

Company: Noble Energy Inc

Well: Wells Ranch State AA33-750

Field: Wattenberg

County: Weld Country: US

UltraSonic Summary Print

County:	Weld			
Field:	Wattenberg			
Location:	SHL: SESW Sec. 21, T6N, R63W			
Well:	Wells Ranch State AA33-750			
Company:	Noble Energy Inc			
	Location:			
	SHL: SESW Sec. 21, T6N, R63W		Elev.:	K.B. 4750.00 ft
	535' FSL & 2613' FEL			G.L. 4720.00 ft
	Lat: 40.46555 / Long: -104.44181			D.F. 4750.00 ft
	Permanent Datum:	Ground Level	Elev.:	4720.00 f
	Log Measured From:	Kelly Bushing	30.00 ft	above Perm.Datum
	Drilling Measured From:	Kelly Bushing		
	API Serial No.	Max.Hole Deviation	Longitude:	Latitude:
	05-123-43873	0 deg	-104.44181 degrees	40.465550 degrees
Logging Date	11-Apr-2017			

Run Number	One		
Depth Driller	16362.00 ft		
Schlumberger Depth	16362.00 ft		
Bottom Log Interval	6100.00 ft		
Top Log Interval	60.00 ft		
Casing Fluid Type	Water		
Salinity			
Density	9 lbm/gal		
Fluid Level	0.00 ft		
BIT/CASING/TUBING STRING			
Bit Size	8.50 in		
From	1938.00 ft		
To	16362.00 ft		
Casing/Tubing Size	5.5 in		
Weight	20 lbm/ft		
Grade	N/A		
From	0.00 ft		
To	16352.40 ft		
Max Recorded Temperatures	213 degF		
Logger on Bottom	11-Apr-2017	14:58:00	
Unit Number	9115	Fort Morgan, CO	
Recorded By	Benjamin Mammon		
Witnessed By	Bill Mansfield		

Disclaimer

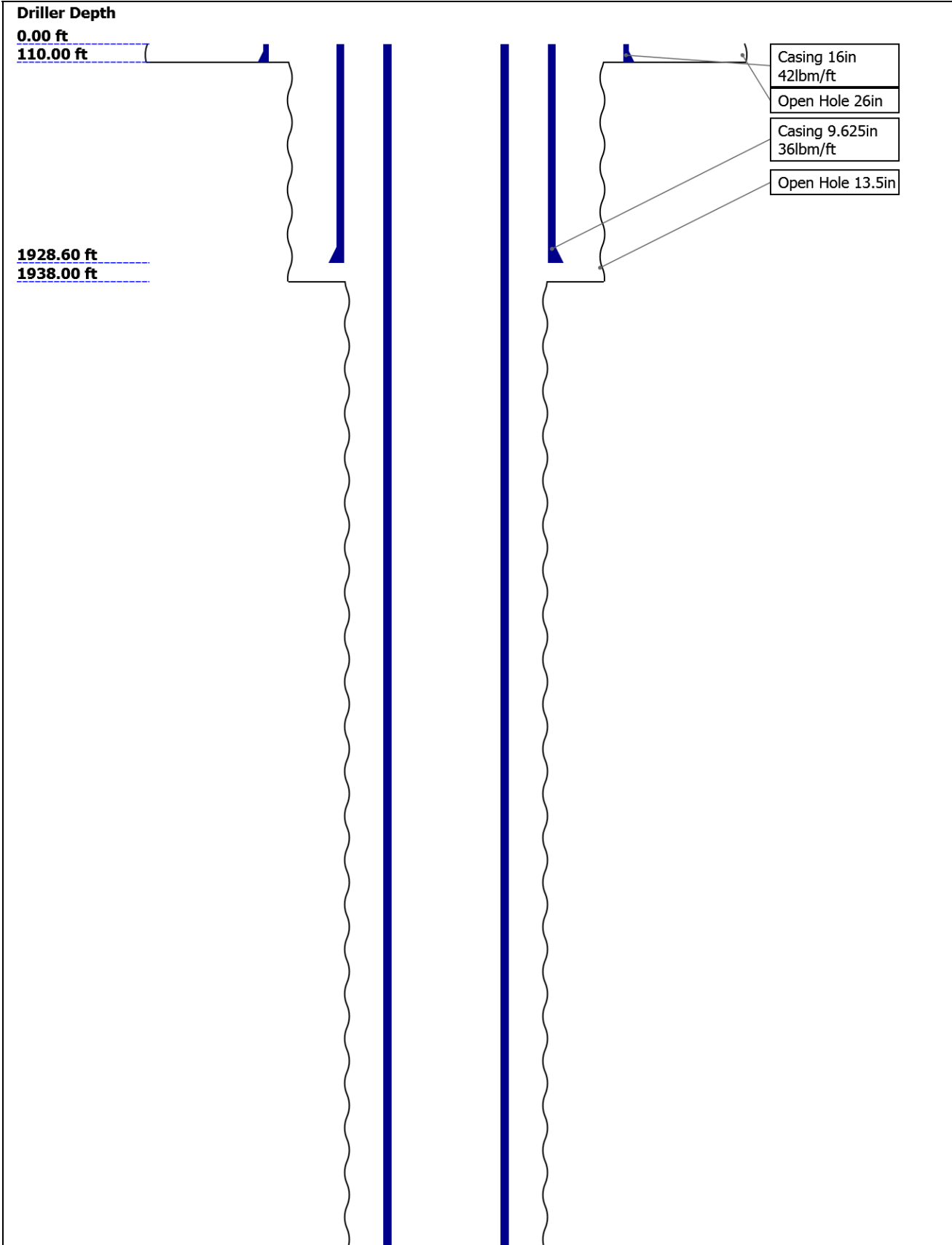
THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA;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

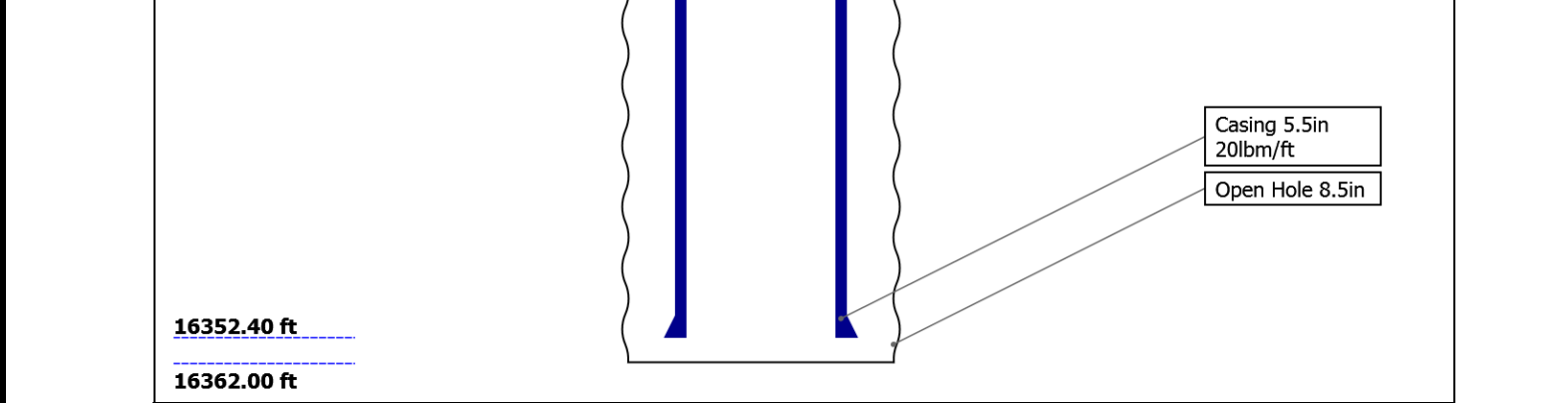
Contents

- | | |
|---|--|
| <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

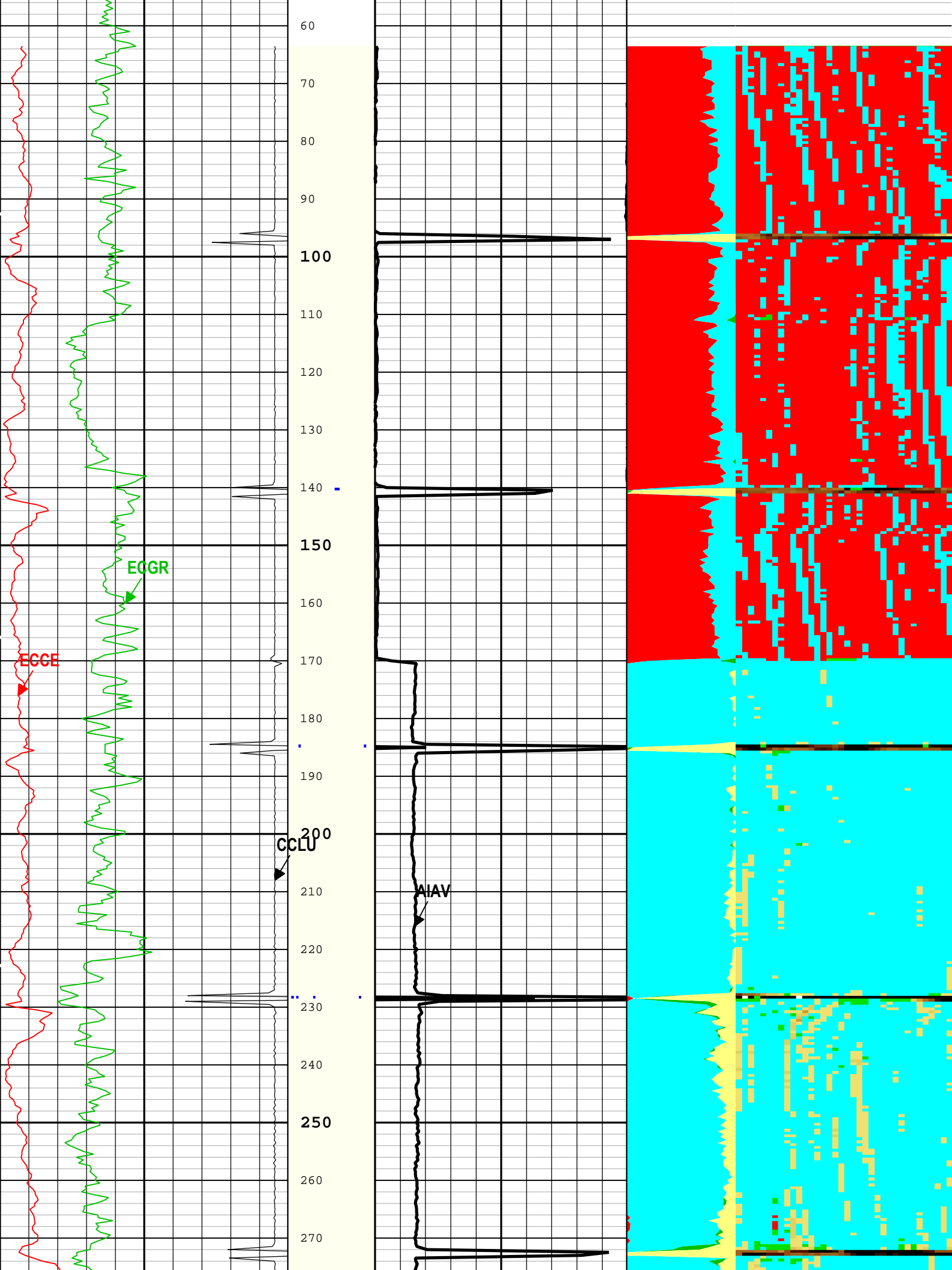
Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	0	110	1938			
Top Logger (ft)	0	110	1938			
Bottom Driller (ft)	110	1938	16362			
Bottom Logger (ft)	110	1938	16362			
Casing						
Size (in)	16	9.625	5.5			
Weight (lbm/ft)	42	36	20			
Inner Diameter (in)	15.512	8.921	4.778			
Grade	N/A	N/A	N/A			
Top Driller (ft)	0	0	0			
Top Logger (ft)	0	0	0			
Bottom Driller (ft)	110	1928.6	16352.4			
Bottom Logger (ft)	110	1928.6	16352.4			

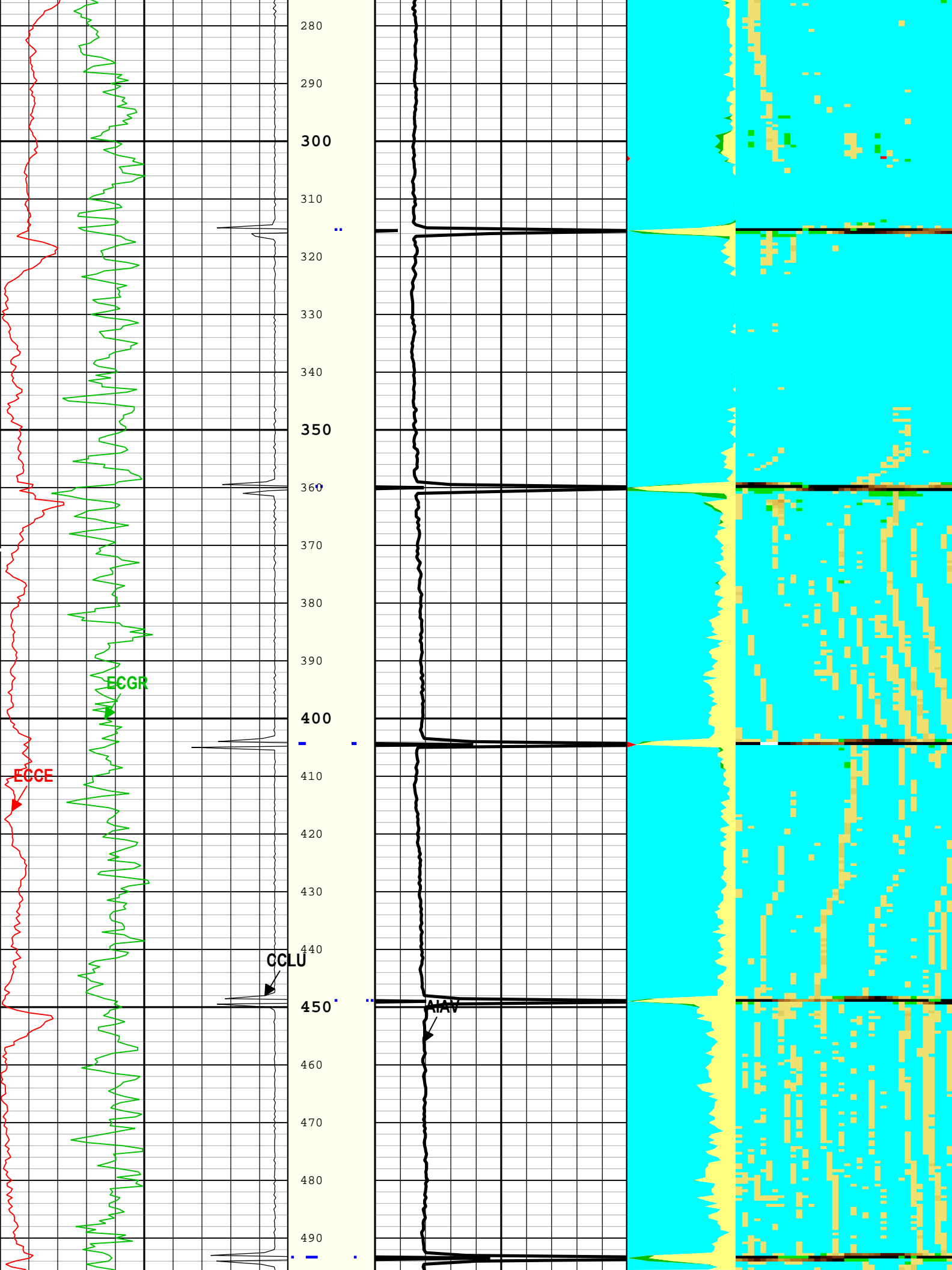
Operational Run Summary

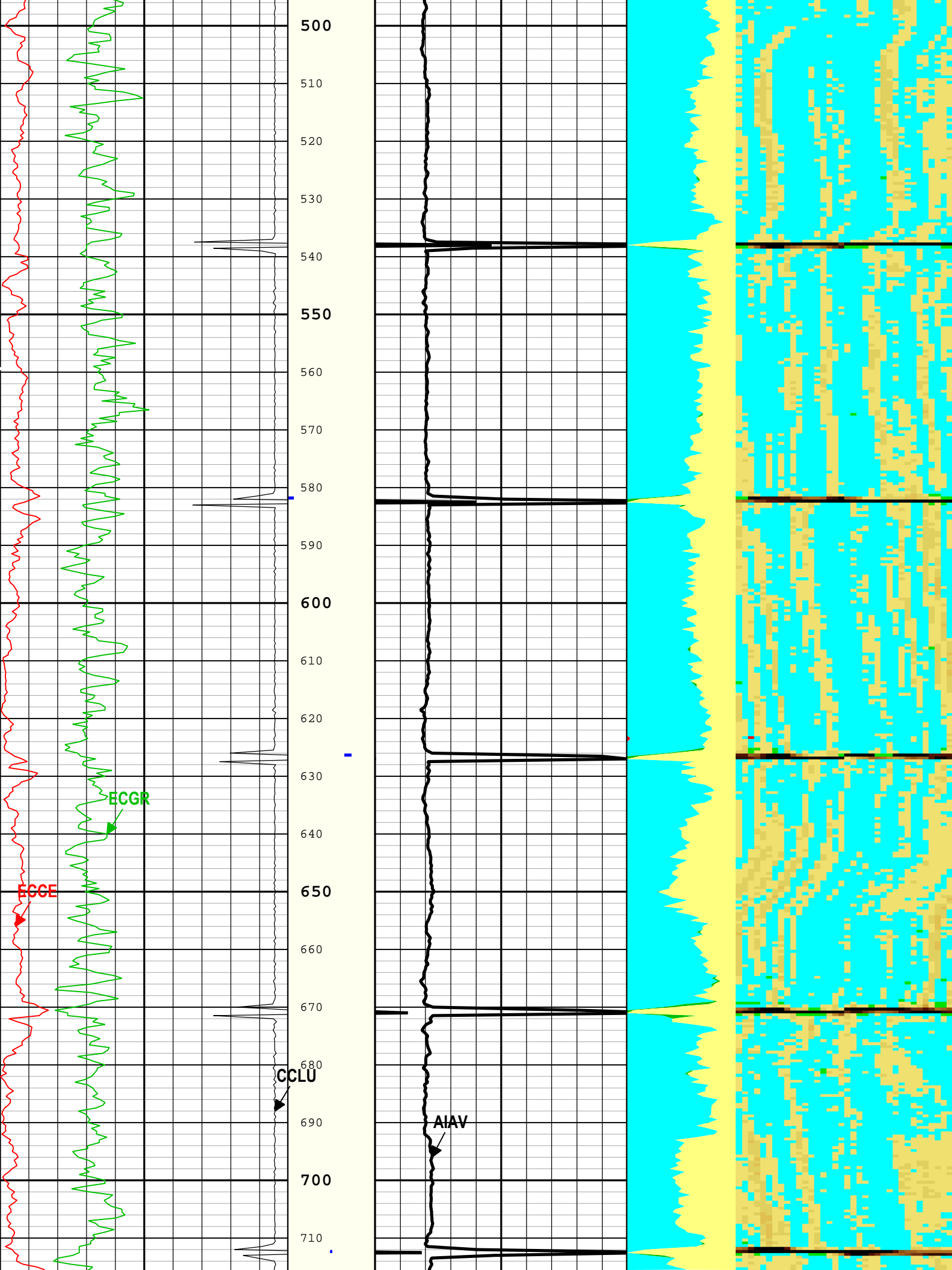
Parameter (unit)	One					
Date Log Started	11-Apr-2017					
Time Log Started	14:23:34					
Date Log Finished	11-Apr-2017					
Time Log Finished	15:54:56					
Top Log Interval (ft)	60.00					
Bottom Log Interval (ft)	6100.00					
Total Depth (ft)						
Max Hole Deviation (deg)	0.00					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	8.500					
Logging Unit Number	9115					
Logging Unit Location	Fort Morgan, CO					
Recorded By	Benjamin Marmon					

