

Company: Noble Energy, Inc.

Well: Bennett LD19-758

Field: Wildcat

County: Weld State: Colorado

UltraSonic Summary Print

County:	Weld
Field:	Wildcat
Location:	SESW Sec 19, T9N, R58W
Well:	Bennett LD19-758
Company:	Noble Energy, Inc.
Location:	
SESW Sec 19, T9N, R58W	Elev.: K.B. 4877.00 ft
SHL: 380' FSL X 1435' FWL	G.L. 4847.00 ft
Lat/Long: 40.7302/-103.91142	D.F. 4876.00 ft
Permanent Datum:	Ground Level
Log Measured From:	Kelly Bushing
Drilling Measured From:	Kelly Bushing
API Serial No.	Section: 19
05-123-43493-0000	Township: 9N
	Range: 58W

Logging Date	08-Dec-2016
Run Number	One
Depth Driller	10963.00 ft
Schlumberger Depth	10963.00 ft
Bottom Log Interval	6160.00 ft
Top Log Interval	0.01 ft
Casing Fluid Type	Water
Salinity	
Density	9.4 lbm/gal
Fluid Level	8.00 ft
BIT/CASING/TUBING STRING	
Bit Size	8.50 in
From	1937.00 ft
To	10963.00 ft
Casing/Tubing Size	5.5 in
Weight	20 lbm/ft
Grade	P110
From	0.00 ft
To	10912.00 ft
Max Recorded Temperatures	199 degF
Logger on Bottom	08-Dec-2016 13:00:00
Unit Number	2161
Recorded By	A Becker
Witnessed By	

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.

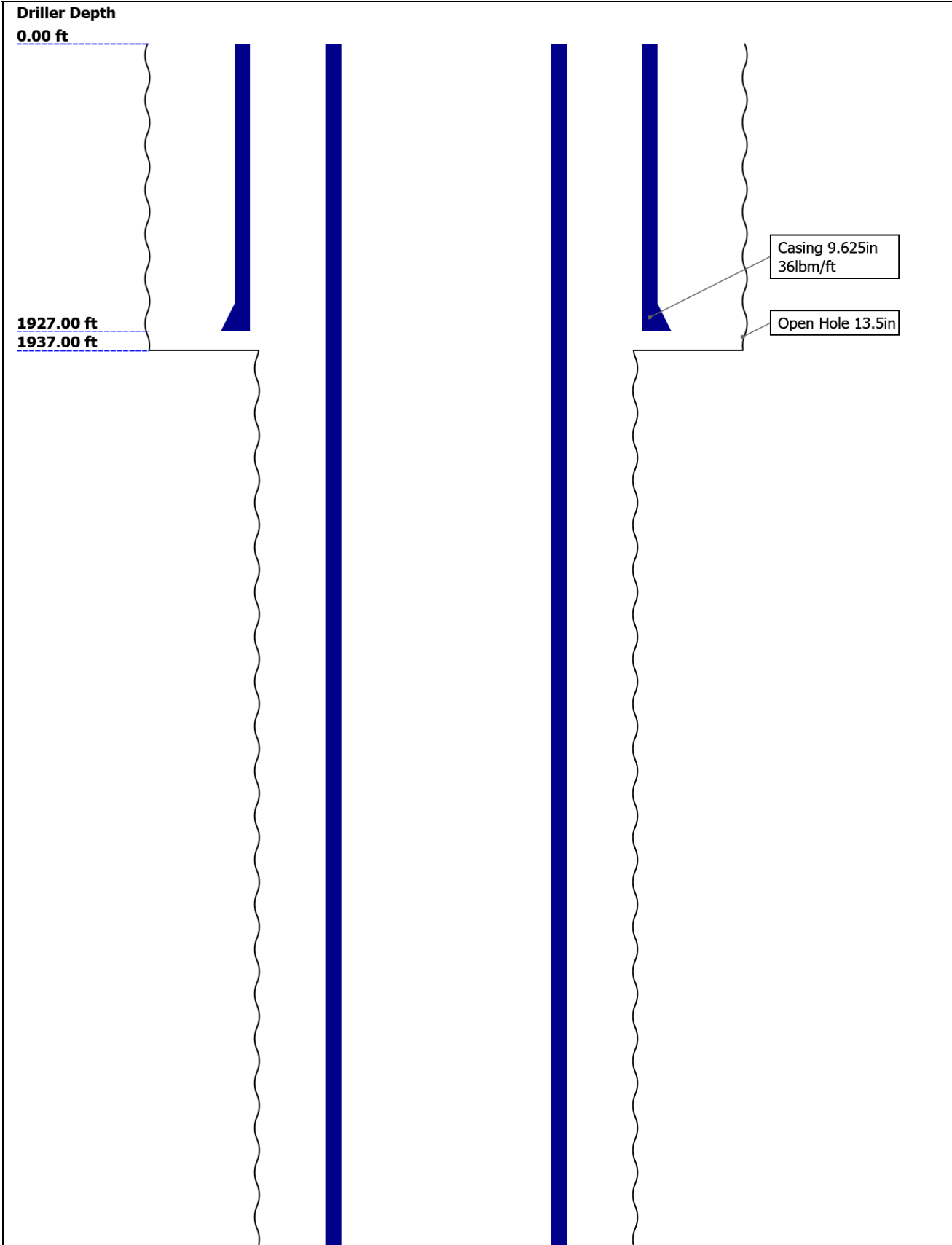
Contents

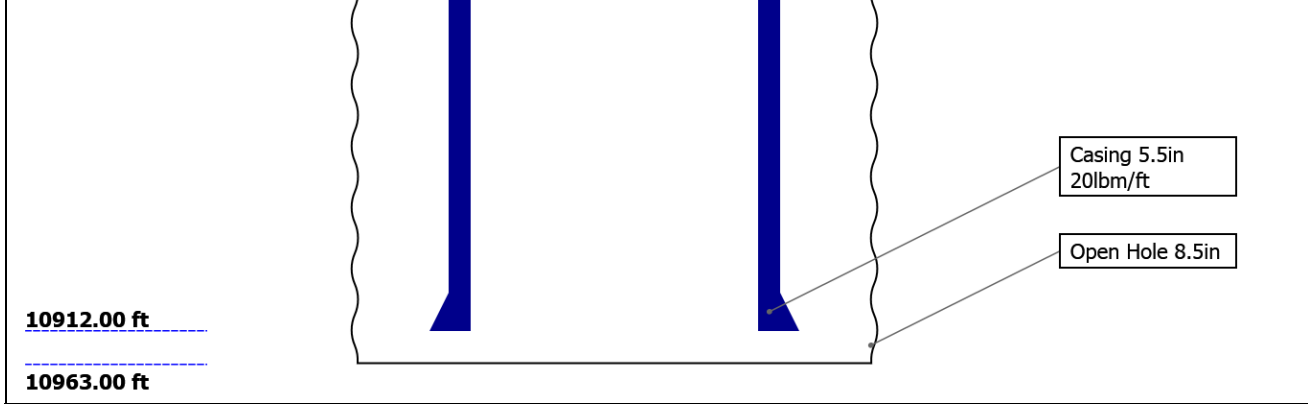
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Well Sketch





Borehole Size/Casing/Tubing Record

Bit						
Bit Size ( in )	13.5	8.5				
Top Driller ( ft )	0	1937				
Top Logger ( ft )	0	1937				
Bottom Driller ( ft )	1937	10963				
Bottom Logger ( ft )	1937	10963				
Casing						
Size ( in )	9.625	5.5				
Weight ( lbm/ft )	36	20				
Inner Diameter ( in )	8.921	4.778				
Grade	N/A	P110				
Top Driller ( ft )	0	0				
Top Logger ( ft )	0	0				
Bottom Driller ( ft )	1927	10912				
Bottom Logger ( ft )	1927	10912				

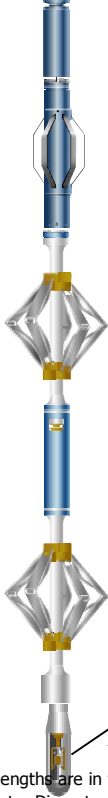
Remarks and Equipment Summary

One: Toolstring			One: Remarks	
<div><div><div>Equip name Length</div><div>LEH-QT 33.83</div><div>LEH-QT</div></div><div><div>SAH-F:99 30.91</div><div>2</div></div><div><div>EDTC-B:9 26.06</div><div>100</div><div>EDTH-B:93 39</div><div>EDTG-A</div><div>EDTC-B:91 00</div></div><div><div>AH-184[ 2]:1962</div><div>19.56</div></div><div><div>AH-184[ 2]:1962</div><div>17.56</div></div></div> <div><div><div>CTEM 22.56</div><div>ACCZ 0.00</div><div>HV 0.00</div><div>Gamma Ray 20.69</div><div>TelStatu s 19.56</div></div></div>				Toolstring run as per tool sketch
				Main pass recorded under 2500 psi, repeat under 0 psi
				Log recorded at 10 deg, 6 in resolution
				Crew: Kris Davis & Fernando Nava
				Thank you for choosing Schlumberger

1J:2749

USIT-E:92 15.56

1  
ECH-MFA:  
1908  
USAC-A:9  
21  
USIS-A:27  
75  
USSC-B:98  
5  
USRS-A:93  
2  
USI-SENS  
OR



USI Sen 0.37  
sor  
TOOL\_ZERO  
Head Fe  
nsion  
Lengths are in ft  
Maximum Outer Diameter = 4.800 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 5836  
Calibration Date 17-Sep-2016  
Calibrator Serial Number  
Calibration Cable Type 7-39P-LXS  
Wheel Correction 1 1  
Wheel Correction 2 -2

### 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 13000.00 ft  
Conveyance Type Wireline  
Rig Type

### One:Depth Control Parameters

Log Sequence First Log In the Well  
Rig Up Length At Surface  
Rig Up Length At Bottom

### Depth Control Remarks

First run in well depth control procedures followed  
IDW used as primary depth device, z-chart used for secondary

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	6196.89	54.73

Fluid Velocity = "Automatic".  
CFVL equals DFSL channel

Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)
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Mud Impedance = "FreePipe Norm."  
Free Pipe normalization zone is : 27.72m(90.95ft) to 34.87m(114.39ft)  
MUD\_N\_FRP = 1.06  
DFD = 1.13g/cm3(9.40lbm/gal)  
CZMD median computed in free pipe normalization interval = 1.74 MRayl

Start Depth(ft)	Stop Depth(ft)	Start Value(Mrayl)	End Value(Mrayl)
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One

2500 PSI Main Pass

## Software Version

Acquisition System	Version
Maxwell 2016 SP2	6.2.64464.3100

## Pass Summary

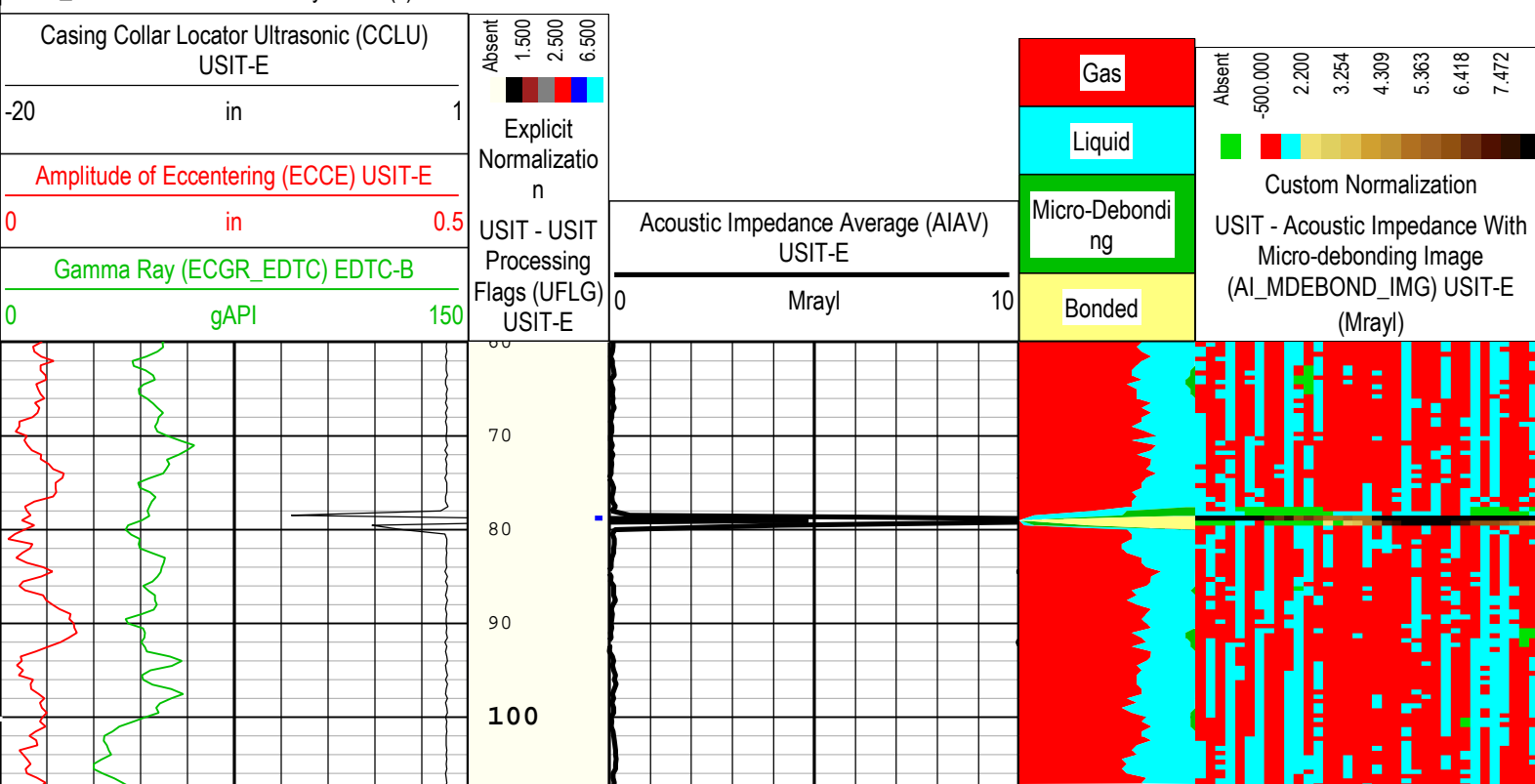
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[4]:Up	Up	54.73 ft	6196.89 ft	08-Dec-2016 7:07:15 PM	08-Dec-2016 7:48:46 PM	OFF	5.99 ft	Yes

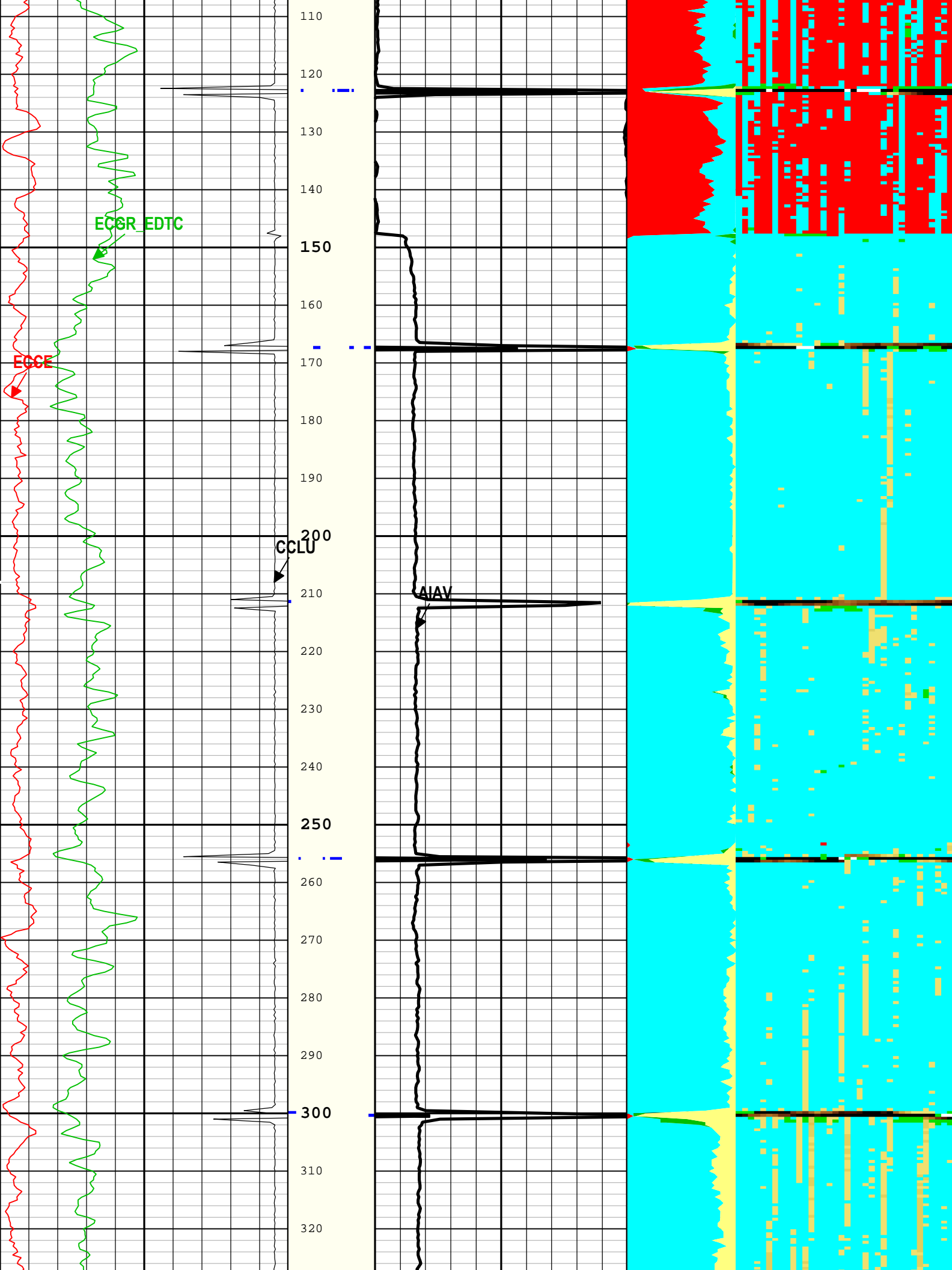
All depths are referenced to toolstring zero

