

Company: Expedition Water Solutions LLC

Well: EWS 4

Field: Wattenburg

County: Weld State: Colorado

Isolation Scanner

Casing Integrity

Gamma Ray - CCL Log

Location:		Permanent Datum:		Ground Level		Elev.:		K.B.		4869.00 ft	
		Log Measured From:		Kelly Bushing		13.00 ft		G.L.		4856.00 ft	
		Drilling Measured From:		Kelly Bushing				D.F.		4869.00 ft	
API Serial No.		Section:		Township:		Range:					
05-123-44167		18		2N		63W					

County: Weld

Field: Wattenburg

Location: NE SE 18-2N-63W

Well: EWS 4

Company: Expedition Water Solutions LLC

Logging Date	22-Feb-2017		22-Feb-2017
Run Number	TWO		
Depth Driller	10204.00 ft		10204.00 ft
Schlumberger Depth	10204.00 ft		10204.00 ft
Bottom Log Interval	8500.00 ft		
Top Log Interval	100.00 ft		
Casing Driller Size @ Depth	7 in @ 8547.00 ft		7 in @ 8547.00 ft
Casing Schlumberger	8552 ft		8552 ft
Bit Size	6:125 in		6:125 in
Type Fluid In Hole	Fresh Water		Fresh Water
Density	Viscosity	43 s	
Fluid Loss	PH	8.8	9.1 lbm/gal 5.2 cm3 8.8
MUD	Active Tank		Active Tank
RM @ Meas Temp	0.5 ohm.m @ 68 degF		0.5 ohm.m @ 68 degF
RMF @ Meas Temp	0.48 ohm.m @ 68 degF		0.48 ohm.m @ 68 degF
RMC @ Meas Temp	0.36 ohm.m @ 68 degF		0.36 ohm.m @ 68 degF
Source RMF	RMC	Calculated	Calculated
RM @ BHT	RMF @ BHT	0.17 @ 210 0.17 @ 210	0.17 @ 212 0.16 @ 212
Max Recorded Temperatures	258 degF		258 degF
Circulation Stopped	21-Feb-2017 21:30:00		
Logger on Bottom	Time	22-Feb-2017 12:50:00	
Unit Number	Location:	OSL C-AR2 2161 Ft. Morgan	OSL C-AR2 2161 Ft. Morgan
Recorded By	L. Await		
Witnessed By	Jeremiah Demuth		

Disclaimer

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## Remarks and Equipment Summary

Thank you for choosing Schlumberger!	
Run ONE: Log ran for open hole formation evaluation	
Run ONE: Tool ran eccentralized as per tool sketch	
Run ONE: Sandstone Matrix of 2.65g/cc used for TD-9800 & 8780 - Surface as per client requ	
Run ONE: Limestone Matrix of 2.71g/cc used for 9800-8780 as per client request.	
Run TWO: Log ran for casing and cement evaluation	
Run TWO: Tool ran centralized with two knuckles as per tool sketch	
TWO: Remarks	Run 3: Remarks

### TWO: Toolstring

Equip name	Length	MP name	Offset
LEH-QT	50.77		
LEH-QT			

EDTC-B	47.85		
EDTH-B			
EDTG-A			
EDTC-B			

CTEM	44.35
ACCZ	0.00
HV	0.00
Gamma	42.48
Ray	
TelStatu	41.35
s	

DSLT-H	41.35		
ECH-KH			
DSLCH			
SLS-E			

CBL 3ft	28.88
Upper-N	28.88
ear	
VDL 5ft	27.88
Upper-F	27.88
ar	
Delta-T	26.5
Lower-F	25.13
ar	
Lower-N	24.13
ear	

### Run 3: Toolstring

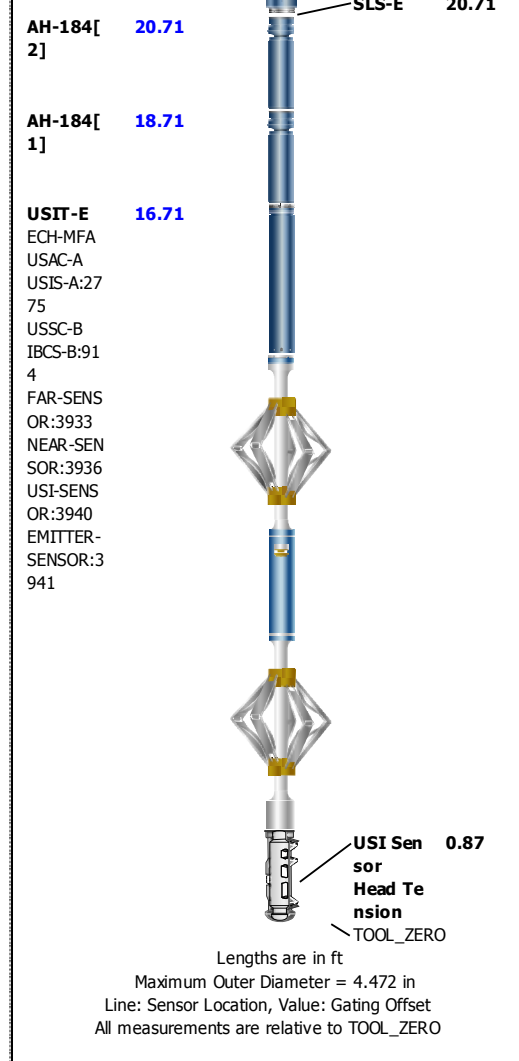
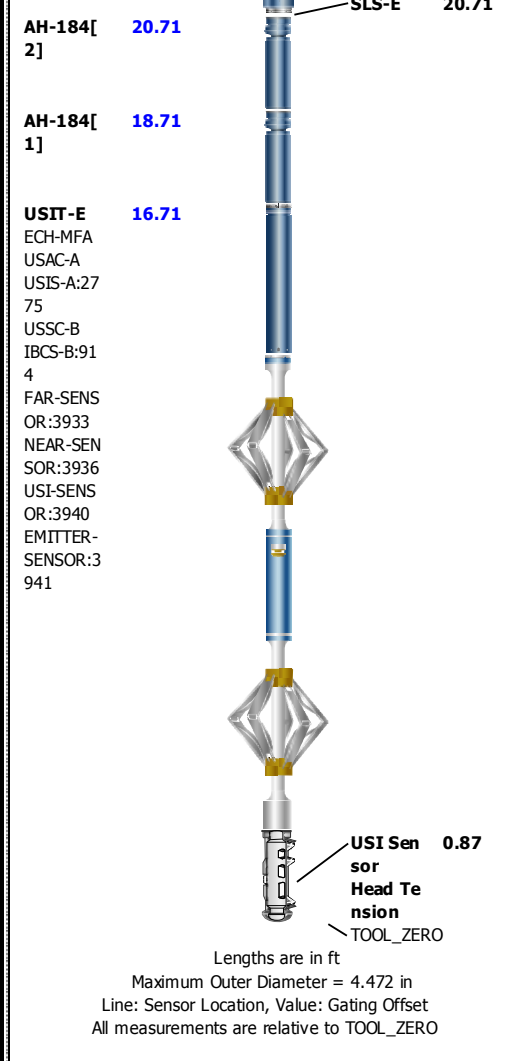
Equip name	Length	MP name	Offset
LEH-QT	50.77		
LEH-QT			

EDTC-B	47.85		
EDTH-B			
EDTG-A			
EDTC-B			

CTEM	44.35
ACCZ	0.00
HV	0.00
Gamma	42.48
Ray	
TelStatu	41.35
s	

DSLT-H	41.35		
ECH-KH			
DSLCH			
SLS-E			

CBL 3ft	28.88
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ear	
VDL 5ft	27.88
Upper-F	27.88
ar	
Delta-T	26.5
Lower-F	25.13
ar	
Lower-N	24.13
ear	



Depth Summary			
	TWO	Run 3	
Depth Measuring Device			
Type	IDW-B	IDW-B	
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0	0	
Wheel Correction 2	0	0	
Tension Device			
Type	CMTD-B/A	CMTD-B/A	
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0	0	
Logging Cable			
Type	7-46A-XS	7-46A-XS	
Serial Number			
Length	17000.00 ft	17000.00 ft	
Conveyance Type	Wireline	Wireline	
Rig Type	Ensian 121	Ensian 121	

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

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

TWO

IBC Casing Integrity

Software Version

Acquisition System	Version
Maxwell 2017 SP1	7.1.82245.3100

Pass Summary

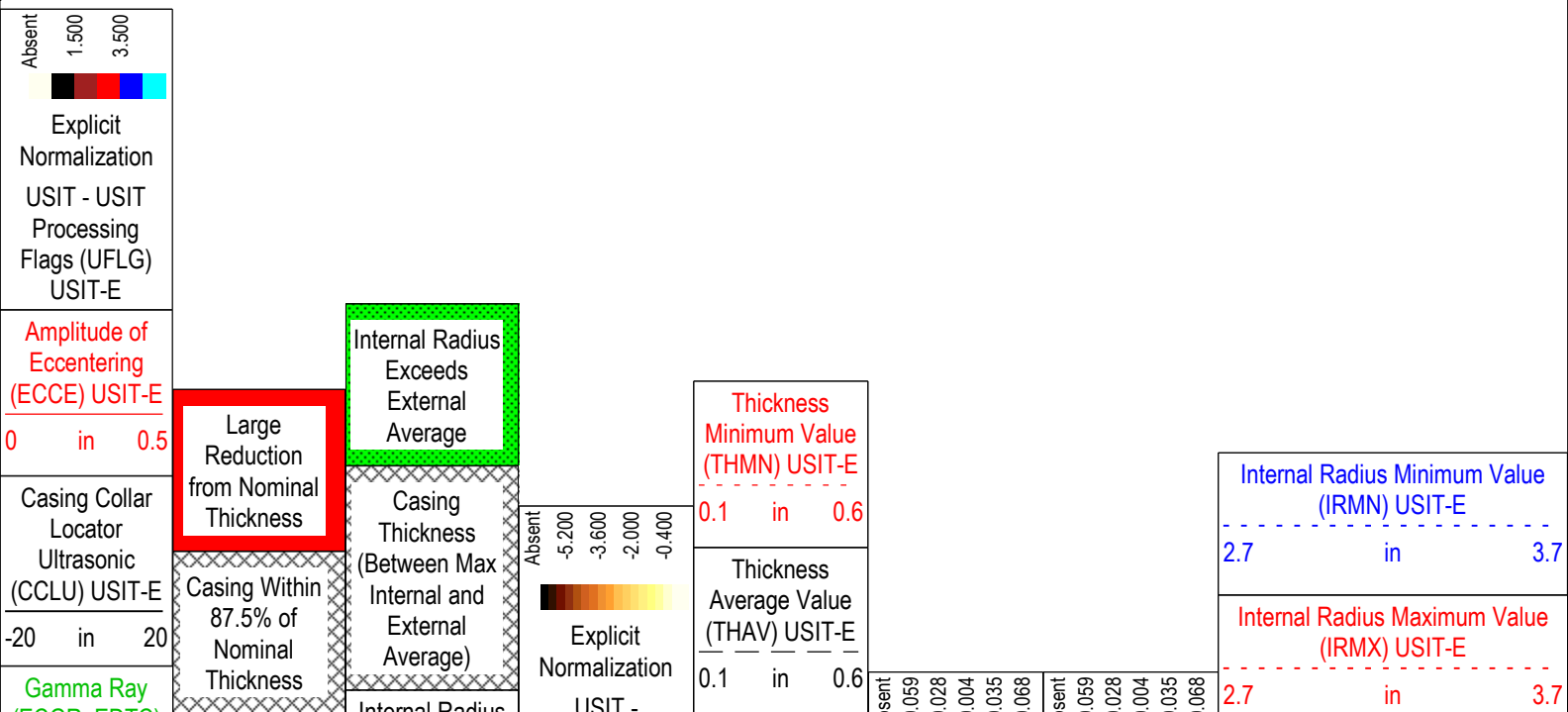
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
TWO	Log[5]:Up	Up	345.71 ft	8524.65 ft	22-Feb-2017 9:48:51 AM	22-Feb-2017 1:03:27 PM	ON	3.65 ft	Yes

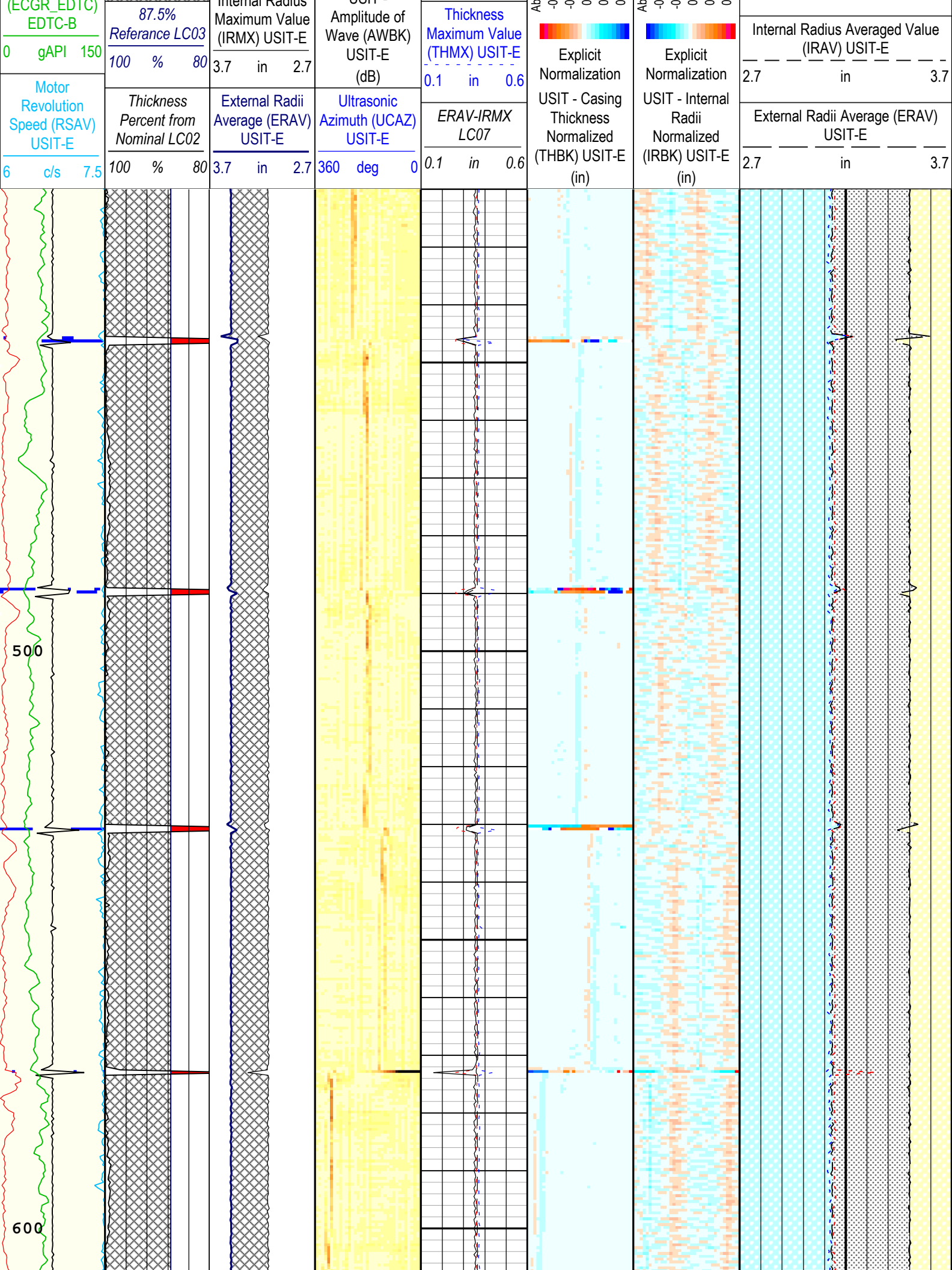
All depths are referenced to toolstring zero

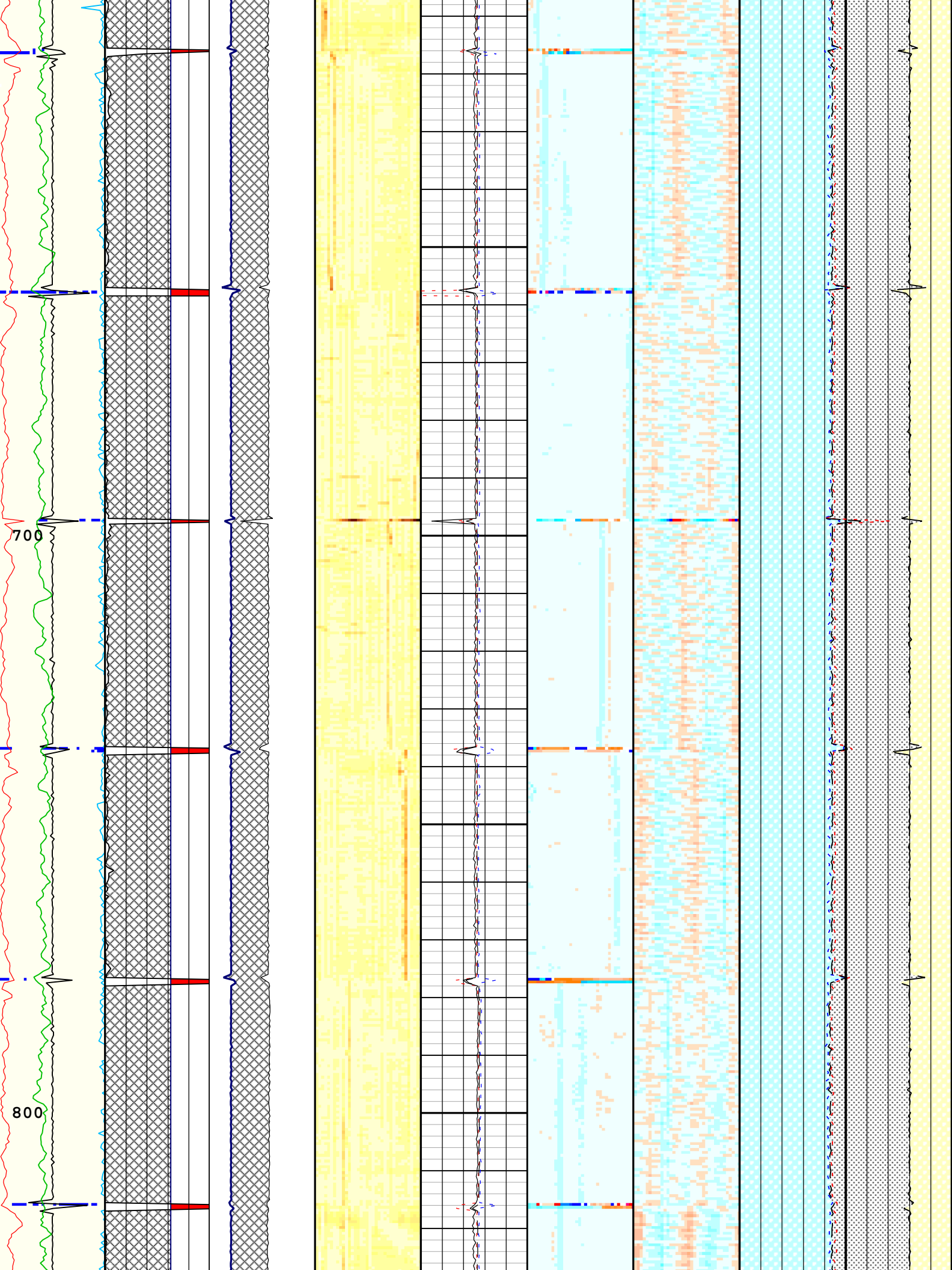
Log	Company:Expedition Water Solutions LLC      Well:EWS 4 TWO: Log[5]:Up:S015
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Description: USI Corrosion    Format: Log ( USI IBC Casing Integrity )    Index Scale: 5 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation Date: 24-Feb-2017 08:56:46

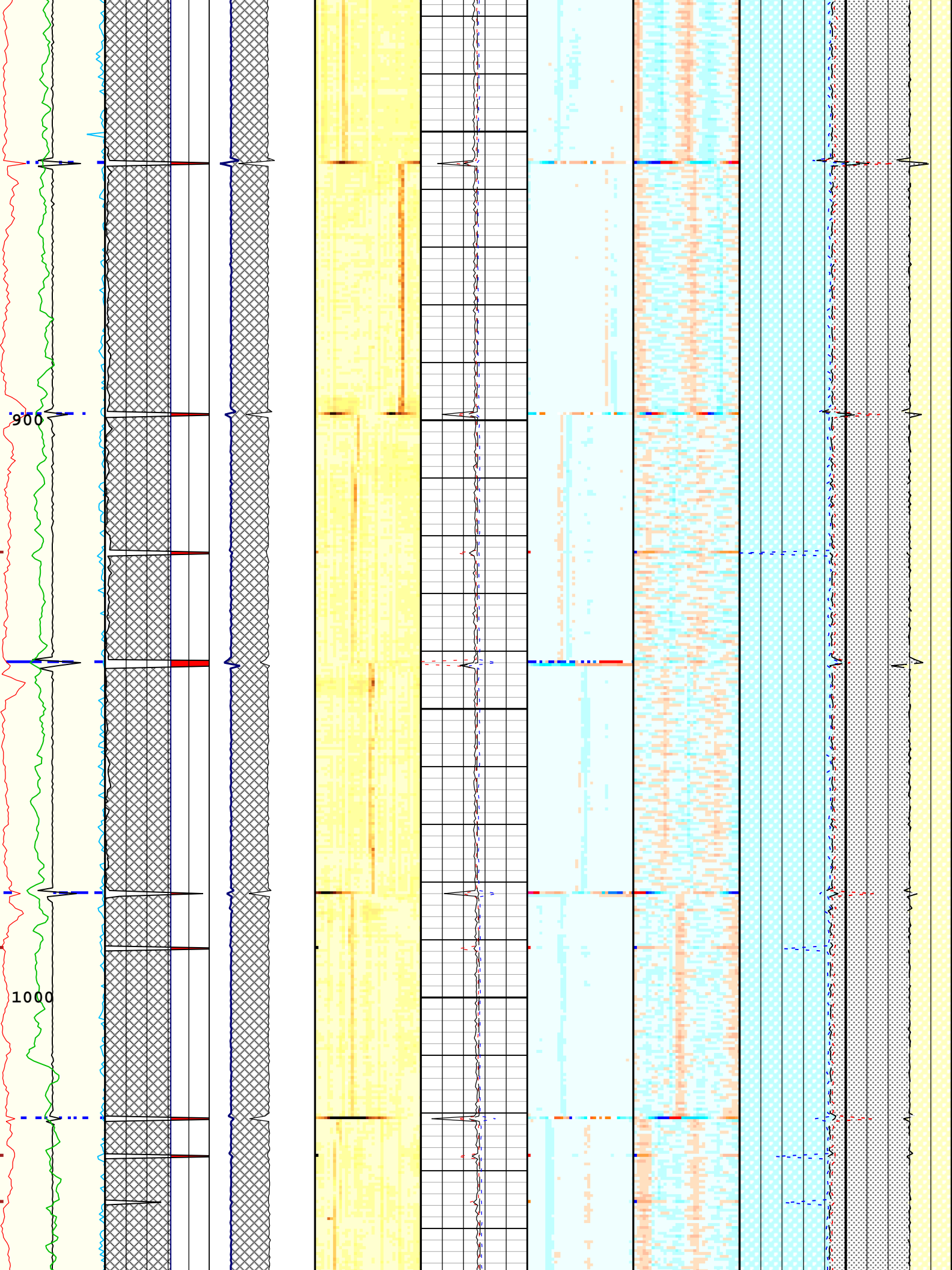
TIME\_1900 - Time Marked every 60.00 (s)

