

Company: Noble Energy Inc

Well: Hurley H26-762

Field: Wattenberg

County: Weld

State: Colorado

UltraSonic Summary Print

County: Weld				
Field: Wattenberg				
Location: SENW Sec. 26, T3N, R65W				
Well: Hurley H26-762				
Company: Noble Energy Inc				
Location:	SENW Sec. 26, T3N, R65W	Elev.:	K.B.	4852.00 ft
	SHL: 2366' FNL & 1341' FWL		G.L.	4822.00 ft
	Lat/Long: 40.1971/-104.63541		D.F.	4852.00 ft
	Permanent Datum:	Ground Level	Elev.:	4822.00 f
Log Measured From:		Kelly Bushing	30.00 ft	above Perm.Datum
Drilling Measured From:		Kelly Bushing		
API Serial No.	Section:	Township:	Range:	
05-123-46767	26	3N	65W	
Logging Date	18-Aug-2018			

Run Number	One
Depth Driller	16196.00 ft
Schlumberger Depth	16196.00 ft
Bottom Log Interval	6930.00 ft
Top Log Interval	100.00 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	1935.00 ft
To	16196.00 ft
Casing/Tubing Size	5.5 in
Weight	20 lbm/ft
Grade	P110
From	0.00 ft
To	16181.70 ft
Max Recorded Temperatures	222.87 degF
Logger on Bottom	18-Aug-2018
Unit Number	2377
Recorded By	Ashley Rosacker
Witnessed By	Bill Mansfield

Disclaimer

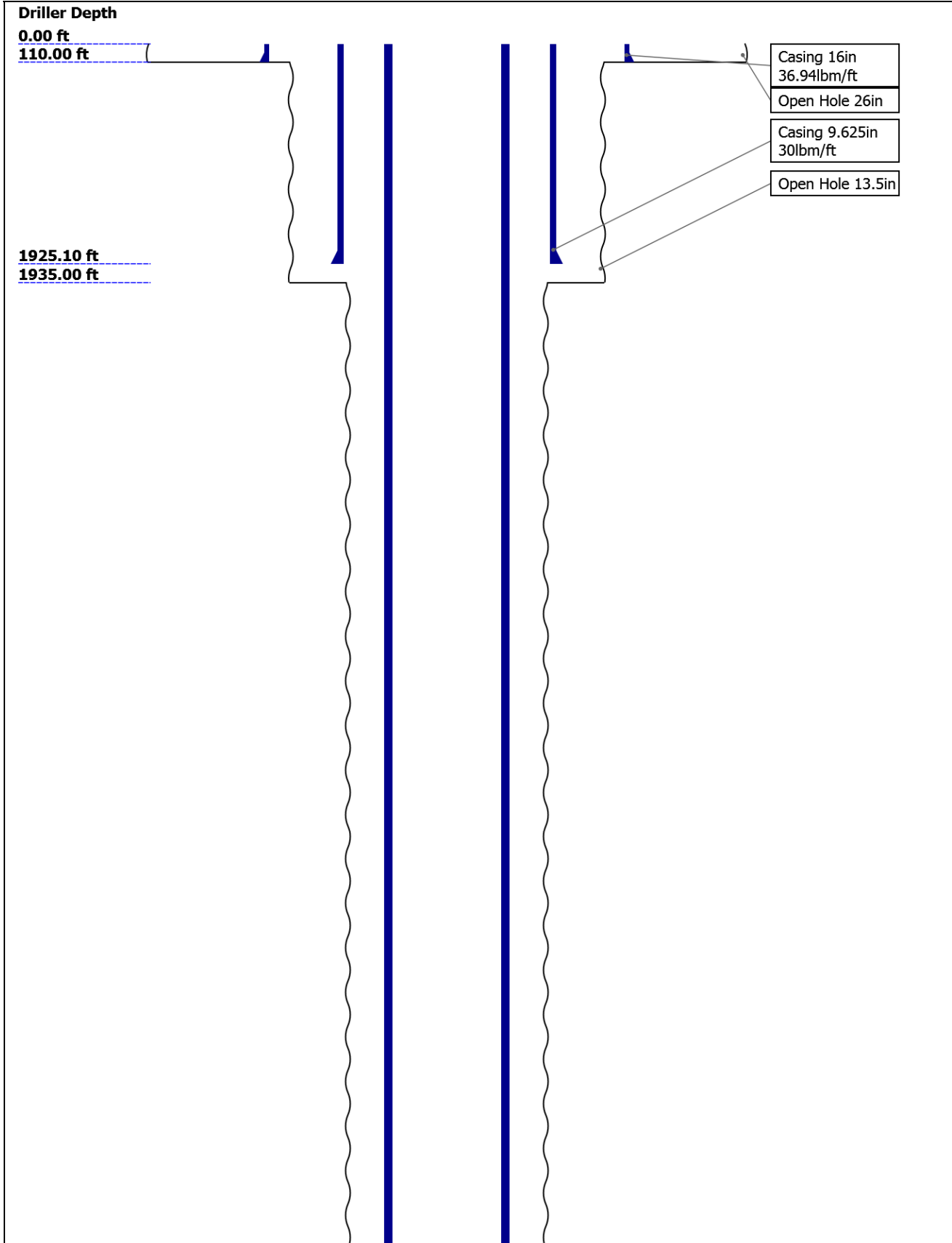
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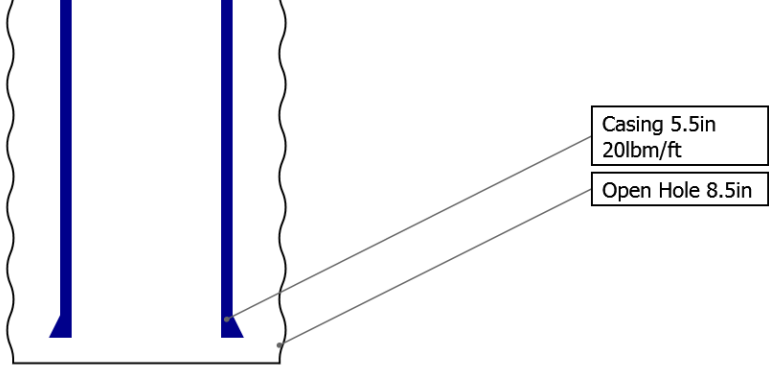
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Well Sketch



16181.70 ft


16196.00 ft

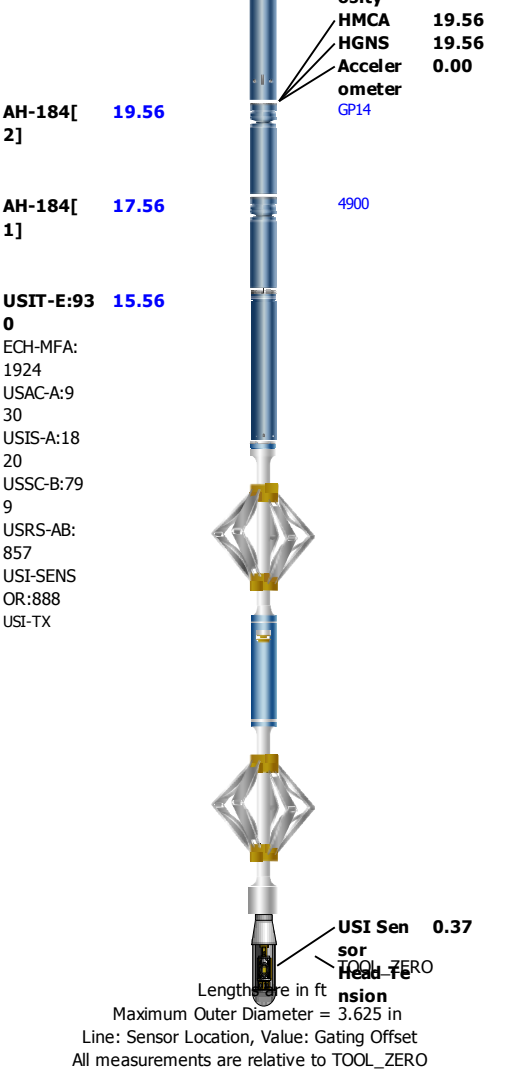


Borehole Size/Casing/Tubing Record

Bit						
Bit Size ( in )	26	13.5	8.5			
Top Driller ( ft )	0	110	1935			
Top Logger ( ft )	0	110	1935			
Bottom Driller ( ft )	110	1935	16196			
Bottom Logger ( ft )	110	1935	16196			
Casing						
Size ( in )	16	9.625	5.5			
Weight ( lbm/ft )	36.94	30	20			
Inner Diameter ( in )	15.572	9.036	4.778			
Grade	N/A	J55	P110			
Top Driller ( ft )	0	0	0			
Top Logger ( ft )	0	0	0			
Bottom Driller ( ft )	110	1925.1	16181.7			
Bottom Logger ( ft )	110	1925.1	16181.7			

Remarks and Equipment Summary

One: Toolstring				One: Remarks	
<div><div><div>Equip nameLengthMP nameOffset</div><div>LEH-QT38.95LEH-QT</div><div>EDTC-B:935.47247</div><div>EDTH-B:9309</div><div>EDTG-B:79445</div><div>EDTC-B:9247</div><div>HGNS-H:428.97736</div><div>HGNH:2987</div><div>NPV-N</div><div>NSR-F:5070</div><div>HACCZ-H:5118</div><div>HMCA-H</div><div>HGNS-H:4736</div></div><div></div><div><div>CTEM31.97</div><div>ACCZ0.00</div><div>HV0.00</div><div>Gamma30.1</div><div>Ray</div><div>TelStatu28.97</div><div>s</div><div>Temper28.94</div><div>ature</div><div>GR28.23</div><div>CNL Por21.89</div><div>osity</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: 215 degF				



## Depth Summary

	One		
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### Depth Measuring Device

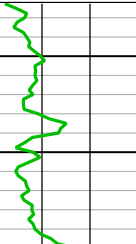
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		

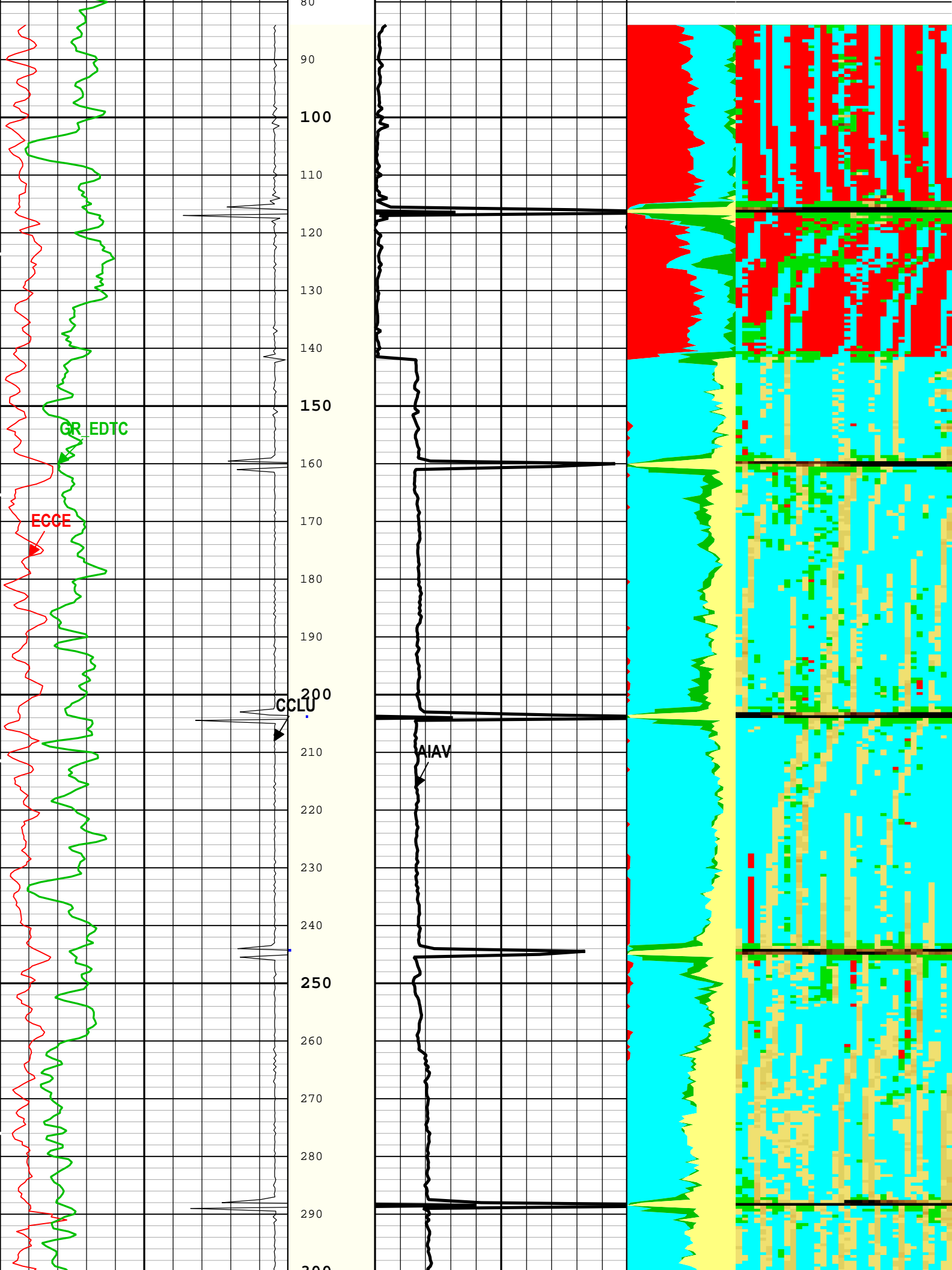
### Tension Device

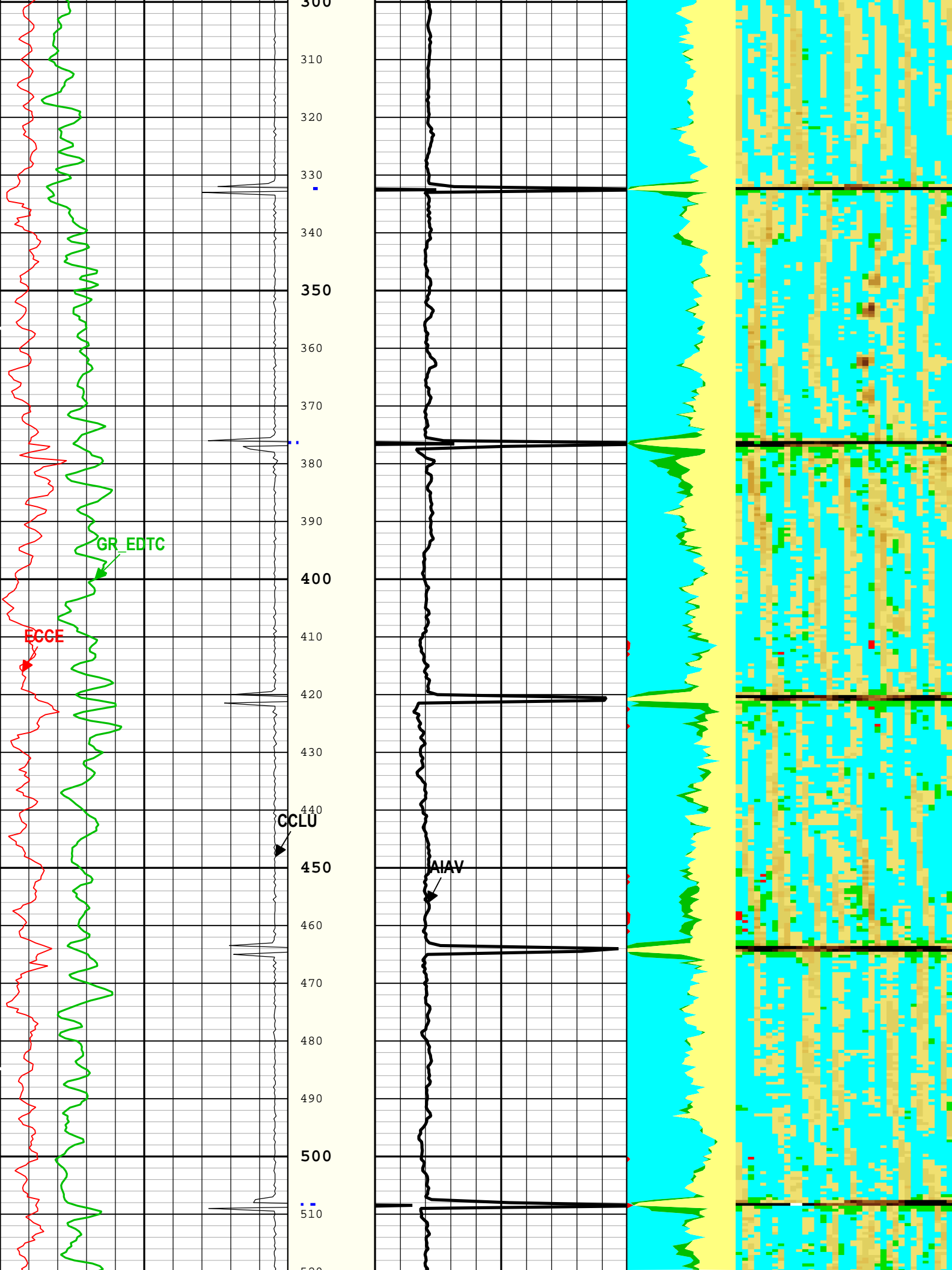
Type	CMTD-B/A		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0		