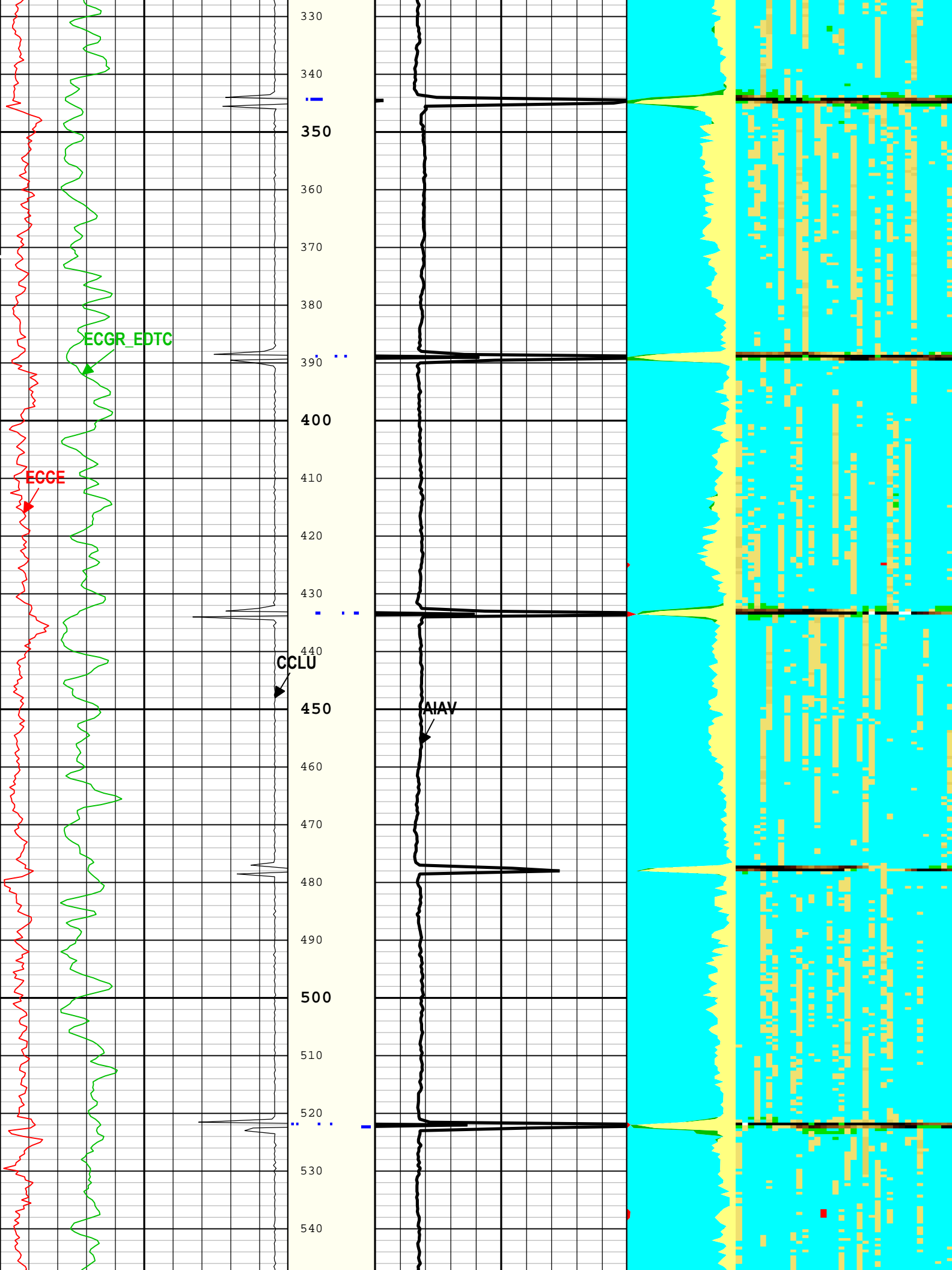
Log	Company:Noble Energy, Inc.	Well:Bennett LD19-758
		One: Log[4]:Up:S004

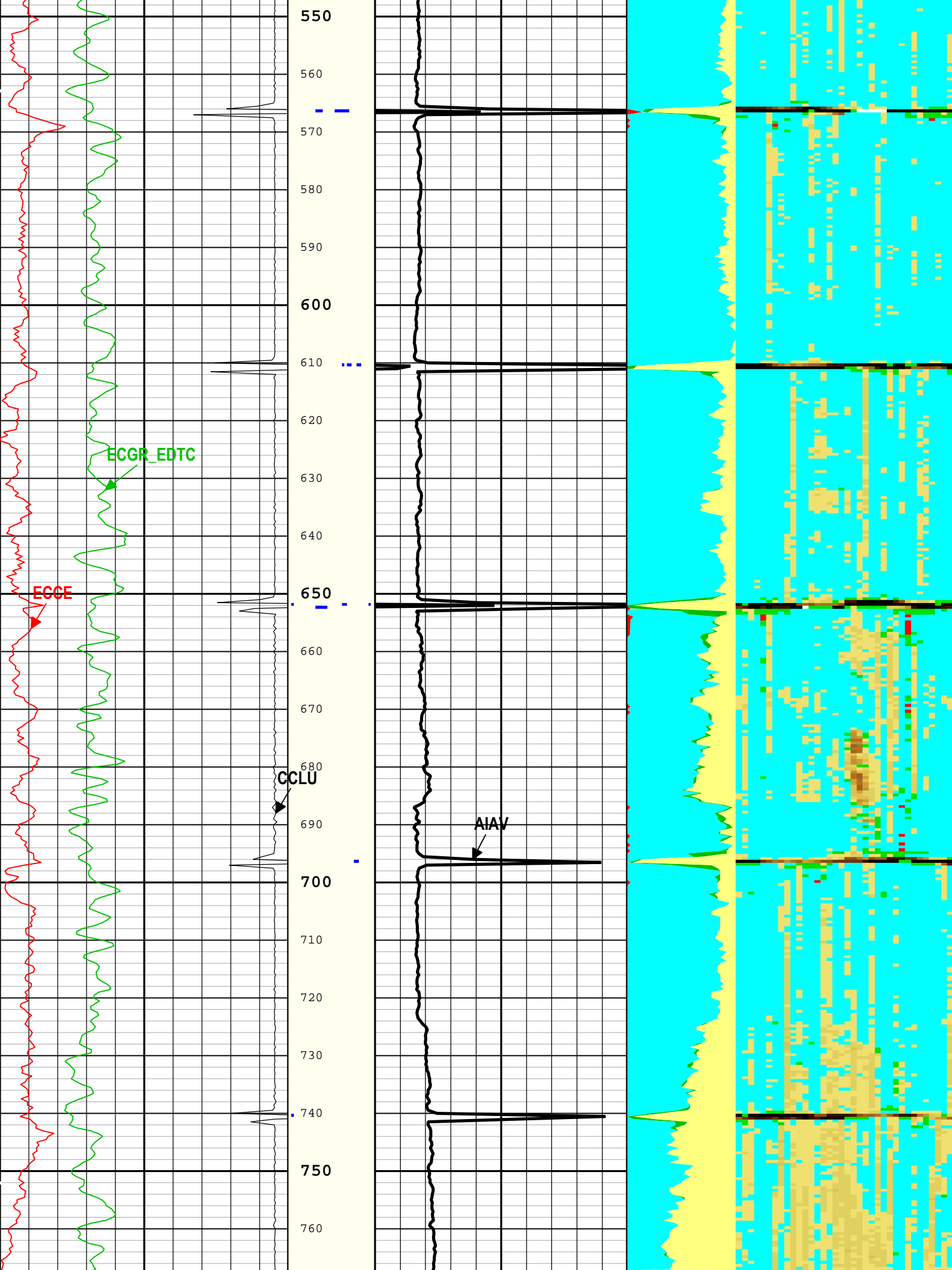
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Creation Date: 08-Dec-2016 20:04:59

TIME\_1900 - Time Marked every 60.00 (s)

