

Company: Occidental Petroleum

Well: Morton 37-1

Field: Wattenberg

County: Weld State: Colorado

Isolation Scanner
Casing Integrity
Gamma Ray - CCL

County: Weld
Field: Wattenberg
Location:
Well: Morton 37-1
Company: Occidental Petroleum

Location:		Elev.:	K.B.	4913.00 ft
Permanent Datum:	Ground Level		G.L.	4898.00 ft
Log Measured From:	Kelly Bushing	15.00 ft	D.F.	
Drilling Measured From:	Kelly Bushing			above Perm.Datum
API Serial No.	Section:	Township:	Range:	
05-123-34061	1	1N	67W	

Logging Date	28-Oct-2021
Run Number	One
Depth Driller	8243.00 ft
Schlumberger Depth	6609.00 ft
Bottom Log Interval	6609.00 ft
Top Log Interval	300.00 ft
Casing Fluid Type	Water
Salinity	
Density	9 lbm/gal
Fluid Level	8.00 ft
BIT/CASING/TUBING STRING	
Bit Size	7.88 in
From	878.00 ft
To	6609.00 ft
Casing/Tubing Size	4.5 in
Weight	11.6 lbm/ft
Grade	N/A
From	0.00 ft
To	8243.00 ft
Max Recorded Temperatures	189 degF
Logger on Bottom	28-Oct-2021 08:53:00
Unit Number	9108
Recorded By	M.Oloyede/T.Mozena Fort Morgan
Witnessed By	David Almaraz

Disclaimer

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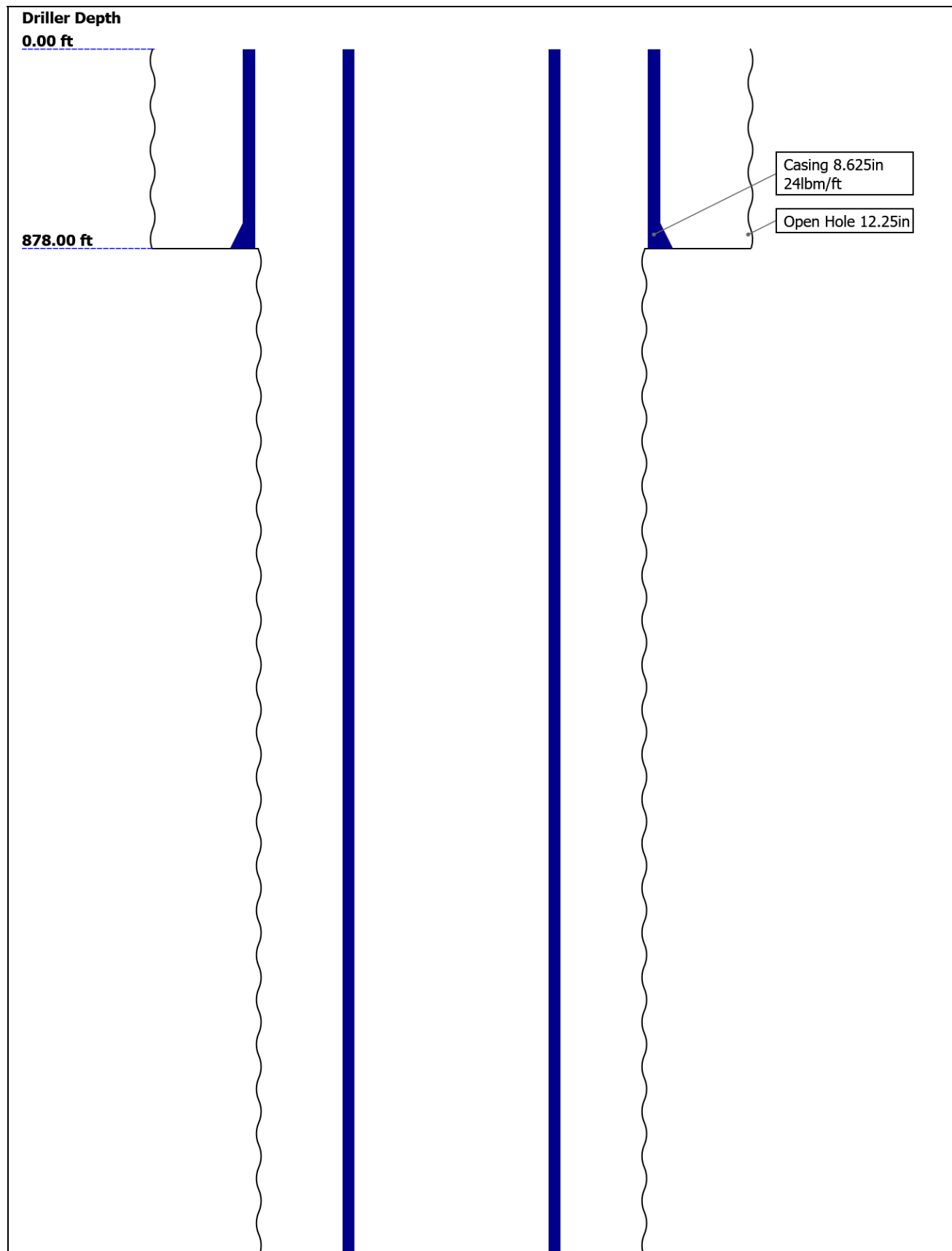
10.5 Parameter Listing

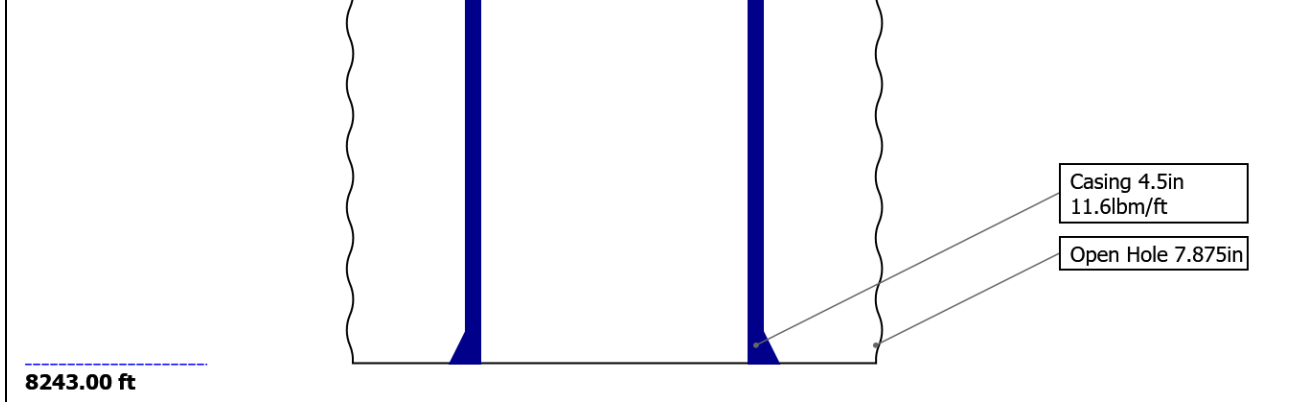
11. XYZ (IBC Fluid Acoustic Slowness vs Depth 6.0 in)

12. XYZ (IBC Acoustic Impedance of Mud vs Depth 6.0 in)

13. Tail

Well Sketch





Borehole Size/Casing/Tubing Record

Bit					
Bit Size (in)	12.25	7.875			
Top Driller (ft)	0	878			
Top Logger (ft)	0	878			
Bottom Driller (ft)	878	8243			
Bottom Logger (ft)	878	6609			
Casing					
Size (in)	8.625	4.5			
Weight (lbm/ft)	24	11.6			
Inner Diameter (in)	8.097	4			
Grade	N/A	N/A			
Top Driller (ft)	0	0			
Top Logger (ft)	0	0			
Bottom Driller (ft)	878	8243			
Bottom Logger (ft)	878	8243			

Remarks and Equipment Summary

One: Toolstring		One: Remarks
Equip name&length LEH-QT 54.87 LEH-QT	MP nameOffset CTEM 47.88 ACCZ 0.00 HV 0.00 Gamma Ray 46.01 TelStat 44.88	Tool was run as per tool sketch All logging intervals as per client request All passes recorded at 10 deg 6 inch resolution Main pass recorded at 500 PSI, surfaced induced Repeat pass recorded at 0 PSI
EDTC-B: 51.38 9301 EDTH-B: 8442 EDTG-A EDTC-B: 9301		
AH-184 44.88 [2]		
CME-AF 42.88 [2]:3308		
ASLT-B: 39.08 8073 ASI T-BR		



CME-AF 24.43
[1]

AH-107 20.64
:3897

AH-184 18.64
[1]

USIT-E:9 16.64
00
ECH-MFA
:1818
USAC-A:
900
USIS-A:9
02
USSC-B
IBCS-A:8
15
FAR-SEN
SOR:4775
IBC-TX
NEAR-SE
NSOR:48
25
IBC-TX
USI-SEN
SOR:4522
IBC-TX
EMITTER
-SENSOR
:4776
IBC-TX

USI Se 0.84
nsor
Head T
ension

TOOL_ZERO

Lengths are in ft
Maximum Outer Diameter = 3.800 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

	One		
Depth Measuring Device			
Type	IDW-B		
Serial Number	5744		

Calibration Date	22-Sep-2021		
Calibrator Serial Number	57		
Calibration Cable Type	7-46A-XS		
Wheel Correction 1	-9		
Wheel Correction 2	-7		

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

Logging Cable			
Type	7-46A-XS		
Serial Number	1234		
Length	30000.00 ft		
Conveyance Type	Wireline		
Rig Type			

One:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well	Schlumberger depth control procedures followed	
Rig Up Length At Surface		IDW used as primary depth control system	
Rig Up Length At Bottom		Z-Chart used as secondary depth control system	
Rig Up Length Correction			
Stretch Correction			
Tool Zero Check At Surface			

USIT - Fluid Properties Measurement

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[6]:Up	6610.38	32.35

**Fluid Velocity = "Automatic".
CFVL equals DFSL channel**

Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)
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**Mud Impedance = "Theoretical".
CZMD uses theoretical results.
MUD_N_THE=1.05
DFD=1.08g/cm3(9.00lbm/gal)**

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

Main Pass

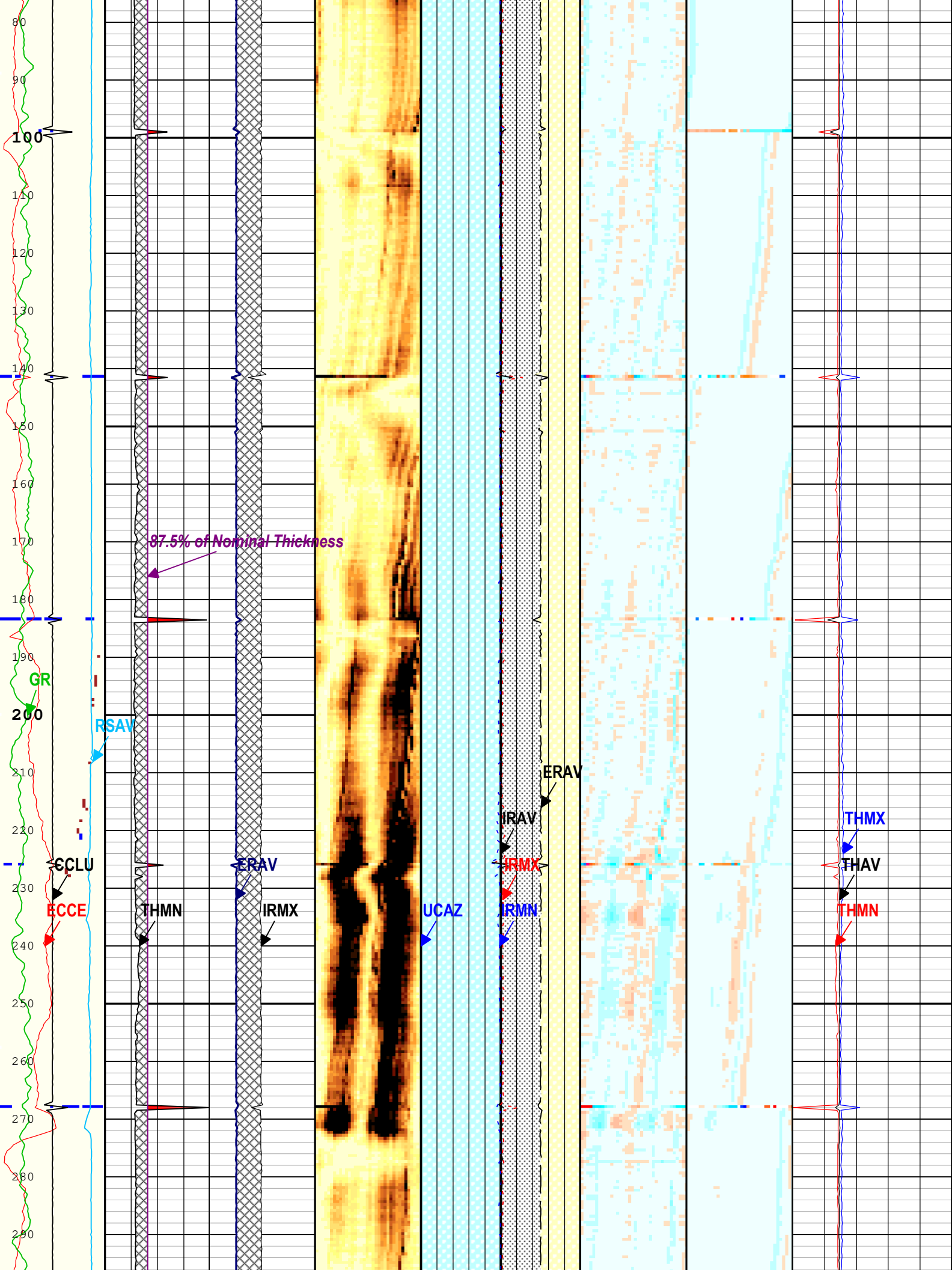
Software Version

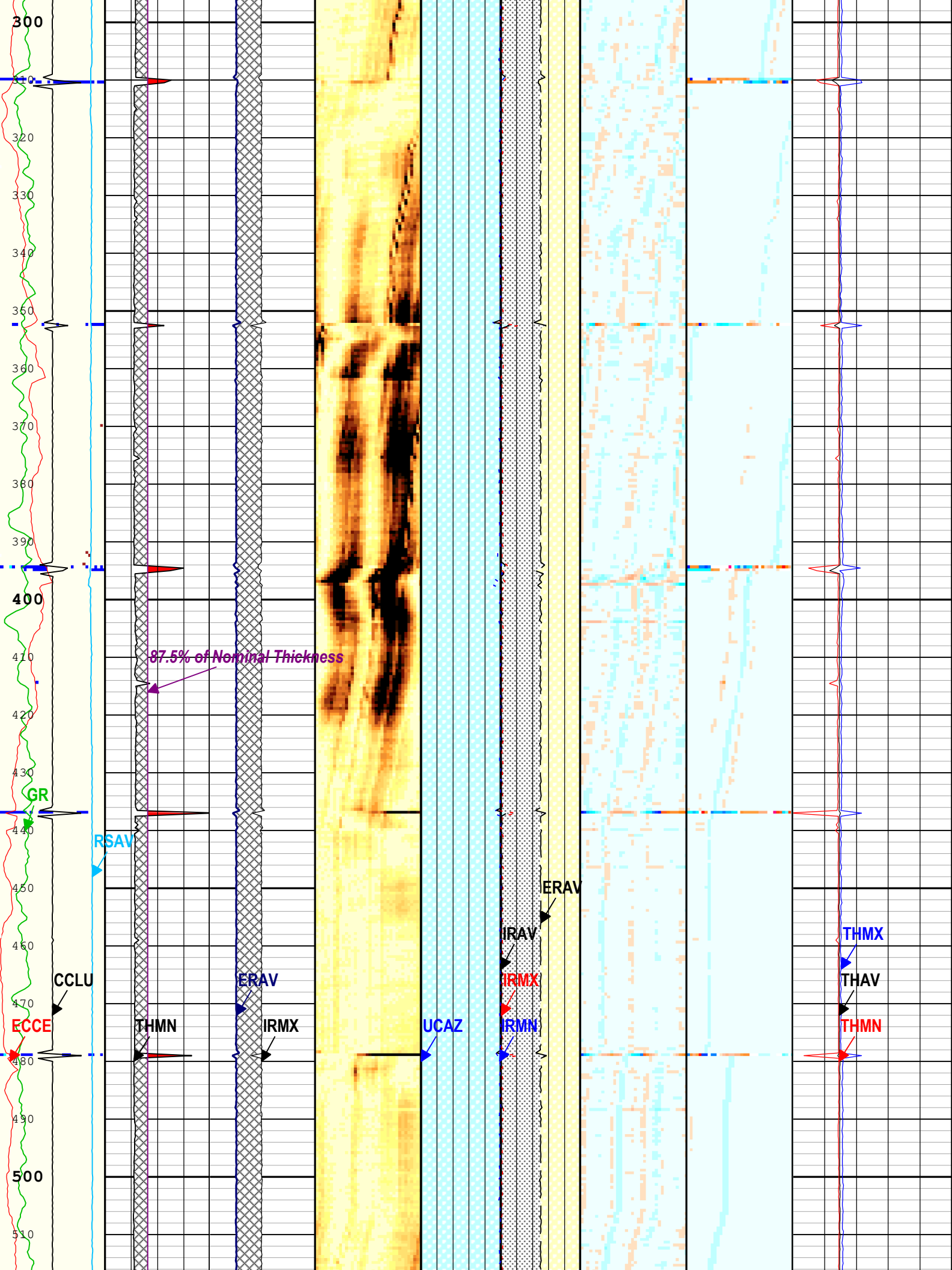
Acquisition System	Version
Maxwell 2021.1	11.1.211946.3100
Application Patch	Wireline_NPD-ThruBit-2021.1_11.1.214024

