Schlumberger

Company: Noble Energy Inc

Well: Wells Ranch AE32-675

Field: Wattenberg

County: Weld State: Colorado

Isolation Scanner

Cement Evaluation (Short)

Gamma Ray - CCL Log

County: Weld
Field: Wattenberg
Location: NWNW Sec. 32, T6N, R62W
Well: Wells Ranch AE32-675
Company: Noble Energy Inc

Location:

NWNW Sec. 32, T6N, R62W	Elev.:	K.B.	4771.00 ft
SHL: 614' FNL x 650' FWL		G.L.	4747.00 ft
Lat: 40.448750/ Long: -104.354230		D.F.	4770.00 ft

Permanent Datum:	Ground Level	Elev.:	4747.00 f
Log Measured From:	Kelly Bushing	24.00 ft	above Perm.Datum
Drilling Measured From:	Kelly Bushing		

API Serial No.	Section:	Township:	Range:
05-123-41732	32	6N	62W

Logging Date	04-Nov-2015		
Run Number	Run 1		
Depth Driller	6890.00 ft		
Schlumberger Depth	6890.00 ft		
Bottom Log Interval	6703.00 ft		
Top Log Interval	24.00 ft		
Casing Fluid Type	Brine		
Salinity			
Density	8.4 lbm/gal		
Fluid Level	0.00 ft		
BIT/CASING/TUBING STRING			
Bit Size	8.75 in		
From	638.00 ft		
To	6890.00 ft		
Casing/Tubing Size	7 in		
Weight	26 lbm/ft		
Grade	P110		
From	0.00 ft		
To	6880.20 ft		
Max Recorded Temperatures	218.9 degF		
Logger on Bottom Time	04-Nov-2015	14:40:00	
Unit Number Location:	9115	Ft. Morgan, CO	
Recorded By	Aleksei Bekhterev		
Witnessed By	Bill Mansfield		

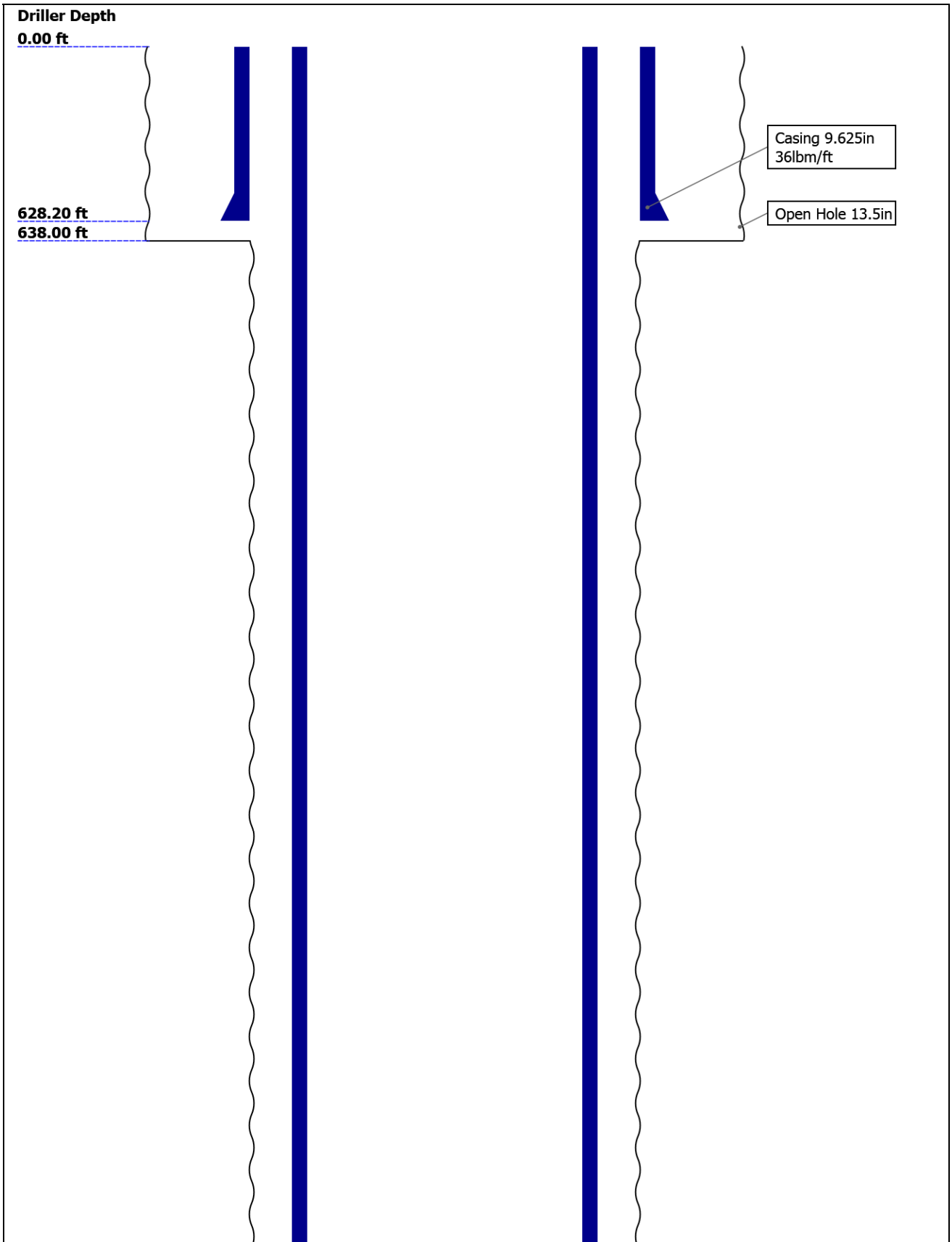
Disclaimer

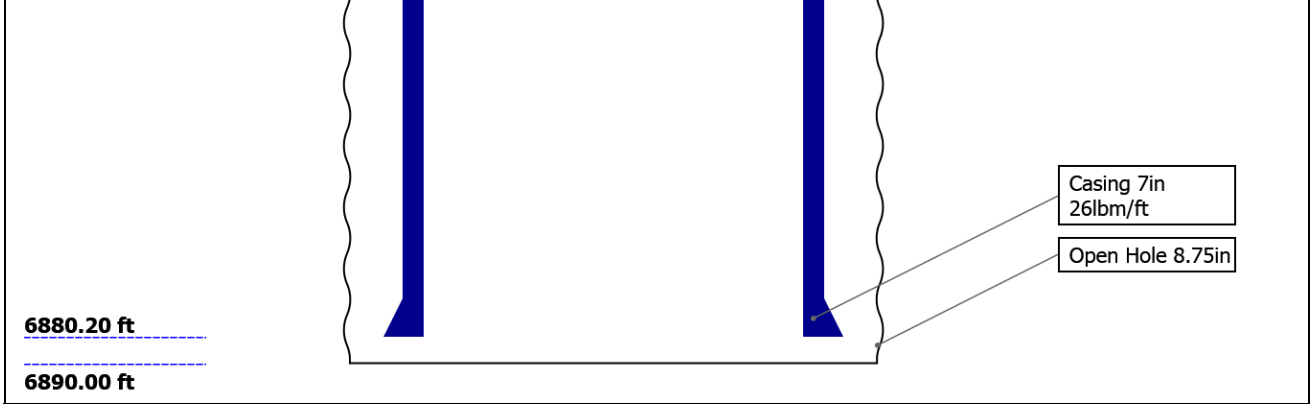
THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

Contents

13. XYZ (USI Acoustic Impedance of Mud vs Depth 6.0 in)
14. Calibration Report
15. Tail

Well Sketch





Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	13.5	8.75				
Top Driller (ft)	0	638				
Top Logger (ft)	0	638				
Bottom Driller (ft)	638	6890				
Bottom Logger (ft)	638	6890				
Casing						
Size (in)	9.625	7				
Weight (lbm/ft)	36	26				
Inner Diameter (in)	8.921	6.276				
Grade	J55	P110				
Top Driller (ft)	0	0				
Top Logger (ft)	0	0				
Bottom Driller (ft)	628.2	6880.2				
Bottom Logger (ft)	628.2	6880.2				

Operational Run Summary

Parameter (unit)	Run 1					
Date Log Started	04-Nov-2015					
Time Log Started	14:16:04					
Date Log Finished	04-Nov-2015					
Time Log Finished	18:52:53					
Top Log Interval (ft)	24.00					
Bottom Log Interval (ft)	6703.00					
Total Depth (ft)						
Max Hole Deviation (deg)	0.00					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	8.750					
Logging Unit Number	9115					
Logging Unit Location	Ft. Morgan, CO					
Recorded By	Aleksei Bekhterev					

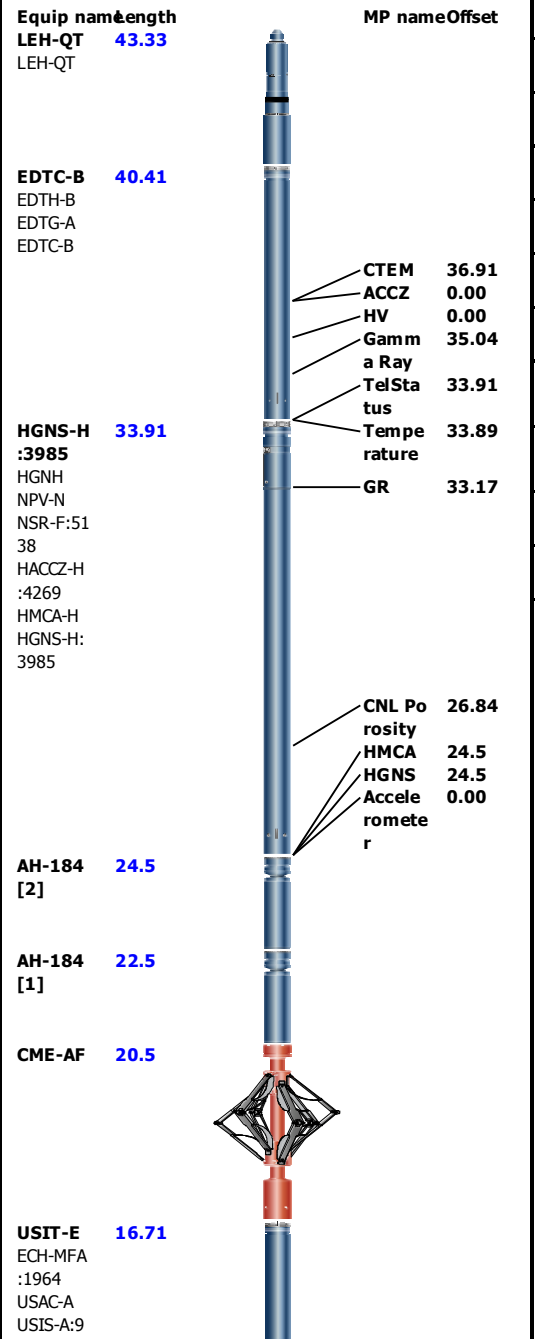
Witnessed By	Bill Mansfield					
Service Order Number	CY37-00150					

Borehole Fluids

Parameter(unit)	Run 1					
Fluid Type	Water					
Fluid Name	Brine					
Max Recorded Temperatures (degF)	218.9					
Salinity (ppm)	0					
Density (lbm/gal)	8.4					
Date Logger on Bottom	04-Nov-2015					
Time Logger on Bottom	14:40:00					
Total Solid (%)						
High Gravity Solids (%)						

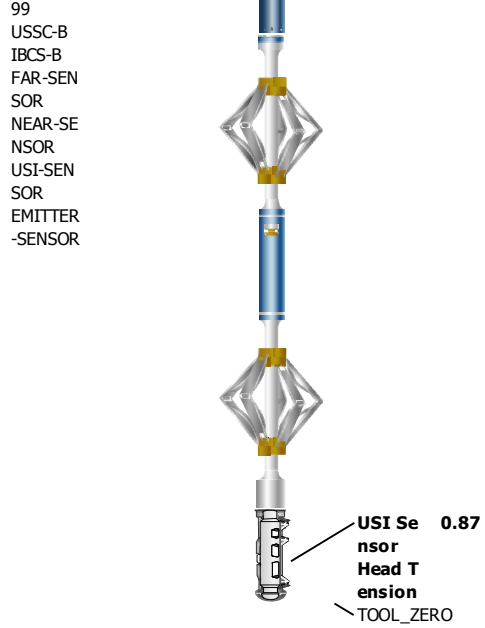
Remarks and Equipment Summary

Run 1: Toolstring



Run 1: Remarks

Run 1: Remarks
Toolstring ran as per tool sketch
12 ppg Flex Seal, 15.8 ppg Tail cement
Repeat pass is done with 0 psi
Main pass is done with 2500 psi
Temperature at the bottom: 218.9 degF
Top of cement: 760 ft
Log started 30 ft above top of the liner (6703 ft)
Data affected by high deviation at TD-6180 ft section
Casing anomaly observed from 760' to 490'. Repeated at high resolution
Crew: Jake Jump, Jay Musgrave
Thank you for choosing Schlumberger Wireline!



