

Company: Noble Energy INC

Well: Wells Ranch BB11-650

Field: Wattenberg

County: WELD State: Colorado

UltraSonic Summary Print

County:	WELD				
Field:	Wattenberg				
Location:	NWSW Sec 11, T5N, R63W				
Well:	Wells Ranch BB11-650				
Company:	Noble Energy INC				
		Location:			
		NWSW Sec 11, T5N, R63W	Elev.:	K.B.	4698.00 ft
		SHL: 2590' FSL & 300' FWL		G.L.	4668.00 ft
		Lat/Long: 40.41268, -104.41263		D.F.	4698.00 ft
		Permanent Datum:	Ground Level	Elev.:	4668.00 f
		Log Measured From:	Kelly Bushing	30.00 ft	above Perm.Datum
		Drilling Measured From:	Kelly Bushing		
		API Serial No.	Section:	Township:	Range:
		05-123-44961	11	5N	63W
Logging Date	18-Sep-2017				

Run Number	One	
Depth Driller	14088.00 ft	
Schlumberger Depth	5900.00 ft	
Bottom Log Interval	5900.00 ft	
Top Log Interval	88.00 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	1931.00 ft	
To	5900.00 ft	
Casing/Tubing Size	5.5 in	
Weight	20 lbm/ft	
Grade	N/A	
From	30.00 ft	
To	5900.00 ft	
Max Recorded Temperatures	226.82 degF	
Logger on Bottom	18-Sep-2017	15:05:00
Unit Number	Location:	
Recorded By	2161	Fort Morgan
Witnessed By	Camila Lang	
	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

- | | |
|---|--|
| <ol style="list-style-type: none">HeaderDisclaimerContentsWell SketchBorehole Size/Casing/Tubing RecordOperational Run SummaryBorehole FluidsRemarks and Equipment SummaryDepth SummaryUSI Fluid Properties Measurement_1One 2500 PSI Main Pass<ol style="list-style-type: none">Integration SummarySoftware VersionComposite SummaryLog (DJ Basin Ultrasonic Cement Summary Report)Parameter Listing | <ol style="list-style-type: none">XYZ (USI Fluid Acoustic Slowness vs Depth 3.0 in)XYZ (USI Acoustic Impedance of Mud vs Depth 3.0 in)Tail |
|---|--|

12. One 0 PSI Repeat Pass

12.1 Integration Summary

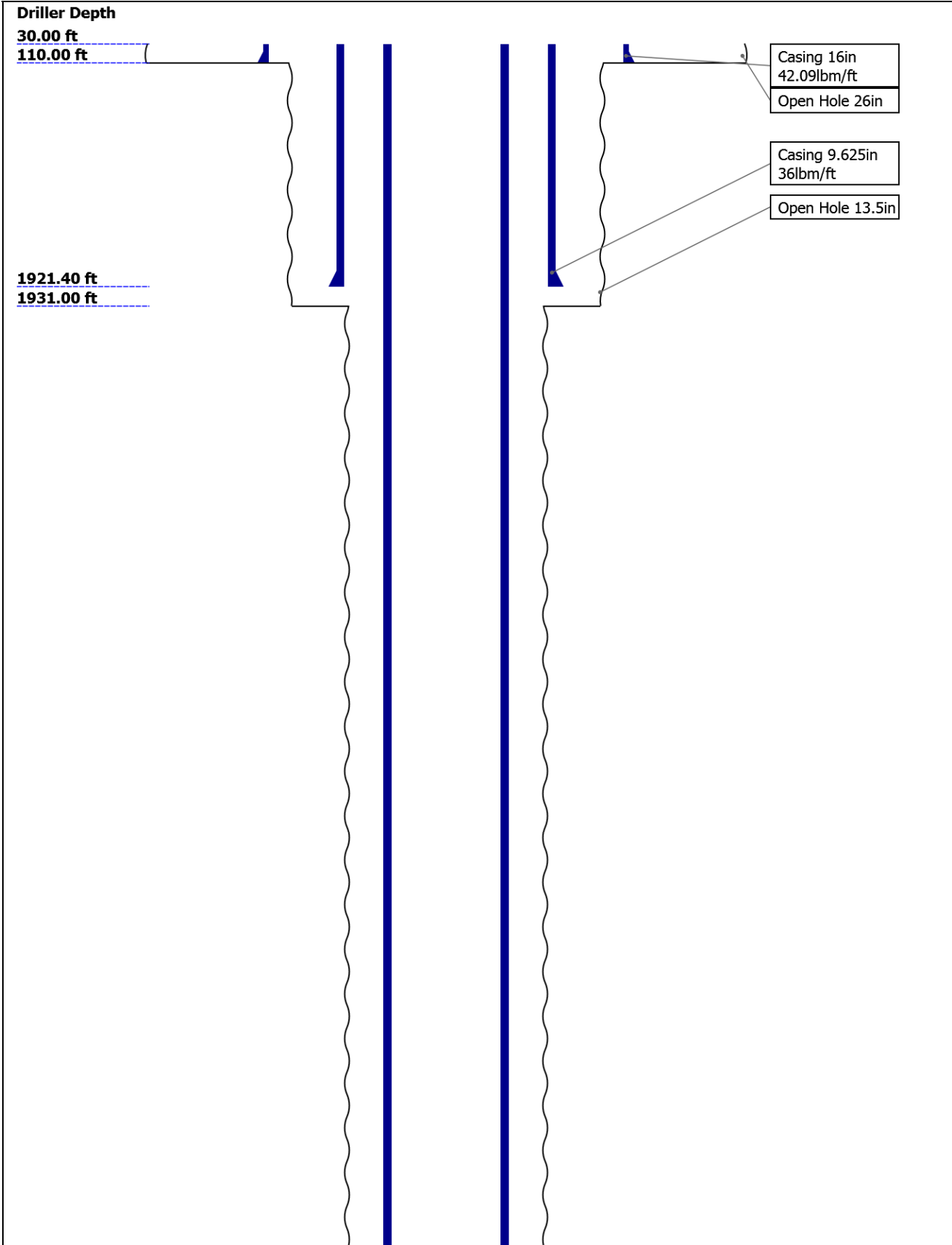
12.2 Software Version

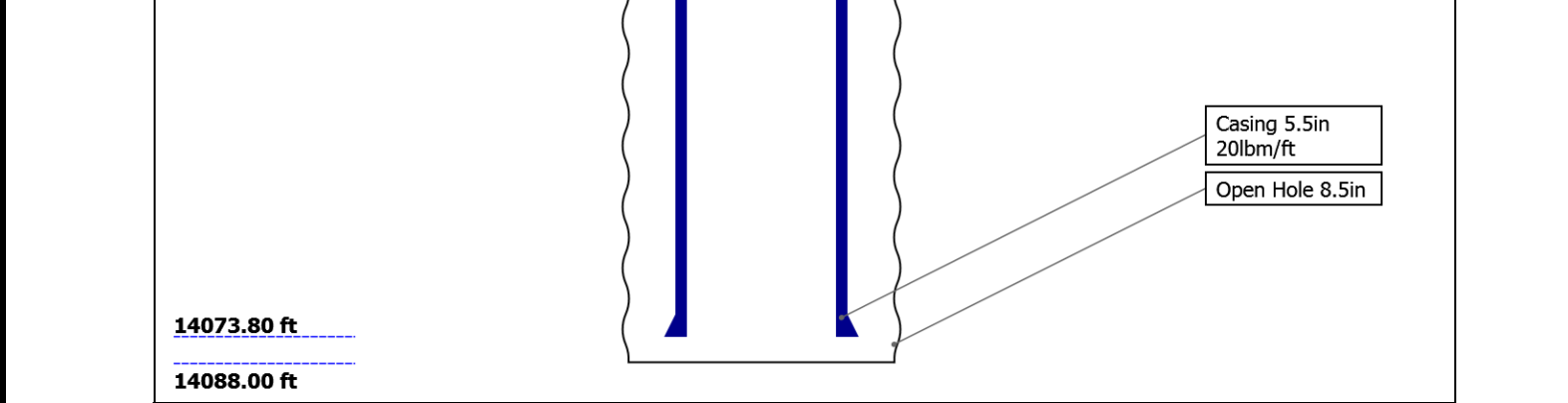
12.3 Composite Summary

12.4 Log (DJ Basin Ultrasonic Cement Summary Report)

12.5 Parameter Listing

Well Sketch





Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	30	110	1931			
Top Logger (ft)	30	110	1931			
Bottom Driller (ft)	110	1931	14088			
Bottom Logger (ft) (ft)	110	1931	5900			
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)	30	30	30			
Top Logger (ft)	30	30	30			
Bottom Driller (ft)	110	1921.4	14073.8			
Bottom Logger (ft)	110	1921.4	5900			

Operational Run Summary

Parameter (unit)	One					
Date Log Started	18-Sep-2017					
Time Log Started	14:03:45					
Date Log Finished	18-Sep-2017					
Time Log Finished	16:05:40					
Top Log Interval (ft)	88.00					
Bottom Log Interval (ft)	5900.00					
Total Depth (ft)	5900.00					
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					
Recorded By	Camila Lang					

Borehole Fluids

Remarks and Equipment Summary

Lengths are in ft
Maximum Outer Diameter = 3.410 in
Line: Sensor Location Value: Gating Offset

Line: Sensor Location, Value: Gating Onset All measurements are relative to TOOL_ZERO			
Depth Summary			
	One		
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	7-39P-LXS		
Serial Number			
Length	10000.00 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 were followed.	
Rig Up Length At Surface		IDW used as a primary depth reference.	
Rig Up Length At Bottom		Z-chart used as a 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[7]:Up	6507.39	57.35
Fluid Velocity = "Automatic". CFVL equals DFSL channel			
Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)
Mud Impedance = "FreePipe Norm." Free Pipe normalization zone is : 22.79m(74.78ft) to 23.81m(78.11ft) MUD_N_FRP = 1.14 DFD = 1.01g/cm3(8.40lbm/gal) CZMD median computed in free pipe normalization interval = 1.64 MRayl			
Start Depth(ft)	Stop Depth(ft)	Start Value(Mrayl)	End Value(Mrayl)
One			
2500 PSI Main Pass			
Software Version			
Acquisition System		Version	

Acquisition System	Version
Maxwell 2017 SP1	7.1.82245.3100
Application Patch	Wireline_NPD-ICE2-2017SP1_7.1.87324

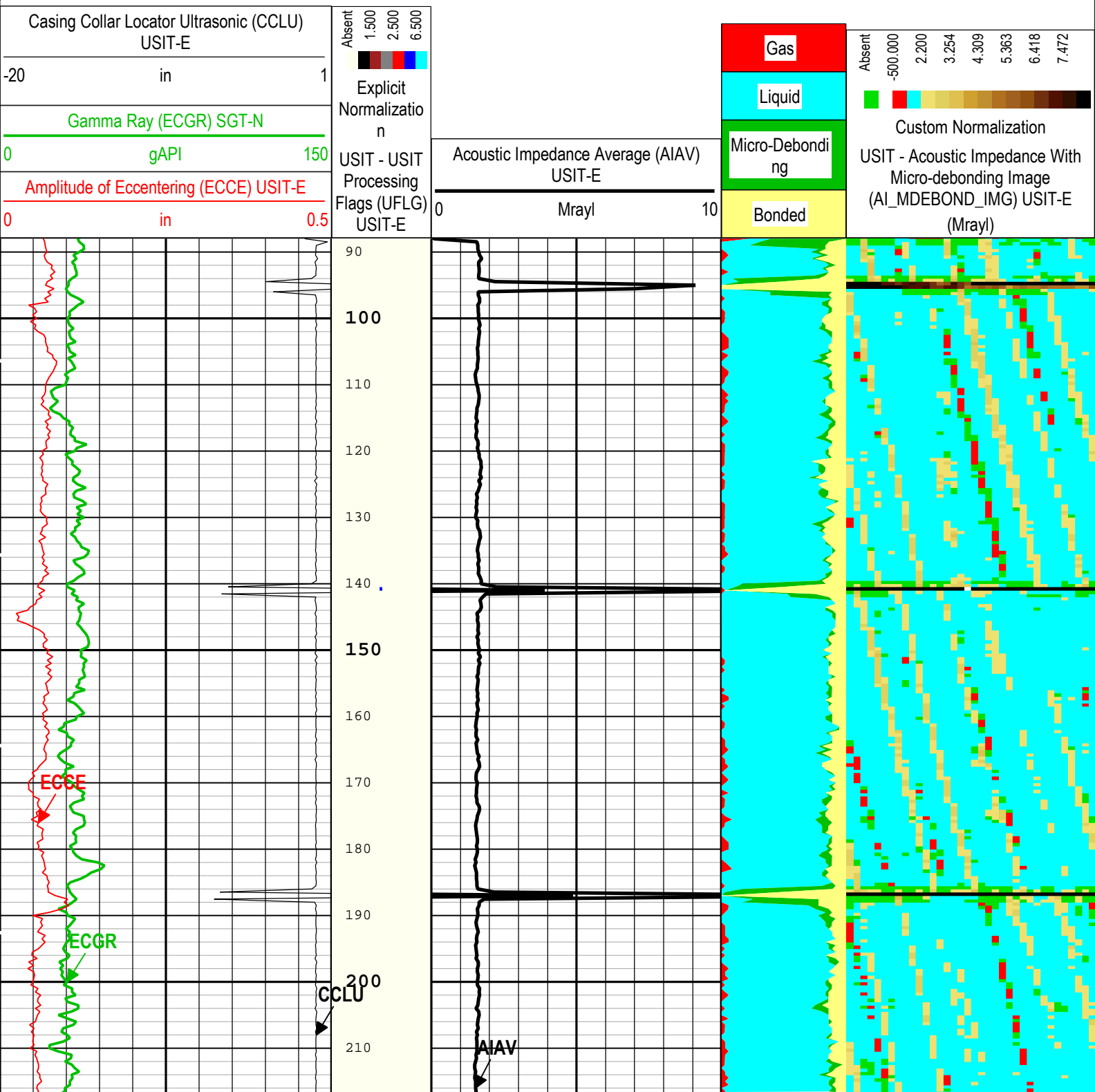
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[7]:Up	Up	57.35 ft	6507.39 ft	18-Sep-2017 3:03:02 PM	18-Sep-2017 4:05:05 PM	ON	3.64 ft	Yes

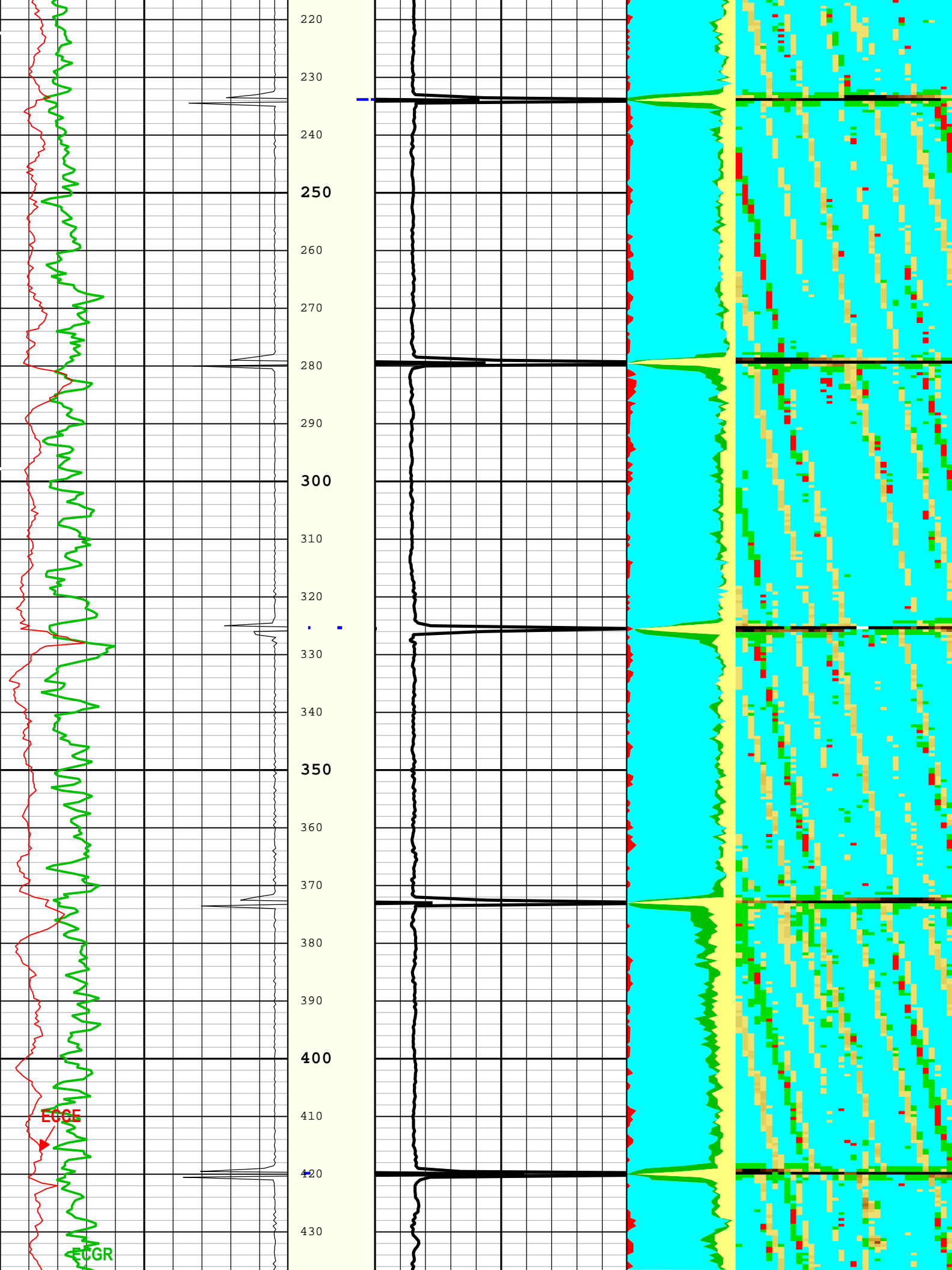
All depths are referenced to toolstring zero

