

Company: Noble Energy Inc

Well: ANNI LD29-755

Field: Wildcat

County: Weld

State: Colorado

UltraSonic Summary Print

County: Weld

Field: Wildcat

Location: SESW: Sec20, T9N, R58W

Well: ANNI LD29-755

Company: Noble Energy Inc

Location:

SESW: Sec20, T9N, R58W

SHL: 380FSL x 1403FWL

Lat/Long: 40.73031/-103.89255

Elev.:

K.B.

4897.00 ft

G.L.

4867.00 ft

D.F.

4896.00 ft

Permanent Datum:

Ground Level

Elev.:

4867.00 f

Log Measured From:

Kelly Bushing

30.00 ft

above Perm.Datum

Drilling Measured From:

Kelly Bushing

API Serial No.

05-123-43289

Section:

20

Township:

9N

Range:

58W

Logging Date05-Nov-2016

Run Number	One		
Depth Driller	10965.00 ft		
Schlumberger Depth	10965.00 ft		
Bottom Log Interval	6100.00 ft		
Top Log Interval	60.00 ft		
Casing Fluid Type	BRINE		
Salinity			
Density	9.3 lbm/gal		
Fluid Level	8.00 ft		
BIT/CASING/TUBING STRING			
Bit Size	8.50 in		
From	1928.00 ft		
To	10965.00 ft		
Casing/Tubing Size	5.5 in		
Weight	20 lbm/ft		
Grade	N/A		
From	30.00 ft		
To	10965.00 ft		
Max Recorded Temperatures	195 degF		
Logger on Bottom	05-Nov-2016	15:39:00	
Unit Number	9115	FtMorgan	
Recorded By	B Kesek		
Witnessed By	Bill Mansfield		

Disclaimer

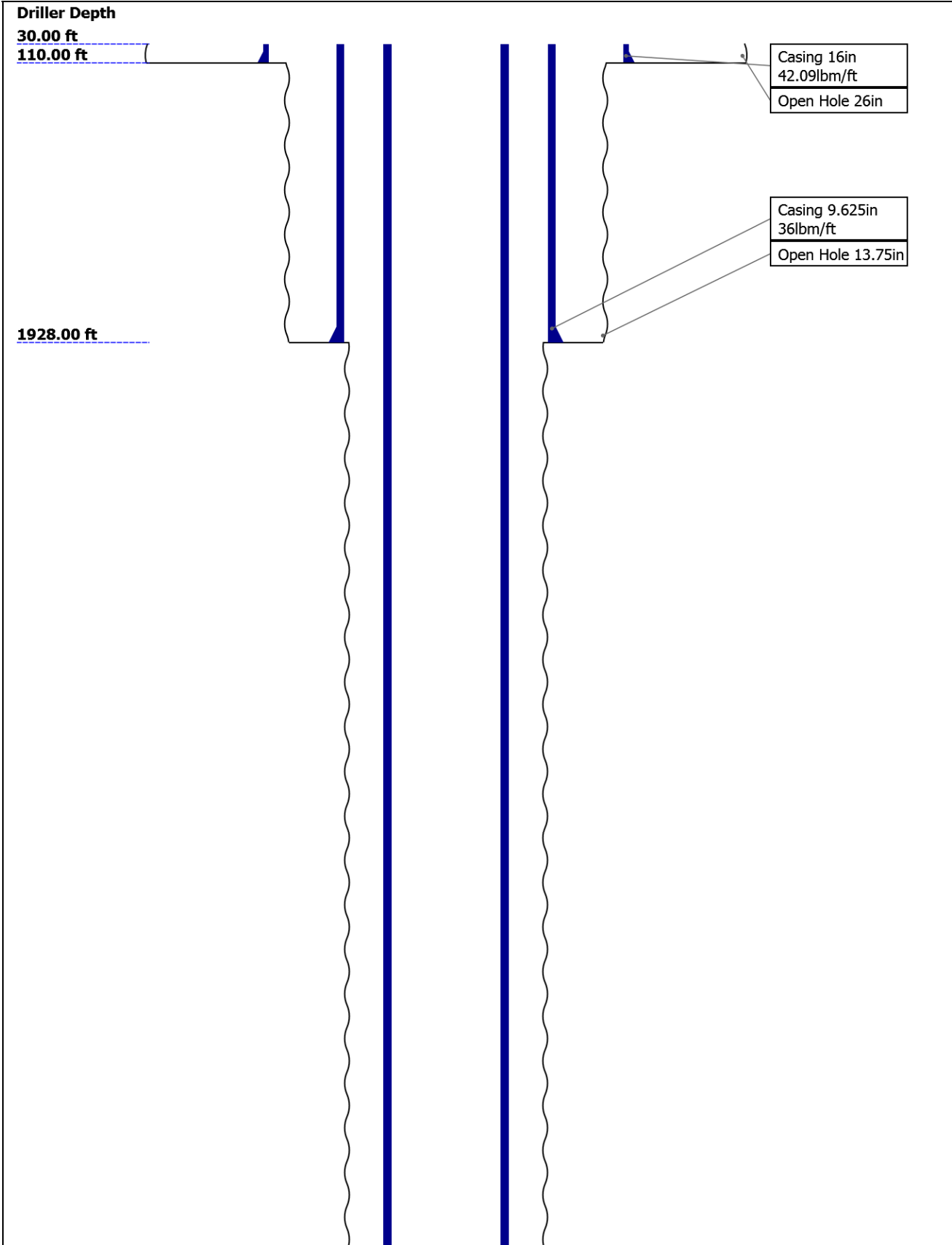
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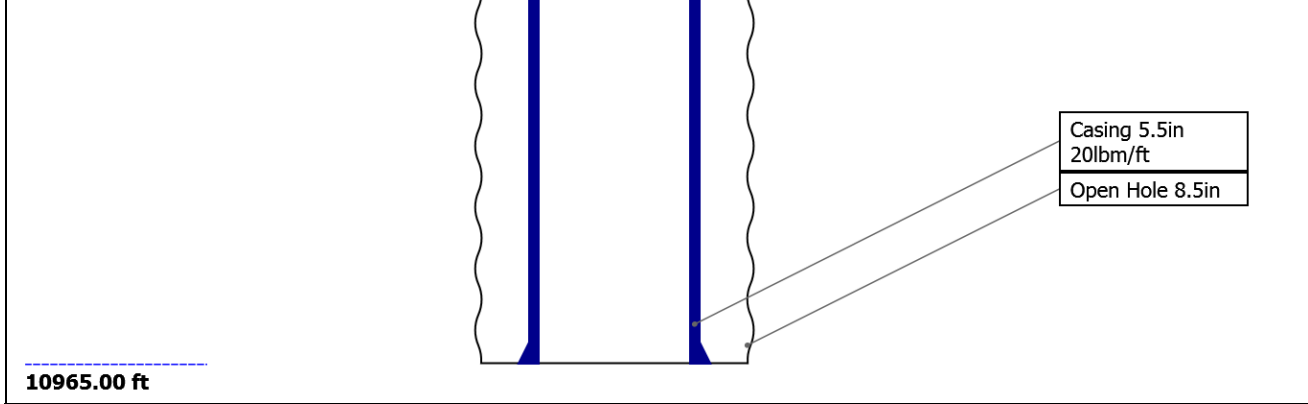
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Well Sketch

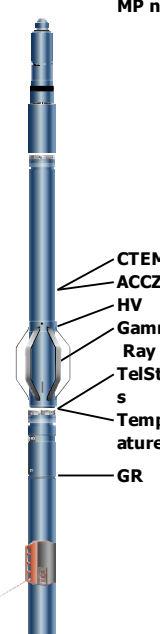


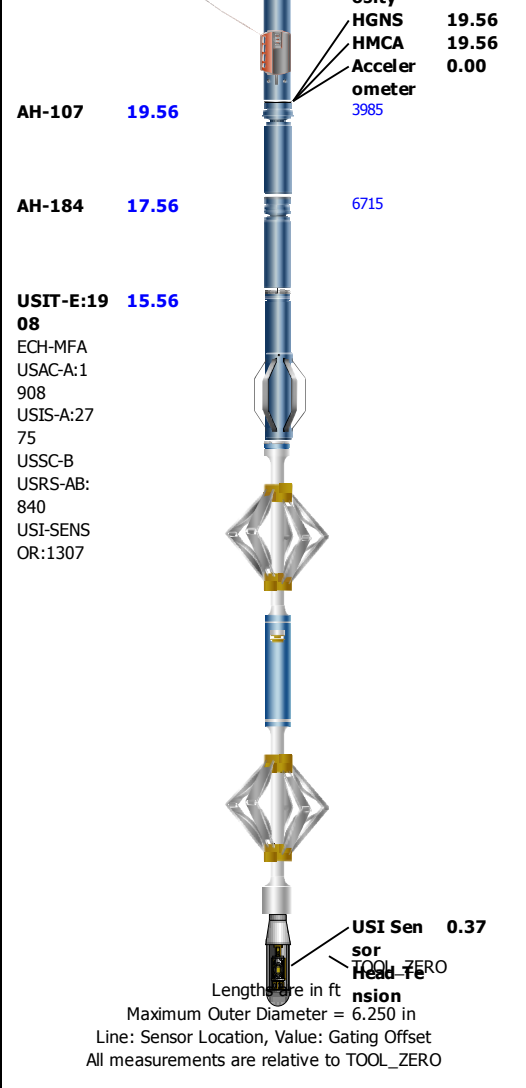


Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	26	13.75	8.5			
Top Driller (ft)	30	110	1928			
Top Logger (ft)	30	110	1928			
Bottom Driller (ft)	110	1928	10965			
Bottom Logger (ft)	110	1928	10965			
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	1928	10965			
Bottom Logger (ft)	110	1928	10965			

Remarks and Equipment Summary

One: Toolstring			One: Remarks	
<div><div><div>Equip nameLength</div><div>LEH-QT38.38</div><div>LEH-QT</div></div><div></div></div> <div><div><div>MP nameOffset</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> <td><div>This is the first run in the hole.</div><div>Tool ran as per toolsketch.</div><div>Houma kit, small hole kit and inline centralisers used for centralization.</div><div>Main pass recorded at 2500PSI, repeat pass at 0PSI.</div></td>	<div>This is the first run in the hole.</div> <div>Tool ran as per toolsketch.</div> <div>Houma kit, small hole kit and inline centralisers used for centralization.</div> <div>Main pass recorded at 2500PSI, repeat pass at 0PSI.</div>			



Depth Summary

	One		
Depth Measuring Device			
Type	IDW-JA		
Serial Number	5797		
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type	7-46 AXXS		
Wheel Correction 1	-5		
Wheel Correction 2	-3		
Tension Device			
Type	CMTD-B/A		
Serial Number	146		
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0		
Logging Cable			
Type	7-46A-XS		
Serial Number			
Length	22000.00 ft		
Conveyance Type	Wireline		

Rig Type		
One:Depth Control Parameters		Depth Control Remarks
Log Sequence	First Log In the Well	All Schlumberger Depth control procedures followed during logging operation.
Rig Up Length At Surface		IDW used as primary depth control device.
Rig Up Length At Bottom		Z-Chart 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 2	Main[5]:Up	6213.2	58.93

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 : 151.78m(497.96ft) to 159.08m(521.92ft)
MUD_N_FRP = 1.03
DFD = 1.11g/cm3(9.30lbm/gal)
CZMD median computed in free pipe normalization interval = 1.71 MRayl

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

2500 PSI Main Pass

Software Version	
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Acquisition System	Version
Maxwell 2016 SP2	6.2.68624.3100

Pass Summary	
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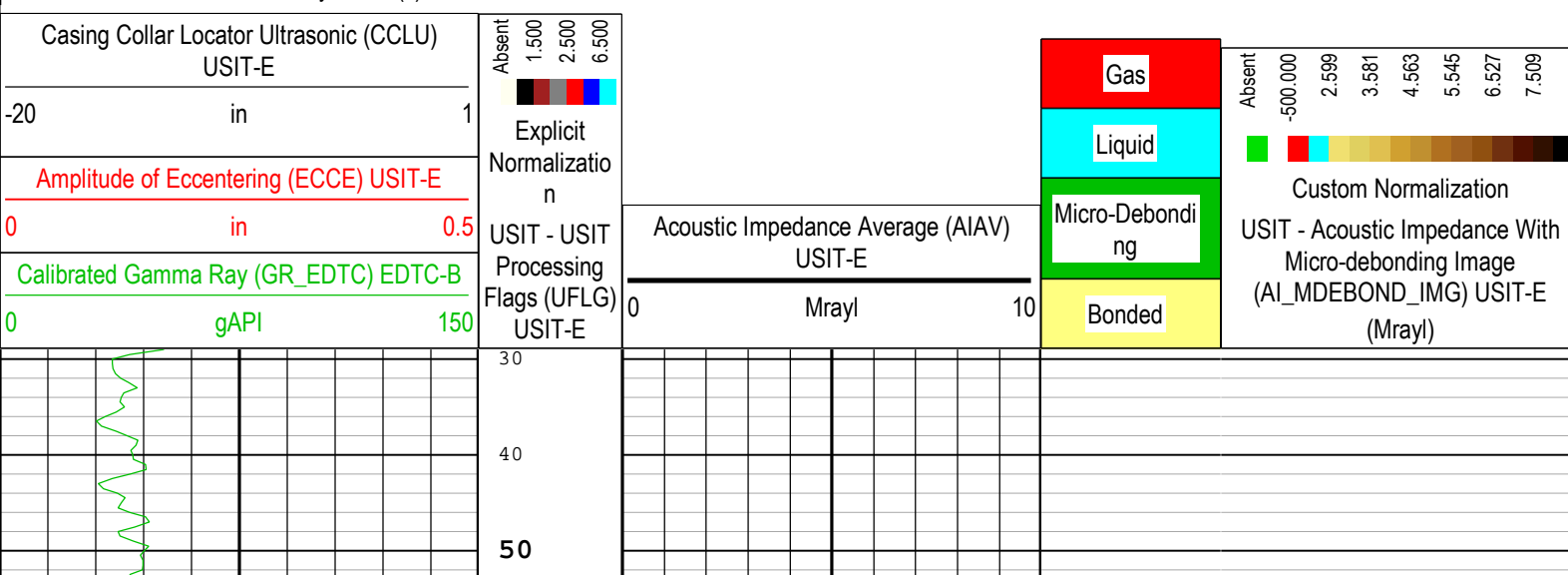
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Main[5]:Up	Up	58.93 ft	6213.20 ft	05-Nov-2016 4:29:41 PM	05-Nov-2016 5:11:46 PM	ON	7.63 ft	Yes

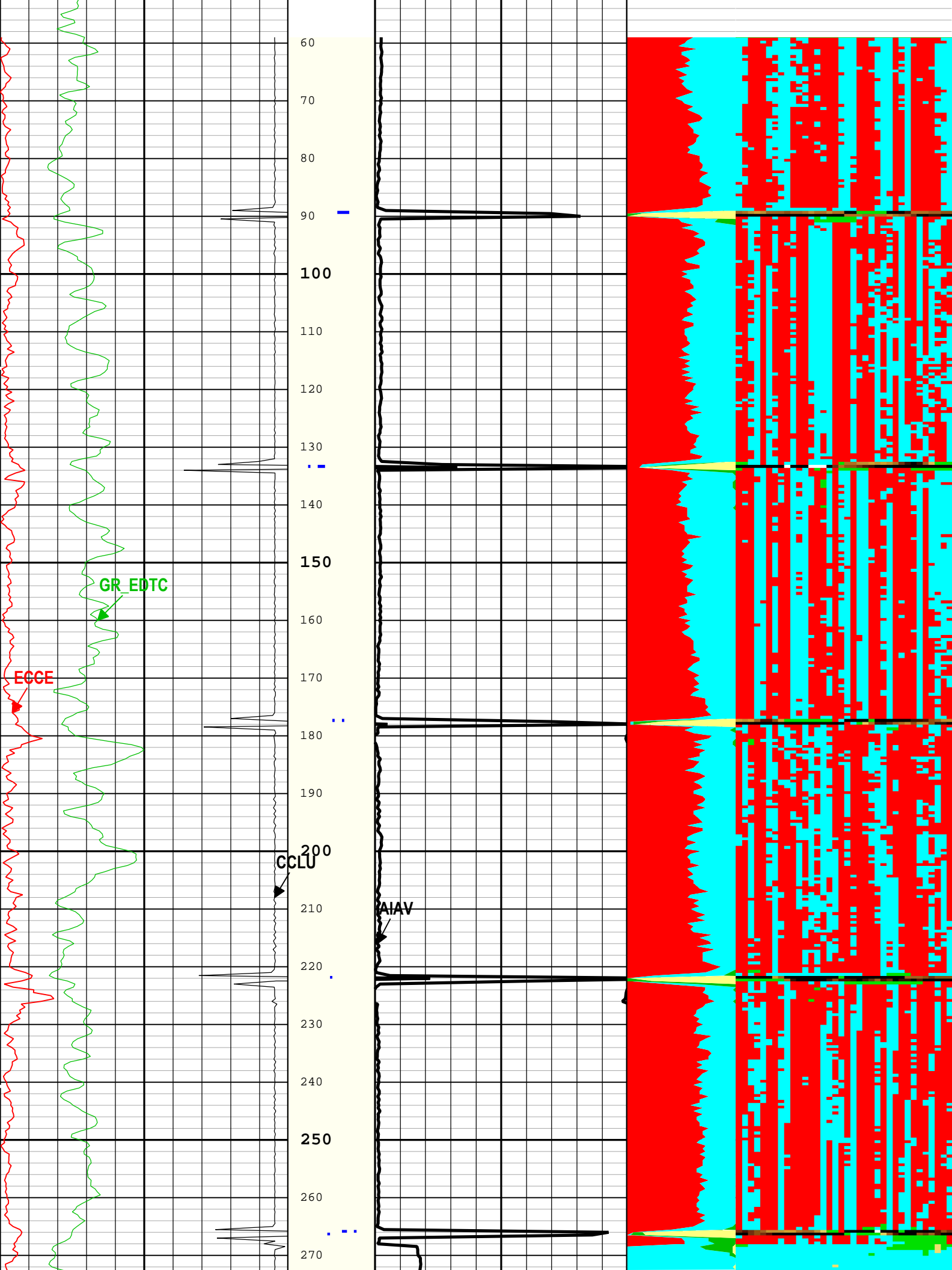
All depths are referenced to toolstring zero