Lengths are in ft
Maximum Outer Diameter = 4.472 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

	Run 1		
Depth Measuring Device			
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		
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			
Length	12000.00 ft		
Conveyance Type	Wireline		
Rig Type	Crane		

Run 1:Depth Control Parameters		Depth Control Remarks
Log Sequence	First Log In the Well	All Schlumberger depth policies followed
Rig Up Length At Surface		IDW used as primary depth device
Rig Up Length At Bottom		Z-chart used as secondary depth reference
Rig Up Length Correction		
Stretch Correction		
Tool Zero Check At Surface		

Tool Zero Check At Surface

USI IBC SLG

USIT - Fluid Properties Measurement

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Main[3]:Up	6709.52	70.33

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 : 119.02m(390.48ft) to 126.62m(415.43ft)
MUD_N_FRP = 1.15
DFD = 1.01g/cm3(8.40lbm/gal)
CZMD median computed in free pipe normalization interval = 1.68 MRayl

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

Run 1

IBC SLG

Software Version

Acquisition System	Version
Maxwell 2016	6.0.52439.3100

Log

Company:Noble Energy Inc Well:Wells Ranch AE32-675

Run 1: Main[3]:Up:S009

Description: USI IBC SLG Format: USI IBC SLG Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Nov-2015 19:18:56

TIME_1900 - Time Marked every 60.00 (s)

Cable Drag

Casing Collar Locator Ultrasonic (CCLU) USIT-E
-20 in 20

Amplitude of Eccentering (ECCE) USIT-E
0 in 0.5

Motor Revolution Speed (RSAV) USIT-E
6 c/s 7.5

Stuck Tool Indicator, Total (STIT)
0 ft 50

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

Gamma Ray (ECGR_EDTC) EDTC-B
0 gAPI 150

Absent -5.200 -3.600 -2.000 -0.400
Explicit Normalization
USIT - Amplitude of Wave (AWBK) USIT-E
(dB)

Acoustic Impedance Minimum (AIMN) USIT-E
0 Mrayl 10

Acoustic Impedance Average (AIAV) USIT-E
0 Mrayl 10

Acoustic Impedance Maximum (AIMX) USIT-E
0 Mrayl 10

Absent 0.750 1.750 2.750 3.750
Custom Normalization
USIT - Acoustic Impedance (AIBK) USIT-E
(Mrayl)

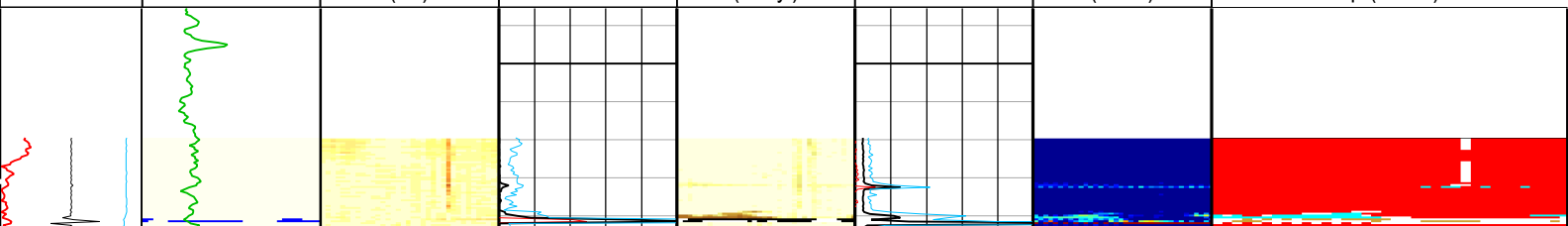
Minimum Flexural Attenuation (U-USIT_UFAN) USIT-E
20 dB/m 120

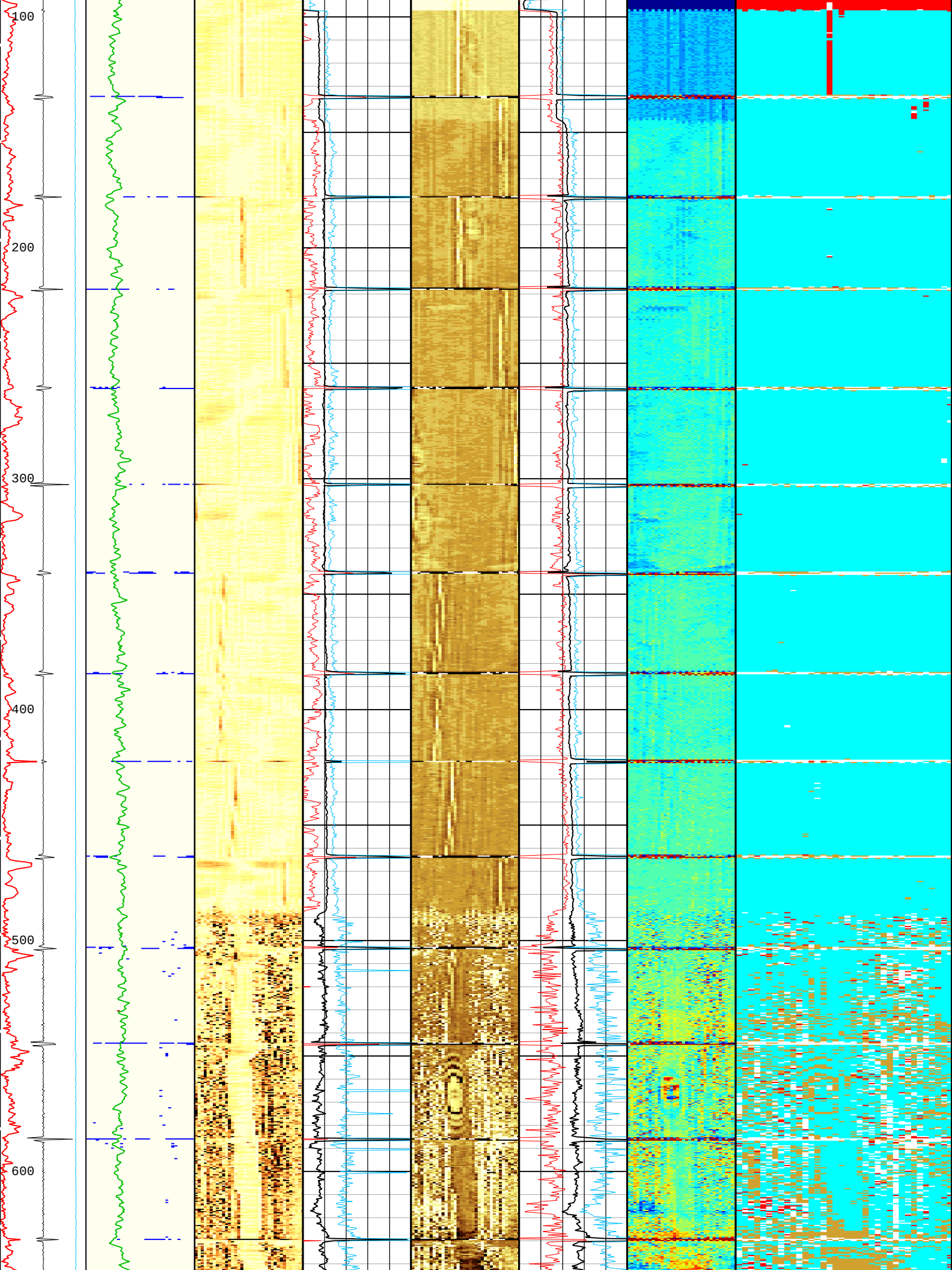
Average Flexural Attenuation (U-USIT_UFAV) USIT-E
20 dB/m 120

Maximum Flexural Attenuation (U-USIT_UFAX) USIT-E
20 dB/m 120

Absent 42.000 66.000 90.000 114.000
Custom Normalization
USIT - Flexural Attenuation (UFAK) USIT-E
(dB/m)

Absent 0.500 1.500 2.500 3.500
Explicit Normalization
USIT - Solid Liquid Gas Sorted Color Map (USLP) USIT-E

