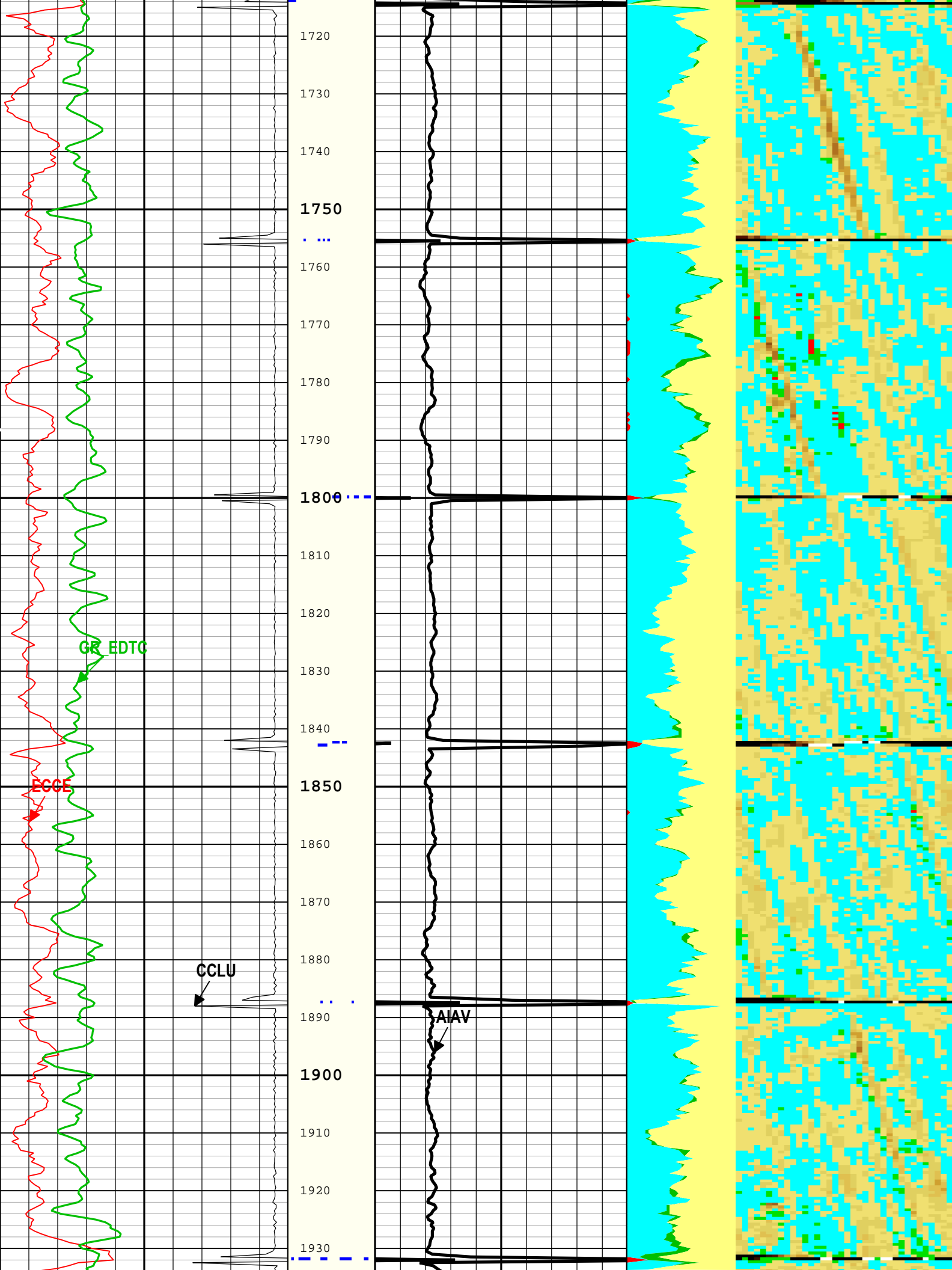


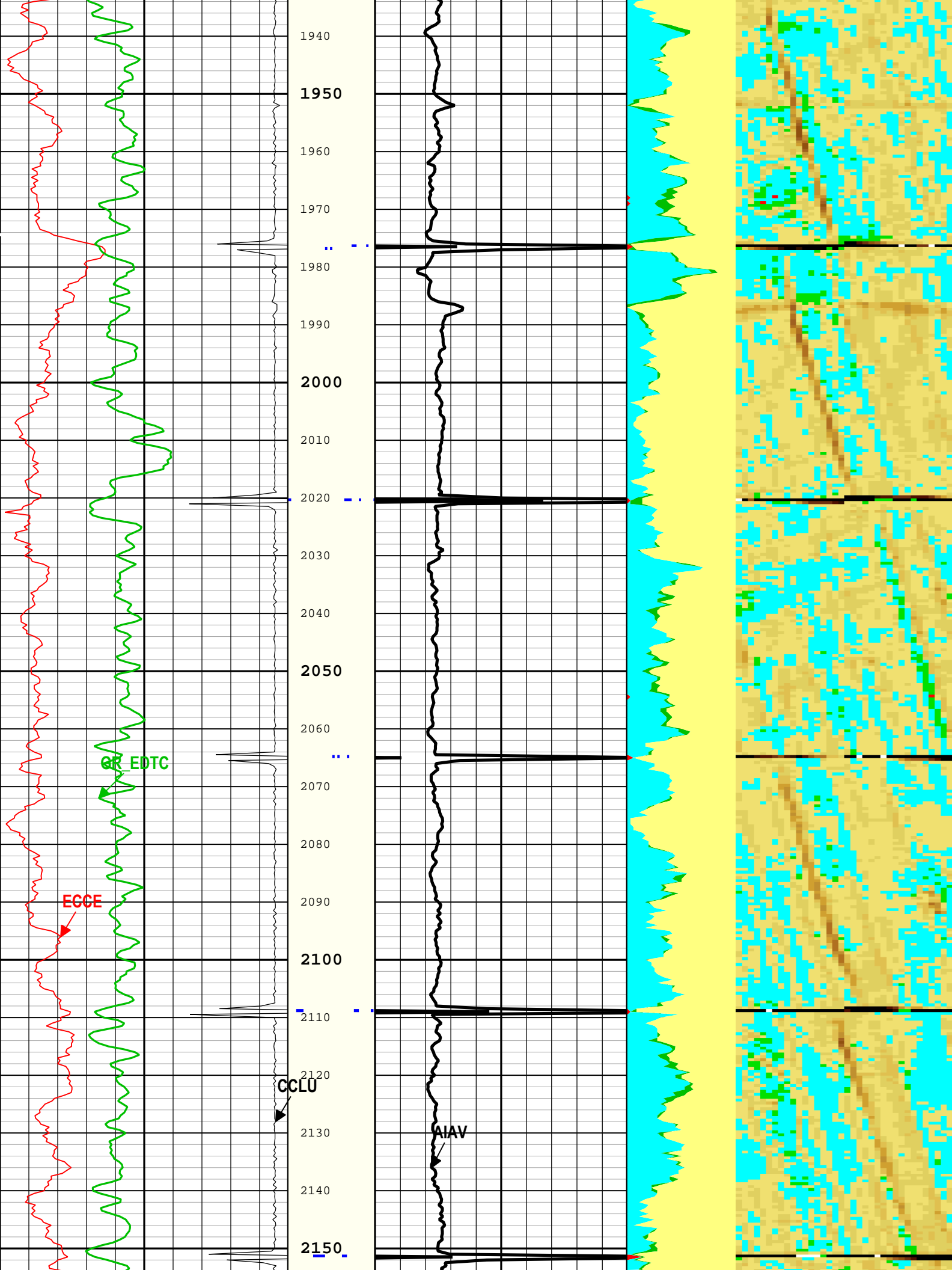


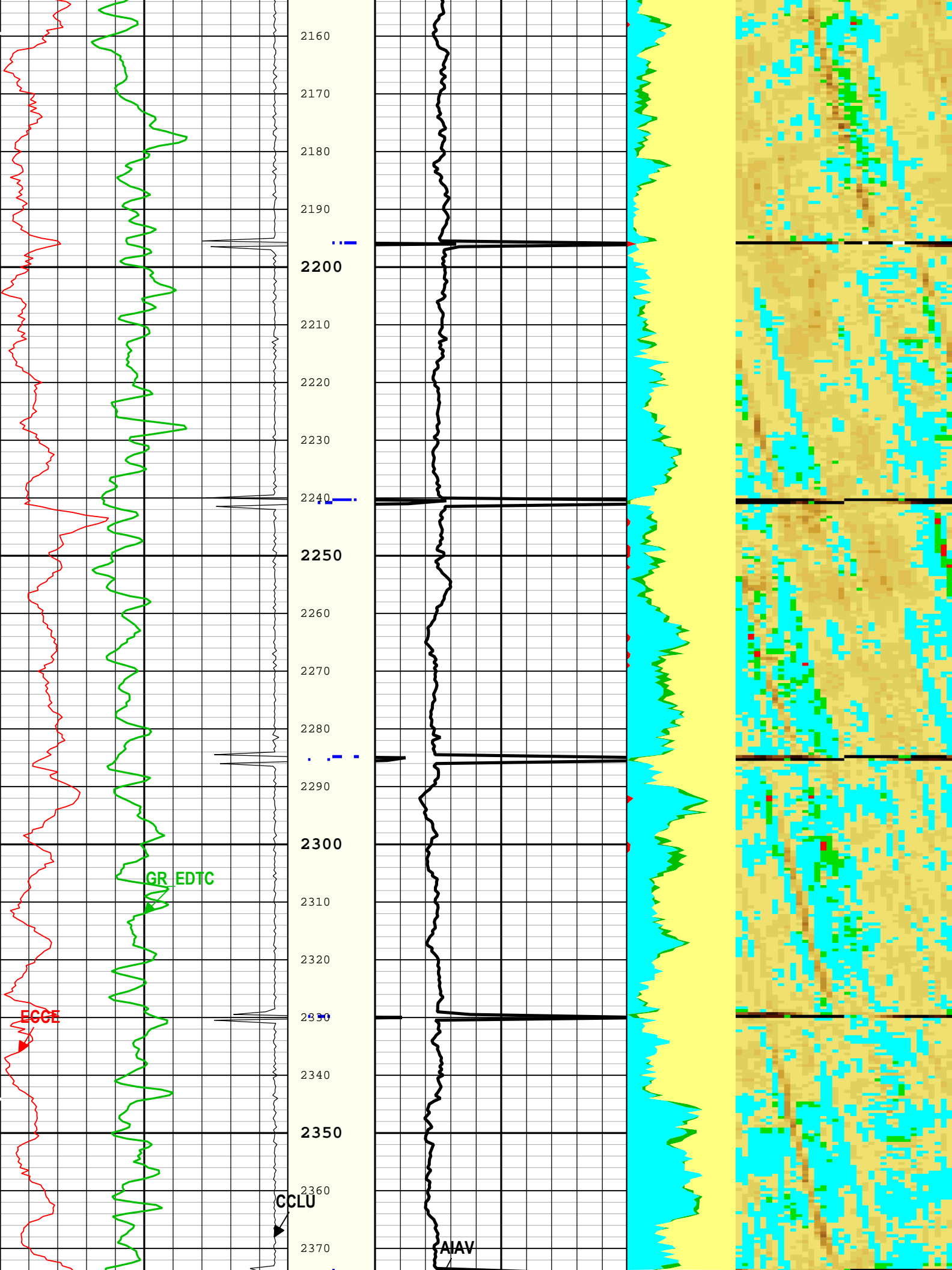


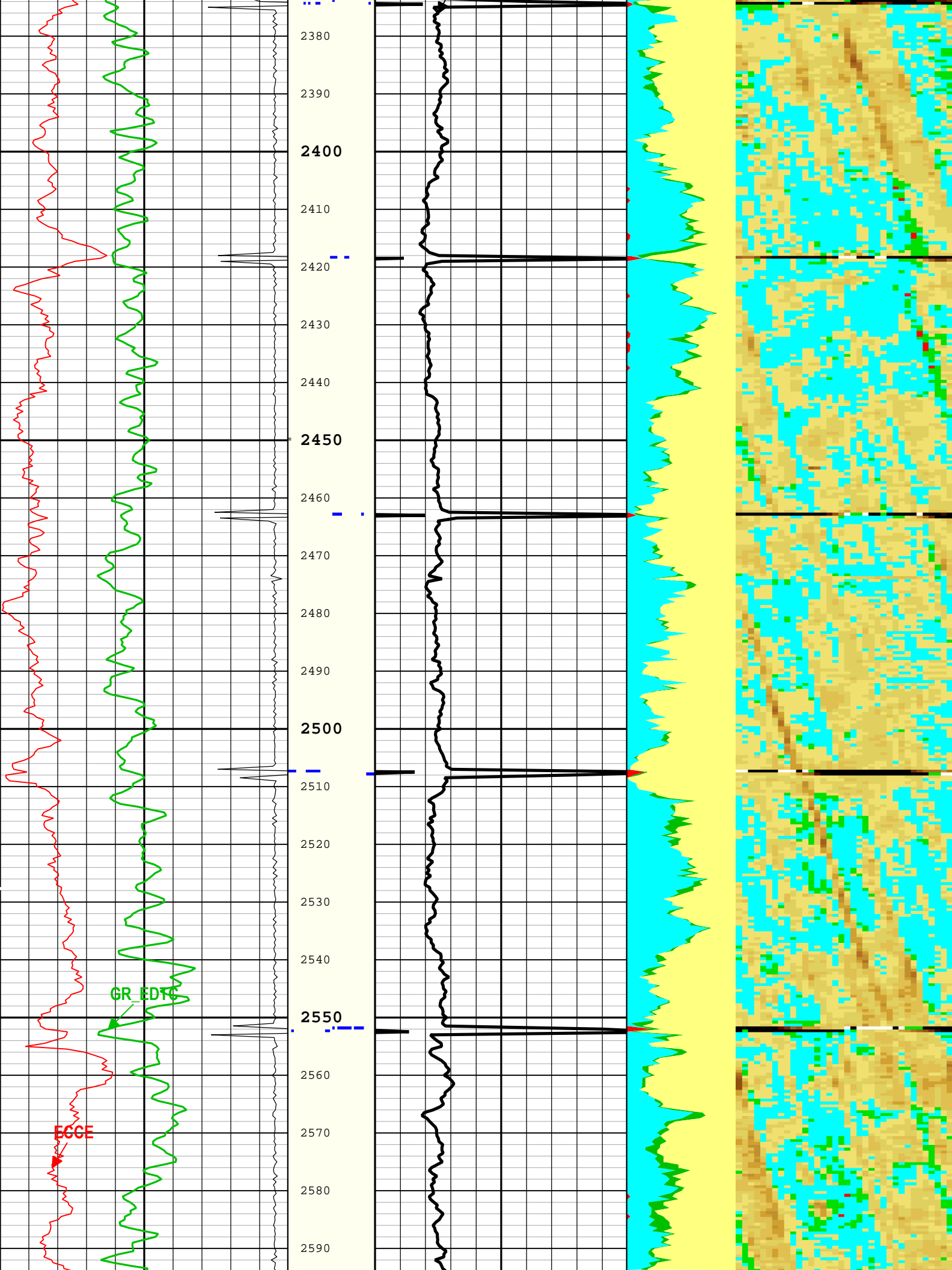


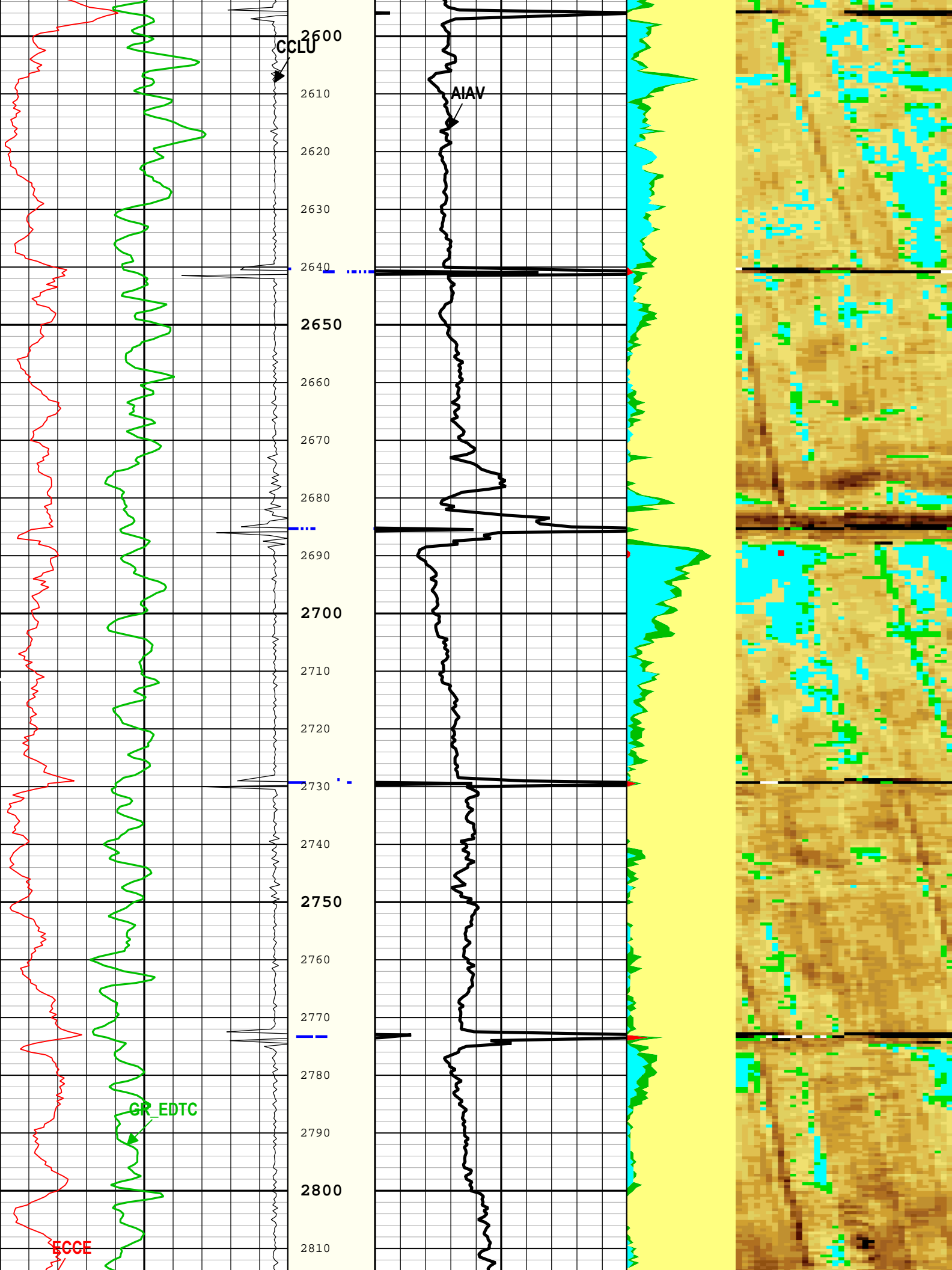


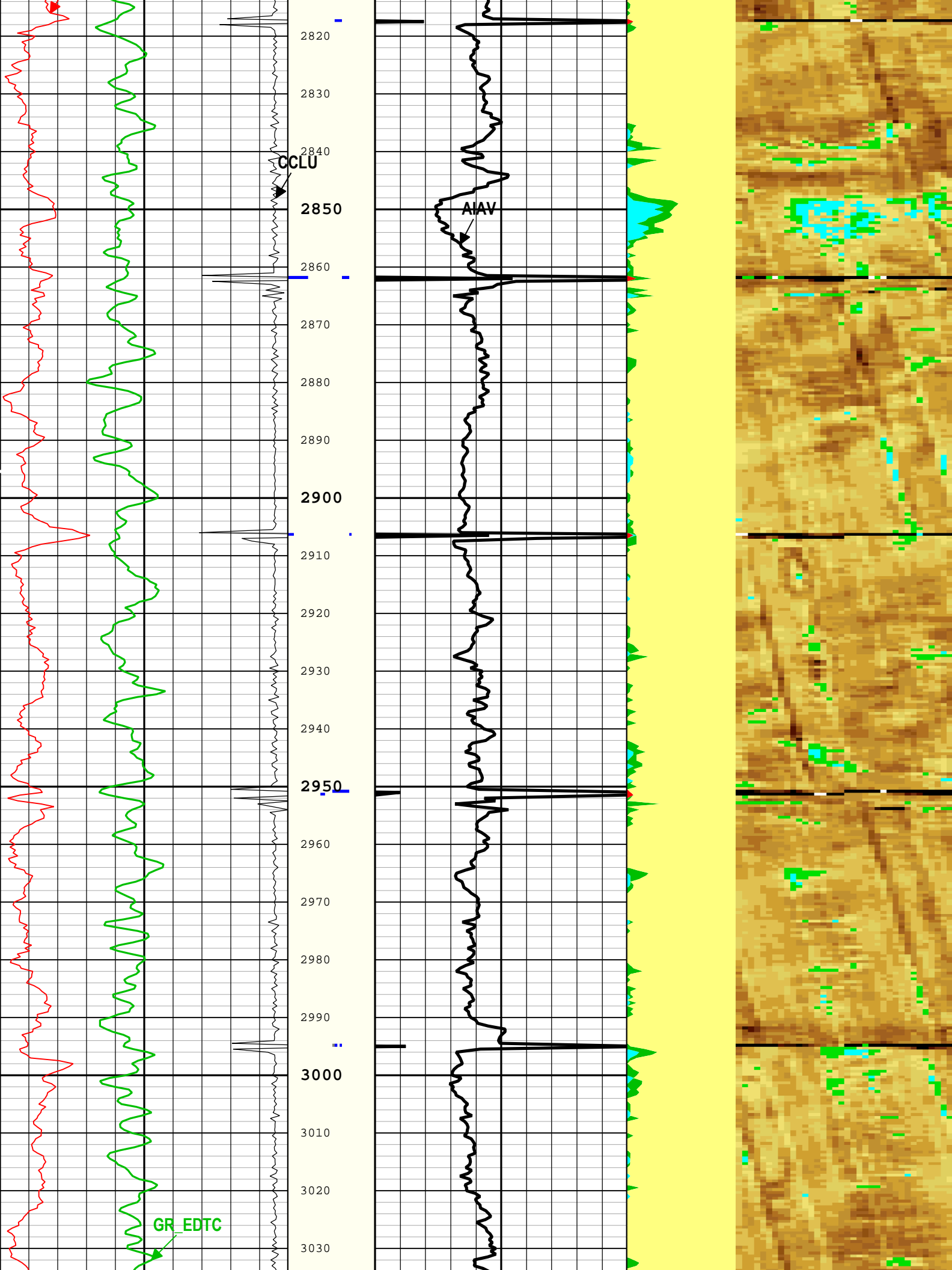


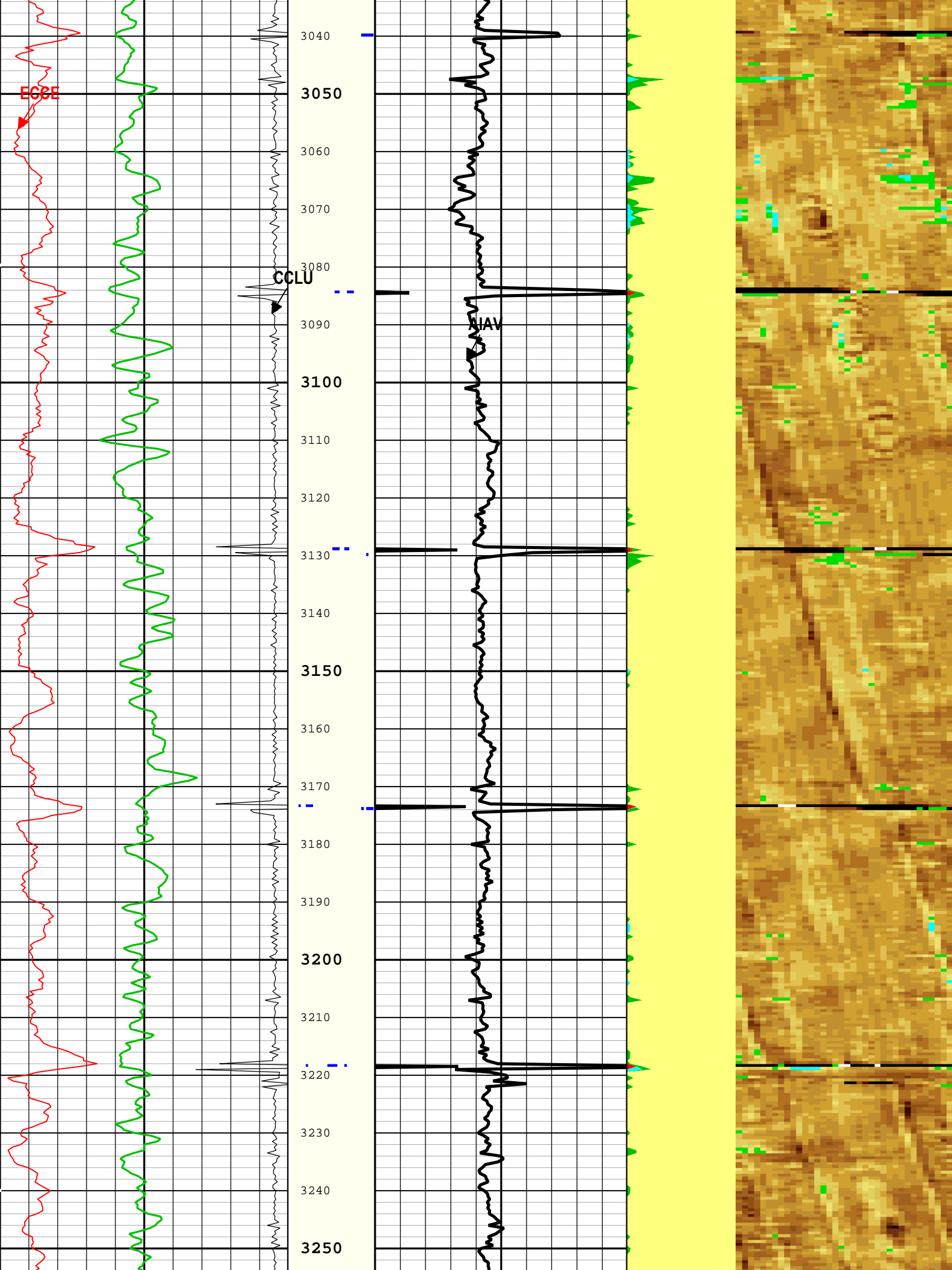


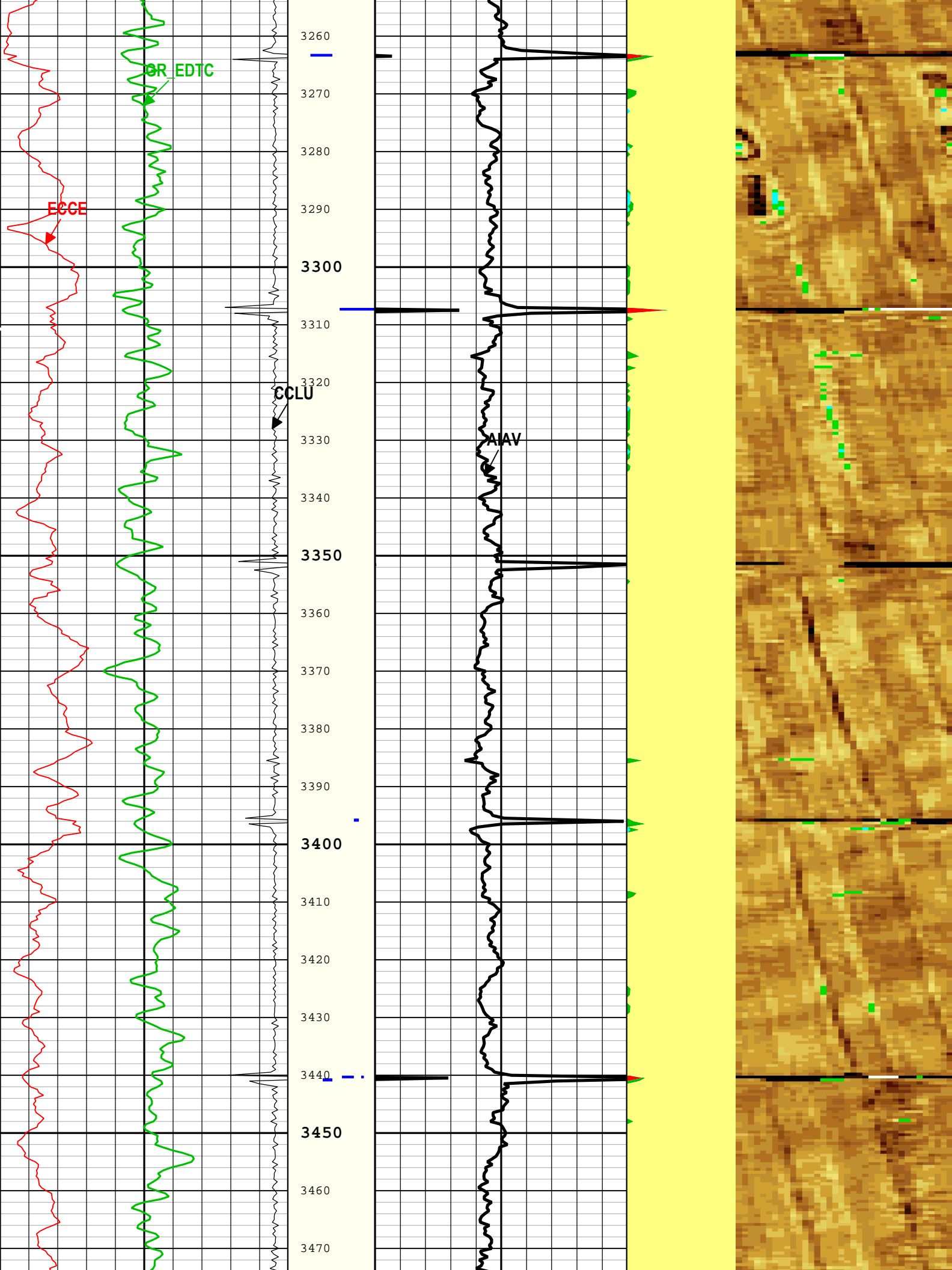


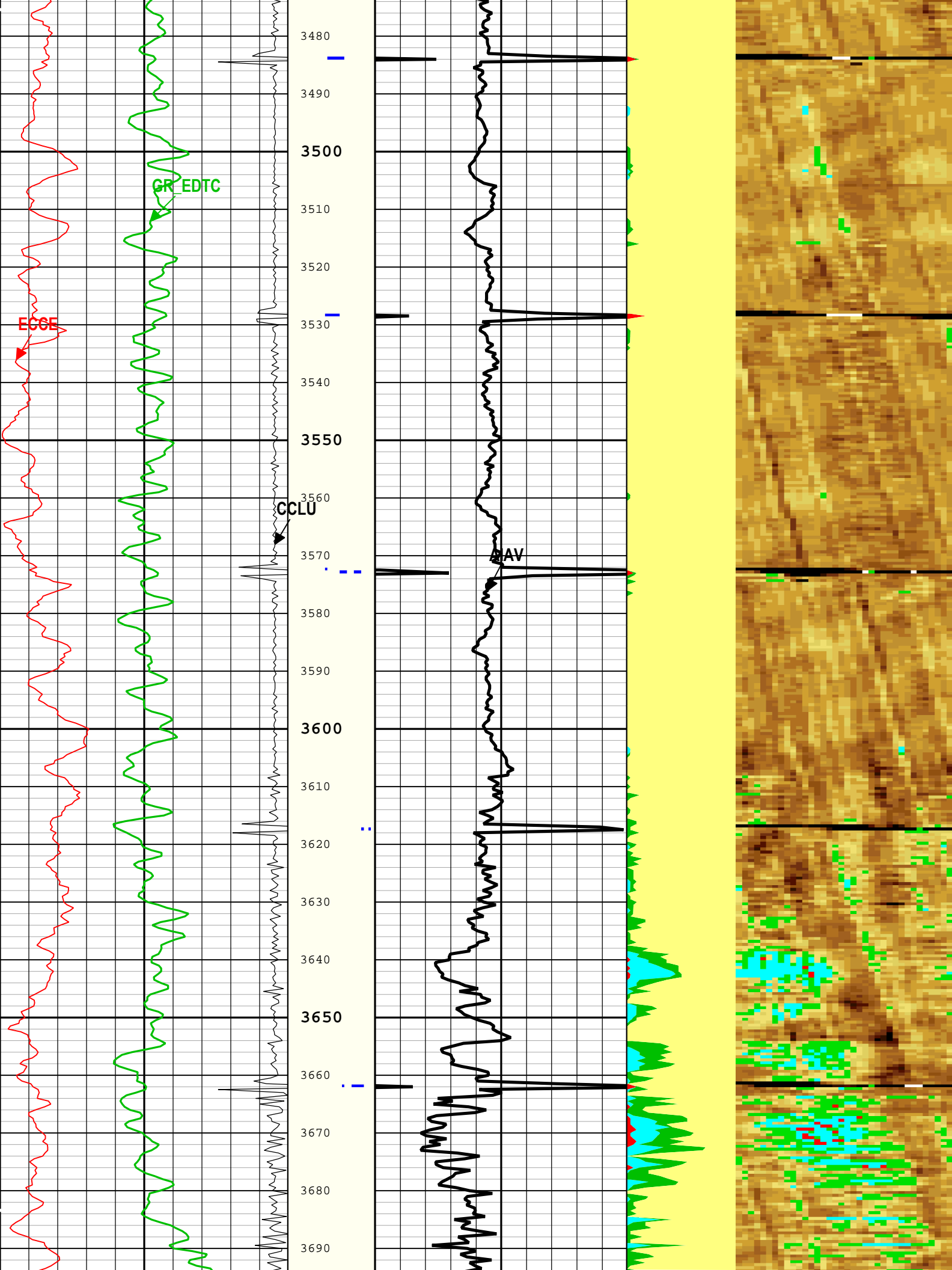


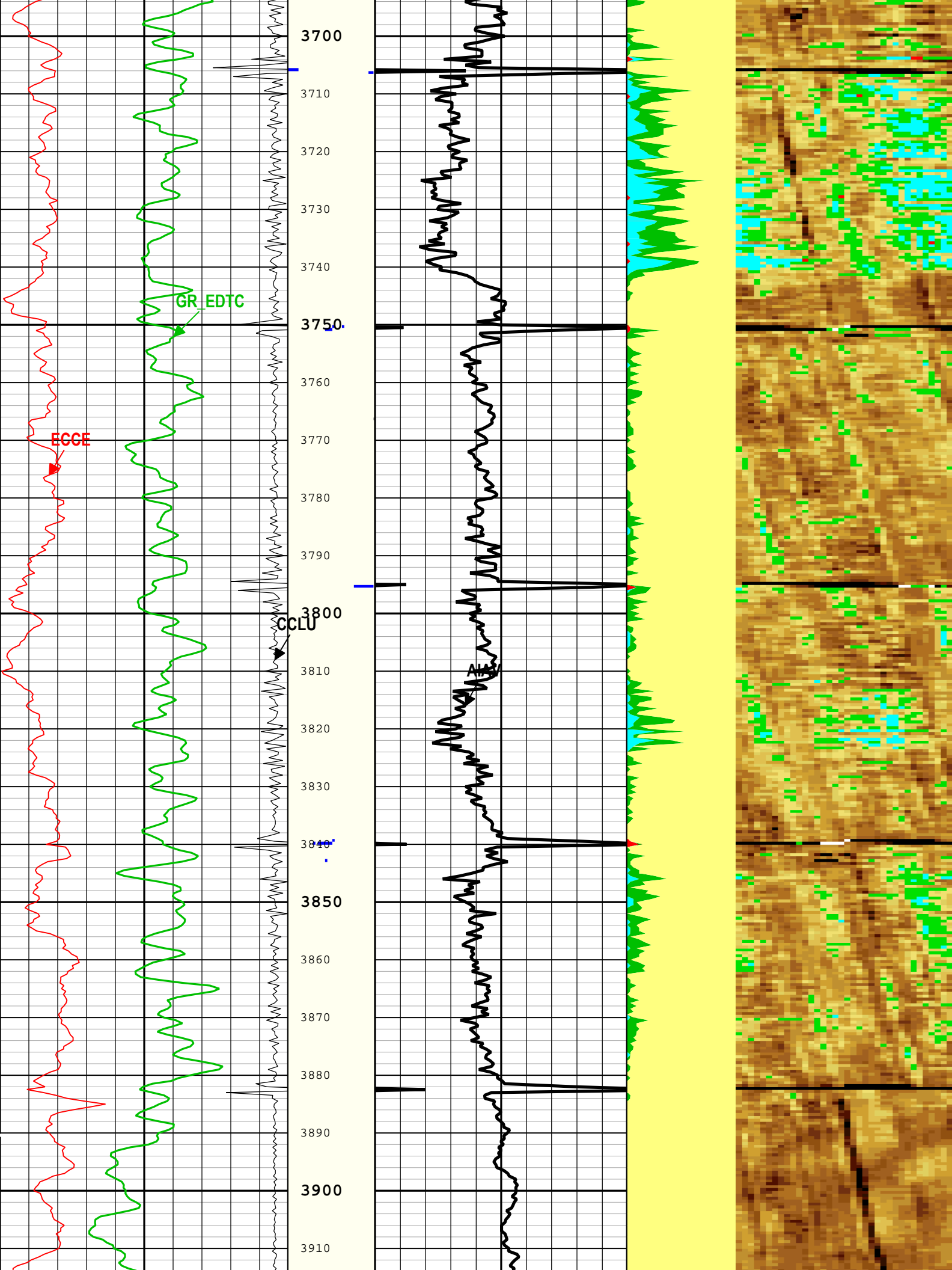


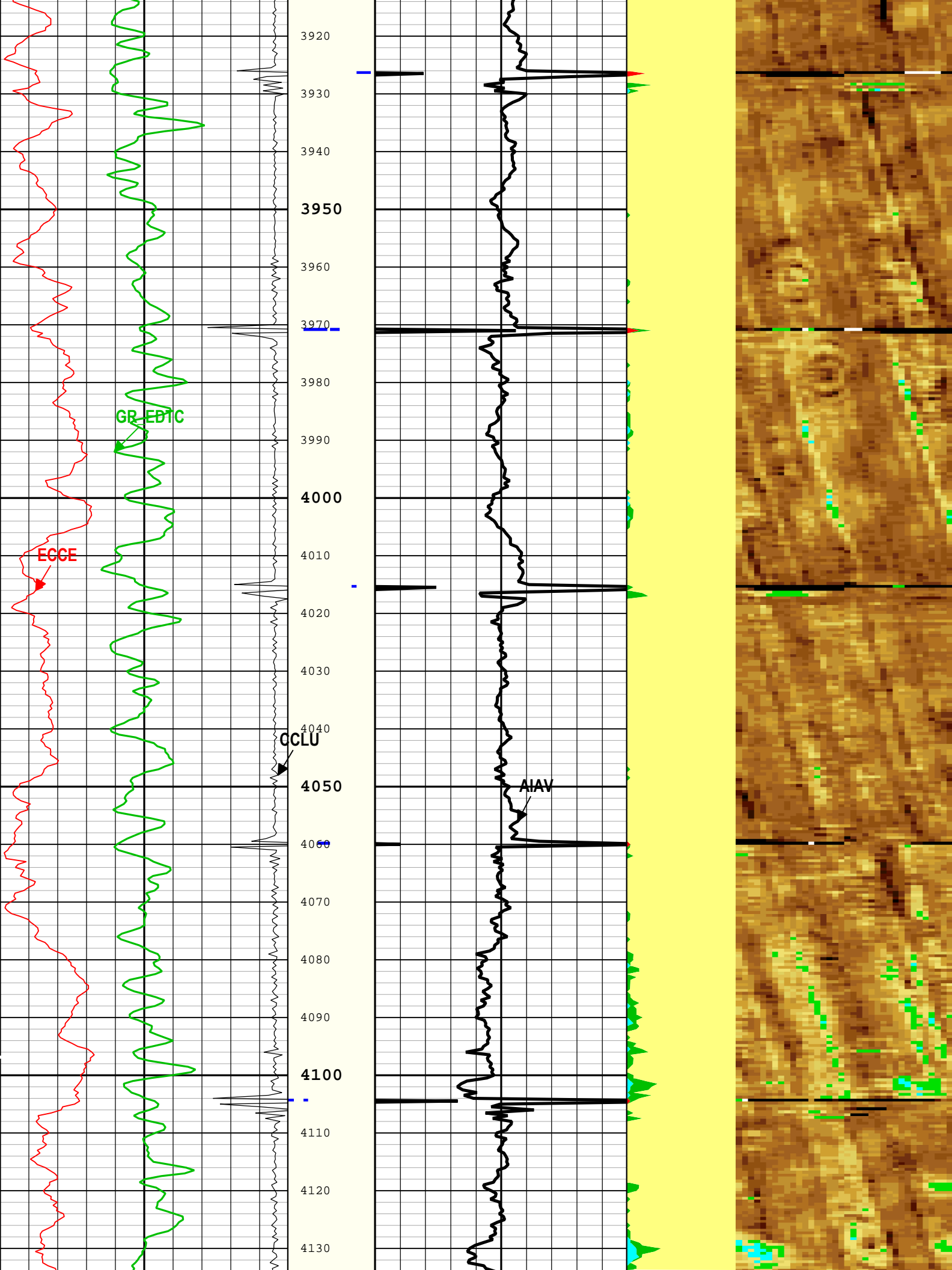


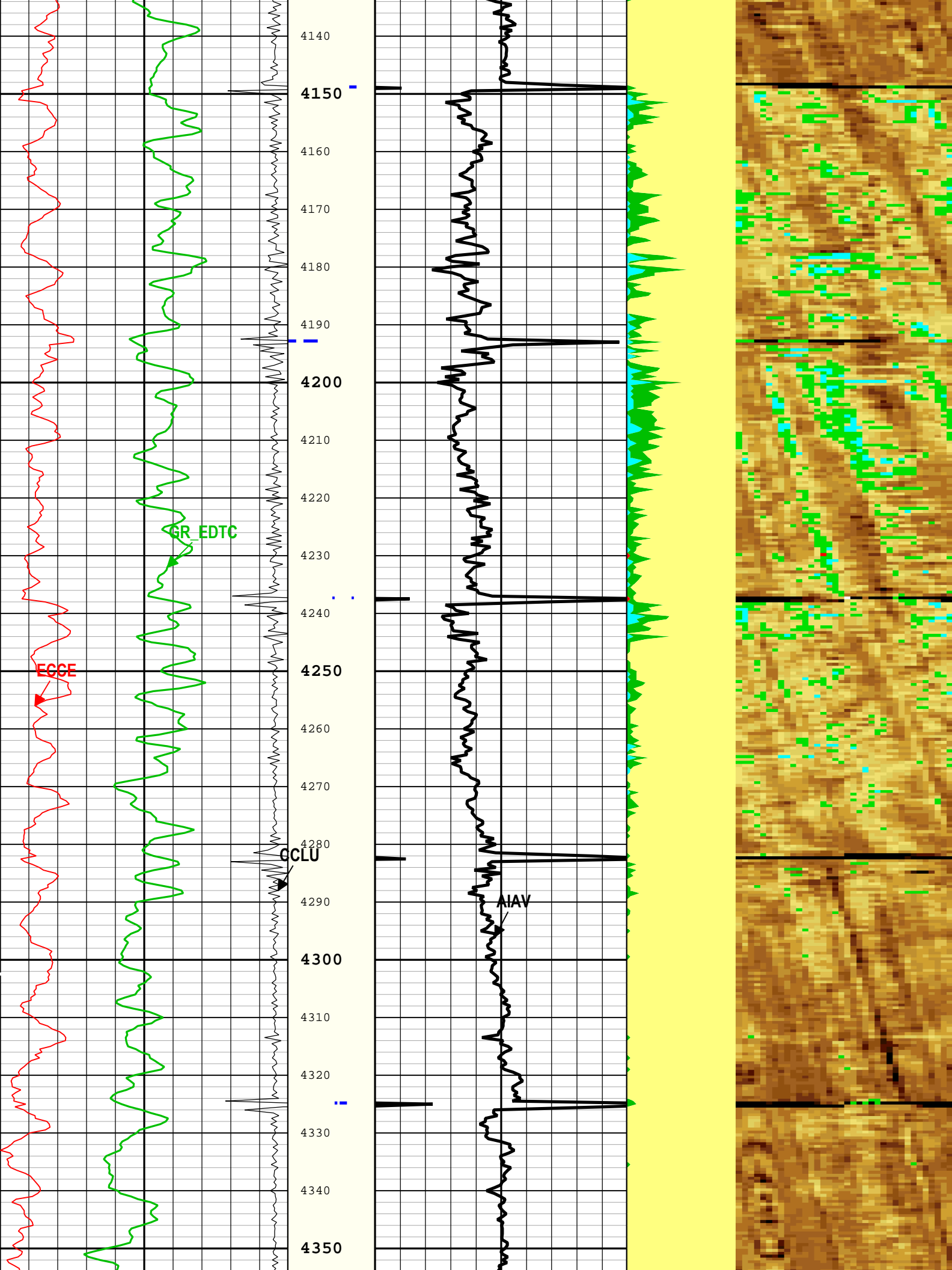


