

Company: Kerr McGee Oil & Gas Onshore LP

Well: Green 1N-8HZ

Field: Wattenberg

County: Weld State: Colorado

Ultrasonic Imager
Cement Evaluation (Short)
Gamma Ray - CCL Log

County: Weld
Field: Wattenberg
Location: NWNW Sec 8 - Twn 1N - Rng 65W
Well: Green 1N-8HZ
Company: Kerr McGee Oil & Gas Onshore LP

Location:			Elev.:	K.B.	4988.00 ft
NWNW Sec 8 - Twn 1N - Rng 65W				G.L.	4972.00 ft
SHL: 357 FNL & 868' FWL				D.F.	4988.00 ft
Lat/Long: 40.072306/-104.69418					
Permanent Datum:	Ground Level	Elev.:	4972.00 f		
Log Measured From:	Kelly Bushing	16.00 ft	above Perm.Datum		
Drilling Measured From:	Kelly Bushing				
API Serial No.	Section:	Township:	Range:		
05-123-40837	8	1N	65W		
	31-Jul-2015				
	ONE				
	13423.00 ft				
	13423.00 ft				
	7650.00 ft				
	12.00 ft				
	Water				
	8.4 lbm/gal				
	8.00 ft				
STRING					
	6.00 in				
	1562.00 ft				
	13423.00 ft				
	5.5 in				
	17 lbm/ft				
	N/A				
	0.00 ft				
	13423.00 ft				
atures					
Time	31-Jul-2015	11:55:00			
Location:	3022	Fort Morgan, CO			
	Evan Meadows				
	DJ Anderson				

Disclaimer

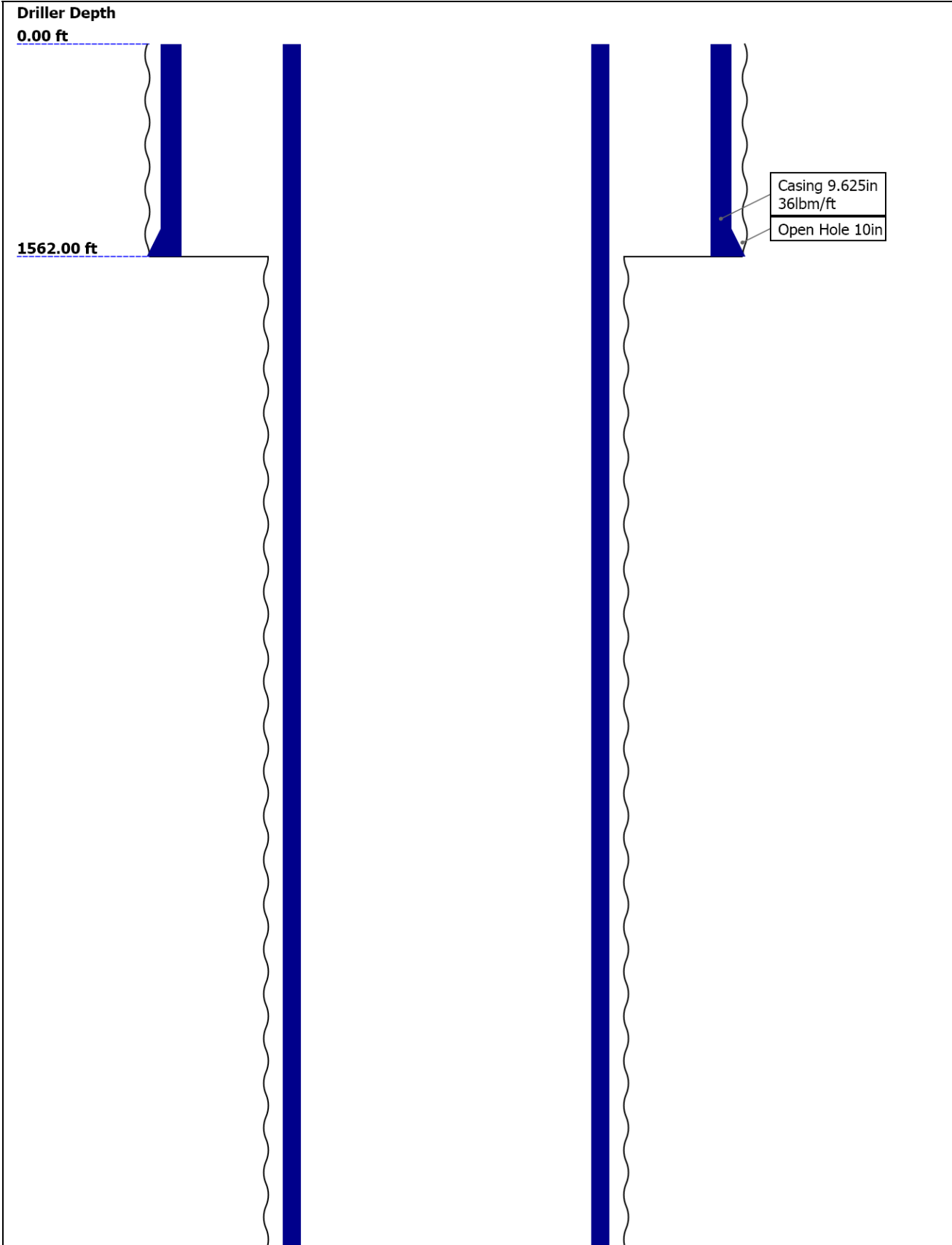
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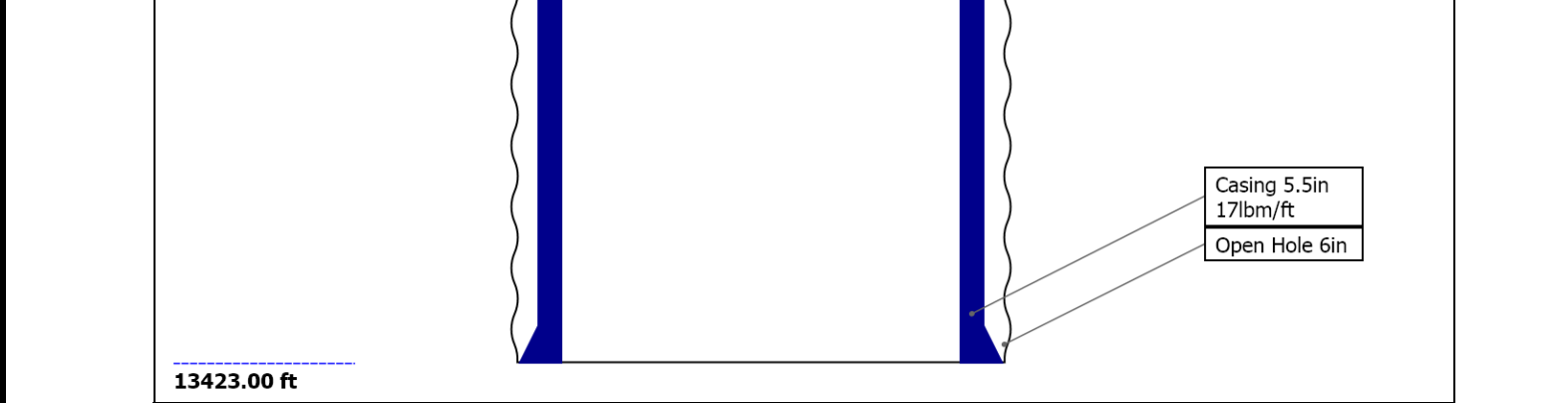
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Well Sketch





Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	10	6				
Top Driller (ft)	0	1562				
Top Logger (ft)	0	1562				
Bottom Driller (ft)	1562	13423				
Bottom Logger (ft)	1562	13423				
Casing						
Size (in)	9.625	5.5				
Weight (lbm/ft)	36	17				
Inner Diameter (in)	8.921	4.892				
Grade	J55	N/A				
Top Driller (ft)	0	0				
Top Logger (ft)	0	0				
Bottom Driller (ft)	1562	13423				
Bottom Logger (ft)	1562	13423				

Operational Run Summary

Parameter (unit)	ONE					
Date Log Started	31-Jul-2015					
Time Log Started	10:36:17					
Date Log Finished	31-Jul-2015					
Time Log Finished	14:29:38					
Top Log Interval (ft)	12.00					
Bottom Log Interval (ft)	7650.00					
Total Depth (ft)	7650.00					
Max Hole Deviation (deg)	0.00					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	6.000					
Logging Unit Number	3022					
Logging Unit Location	Fort Morgan, CO					
Recorded By	Evan Meadows					