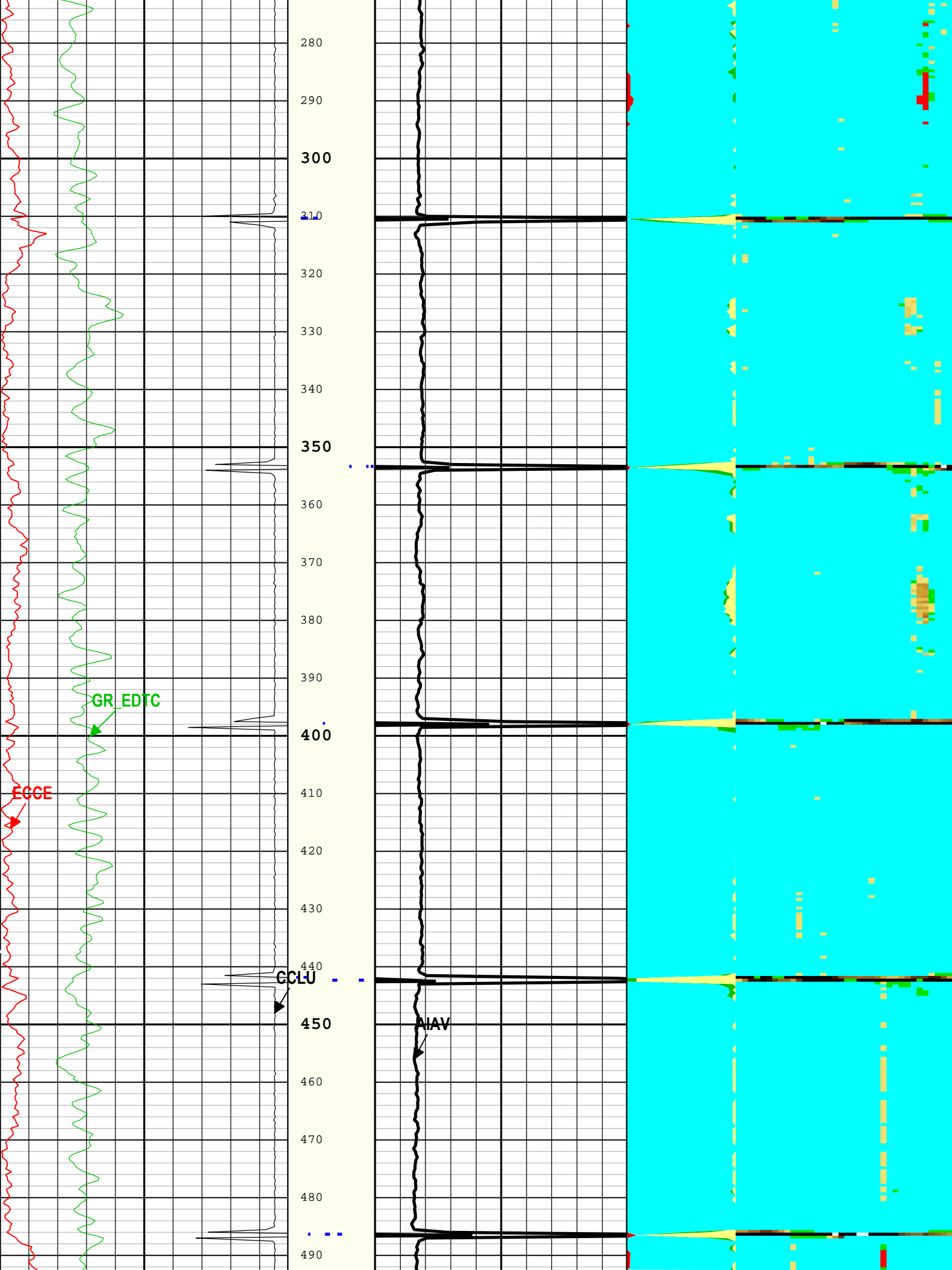
Log	Company:Noble Energy Inc	Well:ANNI LD29-755
		One: Main[5]:Up:S007

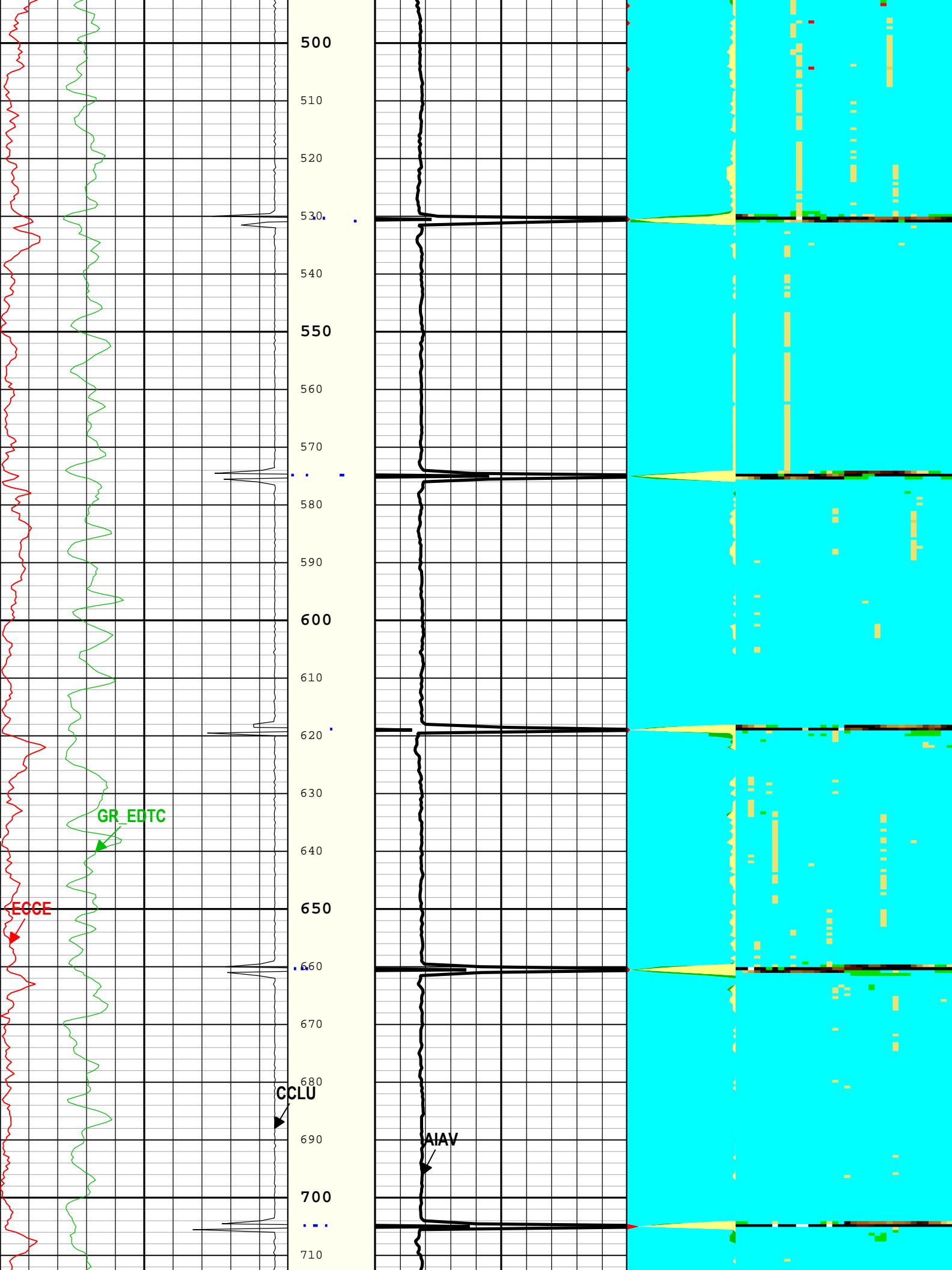
Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 05-Nov-2016 18:42:20

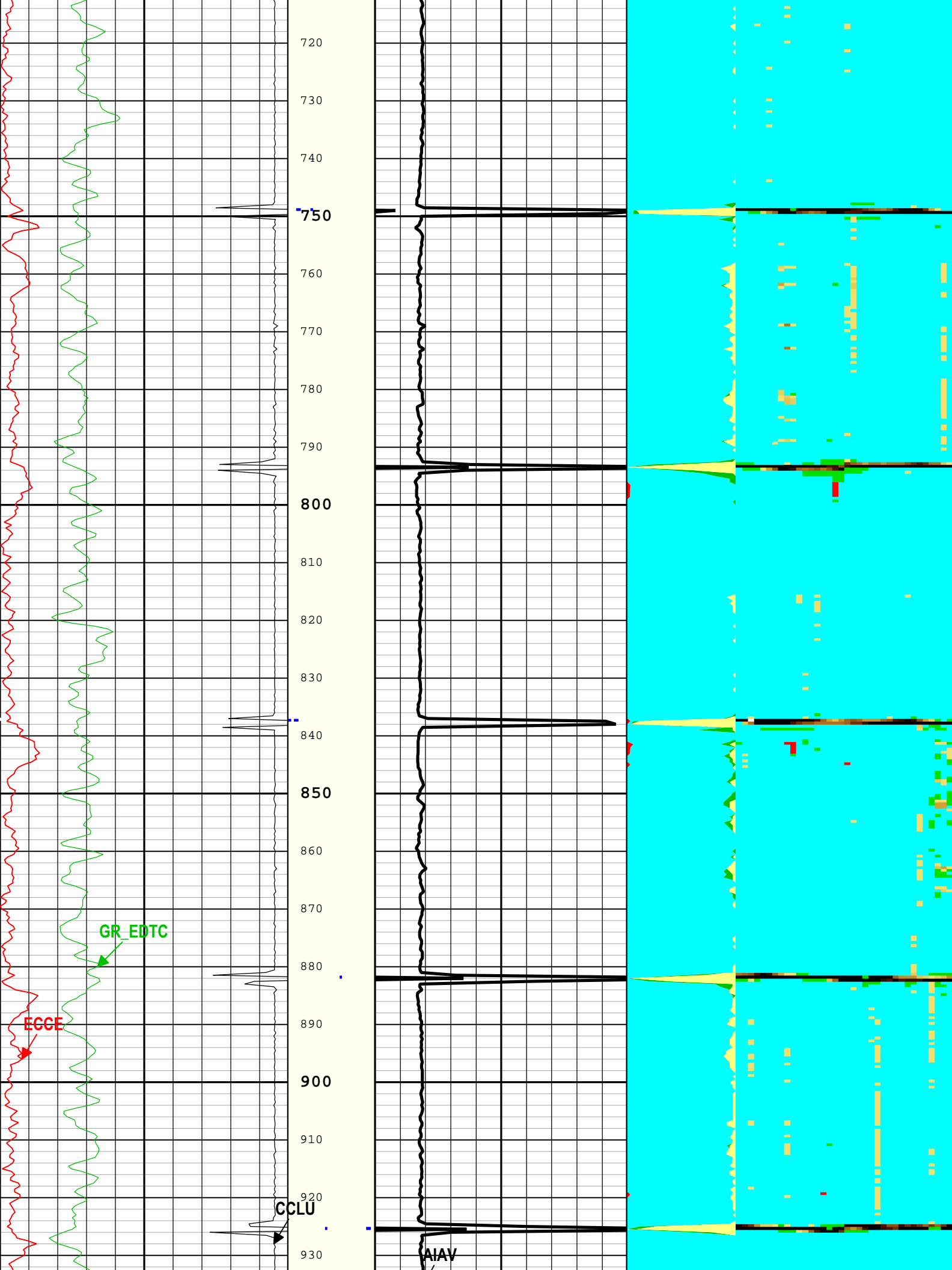
TIME_1900 - Time Marked every 60.00 (s)