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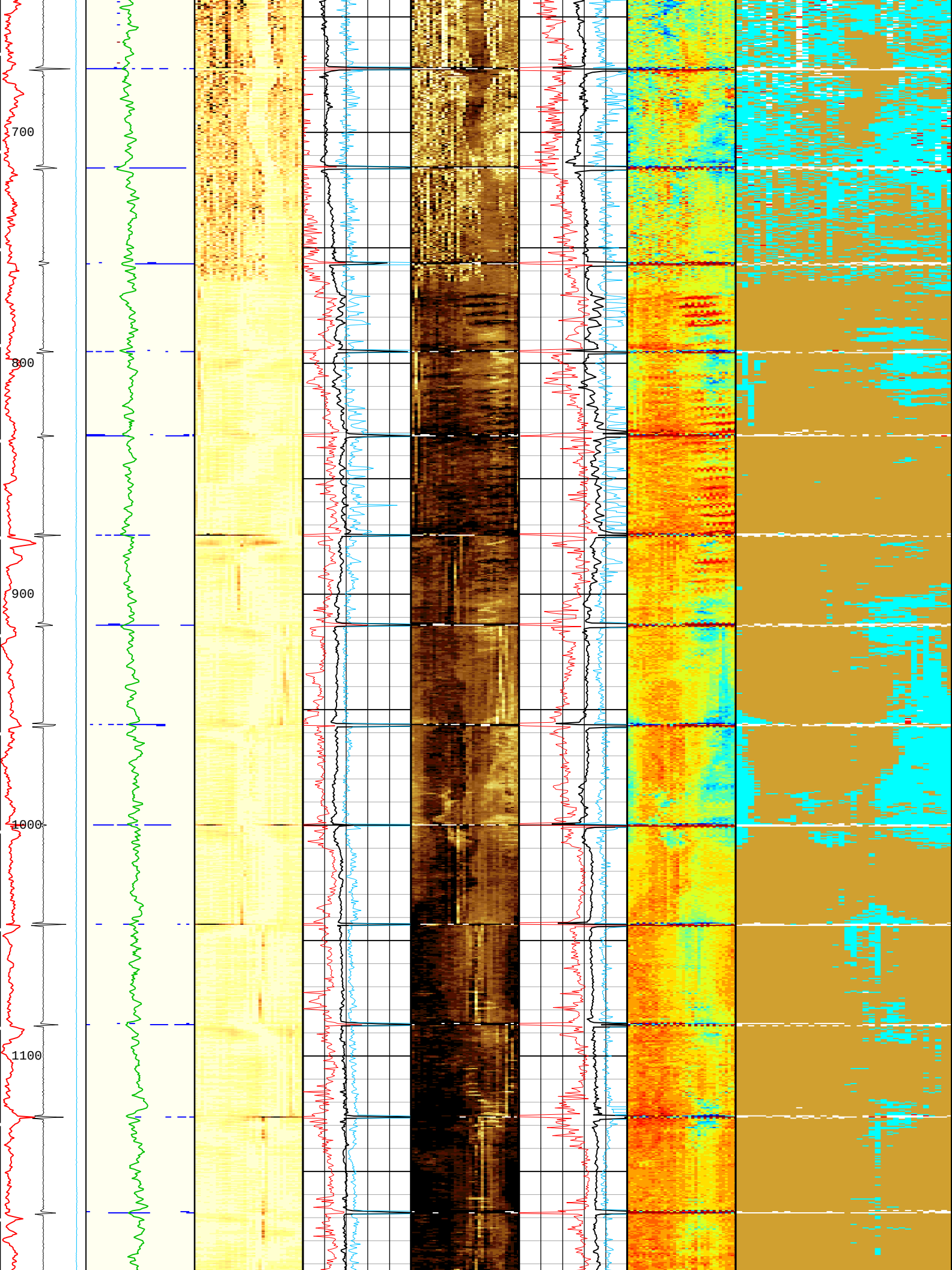
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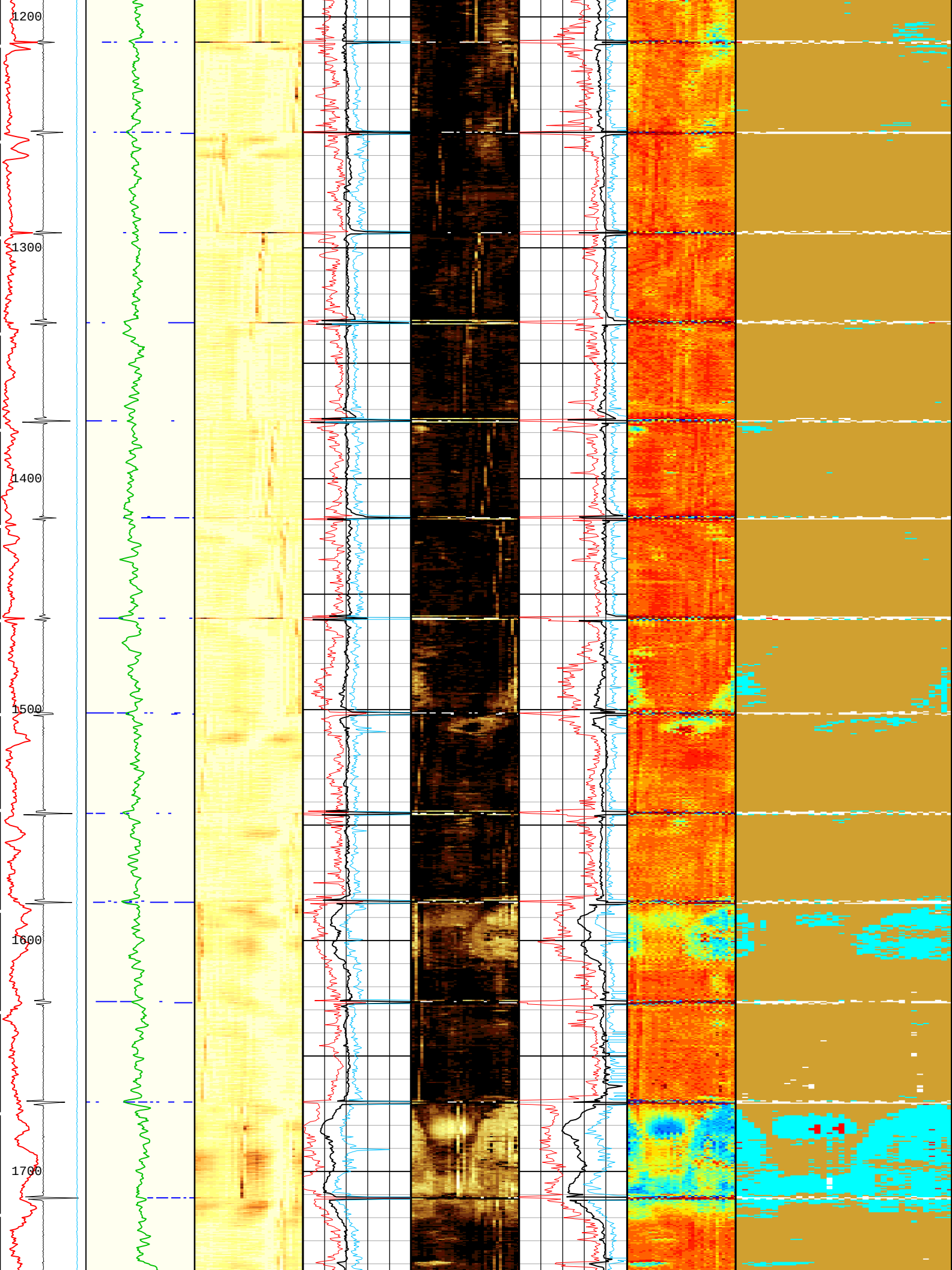
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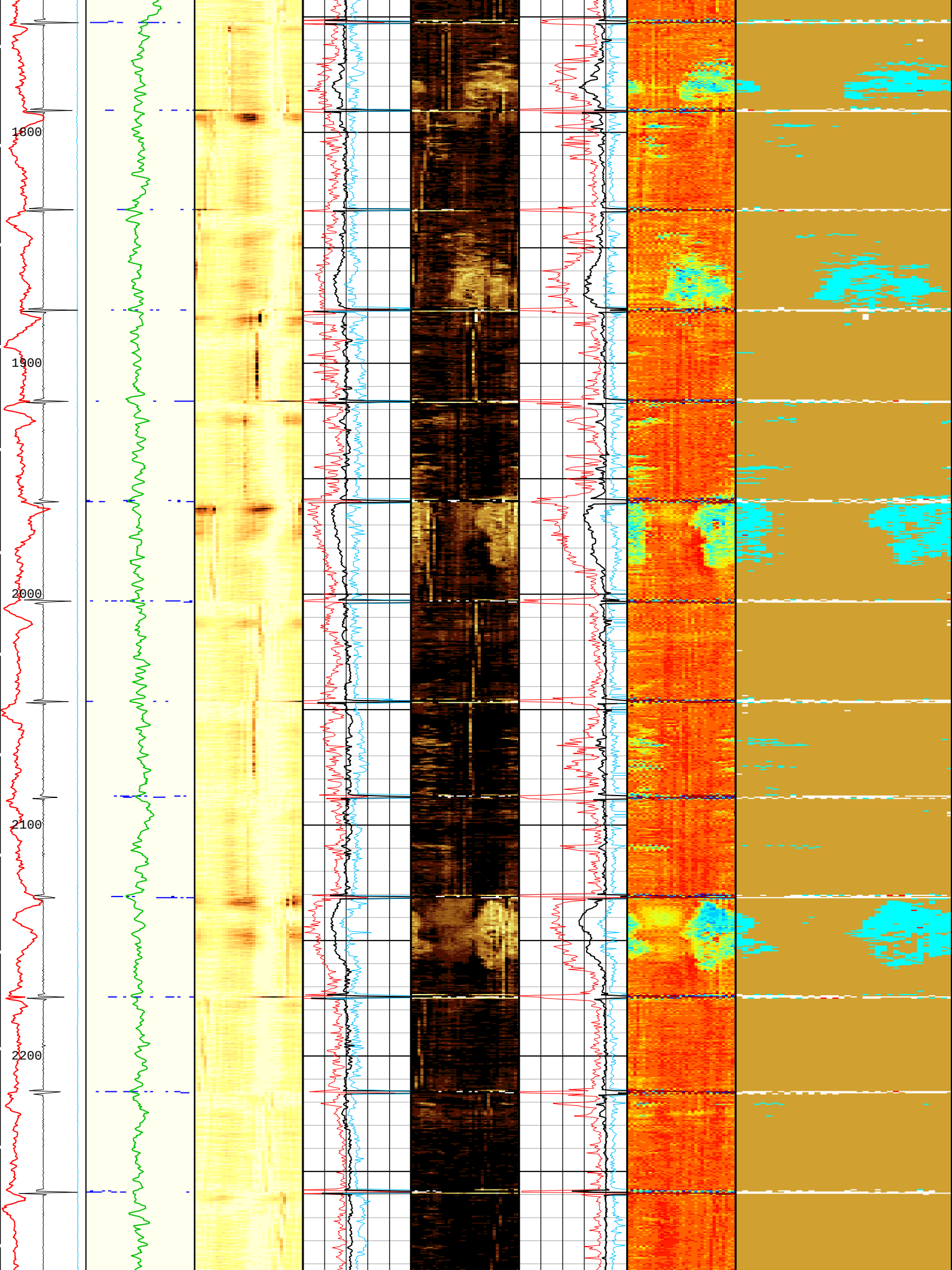
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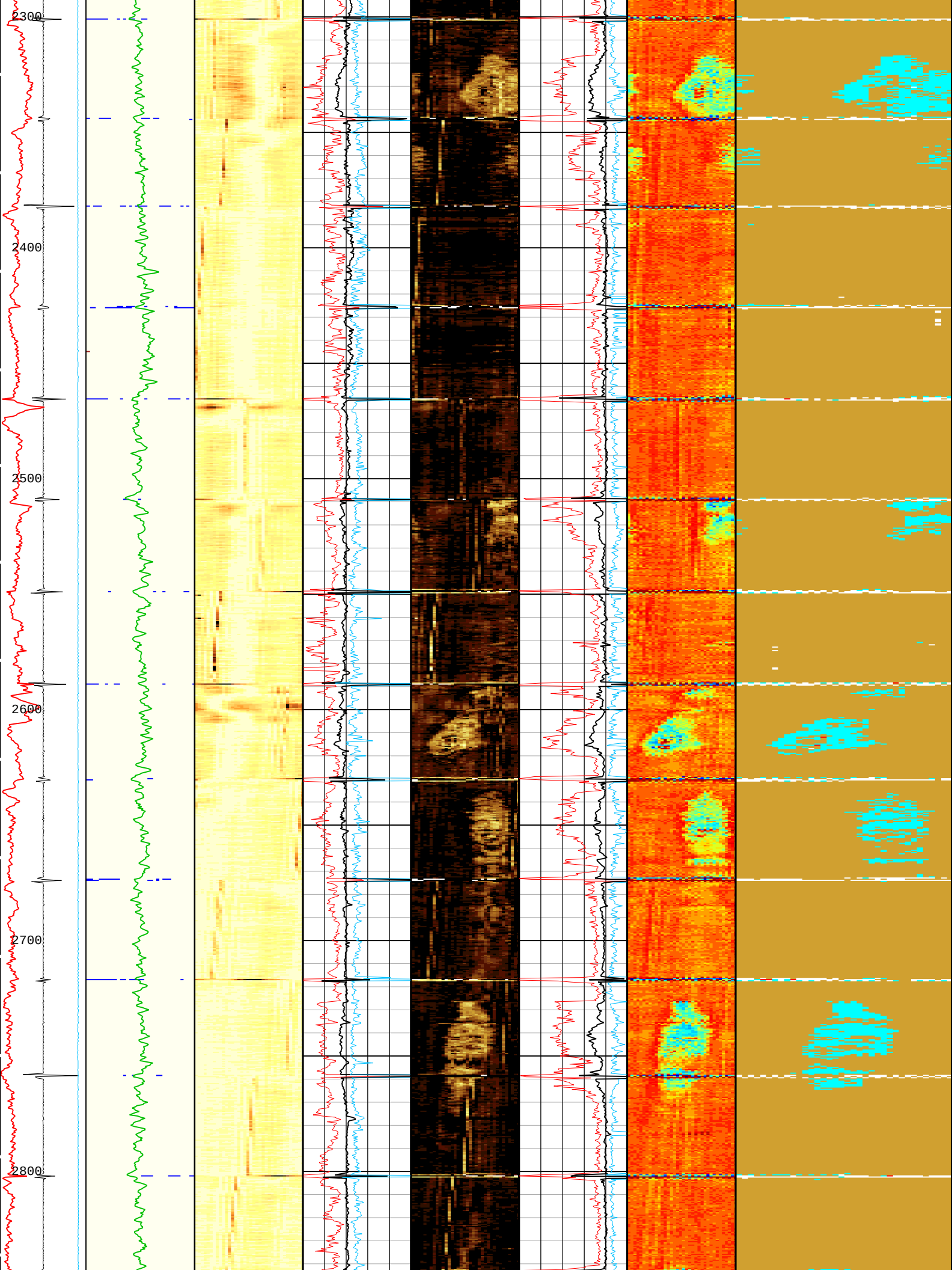