Witnessed By	DJ Anderson					
Service Order Number	D62I-00043					

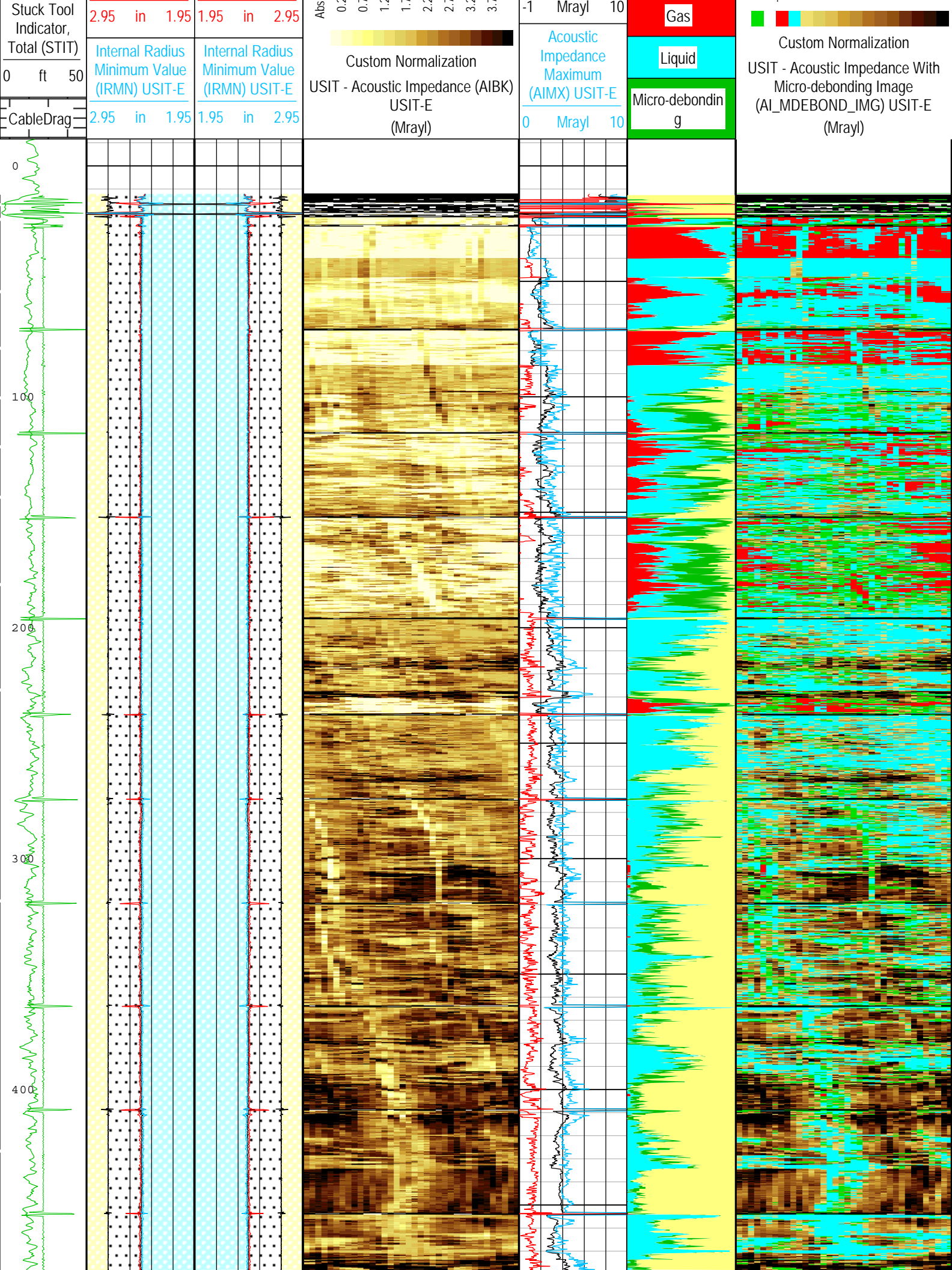
Remarks and Equipment Summary

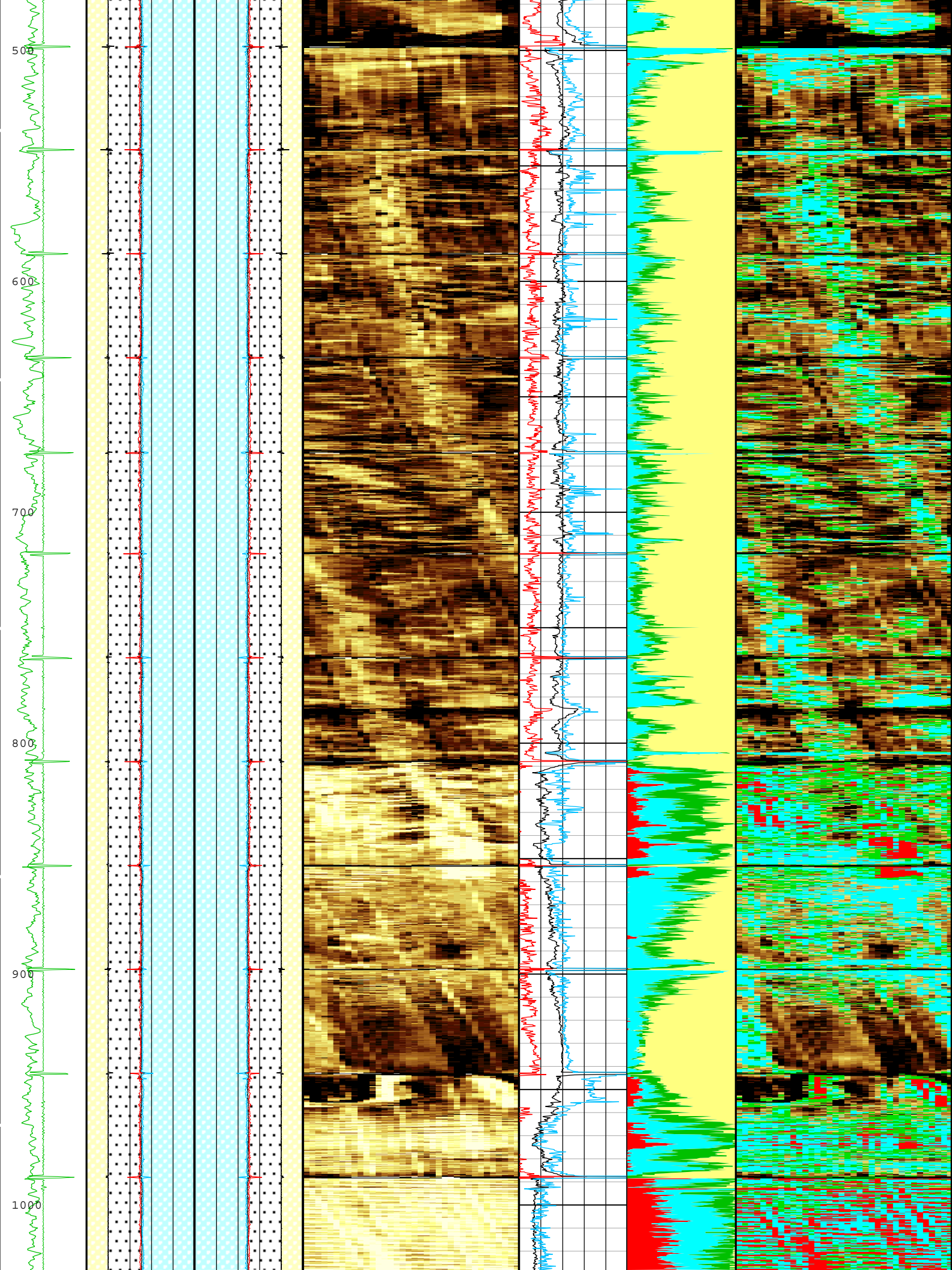
ONE: Toolstring			ONE: Remarks	
<div>Equip nameLength</div> <div>LEH-QT30.97</div> <div>LEH-QT</div>		<div>MP nameOffset</div> <div>CTEM27.16</div> <div>HV0.00</div> <div>TelStatus25.06</div> <div>ToolStatus25.06</div> <div>GR24.14</div>	1. THIS IS THE FIRST RUN IN THE WELL.	
<div>DTC-H28.06</div> <div>ECH-KC</div> <div>DTC-H</div>		2. TOOL RAN AS PER TOOL SKETCH.		
<div>SGT-N25.06</div> <div>SGH-K</div> <div>SGC-TB</div> <div>SGD-TAA</div>		3. CSG: 5.5" 17#		
<div>AH-184[2]19.56</div>		4. SPACER: 11.20 PPG OBM (FULL RETURNS) LEAD: 12.0 PPG (5 BBL RETURNS) TAIL: 13.5 PPG (EST TOC @ 6000')		
<div>AH-184[1]17.56</div>		5. 0 PSI REPEAT PASS 2,800 PSI MAIN PASS		
<div>USIT-E15.56</div> <div>ECH-MFA</div> <div>USAC-A</div> <div>USIS-A</div> <div>USSC-B</div> <div>USRS-AB: 865</div> <div>USI-SENS</div> <div>OR</div>		6. LOG STARTED AT 7,650' DUE TO LOSS OF		
<div>USI Sen0.37</div> <div>sor</div> <div>Head</div> <div>nsion</div> <div>Length in ft</div> <div>Maximum Outer Diameter = 3.410 in</div> <div>Line: Sensor Location, Value: Gating Offset</div> <div>All measurements are relative to TOOL_ZERO</div>				

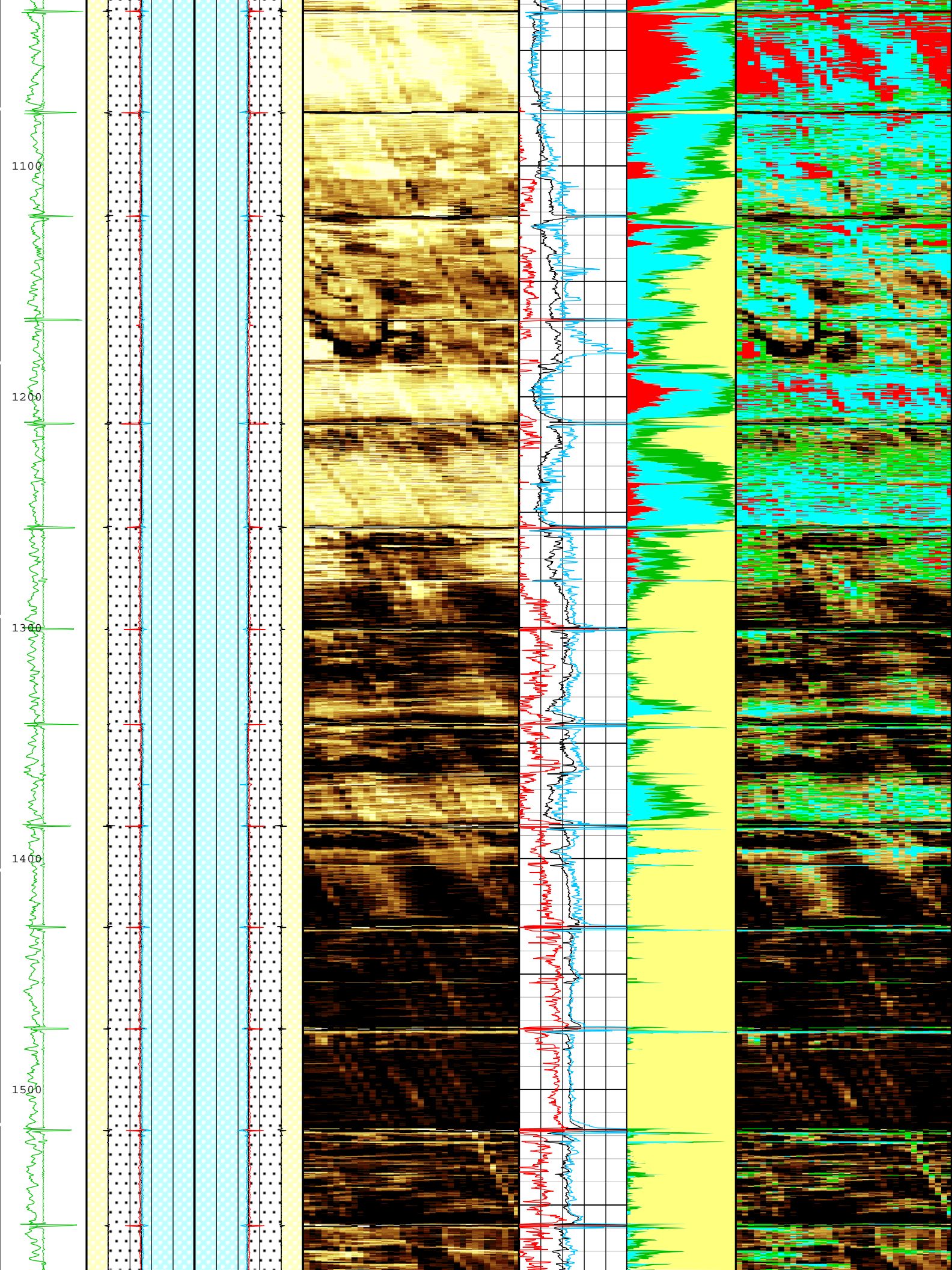
Depth Summary

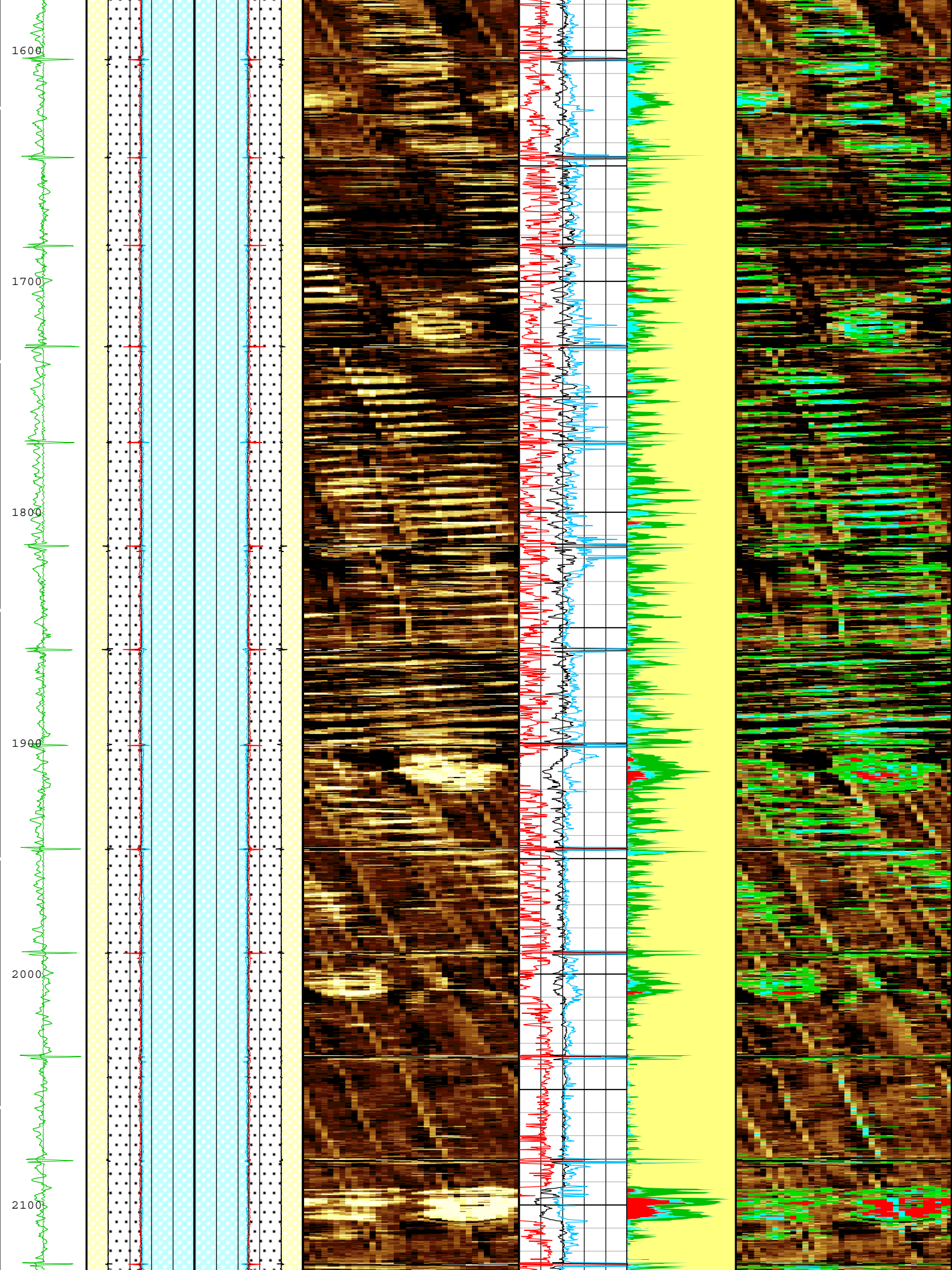
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Depth Measuring Device			
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		

