

Company: Noble Energy Inc

Well: Bison Ridge Y22-771

Field: Wattenberg

County: Weld State: CO

UltraSonic Summary Print

County:	Weld				
Field:	Wattenberg				
Location:	NESW Sec. 10, T2N, R64W				
Well:	Bison Ridge Y22-771				
Company:	Noble Energy Inc				
		Location:			
		NESW Sec. 10, T2N, R64W	Elev.:	K.B.	4961.00 ft
		SHL: 2230' FSL & 2055' FEL		G.L.	4931.00 ft
		Lat/Long: 40.151830/-104.539710		D.F.	4961.00 ft
		Permanent Datum:	Ground Level	Elev.:	4931.00 f
		Log Measured From:	Kelly Bushing	30.00 ft	above Perm.Datum
		Drilling Measured From:	Kelly Bushing		
		API Serial No.	Section:	Township:	Range:
		05-123-45372	10	2N	64W
Logging Date	03-Feb-2018				

Run Number	ONE	
Depth Driller	17095.00 ft	
Schlumberger Depth	6693.00 ft	
Bottom Log Interval	6693.00 ft	
Top Log Interval	60.00 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	2043.00 ft	
To	6693.00 ft	
Casing/Tubing Size	5.5 in	
Weight	20 lbm/ft	
Grade	P110	
From	0.00 ft	
To	17074.70 ft	
Max Recorded Temperatures	211 degF	
Logger on Bottom	03-Feb-2018	07:06:00
Unit Number	Location:	Time
Recorded By	2161	Fort Morgan
Witnessed By	A.Rosacker/ T.Saviole	
	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.

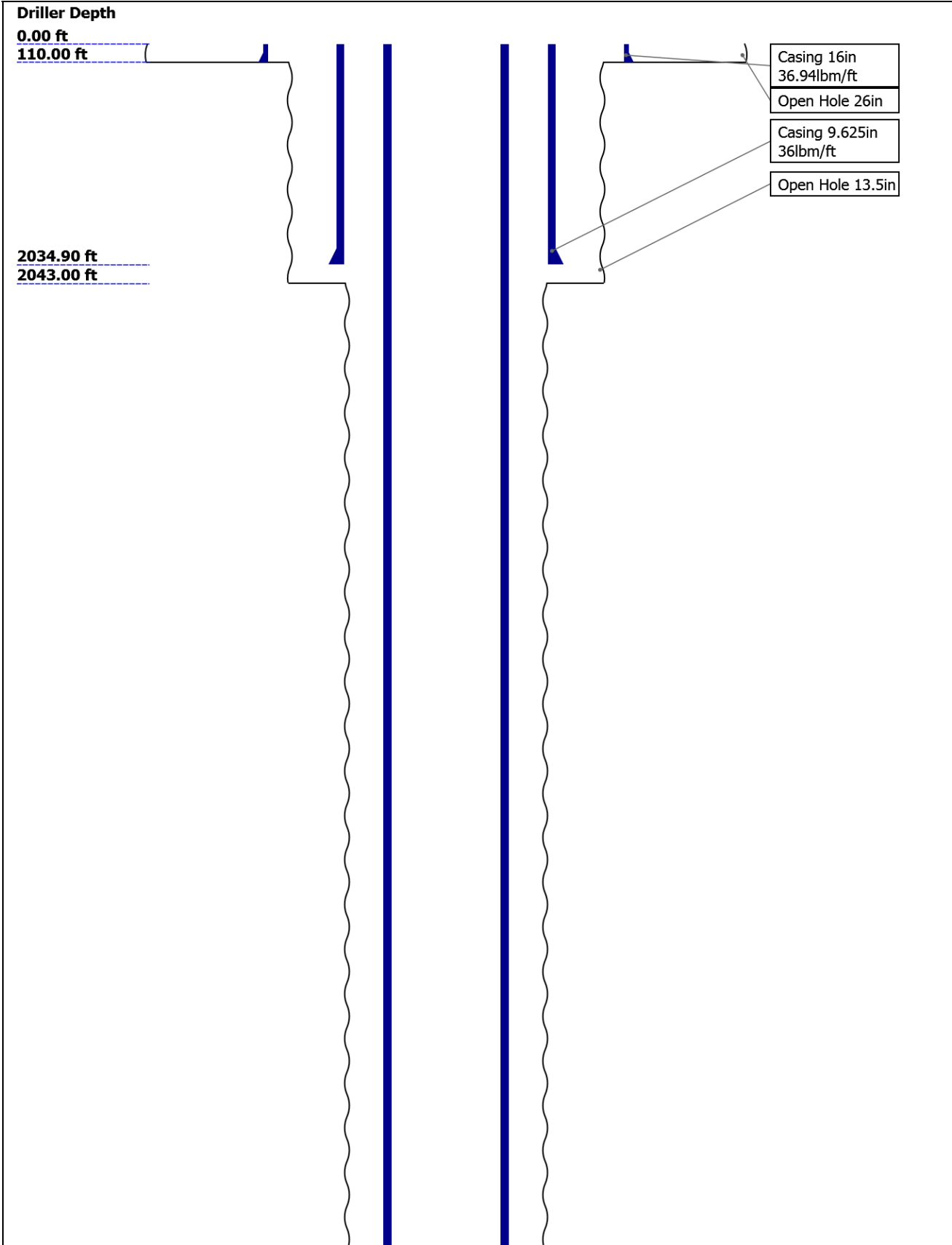
Contents

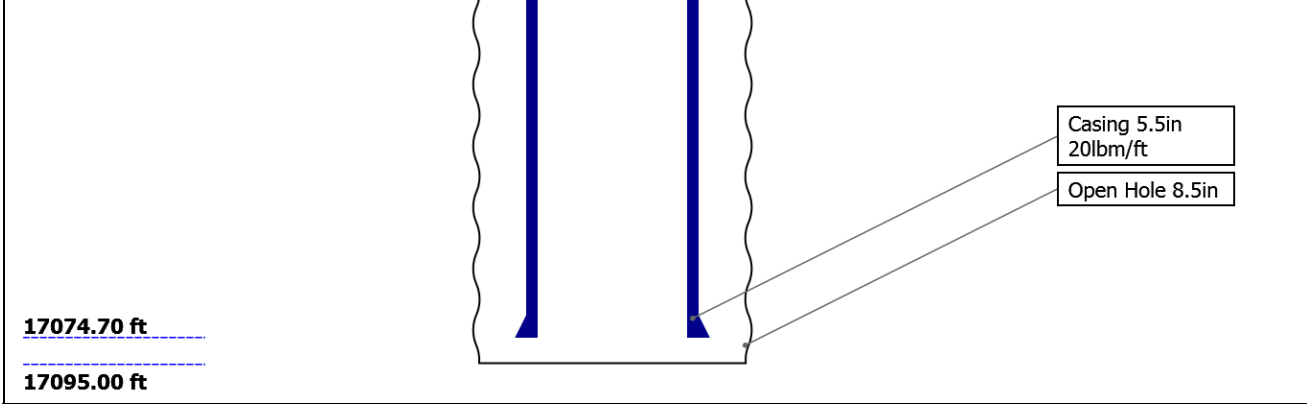
- Header
- Disclaimer
- Contents
- Well Sketch
- Borehole Size/Casing/Tubing Record
- Remarks and Equipment Summary
- Depth Summary
- USI Fluid Properties Measurement_1
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 - Integration Summary
 - Software Version
 - Composite Summary
 - Log (DJ Basin Ultrasonic Cement Summary Report)
 - Parameter Listing
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 - Integration Summary

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- Tail

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- 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	2043			
Top Logger (ft)	0	110	2043			
Bottom Driller (ft)	110	2043	17095			
Bottom Logger (ft)	110	2043	6693			
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	J55	P110			
Top Driller (ft)	0	0	0			
Top Logger (ft)	0	0	0			
Bottom Driller (ft)	110	2034.9	17074.7			
Bottom Logger (ft)	110	2034.9	17074.7			

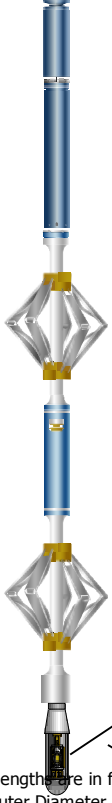
Remarks and Equipment Summary

ONE: Toolstring				ONE: Remarks	
<div><div><div>Equip name Length</div><div>LEH-QT:2 33.83</div><div>353</div><div>LEH-QT:23</div><div>53</div></div><div><div>SAH-F:18 30.91</div><div>17</div></div><div><div>EDTC-B:8 26.06</div><div>424</div><div>EDTH-B:84</div><div>32</div><div>EDTG-B</div><div>EDTC-B:84</div><div>24</div></div><div><div>AH-184[2]:2765 19.56</div></div><div><div>AH-184[2]:2765 17.56</div></div></div> <div><p>CTEM 22.56</p><p>ACCZ 0.00</p><p>HV 0.00</p><p>Gamma Ray 20.69</p><p>TelStatu s 19.56</p></div>	Thank you for choosing Schlumberger!				
	Toolstring ran as per tool sketch and client logging program				
	4.75" Gemcos ran on USAC and EDTC for centralization				
	This is the first log in well.				
	Main pass logged at 2500 PSI; Repeat Pass logged at 0 psi				
	BHT: 211 deg F				
	Estimated Top of Cement is 2000 ft				

1J:2826

USIT-E:94 15.56
3

ECH-MFA:
1928
USAC-A:9
43
USIS-A:27
20
USSC-B:75
8
USRS-AB:
873
USI-SENS
OR
USI-TX



USI Sen 0.37
sor
TOOL_ZERO
Head Fe
nsion

Length in ft

Maximum Outer Diameter = 3.875 in

Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

ONE

Depth Measuring Device

Type IDW-JA
Serial Number 6483
Calibration Date
Calibrator Serial Number
Calibration Cable Type 7-46 PI-XXS
Wheel Correction 1 -4
Wheel Correction 2 -5

Tension Device

Type CMTD-B/A
Serial Number 466
Calibration Date 11-Jan-2018
Calibrator Serial Number 84749A
Number of Calibration Points 10
Calibration Root Mean Square Error 15
Calibration Peak Error 24

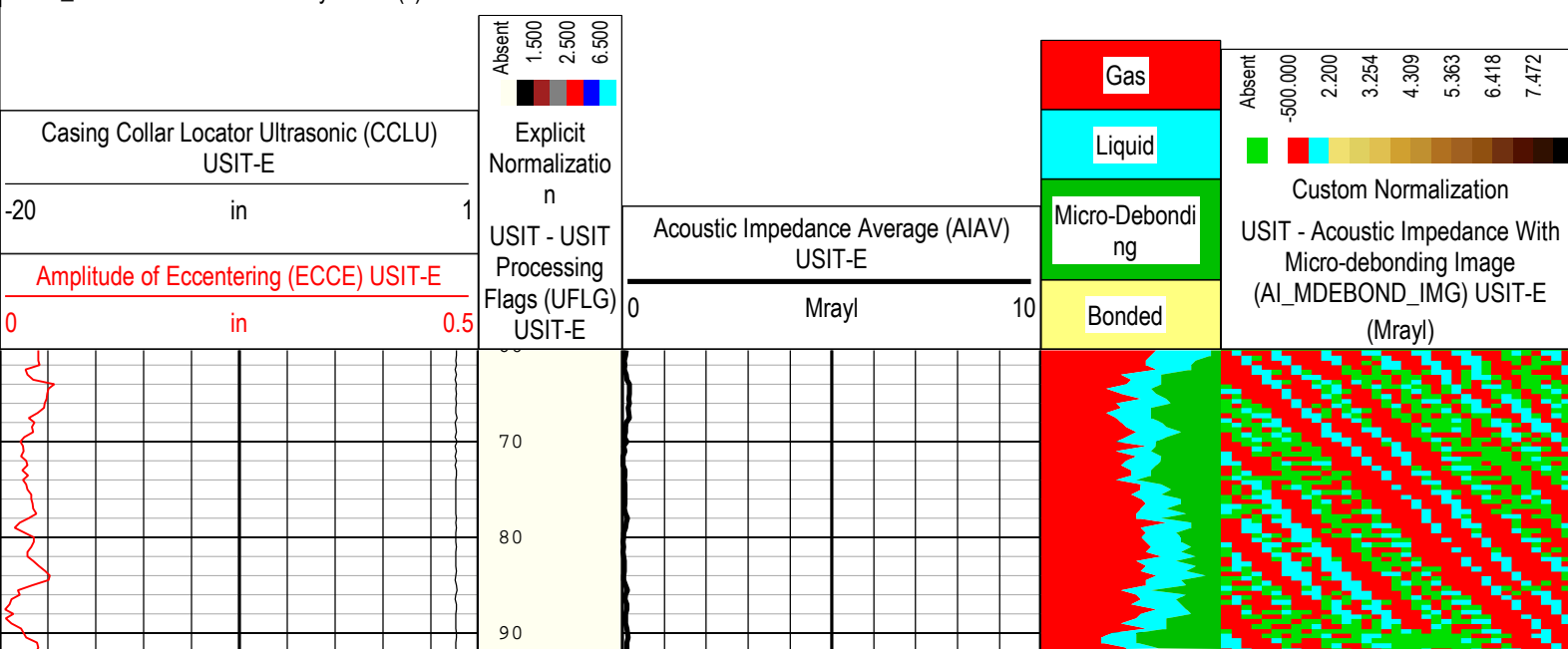
Logging Cable

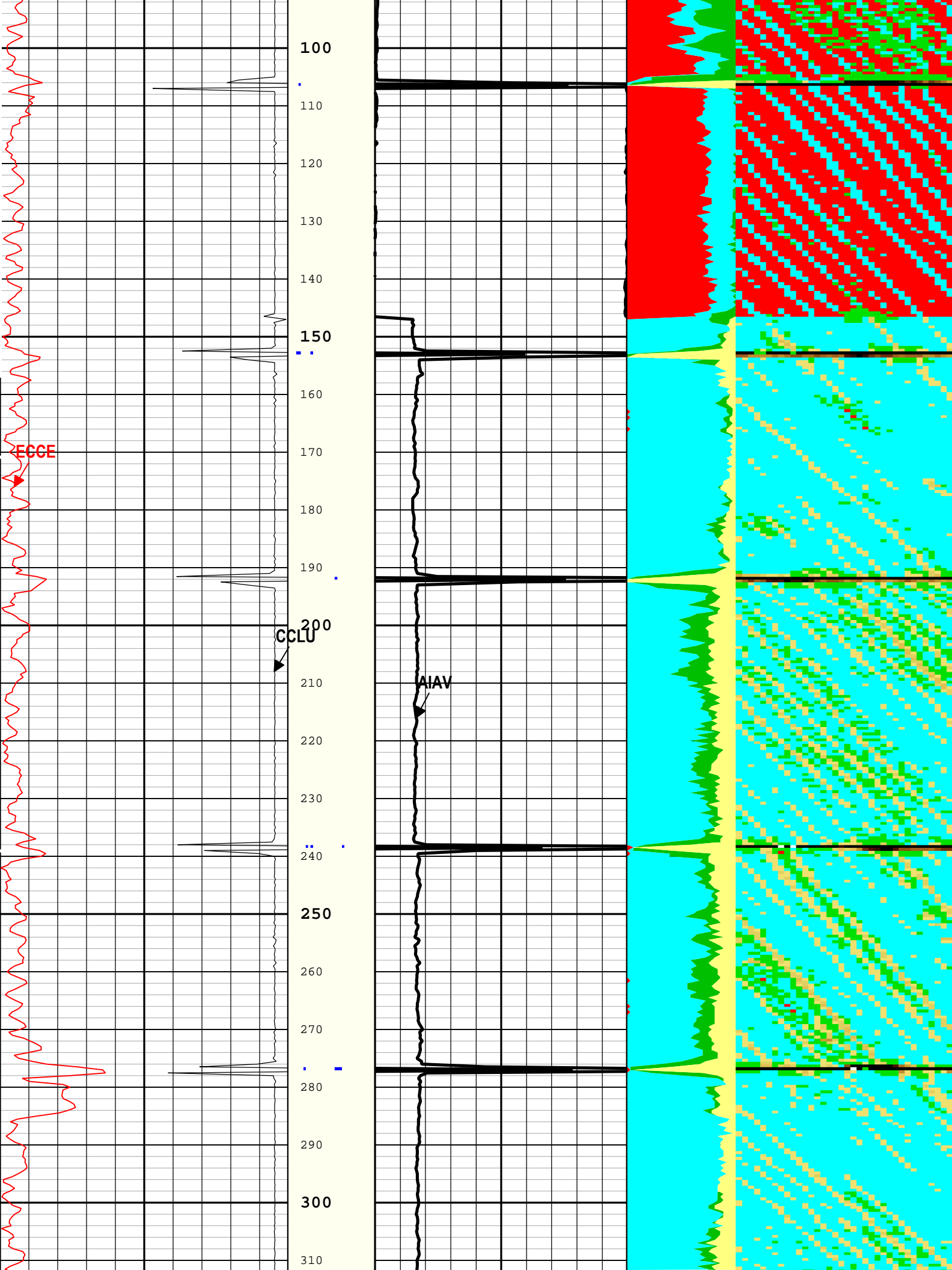
Type 7-46PI-XXS
Serial Number F716045
Length 24000.00 ft
Conveyance Type Wireline
Rig Type Crane

