



**Radial Cement Bond
Variable Density Log
w/ Gamma Ray/CCL**

Company	Noble Energy
Well	Reliance E 23-62-1HN
Field	Wattenberg
County	Weld
State	Colorado
Company	Noble Energy
Well	Reliance E23-62-1HN
Field	Wattenberg
County	Weld
State	Colorado
Location:	API # : 05-123-38220 BHL: 330' FSL & 535' FWL
Other Services	None
SEC 23 TWP 6N RGE 65W	
Permanent Datum	Ground Level Elevation 4724'
Log Measured From	Kelly Bushing 30' APD
Drilling Measured From	Kelly Bushing
Elevation	K.B. 4754' D.F. 4753' G.L. 4724'

Date	March 20, 2015
Run Number	1
Depth Driller	11296'
Depth Logger	7044'
Bottom Logged Interval	7027'
Top Log Interval	Surface
Open Hole Size	8 3/4"
Type Fluid	Fresh Water
Density / Viscosity	8.33#
Max. Recorded Temp.	225 Deg F
Estimated Cement Top	466'
Time Well Ready	8:00
Time Logger on Bottom	8:45
Equipment Number	2366
Location	Brighton, Co
Recorded By	Jon Ostler
Witnessed By	

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
Conductor	26"	32'	132'				
Surface	13 1/2"	132'	848'				
Intermediate	8 3/4"	848'	7252'				
Production	6 1/8"	7252'	11296'				
Casing Record	Size		Wd/ft	Top		Bottom	
Surface String	9 5/8"		36#	32'		838'	
Prot. String							
Production String	7"		26#	32'		7242'	
Liner	4 1/2"		11.6#	7087'		11279'	
Short Joint				6047'		6067'	

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

Primary Log on Well

Logged measured using 30' KB
Repeat Pass logged w/0 PSI
Main Pass logged w/2500 PSI
Estimated Top of Cement @ 466'
Short Joint @ 6047' to 6067'

Thank You for using Allied-Horizontal Wireline Services
(303) 659-4609



Repeat Pass (0 PSI)

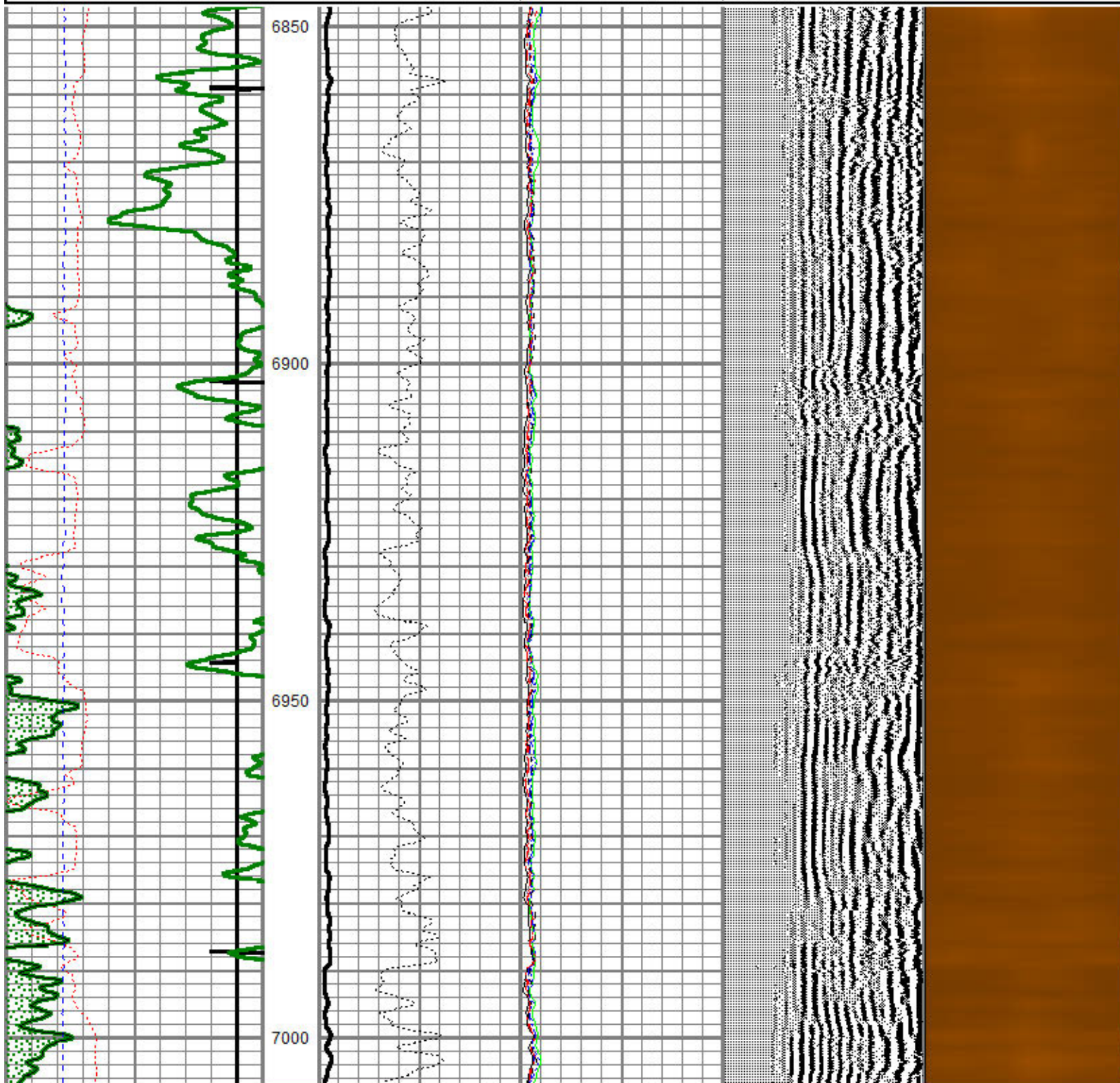
WIRELINE SERVICES

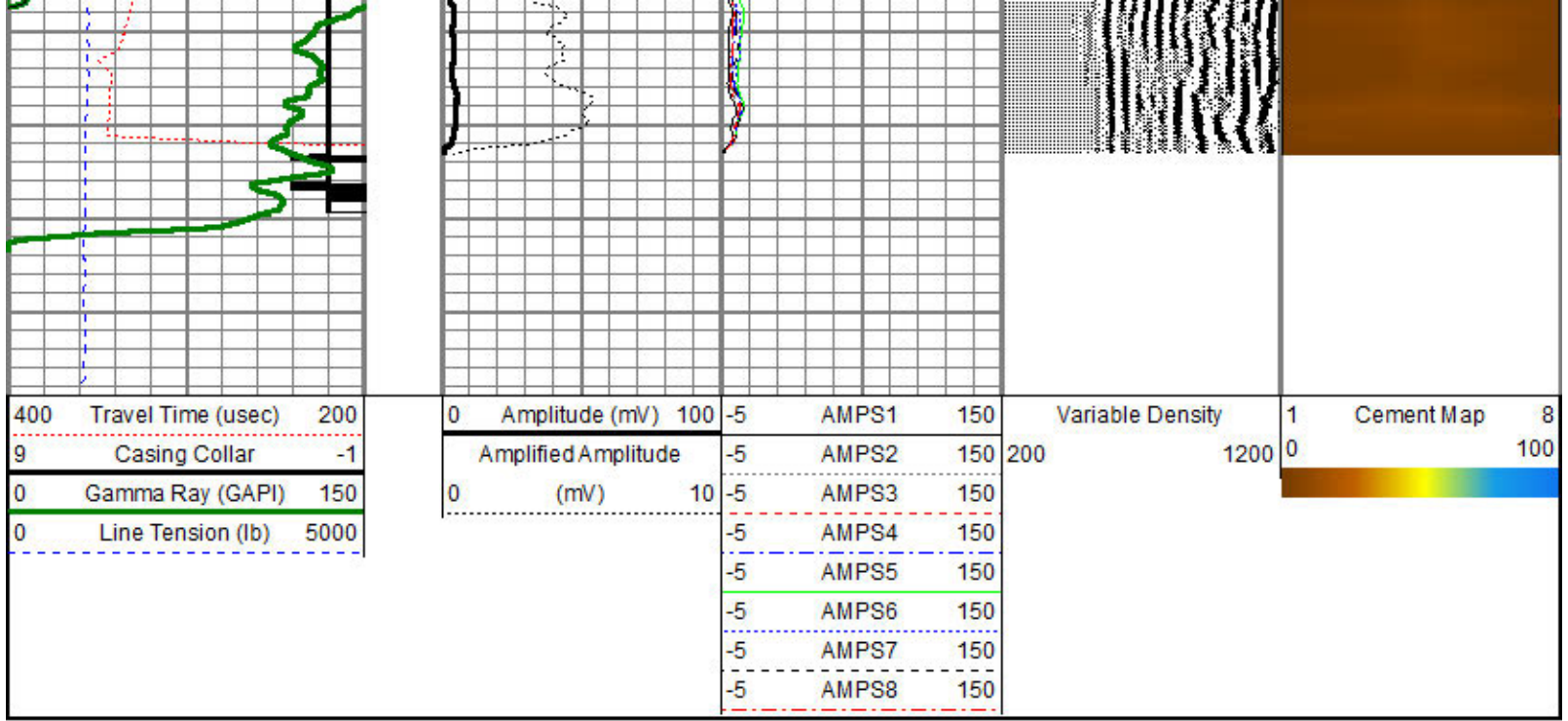
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 Dataset Pathname: pass3
 Presentation Format: scbl03
 Dataset Creation: Fri Mar 20 09:24:51 2015 by Log 7.0 B1
 Charted by: Depth in Feet scaled 1:240

400	Travel Time (usec)	200
9	Casing Collar	-1
0	Gamma Ray (GAPI)	150
0	Line Tension (lb)	5000

0	Amplitude (mV)	100
	Amplified Amplitude	
0	(mV)	10
-5	AMPS1	150
-5	AMPS2	150
-5	AMPS3	150
-5	AMPS4	150
-5	AMPS5	150
-5	AMPS6	150
-5	AMPS7	150
-5	AMPS8	150

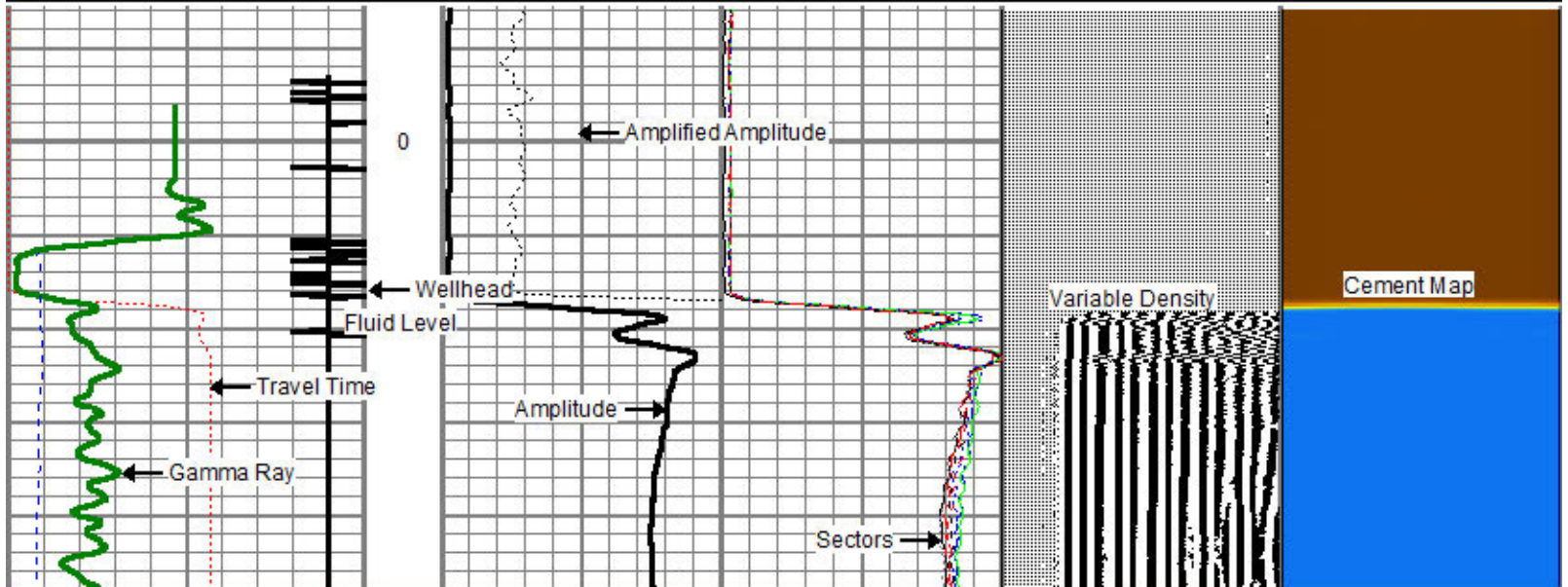
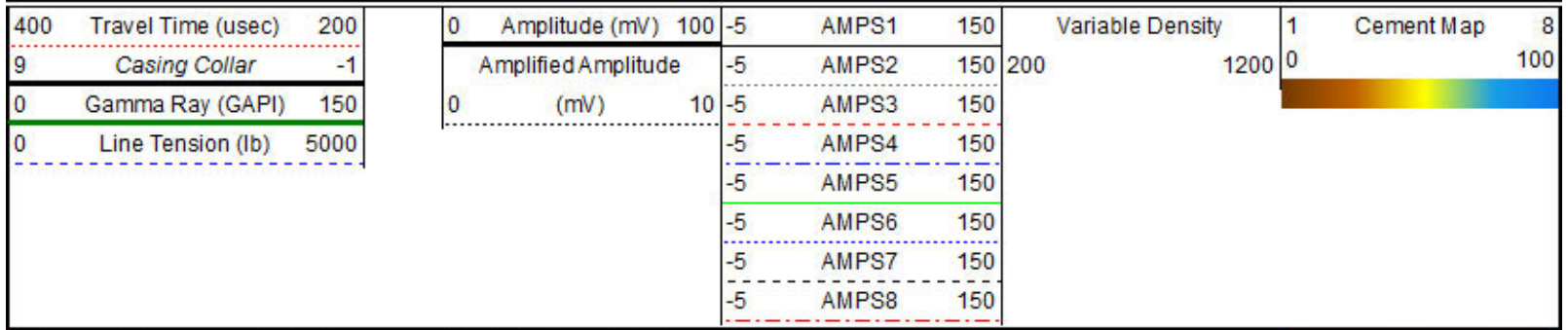
Variable Density	1	Cement Map	8
200	1200	0	100