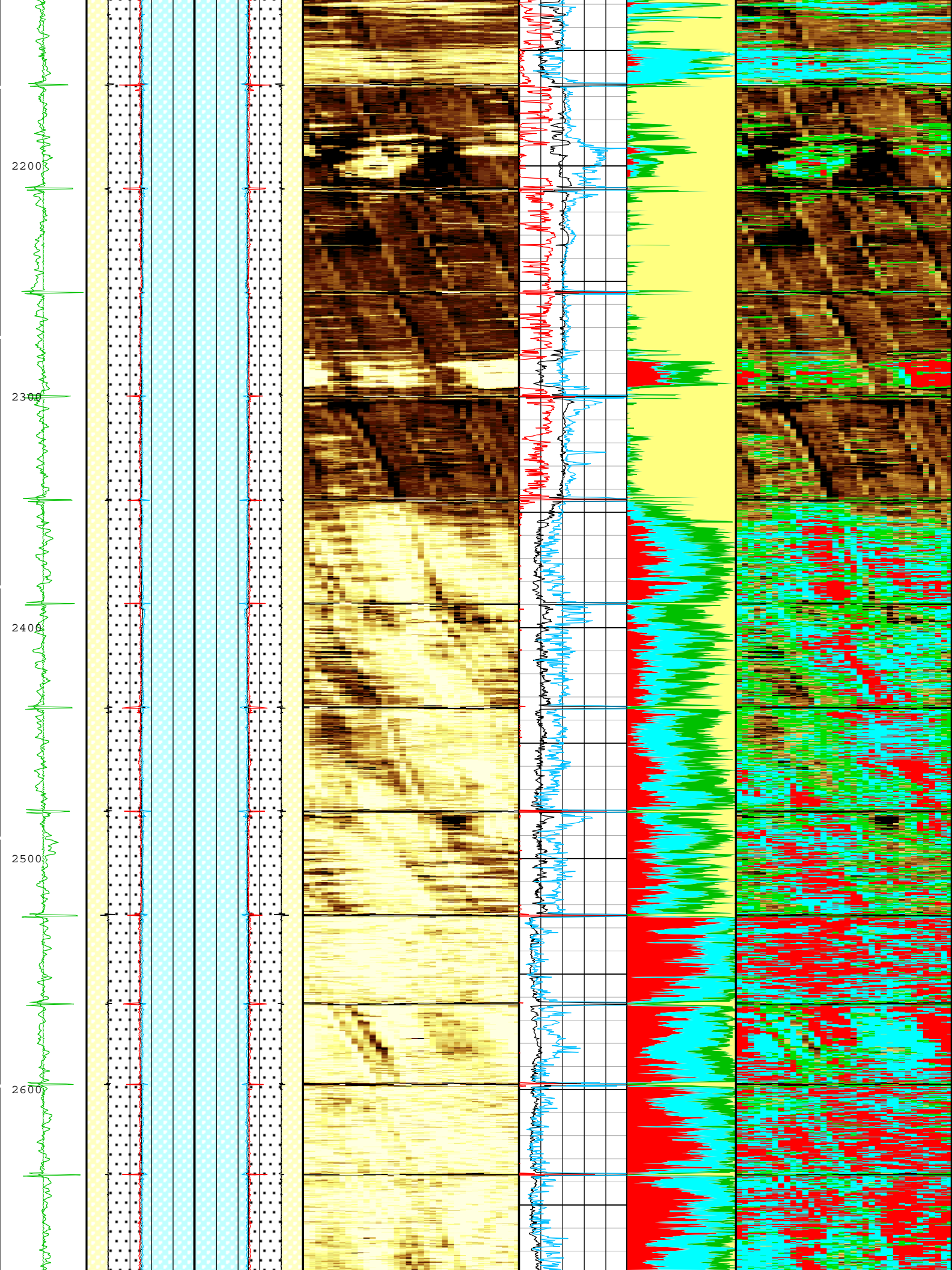
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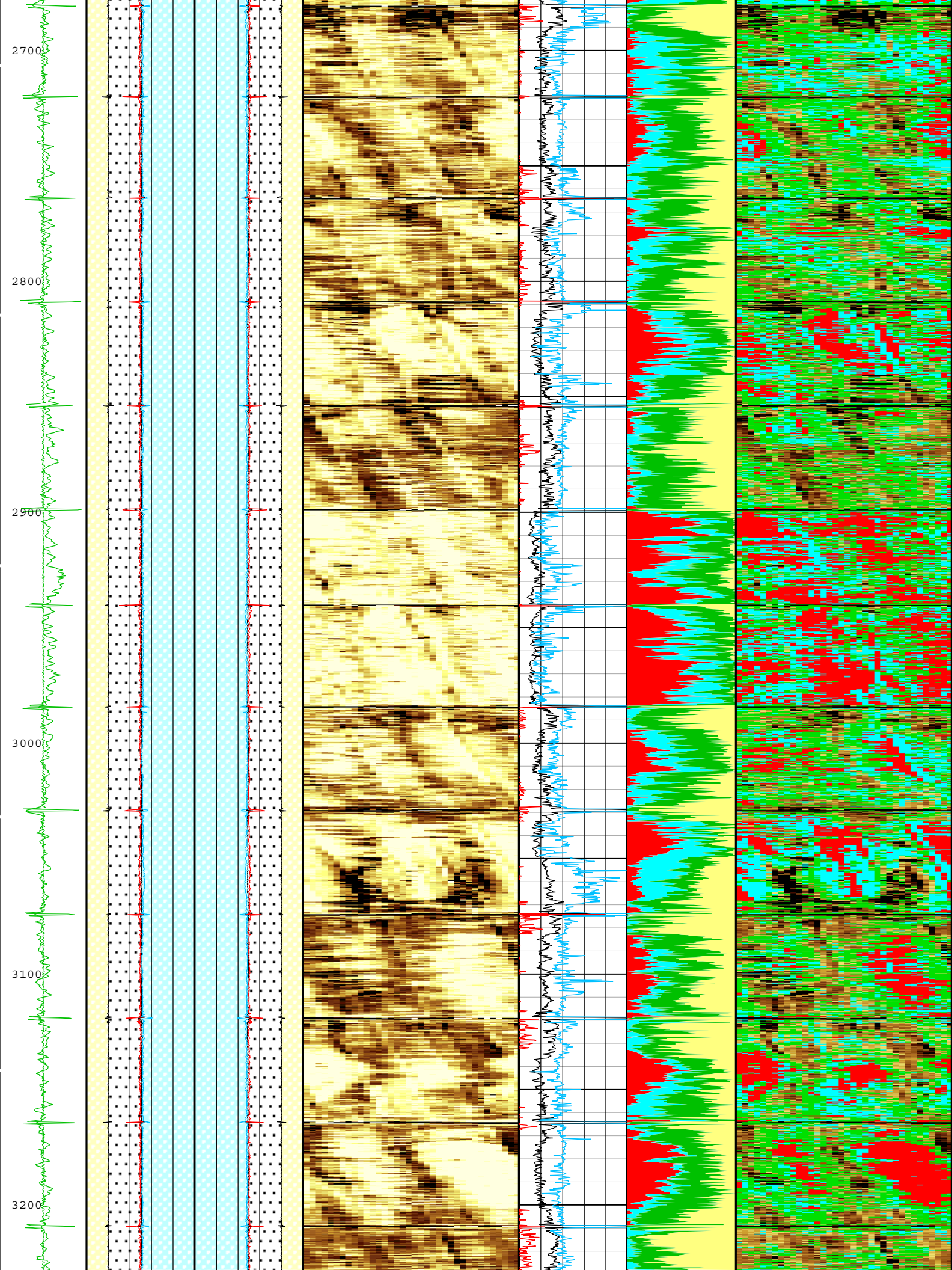


