

Company: Noble Energy Inc

Well: Earp Federal LC23-740

Field: Wildcat

County: WELD Country: US

UltraSonic Summary Print			
County: WELD			
Field: Wildcat			
Location: SHL: SWSE Sec 11, T9N, R59W			
Well: Earp Federal LC23-740			
Company: Noble Energy Inc			
Location:	SHL: SWSE Sec 11, T9N, R59W	Elev.: K.B. 5004.00 ft	
	810' FSL & 1650' FEL	G.L. 4974.00 ft	
	Lat: 40.75922 / Long: -103.94426	D.F. 5004.00 ft	
	Permanent Datum:	Ground Level	Elev.: 4974.00 f
Log Measured From:	Kelly Bushing		30.00 ft
	Kelly Bushing		above Perm.Datum
Drilling Measured From:			
API Serial No. 05-123-42942	Max.Hole Deviation	Longitude: -103.94420 degrees	Latitude: 40.459220 degrees
Logging Date 30-Jan-2017			

Logging Date	30-Jan-2017			
Run Number	One			
Depth Driller	16776.00 ft			
Schlumberger Depth	16776.00 ft			
Bottom Log Interval	6200.00 ft			
Top Log Interval	50.00 ft			
Casing Driller Size @ Depth	5.5 in @ 16766.40 ft			
Casing Schlumberger	16766.4 ft			
Bit Size	8.5 in			
Type Fluid In Hole	Water			
Density	Viscosity	26 s		
Fluid Loss	PH			
Source of Sample	Active Tank			
RM @ Meas Temp	0.2 ohm.m @ 68 degF			
RMF @ Meas Temp	0.15 ohm.m @ 68 degF			
RMC @ Meas Temp				
Source RMF	RMC	Pressed		
RM @ BHT	RMF @ BHT	0.07 @ 212 0.05 @ 212		
Max Recorded Temperatures				
Circulation Stopped	Time			
Logger on Bottom	Time	30-Jan-2017 12:08:00		
Unit Number	Location:	9115 Fort Morgan, CO		
Recorded By	Benjamin Mammom			
Witnessed By	Bill Mansfield			

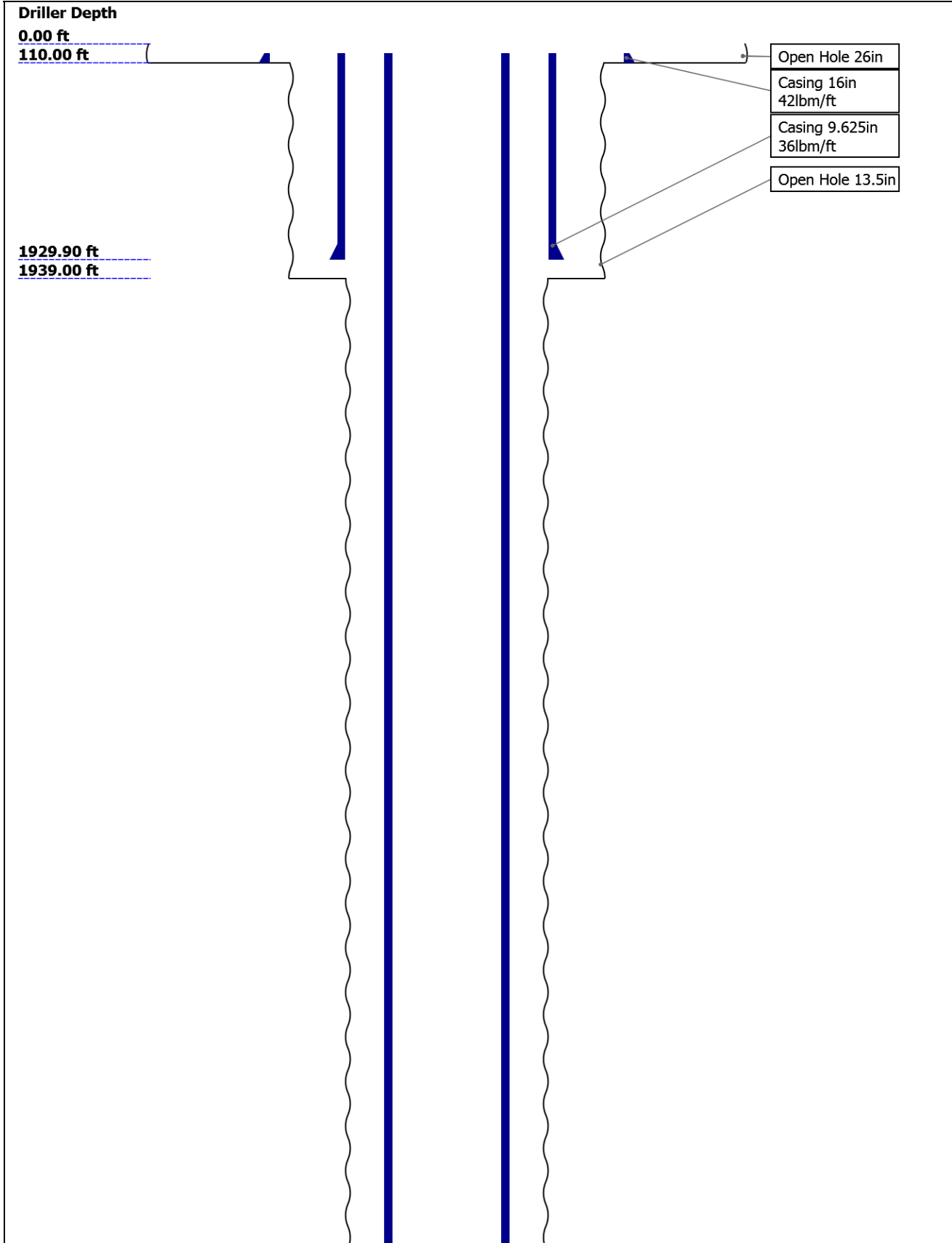
Disclaimer

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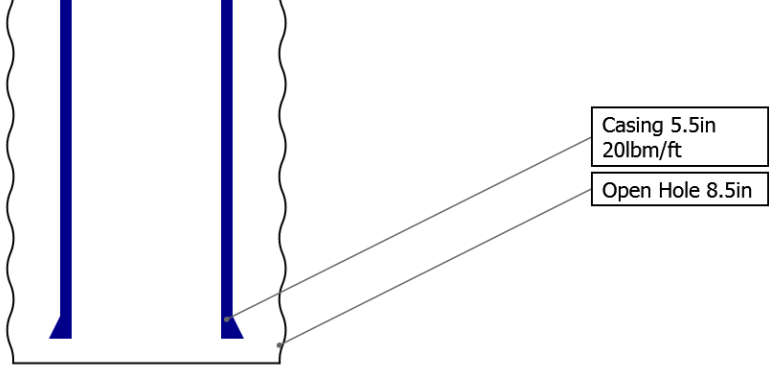
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Well Sketch



16766.40 ft

16776.00 ft



Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	0	110	1939			
Top Logger (ft)	0	110	1939			
Bottom Driller (ft)	110	1939	16776			
Bottom Logger (ft)	110	1939	16776			
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)	30	30	30			
Top Logger (ft)	30	30	30			
Bottom Driller (ft)	110	1929.9	16766.4			
Bottom Logger (ft)	110	1929.9	16766.4			

Operational Run Summary

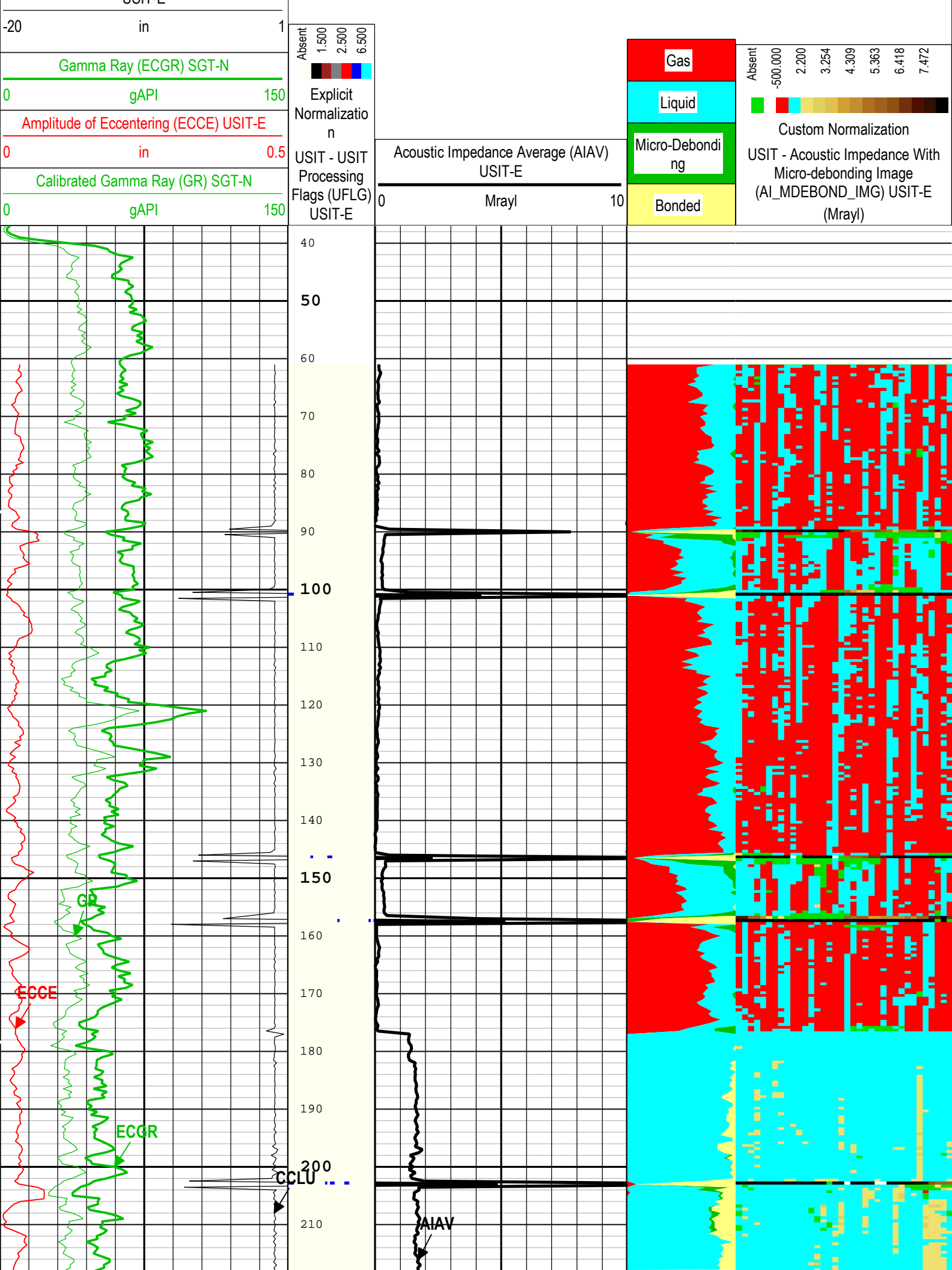
Parameter (unit)	One					
Date Log Started	30-Jan-2017					
Time Log Started	11:42:27					
Date Log Finished	30-Jan-2017					
Time Log Finished	12:51:06					
Top Log Interval (ft)						
Bottom Log Interval (ft)						
Total Depth (ft)						
Max Hole Deviation (deg)						
Azimuth of Max Deviation (deg)						
Bit Size (in)	8.500					
Logging Unit Number	9115					
Logging Unit Location	Fort Morgan, CO					
Recorded By	Benjamin Marmon					

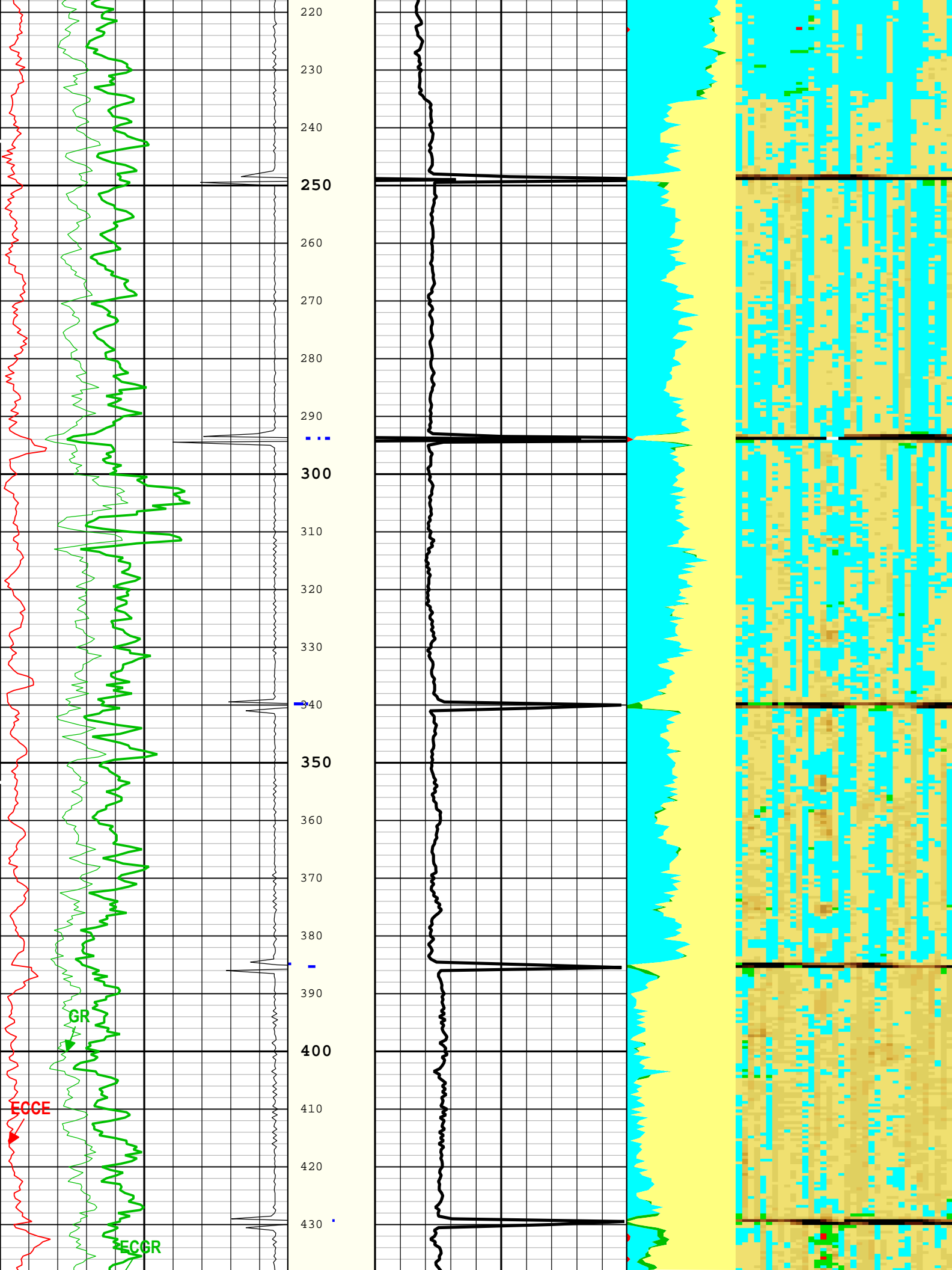
Witnessed By	Bill Mansfield					
Service Order Number	D5ND-00151					

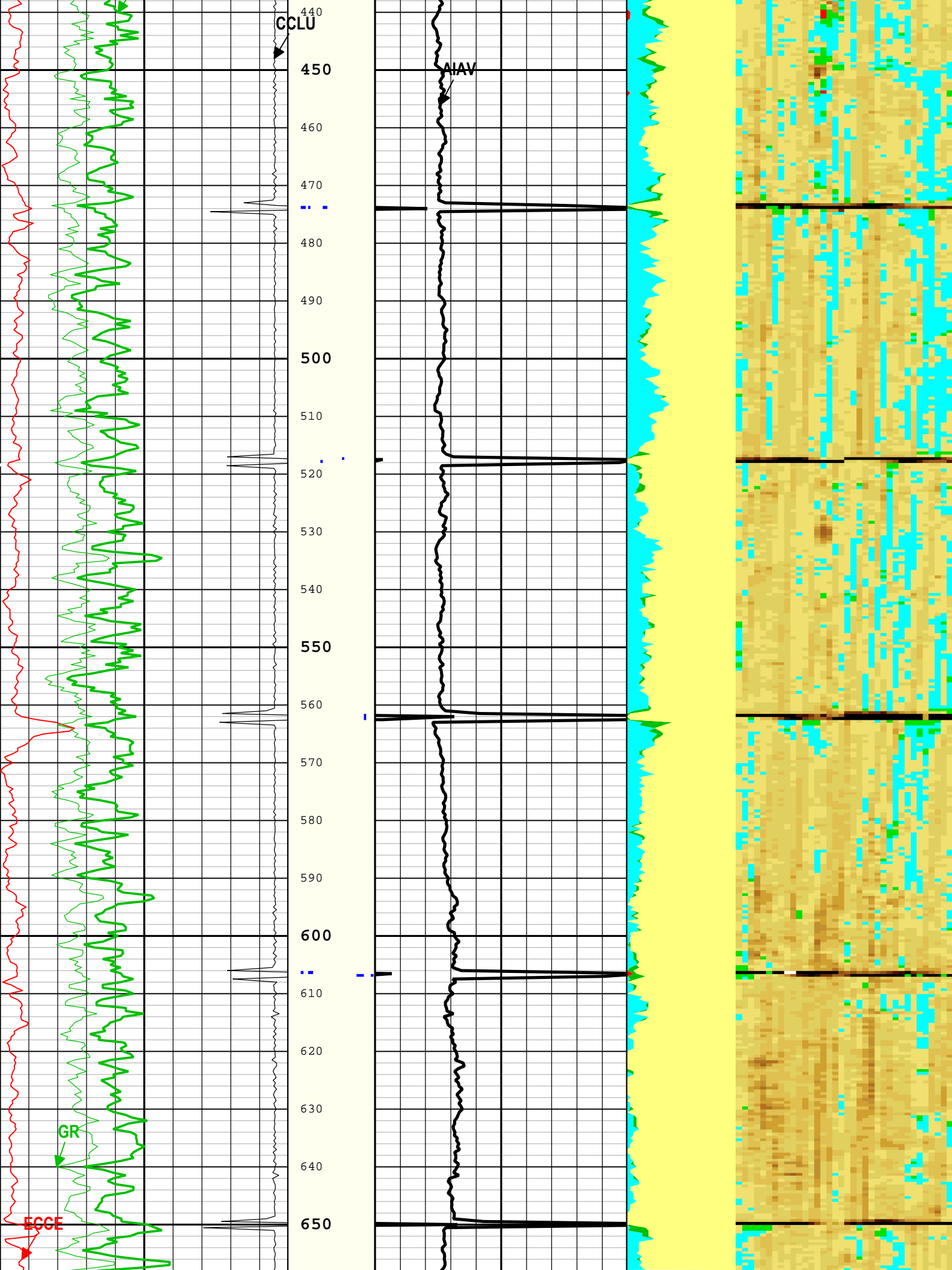
Remarks and Equipment Summary					
One: Toolstring				One: Remarks	
<div><div><div><div><div>LEH-QT</div><div>30.97</div></div><div>LEH-QT</div></div></div><div><div><div>DTC-H:89</div><div>28.06</div></div><div>80</div><div>ECH-KC:1</div><div>0053</div><div>DTC-H:898</div><div>0</div></div><div><div><div>SGT-N:10</div><div>25.06</div></div><div>386</div><div>SGH-K:316</div><div>4</div><div>SGC-TB:10</div><div>386</div><div>SGD-TAA:</div><div>21892</div></div><div><div><div>AH-184[</div><div>2]</div></div><div>19.56</div><div>3855</div></div><div><div><div>AH-184[</div><div>1]</div></div><div>17.56</div><div>955</div></div><div><div><div>USIT-E:92</div><div>15.56</div></div><div>1</div><div>ECH-MFA:</div><div>1908</div><div>USAC-A:9</div><div>21</div><div>USIS-A:27</div><div>75</div><div>USSC-B:98</div><div>5</div><div>USRS-A:93</div><div>2</div><div>USI-SENS</div><div>OR:929</div></div></div> <div><div><div><div><div>USI Sen</div><div>0.37</div></div><div>sor</div><div>TOOL_ZERO</div><div>Head Fe</div><div>nsion</div></div><div>Lengths are in ft</div><div>Maximum Outer Diameter = 3.560 in</div><div>Line: Sensor Location, Value: Gating Offset</div><div>All measurements are relative to TOOL_ZERO</div></div></div>	<div>This is the first log in the well.</div> <div>Toolstring ran as per tool sketch.</div> <div>Main pass recorded under 2500 PSI.</div> <div>Repeat pass recorded with 0 PSI.</div> <div>Expected TOC: 1119'</div>				