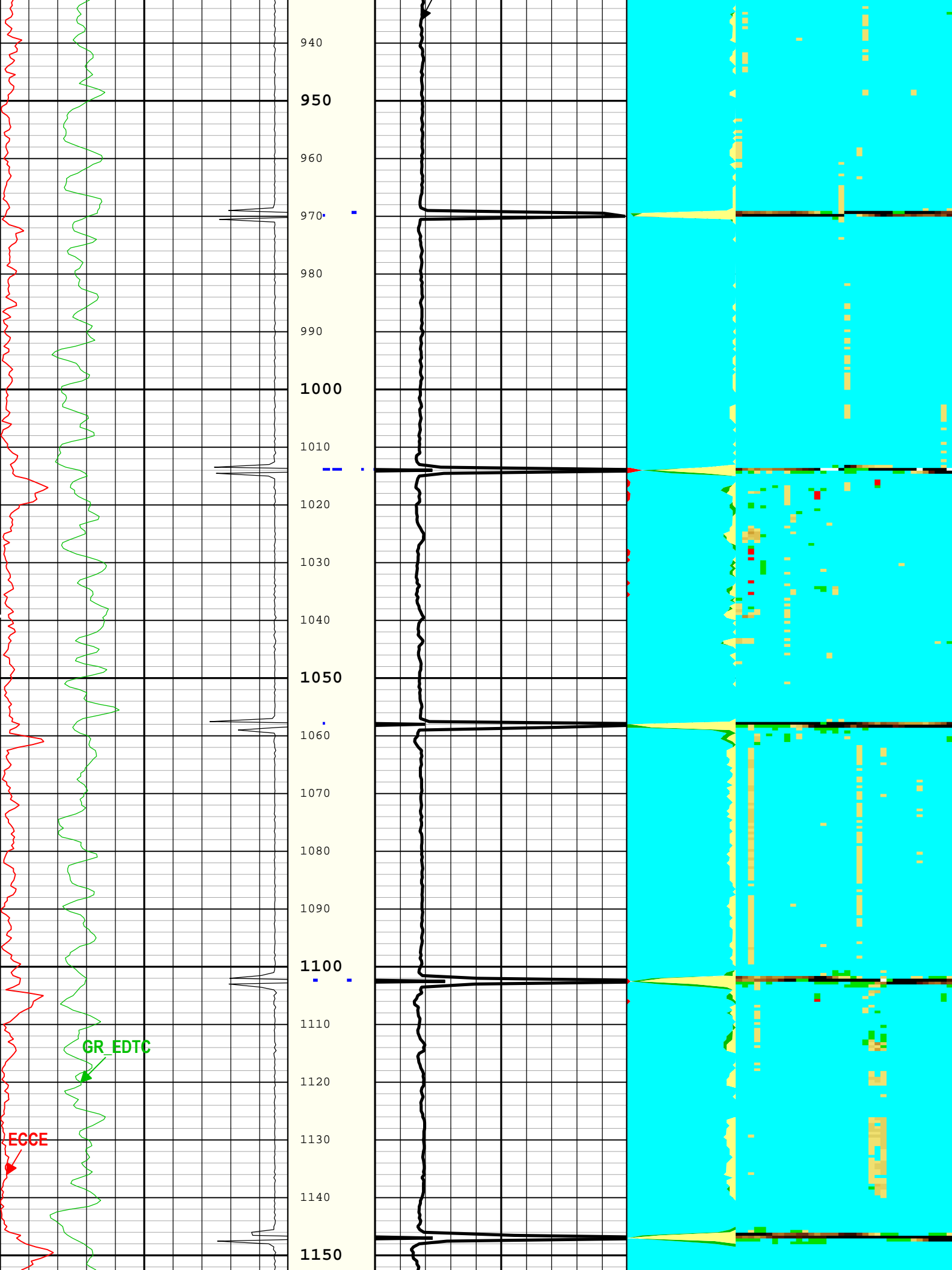


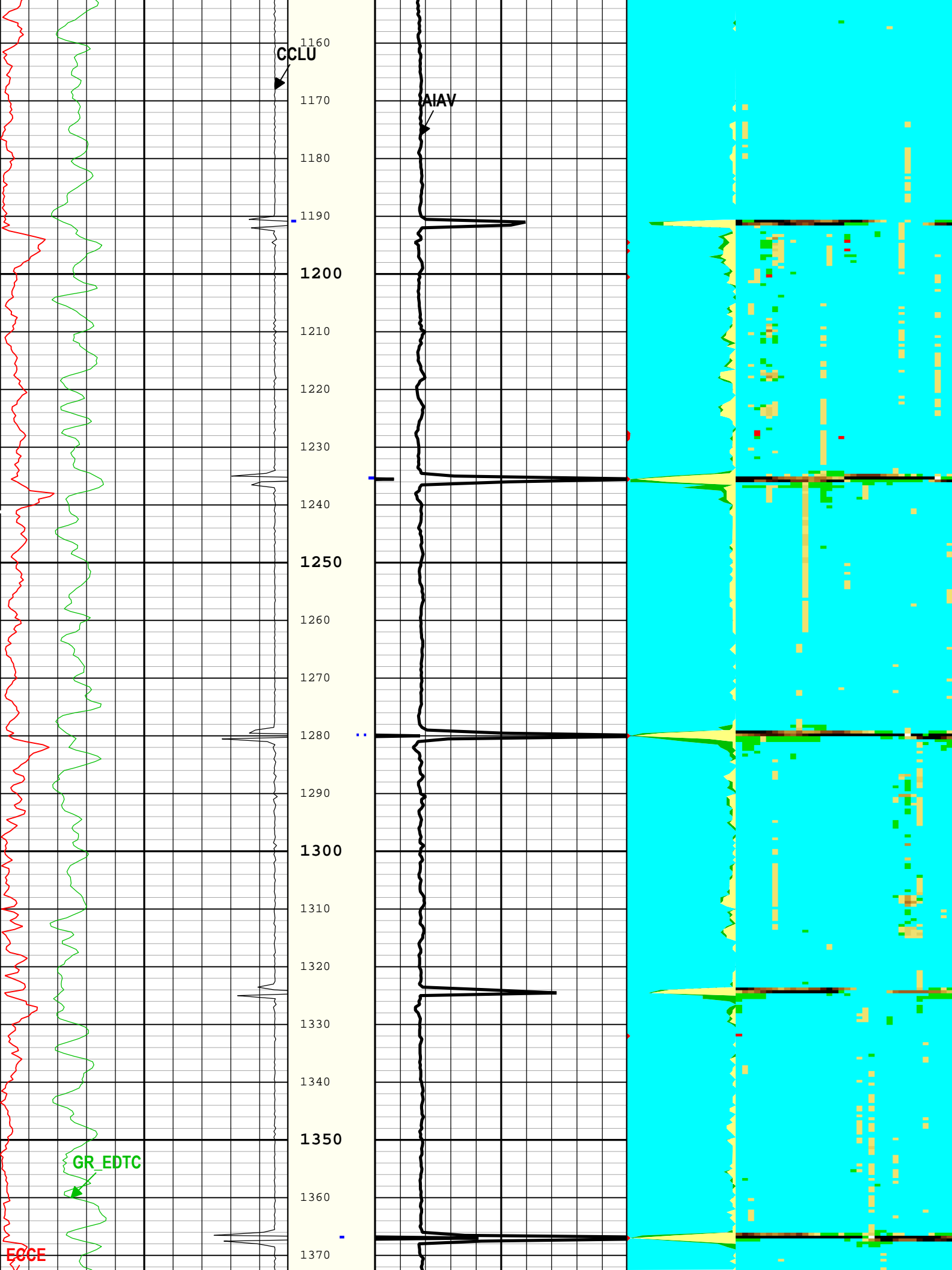


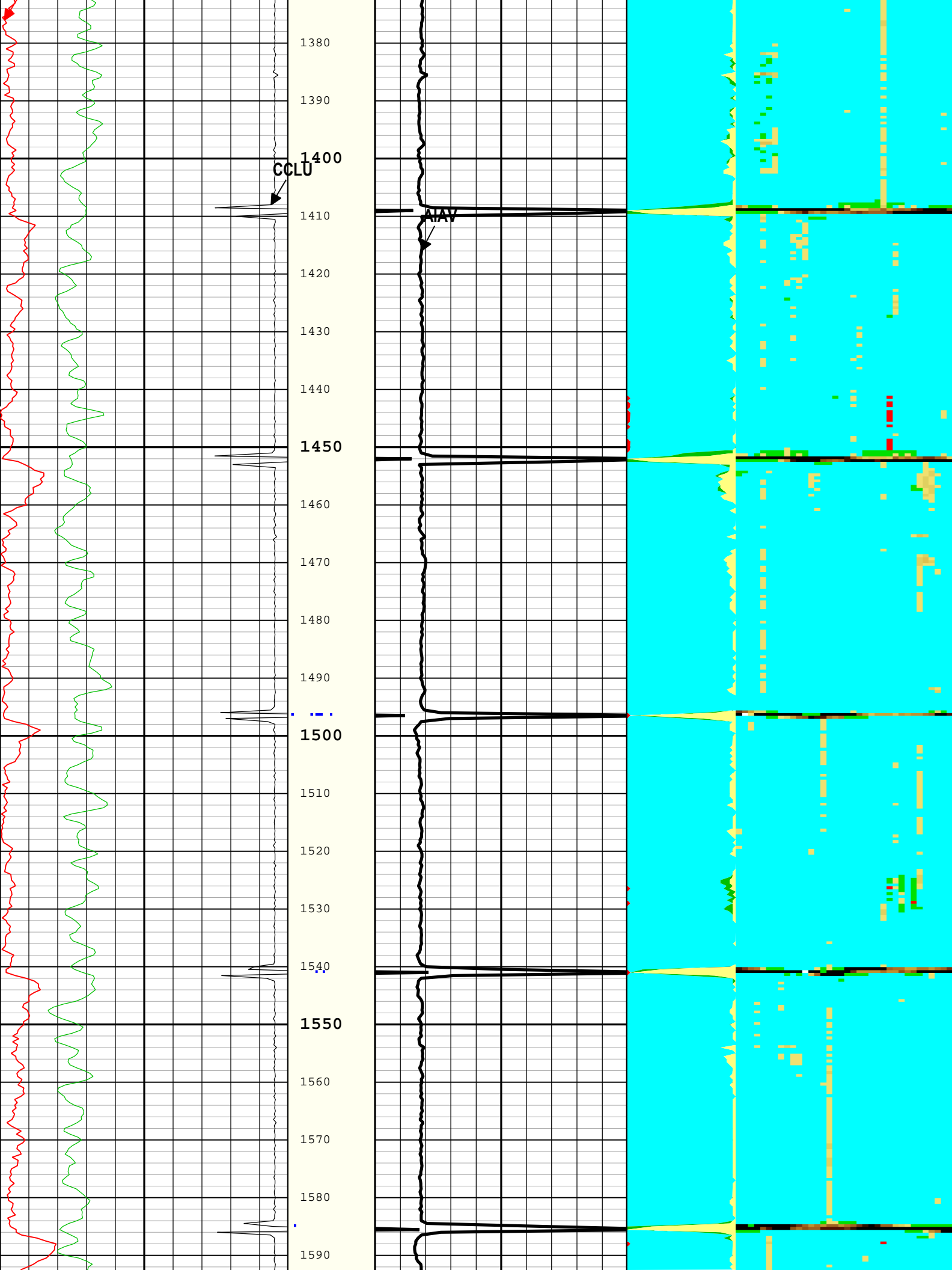


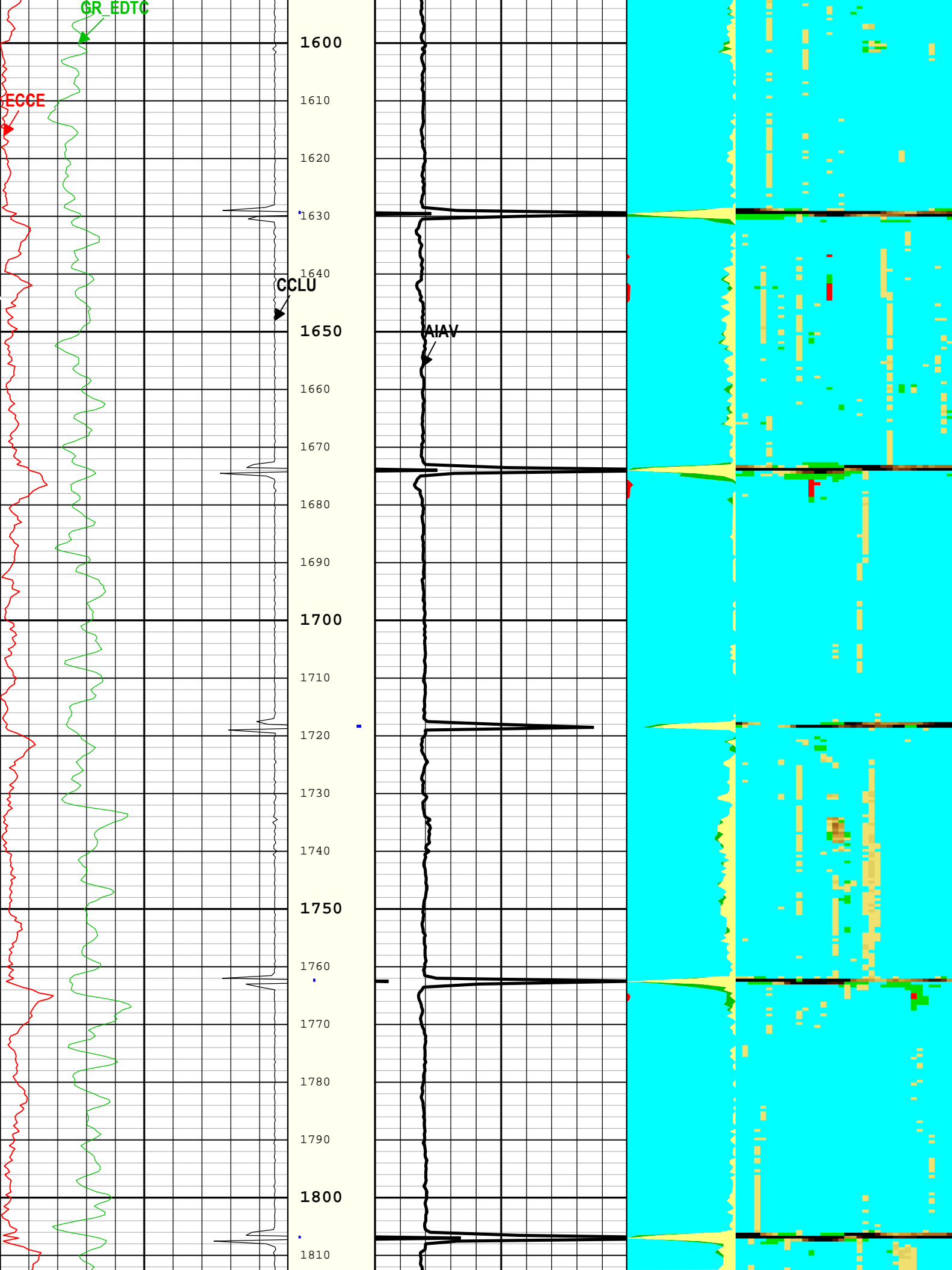


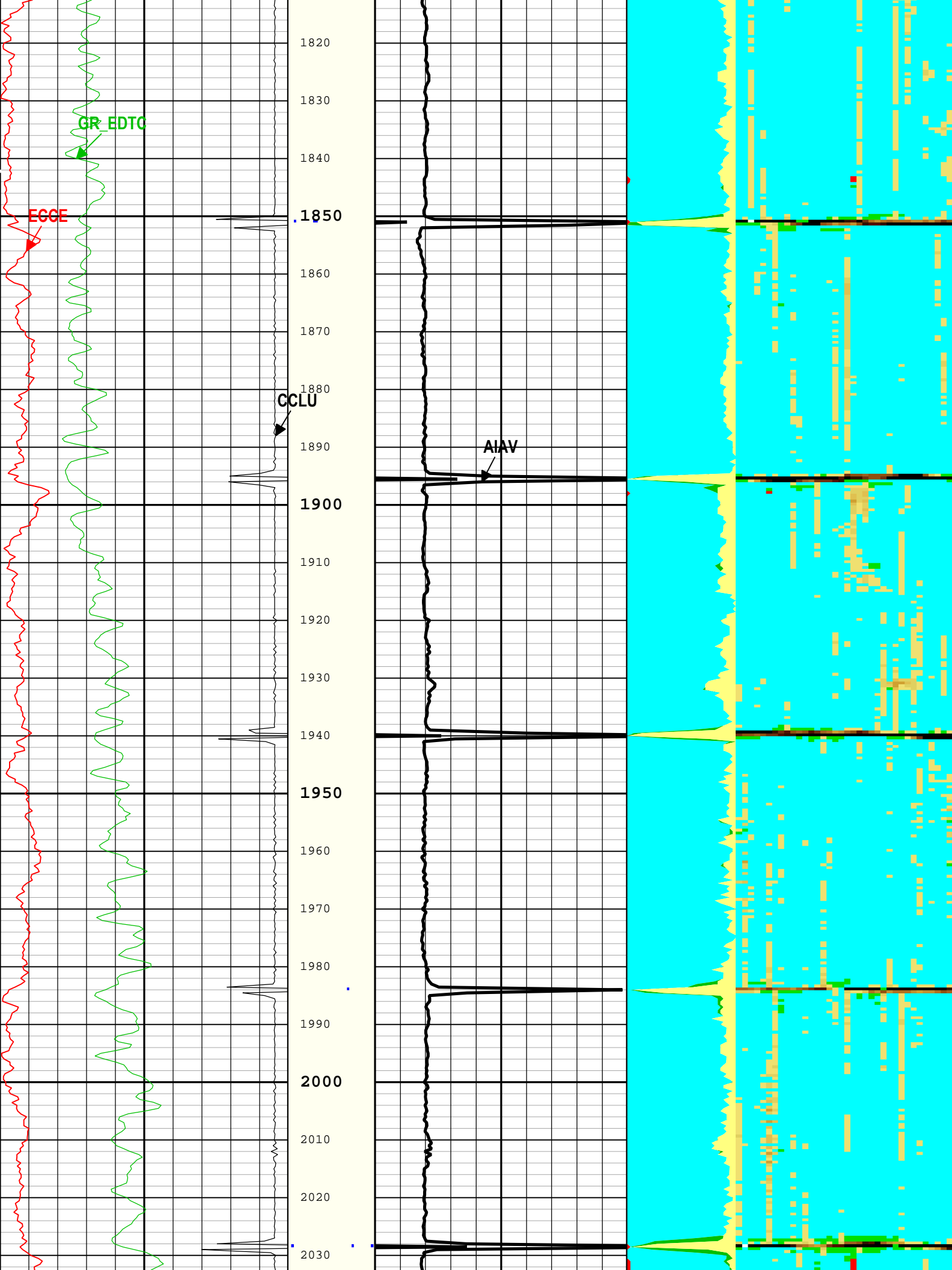


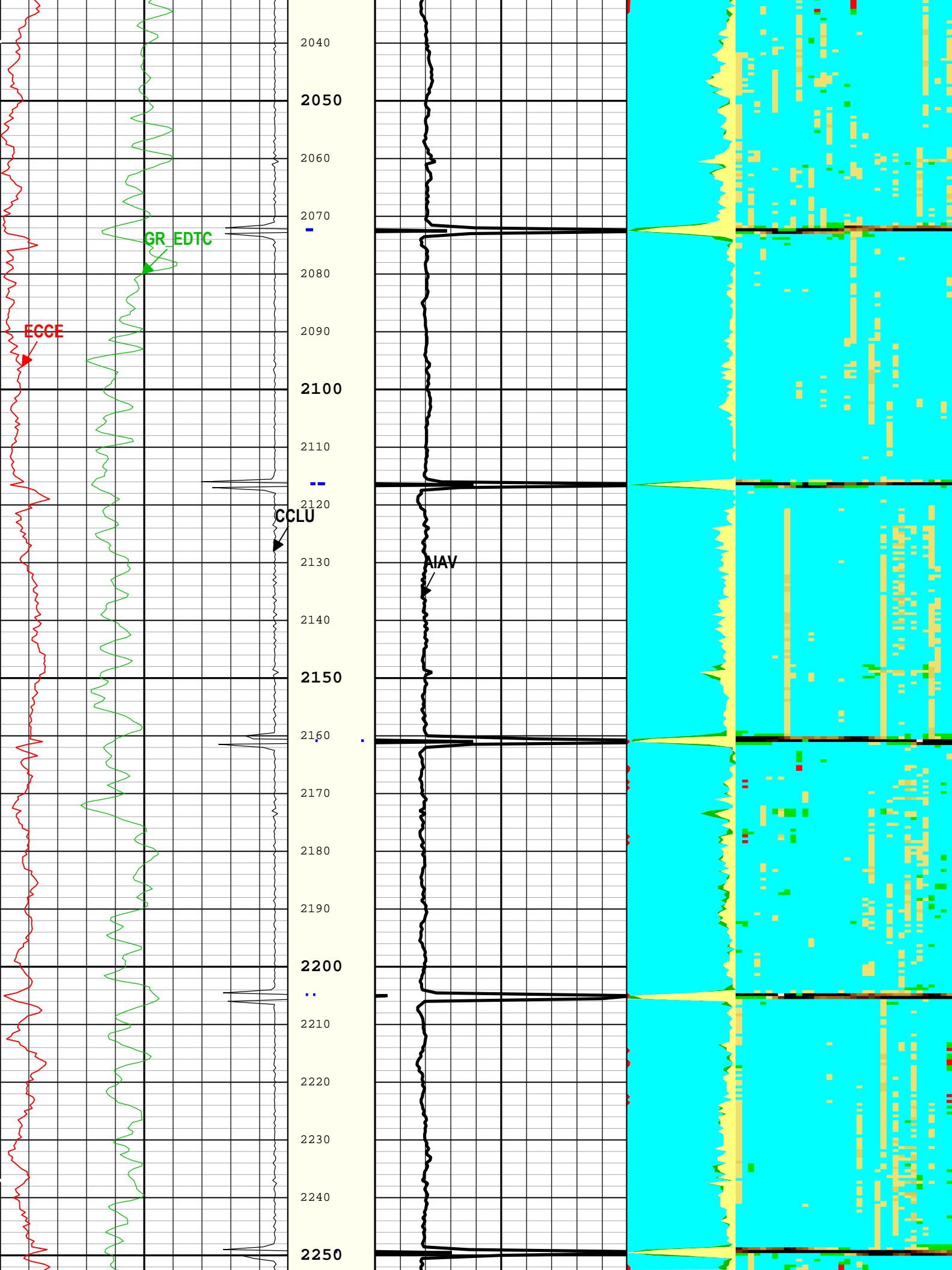


