Schlumberger

Company: **Kerr−McGee Oil & Gas Onshore LP**

Well: **Russian Fiddler 15N−18HZ**
Field: **Wattenberg**
County: **Weld** State: **Colorado**

USIT
Cement Evaluation

County: Weld
Field: Wattenberg
Location: Sec. 19, T2N, R65W
Well: Russian Fiddler 15N−18HZ
Company: Kerr−McGee Oil & Gas Onshore

LOCATION

Sec. 19, T2N, R65W
SHL: 365' FSL X 2464' FEL SWSE

Elev.: K.B. 5005.00 ft
G.L. 4989.00 ft
D.F. 5004.00 ft

Permanent Datum: Ground Level — Elev.: 4989.00 ft
Log Measured From: Kelly Bushing — 16.00 ft above Perm. Datum
Drilling Measured From: Kelly Bushing

API Serial No.	Section	Township	Range
05−123−36229−0000	19	2N	65W

Logging Date		22−May−2013	
Run Number		1	
Depth Driller		12713 ft	
Schlumberger Depth		6570 ft	
Bottom Log Interval		6570 ft	
Top Log Interval		0 ft	
Casing Fluid Type		Fresh Water	
Salinity			
Density		8.9 lbm/gal	
Fluid Level		0 ft	
BIT/CASING/TUBING STRING			
Bit Size		8.750 in	
From			
To			
Casing/Tubing Size		7.000 in	
Weight		26 lbm/ft	
Grade		HCP−110LTC	
From			
To			
Maximum Recorded Temperatures		200 degF	
Logger On Bottom	Time	22−May−2013	
Unit Number	Location	2223 Ft. Morgan, CO	
Recorded By		Tim Hoffman	
Witnessed By		Darrin Kirpatrick	

		Run 1	Run 2	Run
PVT DATA	Oil Density			
	Water Salinity			
	Gas Gravity			
	Bo			
	Bw			
	1/Bg			
	Bubble Point Pressure			
	Bubble Point Temperature			
	Solution GOR			
	Maximum Deviation	90 deg		
	CEMENTING DATA			
	Primary/Squeeze	Primary		
	Casing String No			
	Lead Cement Type			
	Volume			
	Density			
	Water Loss			
	Additives			
	Tail Cement Type			
	Volume			
	Density			
	Water Loss			
	Additives			
	Expected Cement Top			
	Logging Date			
	Run Number			
	Depth Driller			
	Schlumberger Depth			
	Bottom Log Interval			
	Top Log Interval			
	Casing Fluid Type			
	Salinity			
	Density			
	Fluid Level			
	BIT/CASING/TUBING STRING			
	Bit Size			
	From			
	To			
	Casing/Tubing Size			
	Weight			
	Grade			
	From			
	To			
	Maximum Recorded Temperatures			
	Logger On Bottom	Time		
	Unit Number	Location		
	Recorded By			
	Witnessed By			

Run 3

Run 4

DEPTH SUMMARY LISTING

Date Created: 23−MAY−2013 12:18:56

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW−B	Type:	CMTD−B/A	Type:	7−46A−XS
Serial Number:	1918	Serial Number:	1274	Serial Number:	
Calibration Date:	22−Apr−2013	Calibration Date:	30−Apr−2013	Length:	24000 FT
Calibrator Serial Number:		Calibrator Serial Number:	78135	Conveyance Method:	Wireline
Calibration Cable Type:	7−46A−XS	Number of Calibration Points:	10	Rig Type:	LAND
Wheel Correction 1:	−9	Calibration RMS:	36		
Wheel Correction 2:	−8	Calibration Peak Error:	77		

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	0.00 FT
Rig Up Length At Bottom:	0.00 FT
Rig Up Length Correction:	0.00 FT
Stretch Correction:	
Tool Zero Check At Surface:	

Depth Control Remarks

1. All Schlumberger depth policies followed.
2. IDW used as primary depth reference.
3. Z−Chart used as secondary.
4.
5.
6.

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 OF 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.

OTHER SERVICES1	OTHER SERVICES2
OS1:	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
This is the first run in hole	
Logs correlated to original Schlumberger USIT logs	
Toolstring run as per tool sketch	
Top of liner at 6596', will log down to 6570'	
Cement: 14.4 ppg to 6150'	

12.5 ppg to 2860’	
12.7 ppg to 16’	
Repeat pass done under zero pressure	
Main pass logged with 2000 psi	
Rig: Crane	
Crew: Tyler Riter, Josh Strand	

RUN 1			RUN 2		
SERVICE ORDER #:		CCN1−00006	SERVICE ORDER #:		
PROGRAM VERSION:		19C2−270	PROGRAM VERSION:		
FLUID LEVEL:		0 ft	FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

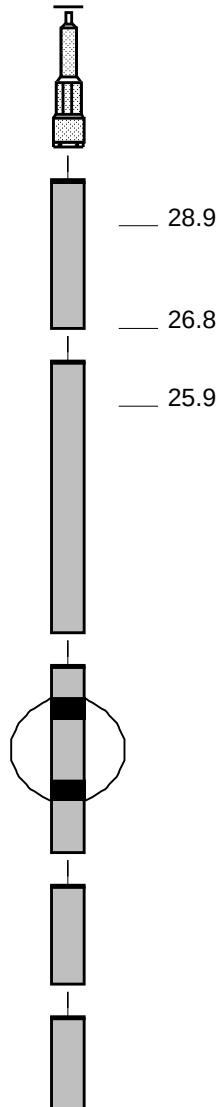
EQUIPMENT DESCRIPTION

RUN 1 | RUN 2

SURFACE EQUIPMENT

GSR−U/Y 599
WITM (DTS)−A

DOWNHOLE EQUIPMENT



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LEH−QT

DTC−H 29.8
ECH−KC 9984
DTCH0−A
DTCH1−A

SGT−N 26.8
SGH−K 3039
SGC−TB 10249
SGD−TAB

AH−CEN 21.3
AH−CEN

AH−107 17.5
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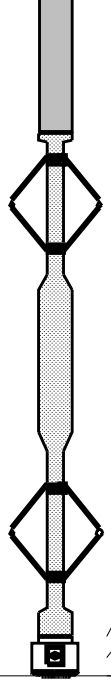


MAXIMUM STRING DIAMETER 7.50 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Company: Kerr−McGee Oil & Gas Onshore LP **Well: Russian Fiddler 15N−18HZ**