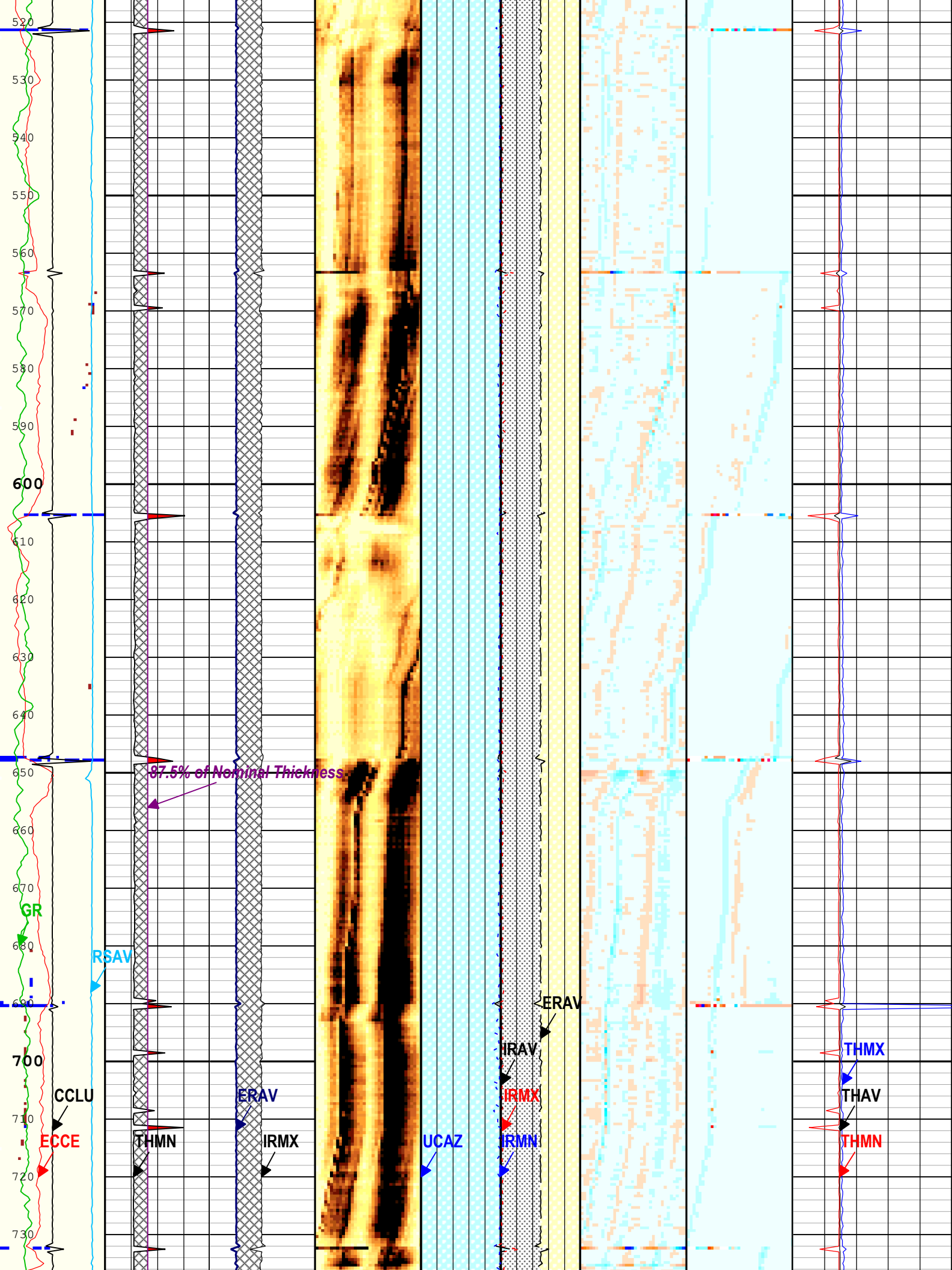
Pass Summary

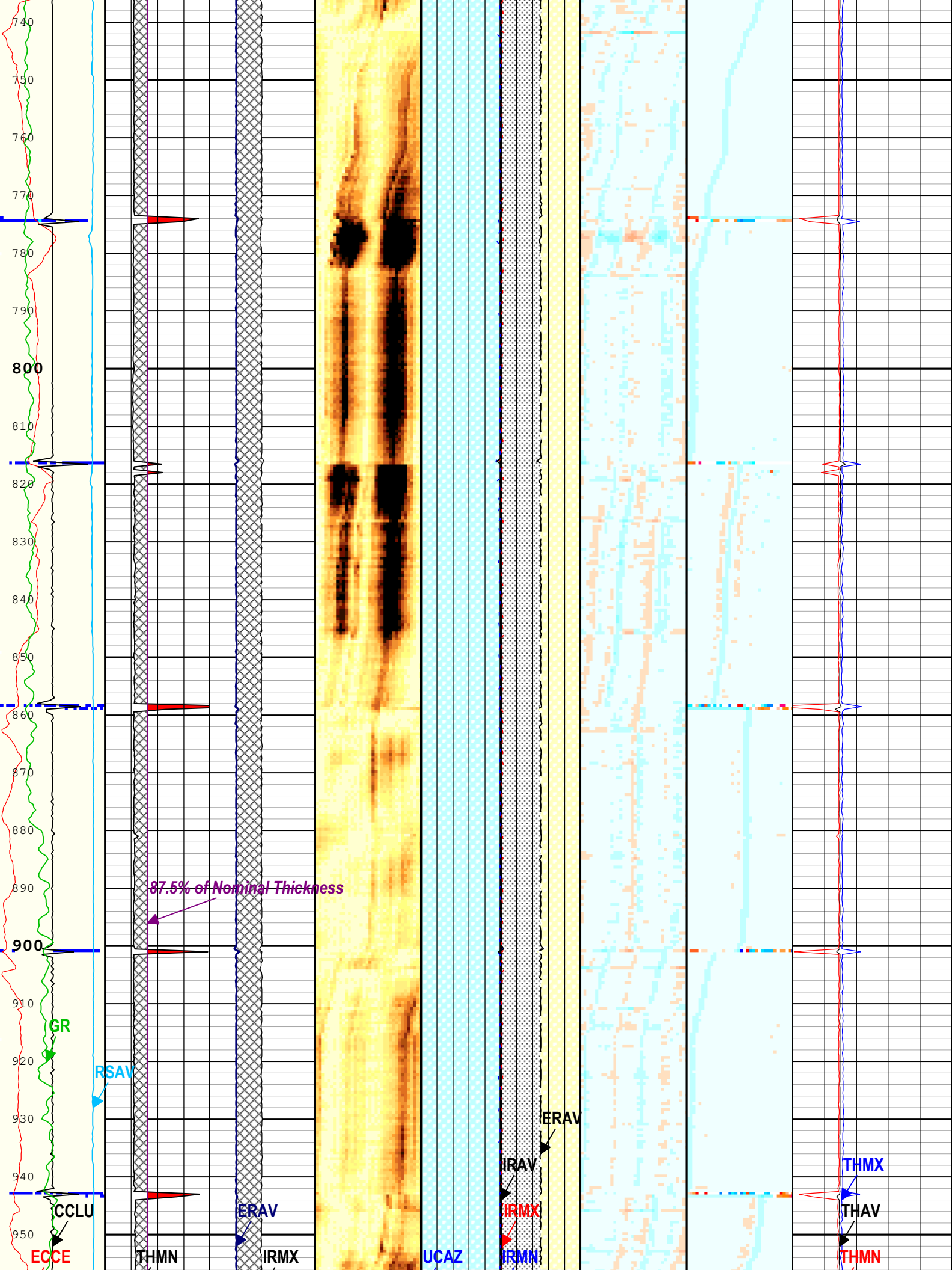
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[6]:Up	Up	32.35 ft	6610.38 ft	28-Oct-2021 8:53:21 AM	28-Oct-2021 10:46:06 AM	ON	9.11 ft	Yes

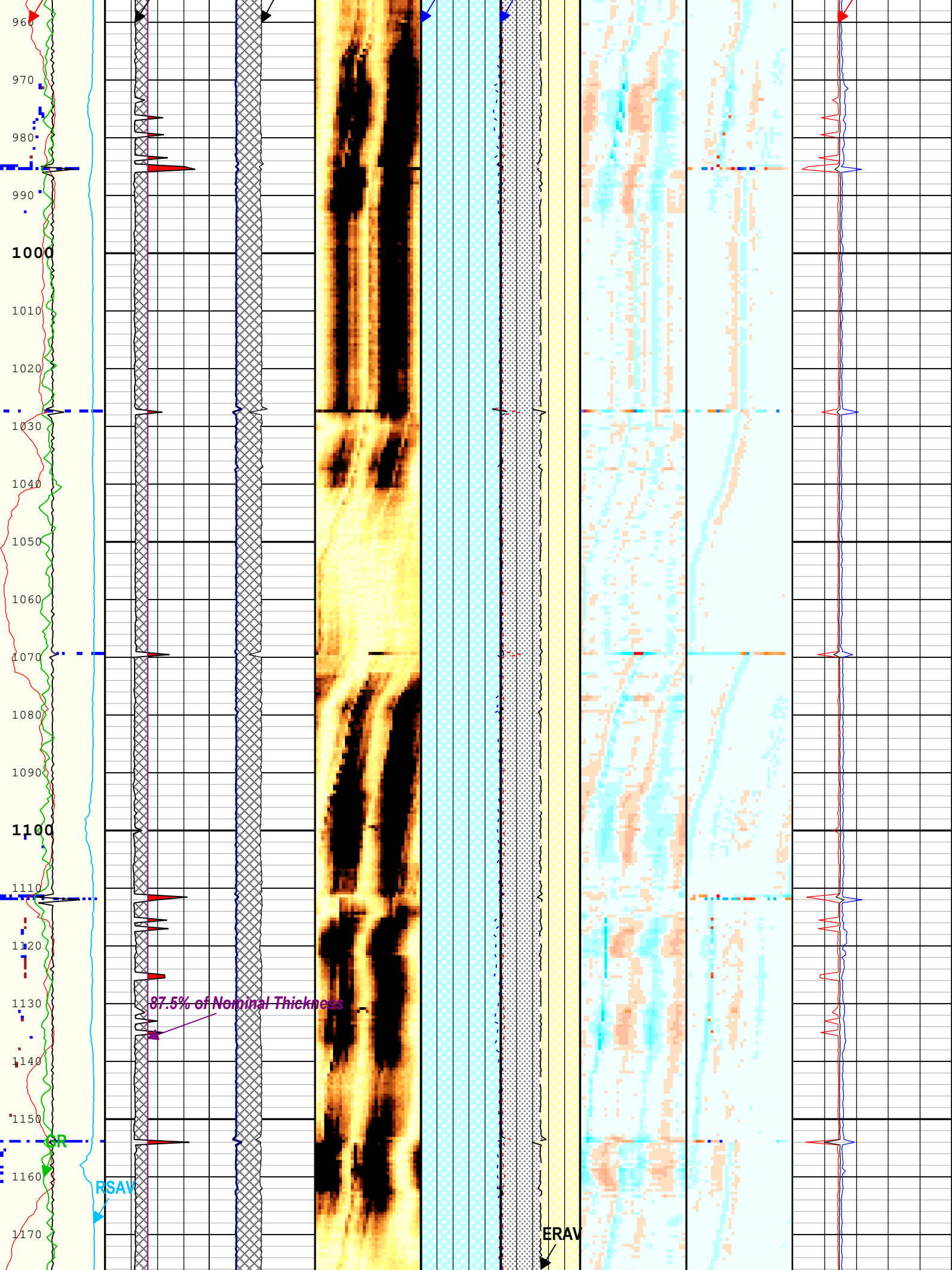
All depths are referenced to toolstring zero