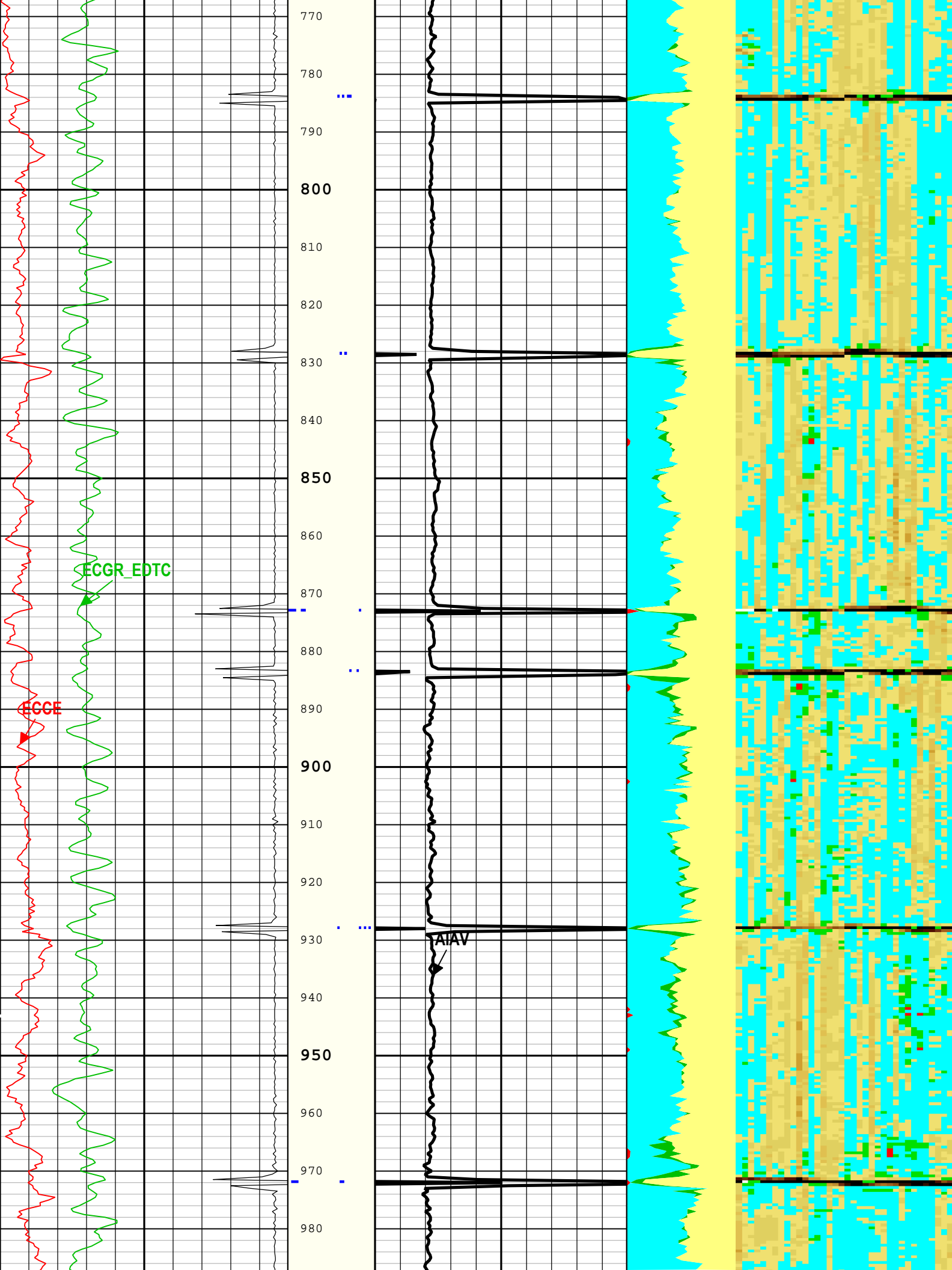


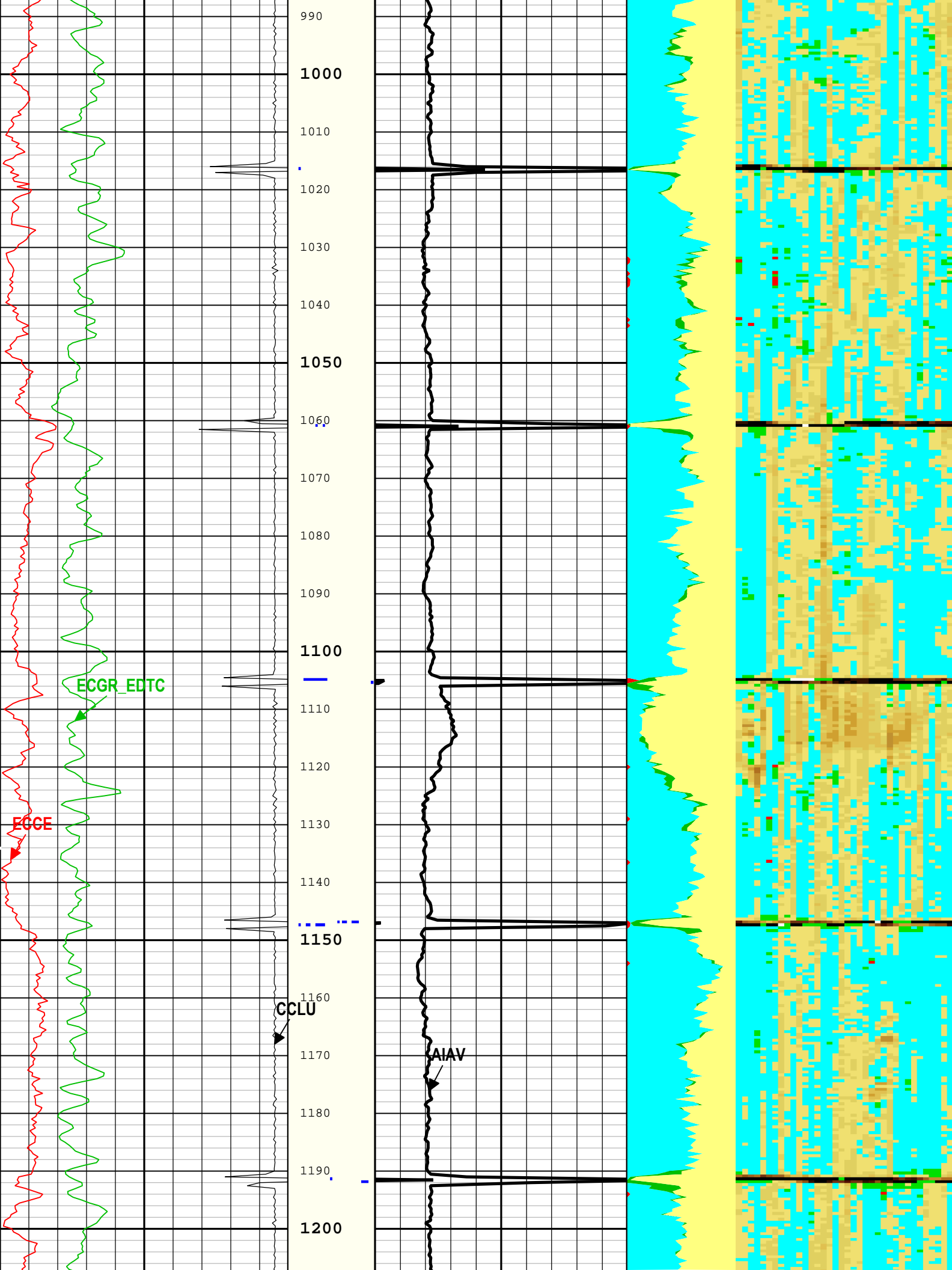


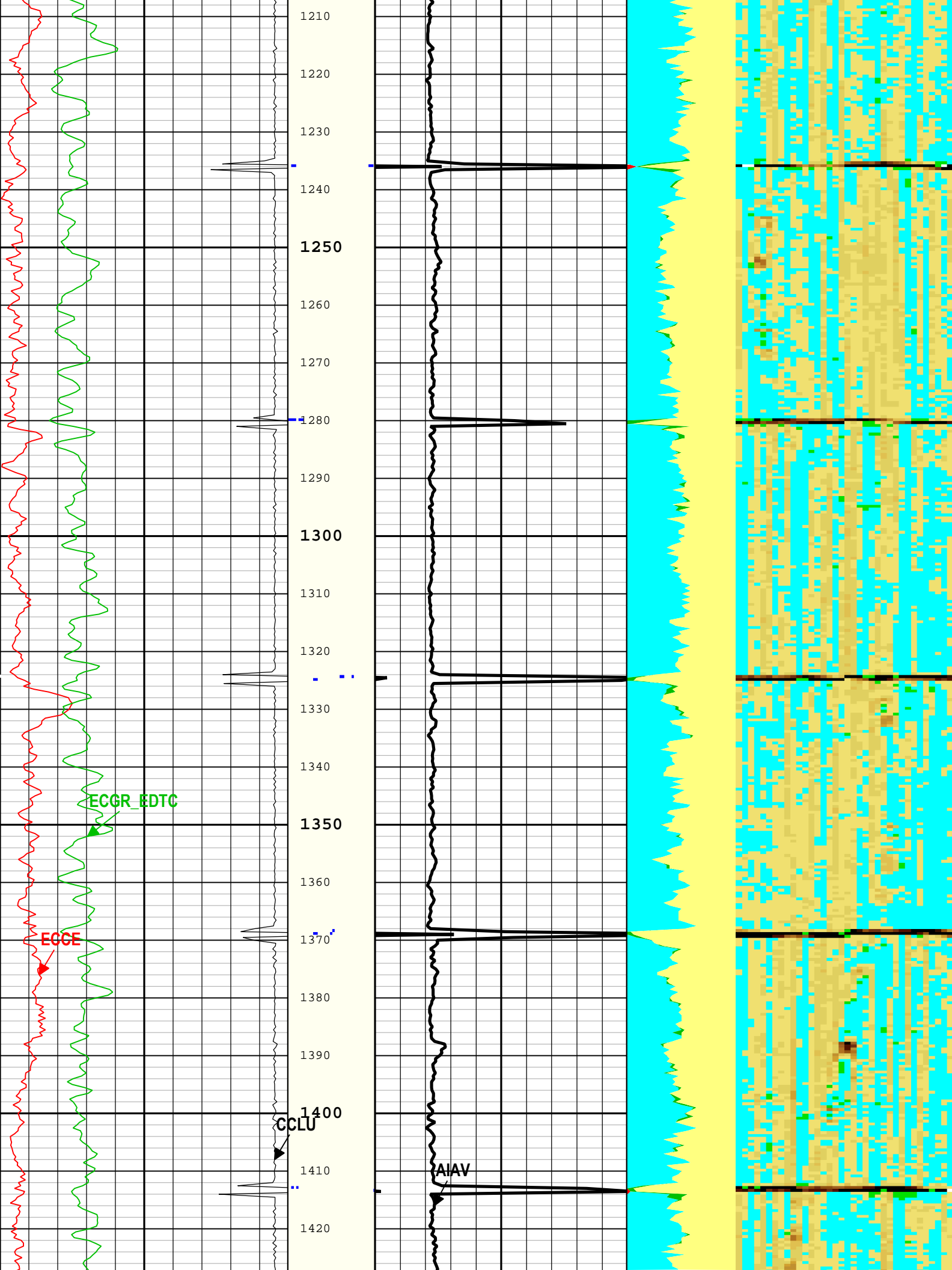


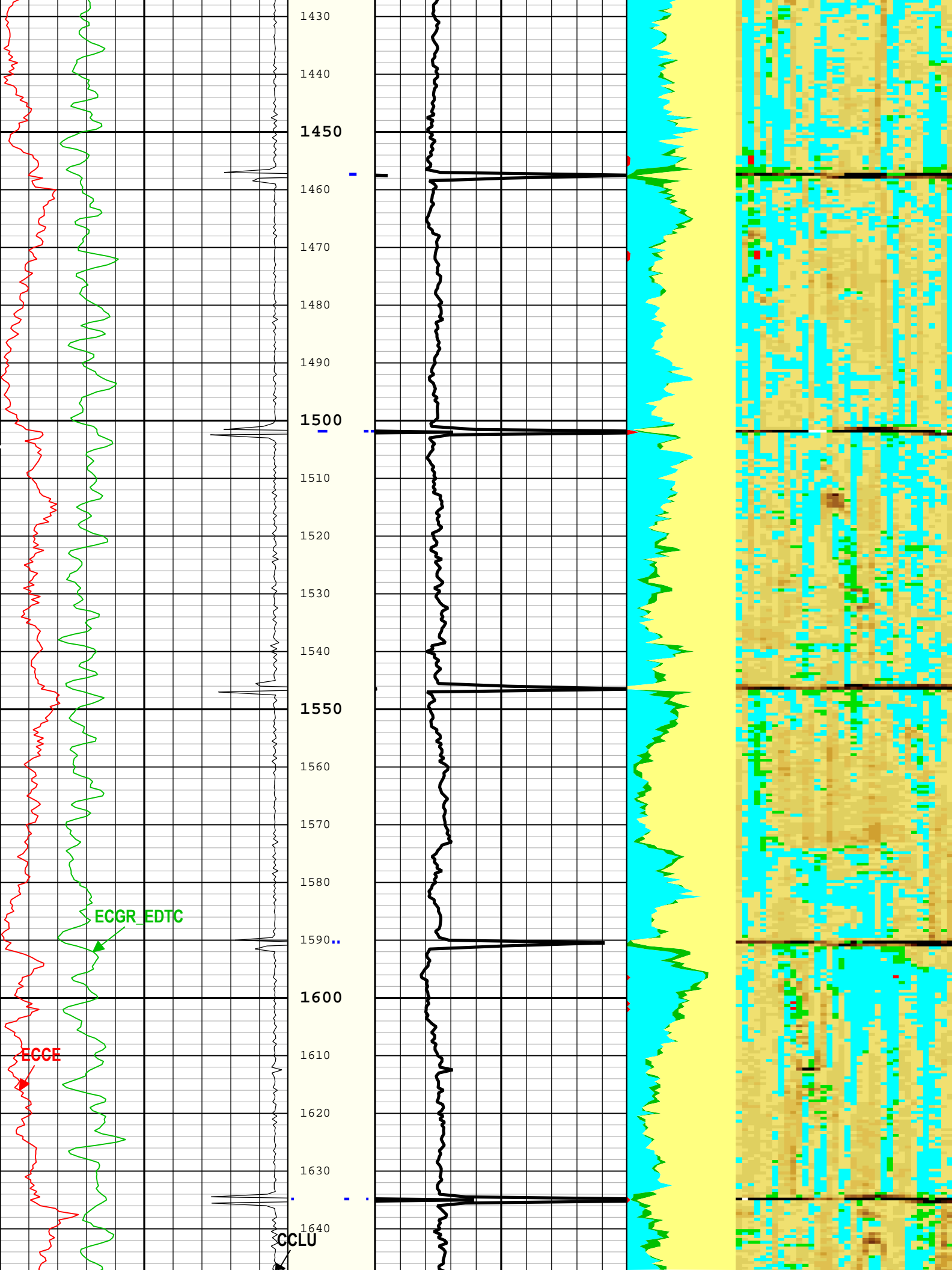


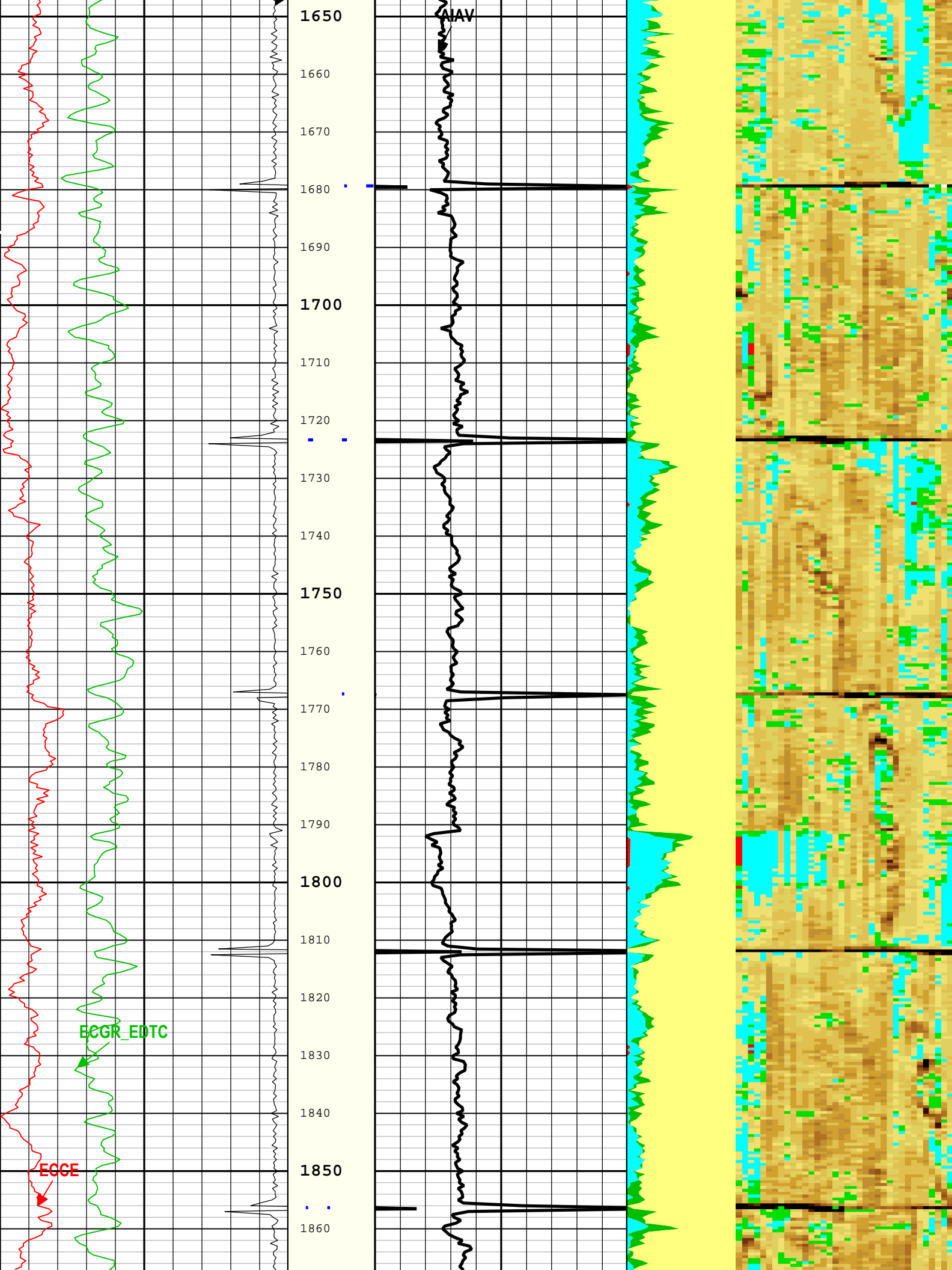


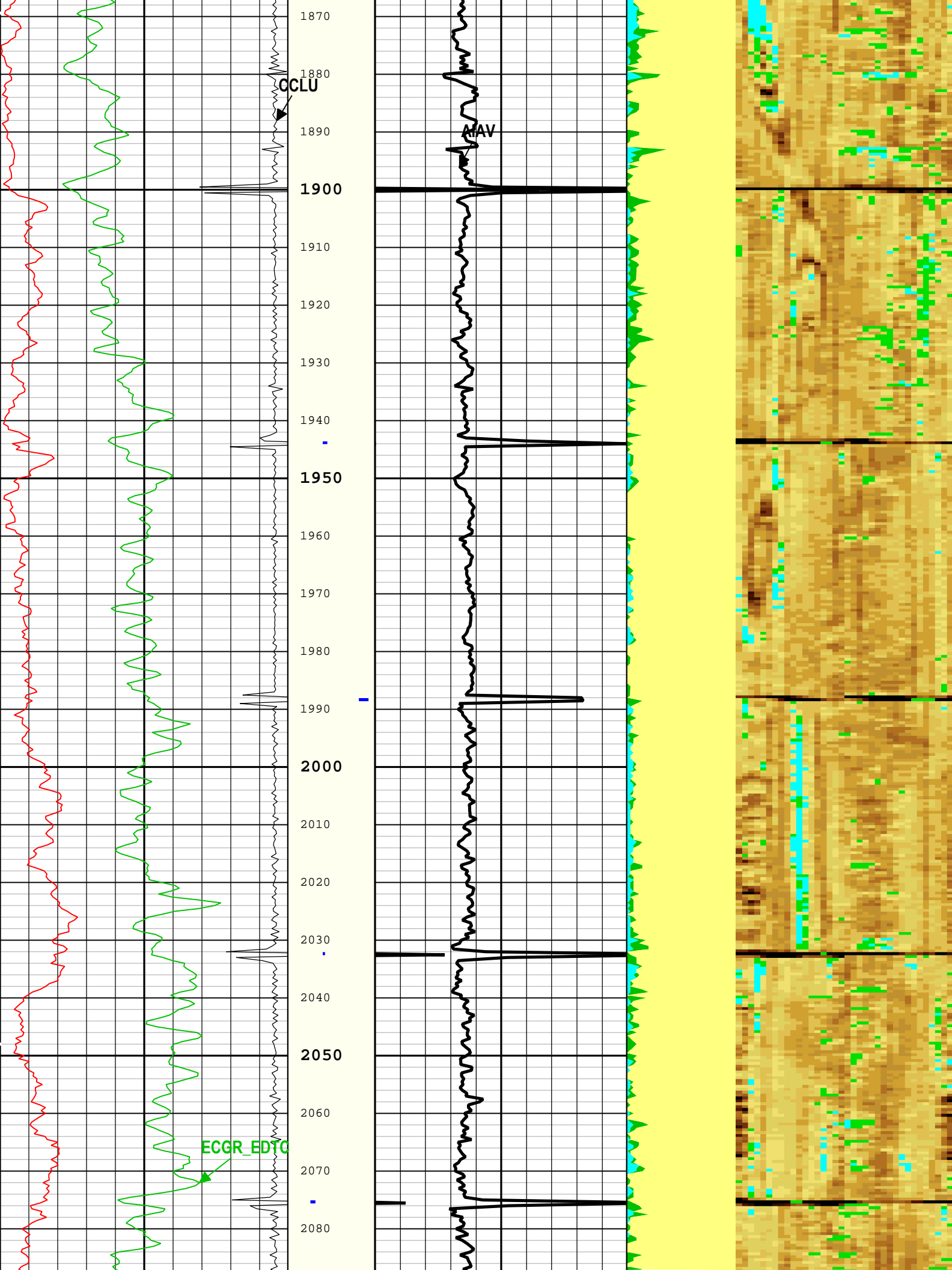


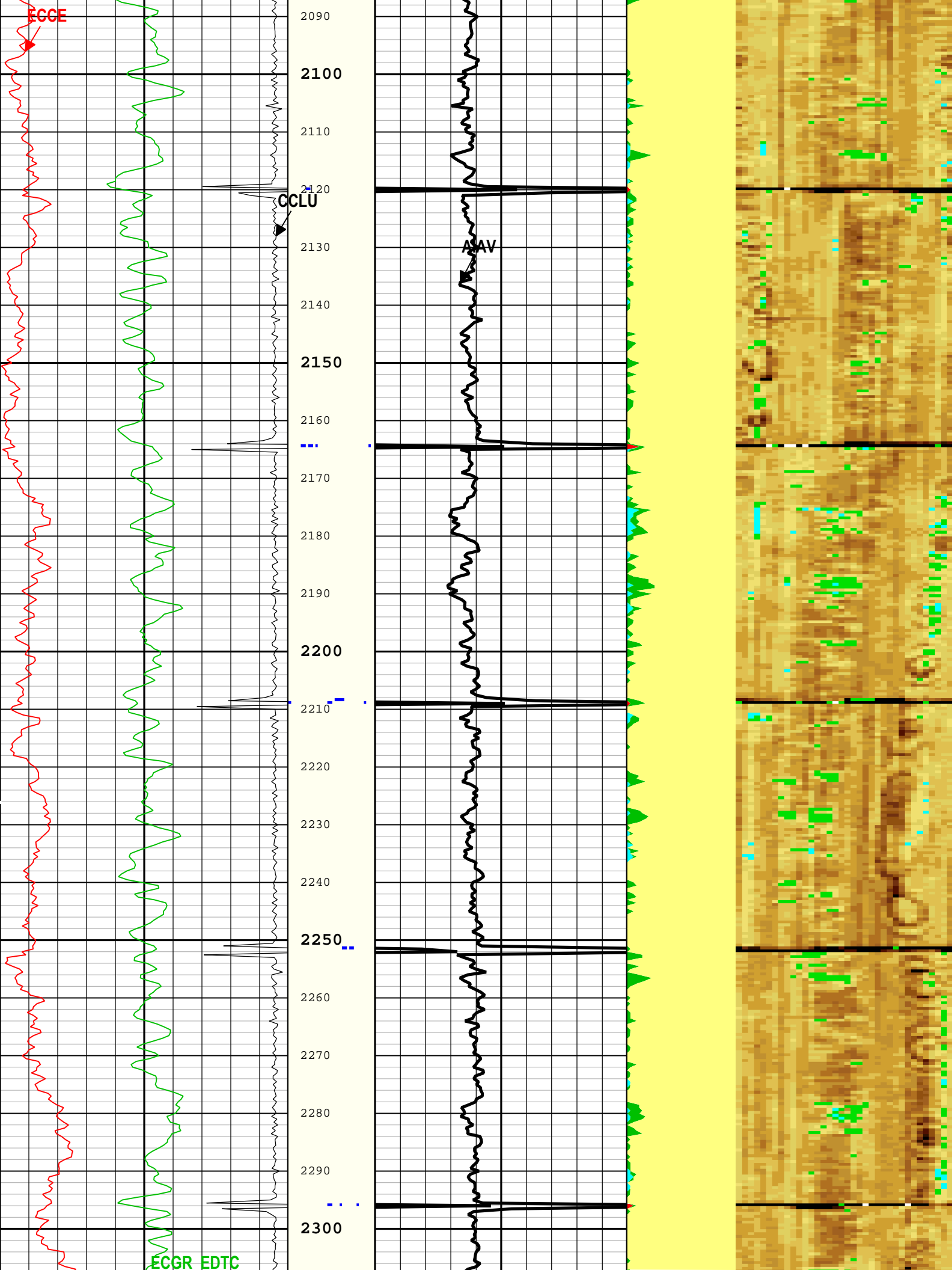


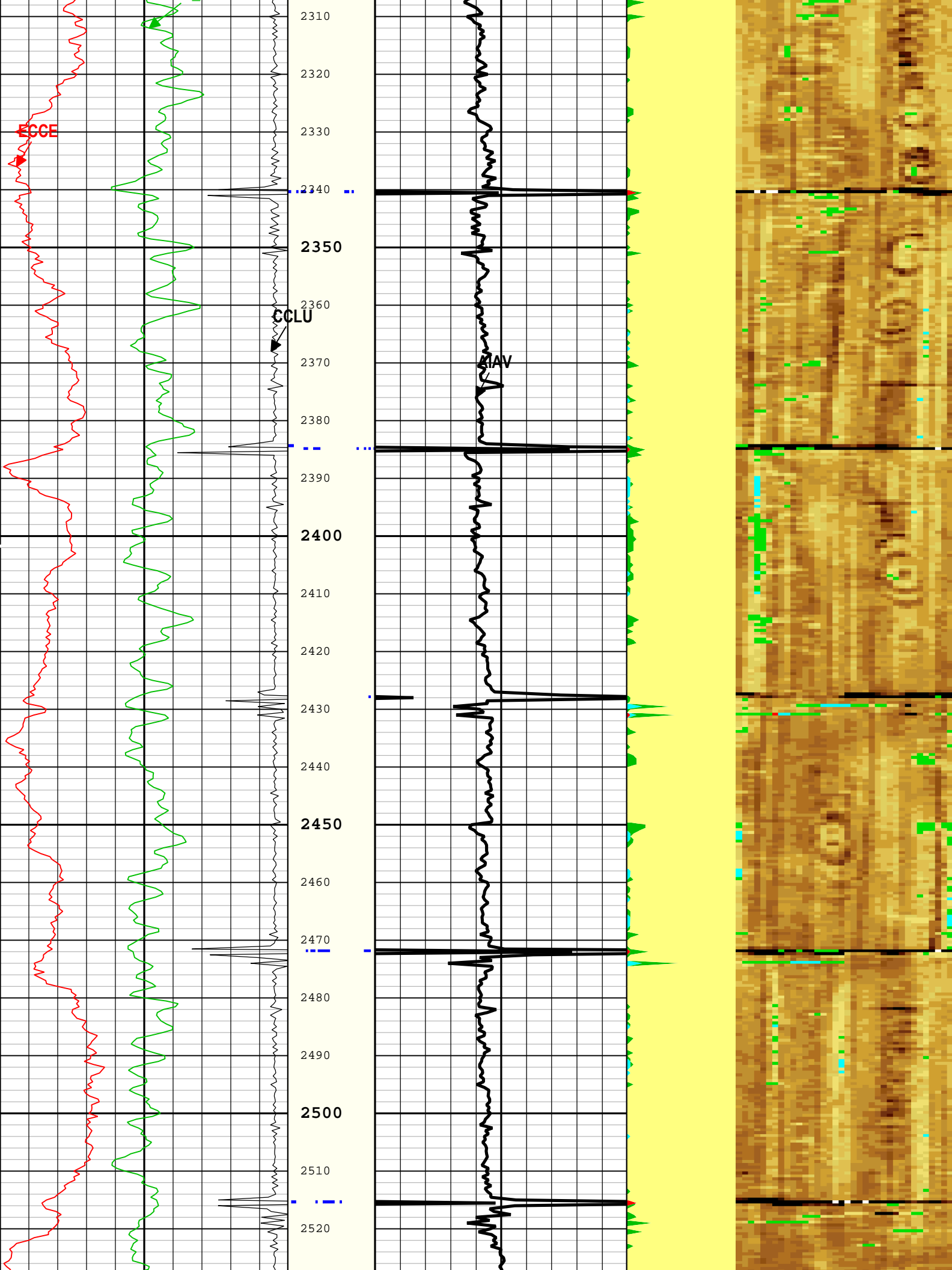




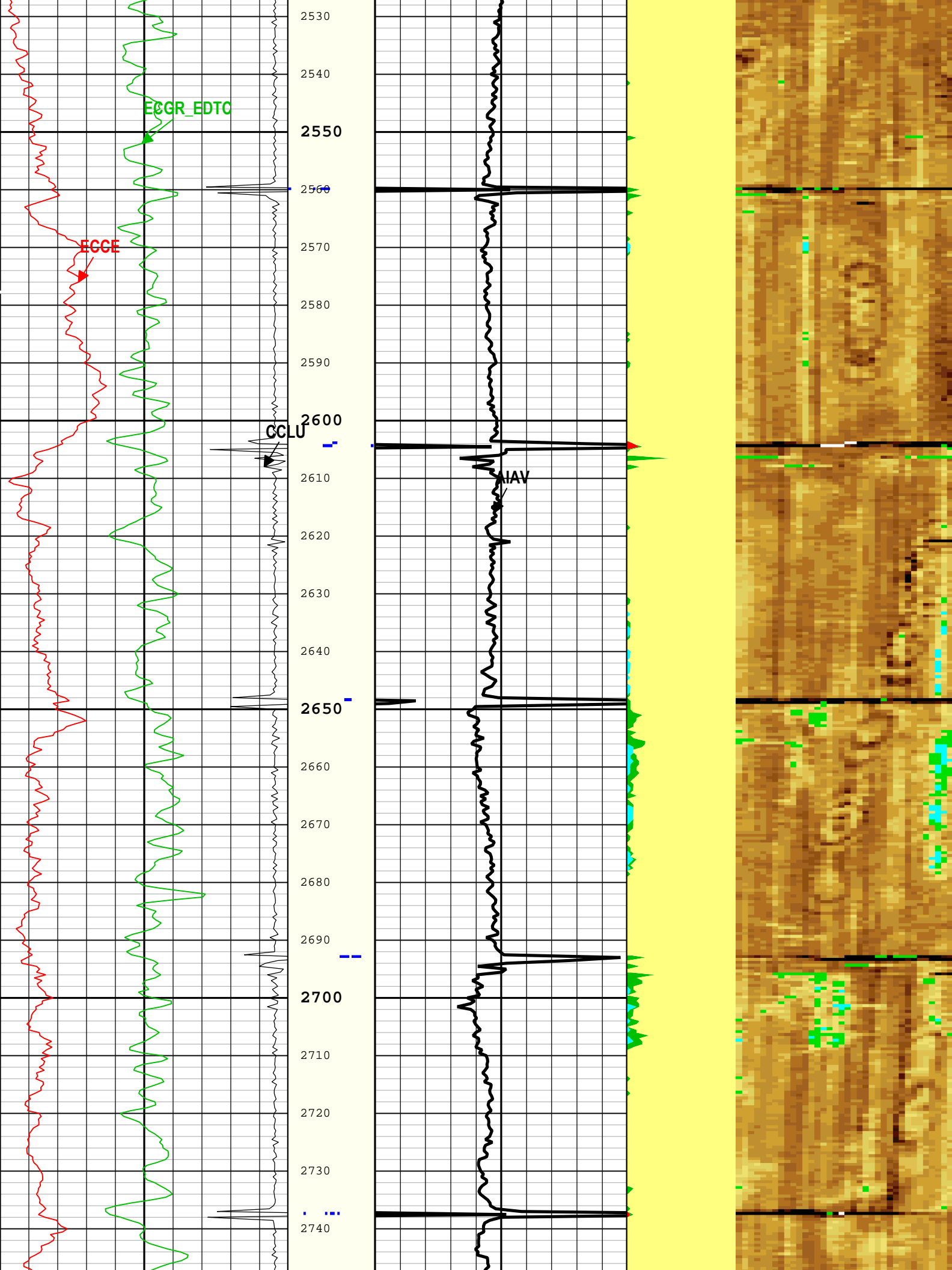


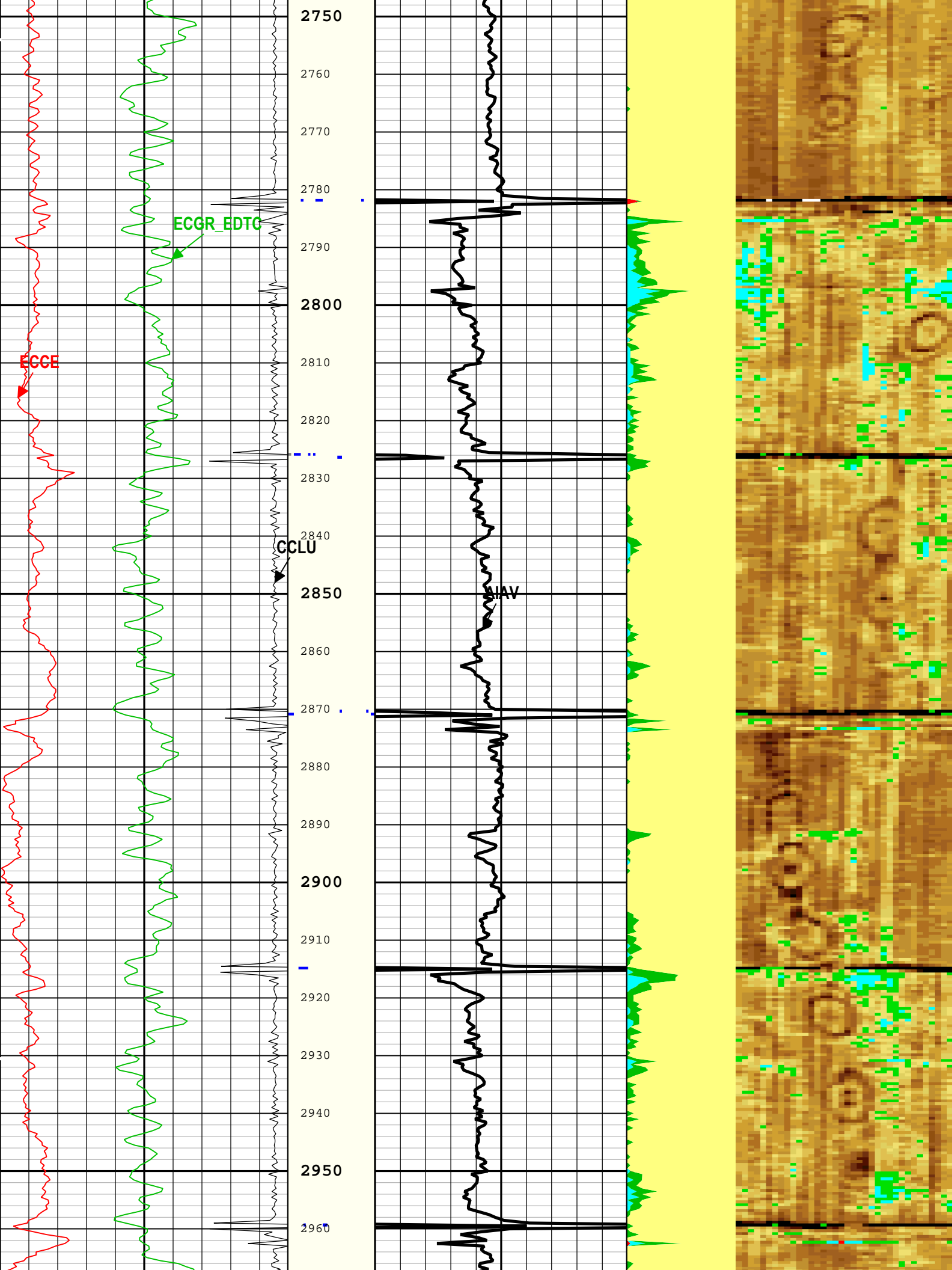


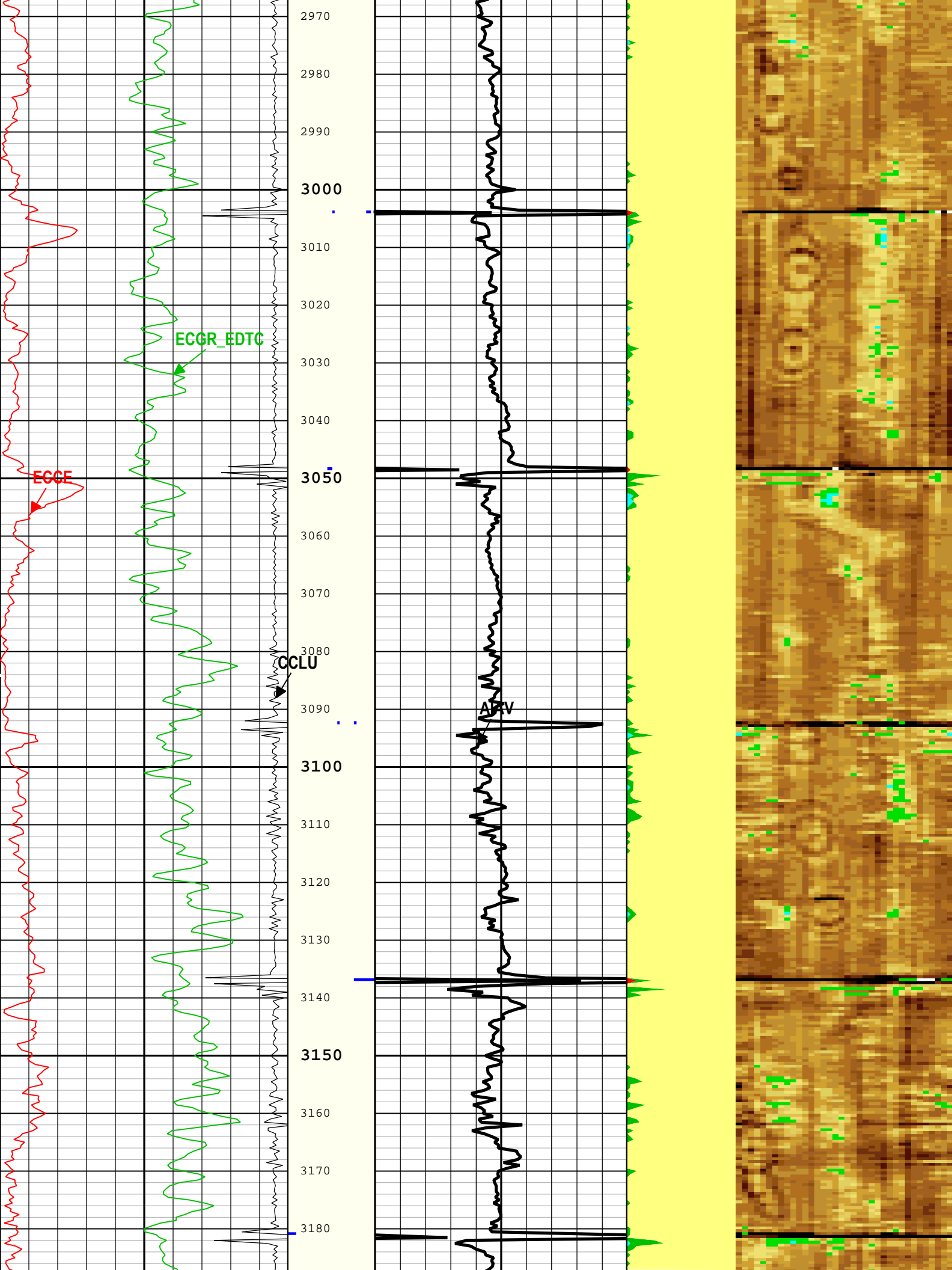


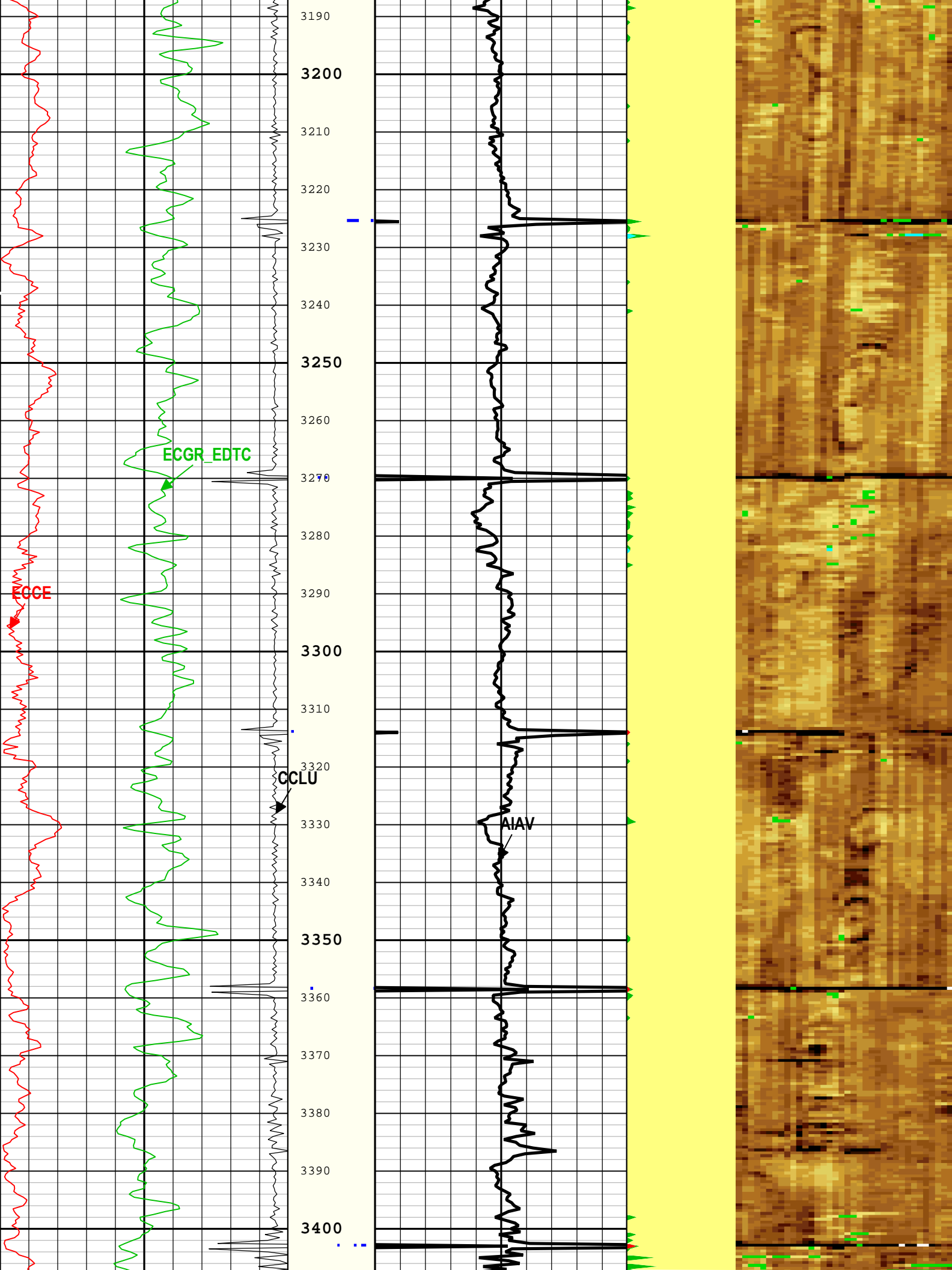


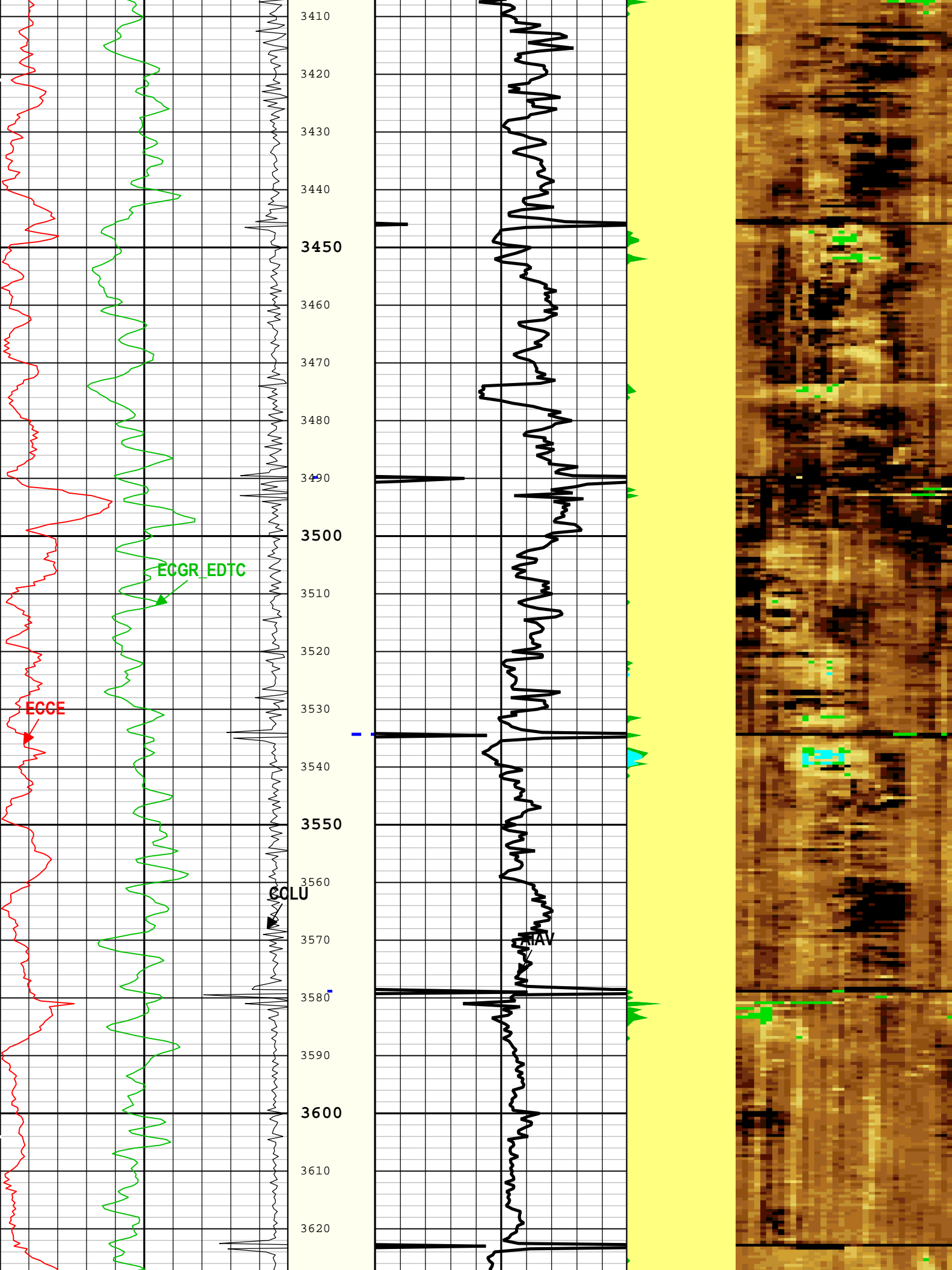


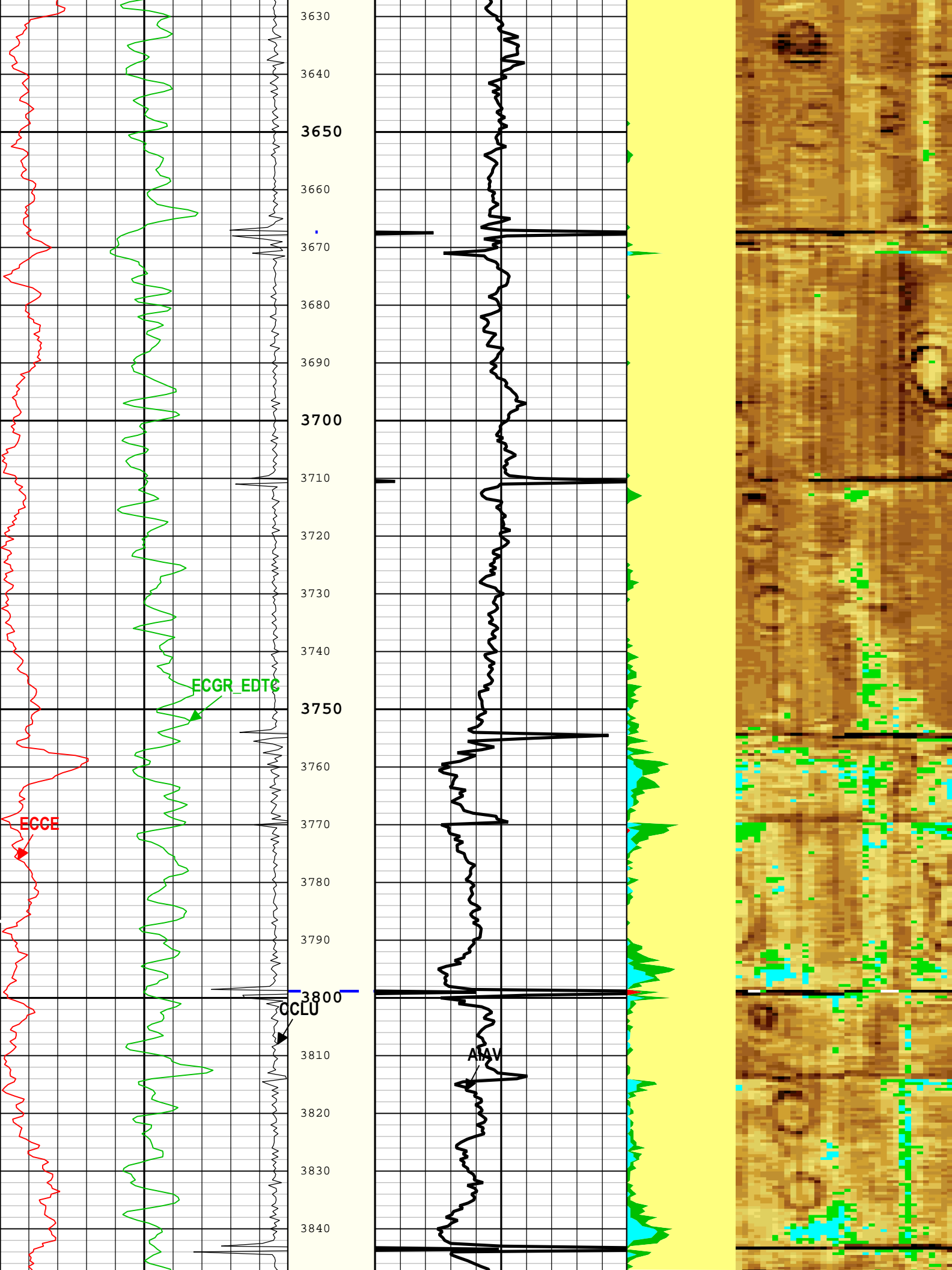


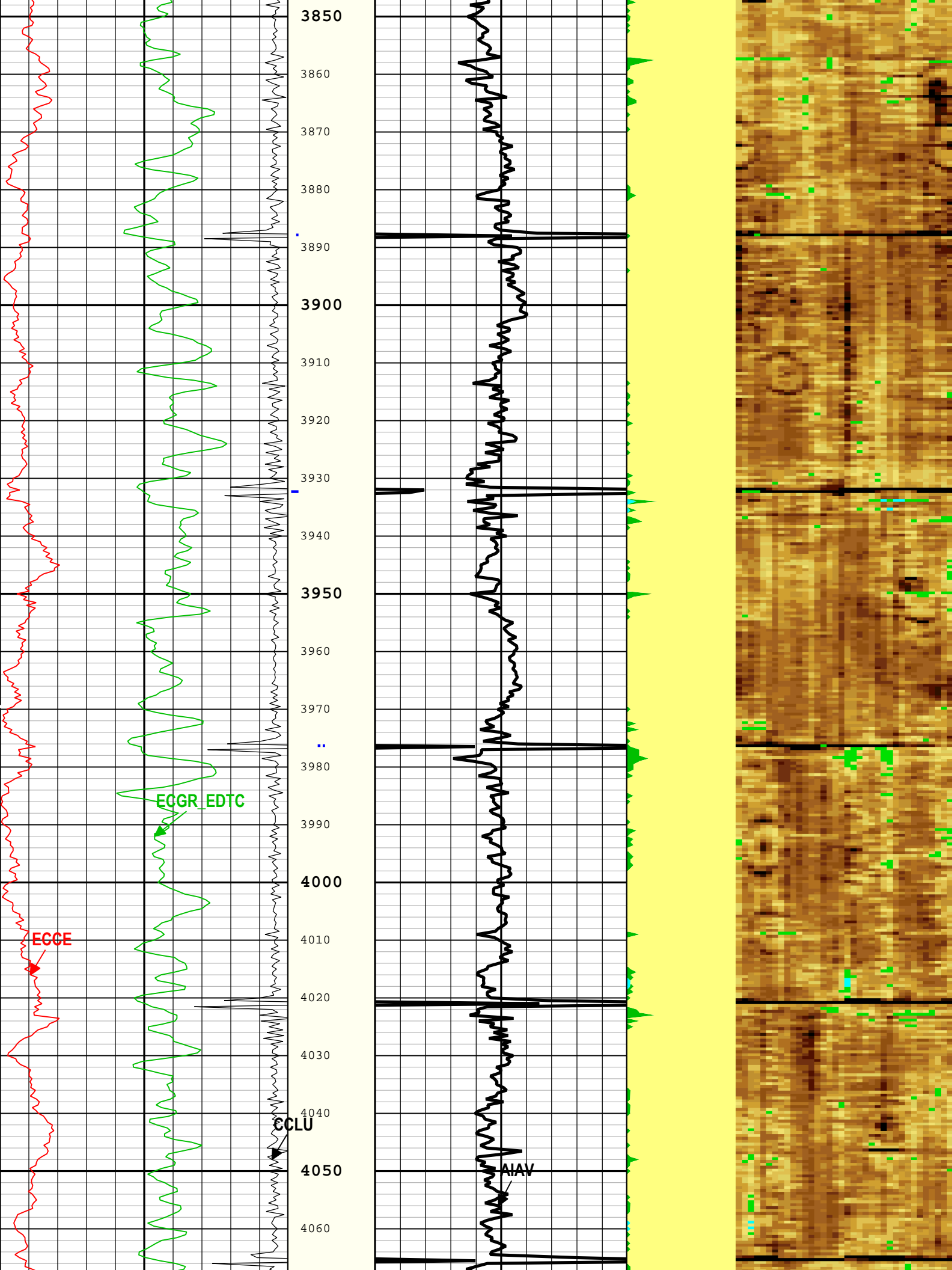


