

Company: Noble Energy Inc

Well: Vogler State D21-731

Field: Wattenberg

County: Weld State: Colorado

UltraSonic Summary Print

County: Weld			
Field: Wattenberg			
Location: SWSE			
Well: Vogler State D21-731			
Company: Noble Energy Inc			
Location:	SWSE	Elev.: K.B. 4855.00 ft	
	SHL: 930' FSL & 2444' FEL	G.L. 4825.00 ft	
	Lat/Long: 40.20623/-104.55565	D.F.	
	Permanent Datum:	Ground Level	Elev.: 4825.00 f
Log Measured From:		Kelly Bushing	30.00 ft above Perm.Datum
Drilling Measured From:		Kelly Bushing	
API Serial No.	Section:	Township:	Range:
05-123-48564	21	3N	64W

Logging Date	27-Apr-2019	27-Apr-2019
Run Number	ONE	
Depth Driller	17810.00 ft	17788.00 ft
Schlumberger Depth	17810.00 ft	17788.00 ft
Bottom Log Interval	6300.00 ft	
Top Log Interval	100.00 ft	
Casing Fluid Type	Brine	Brine
Salinity		
Density	8.4 lbm/gal	8.4 lbm/gal
Fluid Level	8.00 ft	8.00 ft
BIT/CASING/TUBING STRING		
Bit Size	8.50 in	5.50 in
From	1973.00 ft	1962.80 ft
To	17810.00 ft	17788.00 ft
Casing/Tubing Size	5.5 in	5.5 in
Weight	20 lbm/ft	20 lbm/ft
Grade	P110	P110
From	0.00 ft	0.00 ft
To	17788.00 ft	17788.00 ft
Max Recorded Temperatures	205.7 degF	205.7 degF
Logger on Bottom	27-Apr-2019	17:01:00
Unit Number	Time	
Recorded By	Location:	Fort Morgan
	A. Voyage	
Witnessed By	Bill Mansfield	

Disclaimer

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- 12. Tail

- ## Borehole Fluids


Remarks and Equipment Summary

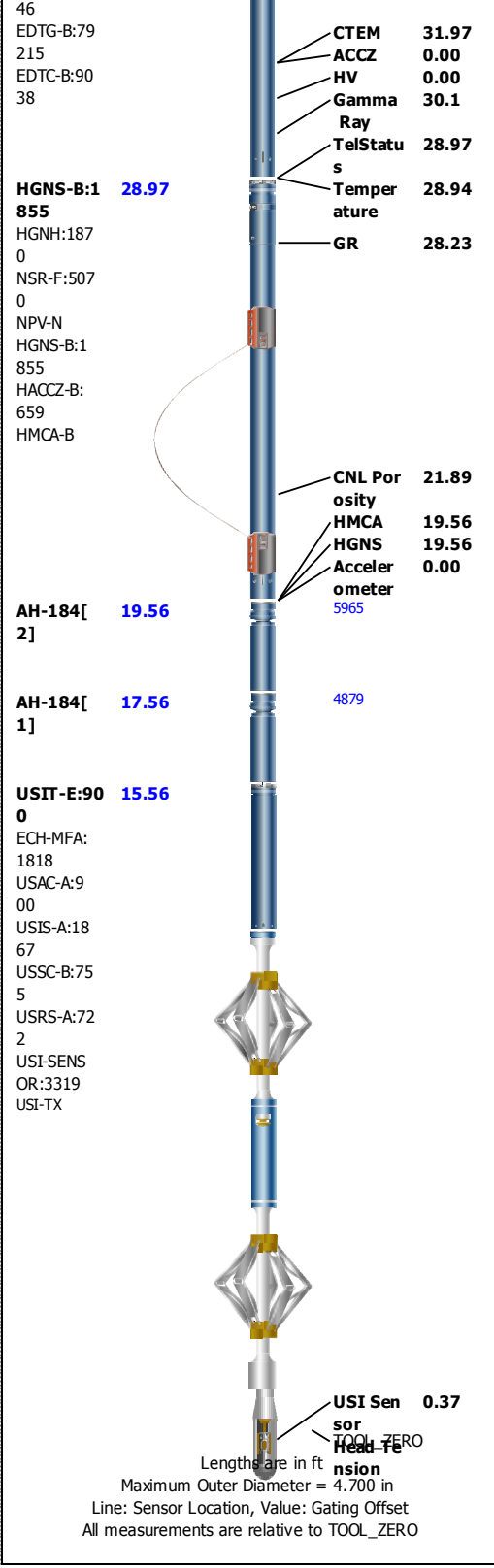
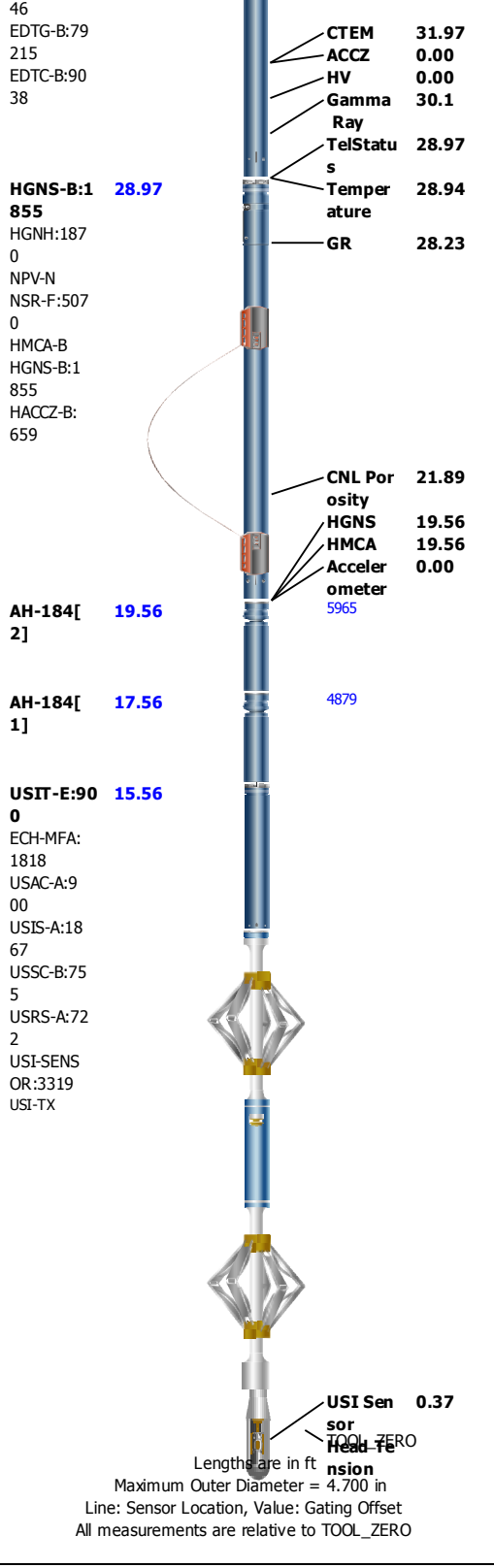
ONE: Remarks	Run 3: Remarks
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ONE: Toolstring

Equip name	Length		MP name	Offset
LEH-QT	38.95			
LEH-QT				
EDTC-B:9	35.47			
038				
EDTH-B:90				

Run 3: Toolstring

Equip name	Length		MP name	Offset
LEH-QT	38.95			
LEH-QT				
EDTC-B:9	35.47			
038				
EDTH-B:90				



Depth Summary			
		ONE	Run 3
Depth Measuring Device			
Type	IDW-JA	IDW-JA	
Serial Number	6455	6455	
Calibration Date	26-JUL-2018	26-JUL-2018	
Calibrator Serial Number	57	57	
Calibration Cable Type	7-32AS-XS	7-32AS-XS	
Wheel Correction 1	-1	-1	
Wheel Correction 2	1	1	

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

Type	7-32AS-XS	7-32AS-XS	
Serial Number			
Length	24000.00 ft	24000.00 ft	
Conveyance Type	Wireline	Wireline	
Rig Type	MAST	MAST	

Log Sequence	First Log In the Well	All Schlumberger depth control standards and guidelines followed.
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		All logs correlated to down pass.
Stretch Correction		
Tool Zero Check At Surface		

Log Sequence	First Log In the Well	All Schl
Rig Up Length At Surface		
Rig Up Length At Bottom		
Rig Up Length Correction		
Stretch Correction		
Tool Zero Check At Surface		

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
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Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)
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Start Depth(ft)	Stop Depth(ft)	Start Value(Mrayl)	End Value(Mrayl)
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Maxwell 2018 SP2	8.2.104493.3100
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	52
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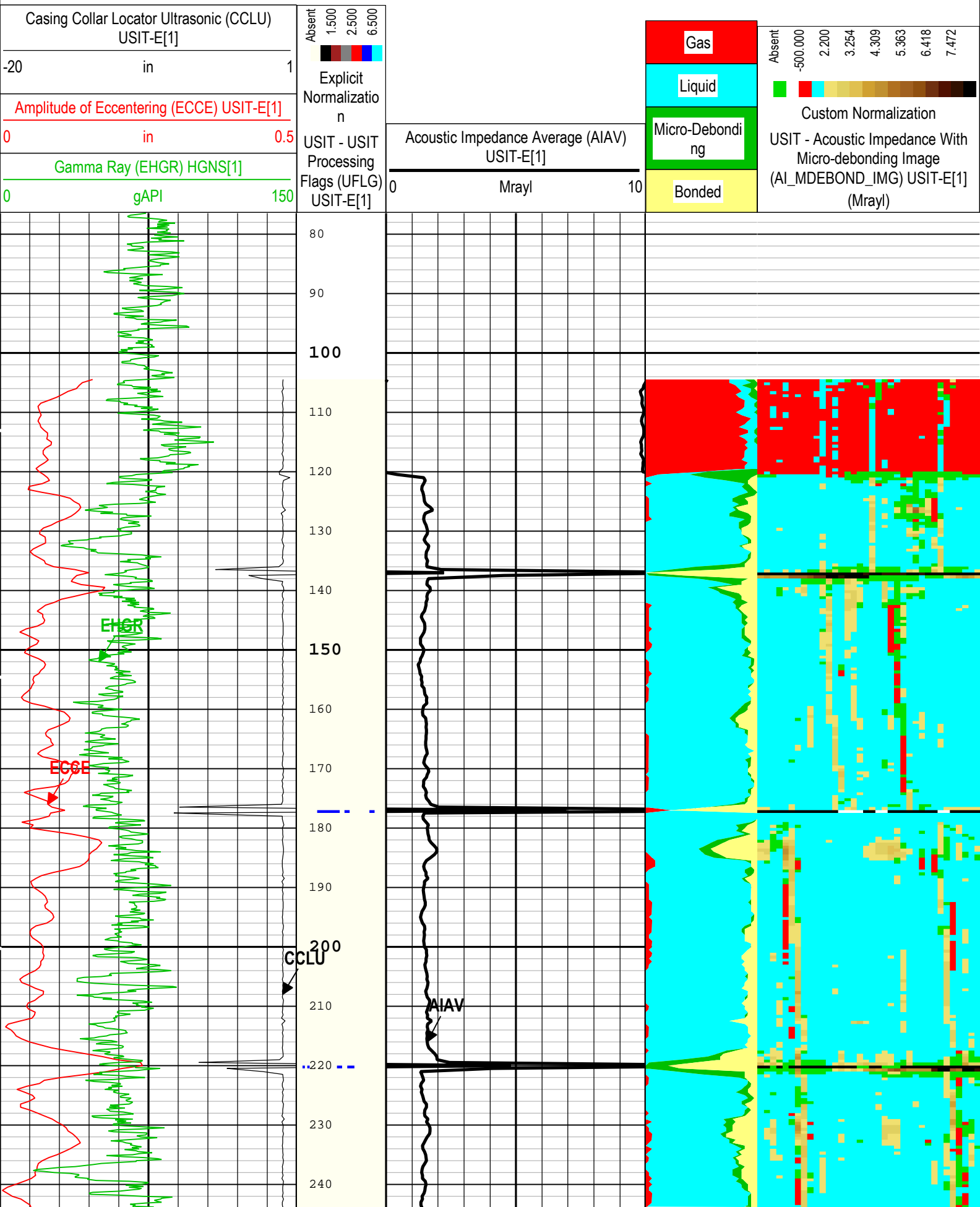
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Run 3	Log[1]:Up	Up	104.67 ft	2970.28 ft	27-Apr-2019 6:14:29 PM	27-Apr-2019 6:34:26 PM	ON	4.85 ft	Yes