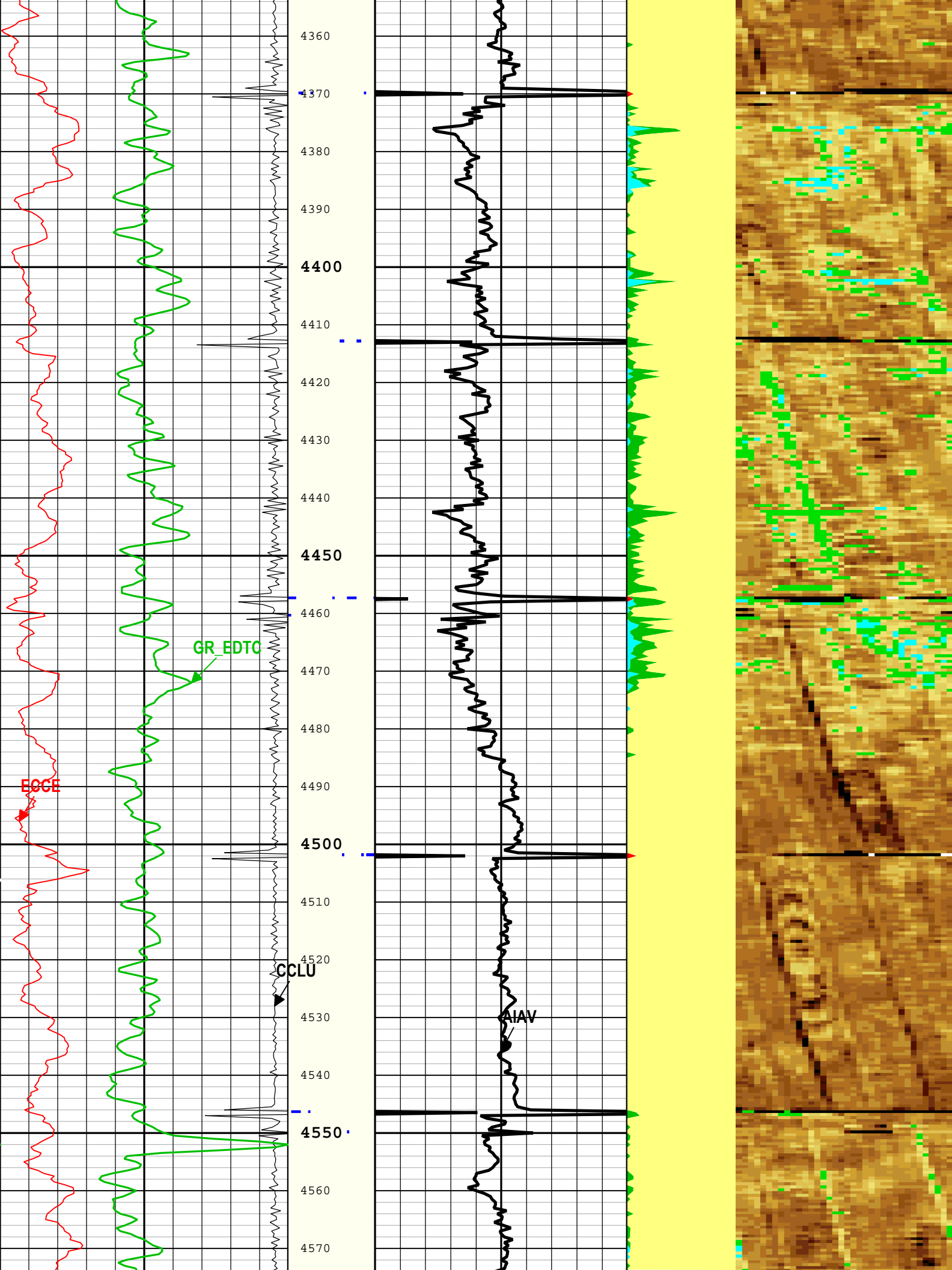


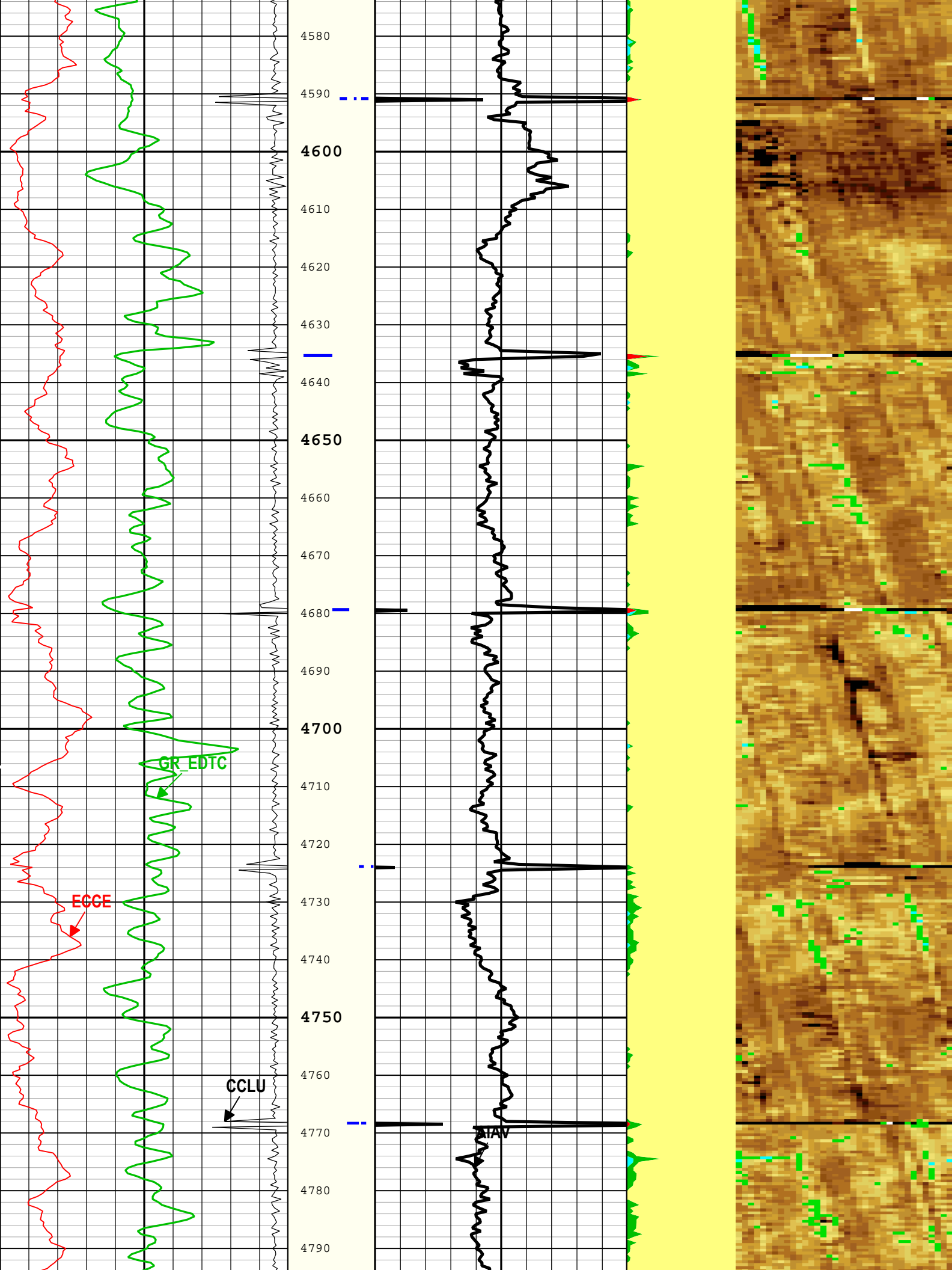


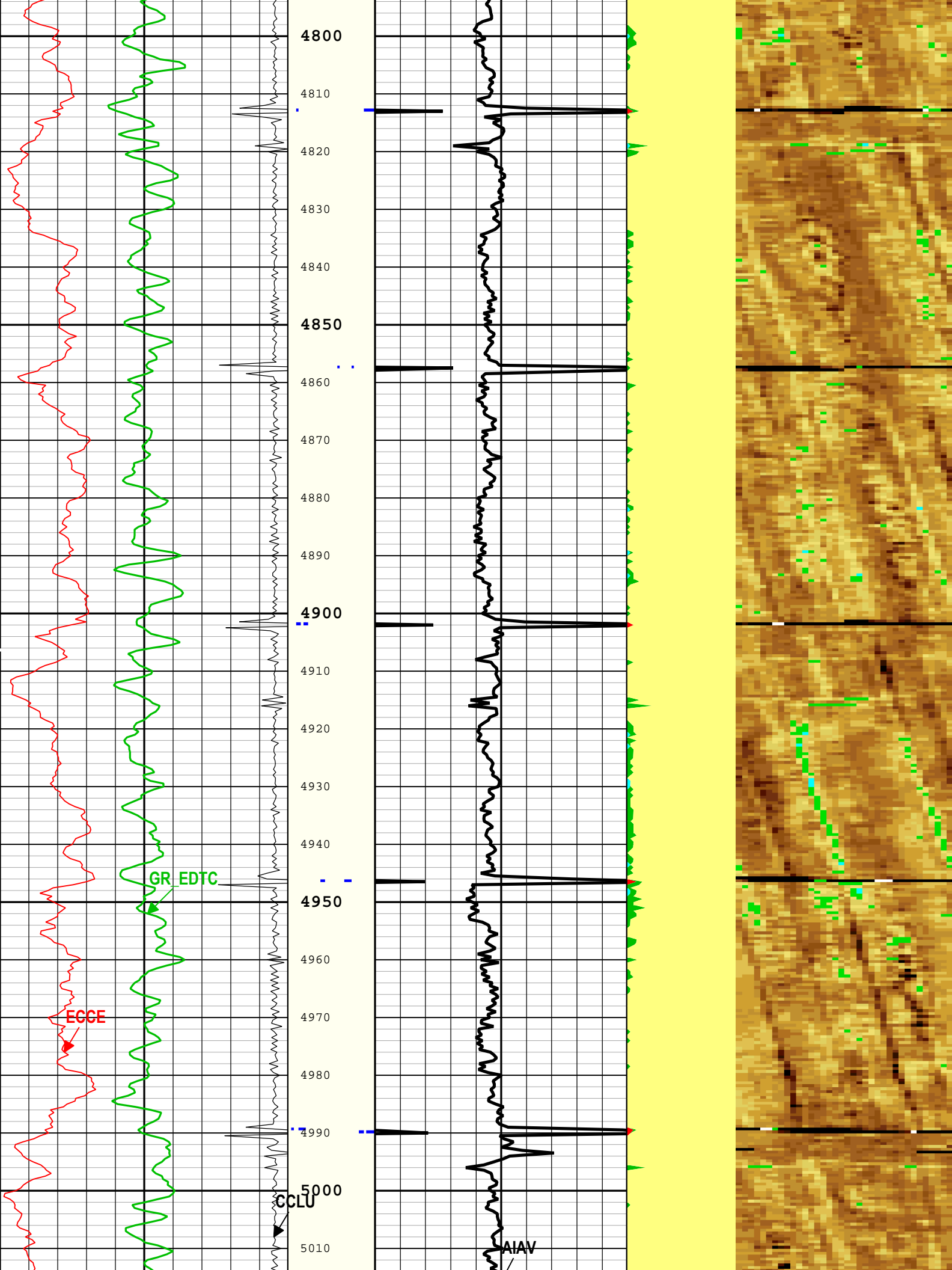


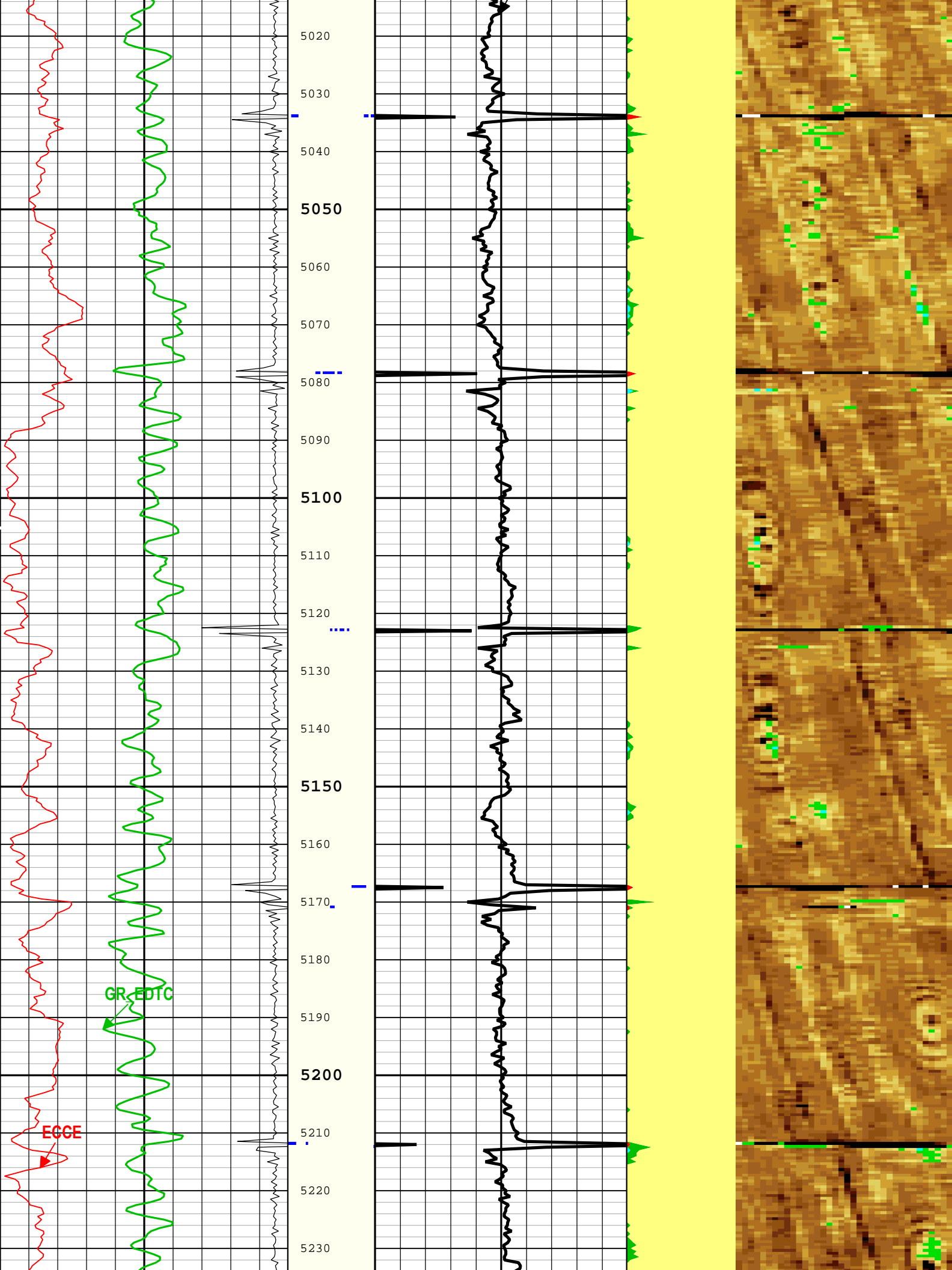


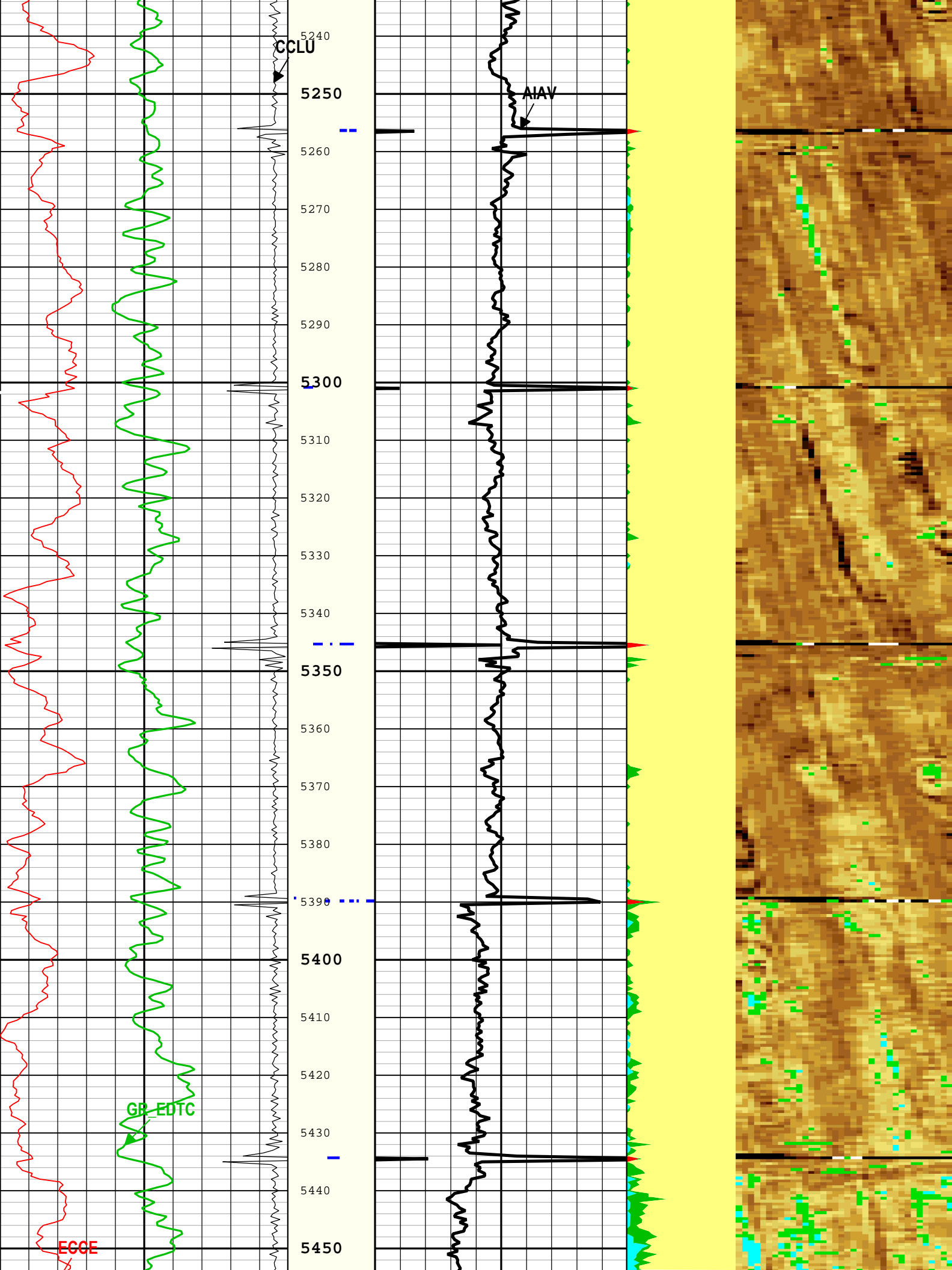


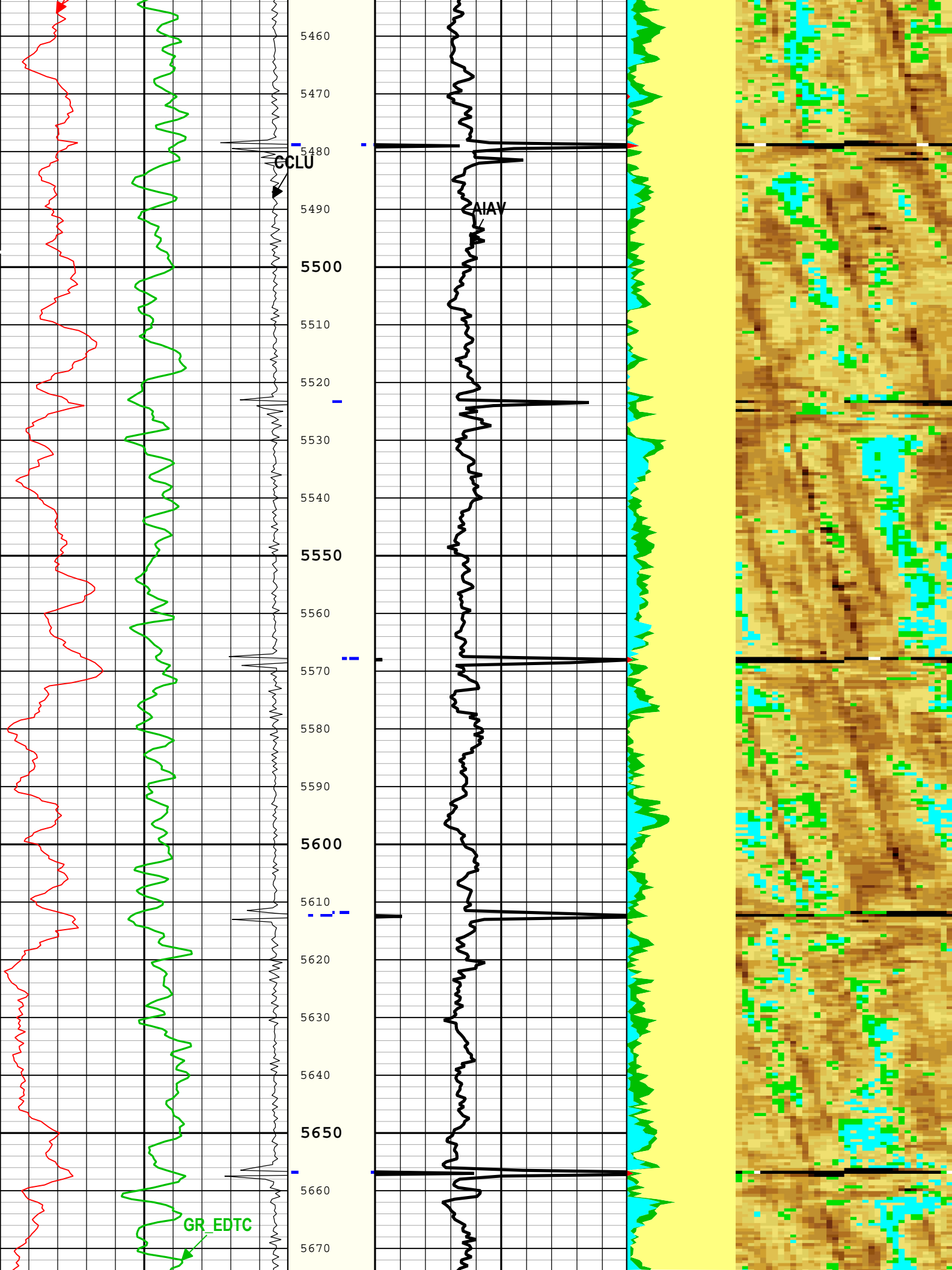


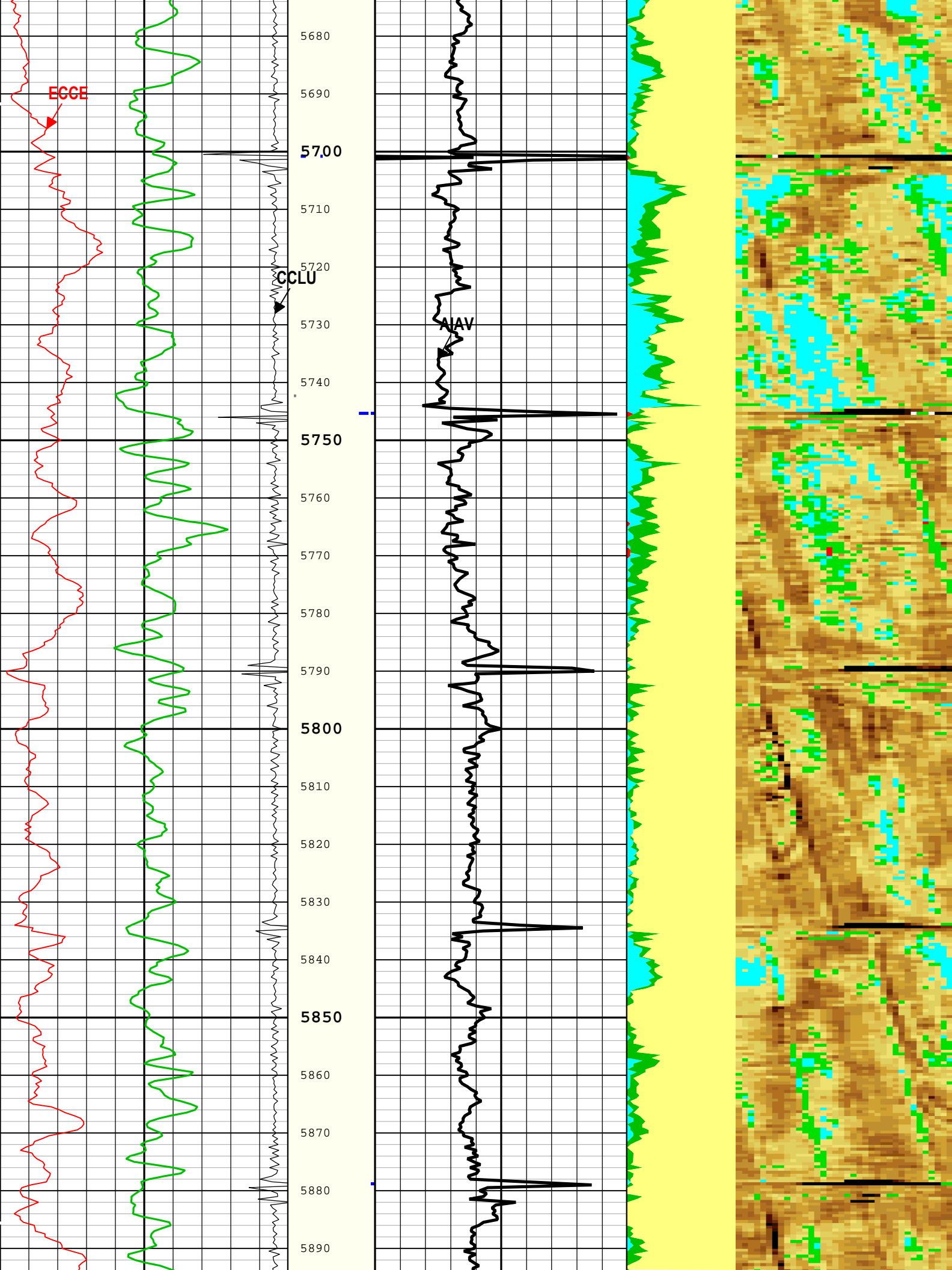


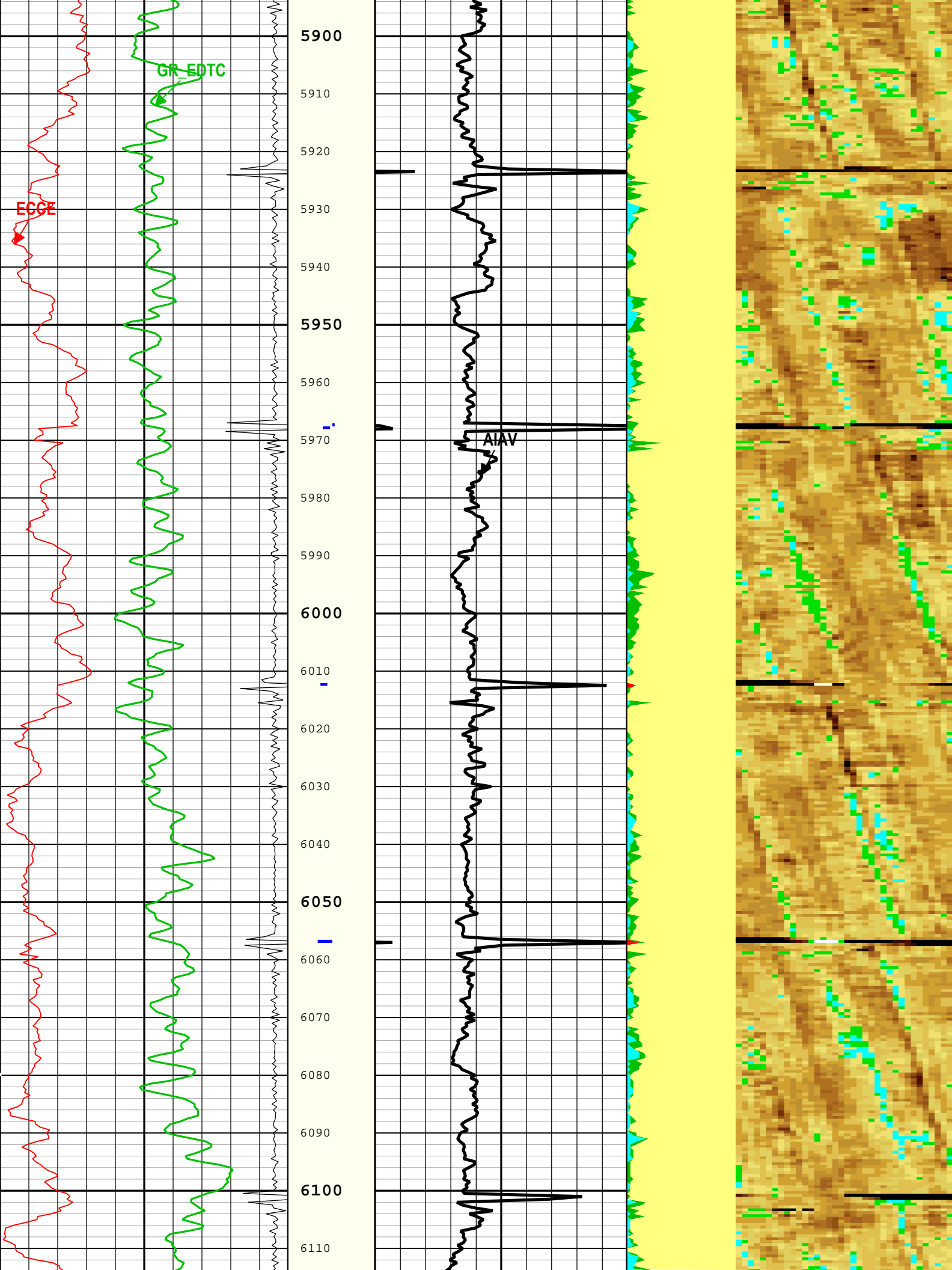


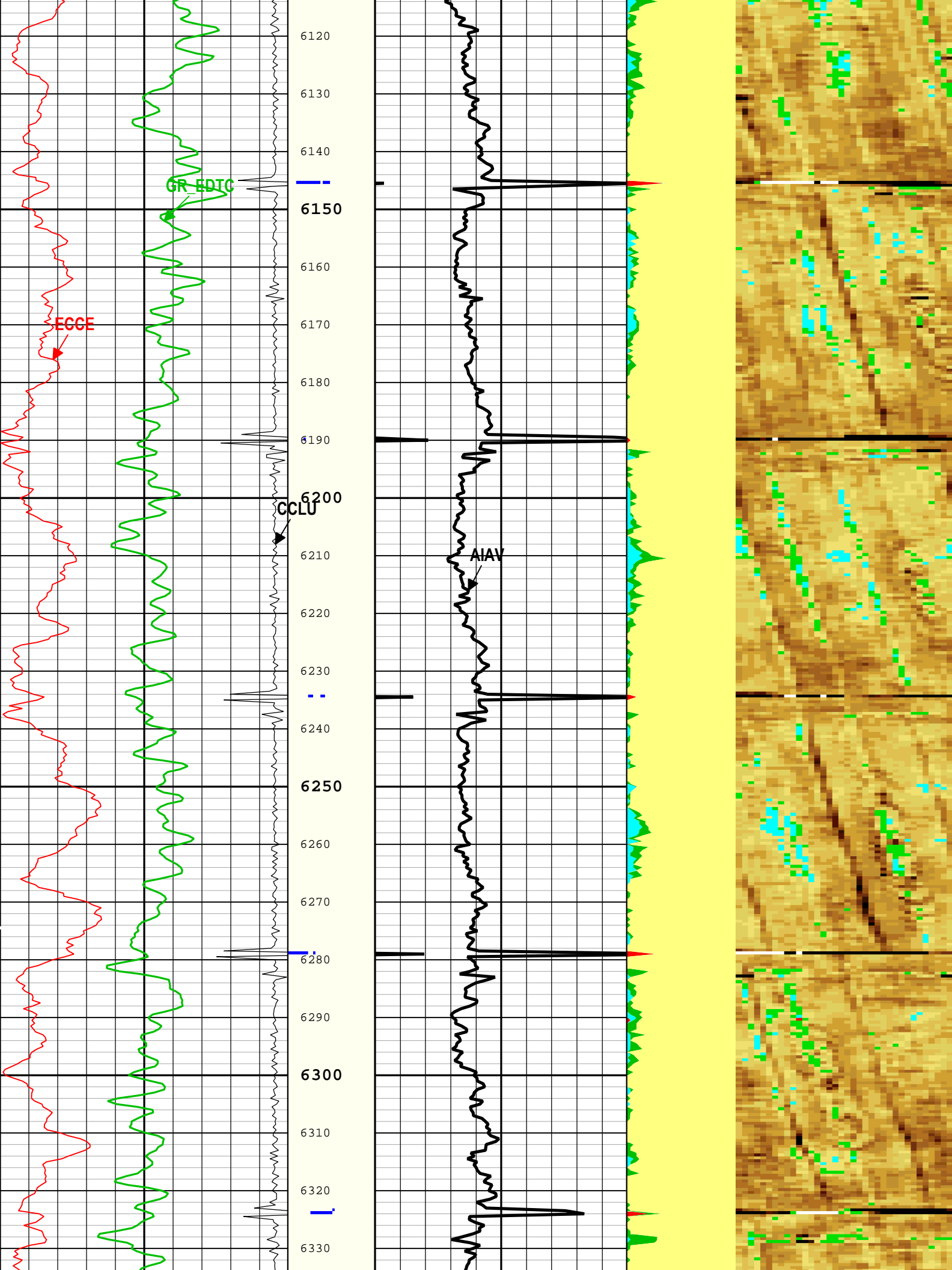


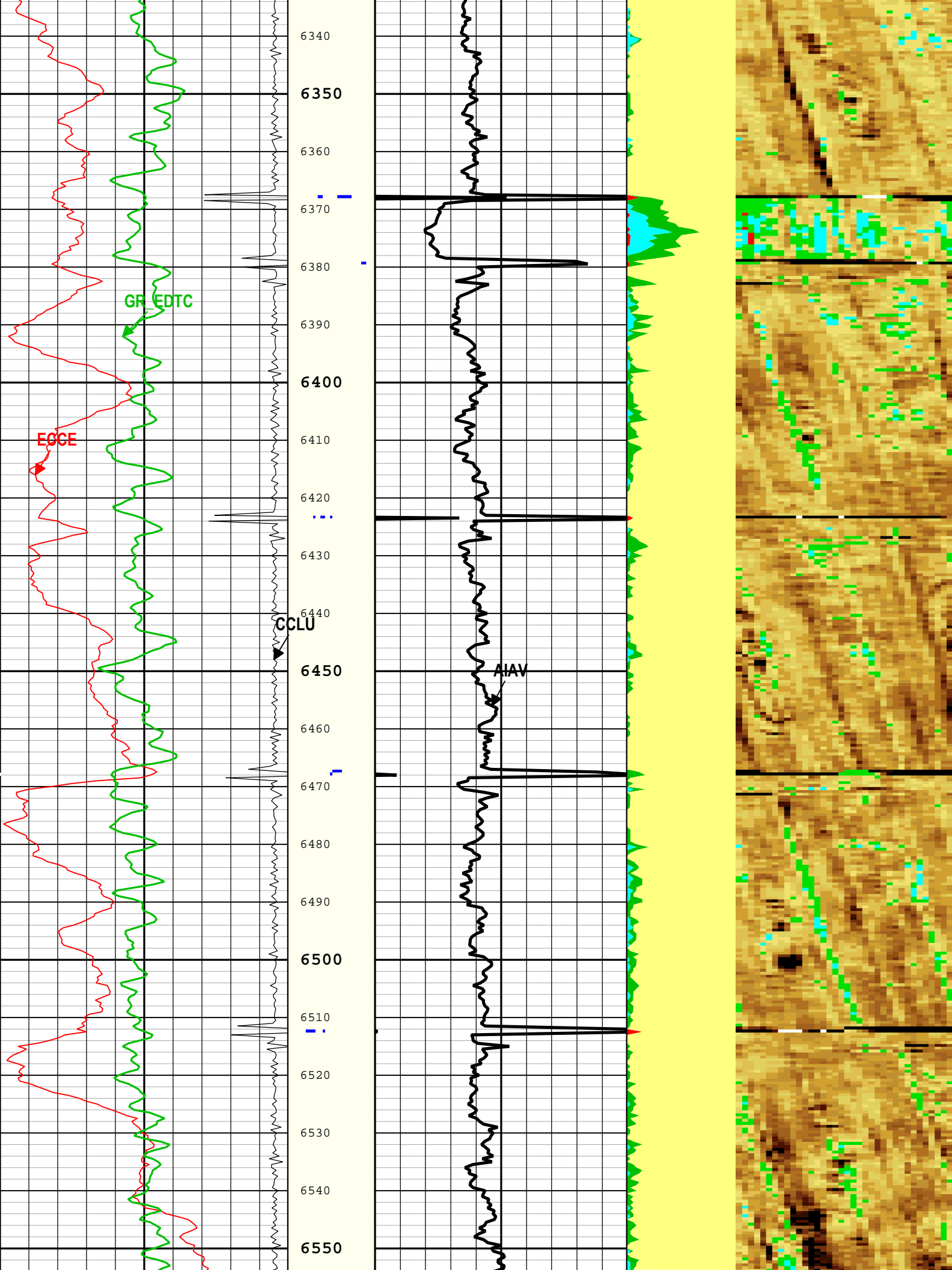


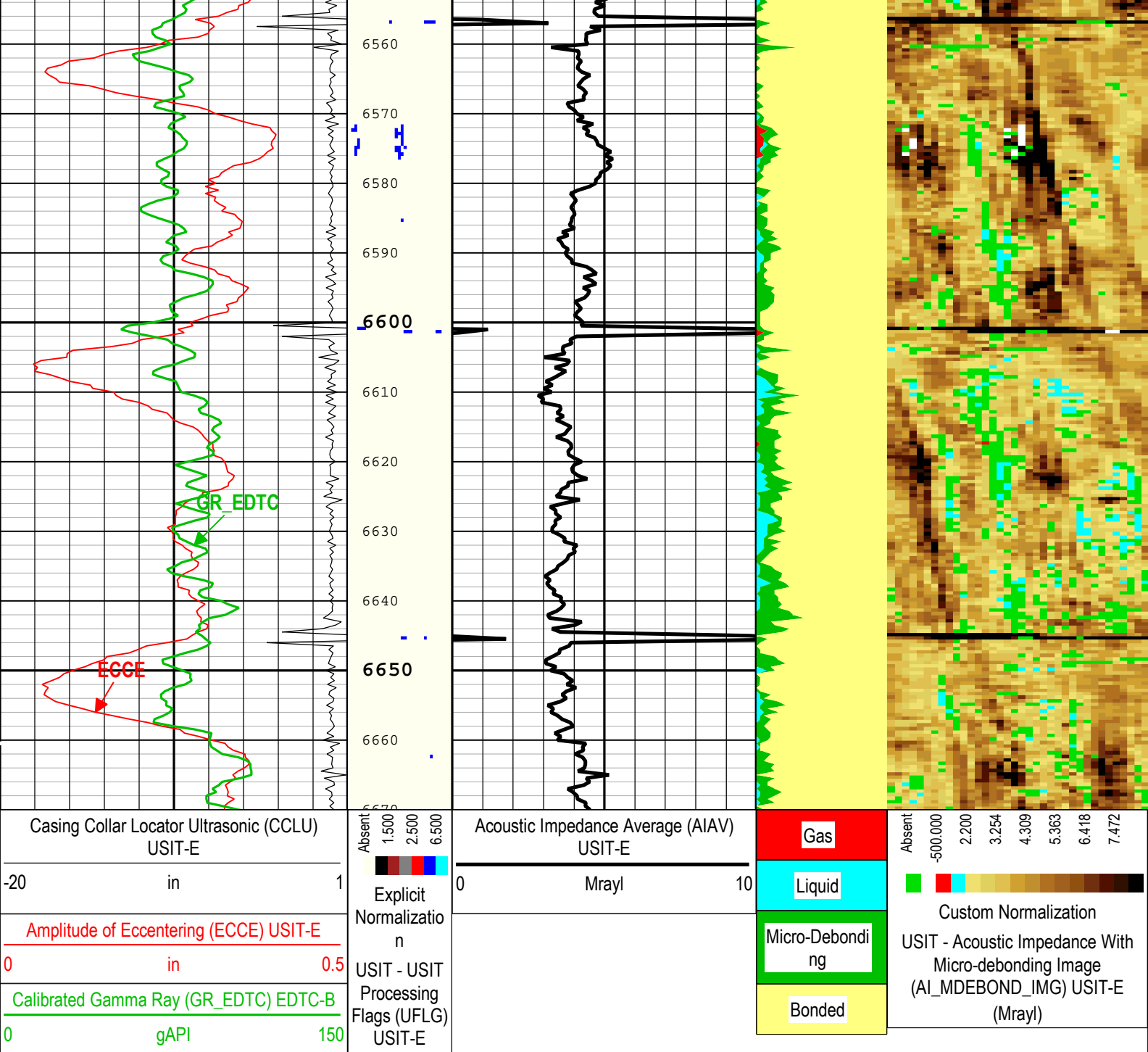












TIME_1900 - Time Marked every 60.00 (s)