Input DLIS Files

DEFAULT	**USI_024PUP**	**FN:22**	**PRODUCER**	**22−May−2013 12:30**	**6568.5 FT**	**−5.5 FT**

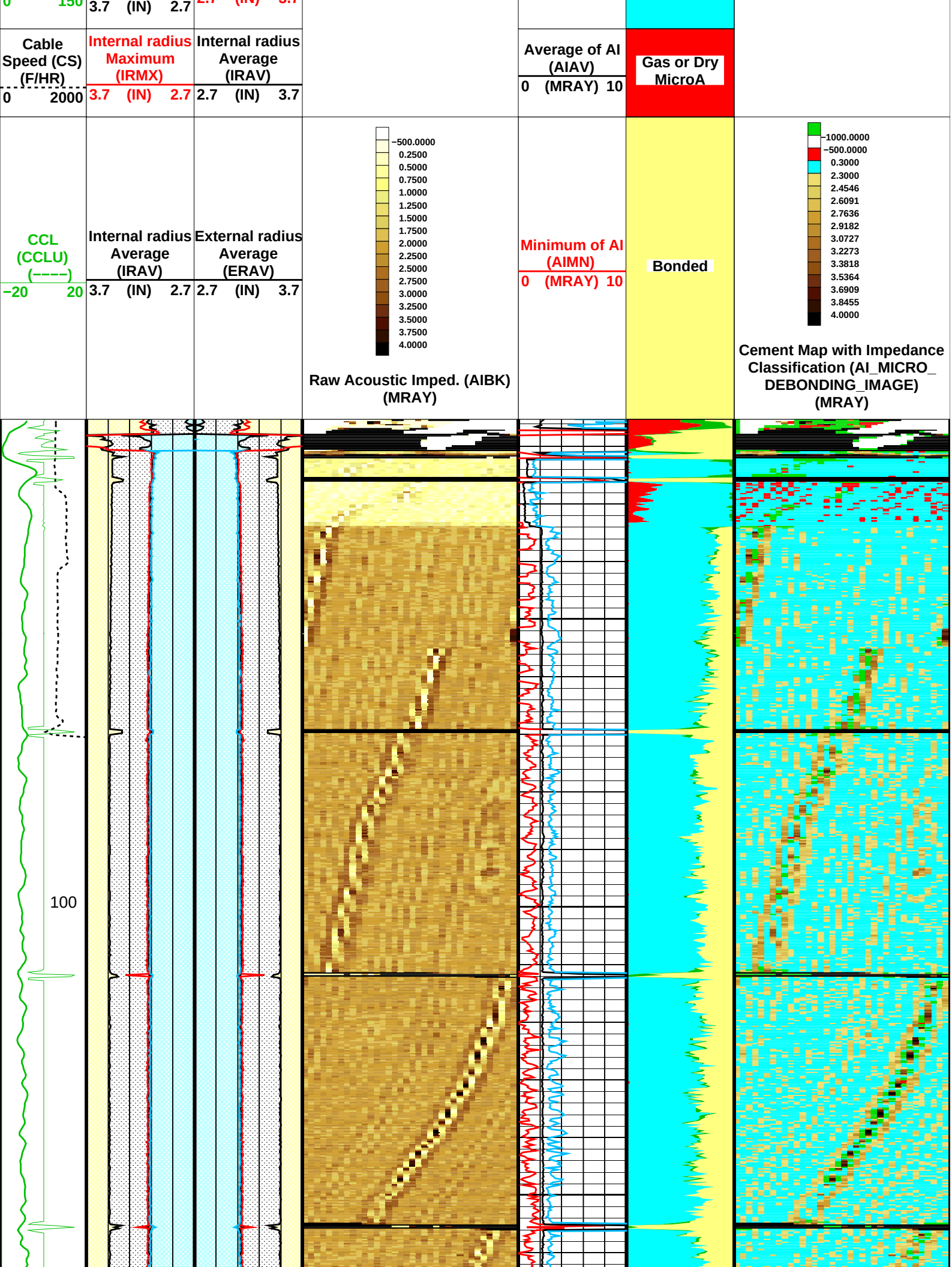
Output DLIS Files

DEFAULT	**USI_005PUP**	**FN:4**	**PRODUCER**	**23−May−2013 12:24**

OP System Version: 19C2−270

USIT−E	**19C2−270**	**SGT−N**	**19C2−270**
DTC−H	**19C2−270**		

Image rotation (UCAZ) (DEG) 0 360				
Tool/Tot. Drag From D4T to STIA				
Cable Drag From D4T to STIT				
Stuck Stretch (STIT) 0 (F) 50	Min of Internal radius (IRMN) 3.7 (IN) 2.7	Min of Internal radius (IRMN) 2.7 (IN) 3.7		Micro−debonding
Gamma Ray (GR) (GAPI) 0 150	External radius Average (ERAV)	Internal radius Maximum (IRMX) 2.7 (IN) 3.7	Maximum of AI (AIMX) 0 (MRAY) 10	Liquid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3.7 (IN) 2.7
2.7 (IN) 3.7
Cable Speed (CS) (F/HR)
0 2000
Internal radius Maximum (IRMX)
3.7 (IN) 2.7
Internal radius Average (IRAV)
2.7 (IN) 3.7
Average of AI (AIAV)
0 (MRAY) 10
Gas or Dry MicroA
CCL (CCLU) (----)
−20 20
Internal radius Average (IRAV)
3.7 (IN) 2.7
External radius Average (ERAV)
2.7 (IN) 3.7
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Raw Acoustic Imped. (AIBK) (MRAY)
Minimum of AI (AIMN)
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Bonded
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2.3000
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2.6091
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3.2273
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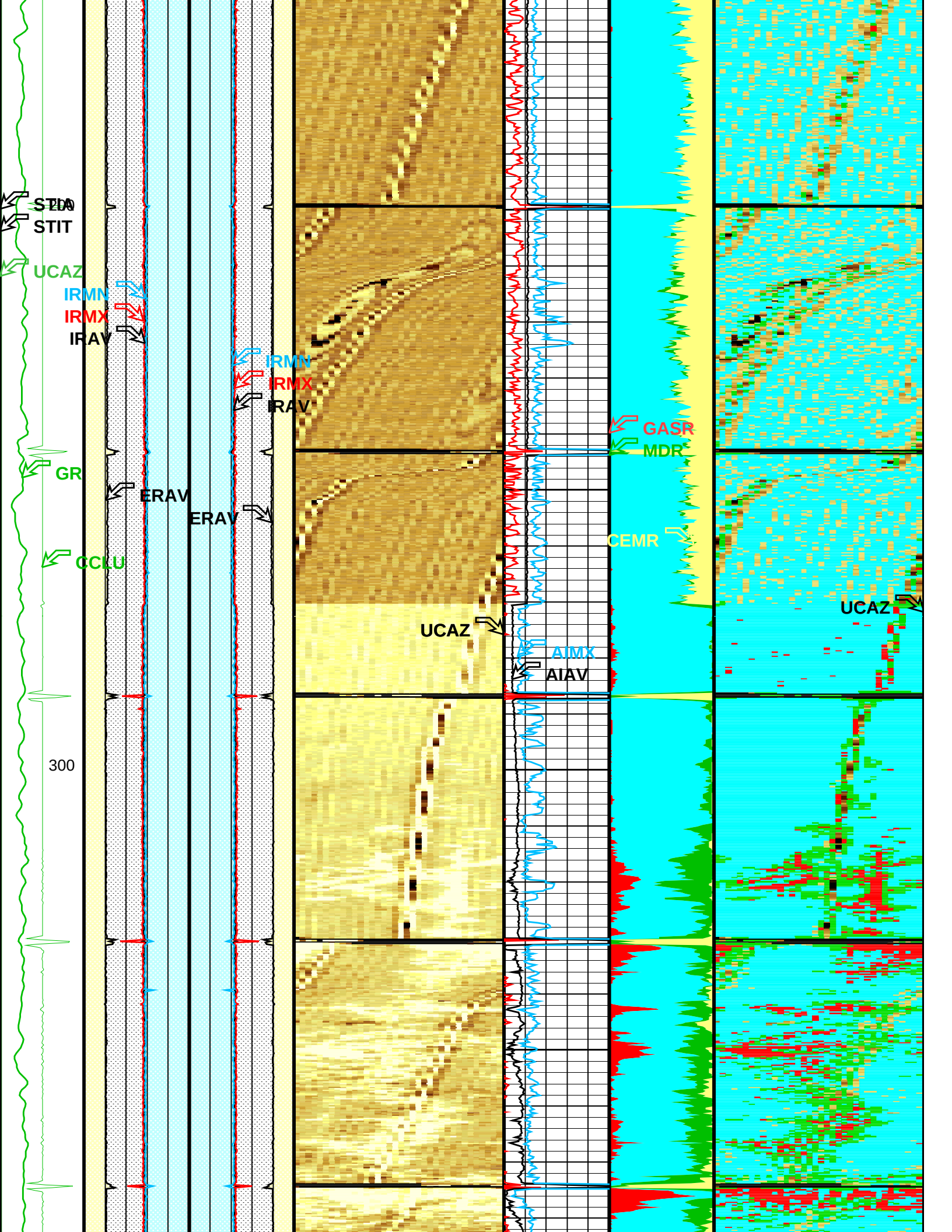
Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (MRAY)
100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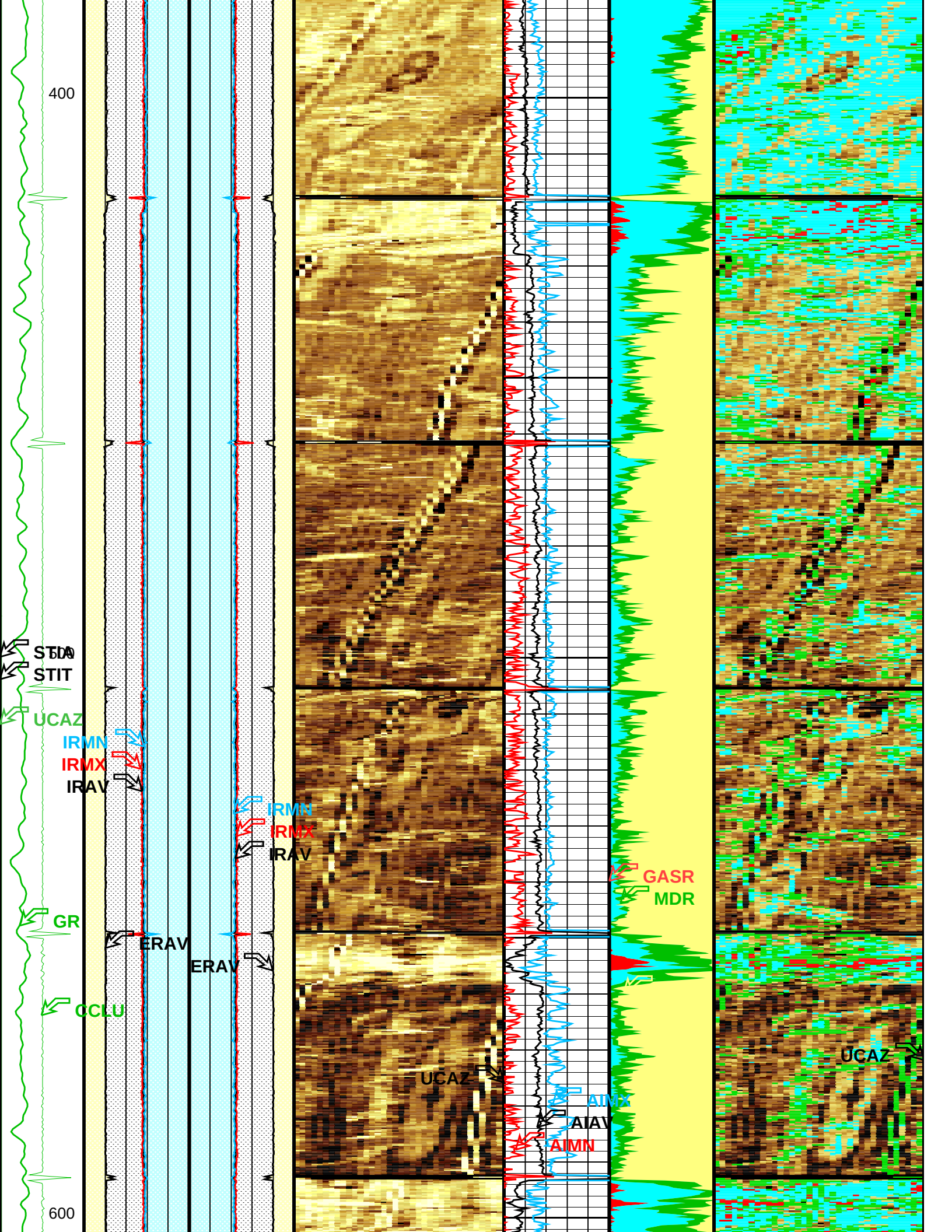
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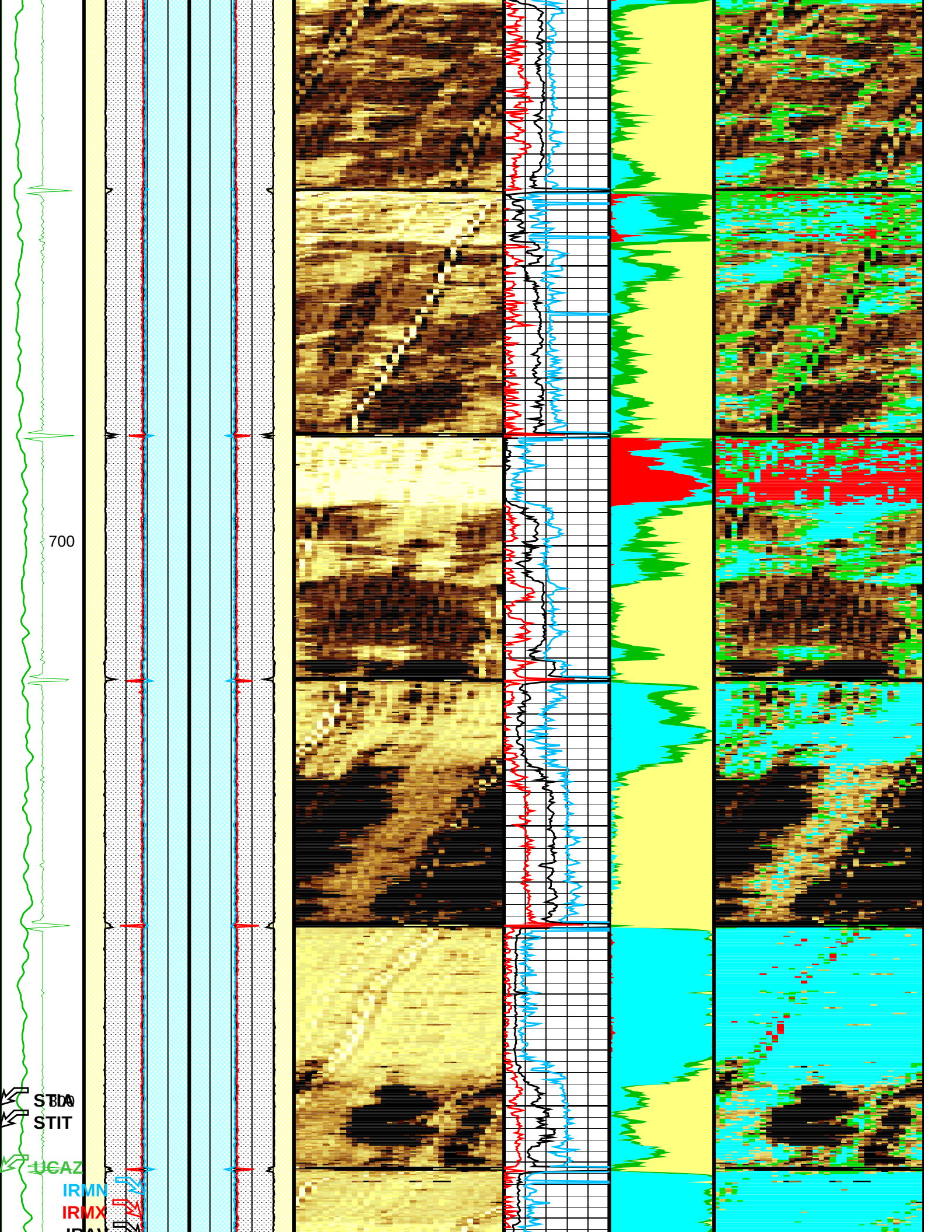
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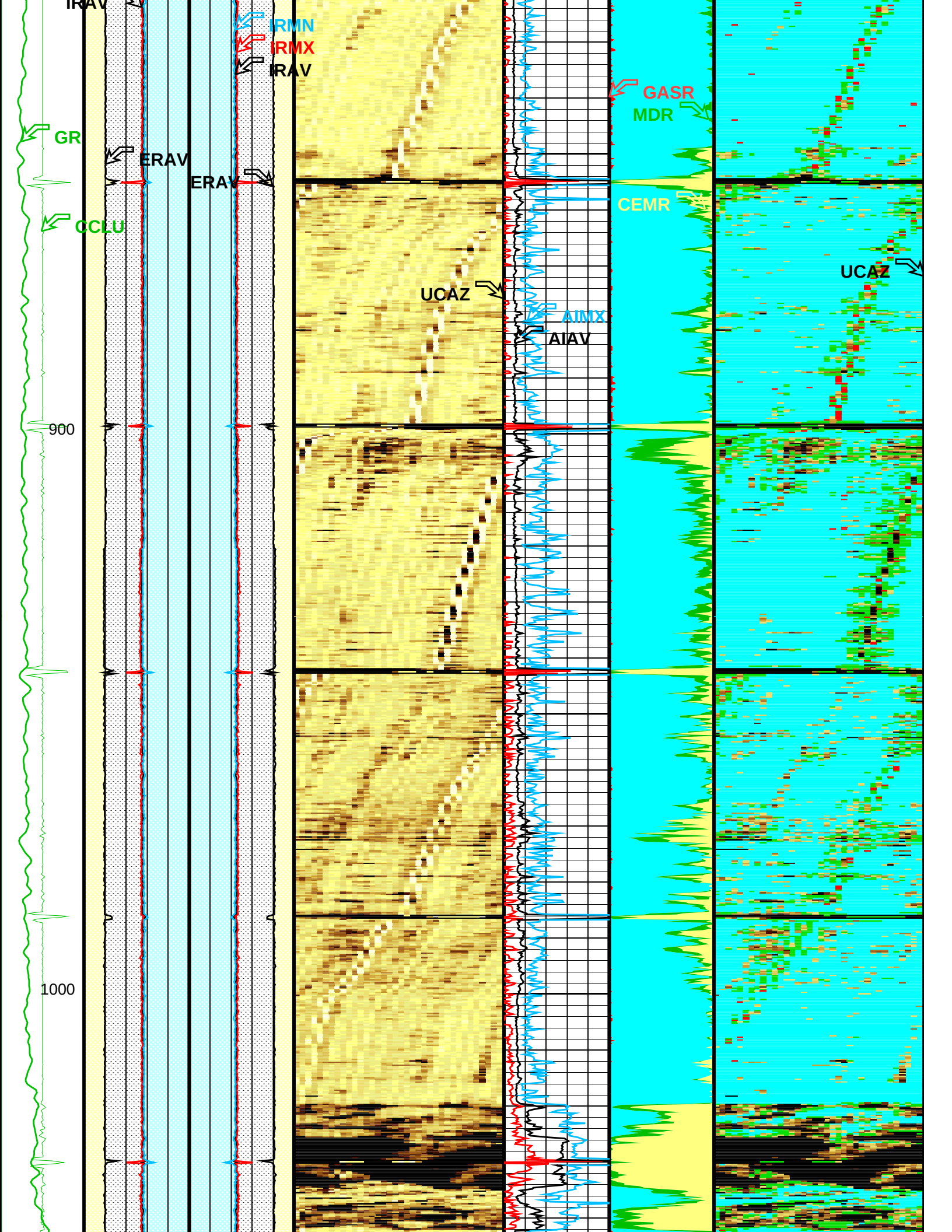
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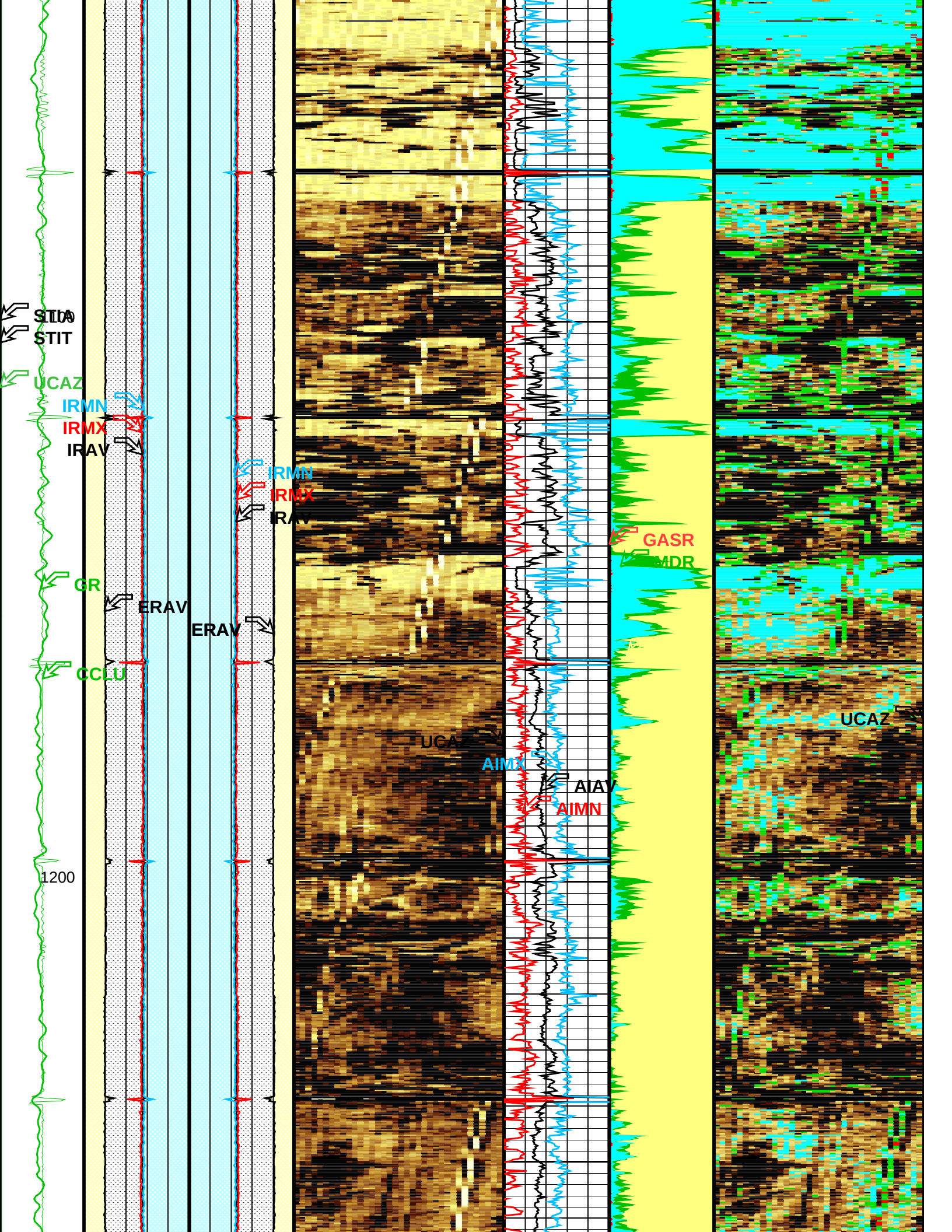
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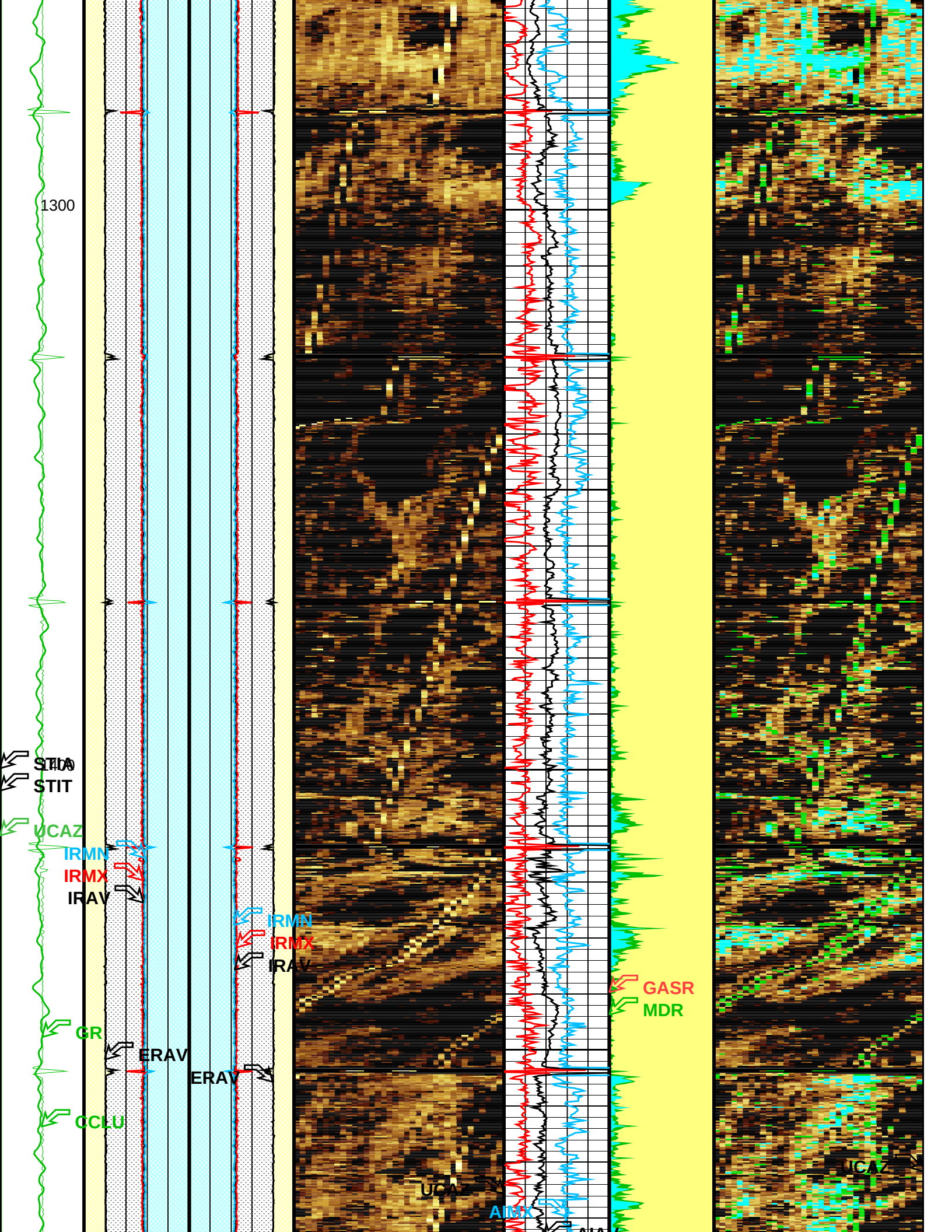
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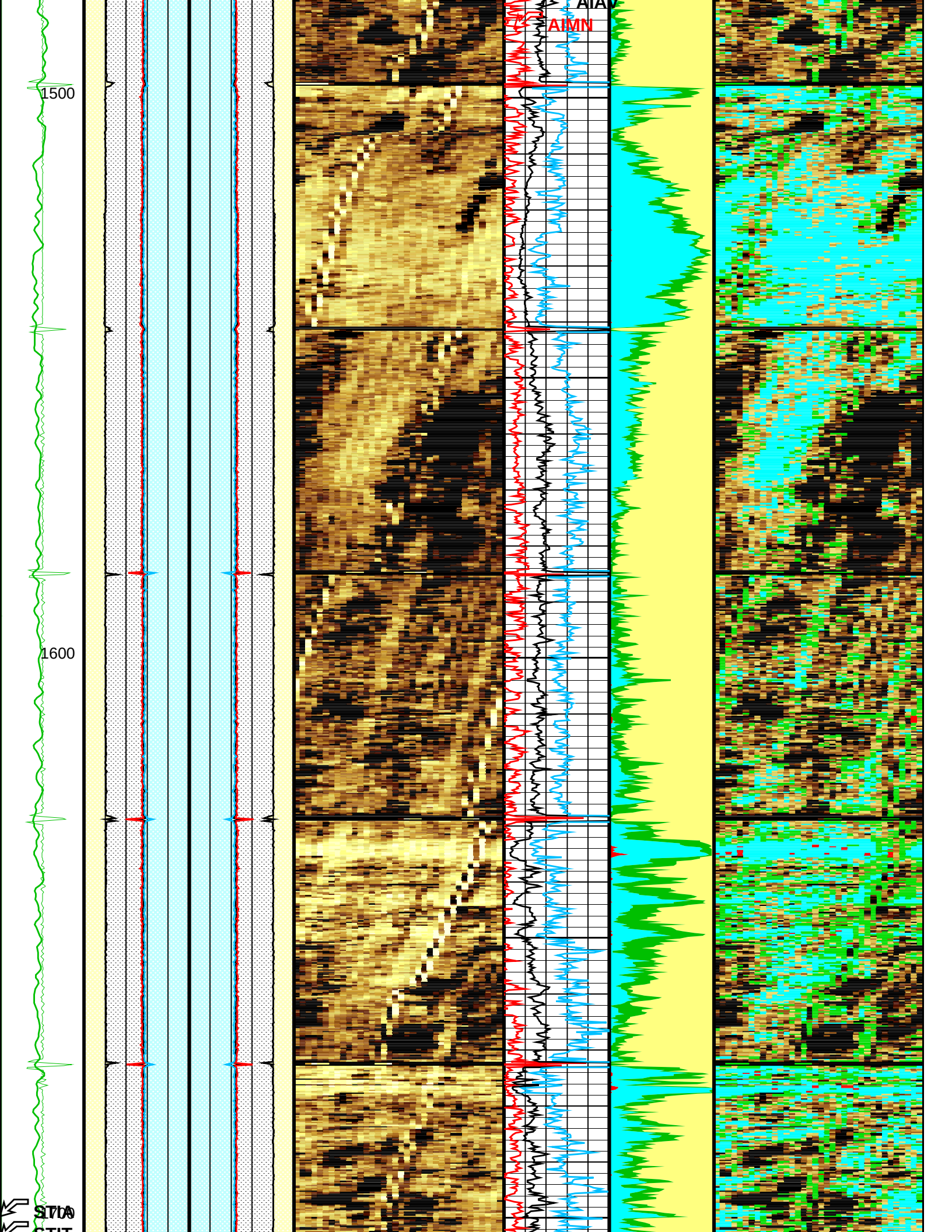
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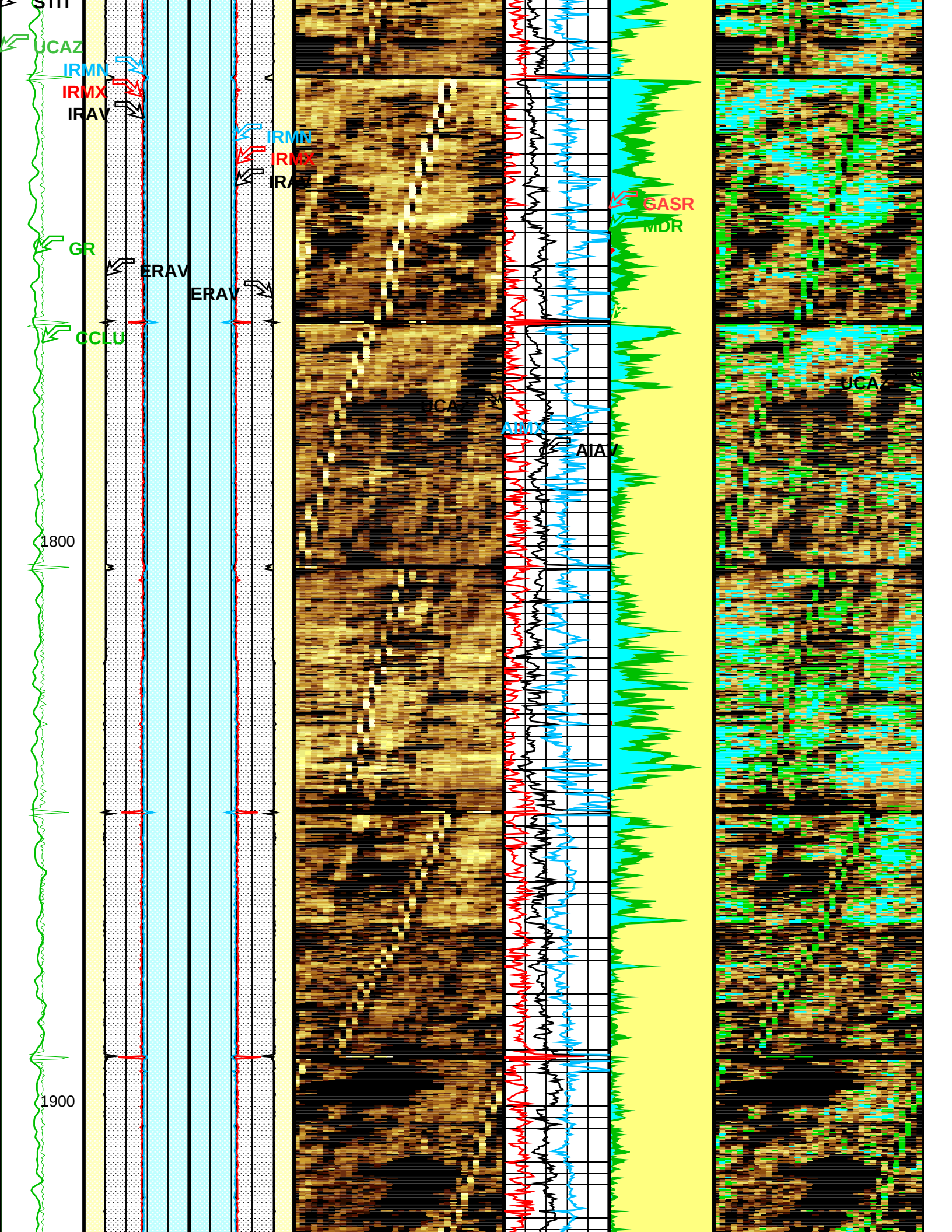
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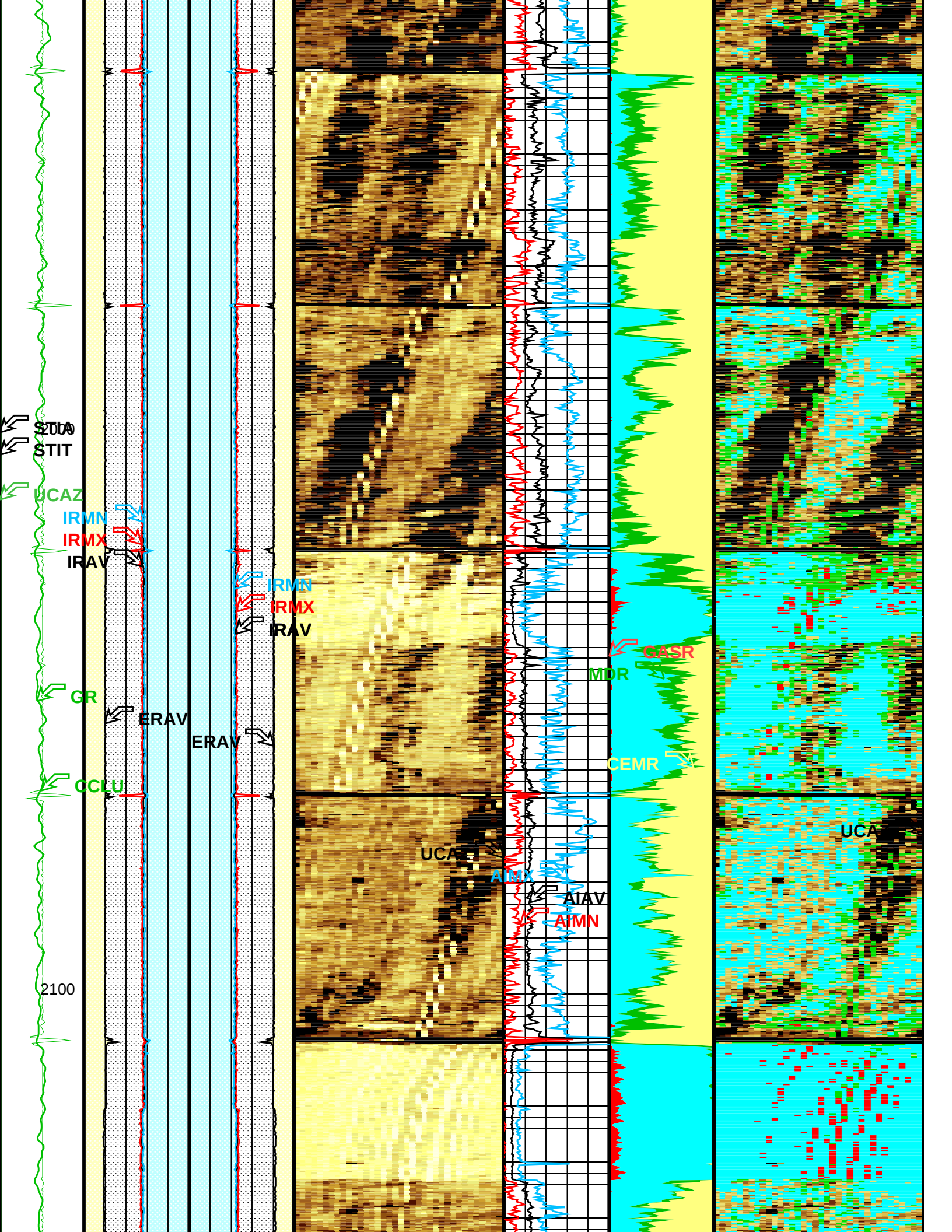
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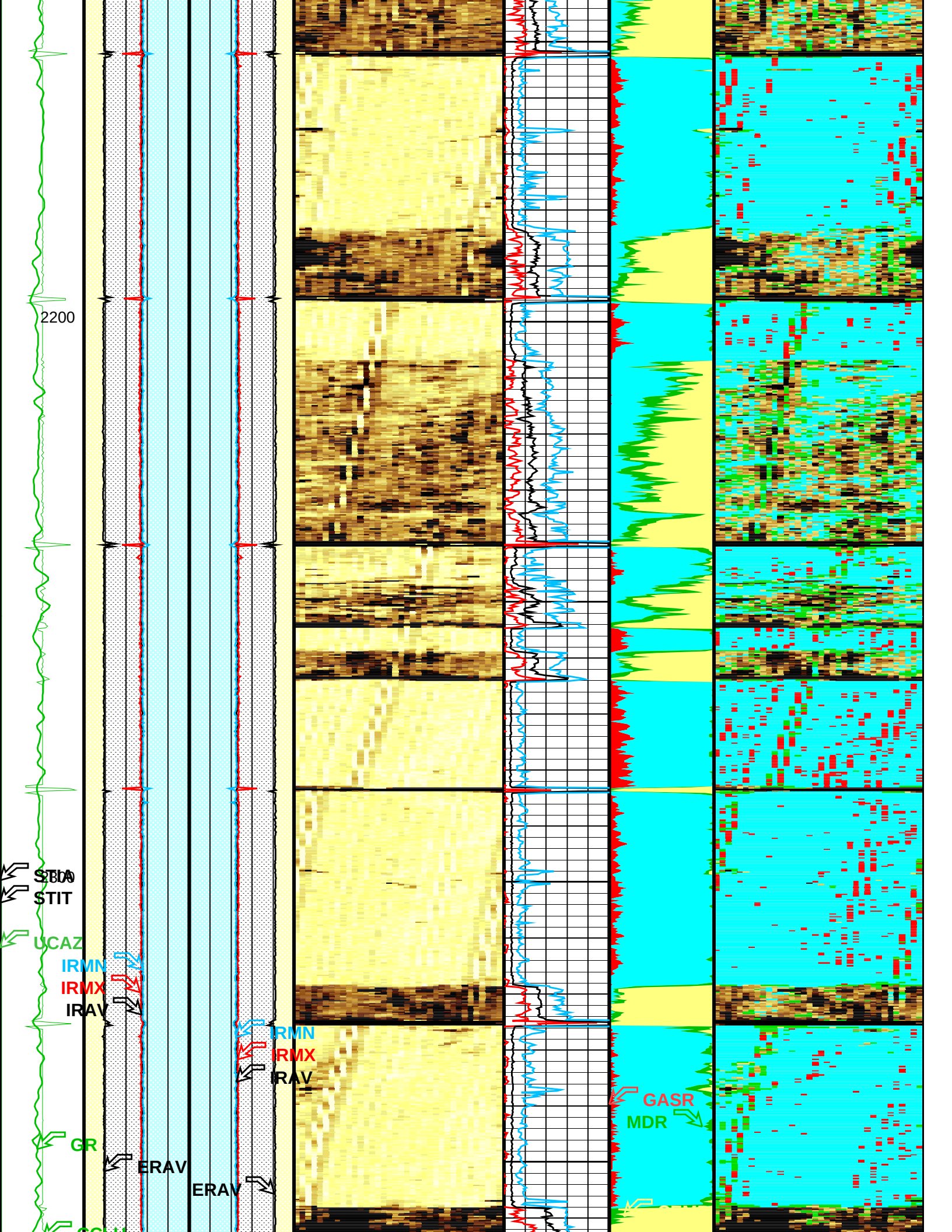
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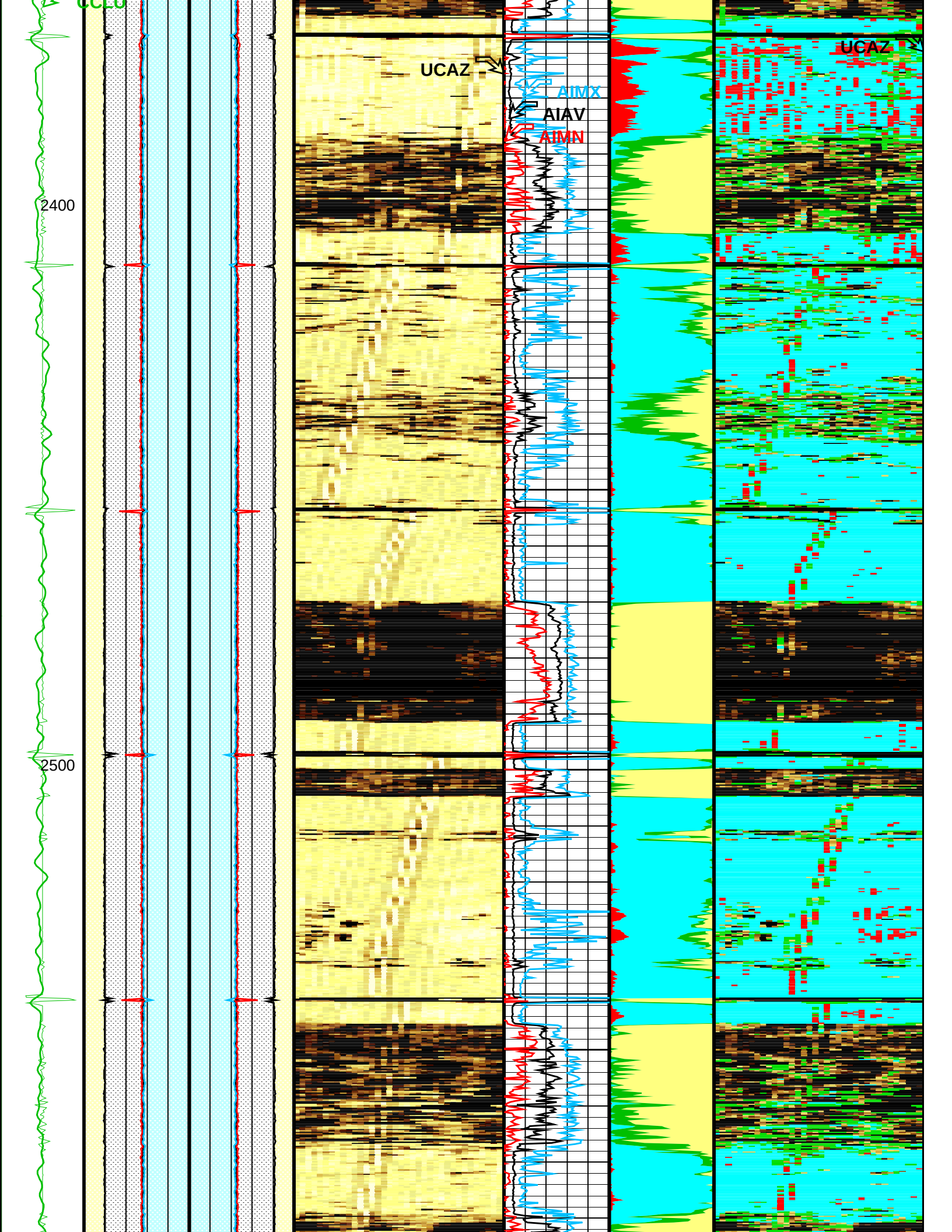
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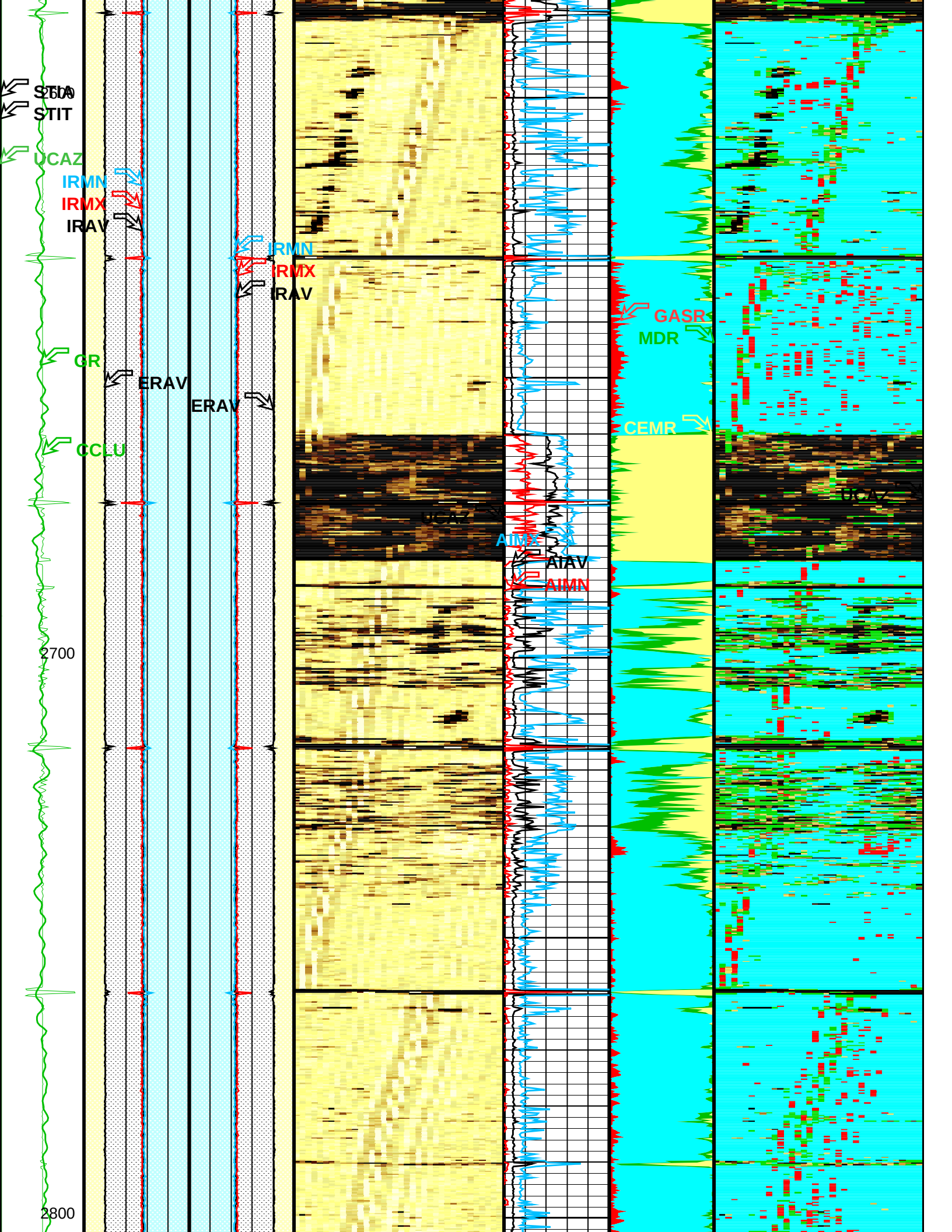
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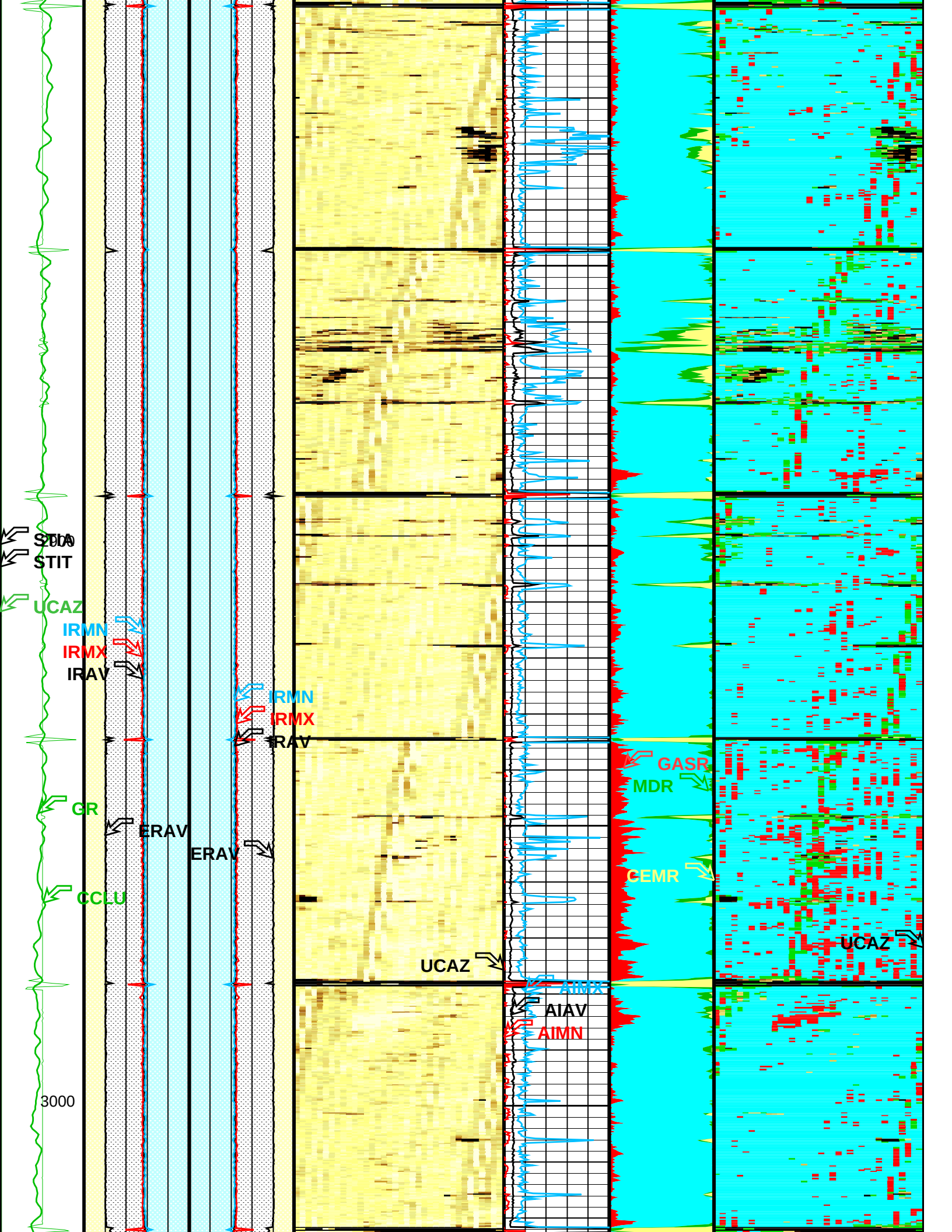
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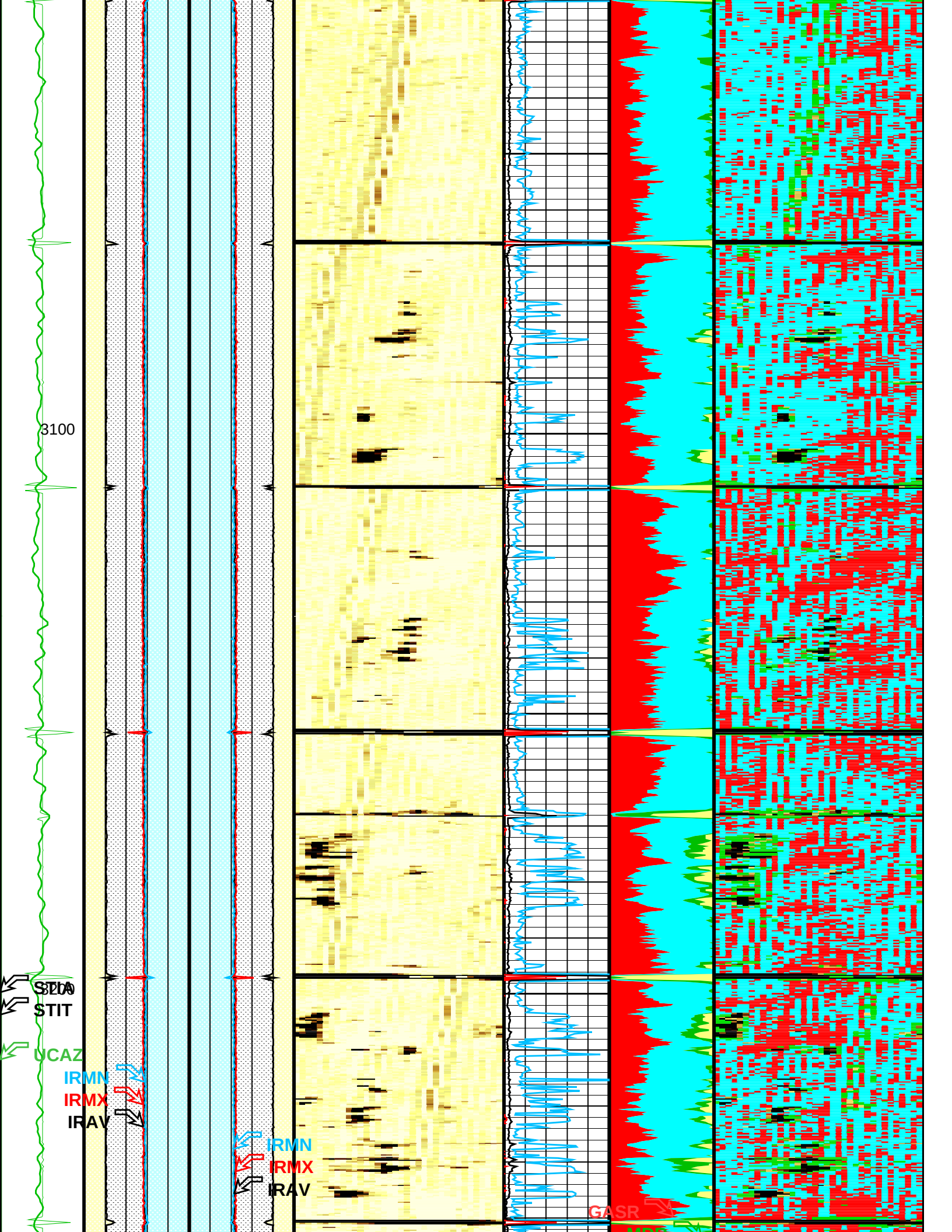
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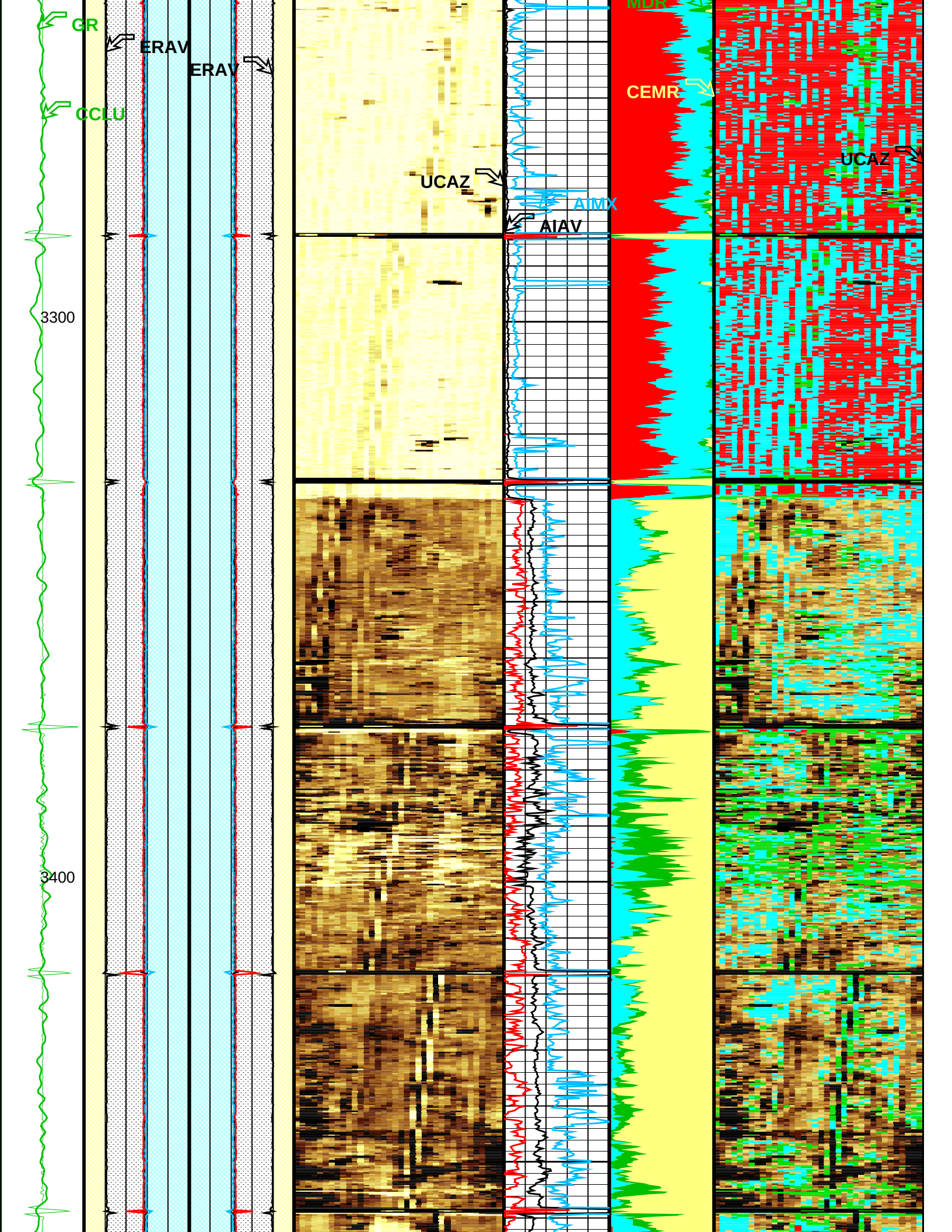
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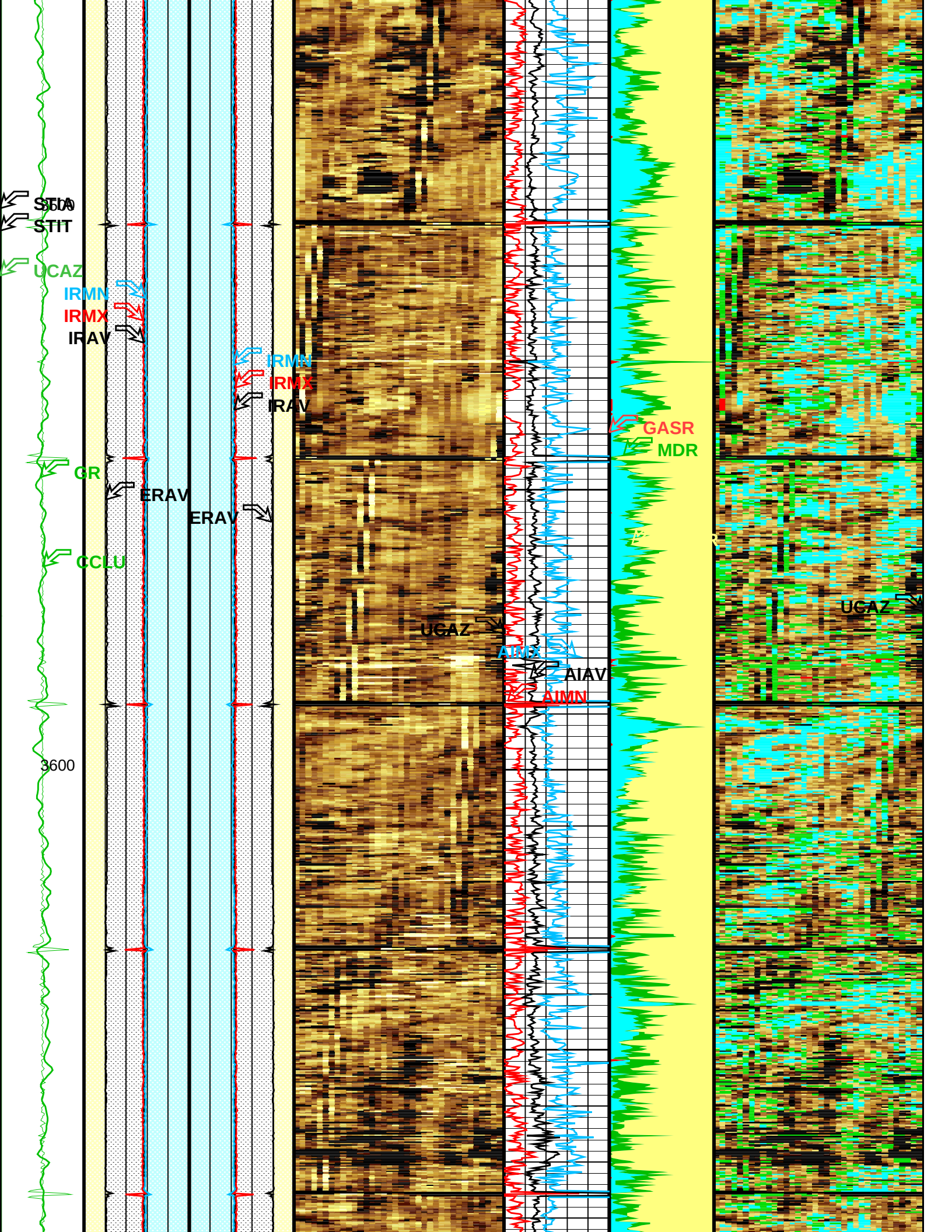
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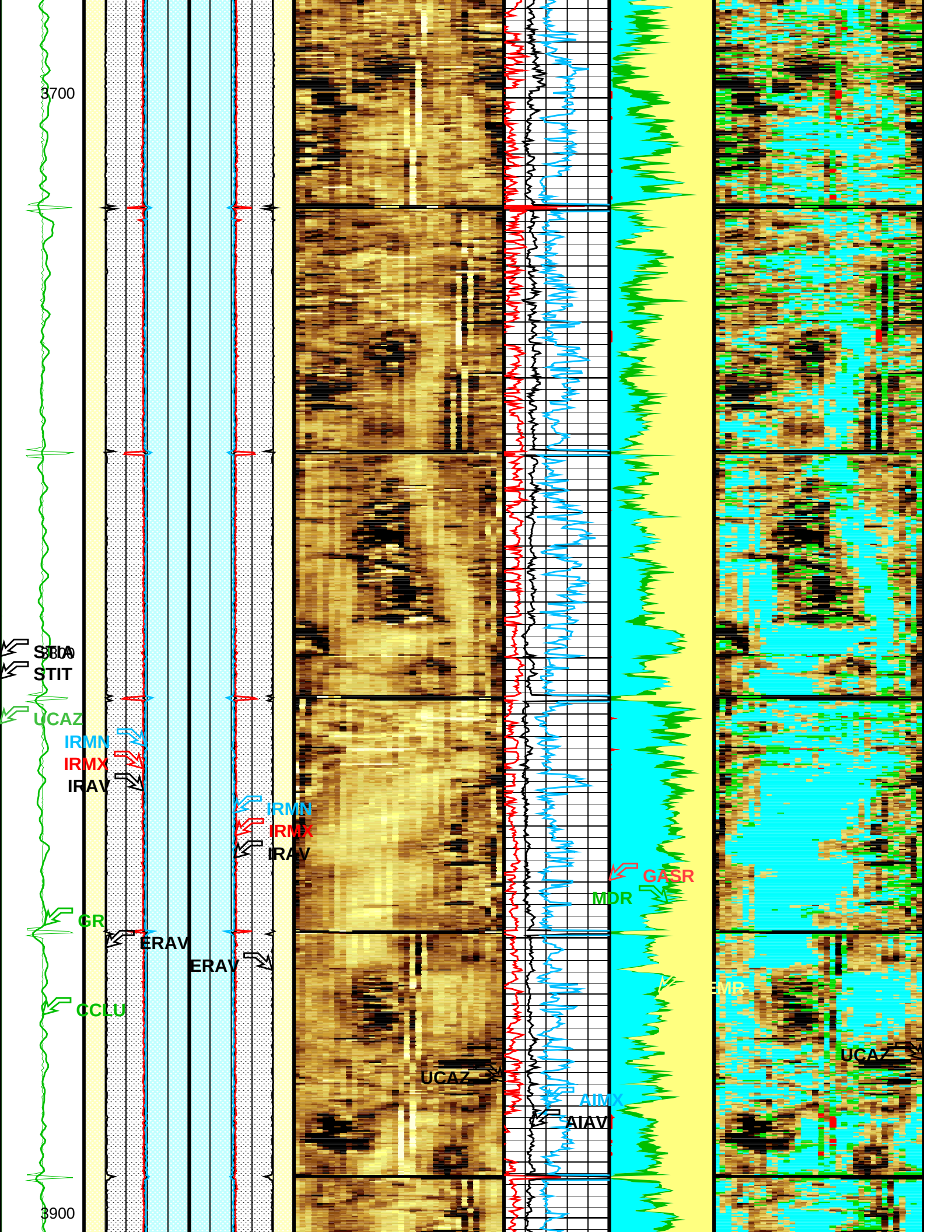