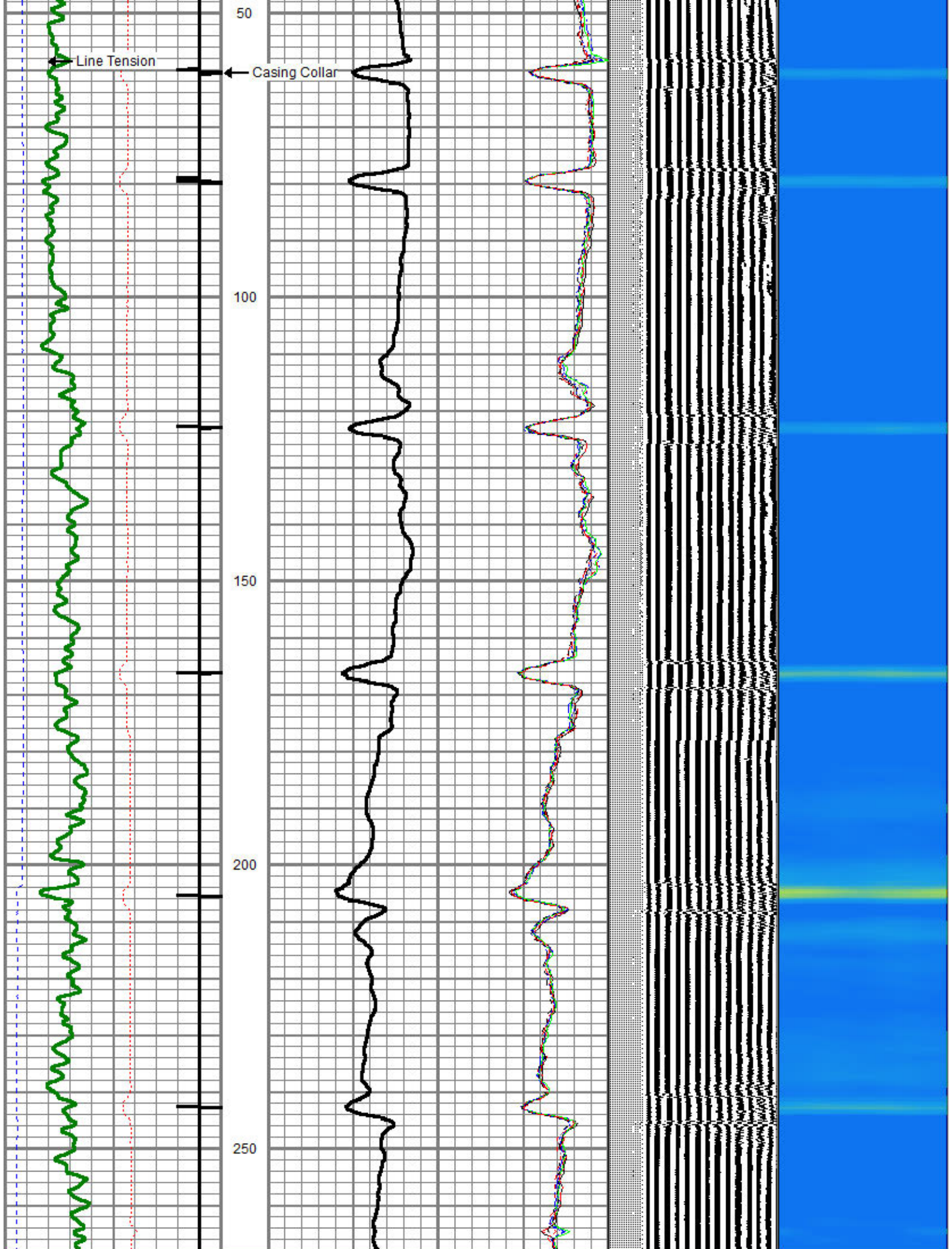


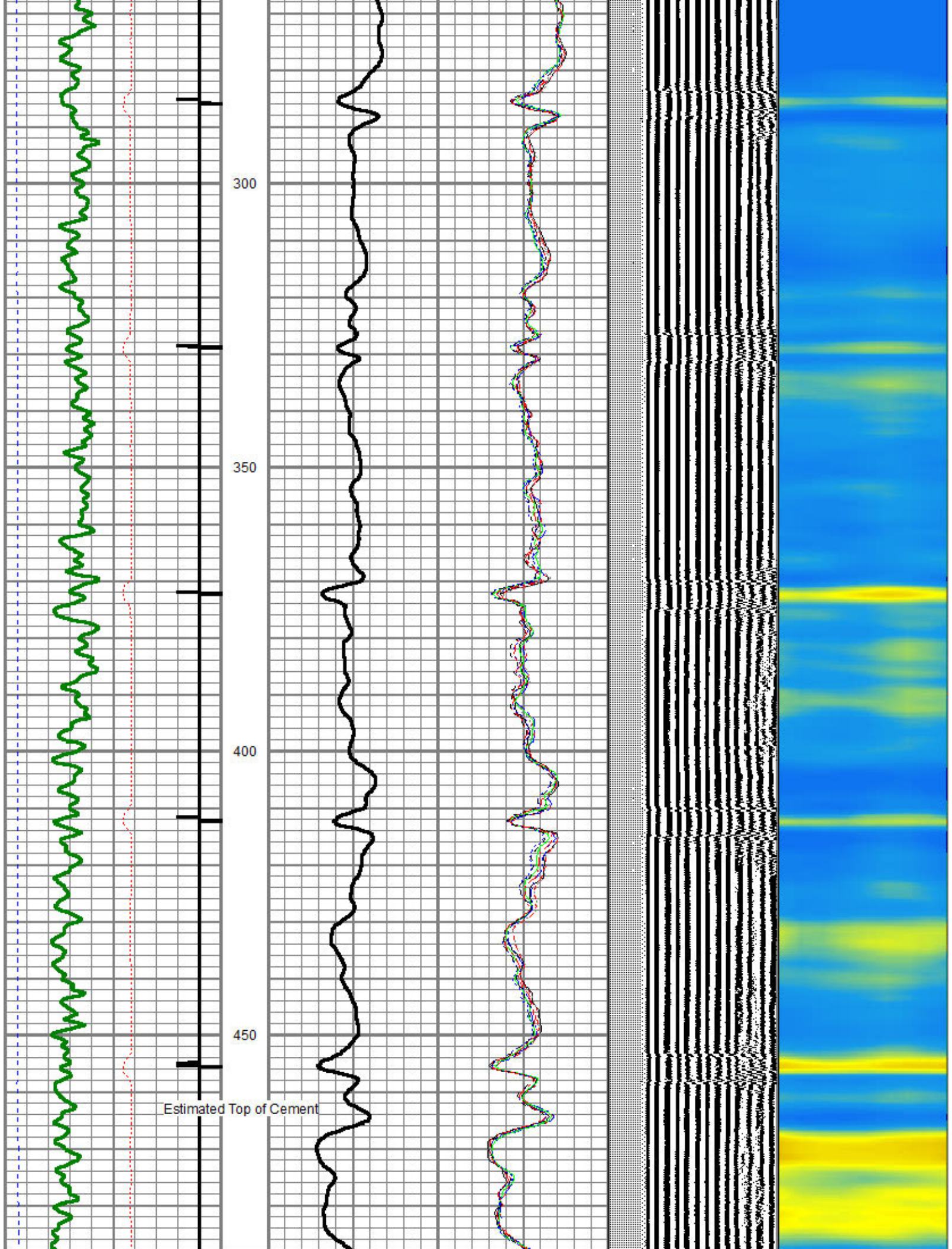


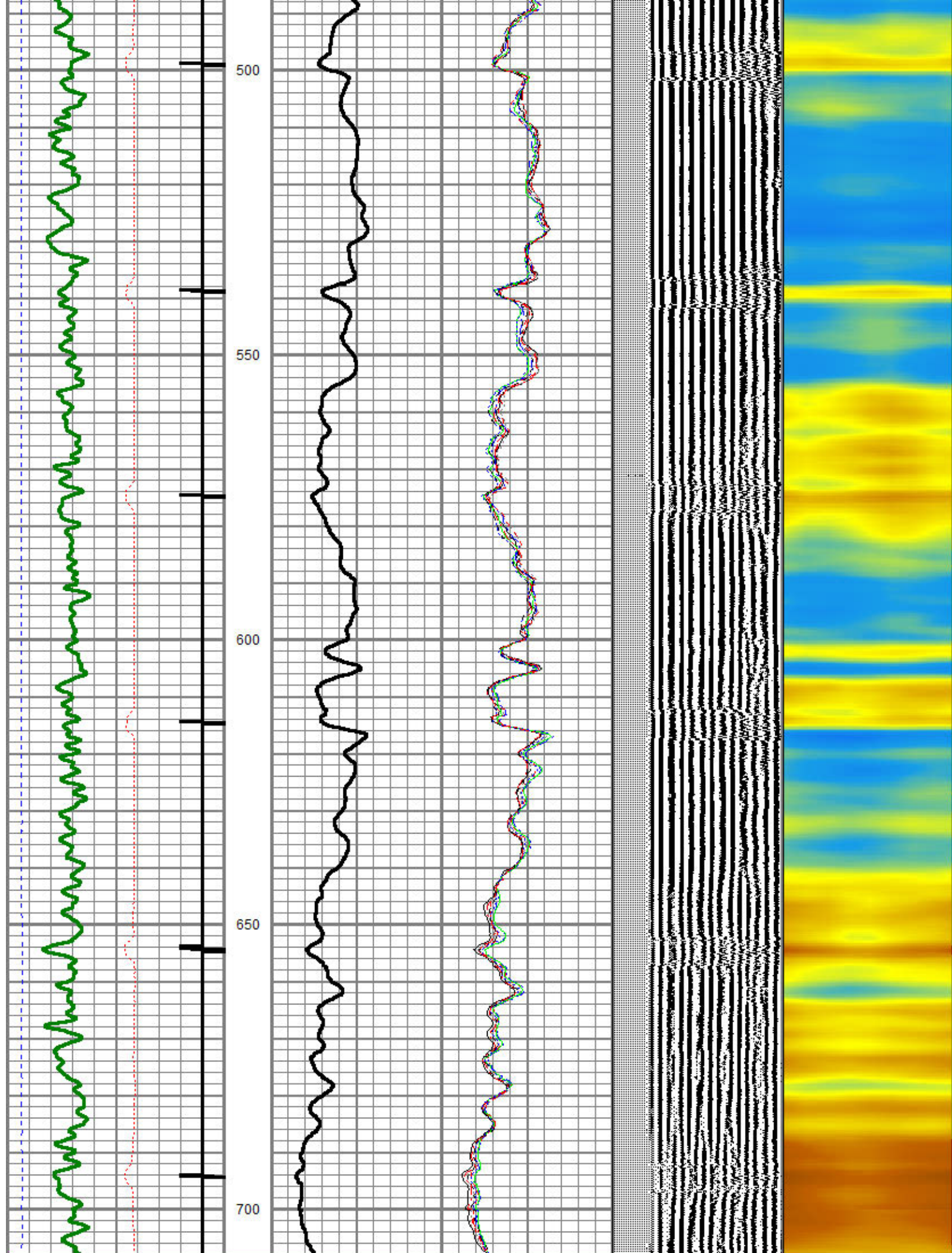
Main Pass (2500 PSI)

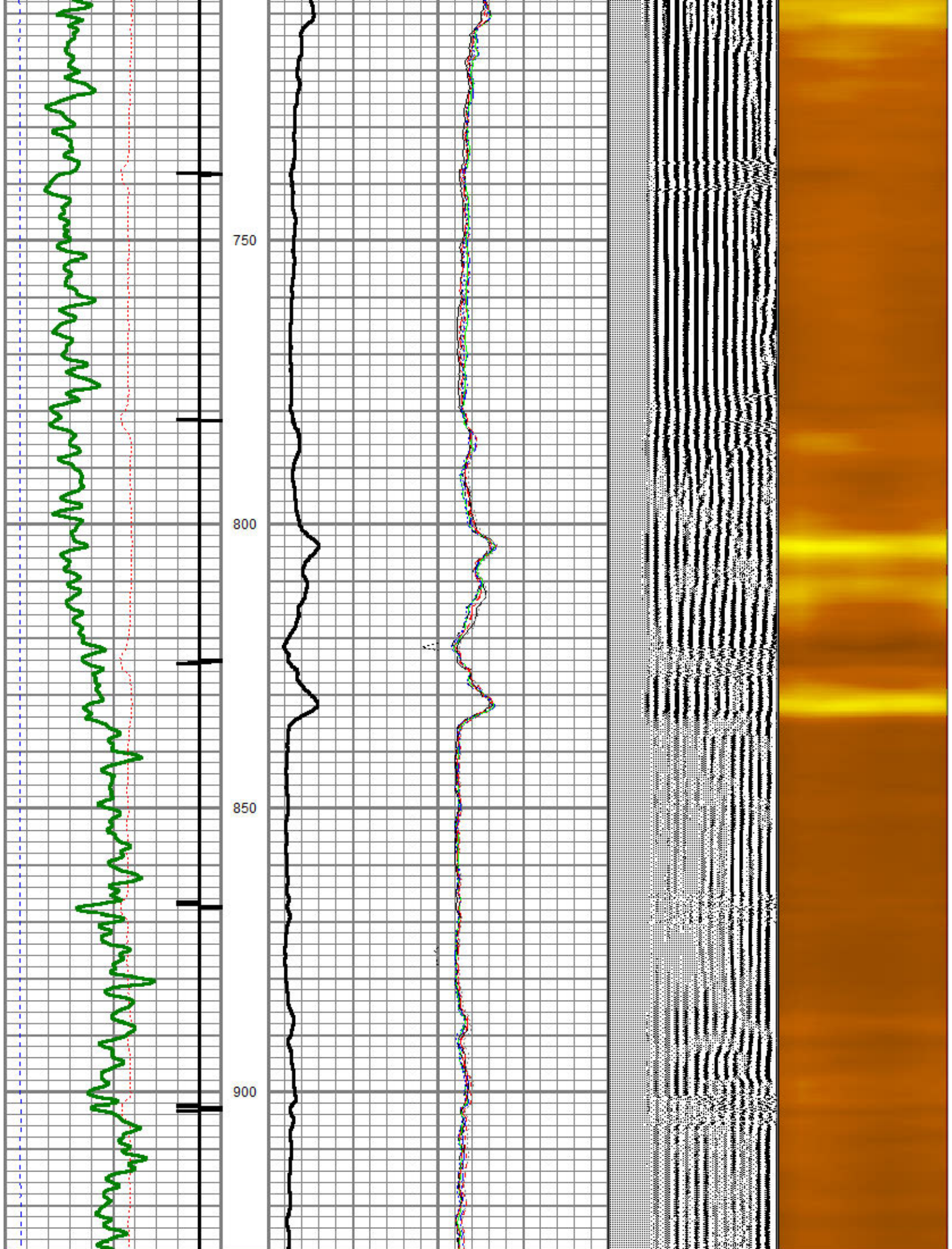
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 Presentation Format: scbl03
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 Charted by: Depth in Feet scaled 1:240