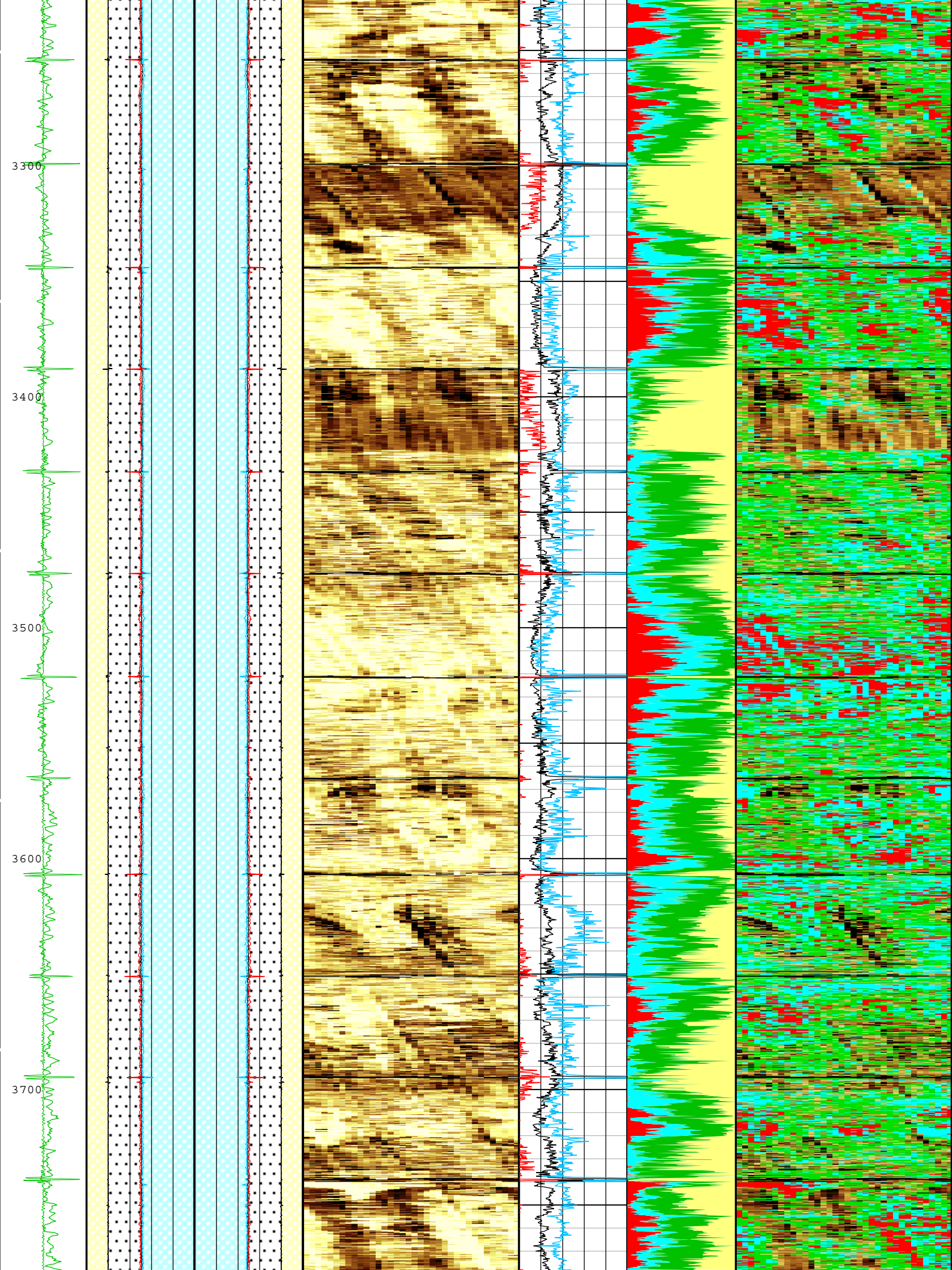


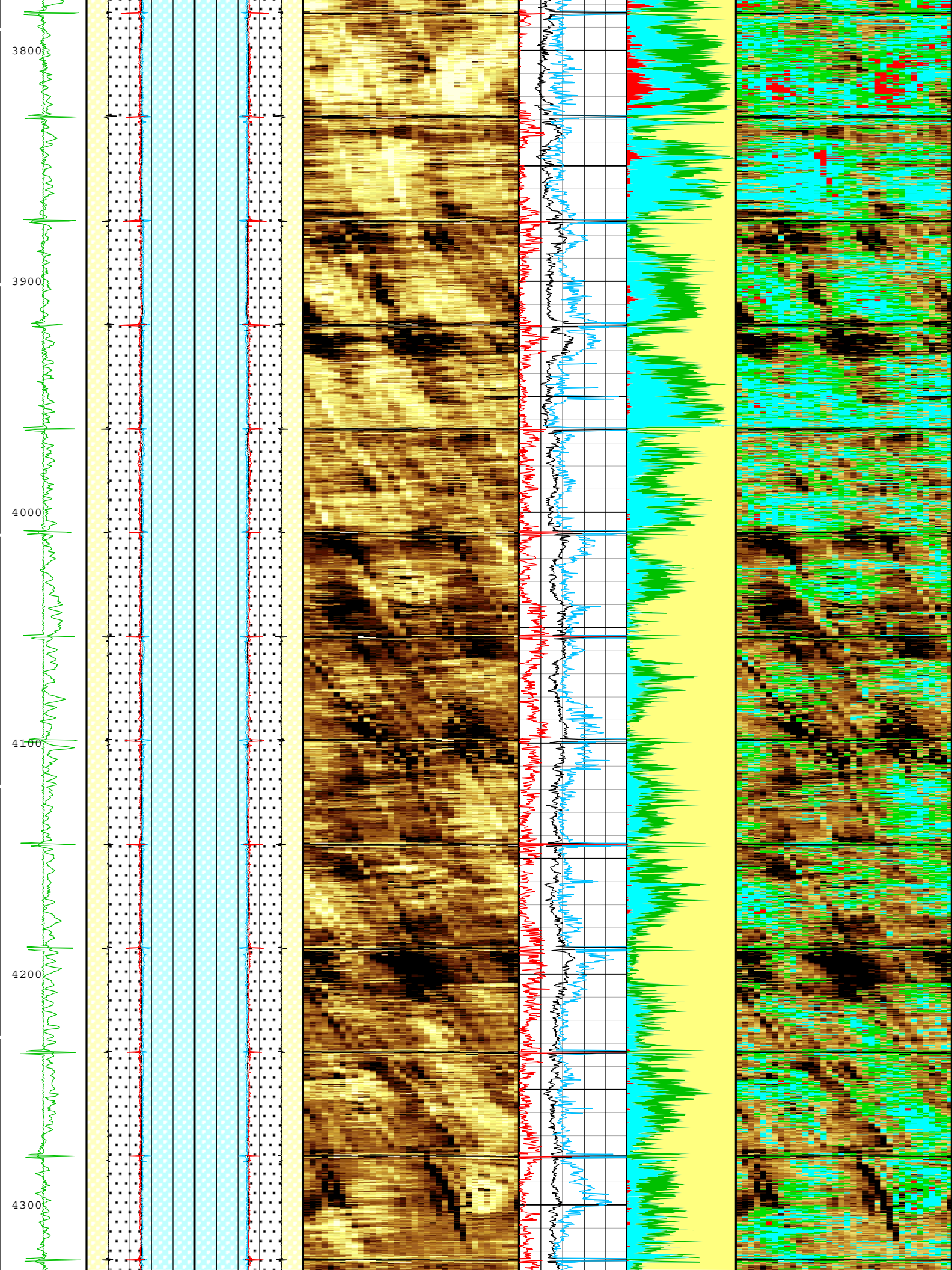


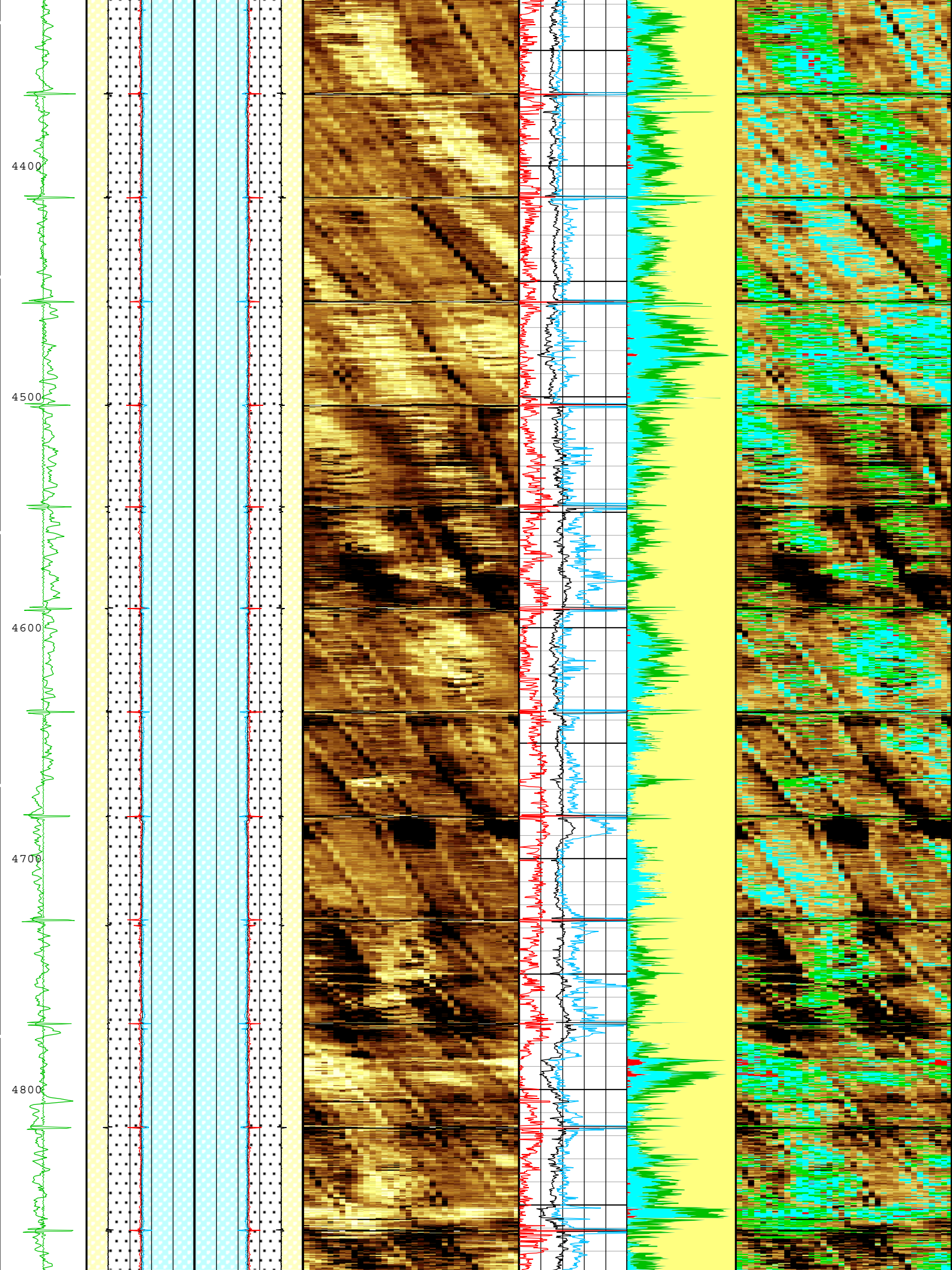


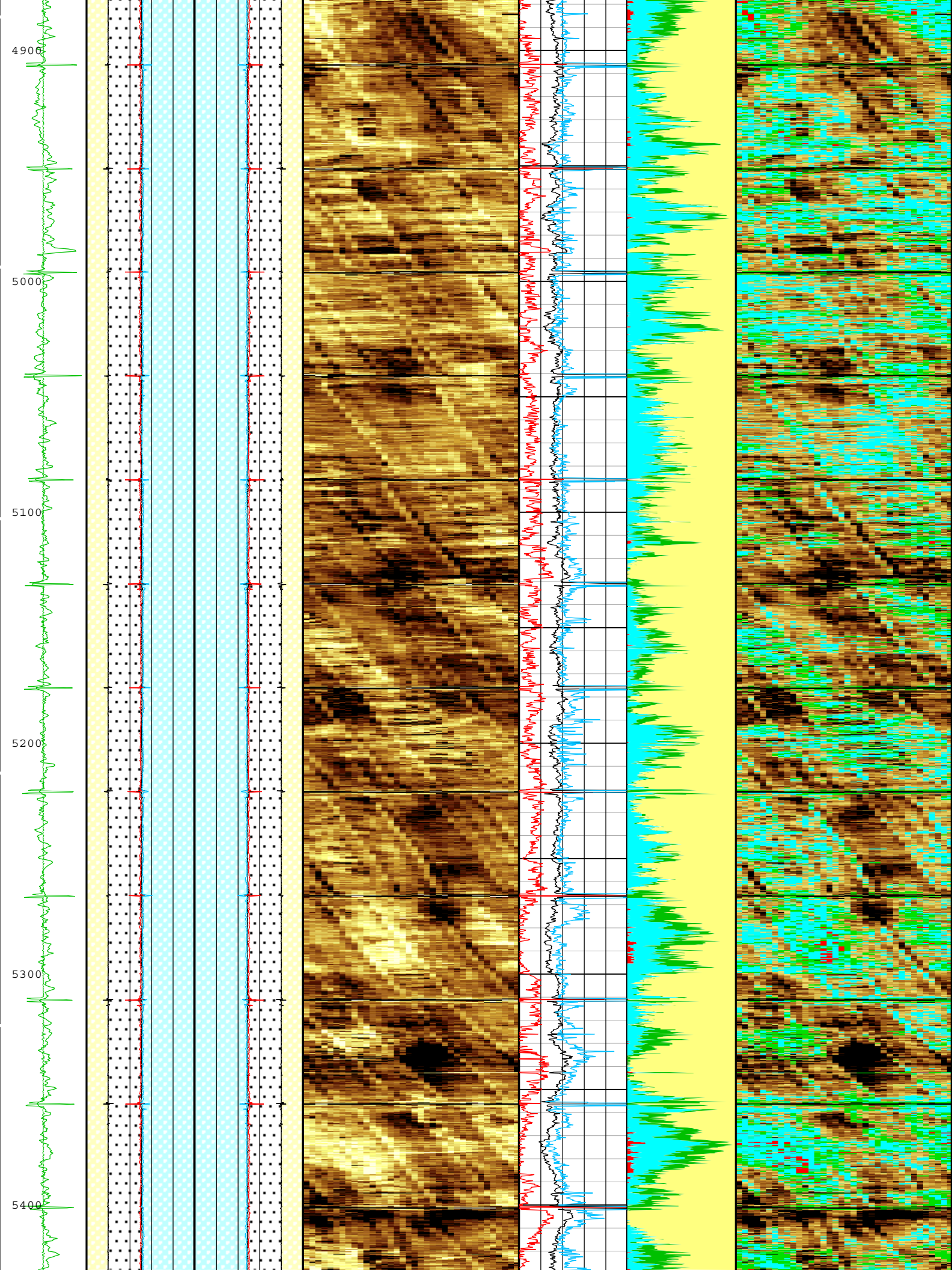


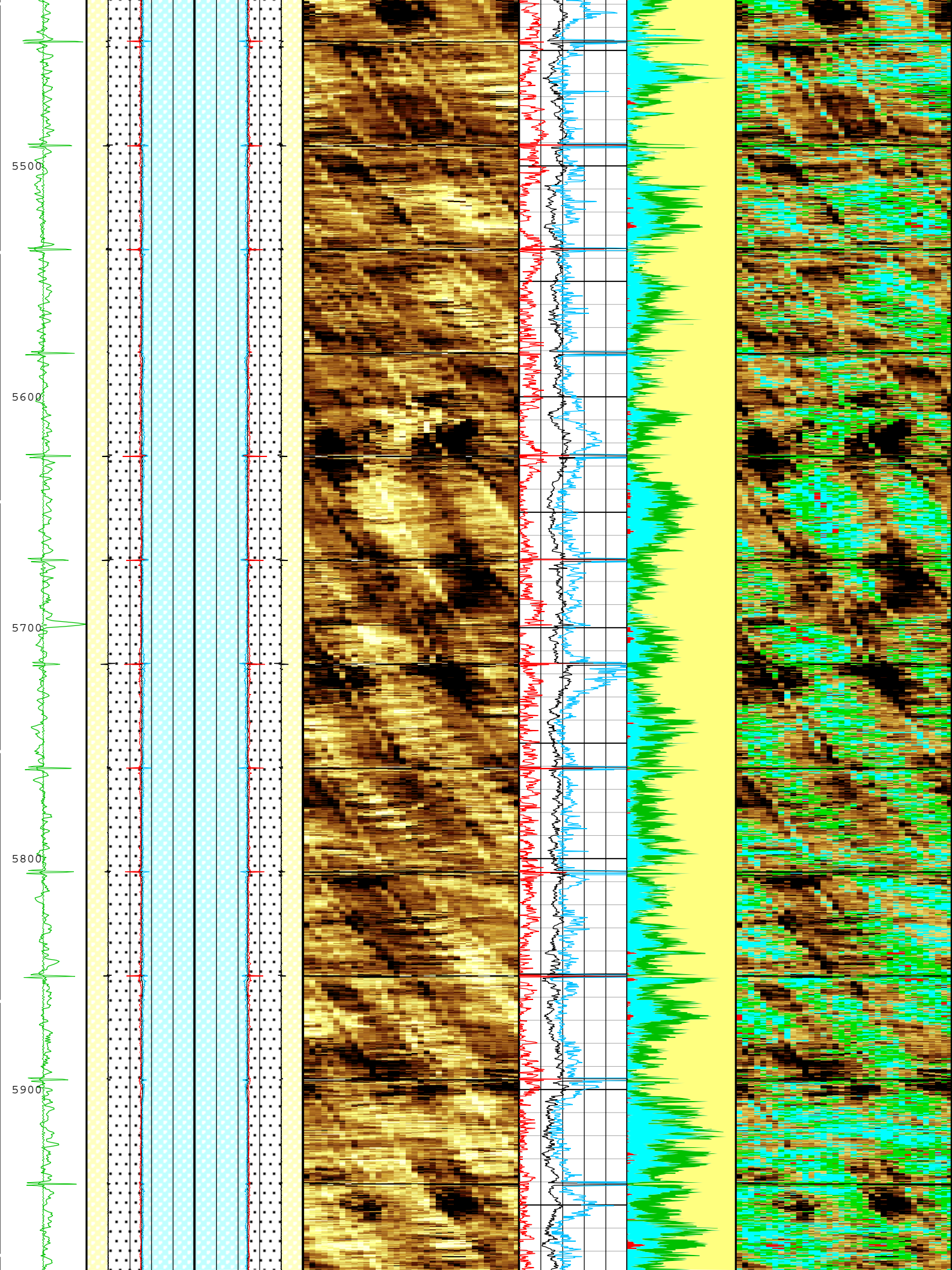


