Schlumberger

Company: Southern California Gas Company

Well: Fernando Fee 38C

Field: Aliso Canyon

County: Los Angeles State: California

Ultrasonic Imager

Gamma Ray - CCL

9-5/8" 47# casing

Location:			Elev.:	K.B.	1748.00 ft
				G.L.	1716.00 ft
				D.F.	
	Permanent Datum:	Ground Level	Elev.:		1716.00 f
	Log Measured From:	Kelly Bushing	32.00 ft		above Perm.Datum
	Drilling Measured From:	Kelly Bushing			

API Serial No.	Section:	Township:	Range:
04-037-24232	27	4N	16W

County: Los Angeles
Field: Aliso Canyon
Location:
Well: Fernando Fee 38C
Company: Southern California Gas Company

Logging Date		22-Mar-2016		
Run Number		One		
Depth Driller		6798.00 ft		
Schlumberger Depth		6778.00 ft		
Bottom Log Interval		6778.00 ft		
Top Log Interval		50.00 ft		
Casing Fluid Type		KCl Polymer		
Salinity				
Density		8.6 lbm/gal		
Fluid Level		32.00 ft		
BIT/CASING/TUBING STRING				
Bit Size		12.25 in		
From		0.00 ft		
To		7366.00 ft		
Casing/Tubing Size		9.625 in		
Weight		47 lbm/ft		
Grade		N80		
From		0.00 ft		
To		7366.00 ft		
Max Recorded Temperatures				
Logger on Bottom	Time	22-Mar-2016	14:34:00	
Unit Number	Location:	3189	Ventura	
Recorded By		I. Kartawidjaja		
Witnessed By		Mr. Jeff Sandoval		

Disclaimer

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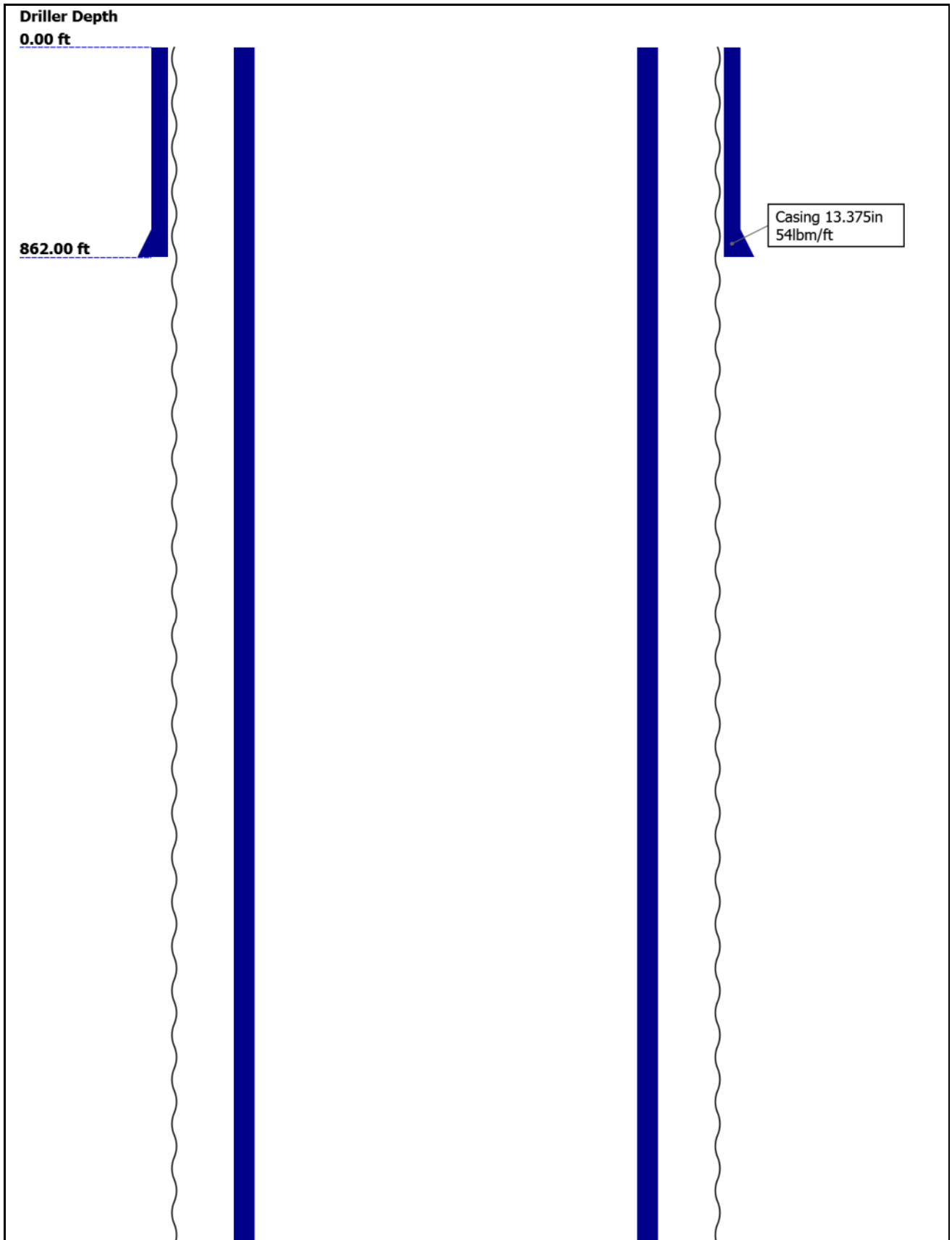
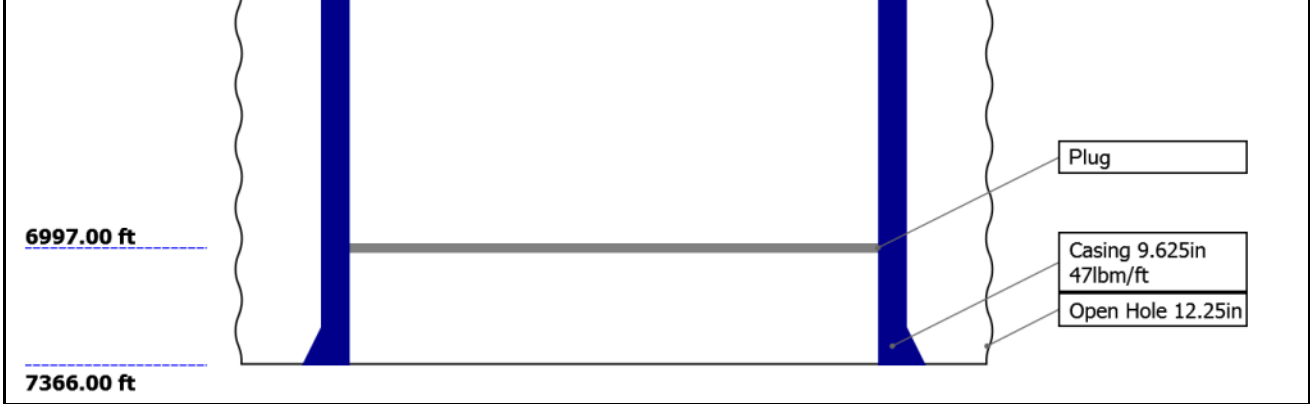
Well Sketch





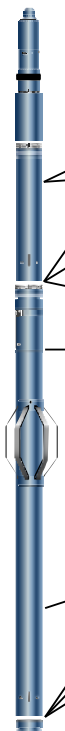
Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	12.25					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	7366					
Bottom Logger (ft)	7366					
Casing						
Size (in)	13.375	9.625				
Weight (lbm/ft)	54	47				
Inner Diameter (in)	12.614	8.681				
Grade	N/A	N80				
Top Driller (ft)	0	0				
Top Logger (ft)	0	0				
Bottom Driller (ft)	862	7366				
Bottom Logger (ft)	862	7366				

Remarks and Equipment Summary

One: Toolstring

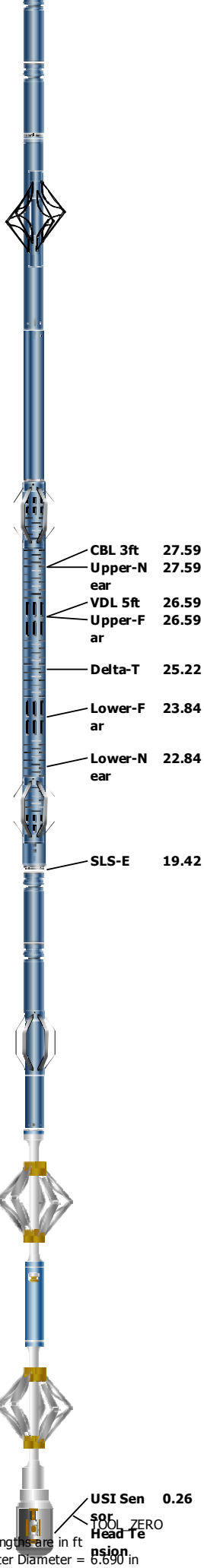
Equip name	Length
LEH-QT:2867	**59.39**
LEH-QT:2867	
DTC-H	**56.47**
ECH-KC	
DTC-H	
HGNS-H:3923	**53.47**
HGNH:4819	
NPV-N	
NSR-F:5002	
HACCZ-H:3923	
HGNS-H:3923	
HMCA-H	
AH-184[	**44.06**



MP name	Offset
Red	
CTEM	**55.57**
HV	**0.00**
TelStatus	**53.47**
ToolStatus	**53.47**
Temperature	**53.44**
GR	**52.73**
CNL Porosity	**46.4**
HGNS	**44.06**
HMCA	**44.06**
Accelerometer	**0.00**

One: Remarks

9-5/8" 47# casing cemented with 758 sx 12 ppg Lead, 48 sx 15.8 ppg Class G, 200 sx 15.8 ppg Class G with Latex
Logging objective is cement and corrosion evaluation
Depths are measured depth (MD)
Repeated anomaly at 6740-6750 ft ad 4722 ft
USIT Logged at 5 deg/3 inch resolution, logging speed 2800-3000 fph. Hi-resolution repeats at 5 deg/0.6 inch, speed 600 fph
USIT run in combination with CBL, Neutron and Gamma Ray tools.
Bridge plug set at 6798 ft with ~10 ft of sand above. Sand tagged at ~6780 ft. Logged from 6787 ft to surface.
Log recorded with 0 psi surface pressure
Tool stopped working intermittently at ~400-450 ft, re-recorded on another pass and data spliced together
Log scale 2 inch, 5 inch and 10 inch



AH-184[4] 44.06

AH-184[3]:2985 42.06

DSLT-H:8236 40.06
ECH-KH:8678
DSLC-H:8236
SLS-E:1206

AH-184[2]:2882 19.42

AH-184[1]:6735 17.42

USIT-E:1764 15.42
ECH-MFA:1764
USAC-A:1764
USIS-A:2720
USSC-B
USRS-C
USI-SENSOR:1528

Lengths are in ft
Maximum Outer Diameter = 6.690 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Job Event Summary

Event	Time	Duration	Interval	Remark
Log[2]:Down	Mar-22-2016 08:14	00:09:44	105.31 - 637.01 ft	FPM
Log[3]:Down	Mar-22-2016 08:26	01:48:13	637.03 - 6776.02 ft	FPM
Log[4]:Up	Mar-22-2016 09:15	00:06:22	6777.88 - 6552.08 ft	Repeat Pass @ TD
Log[5]:Up	Mar-22-2016 09:25	00:12:37	6773.28 - 6646.5 ft	Very Hi-res repeat 6770-6650 ft
Log[6]:Up	Mar-22-2016 09:40	03:48:43	6778.78 - 42.1 ft	Main Pass
Log[7]:Up	Mar-22-2016 13:07	00:04:17	4752.76 - 4709.44 ft	Very Hi-res repeat 4750-4710 ft

USIT - Fluid Properties Measurement

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[6]:Up	6778.78	42.10

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 : 70.75m(232.12ft) to 75.64m(248.16ft)
MUD_N_FRP = 1.03
DFD = 1.03g/cm3(8.60lbm/gal)
CZMD median computed in free pipe normalization interval = 1.61 MRayl

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

Composite 1

Main Pass 5 in = 100 ft

Software Version

Acquisition System	Version
Maxwell 2016 SP1	6.1.58882.3100

Computation	Description	Version
CEVAL	Sonic Cement Evaluation Computation Ensemble provides common Parameters and Channels	6.1.58882.3100
Cementation	Cementation Computation Application	6.1.58882.3100

SoftwareVersion_Tool	SoftwareVersion_Run Version	SoftwareVersion_Build Version
WAFE-SEC	Synergy SV451EC version 9.10	Synergy SV451EC version 9.10
WAFE-FEC	Synergy SV451EC version 9.10	Synergy SV451EC version 9.10
WAFE-TMDI	Synergy SV451EC version 46.19	Synergy SV451EC version 46.19

Tool Elements	Description	Software Version	Firmware Version
SLS-E	Sonic Logging Sonde E supports 3'-5'BHC DT and CBL/VDL	6.1.58882.3100	4.0
USI-SENSOR	USIT Transducer Element	6.1.58882.3100	DSP: v1.82

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[6]:Up	Up	42.10 ft	6778.78 ft	22-Mar-2016 9:40:40 AM	22-Mar-2016 12:29:24 PM	ON	0.00 ft	Yes
One	Log[9]:Up	Up	79.40 ft	514.04 ft	22-Mar-2016 1:43:41 PM	22-Mar-2016 1:53:14 PM	ON	1.22 ft	Yes

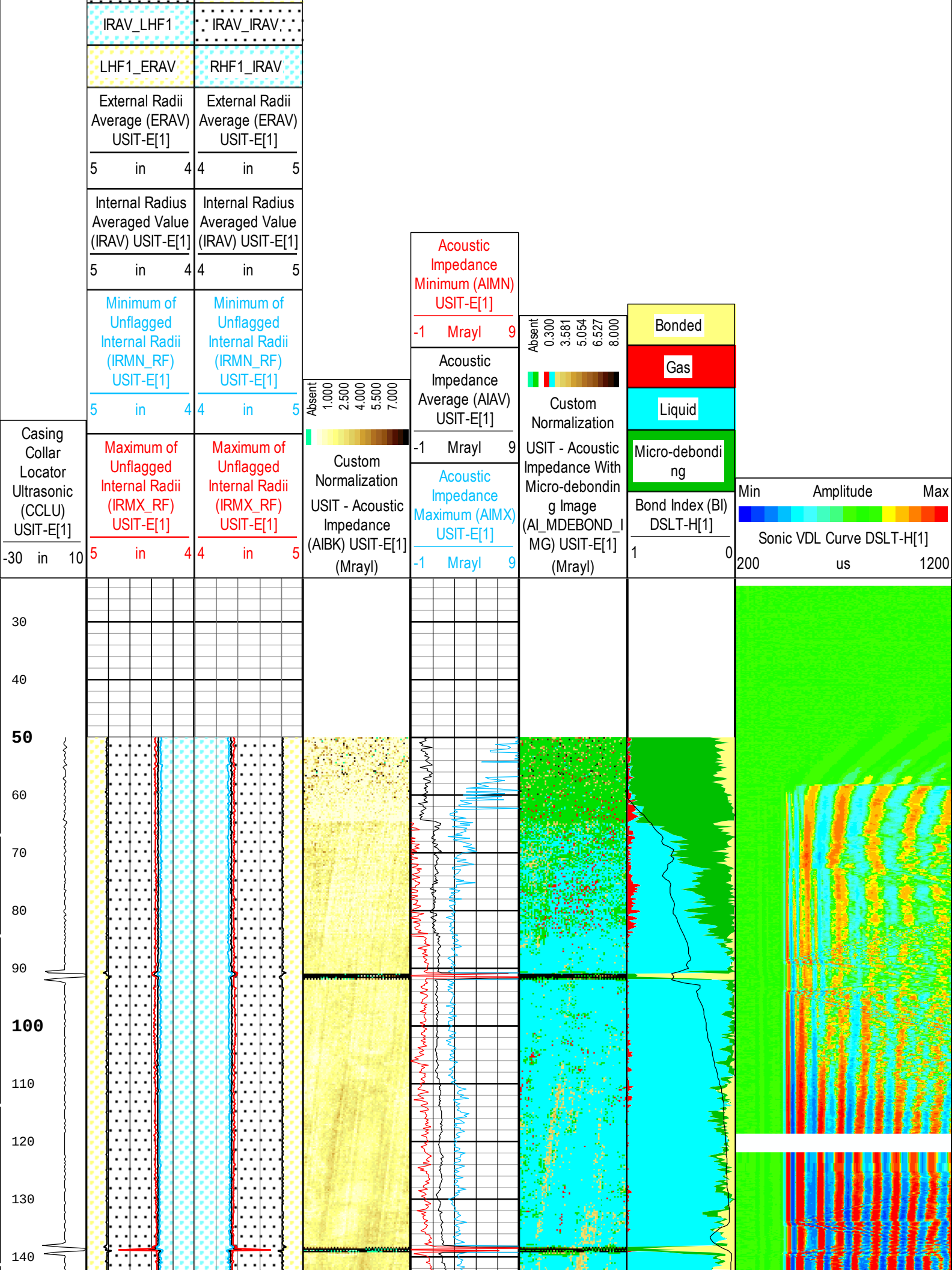
All depths are referenced to toolstring zero

Log

Company:Southern California Gas Company Well:Fernando Fee 38C
Composite 1:S007

Description: USI VDL Cement Format: Log (LBV1_USI-VDL (DSLT) Cement 9.625inch) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 22-Mar-2016 16:04:29