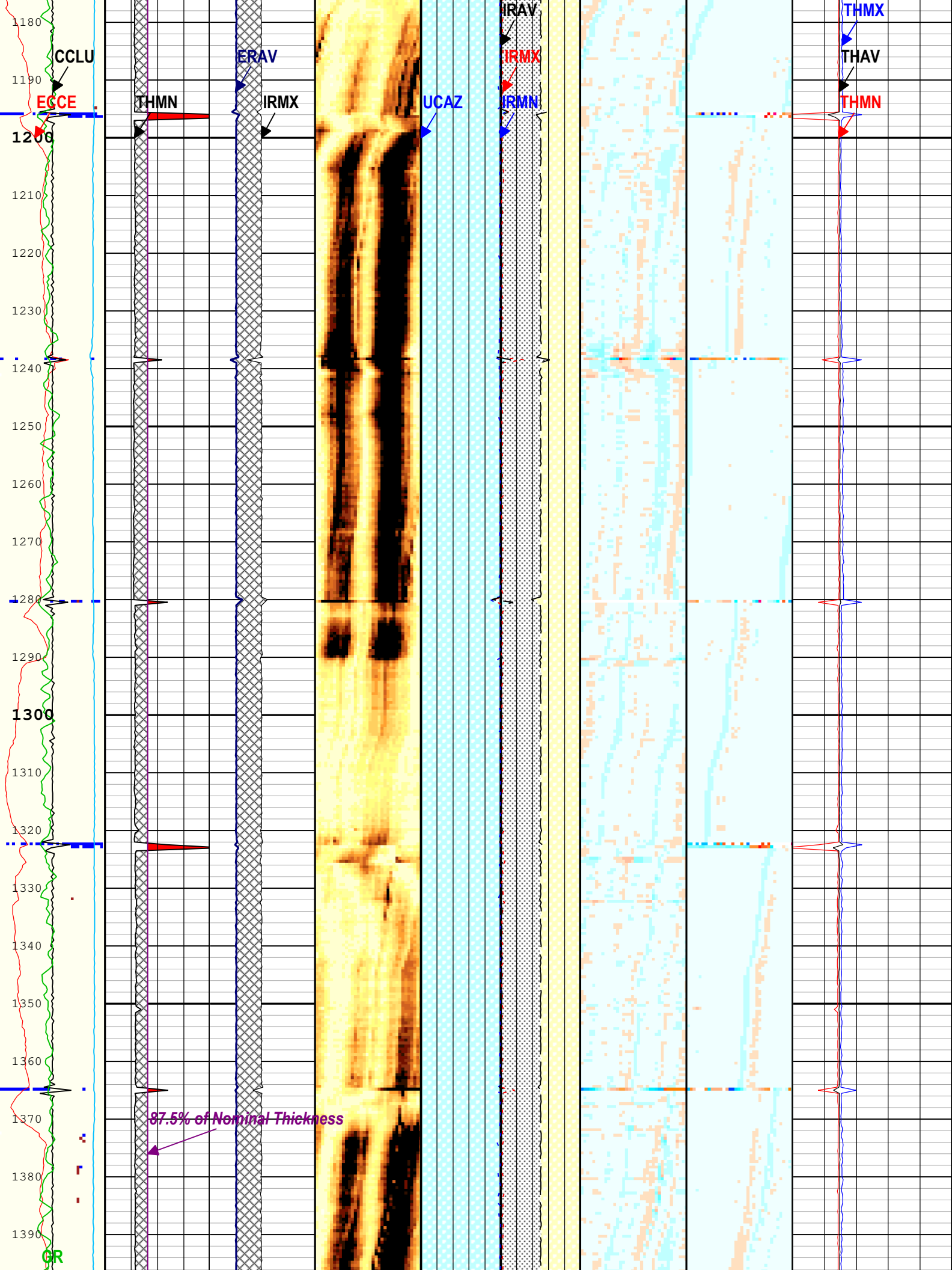


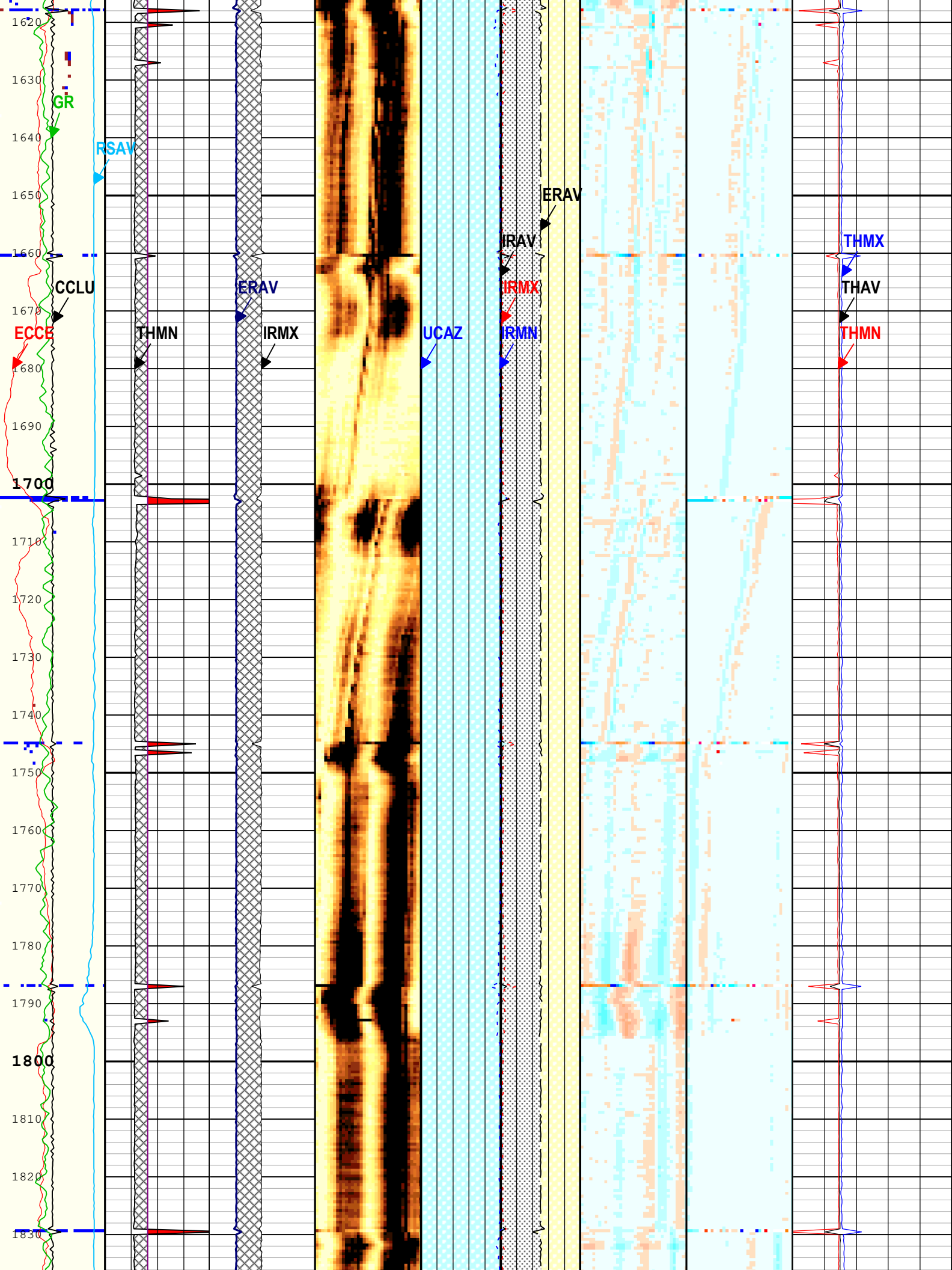


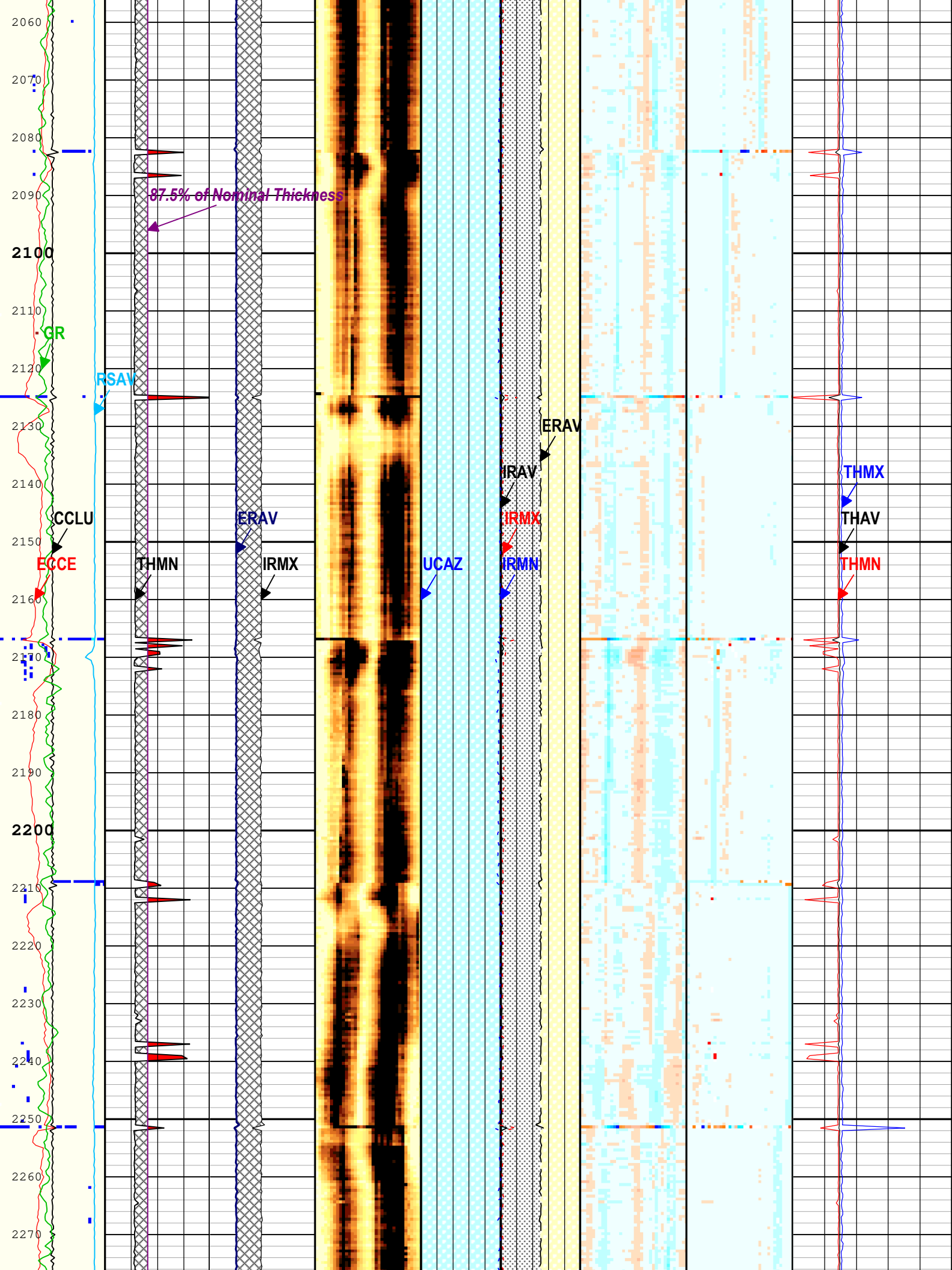


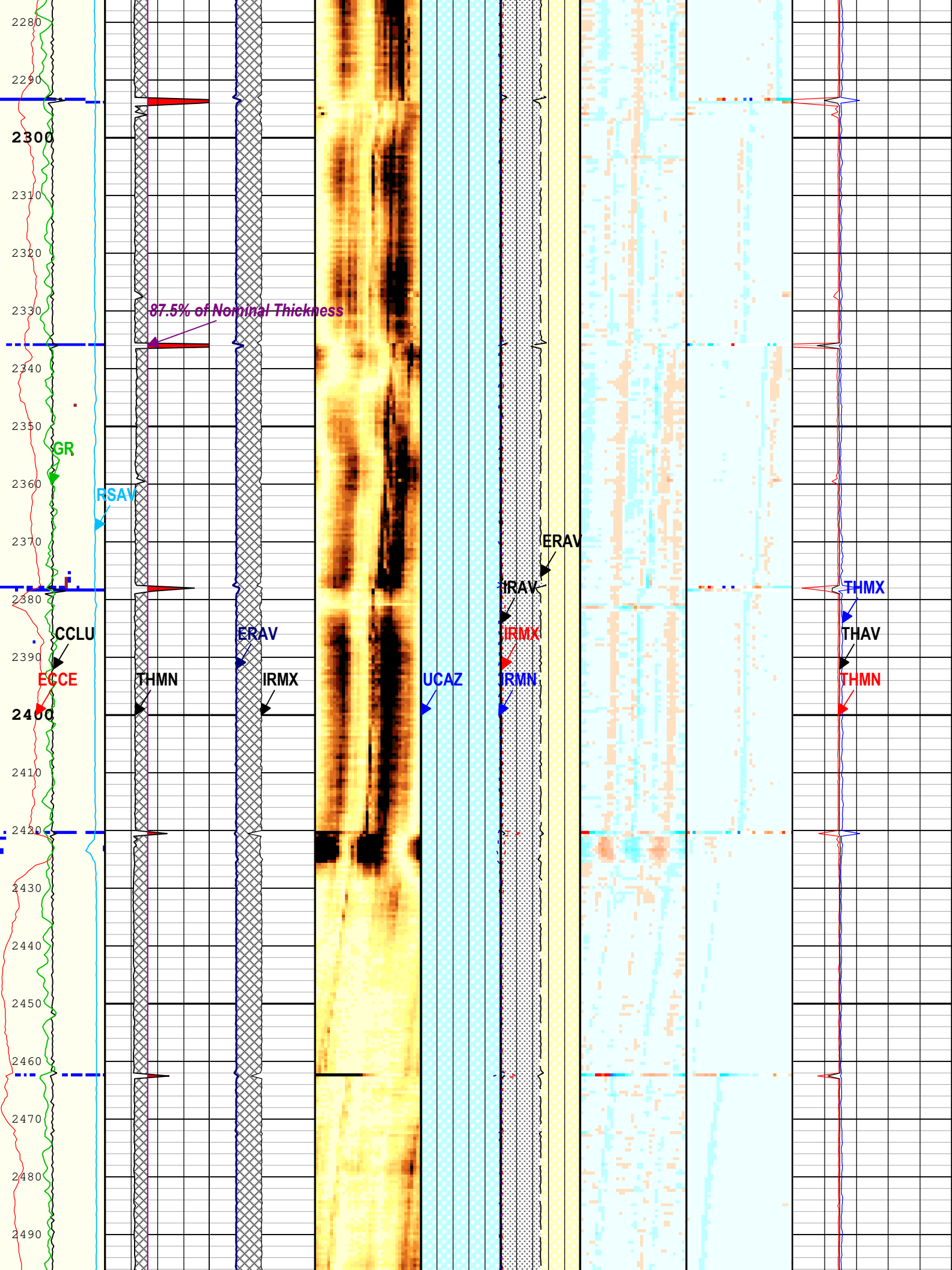


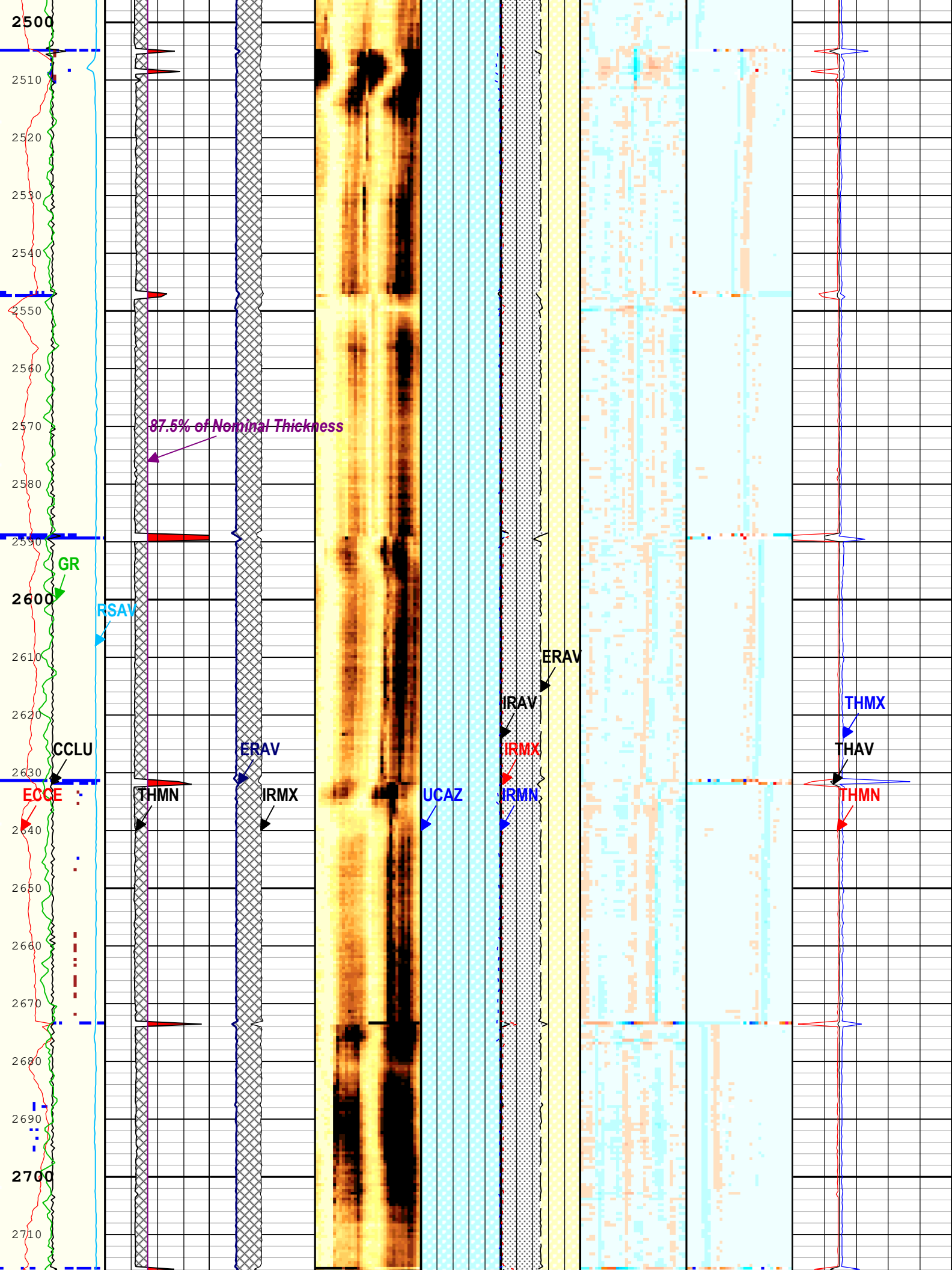


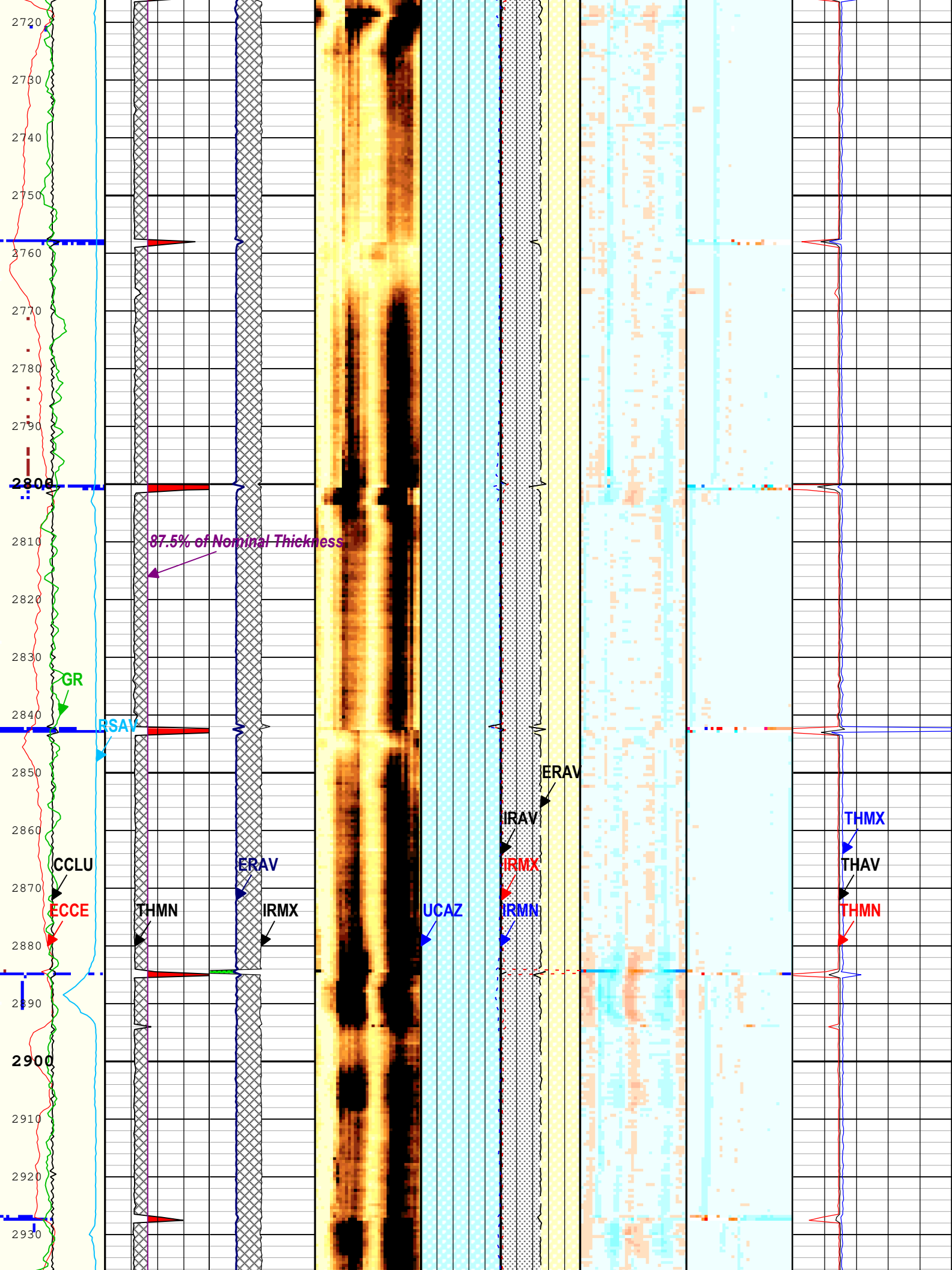


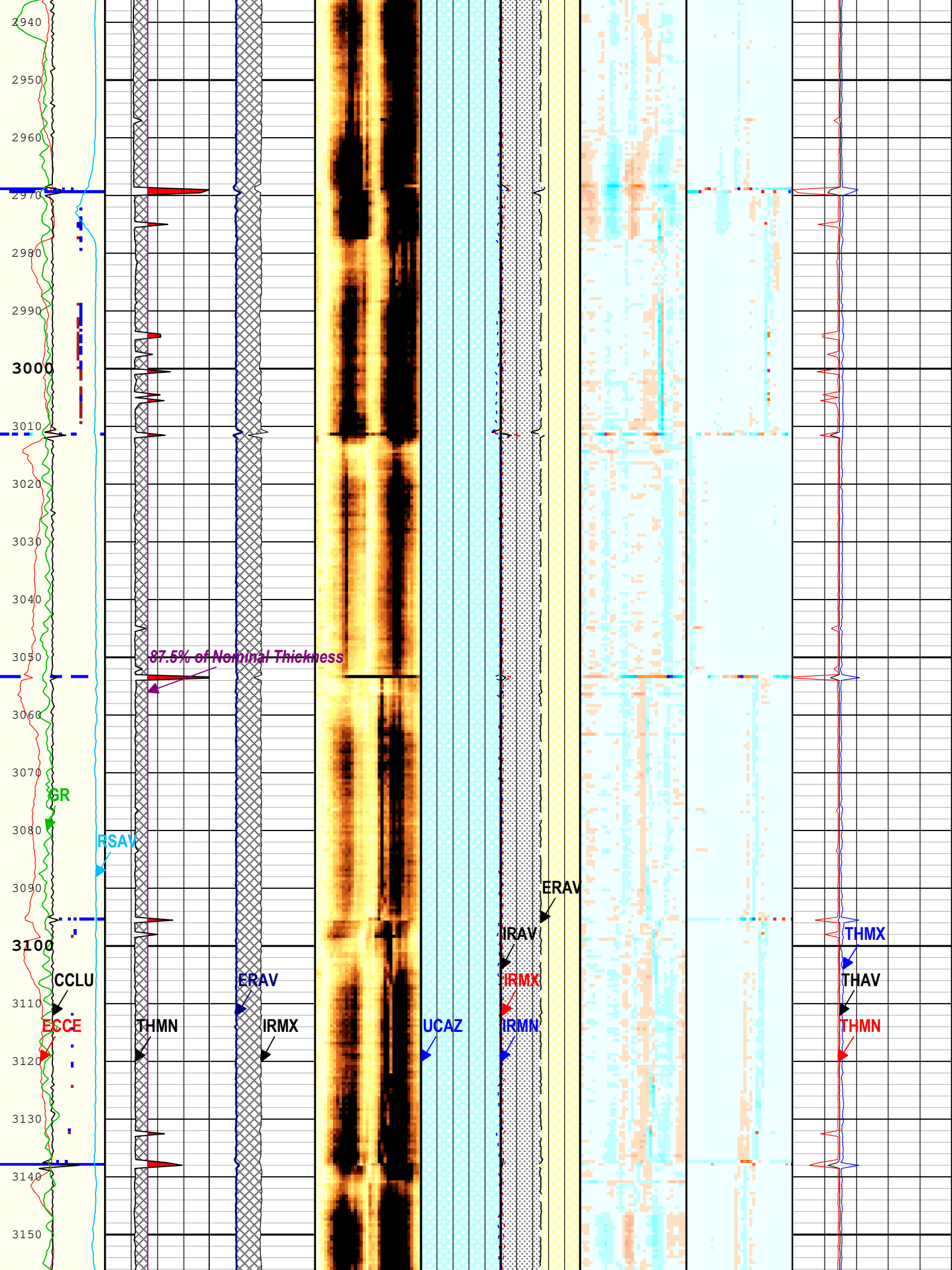


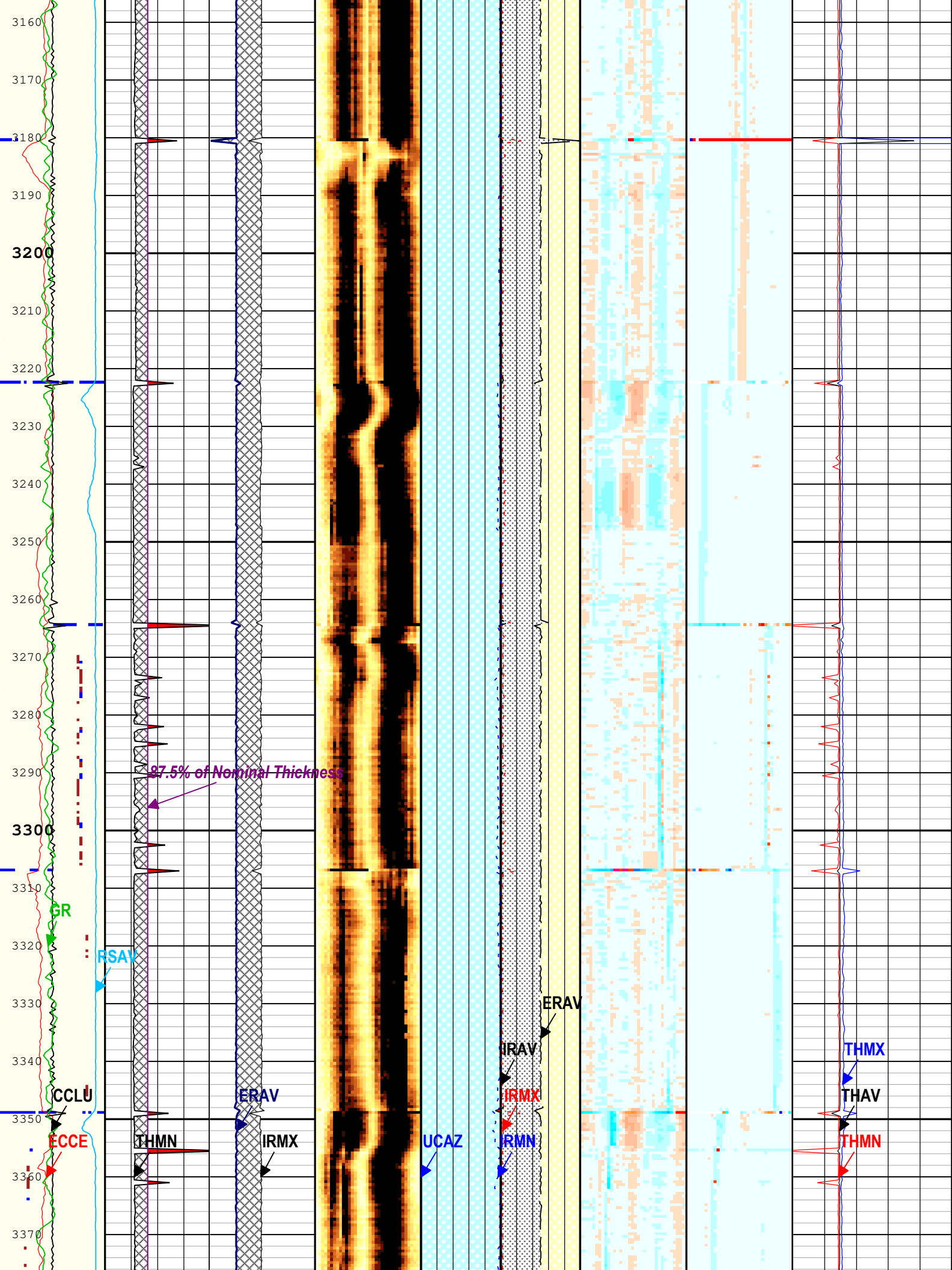


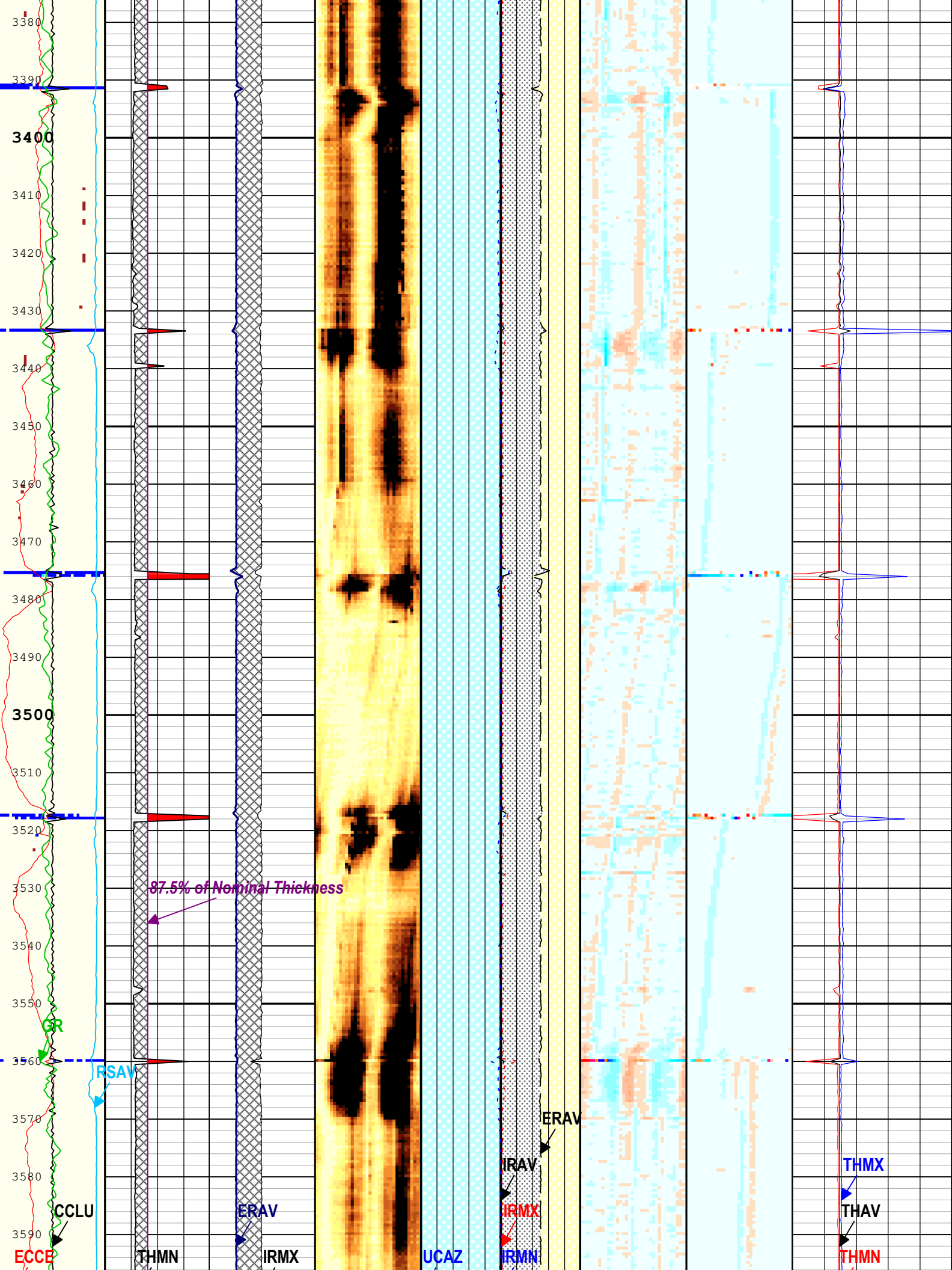


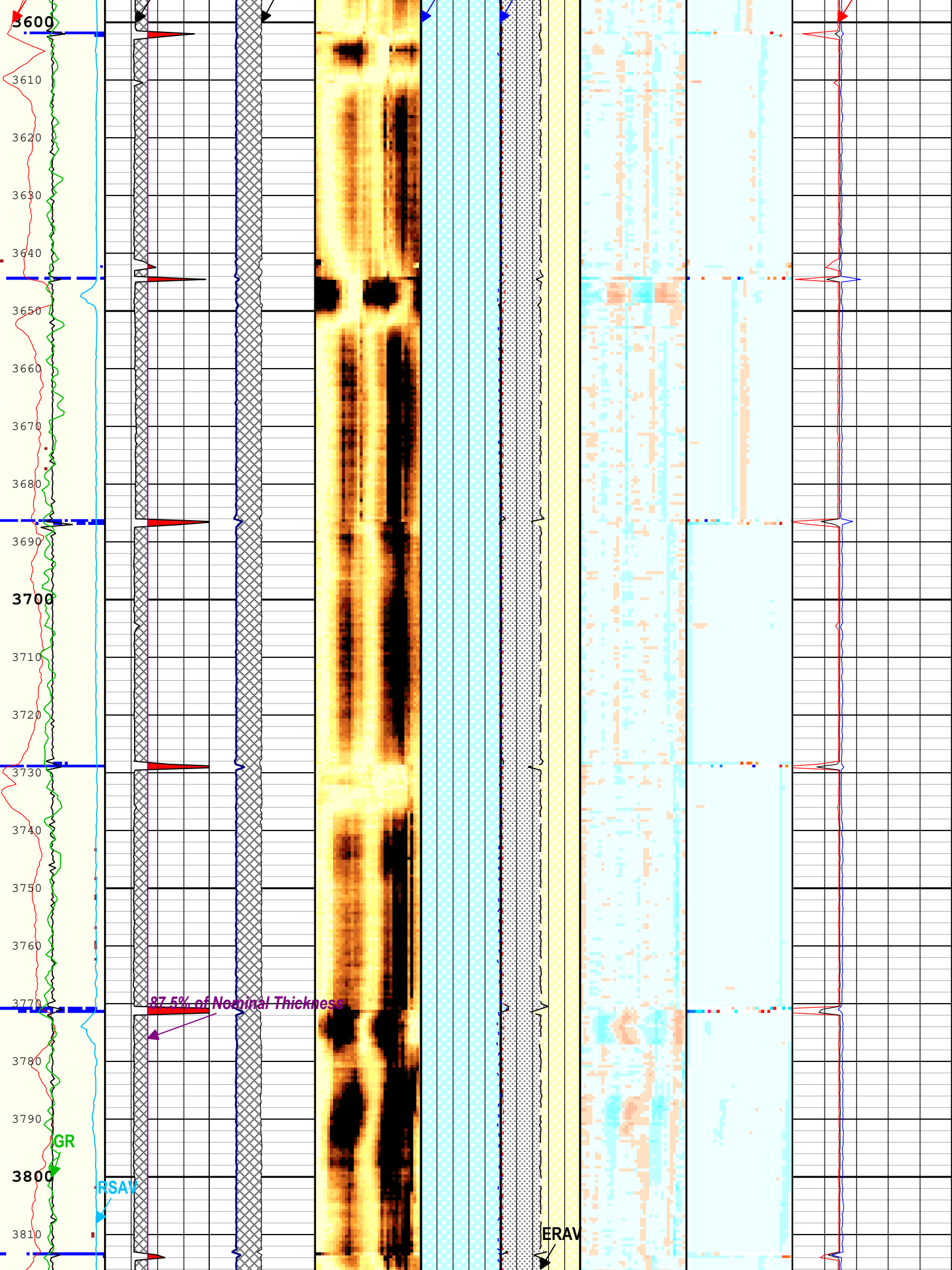


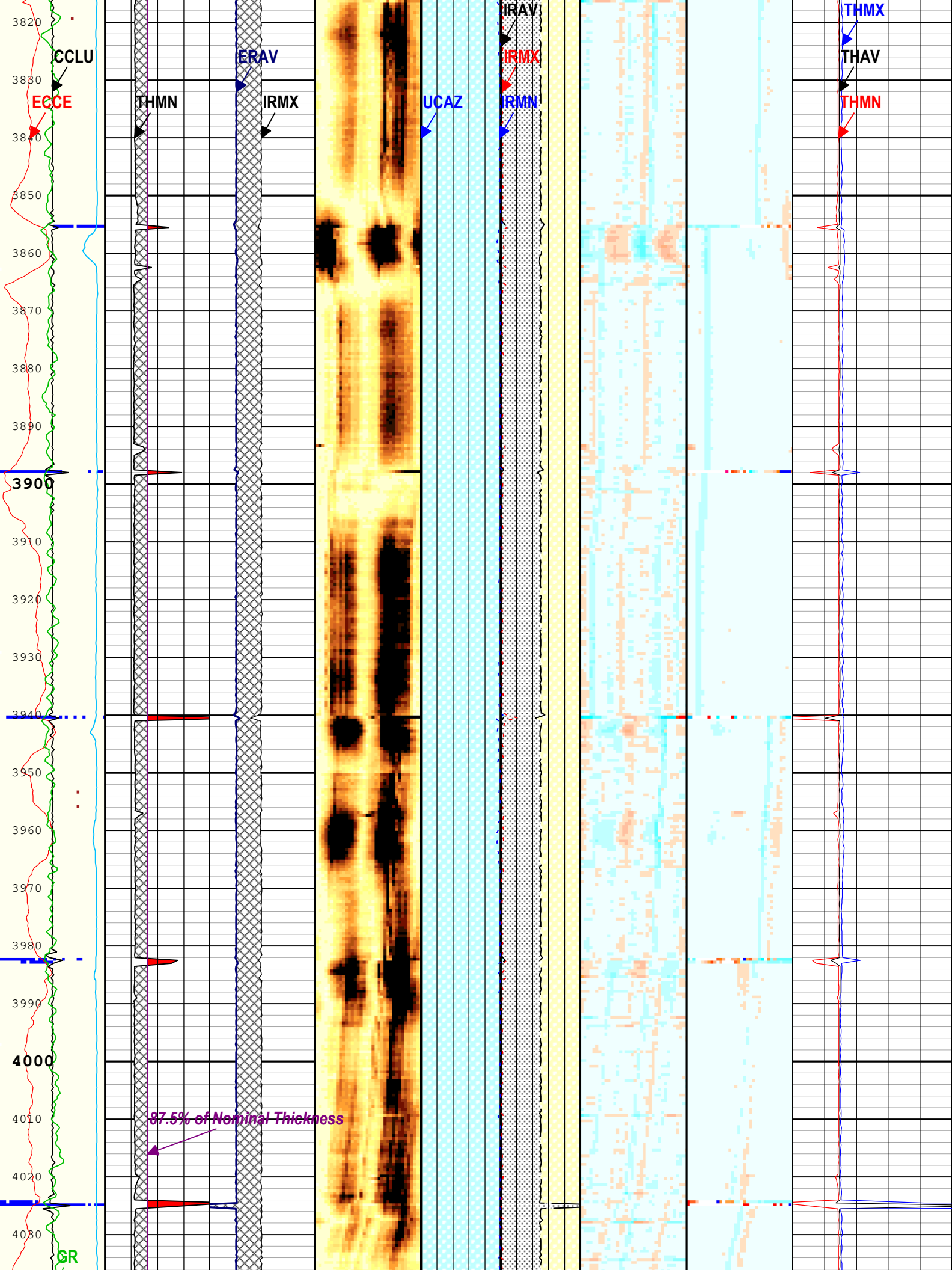


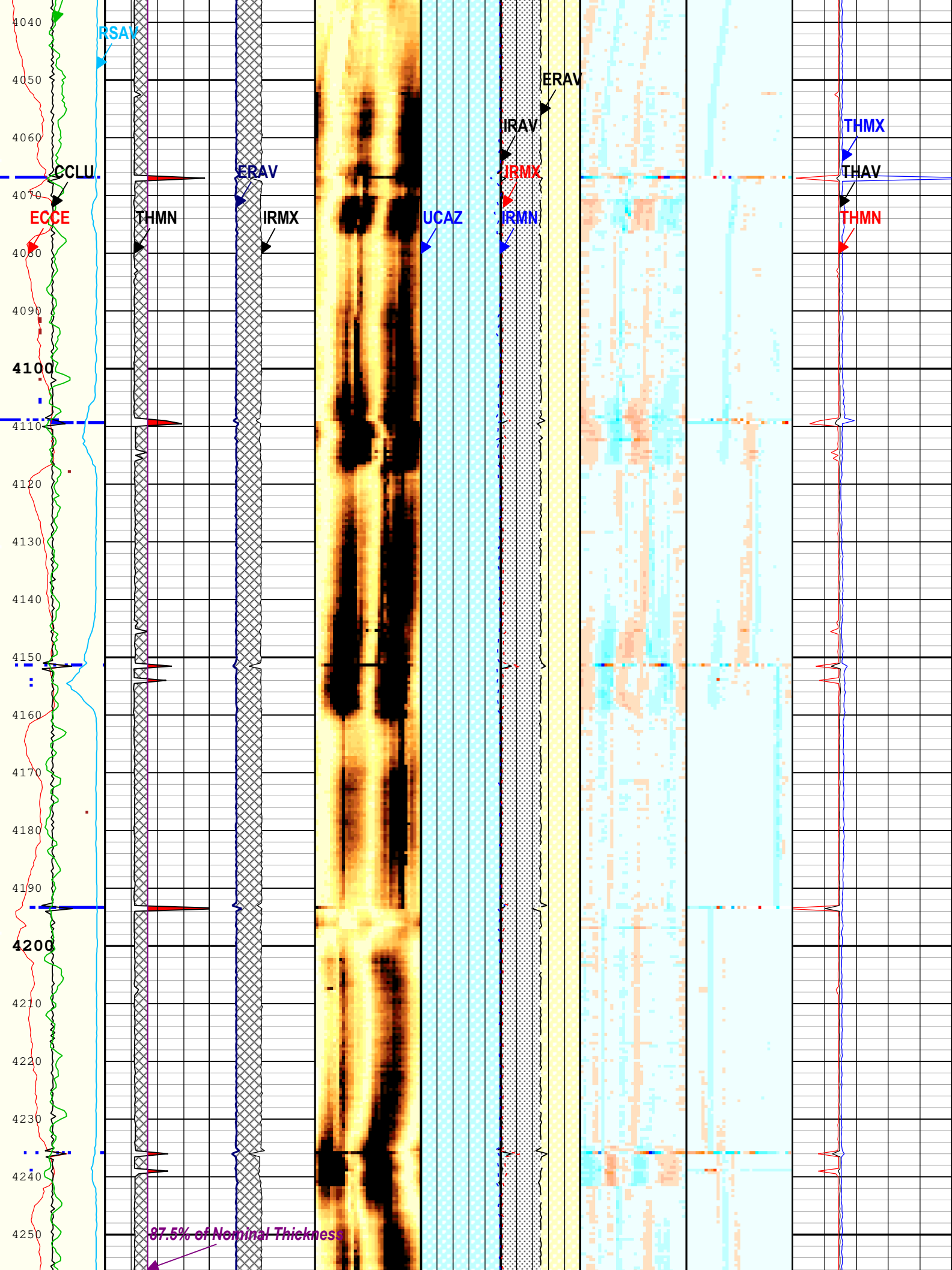


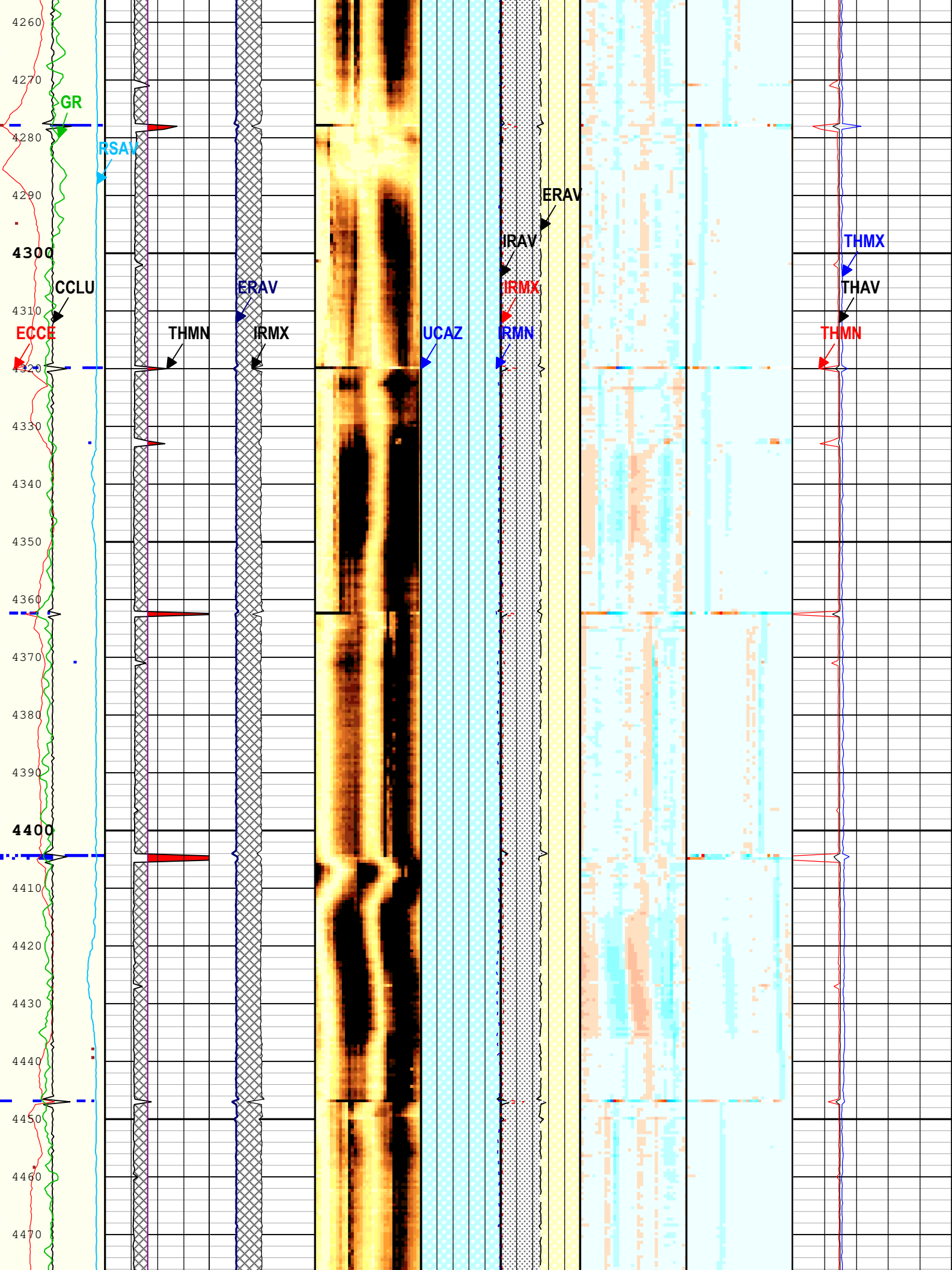


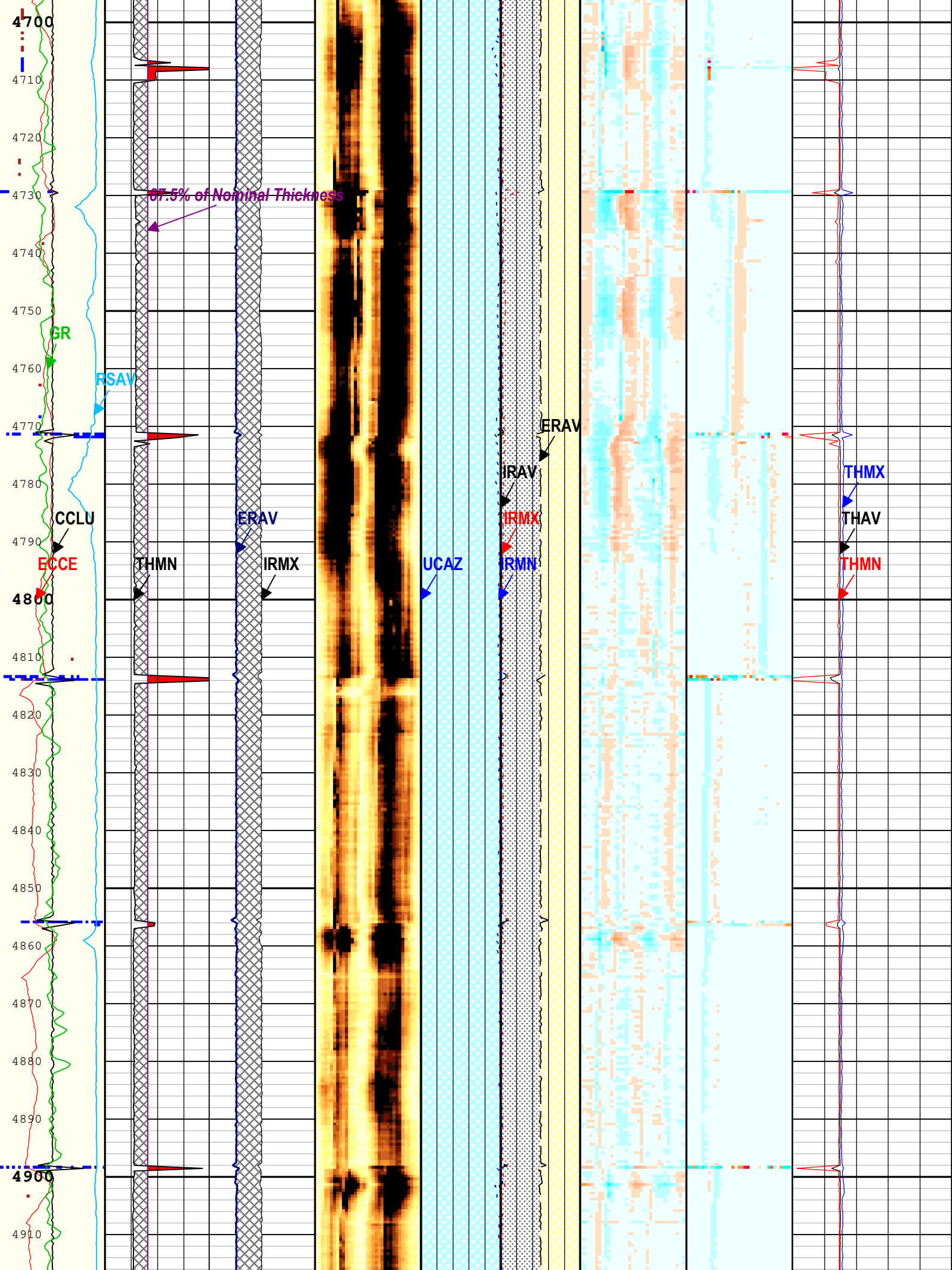


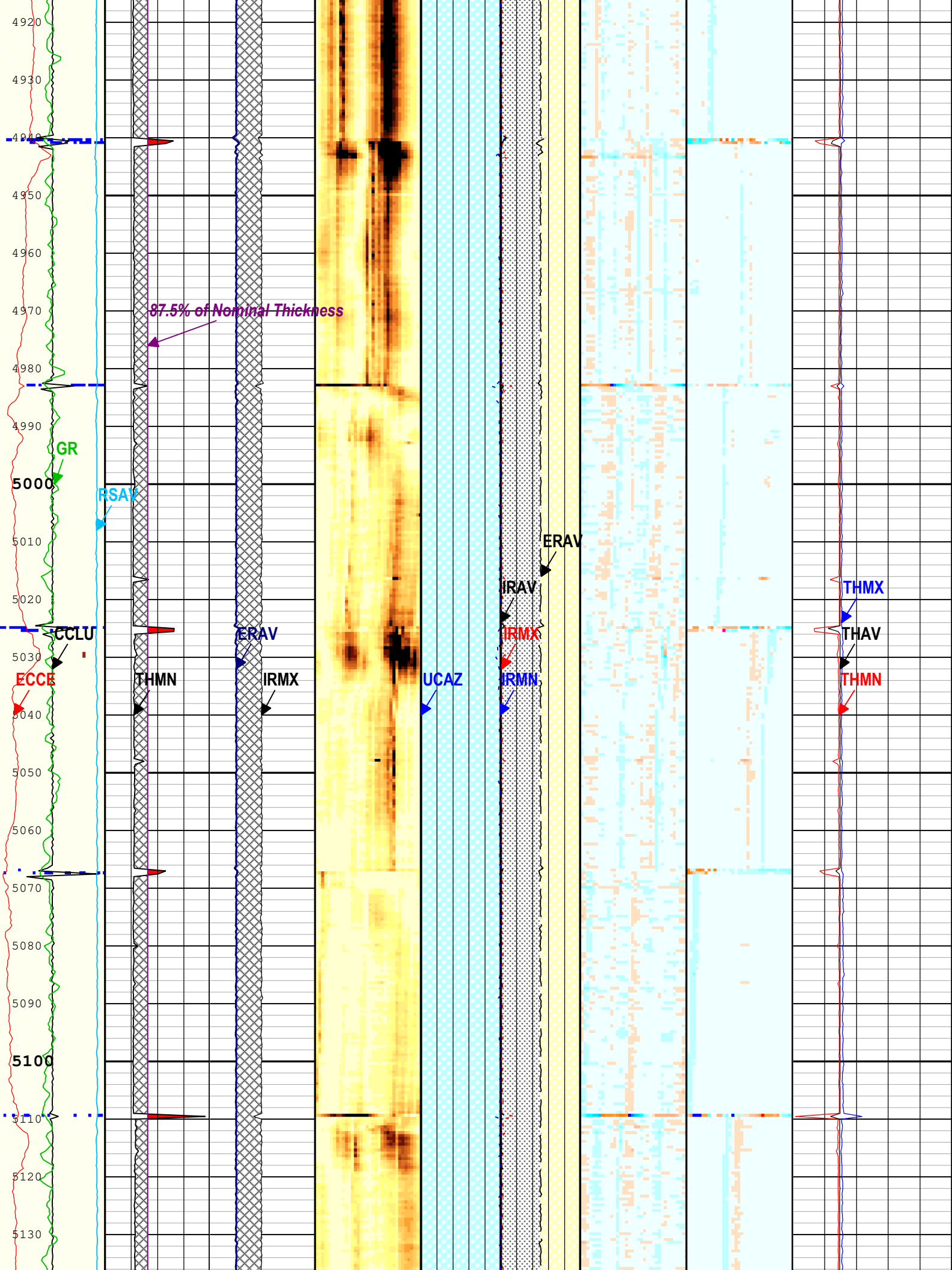


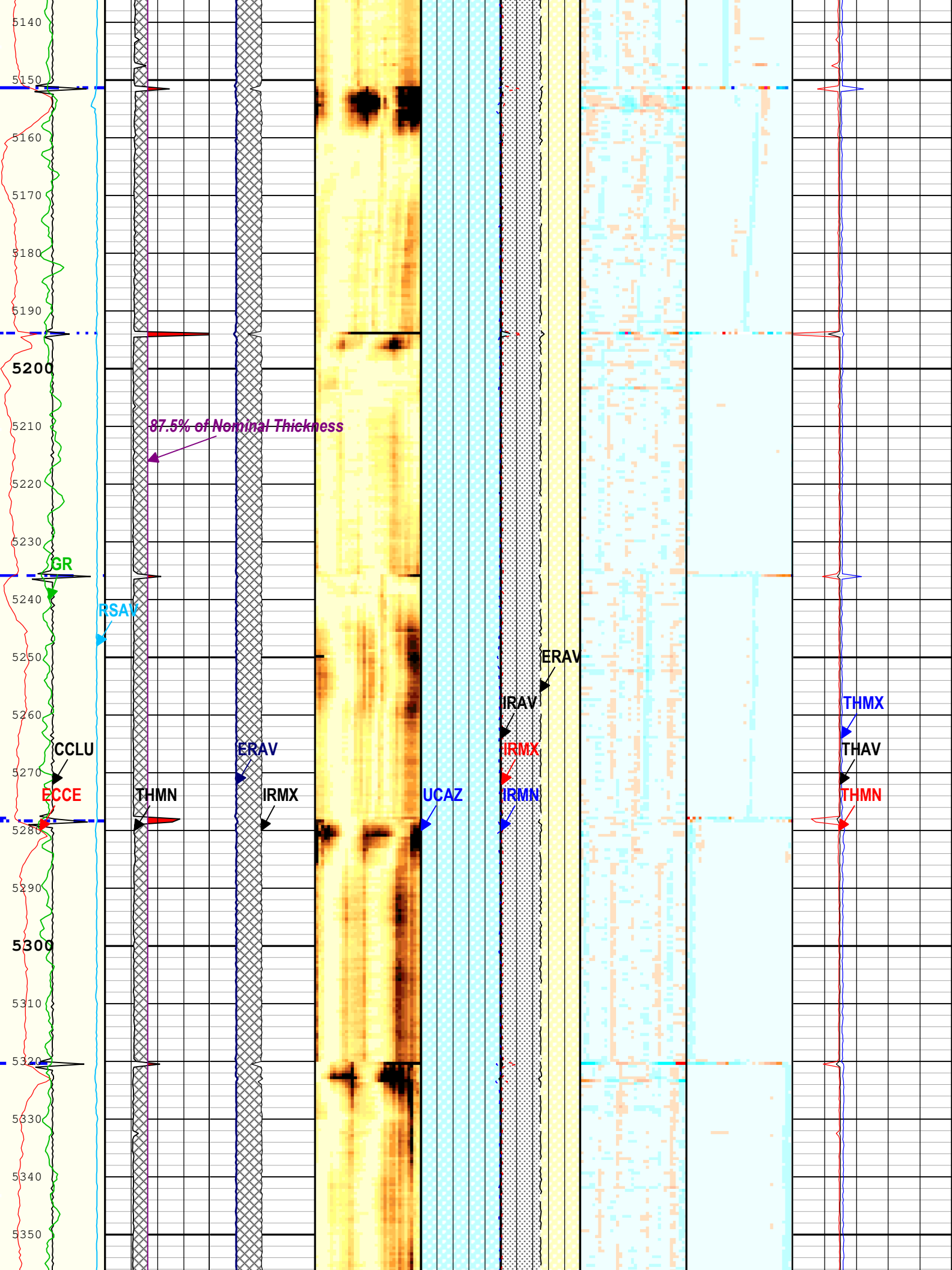


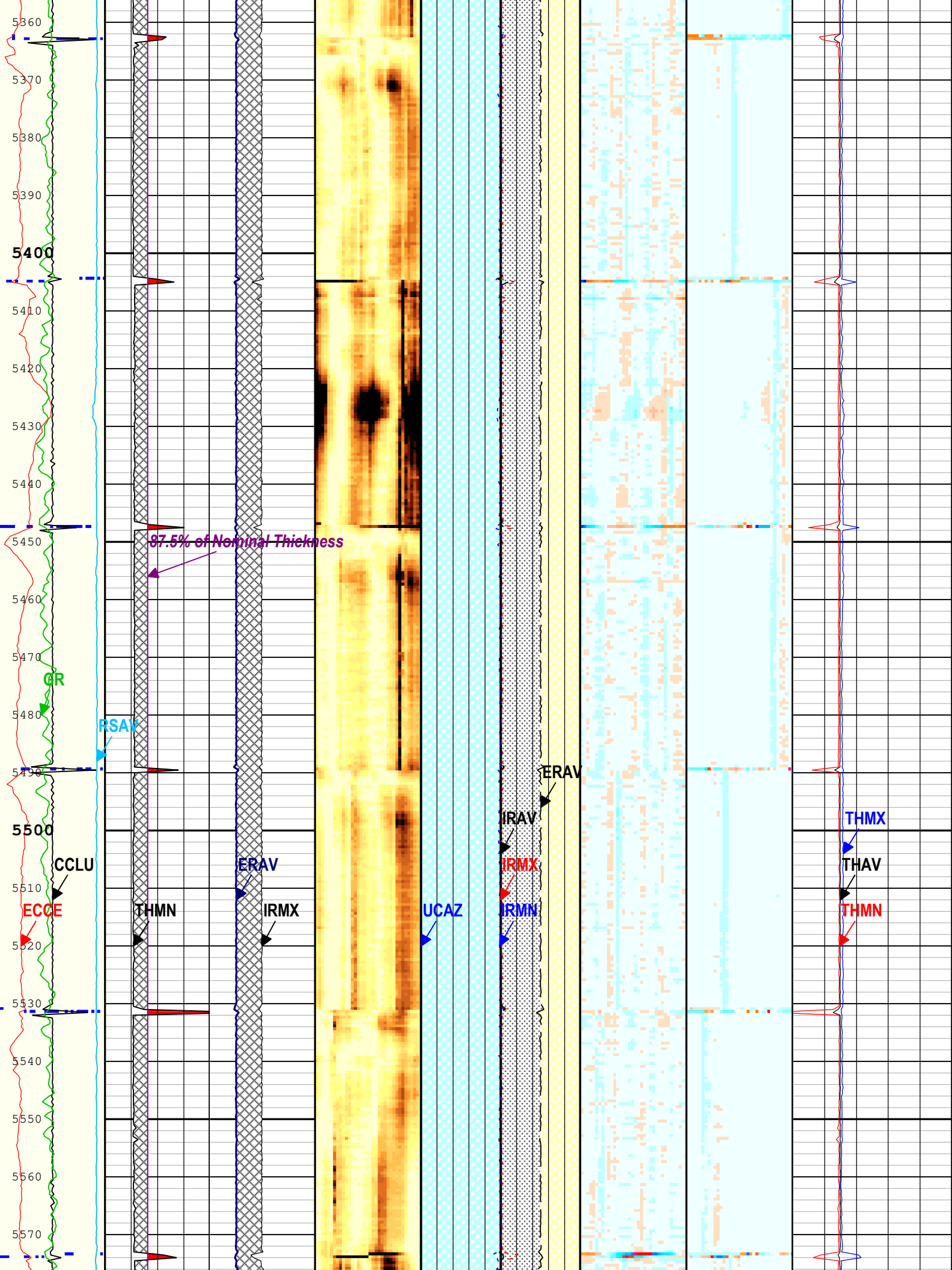


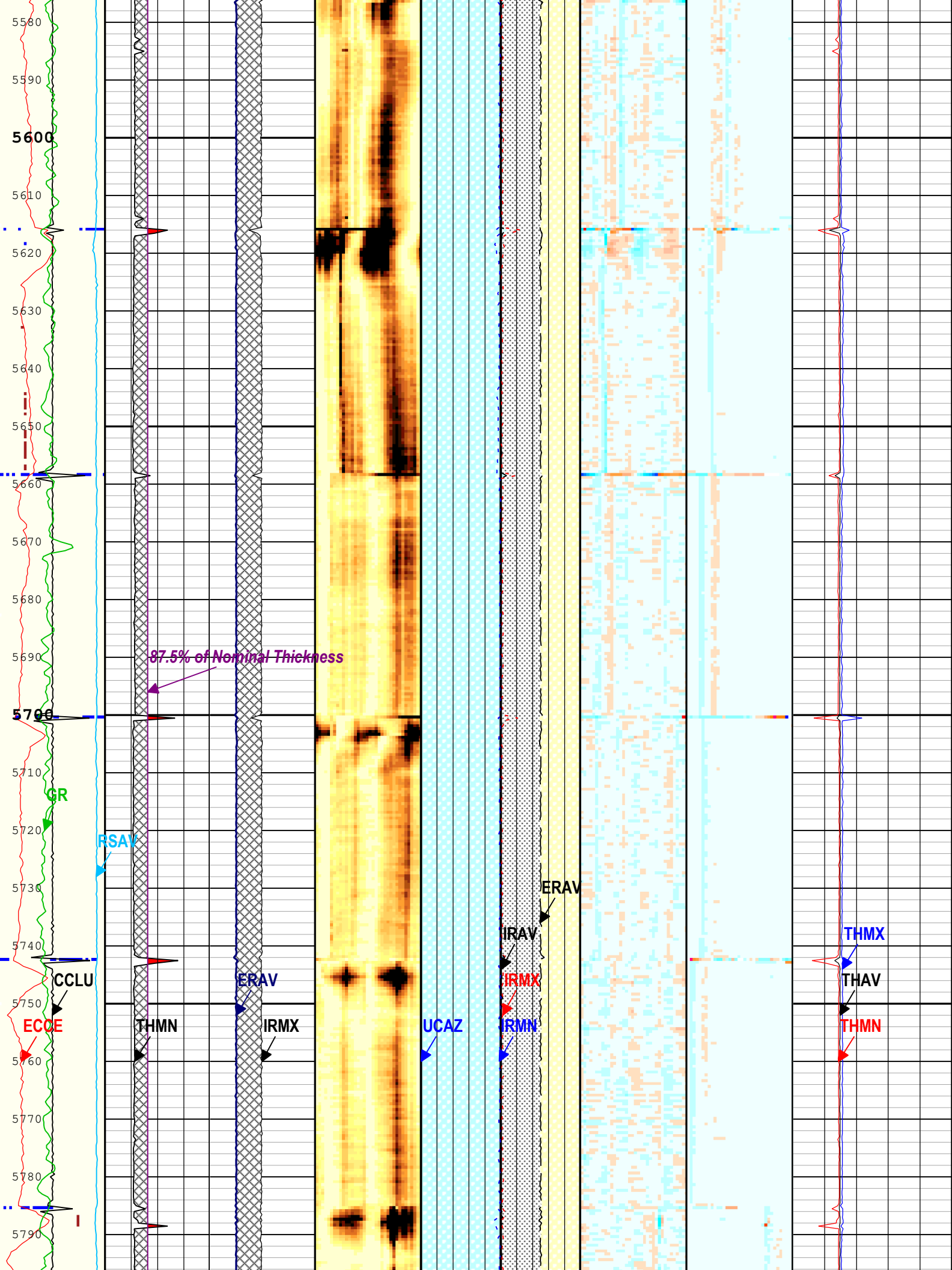


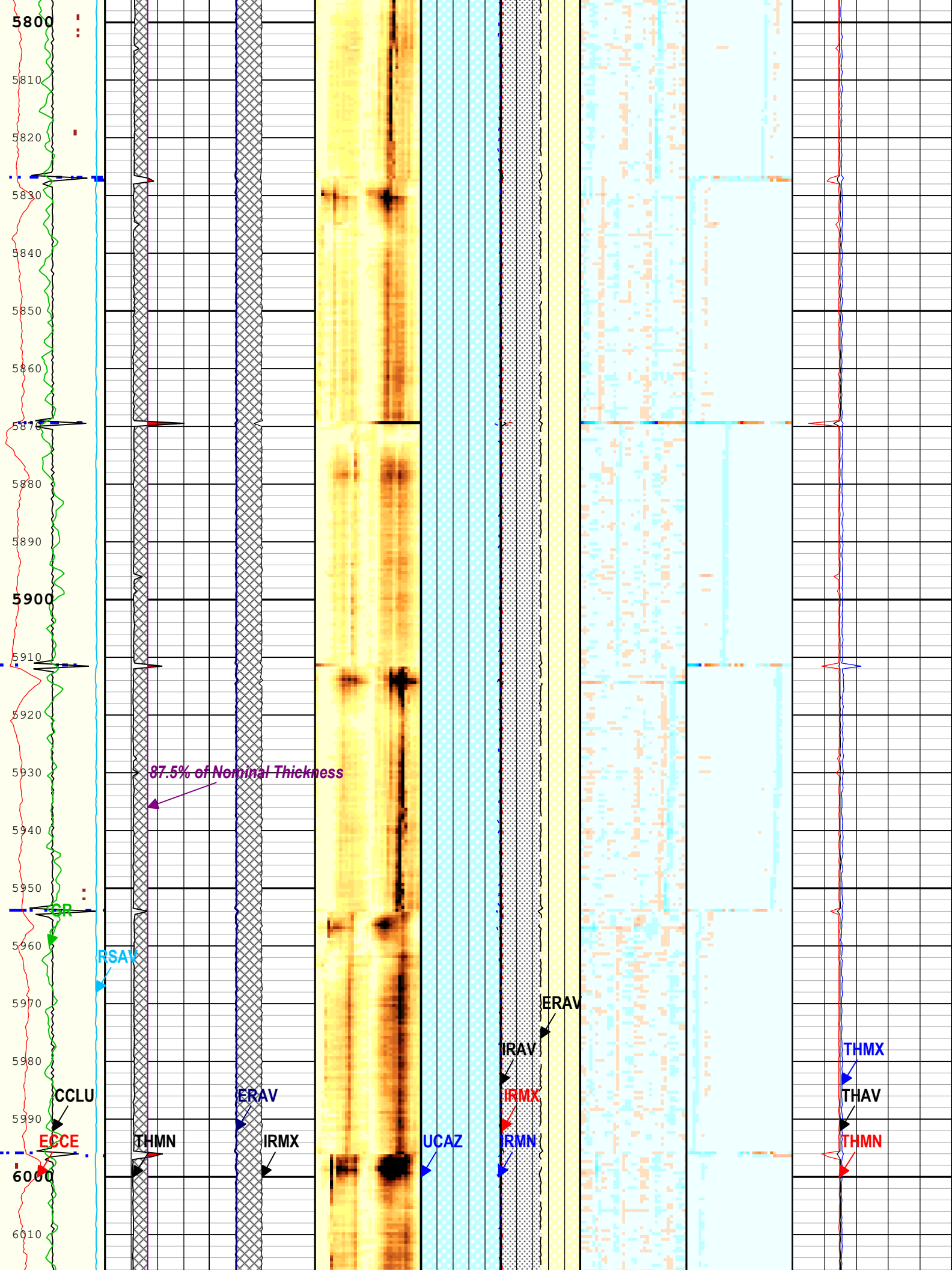


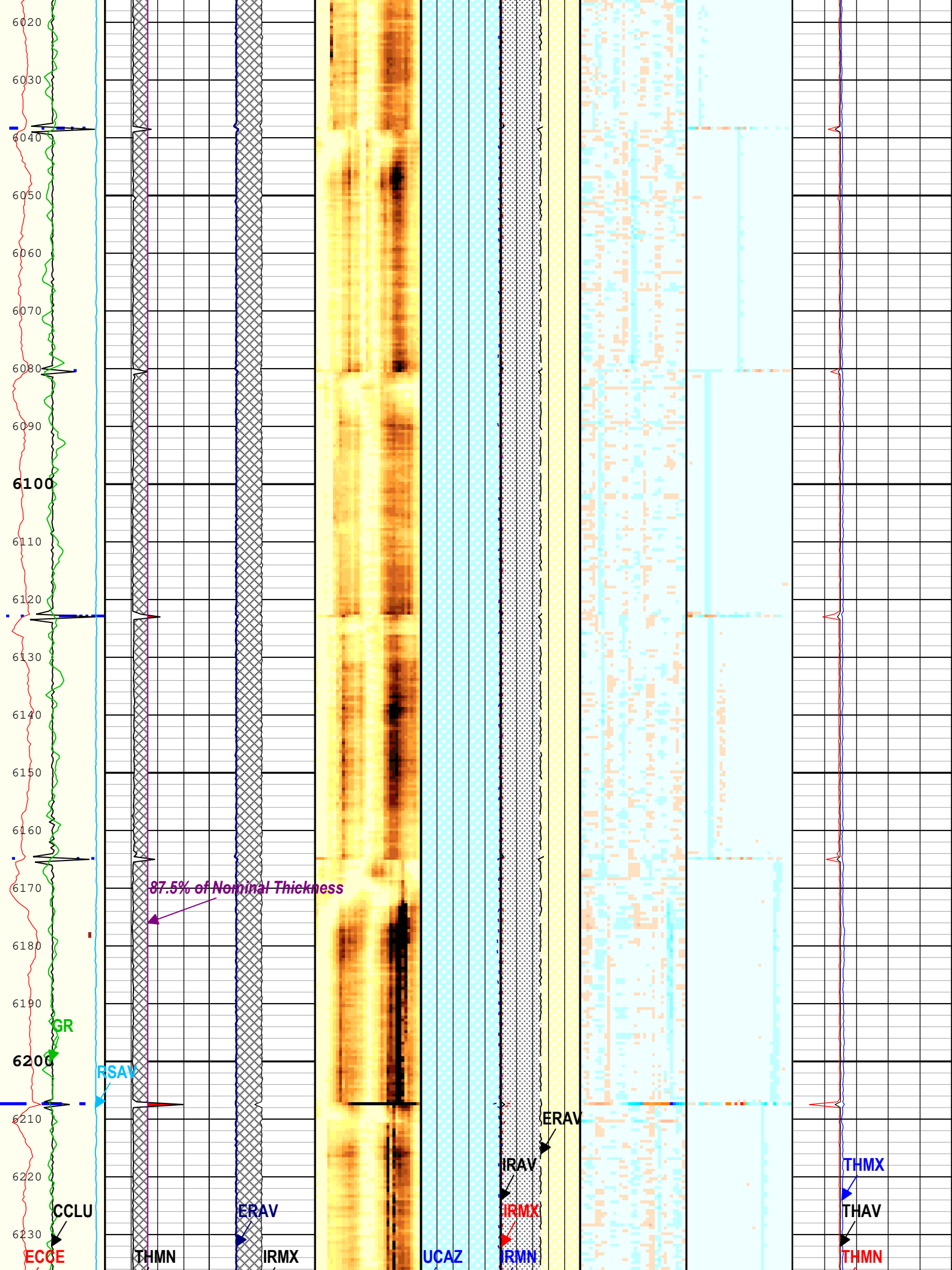


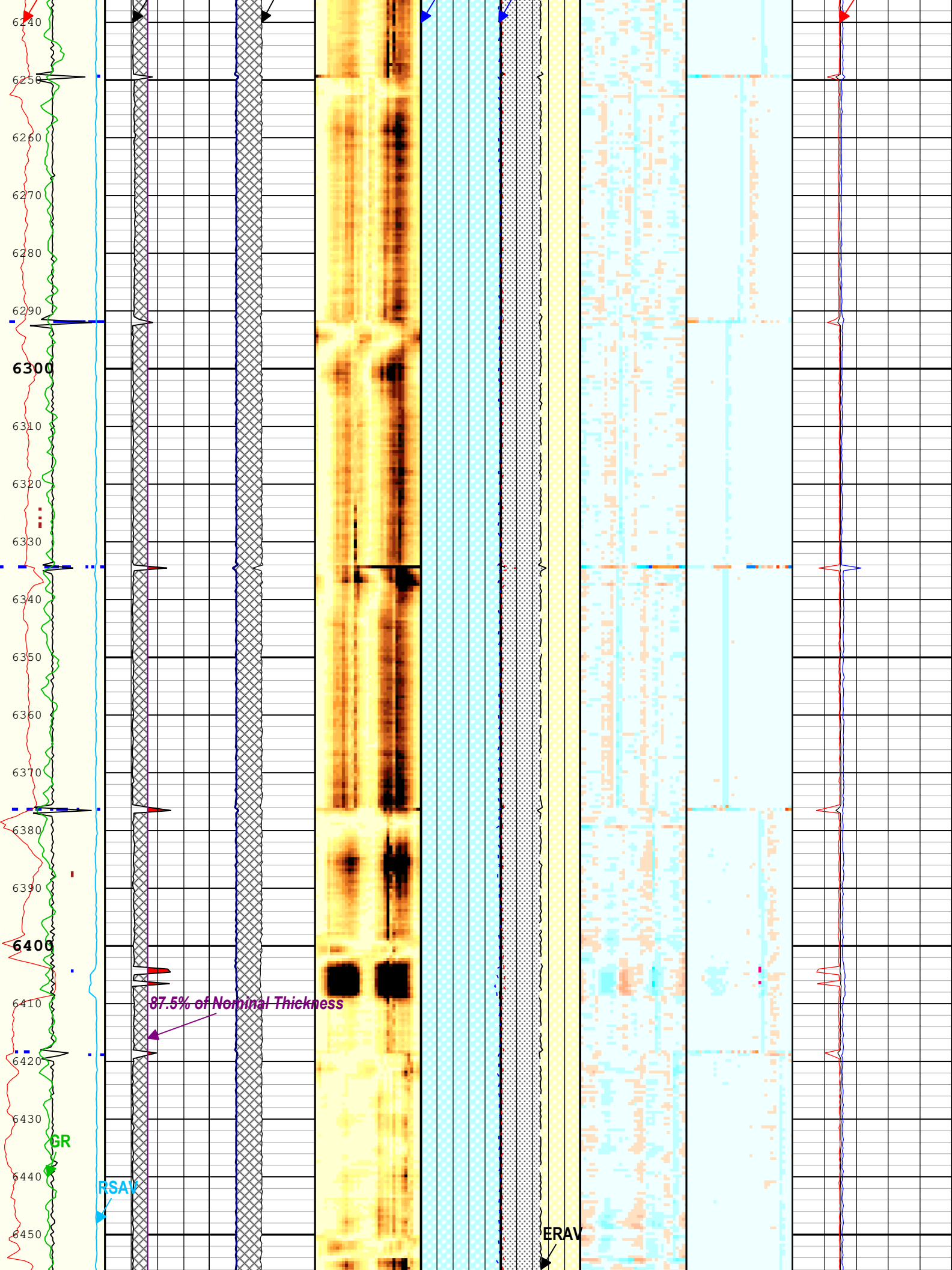


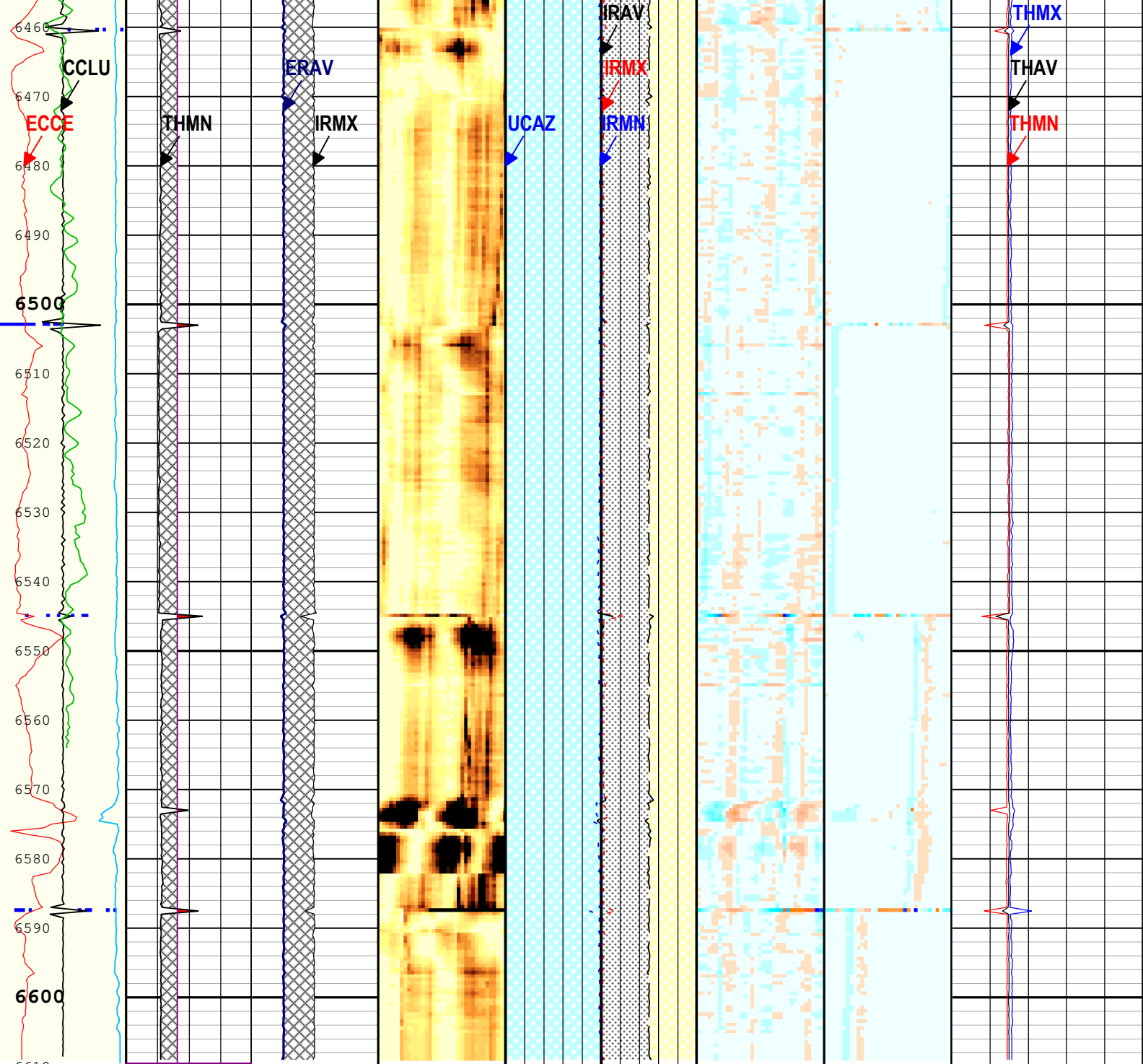