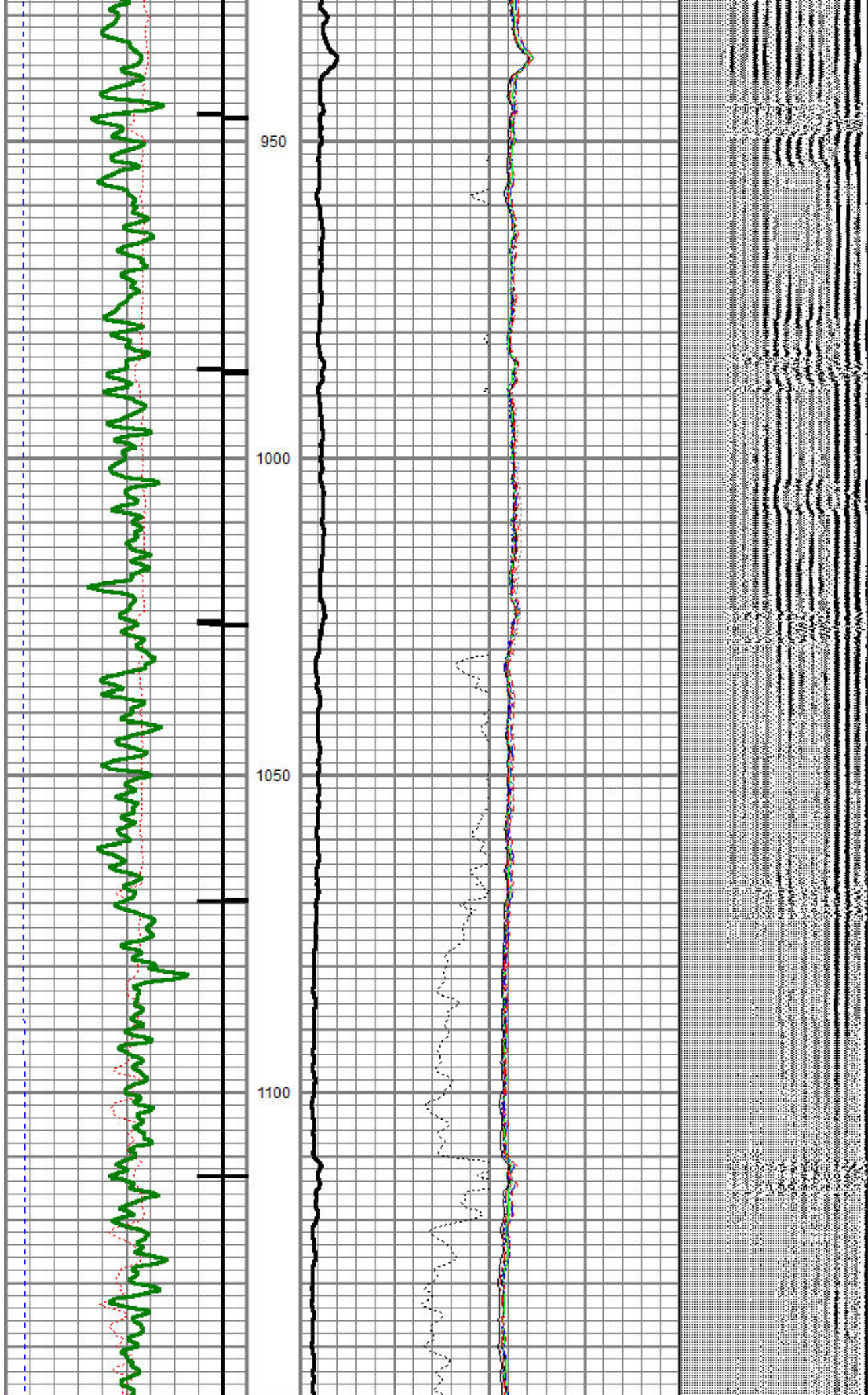


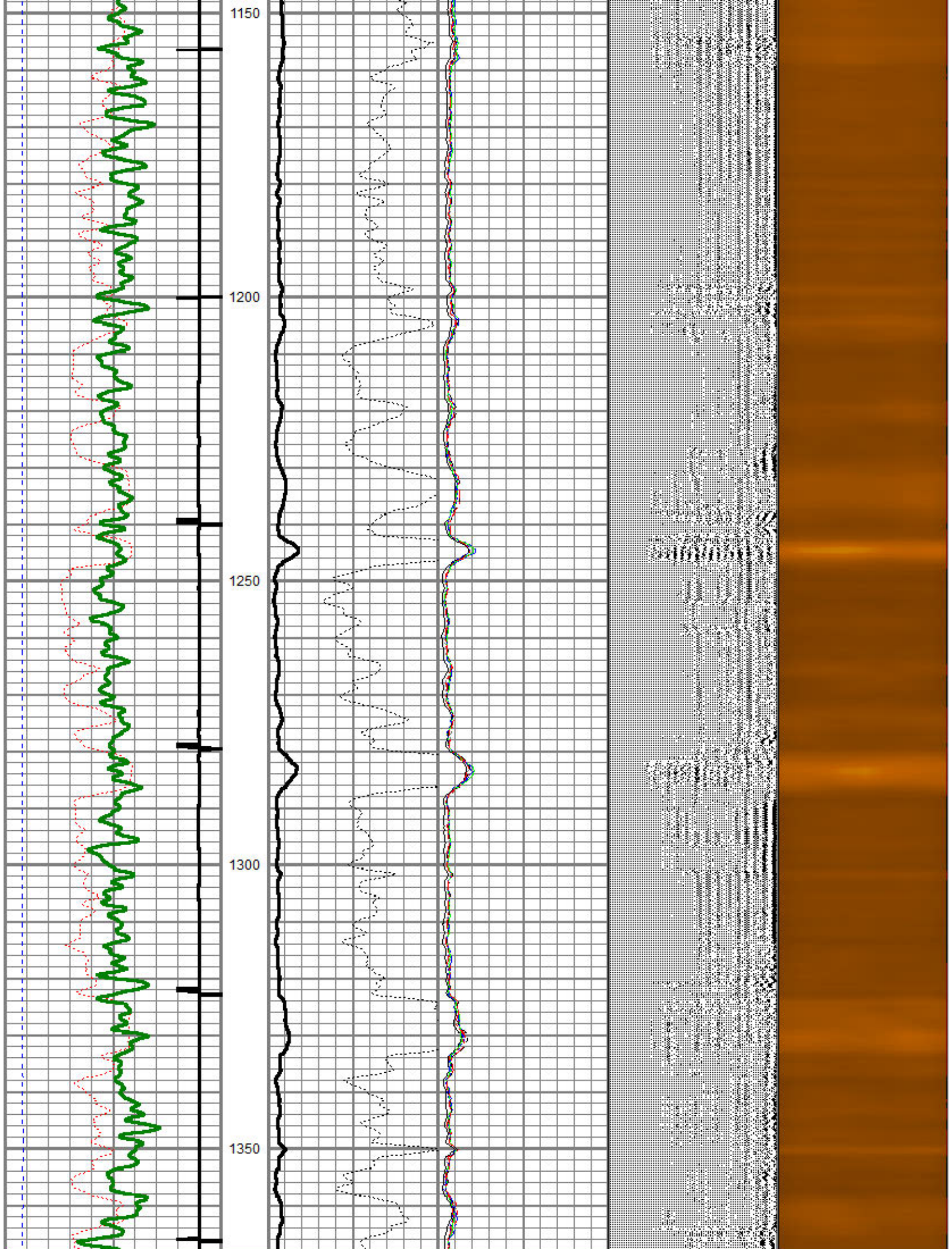


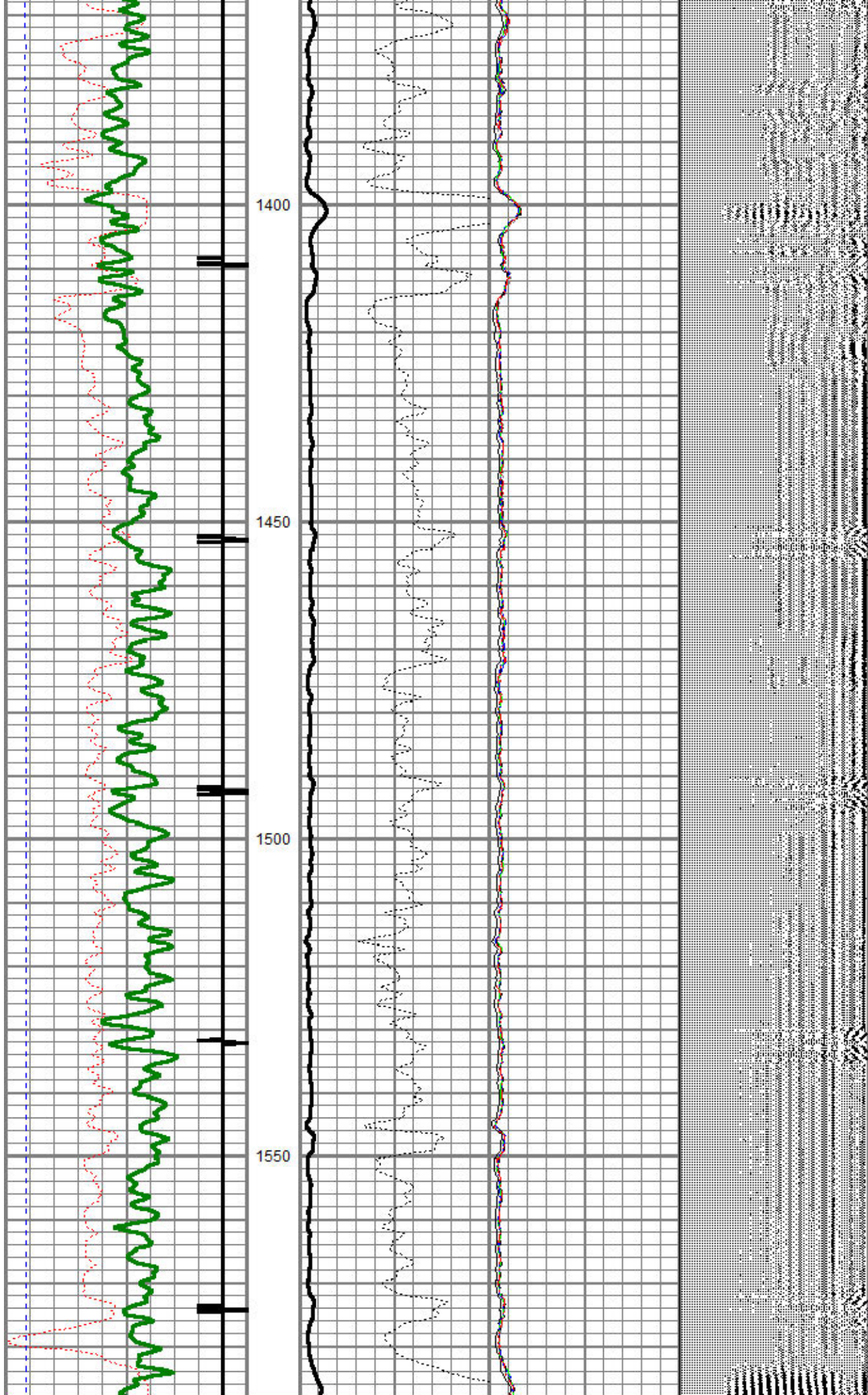


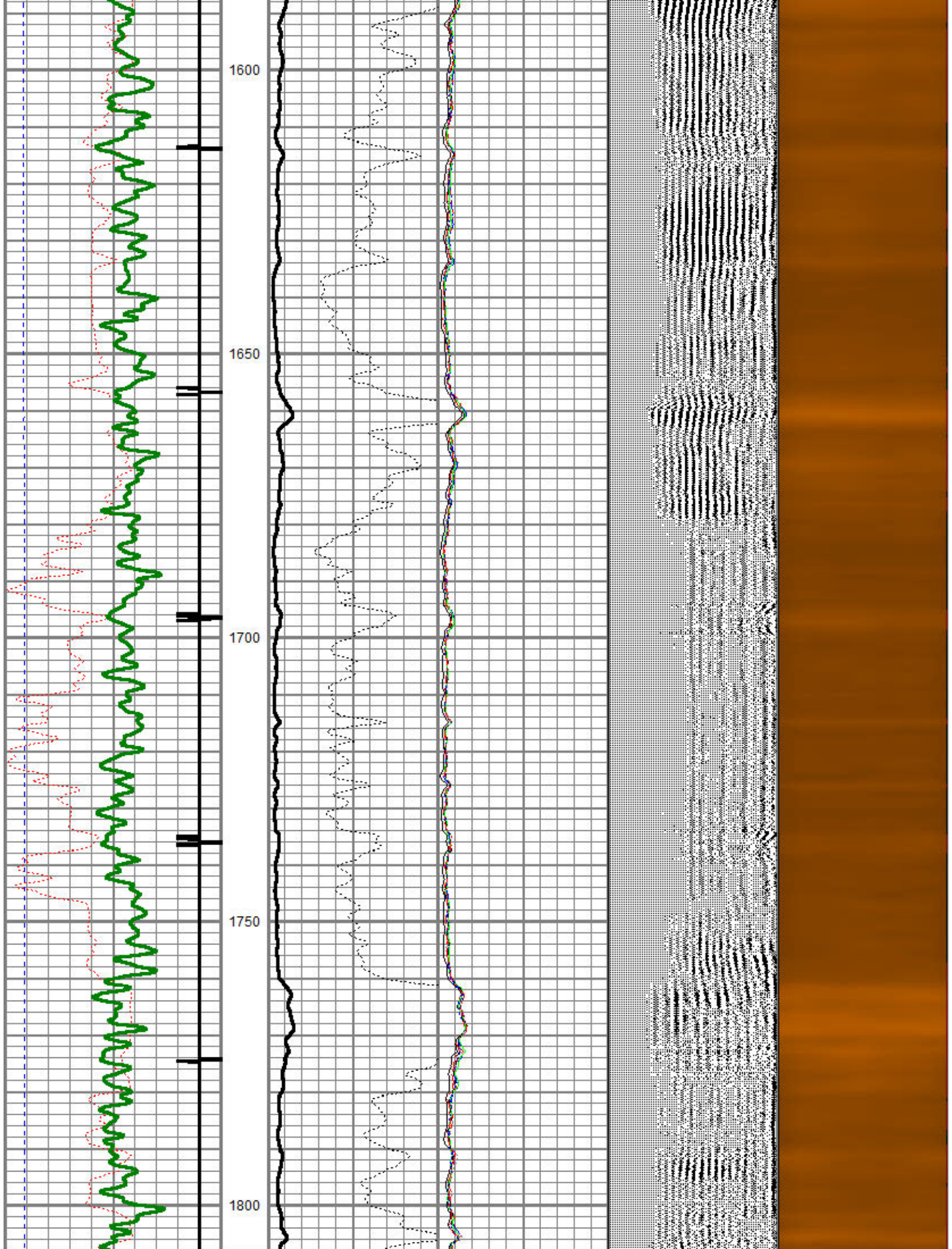


