

Schlumberger

Company: Kerr–McGee Oil & Gas Onshore LP

Well: D&C Farms 36C–33HZ

Field: Wattenberg

County: Weld State: Colorado

Ultrasonic Imager  
Cement Evaluation

County: Weld

Field: Wattenberg

Location: SESW Sec. 28, T1N, R67W

Well: D&C Farms 36C–33HZ

Company: Kerr–McGee Oil & Gas Onshore

LOCATION			
SESW Sec. 28, T1N, R67W SHL: 767' FSL X 2186' FWL		Elev.: K.B. 5027.00 ft G.L. 5011.00 ft D.F. 5026.00 ft	
Permanent Datum:	Ground Level	Elev.: 5011.00 ft	
Log Measured From:	Ground Level	0.00 ft	above Perm. Datum
Drilling Measured From:	Kelly Bushing		
API Serial No. 05–123–37893–000C		Section 28	Township 1N Range 67W

Logging Date	15–Nov–2013		
Run Number	1		
Depth Driller	12000 ft		
Schlumberger Depth	7120 ft		
Bottom Log Interval	7120 ft		
Top Log Interval	0 ft		
Casing Fluid Type	Fresh Water		
Salinity			
Density	8.8 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-110 LTC/DQX		
From			
To			
Maximum Recorded Temperatures			
Logger On Bottom	Time	11:55	
Unit Number	Location		
Recorded By	Tim Hoffman		
Witnessed By	Brandon Hildreth		

PVT DATA				Run 1	Run 2	Run 3
Oil Density						
Water Salinity						
Gas Gravity						
Bo						
Bw						
1/Bg						
Bubble Point Pressure						
Bubble Point Temperature						
Solution GOR						
Maximum Deviation				0 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						

## DEPTH SUMMARY LISTING

Date Created: 15-NOV-2013 9:46:43

## Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW-B	Type:	CMTD-B/A	Type:	7-39P-LXS
Serial Number:	6404	Serial Number:	2858	Serial Number:	
Calibration Date:	30-Oct-2013	Calibration Date:	4-Nov-2013	Length:	17500 FT
Calibrator Serial Number:		Calibrator Serial Number:		Conveyance Method:	Wireline
Calibration Cable Type:	7-39P-LXS	Number of Calibration Points:	10	Rig Type:	LAND
Wheel Correction 1:	-4	Calibration RMS:	4		
Wheel Correction 2:	-4	Calibration Peak Error:	8		

## 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

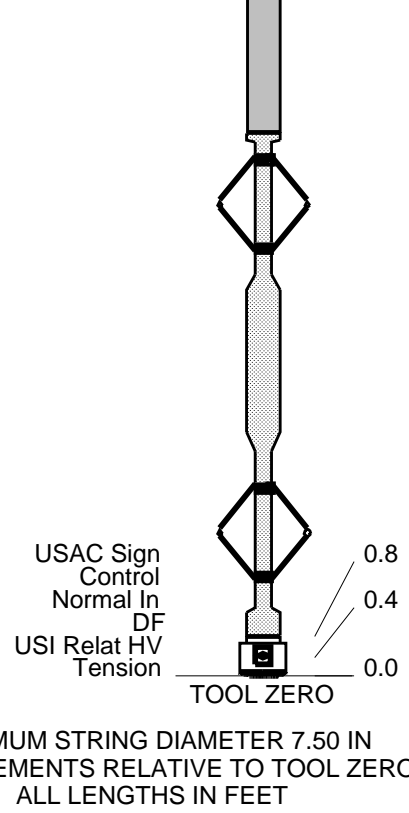
1. All Schlumberger depth policies followed.
2. IDW used as primary depth reference. Z-Chart used as secondary.
- 3.
- 4.
- 5.
- 6.

## 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 OS1:     None OS2: OS3: OS4: OS5:	OTHER SERVICES2 OS1: OS2: OS3: OS4: OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
This is the first run in hole	
Toolstring run as per tool sketch	
Main pass logged with 2800 psi	
Repeats logged with 0 psi	





Schlumberger

Cement Composite  
5" = 100'

MAXIS Field Log

Company: Kerr-McGee Oil & Gas Onshore LP Well: D&C Farms 36C-33HZ

Input DLIS Files						
DEFAULT	Splice_USI_018CUP	FN:1	PRODUCER	15-Nov-2013 13:40	7121.0 FT	-4.7 FT

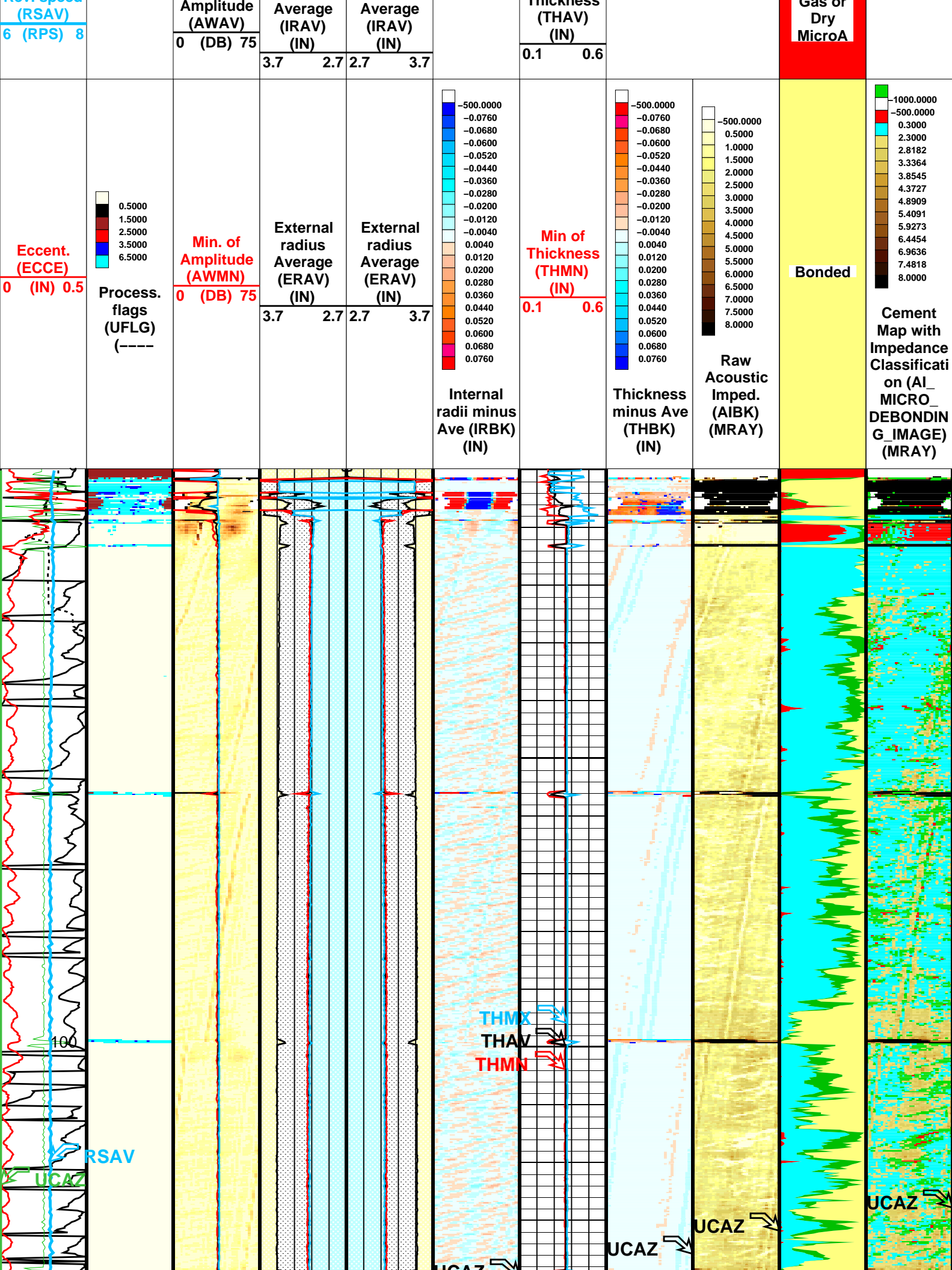
Output DLIS Files						
DEFAULT	USI_022PUP	FN:20	PRODUCER	15-Nov-2013 13:43		

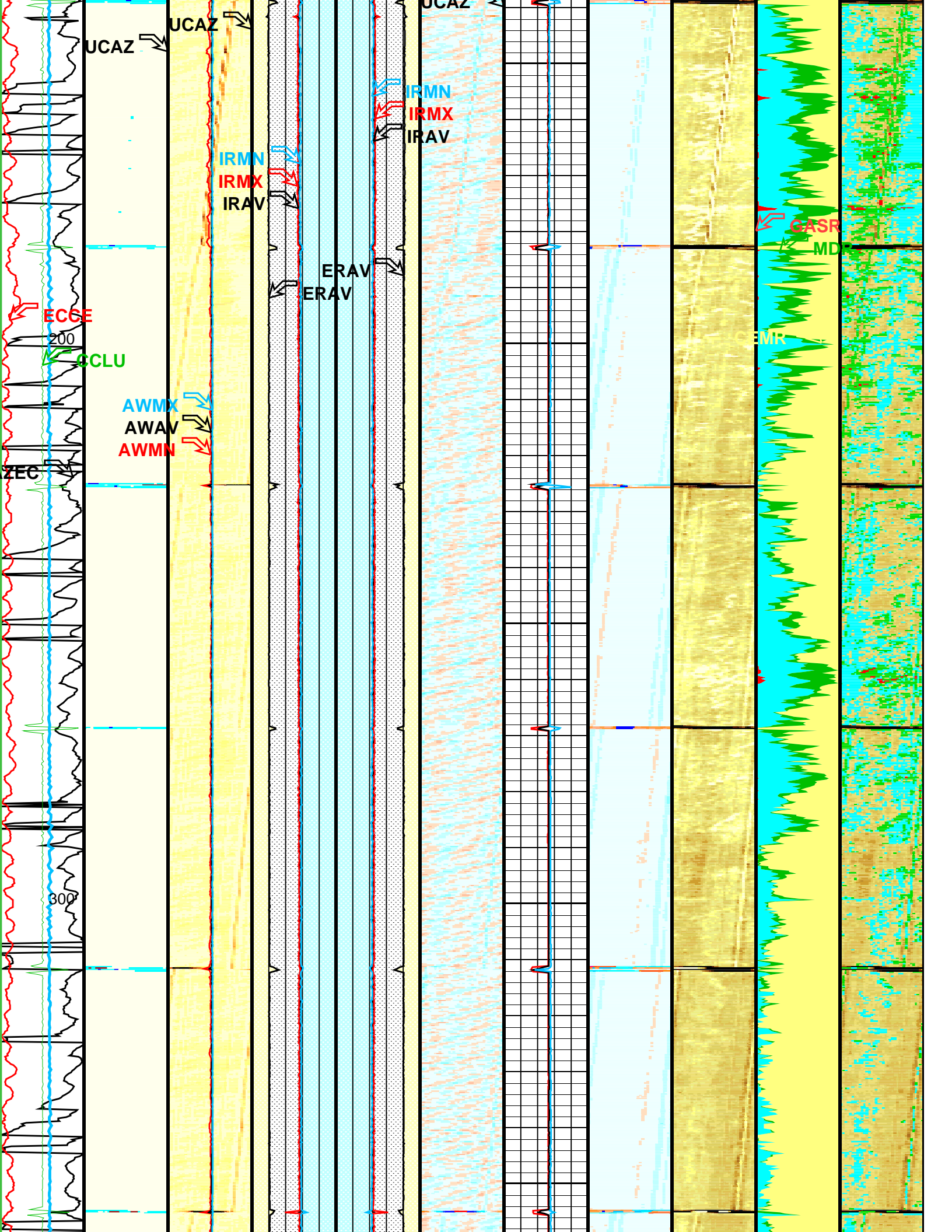
OP System Version: 19C1-222						
USIT-E	19C1-222		SGT-N	19C1-222		
DTC-H	19C1-222					

Zoning of Mud Parameters		
Depth	Fluid Velocity (DFVL)	Acoustic Impedance (ZMUD)
7300.00	188.00	1.67
7000.00	188.00	1.67