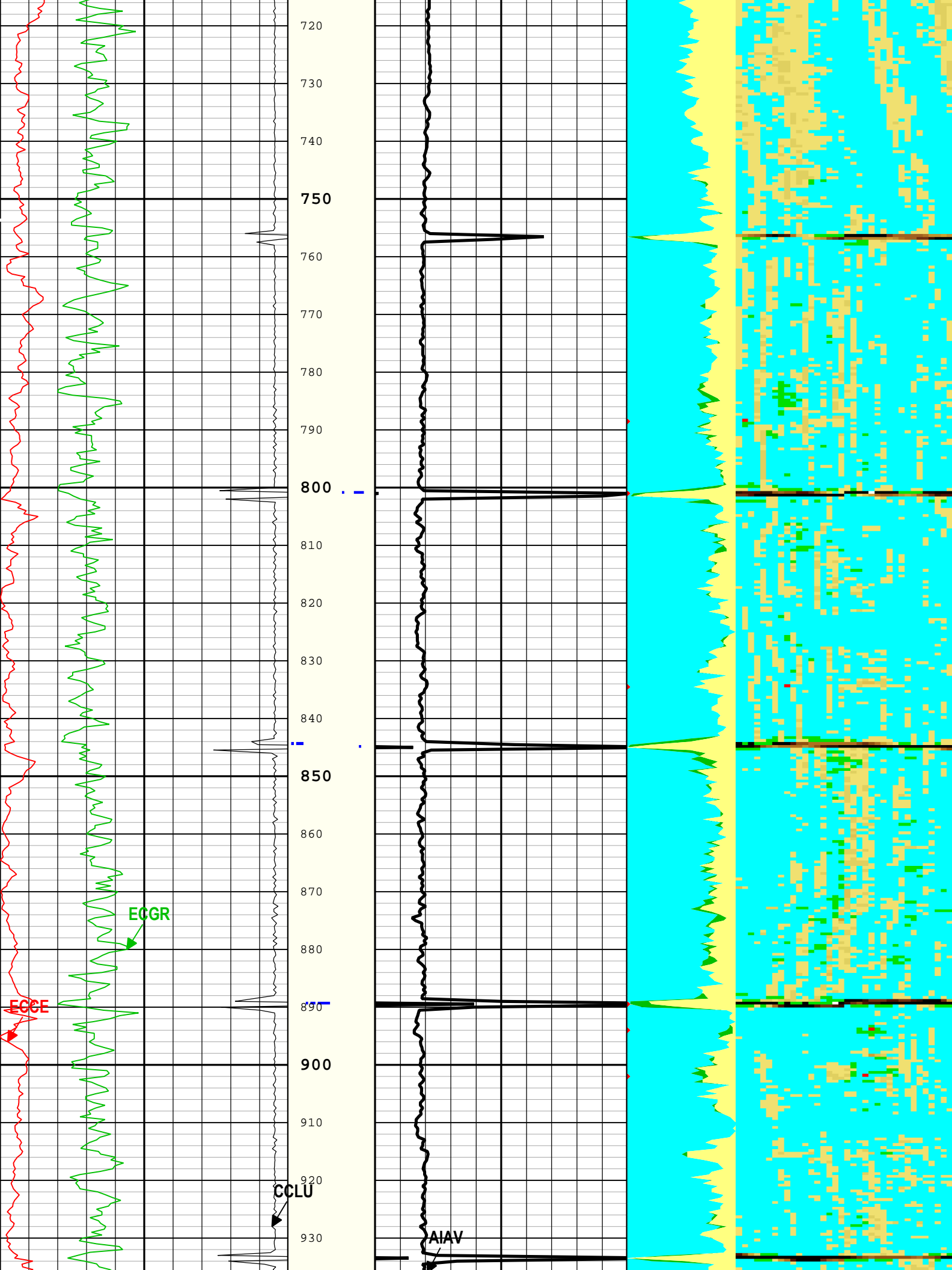
Witnessed By	Bill Mansfield					
Service Order Number	DSP3-00007					
Borehole Fluids						
Parameter(unit)	One					
Fluid Type	Water					
Max Recorded Temperatures (degF)	213					
Source of Sample	Active Tank					
Salinity (ppm)	0					
Density (lbm/gal)	9					
Funnel Viscosity (s)	26					
Fluid Loss (cm3)						
PH						
Date/Time Circulation Stopped	NaN					
Date Logger on Bottom	11-Apr-2017					
Time Logger on Bottom	14:58:00					
Source RMF						
RMC	Pressed					
RM @ Meas Temp (ohm.m@degF)	0.2 @ 68					
RMF @ Meas Temp (ohm.m@degF)	0.15 @ 68					
RMC @ Meas Temp (ohm.m@degF)						
RM @ BHT (ohm.m@degF)	0.07 @ 212					
RMF @ BHT (ohm.m@degF)	0.05 @ 212					
RMC @ BHT (ohm.m@degF)	NaN @ 212					
Total Solid (%)						
High Gravity Solids (%)						
Remarks and Equipment Summary						
One: Toolstring		One: Remarks				
<div><div><div>Equip nameLength</div><div>LEH-QT34.88</div><div>LEH-QT</div></div><div><div><div>DTC-H:9170</div><div>31.97</div></div><div><div>DTC-H:9170</div><div>31.97</div></div><div><div>HGNS-H:4779</div><div>28.97</div></div><div><div>HGNS-H:4779</div><div>28.97</div></div><div><div>HGNH:3826</div><div>28.23</div></div><div><div>NPV-N</div><div></div></div><div><div>NSR-F:5068</div><div></div></div><div><div>HGNS-H:4779</div><div></div></div><div><div>HACCZ-H:5736</div><div></div></div><div><div>HMCA-H</div><div></div></div></div><div><div><div>CNL Porosity</div><div>21.89</div></div><div><div>HMCA</div><div>19.56</div></div><div><div>HGNS</div><div>19.56</div></div><div><div>Acceler</div><div>0.00</div></div></div></div> <div><div>CTEM</div><div>31.07</div></div> <div><div>HV</div><div>0.00</div></div> <div><div>TelStatus</div><div>28.97</div></div> <div><div>ToolStatus</div><div>28.97</div></div> <div><div>Temperature</div><div>28.94</div></div> <div><div>GR</div><div>28.23</div></div> <div><div>This is the first log in the well.</div></div> <div><div>Toolstring ran as per toolsketch.</div></div> <div><div>Main Pass recorded at 2500 PSI. Repeat Pass recorded at 0PSI.</div></div> <div><div>BHT - 213 degF</div></div> <div><div>Expected TOC 2500'</div></div>						

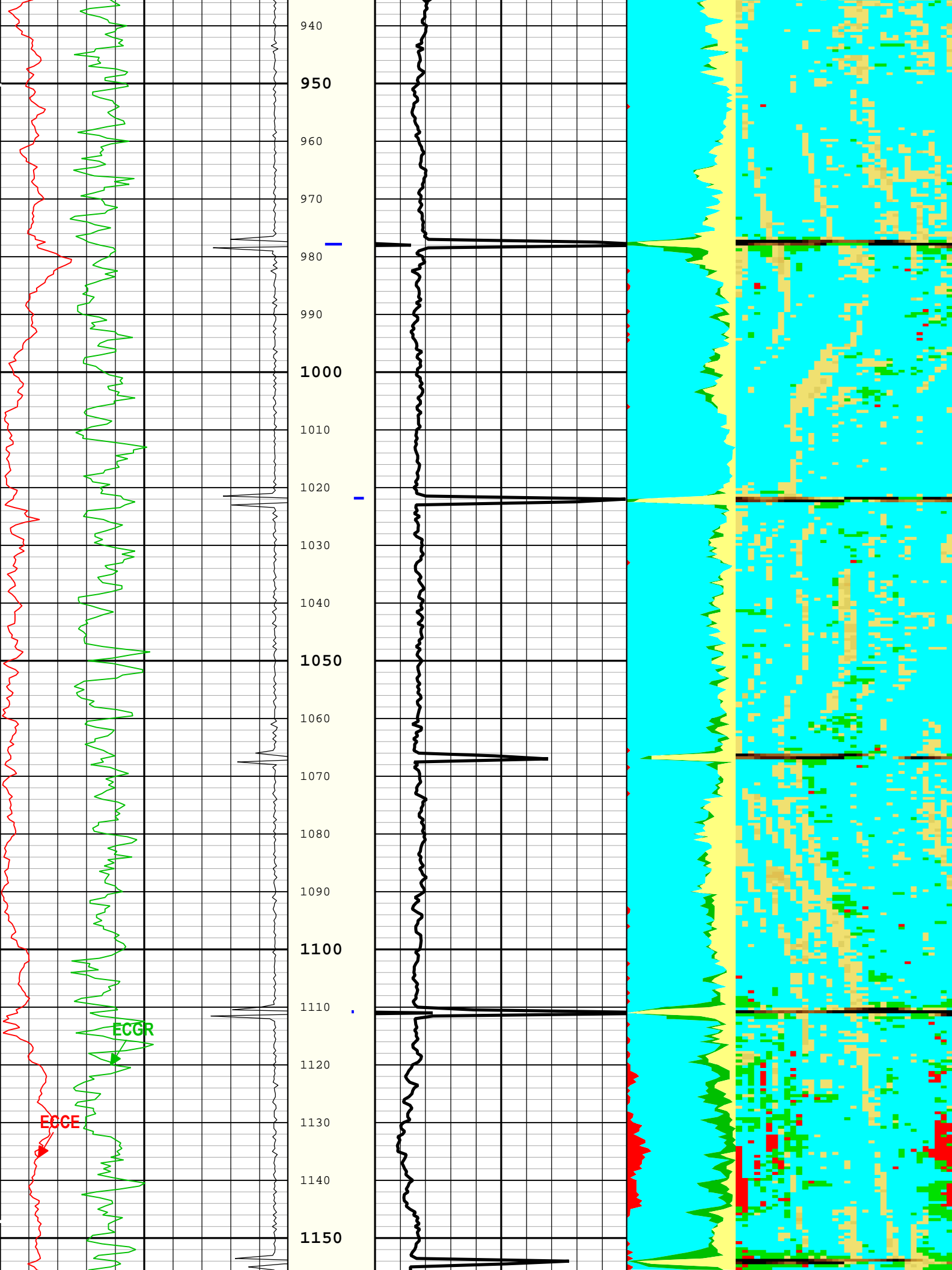
Conveyance Type		Wireline							
Rig Type		Crane							
One:Depth Control Parameters				Depth Control Remarks					
Log Sequence		First Log In the Well		All Schlumberger depth control procedures followed during logging operations.					
Rig Up Length At Surface				IDW used as primary depth control device.					
Rig Up Length At Bottom				ZChart used as secondary depth control device.					
Rig Up Length Correction									
Stretch Correction									
Tool Zero Check At Surface									
USIT - Fluid Properties Measurement									
Run Name		Pass Name		Start Depth(ft)		Stop Depth(ft)			
Run 1		Log[5]:Up		6404.2		63.51			
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 : 31.09m(102.00ft) to 41.74m(136.96ft) MUD_N_FRP = 1.10 DFD = 1.08g/cm3(9.00lbm/gal) CZMD median computed in free pipe normalization interval = 1.68 MRayl									
Start Depth(ft)		Stop Depth(ft)		Start Value(Mrayl)		End Value(Mrayl)			
One									
2500 PSI Main Pass									
Software Version									
Acquisition System				Version					
Maxwell 2016 SP2				6.2.68624.3100					
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[5]:Up	Up	63.51 ft	6404.20 ft	11-Apr-2017 3:13:11 PM	11-Apr-2017 3:54:36 PM	ON	3.92 ft	Yes
All depths are referenced to toolstring zero									
Log				Company:Noble Energy Inc			Well:Wells Ranch State AA33-750		
One: Log[5]:Up:S004									
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: 11-Apr-2017 17:55:31									
TIME_1900 - Time Marked every 60.00 (s)									
Casing Collar Locator Ultrasonic (CCLU) USIT-E				Amplitude of Eccentering (ECCE) USIT-E		Gamma Ray (ECGR) HGNS-H		Acoustic Impedance Average (AIAV) USIT-E	
-20 in 1				0 in 0.5		0 gAPI 150		0 Mrayl 10	
USIT - USIT Processing Flags (UFLG) USIT-E				USIT - USIT Processing Flags (UFLG) USIT-E		USIT - USIT Processing Flags (UFLG) USIT-E		USIT - USIT Processing Flags (UFLG) USIT-E	
40				40		40		40	
50				50		50		50	

