

Company: Noble Energy Inc

Well: Bison Ridge Y22-741

Field: Wattenberg

County: Weld Country: US

UltraSonic Summary Print

County: Weld
Field: Wattenberg
Location: SHL: NWSE Sec. 10, T2N, R64W
Well: Bison Ridge Y22-741
Company: Noble Energy Inc

Location:		SHL: NWSE Sec. 10, T2N, R64W 2640' FSL & 2071' FEL Lat: 40.15182 / Long: -104.5356	Elev.: K.B. 4954.00 ft G.L. 4924.00 ft D.F. 4954.00 ft
Permanent Datum:	Ground Level	Kelly Bushing	Elev.: 30.00 ft
Log Measured From:	Kelly Bushing		
Drilling Measured From:	Kelly Bushing		
API Serial No. 05-123-45374	Max.Hole Deviation 0 deg	Longitude: -104.53560 degrees	Latitude: 40.151820 degrees

Logging Date 24-Jan-2018

Run Number One

Depth Driller 16764.00 ft

Schlumberger Depth 16764.00 ft

Bottom Log Interval 6200.00 ft

Top Log Interval 60.00 ft

Casing Fluid Type Calcium Bromide Brine

Salinity

Density 8.4 lbm/gal

Fluid Level 8.00 ft

BIT/CASING/TUBING STRING

Bit Size 8.50 in

From 2064.00 ft

To 16764.00 ft

Casing/Tubing Size 5.5 in

Weight 20 lbm/ft

Grade N/A

From 0.00 ft

To 16753.40 ft

Max Recorded Temperatures 179 degF

Logger on Bottom 24-Jan-2018 11:25:00

Unit Number 9108 Location: Fort Morgan, CO

Recorded By Benjamin Mammon

Witnessed By Bill Mansfield

Disclaimer

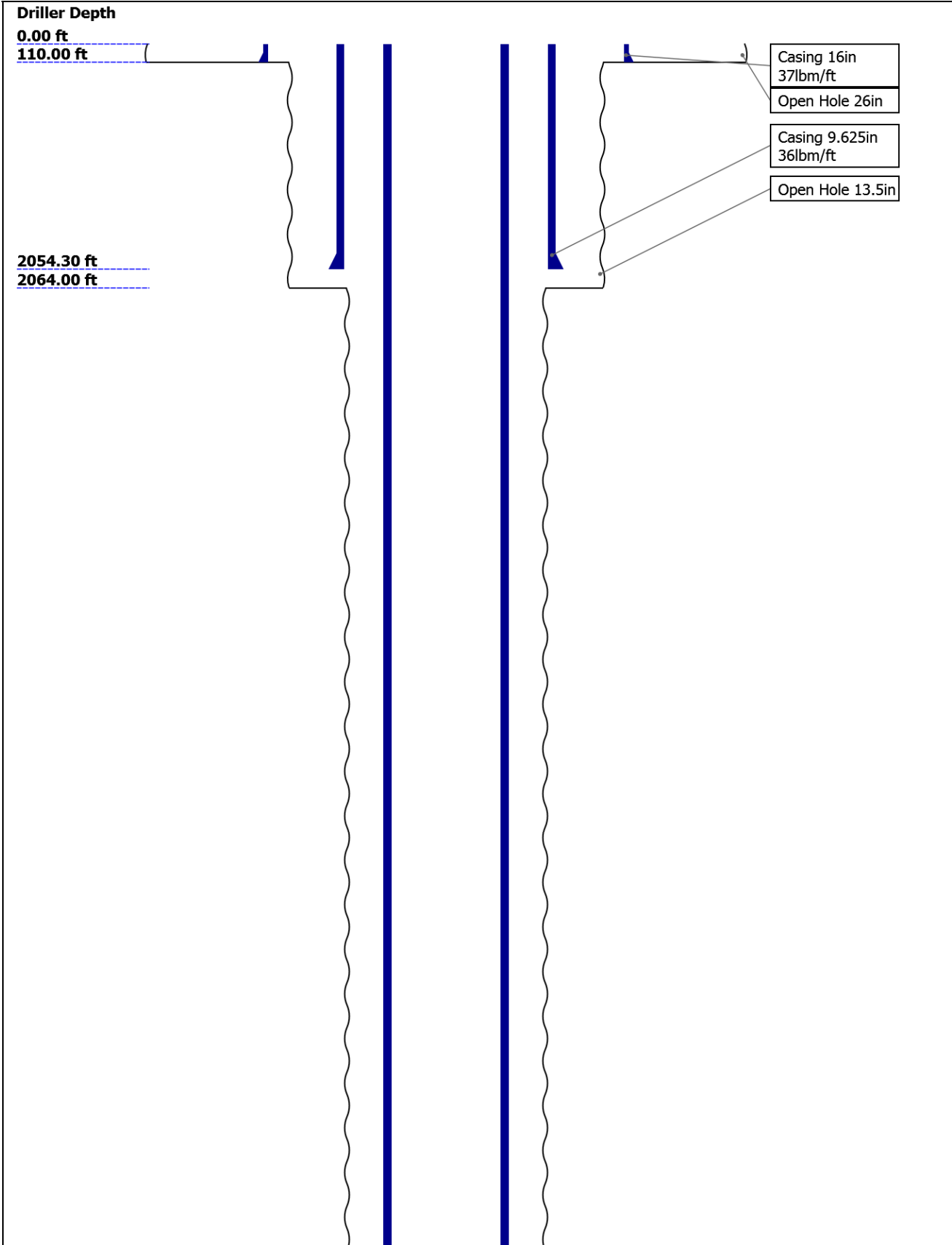
THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA;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

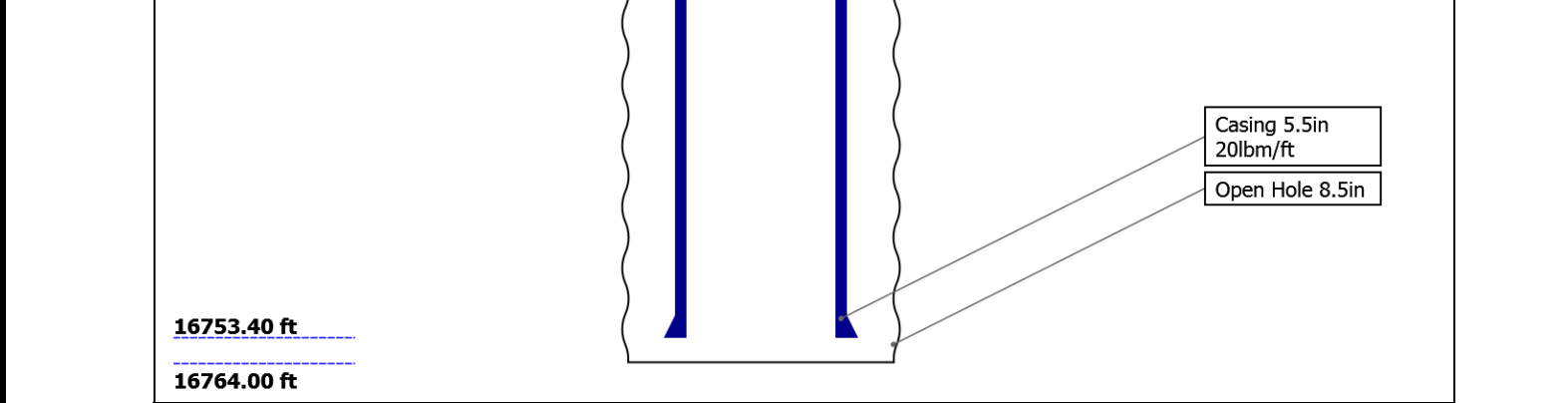
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Well Sketch





Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	0	110	2064			
Top Logger (ft)	0	110	2064			
Bottom Driller (ft)	110	2064	16764			
Bottom Logger (ft)	110	2064	16764			
Casing						
Size (in)	16	9.625	5.5			
Weight (lbm/ft)	37	36	20			
Inner Diameter (in)	15.571	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	2054.3	16753.4			
Bottom Logger (ft)	110	2054.3	16753.4			

Operational Run Summary

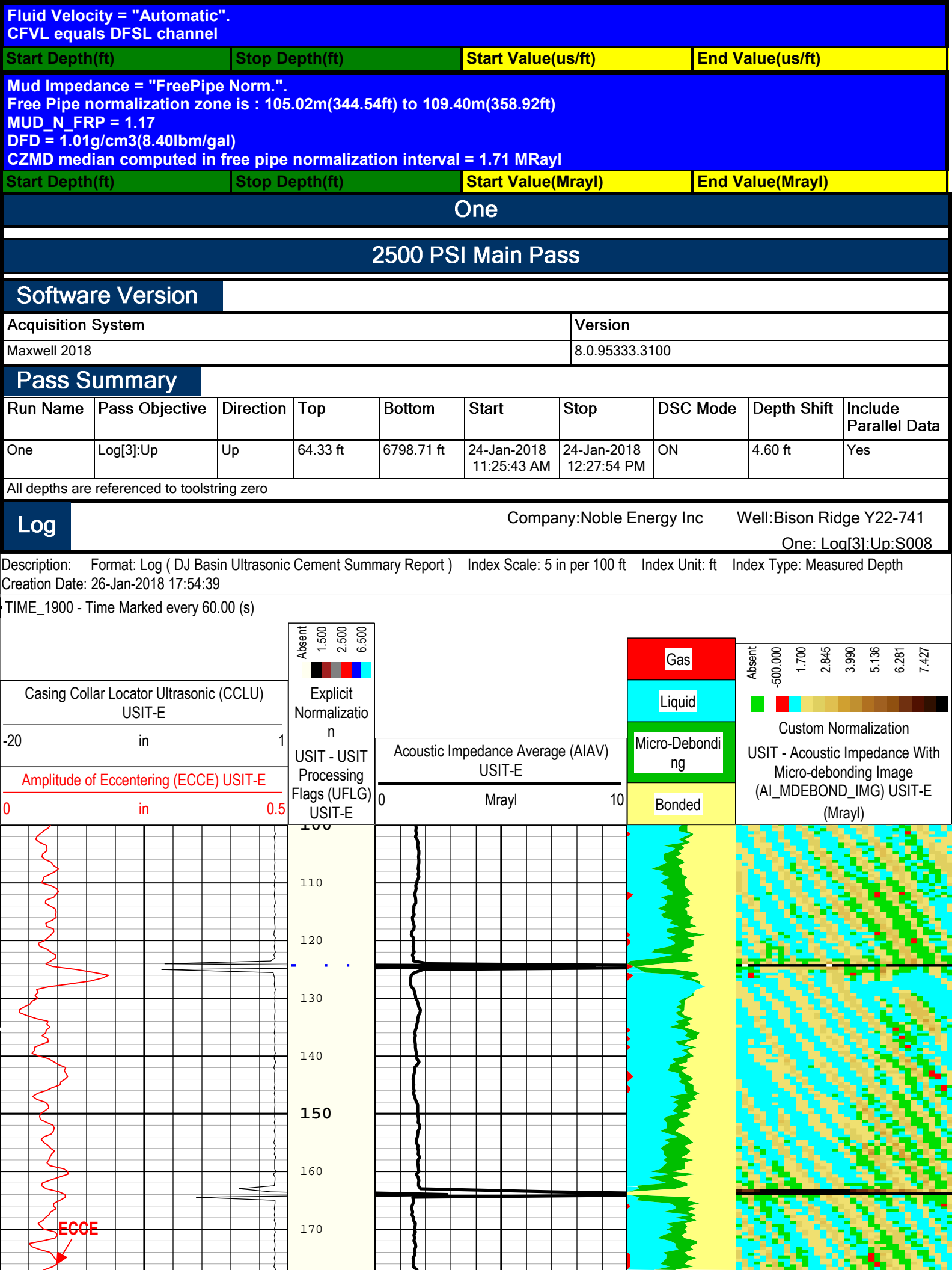
Parameter (unit)	One					
Date Log Started	24-Jan-2018					
Time Log Started	11:01:40					
Date Log Finished	24-Jan-2018					
Time Log Finished	12:28:13					
Top Log Interval (ft)	60.00					
Bottom Log Interval (ft)	6200.00					
Total Depth (ft)						
Max Hole Deviation (deg)	0.00					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	8.500					
Logging Unit Number	9108					
Logging Unit Location	Fort Morgan, CO					
Recorded By	Benjamin Marmon					

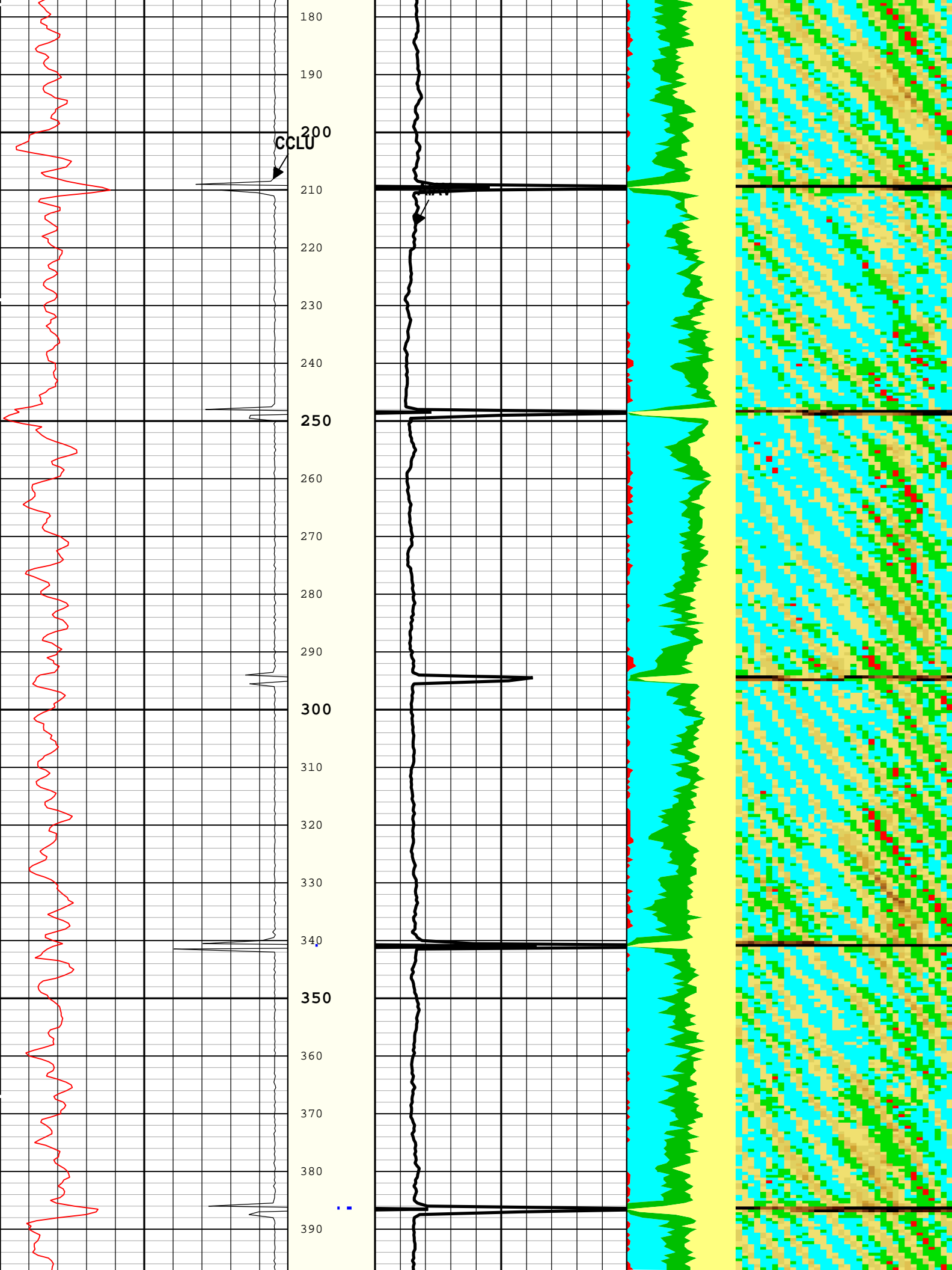
Witnessed By	Bill Mansfield					
Service Order Number	DX2A-00005					

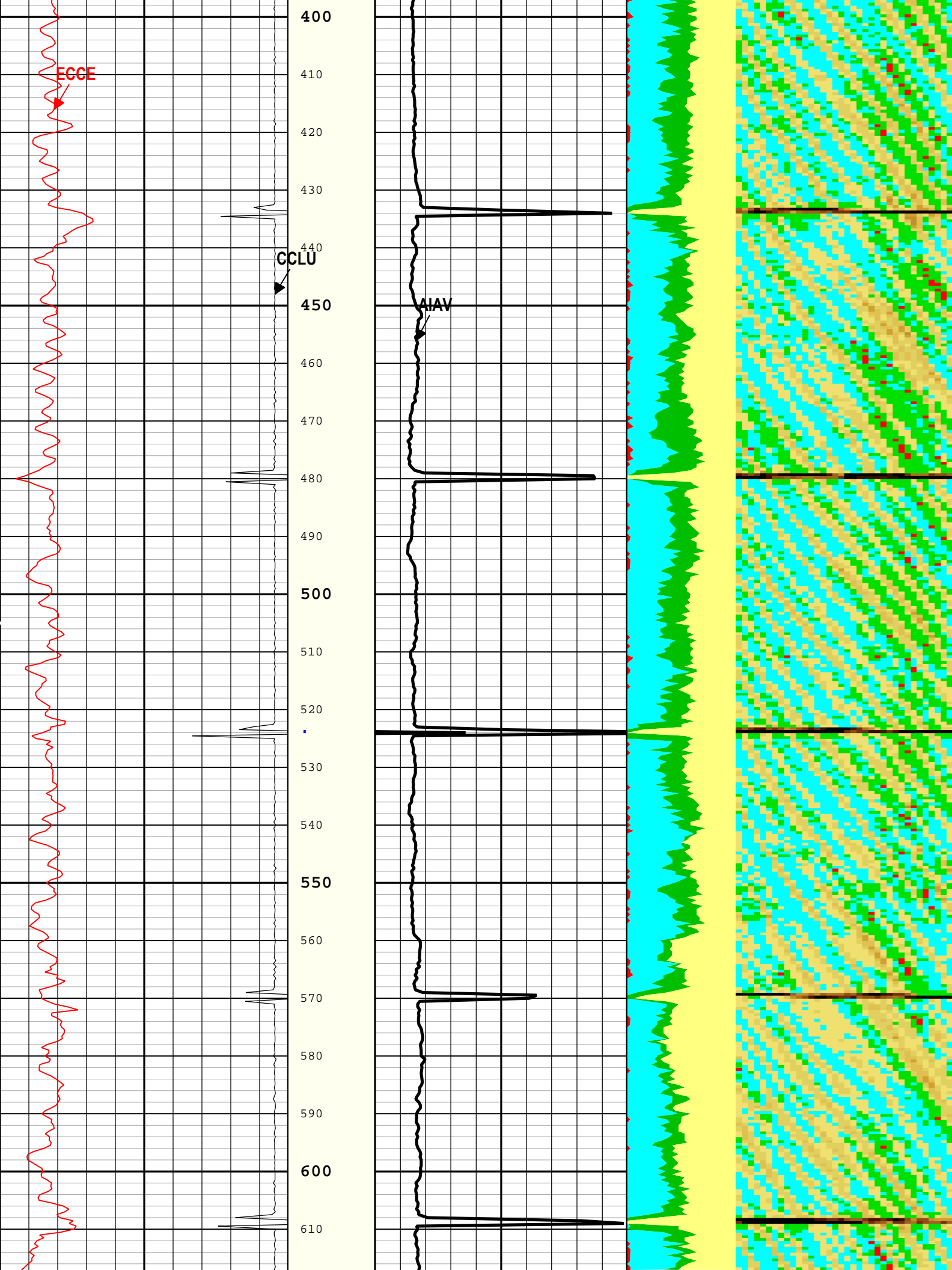
Remarks and Equipment Summary					
One: Toolstring				One: Remarks	
<div><div><div><div><div>Equip name</div><div>Length</div></div><div>LEH-QT:2</div><div>33.83</div></div><div>353</div><div>LEH-QT:23</div><div>53</div></div><div><div><div><div>SAH-F:18</div><div>30.91</div></div><div>17</div></div><div><div><div><div>EDTC-B:8</div><div>26.06</div></div><div>424</div><div>EDTH-B:84</div><div>32</div><div>EDTG-A:7</div><div>7303</div><div>EDTC-B:84</div><div>24</div></div><div><div><div><div>AH-184[</div><div>2]</div></div><div>19.56</div></div><div><div><div><div>AH-184[</div><div>1]</div></div><div>17.56</div></div><div><div><div><div>USIT-E:94</div><div>15.56</div></div><div>3</div><div>ECH-MFA:</div><div>1928</div><div>USAC-A:9</div><div>43</div><div>USIS-A:27</div><div>20</div><div>USSC-B:75</div><div>8</div><div>USRS-A</div><div>USI-SENS</div><div>OR</div><div>USI-TX</div></div></div></div><div><div><div><div>CTEM</div><div>22.56</div></div><div><div>ACCZ</div><div>0.00</div></div><div><div>HV</div><div>0.00</div></div><div><div>Gamma</div><div>20.69</div></div><div><div>Ray</div><div></div></div><div><div>TelStatu</div><div>s</div><div>19.56</div></div></div><div><div><div><div>USI Sen</div><div>0.37</div></div><div>sor</div><div>TOOL_ZERO</div><div>Head Fe</div><div>nsion</div></div><div>Lengths are in ft</div><div>Maximum Outer Diameter = 6.250 in</div><div>Line: Sensor Location, Value: Gating Offset</div><div>All measurements are relative to TOOL_ZERO</div></div></div></div></div></div></div>				This is the first log in the well.	
				Toolstring ran as per toolsketch.	
				Log up correlate to log down.	
				Main pass logged at 2500 PSI.	
				Repeat pass logged at 0 PSI.	