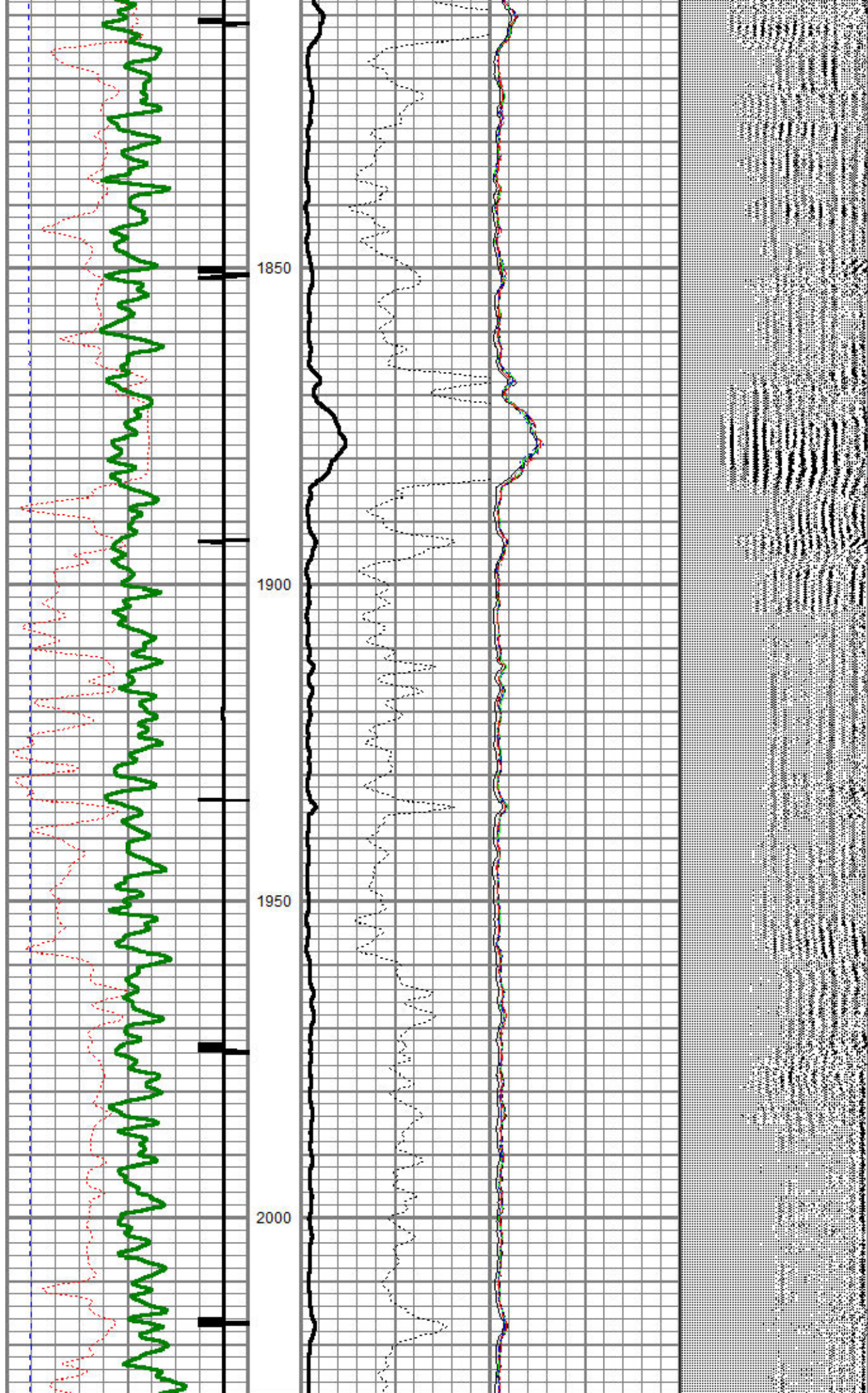


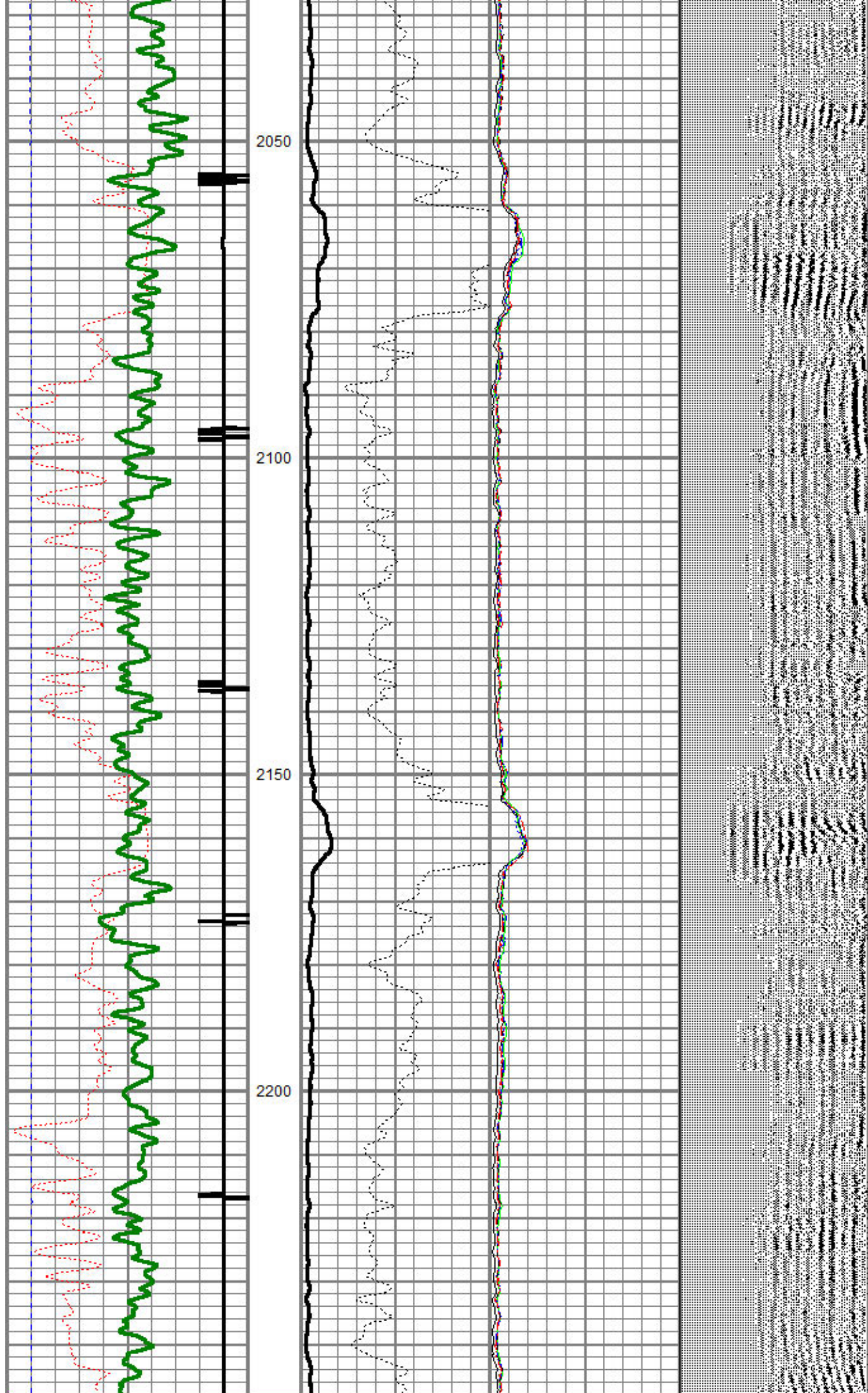


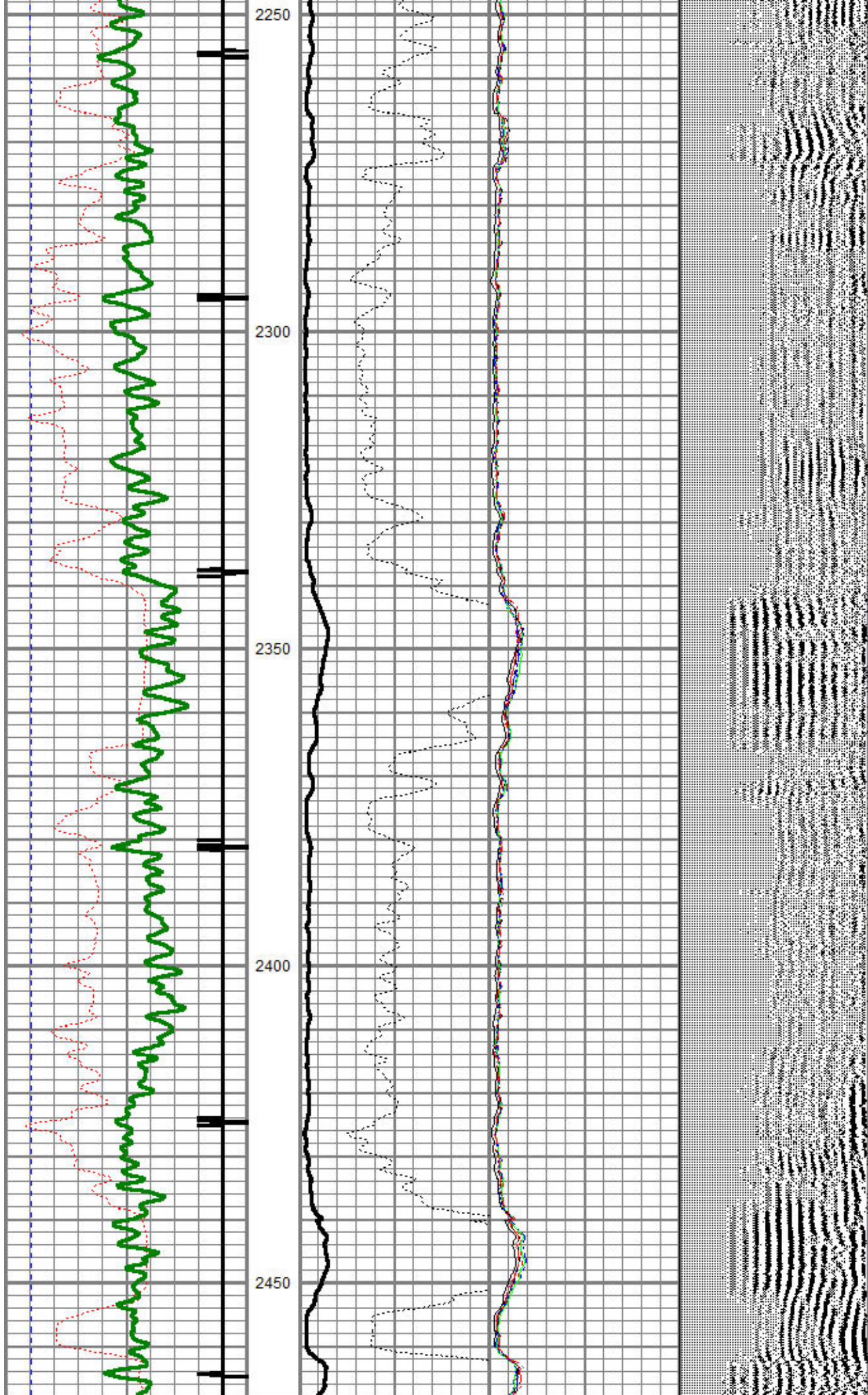


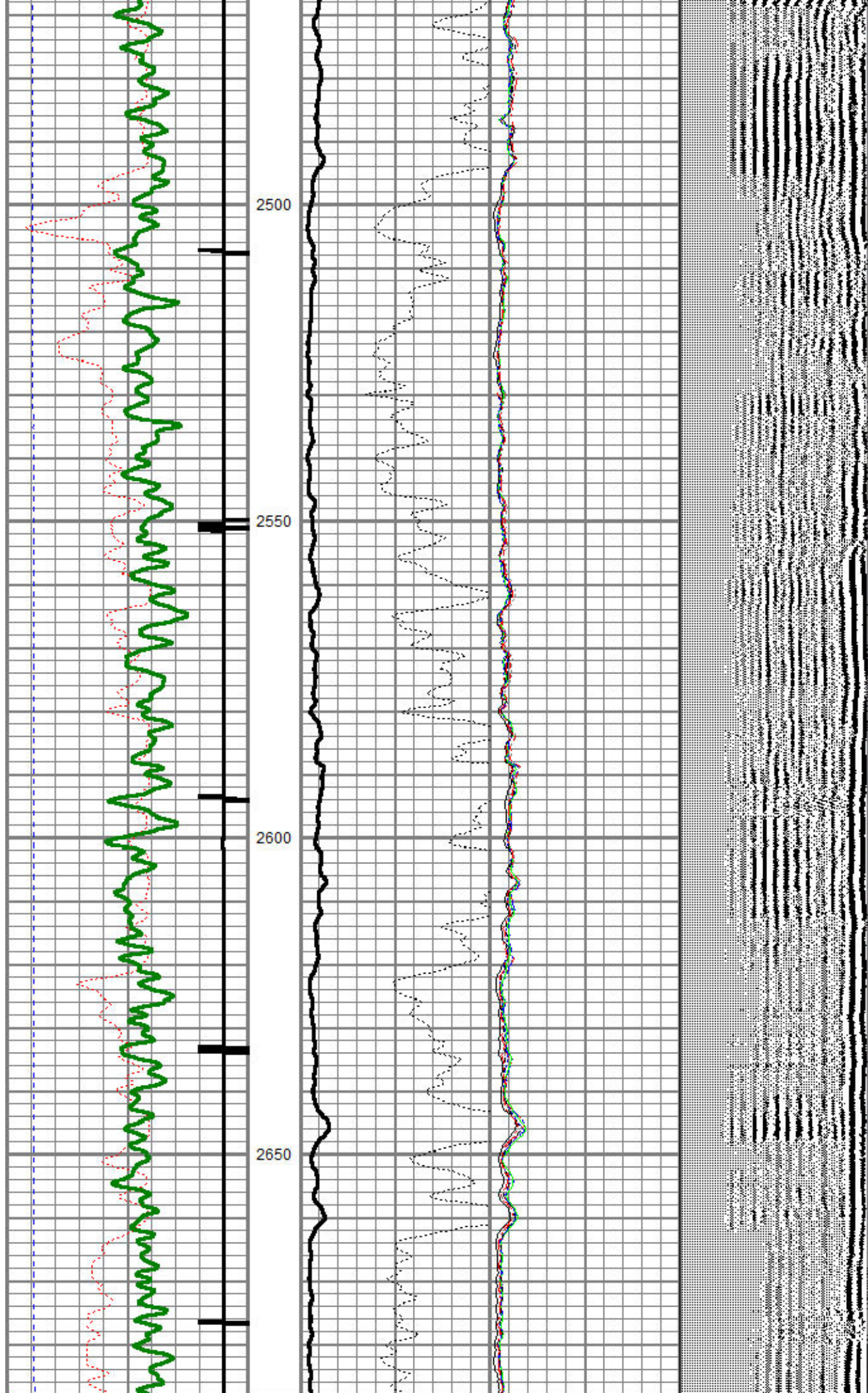