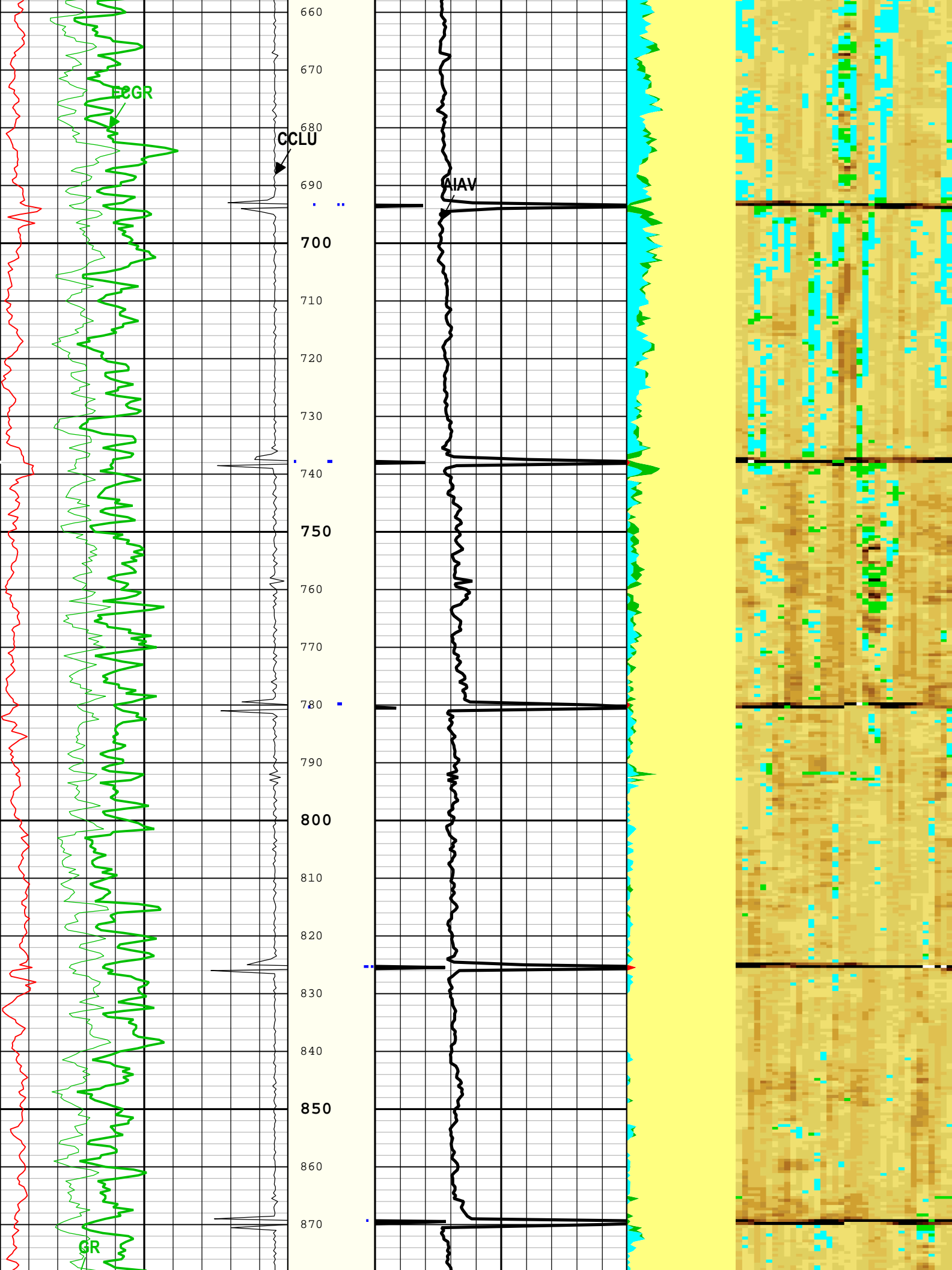
Depth Summary			
	One		
Depth Measuring Device			
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			

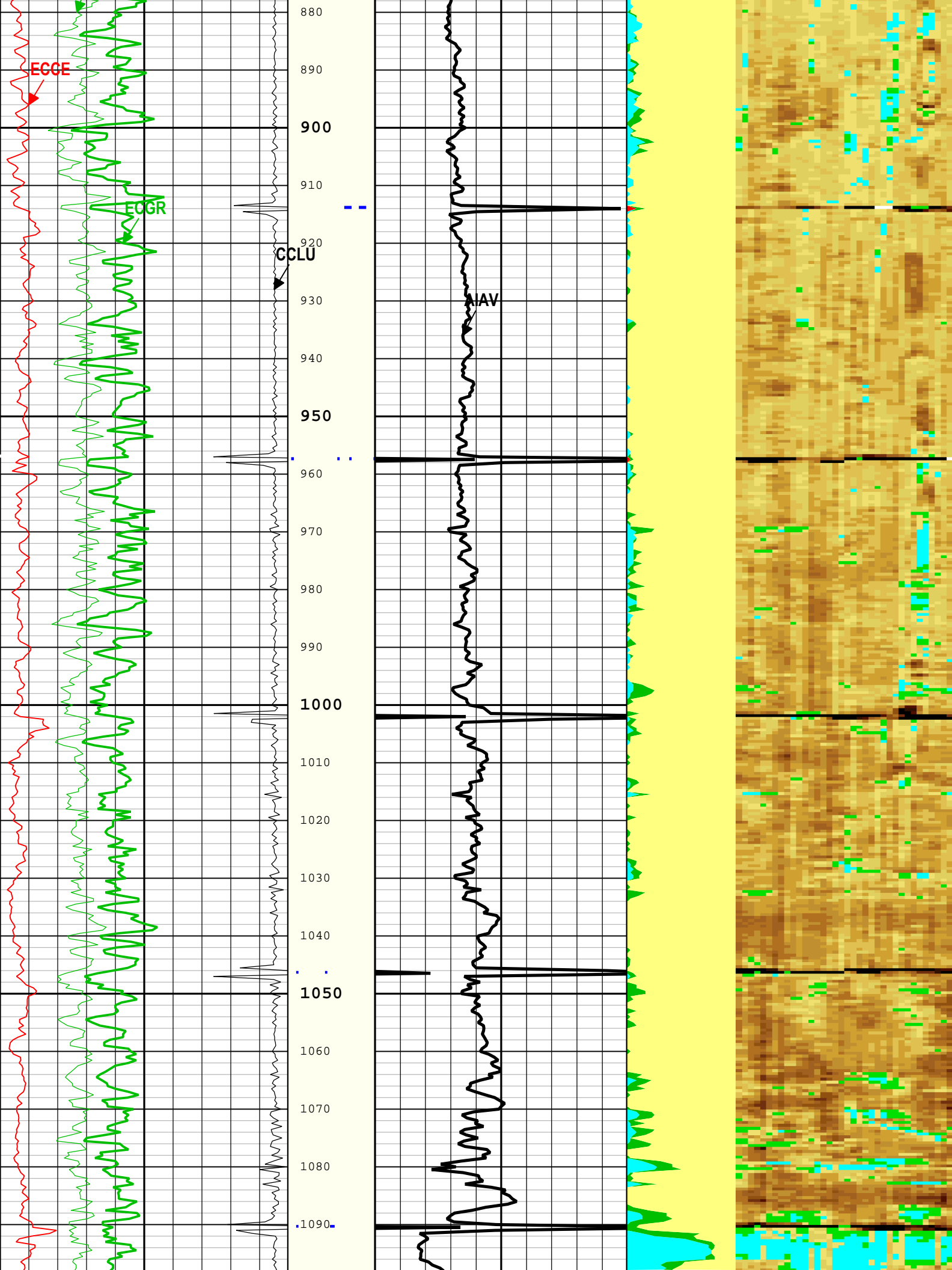
Casing Collar Locator Ultrasonic (CCLU)	USIT-E
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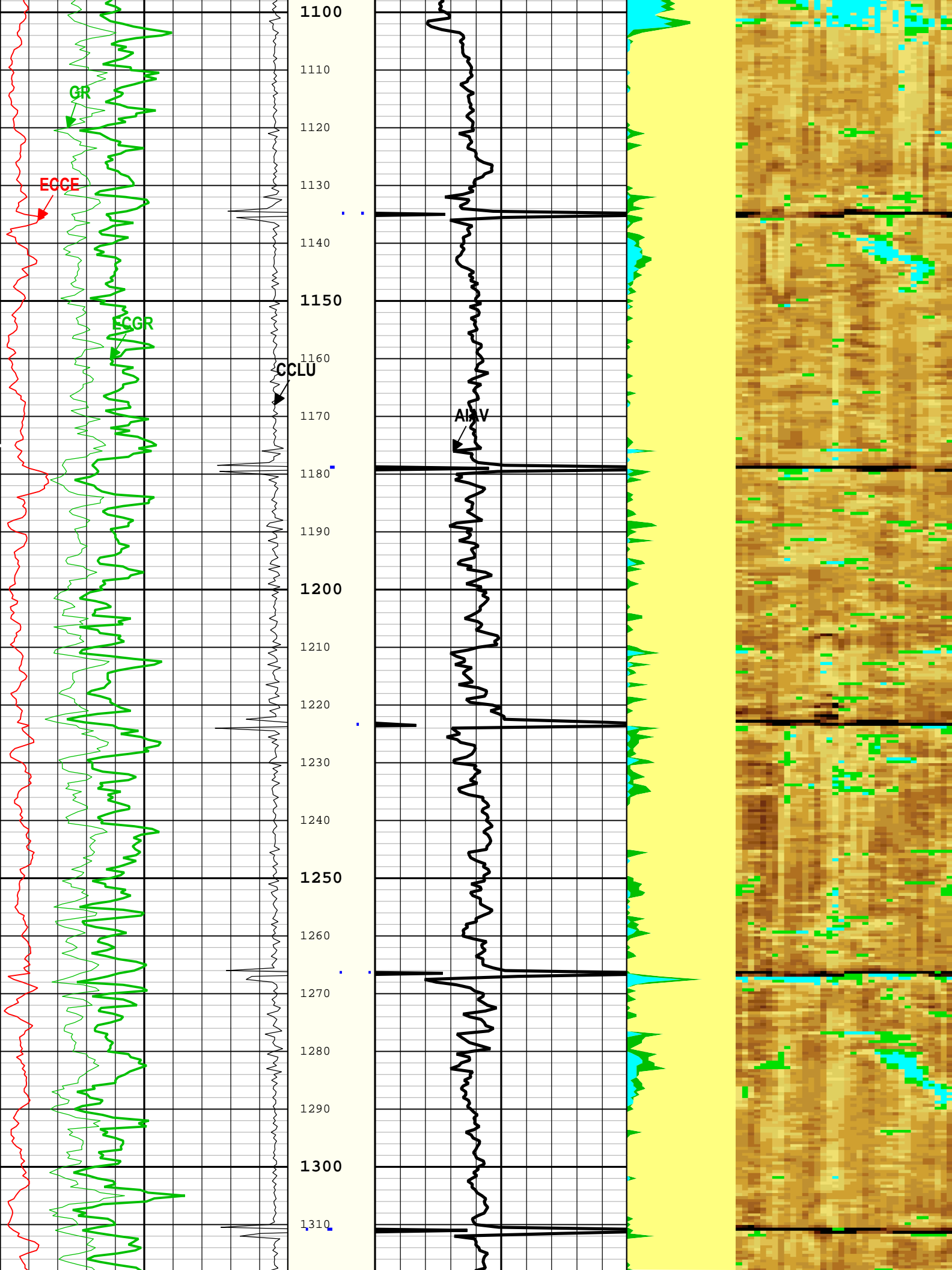