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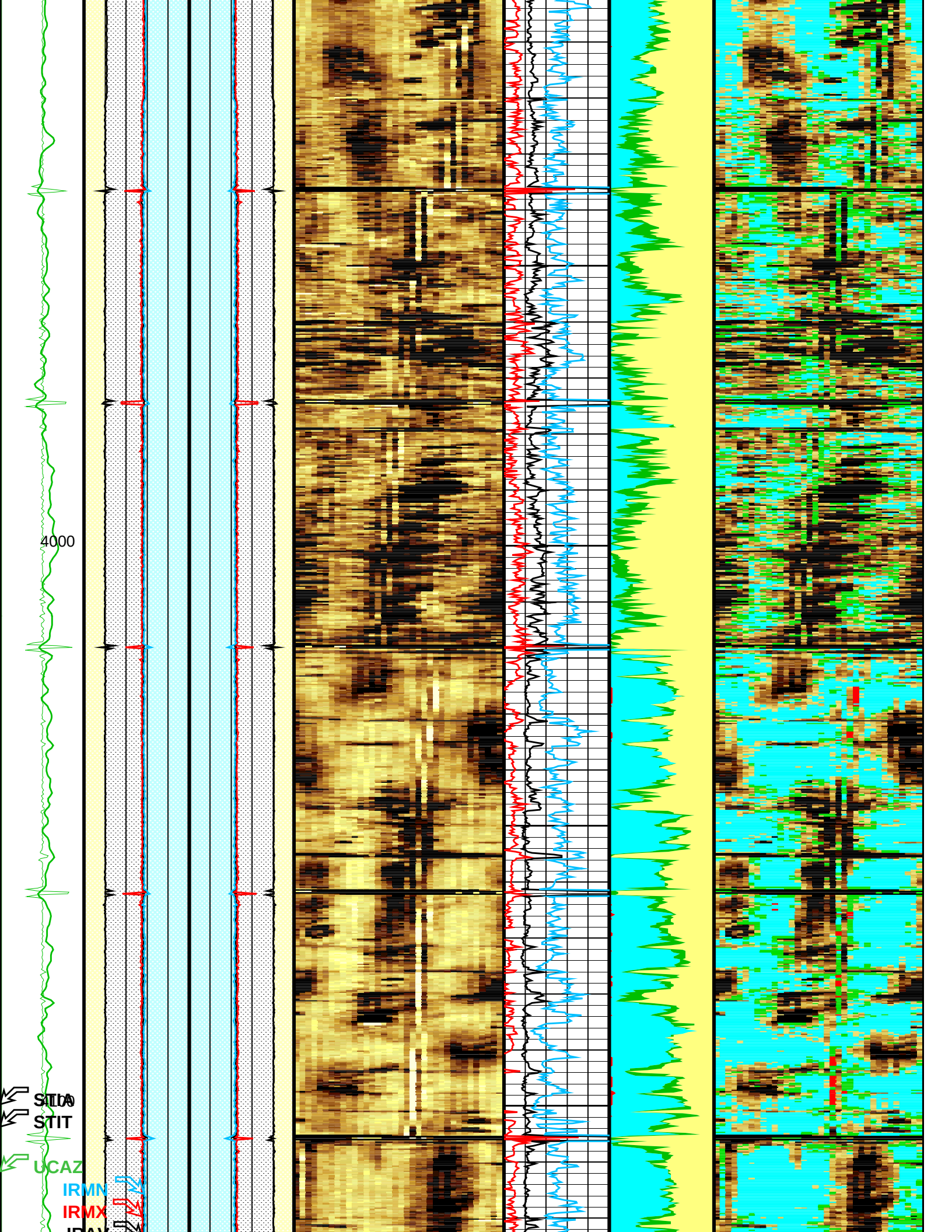
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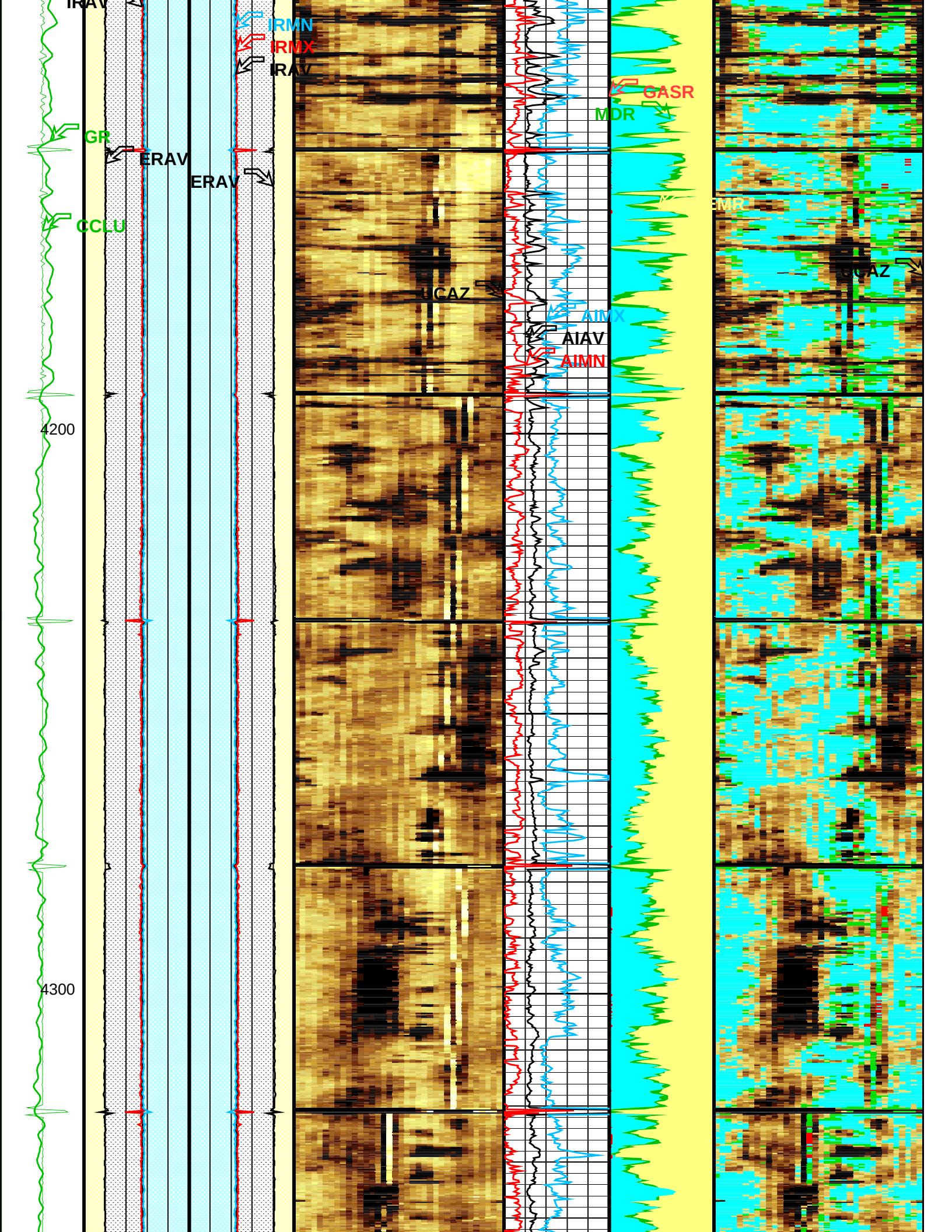
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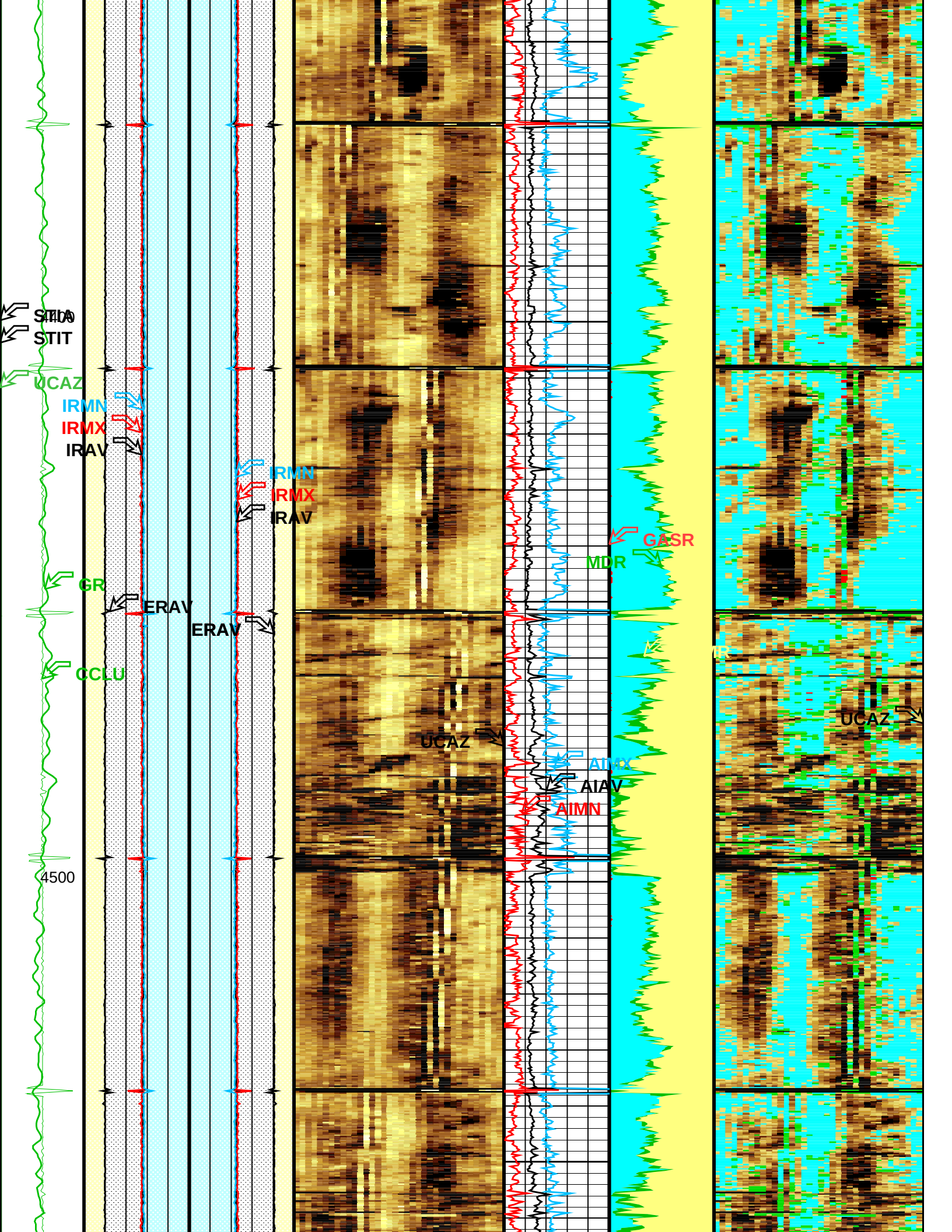
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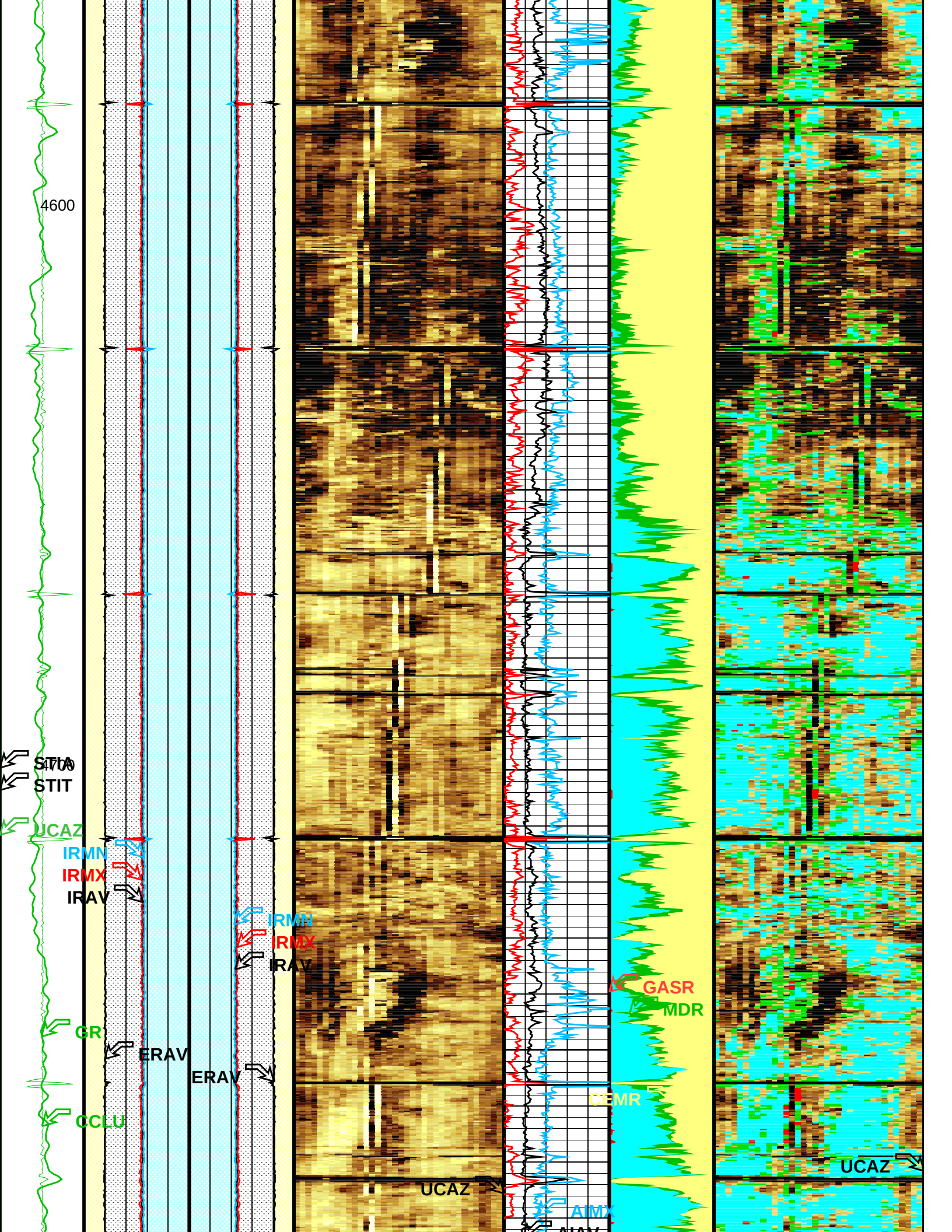
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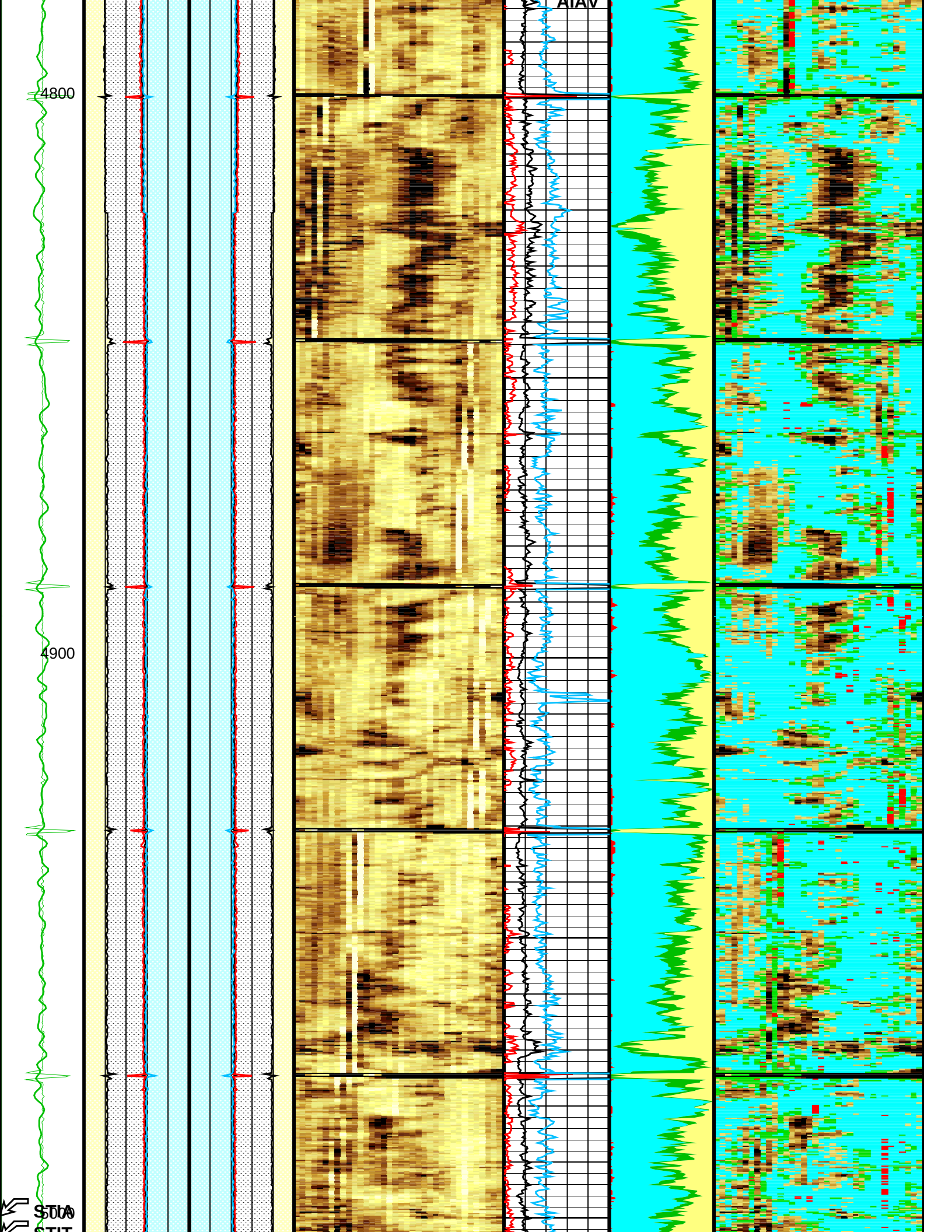
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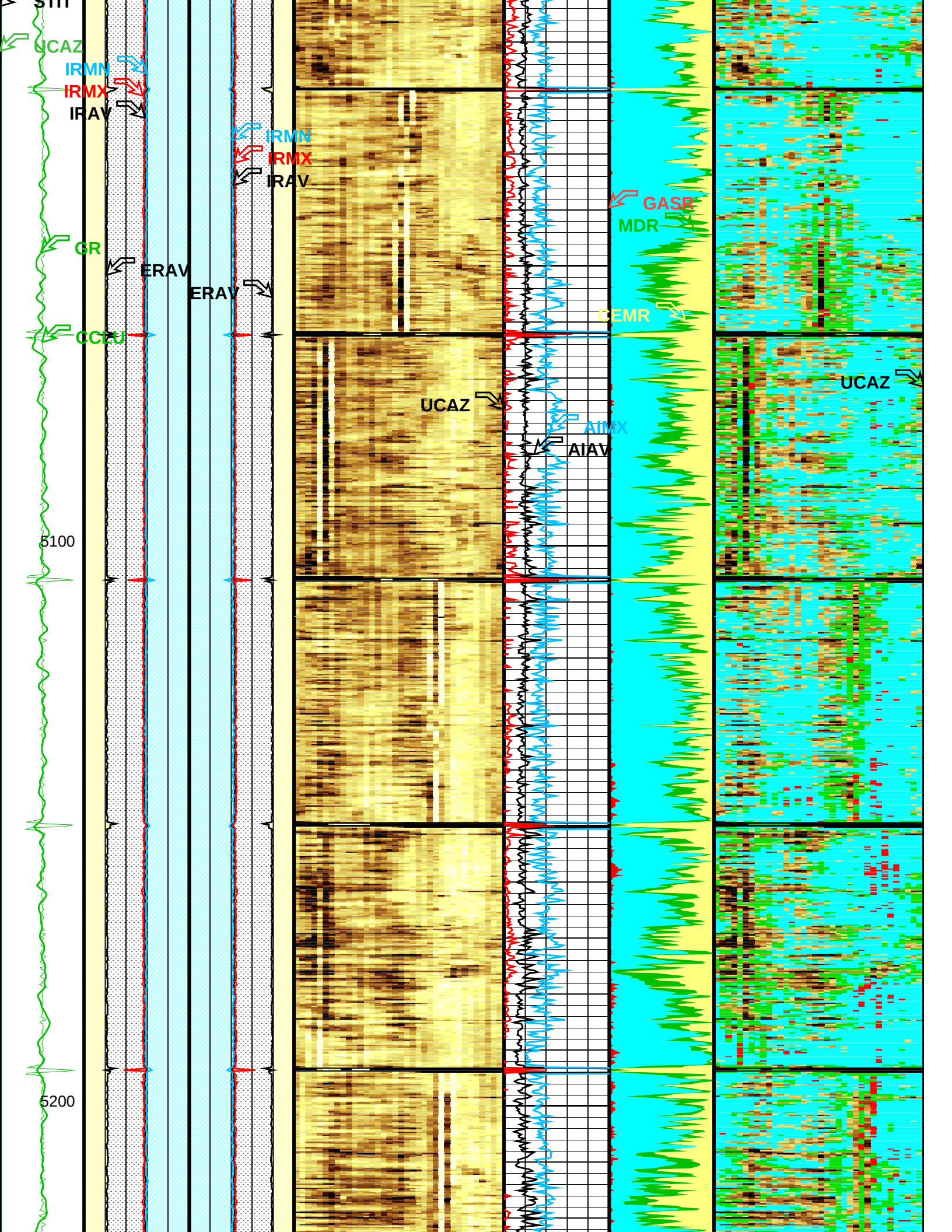
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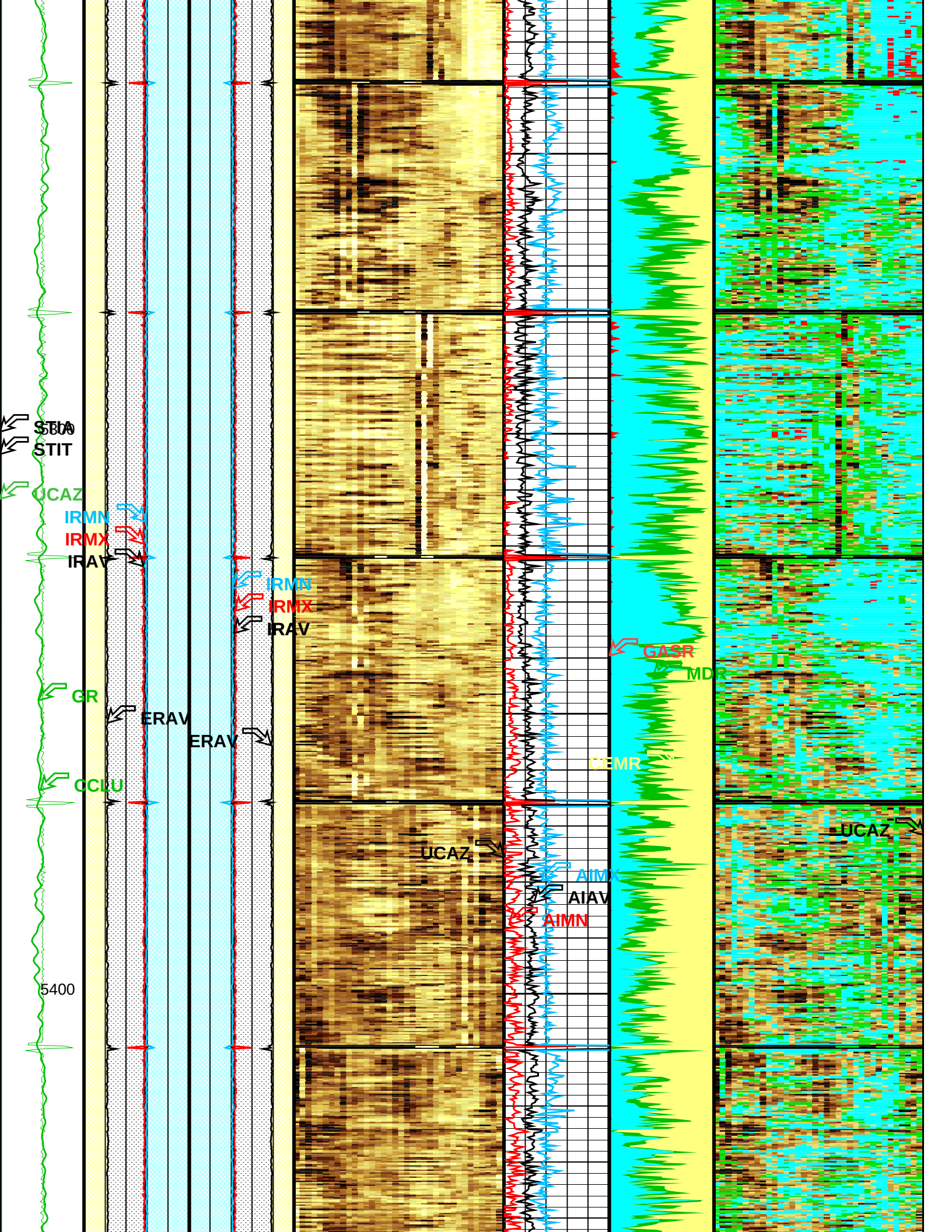
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ERAV
CEMR
CCLU
UCAZ
UCAZ
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AIAV
AIMN
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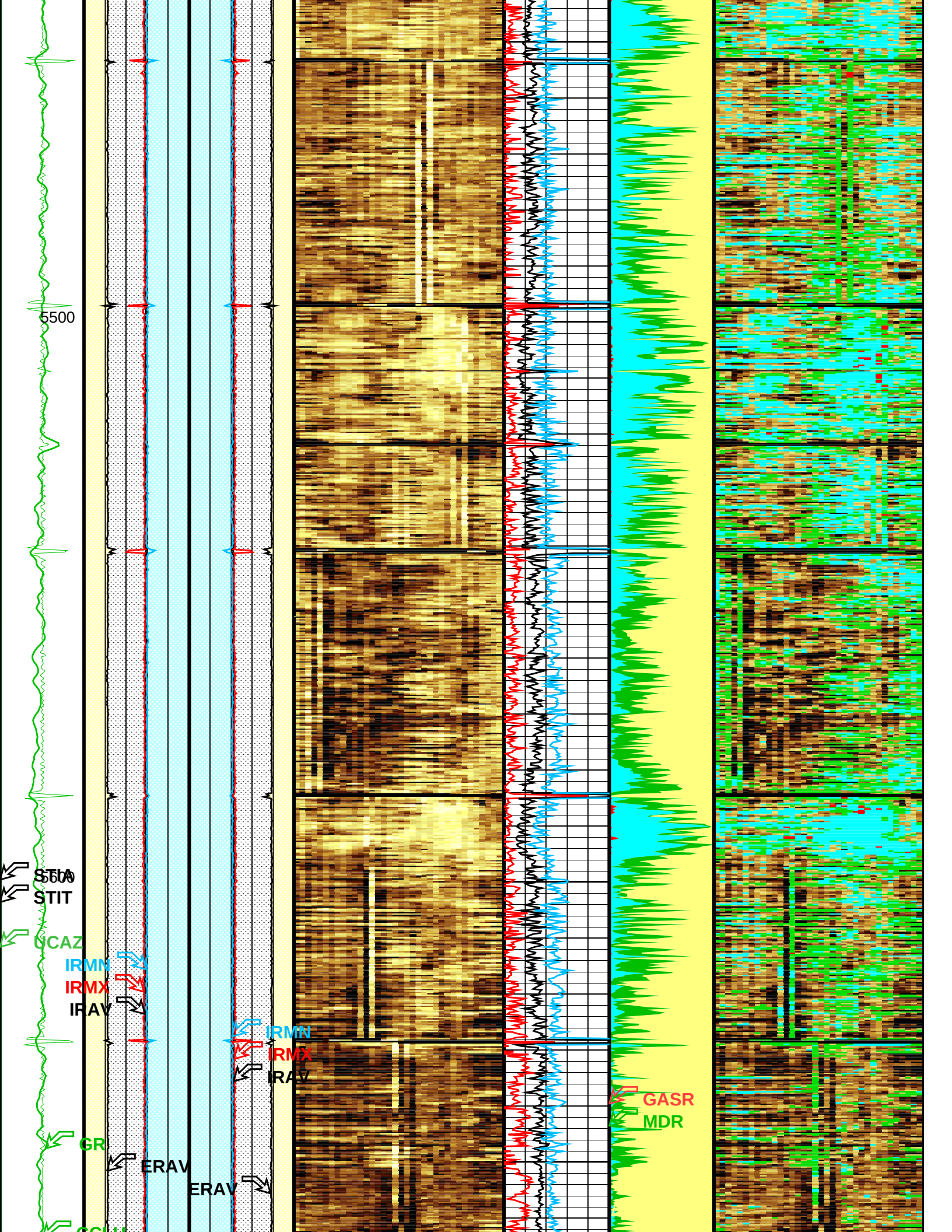
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IRAV
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GR
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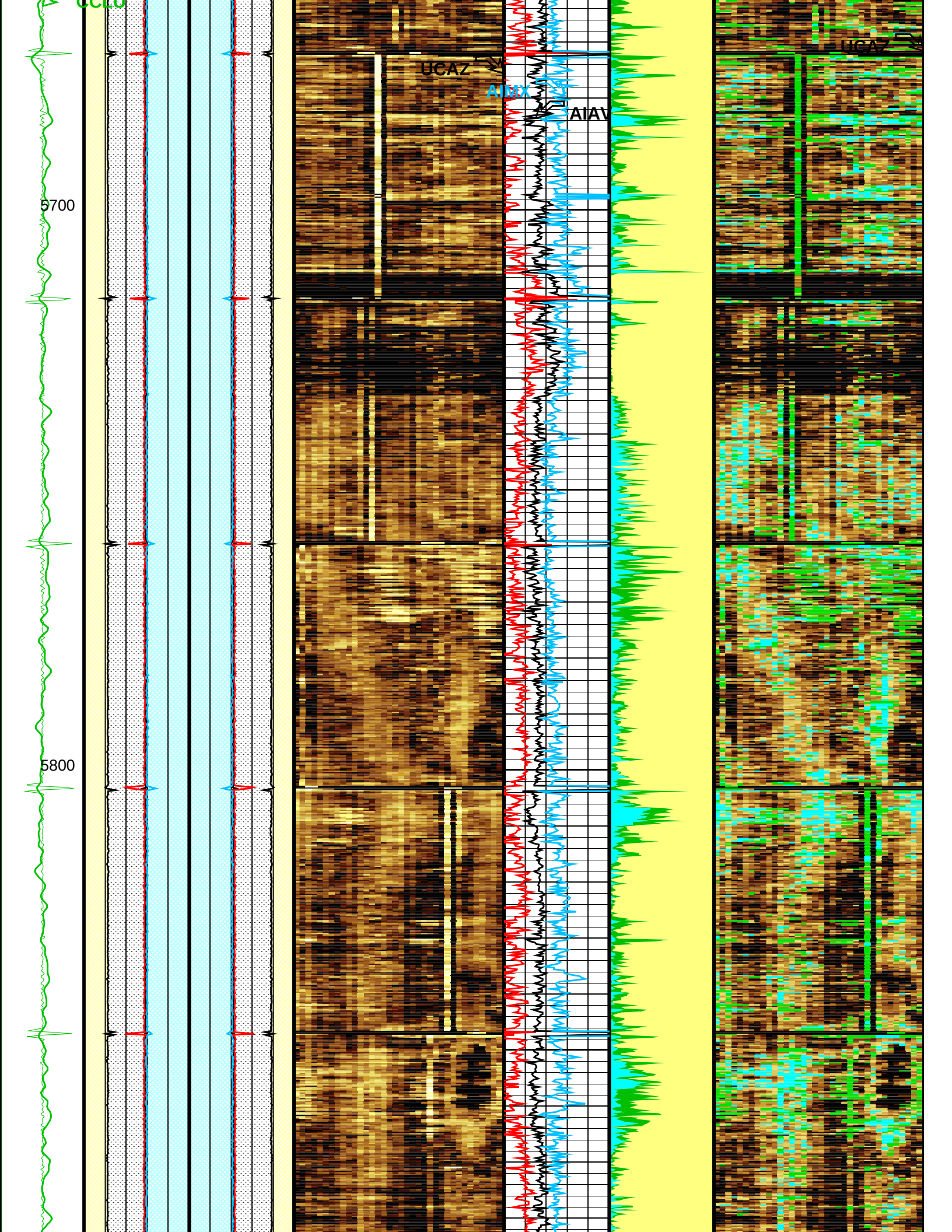
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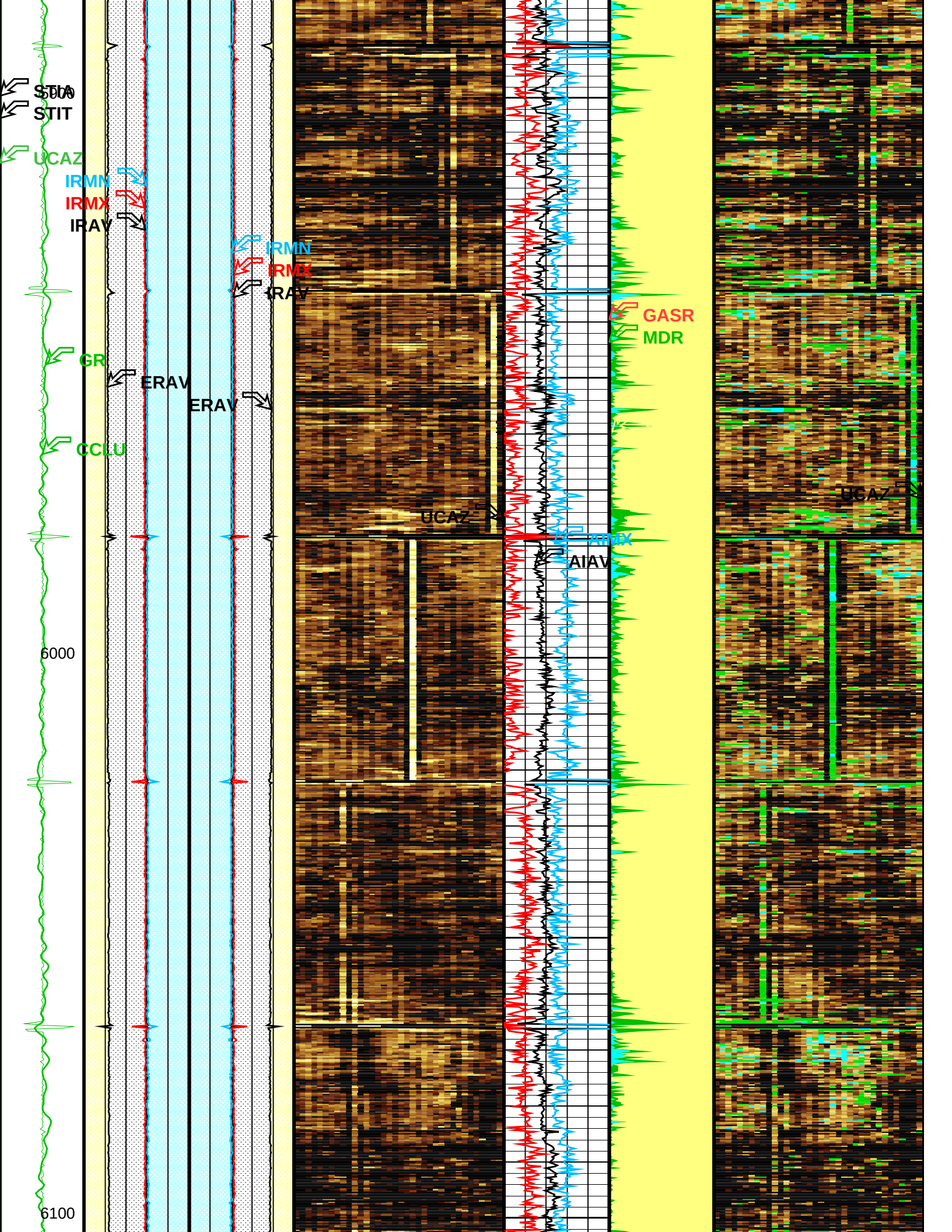
5800
UCAZ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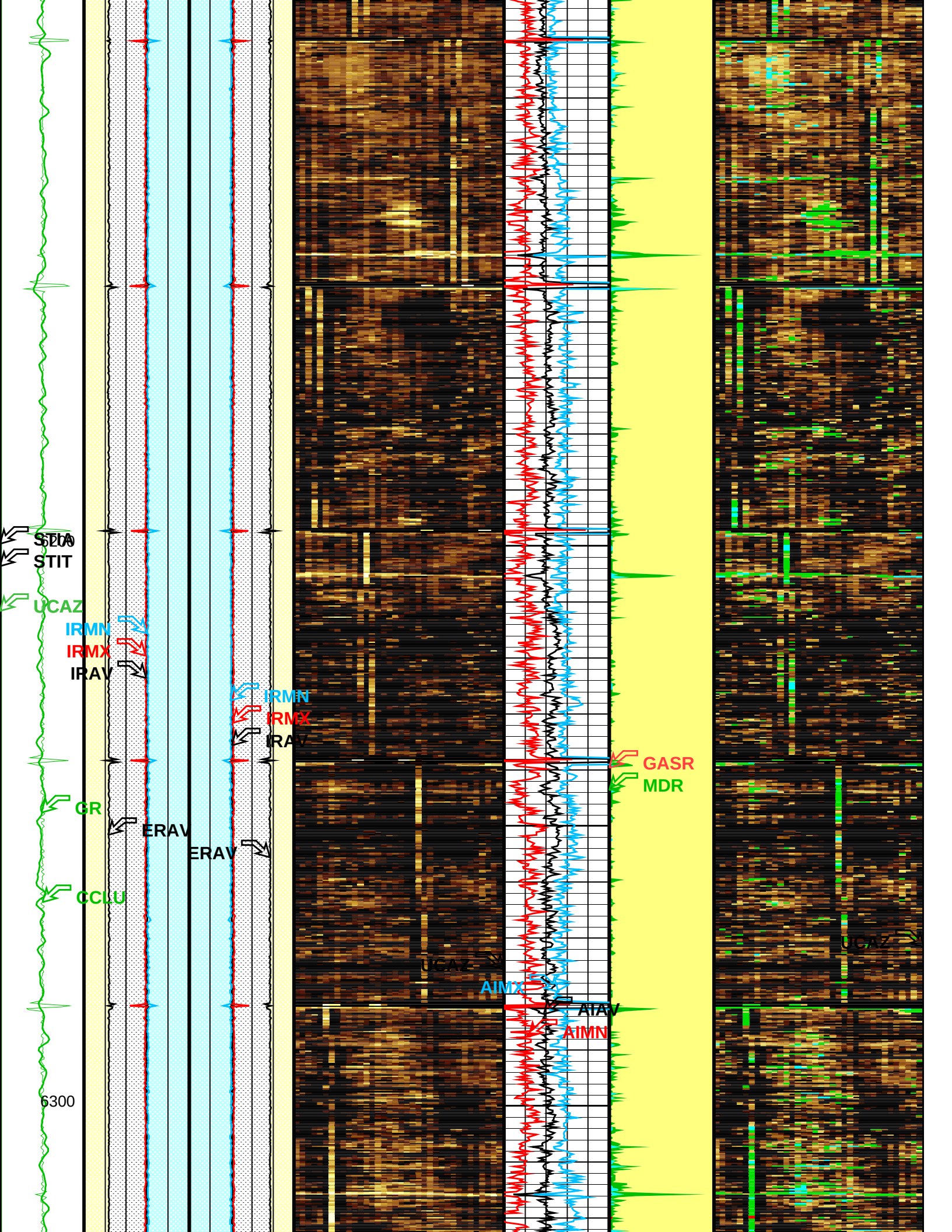
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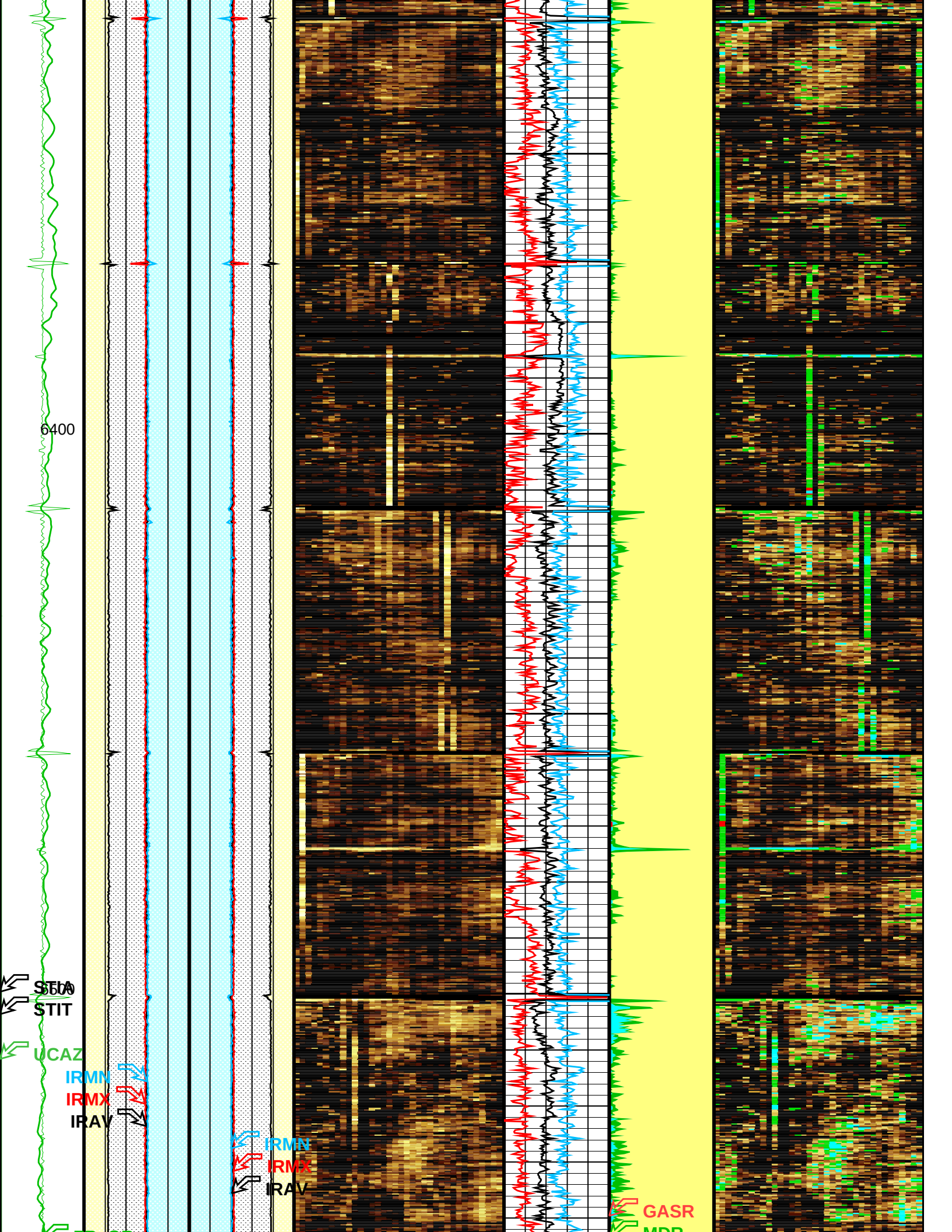
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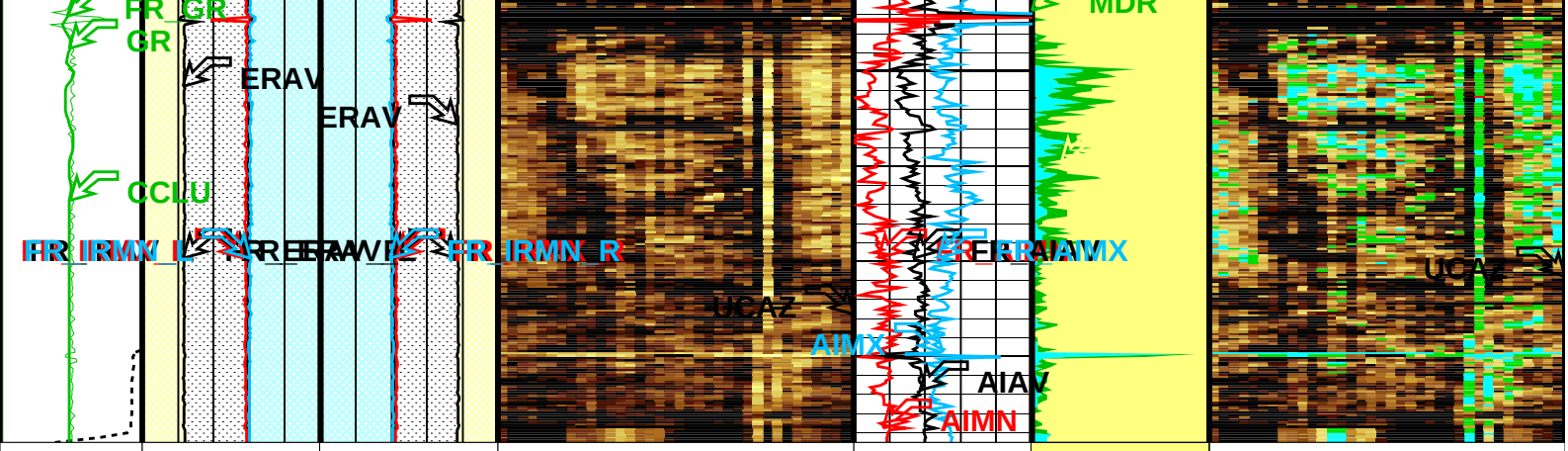