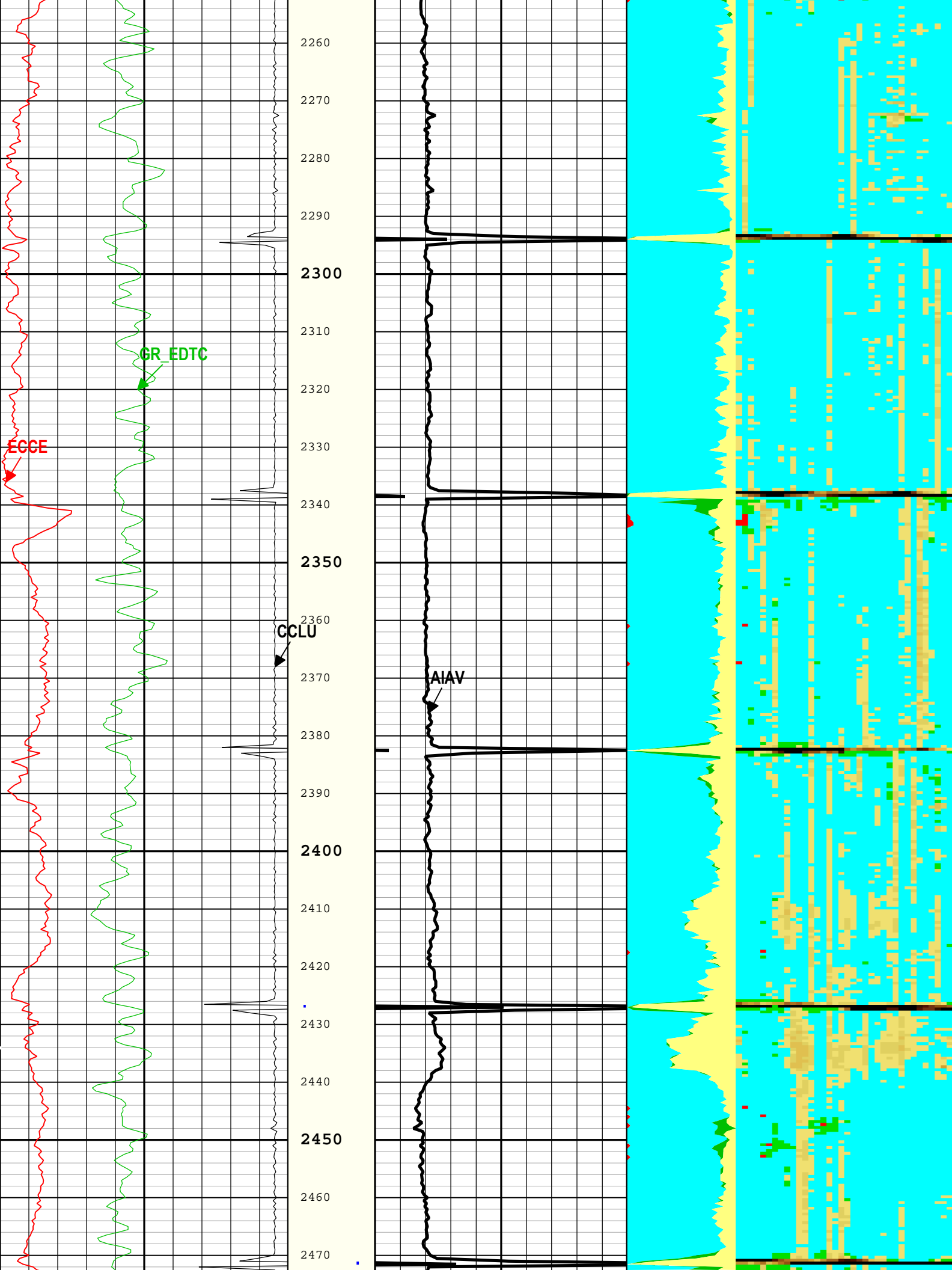


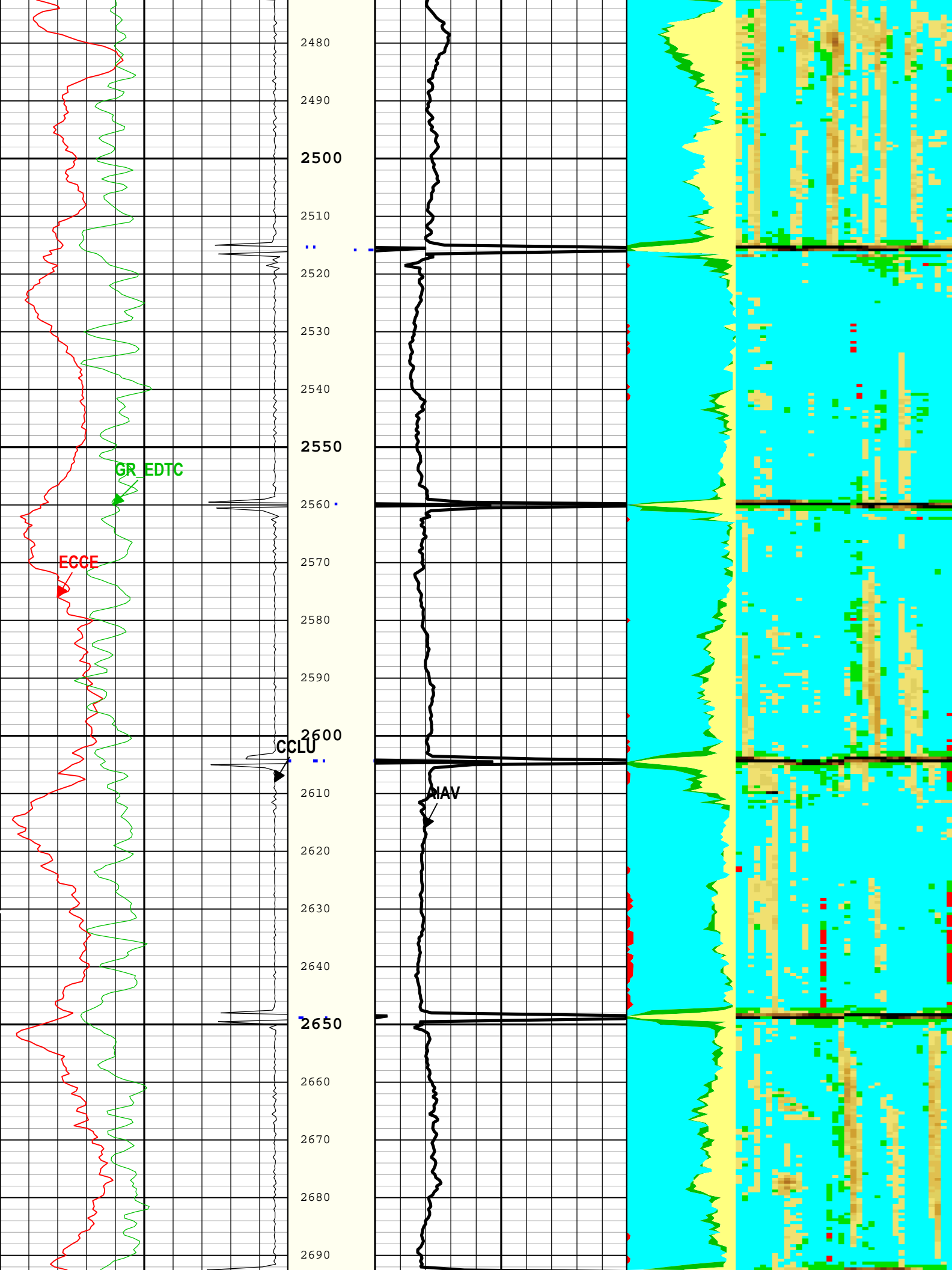


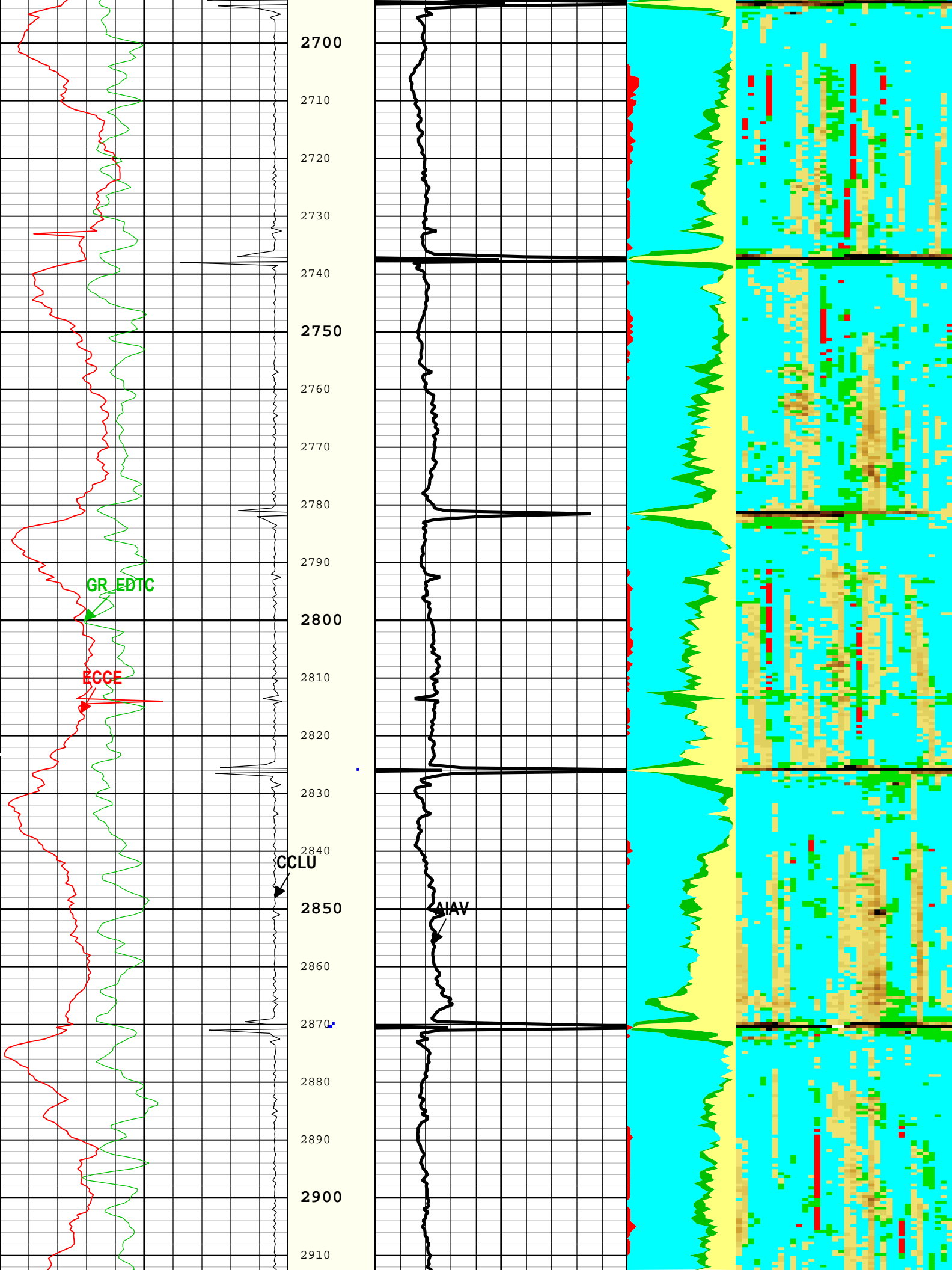


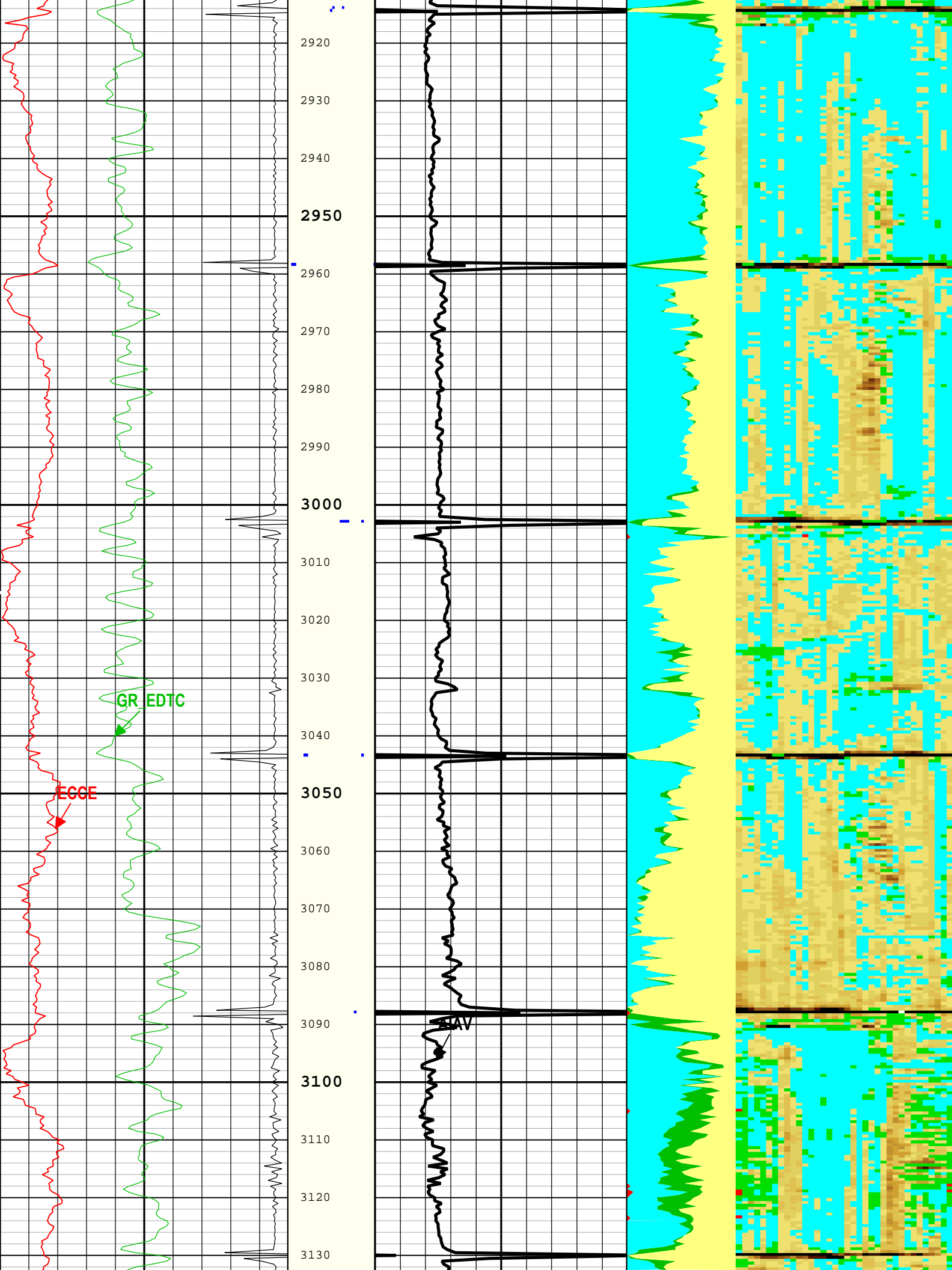


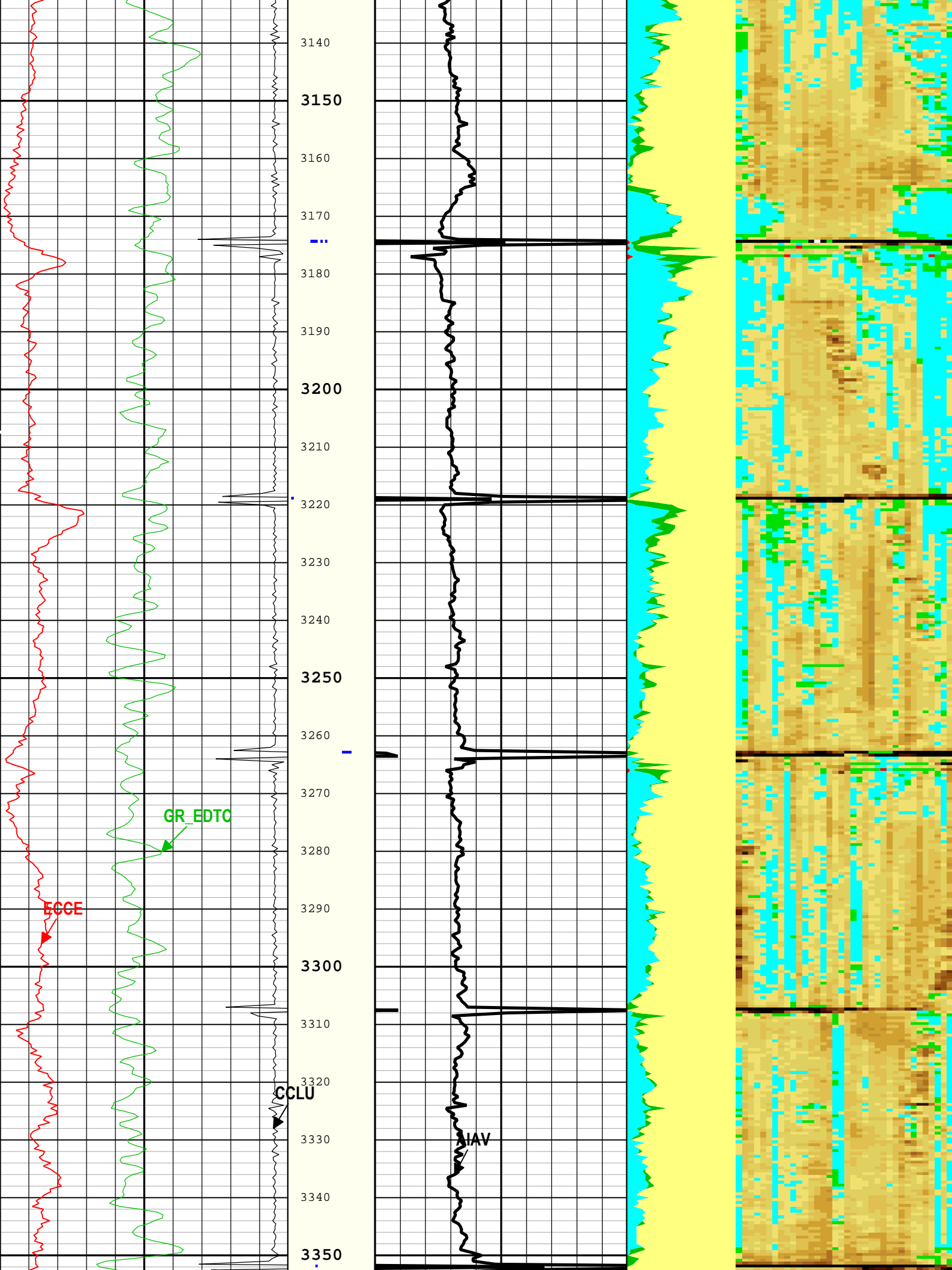