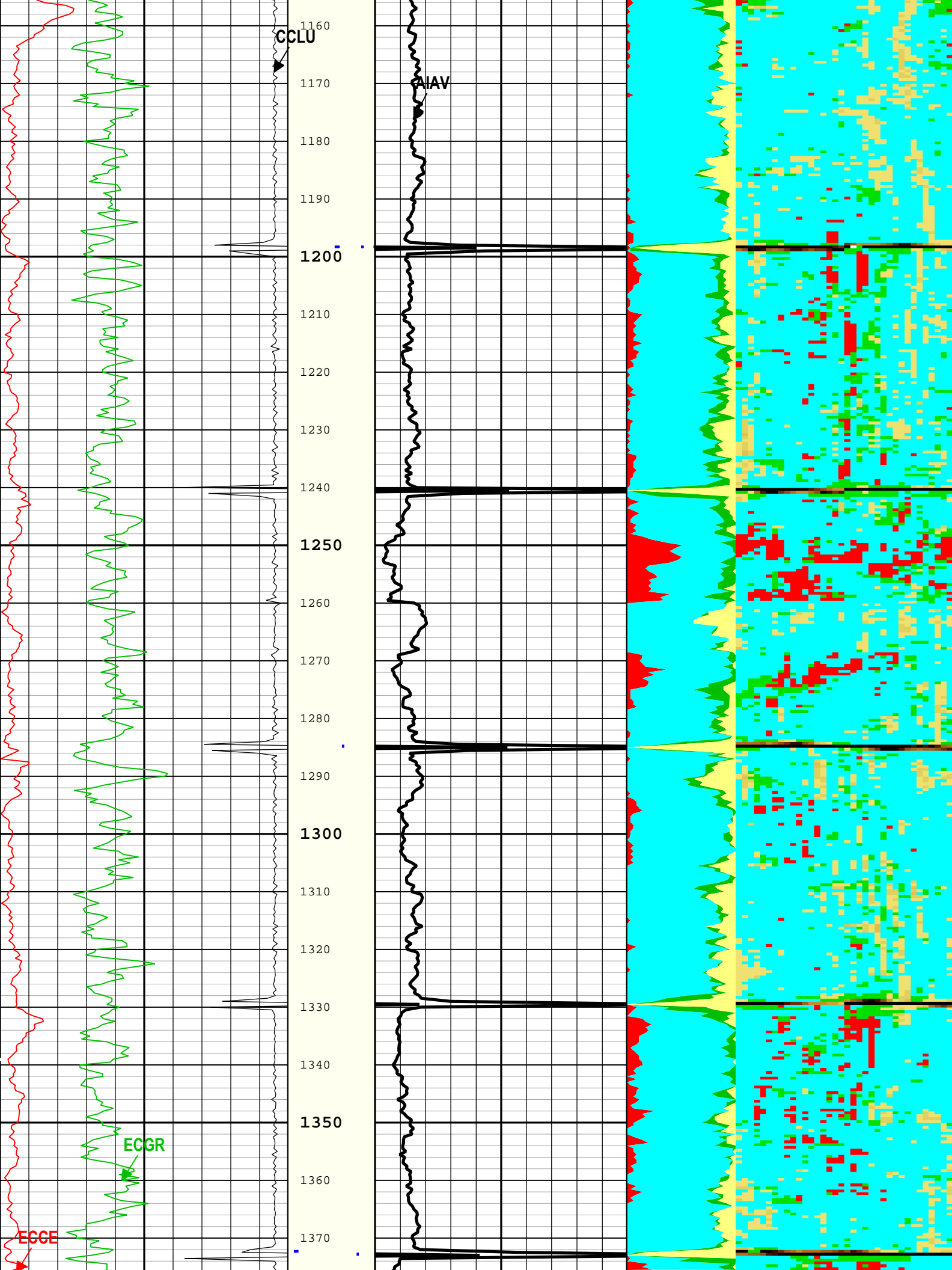


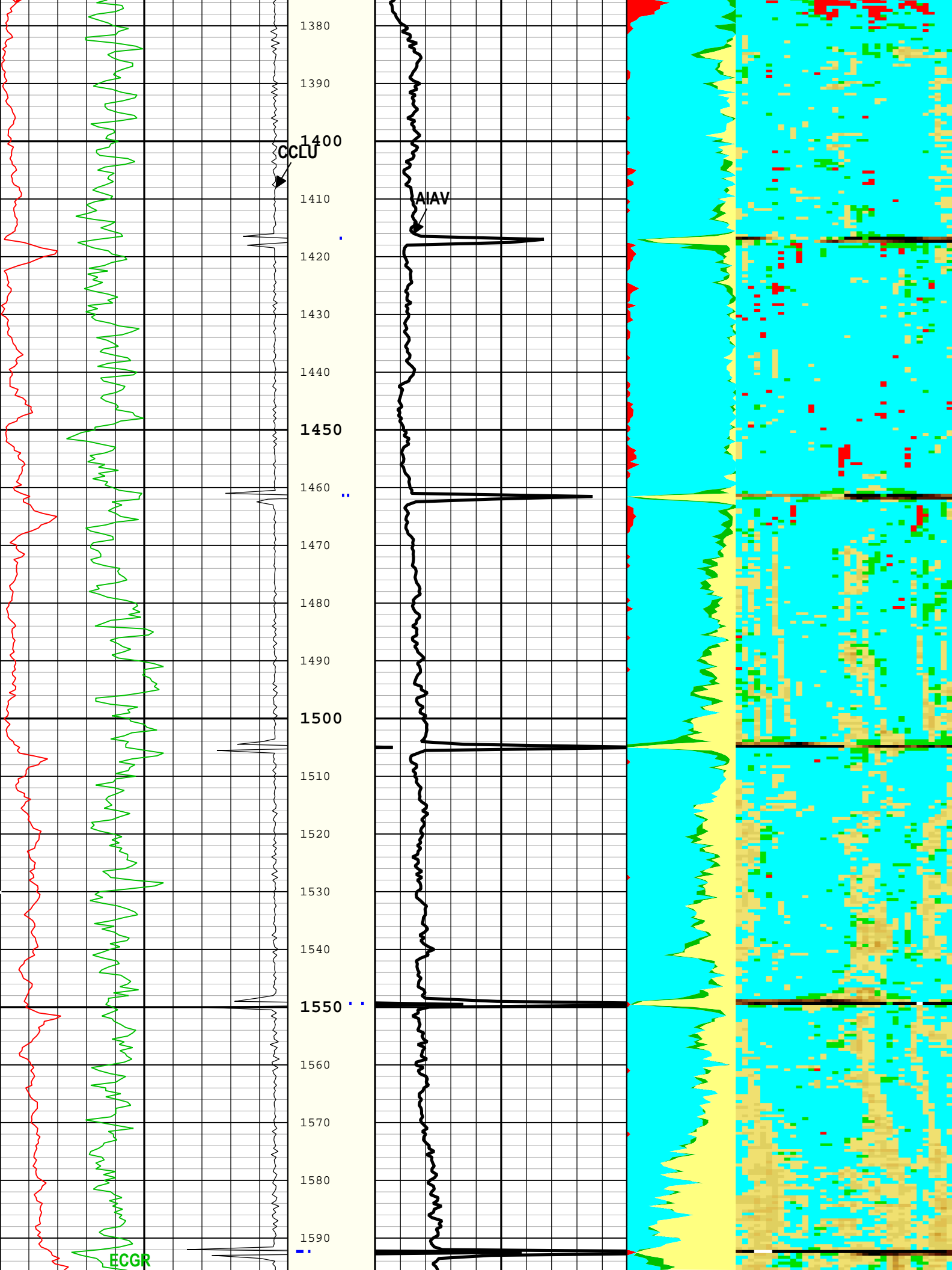


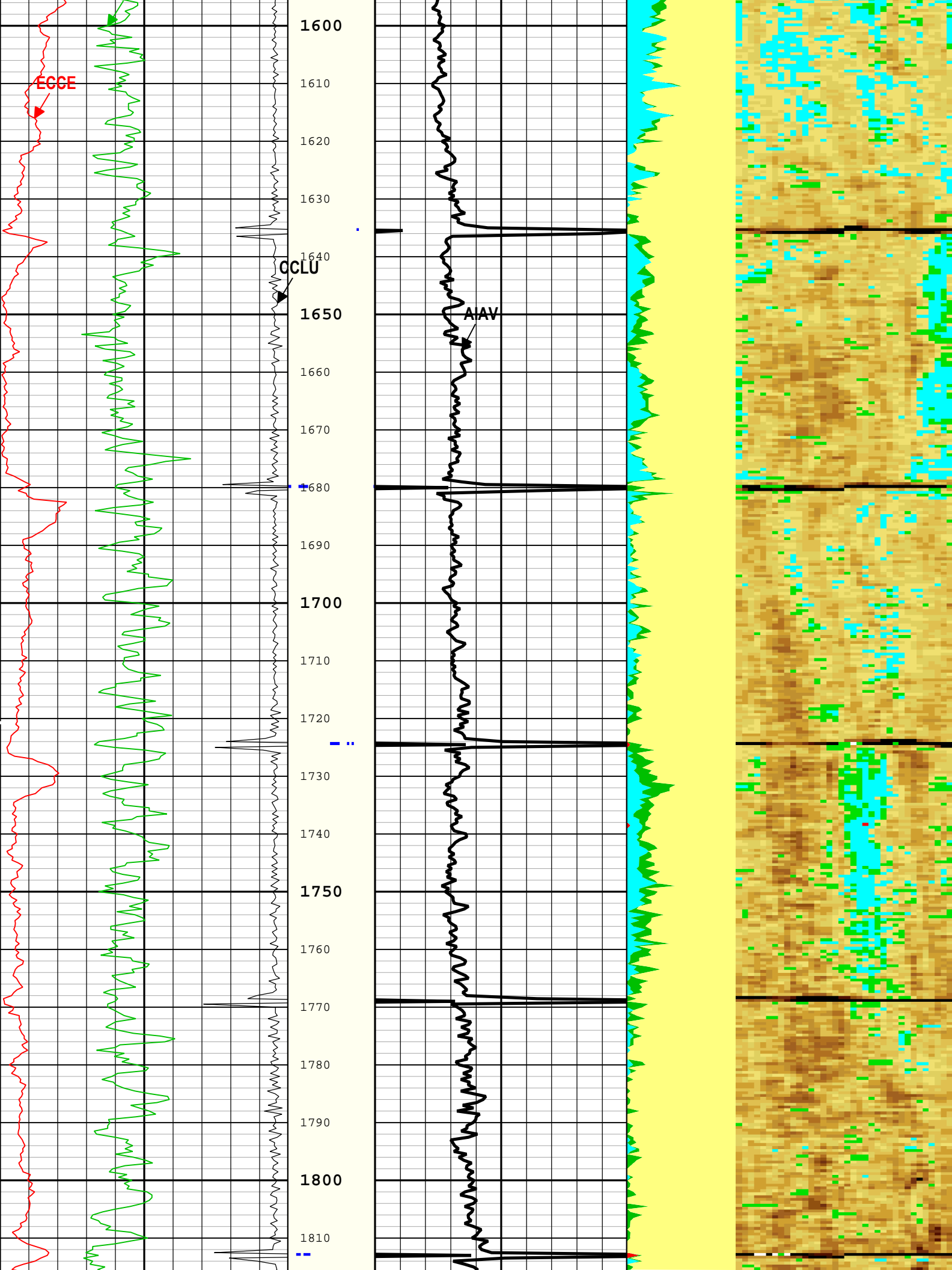


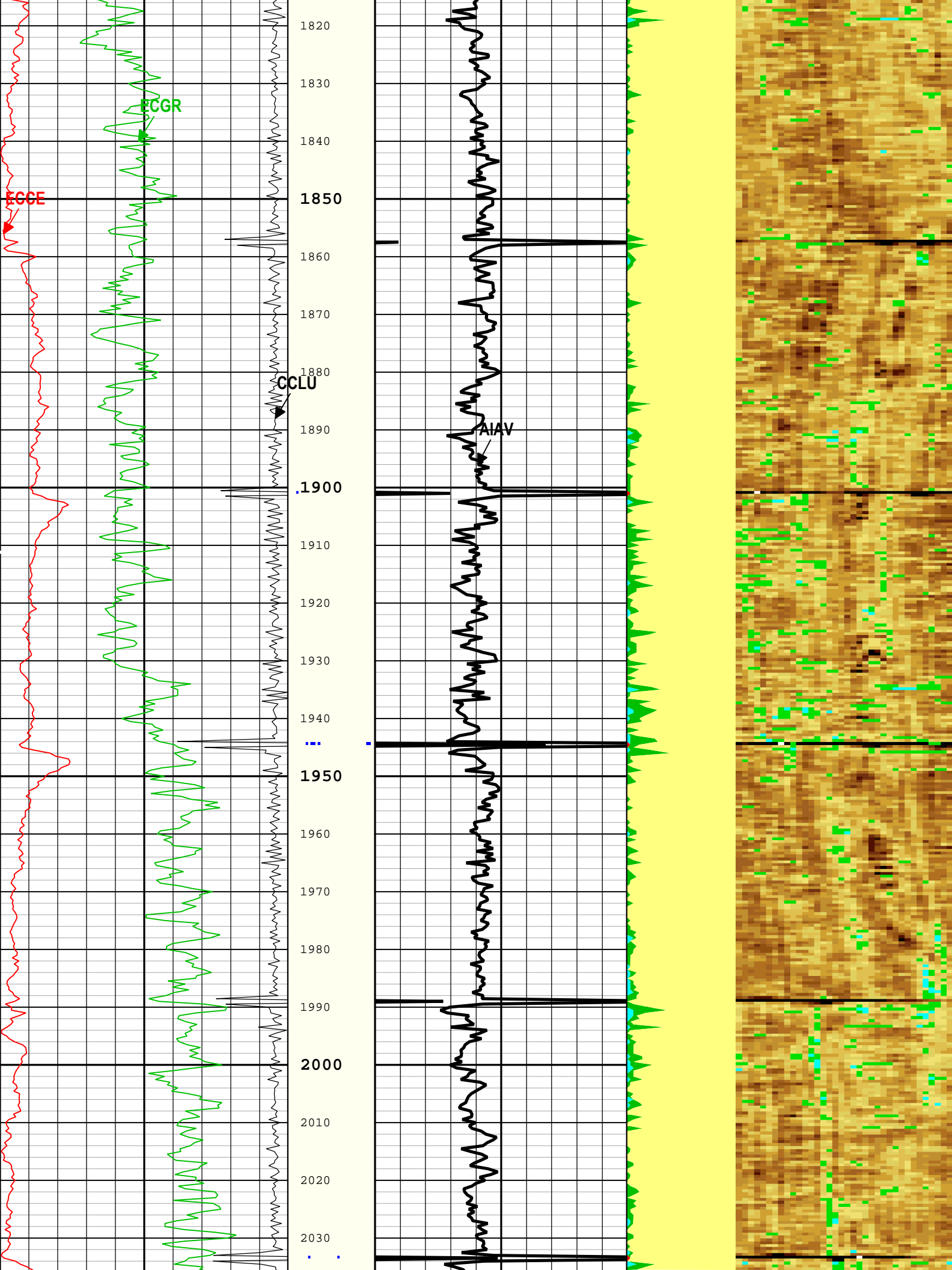


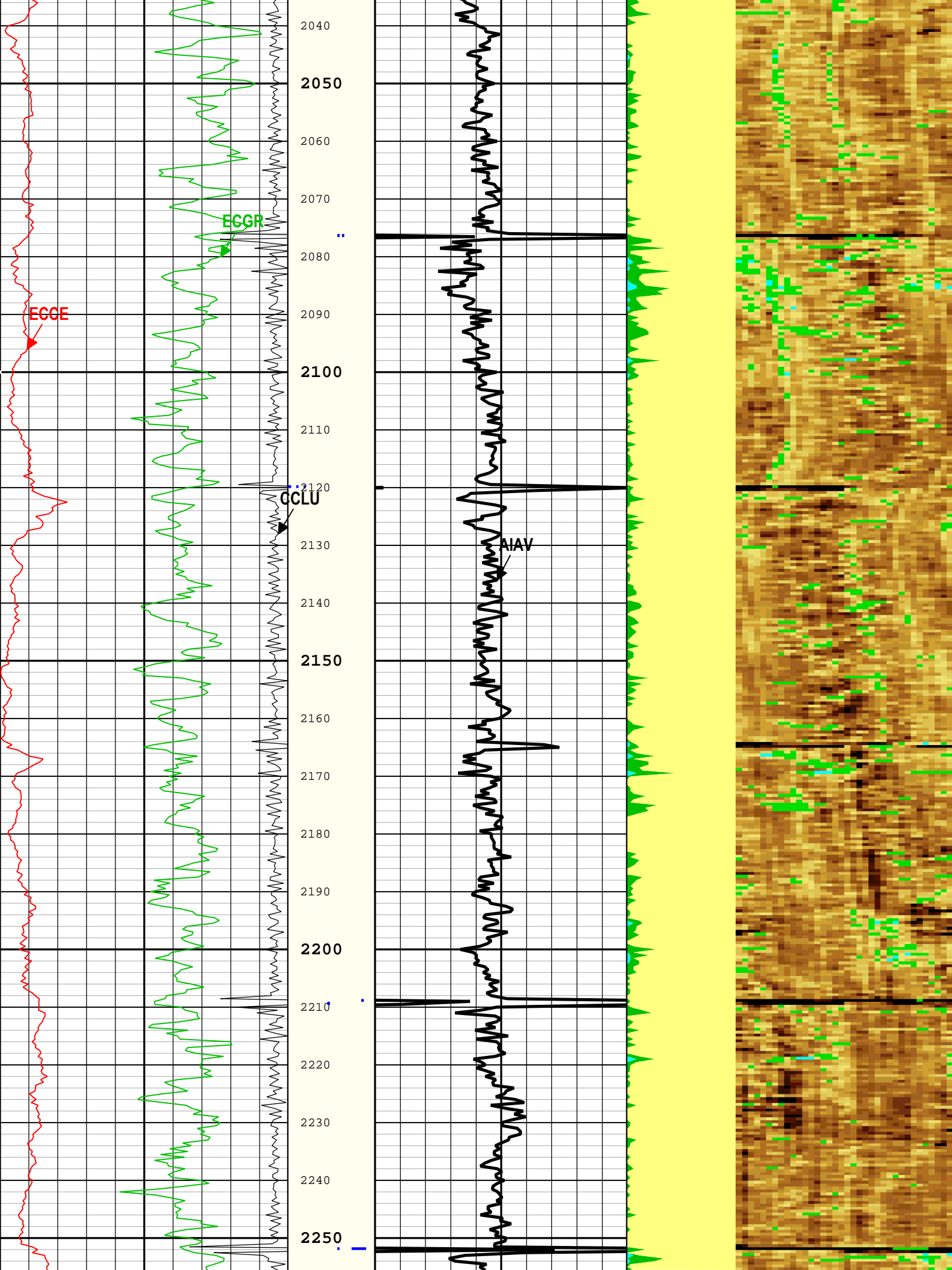


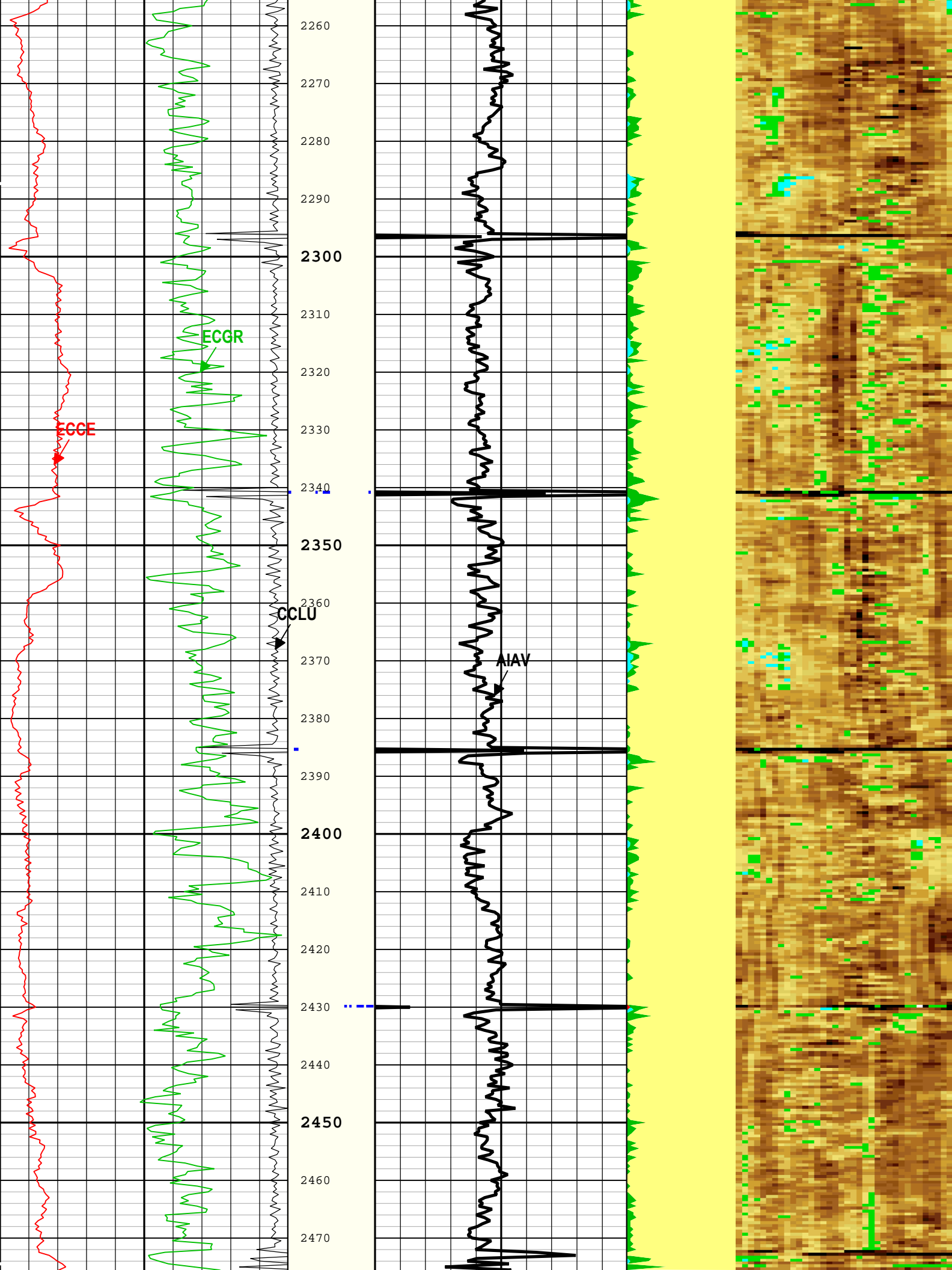


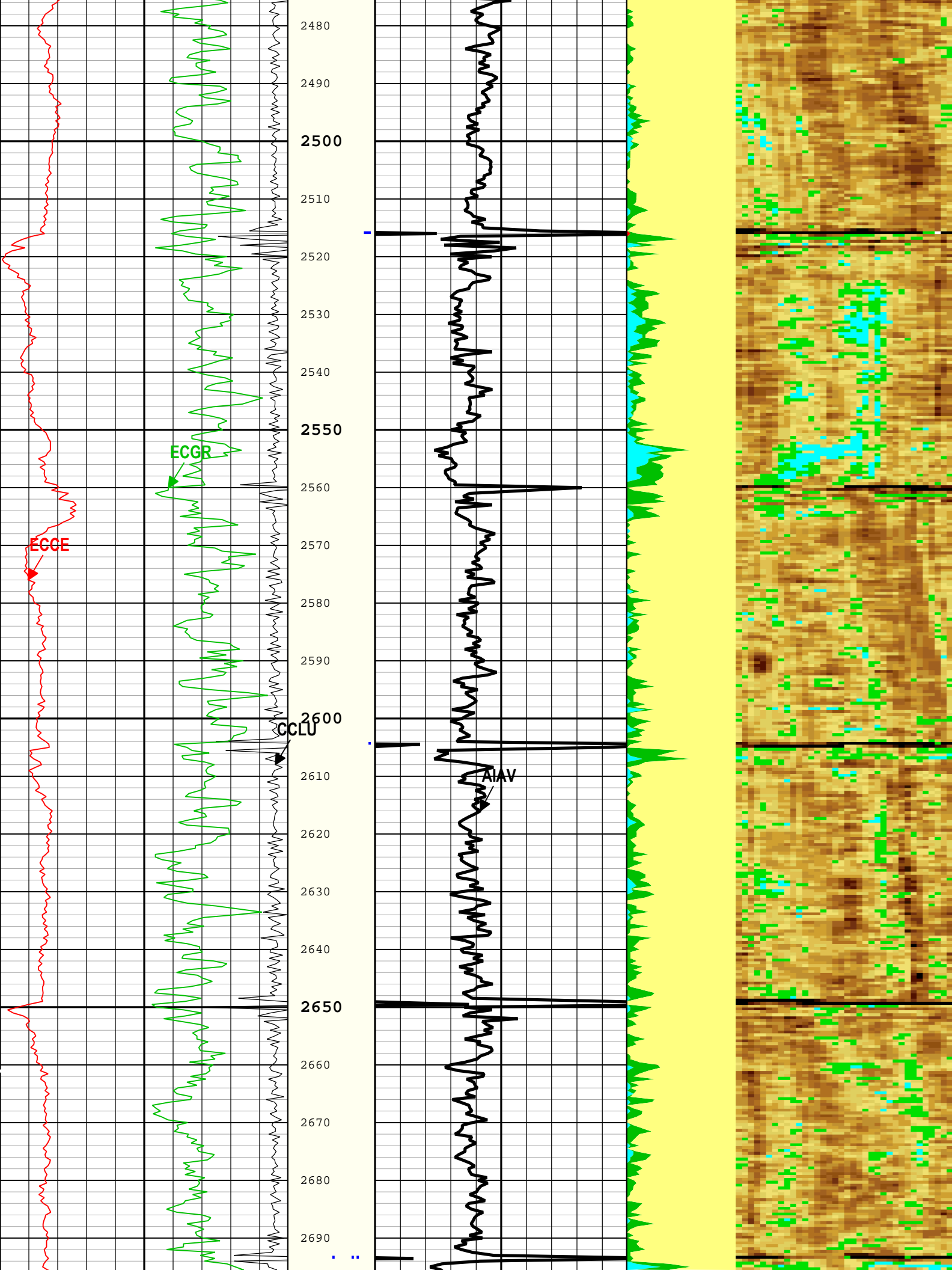


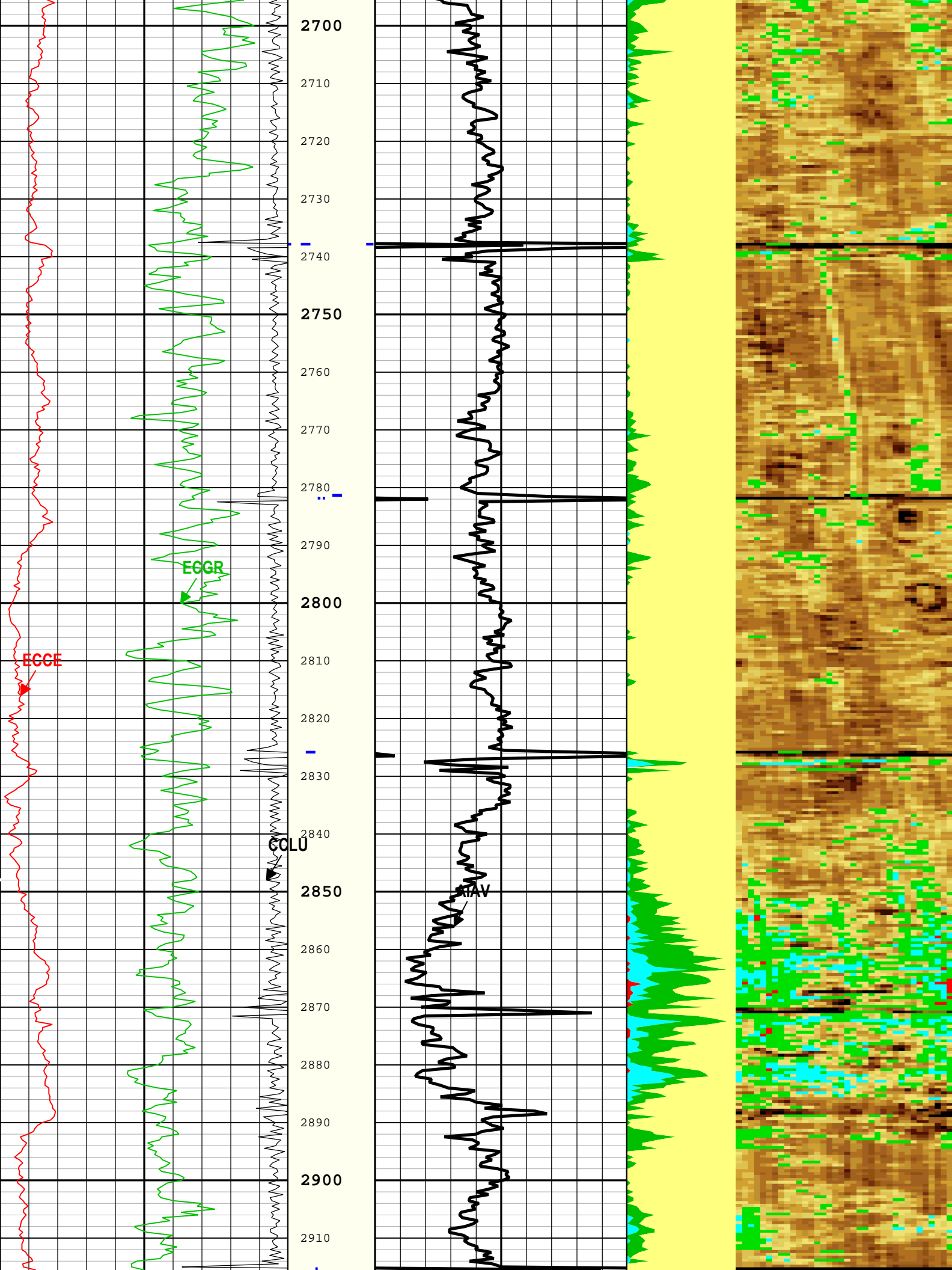