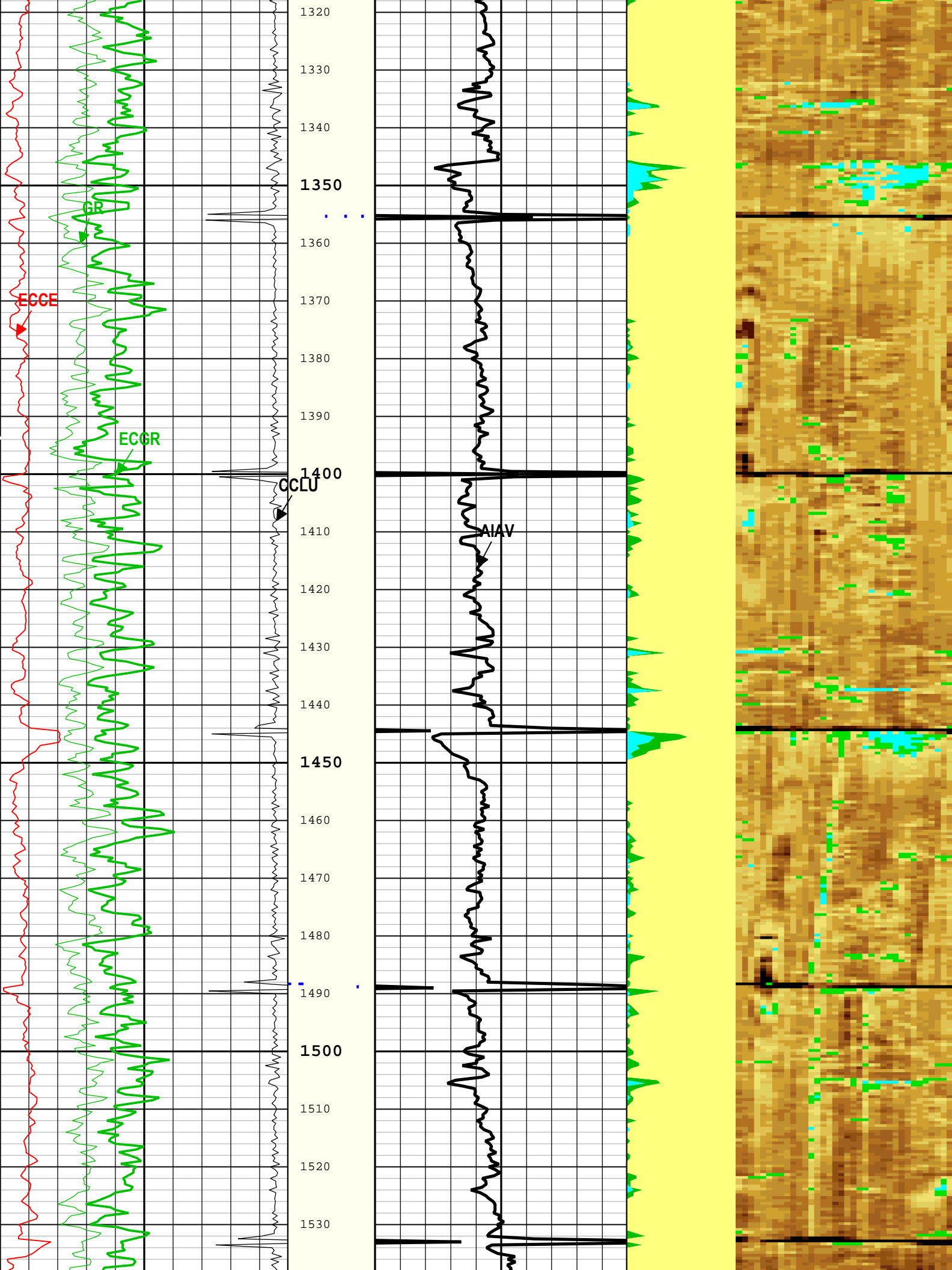


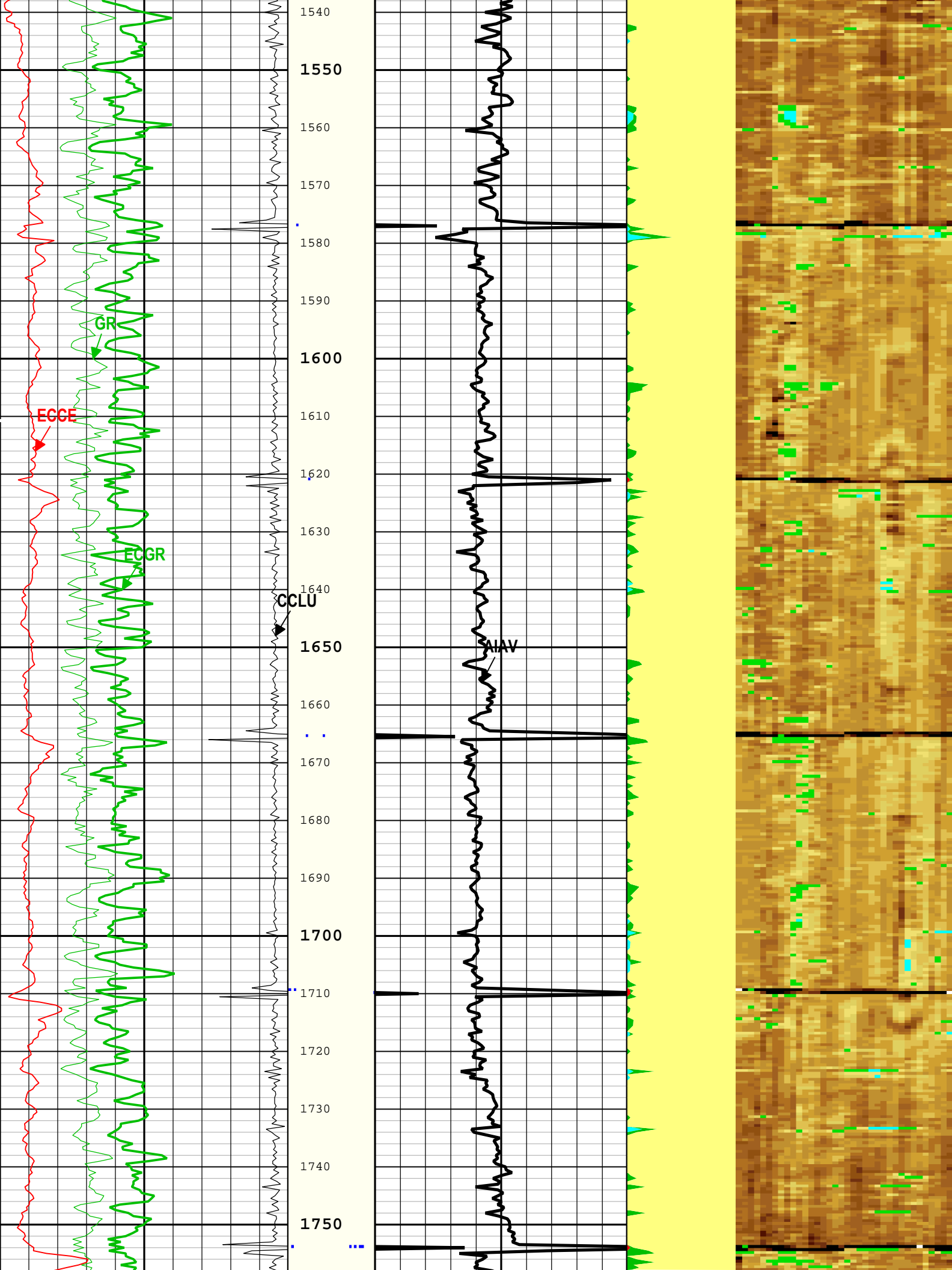


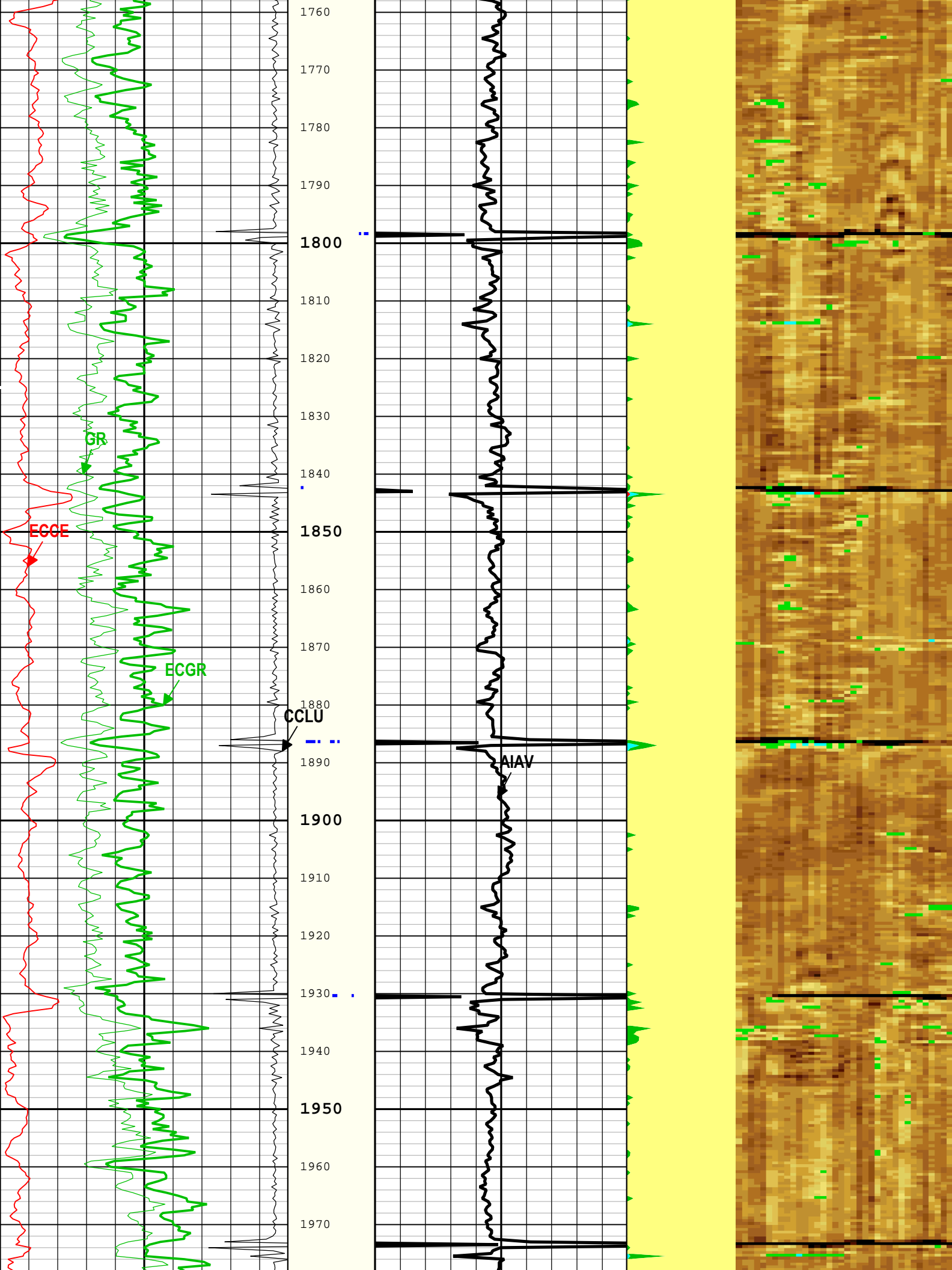


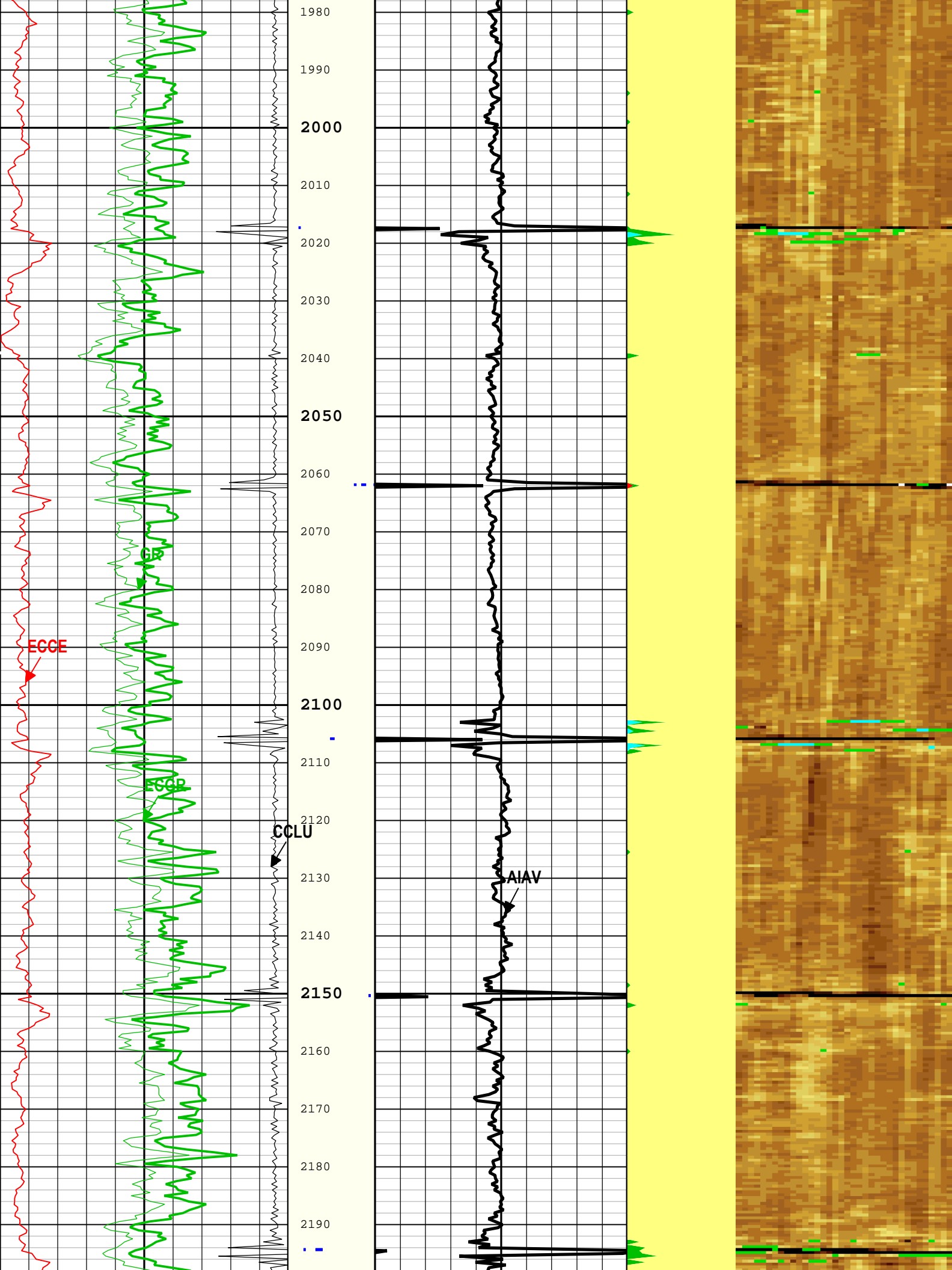


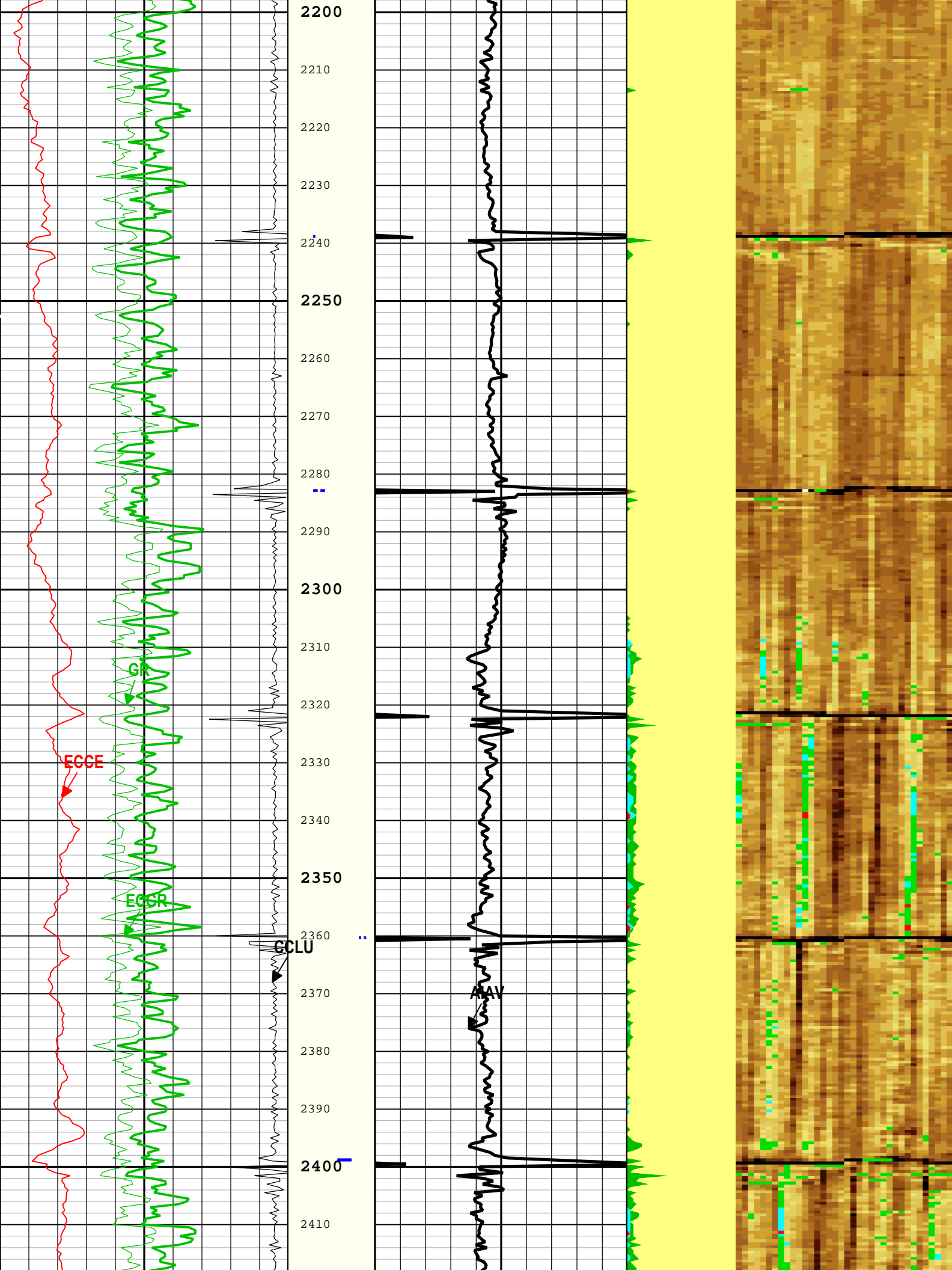