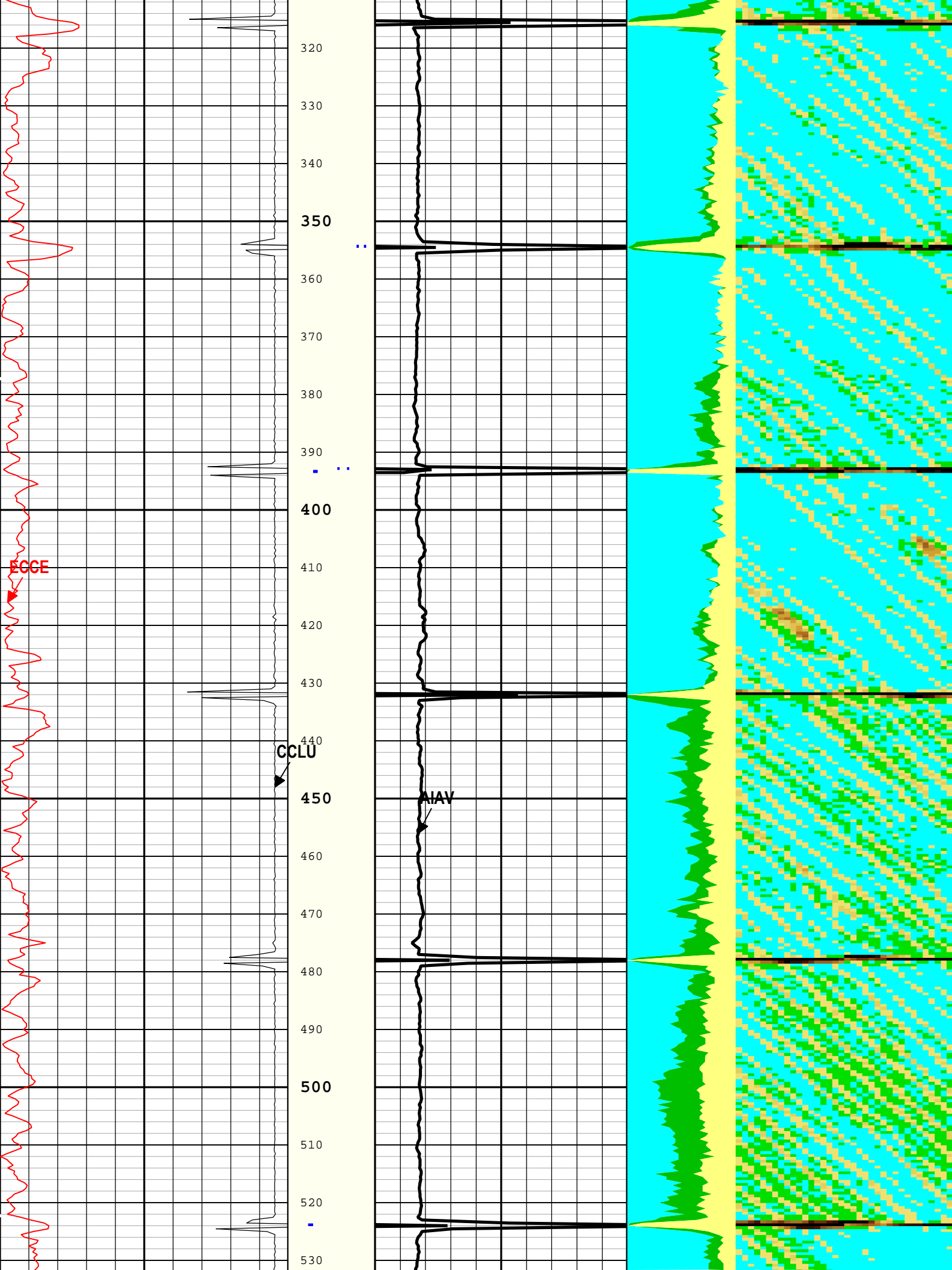
ONE:Depth Control Parameters

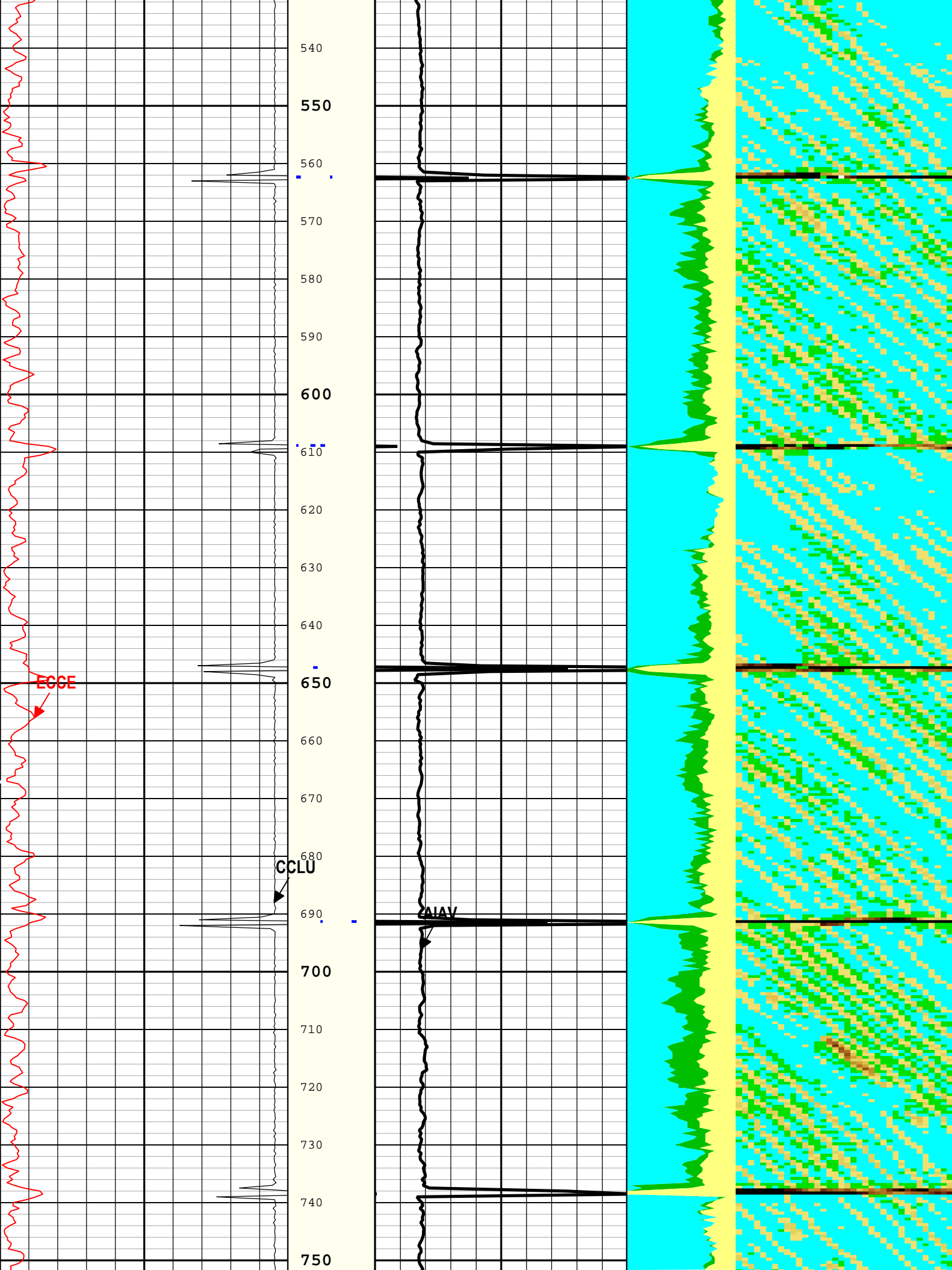
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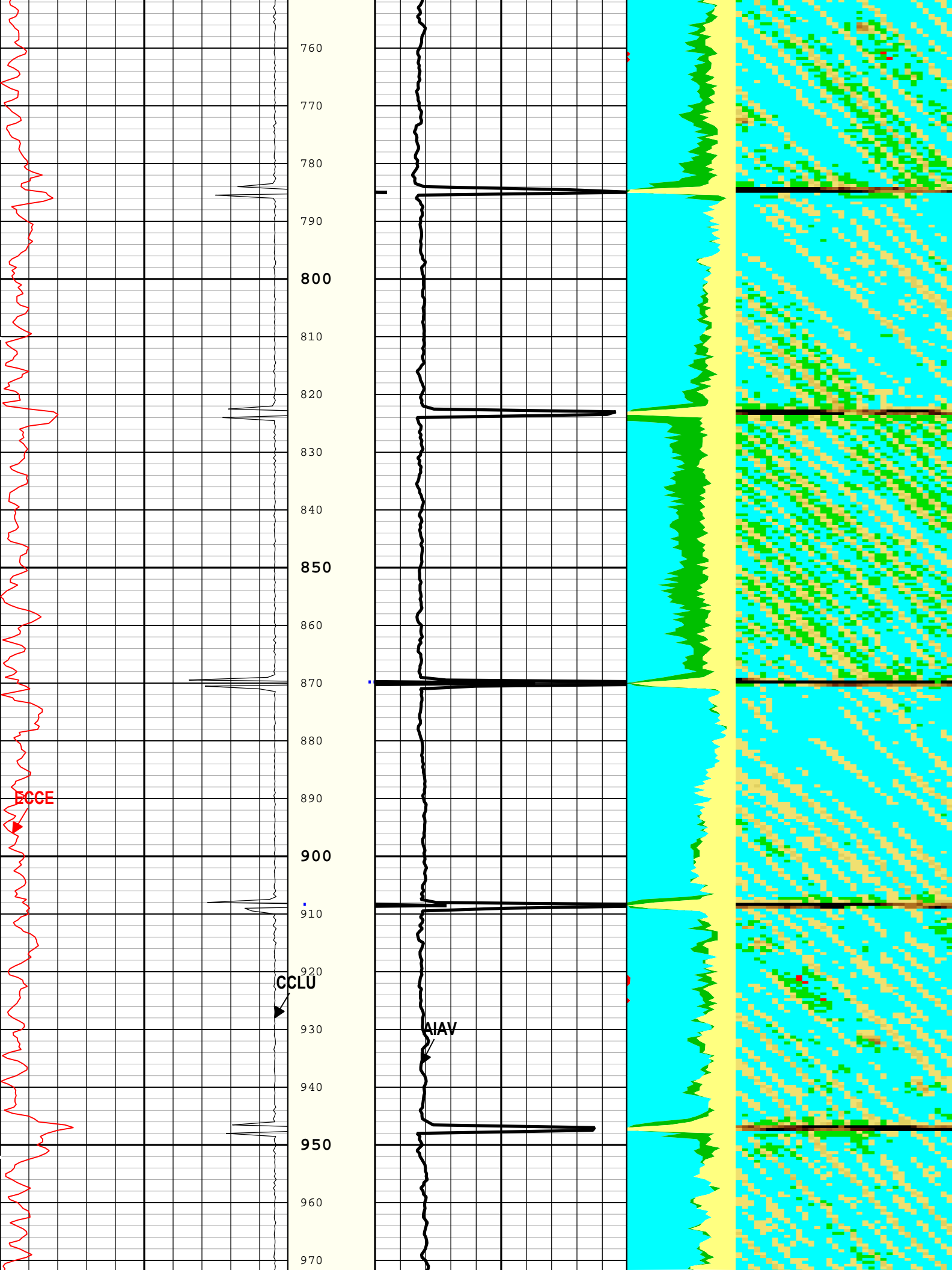
All Schlumberger depth control policies followed.