TIME_1900 - Time Marked every 60.00 (s)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IRAV_IRAV
LHF1_ERAV
RHF1_IRAV
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4 in 5
Internal Radius Averaged Value (IRAV) USIT-E[1]
5 in 4
4 in 5
Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E[1]
5 in 4
4 in 5
Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E[1]
5 in 4
4 in 5
Casing Collar Locator Ultrasonic (CCLU) USIT-E[1]
-30 in 10
Absent 1.000 2.500 4.000 5.500 7.000
Custom Normalization
USIT - Acoustic Impedance (AIBK) USIT-E[1] (Mrayl)
Acoustic Impedance Minimum (AIMN) USIT-E[1]
-1 Mrayl 9
Acoustic Impedance Average (AIAV) USIT-E[1]
-1 Mrayl 9
Acoustic Impedance Maximum (AIMX) USIT-E[1]
-1 Mrayl 9
Absent 0.300 3.581 5.054 6.527 8.000
Custom Normalization
USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E[1] (Mrayl)
Bonded
Gas
Liquid
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Bond Index (BI) DSLT-H[1]
1 0
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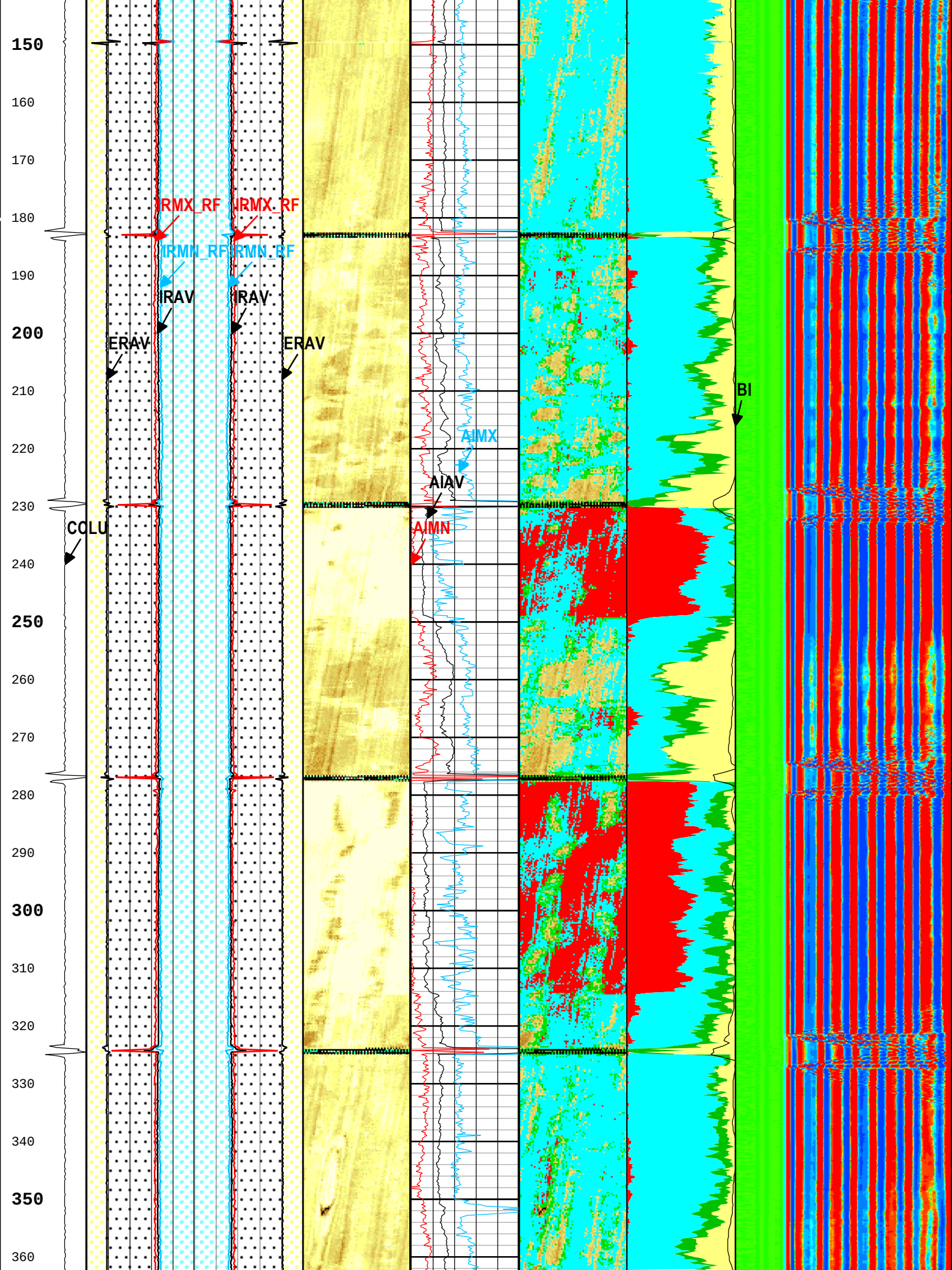
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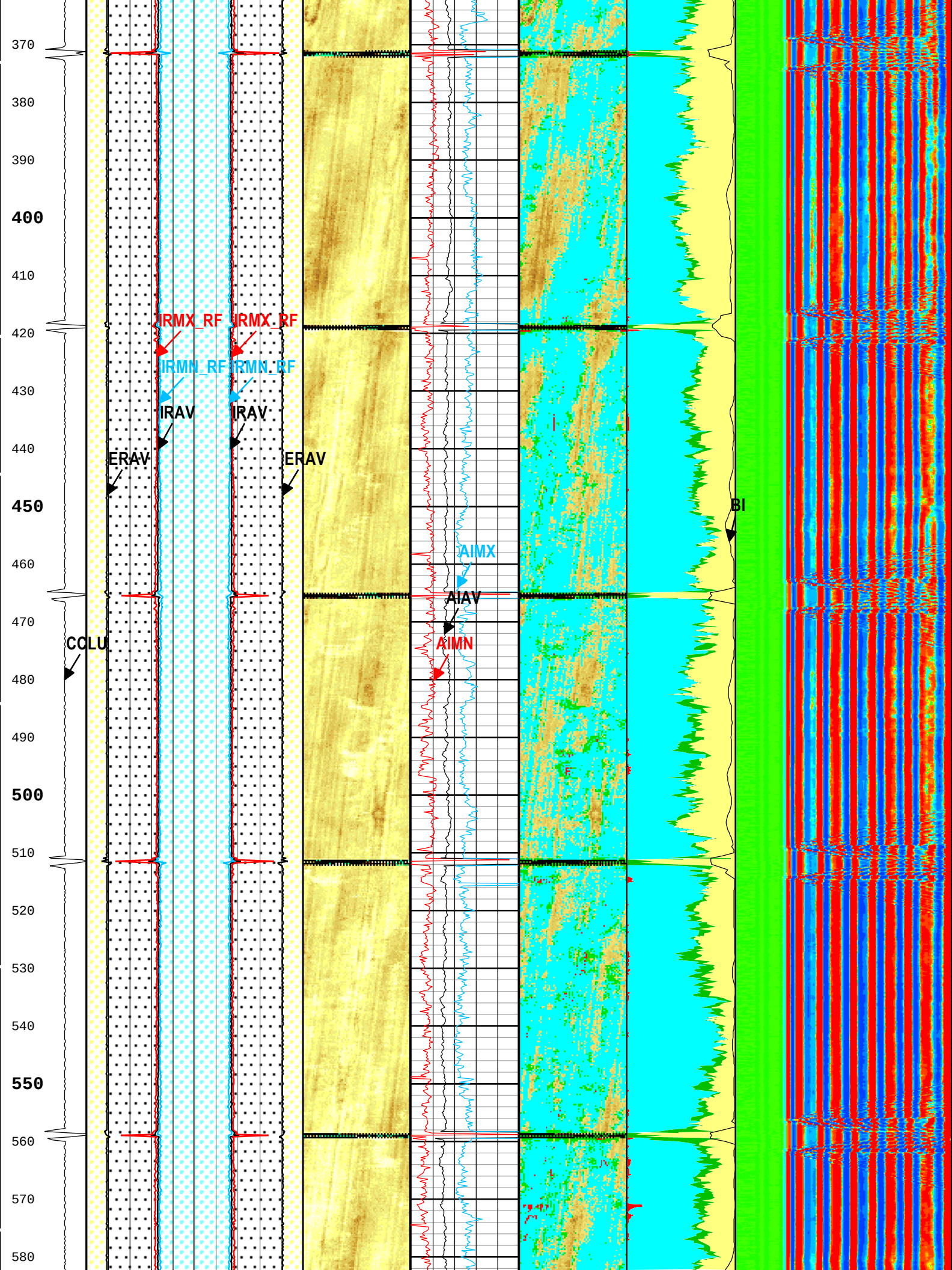
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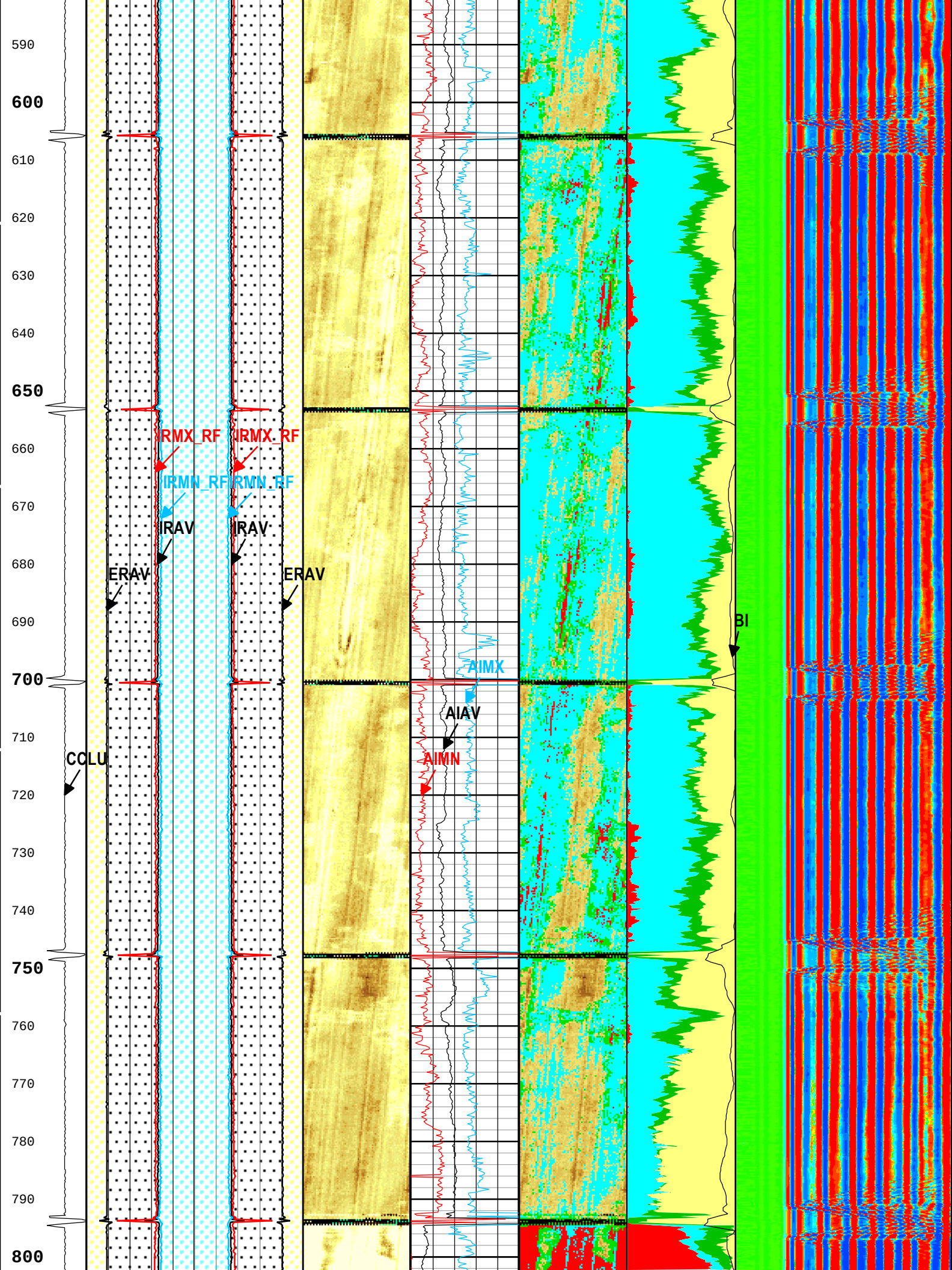
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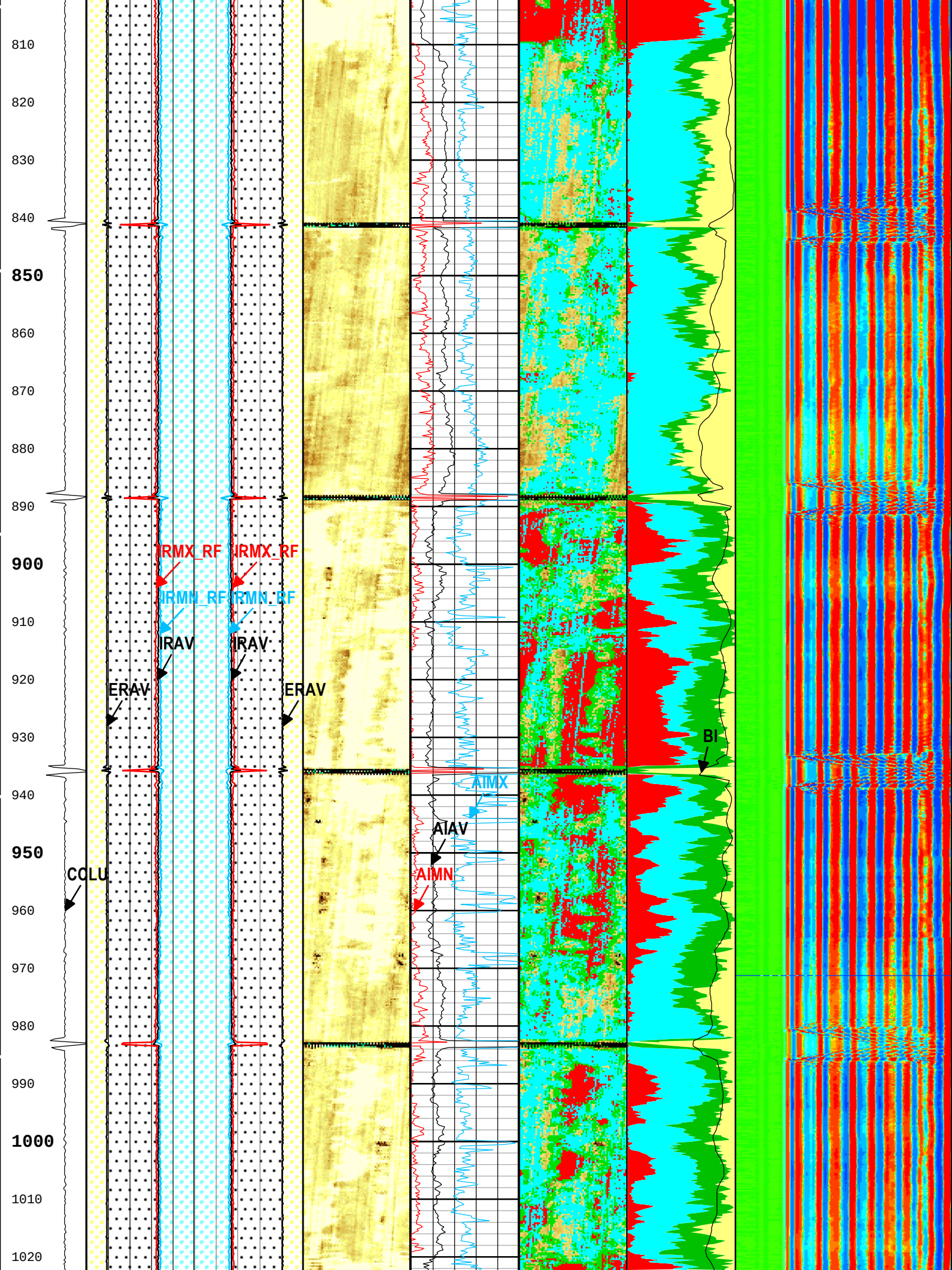
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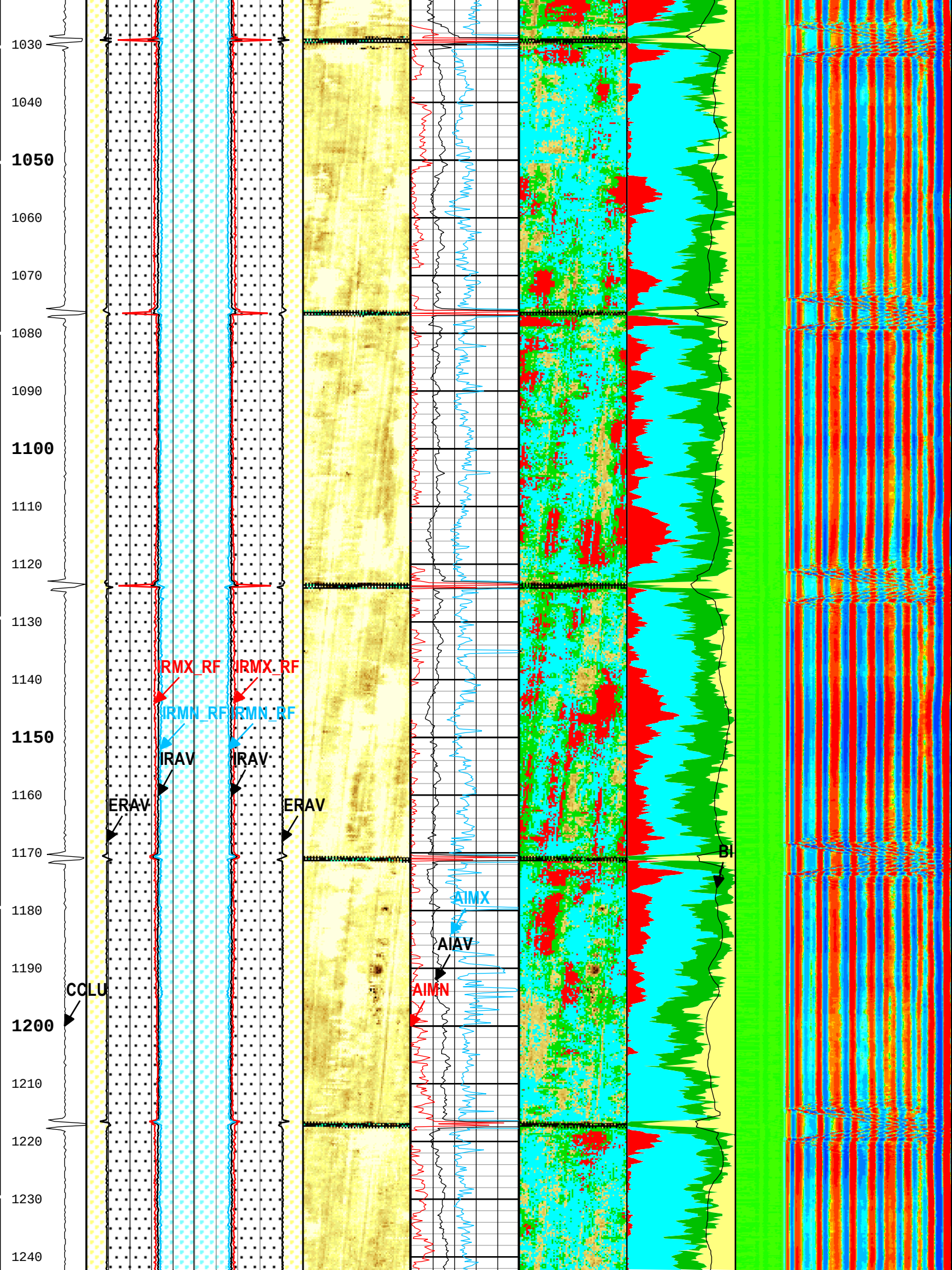
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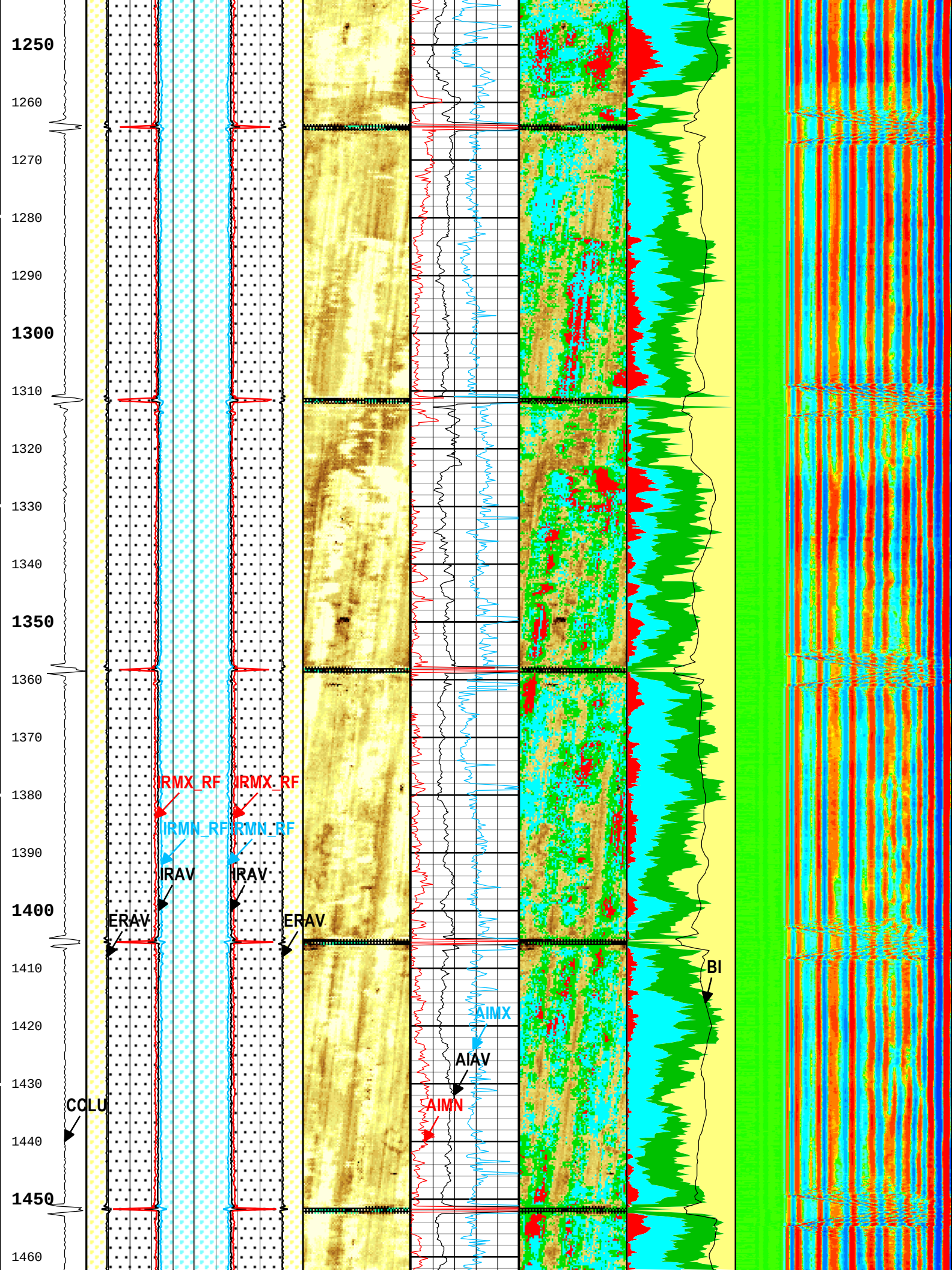
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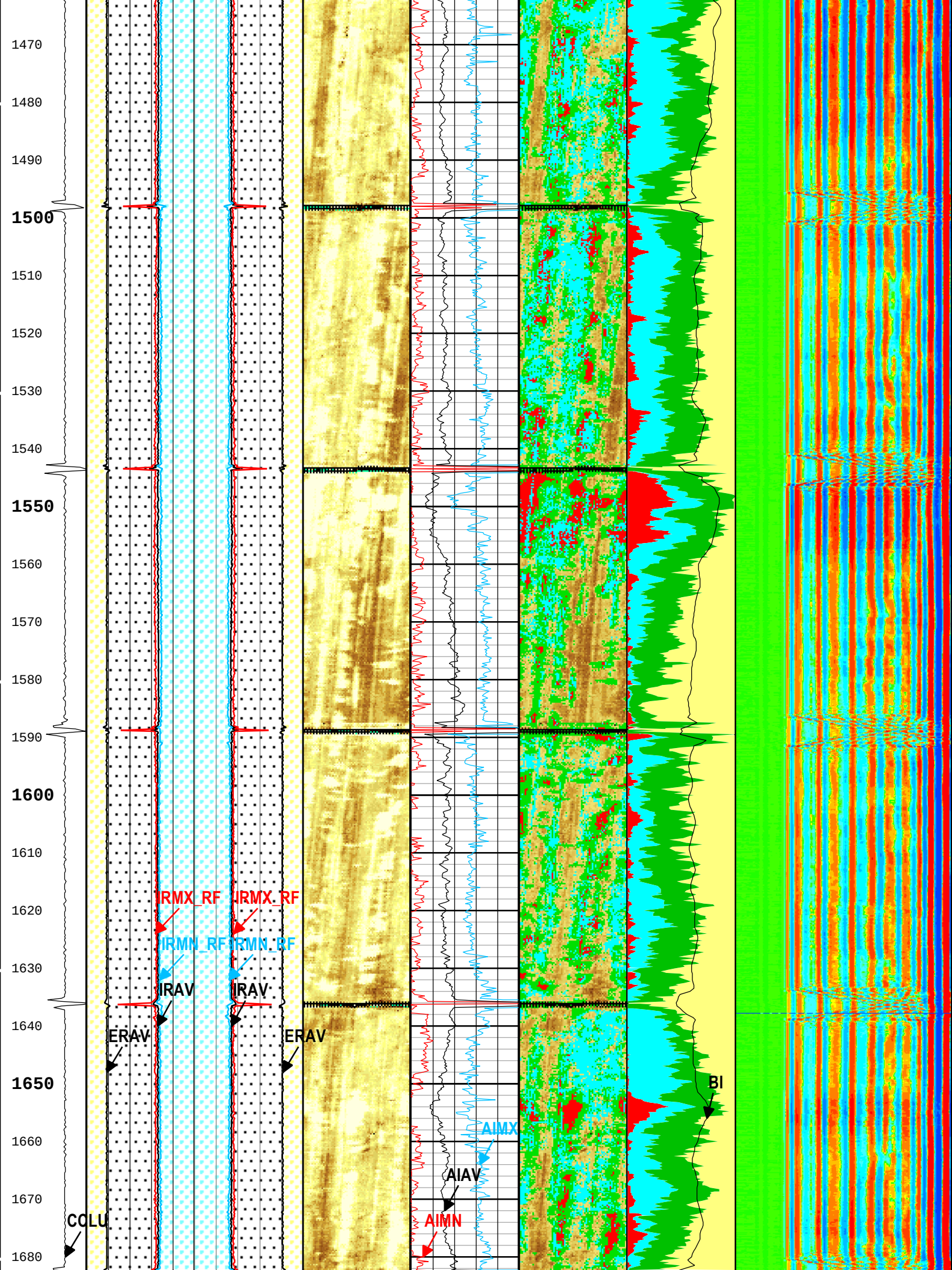
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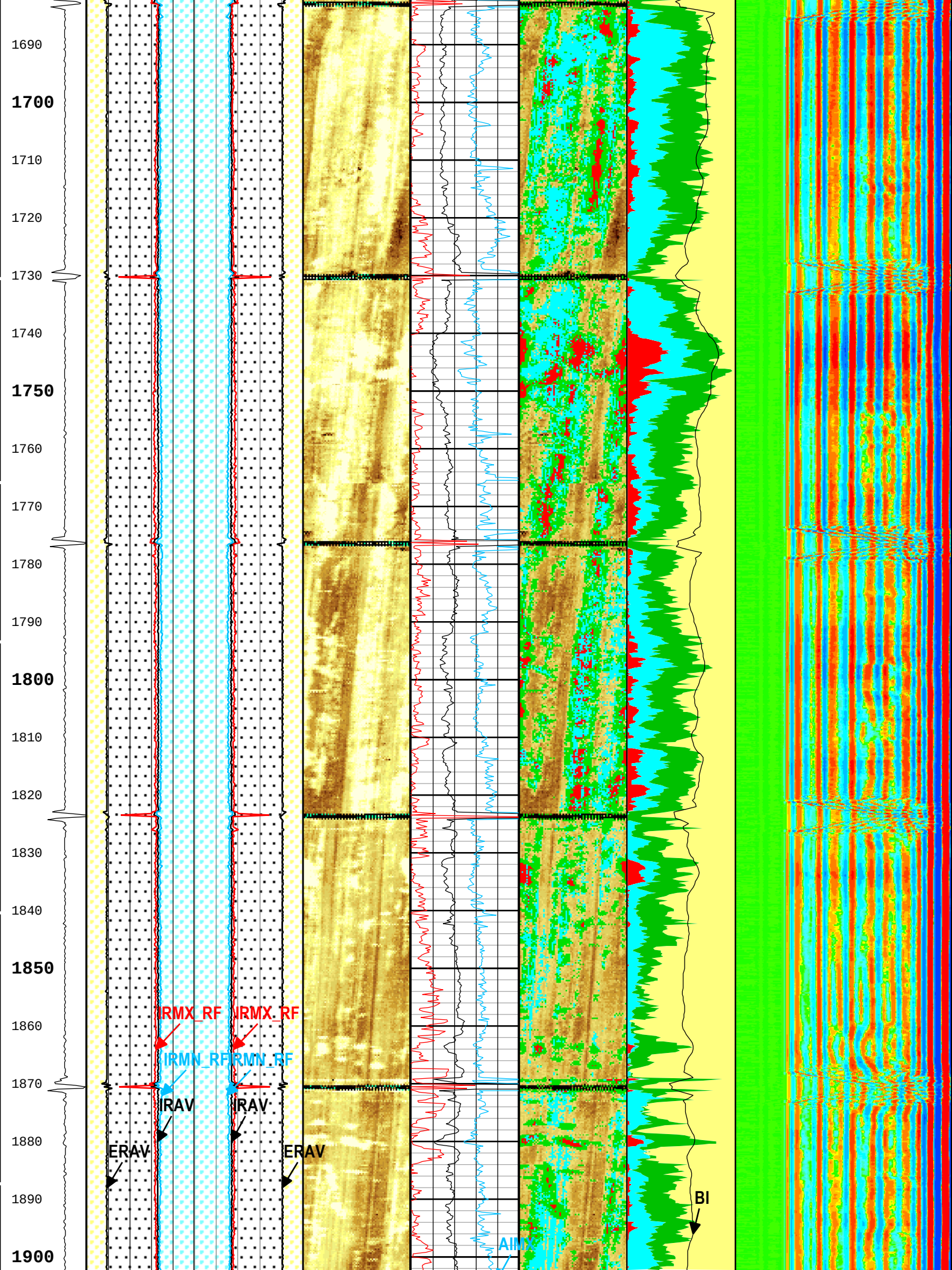
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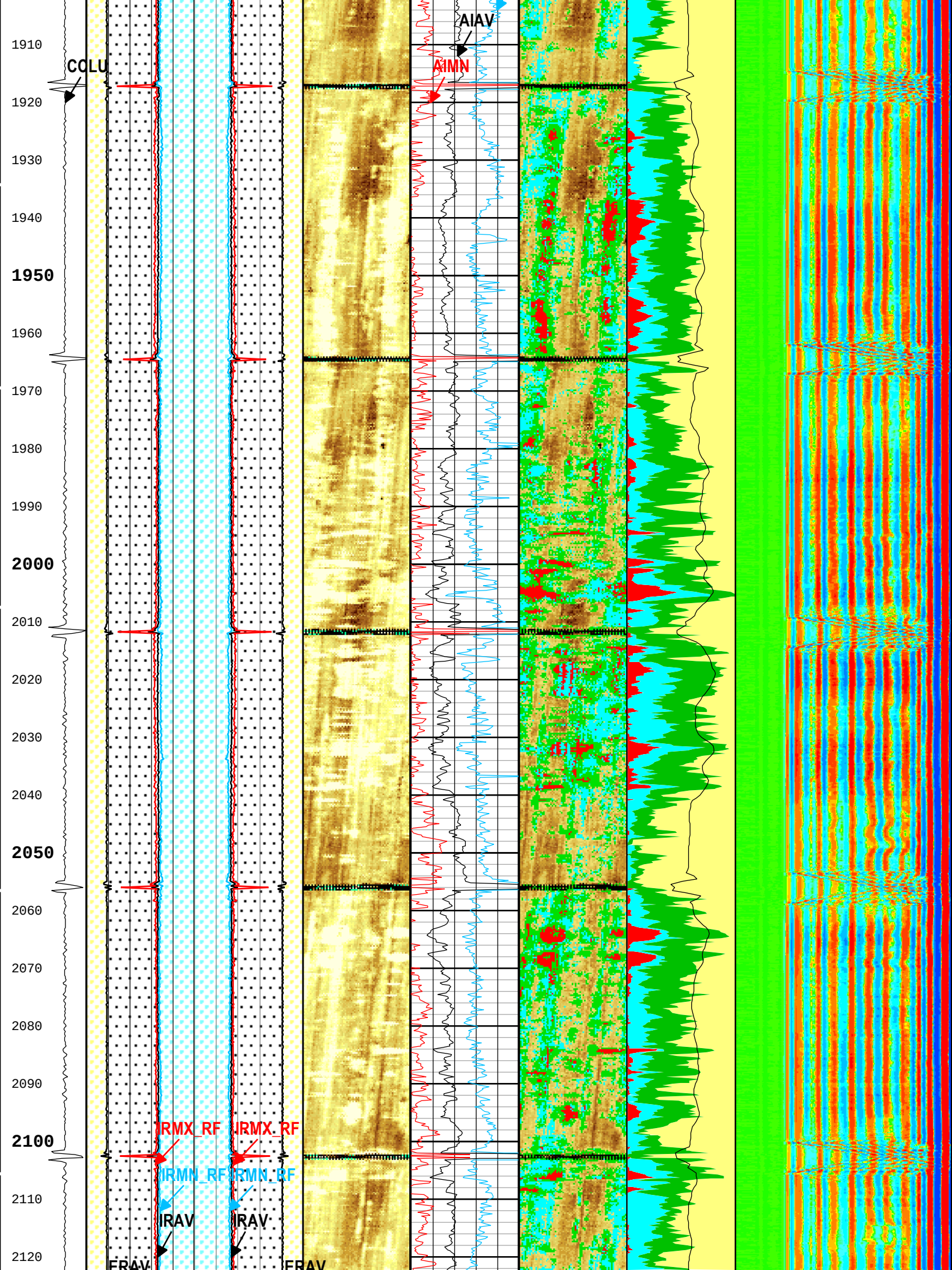
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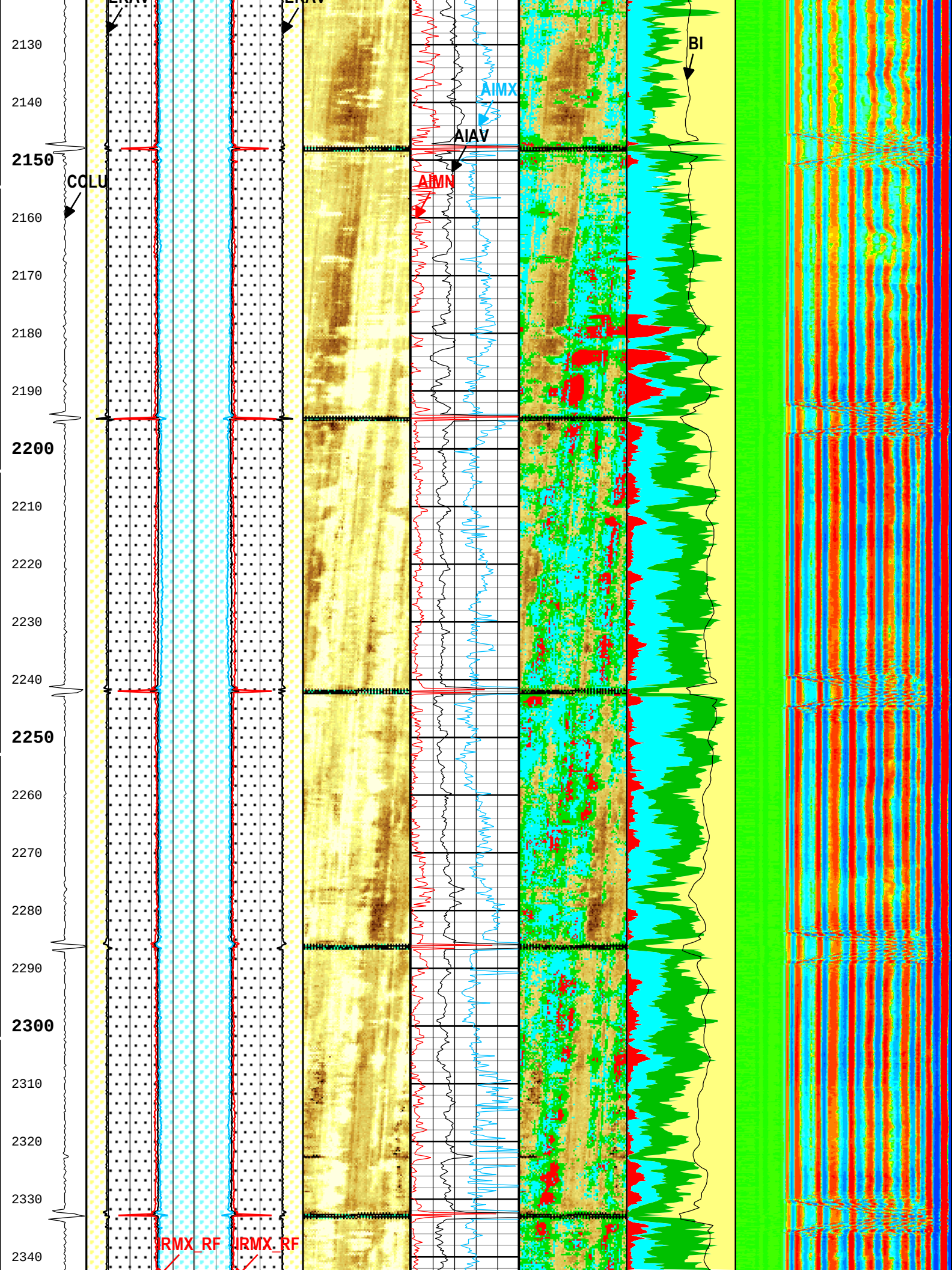
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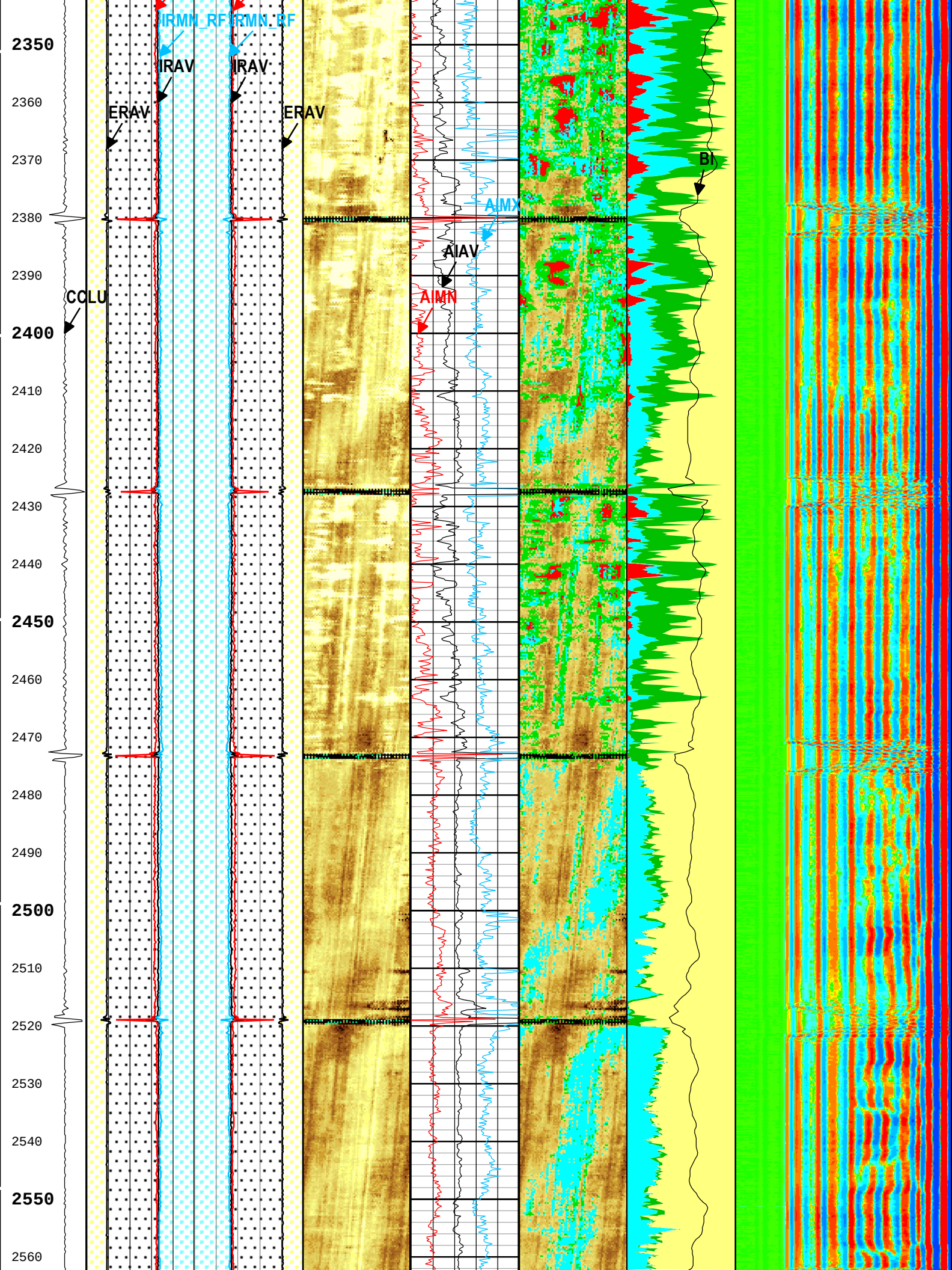
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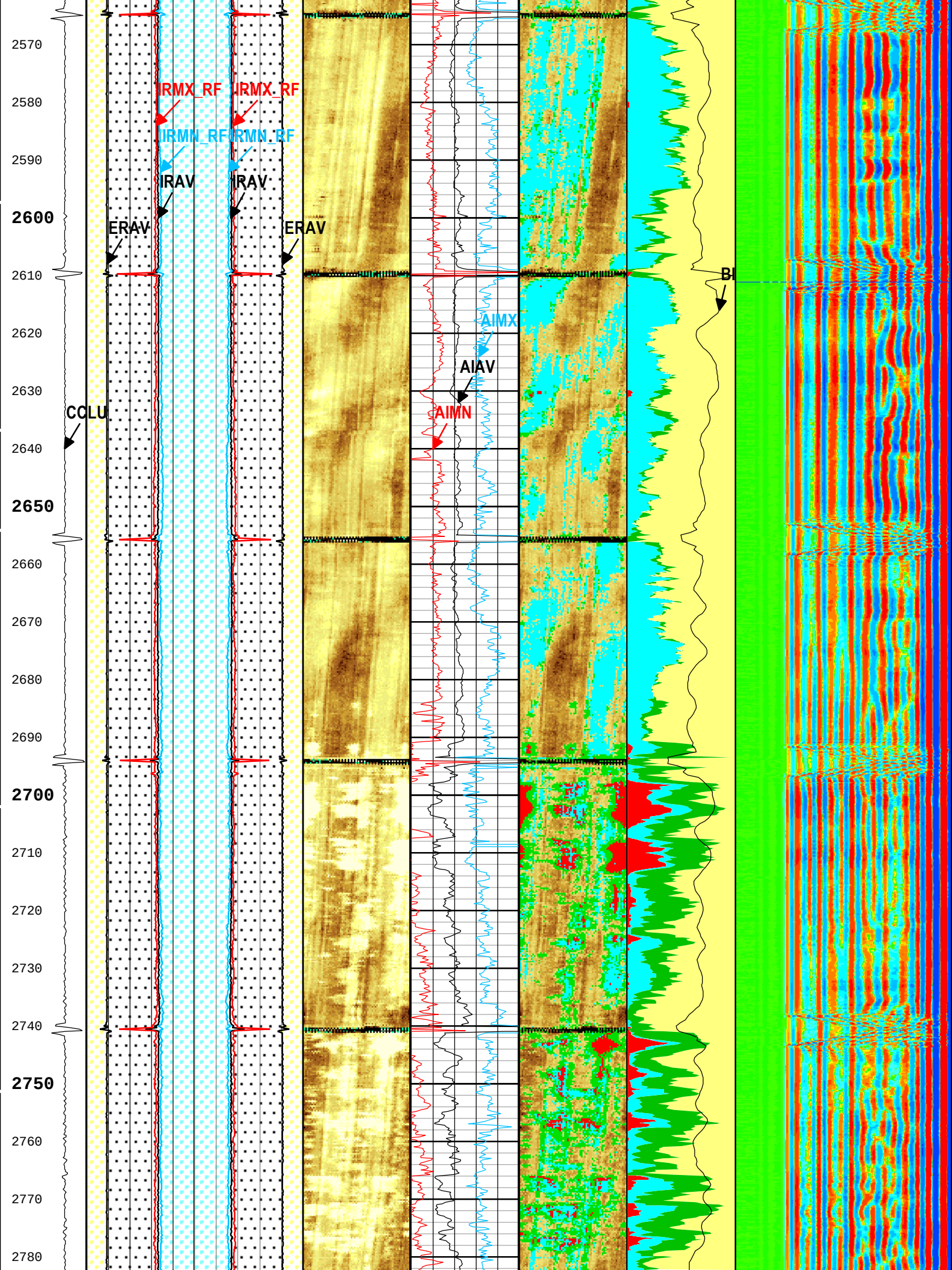
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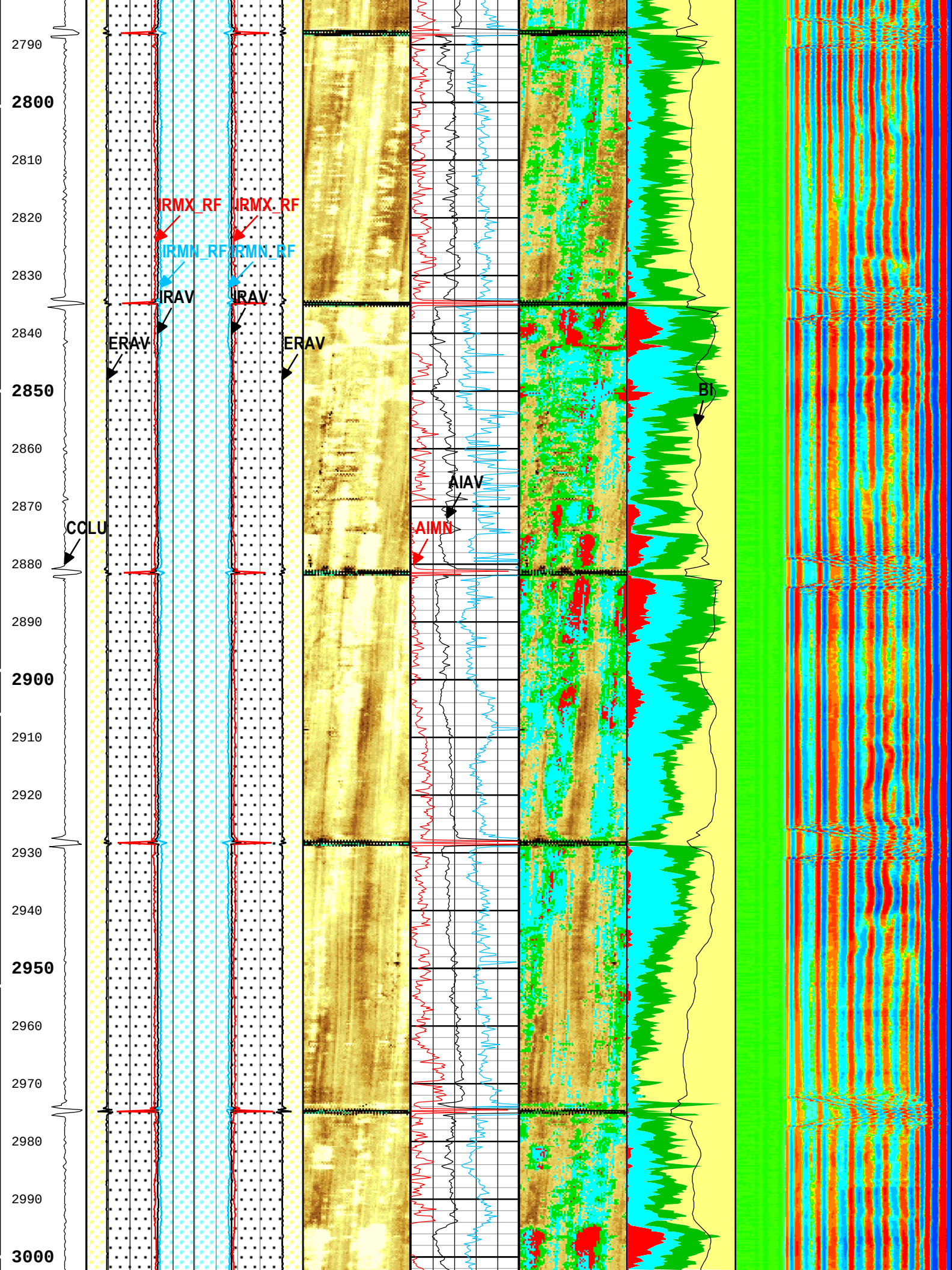
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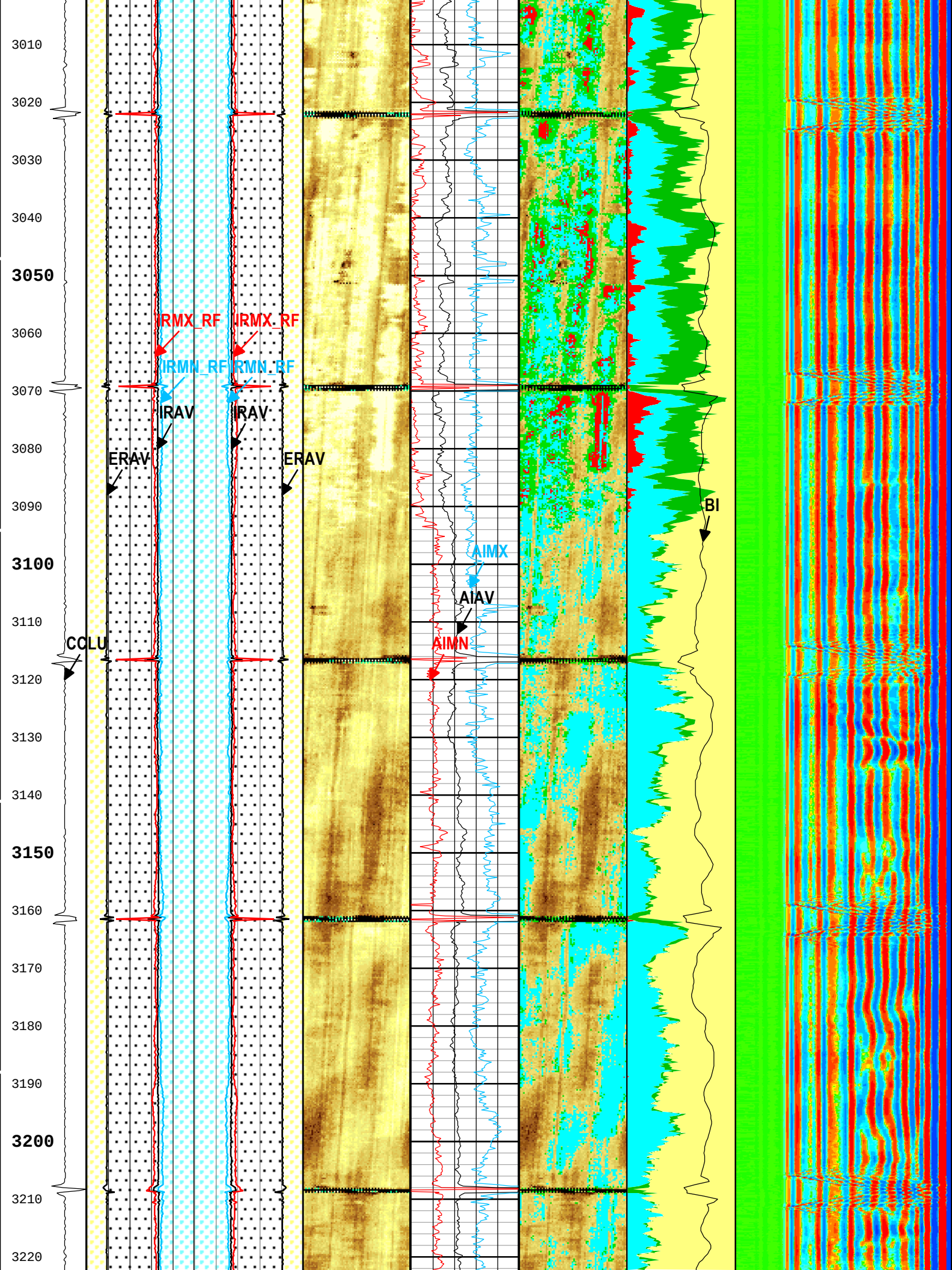
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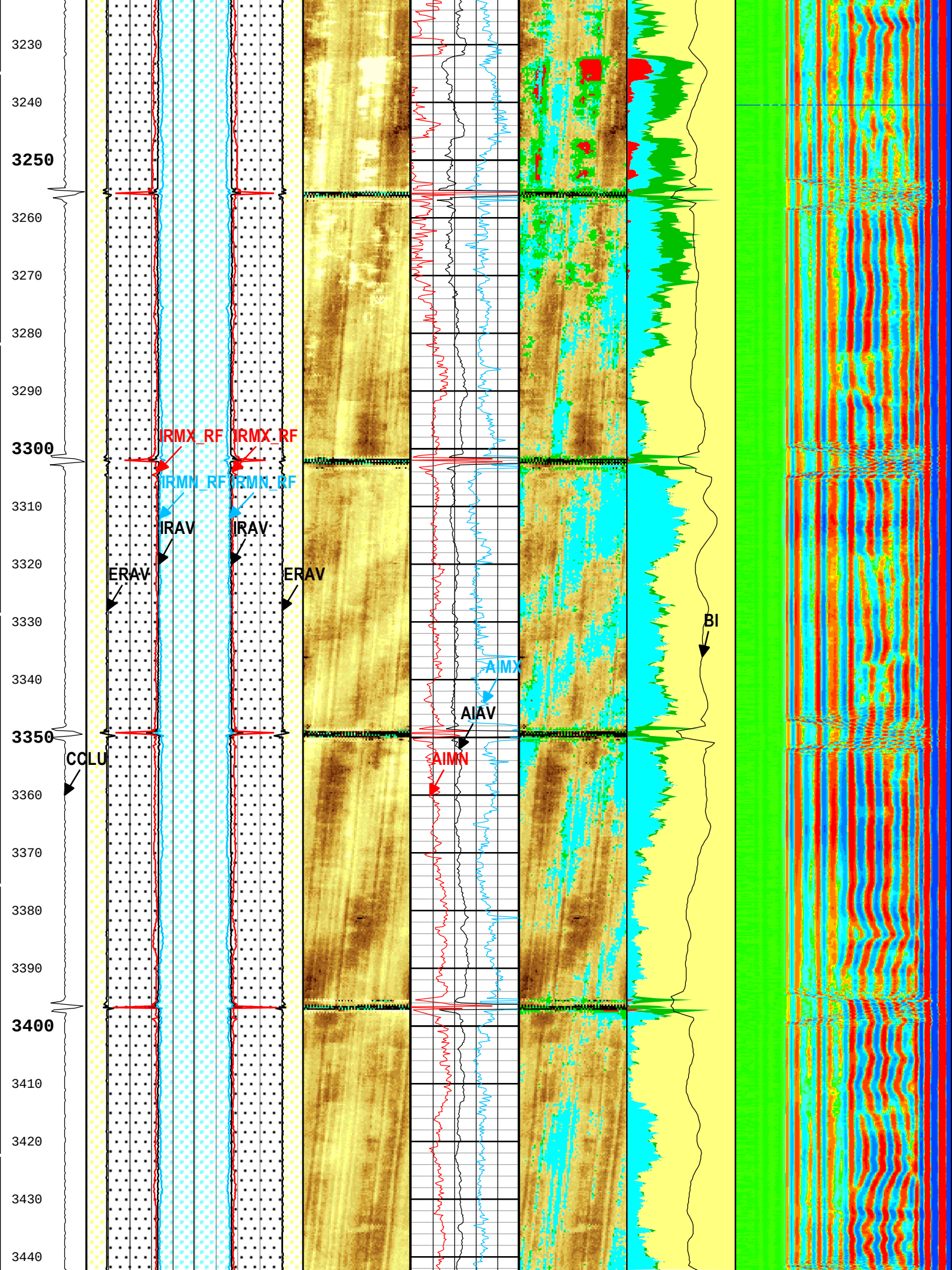
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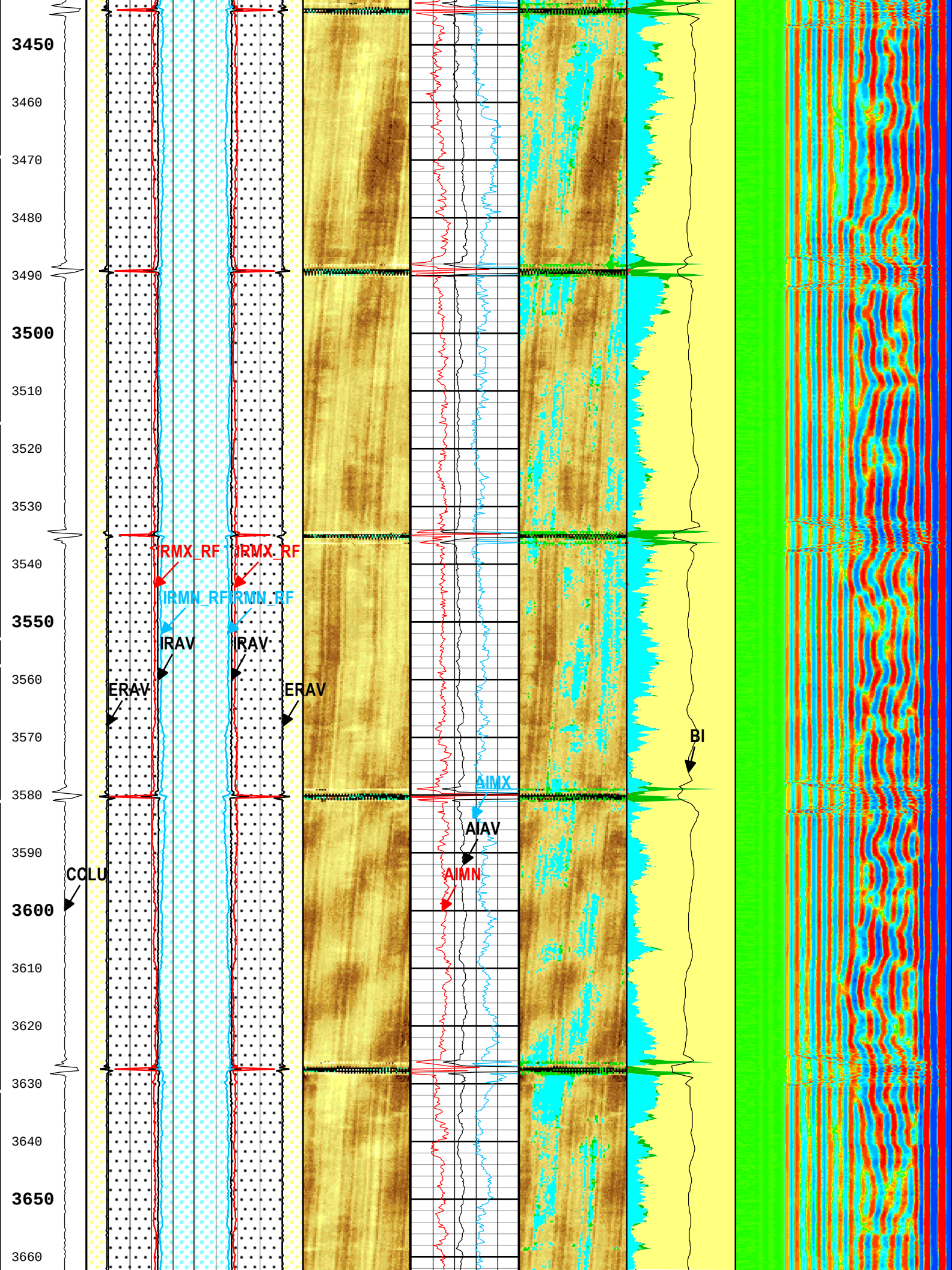
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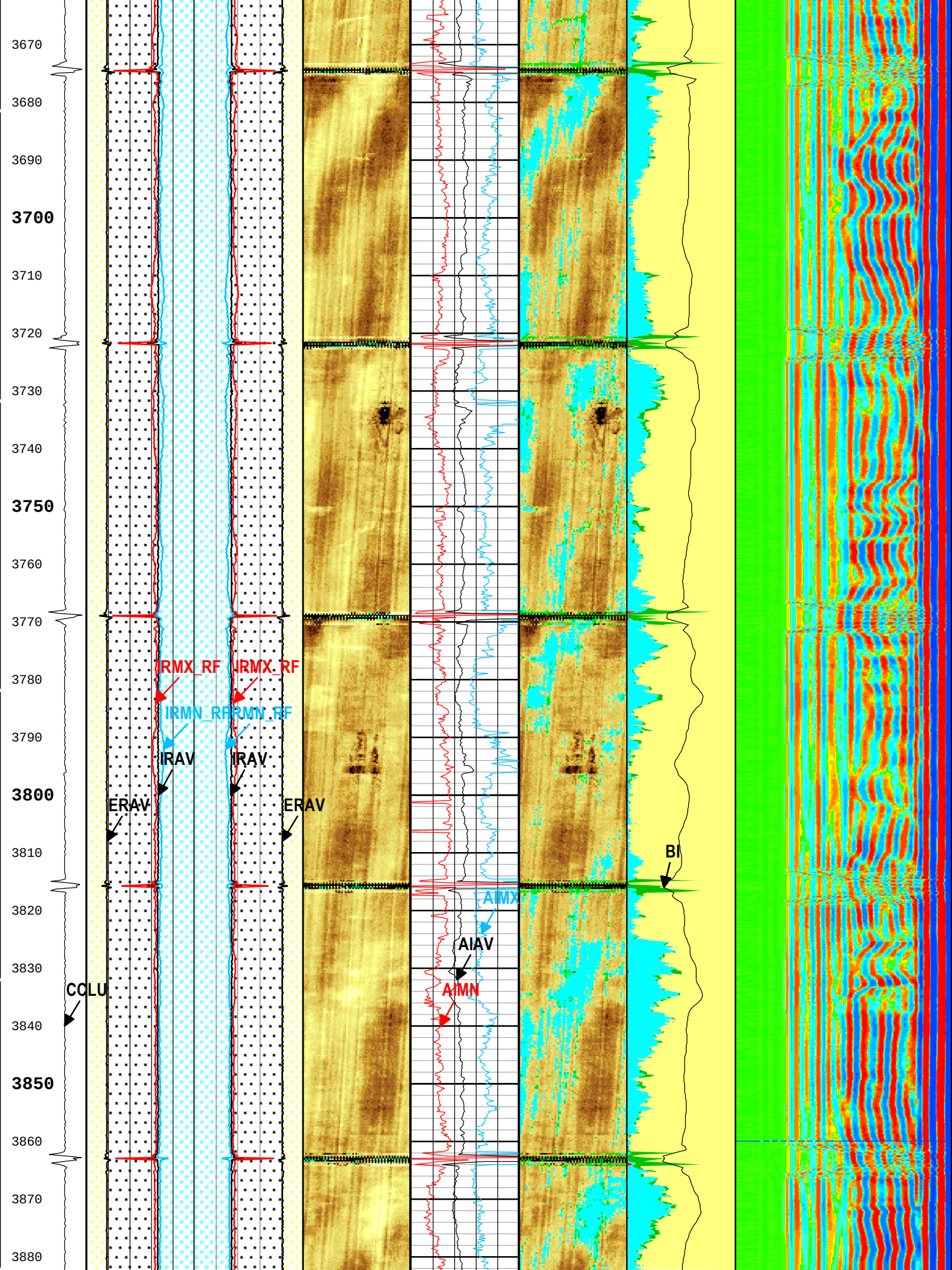
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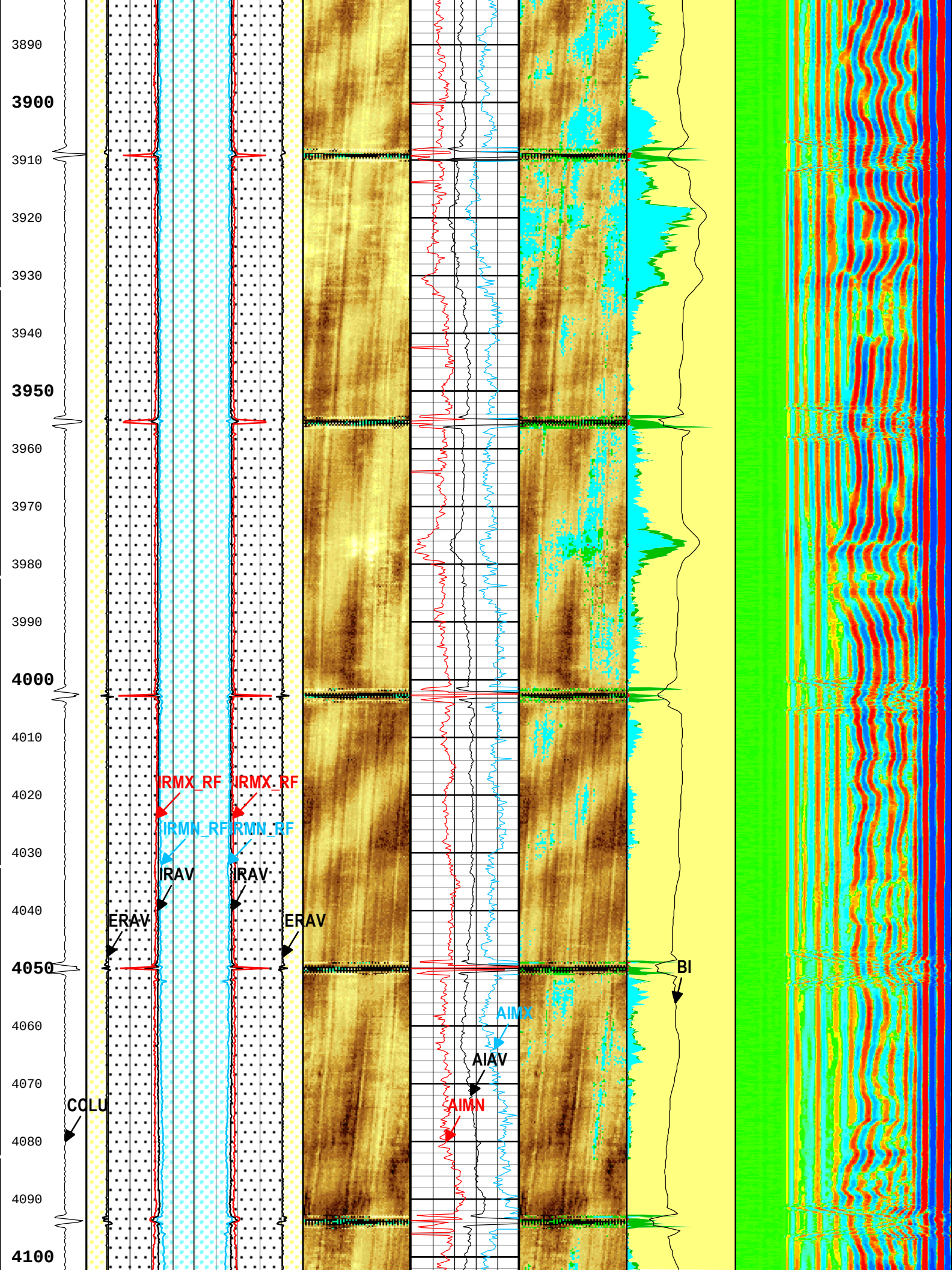
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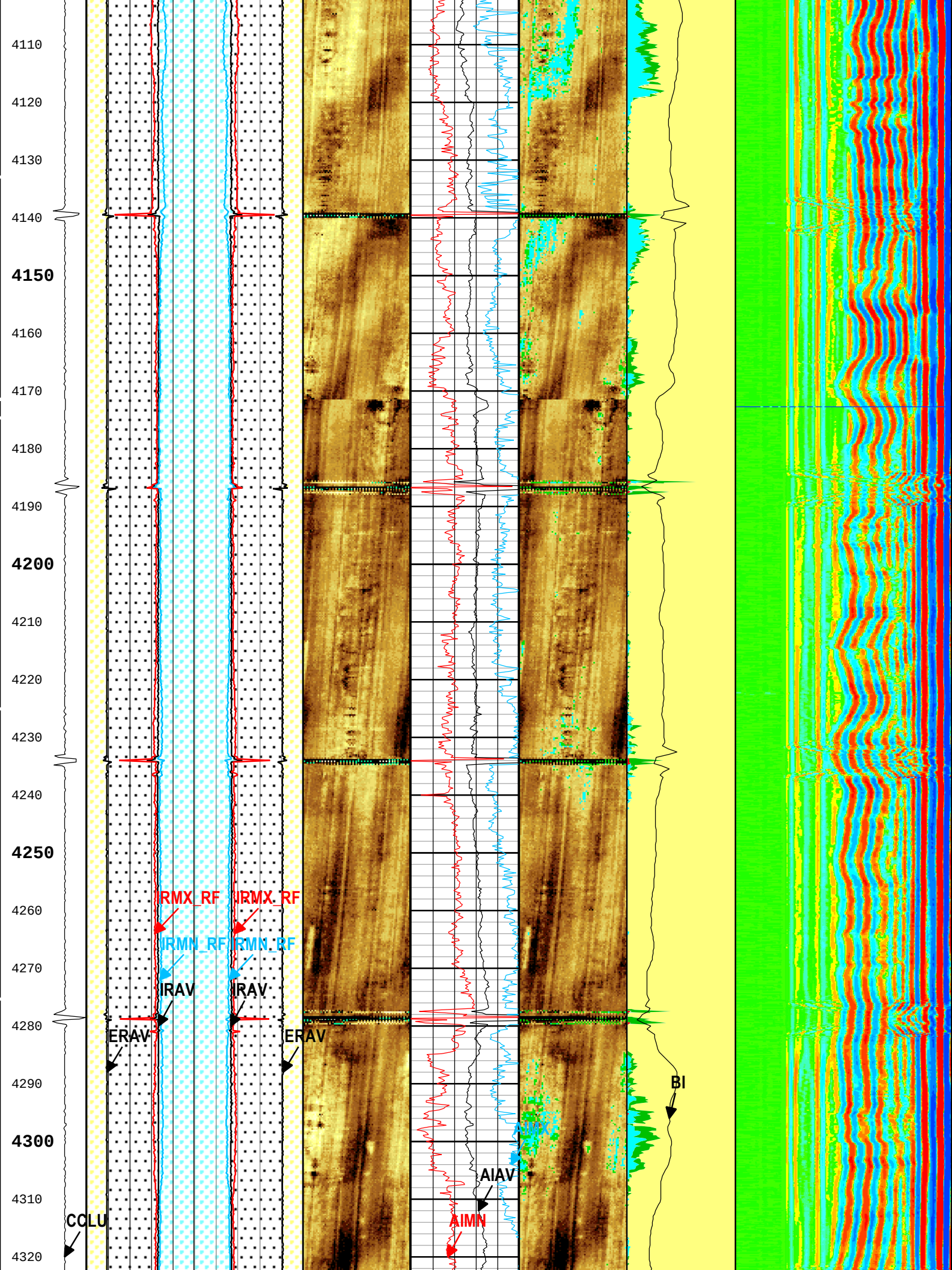
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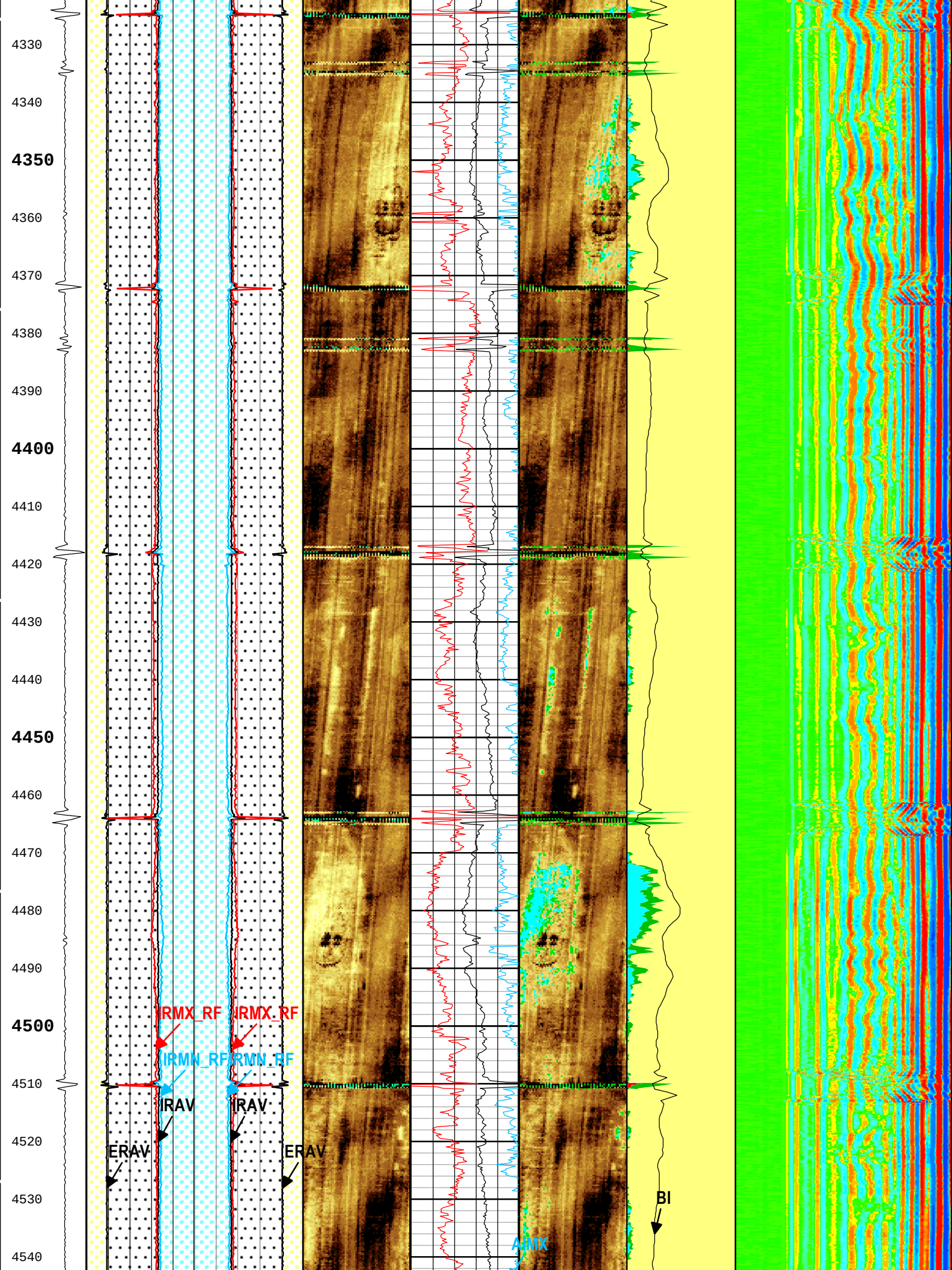
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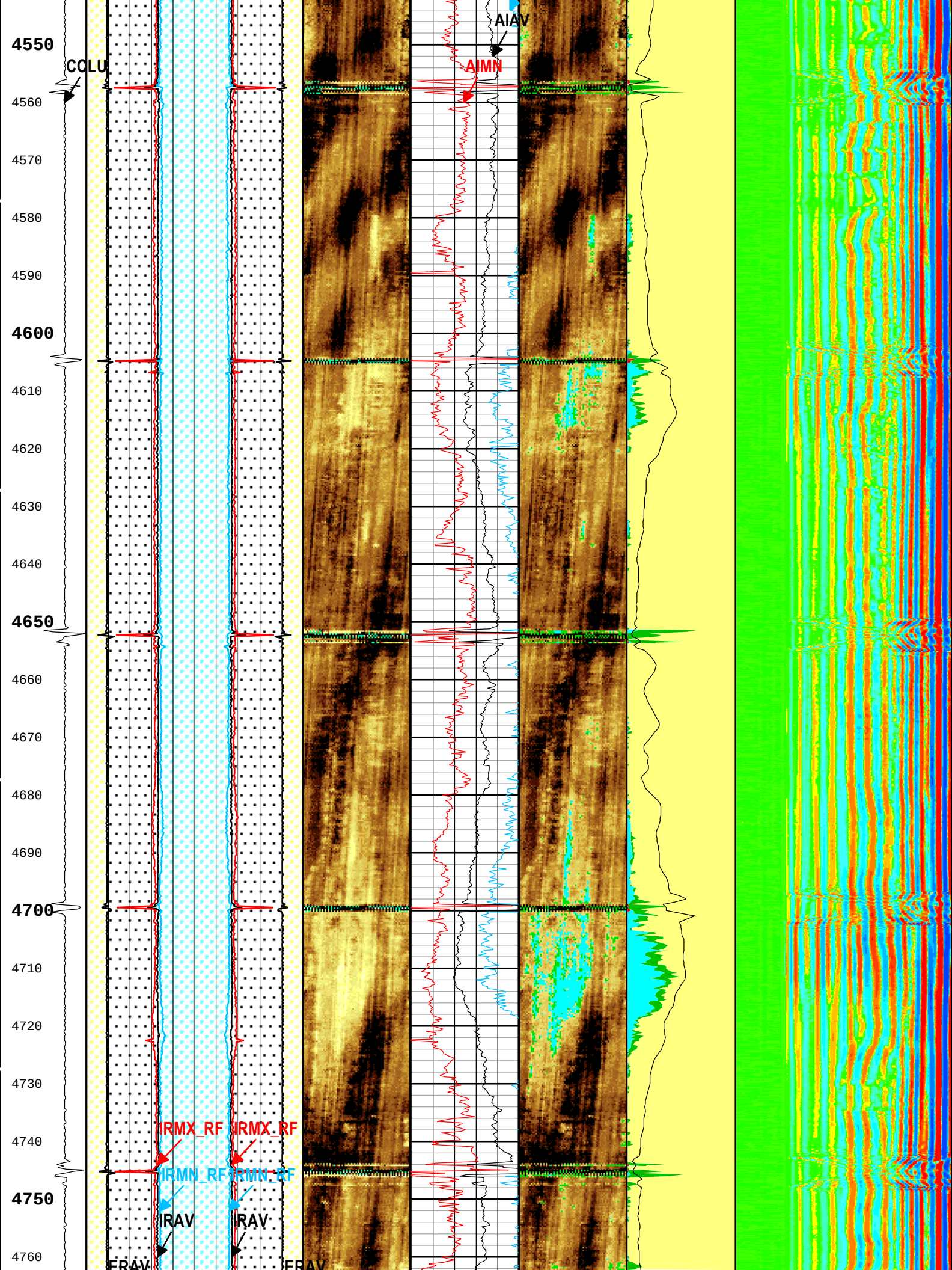
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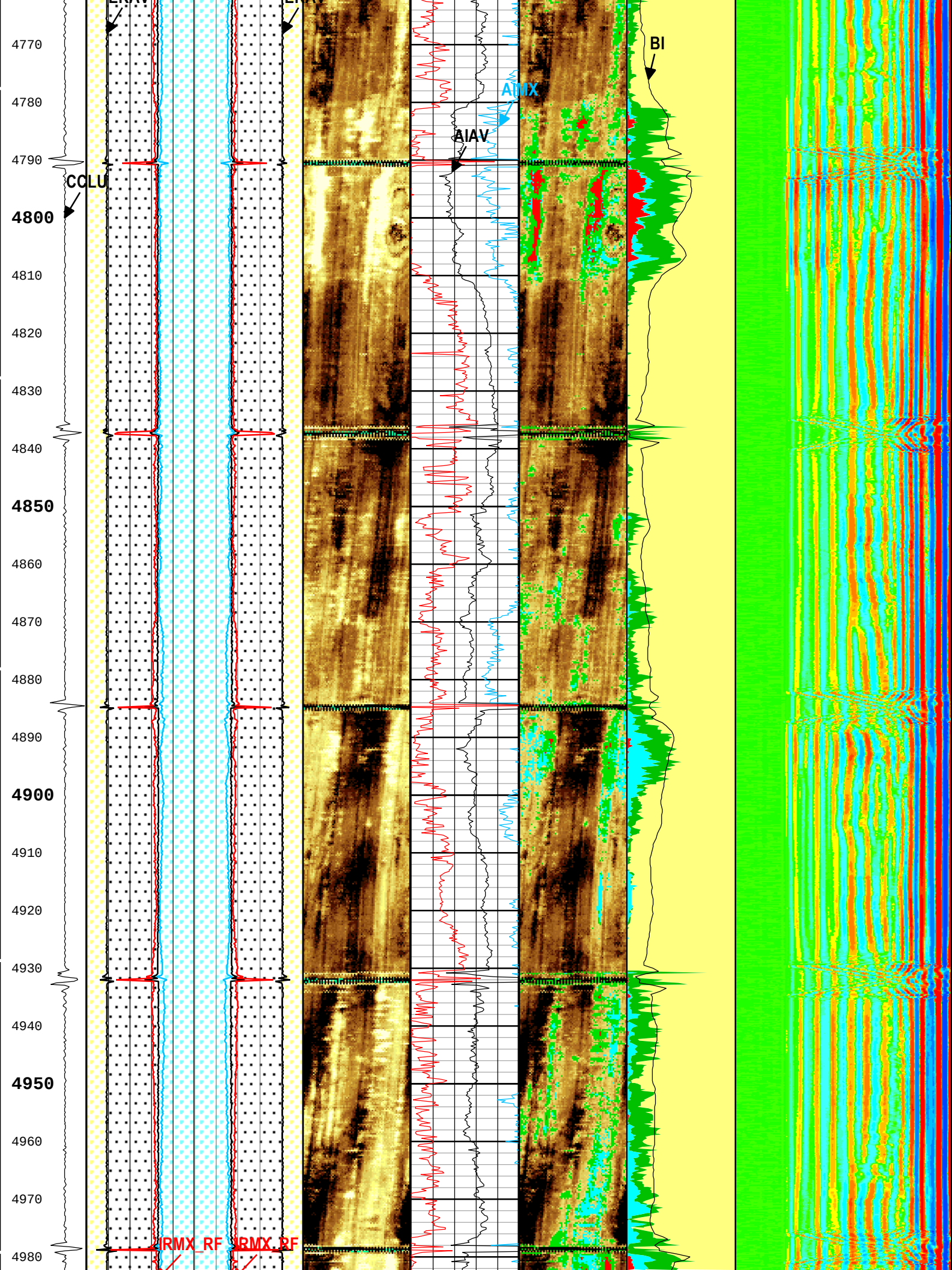
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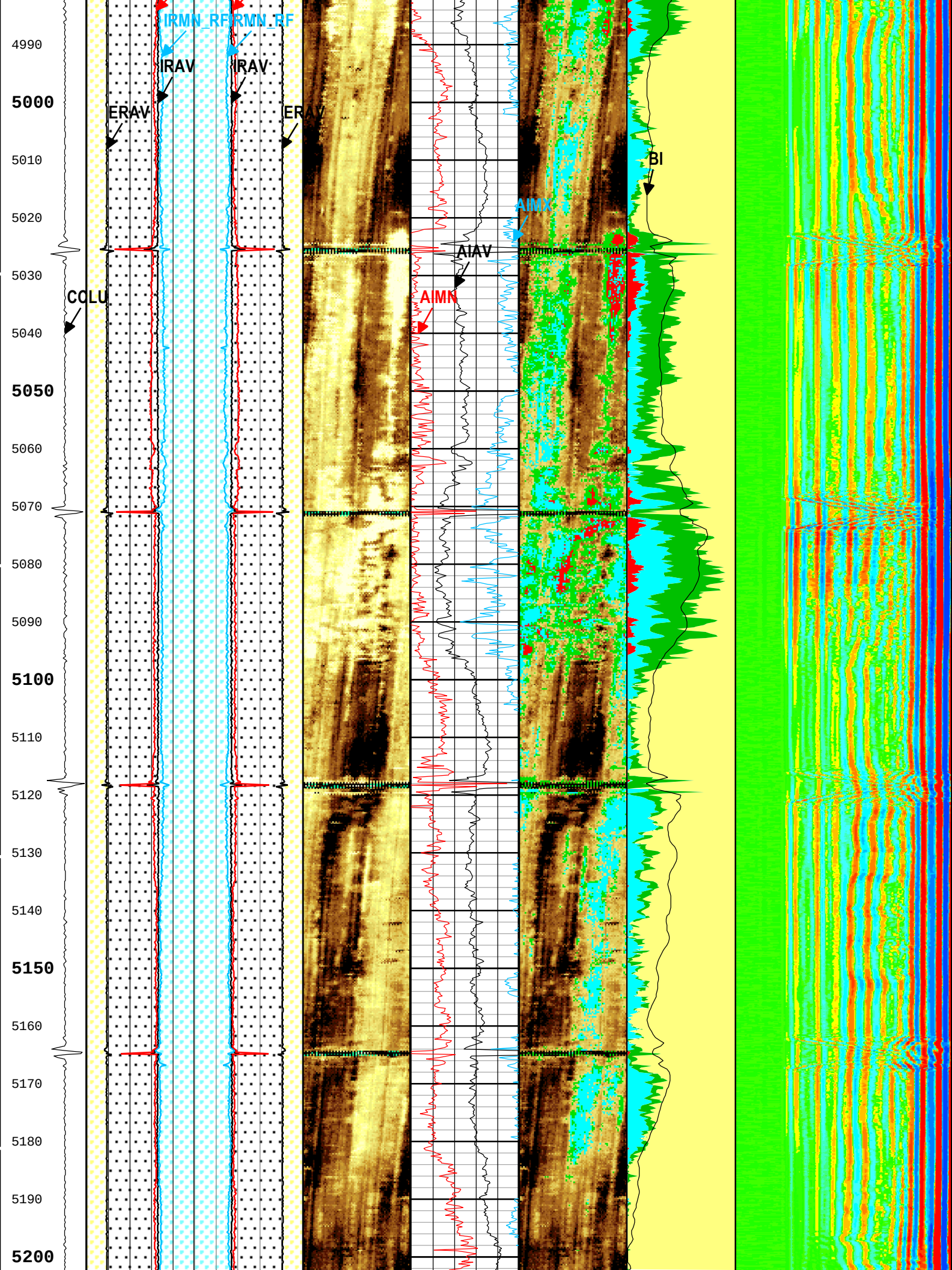
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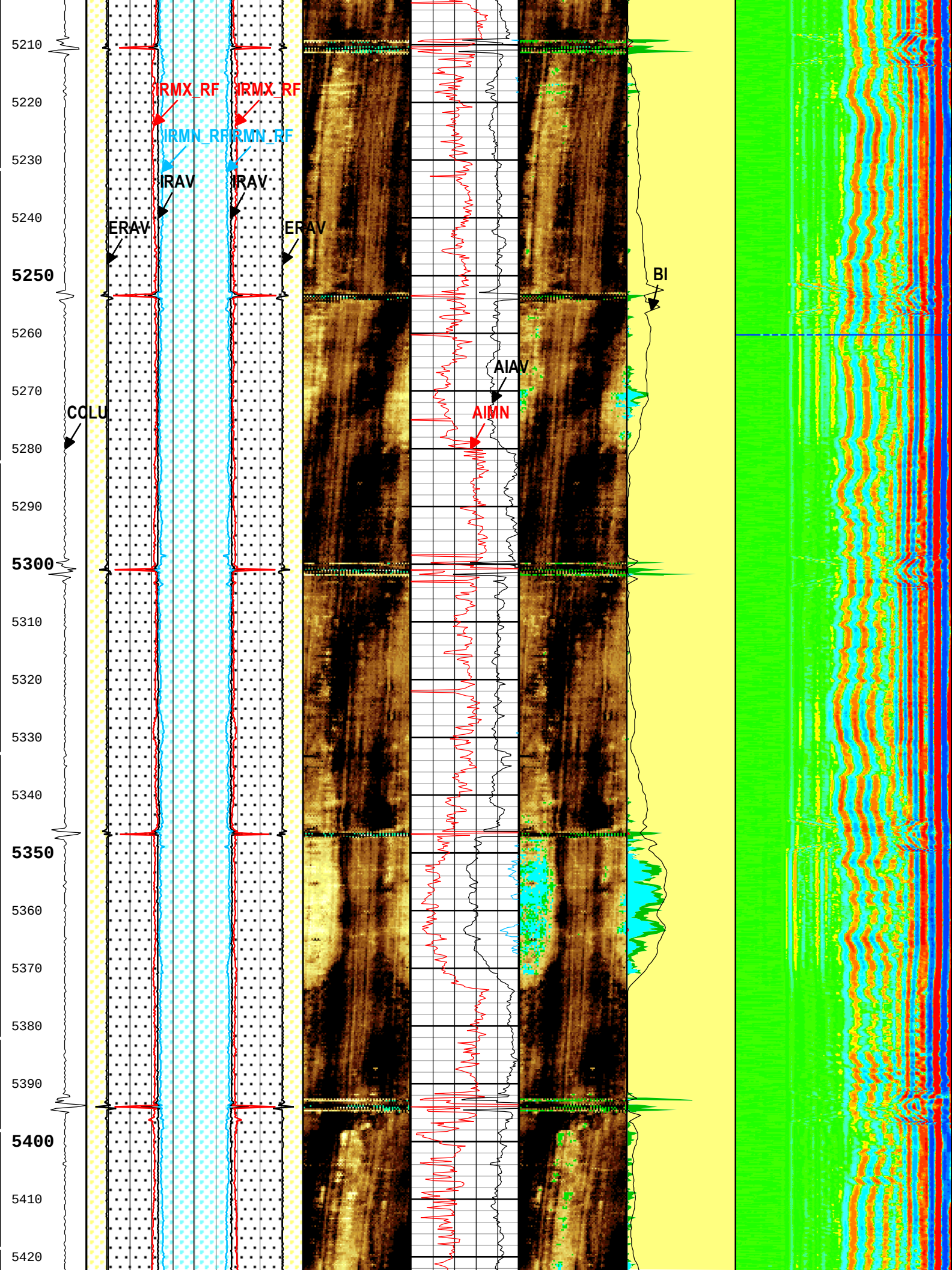
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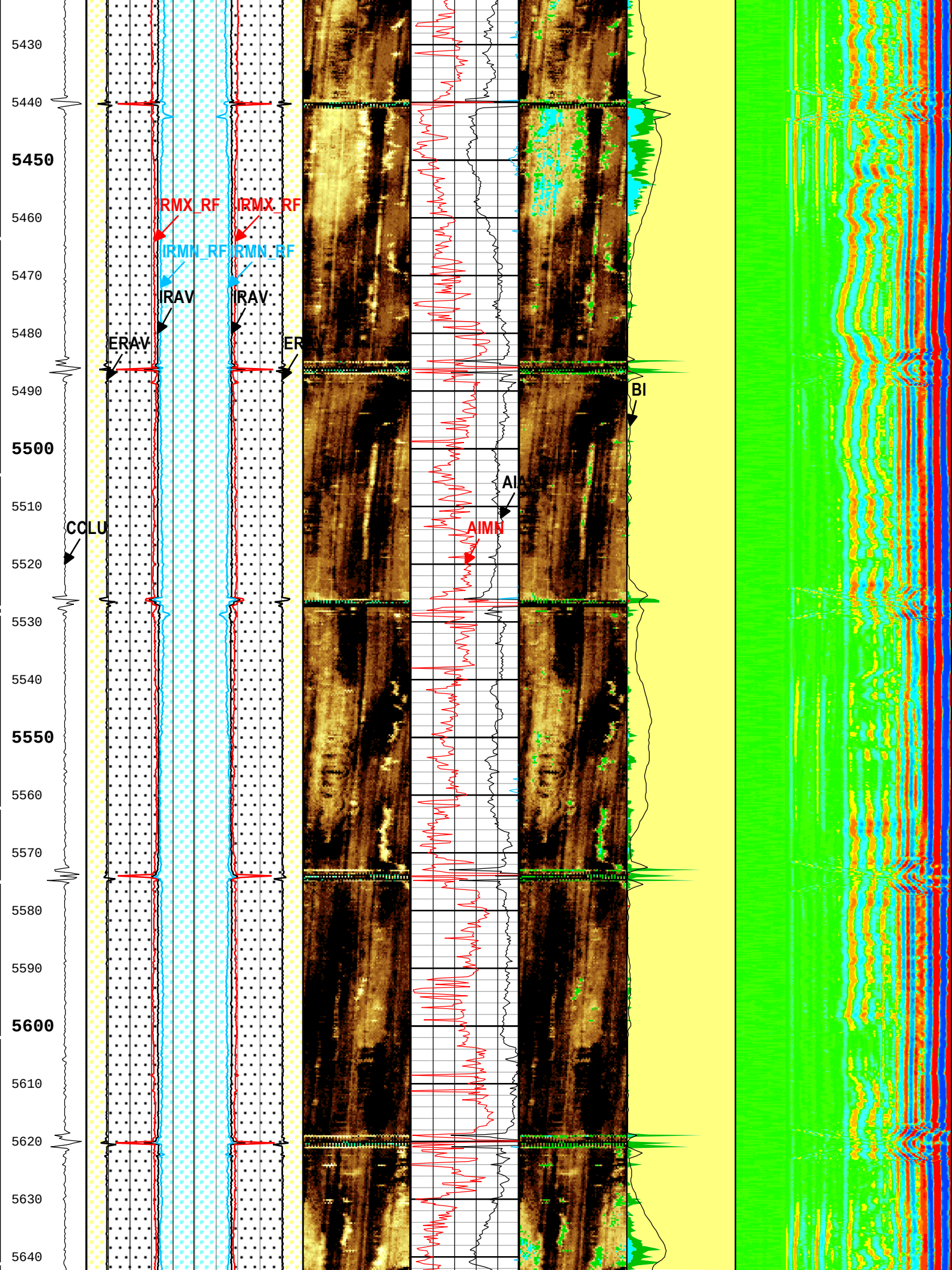
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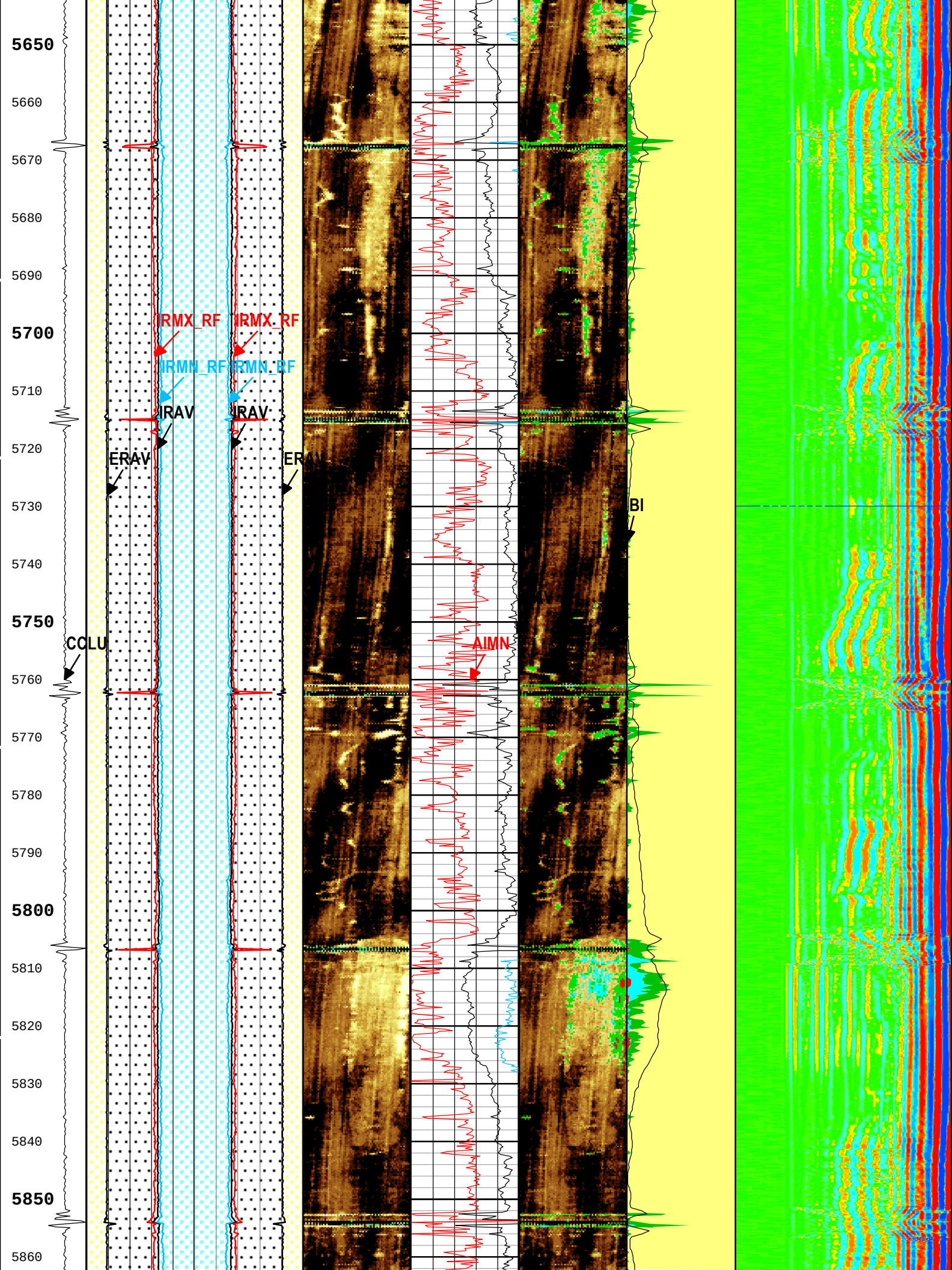
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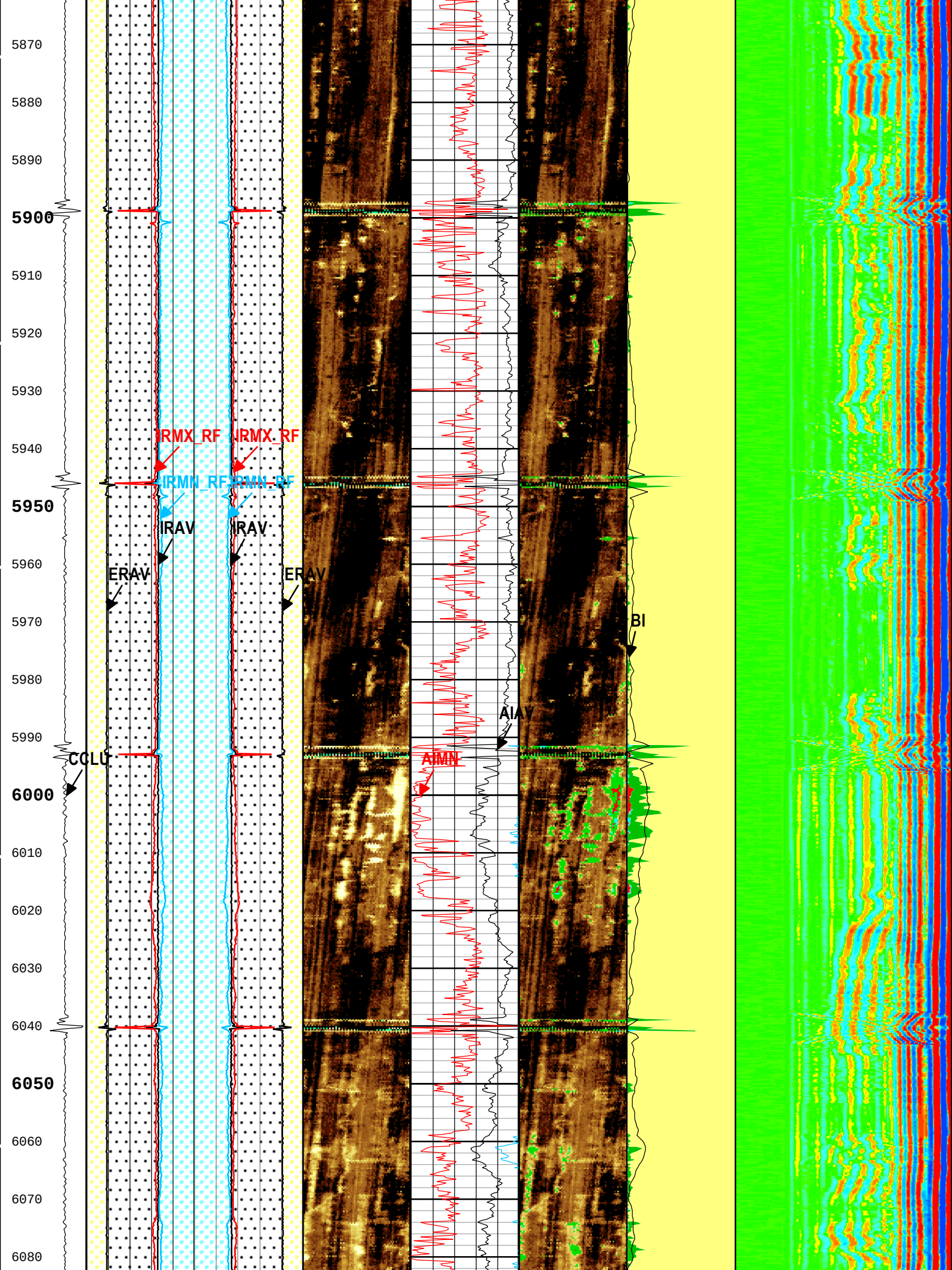
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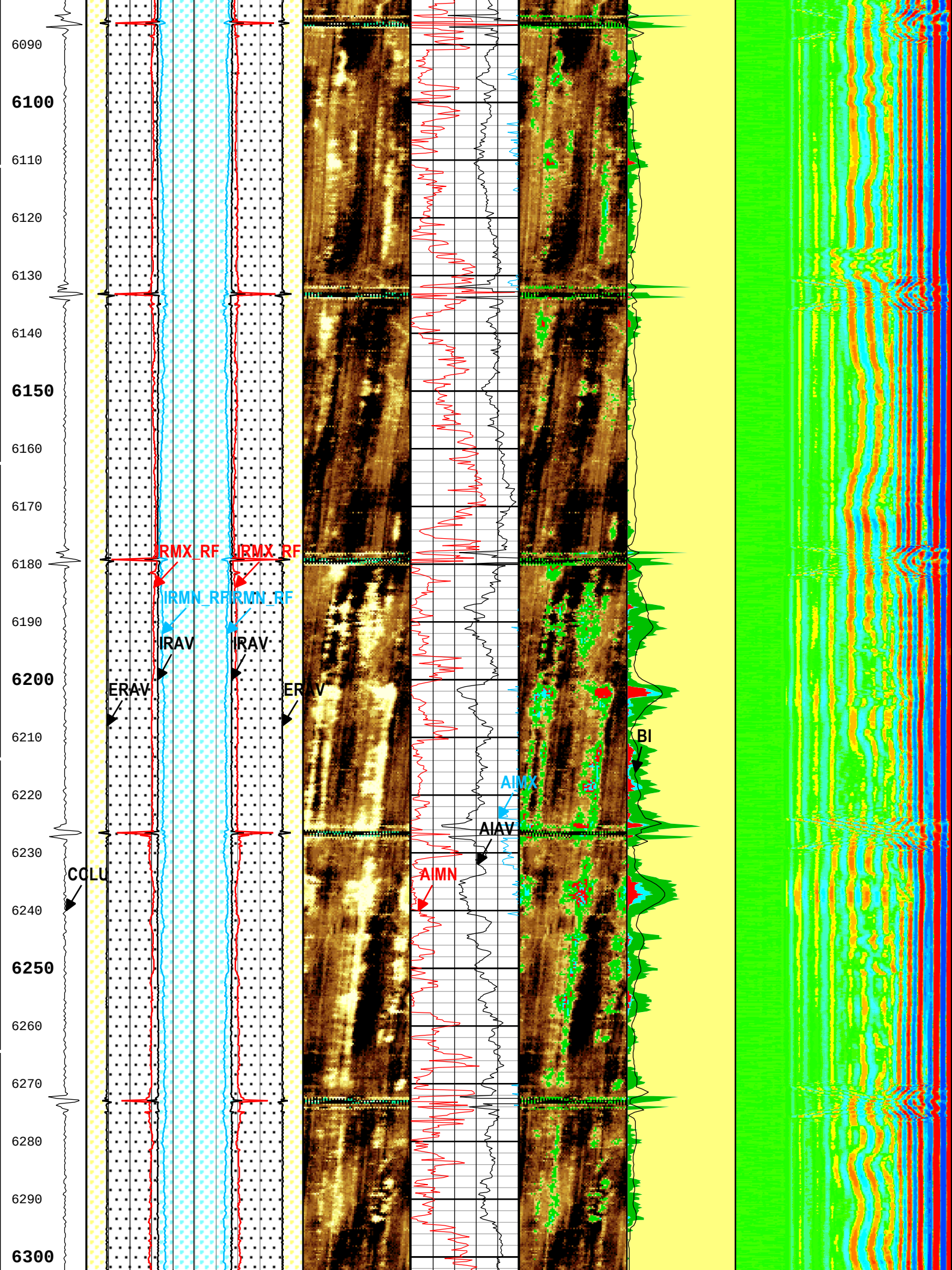
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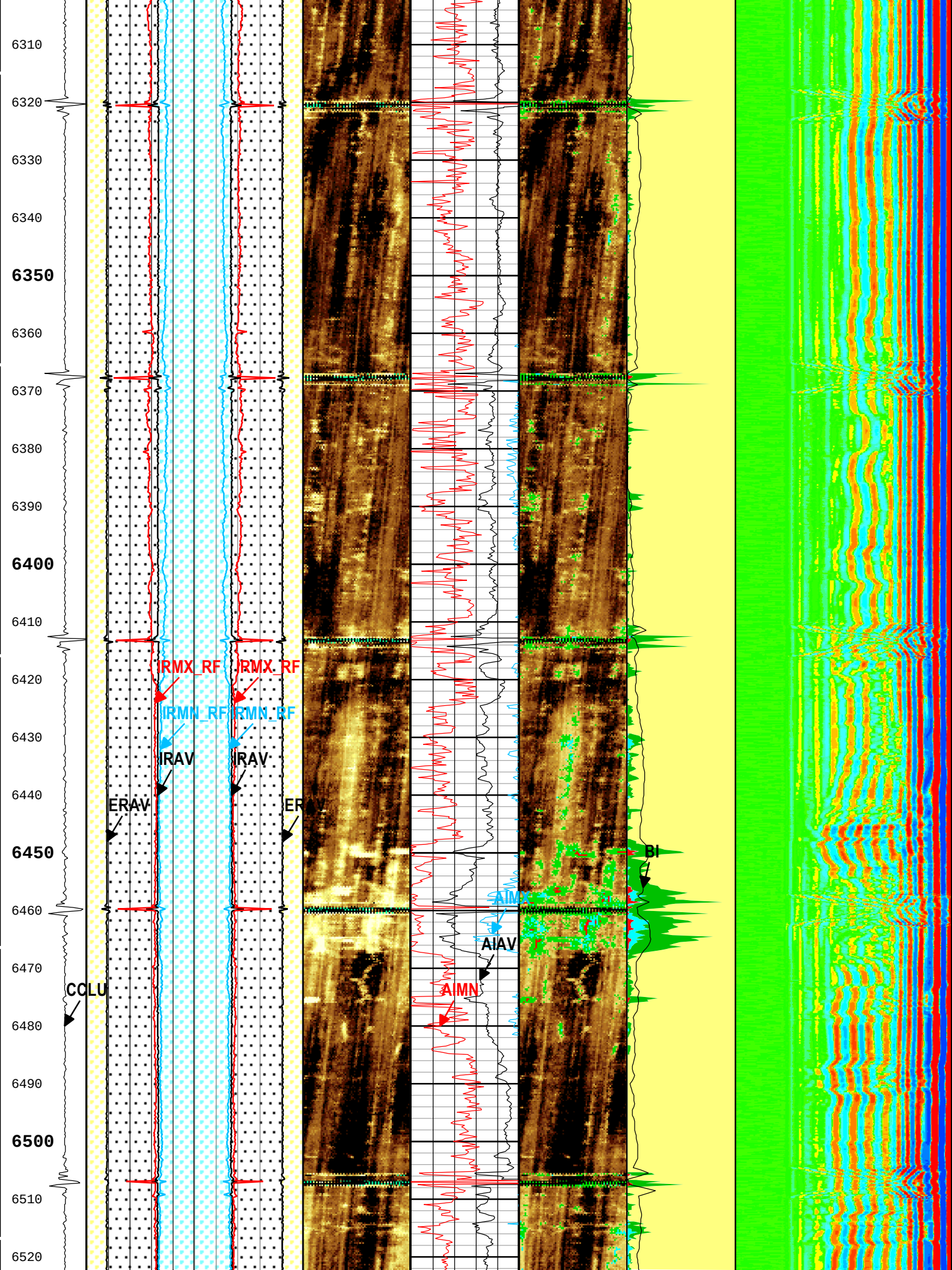
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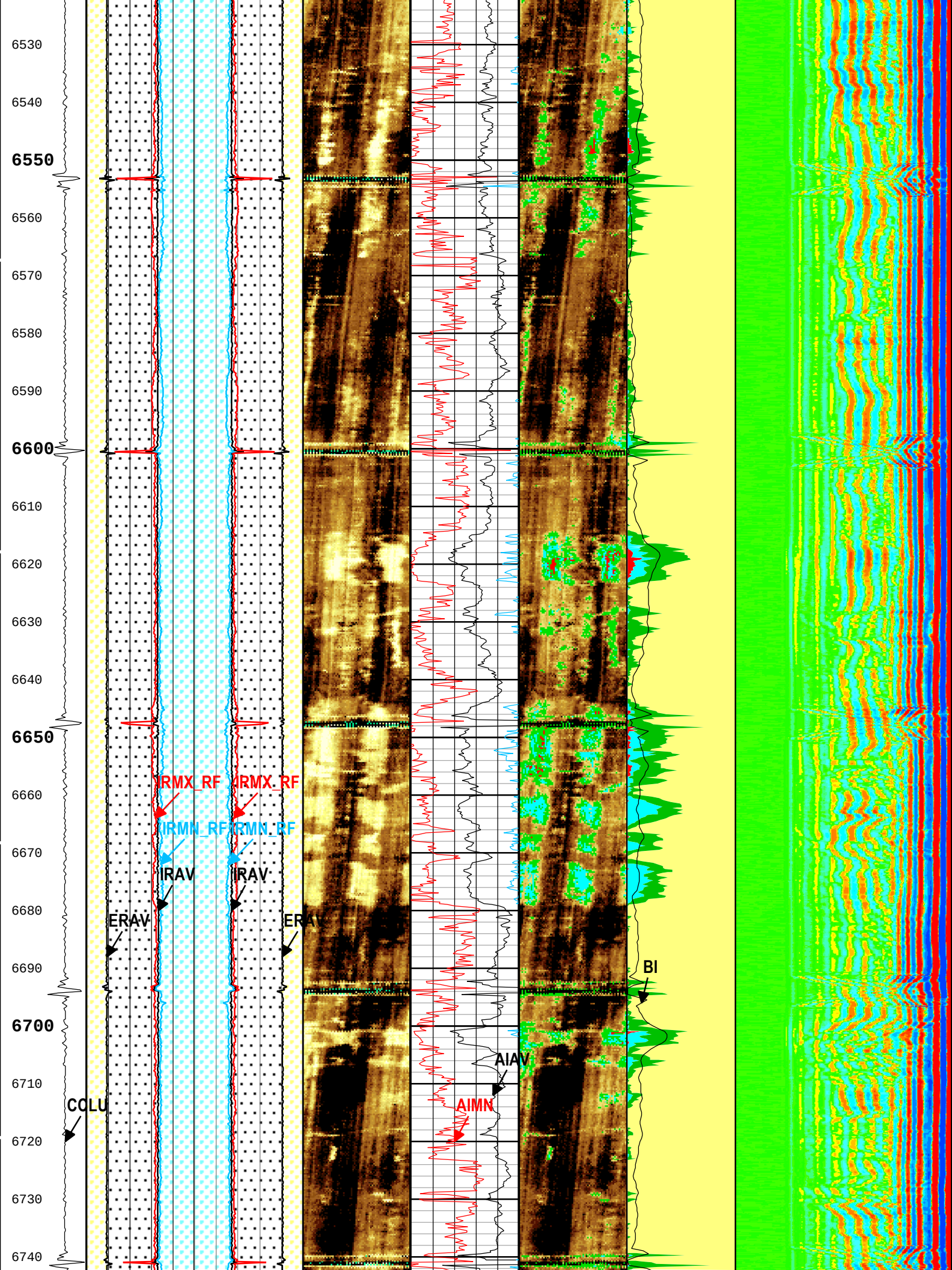
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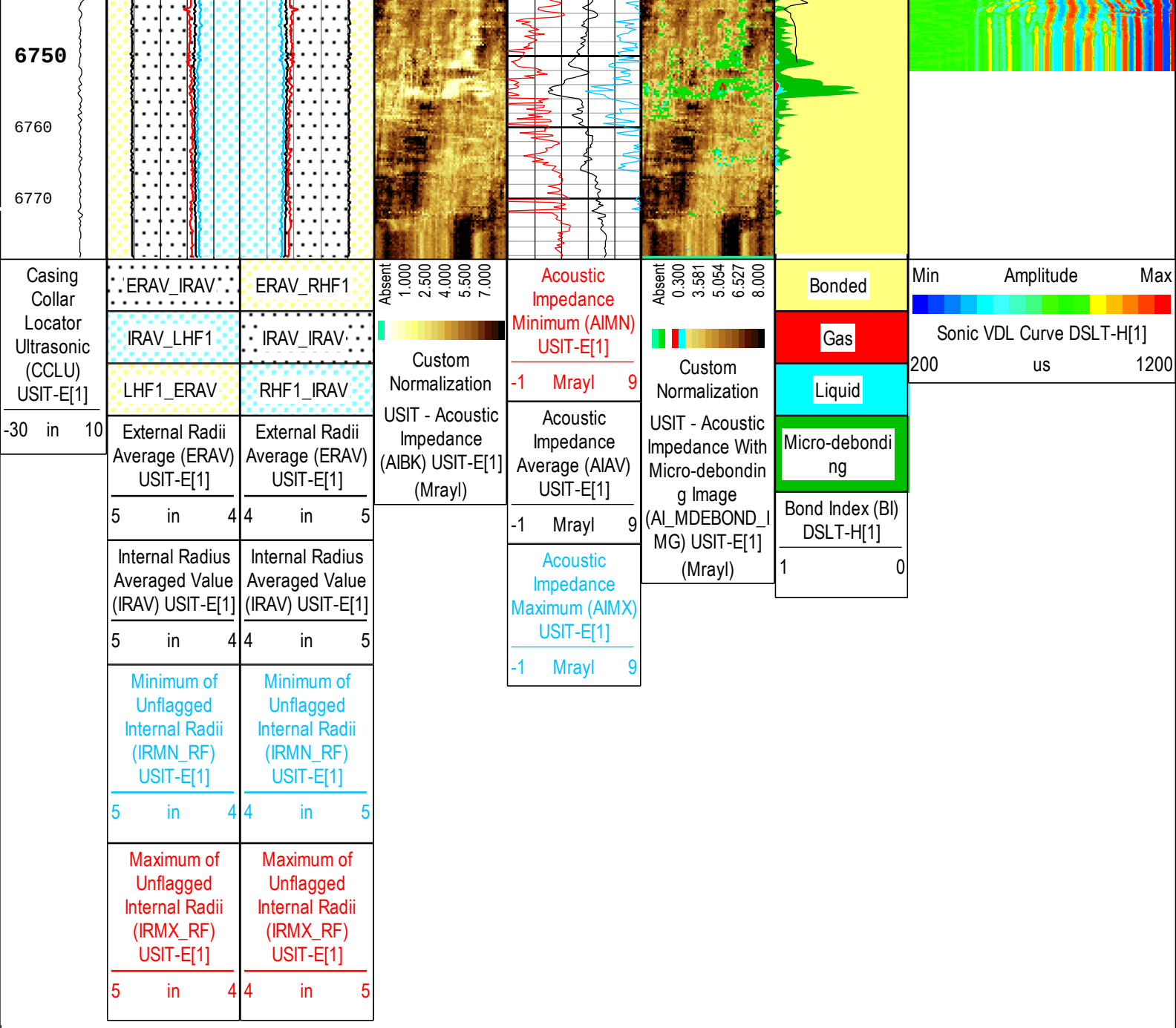