CCL (CCLU) (----) −20 20	Internal radius Average (IRAV) 3.7 (IN) 2.7	External radius Average (ERAV) 2.7 (IN) 3.7	Raw Acoustic Imped. (AIBK) (MRAY)	Minimum of AI (AIMN) 0 (MRAY) 10	Bonded	Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (MRAY)
Cable Speed (CS) (F/HR) 0 2000	Internal radius Maximum (IRMX) 3.7 (IN) 2.7	Internal radius Average (IRAV) 2.7 (IN) 3.7		Average of AI (AIAV) 0 (MRAY) 10	Gas or Dry MicroA	
Gamma Ray (GR) (GAPI) 0 150	External radius Average (ERAV) 3.7 (IN) 2.7	Internal radius Maximum (IRMX) 2.7 (IN) 3.7		Maximum of AI (AIMX) 0 (MRAY) 10	Liquid	
Stuck Stretch (STIT) 0 (F) 50	Min of Internal radius (IRMN) 3.7 (IN) 2.7	Min of Internal radius (IRMN) 2.7 (IN) 3.7			Micro−debonding	
Cable Drag From D4T to STIT						
Tool/Tot. Drag From D4T to STIA						
Image rotation (UCAZ) (DEG) 0 360						

Raw Acoustic Imped. (AIBK) (MRAY): −500.0000, 0.2500, 0.5000, 0.7500, 1.0000, 1.2500, 1.5000, 1.7500, 2.0000, 2.2500, 2.5000, 2.7500, 3.0000, 3.2500, 3.5000, 3.7500, 4.0000

Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (MRAY): −1000.0000, −500.0000, 0.3000, 2.3000, 2.4546, 2.6091, 2.7636, 2.9182, 3.0727, 3.2273, 3.3818, 3.5364, 3.6909, 3.8455, 4.0000

Format: USIT CEMENT 5 inch Vertical Scale: 5" per 100' Graphics File Created: 23−May−2013 12:24

OP System Version: 19C2−270

USIT−E	19C2−270	SGT−N	19C2−270
DTC−H	19C2−270		

All USI Images are outside views

USI : LOW Frequency Compression Mode Used For Logging.

Recommended casing thickness range for optimum cement impedance measurement : 0.27 to 0.6 IN.

Parameters

DLIS Name	Description	Value	
	USIT−E: Ultrasonic Imaging − E		
AGMN	Minimum Gain of Cartridge	−4	DB
AGMX	Maximum Gain of Cartridge	20	DB
BERJ	Bad Echo Rejection	ON	
CDIA	Casing Outer Diameter	7	IN
CSDE	Casing Density	486.94	LBCF
CSID	Casing Inner Diameter	6.276	IN
DFVL	Default Fluid Velocity	188	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	20	V
FDII	FPM Data Interpolation Interval	0	FT
IMAR	Image Rotation	OFF	
MW	Mud Weight	8.9	LB/G
RCOD	Reference Calibrator Outer Diameter	7	IN
RCSO	Reference Calibrator Standoff	1.1811	IN
RCTH	Reference Calibrator Thickness	0.2952	IN
SDNV	Number of Vertical Samples used for Micro−debonding Computation	5	
SDTHOR	Acoustic Impedance STD Horizontal Threshold for Micro−debonding	0.5	
SDTVER	Acoustic Impedance STD Vertical Threshold for Micro−debonding	0.3	
TCUB	T^3 Processing Level	Vax_Loop	
THDH	Maximum Search Thickness (percentage of nominal)	130	
THDL	Minimum Search Thickness (percentage of nominal)	70	
THDP	Thickness Detection Policy	Fundamental	
THNO	Nominal Thickness of Casing	0.362	IN
UMAO	USIT Measurement Angular Offset	18	DEG
USTO	Ultrasonic Time Offset	−2	US
USUB	Ultrasonic Subassembly Identifier	Sub_7_inch	
UWKM	Ultrasonic Working Mode	10DEG_3IN_60U_LF	
VCAS	Ultrasonic Transversal Velocity in Casing	51.4	US/F
WLEN	T^3 Processing Length	21.7078	US
ZCAS	Acoustic Impedance of Casing	46.2537	MRAY
ZINI	Initial Estimate of Cement Impedance	−1	MRAY
ZMUD	Acoustic Impedance of Mud	1.48	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.3	MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3	MRAY
	STI: Stuck Tool Indicator		
LBFR	Trigger for MAXIS First Reading Label	TDL	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth − Driller	12713.00	FT
TDL	Total Depth − Logger	6570.00	FT
	System and Miscellaneous		
CWEI	Casing Weight	26.00	LB/F
DO	Depth Offset for Playback	20.3	FT
PP	Playback Processing	OFF	

Input DLIS Files

DEFAULT	USI_024PUP	FN:22	PRODUCER	22−May−2013 12:30	6568.5 FT	−5.5 FT

Output DLIS Files

DEFAULT	USI_005PUP	FN:4	PRODUCER	23−May−2013 12:24

Input DLIS Files

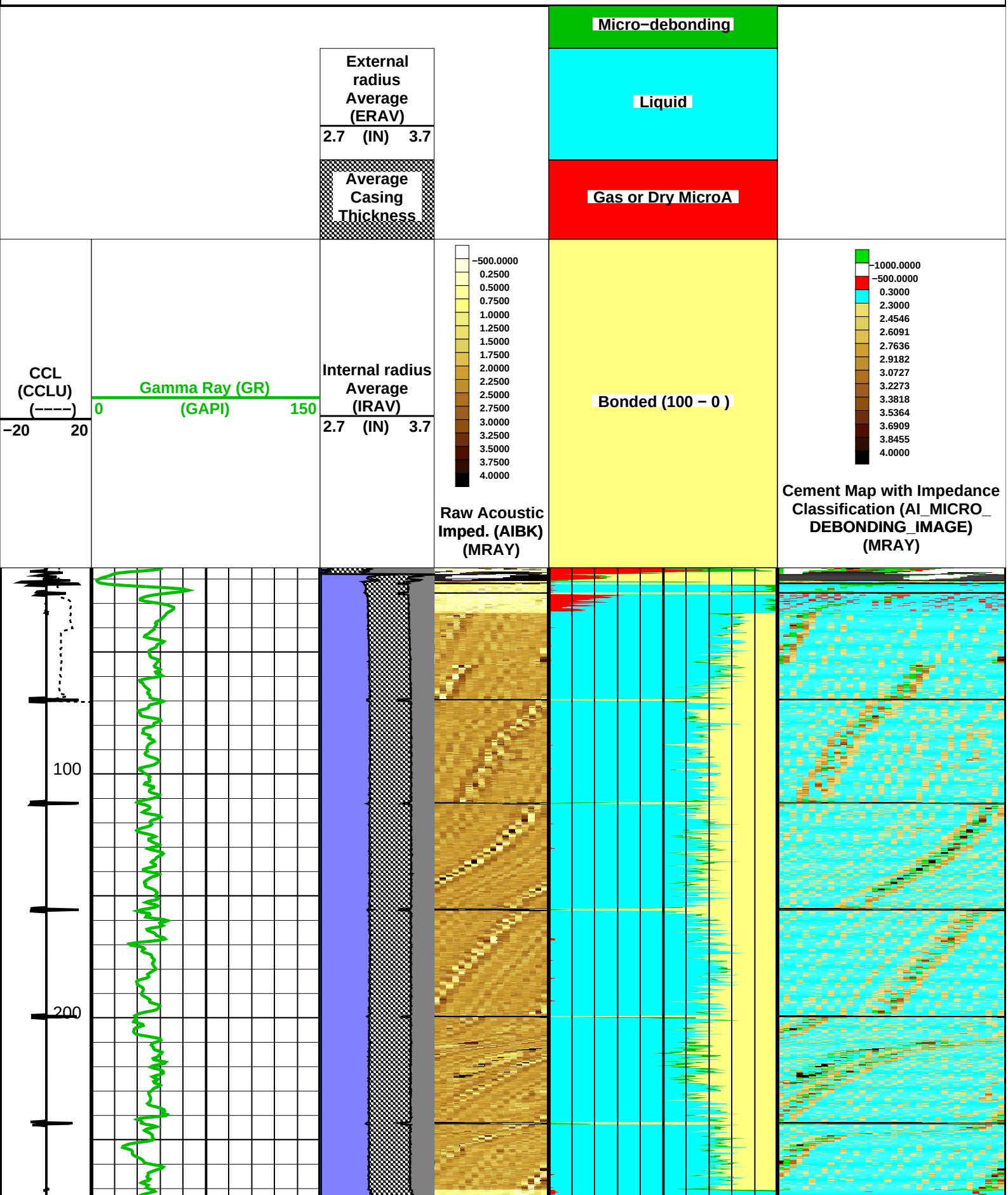
DEFAULT	USI_024PUP	FN:22	PRODUCER	22−May−2013 12:30	6568.5 FT	−5.5 FT