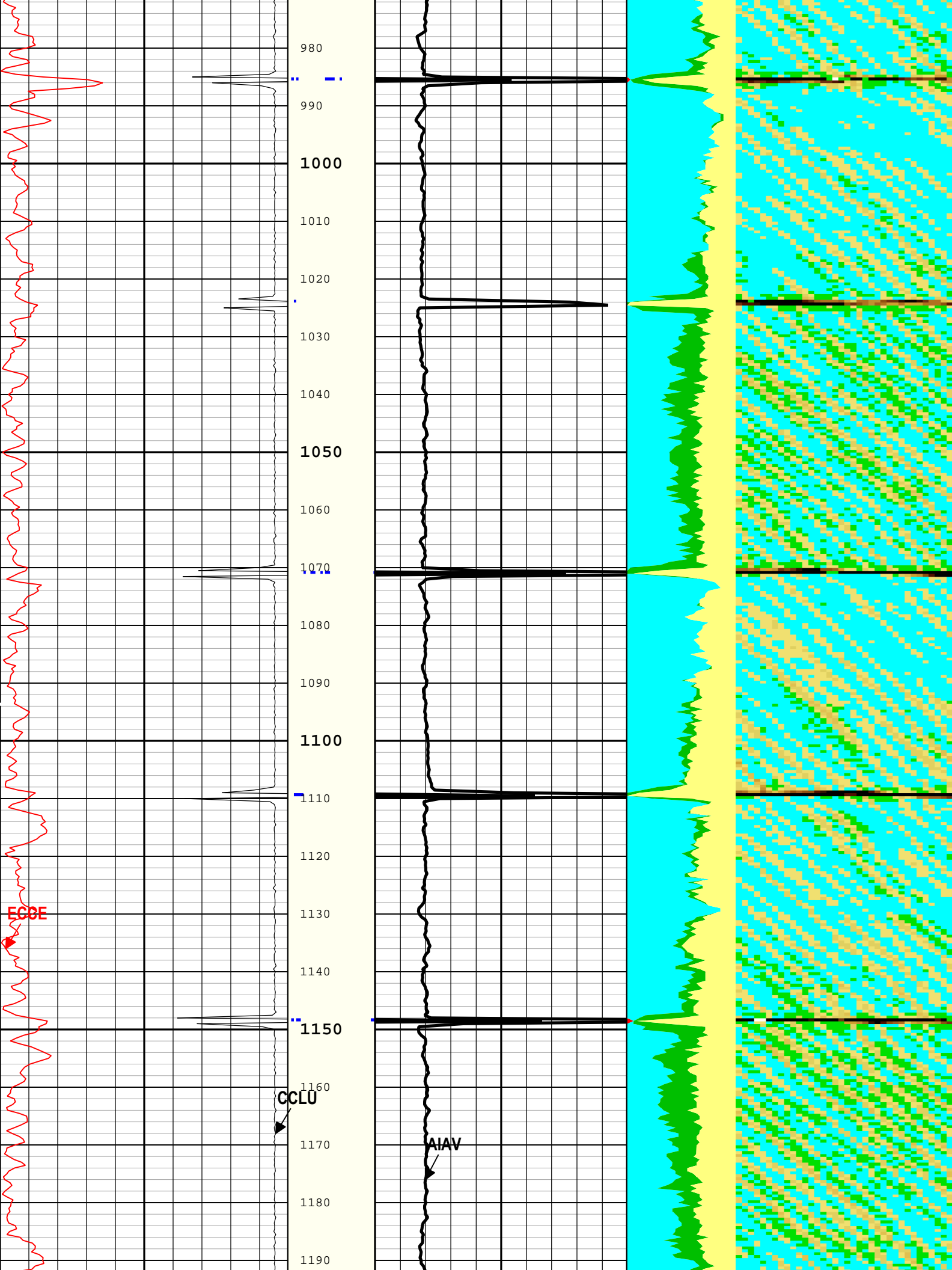


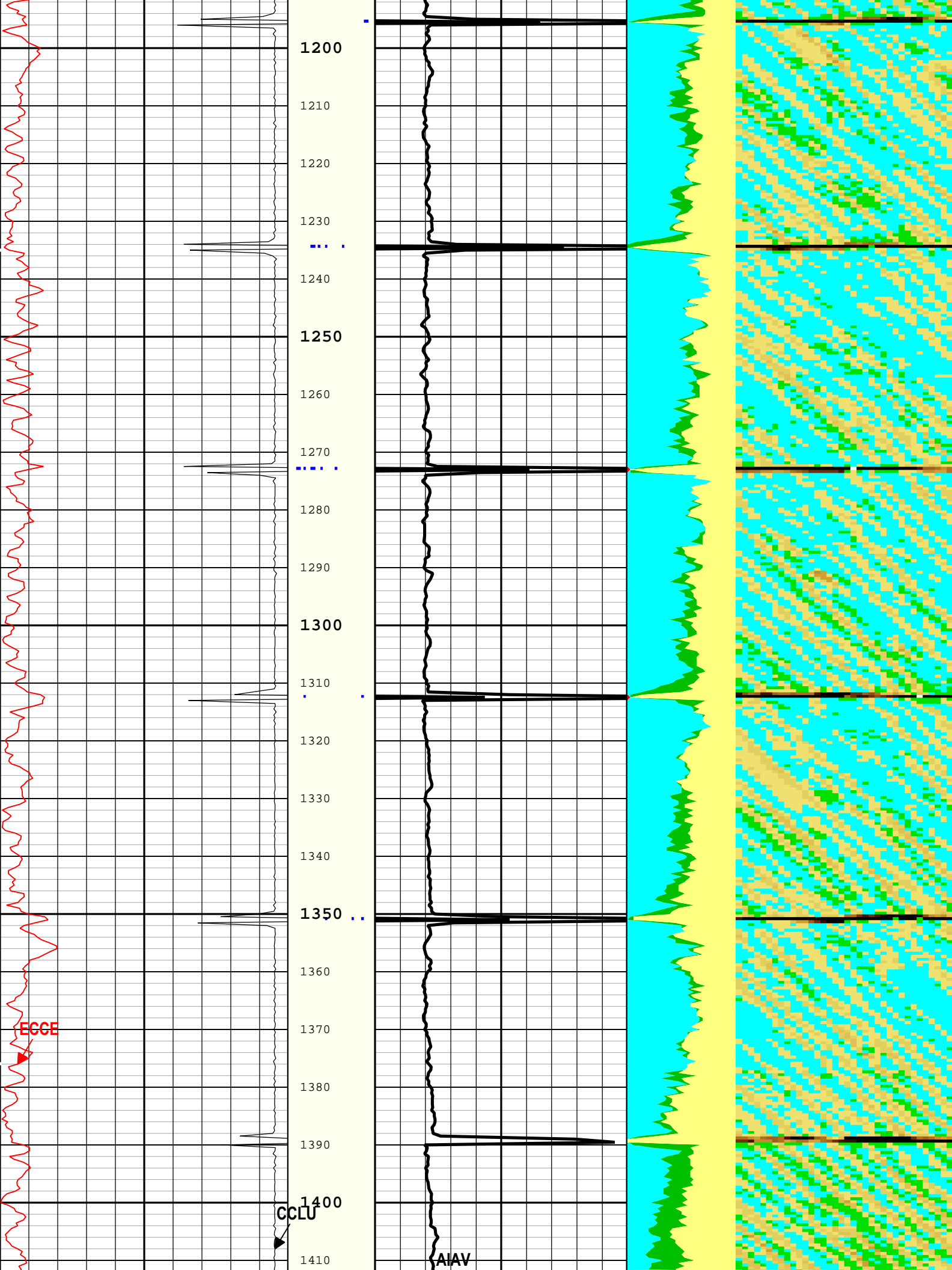


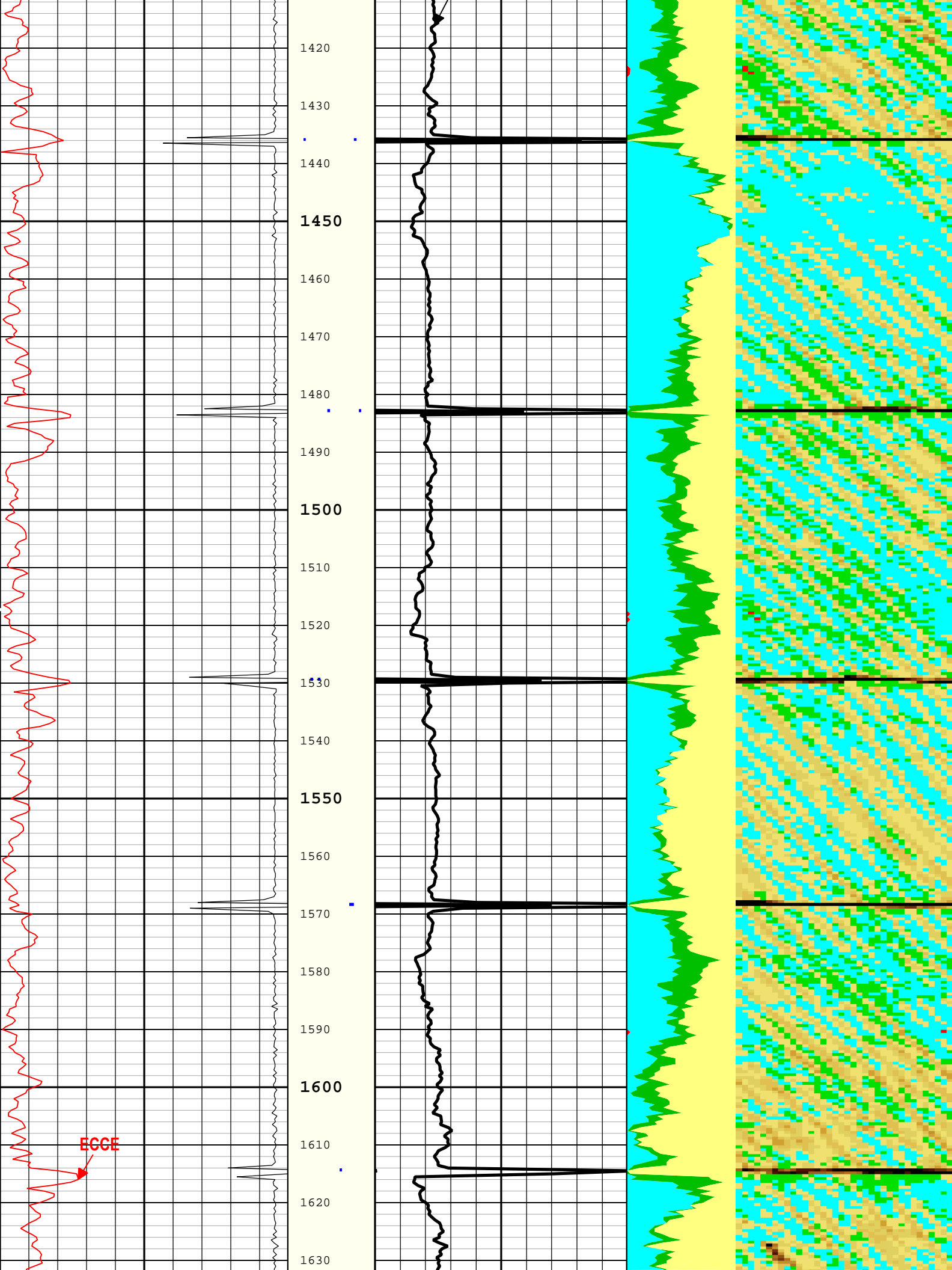


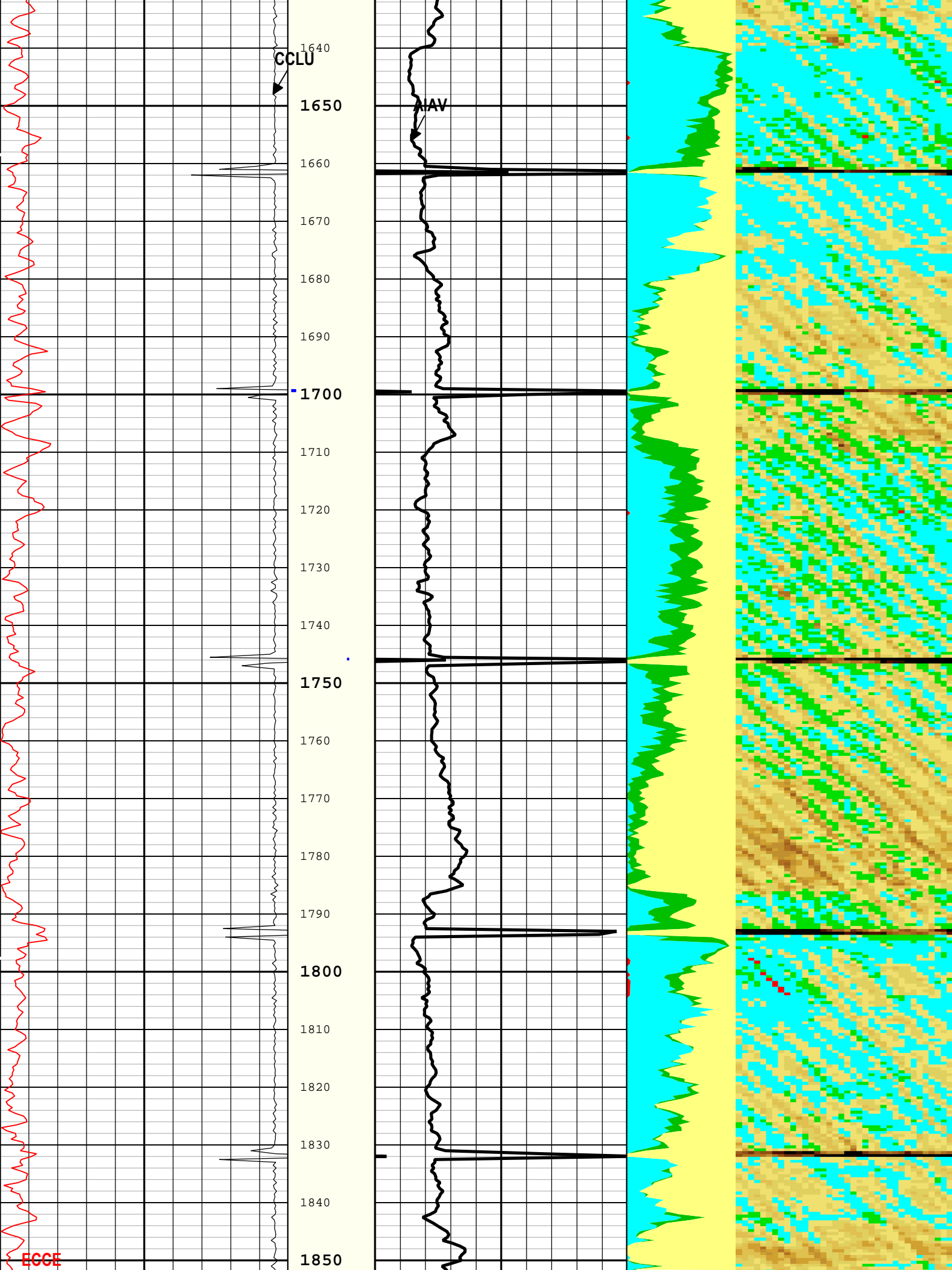


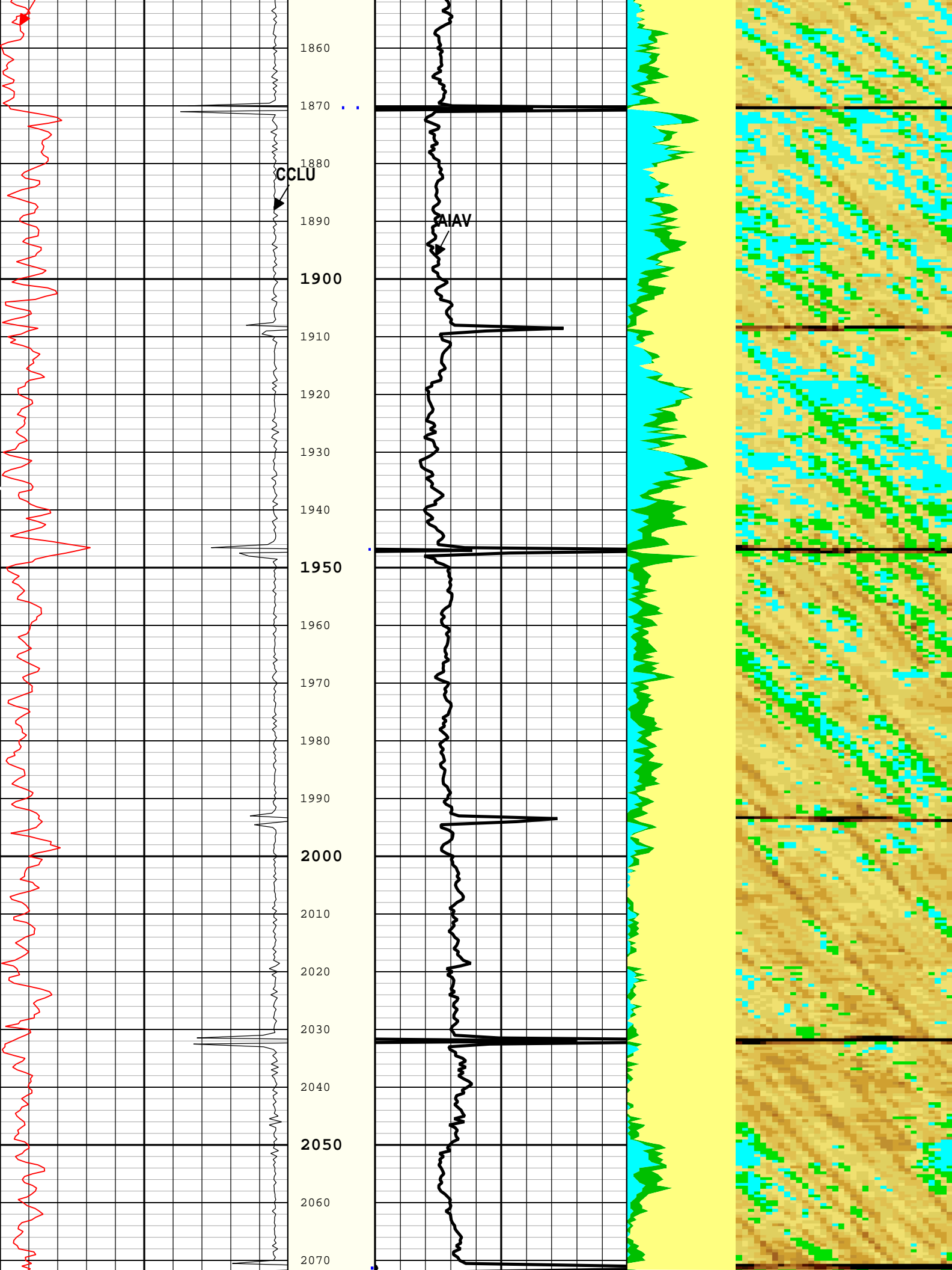


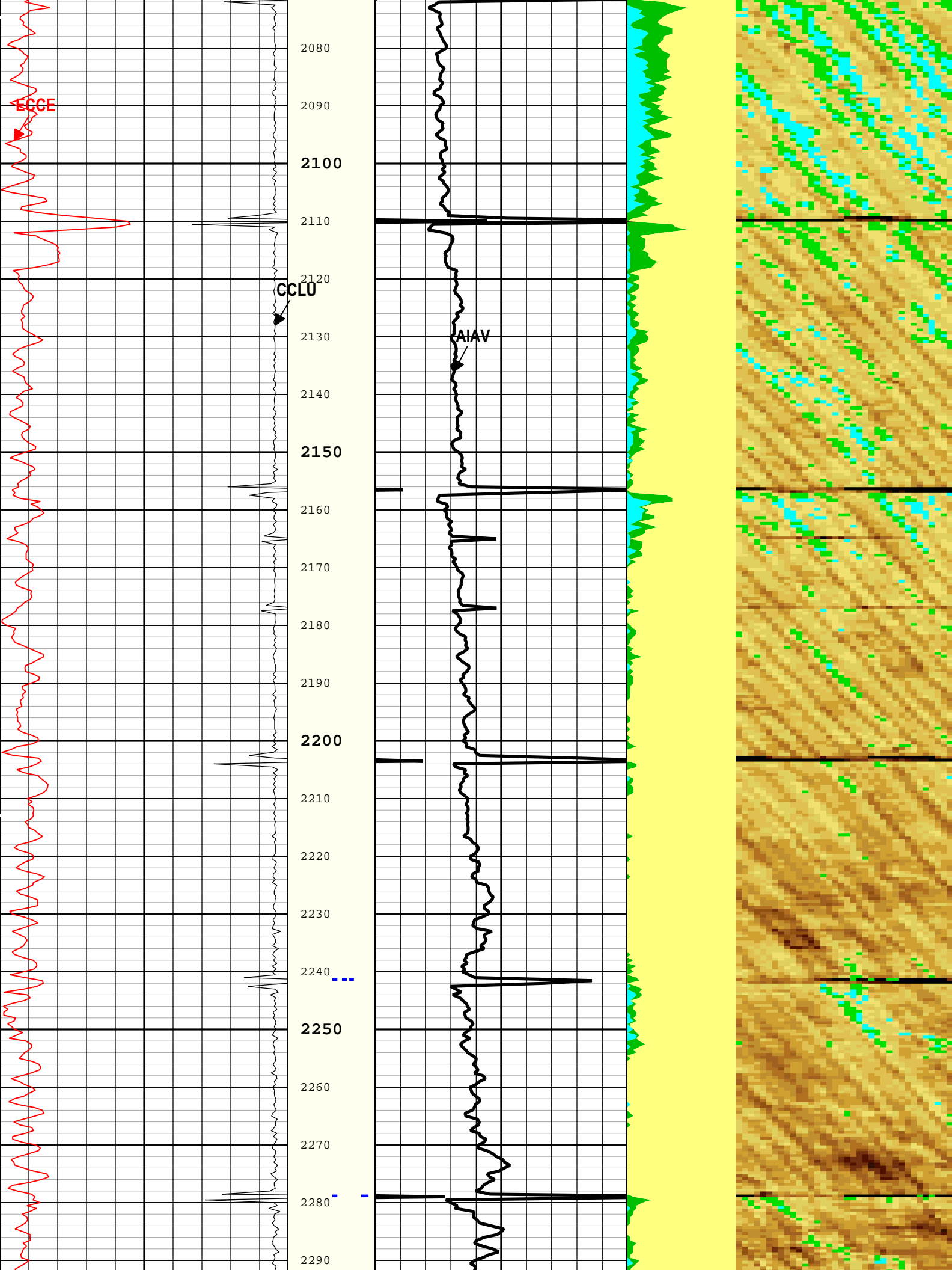


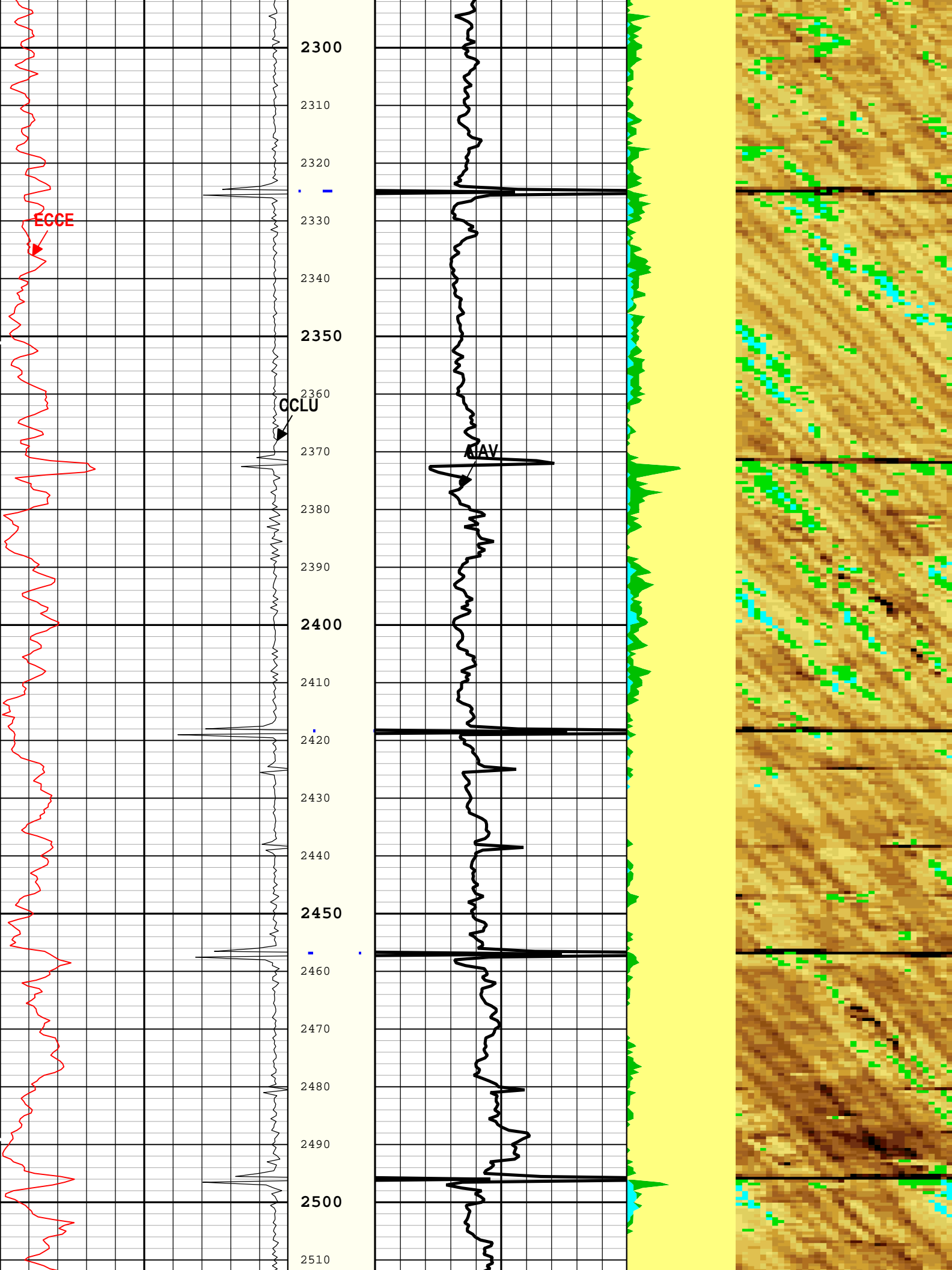


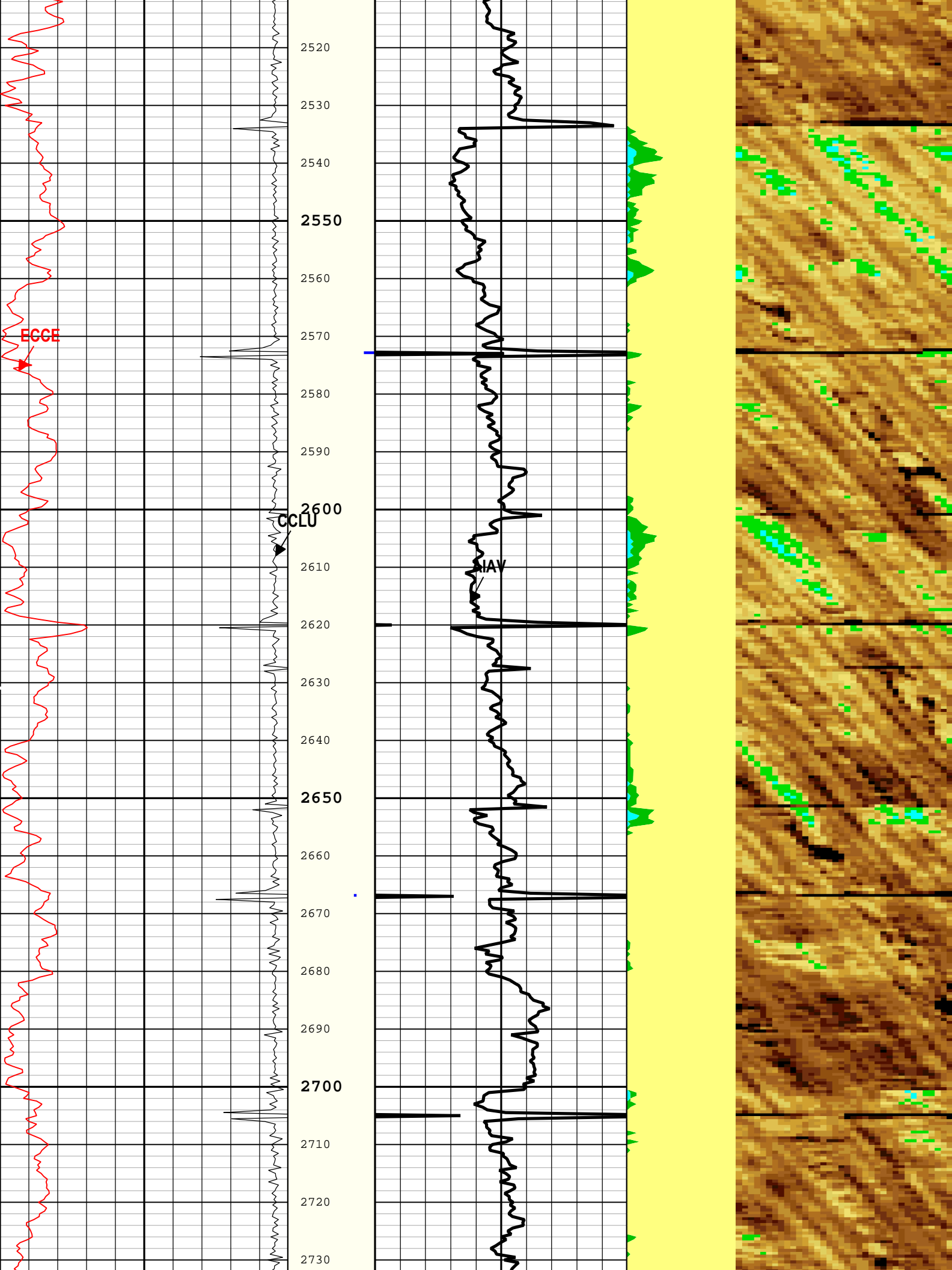


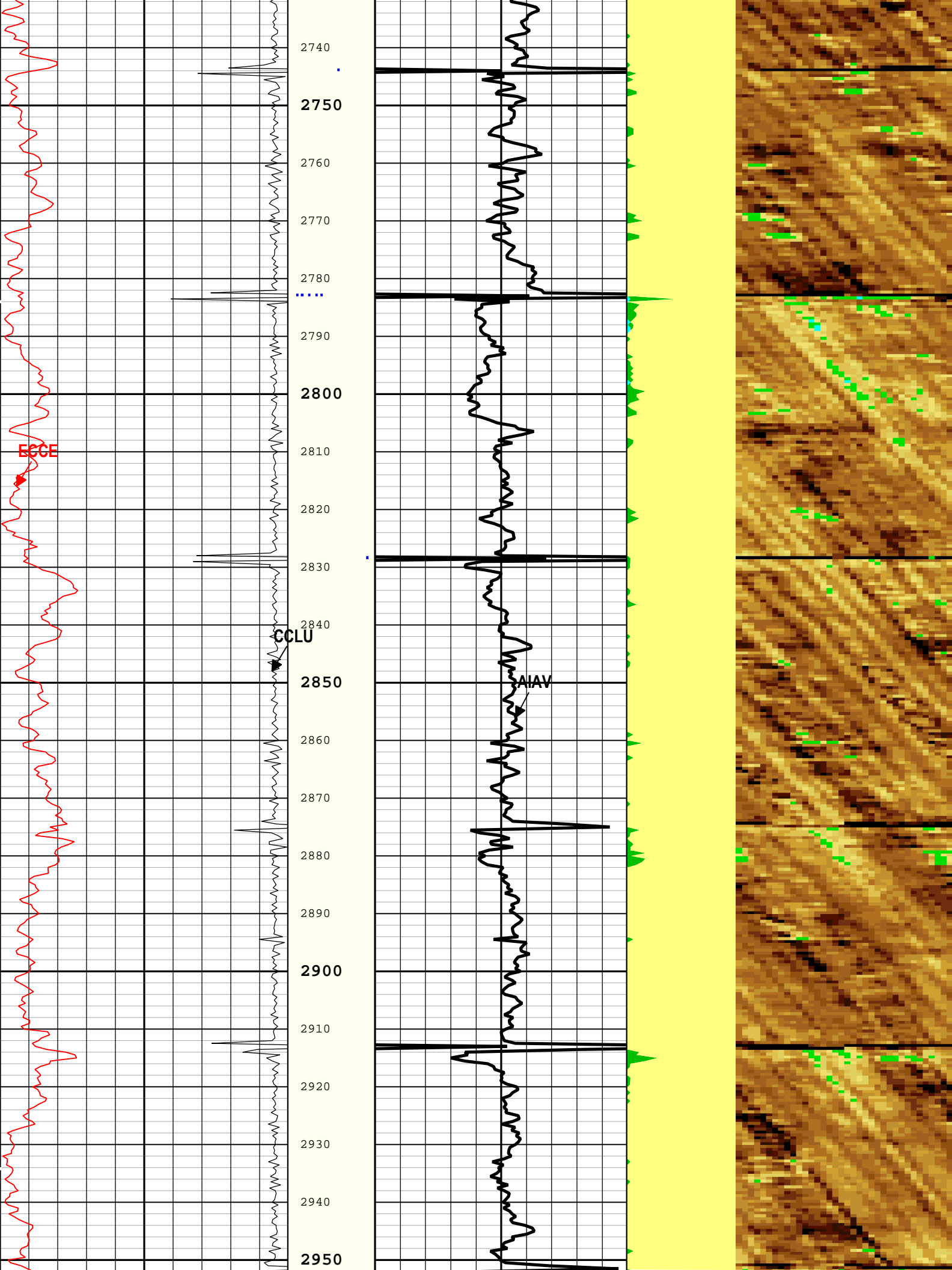


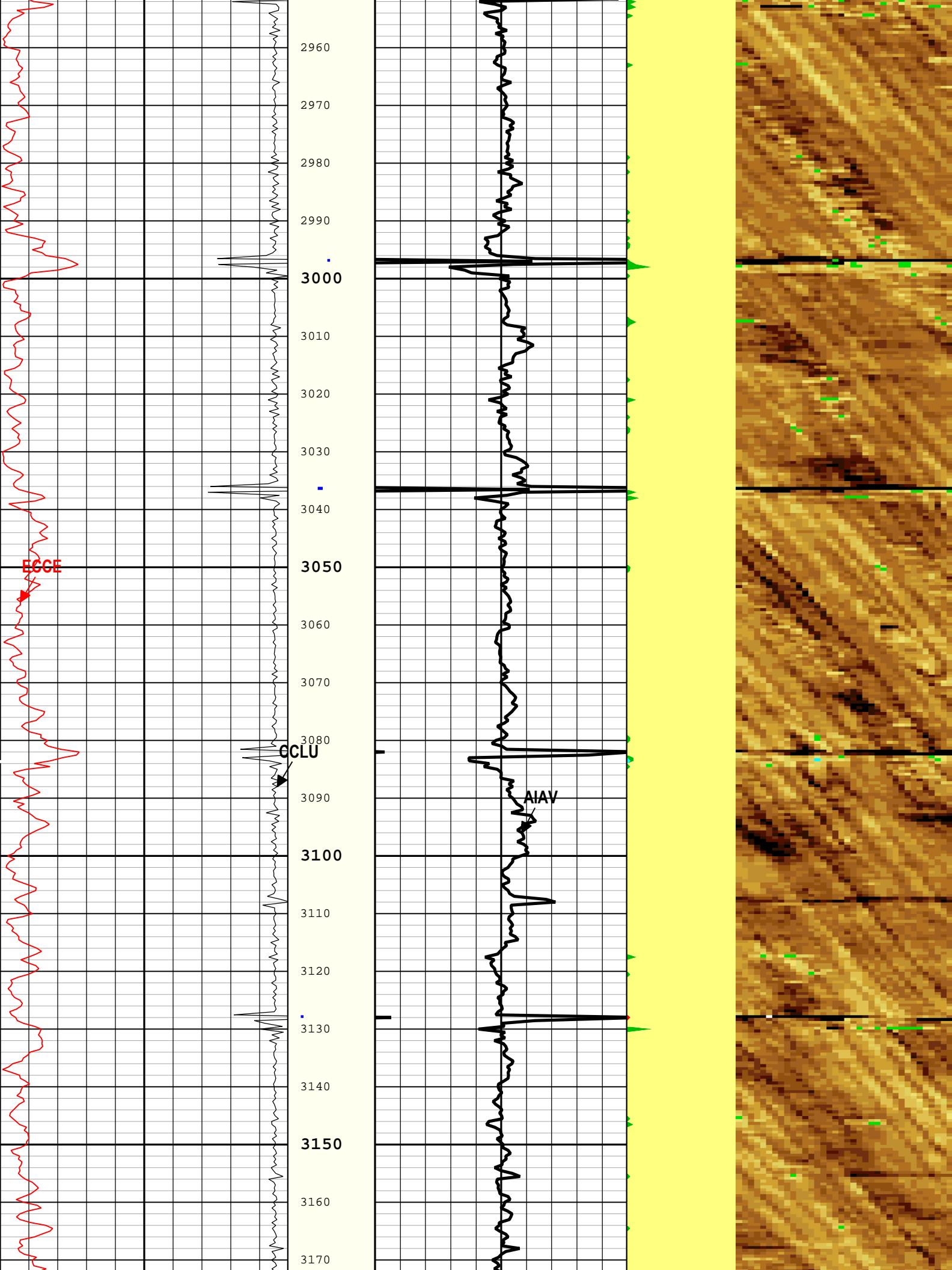


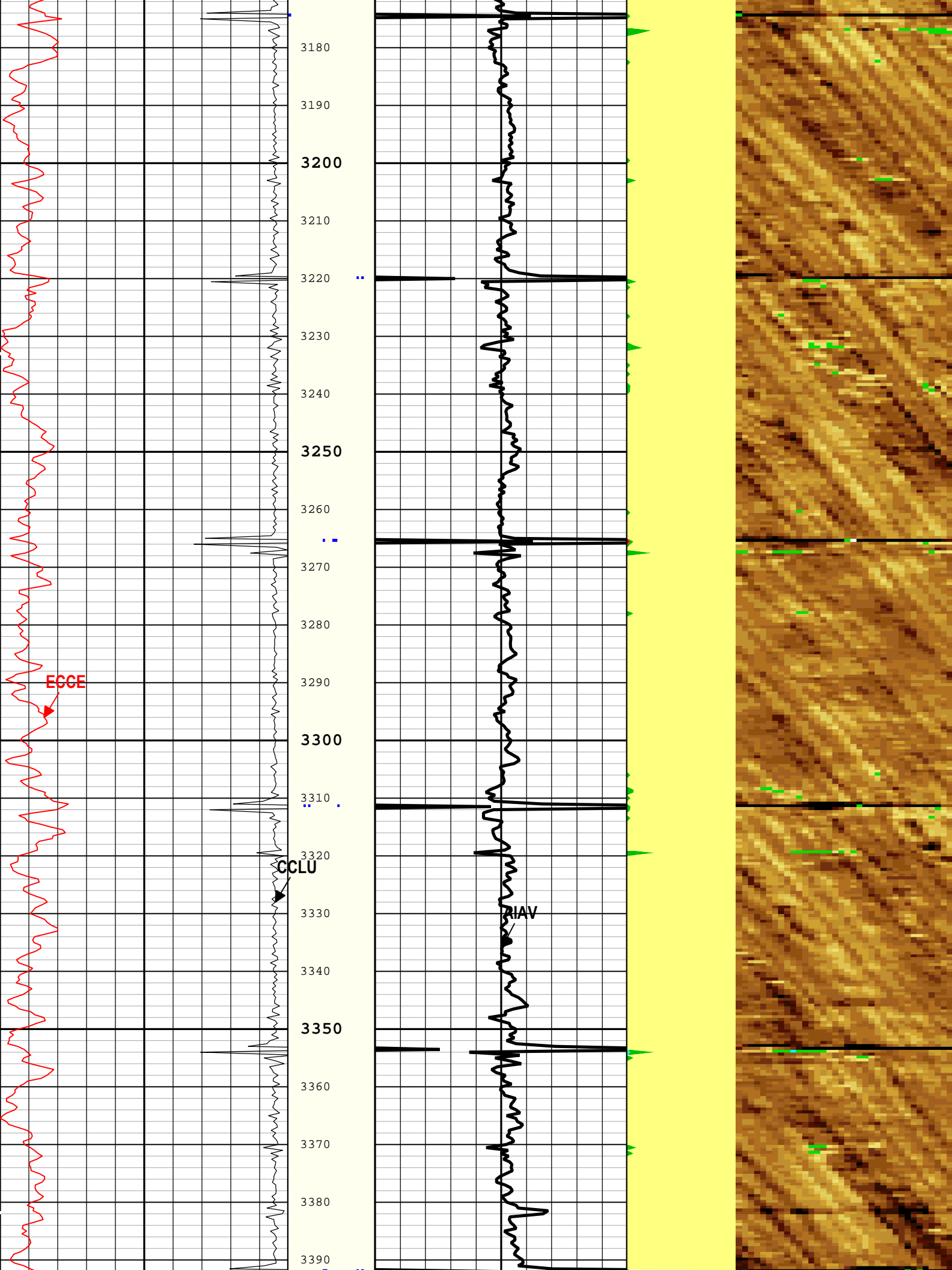


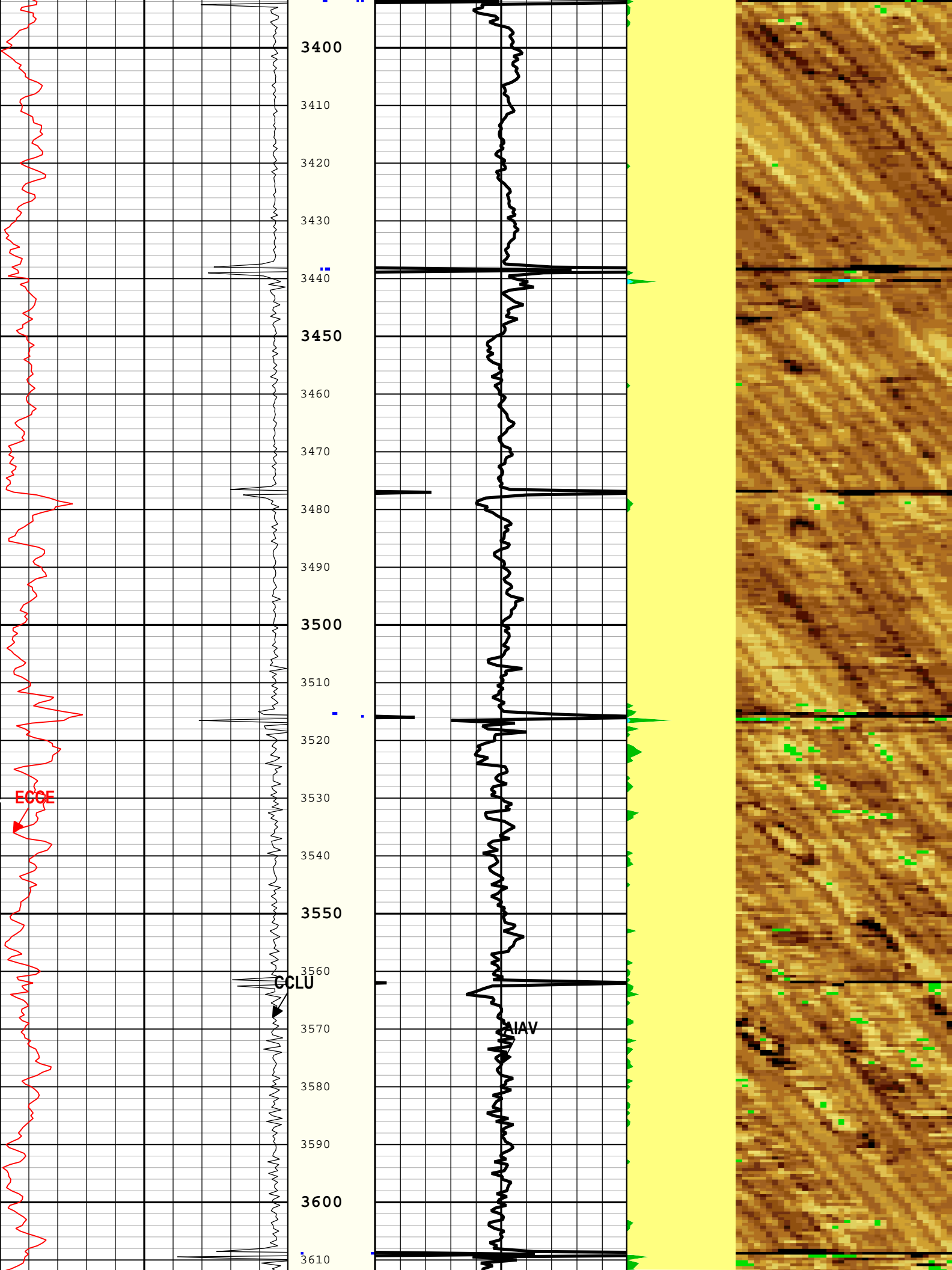


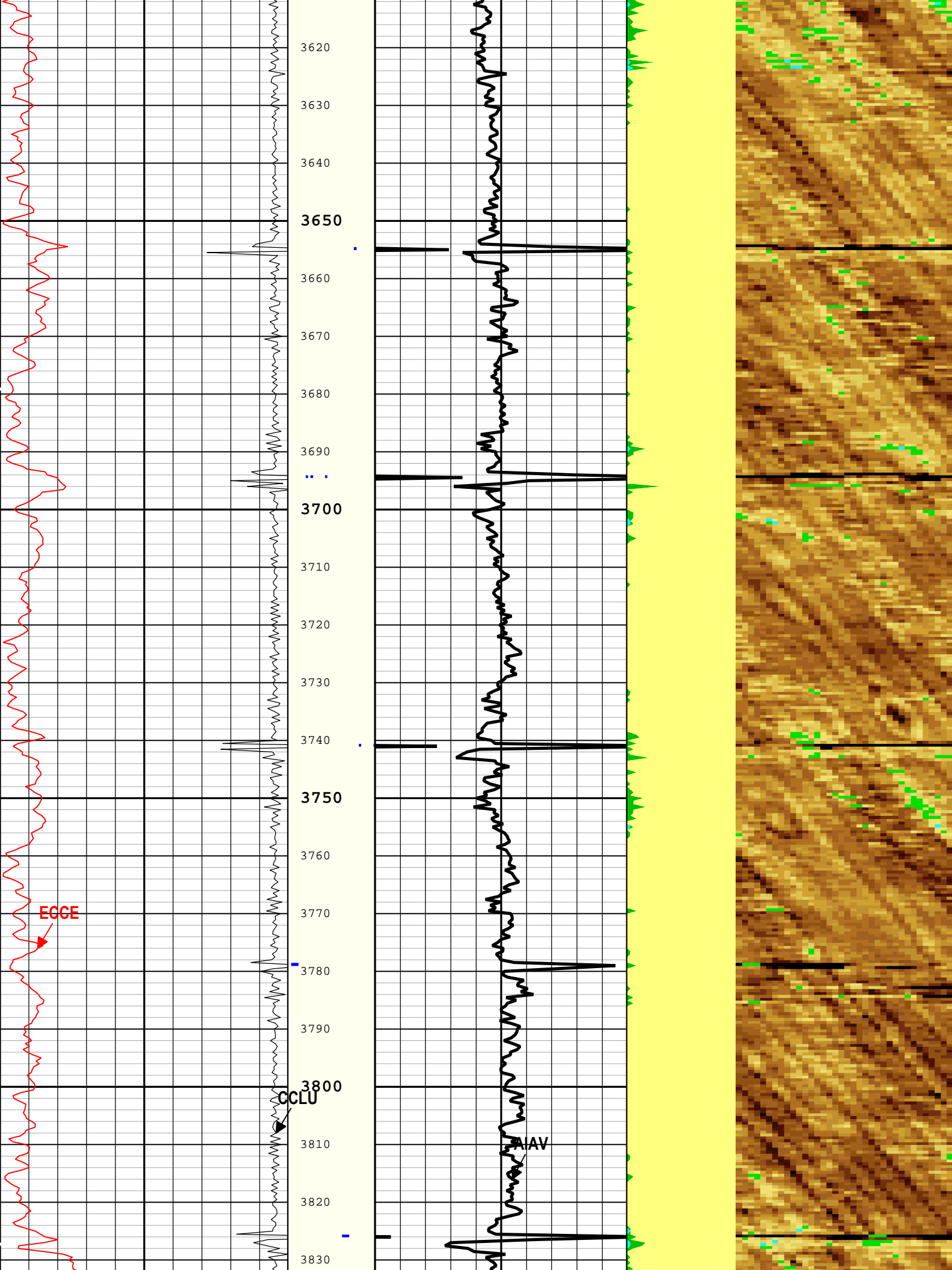


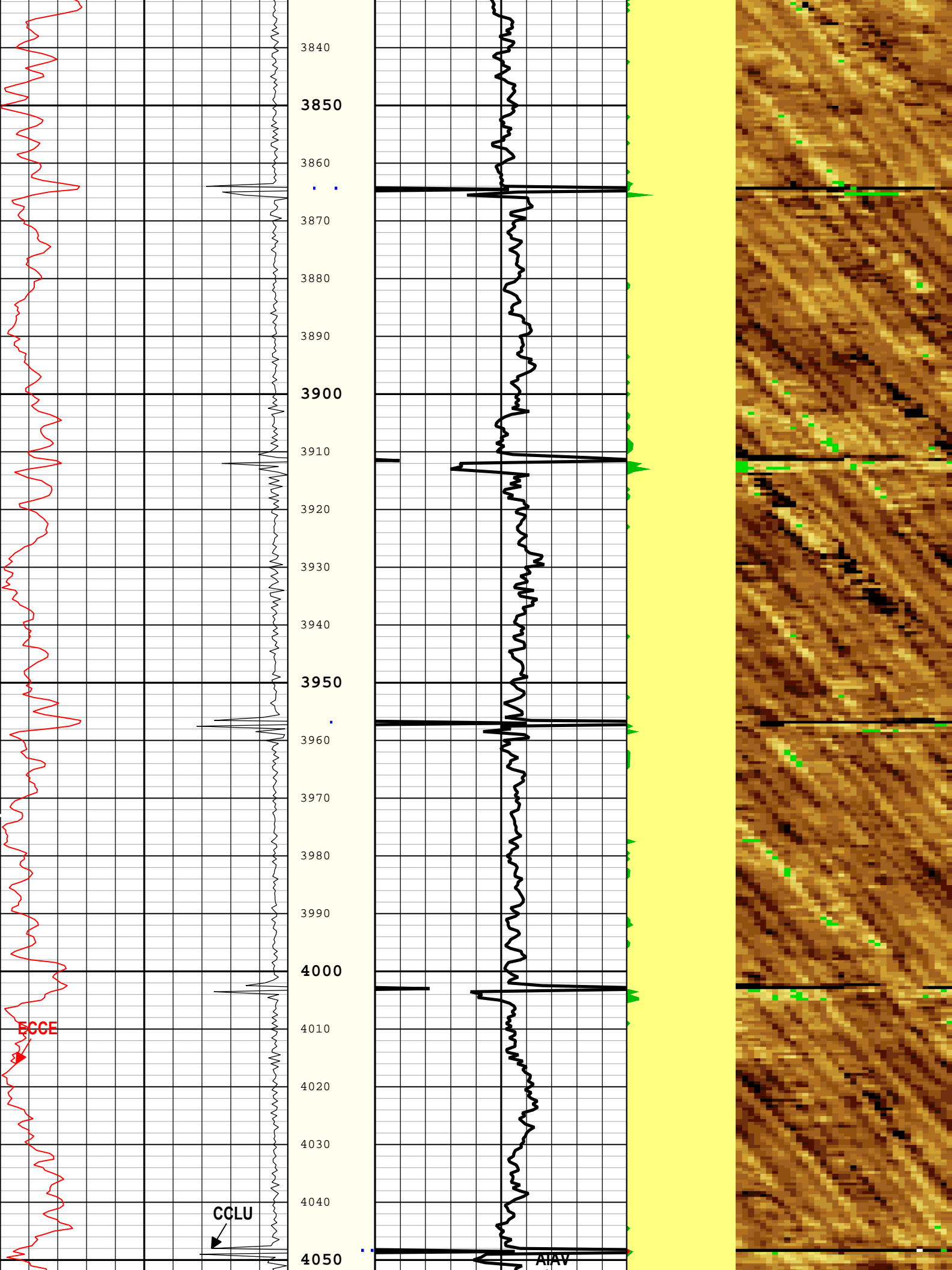