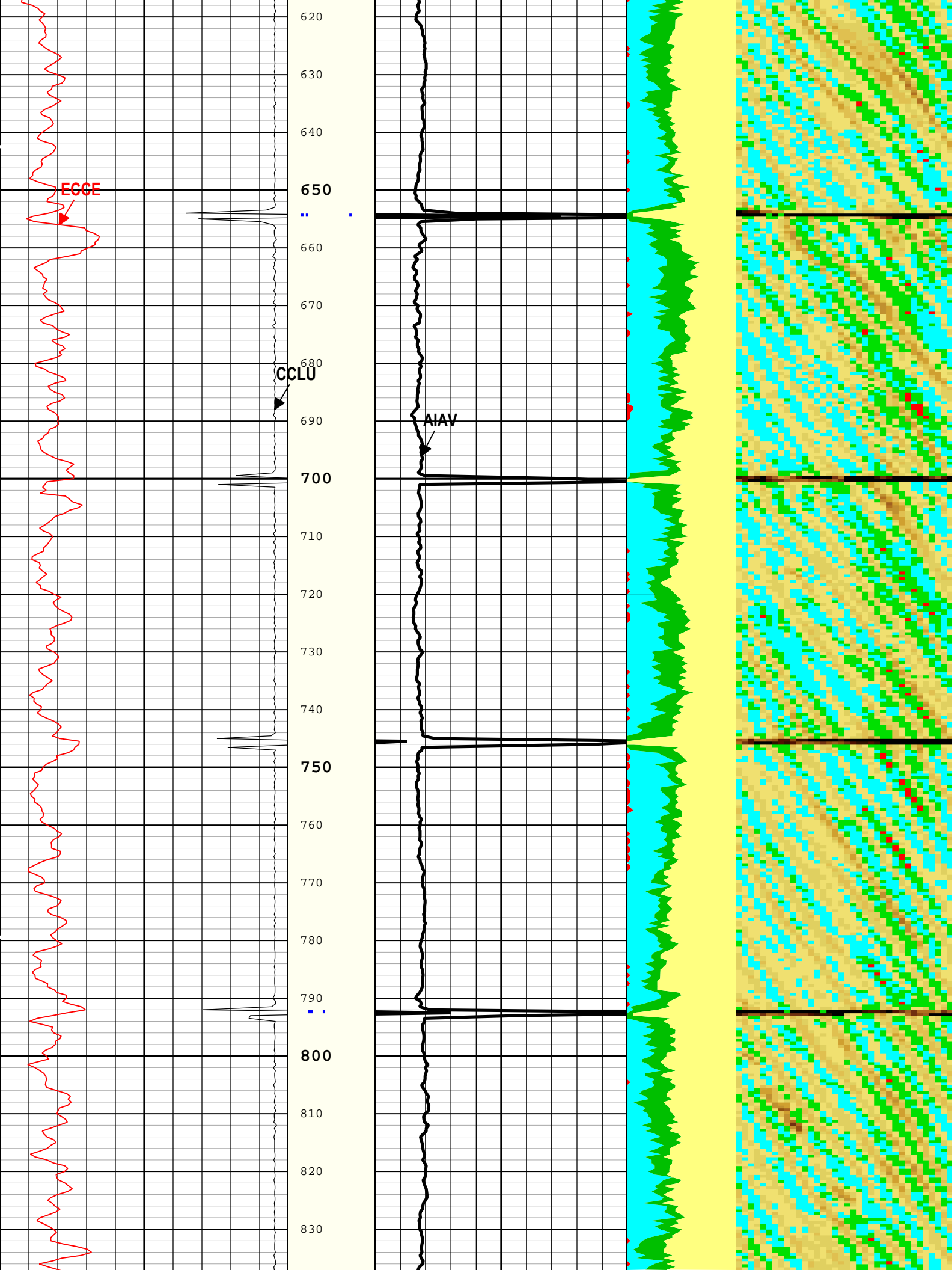
Depth Summary			
		One	
Depth Measuring Device			
Type	IDW-B		
Serial Number	993		

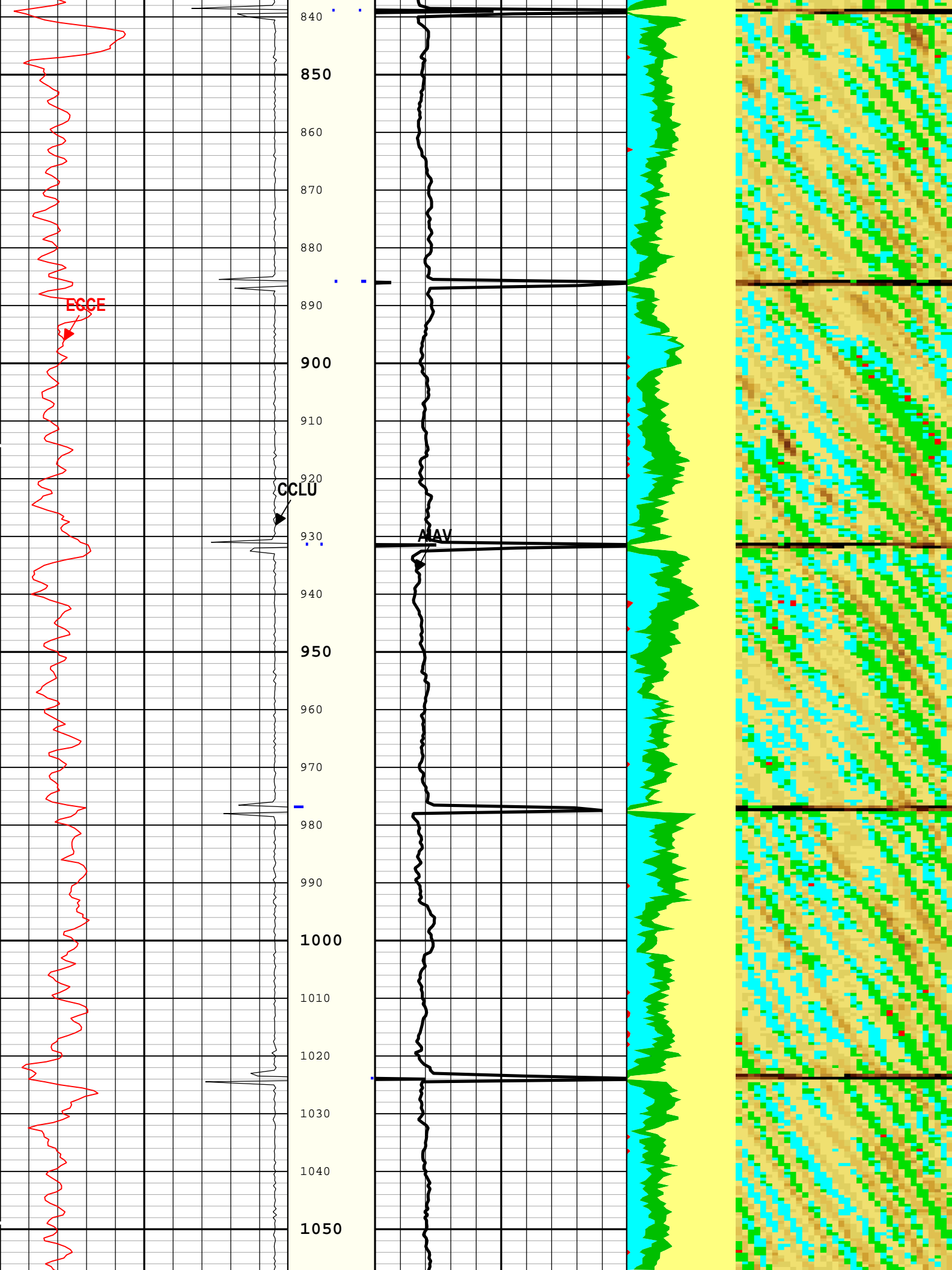
Calibration Date	28-Sep-2017														
Calibrator Serial Number	57														
Calibration Cable Type	7-39 AIXXS														
Wheel Correction 1	-4														
Wheel Correction 2	0														
Tension Device															
Type	CMTD-B/A														
Serial Number	171														
Calibration Date	22-Jan-2018														
Calibrator Serial Number	78796A														
Number of Calibration Points	10														
Calibration Root Mean Square Error	42														
Calibration Peak Error	78														
Logging Cable															
Type	7-39AI-XXS														
Serial Number	F714037														
Length	24000.00 ft														
Conveyance Type	Wireline														
Rig Type	Crane														
One:Depth Control Parameters		Depth Control Remarks													
Log Sequence	First Log In the Well	All Schlumberger depth control procedures followed during logging operation.													
Rig Up Length At Surface		IDW used as primary depth control device.													
Rig Up Length At Bottom		ZChart used as secondary depth control device.													
Rig Up Length Correction															
Stretch Correction															
Tool Zero Check At Surface															
Survey Record															
Survey Calculation															
Method :	Minimum Radius of Curvature	DLS Method :	Lubinski												
North Reference :	True North	Total Correction Formula :	Magnetic Dec												
Rig Location															
Latitude :	40.151820 degrees	Longitude :	-104.53560 degrees												
Tie In Point															
Measured Depth:	0.00 ft	Inclination:	0.00 deg												
True Vertical Depth:	0.00 ft	North Displacement:	0.00 ft												
Survey Quality Index															
28 : Tie-In Point															
Survey Correction Index															
0 : No correction															
Survey Description Index															
0 : Not Flagged Survey															
Seq	MD (ft)	Incl (deg)	Azim (deg)	Course (ft)	TVD (ft)	V Sec (ft)	N/ -S (ft)	E/ -W (ft)	Closure (ft)	at Azim (deg)	DLS deg/100ft	Tool Type	QI	CI	DI
1	0.00	0.00	0.00	- - - -	0.00	0.00	0.00	0.00	0.00	90.00	0.00	TIP	28	0	0
USIT - Fluid Properties Measurement															
Run Name				Pass Name				Start Depth(ft)				Stop Depth(ft)			
Run 1				Log[3]:Up				6798.71				64.33			