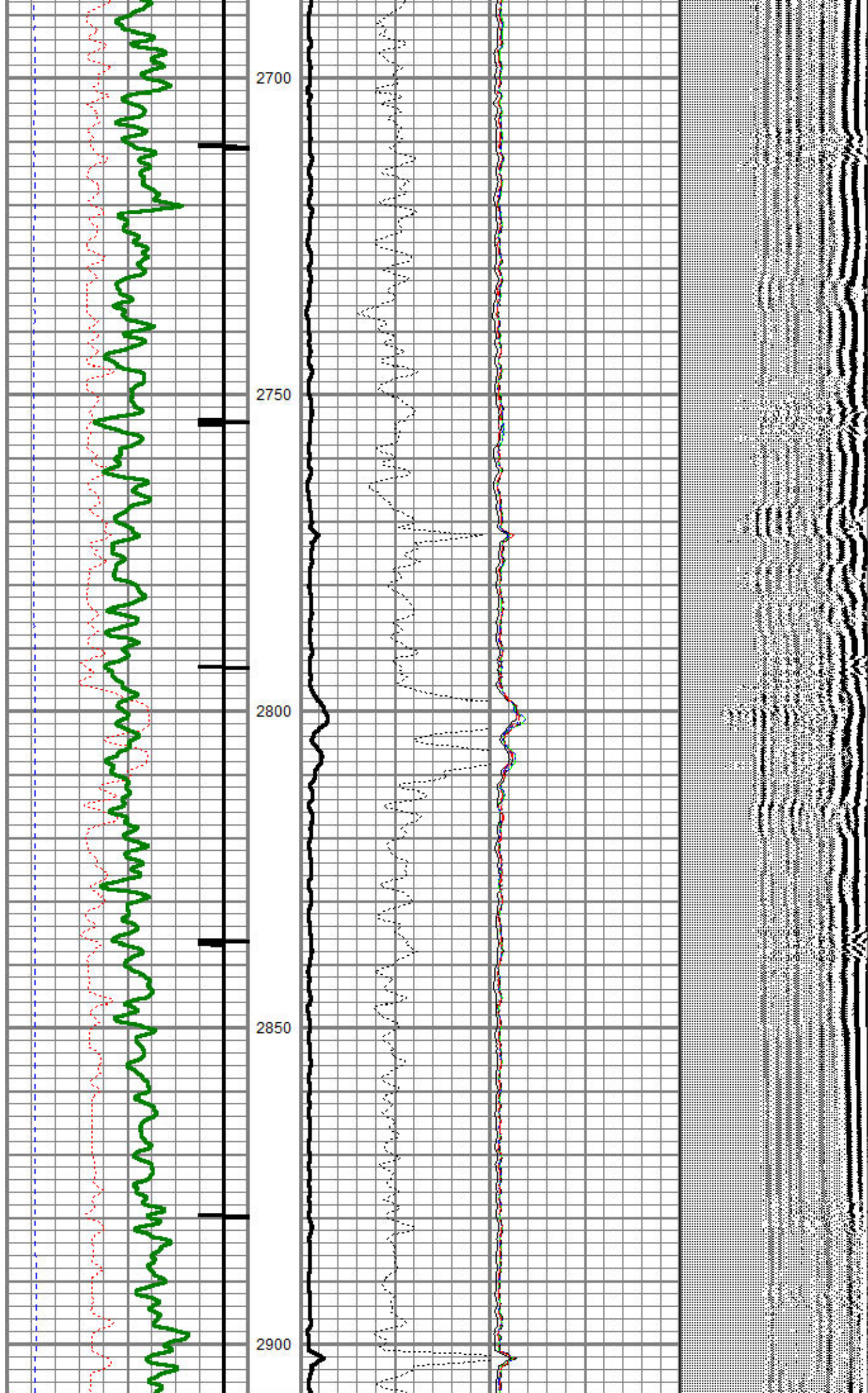


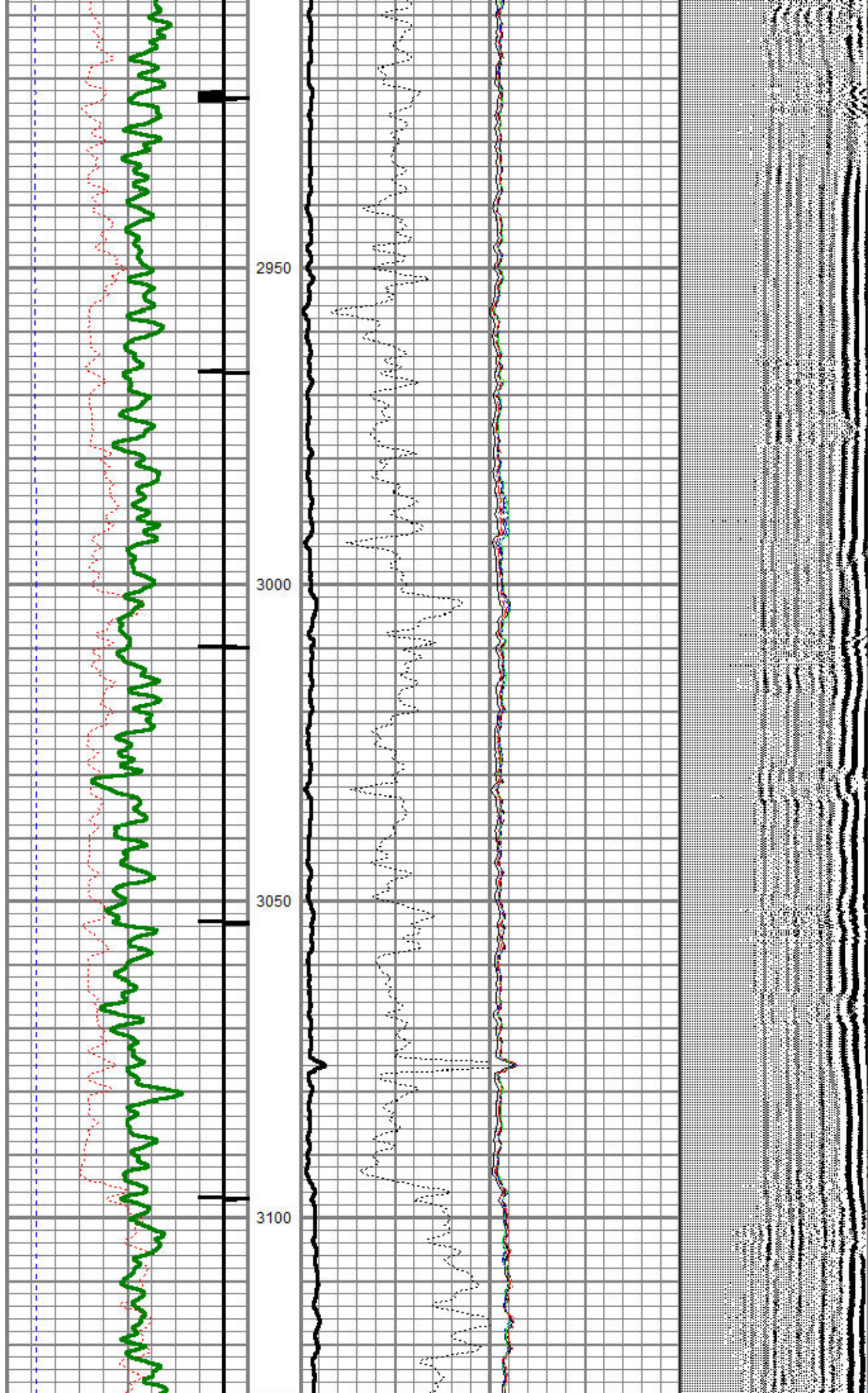


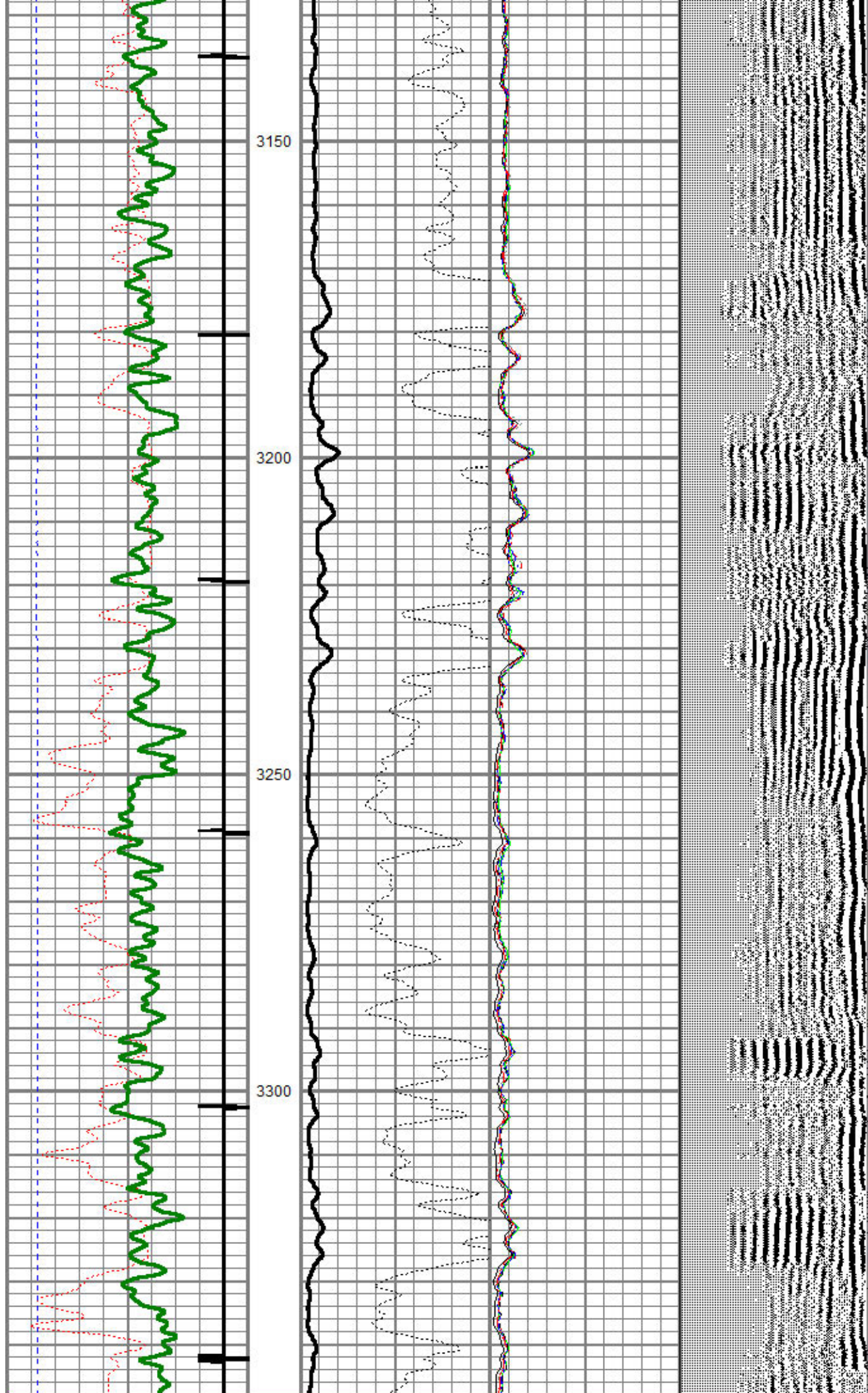


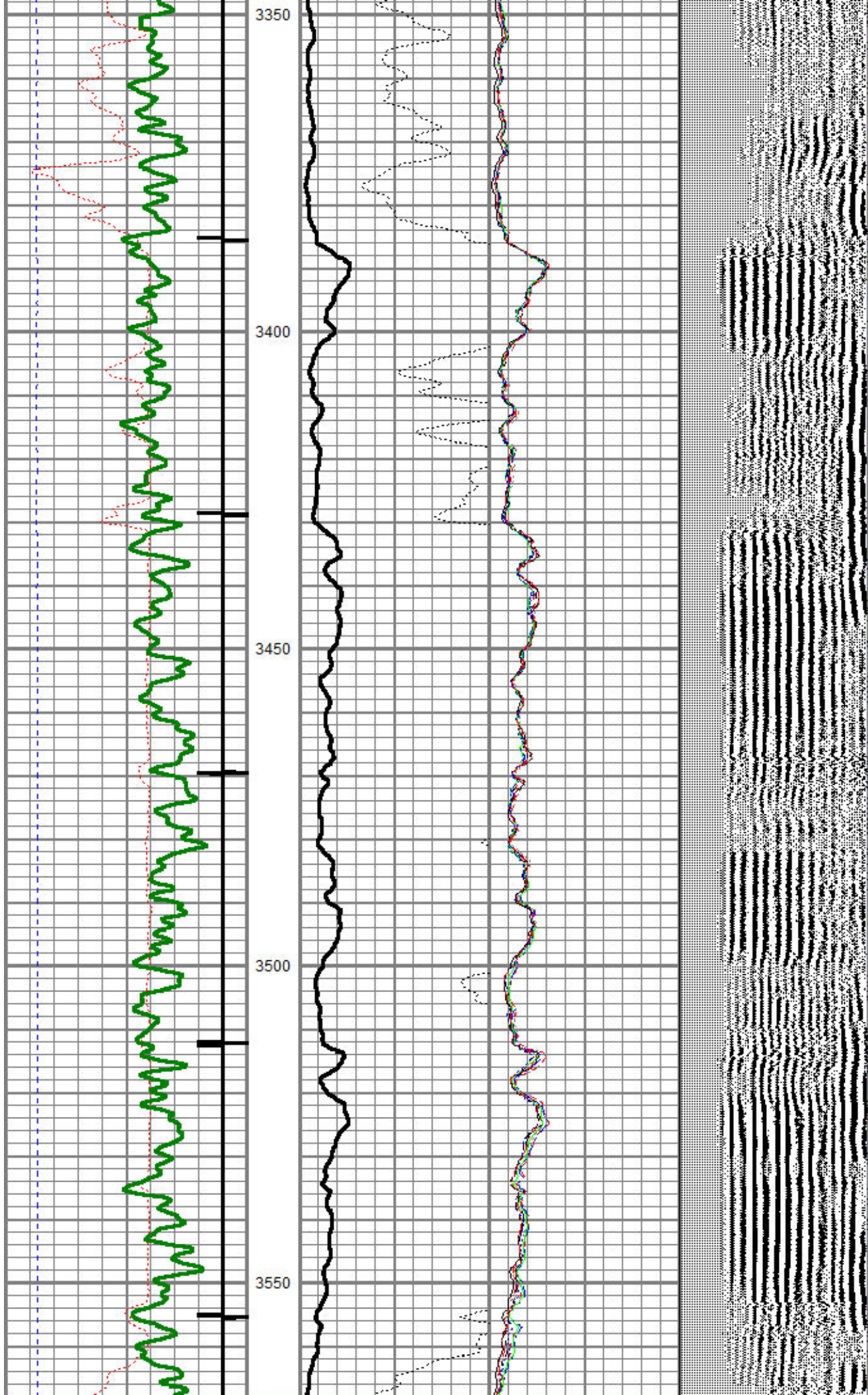