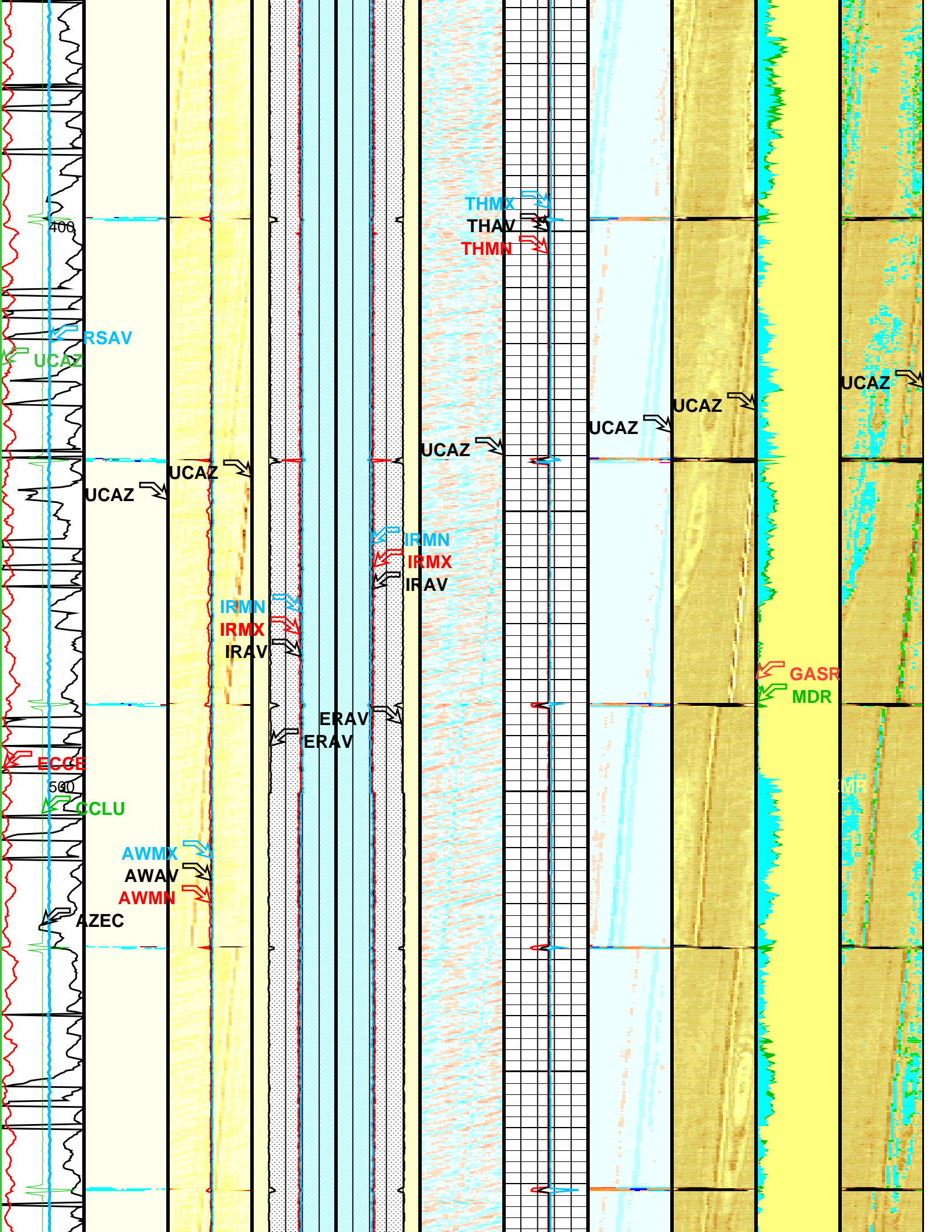


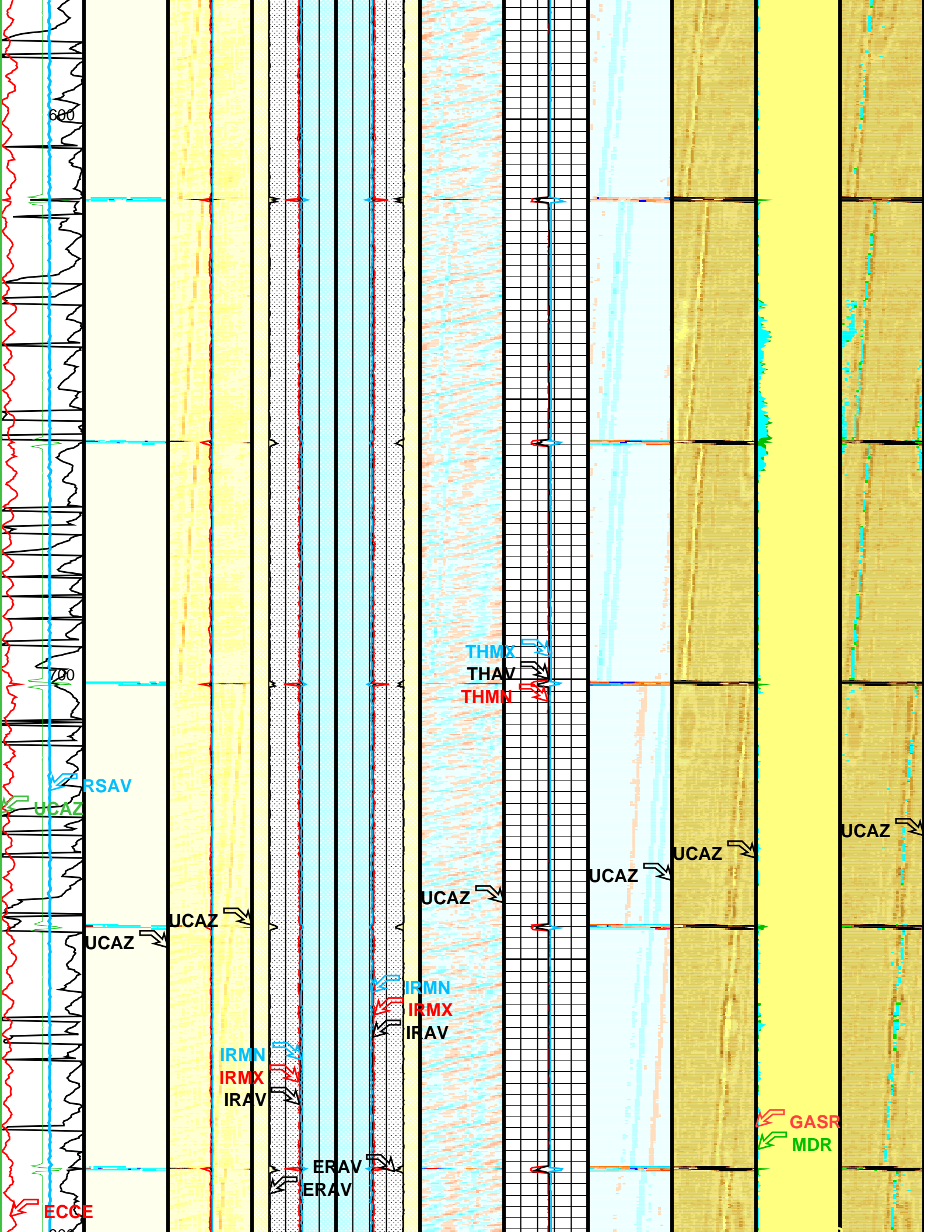




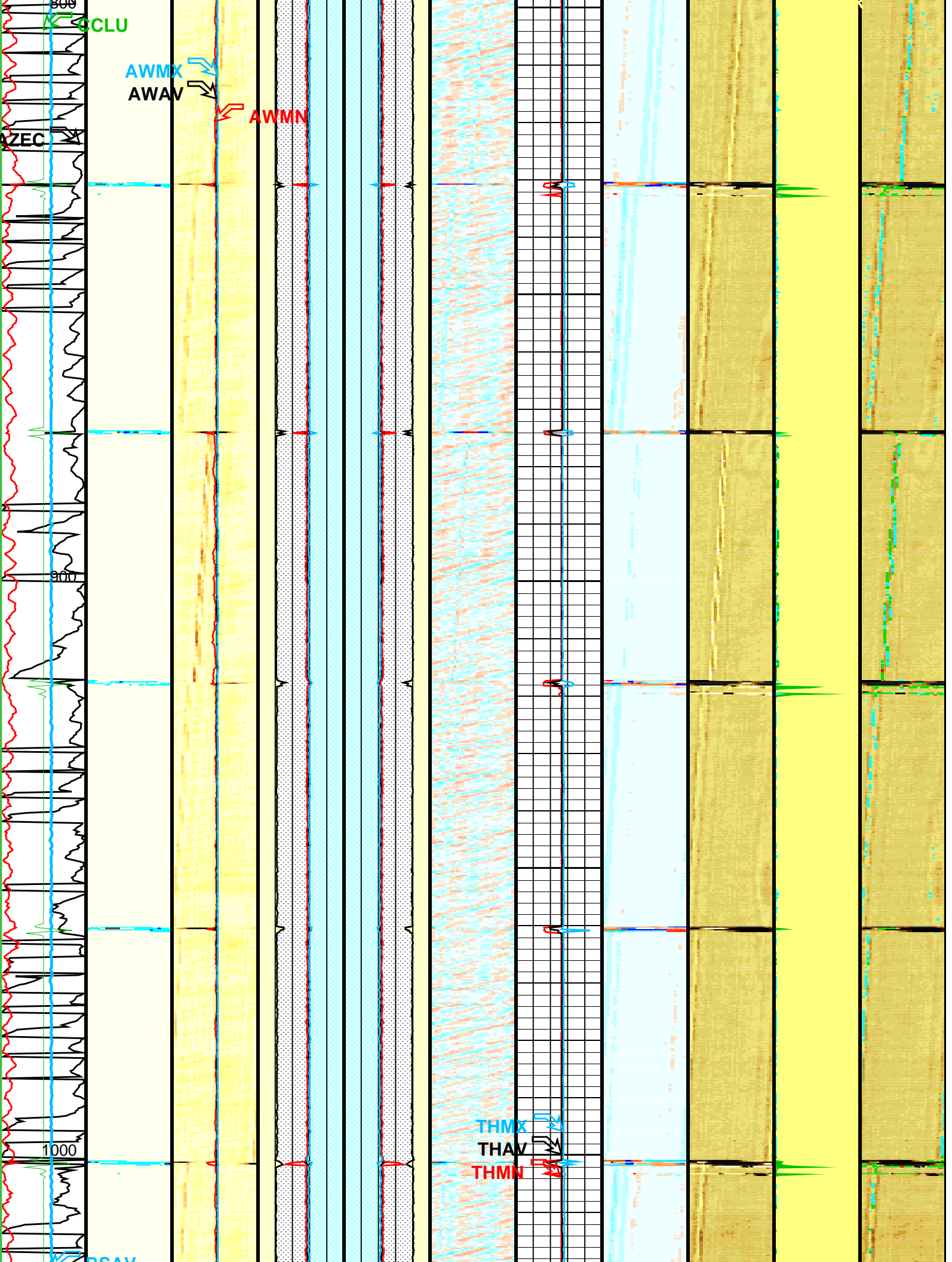


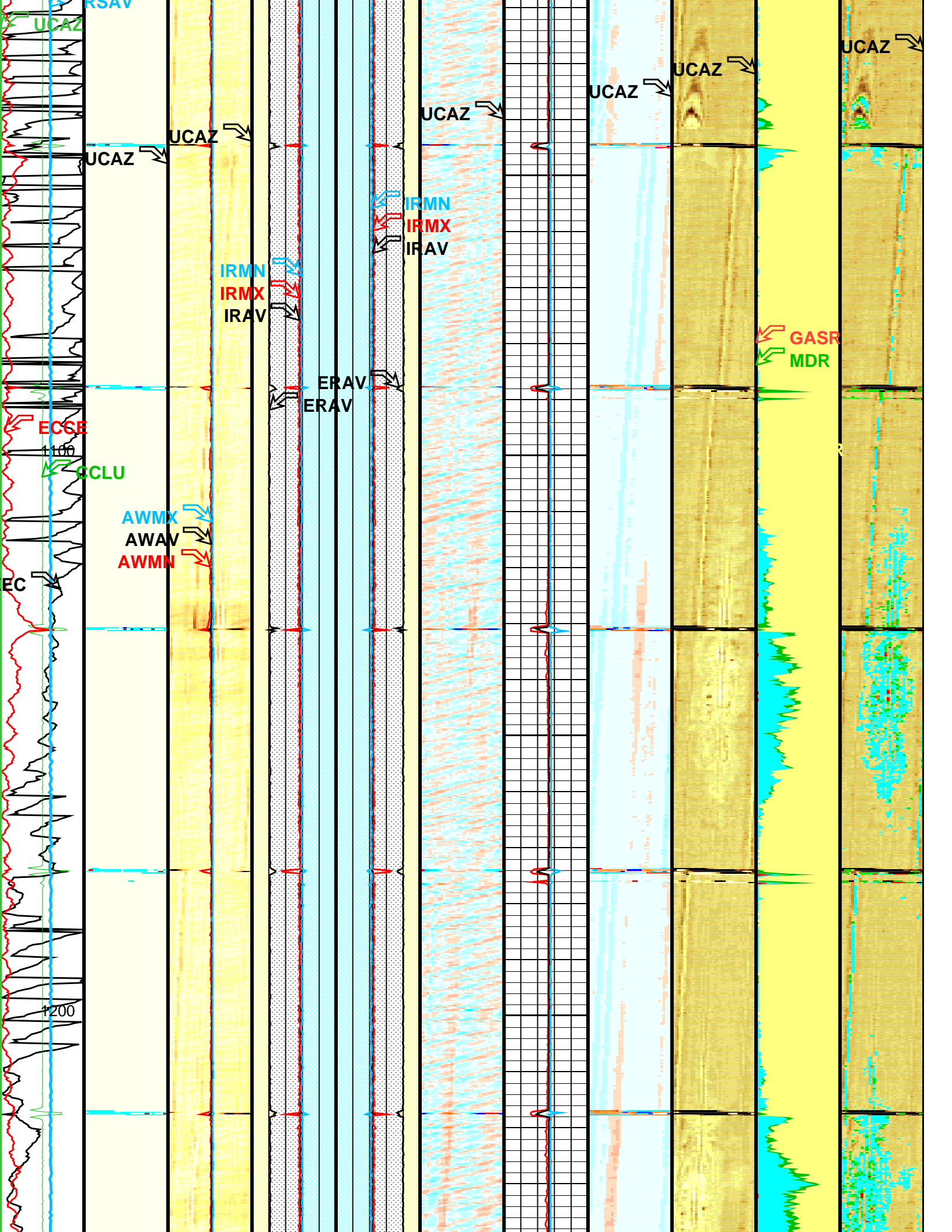




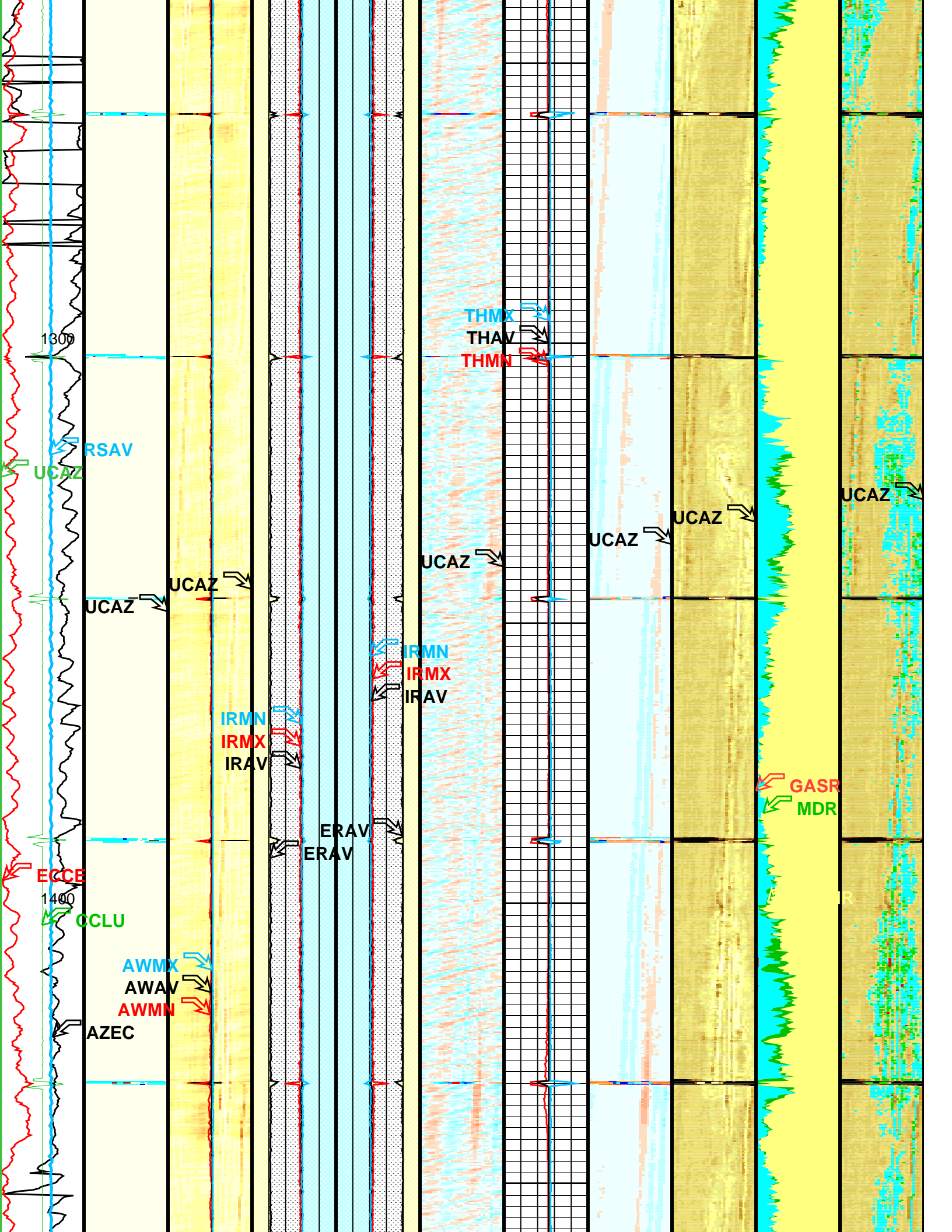




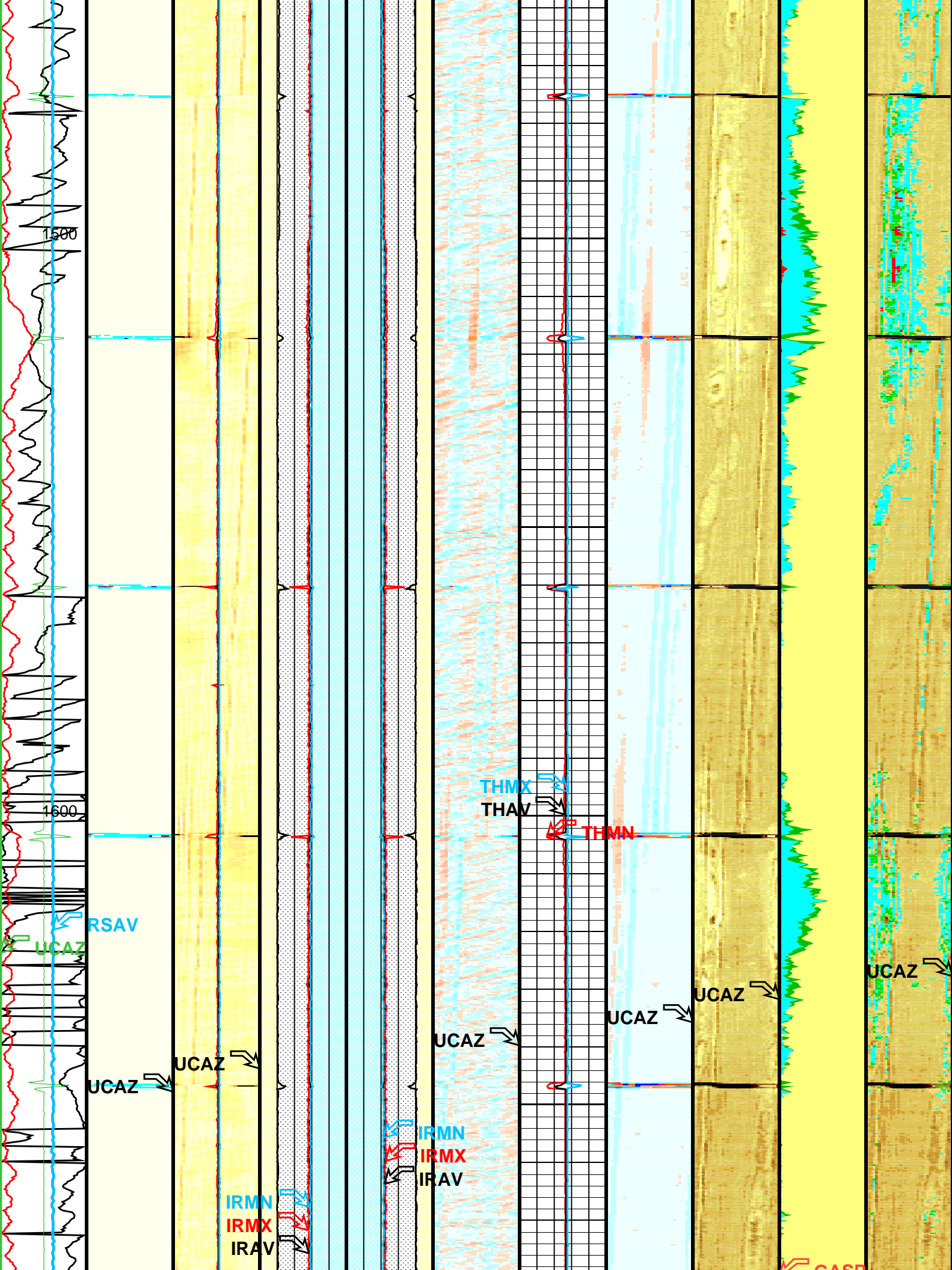


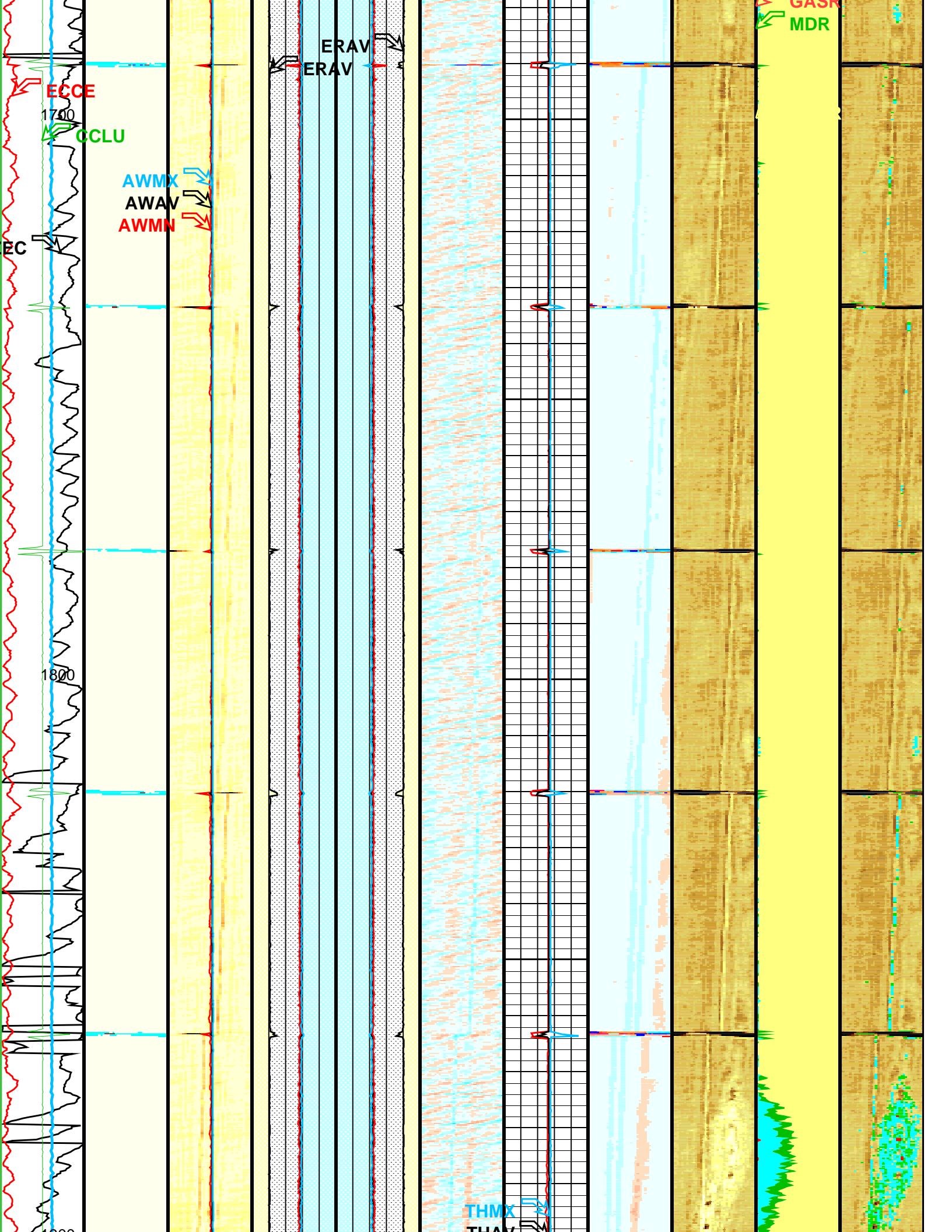




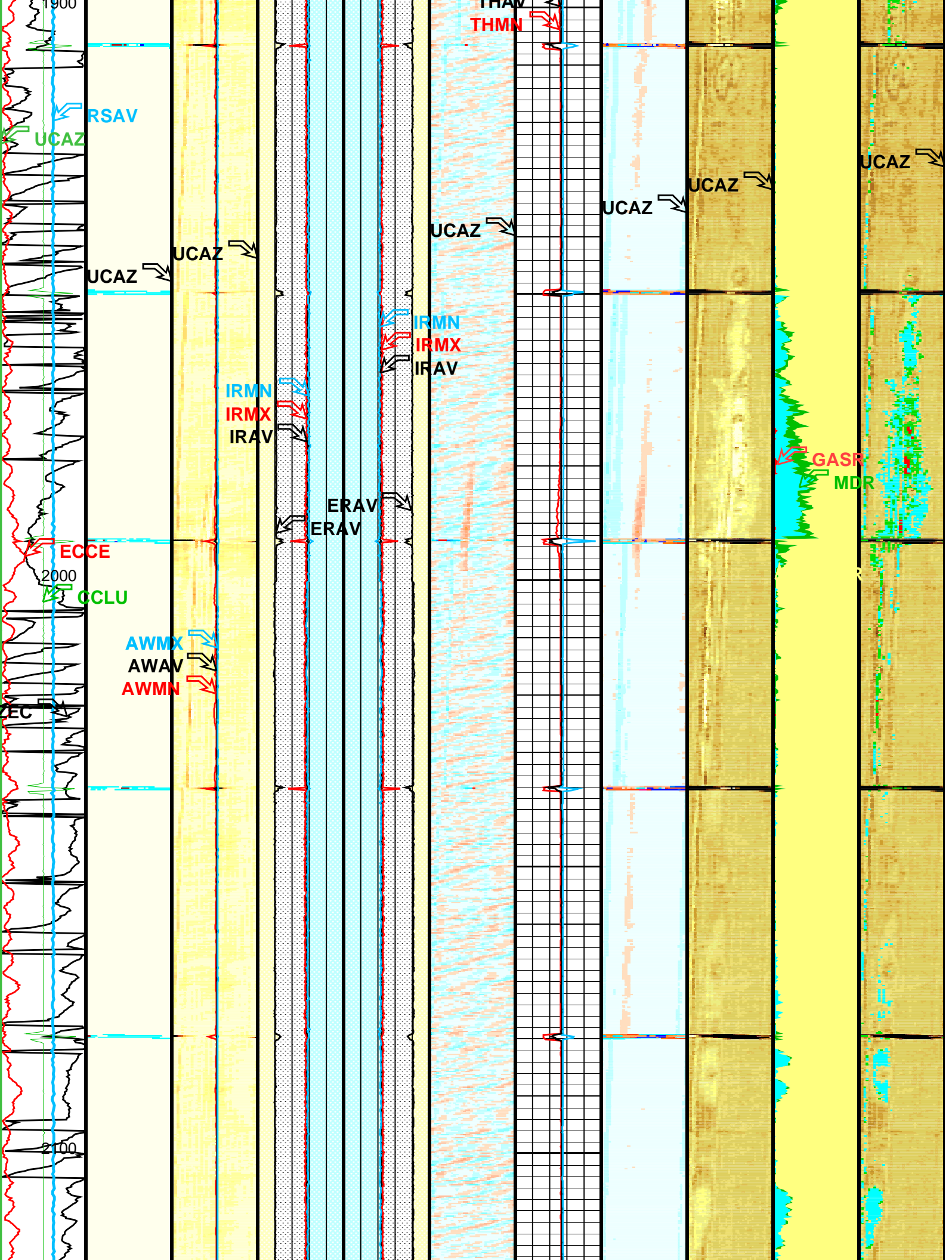


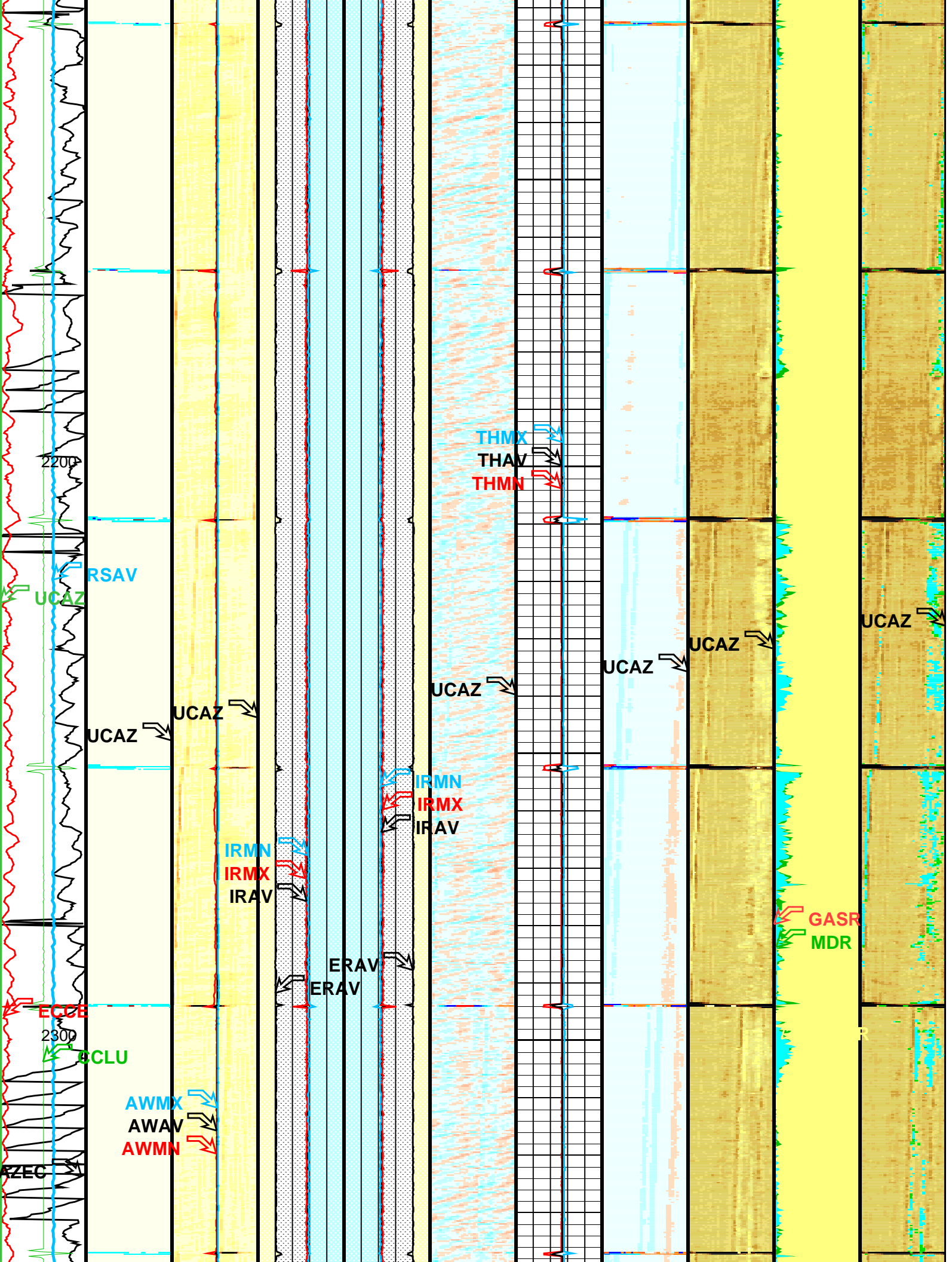




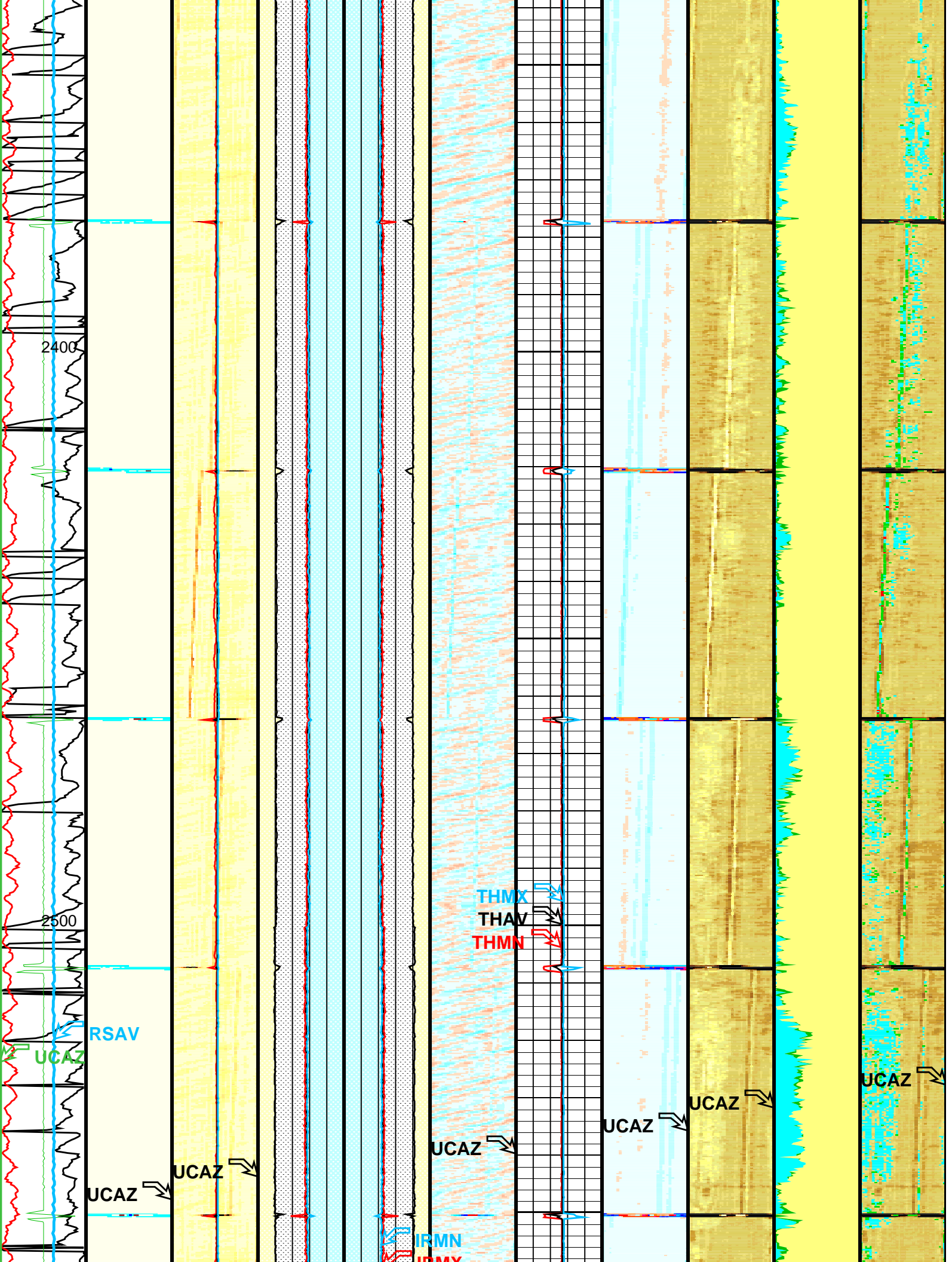


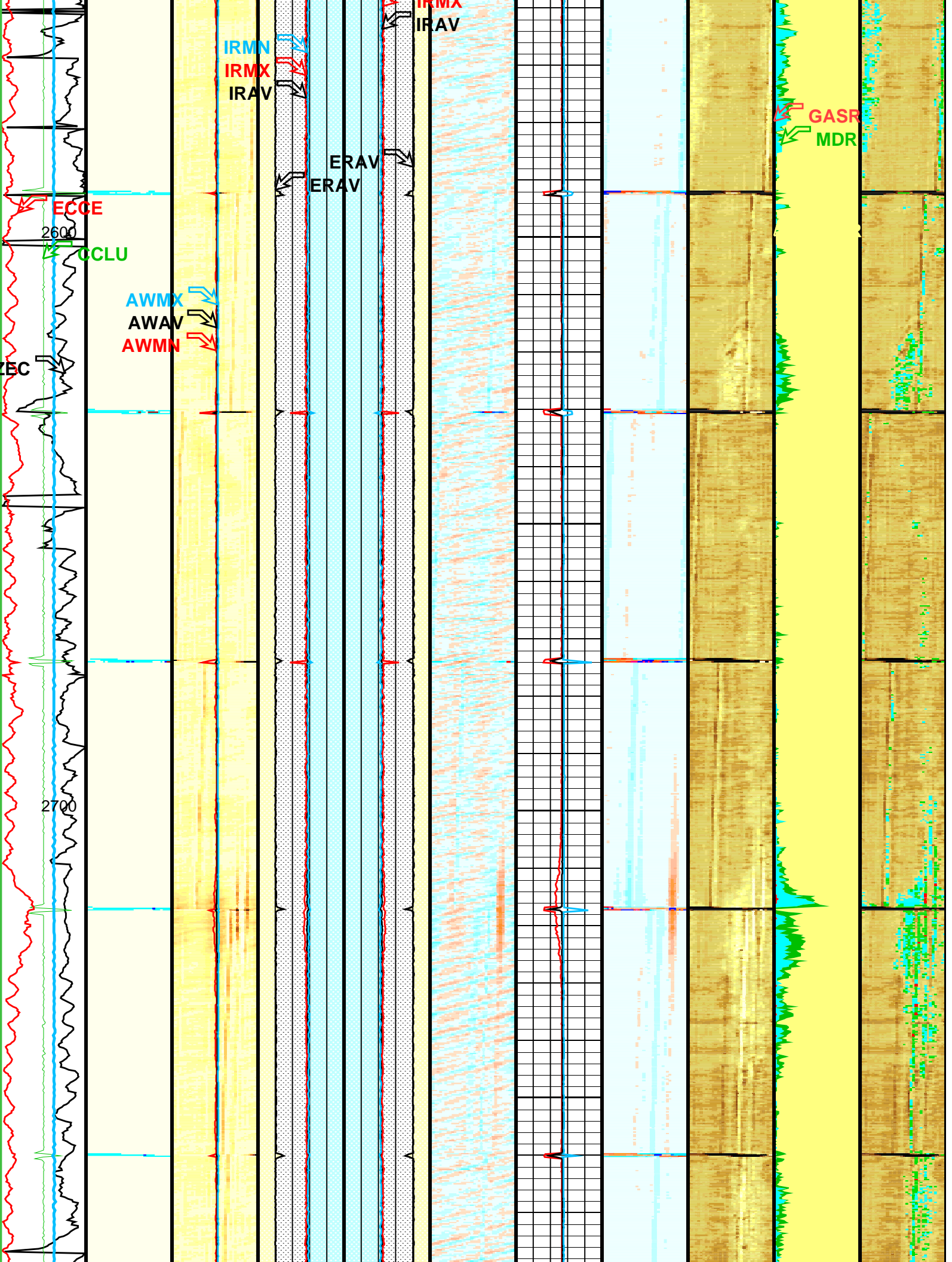




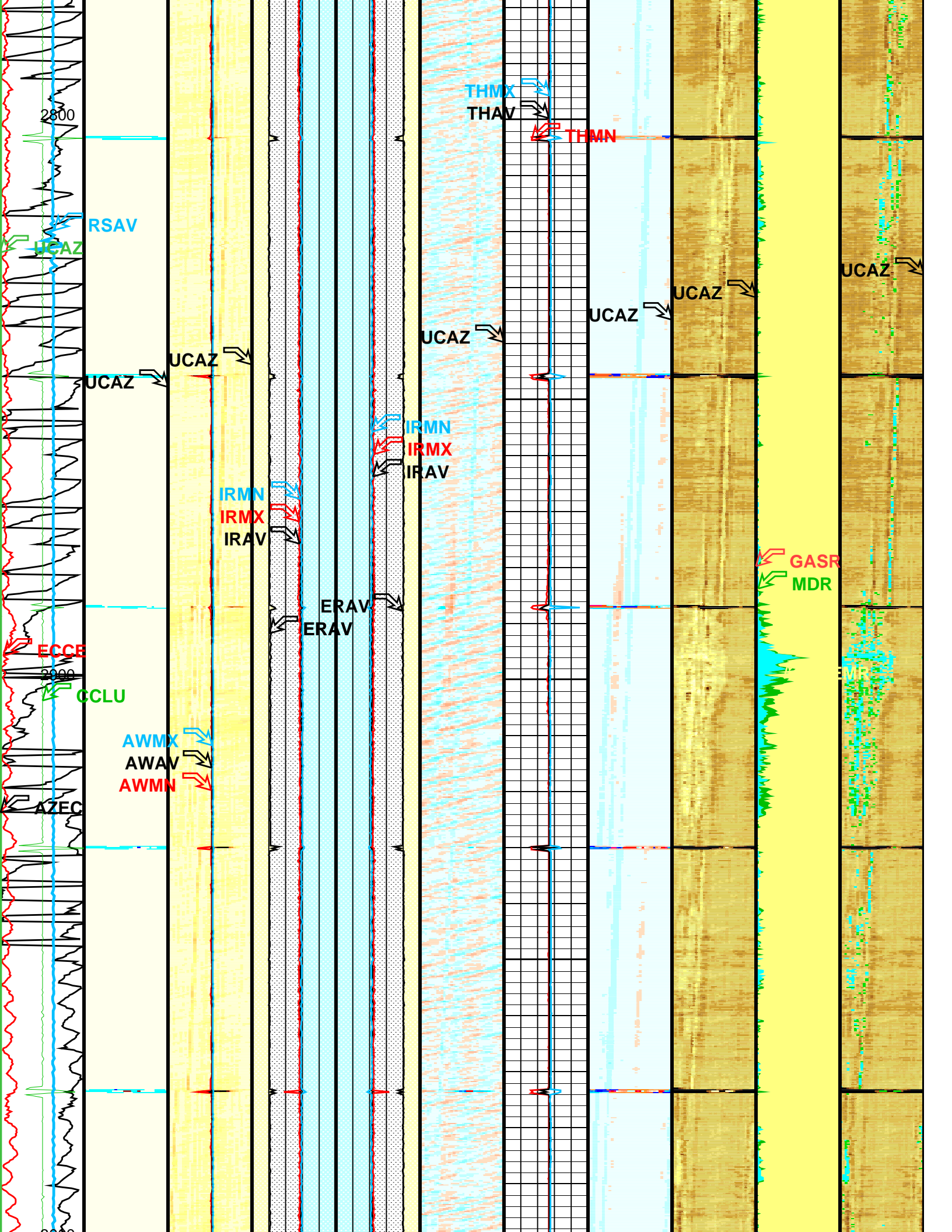


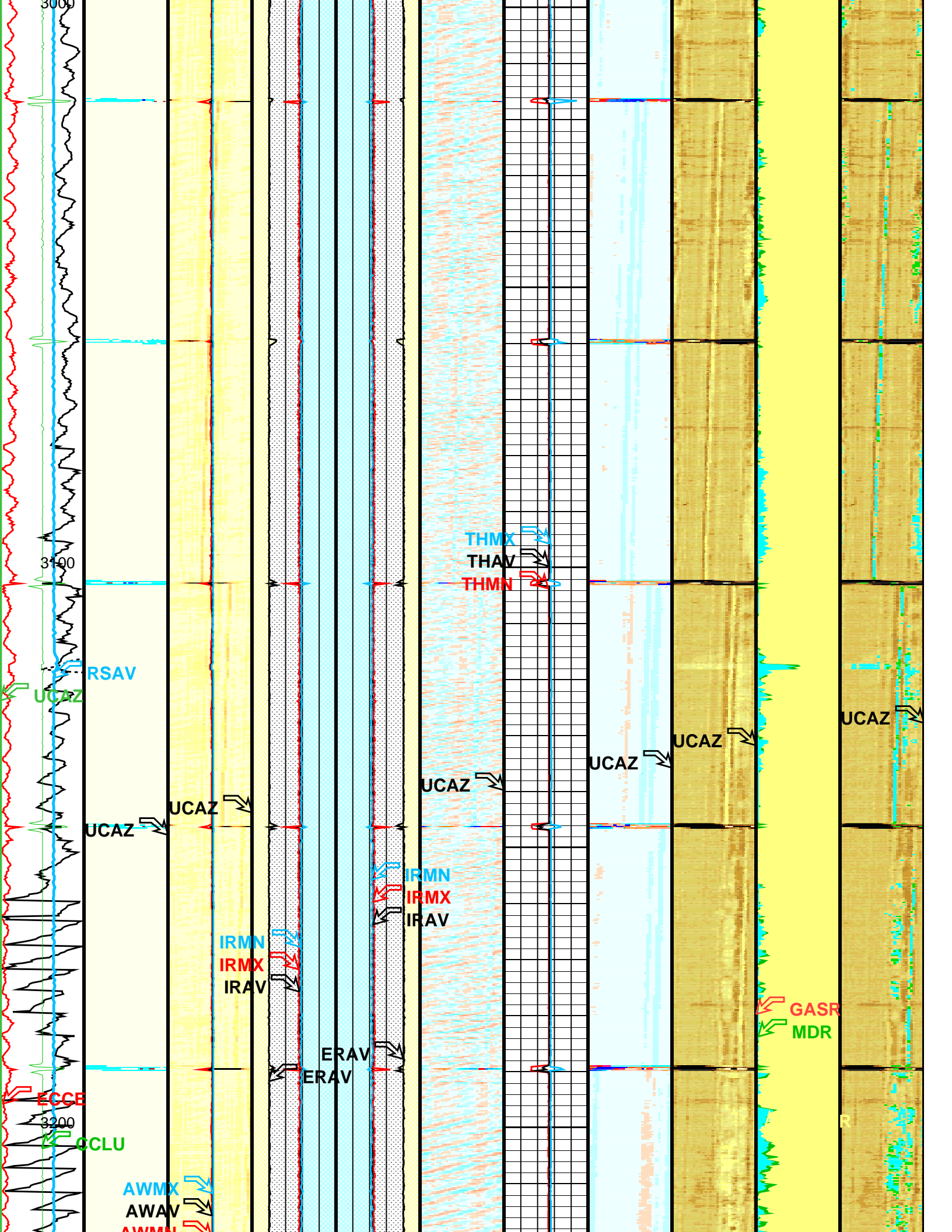




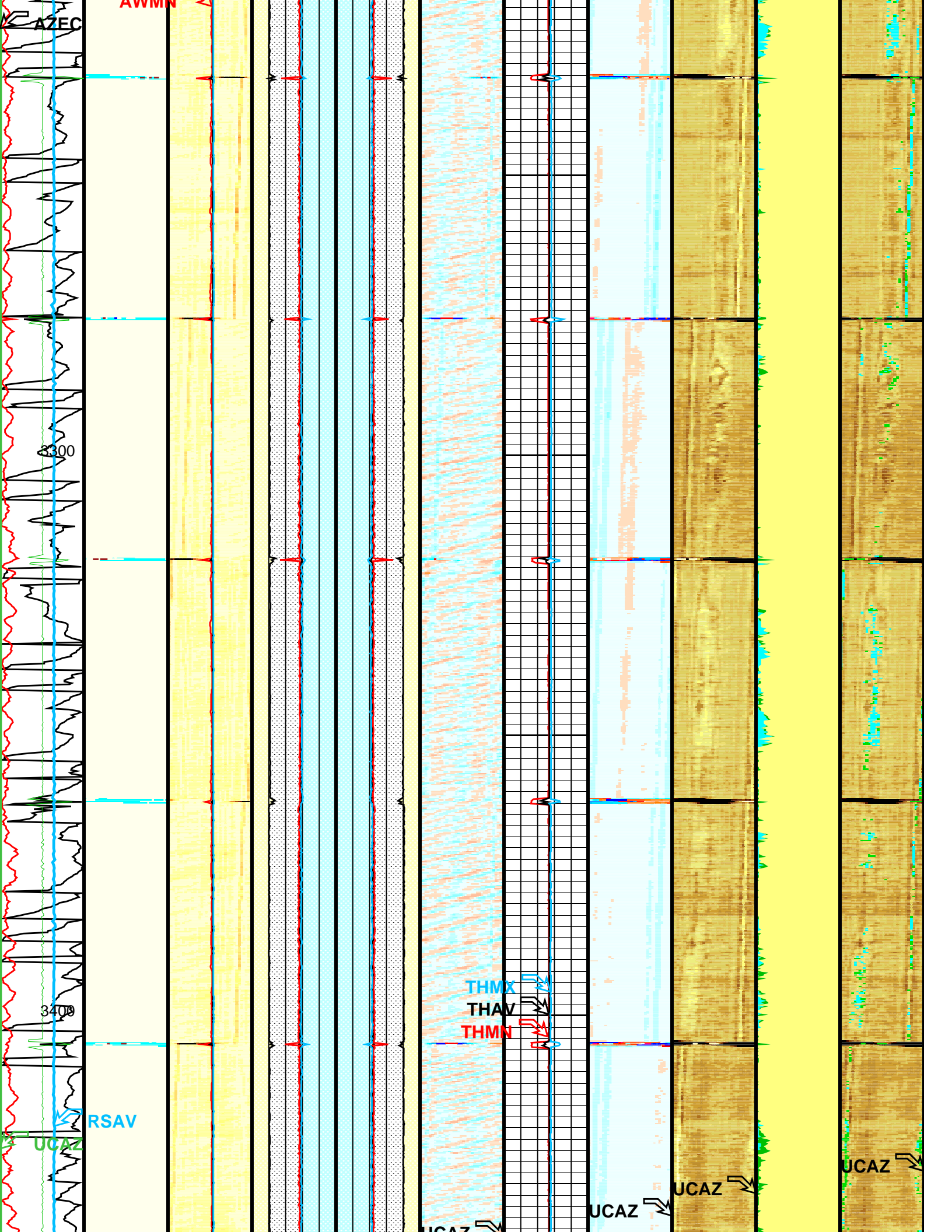


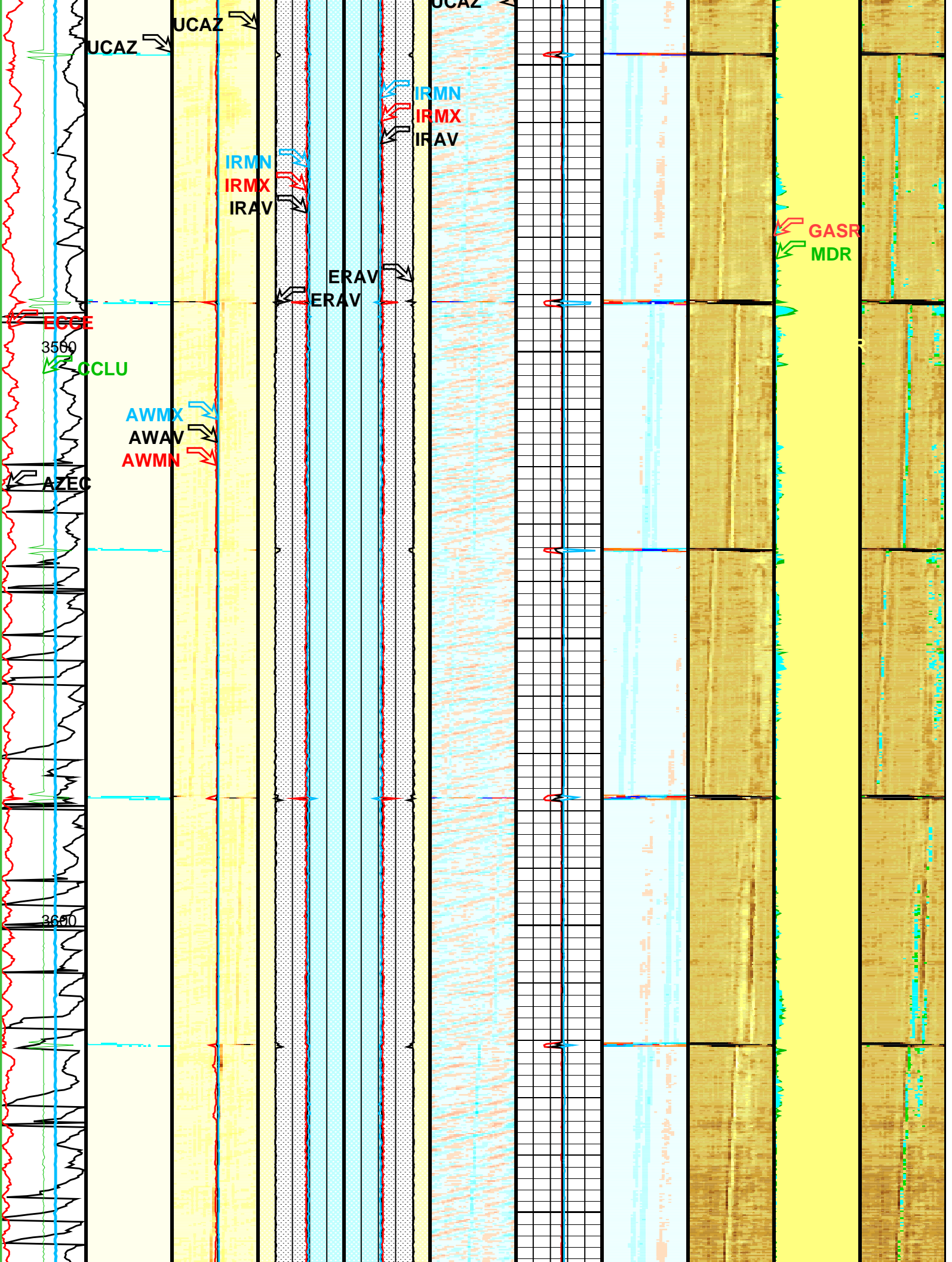




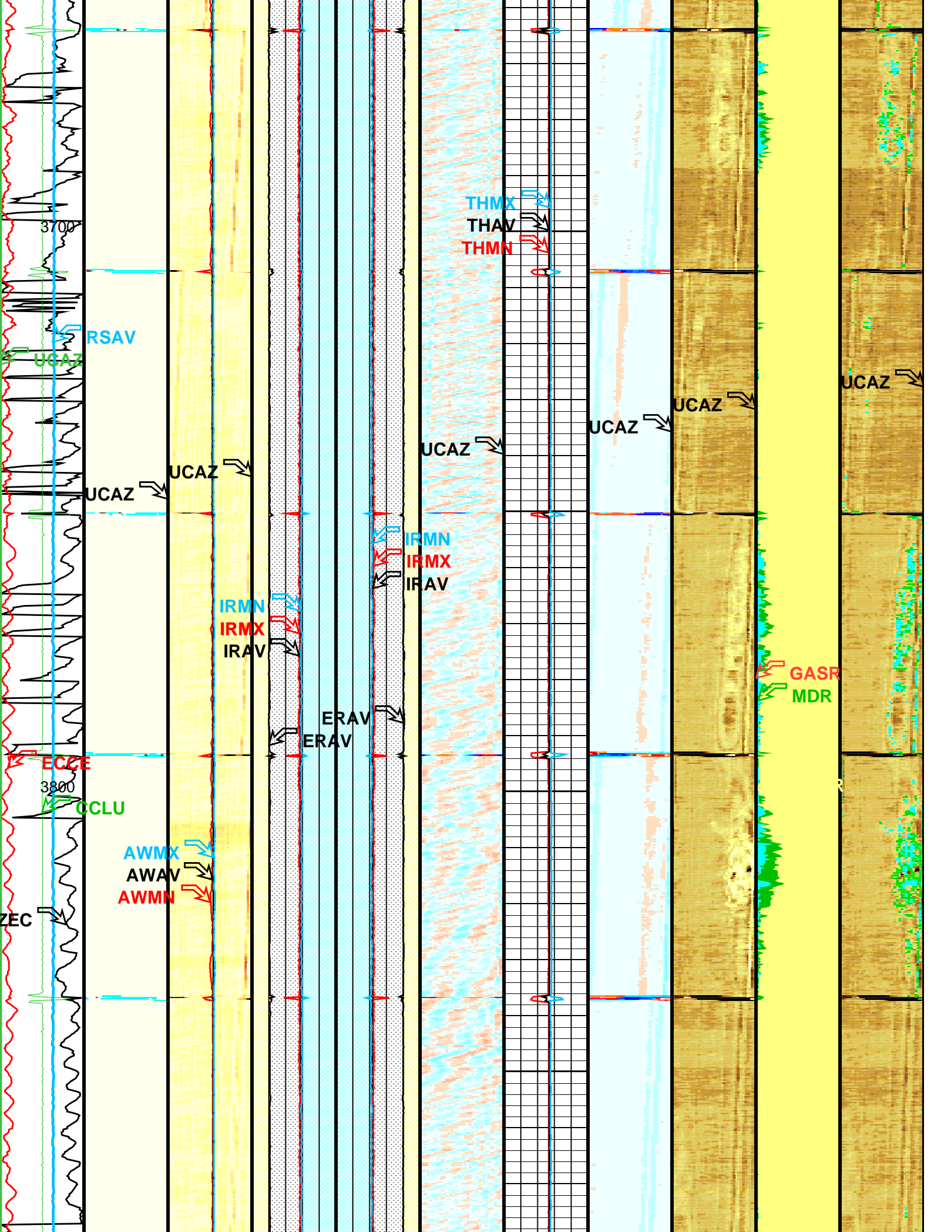


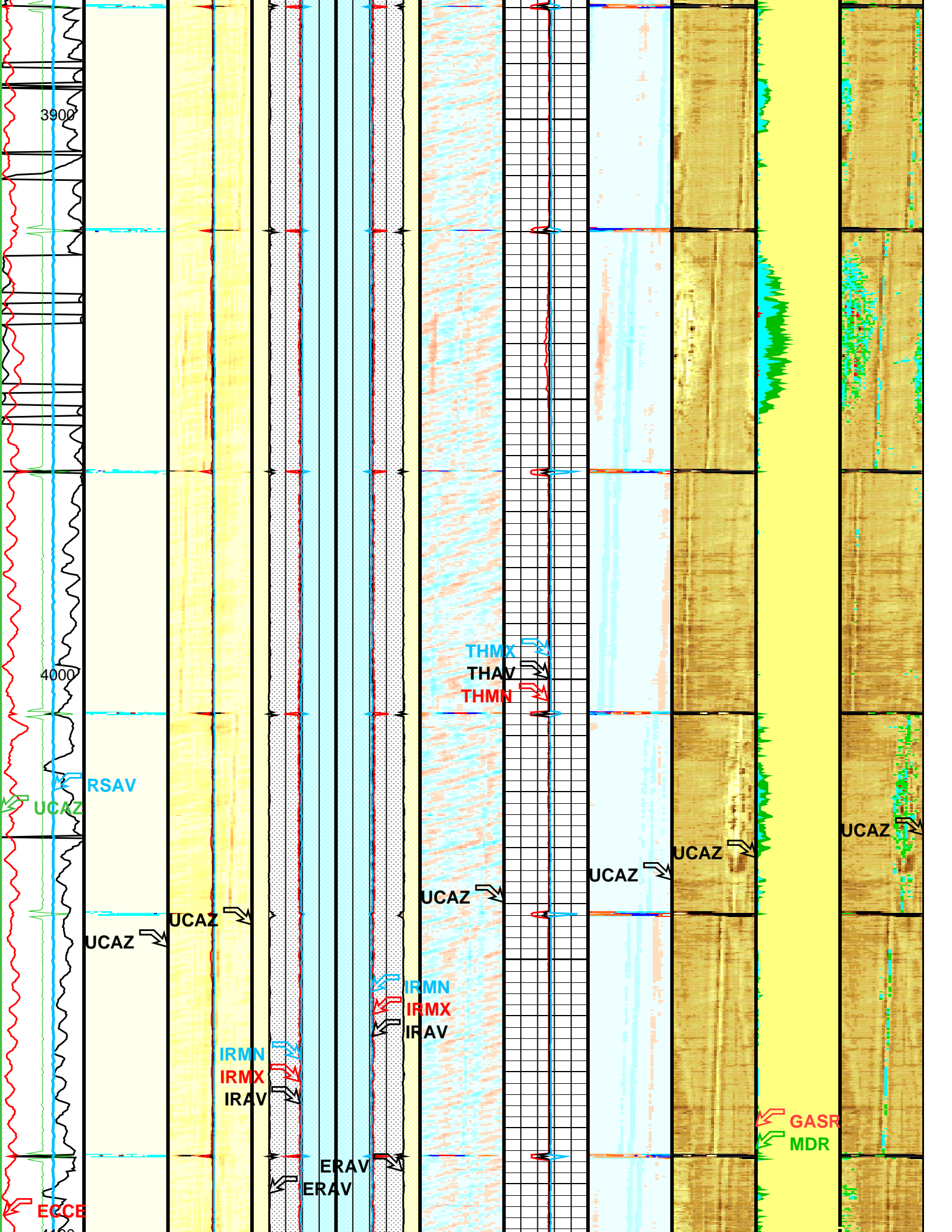




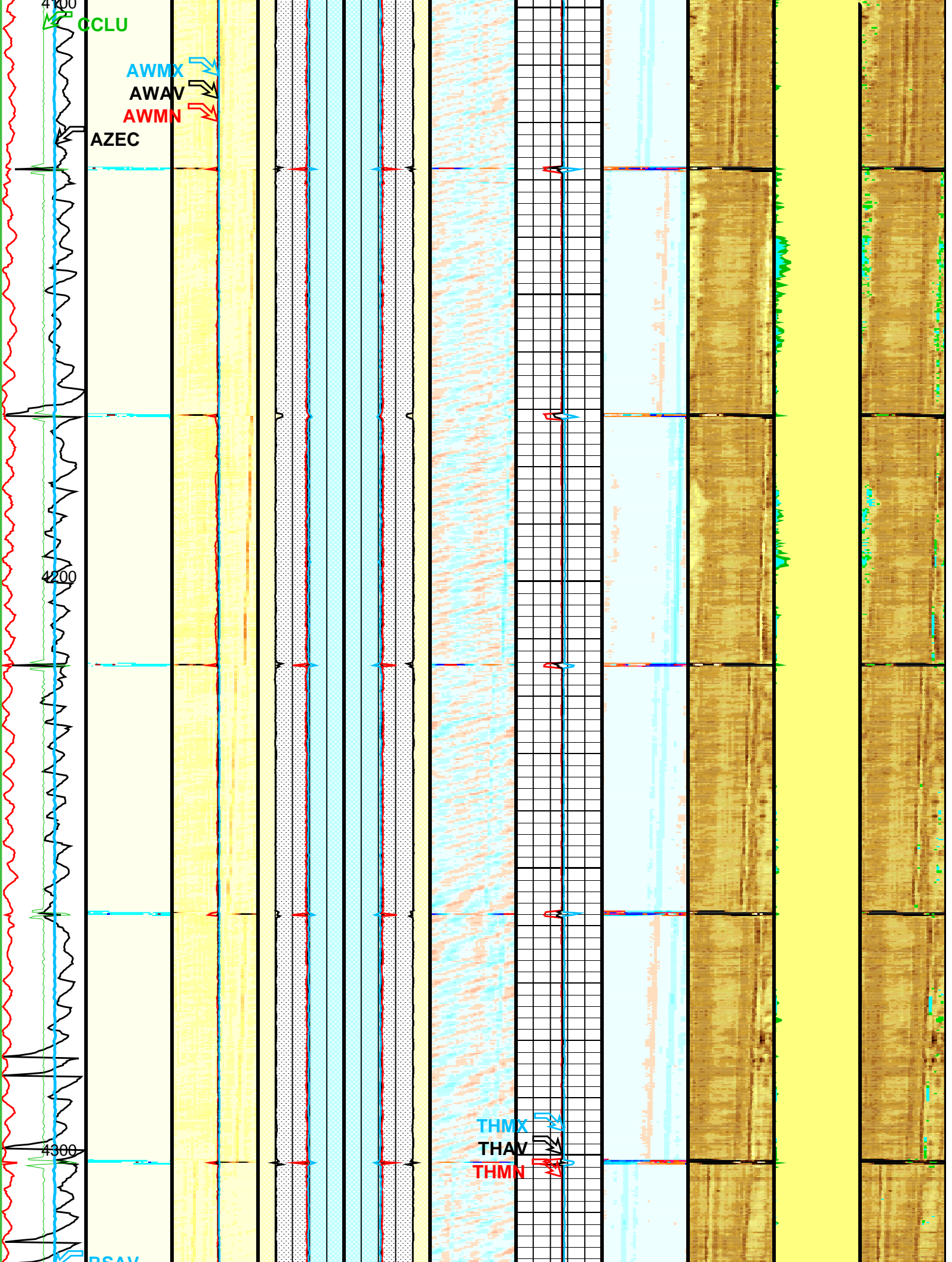


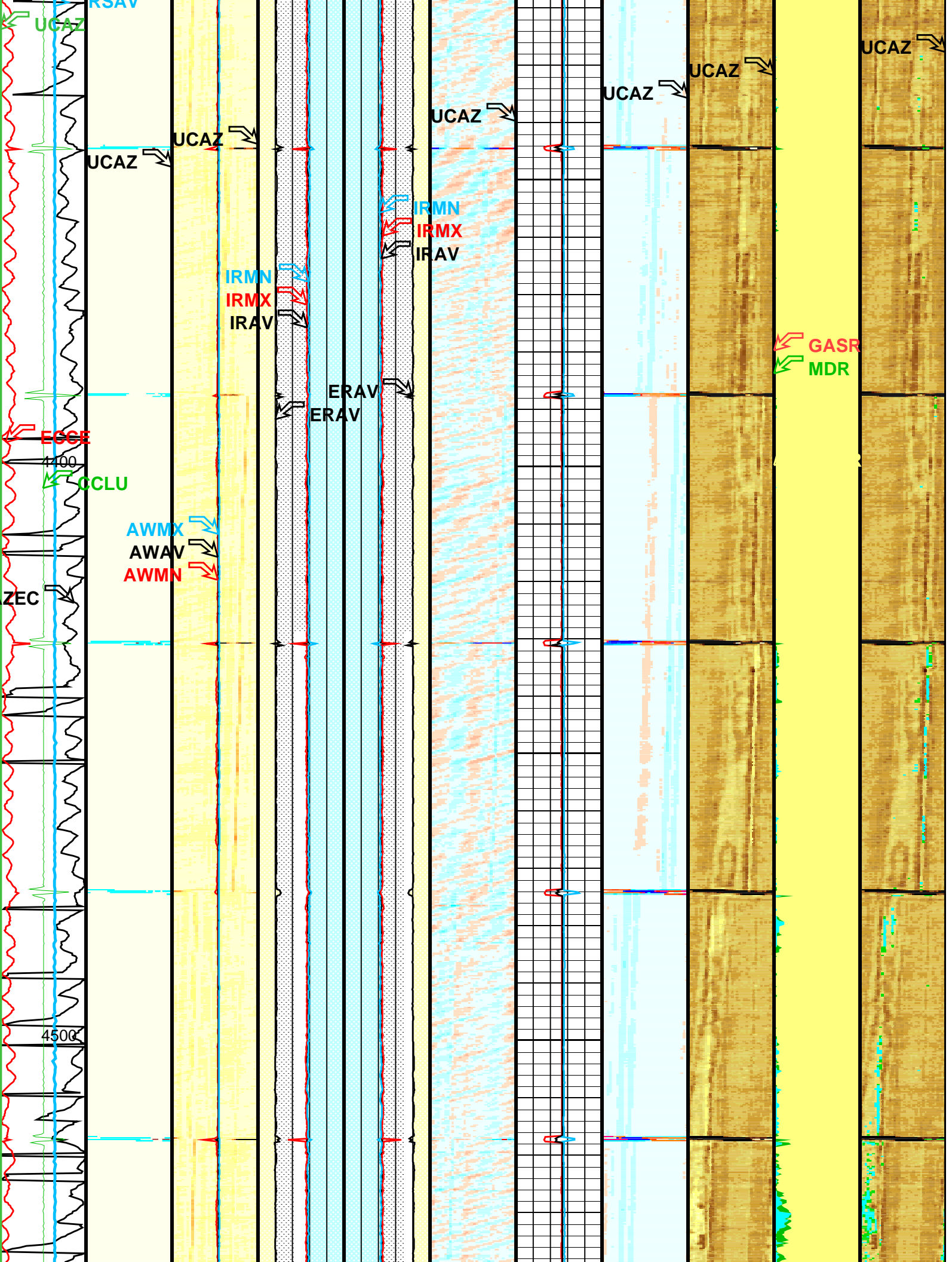




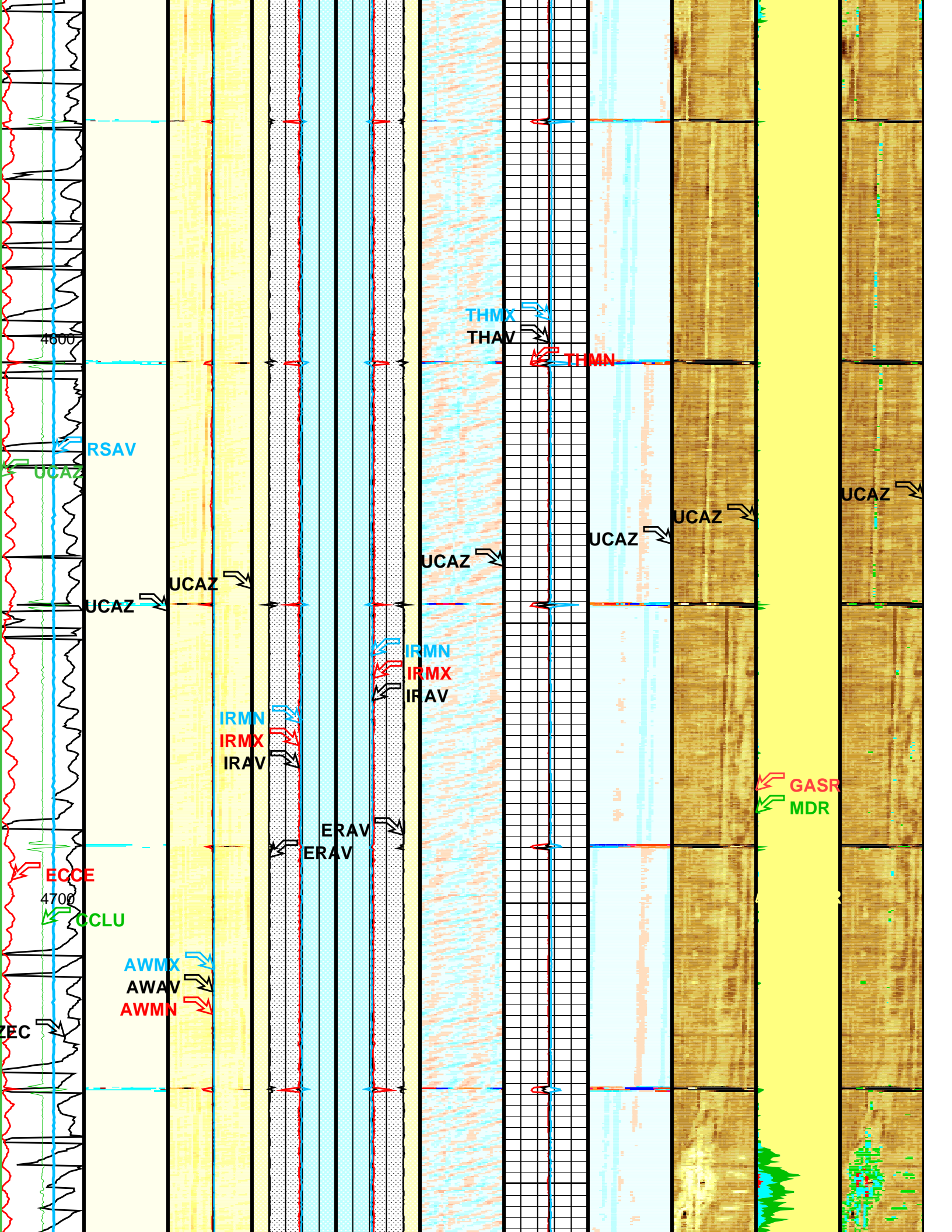


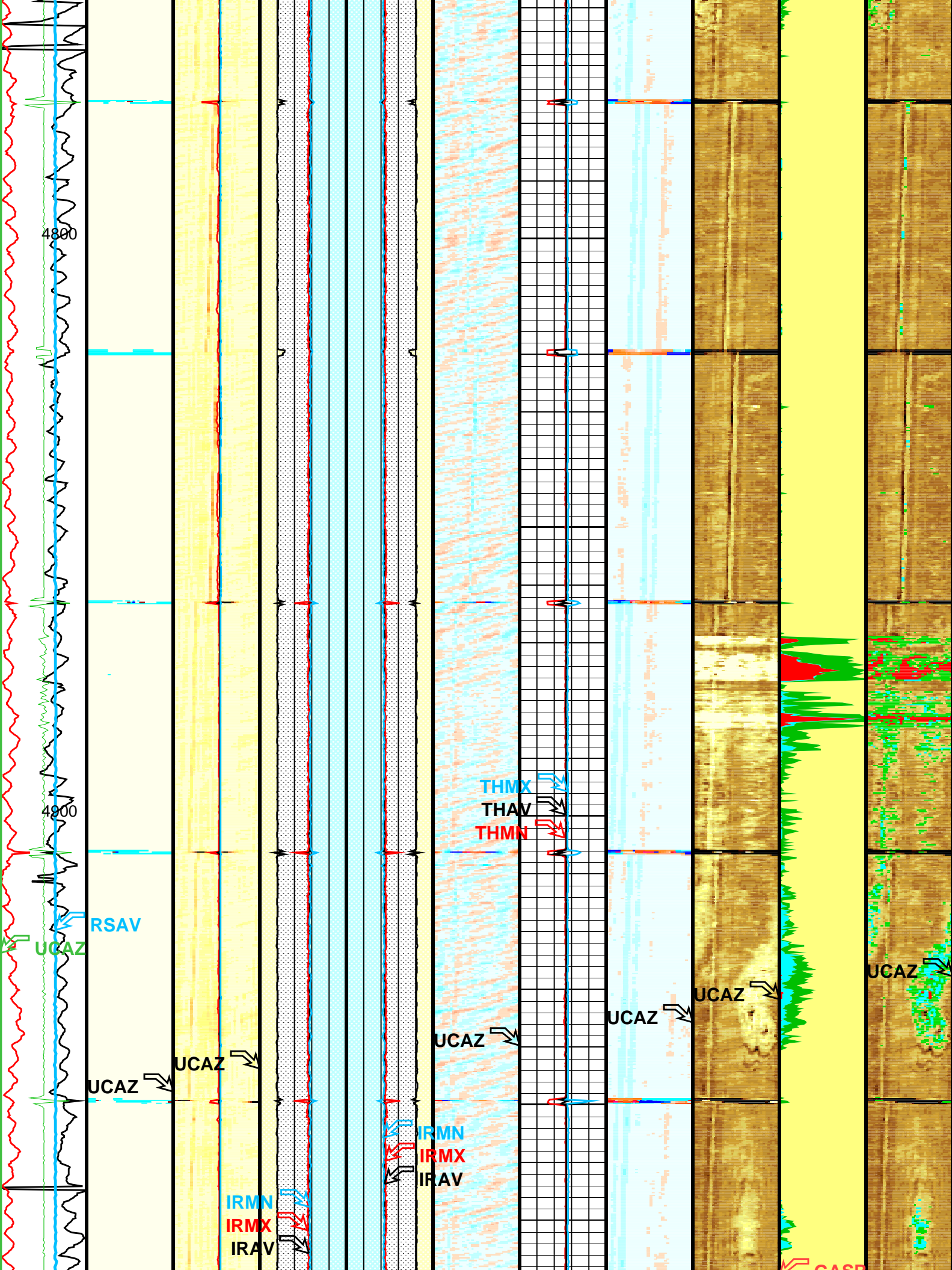




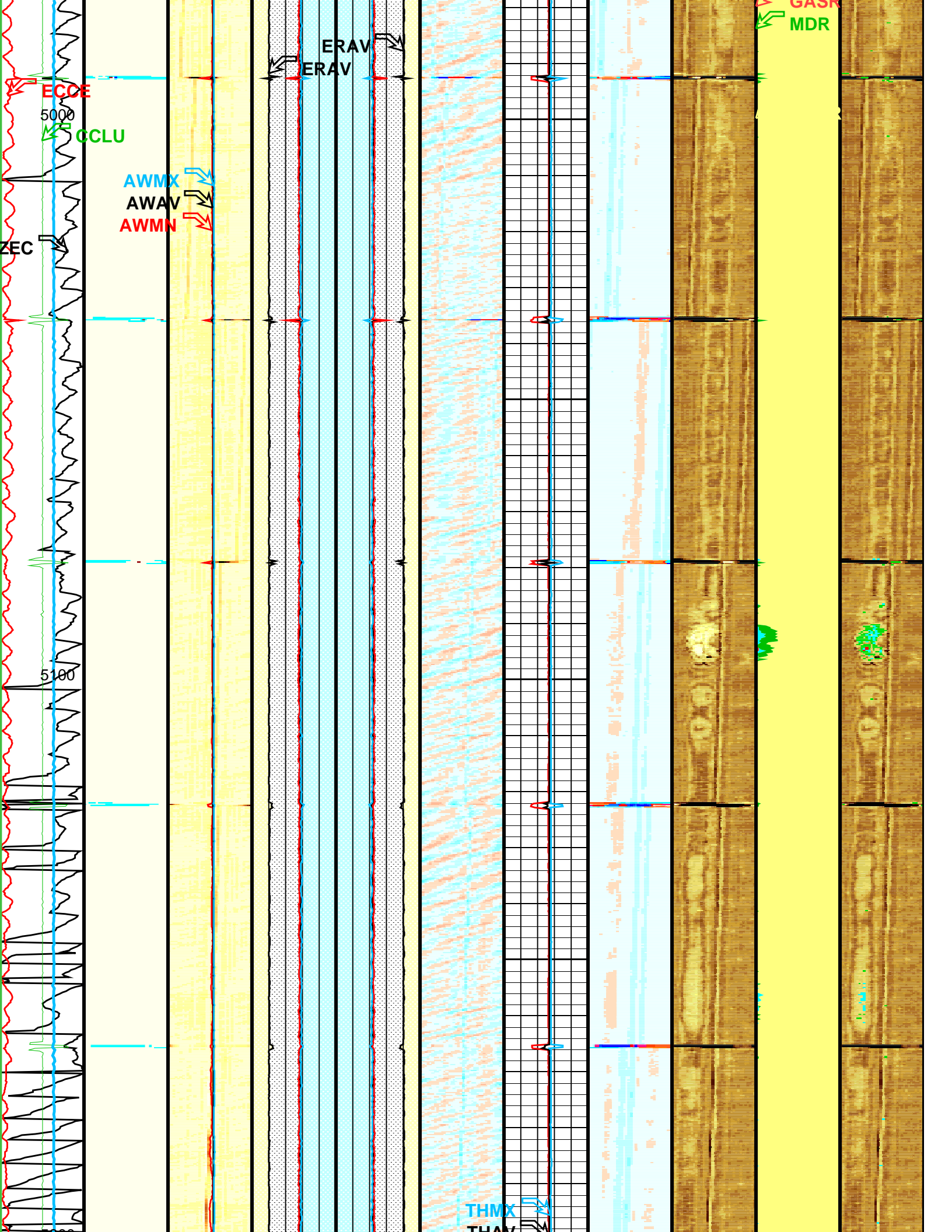


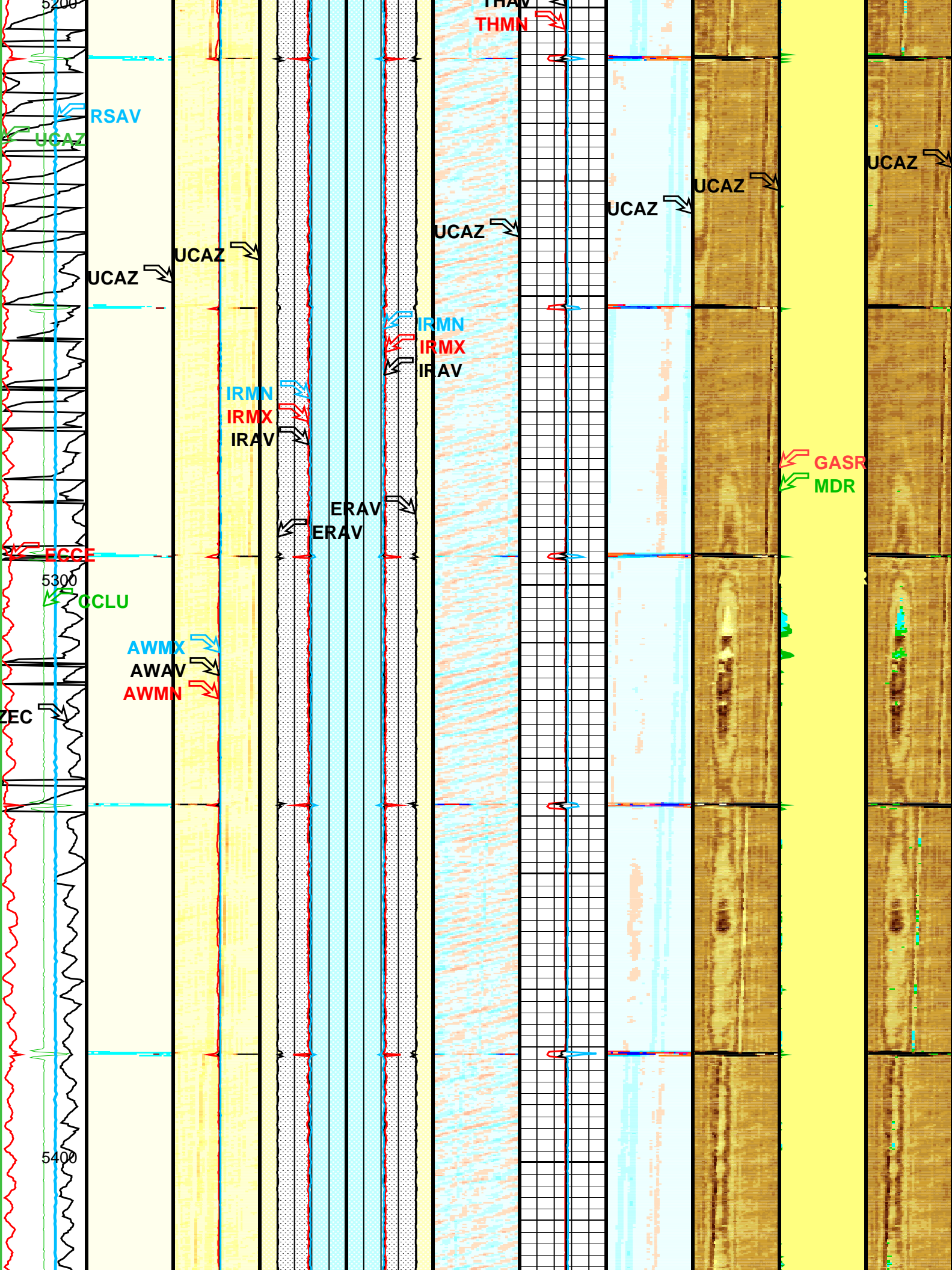