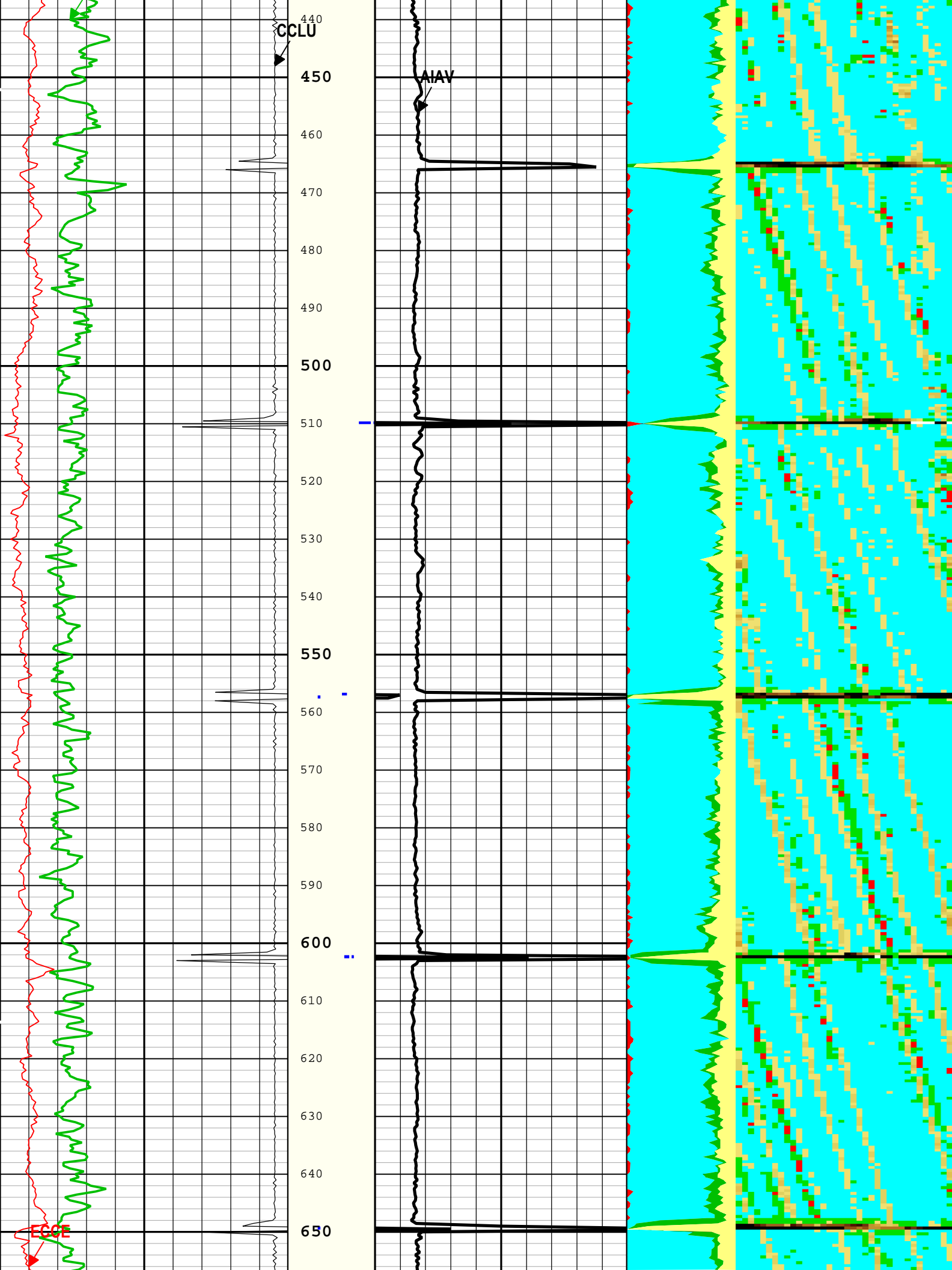
Log	Company:Noble Energy INC	Well:Wells Ranch BB11-650
		One: Log[7]:Up:S008

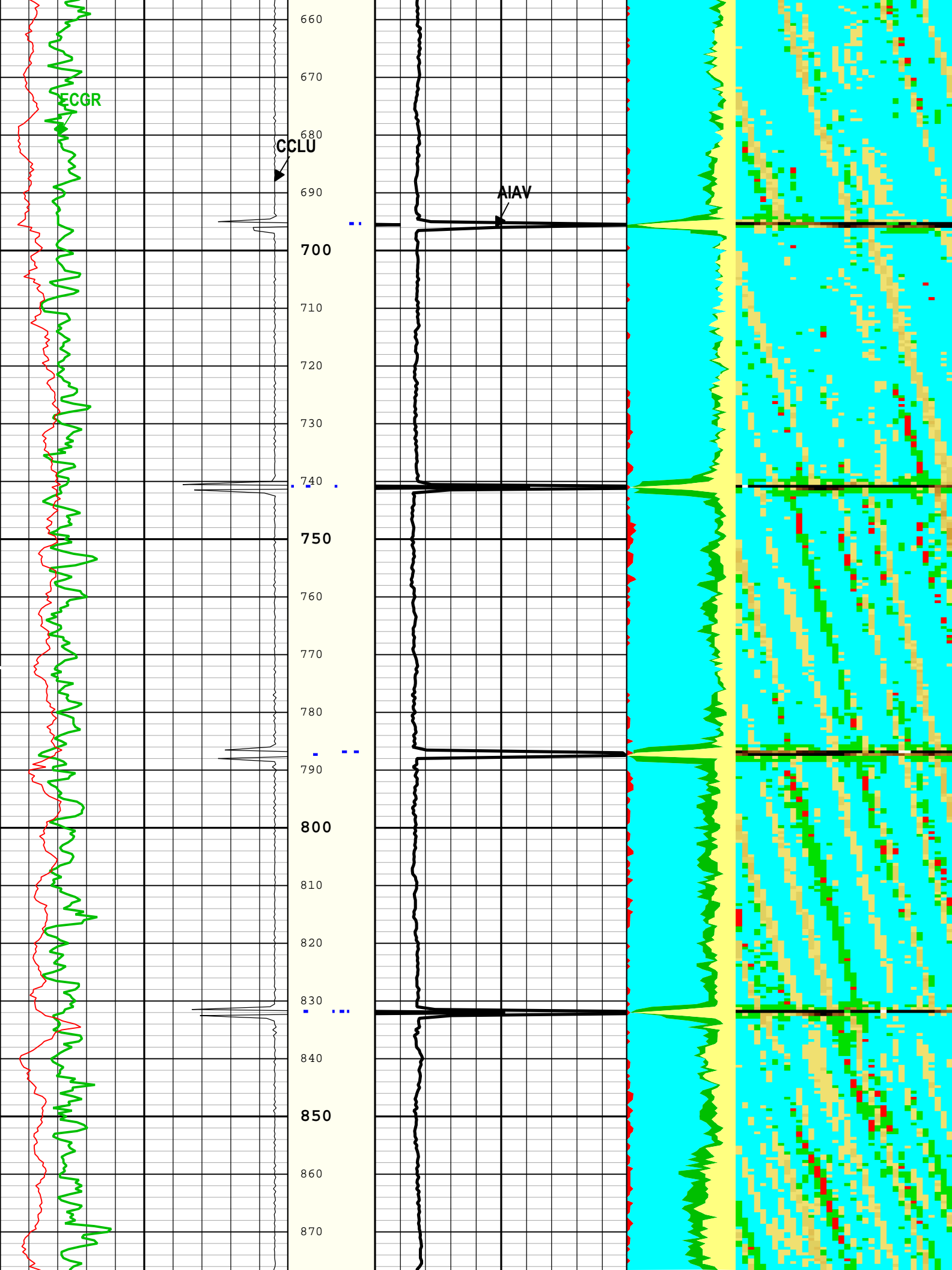
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Creation Date: 18-Sep-2017 16:44:23

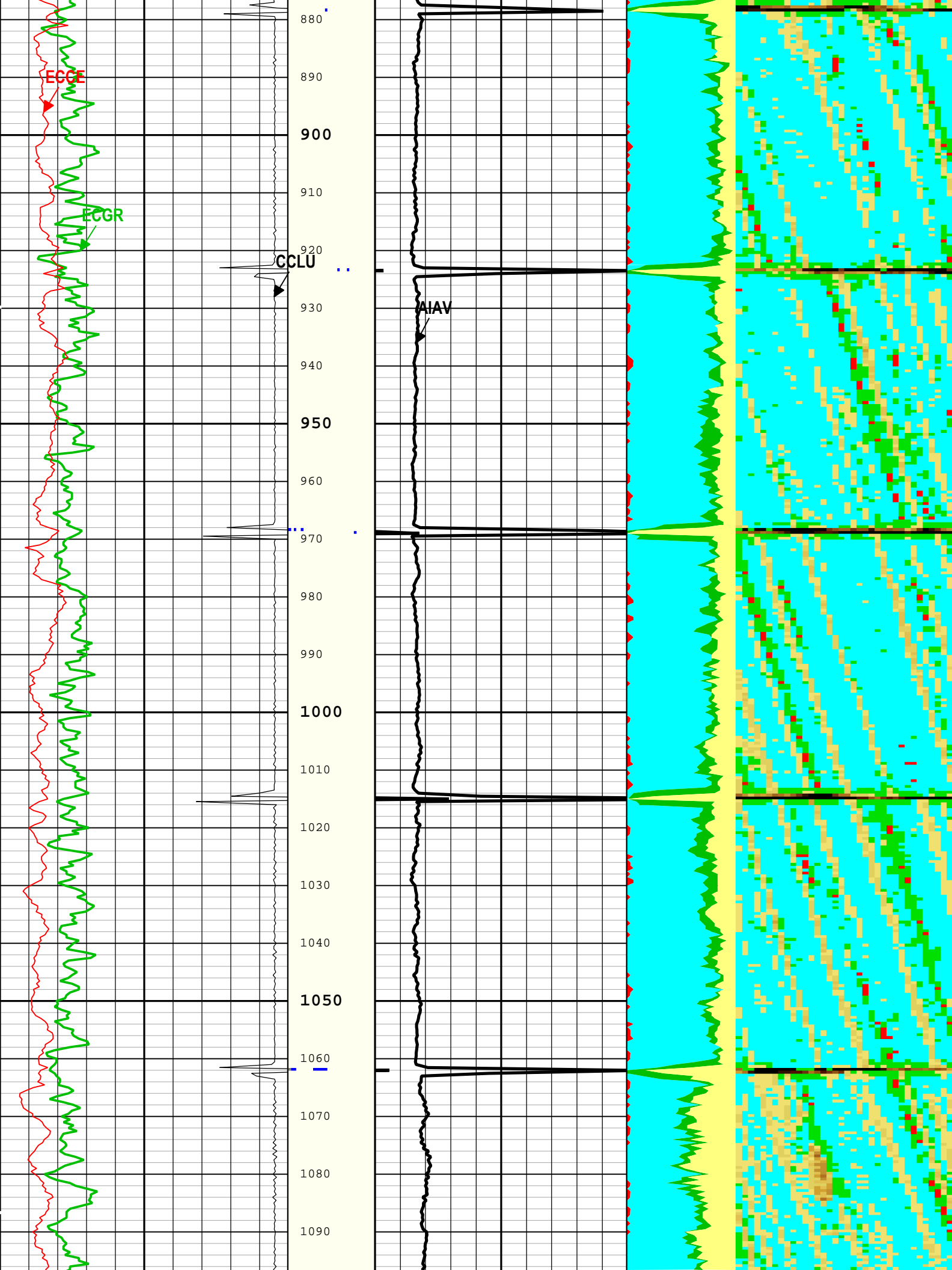
TIME_1900 - Time Marked every 60.00 (s)