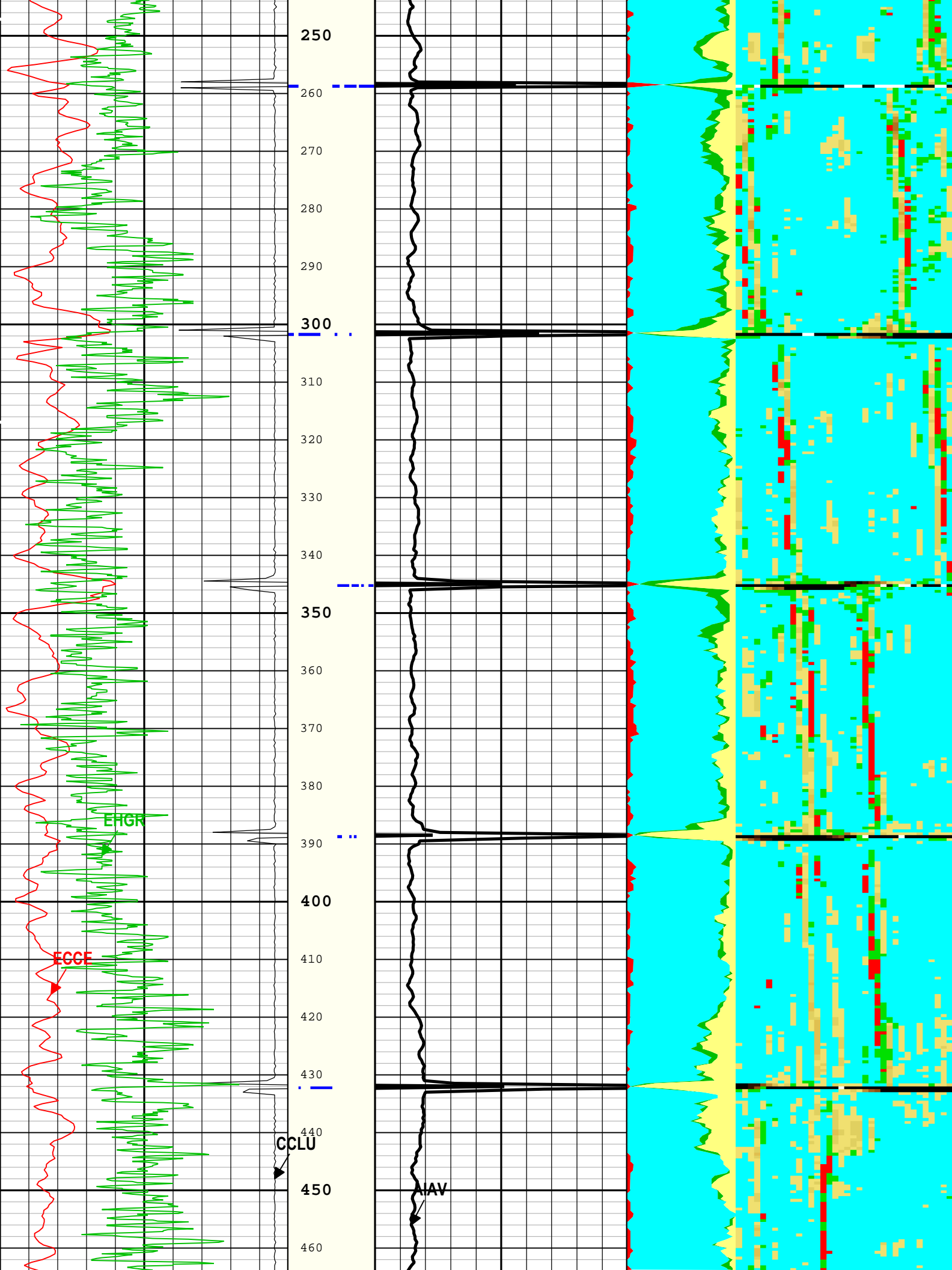
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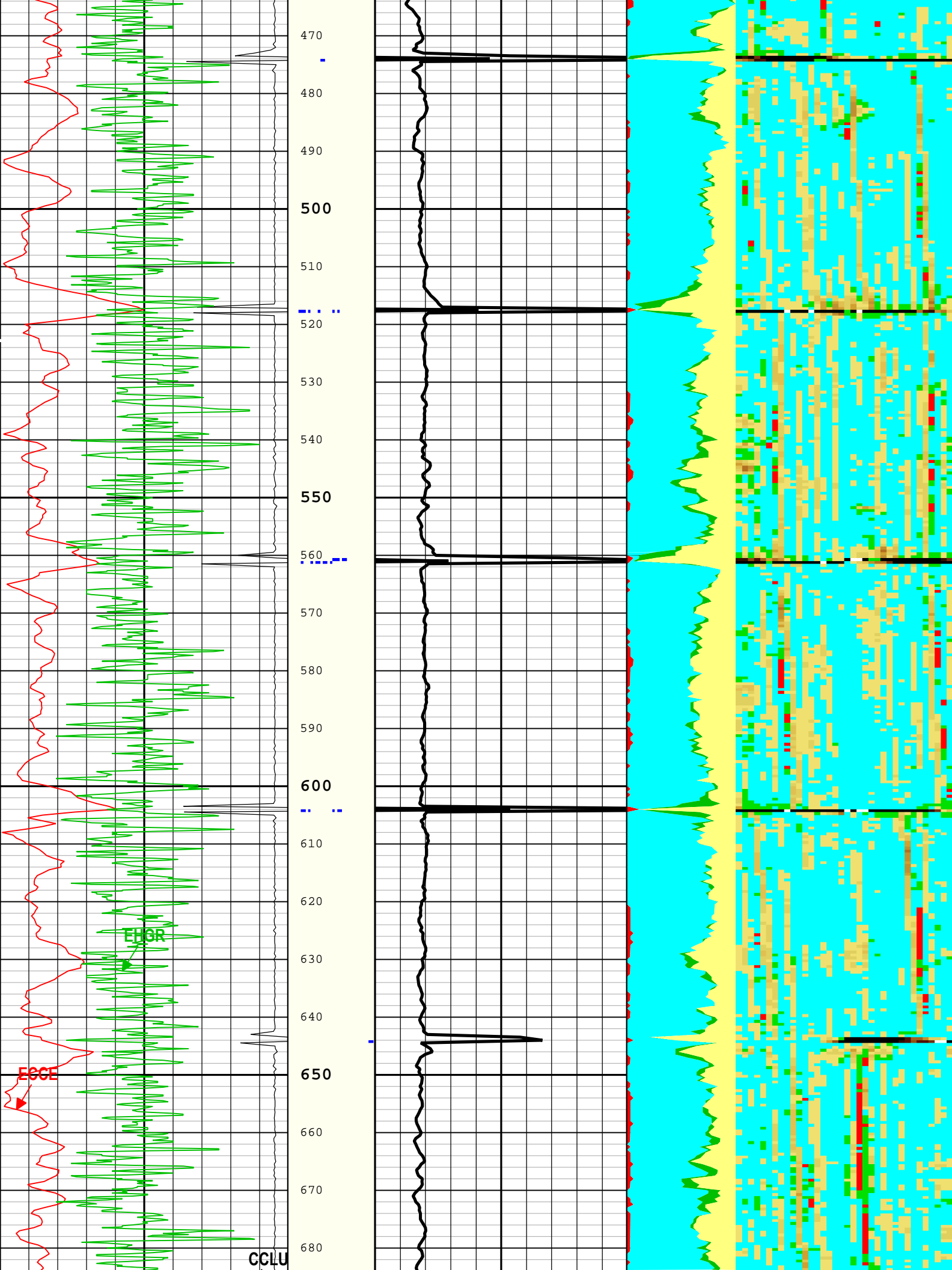
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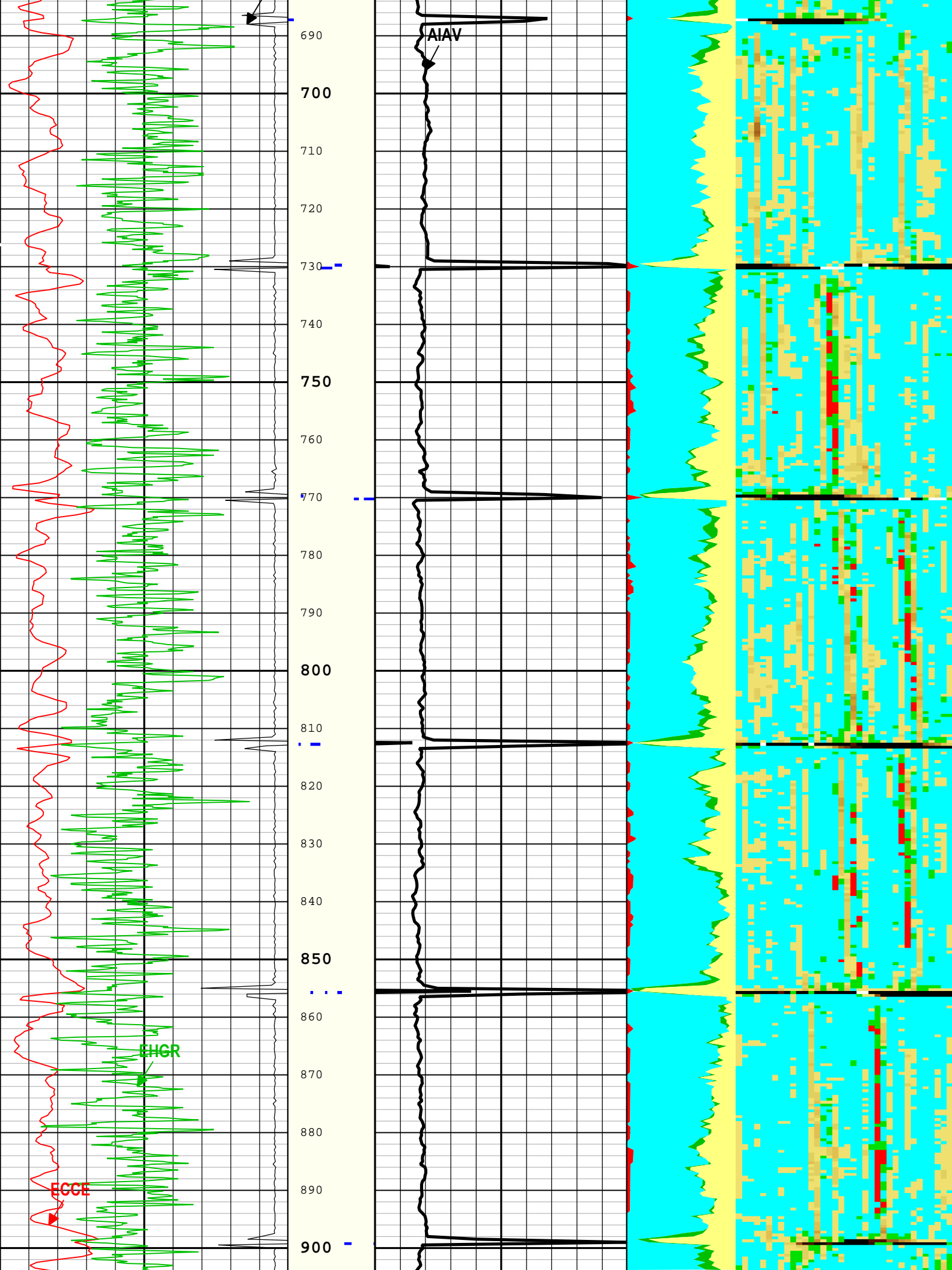
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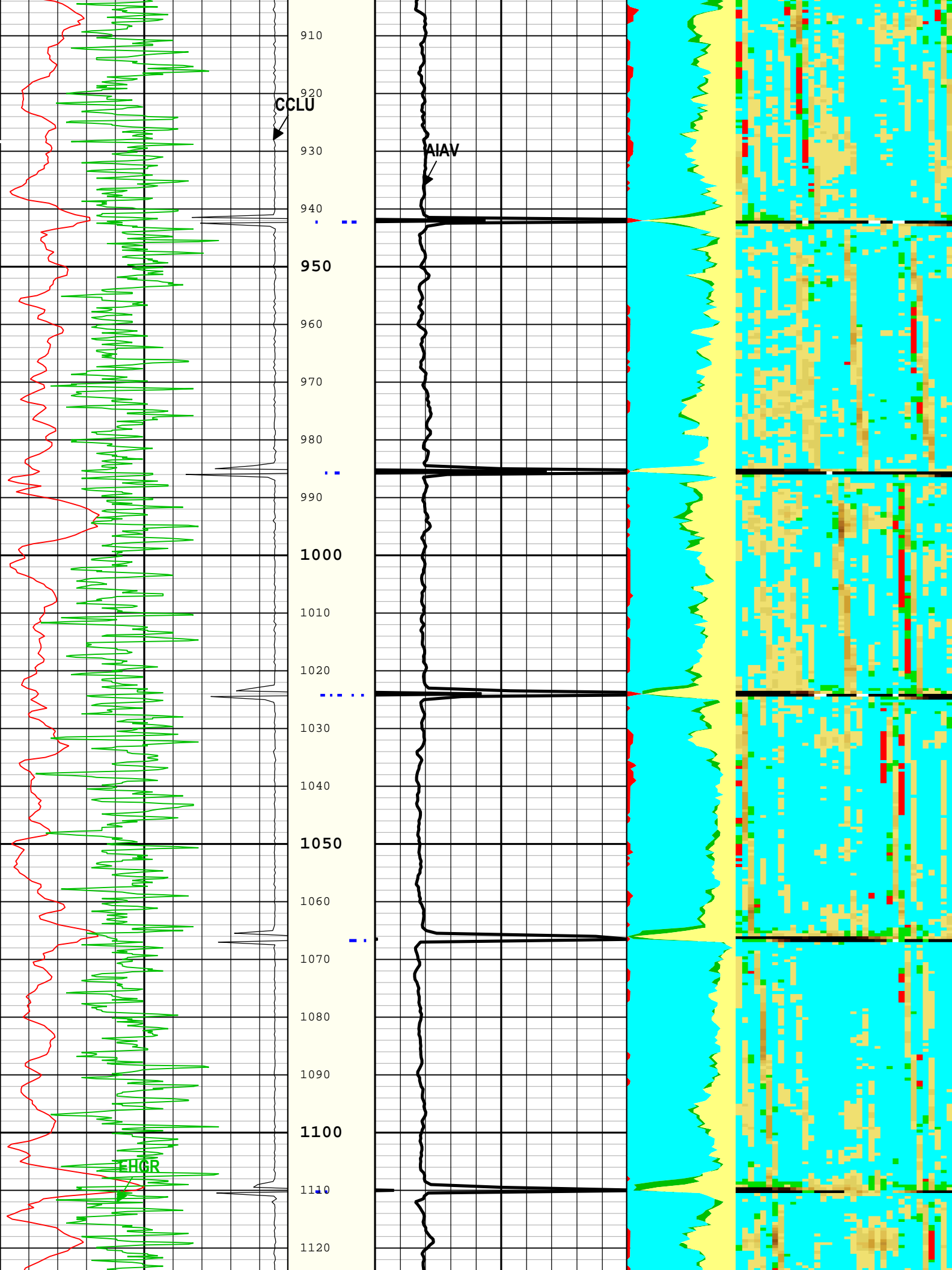
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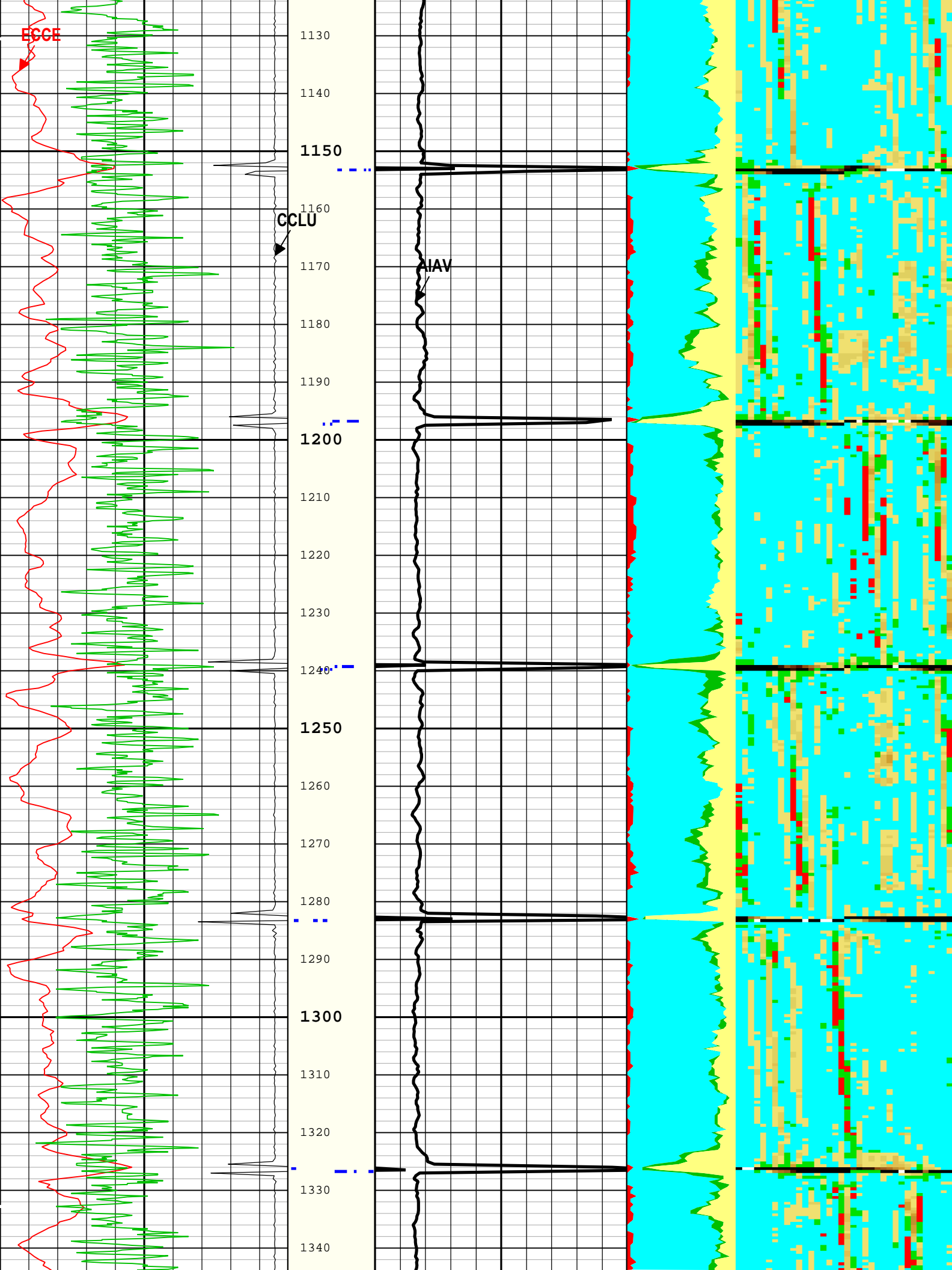