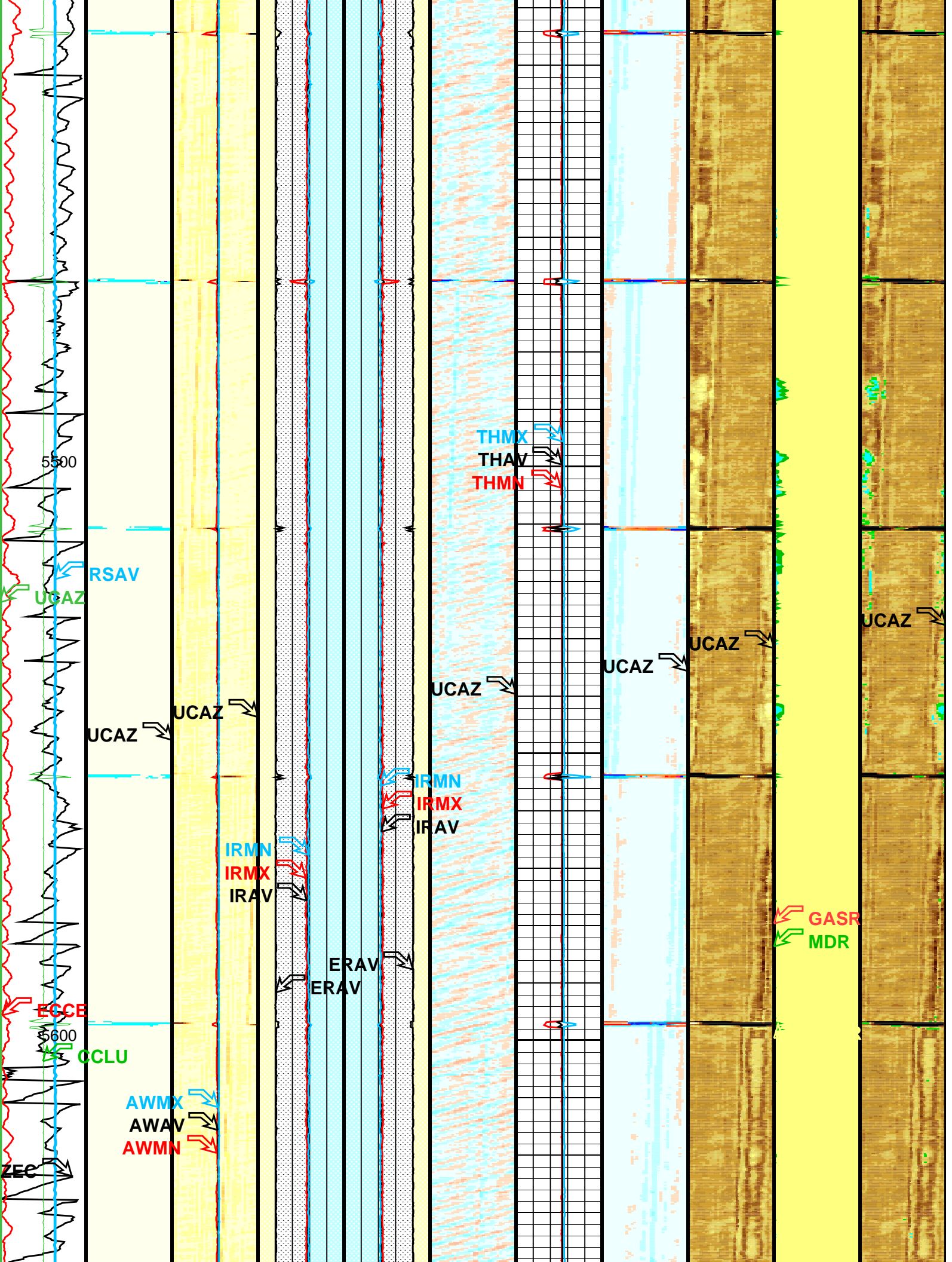


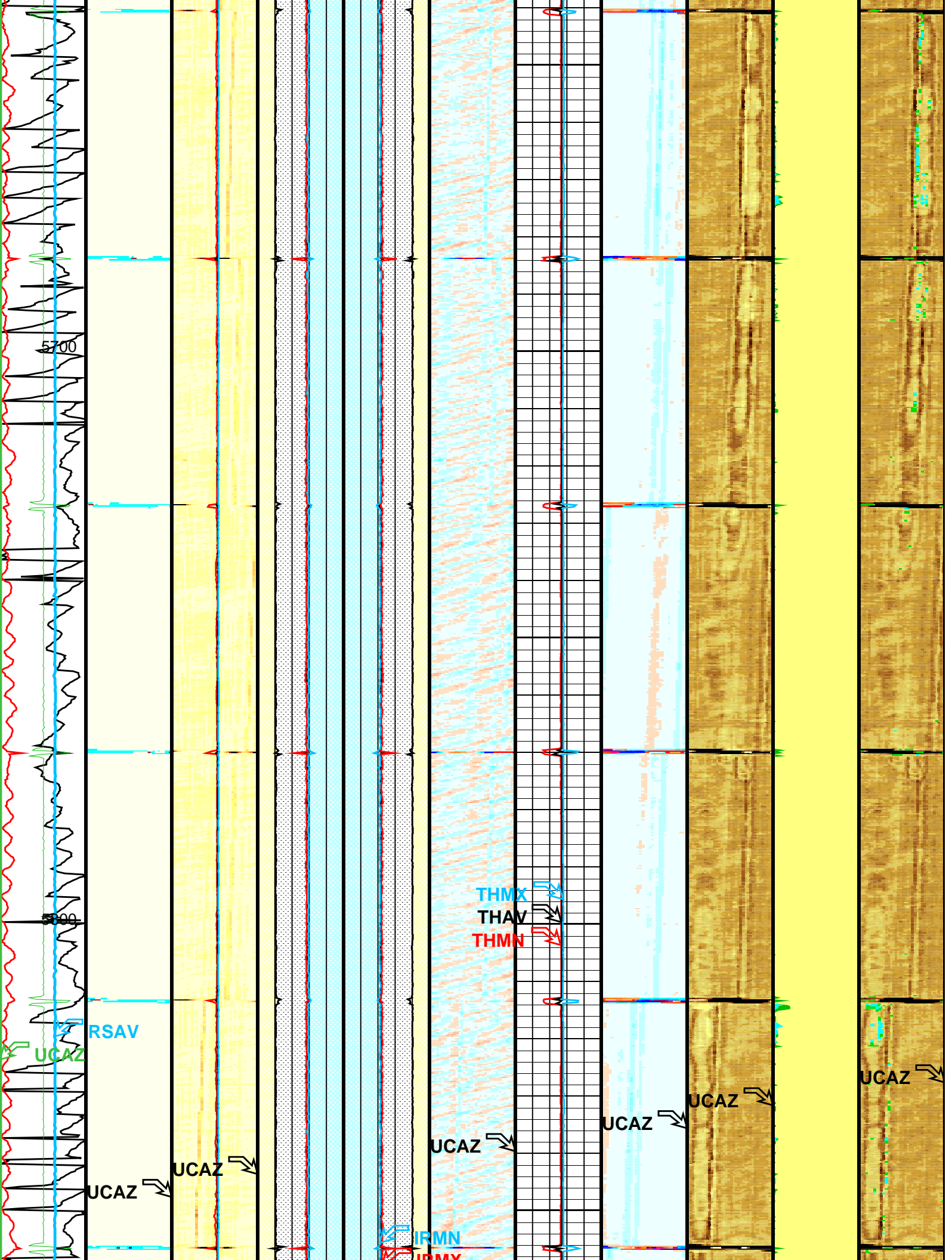




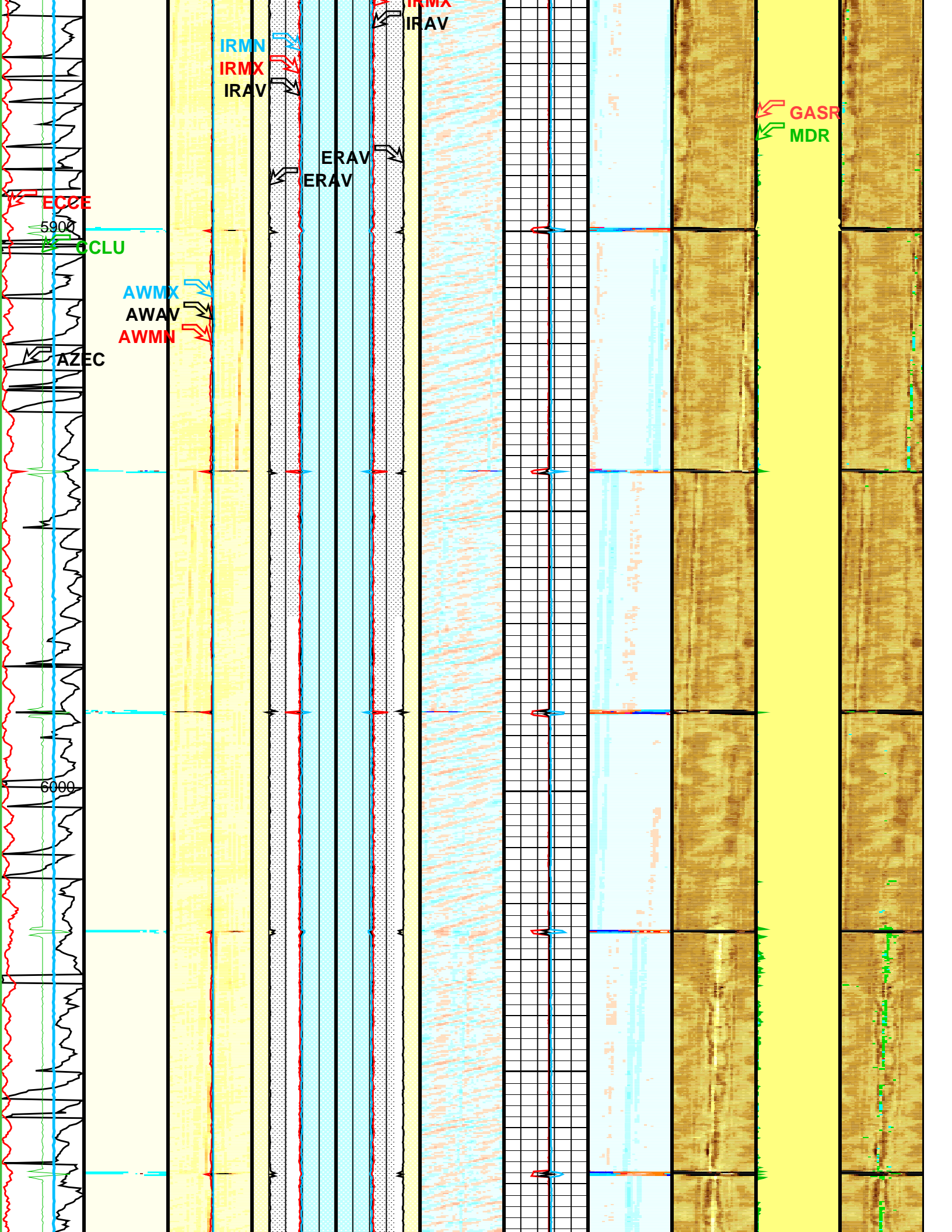


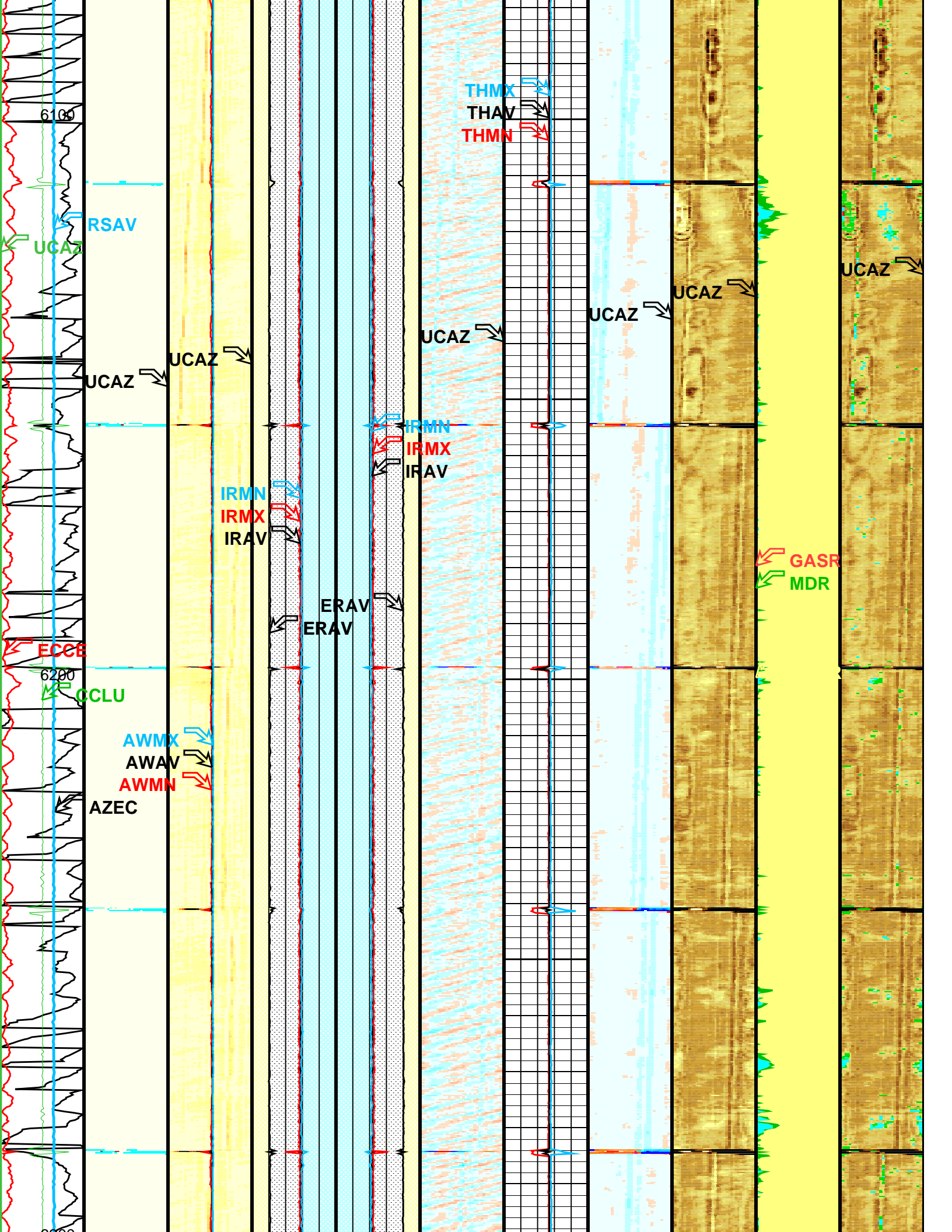




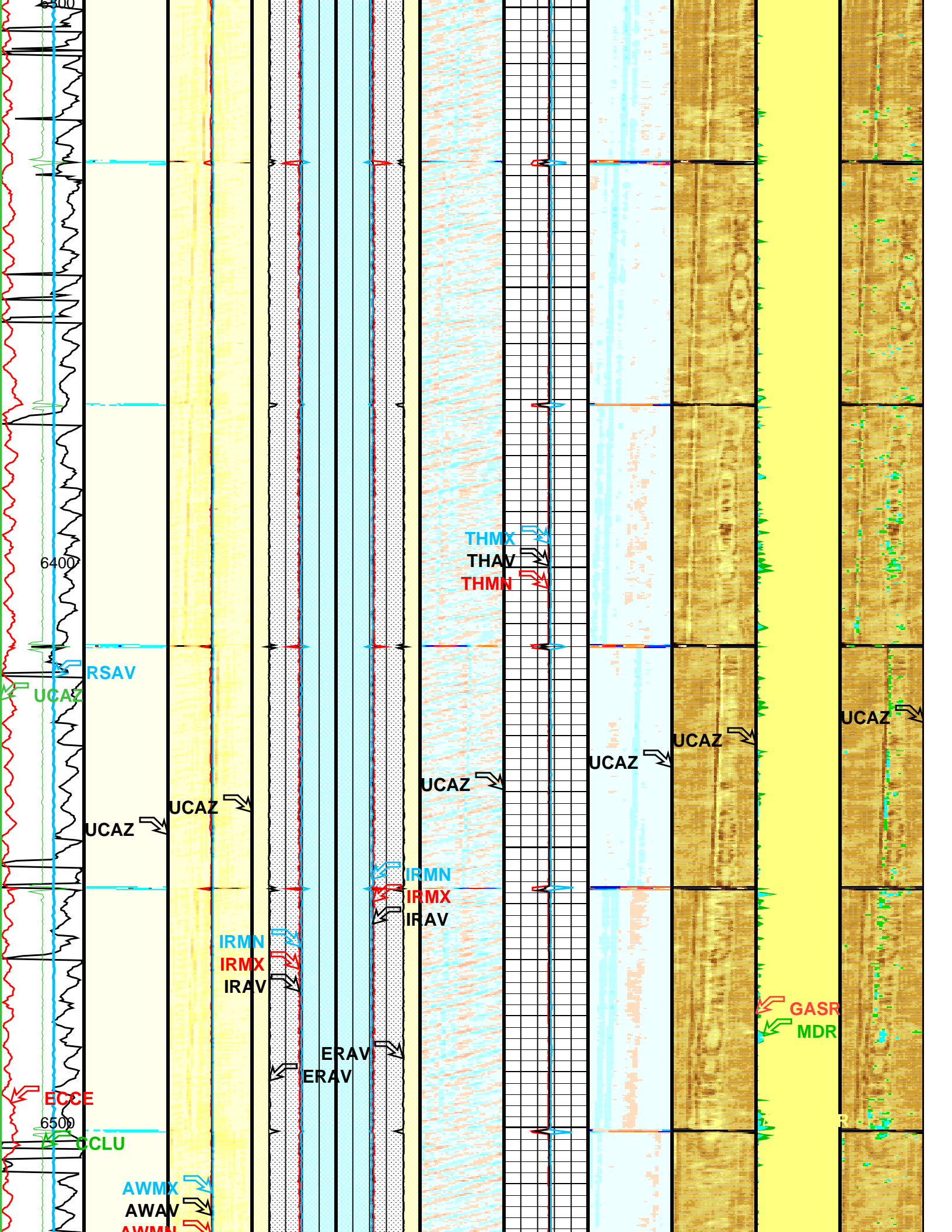


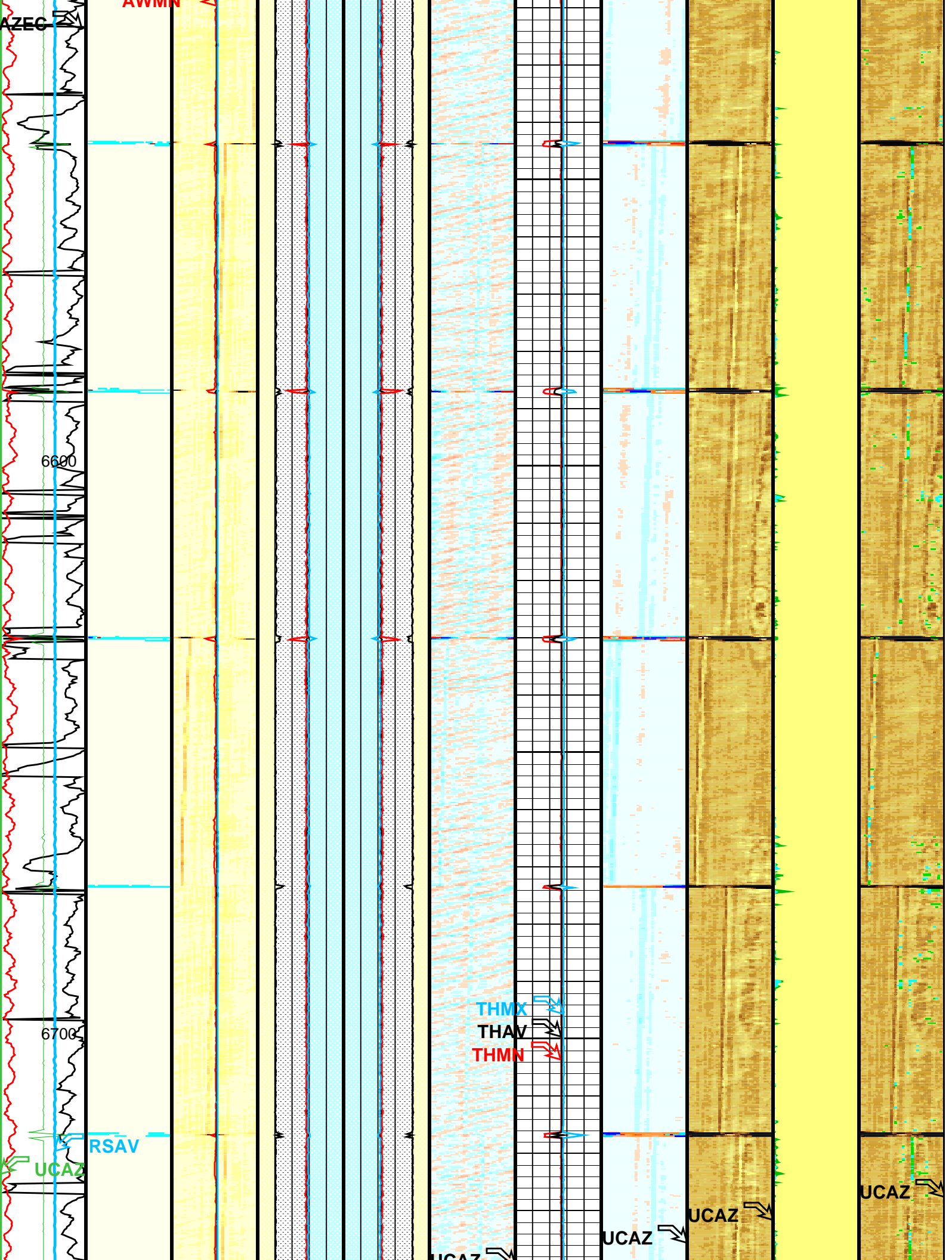




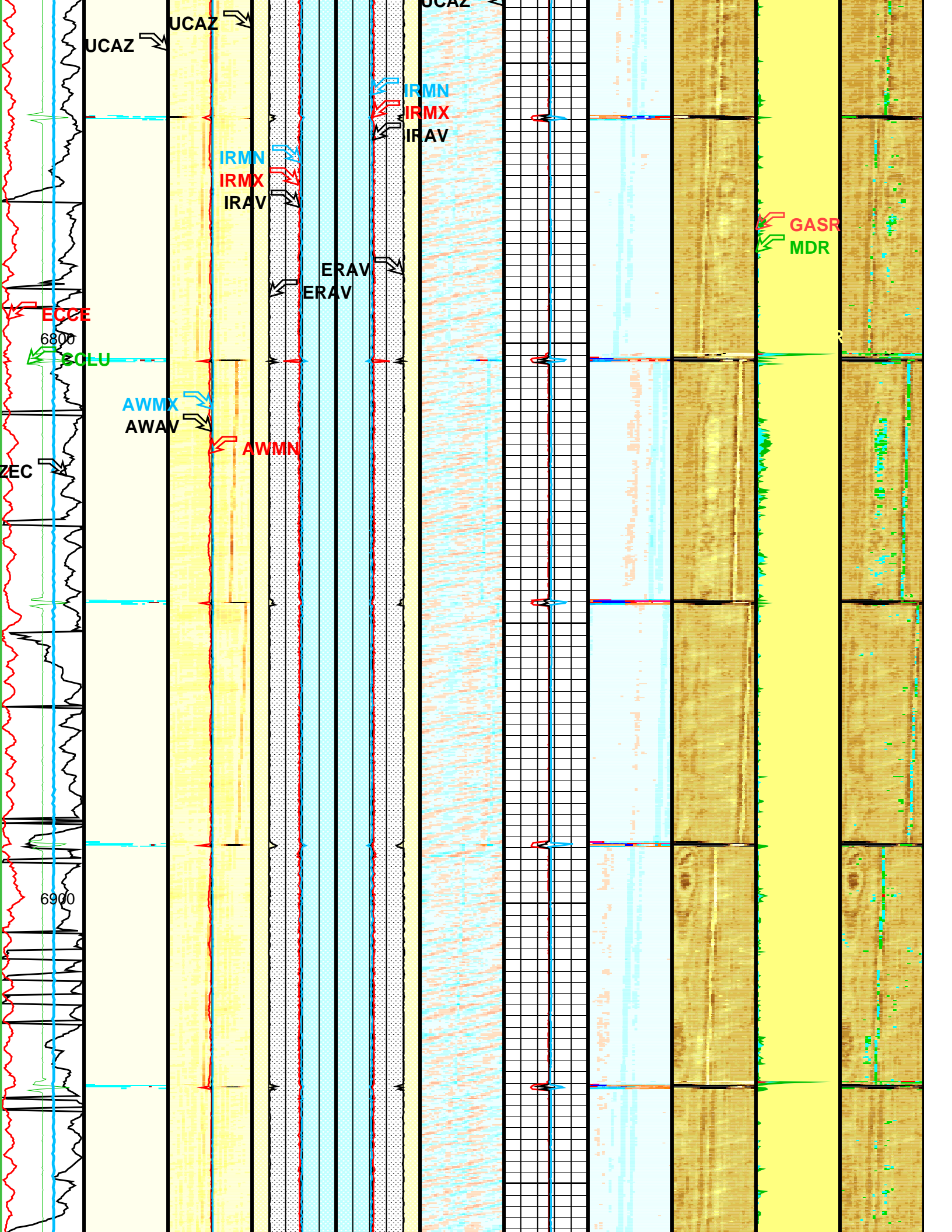


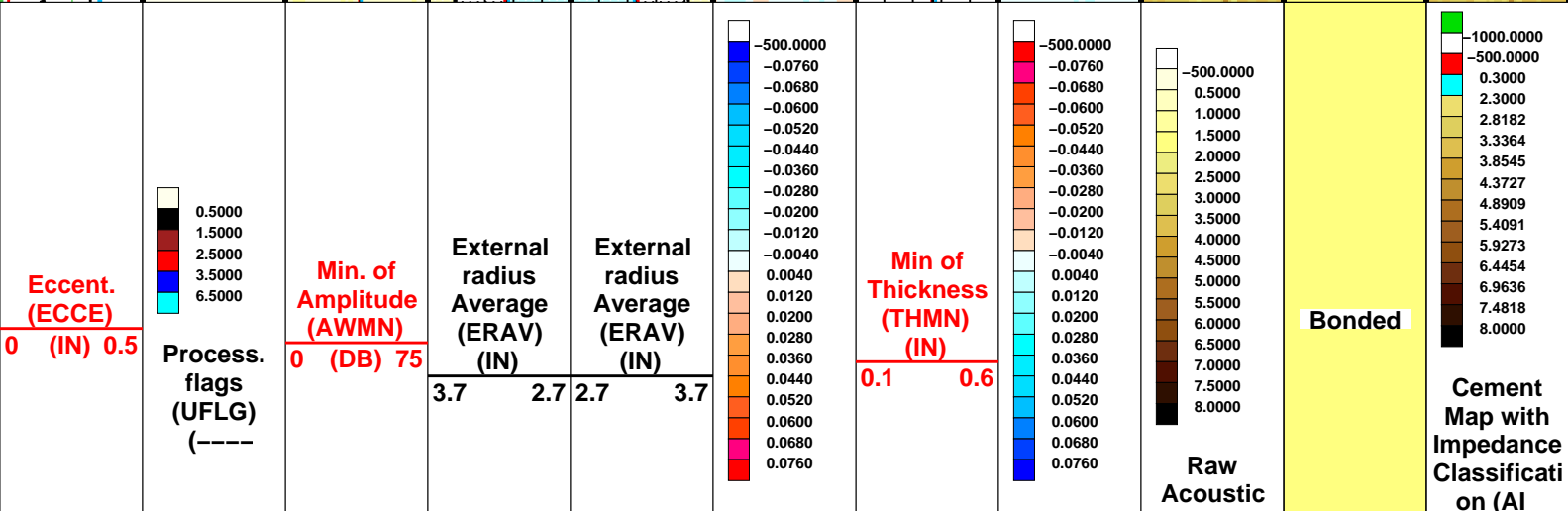
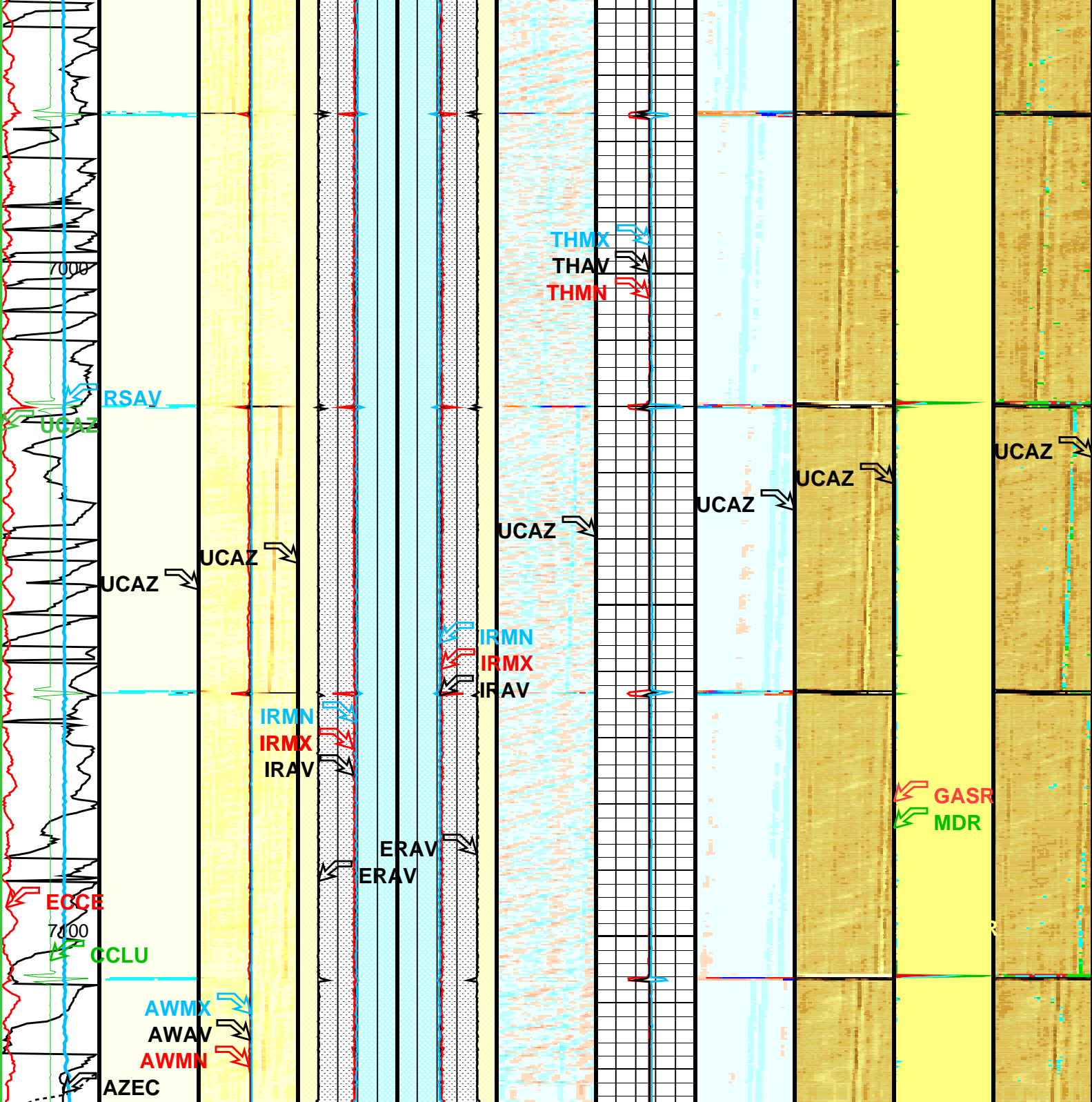




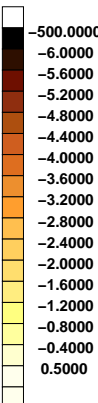










					Internal radii minus Ave (IRBK) (IN)		Thickness minus Ave (THBK) (IN)	Imped. (AIBK) (MRAY)		MICRO_ DEBONDIN G_IMAGE) (MRAY)
Rev. speed (RSAV) 6 (RPS) 8		Average of Amplitude (AWAV) 0 (DB) 75	Internal radius Average (IRAV) (IN) 3.7 2.7	Internal radius Average (IRAV) (IN) 2.7 3.7		Average of Thickness (THAV) (IN) 0.1 0.6			Gas or Dry MicroA	
CCL (CCLU) (---- -20 20		Maximum of Amplitude (AWMX) 0 (DB) 75	Internal radius Maximum (IRMX) (IN) 3.7 2.7	Internal radius Maximum (IRMX) (IN) 2.7 3.7		Maximum of Thickness (THMX) (IN) 0.1 0.6			Liquid	