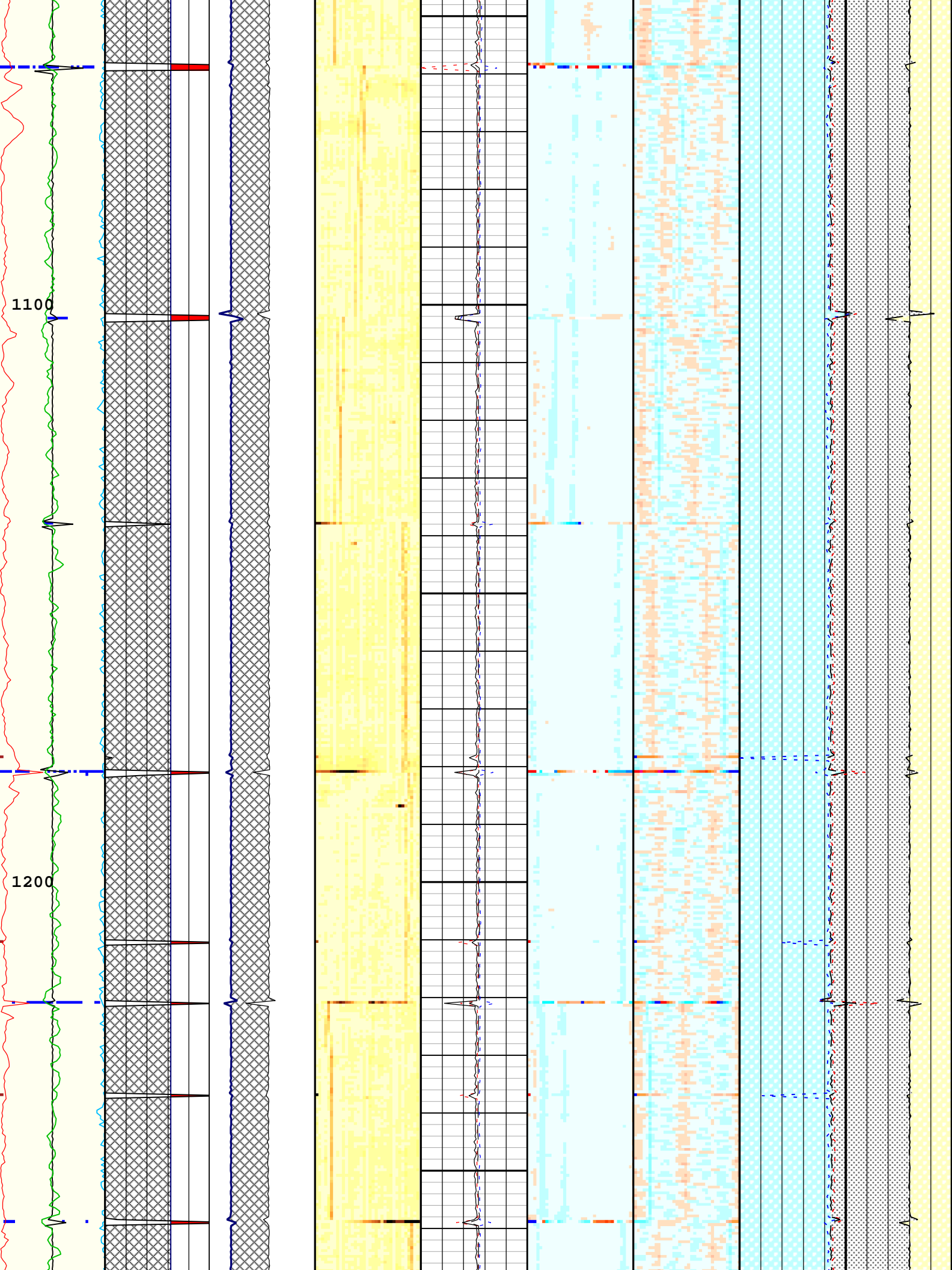




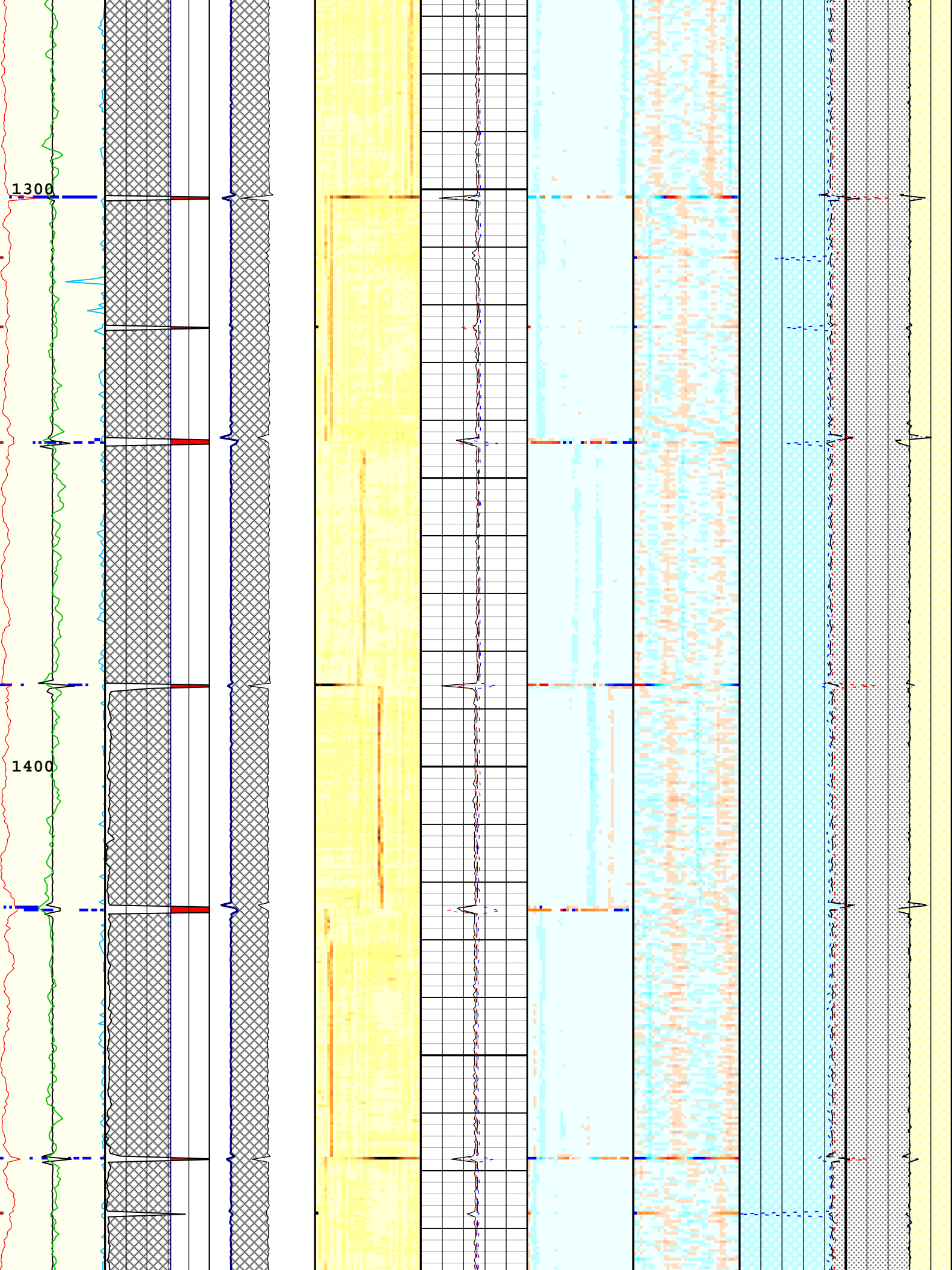


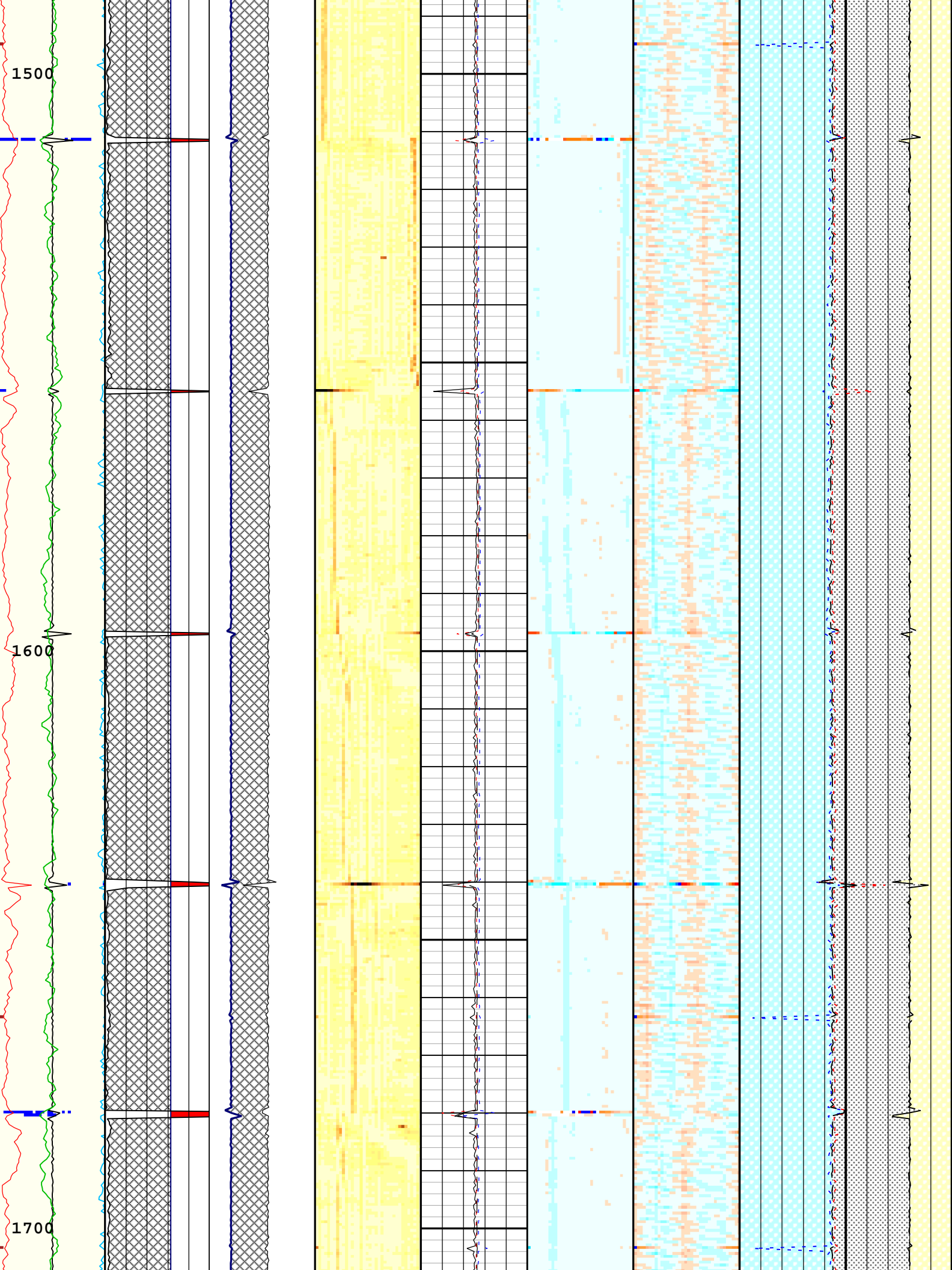


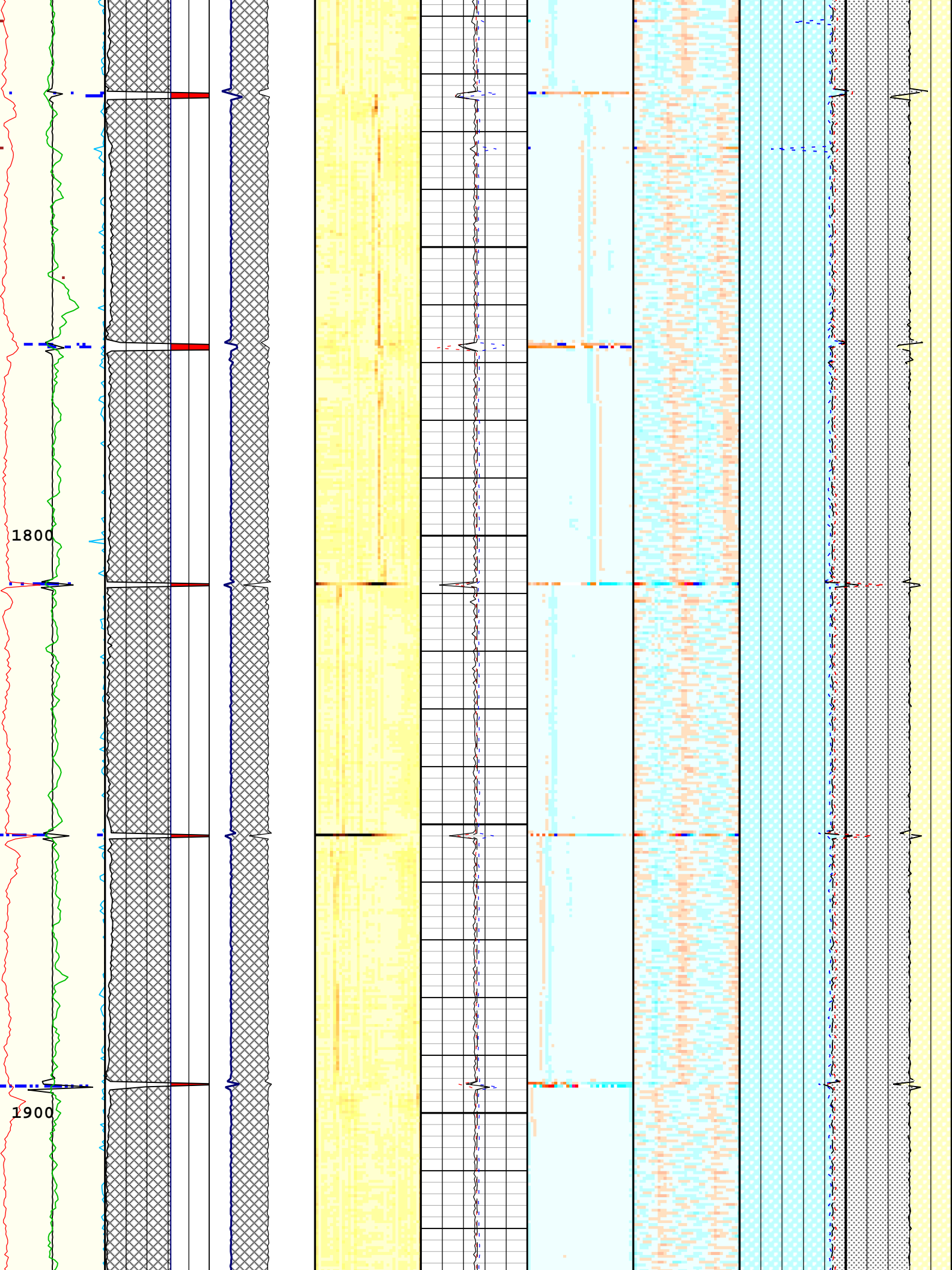


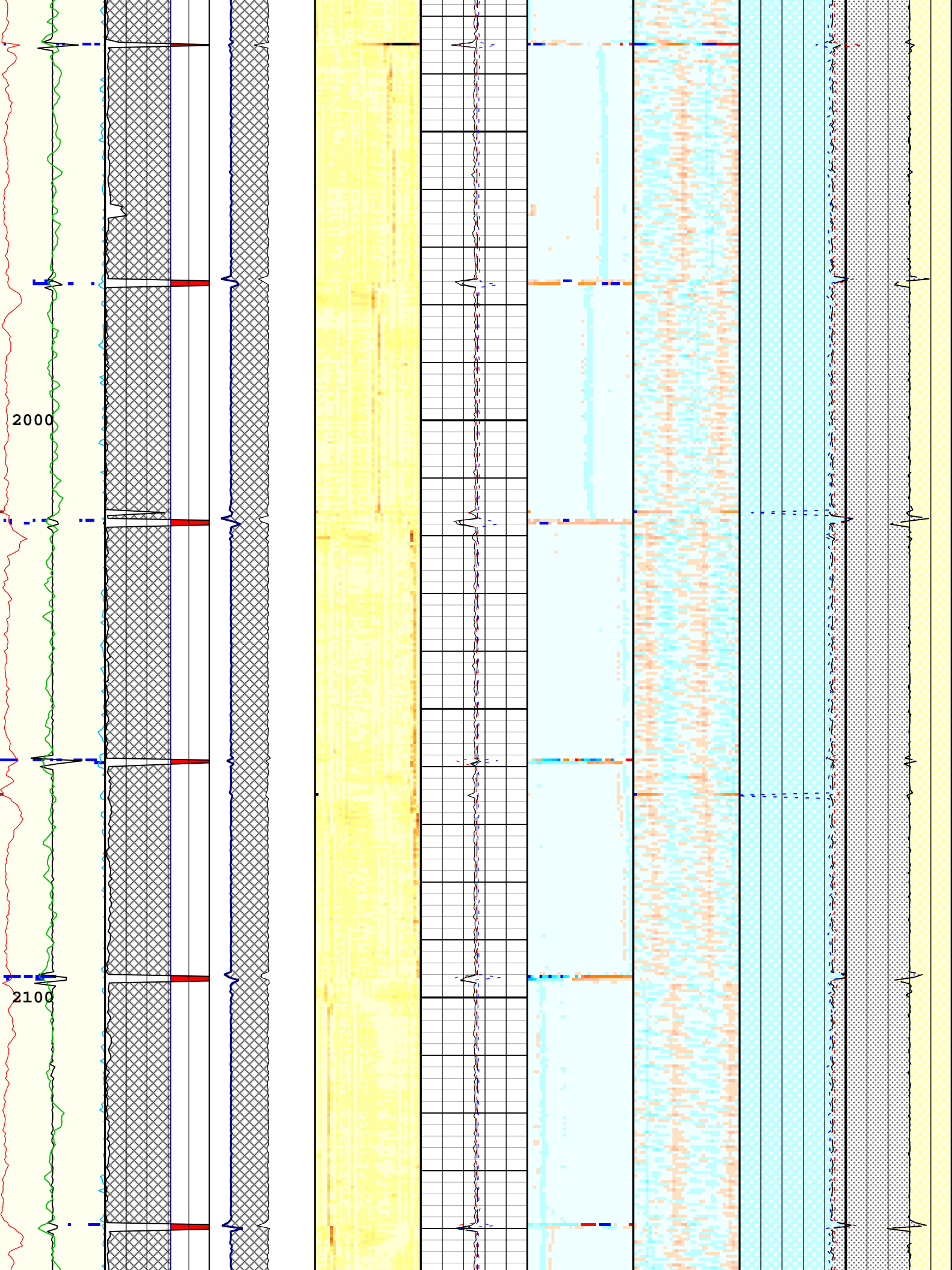


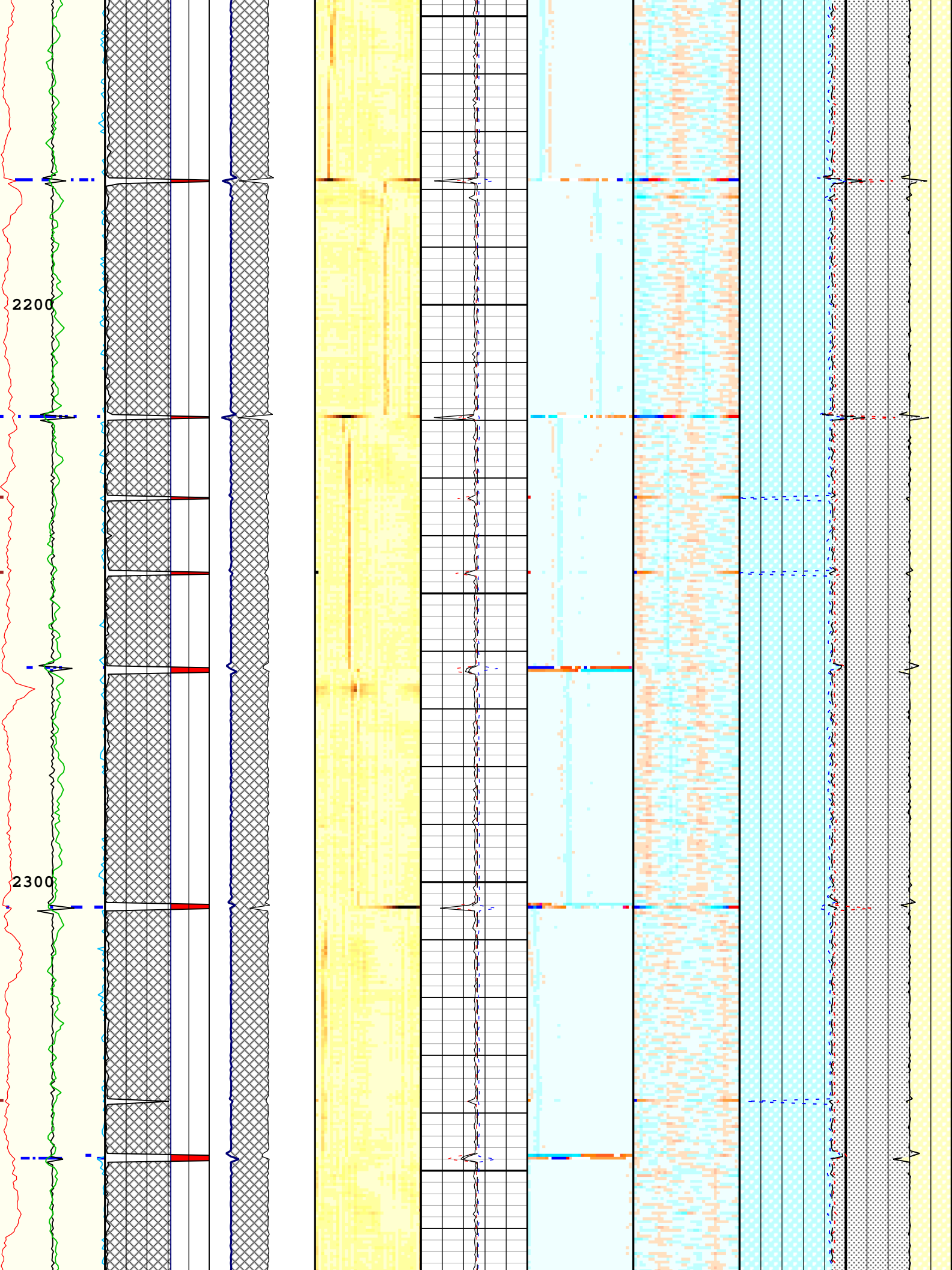




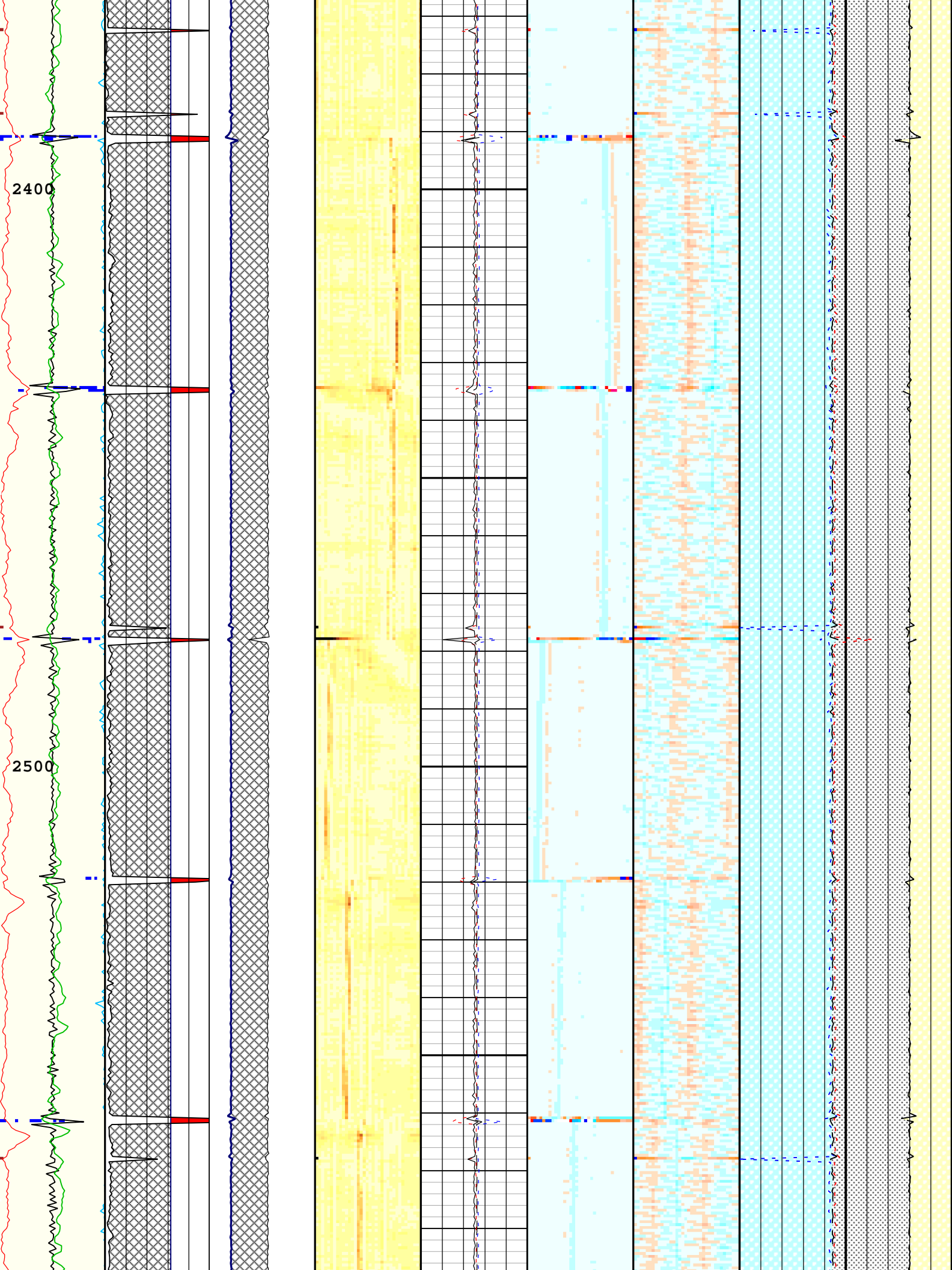




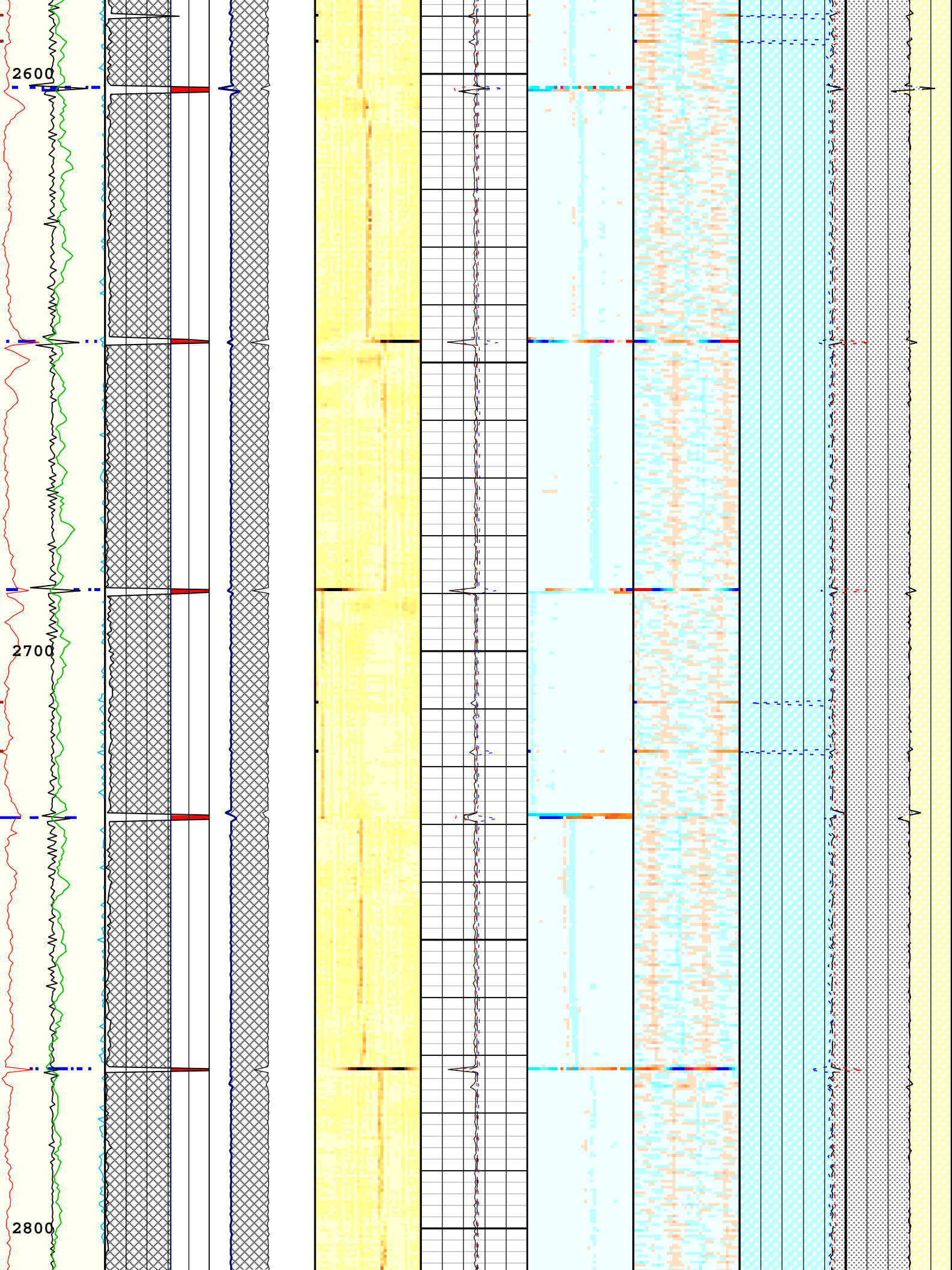


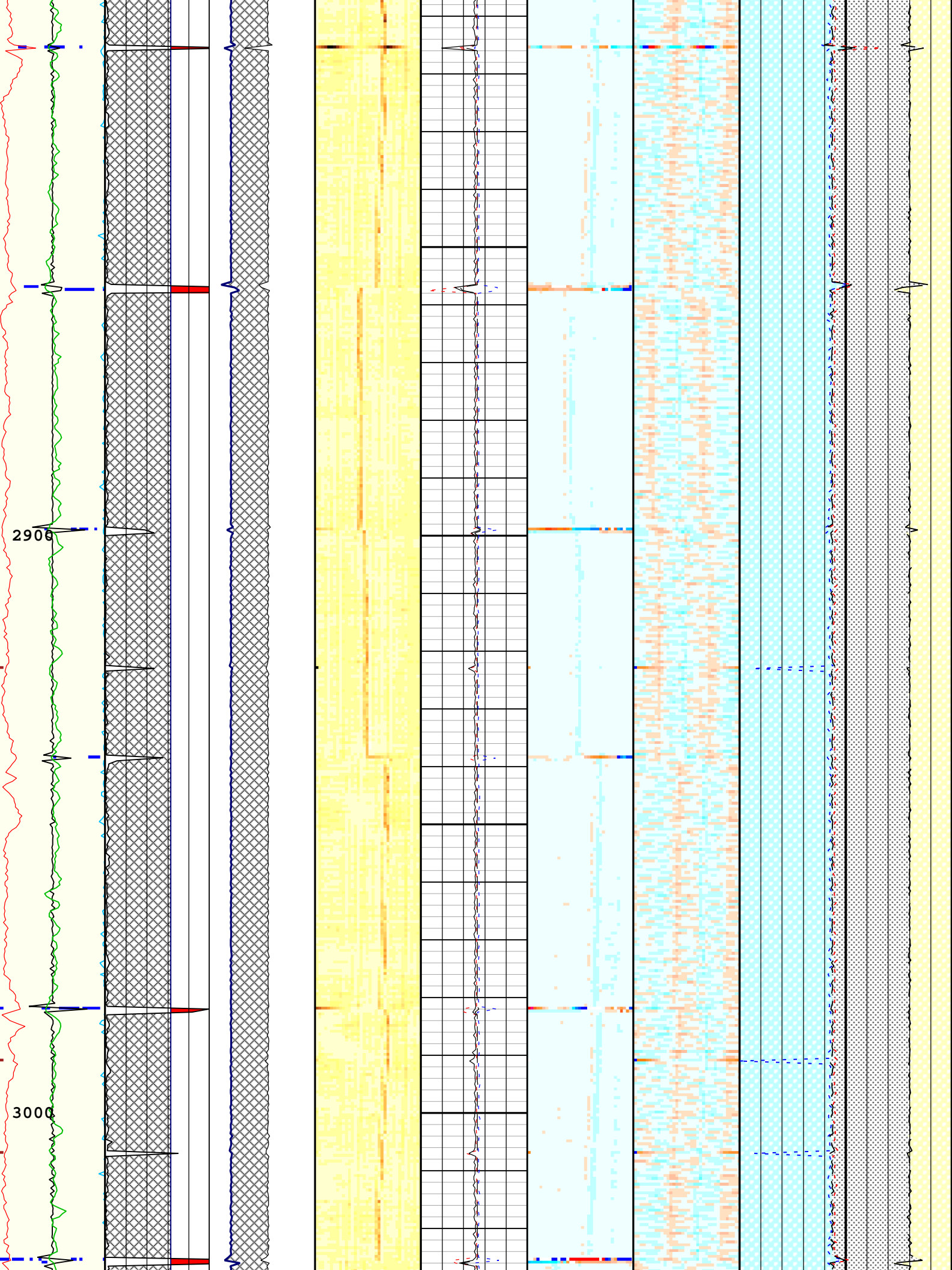


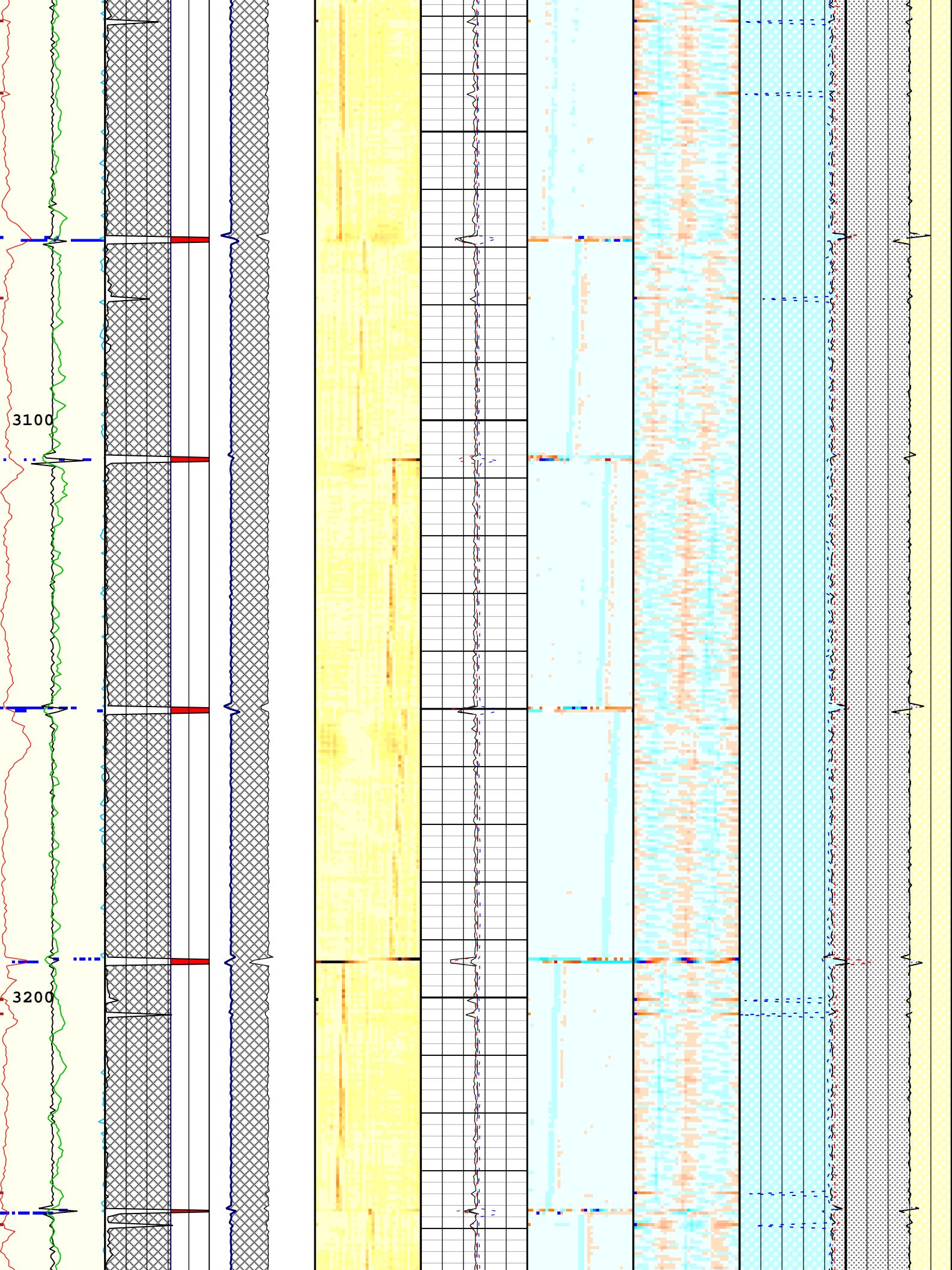


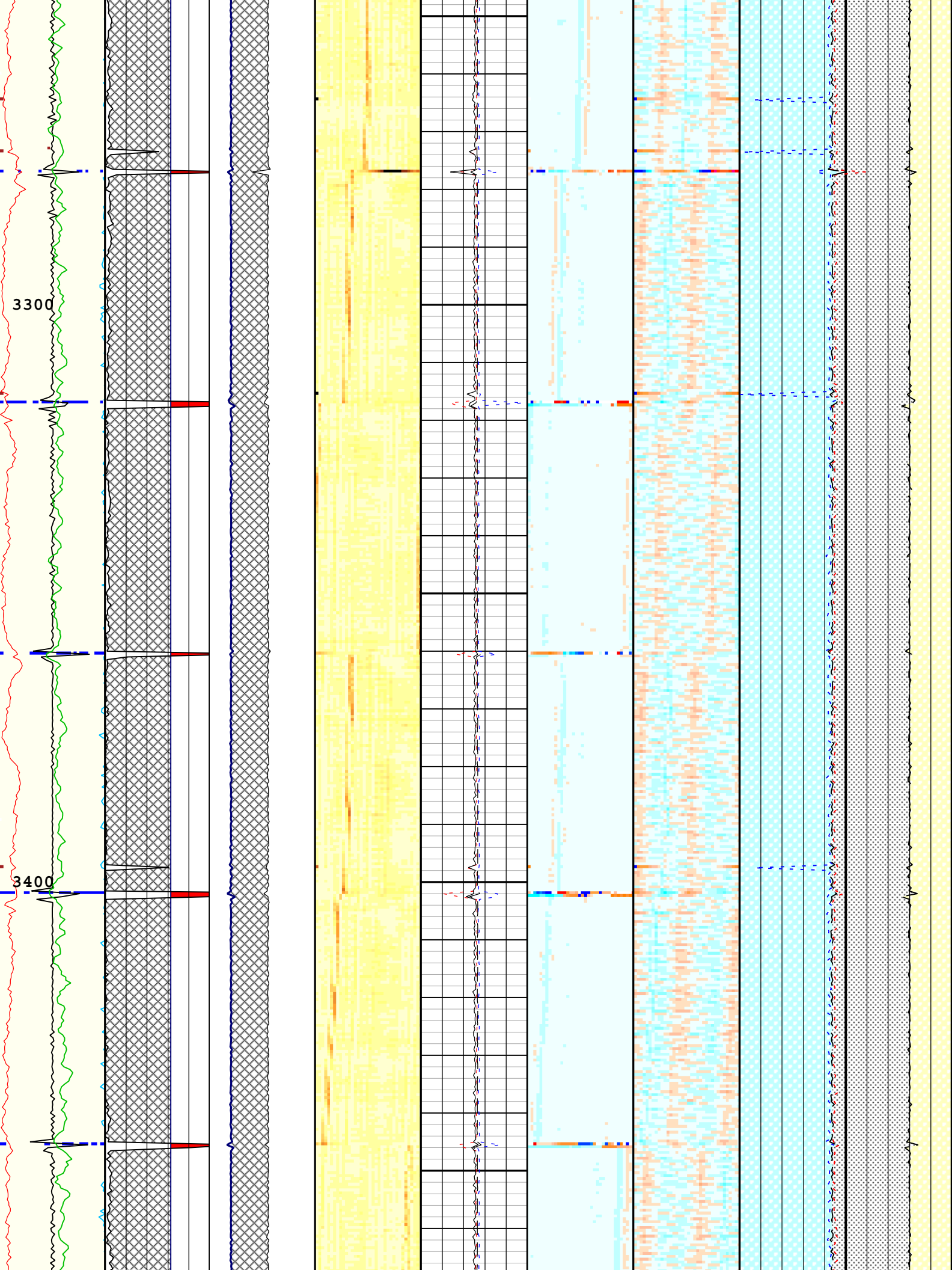




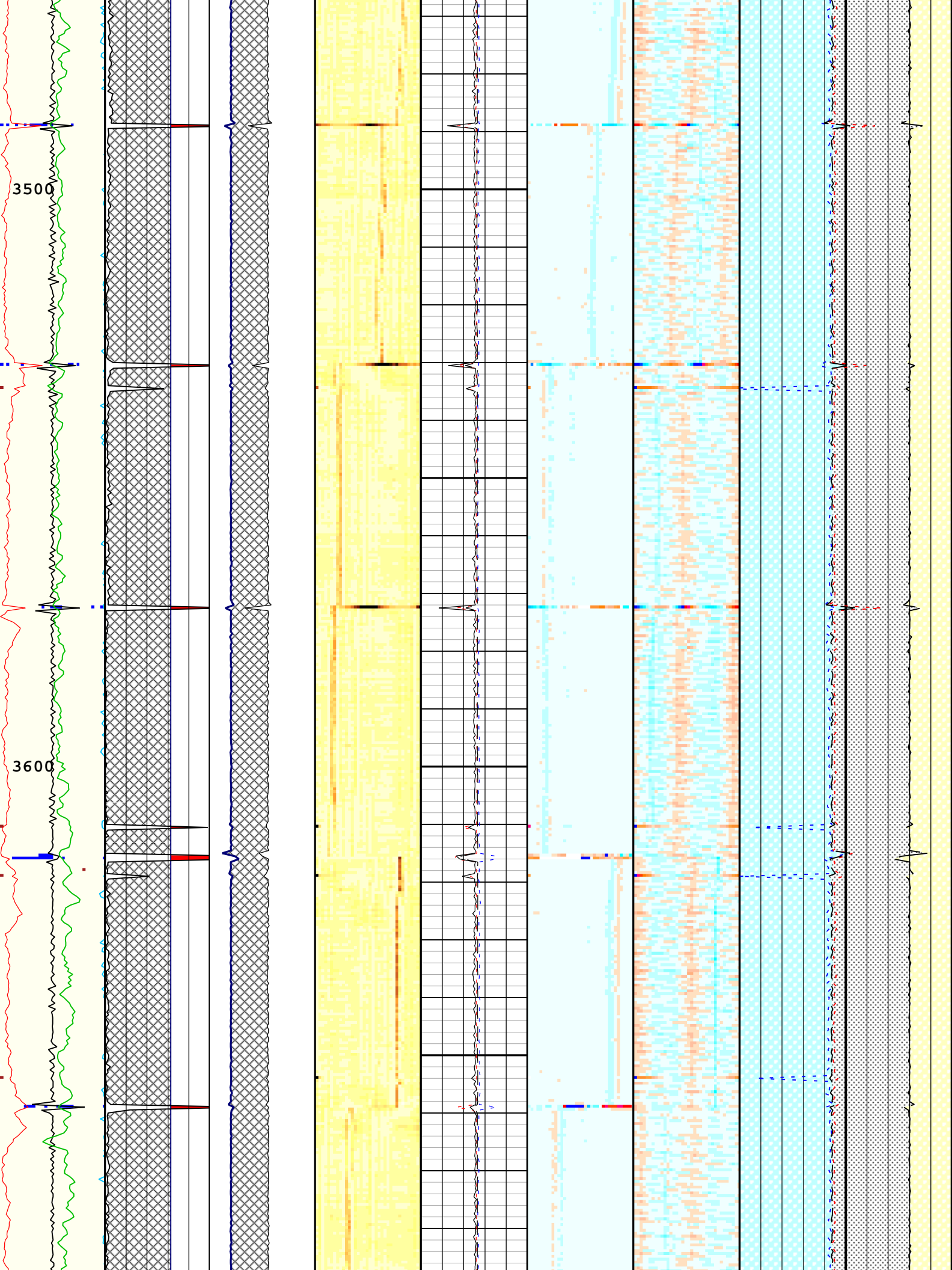


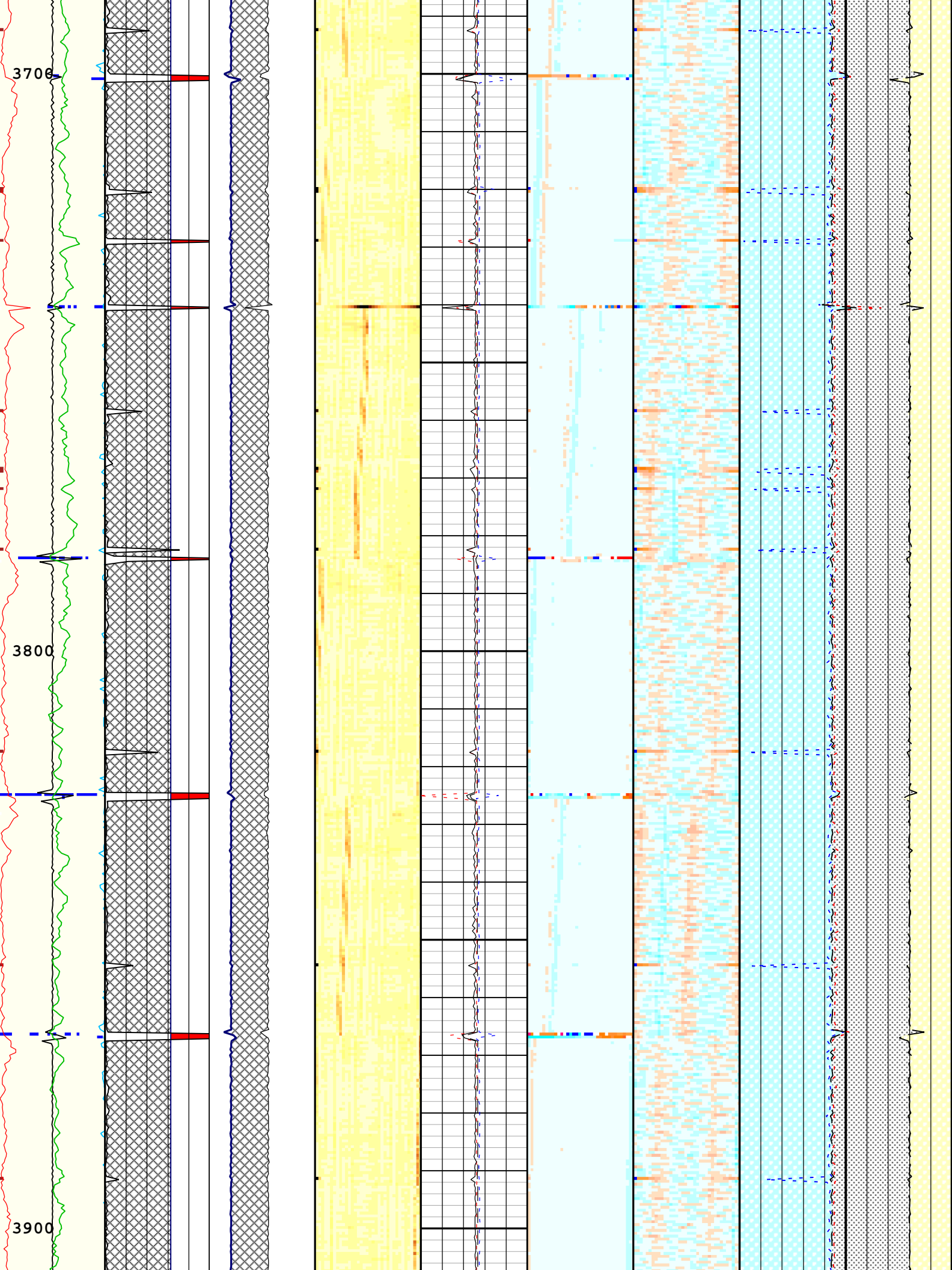




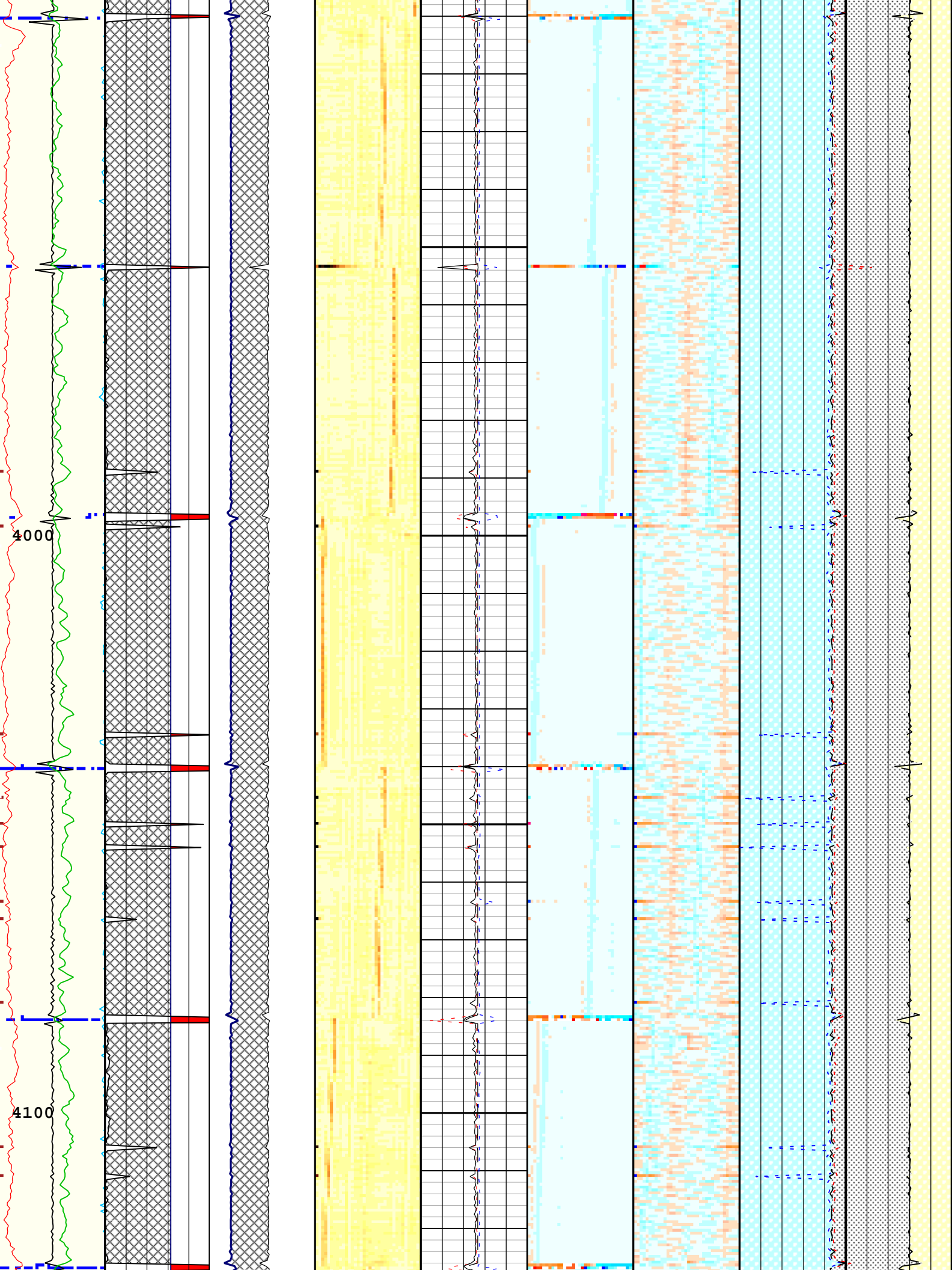


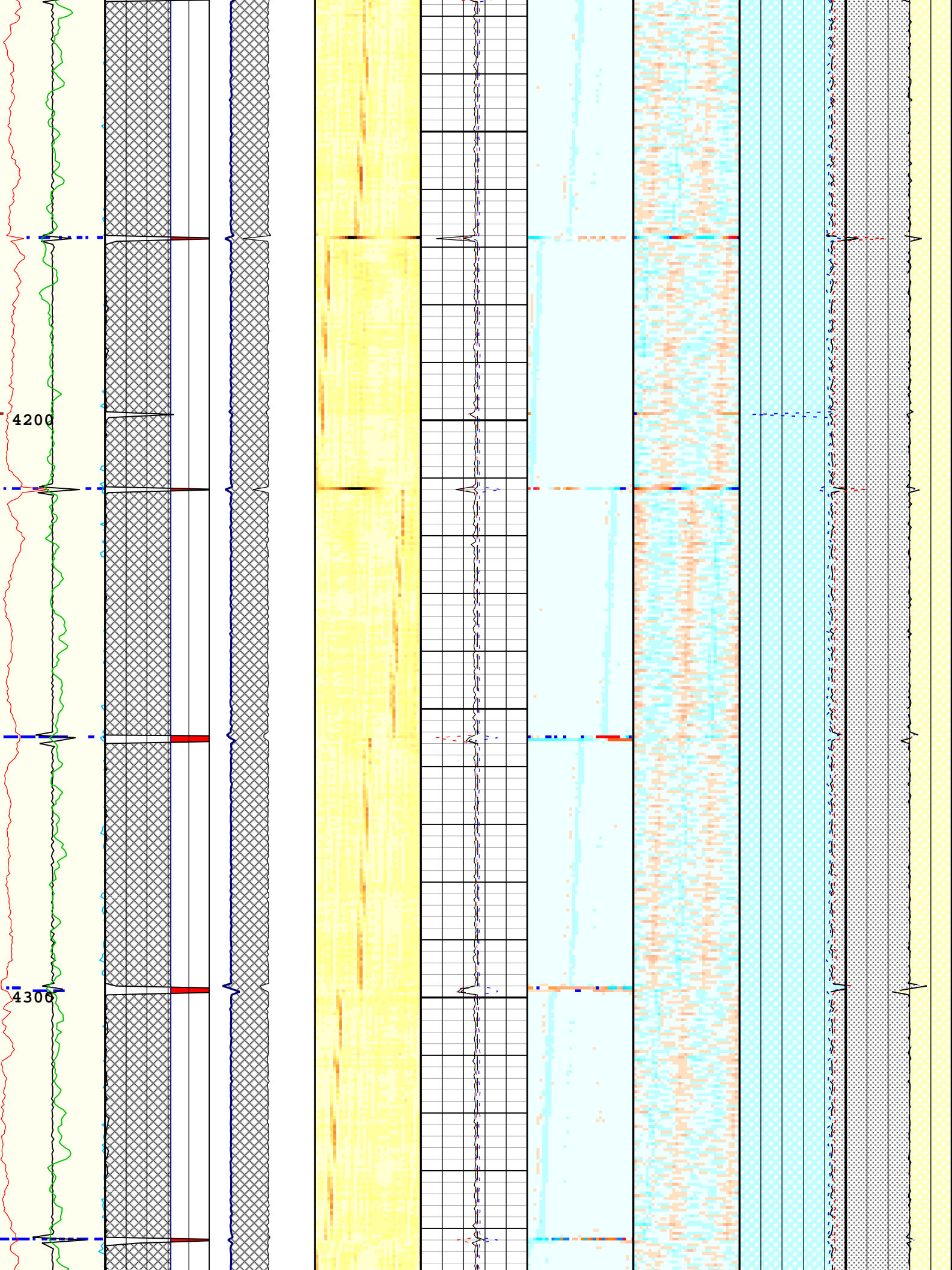


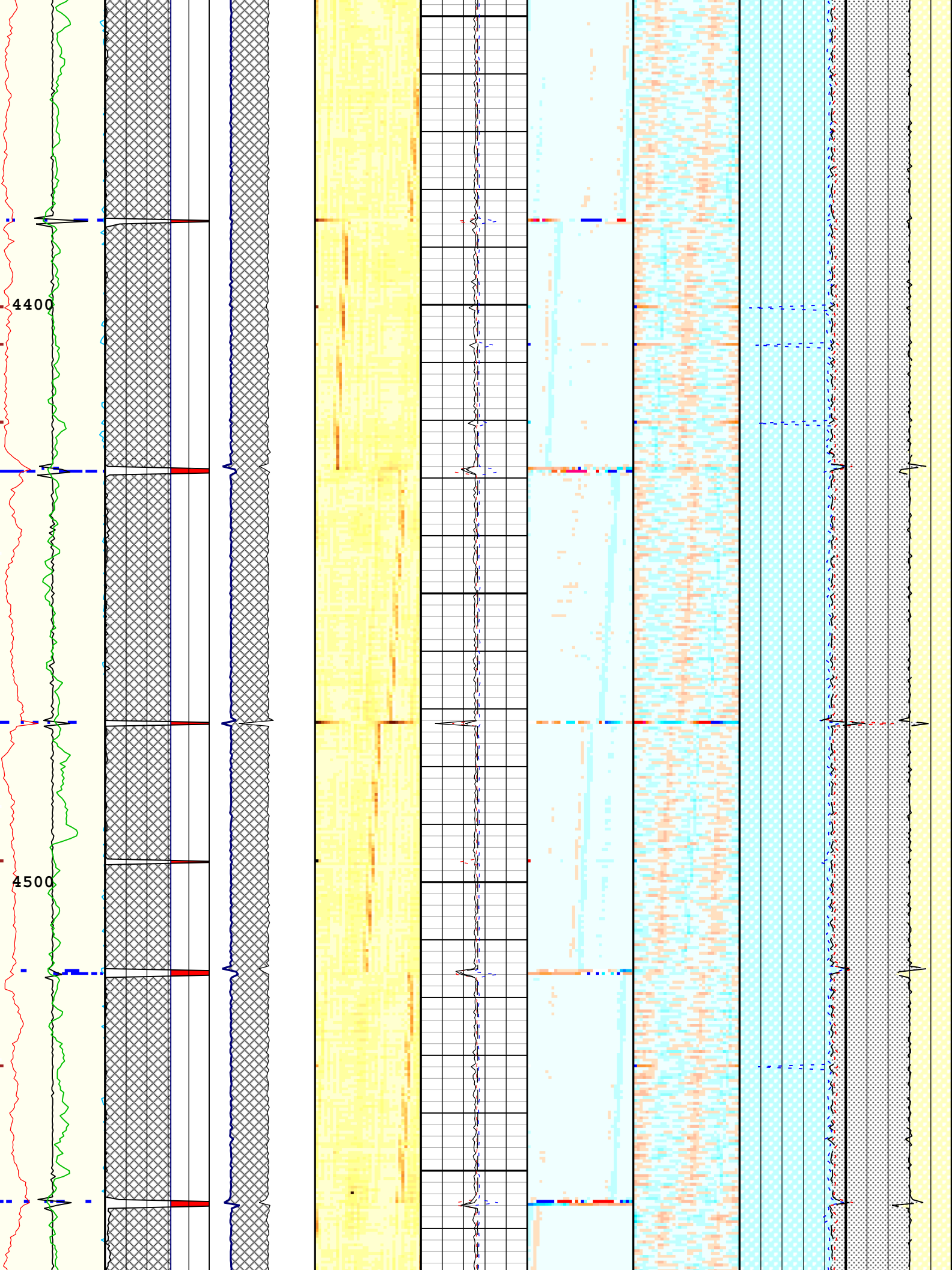


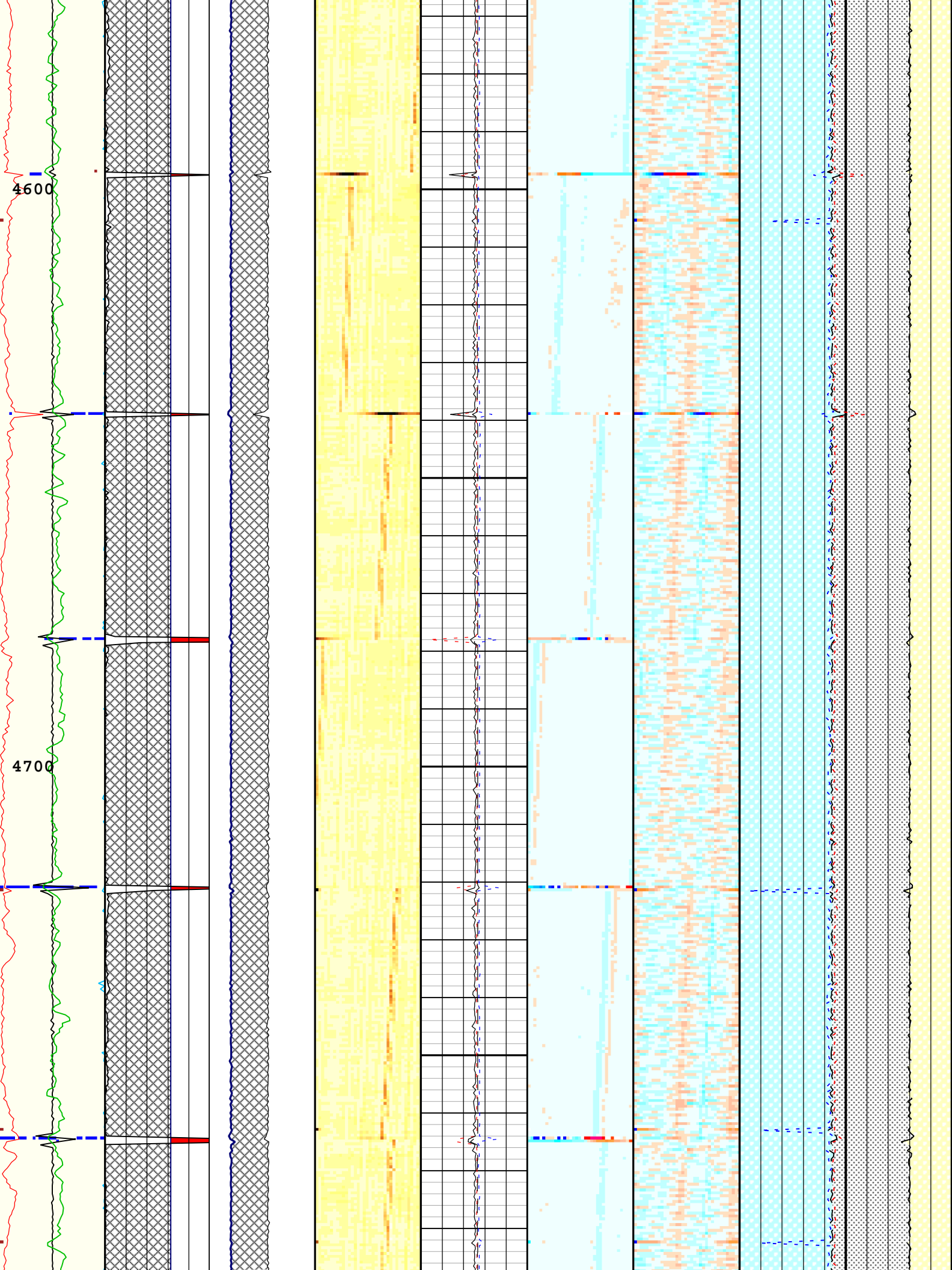




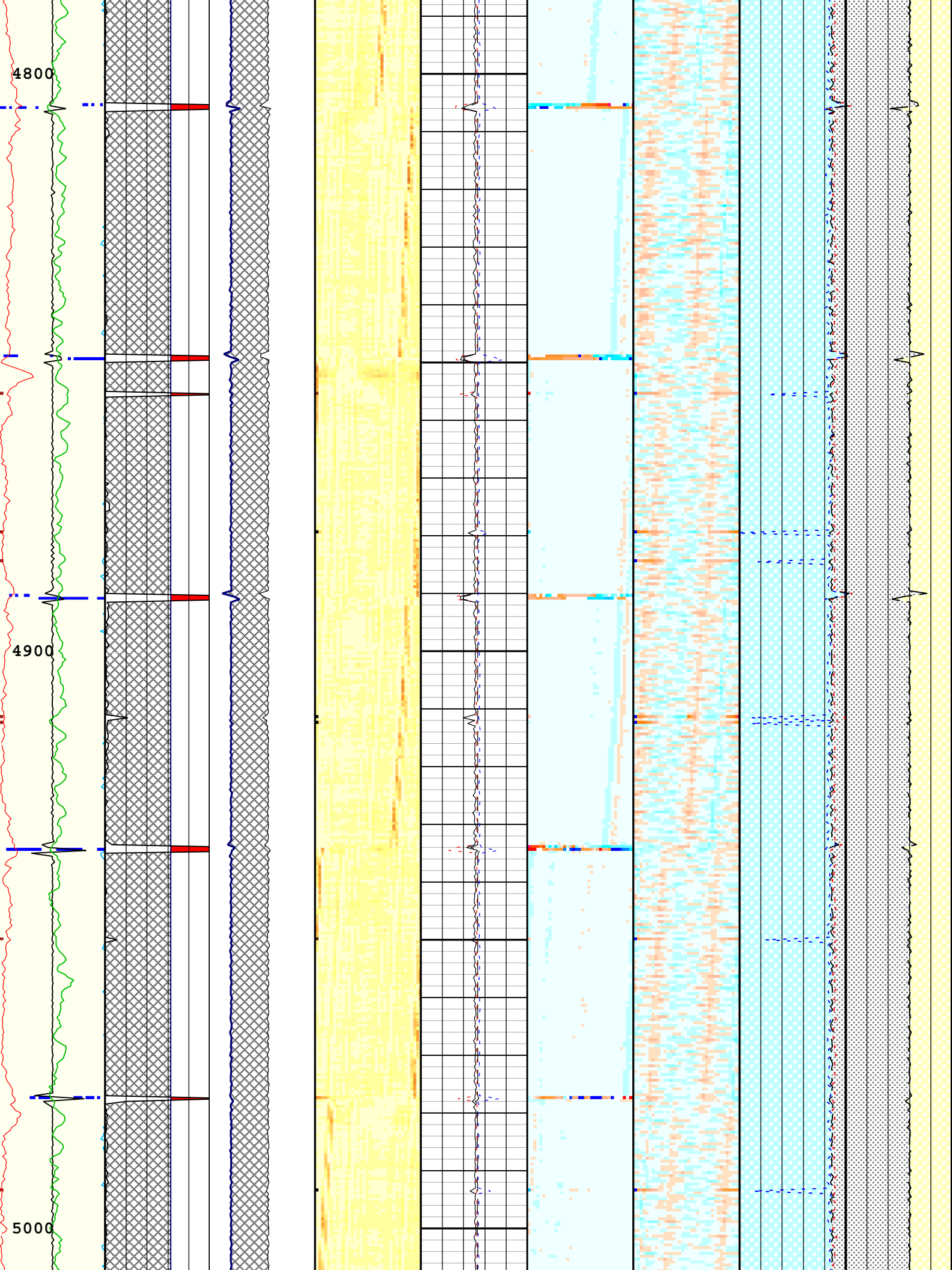


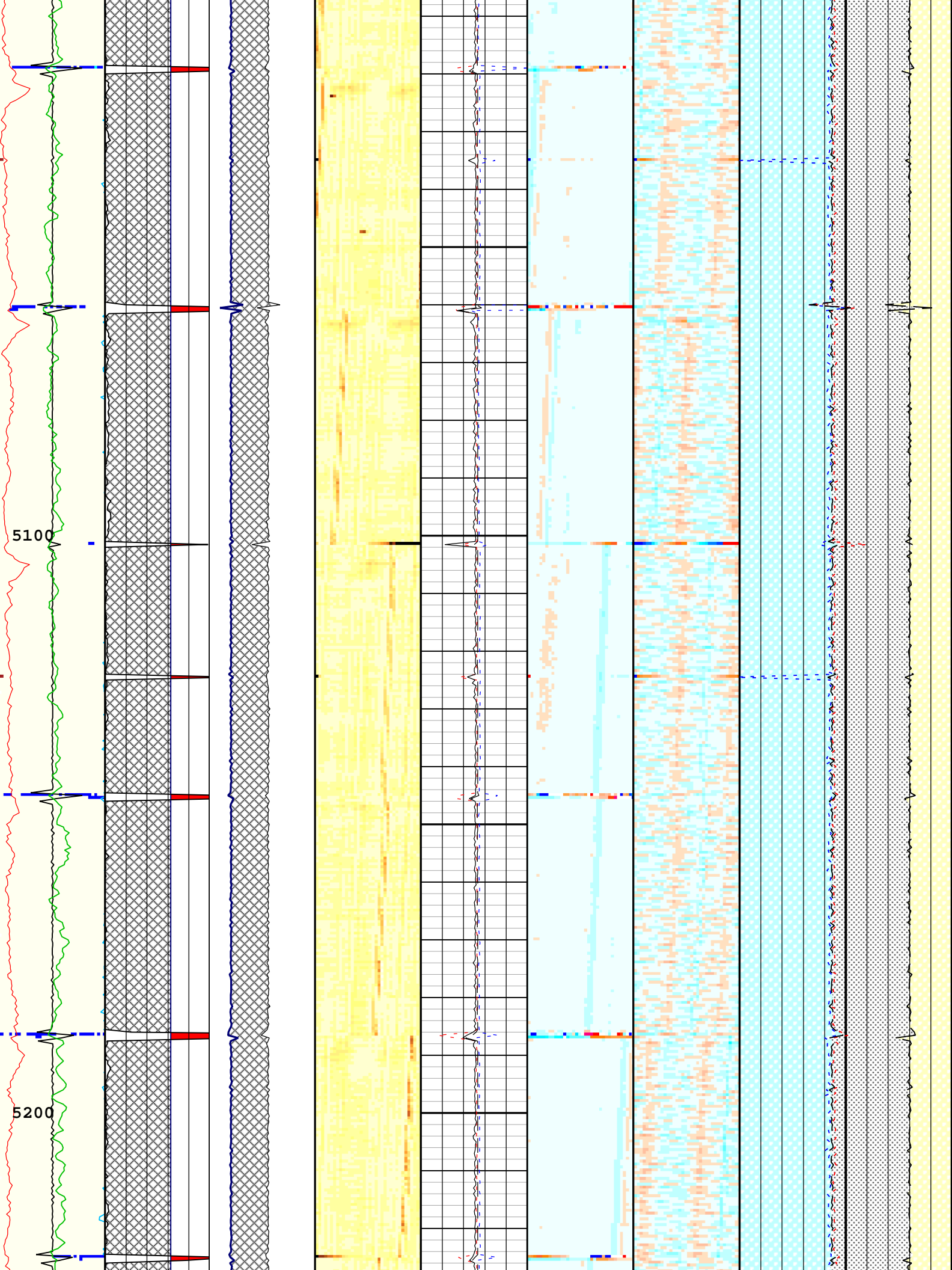