TIME_1900 - Time Marked every 60.00 (s)

Description: USI VDL Cement Format: Log (LBV1_USI-VDL (DSLT) Cement 9.625inch) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 22-Mar-2016 16:04:29

Channel Processing Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
AMSG	Auxiliary Minimum Sliding Gate	DSLT-H	140	us
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BERJ	Bad Echo Rejection	USIT-E	On	
BILI	Bond Index Level for Zone Isolation	DSLT-H	0.8	
BS	Bit Size	WLSESSION	12.25	in
CASING_PRATIO	Casing Poisson Ratio	USIT-E	Standard Poisson Ratio	
CBLG	CBL Gate Width	DSLT-H	45	us
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSLT-H	52	mV
CMCF	CBL Cement Type Compensation Factor	DSLT-H	1	
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.472	in

DETE	Delta-T Detection	DSLT-H	E1	
DFD	Drilling Fluid Density	Borehole	8.6	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	190	us/ft
FCF	CBL Fluid Compensation Factor	DSLT-H	0.91	
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
GOBO_CURR	Good Bond in Arbitrary Cement	DSLT-H	4.79	mV
HEMA	Hematite Presence Flag	Borehole	No	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MAHTR	Manual High Threshold Reference for first arrival detection	DSLT-H	120	
MATT_CURR	Maximum Attenuation in Arbitrary Cement	DSLT-H	9.3	dB/ft
MCI	Minimum Cemented Interval for Isolation	DSLT-H	Depth Zoned	ft
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	29.67	us
MNHTR	Minimum High Threshold Reference for first arrival detection	DSLT-H	100	
MSA	Minimum Sonic Amplitude	DSLT-H	2.64	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	DSLT-H	2.64	mV
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.03	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1	
NMSG	Near Minimum Sliding Gate	DSLT-H	325	us
NMXG	Near Maximum Sliding Gate	DSLT-H	940	us
NUMP	Number of Detection Passes	DSLT-H	2	
OPLEV	USIT Remove Flagged Data Level	USIT-E	OPT2	
RCOD	Reference Calibrator Outer Diameter	USIT-E	7	in
RCSO	Reference Calibrator Standoff	USIT-E	1.378	in
RCTH	Reference Calibrator Thickness	USIT-E	0.295	in
SDNV	Number of Vertical Samples used for Micro-debonding Computation	USIT-E	5	
SDTHOR	Acoustic Impedance STD Horizontal Threshold for Micro-debonding	USIT-E	0.5	Mrayl
SDTVER	Acoustic Impedance STD Vertical Threshold for Micro-debonding	USIT-E	0.3	Mrayl
SFAF	Sonic Formation Attenuation Factor	DSLT-H	3.25	dB/ft
SGAD	Sliding Gate Status	DSLT-H	Off	
SGCL	Sliding Gate Closing Delta-T	DSLT-H	130	us/ft
SGCW	Sliding Gate Closing Width	DSLT-H	25	us
SGDT	Sliding Gate Delta-T	DSLT-H	57	us/ft
SGW	Sliding Gate Width	DSLT-H	110	us
SLEV	Signal Level for AGC	DSLT-H	5000	mV
TCUB	T^3 Processing Level	USIT-E	Loop	
THDH	Maximum Search Thickness (percentage of nominal)	USIT-E	130	%
THDL	Minimum Search Thickness (percentage of nominal)	USIT-E	70	%
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0.1	Mrayl
UFGDE	Fiberglass Density	USIT-E	1.95	g/cm3
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.	
THDP	Thickness Detection Policy	USIT-E	Fundamental	
VCAS	Ultrasonic Transversal Velocity in Casing	USIT-E	51.4	us/ft
VDLG	VDL Manual Gain	DSLT-H	5	

ZCAS	Acoustic Impedance of Casing	USIT-E	46.25	Mrayl
ZCMT	Acoustic Impedance of Cement	DSLT-H	6.8	Mrayl
ZCMT_NEAT	Acoustic Impedance of Cement in Neat Cement	DSLT-H	6.8	Mrayl
ZINI	Initial Estimate of Cement Impedance	USIT-E	-1	Mrayl
ZMUD	Acoustic Impedance of Mud	Borehole	1.6	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.6	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

OneDepth Zoned Parameters

Parameter	Value	Start (ft)	Stop (ft)
MCI	21.68	22.5	862
MCI	14.81	862	6778.5

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
DDEL	Digitizing Delay	DSLT-H	0	us
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
DOT(DOS)	Distance between Opposite Transducer Faces	USIT-E	4.874	in
MODE	DSLT Acquisition Mode	DSLT-H	CBL	
RATE	DSLT Firing Rate	DSLT-H	15 Hz	
DTFS	DSLT Telemetry Frame Size	DSLT-H	536	
DWCO	Digitizer Word Count	DSLT-H	250	
EMXV	EMEX Voltage	USIT-E	40	V
HRES	Horizontal Resolution	USIT-E	5 deg	
MOTOR_PROTECT	Motor Protection	USIT-E	On	
SDTH	Switch Down Threshold	DSLT-H	20000	
SGAI	Selectable Acquisition Gain	DSLT-H	x1	
SUTH	Switch Up Threshold	DSLT-H	1000	
TMUC	Type of Mud	USIT-E	BRI	
UACLV_PERM	Ultrasonic ACLV Permanent	USIT-E	No	
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 500 KHz	
UWKM	USIT Working Mode	USIT-E	Uncompressed 5 deg at 3.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	6760	ft
USSP	Ultrasonic Service	USIT-E	USI	
VRES	Vertical Resolution	USIT-E	3.0 in	
WINB	Window Begin Time	USIT-E	Time Zoned	us
WINE	Window End Time	USIT-E	Time Zoned	us
WMOD	Waveform Firing Mode	DSLT-H	Full	

OneTime Zoned Parameters

Pass Log[6]:Up

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
WINB	25	22-Mar-2016 09:40:40	22-Mar-2016 12:25:51	6778.76	118.51
WINB	25	22-Mar-2016 12:25:51	22-Mar-2016 12:29:24	118.51	50.26

WINE	95	22-Mar-2016 09:40:40	22-Mar-2016 12:25:49	6778.76	119.95
WINE	97.59	22-Mar-2016 12:25:49	22-Mar-2016 12:29:24	119.95	50.26

Pass Log[9]:Up

WINB	20	22-Mar-2016 13:45:23	22-Mar-2016 13:53:14	449.65	174.73
WINE	95	22-Mar-2016 13:45:23	22-Mar-2016 13:53:14	449.65	174.73

All depth are at tool zero.

Composite 1

Main Pass 5 IN = 100 FT

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[6]:Up	Up	42.10 ft	6778.78 ft	22-Mar-2016 9:40:40 AM	22-Mar-2016 12:29:24 PM	ON	0.00 ft	Yes
One	Log[9]:Up	Up	79.40 ft	514.04 ft	22-Mar-2016 1:43:41 PM	22-Mar-2016 1:53:14 PM	ON	1.22 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Southern California Gas Company Well:Fernando Fee 38C

Composite 1:S007

Description: USI Composite Format: Log (LBV1_USI Composite 9.625inch) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth

Creation Date: 22-Mar-2016 16:04:56

TIME_1900 - Time Marked every 60.00 (s)

USIT Processing Flags (UFLG[0]) USIT-E[1]

1 - UFLG 1 Value within [0.0 - 1.5] - :

2 - UFLG 2 Value within [1.5 - 2.5] - :

3 - UFLG 3 Value within [2.5 - 3.5] - :

4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :

5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :

