

HALLIBURTON

RADIAL CEMENT
BOND LOG

Company	EXTRACTION OIL & GAS INC	
Well	LIVINGSTON S19-25-12N	
Field	WATTENBERG	
County	BROOMFIELD	State CO
Company EXTRACTION OIL & GAS INC		
Well LIVINGSTON S19-25-12N		
Field WATTENBERG		
County BROOMFIELD State CO		
API No.: 05142075000	Serv #: 906093751	Other Services
Location: SURFACE HOLE LOCATION: 2331' FSL & 1330' FEL NWSE		
LATITUDE: 39.978561		
LONGITUDE: -105.039416		
NONE		
Sec: 7 Twp: 1S Rge: 68W		
Permanent Datum	GROUND LEVEL	Elevation 5320
Log Measured From	KB	29 Ft. above perm. datum
Drilling Measured From	KB	K.B. 5349 D.F. 5349 G.L. 5320
Date @ Time Logged	11/6/19 @ 13:30	Type Fluid in Hole
Run No.	ONE	Density of Fluid
Depth - Driller	20993	Fluid Level
Depth - Logger	7390	Cement Top Est. Logged
Bottom - Logged Interval	7380	Equipment / Location
Top - Log Interval	SURFACE	Recorded by
Max. Recorded Temp.	226 F	Witnessed by
CEMENTING DATA	Surface	Protection
	String	String
Date / Time Cemented		
Primary / Squeeze		
Expected Compressive Strength	psi@ hrs	psi@ hrs
Cement Volume		
Cement Type / Weight	/	/
Formulation		
Mud Type / Mud Wgt.	/	/
Borehole Record		
Run Number	Bit	From
ONE	12.25	0
TWO	8.5	1500
		20993
		5.5
		17
		0
		20993
Casing & Tubing Record		
	Weight	From
		1500
		20993

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HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.

Comments

RCBL - GR - CCL RAN IN COMBINATION.

LOG RECORDED WITH 0 PSI WELLHEAD PRESSURE.

LOG CORRELATED TO MARKER JOINT AT 7225.

BOND INDEX CALCULATED FOR 3000 PSI COMPRESSIVE STRENGTH CEMENT.

THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES.

YOUR CREW TODAY WAS:

C. KLEINSASSER & E. GOOD

Service Ticket No.	906093751	API No.	05142075000	PGM Ver	WARRIOR 8
The Well Name, Location, Borehole Description, and / or Cementing Data Furnished by Client					
EQUIPMENT DATA					
RCBL		GAMMA CCL			
Run No.	ONE	Run No.	ONE	Run No.	
Serial No.	11568129	Serial No.	50806	Serial No.	
Model No.	PROBE	Model No.	PROBE	Model No.	
Diameter	2.75	Diameter	2.75	Diameter	
LOGGING DATA					
General Data					
Pass	Depths		Well Head	Speed	Logging Run Comments
No	From	To	Pressure	Ft/Min	

ONE	KOP	SURFACE	0 PSI	100				
	GAMMA RAY		AMPLITUDE		VDL		RADIAL MAP	
Pass	Scale		Scale		Scale		Scale	
No.	L	R	L	R	L	R	L	L
ONE	0	150	0	100	200	1200	1	8
DIRECTIONAL INFORMATION								
Maximum Deviation		90	deg. @		KOP			

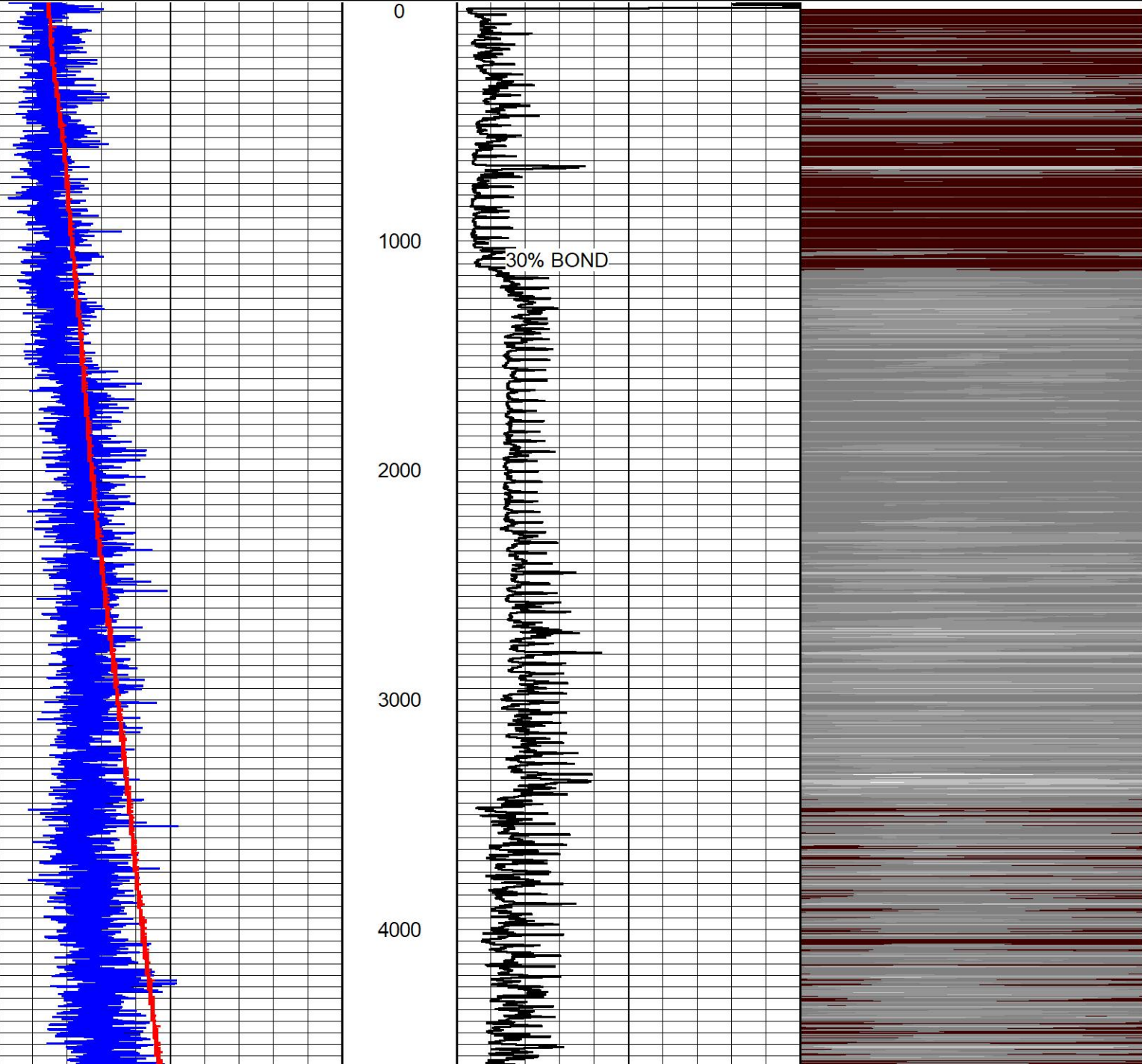
HALLIBURTON

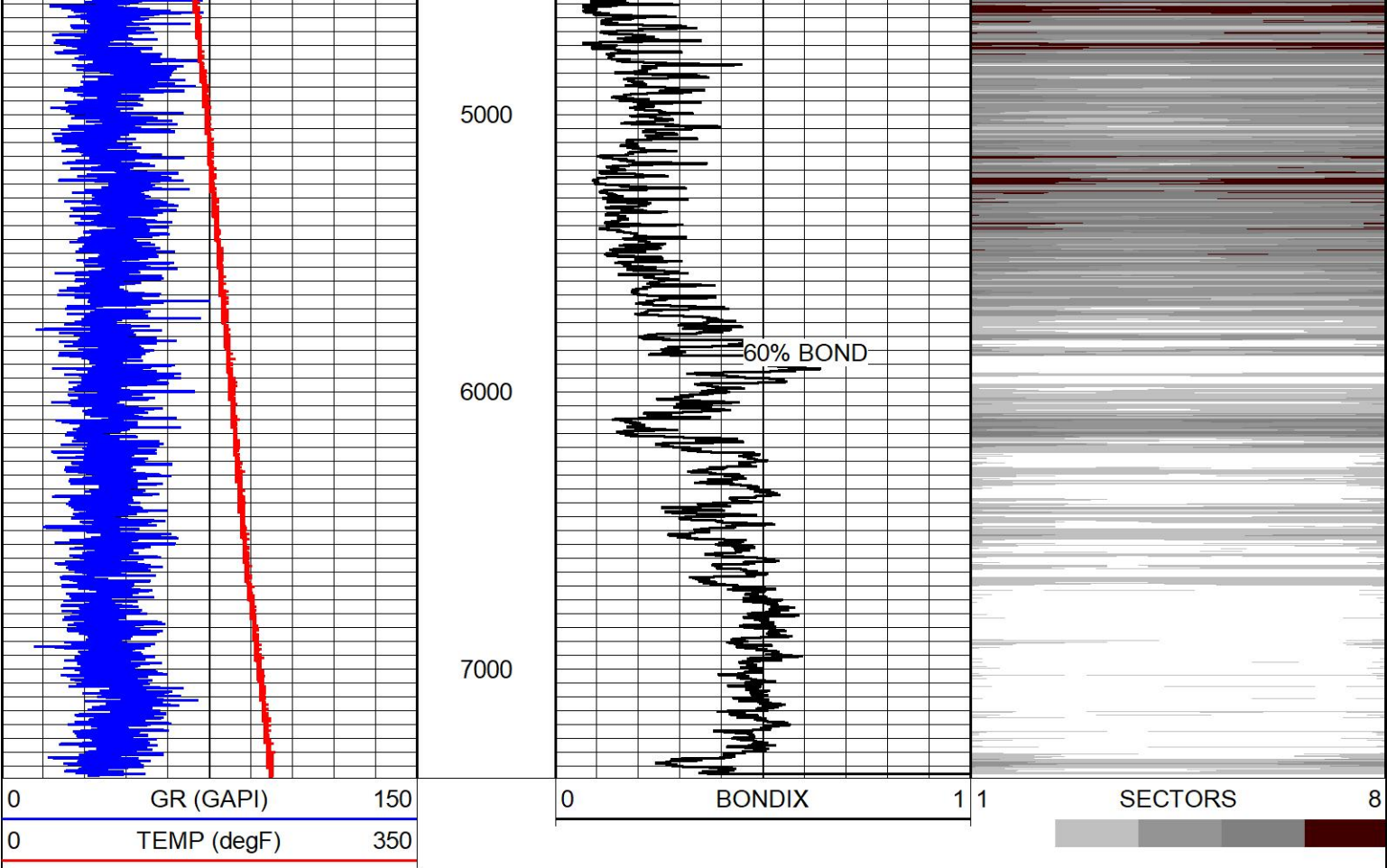
BOND INDEX

1:7500

Database File livingston s19-25-12n.db
Dataset Pathname MAIN_PASS.1
Presentation Format EXTRAC~2
Dataset Creation Wed Nov 06 14:52:58 2019
Charted by Depth in Feet scaled 1:7500

0	GR (GAPI)	150	0	BONDIX	1	1	SECTORS	8
0	TEMP (degF)	350						





BOND INDEX

HALLIBURTON

1:7500

FREE PIPE PASS

HALLIBURTON

5" = 100'

Database File

livingston s19-25-12n.db

Dataset Pathname

FREE_PIPE_PASS

Presentation Format

EXTRAC~1

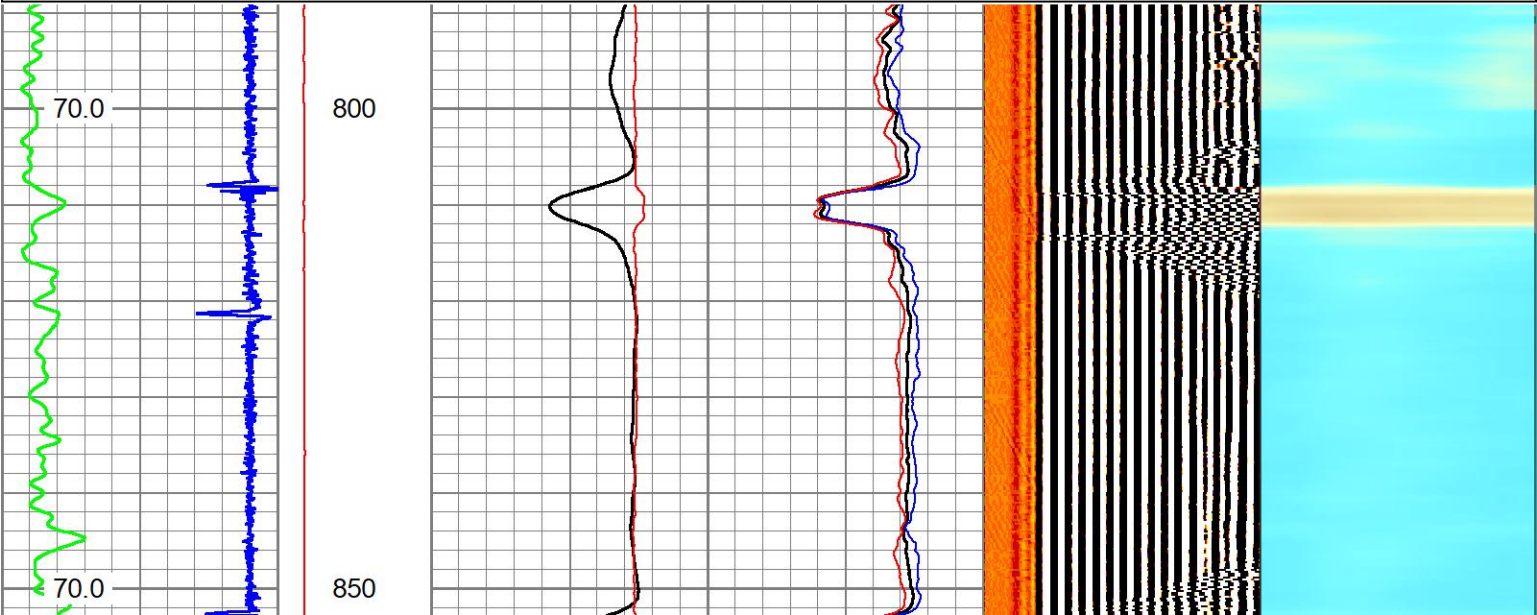
Dataset Creation

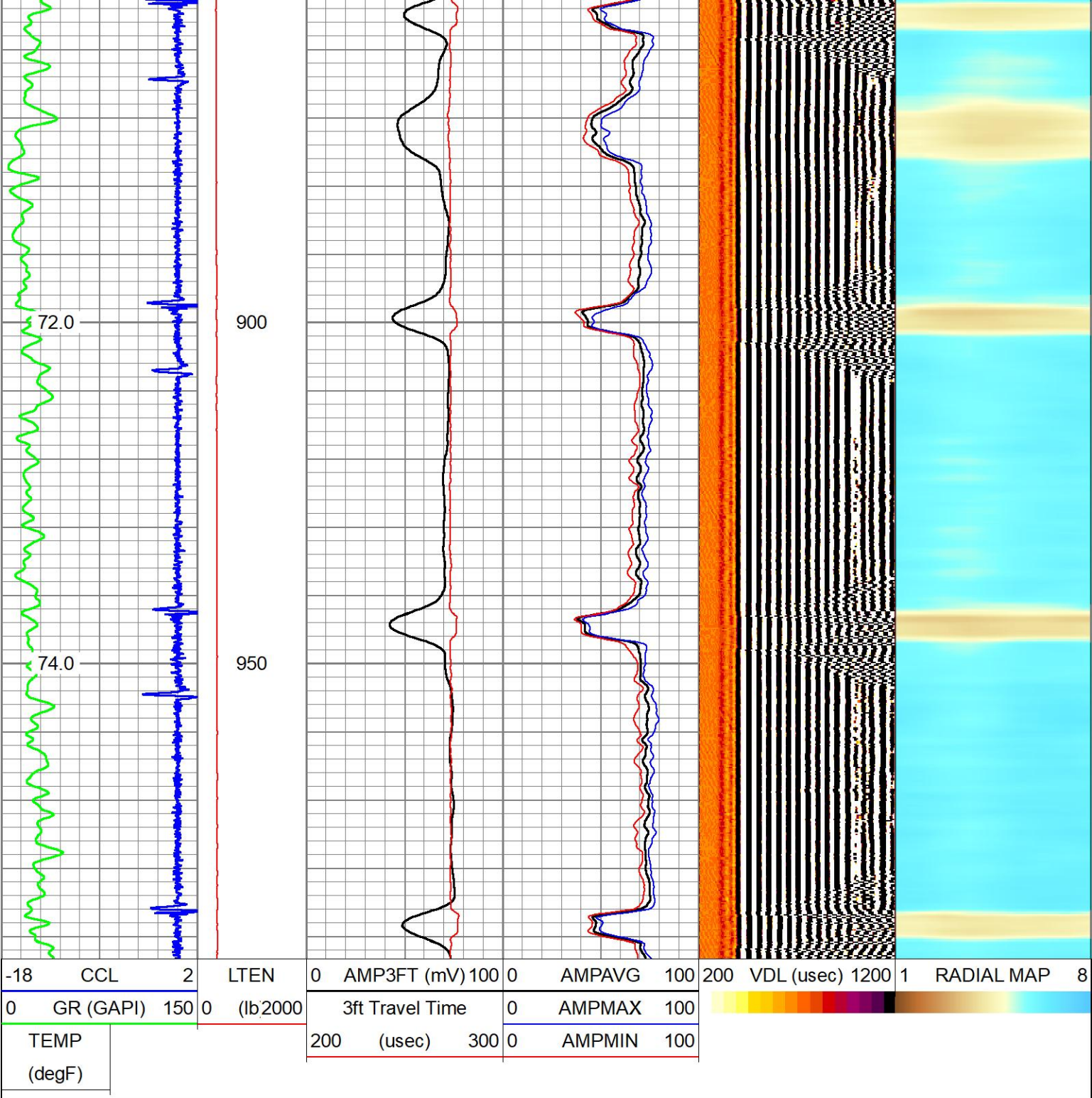
Wed Nov 06 13:04:12 2019

Charted by

Depth in Feet scaled 1:240

-18	CCL	2	LTEN	0	AMP3FT (mV)	100	0	AMPAVG	100	200	VDL (usec)	1200	1	RADIAL MAP	8
0	GR (GAPI)	150	0	(lb/2000)	3ft Travel Time		0	AMPMAX	100						
TEMP				200	(usec)	300	0	AMPMIN	100						
(degF)															