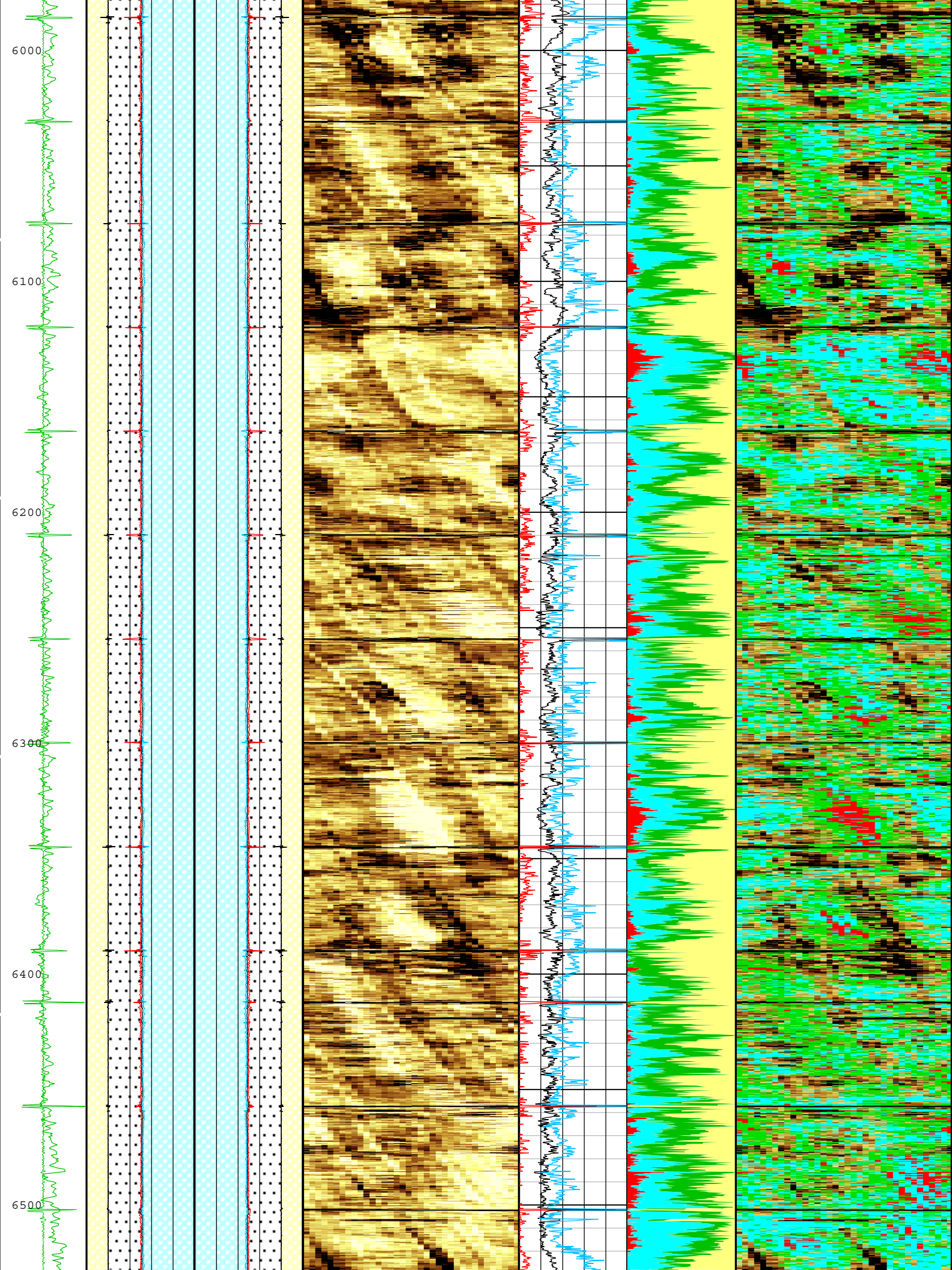


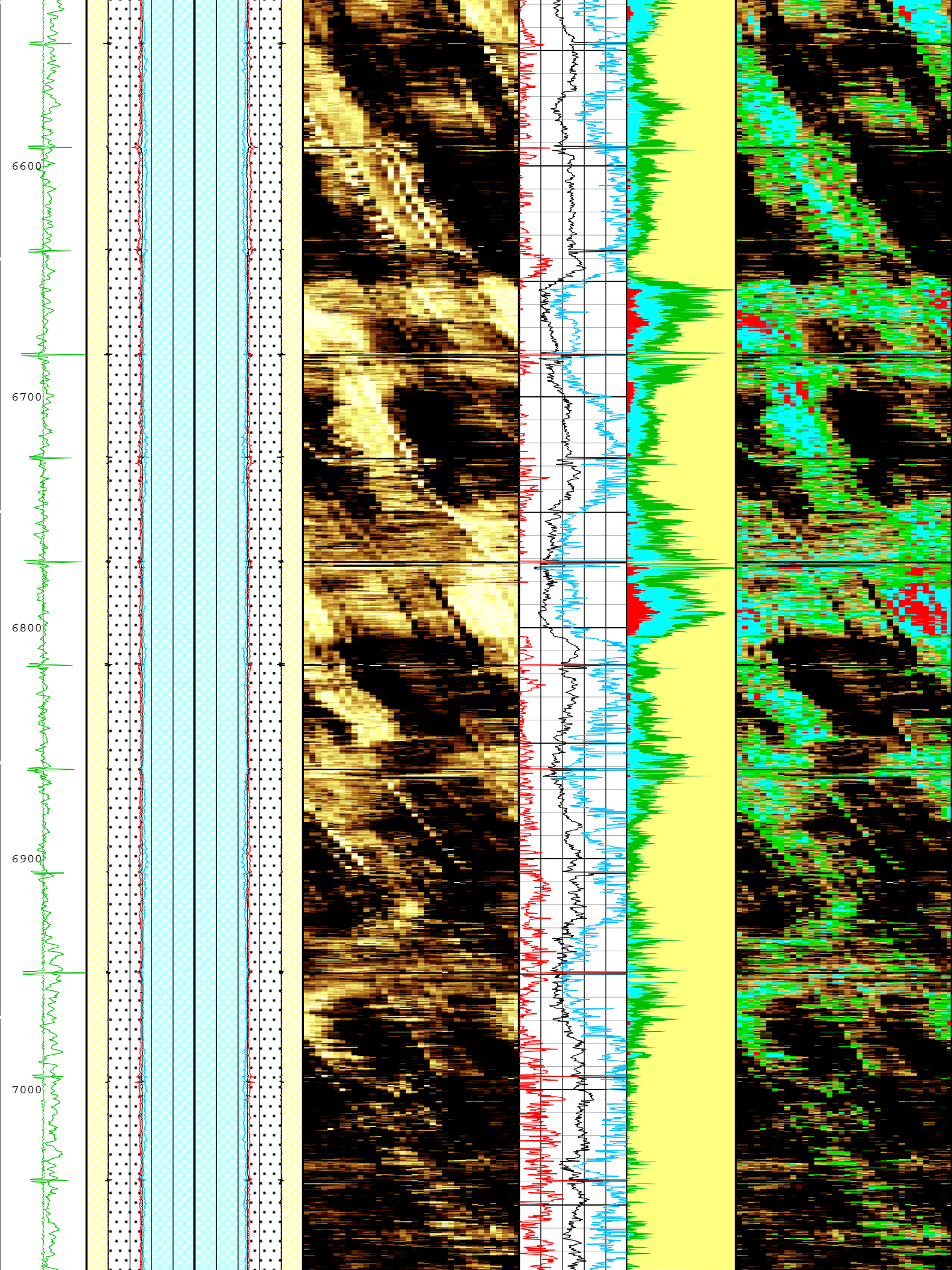


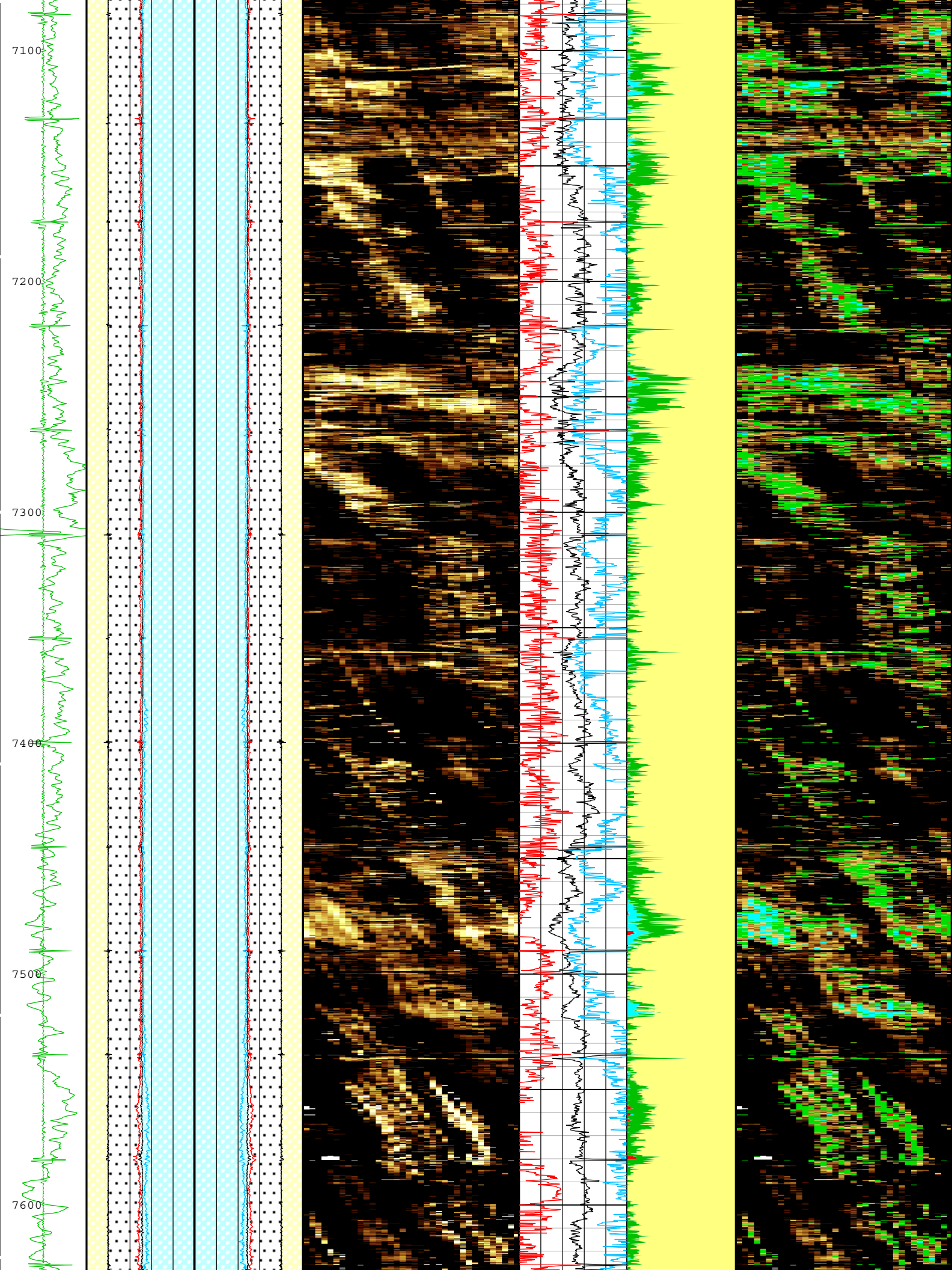


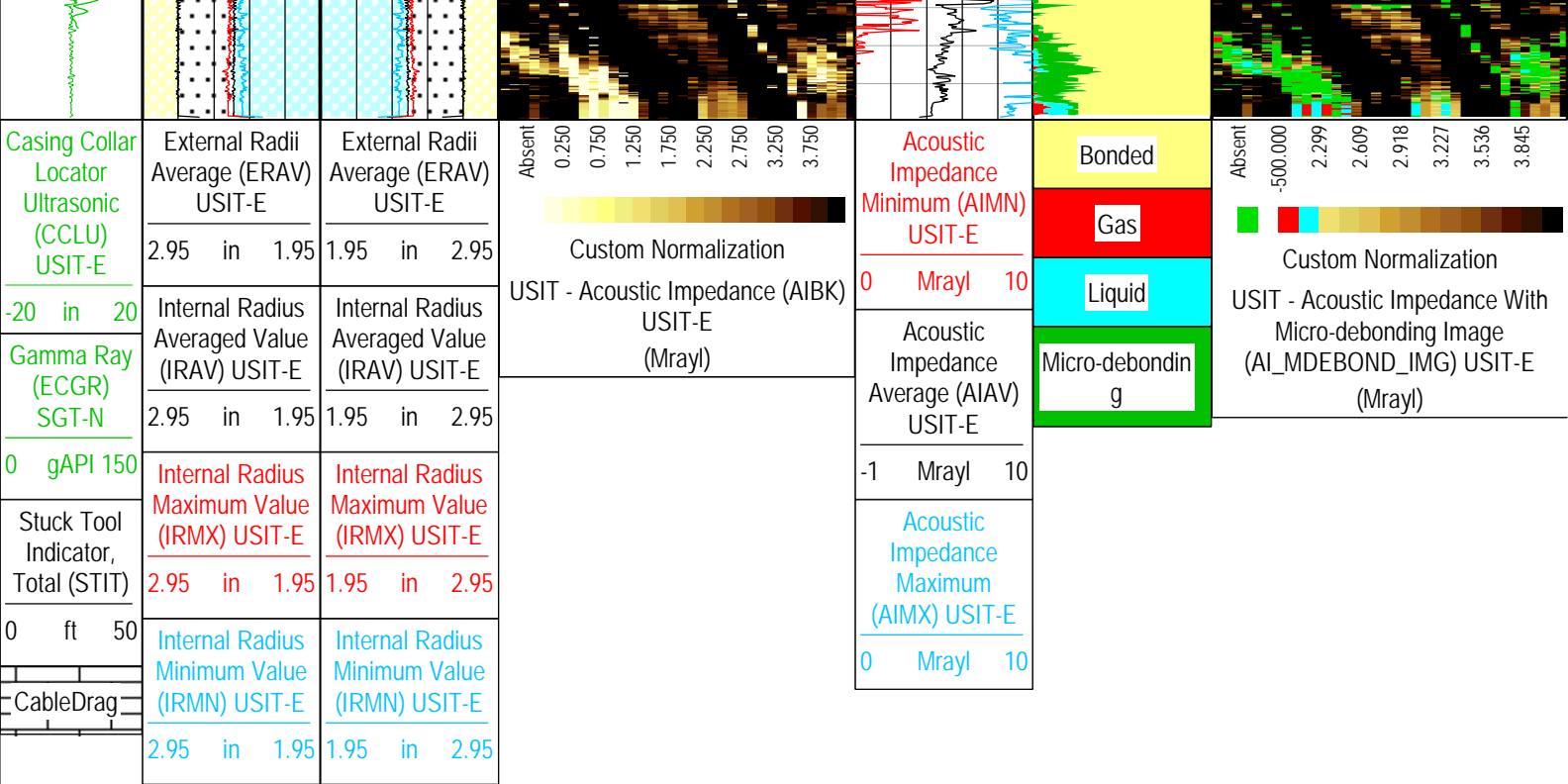












TIME_1900 - Time Marked every 60.00 (s)