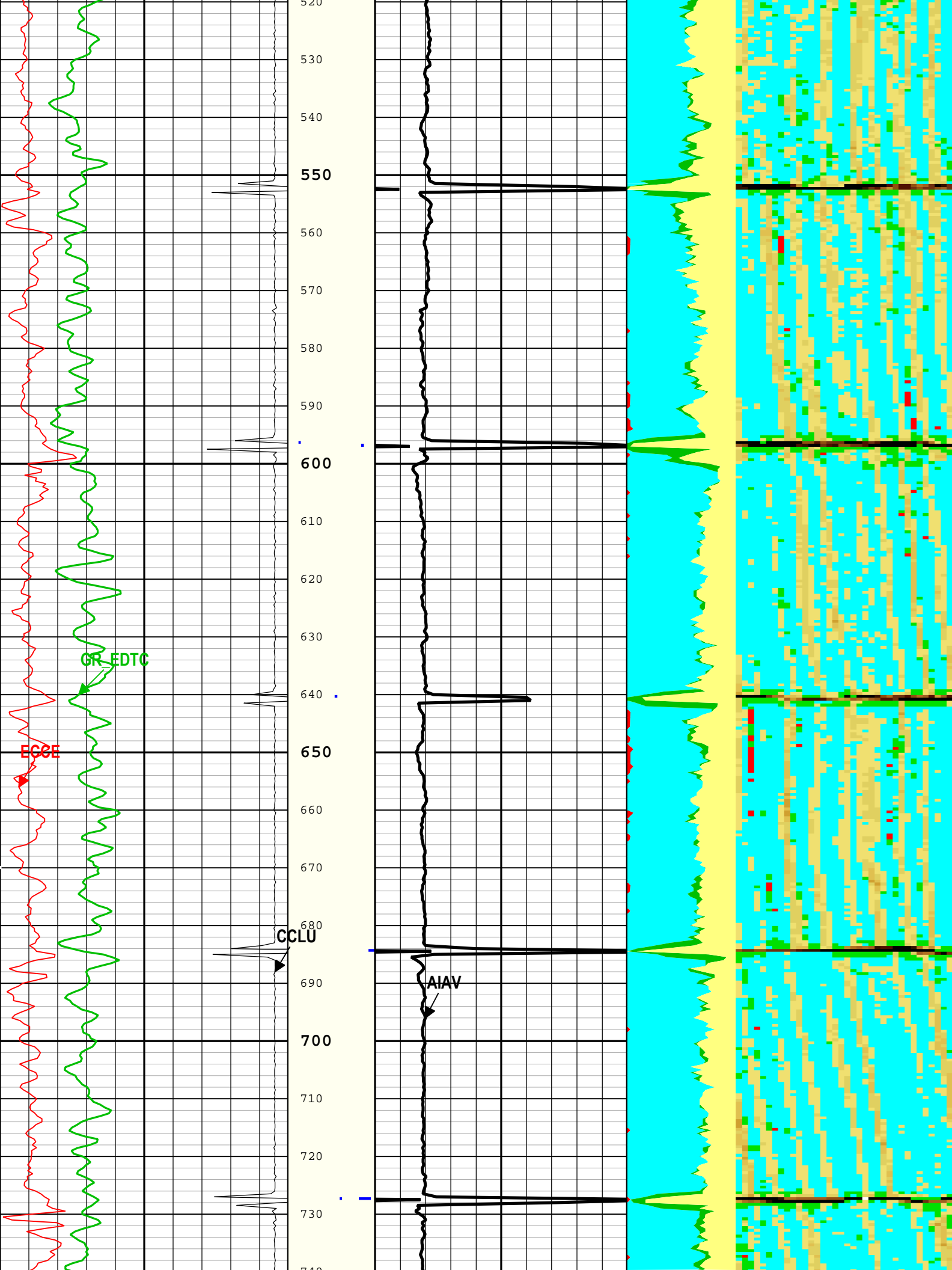
### Logging Cable

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

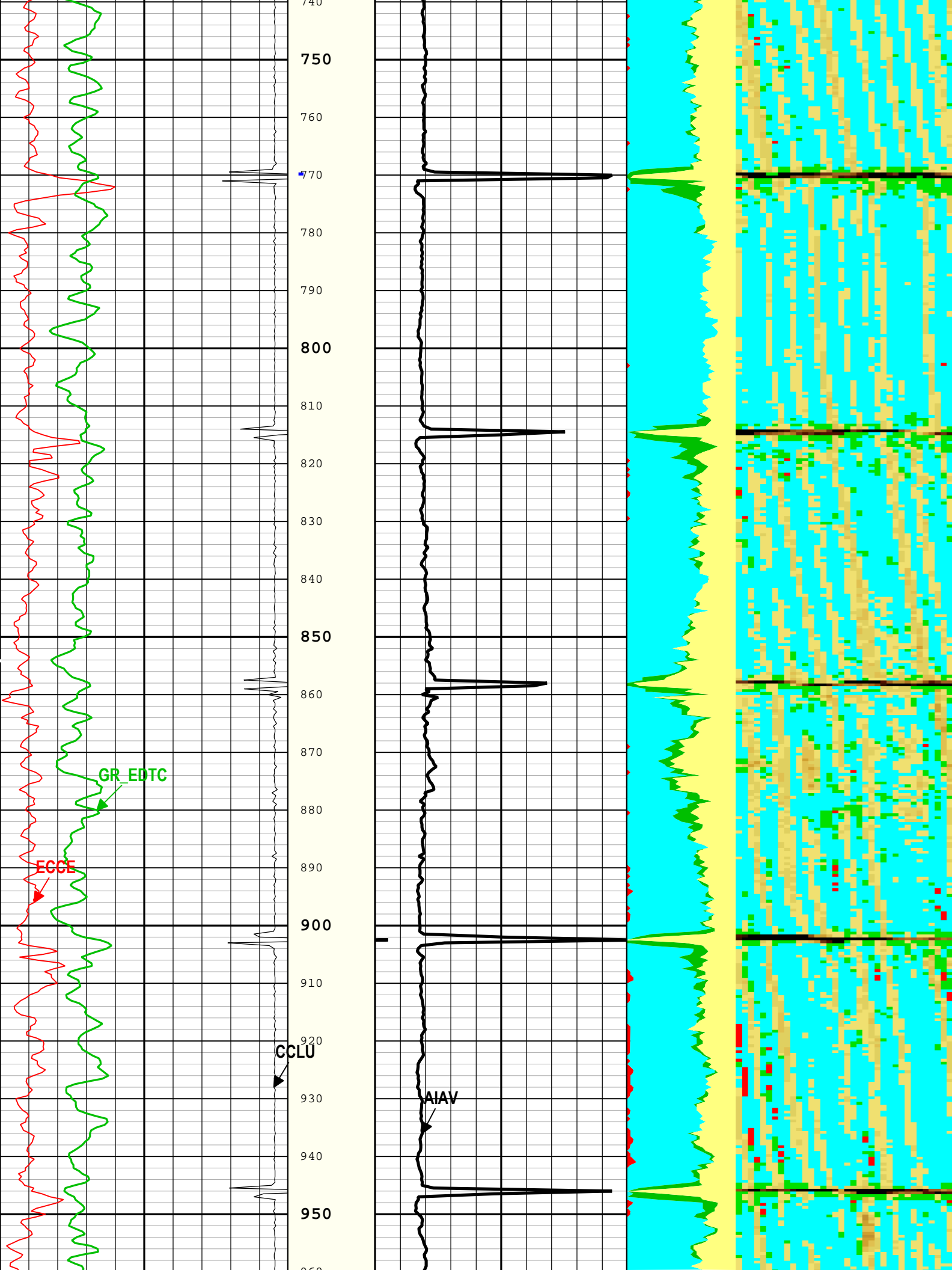
Rig Type		Crane							
One:Depth Control Parameters				Depth Control Remarks					
Log Sequence		First Log In the Well		All Schlumberger depth control policies followed.  IDW used as primary depth reference.  Z-Chart used as secondary depth reference.  Log depth shifted to marker joint at 6380.5 ft.					
Rig Up Length At Surface									
Rig Up Length At Bottom									
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		6931.82		84.28			
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 : 33.11m(108.64ft) to 35.91m(117.81ft) MUD_N_FRP = 1.13 DFD = 1.01g/cm3(8.40lbm/gal) CZMD median computed in free pipe normalization interval = 1.63 MRayl									
Start Depth(ft)		Stop Depth(ft)		Start Value(Mrayl)		End Value(Mrayl)			
One									
2500 PSI Main Pass									
Software Version									
Acquisition System				Version					
Maxwell 2018 SP2				8.2.104493.3100					
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[4]:Up	Up	84.28 ft	6931.82 ft	18-Aug-2018 5:45:09 PM	18-Aug-2018 7:09:58 PM	ON	-5.54 ft	No
All depths are referenced to toolstring zero									
Log						Company:Noble Energy Inc		Well:Hurley H26-762	
								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: 18-Aug-2018 19:29:01									
TIME_1900 - Time Marked every 60.00 (s)									
Casing Collar Locator Ultrasonic (CCLU) USIT-E			Absent 1,500 2,500 6,500		Acoustic Impedance Average (AIAV) USIT-E		Gas		
-20 in 1			Explicit Normalization		0 Mrayl 10		Liquid		
Amplitude of Eccentering (ECCE) USIT-E			USIT - USIT Processing Flags (UFLG) USIT-E				Micro-Debonding		
0 in 0.5							Bonded		
Calibrated Gamma Ray (GR_EDTC) EDTC-B							Custom Normalization		
0 gAPI 150							USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E (Mrayl)		
			60						
			70						
			80						
			90						
			100						
			110						
			120						
			130						
			140						
			150						
			160						
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			990						
			1000						