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: 06-Sep-2018 17:15:00

Channel Processing Parameters

1: Parameters

Parameter	Description	Tool	Value	Unit
BAR(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	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/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_THE	Theoretical Mud Normalization Factor	USIT-E	1.12	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0	Mrayl
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-E	Automatic	
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	Theoretical	
ZMUD	Acoustic Impedance of Mud	Borehole	1.75	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Parameter	Value	Start (ft)	Stop (ft)
BS	26	100	110
BS	13.5	110	1940
BS	8.5	1940	6670

Tool Control Parameters	
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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	Time Zoned	V
HRES	Horizontal Resolution	USIT-E	10 deg	
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
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

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
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EMXV	60	06-Sep-2018 14:25:58	06-Sep-2018 14:26:30	6664.29	6563.9
EMXV	70	06-Sep-2018 14:26:30	06-Sep-2018 14:29:38	6563.9	5954.4
EMXV	60	06-Sep-2018 14:29:38	06-Sep-2018 14:52:45	5954.4	1647.47
EMXV	50	06-Sep-2018 14:52:45	06-Sep-2018 15:04:41	1647.47	60.33
WINB	31.88	06-Sep-2018 14:18:37	06-Sep-2018 14:25:51	6776.25	6687.45
WINB	26.6	06-Sep-2018 14:25:51	06-Sep-2018 14:26:09	6687.45	6630.84
WINB	23.53	06-Sep-2018 14:26:09	06-Sep-2018 15:04:41	6630.84	60.33
WINE	71.88	06-Sep-2018 14:18:37	06-Sep-2018 14:25:25	6776.25	6763.36
WINE	77.25	06-Sep-2018 14:25:25	06-Sep-2018 14:26:05	6763.36	6642.58
WINE	72.64	06-Sep-2018 14:26:05	06-Sep-2018 14:26:36	6642.58	6542.98
WINE	75.71	06-Sep-2018 14:26:36	06-Sep-2018 14:27:08	6542.98	6440.97
WINE	74.18	06-Sep-2018 14:27:08	06-Sep-2018 15:04:41	6440.97	60.33

Software Version

Acquisition System

Maxwell 2018 SP2

Version