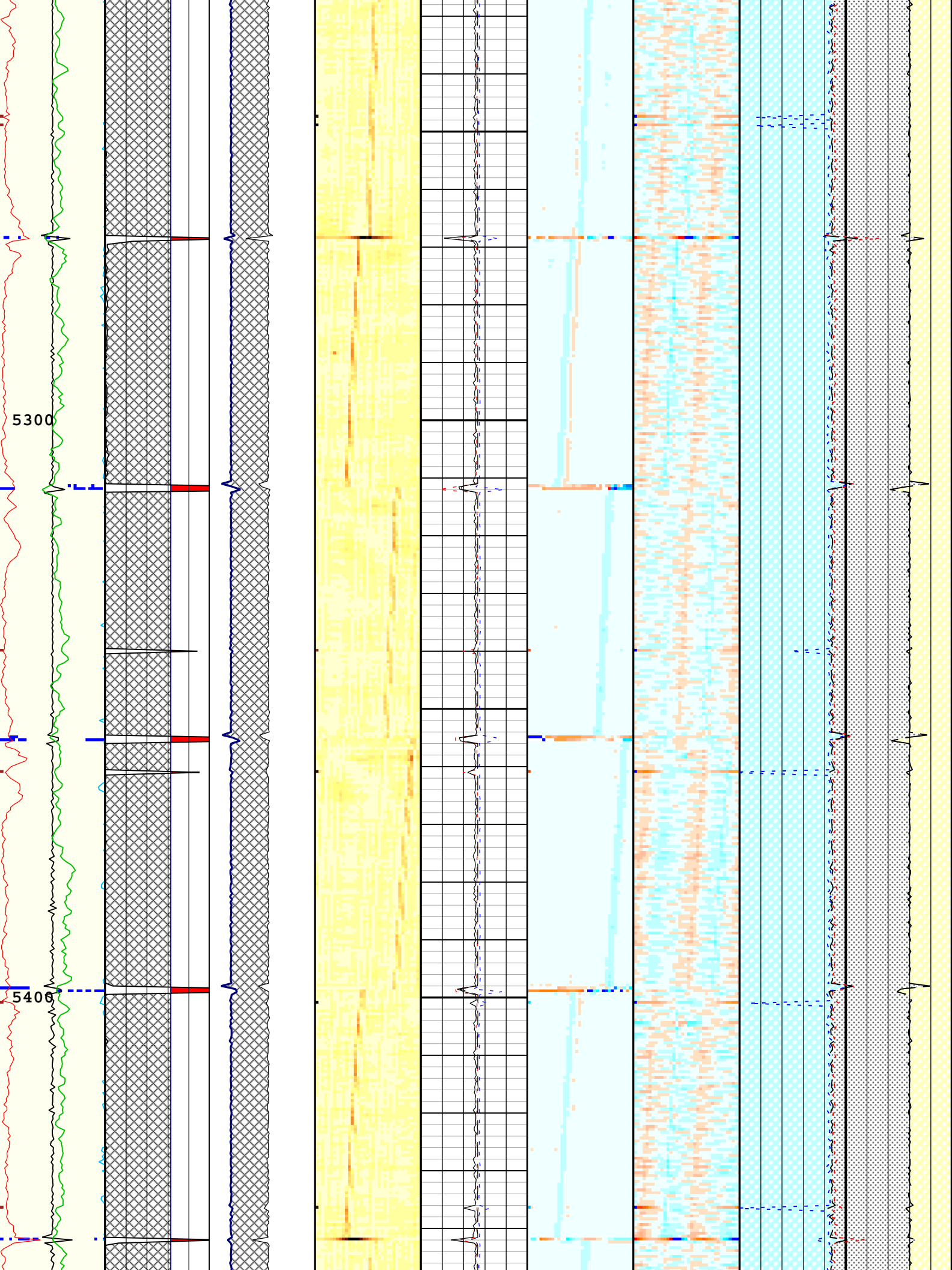


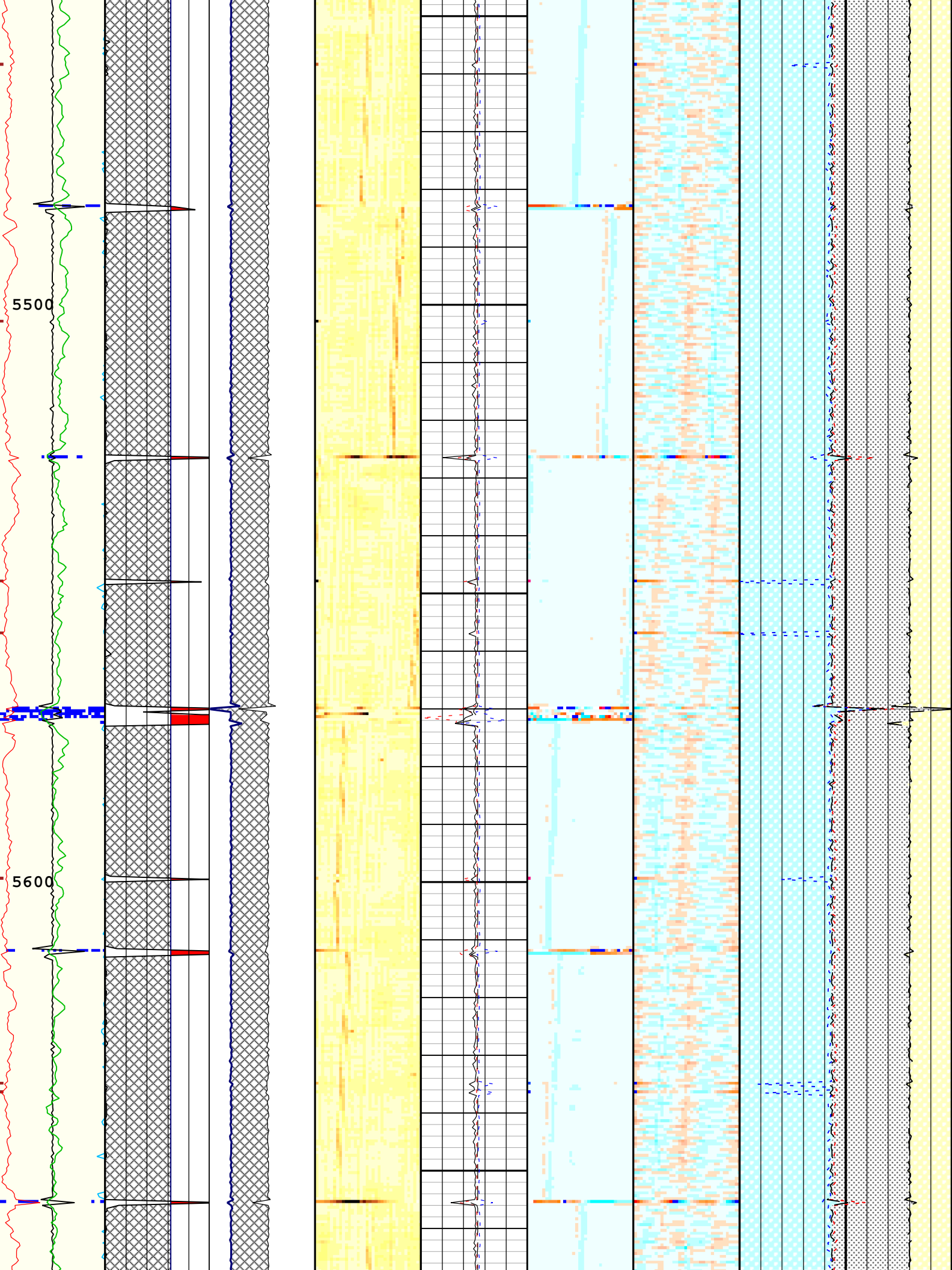


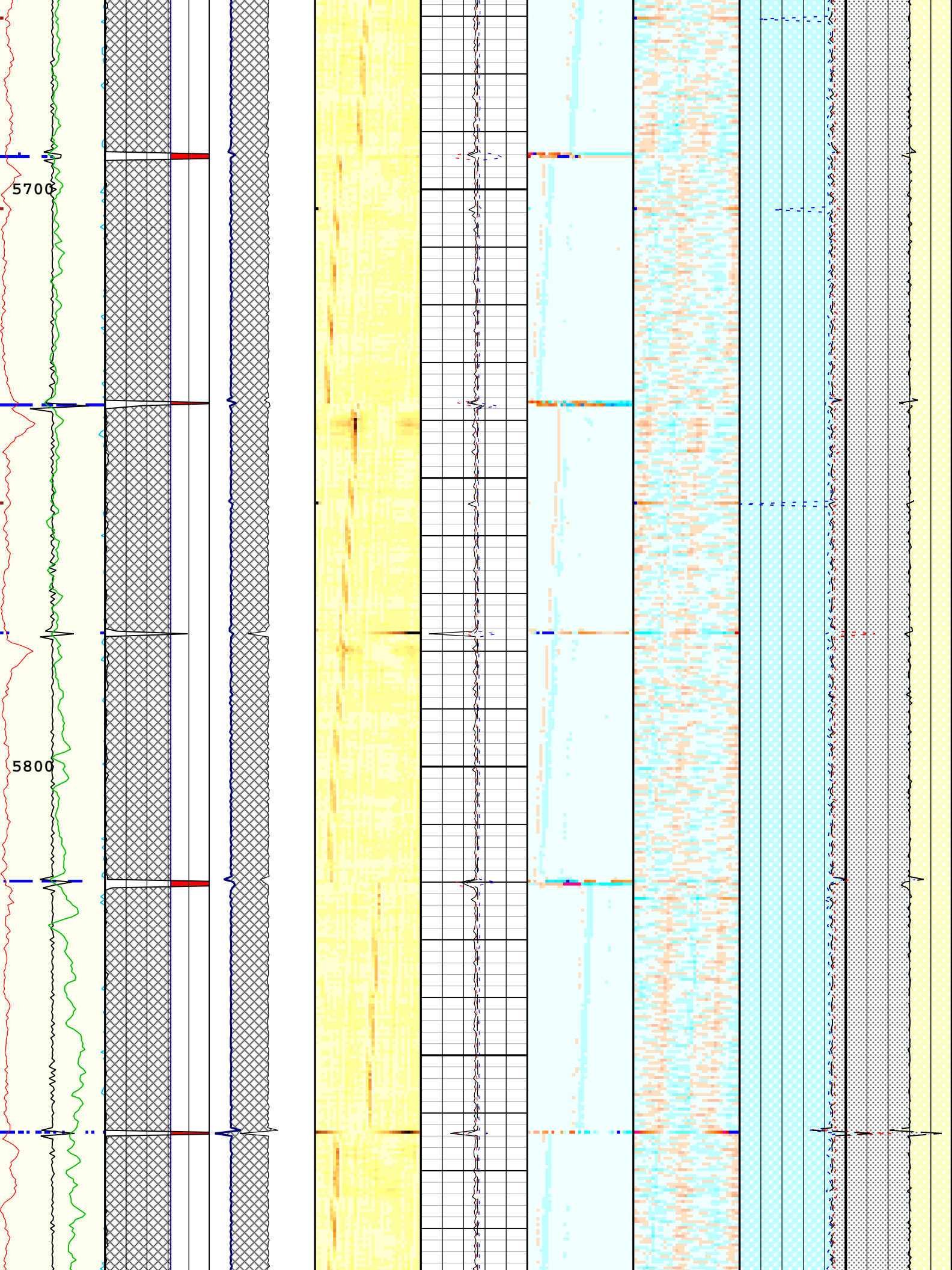


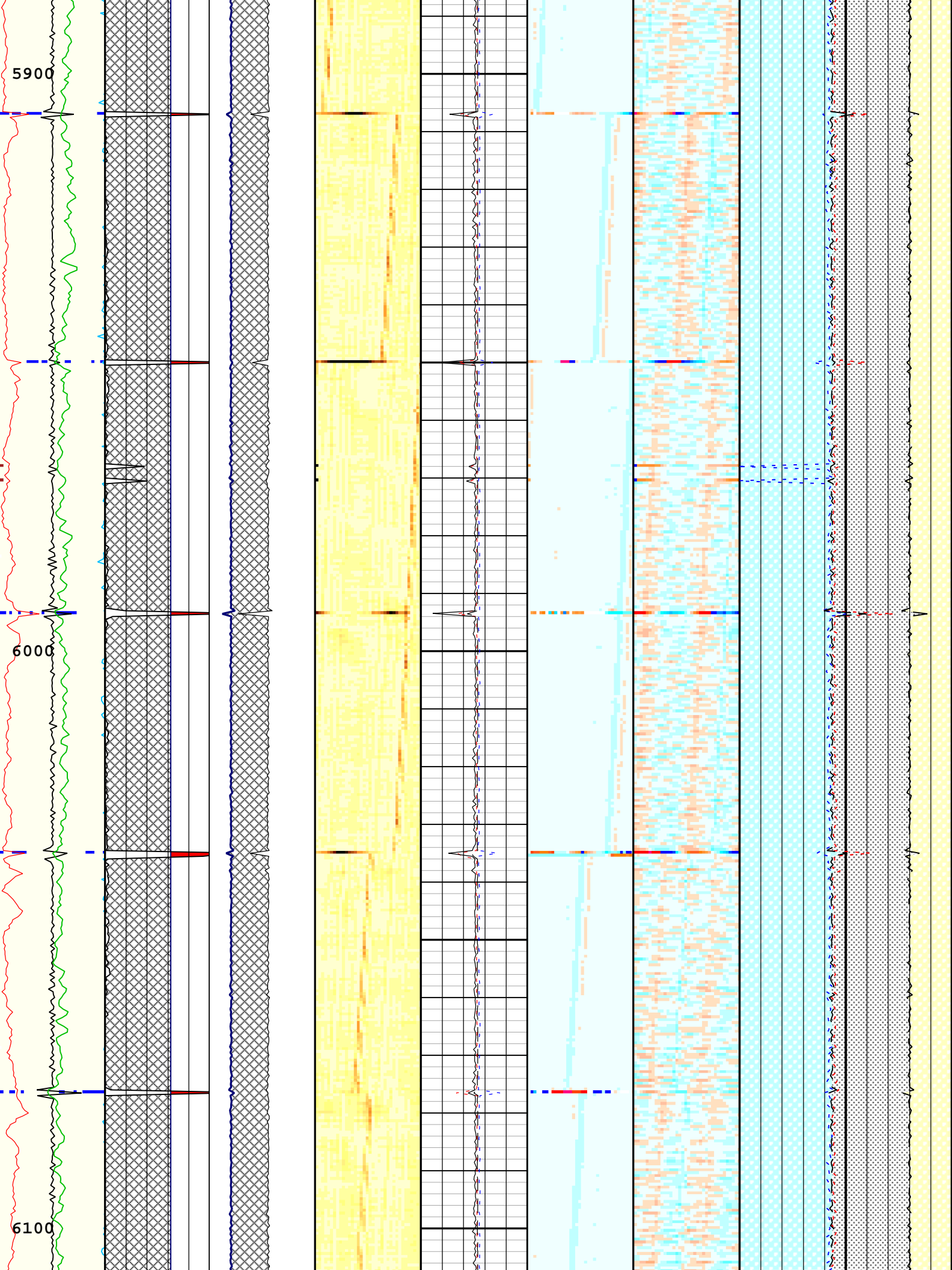




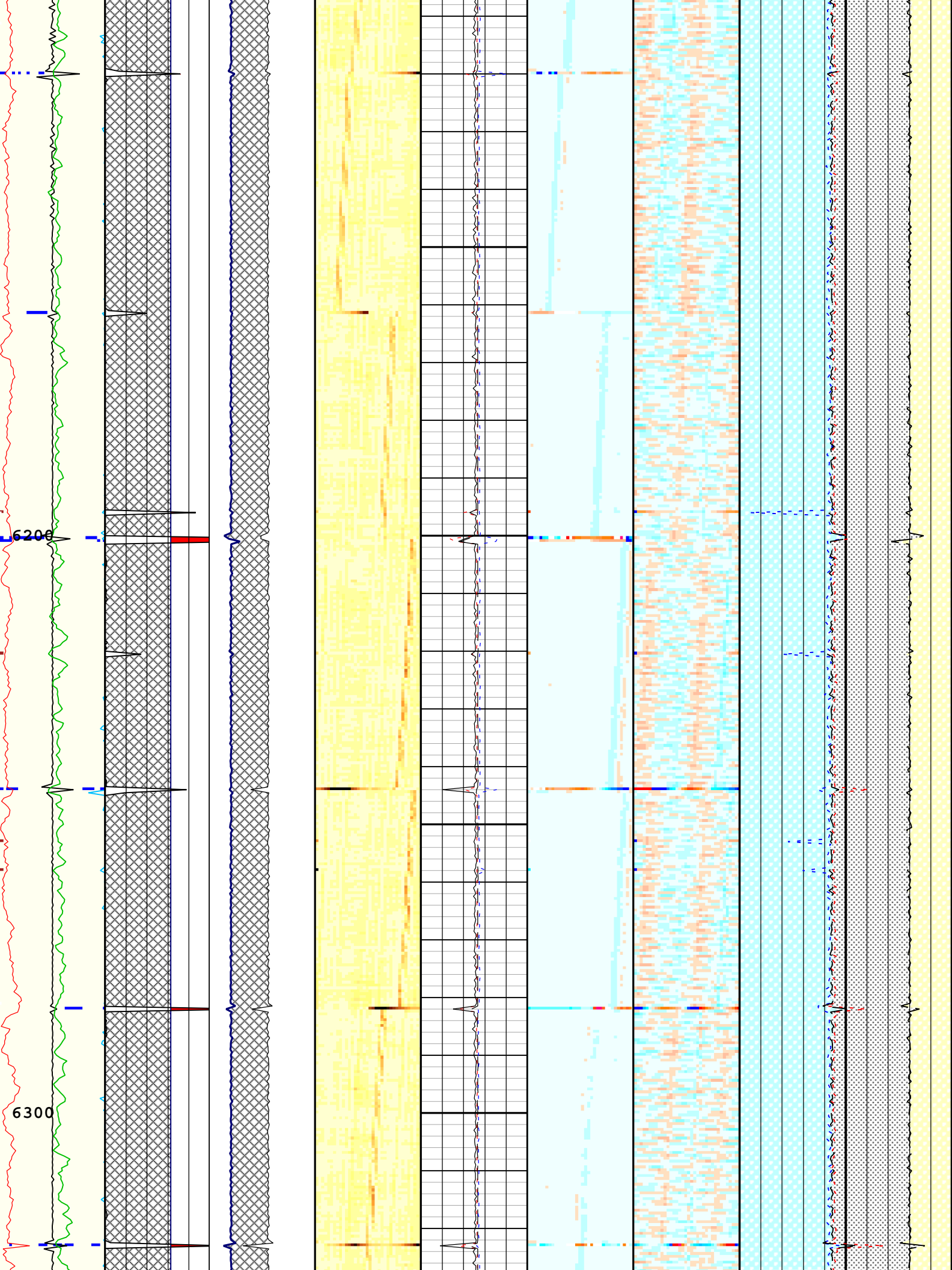


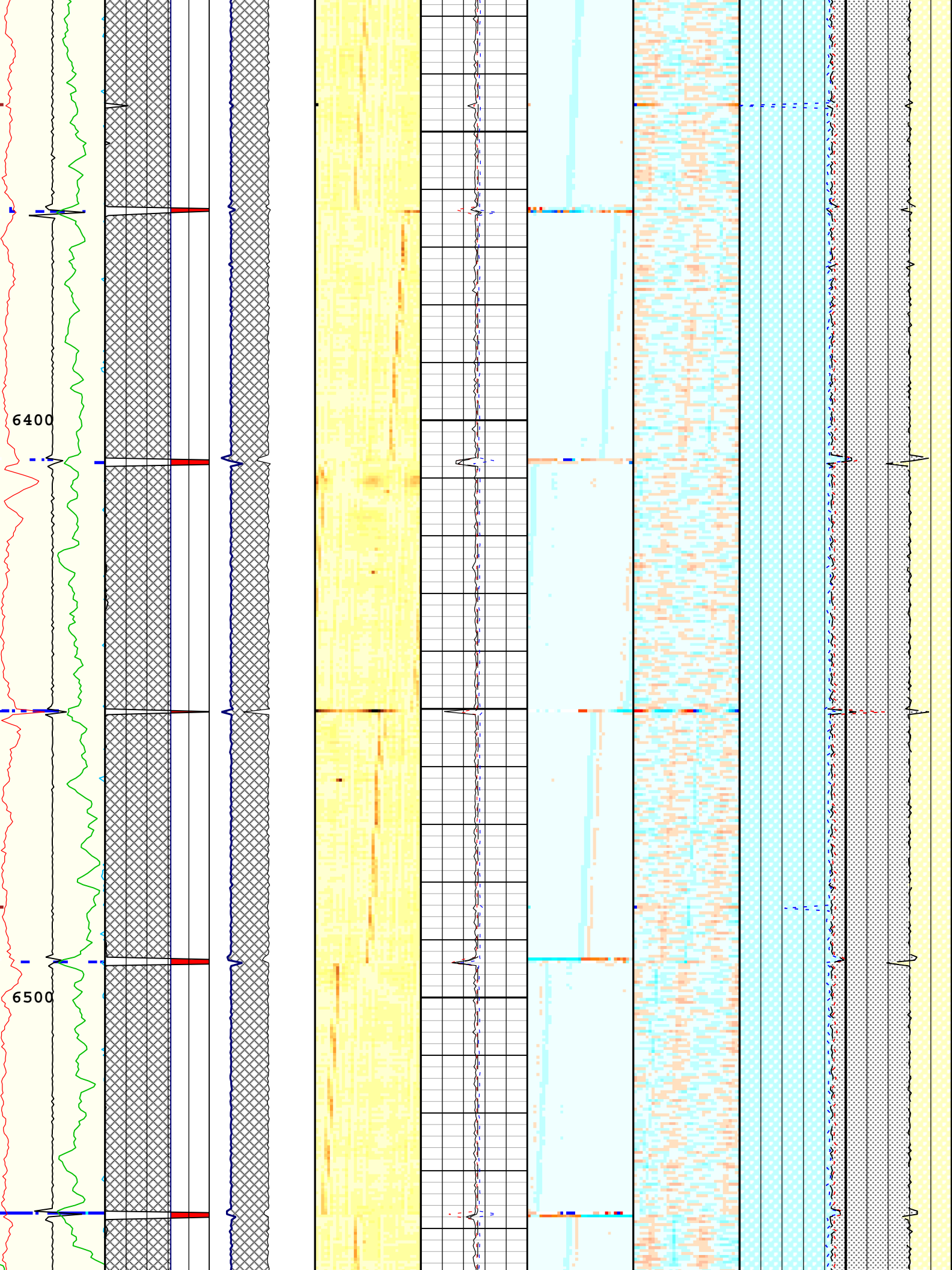




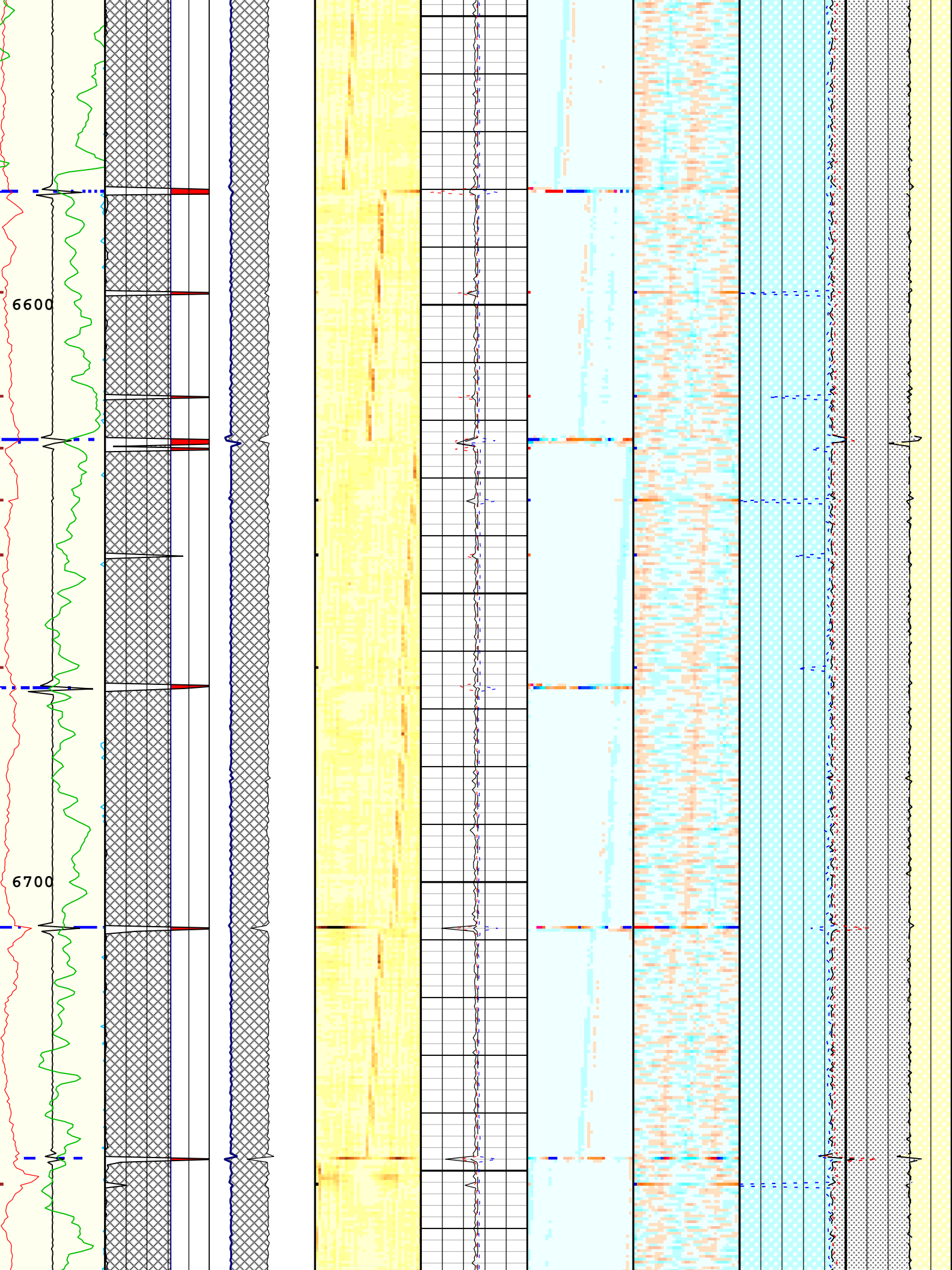


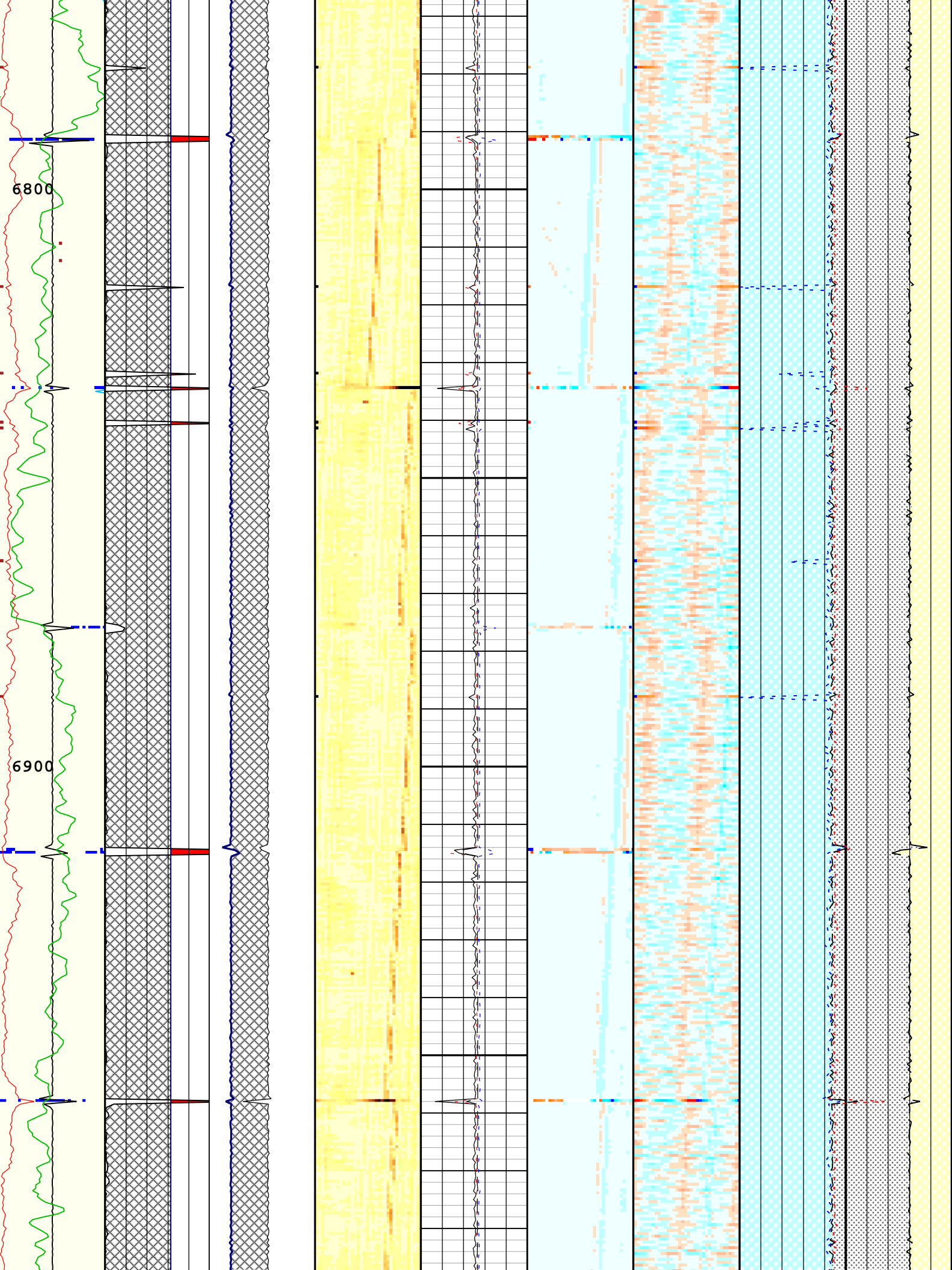


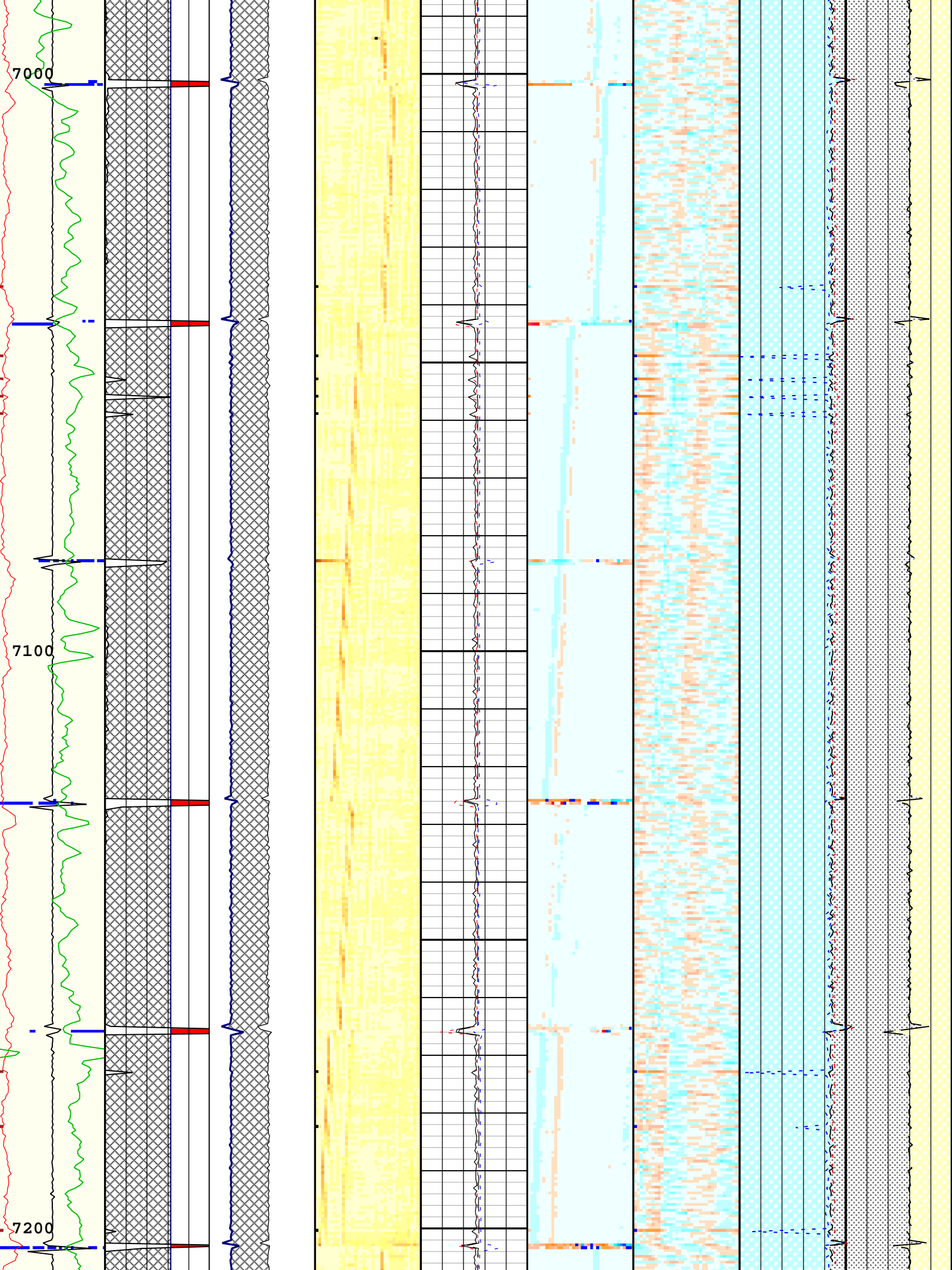


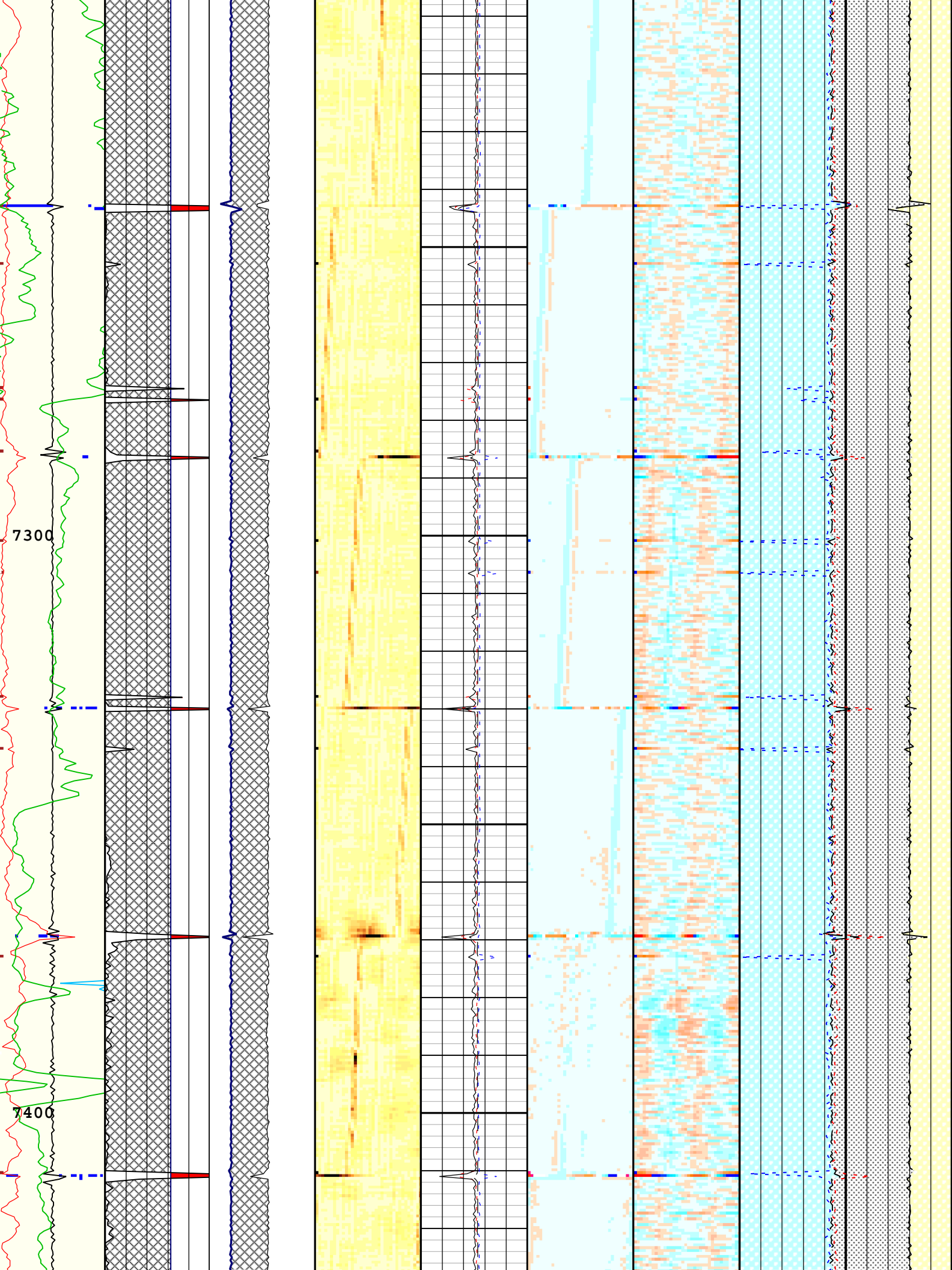




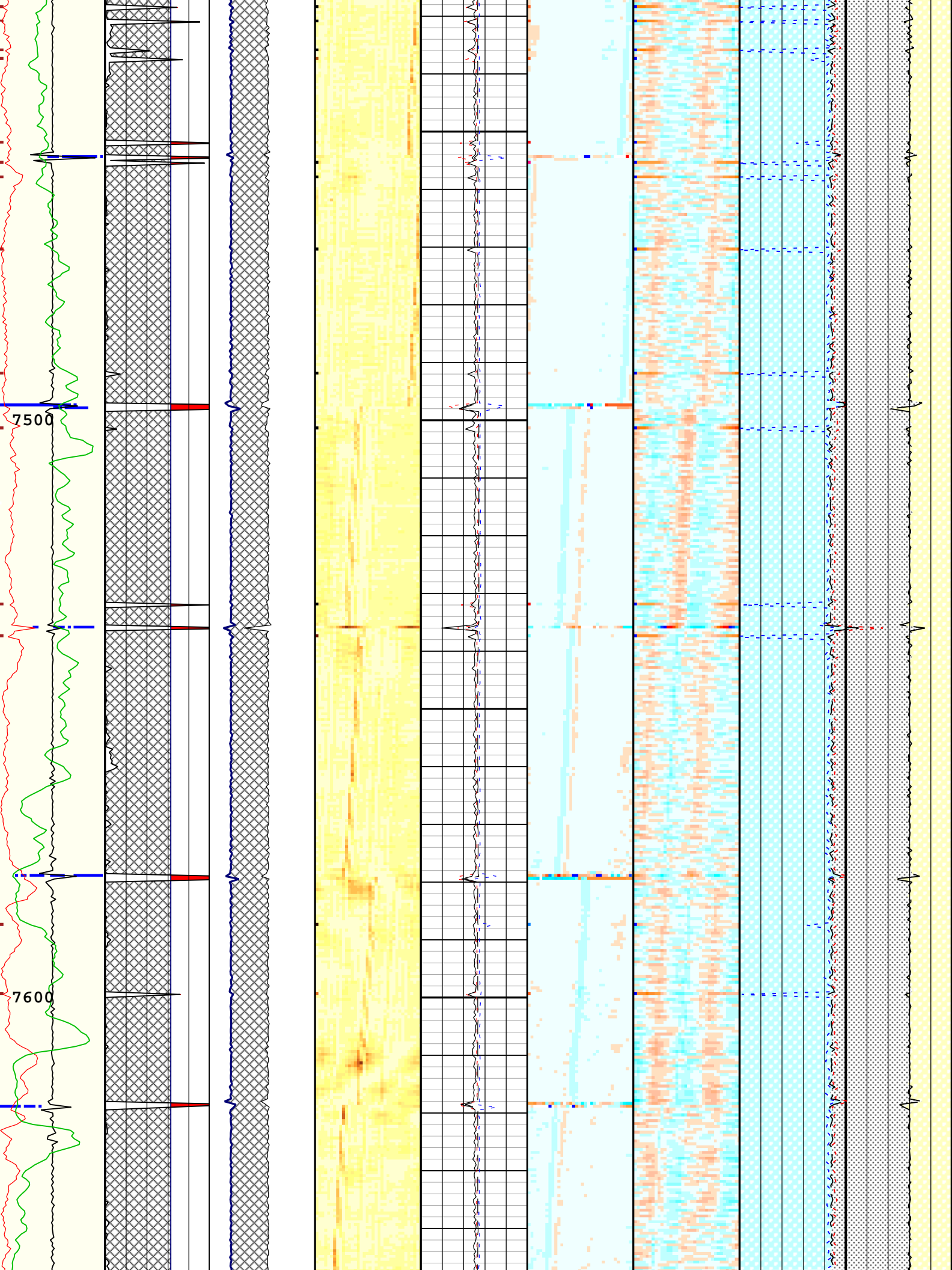




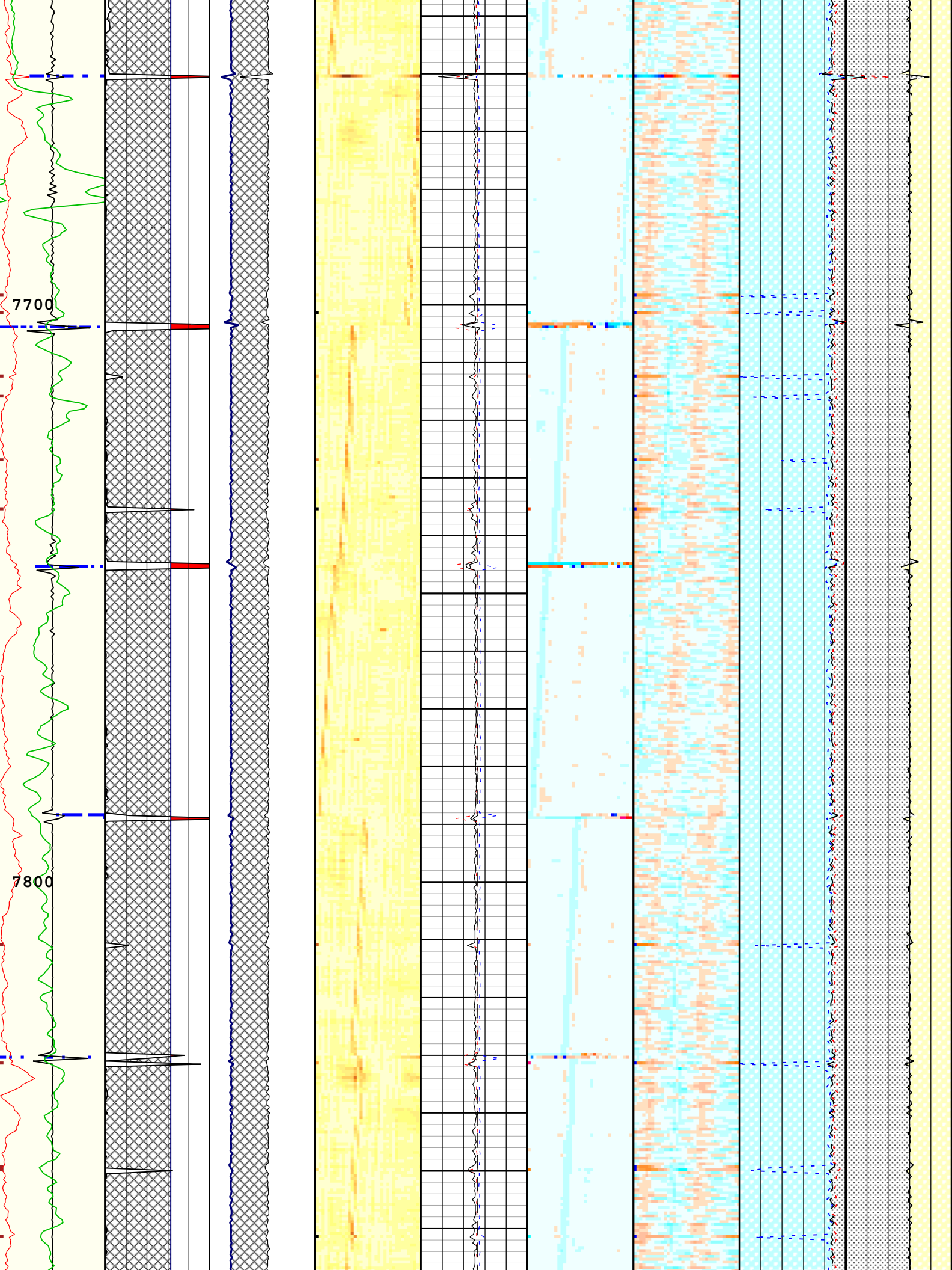


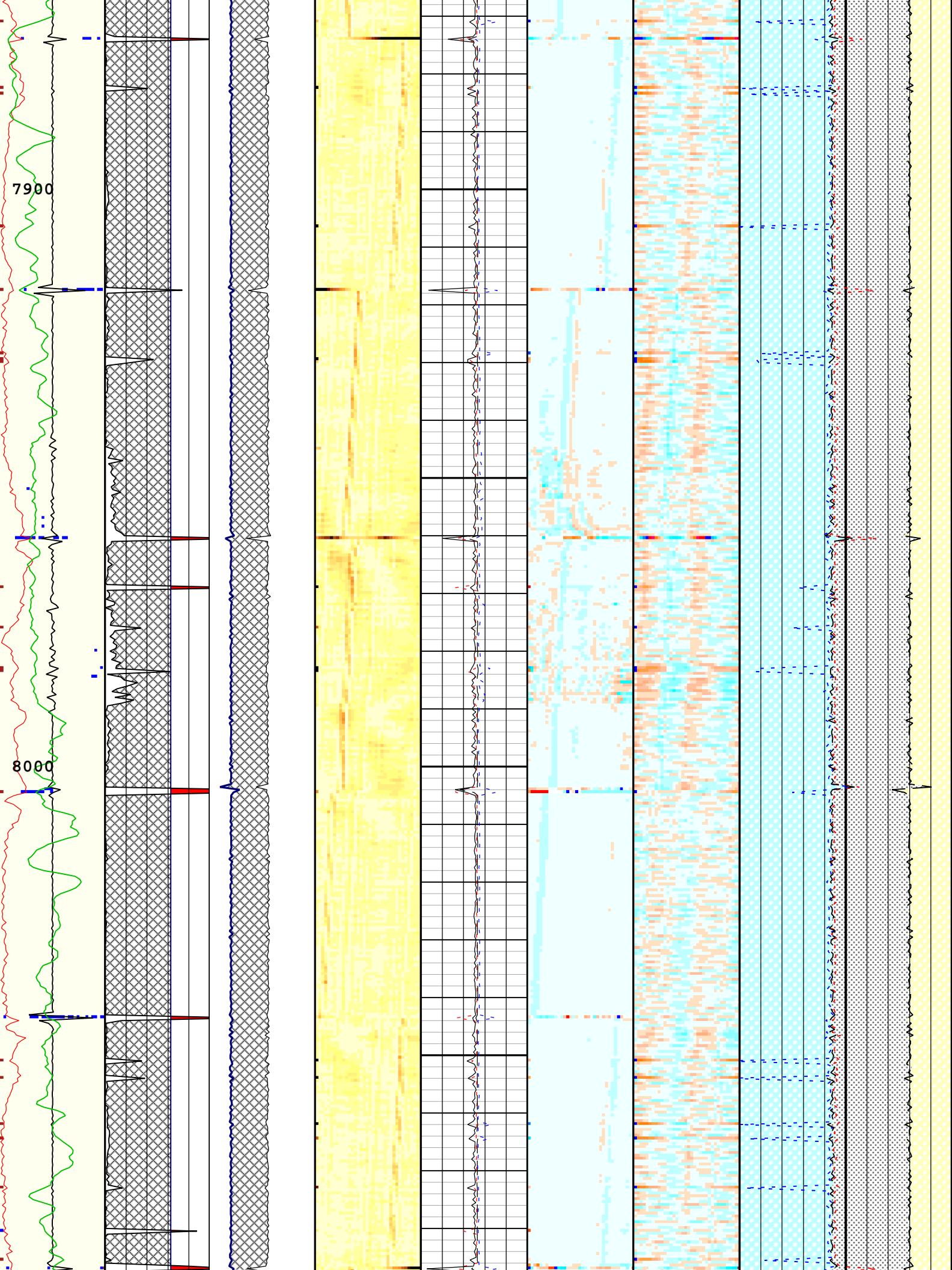


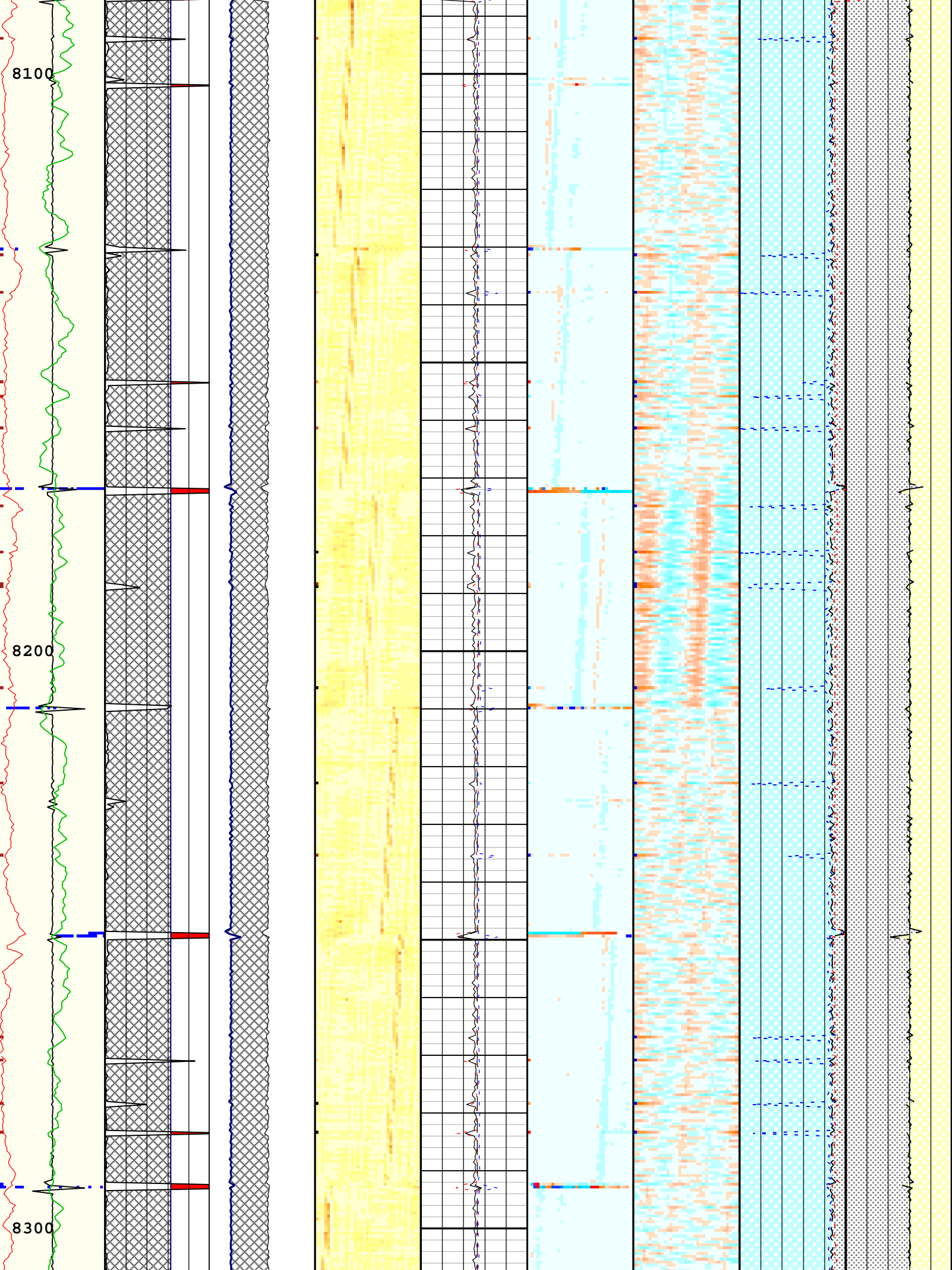


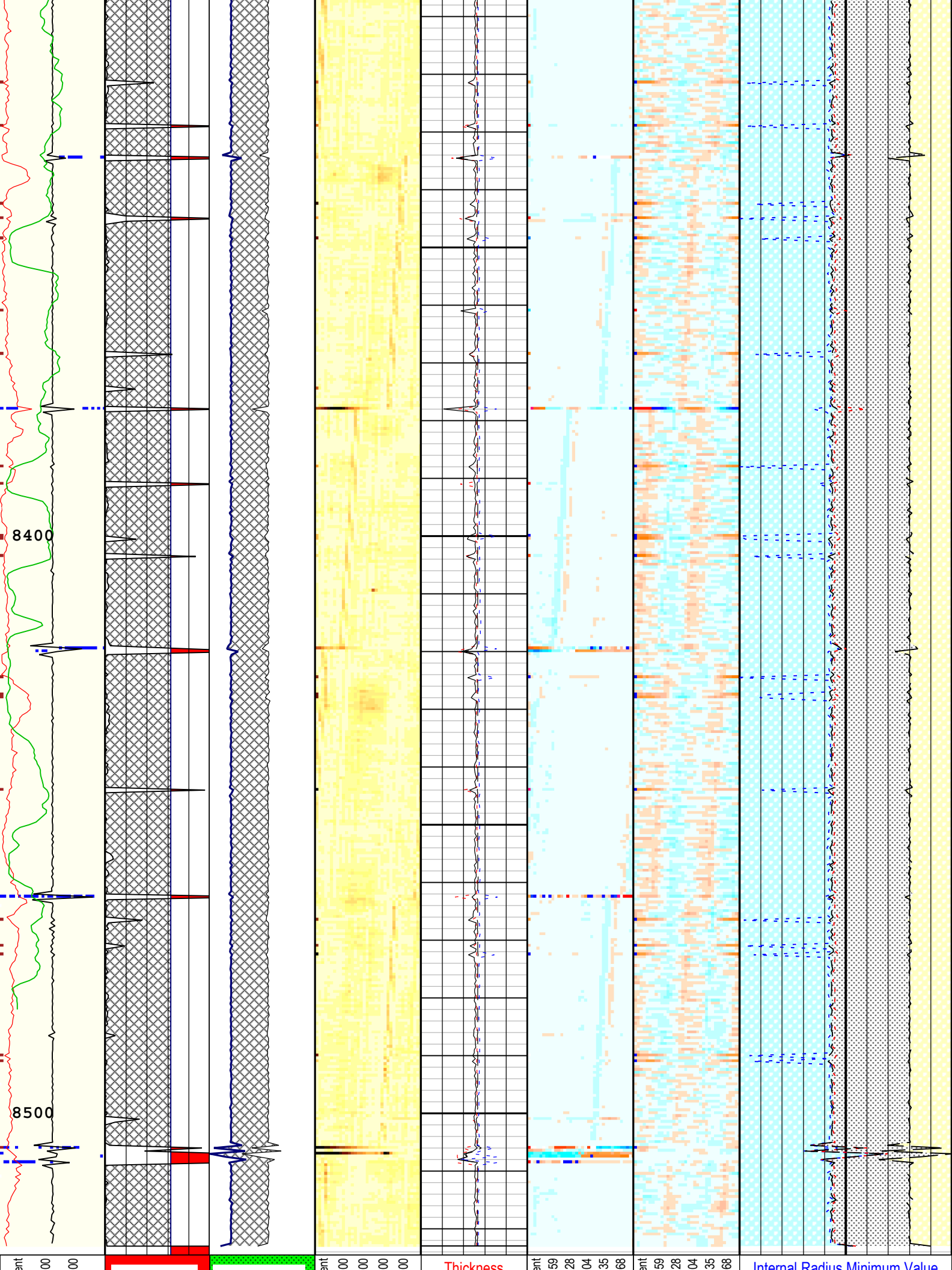


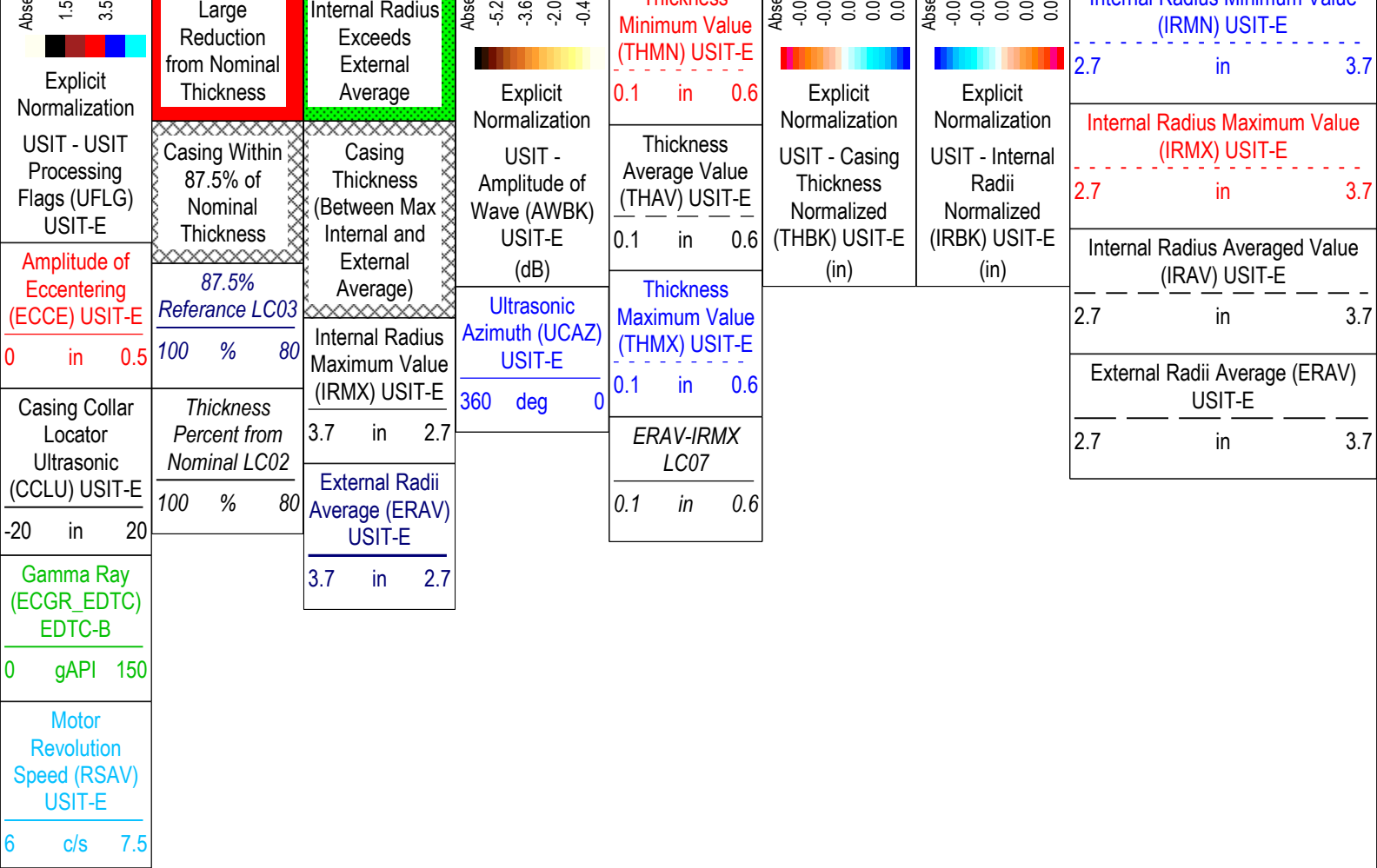














IBC_FRP_OFFSET	IBC Flexural Offset from Free Pipe	USIT-E	8.23	dB/m
FSOD	USIT IBC Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF	