FREE PIPE PASS

HALLIBURTON


5" = 100'

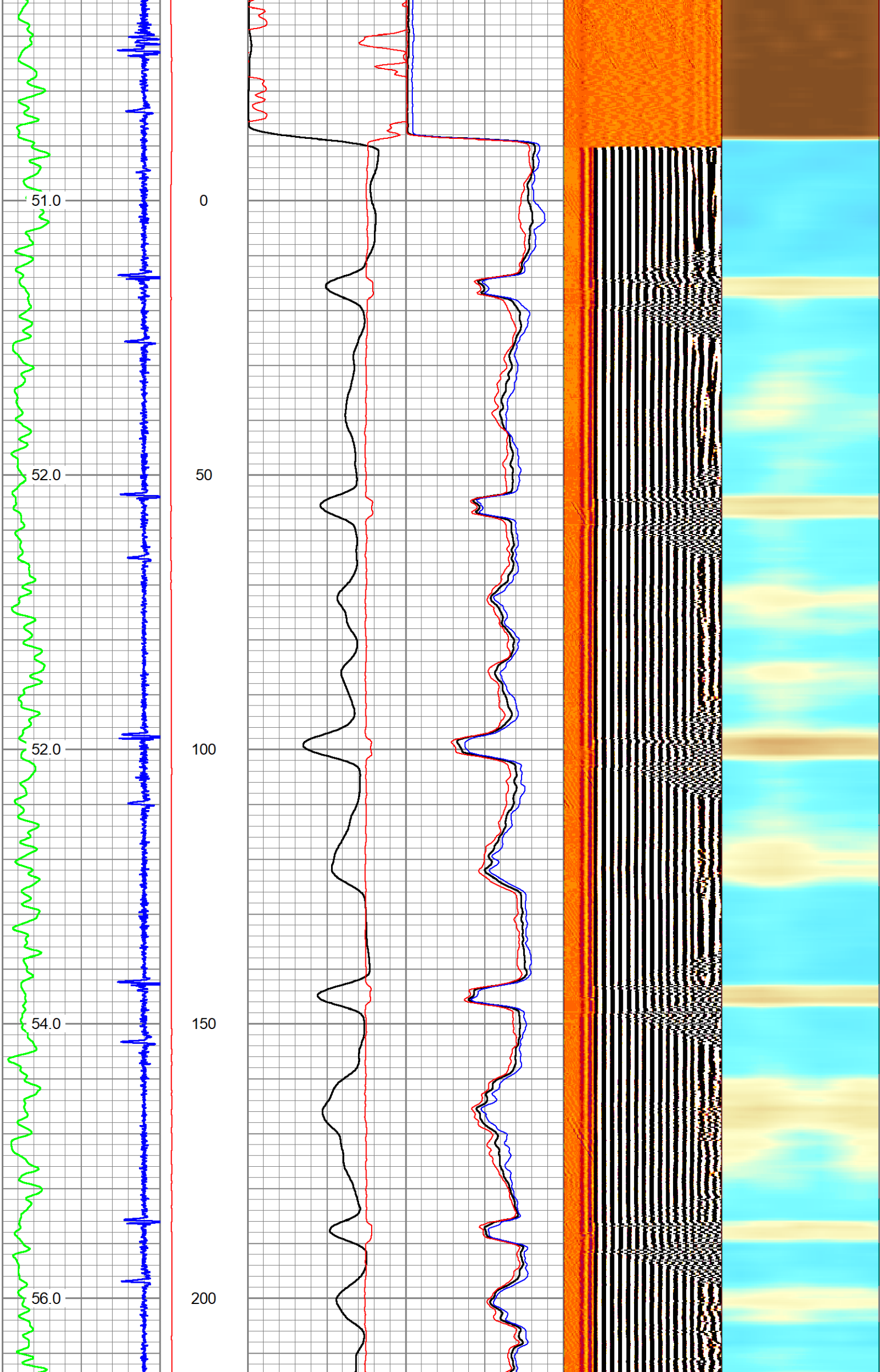
MAIN PASS

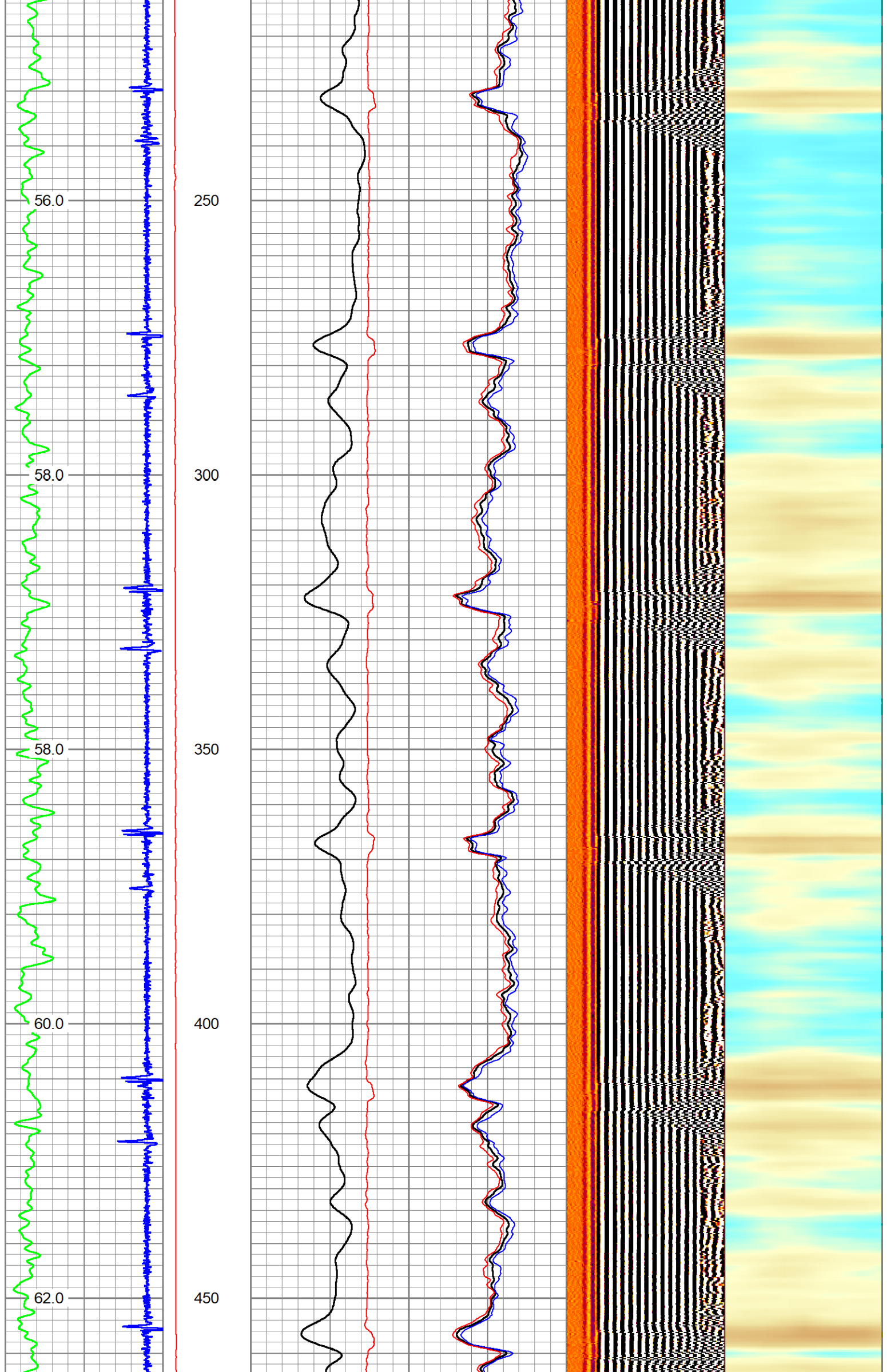
HALLIBURTON

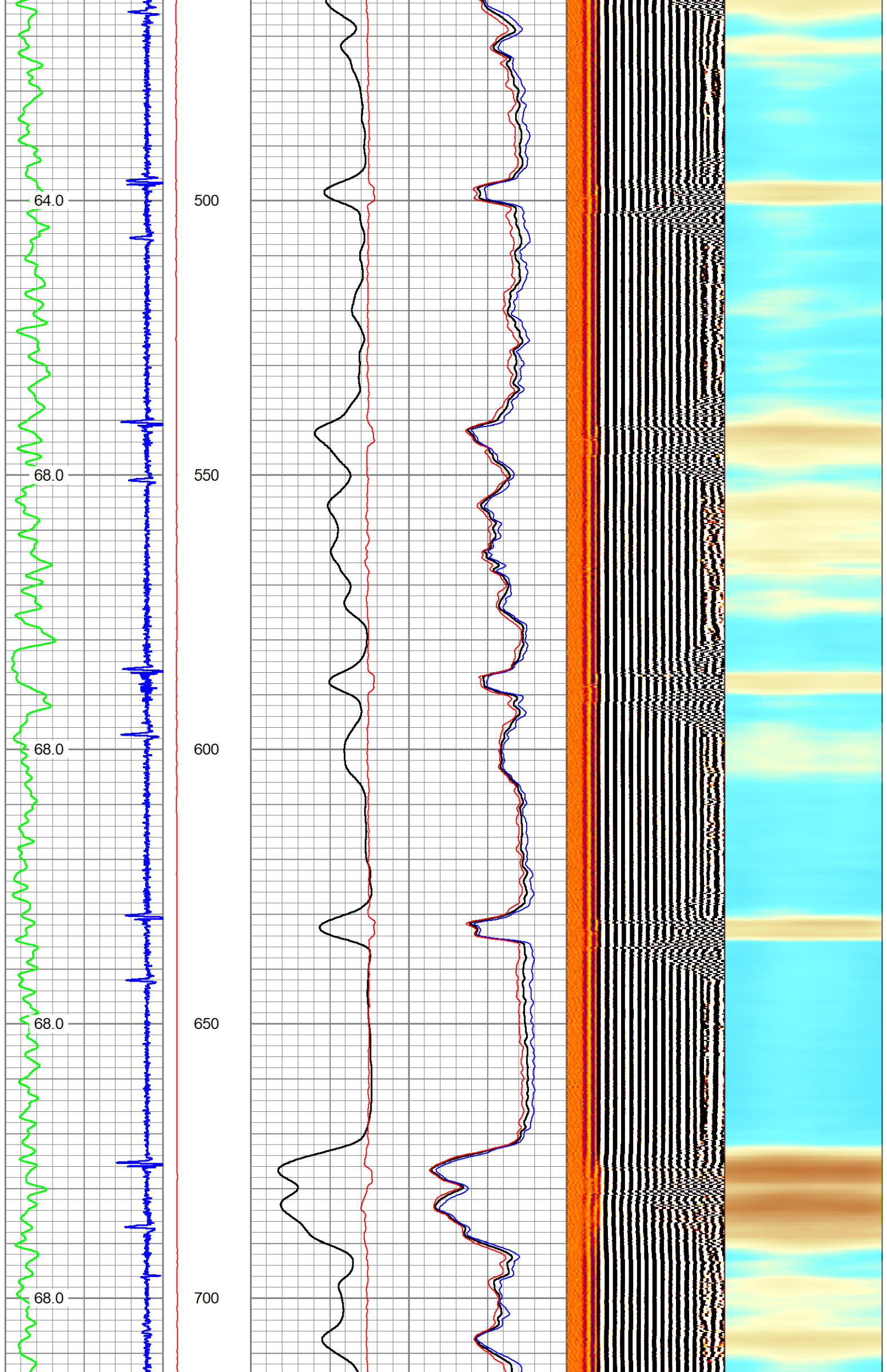
5" = 100'

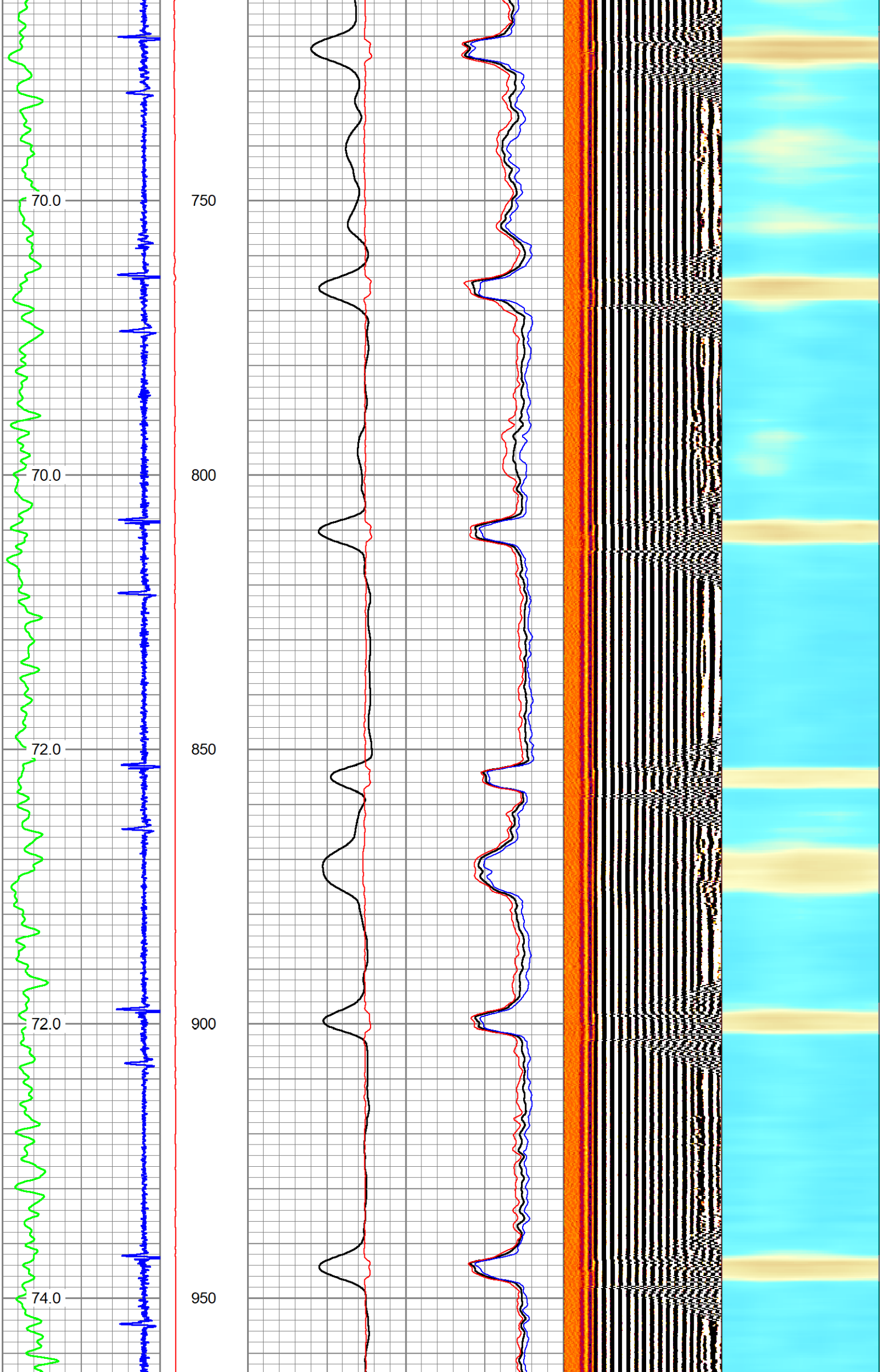
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Dataset Pathname	MAIN_PASS														
Presentation Format	extraction rcbl														
Dataset Creation	Wed Nov 06 13:29:23 2019														
Charted by	Depth in Feet scaled 1:240														