8.2.104493.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
1	Log[1]:Up	Up	1987.68 ft	2530.32 ft	06-Sep-2018 1:53:21 PM	06-Sep-2018 1:57:13 PM	ON	-8.85 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Noble Energy Inc.

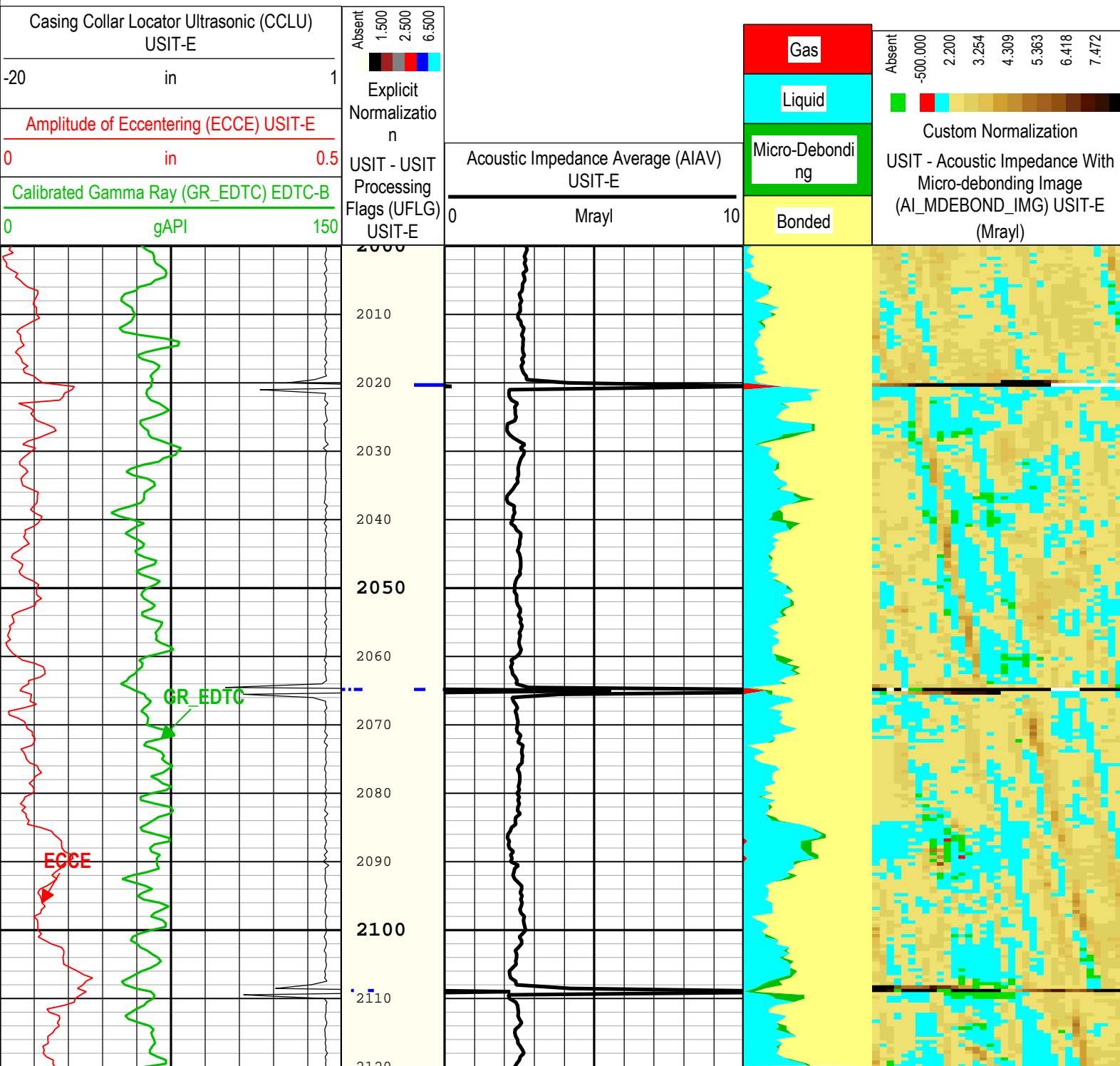
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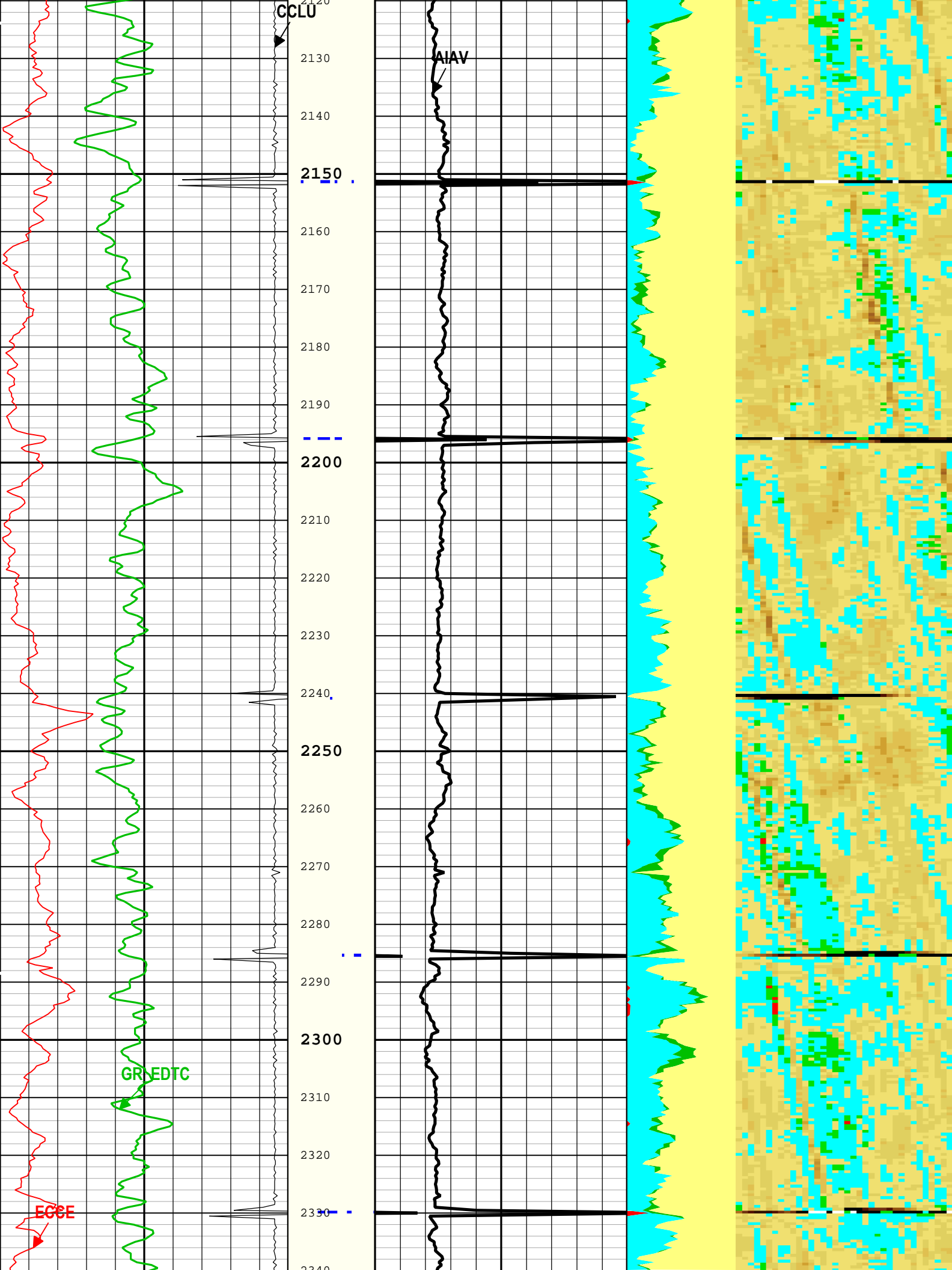
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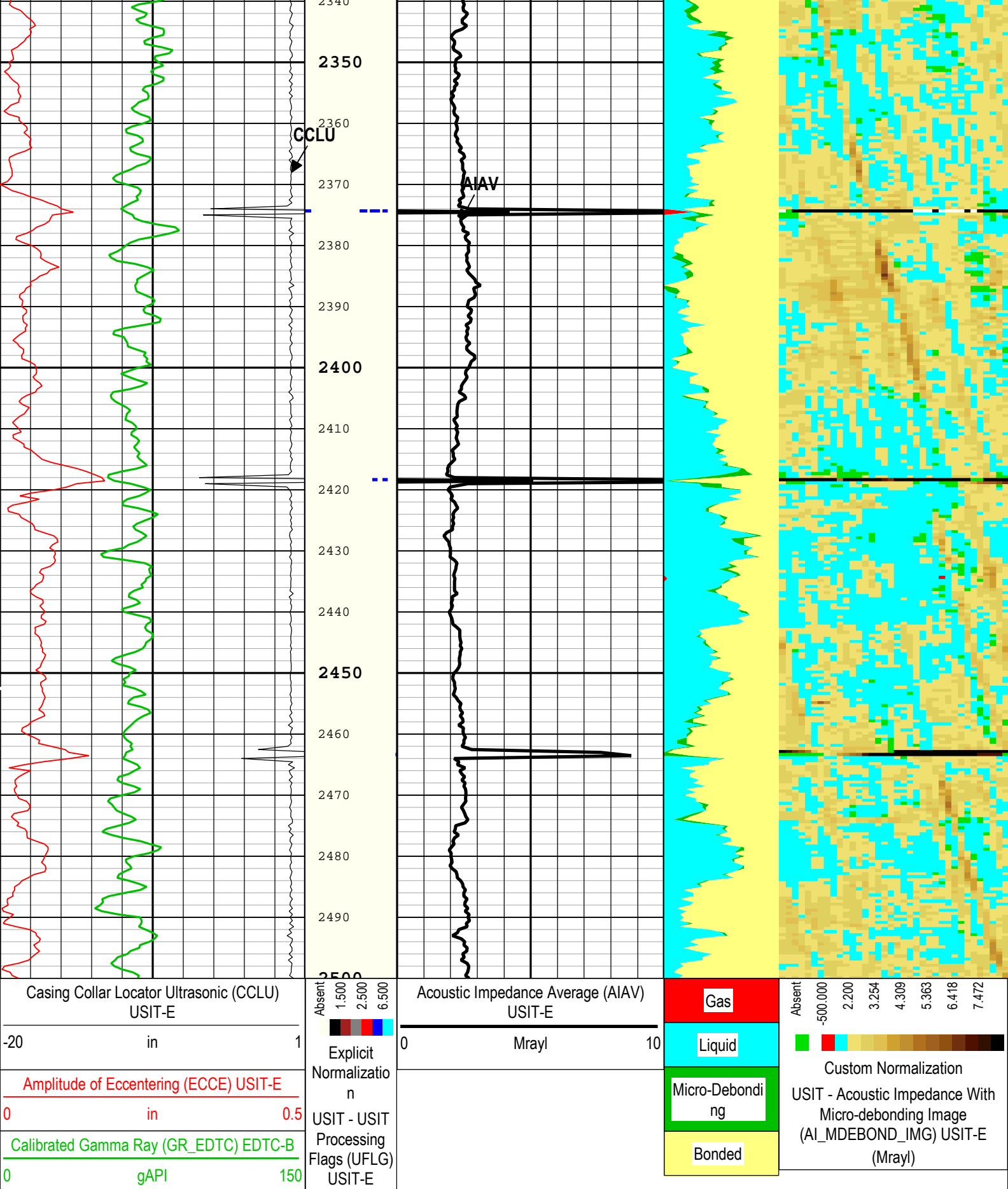
Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth