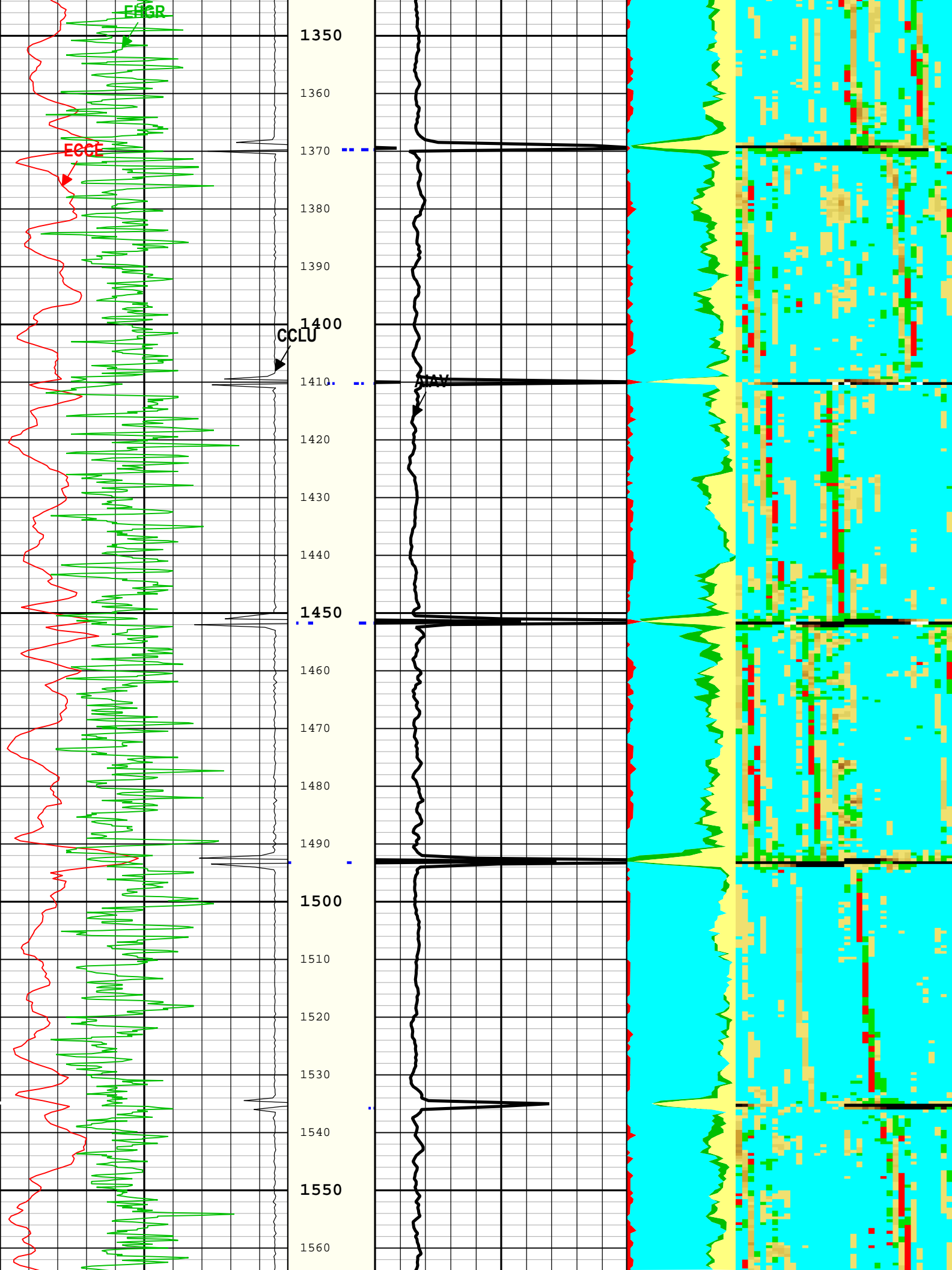


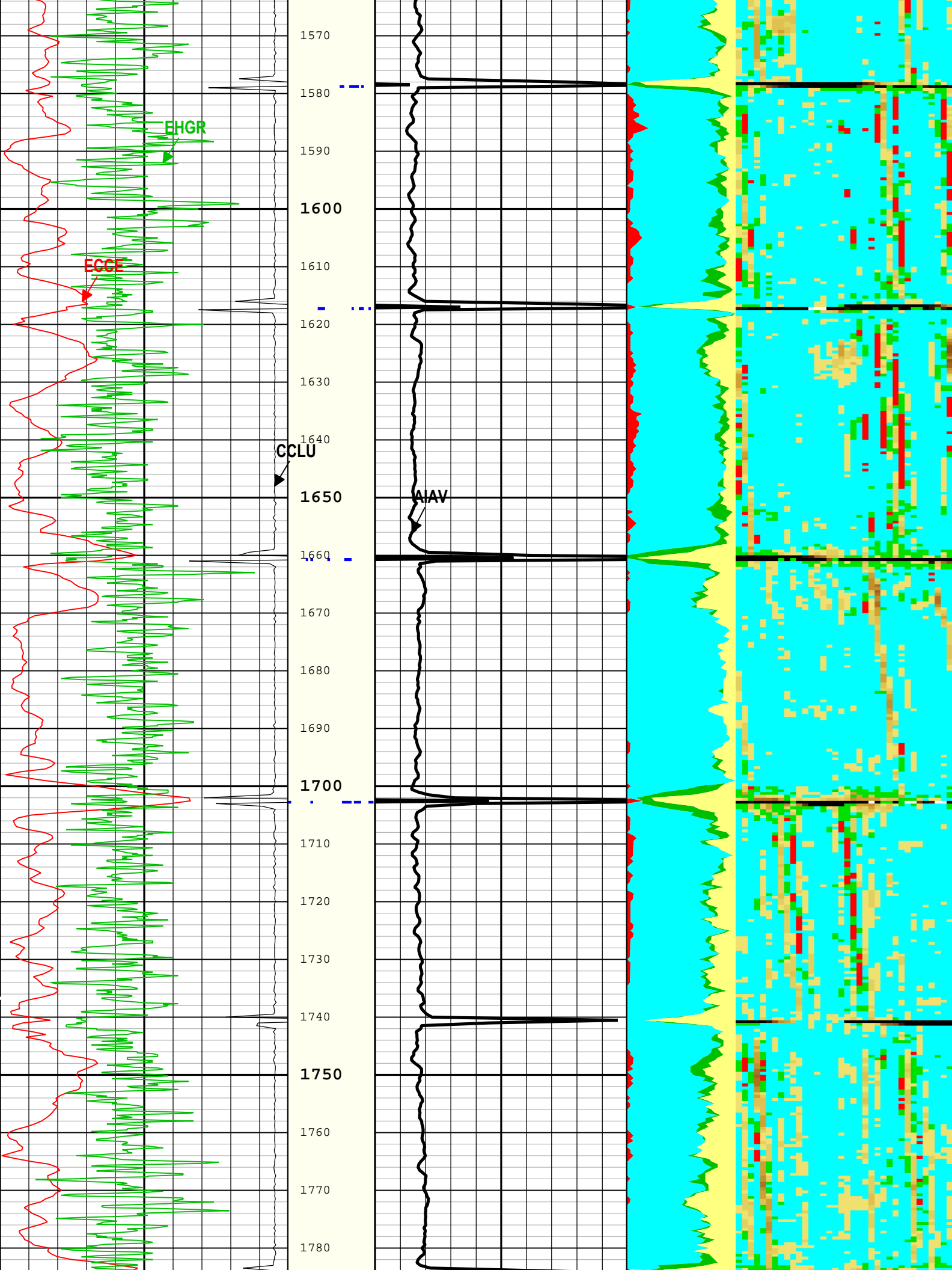


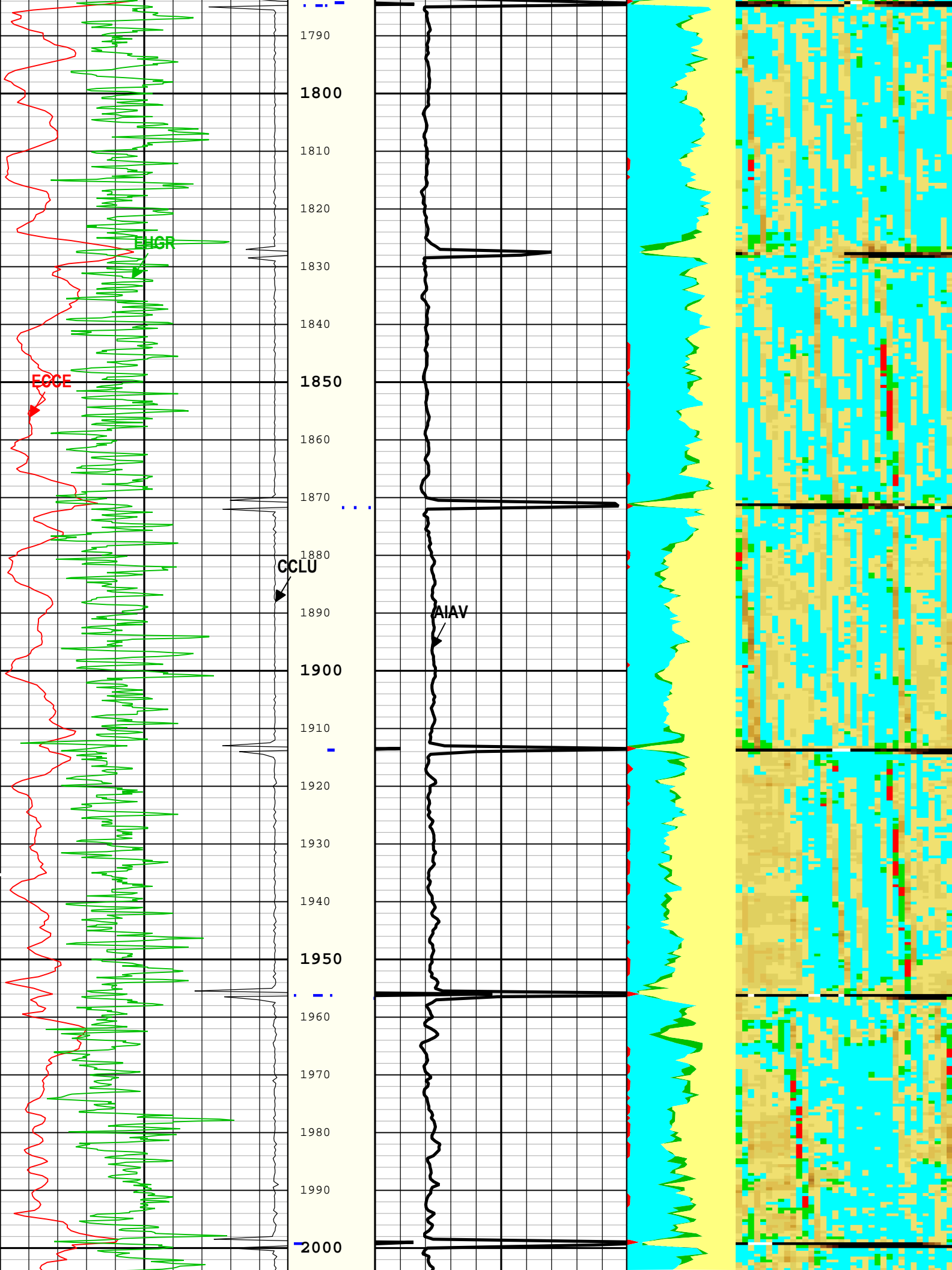


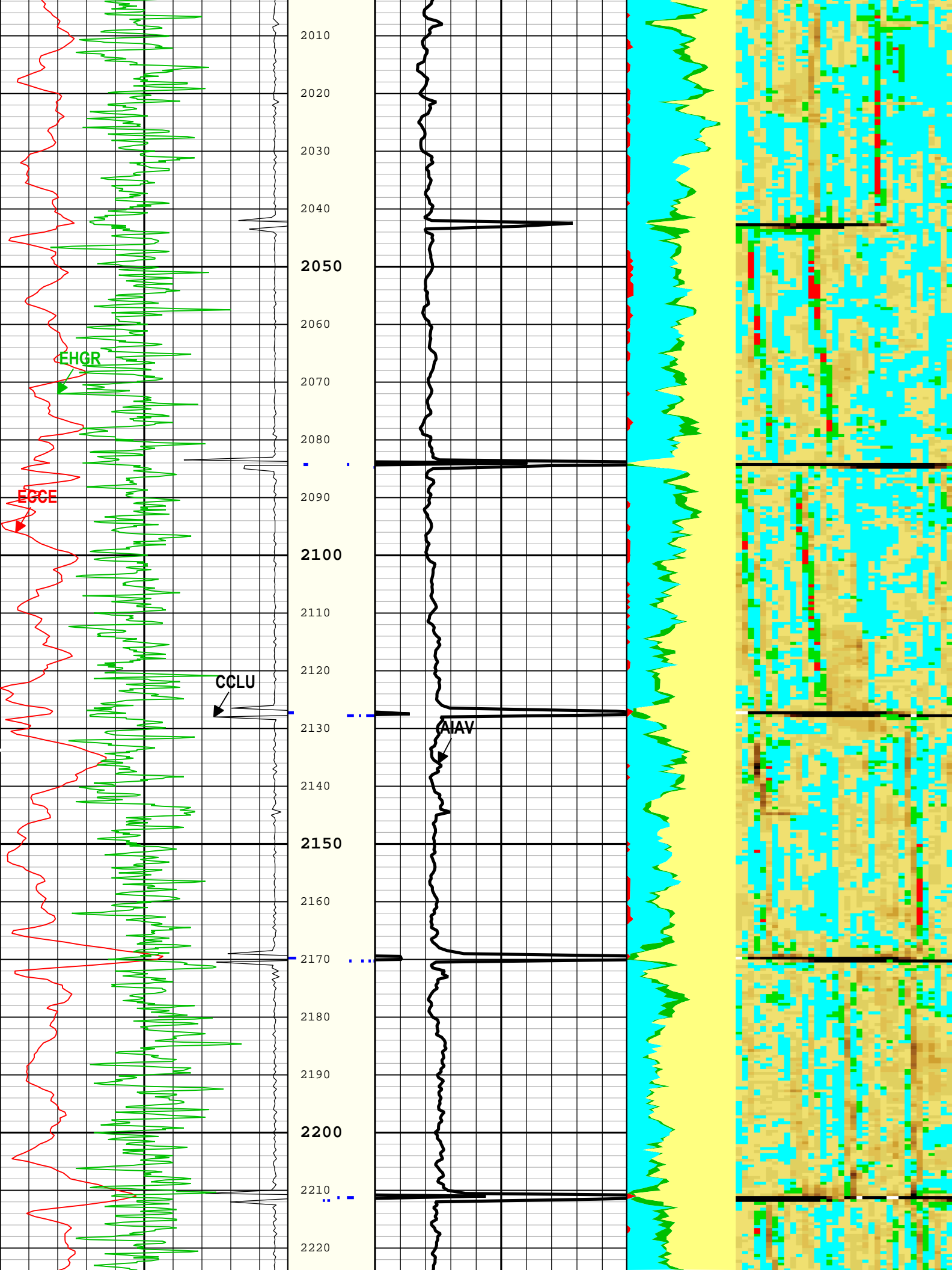


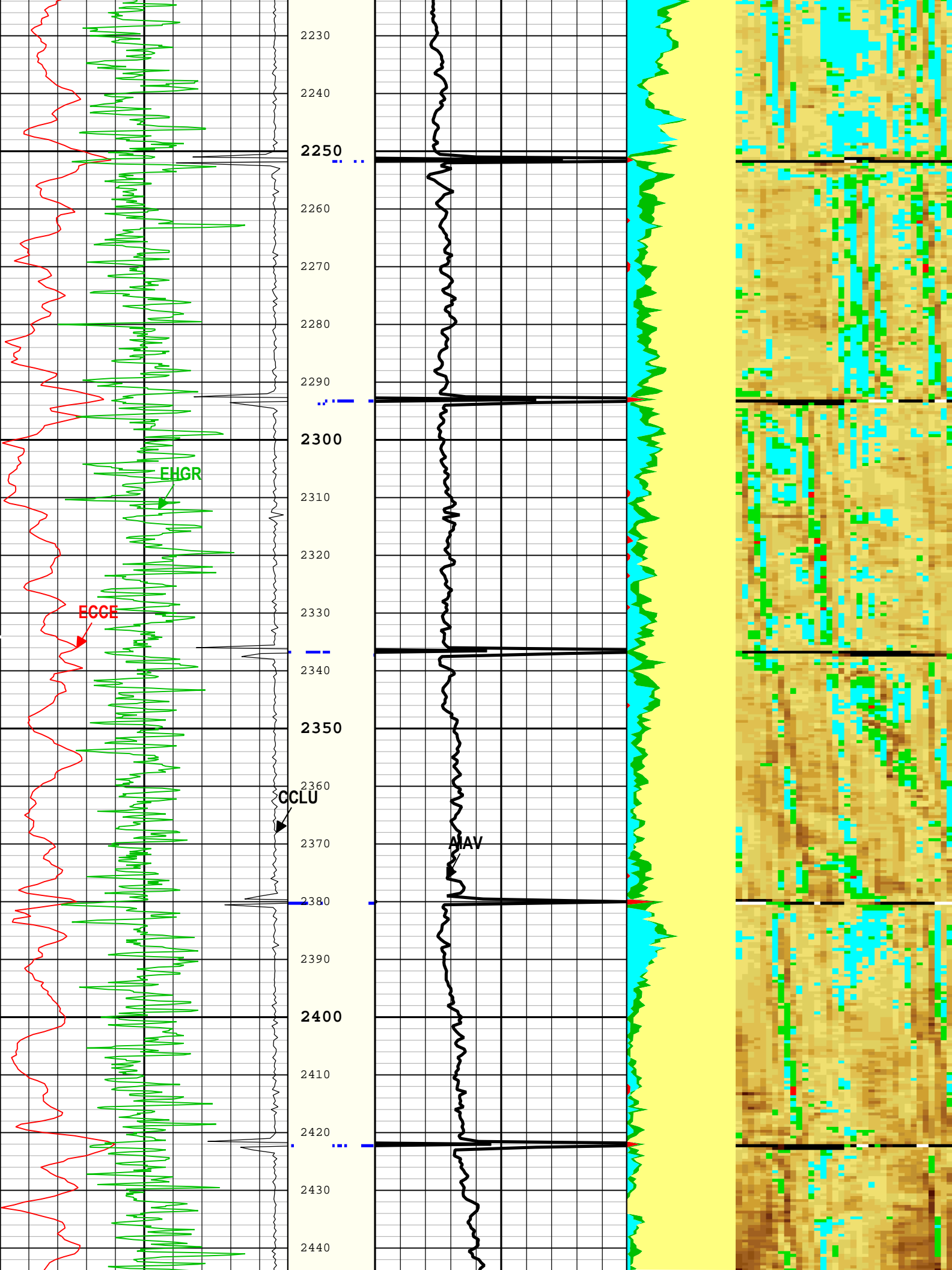


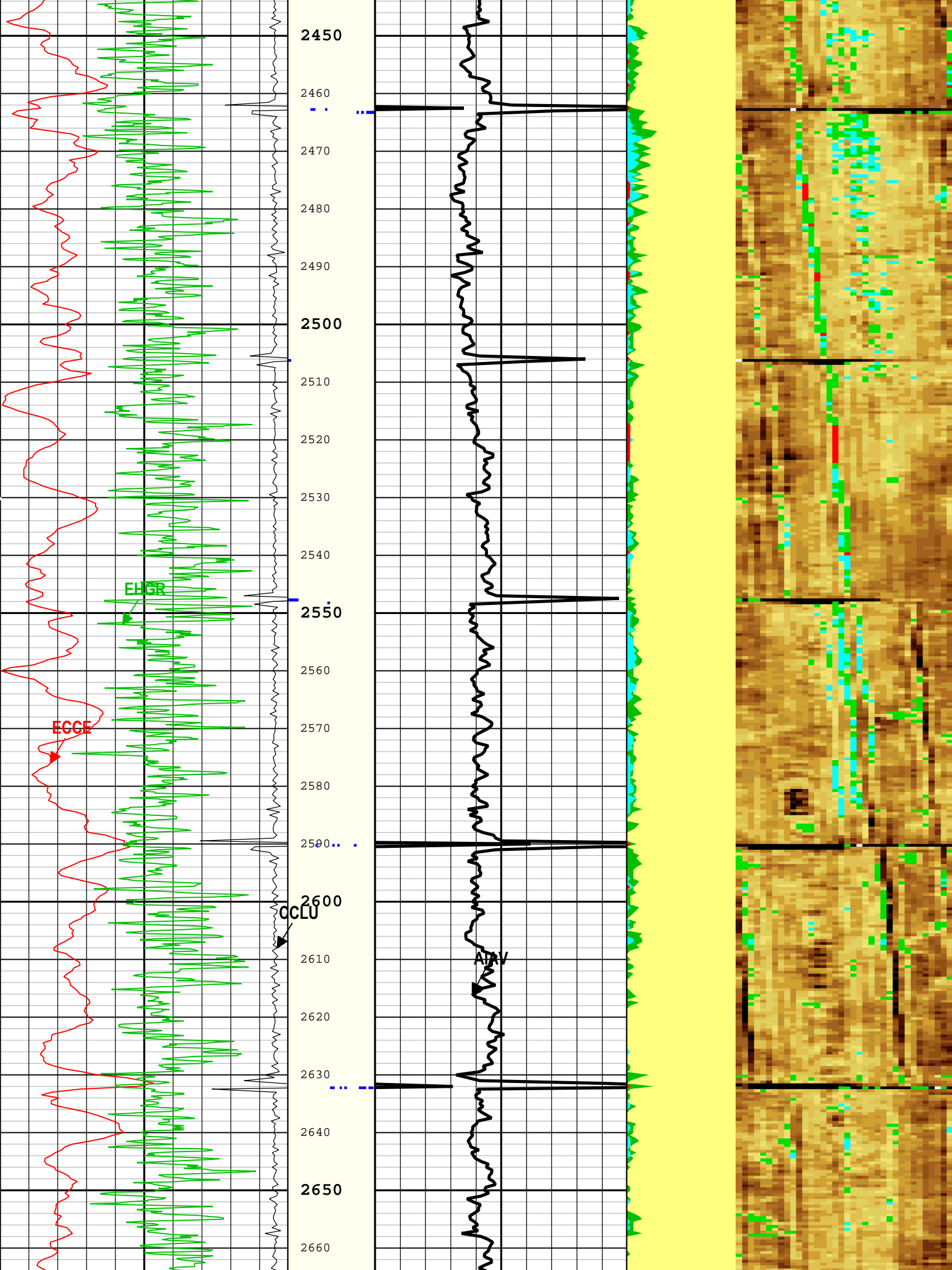


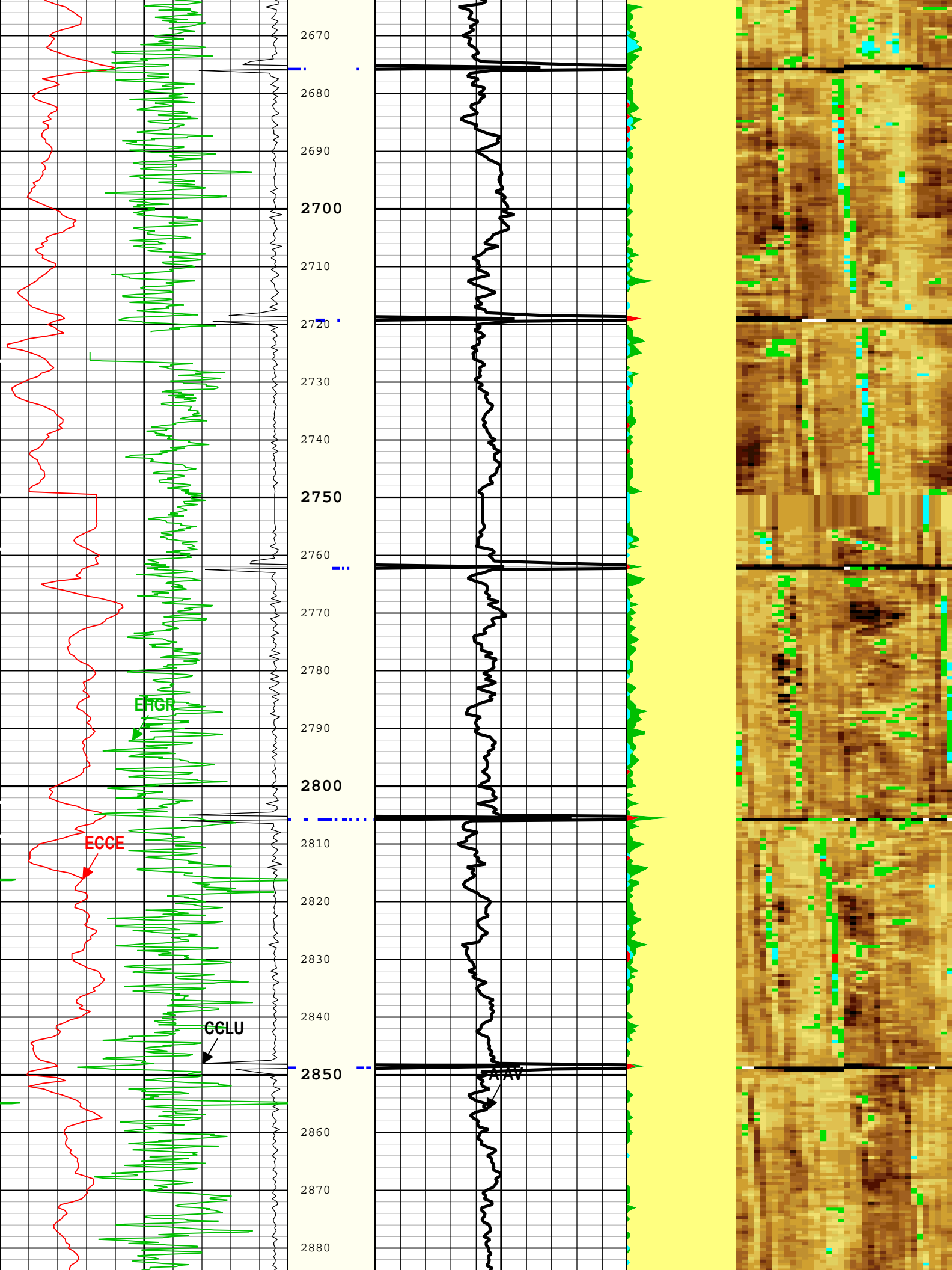


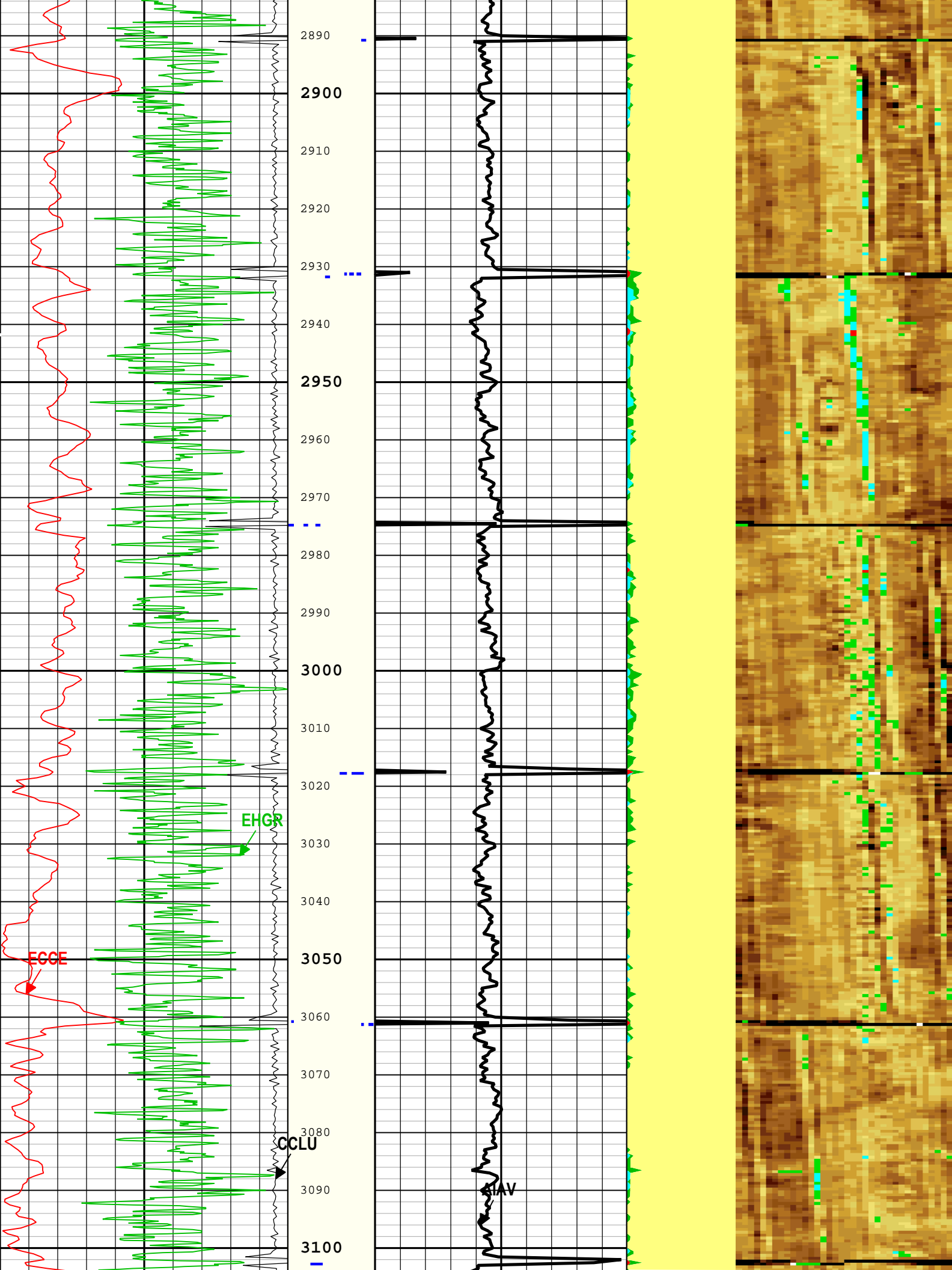


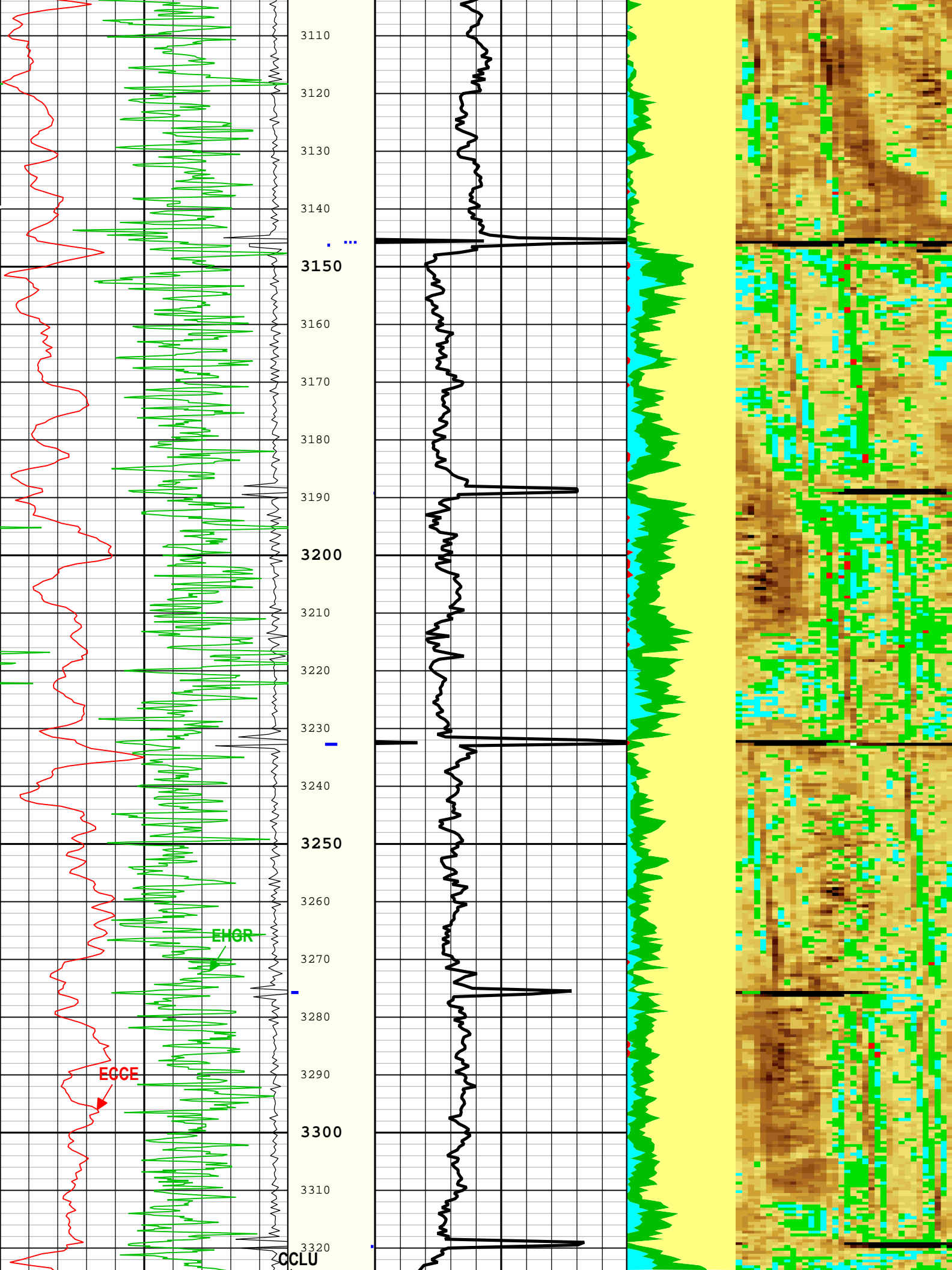


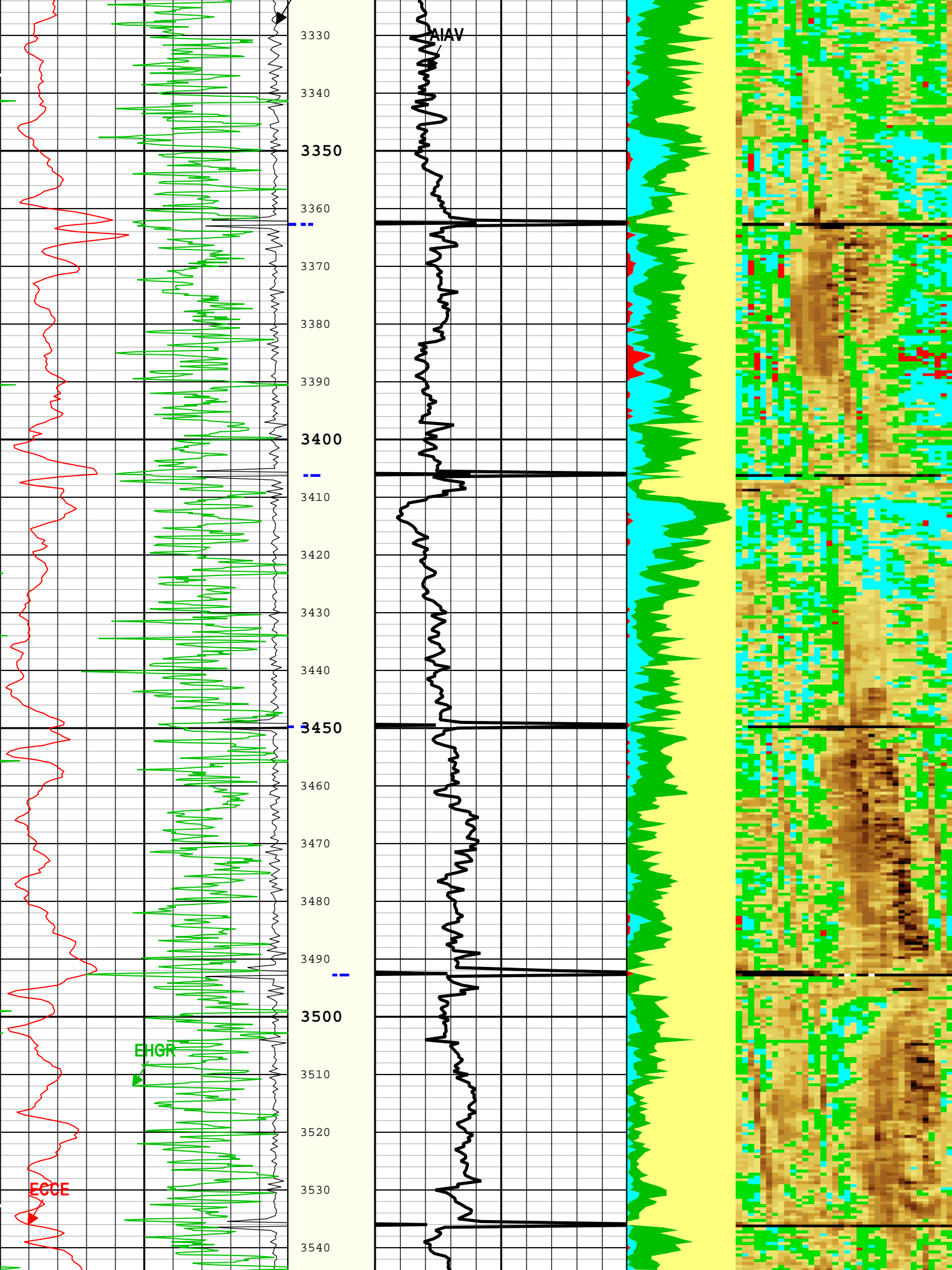


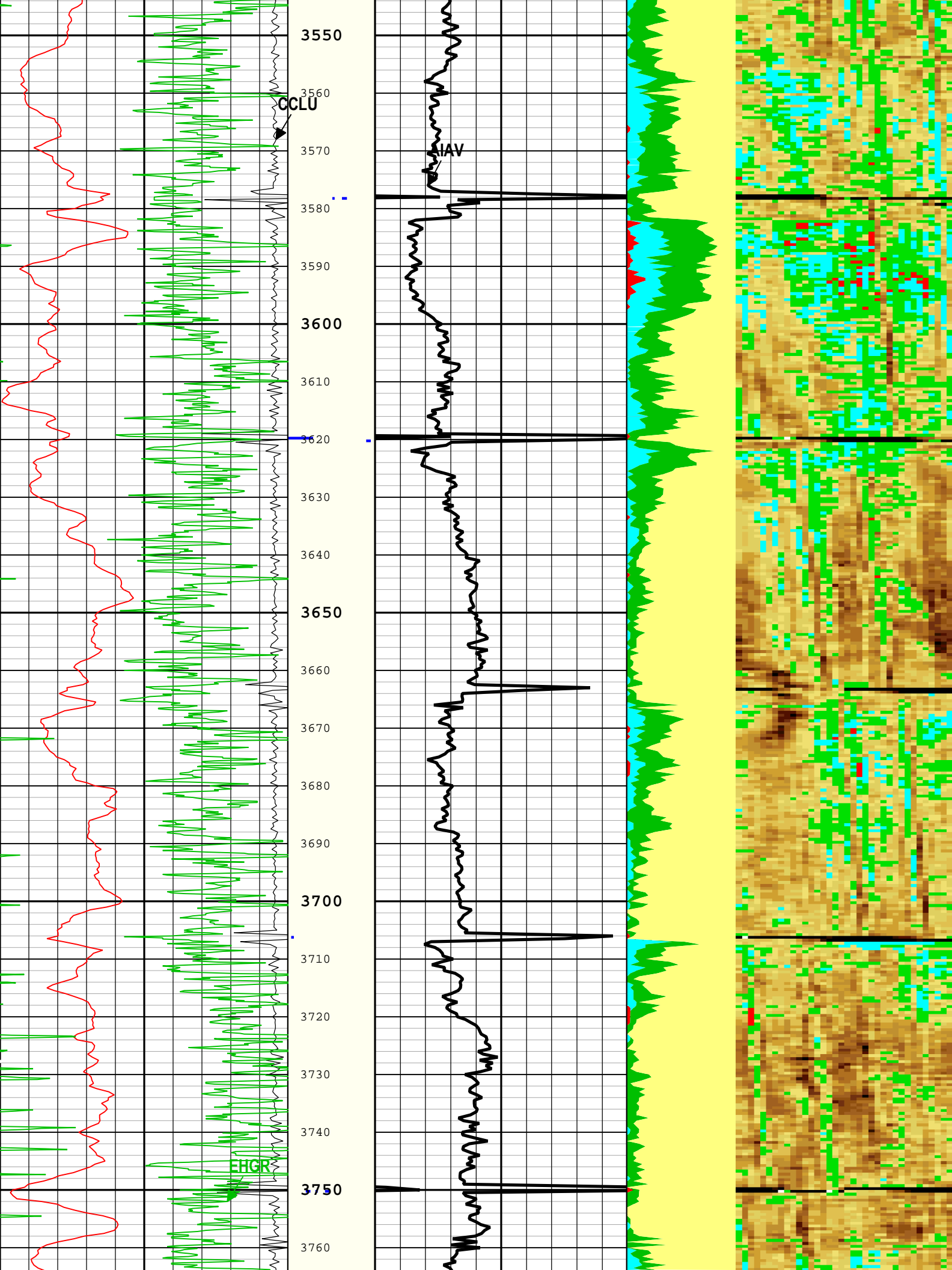


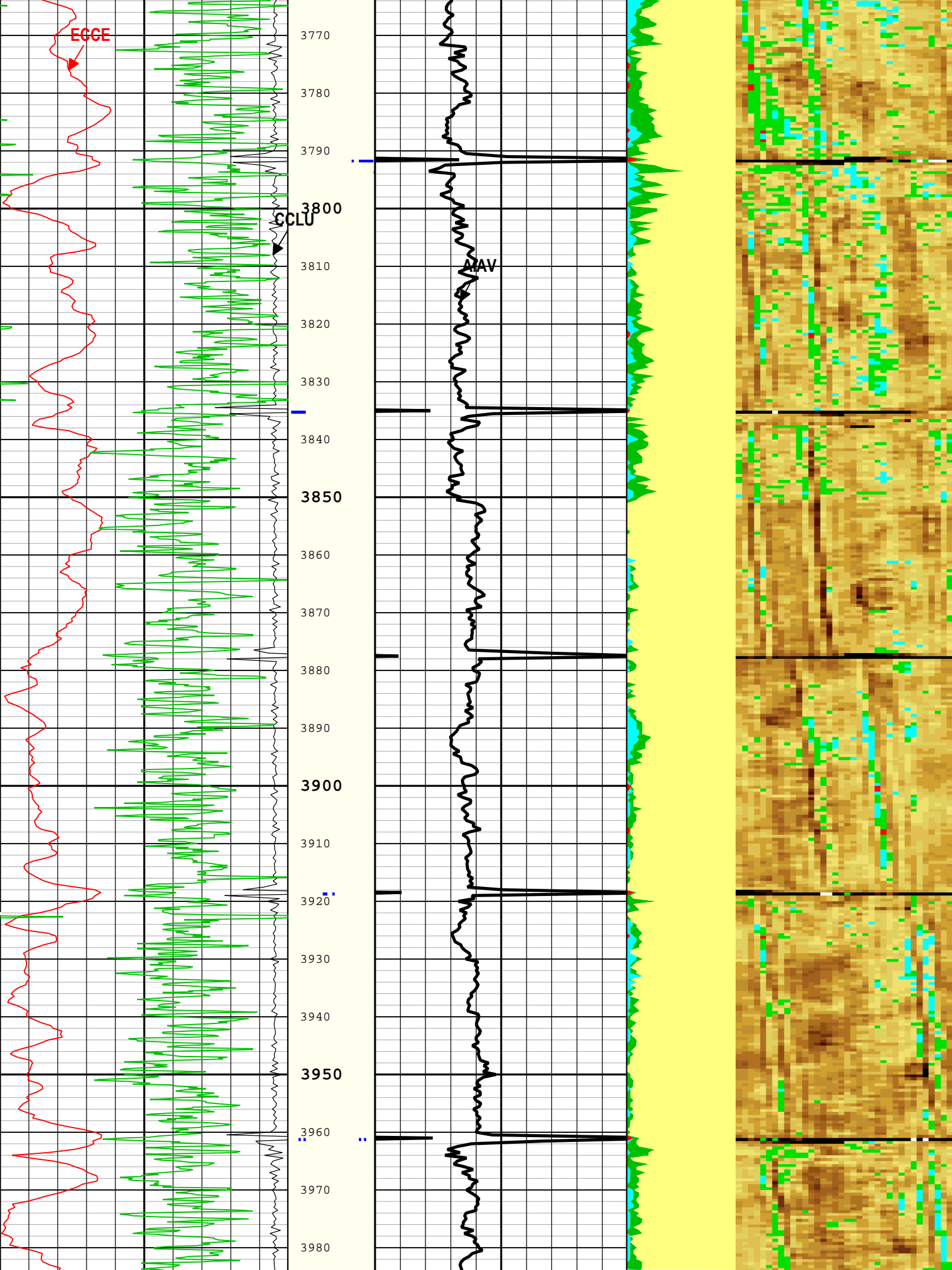


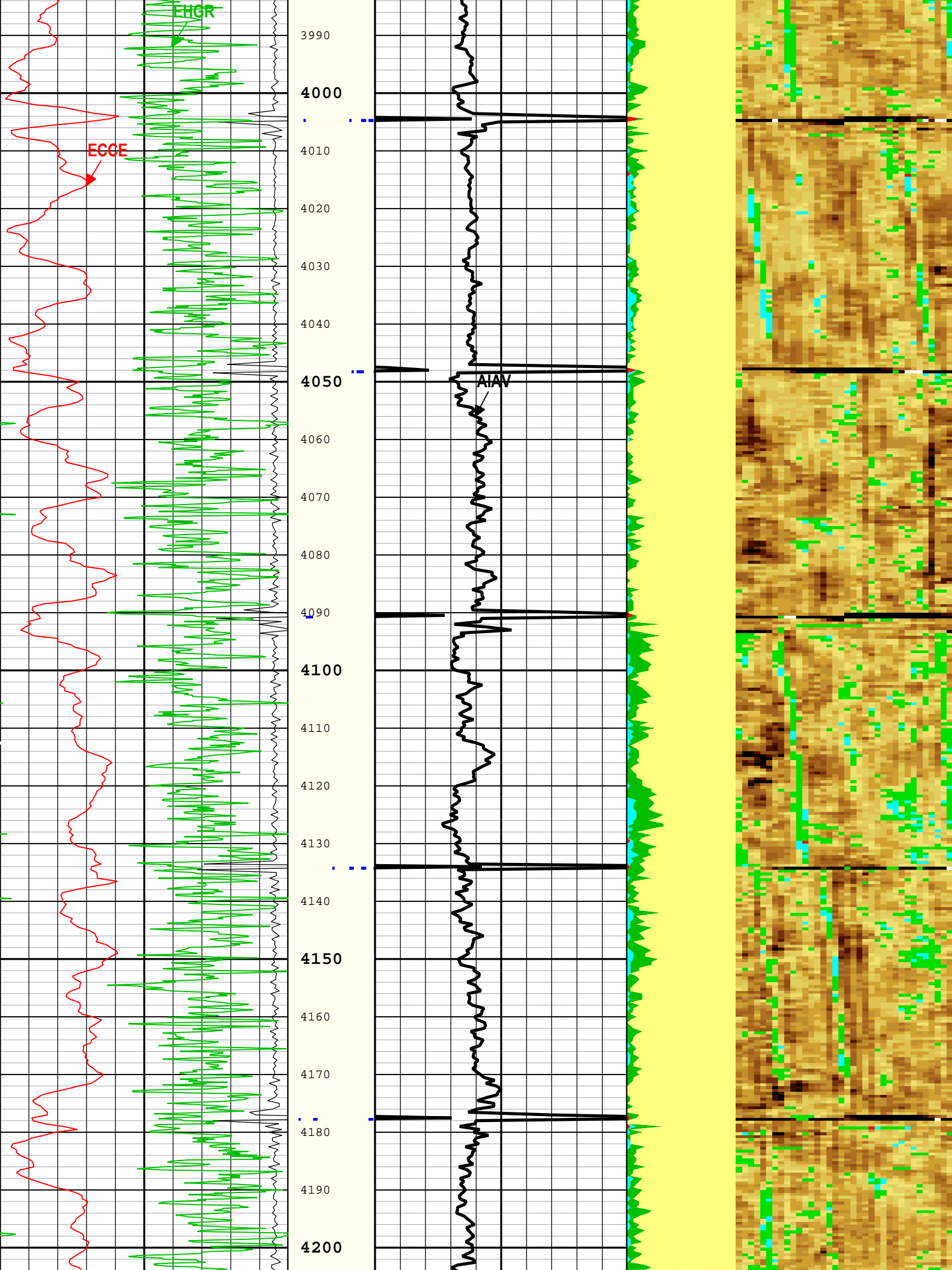


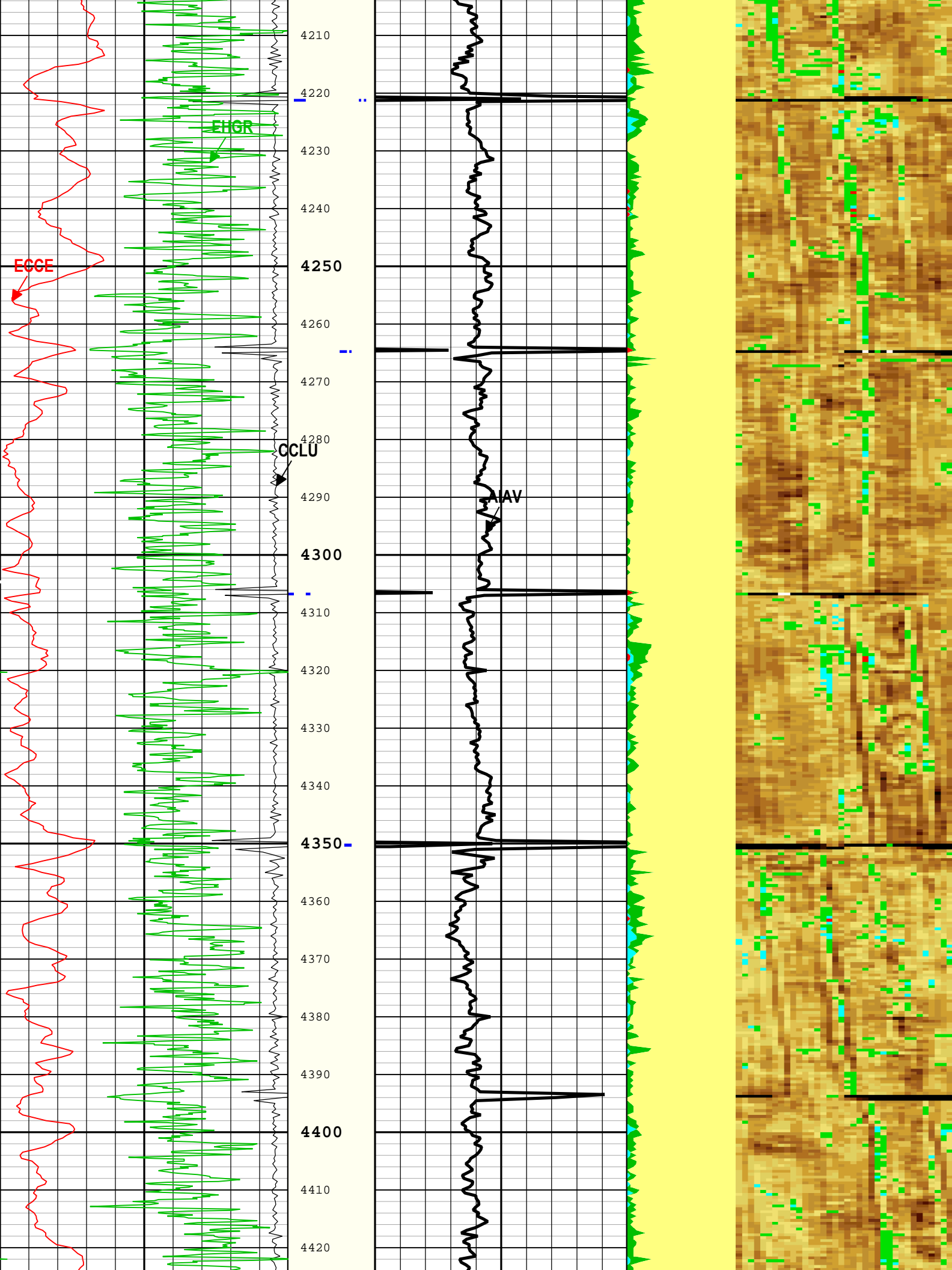


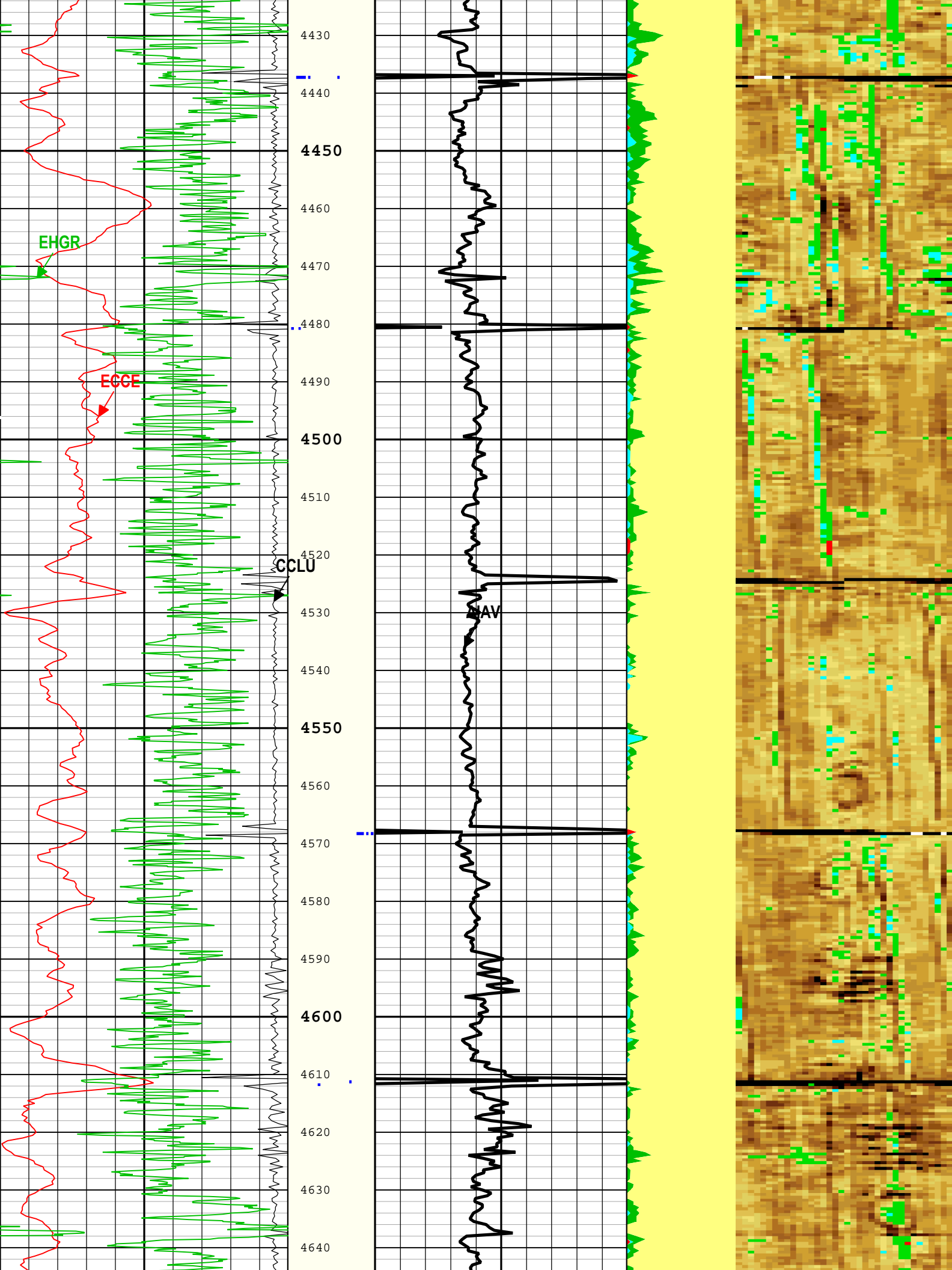


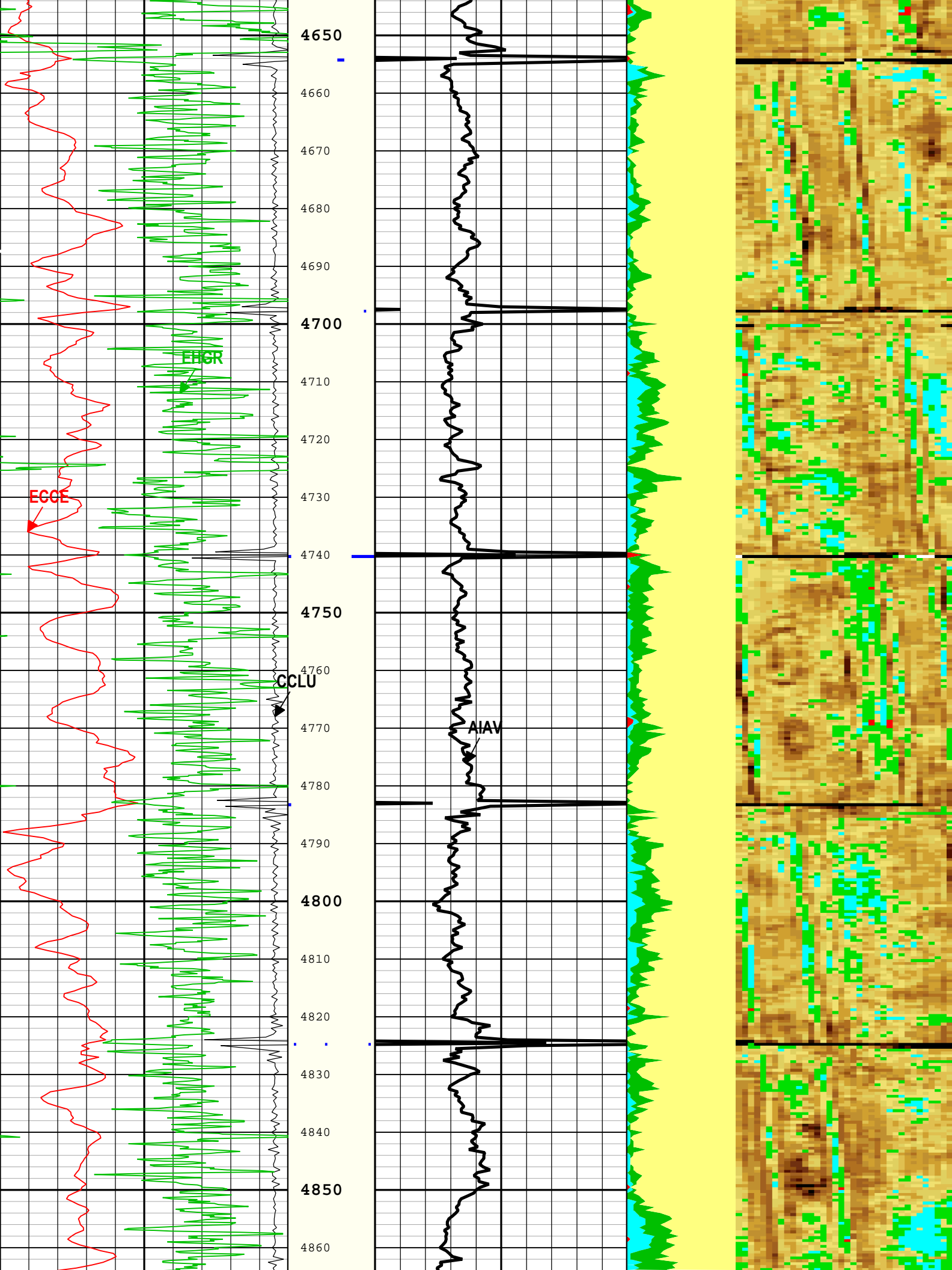


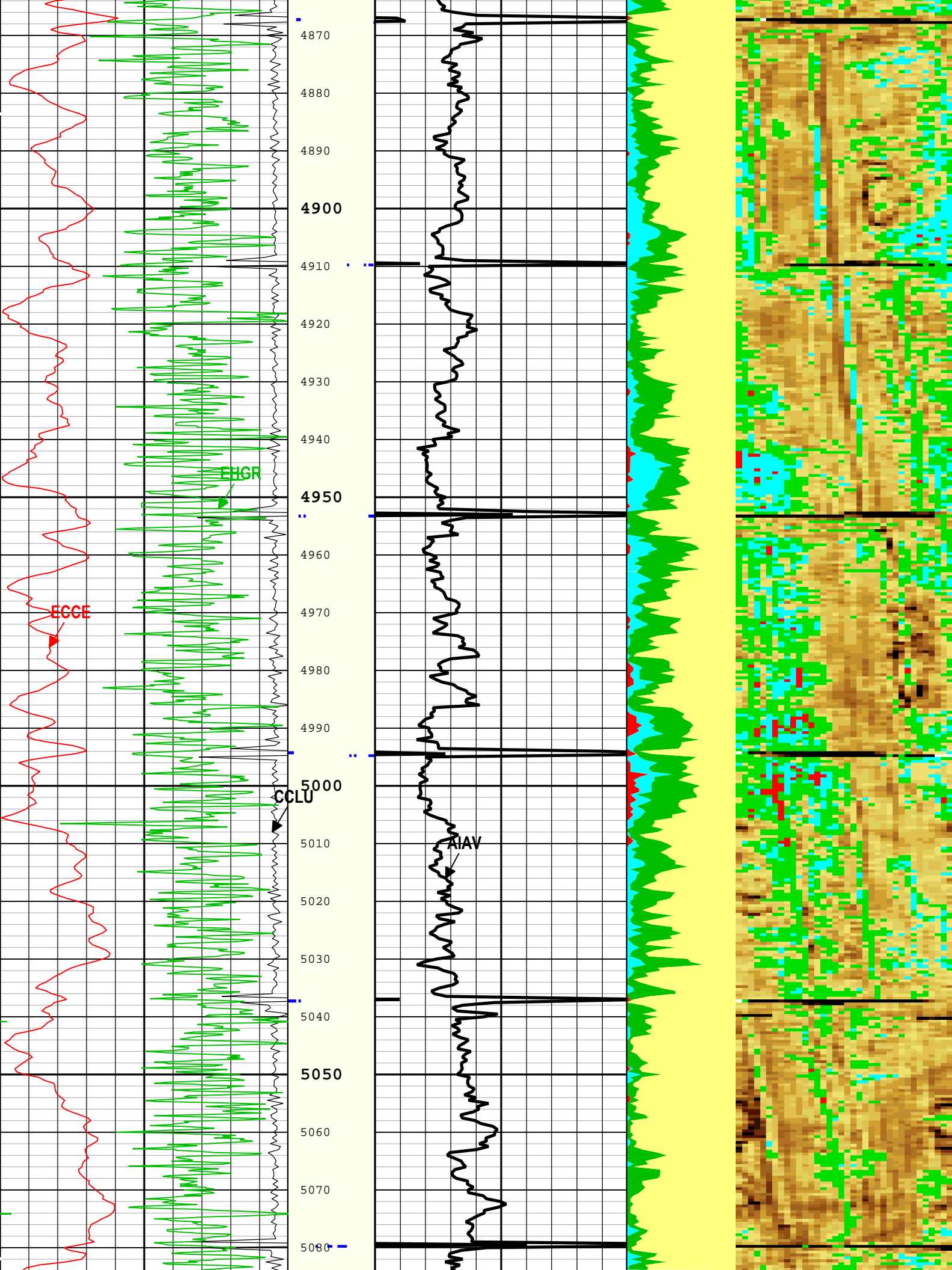