IBC_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	IBC_FRP_OFFSET	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	FreePipe Norm.	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.5	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.27	
MUD_N_INV	IBC Inversion Mud Normalization Factor	USIT-E	1.2	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1	
U-USIT_OCDI	Outer Casing Diameter	USIT-E	0	in
U-USIT_OCSH	Outer Casing Shoe	USIT-E	0	ft
U-USIT_OCWE	Outer Casing Weight	USIT-E	0	lbm/ft
RCOD	Reference Calibrator Outer Diameter	USIT-E	7	in
RCSO	Reference Calibrator Standoff	USIT-E	1.181	in
RCTH	Reference Calibrator Thickness	USIT-E	0.295	in
SOCN	Standoff Distance	EDTC-B	0.125	in
SOCO	Standoff Correction Option	EDTC-B	No	
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	%
TPOS_EDTC	Tool Position: Centered or Eccentered	EDTC-B	Eccentered	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.75	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	-18.58	dB/m
UFGDE	Fiberglass Density	USIT-E	16.27	lbm/gal
UFGPS	Fiberglass Processing Selection	USIT-E	No	
UFGVL	Fiberglass Velocity	USIT-E	9678.48	ft/s
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SLG - TIE Picking	
THDP	Thickness Detection Policy	USIT-E	Fundamental	
VCAS	Ultrasonic Transversal Velocity in Casing	USIT-E	51.4	us/ft
ZCAS	Acoustic Impedance of Casing	USIT-E	46.25	Mrayl
ZINI	Initial Estimate of Cement Impedance	USIT-E	-1	Mrayl
ZMUD	Acoustic Impedance of Mud	Borehole	1.75	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.4	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Depth Zone Parameters			
Parameter	Value	Start ( ft )	Stop ( ft )
BS	12.25	420	1009
BS	8.75	1009	8524.5
All depth are actual.			