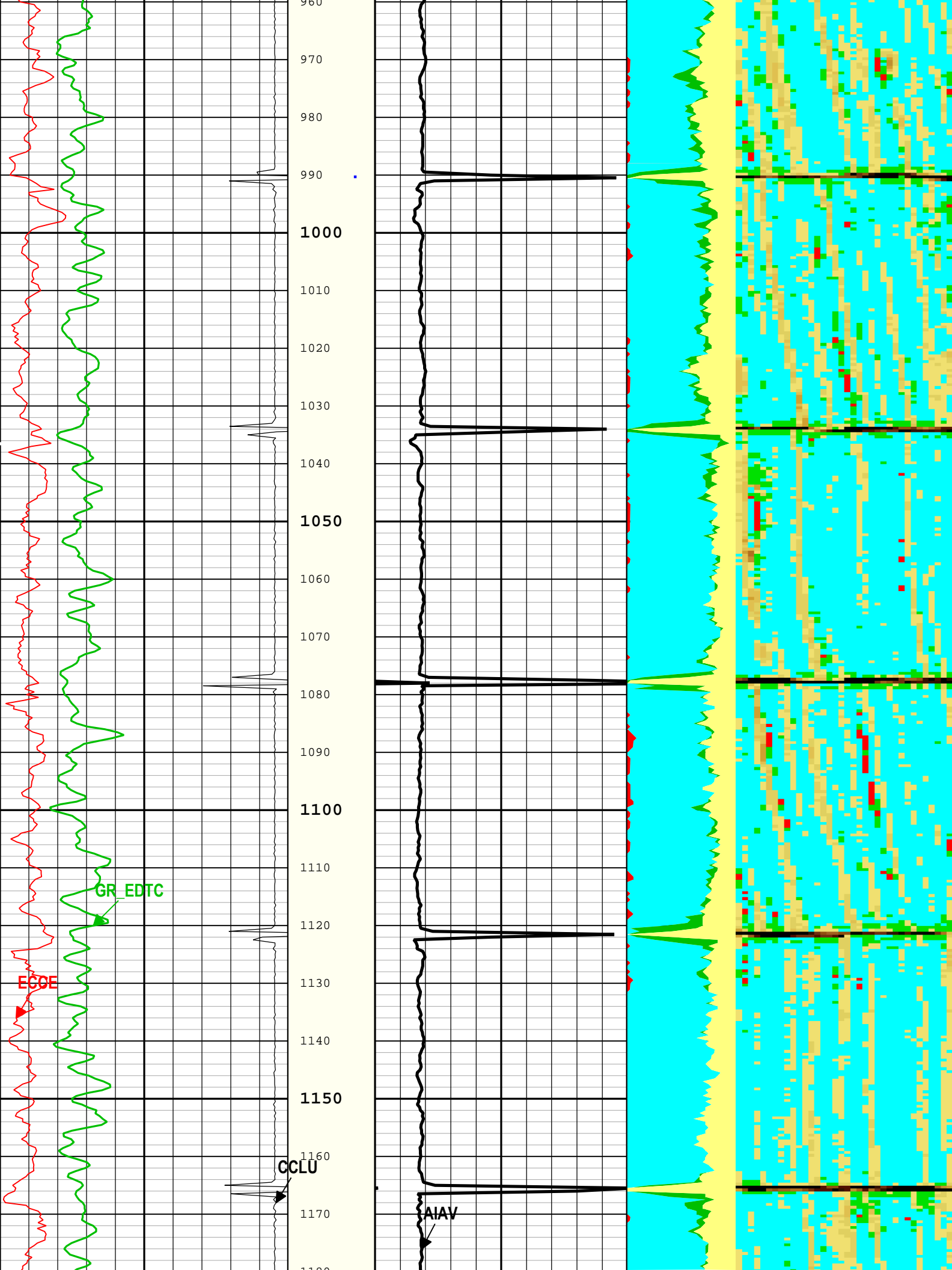


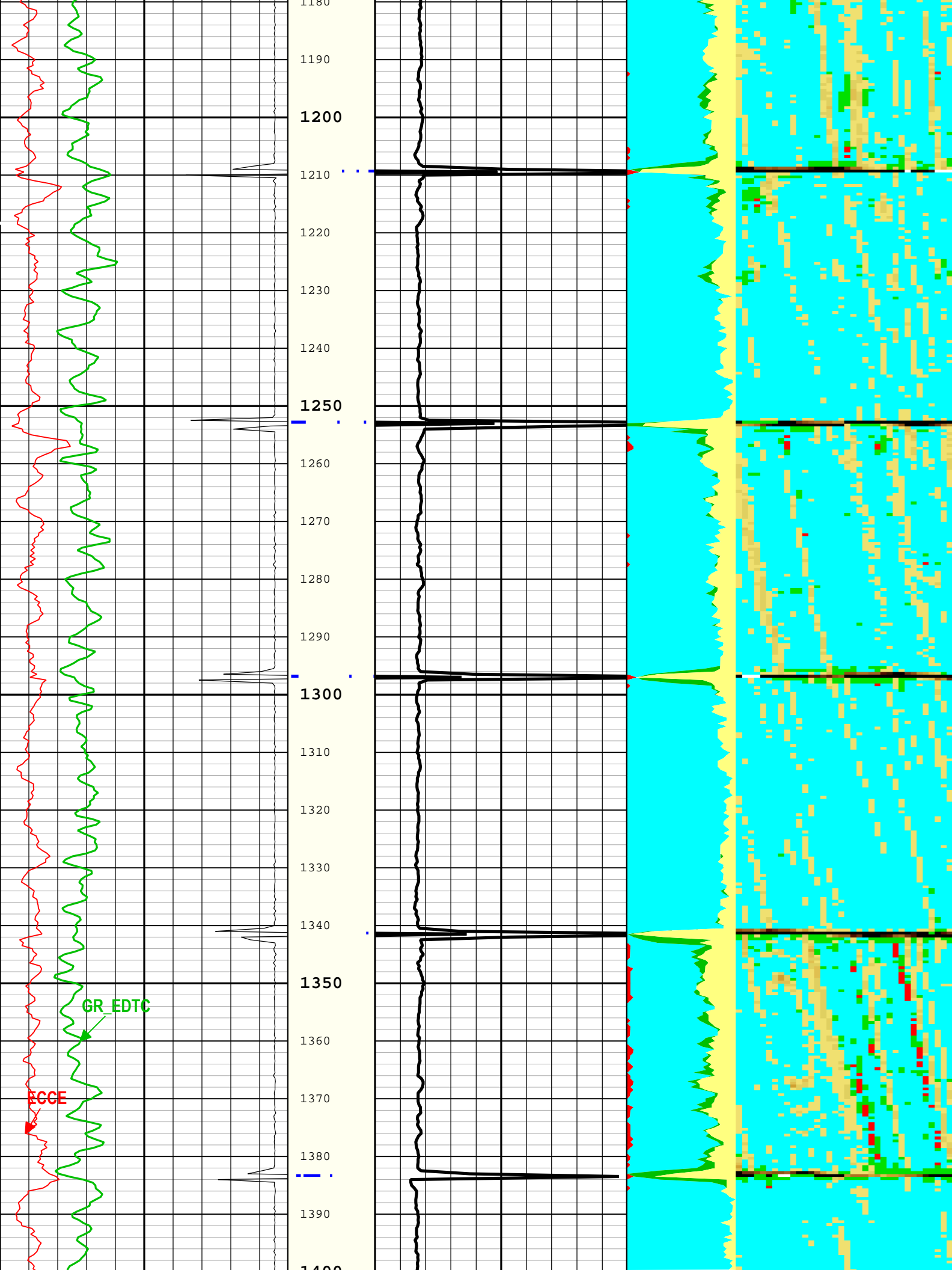


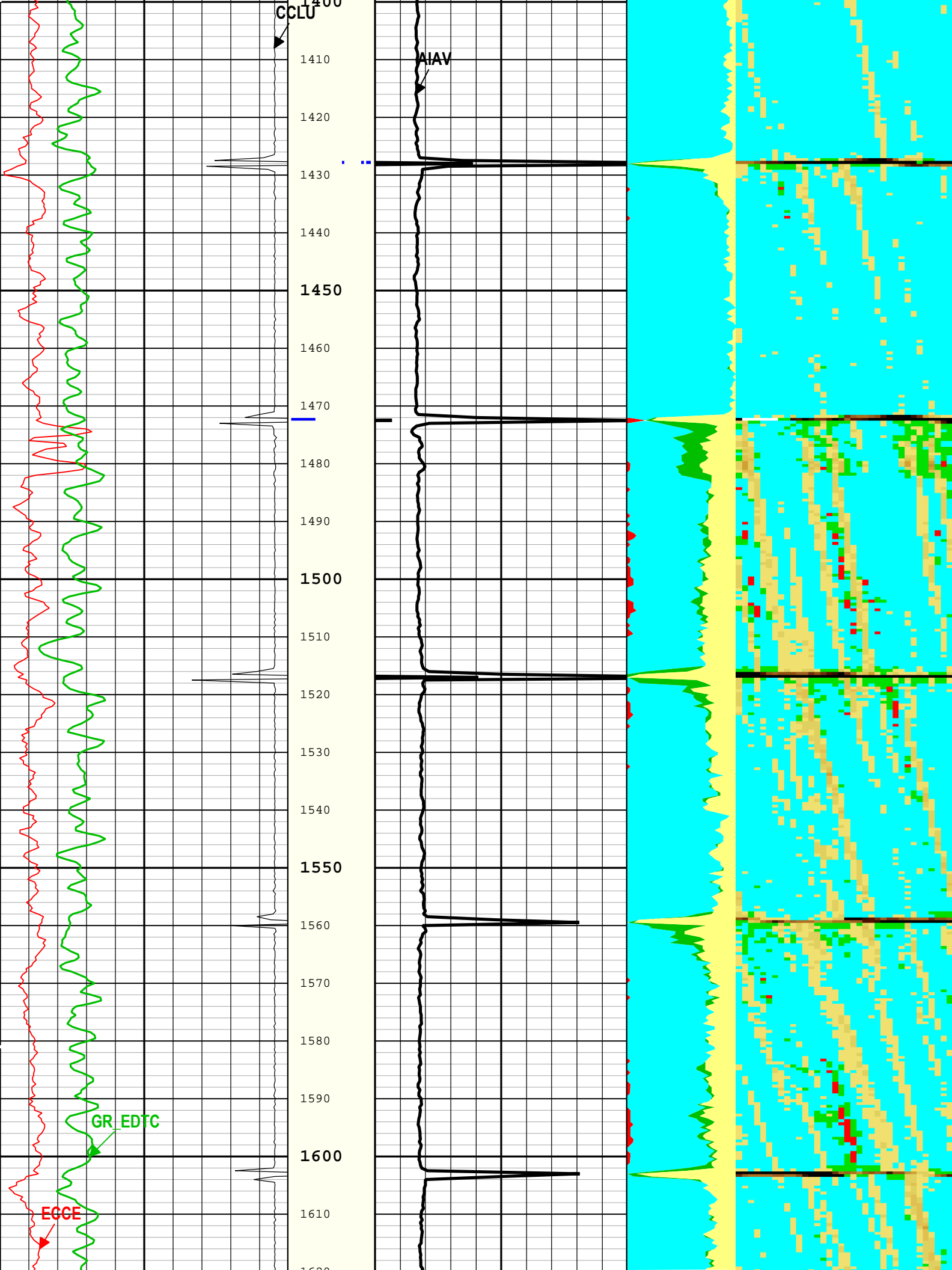


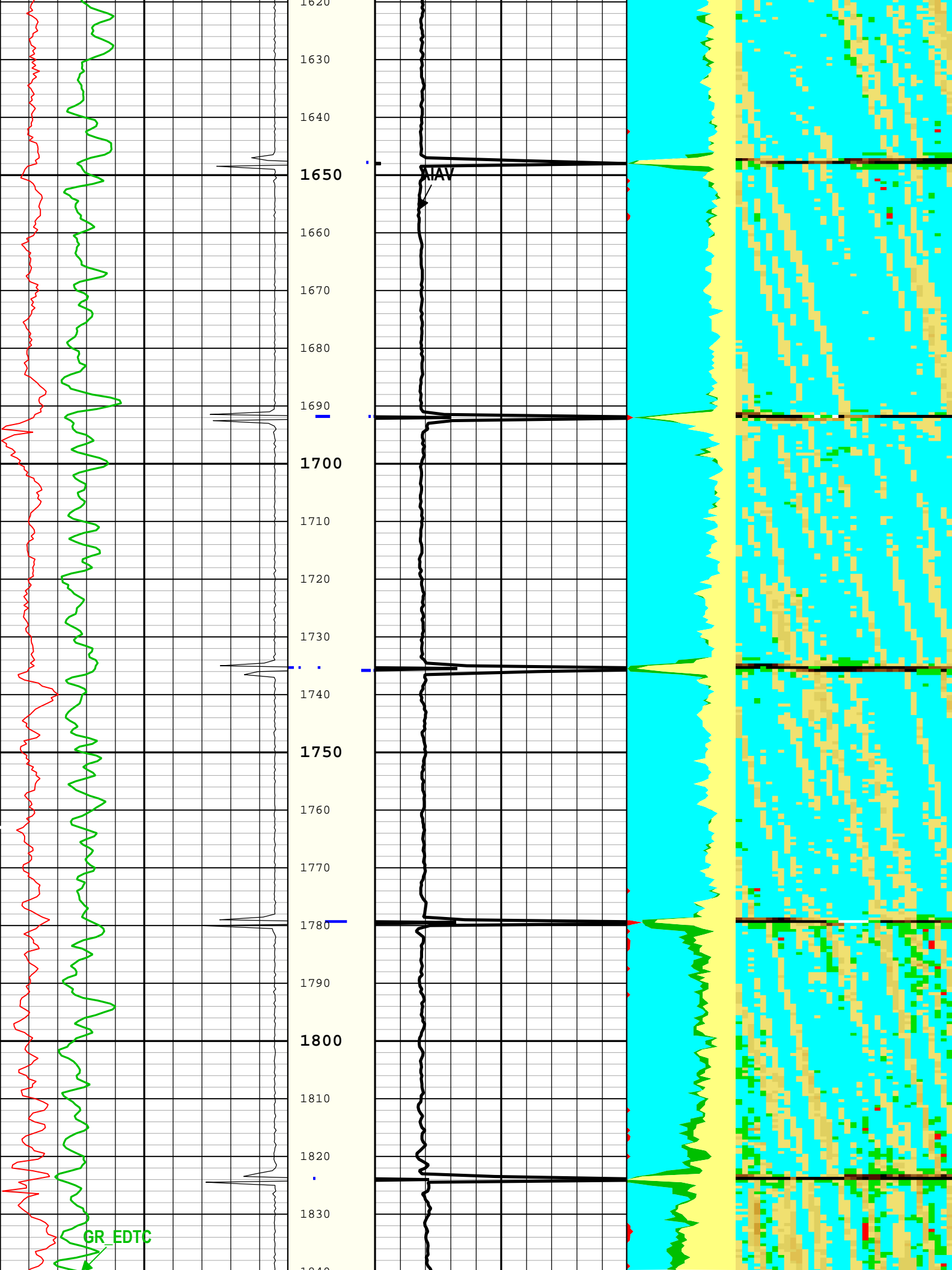


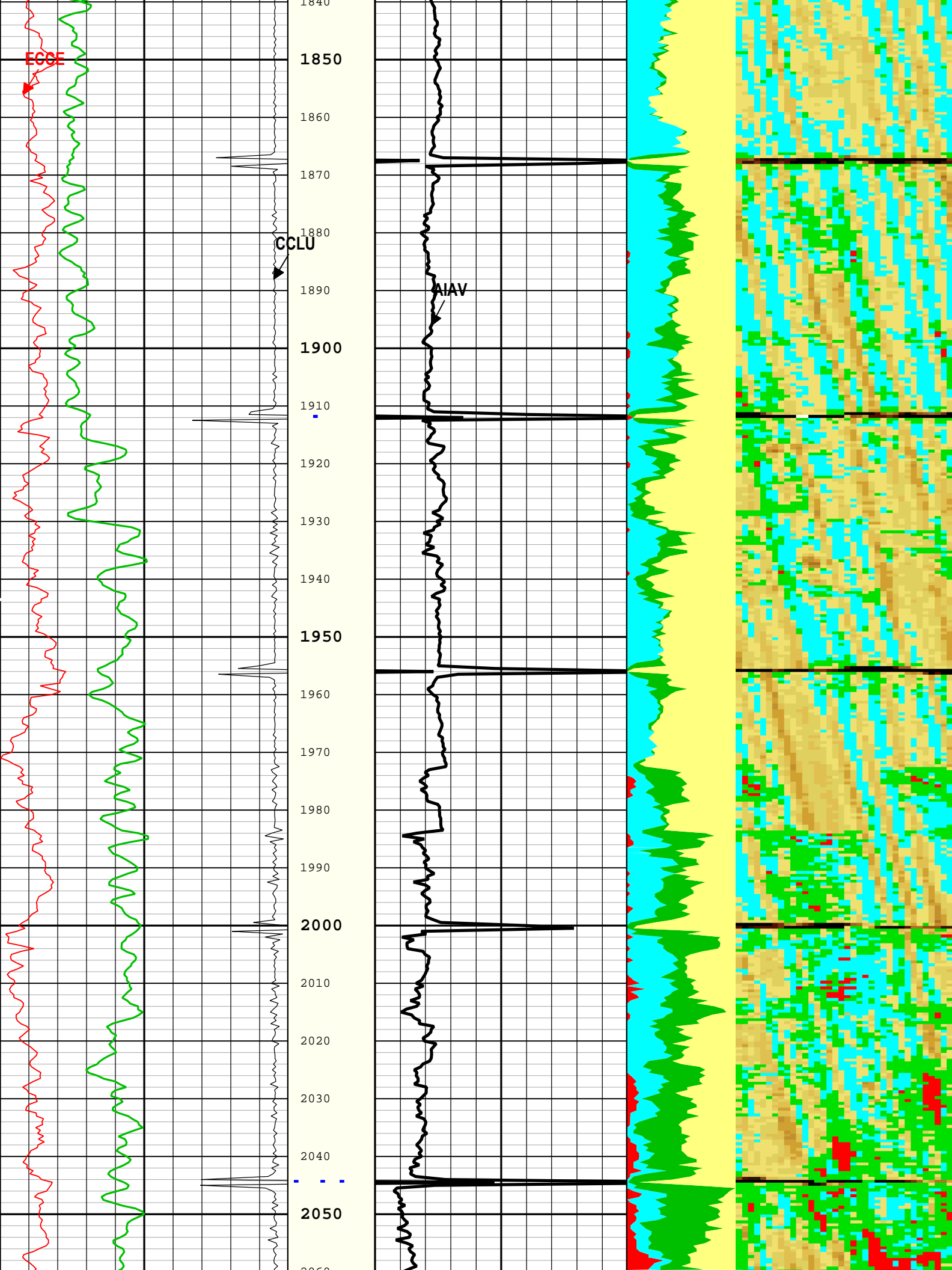


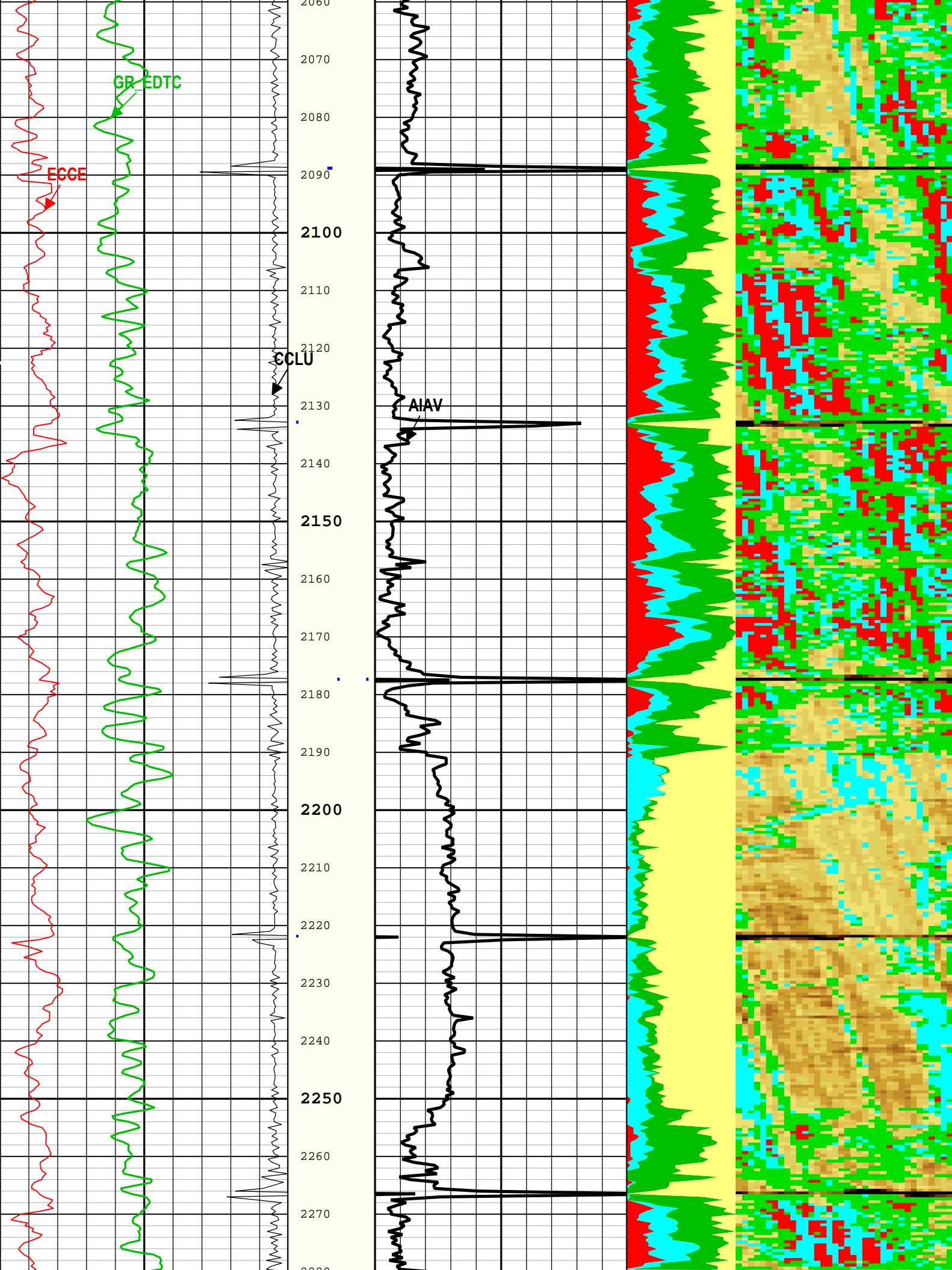


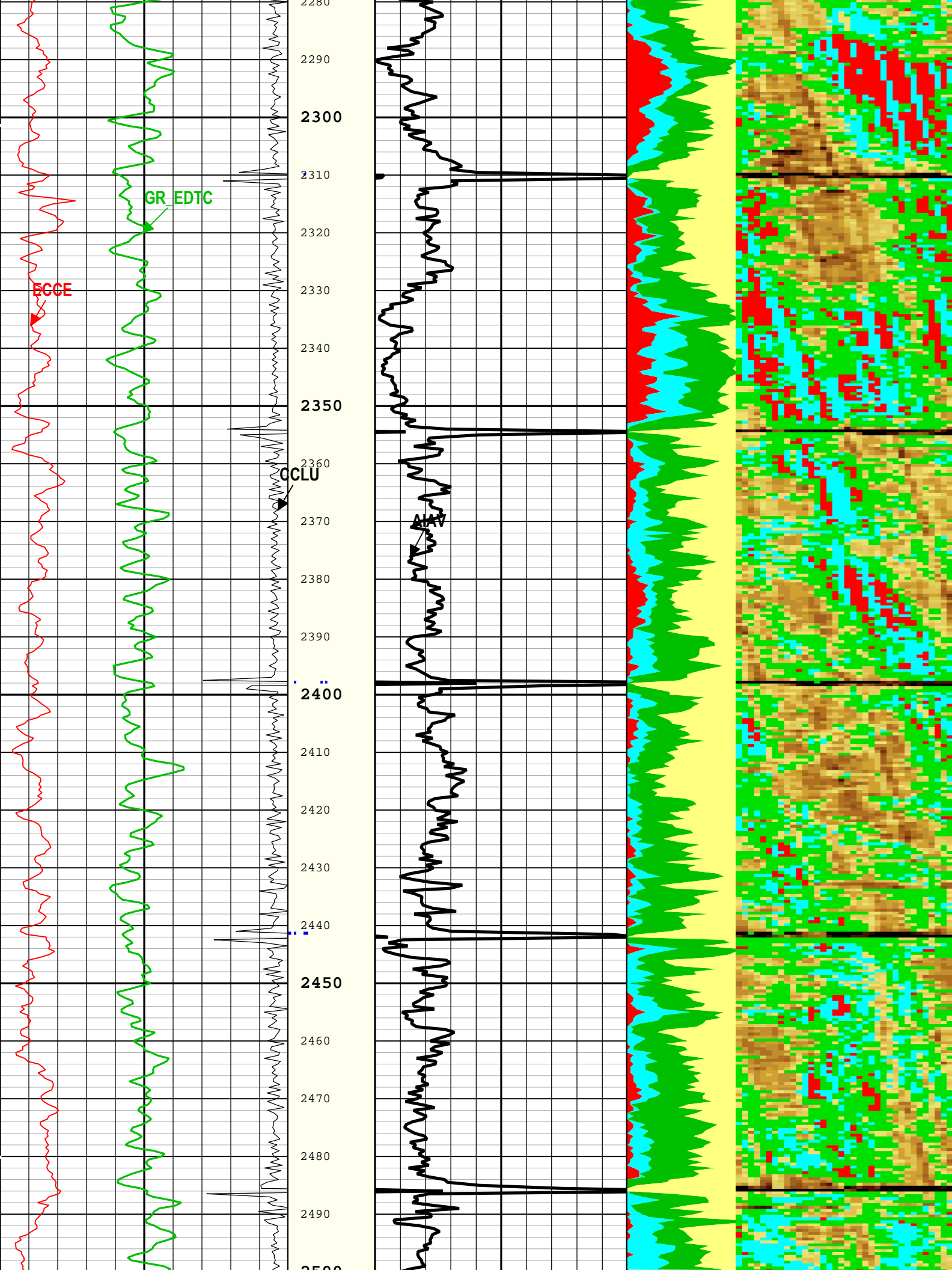




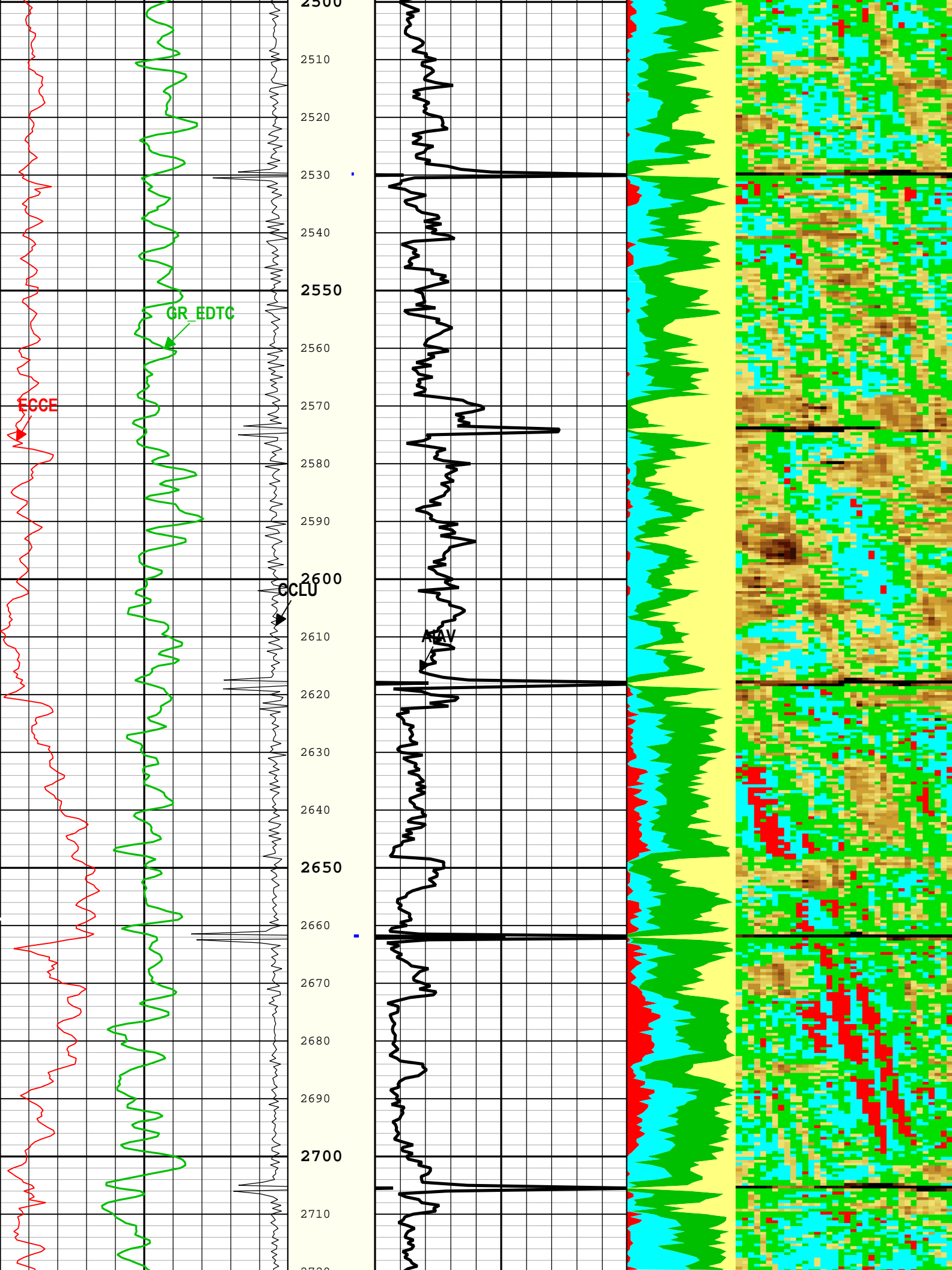


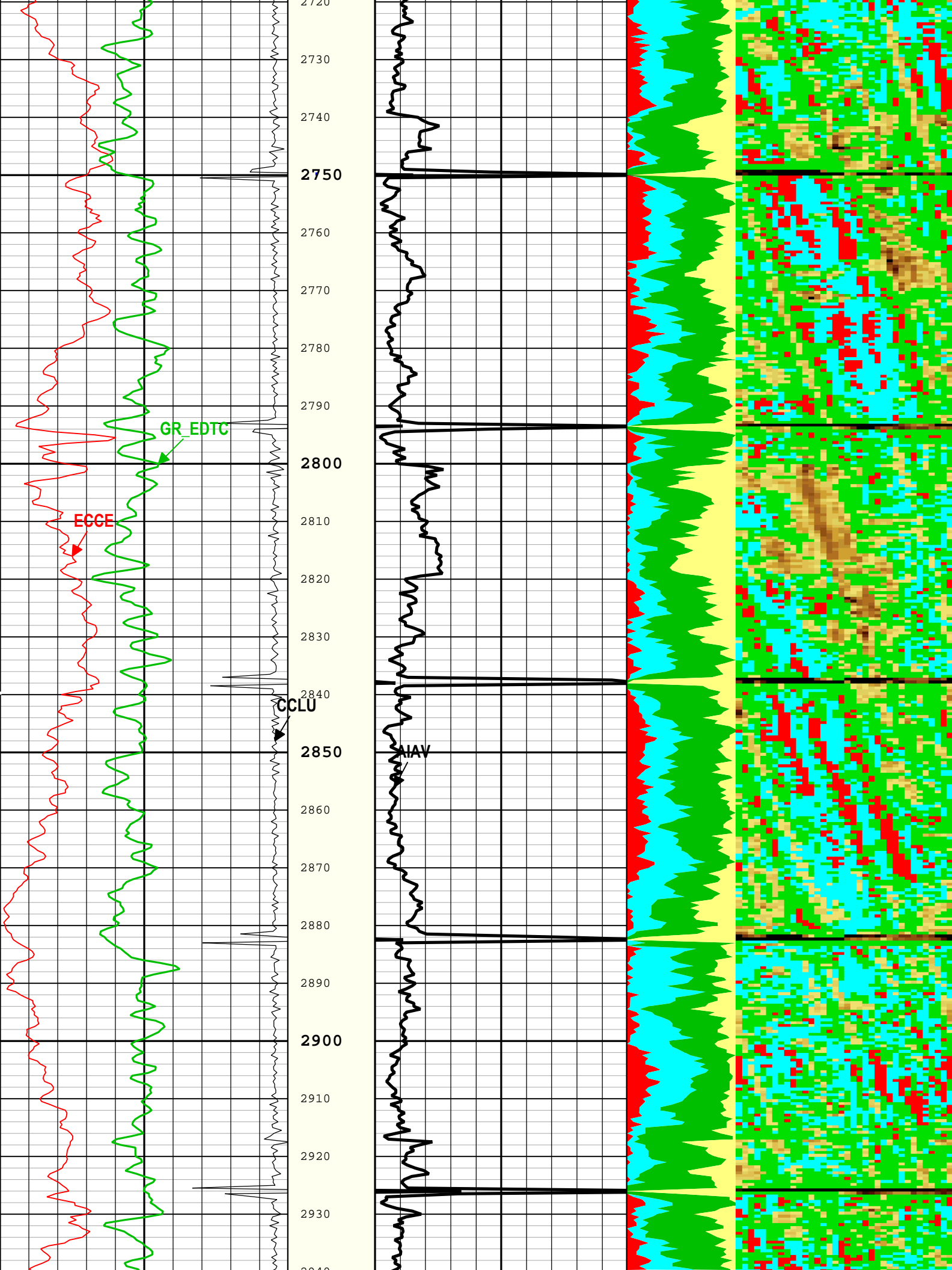


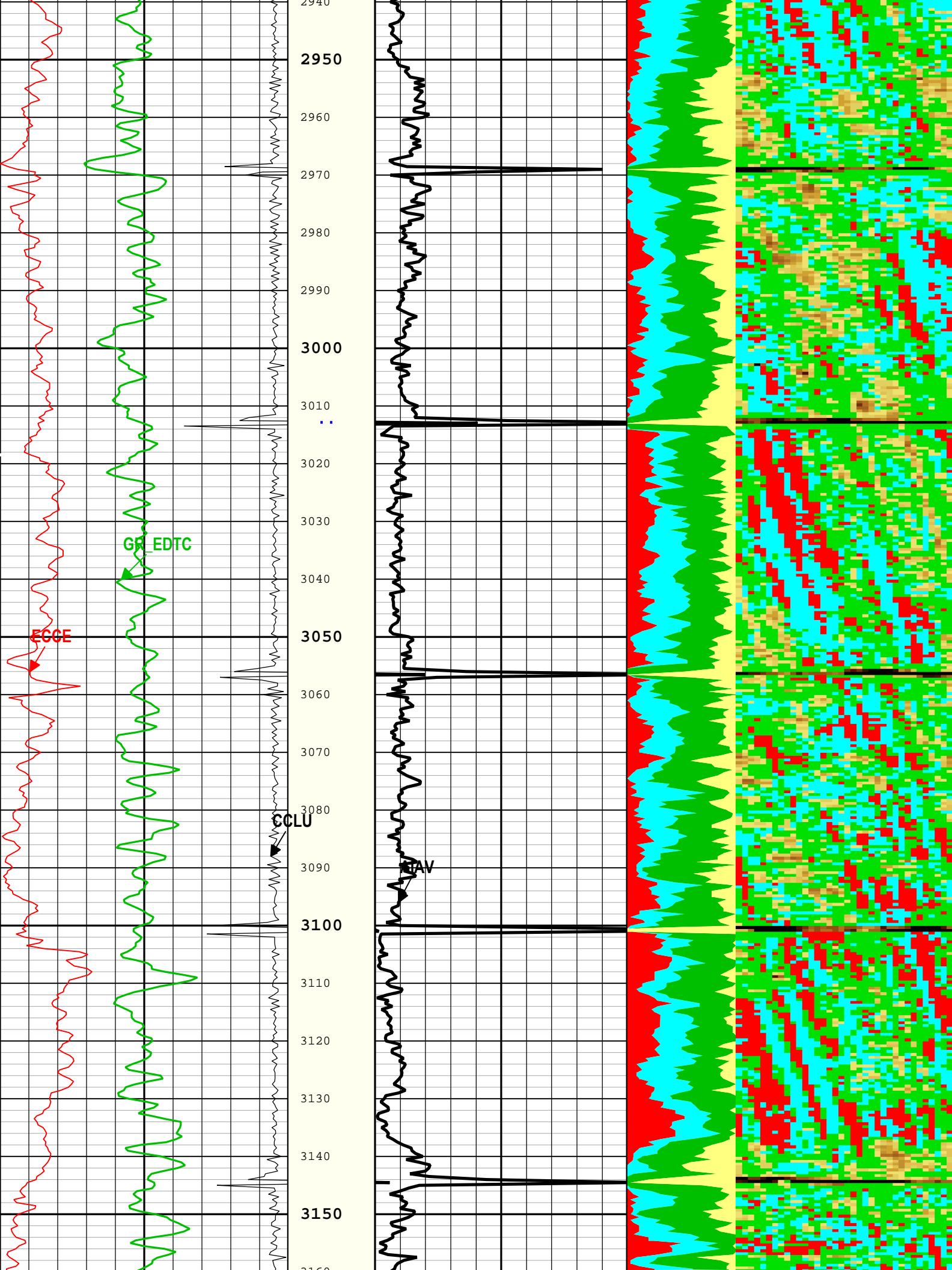