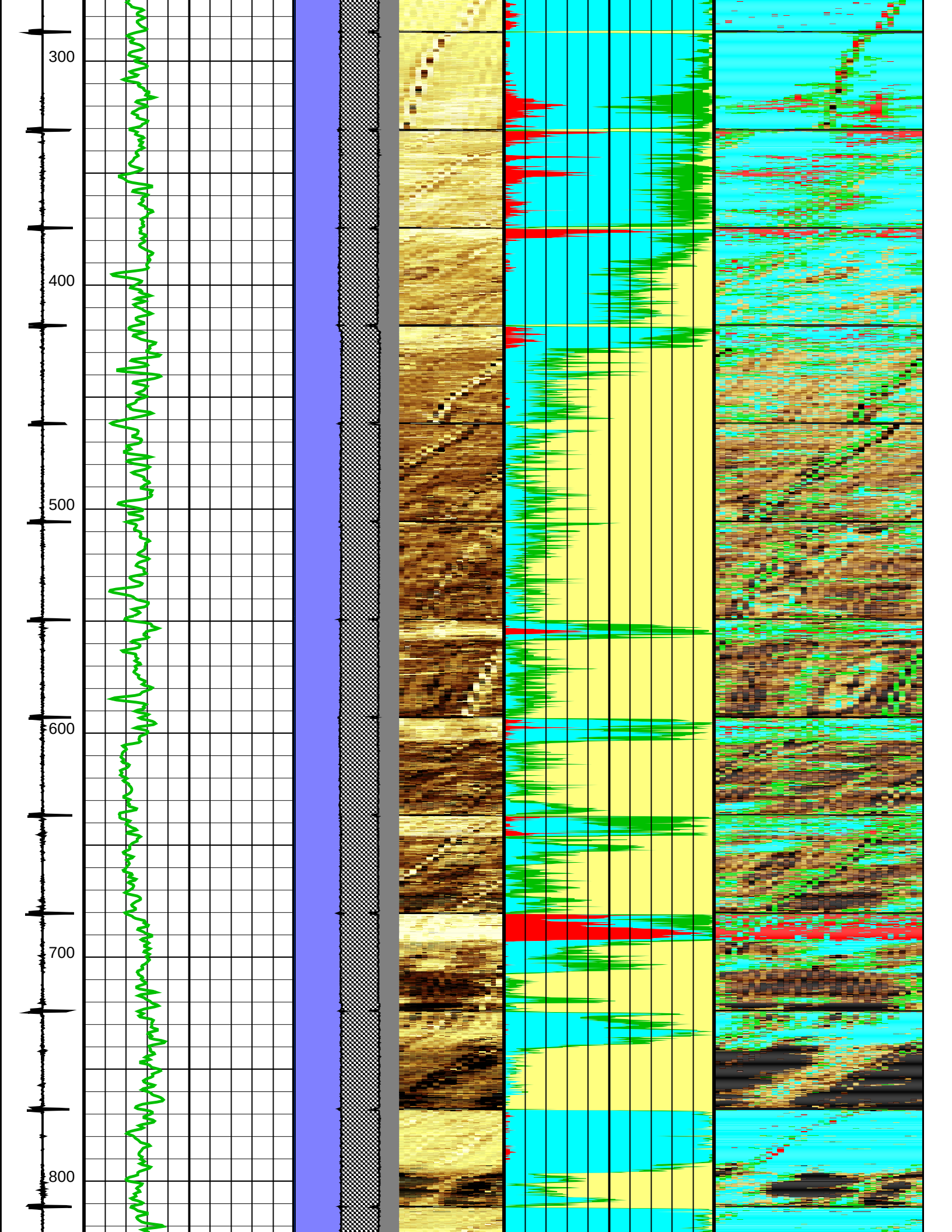
Output DLIS Files

DEFAULT USI_005PUP FN:4 PRODUCER 23−May−2013 12:24

OP System Version: 19C2−270

USIT−E 19C2−270 SGT−N 19C2−270
DTC−H 19C2−270

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700
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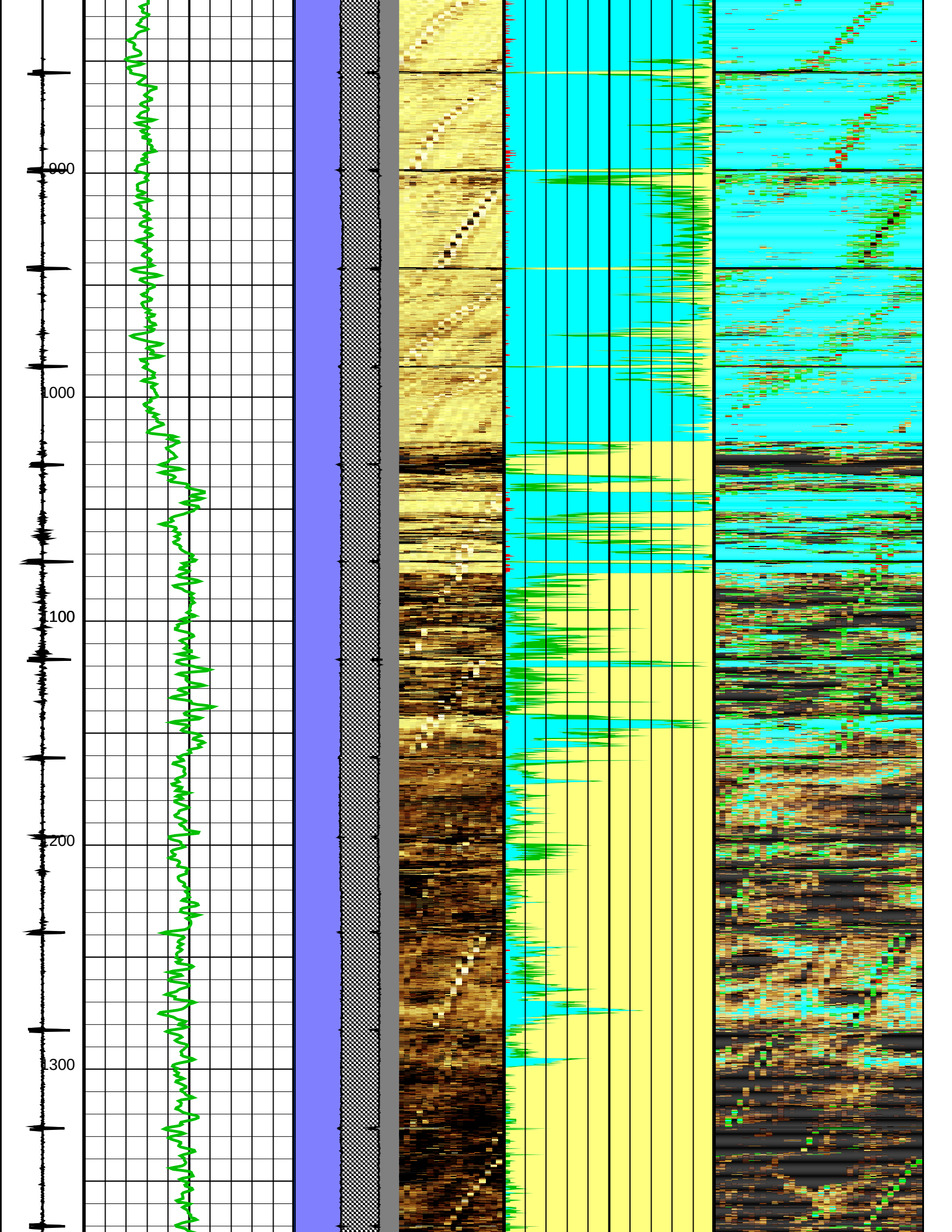
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1000
1100
1200
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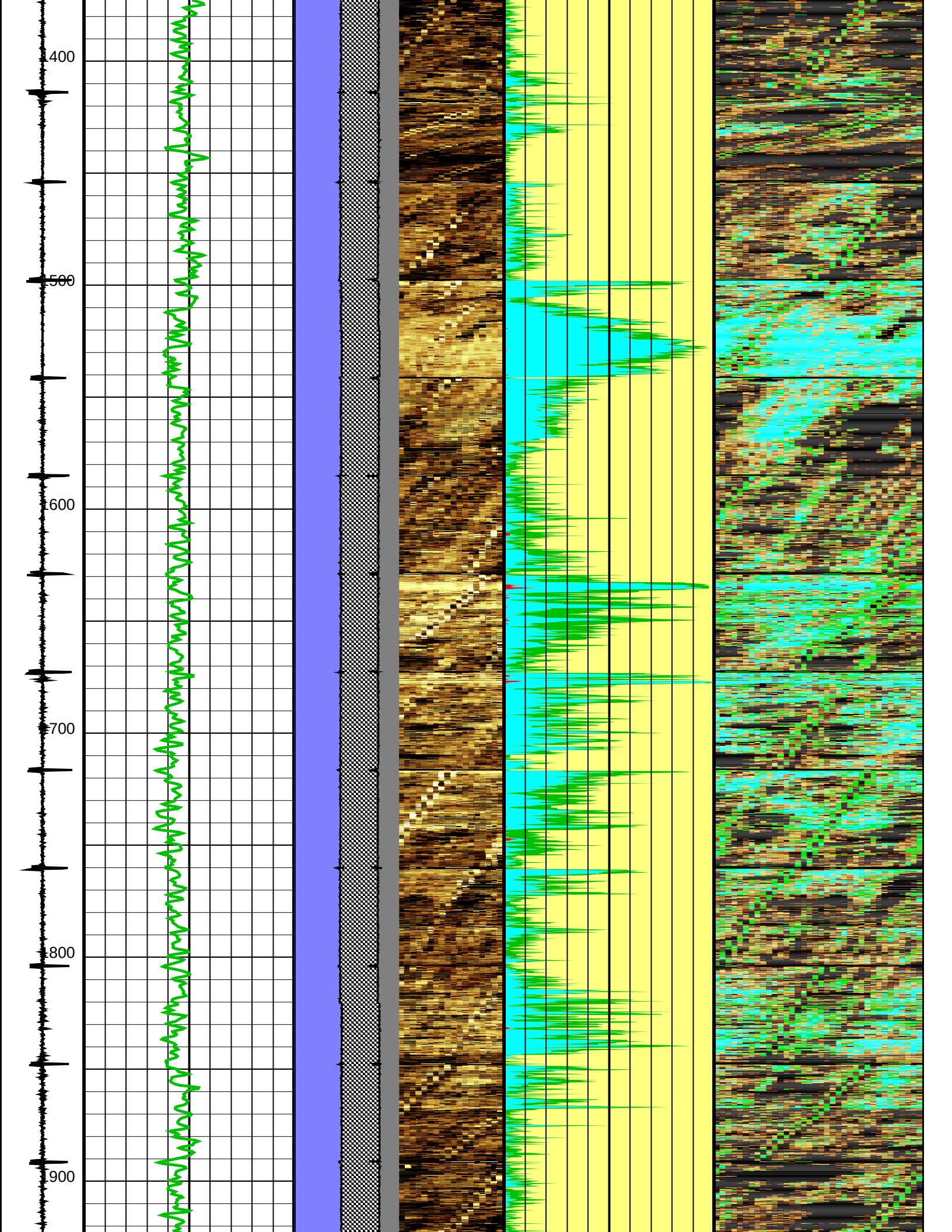
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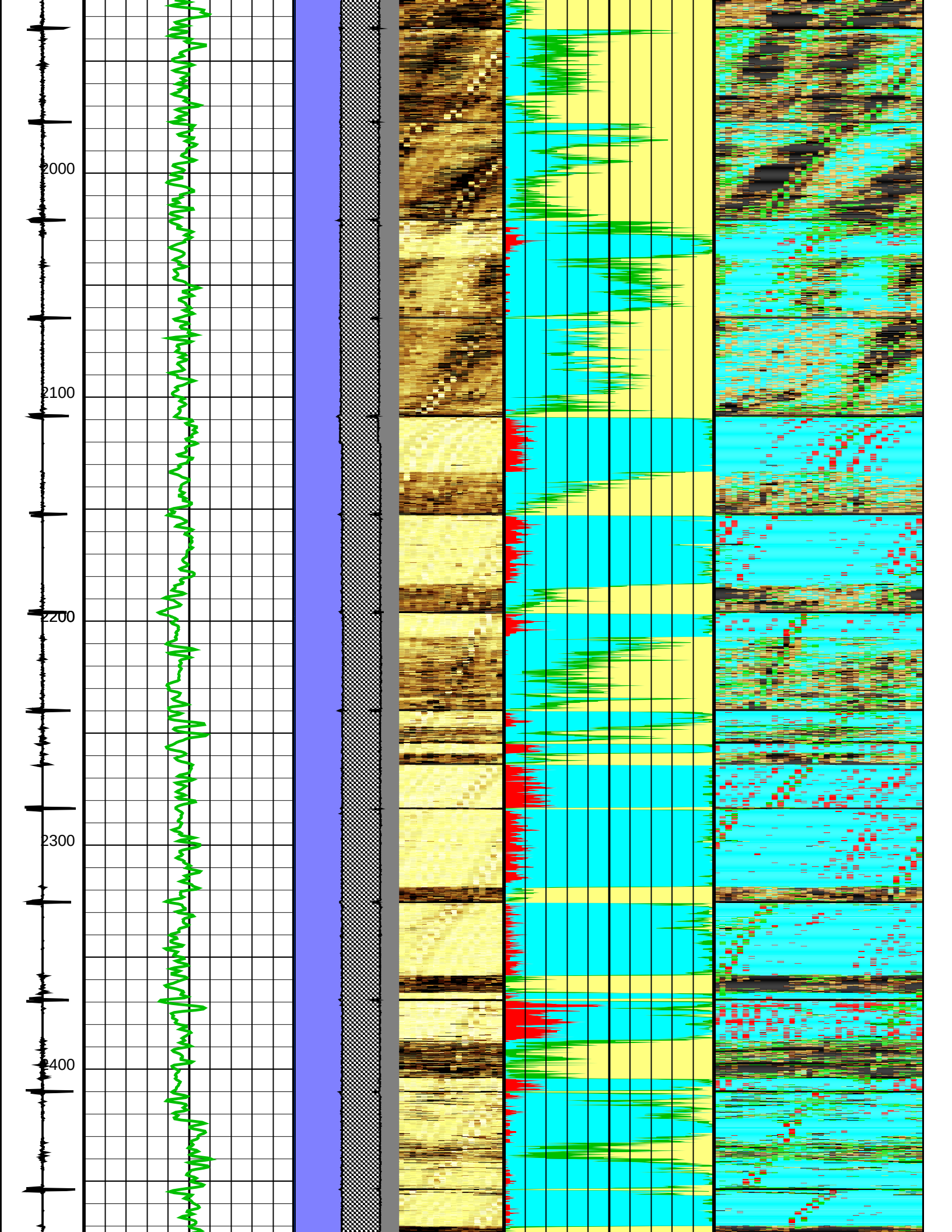
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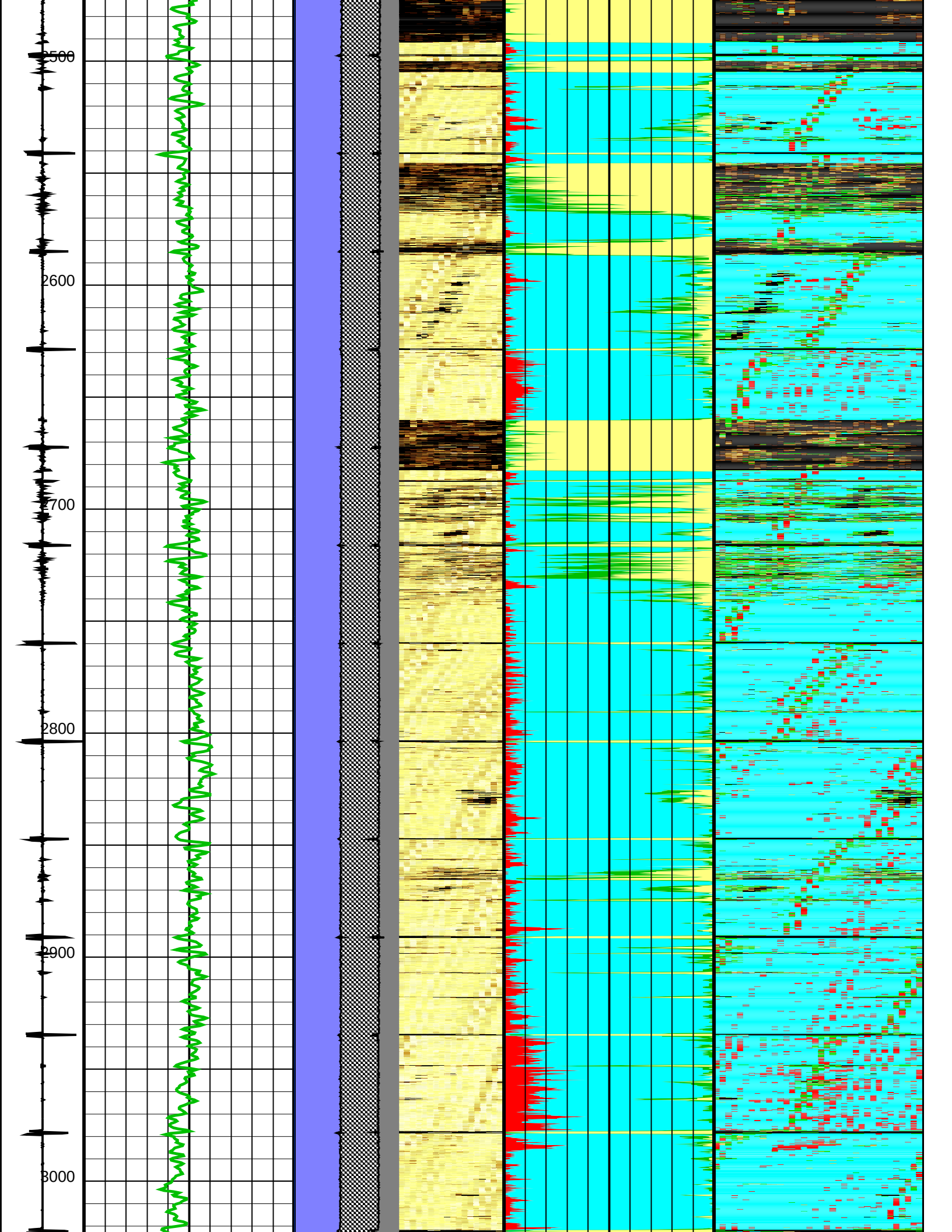
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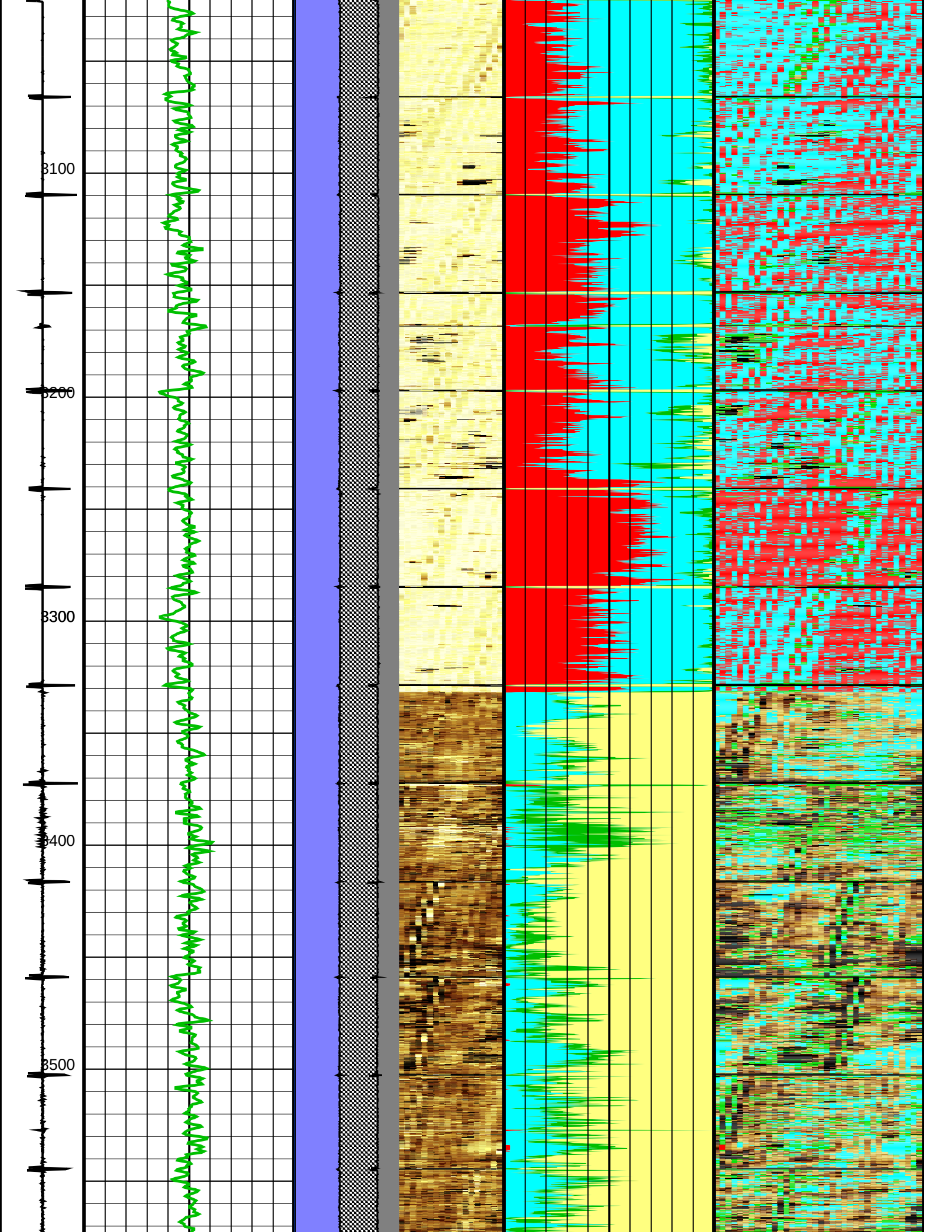
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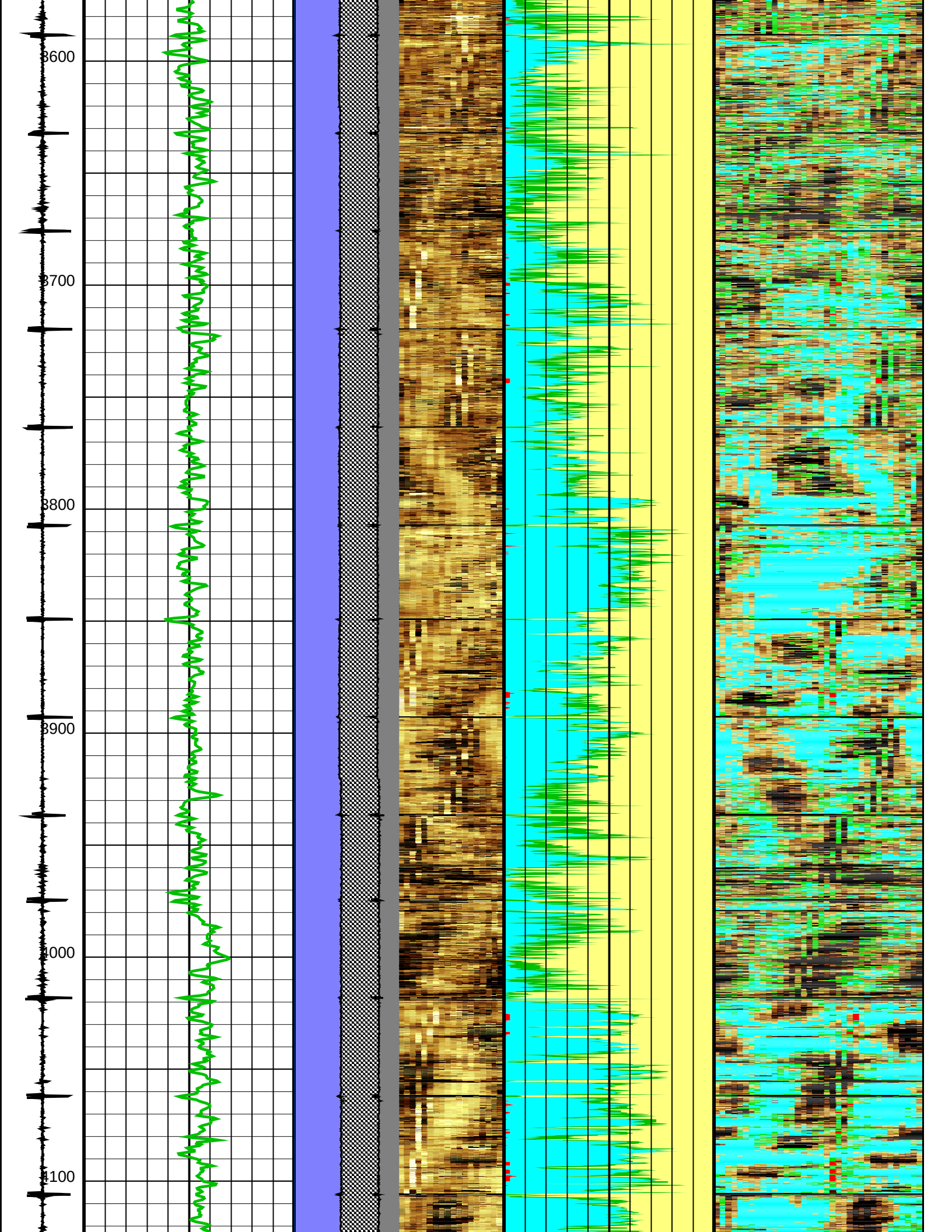
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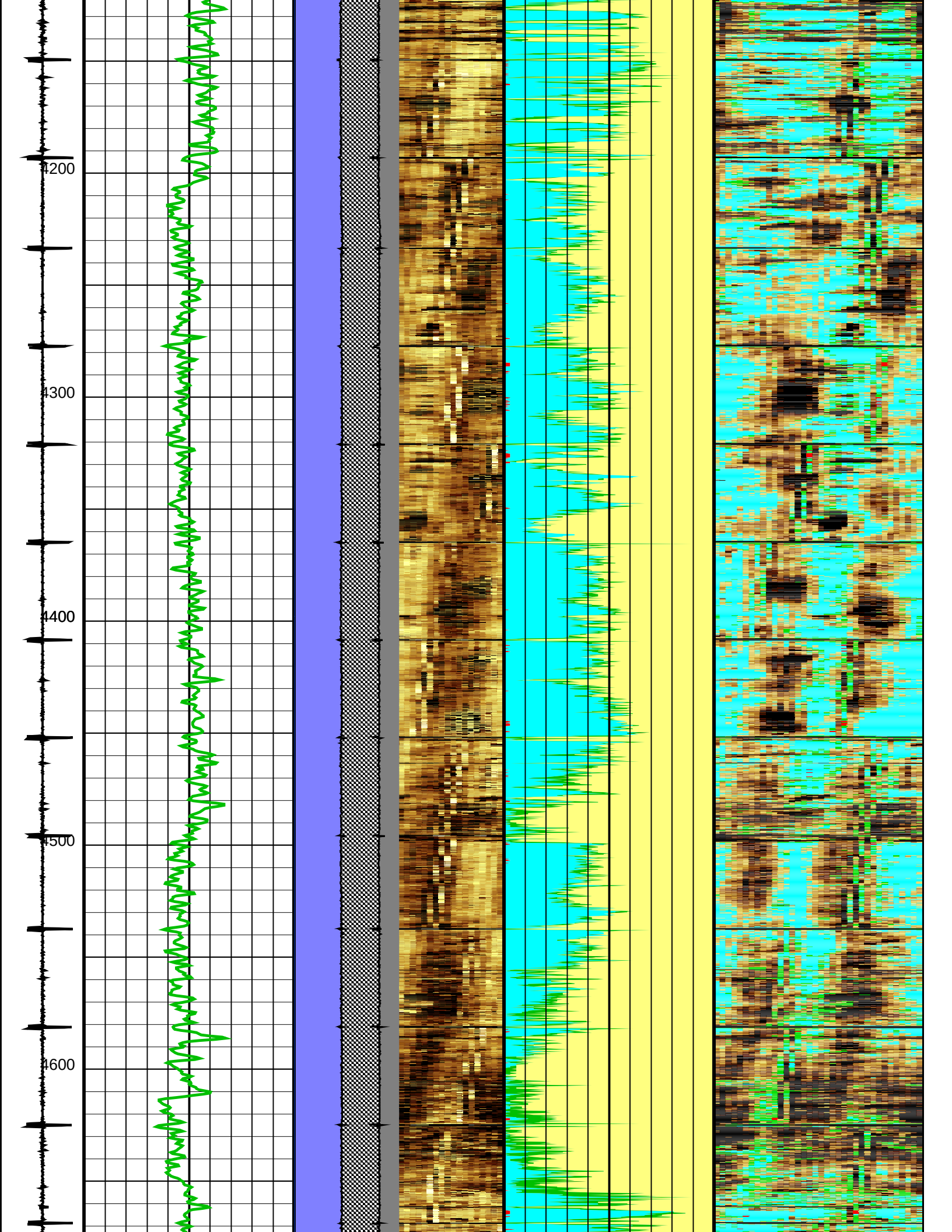
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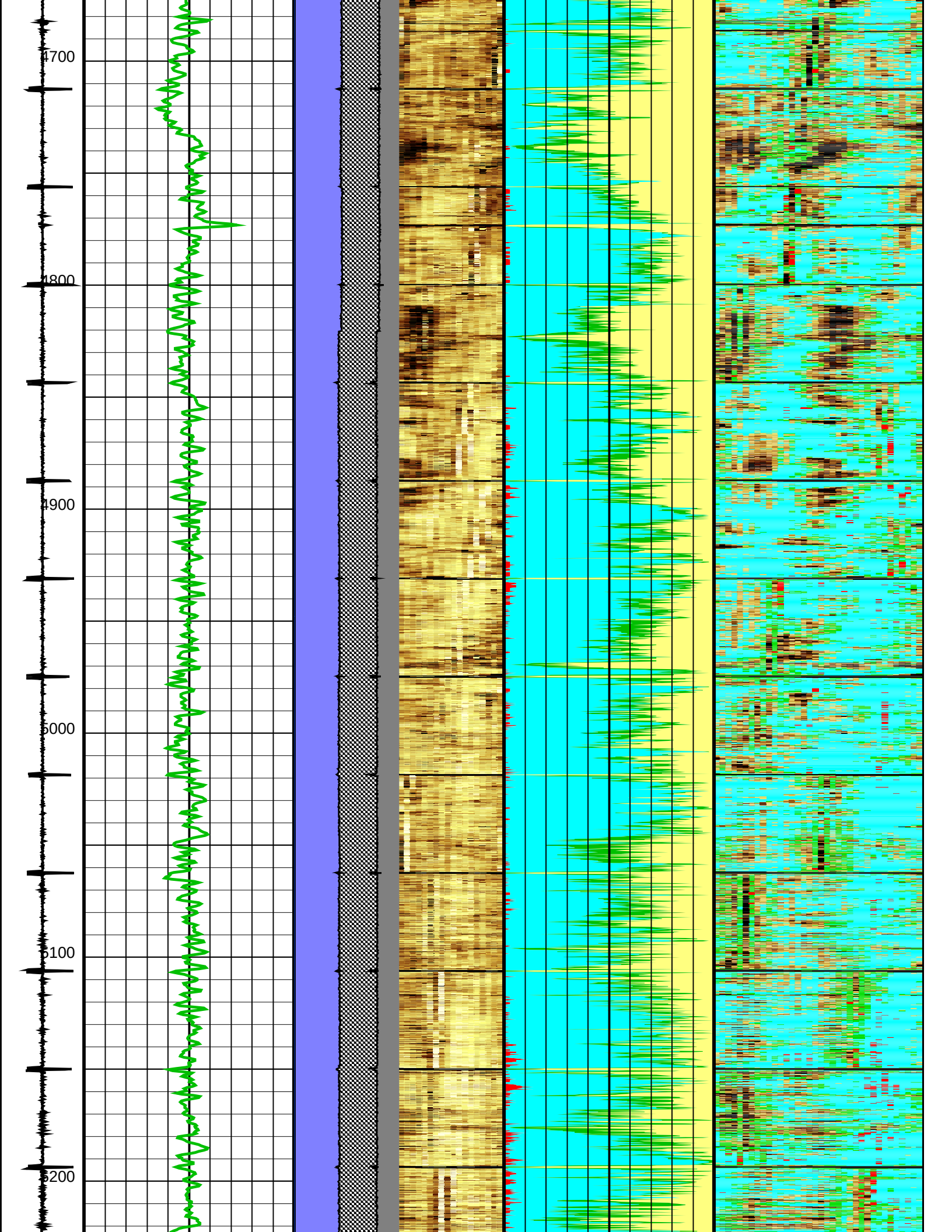
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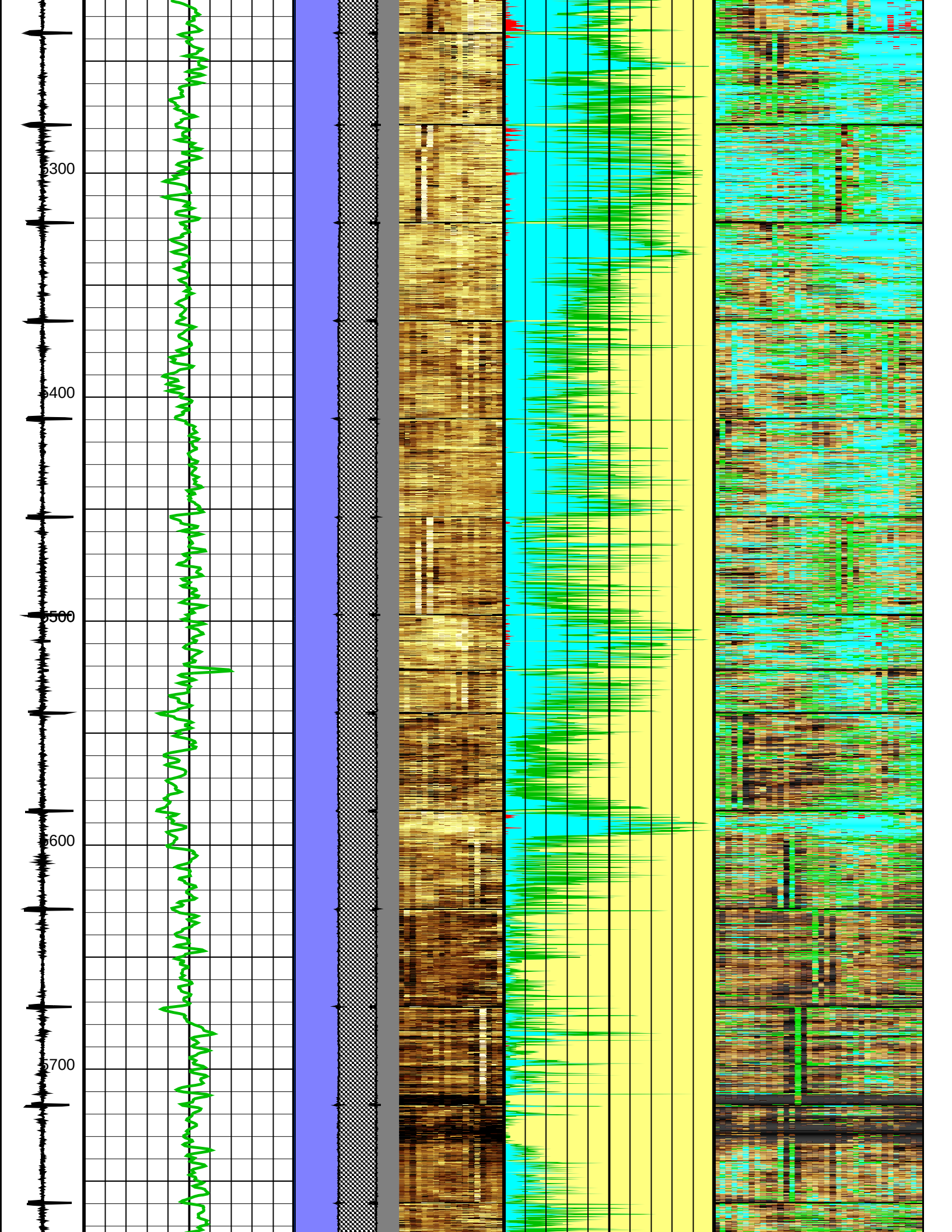
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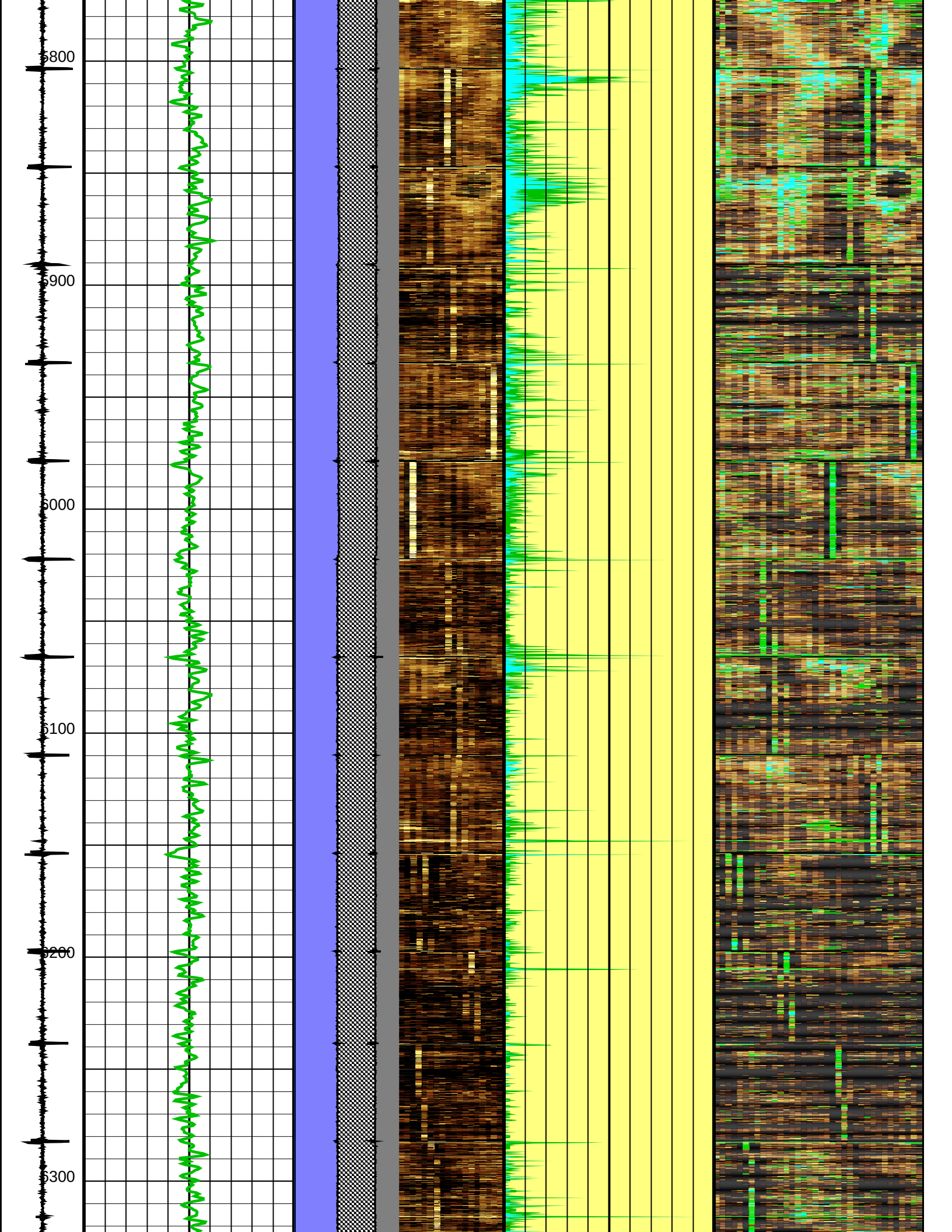
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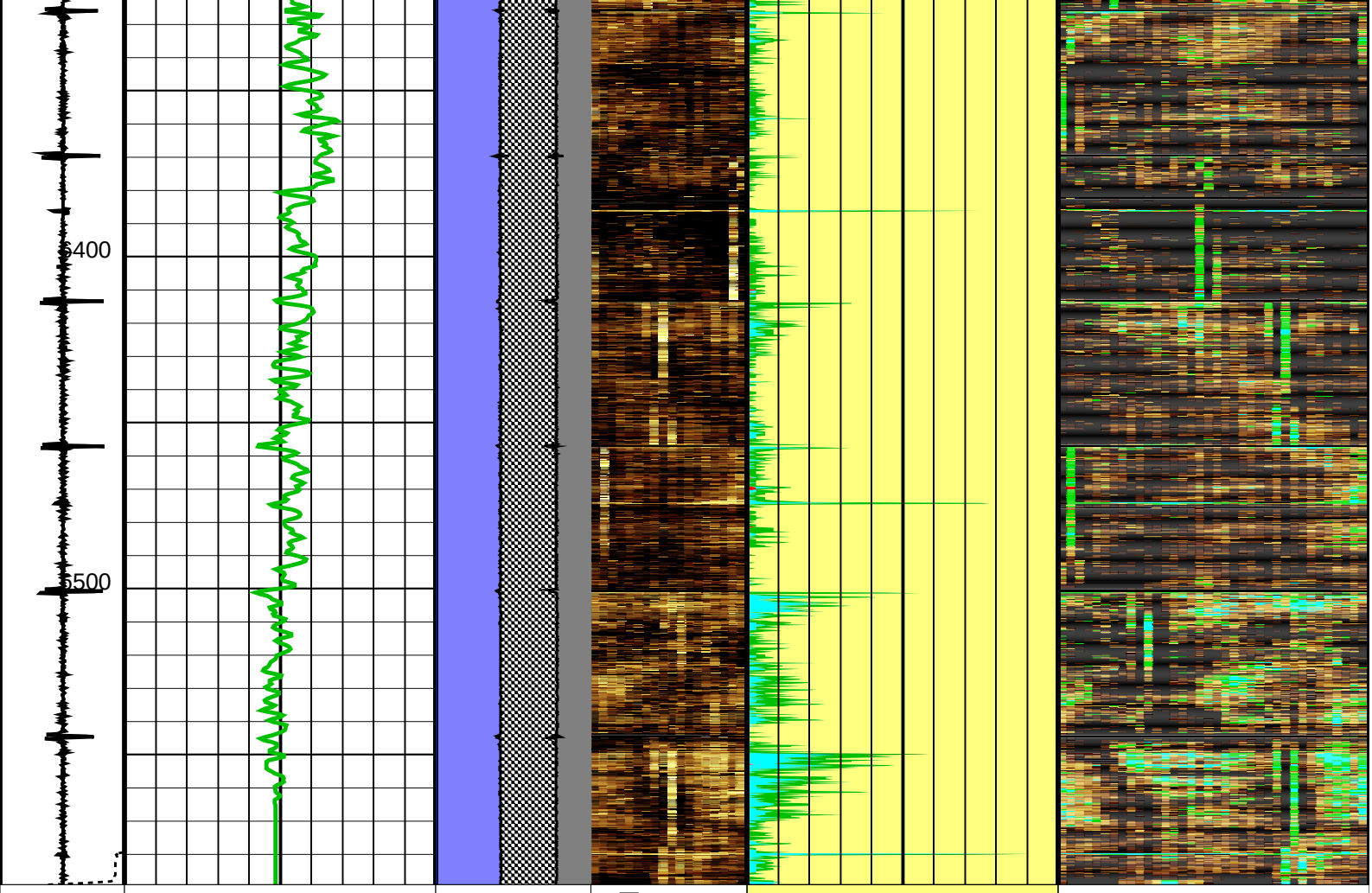