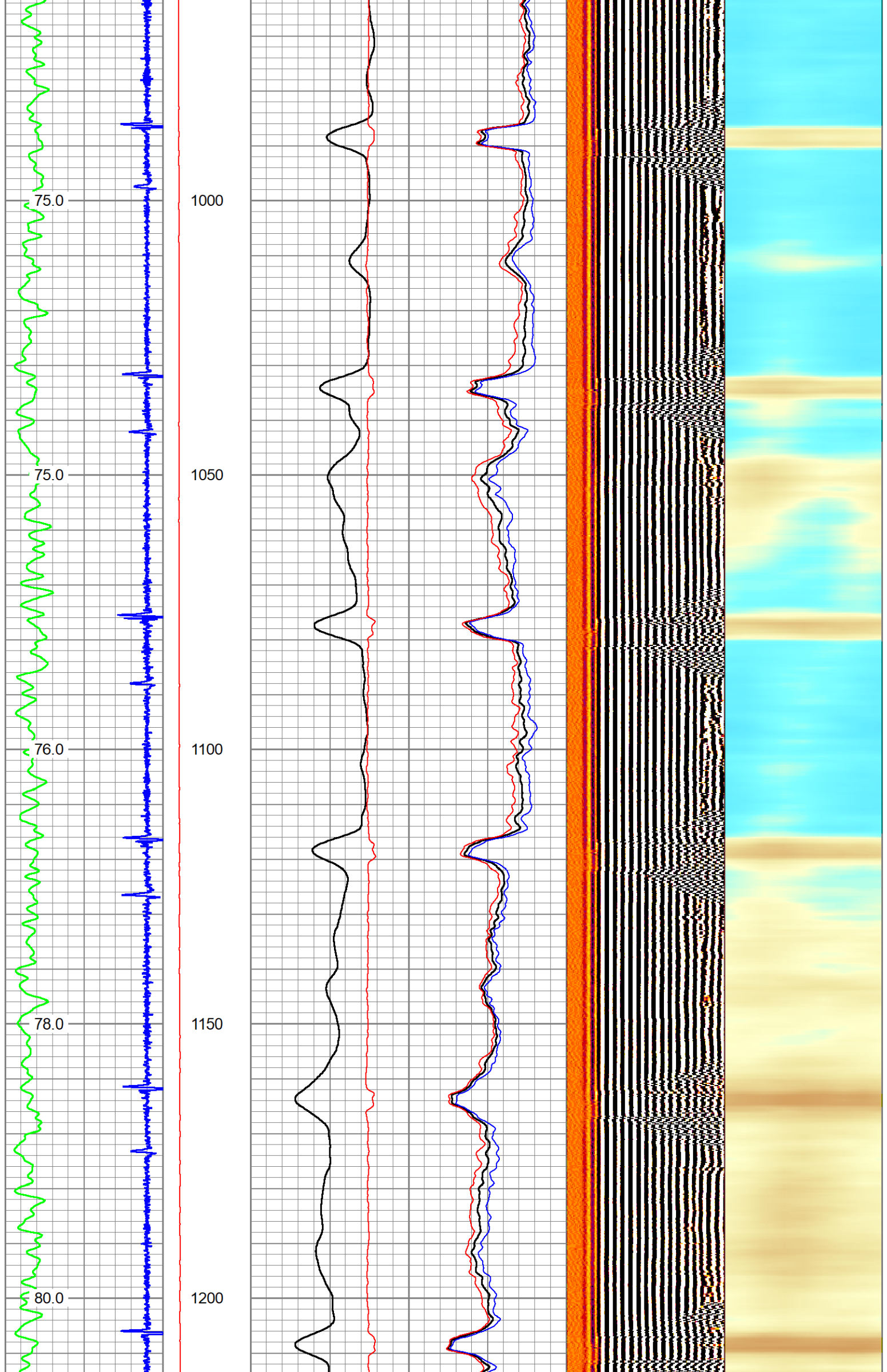
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0	GR (GAPI)	150	0	(lb/2000)	3ft Travel Time	300	0	AMPMAX	100						
TEMP															
(degF)															