Rev. speed (RSAV) (RPS) -8 -6		 Amplitude of echo minus Max (AWBK) (DB)	Min of Internal radius (IRMN) (IN) 3.7 2.7	Min of Internal radius (IRMN) (IN) 2.7 3.7					Micro-deb onding	
Cable Speed (CS) (F/HR) 0 2000										
Azimuth of eccent. (AZEC) (DEG) 0 360										
Image rotation (UCAZ) (DEG) 0 360										

Format: USI_Composite		Vertical Scale: 5" per 100'		Graphics File Created: 15-Nov-2013 13:43	
OP System Version: 19C1-222					
USIT-E	19C1-222	SGT-N		19C1-222	
DTC-H	19C1-222				
All USI Images are outside views					
COMPUTATION FLAGS LABELLING					
(0 - 1.5)	UFLG 1	UTIM error			

(1.5 – 2.5)	UFLG 2	Pulse origin not detected
(2.5 – 3.5)	UFLG 3	WINLEN error
(3.5 – 6.5)	UFLG 4 UFLG 5 UFLG 6	CASING THICKNESS error
(6.5 – 10)	UFLG 7 UFLG 8 UFLG 9	LOOP PROCESSING error

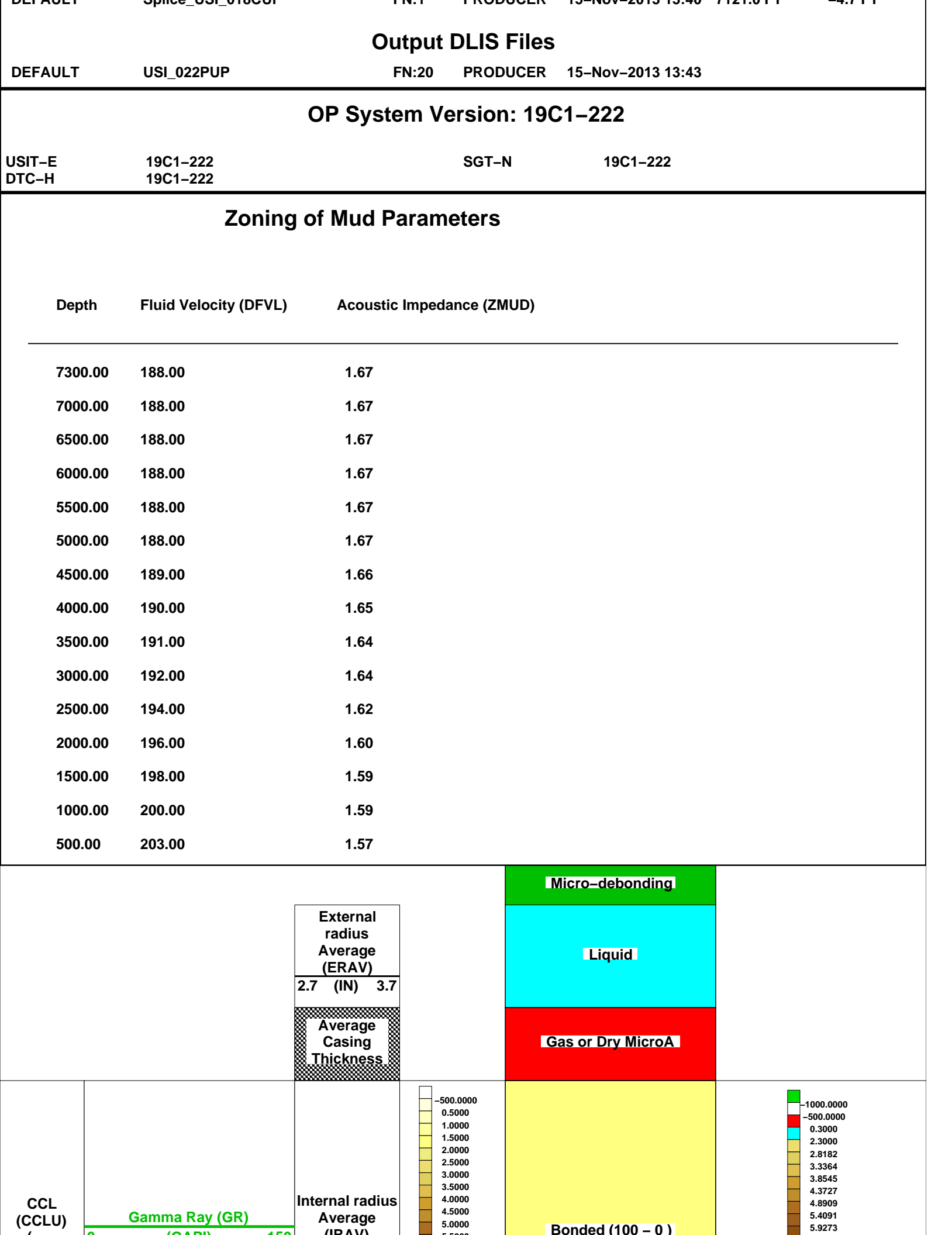
USI :   LOW Frequency Compression Mode Used For Logging.  
 Recommended casing thickness range for optimum cement impedance measurement : 0.27 to 0.6 IN.

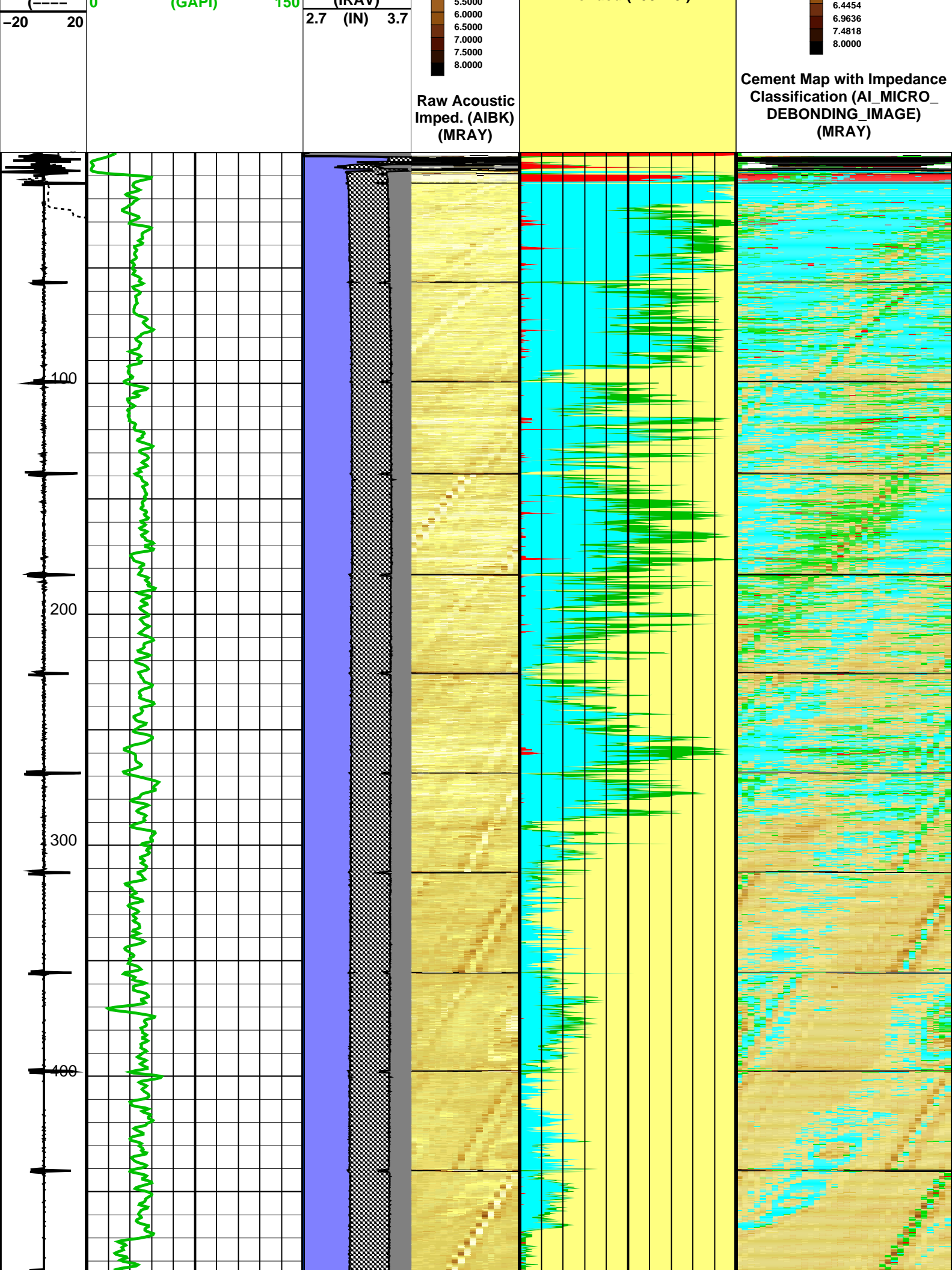