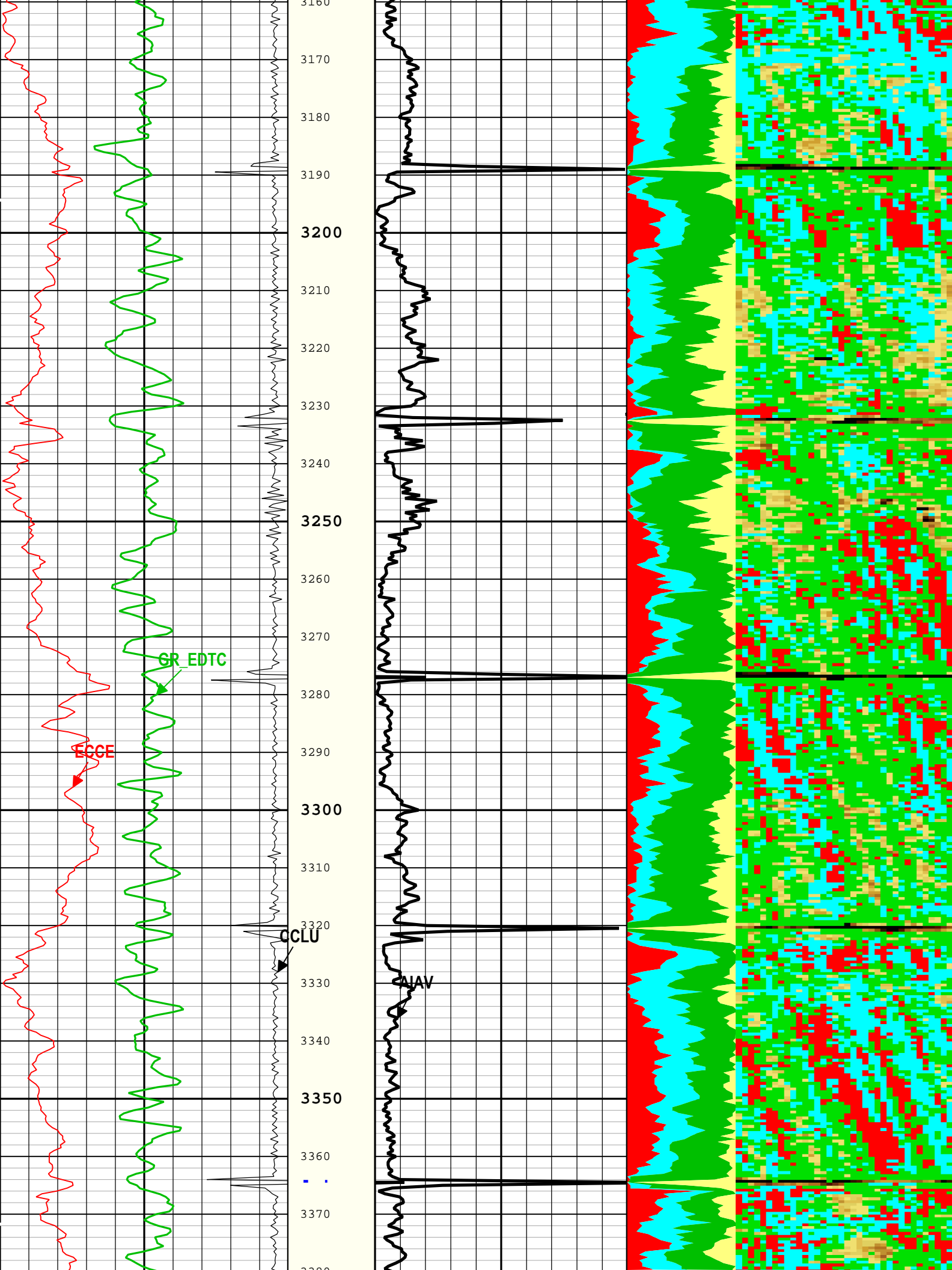


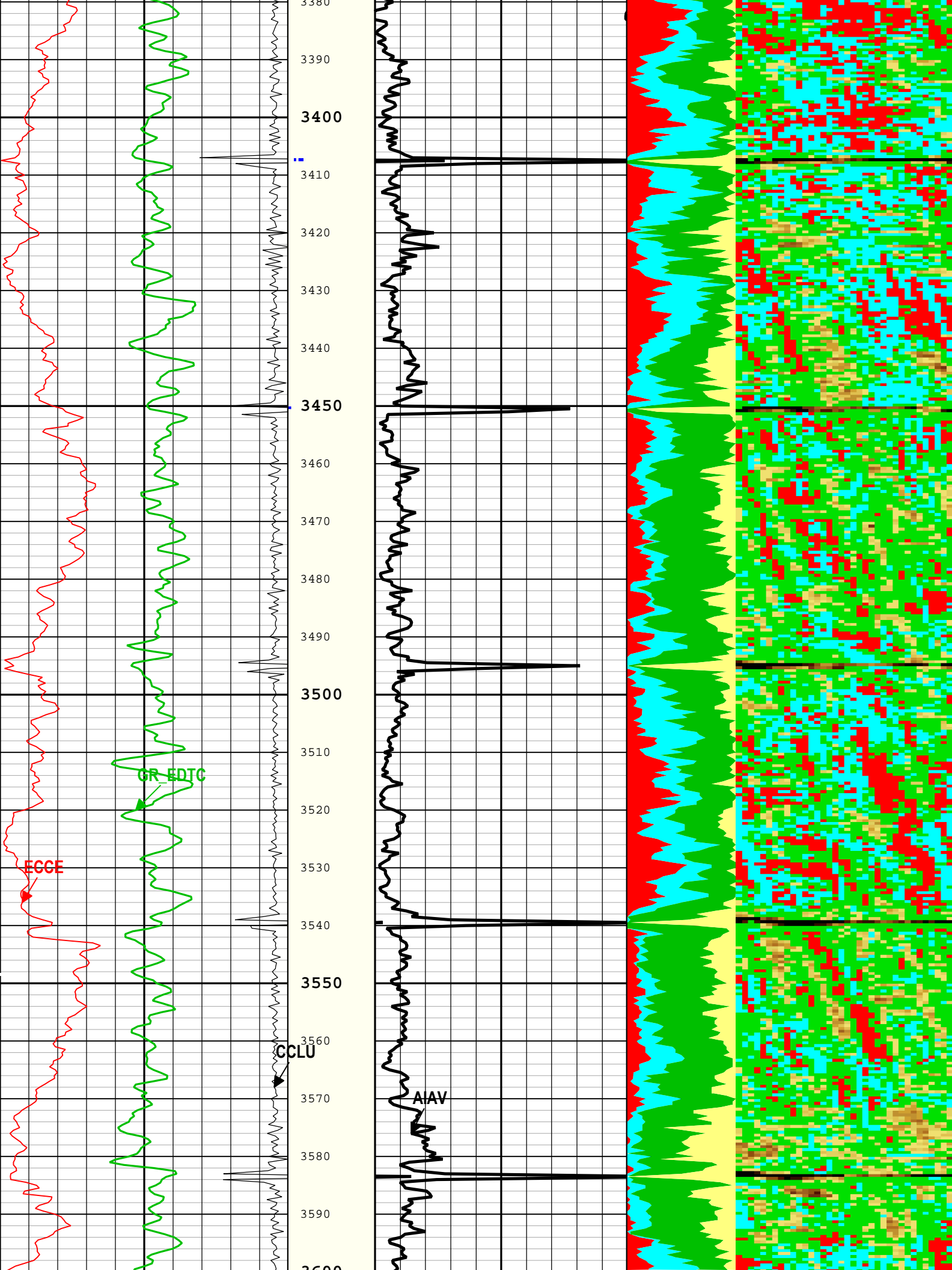


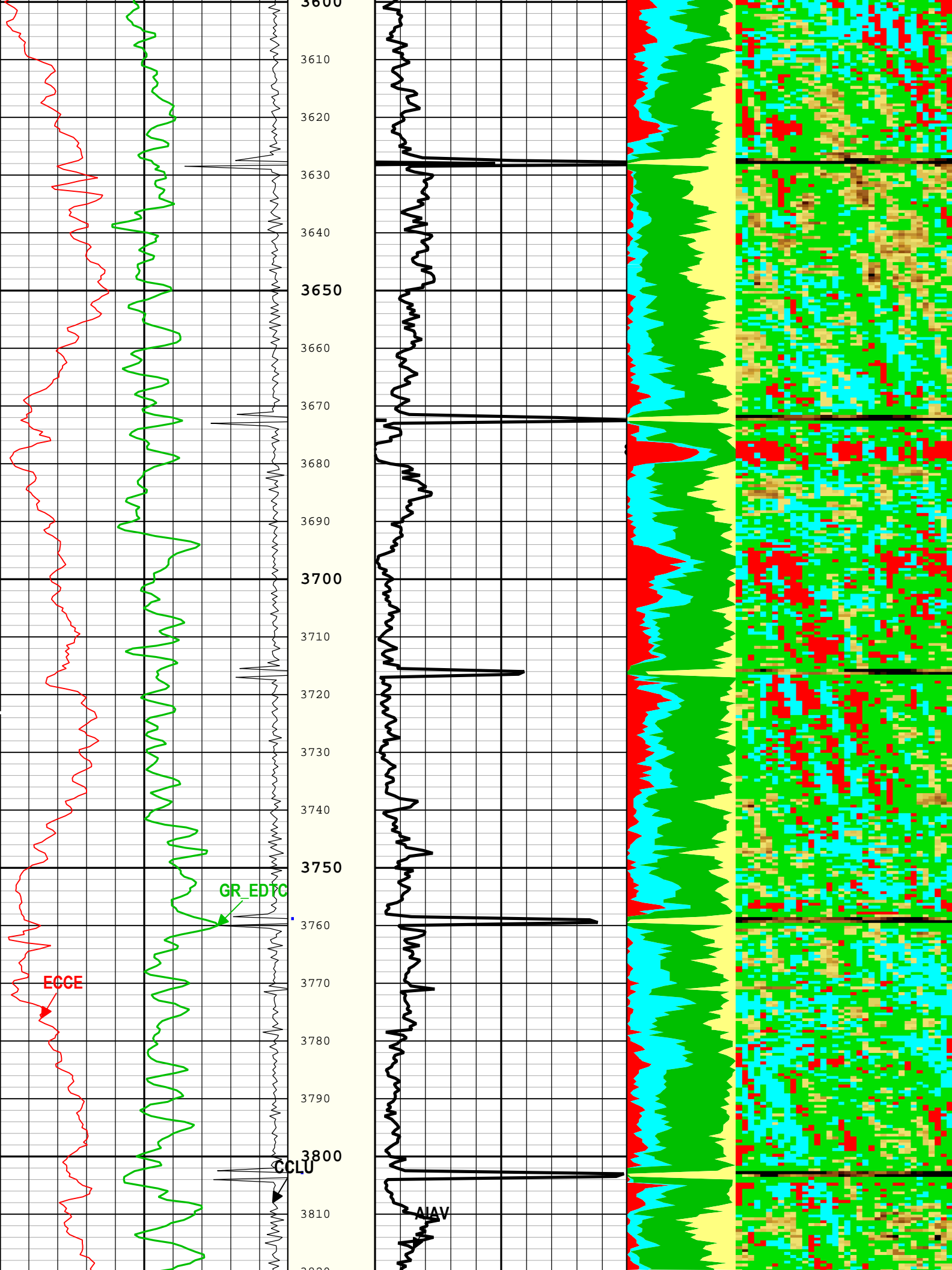


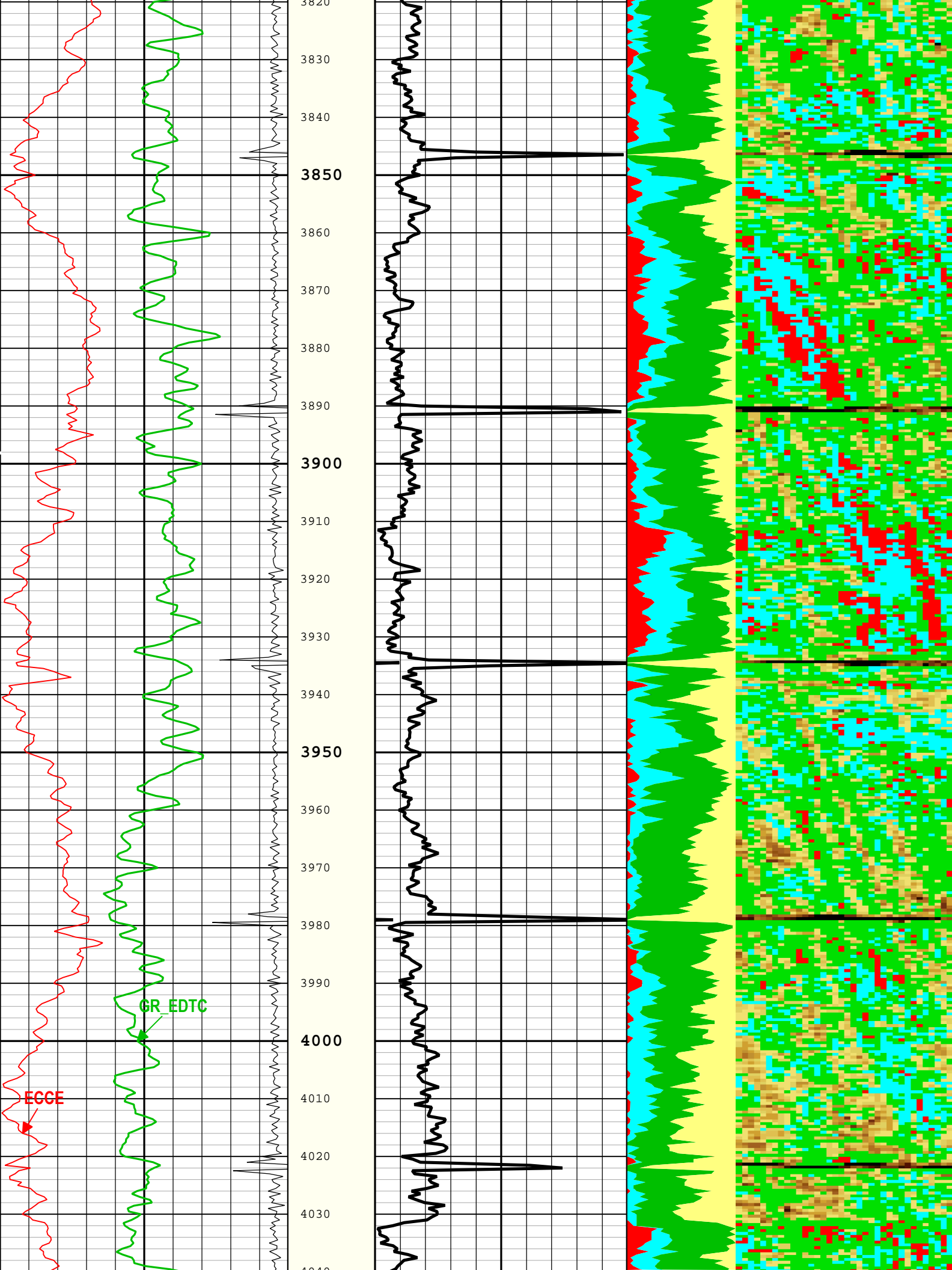




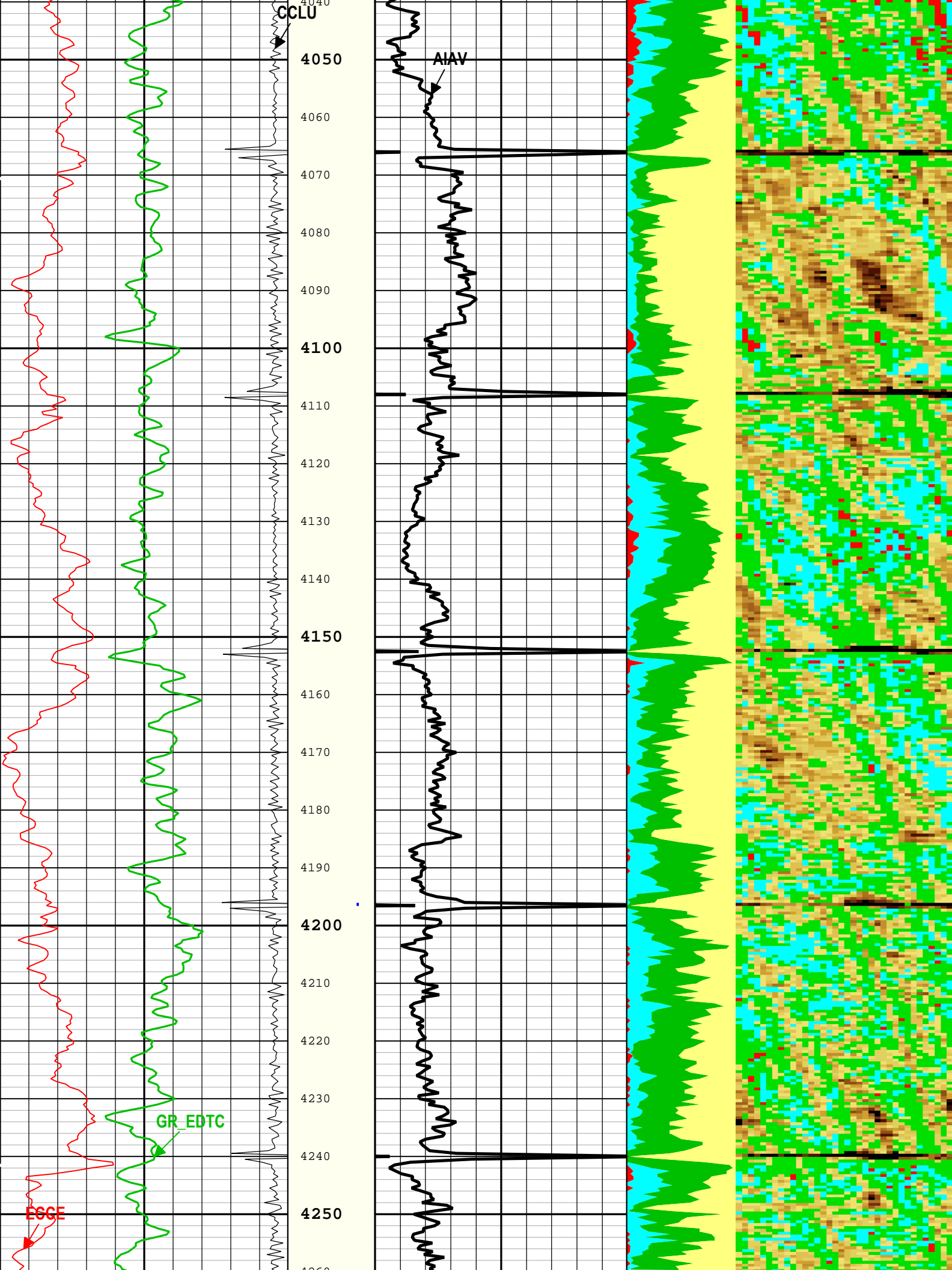




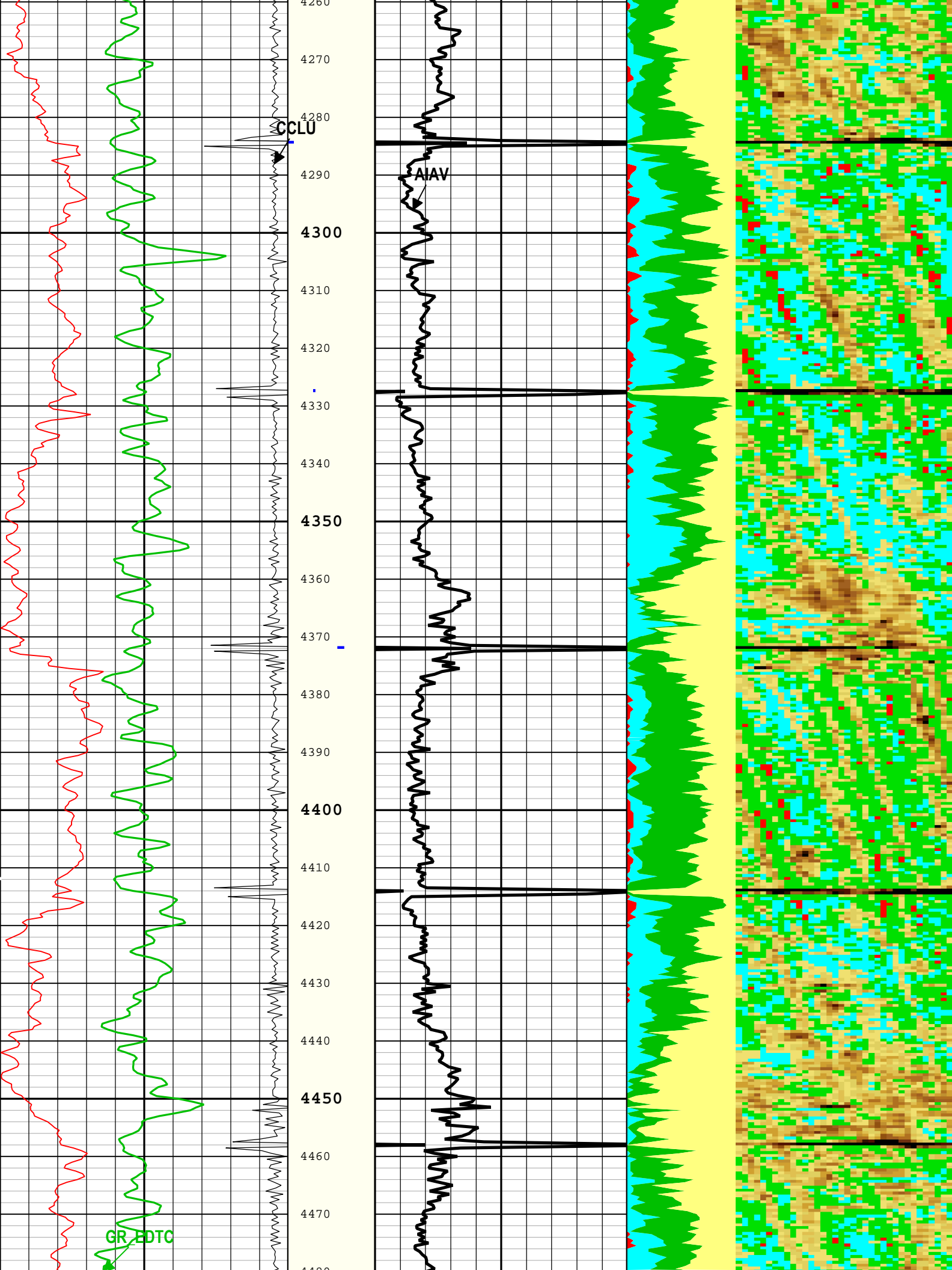


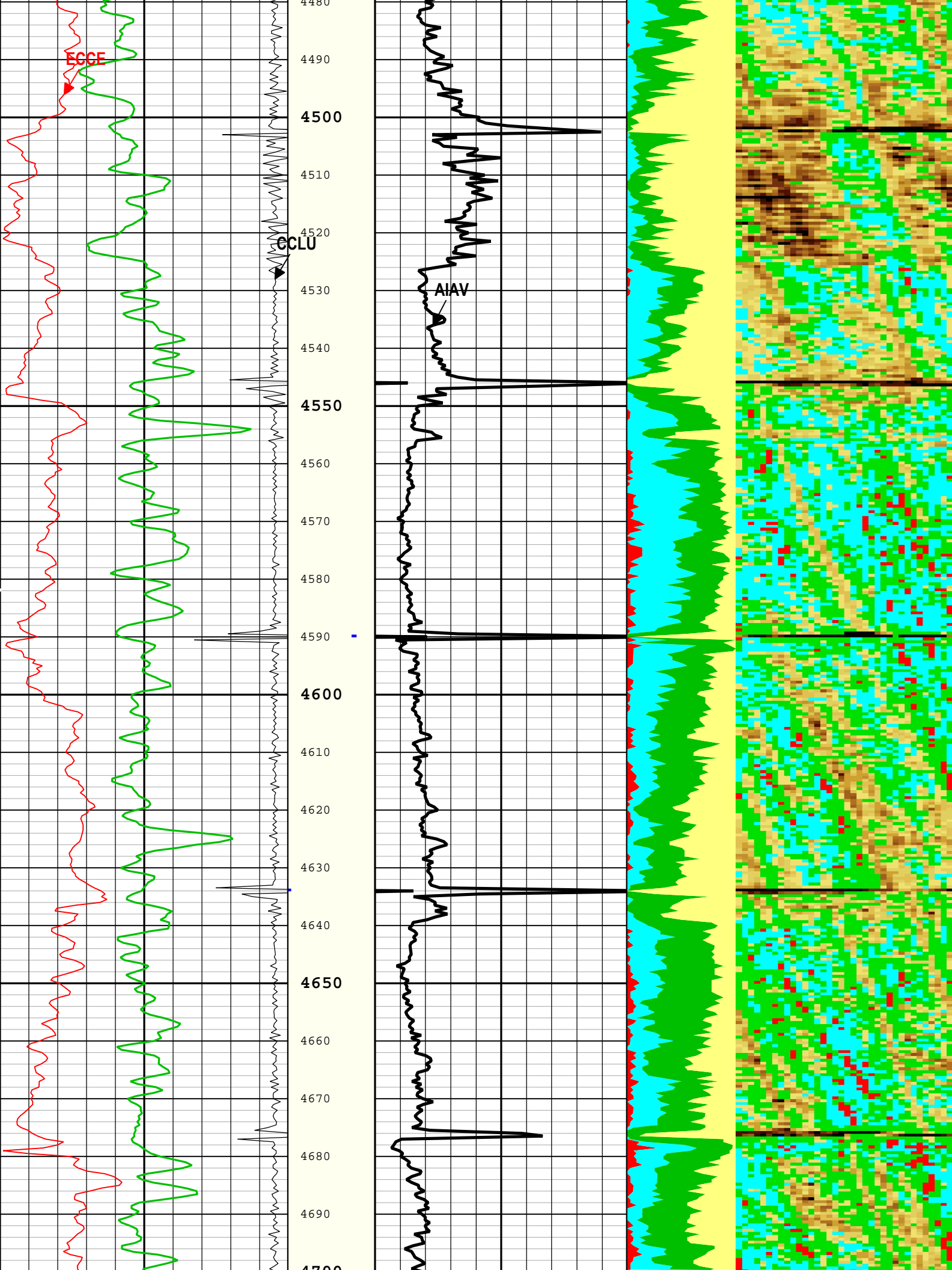


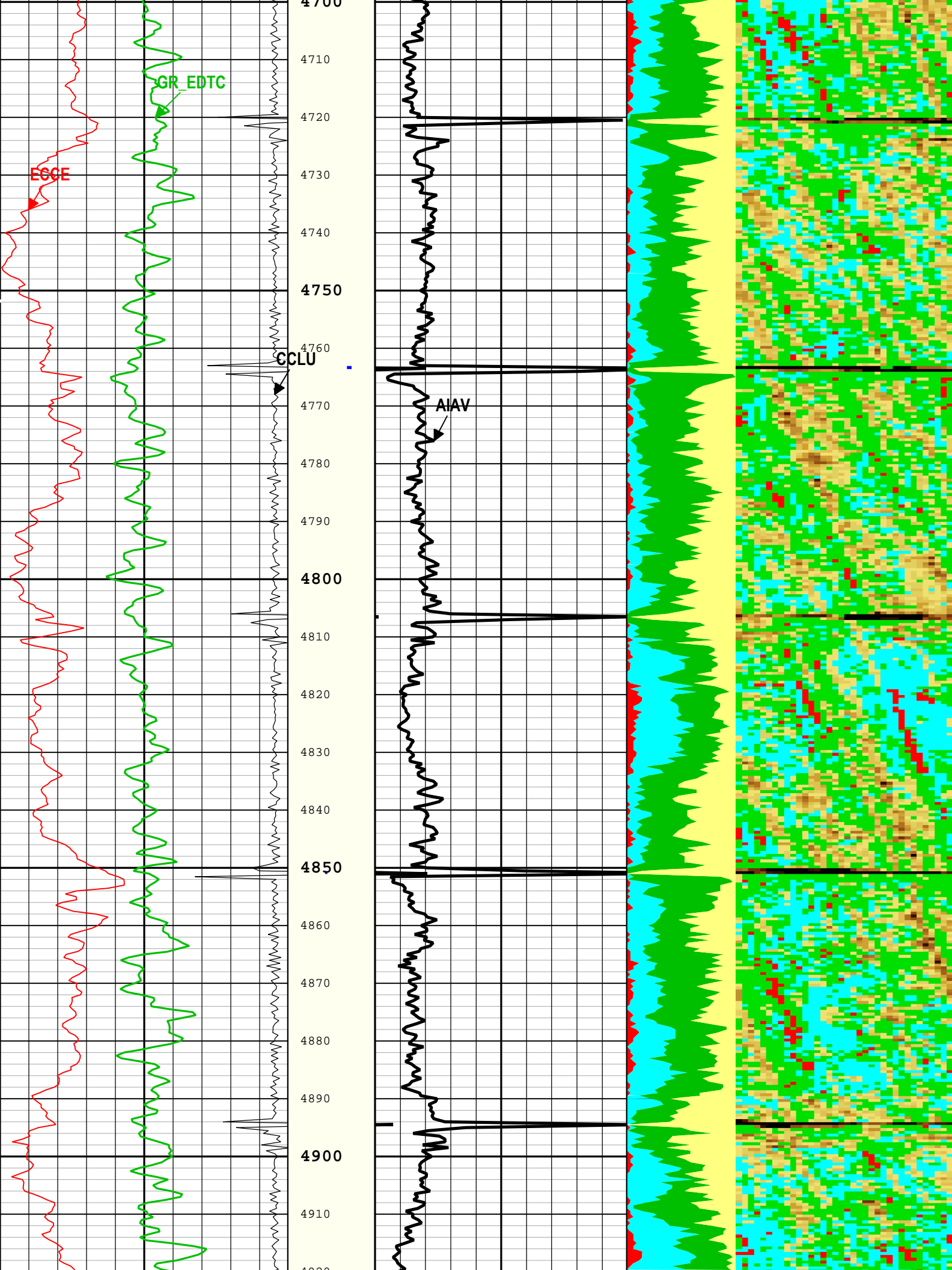


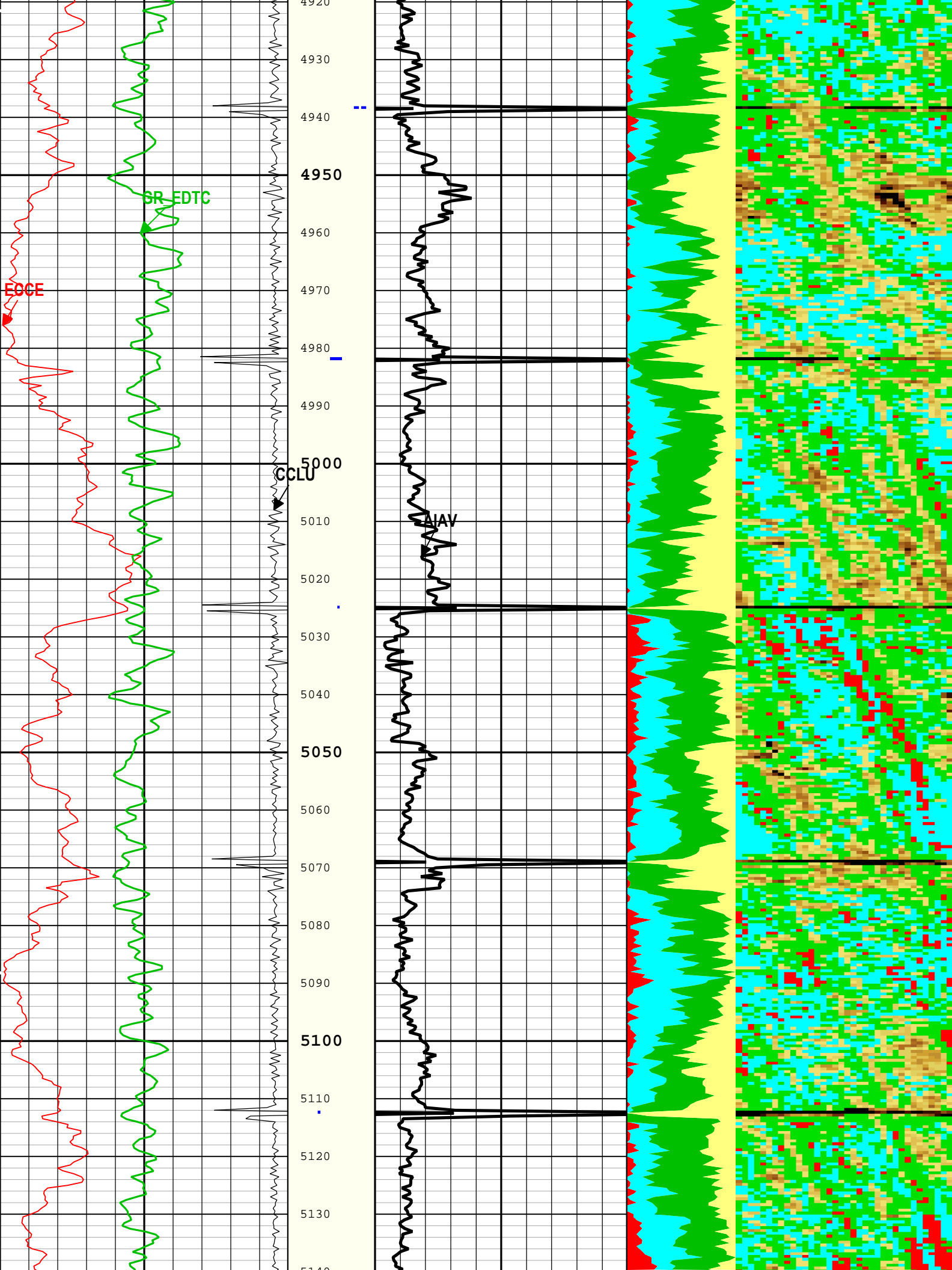


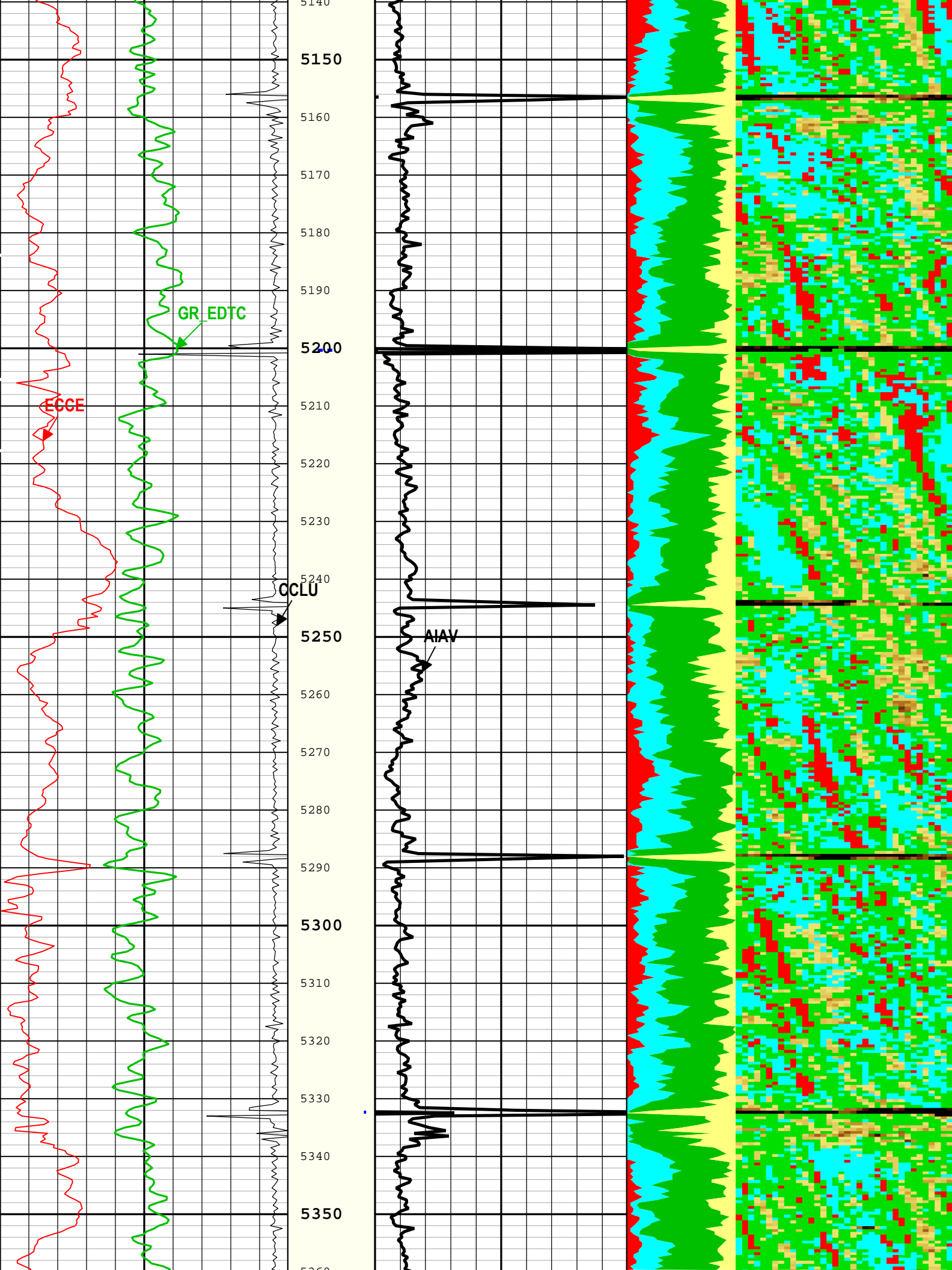