Creation Date: 06-Sep-2018 17:15:07

TIME_1900 - Time Marked every 60.00 (s)







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Creation Date: 06-Sep-2018 17:15:07

Channel Processing Parameters	
1: Parameters	

Parameter	Description	Tool	Value	Unit
BARI(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
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USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	Theoretical	
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ULOG	Logging Objective	USIT-E	MEASUREMENT	
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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

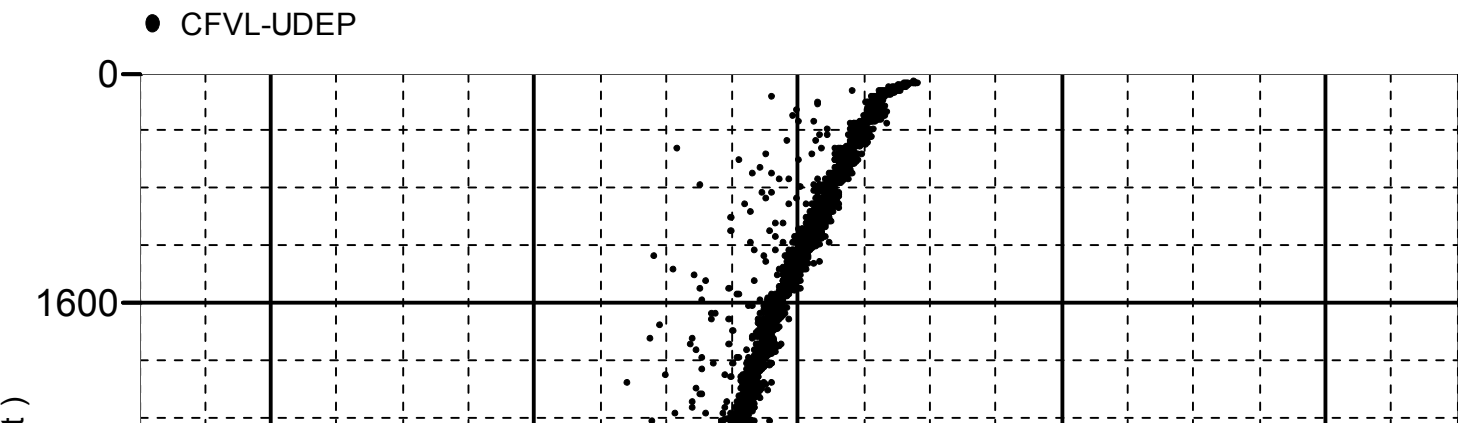
Company:Noble Energy Inc. Well:Hurley H26-736

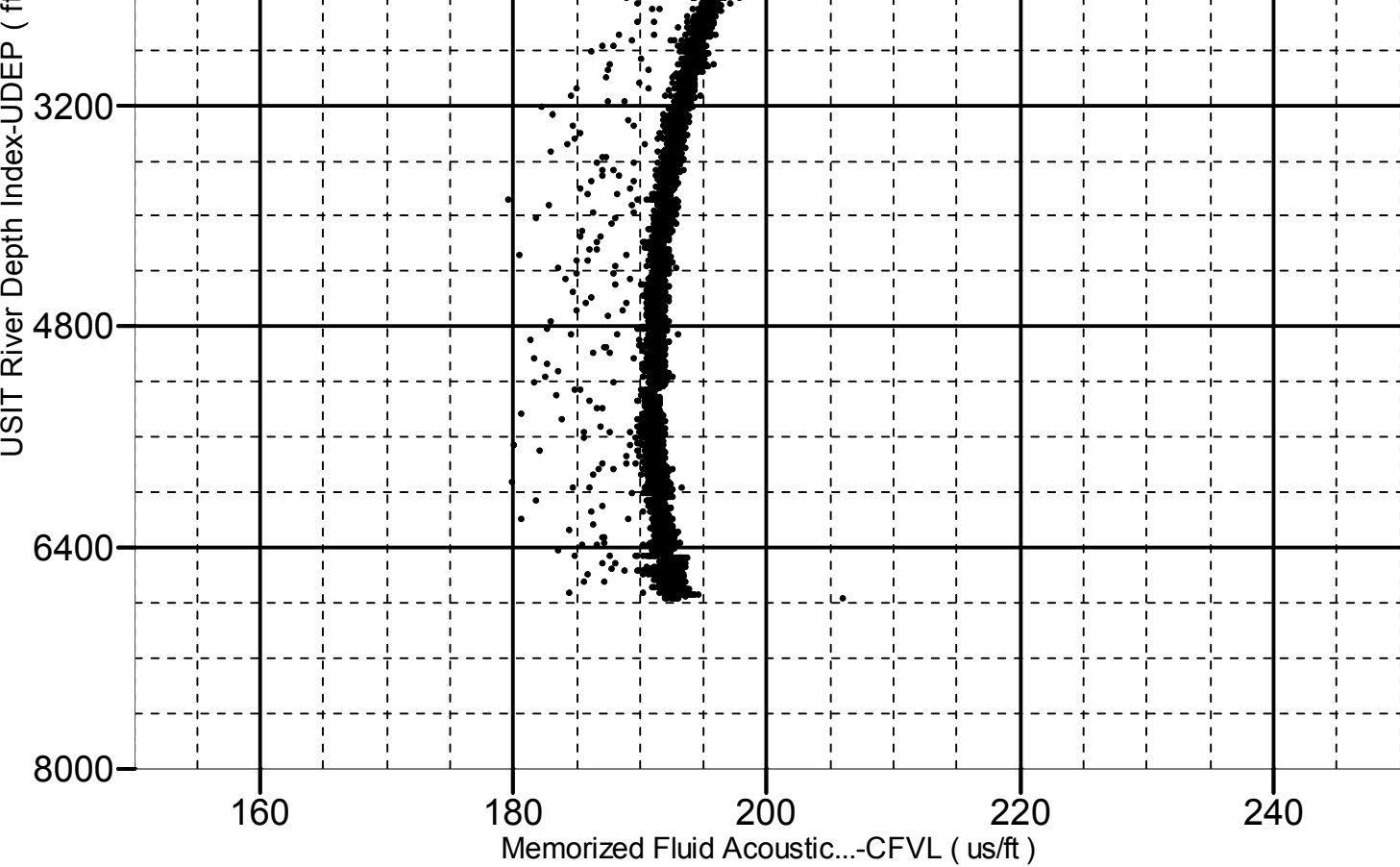
1: Log[3]:Up:S003

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6776.00 to 60.00 ft





XYZ

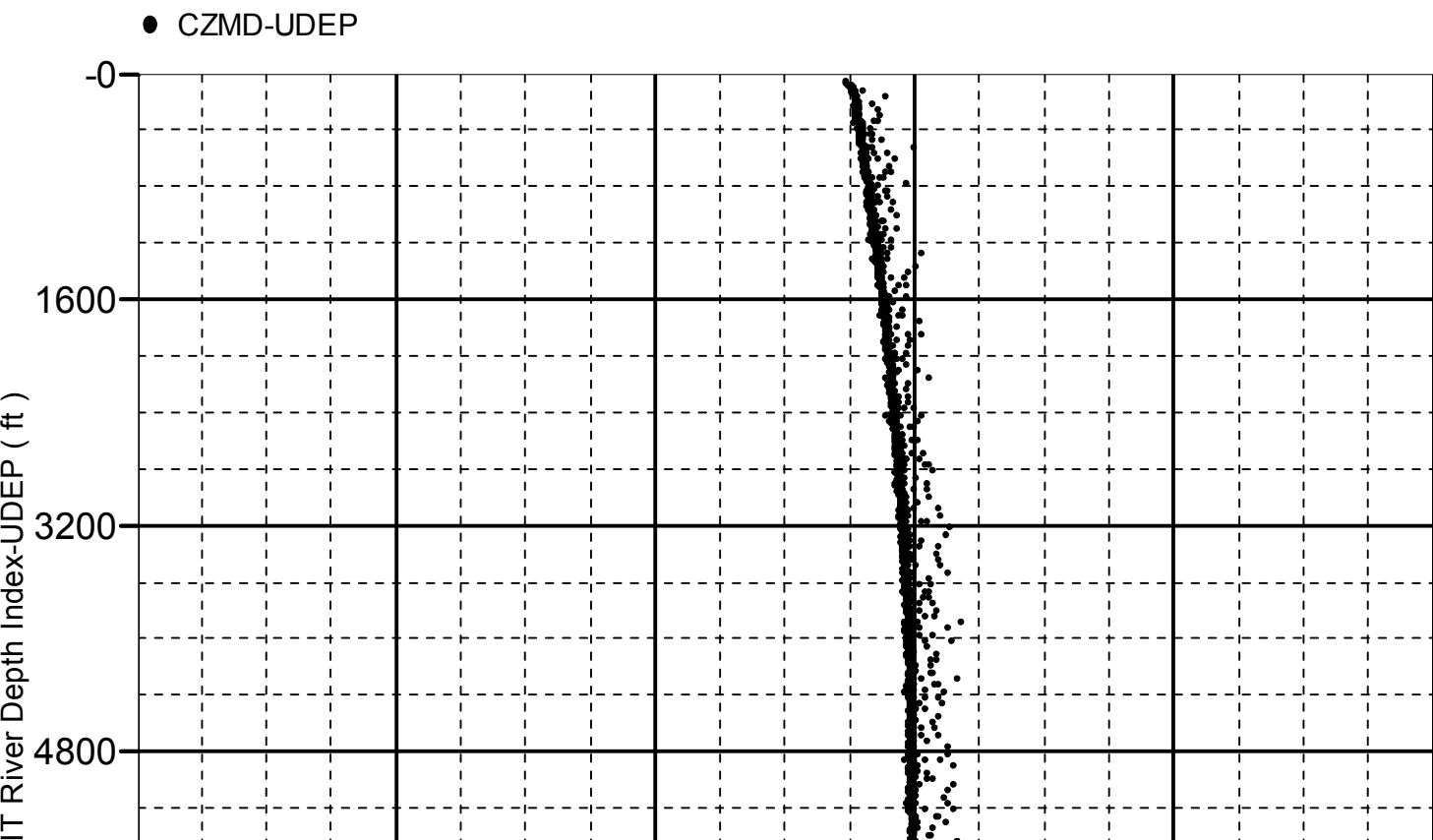
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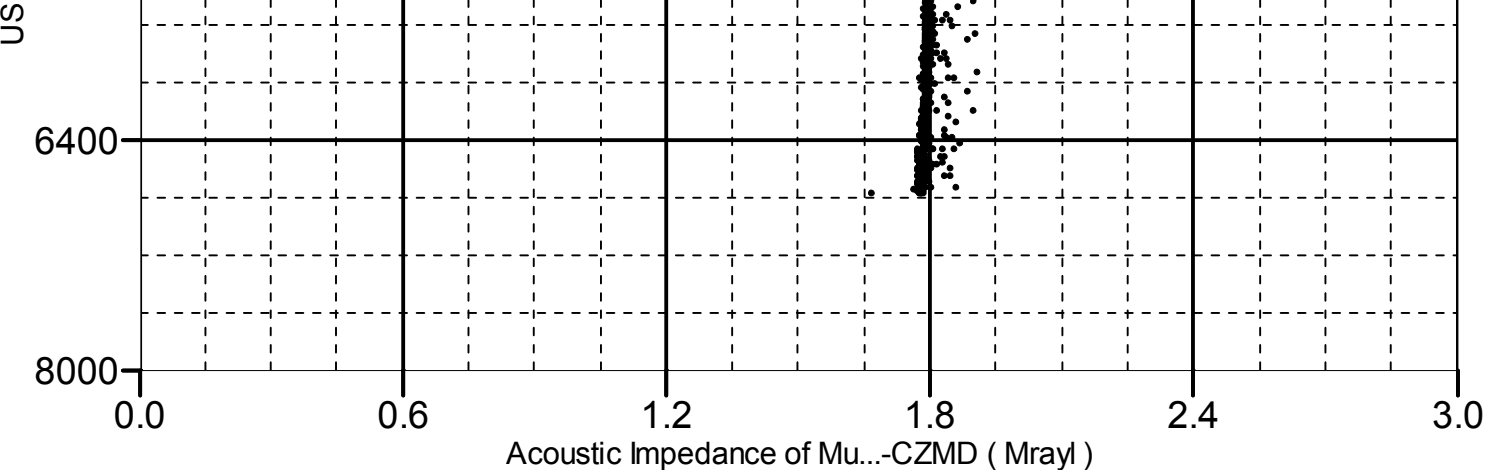
1: Log[3]:Up:S003

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6776.00 to 60.00 ft





Company: Noble Energy Inc.

Schlumberger

Well: Hurley H26-736

Field: Wattenberg

County: Weld

State: Colorado

UltraSonic Summary Print