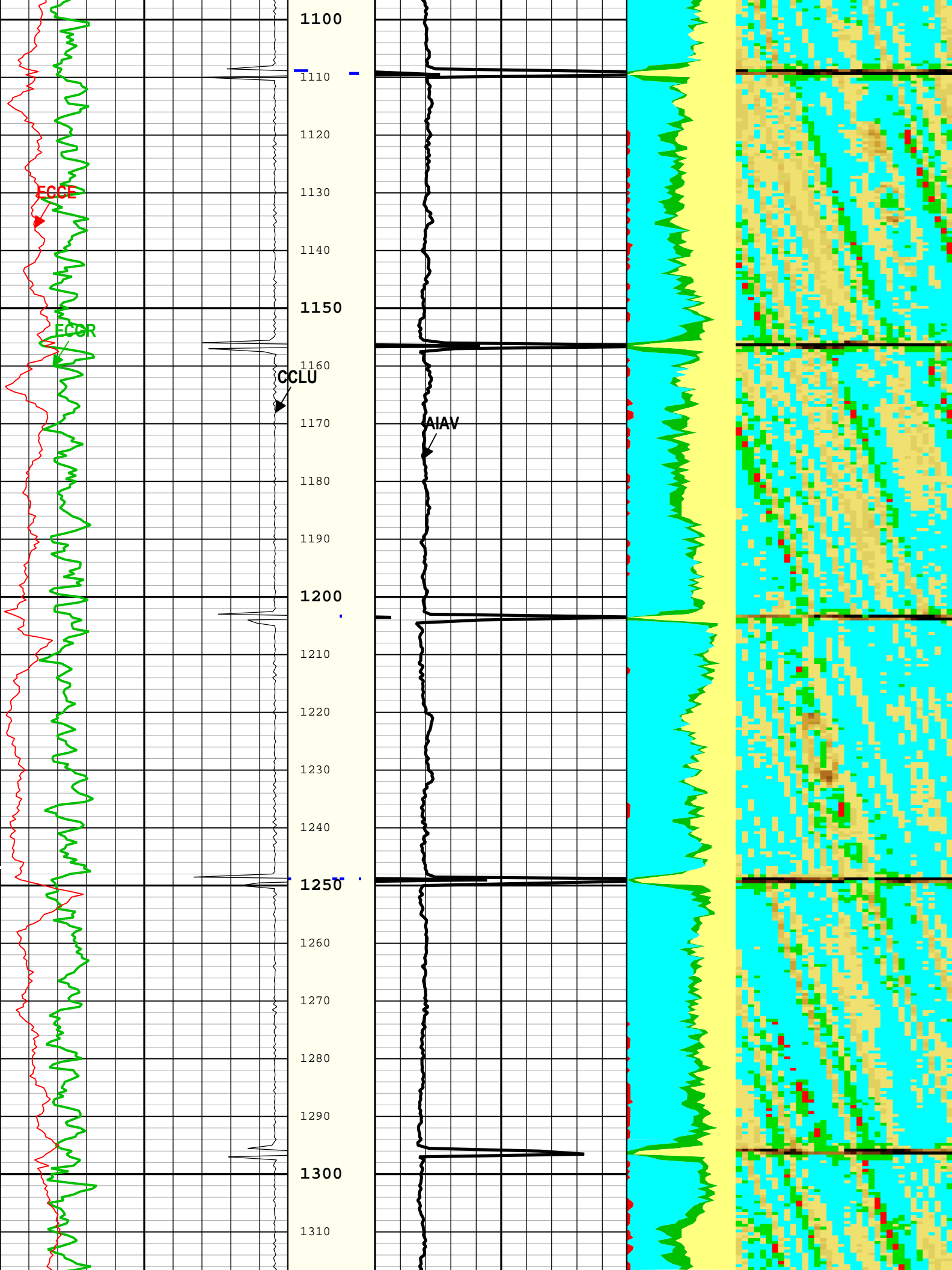


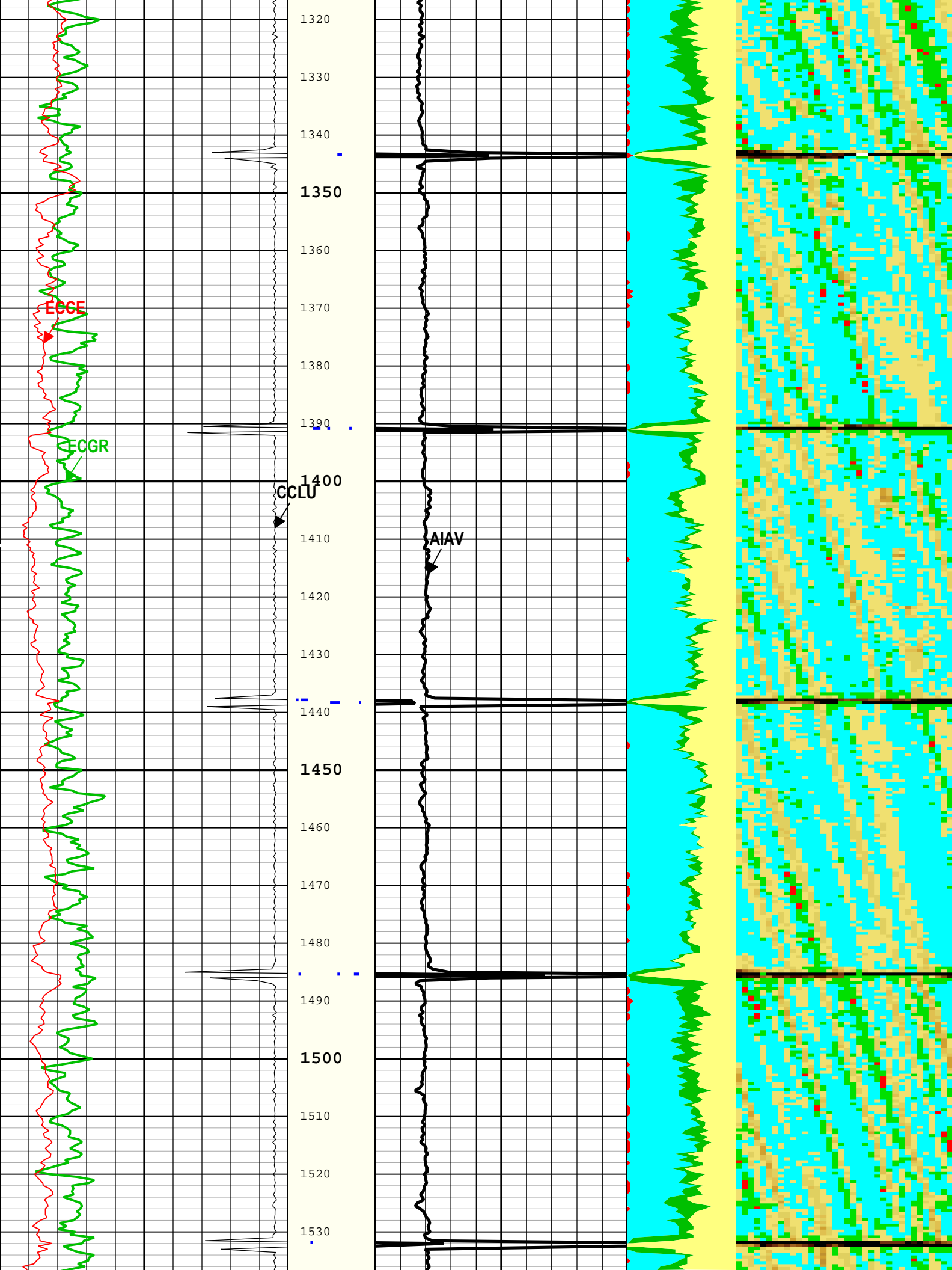


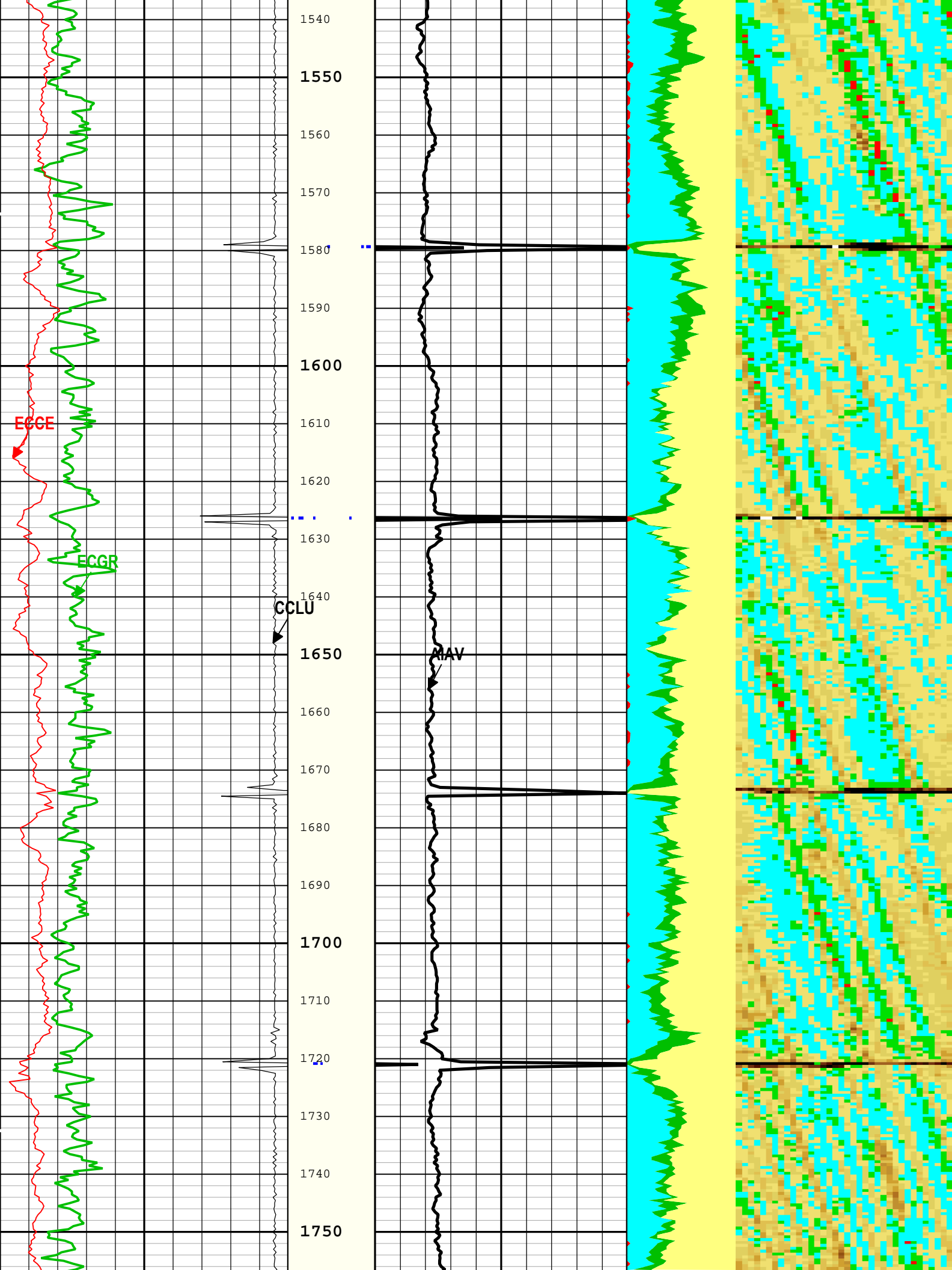


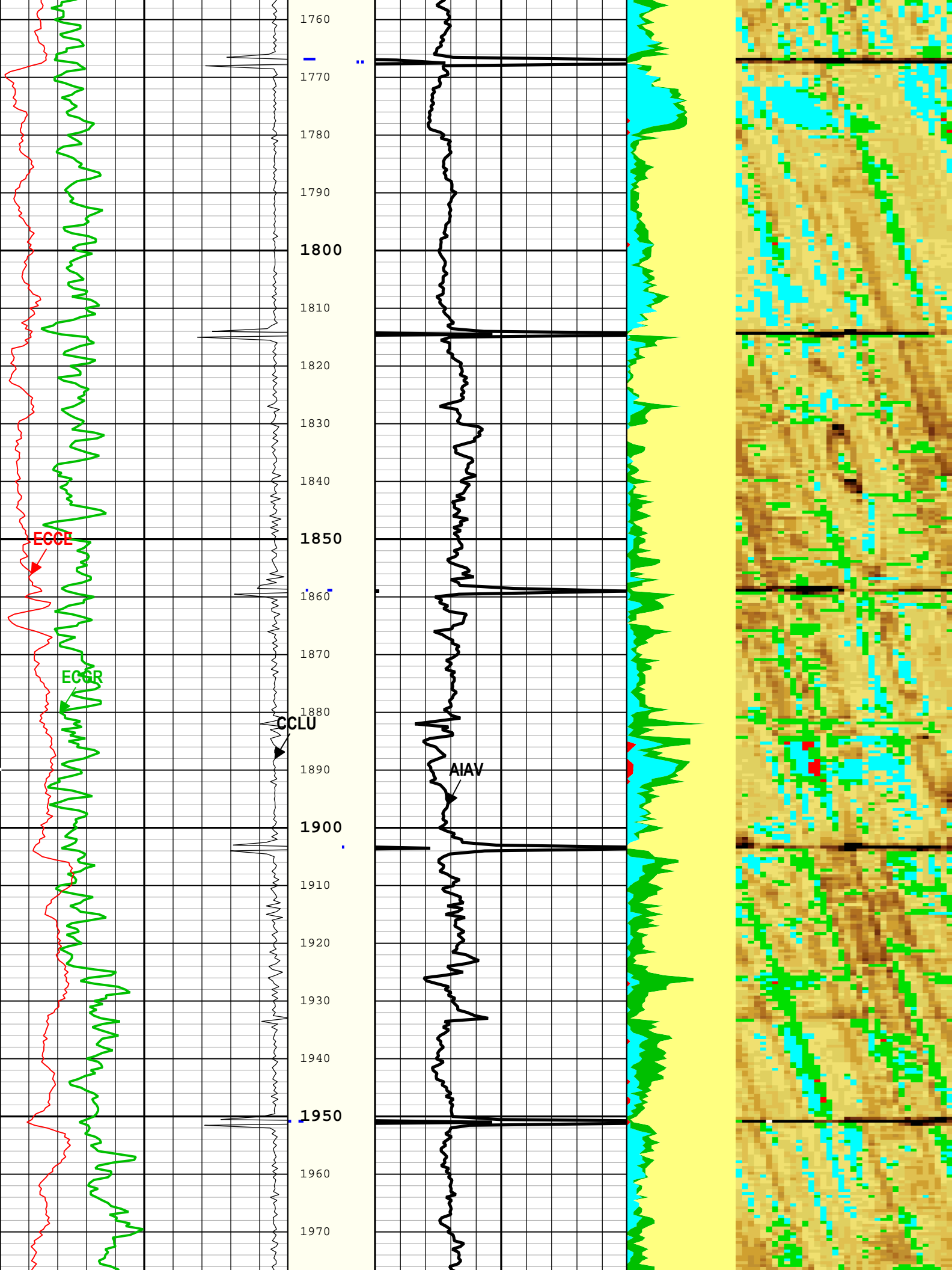


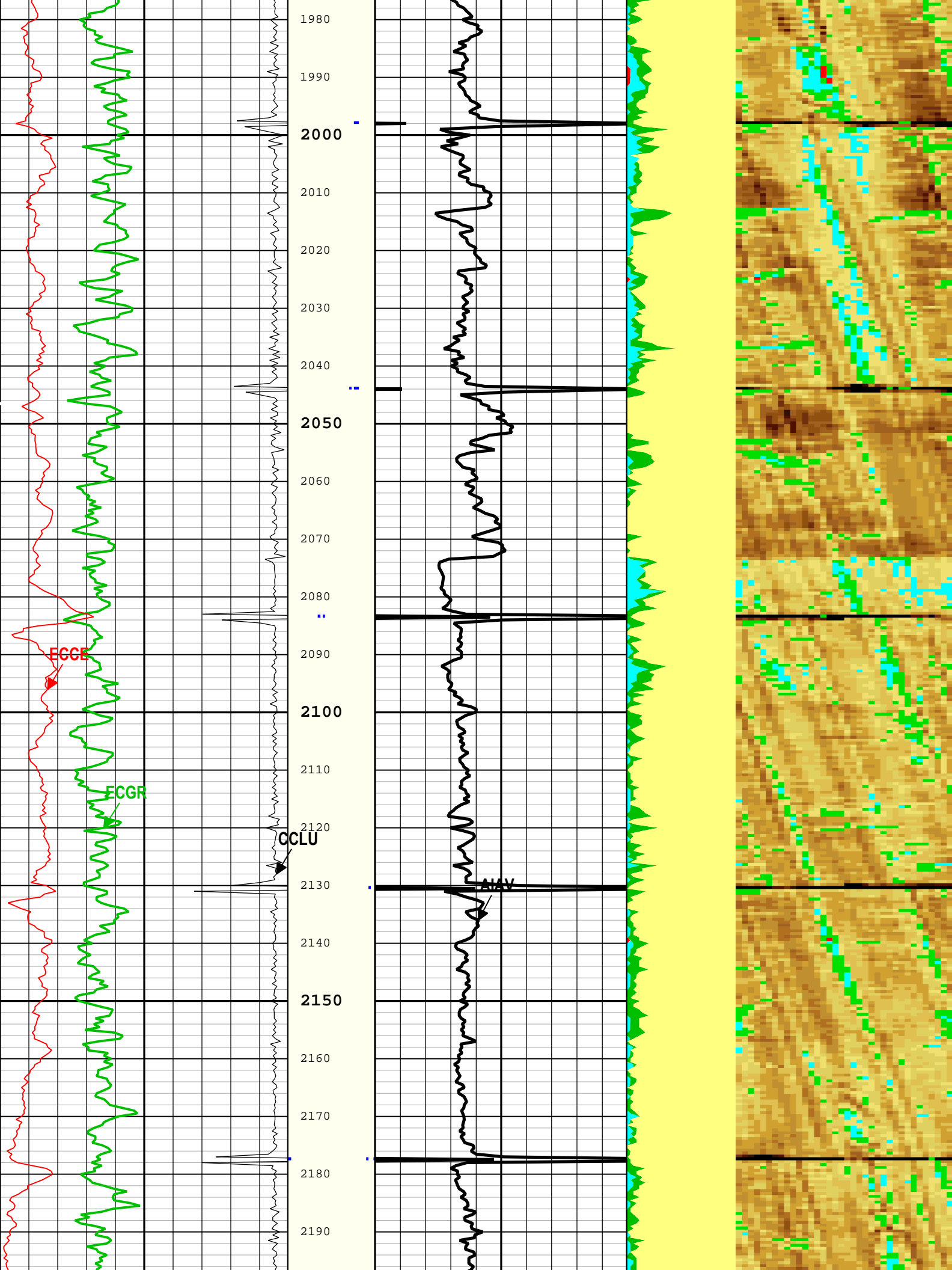


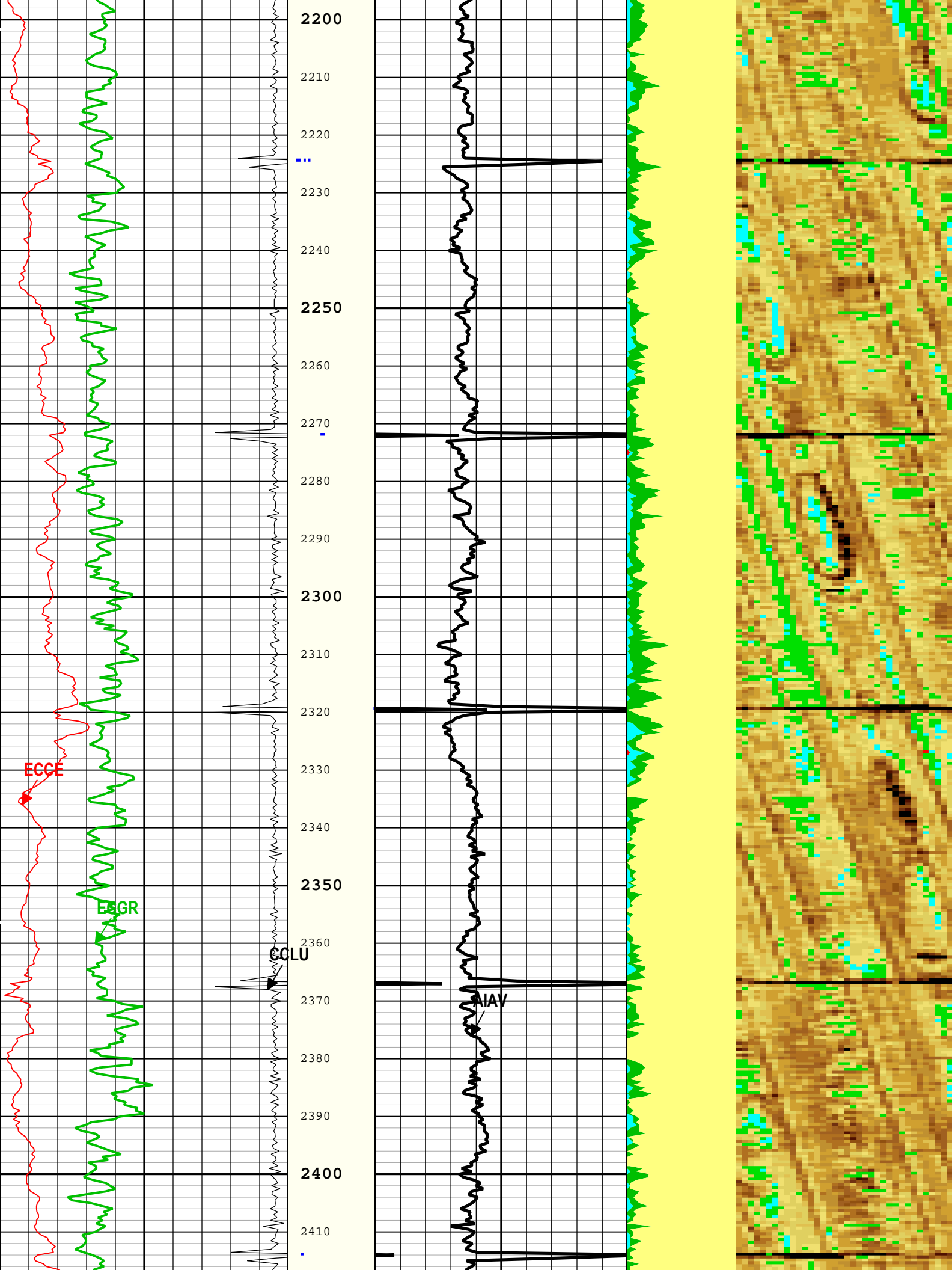


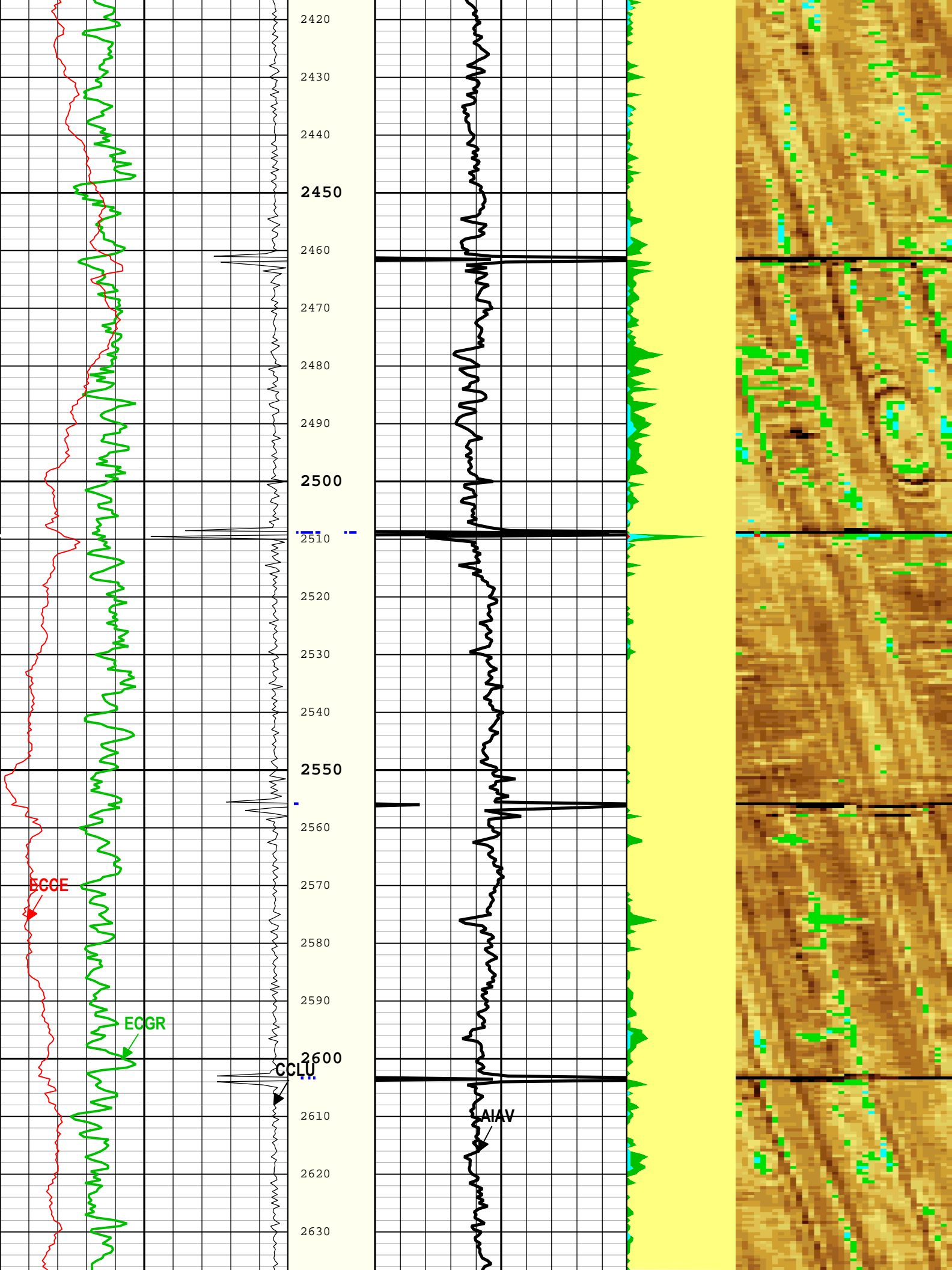


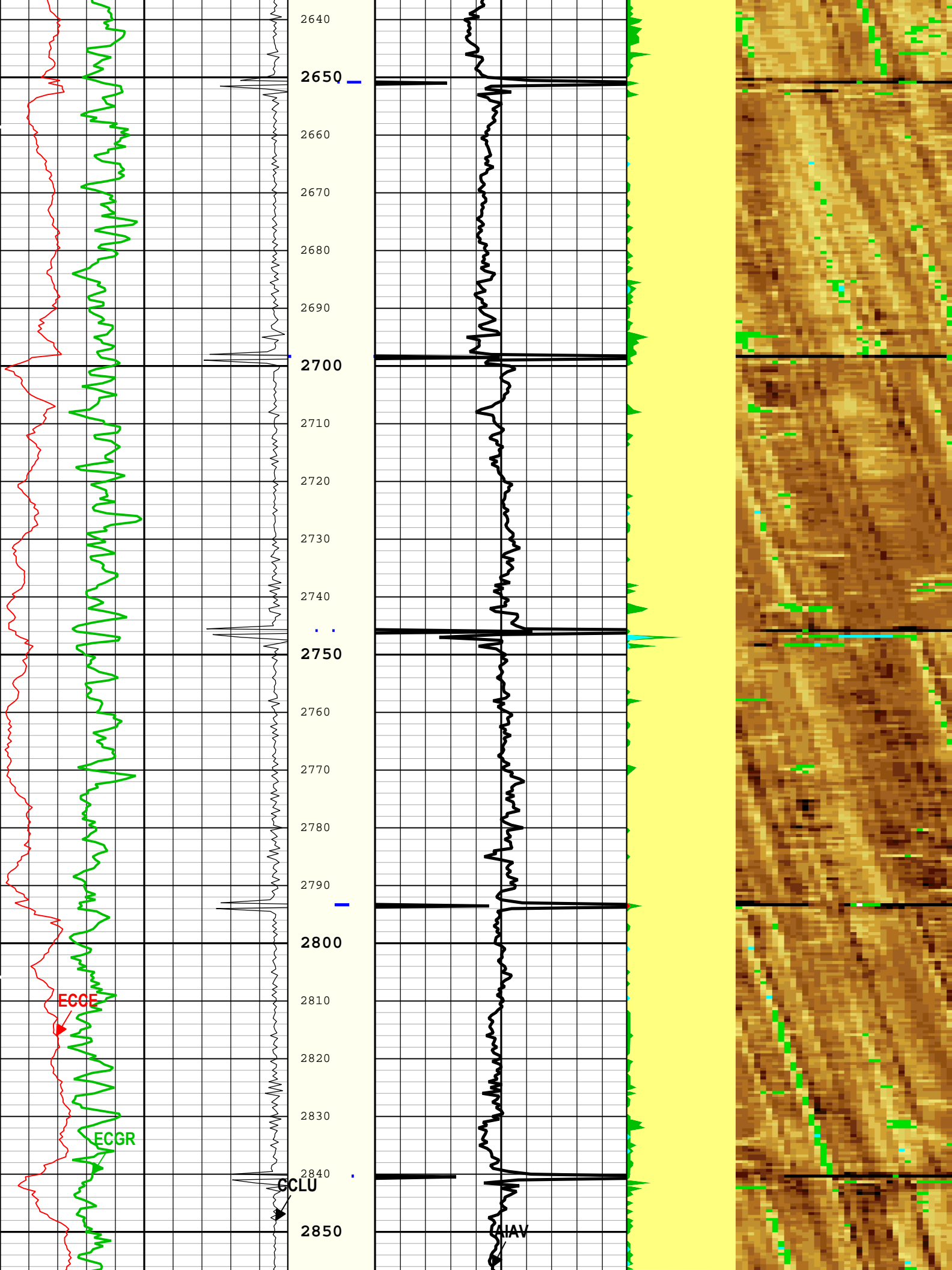


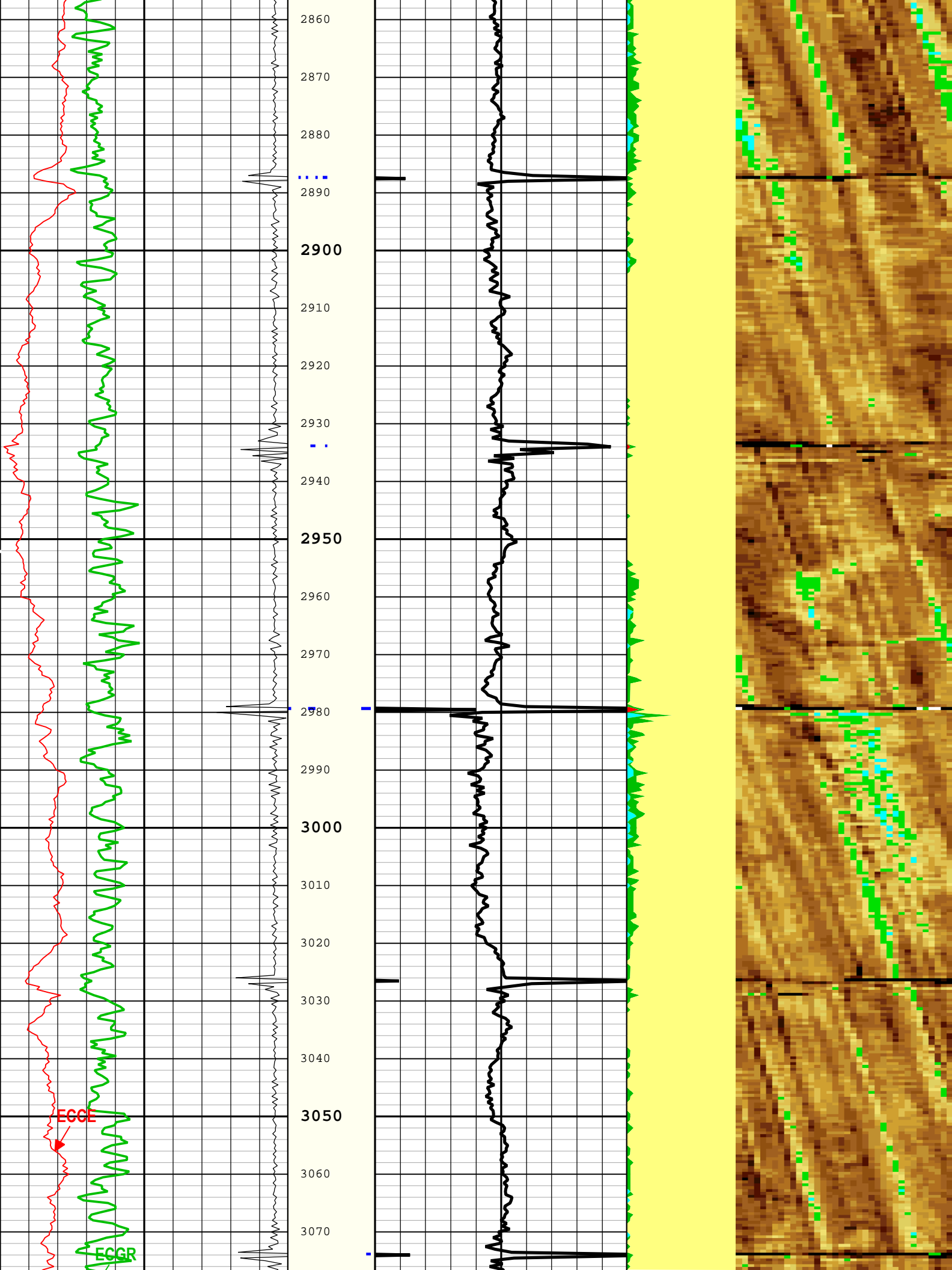