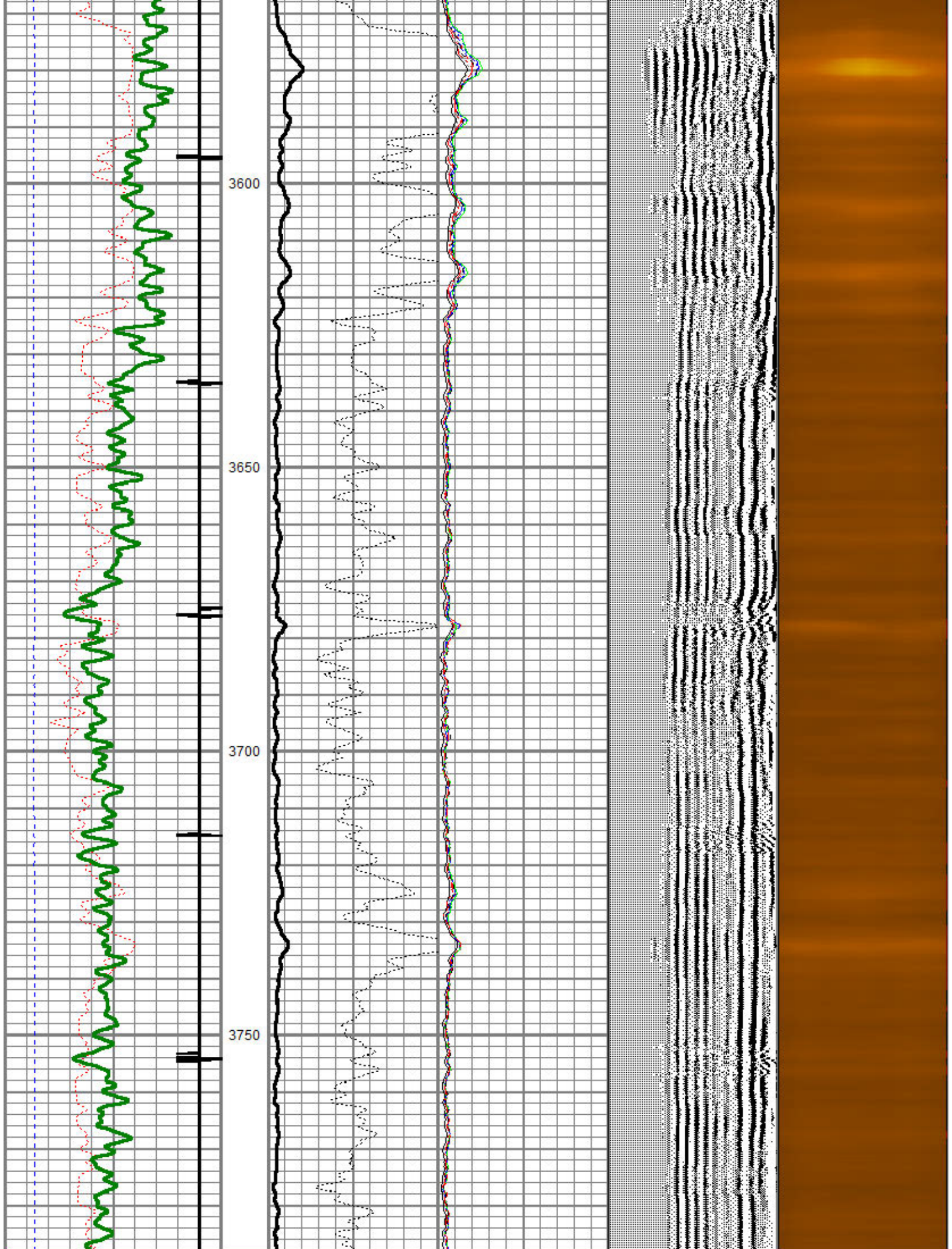


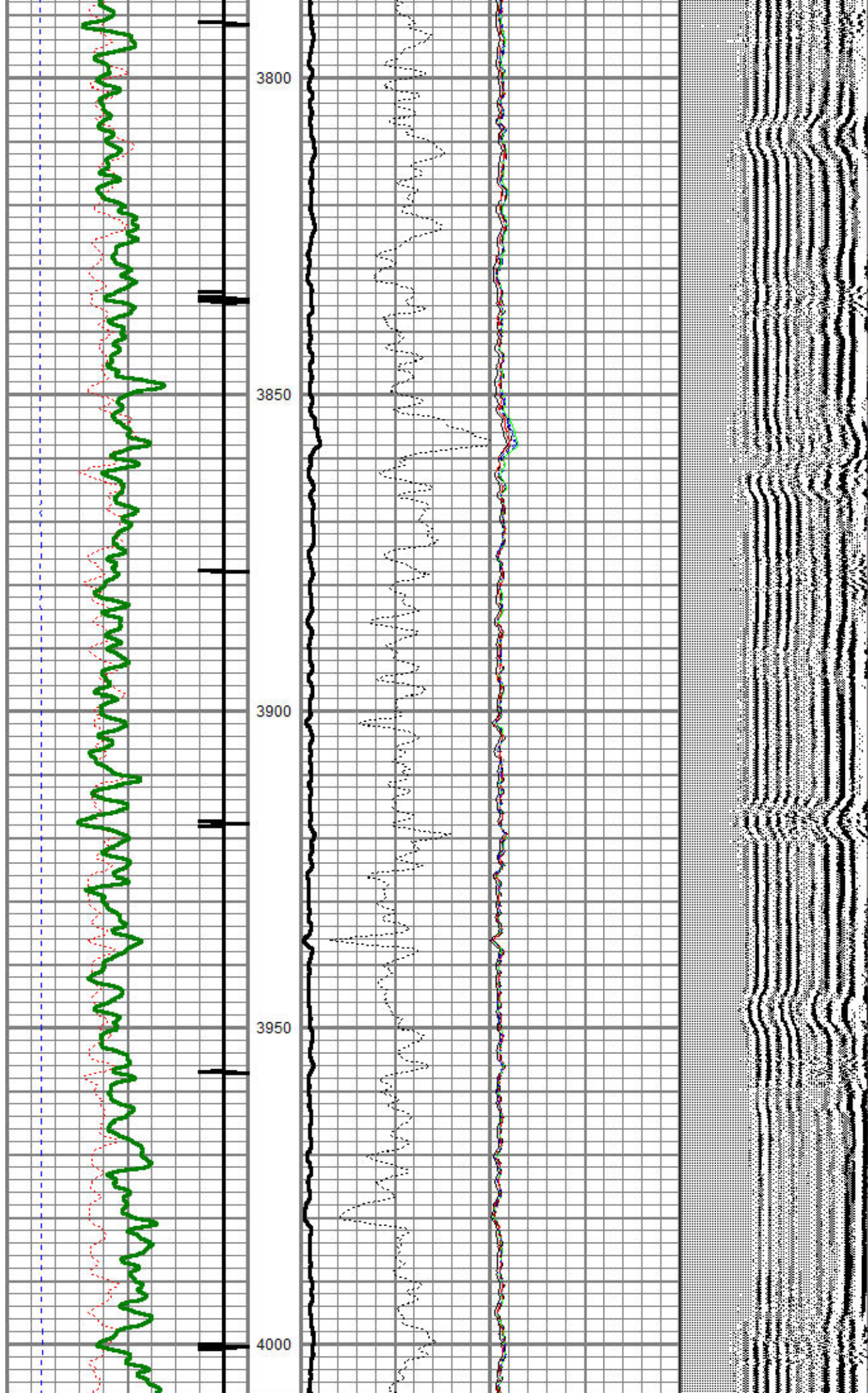


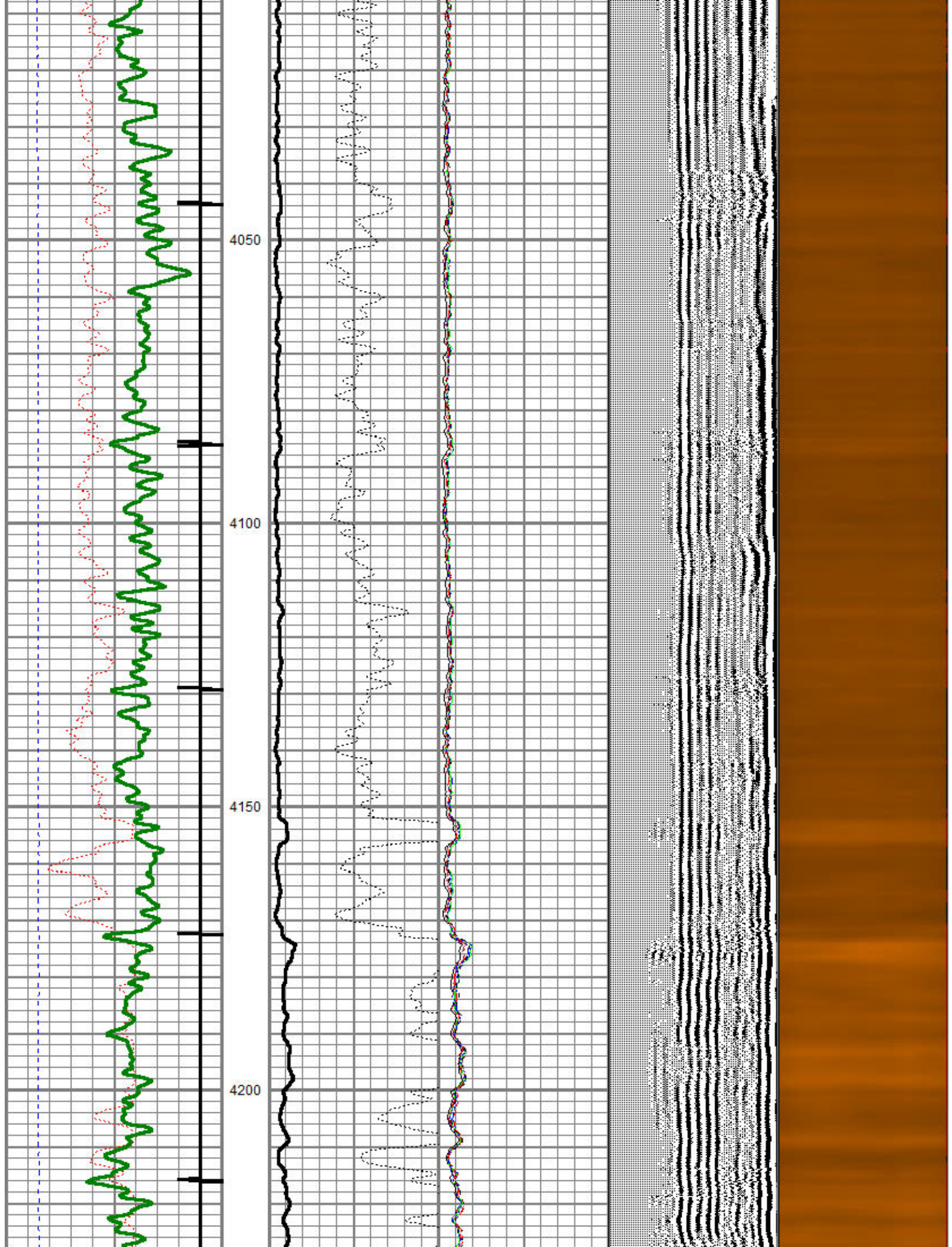


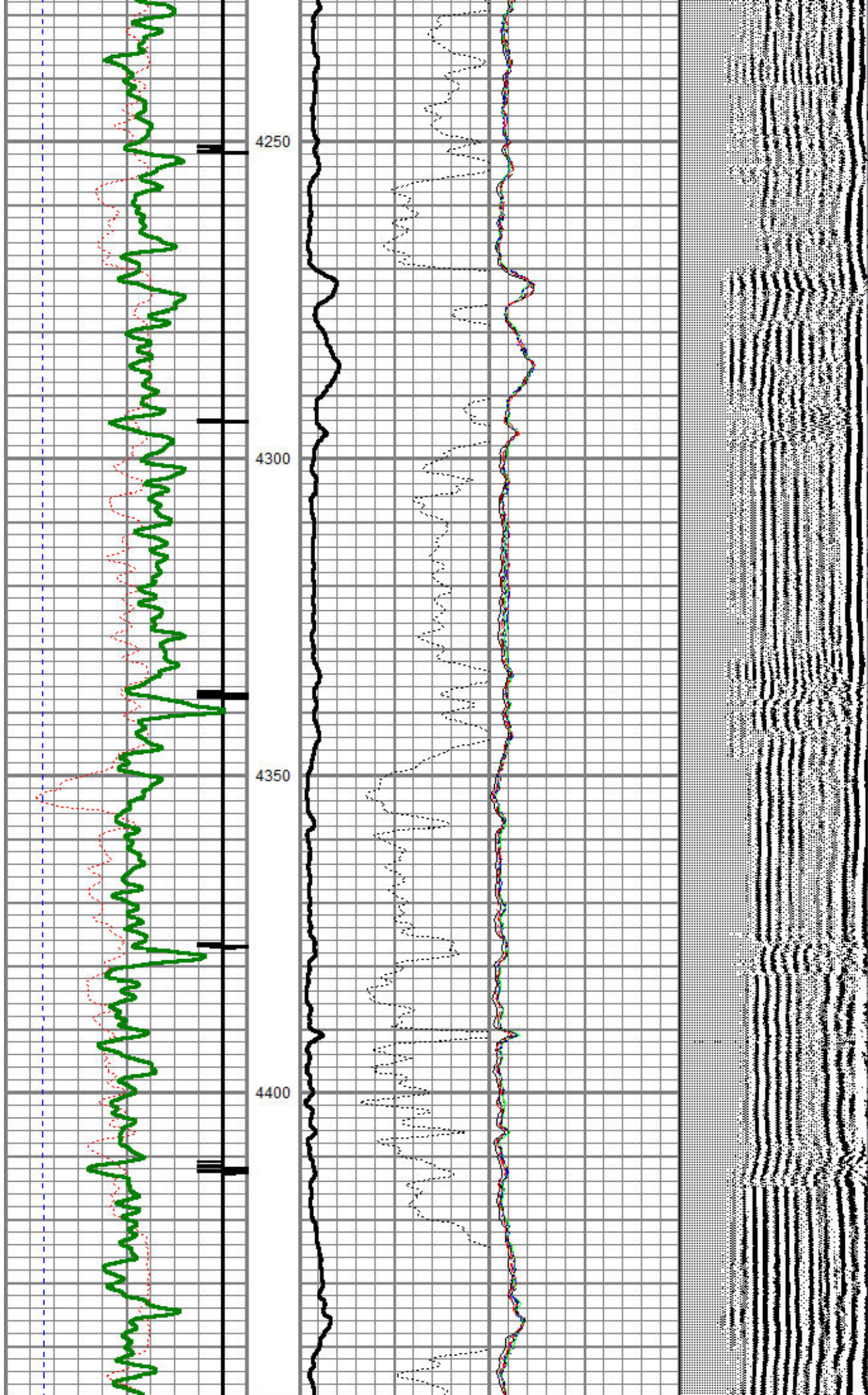