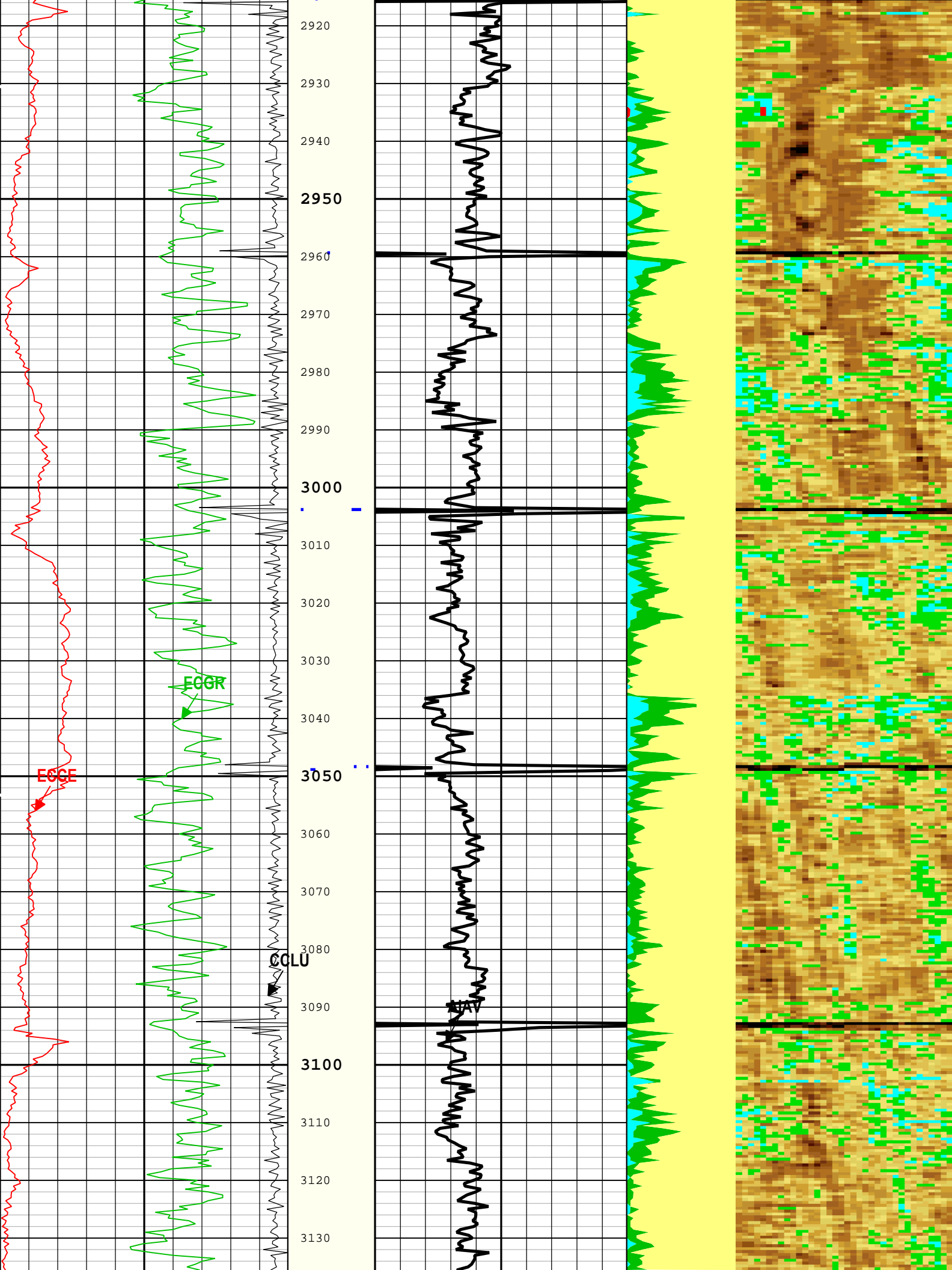


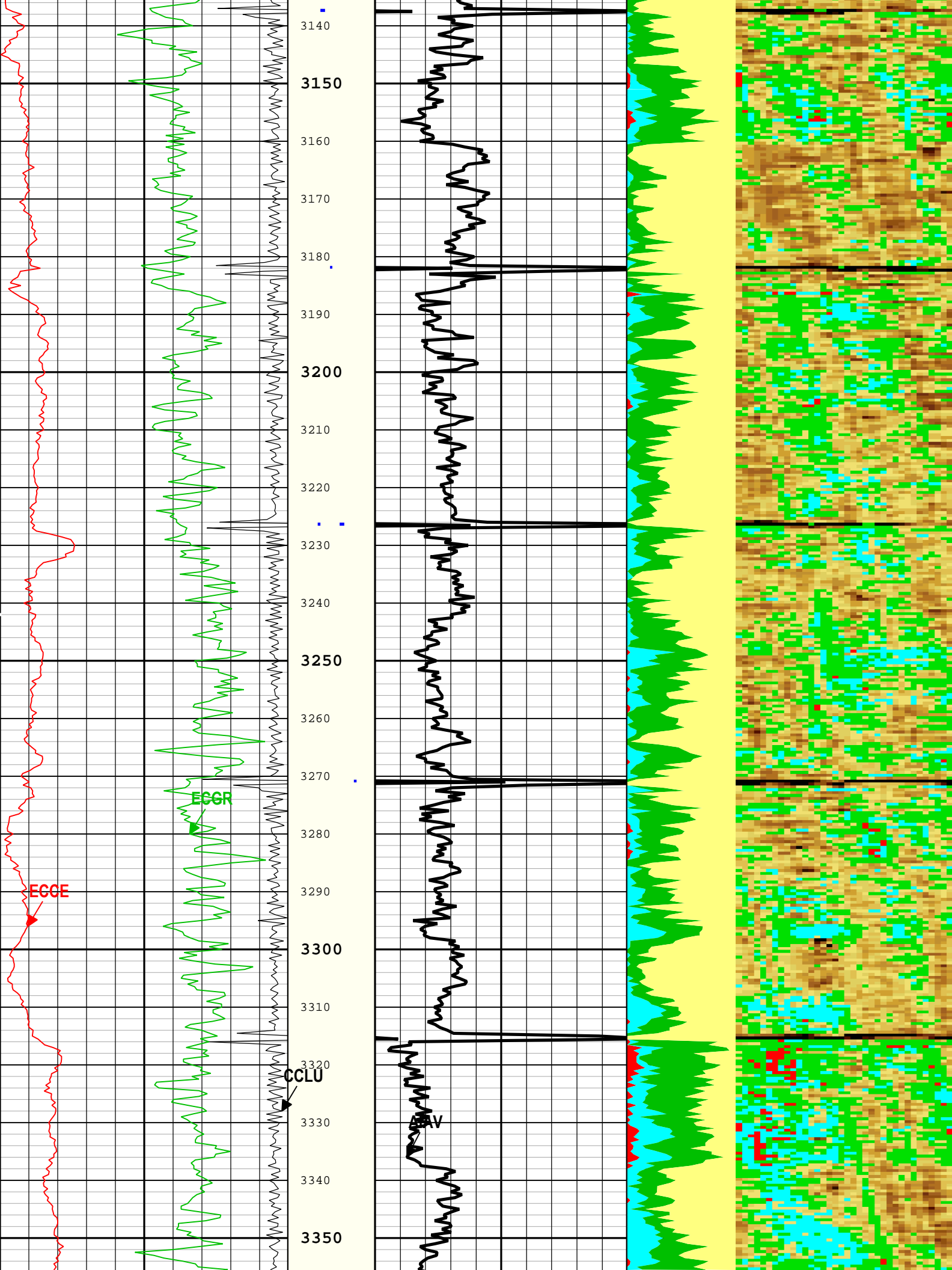


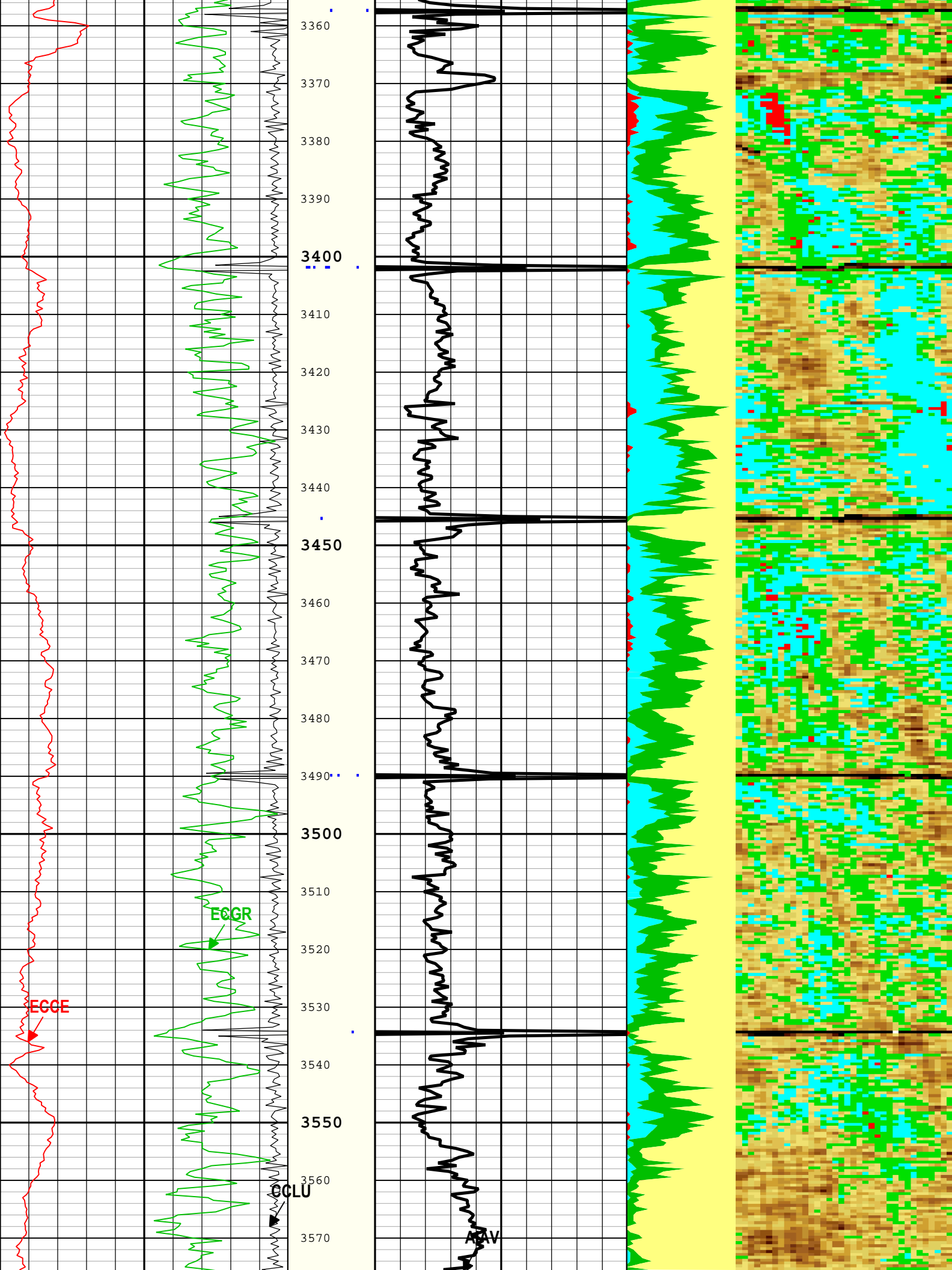


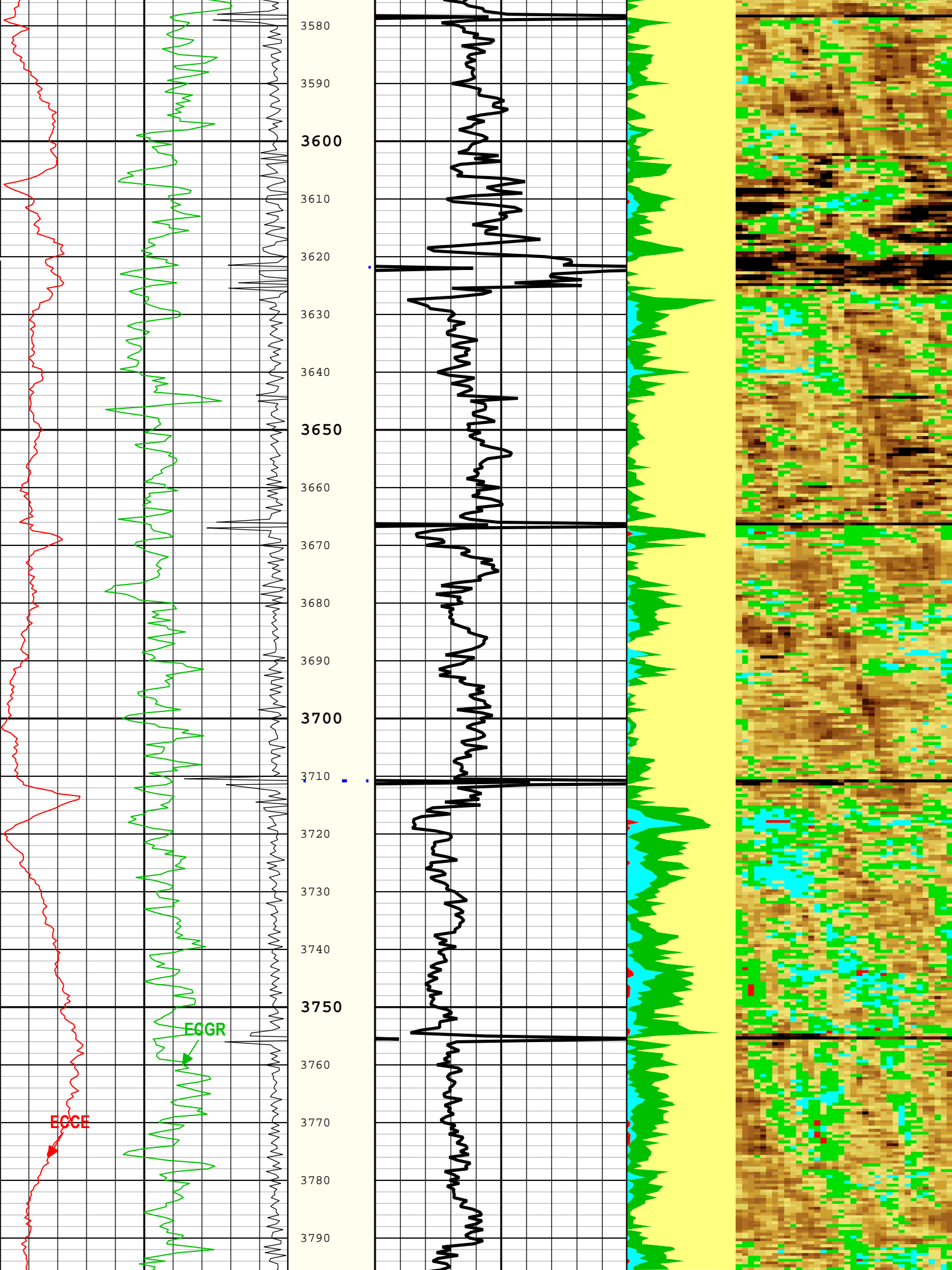


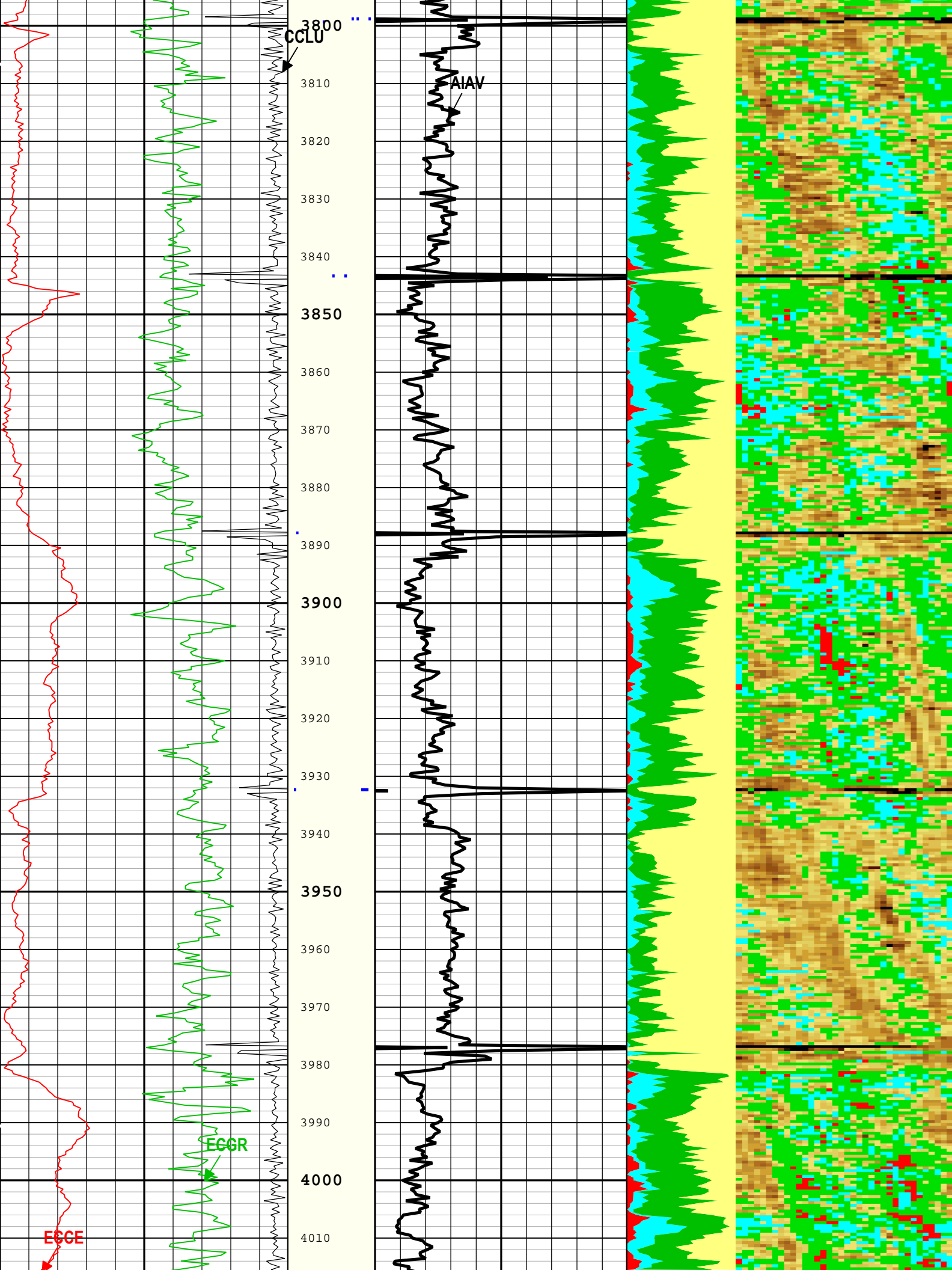


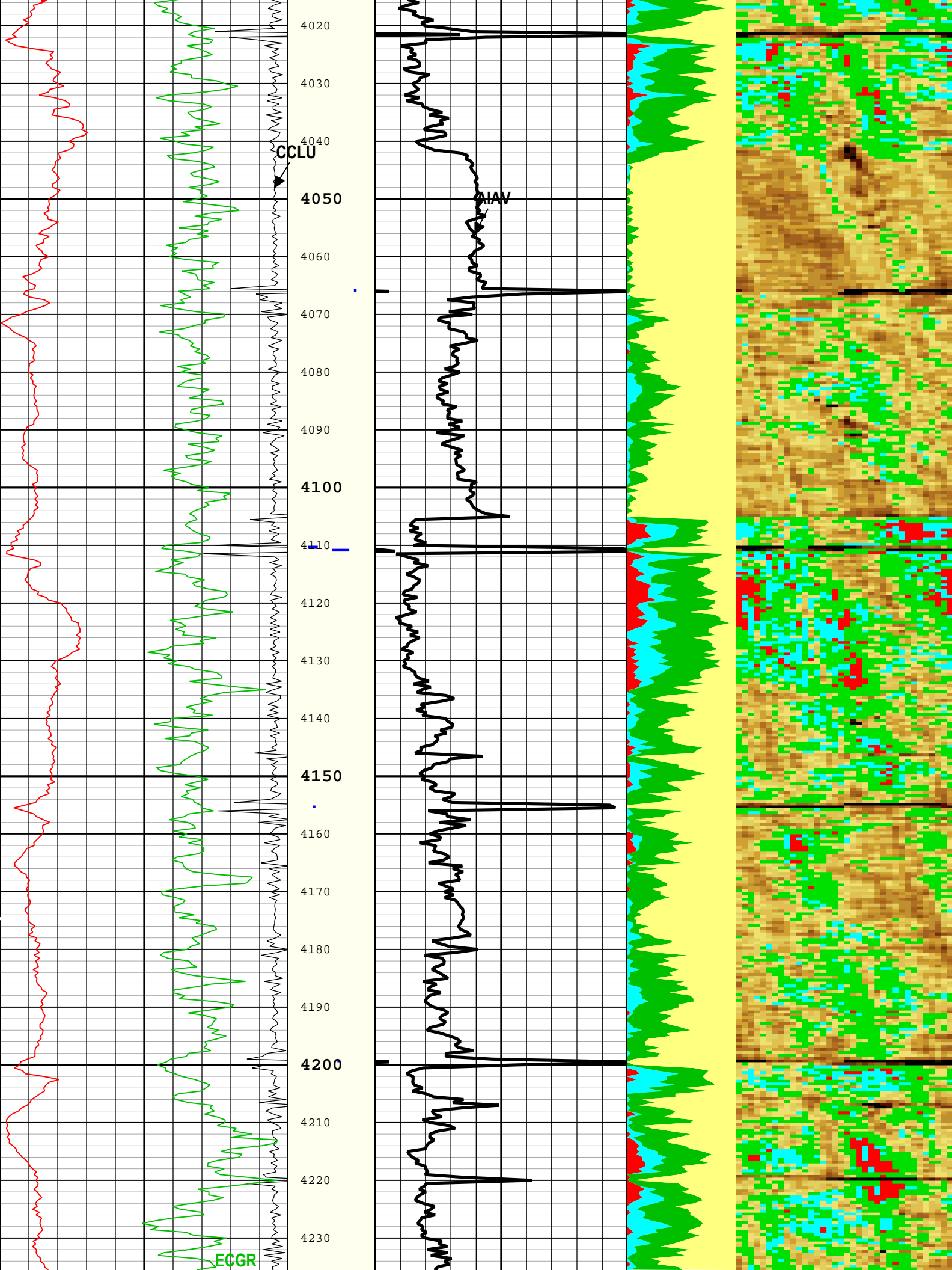


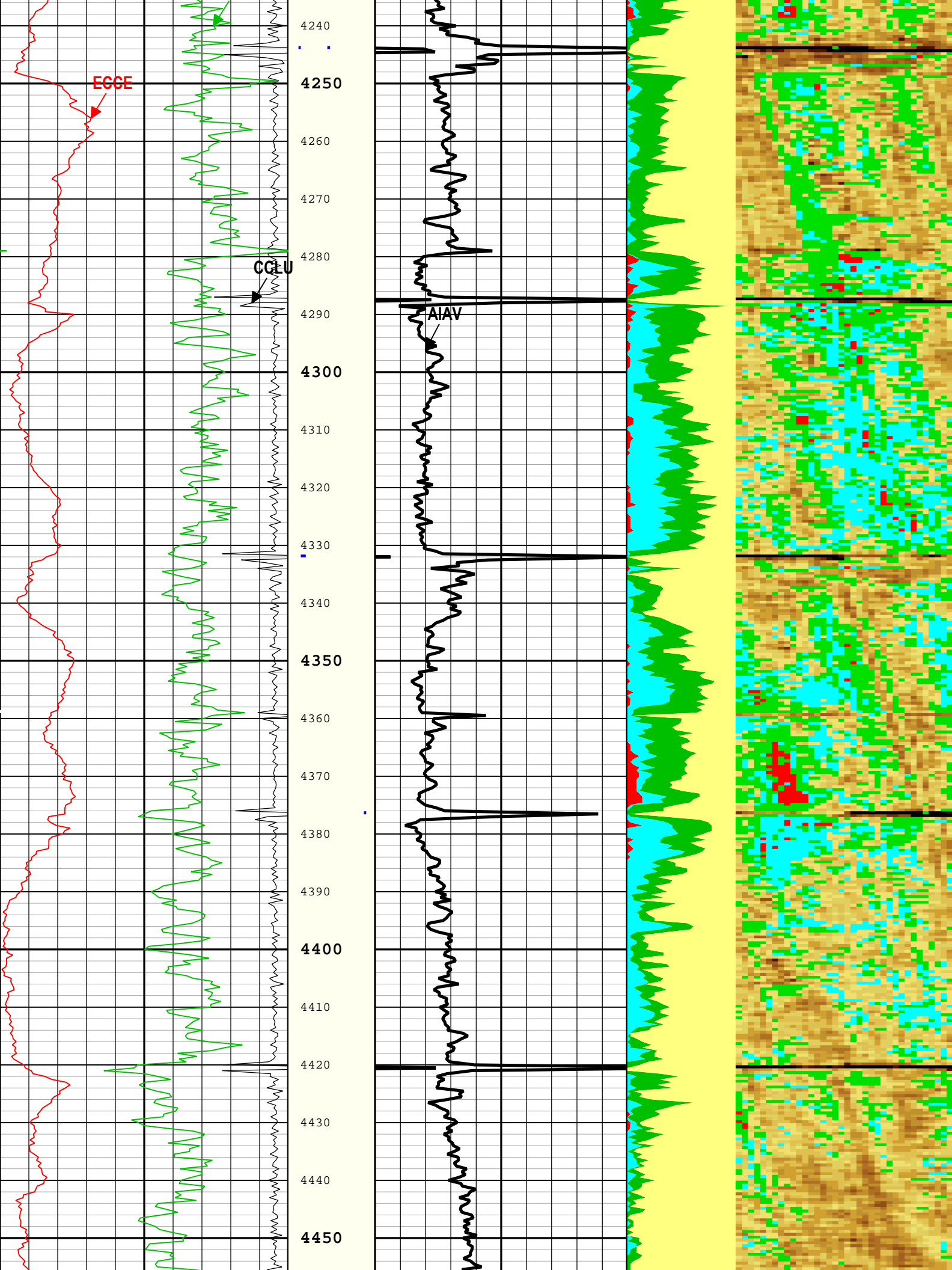


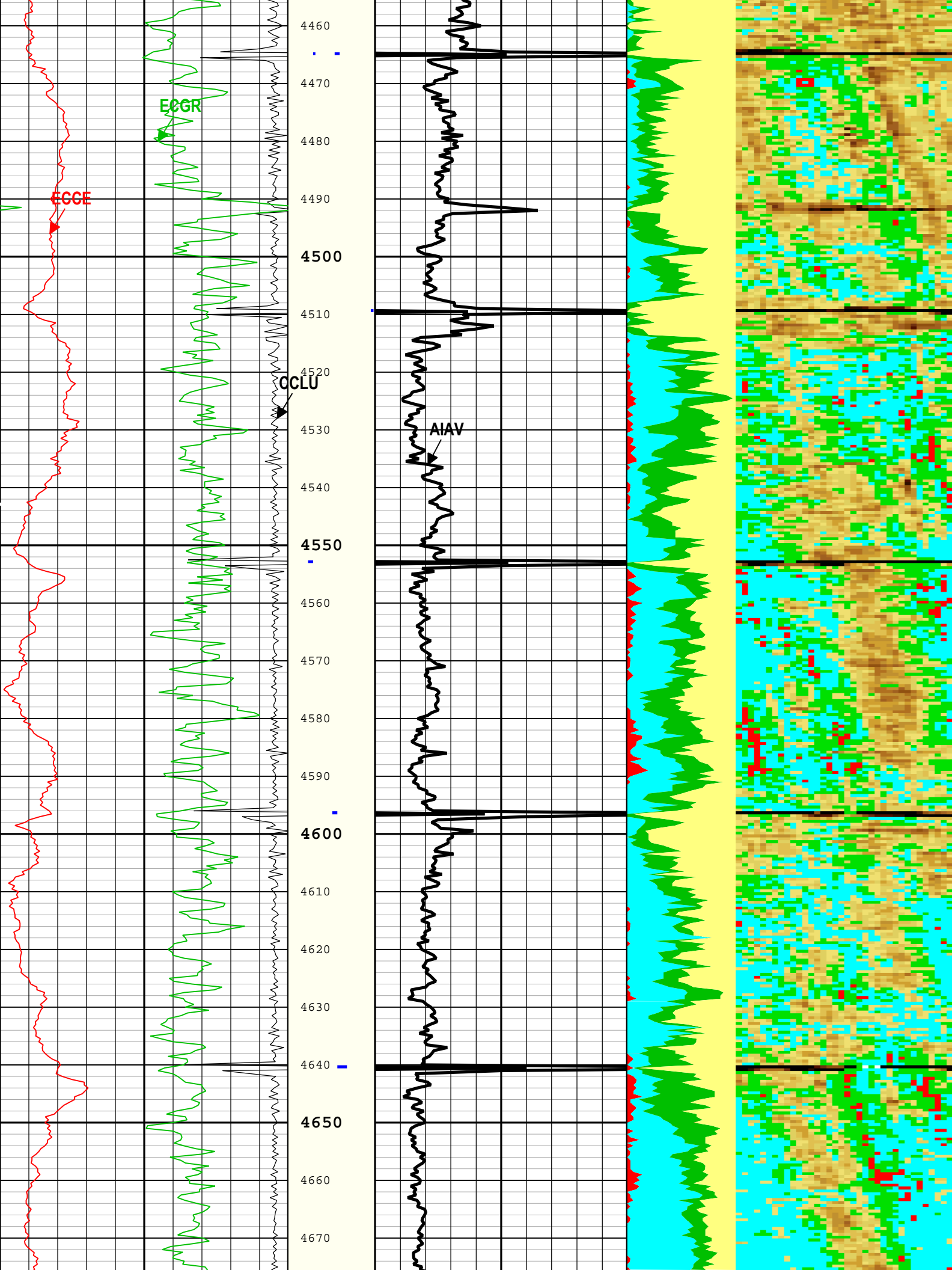