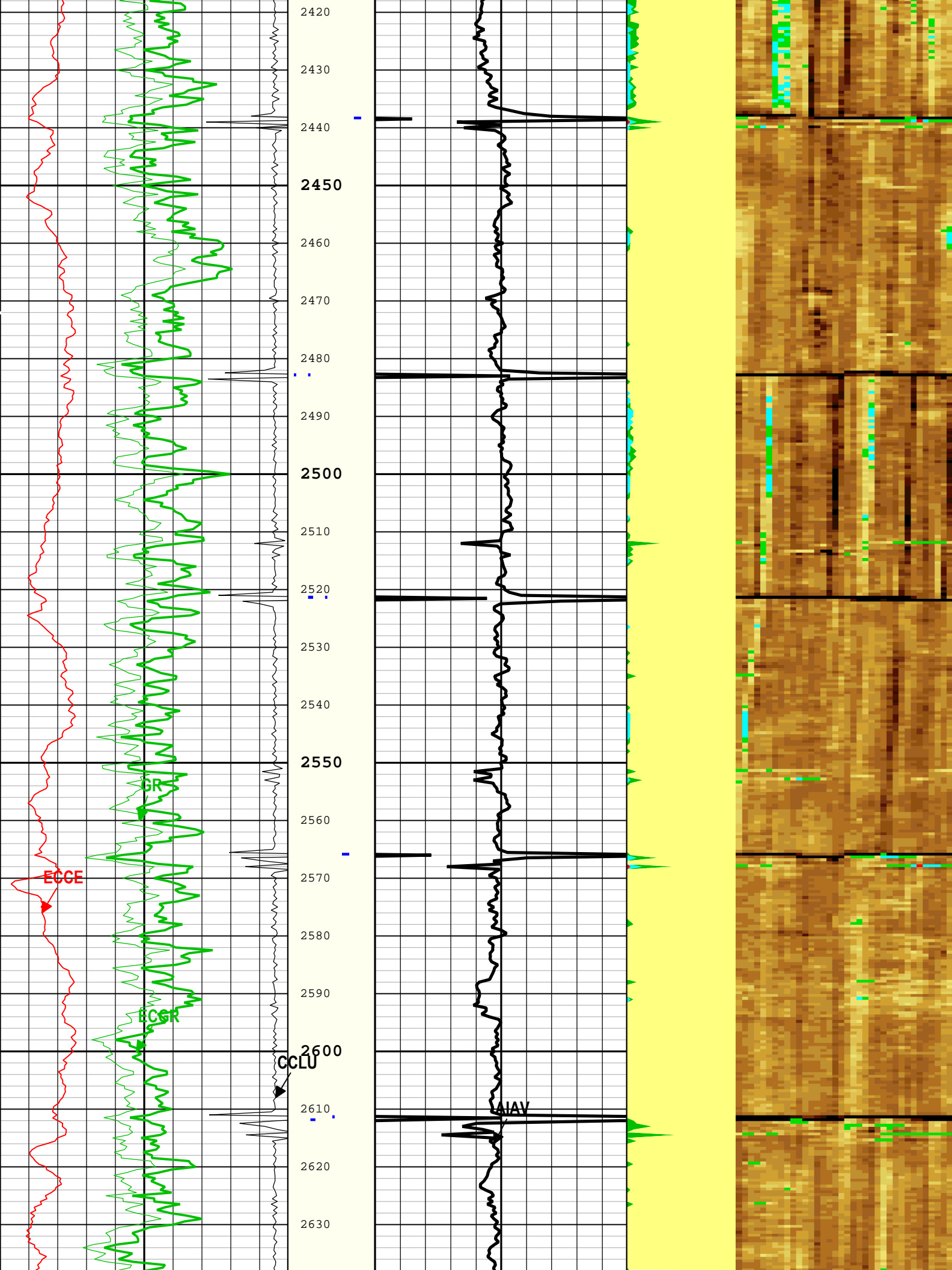


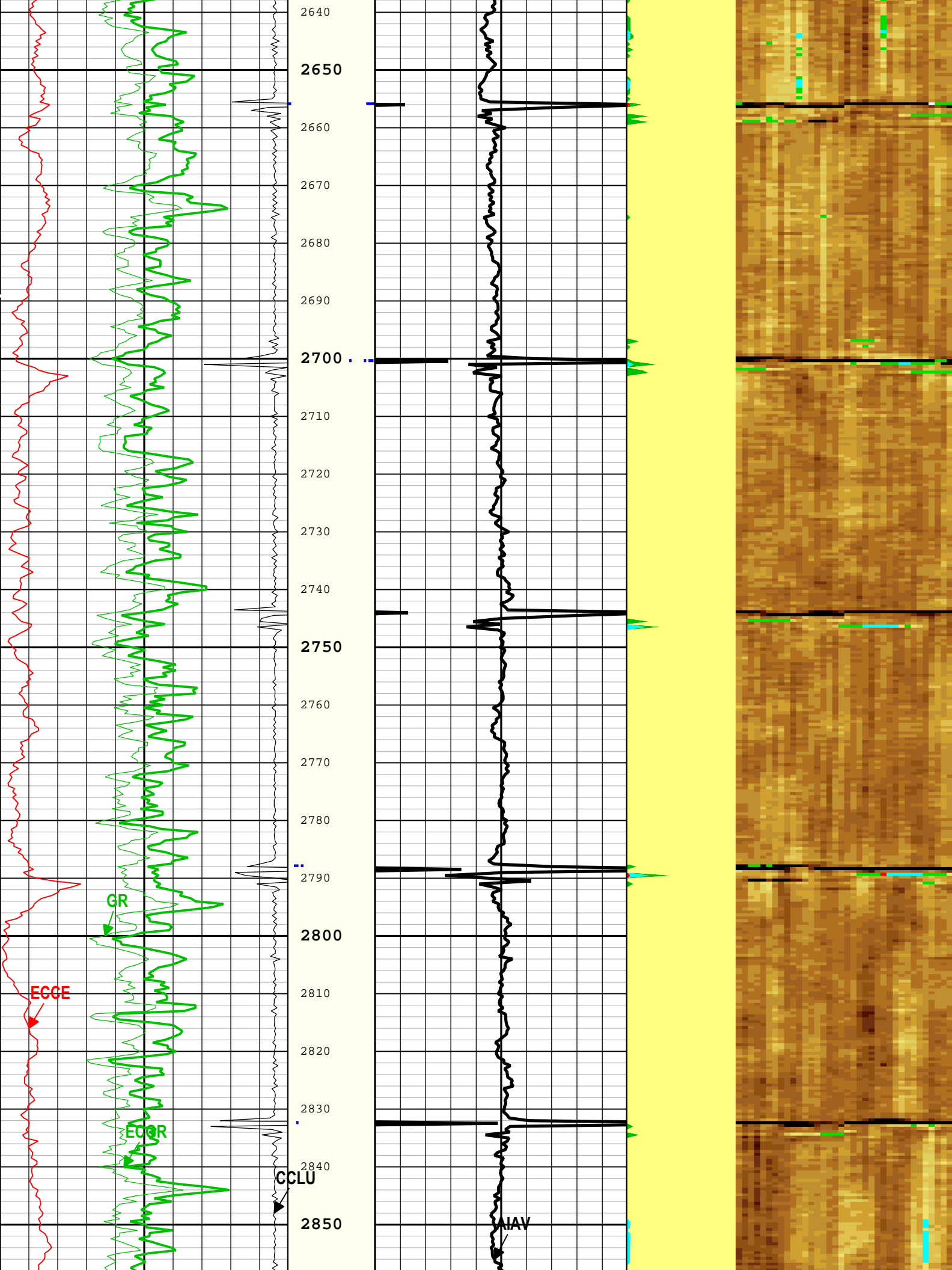


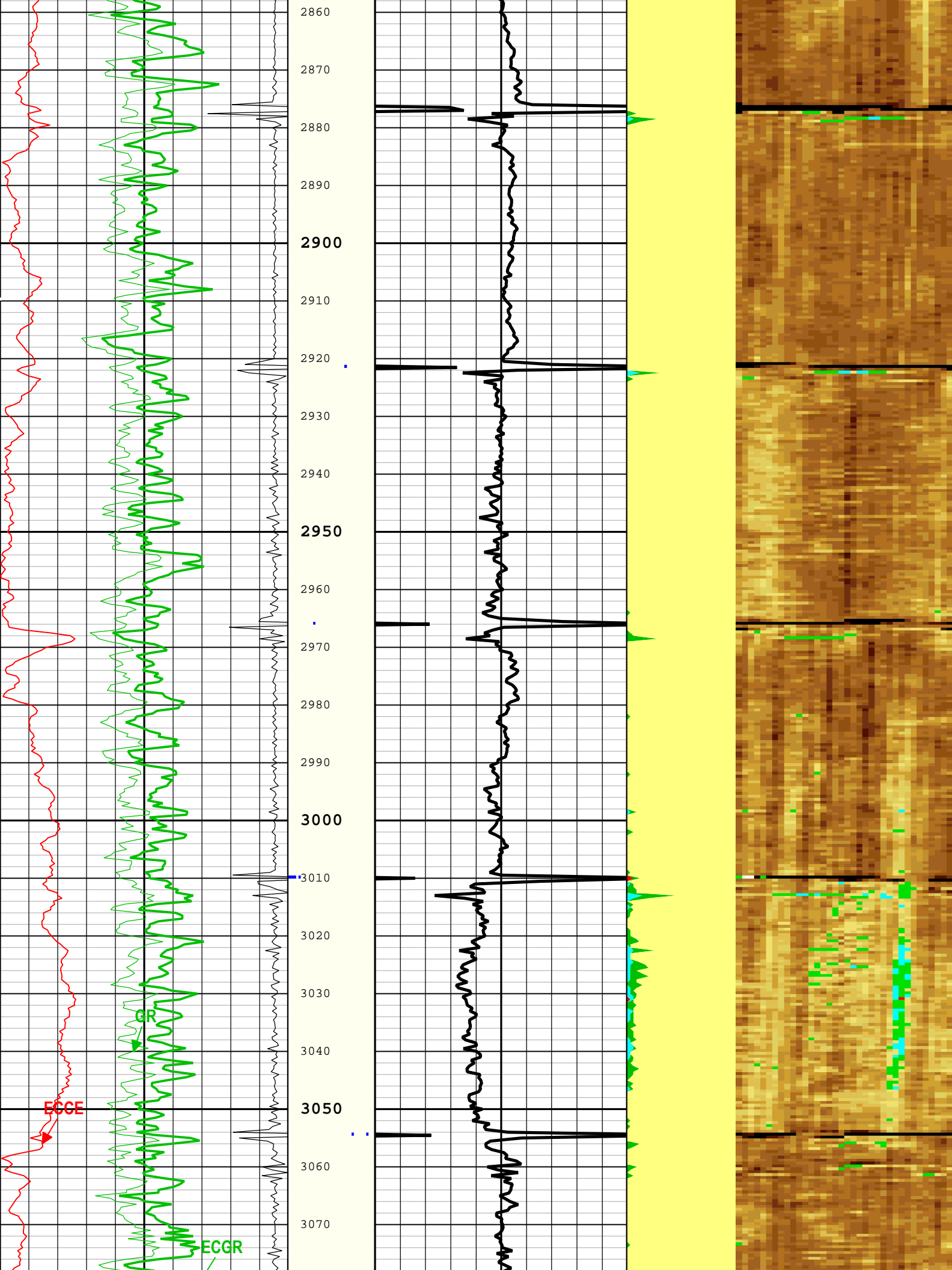


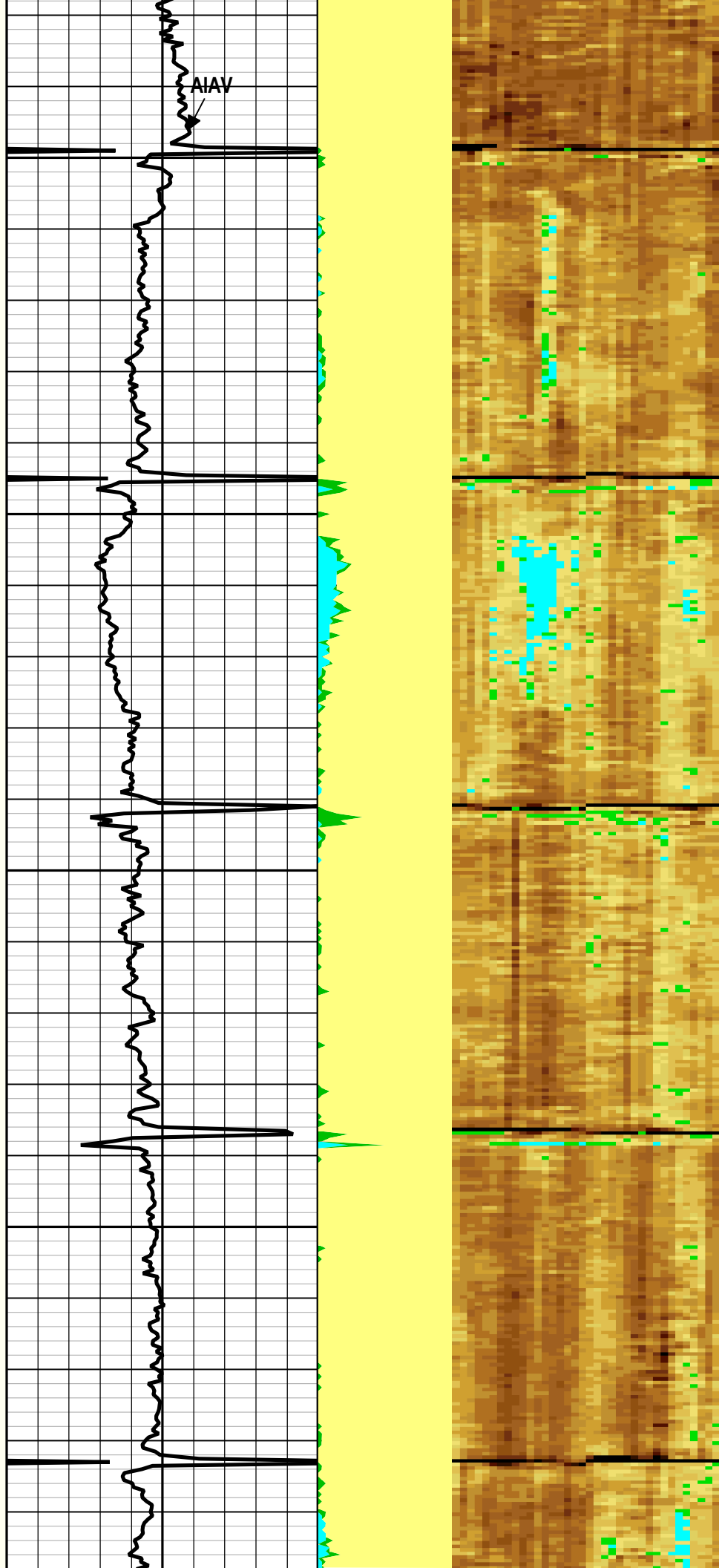
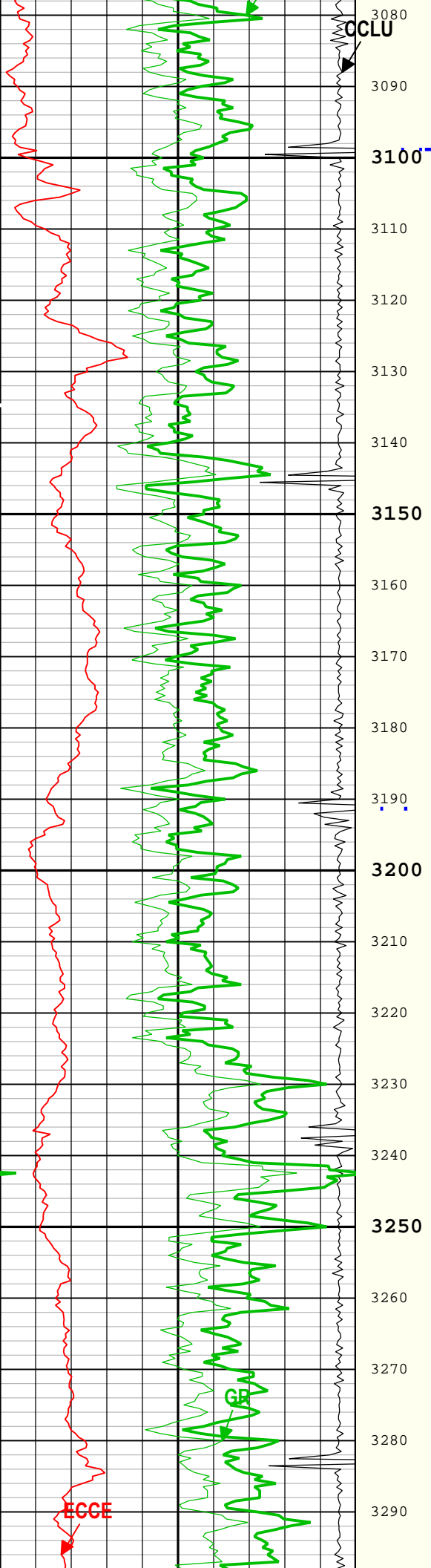