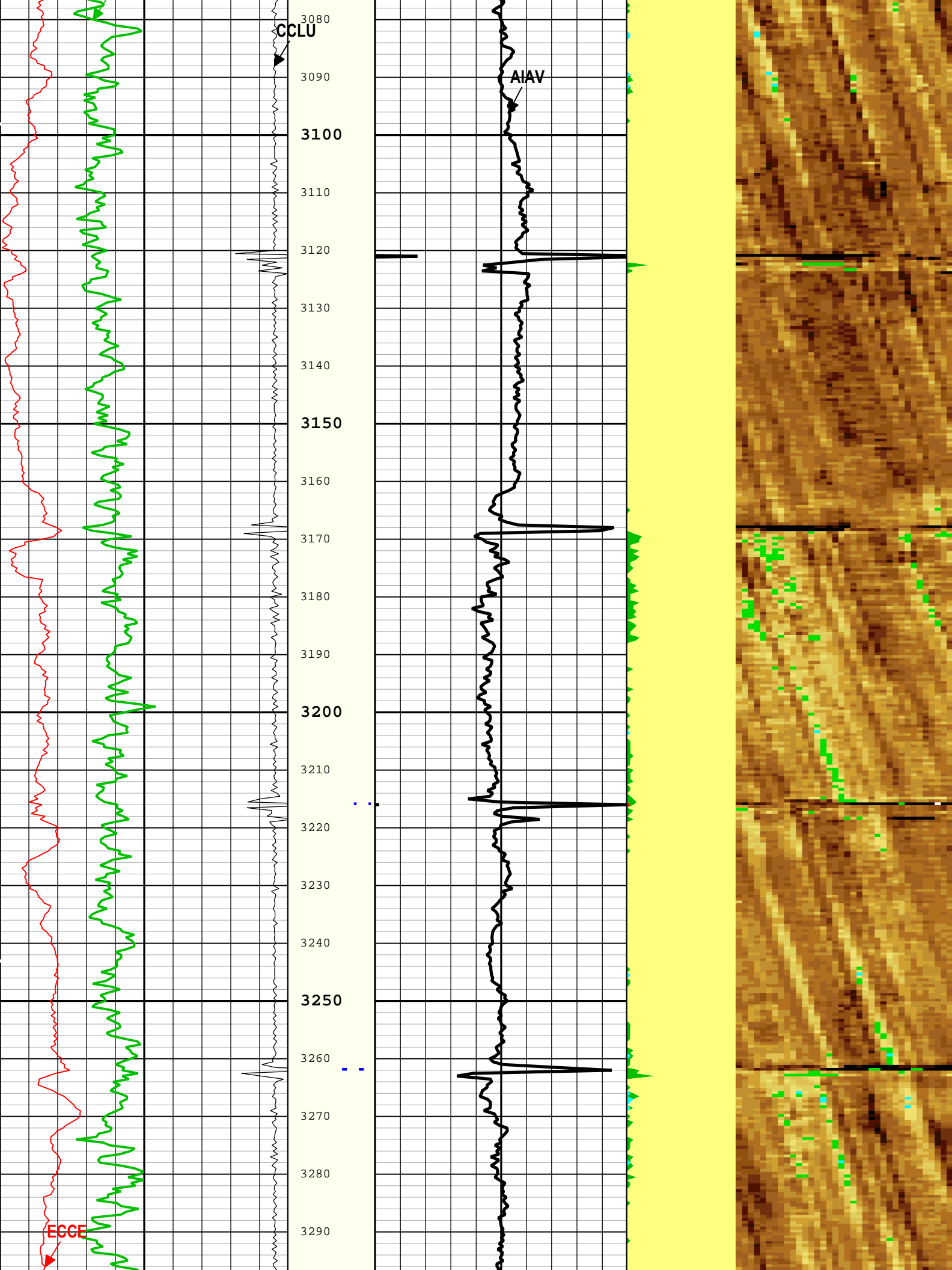


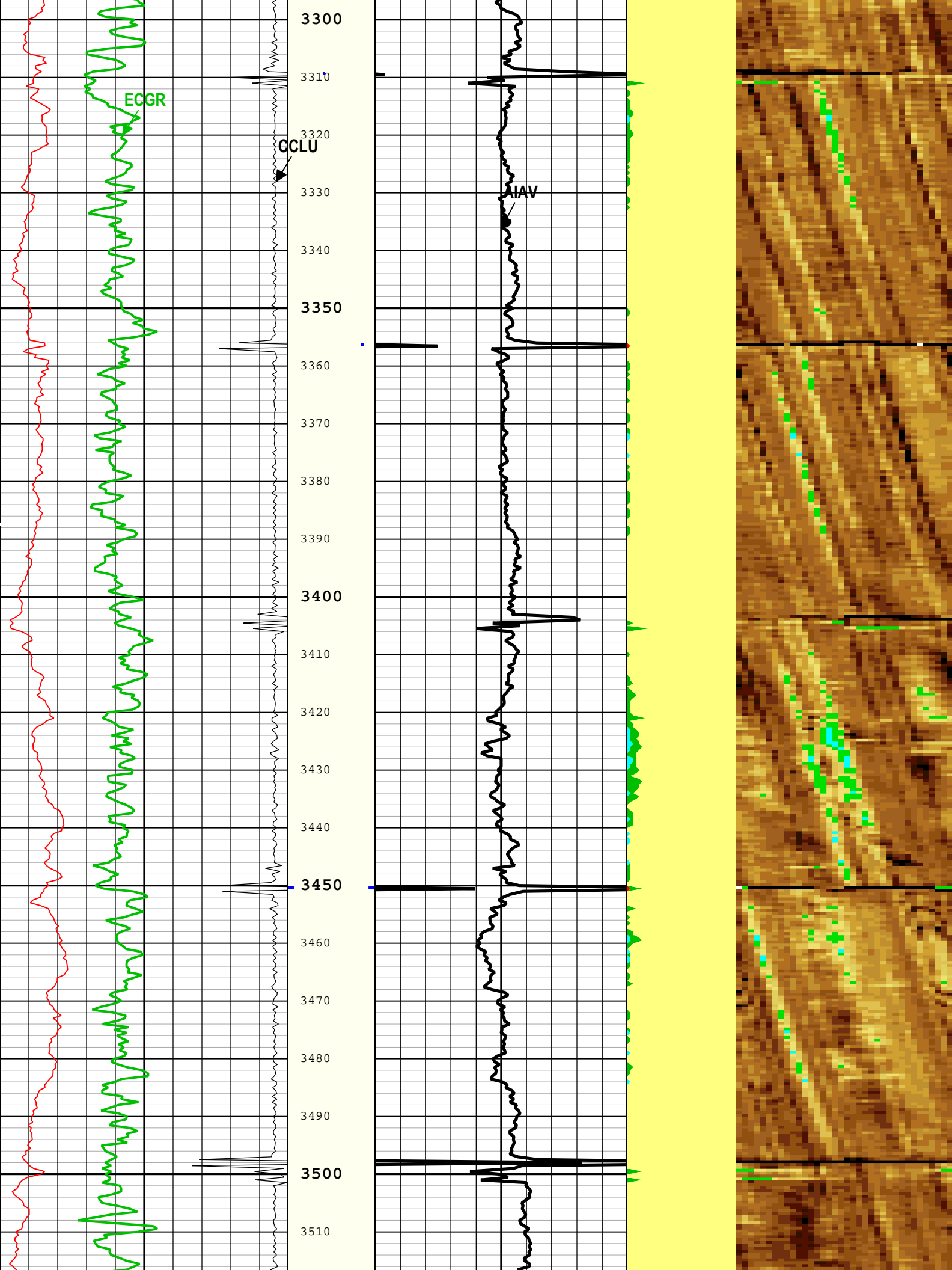


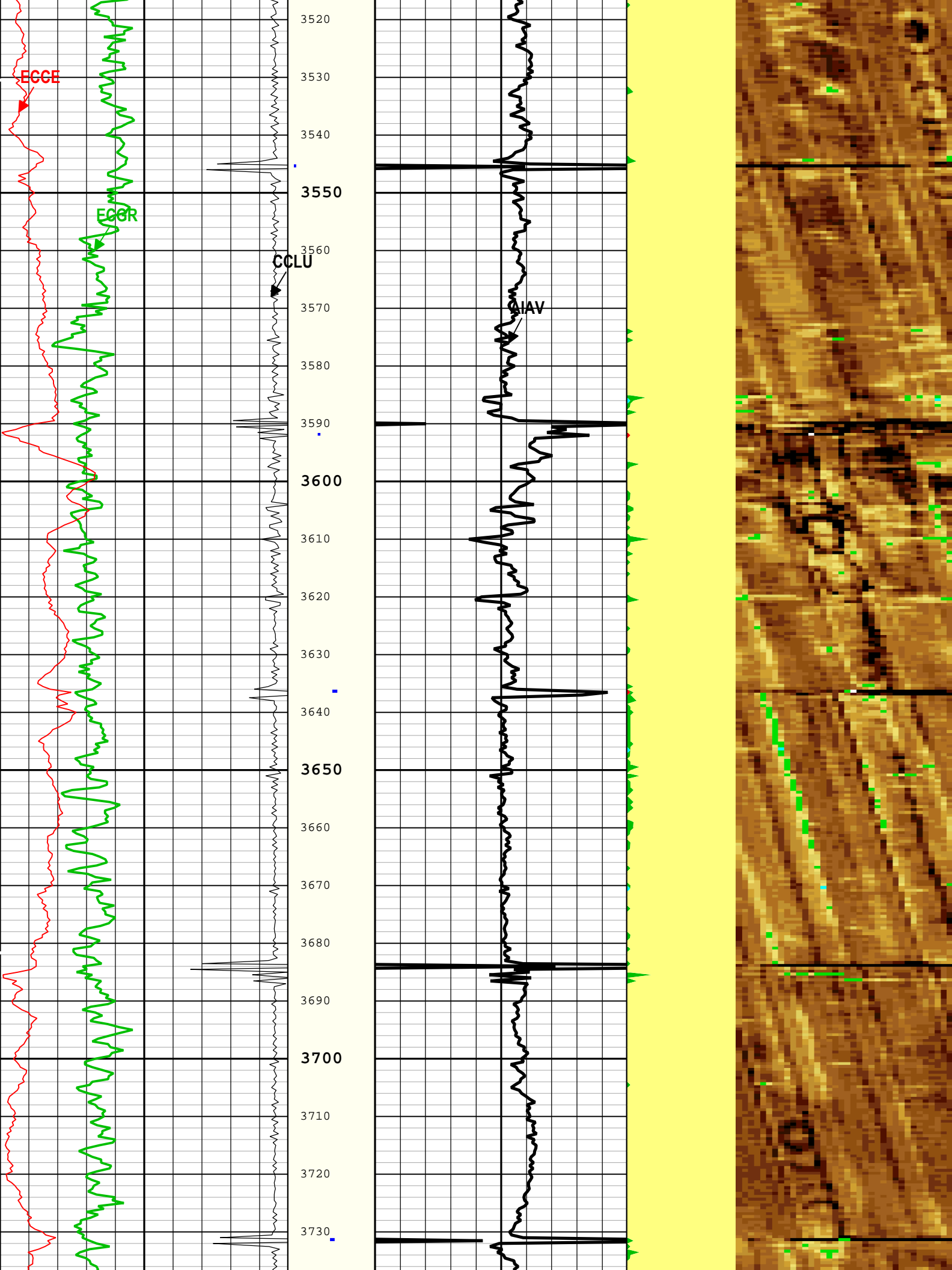


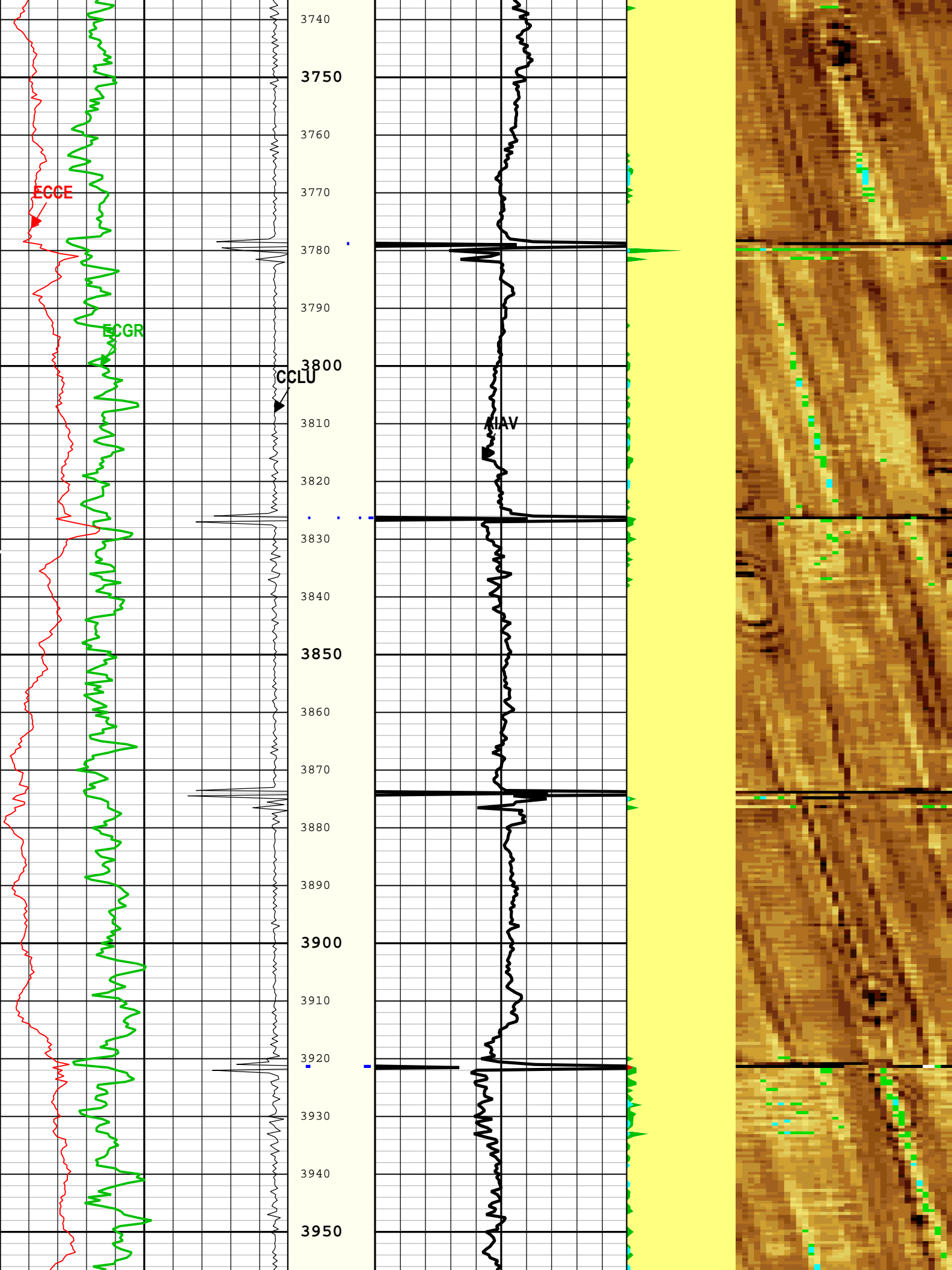


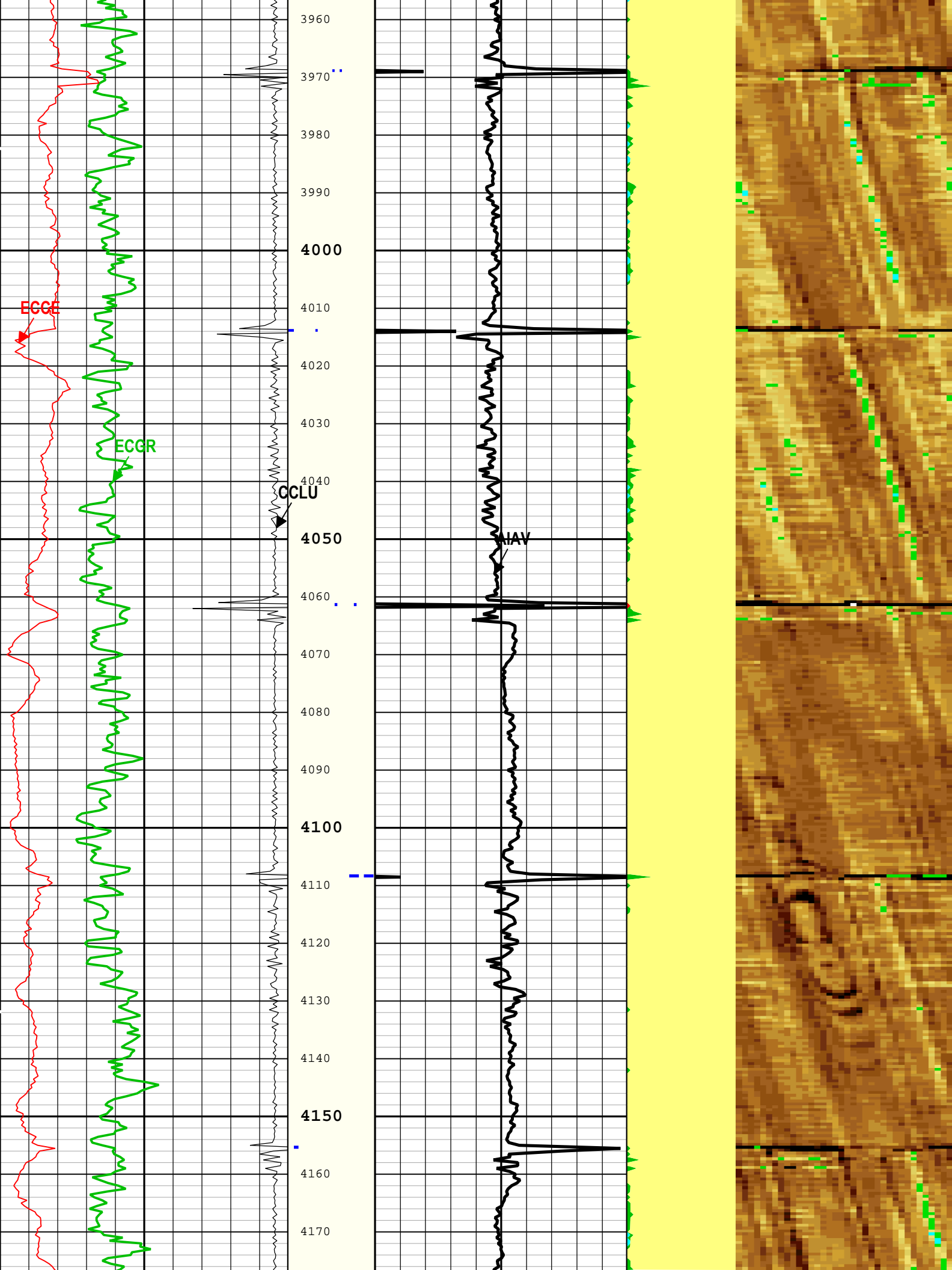


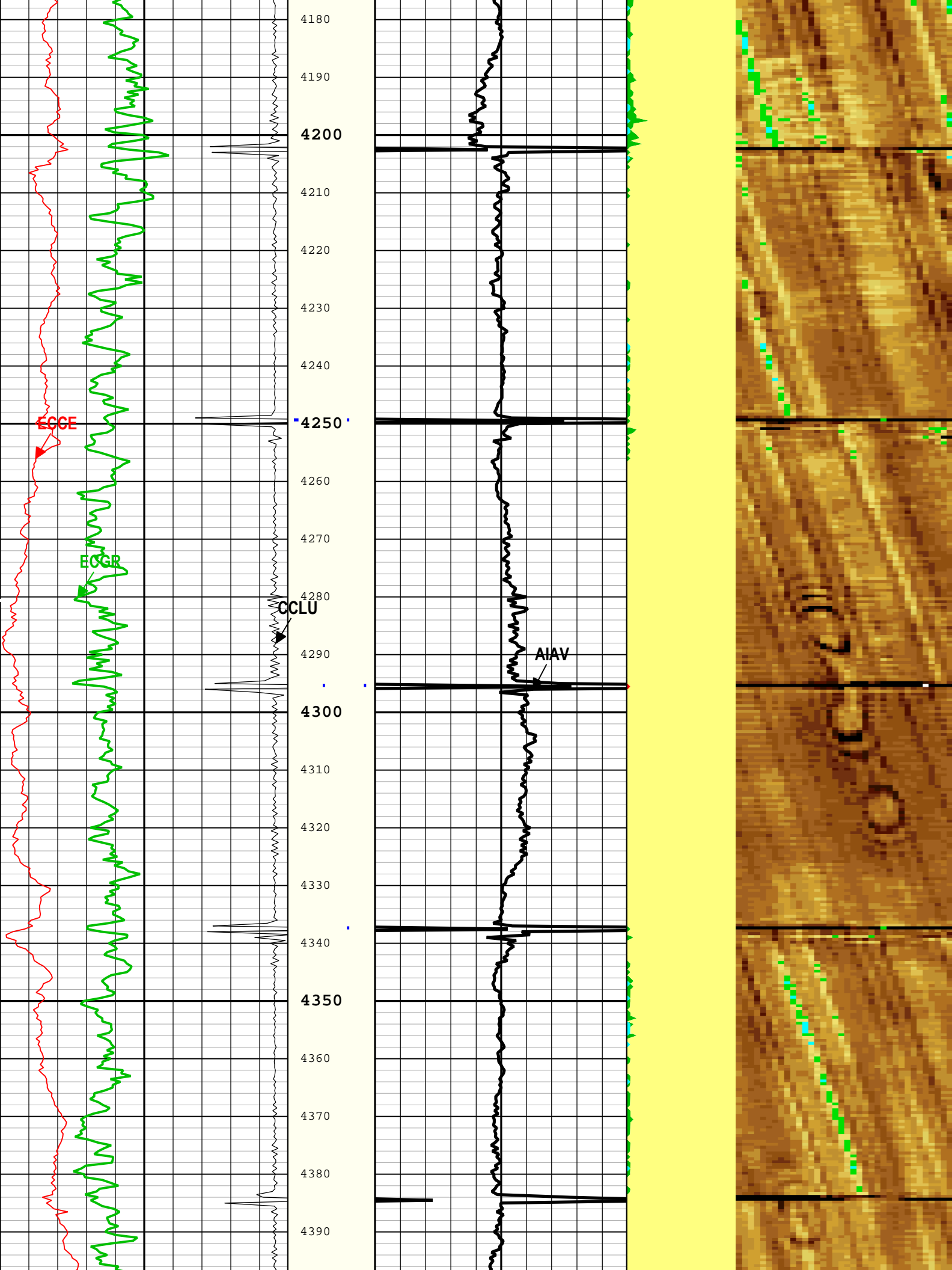


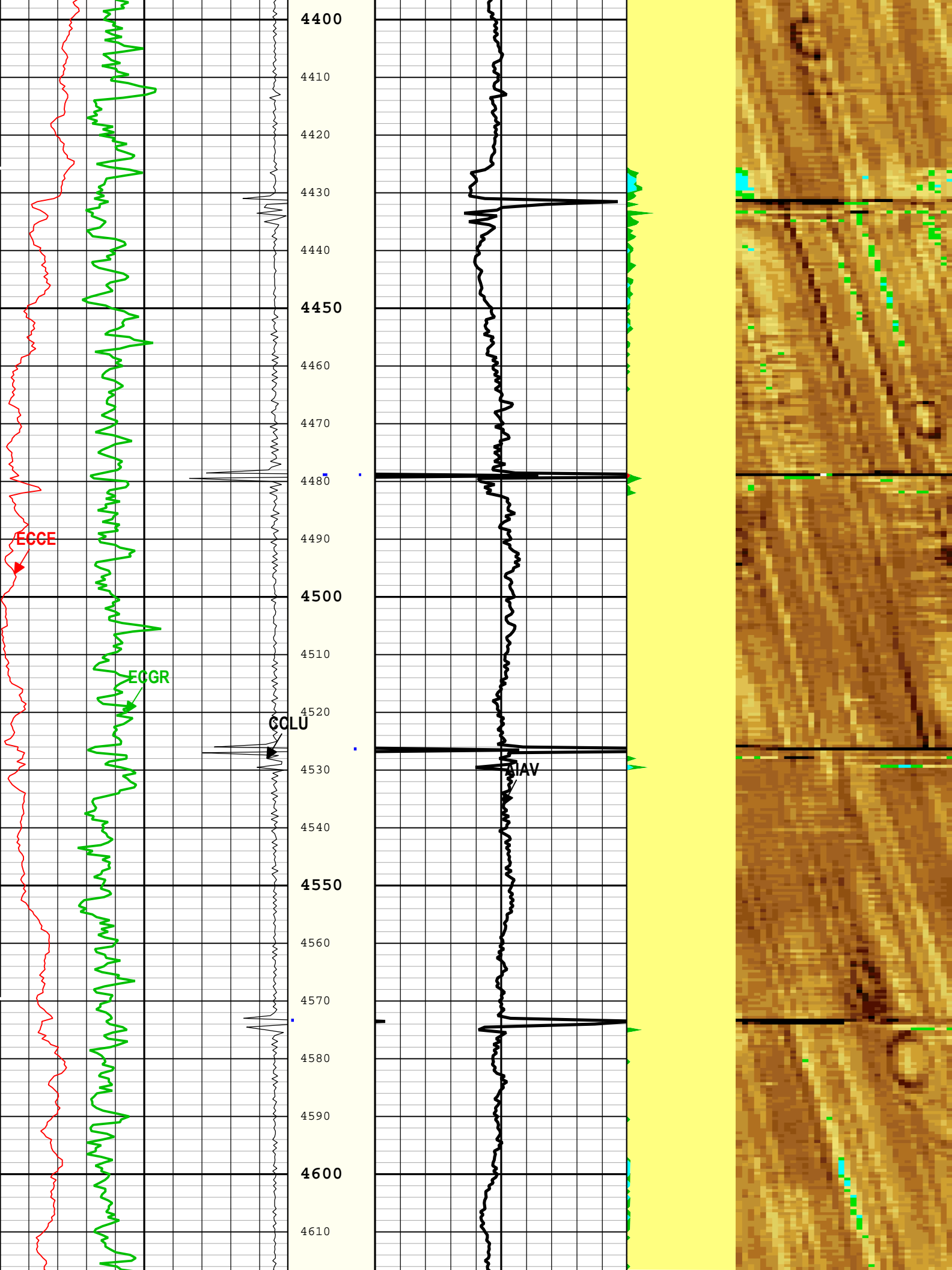


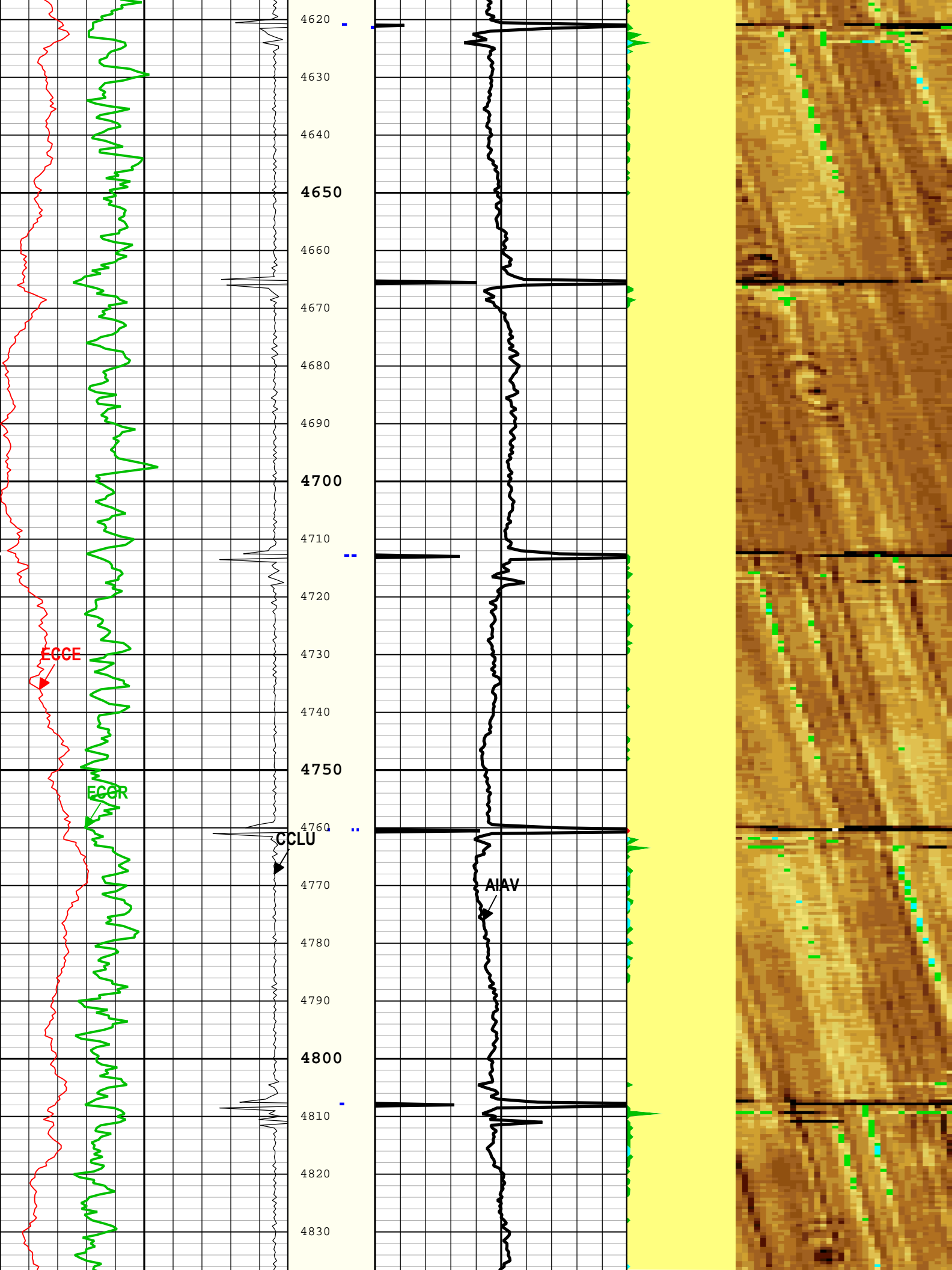


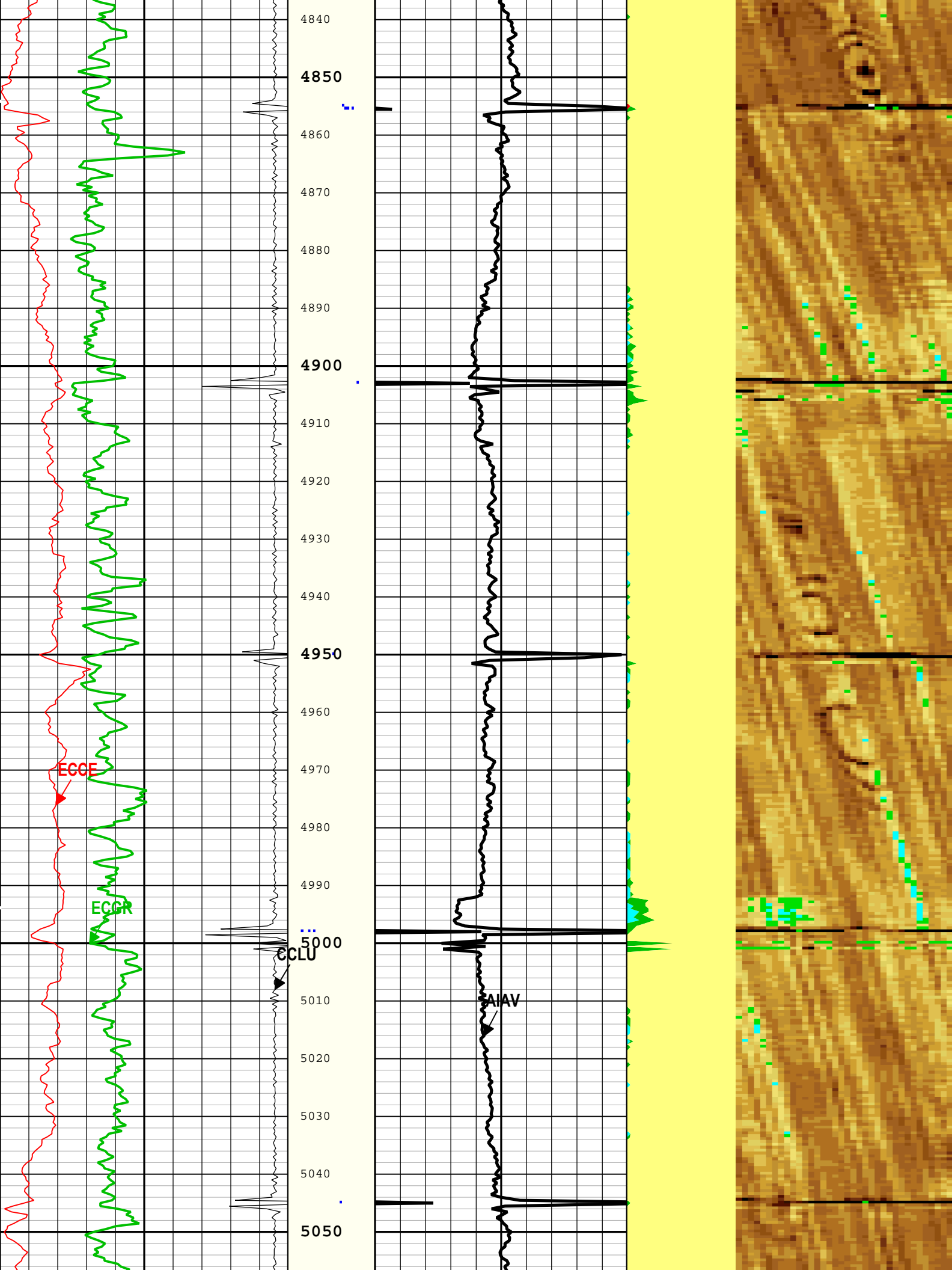