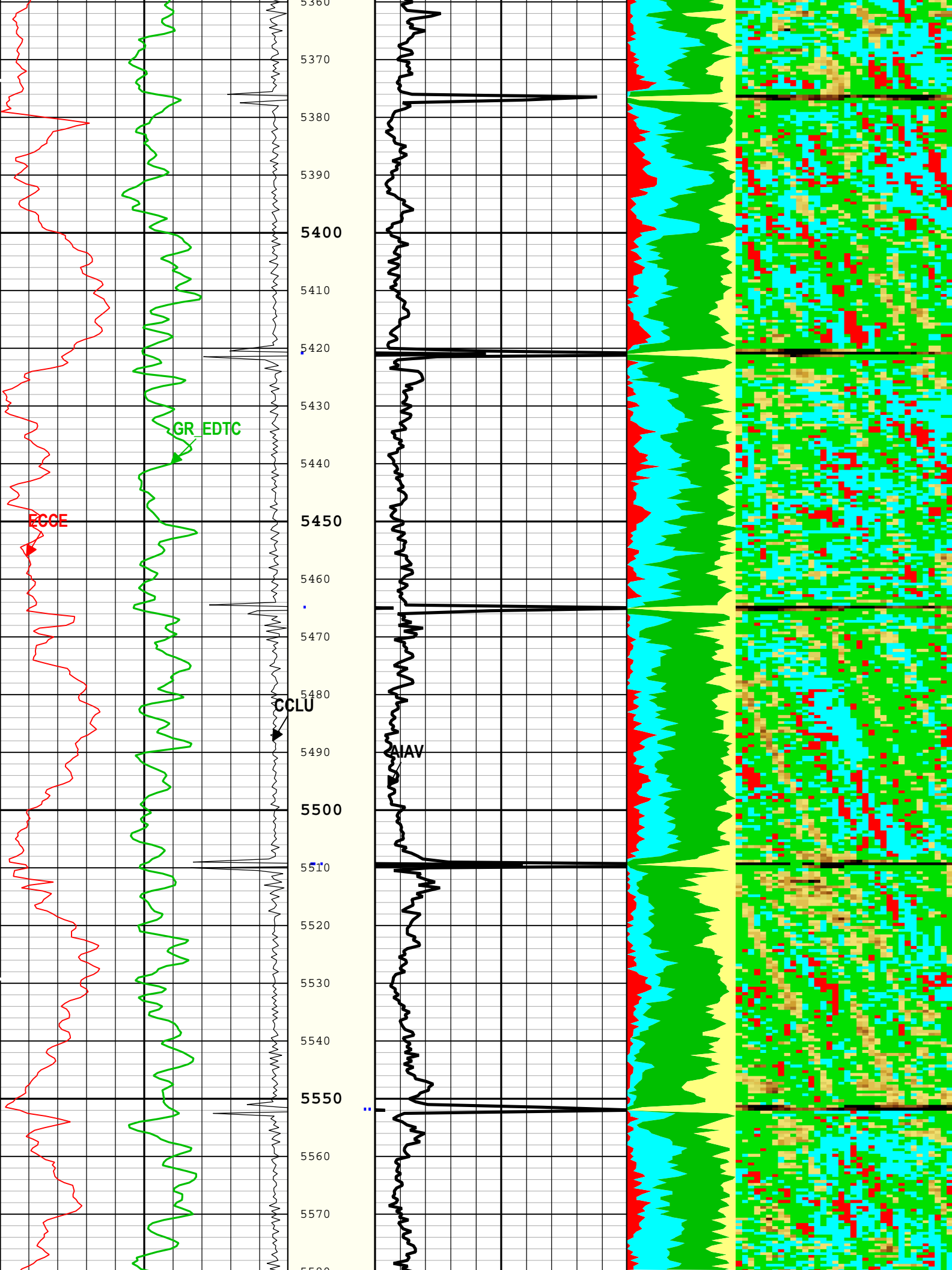


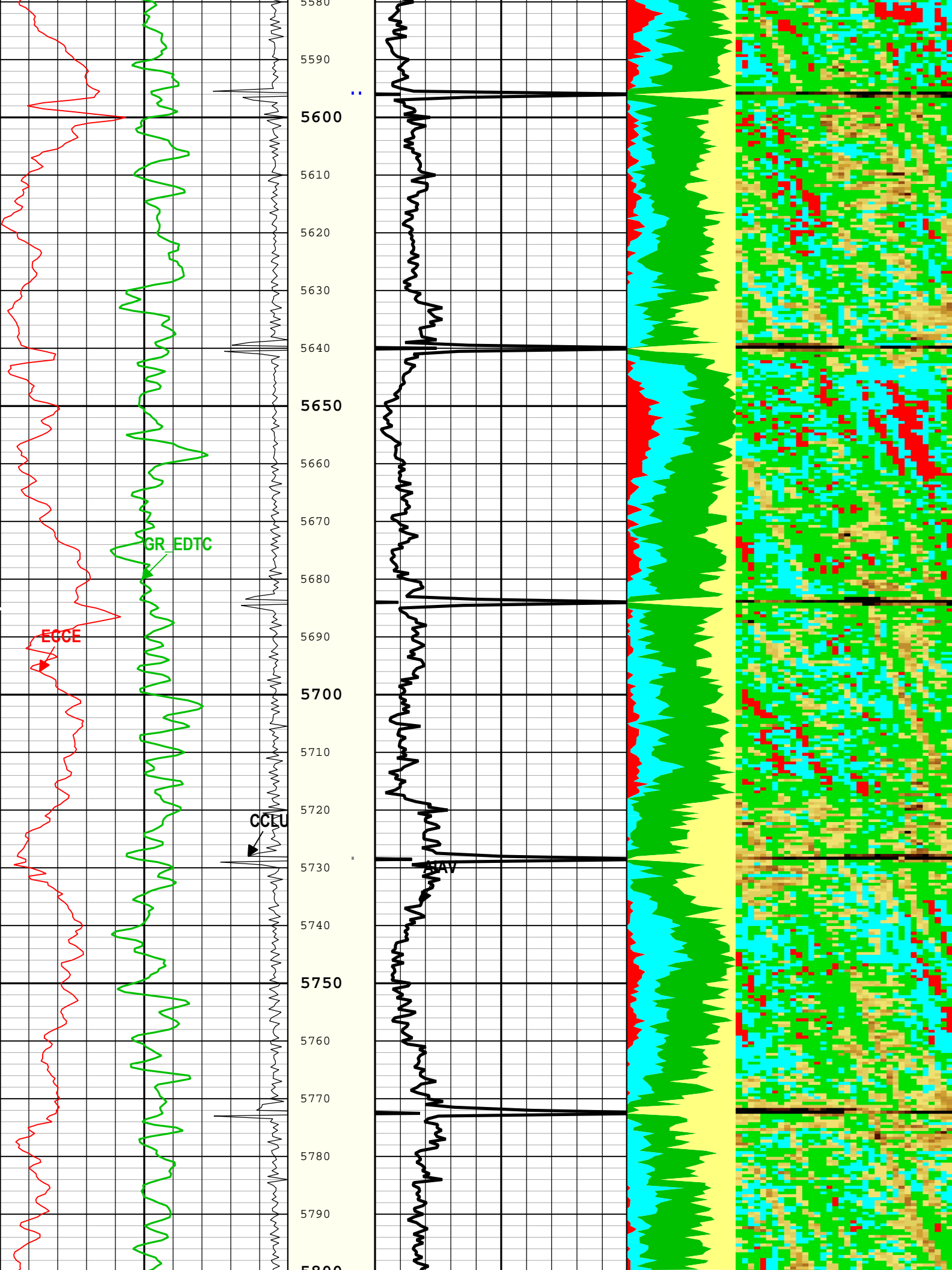




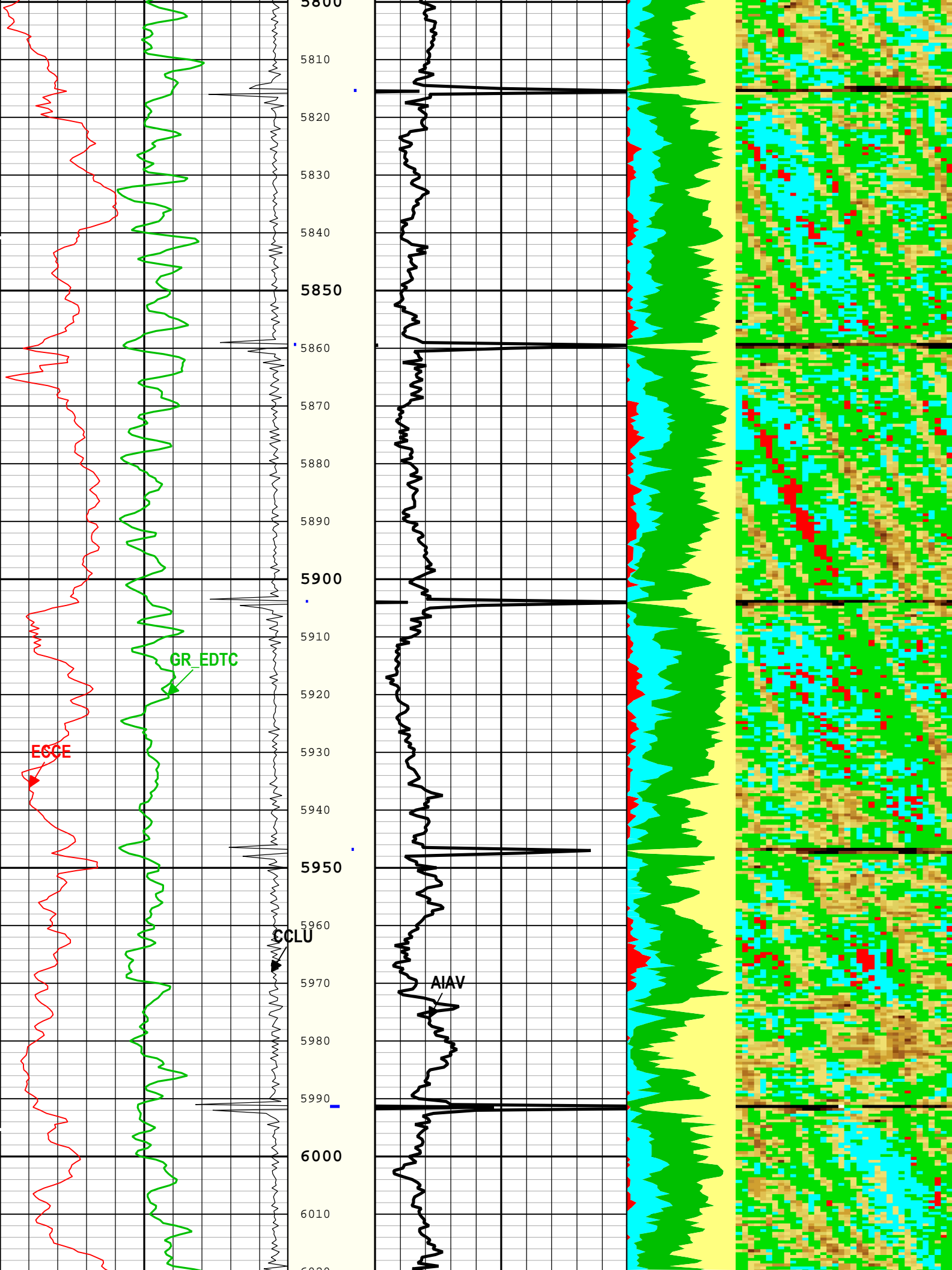




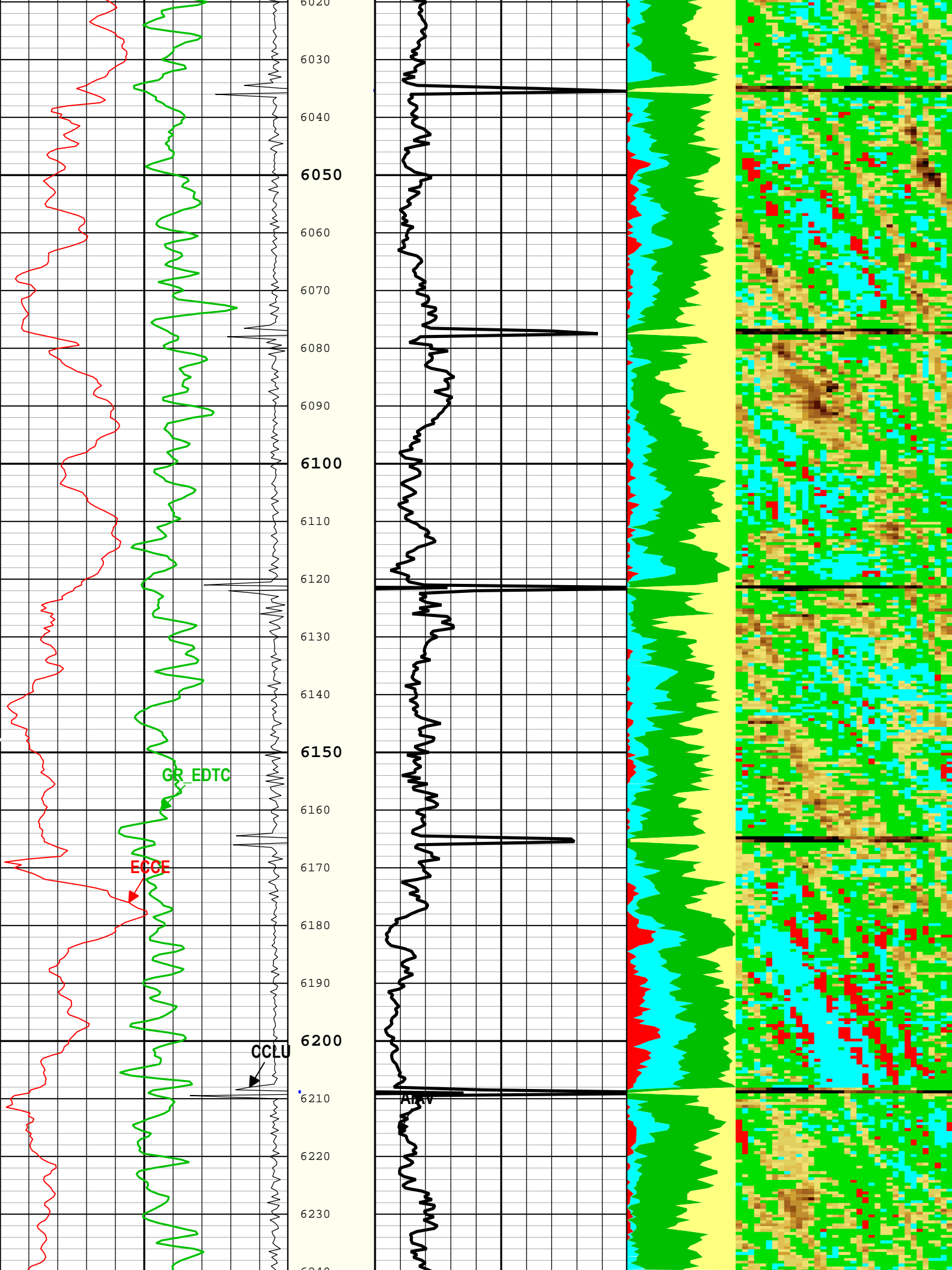


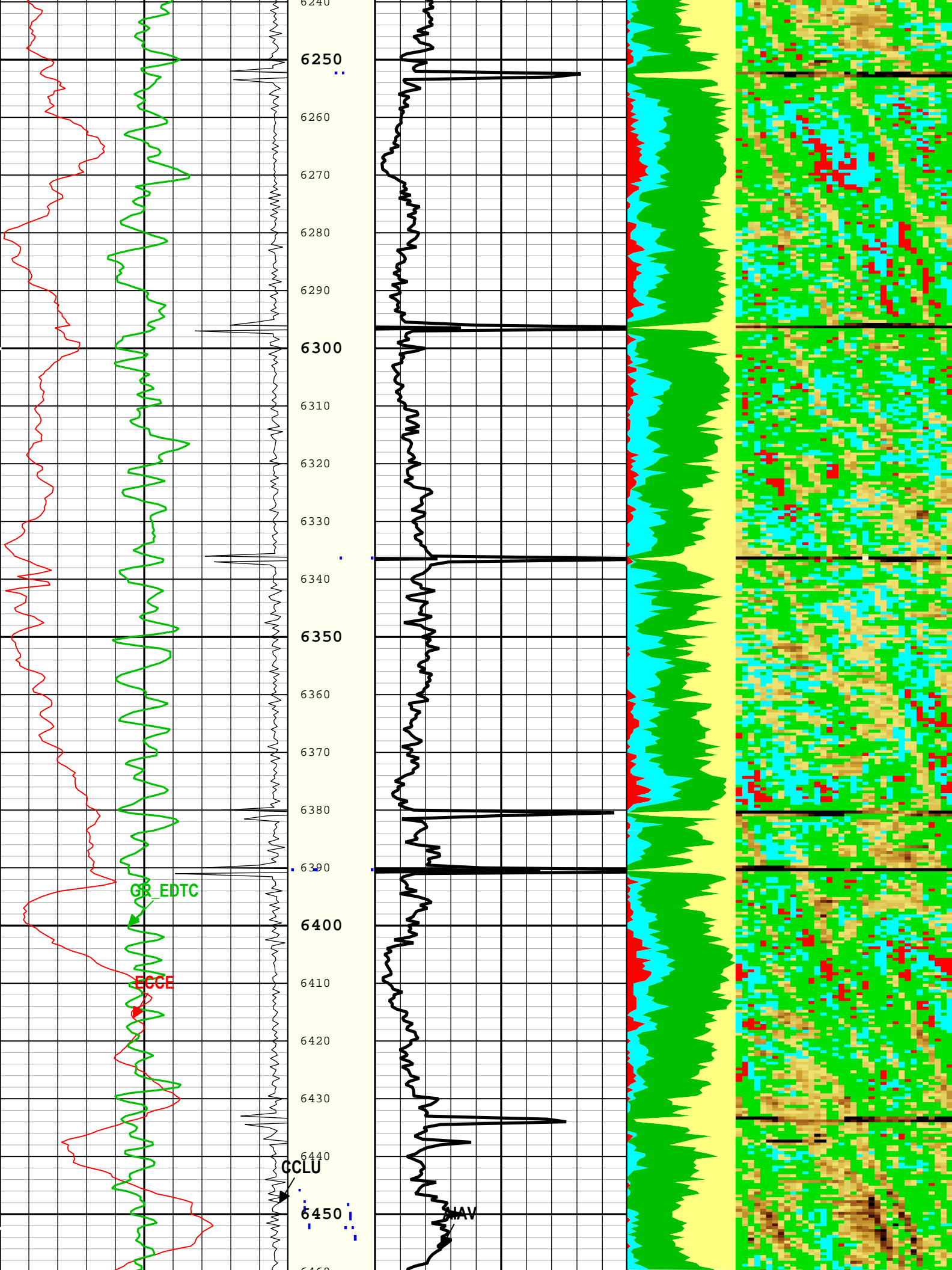


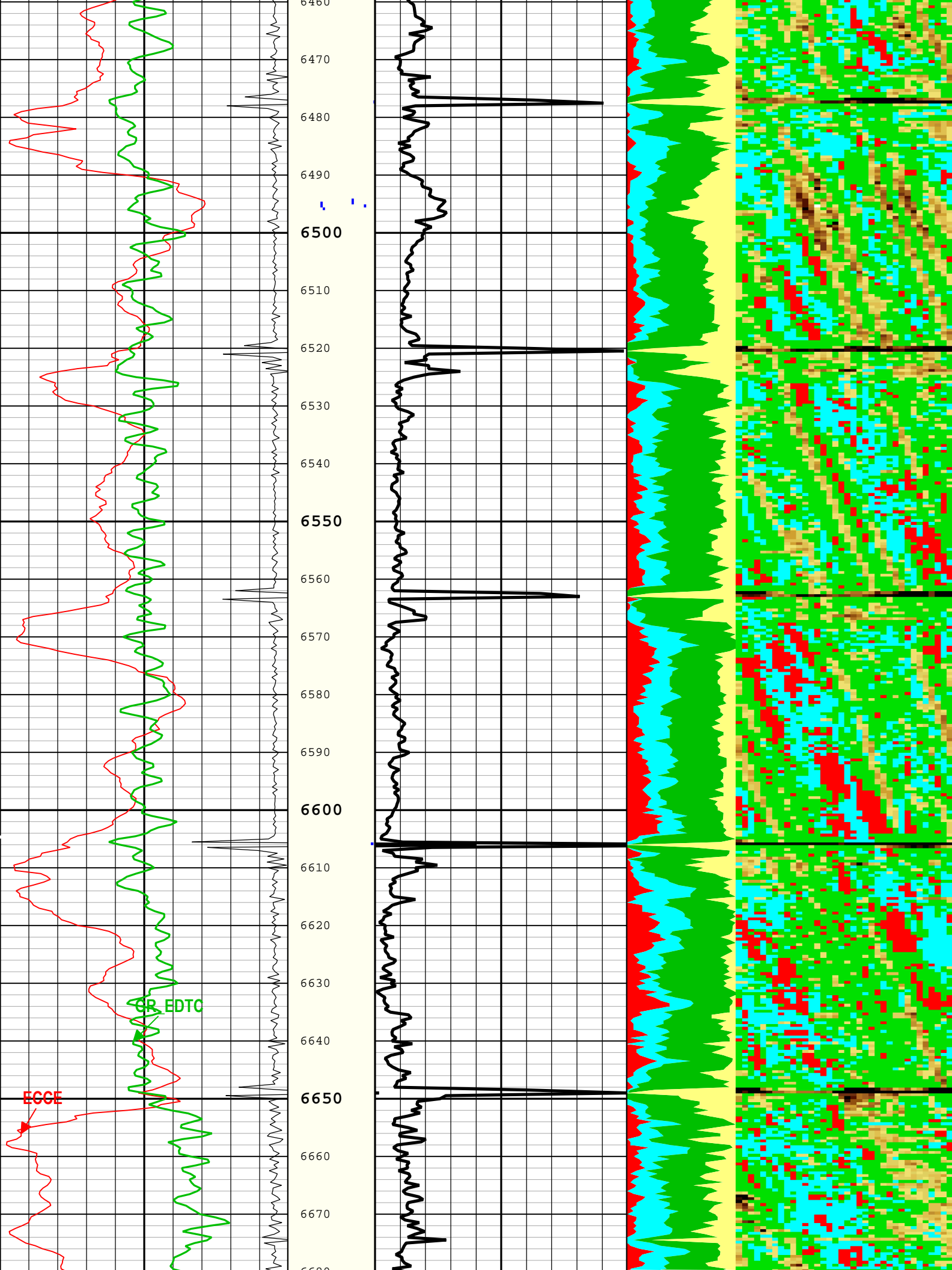


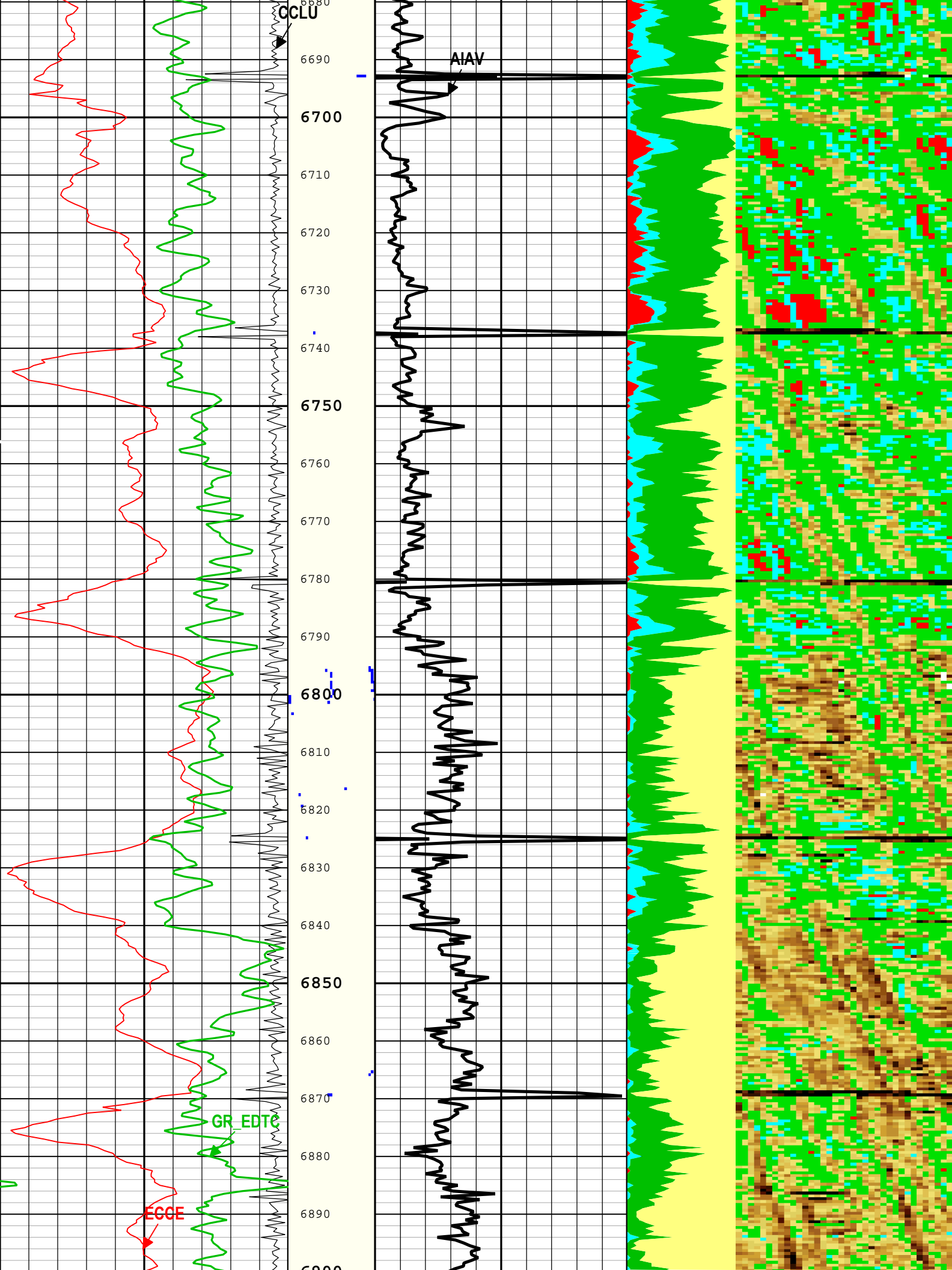


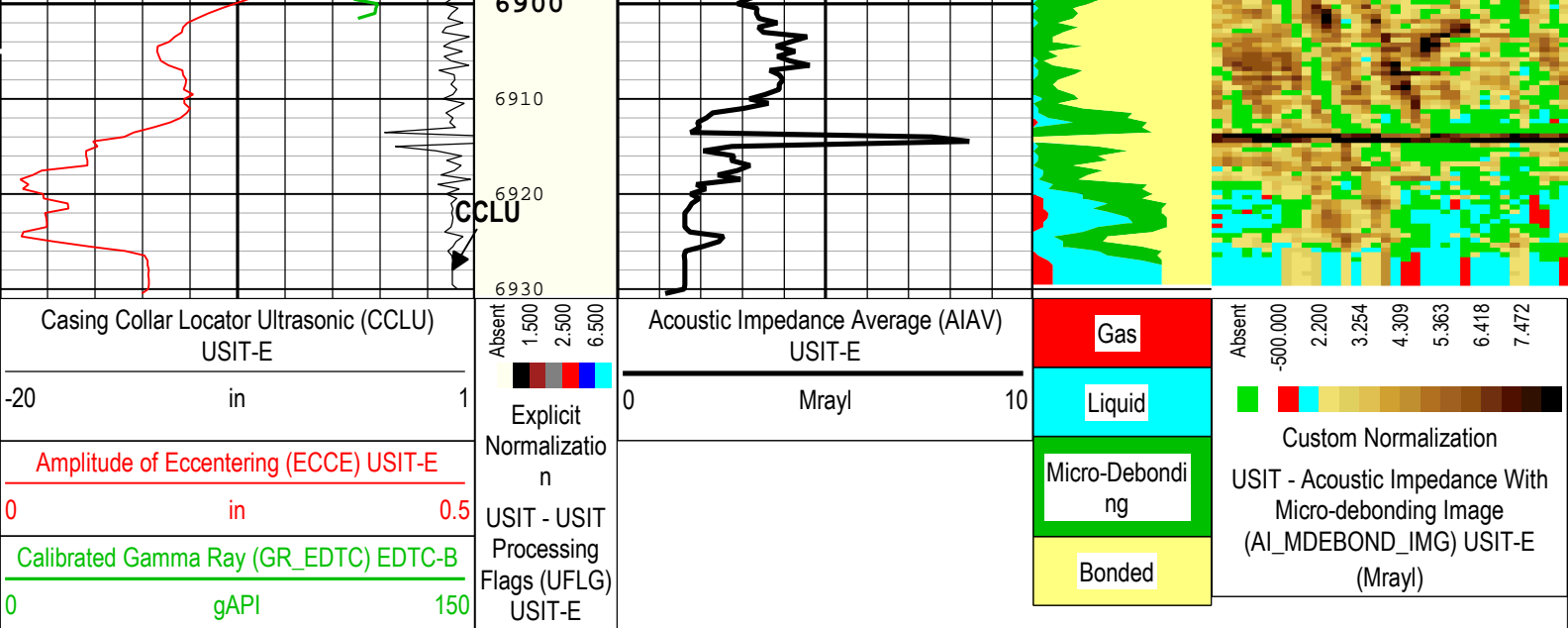












TIME\_1900 - Time Marked every 60.00 (s)