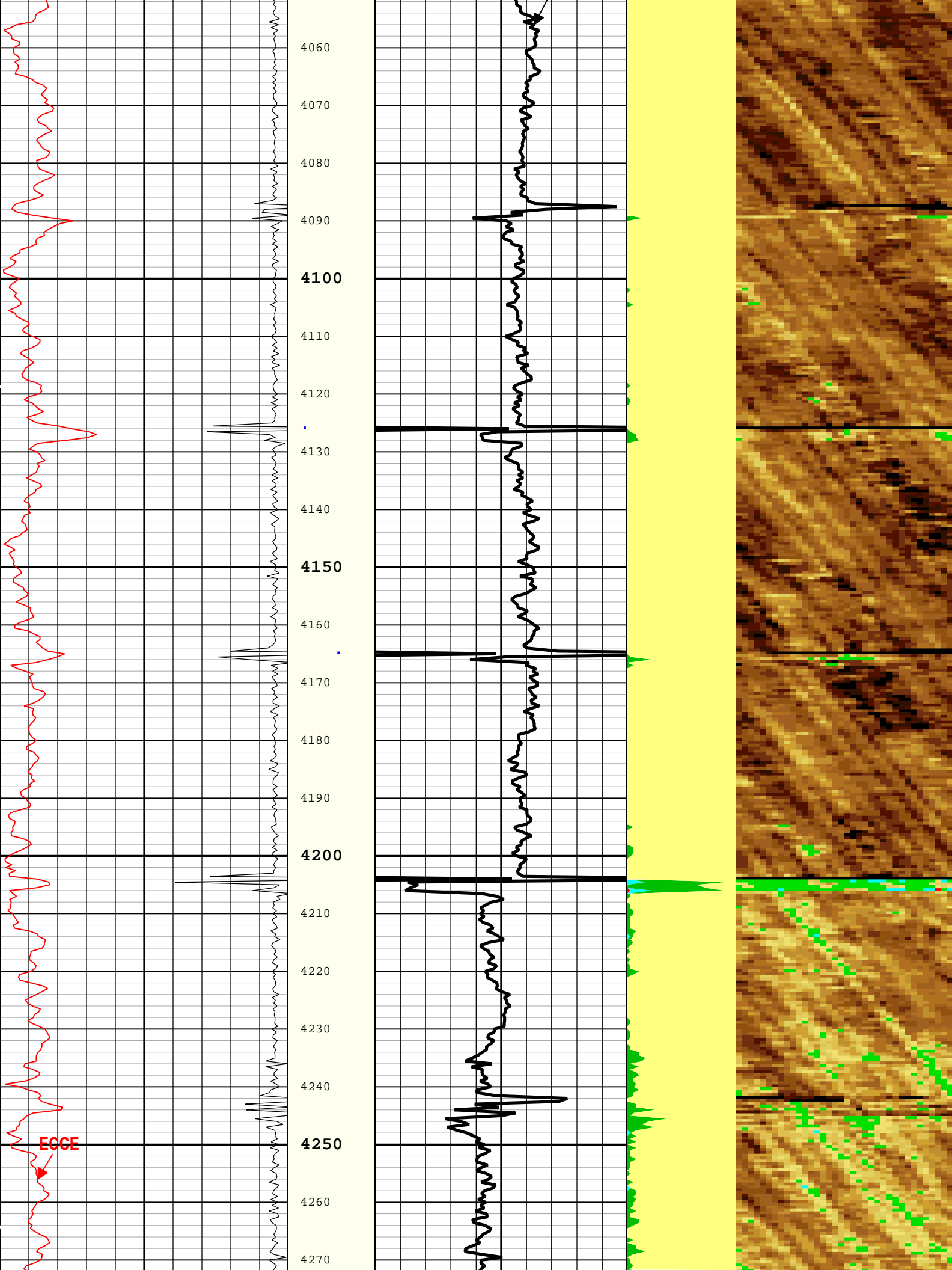


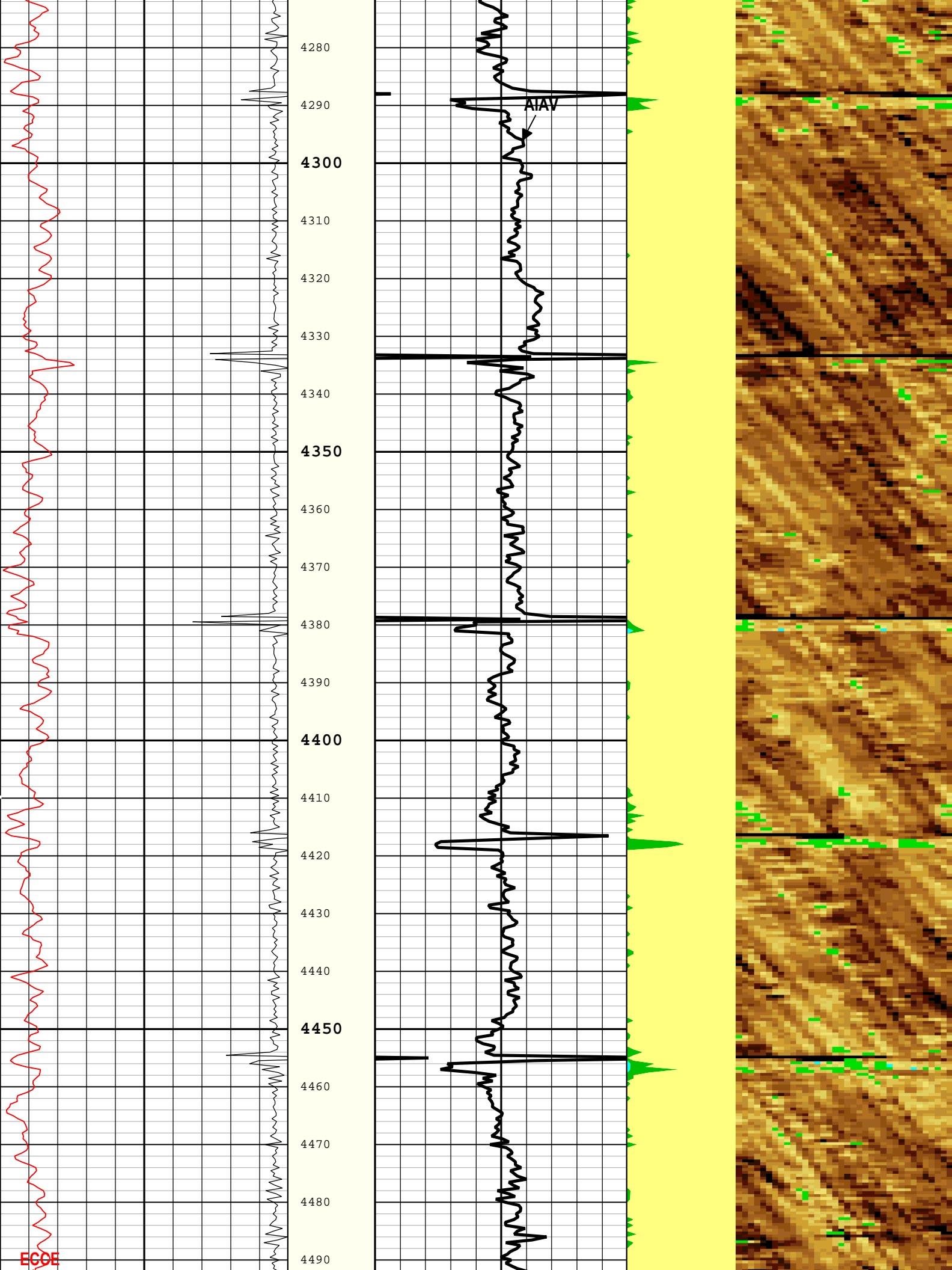


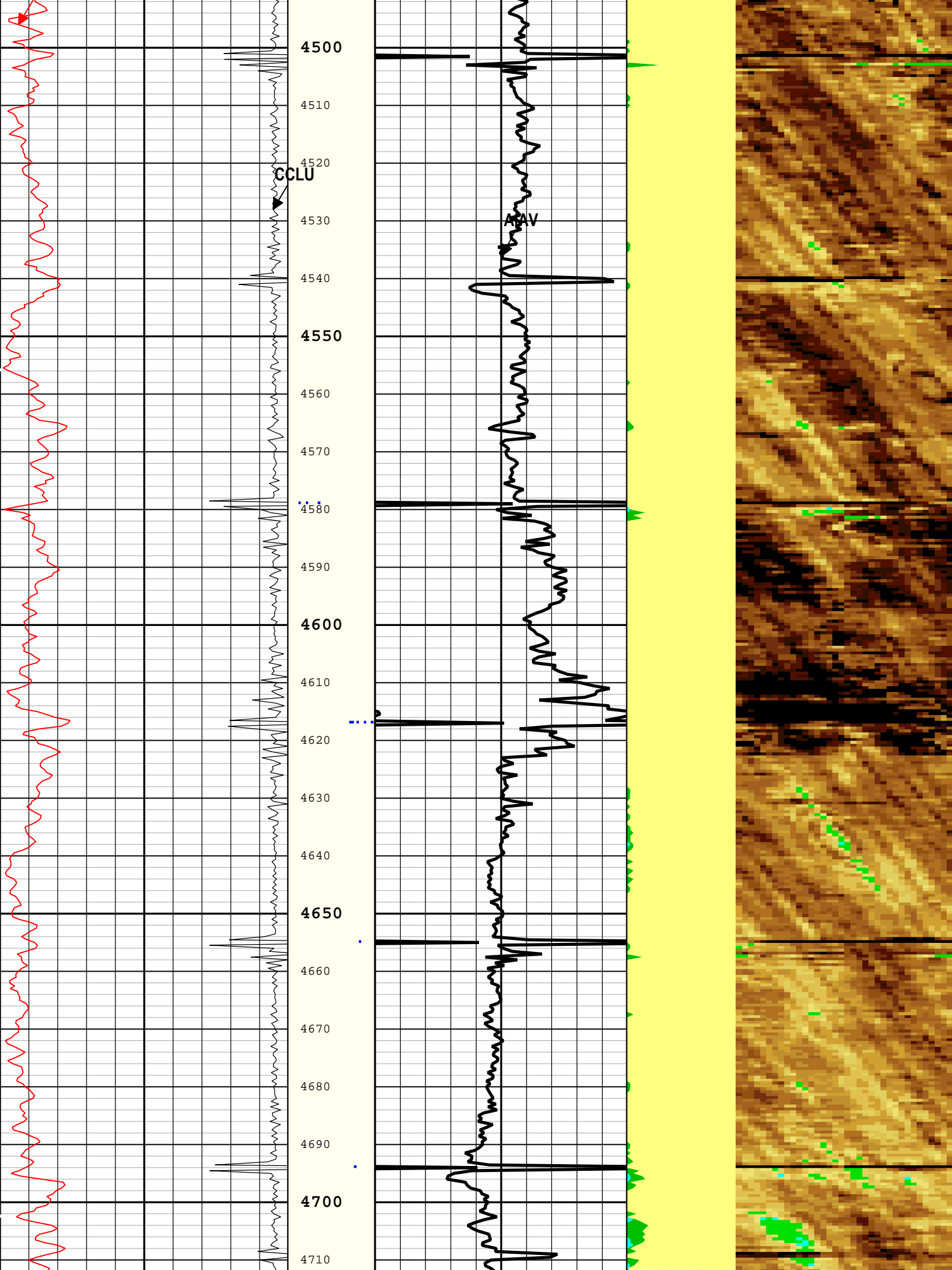


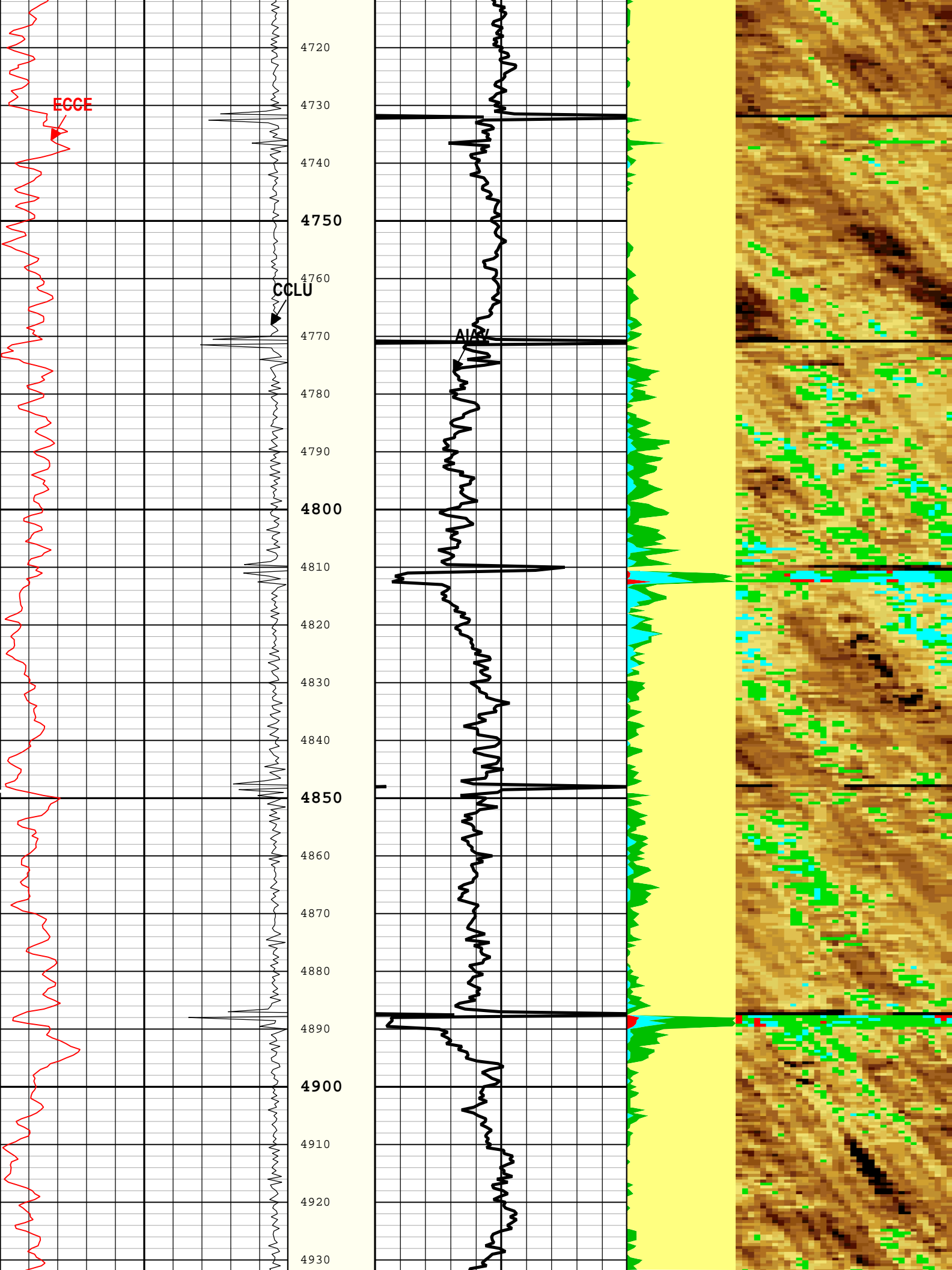


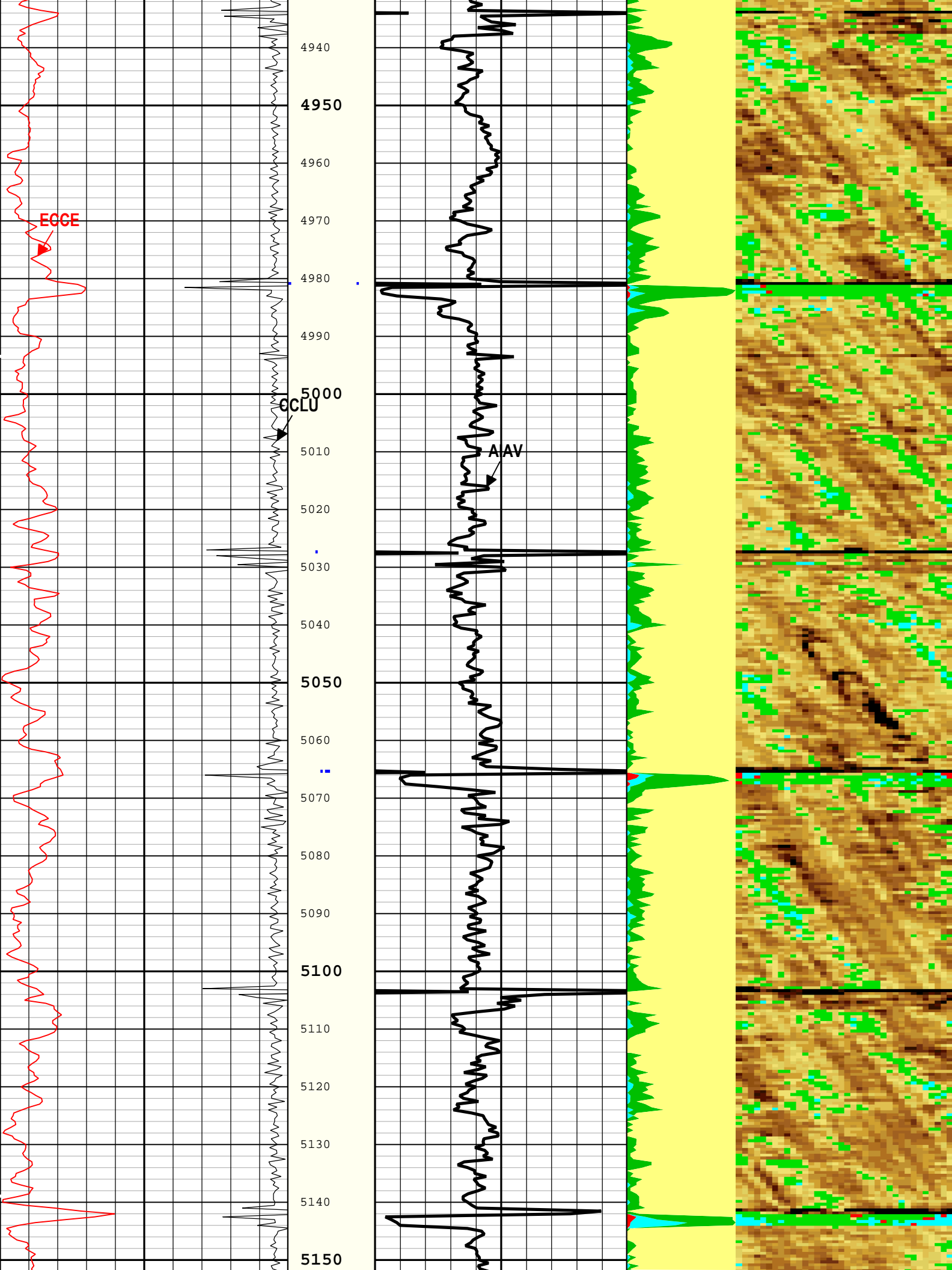


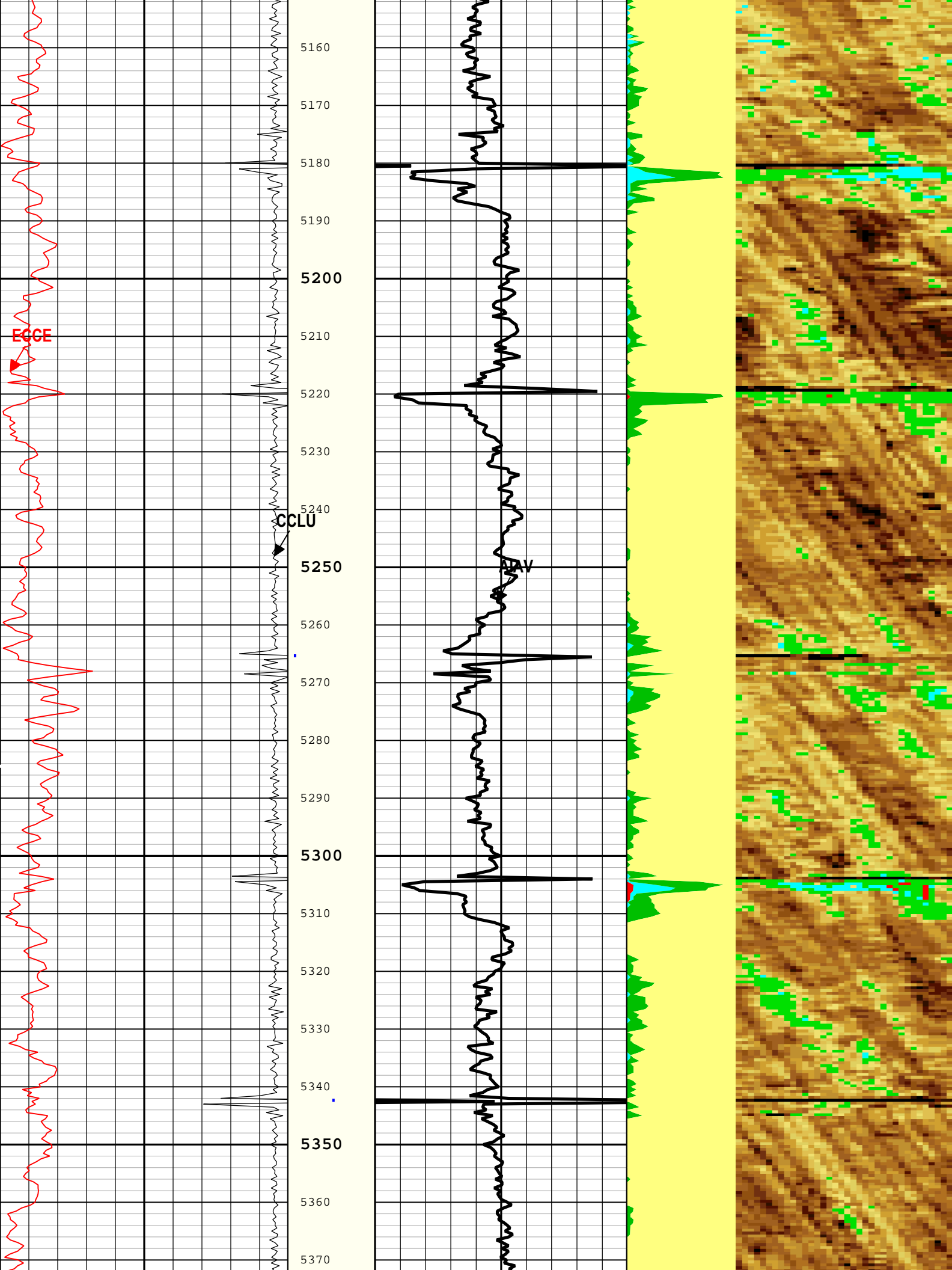


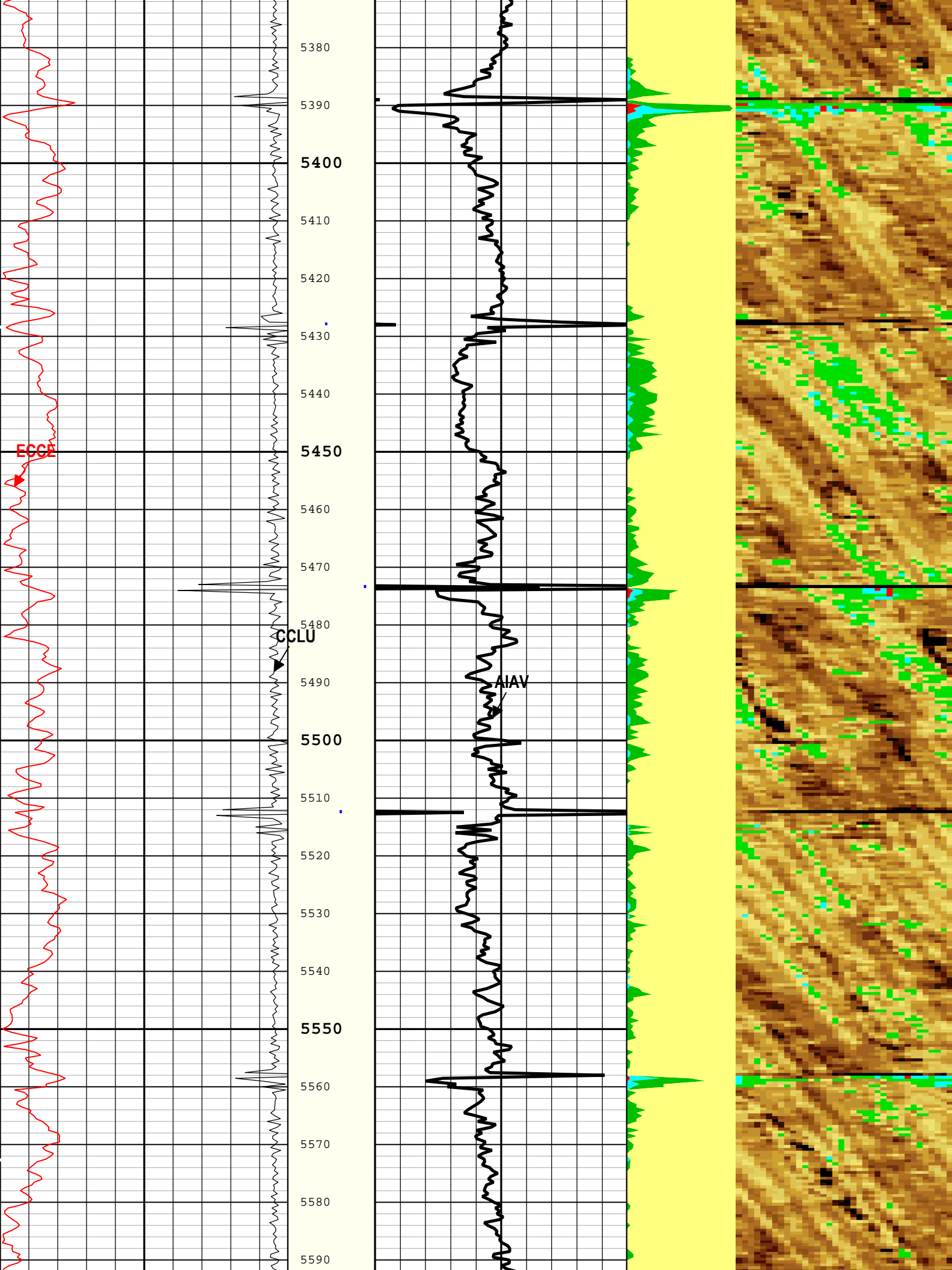


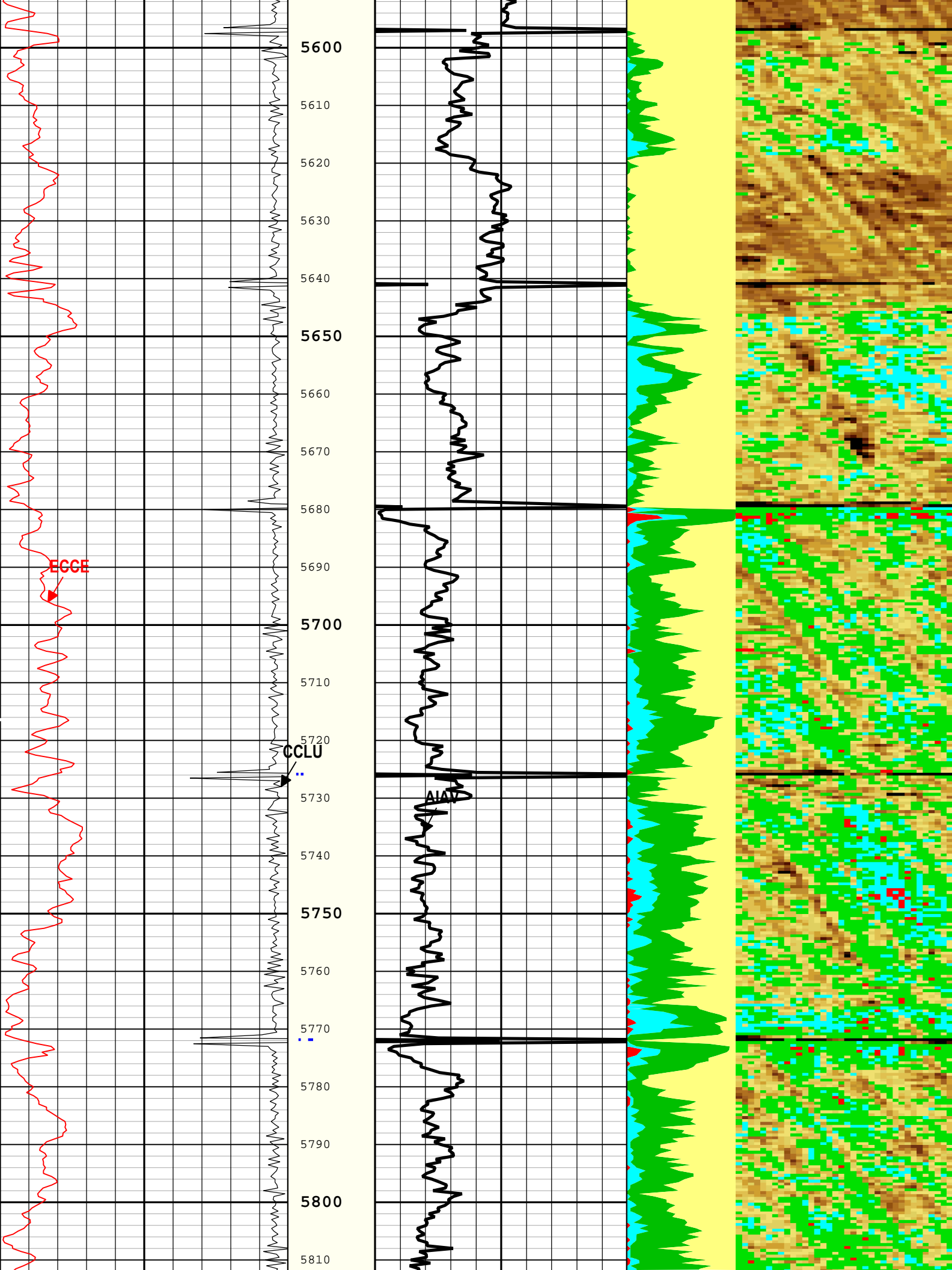


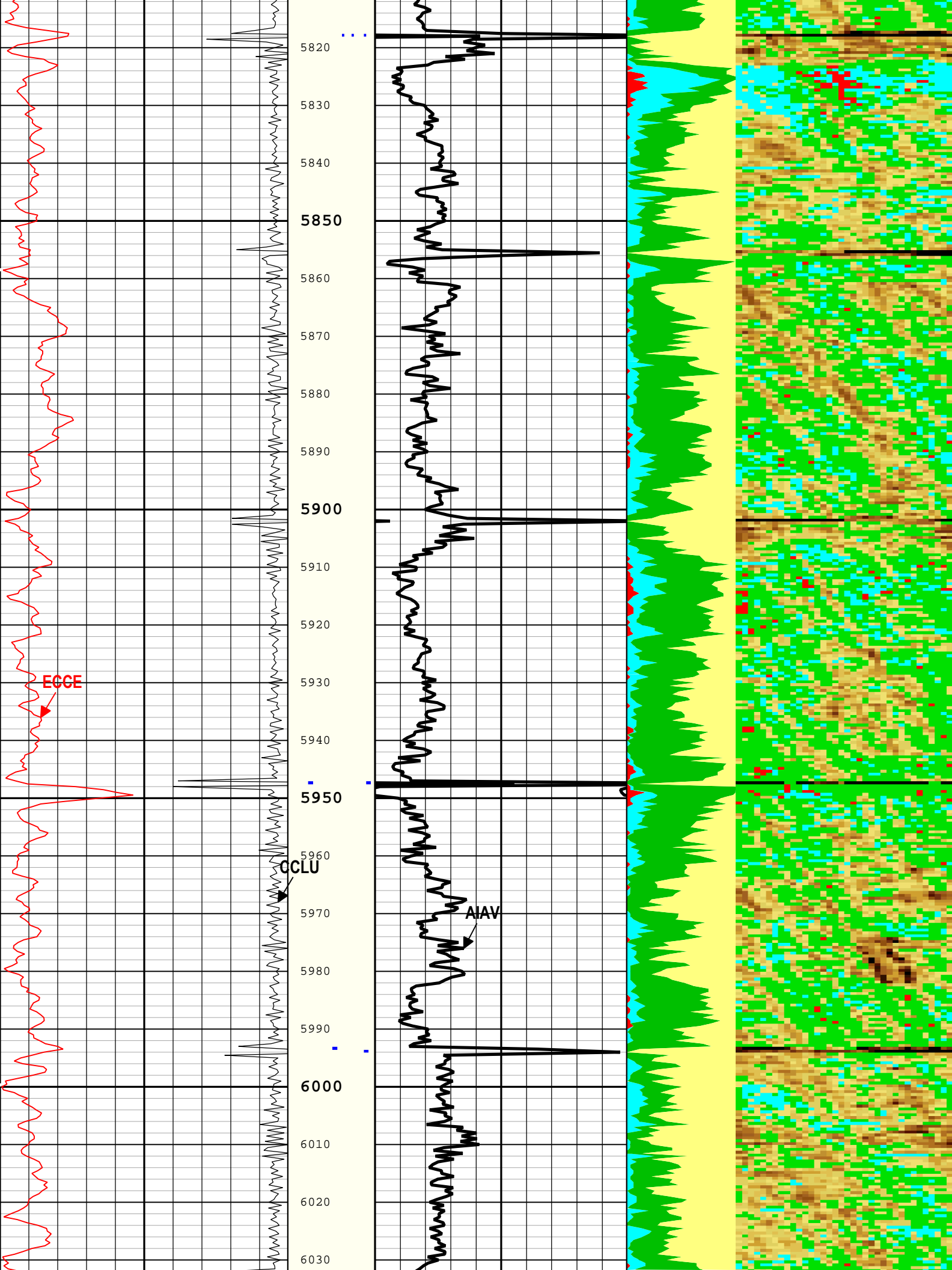


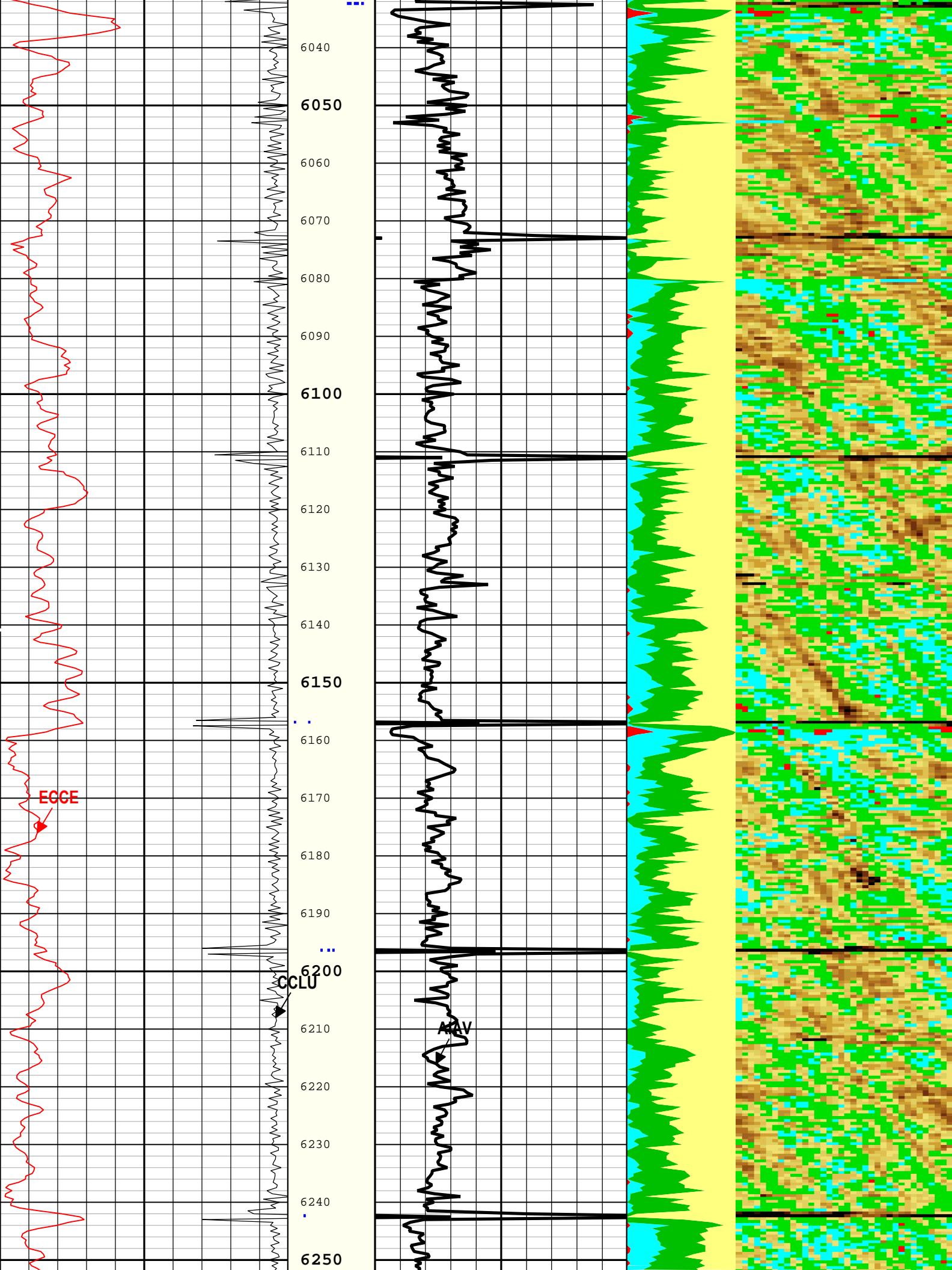


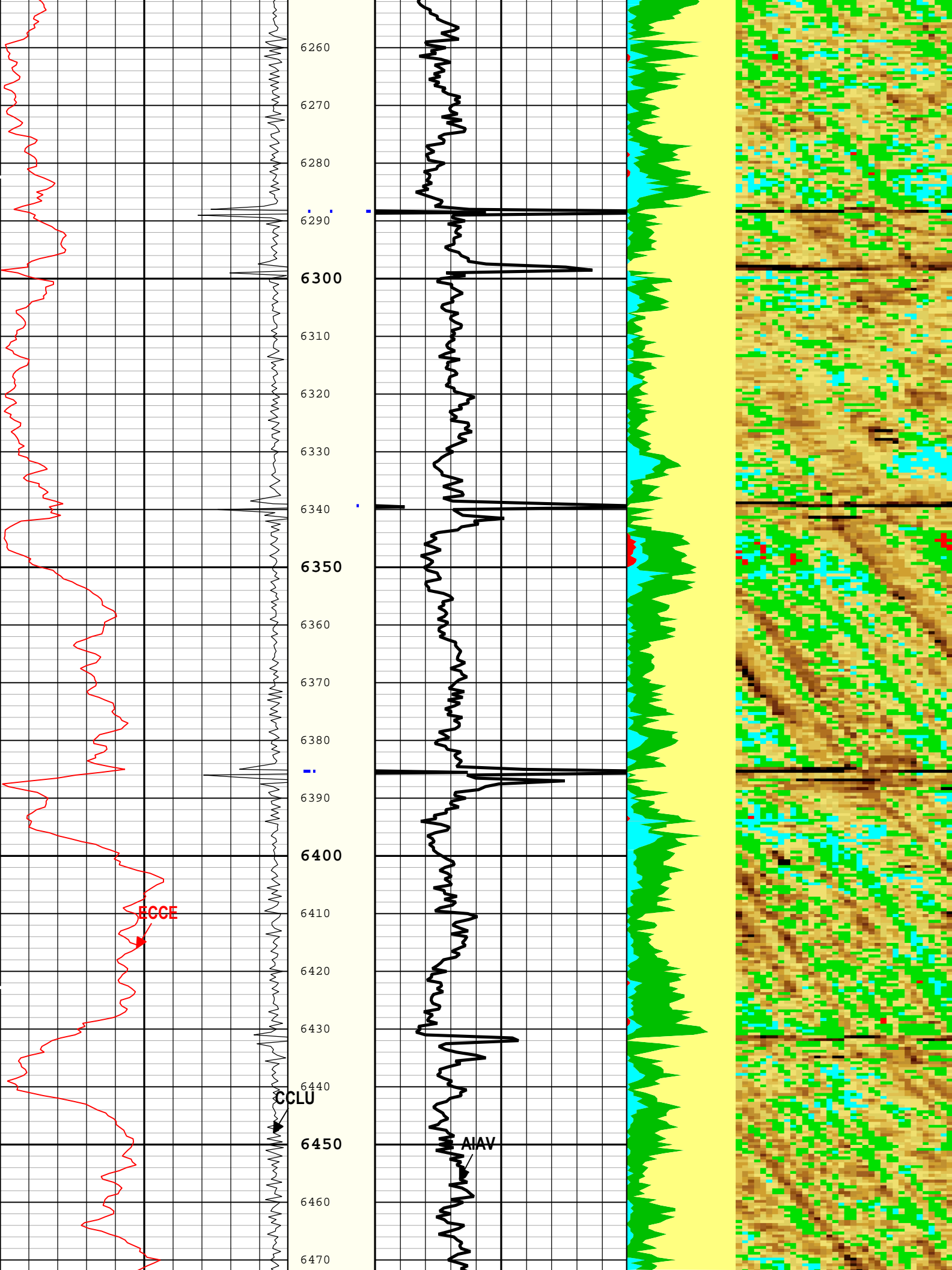


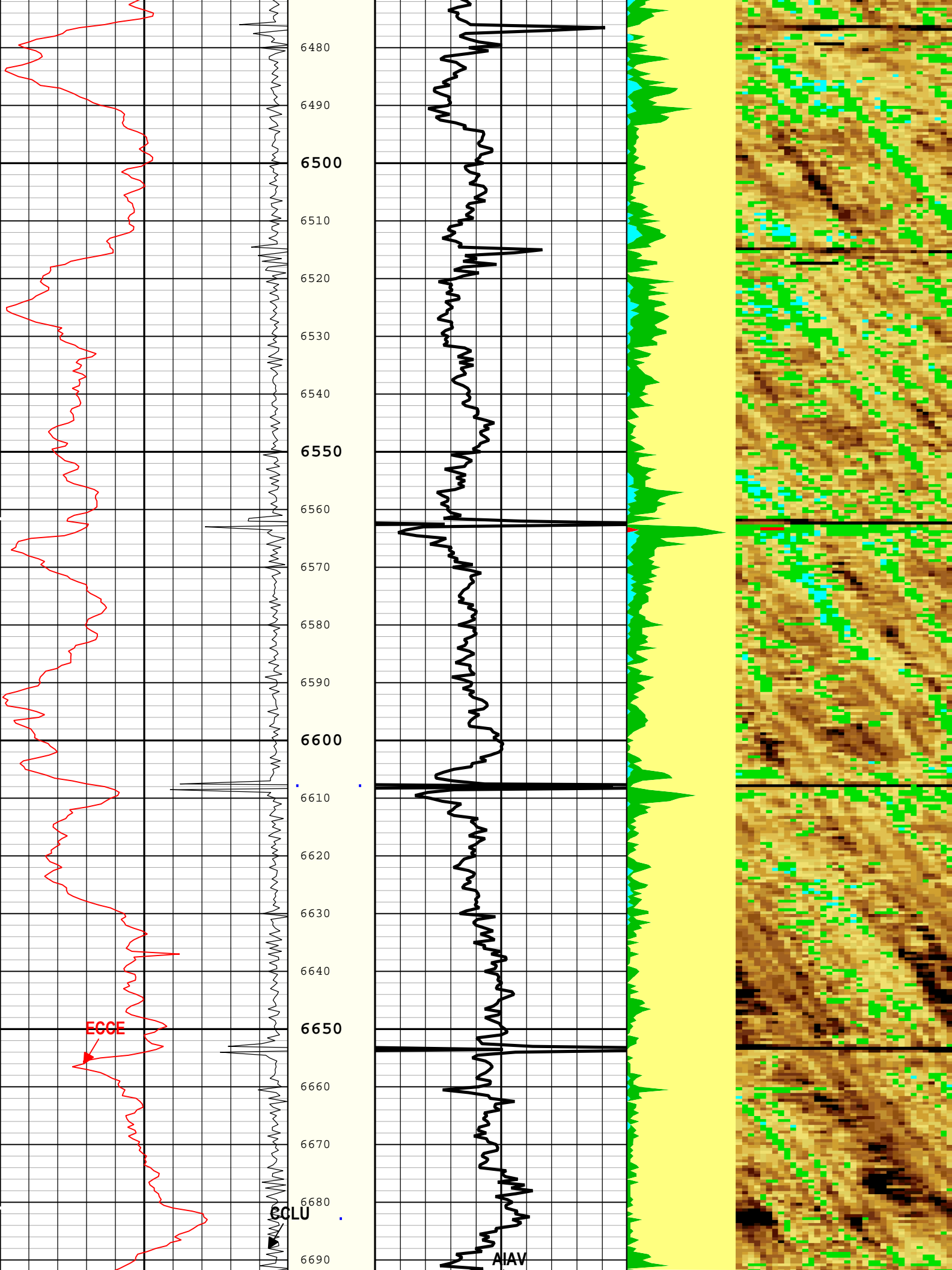


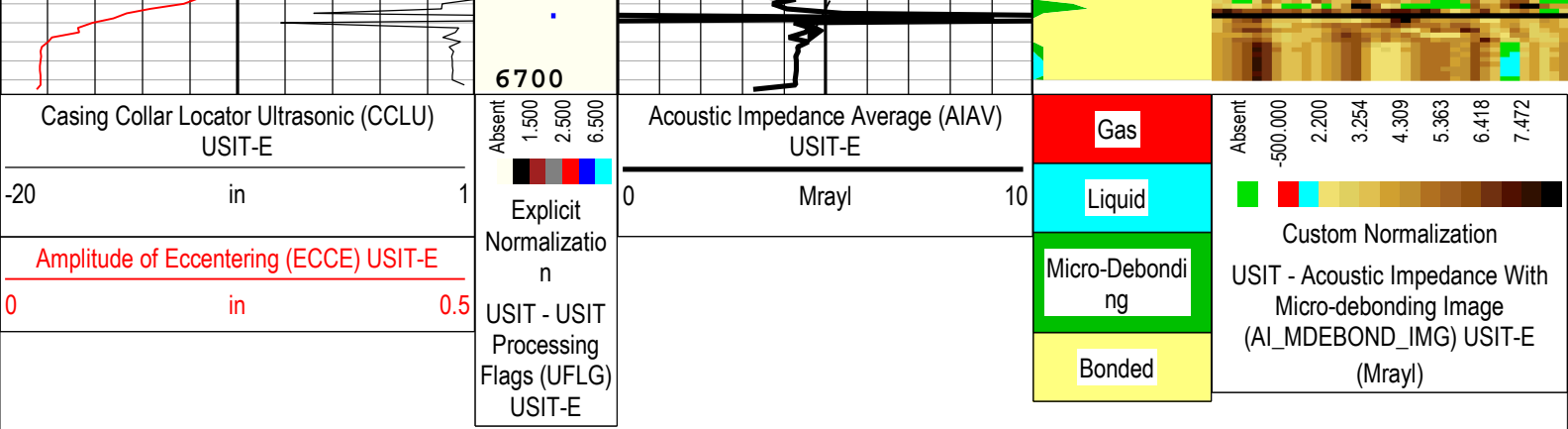