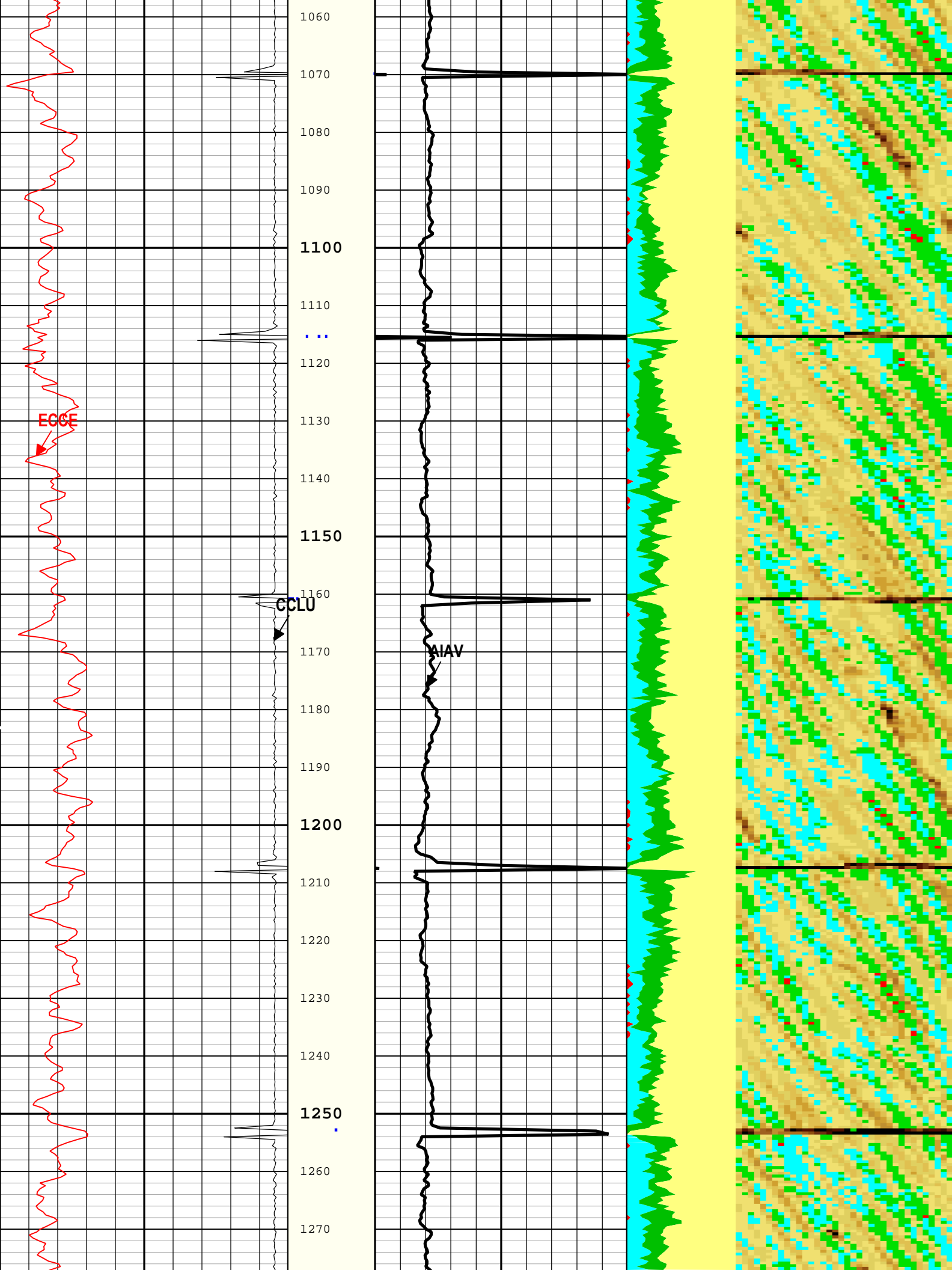


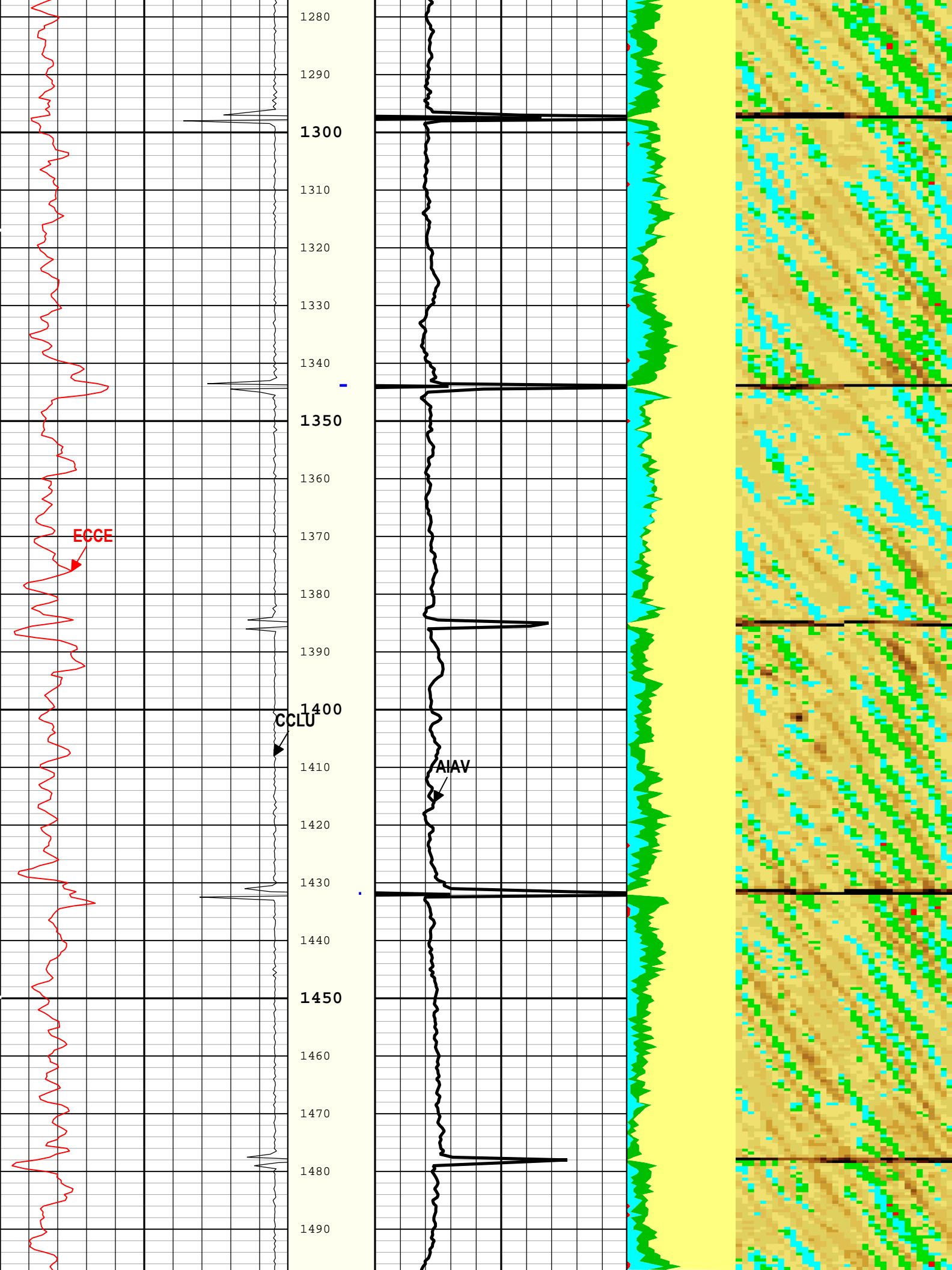


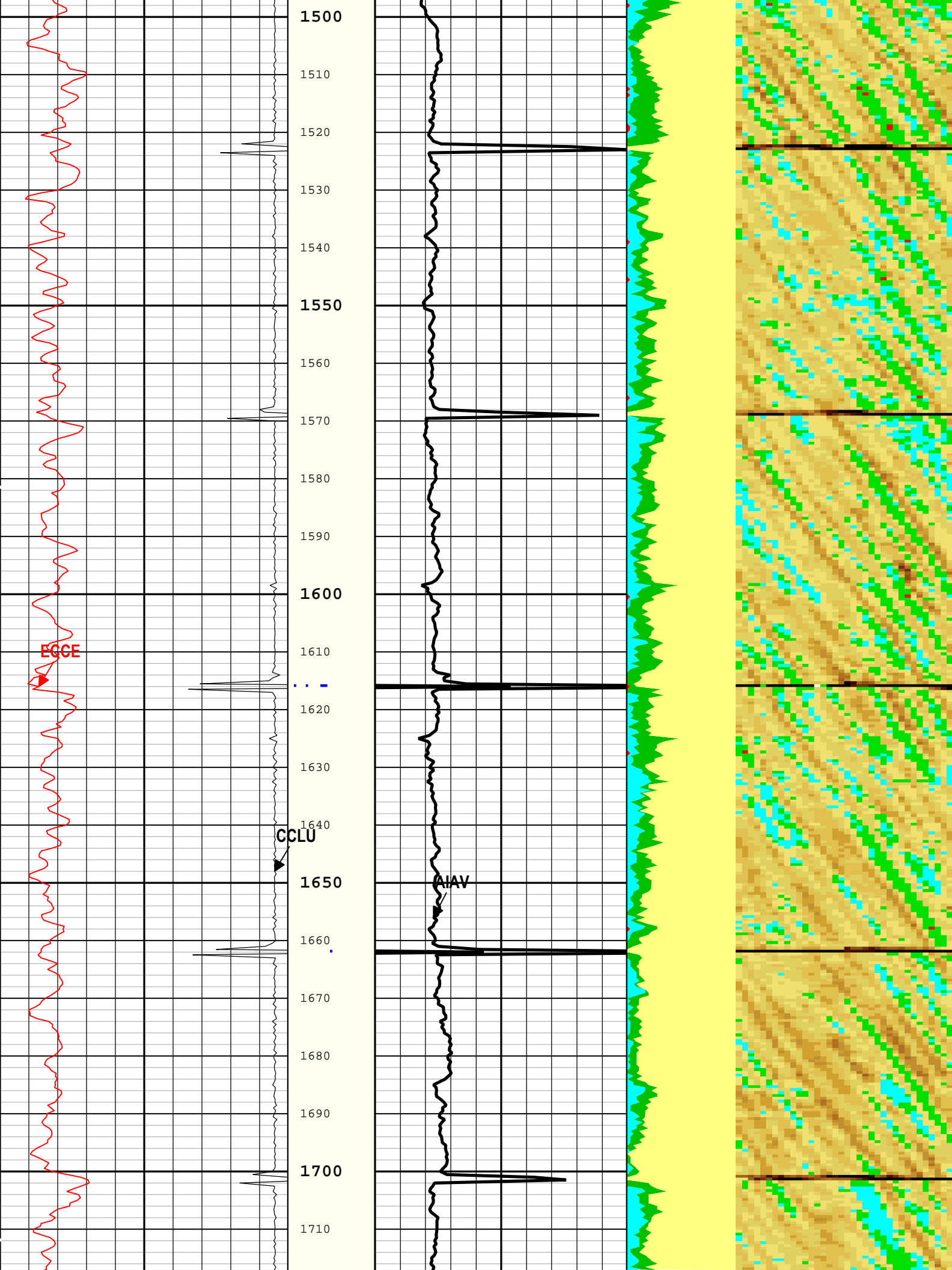


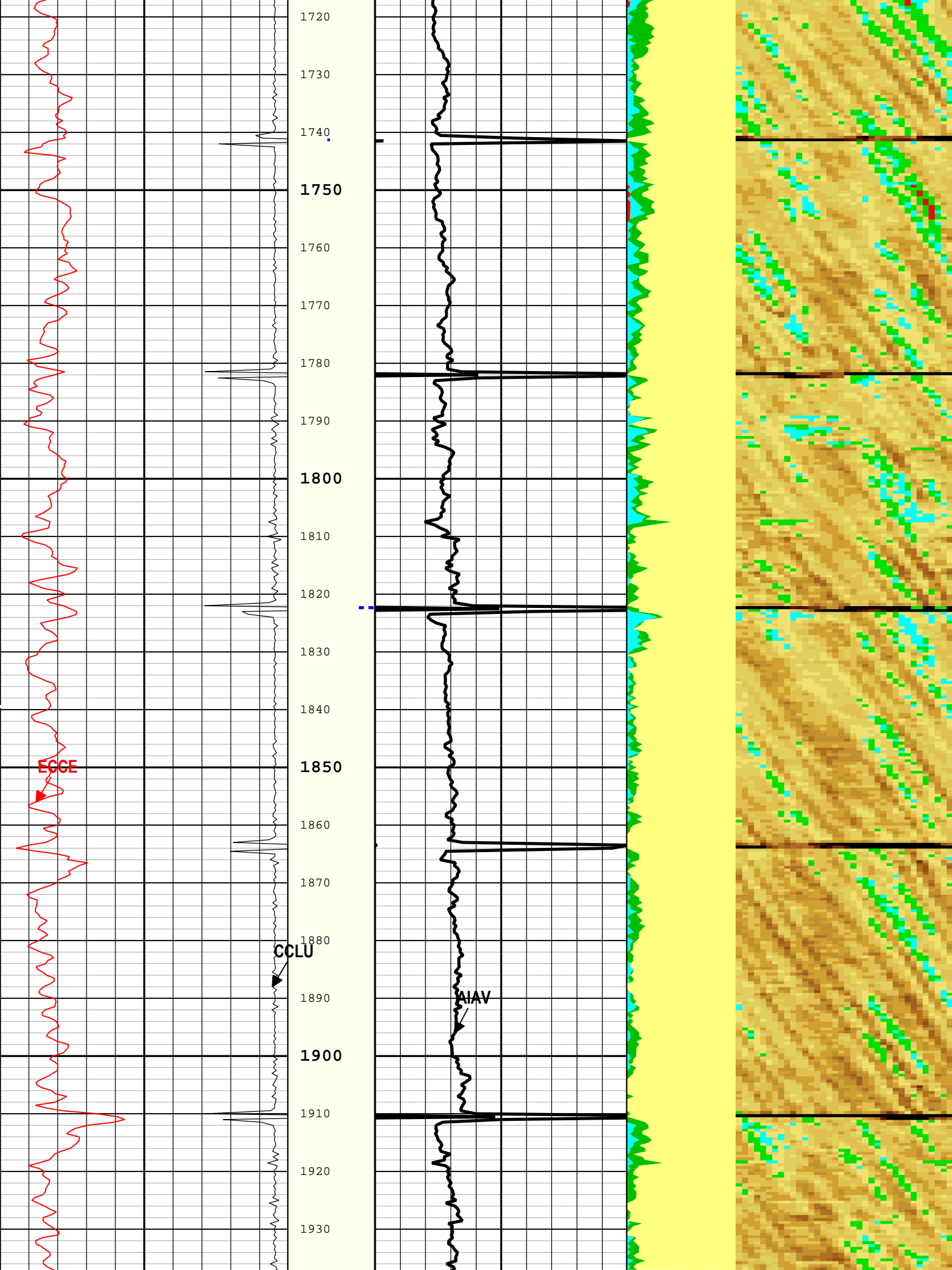


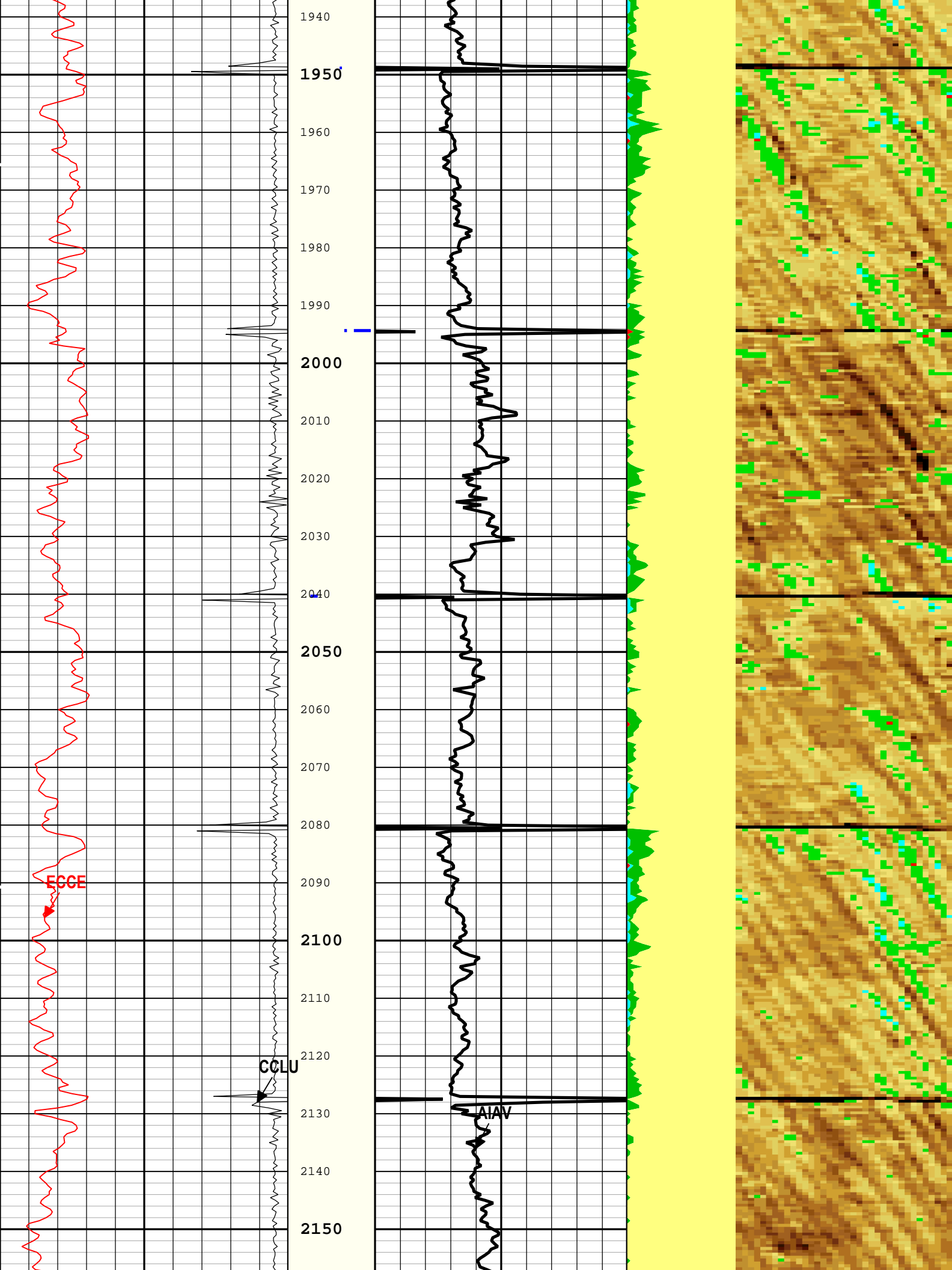


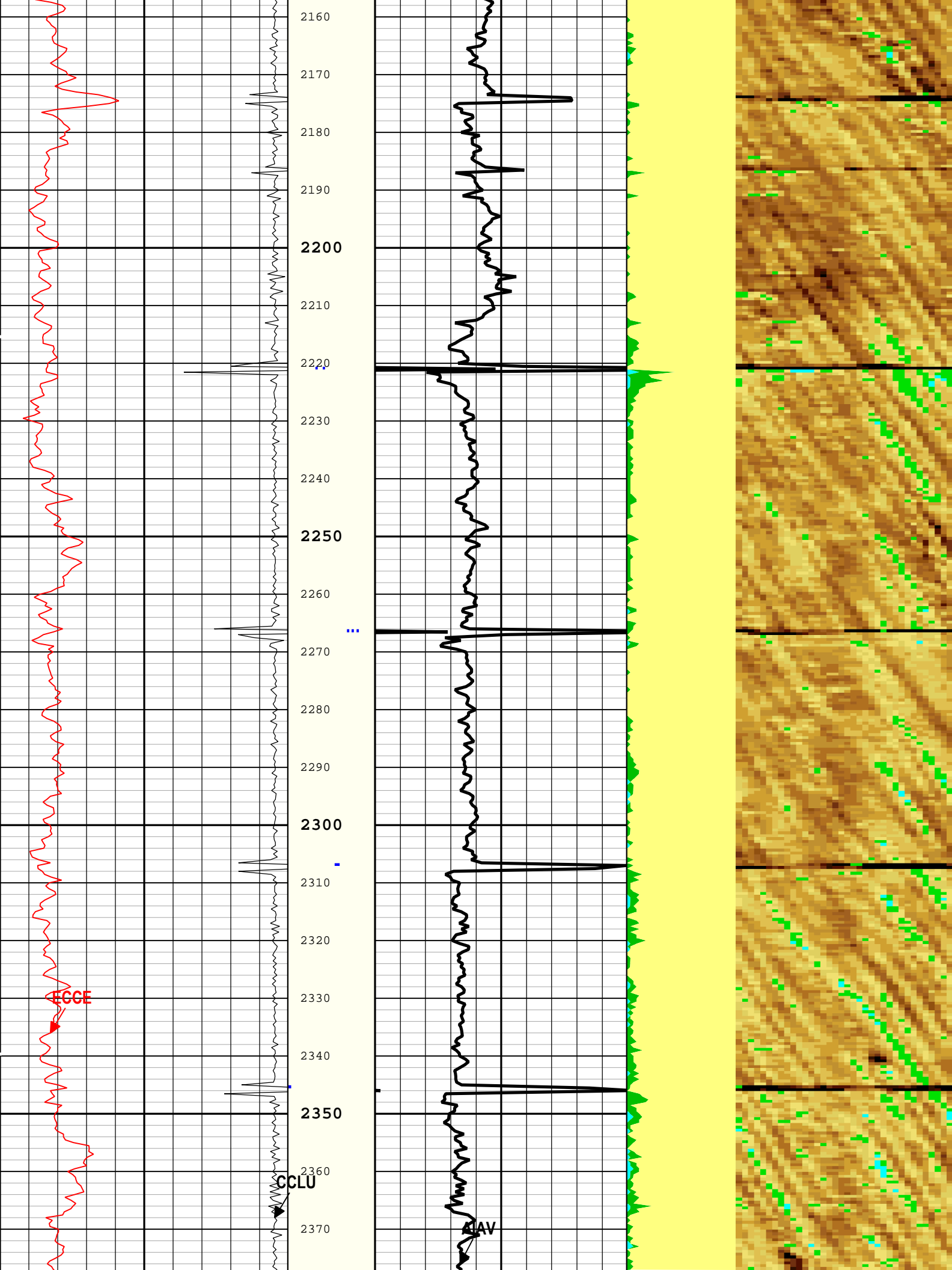


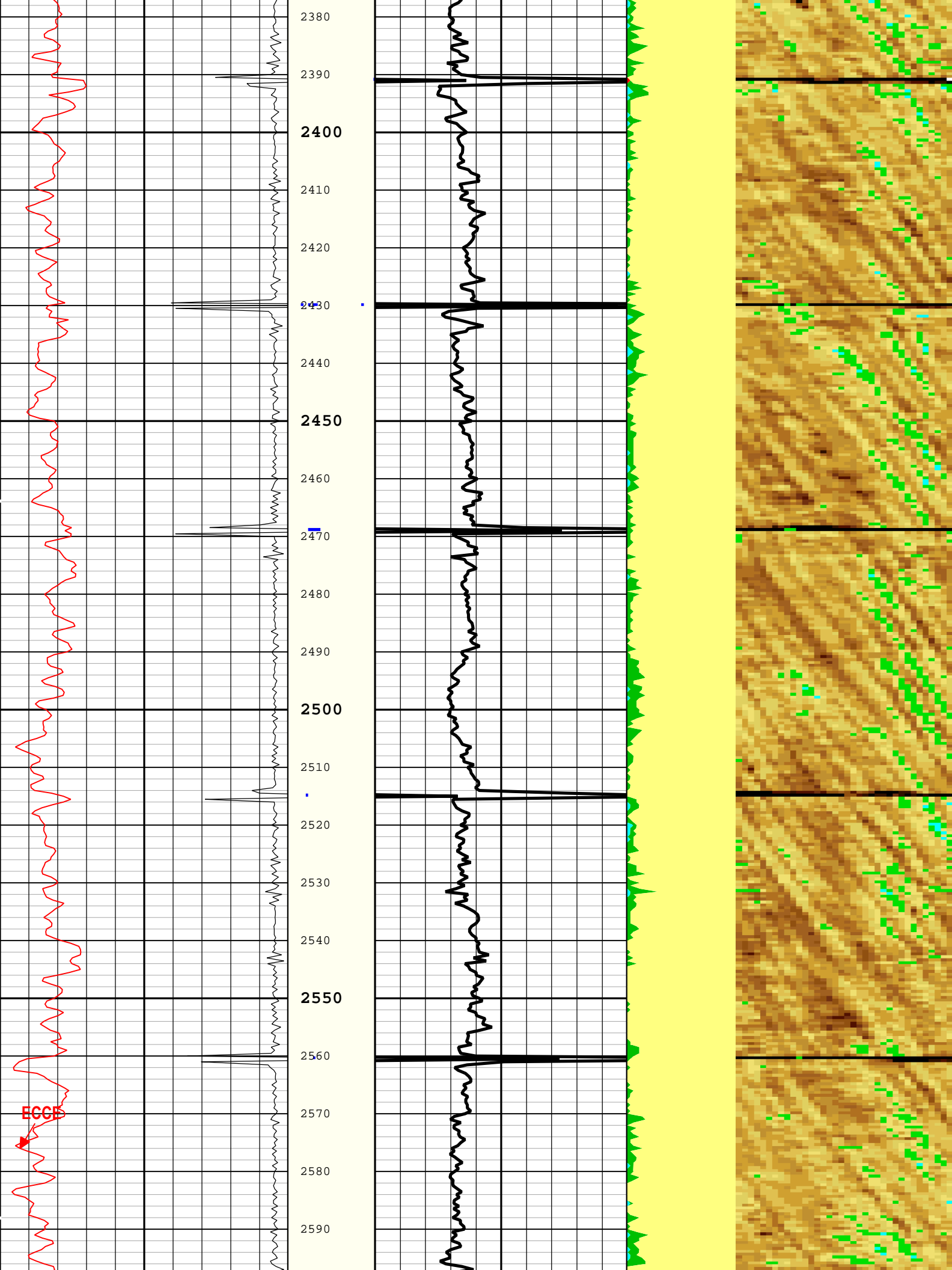


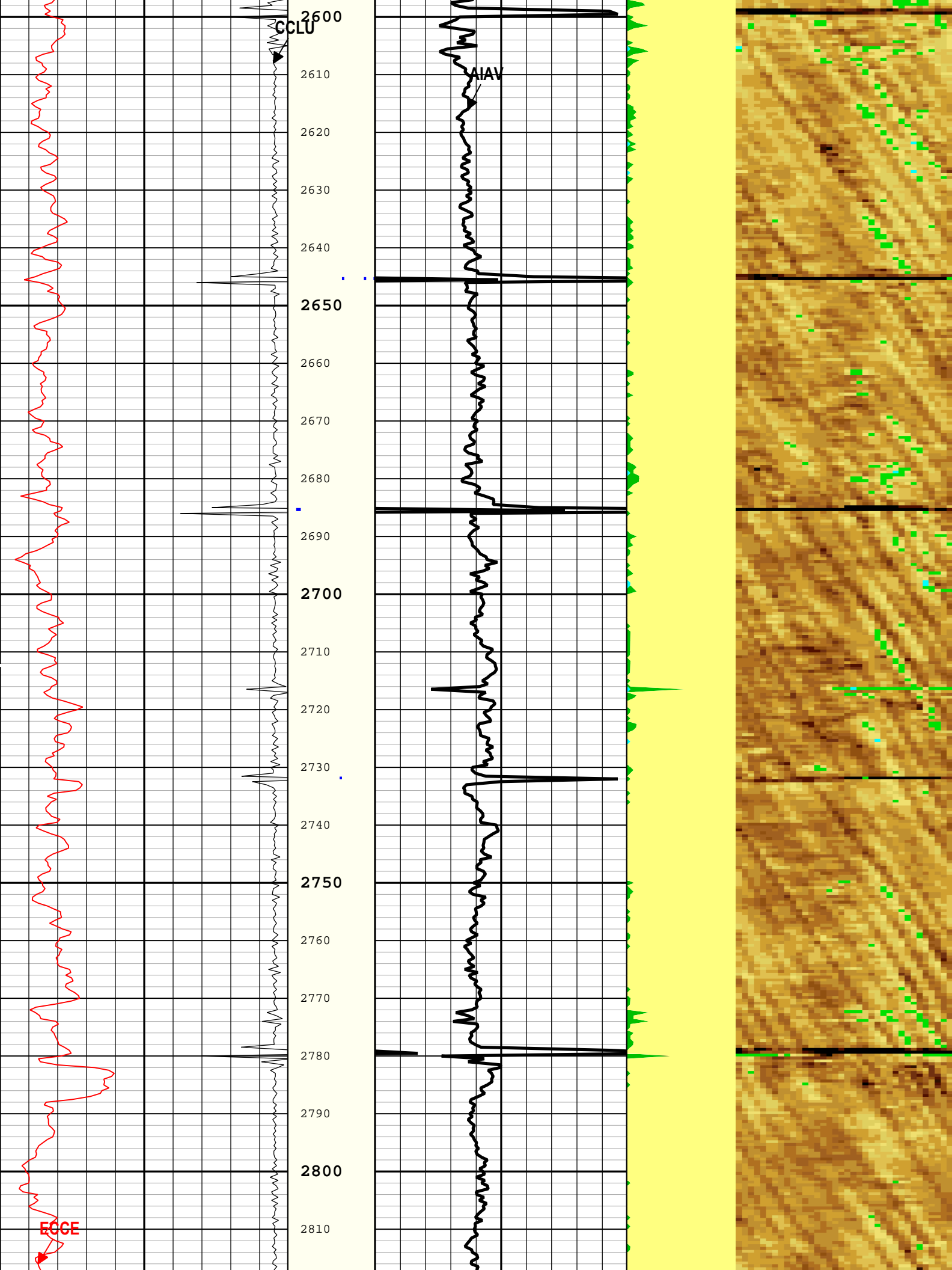


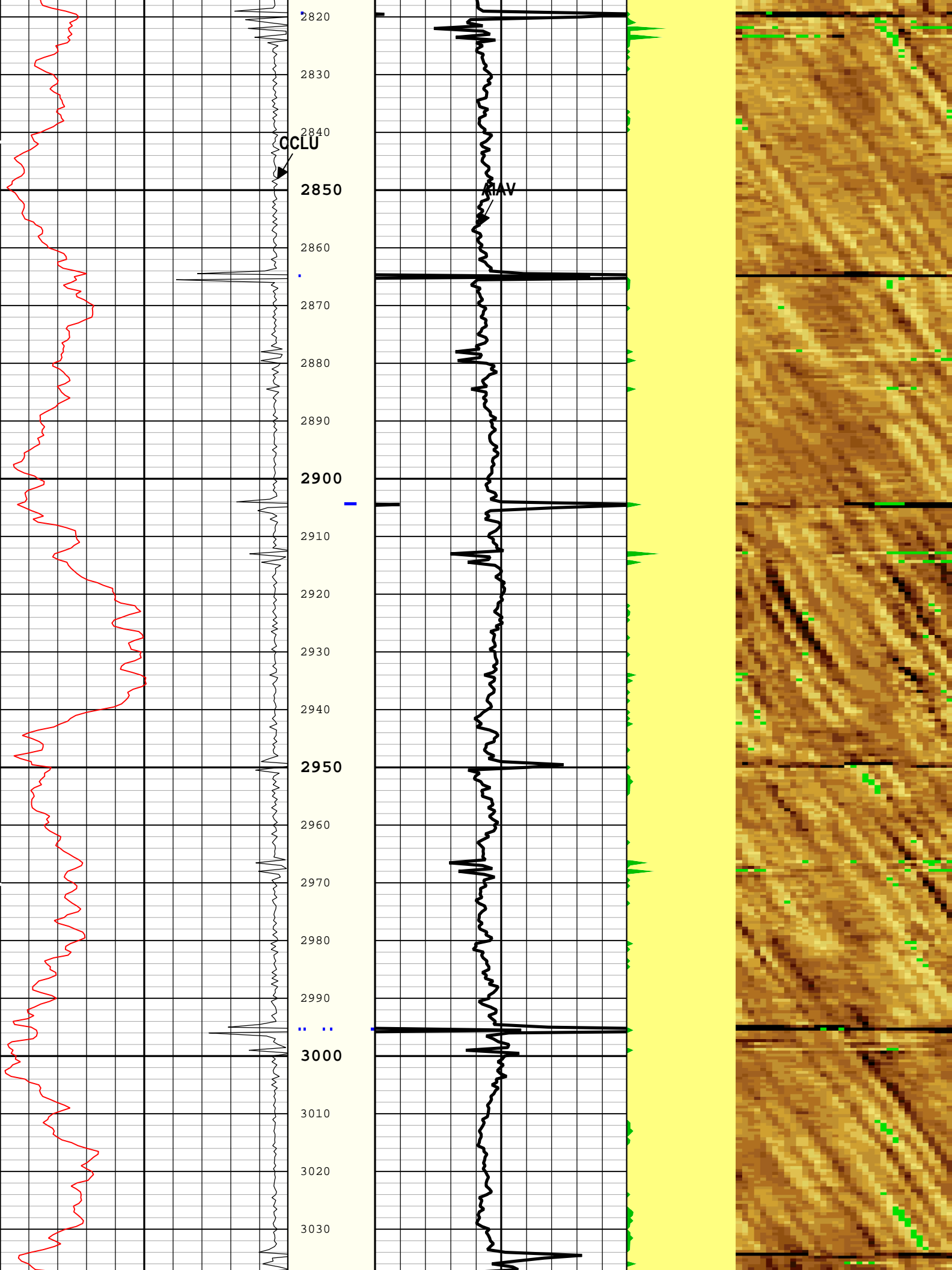


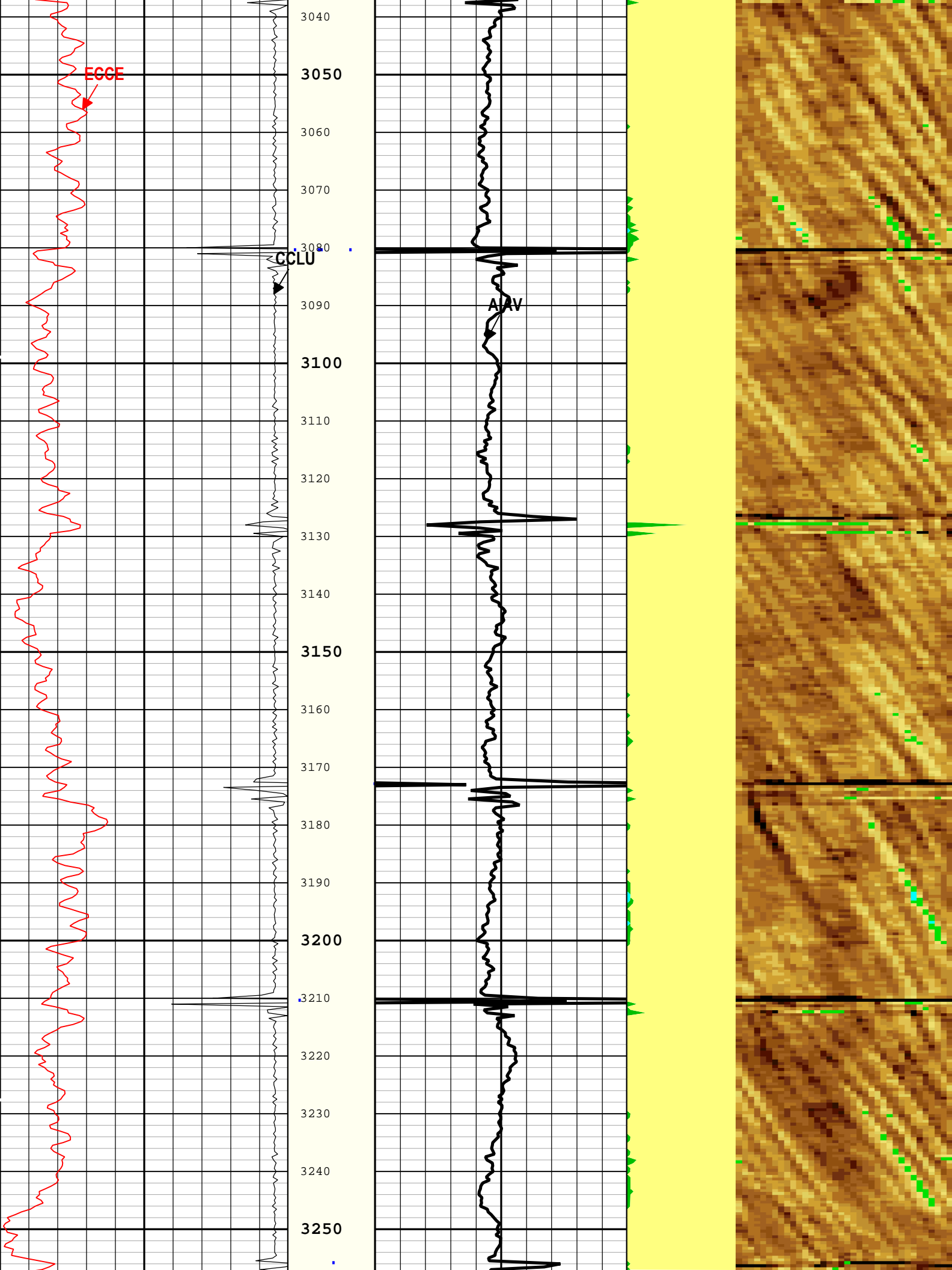