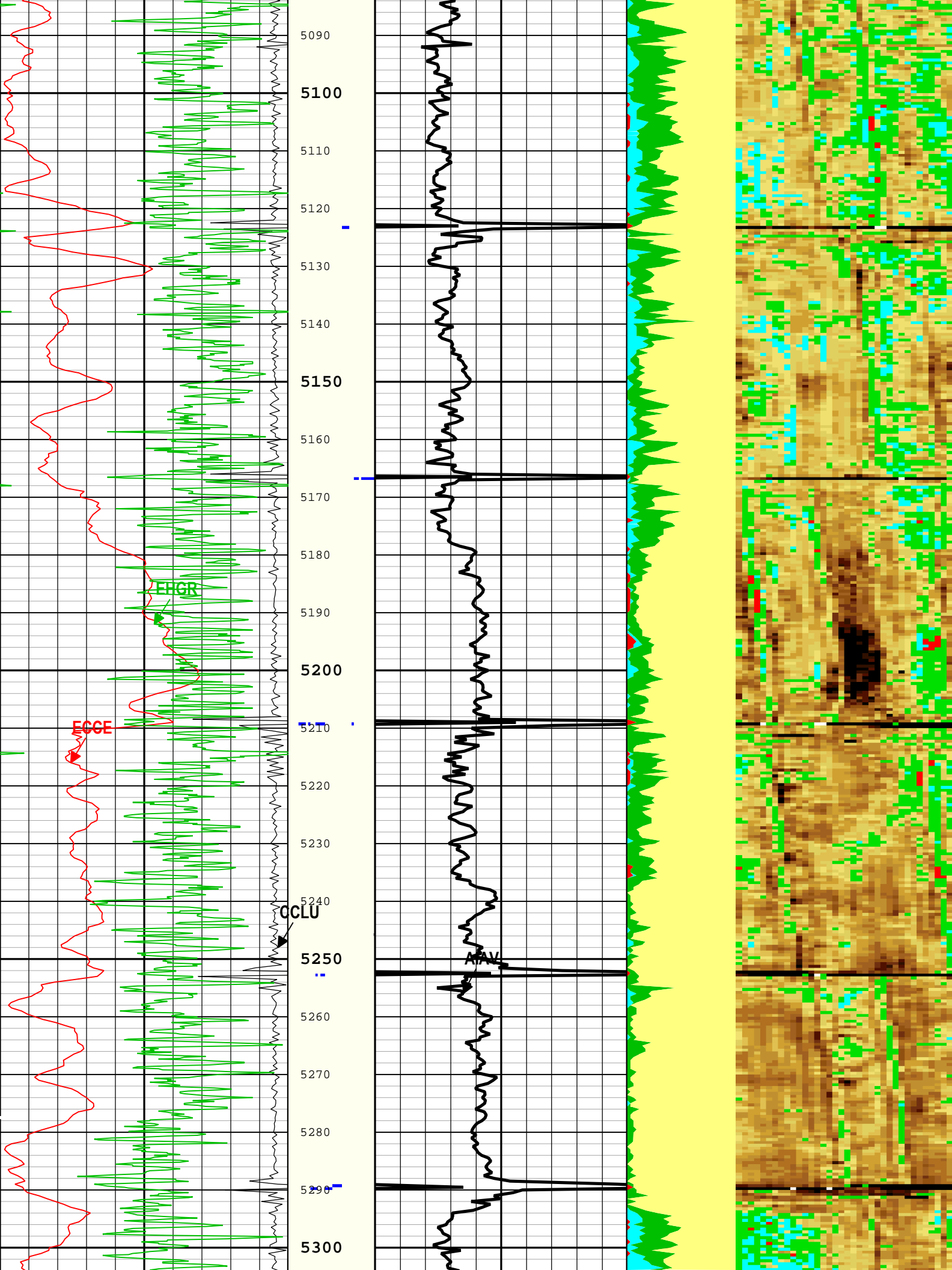


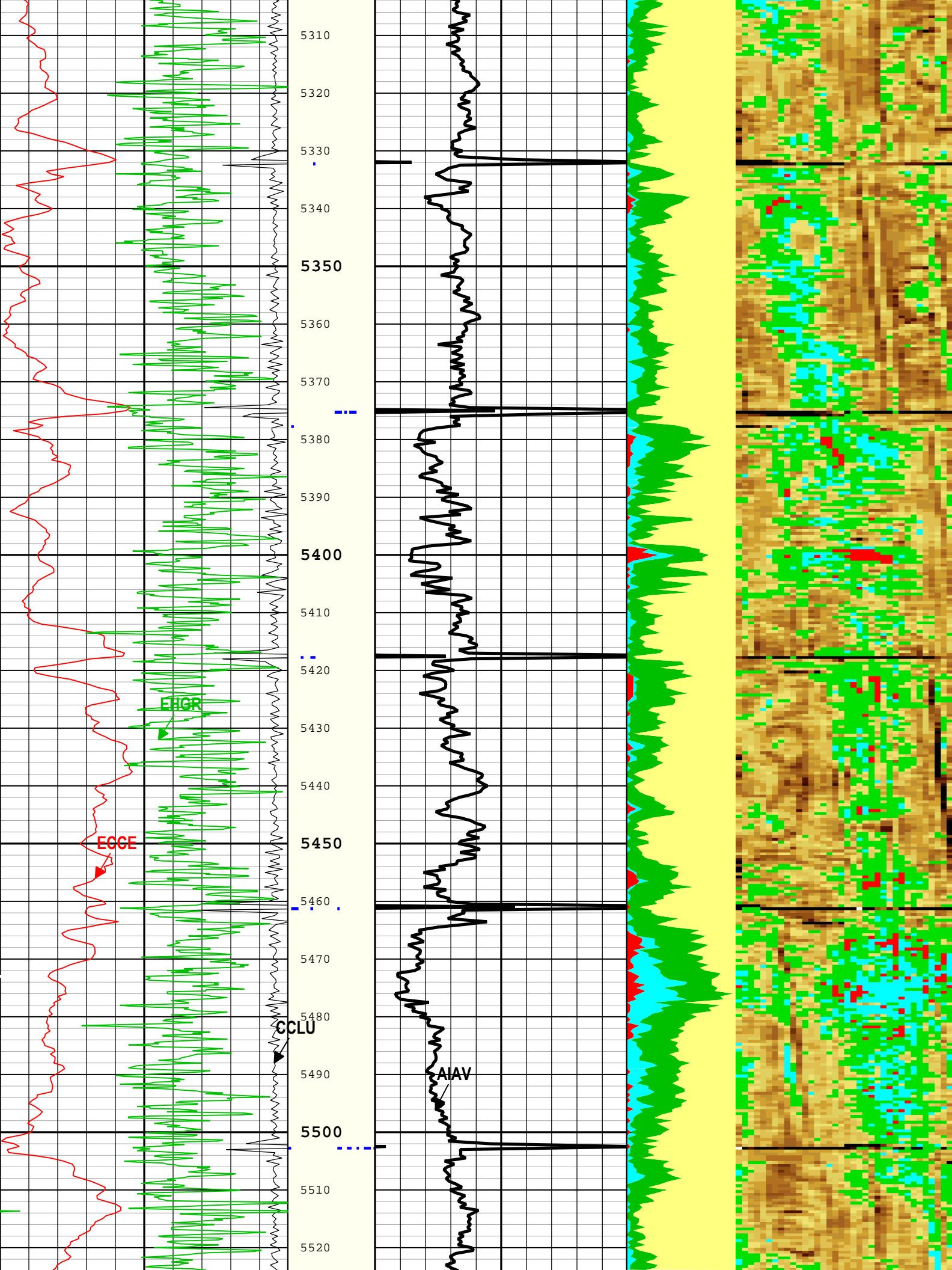


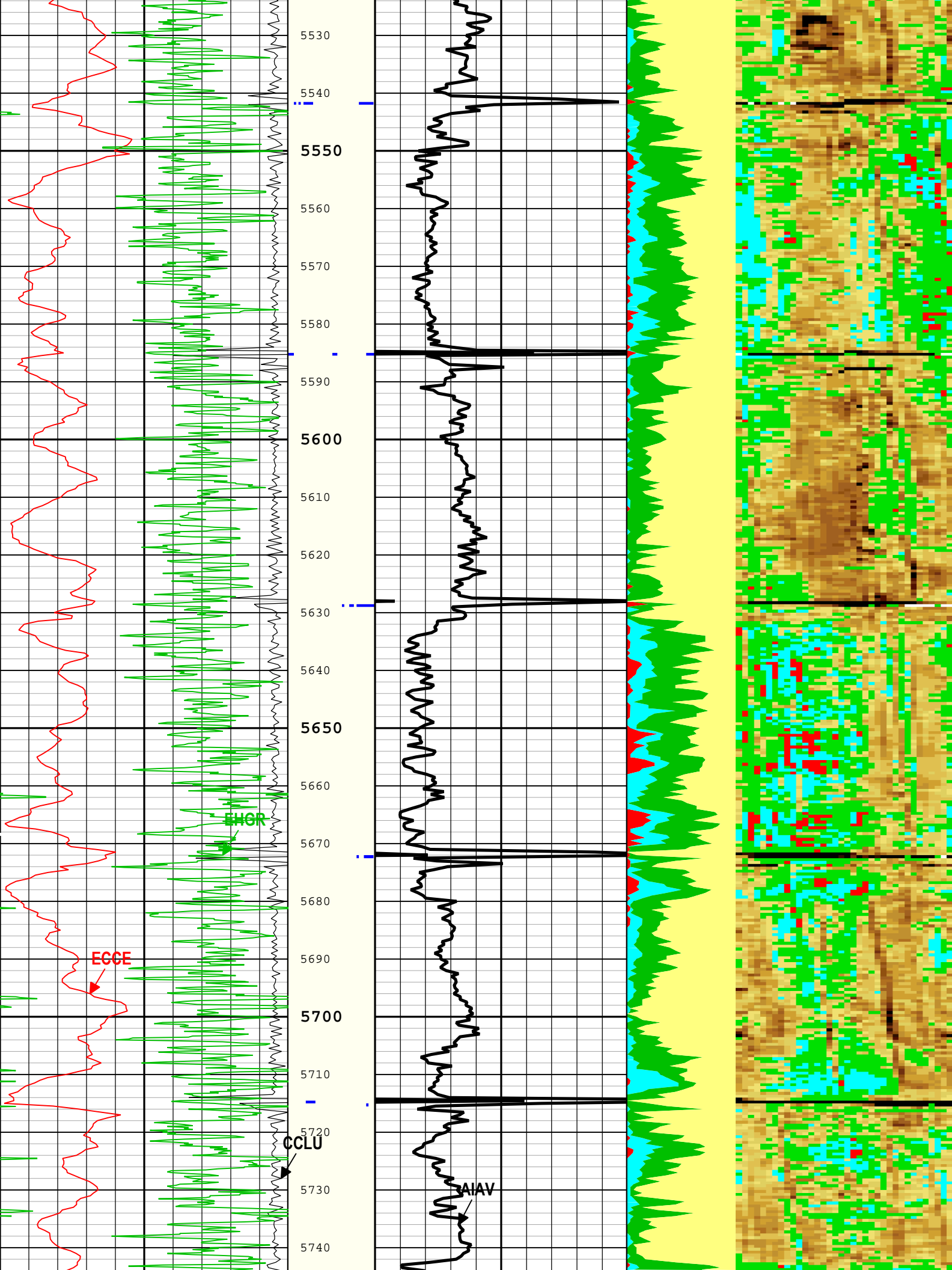


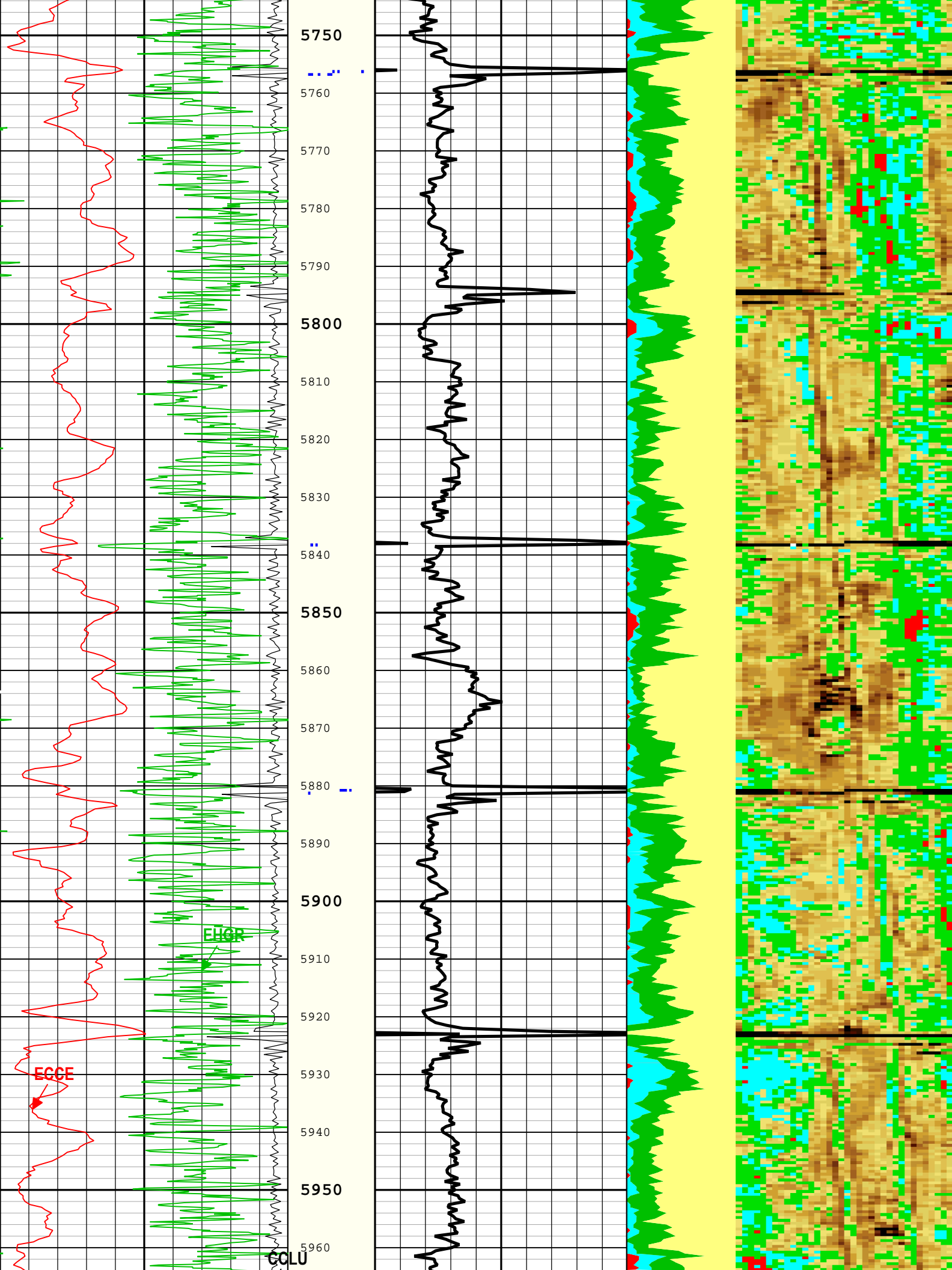


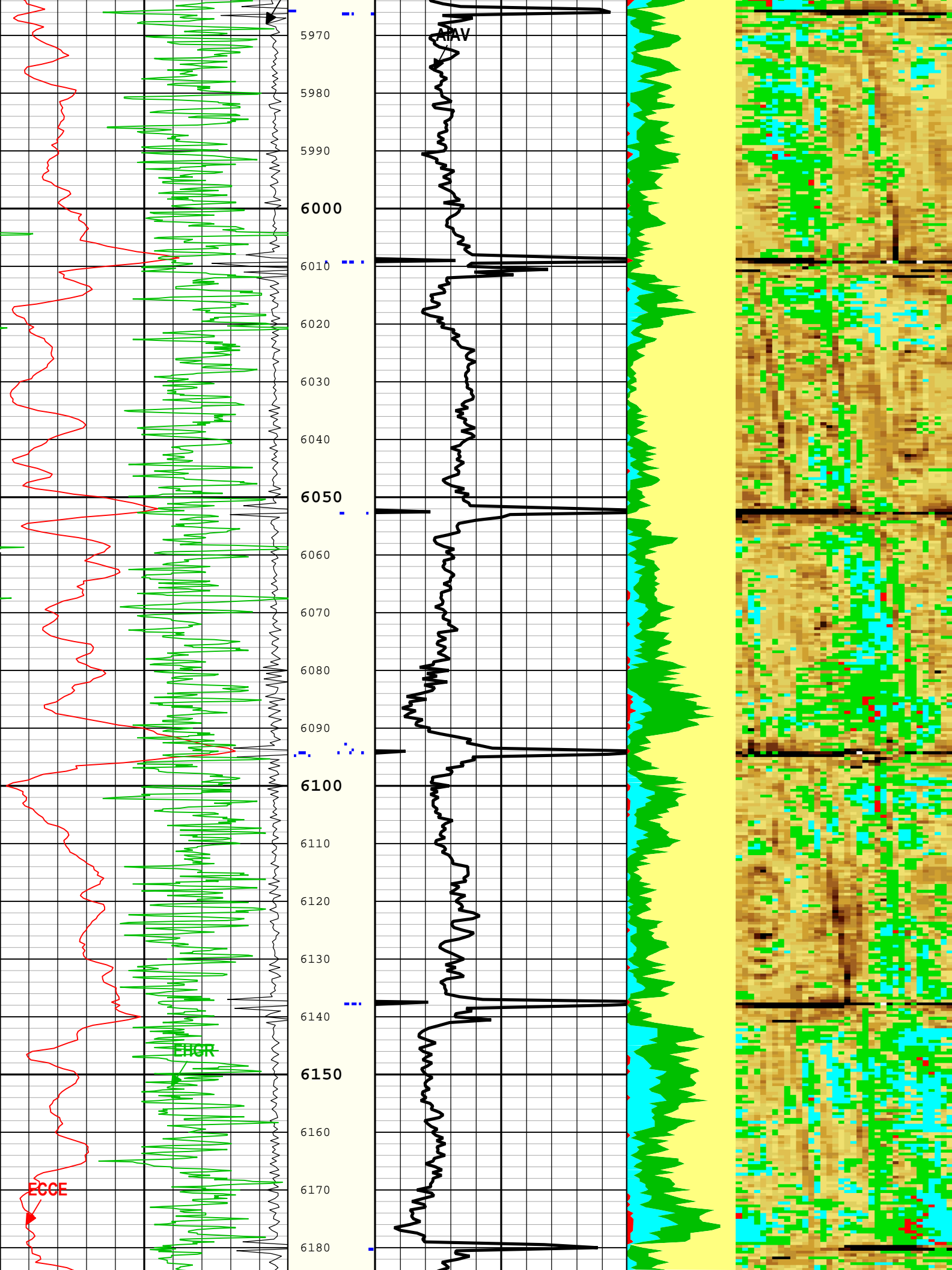


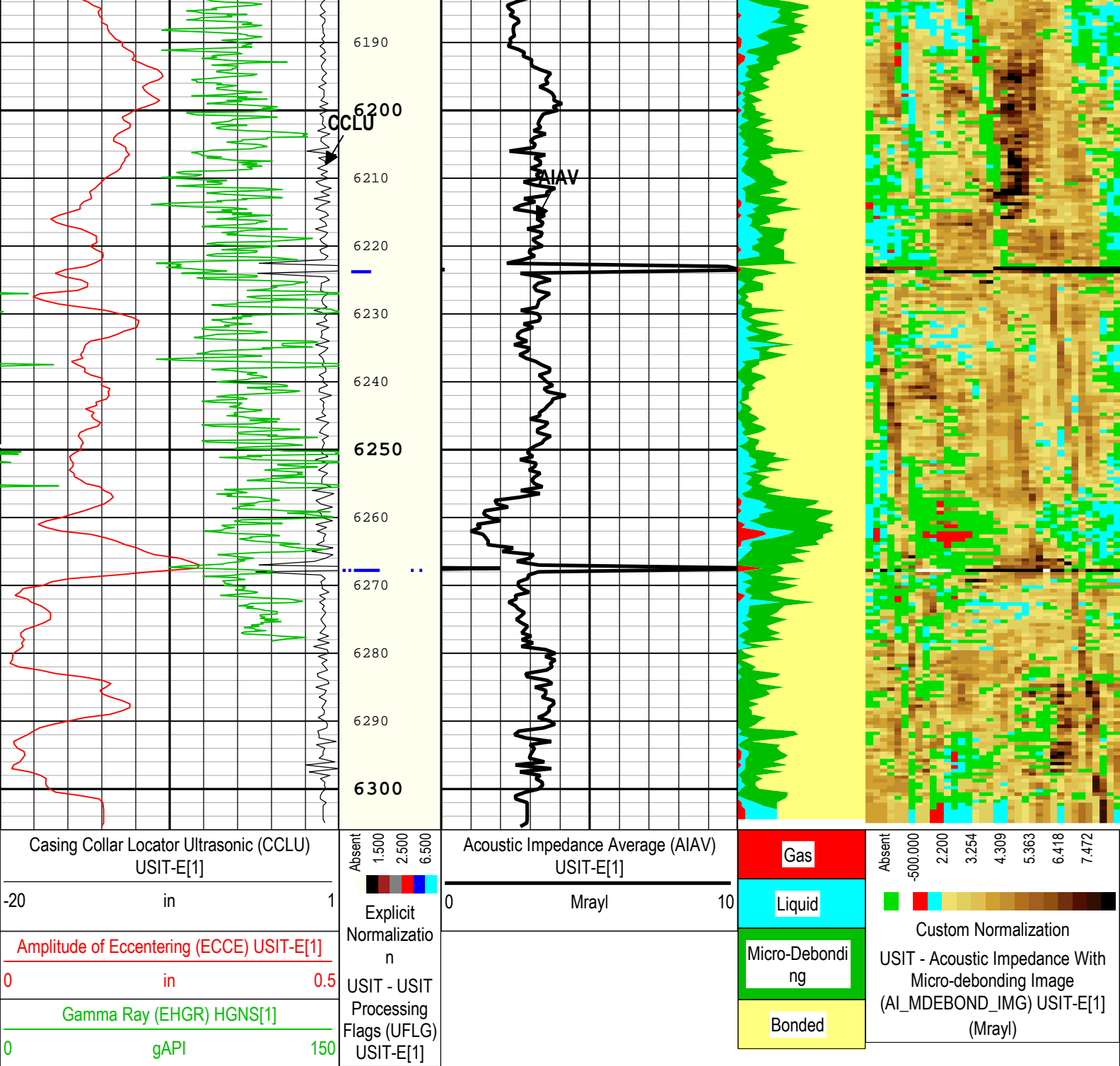












Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 29-Apr-2019 10:03:56

Channel Processing Parameters				
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
BARI(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	17788	ft
CDEN	Cement Density	HGNS-B	16.69	lbm/gal
CMTY(U-USIT_CENT)	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	201	us/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	1.15	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.11	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.54	Mrayl