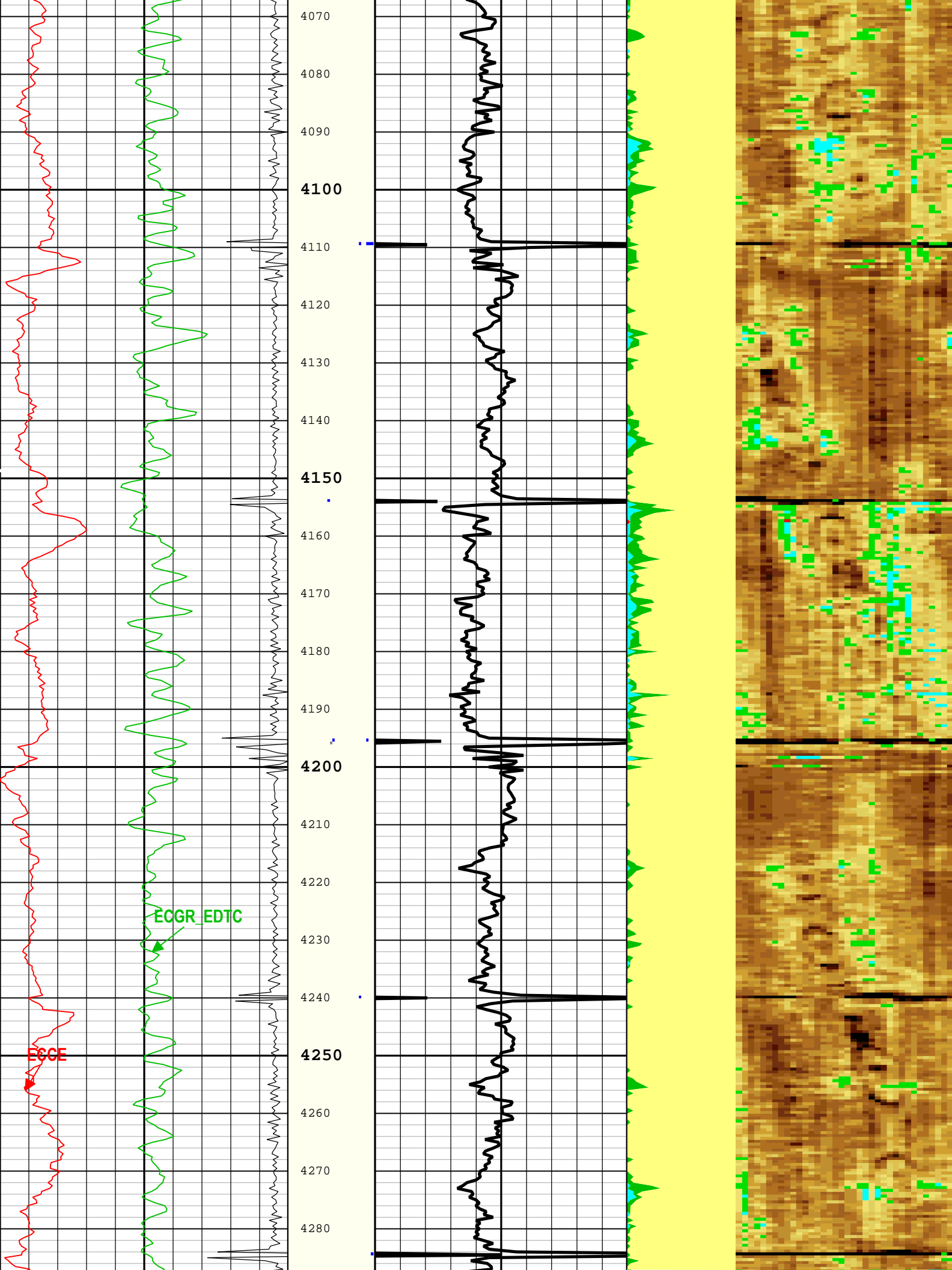




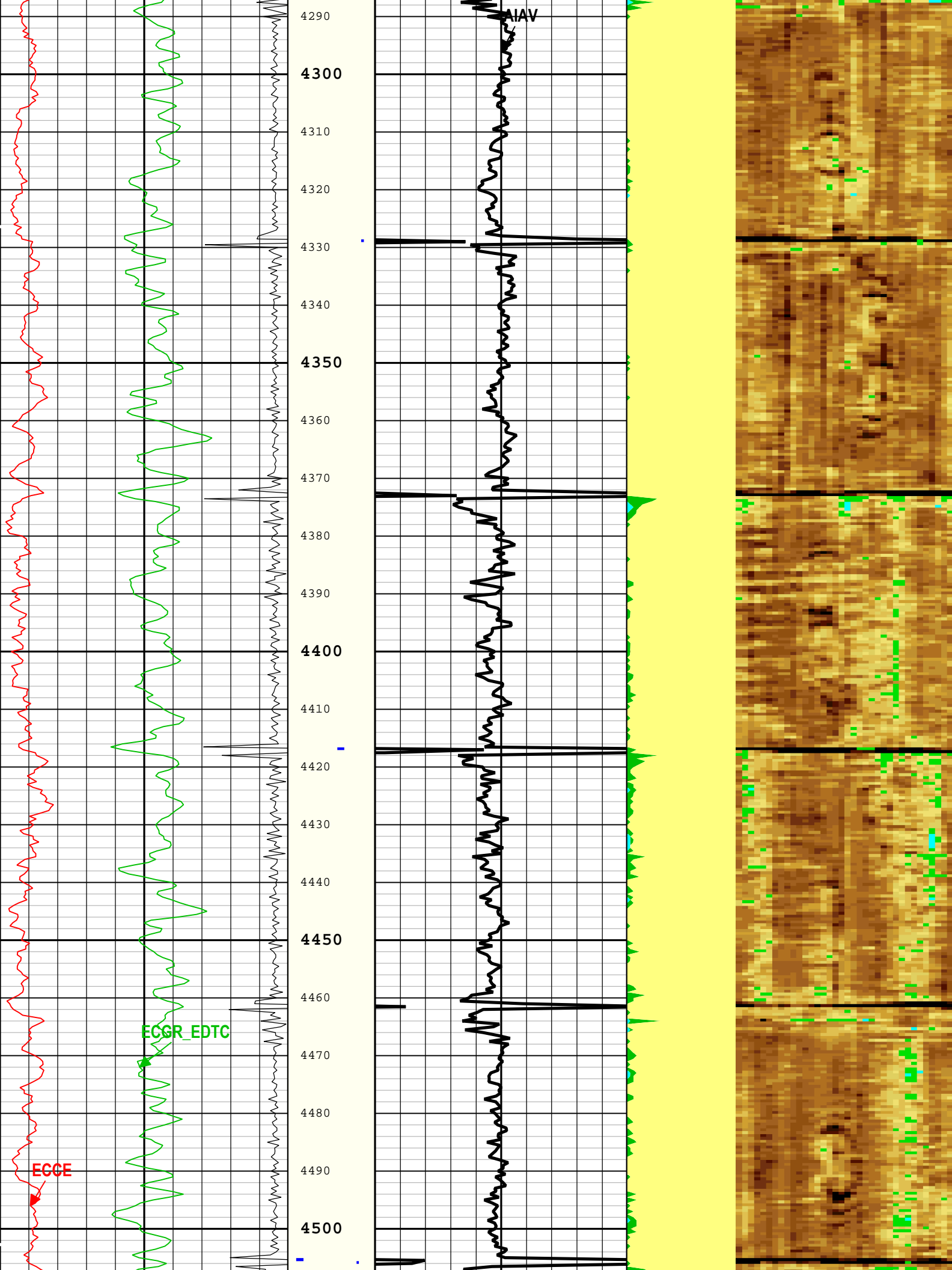


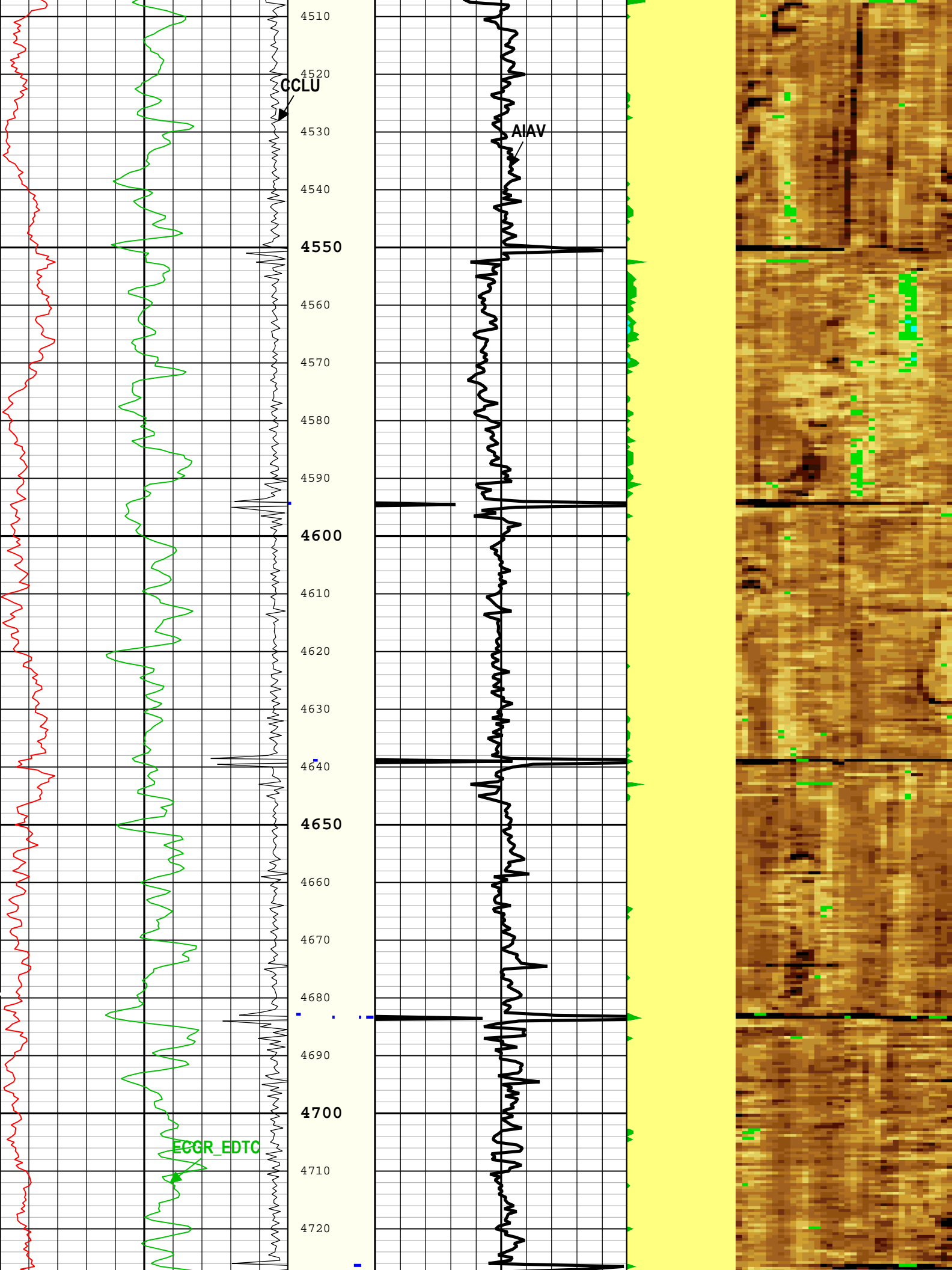


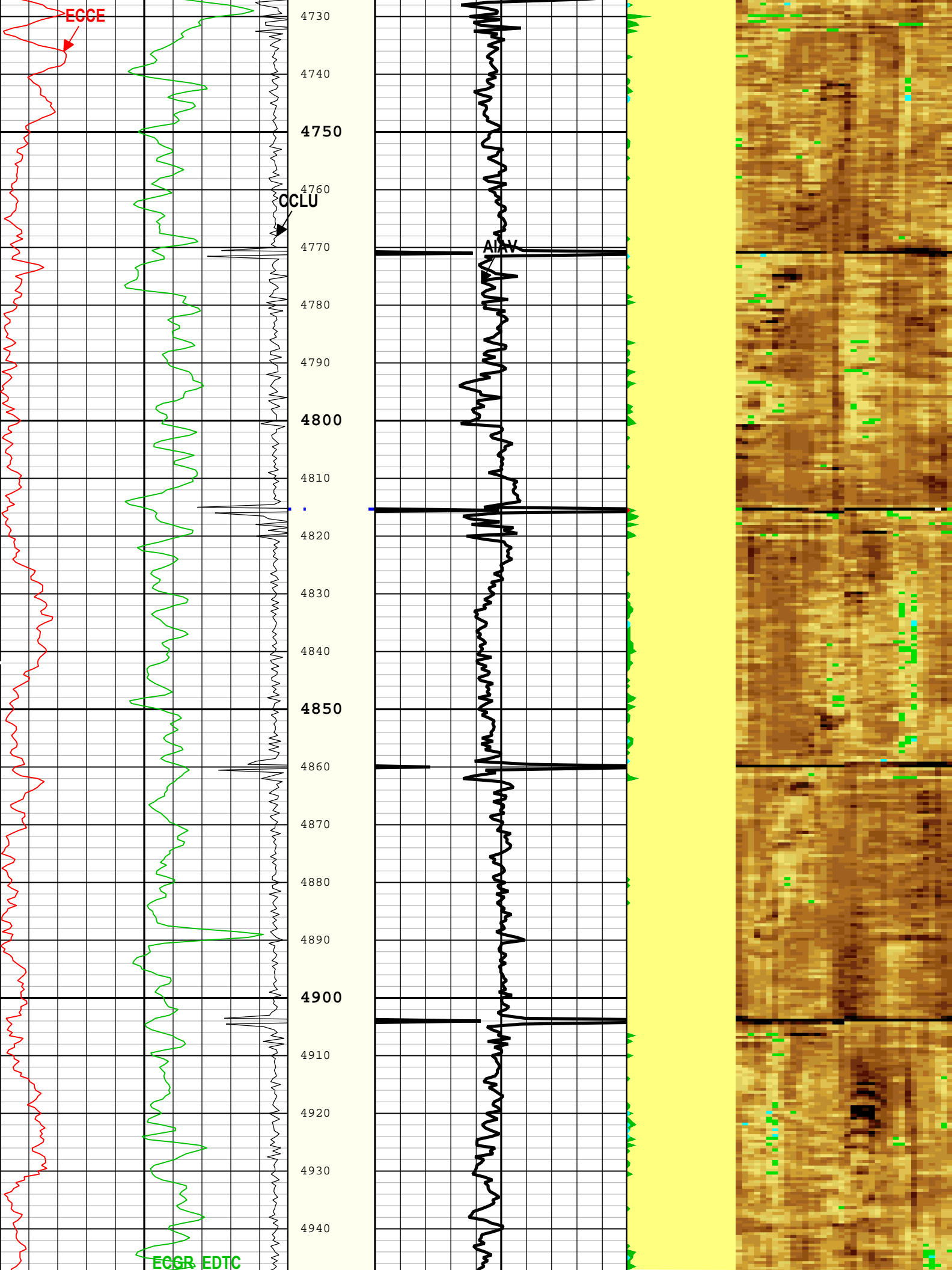


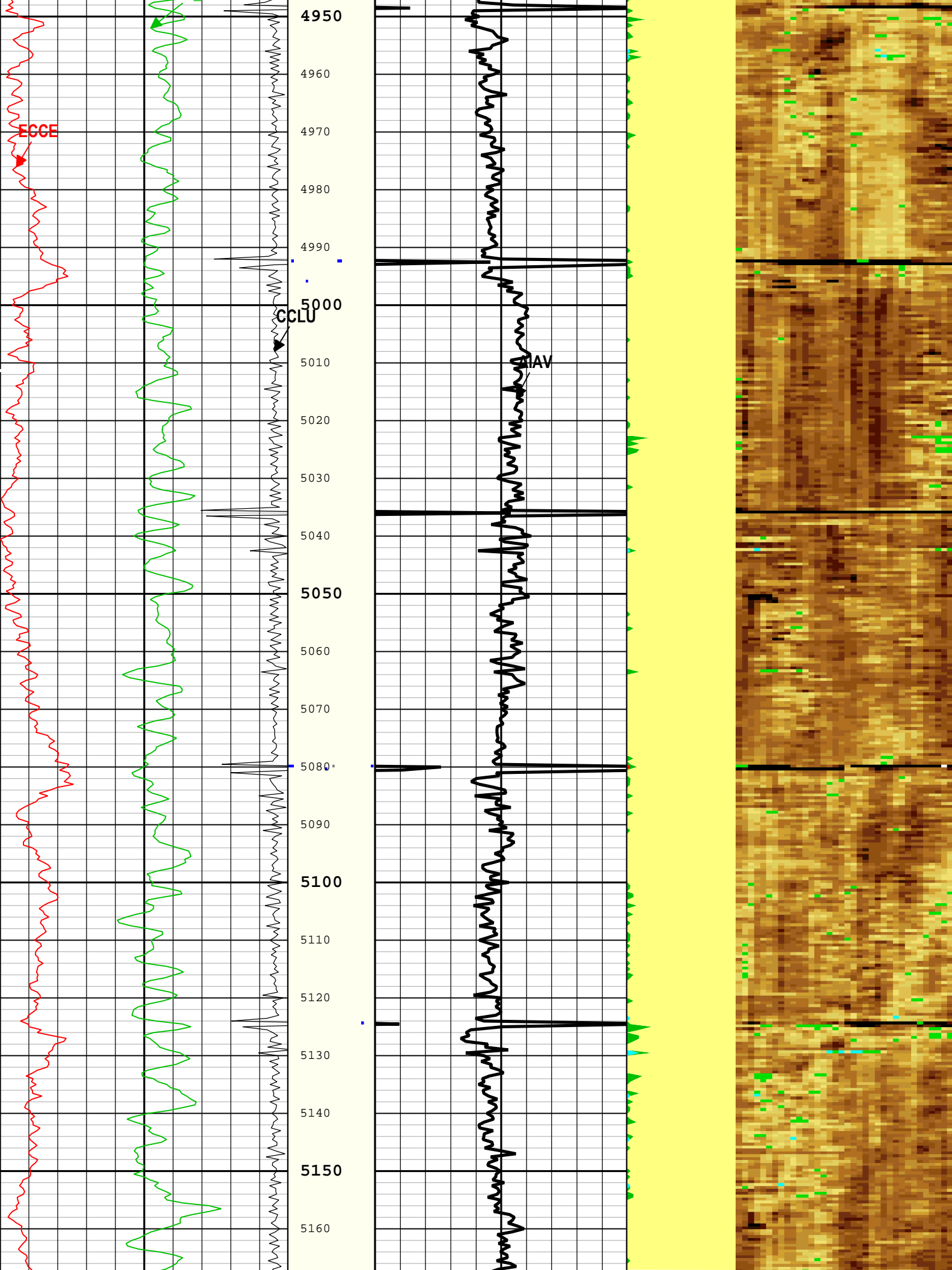


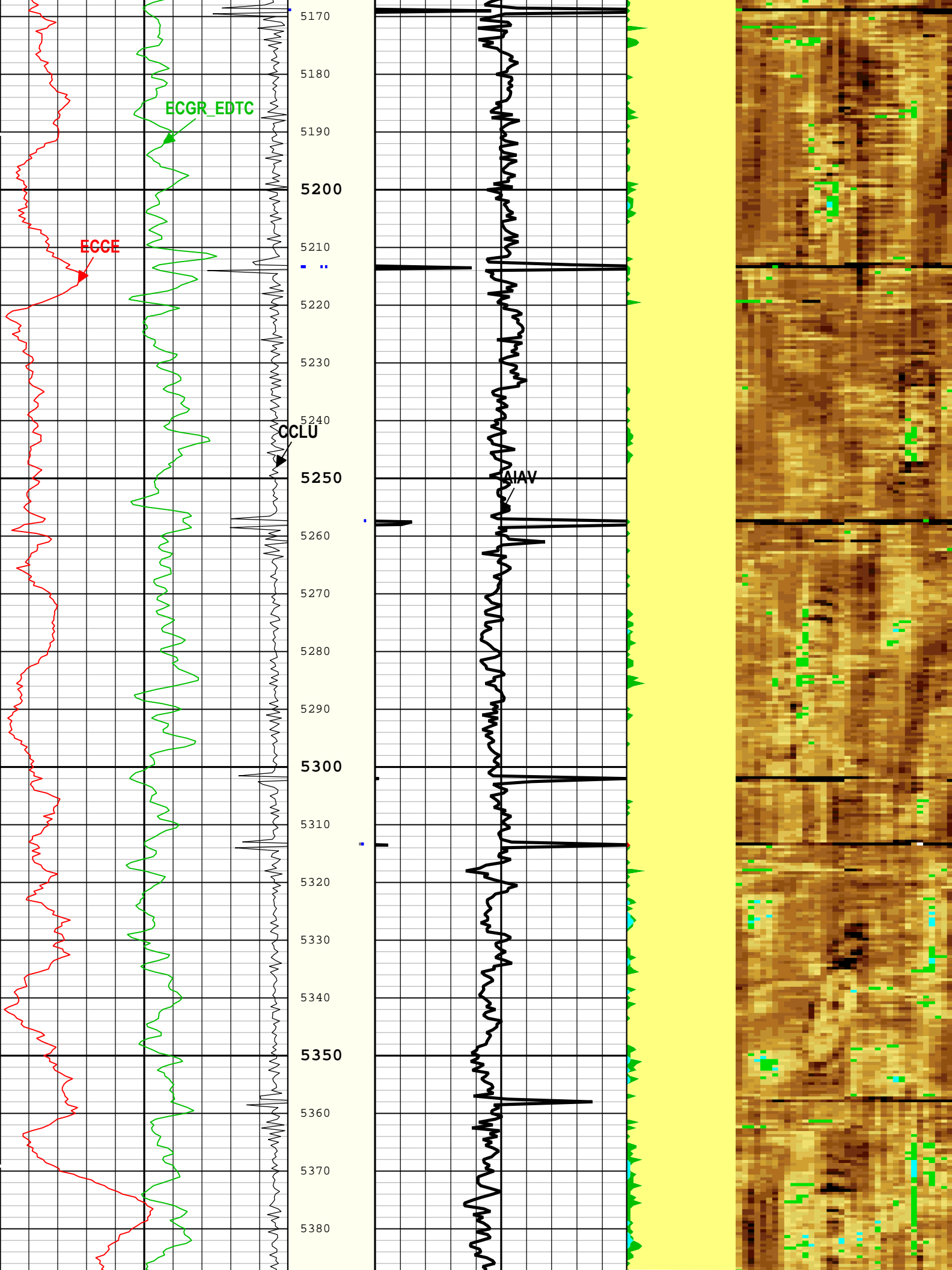


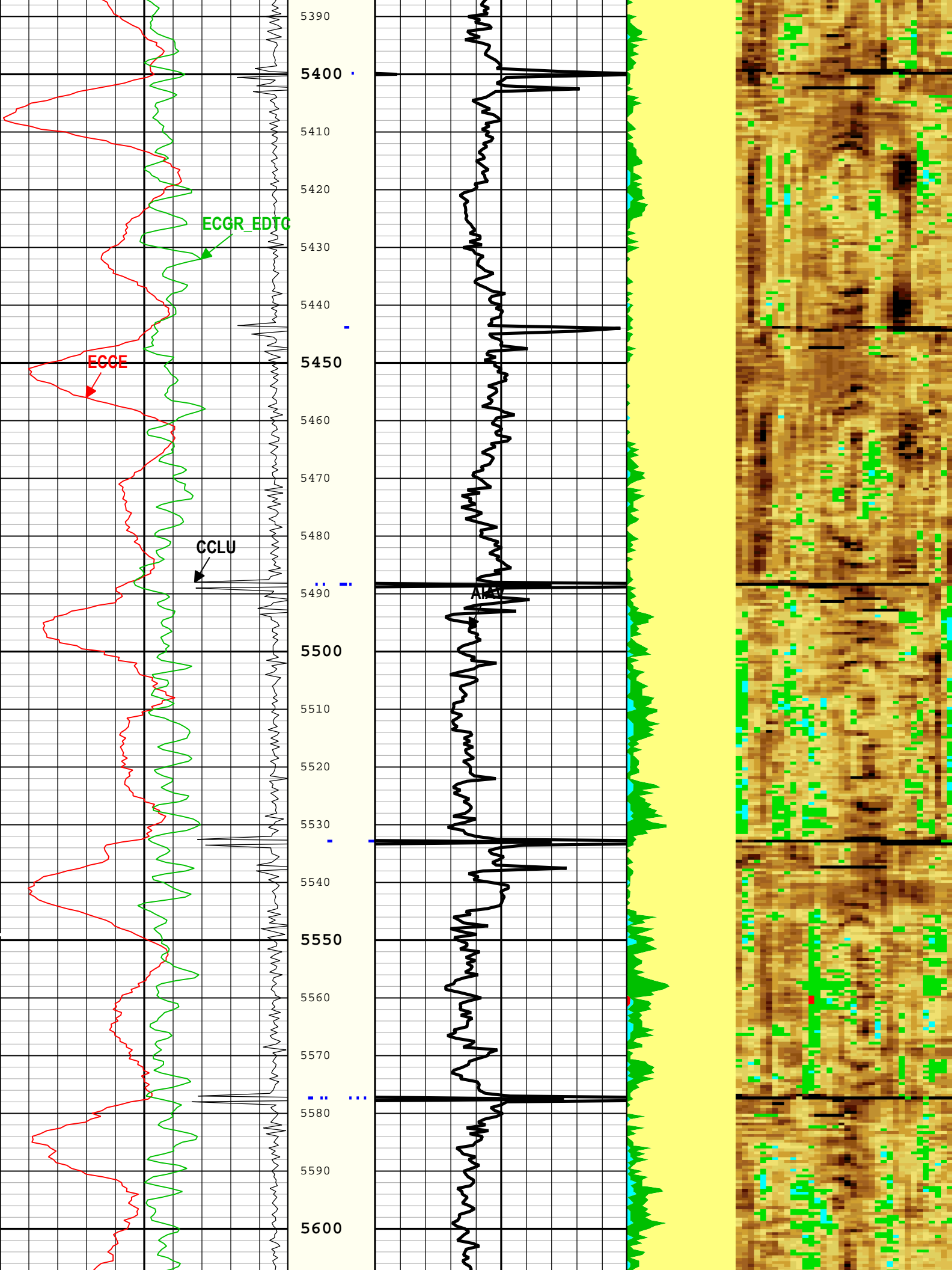


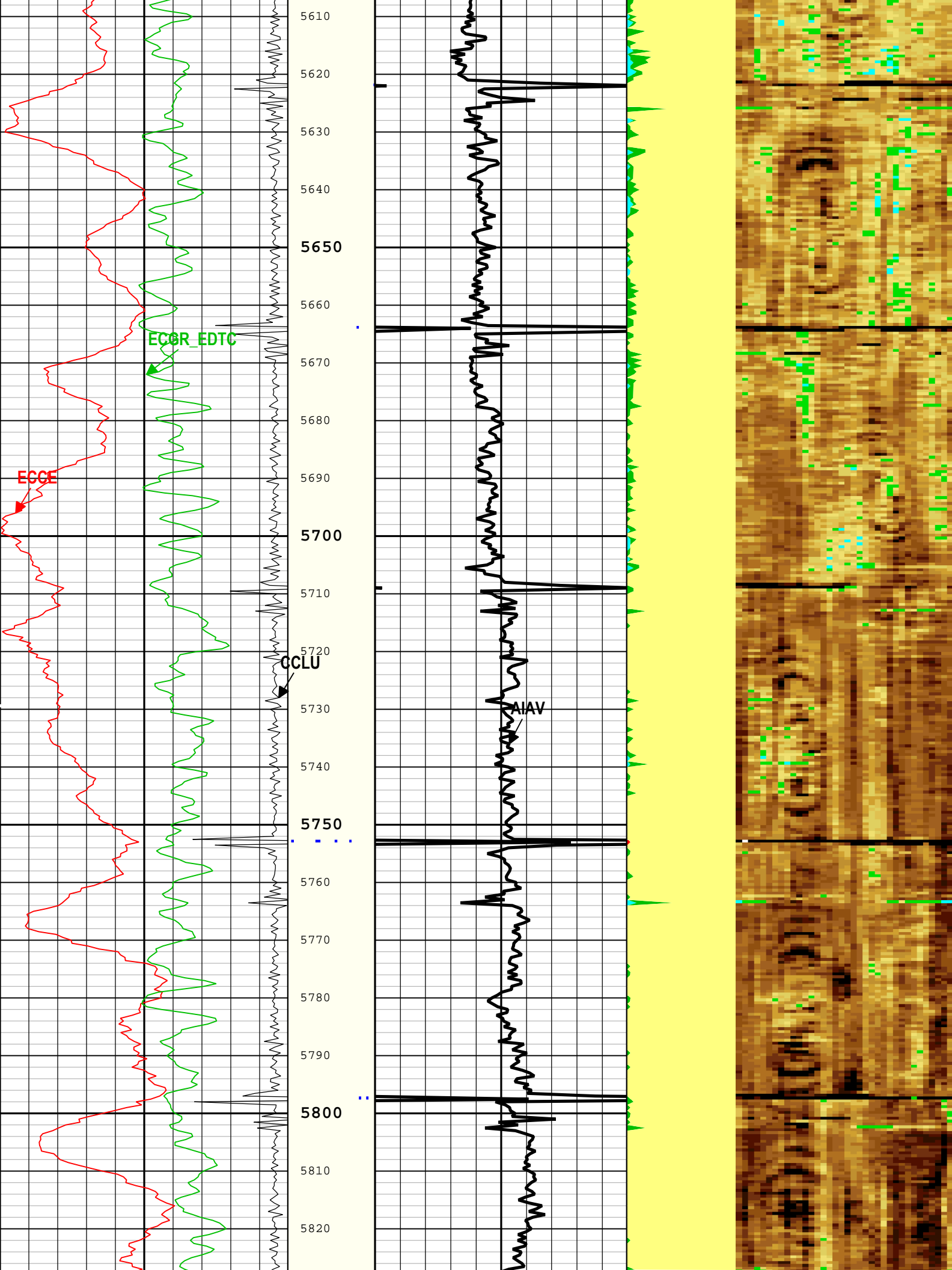


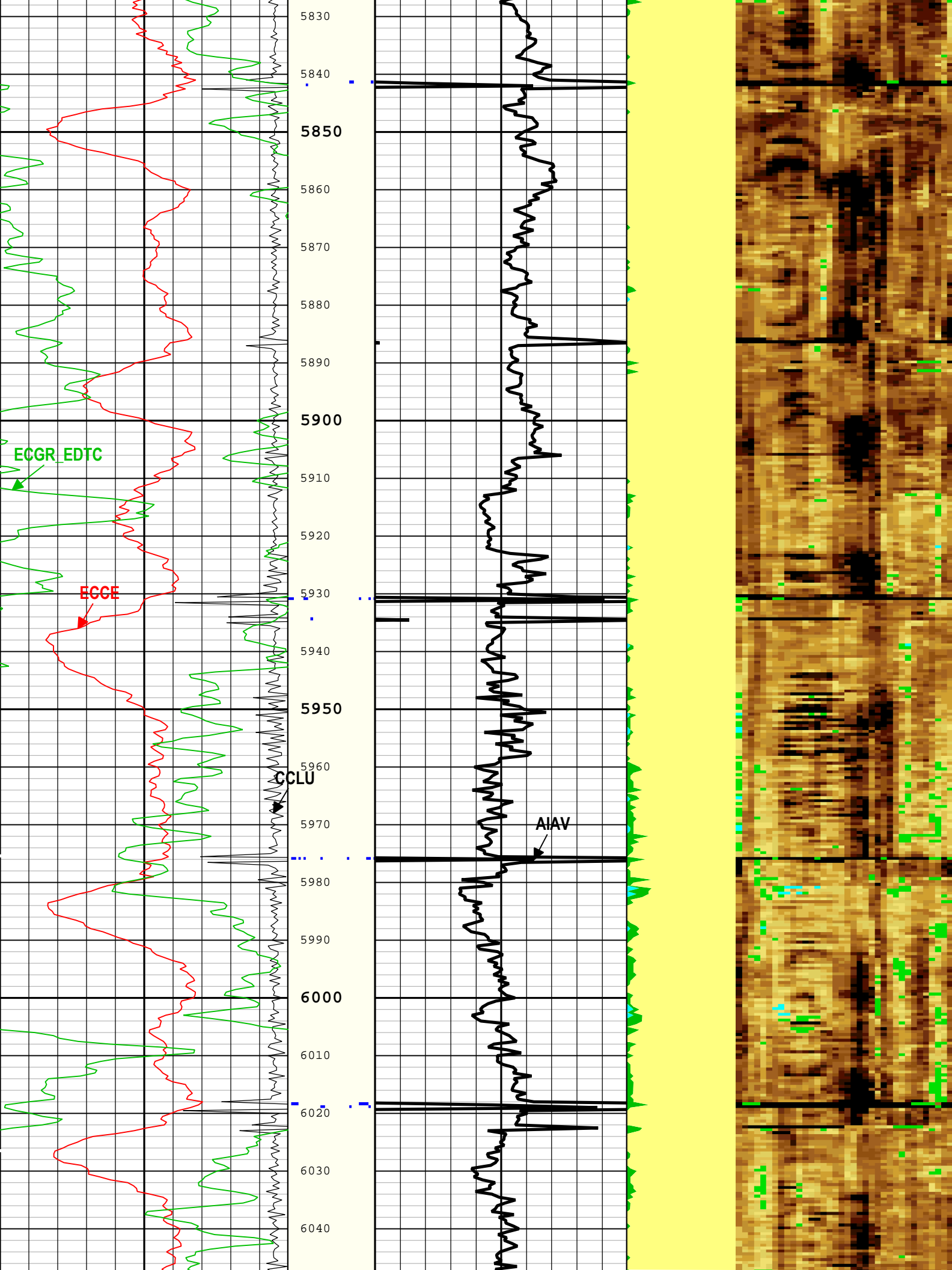




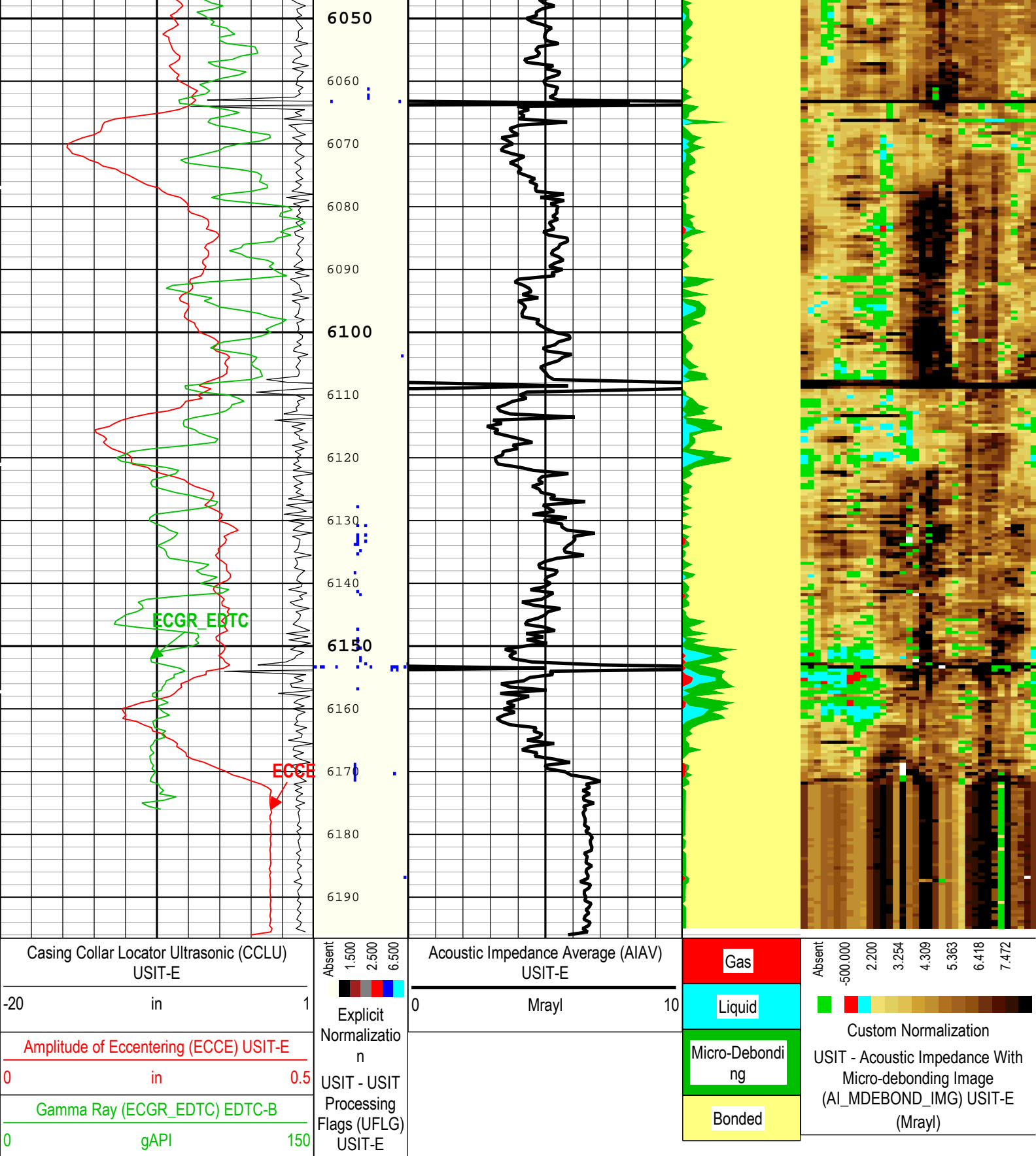












TIME\_1900 - Time Marked every 60.00 (s)

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: 08-Dec-2016 20:04:59

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	

	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	Depth Zoned	in