Tool Control Parameters

TWO: Parameters				
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	48	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
DOT(DOS)	Distance between Opposite Transducer Faces	USIT-E	2.874	in
EMXY	EMEX Voltage	USIT-E	45	V

MMV	EMEX Voltage	USIT-E	43	V
HRES	Horizontal Resolution	USIT-E	10 deg	
MOTOR_PROTECT	Motor Protection	USIT-E	On	
TMUC	Type of Mud	USIT-E	BRI	
UACLV_PERM	Ultrasonic ACLV Permanent	USIT-E	No	
U-USIT_UFWB	Far Receiver Window Begin Time	USIT-E	130	us
U-USIT_UFWE	Far Receiver Window End Time	USIT-E	Time Zoned	us
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UMFR	Modulation Frequency	USIT-E	333333	Hz
U-USIT_UNWB	Near Receiver Window Begin Time	USIT-E	99	us
U-USIT_UNWE	Near Receiver Window End Time	USIT-E	Time Zoned	us
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 6.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	8525	ft
USSP	Ultrasonic Service	USIT-E	IBC	
U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VRES	Vertical Resolution	USIT-E	6.0 in	
WINB	Window Begin Time	USIT-E	35.04	us
WINE	Window End Time	USIT-E	75.04	us

Time Zone Parameters					
Parameter	Value	Start Time	Stop Time	Start Depth ( ft )	Stop Depth ( ft )
U-USIT_UFWE	170	22-Feb-2017 09:48:51	22-Feb-2017 09:49:21	8524.65	8520.98
U-USIT_UFWE	167.97	22-Feb-2017 09:49:21	22-Feb-2017 09:49:22	8520.98	8520.62
U-USIT_UFWE	165.59	22-Feb-2017 09:49:22	22-Feb-2017 09:50:51	8520.62	8497.67
U-USIT_UFWE	168.37	22-Feb-2017 09:50:51	22-Feb-2017 10:04:53	8497.67	7938.52
U-USIT_UFWE	173.13	22-Feb-2017 10:04:53	22-Feb-2017 10:14:43	7938.52	7525.54
U-USIT_UFWE	168.37	22-Feb-2017 10:14:43	22-Feb-2017 10:14:46	7525.54	7523.98
U-USIT_UFWE	166.38	22-Feb-2017 10:14:46	22-Feb-2017 10:14:52	7523.98	7519.51
U-USIT_UFWE	165.19	22-Feb-2017 10:14:52	22-Feb-2017 10:19:25	7519.51	7329.98
U-USIT_UFWE	162.18	22-Feb-2017 10:19:25	22-Feb-2017 10:23:27	7329.98	7161.93
U-USIT_UFWE	161.53	22-Feb-2017 10:23:27	22-Feb-2017 10:26:45	7161.93	7020.88
U-USIT_UFWE	159.27	22-Feb-2017 10:26:45	22-Feb-2017 11:13:20	7020.88	5028.98
U-USIT_UFWE	165.29	22-Feb-2017 11:13:20	22-Feb-2017 11:13:24	5028.98	5026.23
U-USIT_UFWE	169.06	22-Feb-2017 11:13:24	22-Feb-2017 12:03:01	5026.23	2869.55
U-USIT_UFWE	165.99	22-Feb-2017 12:03:01	22-Feb-2017 12:32:35	2869.55	1648.29
U-USIT_UFWE	172.92	22-Feb-2017 12:32:35	22-Feb-2017 12:36:43	1648.29	1476.54
U-USIT_UFWE	168.72	22-Feb-2017 12:36:43	22-Feb-2017 12:36:46	1476.54	1474.1
U-USIT_UFWE	165.57	22-Feb-2017 12:36:46	22-Feb-2017 12:38:36	1474.1	1397.46
U-USIT_UFWE	152.69	22-Feb-2017 12:38:36	22-Feb-2017 12:38:39	1397.46	1395.76
U-USIT_UFWE	154.1	22-Feb-2017 12:38:39	22-Feb-2017 12:38:42	1395.76	1393.15
U-USIT_UFWE	158.33	22-Feb-2017 12:38:42	22-Feb-2017 13:03:27	1393.15	345.71
U-USIT_UNWE	139	22-Feb-2017 09:48:51	22-Feb-2017 09:49:16	8524.65	8522.17
U-USIT_UNWE	134.27	22-Feb-2017 09:49:16	22-Feb-2017 09:49:18	8522.17	8521.64
U-USIT_UNWE	133.48	22-Feb-2017 09:49:18	22-Feb-2017 09:59:23	8521.64	8169.99
U-USIT_UNWE	139.34	22-Feb-2017 09:59:23	22-Feb-2017 10:04:57	8169.99	7935.49
U-USIT_UNWE	141.42	22-Feb-2017 10:04:57	22-Feb-2017 10:09:59	7935.49	7722.39

U-USIT_UNWE	136.16	22-Feb-2017 10:09:59	22-Feb-2017 10:10:03	7722.39	7720.15
U-USIT_UNWE	135.46	22-Feb-2017 10:10:03	22-Feb-2017 10:15:01	7720.15	7513.1
U-USIT_UNWE	133.48	22-Feb-2017 10:15:01	22-Feb-2017 10:16:42	7513.1	7443.39
U-USIT_UNWE	136.87	22-Feb-2017 10:16:42	22-Feb-2017 10:16:43	7443.39	7442.4
U-USIT_UNWE	137.57	22-Feb-2017 10:16:43	22-Feb-2017 10:17:22	7442.4	7415.64
U-USIT_UNWE	133.35	22-Feb-2017 10:17:22	22-Feb-2017 10:23:19	7415.64	7167.08
U-USIT_UNWE	128.42	22-Feb-2017 10:23:19	22-Feb-2017 12:03:15	7167.08	2859.58
U-USIT_UNWE	125.55	22-Feb-2017 12:03:15	22-Feb-2017 12:03:25	2859.58	2852.23
U-USIT_UNWE	129.91	22-Feb-2017 12:03:25	22-Feb-2017 12:32:31	2852.23	1651.09
U-USIT_UNWE	135.11	22-Feb-2017 12:32:31	22-Feb-2017 12:36:49	1651.09	1472.08
U-USIT_UNWE	127.76	22-Feb-2017 12:36:49	22-Feb-2017 13:03:27	1472.08	345.71

All depth are at tool zero.

TWO

High Resolution IBC Casing Integrity TD-7400

Software Version	
Acquisition System	Version
Maxwell 2017 SP1	7.1.82245.3100

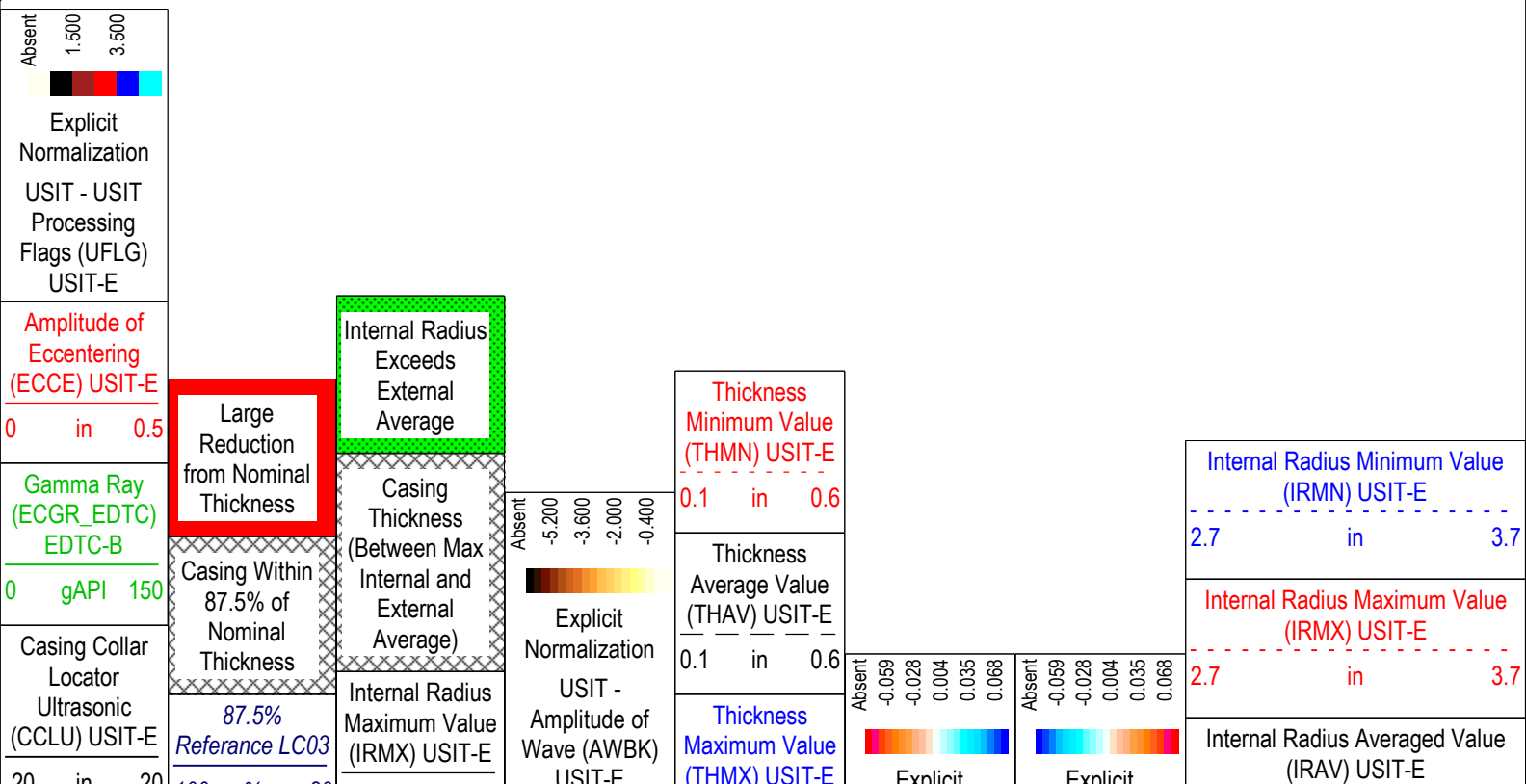
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
TWO	Log[6]:Up	Up	7348.22 ft	8515.40 ft	22-Feb-2017 1:28:08 PM	22-Feb-2017 2:25:22 PM	ON	3.65 ft	Yes

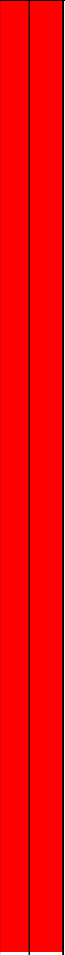
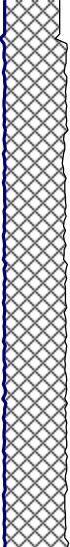
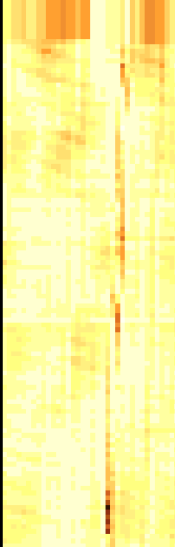
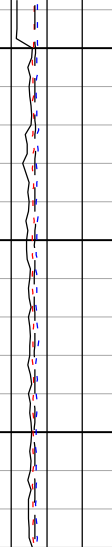
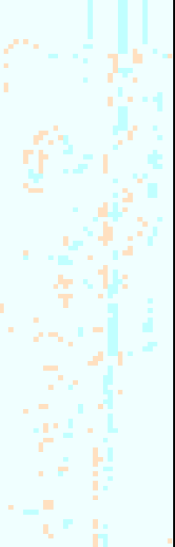
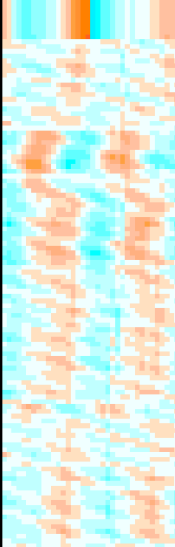
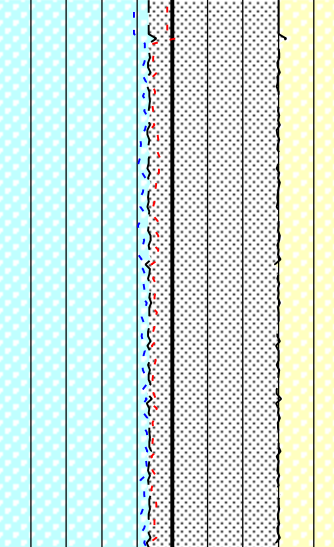
All depths are referenced to toolstring zero

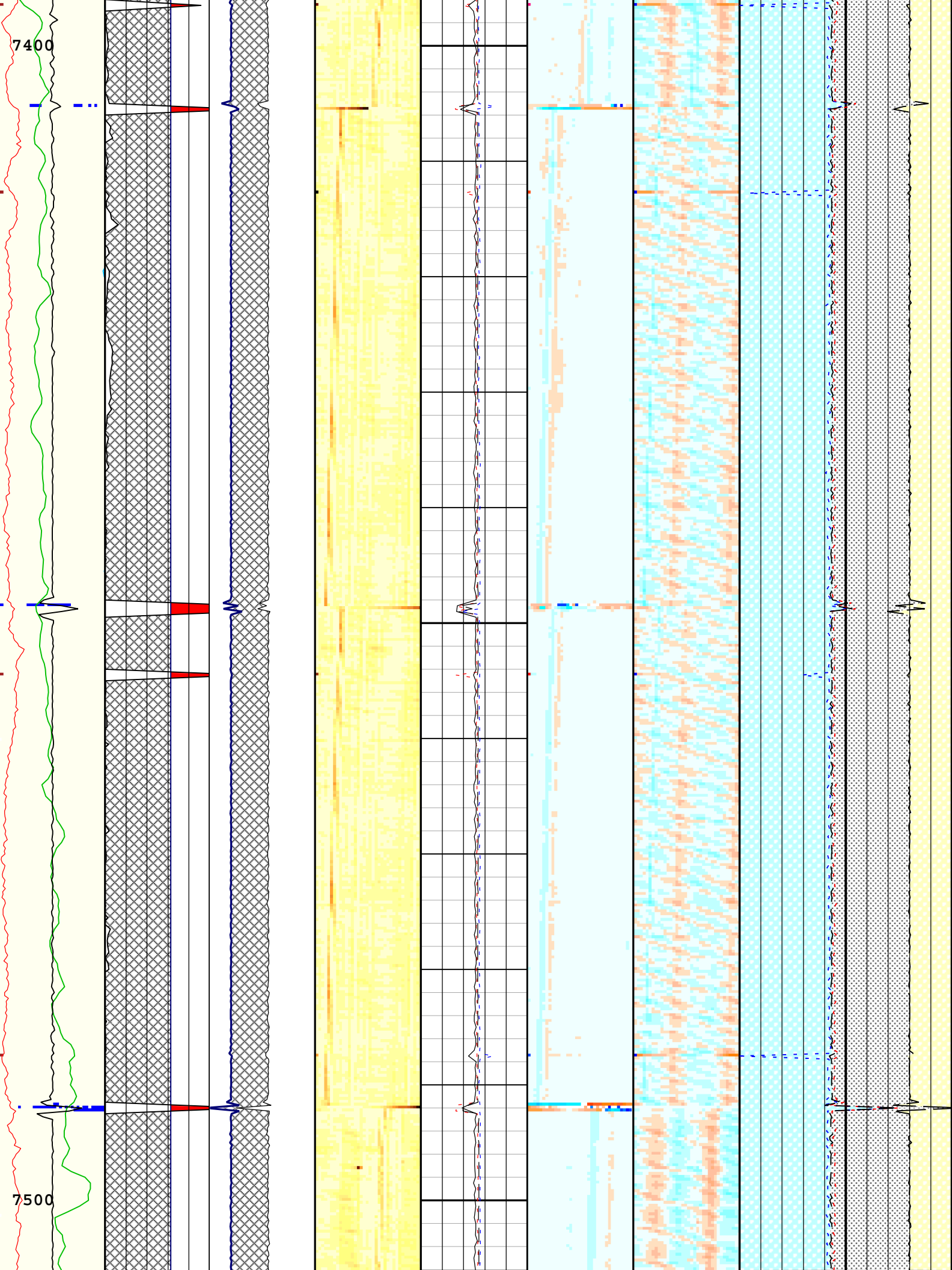
Log	Company:Expedition Water Solutions LLC      Well:EWS 4 TWO: Log[6]:Up:S015
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Description: USI Corrosion    Format: Log ( USI IBC Casing Integrity HiRes )    Index Scale: 10 in per 100 ft    Index Unit: ft    Index Type: Measured Depth  
Creation Date: 24-Feb-2017 08:57:00

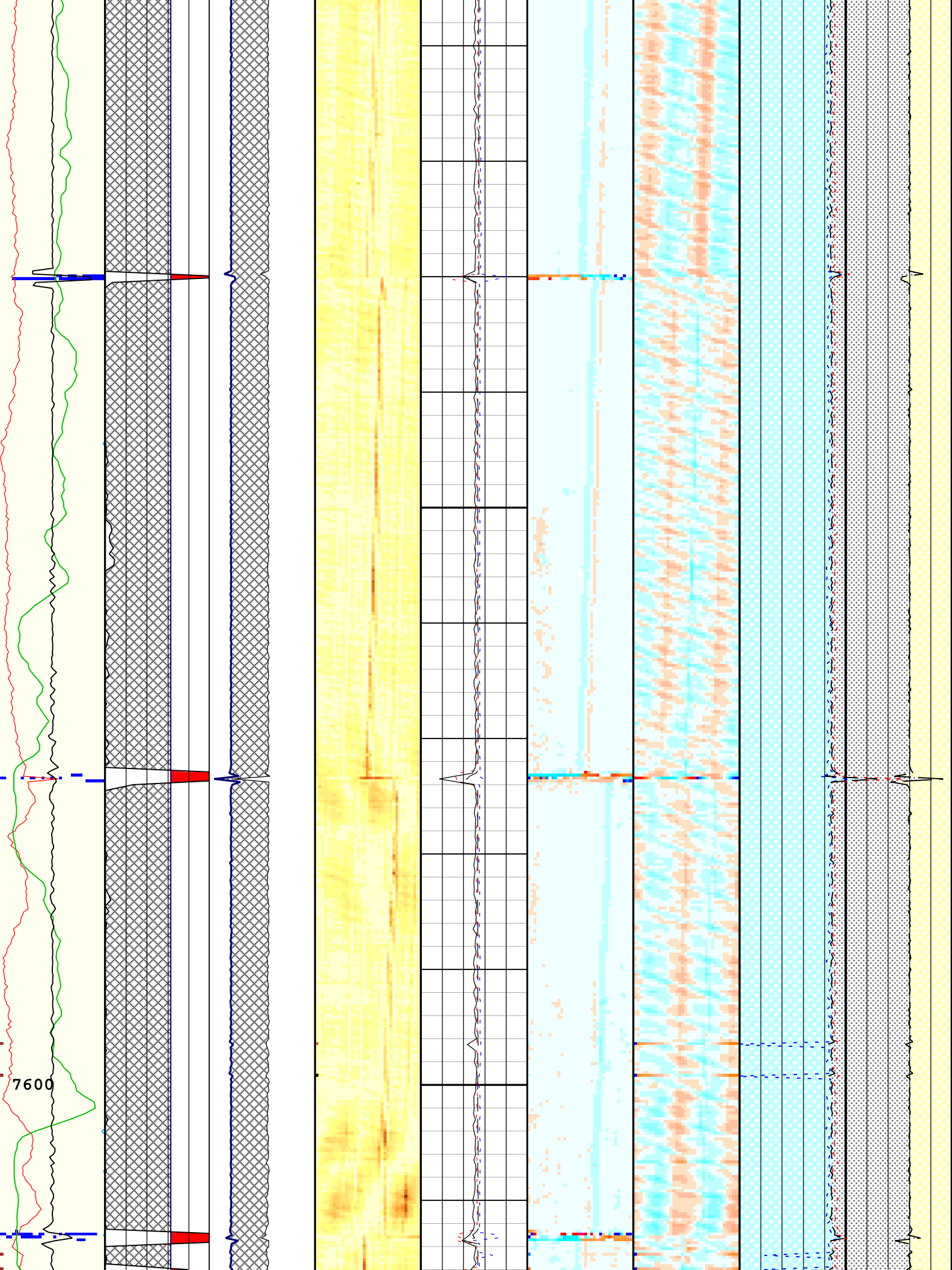
TIME\_1900 - Time Marked every 60.00 (s)

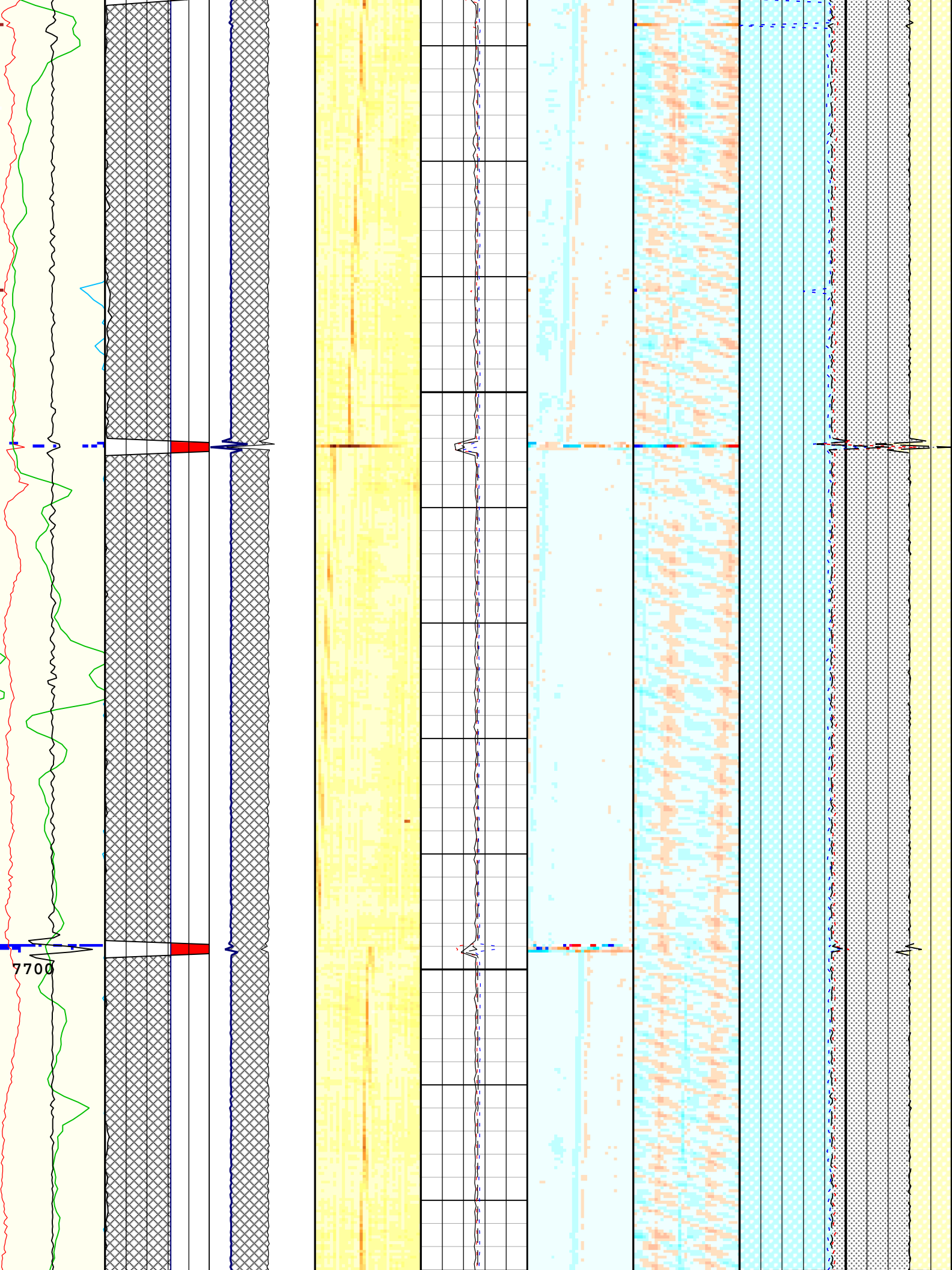


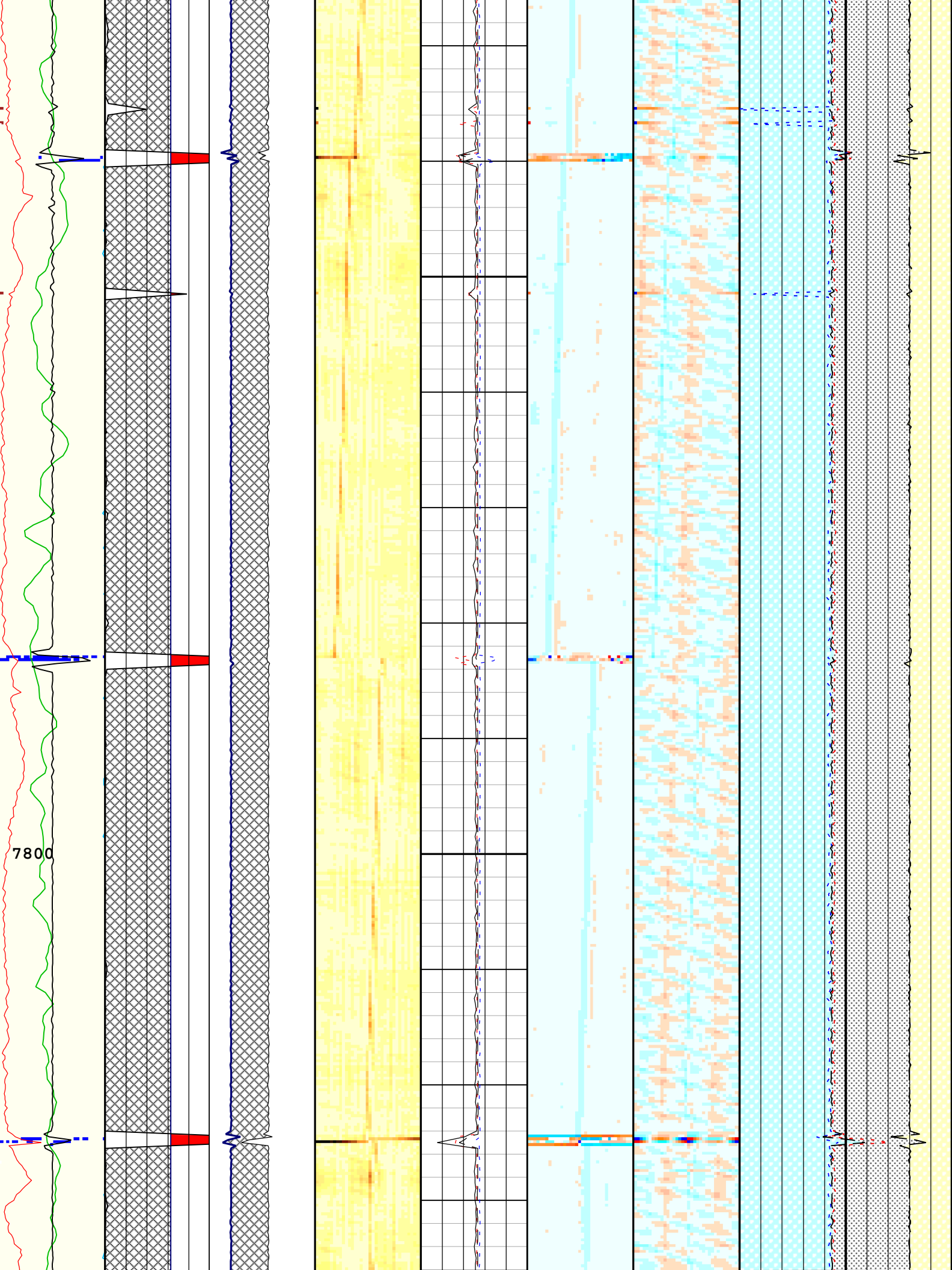
Motor Revolution Speed (RSAV) USIT-E			Thickness Percent from Nominal LC02			External Radii Average (ERAV) USIT-E			Ultrasonic Azimuth (UCAZ) USIT-E			ERAV-IRMX LC07			Explicit Normalization USIT - Casing Thickness Normalized (THBK) USIT-E (in)			Explicit Normalization USIT - Internal Radii Normalized (IRBK) USIT-E (in)			External Radii Average (ERAV) USIT-E		
20	in	20	100	%	80	3.7	in	2.7	(dB)	0.1	in	0.6	0.1	in	0.6	2.7	in	3.7					
6	c/s	7.5	100	%	80	3.7	in	2.7	360 deg	0	0.1	in	0.6			2.7	in	3.7					
7300																							