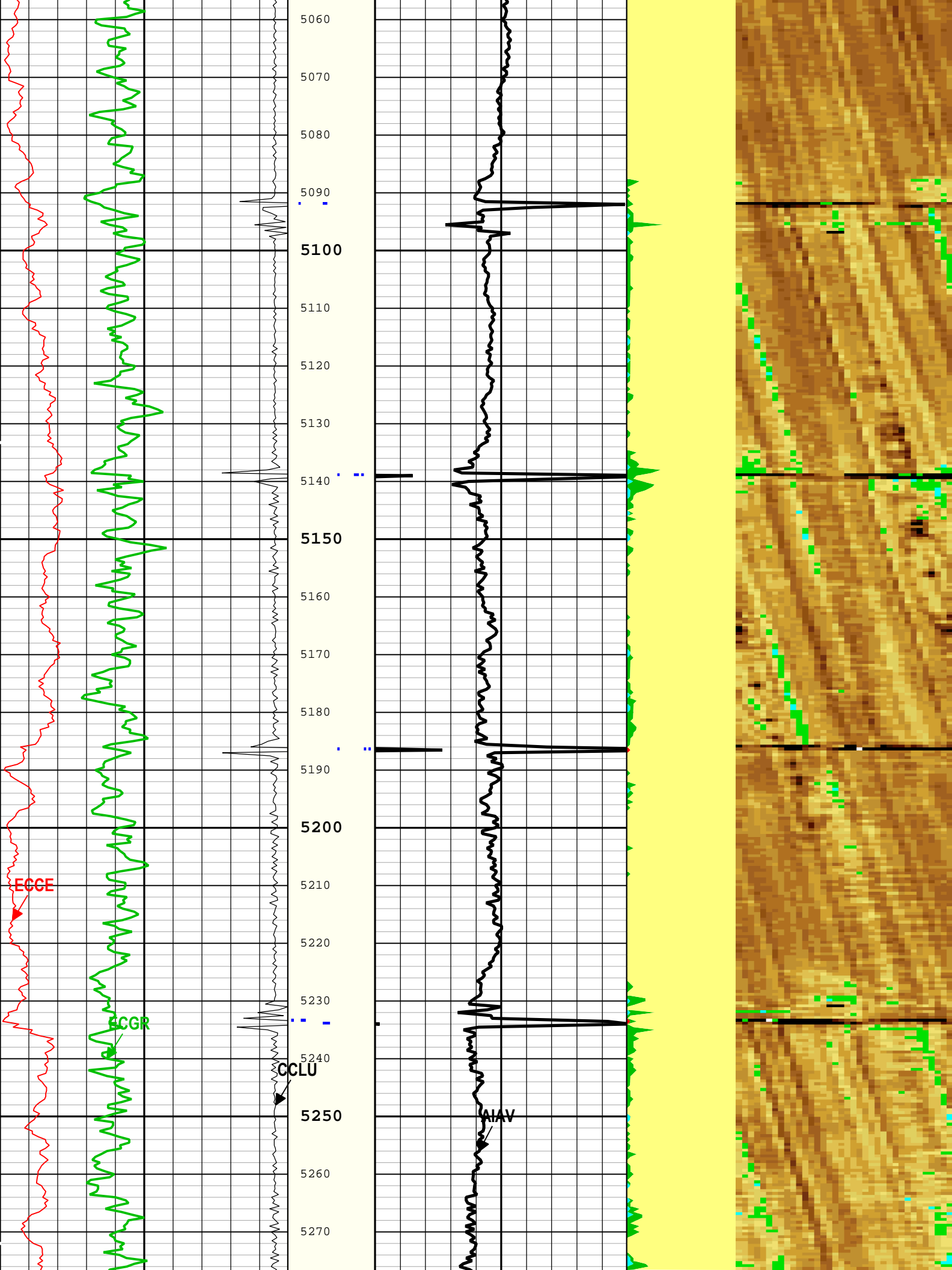


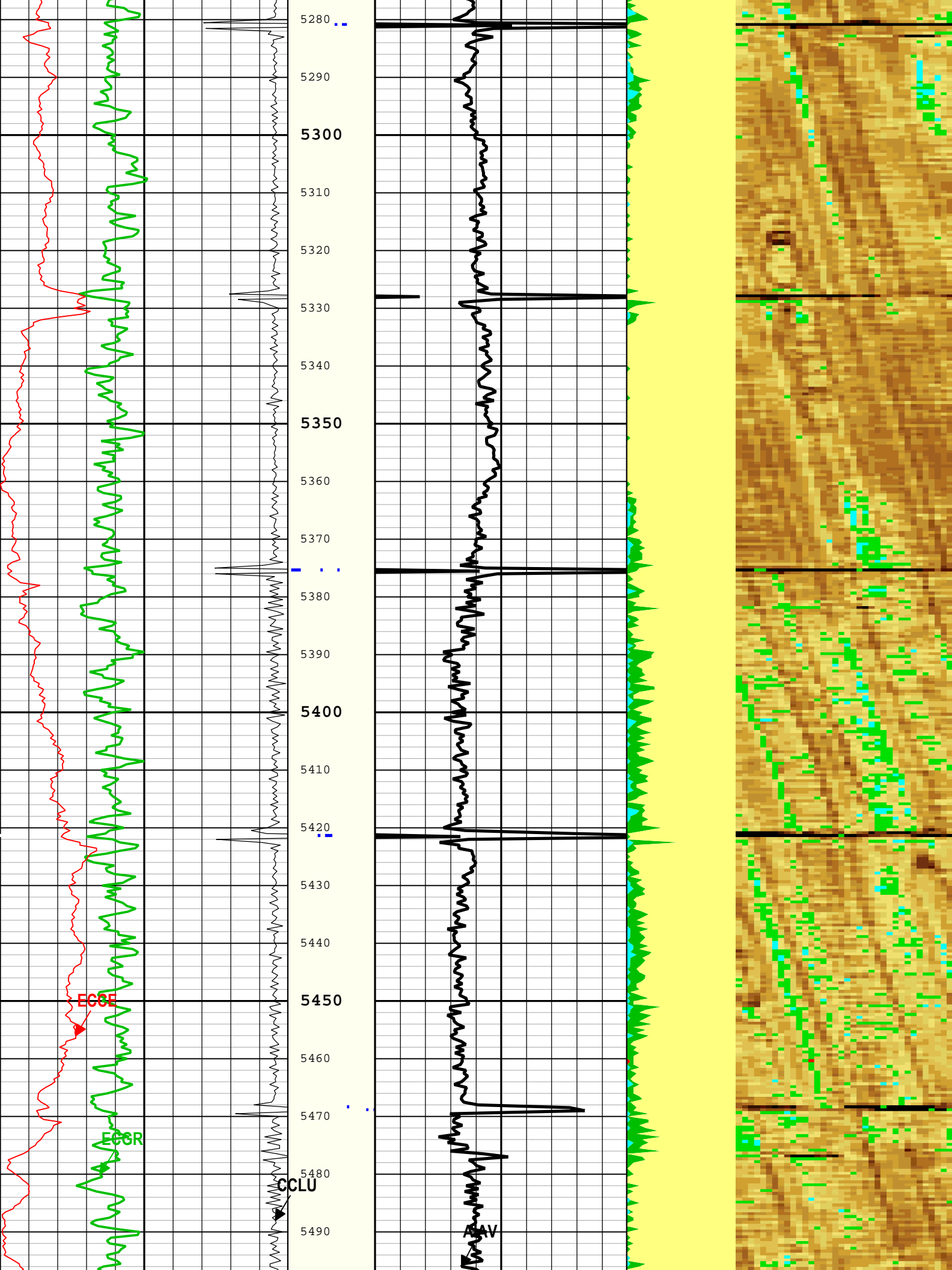


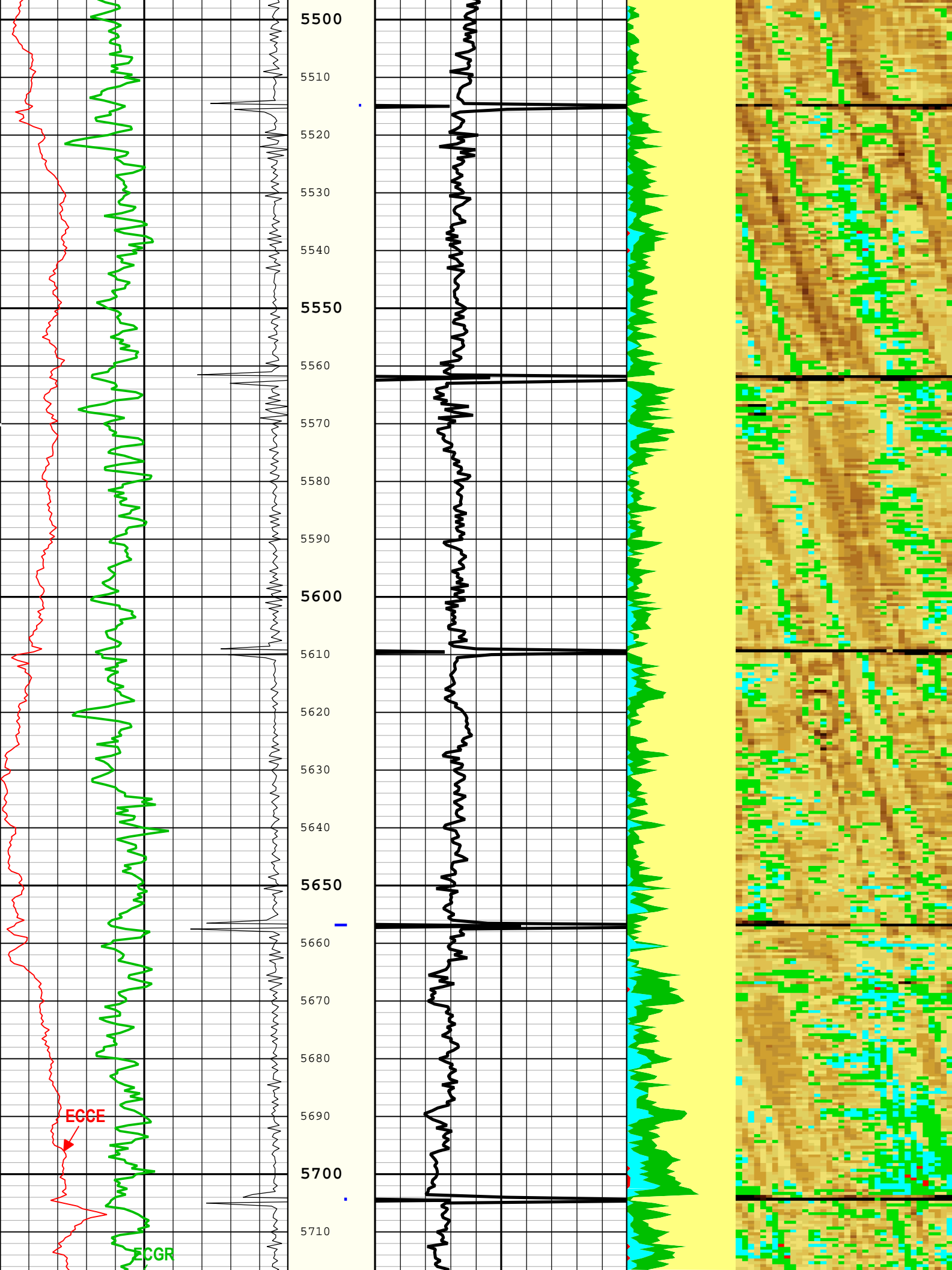


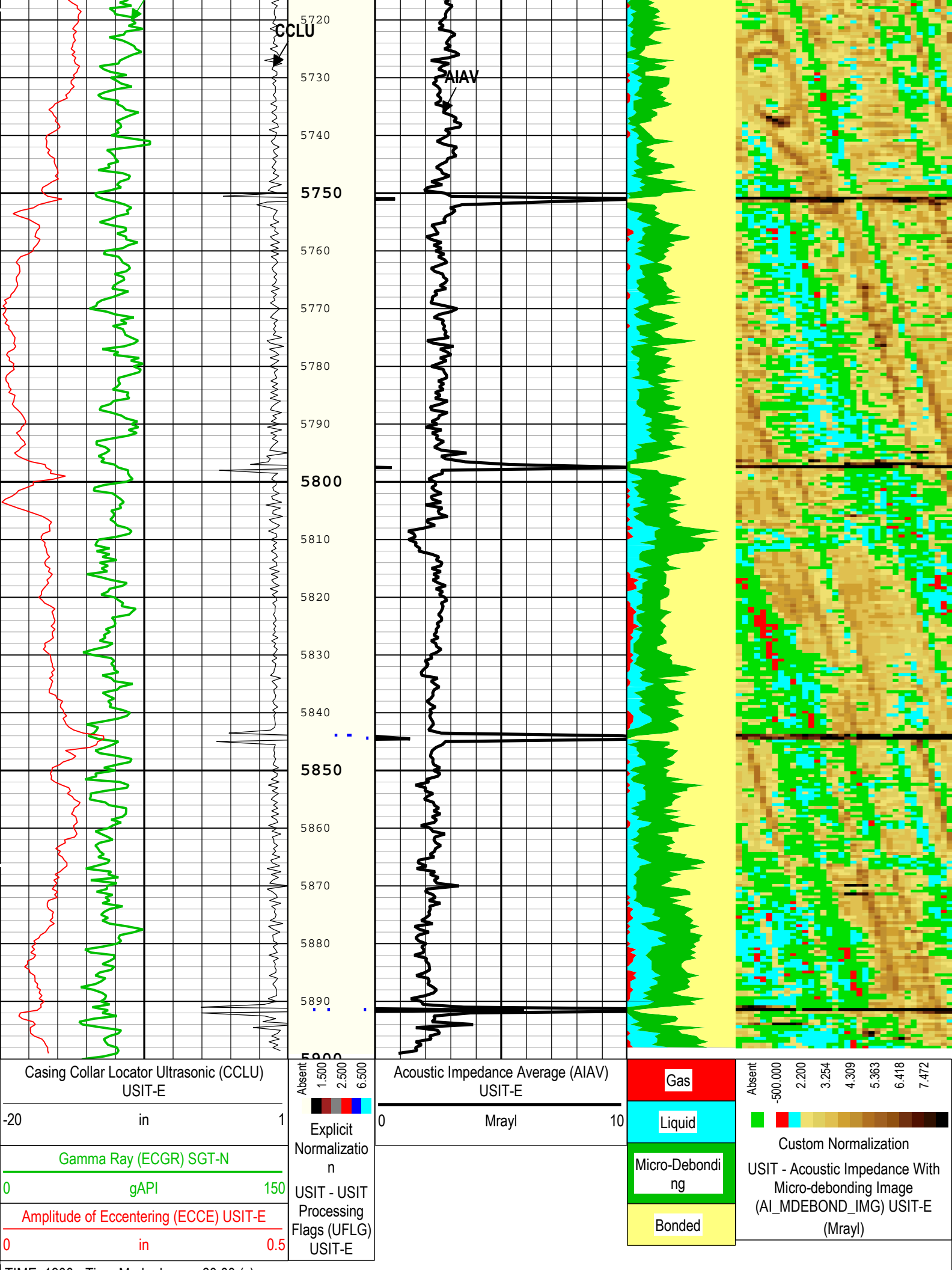












Channel Processing Parameters

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	5900	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	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	1.14	
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

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	26	88	110
BS	13.5	110	1931
BS	8.5	1931	5900

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	
ULPHIT	Ultrasonic Pulse Echo Large Inhibit Time	USIT-E	Off	

USFR	USIT-E	On	666667	Hz
UPAT	USIT-E	Pattern 375 KHz		
UWKM	USIT-E	Uncompressed 10 deg at 6.0 in		
USIT_DEPTHLOG	USIT-E	7000		ft
WINB	USIT-E	31.88		us
WINE	USIT-E	Time Zoned		us

Time Zone Parameters					
Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	45	18-Sep-2017 15:03:02	18-Sep-2017 15:15:26	6507.39	6478.78
EMXV	65	18-Sep-2017 15:15:26	18-Sep-2017 16:05:05	6478.78	57.35
WINE	71.88	18-Sep-2017 15:03:02	18-Sep-2017 15:03:43	6507.39	6504.86
WINE	72.64	18-Sep-2017 15:03:43	18-Sep-2017 16:05:05	6504.86	57.35
All depths are at tool zero.					