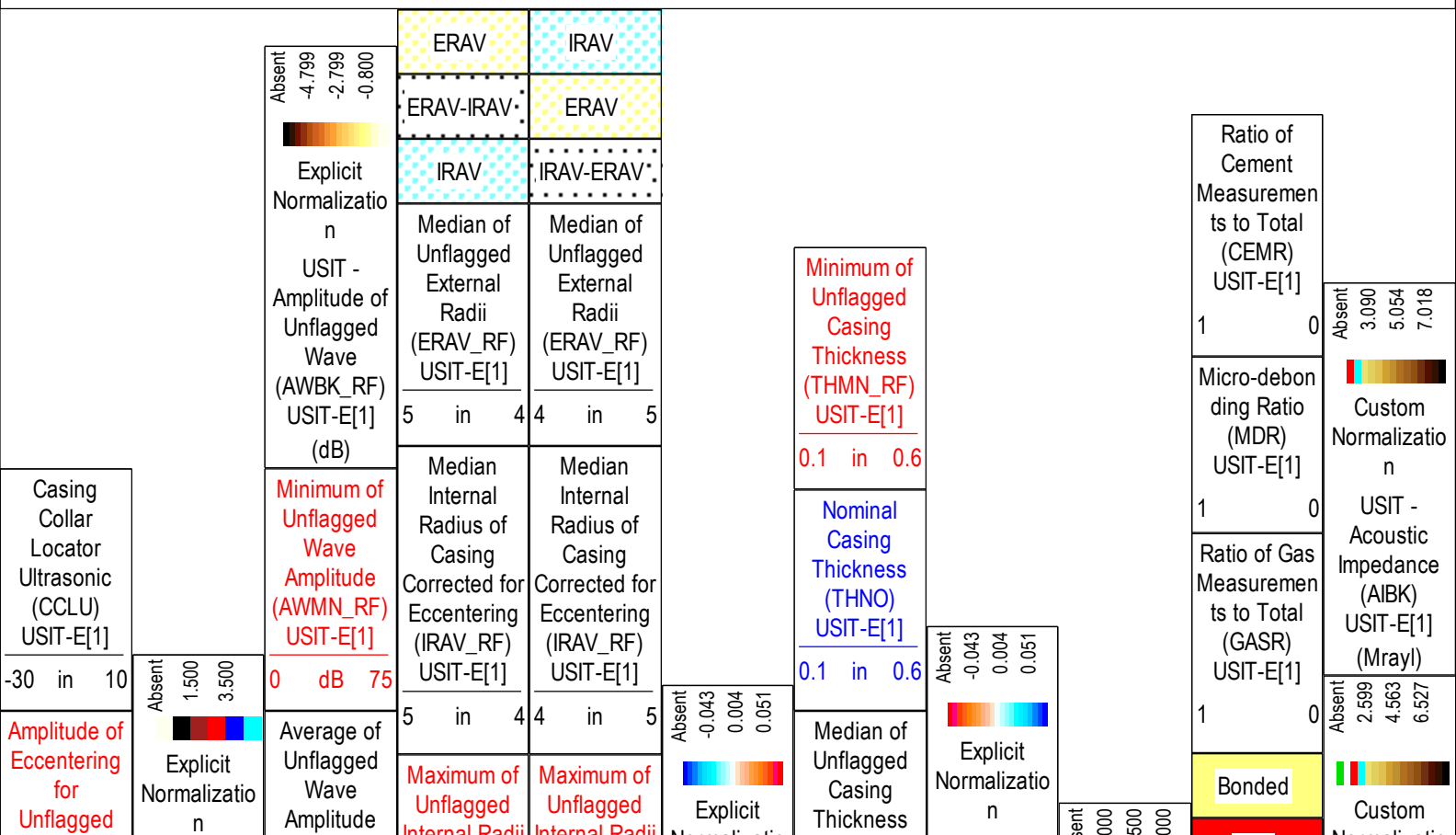
UTIM Error

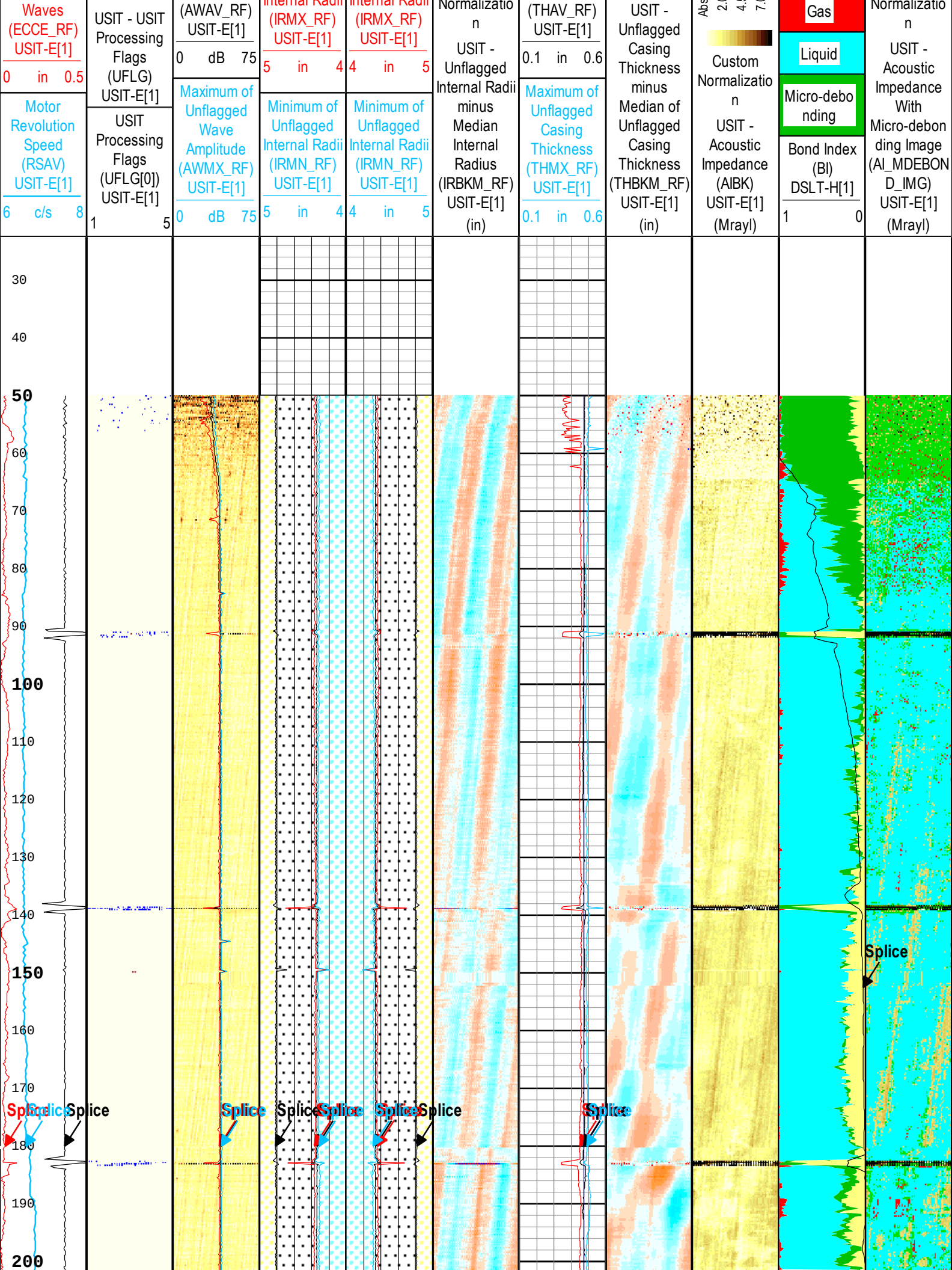
Pulse Origin Not Detected

WINLEN Error

Casing Thickness Error

Loop Processing Error




Waves (ECCE_RF) USIT-E[1]
0 in 0.5
Motor Revolution Speed (RSAV) USIT-E[1]
6 c/s 8
USIT - USIT Processing Flags (UFLG) USIT-E[1]
USIT Processing Flags (UFLG[0]) USIT-E[1]
1 5
(AWAV_RF) USIT-E[1]
0 dB 75
Maximum of Unflagged Wave Amplitude (AWMX_RF) USIT-E[1]
0 dB 75
Internal Radii (IRMX_RF) USIT-E[1]
5 in 4
Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E[1]
5 in 4
Internal Radii (IRMX_RF) USIT-E[1]
4 in 5
Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E[1]
4 in 5
Normalization
USIT - Unflagged Internal Radii minus Median Internal Radius (IRBKM_RF) USIT-E[1] (in)
(THAV_RF) USIT-E[1]
0.1 in 0.6
Maximum of Unflagged Casing Thickness (THMX_RF) USIT-E[1]
0.1 in 0.6
USIT - Unflagged Casing Thickness minus Median of Unflagged Casing Thickness (THBKM_RF) USIT-E[1] (in)
Custom Normalization
USIT - Acoustic Impedance (AIBK) USIT-E[1] (Mrayl)
Gas
Liquid
Micro-debonding
Bond Index (BI) DSLT-H[1]
1 0
Normalization
USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E[1] (Mrayl)
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140
150
160
170
180
190
200
Splice
Splice
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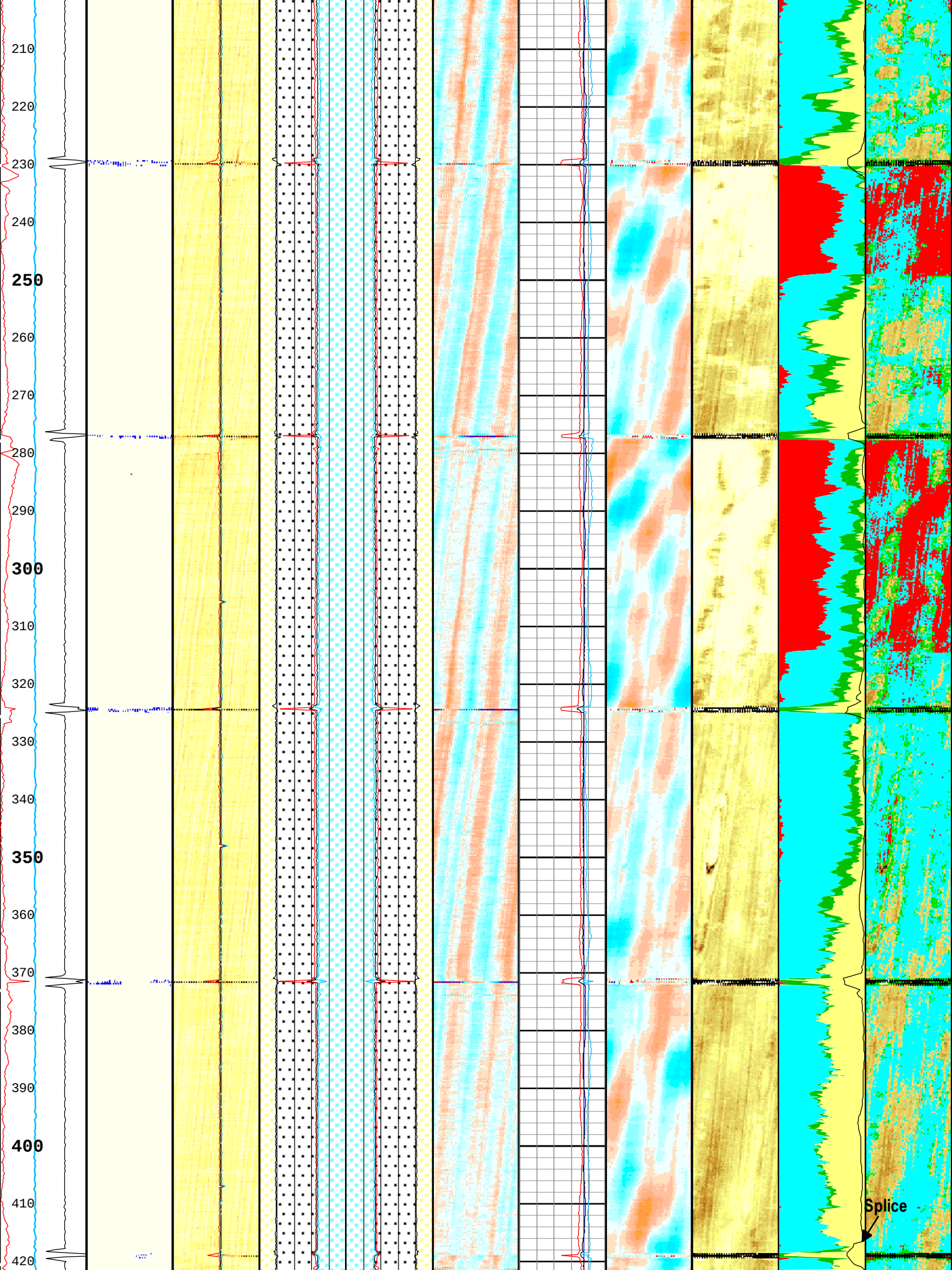
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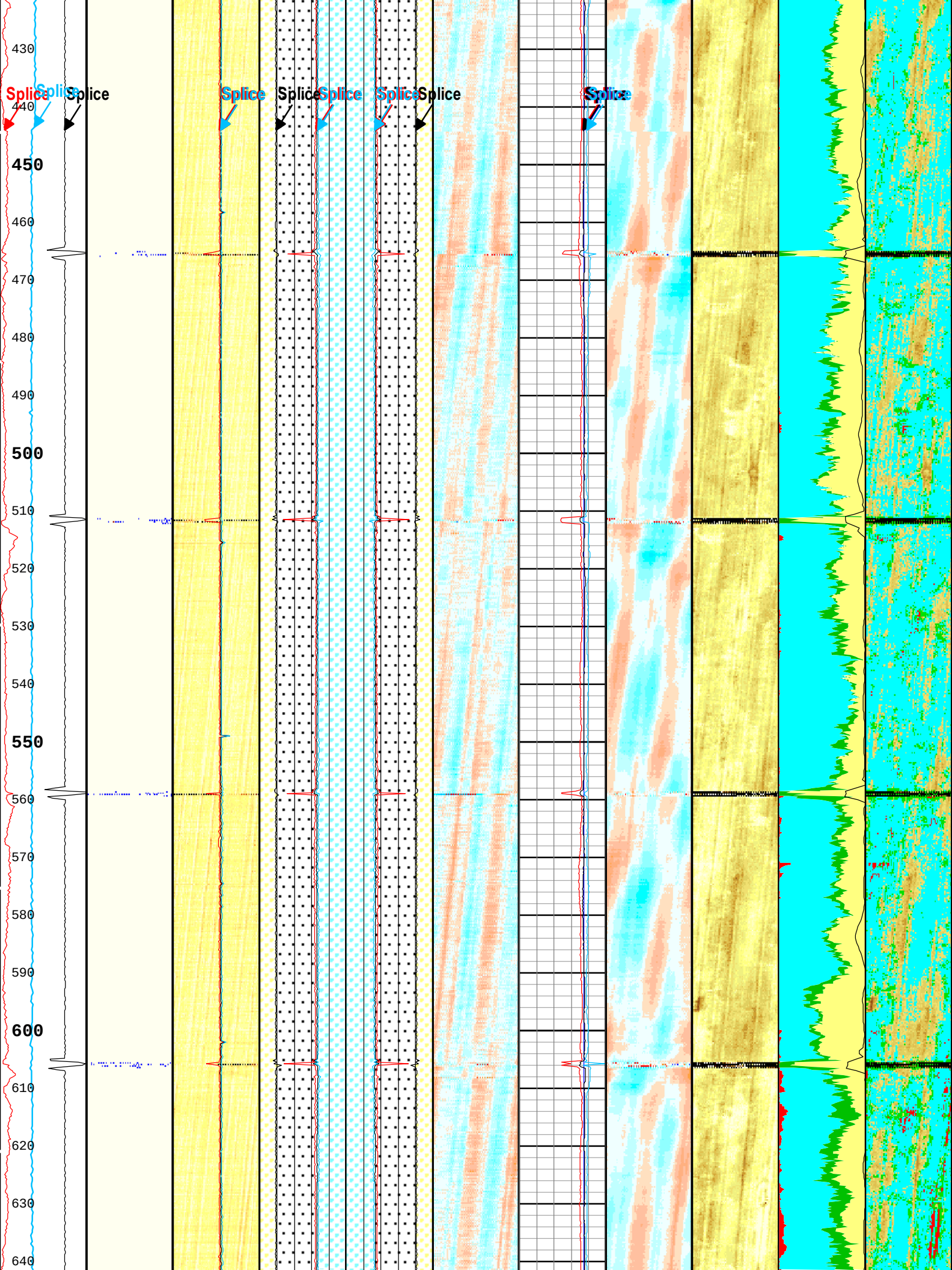
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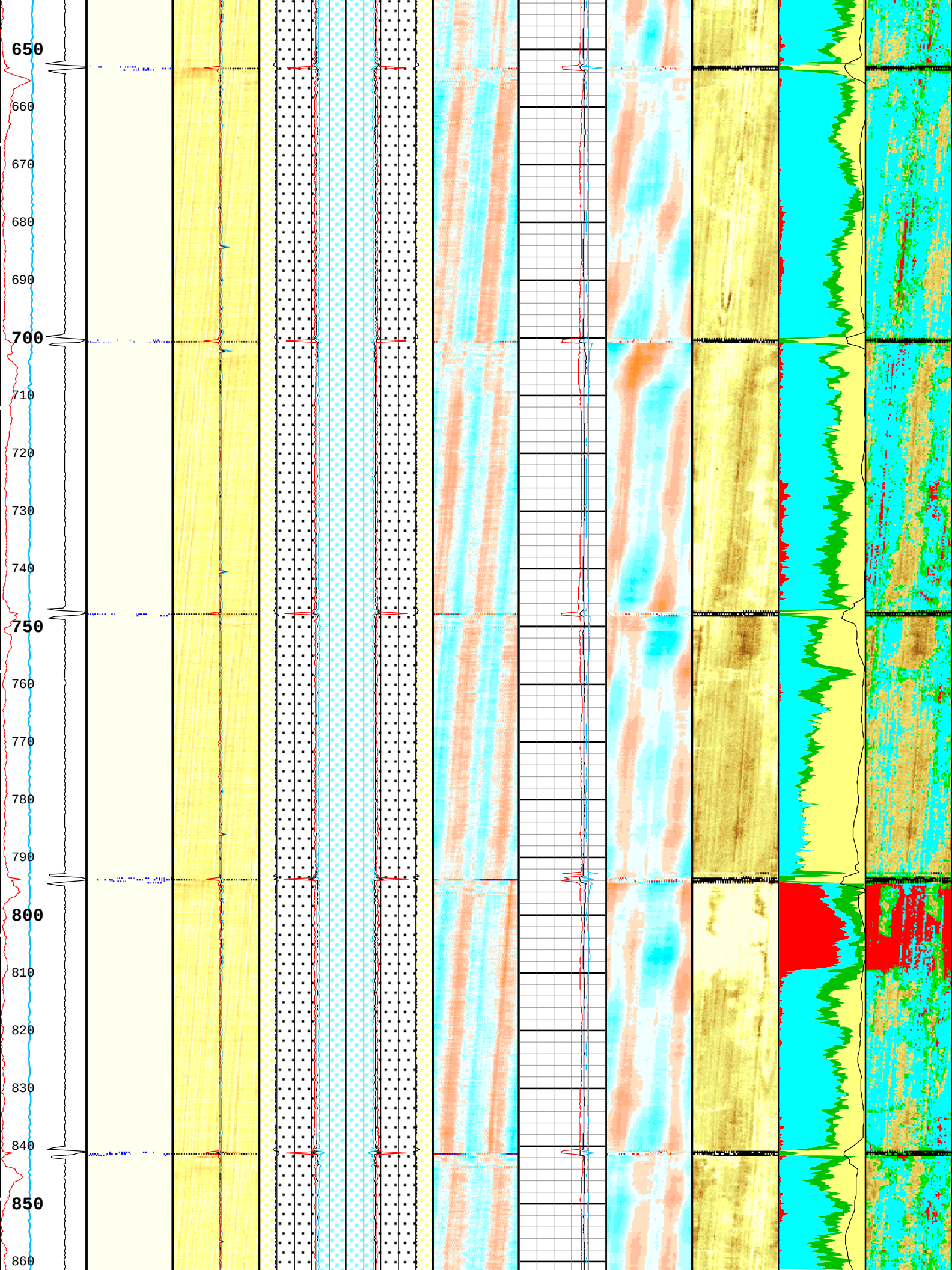
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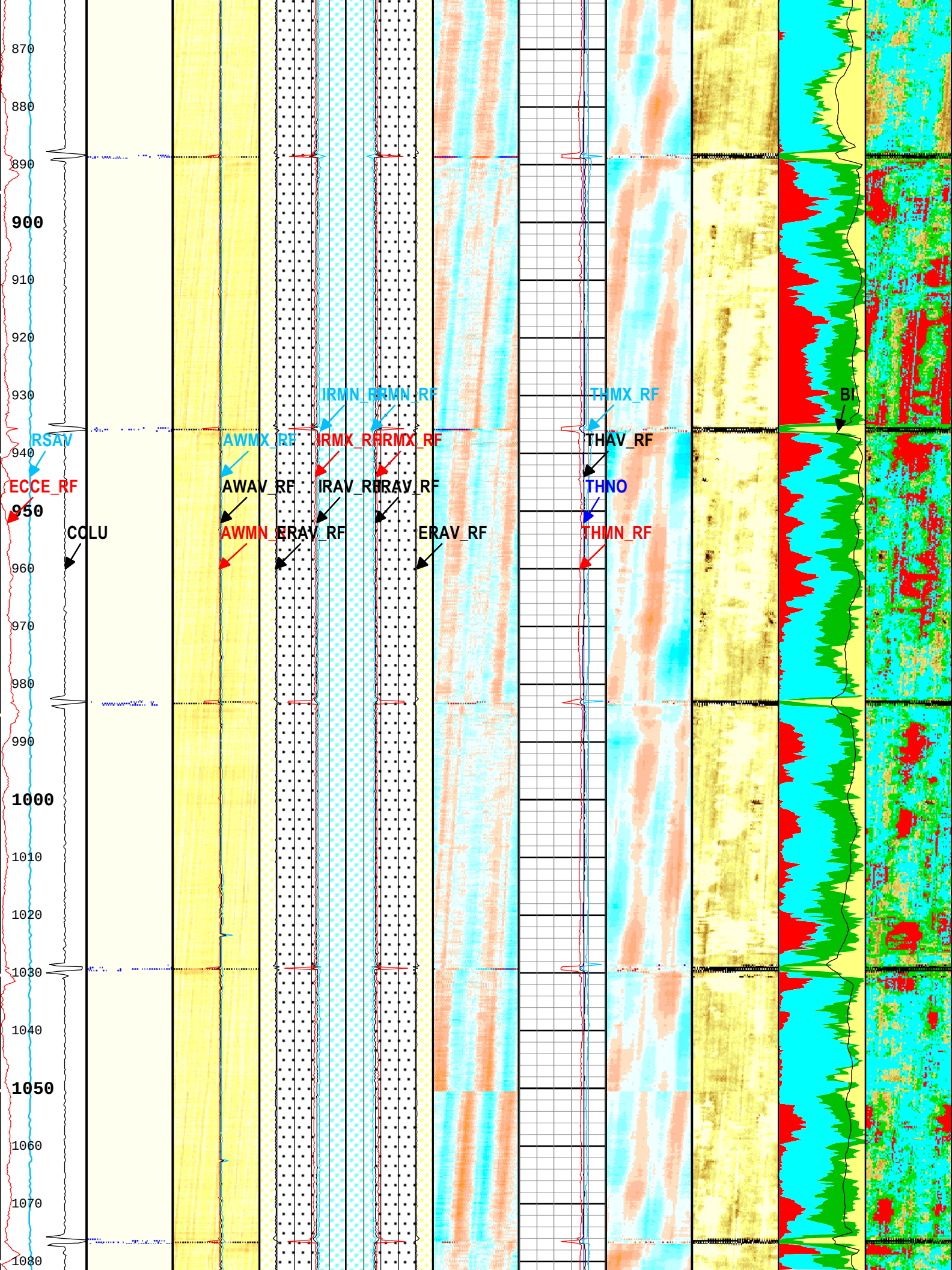
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RMX_RF
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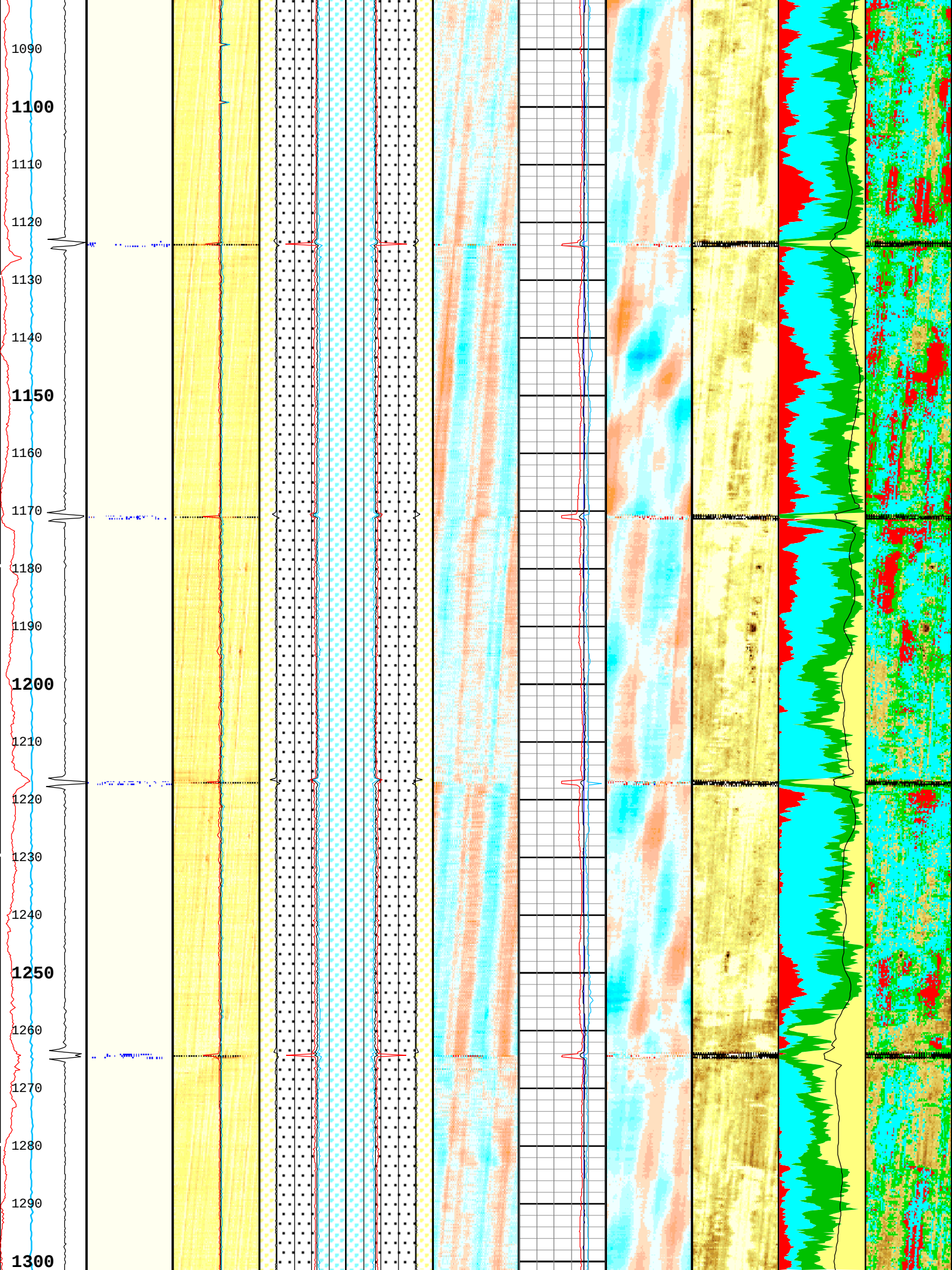
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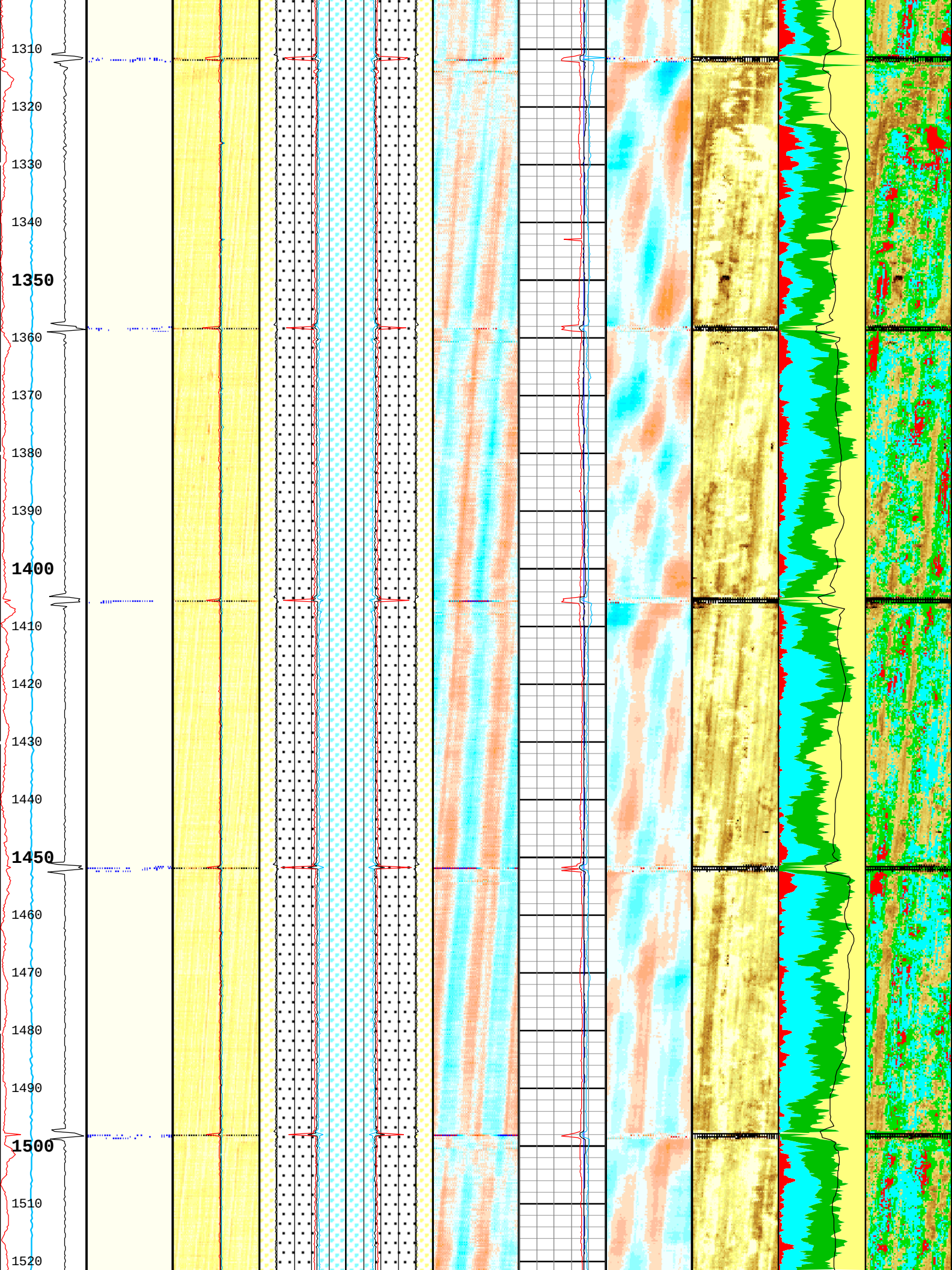
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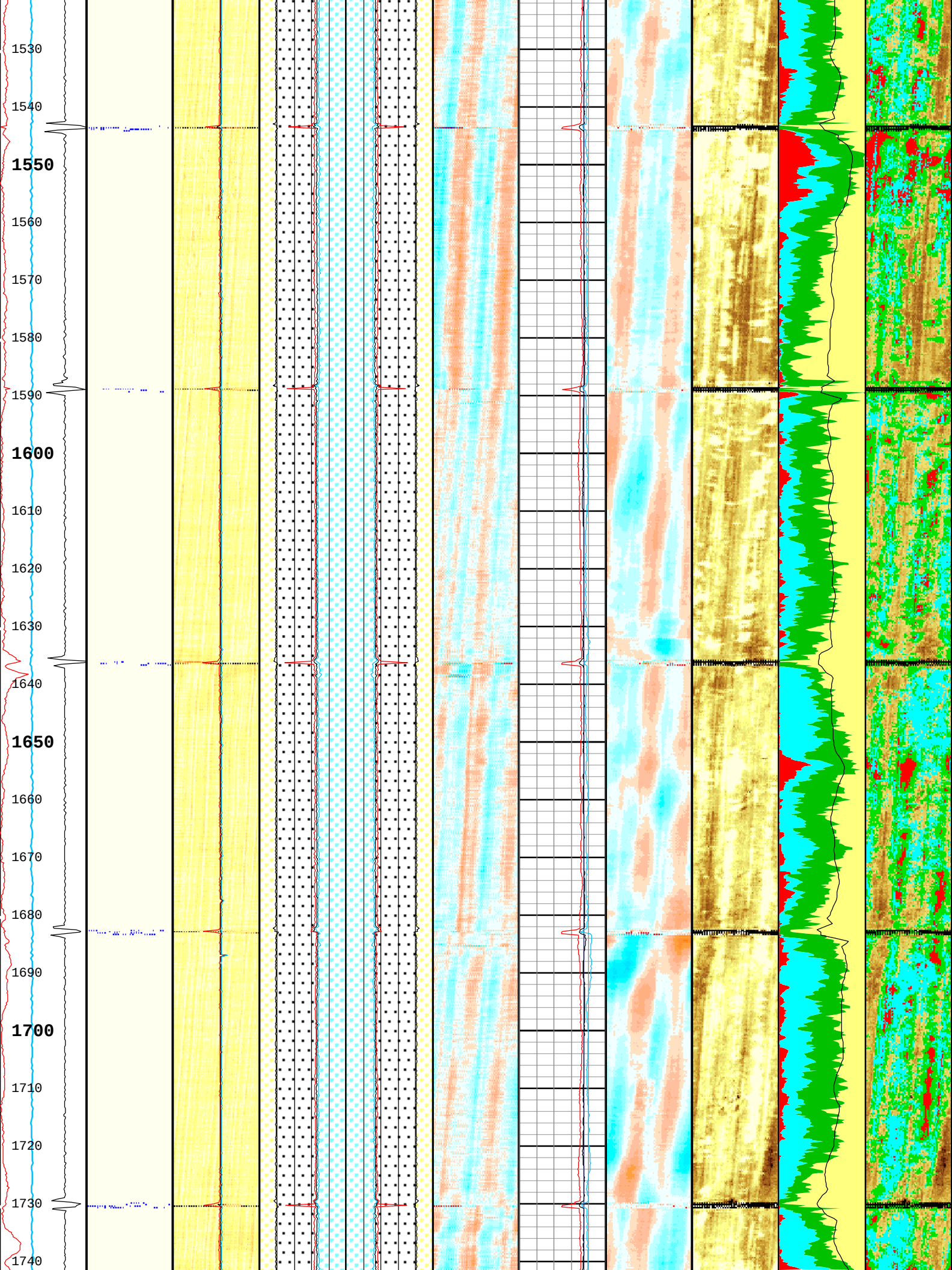
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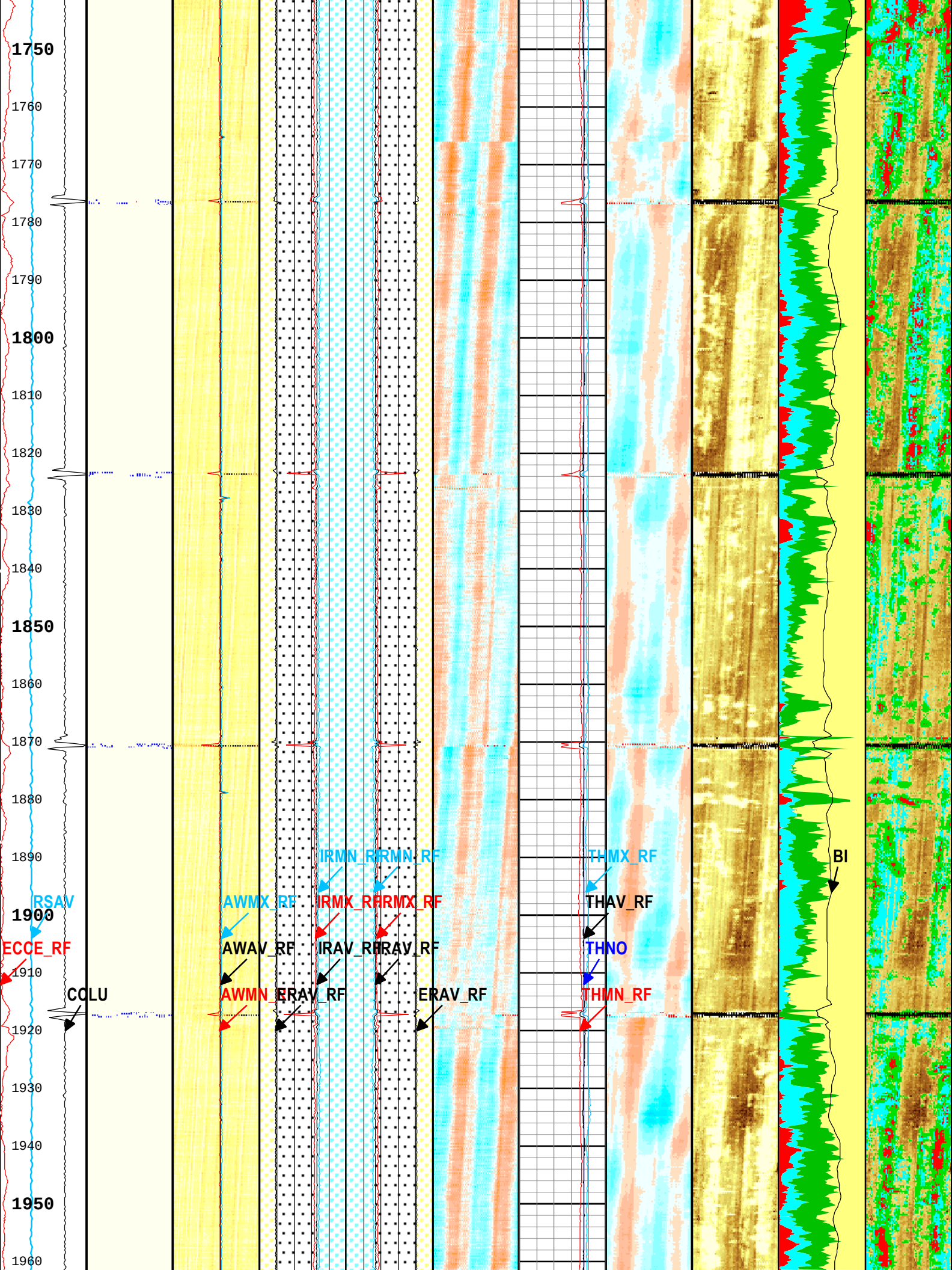
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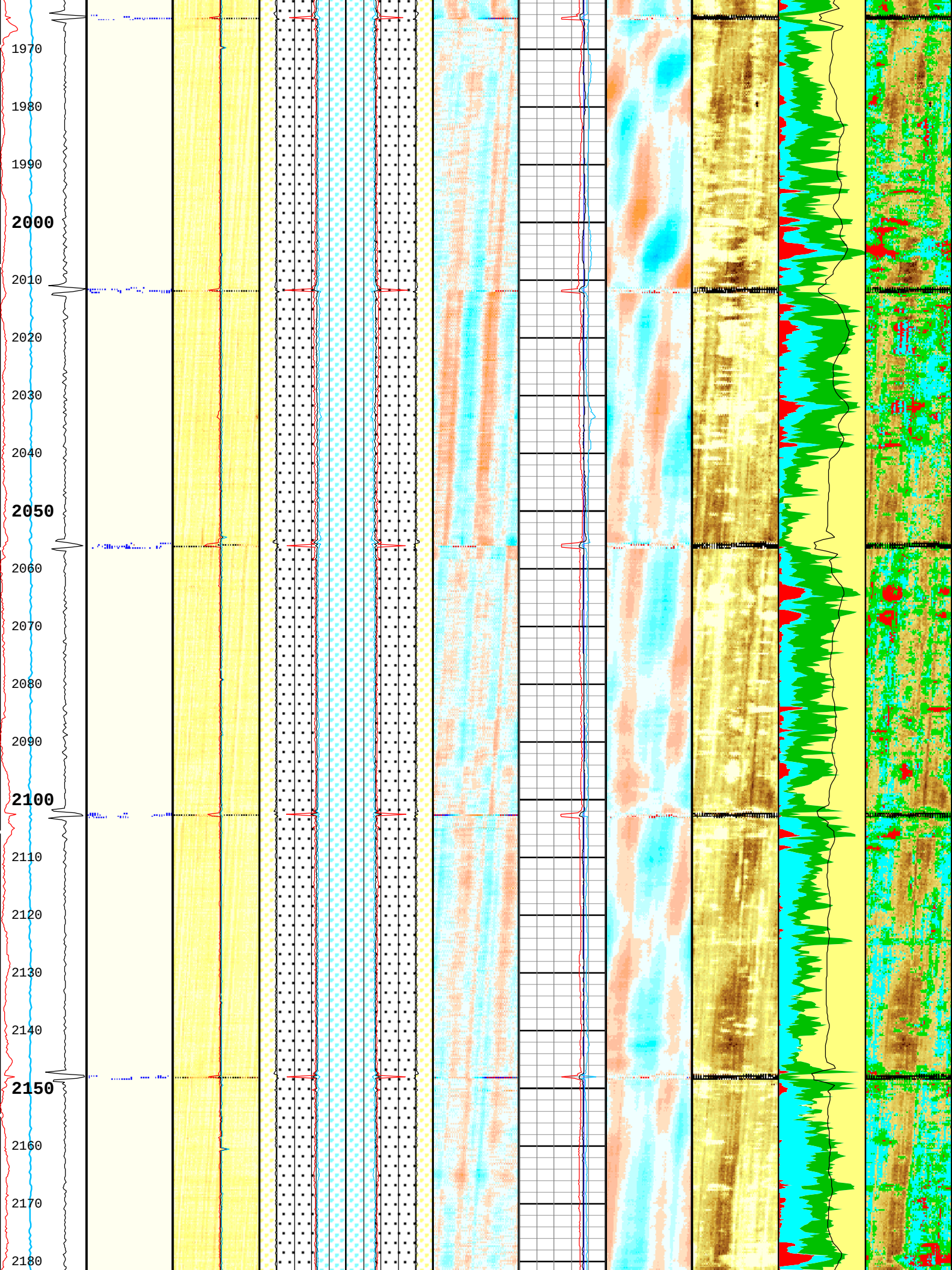
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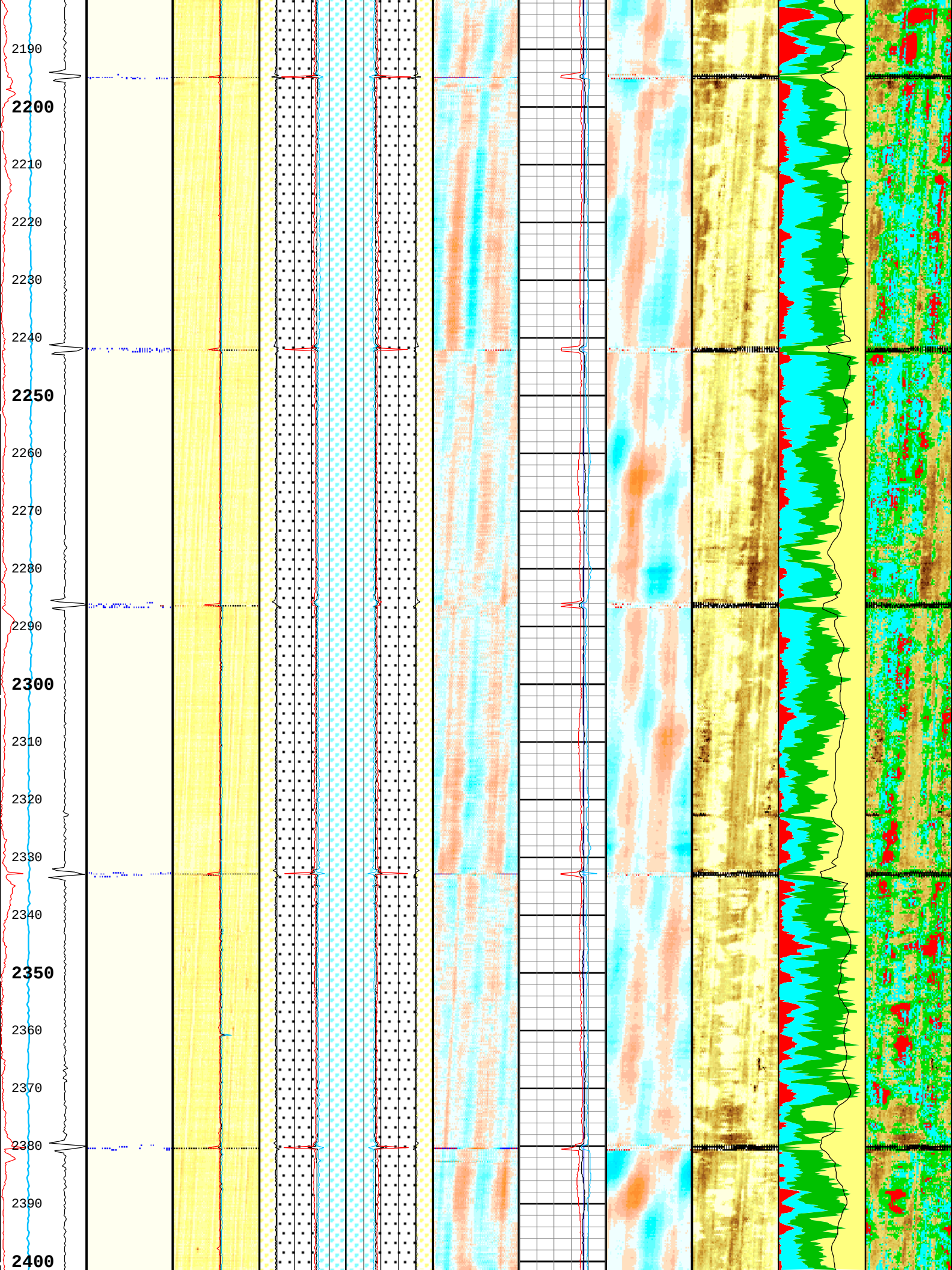
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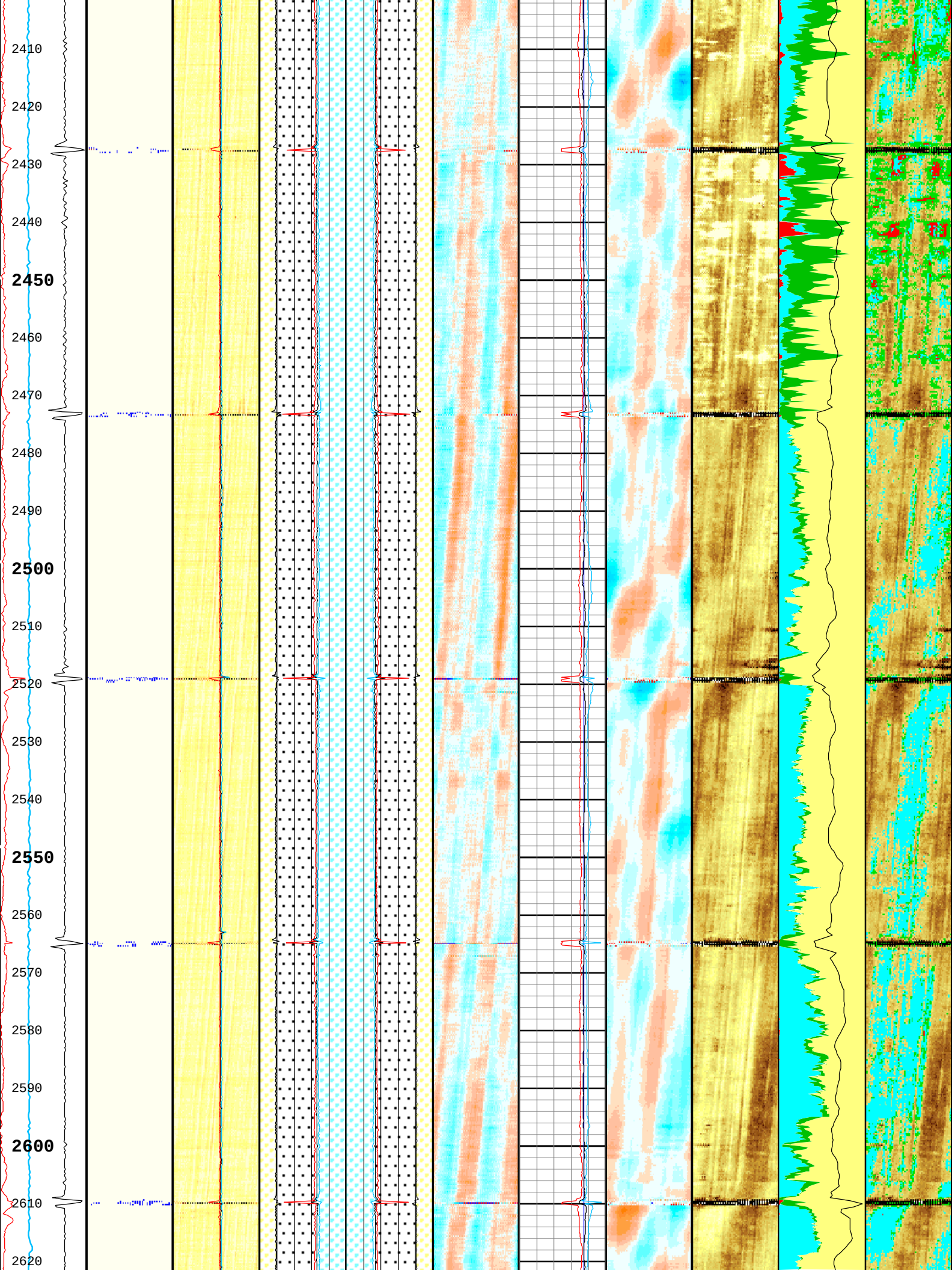
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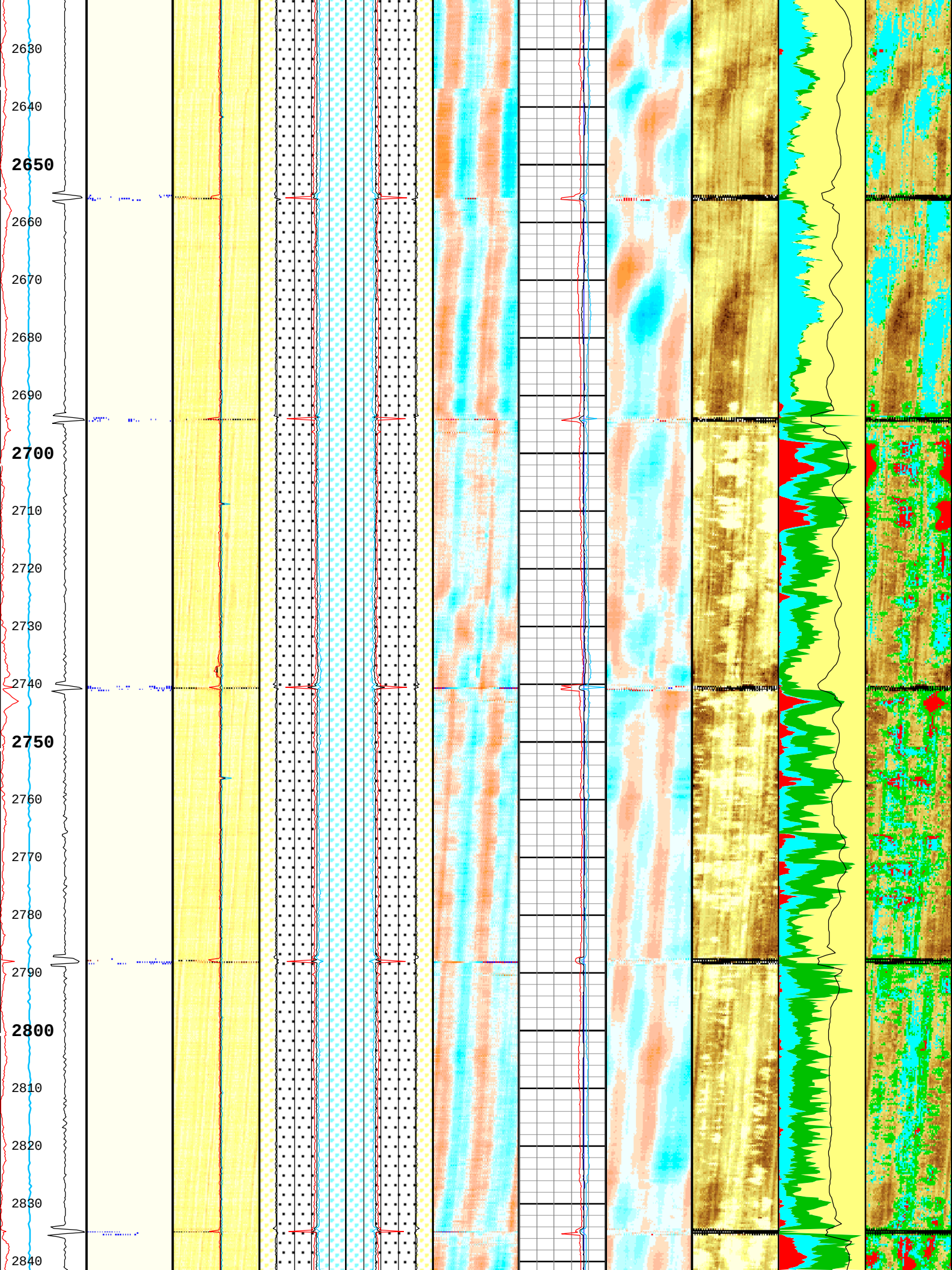
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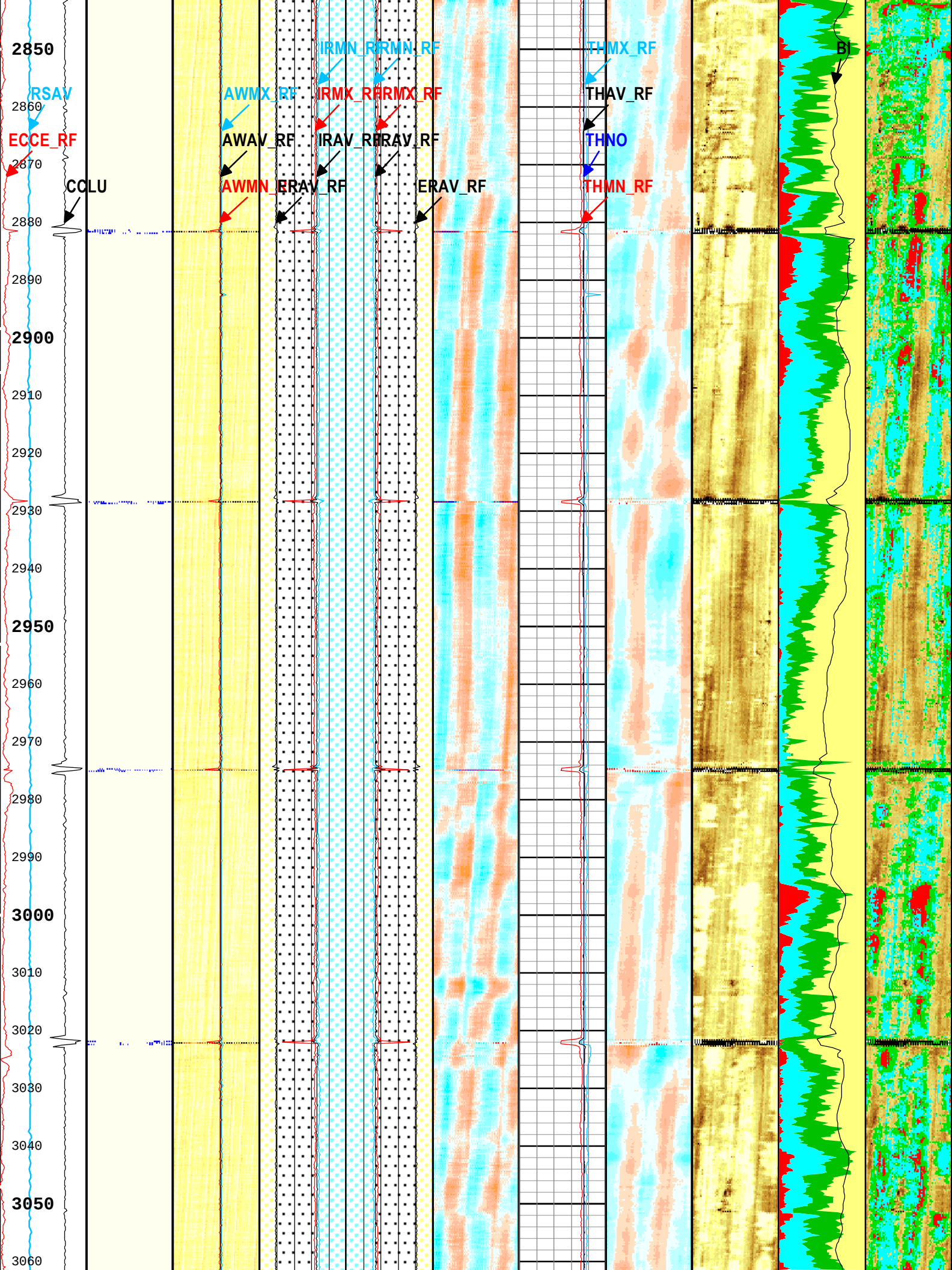
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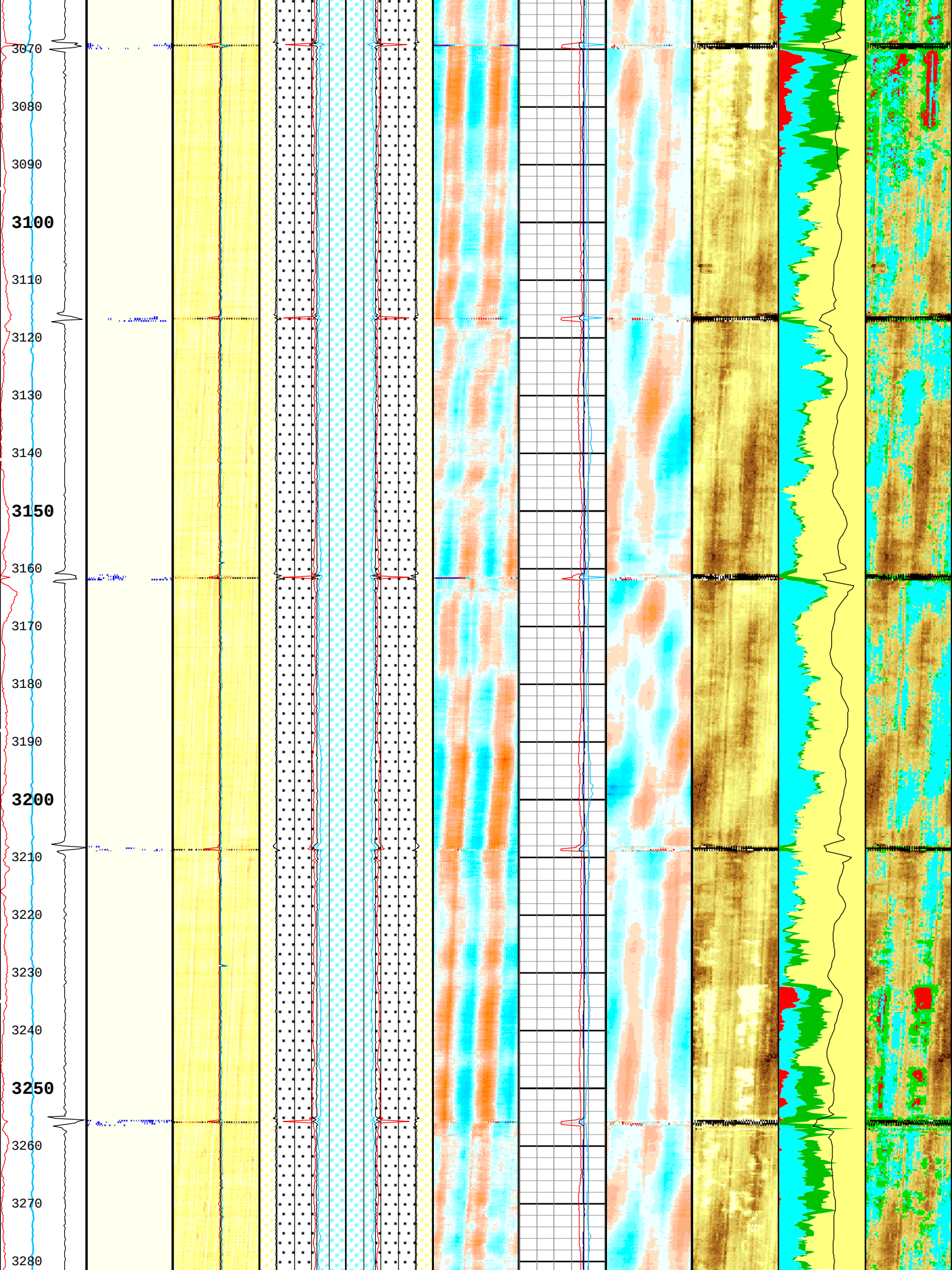
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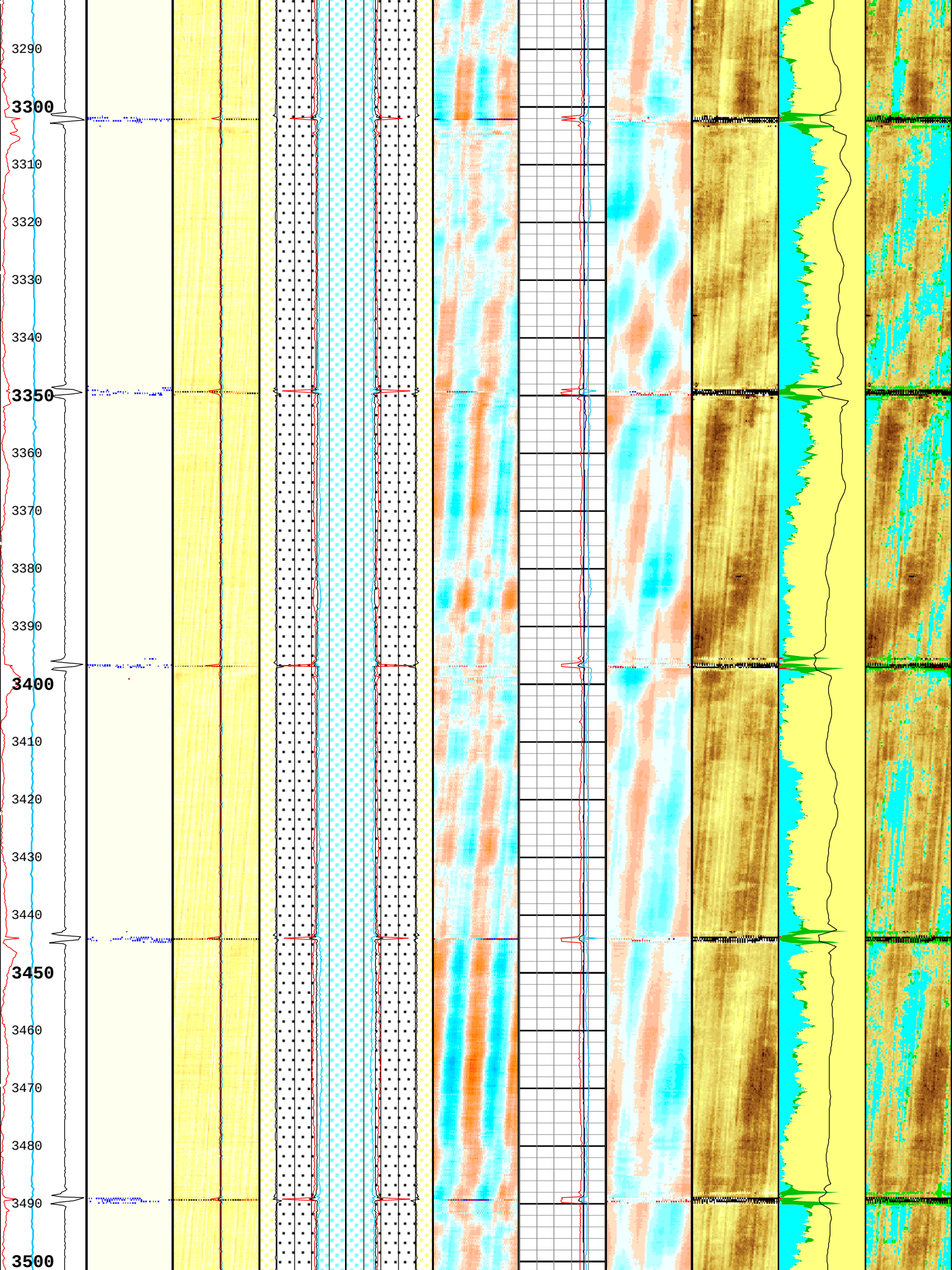
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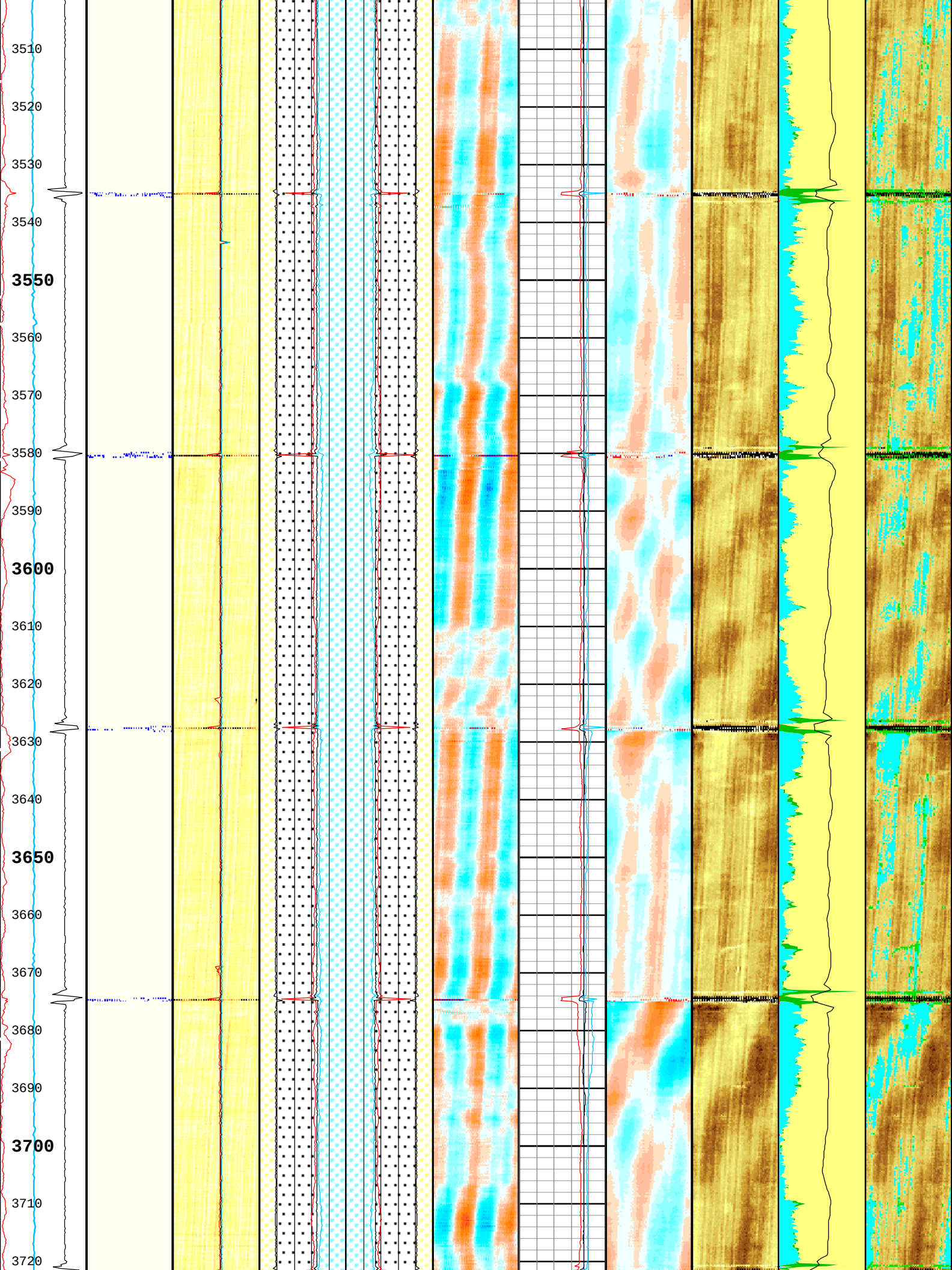
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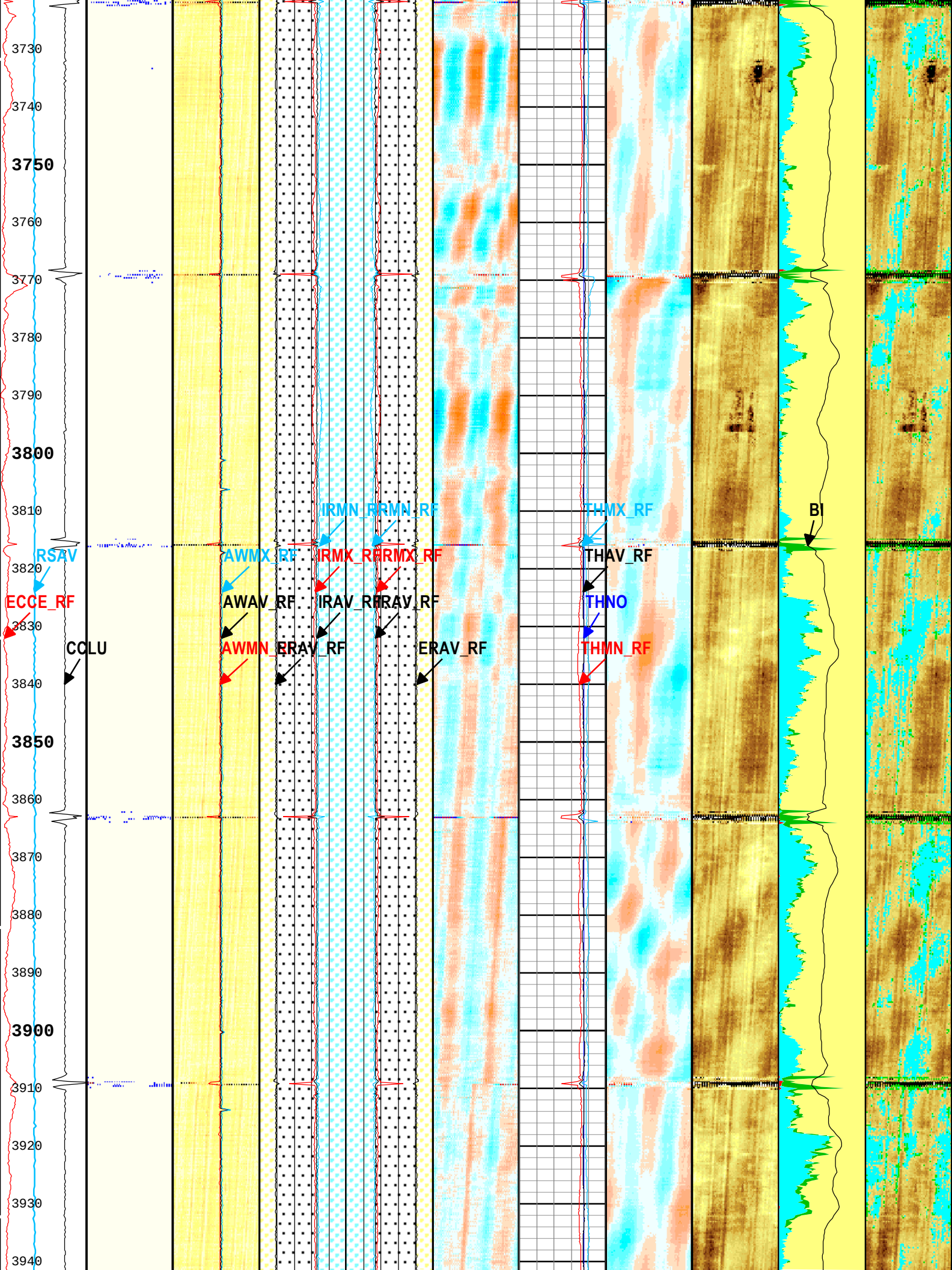
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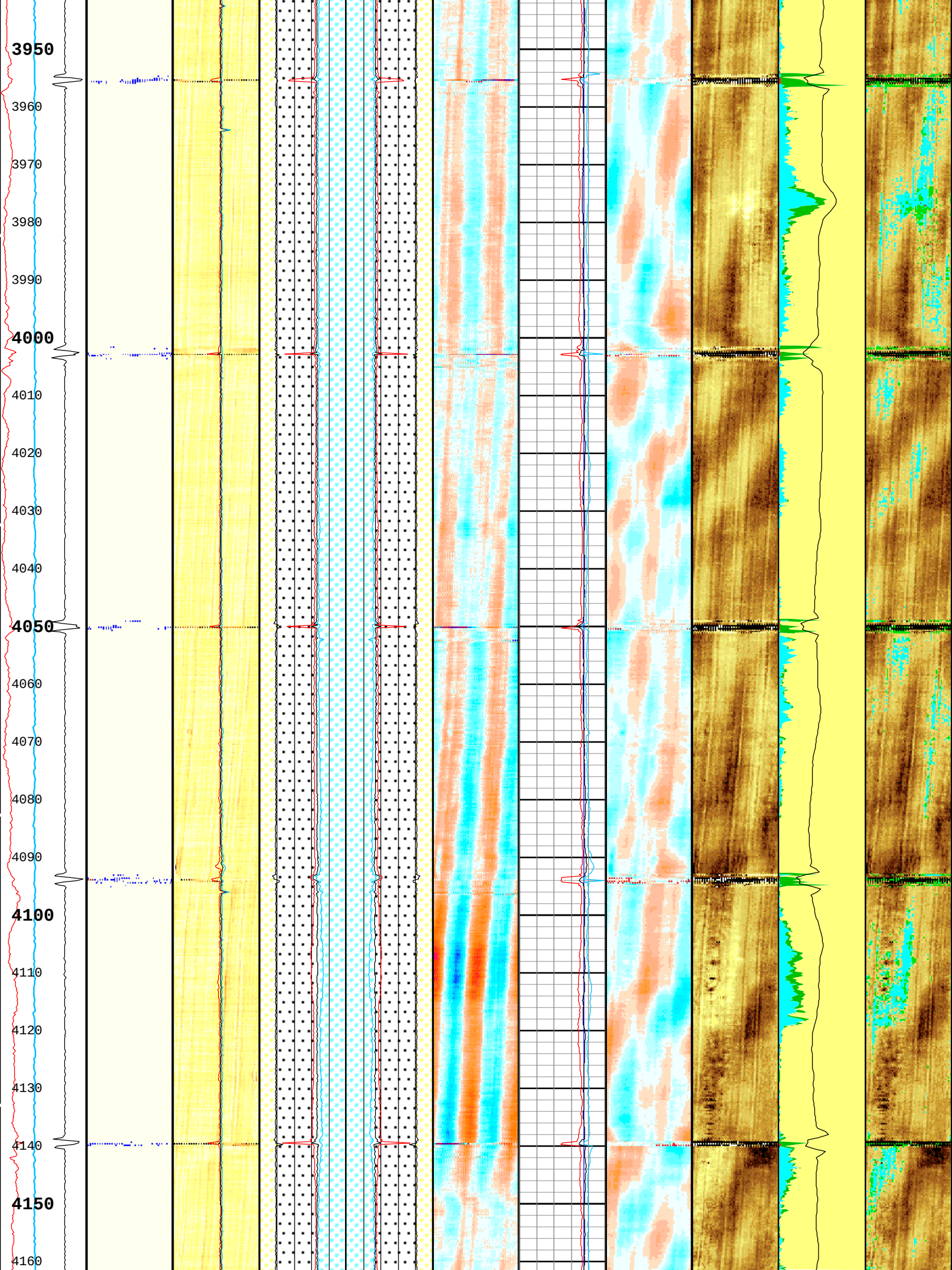
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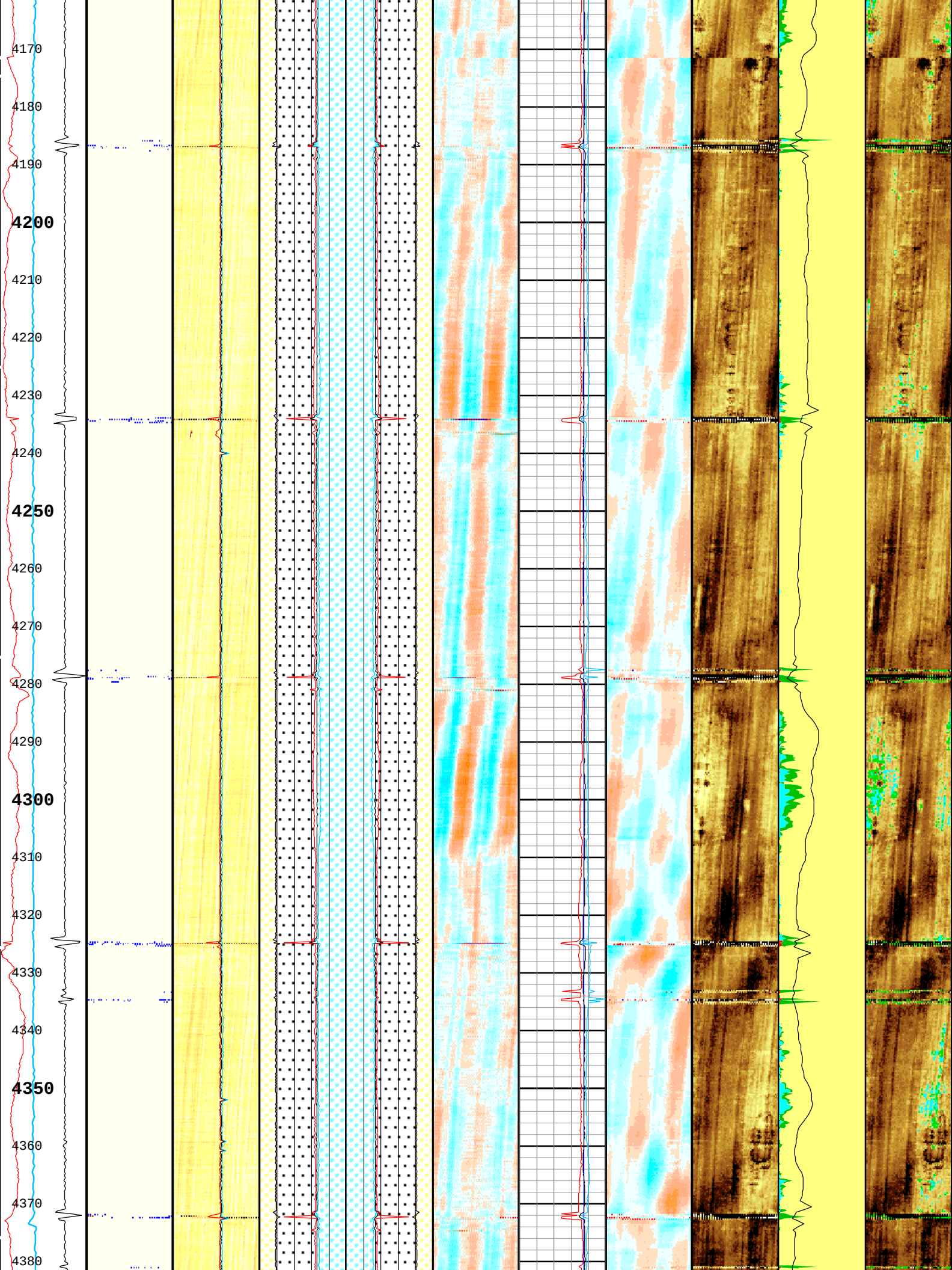
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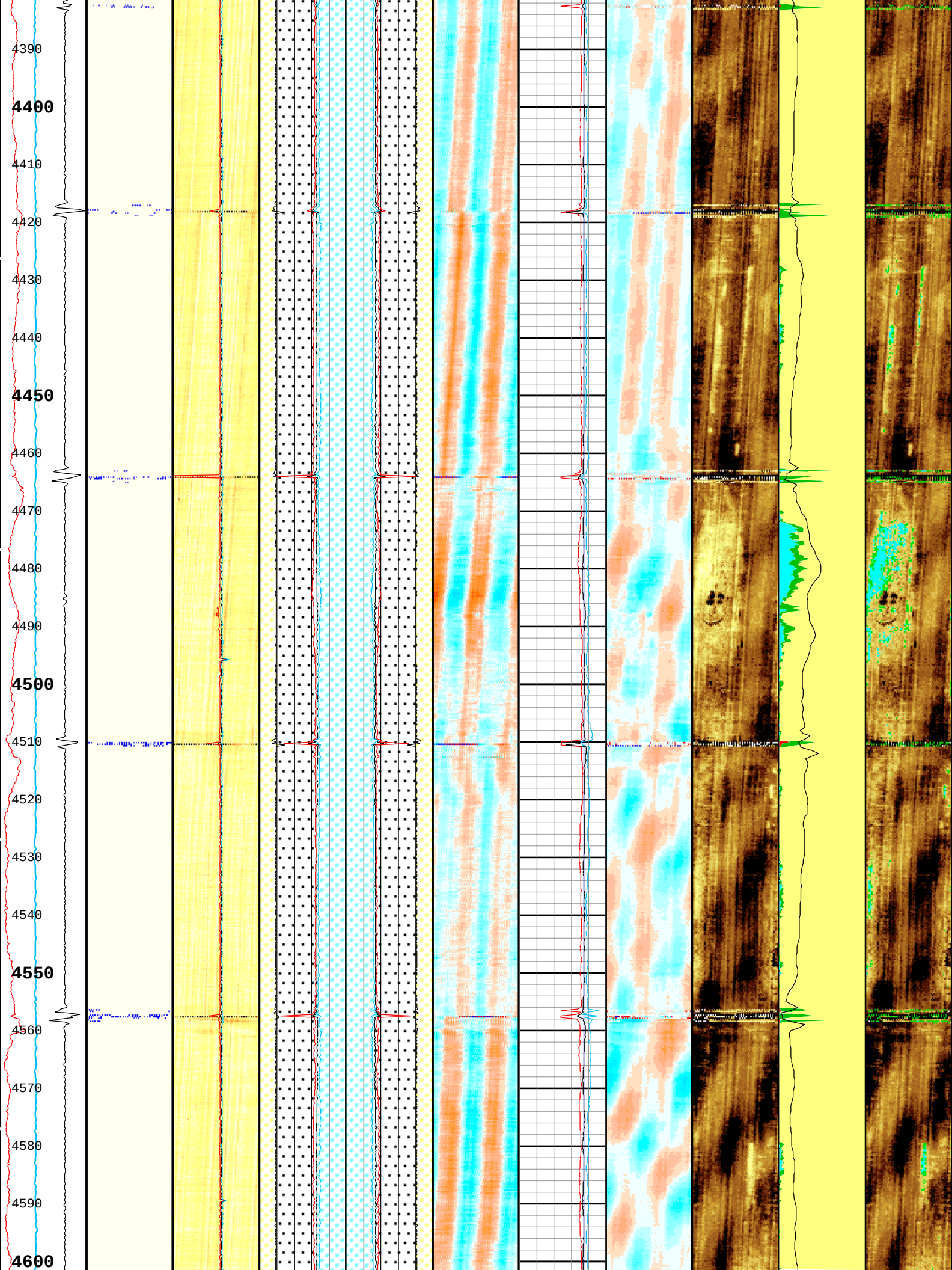
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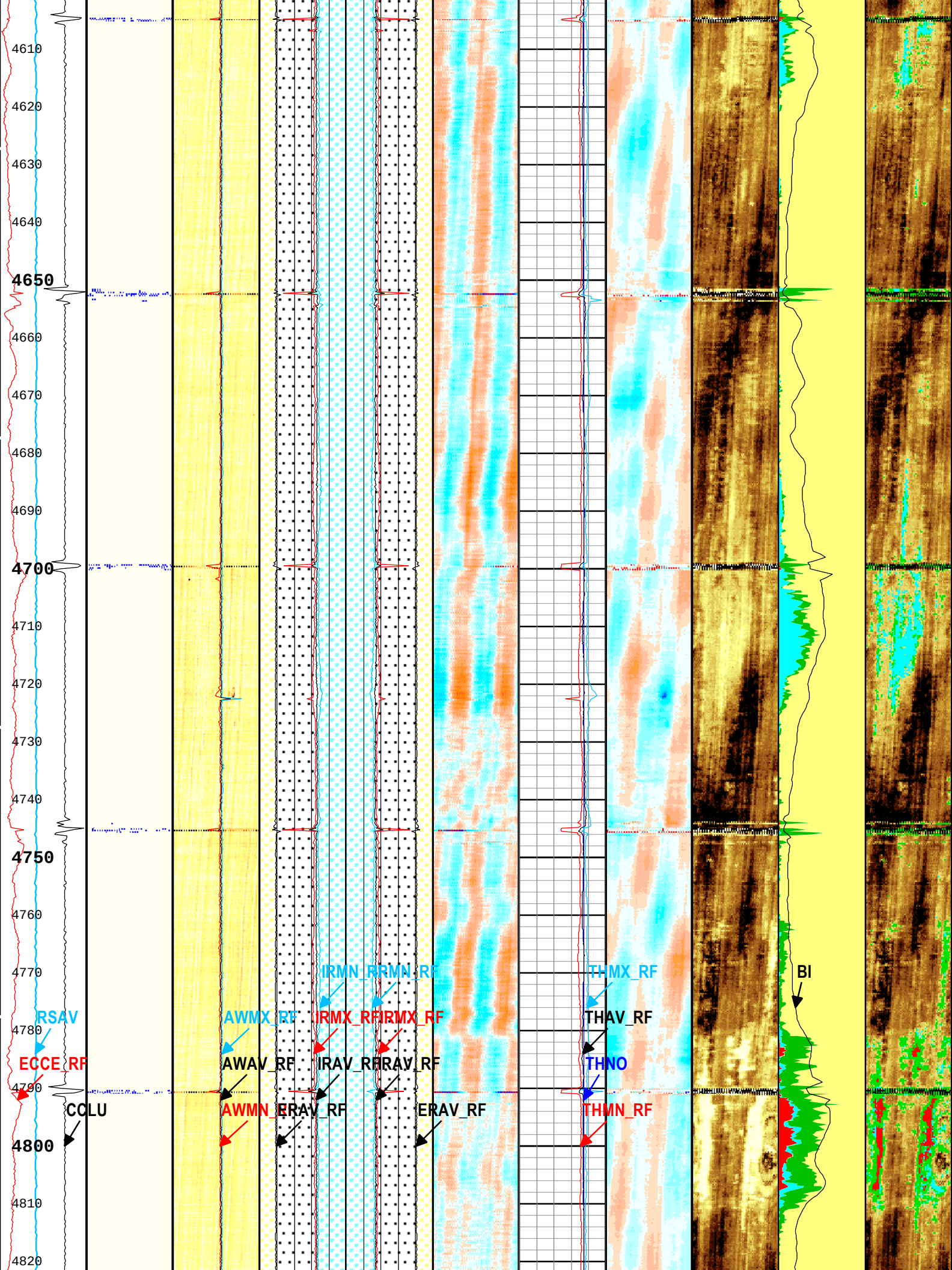
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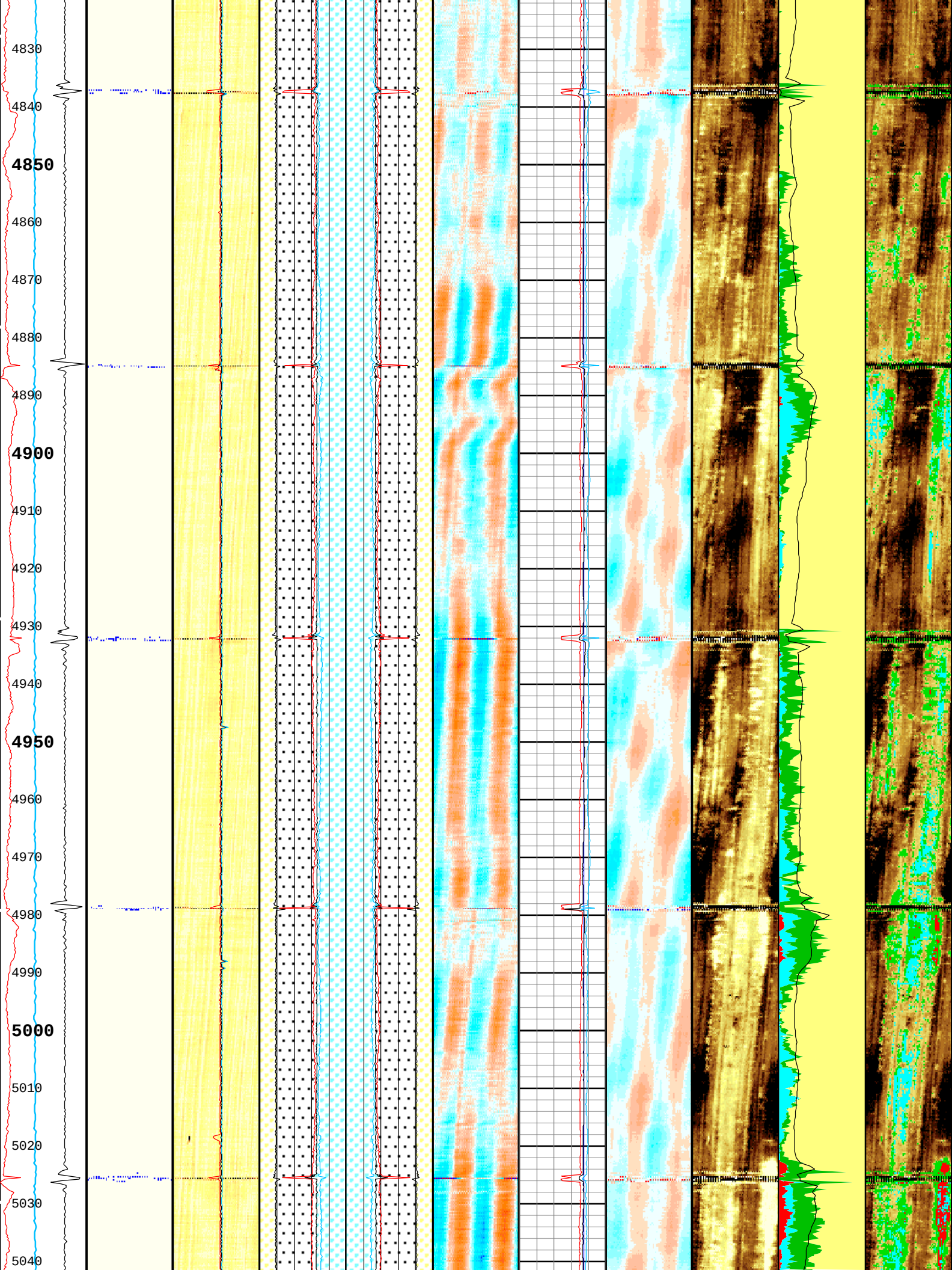
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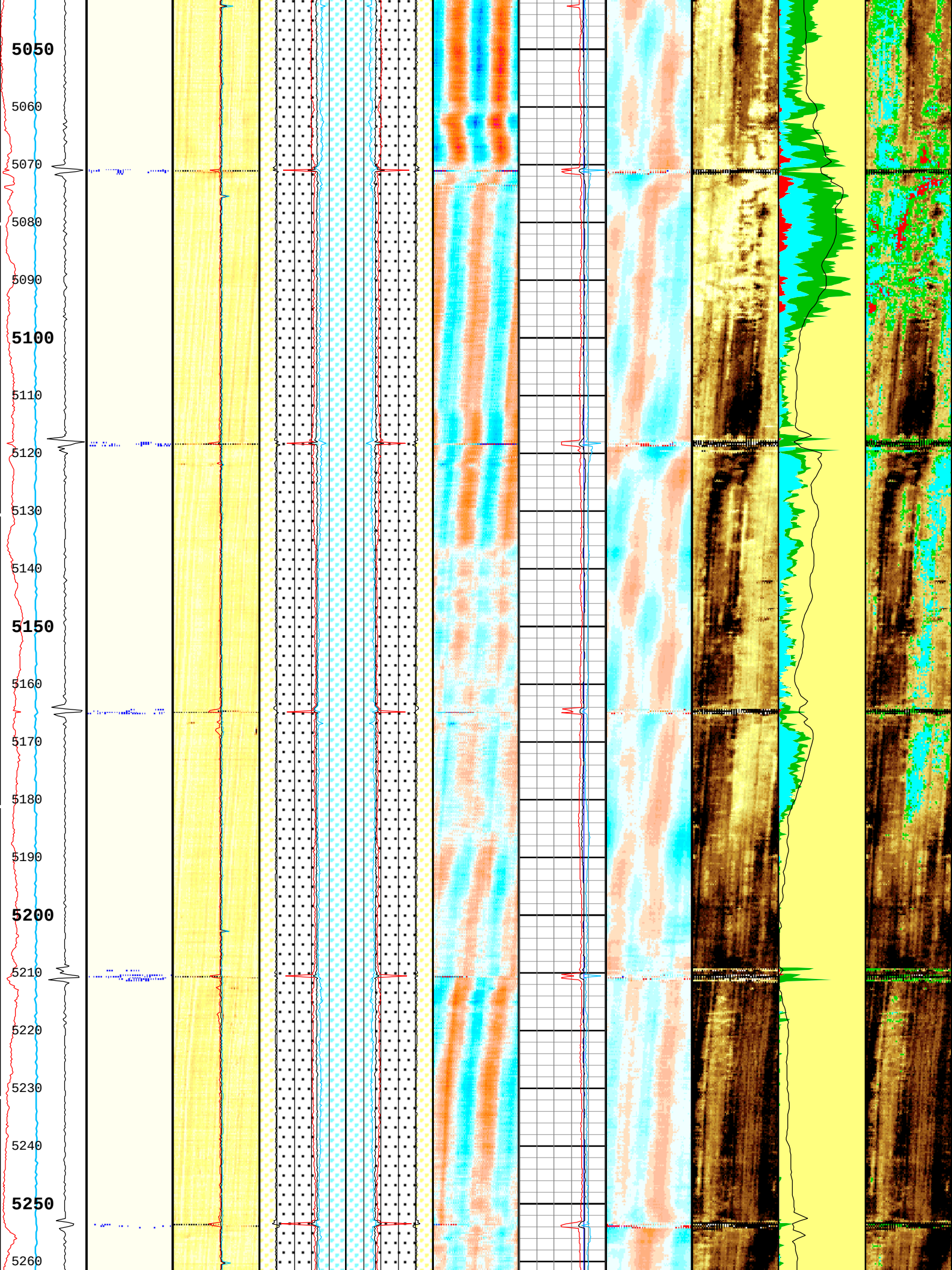
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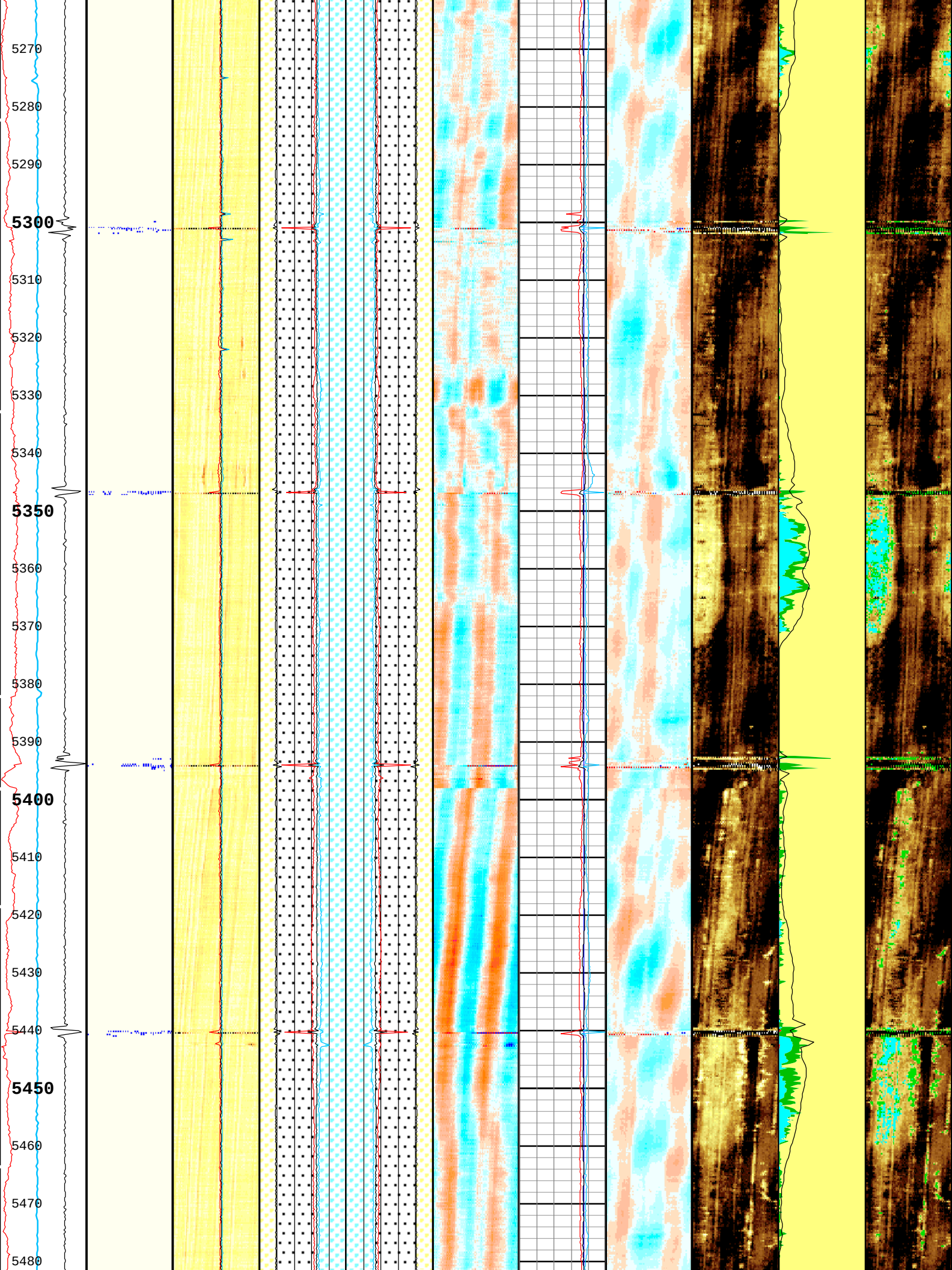
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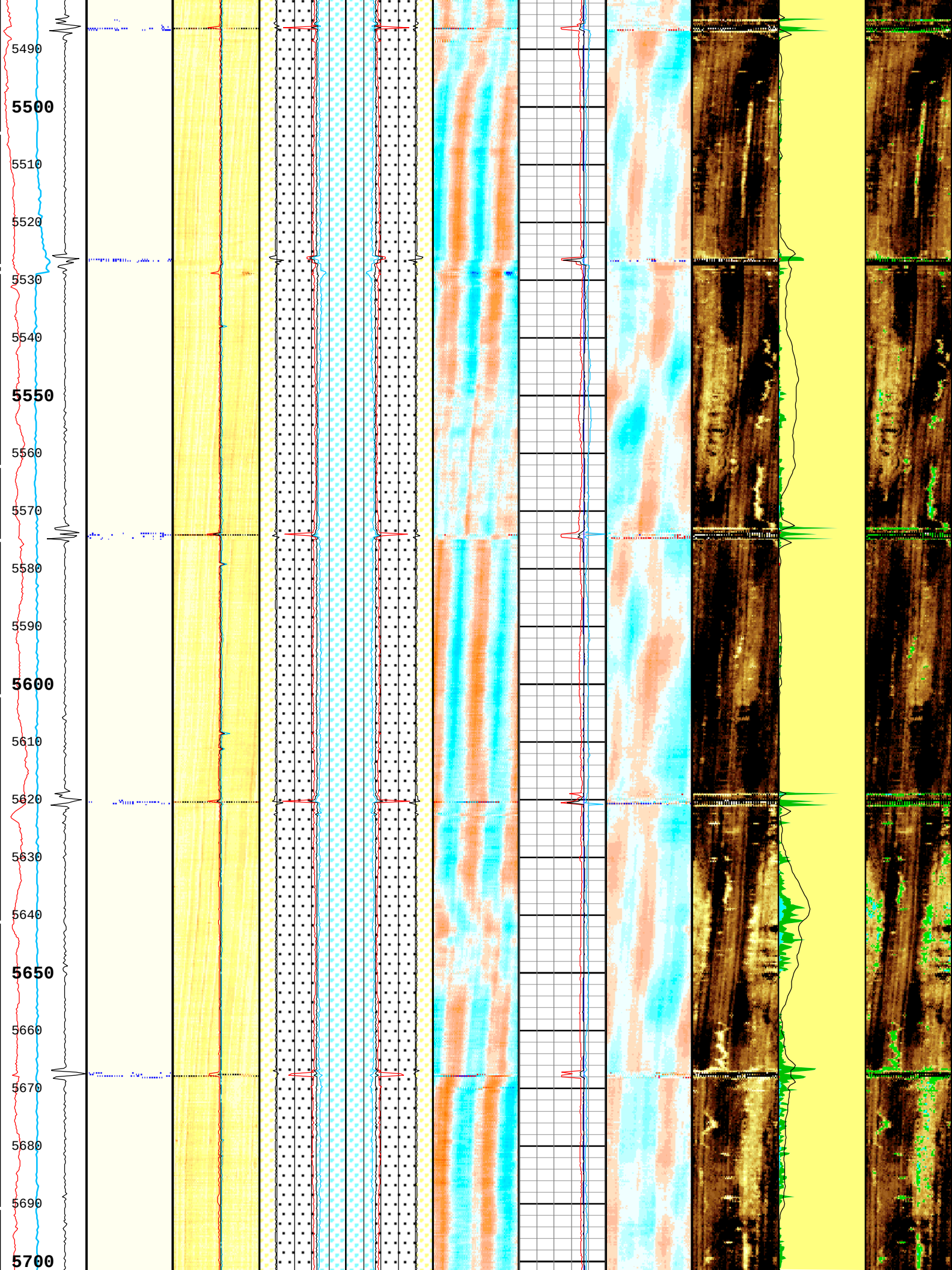
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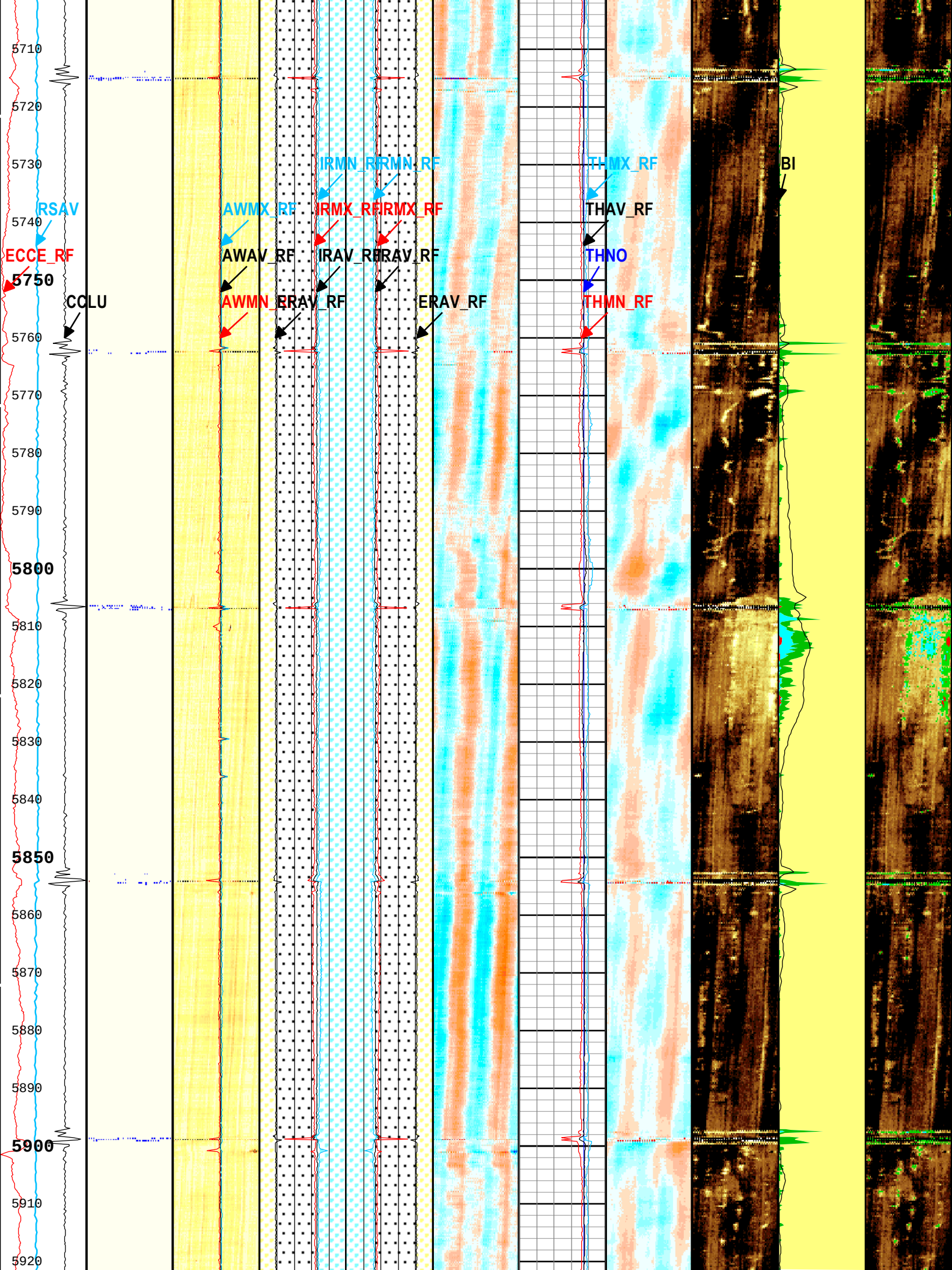
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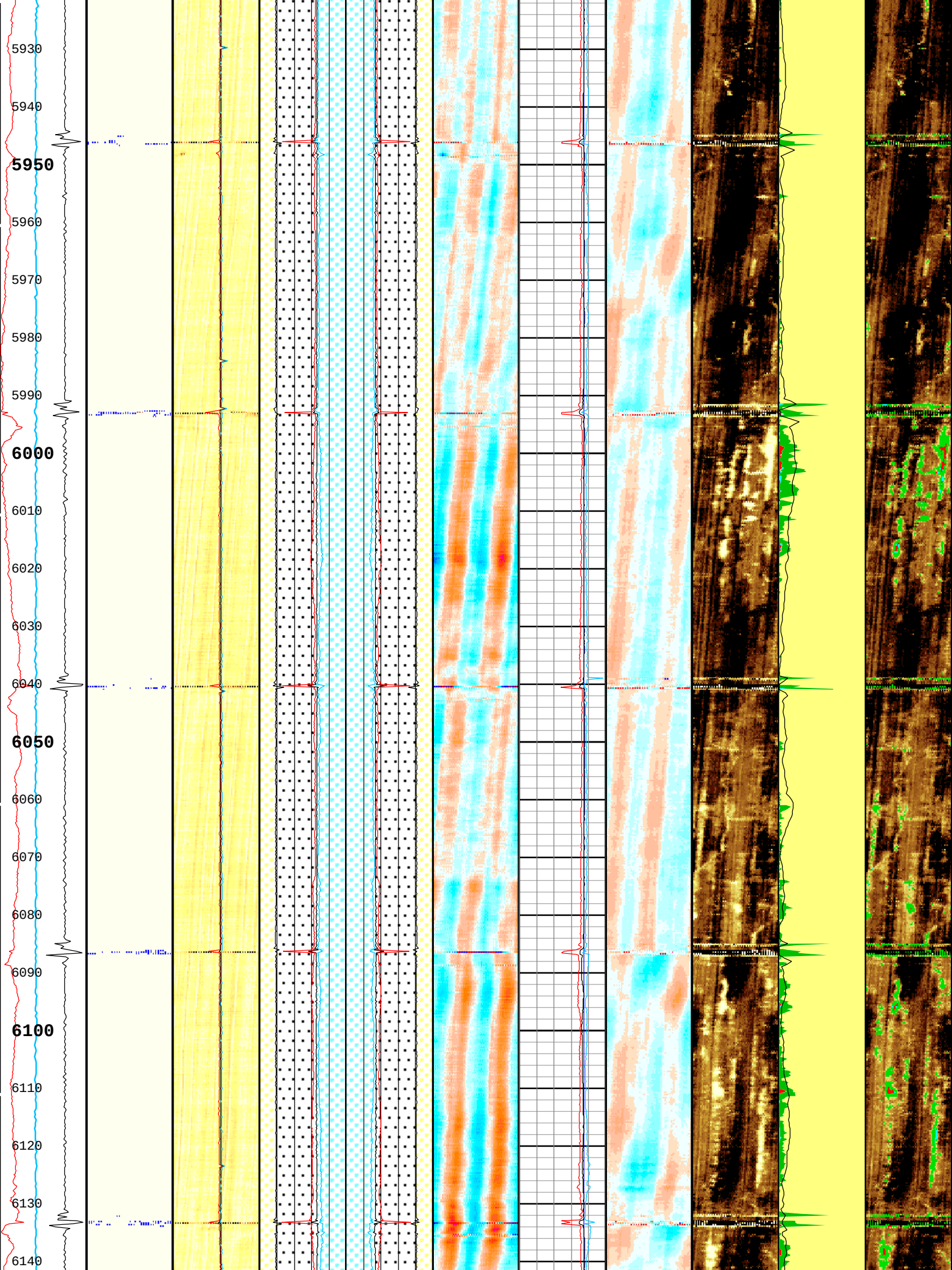
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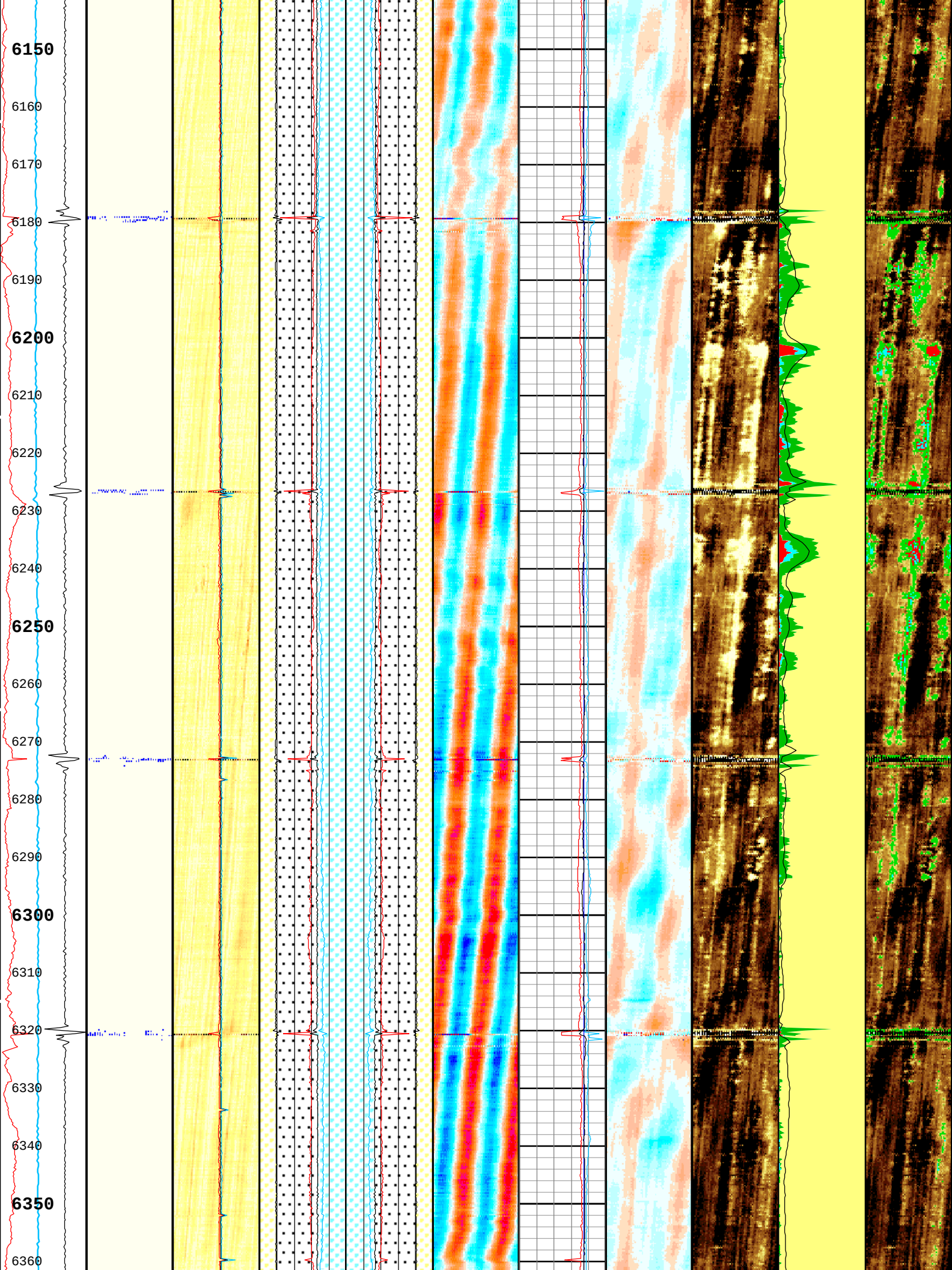
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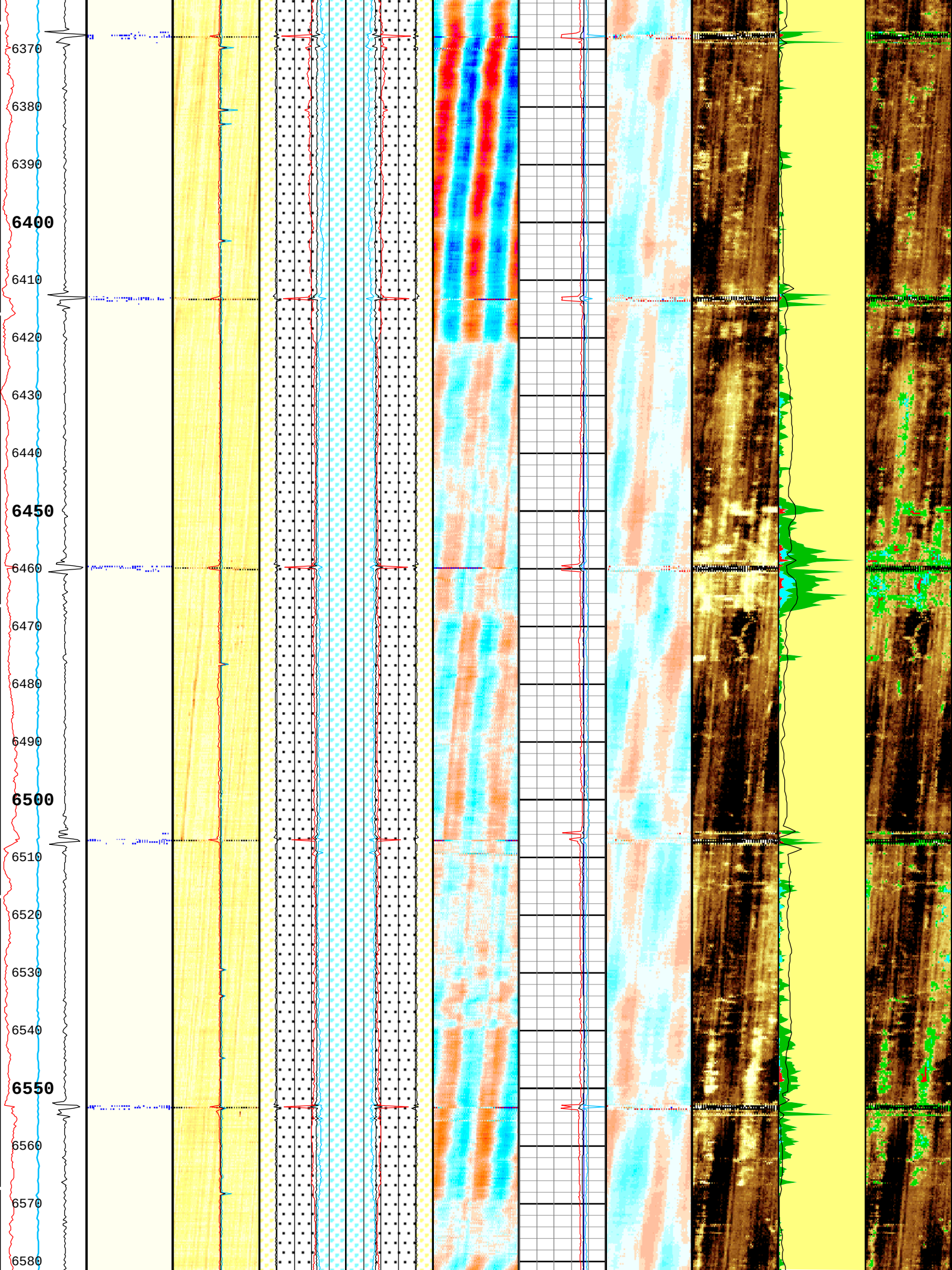
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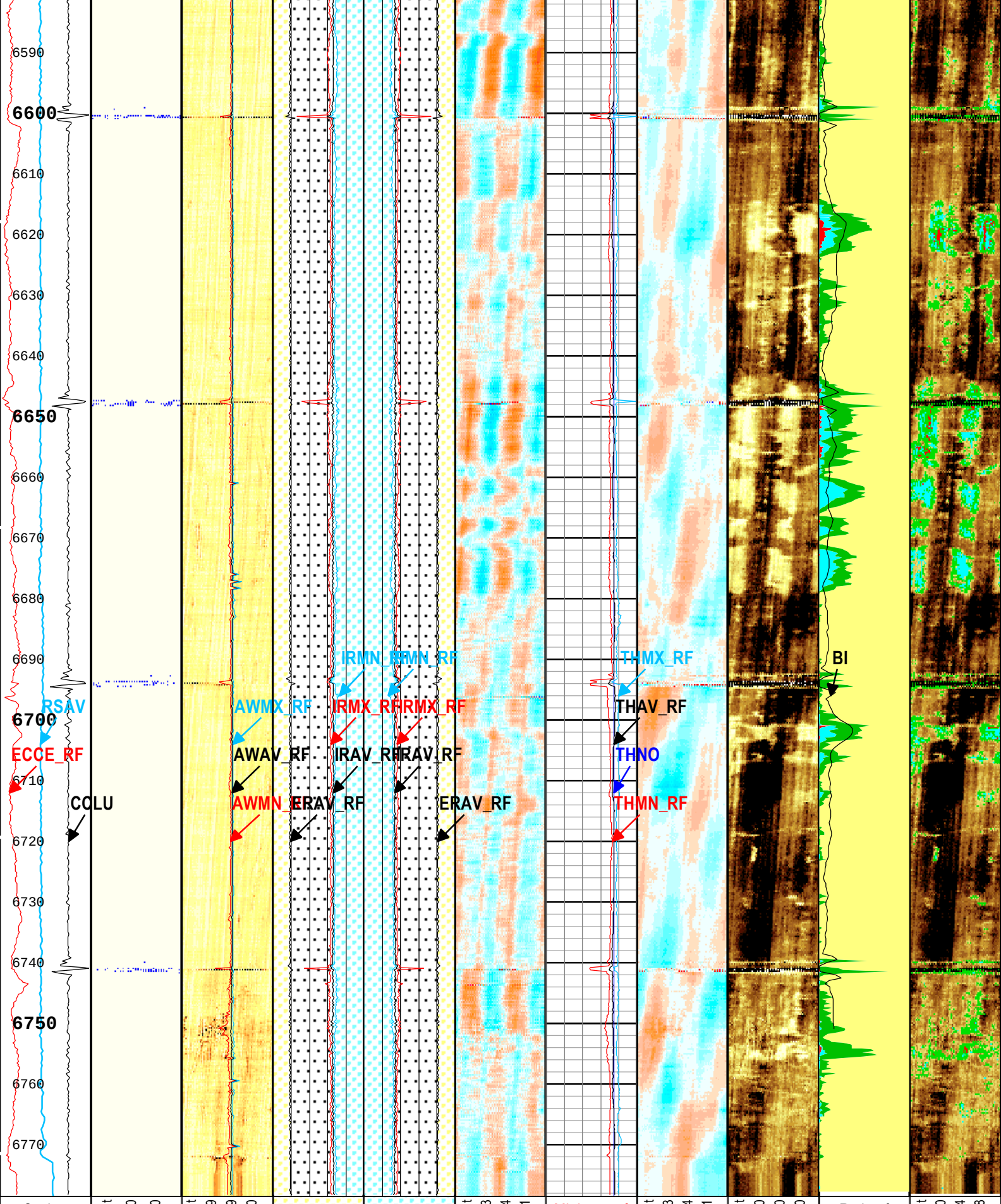