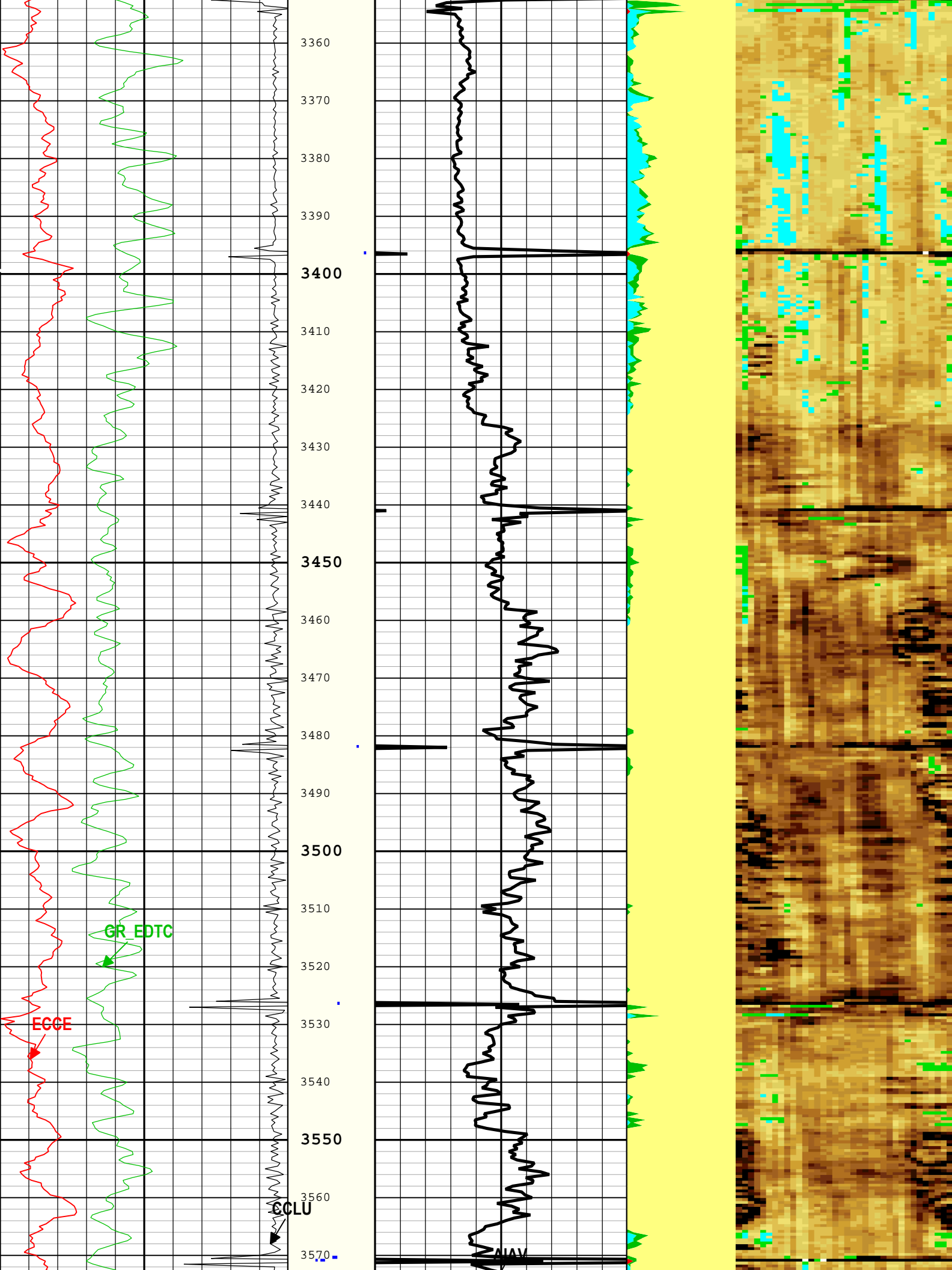


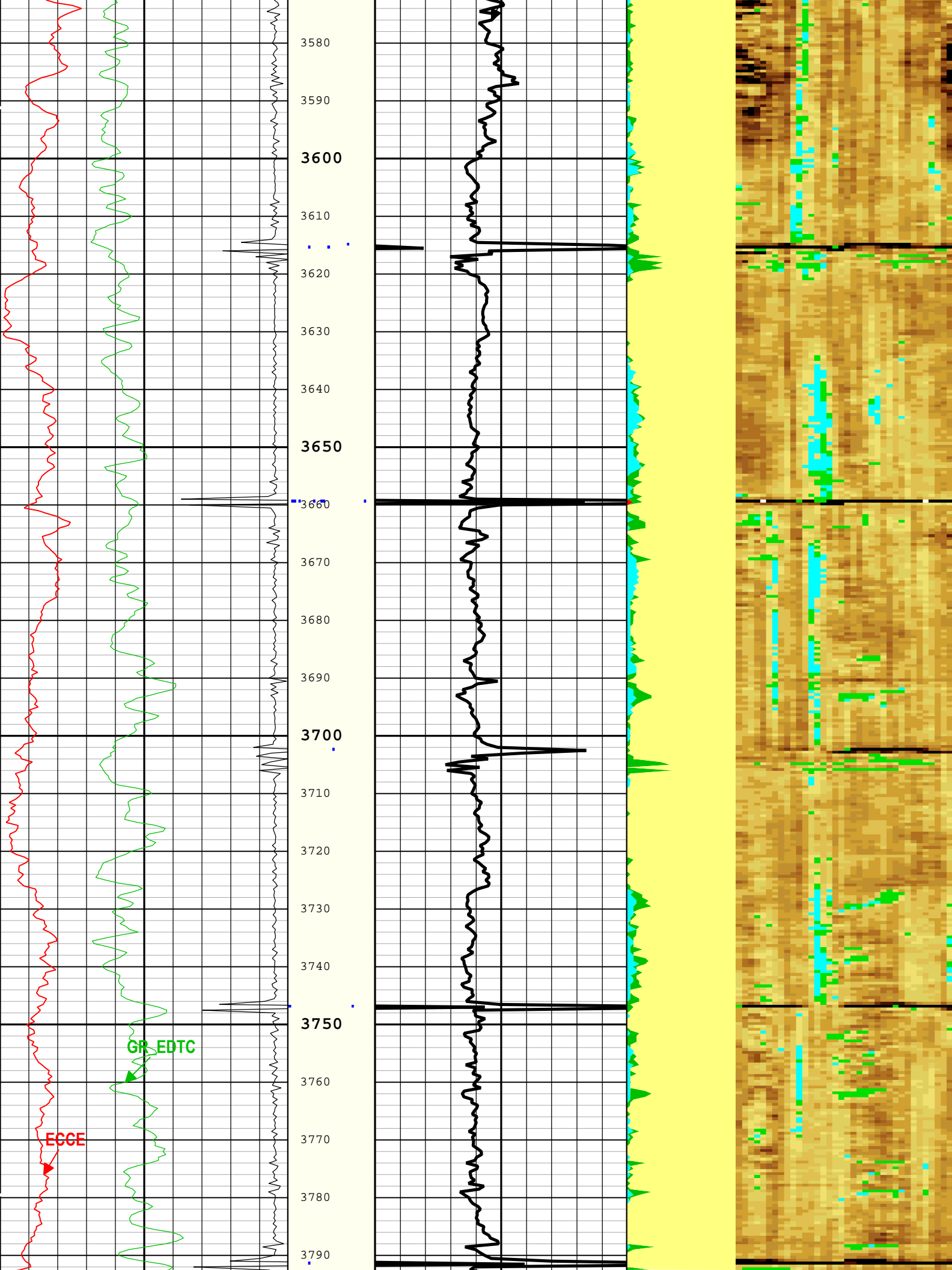


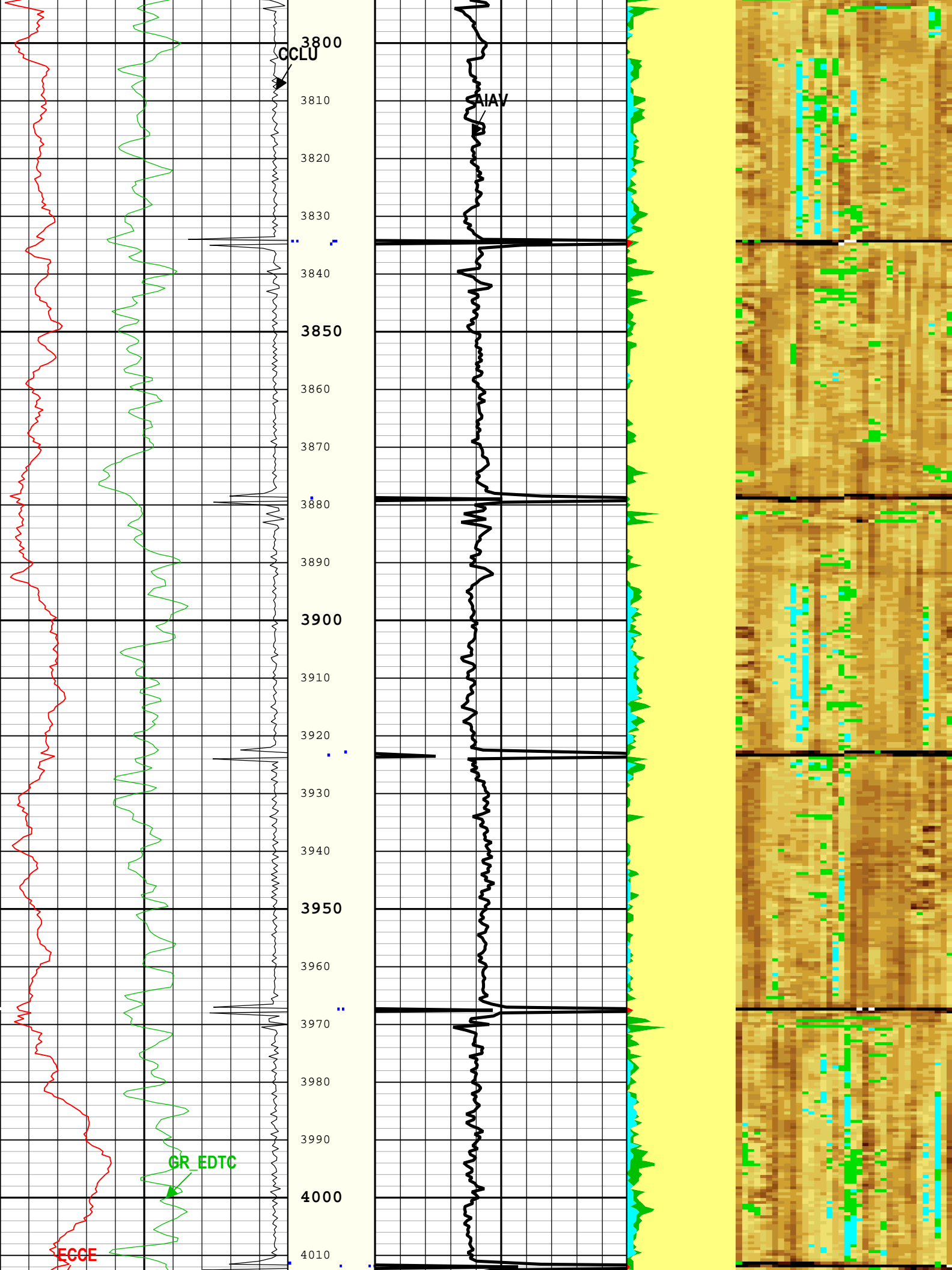


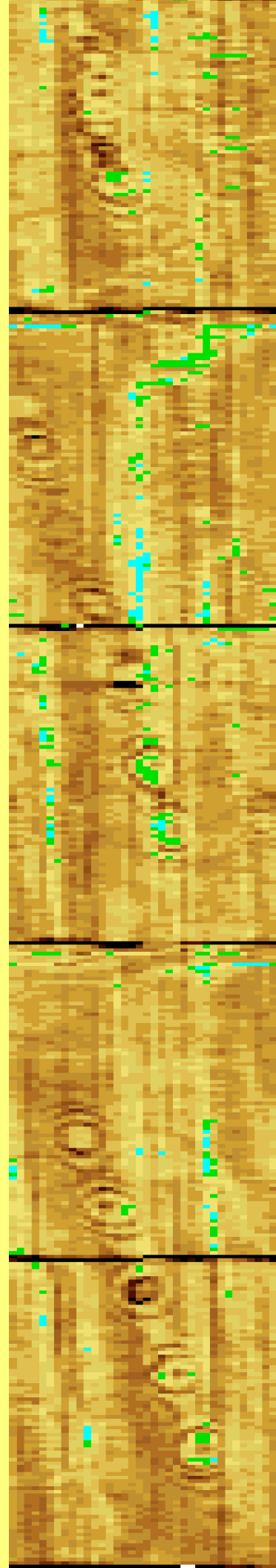
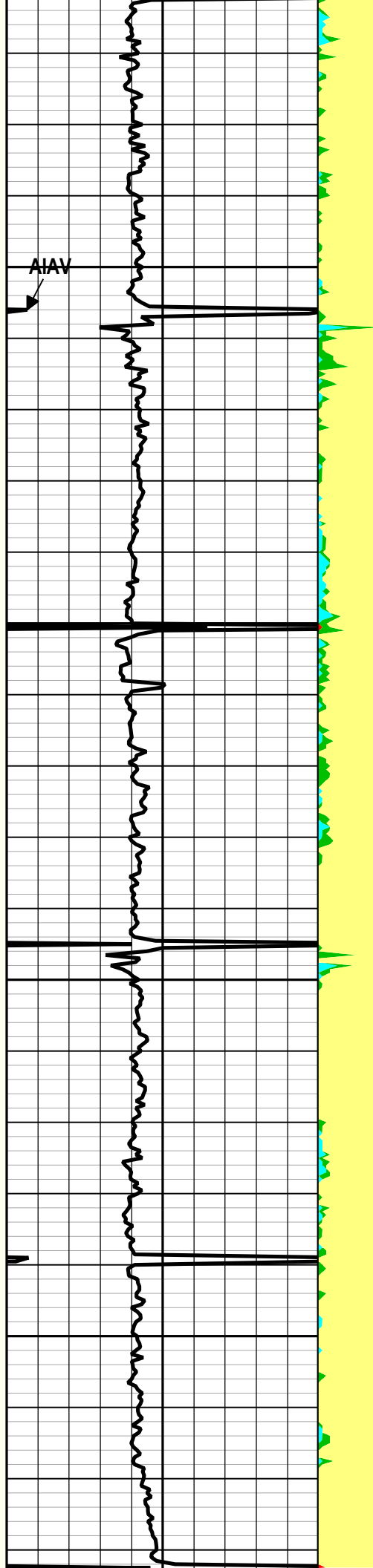
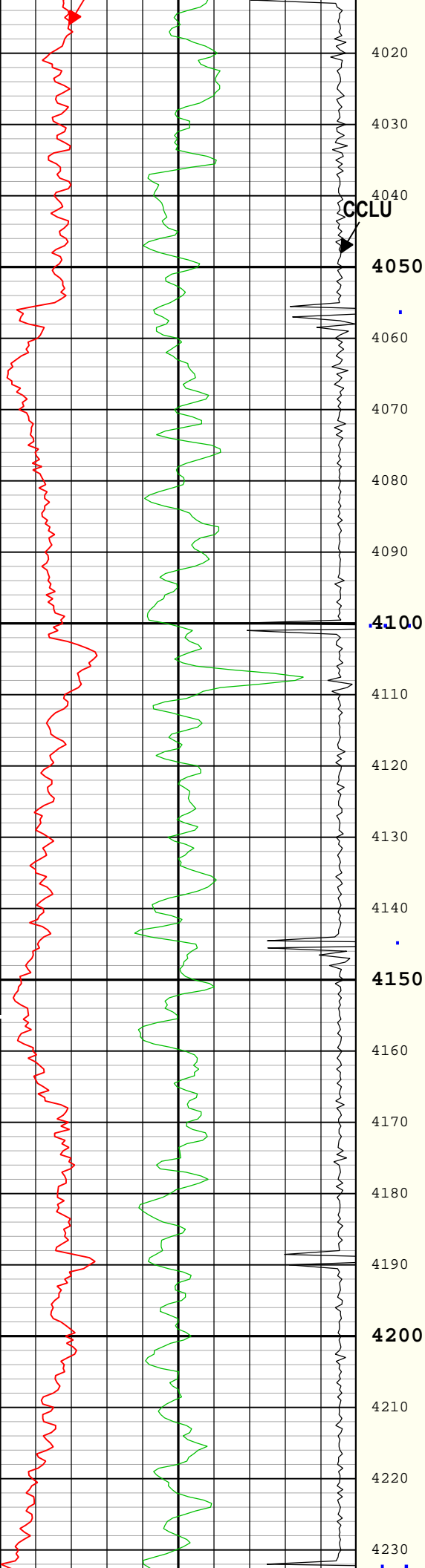