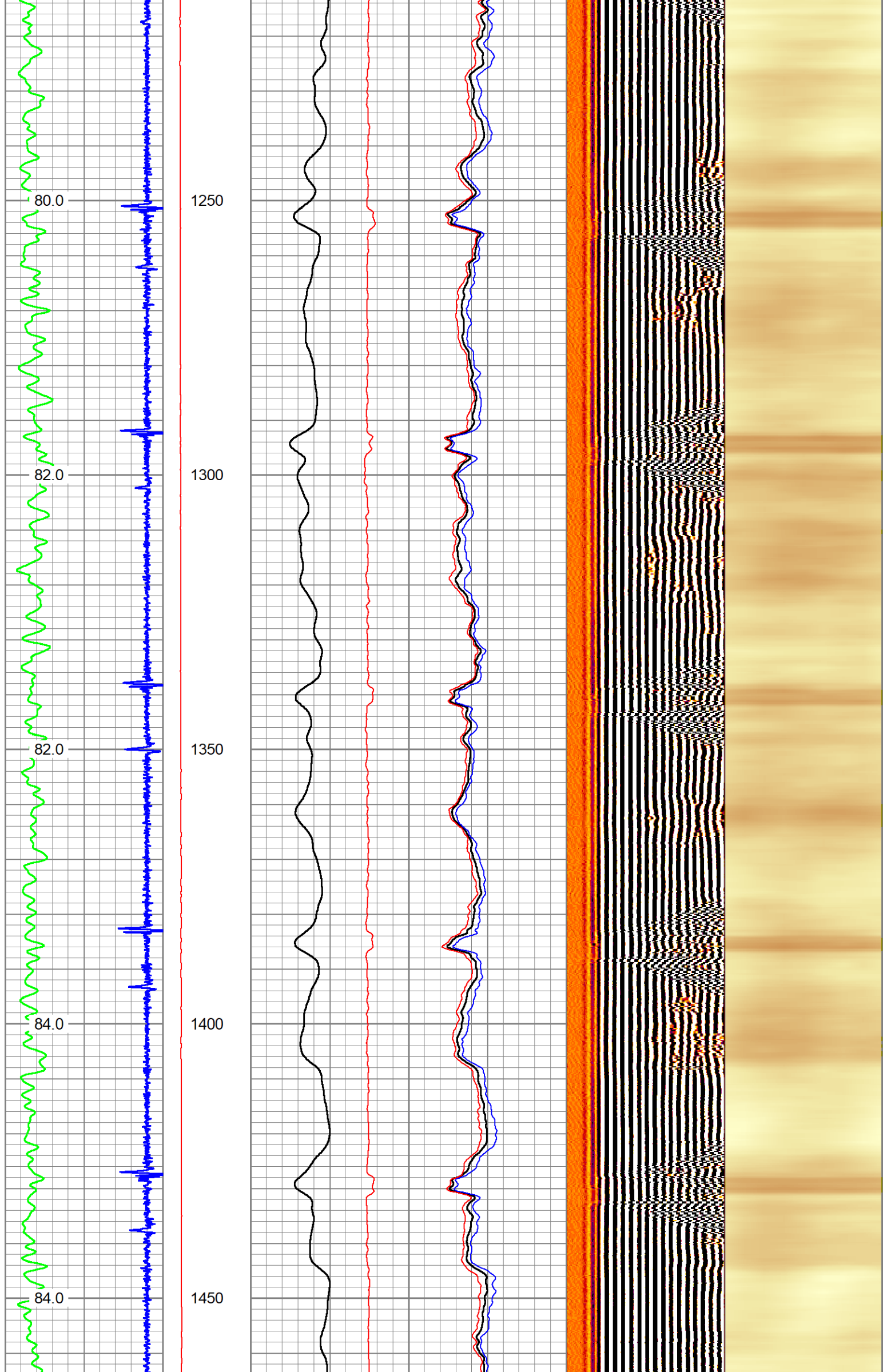


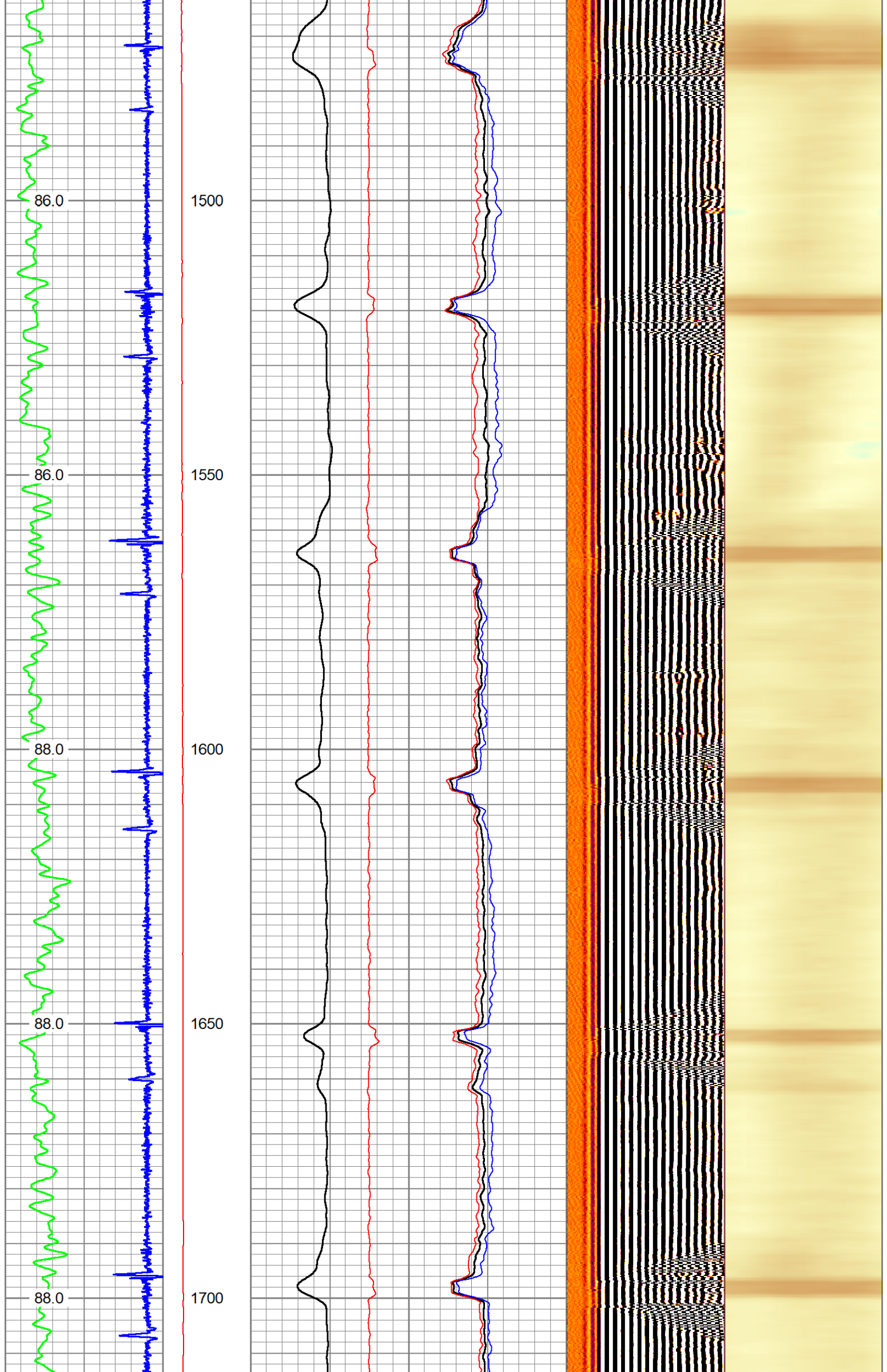


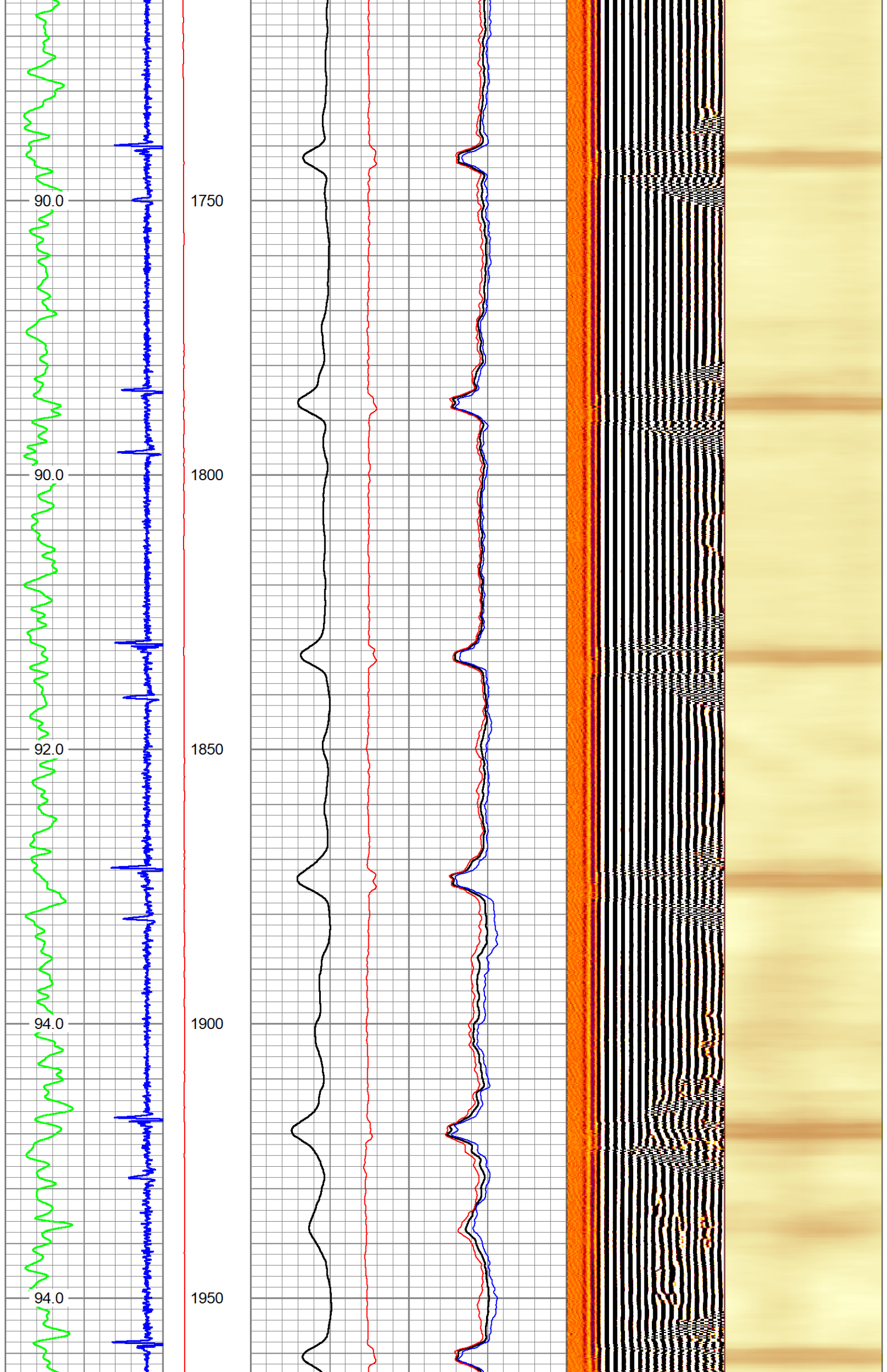


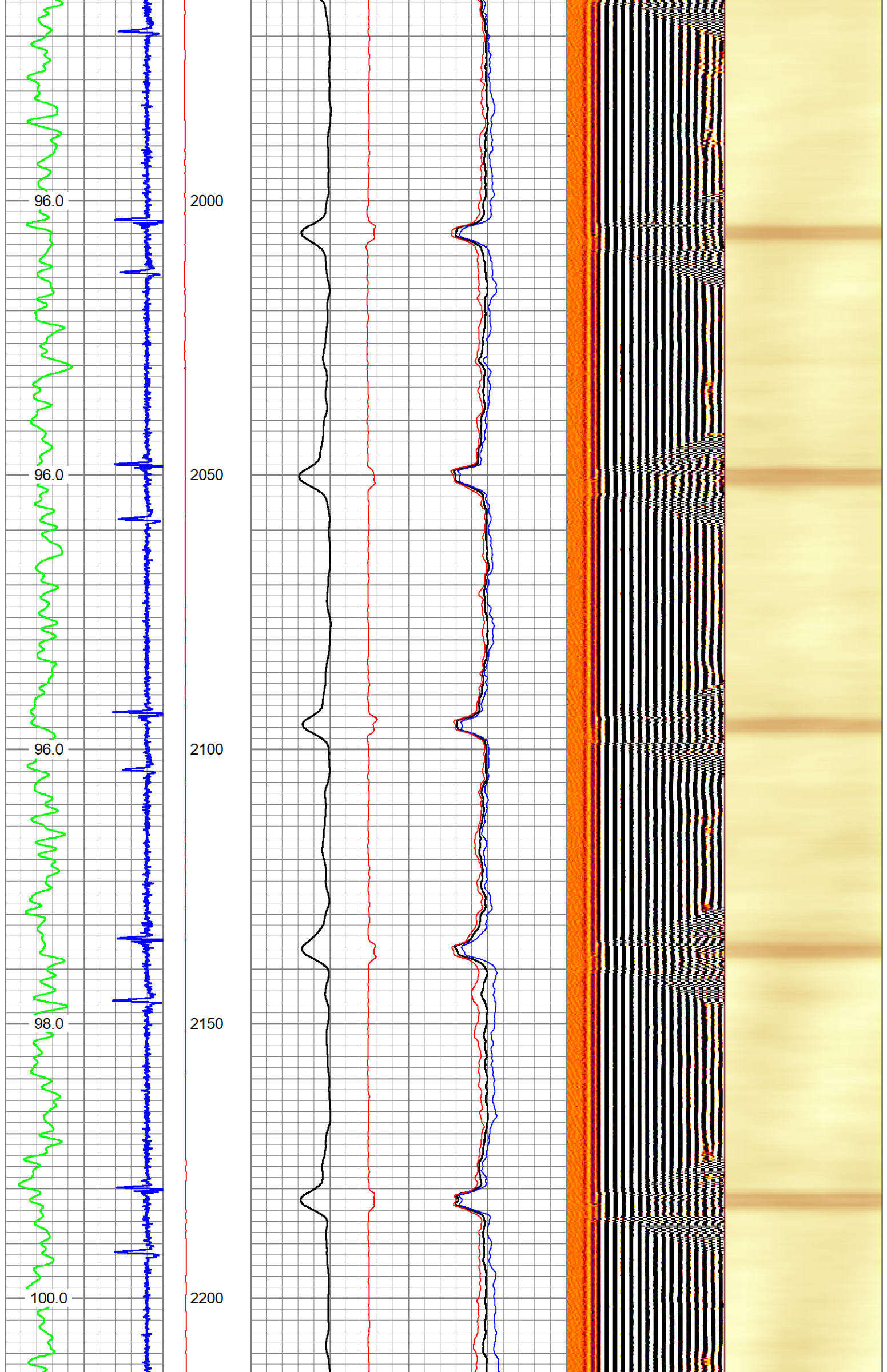


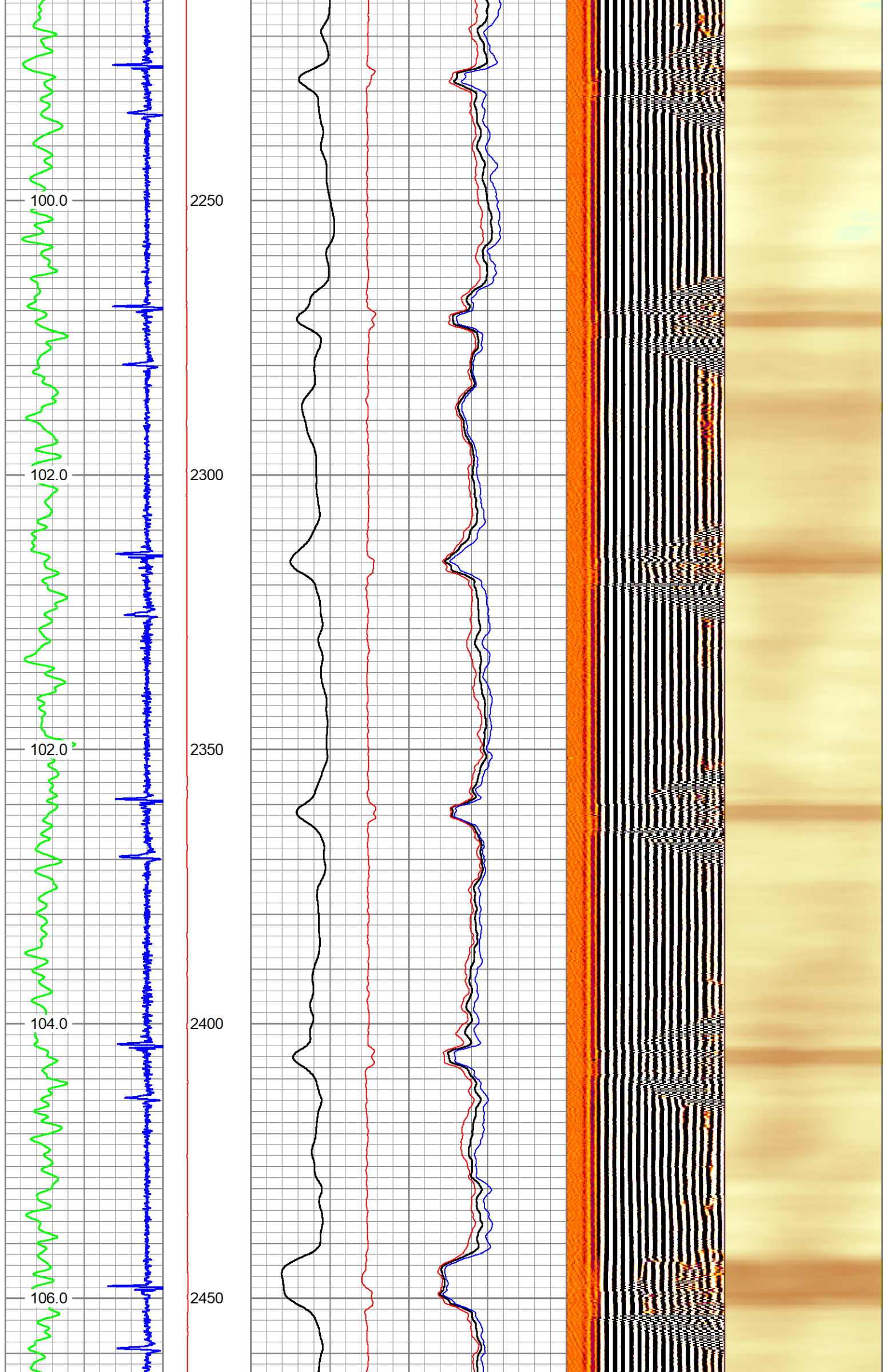


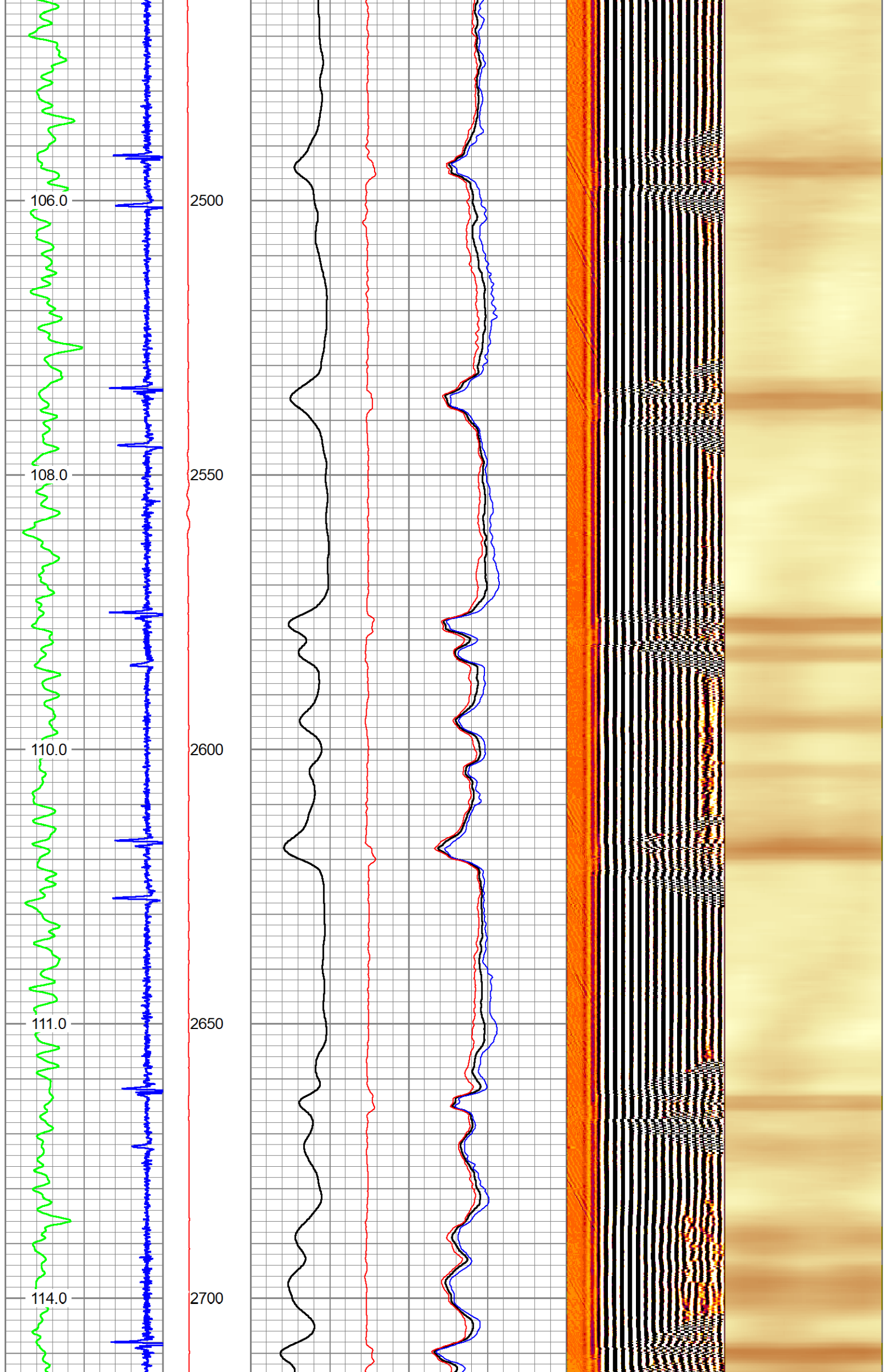


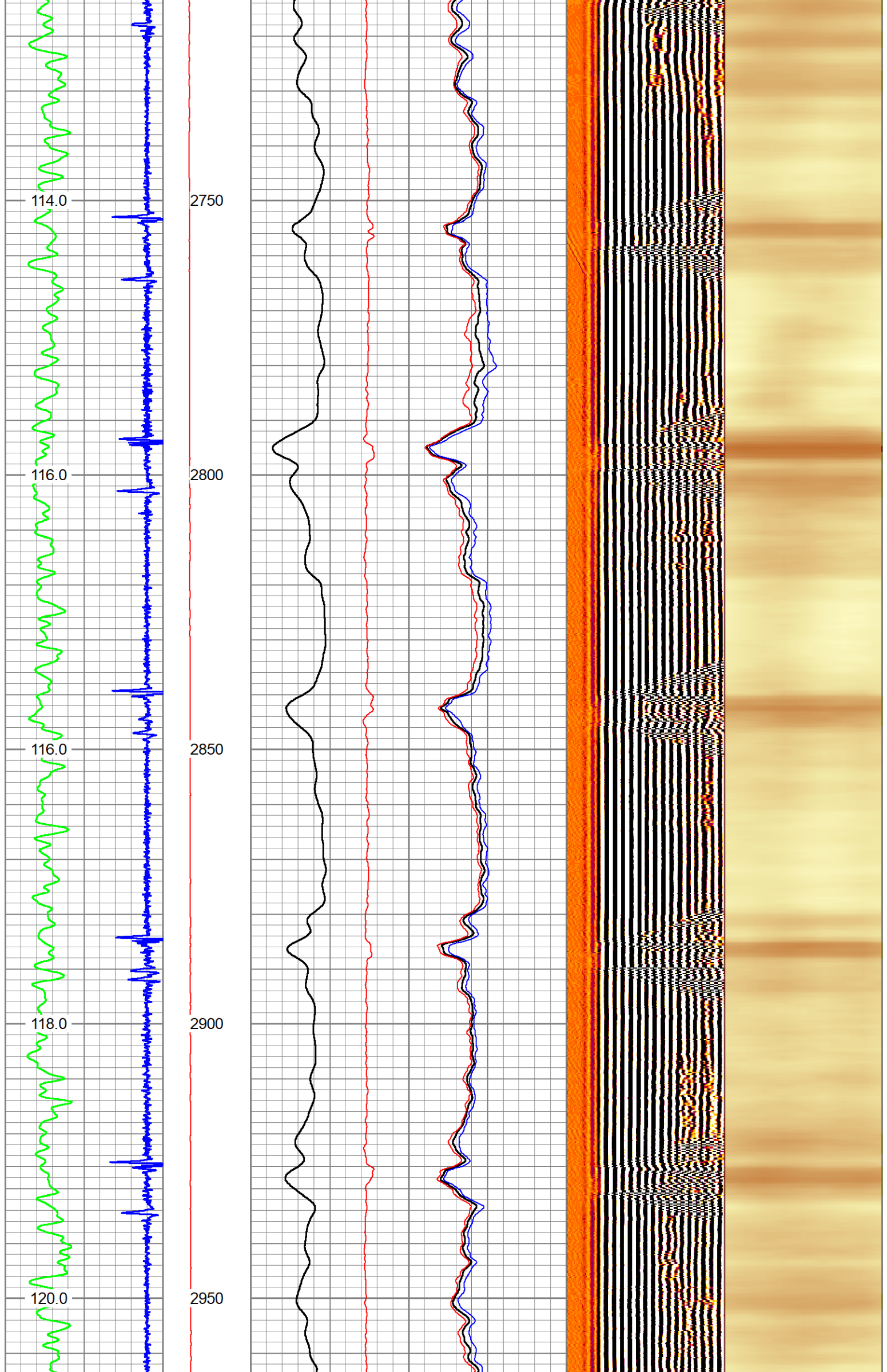


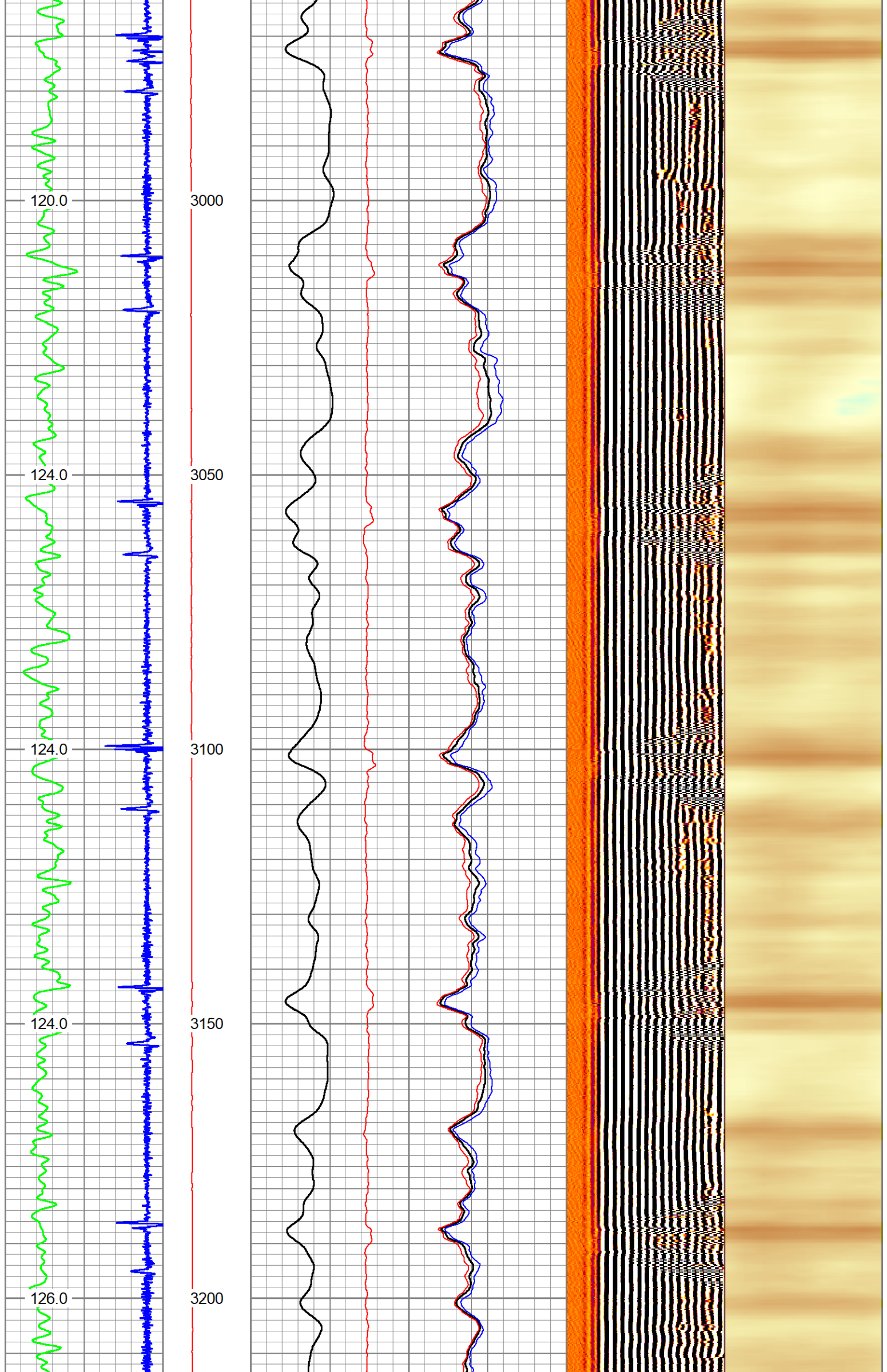


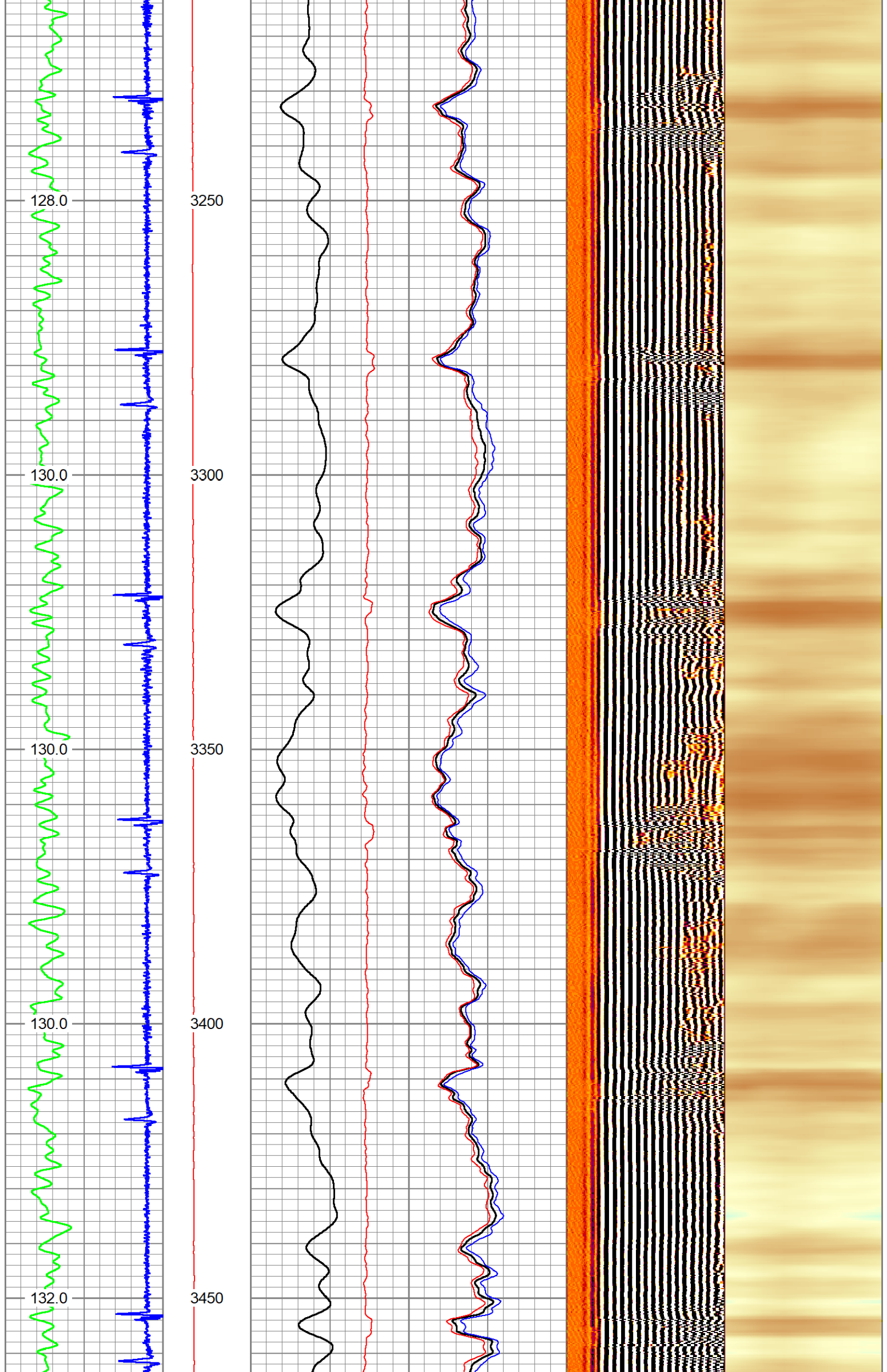


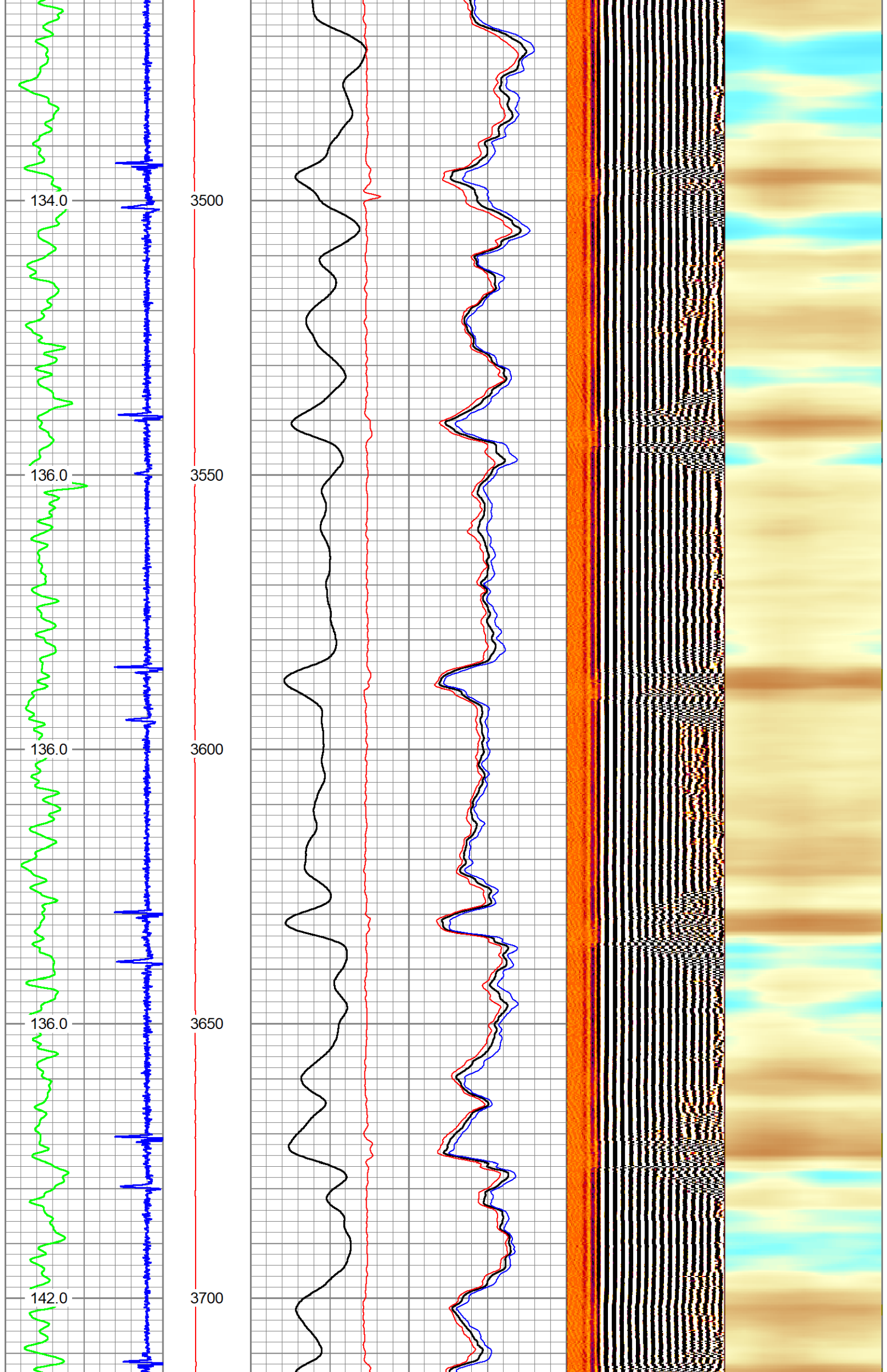


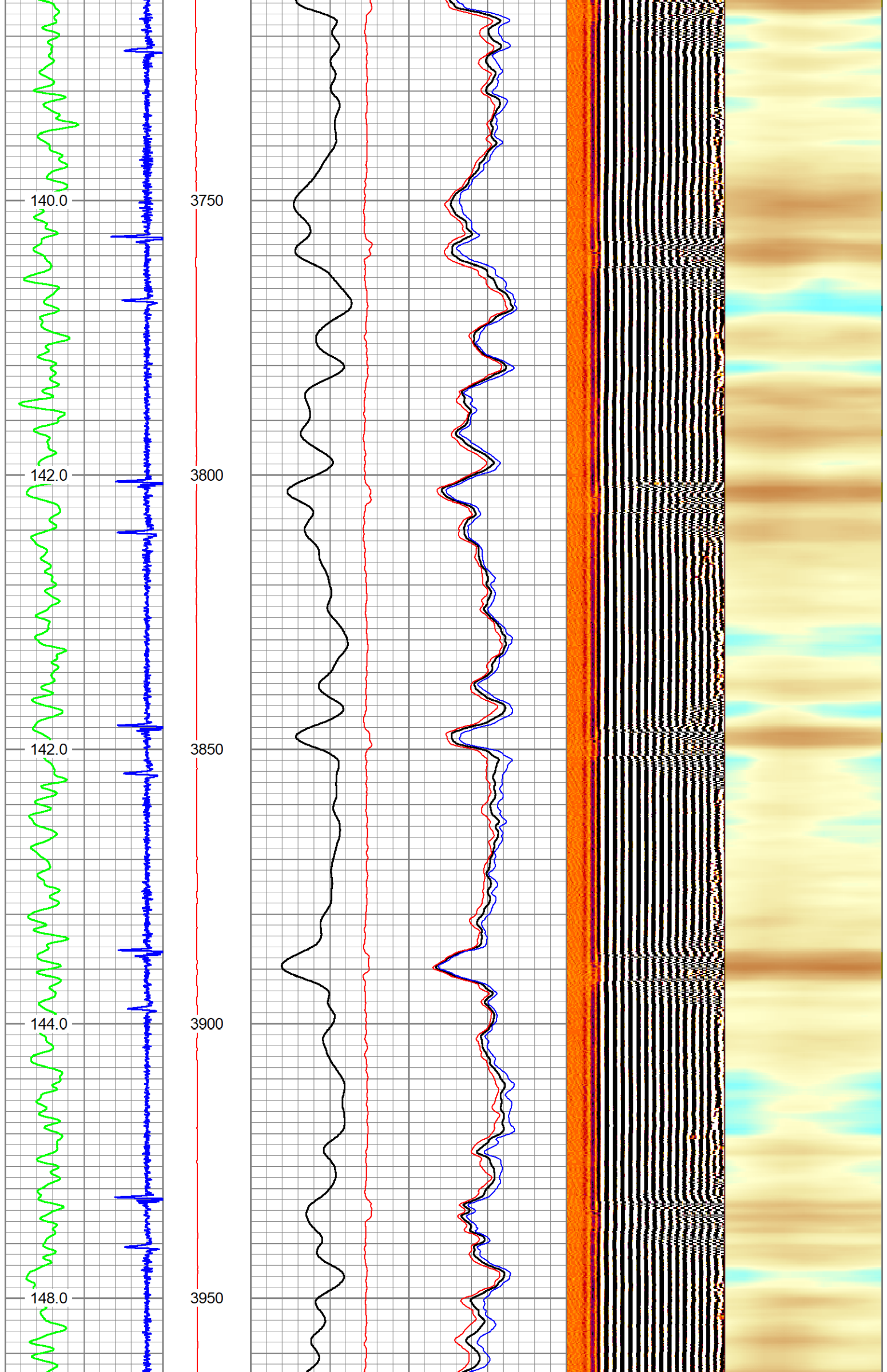


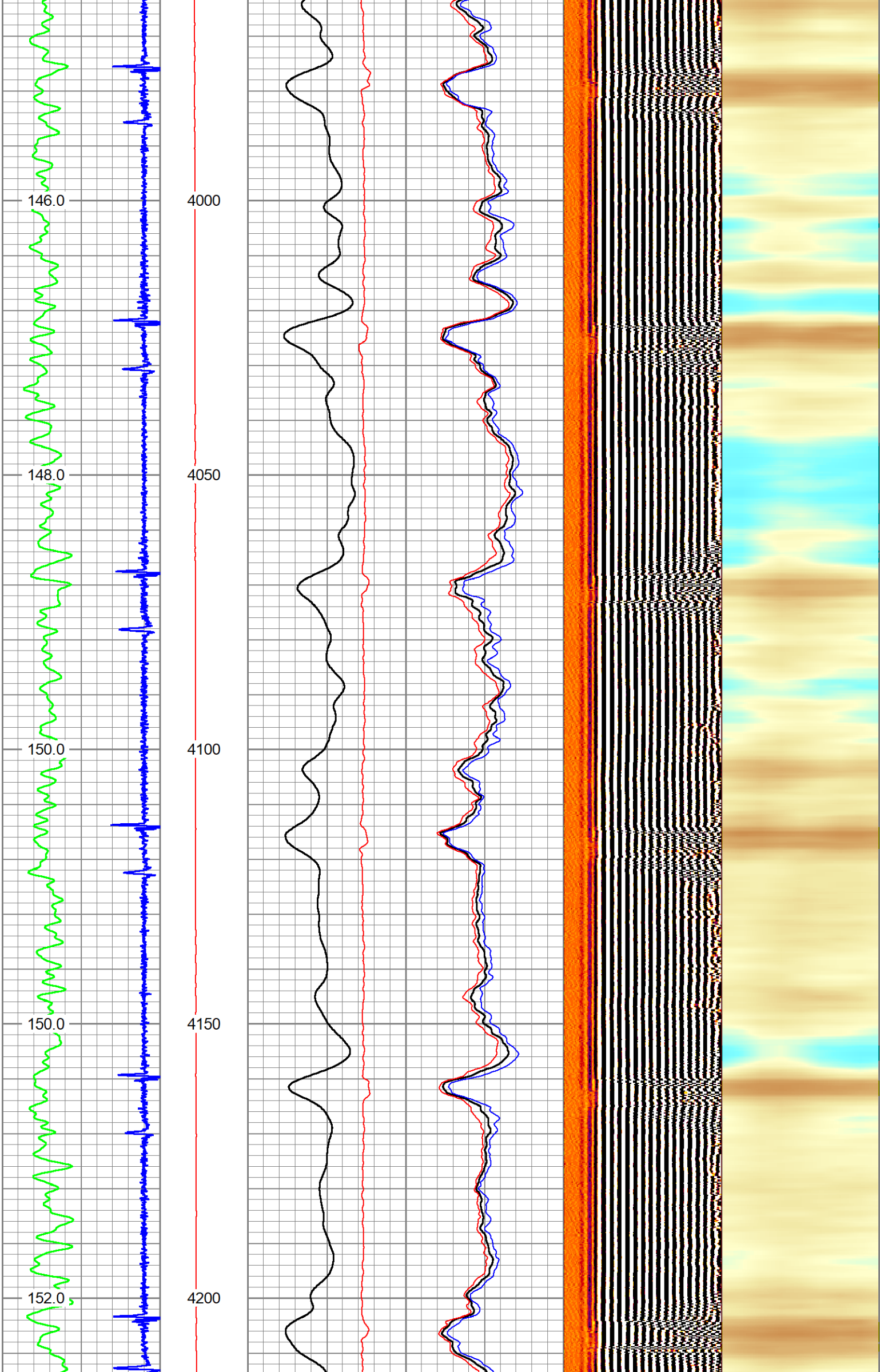


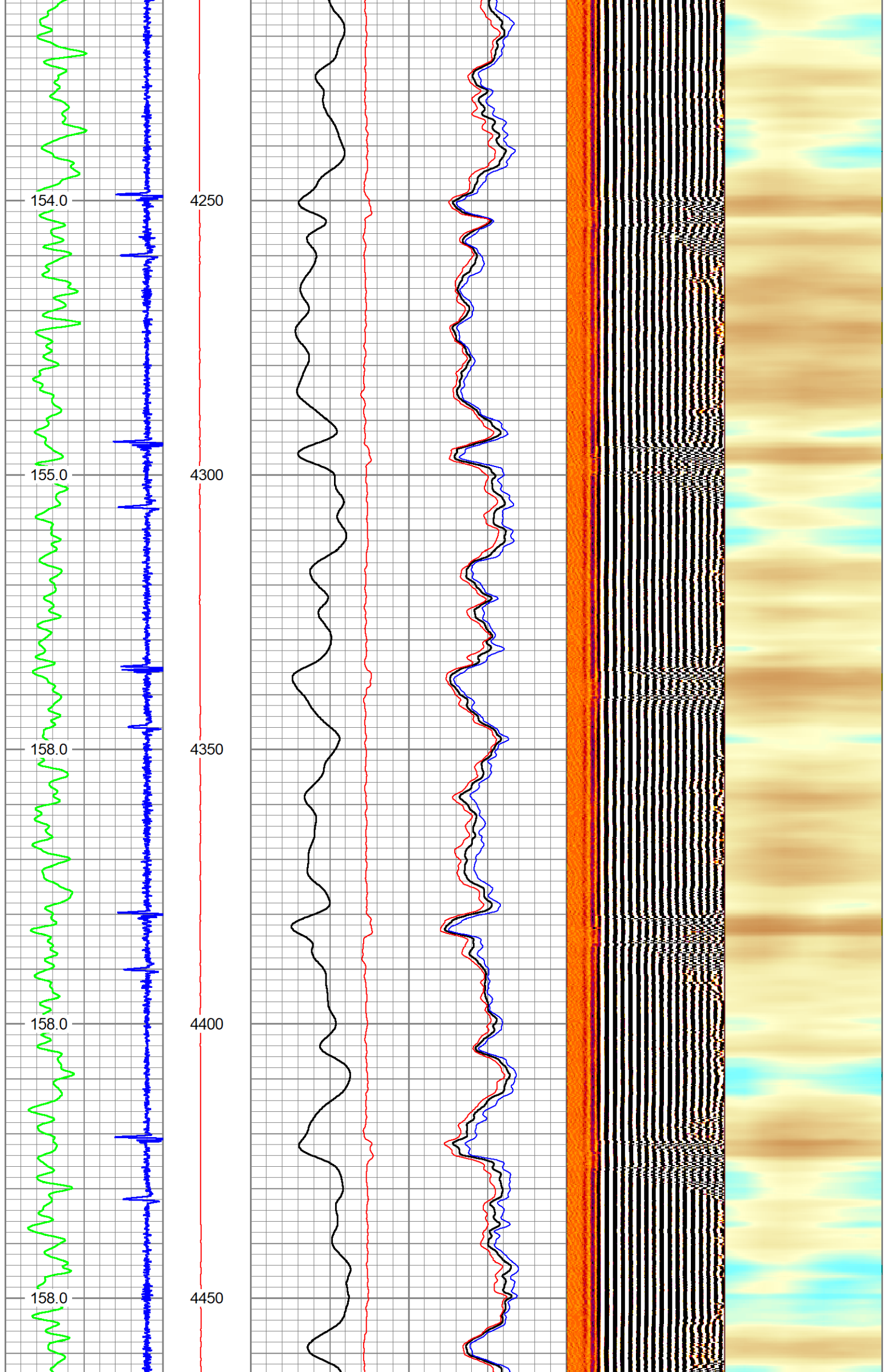


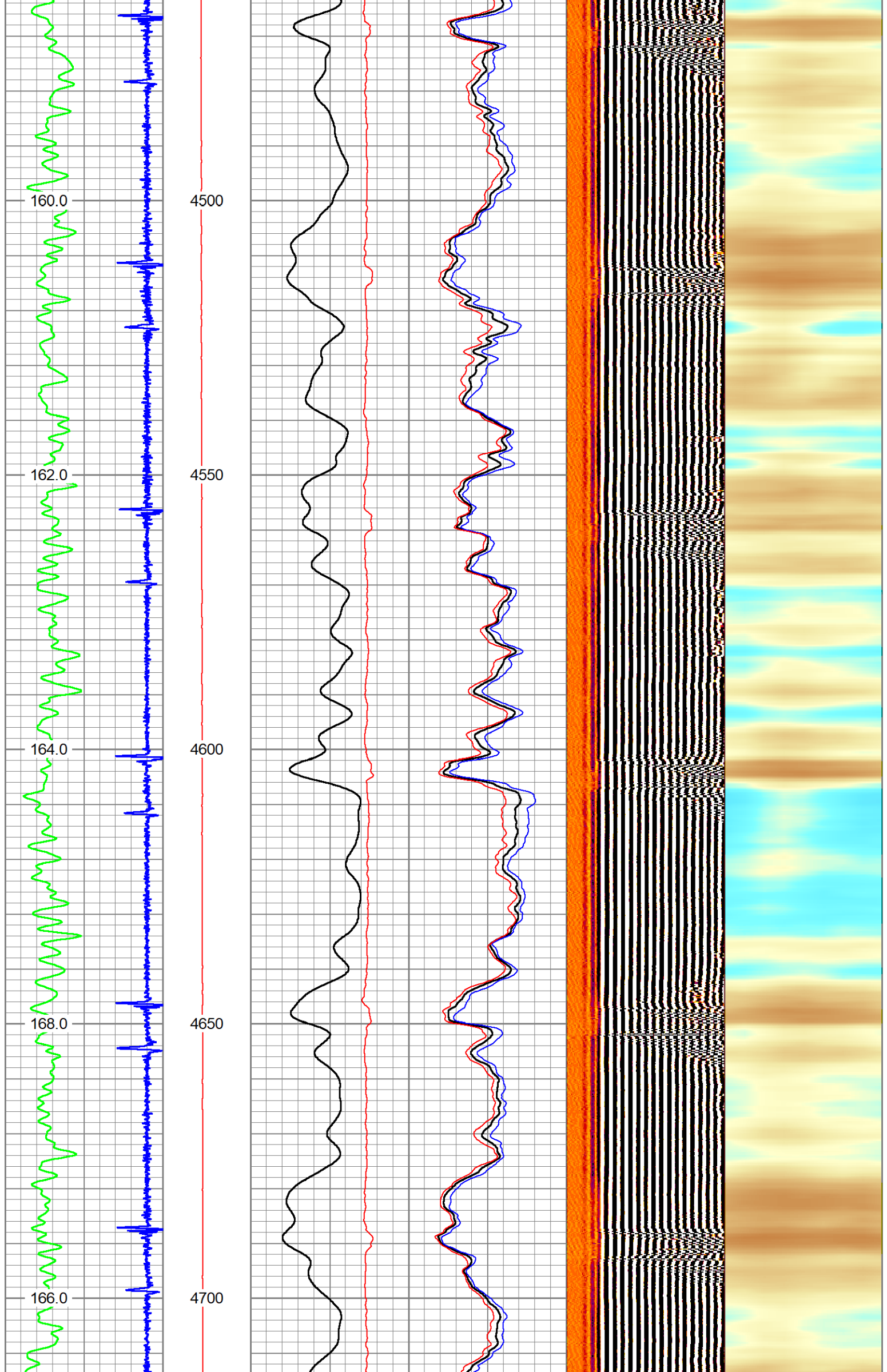


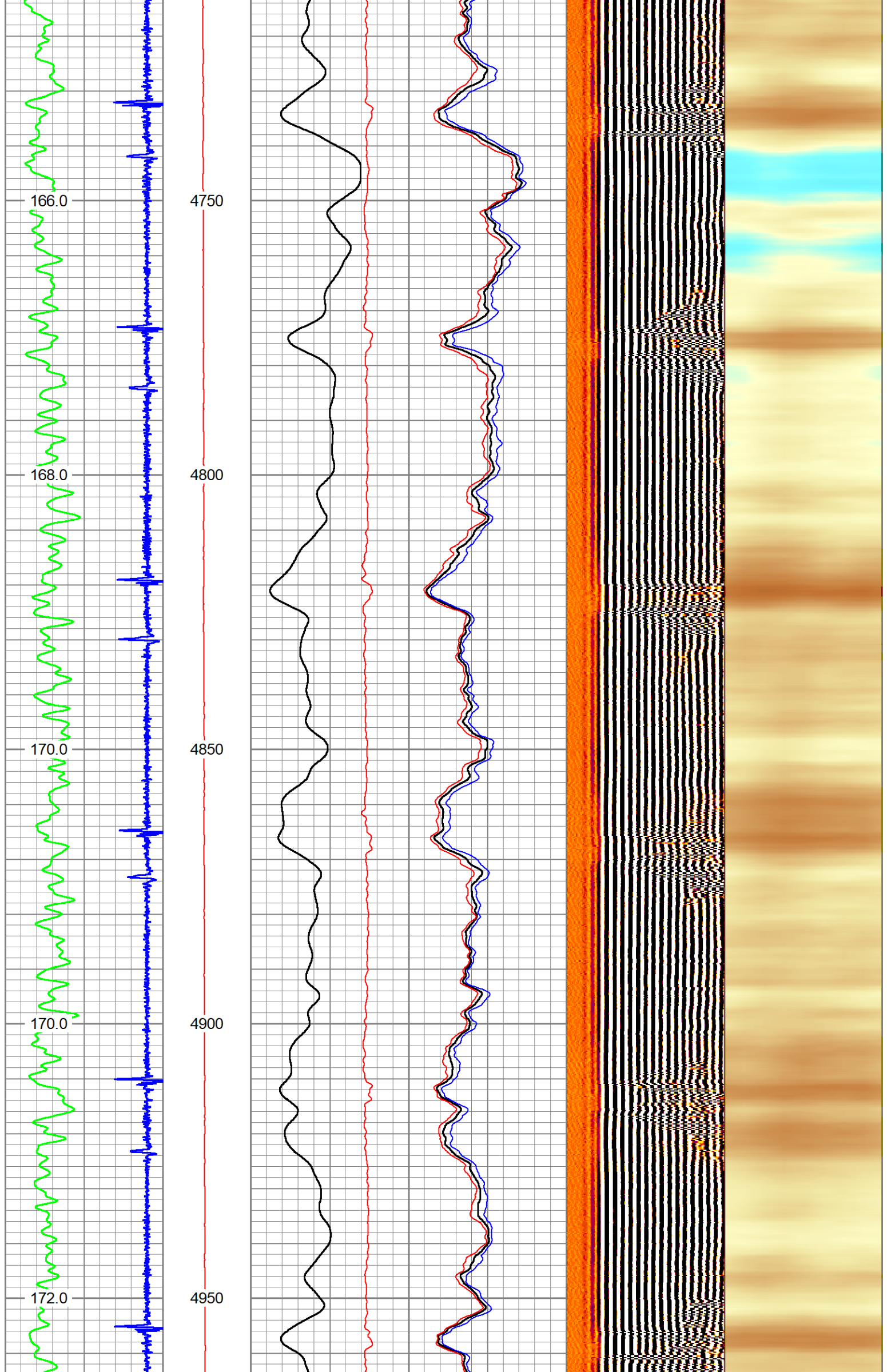


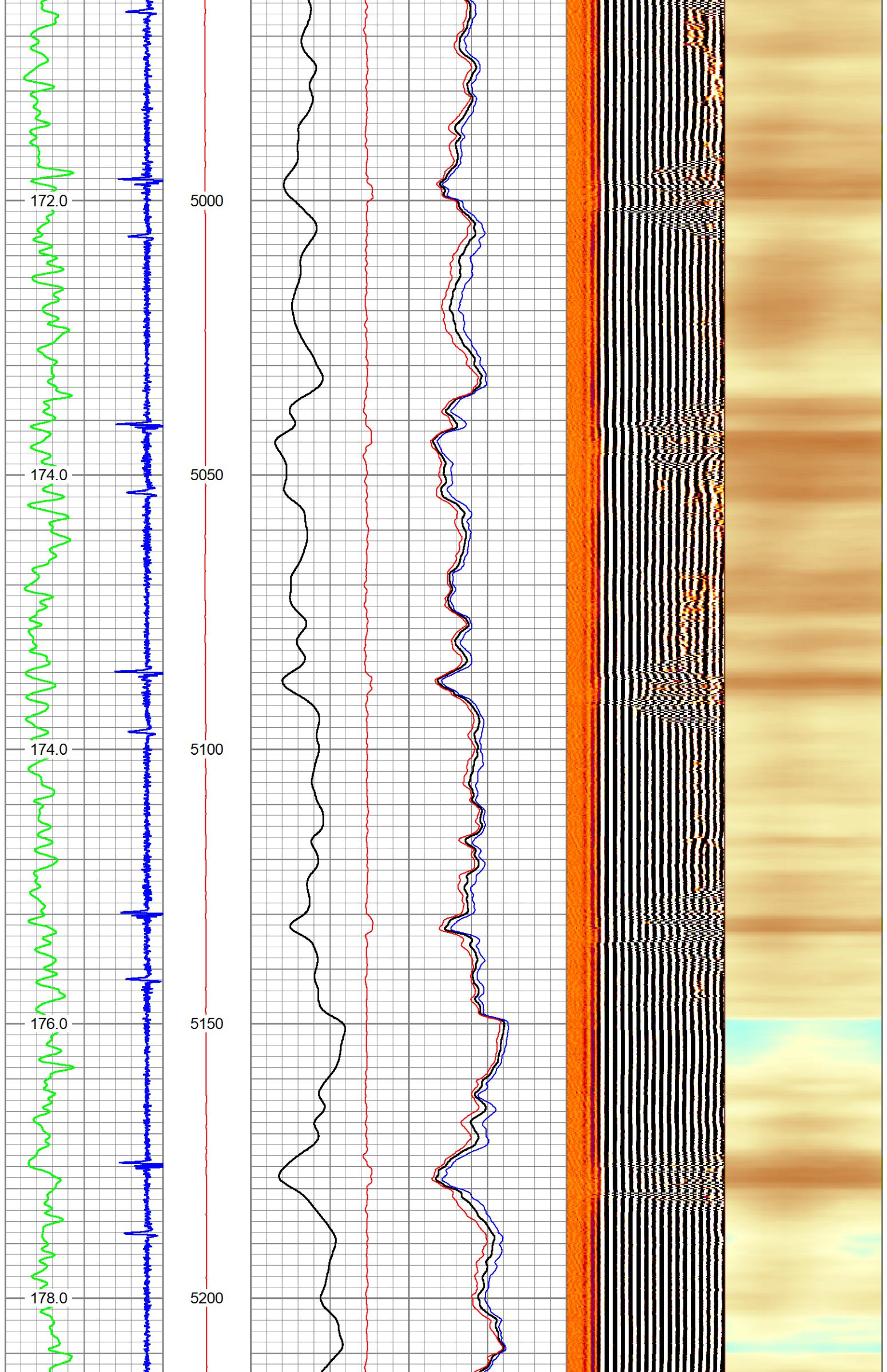


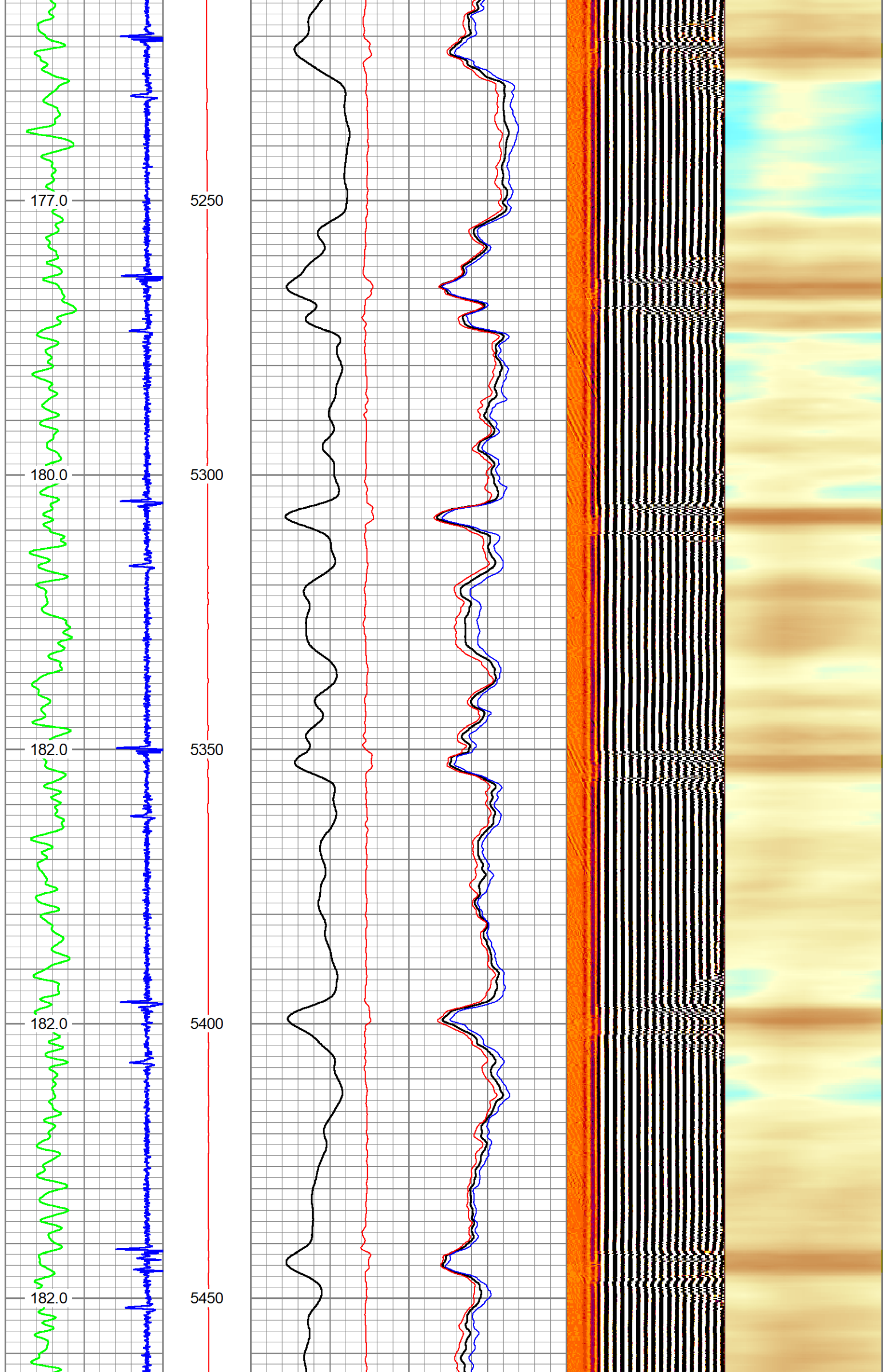


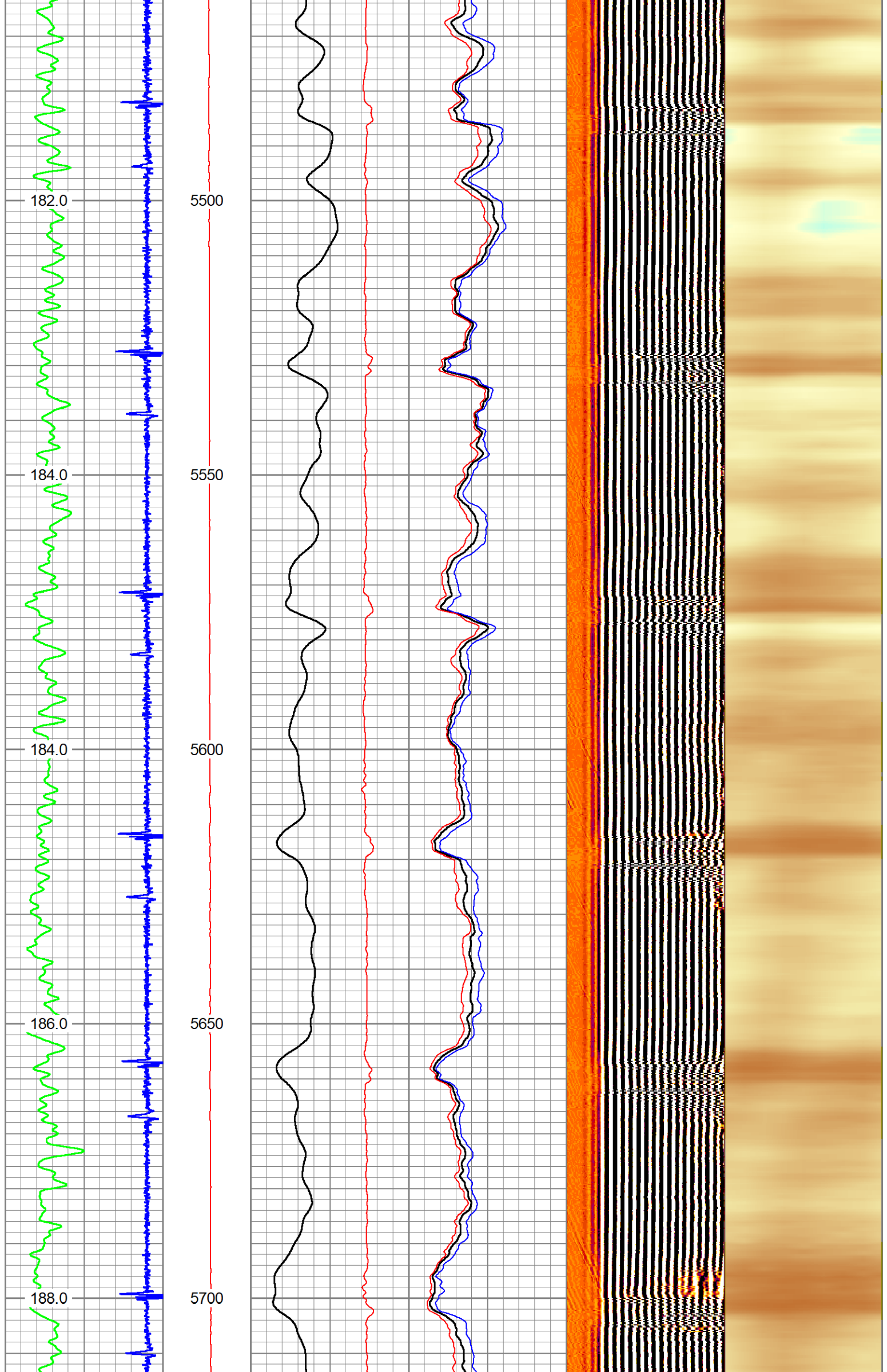


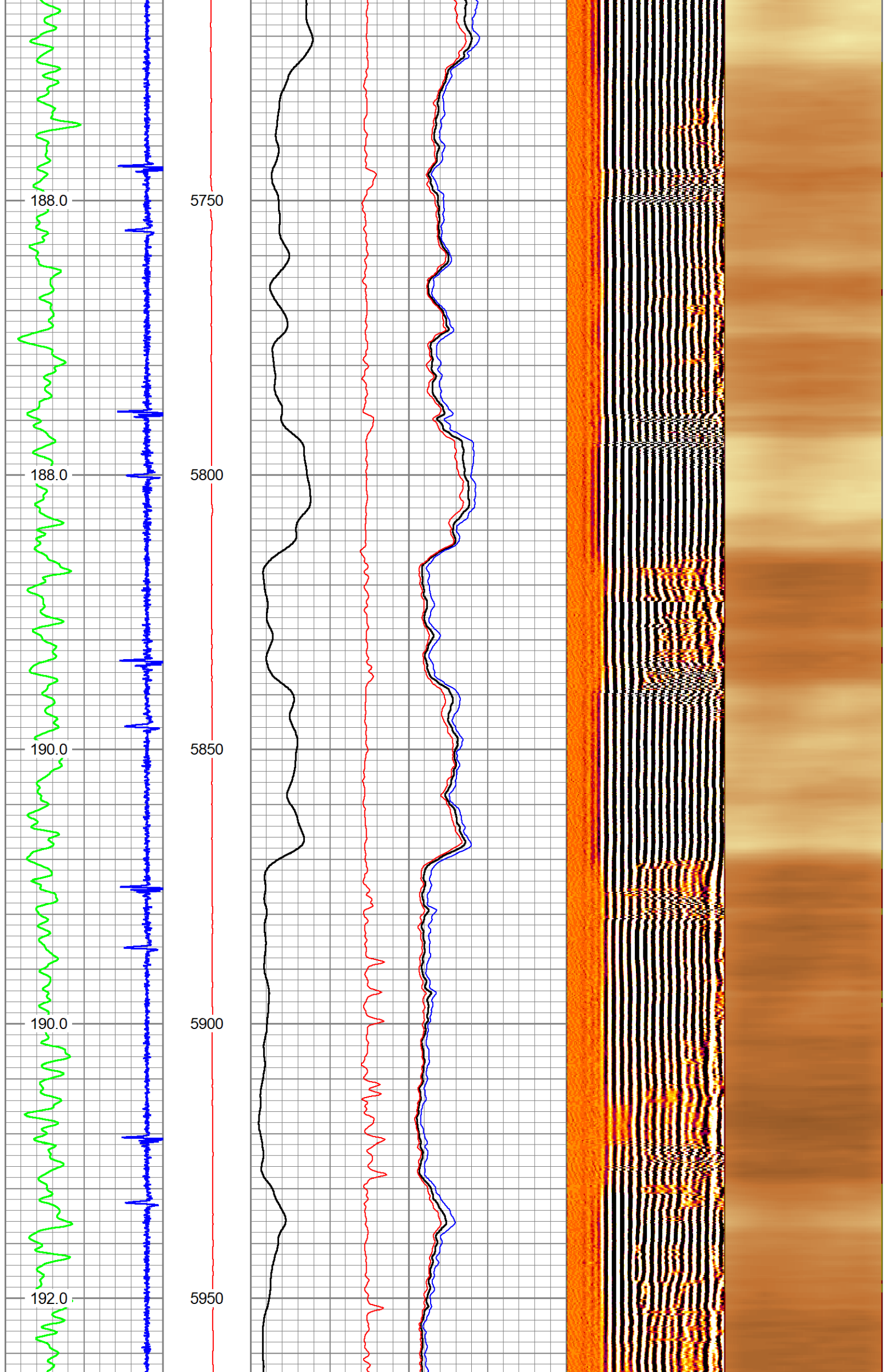


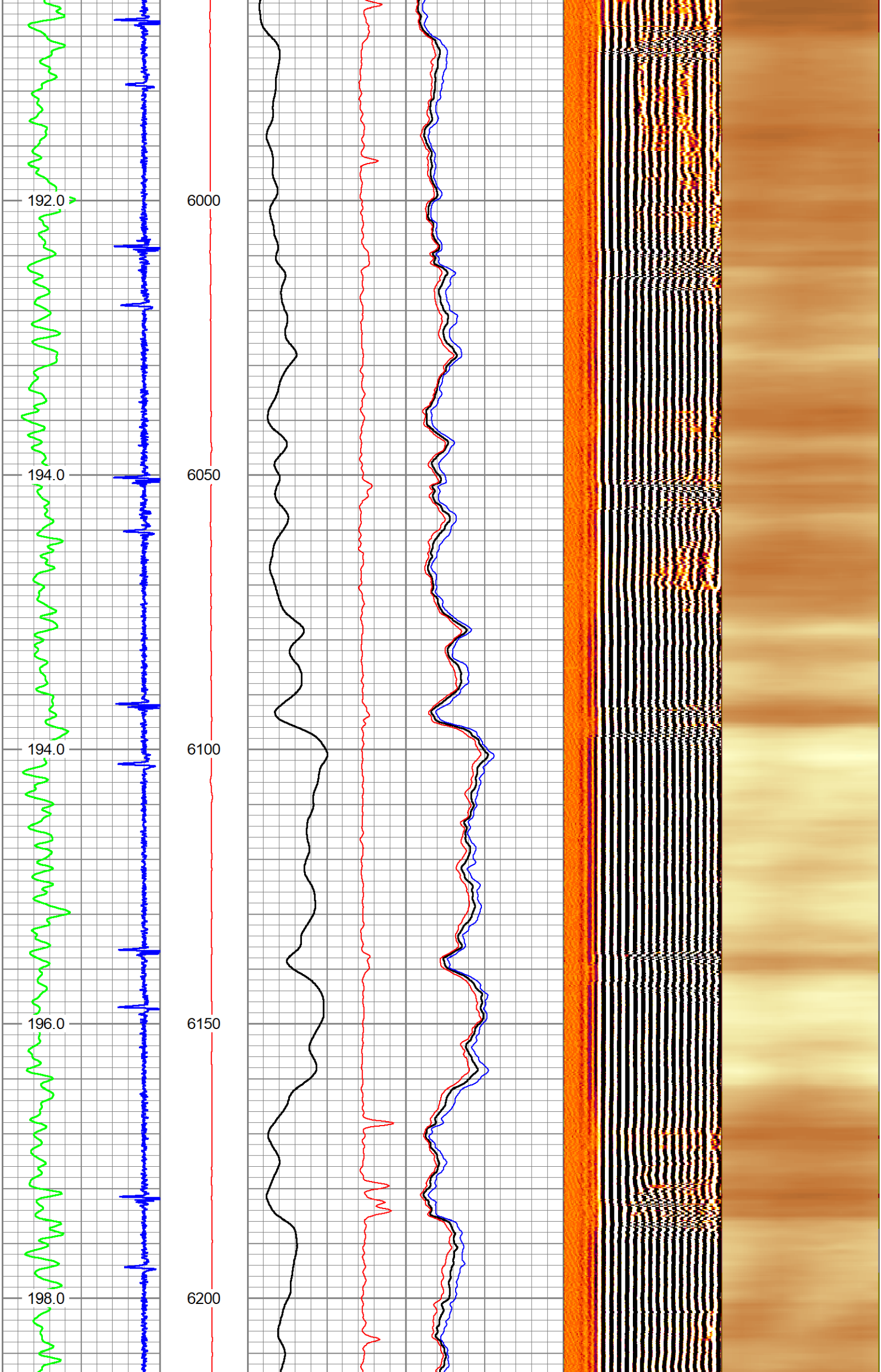


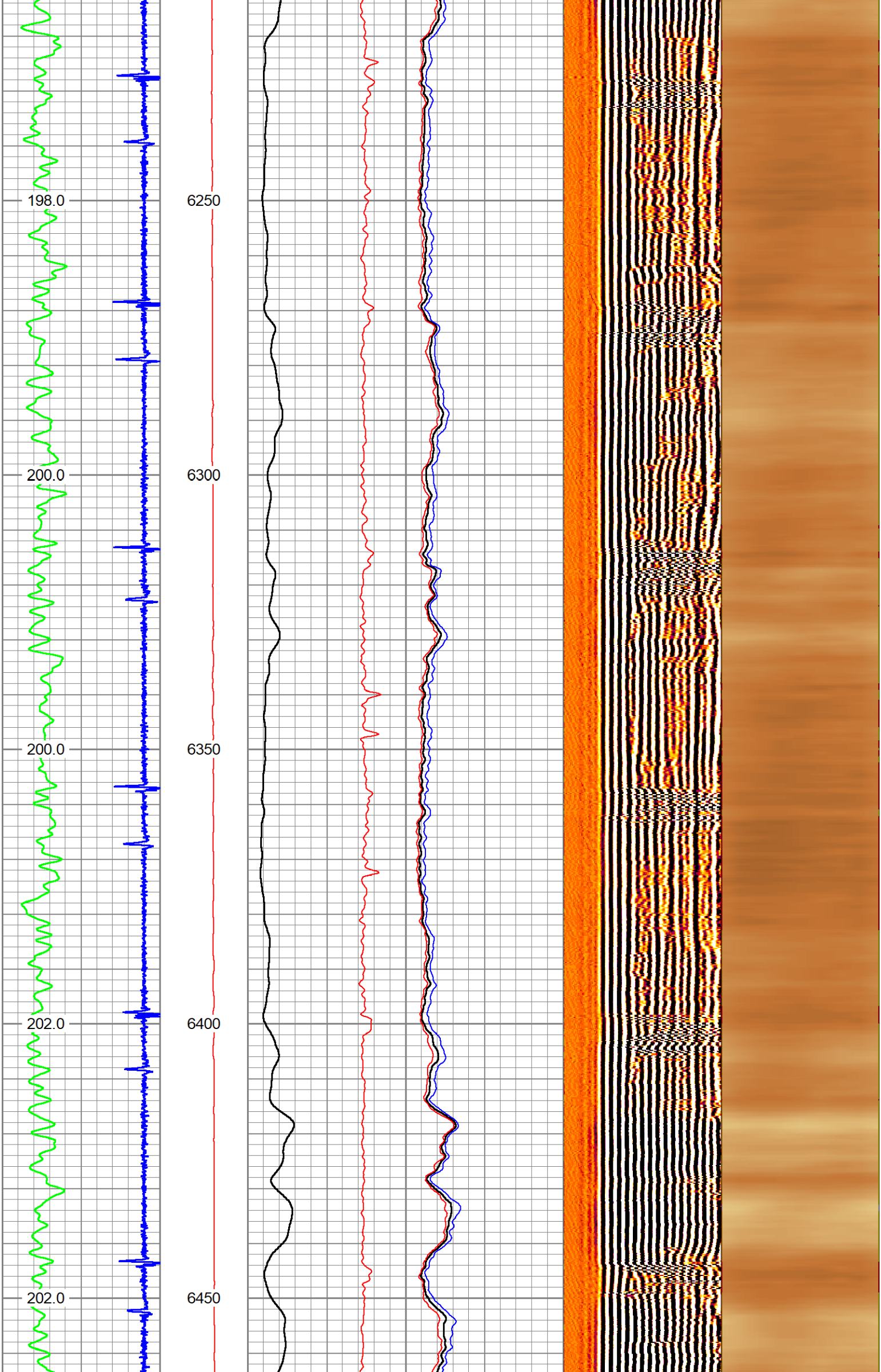


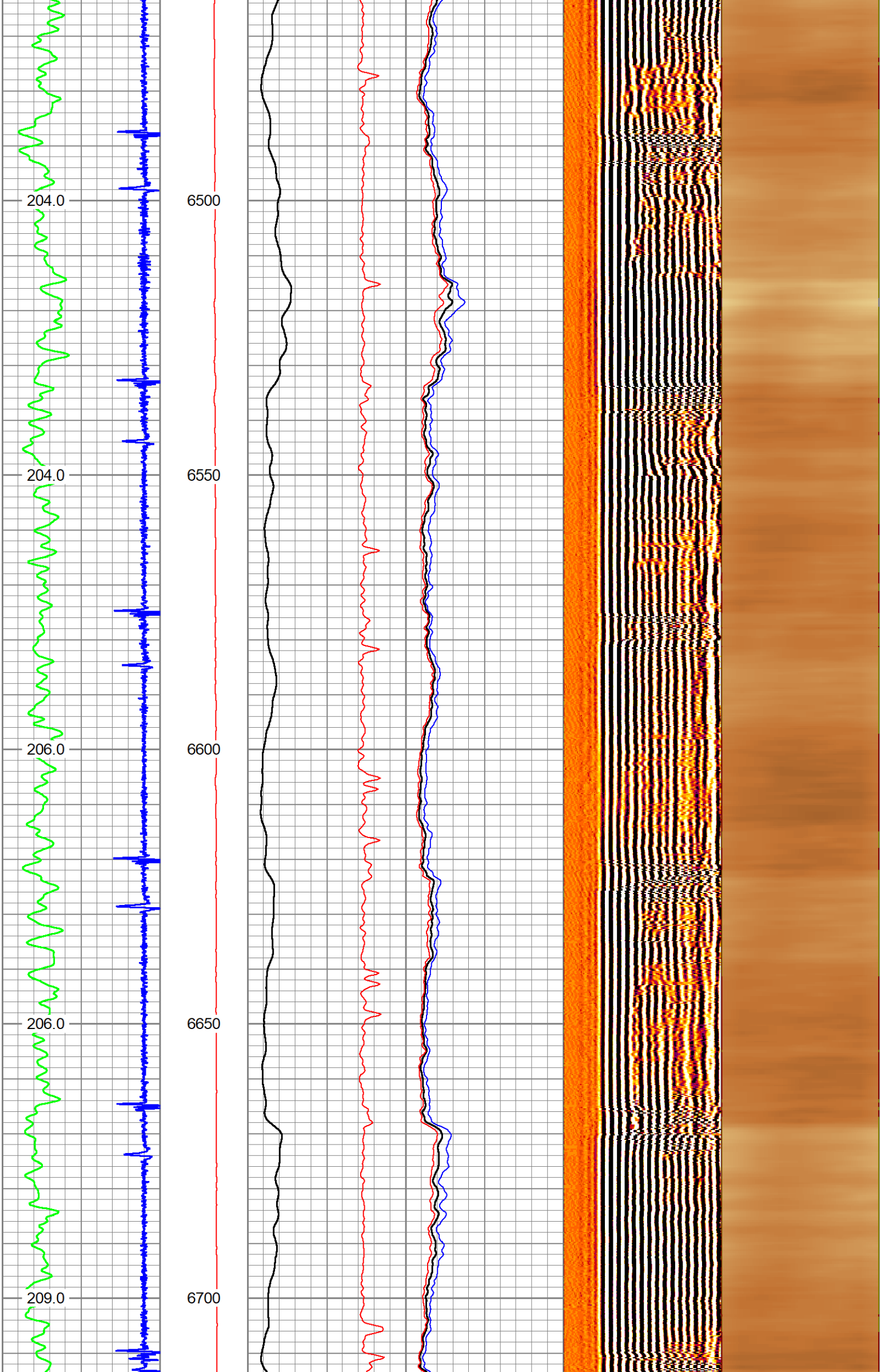