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: 18-Aug-2018 19:29:01

## Channel Processing Parameters

### One: Parameters

Parameter	Description	Tool	Value	Unit
BARI(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	1.13	
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	54.5	110
BS	13.5	110	1935
BS	8.5	1935	6931

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	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	31.88	us
WINE	Window End Time	USIT-E	71.88	us

Time Zone Parameters					
Parameter	Value	Start Time	Stop Time	Start Depth ( ft )	Stop Depth ( ft )
EMXV	45	18-Aug-2018 17:45:09	18-Aug-2018 17:51:47	6931.82	6636.29
EMXV	60	18-Aug-2018 17:51:47	18-Aug-2018 19:09:58	6636.29	84.28
All depth are at tool zero.					
One					
0 PSI Repeat Pass					

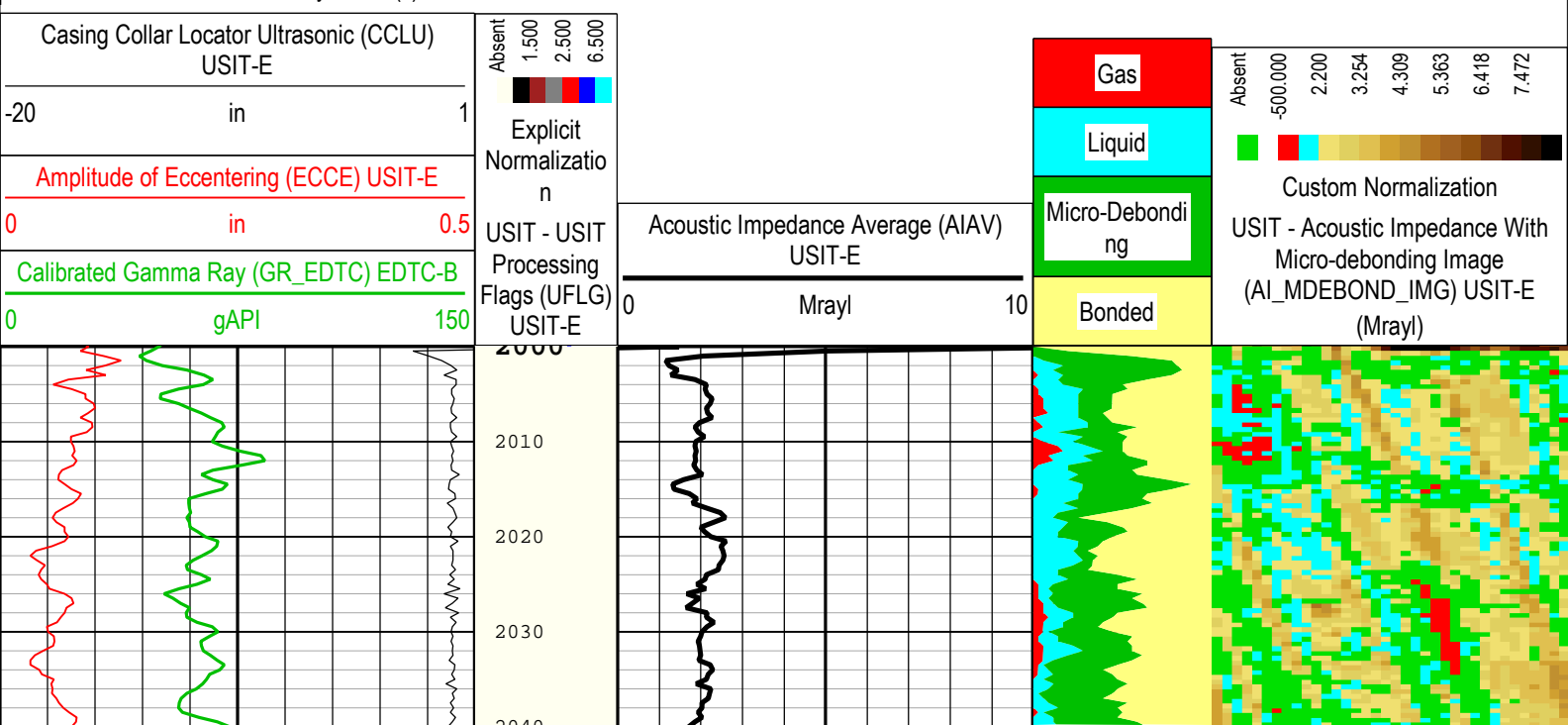
Software Version	
Acquisition System	Version
Maxwell 2018 SP2	8.2.104493.3100