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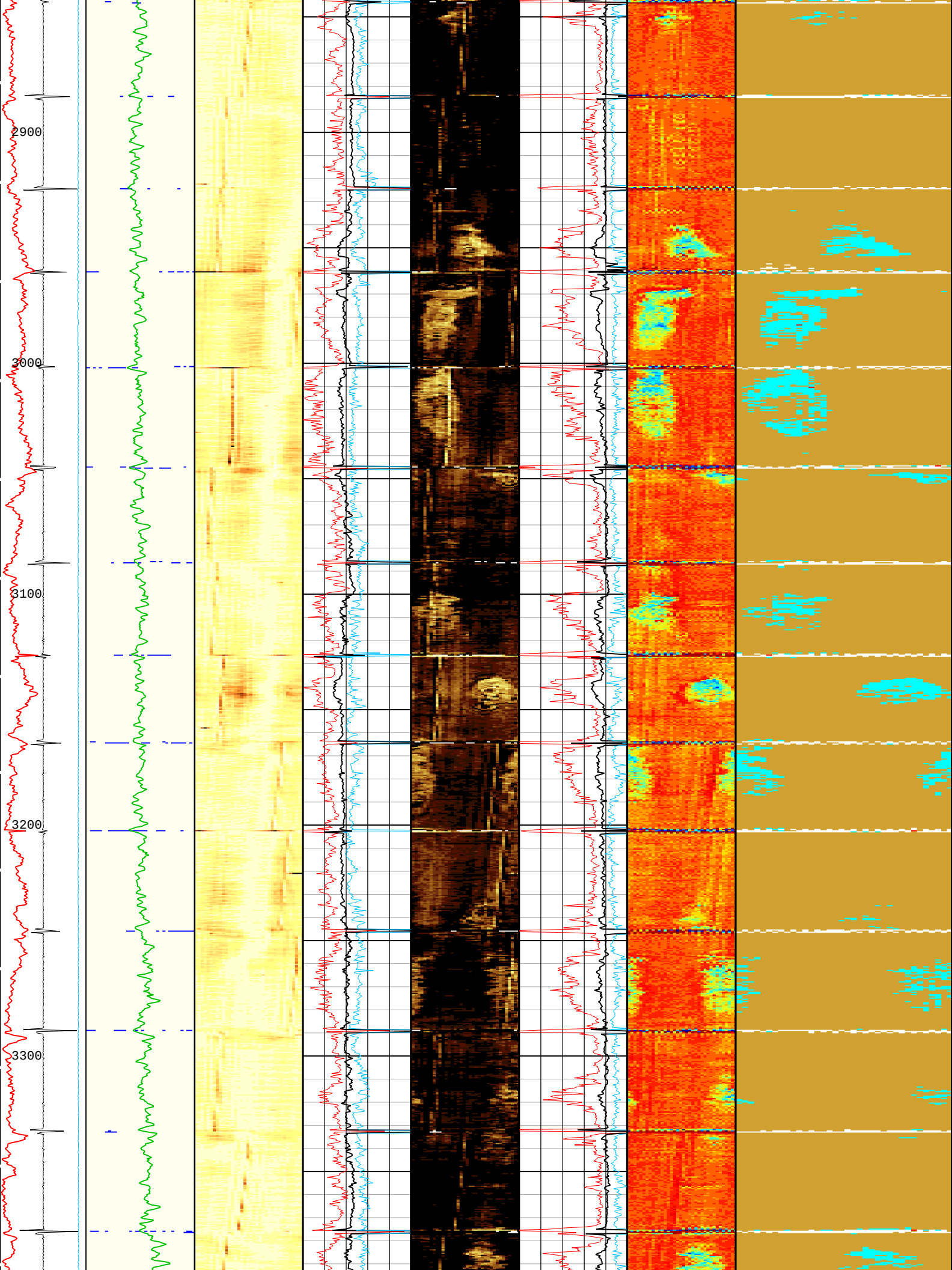
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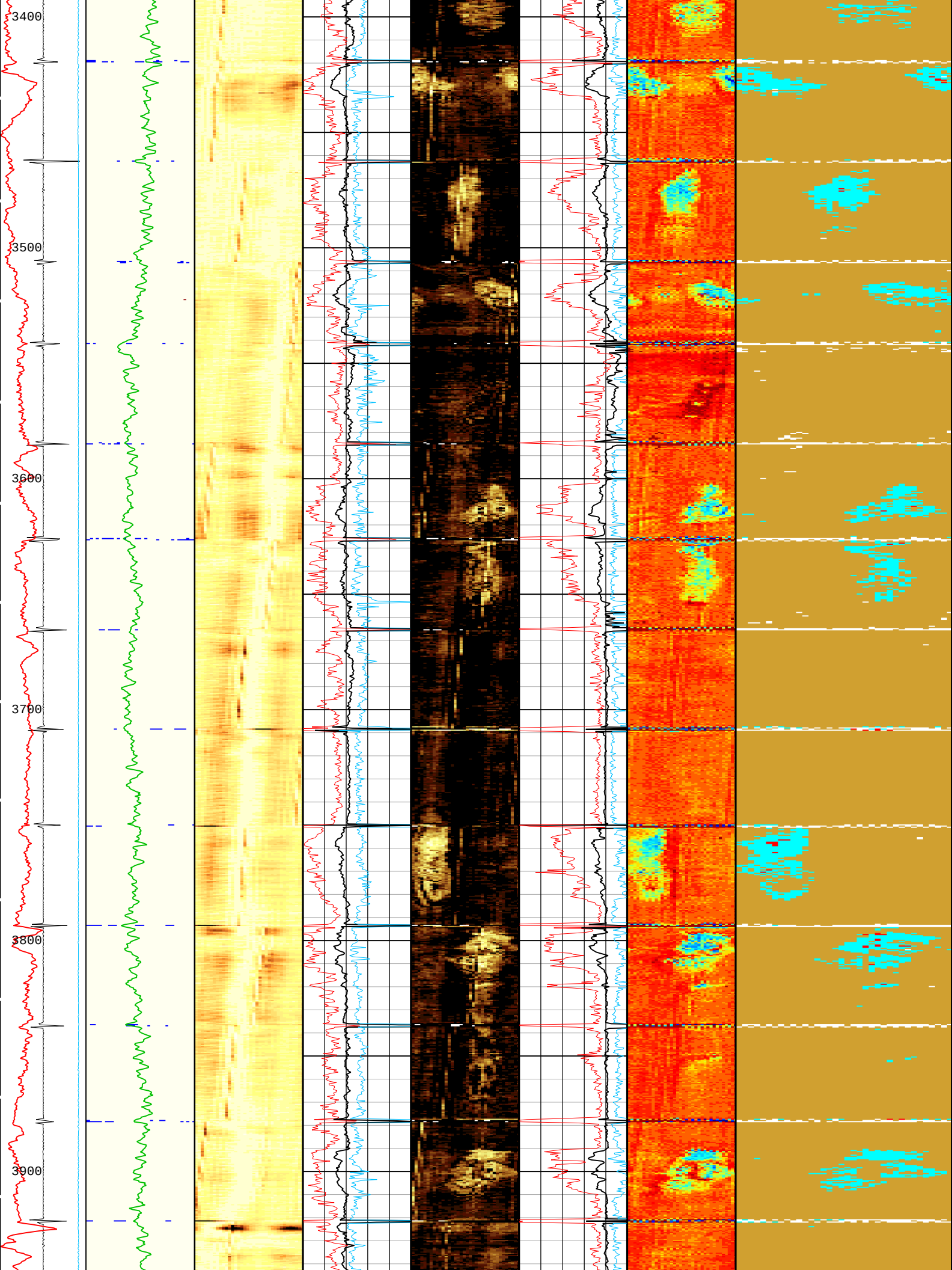
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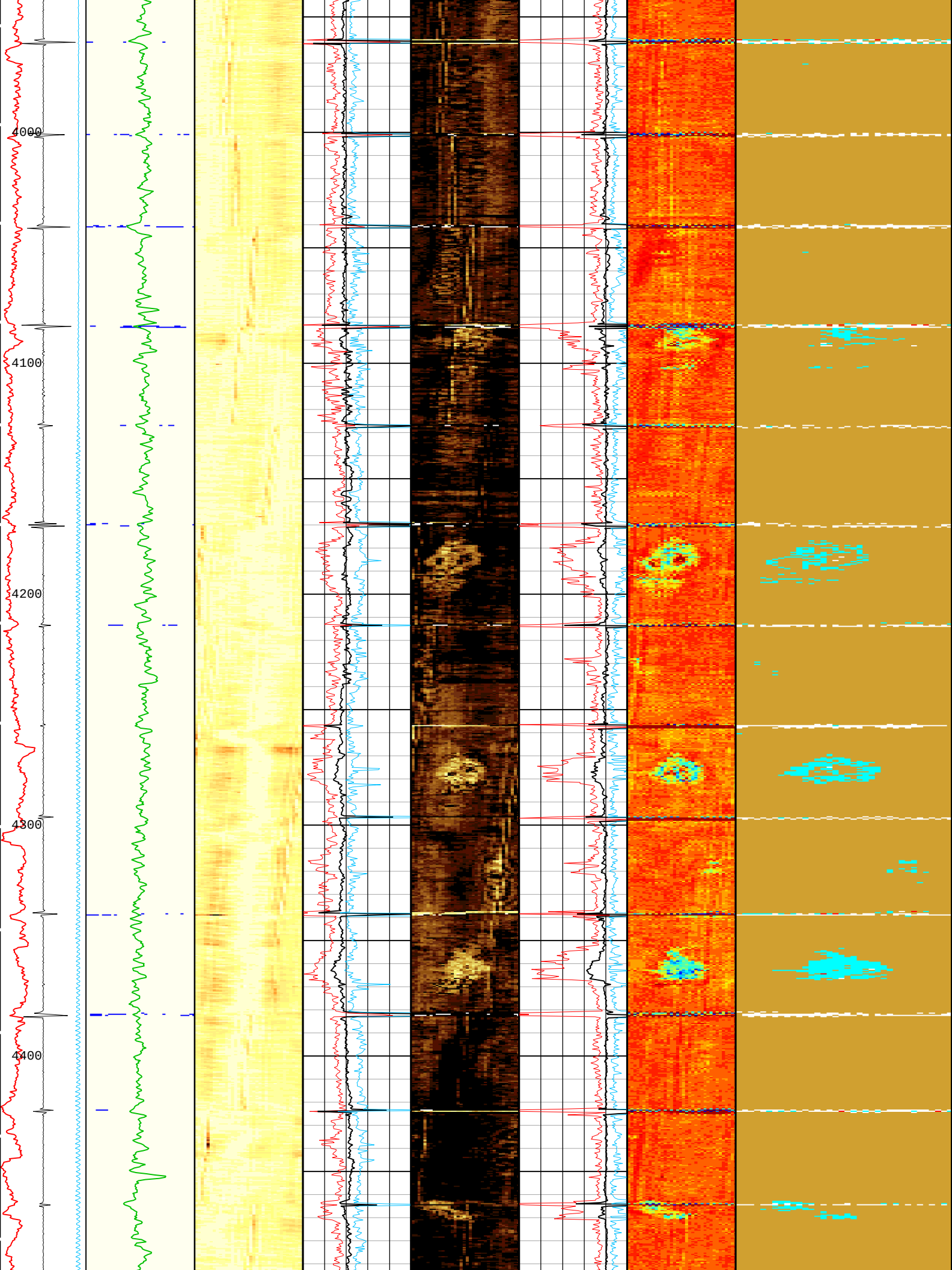
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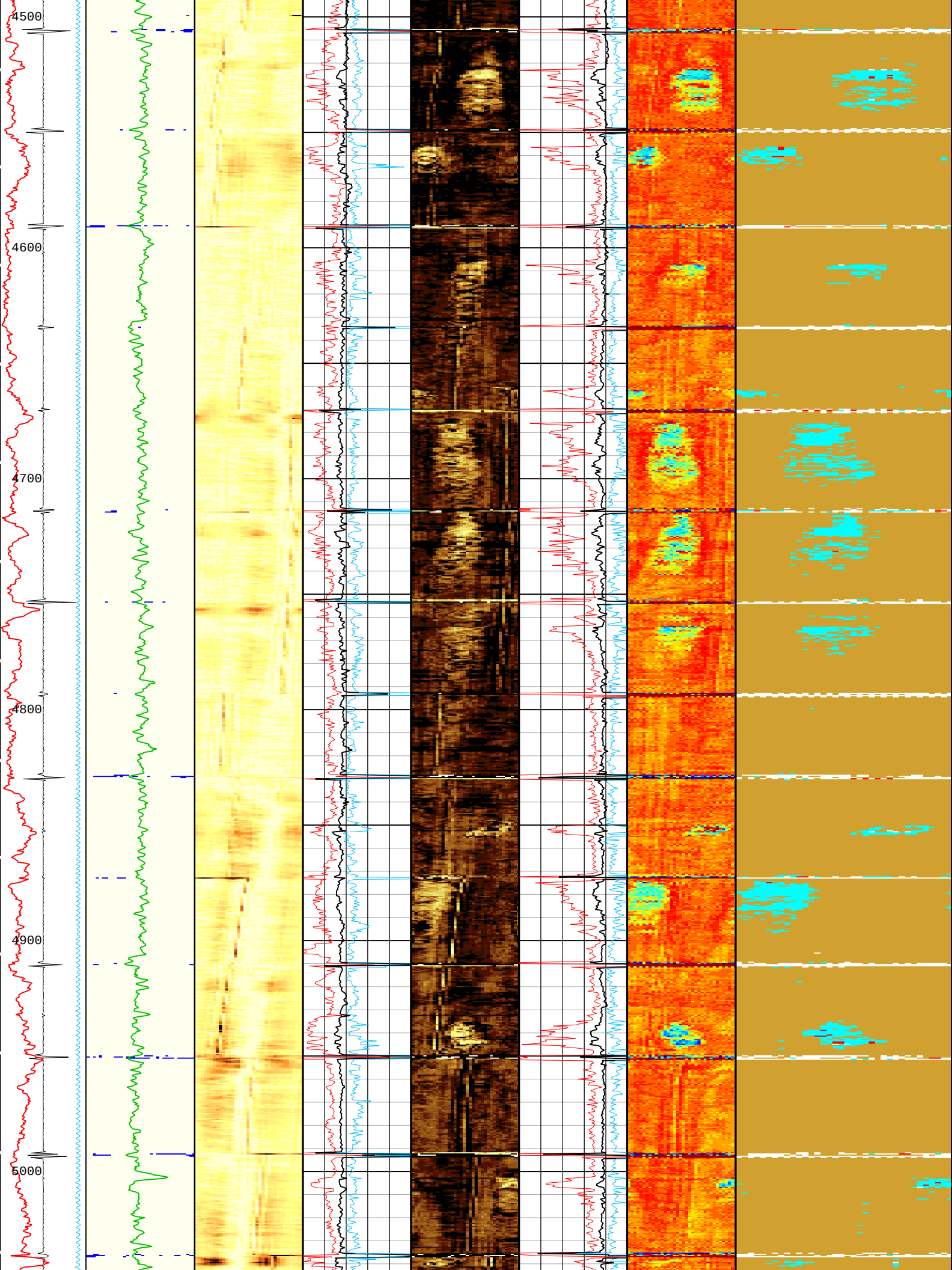