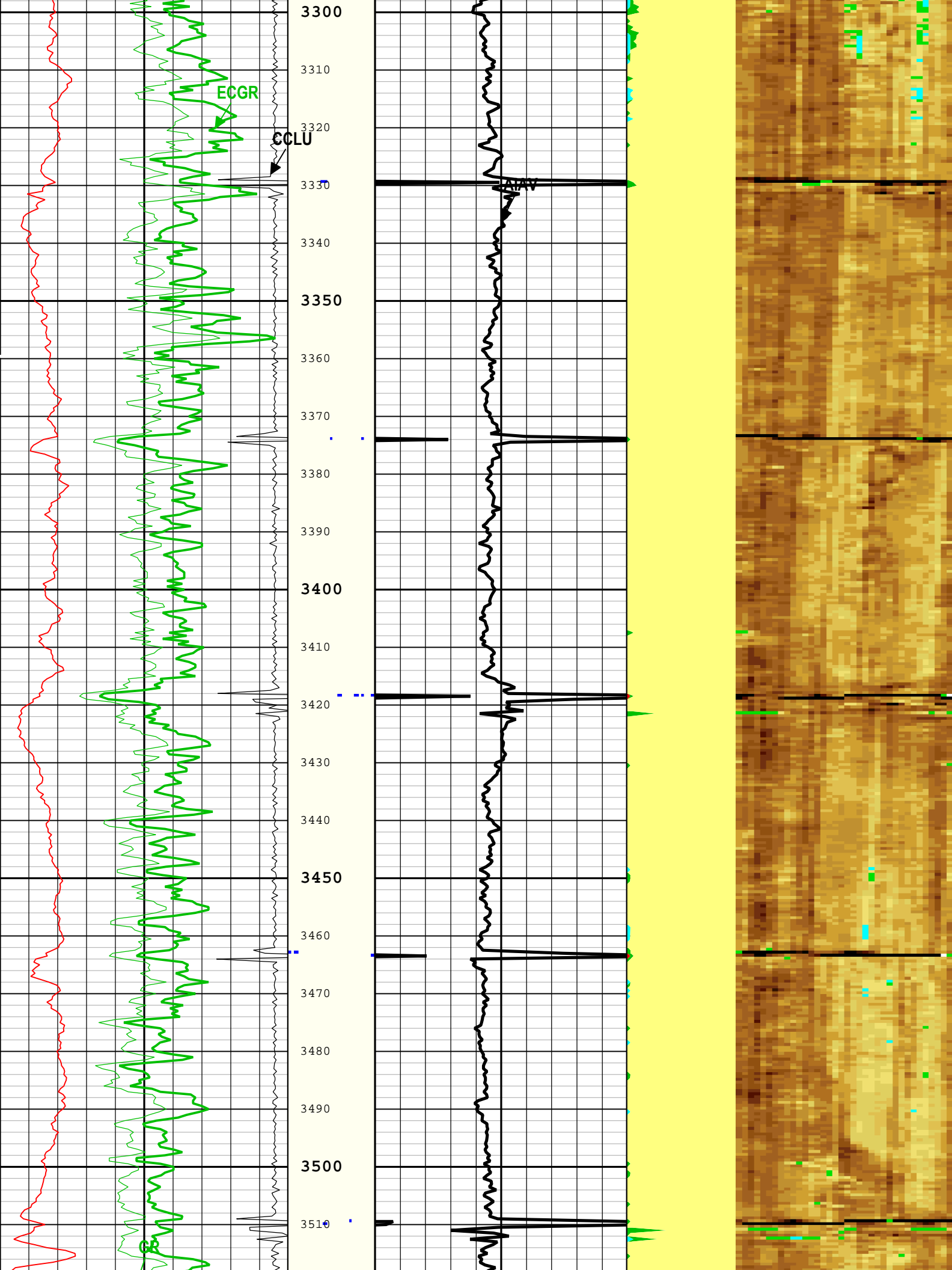


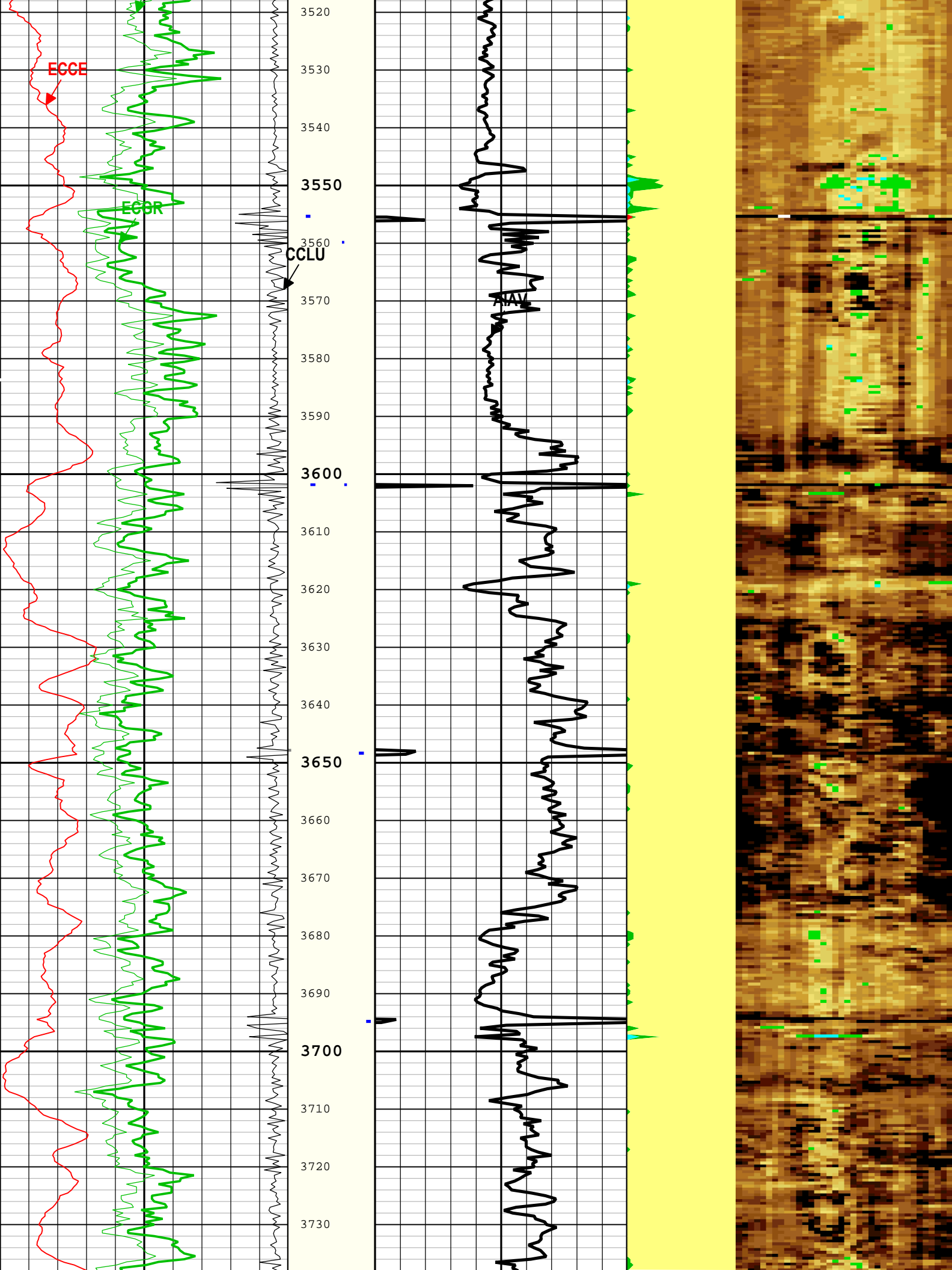


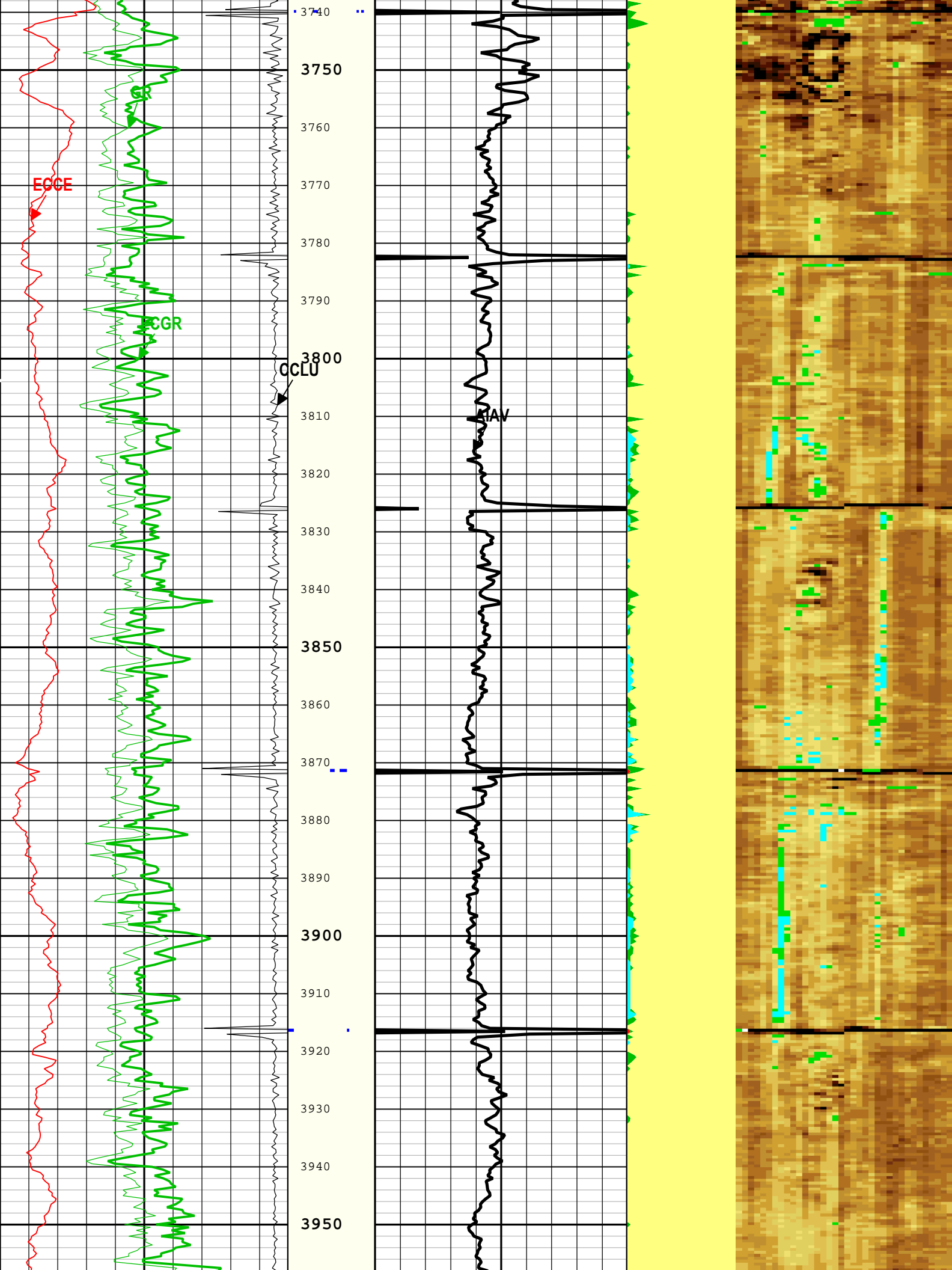


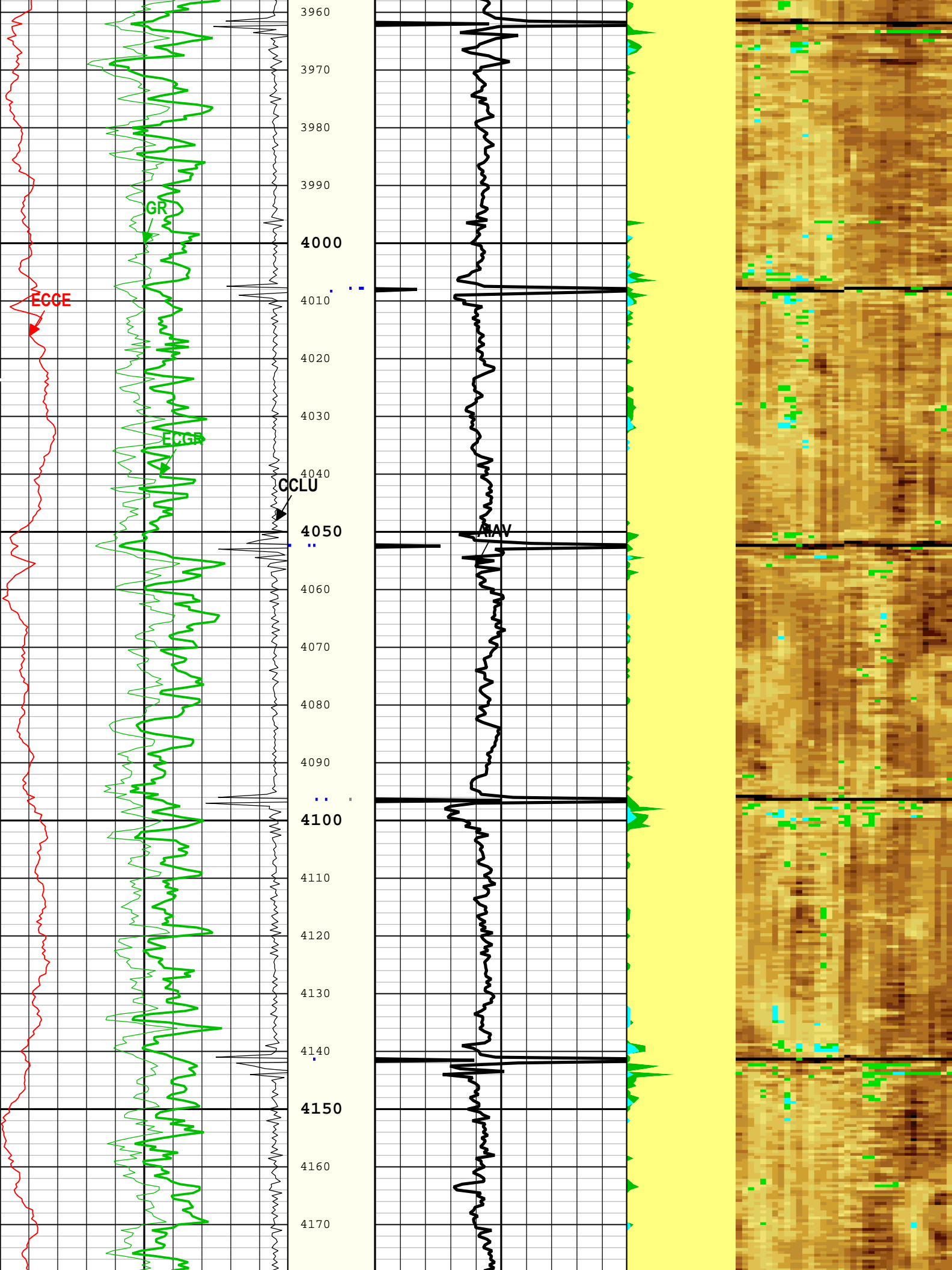


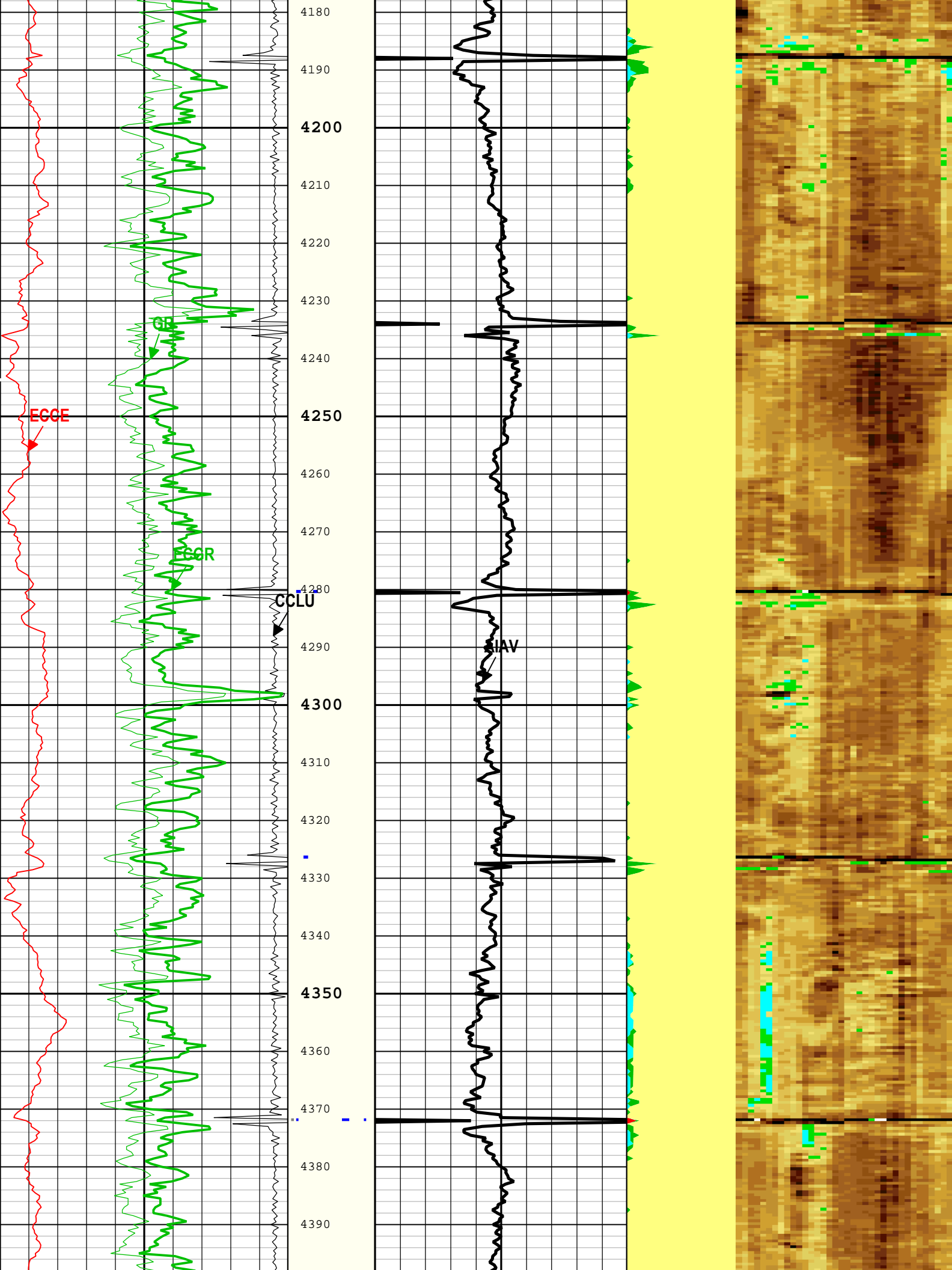


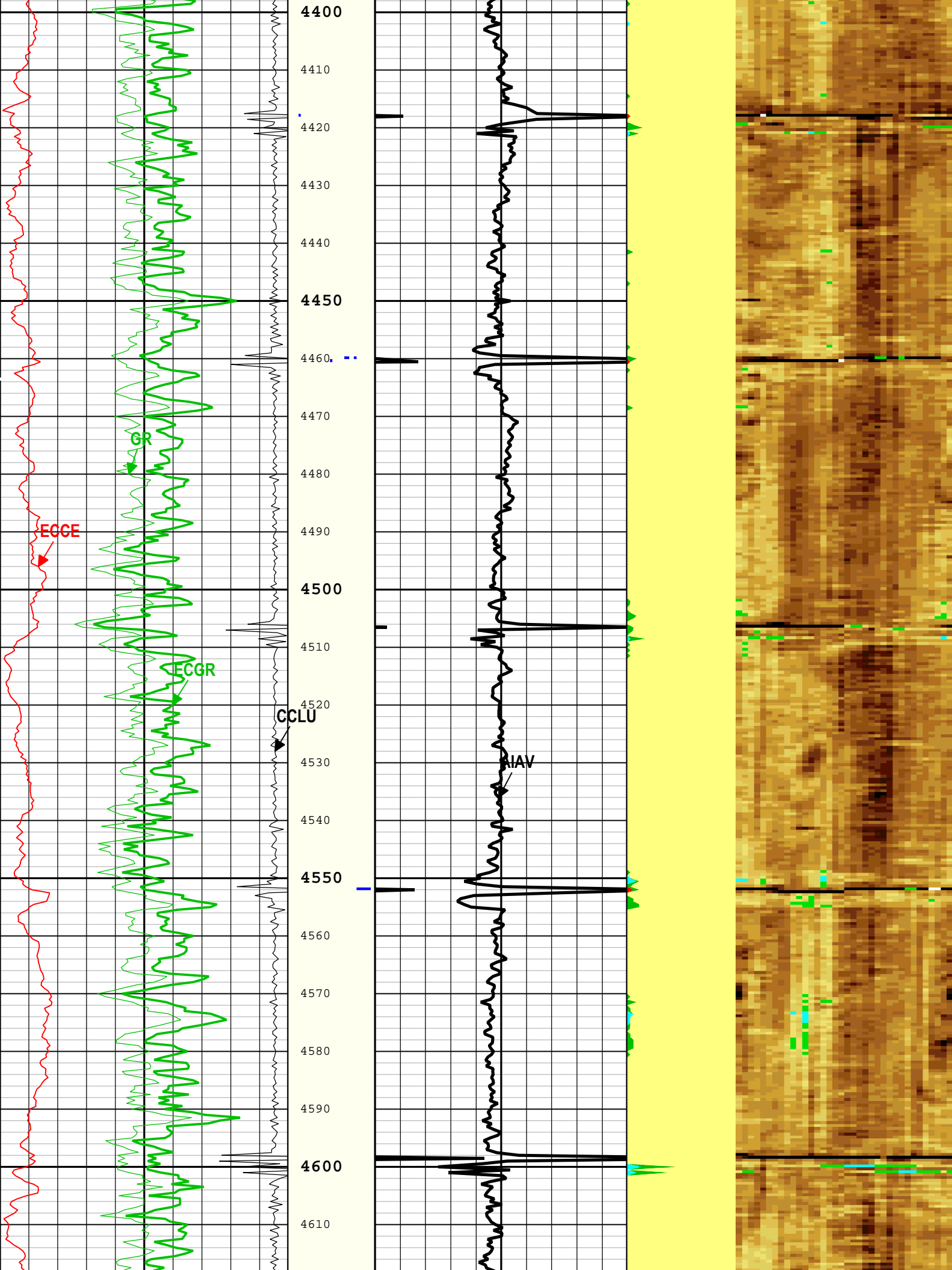


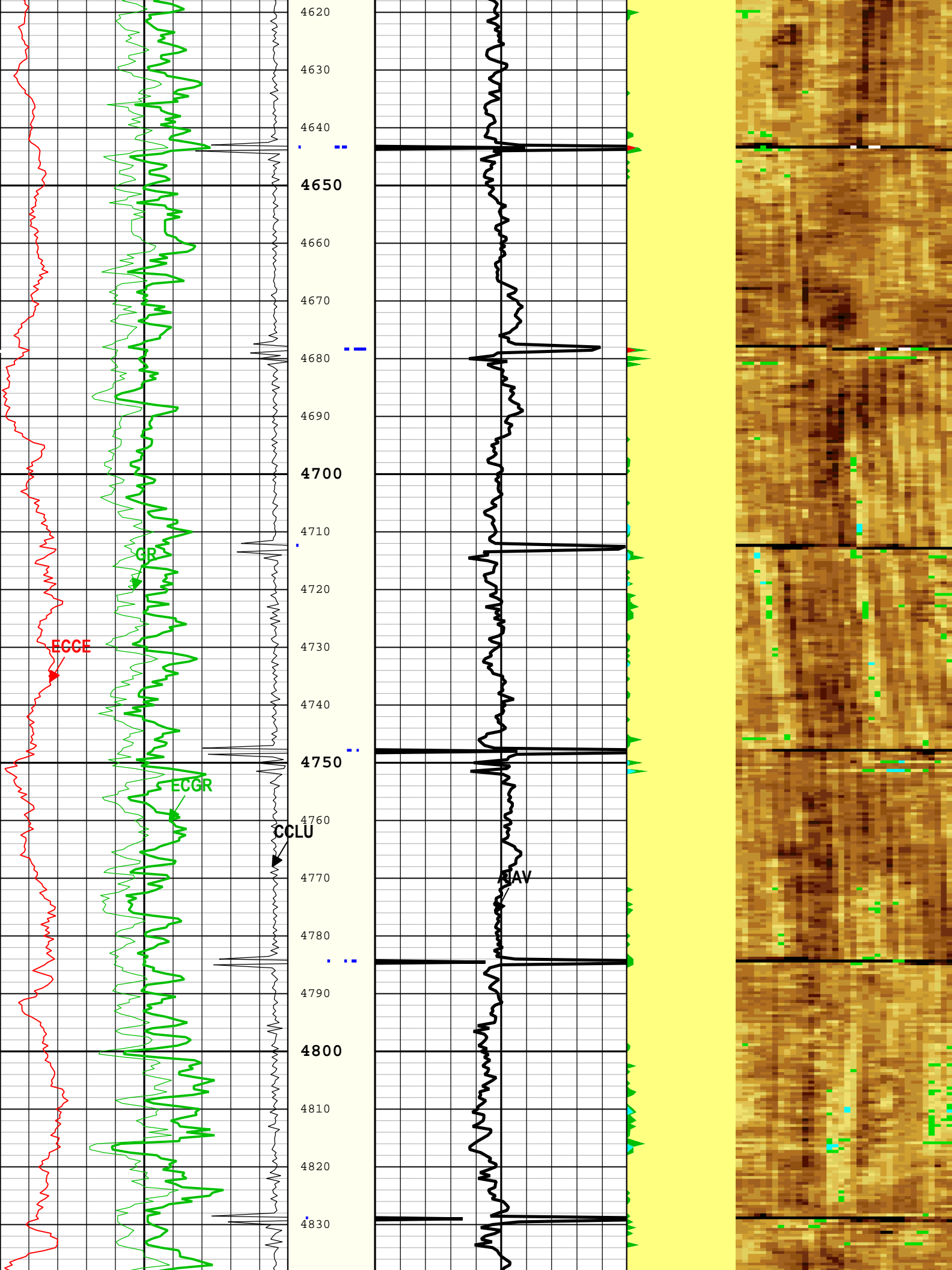


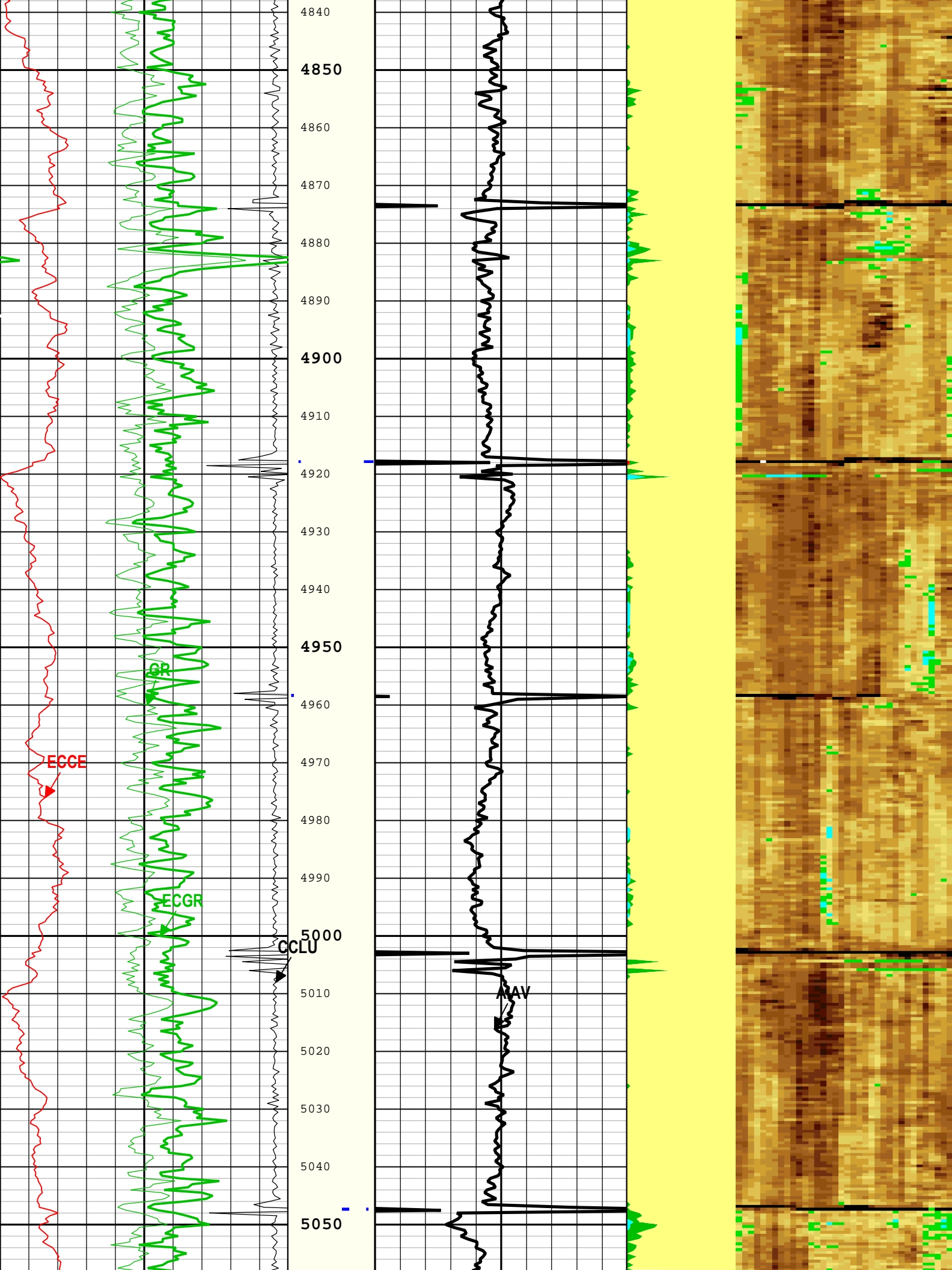


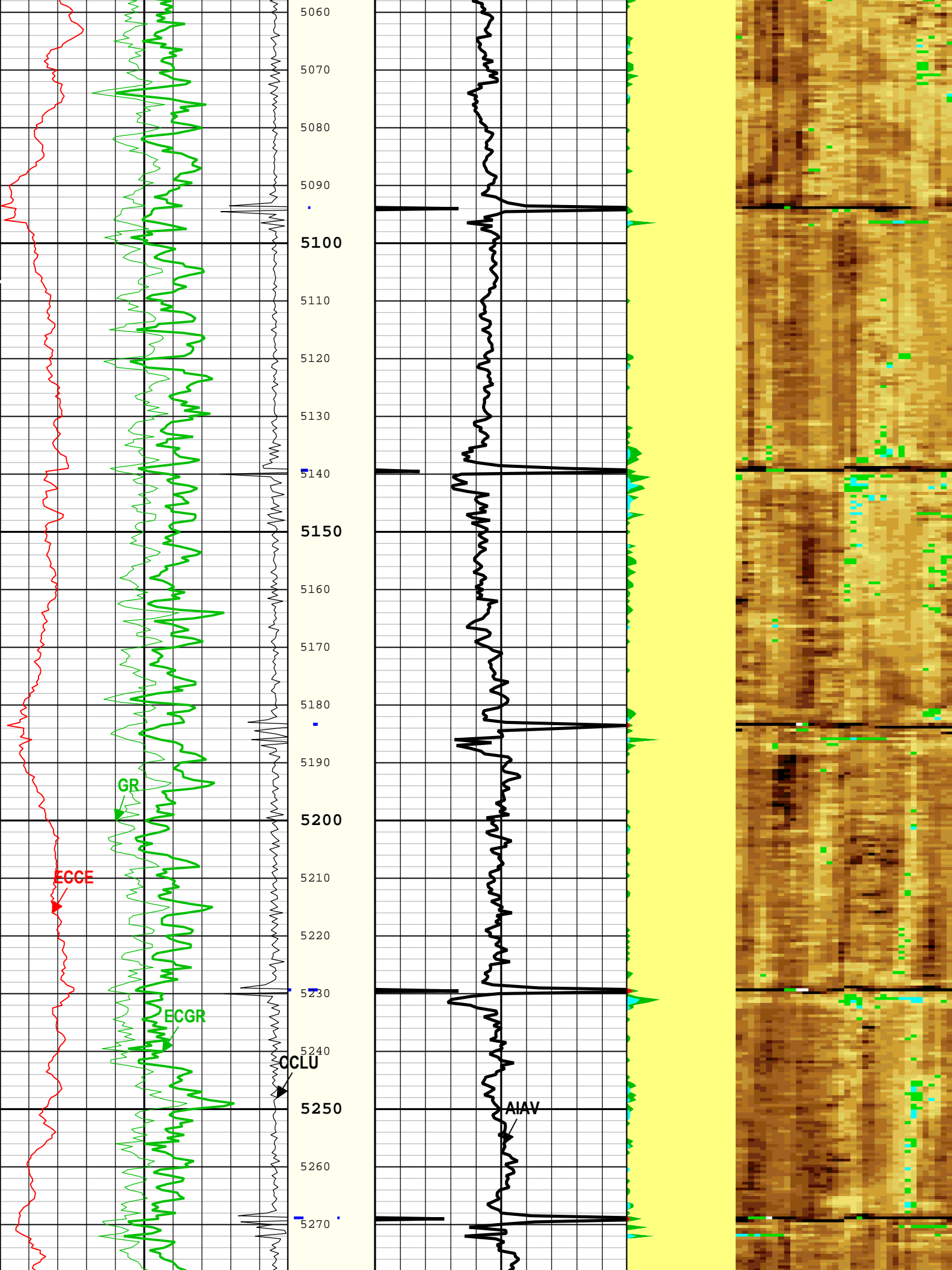


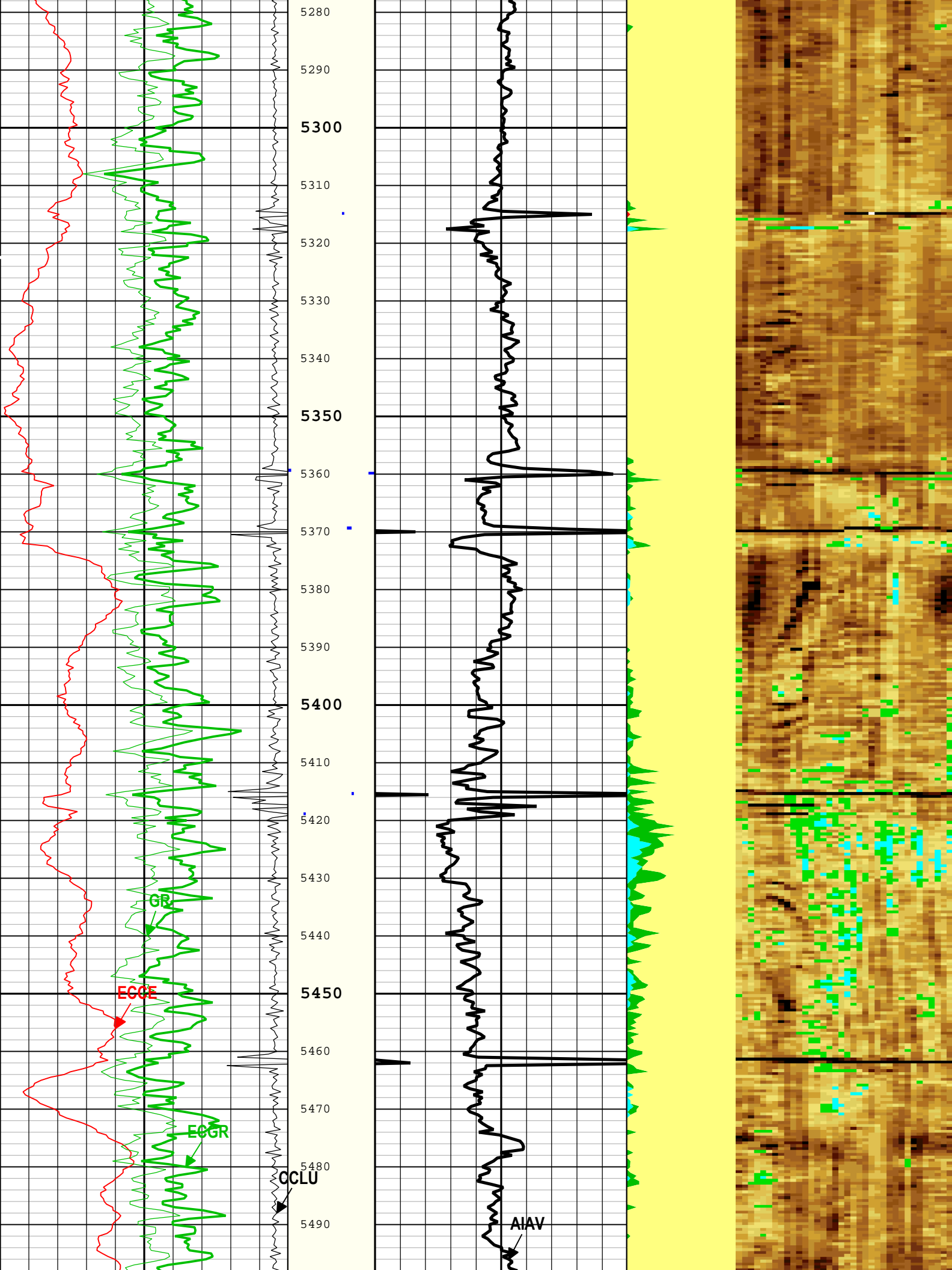


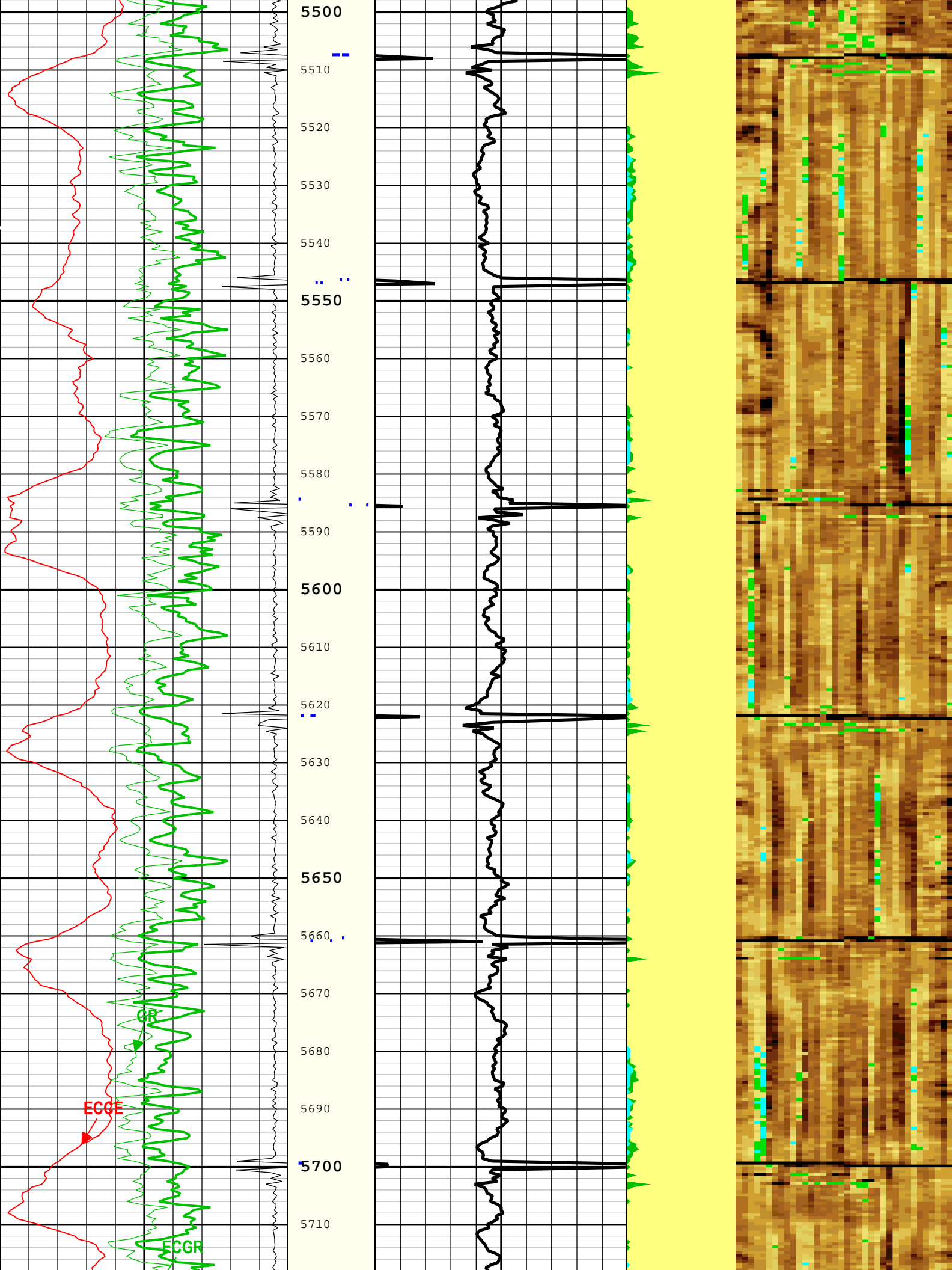


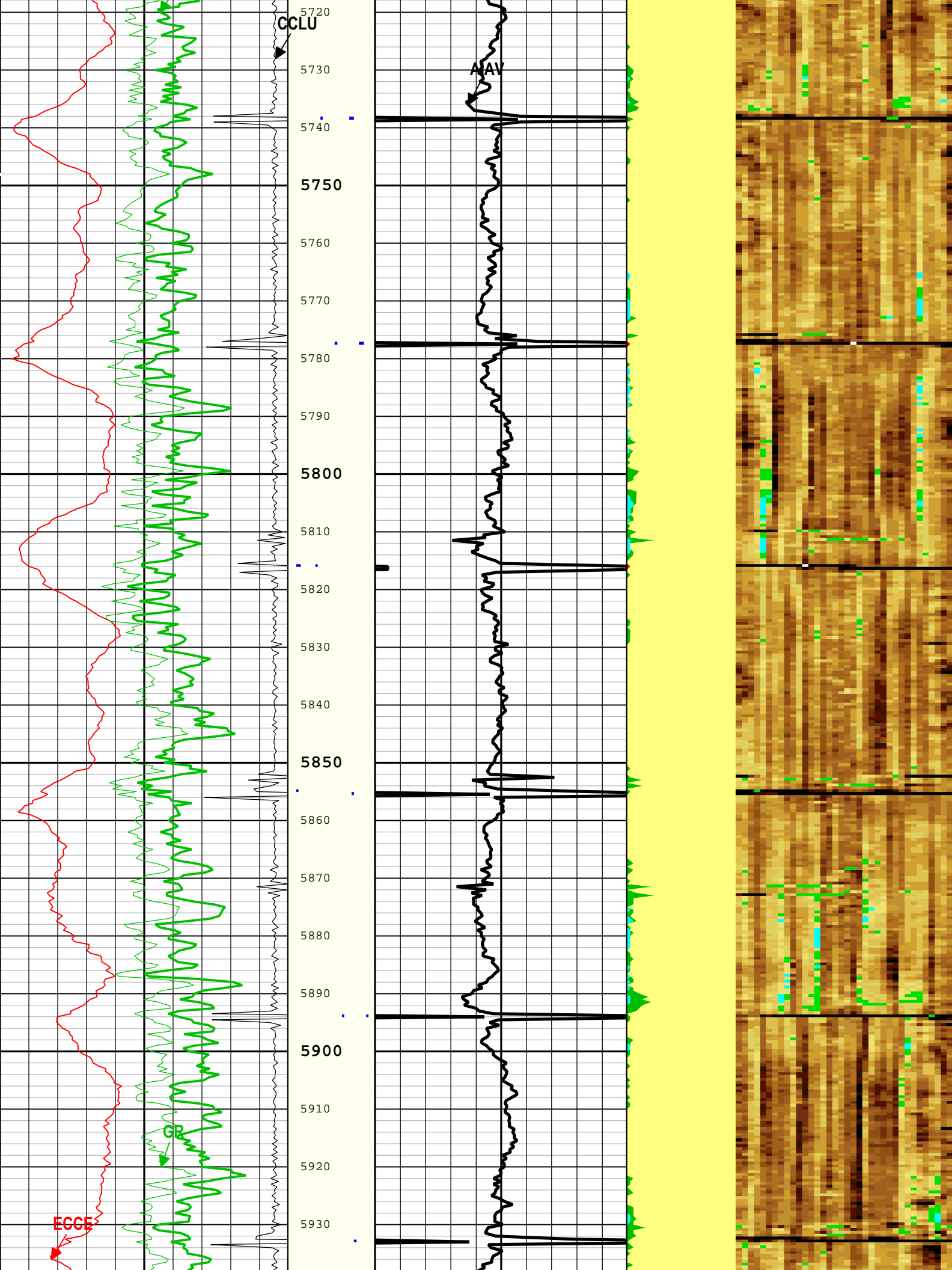


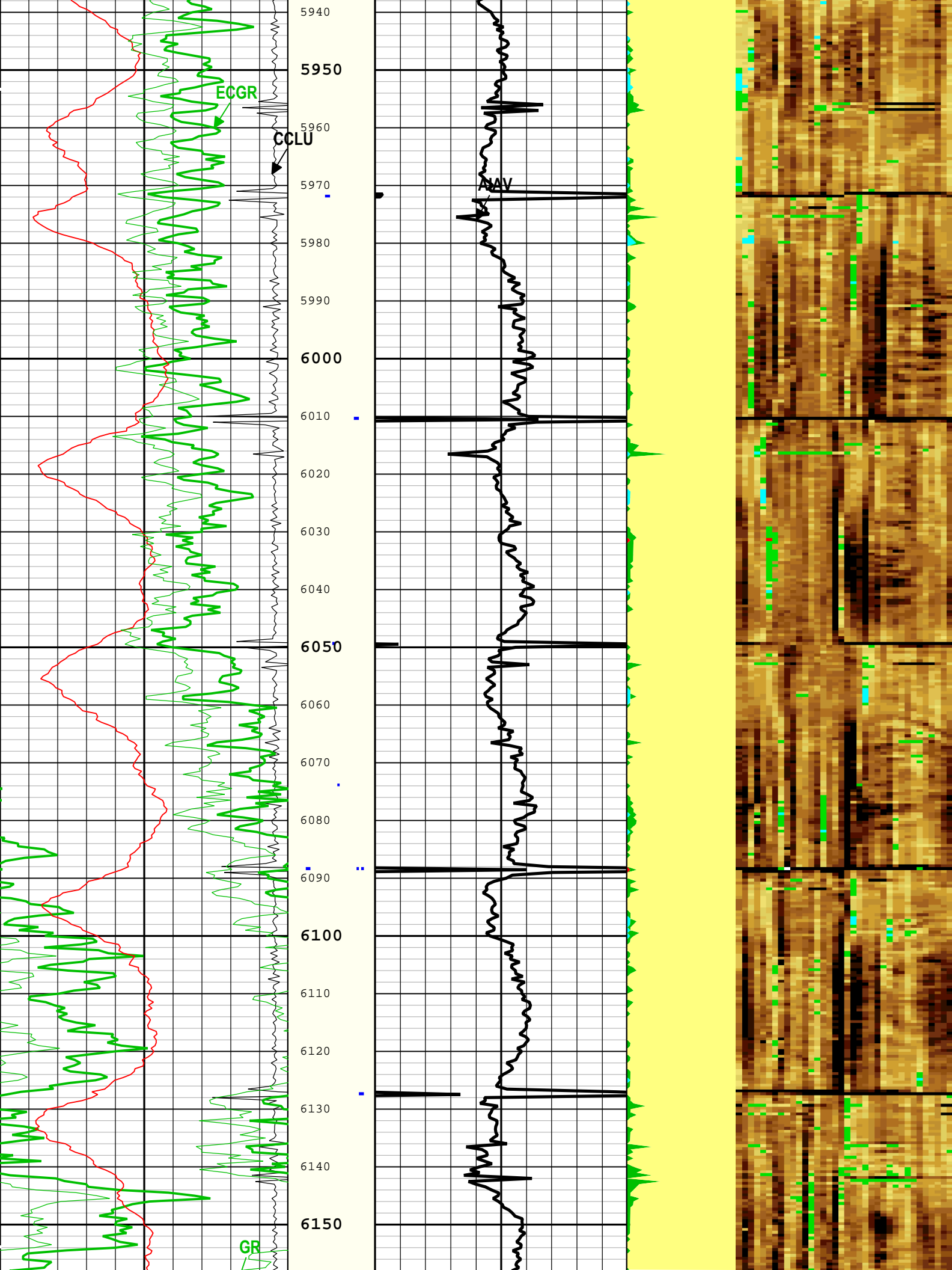


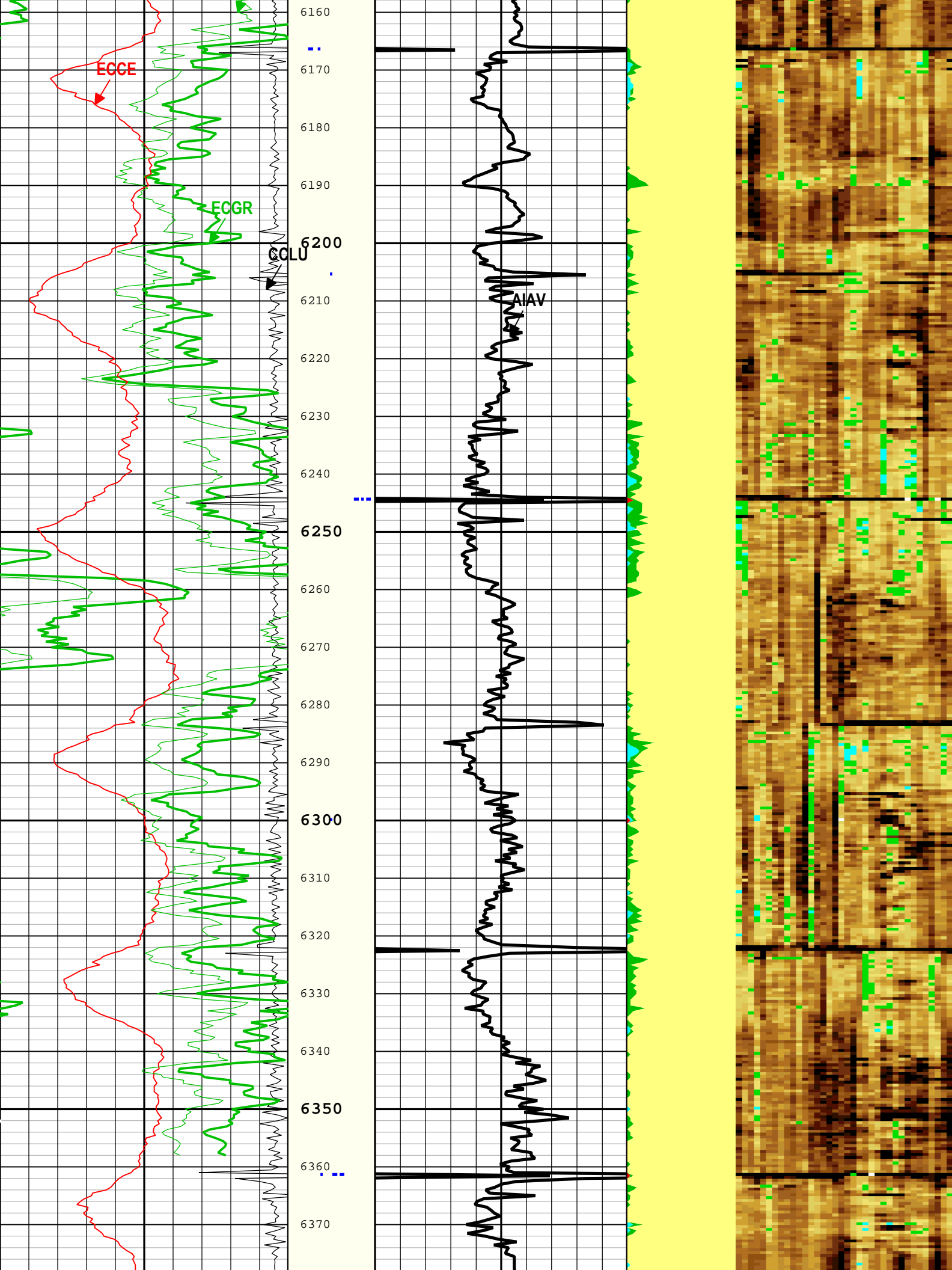












6380

USIT-E

USIT - USIT Processing Flags (UFLG) USIT-E

1.500
2.500