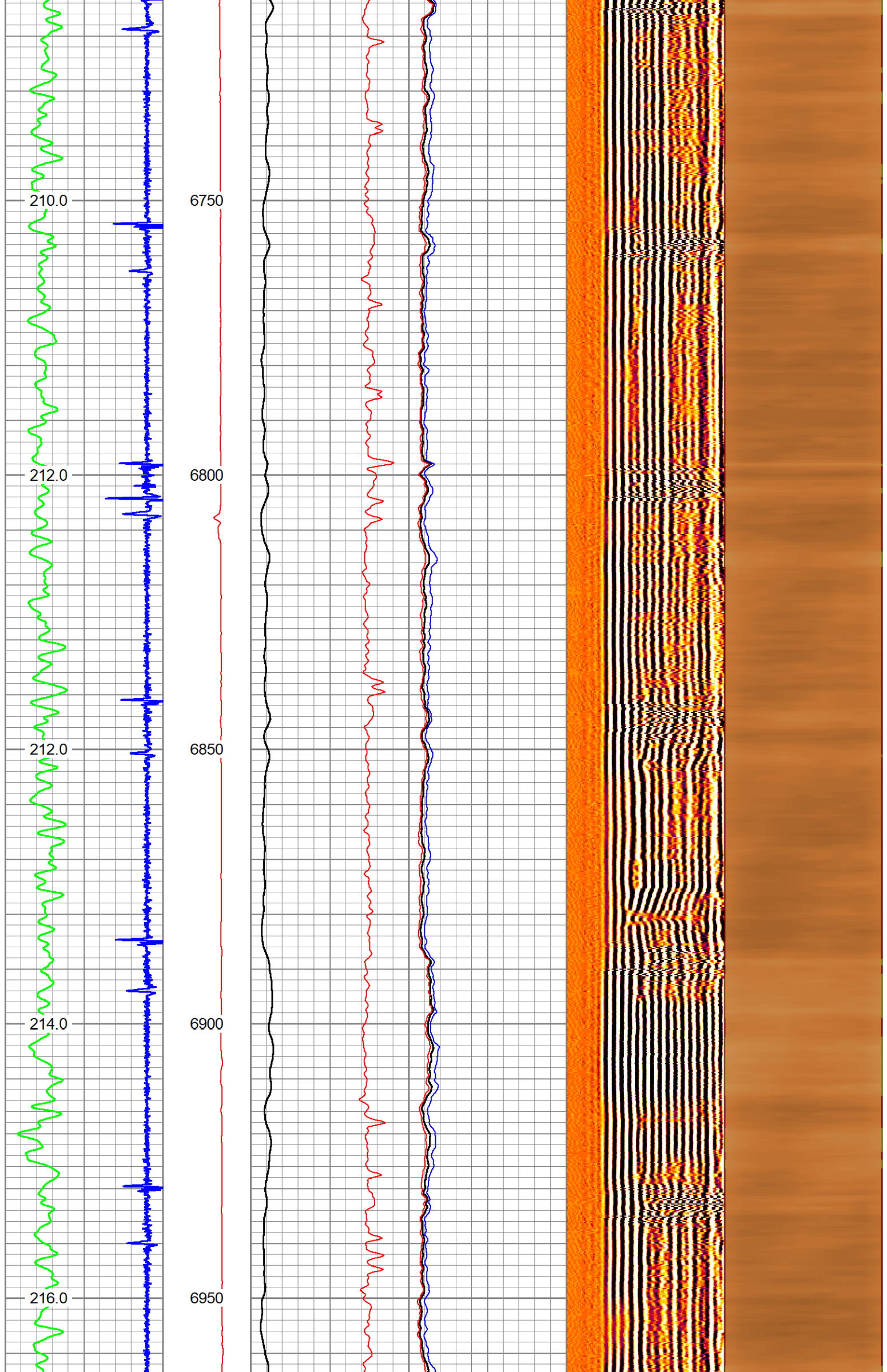


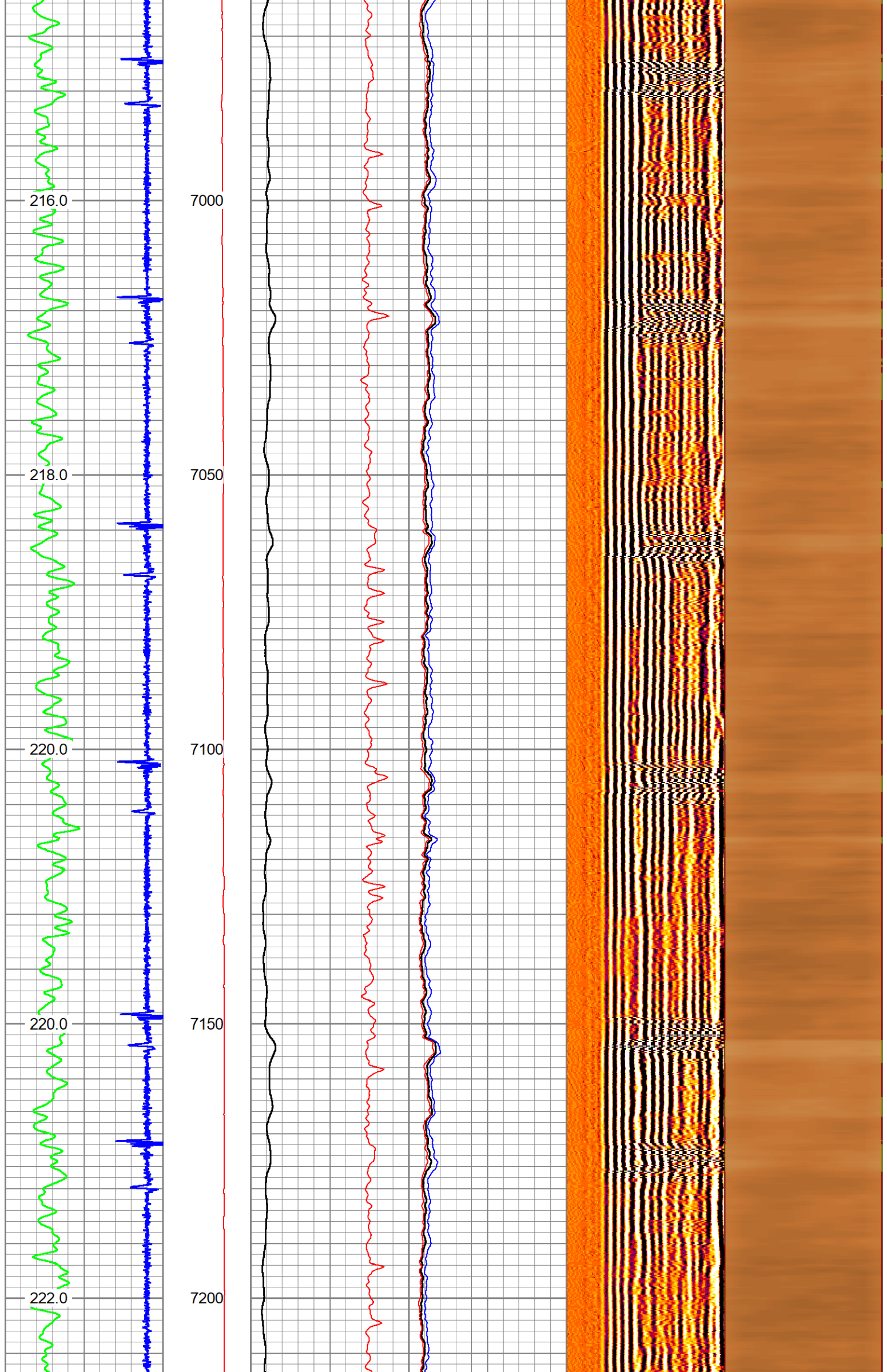


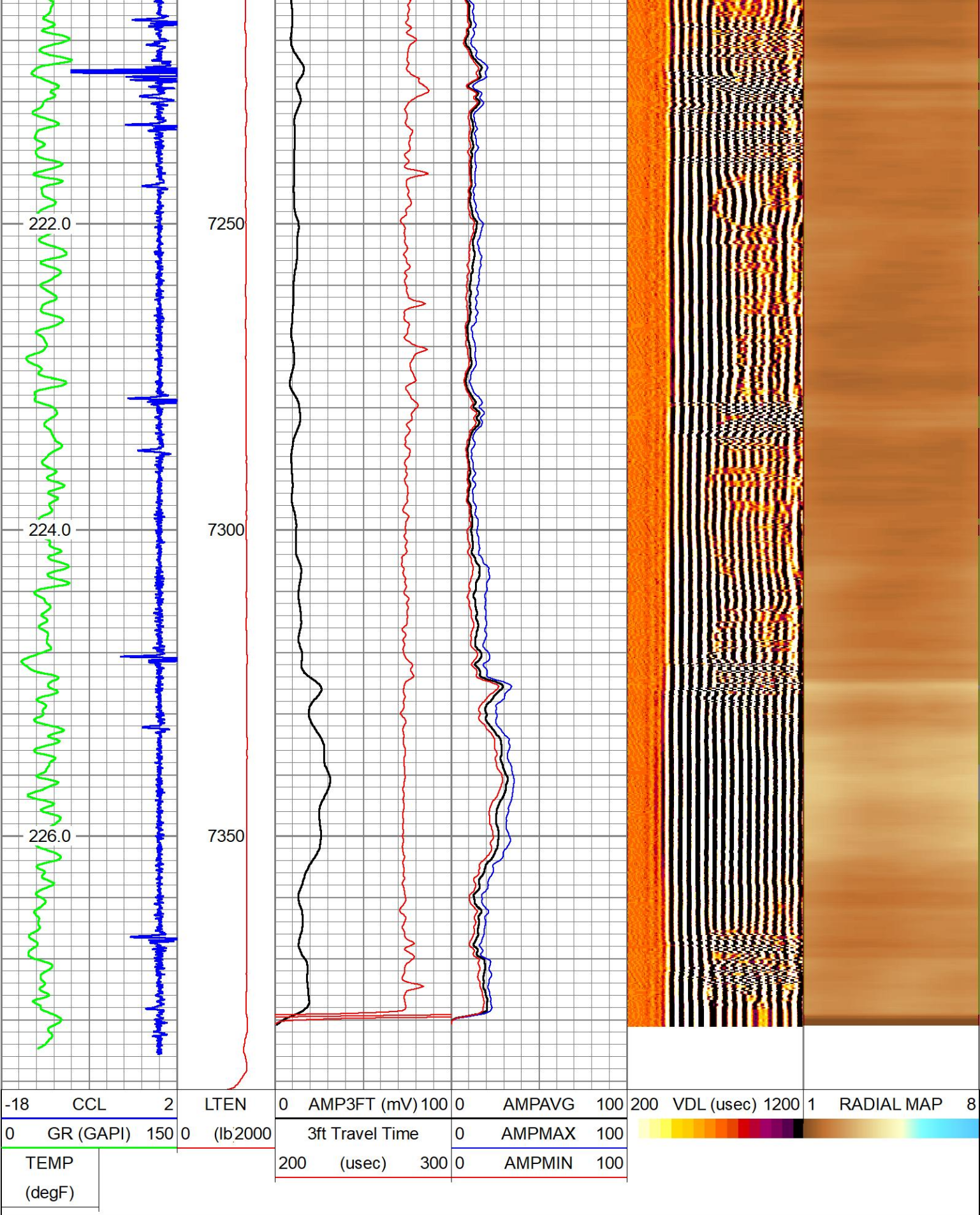












MAIN PASS

HALLIBURTON

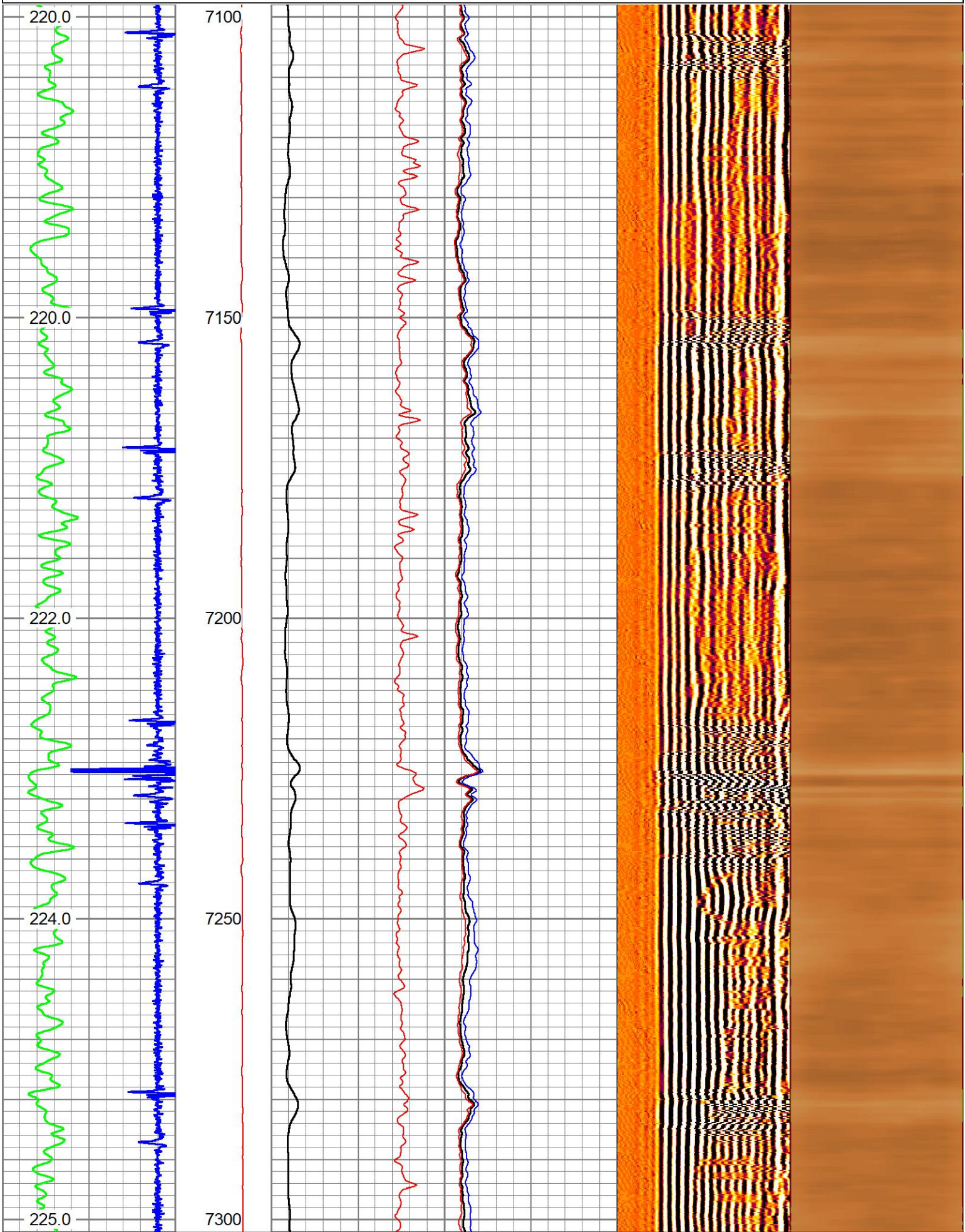
5" = 100'

REPEAT PASS

HALLIBURTON

5" = 100'

-18	CCL	2	LTEN	0	AMP3FT (mV) 100	0	AMPAVG	100	200	VDL (usec) 1200	1	RADIAL MAP	8
0	GR (GAPI)	150	0	(lb/2000)	3ft Travel Time	0	AMPMAX	100					
TEMP					200 (usec) 300	0	AMPMIN	100					
(degF)													



TEMP
(degF)

200 (usec)3000AMP MIN100

HALLIBURTON

REPEAT PASS

5" = 100'

Log Variables

DatabaseC:\ProgramData\Warrior\Data\livingston s19-25-12n.db
Dataset field/well/run1/MAIN_PASS.1/_vars_


Top - Bottom

BHTEMP_Src TEMP	BITSIZE in 8.5	BOTTEMP degF 220	CASEOD in 5.5	CASETHCK in 0.304	CASEWGHT lb/ft 17	MAXAMPL mV 72	MINAMPL mV 1
MINATTN db/ft 0.8	MudWgt lb/gal 8.4	PERFS No	PPT usec 214	SRFTEMP degF 40	TDEPTH ft 7500		

Calibration Report					