TIME_1900 - Time Marked every 60.00 (s)

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: 03-Feb-2018 12:37:31

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_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
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	1.07	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0.1	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	60.5	110
BS	13.5	110	2043
BS	8.5	2043	6693

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	55	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	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	03-Feb-2018 08:49:30	03-Feb-2018 08:50:16	6702.26	6645.56
WINB	26.8	03-Feb-2018 08:50:16	03-Feb-2018 09:41:52	6645.56	60.63
WINE	71.88	03-Feb-2018 08:49:30	03-Feb-2018 08:50:20	6702.26	6637.73
WINE	70.59	03-Feb-2018 08:50:20	03-Feb-2018 08:50:32	6637.73	6617.68
WINE	72.99	03-Feb-2018 08:50:32	03-Feb-2018 08:51:27	6617.68	6499.32
WINE	70.59	03-Feb-2018 08:51:27	03-Feb-2018 08:51:36	6499.32	6477.8
WINE	75.39	03-Feb-2018 08:51:36	03-Feb-2018 08:51:43	6477.8	6461.92
WINE	73.59	03-Feb-2018 08:51:43	03-Feb-2018 08:51:47	6461.92	6451.78
WINE	67.59	03-Feb-2018 08:51:47	03-Feb-2018 08:51:50	6451.78	6446.14