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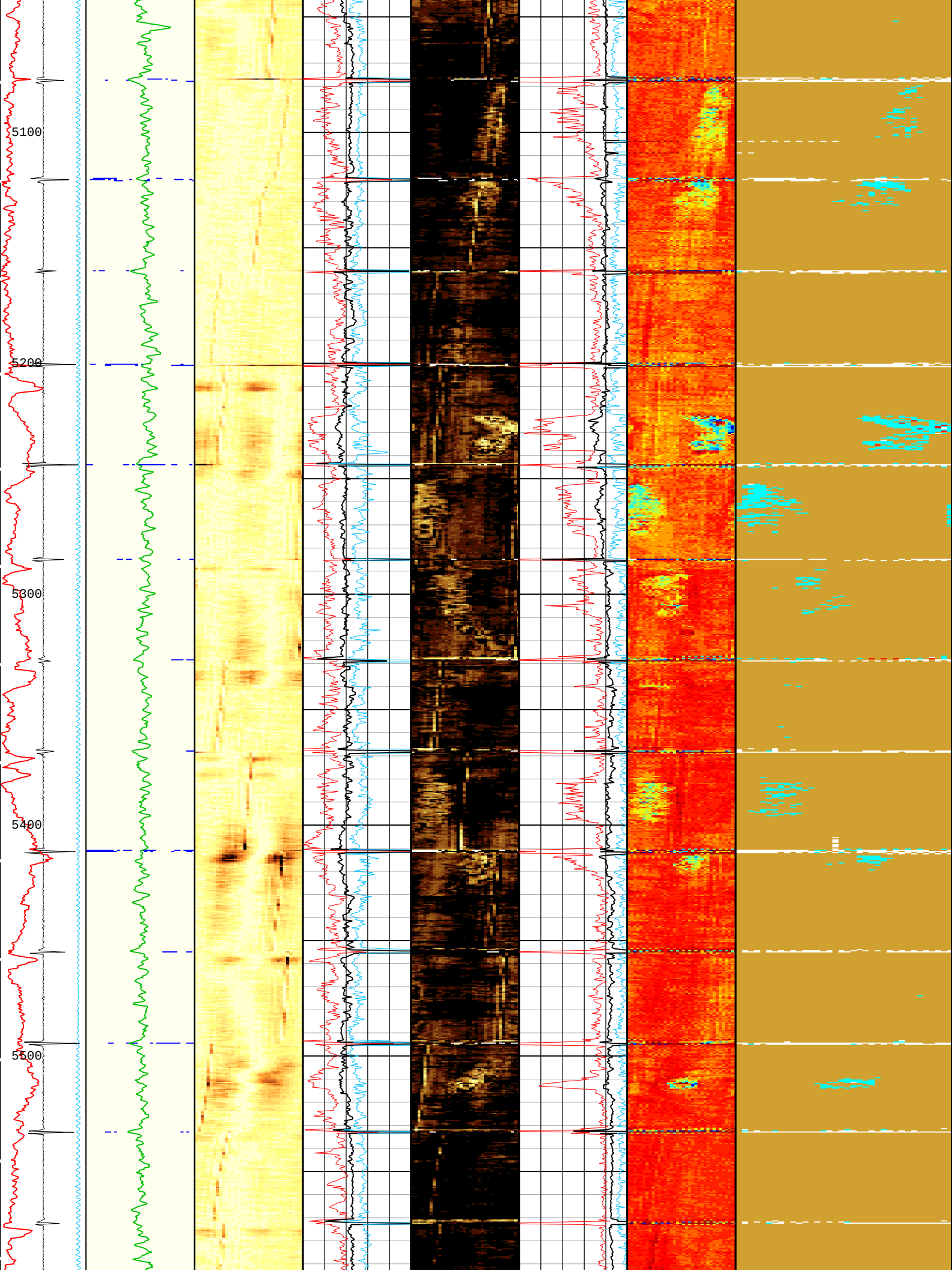
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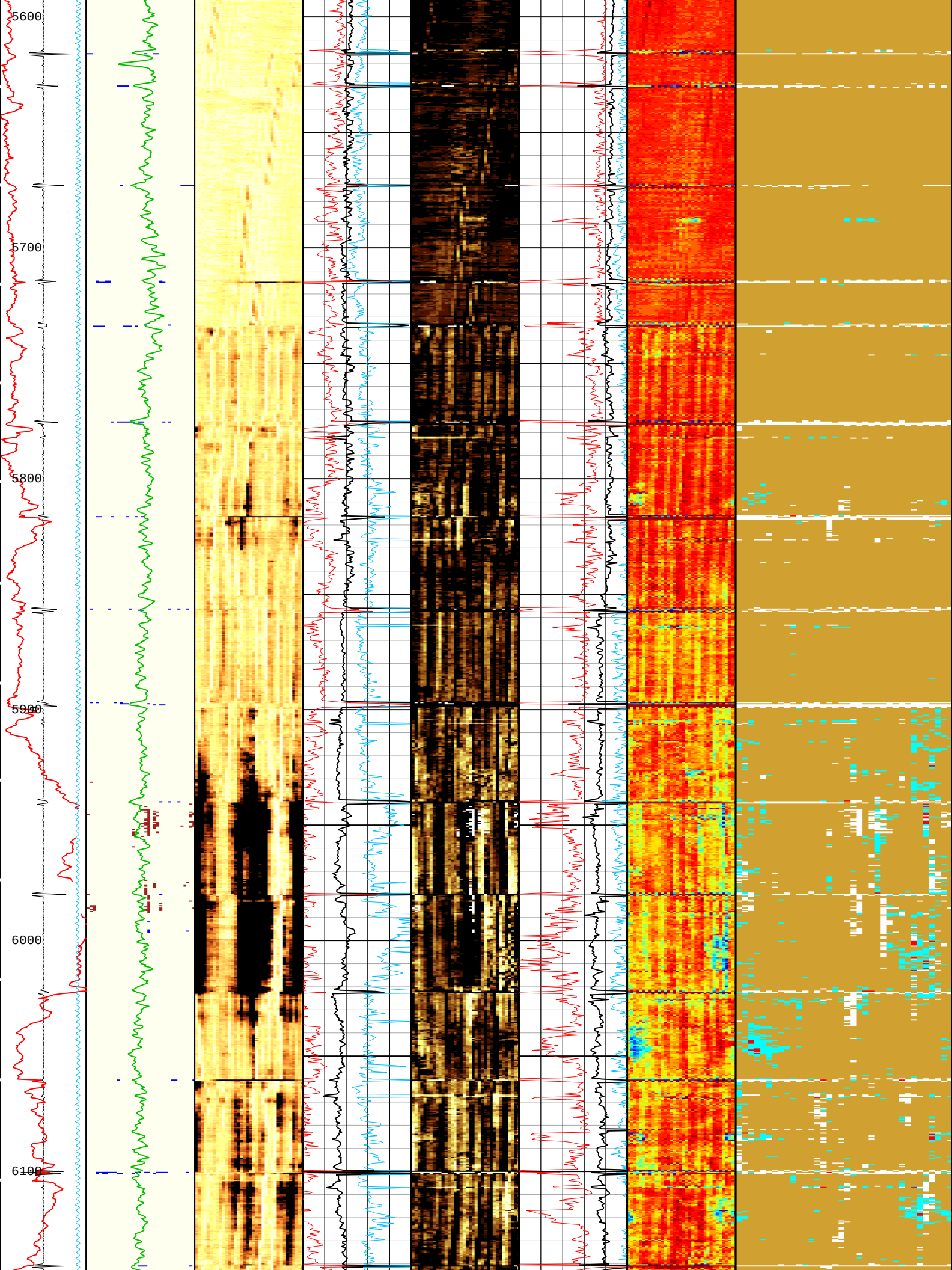
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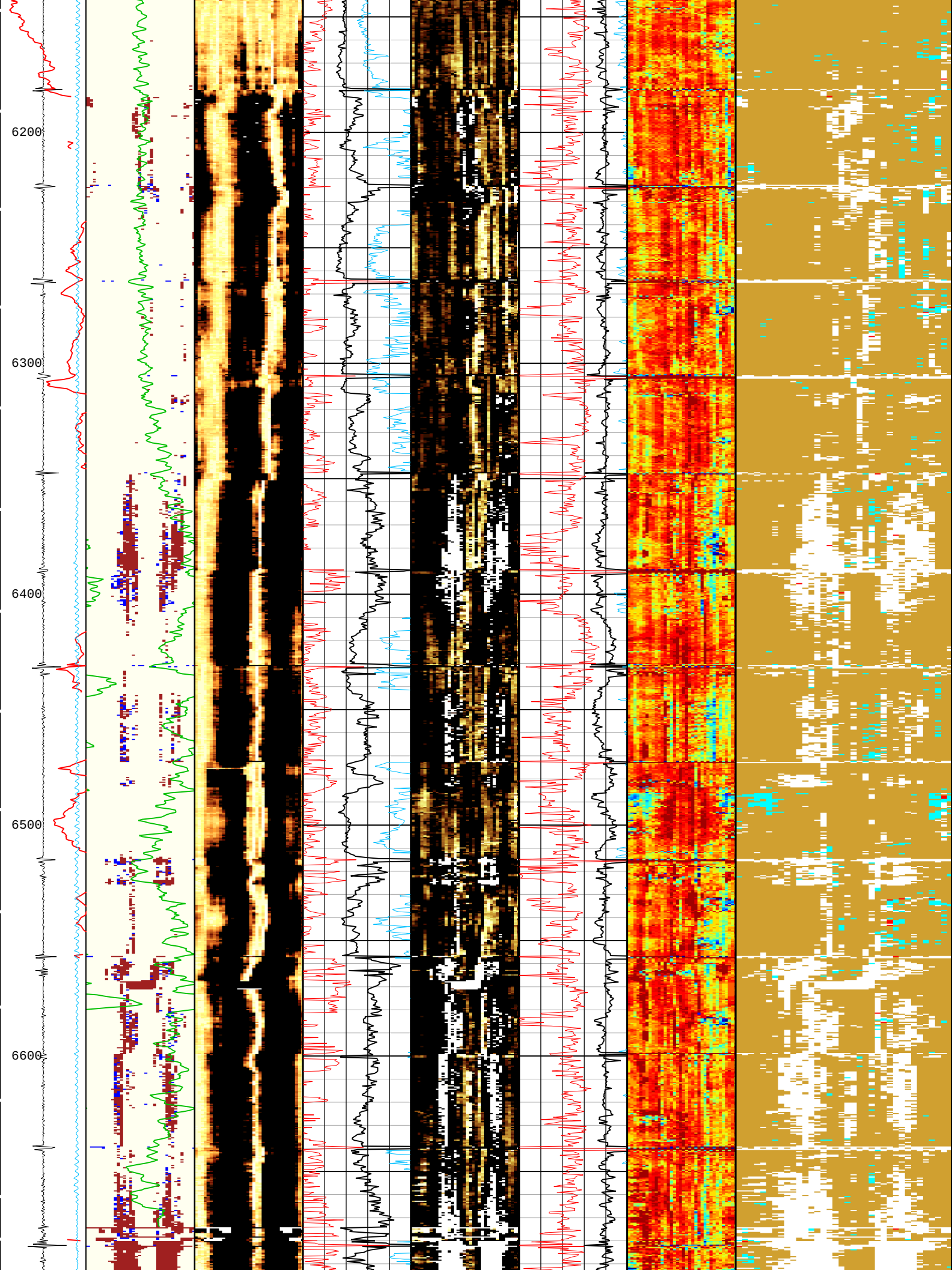
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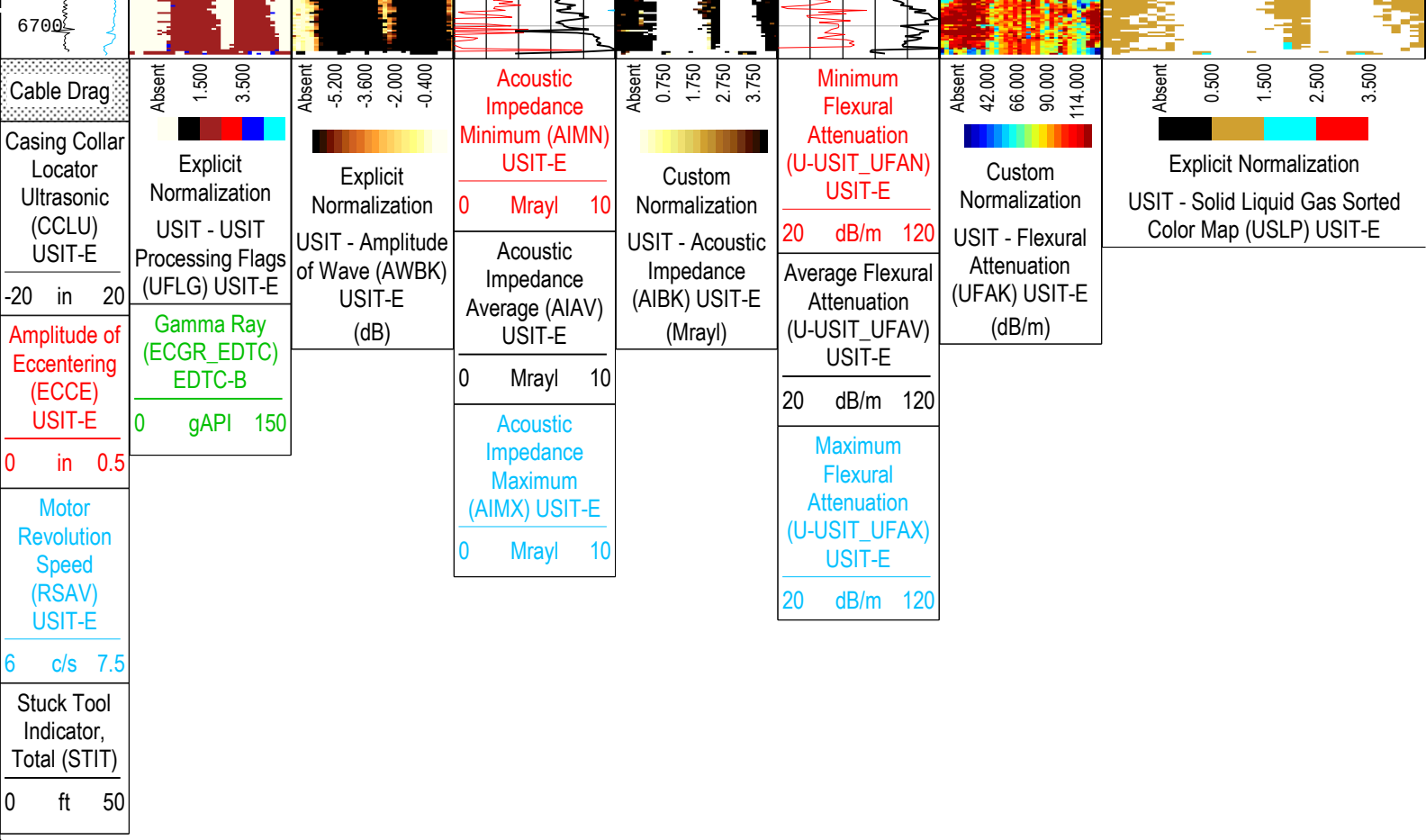