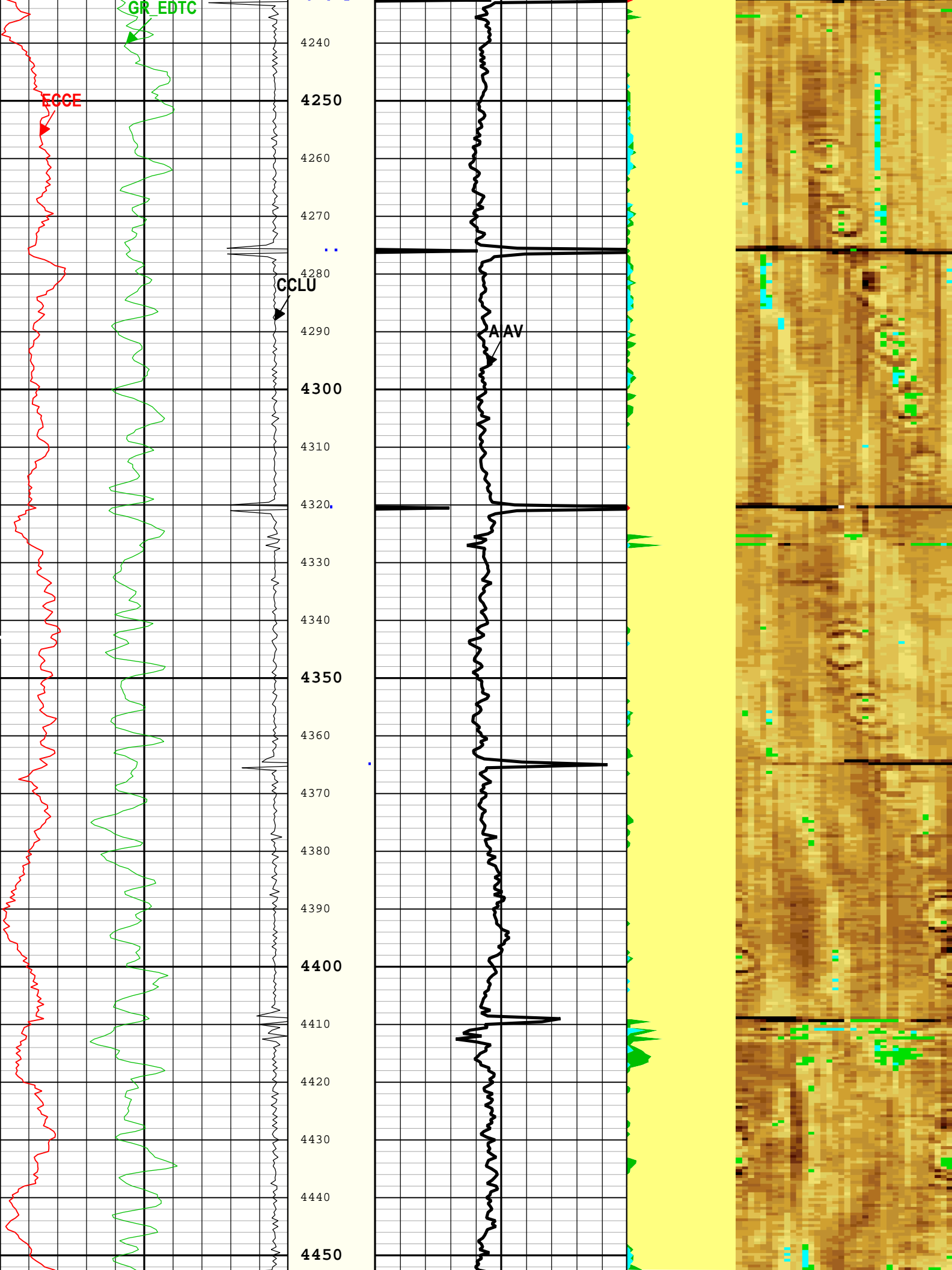


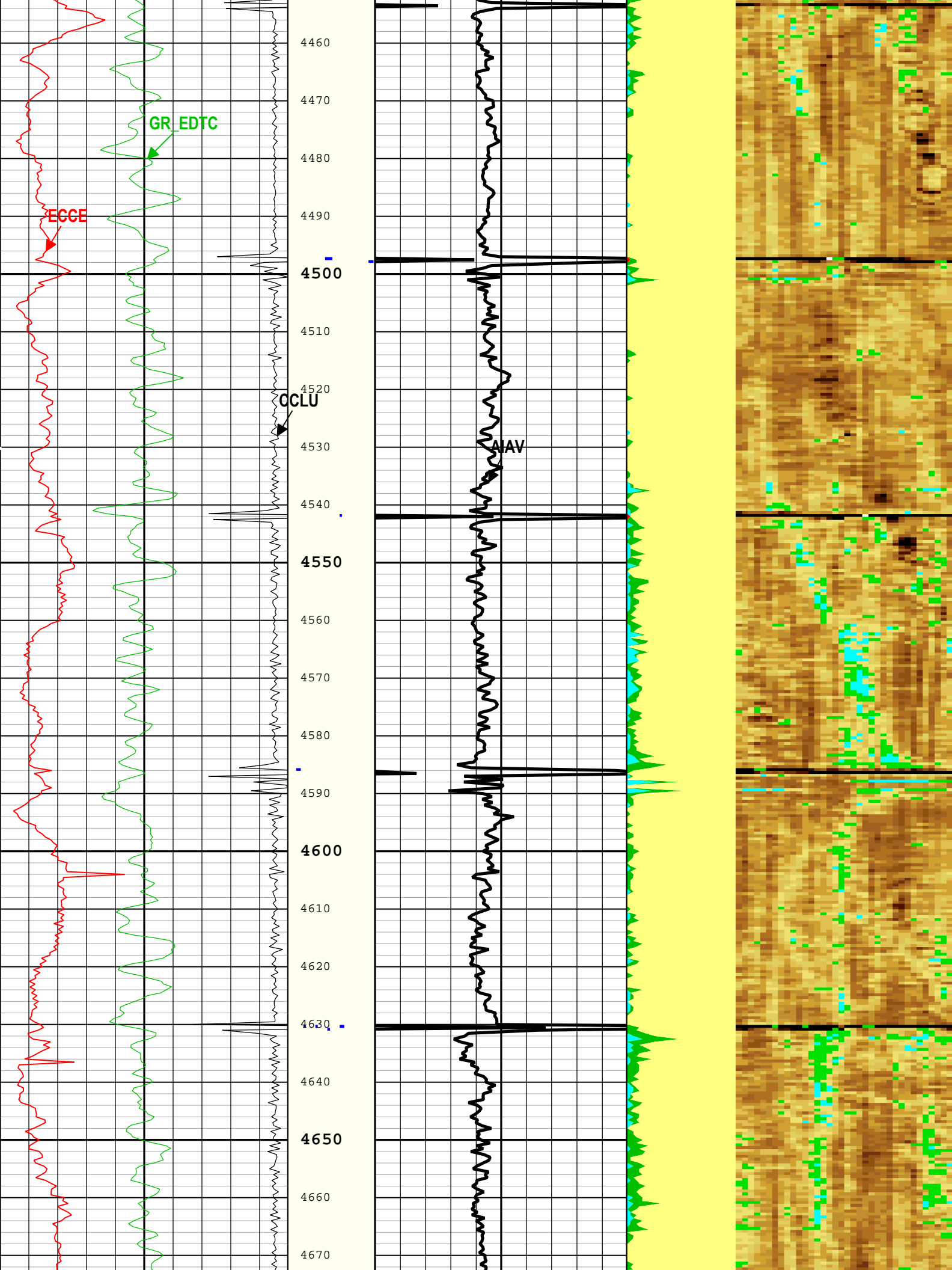


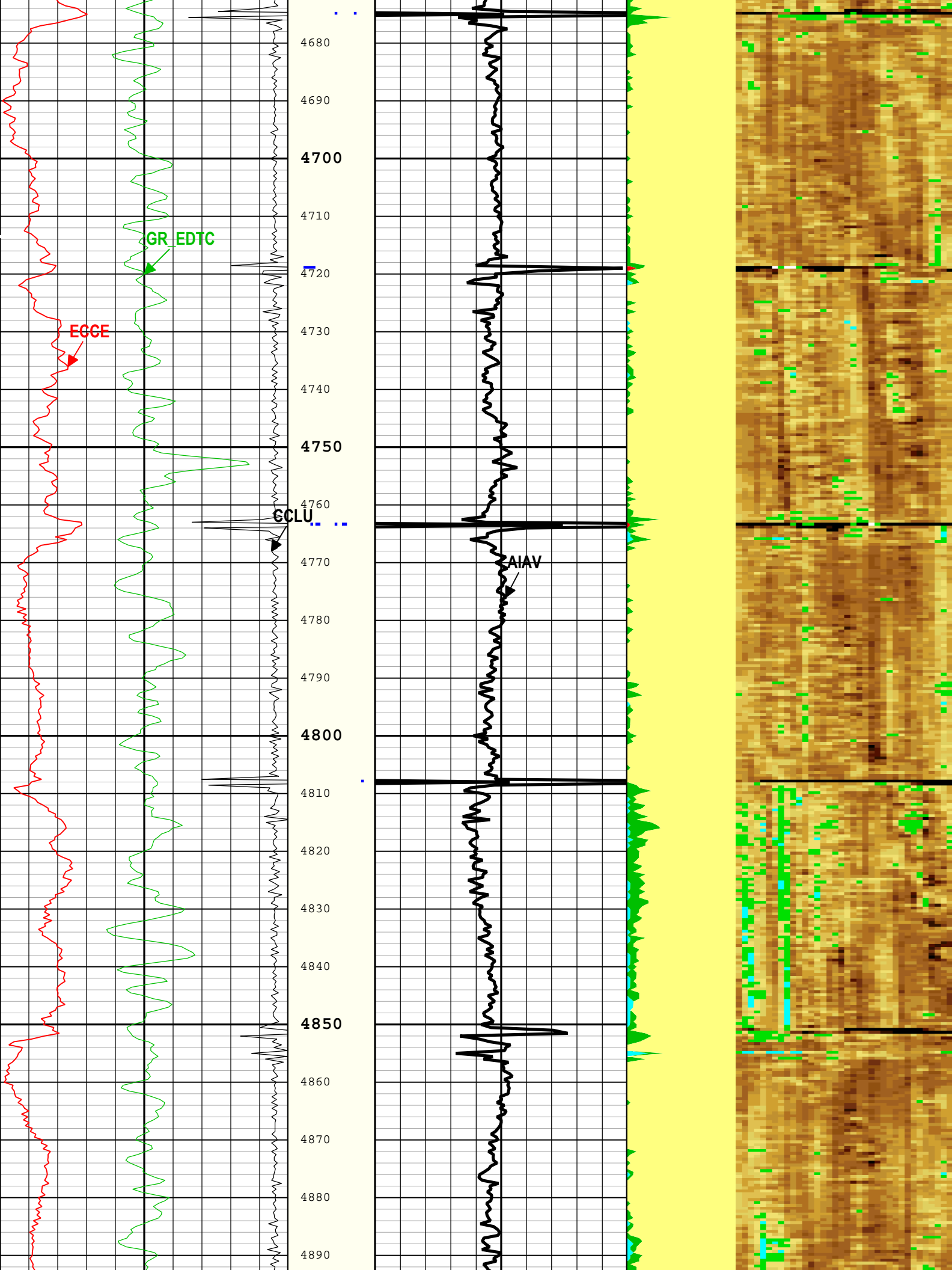


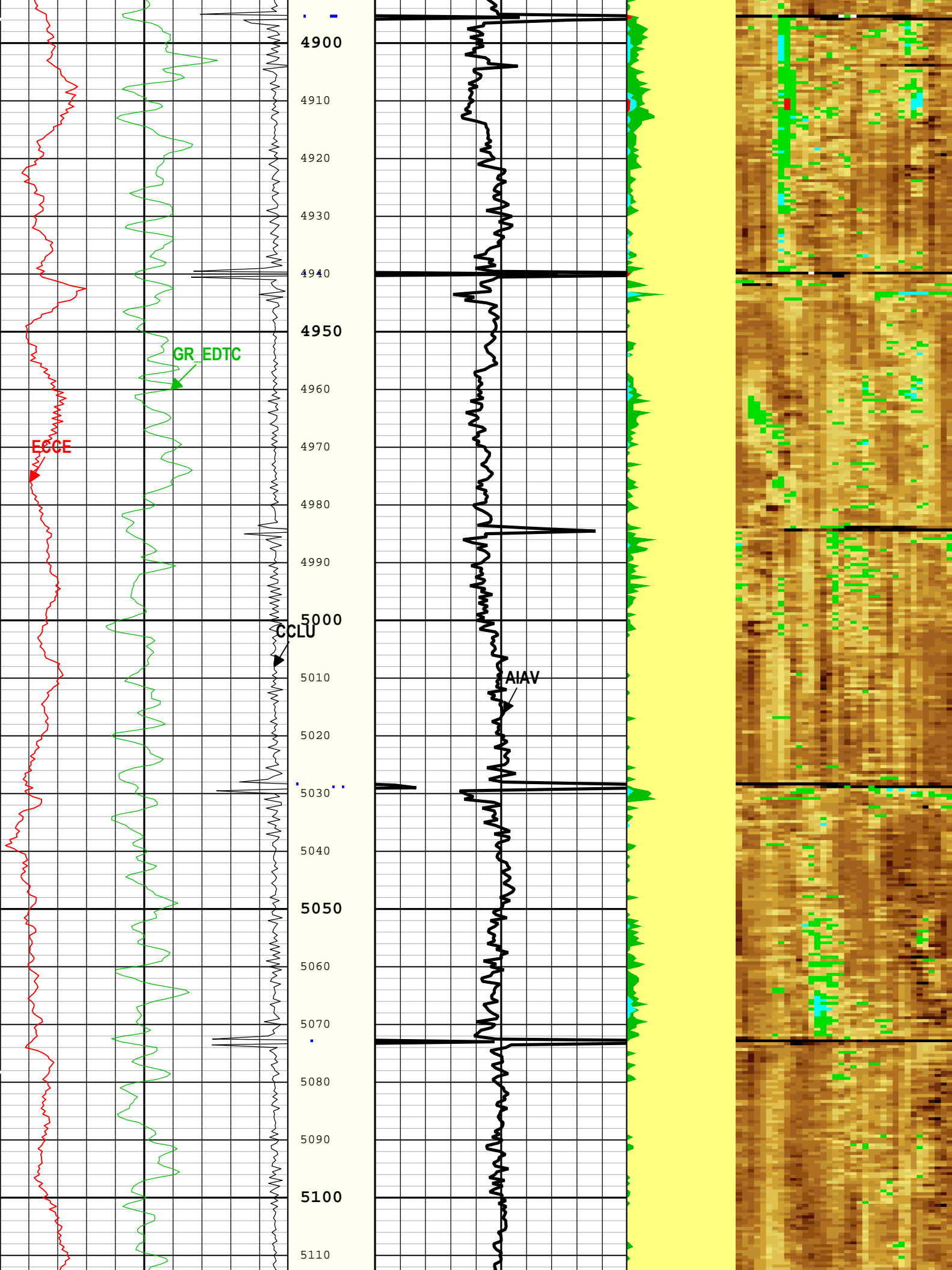


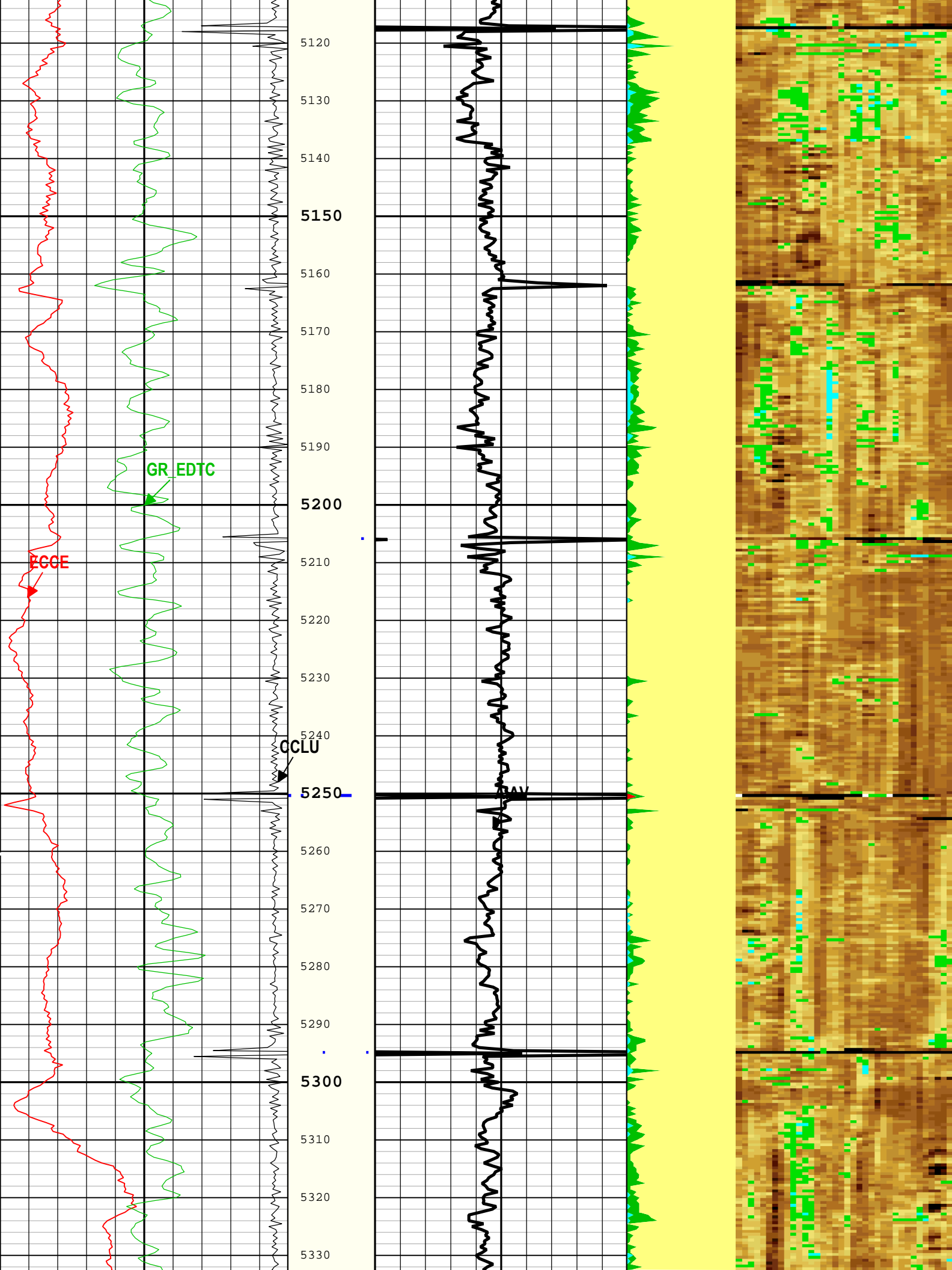


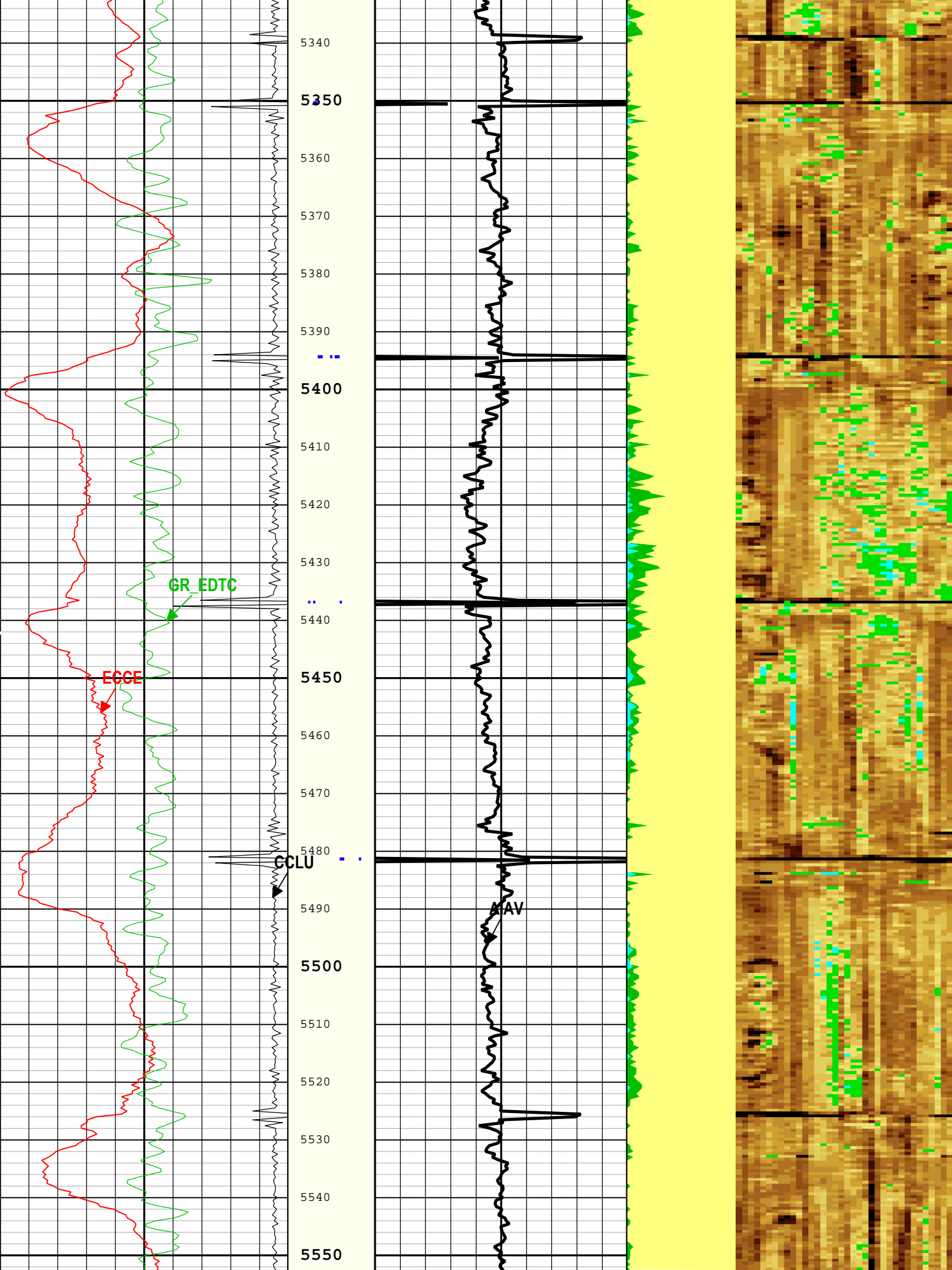


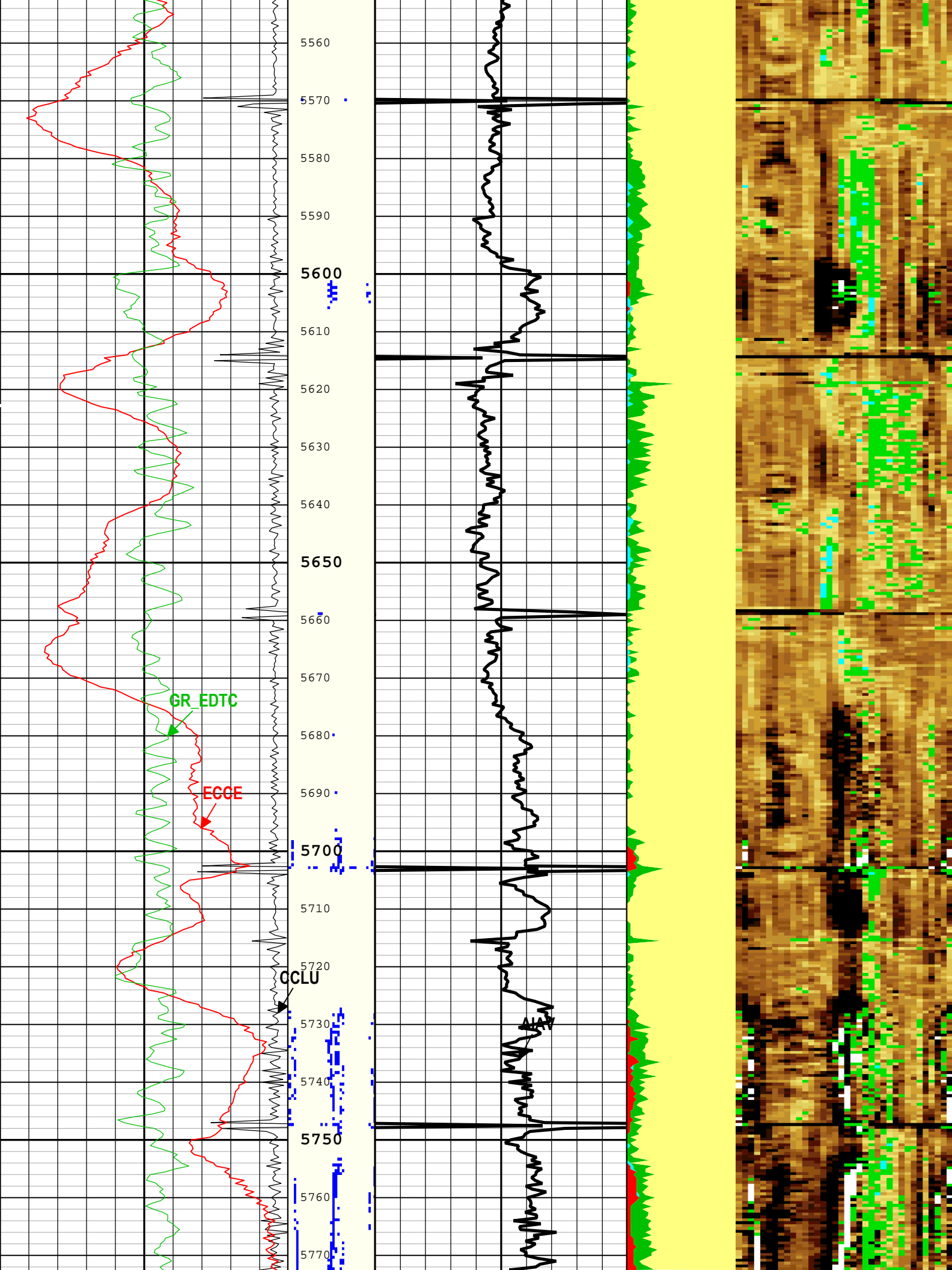


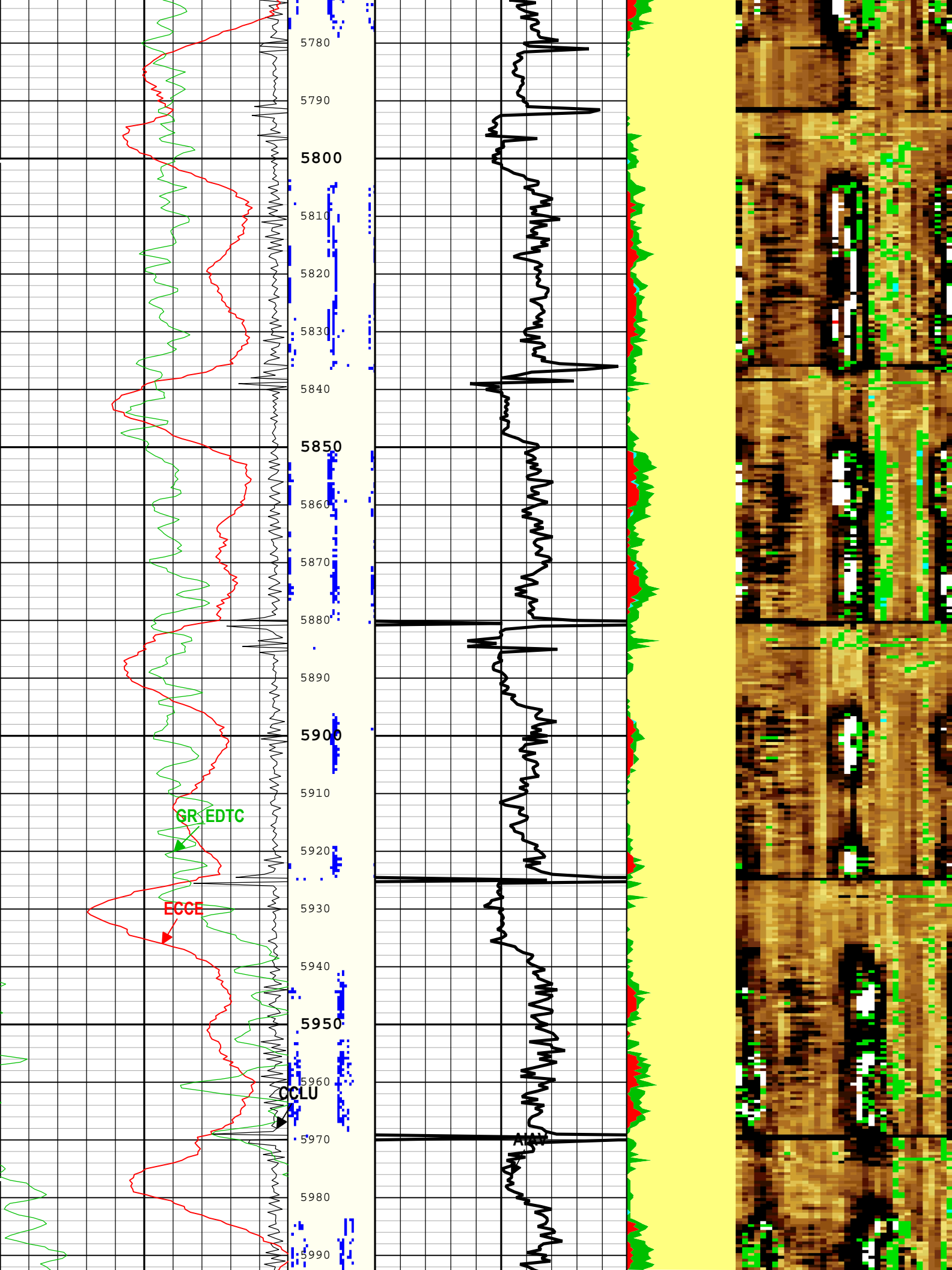


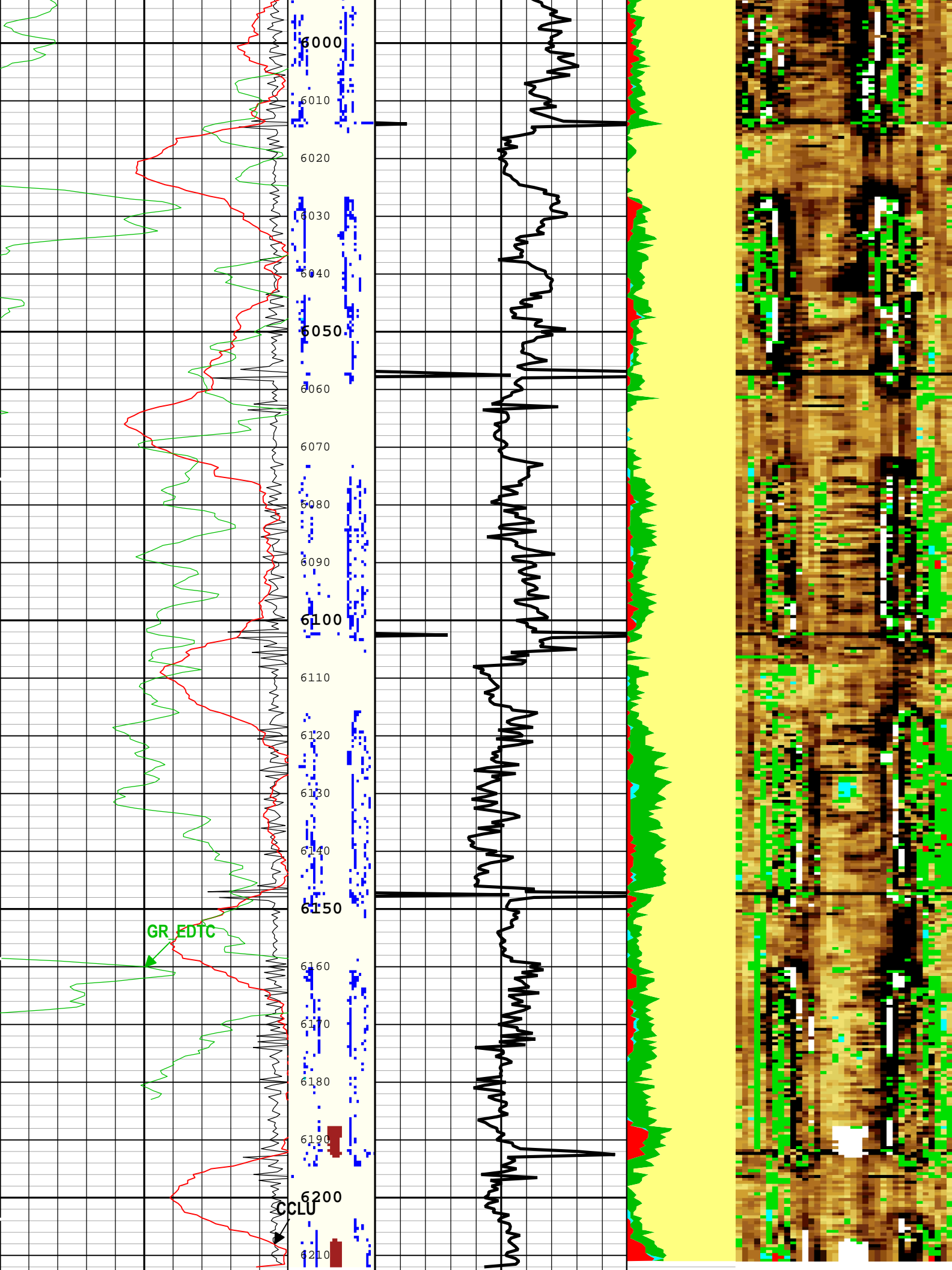












One: Parameters				
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB

AGMX	Maximum Gain of Cartridge	USIT-E	Time Zoned	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	6200	ft
WINB	Window Begin Time	USIT-E	Time Zoned	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)
AGMX	18	05-Nov-2016 16:29:41	05-Nov-2016 16:37:41	6213.2	6172.32
AGMX	48	05-Nov-2016 16:37:41	05-Nov-2016 17:11:46	6172.32	58.93
EMXV	55	05-Nov-2016 16:29:41	05-Nov-2016 16:37:05	6213.2	6199.58
EMXV	60	05-Nov-2016 16:37:05	05-Nov-2016 16:37:36	6199.58	6176.39
EMXV	65	05-Nov-2016 16:37:36	05-Nov-2016 16:37:46	6176.39	6168.54
EMXV	70	05-Nov-2016 16:37:46	05-Nov-2016 16:37:52	6168.54	6164.31
EMXV	75	05-Nov-2016 16:37:52	05-Nov-2016 16:37:56	6164.31	6161.04
EMXV	80	05-Nov-2016 16:37:56	05-Nov-2016 16:38:01	6161.04	6157.35
EMXV	85	05-Nov-2016 16:38:01	05-Nov-2016 16:38:05	6157.35	6154.24
EMXV	90	05-Nov-2016 16:38:05	05-Nov-2016 16:38:11	6154.24	6149.95
EMXV	95	05-Nov-2016 16:38:11	05-Nov-2016 16:38:17	6149.95	6145.5
EMXV	100	05-Nov-2016 16:38:17	05-Nov-2016 16:38:24	6145.5	6140.19
EMXV	105	05-Nov-2016 16:38:24	05-Nov-2016 16:38:35	6140.19	6124.16
EMXV	110	05-Nov-2016 16:38:35	05-Nov-2016 16:39:07	6124.16	6075.55
EMXV	115	05-Nov-2016 16:39:07	05-Nov-2016 16:39:11	6075.55	6075.29
EMXV	120	05-Nov-2016 16:39:11	05-Nov-2016 16:47:02	6075.29	4705.37
EMXV	115	05-Nov-2016 16:47:02	05-Nov-2016 16:47:06	4705.37	4694.41
EMXV	110	05-Nov-2016 16:47:06	05-Nov-2016 16:47:10	4694.41	4682.06
EMXV	105	05-Nov-2016 16:47:10	05-Nov-2016 16:47:15	4682.06	4667.6
EMXV	100	05-Nov-2016 16:47:15	05-Nov-2016 16:47:19	4667.6	4654.14