Parameters			
DLIS Name	Description	Value	
USIT-E: Ultrasonic Imaging – E			
AGMN	Minimum Gain of Cartridge	–4	DB
AGMX	Maximum Gain of Cartridge	20	DB
BERJ	Bad Echo Rejection	ON	
CDIA	Casing Outer Diameter	7	IN
CSDE	Casing Density	486.94	LBCF
CSID	Casing Inner Diameter	6.276	IN
DFVL	Default Fluid Velocity	190	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	50	V
FDII	FPM Data Interpolation Interval	0	FT
IMAR	Image Rotation	OFF	
MW	Mud Weight	8.8	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	1.8	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	4.0	FT
PP	Playback Processing	RECOMPUTE	

Input DLIS Files						
DEFAULT	Splice_USI_018CUP	FN:1	PRODUCER	15–Nov–2013 13:40	7121.0 FT	–4.7 FT
Output DLIS Files						
DEFAULT	USI_022PUP	FN:20	PRODUCER	15–Nov–2013 13:43		

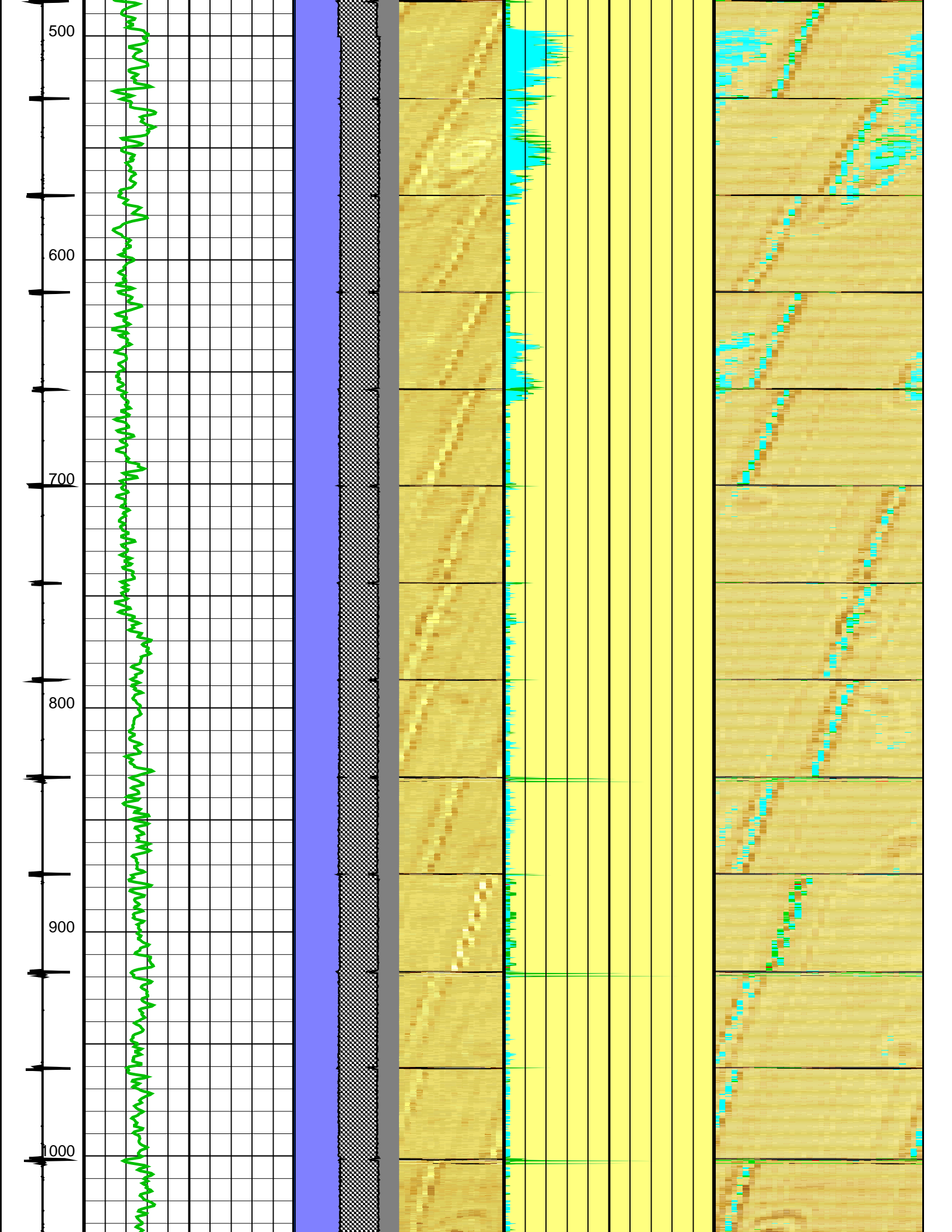
Company: Kerr–McGee Oil & Gas Onshore LP				Well: D&C Farms 36C–33HZ			
Input DLIS Files							
DEFAULT	Splice_USI_018CUP	FN:1	PRODUCER	15–Nov–2013 13:40	7121.0 FT	–4.7 FT	