Casing Collar Locator Ultrasonic (CCLU) USIT-E[1]	Explicit Normalization USIT-E[1]	Explicit Normalization USIT-E[1]	ERAV-IRAV	IRAV-ERAV	Explicit Normalization USIT-E[1]	Minimum of Unflagged Casing Thickness (THMN_RF) USIT-E[1]	Explicit Normalization USIT-E[1]	Custom Normalization USIT-E[1]	Ratio of Cement Measurements to Total (CEMR) USIT-E[1]	Custom Normalization USIT-E[1]
	Absent 1.500 3.500	Absent -4.799 -2.799 -0.800	ERAV / IRAV		Absent -0.043 0.004 0.051		Absent -0.043 0.004 0.051	Absent 2.000 4.500 7.000		Absent 3.090 5.054 7.018

-30 in 10

Amplitude of Eccentering for Unflagged Waves (ECCE_RF) USIT-E[1]
0 in 0.5

Motor Revolution Speed (RSAV) USIT-E[1]
6 c/s 8

USIT - USIT Processing Flags (UFLG) USIT-E[1]

USIT Processing Flags (UFLG[0]) USIT-E[1]
1 5

USIT - Amplitude of Unflagged Wave (AWBK_RF) USIT-E[1] (dB)

Minimum of Unflagged Wave Amplitude (AWMN_RF) USIT-E[1]
0 dB 75

Average of Unflagged Wave Amplitude (AWAV_RF) USIT-E[1]
0 dB 75

Maximum of Unflagged Wave Amplitude (AWMX_RF) USIT-E[1]
0 dB 75

Median of Unflagged External Radii (ERAV_RF) USIT-E[1]
5 in 4

Median Internal Radius of Casing Corrected for Eccentering (IRAV_RF) USIT-E[1]
5 in 4

Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E[1]
5 in 4

Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E[1]
5 in 4

Median of Unflagged External Radii (ERAV_RF) USIT-E[1]
4 in 5

Median Internal Radius of Casing Corrected for Eccentering (IRAV_RF) USIT-E[1]
4 in 5

Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E[1]
4 in 5

Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E[1]
4 in 5

USIT - Unflagged Internal Radii minus Median Internal Radius (IRBKM_RF) USIT-E[1] (in)

0.1 in 0.6

Nominal Casing Thickness (THNO) USIT-E[1]
0.1 in 0.6

Median of Unflagged Casing Thickness (THAV_RF) USIT-E[1]
0.1 in 0.6

Maximum of Unflagged Casing Thickness (THMX_RF) USIT-E[1]
0.1 in 0.6

USIT - Unflagged Casing Thickness minus Median of Unflagged Casing Thickness (THBKM_RF) USIT-E[1] (in)

USIT - Acoustic Impedance (AIBK) USIT-E[1] (Mrayl)

1 0

Micro-debonding Ratio (MDR) USIT-E[1]
1 0

Absent 2.599 4.563 6.527

Ratio of Gas Measurements to Total (GASR) USIT-E[1]
1 0

Bonded

Gas

Liquid

Micro-debonding

Bond Index (BI) DSLT-H[1]
1 0

USIT - Acoustic Impedance (AIBK) USIT-E[1] (Mrayl)

Custom Normalization

USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E[1] (Mrayl)

USIT Processing Flags (UFLG[0]) USIT-E[1]

1 - UFLG 1 Value within [0.0 - 1.5] - :
2 - UFLG 2 Value within [1.5 - 2.5] - :
3 - UFLG 3 Value within [2.5 - 3.5] - :
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :

UTIM Error
Pulse Origin Not Detected
WINLEN Error
Casing Thickness Error
Loop Processing Error

TIME_1900 - Time Marked every 60.00 (s)

Description: USI Composite Format: Log (LBV1_USI Composite 9.625inch) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 22-Mar-2016 16:04:56

Composite 1

Cement Log 2 IN = 100 FT

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[6]:Up	Up	42.10 ft	6778.78 ft	22-Mar-2016 9:40:40 AM	22-Mar-2016 12:29:24 PM	ON	0.00 ft	Yes
One	Log[9]:Up	Up	79.40 ft	514.04 ft	22-Mar-2016 1:43:41 PM	22-Mar-2016 1:53:14 PM	ON	1.22 ft	Yes

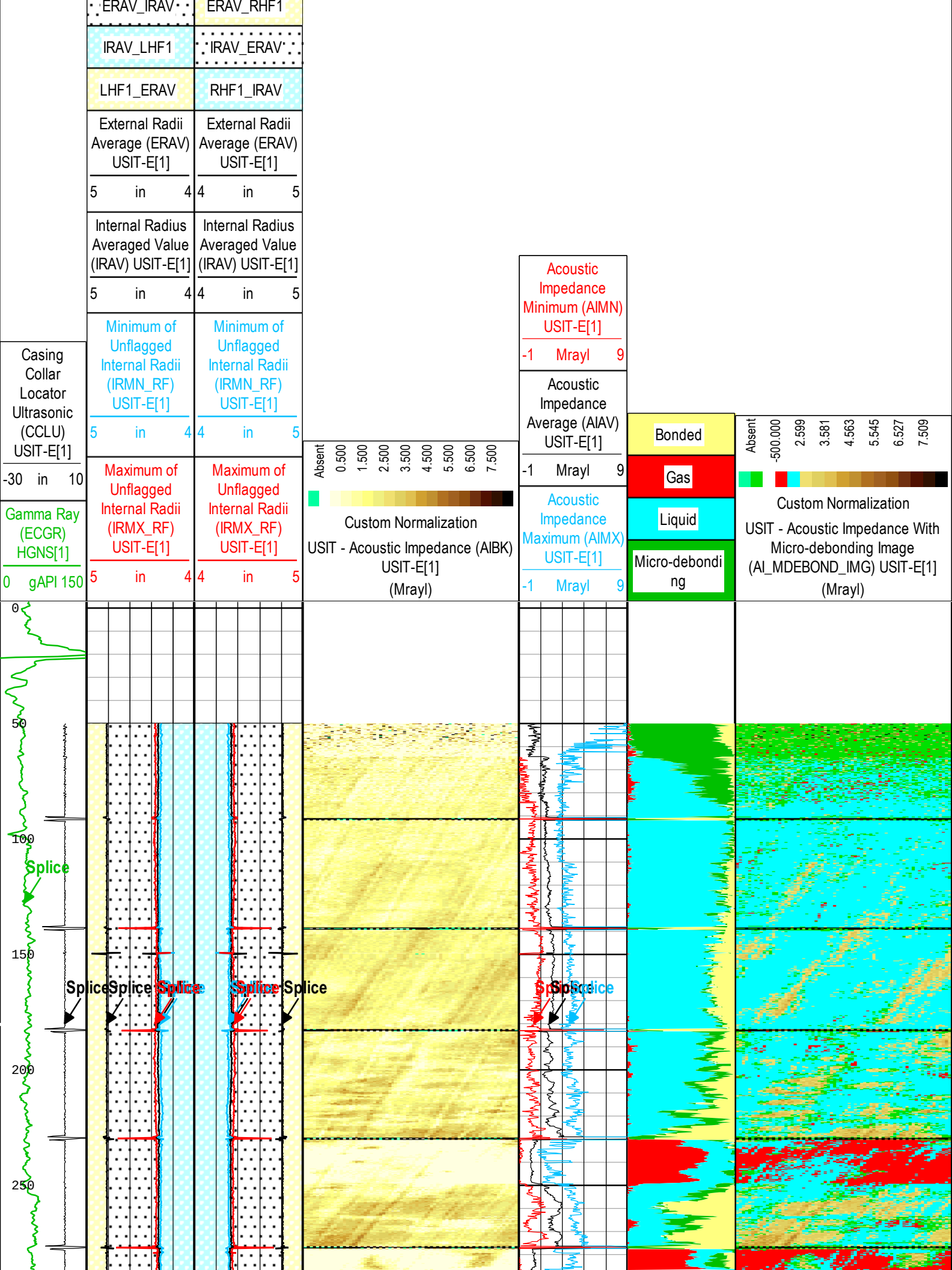
All depths are referenced to toolstring zero

Log

Company:Southern California Gas Company Well:Fernando Fee 38C
Composite 1:S007

Description: USI Cement Format: Log (LBV1_USI Cement 9.625inch) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 22-Mar-2016 16:05:34

TIME_1900 - Time Marked every 60.00 (s)


ERAV_IRAV
ERAV_RHF1
IRAV_LHF1
IRAV_ERAV
LHF1_ERAV
RHF1_IRAV
External Radii Average (ERAV) USIT-E[1]
5 in 4
4 in 5
Internal Radius Averaged Value (IRAV) USIT-E[1]
5 in 4
4 in 5
Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E[1]
5 in 4
4 in 5
Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E[1]
5 in 4
4 in 5
Casing Collar Locator Ultrasonic (CCLU) USIT-E[1]
-30 in 10
Gamma Ray (ECGR) HGNS[1]
0 gAPI 150
Absent 0.500 1.500 2.500 3.500 4.500 5.500 6.500 7.500
Custom Normalization
USIT - Acoustic Impedance (AIBK) USIT-E[1] (Mrayl)
Acoustic Impedance Minimum (AIMN) USIT-E[1]
-1 Mrayl 9
Acoustic Impedance Average (AIAV) USIT-E[1]
-1 Mrayl 9
Acoustic Impedance Maximum (AIMX) USIT-E[1]
-1 Mrayl 9
Bonded
Gas
Liquid
Micro-debonding
Absent -500.000 2.599 3.581 4.563 5.545 6.527 7.509
Custom Normalization
USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E[1] (Mrayl)
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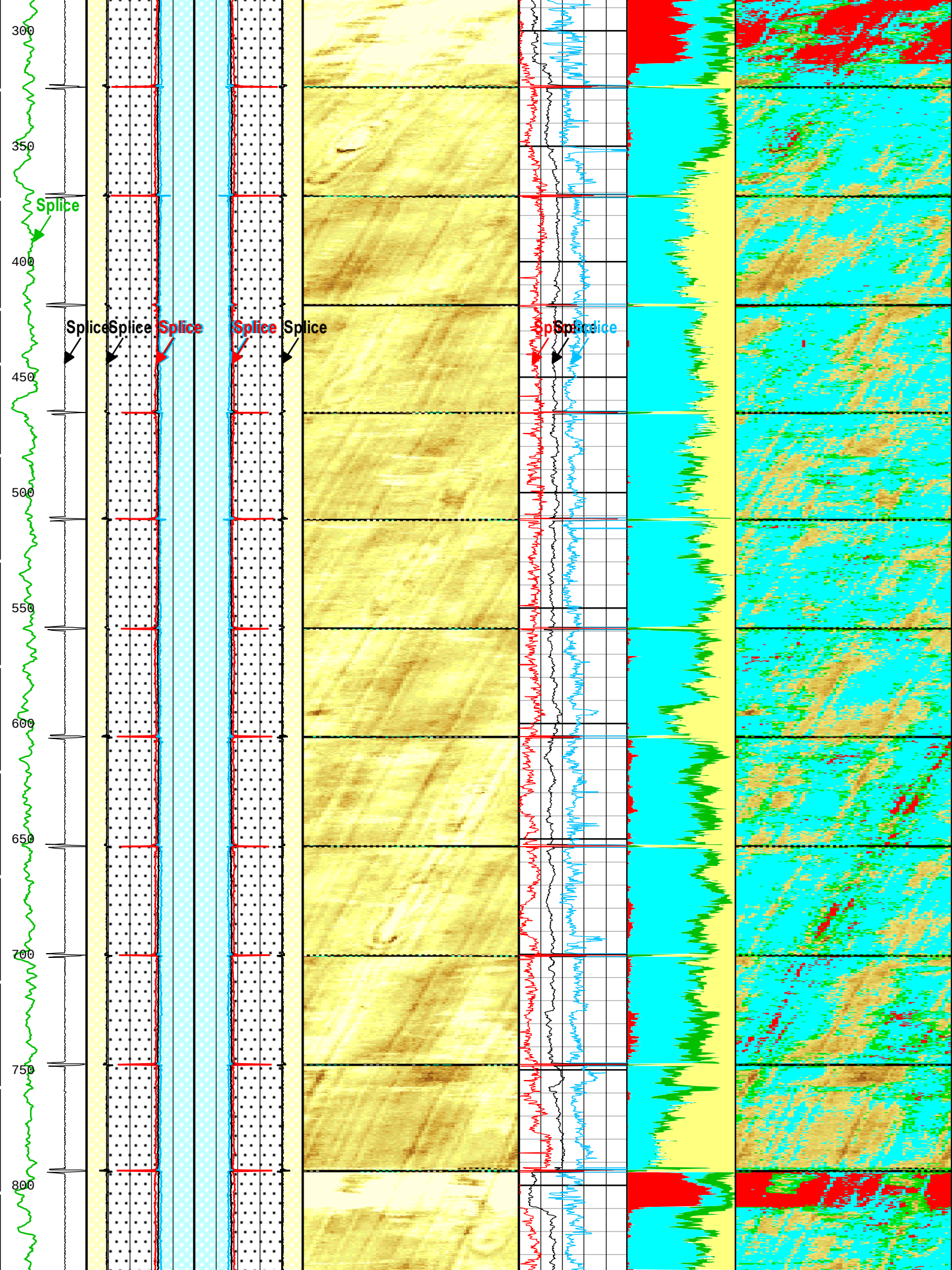
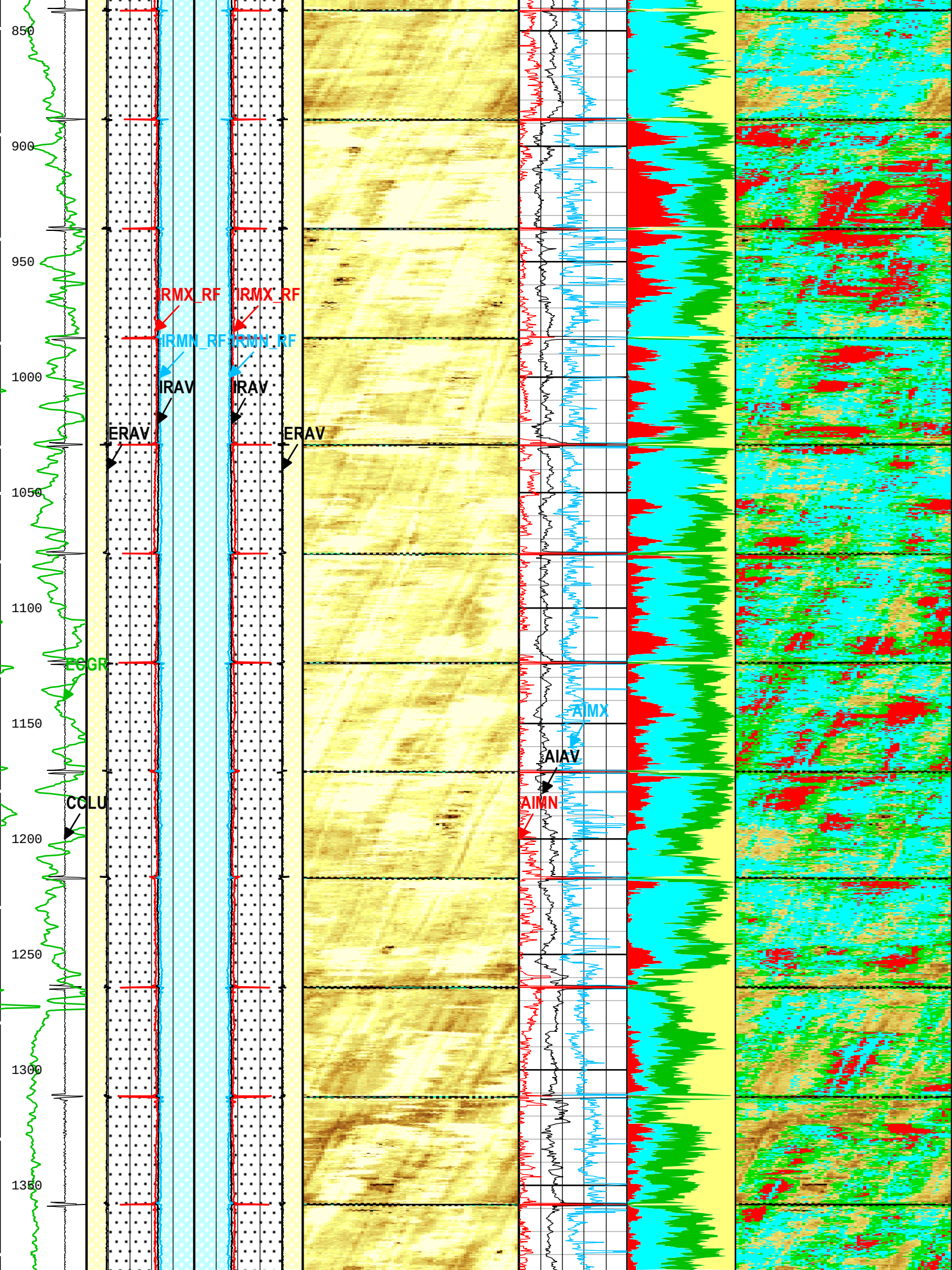
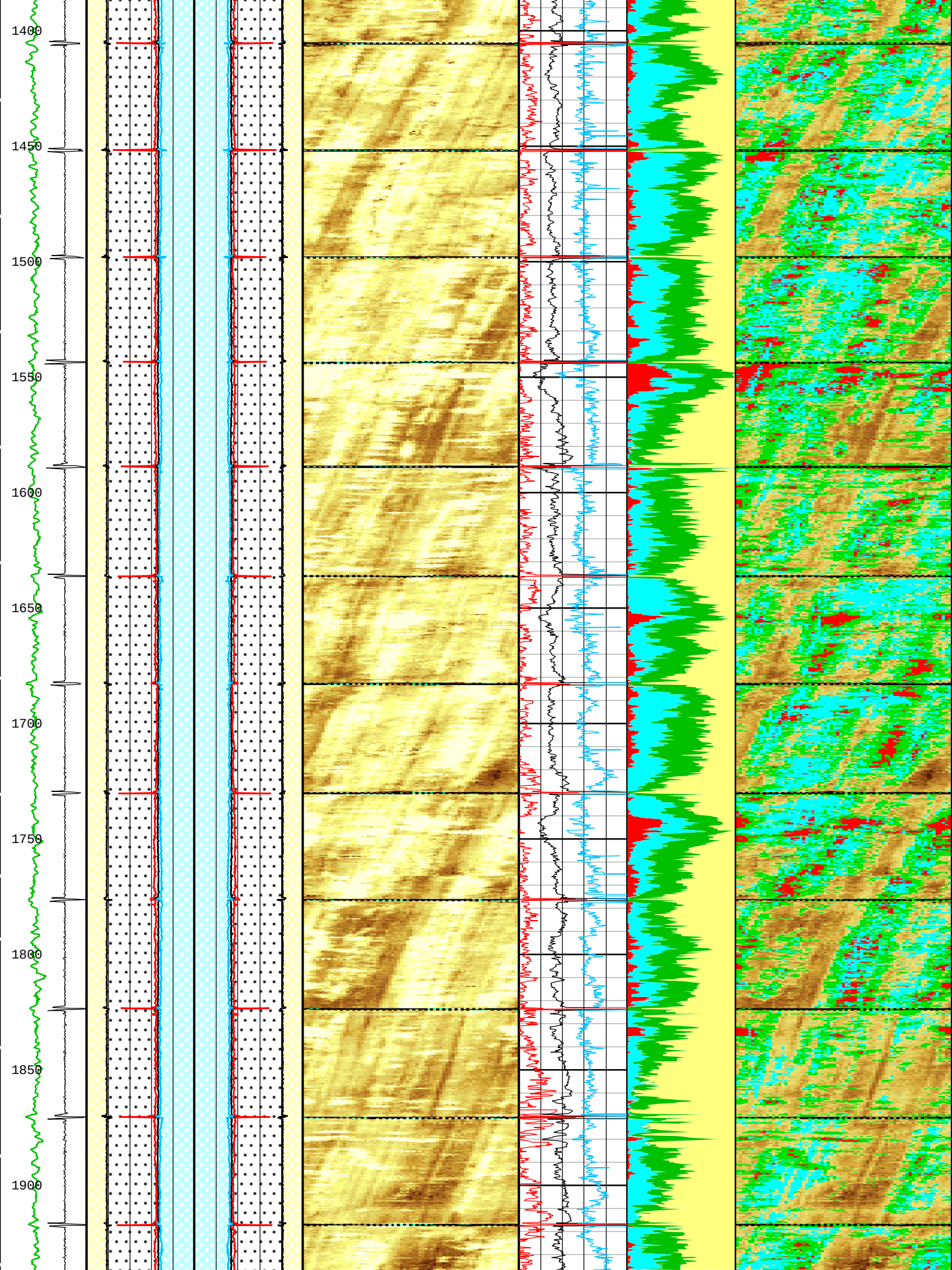
50
100
150
200
250
Splice
Splice
Splice
Splice
Splice
Splice
Splice
Splice


300
350
Splice
400
Splice
Splice
Splice
Splice
Splice
Splice
Splice
450
500
550
600
650
700
750
800


850
900
950
1000
1050
1100
1150
1200
1250
1300
1350
IRMX_RF
IRMX_RF
IRMN_RF
IRMN_RF
IRAV
IRAV
ERAV
ERAV
ECGR
AIMX
AIAV
AIMN
CCLU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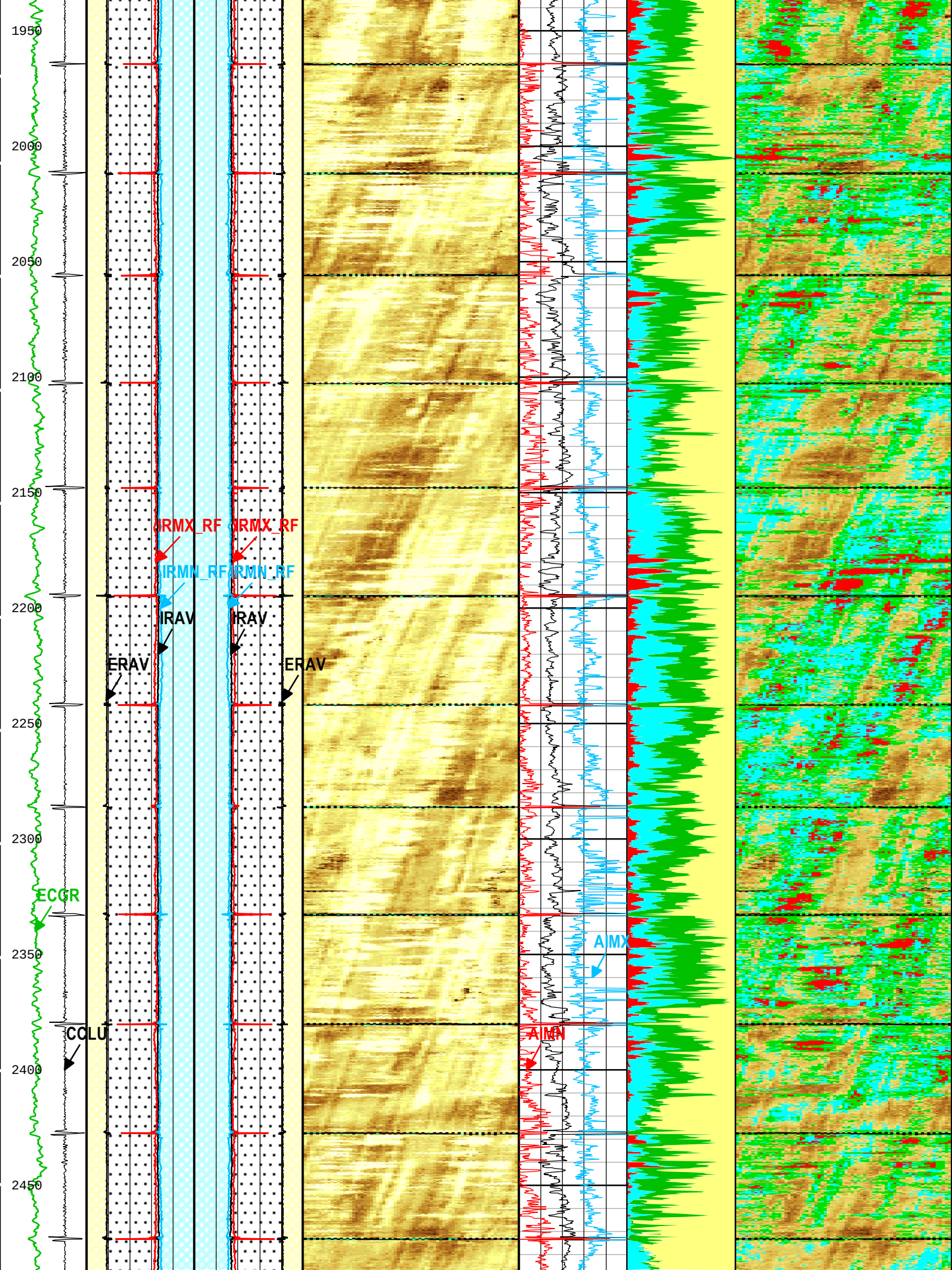
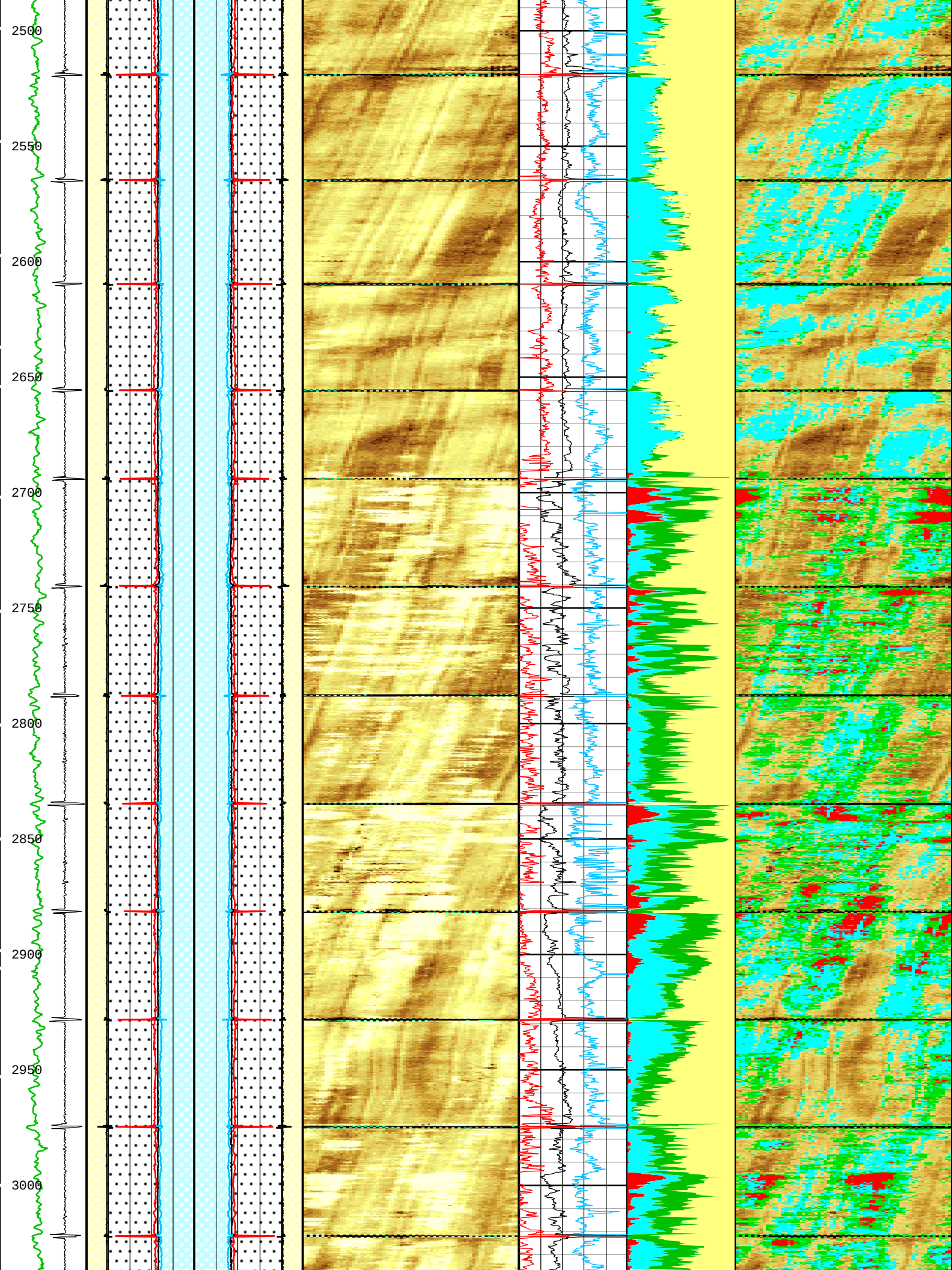
1450
1500
1550
1600
1650
1700
1750
1800
1850
1900


1950
2000
2050
2100
2150
2200
2250
2300
2350
2400
2450
IRMX_RF
IRMX_RF
IRMN_RF
IRMN_RF
IRAV
IRAV
ERAV
ERAV
ECGR
CCLU
AIMX
AIMN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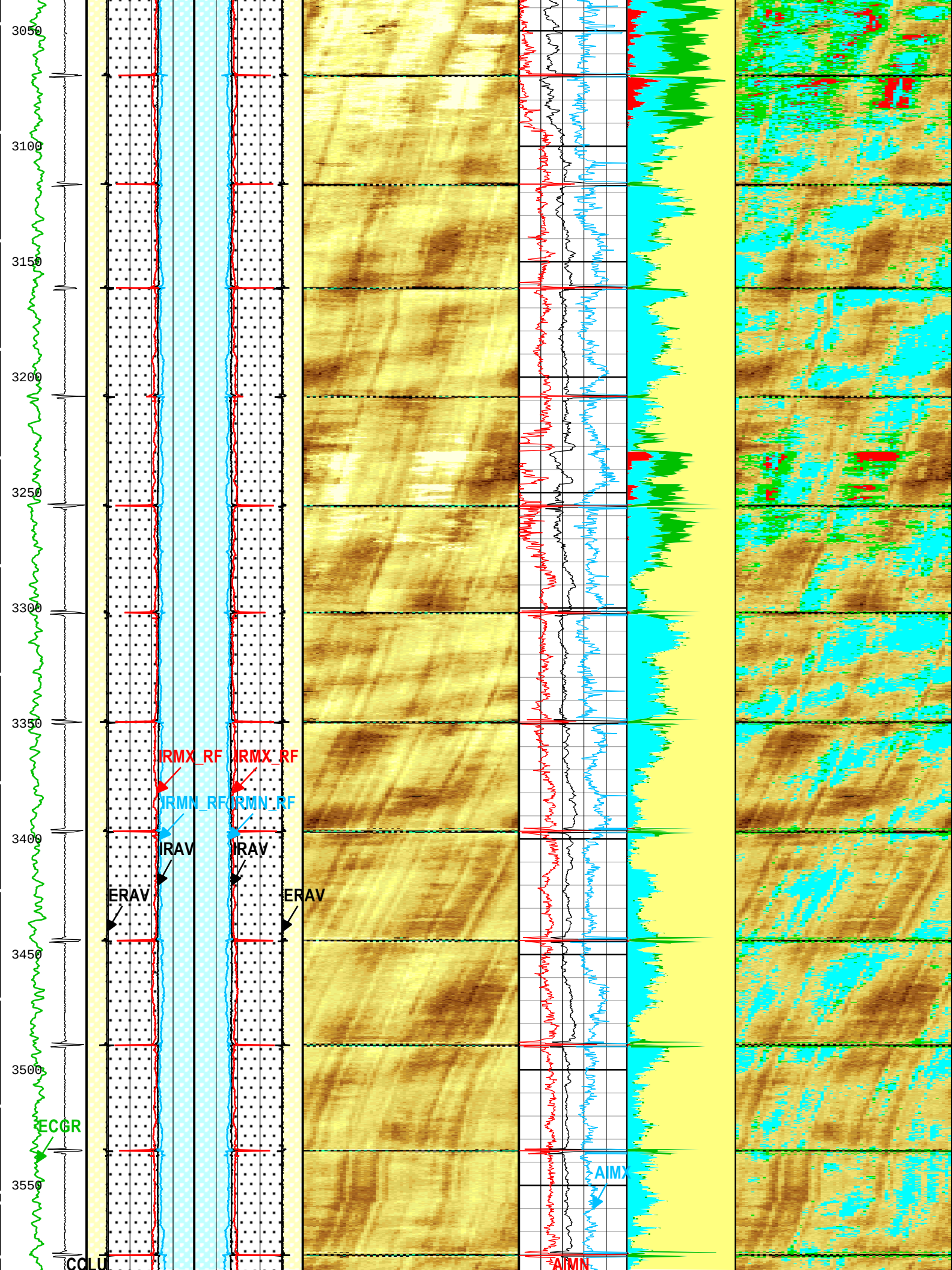
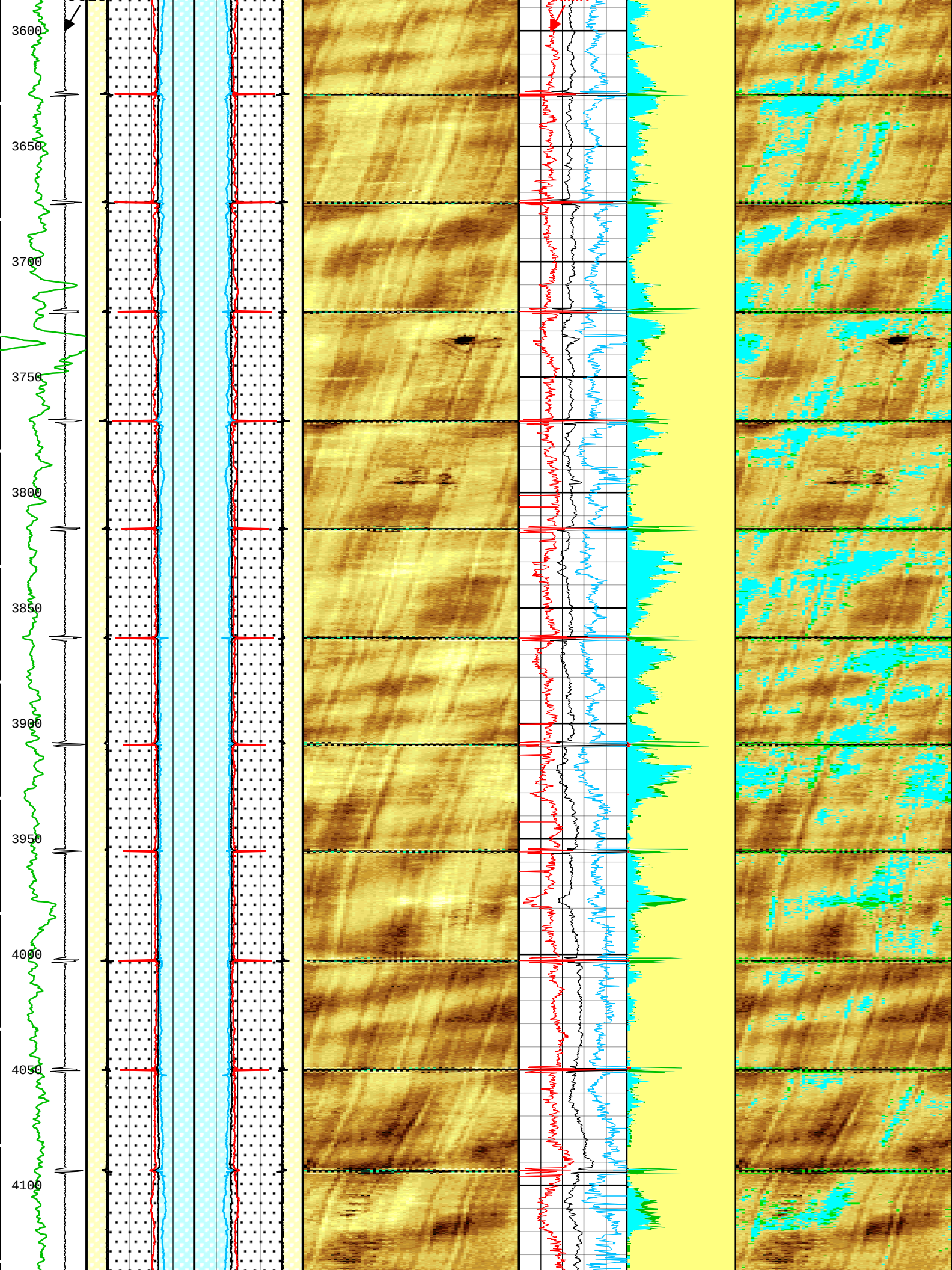
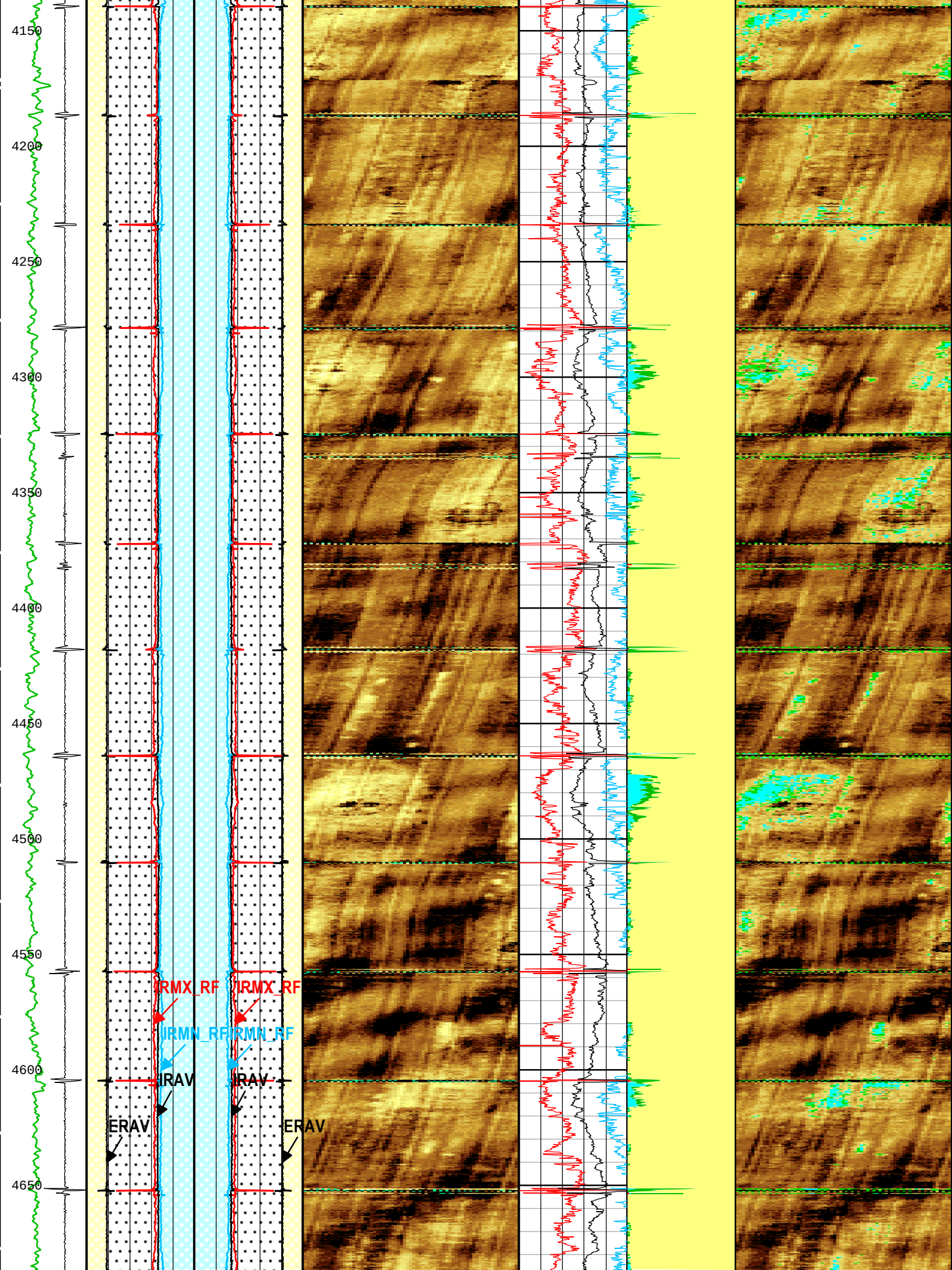
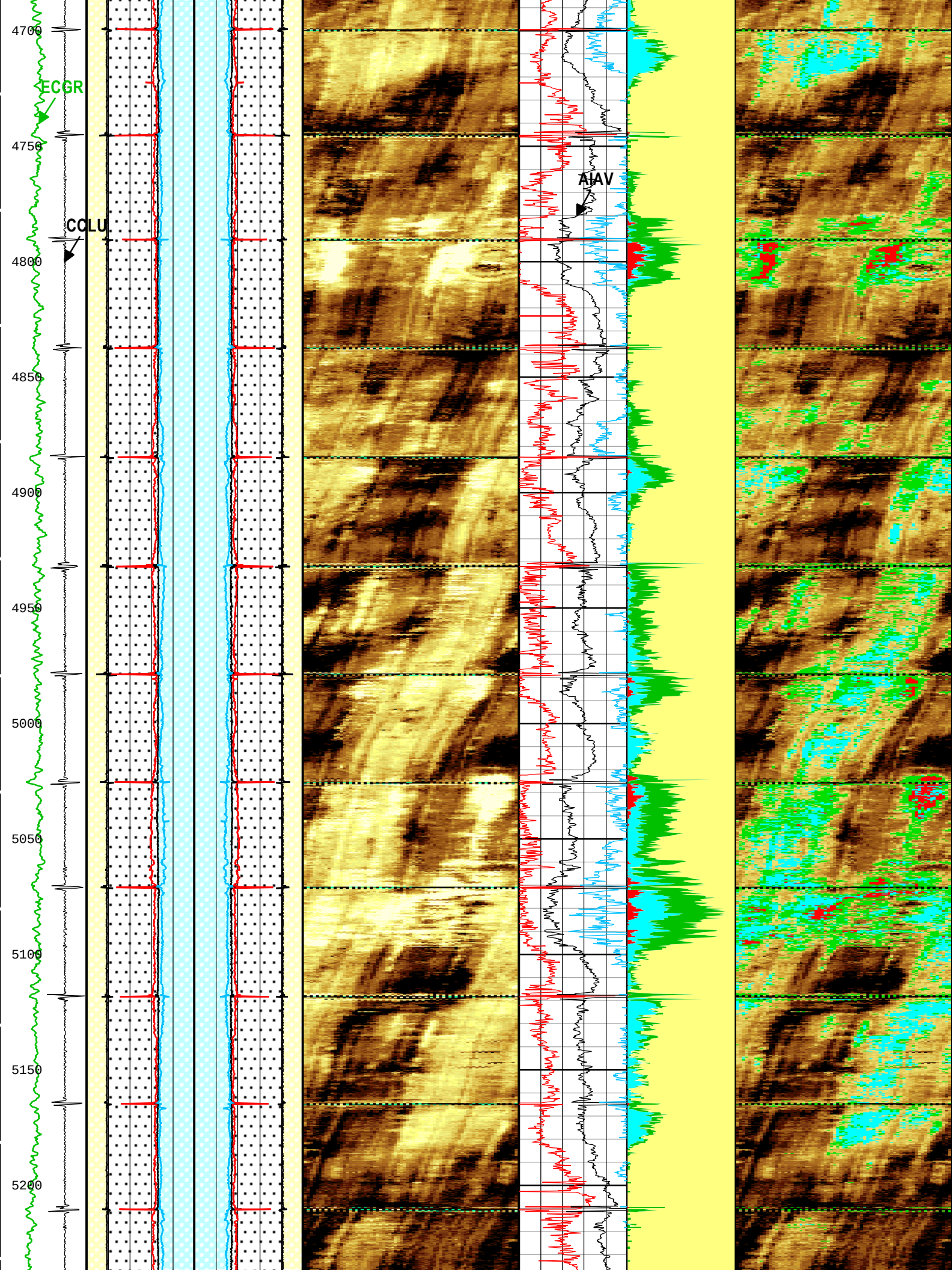
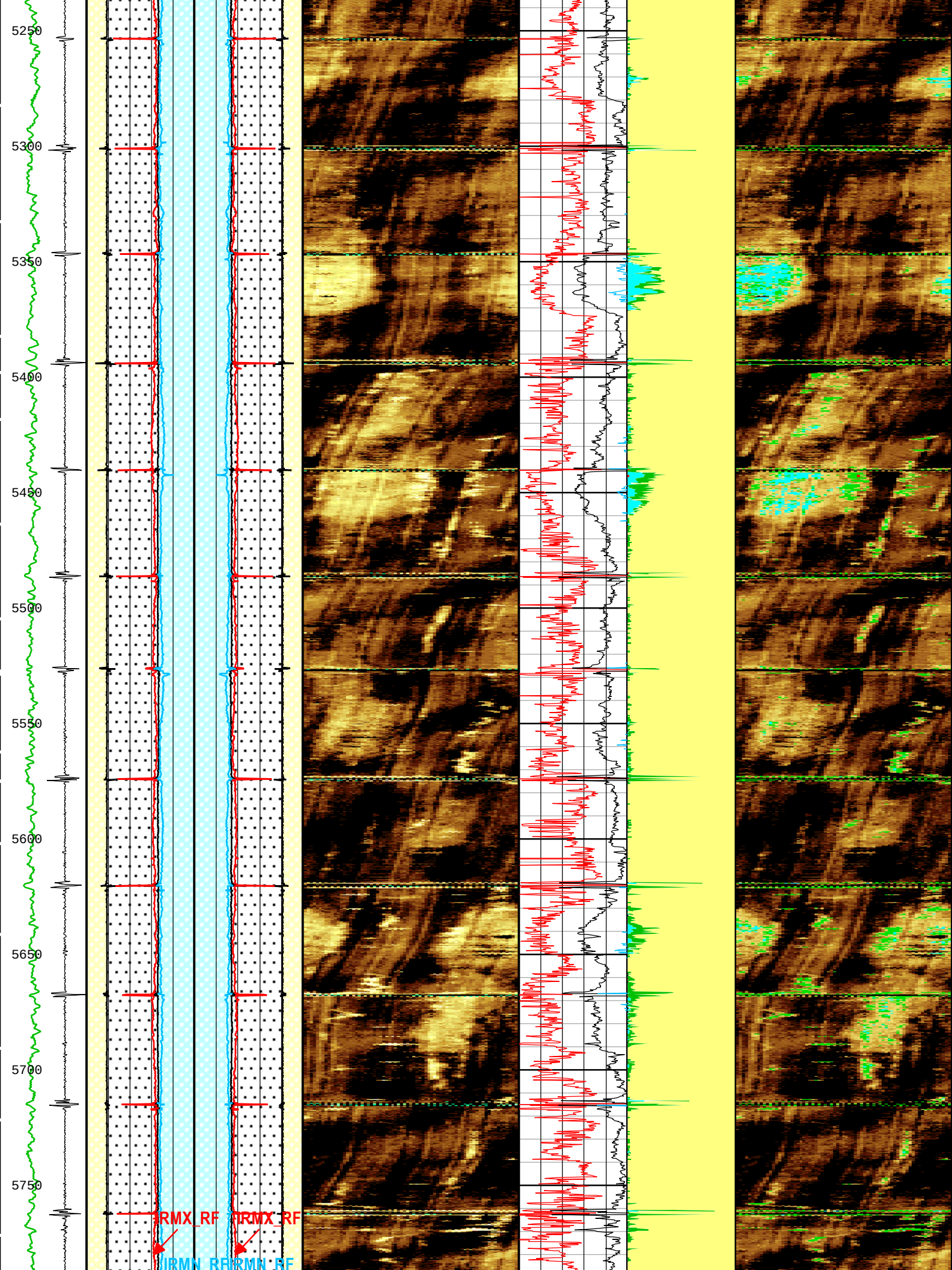
2550
2600
2650
2700
2750
2800
2850
2900
2950
3000

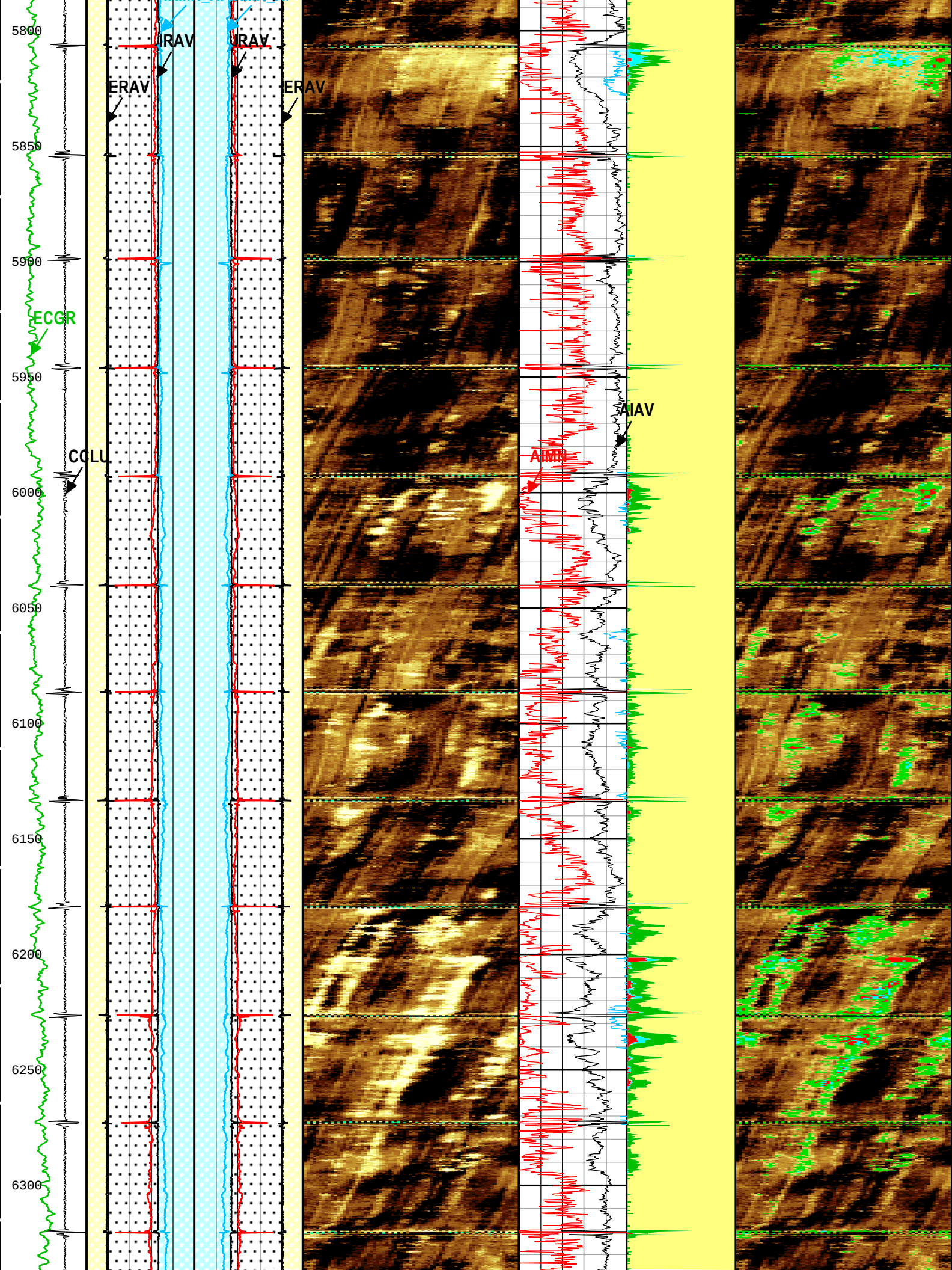

3050
3100
3150
3200
3250
3300
3350
3400
3450
3500
3550
IRMX_RF
IRMX_RF
IRMN_RF
IRMN_RF
IRAV
IRAV
ERAV
ERAV
ECGR
AIMX
AIMN
COLU

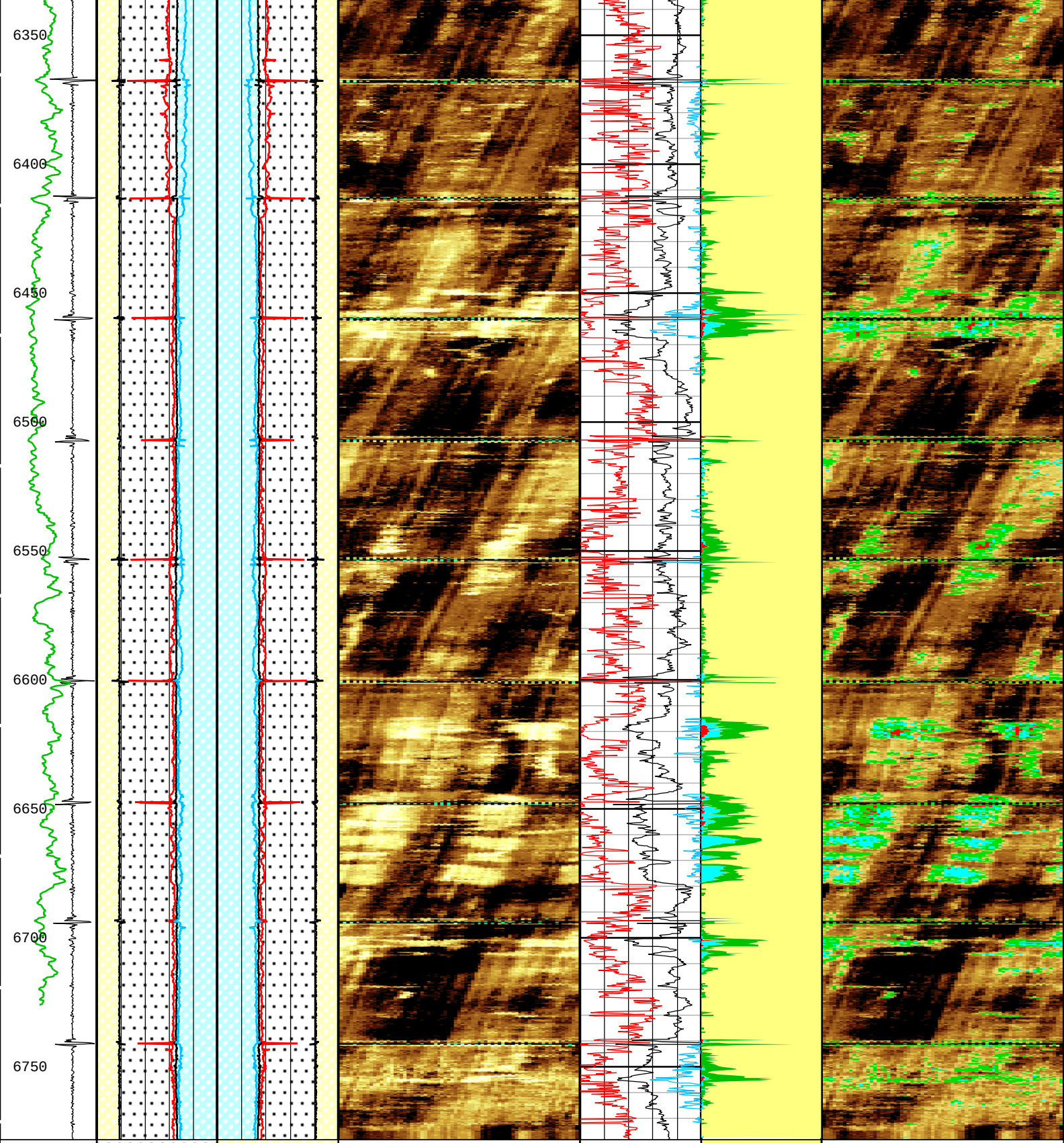

3600
3650
3700
3750
3800
3850
3900
3950
4000
4050
4100


4150
4200
4250
4300
4350
4400
4450
4500
4550
4600
4650
IRMX_RF
IRMX_RF
IRMN_RF
IRMN_RF
IRAV
IRAV
ERAV
ERAV


4700
ECGR
4750
AIAV
CCLU
4800
4850
4900
4950
5000
5050
5100
5150
5200


5250
5300
5350
5400
5450
5500
5550
5600
5650
5700
5750
RMX_RF
RMX_RF
RMN_RF
RMN_RF


5800
5850
5900
5950
6000
6050
6100
6150
6200
6250
6300
IRAV
IRAV
ERAV
ERAV
ECGR
CCLU
AIAV
AIMR



Casing Collar Locator Ultrasonic (CCLU) USIT-E[1]

-30 in 10

Gamma Ray (ECGR) HGNS[1]

0 gAPI 150

ERAV_IRAV

IRAV_LHF1

LHF1_ERAV

External Radii Average (ERAV) USIT-E[1]

5 in 4

Internal Radius

ERAV_RHF1

IRAV_ERAV

RHF1_IRAV

External Radii Average (ERAV) USIT-E[1]

4 in 5

Internal Radius

Absent 0.500 1.500 2.500 3.500 4.500 5.500 6.500 7.500

Custom Normalization

USIT - Acoustic Impedance (AIBK) USIT-E[1] (Mrayl)

Acoustic Impedance Minimum (AIMN) USIT-E[1]

-1 Mrayl 9

Acoustic Impedance Average (AIAV) USIT-E[1]

-1 Mrayl 9

Acoustic

Bonded

Gas

Liquid

Micro-debonding

Absent -500.000 2.599 3.581 4.563 5.545 6.527 7.509

Custom Normalization

USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E[1] (Mrayl)

Averaged Value (IRAV) USIT-E[1]
5 in 4

Averaged Value (IRAV) USIT-E[1]
4 in 5

Acoustic Impedance Maximum (AIMX) USIT-E[1]
-1 Mrayl 9

Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E[1]
5 in 4

Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E[1]
4 in 5

Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E[1]
5 in 4

Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E[1]
4 in 5

TIME_1900 - Time Marked every 60.00 (s)

Description: USI Cement Format: Log (LBV1_USI Cement 9.625inch) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 22-Mar-2016 16:05:34

Composite 1

Corrosion 5 in = 100 ft

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[6]:Up	Up	42.10 ft	6778.78 ft	22-Mar-2016 9:40:40 AM	22-Mar-2016 12:29:24 PM	ON	0.00 ft	Yes
One	Log[9]:Up	Up	79.40 ft	514.04 ft	22-Mar-2016 1:43:41 PM	22-Mar-2016 1:53:14 PM	ON	1.22 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Southern California Gas Company Well:Fernando Fee 38C
Composite 1:S007

Description: USI Composite Format: Log (LBV1_USI Corrosion 9.625inch) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 22-Mar-2016 16:05:57

TIME_1900 - Time Marked every 60.00 (s)

USIT Processing Flags (UFLG[0]) USIT-E[1]

1 - UFLG 1 Value within [0.0 - 1.5] - :
2 - UFLG 2 Value within [1.5 - 2.5] - :
3 - UFLG 3 Value within [2.5 - 3.5] - :
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :

UTIM Error
Pulse Origin Not Detected
WINLEN Error
Casing Thickness Error
Loop Processing Error

Absent -5.200 -3.600 -2.000 -0.400

Explicit Normalization

USIT - Amplitude of Unflagged Wave (AWBK_RF) USIT-E[1] (dB)

Minimum of Unflagged

ERAV IRAV
ERAV-IRAV ERAV
IRAV IRAV-ERAV

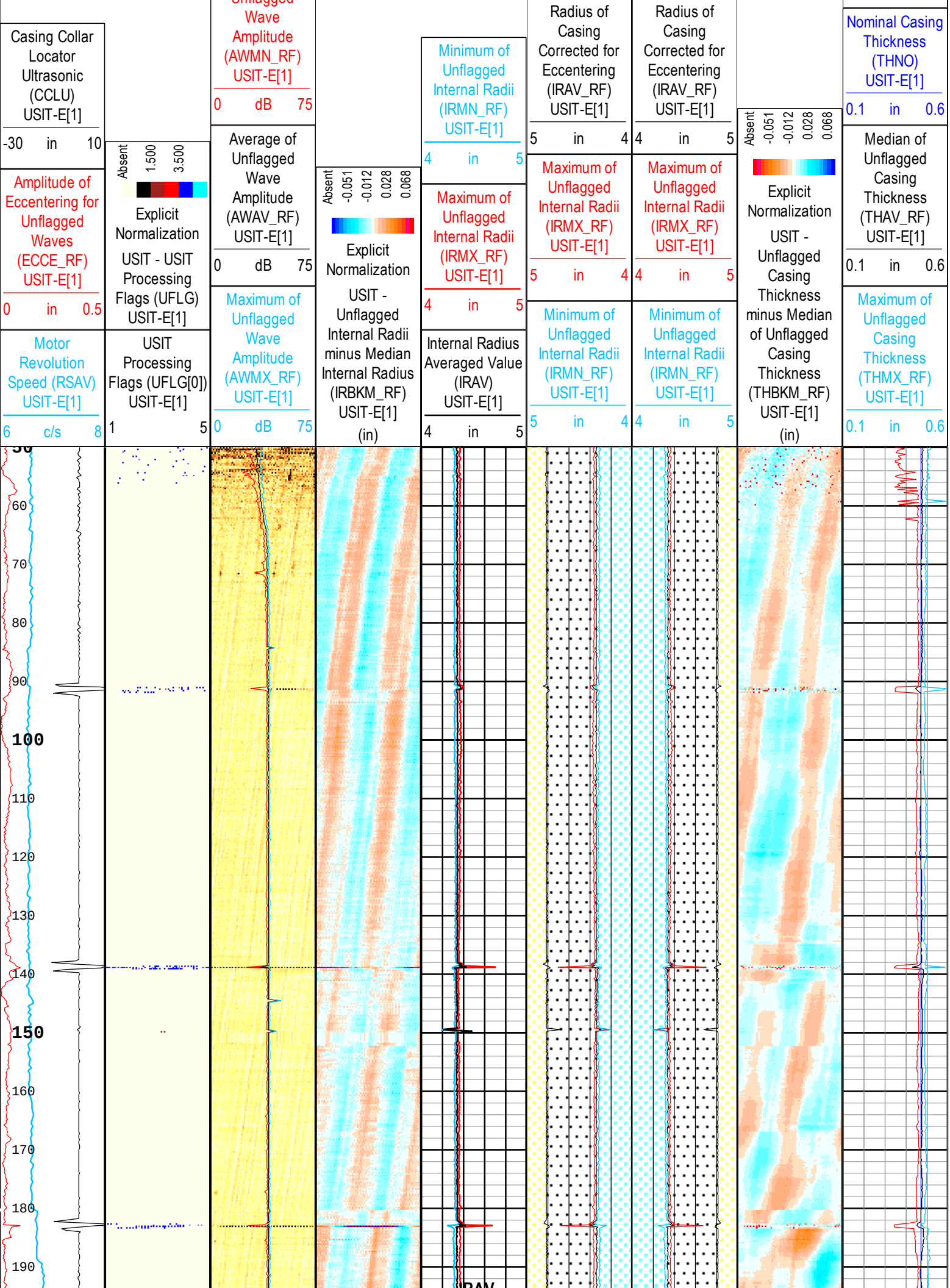
Median of Unflagged External Radii (ERAV_RF) USIT-E[1]
5 in 4