EMXV	95	05-Nov-2016 16:47:19	05-Nov-2016 16:47:27	4654.14	4630.64
EMXV	90	05-Nov-2016 16:47:27	05-Nov-2016 16:47:32	4630.64	4613.45
EMXV	85	05-Nov-2016 16:47:32	05-Nov-2016 16:47:38	4613.45	4596.65
EMXV	80	05-Nov-2016 16:47:38	05-Nov-2016 16:47:44	4596.65	4579.83
EMXV	75	05-Nov-2016 16:47:44	05-Nov-2016 16:47:48	4579.83	4565.92
EMXV	70	05-Nov-2016 16:47:48	05-Nov-2016 16:47:52	4565.92	4553.89
EMXV	65	05-Nov-2016 16:47:52	05-Nov-2016 16:47:56	4553.89	4540.71
EMXV	60	05-Nov-2016 16:47:56	05-Nov-2016 16:48:01	4540.71	4525.91
EMXV	55	05-Nov-2016 16:48:01	05-Nov-2016 16:48:05	4525.91	4511.8
EMXV	50	05-Nov-2016 16:48:05	05-Nov-2016 16:48:11	4511.8	4493.77

EMXV	45	05-Nov-2016 16:48:11	05-Nov-2016 17:11:46	4493.77	58.93
WINB	31.88	05-Nov-2016 16:29:41	05-Nov-2016 16:37:20	6213.2	6188.13
WINB	28.9	05-Nov-2016 16:37:20	05-Nov-2016 16:37:29	6188.13	6181.25
WINB	20.46	05-Nov-2016 16:37:29	05-Nov-2016 16:47:00	6181.25	4713.08
WINB	23.53	05-Nov-2016 16:47:00	05-Nov-2016 16:47:24	4713.08	4637.72
WINB	31.2	05-Nov-2016 16:47:24	05-Nov-2016 16:47:35	4637.72	4605.15
WINB	25.83	05-Nov-2016 16:47:35	05-Nov-2016 16:49:55	4605.15	4170.58
WINB	28.9	05-Nov-2016 16:49:55	05-Nov-2016 16:53:49	4170.58	3433.21
WINB	29.67	05-Nov-2016 16:53:49	05-Nov-2016 16:57:02	3433.21	2814.88
WINB	35.81	05-Nov-2016 16:57:02	05-Nov-2016 16:57:09	2814.88	2794.17
WINB	30.44	05-Nov-2016 16:57:09	05-Nov-2016 16:57:27	2794.17	2734.32
WINB	28.9	05-Nov-2016 16:57:27	05-Nov-2016 17:11:46	2734.32	58.93
WINE	71.88	05-Nov-2016 16:29:41	05-Nov-2016 16:36:53	6213.2	6208.85
WINE	90.3	05-Nov-2016 16:36:53	05-Nov-2016 16:46:58	6208.85	4719.16
WINE	84.16	05-Nov-2016 16:46:58	05-Nov-2016 16:47:23	4719.16	4643.39
WINE	78.78	05-Nov-2016 16:47:23	05-Nov-2016 16:47:30	4643.39	4620.74
WINE	78.02	05-Nov-2016 16:47:30	05-Nov-2016 16:49:53	4620.74	4176.86
WINE	75.71	05-Nov-2016 16:49:53	05-Nov-2016 16:53:46	4176.86	3443.64
WINE	72.64	05-Nov-2016 16:53:46	05-Nov-2016 16:57:00	3443.64	2822.12
WINE	69.57	05-Nov-2016 16:57:00	05-Nov-2016 17:11:46	2822.12	58.93
All depth are at tool zero.					