Description: USI IBC SLG Format: USI IBC SLG Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Nov-2015 19:18:56

Channel Processing Parameters

Run 1: 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	Cased	
BS	Bit Size	WLSESSION	Depth Zoned	in
CASING_PRATIO	Casing Poisson Ratio	USIT-E	Standard Poisson Ratio	
CBLO	Casing Bottom (Logger)	WLSESSION	6880.2	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	Light Cement	
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FD	Fluid Density	USIT-E	11.5	lbm/gal
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS	
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	-11.83	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	1.15	
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	Centered	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	2.07	Mrayl
U-USIT_UFAO	SIT Flexural Attenuation Offset	USIT-E	-15	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	1.48	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	13.5	35.5	638
BS	8.75	638	6709.5

All depth are actual.

Tool Control Parameters

Run 1: 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	Time Zoned	V
HRES	Horizontal Resolution	USIT-E	10 deg	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	2700	ft/h
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	Time Zoned	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	Time Zoned	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	6703.8	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	Time Zoned	us
WINE	Window End Time	USIT-E	Time Zoned	us

Time Zone Parameters

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	100	04-Nov-2015 15:29:07	04-Nov-2015 15:50:20	6709.52	6304.7
EMXV	95	04-Nov-2015 15:50:20	04-Nov-2015 15:50:23	6304.7	6301.88
EMXV	90	04-Nov-2015 15:50:23	04-Nov-2015 15:52:13	6301.88	6223.76
EMXV	95	04-Nov-2015 15:52:13	04-Nov-2015 15:52:17	6223.76	6221.22
EMXV	100	04-Nov-2015 15:52:17	04-Nov-2015 15:52:20	6221.22	6218.96
EMXV	105	04-Nov-2015 15:52:20	04-Nov-2015 15:52:22	6218.96	6217.08
EMXV	110	04-Nov-2015 15:52:22	04-Nov-2015 15:52:26	6217.08	6214.92
EMXV	115	04-Nov-2015 15:52:26	04-Nov-2015 15:54:13	6214.92	6137.62
EMXV	110	04-Nov-2015 15:54:13	04-Nov-2015 15:54:16	6137.62	6134.91
EMXV	105	04-Nov-2015 15:54:16	04-Nov-2015 15:54:22	6134.91	6131.04
EMXV	100	04-Nov-2015 15:54:22	04-Nov-2015 15:54:25	6131.04	6128.34
EMXV	95	04-Nov-2015 15:54:25	04-Nov-2015 15:54:29	6128.34	6125.38
EMXV	90	04-Nov-2015 15:54:29	04-Nov-2015 15:54:33	6125.38	6122.53
EMXV	85	04-Nov-2015 15:54:33	04-Nov-2015 15:54:39	6122.53	6118.62
EMXV	80	04-Nov-2015 15:54:39	04-Nov-2015 16:19:16	6118.62	5066.61
EMXV	75	04-Nov-2015 16:19:16	04-Nov-2015 16:19:19	5066.61	5064.39
EMXV	70	04-Nov-2015 16:19:19	04-Nov-2015 16:19:22	5064.39	5061.93
EMXV	65	04-Nov-2015 16:19:22	04-Nov-2015 16:19:25	5061.93	5059.68
EMXV	60	04-Nov-2015 16:19:25	04-Nov-2015 16:19:29	5059.68	5057.18
EMXV	55	04-Nov-2015 16:19:29	04-Nov-2015 18:16:32	5057.18	70.33
U-USIT_UFWB	133	04-Nov-2015 15:29:07	04-Nov-2015 15:39:08	6709.52	6709.02
U-USIT_UFWB	80.28	04-Nov-2015 15:39:08	04-Nov-2015 15:40:28	6709.02	6687.75
U-USIT_UFWB	82.32	04-Nov-2015 15:40:28	04-Nov-2015 15:41:56	6687.75	6662.55
U-USIT_UFWB	70.81	04-Nov-2015 15:41:56	04-Nov-2015 15:55:28	6662.55	6083.27
U-USIT_UFWB	88.6	04-Nov-2015 15:55:28	04-Nov-2015 15:55:44	6083.27	6071.17
U-USIT_UFWB	103.25	04-Nov-2015 15:55:44	04-Nov-2015 16:01:05	6071.17	5841.44
U-USIT_UFWB	110.57	04-Nov-2015 16:01:05	04-Nov-2015 16:18:22	5841.44	5105.48

U-USIT_UFWB	124.18	04-Nov-2015 16:18:22	04-Nov-2015 18:16:32	5105.48	70.33
U-USIT_UFWE	173	04-Nov-2015 15:29:07	04-Nov-2015 15:39:10	6709.52	6708.52
U-USIT_UFWE	225.08	04-Nov-2015 15:39:10	04-Nov-2015 15:39:51	6708.52	6697.78
U-USIT_UFWE	199.52	04-Nov-2015 15:39:51	04-Nov-2015 15:55:31	6697.78	6080.62
U-USIT_UFWE	197.43	04-Nov-2015 15:55:31	04-Nov-2015 16:01:07	6080.62	5840.02
U-USIT_UFWE	191.15	04-Nov-2015 16:01:07	04-Nov-2015 16:01:23	5840.02	5828.08
U-USIT_UFWE	179.64	04-Nov-2015 16:01:23	04-Nov-2015 16:18:23	5828.08	5104.48
U-USIT_UFWE	174.41	04-Nov-2015 16:18:23	04-Nov-2015 18:16:32	5104.48	70.33
U-USIT_UNWB	102	04-Nov-2015 15:29:07	04-Nov-2015 15:39:15	6709.52	6707.31
U-USIT_UNWB	48.1	04-Nov-2015 15:39:15	04-Nov-2015 15:40:16	6707.31	6690.98
U-USIT_UNWB	51.97	04-Nov-2015 15:40:16	04-Nov-2015 15:55:20	6690.98	6088.52
U-USIT_UNWB	64.53	04-Nov-2015 15:55:20	04-Nov-2015 15:55:52	6088.52	6065.82
U-USIT_UNWB	76.04	04-Nov-2015 15:55:52	04-Nov-2015 15:56:57	6065.82	6018.6
U-USIT_UNWB	58.25	04-Nov-2015 15:56:57	04-Nov-2015 15:57:02	6018.6	6014.78
U-USIT_UNWB	77.08	04-Nov-2015 15:57:02	04-Nov-2015 16:01:10	6014.78	5837.64
U-USIT_UNWB	82.32	04-Nov-2015 16:01:10	04-Nov-2015 16:18:15	5837.64	5110.44
U-USIT_UNWB	91.74	04-Nov-2015 16:18:15	04-Nov-2015 18:16:32	5110.44	70.33
U-USIT_UNWE	142	04-Nov-2015 15:29:07	04-Nov-2015 15:39:16	6709.52	6707
U-USIT_UNWE	147.15	04-Nov-2015 15:39:16	04-Nov-2015 15:39:17	6707	6706.84
U-USIT_UNWE	175.8	04-Nov-2015 15:39:17	04-Nov-2015 15:40:15	6706.84	6691.48
U-USIT_UNWE	159.76	04-Nov-2015 15:40:15	04-Nov-2015 15:41:53	6691.48	6664.24
U-USIT_UNWE	171.27	04-Nov-2015 15:41:53	04-Nov-2015 15:55:22	6664.24	6087.07
U-USIT_UNWE	160.8	04-Nov-2015 15:55:22	04-Nov-2015 16:01:09	6087.07	5838.53
U-USIT_UNWE	152.43	04-Nov-2015 16:01:09	04-Nov-2015 16:18:17	5838.53	5109.12
U-USIT_UNWE	139.87	04-Nov-2015 16:18:17	04-Nov-2015 17:50:59	5109.12	1129.98
U-USIT_UNWE	144.06	04-Nov-2015 17:50:59	04-Nov-2015 18:16:32	1129.98	70.33
WINB	37.61	04-Nov-2015 15:29:07	04-Nov-2015 15:39:12	6709.52	6708.1
WINB	14.62	04-Nov-2015 15:39:12	04-Nov-2015 15:40:53	6708.1	6681.18
WINB	44.25	04-Nov-2015 15:40:53	04-Nov-2015 15:40:59	6681.18	6679.44
WINB	18.93	04-Nov-2015 15:40:59	04-Nov-2015 15:41:06	6679.44	6677.57
WINB	51.92	04-Nov-2015 15:41:06	04-Nov-2015 15:41:14	6677.57	6675.33
WINB	19.69	04-Nov-2015 15:41:14	04-Nov-2015 15:55:24	6675.33	6085.92
WINB	28.13	04-Nov-2015 15:55:24	04-Nov-2015 15:57:38	6085.92	5989.41
WINB	17.39	04-Nov-2015 15:57:38	04-Nov-2015 16:01:03	5989.41	5843.08
WINB	28.13	04-Nov-2015 16:01:03	04-Nov-2015 16:18:19	5843.08	5107.68
WINB	35.81	04-Nov-2015 16:18:19	04-Nov-2015 18:16:32	5107.68	70.33
WINE	77.61	04-Nov-2015 15:29:07	04-Nov-2015 15:39:13	6709.52	6707.73
WINE	90.58	04-Nov-2015 15:39:13	04-Nov-2015 15:44:09	6707.73	6572.32
WINE	68.81	04-Nov-2015 15:44:09	04-Nov-2015 15:44:14	6572.32	6568.97
WINE	89.53	04-Nov-2015 15:44:14	04-Nov-2015 15:48:47	6568.97	6372.58
WINE	101.81	04-Nov-2015 15:48:47	04-Nov-2015 15:55:26	6372.58	6084.67
WINE	91.06	04-Nov-2015 15:55:26	04-Nov-2015 16:18:20	6084.67	5106.77
WINE	78.78	04-Nov-2015 16:18:20	04-Nov-2015 17:50:51	5106.77	1135.72
WINE	83.39	04-Nov-2015 17:50:51	04-Nov-2015 17:50:58	1135.72	1130.86

WINE	78.02	04-Nov-2015 17:50:58	04-Nov-2015 18:16:32	1130.86	70.33

All depth are at tool zero.