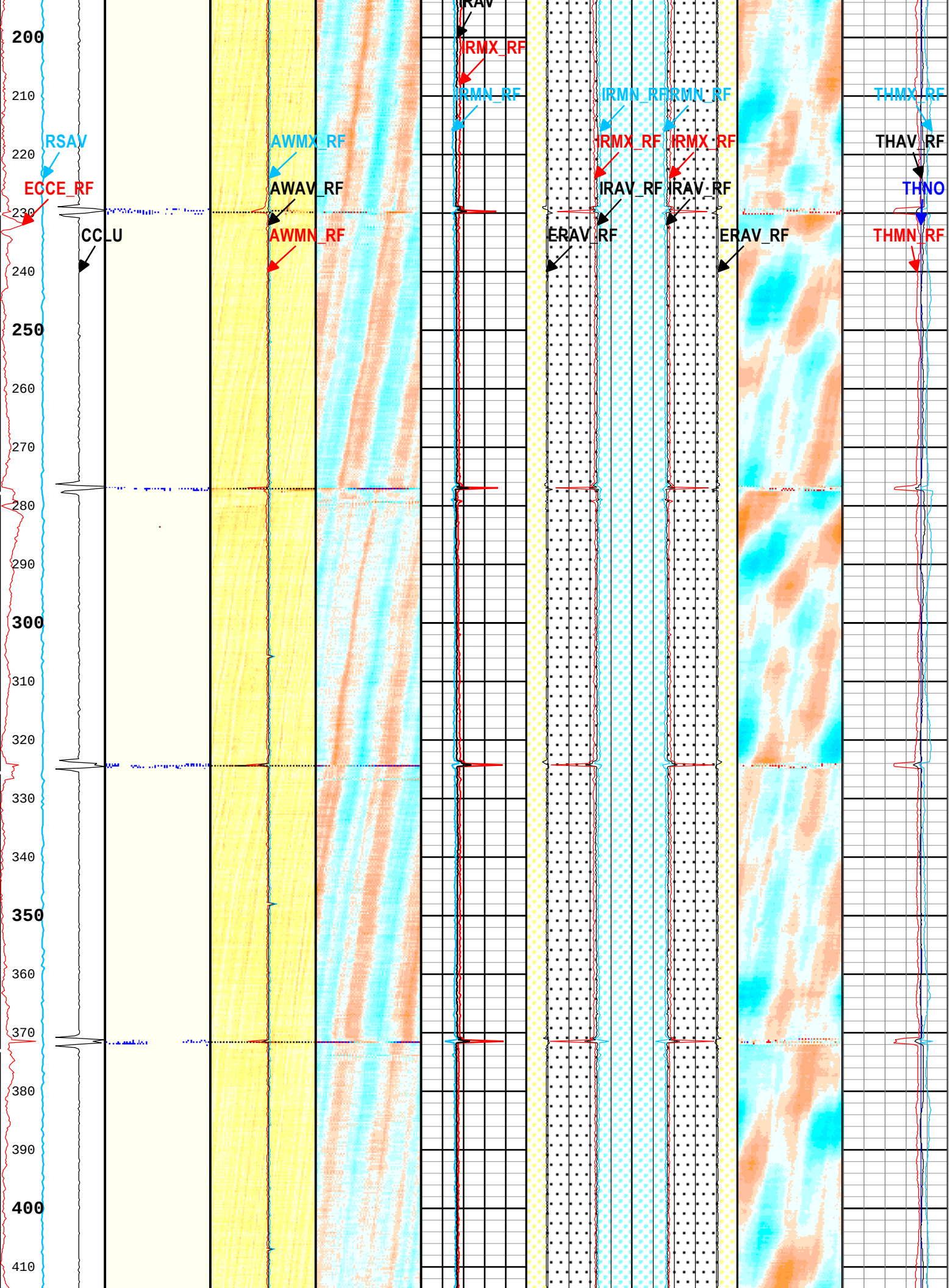
Median of Unflagged External Radii (ERAV_RF) USIT-E[1]
4 in 5

Median Internal

Median Internal

Minimum of Unflagged Casing Thickness (THMN_RF) USIT-E[1]
0.1 in 0.6


Casing Collar Locator Ultrasonic (CCLU) USIT-E[1]
-30 in 10
Amplitude of Eccentering for Unflagged Waves (ECCE_RF) USIT-E[1]
0 in 0.5
Motor Revolution Speed (RSAV) USIT-E[1]
6 c/s 8
Absent 1.500 3.500
Explicit Normalization
USIT - USIT Processing Flags (UFLG) USIT-E[1]
USIT Processing Flags (UFLG[0]) USIT-E[1]
1 5
Maximum of Unflagged Wave Amplitude (AWMX_RF) USIT-E[1]
0 dB 75
Average of Unflagged Wave Amplitude (AWAV_RF) USIT-E[1]
0 dB 75
Maximum of Unflagged Wave Amplitude (AWMN_RF) USIT-E[1]
0 dB 75
Absent -0.051 -0.012 0.028 0.068
Explicit Normalization
USIT - Unflagged Internal Radii minus Median Internal Radius (IRBKM_RF) USIT-E[1]
(in)
Internal Radius Averaged Value (IRAV) USIT-E[1]
4 in 5
Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E[1]
4 in 5
Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E[1]
4 in 5
Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E[1]
5 in 4
Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E[1]
5 in 4
Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E[1]
4 in 5
Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E[1]
4 in 5
Absent -0.051 -0.012 0.028 0.068
Explicit Normalization
USIT - Unflagged Casing Thickness minus Median of Unflagged Casing Thickness (THBKM_RF) USIT-E[1]
(in)
Nominal Casing Thickness (THNO) USIT-E[1]
0.1 in 0.6
Median of Unflagged Casing Thickness (THAV_RF) USIT-E[1]
0.1 in 0.6
Maximum of Unflagged Casing Thickness (THMX_RF) USIT-E[1]
0.1 in 0.6
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190


IRAV
IRMX_RF
IRMN_RF
IRMN_RF
IRMN_RF
THMX_RF
RSAV
AWMX_RF
IRMX_RF
IRMX_RF
THAV_RF
ECCE_RF
AWAV_RF
IRAV_RF
IRAV_RF
THNO
CC_LU
AWMN_RF
ERAV_RF
ERAV_RF
THMN_RF
200
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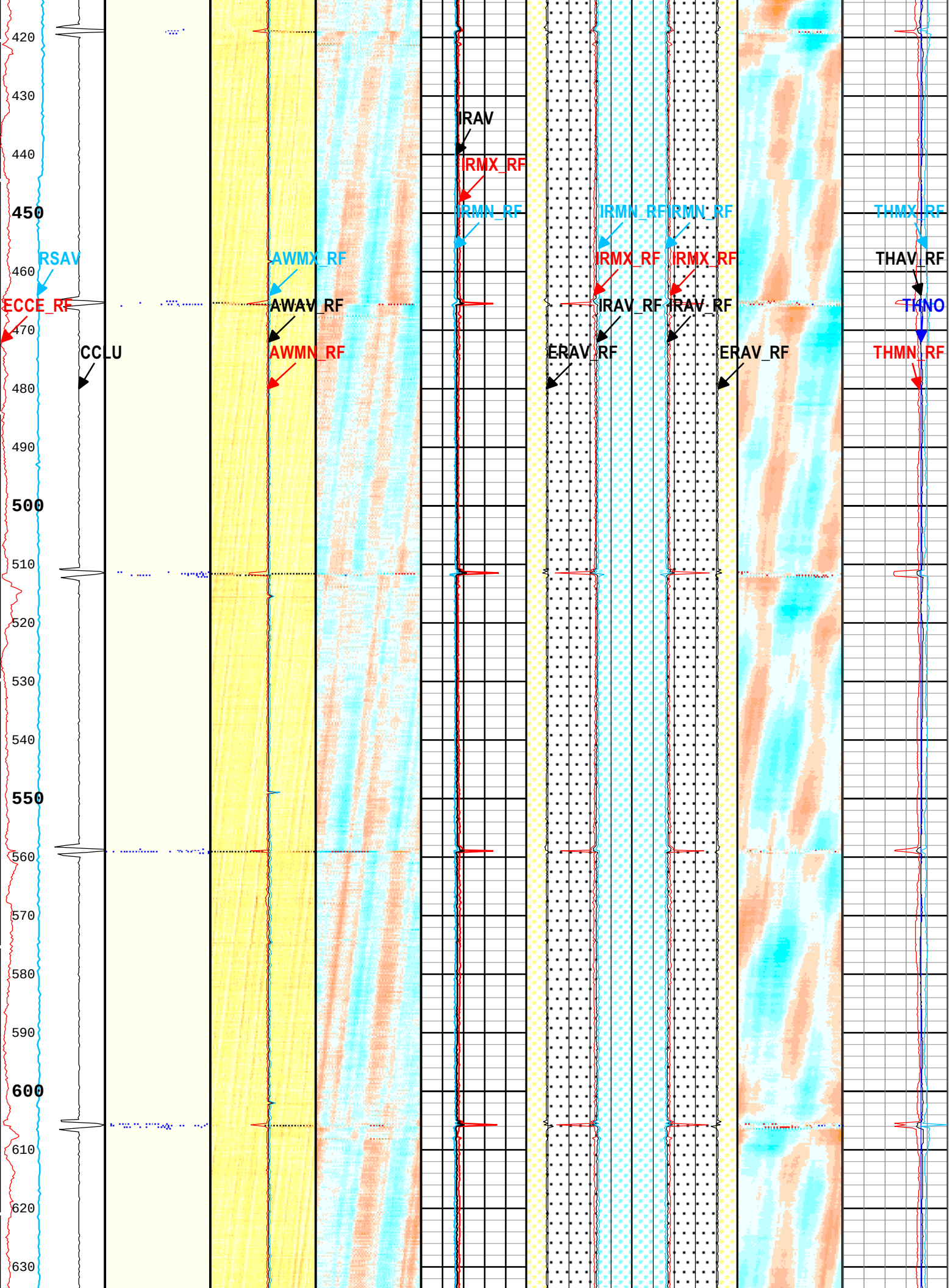
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620
630
IRAV
IRMX_RF
IRMN_RF
IRMN_RF
IRMN_RF
THMX_RF
RSAV
AWMX_RF
IRMX_RF
IRMX_RF
THAV_RF
ECCE_RF
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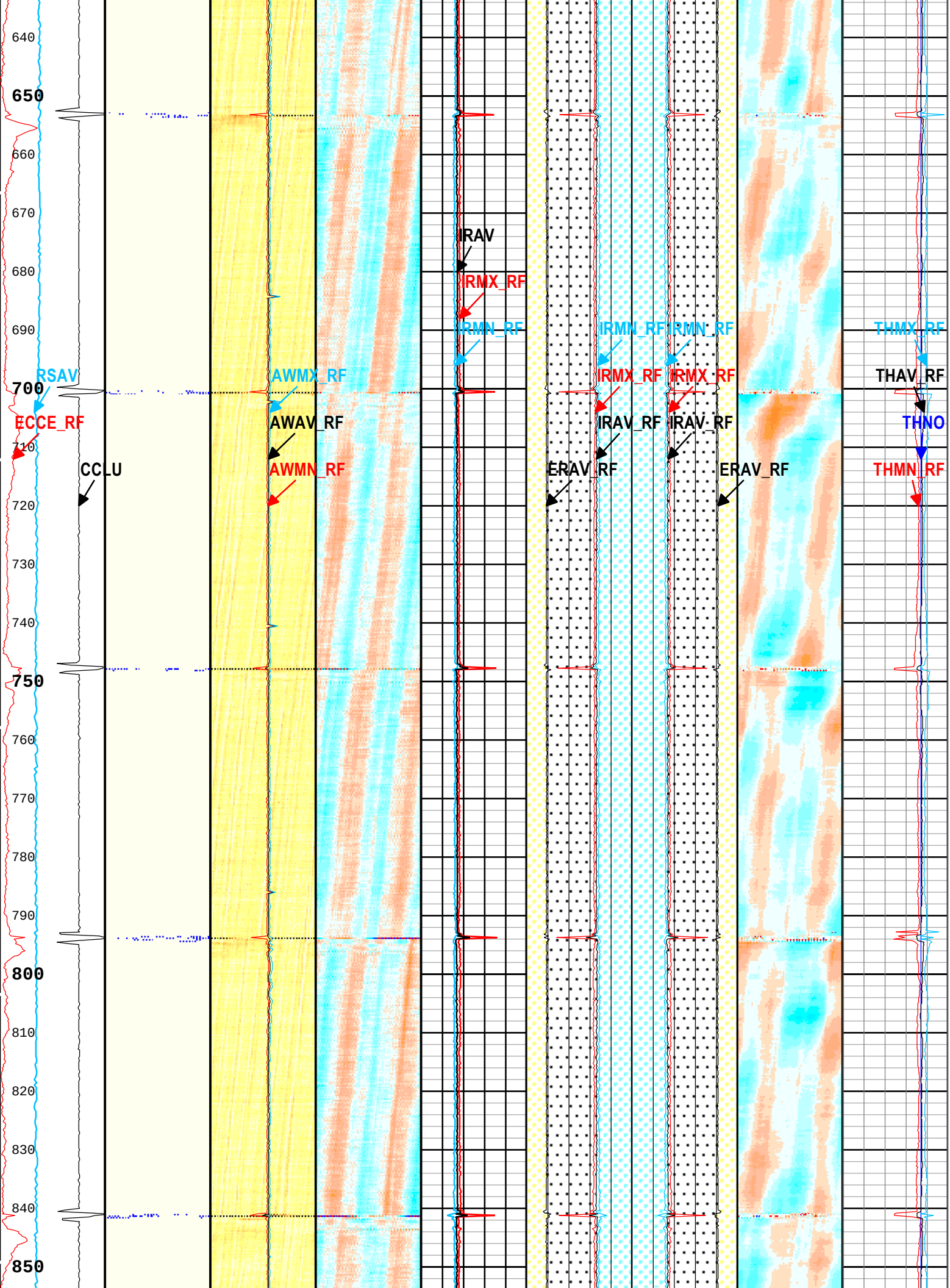
ERAV_RF
ERAV_RF
THMN_RF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670
680
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780
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800
810
820
830
840
850
RSAV
ECCE_RF
CCLU
AWMX_RF
AWAV_RF
AWMN_RF
IRAV
IRMX_RF
IRMN_RF
IRMN_RF
IRMX_RF
IRAV_RF
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IRMN_RF
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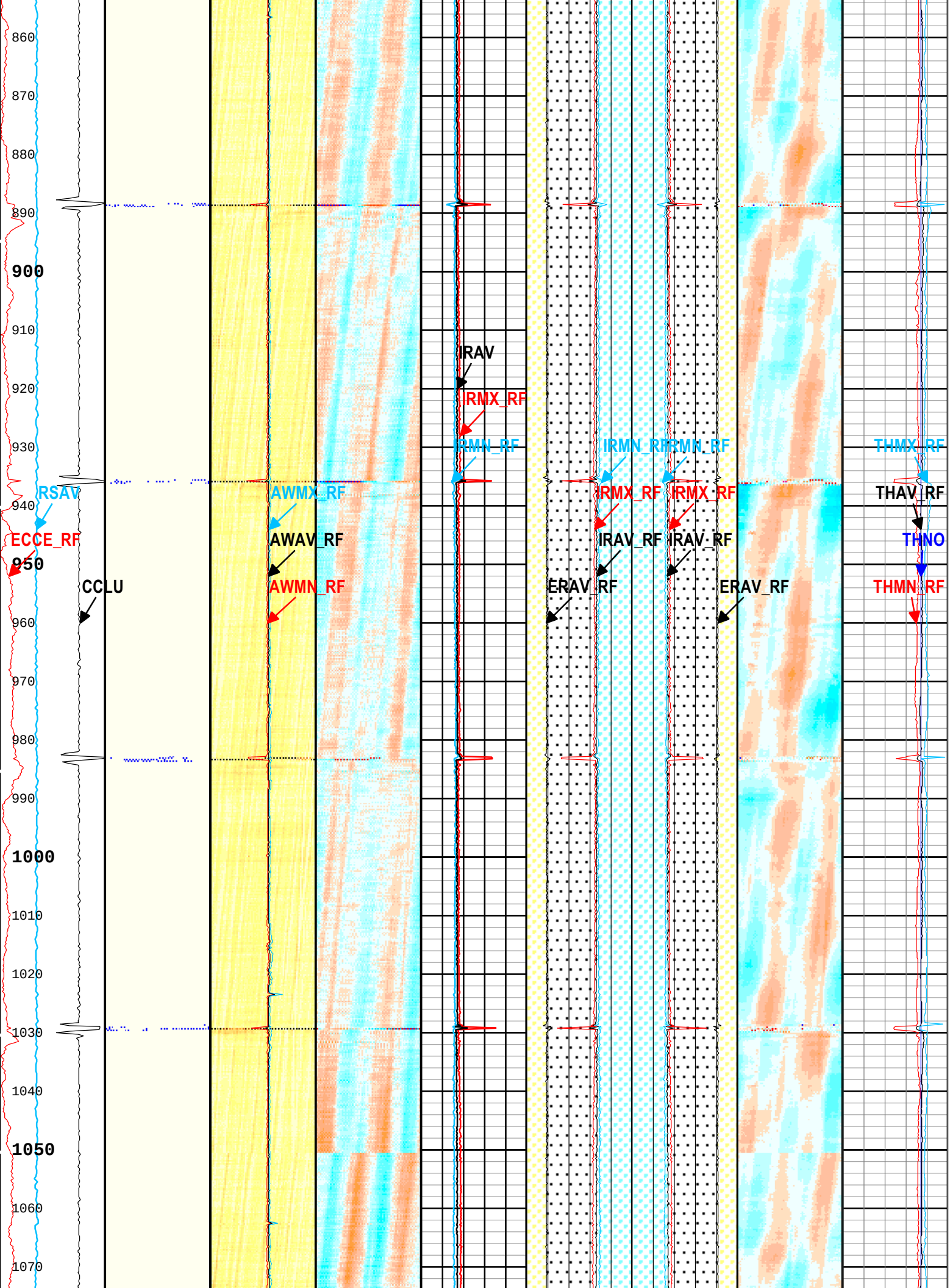
THAV_RF
THNO
THMN_RF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960
970
980
990
1000
1010
1020
1030
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1060
1070
RSAV
ECCE_RF
CCLU
AWMX_RF
AWAV_RF
AWMN_RF
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IRMX_RF
IRMN_RF
IRMN_RF
IRMX_RF
IRAV_RF
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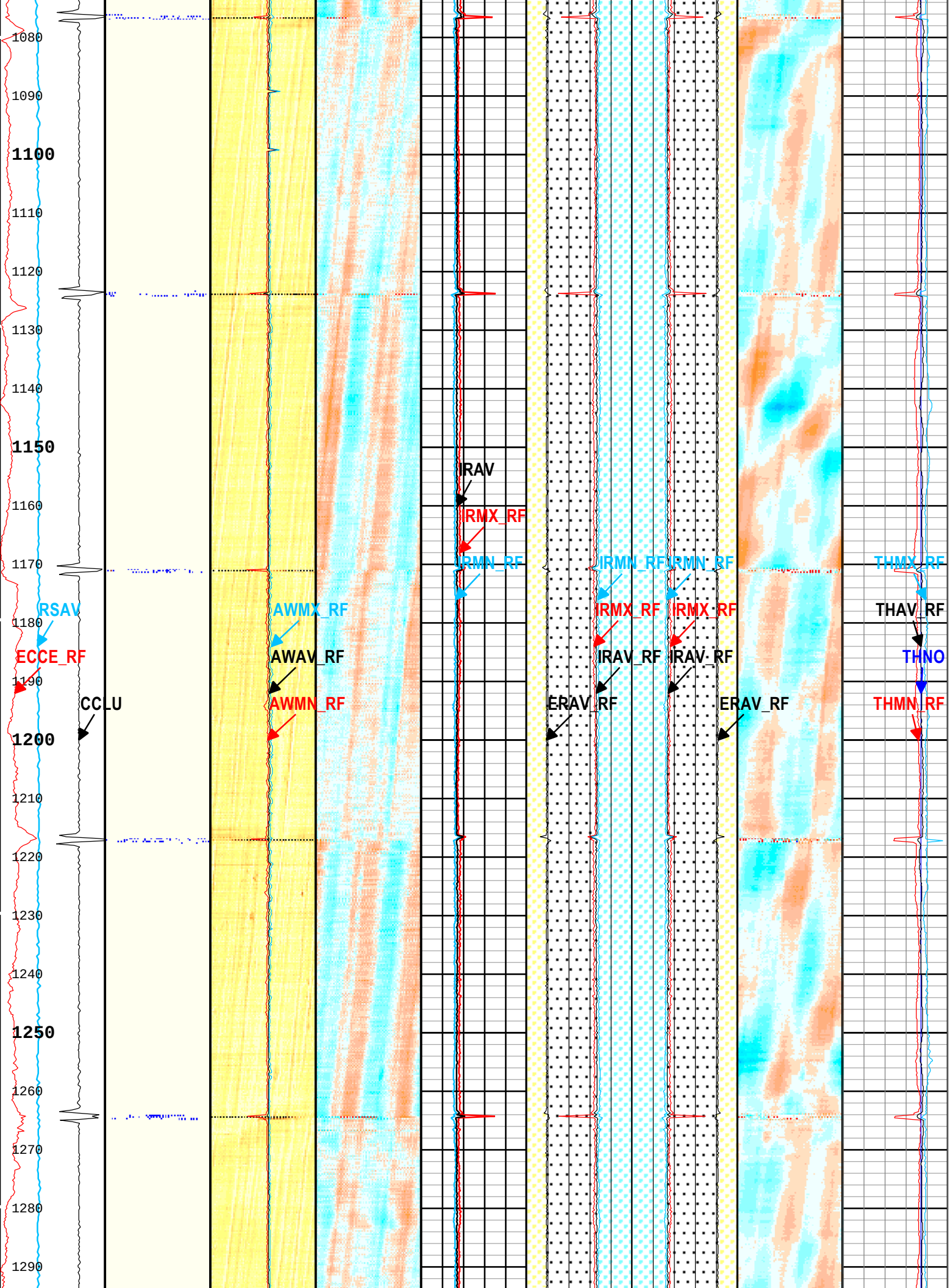
ERAV_RF
THMX_RF
THAV_RF
THNO
THMN_RF


1080
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1230
1240
1250
1260
1270
1280
1290
RSAV
ECCE_RF
CCLU
AWMX_RF
AWAV_RF
AWMN_RF
IRAV
IRMX_RF
IRMN_RF
IRMN_RF
IRMX_RF
IRAV_RF
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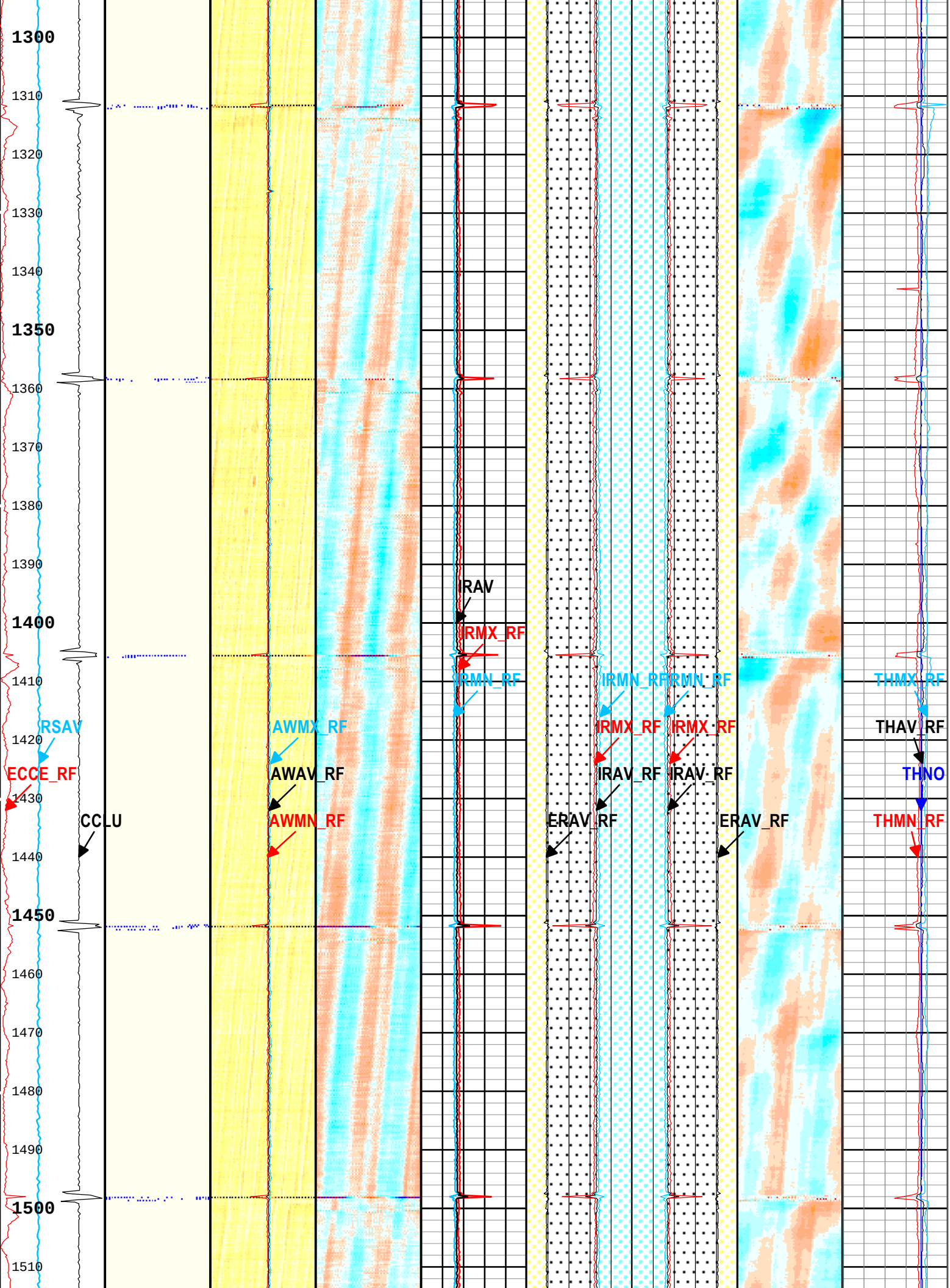
THAV_RF
THNO
THMN_RF


1300
1310
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1450
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1480
1490
1500
1510
IRAV
IRMX_RF
IRMN_RF
RSAV
ECCE_RF
CCLU
AWMX_RF
AWAV_RF
AWMN_RF
IRMN_RF
IRMN_RF
IRMX_RF
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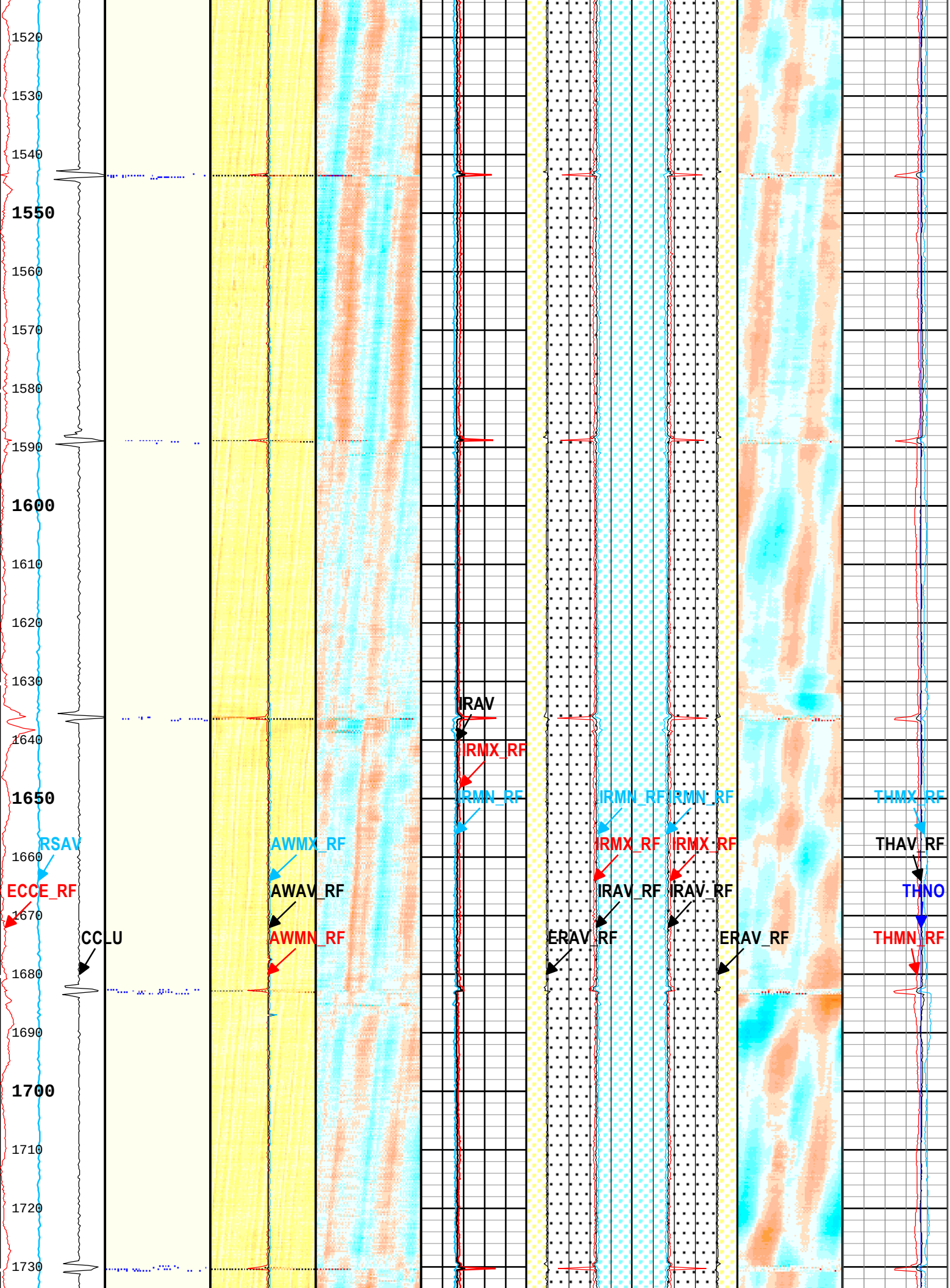
IRAV_RF
IRAV_RF
ERAV_RF
ERAV_RF
THMX_RF
THAV_RF
THNO
THMN_RF


1520
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1580
1590
1600
1610
1620
1630
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1650
1660
1670
1680
1690
1700
1710
1720
1730
IRAV
IRMX_RF
IRMN_RF
IRMN_RF
IRMN_RF
THMX_RF
RSAV
AWMX_RF
IRMX_RF
IRMX_RF
THAV_RF
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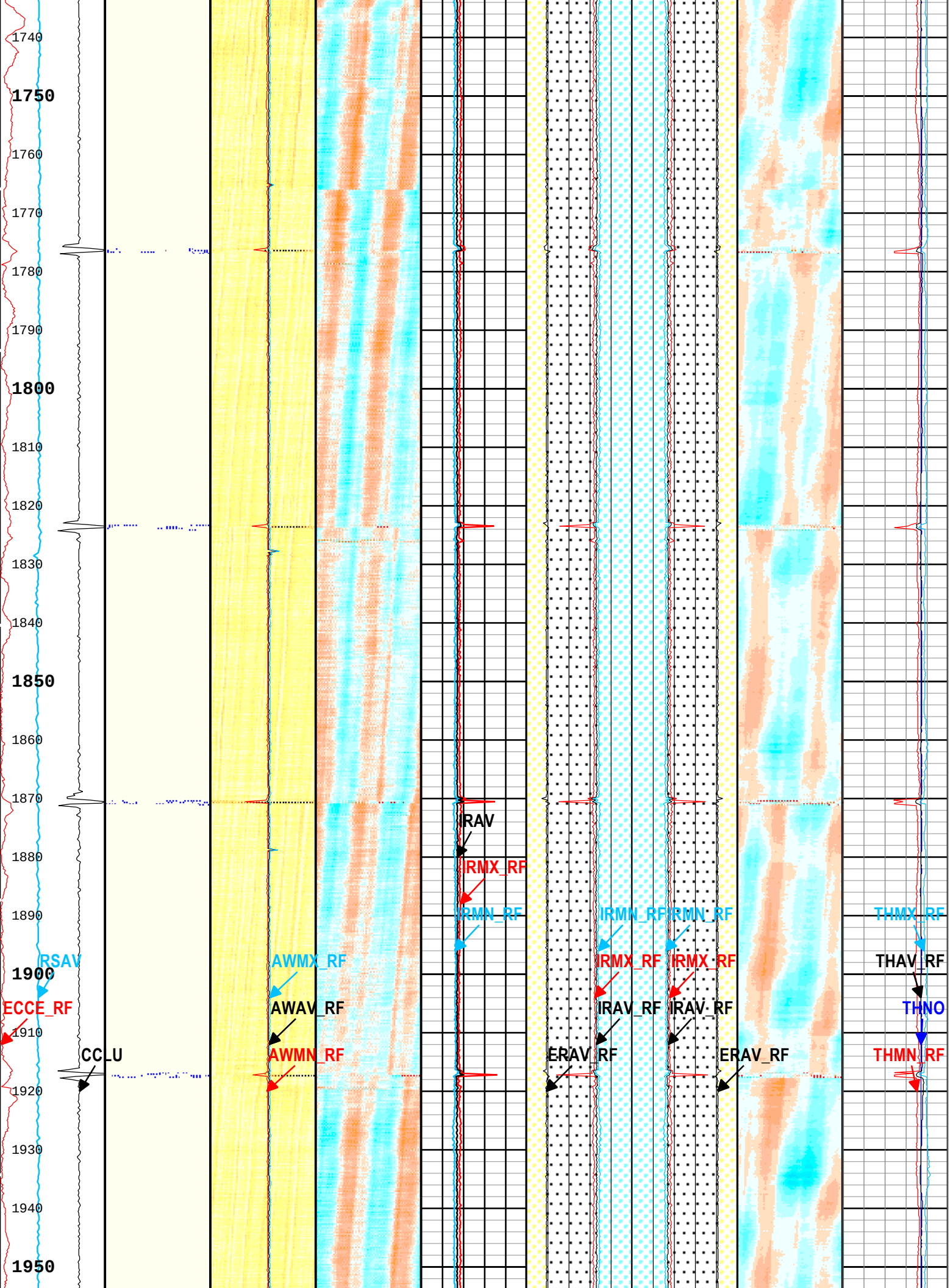
ERAV_RF
ERAV_RF
THMN_RF