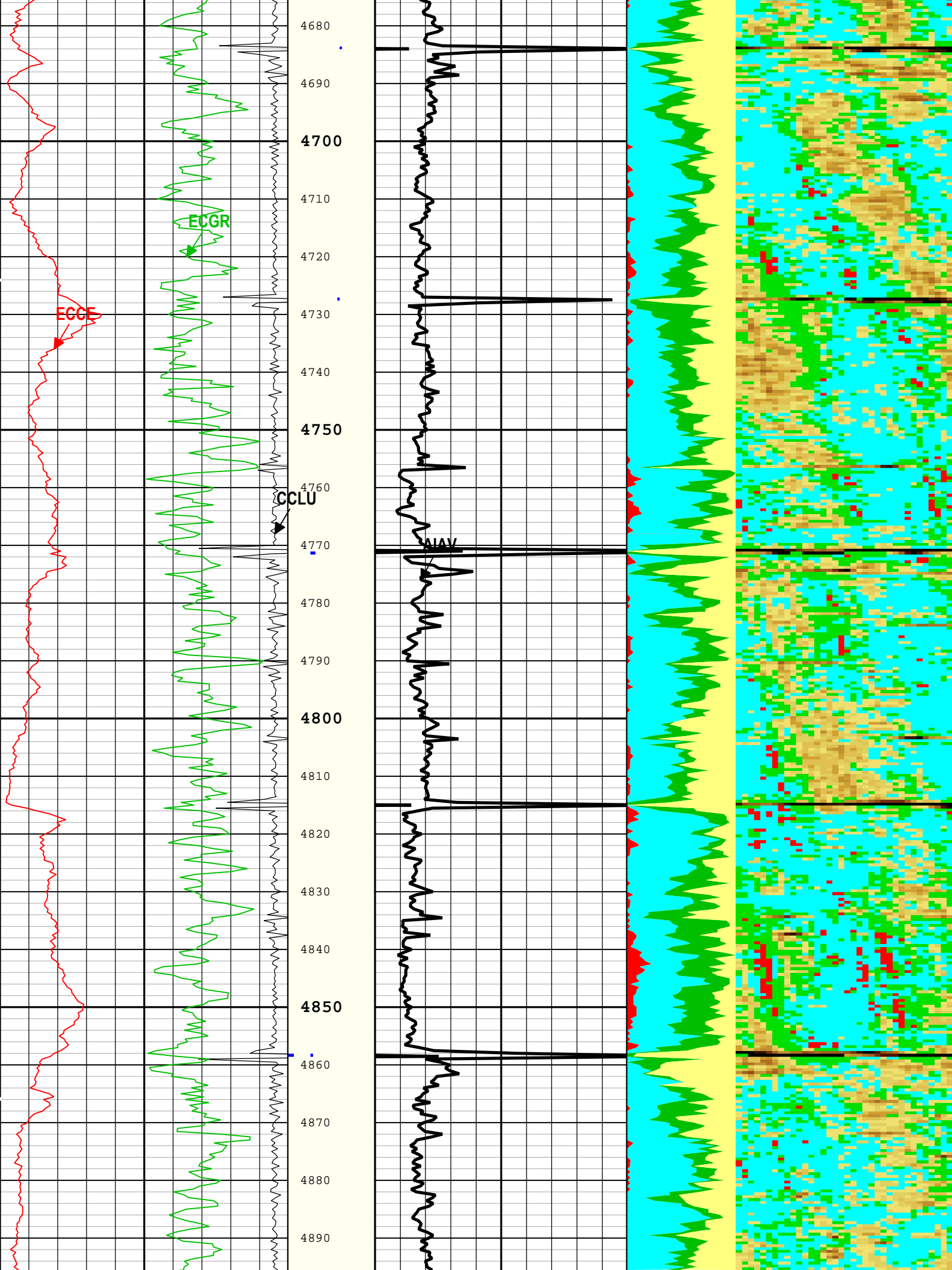


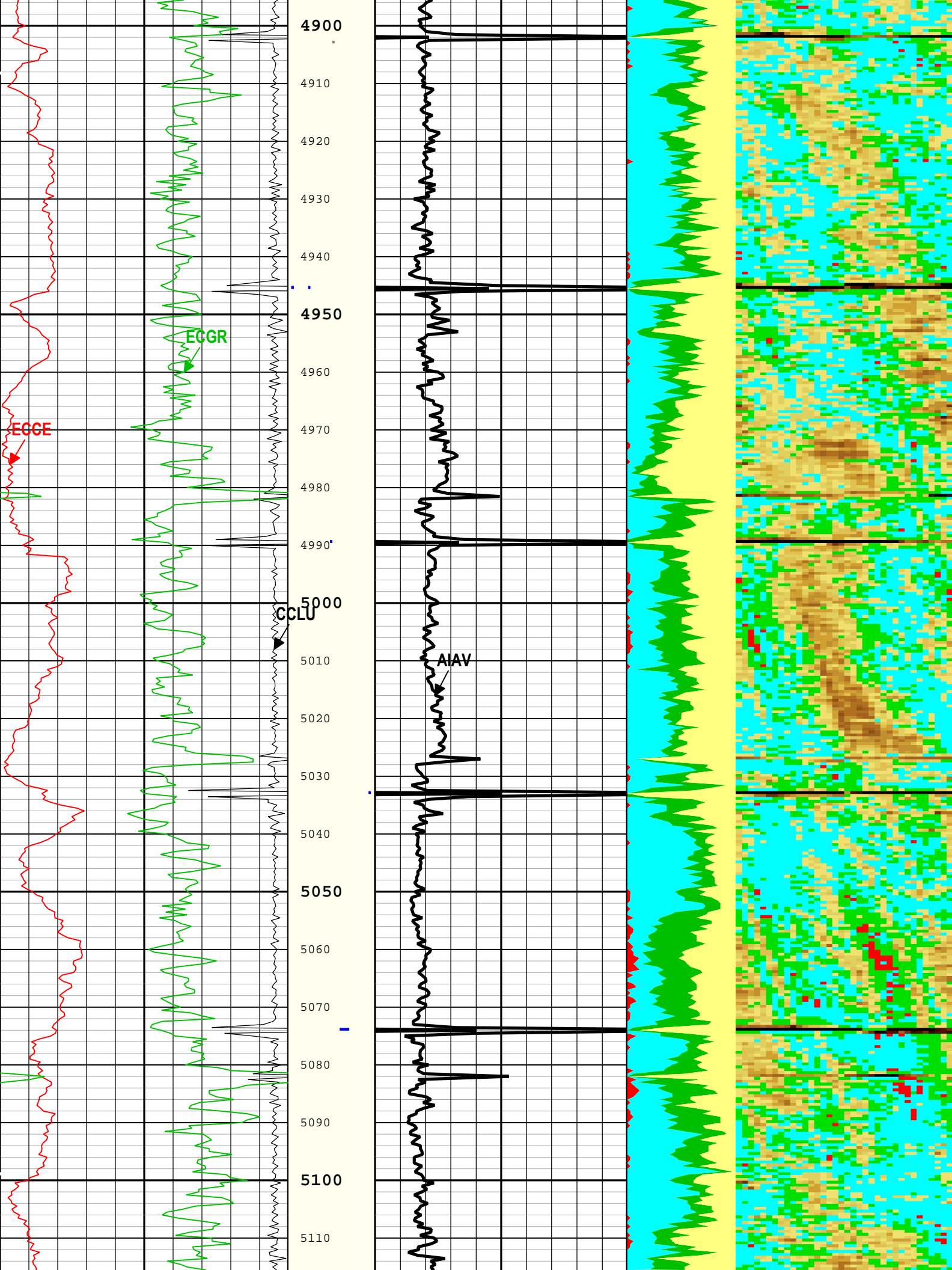


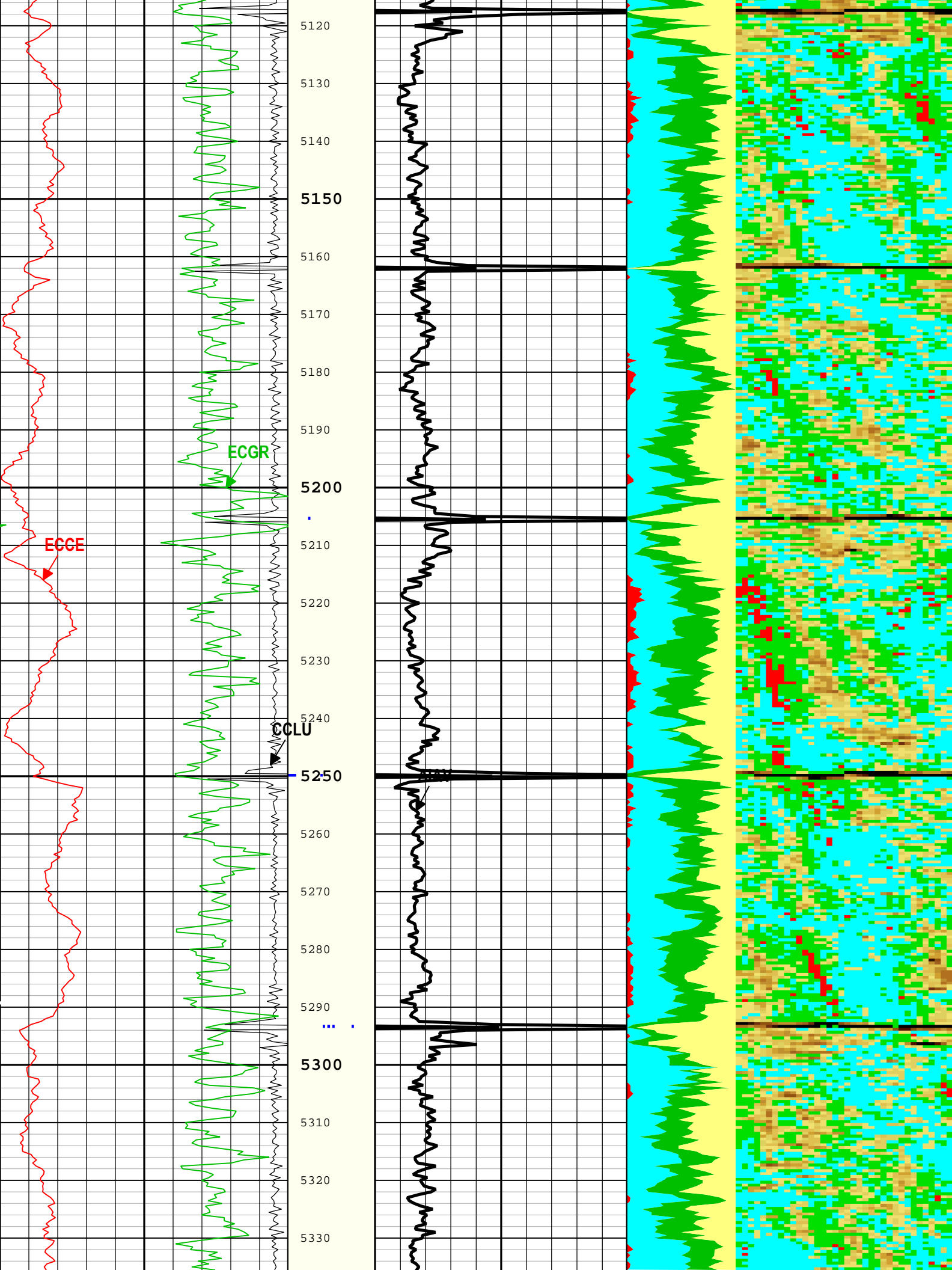


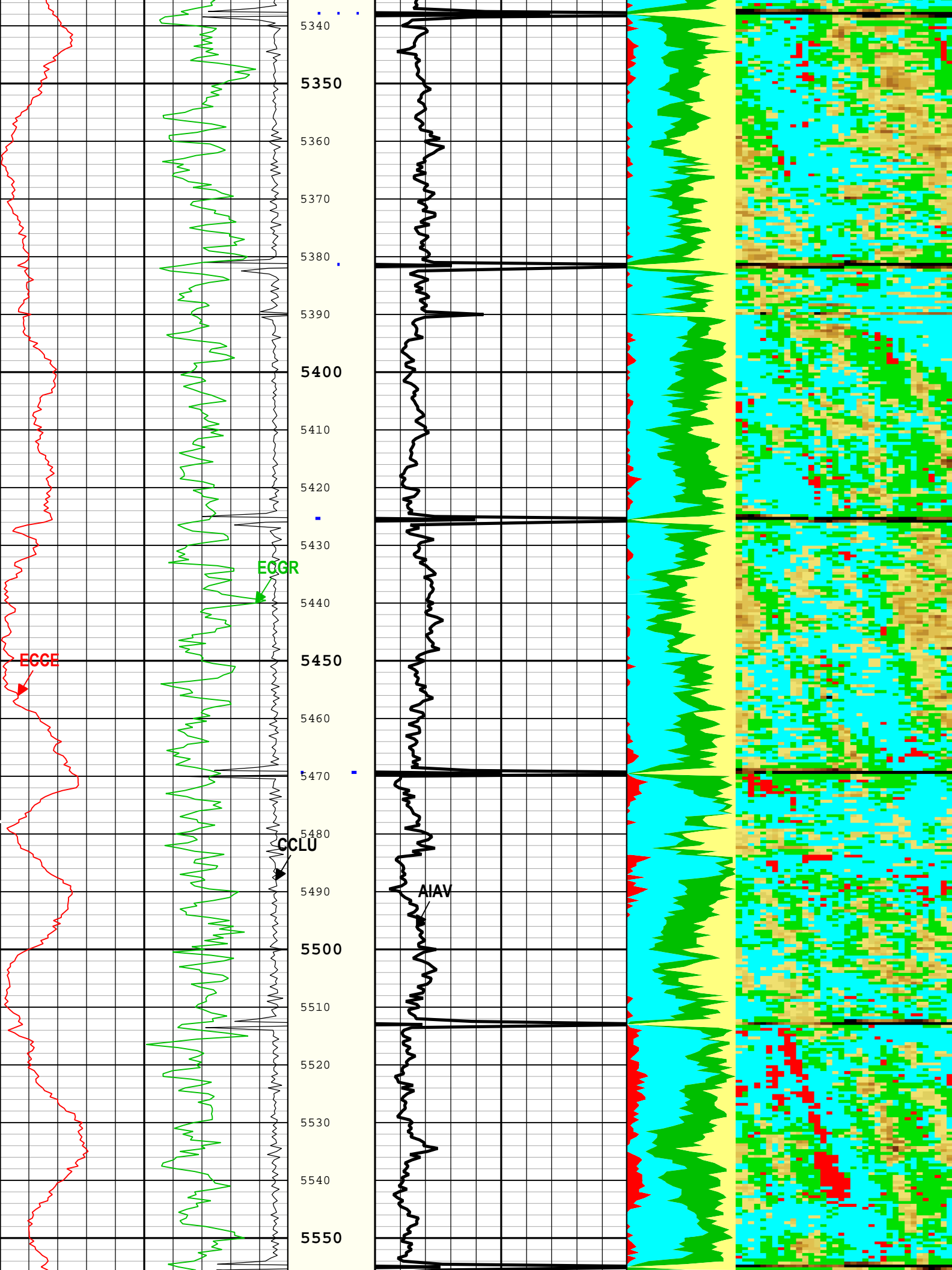


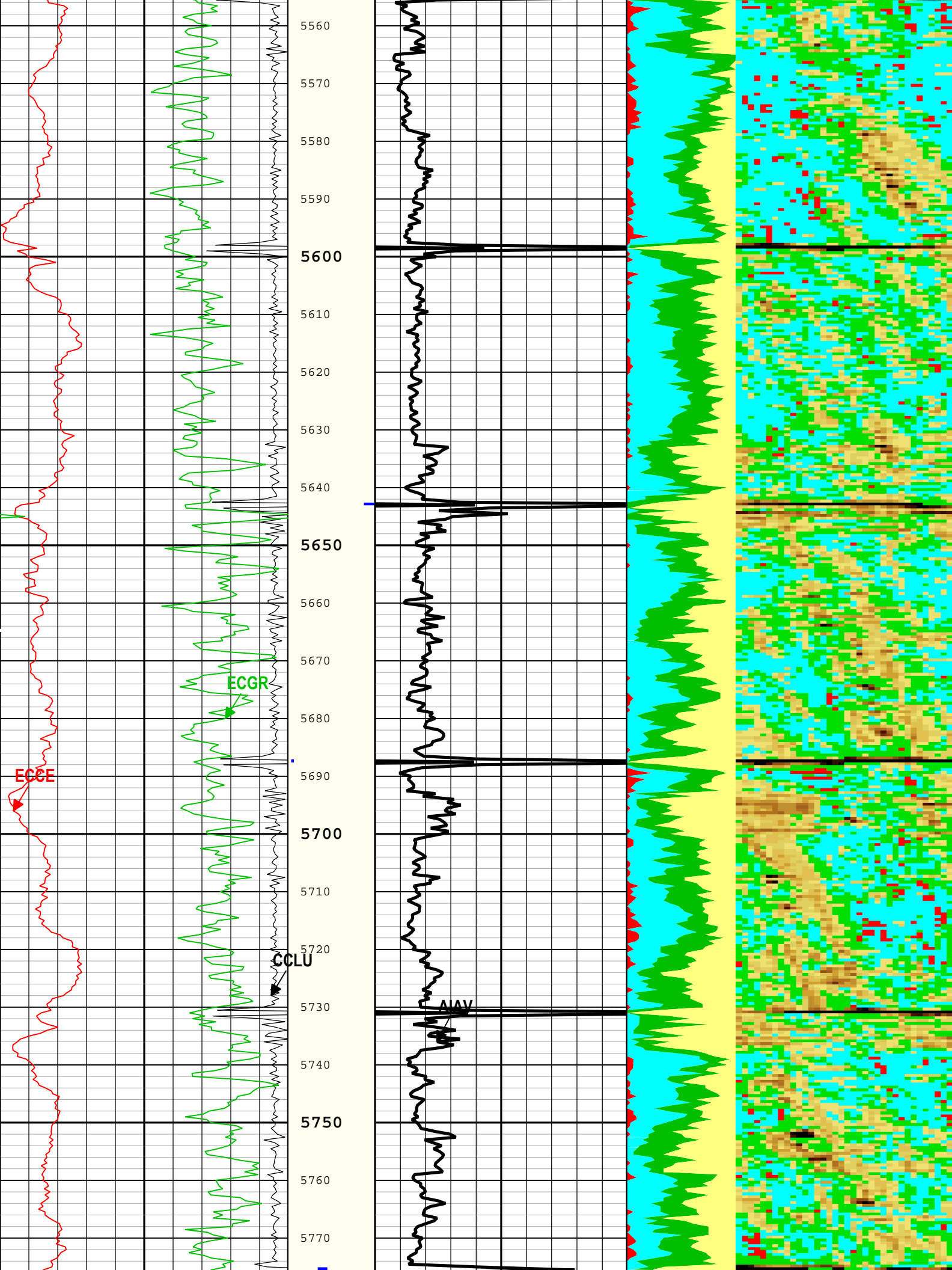


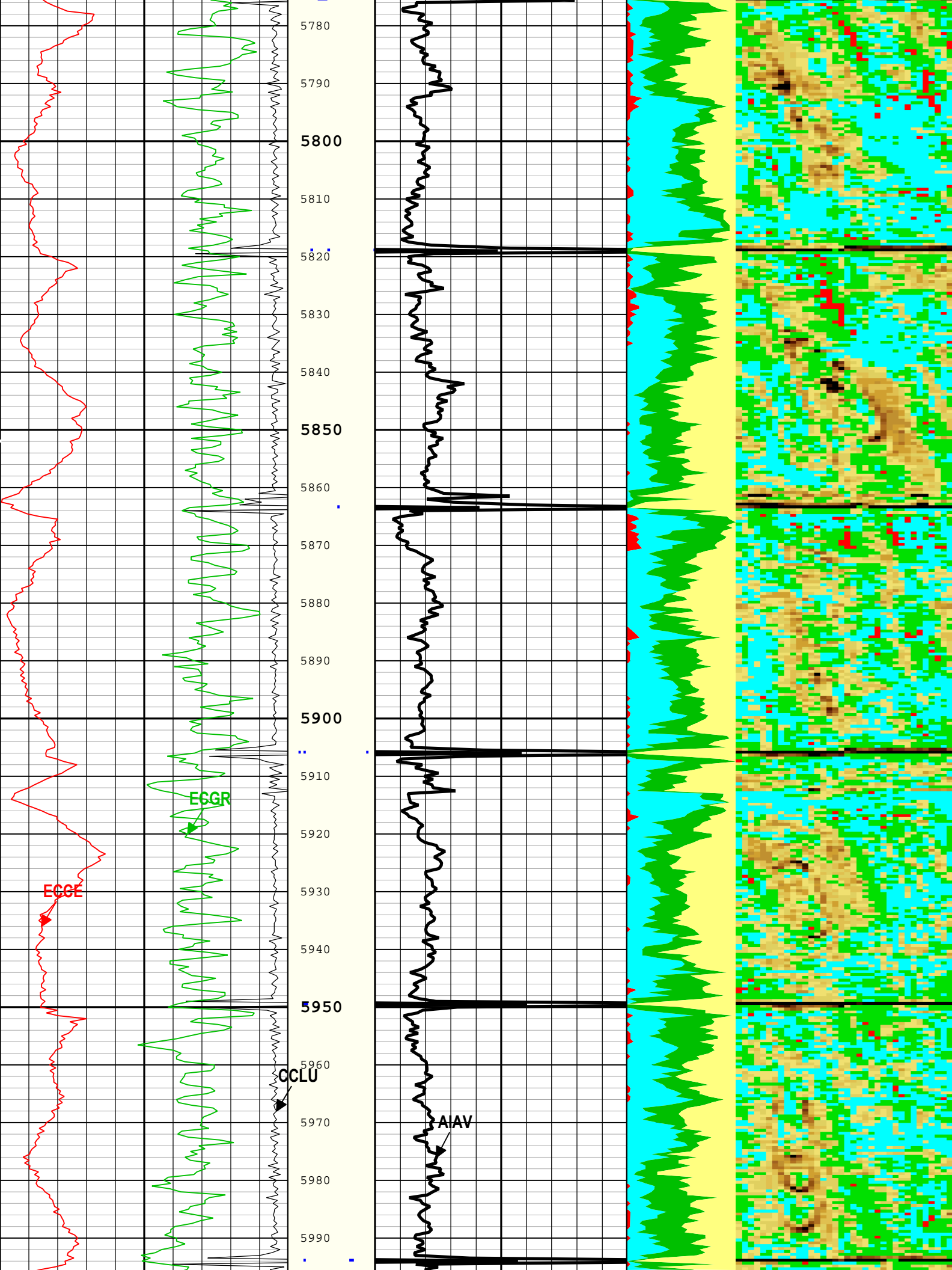


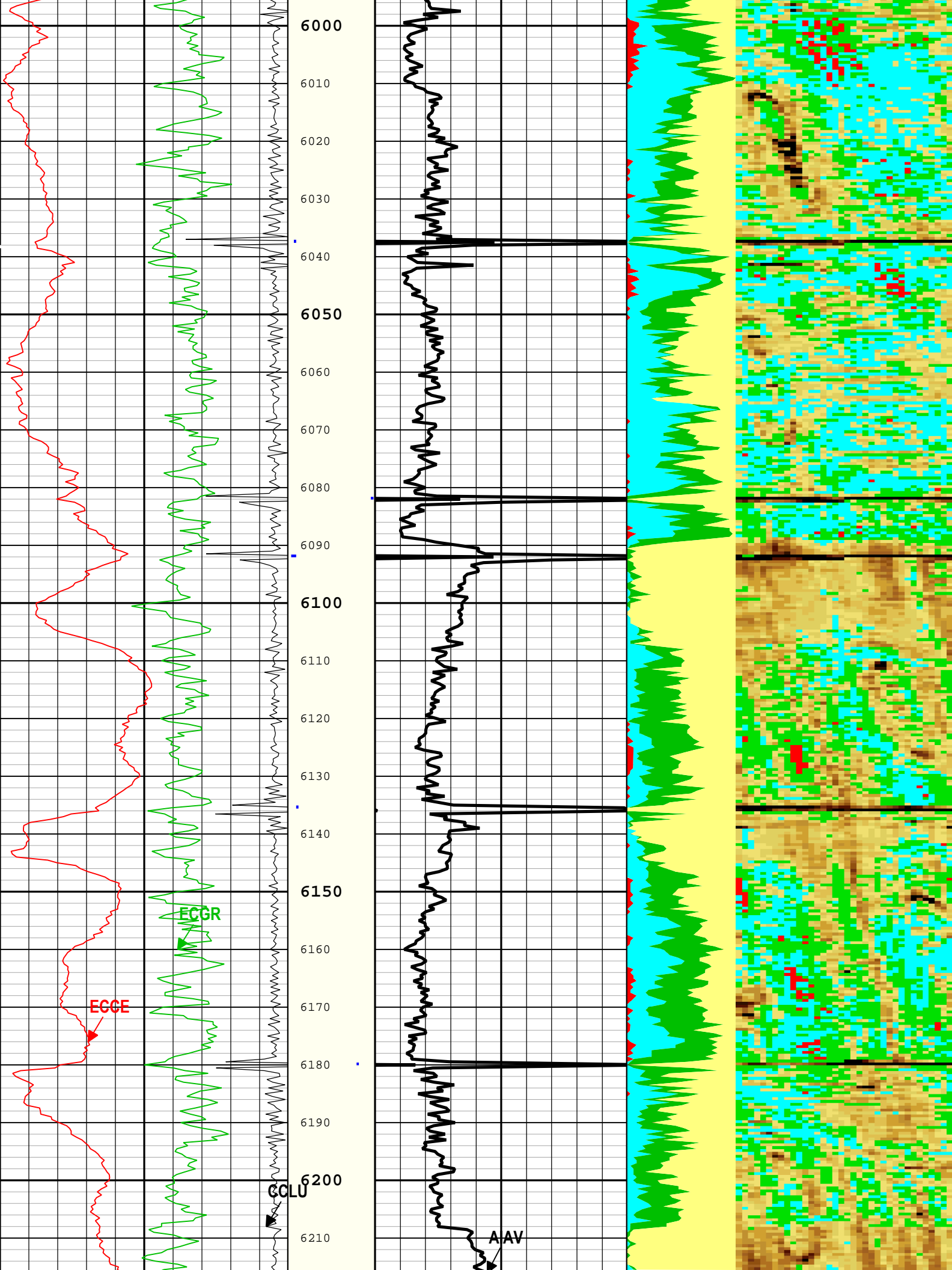


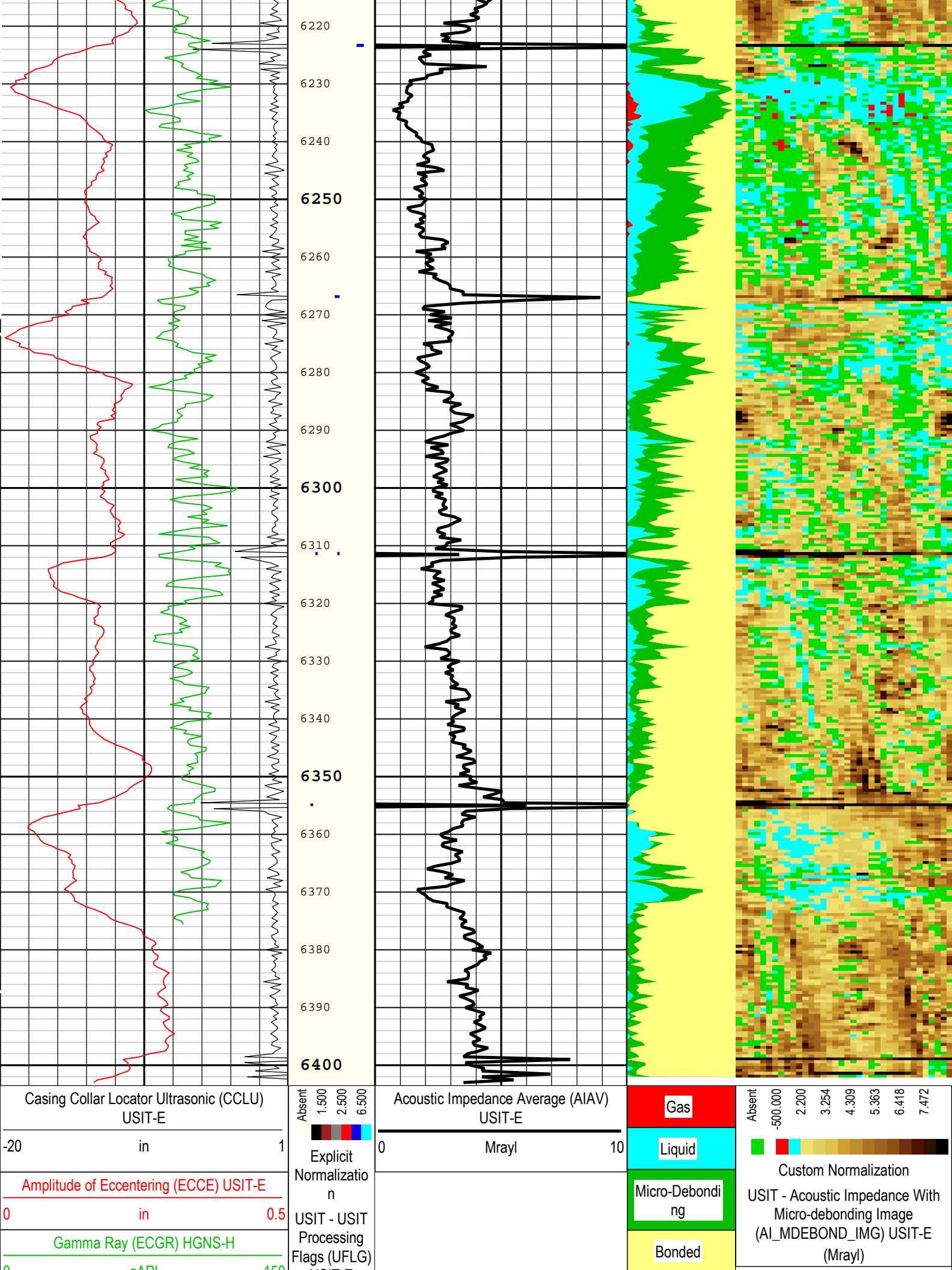