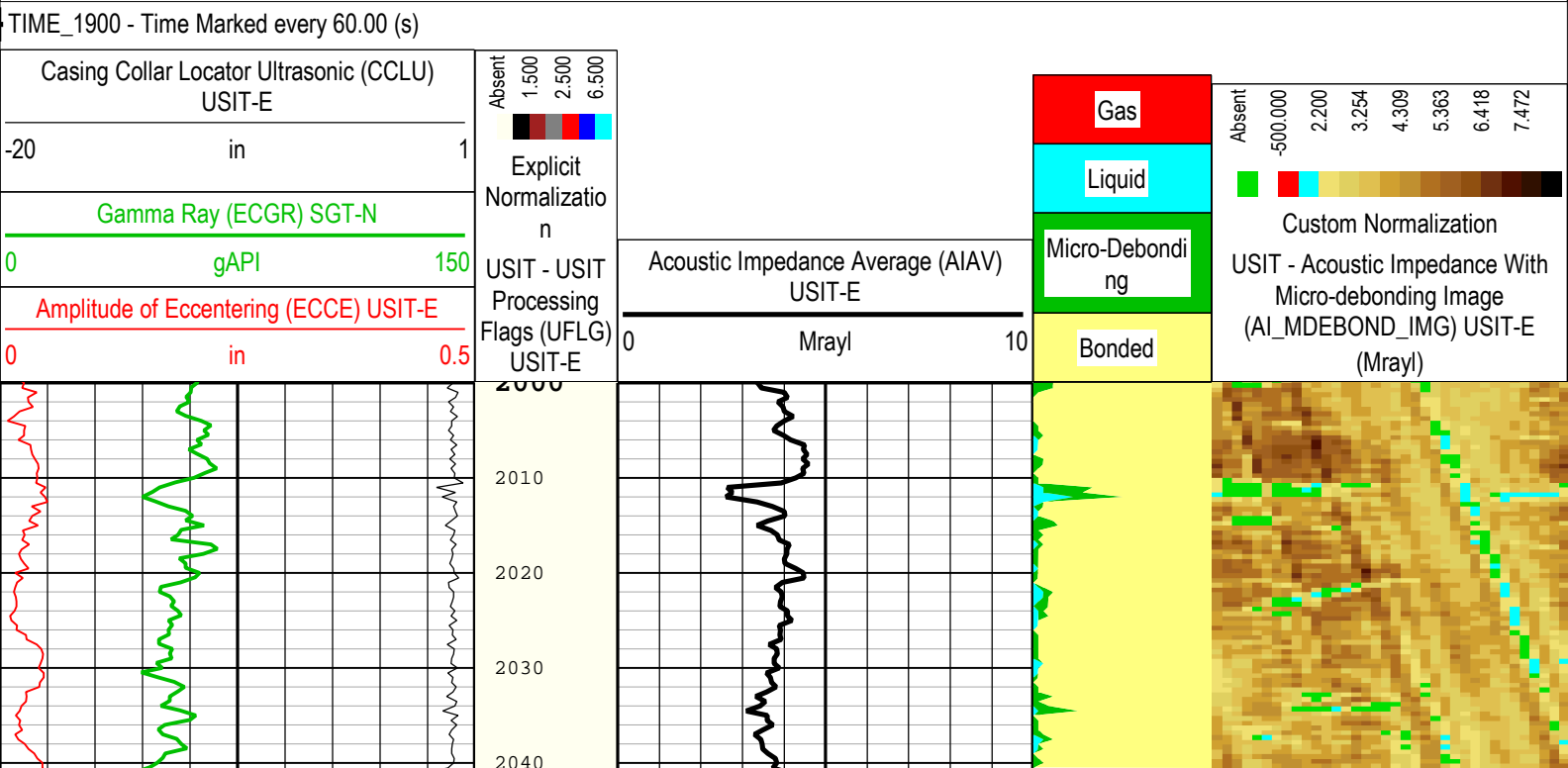
One					
0 PSI Repeat Pass					

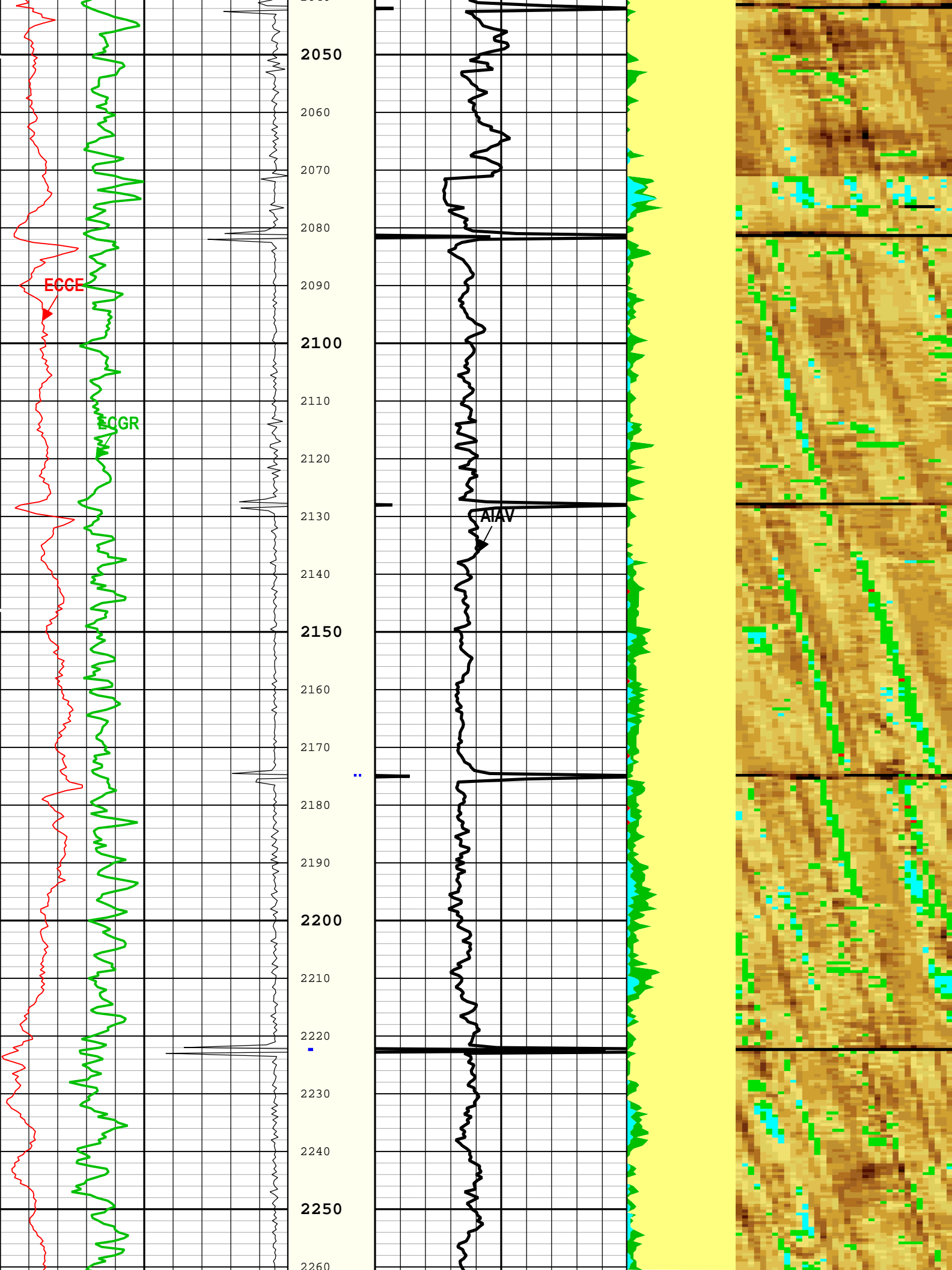
Software Version					
Acquisition System			Version		
Maxwell 2017 SP1			7.1.82245.3100		
Application Patch			Wireline_NPD-ICE2-2017SP1_7.1.87324		

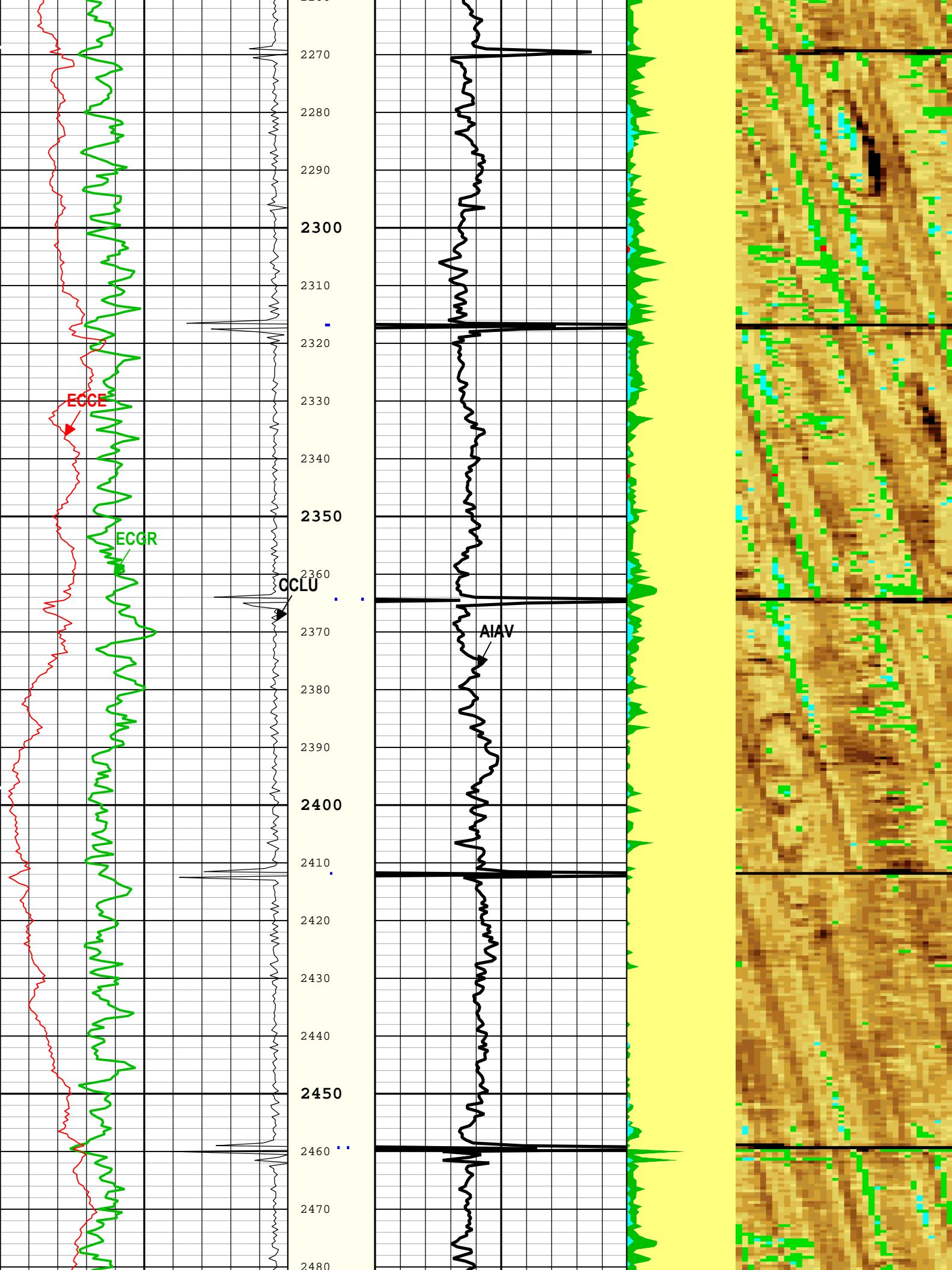
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[2]:Up	Up	1965.80 ft	2549.23 ft	18-Sep-2017 2:27:31 PM	18-Sep-2017 2:32:53 PM	ON	0.21 ft	Yes
All depths are referenced to toolstring zero									

Log		Company:Noble Energy INC Well:Wells Ranch BB11-650			
		One: Log[2]: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: 18-Sep-2017 16:44:27





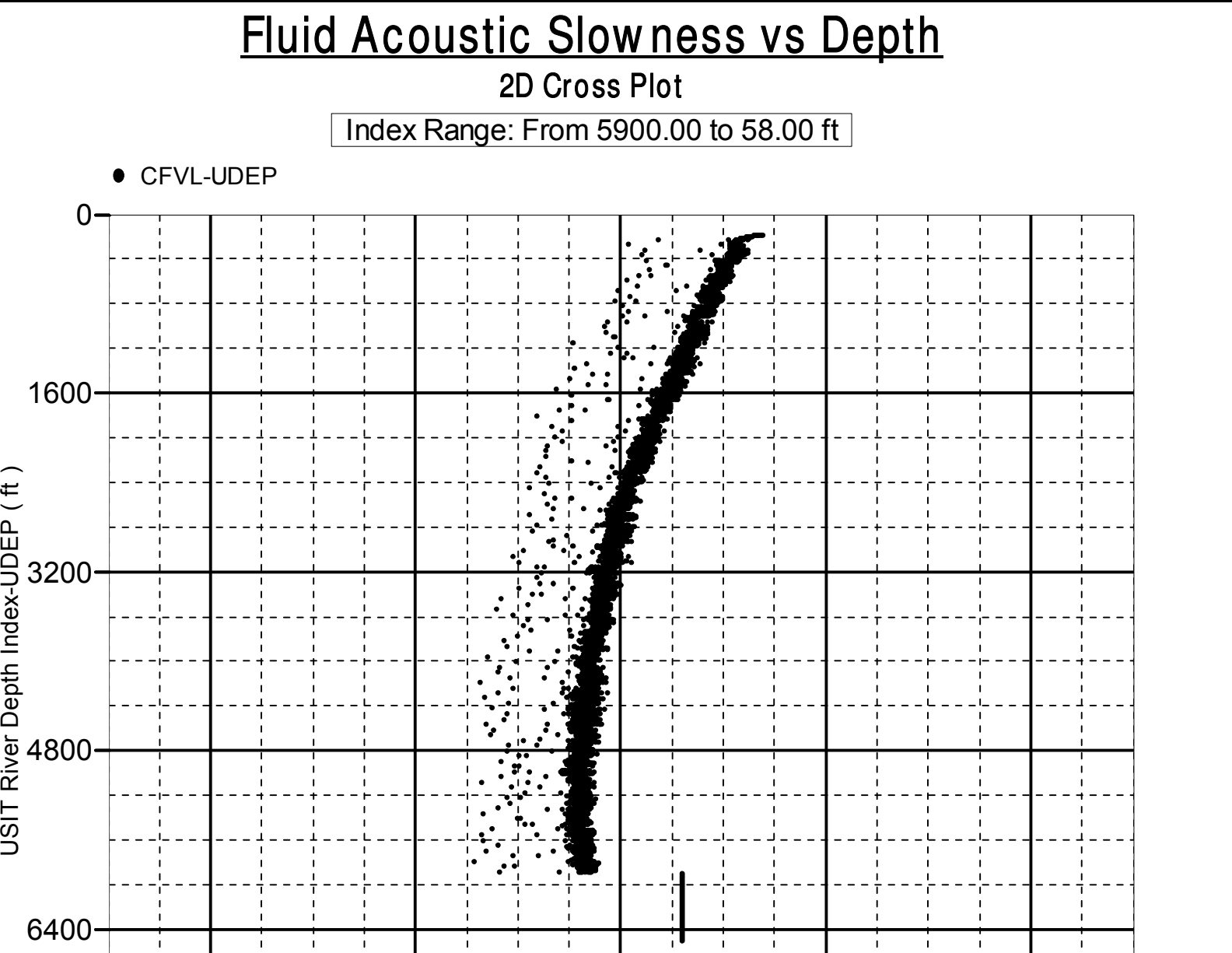


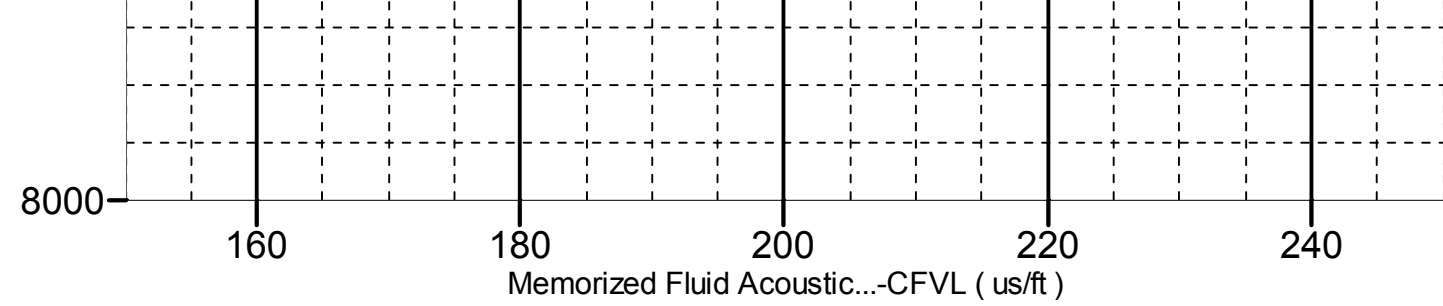
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB

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	45	V
HRES	Horizontal Resolution	USIT-E	10 deg	
TMUC	Type of Mud	USIT-E	BRI	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UPLIHT	Ultrasonic Pulse Echo Large Inhibit Time	USIT-E	Off	
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	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	3000	ft
WINB	Window Begin Time	USIT-E	31.88	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)
WINE	71.88	18-Sep-2017 14:27:31	18-Sep-2017 14:27:51	2549.23	2537.42
WINE	73.41	18-Sep-2017 14:27:51	18-Sep-2017 14:32:53	2537.42	1965.8
All depth are at tool zero.					

XYZ	Company:Noble Energy INC Well:Wells Ranch BB11-650 One: Log[7]:Up:S008
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XYZ

Company:Noble Energy INC Well:Wells Ranch BB11-650

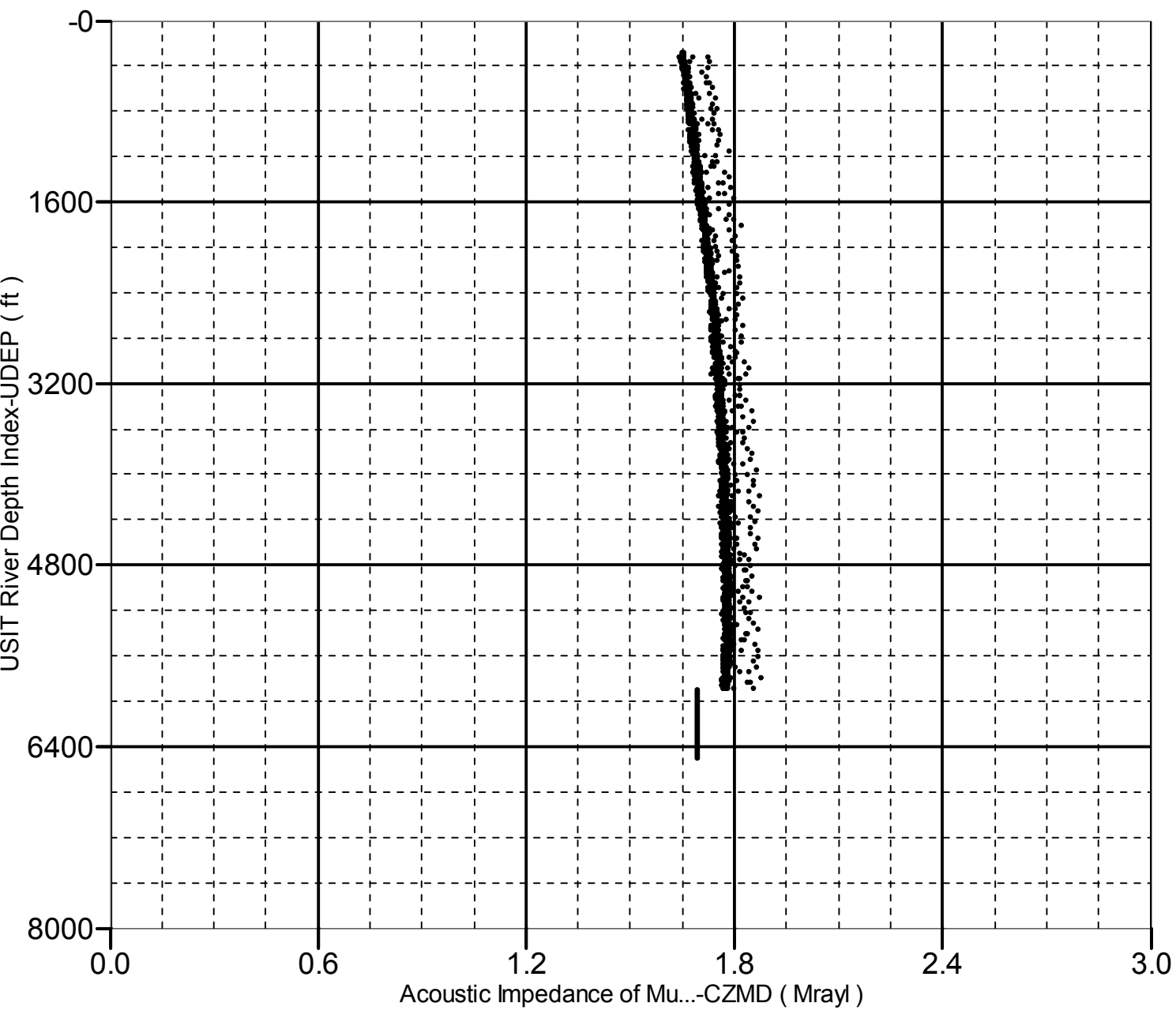
One: Log[7]:Up:S008

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 5900.00 to 88.00 ft

● CZMD-UDEP



Company:	Noble Energy INC	Schlumberger
Well:	Wells Ranch BB11-650	
Field:	Wattenberg	
County:	WELD	
State:	Colorado	

UltraSonic Summary Print