Database File	livingston s19-25-12n.db				
Dataset Pathname	MAIN_PASS.1				
Dataset Creation	Wed Nov 06 14:52:58 2019				
Temperature Calibration Report					
Serial Number:	Tit1.3_02				
Tool Model:	Titan				
Performed:	Fri Jan 04 06:55:24 2002				
	Reference		Reading		
Low Reference:	0.00	degF	0.00	cps	
High Reference:	1.00	degF	1.00	cps	
Gain:	0.10				
Offset:	0.00				
Delta Spacing	2				
Gamma Ray Calibration Report					
Serial Number:	pr050806				
Tool Model:	Probe275dig				
Performed:	Tue Nov 01 09:40:24 2005				
Calibrator Value:	240.0		GAPI		
Background Reading:	79.3		cps		
Calibrator Reading:	459.5		cps		
Sensitivity:	0.6312		GAPI/cps		
Segmented Cement Bond Log Calibration Report					
Serial Number:	11577056				
Tool Model:	Probe				
Calibration Casing Diameter:	5.500		in		
Calibration Depth:	456.272		ft		

Master Calibration, performed Wed Nov 06 06:54:45 2019:						
	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.000	0.767	0.000	72.000	93.866	0.000
CAL	0.000	0.874				
5'	0.000	0.640	0.000	72.000	112.506	0.000
CUM						

SUM						
S1	0.000	0.865	0.000	72.000	83.246	0.000
S2	0.000	0.896	0.000	72.000	80.375	0.000
S3	0.000	0.925	0.000	72.000	77.805	0.000
S4	0.000	0.884	0.000	72.000	81.407	0.000
S5	0.000	0.781	0.000	72.000	92.182	0.000
S6	0.000	0.676	0.000	72.000	106.551	0.000
S7	0.000	0.665	0.000	72.000	108.278	0.000
S8	0.000	0.720	0.000	72.000	99.985	0.000
Internal Reference Calibration, performed (Not Performed):						
Raw (v)		Calibrated (v)		Results		
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.000	0.874	1.000	0.000
Air Zero Calibration, performed Wed Nov 06 06:40:25 2019:						
Raw (v)		Calibrated (v)		Results		
	Zero		Zero		Offset	
3'	0.000		0.000		0.000	
5'	0.000		0.000		0.000	
SUM						
S1	0.000		0.000		0.000	
S2	0.000		0.000		0.000	
S3	0.000		0.000		0.000	
S4	0.000		0.000		0.000	
S5	0.000		0.000		0.000	