Description: USI Cement Format: USI Cement Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 31-Jul-2015 17:04:53

Channel Processing Parameters				
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
AFVU	Automatic Fluid Velocity Update	USIT-E	On	
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	13423	ft
CDEN	Cement Density	SGT-N	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Light Cement	
THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.304	in
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	8.4	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	SGT-N	1	
HEMA	Hematite Presence Flag	Borehole	No	
ICE_BINPROC	ICE Bin Processing Depth Interval	USIT-E	0	ft
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	18.79	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.13	

MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1	
RAPID_OPTION	Rapid Access Computation Option	USIT-E	Off	
RCOD	Reference Calibrator Outer Diameter	USIT-E	4.5	in
RCSO	Reference Calibrator Standoff	USIT-E	0.842	in
RCTH	Reference Calibrator Thickness	USIT-E	0.216	in
SDNV	Number of Vertical Samples used for Micro-debonding Computation	USIT-E	5	
SDTHOR	Acoustic Impedance STD Horizontal Threshold for Micro-debonding	USIT-E	0.5	Mrayl
SDTVER	Acoustic Impedance STD Vertical Threshold for Micro-debonding	USIT-E	0.3	Mrayl
SOGR	Standoff Distance of the Gamma Ray Tool	SGT-N	0	in
TCUB	T*3 Processing Level	USIT-E	Loop	
TD	Total Measured Depth	Borehole	7650	ft
THDH	Maximum Search Thickness (percentage of nominal)	USIT-E	130	%
THDL	Minimum Search Thickness (percentage of nominal)	USIT-E	70	%
TPOS	Tool Position: Centered or Eccentered	SGT-N	Eccentered	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0.1	Mrayl
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
USI_FSOD	USIT USI Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF	
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-E	Automatic	
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	FreePipe Norm.	
THDP	Thickness Detection Policy	USIT-E	Fundamental	
VCAS	Ultrasonic Transversal Velocity in Casing	USIT-E	51.4	us/ft
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	Depth Zoned	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.3	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Depth Zone Parameters			
Parameter	Value	Start (ft)	Stop (ft)
BS	10	0	1562
BS	6	1562	7659.5
ZMUD	1.63	0	150
ZMUD	1.64	150	300
ZMUD	1.65	300	600
ZMUD	1.66	600	950
ZMUD	1.67	950	1300
ZMUD	1.68	1300	1650
ZMUD	1.69	1650	2000
ZMUD	1.7	2000	2600
ZMUD	1.71	2600	3200
ZMUD	1.72	3200	3800
ZMUD	1.73	3800	4400
ZMUD	1.74	4400	5000
ZMUD	1.75	5000	7659.5
All depth are actual.			

Tool Control Parameters

ONE: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	30	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
DOT(DOS)	Distance between Opposite Transducer Faces	USIT-E	1.756	in
EMXV	EMEX Voltage	USIT-E	50	V
HRES	Horizontal Resolution	USIT-E	10 deg	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
MOTOR_PROTECT	Motor Protection	USIT-E	On	
TMUC	Type of Mud	USIT-E	BRI	
UACLV_PERM	Ultrasonic ACLV Permanent	USIT-E	No	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UMFR	Modulation Frequency	USIT-E	333333	Hz
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 500 KHz	
UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 3.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	8000	ft
USSP	Ultrasonic Service	USIT-E	USI	
VRES	Vertical Resolution	USIT-E	3.0 in	
WINB	Window Begin Time	USIT-E	33.83	us
WINE	Window End Time	USIT-E	73.83	us

USI Goodwin

ONE

USI Goodwin Compressed

Log

Company:Kerr McGee Oil & Gas Onshore LP Well:Green 1N-8HZ

ONE: Main[4]:Up:S006

Description: USI Goodwin Format: USI Goodwin Index Scale: 0.1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 31-Jul-2015 17:05:14

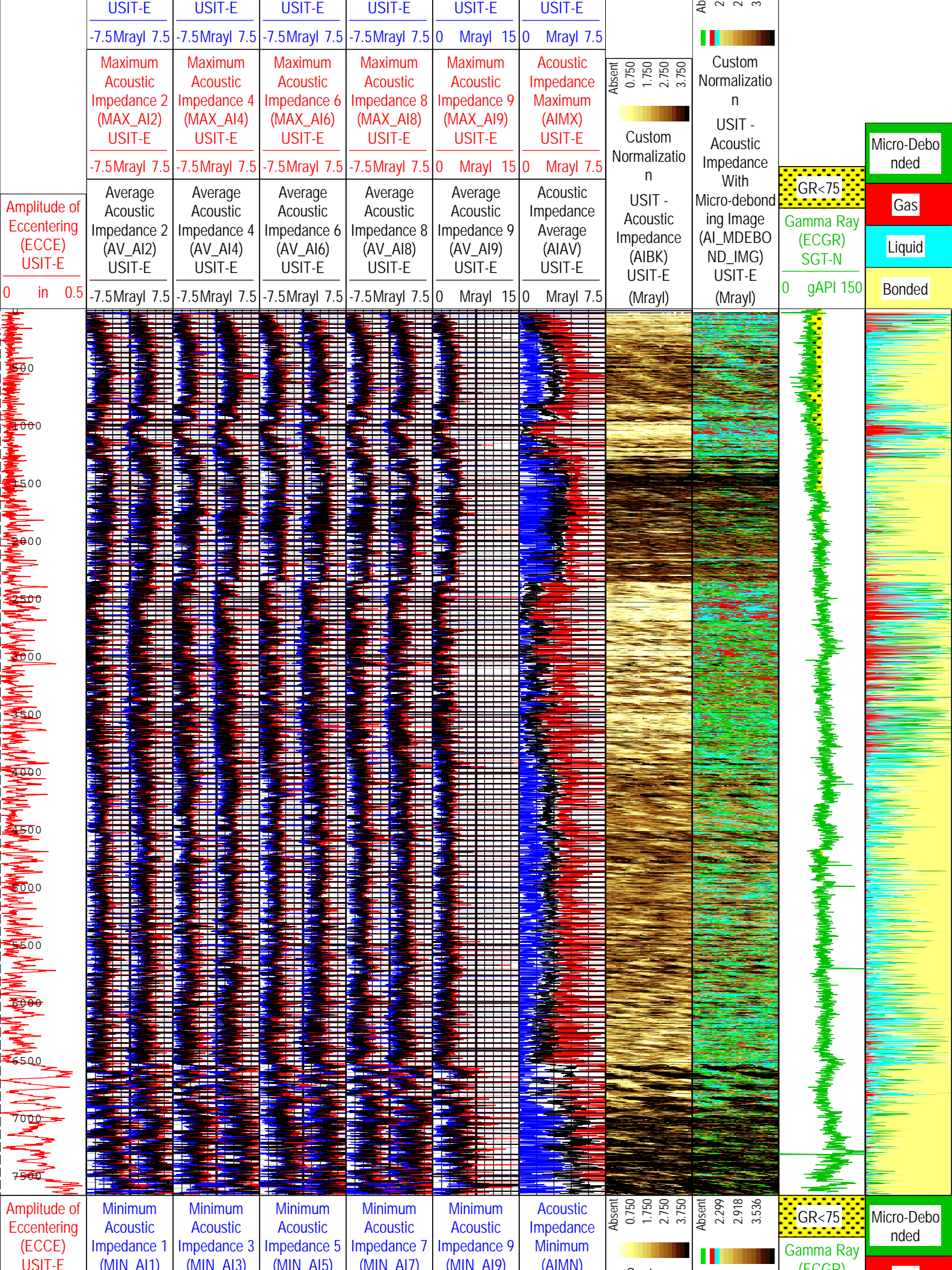
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Minimum Acoustic Impedance 1 (MIN_AI1) USIT-E	Minimum Acoustic Impedance 3 (MIN_AI3) USIT-E	Minimum Acoustic Impedance 5 (MIN_AI5) USIT-E	Minimum Acoustic Impedance 7 (MIN_AI7) USIT-E
0 Mrayl 15	0 Mrayl 15	0 Mrayl 15	0 Mrayl 15
Maximum Acoustic Impedance 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