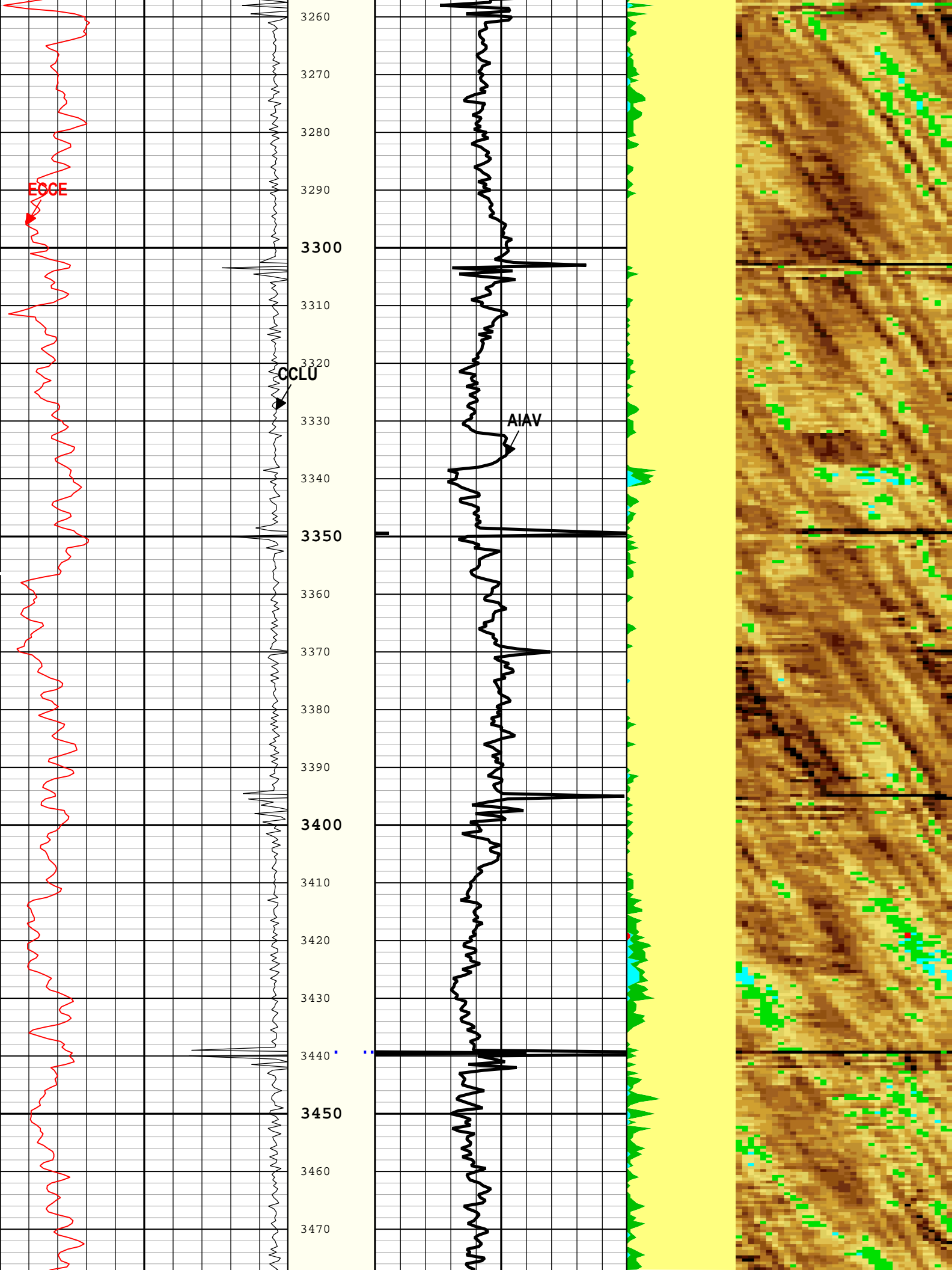


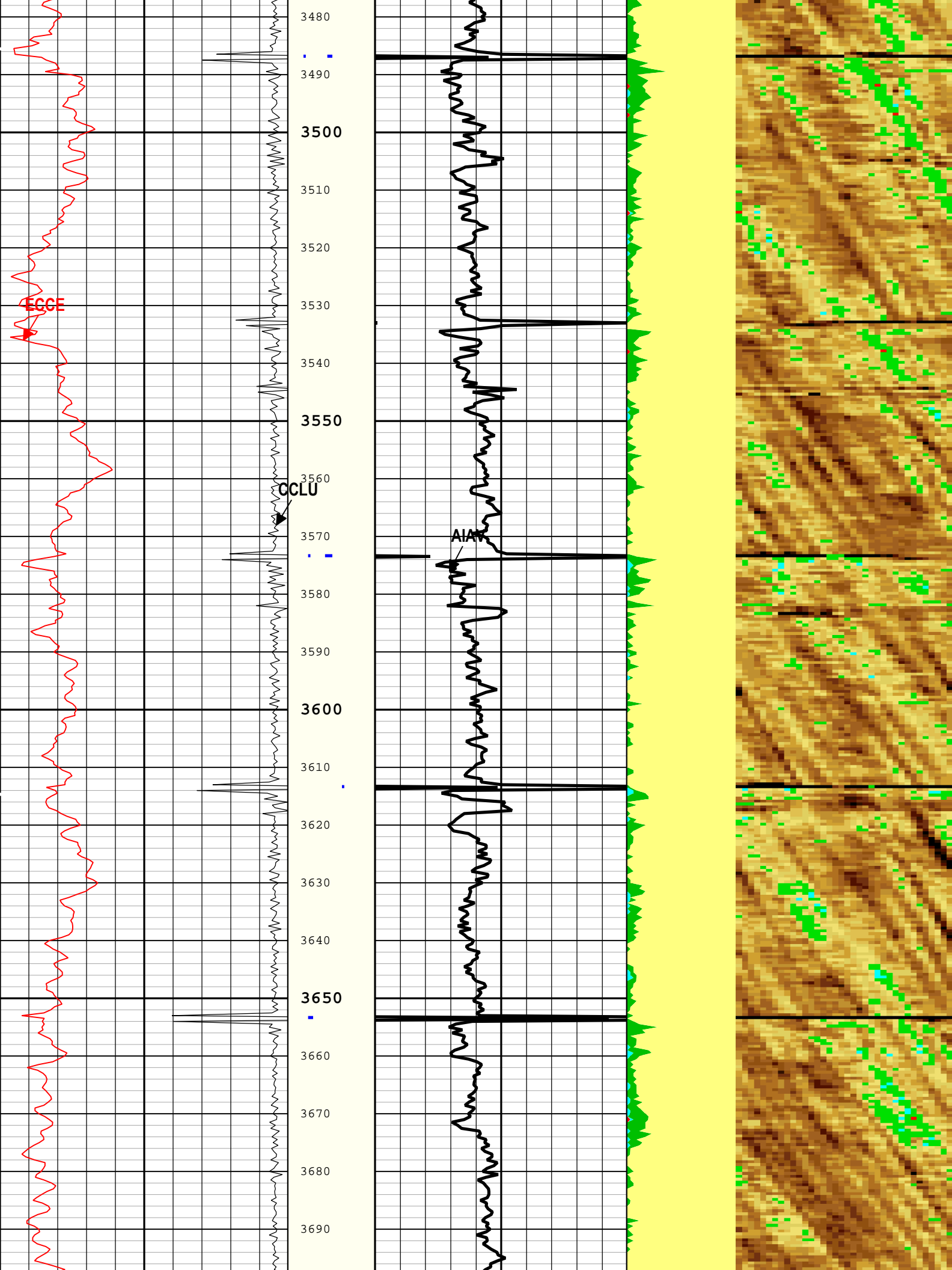


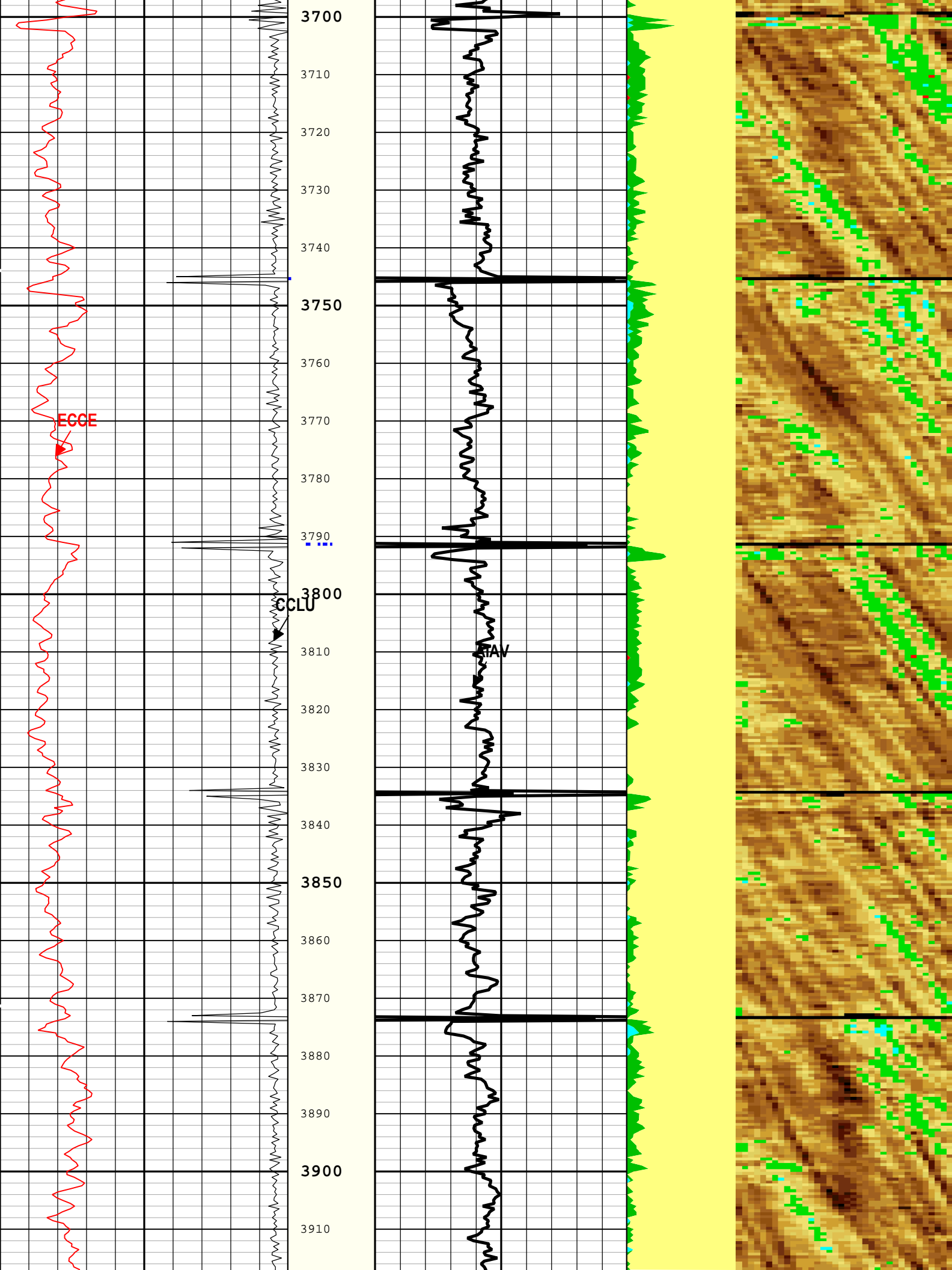


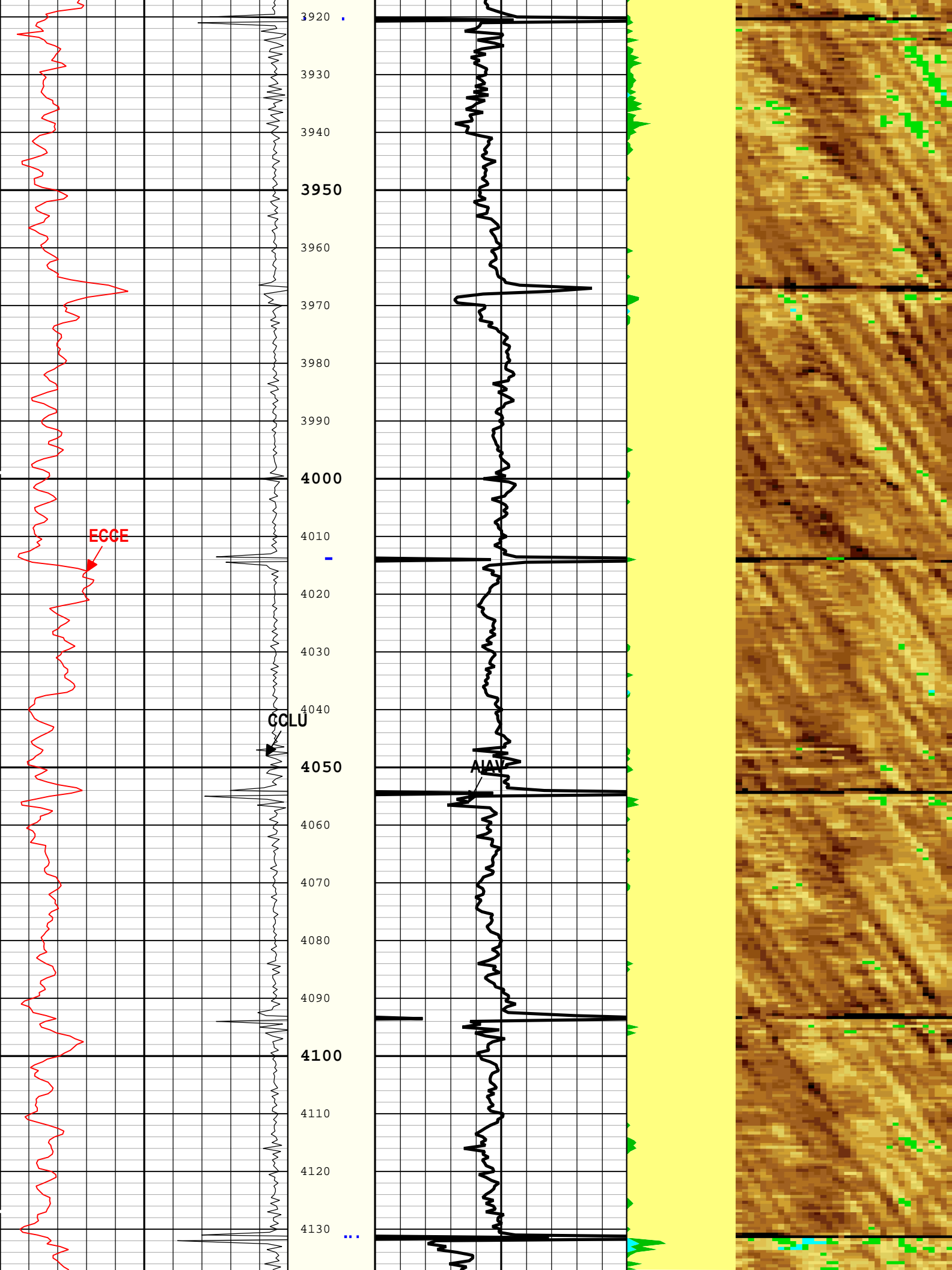


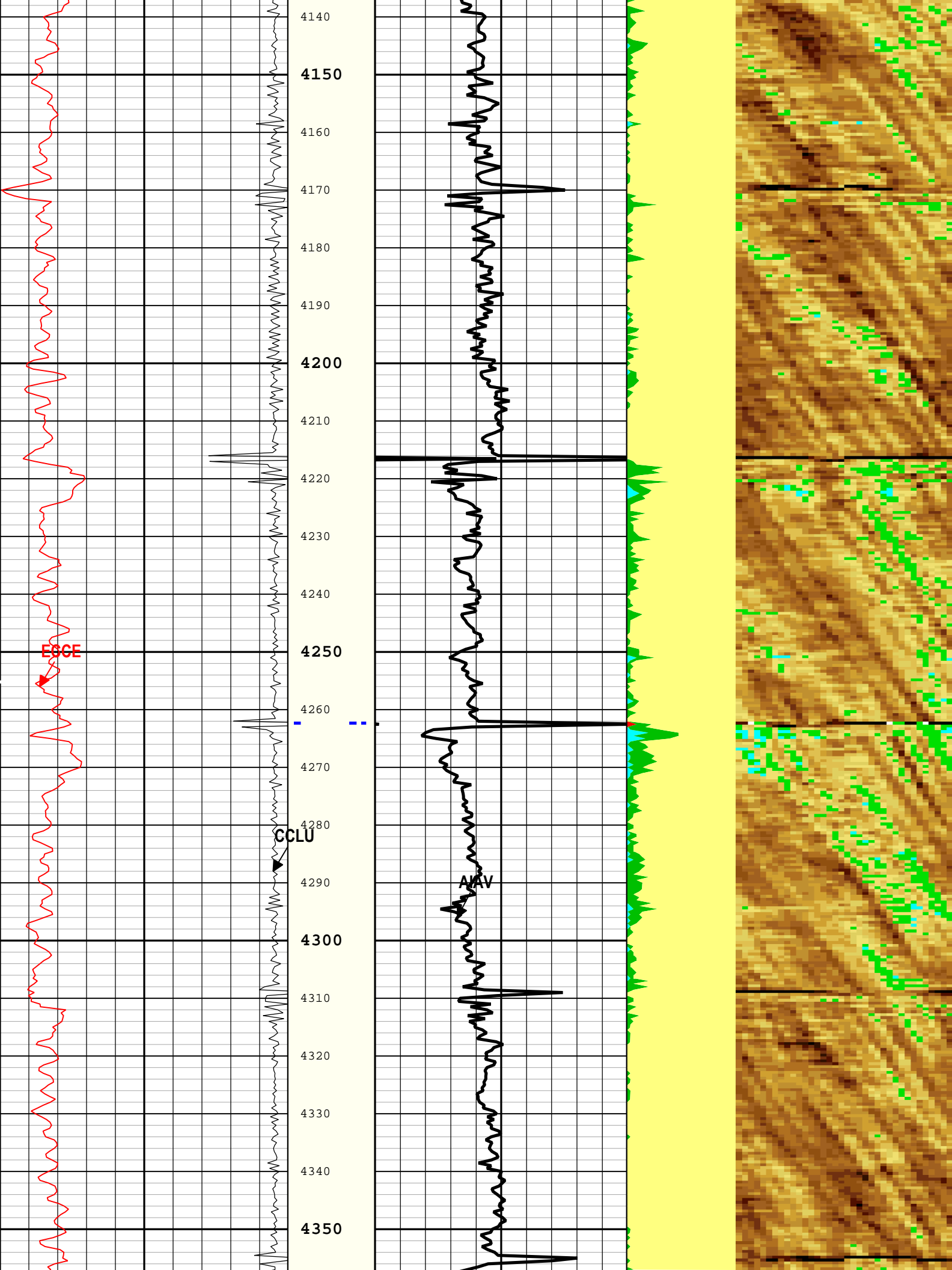


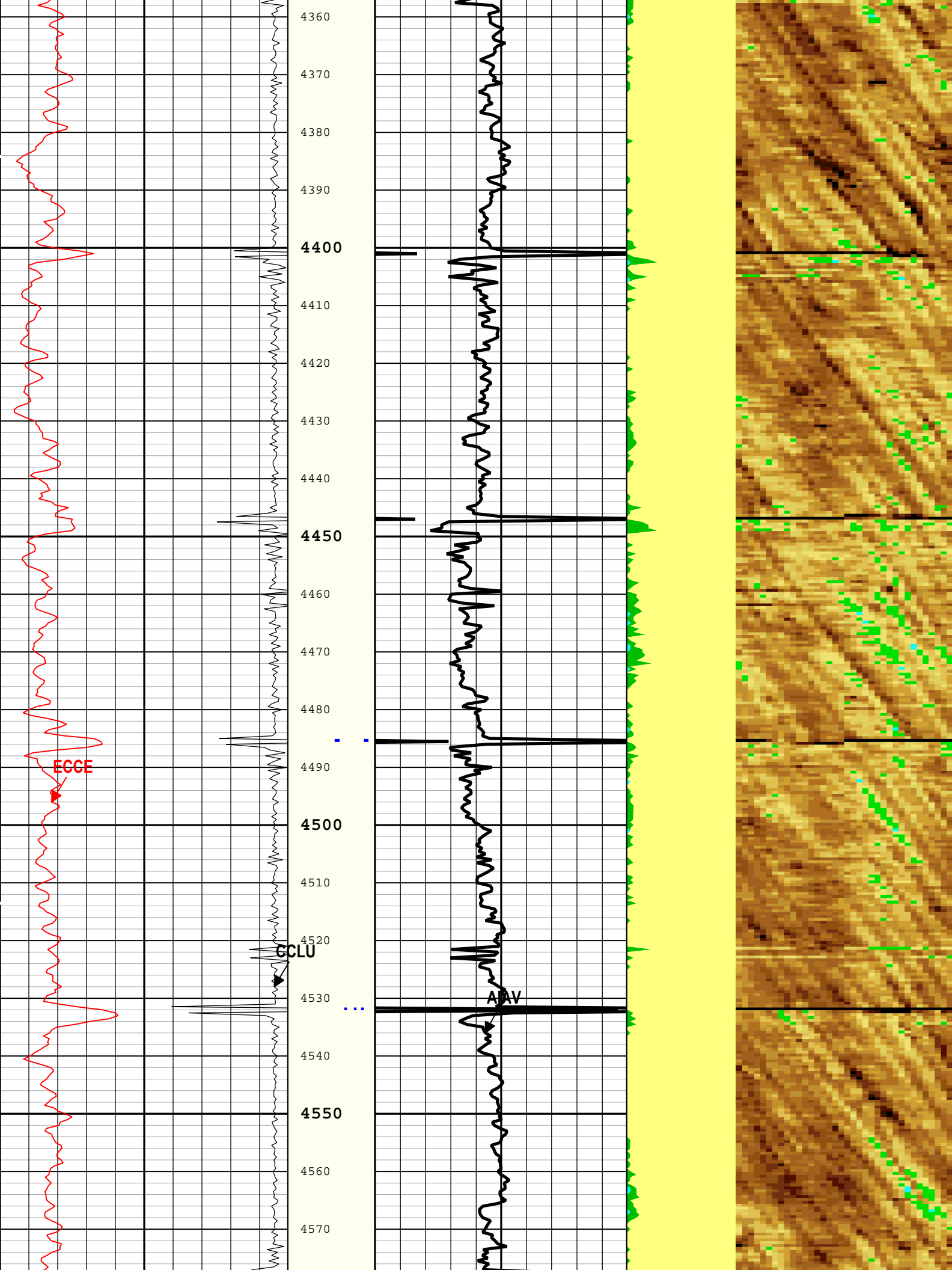


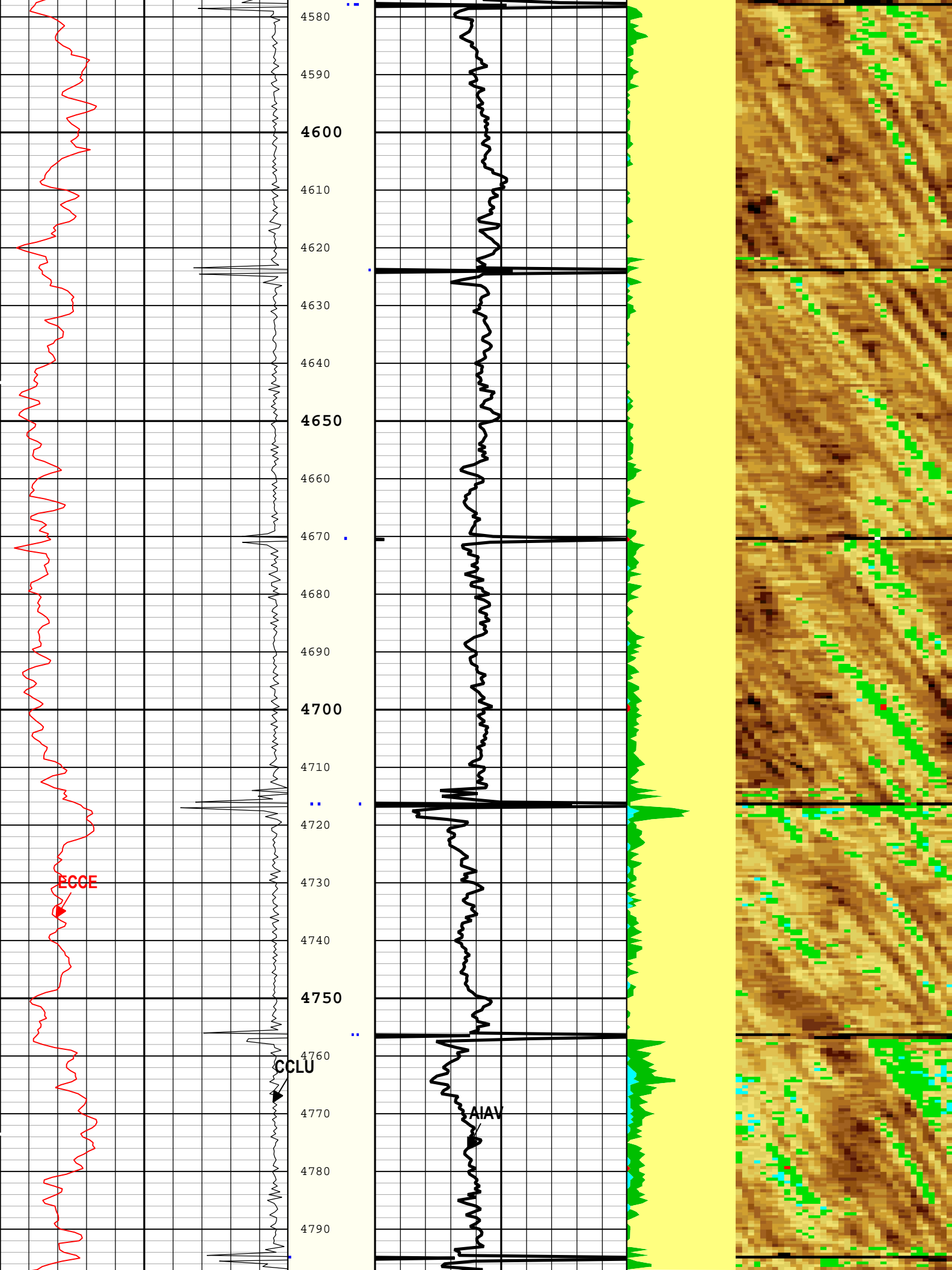


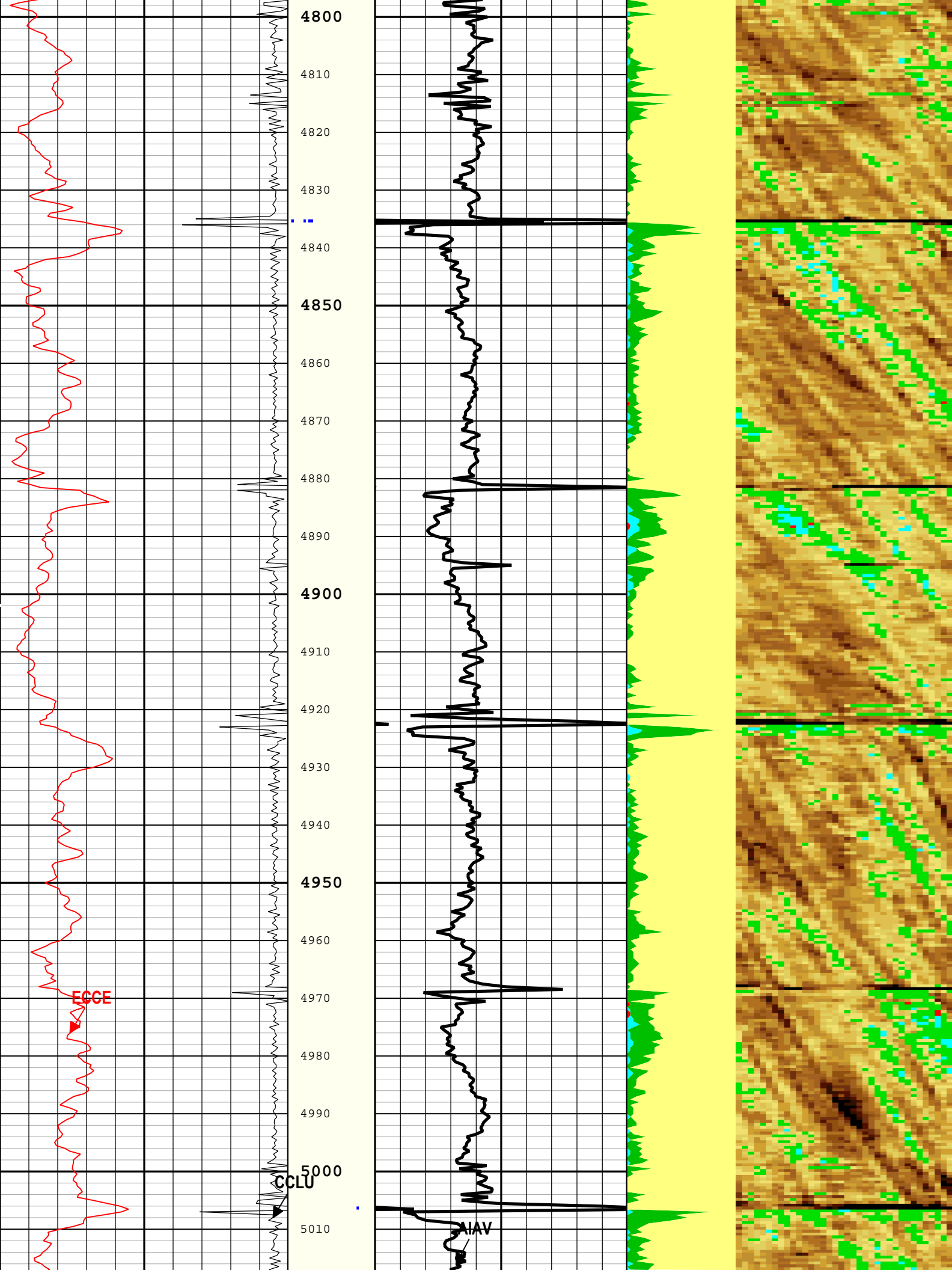


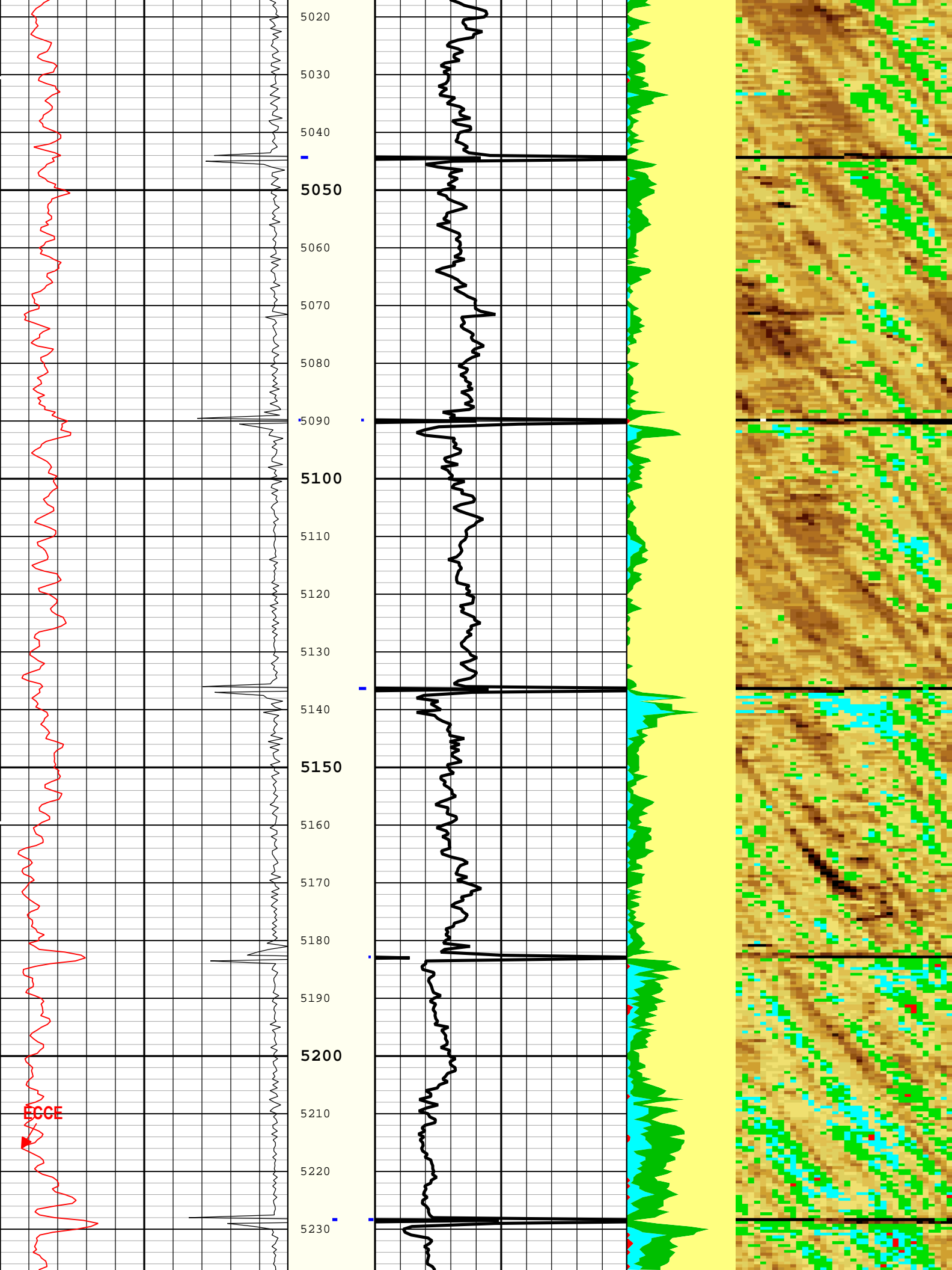


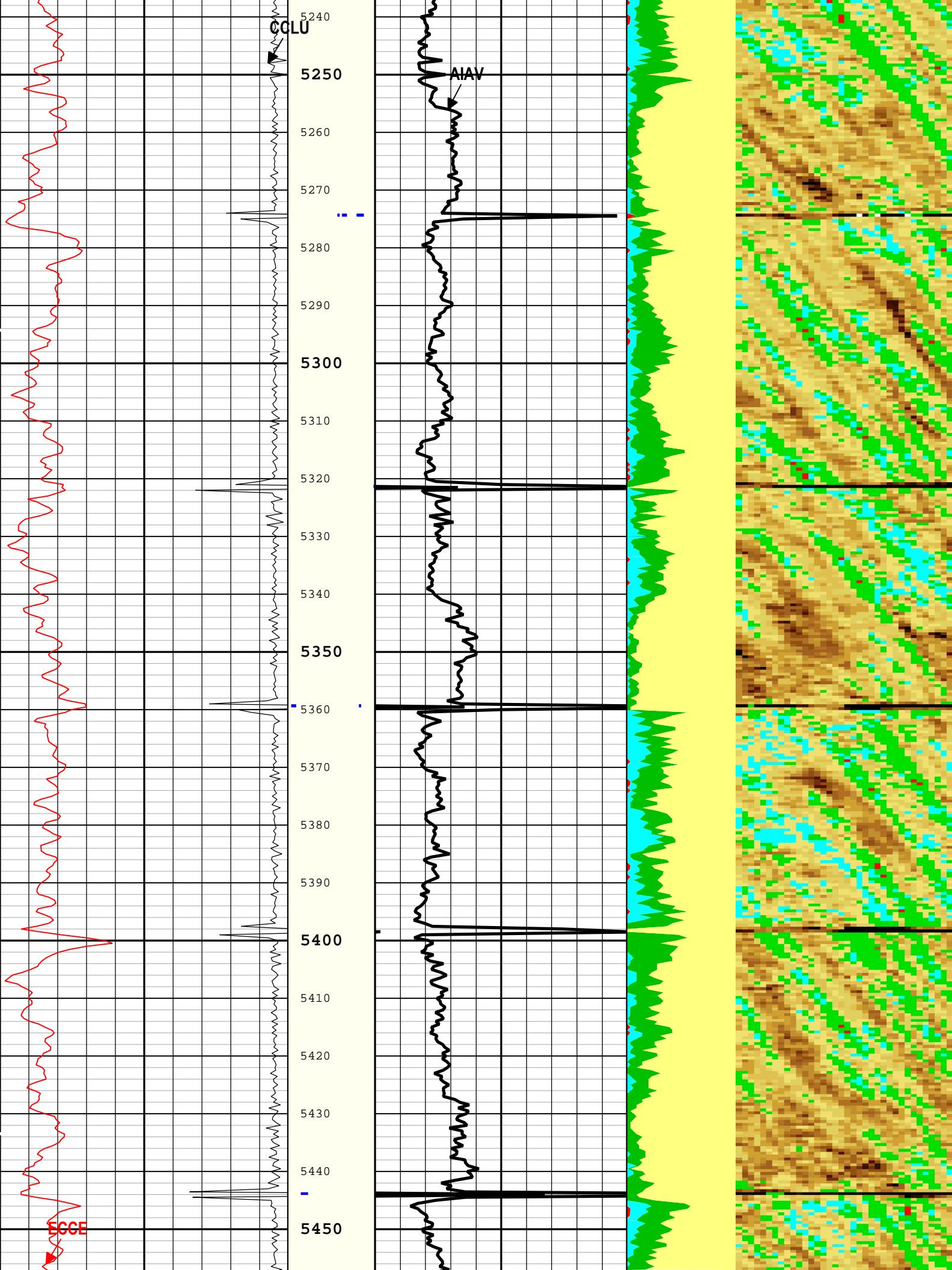