<p>Absent 1.500 3.500</p> <p>Explicit Normalization</p> <p>USIT - USIT Processing Flags (UFLG) USIT-E</p> <p>Amplitude of Eccentering (ECCE) USIT-E</p> <p>0 in 0.5</p> <p>Casing Collar Locator Ultrasonic (CCLU) USIT-E</p> <p>20 in 20</p>	<p>Large Reduction from Nominal Thickness</p> <p>Casing Within 87.5% of Nominal Thickness</p> <p>Thickness Minimum Value (THMN) USIT-E</p> <p>0.3 in 0.1</p> <p>87.5% of Nominal Thickness</p> <p>0.3 in 0.1</p>	<p>Internal Radius Exceeds External Average</p> <p>Casing Thickness (Between Max Internal and External Average)</p> <p>Internal Radius Maximum Value (IRMX) USIT-E</p> <p>2.5 in 1.5</p> <p>External Radii Average (ERAV)</p> <p>1.5 in 2.5</p>	<p>Absent -5.200 -3.600 -2.000 -0.400</p> <p>Explicit Normalization</p> <p>USIT - Amplitude of Wave (AWBK) USIT-E</p> <p>Ultrasonic Azimuth (UCAZ) USIT-E</p> <p>360 deg 0</p>	<p>Internal Radius Minimum Value (IRMN) USIT-E</p> <p>1.5 in 2.5</p> <p>Internal Radius Maximum Value (IRMX) USIT-E</p> <p>1.5 in 2.5</p> <p>Internal Radius Averaged Value (IRAV) USIT-E</p> <p>1.5 in 2.5</p> <p>External Radii Average (ERAV) USIT-E</p> <p>1.5 