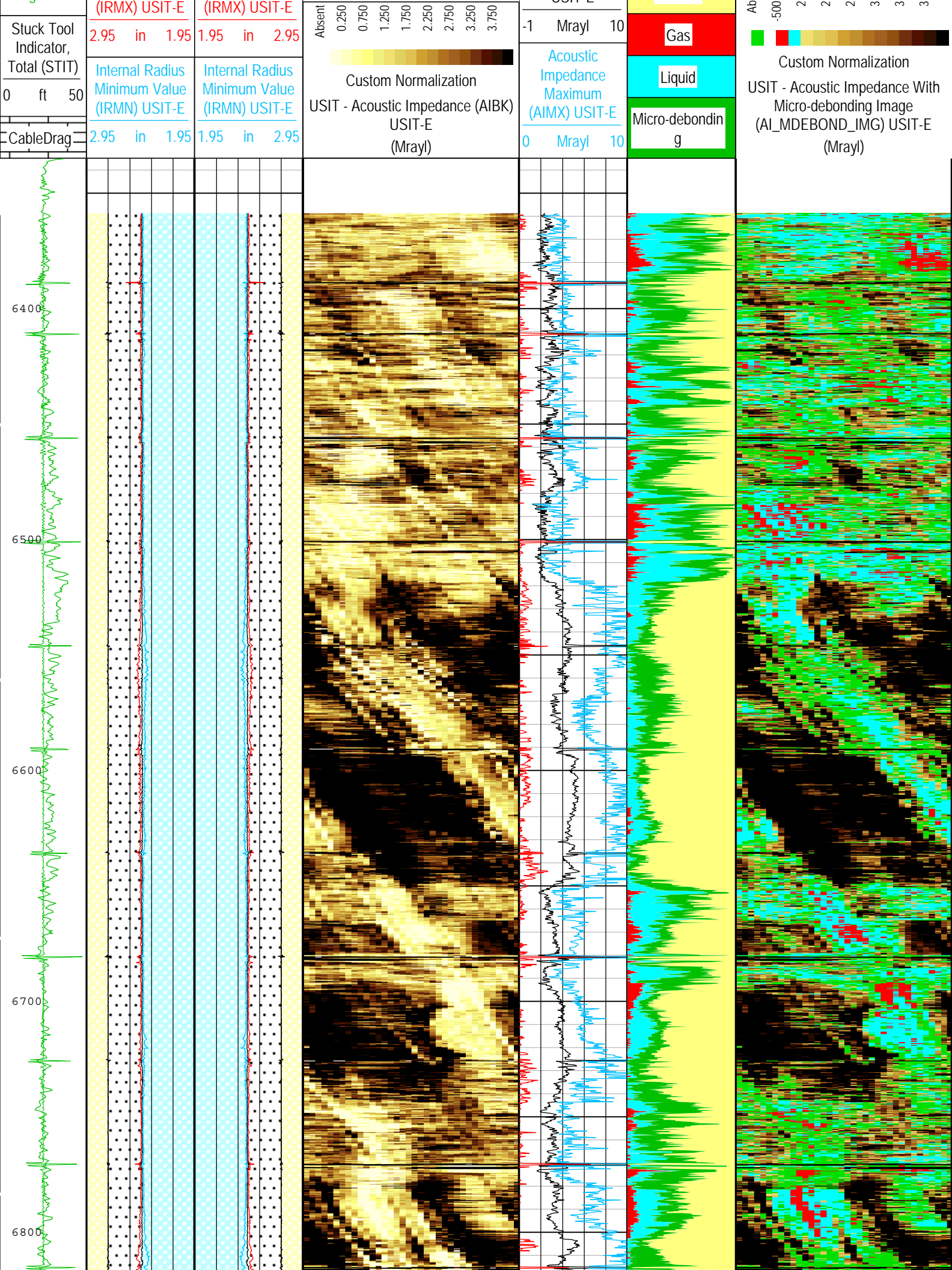
Minimum Acoustic Impedance 2 (MIN_AI2)	Minimum Acoustic Impedance 4 (MIN_AI4)	Minimum Acoustic Impedance 6 (MIN_AI6)	Minimum Acoustic Impedance 8 (MIN_AI8)	Minimum Acoustic Impedance 9 (MIN_AI9)	Acoustic Impedance Minimum (AIMN)
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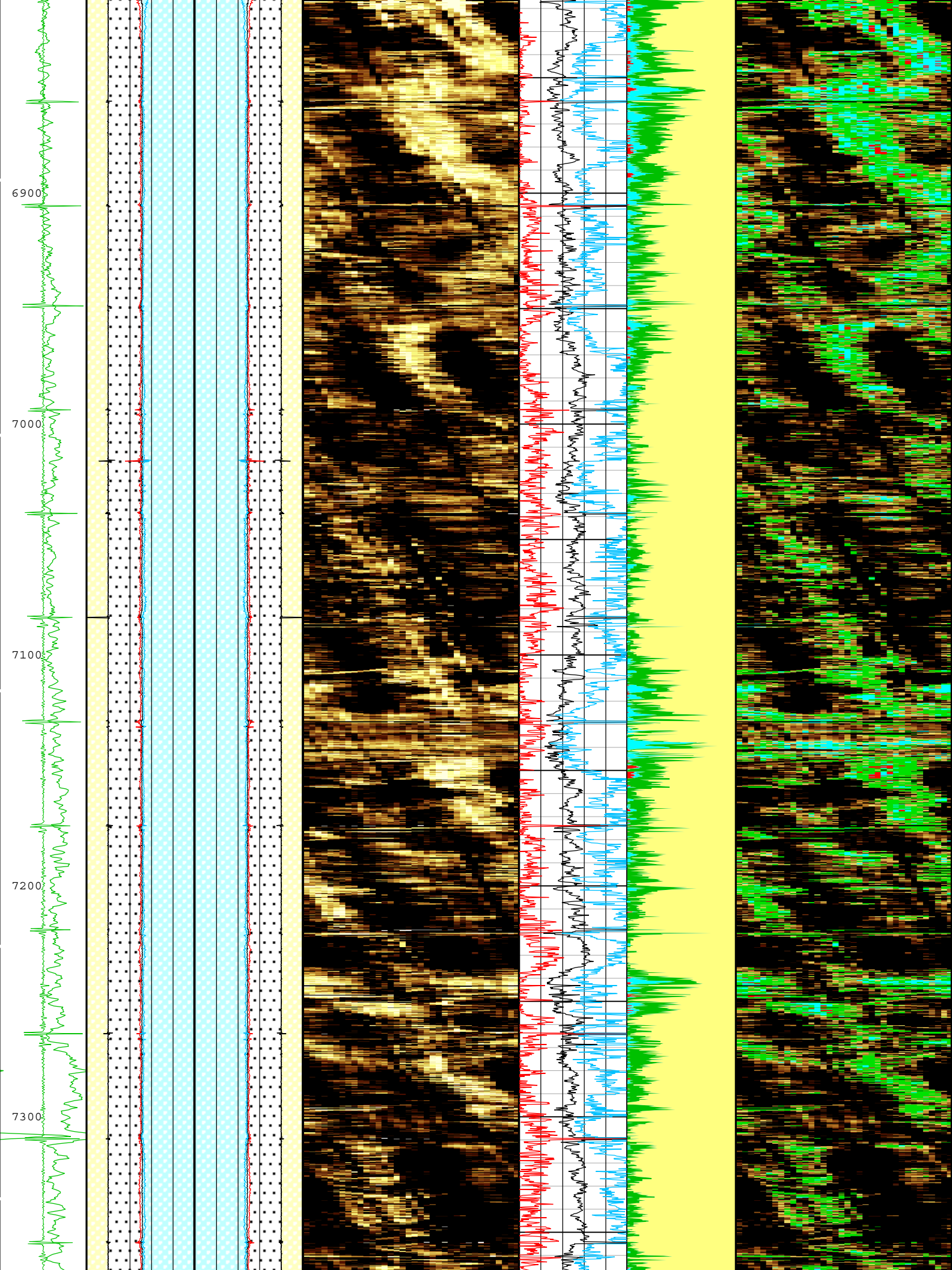
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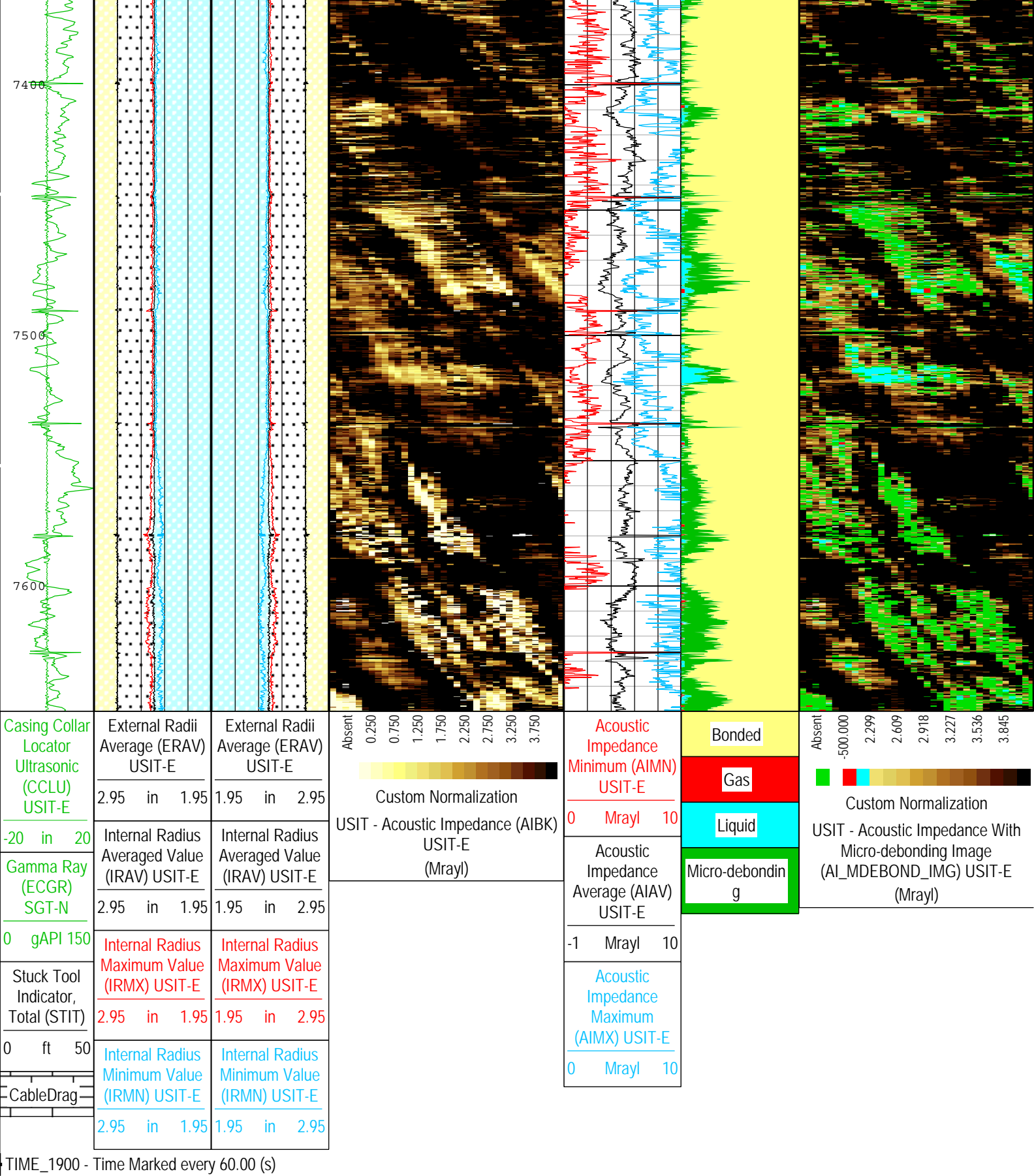
299
918
536



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Channel Processing Parameters

ONE: Parameters				
Parameter	Description	Tool	Value	Unit
AFVU	Automatic Fluid Velocity Update	USIT-E	On	
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BERJ	Bad Echo Rejection	USIT-E	On	
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FDII	FPM Data Interpolation Interval	USIT-E	0	ft
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GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS	
GR_MULTIPLIER	Gamma Ray Multiplier	SGT-N	1	
HEMA	Hematite Presence Flag	Borehole	No	
ICE_BINPROC	ICE Bin Processing Depth Interval	USIT-E	0	ft
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	18.79	us
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RCTH	Reference Calibrator Thickness	USIT-E	0.216	in
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SDTVER	Acoustic Impedance STD Vertical Threshold for Micro-debonding	USIT-E	0.3	Mrayl
SOGR	Standoff Distance of the Gamma Ray Tool	SGT-N	0	in
TCUB	T^3 Processing Level	USIT-E	Loop	
TD	Total Measured Depth	Borehole	7650	ft
THDH	Maximum Search Thickness (percentage of nominal)	USIT-E	130	%
THDL	Minimum Search Thickness (percentage of nominal)	USIT-E	70	%
TPOS	Tool Position: Centered or Eccentered	SGT-N	Eccentered	
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UFGPS	Fiberglass Processing Selection	USIT-E	No	
UFGVL	Fiberglass Velocity	USIT-E	9678.48	ft/s
USI_FSOD	USIT USI Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF	
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-E	Automatic	
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	FreePipe Norm.	
THDP	Thickness Detection Policy	USIT-E	Fundamental	
VCAS	Ultrasonic Transversal Velocity in Casing	USIT-E	51.4	us/ft
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	2.3	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Tool Control Parameters

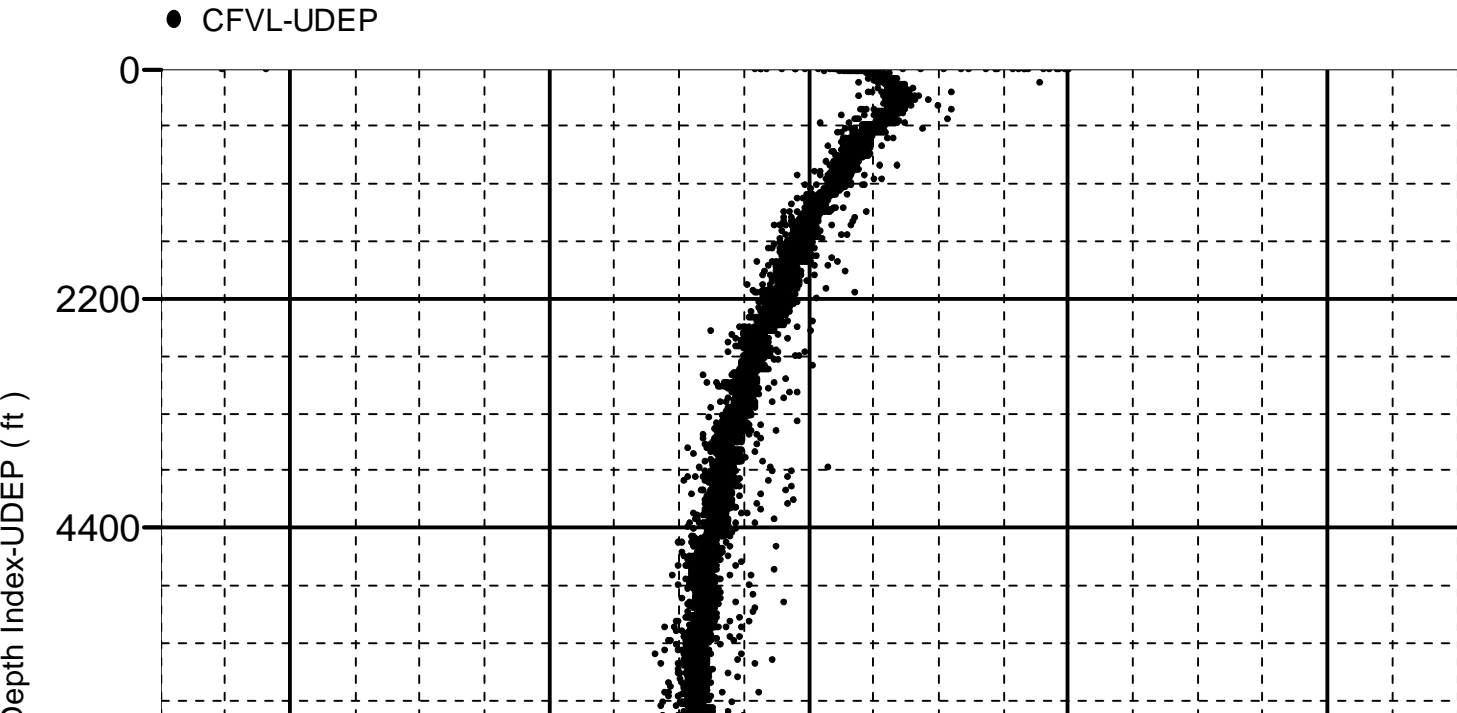
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	30	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
DOT(DOS)	Distance between Opposite Transducer Faces	USIT-E	1.756	in
EMXV	EMEX Voltage	USIT-E	50	V
HRES	Horizontal Resolution	USIT-E	10 deg	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
MOTOR_PROTECT	Motor Protection	USIT-E	On	
TMUC	Type of Mud	USIT-E	BRI	
UACLV_PERM	Ultrasonic ACLV Permanent	USIT-E	No	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UMFR	Modulation Frequency	USIT-E	333333	Hz
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 500 KHz	
UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 3.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	8000	ft
USSP	Ultrasonic Service	USIT-E	USI	
VRES	Vertical Resolution	USIT-E	3.0 in	
WINB	Window Begin Time	USIT-E	33.83	us
WINE	Window End Time	USIT-E	73.83	us