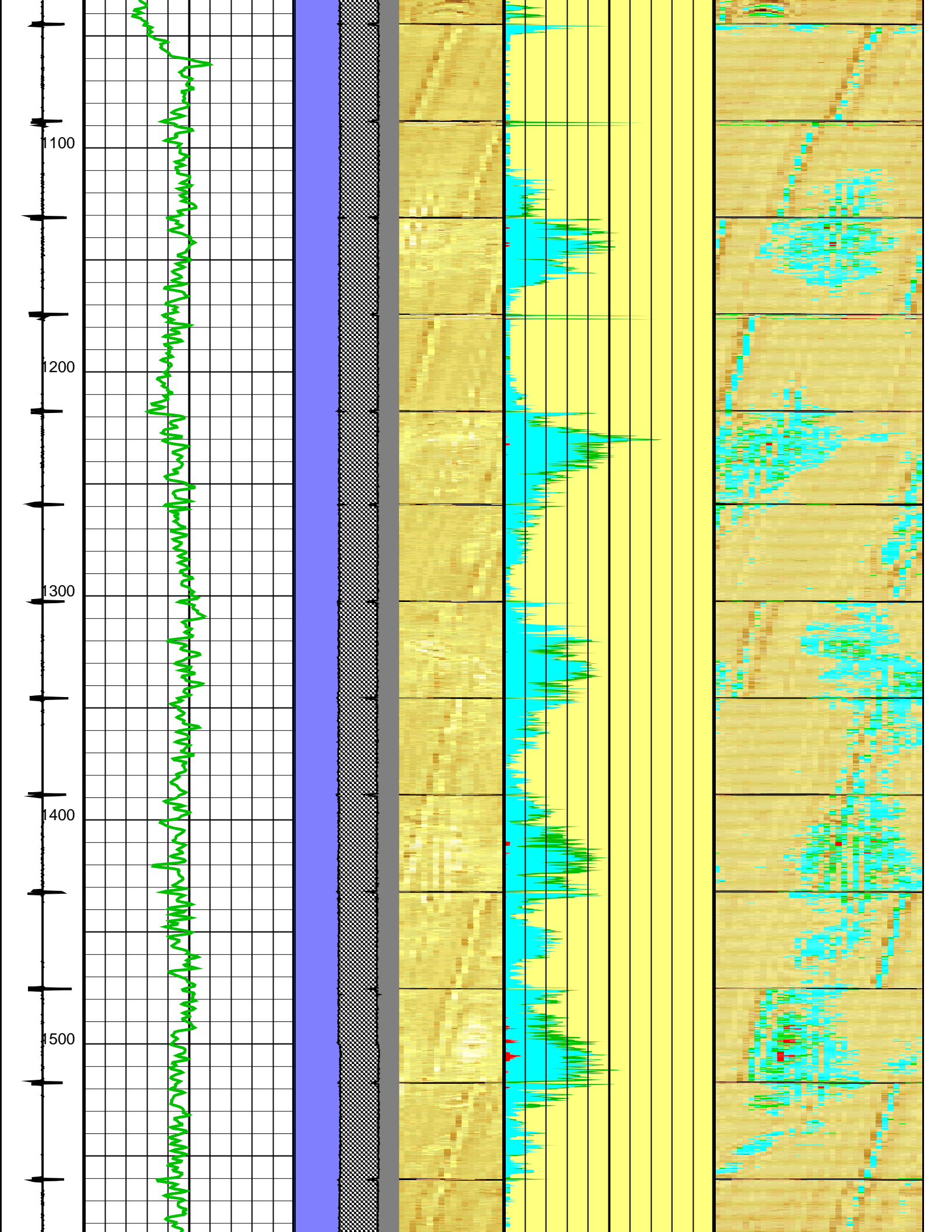




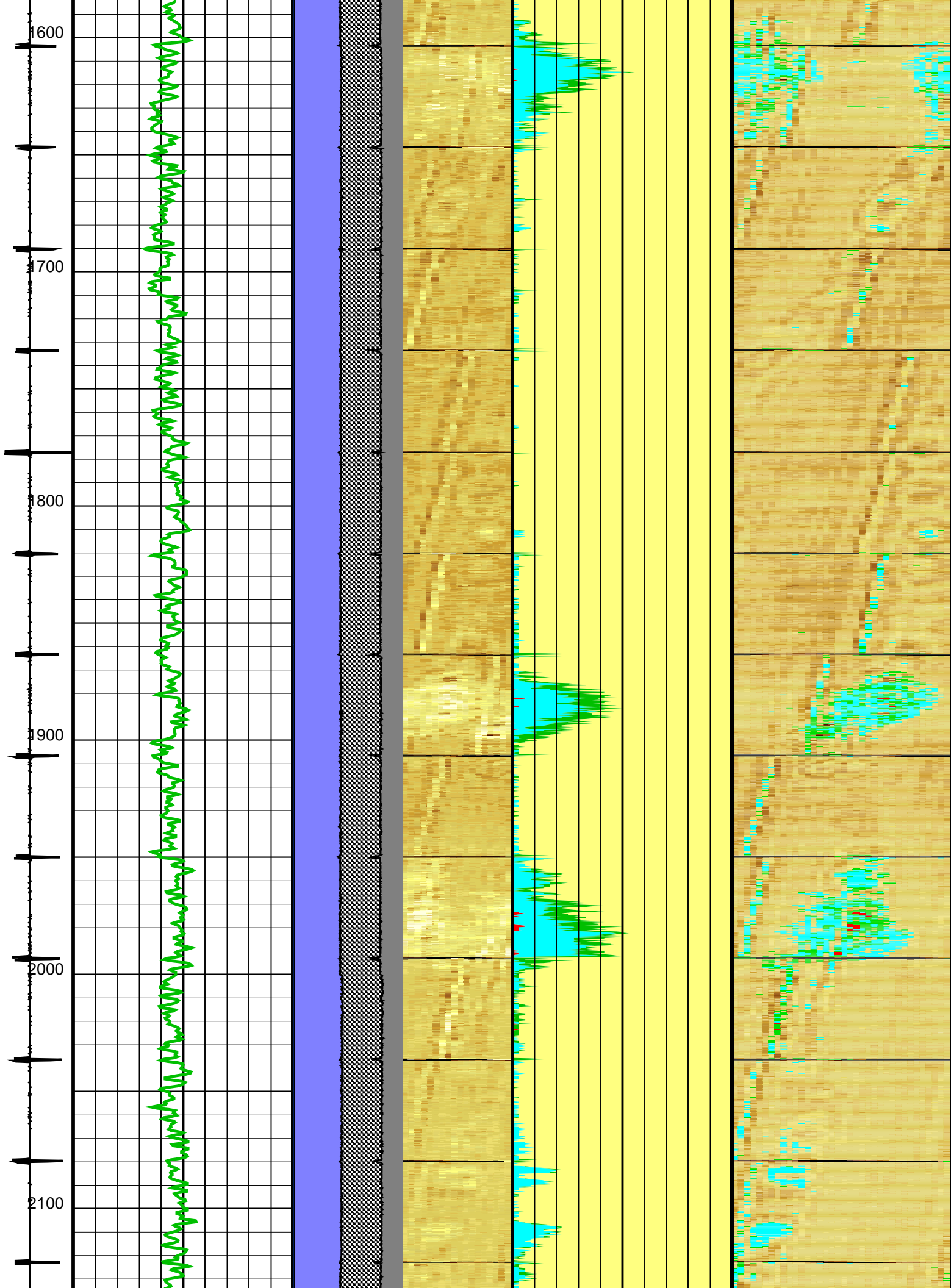


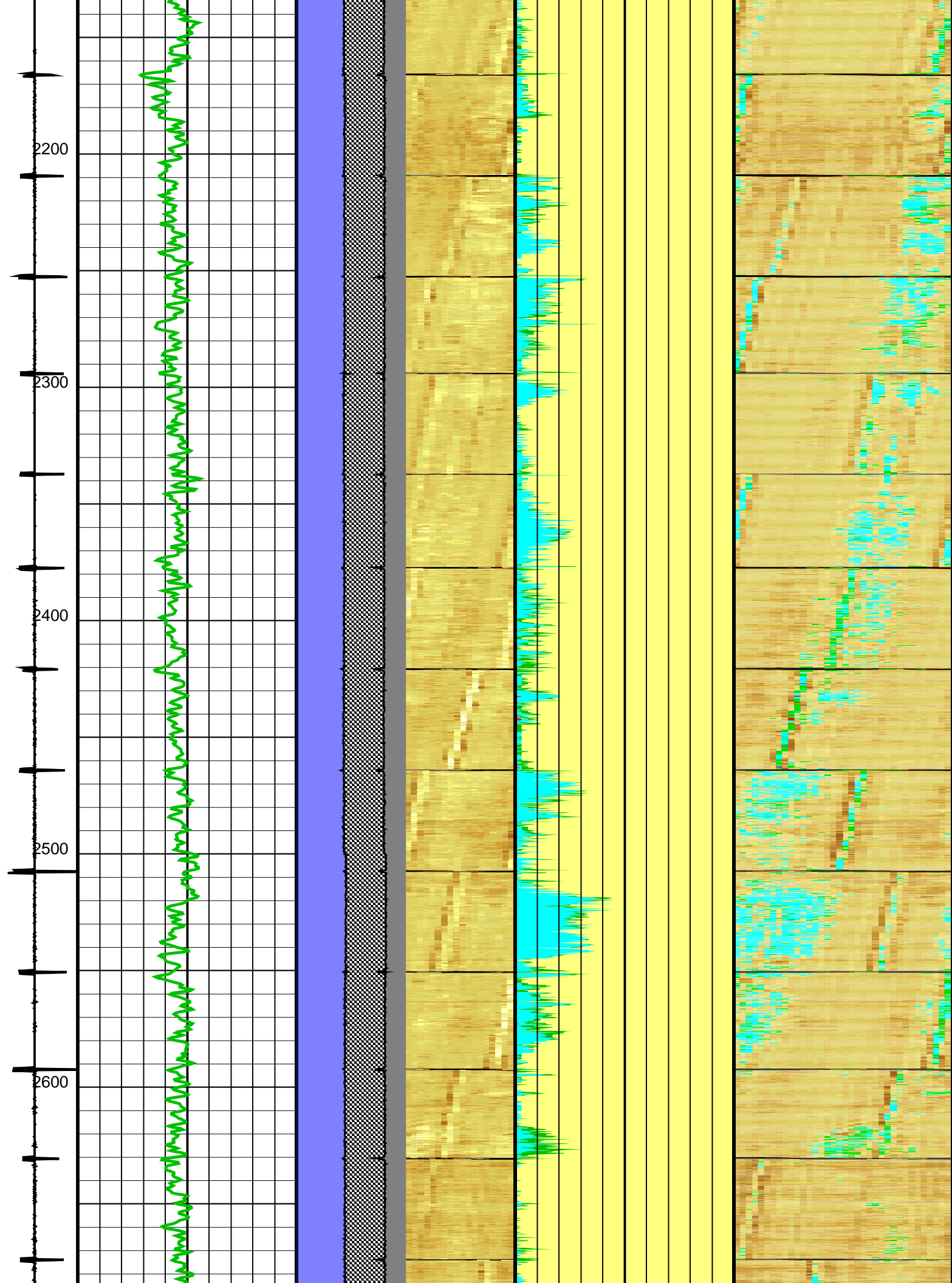




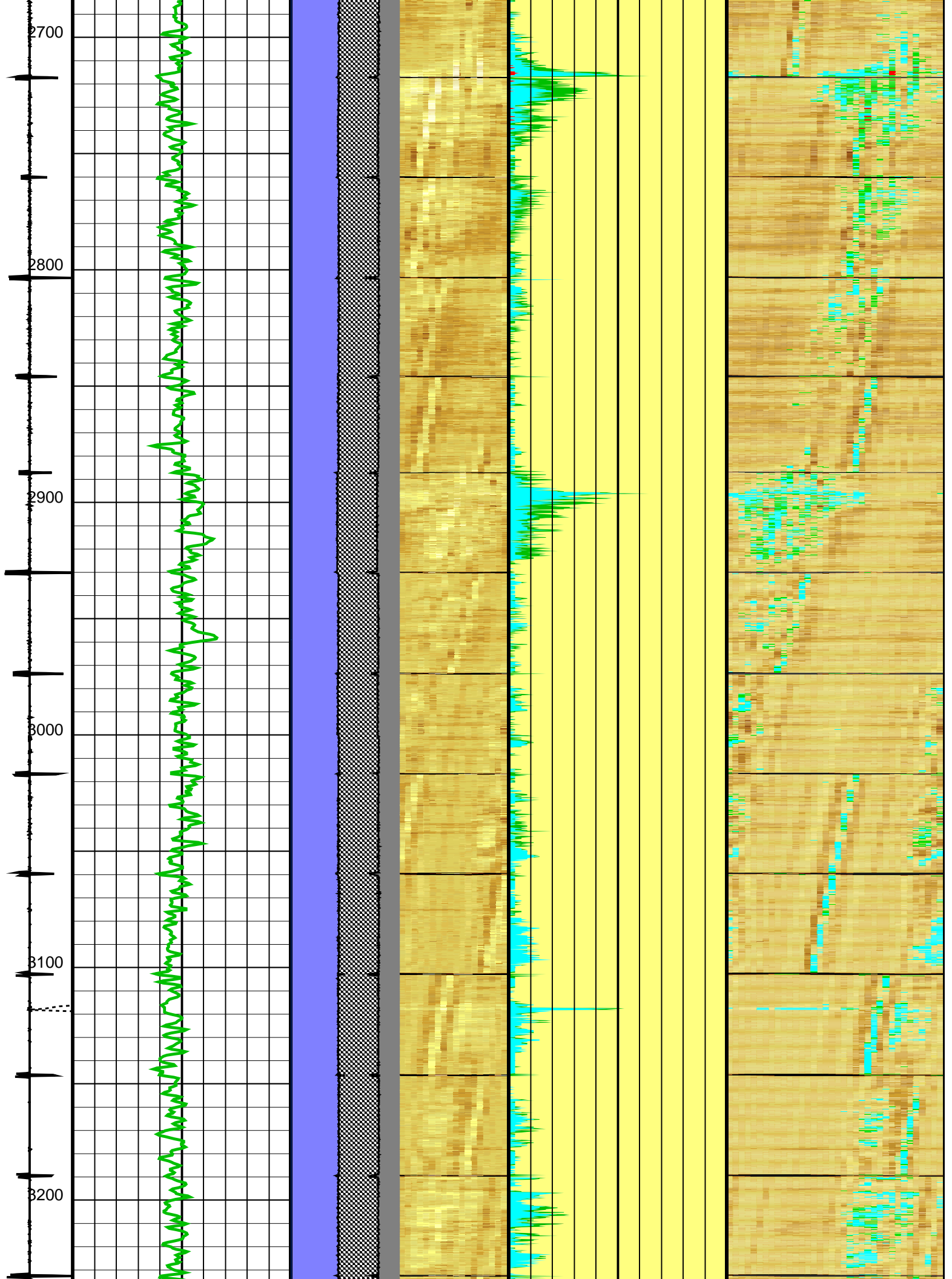


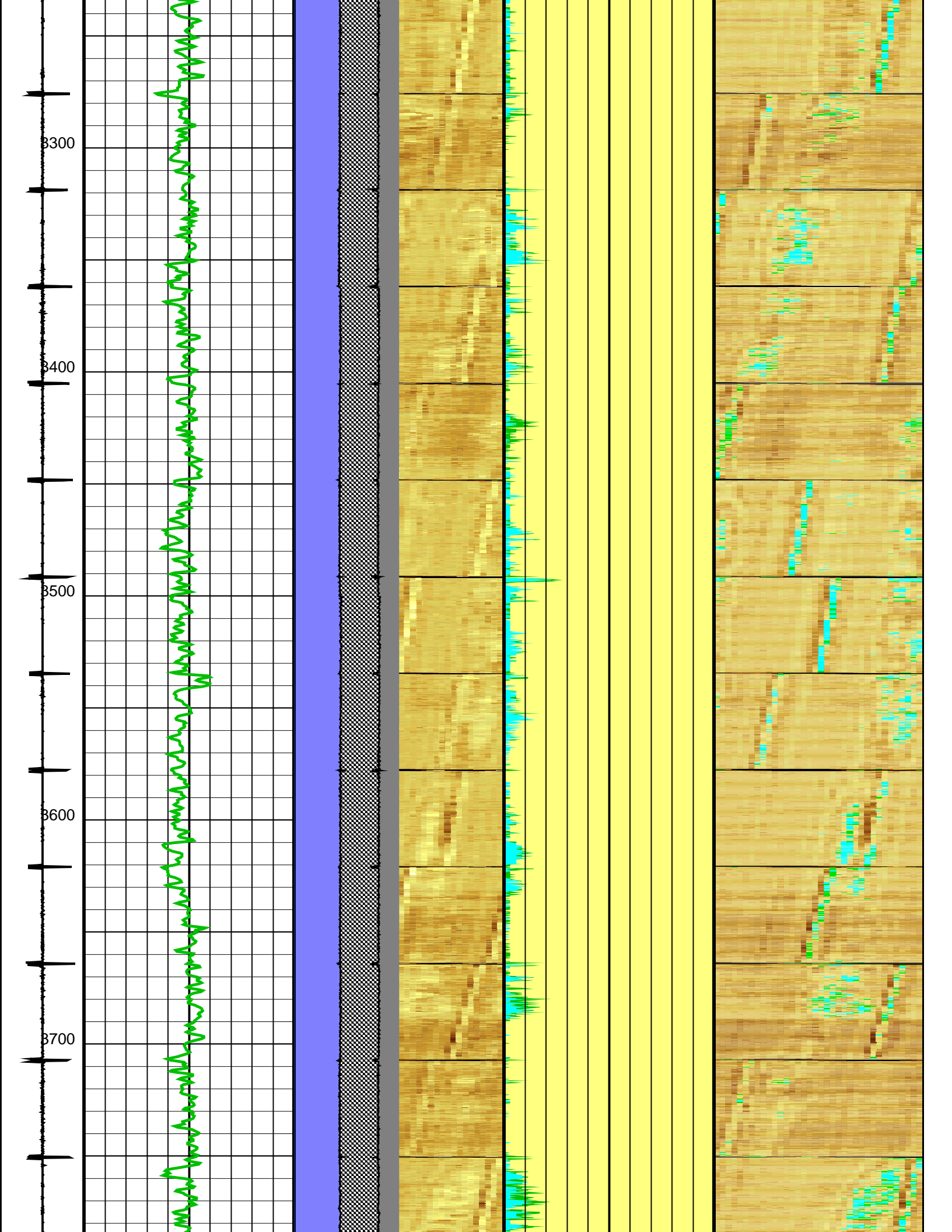




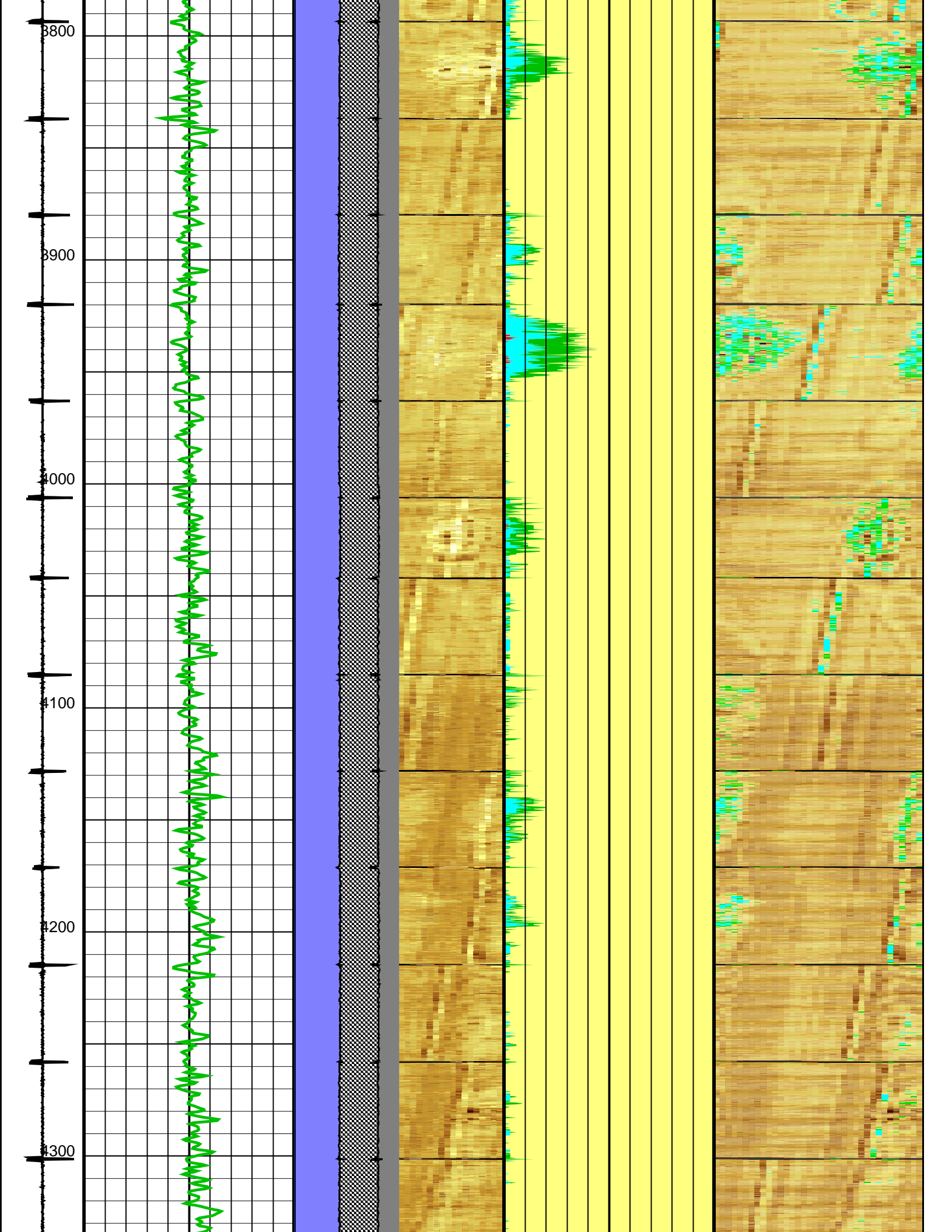


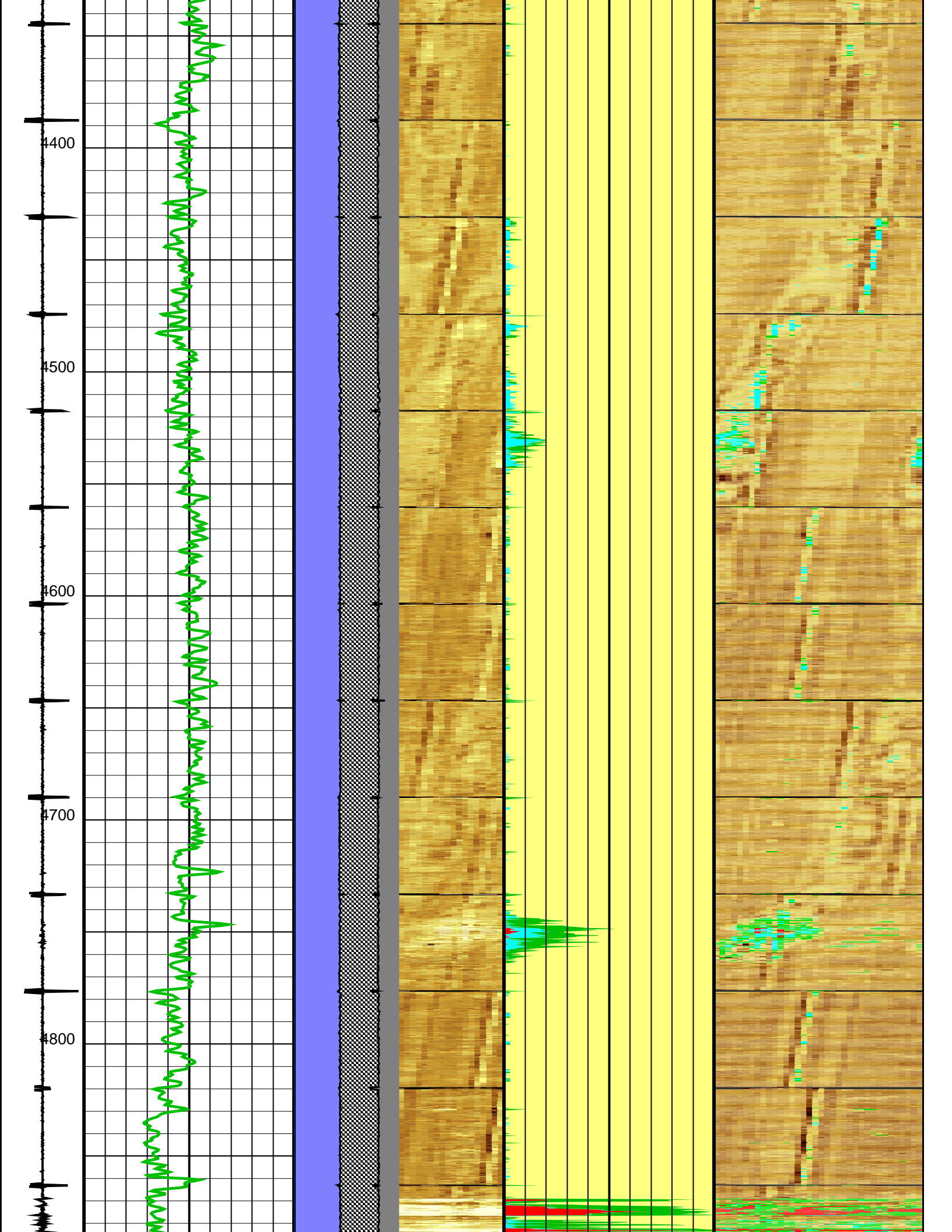




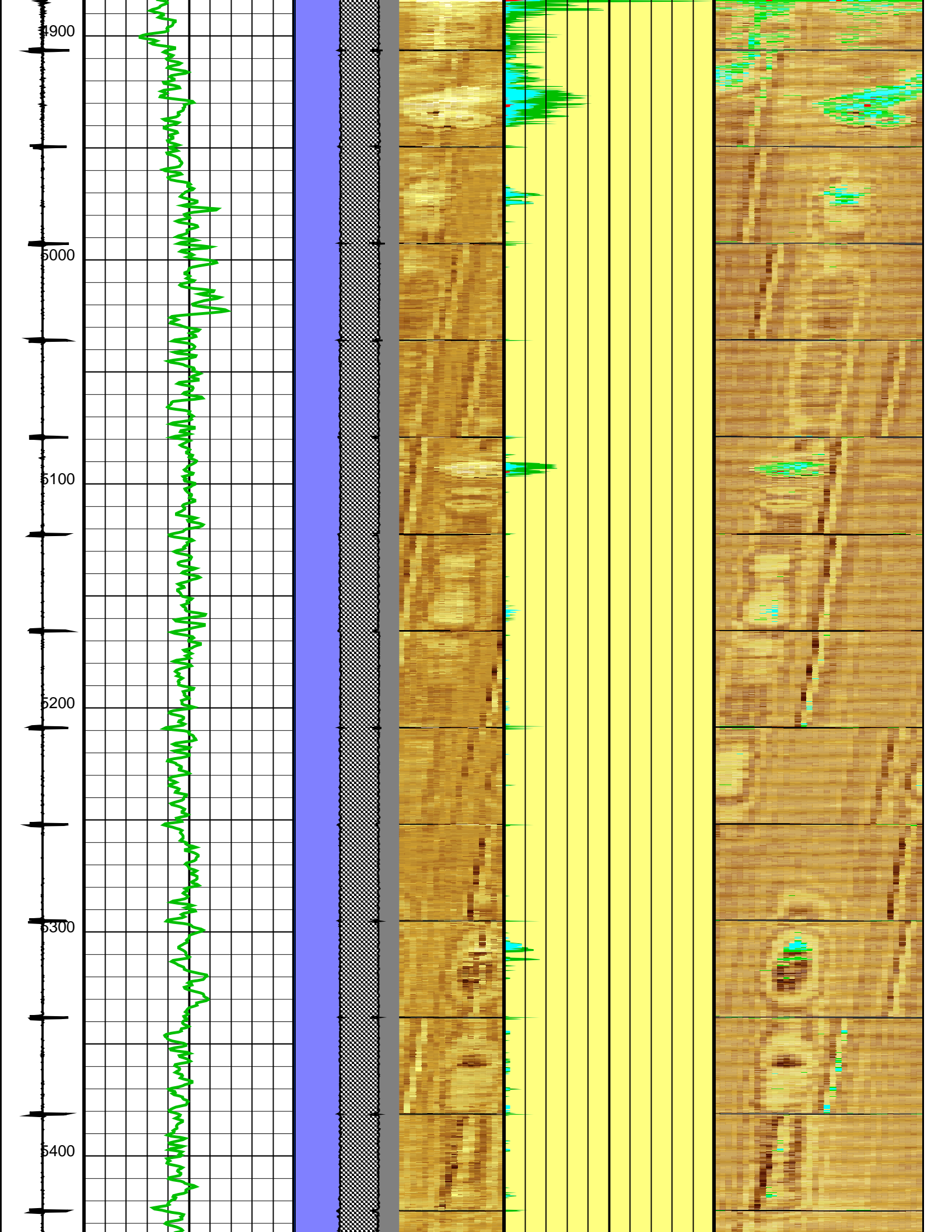


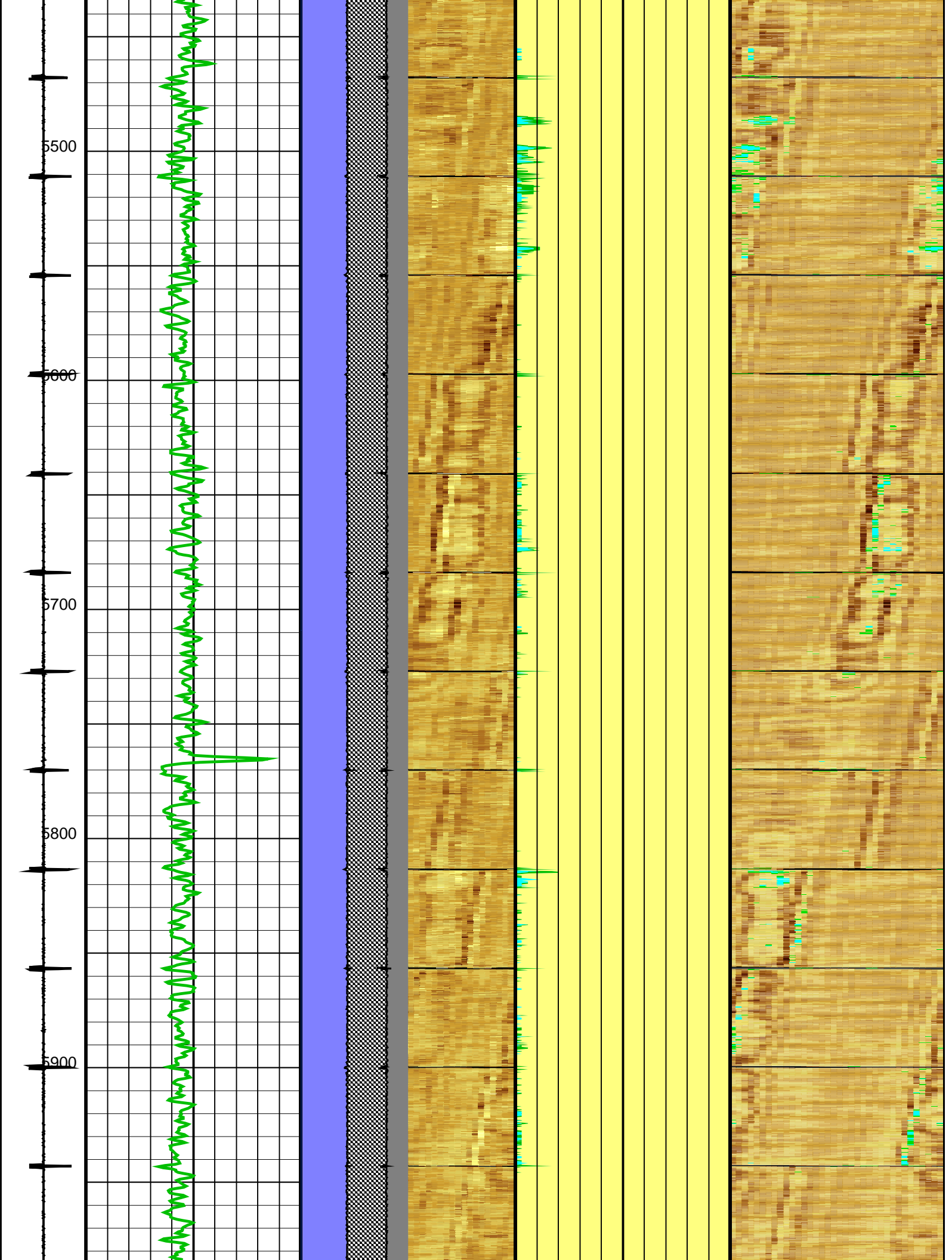


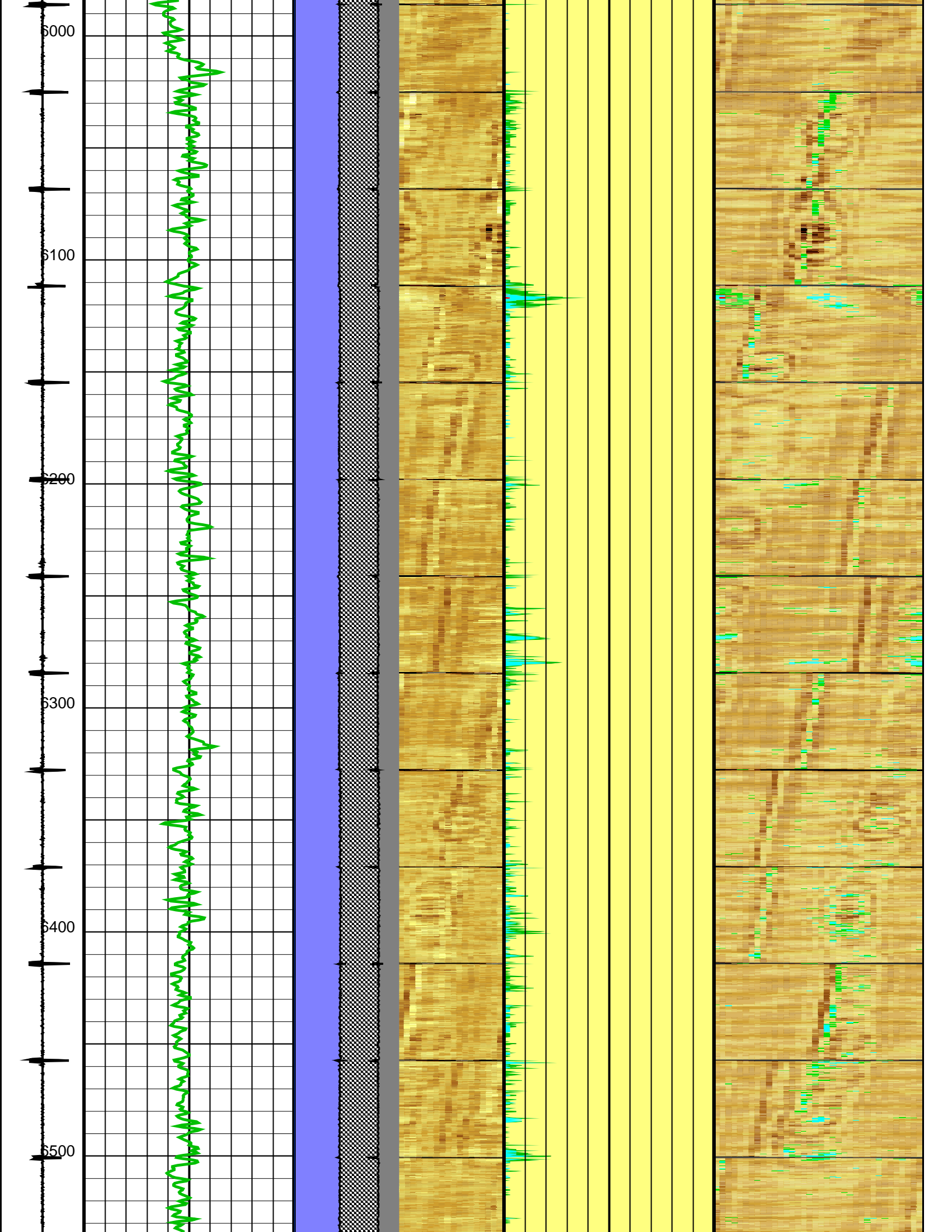




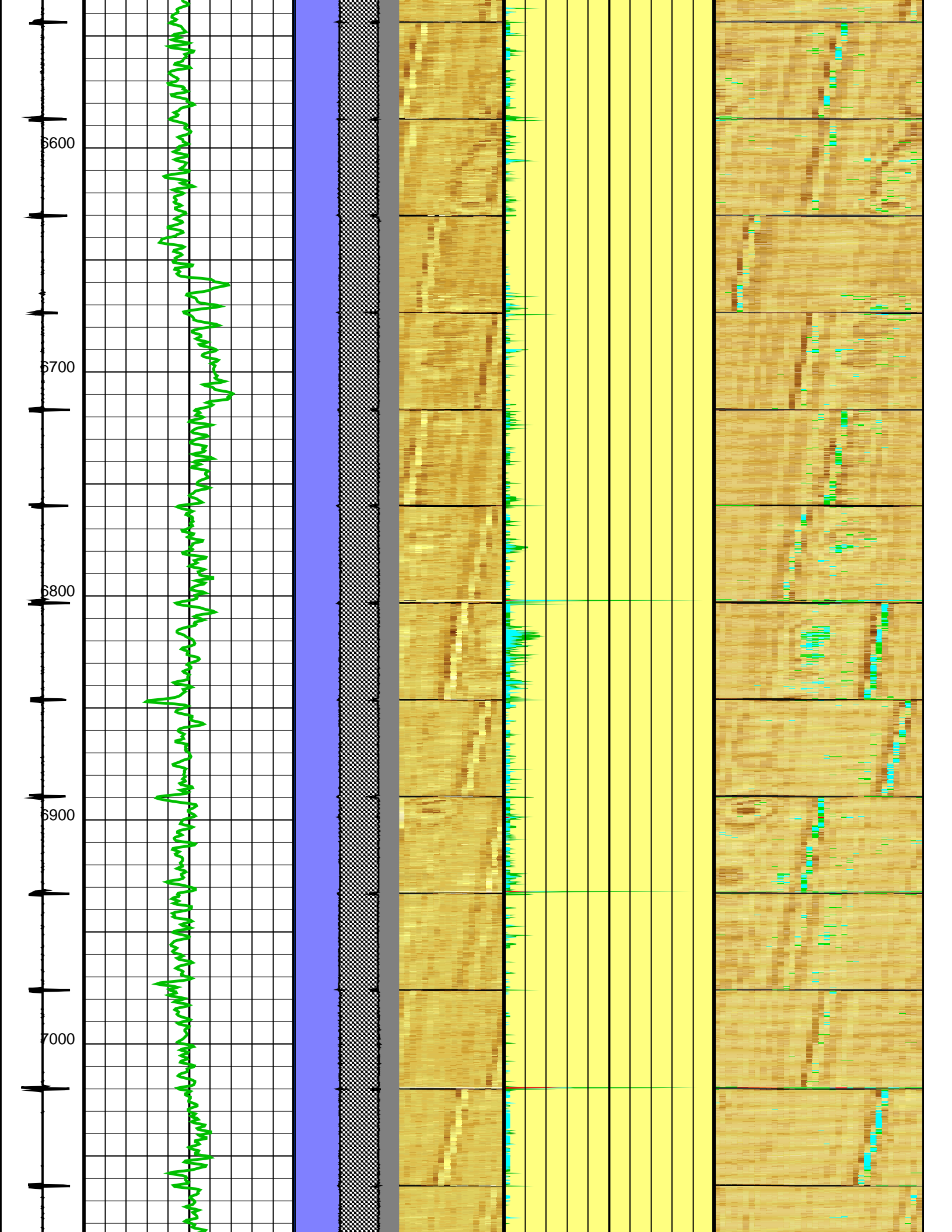


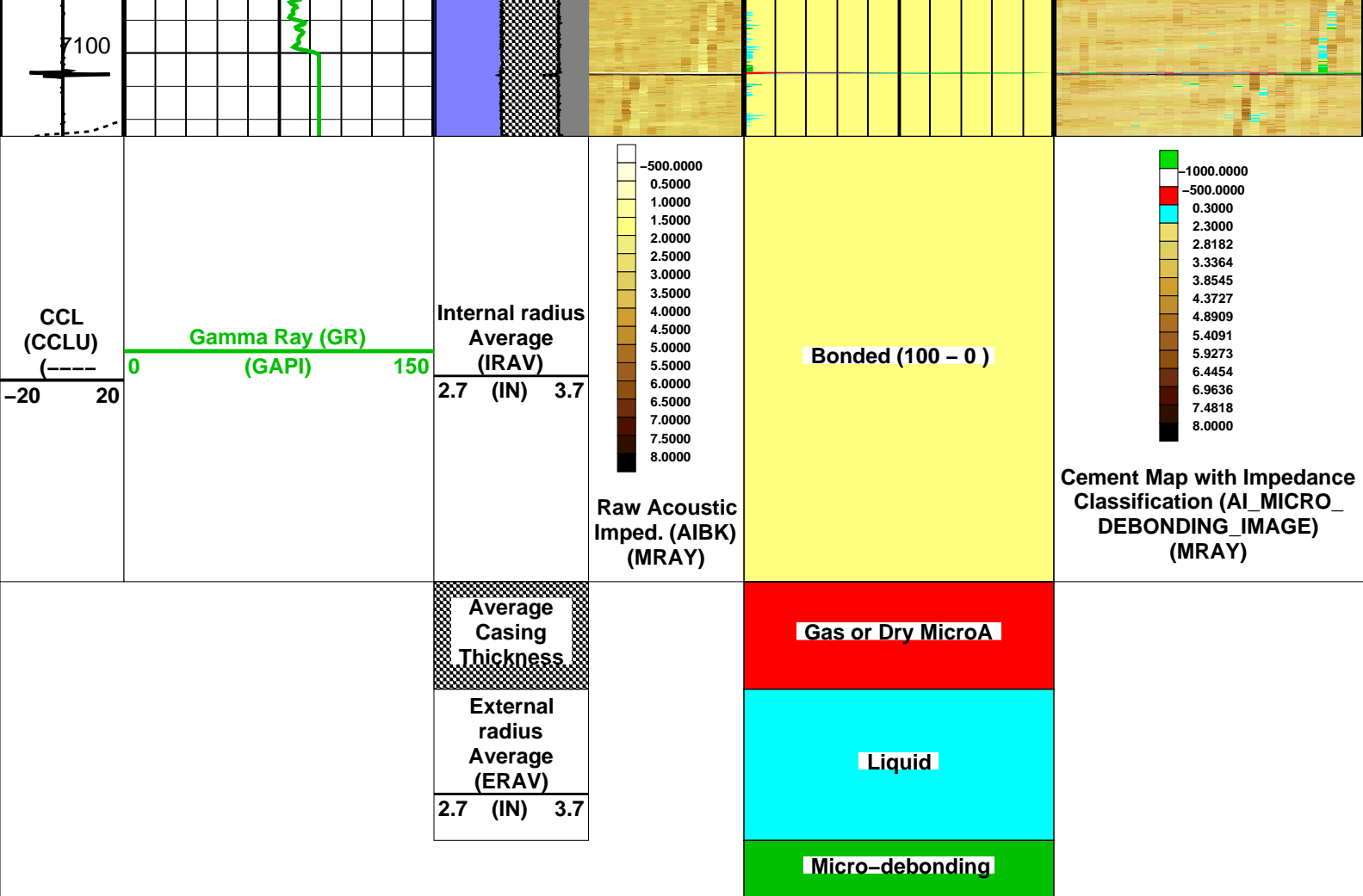












Format: USIT ND State 2 inch      Vertical Scale: 2" per 100'      Graphics File Created: 15-Nov-2013 13:43

## OP System Version: 19C1-222

USIT-E	19C1-222	SGT-N	19C1-222
DTC-H	19C1-222		

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	190	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	50	V
FDII	FPM Data Interpolation Interval	0	FT
IMAR	Image Rotation	OFF	
MW	Mud Weight	8.8	LB/G
RCOD	Reference Calibrator Outer Diameter	7	IN
RCSO	Reference Calibrator Standoff	1.1811	IN

RCSO	Reference Calibrator Standoff	1.1011	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	1.8	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	4.0	FT
PP	Playback Processing	RECOMPUTE	

### Input DLIS Files

DEFAULT	Splice_USI_018CUP	FN:1	PRODUCER	15-Nov-2013 13:40	7121.0 FT	-4.7 FT
---------	-------------------	------	----------	-------------------	-----------	---------

### Output DLIS Files

DEFAULT	USI_022PUP	FN:20	PRODUCER	15-Nov-2013 13:43
---------	------------	-------	----------	-------------------

**Schlumberger**

**Compressed Goodwin**

MAXIS Field Log

Company: Kerr-McGee Oil & Gas Onshore LP

Well: D&C Farms 36C-33HZ

### Input DLIS Files

DEFAULT	Splice_USI_018CUP	FN:1	PRODUCER	15-Nov-2013 13:40	7121.0 FT	-4.7 FT
---------	-------------------	------	----------	-------------------	-----------	---------

### Output DLIS Files

DEFAULT	USI_022PUP	FN:20	PRODUCER	15-Nov-2013 13:43
---------	------------	-------	----------	-------------------

### OP System Version: 19C1-222

USIT-E	19C1-222	SGT-N	19C1-222
DTC-H	19C1-222		

### Zoning of Mud Parameters

Depth	Fluid Velocity (DFVL)	Acoustic Impedance (ZMUD)
7300.00	188.00	1.67



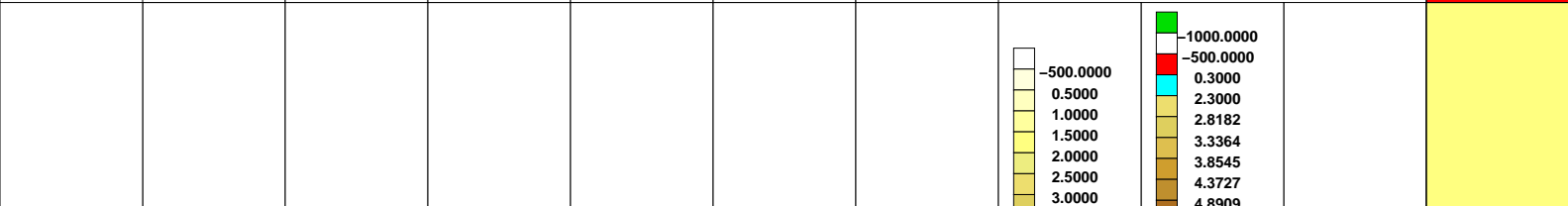
7000.00	188.00	1.67
6500.00	188.00	1.67
6000.00	188.00	1.67
5500.00	188.00	1.67
5000.00	188.00	1.67
4500.00	189.00	1.66
4000.00	190.00	1.65
3500.00	191.00	1.64
3000.00	192.00	1.64
2500.00	194.00	1.62
2000.00	196.00	1.60
1500.00	198.00	1.59
1000.00	200.00	1.59
500.00	203.00	1.57

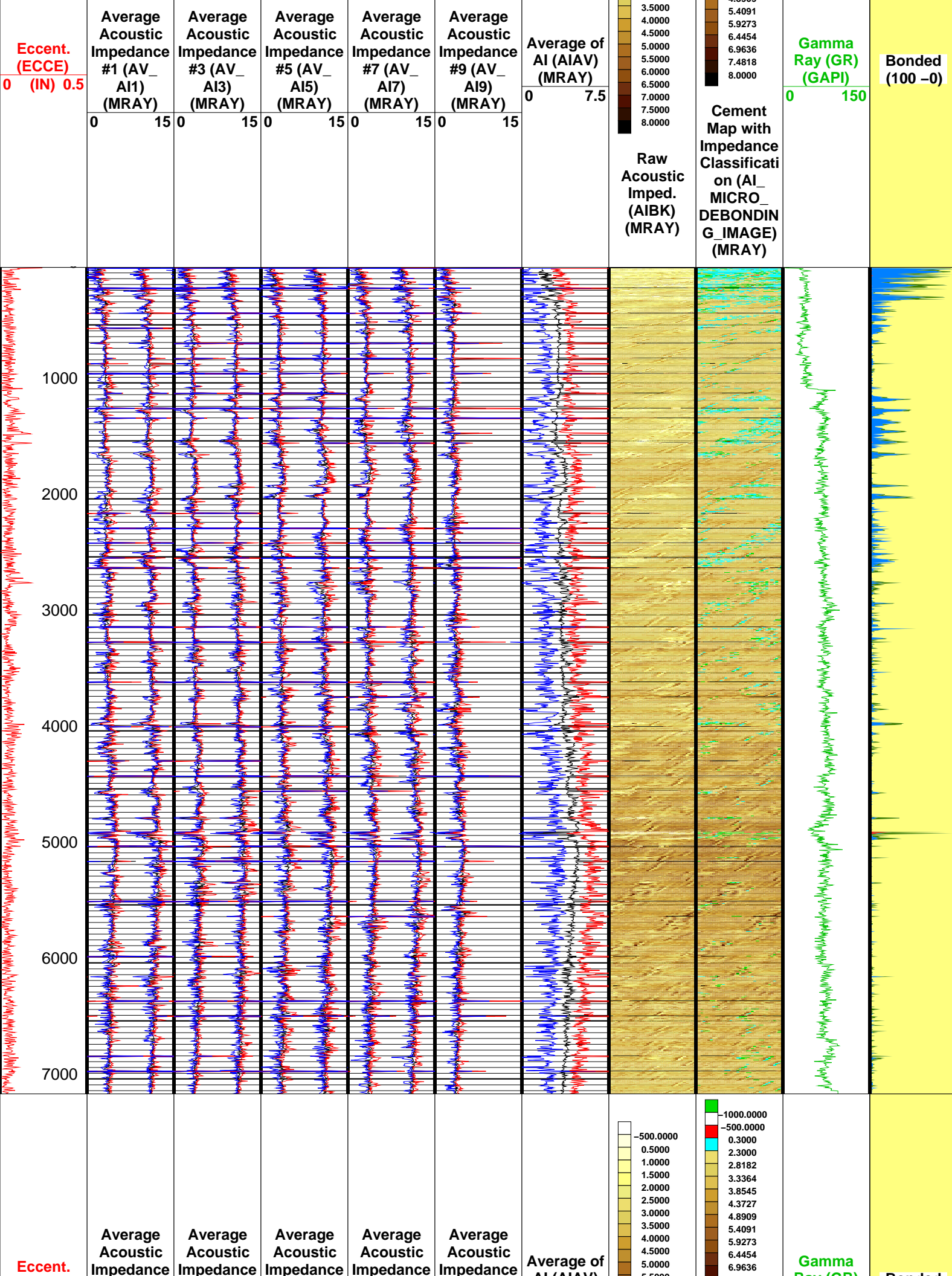
	Minimum Acoustic Impedance #2 (MIN_ AI2) (MRAY)	Minimum Acoustic Impedance #4 (MIN_ AI4) (MRAY)	Minimum Acoustic Impedance #6 (MIN_ AI6) (MRAY)	Minimum Acoustic Impedance #8 (MIN_ AI8) (MRAY)		