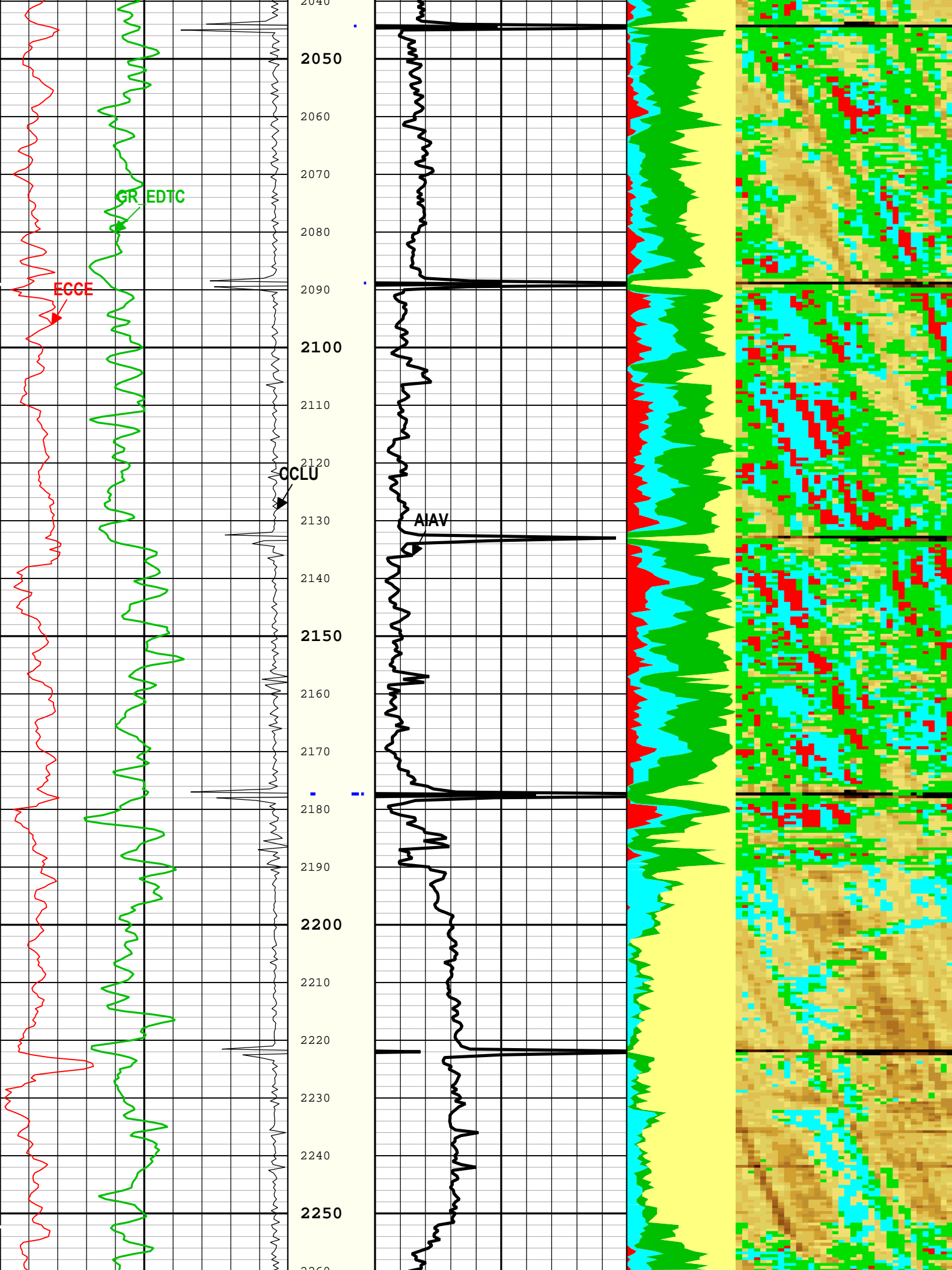
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[2]:Up	Up	1932.43 ft	2553.58 ft	18-Aug-2018 5:15:03 PM	18-Aug-2018 5:19:08 PM	ON	-7.16 ft	No

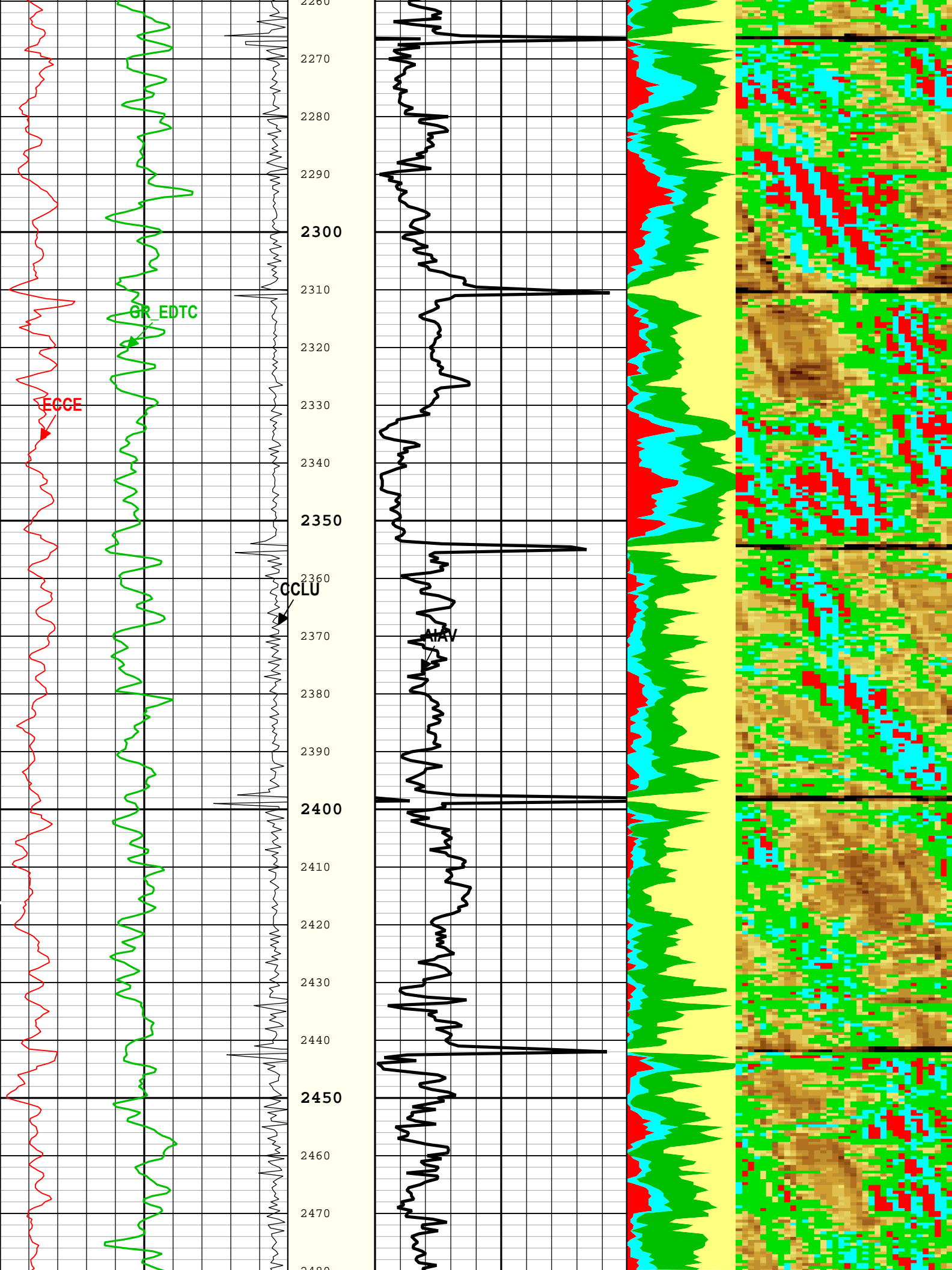
All depths are referenced to toolstring zero									
Log					Company:Noble Energy Inc		Well:Hurley H26-762		
							One: Log[2]:Up:S005		

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: 18-Aug-2018 19:29:08

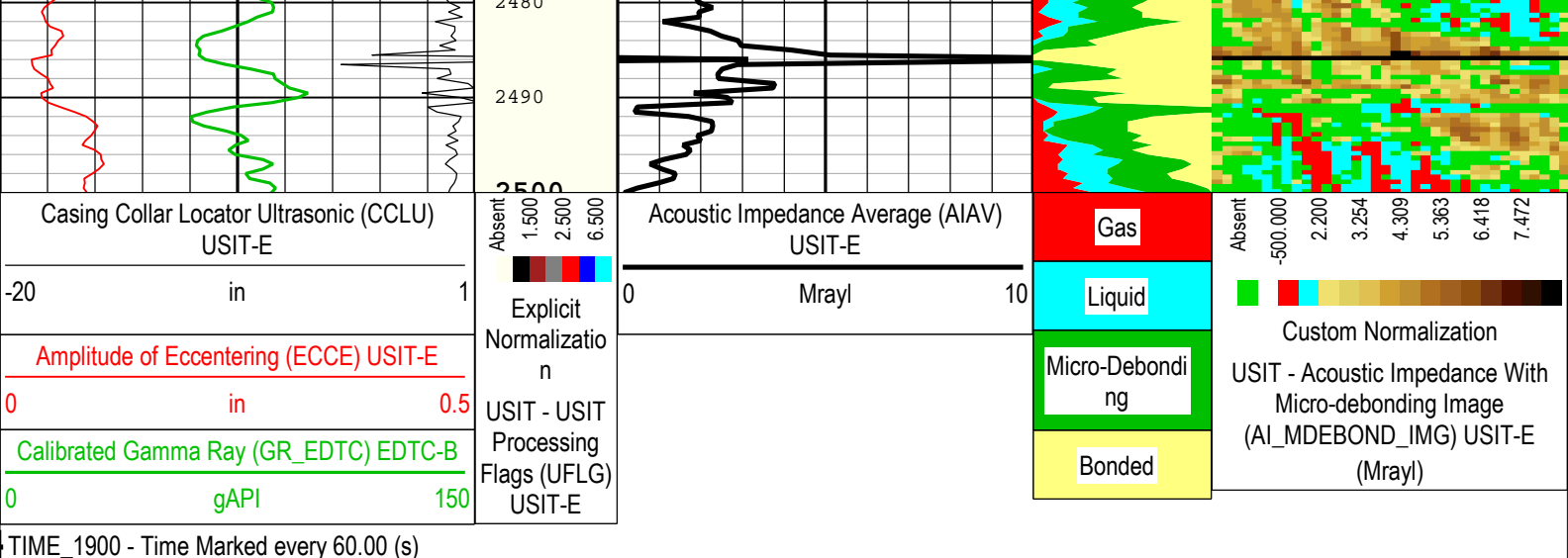
TIME\_1900 - Time Marked every 60.00 (s)











## Channel Processing Parameters

One: 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
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	1.13	
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

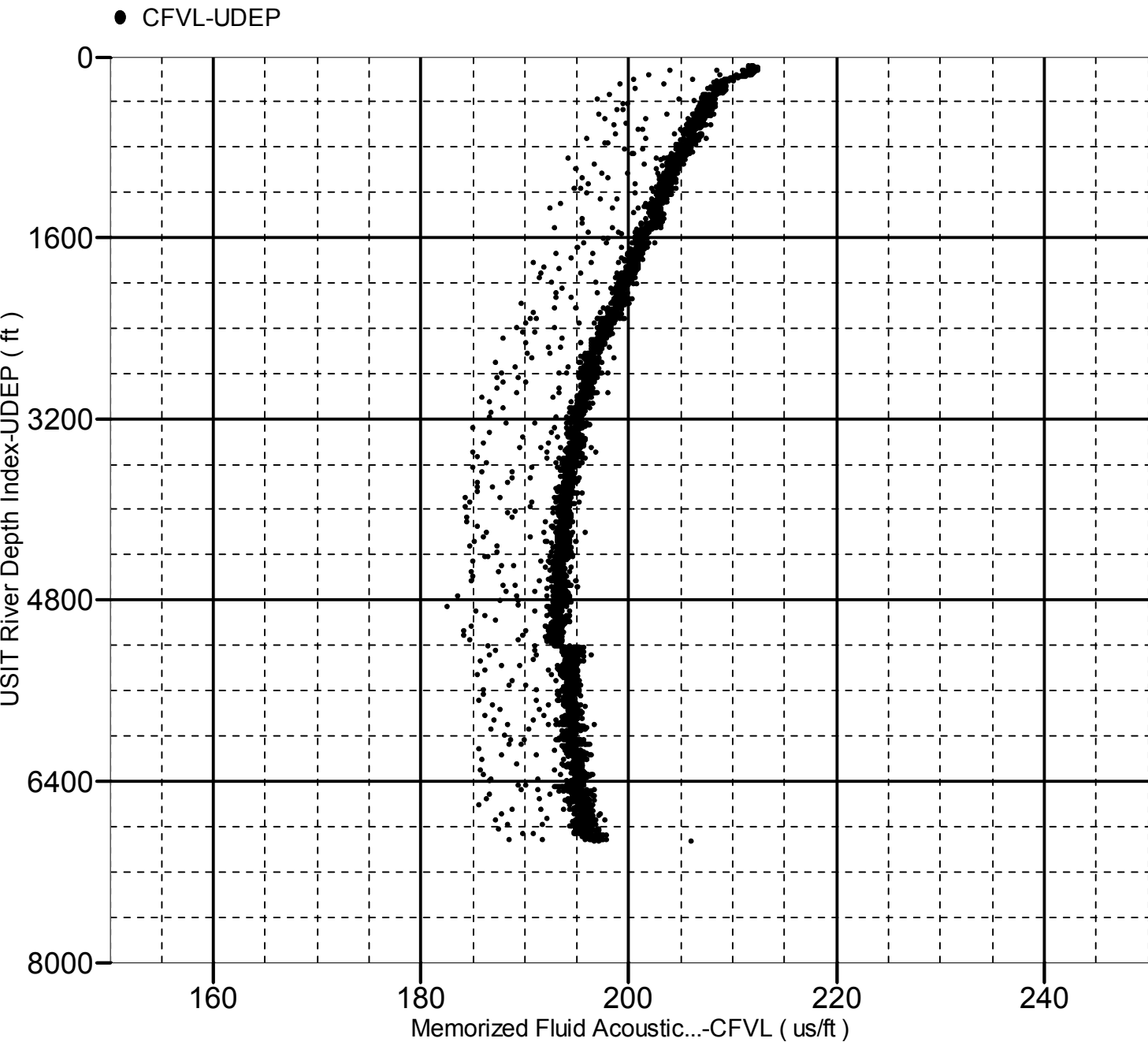
## Tool Control Parameters

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	45	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	31.88	us

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6931.50 to 84.00 ft

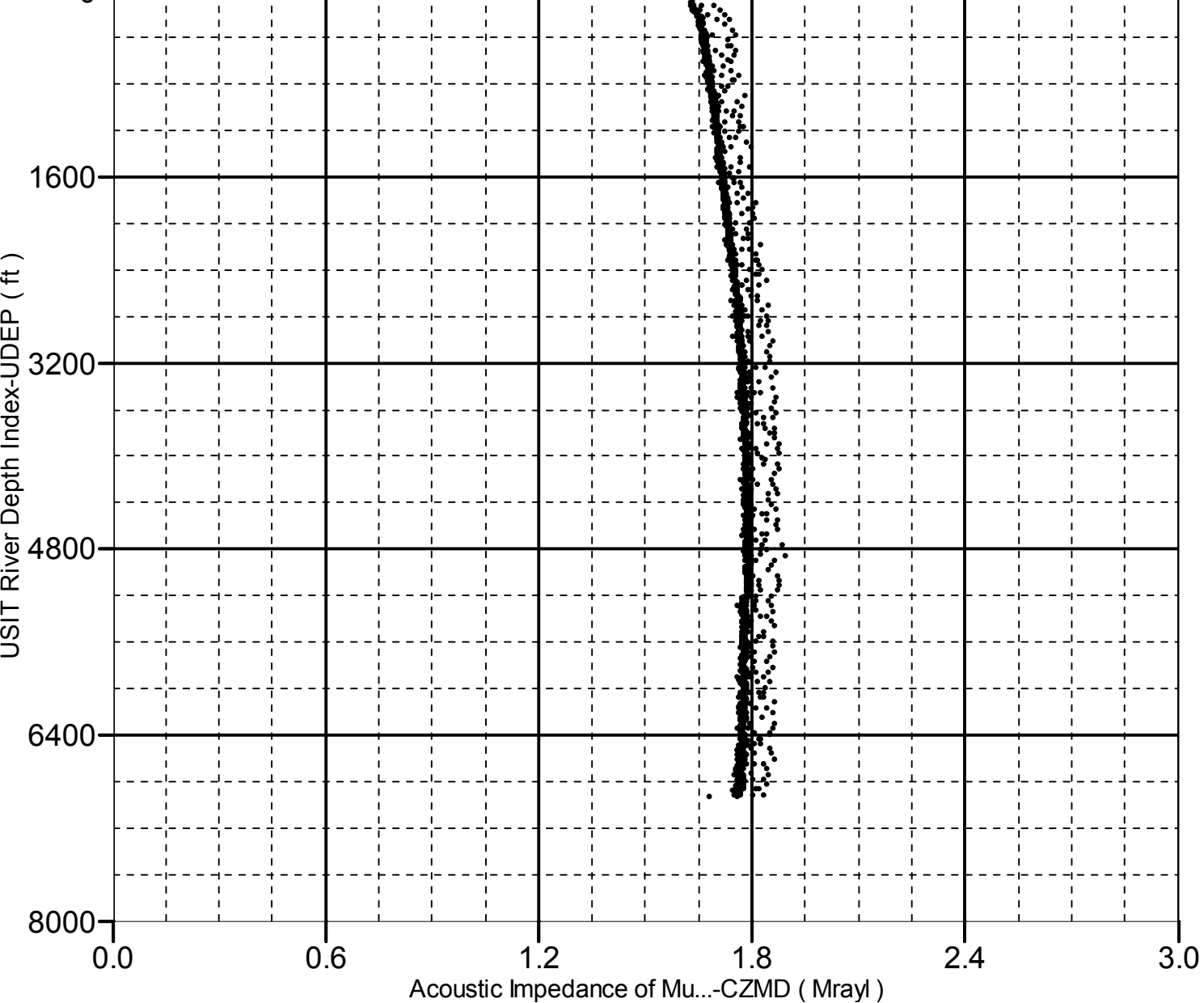


Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6931.50 to 84.00 ft





Company: Noble Energy Inc

**Schlumberger**

Well: Hurley H26-762

Field: Wattenberg

County:	Weld
State:	Colorado
UltraSonic Summary Print	