1740
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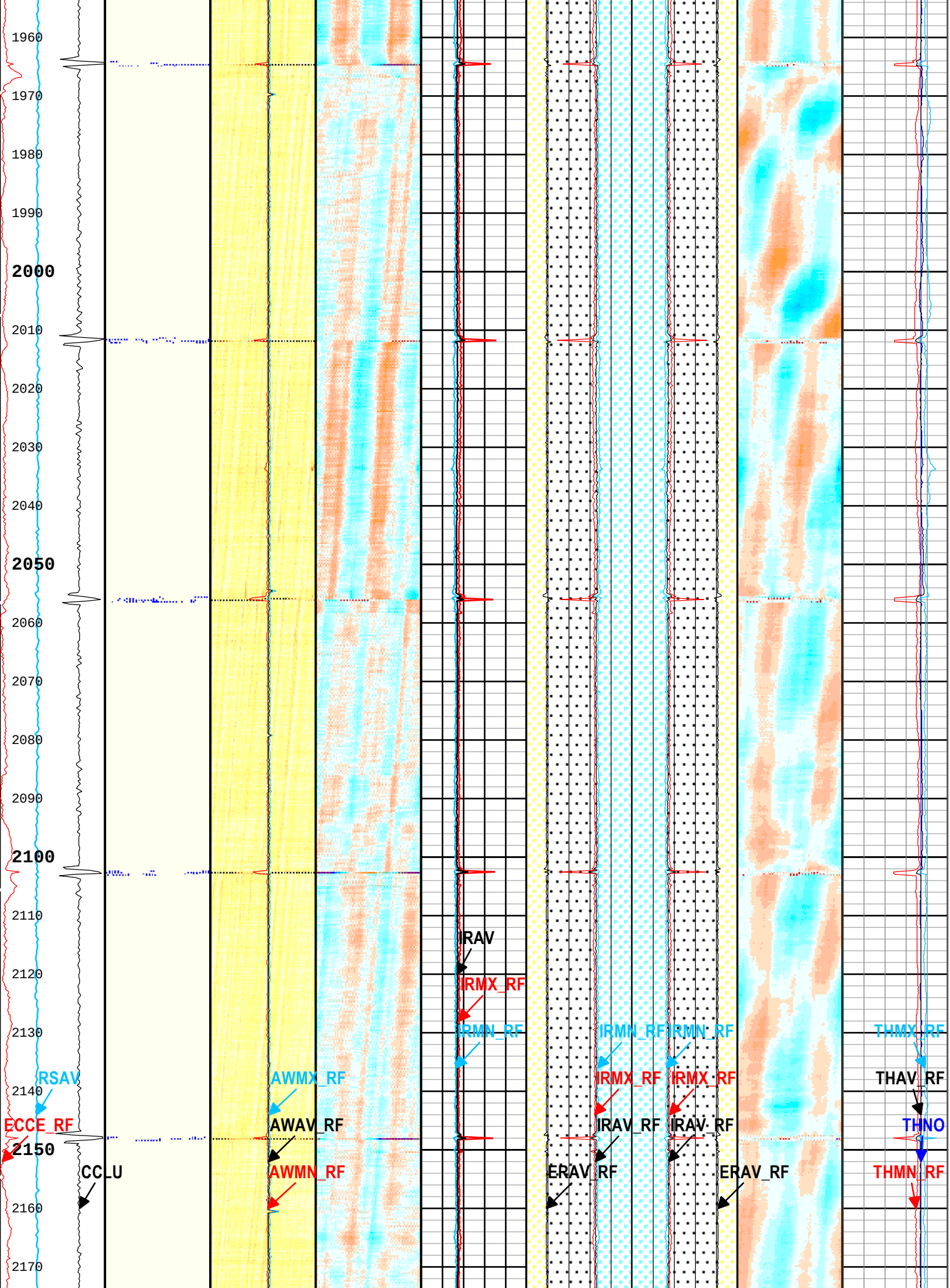
1890
1900
1910
1920
1930
1940
1950
RAV
IRMX_RF
IRMN_RF
RSAV
AWMX_RF
ECCE_RF
AWAV_RF
CC_U
AWMN_RF
IRMN_RF
IRMN_RF
IRMX_RF
IRMX_RF
IRAV_RF
IRAV_RF
ERAV_RF
ERAV_RF
THMX_RF
THAV_RF
THNO
THMN_RF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2170
RSAV
ECCE_RF
CC_U
AWMX_RF
AWAV_RF
AWMN_RF
IRAV
IRMX_RF
IRMN_RF
IRMN_RF
IRMN_RF
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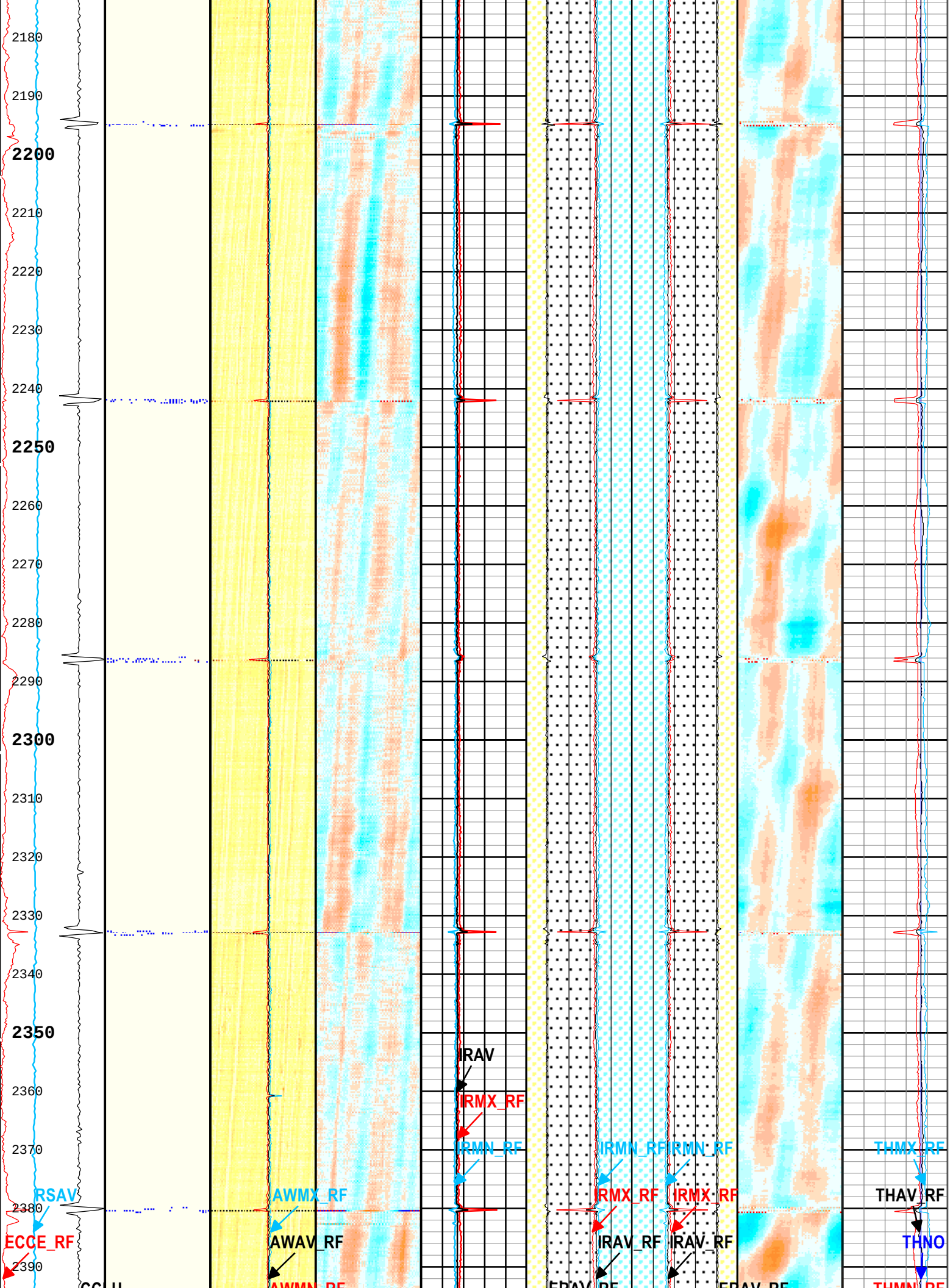
THMN_RF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2390
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IRMX_RF
IRMN_RF
IRMN_RF
IRMN_RF
THMX_RF
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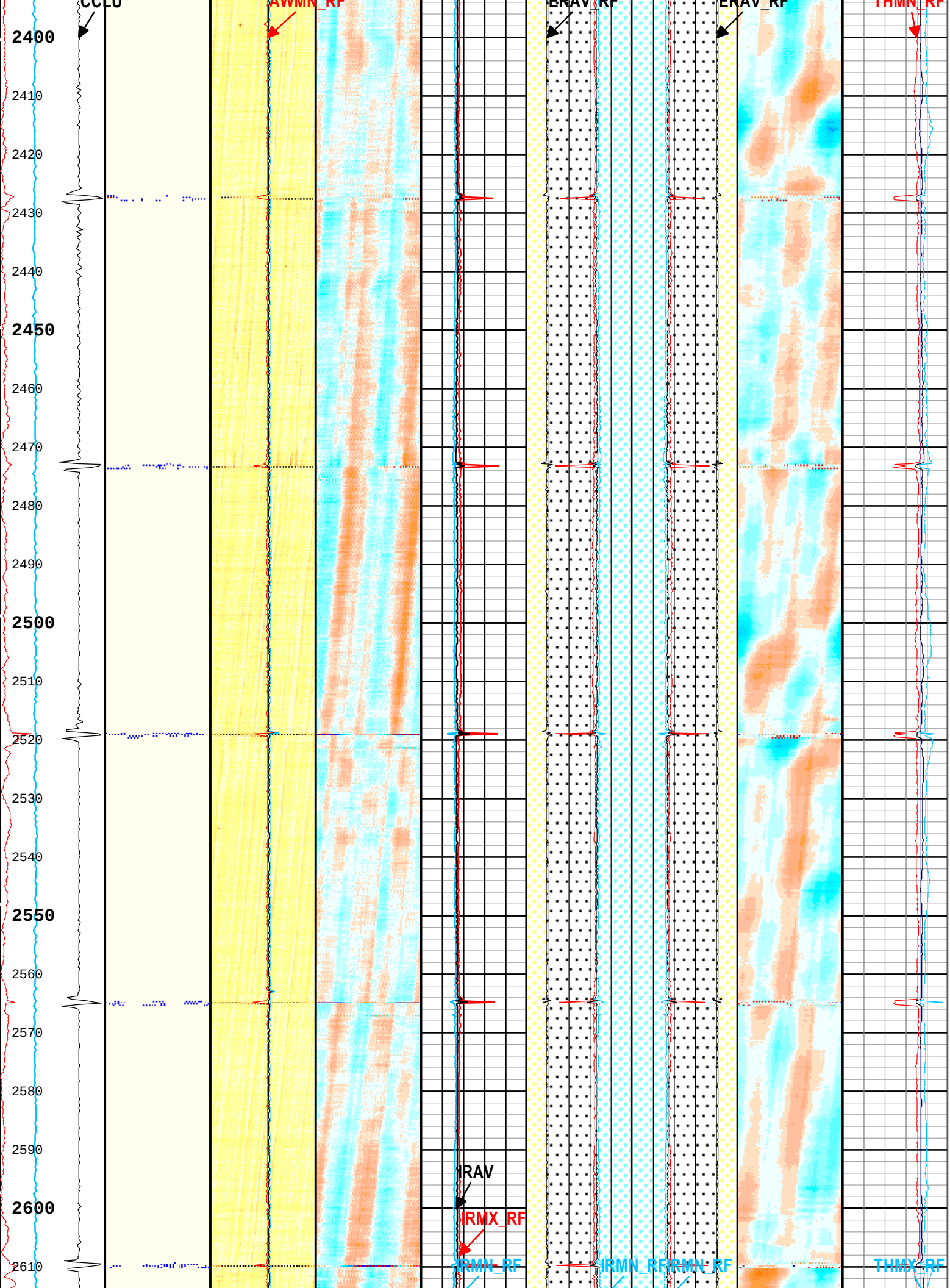
AWAV_RF
IRAV_RF
IRAV_RF
THNO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ERAV_RF
ERAV_RF
THMN_RF
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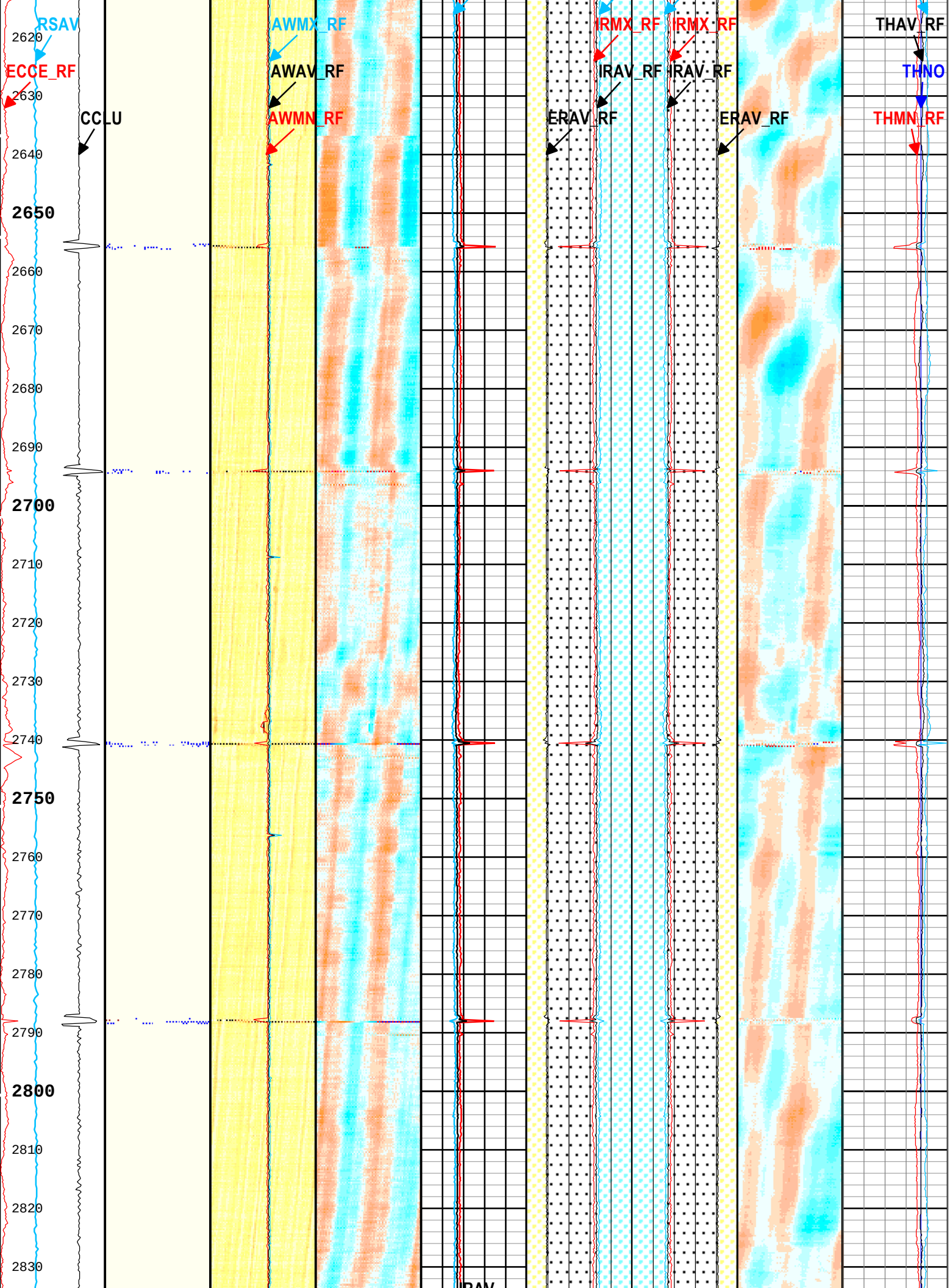
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ERAV_RF
THAV_RF
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THMN_RF
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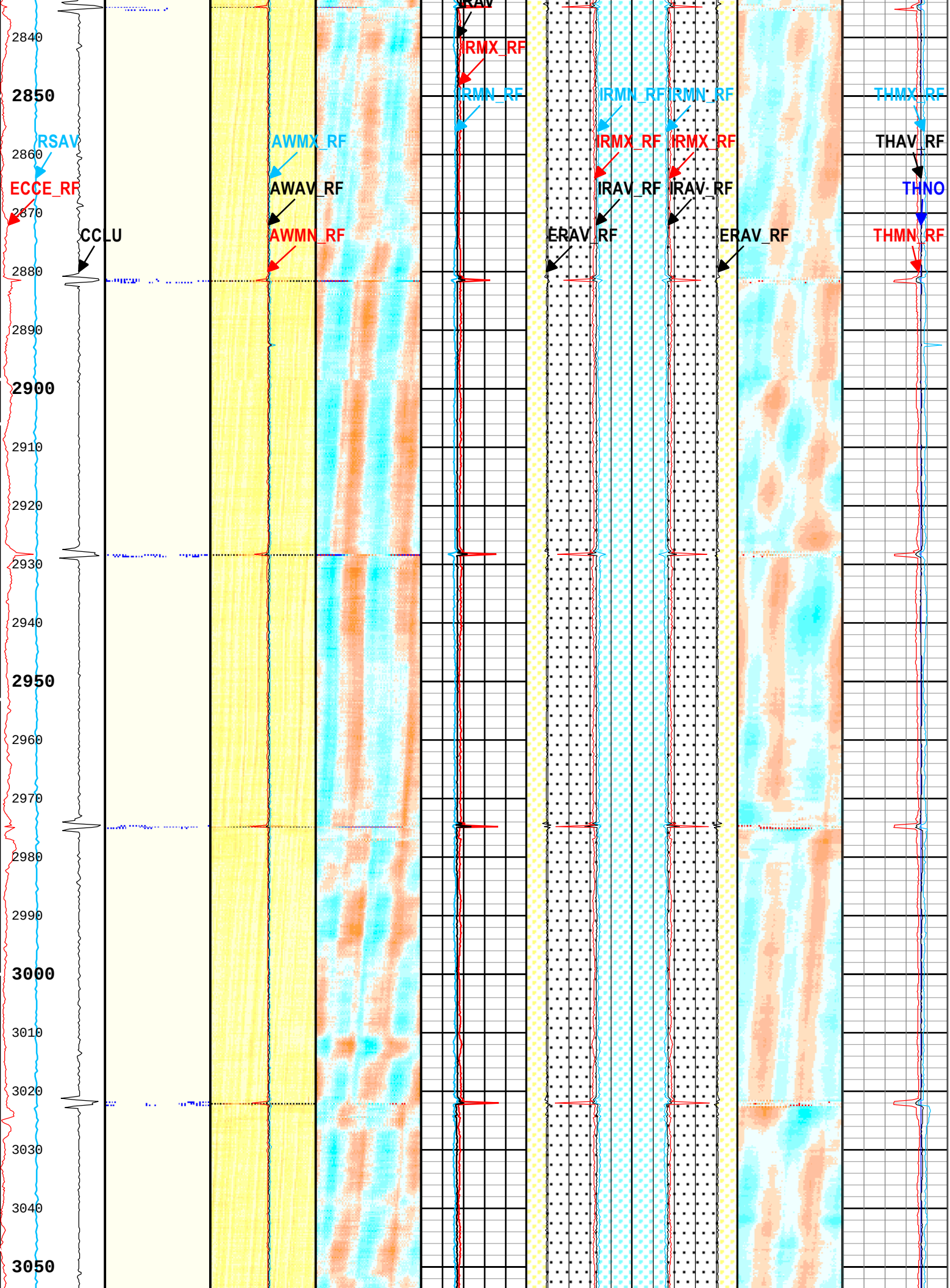
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3010
3020
3030
3040
3050
IRAV
IRMX_RF
IRMN_RF
IRMN_RF
IRMN_RF
THMX_RF
RSAV
AWMX_RF
IRMX_RF
IRMX_RF
THAV_RF
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IRAV_RF
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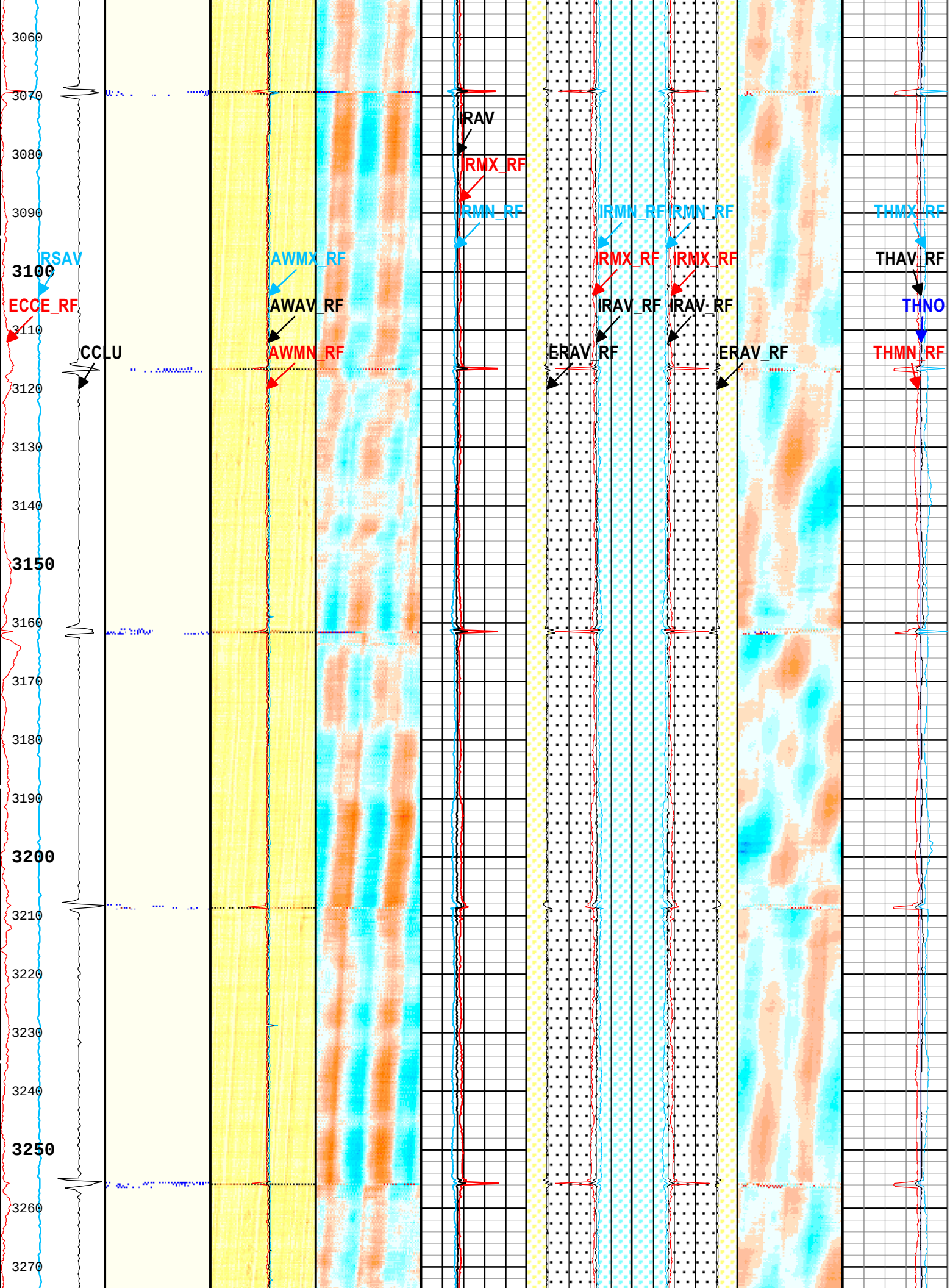
AWMN_RF
ERAV_RF
ERAV_RF
THMN_RF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3270
IRAV
IRMX_RF
IRMN_RF
IRMN_RF
IRMN_RF
THMX_RF
RSAV
AWMX_RF
IRMX_RF
IRMX_RF
THAV_RF
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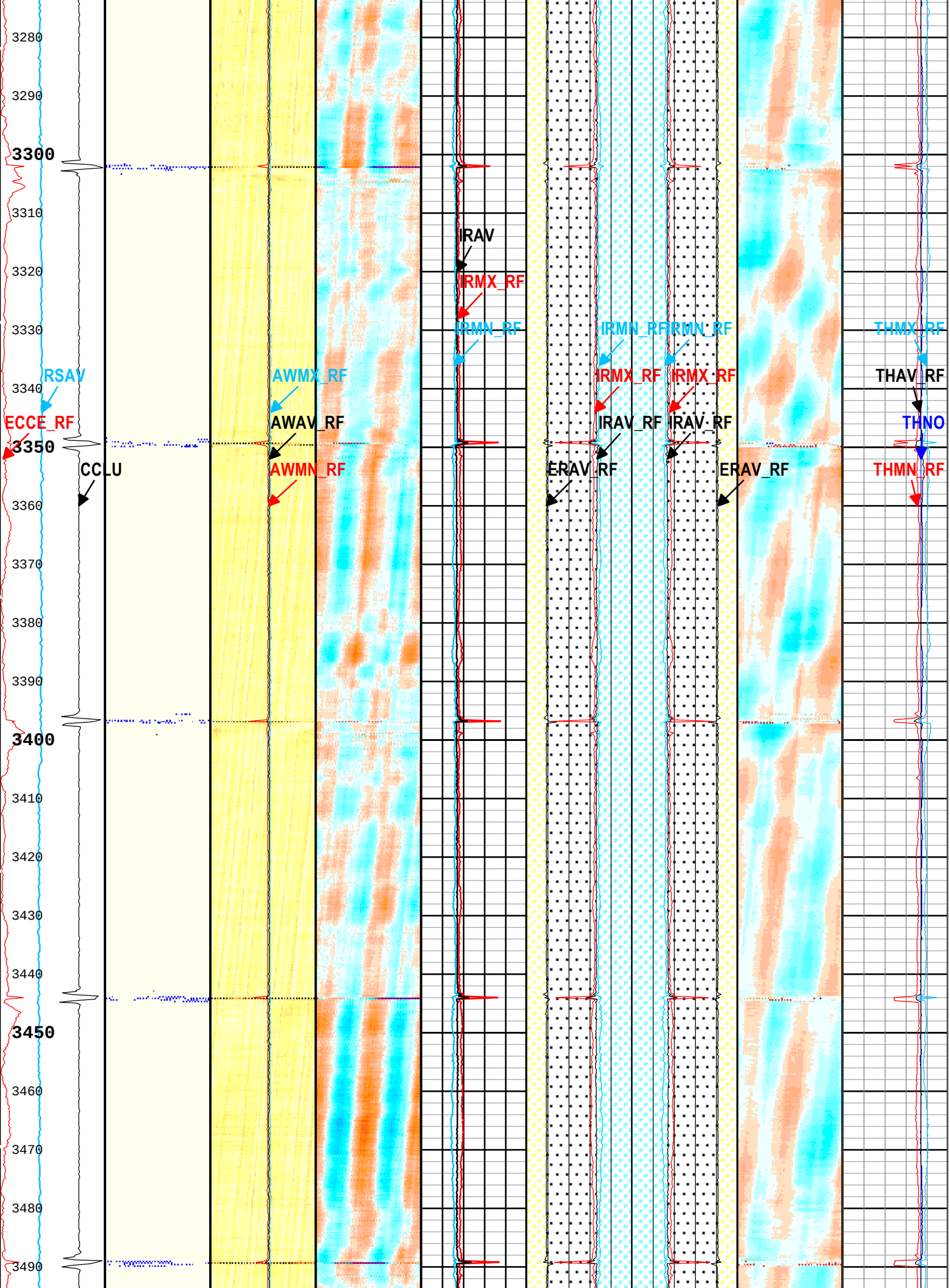
ERAV_RF
THMN_RF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3460
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3490
RSAV
ECCE_RF
CCLU
AWMX_RF
AWAV_RF
AWMN_RF
IRAV
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IRMN_RF
IRMN_RF
IRMN_RF
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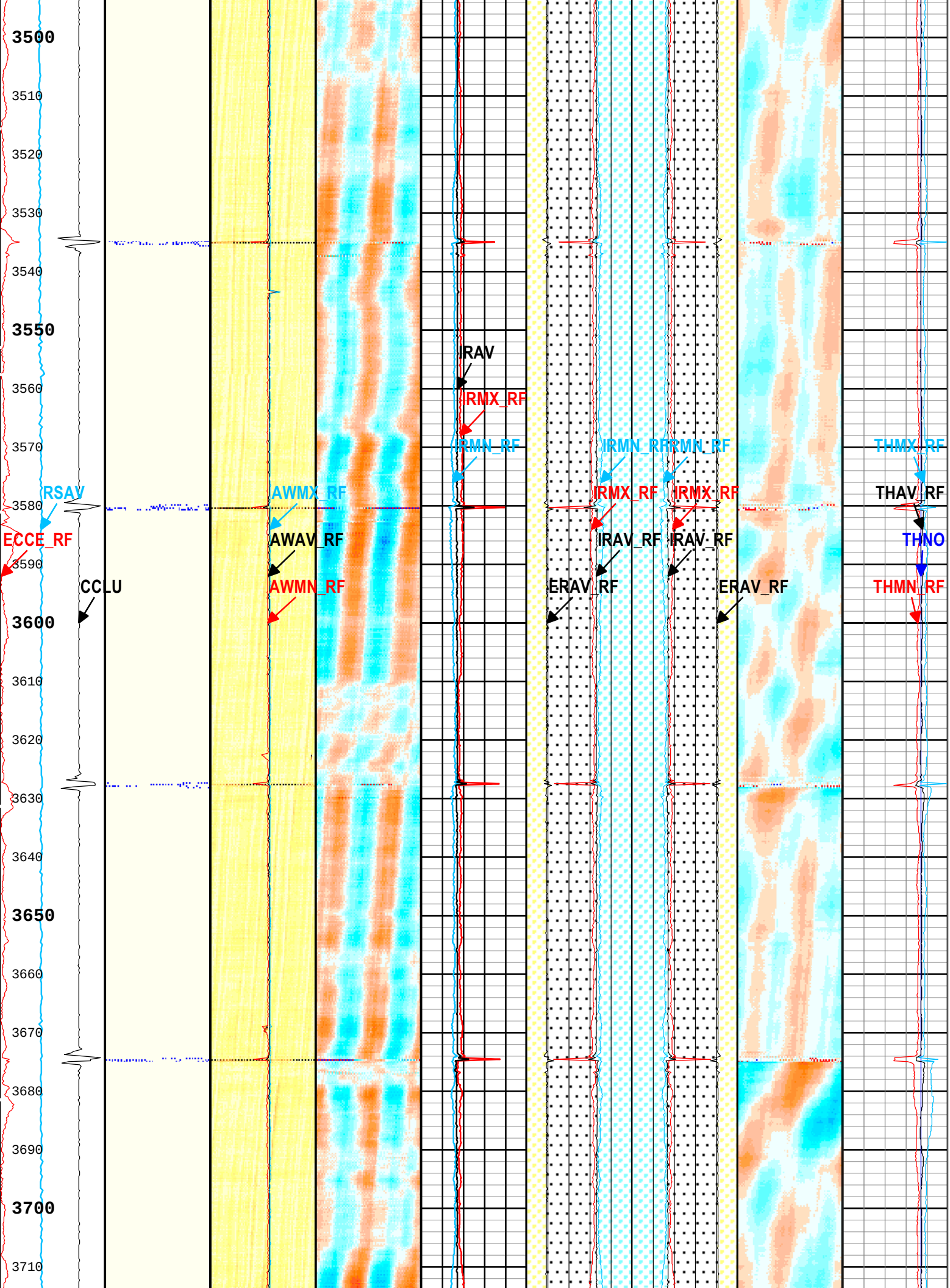
THNO
THMN_RF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THMX_RF
RSAV
AWMX_RF
IRMX_RF
IRMX_RF
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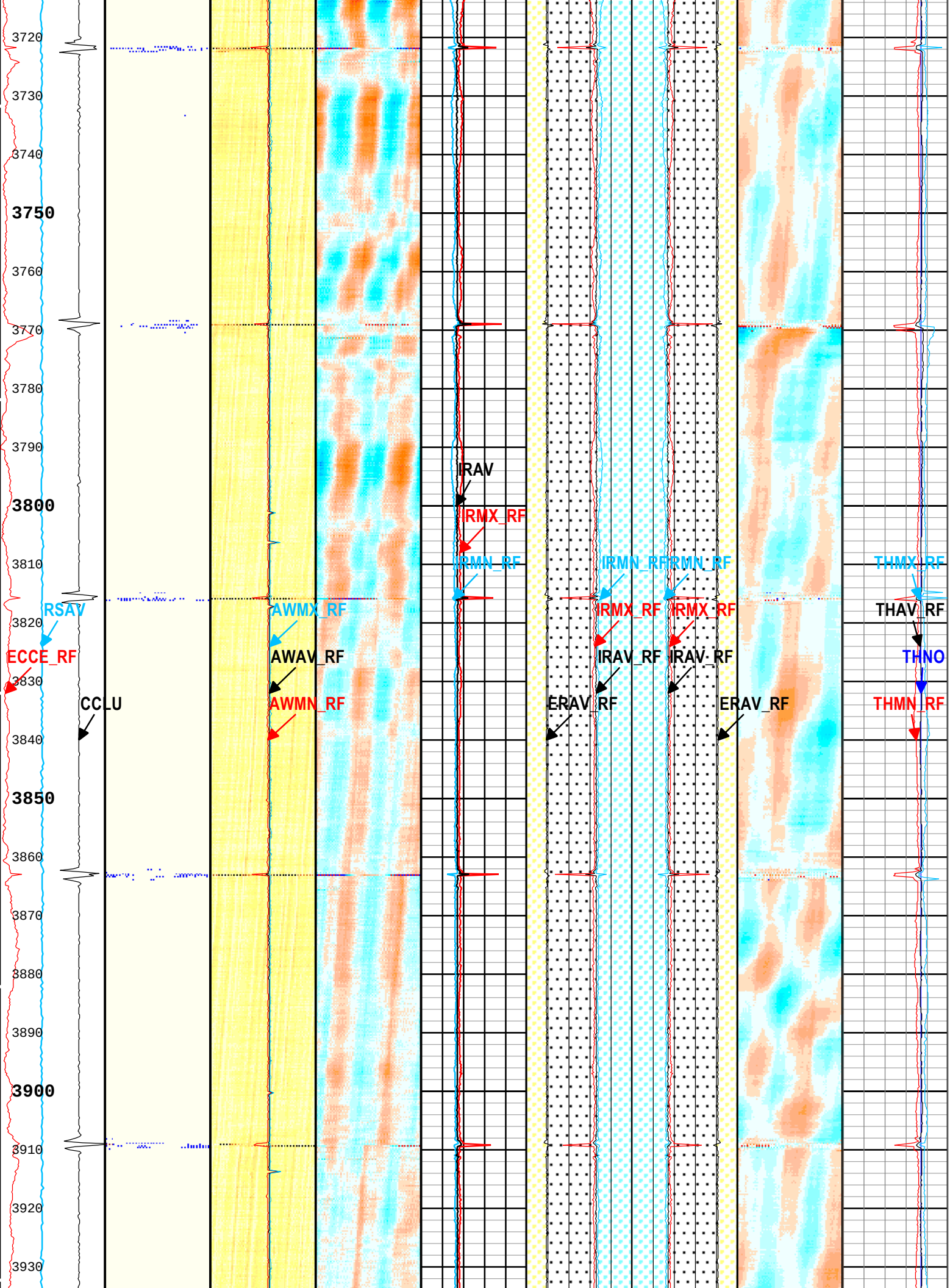
THMN_RF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CCLU
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AWAV_RF
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IRMN_RF
IRMN_RF
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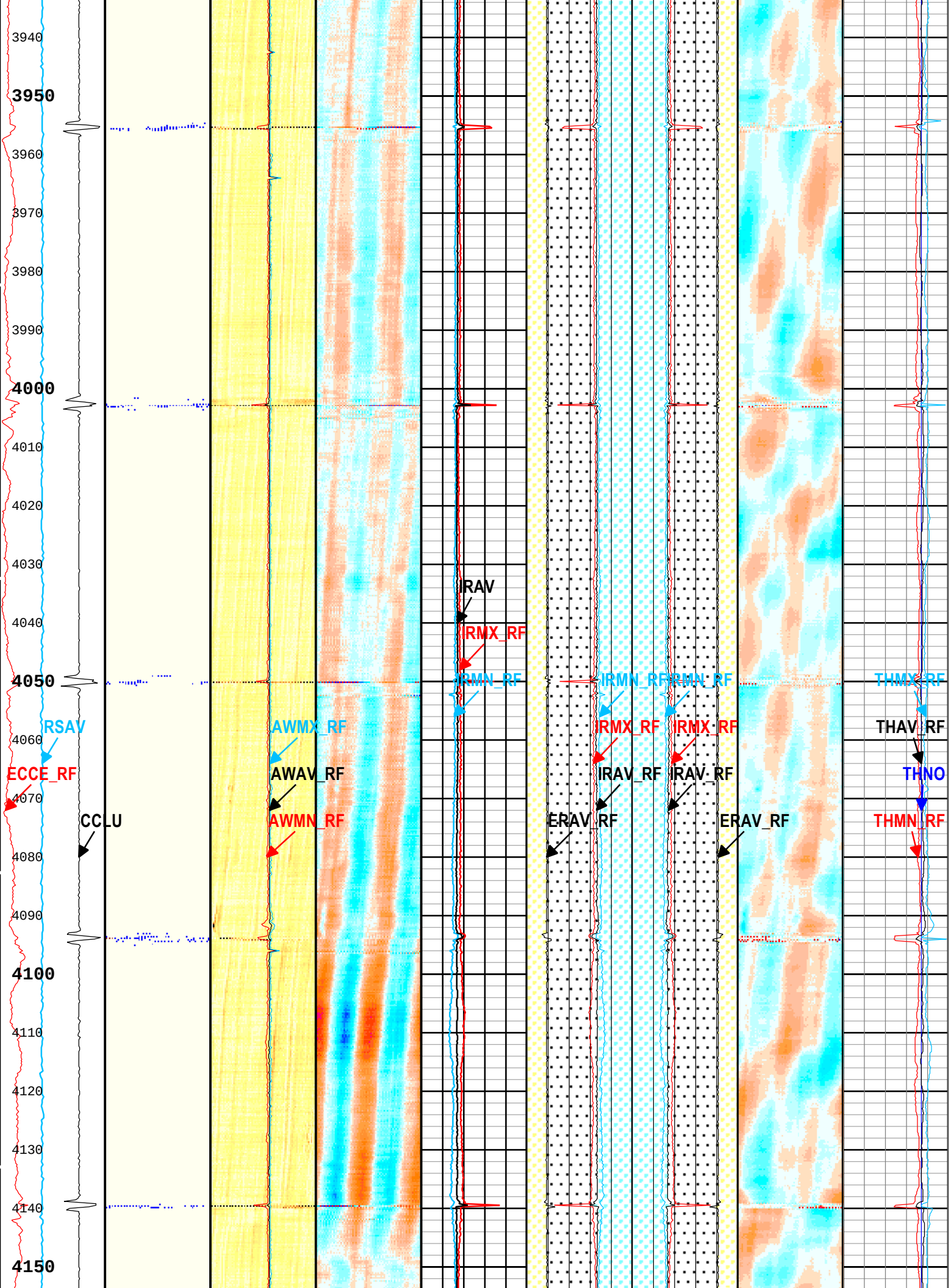
THMN_RF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4130
4140
4150
IRAV
IRMX_RF
IRMN_RF
IRMN_RF
IRMN_RF
THMX_RF
RSAV
AWMX_RF
IRMX_RF
IRMX_RF
THAV_RF
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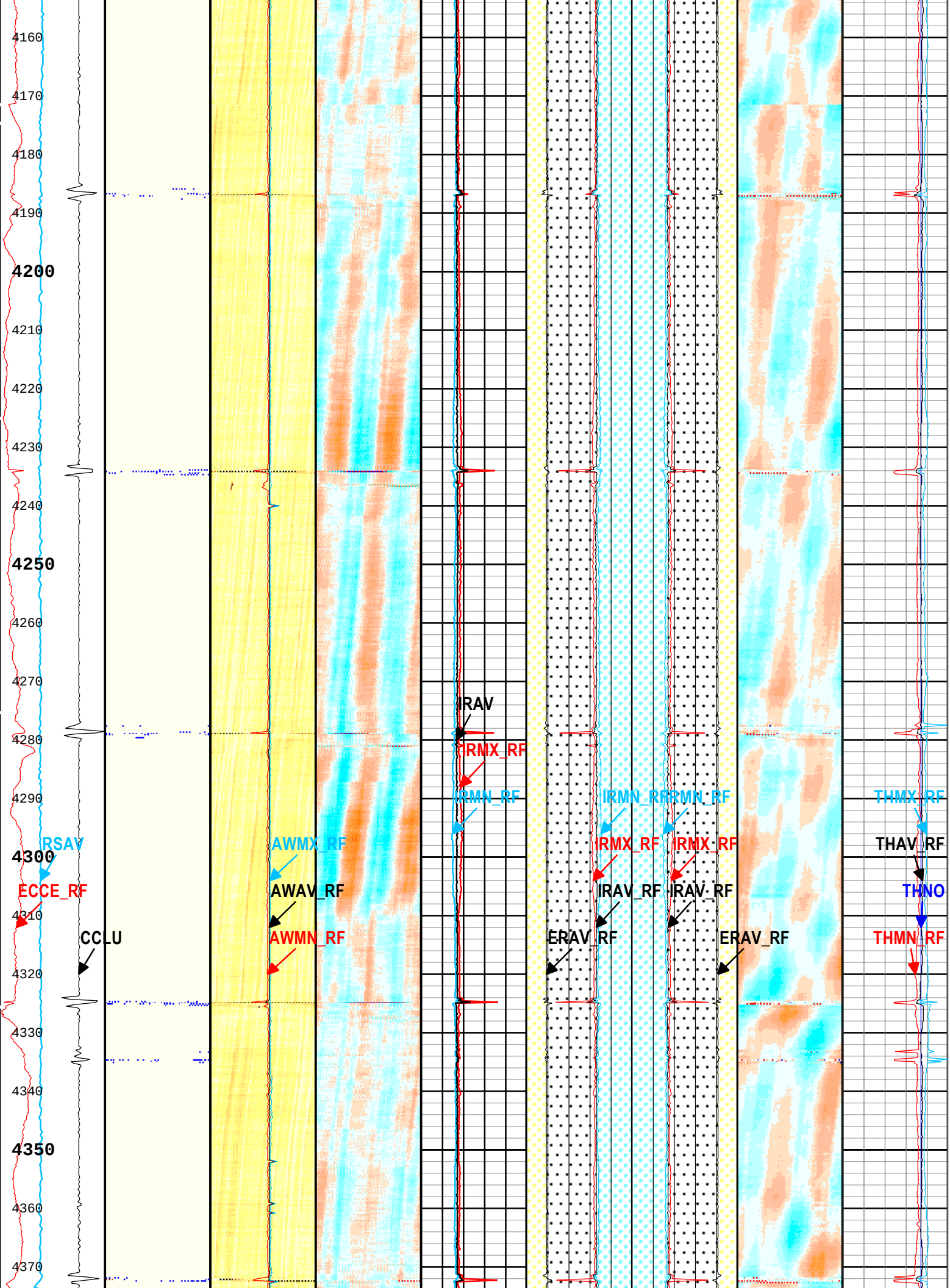
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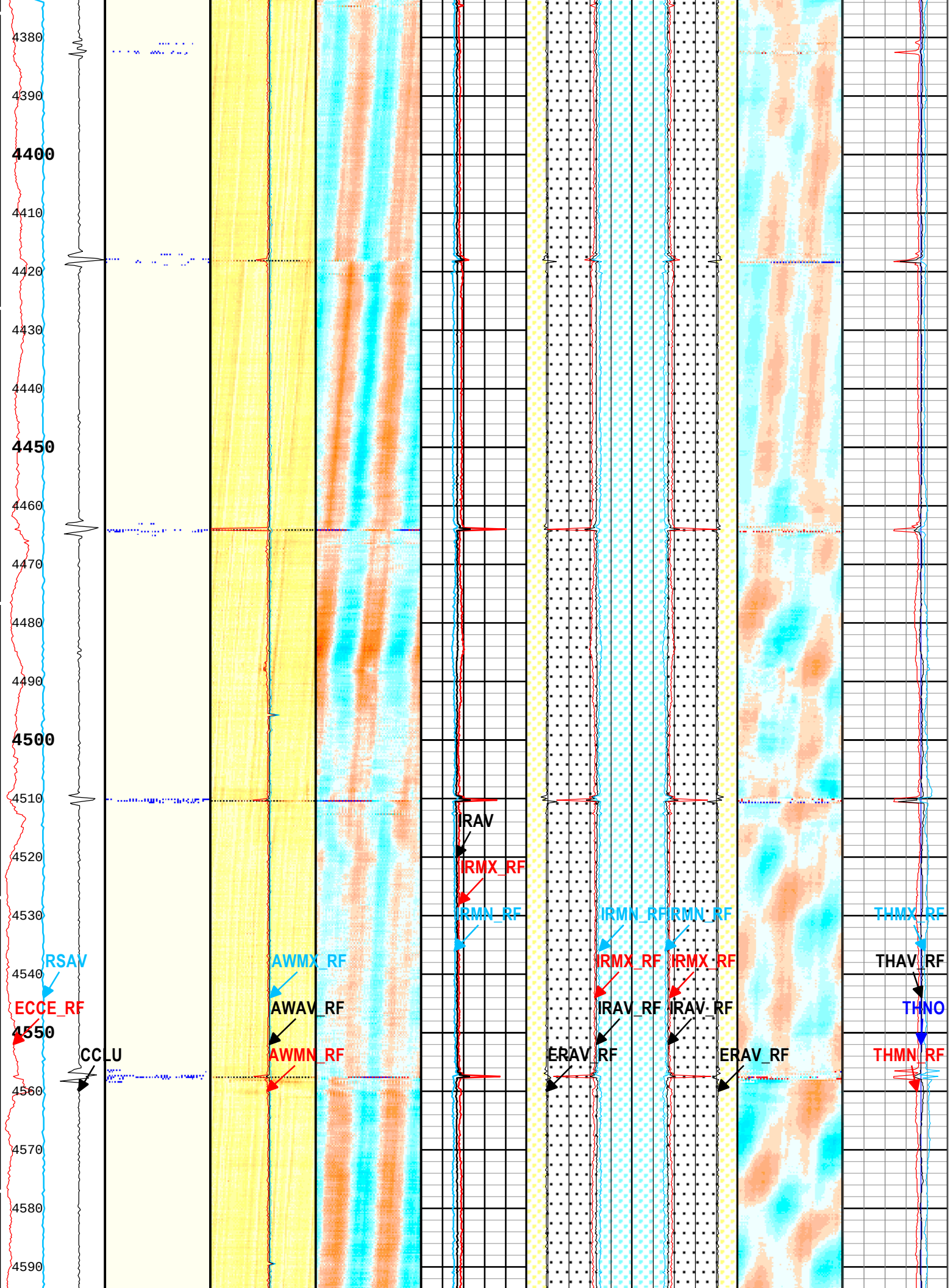
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IRAV
IRMX_RF
IRMN_RF
IRMN_RF
IRMN_RF
THMX_RF
RSAV
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IRMX_RF
IRMX_RF
THAV_RF
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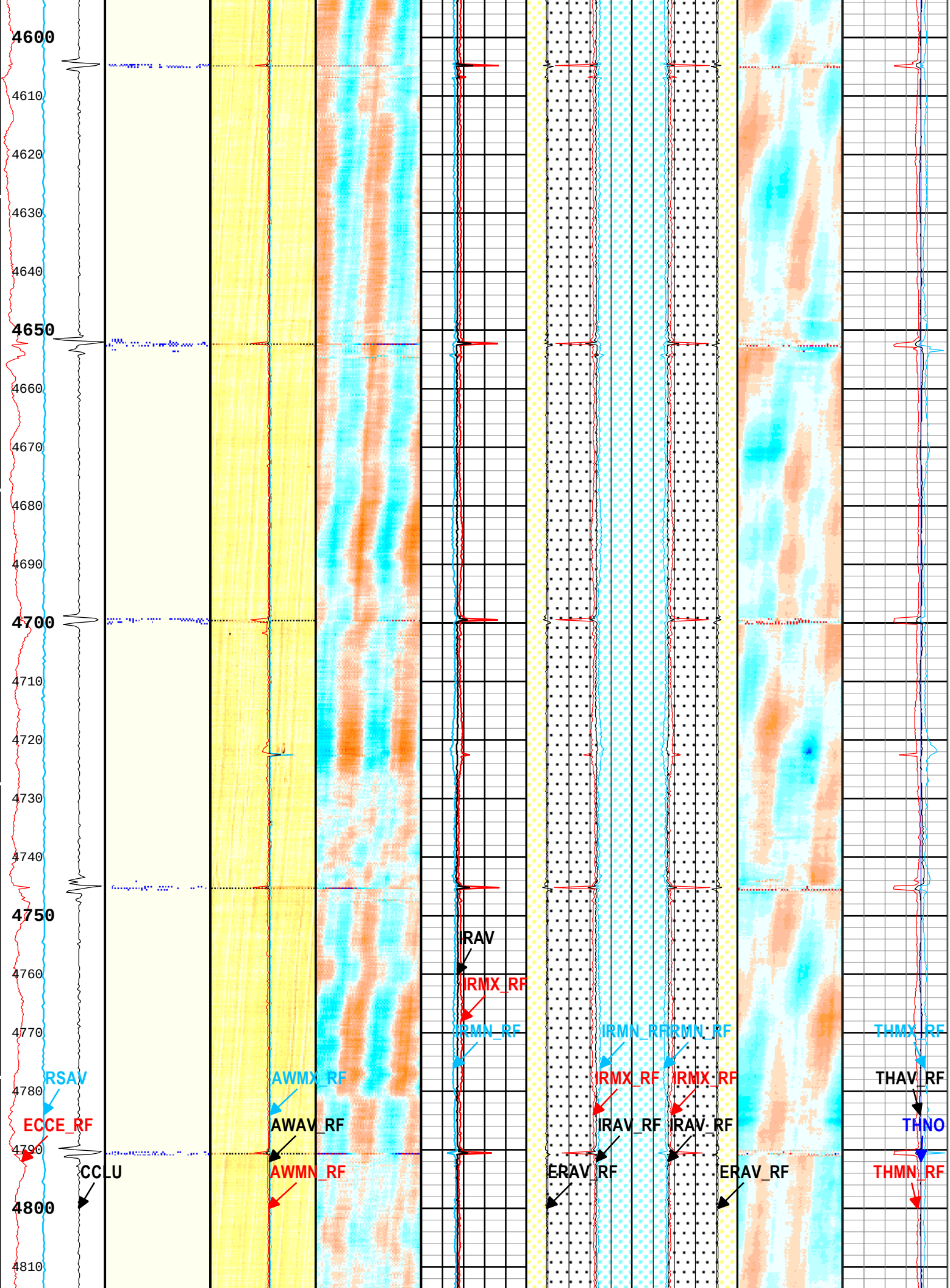
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4810
RAV
IRMX_RF
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RSAV
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CCLU
AWMX_RF
AWAV_RF
AWMN_RF
IRMN_RF
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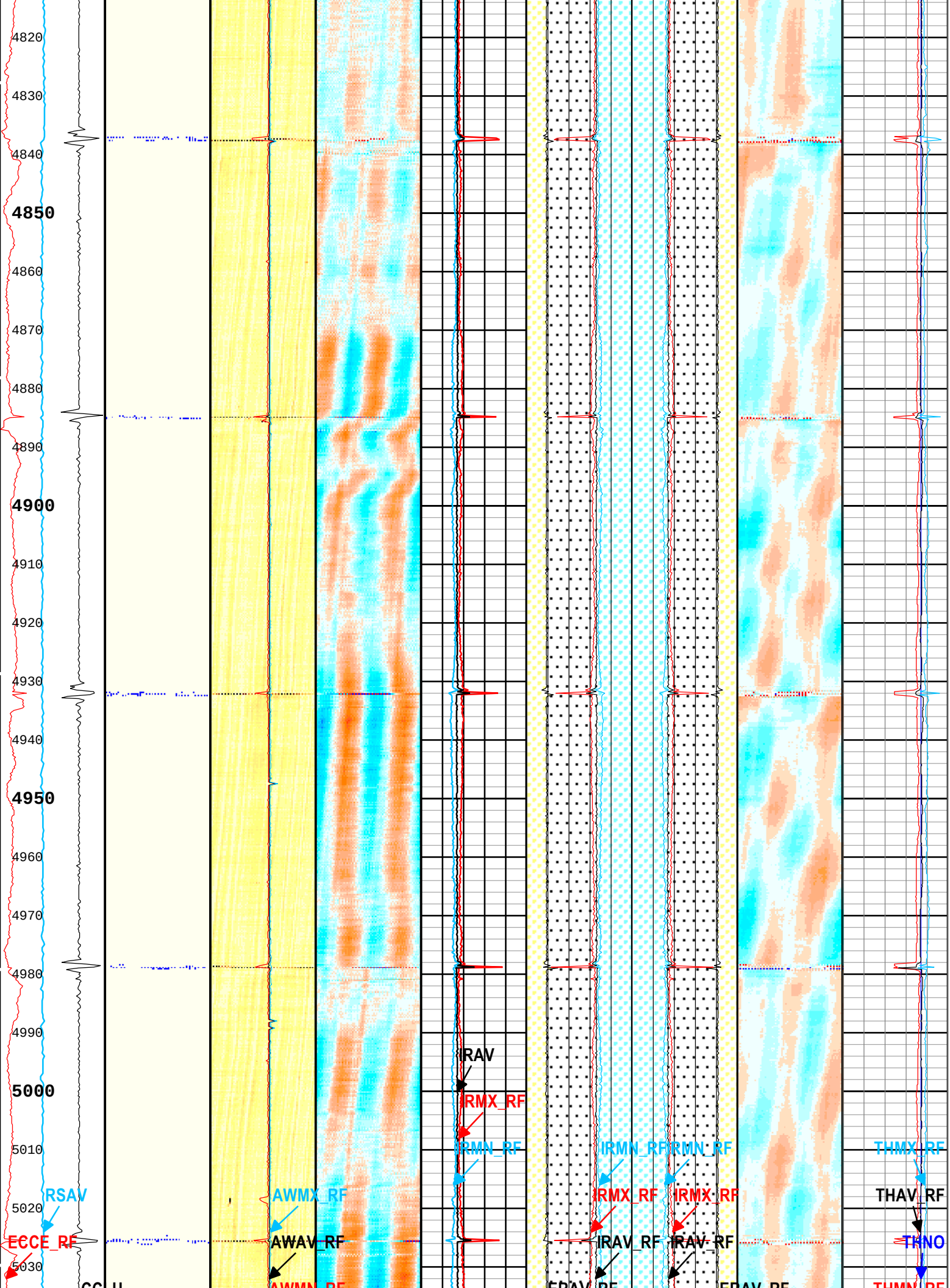
THMN_RF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IRMX_RF
IRMN_RF
IRMN_RF
IRMN_RF
THMX_RF
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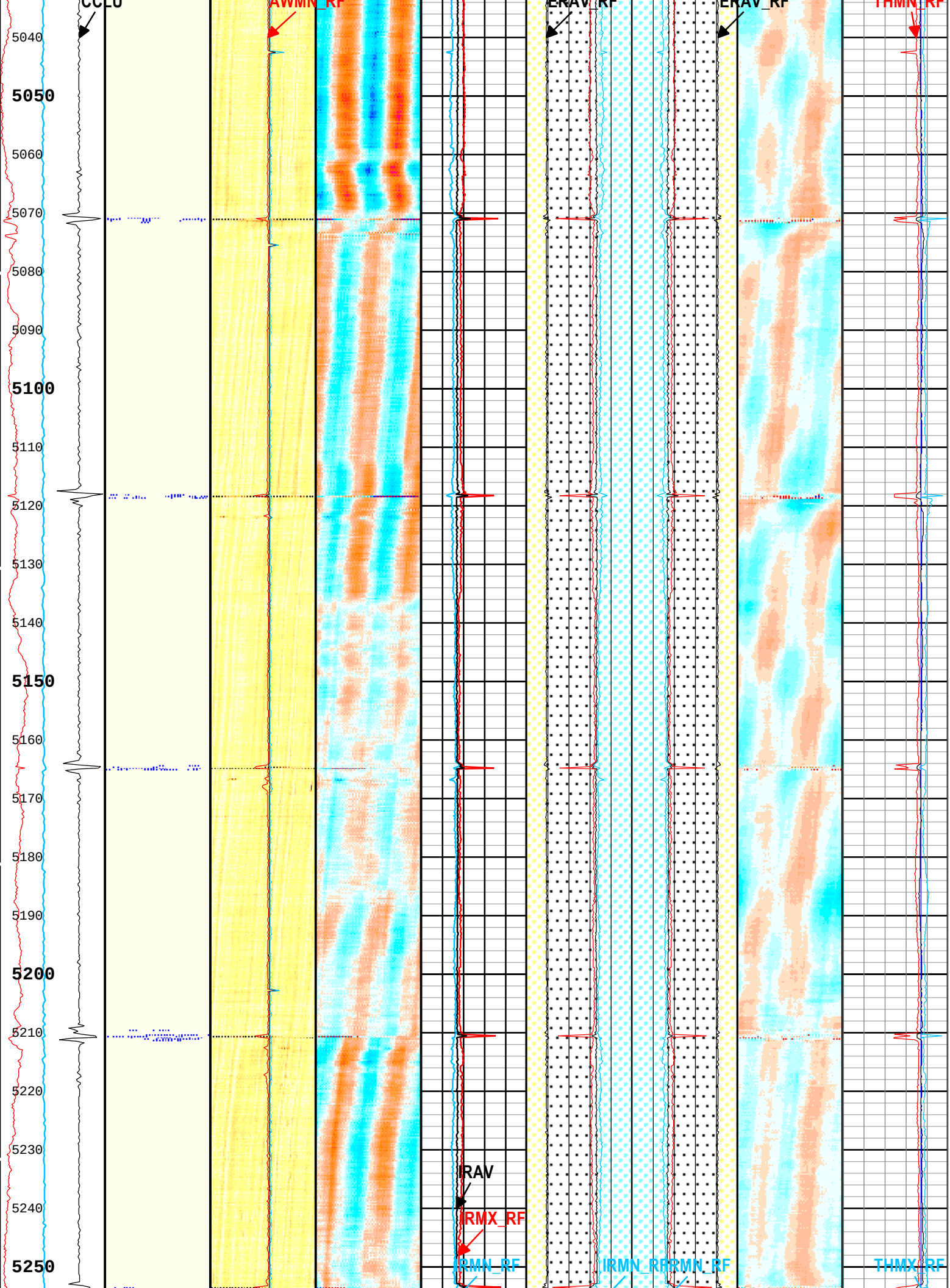
IRAV_RF
THNO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ERAV_RF
THMN_RF
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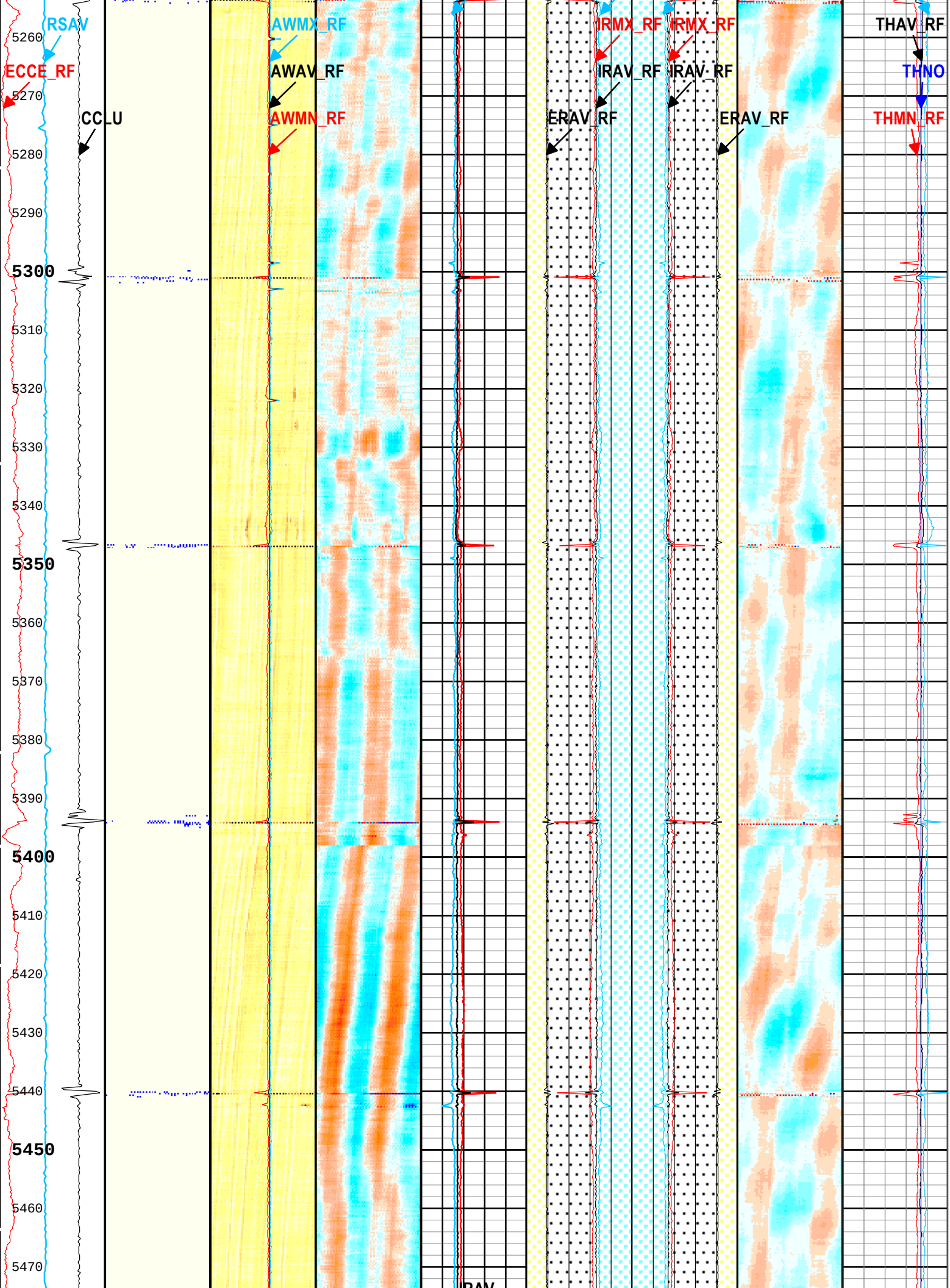
RMN_RF
THMX_RF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ERAV_RF
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THAV_RF
THNO
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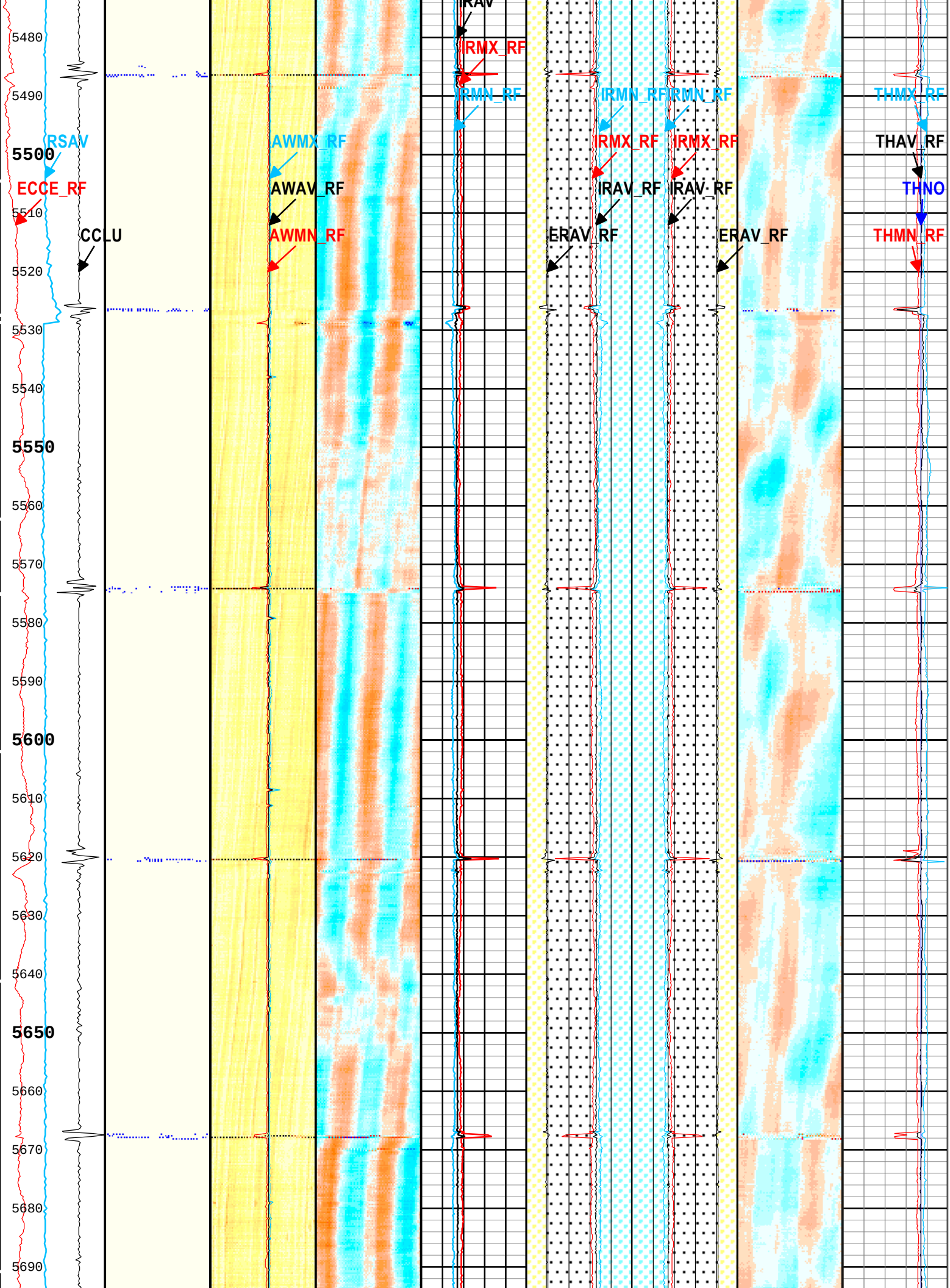
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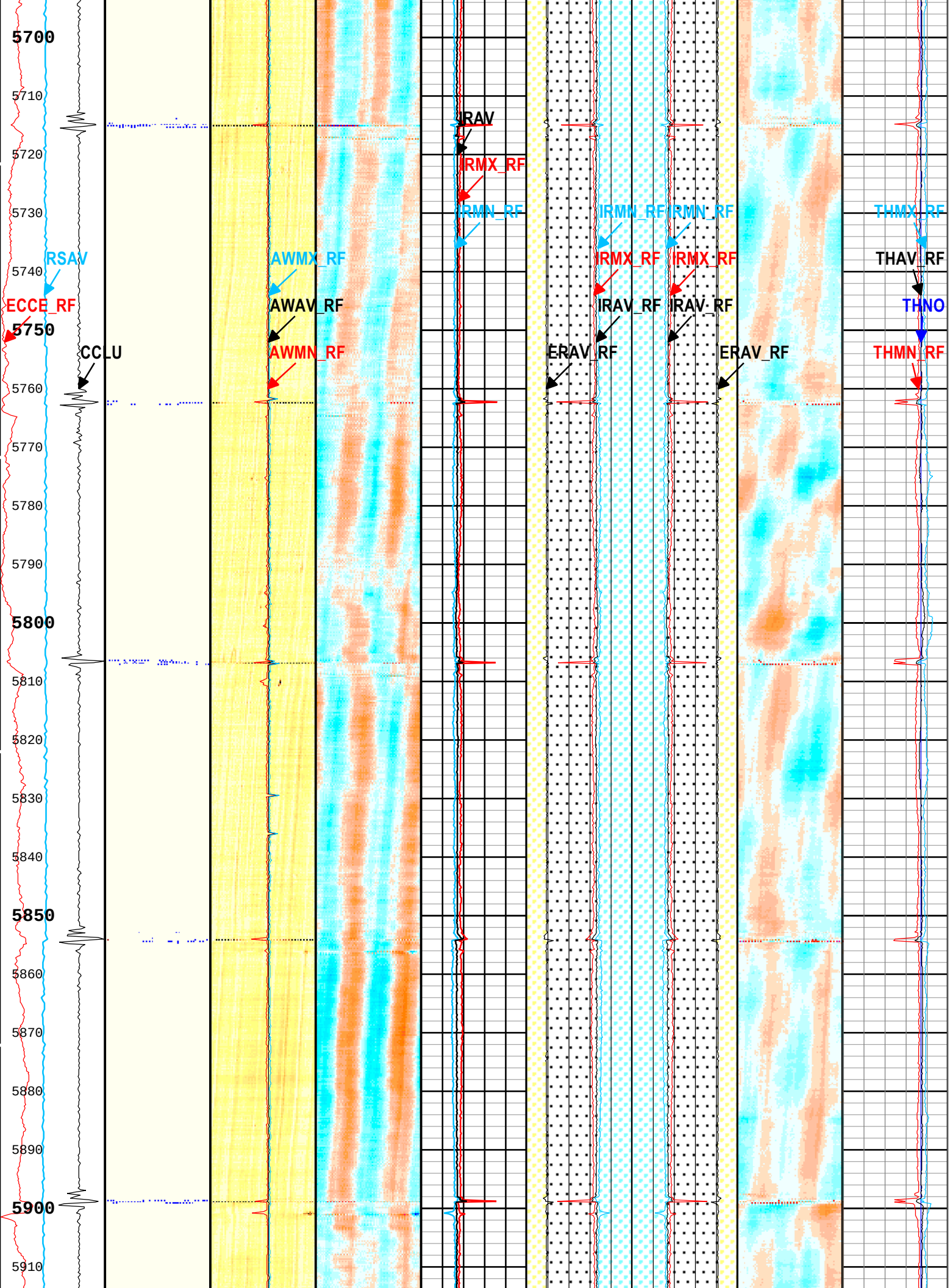
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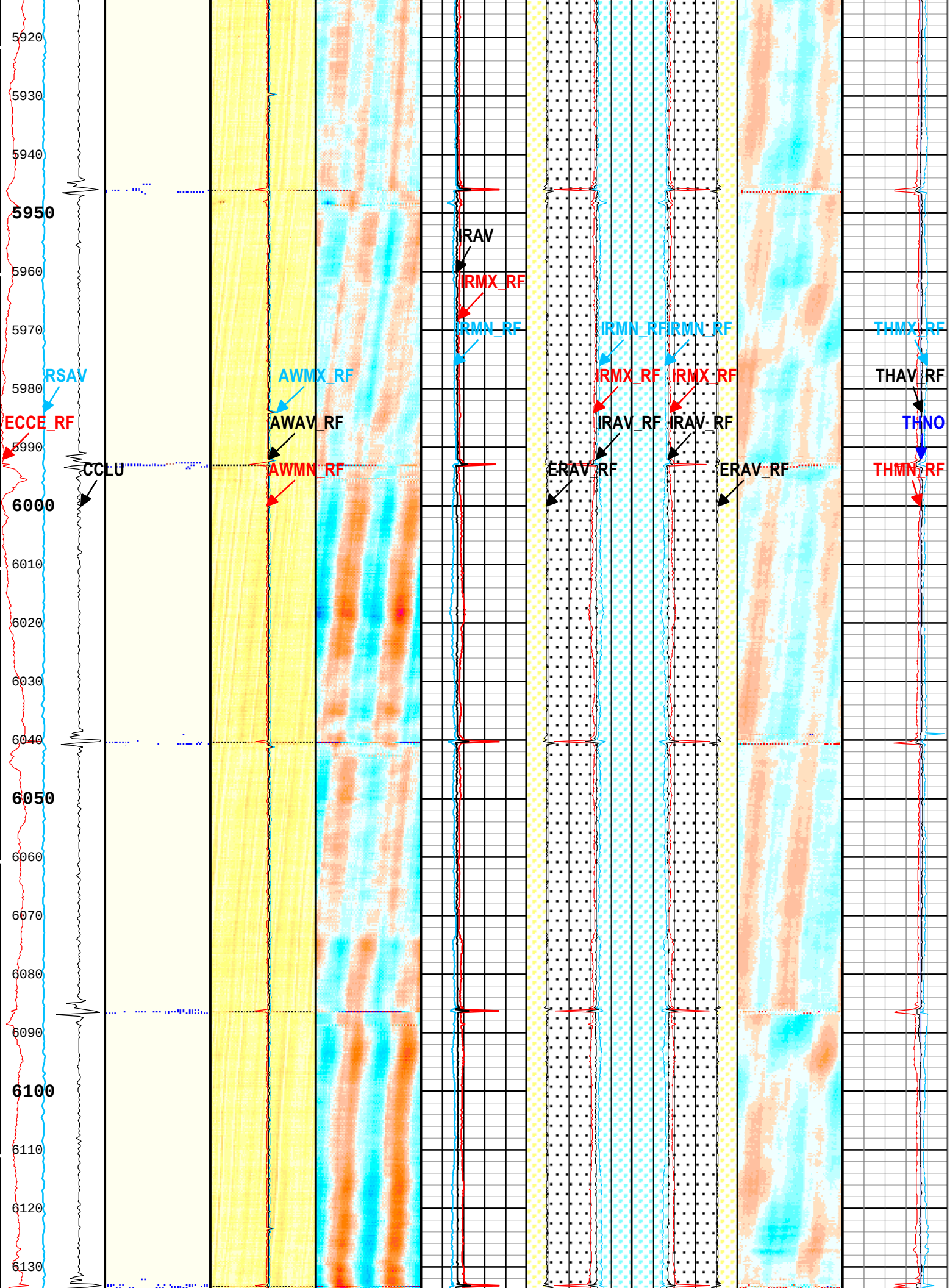
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CCLU
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IRAV
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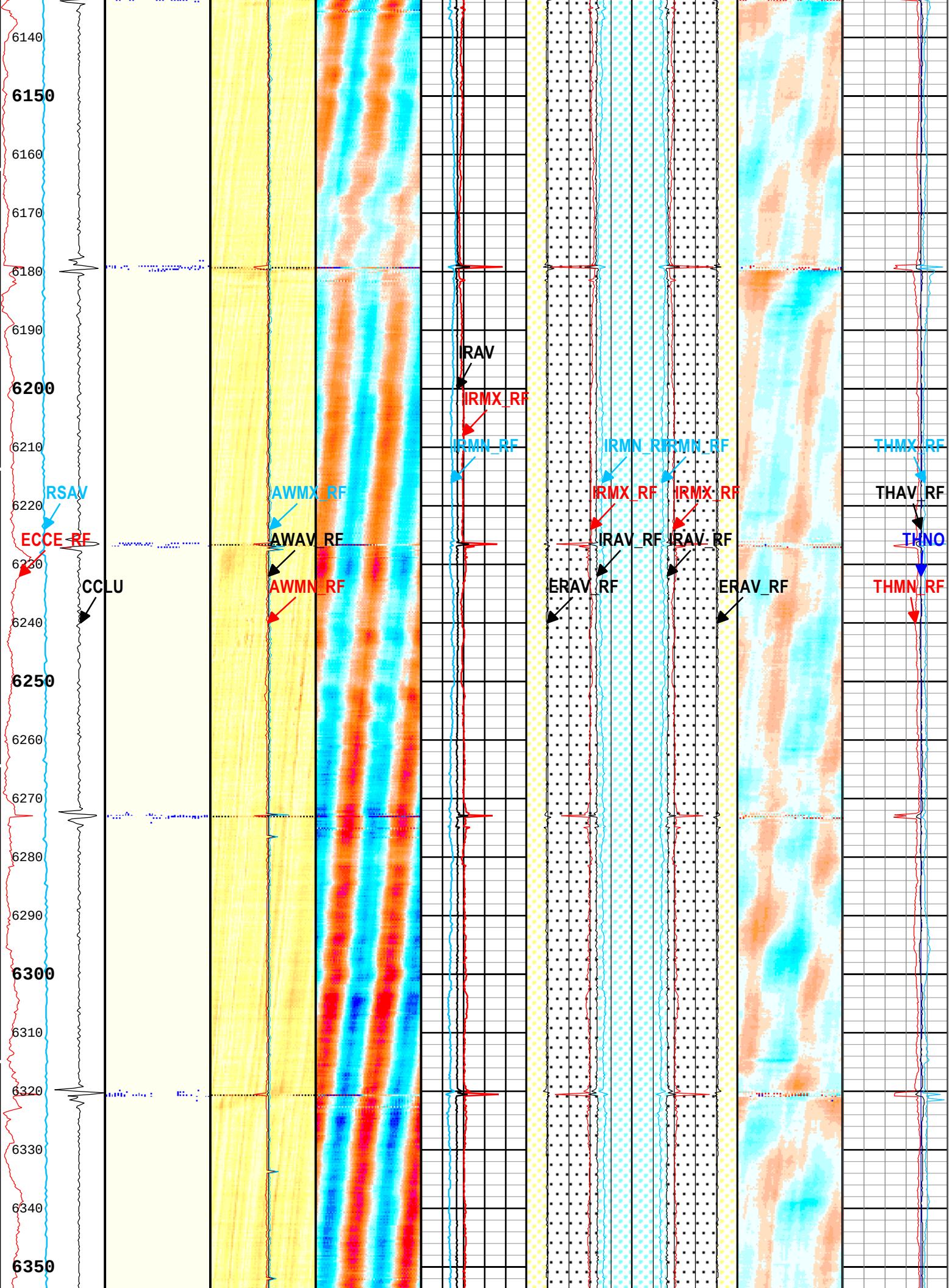
THNO
THMN_RF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CCLU
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AWAV_RF
AWMN_RF
RAV
IRMX_RF
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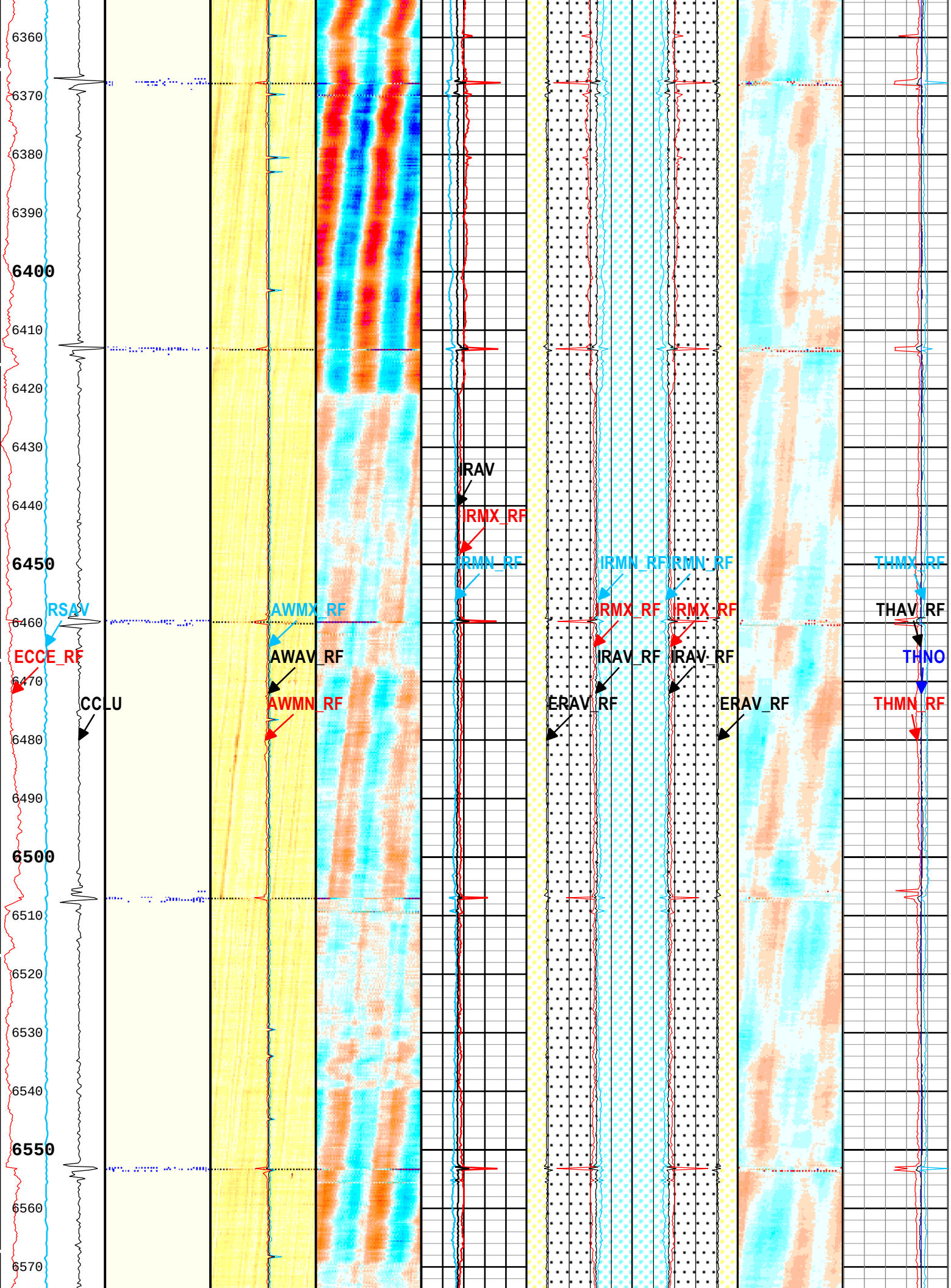
THMN_RF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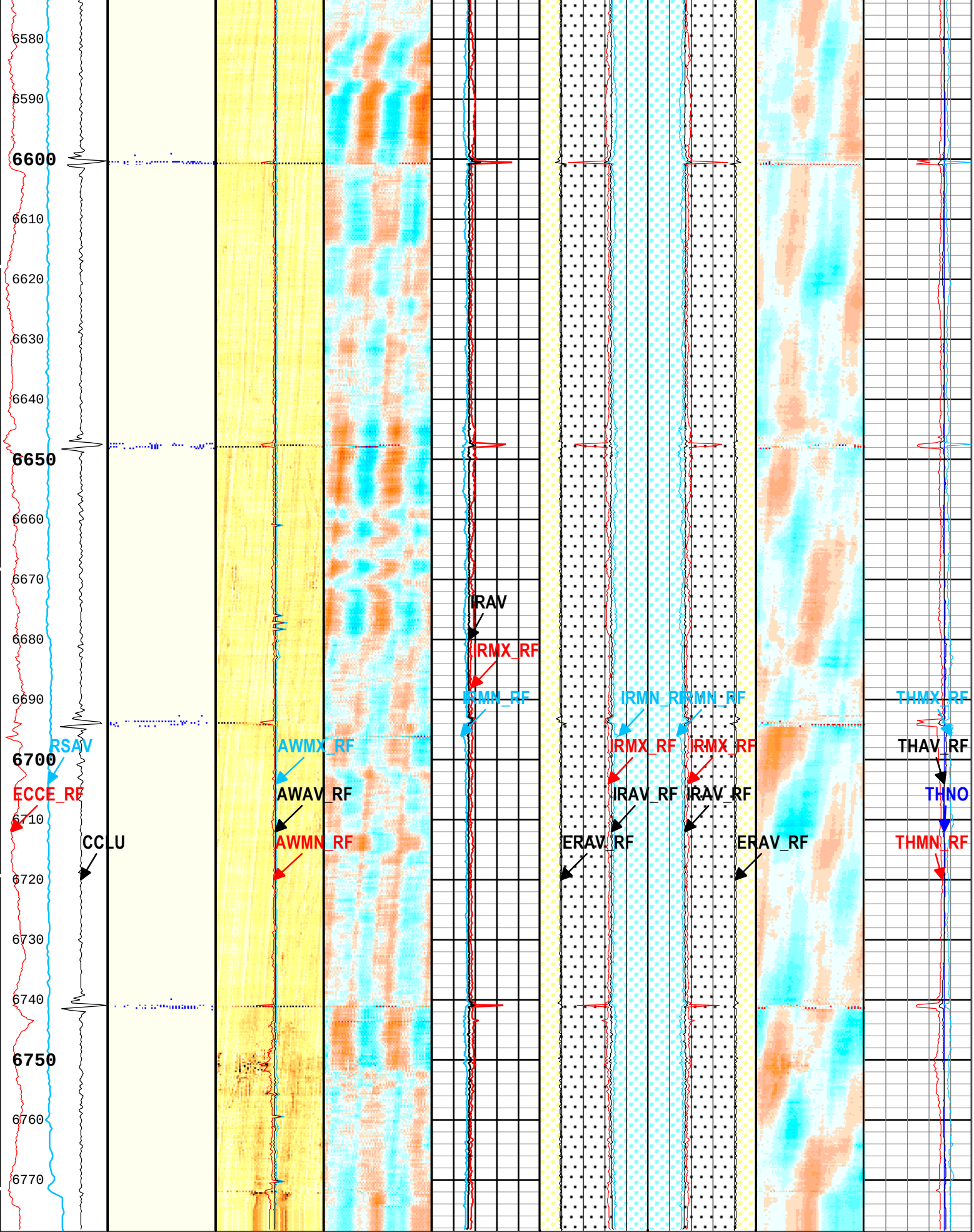
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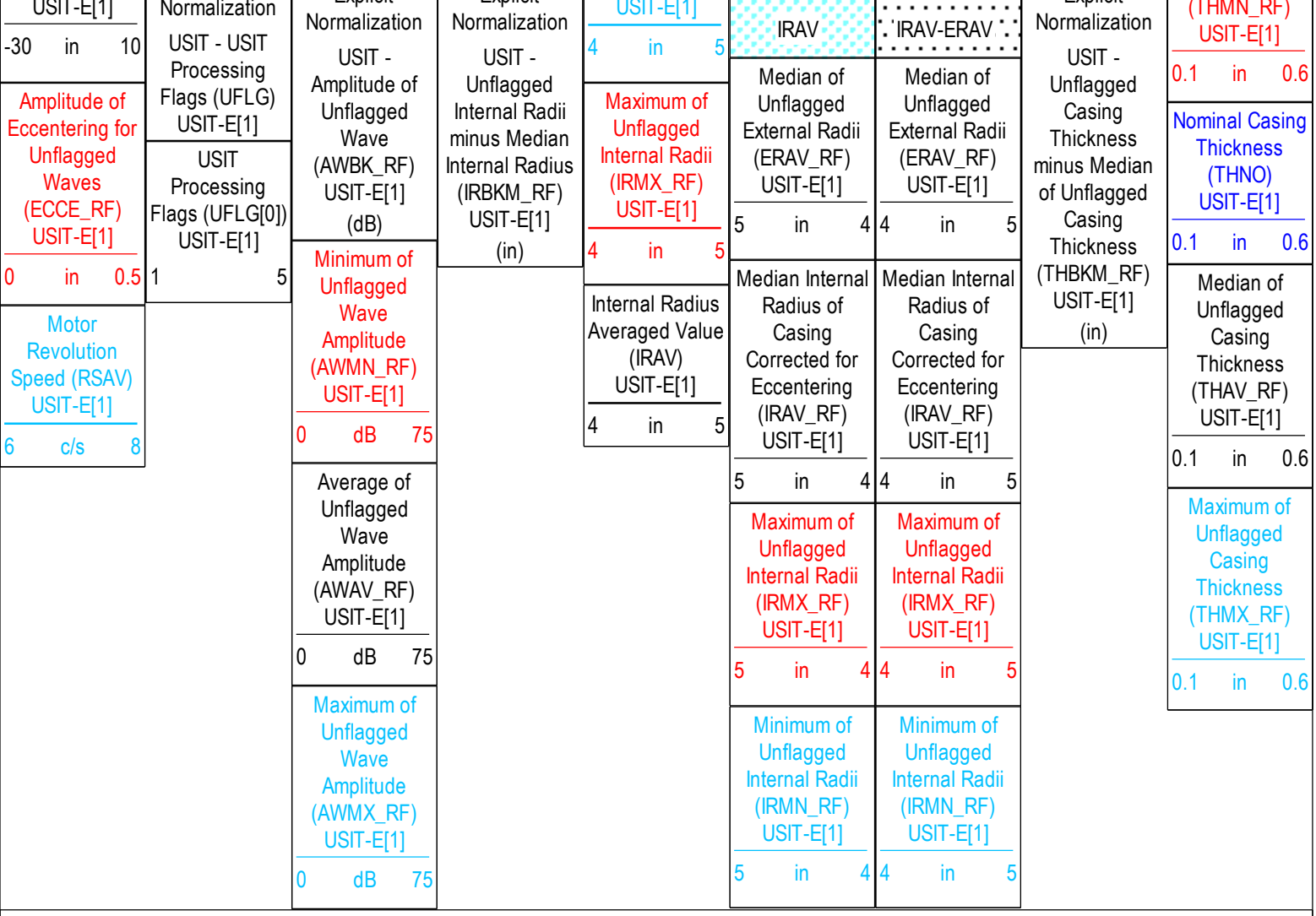
IRAV_RF
IRAV_RF
ERAV_RF
ERAV_RF
THMX_RF
THAV_RF
THNO
THMN_RF
Casing Collar Locator
Ultrasonic (CCLU)
Absent
1.500
3.500
Explicit
Absent
-5.200
-3.600
-2.000
-0.400
Explicit
Absent
-0.051
-0.012
0.028
0.068
Explicit
Minimum of Unflagged Internal Radii (IRMN_RF)
ERAV
IRAV
ERAV-IRAV
ERAV
Absent
-0.051
-0.012
0.028
0.068
Explicit
Minimum of Unflagged Casing Thickness



USIT Processing Flags (UFLG[0]) USIT-E[1]

1 - UFLG 1 Value within [0.0 - 1.5] - :
2 - UFLG 2 Value within [1.5 - 2.5] - :
3 - UFLG 3 Value within [2.5 - 3.5] - :
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :

UTIM Error
Pulse Origin Not Detected
WINLEN Error
Casing Thickness Error
Loop Processing Error

TIME_1900 - Time Marked every 60.00 (s)

Description: USI Composite Format: Log (LBV1_USI Corrosion 9.625inch) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 22-Mar-2016 16:05:57

Composite 1

USIT Goodwin Compressed 1 IN=100 FT

Composite Summary

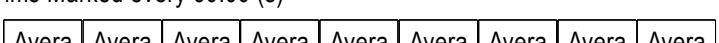
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[6]:Up	Up	42.10 ft	6778.78 ft	22-Mar-2016 9:40:40 AM	22-Mar-2016 12:29:24 PM	ON	0.00 ft	Yes
One	Log[9]:Up	Up	79.40 ft	514.04 ft	22-Mar-2016 1:43:41 PM	22-Mar-2016 1:53:14 PM	ON	1.22 ft	Yes

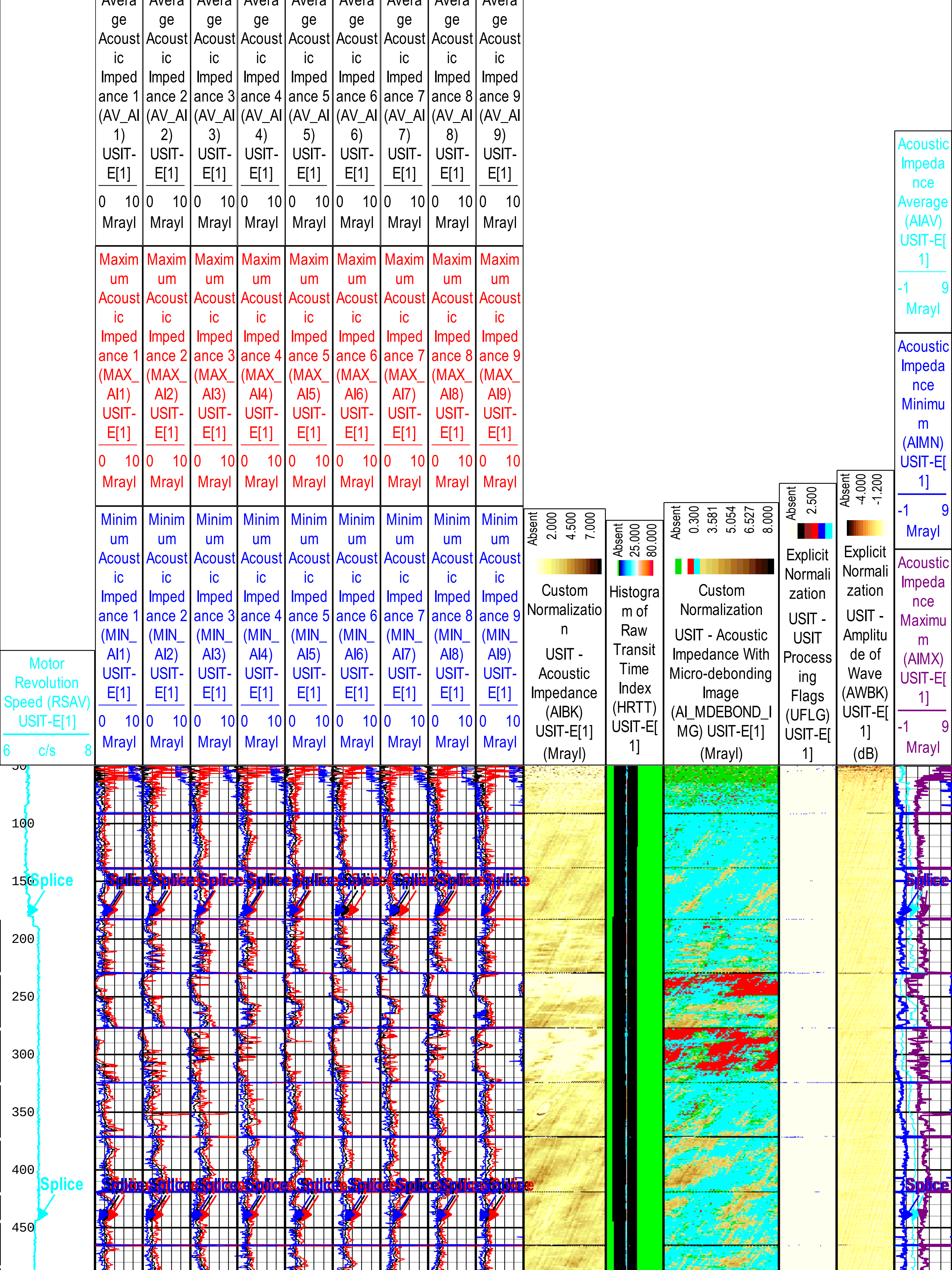
All depths are referenced to toolstring zero

Log Company:Southern California Gas Company Well:Fernando Fee 38C
Composite 1:S007