CBLO	Casing Bottom (Logger)	WLSESSION	10912	ft
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	9.4	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	1.06	
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	1.72	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	13.5	60	1937
BS	8.5	1937	6196.5

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	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	
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	5000	ft
WINB	Window Begin Time	USIT-E	Time Zoned	us
WINE	Window End Time	USIT-E	Time Zoned	us

## Time Zone Parameters

## Time Log Parameters

Parameter	Value	Start Time	Stop Time	Start Depth ( ft )	Stop Depth ( ft )
EMXV	60	08-Dec-2016 19:07:15	08-Dec-2016 19:07:42	6196.89	6180.95
EMXV	65	08-Dec-2016 19:07:42	08-Dec-2016 19:07:46	6180.95	6177.93
EMXV	70	08-Dec-2016 19:07:46	08-Dec-2016 19:14:34	6177.93	5945.5
EMXV	75	08-Dec-2016 19:14:34	08-Dec-2016 19:15:31	5945.5	5813.87
EMXV	80	08-Dec-2016 19:15:31	08-Dec-2016 19:23:56	5813.87	4336.84
EMXV	75	08-Dec-2016 19:23:56	08-Dec-2016 19:24:01	4336.84	4322.84
EMXV	70	08-Dec-2016 19:24:01	08-Dec-2016 19:48:46	4322.84	54.73
WINB	31.88	08-Dec-2016 19:07:15	08-Dec-2016 19:08:06	6196.89	6146.97
WINB	28	08-Dec-2016 19:08:06	08-Dec-2016 19:40:20	6146.97	1440.77