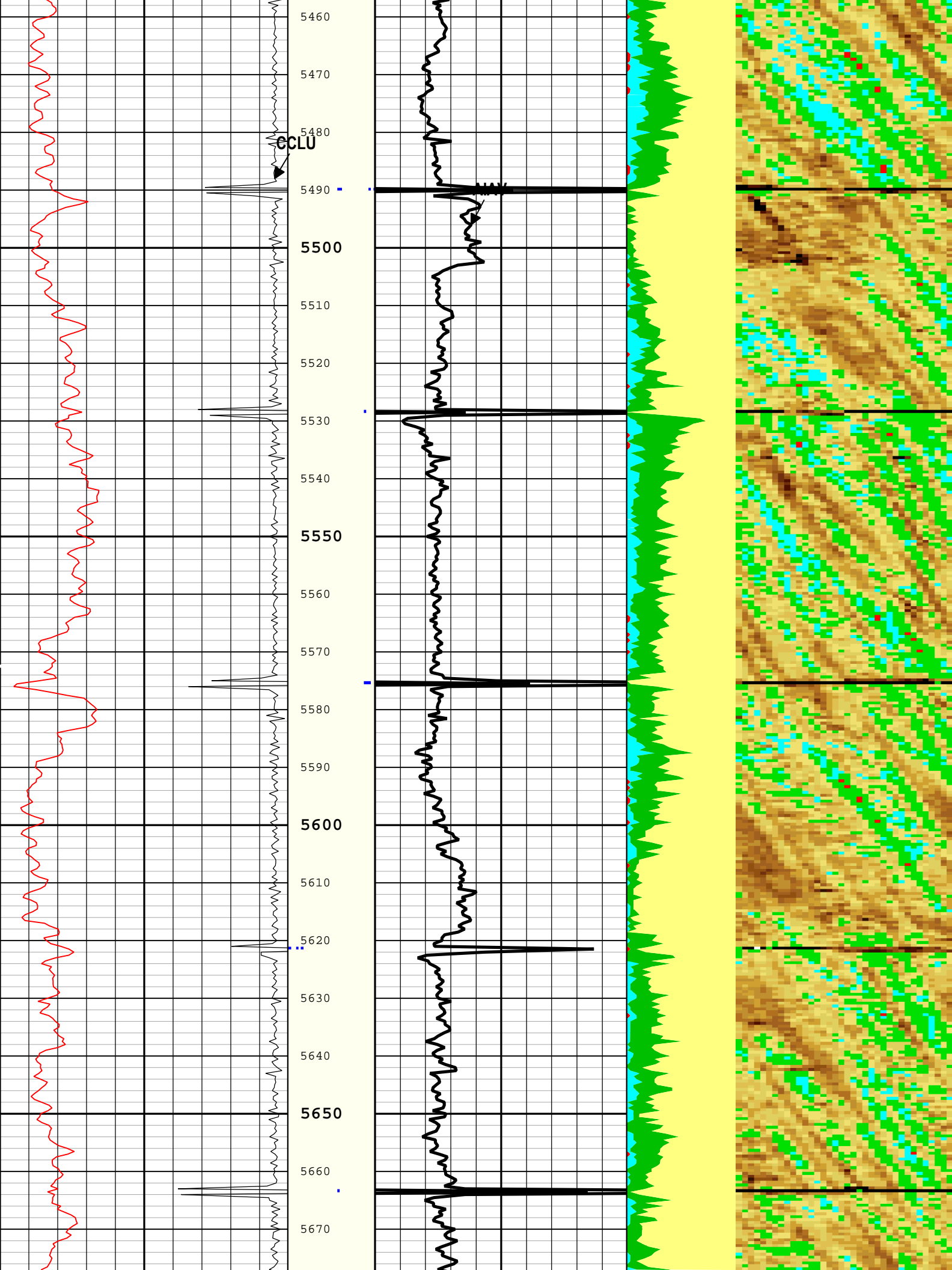


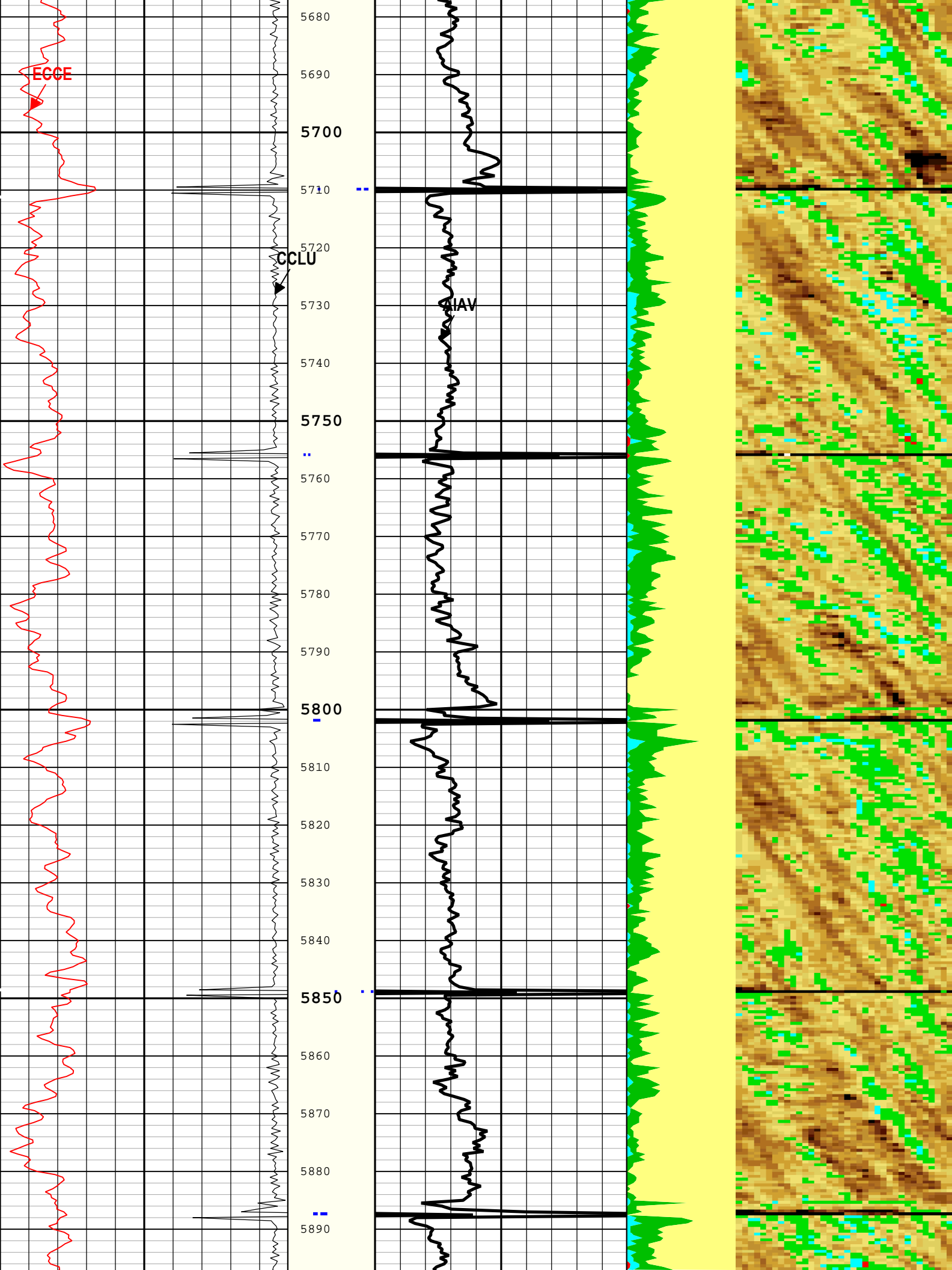


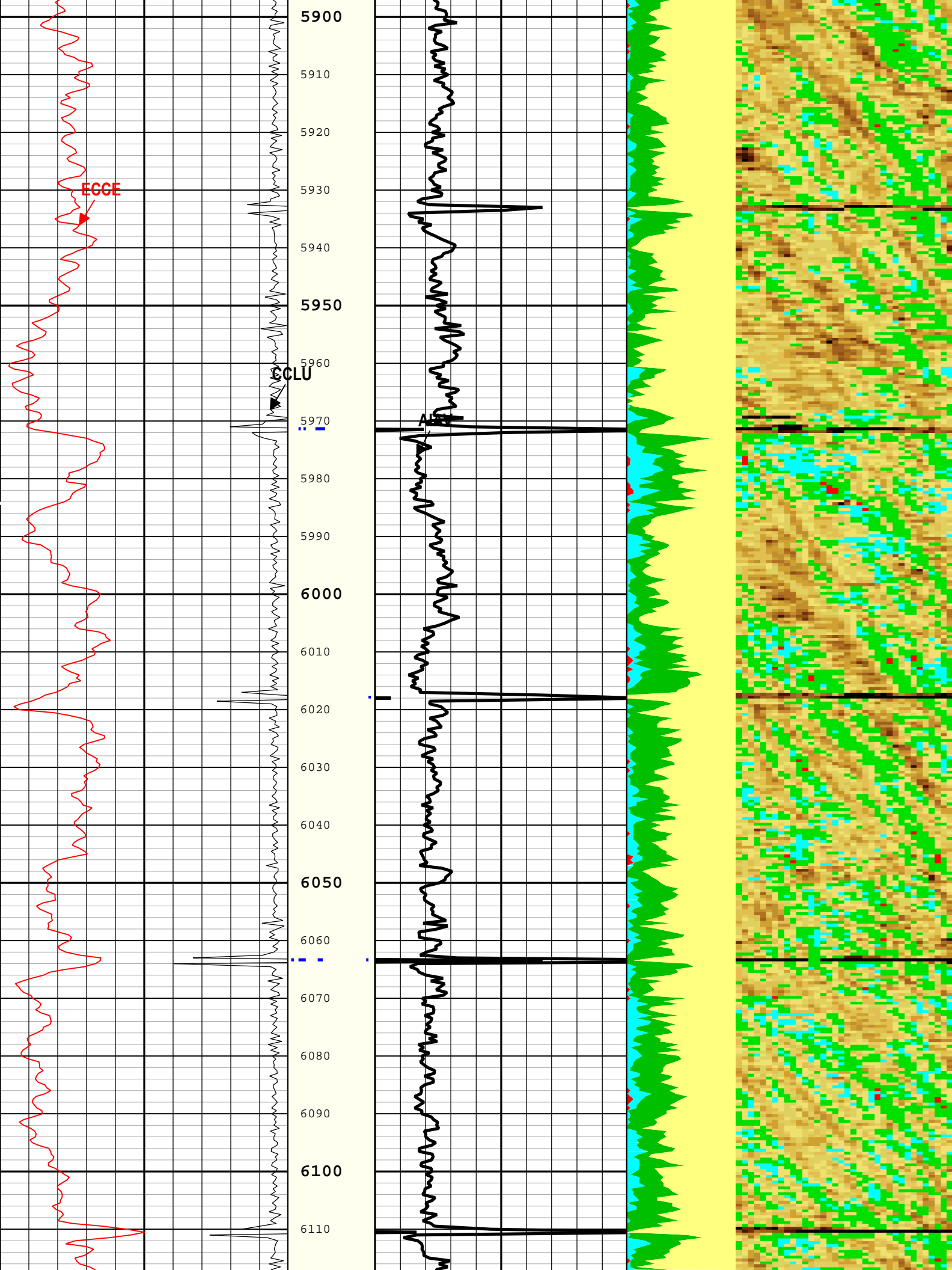


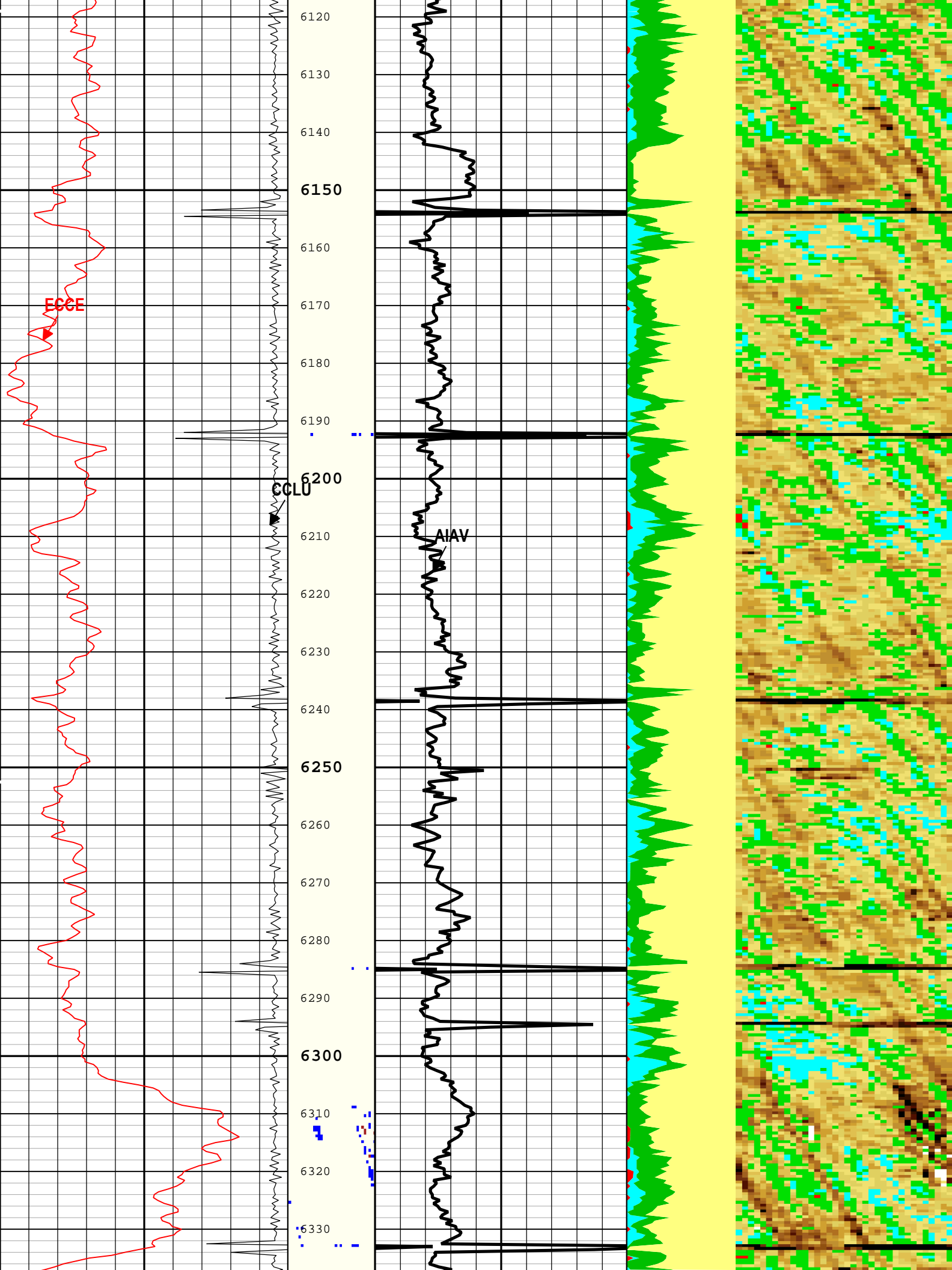


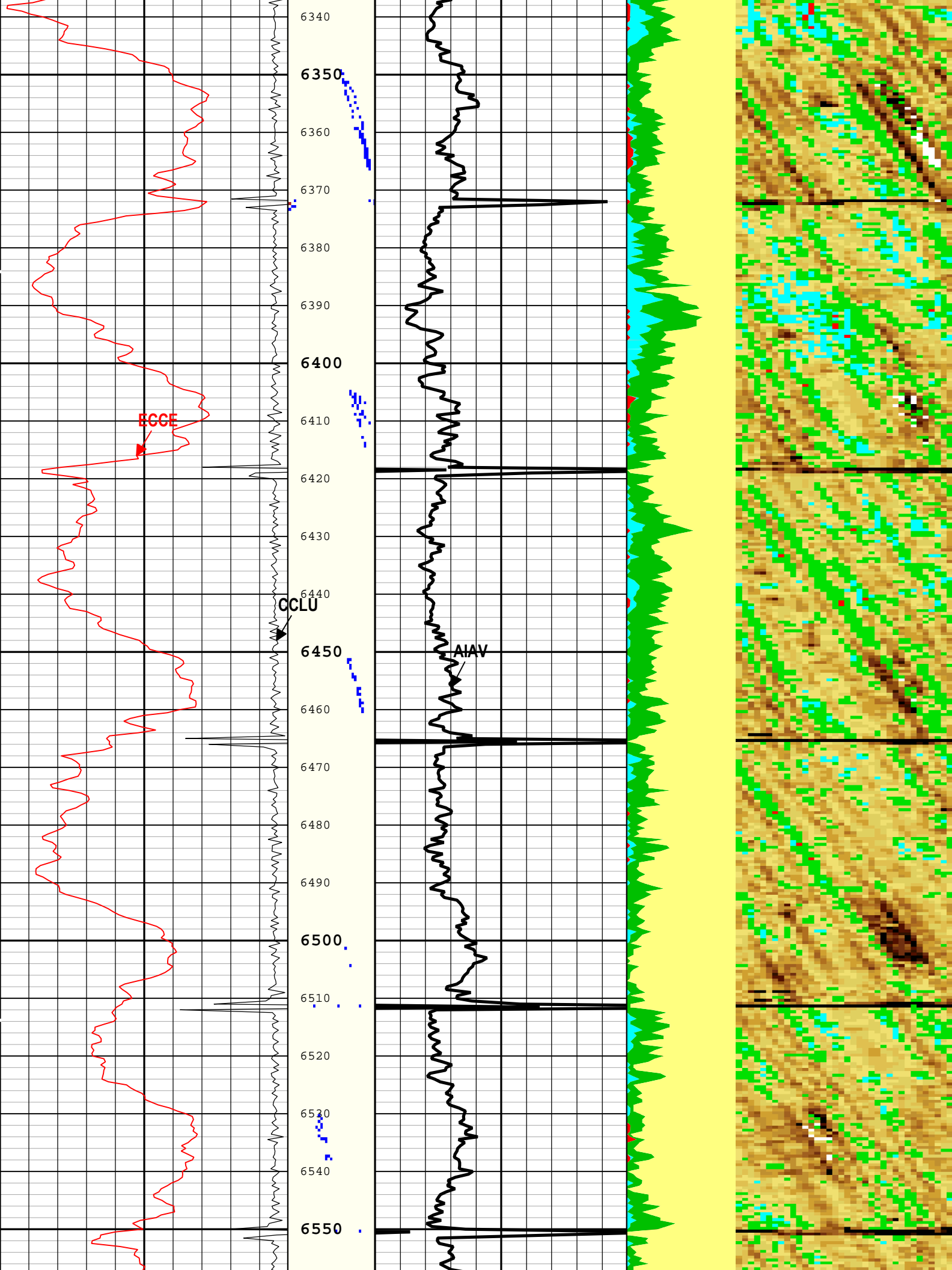


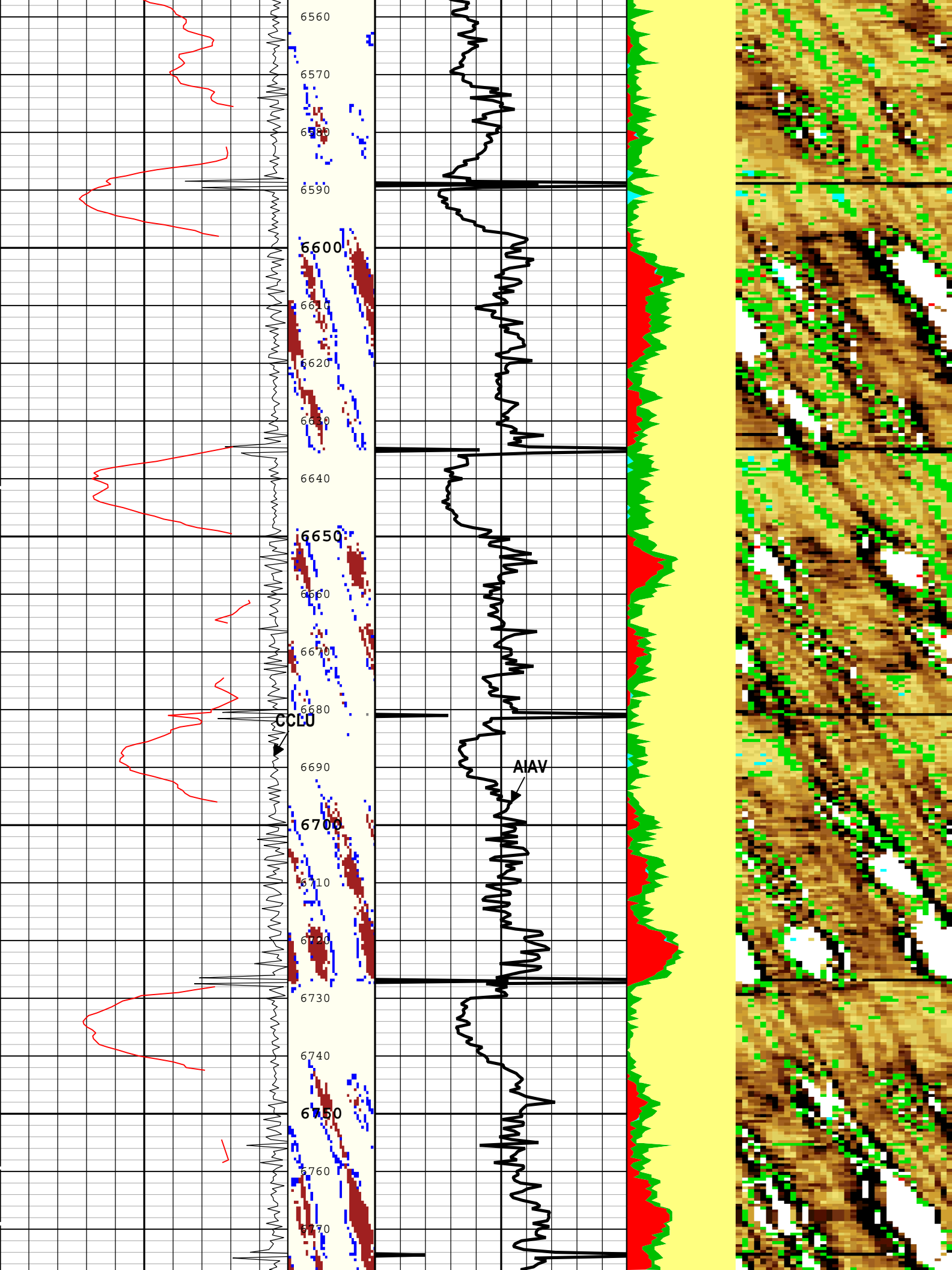












HRES	Horizontal Resolution	USIT-E	10 deg	
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	No	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 6.0 in LF	