USI Goodwin

Run 1

IBC Goodwin Compressed

Log

Company:Noble Energy Inc Well:Wells Ranch AE32-675

Run 1: Main[3]:Up:S009

Description: USI Goodwin Format: USI Goodwin Index Scale: 0.1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Nov-2015 19:19:03

TIME_1900 - Time Marked every 60.00 (s)

Minimum Acoustic Impedance 1 (MIN_AI1) USIT-E	Minimum Acoustic Impedance 3 (MIN_AI3) USIT-E	Minimum Acoustic Impedance 5 (MIN_AI5) USIT-E	Minimum Acoustic Impedance 7 (MIN_AI7) USIT-E
0 Mrayl 15	0 Mrayl 15	0 Mrayl 15	0 Mrayl 15
Maximum Acoustic Impedance 1 (MAX_AI1) USIT-E	Maximum Acoustic Impedance 3 (MAX_AI3) USIT-E	Maximum Acoustic Impedance 5 (MAX_AI5) USIT-E	Maximum Acoustic Impedance 7 (MAX_AI7) USIT-E
0 Mrayl 15	0 Mrayl 15	0 Mrayl 15	0 Mrayl 15
Average Acoustic Impedance 1 (AV_AI1) USIT-E	Average Acoustic Impedance 3 (AV_AI3) USIT-E	Average Acoustic Impedance 5 (AV_AI5) USIT-E	Average Acoustic Impedance 7 (AV_AI7) USIT-E
0 Mrayl 15	0 Mrayl 15	0 Mrayl 15	0 Mrayl 15

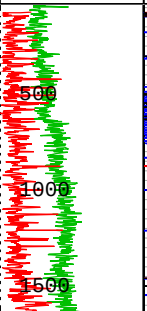
Minimum Acoustic Impedance 2 (MIN_AI2) USIT-E	Minimum Acoustic Impedance 4 (MIN_AI4) USIT-E	Minimum Acoustic Impedance 6 (MIN_AI6) USIT-E	Minimum Acoustic Impedance 8 (MIN_AI8) USIT-E	Minimum Acoustic Impedance 9 (MIN_AI9) USIT-E	Acoustic Impedance Minimum (AIMN) USIT-E	Minimum Flexural Attenuation (U-USIT_UFAN) USIT-E
-7.5 Mrayl 7.5	-7.5 Mrayl 7.5	-7.5 Mrayl 7.5	-7.5 Mrayl 7.5	0 Mrayl 15	0 Mrayl 7.5	40 dB/m 140
Maximum Acoustic Impedance 2 (MAX_AI2) USIT-E	Maximum Acoustic Impedance 4 (MAX_AI4) USIT-E	Maximum Acoustic Impedance 6 (MAX_AI6) USIT-E	Maximum Acoustic Impedance 8 (MAX_AI8) USIT-E	Maximum Acoustic Impedance 9 (MAX_AI9) USIT-E	Acoustic Impedance Maximum (AIMX) USIT-E	Maximum Flexural Attenuation (U-USIT_UFAX) USIT-E
-7.5 Mrayl 7.5	-7.5 Mrayl 7.5	-7.5 Mrayl 7.5	-7.5 Mrayl 7.5	0 Mrayl 15	0 Mrayl 7.5	40 dB/m 140
Average Acoustic Impedance 2 (AV_AI2) USIT-E	Average Acoustic Impedance 4 (AV_AI4) USIT-E	Average Acoustic Impedance 6 (AV_AI6) USIT-E	Average Acoustic Impedance 8 (AV_AI8) USIT-E	Average Acoustic Impedance 9 (AV_AI9) USIT-E	Acoustic Impedance Average (AIAV) USIT-E	Average Flexural Attenuation (U-USIT_UFAV) USIT-E
-7.5 Mrayl 7.5	-7.5 Mrayl 7.5	-7.5 Mrayl 7.5	-7.5 Mrayl 7.5	0 Mrayl 15	0 Mrayl 7.5	40 dB/m 140

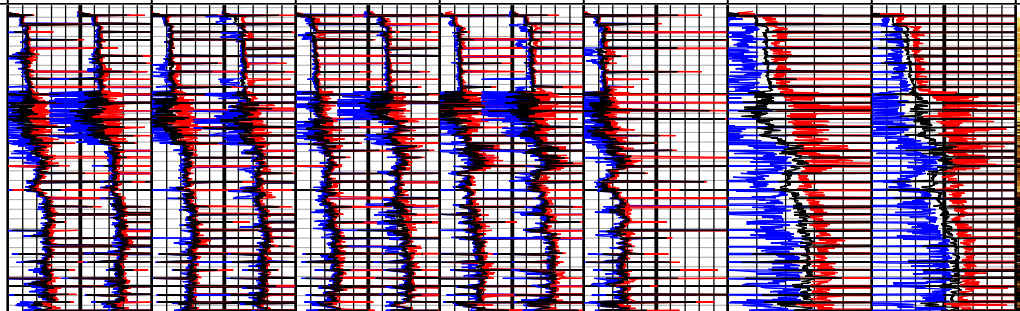
Gamma Ray (ECGR_EDTC) EDTC-B

0 gAPI 150

Amplitude of Eccentering (ECCE) USIT-E

0 in 0.5

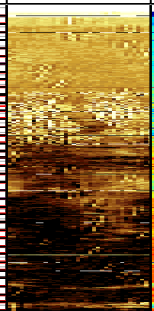




Absent 0.750 1.750 2.750 3.750

Custom Normalization

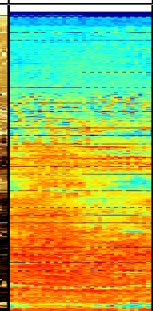
USIT - Acoustic Impedance (AIBK) USIT-E (Mrayl)



Absent 42.000 66.000 90.000 114.000

Custom Normalization

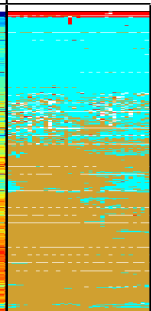
USIT - Flexural Attenuation (UFAK) USIT-E (dB/m)