WINB	30	08-Dec-2016 19:40:20	08-Dec-2016 19:48:46	1440.77	54.73
WINE	71.88	08-Dec-2016 19:07:15	08-Dec-2016 19:08:13	6196.89	6137.83
WINE	74	08-Dec-2016 19:08:13	08-Dec-2016 19:40:26	6137.83	1422.38
WINE	72	08-Dec-2016 19:40:26	08-Dec-2016 19:48:46	1422.38	54.73

All depth are at tool zero.

One

0 PSI Repeat Pass

## Software Version

Acquisition System	Version
Maxwell 2016 SP2	6.2.64464.3100

## Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[2]:Up	Up	1730.46 ft	2387.08 ft	08-Dec-2016 6:44:57 PM	08-Dec-2016 6:49:21 PM	OFF	2.08 ft	Yes

All depths are referenced to toolstring zero

## Log

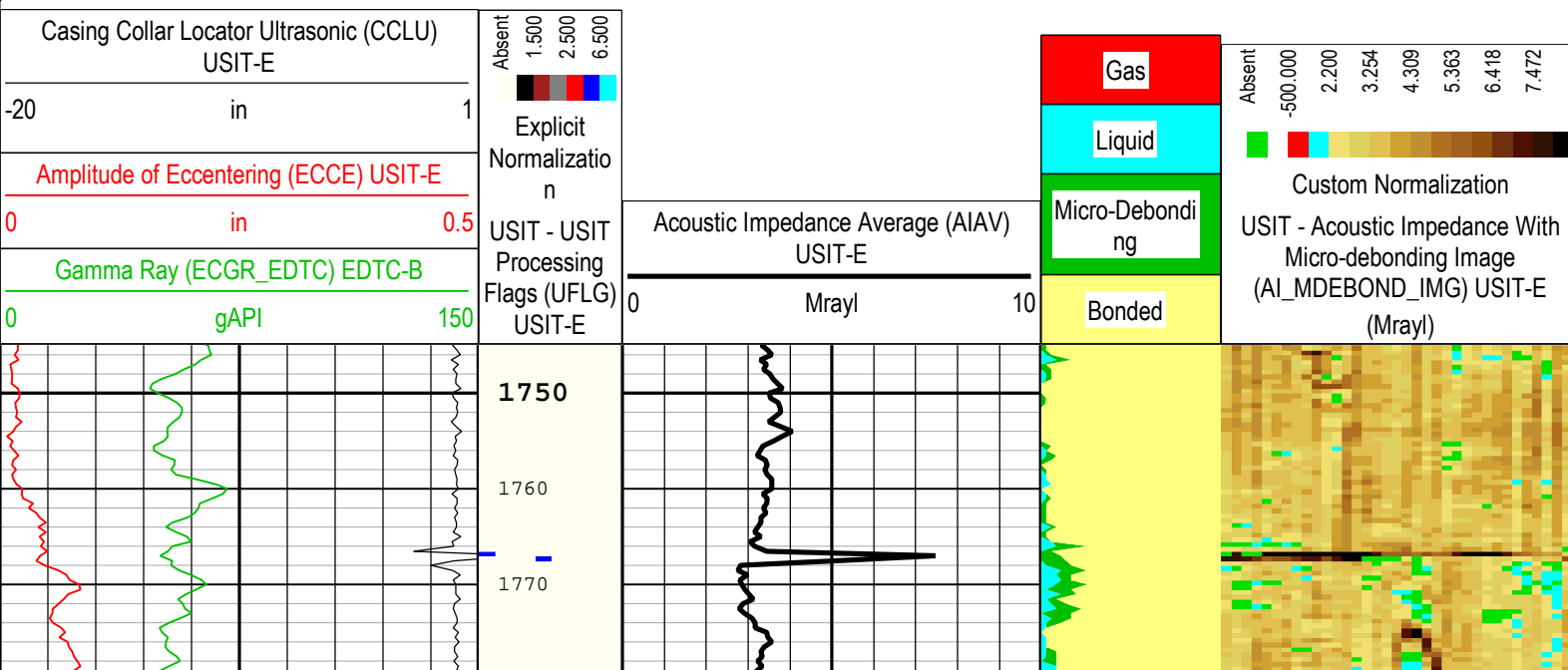
Company:Noble Energy, Inc.