TIME_1900 - Time Marked every 60.00 (s)

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: 11-Apr-2017 17:55:31

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	16352.4	ft
CDEN	Cement Density	HGNS-H	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	9	lbm/gal
DFT	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	
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	1.1	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0.05	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

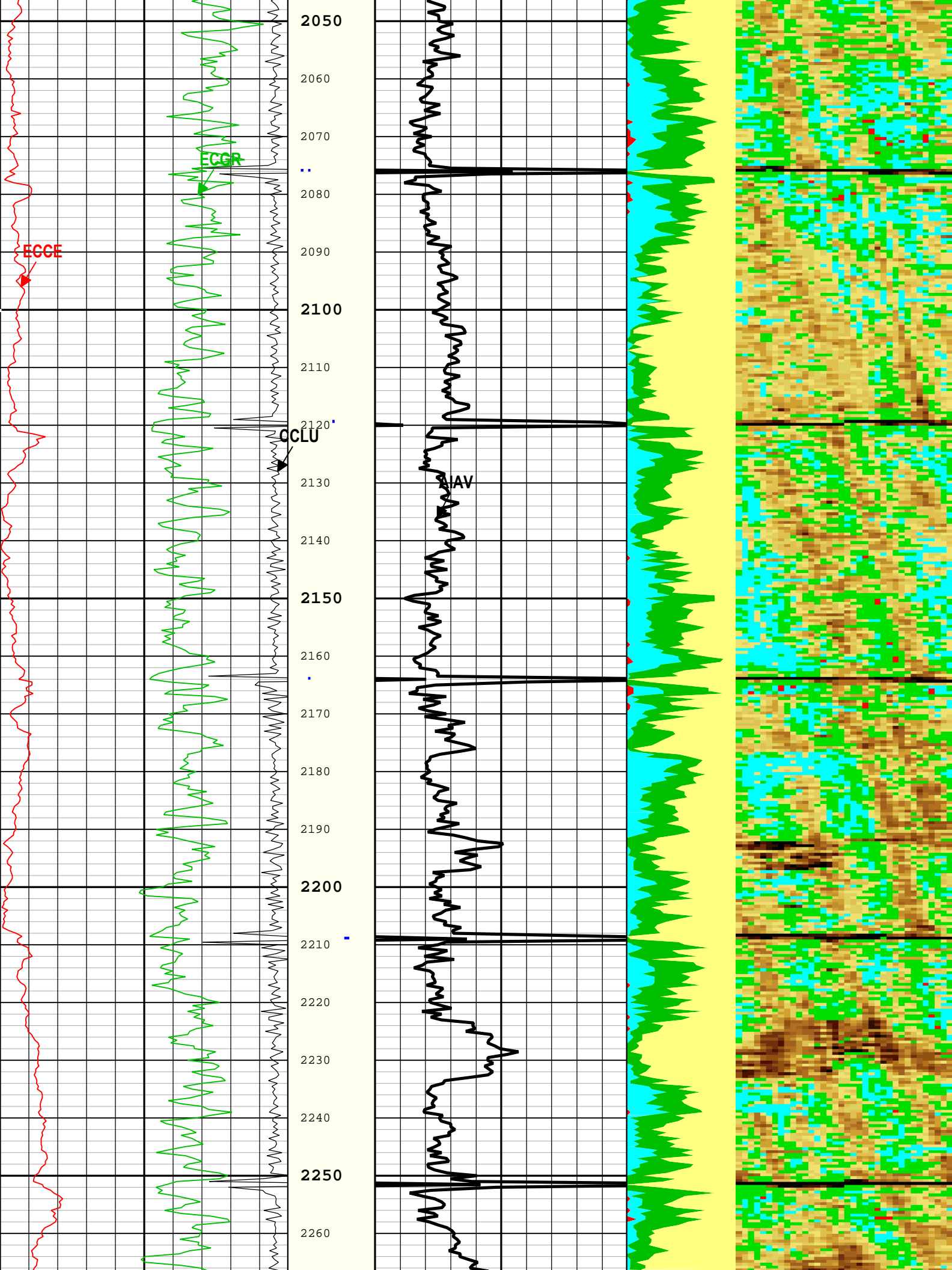
Parameter	Value	Start (ft)	Stop (ft)
BS	26	35.5	110
BS	13.5	110	1938
BS	8.5	1938	6403.5

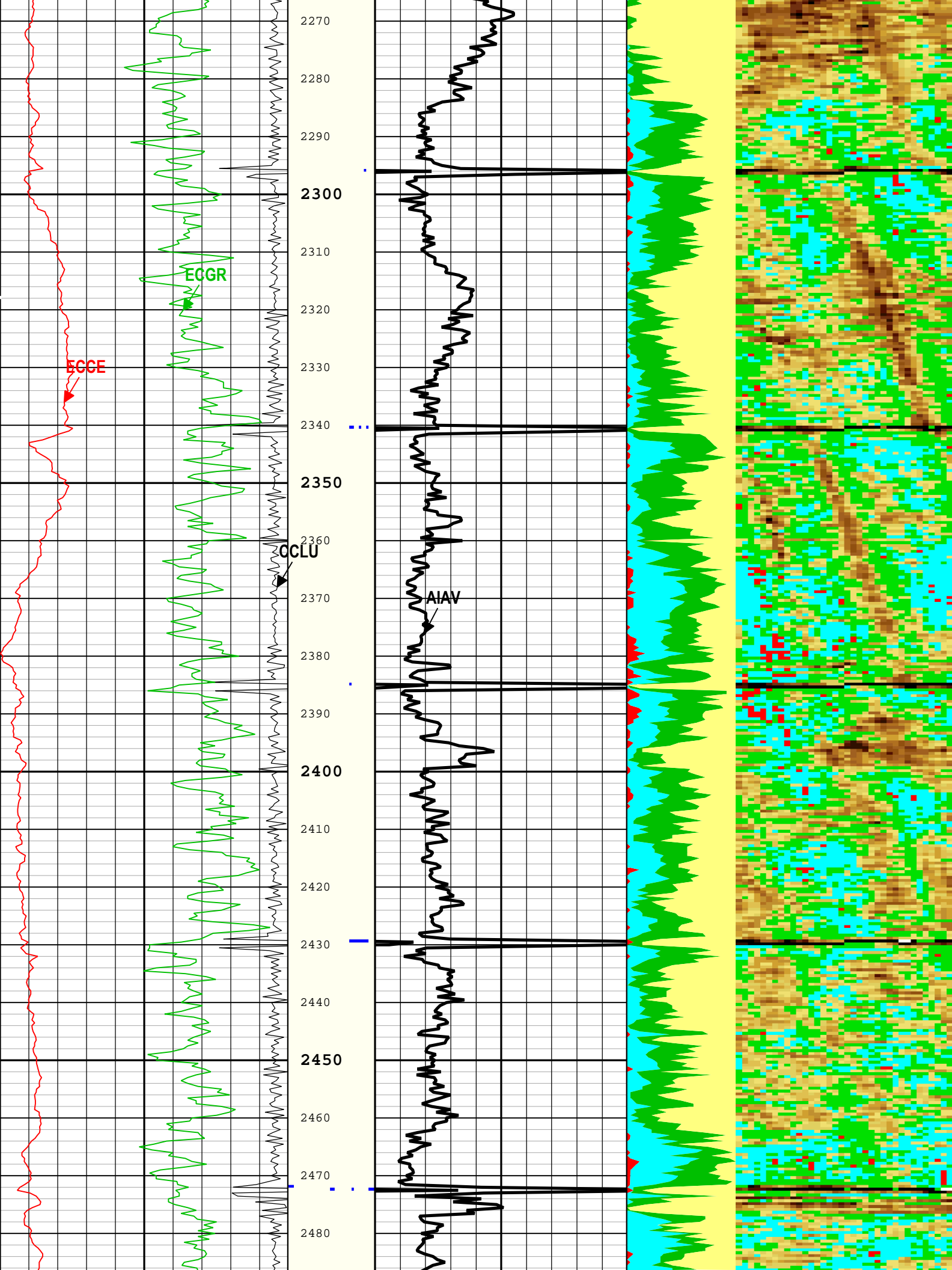
All depth are actual.