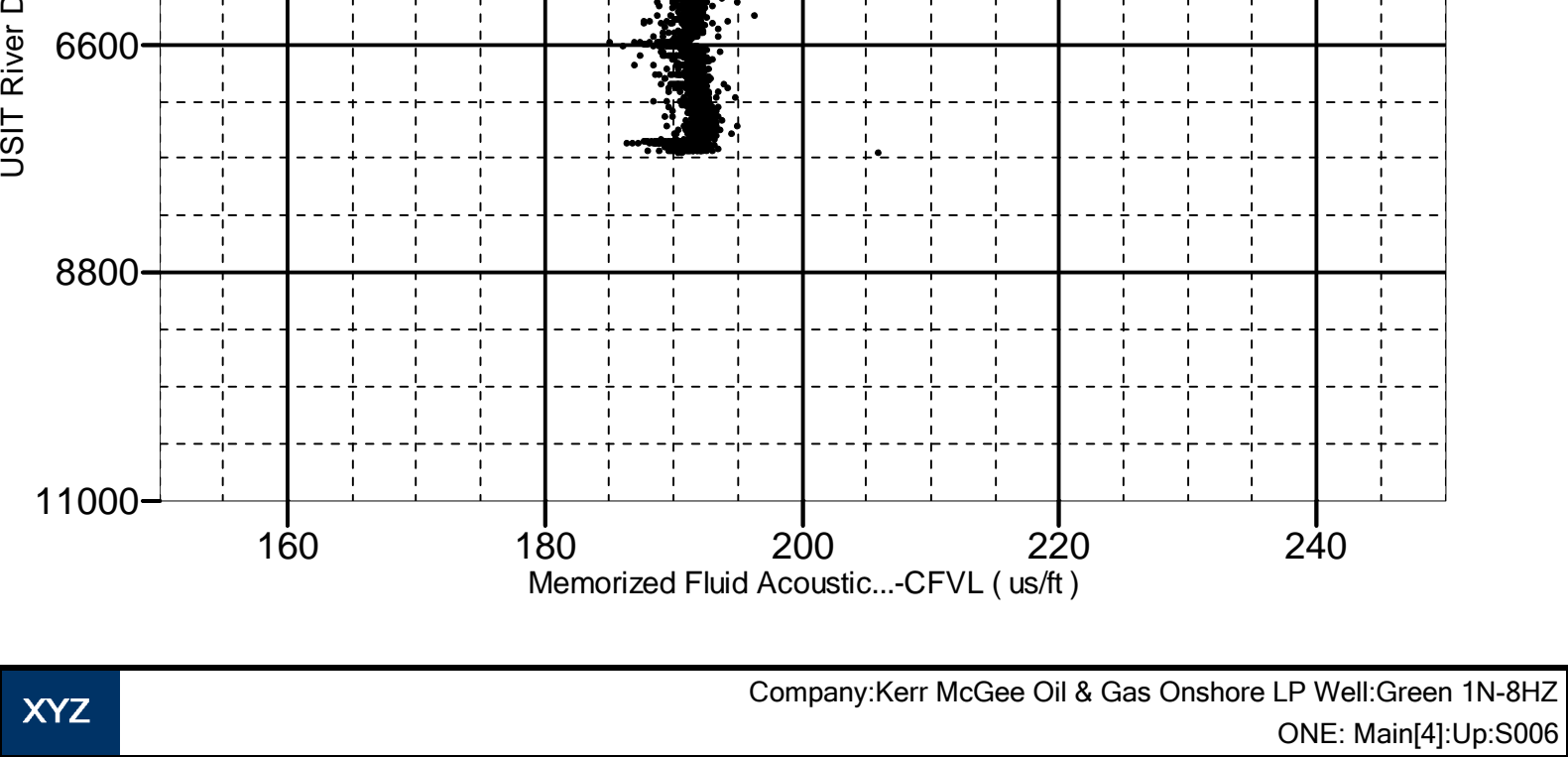
XYZ

Company:Kerr McGee Oil & Gas Onshore LP Well:Green 1N-8HZ
ONE: Main[4]:Up:S006

Fluid Acoustic Slowness vs Depth
2D Cross Plot

Index Range: From 7659.50 to 12.00 ft

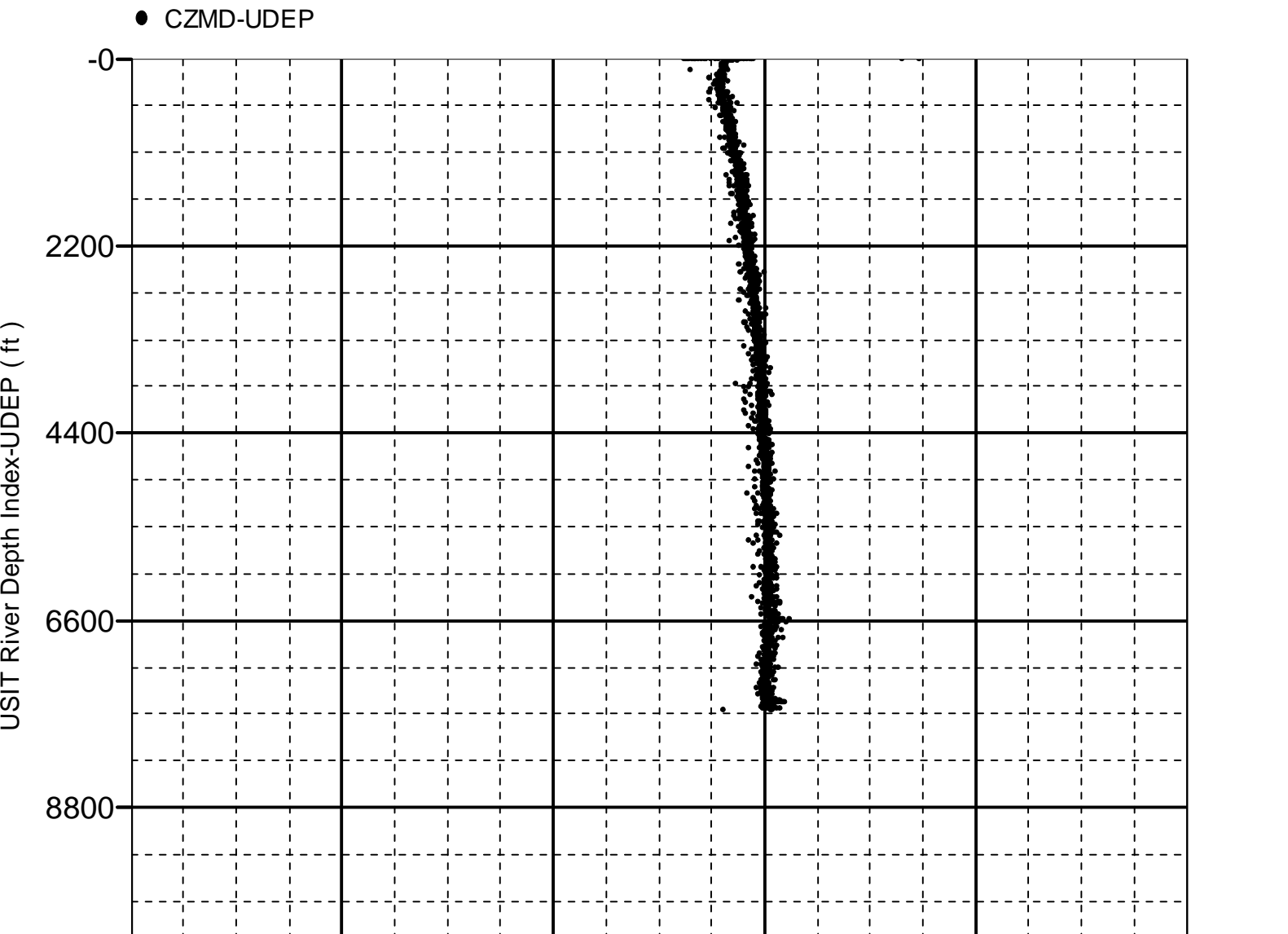


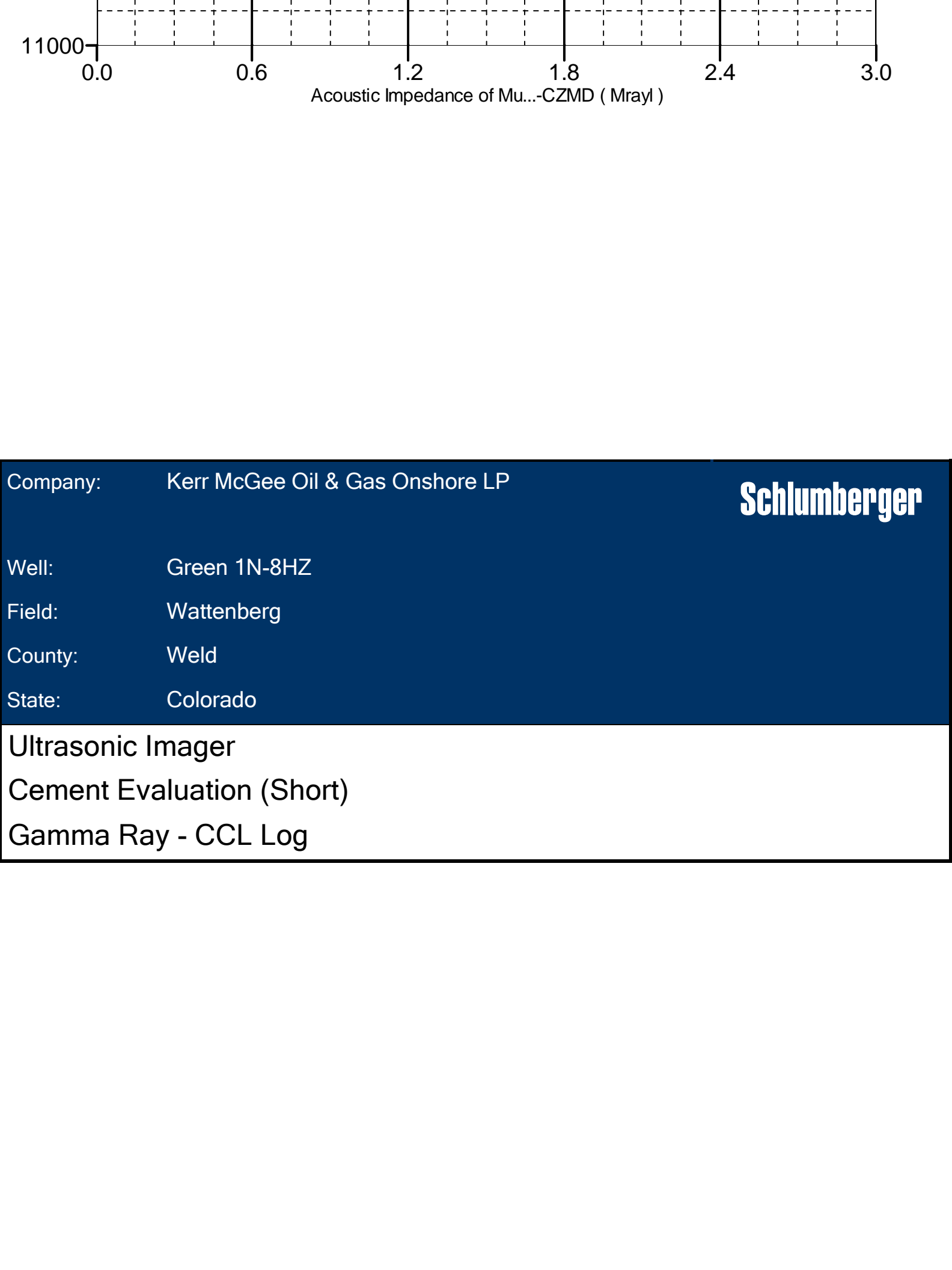


Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 7659.50 to 12.00 ft





Company:	Kerr McGee Oil & Gas Onshore LP	Schlumberger
Well:	Green 1N-8HZ	
Field:	Wattenberg	
County:	Weld	
State:	Colorado	
Ultrasonic Imager		
Cement Evaluation (Short)		
Gamma Ray - CCL Log		