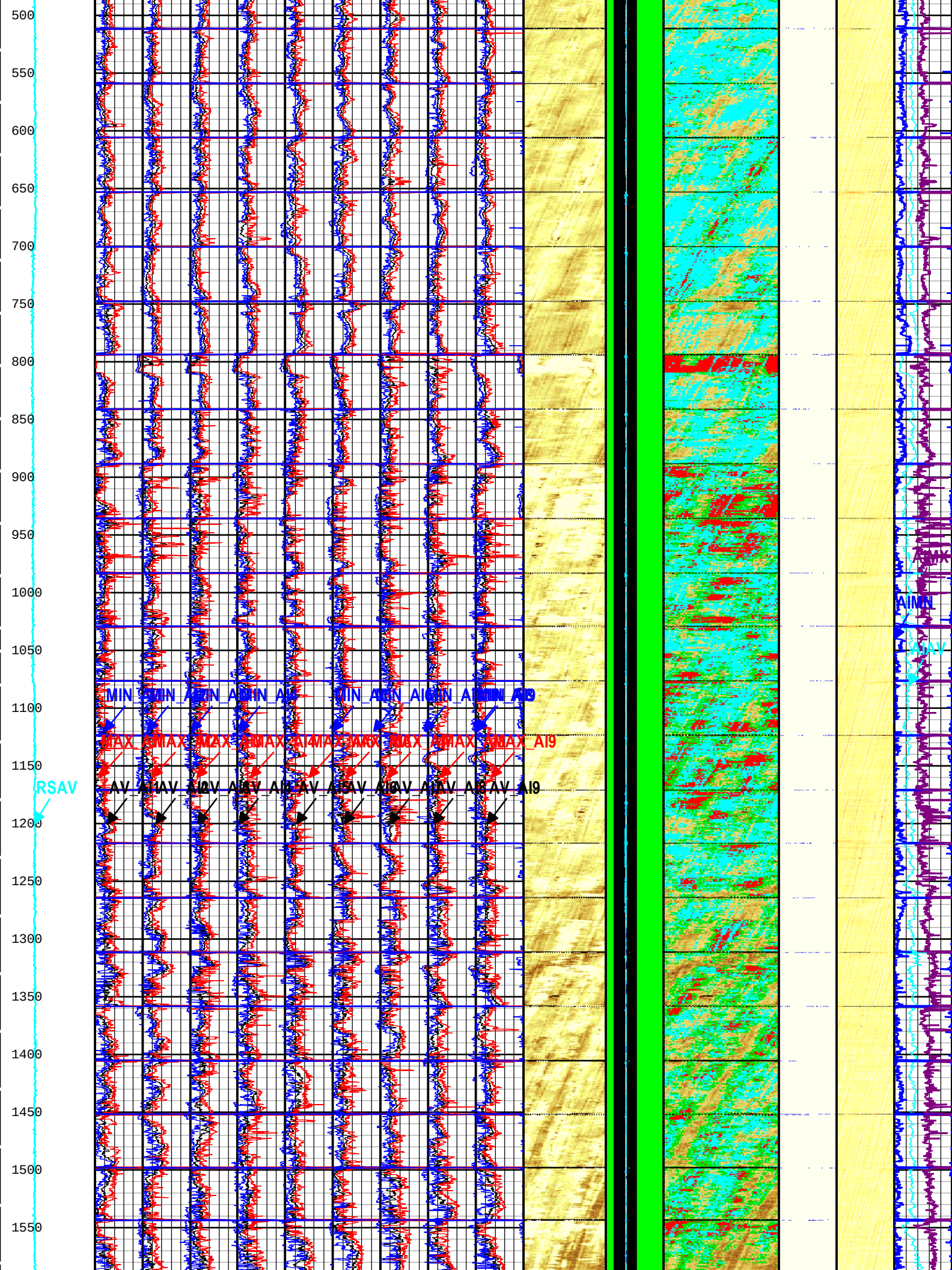
Description: USI Goodwin Format: Log (LBV1_Long Beach Custom Goodwin) Index Scale: 1 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 22-Mar-2016 16:06:24

TIME_1900 - Time Marked every 60.00 (s)





Average Acoustic Impedance 1 (AV_AI1) USIT-E[1] 0 10 Mrayl
Average Acoustic Impedance 2 (AV_AI2) USIT-E[1] 0 10 Mrayl
Average Acoustic Impedance 3 (AV_AI3) USIT-E[1] 0 10 Mrayl
Average Acoustic Impedance 4 (AV_AI4) USIT-E[1] 0 10 Mrayl
Average Acoustic Impedance 5 (AV_AI5) USIT-E[1] 0 10 Mrayl
Average Acoustic Impedance 6 (AV_AI6) USIT-E[1] 0 10 Mrayl
Average Acoustic Impedance 7 (AV_AI7) USIT-E[1] 0 10 Mrayl
Average Acoustic Impedance 8 (AV_AI8) USIT-E[1] 0 10 Mrayl
Average Acoustic Impedance 9 (AV_AI9) USIT-E[1] 0 10 Mrayl
Maximum Acoustic Impedance 1 (MAX_AI1) USIT-E[1] 0 10 Mrayl
Maximum Acoustic Impedance 2 (MAX_AI2) USIT-E[1] 0 10 Mrayl
Maximum Acoustic Impedance 3 (MAX_AI3) USIT-E[1] 0 10 Mrayl
Maximum Acoustic Impedance 4 (MAX_AI4) USIT-E[1] 0 10 Mrayl
Maximum Acoustic Impedance 5 (MAX_AI5) USIT-E[1] 0 10 Mrayl
Maximum Acoustic Impedance 6 (MAX_AI6) USIT-E[1] 0 10 Mrayl
Maximum Acoustic Impedance 7 (MAX_AI7) USIT-E[1] 0 10 Mrayl
Maximum Acoustic Impedance 8 (MAX_AI8) USIT-E[1] 0 10 Mrayl
Maximum Acoustic Impedance 9 (MAX_AI9) USIT-E[1] 0 10 Mrayl
Minimum Acoustic Impedance 1 (MIN_AI1) USIT-E[1] 0 10 Mrayl
Minimum Acoustic Impedance 2 (MIN_AI2) USIT-E[1] 0 10 Mrayl
Minimum Acoustic Impedance 3 (MIN_AI3) USIT-E[1] 0 10 Mrayl
Minimum Acoustic Impedance 4 (MIN_AI4) USIT-E[1] 0 10 Mrayl
Minimum Acoustic Impedance 5 (MIN_AI5) USIT-E[1] 0 10 Mrayl
Minimum Acoustic Impedance 6 (MIN_AI6) USIT-E[1] 0 10 Mrayl
Minimum Acoustic Impedance 7 (MIN_AI7) USIT-E[1] 0 10 Mrayl
Minimum Acoustic Impedance 8 (MIN_AI8) USIT-E[1] 0 10 Mrayl
Minimum Acoustic Impedance 9 (MIN_AI9) USIT-E[1] 0 10 Mrayl
Motor Revolution Speed (RSAV) USIT-E[1] 6 c/s 8
Absent 2.000 4.500 7.000
Custom Normalization
USIT - Acoustic Impedance (AIBK) USIT-E[1] (Mrayl)
Absent 25.000 80.000
Histogram of Raw Transit Time Index (HRTT) USIT-E[1]
Absent 0.300 3.581 5.054 6.527 8.000
Custom Normalization
USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E[1] (Mrayl)
Absent 2.500
Explicit Normalization
USIT - USIT Processing Flags (UFLG) USIT-E[1]
Absent -4.000 -1.200
Explicit Normalization
USIT - Amplitude of Wave (AWBK) USIT-E[1] (dB)
Acoustic Impedance Average (AIAV) USIT-E[1] -1 9 Mrayl
Acoustic Impedance Minimum (AIMN) USIT-E[1] -1 9 Mrayl
Acoustic Impedance Maximum (AIMX) USIT-E[1] -1 9 Mrayl
100
150
200
250
300
350
400
450
Splice


500
550
600
650
700
750
800
850
900
950
1000
1050
1100
1150
1200
1250
1300
1350
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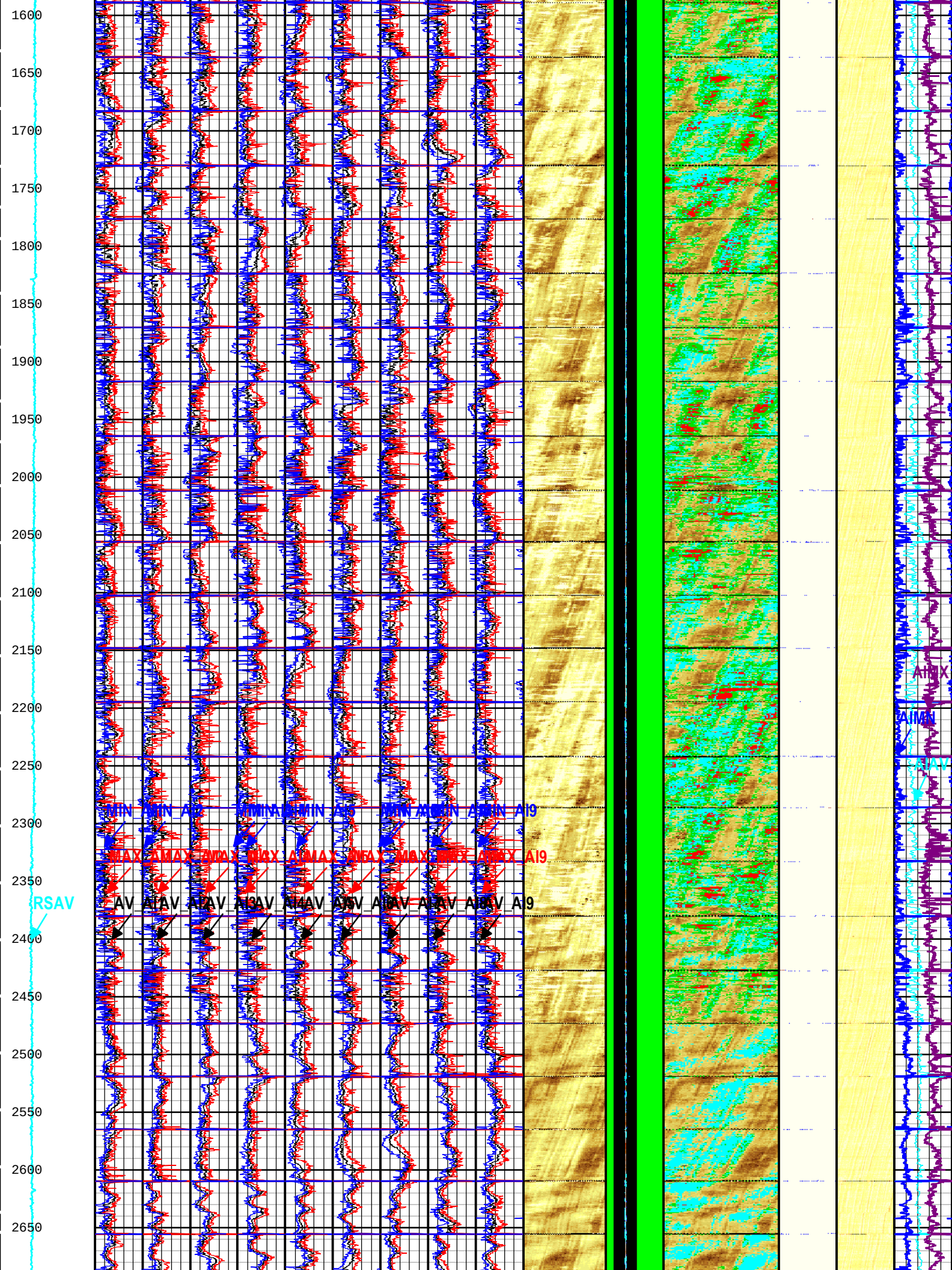
1500
1550
RSAV
AIMIN
ASAV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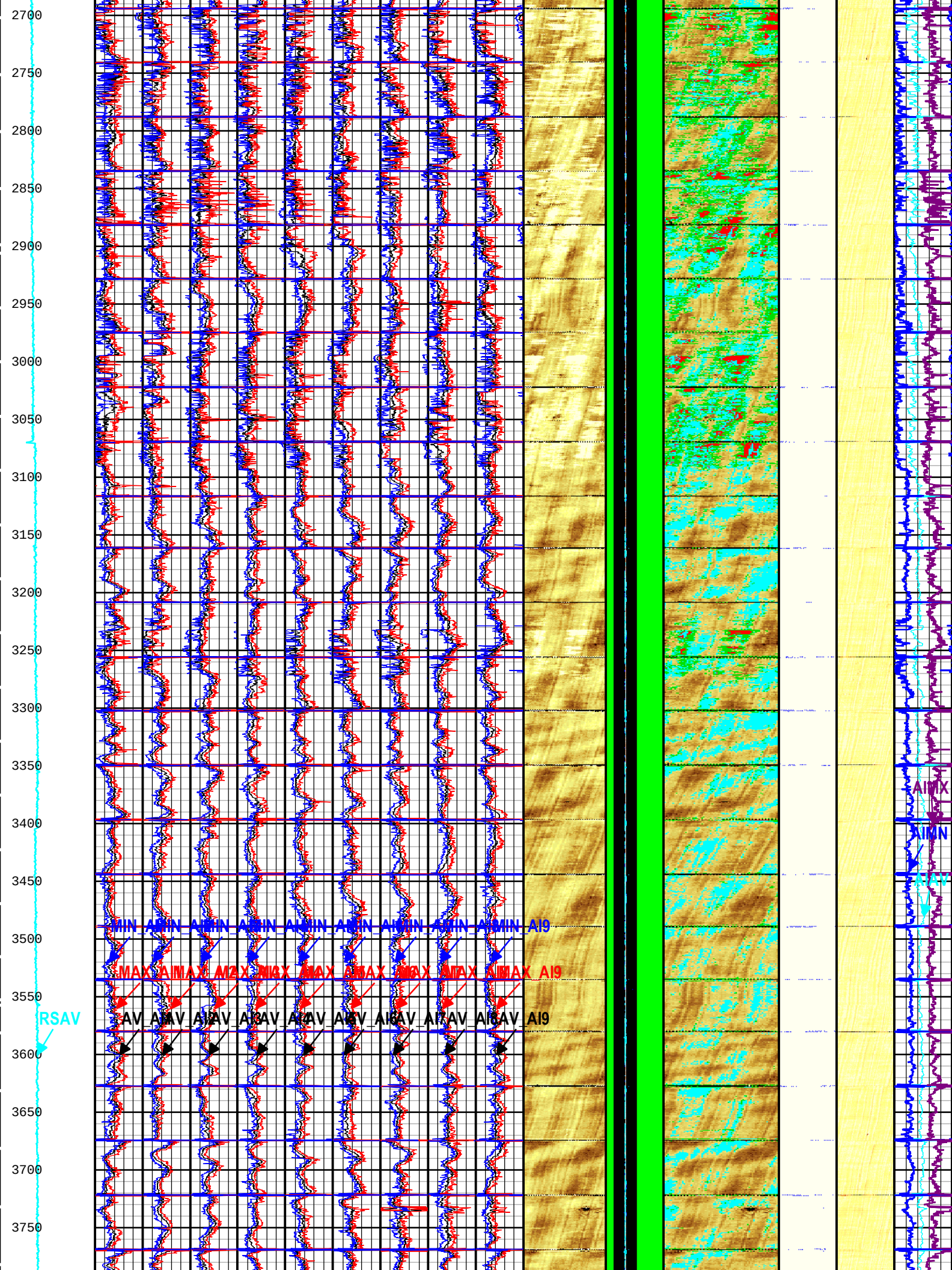
1800
1850
1900
1950
2000
2050
2100
2150
2200
2250
2300
2350
2400
2450
2500
2550
2600
2650
RSAV
AV A1AV A2AV A3AV A4AV A5AV A6AV A7AV A8AV A9
A9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2750
2800
2850
2900
2950
3000
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3250
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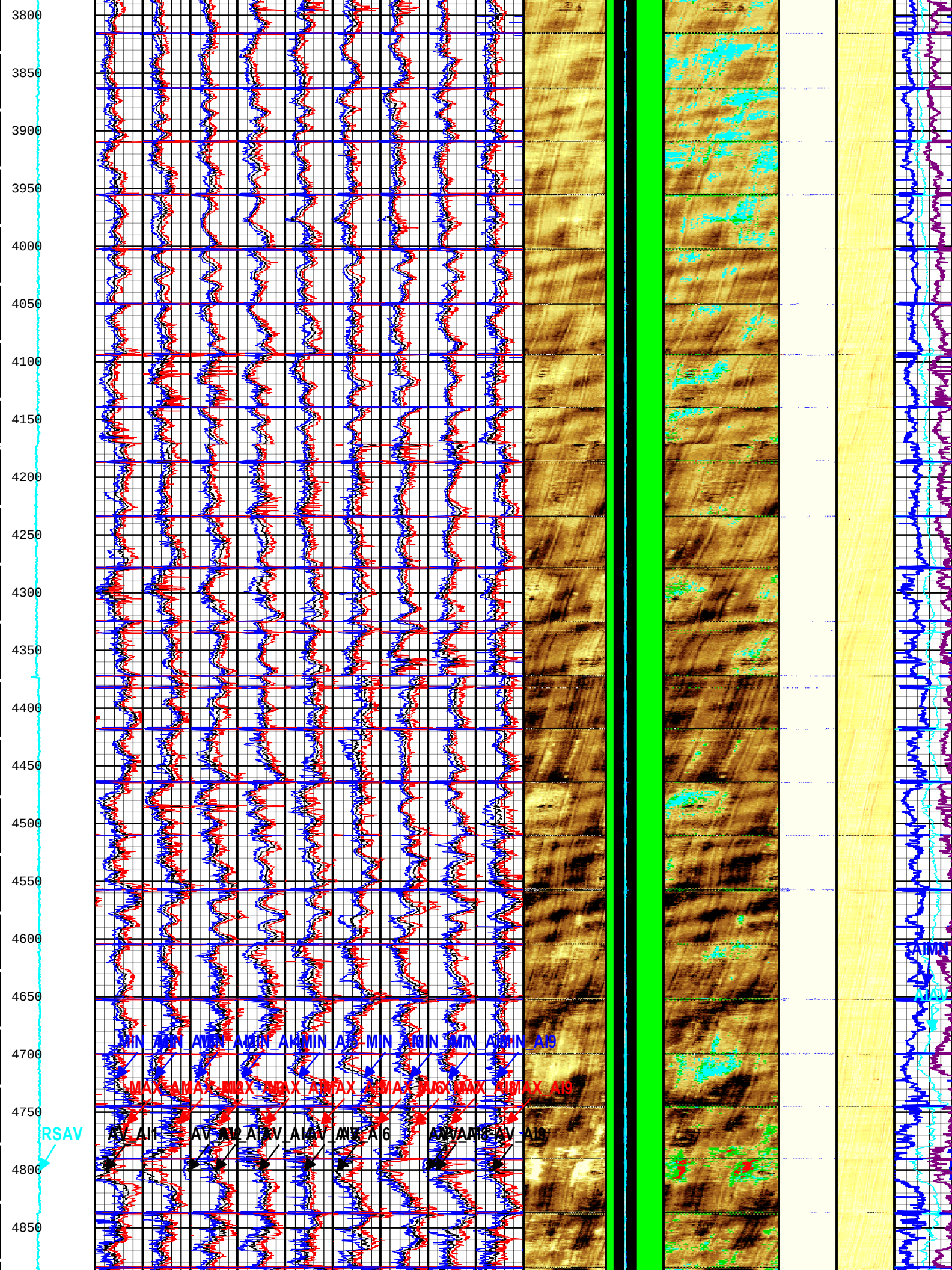
3550
3600
3650
3700
3750
RSAV
AIMX
AIMN
AIV
AI9


3800
3850
3900
3950
4000
4050
4100
4150
4200
4250
4300
4350
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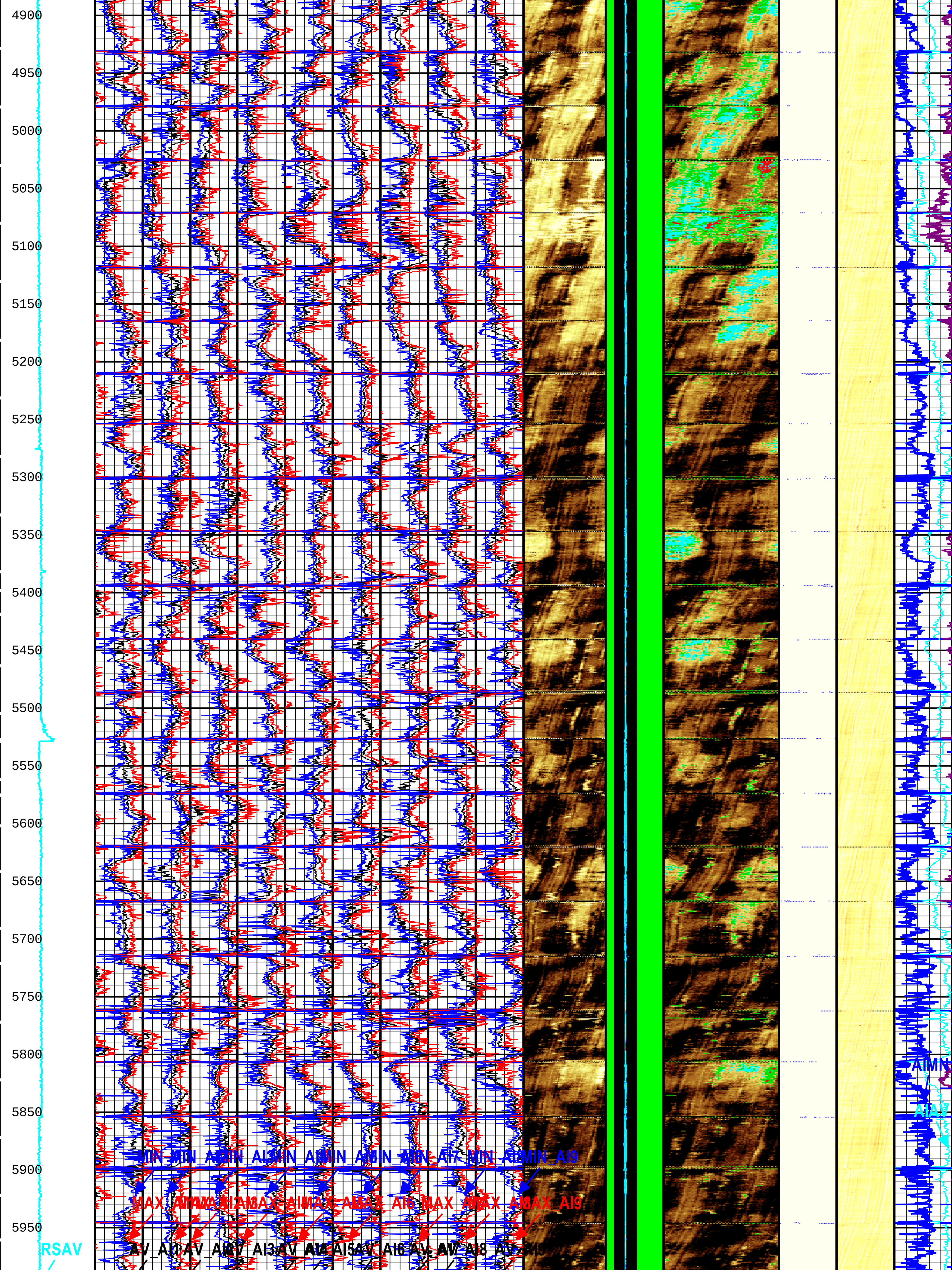
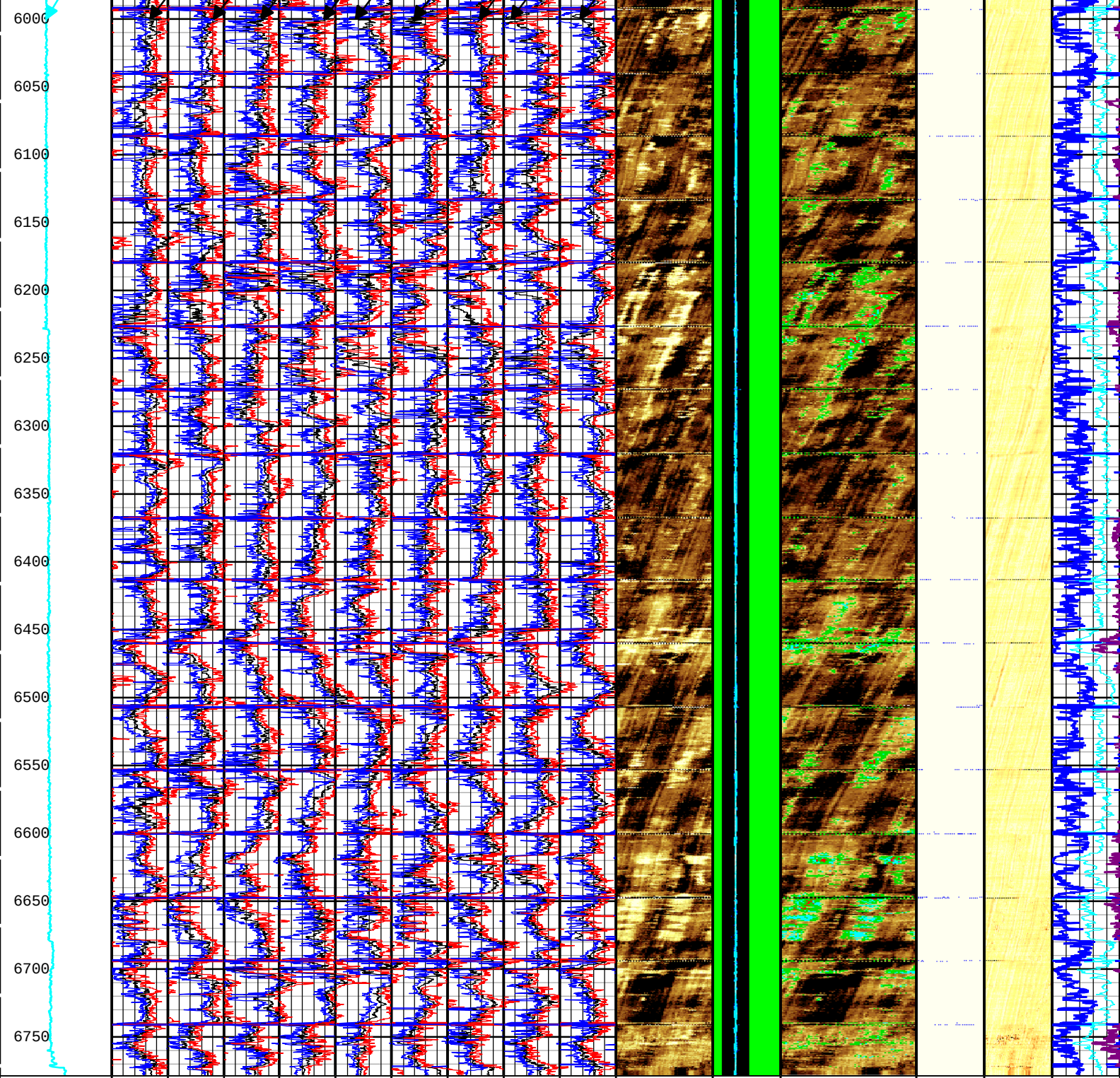
4450
4500
4550
4600
4650
4700
4750
4800
4850
RSAV
AIMN
AI9


4900
4950
5000
5050
5100
5150
5200
5250
5300
5350
5400
5450
5500
5550
5600
5650
5700
5750
5800
5850
5900
5950
RSAV
MIN_AI9
MAX_AI9
AIMN
AIAV



Motor Revolution Speed (RSAV) USIT-E[1]
6 c/s 8

Average Acoustic Impedance 1 (AV_AI 1) USIT-E[1]
0 10 Mrayl

Average Acoustic Impedance 2 (AV_AI 2) USIT-E[1]
0 10 Mrayl

Average Acoustic Impedance 3 (AV_AI 3) USIT-E[1]
0 10 Mrayl

Average Acoustic Impedance 4 (AV_AI 4) USIT-E[1]
0 10 Mrayl

Average Acoustic Impedance 5 (AV_AI 5) USIT-E[1]
0 10 Mrayl

Average Acoustic Impedance 6 (AV_AI 6) USIT-E[1]
0 10 Mrayl

Average Acoustic Impedance 7 (AV_AI 7) USIT-E[1]
0 10 Mrayl

Average Acoustic Impedance 8 (AV_AI 8) USIT-E[1]
0 10 Mrayl

Average Acoustic Impedance 9 (AV_AI 9) USIT-E[1]
0 10 Mrayl

Maximum Acoustic Imped

Absent 2.000 4.500 7.000
Custom Normalization
USIT - Acoustic Impedance (AIBK) USIT-E[1] (Mrayl)

Absent 25.000 80.000
Histogram of Raw Transit Time Index (HRTT) USIT-E[1]

Absent 0.300 3.581 5.054 6.527 8.000
Custom Normalization
USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E[1] (Mrayl)

Absent 2.500
Explicit Normalization
USIT - USIT Processing Flags (UFLG) USIT-E[1]

Absent -4.000 -1.200
Explicit Normalization
USIT - Amplitude of Wave (AWBK) USIT-E[1] (dB)

Acoustic Impedance Average (AIAV) USIT-E[1]
-1 9 Mrayl

Acoustic Impedance Minimum (AIMN) USIT-E[1]

Impedance 1 (MAX_AI1) USIT-E[1]	Impedance 2 (MAX_AI2) USIT-E[1]	Impedance 3 (MAX_AI3) USIT-E[1]	Impedance 4 (MAX_AI4) USIT-E[1]	Impedance 5 (MAX_AI5) USIT-E[1]	Impedance 6 (MAX_AI6) USIT-E[1]	Impedance 7 (MAX_AI7) USIT-E[1]	Impedance 8 (MAX_AI8) USIT-E[1]	Impedance 9 (MAX_AI9) USIT-E[1]
0 10 Mrayl	0 10 Mrayl	0 10 Mrayl	0 10 Mrayl	0 10 Mrayl	0 10 Mrayl	0 10 Mrayl	0 10 Mrayl	0 10 Mrayl
Minimum Acoustic Impedance 1 (MIN_AI1) USIT-E[1]	Minimum Acoustic Impedance 2 (MIN_AI2) USIT-E[1]	Minimum Acoustic Impedance 3 (MIN_AI3) USIT-E[1]	Minimum Acoustic Impedance 4 (MIN_AI4) USIT-E[1]	Minimum Acoustic Impedance 5 (MIN_AI5) USIT-E[1]	Minimum Acoustic Impedance 6 (MIN_AI6) USIT-E[1]	Minimum Acoustic Impedance 7 (MIN_AI7) USIT-E[1]	Minimum Acoustic Impedance 8 (MIN_AI8) USIT-E[1]	Minimum Acoustic Impedance 9 (MIN_AI9) USIT-E[1]
0 10 Mrayl	0 10 Mrayl	0 10 Mrayl	0 10 Mrayl	0 10 Mrayl	0 10 Mrayl	0 10 Mrayl	0 10 Mrayl	0 10 Mrayl

-1 9 Mrayl

Acoustic Impedance Maximum (AIMX) USIT-E[1]

-1 9 Mrayl

TIME_1900 - Time Marked every 60.00 (s)

Description: USI Goodwin Format: Log (LBV1_Long Beach Custom Goodwin) Index Scale: 1 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 22-Mar-2016 16:06:24

One

Very Hi-Res Repeat 10 IN=100 FT

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[7]:Up	Up	4709.44 ft	4752.76 ft	22-Mar-2016 1:07:24 PM	22-Mar-2016 1:11:42 PM	ON	0.00 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Southern California Gas Company Well:Fernando Fee 38C

One: Log[7]:Up:S007

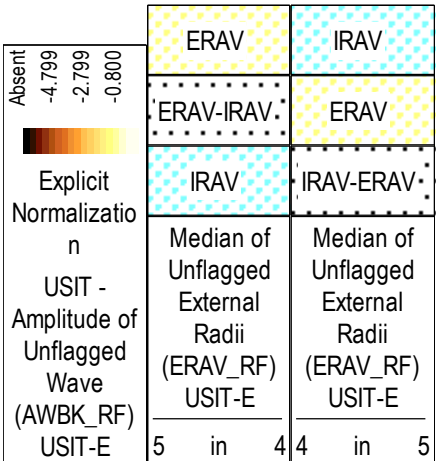
Description: USI Composite Format: Log (LBV1_USI Composite 9.625inch) Index Scale: 10 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 22-Mar-2016 16:06:46

USIT Processing Flags (UFLG[0]) USIT-E

1 - UFLG 1 Value within [0.0 - 1.5] - :
2 - UFLG 2 Value within [1.5 - 2.5] - :
3 - UFLG 3 Value within [2.5 - 3.5] - :
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :

UTIM Error
Pulse Origin Not Detected
WINLEN Error
Casing Thickness Error
Loop Processing Error

TIME_1900 - Time Marked every 60.00 (s)

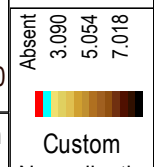


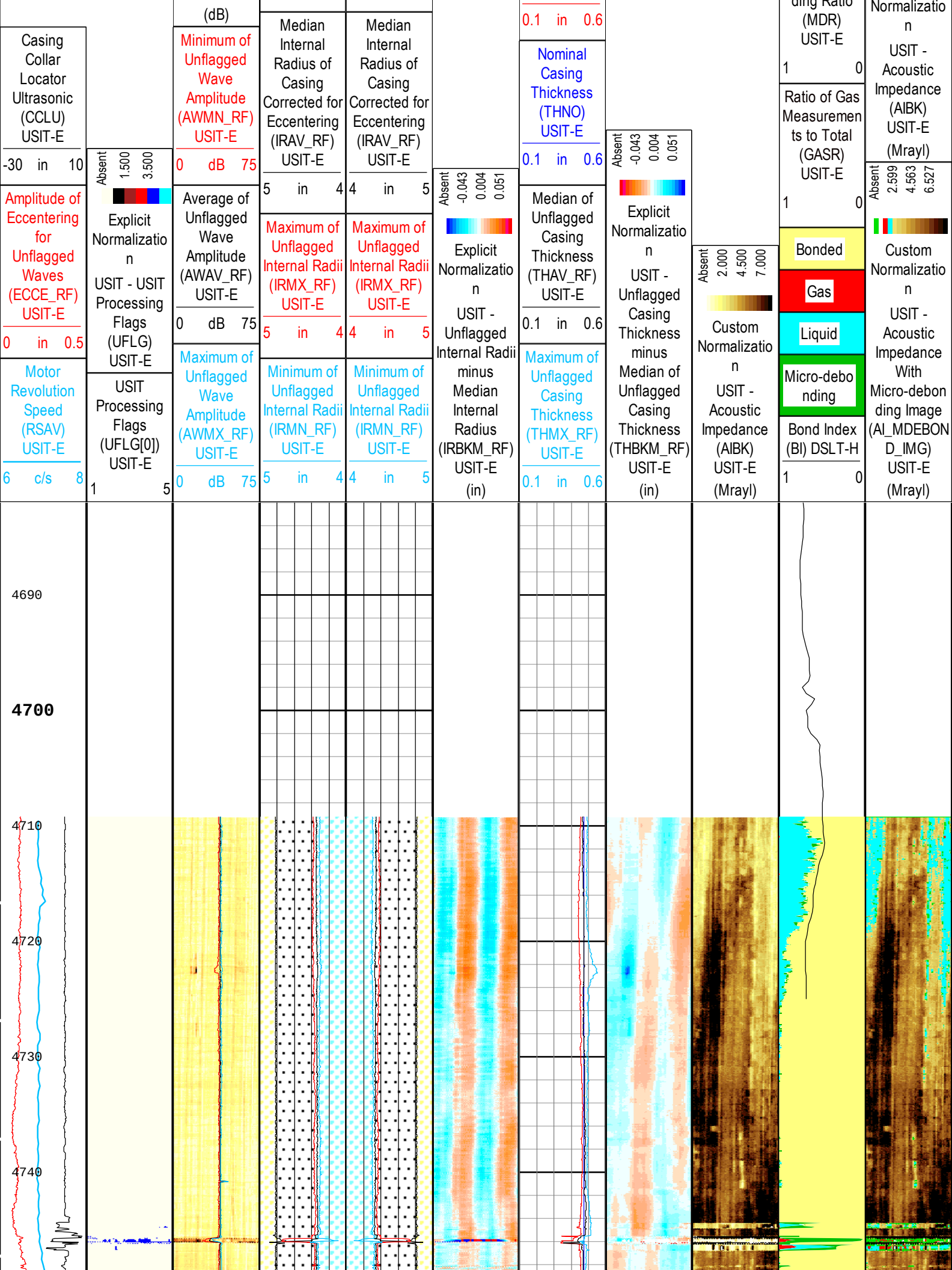
Minimum of Unflagged Casing Thickness (THMN_RF) USIT-E

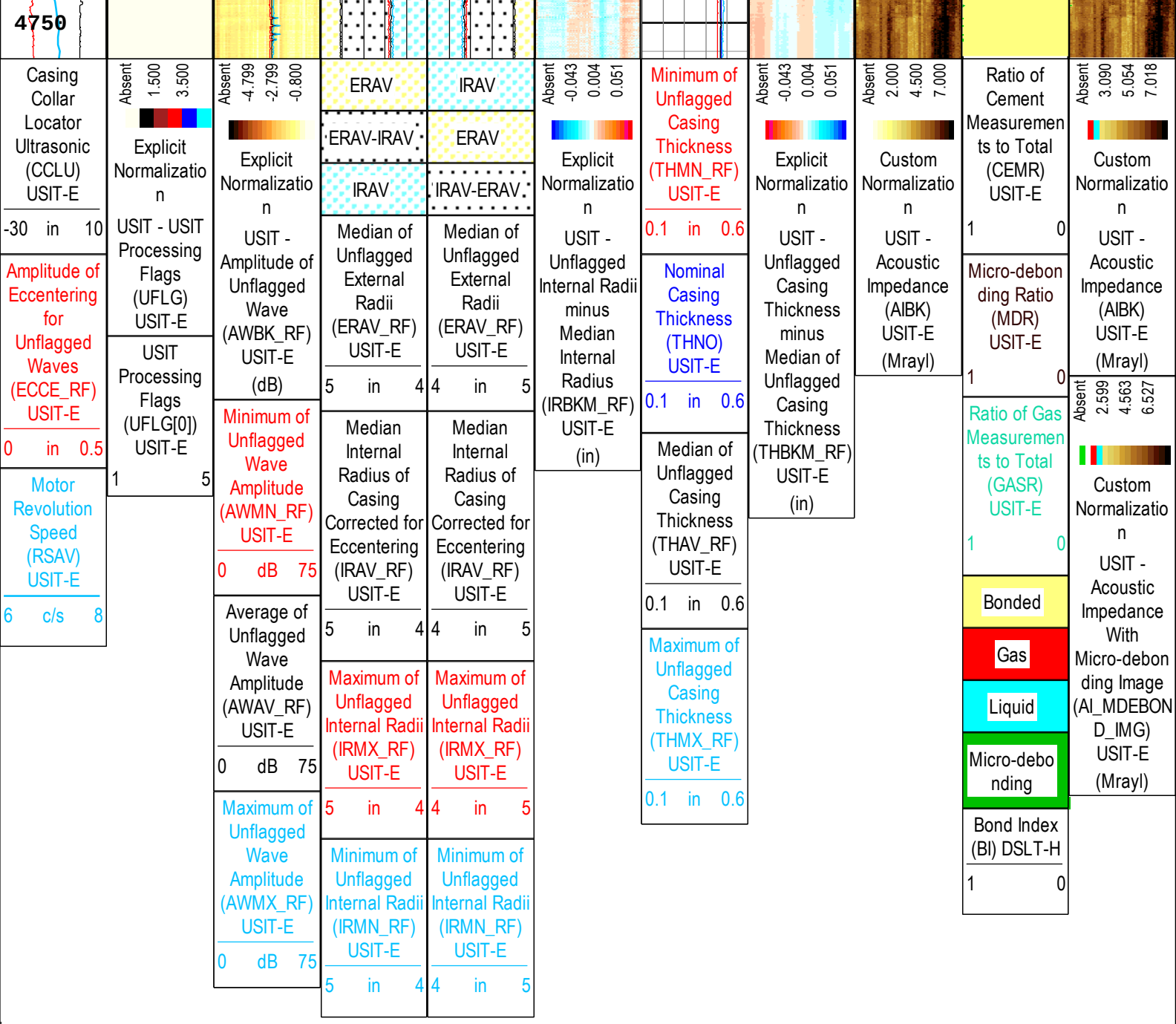
Ratio of Cement Measurements to Total (CEMR) USIT-E

1 0

Micro-debonding Ratio




Casing Collar Locator Ultrasonic (CCLU) USIT-E
-30 in 10
Amplitude of Eccentering for Unflagged Waves (ECCE_RF) USIT-E
0 in 0.5
Motor Revolution Speed (RSAV) USIT-E
6 c/s 8
Absent 1.500 3.500
Explicit Normalization
USIT - USIT Processing Flags (UFLG) USIT-E
USIT Processing Flags (UFLG[0]) USIT-E
1 5
(dB)
Minimum of Unflagged Wave Amplitude (AWMN_RF) USIT-E
0 dB 75
Average of Unflagged Wave Amplitude (AWAV_RF) USIT-E
0 dB 75
Maximum of Unflagged Wave Amplitude (AWMX_RF) USIT-E
0 dB 75
Median Internal Radius of Casing Corrected for Eccentering (IRAV_RF) USIT-E
5 in 4
Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E
5 in 4
Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E
5 in 4
Median Internal Radius of Casing Corrected for Eccentering (IRAV_RF) USIT-E
4 in 5
Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E
4 in 5
Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E
4 in 5
Absent -0.043 0.004 0.051
Explicit Normalization
USIT - Unflagged Internal Radii minus Median Internal Radius (IRBKM_RF) USIT-E (in)
0.1 in 0.6
Nominal Casing Thickness (THNO) USIT-E
0.1 in 0.6
Median of Unflagged Casing Thickness (THAV_RF) USIT-E
0.1 in 0.6
Maximum of Unflagged Casing Thickness (THMX_RF) USIT-E
0.1 in 0.6
Absent -0.043 0.004 0.051
Explicit Normalization
USIT - Unflagged Casing Thickness minus Median of Unflagged Casing Thickness (THBKM_RF) USIT-E (in)
Absent 2.000 4.500 7.000
Custom Normalization
USIT - Acoustic Impedance (AIBK) USIT-E (Mrayl)
ding Ratio (MDR) USIT-E
1 0
Ratio of Gas Measurements to Total (GASR) USIT-E
1 0
Bonded
Gas
Liquid
Micro-debonding
Bond Index (BI) DSLT-H
1 0
Normalization
USIT - Acoustic Impedance (AIBK) USIT-E (Mrayl)
Absent 2.599 4.563 6.527
Custom Normalization
USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E (Mrayl)
4690
4700
4710
4720
4730
4740



TIME_1900 - Time Marked every 60.00 (s)

USIT Processing Flags (UFLG[0]) USIT-E

1 - UFLG 1 Value within [0.0 - 1.5] - :
2 - UFLG 2 Value within [1.5 - 2.5] - :
3 - UFLG 3 Value within [2.5 - 3.5] - :
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :

- UTIM Error
- Pulse Origin Not Detected
- WINLEN Error
- Casing Thickness Error
- Loop Processing Error

Description: USI Composite Format: Log (LBV1_USI Composite 9.625inch) Index Scale: 10 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 22-Mar-2016 16:06:46

One

Very Hi-Res Repeat 10 IN=100 FT

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[5]:Up	Up	6646.50 ft	6773.28 ft	22-Mar-2016 9:25:31 AM	22-Mar-2016 9:38:09 AM	ON	7.72 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Southern California Gas Company Well:Fernando Fee 38C

One: Log[5]:Up:S007

Description: USI Composite Format: Log (LBV1_USI Composite 9.625inch) Index Scale: 10 in per 100 ft Index Unit: ft Index Type: Measured Depth

Creation Date: 22-Mar-2016 16:06:49

TIME_1900 - Time Marked every 60.00 (s)

USIT Processing Flags (UFLG[0]) USIT-E

1 - UFLG 1 Value within [0.0 - 1.5] - :

2 - UFLG 2 Value within [1.5 - 2.5] - :

3 - UFLG 3 Value within [2.5 - 3.5] - :

4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :

5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :

UTIM Error

Pulse Origin Not Detected

WINLEN Error

Casing Thickness Error

Loop Processing Error

Casing Collar Locator Ultrasonic (CCLU) USIT-E

-30 in 10

Amplitude of Eccentering for Unflagged Waves (ECCE_RF) USIT-E

0 in 0.5

Motor Revolution Speed (RSAV) USIT-E

6 c/s 8

Absent 1.500 3.500

Explicit Normalization

USIT - USIT Processing Flags (UFLG) USIT-E

USIT Processing Flags (UFLG[0]) USIT-E

1 5

Absent -4.799 -2.799 -0.800

Explicit Normalization

USIT - Amplitude of Unflagged Wave (AWBK_RF) USIT-E (dB)

Minimum of Unflagged Wave Amplitude (AWMN_RF) USIT-E

0 dB 75

Average of Unflagged Wave Amplitude (AWAV_RF) USIT-E

0 dB 75

Maximum of Unflagged Wave Amplitude (AWMX_RF) USIT-E

0 dB 75

ERAV IRAV

ERAV-IRAV ERAV

IRAV IRAV-ERAV

Median of Unflagged External Radii (ERAV_RF) USIT-E

5 in 4

Median of Unflagged External Radii (ERAV_RF) USIT-E

4 in 5

Median Internal Radius of Casing Corrected for Eccentering (IRAV_RF) USIT-E

5 in 4

Median Internal Radius of Casing Corrected for Eccentering (IRAV_RF) USIT-E

4 in 5

Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E

5 in 4

Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E

4 in 5

Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E

5 in 4

Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E

4 in 5

Absent -0.043 0.004 0.051

Explicit Normalization

USIT - Unflagged Internal Radii minus Median Internal Radius (IRBKM_RF) USIT-E (in)

Minimum of Unflagged Casing Thickness (THMN_RF) USIT-E

0.1 in 0.6

Nominal Casing Thickness (THNO) USIT-E

0.1 in 0.6

Median of Unflagged Casing Thickness (THAV_RF) USIT-E

0.1 in 0.6

Maximum of Unflagged Casing Thickness (THMX_RF) USIT-E

0.1 in 0.6

Absent -0.043 0.004 0.051

Explicit Normalization

USIT - Unflagged Casing Thickness minus Median of Unflagged Casing Thickness (THBKM_RF) USIT-E (in)

Absent 2.000 4.500 7.000

Custom Normalization

USIT - Acoustic Impedance (AIBK) USIT-E (Mrayl)

Ratio of Cement Measurements to Total (CEMR) USIT-E

1 0

Micro-debonding Ratio (MDR) USIT-E

1 0

Ratio of Gas Measurements to Total (GASR) USIT-E

1 0

Bonded

Gas

Liquid

Micro-debonding

Bond Index (BI) DSLT-H

1 0

Absent 3.090 5.054 7.018

Custom Normalization

USIT - Acoustic Impedance (AIBK) USIT-E (Mrayl)

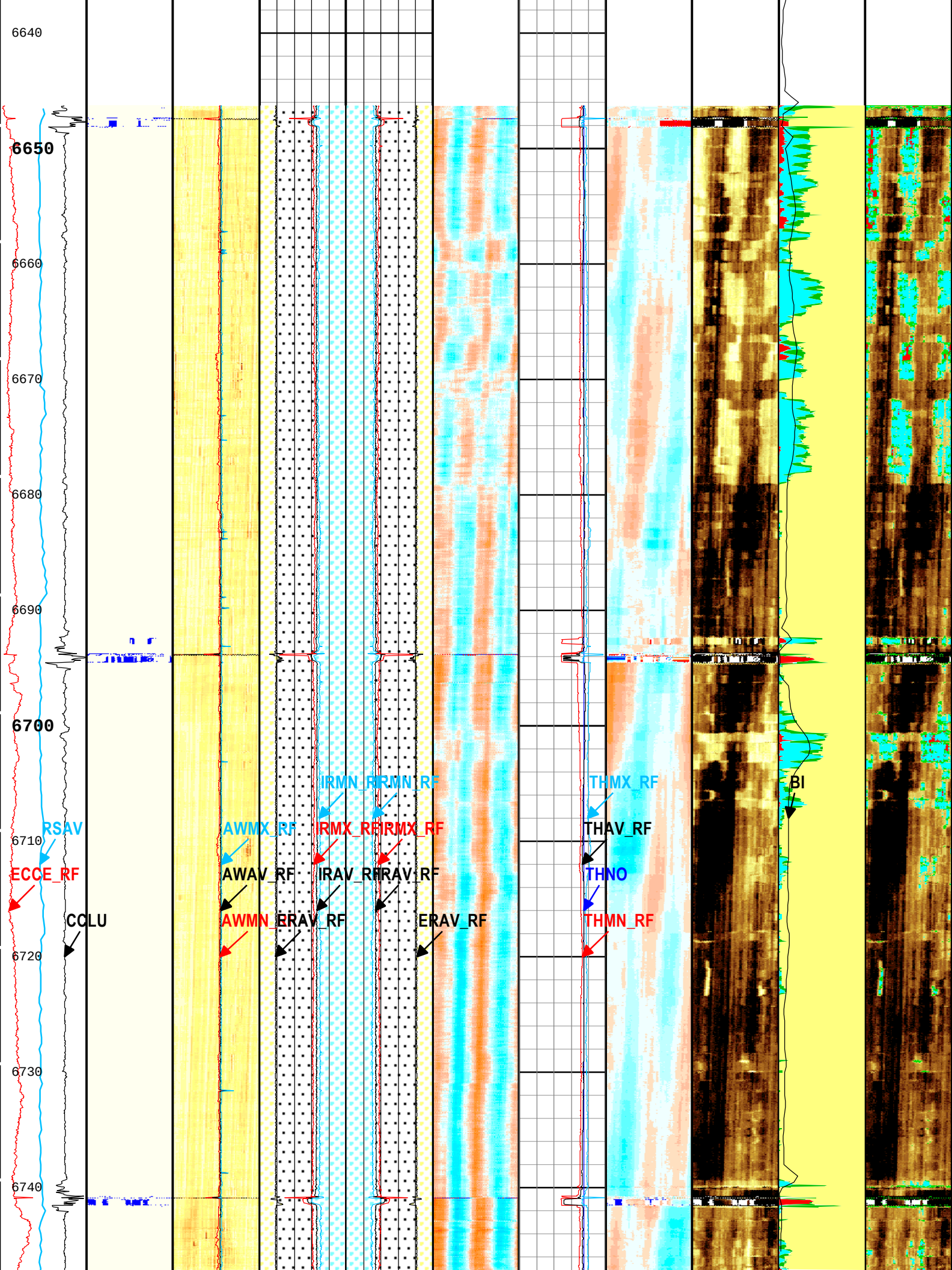
Absent 2.599 4.563 6.527

Custom Normalization

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

6620

6630


6640
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6730
6740
RSAV
ECCE_RF
CCLU
AWMX_RF
AWAV_RF
AWMN_RF
IRMN_RF
IRMX_RF
IRAV_RF
ERAV_RF
IRMN_RF
IRMX_RF
IRAV_RF
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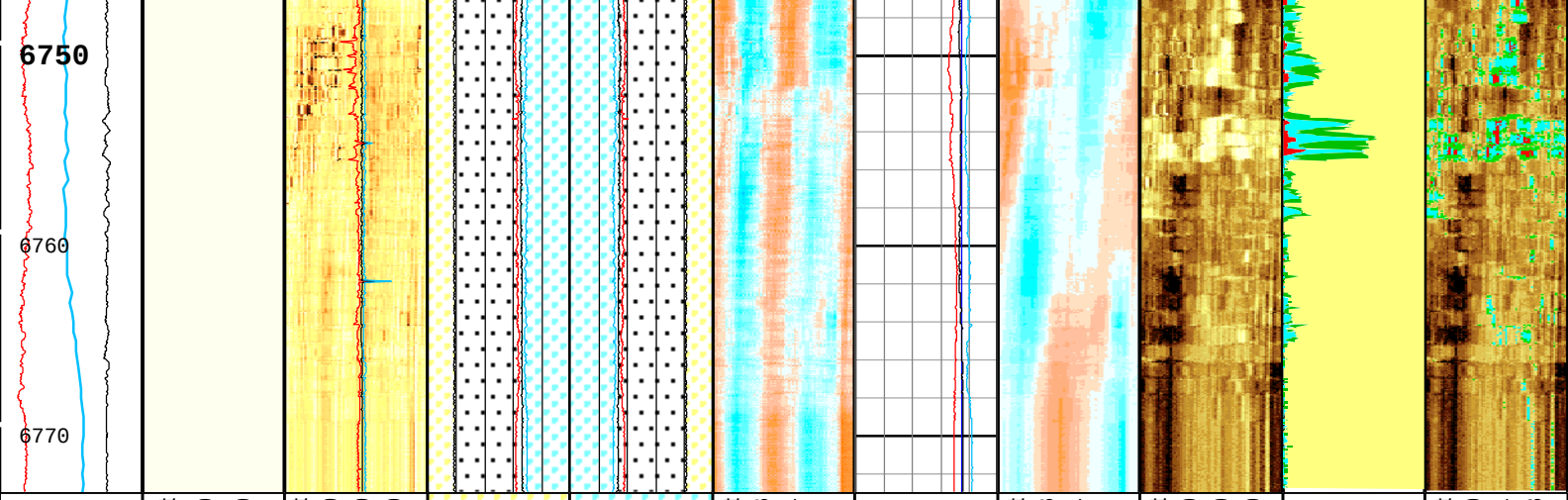
THMX_RF
THAV_RF
THNO
THMN_RF
BI



Casing Collar Locator Ultrasonic (CCLU) USIT-E
-30 in 10

Amplitude of Eccentering for Unflagged Waves (ECCE_RF) USIT-E
0 in 0.5

Motor Revolution Speed (RSAV) USIT-E
6 c/s 8

Absent 1.500 3.500
Explicit Normalization
USIT - USIT Processing Flags (UFLG) USIT-E

USIT Processing Flags (UFLG[0]) USIT-E
1 5

Absent -4.799 -2.799 -0.800
Explicit Normalization
USIT - Amplitude of Unflagged Wave (AWBK_RF) USIT-E
(dB)

Minimum of Unflagged Wave Amplitude (AWMN_RF) USIT-E
0 dB 75

Average of Unflagged Wave Amplitude (AWAV_RF) USIT-E
0 dB 75

Maximum of Unflagged Wave Amplitude (AWMX_RF) USIT-E
0 dB 75

ERAV
ERAV-IRAV
IRAV

Median of Unflagged External Radii (ERAV_RF) USIT-E
5 in 4

Median Internal Radius of Casing Corrected for Eccentering (IRAV_RF) USIT-E
5 in 4

Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E
5 in 4

Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E
5 in 4

IRAV
ERAV
IRAV-ERAV

Median of Unflagged External Radii (ERAV_RF) USIT-E
4 in 5

Median Internal Radius of Casing Corrected for Eccentering (IRAV_RF) USIT-E
4 in 5

Maximum of Unflagged Internal Radii (IRMX_RF) USIT-E
4 in 5

Minimum of Unflagged Internal Radii (IRMN_RF) USIT-E
4 in 5

Absent -0.043 0.004 0.051
Explicit Normalization
USIT - Unflagged Internal Radii minus Median Internal Radius (IRBKM_RF) USIT-E
(in)

Minimum of Unflagged Casing Thickness (THMN_RF) USIT-E
0.1 in 0.6

Nominal Casing Thickness (THNO) USIT-E
0.1 in 0.6

Median of Unflagged Casing Thickness (THAV_RF) USIT-E
0.1 in 0.6

Maximum of Unflagged Casing Thickness (THMX_RF) USIT-E
0.1 in 0.6

Absent -0.043 0.004 0.051
Explicit Normalization
USIT - Unflagged Casing Thickness minus Median of Unflagged Casing Thickness (THBKM_RF) USIT-E
(in)

Absent 2.000 4.500 7.000
Custom Normalization
USIT - Acoustic Impedance (AIBK) USIT-E
(Mrayl)

Ratio of Cement Measurements to Total (CEMR) USIT-E
1 0

Micro-debonding Ratio (MDR) USIT-E
1 0

Ratio of Gas Measurements to Total (GASR) USIT-E
1 0

Bonded
Gas
Liquid
Micro-debonding

Bond Index (BI) DSLT-H
1 0

Absent 3.090 5.054 7.018
Custom Normalization
USIT - Acoustic Impedance (AIBK) USIT-E
(Mrayl)

Absent 2.599 4.563 6.527
Custom Normalization
USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E
(Mrayl)

USIT Processing Flags (UFLG[0]) USIT-E

1 - UFLG 1 Value within [0.0 - 1.5] - :
2 - UFLG 2 Value within [1.5 - 2.5] - :
3 - UFLG 3 Value within [2.5 - 3.5] - :
4 - UFLG 4 UFLG 5 UFLG 6 Value within [3.5 - 6.5] - :
5 - UFLG 7 UFLG 8 UFLG 9 Value within [6.5 - 10] - :

UTIM Error
Pulse Origin Not Detected
WINLEN Error
Casing Thickness Error
Loop Processing Error

TIME_1900 - Time Marked every 60.00 (s)

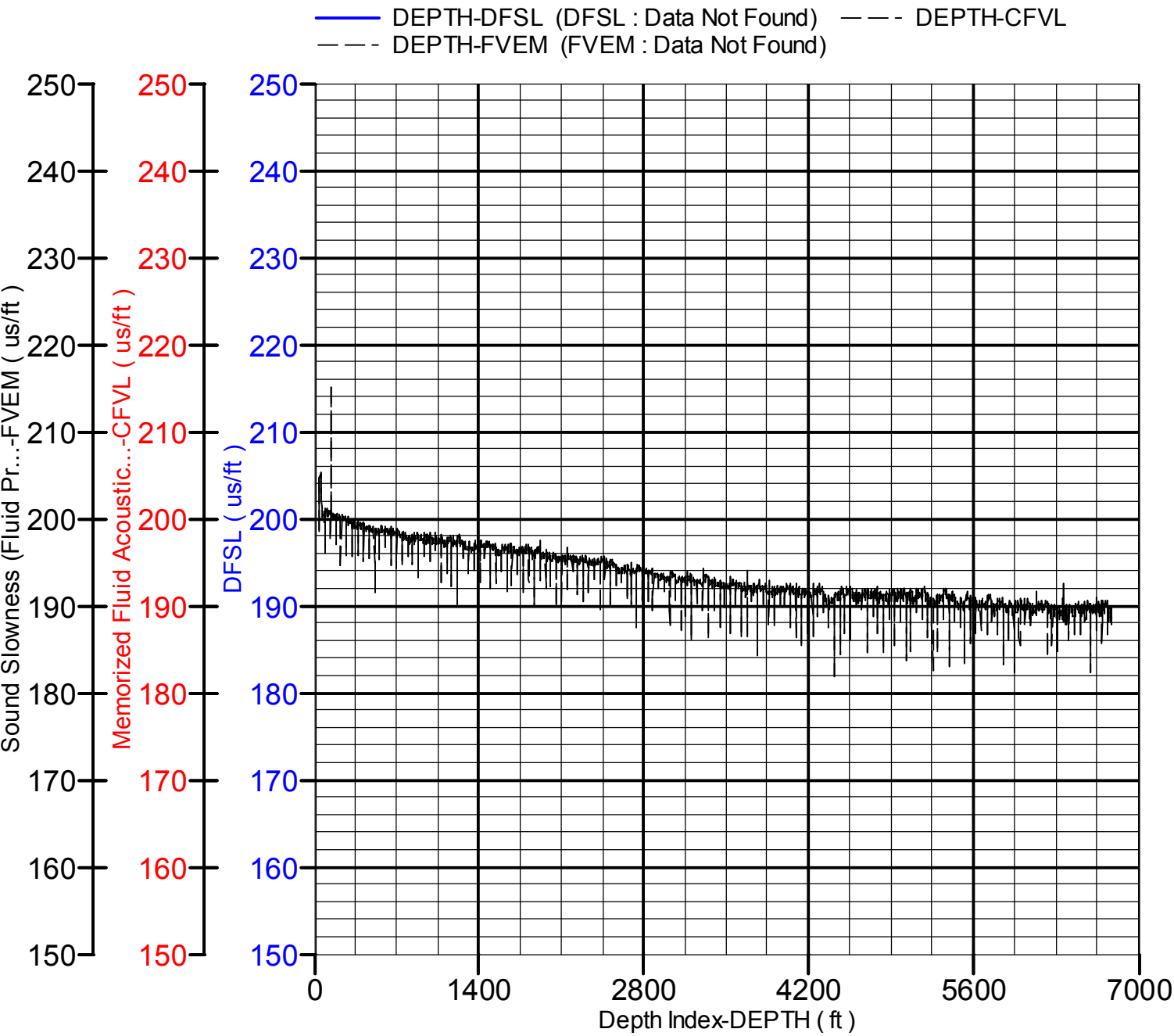
XYZ

Company:Southern California Gas Company Well:Fernando Fee 38C
One: Log[6]:Up:S007

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6779.00 to 42.00 ft



XYZ

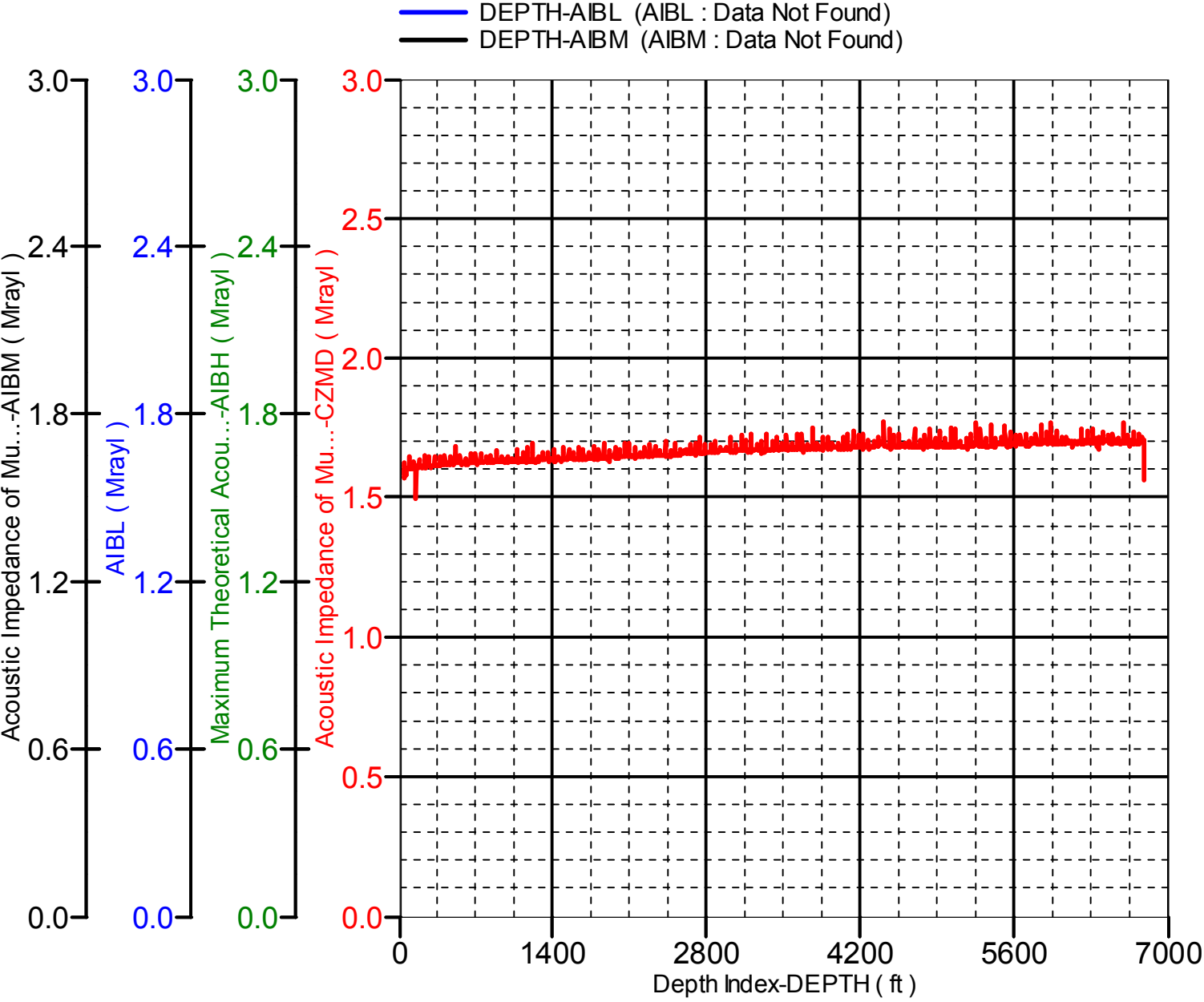
Company:Southern California Gas Company Well:Fernando Fee 38C
One: Log[6]:Up:S007

Theoretical Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6779.00 to 42.00 ft

DEPTH-CZMD
DEPTH-AIBH (AIBH : Data Not Found)



Company:	Southern California Gas Company
Well:	Fernando Fee 38C
Field:	Aliso Canyon
County:	Los Angeles
State:	California

Schlumberger

Ultrasonic Imager

Gamma Ray - CCL

9-5/8" 47# casing