CCL (CCLU) (----)
−20 20

Gamma Ray (GR) (GAPI)
0 150

Internal radius Average (IRAV)
2.7 (IN) 3.7

Average Casing Thickness

External radius Average (ERAV)
2.7 (IN) 3.7

−500.0000
0.2500
0.5000
0.7500
1.0000
1.2500
1.5000
1.7500
2.0000
2.2500
2.5000
2.7500
3.0000
3.2500
3.5000
3.7500
4.0000

Raw Acoustic Imped. (AIBK) (MRAY)

Bonded (100 − 0)

Gas or Dry MicroA

Liquid

Micro−debonding

−1000.0000
−500.0000
0.3000
2.3000
2.4546
2.6091
2.7636
2.9182
3.0727
3.2273
3.3818
3.5364
3.6909
3.8455
4.0000

Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (MRAY)

Format: USIT ND State 2 inch Vertical Scale: 2" per 100' Graphics File Created: 23−May−2013 12:24

OP System Version: 19C2−270

USIT−E 19C2−270 SGT−N 19C2−270
DTC−H 19C2−270

All USI Images are outside views

USI : LOW Frequency Compression Mode Used For Logging.

Recommended casing thickness range for optimum cement impedance measurement : 0.27 to 0.6 IN.

Parameters

DLIS Name	Description	Value	
USIT−E: Ultrasonic Imaging − E			
AGMN	Minimum Gain of Cartridge	−4	DB
AGMX	Maximum Gain of Cartridge	20	DB
BERJ	Bad Echo Rejection	ON	
CDIA	Casing Outer Diameter	7	IN
CSDE	Casing Density	486.94	LBCF
CSID	Casing Inner Diameter	6.276	IN
DFVL	Default Fluid Velocity	188	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	20	V
FDII	FPM Data Interpolation Interval	0	FT
IMAR	Image Rotation	OFF	
MW	Mud Weight	8.9	LB/G
RCOD	Reference Calibrator Outer Diameter	7	IN
RCSO	Reference Calibrator Standoff	1.1811	IN
RCTH	Reference Calibrator Thickness	0.2952	IN
SDNV	Number of Vertical Samples used for Micro−debonding Computation	5	
SDTHOR	Acoustic Impedance STD Horizontal Threshold for Micro−debonding	0.5	
SDTVER	Acoustic Impedance STD Vertical Threshold for Micro−debonding	0.3	
TCUB	T^3 Processing Level	Vax_Loop	
THDH	Maximum Search Thickness (percentage of nominal)	130	
THDL	Minimum Search Thickness (percentage of nominal)	70	
THDP	Thickness Detection Policy	Fundamental	
THNO	Nominal Thickness of Casing	0.362	IN
UMAO	USIT Measurement Angular Offset	18	DEG
USTO	Ultrasonic Time Offset	−2	US
USUB	Ultrasonic Subassembly Identifier	Sub_7_inch	
UWKM	Ultrasonic Working Mode	10DEG_3IN_60U_LF	
VCAS	Ultrasonic Transversal Velocity in Casing	51.4	US/F
WLEN	T^3 Processing Length	21.7078	US
ZCAS	Acoustic Impedance of Casing	46.2537	MRAY
ZINI	Initial Estimate of Cement Impedance	−1	MRAY
ZMUD	Acoustic Impedance of Mud	1.48	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.3	MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3	MRAY
System and Miscellaneous			
CWEI	Casing Weight	26.00	LB/F
DO	Depth Offset for Playback	20.3	FT
PP	Playback Processing	OFF	

Input DLIS Files

DEFAULT	USI_024PUP	FN:22	PRODUCER	22−May−2013 12:30	6568.5 FT	−5.5 FT

Output DLIS Files

DEFAULT	USI_005PUP	FN:4	PRODUCER	23−May−2013 12:24

Company: Kerr−McGee Oil & Gas Onshore LP Well: Russian Fiddler 15N−18HZ

Input DLIS Files

DEFAULT	USI_024PUP	FN:22	PRODUCER	22−May−2013 12:30	6568.5 FT	−5.5 FT

Output DLIS Files

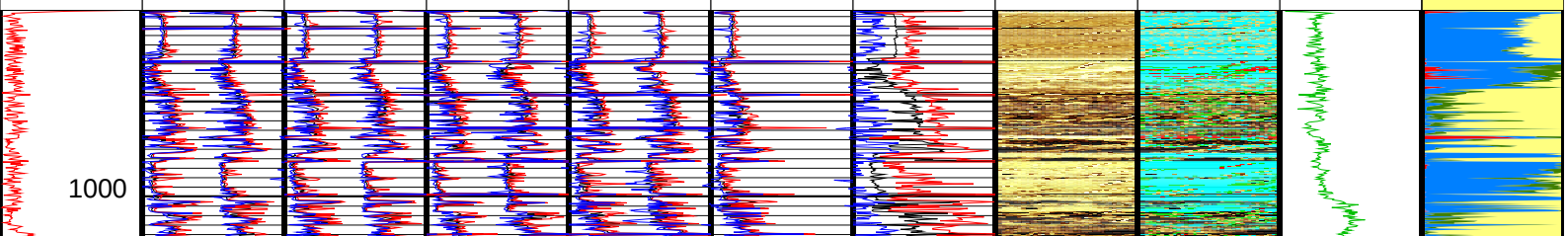
DEFAULT	USI_005PUP	FN:4	PRODUCER	23−May−2013 12:24	6589.0 FT	15.0 FT

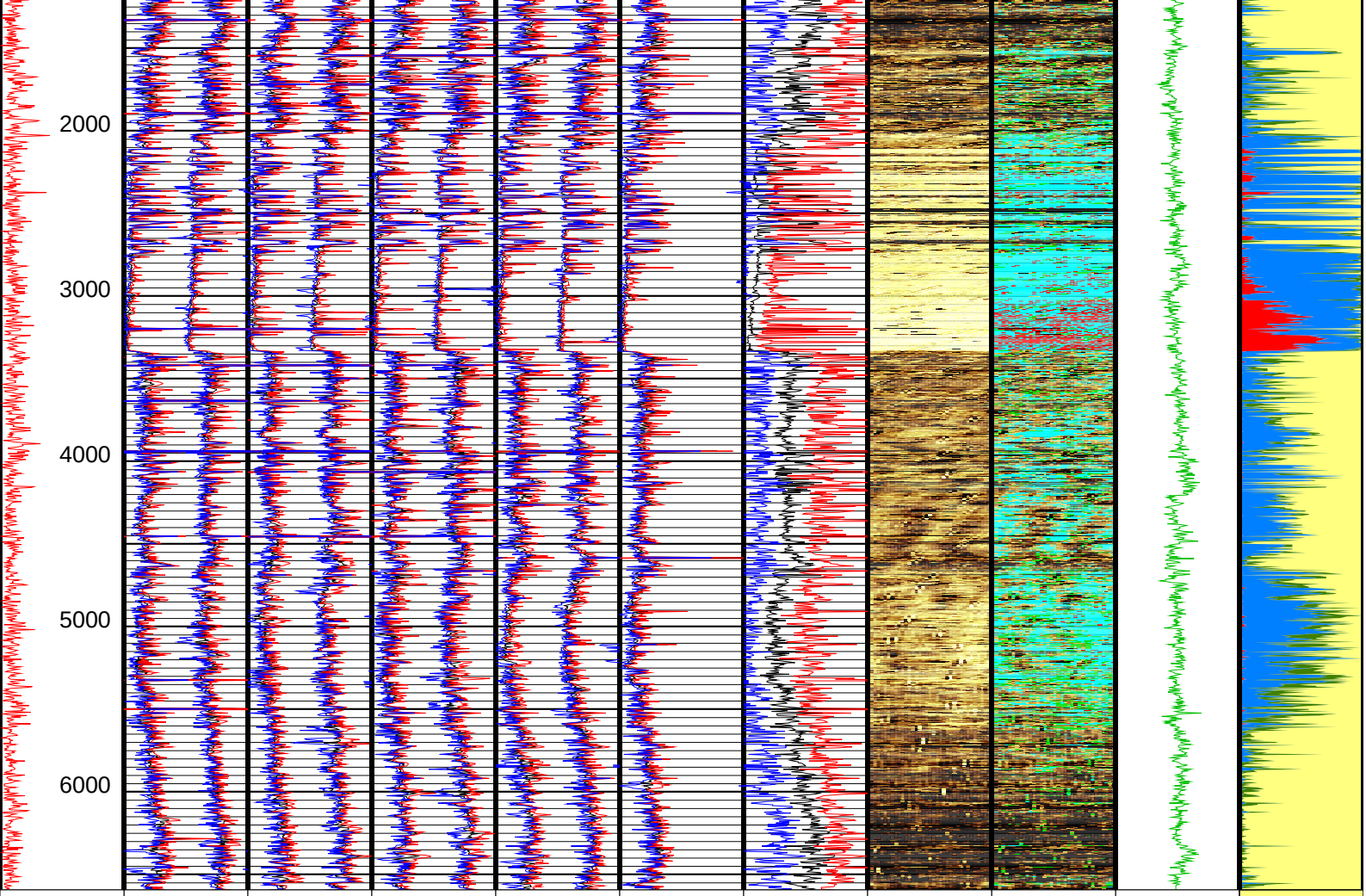
OP System Version: 19C2−270

CP System version: 19C2-270

USIT-E 19C2-270 SGT-N 19C2-270
DTC-H 19C2-270

	Minimum Acoustic Impedance #2 (MIN_AI2) (MRAY) −7.5 7.5	Minimum Acoustic Impedance #4 (MIN_AI4) (MRAY) −7.5 7.5	Minimum Acoustic Impedance #6 (MIN_AI6) (MRAY) −7.5 7.5	Minimum Acoustic Impedance #8 (MIN_AI8) (MRAY) −7.5 7.5						
	Minimum Acoustic Impedance #1 (MIN_AI1) (MRAY) 0 15	Minimum Acoustic Impedance #3 (MIN_AI3) (MRAY) 0 15	Minimum Acoustic Impedance #5 (MIN_AI5) (MRAY) 0 15	Minimum Acoustic Impedance #7 (MIN_AI7) (MRAY) 0 15						
	Maximum Acoustic Impedance #2 (MAX_AI2) (MRAY) −7.5 7.5	Maximum Acoustic Impedance #4 (MAX_AI4) (MRAY) −7.5 7.5	Maximum Acoustic Impedance #6 (MAX_AI6) (MRAY) −7.5 7.5	Maximum Acoustic Impedance #8 (MAX_AI8) (MRAY) −7.5 7.5						Area
	Maximum Acoustic Impedance #1 (MAX_AI1) (MRAY) 0 15	Maximum Acoustic Impedance #3 (MAX_AI3) (MRAY) 0 15	Maximum Acoustic Impedance #5 (MAX_AI5) (MRAY) 0 15	Maximum Acoustic Impedance #7 (MAX_AI7) (MRAY) 0 15	Minimum Acoustic Impedance #9 (MIN_AI9) (MRAY) 0 15	Maximum of AI (AIMX) (MRAY) 0 7.5				Liquid
	Average Acoustic Impedance #2 (AV_AI2) (MRAY) −7.5 7.5	Average Acoustic Impedance #4 (AV_AI4) (MRAY) −7.5 7.5	Average Acoustic Impedance #6 (AV_AI6) (MRAY) −7.5 7.5	Average Acoustic Impedance #8 (AV_AI8) (MRAY) −7.5 7.5	Maximum Acoustic Impedance #9 (MAX_AI9) (MRAY) 0 15	Minimum of AI (AIMN) (MRAY) 0 7.5				Gas
Eccent. (ECCE) 0 (IN) 0.5	Average Acoustic Impedance #1 (AV_AI1) (MRAY) 0 15	Average Acoustic Impedance #3 (AV_AI3) (MRAY) 0 15	Average Acoustic Impedance #5 (AV_AI5) (MRAY) 0 15	Average Acoustic Impedance #7 (AV_AI7) (MRAY) 0 15	Average Acoustic Impedance #9 (AV_AI9) (MRAY) 0 15	Average of AI (AIAV) (MRAY) 0 7.5	Raw Acoustic Imped. (AIBK) (MRAY) −500.0000, 0.2500, 0.5000, 0.7500, 1.0000, 1.2500, 1.5000, 1.7500, 2.0000, 2.2500, 2.5000, 2.7500, 3.0000, 3.2500, 3.5000, 3.7500, 4.0000	Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (MRAY) −1000.0000, −500.0000, 0.3000, 2.3000, 2.4546, 2.6091, 2.7636, 2.9182, 3.0727, 3.2273, 3.3818, 3.5364, 3.6909, 3.8455, 4.0000	Gamma Ray (GR) (GAPI) 0 150	Bonded (100 −0)





Eccent. (ECCE) 0 (IN) 0.5	Average Acoustic Impedance #1 (AV_AI1) (MRAY) 0 15	Average Acoustic Impedance #3 (AV_AI3) (MRAY) 0 15	Average Acoustic Impedance #5 (AV_AI5) (MRAY) 0 15	Average Acoustic Impedance #7 (AV_AI7) (MRAY) 0 15	Average Acoustic Impedance #9 (AV_AI9) (MRAY) 0 15	Average of AI (AIAV) (MRAY) 0 7.5	Raw Acoustic Imped. (AIBK) (MRAY)	Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (MRAY)	Gamma Ray (GR) (GAPI) 0 150	Bonded (100 −0)
	Average Acoustic Impedance #2 (AV_AI2) (MRAY) −7.5 7.5	Average Acoustic Impedance #4 (AV_AI4) (MRAY) −7.5 7.5	Average Acoustic Impedance #6 (AV_AI6) (MRAY) −7.5 7.5	Average Acoustic Impedance #8 (AV_AI8) (MRAY) −7.5 7.5	Maximum Acoustic Impedance #9 (MAX_AI9) (MRAY) 0 15	Minimum of AI (AIMN) (MRAY) 0 7.5				Gas
	Maximum Acoustic Impedance #1 (MAX_AI1) (MRAY) 0 15	Maximum Acoustic Impedance #3 (MAX_AI3) (MRAY) 0 15	Maximum Acoustic Impedance #5 (MAX_AI5) (MRAY) 0 15	Maximum Acoustic Impedance #7 (MAX_AI7) (MRAY) 0 15	Minimum Acoustic Impedance #9 (MIN_AI9) (MRAY) 0 15	Maximum of AI (AIMX) (MRAY) 0 7.5				Liquid

Raw Acoustic Imped. (AIBK) (MRAY)

−500.0000
0.2500
0.5000
0.7500
1.0000
1.2500
1.5000
1.7500
2.0000
2.2500
2.5000
2.7500
3.0000
3.2500
3.5000
3.7500
4.0000

Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (MRAY)

−1000.0000
−500.0000
0.3000
2.3000
2.4546
2.6091
2.7636
2.9182
3.0727
3.2273
3.3818
3.5364
3.6909
3.8455
4.0000

Maximum Acoustic Impedance #2 (MAX_AI2) (MRAY)	Maximum Acoustic Impedance #4 (MAX_AI4) (MRAY)	Maximum Acoustic Impedance #6 (MAX_AI6) (MRAY)	Maximum Acoustic Impedance #8 (MAX_AI8) (MRAY)
−7.5 7.5	−7.5 7.5	−7.5 7.5	−7.5 7.5
Minimum Acoustic Impedance #1 (MIN_AI1) (MRAY)	Minimum Acoustic Impedance #3 (MIN_AI3) (MRAY)	Minimum Acoustic Impedance #5 (MIN_AI5) (MRAY)	Minimum Acoustic Impedance #7 (MIN_AI7) (MRAY)
0 15	0 15	0 15	0 15
Minimum Acoustic Impedance #2 (MIN_AI2) (MRAY)	Minimum Acoustic Impedance #4 (MIN_AI4) (MRAY)	Minimum Acoustic Impedance #6 (MIN_AI6) (MRAY)	Minimum Acoustic Impedance #8 (MIN_AI8) (MRAY)
−7.5 7.5	−7.5 7.5	−7.5 7.5	−7.5 7.5

Area

Format: USIT only Goodwin Compressed Vertical Scale: 0.1" per 100' Graphics File Created: 23−May−2013 12:24

OP System Version: 19C2−270

USIT−E	19C2−270	SGT−N	19C2−270
DTC−H	19C2−270		

All USI Images are outside views

USI : LOW Frequency Compression Mode Used For Logging.

Recommended casing thickness range for optimum cement impedance measurement : 0.27 to 0.6 IN.

Input DLIS Files

DEFAULT	USI_024PUP	FN:22	PRODUCER	22−May−2013 12:30	6568.5 FT	−5.5 FT

Output DLIS Files

DEFAULT	USI_005PUP	FN:4	PRODUCER	23−May−2013 12:24

Company: Kerr−McGee Oil & Gas Onshore LP Well: Russian Fiddler 15N−18HZ

Input DLIS Files

DEFAULT	USI_025PUP	FN:23	PRODUCER	22−May−2013 12:38	6568.5 FT	6009.5 FT

Output DLIS Files

DEFAULT	USI_006PUP	FN:5	PRODUCER	23−May−2013 12:39	6589.0 FT	6030.0 FT

OP System Version: 19C2−270

USIT−E	19C2−270	SGT−N	19C2−270
DTC−H	19C2−270		

Image rotation (UCAZ) (DEG)	

(DEG)
0 360

Tool/Tot. Drag From D4T to STIA

Cable Drag From D4T to STIT

Stuck Stretch (STIT)
0 (F) 50

Min of Internal radius (IRMN)
3.7 (IN) 2.7

Min of Internal radius (IRMN)
2.7 (IN) 3.7

Micro−debonding

Gamma Ray (GR) (GAPI)
0 150

External radius Average (ERAV)
3.7 (IN) 2.7

Internal radius Maximum (IRMX)
2.7 (IN) 3.7

Maximum of AI (AIMX)
0 (MRAY) 10

Liquid

Cable Speed (CS) (F/HR)
0 2000

Internal radius Maximum (IRMX)
3.7 (IN) 2.7

Internal radius Average (IRAV)
2.7 (IN) 3.7

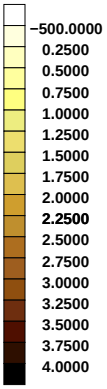
Average of AI (AIAV)
0 (MRAY) 10

Gas or Dry MicroA

CCL (CCLU) (−−−−)
−20 20

Internal radius Average (IRAV)
3.7 (IN) 2.7

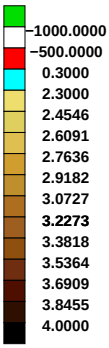
External radius Average (ERAV)
2.7 (IN) 3.7



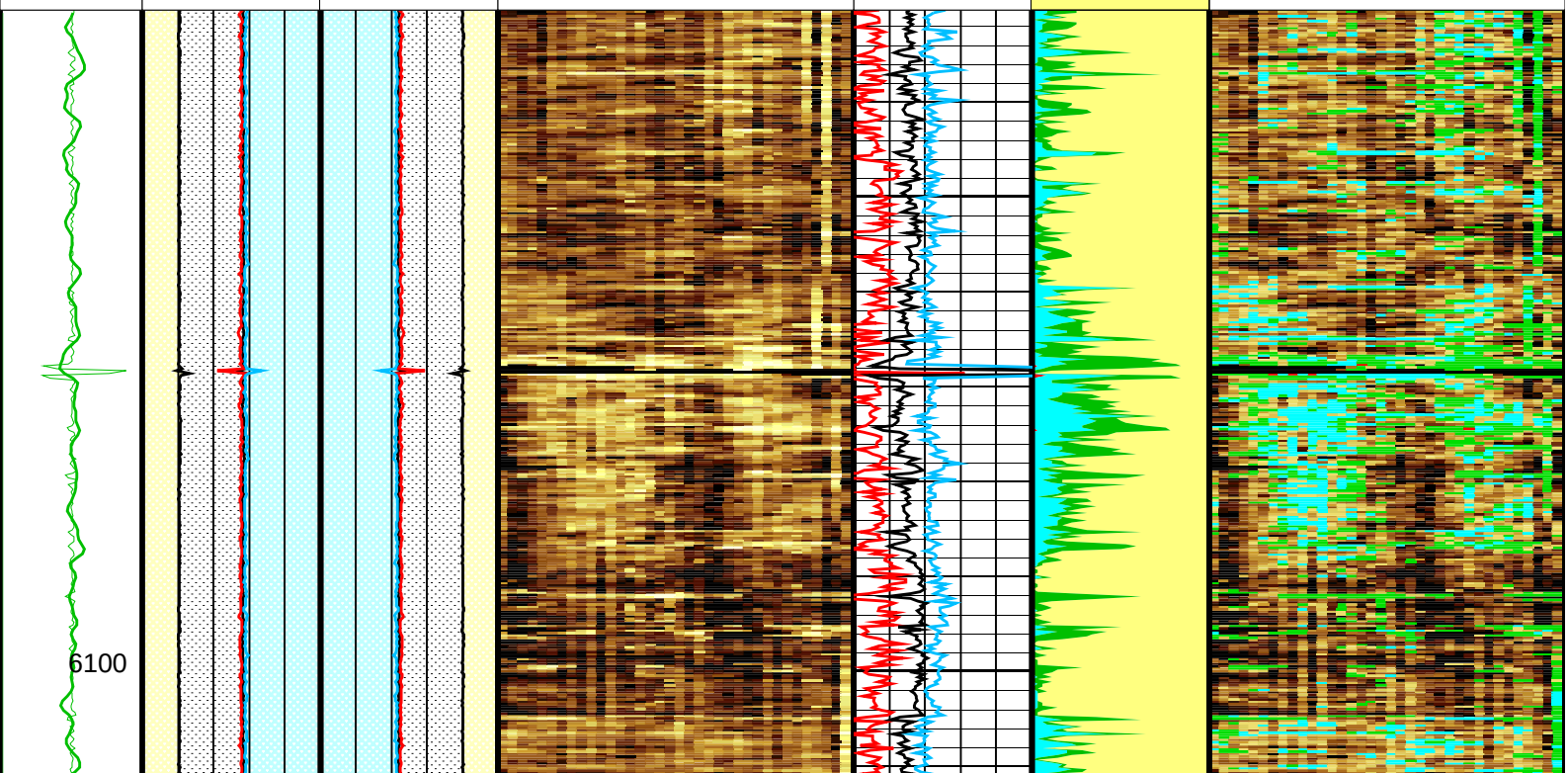
Raw Acoustic Imped. (AIBK) (MRAY)