in 2.5</p>	<p>Absent -0.059 -0.028 0.004 0.035 0.068</p> <p>Explicit Normalization</p> <p>USIT - Internal Radii Normalized (IRBK) USIT-E (in)</p>	<p>Absent -0.059 -0.028 0.004 0.035 0.068</p> <p>Explicit Normalization</p> <p>USIT - Casing Thickness Normalized (THBK) USIT-E (in)</p>	<p>Thickness Minimum Value (THMN) USIT-E</p> <p>0.1 in 0.6</p> <p>Thickness Average Value (THAV) USIT-E</p> <p>0.1 in 0.6</p> <p>Thickness Maximum Value (THMX) USIT-E</p> <p>0.1 in 0.6</p>
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20	in	20	USIT-E	2.5	in	1.5
Motor Revolution Speed (RSAV) USIT-E						
6	c/s	7.5				
GR						
0	gAPI	200				

TIME_1900 - Time Marked every 60.00 (s)

Description: USI Corrosion Format: Log (IBC Casing Integrity 5.5IN) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Oct-2021 18:51:10

Channel Processing Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
BARI(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BS	Bit Size	WLSESSION	Depth Zoned	in
CDEN	Cement Density	USIT-E	14.6	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.25	in
CYSTLGR	Casing Yield Strength - Zoned along logger depths	WLSESSION	0	psi
DFD	Drilling Fluid Density	Borehole	9	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FD	Fluid Density	USIT-E	9.01	lbm/gal
HEMA	Hematite Presence Flag	Borehole	No	
IBC_FRP_OFFSET	IBC Flexural Offset from Free Pipe	USIT-E	-8.35	dB/m
IBC_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	IBC_FRP_OFFSET	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	Theoretical	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	15.37	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.05	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.05	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.6	Mrayl
U-USIT_UFAO	USIT Flexural Attenuation Offset	USIT-E	-10.29	dB/m
UFSFILT	Ultrasonic Flexural Surface Filter	USIT-E	LPF 250k	
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	ThirdInterfaceEcho	
ZMUD	Acoustic Impedance of Mud	Borehole	1.75	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.6	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	12.25	0	878