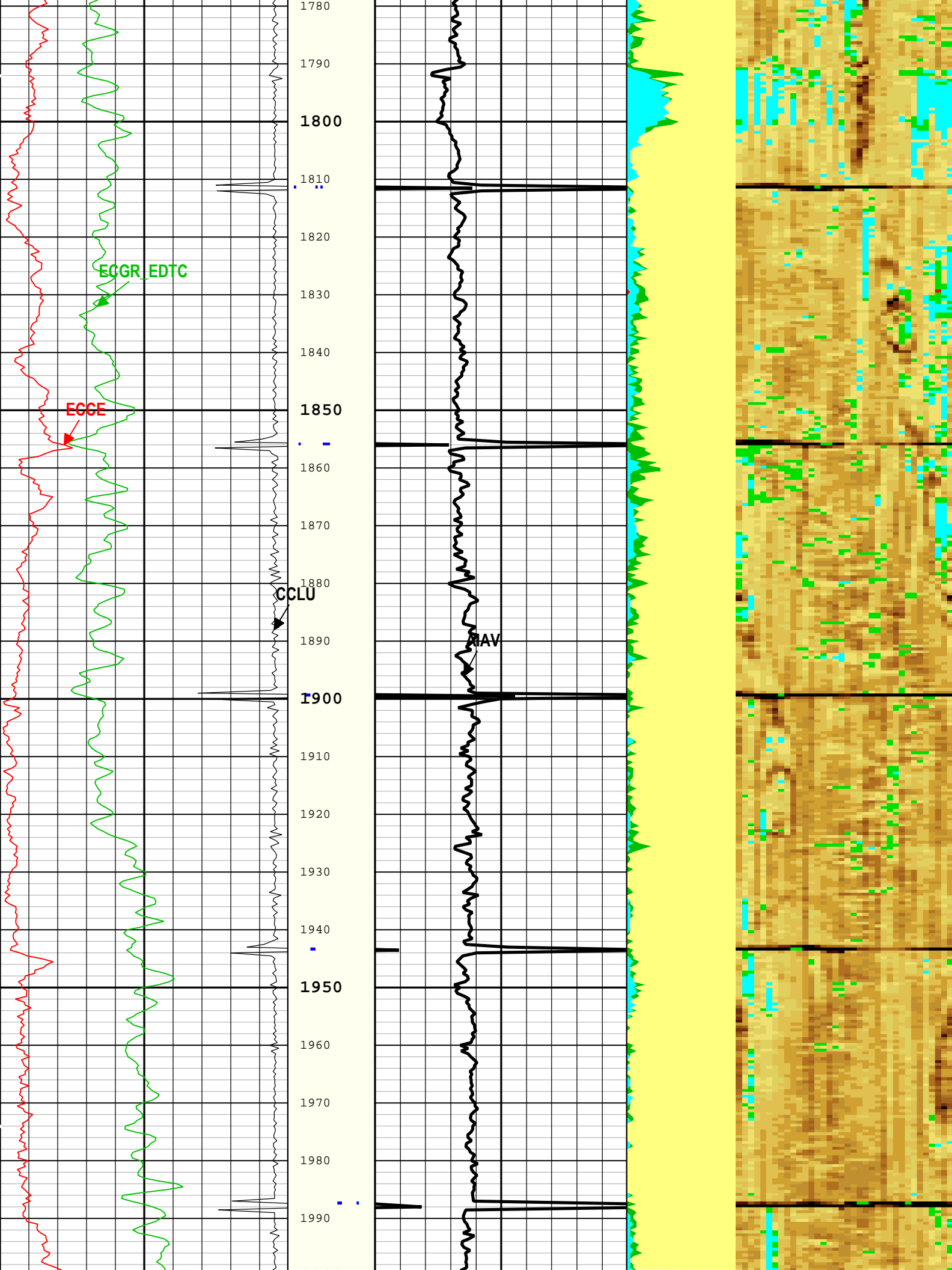
Well:Bennett LD19-758

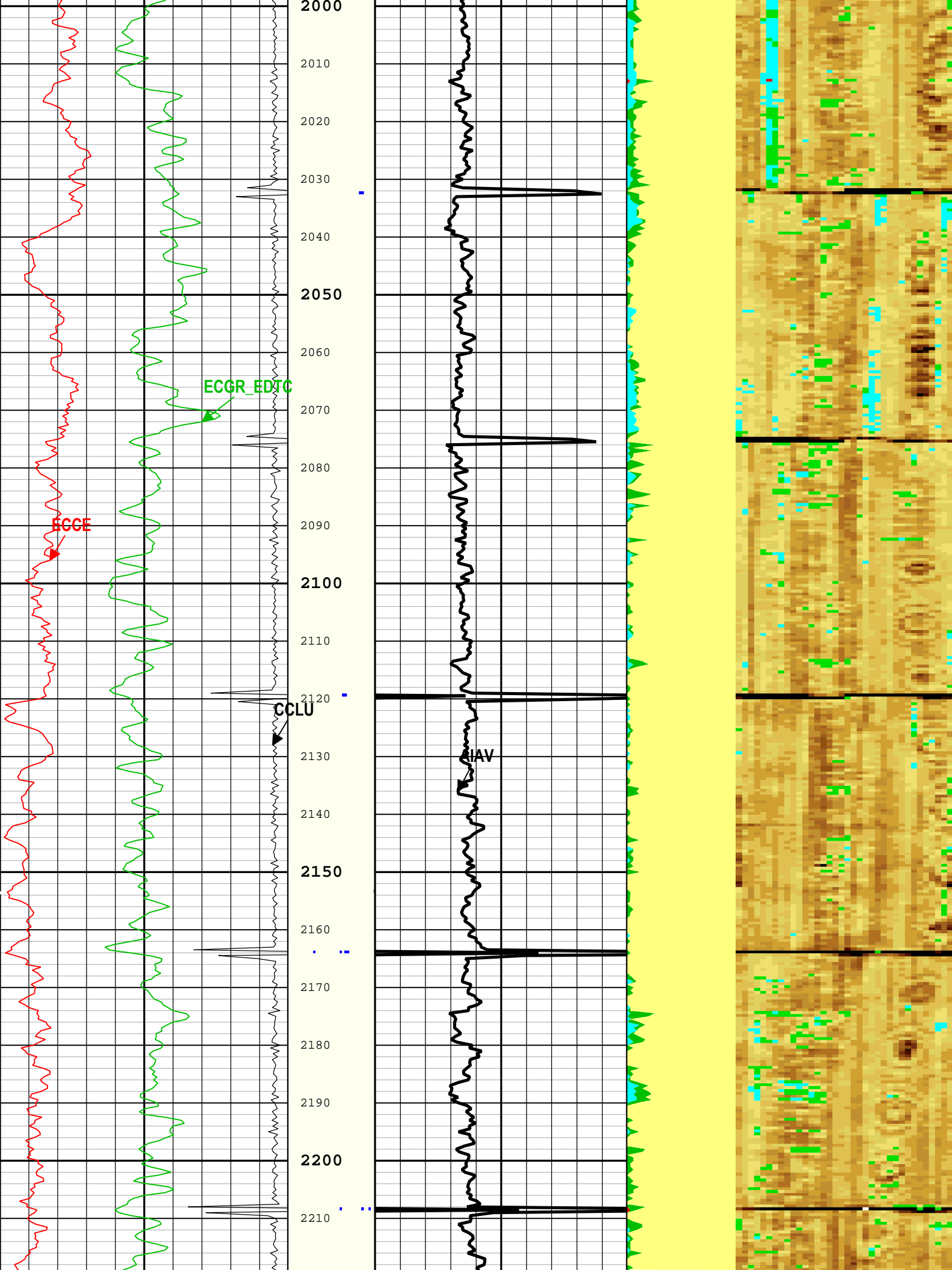
One: Log[2]:Up:S004

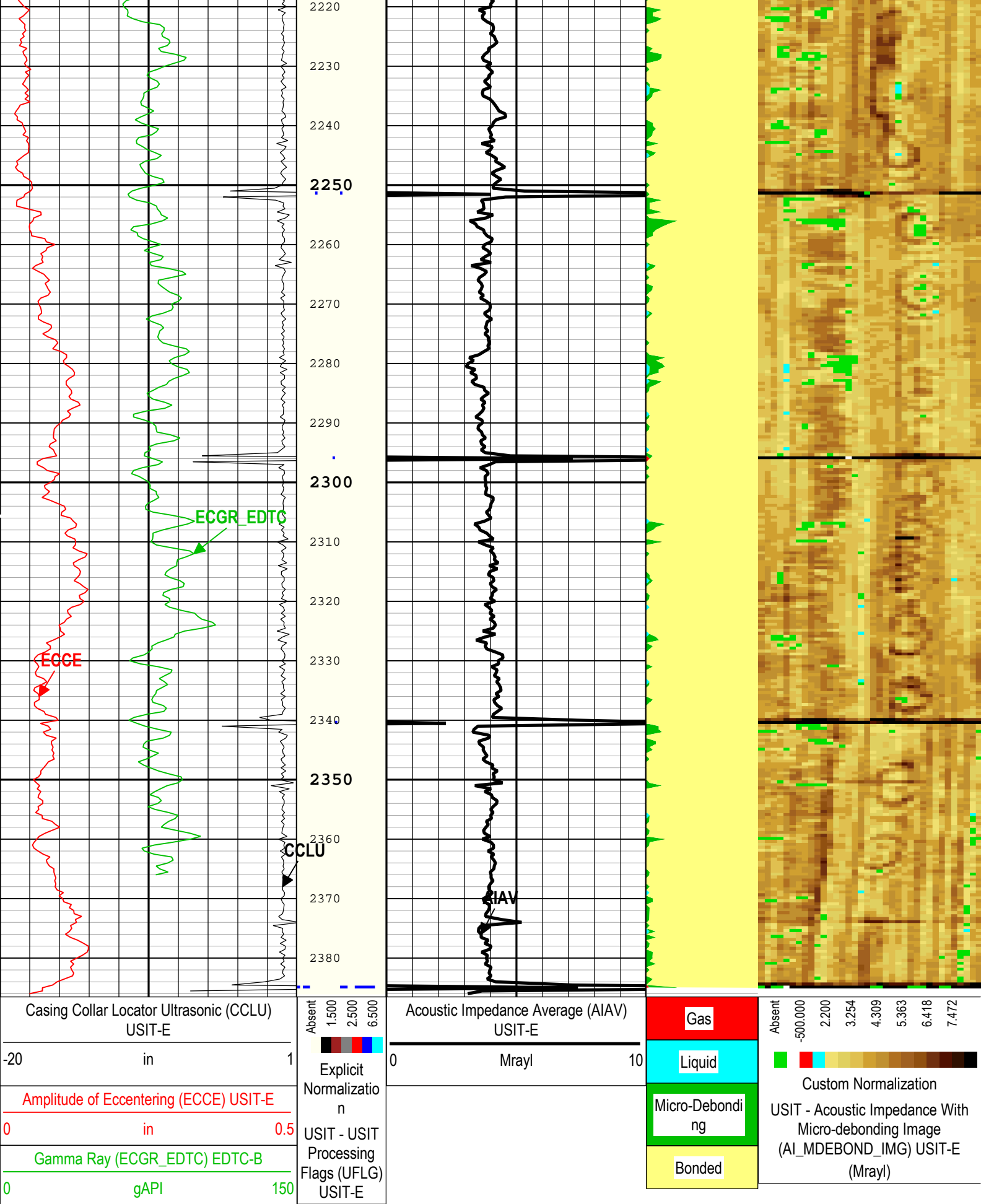
Description: Format: Log ( DJ Basin Ultrasonic Cement Summary Report ) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth  
Creation Date: 08-Dec-2016 20:05:06

TIME\_1900 - Time Marked every 60.00 (s)









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	10912	ft
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	9.4	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	1.06	
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	1.72	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	13.5	1745	1937
BS	8.5	1937	2386.5

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	18	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
EMXV	EMEX Voltage	USIT-E	60	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	5000	ft
WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	71.88	us

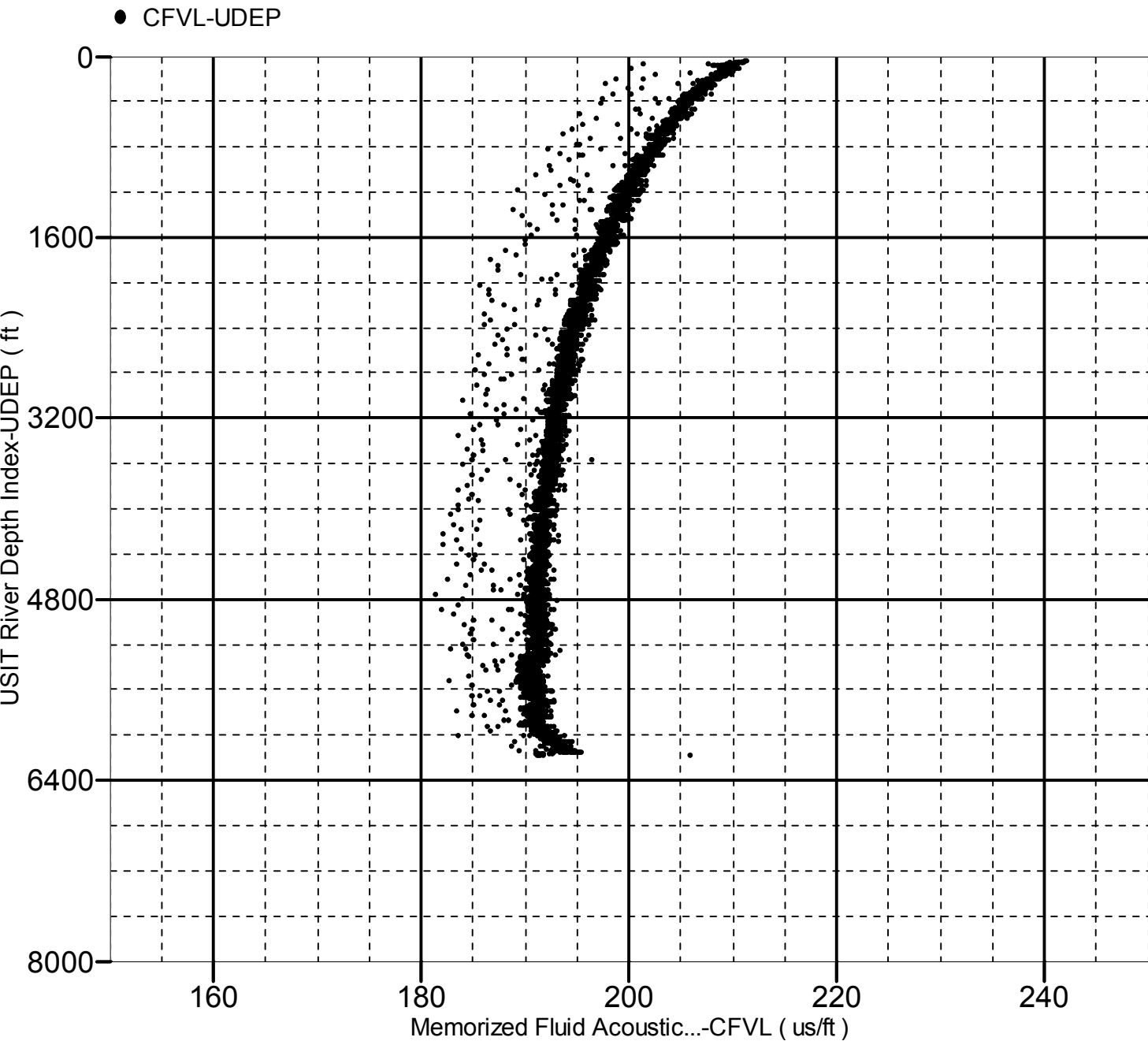
XYZ

Company:Noble Energy, Inc. Well:Bennett LD19-758  
One: Log[4]:Up:S004

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6196.50 to 54.50 ft



XYZ

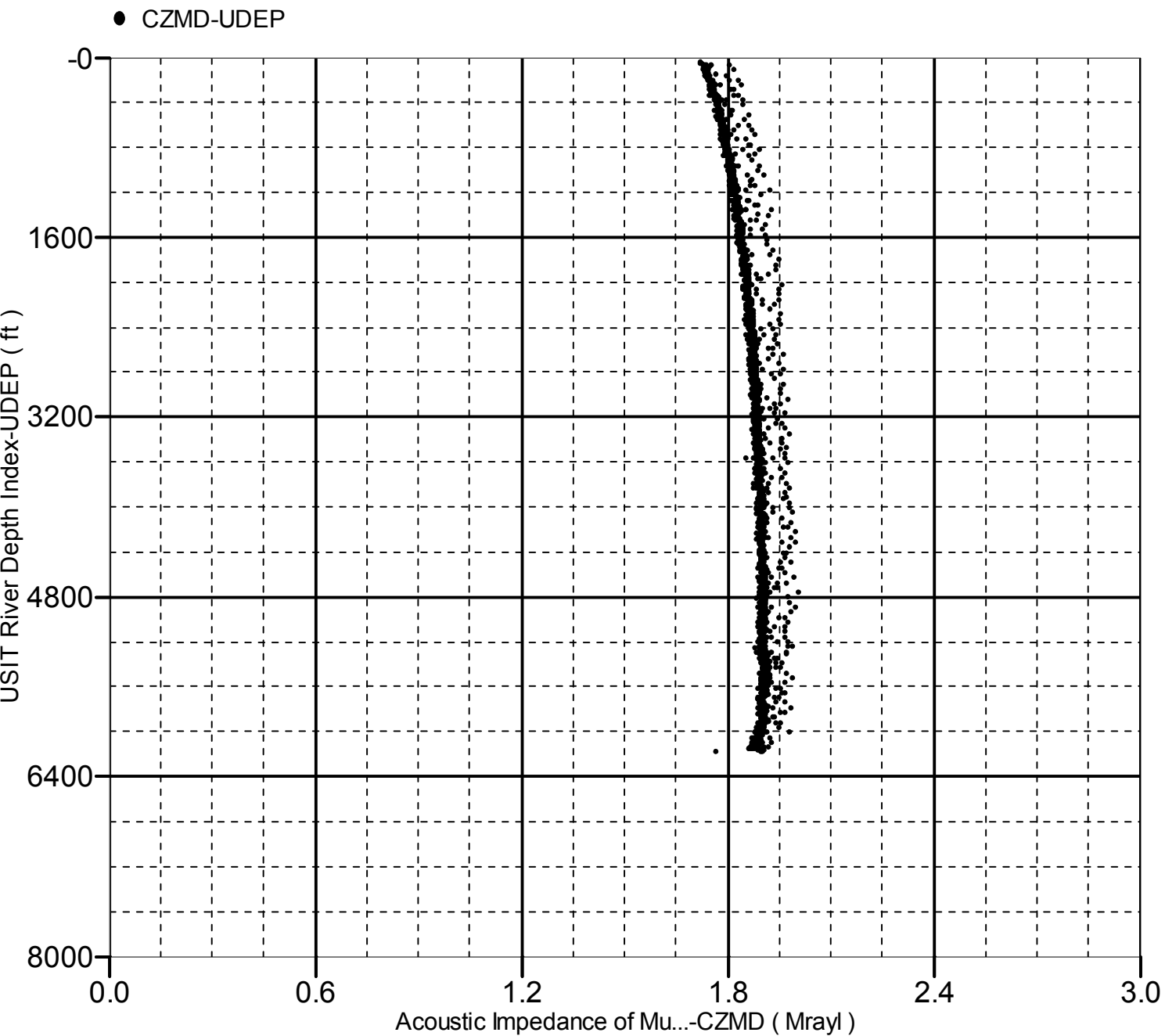
Company:Noble Energy, Inc. Well:Bennett LD19-758  
One: Log[4]:Up:S004

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6196.50 to 54.50 ft





Company:	Noble Energy, Inc.	<b>Schlumberger</b>
Well:	Bennett LD19-758	
Field:	Wildcat	
County:	Weld	
State:	Colorado	

UltraSonic Summary Print