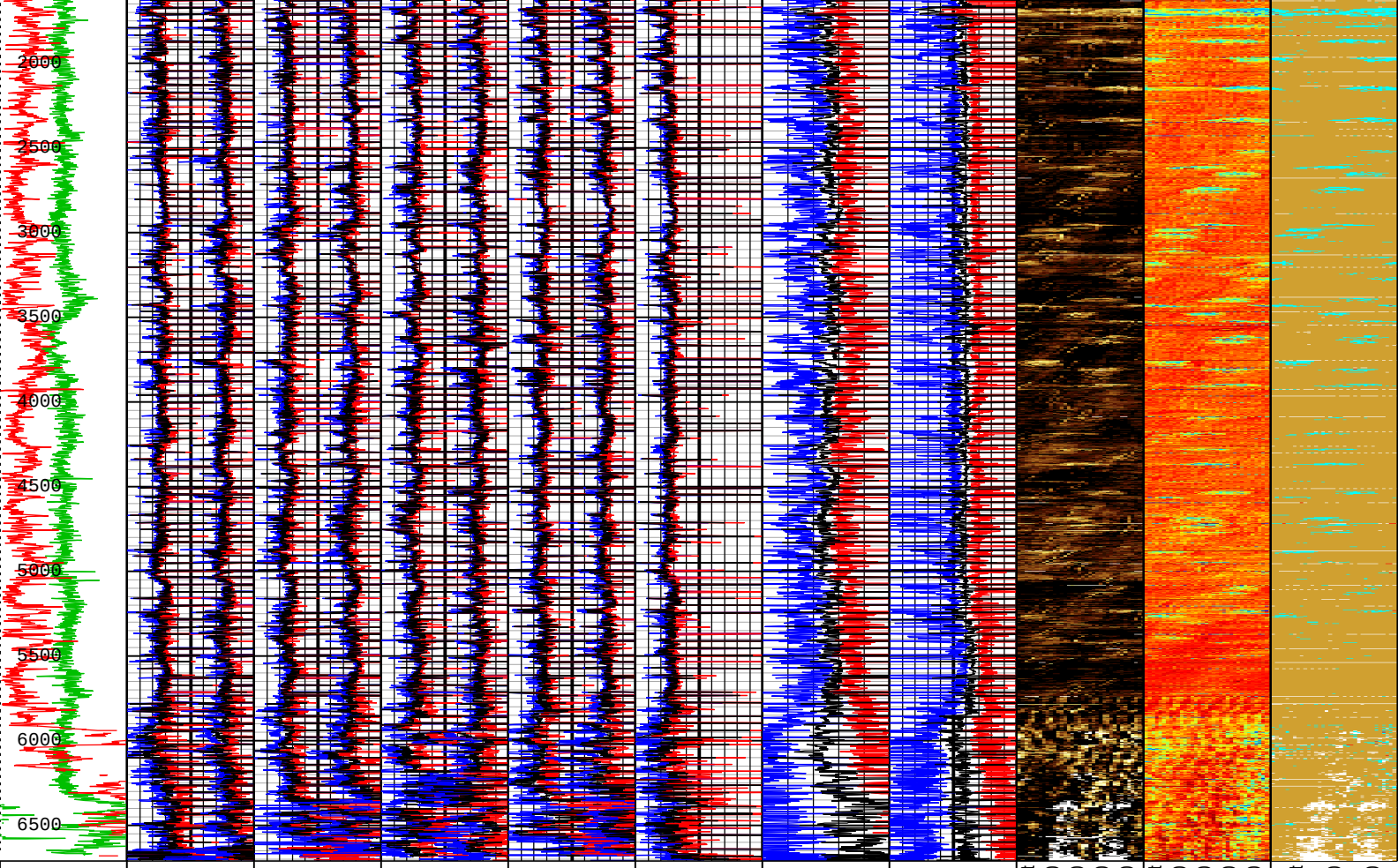


Absent 1.500 3.500

Explicit Normalization

USIT - Solid Liquid Gas Sorted Color Map (USLP) USIT-E





Gamma Ray (ECGR_EDTC) EDTC-B	Minimum Acoustic Impedance 1 (MIN_AI1) USIT-E	Minimum Acoustic Impedance 3 (MIN_AI3) USIT-E	Minimum Acoustic Impedance 5 (MIN_AI5) USIT-E	Minimum Acoustic Impedance 7 (MIN_AI7) USIT-E	Minimum Acoustic Impedance 9 (MIN_AI9) USIT-E	Acoustic Impedance Minimum (AIMN) USIT-E	Minimum Flexural Attenuation (U-USIT_UFAN) USIT-E	Absent 0.750 1.750 2.750 3.750	Absent 42.000 66.000 90.000 114.000	Absent 1.500 3.500
0 gAPI 150	0 Mrayl 15	0 Mrayl 15	0 Mrayl 15	0 Mrayl 15	0 Mrayl 15	0 Mrayl 7.5	40 dB/m 140	Custom Normalization USIT - Acoustic Impedance (AIBK) USIT-E (Mrayl)	Custom Normalization USIT - Flexural Attenuation (UFAK) USIT-E (dB/m)	Explicit Normalization USIT - Solid Liquid Gas Sorted Color Map (USLP) USIT-E
Amplitude of Eccentering (ECCE) USIT-E	Maximum Acoustic Impedance 1 (MAX_AI1) USIT-E	Maximum Acoustic Impedance 3 (MAX_AI3) USIT-E	Maximum Acoustic Impedance 5 (MAX_AI5) USIT-E	Maximum Acoustic Impedance 7 (MAX_AI7) USIT-E	Maximum Acoustic Impedance 9 (MAX_AI9) USIT-E	Acoustic Impedance Maximum (AIMX) USIT-E	Maximum Flexural Attenuation (U-USIT_UFAX) USIT-E			
0 in 0.5	0 Mrayl 15	0 Mrayl 15	0 Mrayl 15	0 Mrayl 15	0 Mrayl 15	0 Mrayl 7.5	40 dB/m 140			
	Average Acoustic Impedance 1 (AV_AI1) USIT-E	Average Acoustic Impedance 3 (AV_AI3) USIT-E	Average Acoustic Impedance 5 (AV_AI5) USIT-E	Average Acoustic Impedance 7 (AV_AI7) USIT-E	Average Acoustic Impedance 9 (AV_AI9) USIT-E	Acoustic Impedance Average (AIAV) USIT-E	Average Flexural Attenuation (U-USIT_UFAV) USIT-E			
	0 Mrayl 15	0 Mrayl 15	0 Mrayl 15	0 Mrayl 15	0 Mrayl 15	0 Mrayl 7.5	40 dB/m 140			
	Minimum Acoustic Impedance 2 (MIN_AI2) USIT-E	Minimum Acoustic Impedance 4 (MIN_AI4) USIT-E	Minimum Acoustic Impedance 6 (MIN_AI6) USIT-E	Minimum Acoustic Impedance 8 (MIN_AI8) USIT-E						
	-7.5 Mrayl 7.5	-7.5 Mrayl 7.5	-7.5 Mrayl 7.5	-7.5 Mrayl 7.5						
	Maximum Acoustic Impedance 2 (MAX_AI2) USIT-E	Maximum Acoustic Impedance 4 (MAX_AI4) USIT-E	Maximum Acoustic Impedance 6 (MAX_AI6) USIT-E	Maximum Acoustic Impedance 8 (MAX_AI8) USIT-E						
	-7.5 Mrayl 7.5	-7.5 Mrayl 7.5	-7.5 Mrayl 7.5	-7.5 Mrayl 7.5						
	Average Acoustic	Average Acoustic	Average Acoustic	Average Acoustic						

Acoustic Impedance 2 (AV_AI2) USIT-E	Acoustic Impedance 4 (AV_AI4) USIT-E	Acoustic Impedance 6 (AV_AI6) USIT-E	Acoustic Impedance 8 (AV_AI8) USIT-E
-7.5Mrayl 7.5	-7.5Mrayl 7.5	-7.5Mrayl 7.5	-7.5Mrayl 7.5

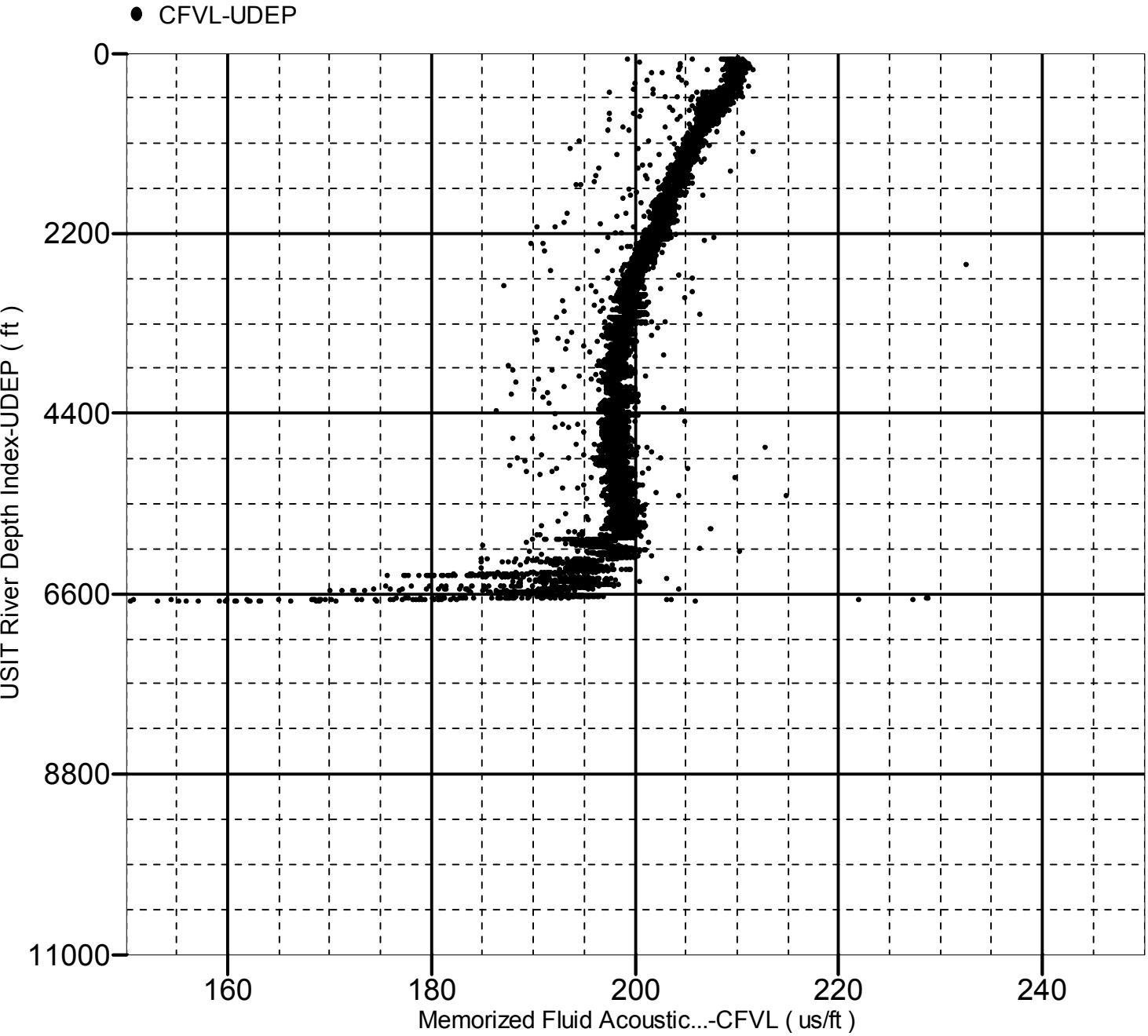
TIME_1900 - Time Marked every 60.00 (s)

Description: USI Goodwin Format: USI Goodwin Index Scale: 0.1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Nov-2015 19:19:03

Fluid Acoustic Slowness vs Depth

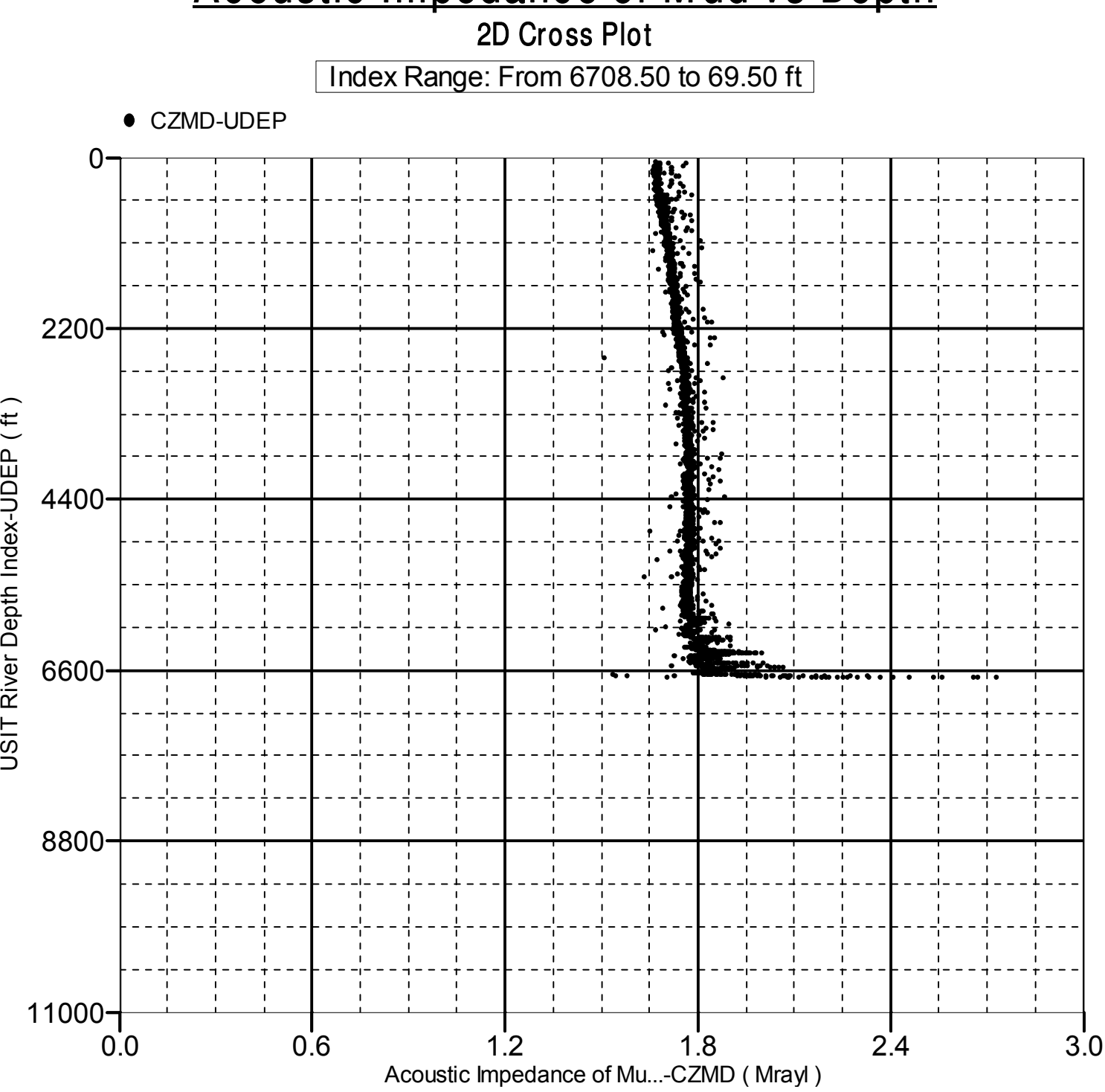
2D Cross Plot

Index Range: From 6708.50 to 69.50 ft



XYZ
Company:Noble Energy Inc Well:Wells Ranch AE32-675
Run 1: Main[3]:Up:S009

Acoustic Impedance of Mud vs Depth



Calibration Report

EDTC-B (Enhanced Digital Telemetry Cartridge - Version B) Calibration - Run 1

Primary Equipment :

EDTC-B	EDTC-B

Calibration Parameter :

Plus Reference (Jig minus background reference)	160

EDTC-B Accelerometer Calibration - EDTC-B Accelerometer Calibration

Before (Measured): 14:16:55 04-Nov-2015

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
AZ Vertical Measurement	ft/s2	Before	32.19	31.53	32.09	32.84

EDTC-B Memory Data - EDTC-B Memory Data

Master (EEPROM): 14:16:38 04-Nov-2015

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Initial PMT HV	V	Master			1482.000	

Accelerometer Serial Number		Master			696		
Accelerometer Coefficients - 0		Master	-----	-----	2.987	-----	
Accelerometer Coefficients - 1		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 2		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 3		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 4		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 5		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 6		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 7		Master	-----	-----	-0.007	-----	
Accelerometer Coefficients - 8		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 9		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 10		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 11		Master	-----	-----	0.000	-----	
Gamma-Ray Detector Serial Number		Master			7792		

EDTC-B Gamma-Ray Calibration - Gamma Ray Coefficients

Before (Measured): 20:41:14 01-Nov-2015

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Gamma Ray Gain		Before	1.000	0.900	1.066	1.100	

EDTC-B Gamma-Ray Calibration - Gamma Ray Accumulations

Before (Measured): 20:41:14 01-Nov-2015

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RGR Zero Measurement	gAPI	Before		0	70.943	120.000	
RGR Plus Measurement	gAPI	Before	160.000	145.000	150.150	175.000	

Well:	Wells Ranch AE32-675
Field:	Wattenberg
County:	Weld
State:	Colorado

Isolation Scanner

Cement Evaluation (Short)

Gamma Ray - CCL Log