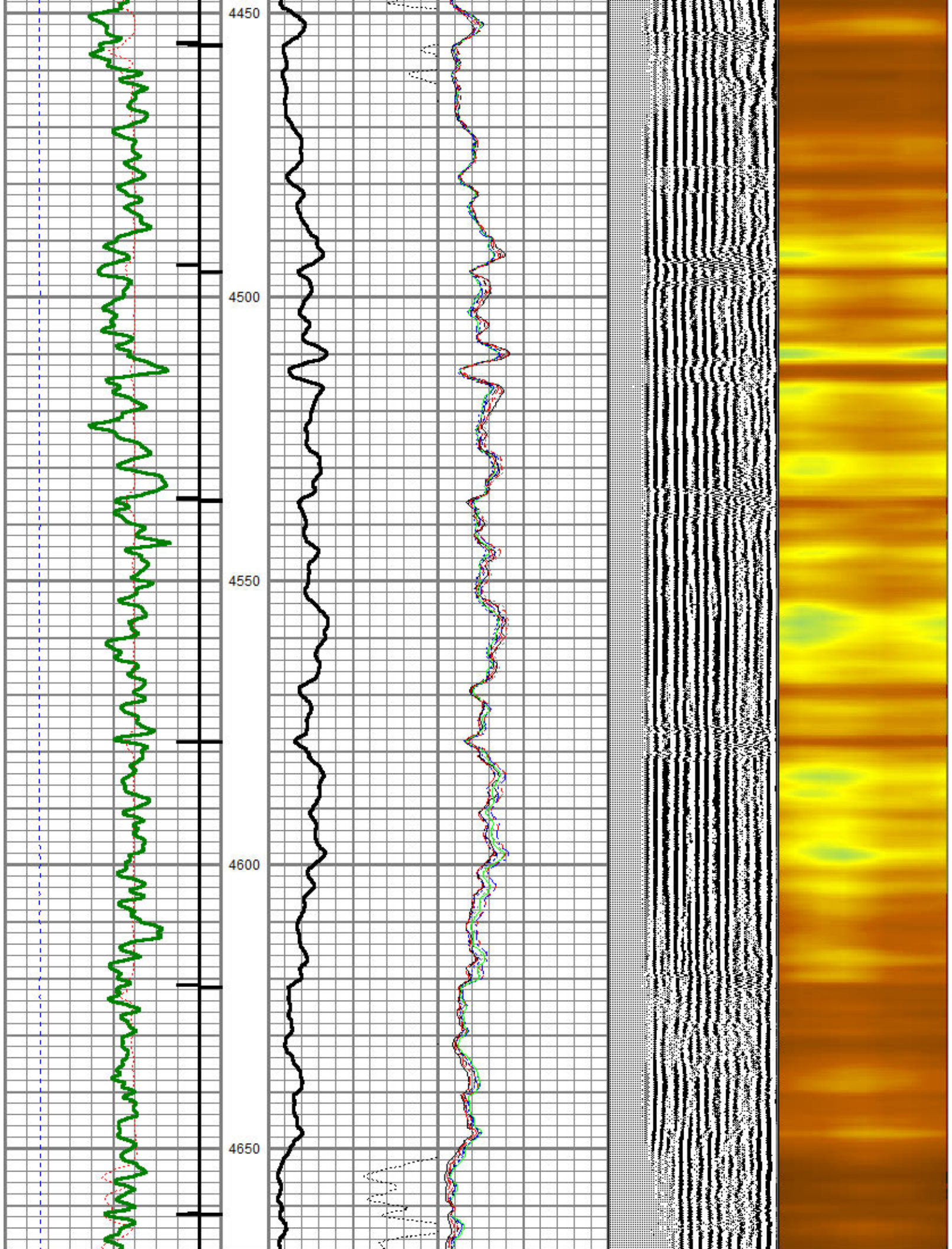


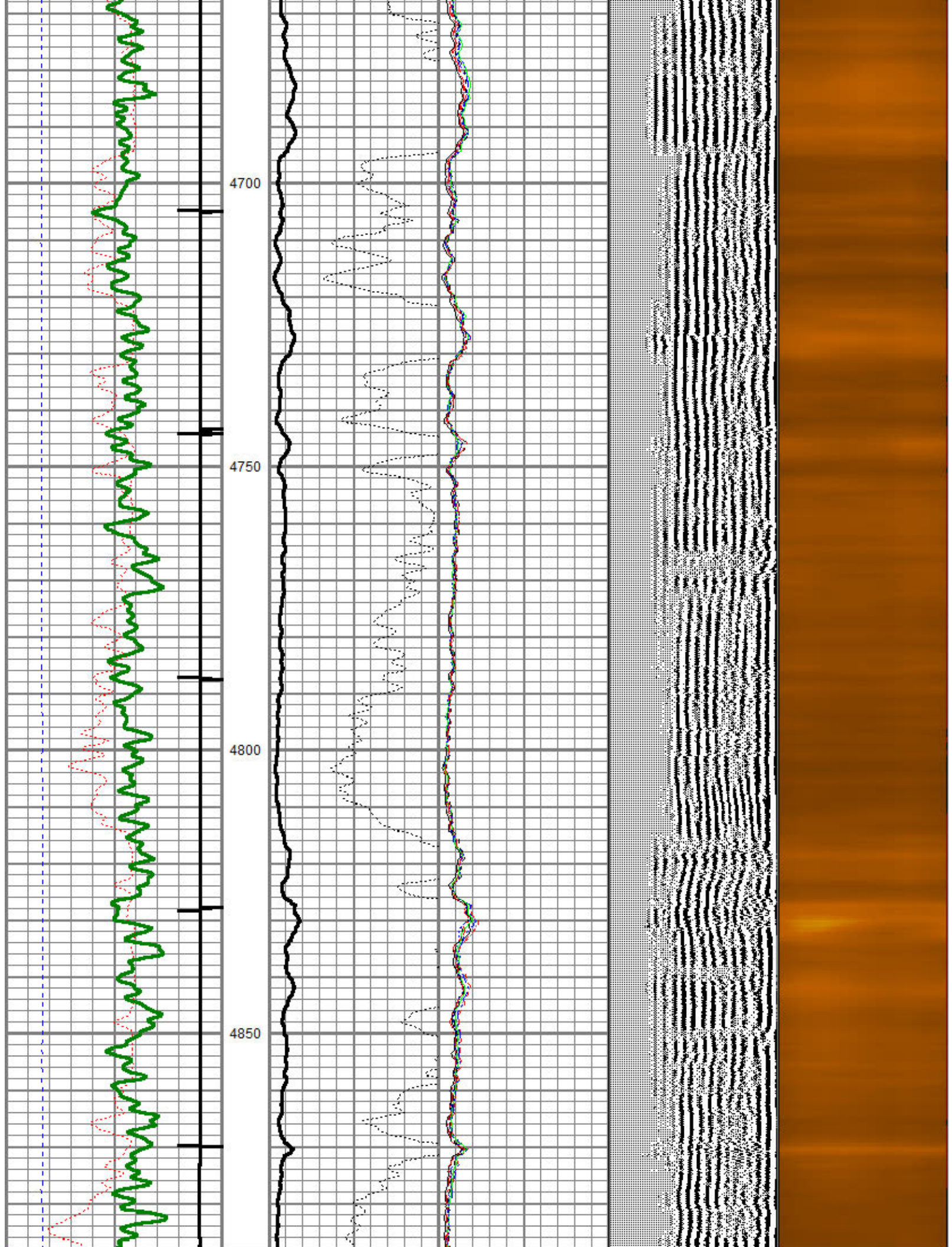


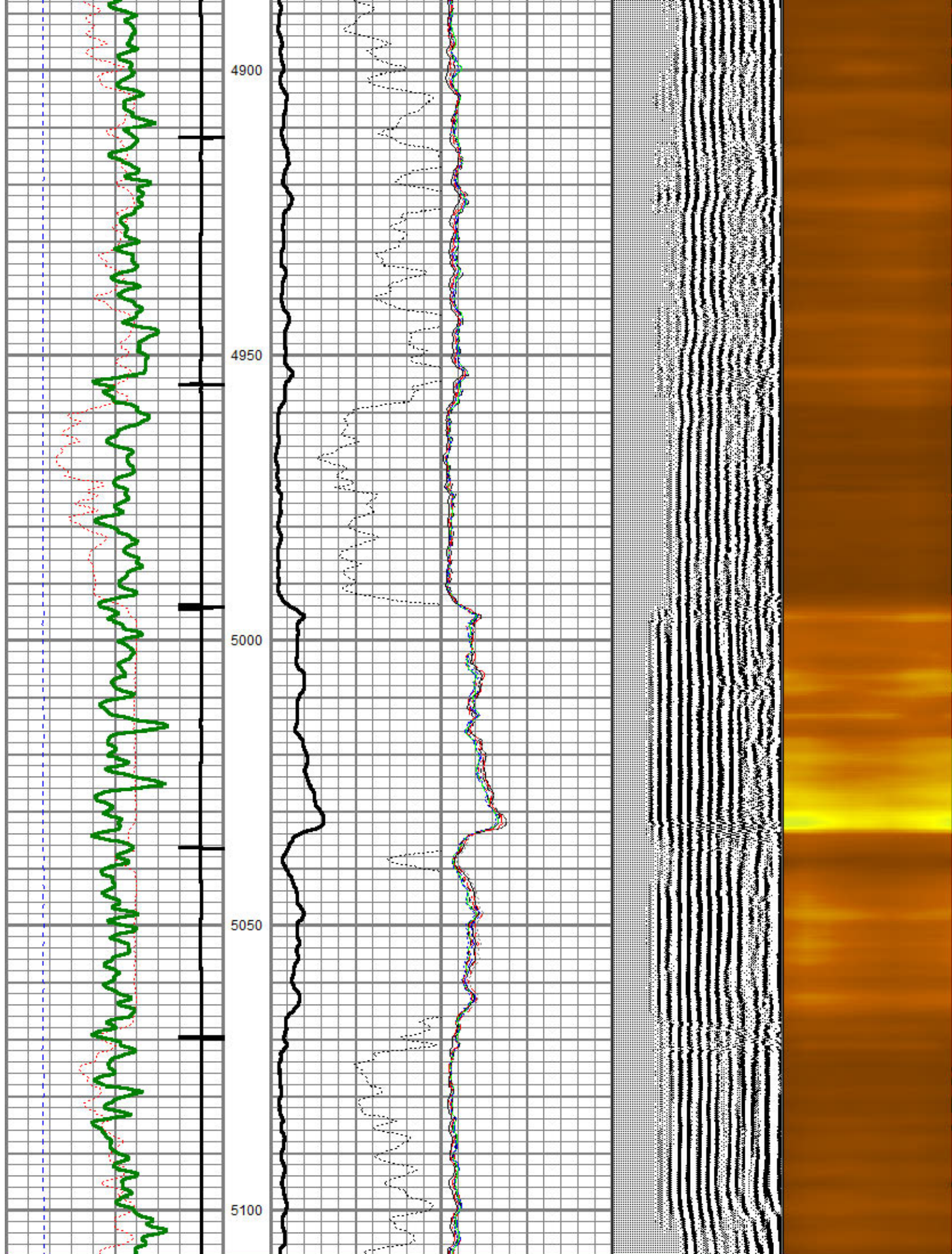


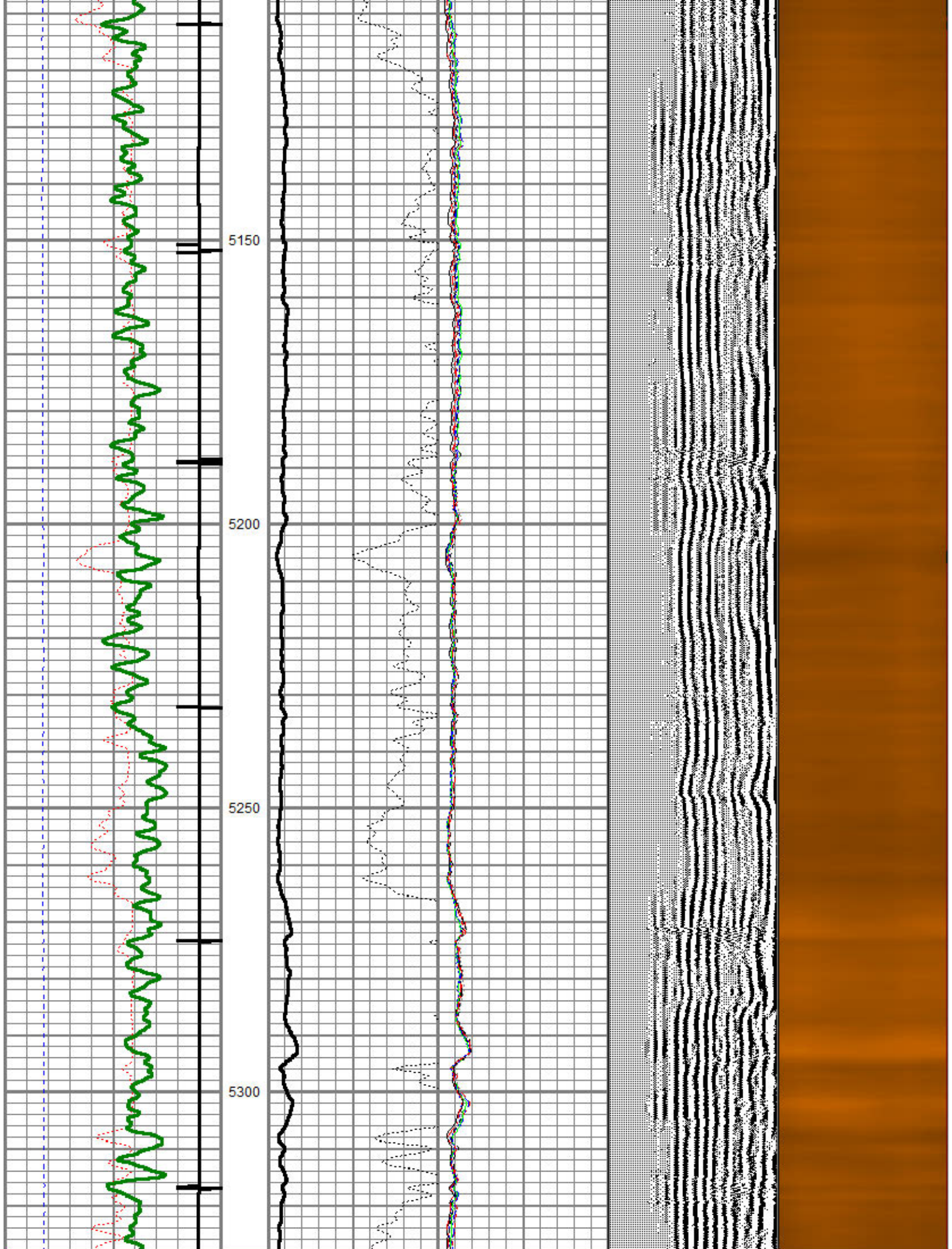