WINB	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	31.88	24-Jan-2018 11:25:43	24-Jan-2018 11:25:58	6798.71	6793.48
WINB	16.62	24-Jan-2018 11:25:58	24-Jan-2018 12:27:54	6793.48	64.33
WINE	71.88	24-Jan-2018 11:25:43	24-Jan-2018 11:26:11	6798.71	6784.84
WINE	74.95	24-Jan-2018 11:26:11	24-Jan-2018 11:31:09	6784.84	6769.08
WINE	78.02	24-Jan-2018 11:31:09	24-Jan-2018 12:27:54	6769.08	64.33

All depth are at tool zero.

One

0 PSI Repeat Pass

Software Version

Acquisition System	Version
Maxwell 2018	8.0.95333.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[1]:Up	Up	1986.53 ft	2546.55 ft	24-Jan-2018 11:08:48 AM	24-Jan-2018 11:11:57 AM	ON	1.67 ft	Yes

All depths are referenced to toolstring zero

Log

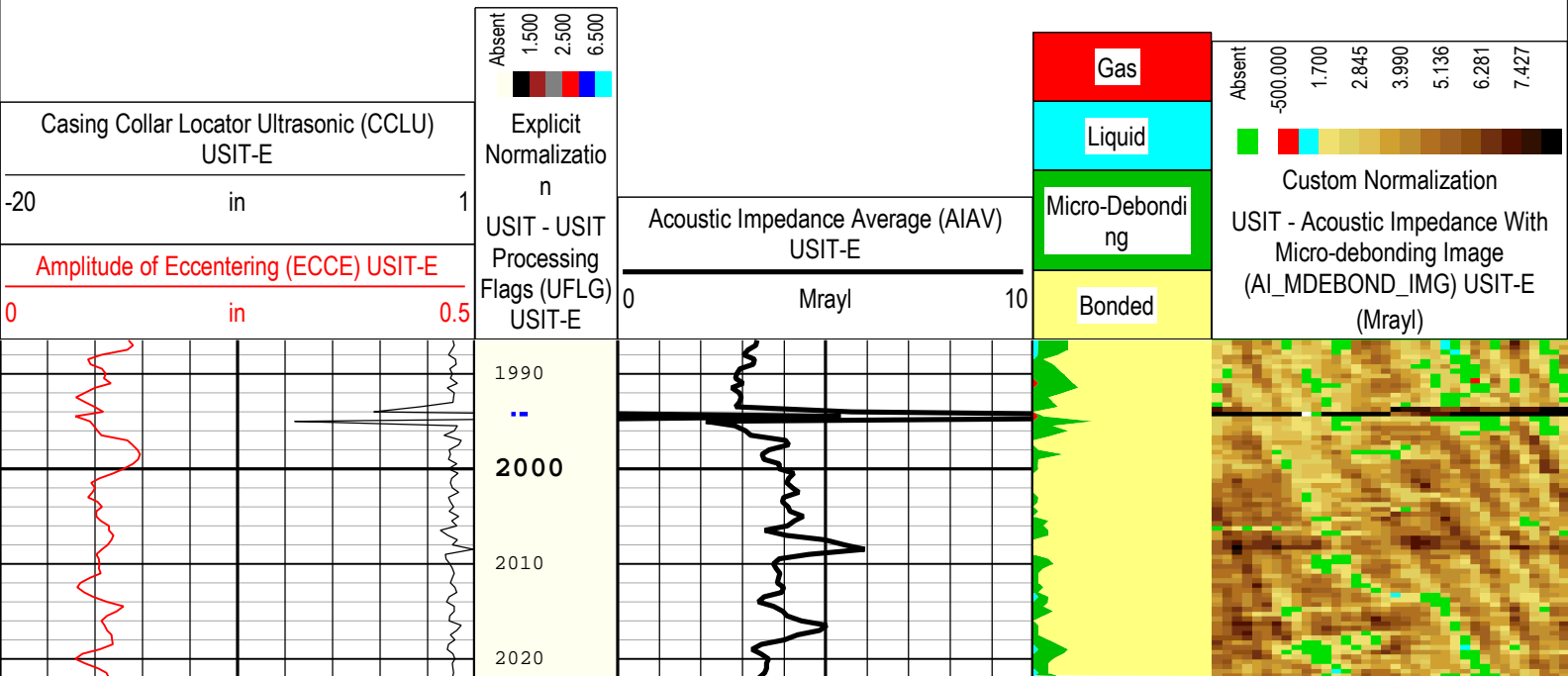
Company:Noble Energy Inc Well:Bison Ridge Y22-741