BS	7.875	878	6609

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	48	dB
EMXV	EMEX Voltage	USIT-E	100	V
IBC_ACQTYPE	IBC Acquisition type	USIT-E	1 MHz	
IBC_FLEXDBP	IBC Flex Duration Before Peak	USIT-E	30	us
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
UPAT	USIT Emission Pattern	USIT-E	Pattern 750 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 6.0 in	
U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VRES	Vertical Resolution	USIT-E	6.0 in	

One

RepeatPass

Software Version

Acquisition System	Version
Maxwell 2021.1	11.1.211946.3100
Application Patch	Wireline_NPD-ThruBit-2021.1_11.1.214024

Pass Summary

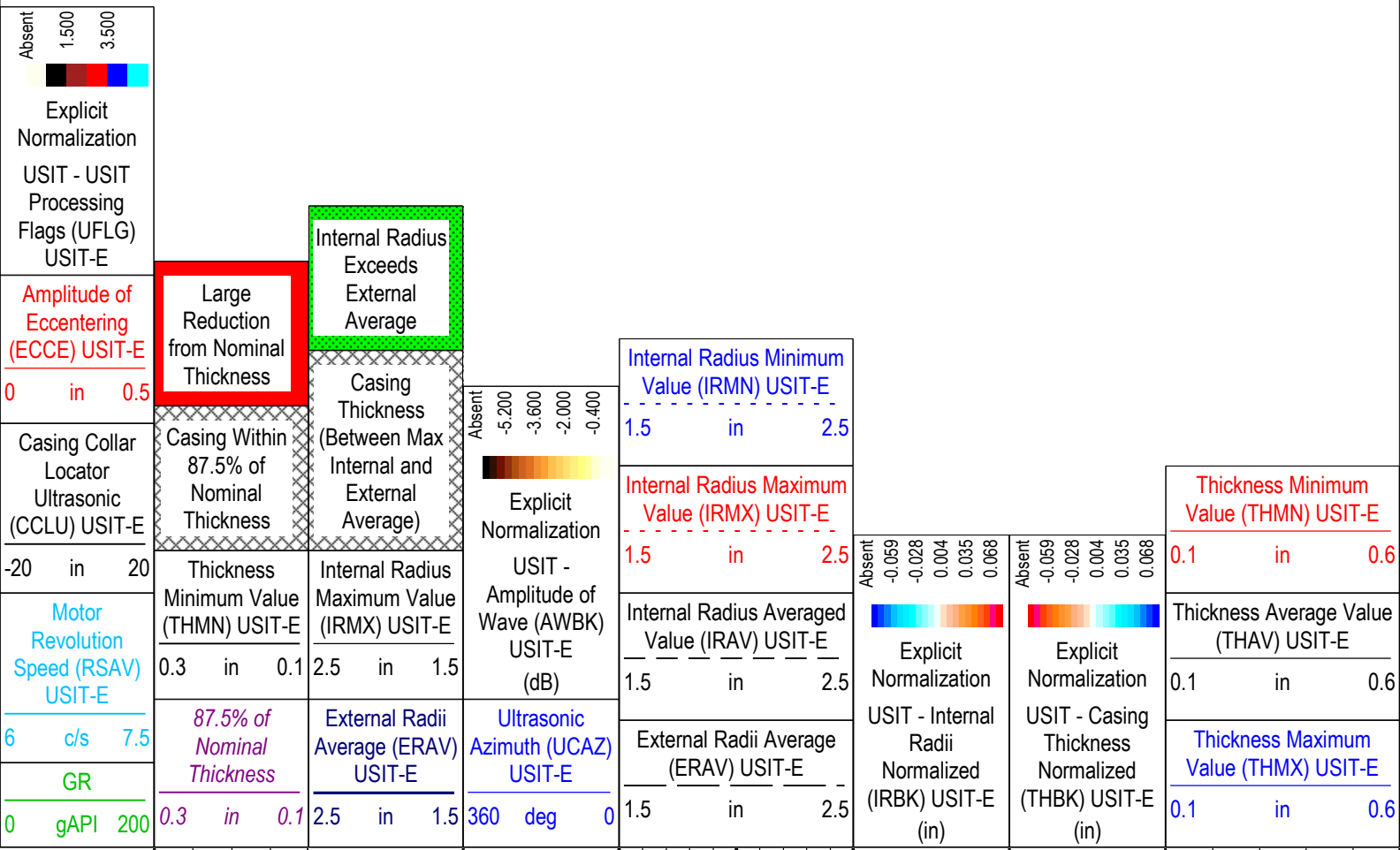
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[5]:Up	Up	6298.00 ft	6610.06 ft	28-Oct-2021 8:45:41 AM	28-Oct-2021 8:50:35 AM	ON	8.07 ft	Yes

All depths are referenced to toolstring zero

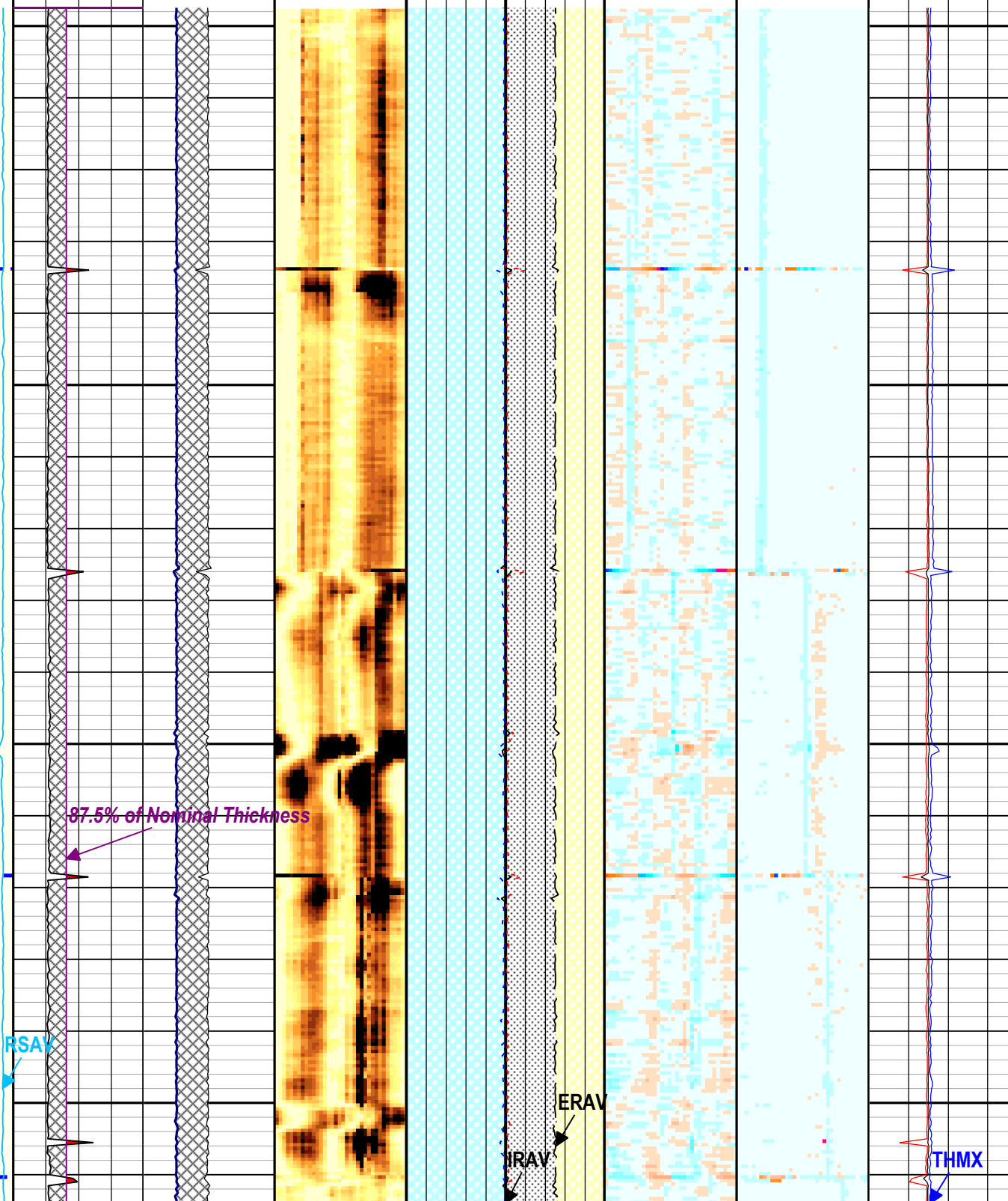
Log Company: Occidental Petroleum Well: Morton 37-1
One: Log[5]:Up:S007