WINE	71.79	03-Feb-2018 08:51:50	03-Feb-2018 08:51:52	6446.14	6441.03
WINE	75.99	03-Feb-2018 08:51:52	03-Feb-2018 08:52:08	6441.03	6401.98
WINE	70.59	03-Feb-2018 08:52:08	03-Feb-2018 08:52:12	6401.98	6393.86
WINE	74.19	03-Feb-2018 08:52:12	03-Feb-2018 09:41:52	6393.86	60.63

All depth are at tool zero.

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[3]:Up	Up	1996.52 ft	2523.46 ft	03-Feb-2018 7:51:04 AM	03-Feb-2018 7:54:55 AM	ON	3.65 ft	No

All depths are referenced to toolstring zero

Log

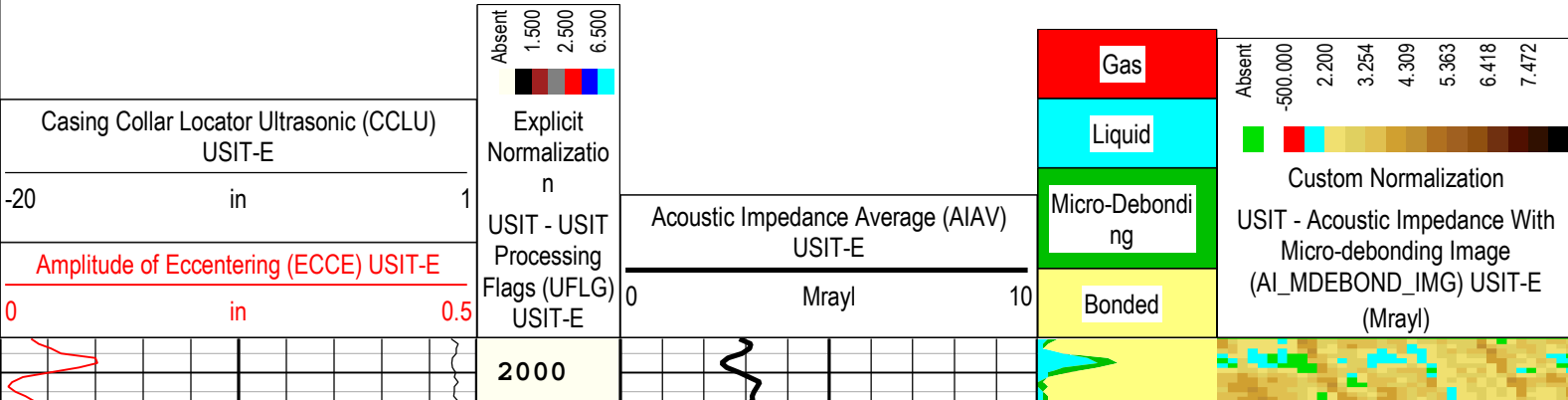
Company:Noble Energy Inc Well:Bison Ridge Y22-771