6.500

Explicit Normalization

0

150

0

0.5

0

150

Casing Collar Locator Ultrasonic (CCLU)

USIT-E

-20 in 1

Gamma Ray (ECGR) SGT-N

Amplitude of Eccentering (ECCE) USIT-E

Calibrated Gamma Ray (GR) SGT-N

TIME_1900 - Time Marked every 60.00 (s)

Acoustic Impedance Average (AIAV)

USIT-E

0 Mrayl 10

Gas

Liquid

Micro-Debonding

Bonded

Absent

500.000

2.200

3.254

4.309

5.363

6.418

7.472

Custom Normalization

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

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: 30-Jan-2017 13:45:22

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	16766.4	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	8.9	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	0.1	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	37	110
BS	13.5	110	1939
BS	8.5	1939	6381.5

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	30	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	2514	ft
WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	71.88	us

One

0 PSI Repeat 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[2]:Up	Up	1994.41 ft	2518.77 ft	30-Jan-2017 11:51:53 AM	30-Jan-2017 11:54:44 AM	ON	5.32 ft	No

All depths are referenced to toolstring zero

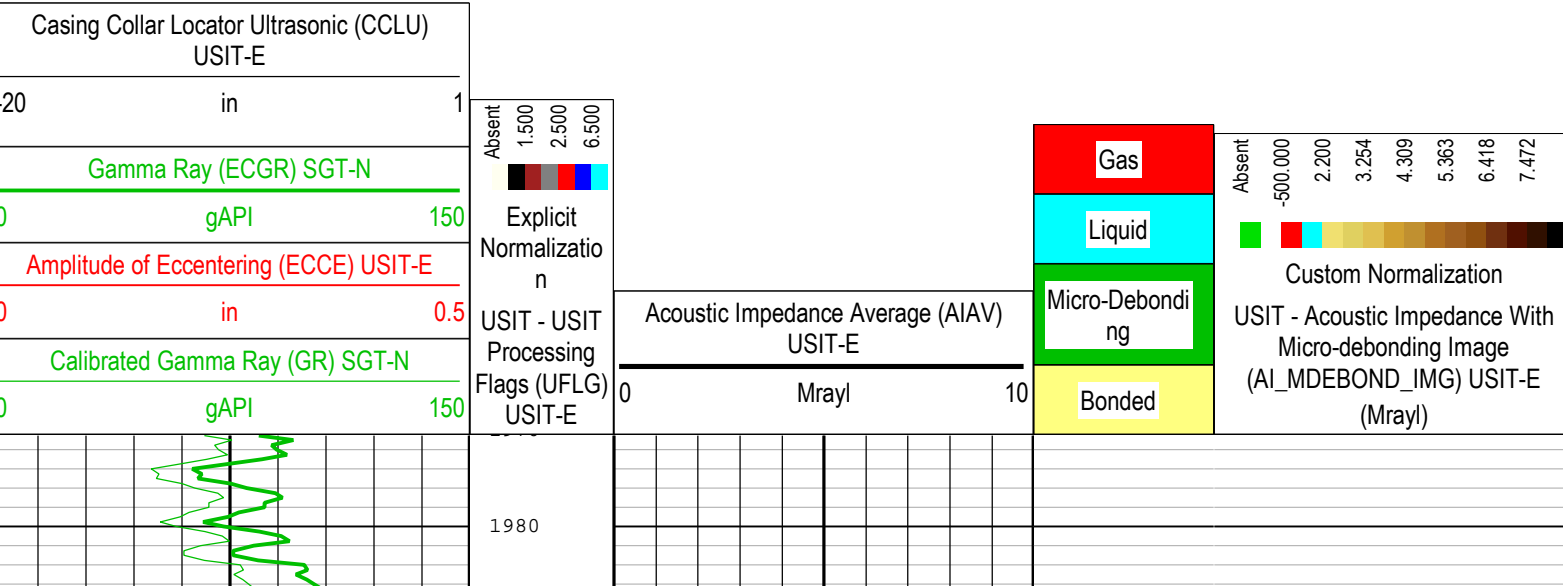
Log

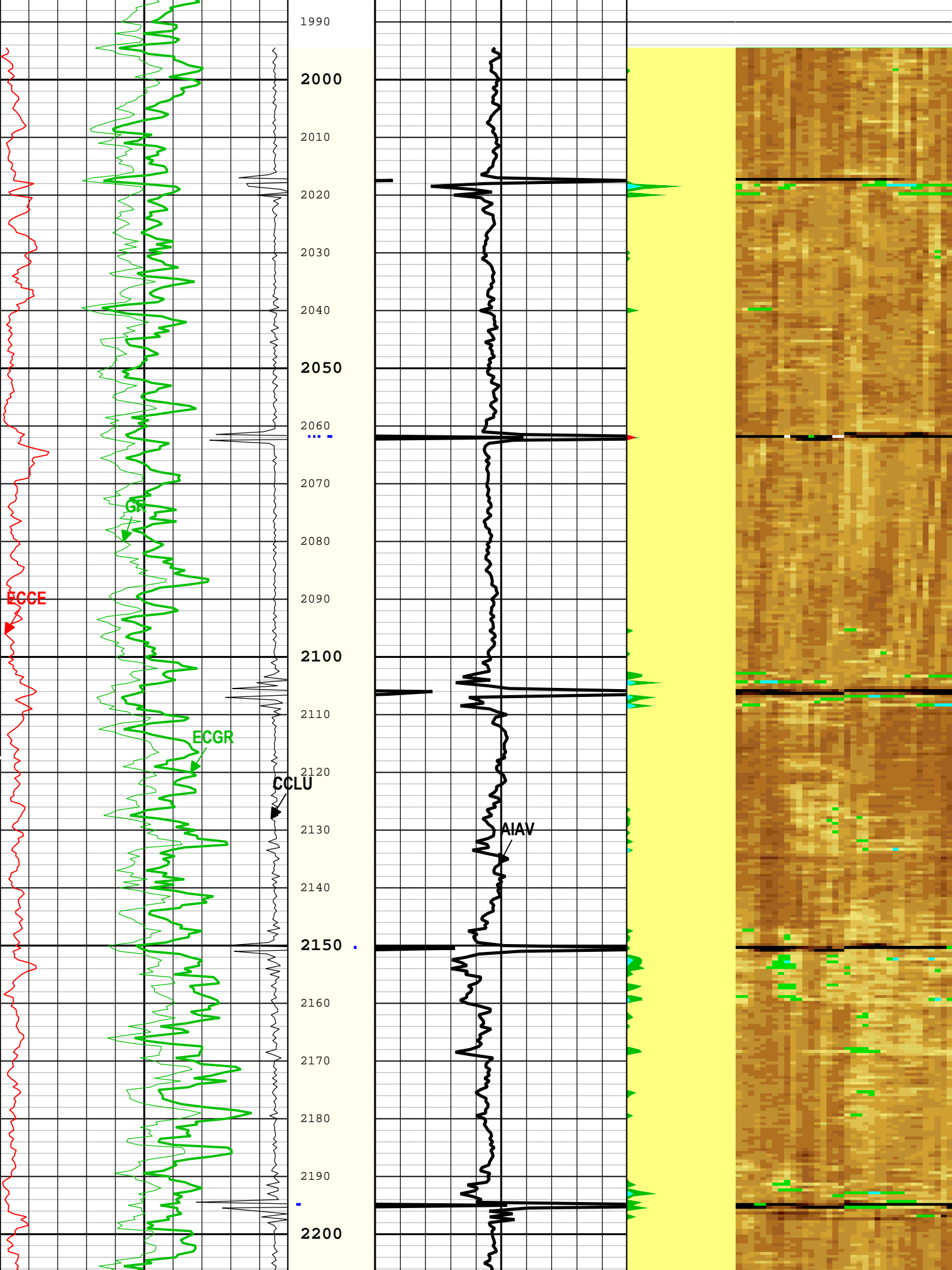
Company:Noble Energy Inc Well:Earp Federal LC23-740