	-7.57.5	-7.57.5	-7.57.5	-7.57.5		
	Minimum Acoustic Impedance #1 (MIN_ AI1) (MRAY)	Minimum Acoustic Impedance #3 (MIN_ AI3) (MRAY)	Minimum Acoustic Impedance #5 (MIN_ AI5) (MRAY)	Minimum Acoustic Impedance #7 (MIN_ AI7) (MRAY)		
	015	015	015	015		
	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)		
	-7.57.5	-7.57.5	-7.57.5	-7.57.5		
	Maximum Acoustic Impedance #1 (MAX_ AI1) (MRAY)	Maximum Acoustic Impedance #3 (MAX_ AI3) (MRAY)	Maximum Acoustic Impedance #5 (MAX_ AI5) (MRAY)	Maximum Acoustic Impedance #7 (MAX_ AI7) (MRAY)	Minimum Acoustic Impedance #9 (MIN_ AI9) (MRAY)	Maximum of AI (AIMX) (MRAY)
	015	015	015	015	015	07.5
	Average Acoustic Impedance #2 (AV_ AI2) (MRAY)	Average Acoustic Impedance #4 (AV_ AI4) (MRAY)	Average Acoustic Impedance #6 (AV_ AI6) (MRAY)	Average Acoustic Impedance #8 (AV_ AI8) (MRAY)	Maximum Acoustic Impedance #9 (MAX_ AI9) (MRAY)	Minimum of AI (AIMN) (MRAY)
	-7.57.5	-7.57.5	-7.57.5	-7.57.5	015	07.5

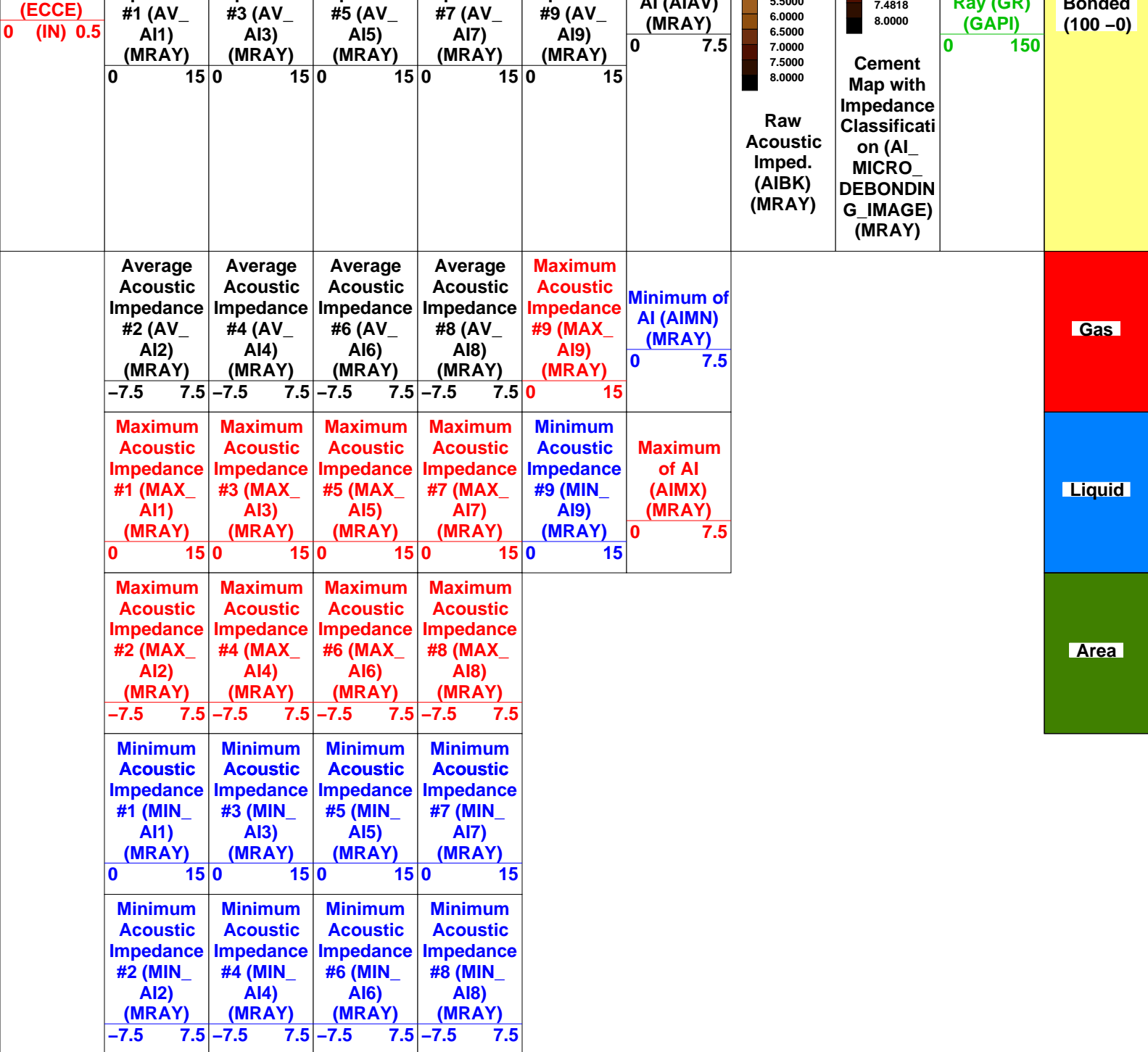
Area

Liquid

Gas







Format: USIT only Goodwin Compressed Vertical Scale: 0.1" per 100' Graphics File Created: 15-Nov-2013 13:43

## OP System Version: 19C1-222

USIT-E 19C1-222 SGT-N 19C1-222  
DTC-H 19C1-222

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 Splice USI 018CHP FN:1 PRODUCER 15-Nov-2013 13:43 7121.0 FT 1.7 FT



DEFAULT	Splice_USI_018CUP	FN:1	PRODUCER	15-Nov-2013 13:40	7121.0 FT	-4.7 FT
Output DLIS Files						
DEFAULT	USI_022PUP	FN:20	PRODUCER	15-Nov-2013 13:43		



Repeat Pass

MAXIS Field Log

Company: Kerr-McGee Oil & Gas Onshore LP Well: D&C Farms 36C-33HZ

Input DLIS Files						
DEFAULT	USI_011LUP	FN:10	PRODUCER	15-Nov-2013 11:43	7055.0 FT	6749.0 FT
Output DLIS Files						
DEFAULT	USI_025PUP	FN:23	PRODUCER	15-Nov-2013 13:55	7058.0 FT	6752.0 FT

OP System Version: 19C1-222						
USIT-E	19C1-222		SGT-N	19C1-222		
DTC-H	19C1-222					

Zoning of Mud Parameters		
Depth	Fluid Velocity (DFVL)	Acoustic Impedance (ZMUD)
7300.00	188.00	1.67
7000.00	188.00	1.67
6500.00	188.00	1.67
6000.00	188.00	1.67
5500.00	193.26	1.66
5000.00	193.54	1.73
4500.00	192.31	1.84
4000.00	193.12	1.72
3500.00	193.21	1.59
3000.00	194.79	1.71
2500.00	196.36	1.70
2000.00	198.31	1.75
1500.00	203.25	1.77
1000.00	204.70	1.70

**500.00**

**207.68**

**1.66**

Image  
rotation  
(UCAZ)  
(DEG)

0 360

**Azimuth of  
eccent.  
(AZEC)  
(DEG)**

0	360
---	-----

**Cable  
Speed (CS)  
(F/HR)**

0 2000

Rev. speed  
(RSAV)  
(RPS)

**-8**                      **-6**

CCL  
(CCLU)  
(----

-20	20
-----	----

Rev. speed (RSAV)	
6 (PPS)	8

0 (K10) 0

**Eccent.  
(ECCF)**

0 (IN) 0.5

**Process.  
flags  
(UFLG)  
(----**

Min. of  
Amplitude  
(AWMN)

**External  
radius  
Average  
(ERAV)  
(IN)**

3.7 2.