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-E	Automatic	
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	Theoretical	
ZMUD	Acoustic Impedance of Mud	Borehole	1.52	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Run 3: Parameters

Parameter	Description	Tool	Value	Unit
BAR(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	17788	ft
CDEN	Cement Density	HGNS-B	16.69	lbm/gal
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	201	us/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_THE	Theoretical Mud Normalization Factor	USIT-E	1.11	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.54	Mrayl
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-E	Automatic	
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	Theoretical	
ZMUD	Acoustic Impedance of Mud	Borehole	1.52	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Run 3Depth Zoned Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	26	76.5	110
BS	13.5	110	1962.8
BS	5.5	1962.8	2970.28
All depth are actual.			

Tool Control Parameters

ONE: Parameters

Parameter	Description	Tool	Value	Unit
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AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	48	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	30.62	us
WINE	Window End Time	USIT-E	70.62	us

ONETime Zoned Parameters

Pass Log[5]:Up

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	40	27-Apr-2019 17:11:10	27-Apr-2019 17:23:06	6306.42	5843.94
EMXV	50	27-Apr-2019 17:23:06	27-Apr-2019 17:33:17	5843.94	3866.5
EMXV	45	27-Apr-2019 17:33:17	27-Apr-2019 17:43:46	3866.5	2749.58

All depth are at tool zero.

Run 3: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	48	dB
EMXV	EMEX Voltage	USIT-E	40	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	30.62	us
WINE	Window End Time	USIT-E	70.62	us

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[3]:Up	Up	1890.91 ft	2515.96 ft	27-Apr-2019 4:41:48 PM	27-Apr-2019 4:46:04 PM	ON	1.02 ft	Yes

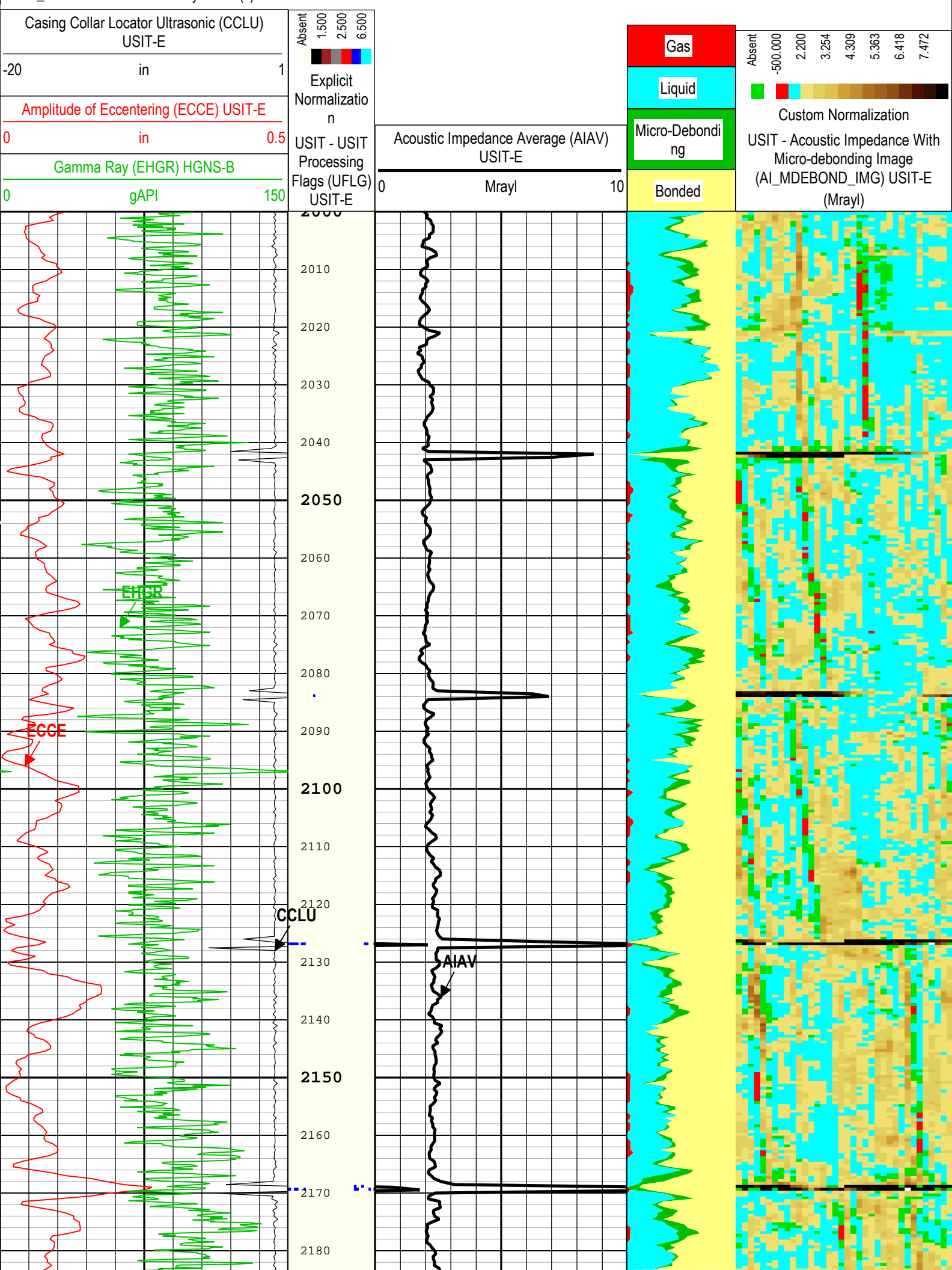
All depths are referenced to toolstring zero