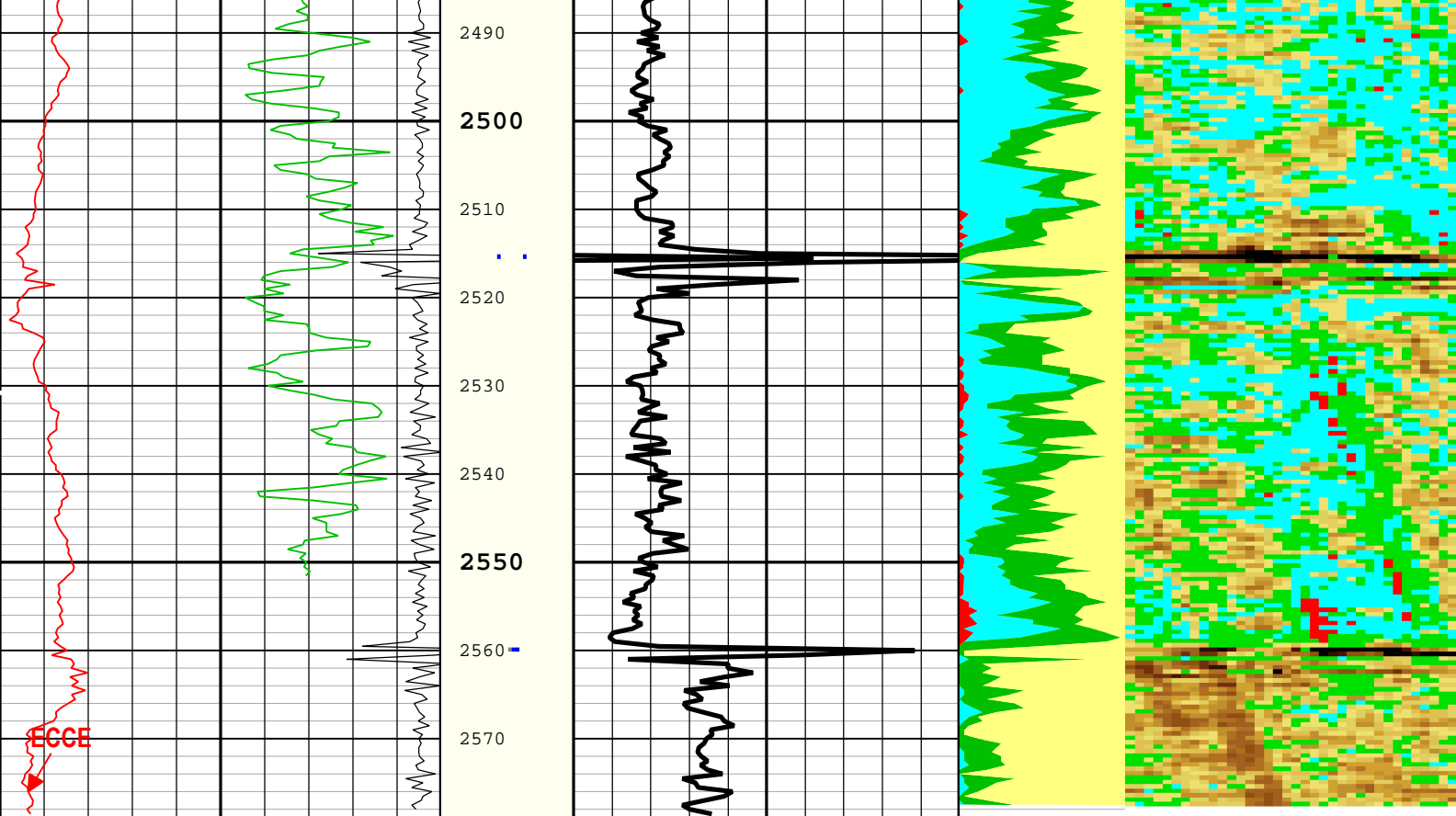
Tool Control Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	40	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	RED	







Casing Collar Locator Ultrasonic (CCLU)
USIT-E

Amplitude of Eccentering (ECCE) USIT-E

Gamma Ray (ECGR) HGNS-H

gAPI

Acoustic Impedance Average (AIAV)
USIT-E

Gas

Liquid

Micro-Debonding

Bonded

Custom Normalization
USIT - Acoustic Impedance With
Micro-debonding Image
(AI_MDEBOND_IMG) USIT-E
(Mrayl)

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: 11-Apr-2017 17:55:39

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	8.5	in
CBLO	Casing Bottom (Logger)	WLSESSION	16352.4	ft
CDEN	Cement Density	HGNS-H	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	9	lbm/gal
DFT	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	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAP	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	1.1	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0.05	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

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	40	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	
UMFR	Modulation Frequency	USIT-E	333333	Hz
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	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	7500	ft
WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	71.88	us

XYZ

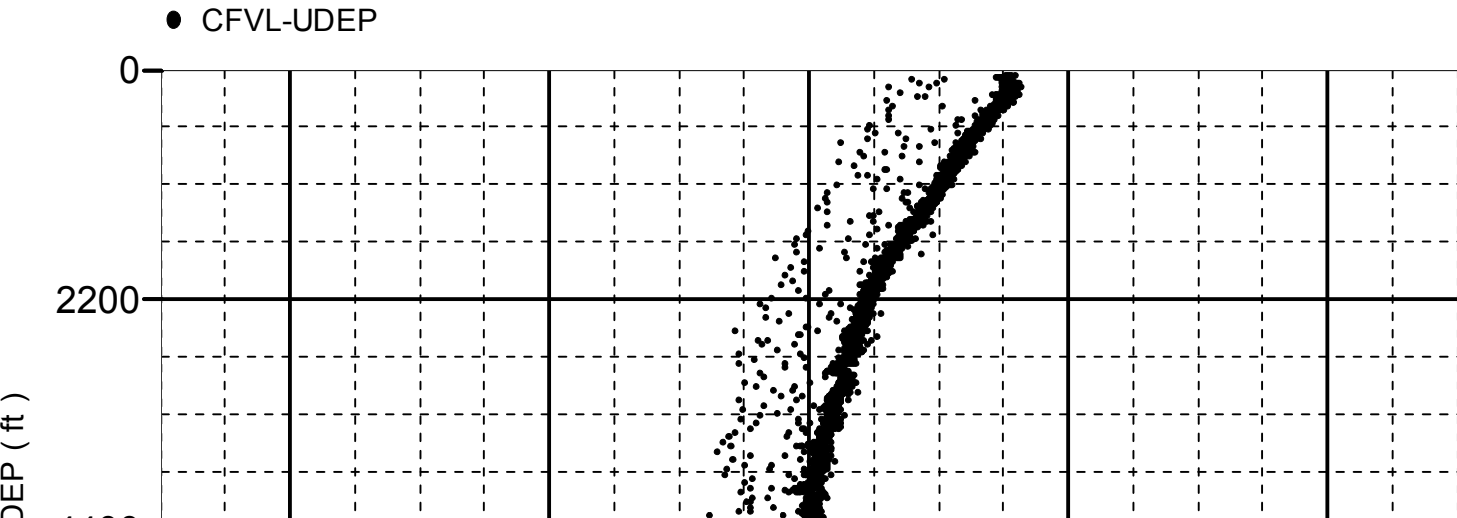
Company:Noble Energy Inc Well:Wells Ranch State AA33-750

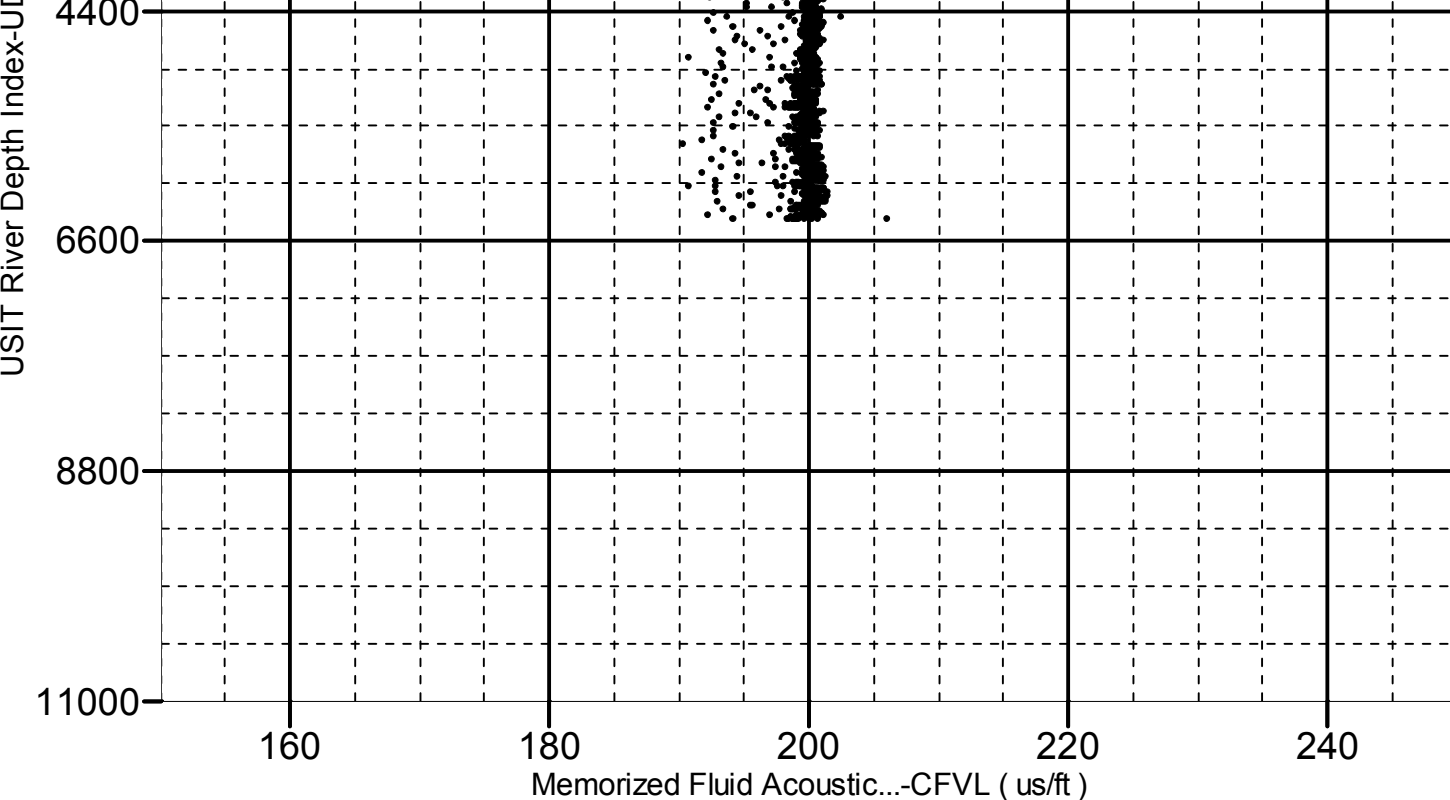
One: Log[5]:Up:S004

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6404.00 to 63.50 ft





XYZ

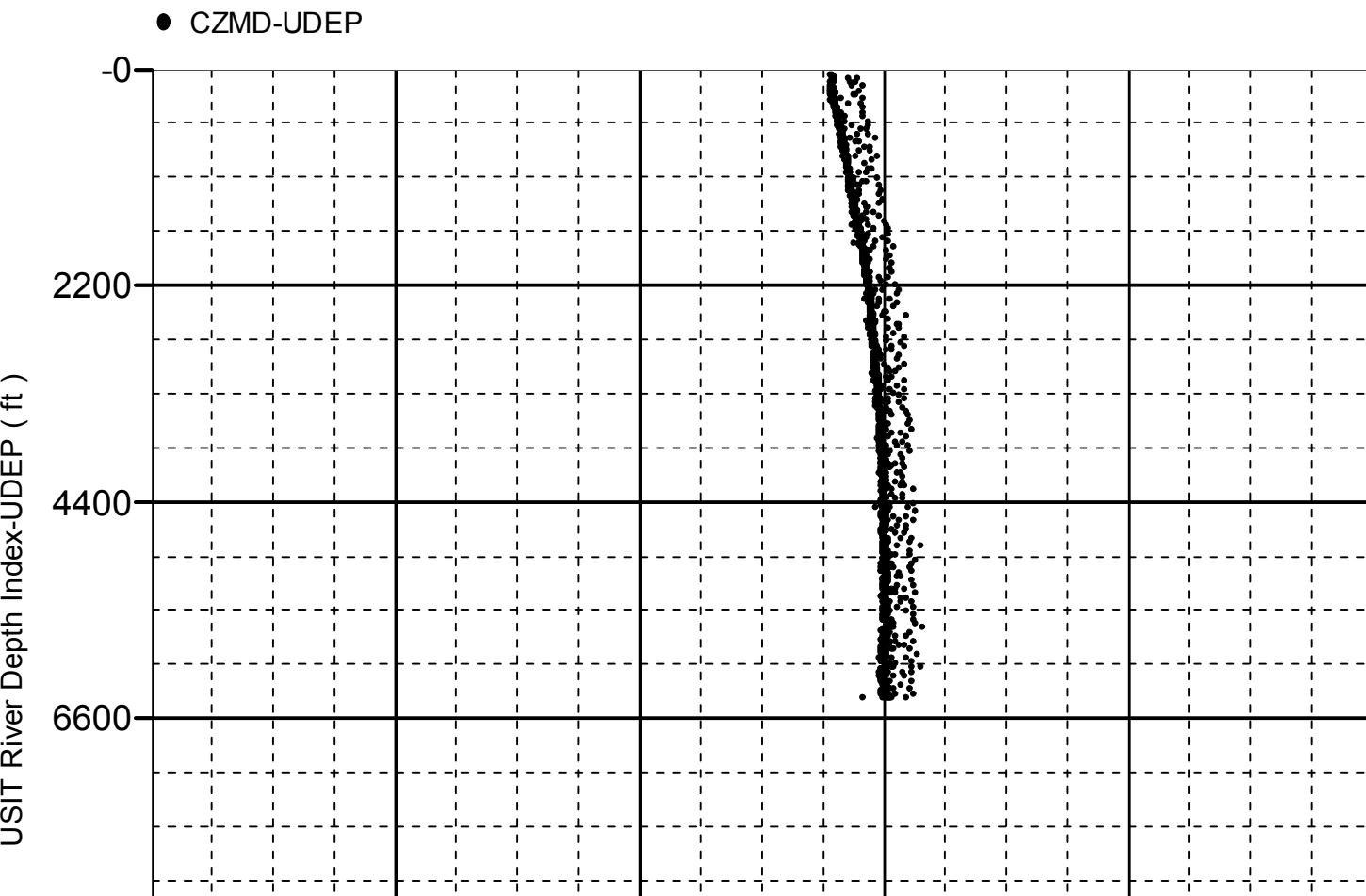
Company:Noble Energy Inc Well:Wells Ranch State AA33-750

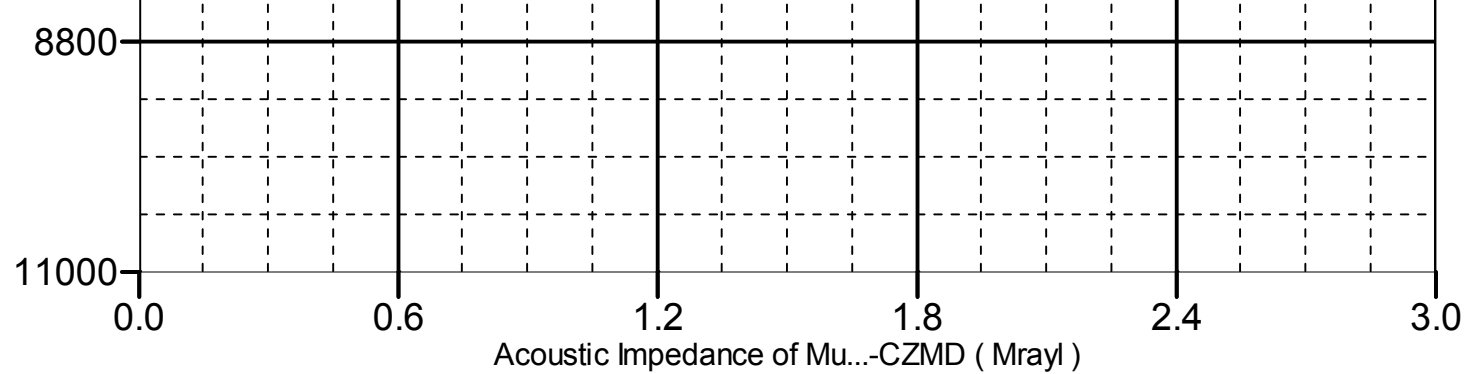
One: Log[5]:Up:S004

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6404.00 to 63.50 ft





Company: Noble Energy Inc

Schlumberger

Well: Wells Ranch State AA33-750

Field: Wattenberg

County:	Weld
Country:	US
UltraSonic Summary Print	