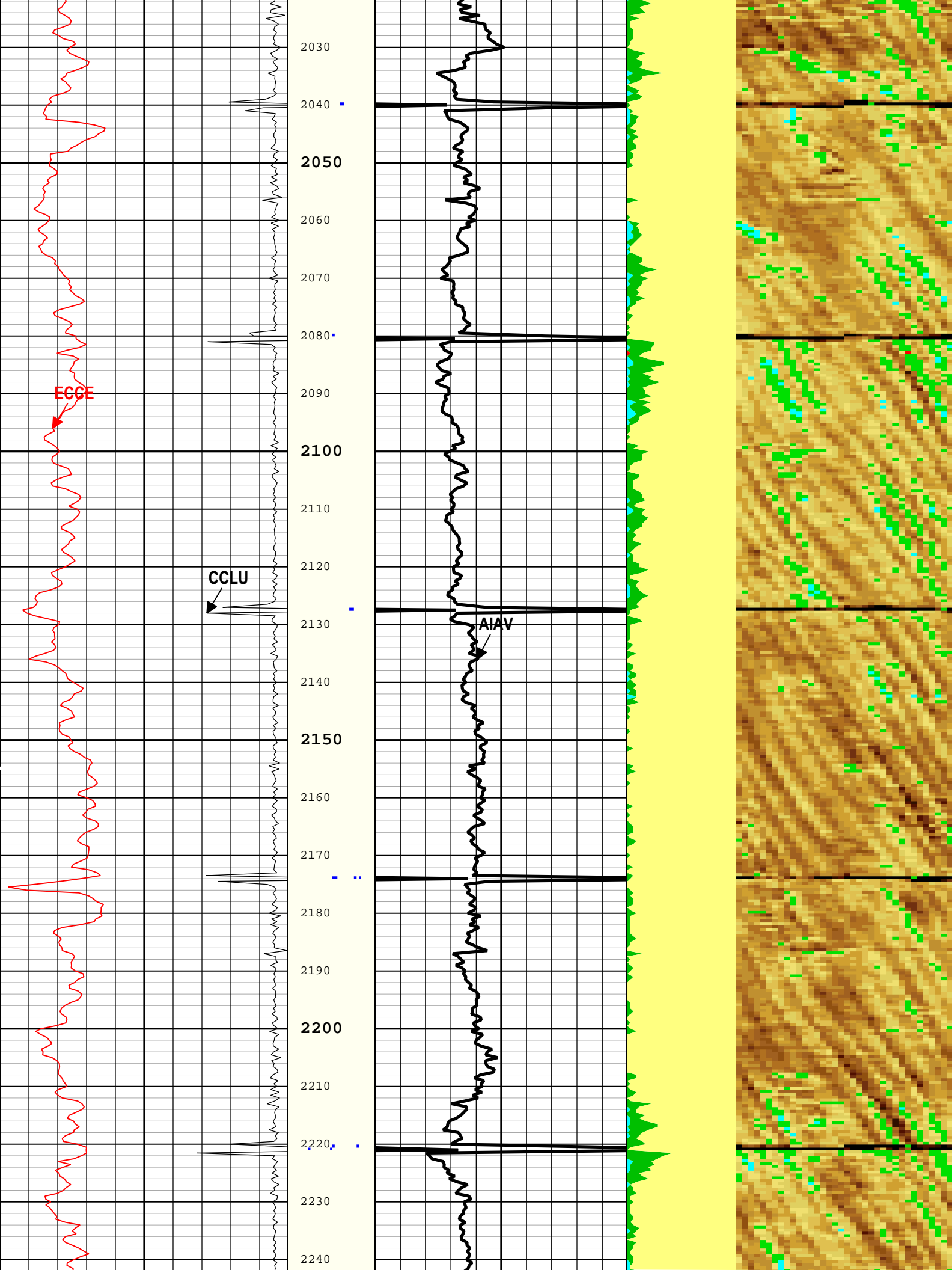
One: Log[1]:Up:S008

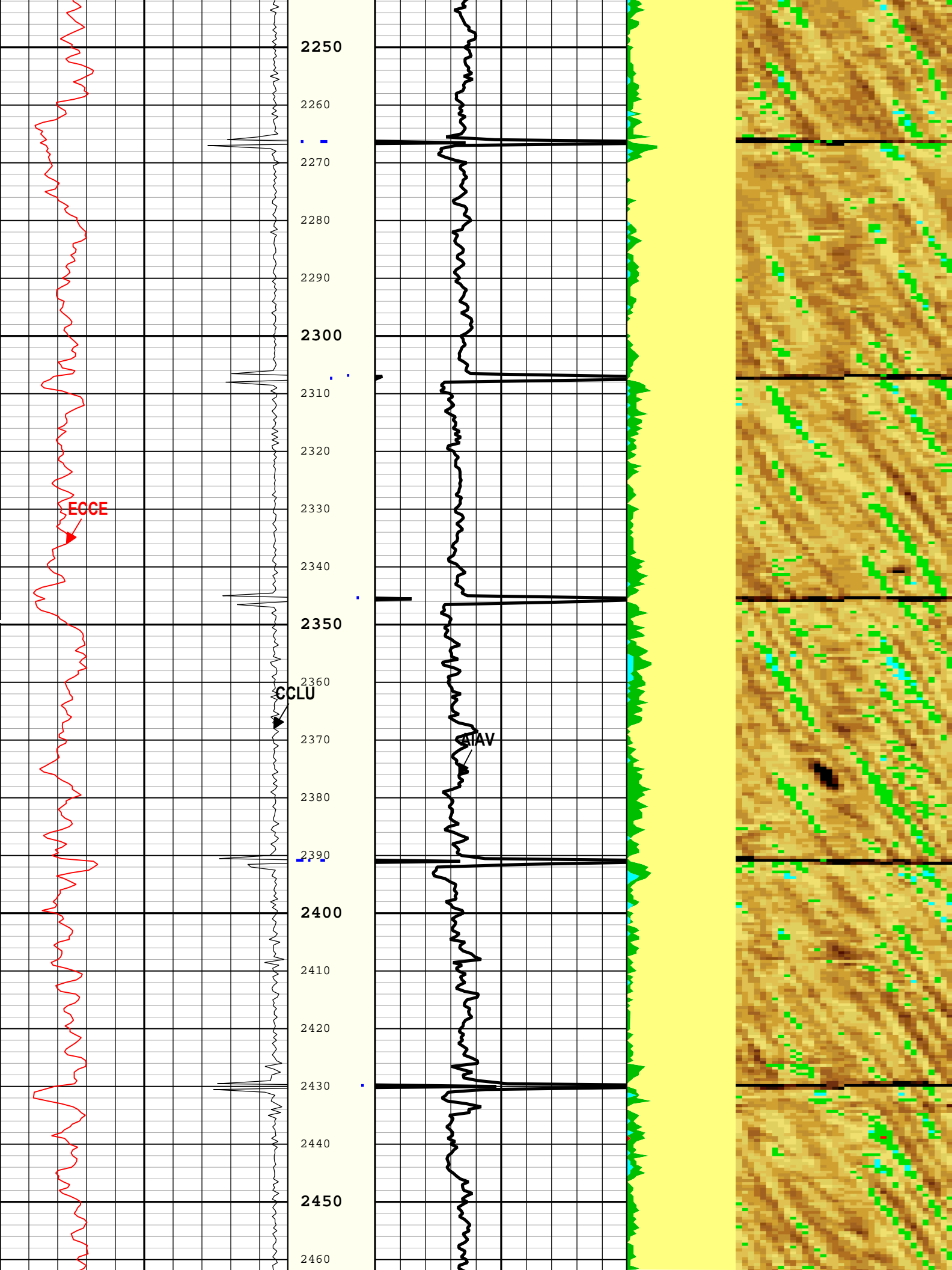
Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth

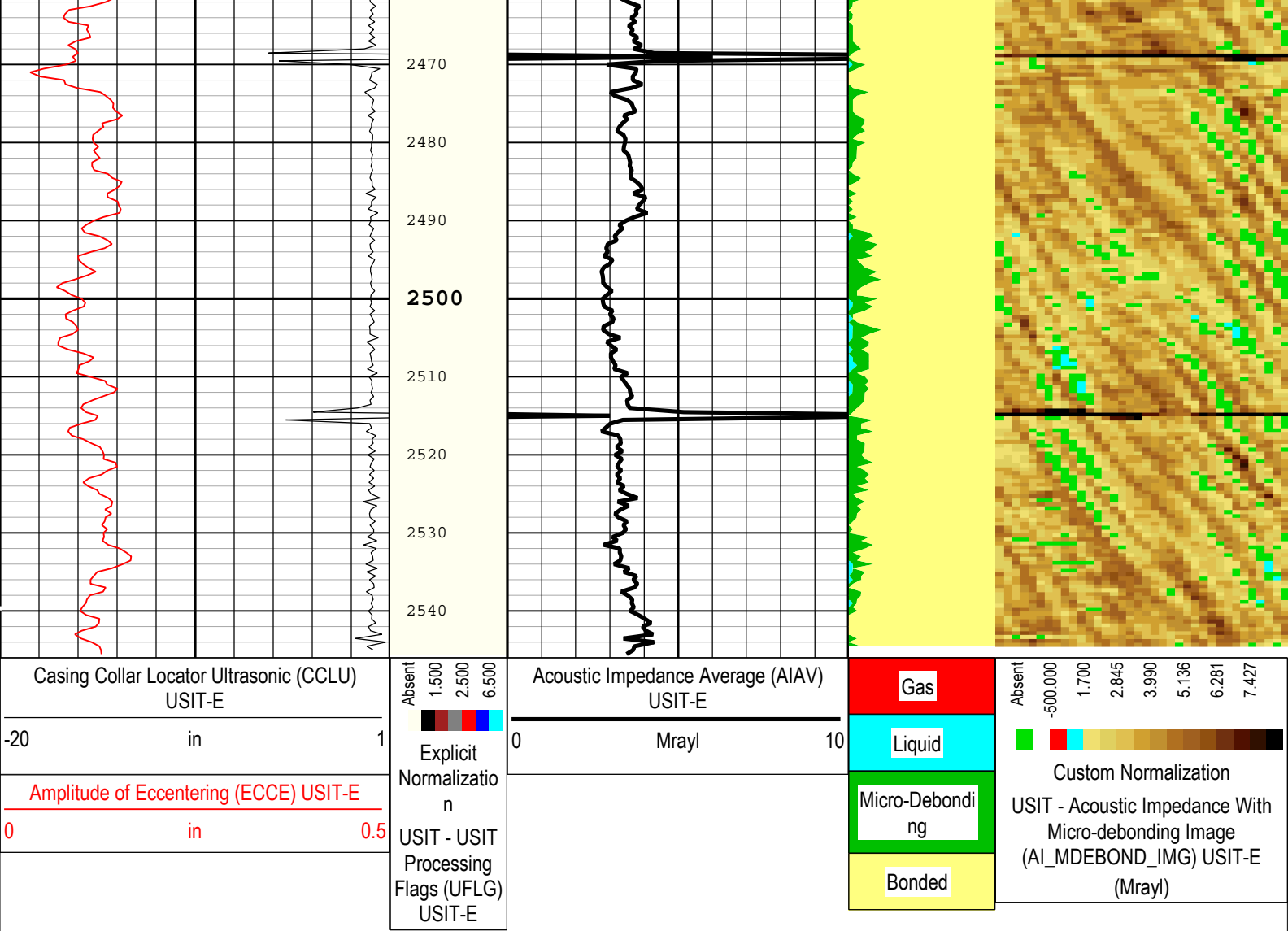
Creation Date: 26-Jan-2018 17:54:44

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: 26-Jan-2018 17:54:44

Channel Processing Parameters				
One: 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_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_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.17	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.6	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	1.7	Mrayl
ZTCG	Acoustic Impedance Threshold for Gas	USIT-E	0.2	Mrayl

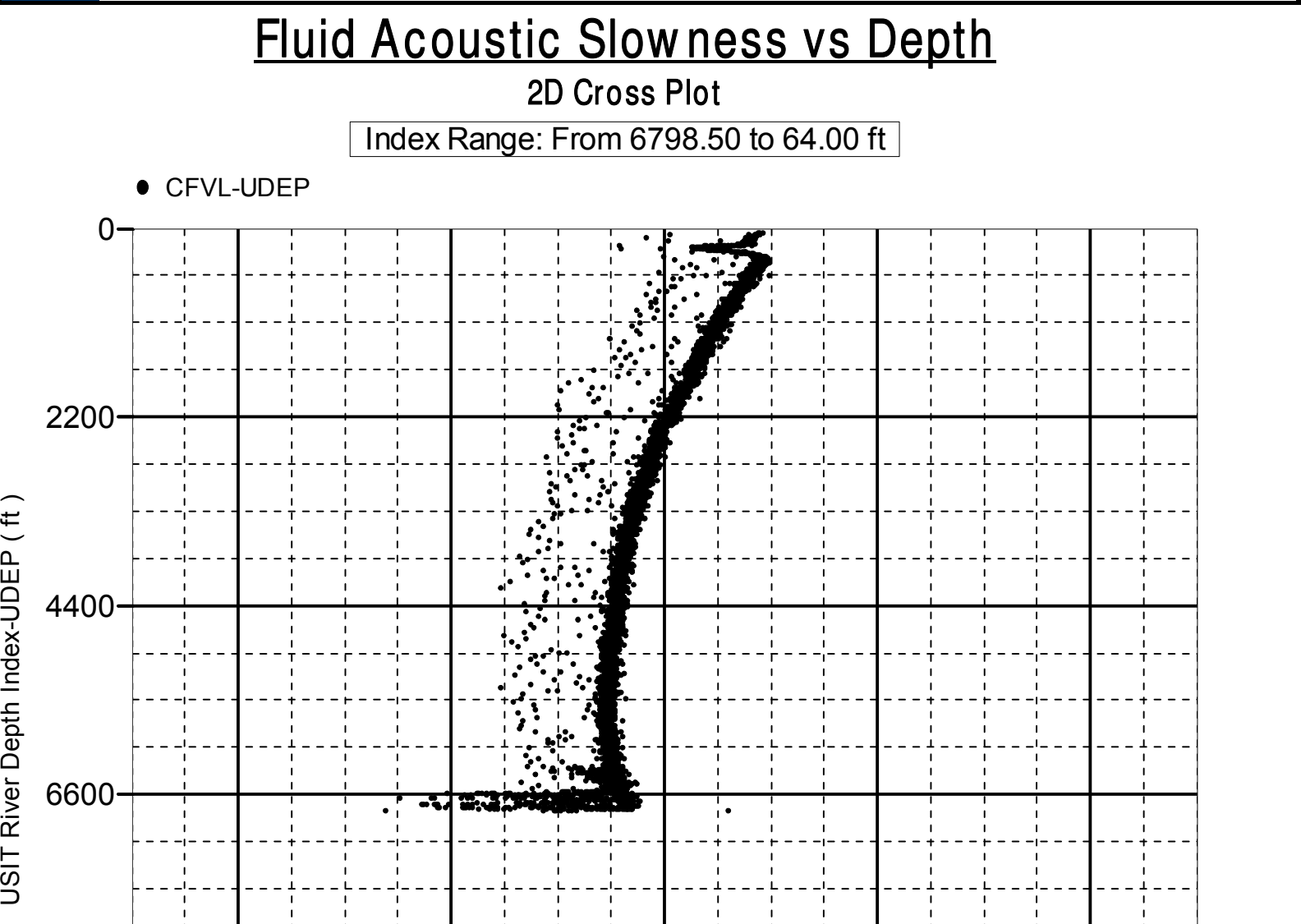
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	May1
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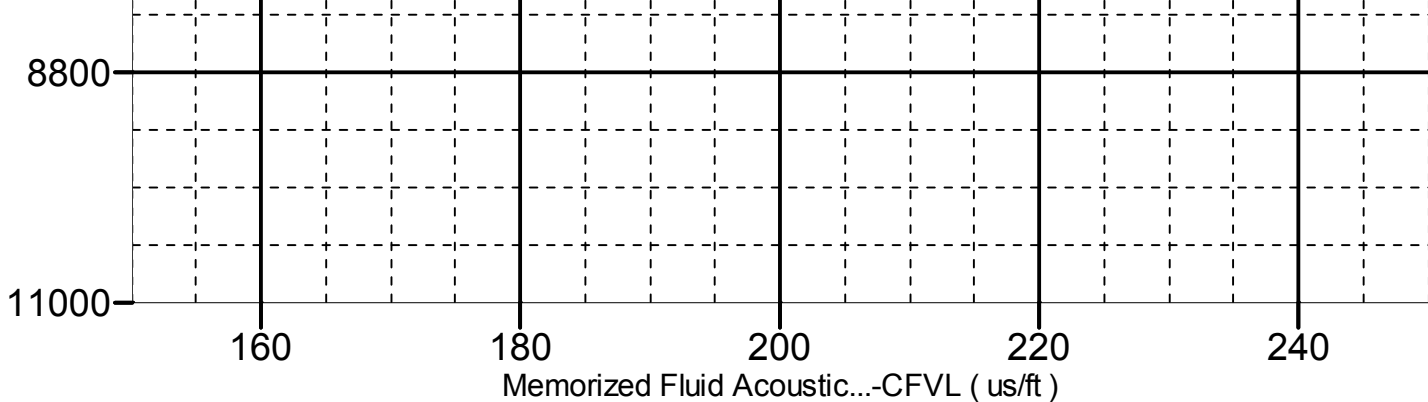
Depth Zone Parameters			
Parameter	Value	Start (ft)	Stop (ft)
BS	13.5	1986.5	2064
BS	8.5	2064	2546
All depth are actual.			

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
EMXV	EMEX Voltage	USIT-E	85	V
HRES	Horizontal Resolution	USIT-E	10 deg	
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	No	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
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	
WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	71.88	us

XYZ	Company:Noble Energy Inc Well:Bison Ridge Y22-741 One: Log[3]:Up:S008
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XYZ

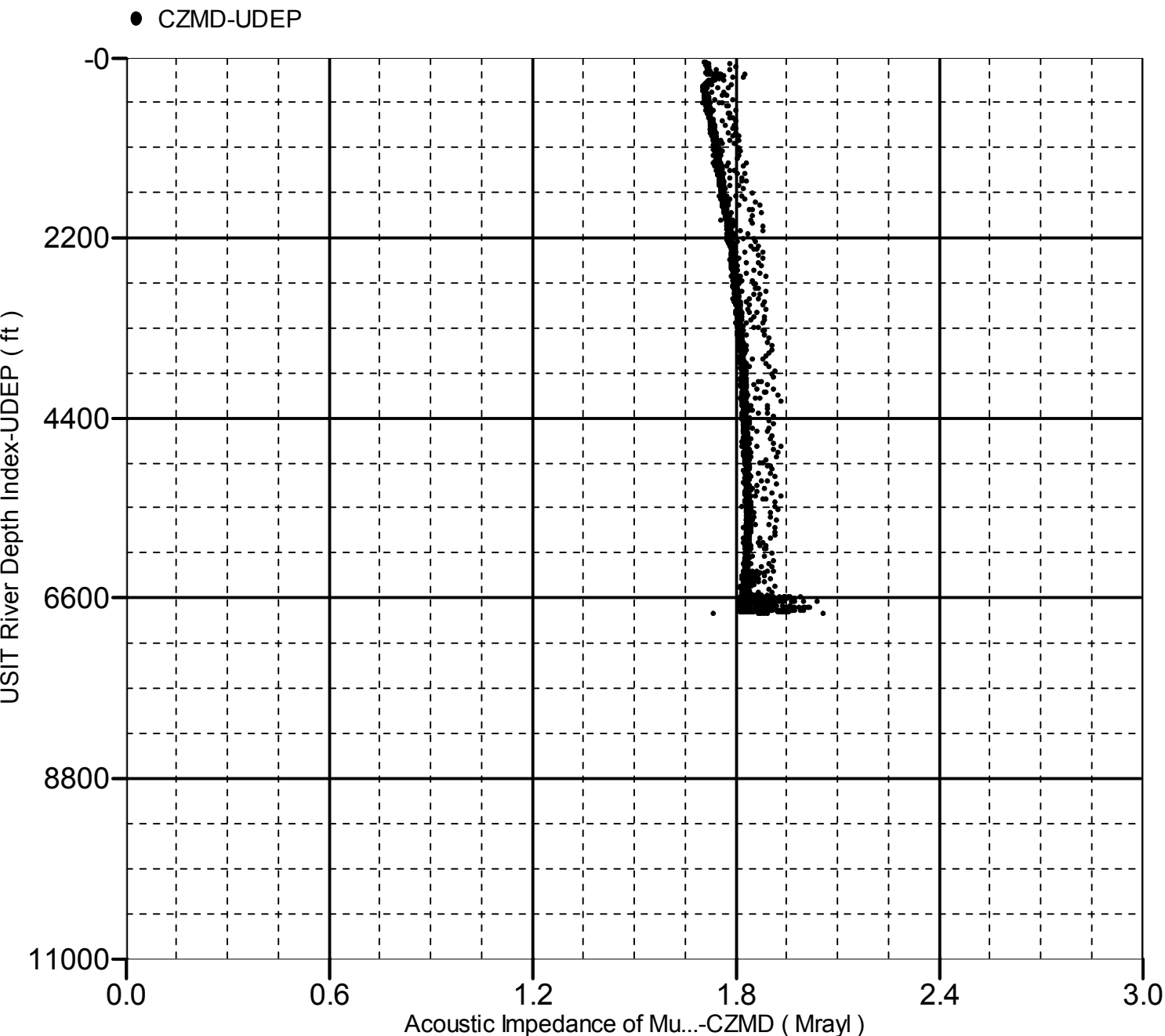
Company:Noble Energy Inc Well:Bison Ridge Y22-741

One: Log[3]:Up:S008

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6798.50 to 64.00 ft



Company:	Noble Energy Inc	Schlumberger
Well:	Bison Ridge Y22-741	
Field:	Wattenberg	
County:	Weld	
Country:	US	

UltraSonic Summary Print