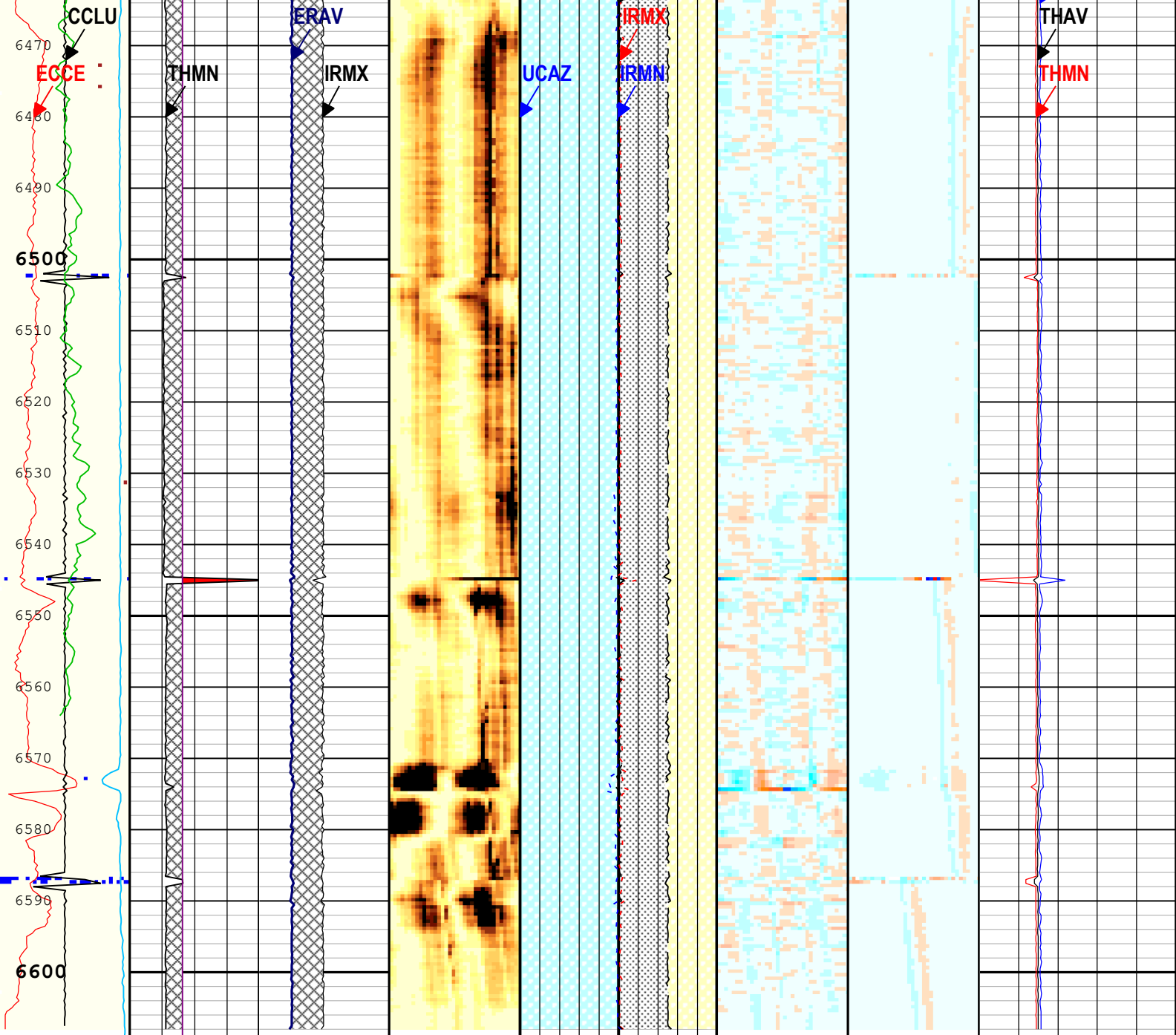
Description: USI Corrosion Format: Log (IBC Casing Integrity 5.5IN) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Oct-2021 18:51:23

TIME_1900 - Time Marked every 60.00 (s)



6250
6260
6270
6280
6290
6300
6310
6320
6330
6340
6350
6360
6370
6380
6390
6400
6410
6420
6430
6440
6450
6460





<p>Absent 1.500 3.500</p> <p>Explicit Normalization</p> <p>USIT - USIT Processing Flags (UFLG) USIT-E</p> <p>Amplitude of Eccentering (ECCE) USIT-E</p> <p>0 in 0.5</p> <p>Casing Collar Locator Ultrasonic (CCLU) USIT-E</p> <p>-20 in 20</p> <p>Motor</p>	<p>Large Reduction from Nominal Thickness</p> <p>Casing Within 87.5% of Nominal Thickness</p> <p>Thickness Minimum Value (THMN) USIT-E</p> <p>0.3 in 0.1</p> <p>87.5% of Nominal Thickness</p> <p>0.3 in 0.1</p>	<p>Internal Radius Exceeds External Average</p> <p>Casing Thickness (Between Max Internal and External Average)</p> <p>Internal Radius Maximum Value (IRMX) USIT-E</p> <p>2.5 in 1.5</p> <p>External Radii Average (ERAV) USIT-E</p> <p>2.5 in 1.5</p>	<p>Absent -5.200 -3.600 -2.000 -0.400</p> <p>Explicit Normalization</p> <p>USIT - Amplitude of Wave (AWBK) USIT-E (dB)</p> <p>Ultrasonic Azimuth (UCAZ) USIT-E</p> <p>360 deg 0</p>	<p>Internal Radius Minimum Value (IRMN) USIT-E</p> <p>1.5 in 2.5</p> <p>Internal Radius Maximum Value (IRMX) USIT-E</p> <p>1.5 in 2.5</p> <p>Internal Radius Averaged Value (IRAV) USIT-E</p> <p>1.5 in 2.5</p> <p>External Radii Average (ERAV) USIT-E</p> <p>1.5 in 2.5</p>	<p>Absent -0.059 -0.028 0.004 0.035 0.068</p> <p>Explicit Normalization</p> <p>USIT - Internal Radii Normalized (IRBK) USIT-E (in)</p>	<p>Absent -0.059 -0.028 0.004 0.035 0.068</p> <p>Explicit Normalization</p> <p>USIT - Casing Thickness Normalized (THBK) USIT-E (in)</p>	<p>Thickness Minimum Value (THMN) USIT-E</p> <p>0.1 in 0.6</p> <p>Thickness Average Value (THAV) USIT-E</p> <p>0.1 in 0.6</p> <p>Thickness Maximum Value (THMX) USIT-E</p> <p>0.1 in 0.6</p>
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Revolution
Speed (RSAV)
USIT-E

6 c/s 7.5

GR

0 gAPI 200

TIME_1900 - Time Marked every 60.00 (s)

Description: USI Corrosion Format: Log (IBC Casing Integrity 5.5IN) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Oct-2021 18:51:23

Channel Processing Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
BARI(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BS	Bit Size	WLSESSION	7.875	in
CDEN	Cement Density	USIT-E	14.6	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.25	in
CYSTLGR	Casing Yield Strength - Zoned along logger depths	WLSESSION	0	psi
DFD	Drilling Fluid Density	Borehole	9	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FD	Fluid Density	USIT-E	9.01	lbm/gal
HEMA	Hematite Presence Flag	Borehole	No	
IBC_FRP_OFFSET	IBC Flexural Offset from Free Pipe	USIT-E	-8.35	dB/m
IBC_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	IBC_FRP_OFFSET	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	Theoretical	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	15.37	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.05	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1.05	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.6	Mrayl
U-USIT_UFAO	USIT Flexural Attenuation Offset	USIT-E	-10.29	dB/m
UFSFILT	Ultrasonic Flexural Surface Filter	USIT-E	LPF 250k	
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	ThirdInterfaceEcho	
ZMUD	Acoustic Impedance of Mud	Borehole	1.75	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.6	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Tool Control Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	48	dB
EMXV	EMEX Voltage	USIT-E	100	V
IBC_ACQTYPE	IBC Acquisition type	USIT-E	1 MHz	
IBC_FLEXDBP	IBC Flex Duration Before Peak	USIT-E	30	us
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
UPAT	USIT Emission Pattern	USIT-E	Pattern 750 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 6.0 in	

U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG
VRES	Vertical Resolution	USIT-E	6.0 in

XYZ

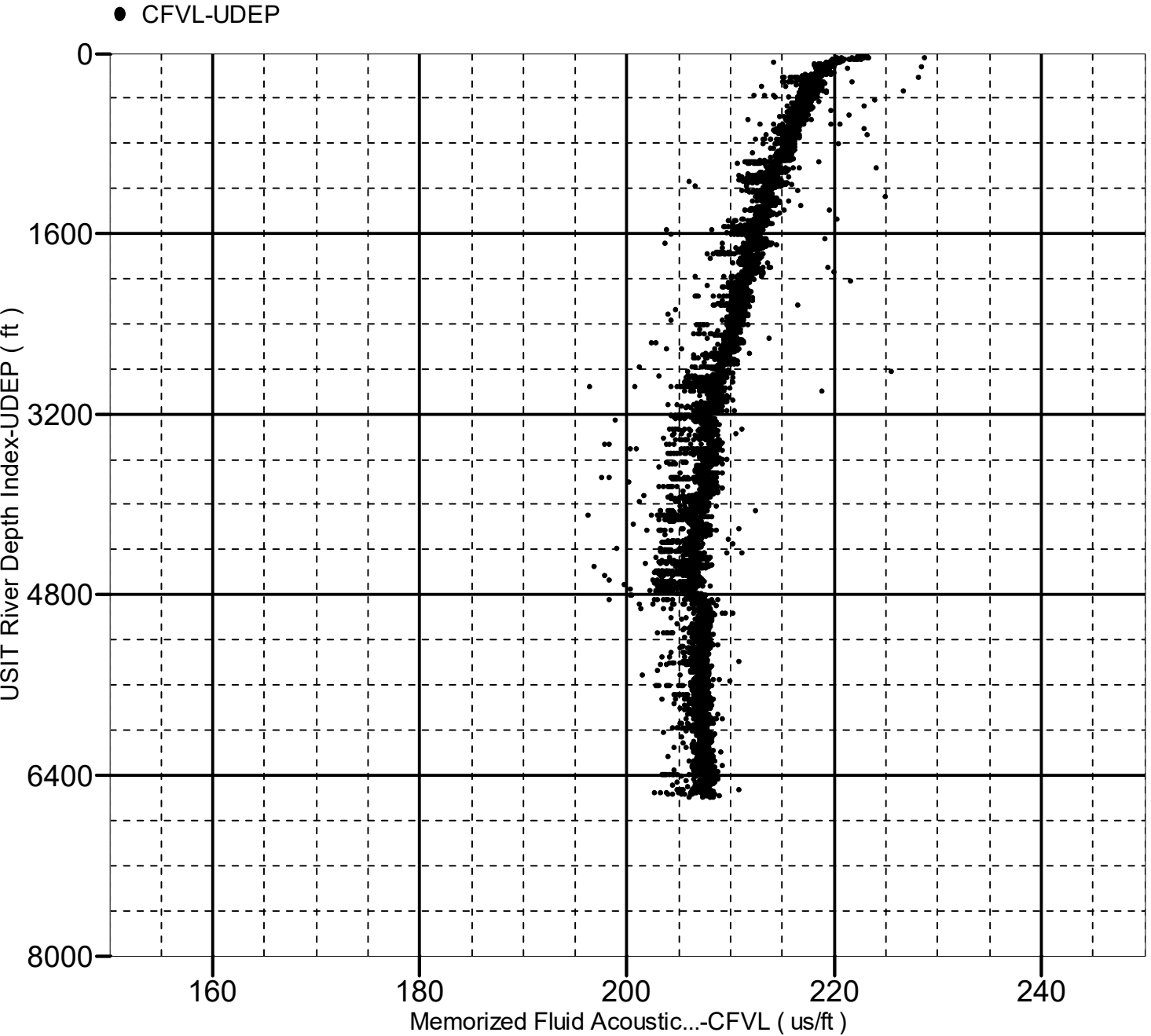
Company:Occidental Petroleum Well:Morton 37-1

One: Log[6]:Up:S007

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6609.50 to 32.00 ft



XYZ

Company:Occidental Petroleum Well:Morton 37-1

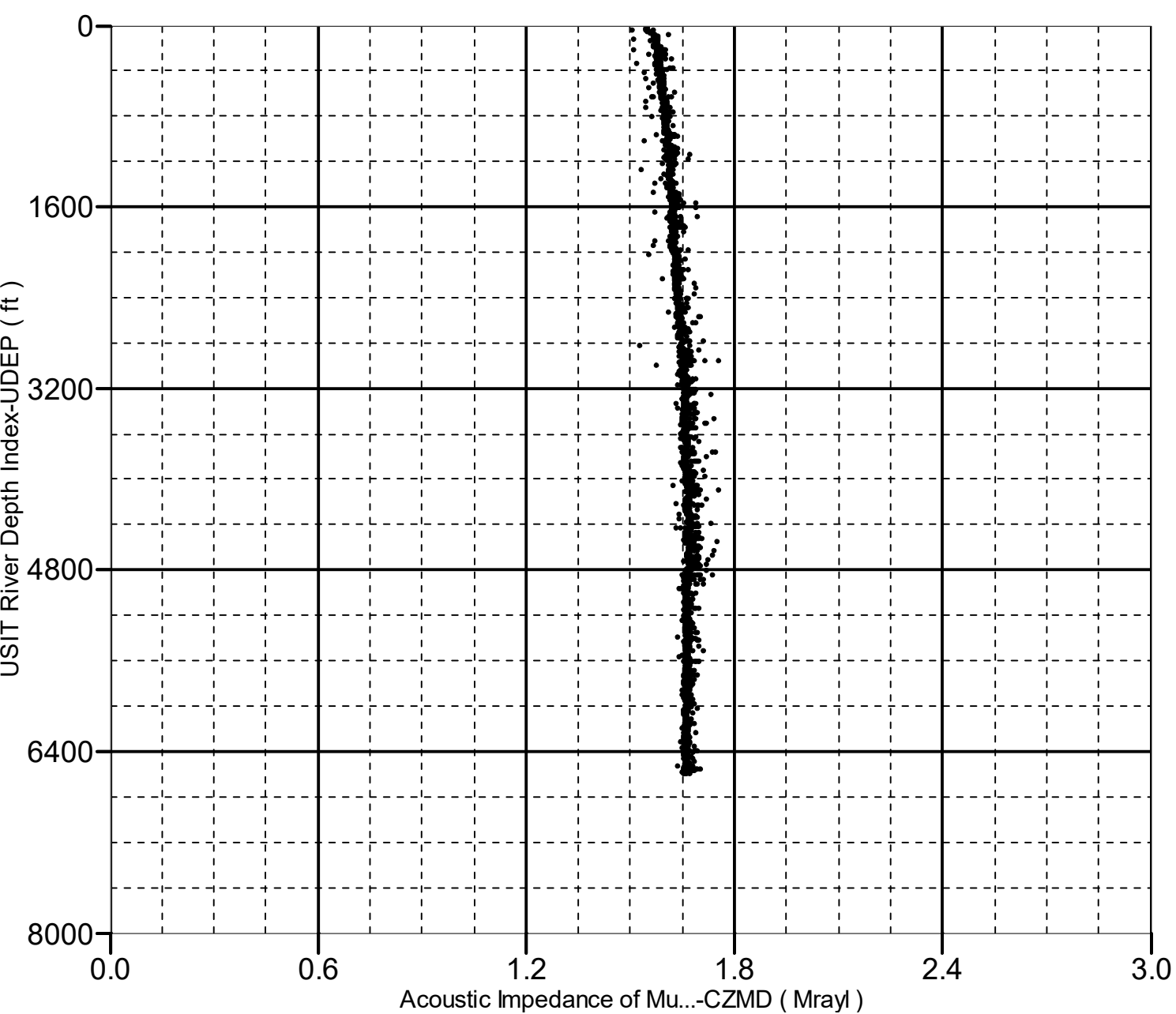
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Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6609.50 to 32.00 ft

● CZMD-UDEP



Company: Occidental Petroleum

Well: Morton 37-1

Field: Wattenberg



Isolation Scanner
Casing Integrity
Gamma Ray - CCL