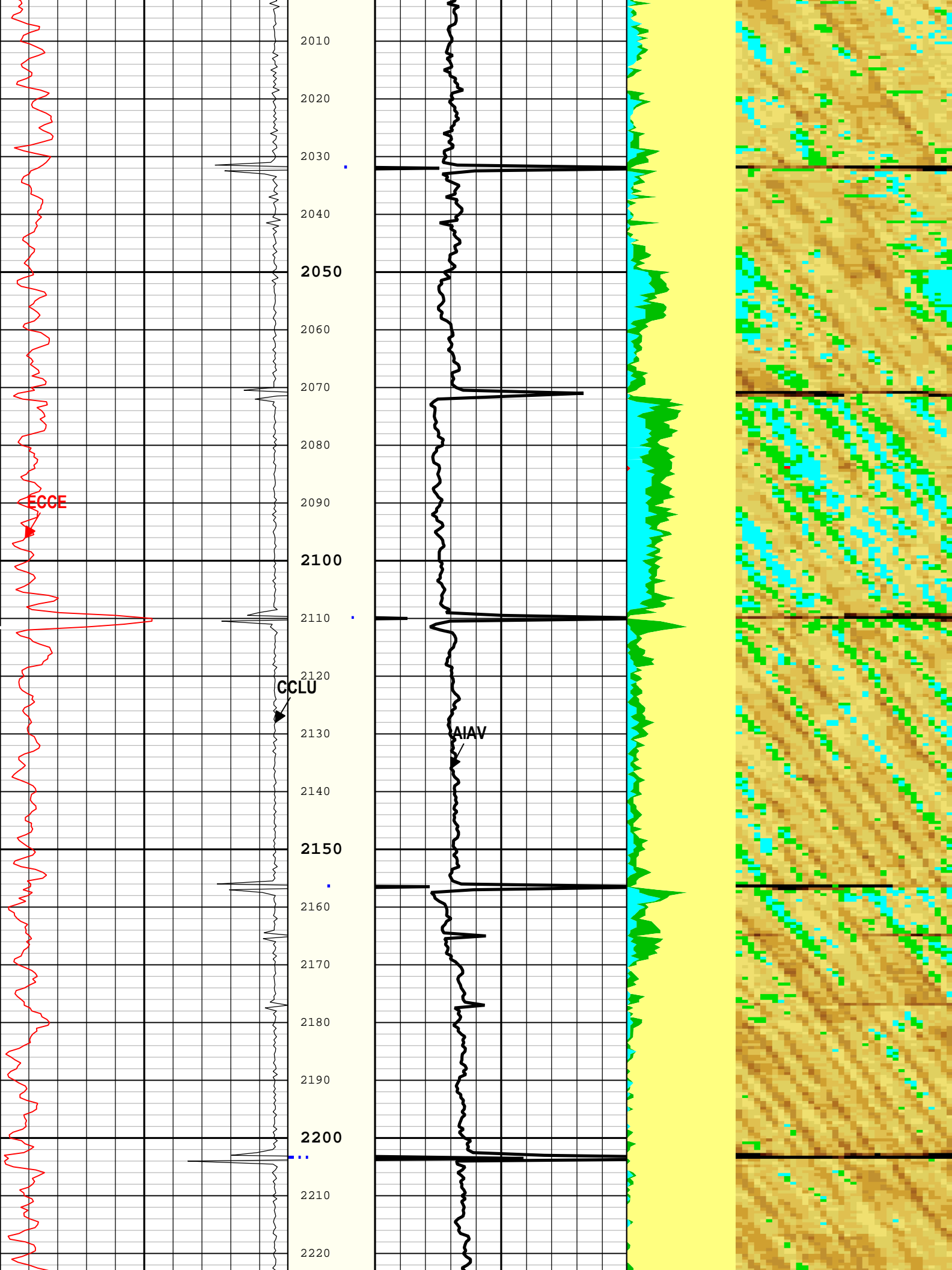
ONE: Log[3]:Up:S003

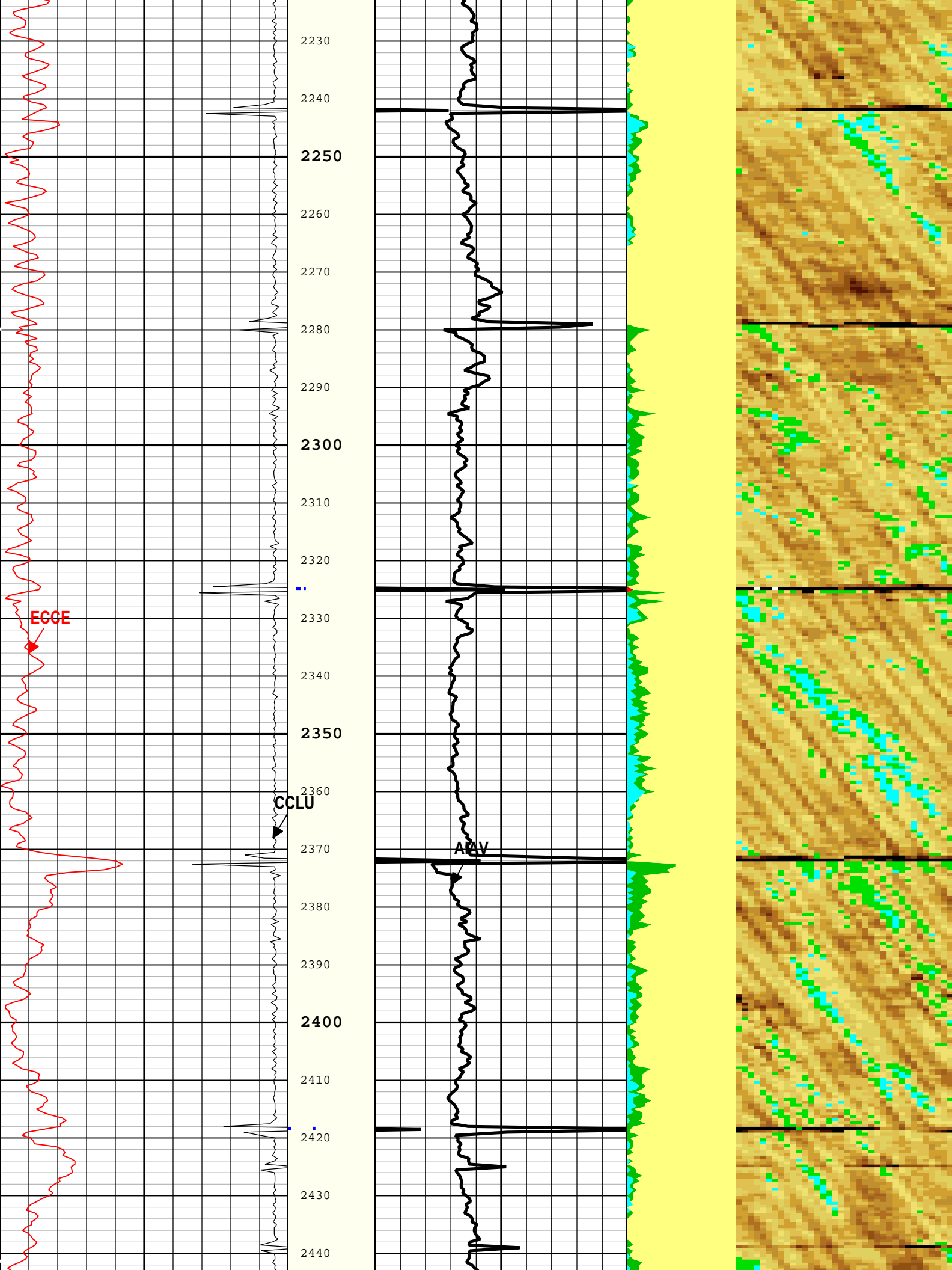
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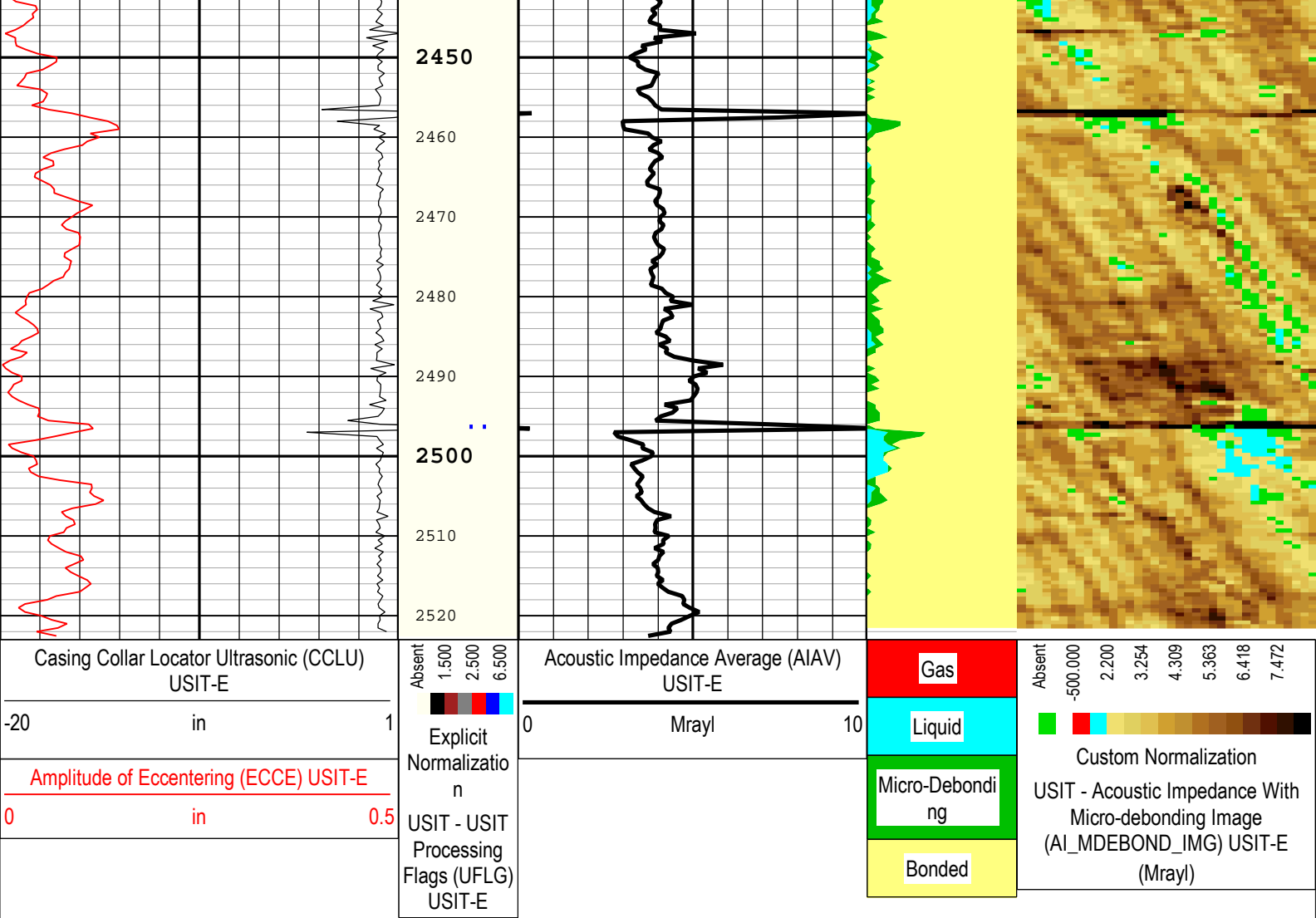
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TIME_1900 - Time Marked every 60.00 (s)









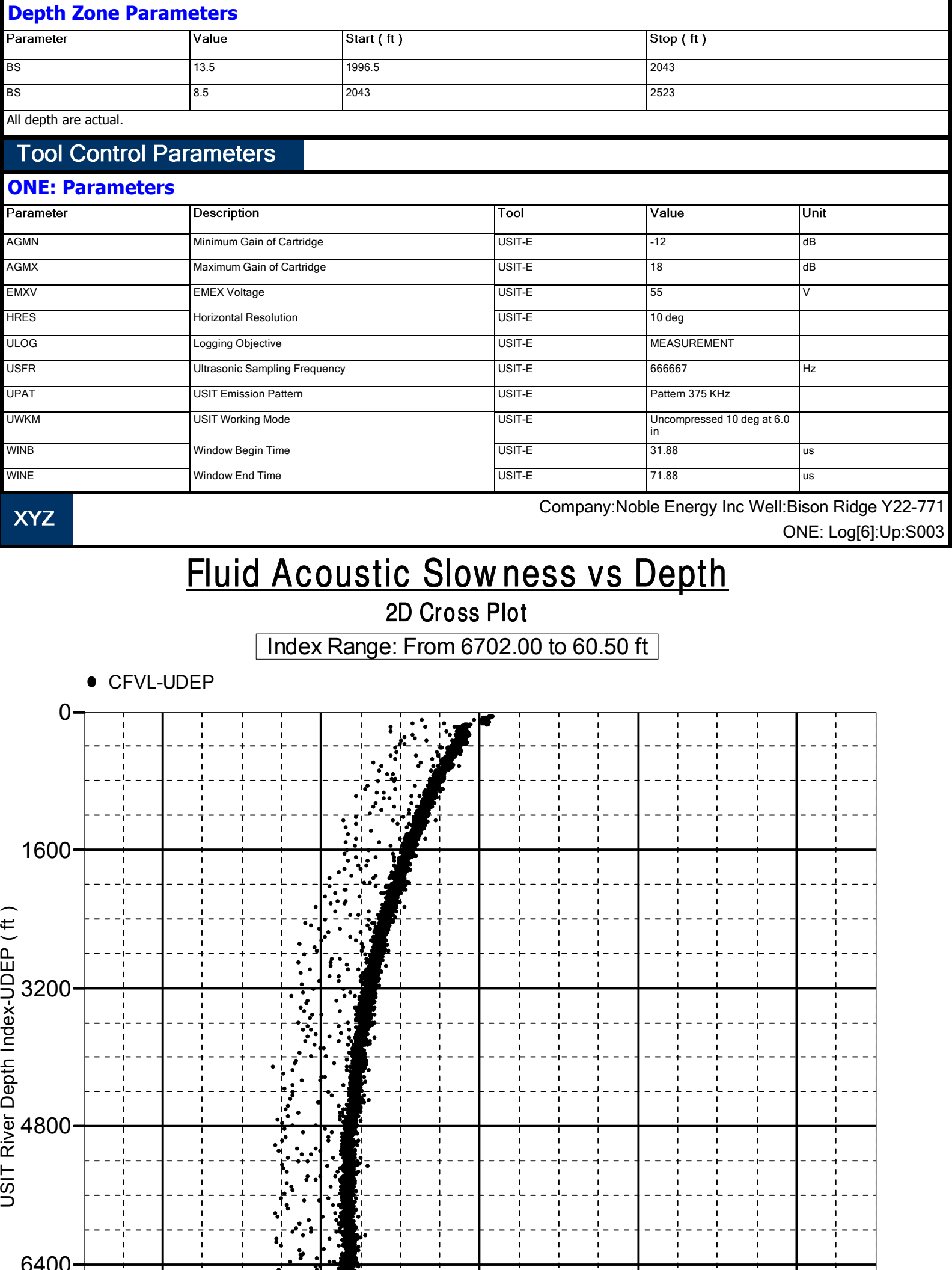
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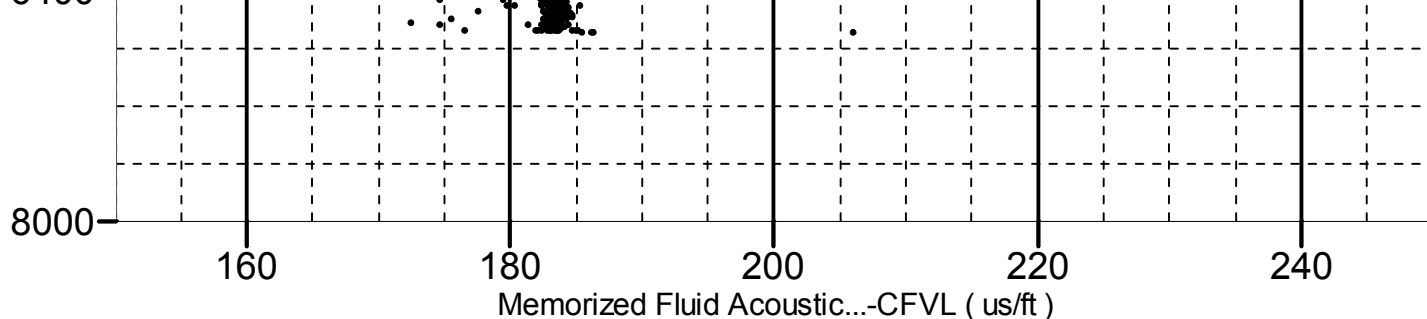
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Creation Date: 03-Feb-2018 12:37:36

Channel Processing Parameters

ONE: Parameters

Parameter	Description	Tool	Value	Unit
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CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
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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	1.07	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0.1	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





XYZ

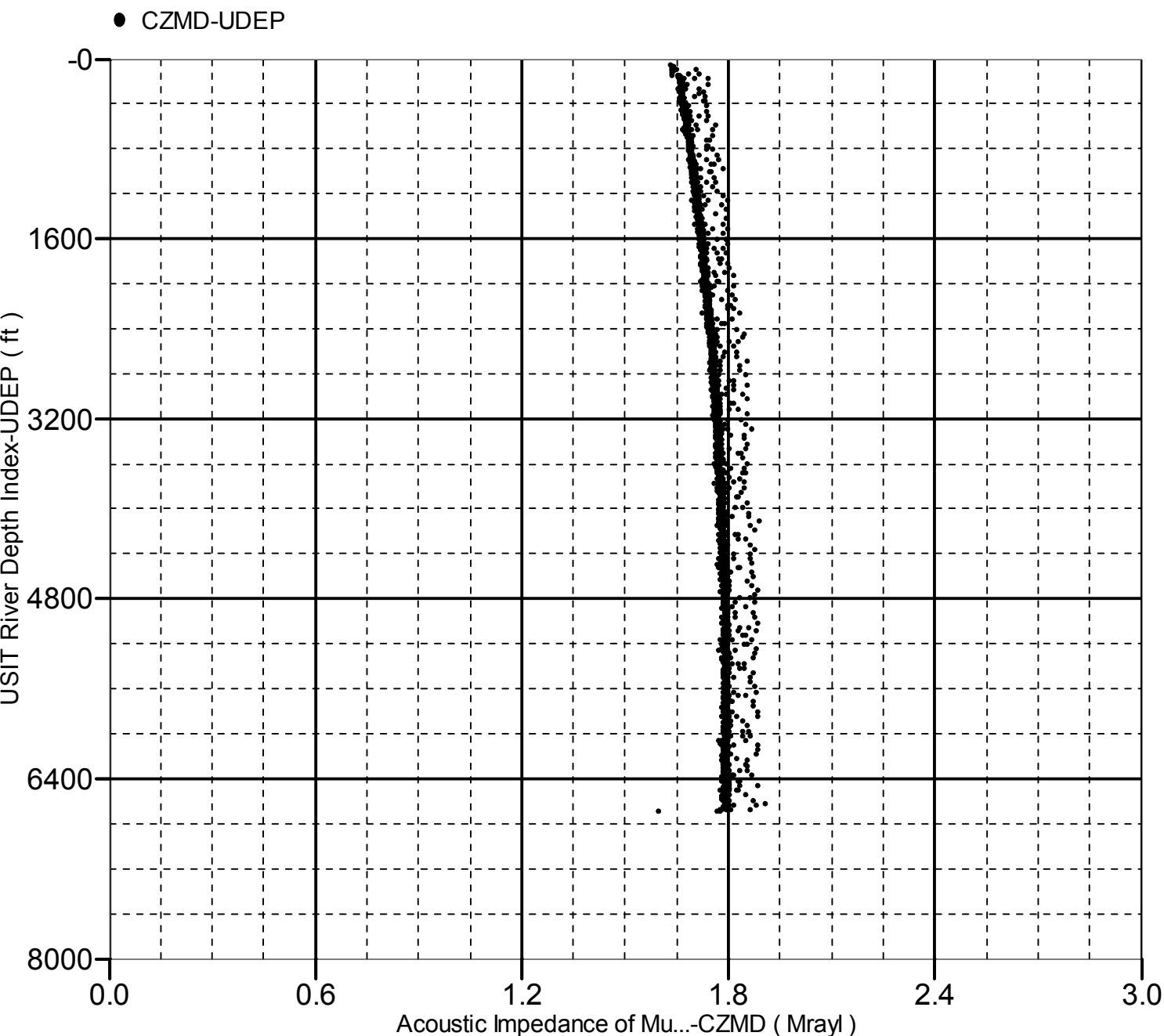
Company:Noble Energy Inc Well:Bison Ridge Y22-771

ONE: Log[6]:Up:S003

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6702.00 to 60.50 ft



Company: Noble Energy Inc

Schlumberger

Well: Bison Ridge Y22-771

Field: Wattenberg

County:	Weld
State:	CO
UltraSonic Summary Print	