S6	0.000		0.000		0.000	
S7	0.000		0.000		0.000	
S8	0.000		0.000		0.000	

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
WVFCAL WVF3FT WVF5FT	12.58		STNDCH-1_11_16_CH 1.6875 IN CABLE HEAD	1.50	1.44	1.00
	12.58		CENT-Probe_275 Probe 2 3/4 Centralizer	2.88	2.75	20.00
	10.58		RBT_PRB275-Probe (11577056) Probe Radii Bond Tool with Digital Telemetry	8.33	2.75	90.00

WWCT	10.00						
				CENT-Probe_275 Probe 2 3/4 Centralizer	2.88	2.75	20.00
CCL	6.13						
GR	4.75			GR_PRB275-probe275dig (pr050806) Probe Digital Gamma CCL	4.75	2.75	57.00
TEMP	0.17			TEMP-Titan (Tit1.3_02) Titan Temp 1.3875	2.21	1.39	10.00
LLMTEN	0.00						
Dataset: livingston s19-25-12n.db: field/well/run1/MAIN_PASS.1 Total length: 22.54 ft Total weight: 198.00 lb O.D.: 2.75 in							

Company	EXTRACTION OIL & GAS INC				
Well	LIVINGSTON S19-25-12N				
Field	WATTENBERG				
County	BROOMFIELD		State	CO	
HALLIBURTON	RADIAL CEMENT BOND LOG				