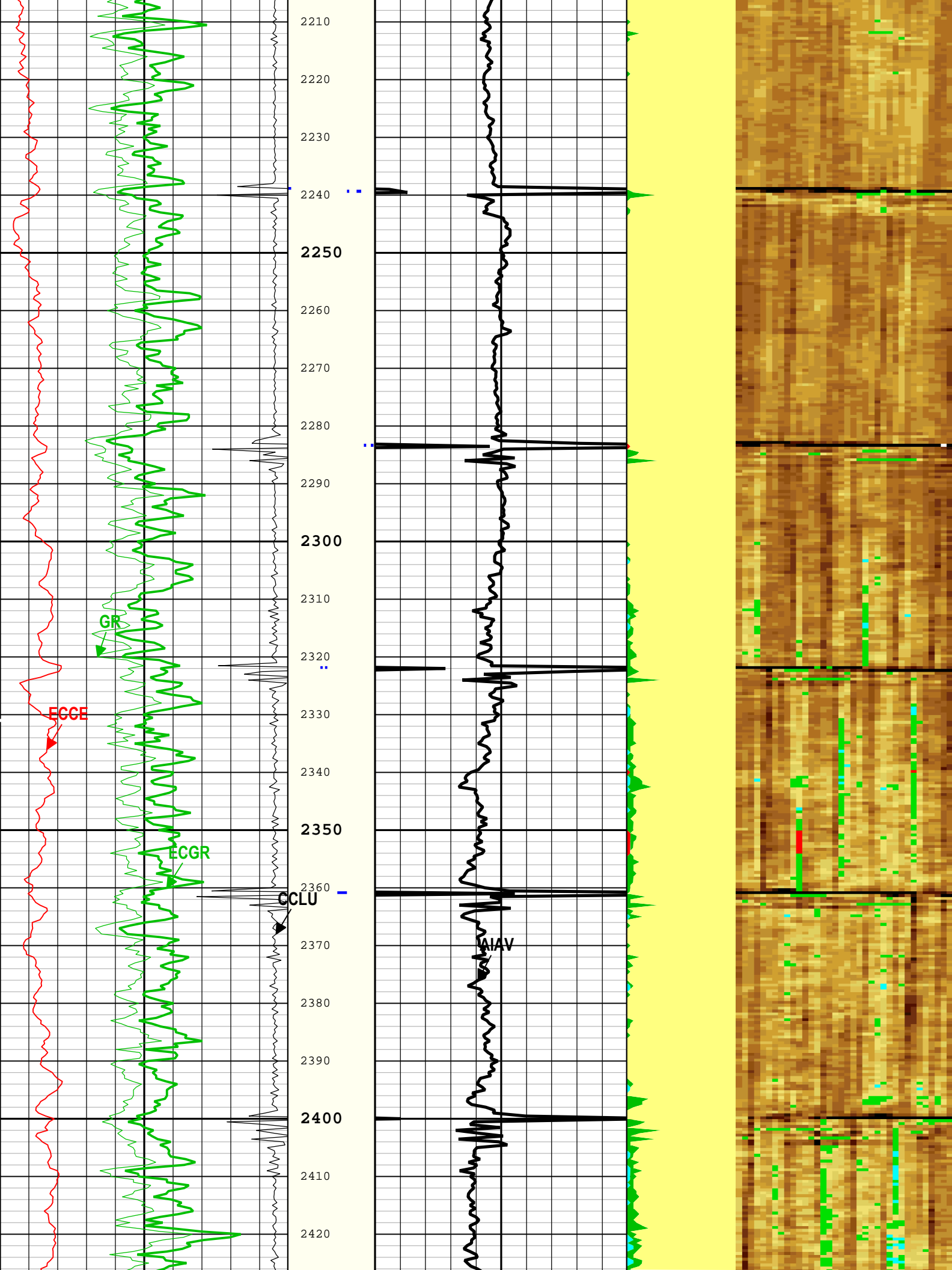
One: Log[2]:Up:S004

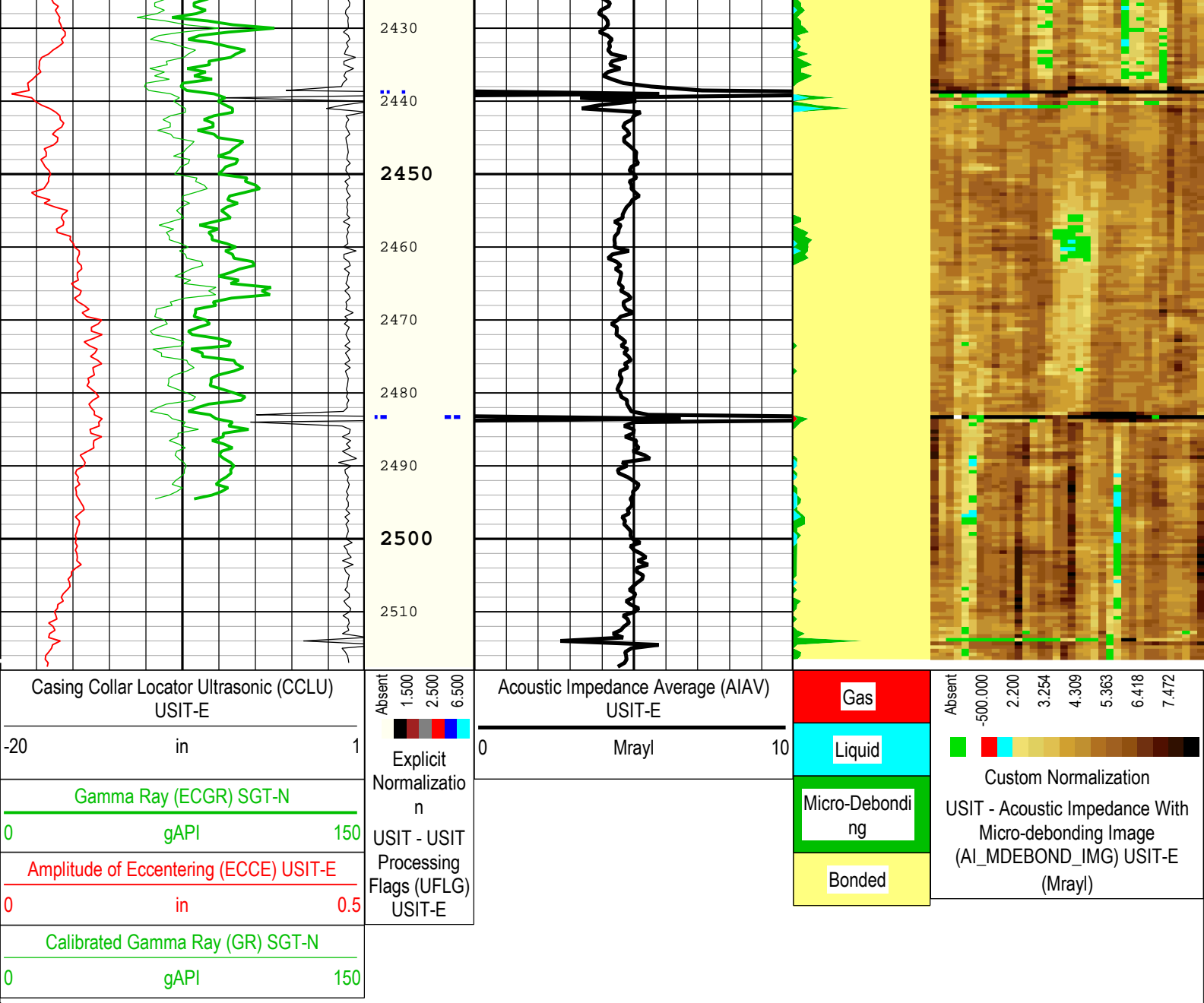
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Creation Date: 30-Jan-2017 13:45:29

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: 30-Jan-2017 13:45:29

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	16766.4	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	8.9	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)	
MEMM	Memory Buffer Flag	Borehole	No	

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	0.1	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

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	30	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	2514	ft
WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	71.88	us

XYZ

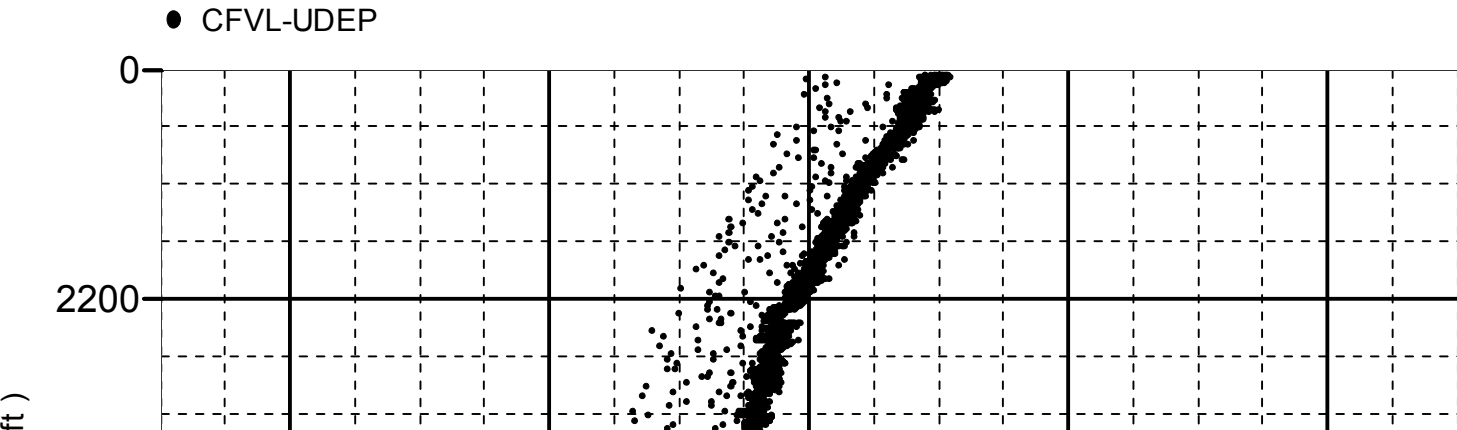
Company:Noble Energy Inc Well:Earp Federal LC23-740

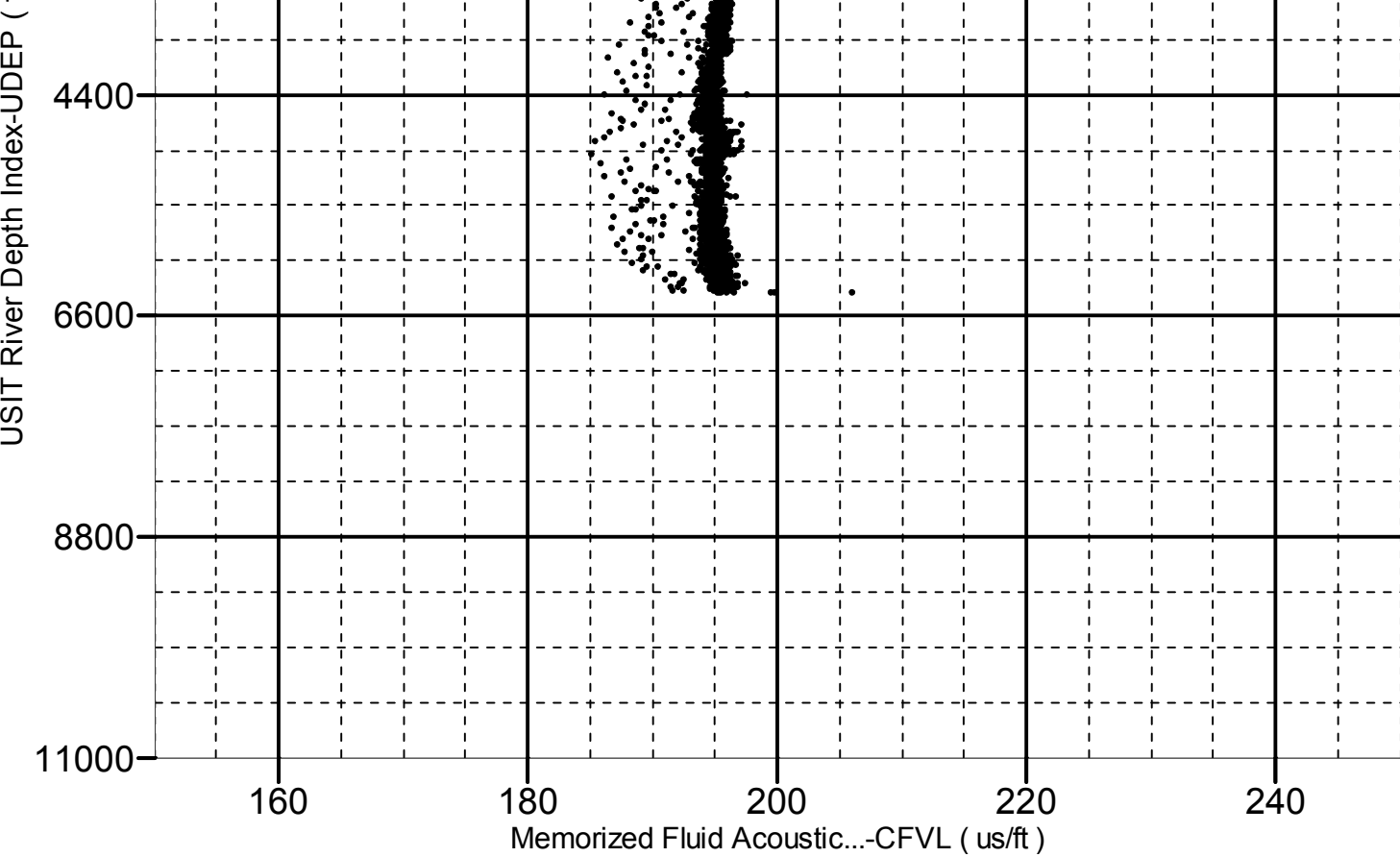
One: Log[4]:Up:S004

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6382.00 to 61.00 ft

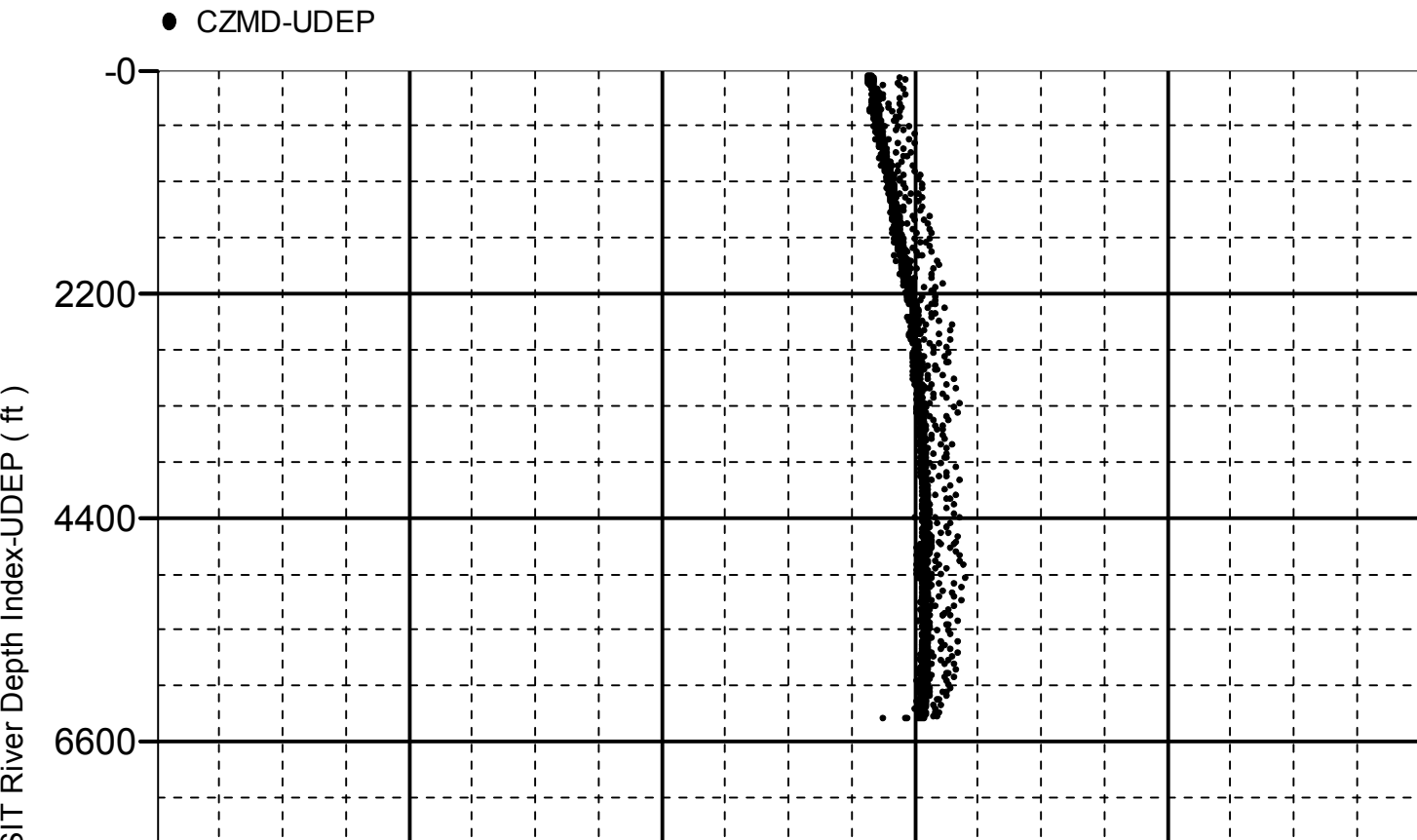


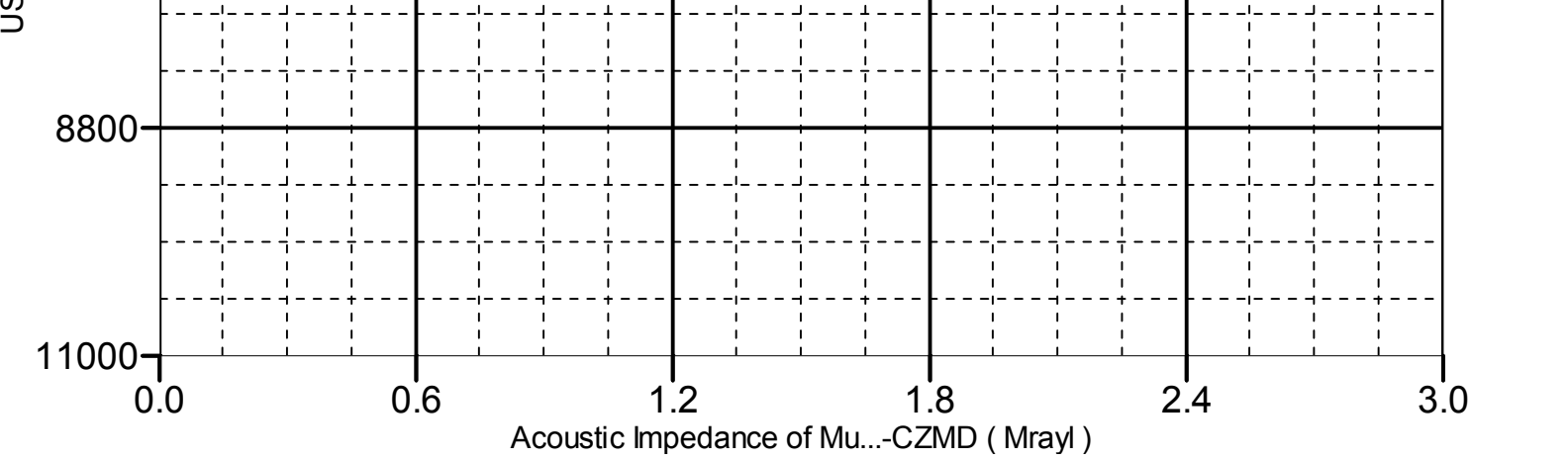


Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6382.00 to 61.00 ft





Company:	Noble Energy Inc	Schlumberger
Well:	Earp Federal LC23-740	
Field:	Wildcat	
County:	WELD	
Country:	US	