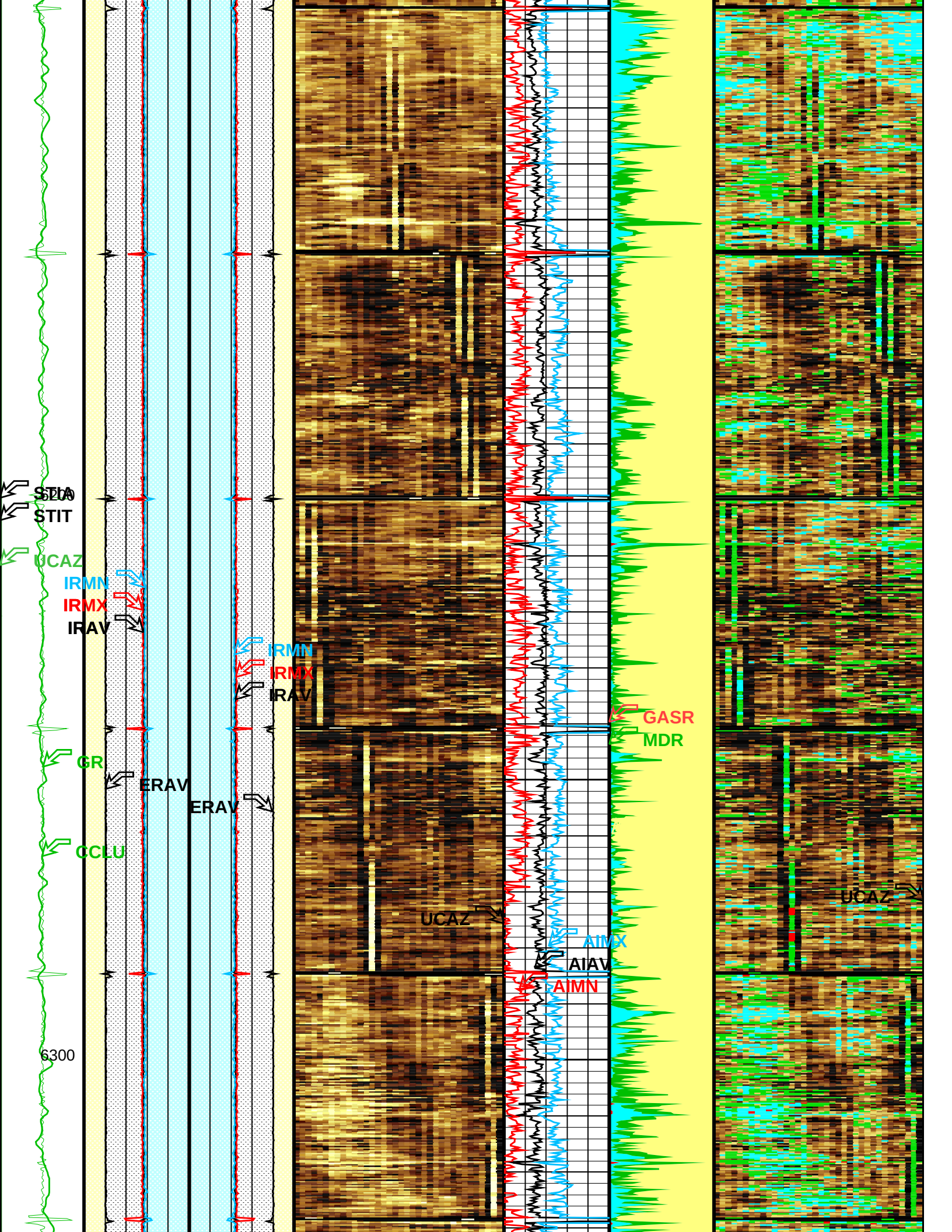
Minimum of AI (AIMN)
0 (MRAY) 10

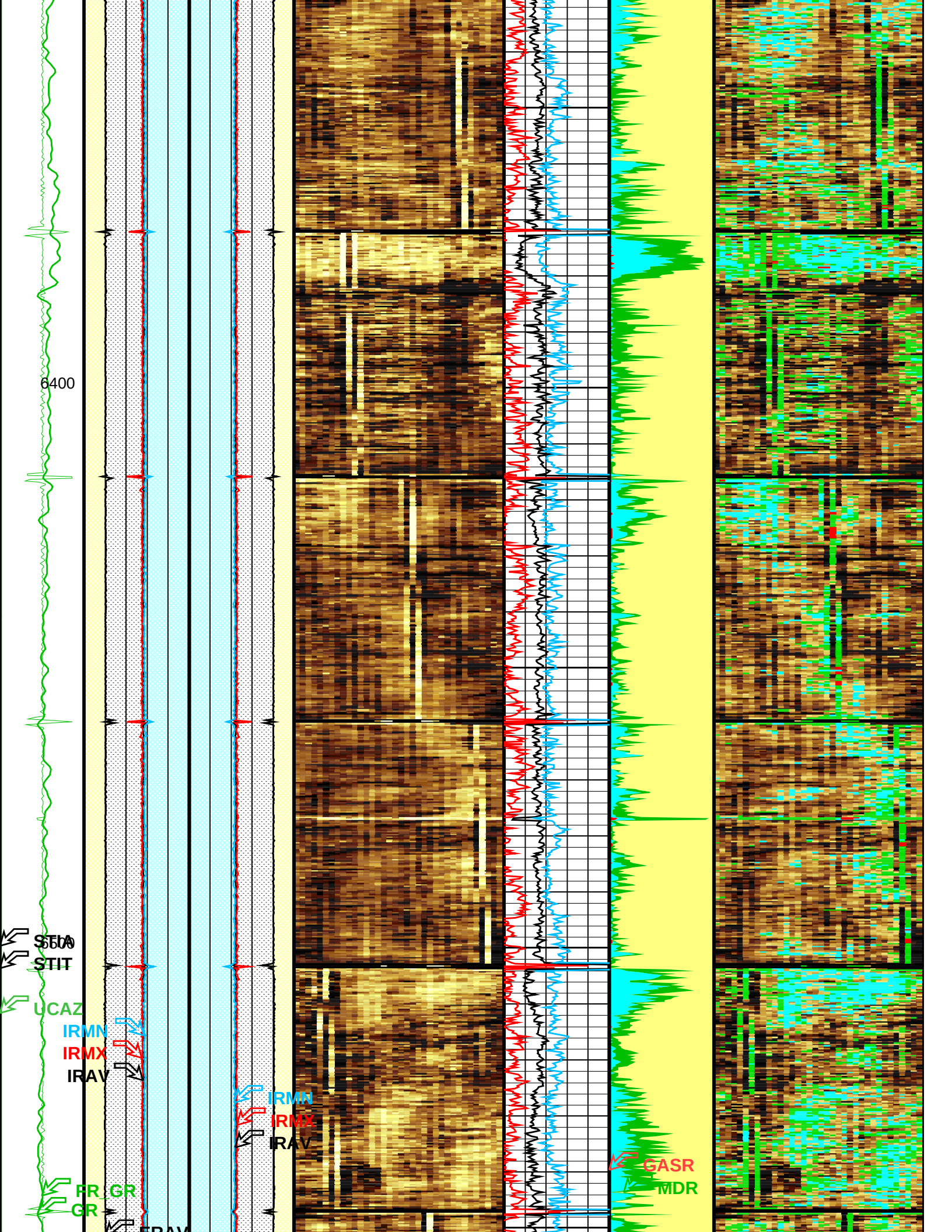
Bonded

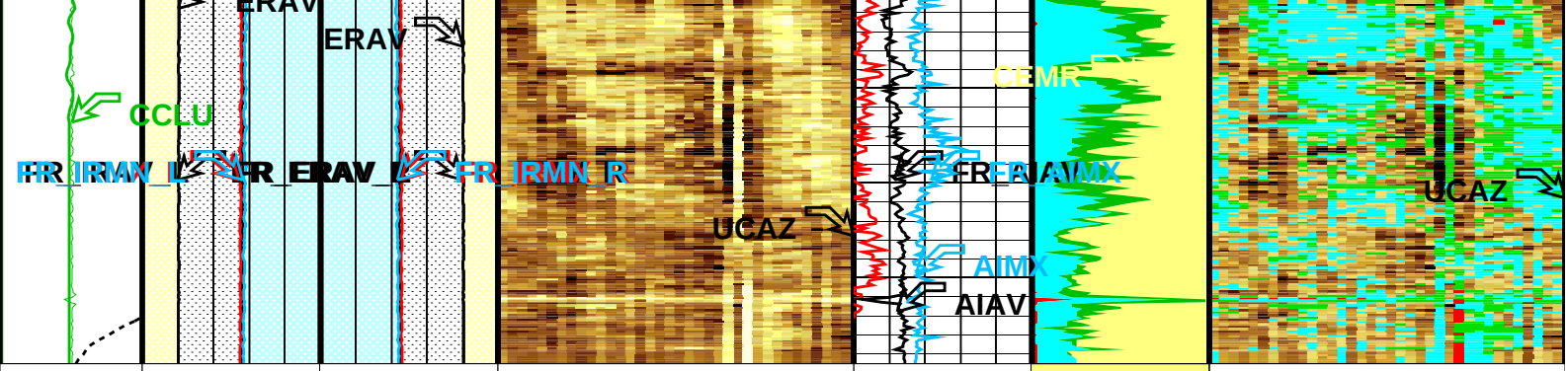


Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (MRAY)




STIA
STIT
UCAZ
IRMN
IRMX
IRAV
IRMN
IRMX
IRAV
GASR
MDR
GR
ERAV
ERAV
CCLU
UCAZ
UCAZ
AIMX
AIAV
AIMN
6300


6400
STIA
STIT
UCAZ
IRMN
IRMX
IRAV
IRMN
IRMX
IRAV
GASR
MDR
FR_GR
GR
IRAV



CCL (CCLU) (----) −20 20	Internal radius Average (IRAV) 3.7 (IN) 2.7	External radius Average (ERAV) 2.7 (IN) 3.7	−500.0000, 0.2500, 0.5000, 0.7500, 1.0000, 1.2500, 1.5000, 1.7500, 2.0000, 2.2500, 2.5000, 2.7500, 3.0000, 3.2500, 3.5000, 3.7500, 4.0000 Raw Acoustic Imped. (AIBK) (MRAY)	Minimum of AI (AIMN) 0 (MRAY) 10	Bonded	−1000.0000, −500.0000, 0.3000, 2.3000, 2.4546, 2.6091, 2.7636, 2.9182, 3.0727, 3.2273, 3.3818, 3.5364, 3.6909, 3.8455, 4.0000 Cement Map with Impedance Classification (AI_MICRO_DEBONDING_IMAGE) (MRAY)
Cable Speed (CS) (F/HR) 0 2000	Internal radius Maximum (IRMX) 3.7 (IN) 2.7	Internal radius Average (IRAV) 2.7 (IN) 3.7		Average of AI (AIAV) 0 (MRAY) 10	Gas or Dry MicroA	
Gamma Ray (GR) (GAPI) 0 150	External radius Average (ERAV) 3.7 (IN) 2.7	Internal radius Maximum (IRMX) 2.7 (IN) 3.7		Maximum of AI (AIMX) 0 (MRAY) 10	Liquid	
Stuck Stretch (STIT) 0 (F) 50	Min of Internal radius (IRMN) 3.7 (IN) 2.7	Min of Internal radius (IRMN) 2.7 (IN) 3.7			Micro−debonding	
Cable Drag From D4T to STIT						
Tool/Tot. Drag From D4T to STIA						
Image rotation (UCAZ) (DEG) 0 360						

Format: USIT CEMENT 5 inch Vertical Scale: 5" per 100' Graphics File Created: 23−May−2013 12:39

OP System Version: 19C2−270

USIT−E	19C2−270	SGT−N	19C2−270
DTC−H	19C2−270		

All USI Images are outside views

USI : LOW Frequency Compression Mode Used For Logging.

Recommended casing thickness range for optimum cement impedance measurement : 0.27 to 0.6 IN.

Parameters

DLIS Name	Description	Value	
	USIT−E: Ultrasonic Imaging − E		
AGMN	Minimum Gain of Cartridge	−4	DB
AGMX	Maximum Gain of Cartridge	20	DB
BERJ	Bad Echo Rejection	ON	
CDIA	Casing Outer Diameter	7	IN
CSDE	Casing Density	486.94	LBCF
CSID	Casing Inner Diameter	6.276	IN
DFVL	Default Fluid Velocity	188	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	20	V
FDII	FPM Data Interpolation Interval	0	FT
IMAR	Image Rotation	OFF	
MW	Mud Weight	8.9	LB/G
RCOD	Reference Calibrator Outer Diameter	7	IN
RCSO	Reference Calibrator Standoff	1.1811	IN
RCTH	Reference Calibrator Thickness	0.2952	IN
SDNV	Number of Vertical Samples used for Micro−debonding Computation	5	
SDTHOR	Acoustic Impedance STD Horizontal Threshold for Micro−debonding	0.5	
SDTVER	Acoustic Impedance STD Vertical Threshold for Micro−debonding	0.3	
TCUB	T^3 Processing Level	Vax_Loop	
THDH	Maximum Search Thickness (percentage of nominal)	130	
THDL	Minimum Search Thickness (percentage of nominal)	70	
THDP	Thickness Detection Policy	Fundamental	
THNO	Nominal Thickness of Casing	0.362	IN
UMAO	USIT Measurement Angular Offset	18	DEG
USTO	Ultrasonic Time Offset	−2	US
USUB	Ultrasonic Subassembly Identifier	Sub_7_inch	
UWKM	Ultrasonic Working Mode	10DEG_3IN_60U_LF	
VCAS	Ultrasonic Transversal Velocity in Casing	51.4	US/F
WLEN	T^3 Processing Length	21.7078	US
ZCAS	Acoustic Impedance of Casing	46.2537	MRAY
ZINI	Initial Estimate of Cement Impedance	−1	MRAY
ZMUD	Acoustic Impedance of Mud	1.48	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.3	MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3	MRAY
	STI: Stuck Tool Indicator		
LBFR	Trigger for MAXIS First Reading Label	TDL	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth − Driller	12713.00	FT
TDL	Total Depth − Logger	6570.00	FT
	System and Miscellaneous		
CWEI	Casing Weight	26.00	LB/F
DO	Depth Offset for Playback	20.3	FT
PP	Playback Processing	OFF	

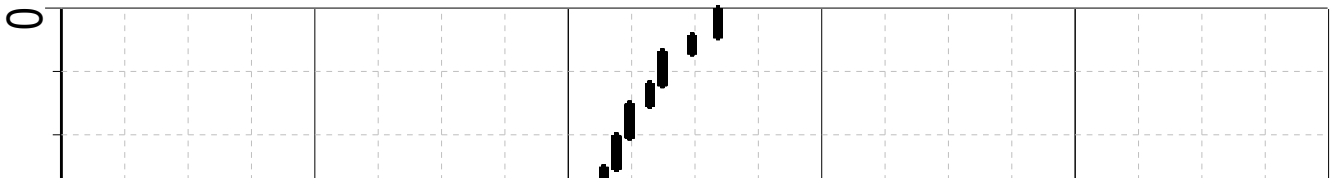
Input DLIS Files

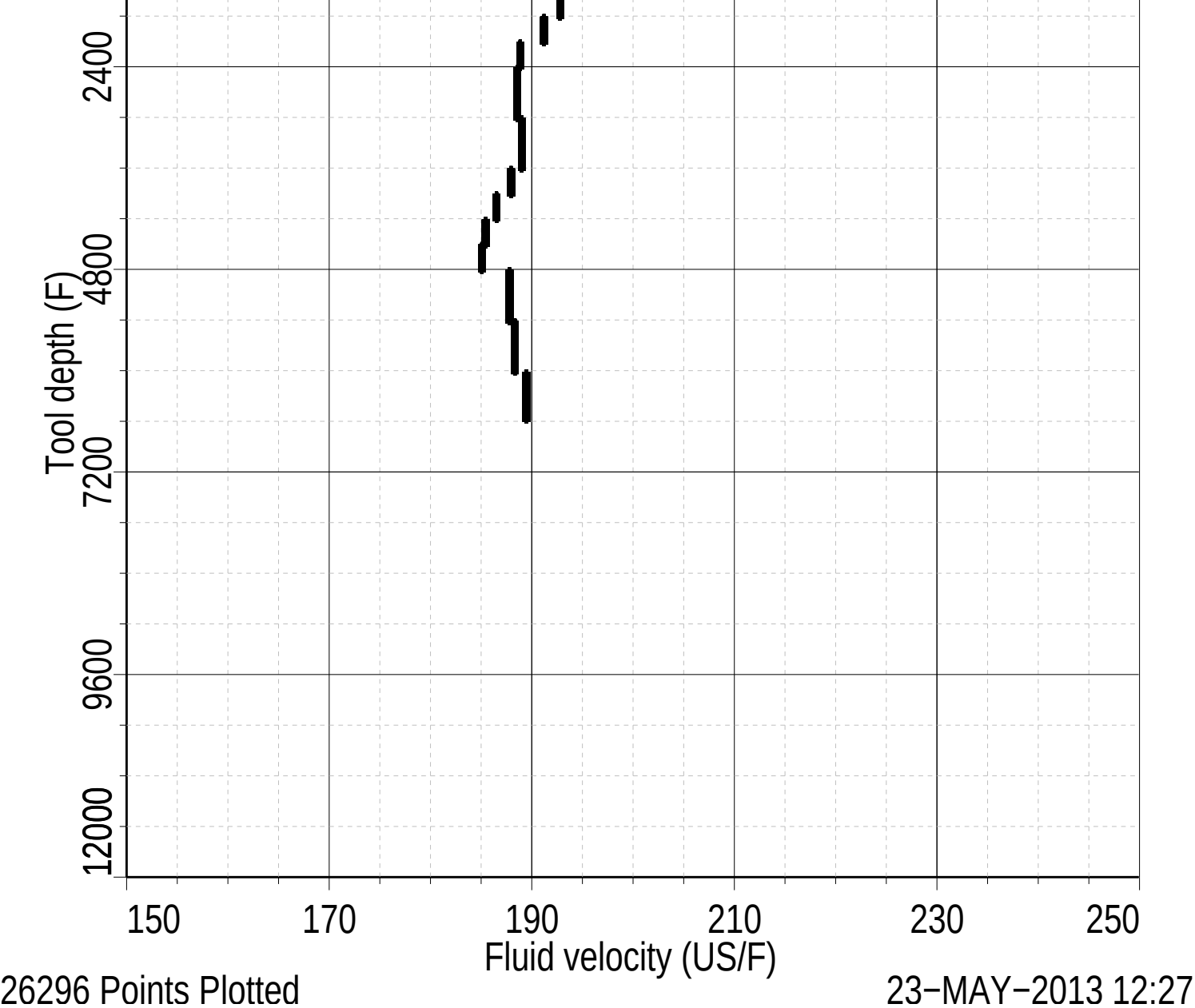
DEFAULT	USI_025PUP	FN:23	PRODUCER	22−May−2013 12:38	6568.5 FT	6009.5 FT

Output DLIS Files

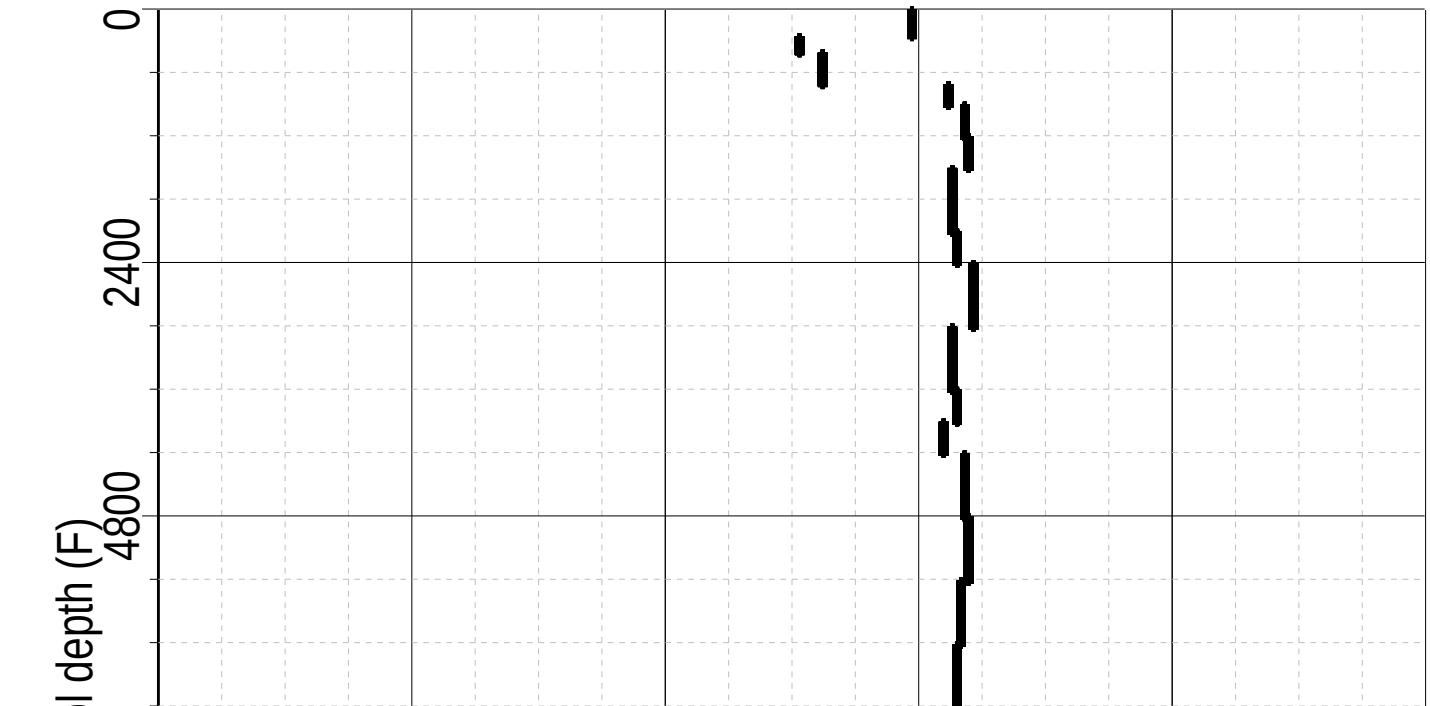
DEFAULT	USI_006PUP	FN:5	PRODUCER	23−May−2013 12:39

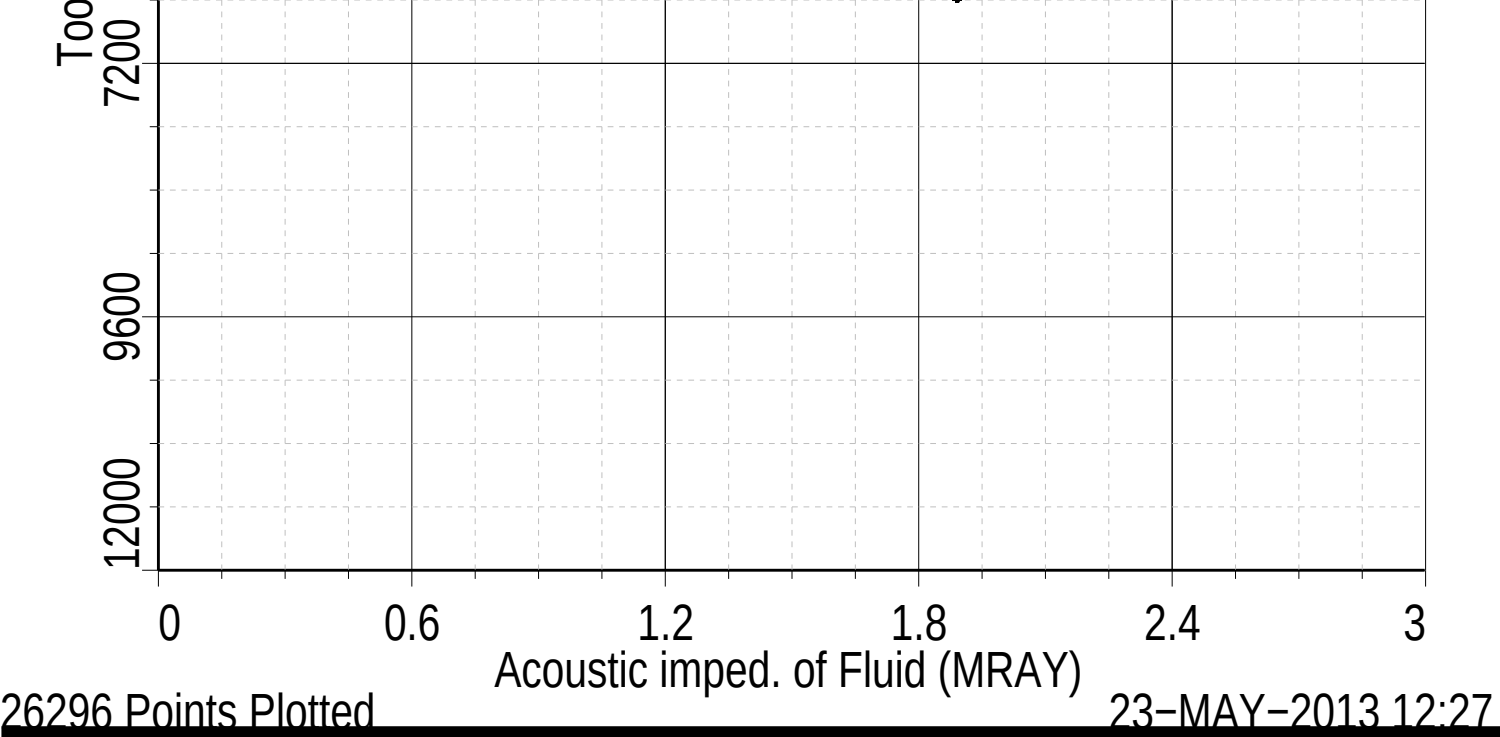
Index: 6589.0 − 15.2 FT





Index: 6589.0 − 15.2 FT





26296 Points Plotted

23−MAY−2013 12:27

Company: **Kerr−McGee Oil & Gas Onshore LP**

Schlumberger

Well: **Russian Fiddler 15N−18HZ**
Field: **Wattenberg**
County: **Weld**
State: **Colorado**

USIT
Cement Evaluation