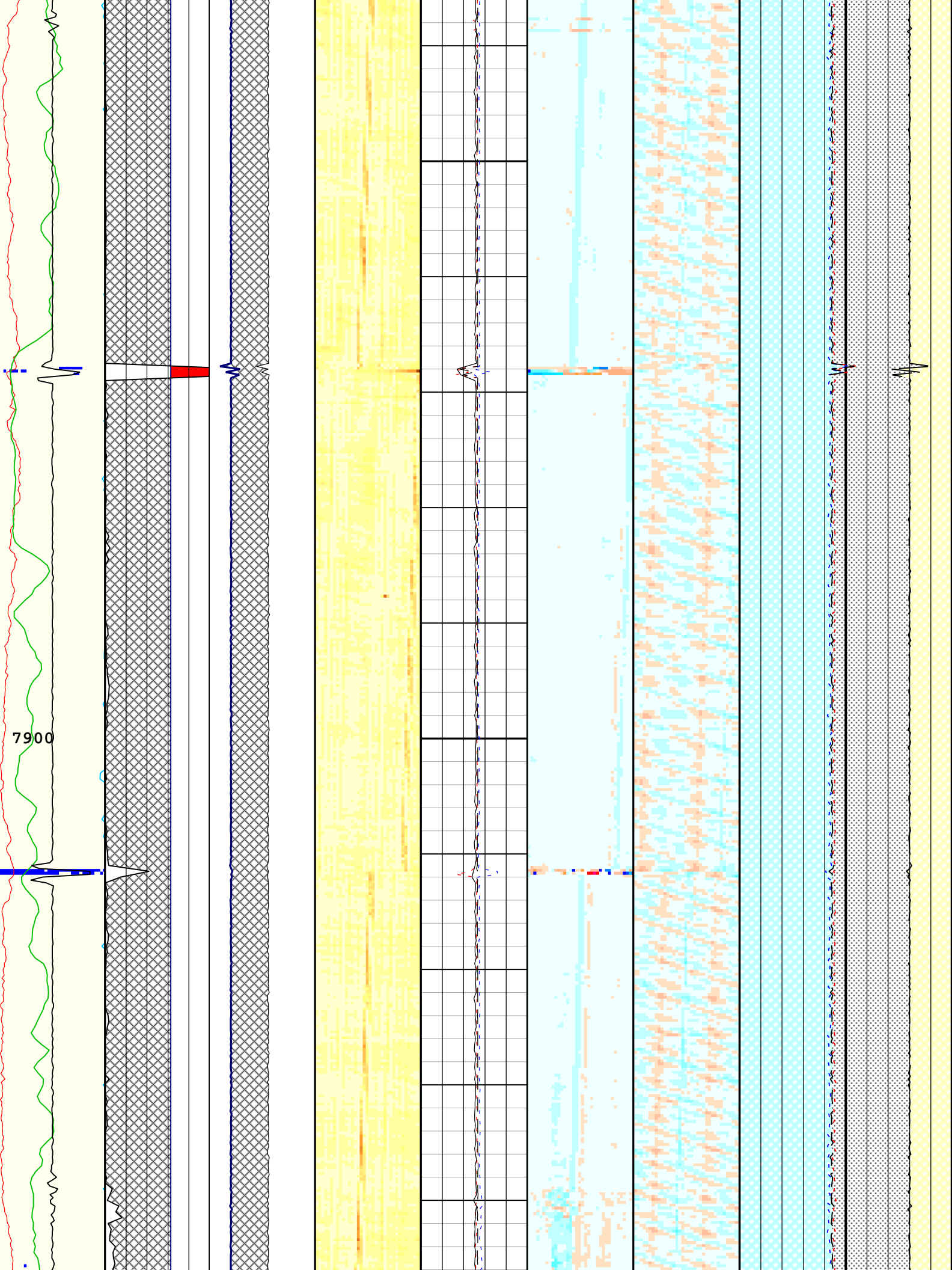


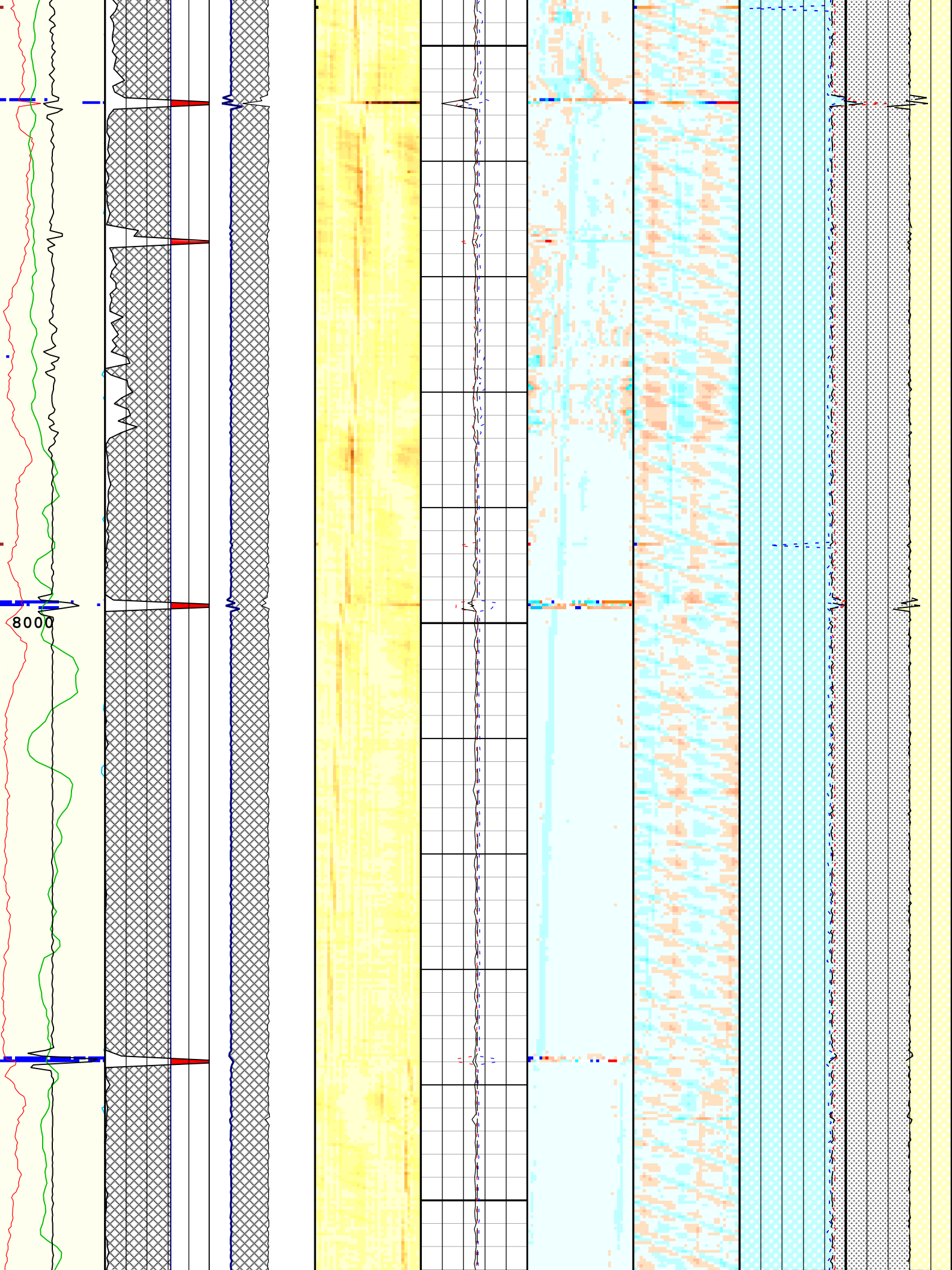




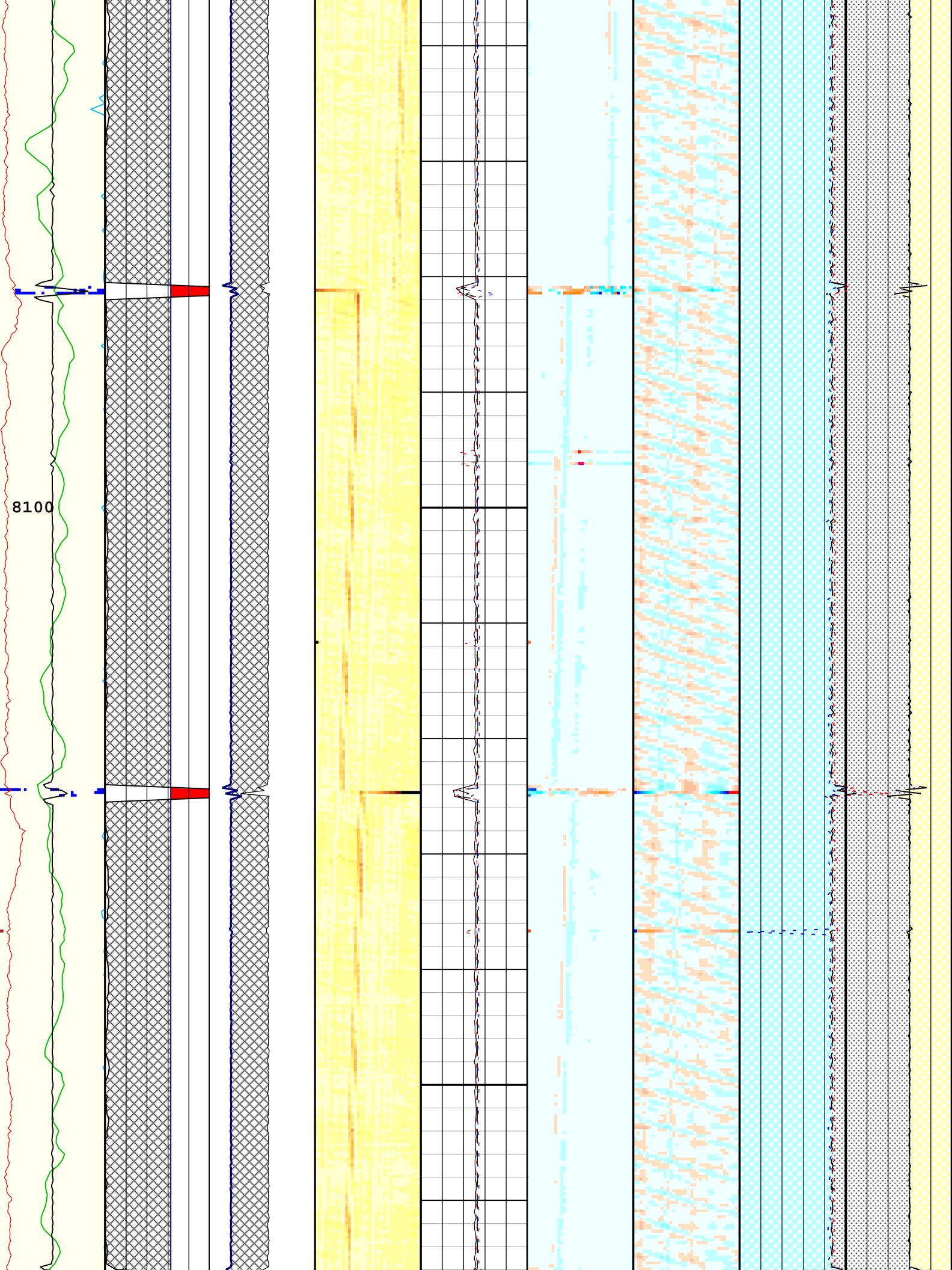


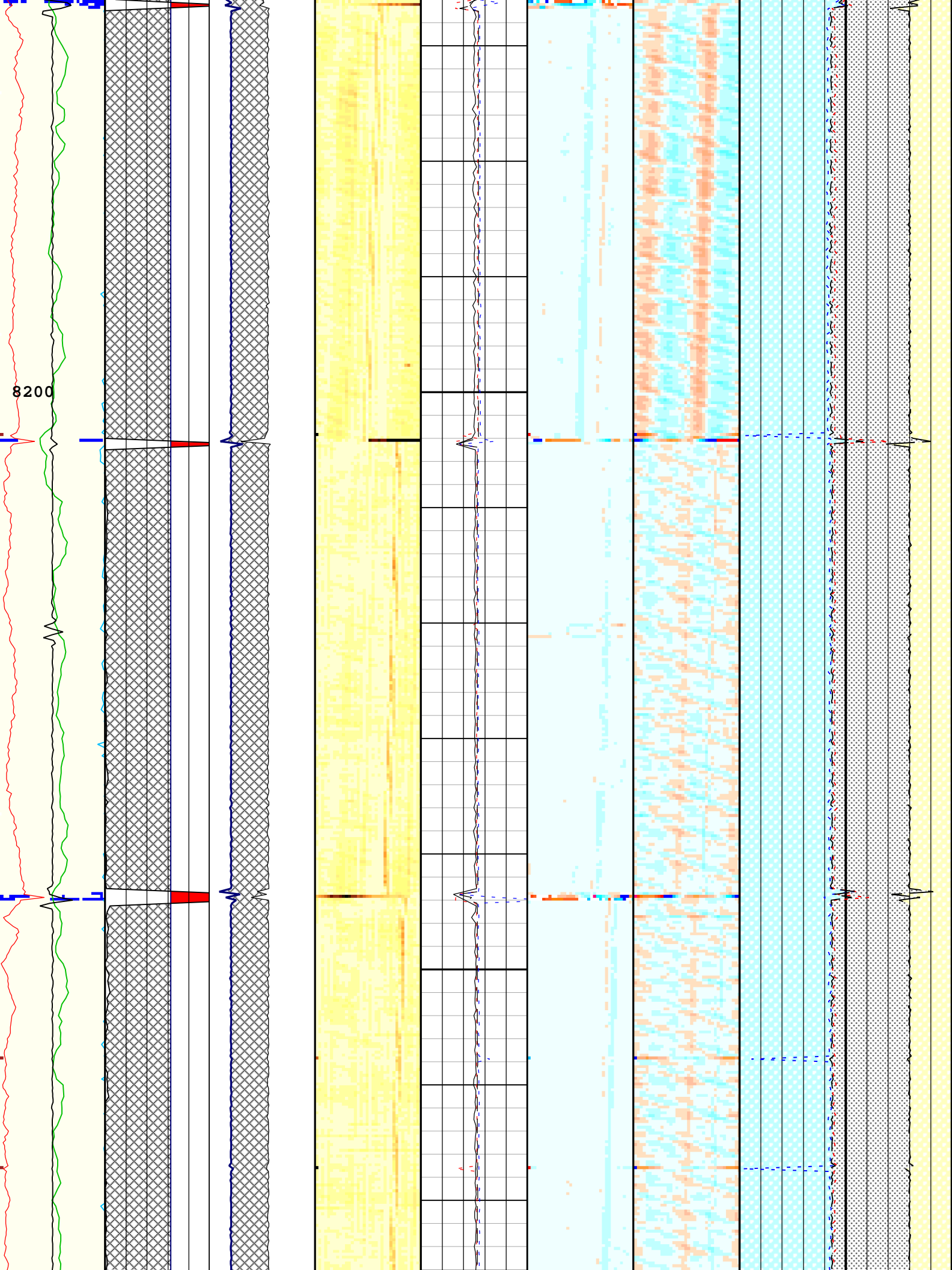


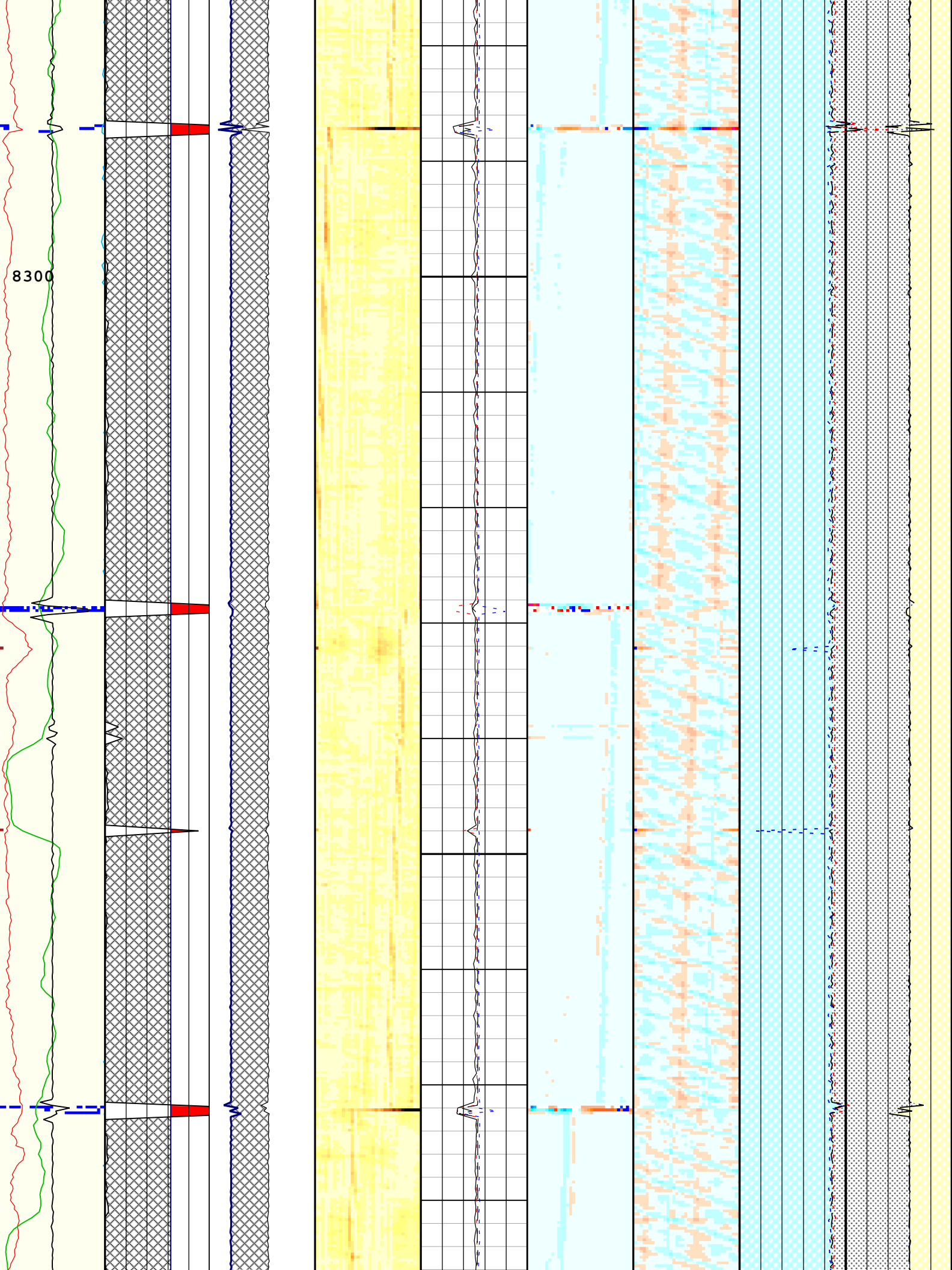


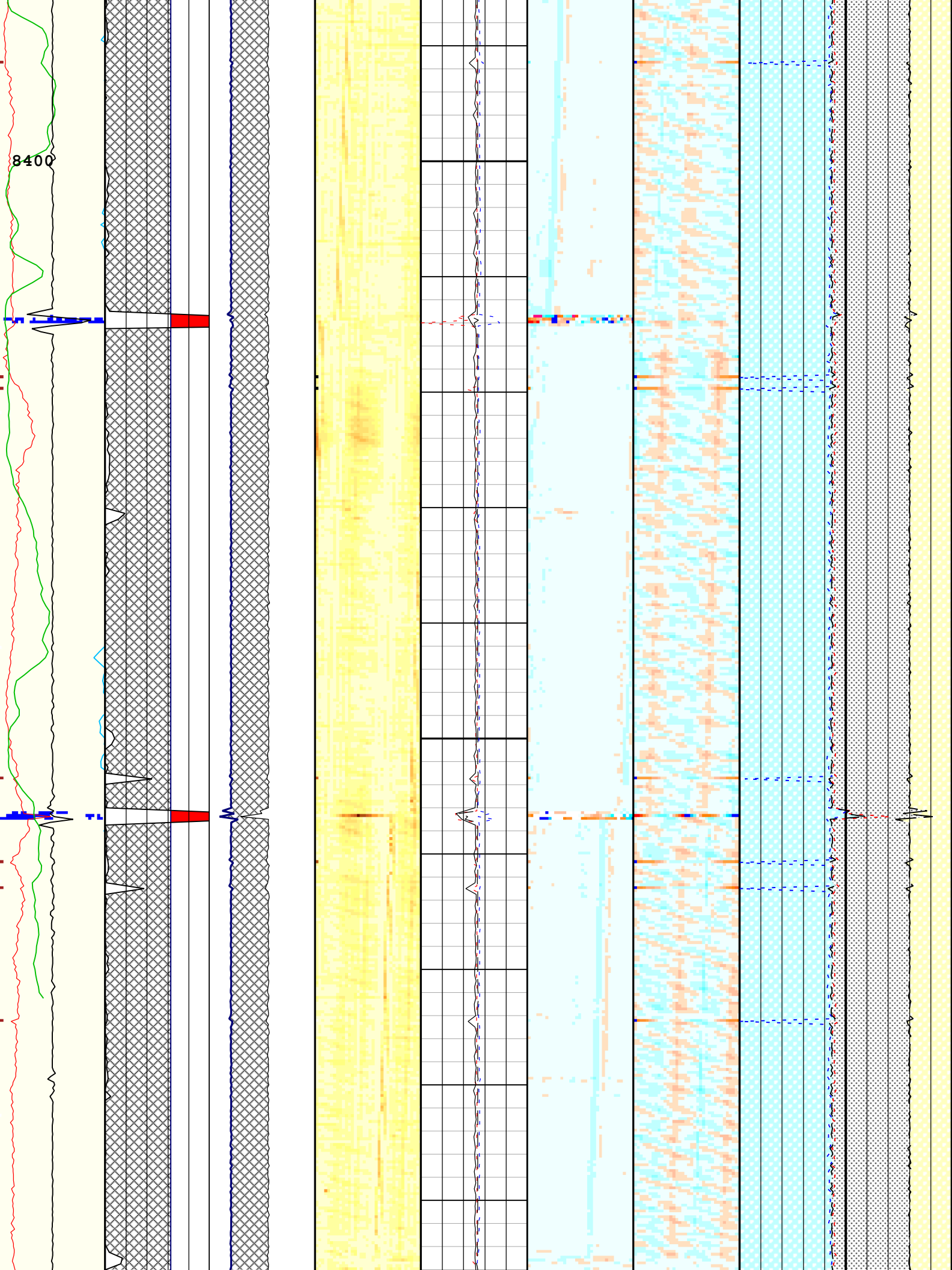


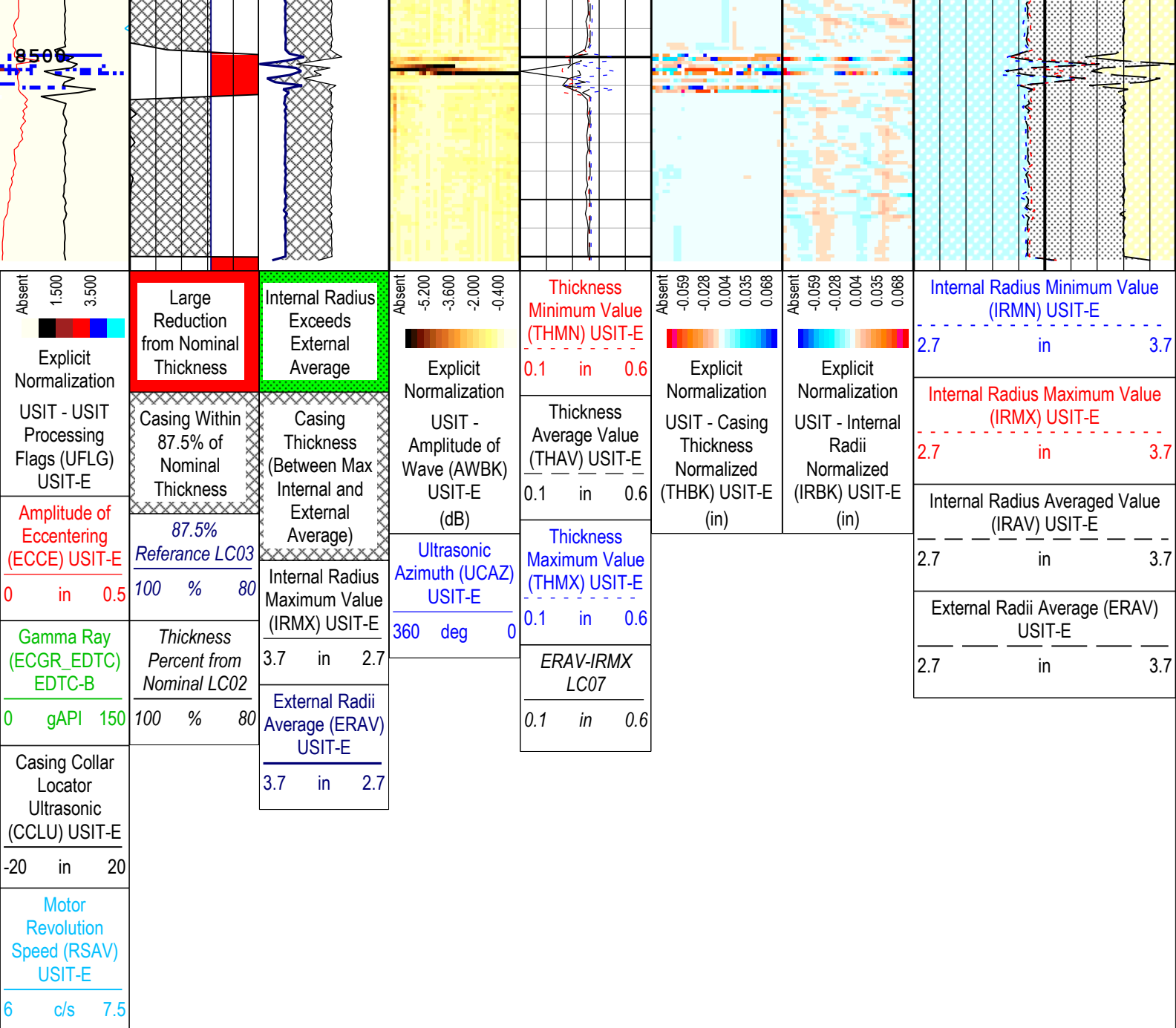












## Channel Processing Parameters

### TWO: Parameters



DFD	Drilling Fluid Density	Borehole	9.1	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	190	us/ft
FD	Fluid Density	USIT-E	10	lbm/gal
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
GR_MULTIPLIER	Gamma Ray Multiplier	EDTC-B	1	
HEMA	Hematite Presence Flag	Borehole	No	
IBC_FRP_OFFSET	IBC Flexural Offset from Free Pipe	USIT-E	8.23	dB/m
FSOD	USIT IBC Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF	
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	FreePipe Norm.	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.5	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.27	
MUD_N_INV	IBC Inversion Mud Normalization Factor	USIT-E	1.2	
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1	
U-USIT_OCDI	Outer Casing Diameter	USIT-E	0	in
U-USIT_OCSH	Outer Casing Shoe	USIT-E	0	ft
U-USIT_OCWE	Outer Casing Weight	USIT-E	0	lbm/ft
RCOD	Reference Calibrator Outer Diameter	USIT-E	7	in
RCSO	Reference Calibrator Standoff	USIT-E	1.181	in
RCTH	Reference Calibrator Thickness	USIT-E	0.295	in
SOCN	Standoff Distance	EDTC-B	0.125	in
SOCO	Standoff Correction Option	EDTC-B	No	
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	%
TPOS_EDTC	Tool Position: Centered or Eccentered	EDTC-B	Eccentered	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	1.75	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	-18.58	dB/m
UFGDE	Fiberglass Density	USIT-E	16.27	lbm/gal
UFGPS	Fiberglass Processing Selection	USIT-E	No	
UFGVL	Fiberglass Velocity	USIT-E	9678.48	ft/s
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SLG - TIE Picking	
THDP	Thickness Detection Policy	USIT-E	Fundamental	
VCAS	Ultrasonic Transversal Velocity in Casing	USIT-E	51.4	us/ft
ZCAS	Acoustic Impedance of Casing	USIT-E	46.25	Mrayl
ZINI	Initial Estimate of Cement Impedance	USIT-E	-1	Mrayl
ZMUD	Acoustic Impedance of Mud	Borehole	1.75	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.4	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

## Tool Control Parameters

### TWO: Parameters

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

AGMX	Maximum Gain of Cartridge	USIT-E	48	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
DOT(DOS)	Distance between Opposite Transducer Faces	USIT-E	2.874	in
EMXV	EMEX Voltage	USIT-E	45	V
HRES	Horizontal Resolution	USIT-E	10 deg	
MOTOR_PROTECT	Motor Protection	USIT-E	On	
TMUC	Type of Mud	USIT-E	BRI	
UACLV_PERM	Ultrasonic ACLV Permanent	USIT-E	No	
U-USIT_UFWB	Far Receiver Window Begin Time	USIT-E	130	us
U-USIT_UFWE	Far Receiver Window End Time	USIT-E	Time Zoned	us
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UMFR	Modulation Frequency	USIT-E	333333	Hz
U-USIT_UNWB	Near Receiver Window Begin Time	USIT-E	99	us
U-USIT_UNWE	Near Receiver Window End Time	USIT-E	Time Zoned	us
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 3.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	8525	ft
USSP	Ultrasonic Service	USIT-E	IBC	
U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VRES	Vertical Resolution	USIT-E	3.0 in	
WINB	Window Begin Time	USIT-E	35.04	us
WINE	Window End Time	USIT-E	Time Zoned	us

## Time Zone Parameters

Parameter	Value	Start Time	Stop Time	Start Depth ( ft )	Stop Depth ( ft )
U-USIT_UFWE	170	22-Feb-2017 13:28:08	22-Feb-2017 13:29:14	8515.4	8497.83
U-USIT_UFWE	169.77	22-Feb-2017 13:29:14	22-Feb-2017 13:33:52	8497.83	8403.94
U-USIT_UFWE	166.62	22-Feb-2017 13:33:52	22-Feb-2017 14:25:22	8403.94	7348.22
U-USIT_UNWE	139	22-Feb-2017 13:28:08	22-Feb-2017 13:29:11	8515.4	8498.81
U-USIT_UNWE	133.01	22-Feb-2017 13:29:11	22-Feb-2017 13:34:00	8498.81	8401.17
U-USIT_UNWE	128.81	22-Feb-2017 13:34:00	22-Feb-2017 14:25:22	8401.17	7348.22
WINE	75.04	22-Feb-2017 13:28:08	22-Feb-2017 13:30:08	8515.4	8479.71
WINE	75.35	22-Feb-2017 13:30:08	22-Feb-2017 13:30:09	8479.71	8479.33
WINE	77.1	22-Feb-2017 13:30:09	22-Feb-2017 14:25:22	8479.33	7348.22

All depth are at tool zero.

## Run 3

## High Resolution IBC Casing Integrity

### Software Version

Acquisition System	Version
Maxwell 2017 SP1	7.1.82245.3100

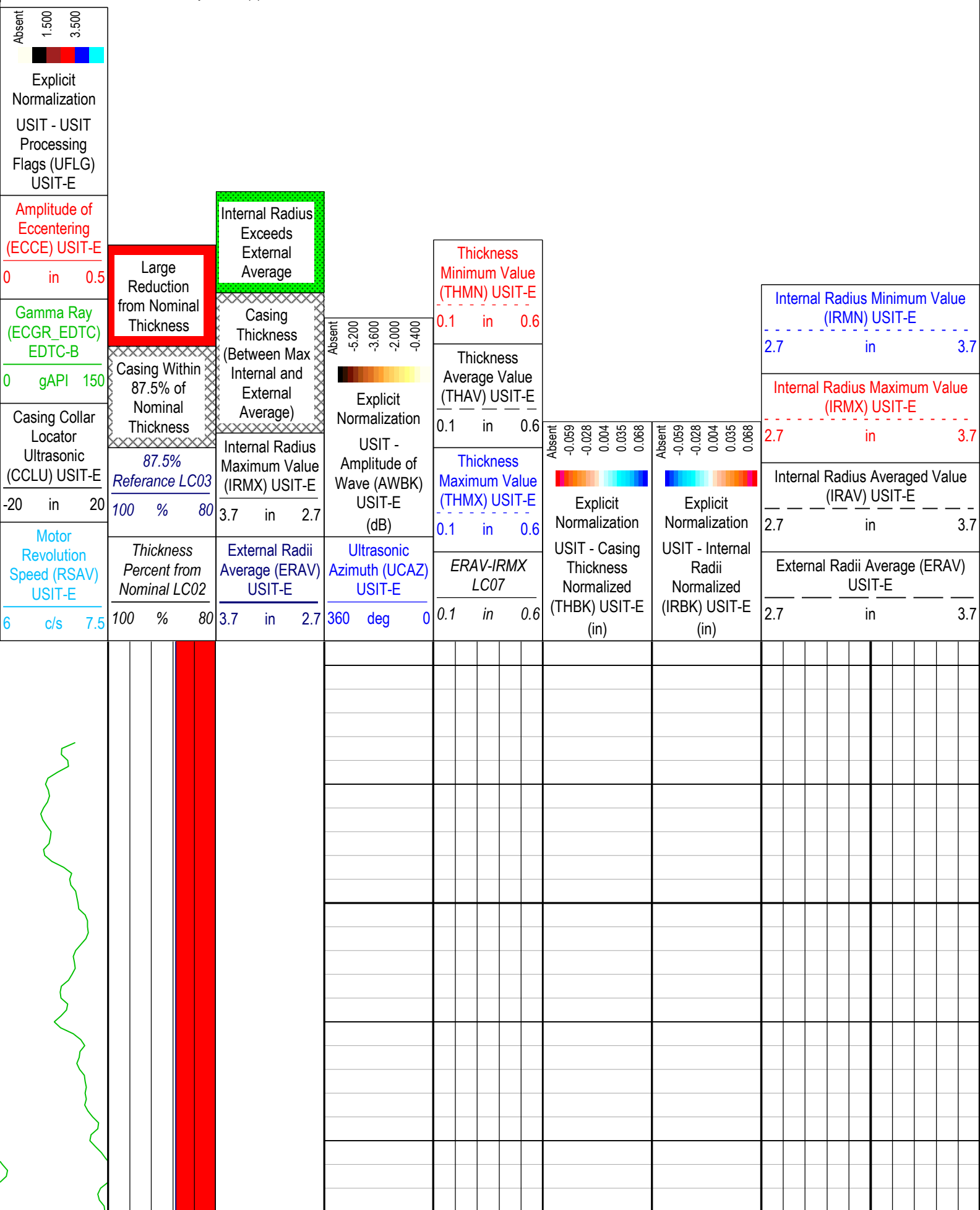
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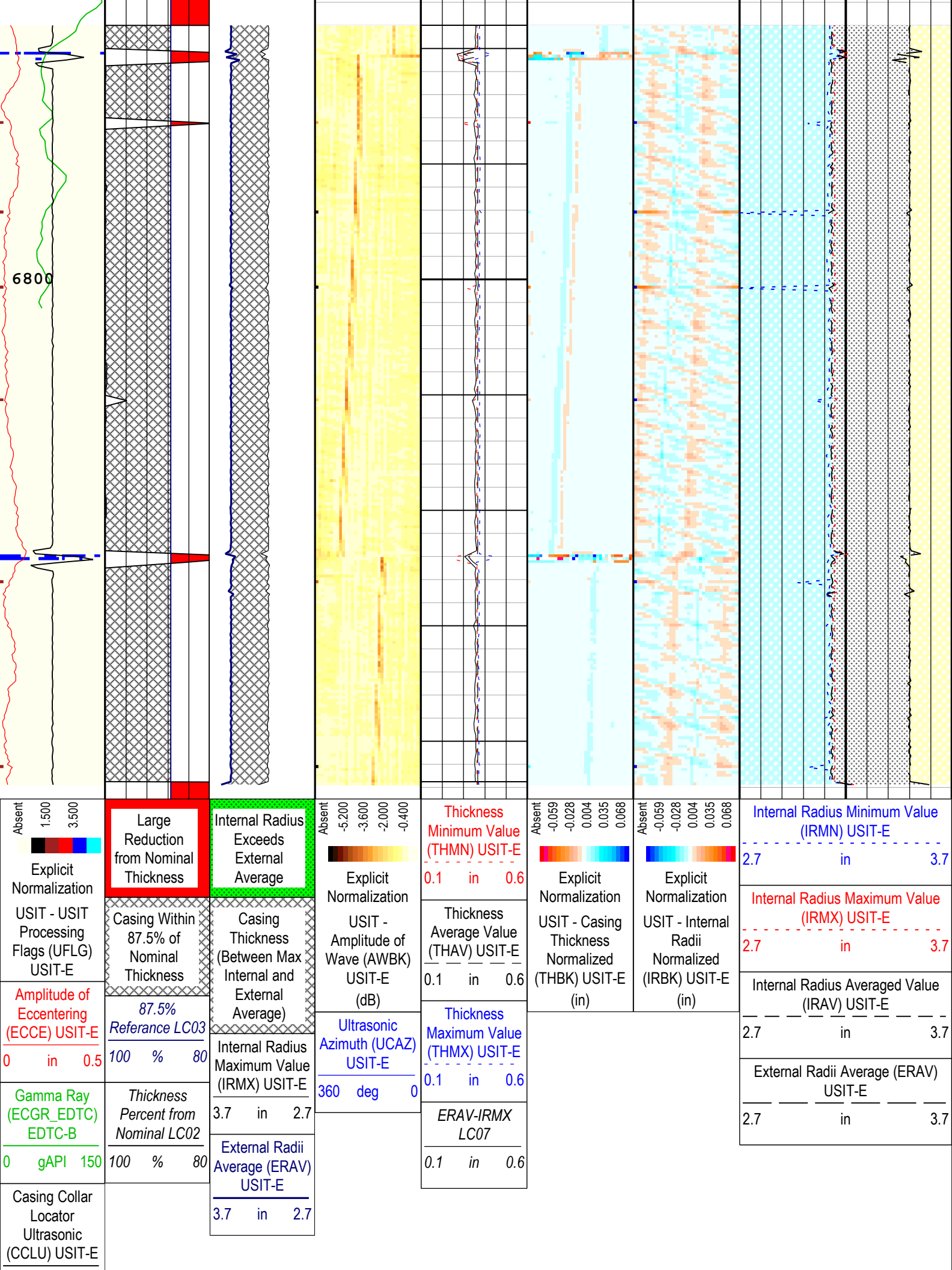
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Run 3	Log[3]:Up	Up	6778.66 ft	6845.27 ft	22-Feb-2017 3:46:56 PM	22-Feb-2017 3:50:12 PM	ON	3.39 ft	Yes