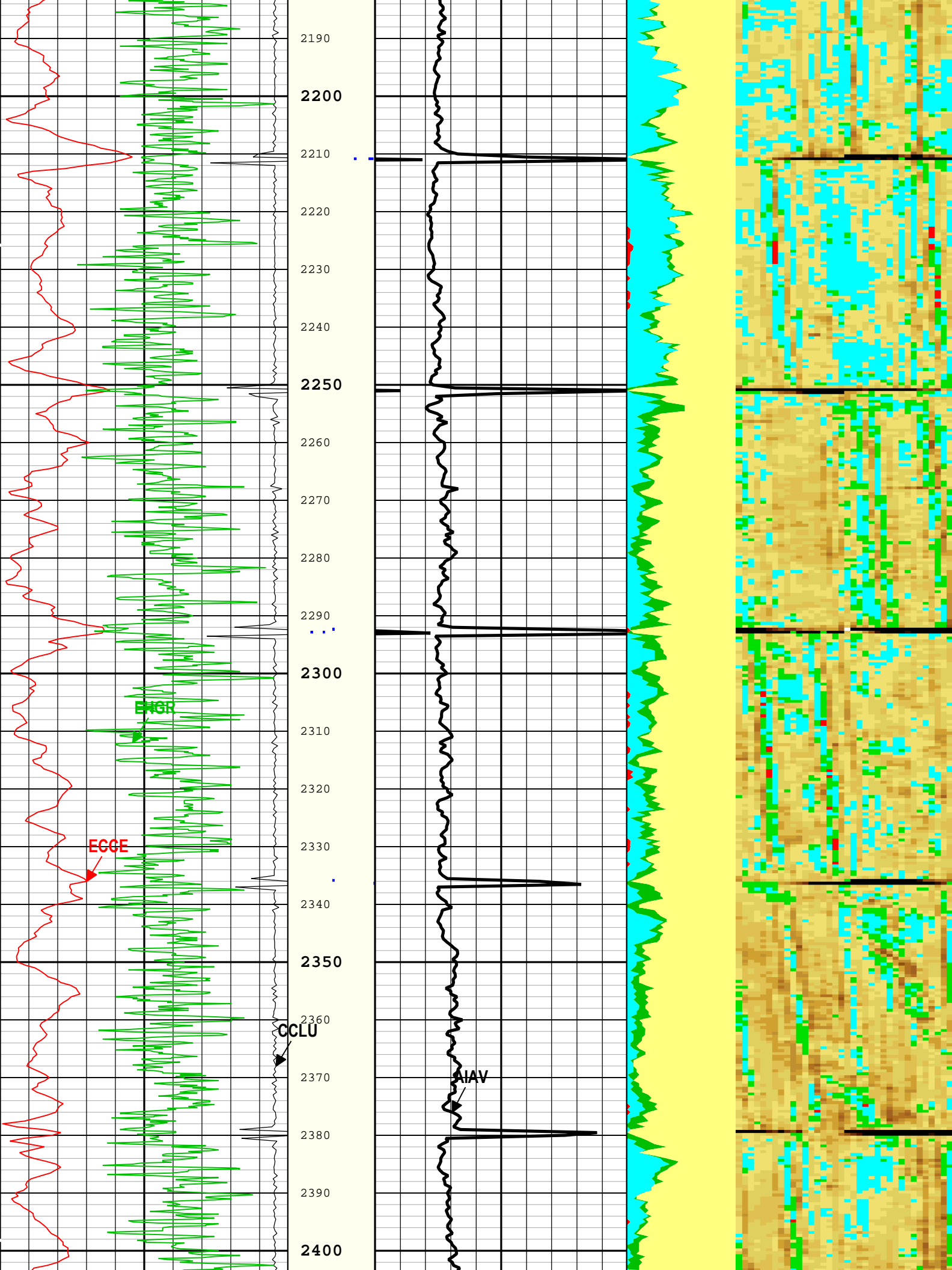
Log

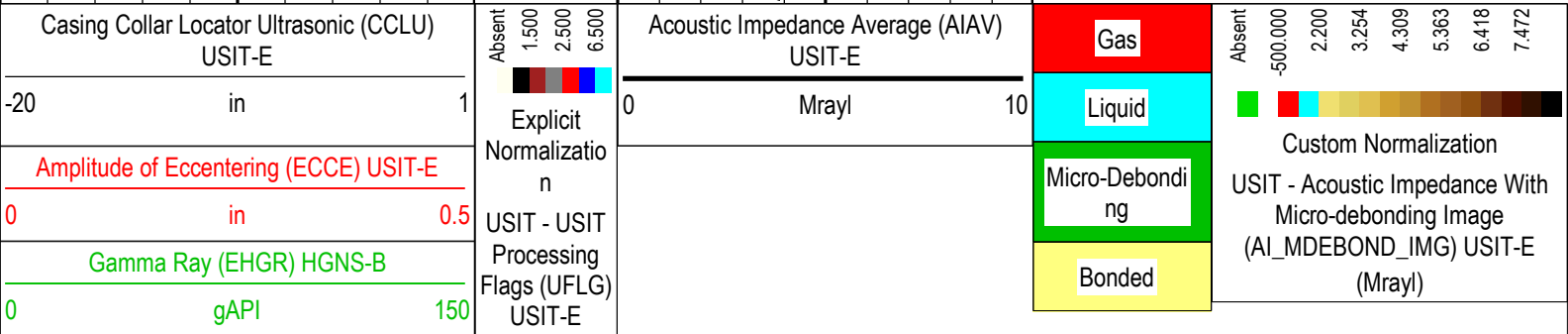
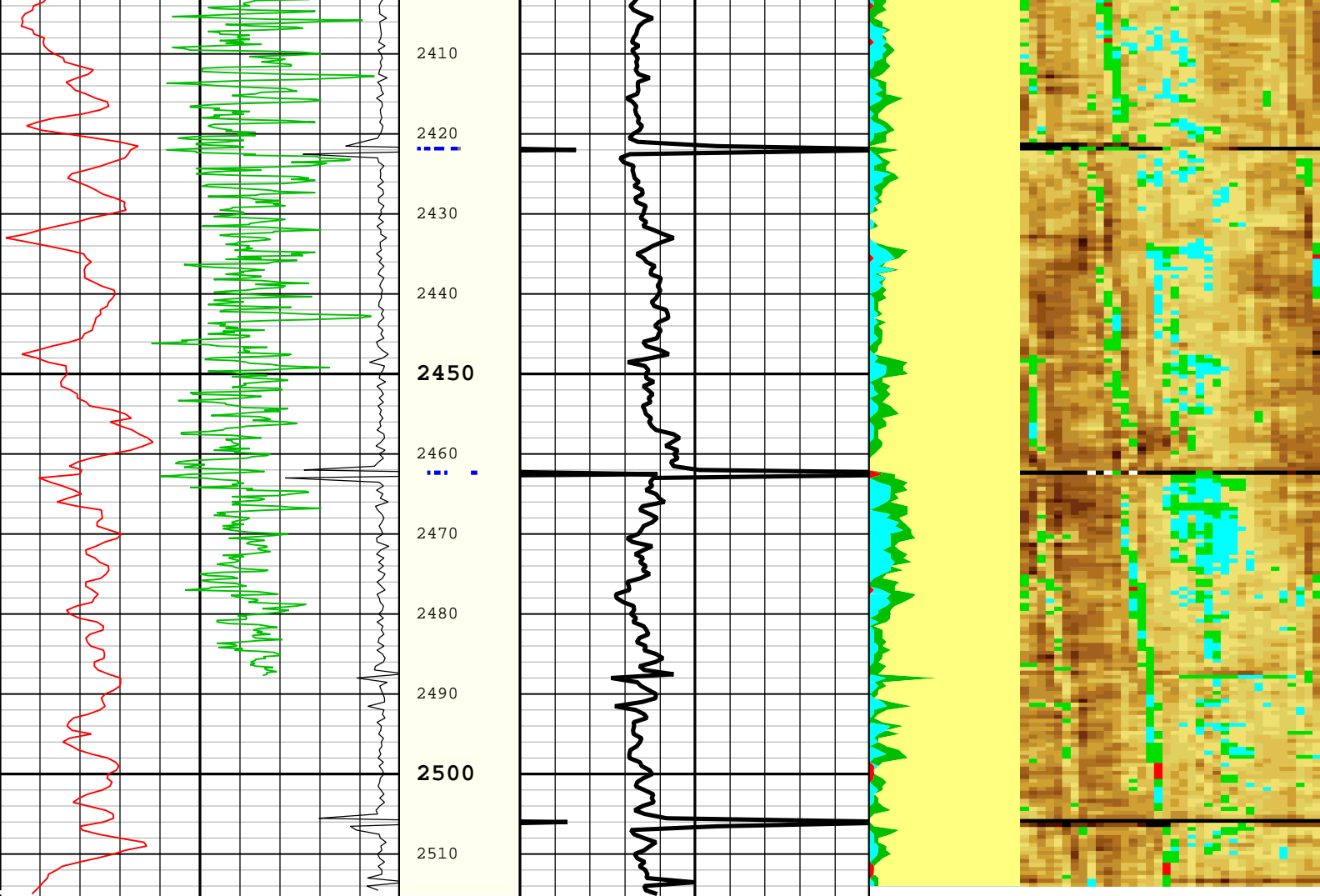
Company:Noble Energy Inc

Well:Vogler State D21-731

ONE: Log[3]:Up:S008







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: 29-Apr-2019 10:04:05

Channel Processing Parameters

ONE: Parameters

Parameter	Description	Tool	Value	Unit
BARI(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	17788	ft
CDEN	Cement Density	HGNS-B	16.69	lbm/gal
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	201	us/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	1.15	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.11	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.54	Mrayl
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-E	Automatic	
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	Theoretical	
ZMUD	Acoustic Impedance of Mud	Borehole	1.52	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	48	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	30.62	us
WINE	Window End Time	USIT-E	70.62	us

Time Zone Parameters

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	40	27-Apr-2019 16:41:48	27-Apr-2019 16:43:06	2515.96	2378.72
EMXV	50	27-Apr-2019 16:43:06	27-Apr-2019 16:45:05	2378.72	2039.26
EMXV	40	27-Apr-2019 16:45:05	27-Apr-2019 16:46:04	2039.26	1890.91

All depth are at tool zero.

XYZ

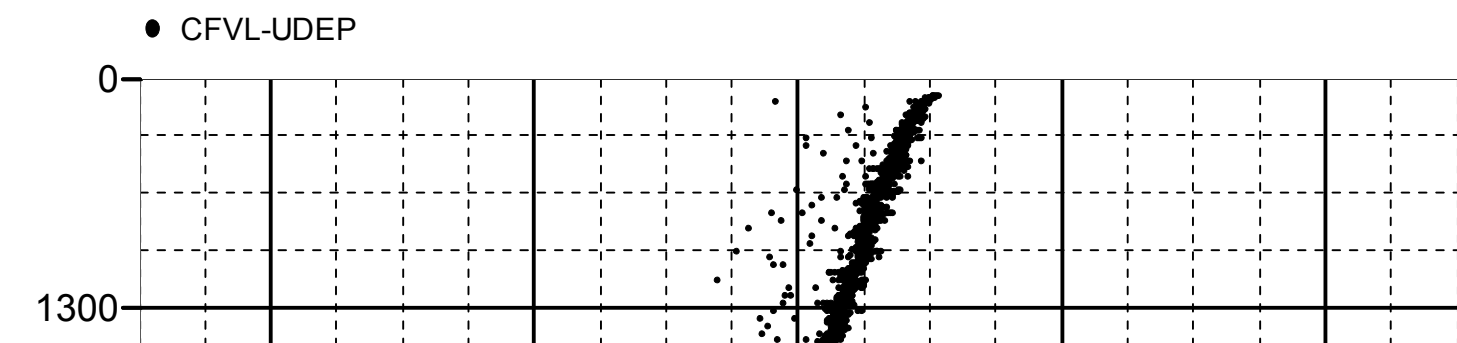
Company:Noble Energy Inc Well:Vogler State D21-731

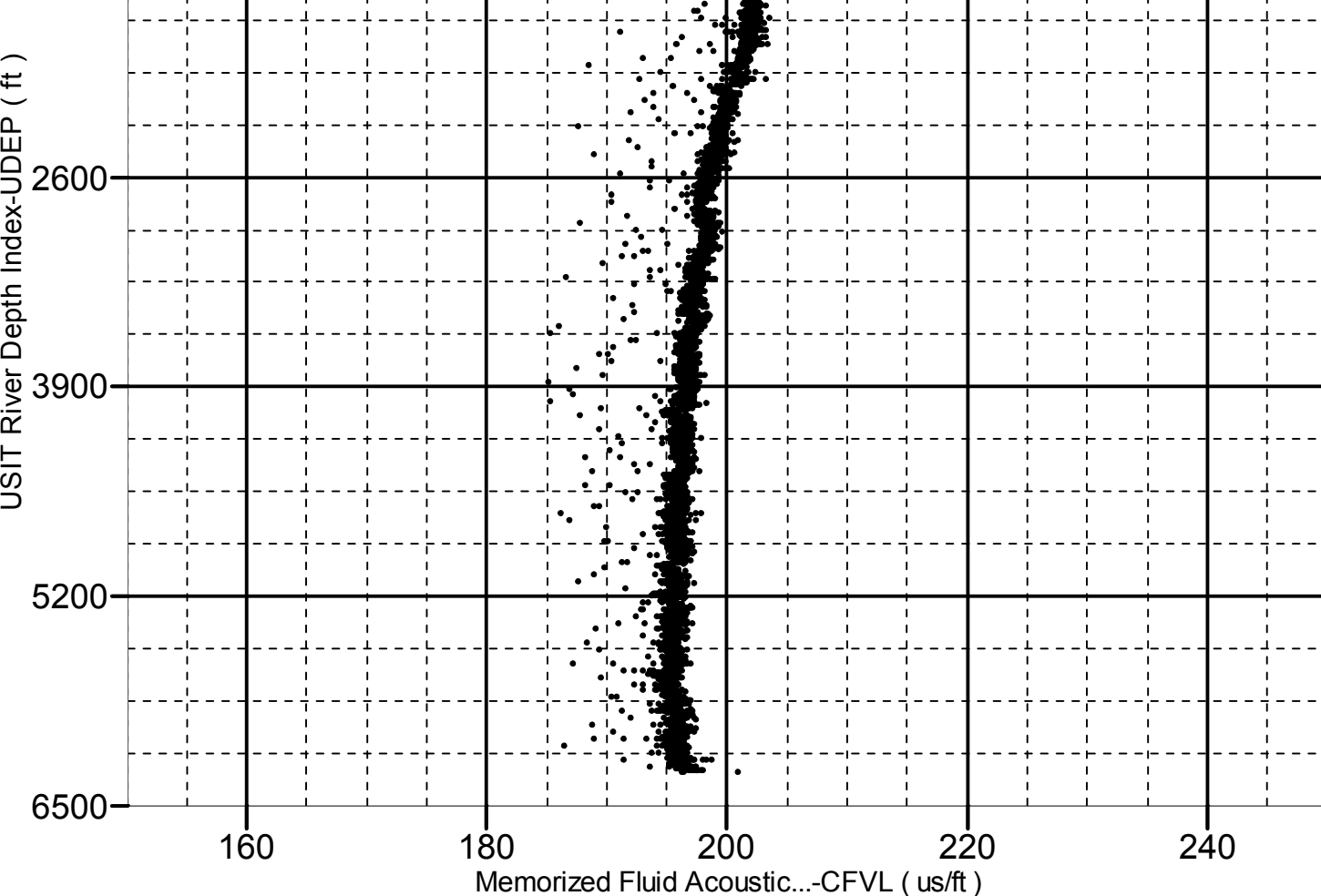
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Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 104.50 to 6306.00 ft





XYZ

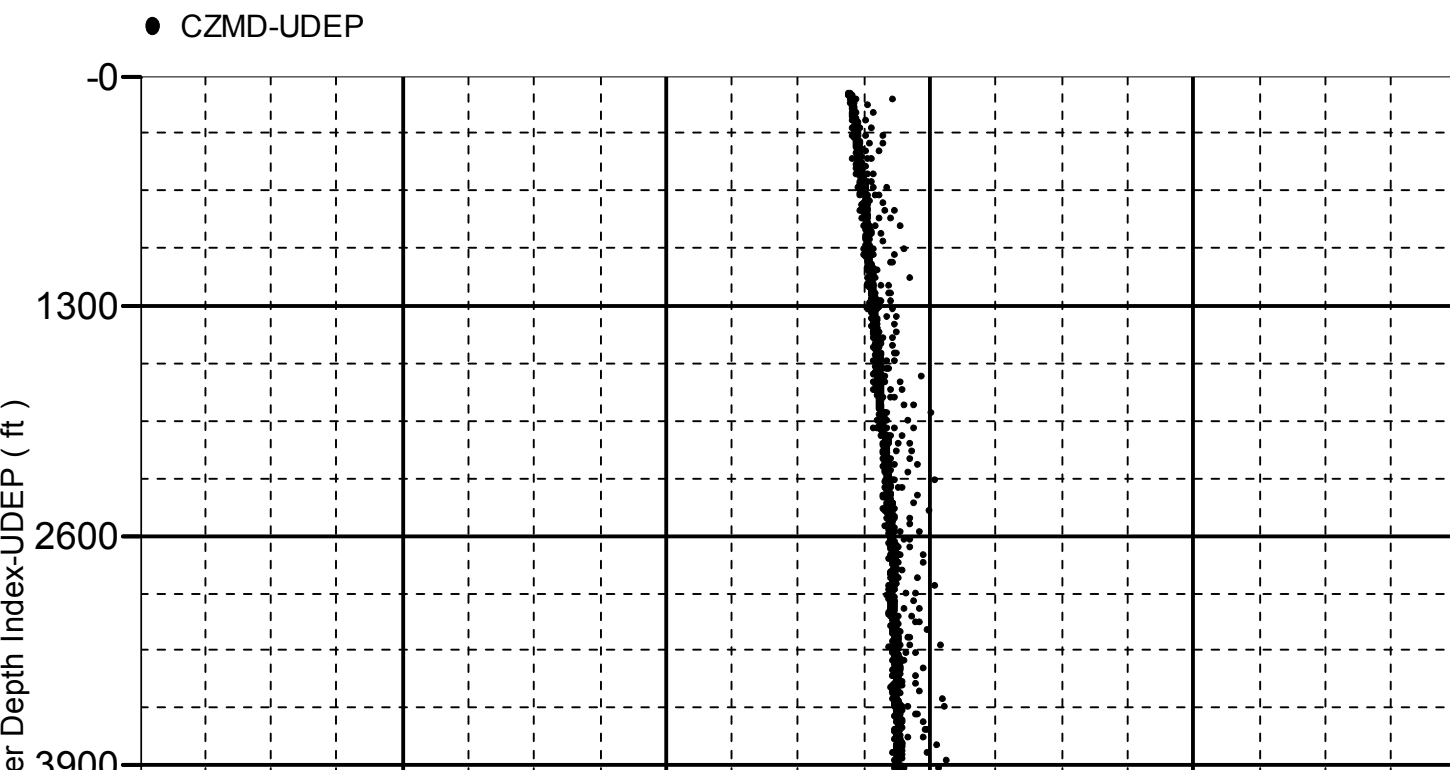
Company:Noble Energy Inc Well:Vogler State D21-731

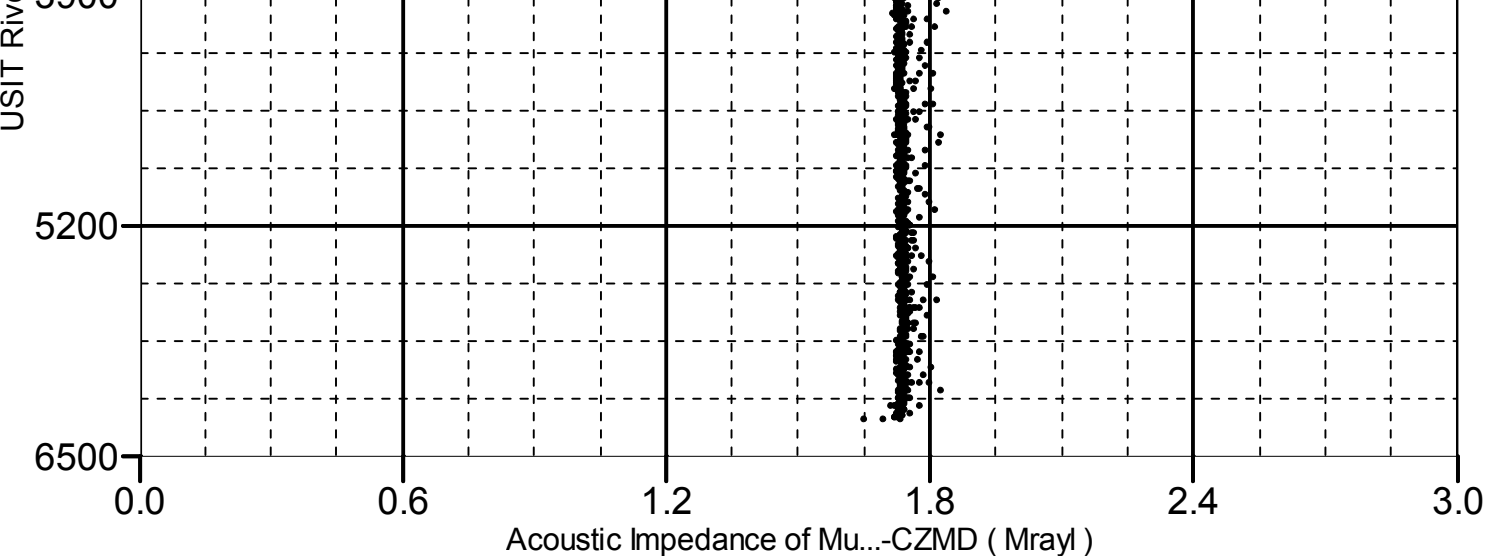
Composite 1:S008

Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 104.50 to 6306.00 ft





Company: Noble Energy Inc

Schlumberger

Well: Vogler State D21-731

Field: Wattenberg

County: Weld

State: Colorado

UltraSonic Summary Print