**External  
radius  
Average  
(ERAV)  
(IN)**

**.7      3.7**

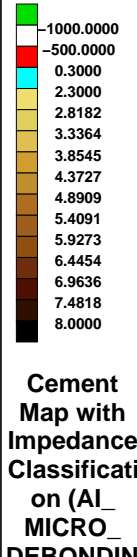
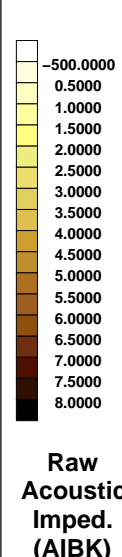
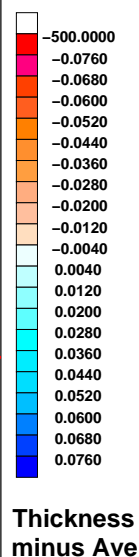
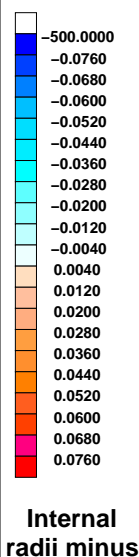
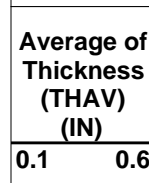
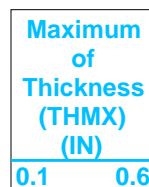
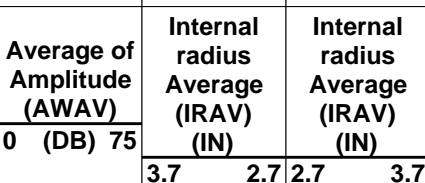
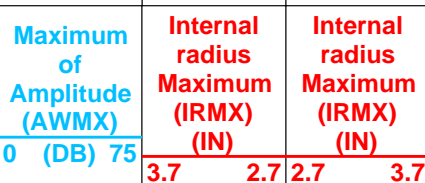
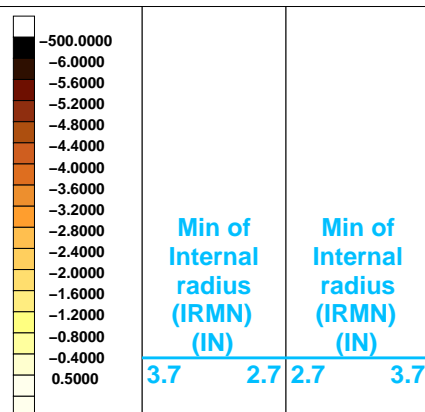
Min of Thickness (THMN) (IN)

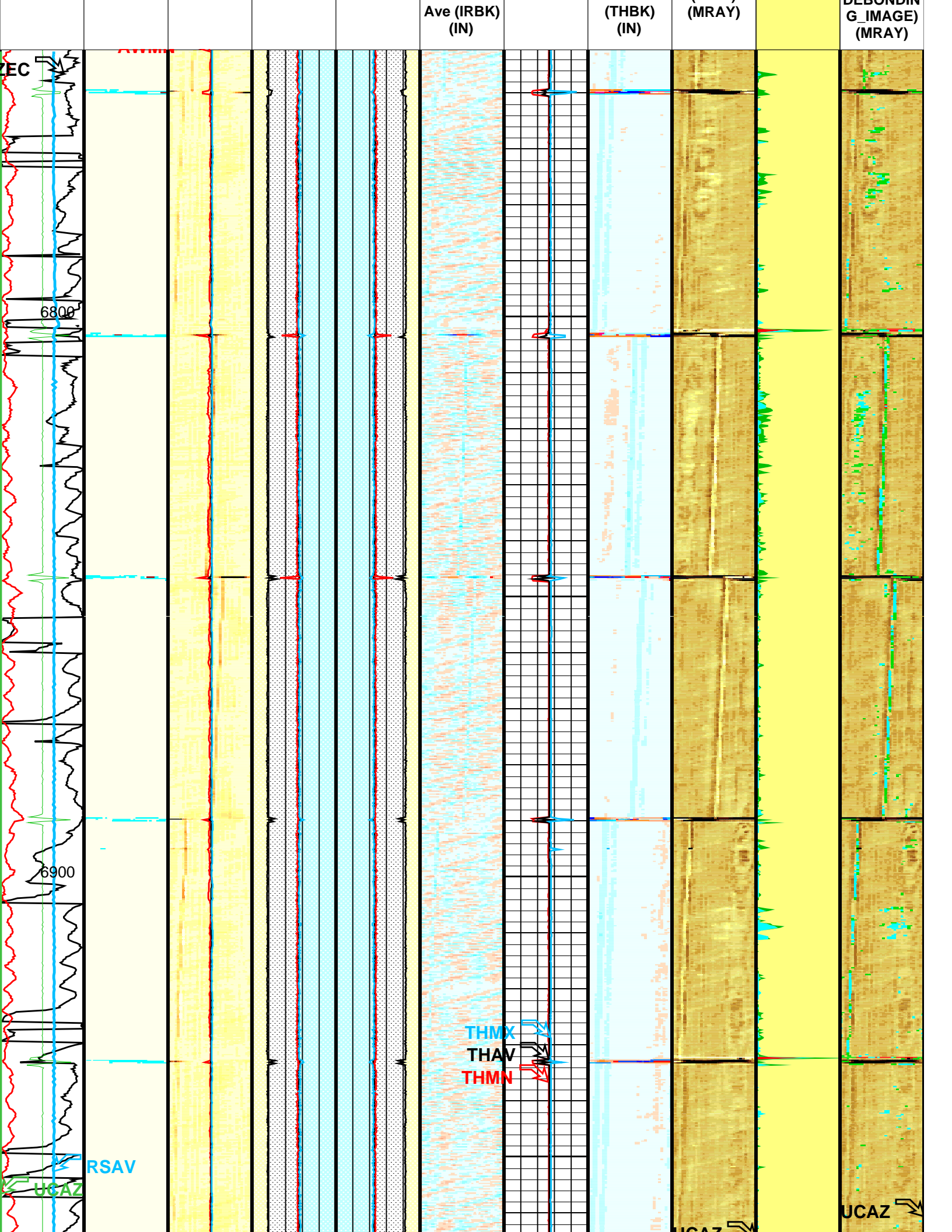
0.1 0.6

Raw  
Acoustic  
Imped.  
(AIBK)

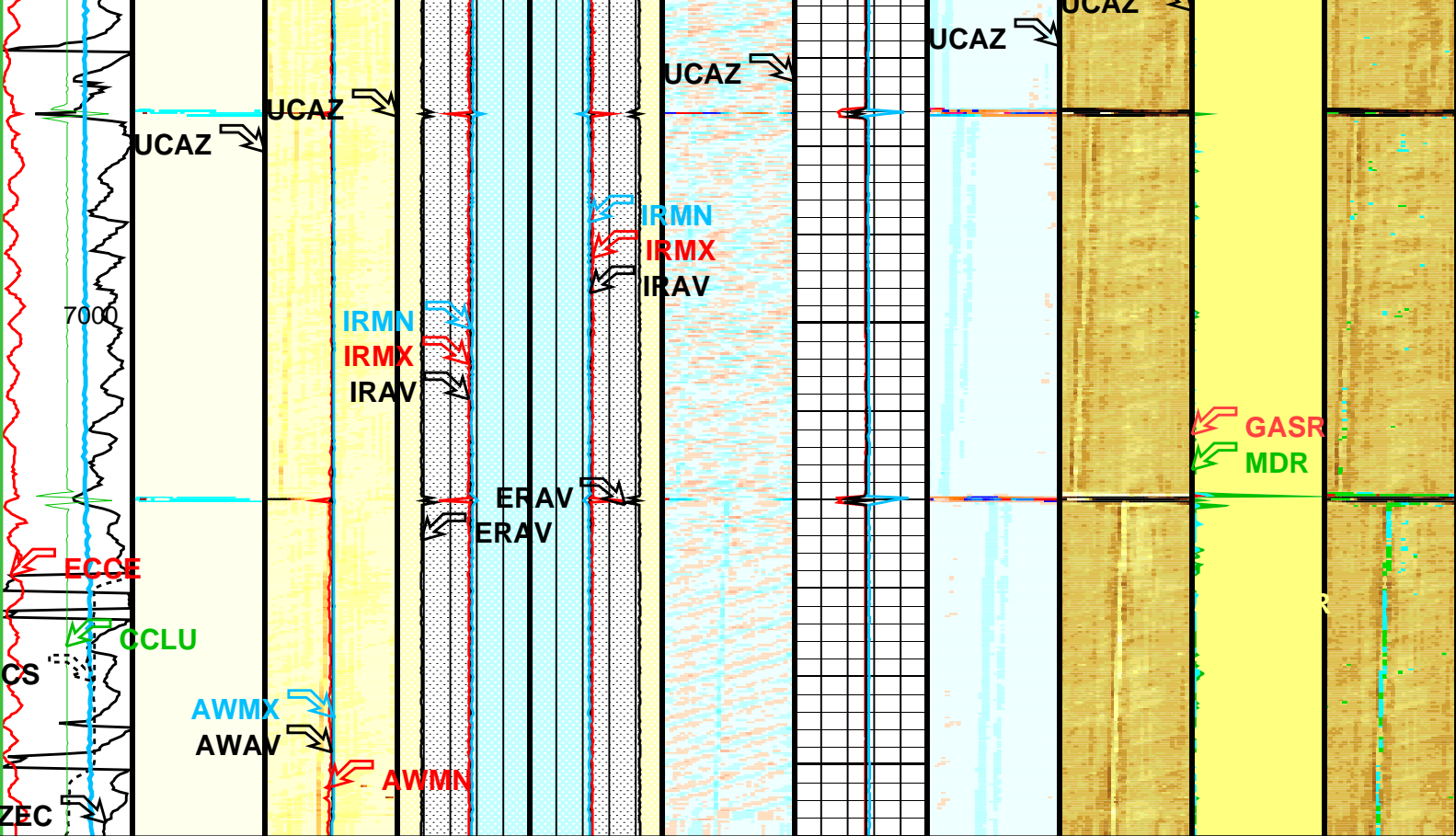
**Bonded**

# Cement Map with Impedance Classification (AI\_MICRO\_DEBONDING)









<div><div>Eccent. (ECCE)</div><div>0 (IN) 0.5</div></div>	<div><div>Process. flags (UFLG) (----</div><div><div>0.5000 1.5000 2.5000 3.5000 6.5000</div></div></div>	<div><div>Min. of Amplitude (AWMN)</div><div>0 (DB) 75</div></div>	<div><div>External radius Average (ERAV) (IN)</div><div>3.7 2.7 2.7 3.7</div></div>	<div><div>External radius Average (ERAV) (IN)</div><div>3.7 2.7 2.7 3.7</div></div>	<div><div>Internal radii minus Ave (IRBK) (IN)</div><div><div><div><div></div><div>-500.0000 -0.0760 -0.0680 -0.0600 -0.0520 -0.0440 -0.0360 -0.0280 -0.0200 -0.0120 -0.0040 0.0040 0.0120 0.0200 0.0280 0.0360 0.0440 0.0520 0.0600 0.0680 0.0760</div></div></div></div></div>	<div><div>Min of Thickness (THMN) (IN)</div><div>0.1 0.6</div></div>	<div><div>Thickness minus Ave (THBK) (IN)</div><div><div><div><div></div><div>-500.0000 -0.0760 -0.0680 -0.0600 -0.0520 -0.0440 -0.0360 -0.0280 -0.0200 -0.0120 -0.0040 0.0040 0.0120 0.0200 0.0280 0.0360 0.0440 0.0520 0.0600 0.0680 0.0760</div></div></div></div></div>	<div><div>Raw Acoustic Imped. (AIBK) (MRAY)</div><div><div><div><div></div><div>-500.0000 0.5000 1.0000 1.5000 2.0000 2.5000 3.0000 3.5000 4.0000 4.5000 5.0000 5.5000 6.0000 6.5000 7.0000 7.5000 8.0000</div></div></div></div></div>	<div><div>Bonded</div></div>	<div><div>Cement Map with Impedance Classificati on (AI_ MICRO_ DEBONDIN G_IMAGE) (MRAY)</div><div><div><div><div></div><div>-1000.0000 -500.0000 0.3000 2.3000 2.8182 3.3364 3.8545 4.3727 4.8909 5.4091 5.9273 6.4454 6.9636 7.4818 8.0000</div></div></div></div></div>
<div><div>Rev. speed (RSAV)</div><div>6 (RPS) 8</div></div>		<div><div>Average of Amplitude (AWAV)</div><div>0 (DB) 75</div></div>	<div><div>Internal radius Average (IRAV) (IN)</div><div>3.7 2.7 2.7 3.7</div></div>	<div><div>Internal radius Average (IRAV) (IN)</div><div>3.7 2.7 2.7 3.7</div></div>		<div><div>Average of Thickness (THAV) (IN)</div><div>0.1 0.6</div></div>			<div><div>Gas or Dry MicroA</div></div>	
<div><div>CCL (CCLU) (----</div><div>-20 20</div></div>		<div><div>Maximum of Amplitude (AWMX)</div><div>0 (DB) 75</div></div>	<div><div>Internal radius Maximum (IRMX) (IN)</div><div>3.7 2.7 2.7 3.7</div></div>	<div><div>Internal radius Maximum (IRMX) (IN)</div><div>3.7 2.7 2.7 3.7</div></div>		<div><div>Maximum of Thickness (THMX) (IN)</div><div>0.1 0.6</div></div>			<div><div>Liquid</div></div>	
		<div><div><div><div></div><div>-500.0000 -6.0000 -5.6000 -5.2000 -4.8000 -4.4000 -4.0000</div></div></div></div>								

<div>Rev. speed (RSAV) (RPS)</div> <div>-8-6</div>	<div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div></div>
--	---

Format: USI_Composite		Vertical Scale: 5" per 100'		Graphics File Created: 15-Nov-2013 13:55	
OP System Version: 19C1-222					
USIT-E	19C1-222	SGT-N	19C1-222		
DTC-H	19C1-222				
All USI Images are outside views					
COMPUTATION FLAGS LABELLING					
(0 – 1.5)	UFLG 1	UTIM error			
(1.5 – 2.5)	UFLG 2	Pulse origin not detected			
(2.5 – 3.5)	UFLG 3	WINLEN error			
(3.5 – 6.5)	UFLG 4	UFLG 5	UFLG 6	CASING THICKNESS error	
(6.5 – 10)	UFLG 7	UFLG 8	UFLG 9	LOOP PROCESSING error	
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	190	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	50	V
FDII	FPM Data Interpolation Interval	0	FT
IMAR	Image Rotation	OFF	
MW	Mud Weight	8.8	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	1.8	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	3.0	FT
PP	Playback Processing	RECOMPUTE	

## Input DLIS Files

DEFAULT	USI_011LUP	FN:10	PRODUCER	15-Nov-2013 11:43	7055.0 FT	6749.0 FT
---------	------------	-------	----------	-------------------	-----------	-----------

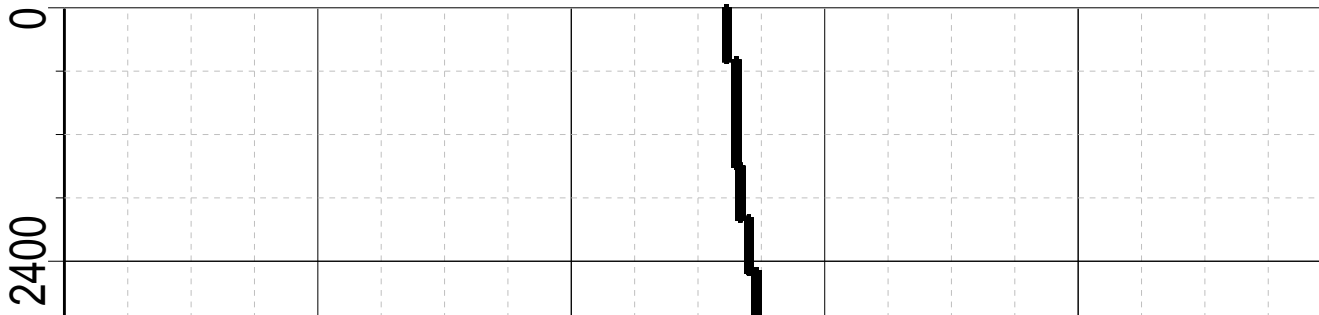
## Output DLIS Files

DEFAULT	USI_025PUP	FN:23	PRODUCER	15-Nov-2013 13:55
---------	------------	-------	----------	-------------------

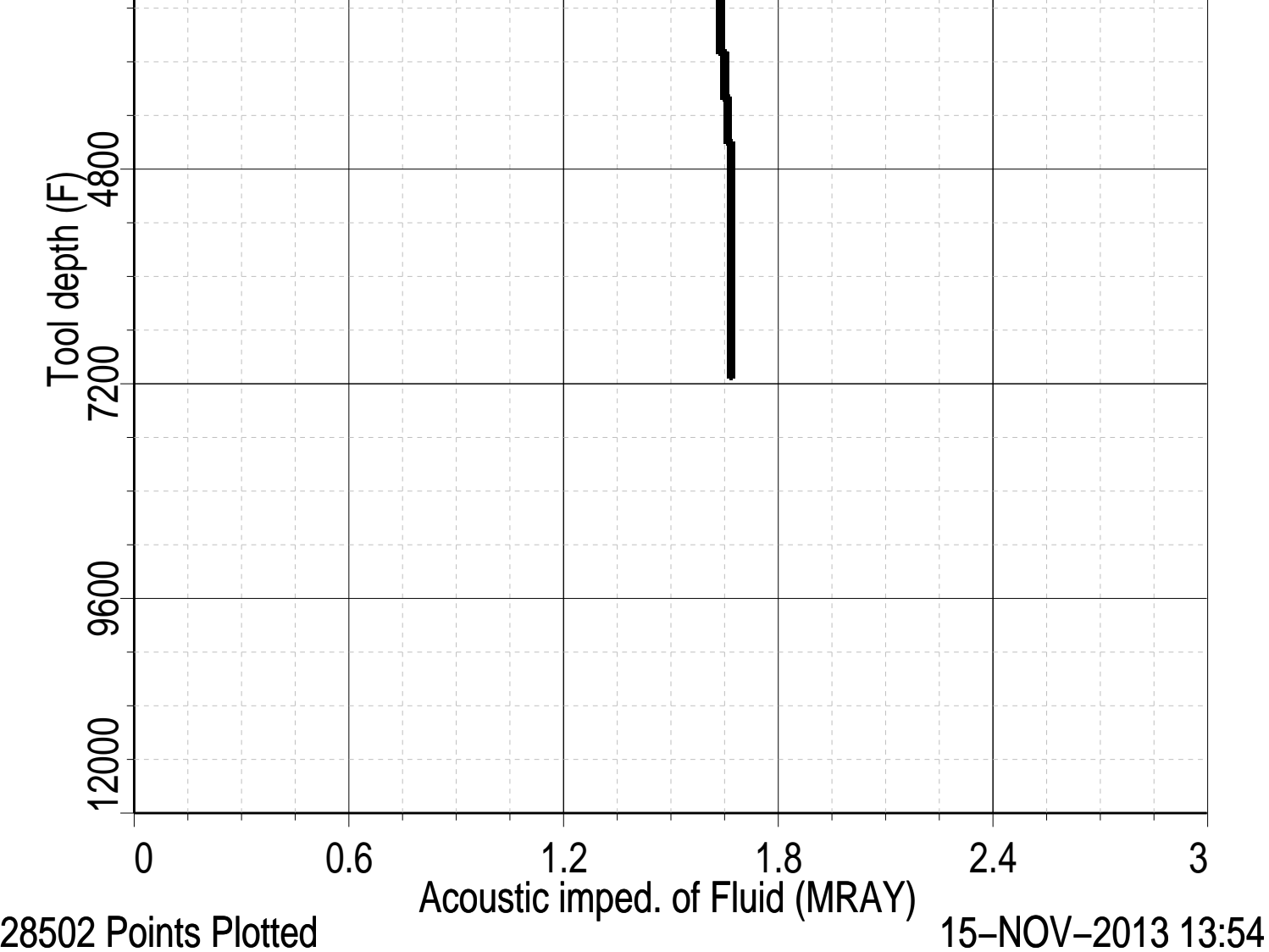
**Schlumberger****Fluid Properties**

MAXIS Field Log

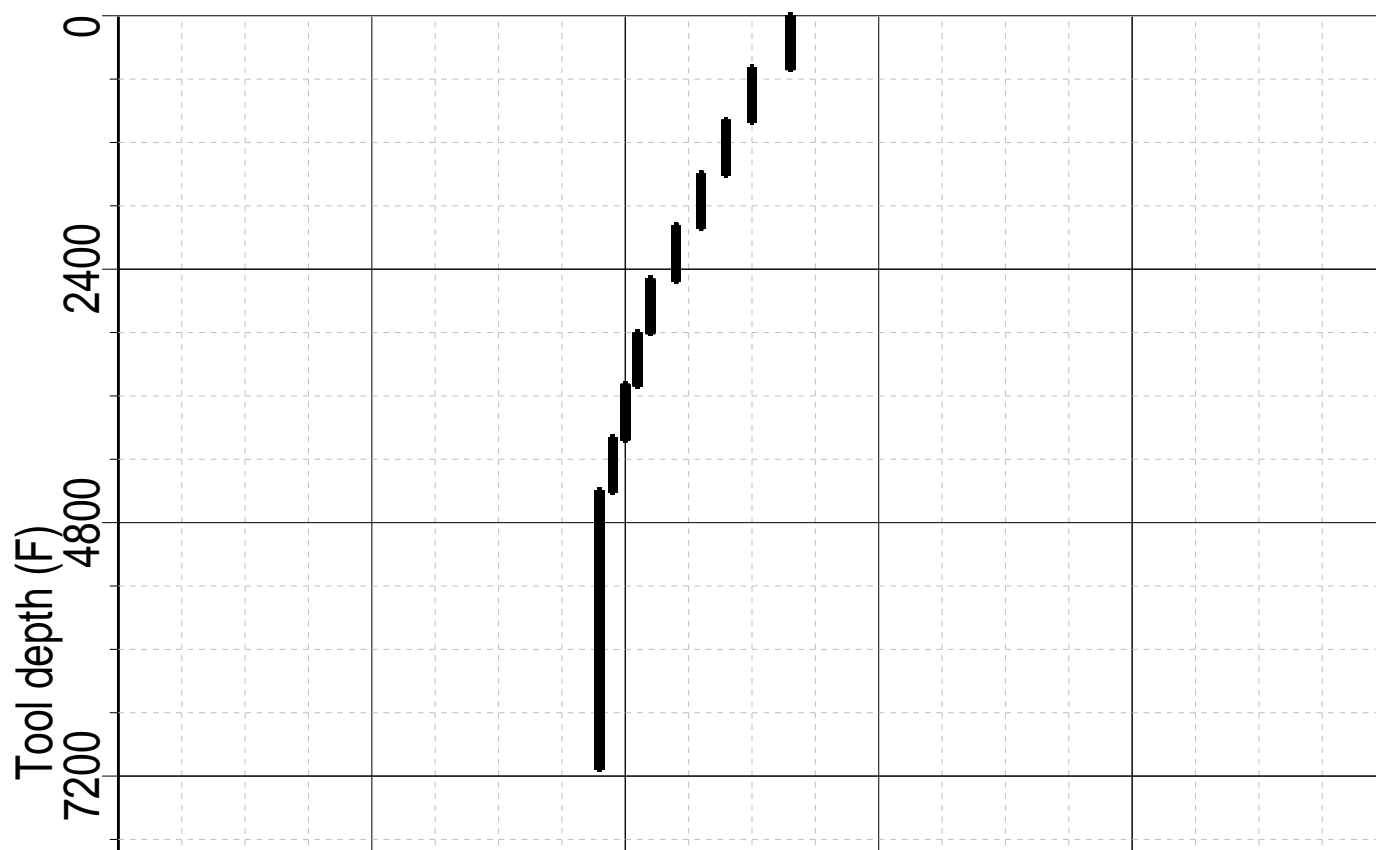
Index: 7125.0 - -0.2 FT

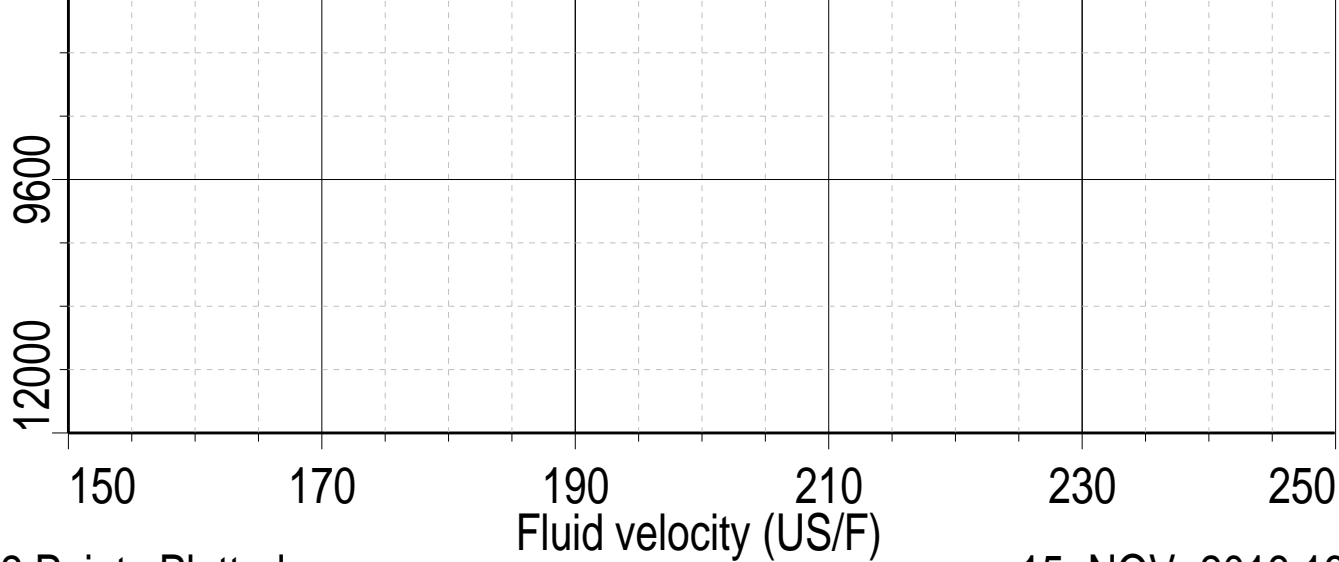






Index: 7125.0 - -0.2 FT





28502 Points Plotted

15-NOV-2013 13:54

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

**Schlumberger**

Well: **D&C Farms 36C-33HZ**

Field: **Wattenberg**

County: **Weld**

State: **Colorado**

Ultrasonic Imager  
Cement Evaluation