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	2219.11 ft	2602.29 ft	05-Nov-2016 4:07:23 PM	05-Nov-2016 4:10:27 PM	ON	6.03 ft	Yes

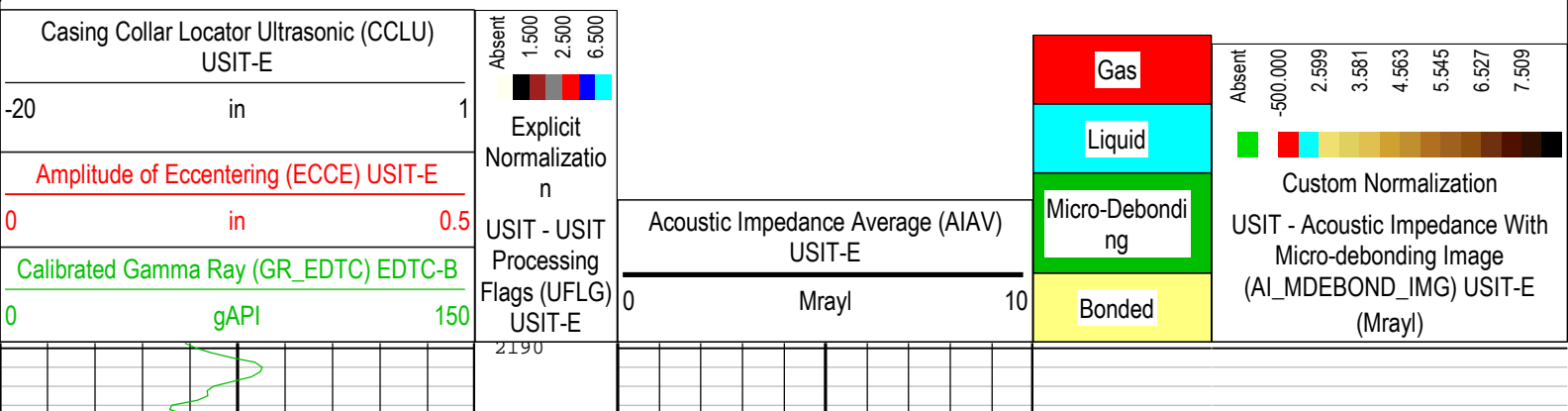
All depths are referenced to toolstring zero

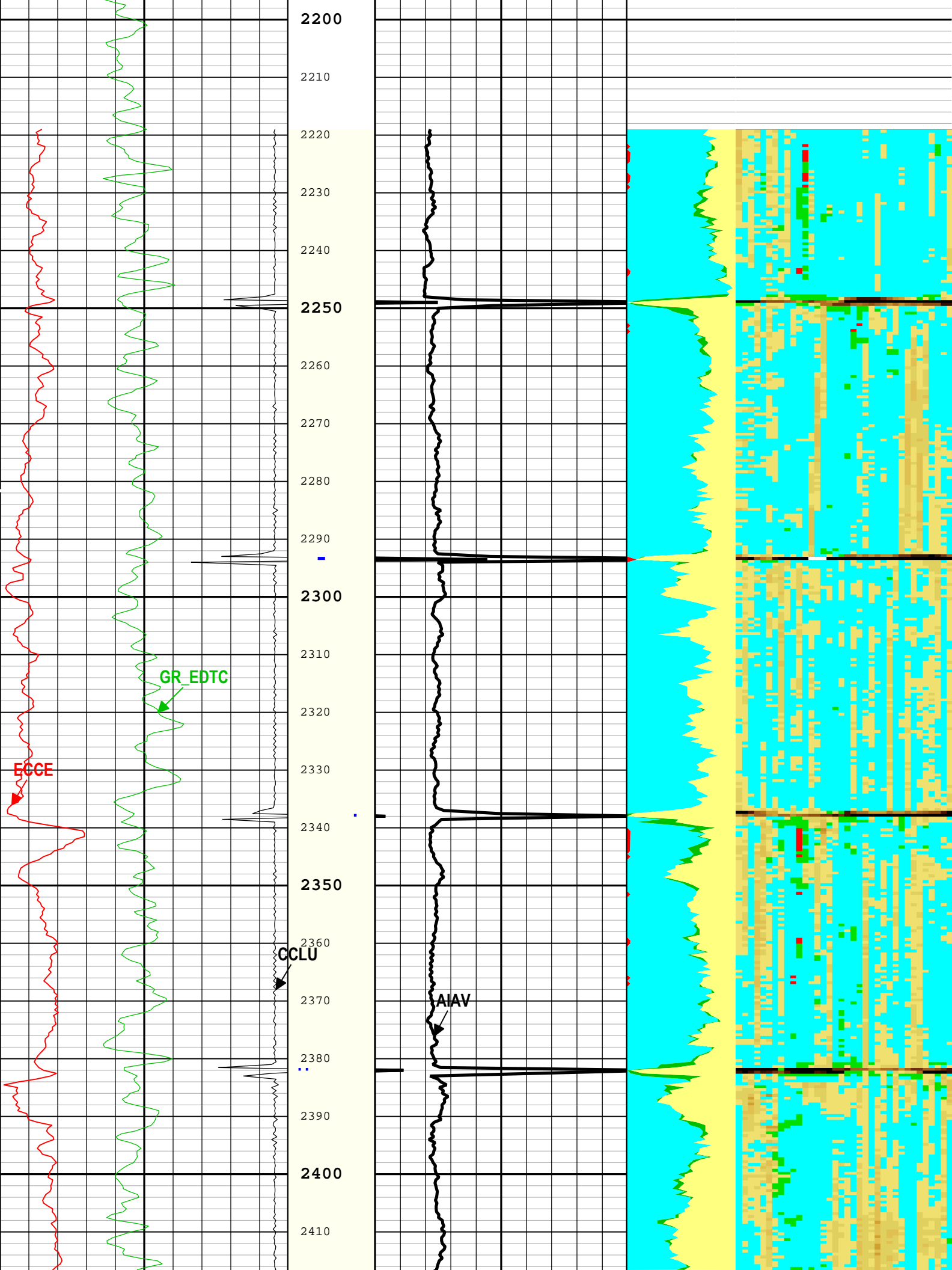
Log

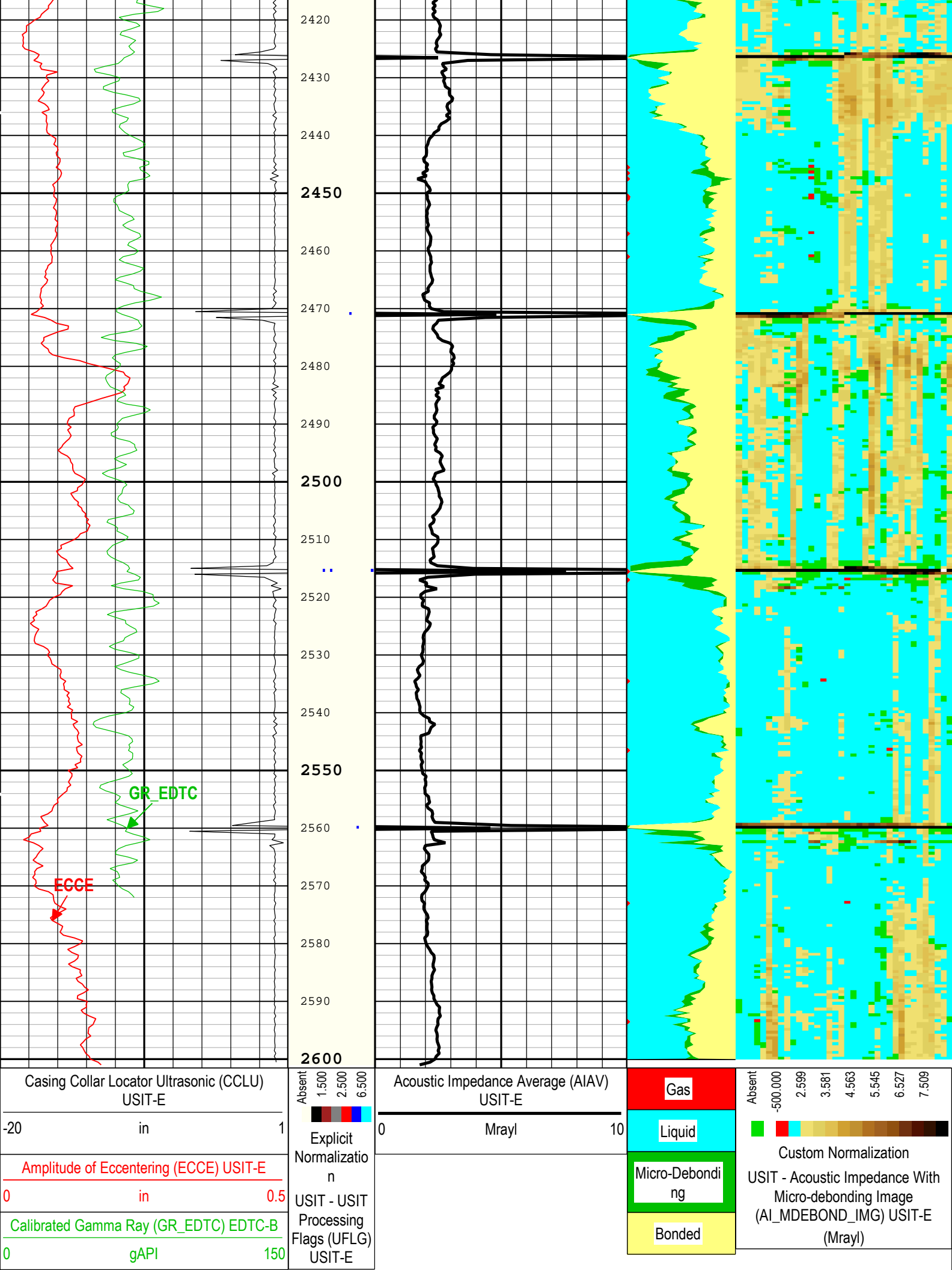
Company:Noble Energy Inc Well:ANNI LD29-755
One: Log[2]:Up:S007

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: 05-Nov-2016 18:42:28

TIME_1900 - Time Marked every 60.00 (s)





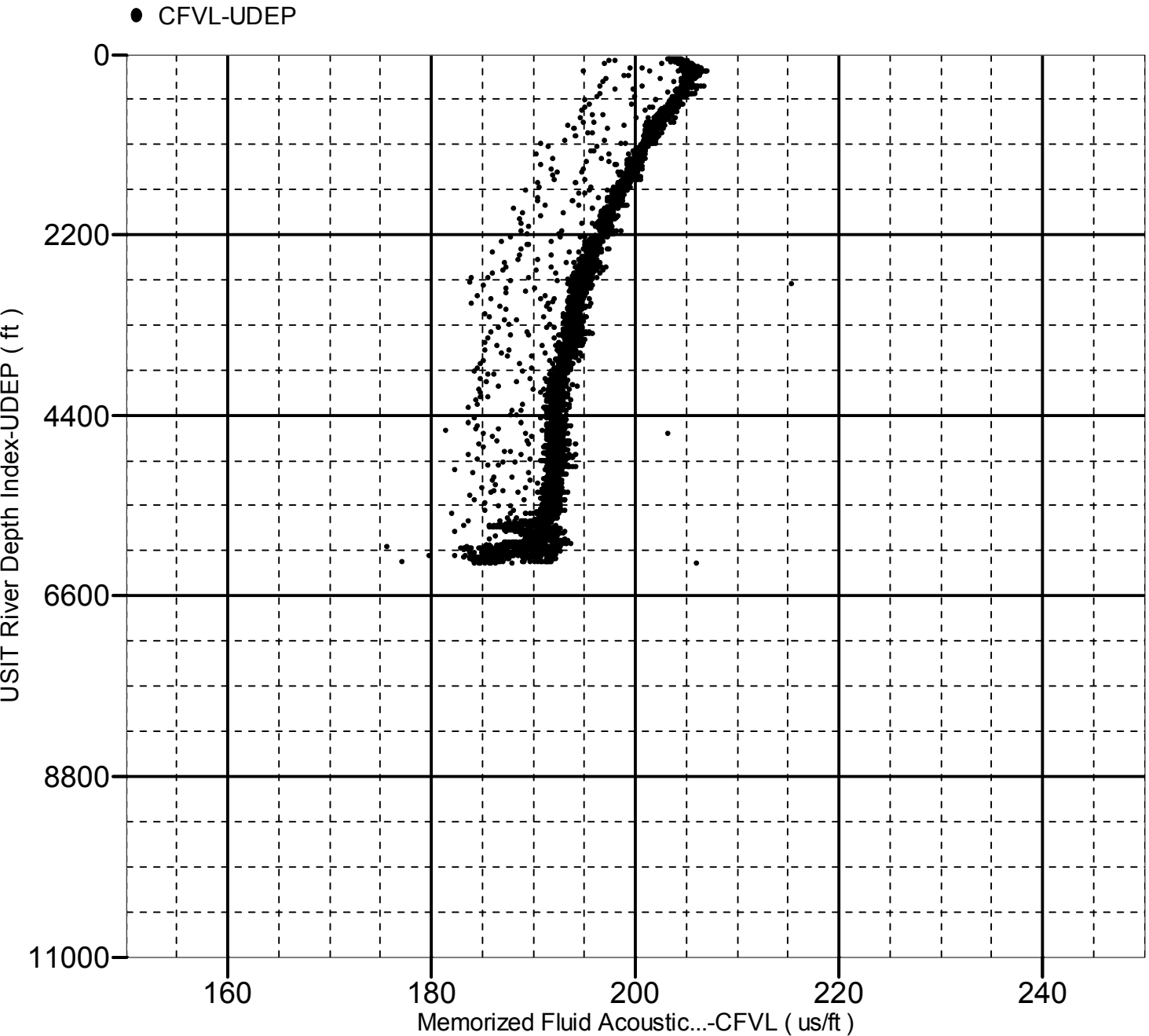


Channel Processing Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BS	Bit Size	WLSESSION	8.5	in
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	9.3	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
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	1.03	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.8	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	2.6	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
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
EMXV	EMEX Voltage	USIT-E	55	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	2500	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:ANNI LD29-755			
	One: Main[5]:Up:S007			

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6213.00 to 59.00 ft



XYZ

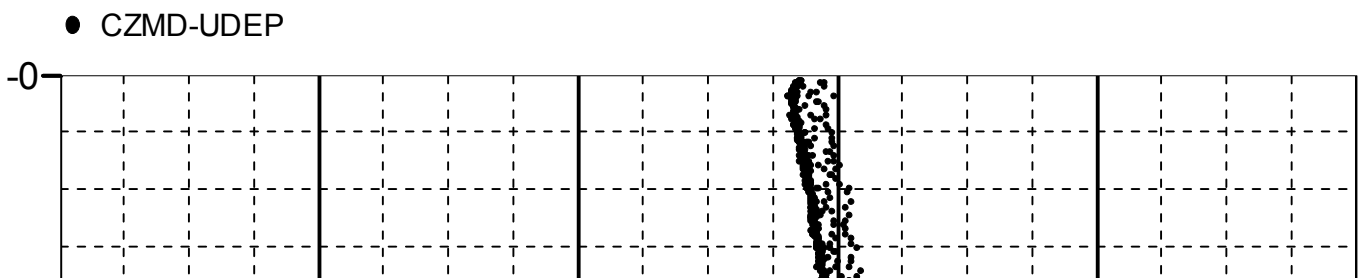
Company:Noble Energy Inc Well:ANNI LD29-755

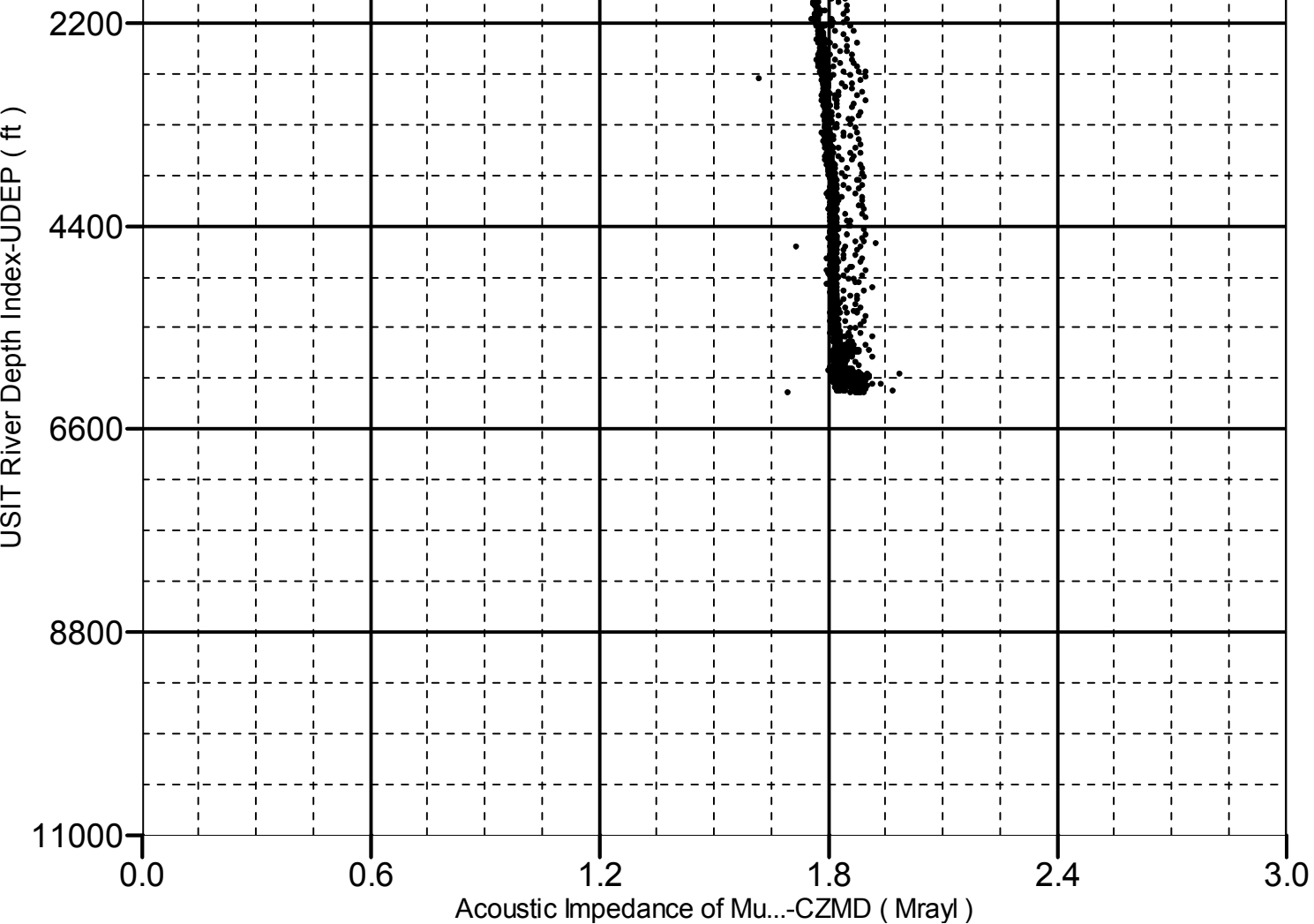
One: Main[5]:Up:S007

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6213.00 to 59.00 ft





Company: Noble Energy Inc

Schlumberger

Well: ANNI LD29-755

Field: Wildcat

County: Weld

State: Colorado

UltraSonic Summary Print