All depths are referenced to toolstring zero

Description: USI Corrosion    Format: Log ( USI IBC Casing Integrity HiRes )    Index Scale: 10 in per 100 ft    Index Unit: ft    Index Type: Measured Depth  
Creation Date: 24-Feb-2017 08:57:09

TIME\_1900 - Time Marked every 60.00 (s)





Channel Processing Parameters

Run 3: Parameters

Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BERJ	Bad Echo Rejection	USIT-E	On	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	8.75	in
CASING_PRATIO	Casing Poisson Ratio	USIT-E	Standard Poisson Ratio	
CBLO	Casing Bottom (Logger)	WLSESSION	8552	ft
CDEN	Cement Density	USIT-E	0	lbm/gal
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.362	in
CYSTLGR	Casing Yield Strength - Zoned along logger depths	WLSESSION	0	psi
DFD	Drilling Fluid Density	Borehole	9.1	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	190	us/ft
FD	Fluid Density	USIT-E	10	lbm/gal
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
GR_MULTIPLIER	Gamma Ray Multiplier	EDTC-B	1	
HEMA	Hematite Presence Flag	Borehole	No	
FSOD	USIT IBC Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF	
IBC_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	UFAO	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	Theoretical	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.5	us
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1	
U-USIT_OCDI	Outer Casing Diameter	USIT-E	0	in
U-USIT_OCSH	Outer Casing Shoe	USIT-E	0	ft
U-USIT_OCWE	Outer Casing Weight	USIT-E	0	lbm/ft
RCOD	Reference Calibrator Outer Diameter	USIT-E	7	in
RCSO	Reference Calibrator Standoff	USIT-E	1.181	in
RCTH	Reference Calibrator Thickness	USIT-E	0.295	in
SOCN	Standoff Distance	EDTC-B	0.125	in
SOCO	Standoff Correction Option	EDTC-B	No	
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	%
TPOS_EDTC	Tool Position: Centered or Eccentered	EDTC-B	Eccentered	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	0	dB/m
UFGDE	Fiberglass Density	USIT-E	16.27	lbm/gal
UFGPS	Fiberglass Processing Selection	USIT-E	No	
UFGVL	Fiberglass Velocity	USIT-E	9678.48	ft/s
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SolidLiquidGasMap	
THDP	Thickness Detection Policy	USIT-E	Fundamental	
VCAS	Ultrasonic Transversal Velocity in Casing	USIT-E	51.4	us/ft
ZCAS	Acoustic Impedance of Casing	USIT-E	46.25	Mrayl
ZINI	Initial Estimate of Cement Impedance	USIT-E	-1	Mrayl
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

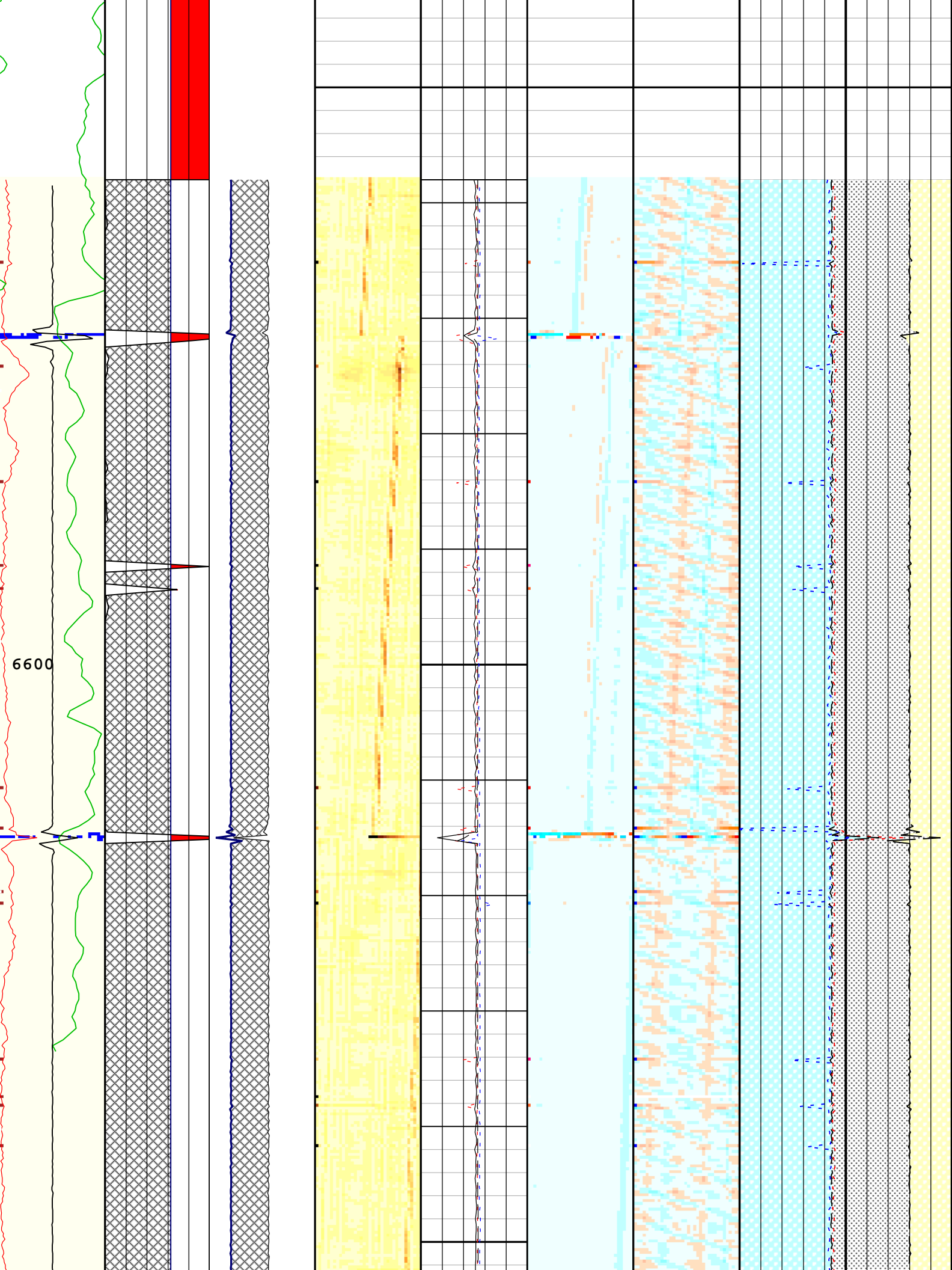
Run 3: Parameters				
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
DOT(DOS)	Distance between Opposite Transducer Faces	USIT-E	2.874	in
EMXV	EMEX Voltage	USIT-E	50	V
HRES	Horizontal Resolution	USIT-E	10 deg	
MOTOR_PROTECT	Motor Protection	USIT-E	On	
TMUC	Type of Mud	USIT-E	BRI	
UACLV_PERM	Ultrasonic ACLV Permanent	USIT-E	No	
U-USIT_UFWB	Far Receiver Window Begin Time	USIT-E	130	us
U-USIT_UFWE	Far Receiver Window End Time	USIT-E	170	us
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UMFR	Modulation Frequency	USIT-E	333333	Hz
U-USIT_UNWB	Near Receiver Window Begin Time	USIT-E	99	us
U-USIT_UNWE	Near Receiver Window End Time	USIT-E	139	us
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 3.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	8000	ft
USSP	Ultrasonic Service	USIT-E	IBC	
U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VRES	Vertical Resolution	USIT-E	3.0 in	
WINB	Window Begin Time	USIT-E	35.04	us
WINE	Window End Time	USIT-E	75.04	us

Run 3

High Resolution IBC Casing Integrity

Software Version	
Acquisition System	Version
Maxwell 2017 SP1	7.1.82245.3100





Description: USI Corrosion   Format: Log ( USI IBC Casing Integrity HiRes )   Index Scale: 10 in per 100 ft   Index Unit: ft   Index Type: Measured Depth  
Creation Date: 24-Feb-2017 08:57:14

USIT(U-CON_CEMT)	Cement Type	USIT-E	Regular Cement	
THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.362	in
CYSTLGR	Casing Yield Strength - Zoned along logger depths	WLSESSION	0	psi
DFD	Drilling Fluid Density	Borehole	9.1	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	190	us/ft
FD	Fluid Density	USIT-E	10	lbm/gal
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
GR_MULTIPLIER	Gamma Ray Multiplier	EDTC-B	1	
HEMA	Hematite Presence Flag	Borehole	No	
FSOD	USIT IBC Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF	
IBC_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	UFAO	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	Theoretical	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.5	us
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1	
U-USIT_OCDI	Outer Casing Diameter	USIT-E	0	in
U-USIT_OCSH	Outer Casing Shoe	USIT-E	0	ft
U-USIT_OCWE	Outer Casing Weight	USIT-E	0	lbm/ft
RCOD	Reference Calibrator Outer Diameter	USIT-E	7	in
RCSO	Reference Calibrator Standoff	USIT-E	1.181	in
RCTH	Reference Calibrator Thickness	USIT-E	0.295	in
SOCN	Standoff Distance	EDTC-B	0.125	in
SOCO	Standoff Correction Option	EDTC-B	No	
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	%
TPOS_EDTC	Tool Position: Centered or Eccentered	EDTC-B	Eccentered	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	0	dB/m
UFGDE	Fiberglass Density	USIT-E	16.27	lbm/gal
UFGPS	Fiberglass Processing Selection	USIT-E	No	
UFGVL	Fiberglass Velocity	USIT-E	9678.48	ft/s
U-USIT_UIAP	IBC Answer Product Enabled	USIT-E	SolidLiquidGasMap	
THDP	Thickness Detection Policy	USIT-E	Fundamental	
VCAS	Ultrasonic Transversal Velocity in Casing	USIT-E	51.4	us/ft
ZCAS	Acoustic Impedance of Casing	USIT-E	46.25	Mrayl
ZINI	Initial Estimate of Cement Impedance	USIT-E	-1	Mrayl
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

Run 3: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB



U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
DOT(DOS)	Distance between Opposite Transducer Faces	USIT-E	2.874	in
EMXV	EMEX Voltage	USIT-E	50	V
HRES	Horizontal Resolution	USIT-E	10 deg	
MOTOR_PROTECT	Motor Protection	USIT-E	On	
TMUC	Type of Mud	USIT-E	BRI	
UACLV_PERM	Ultrasonic ACLV Permanent	USIT-E	No	
U-USIT_UFWB	Far Receiver Window Begin Time	USIT-E	130	us
U-USIT_UFWE	Far Receiver Window End Time	USIT-E	170	us
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UMFR	Modulation Frequency	USIT-E	333333	Hz
U-USIT_UNWB	Near Receiver Window Begin Time	USIT-E	99	us
U-USIT_UNWE	Near Receiver Window End Time	USIT-E	139	us
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	10 deg at 3.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	8000	ft
USSP	Ultrasonic Service	USIT-E	IBC	
U-USIT_UTAN	Transducer Angles	USIT-E	33_DEG	
VRES	Vertical Resolution	USIT-E	3.0 in	
WINB	Window Begin Time	USIT-E	35.04	us
WINE	Window End Time	USIT-E	75.04	us

Run 3

High Resolution IBC Casing Integrity

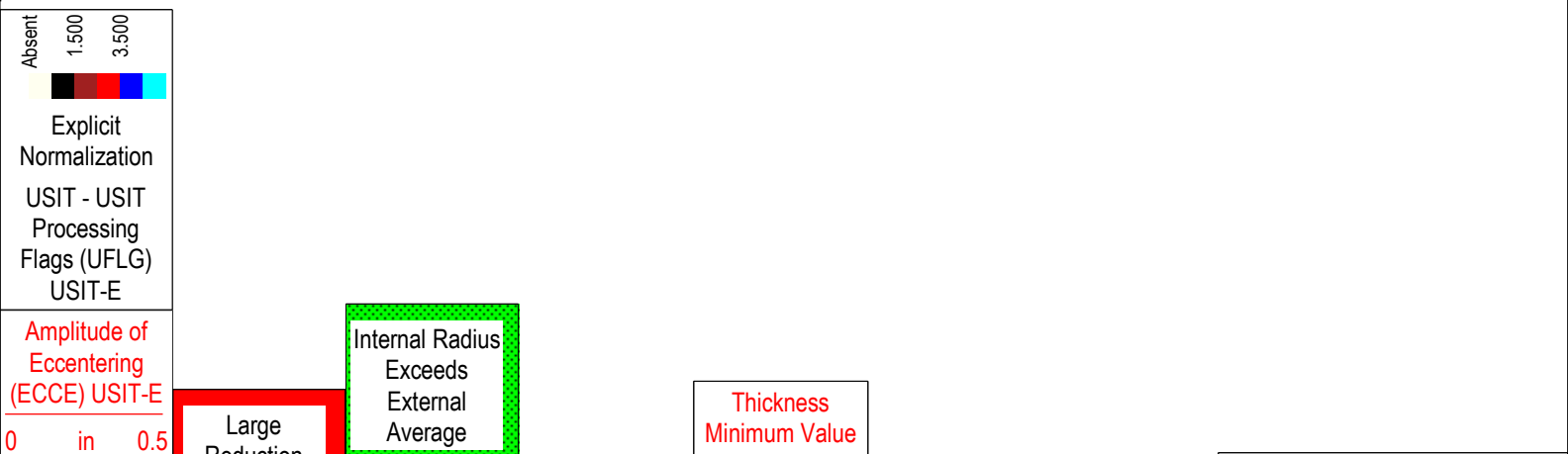
Software Version	
Acquisition System	Version
Maxwell 2017 SP1	7.1.82245.3100

Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Run 3	Log[5]:Up	Up	5512.75 ft	5575.93 ft	22-Feb-2017 4:16:37 PM	22-Feb-2017 4:19:33 PM	ON	5.21 ft	Yes

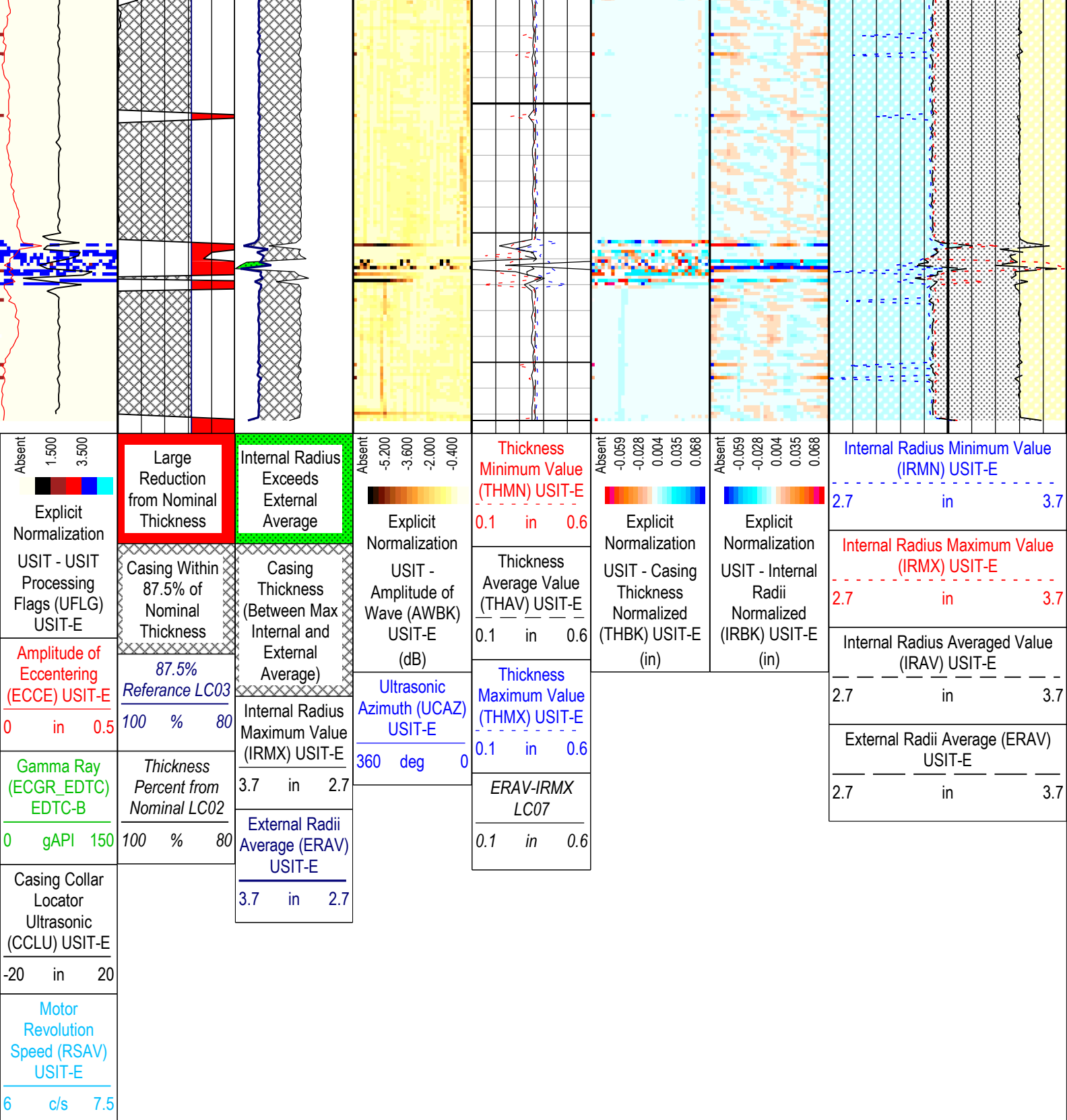
All depths are referenced to toolstring zero									
Log	<div>Company:Expedition Water Solutions LLC      Well:EWS 4</div> <div>Run 3: Log[5]:Up:S015</div>								

Description: USI Corrosion    Format: Log ( USI IBC Casing Integrity HiRes )    Index Scale: 10 in per 100 ft    Index Unit: ft    Index Type: Measured Depth  
 Creation Date: 24-Feb-2017 08:57:20

TIME\_1900 - Time Marked every 60.00 (s)



[illegible]



TIME\_1900 - Time Marked every 60.00 (s)

Description: USI Corrosion Format: Log ( USI IBC Casing Integrity HiRes ) Index Scale: 10 in per 100 ft Index Unit: ft Index Type: Measured Depth  
Creation Date: 24-Feb-2017 08:57:20

Channel Processing Parameters				
Run 3: Parameters				
Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BERJ	Bad Echo Rejection	USIT-E	On	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	8.75	in

CASING_PRATIO	Casing Poisson Ratio	USIT-E	Standard Poisson Ratio	
CBLO	Casing Bottom (Logger)	WLSESSION	8552	ft
CDEN	Cement Density	USIT-E	0	lbm/gal
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.362	in
CYSTLGR	Casing Yield Strength - Zoned along logger depths	WLSESSION	0	psi
DFD	Drilling Fluid Density	Borehole	9.1	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	190	us/ft
FD	Fluid Density	USIT-E	10	lbm/gal
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
GR_MULTIPLIER	Gamma Ray Multiplier	EDTC-B	1	
HEMA	Hematite Presence Flag	Borehole	No	
FSOD	USIT IBC Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF	
IBC_FVEL_SEL	IBC Fluid Velocity Selection	USIT-E	Automatic	
IBC_OFFSET_SEL	IBC Flexural Offset Selector	USIT-E	UFAO	
IBC_ZMUD_SEL	IBC Mud Impedance Selection	USIT-E	Theoretical	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.5	us
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1	
U-USIT_OCDI	Outer Casing Diameter	USIT-E	0	in
U-USIT_OCSH	Outer Casing Shoe	USIT-E	0	ft
U-USIT_OCWE	Outer Casing Weight	USIT-E	0	lbm/ft
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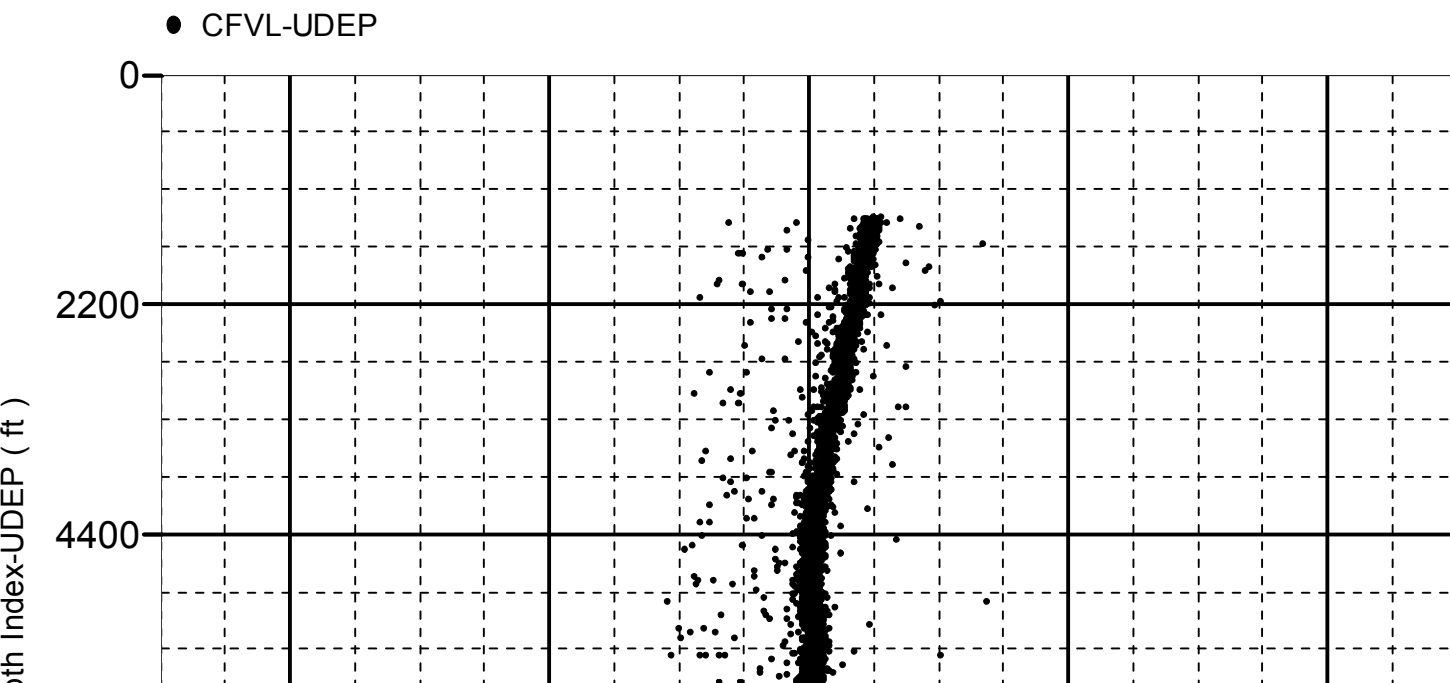
XYZ

Company:Expedition Water Solutions LLC Well:EWS 4  
TWO: Log[5]:Up:S015

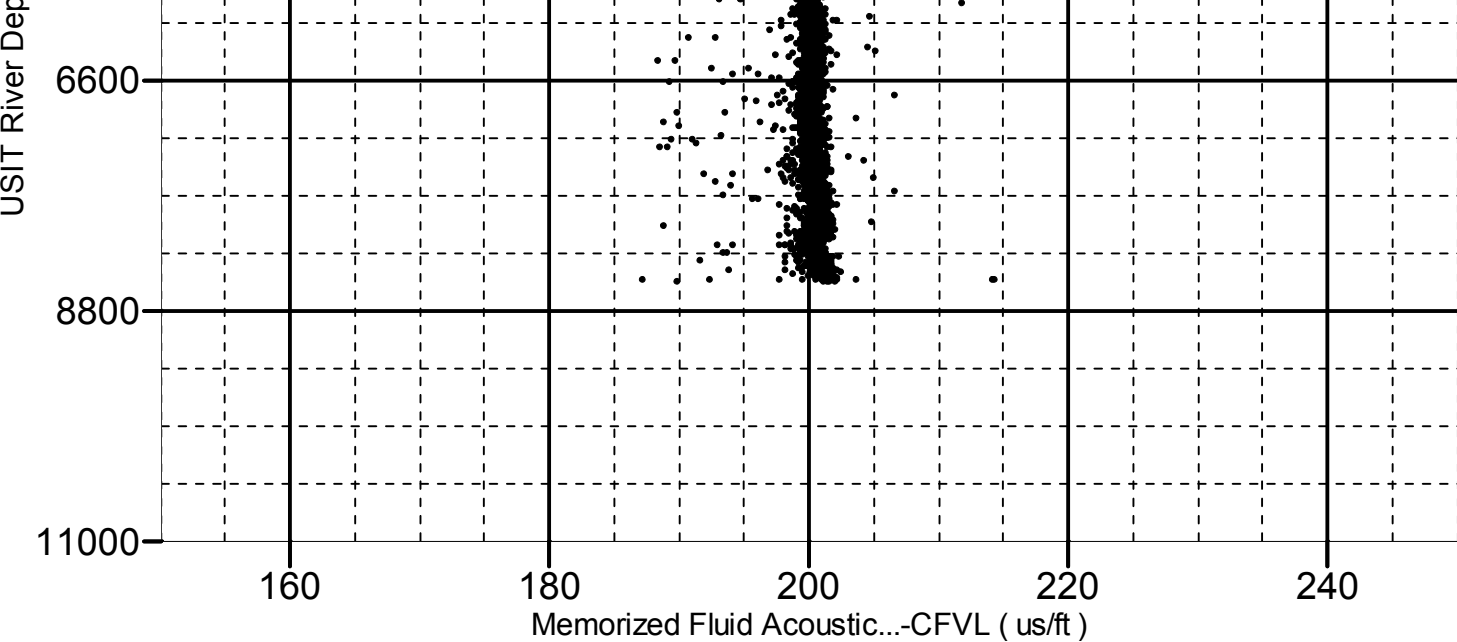
## Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 8524.00 to 420.00 ft



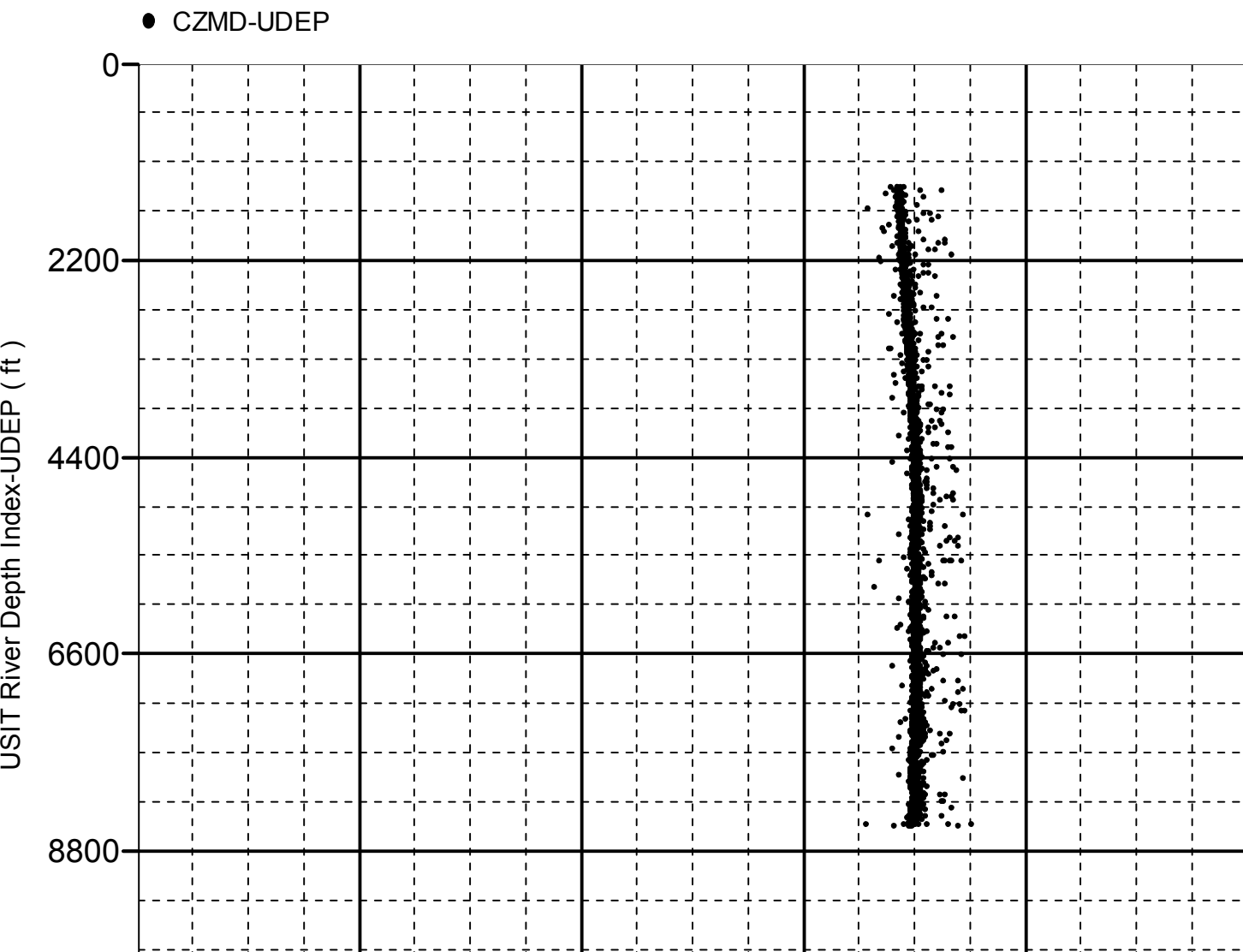


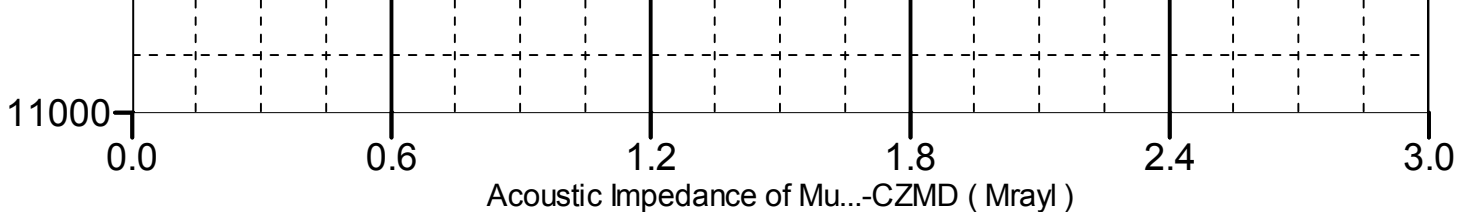


## Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 8524.00 to 420.00 ft





Company:	Expedition Water Solutions LLC	<b>Schlumberger</b>
Well:	EWS 4	
Field:	Wattenburg	
County:	Weld	
State:	Colorado	
Isolation Scanner		
Casing Integrity		
Gamma Ray - CCL Log		