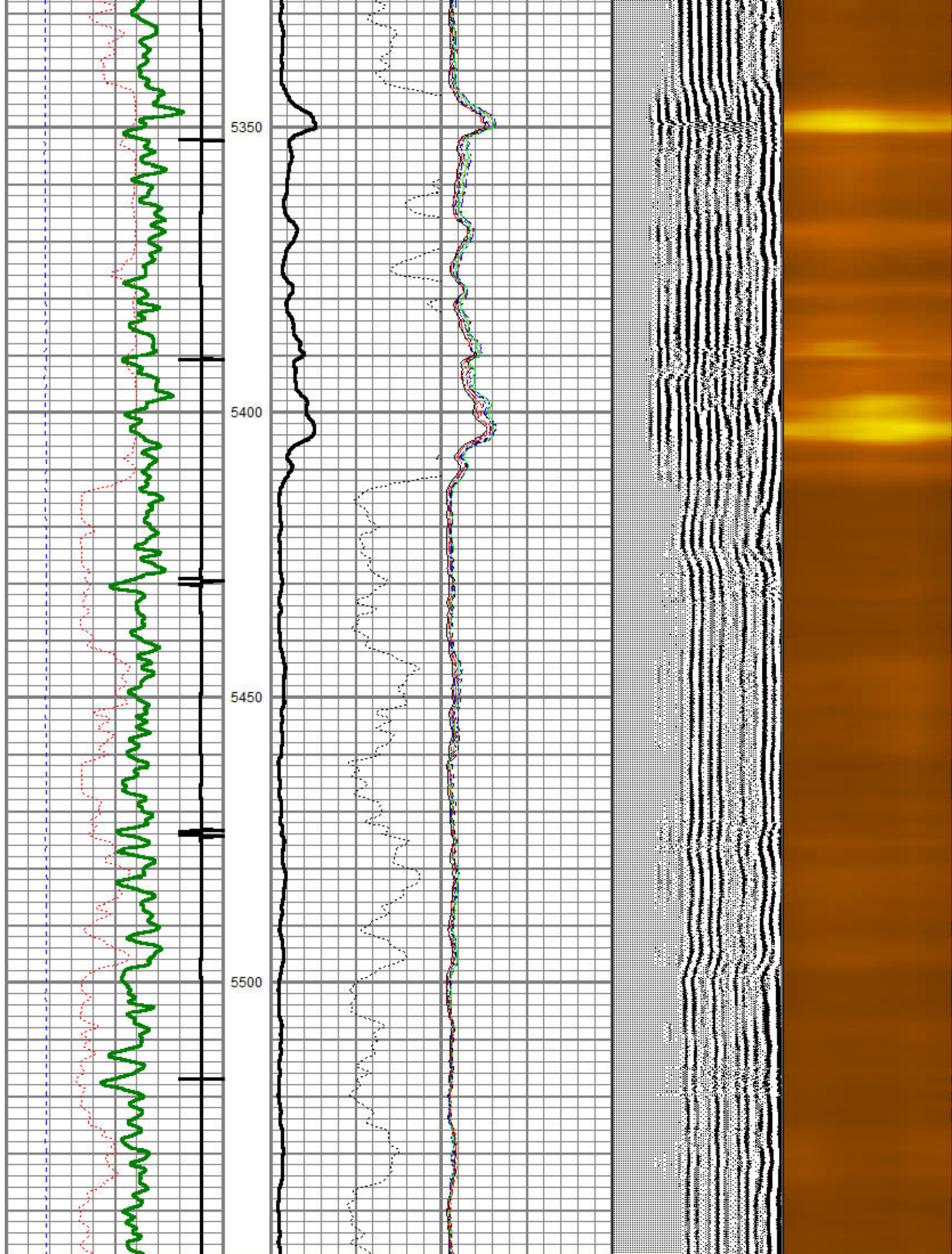


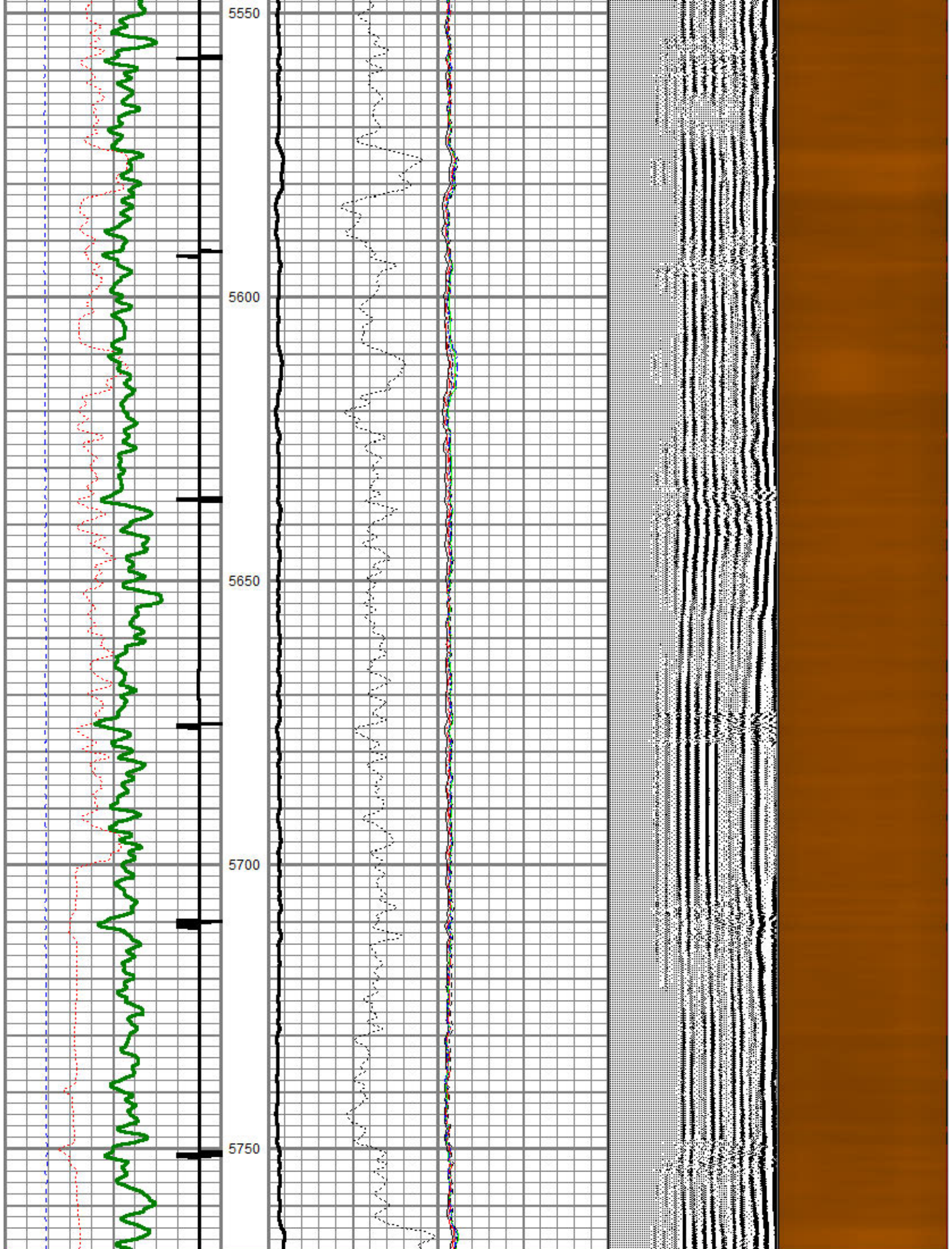


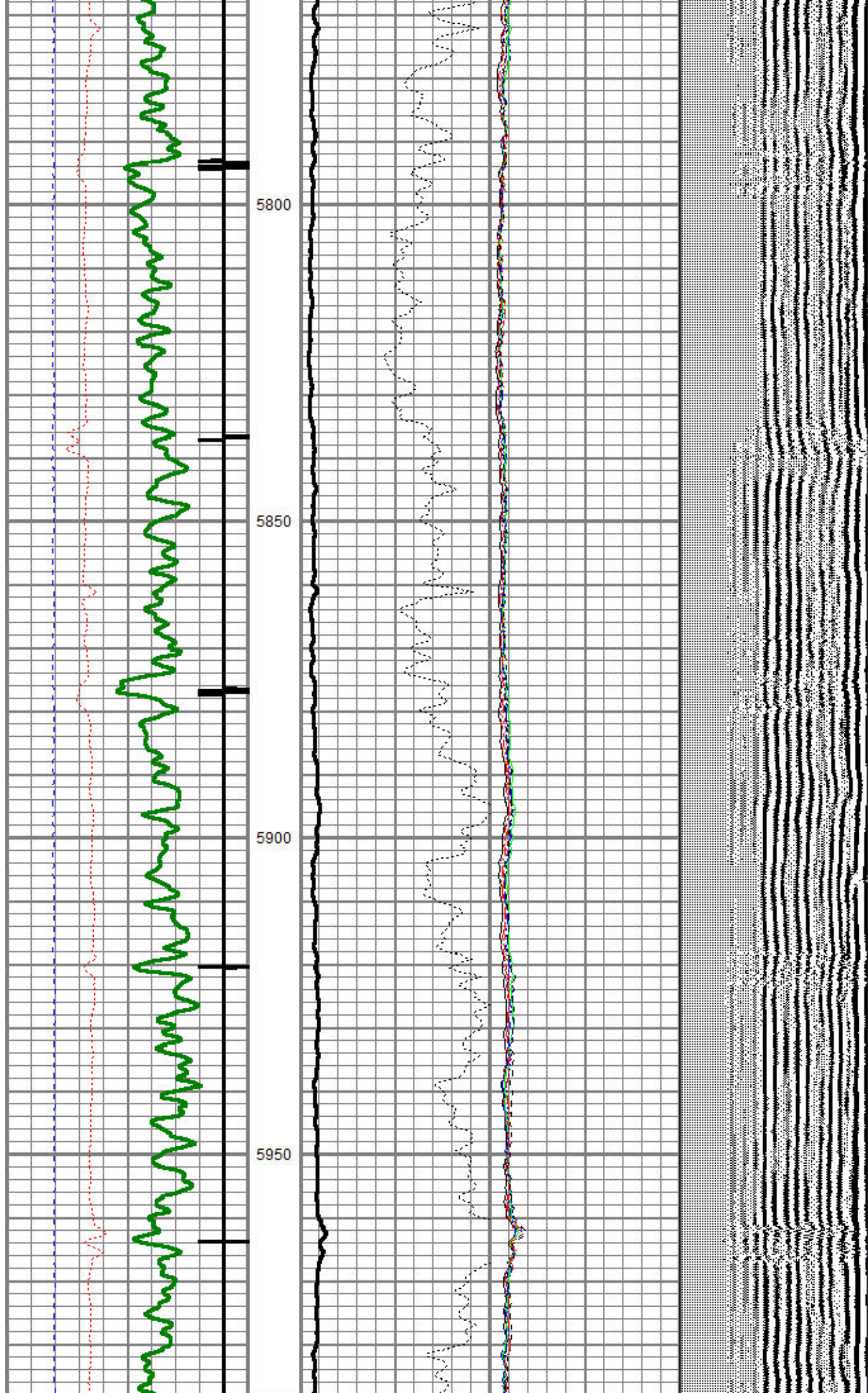


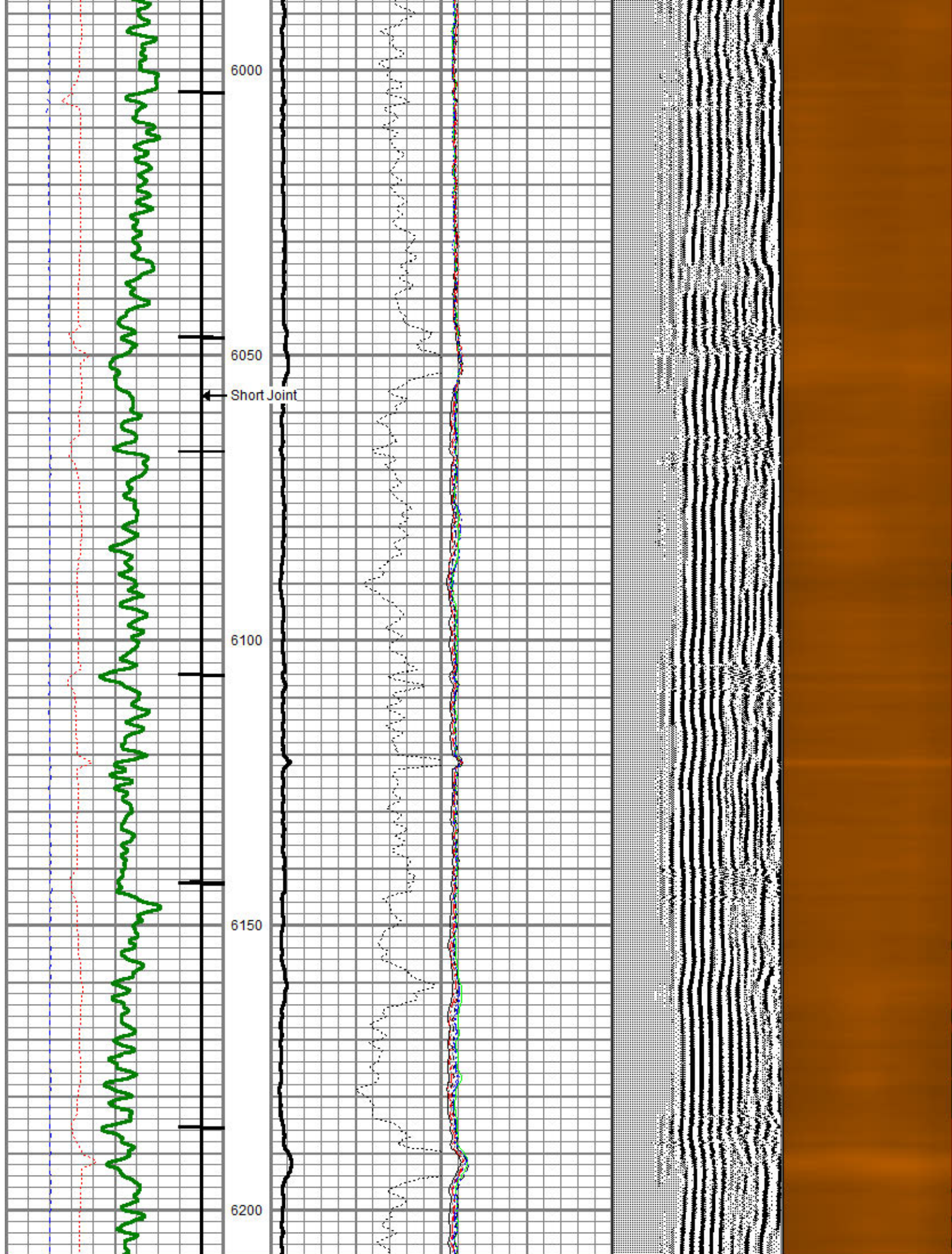


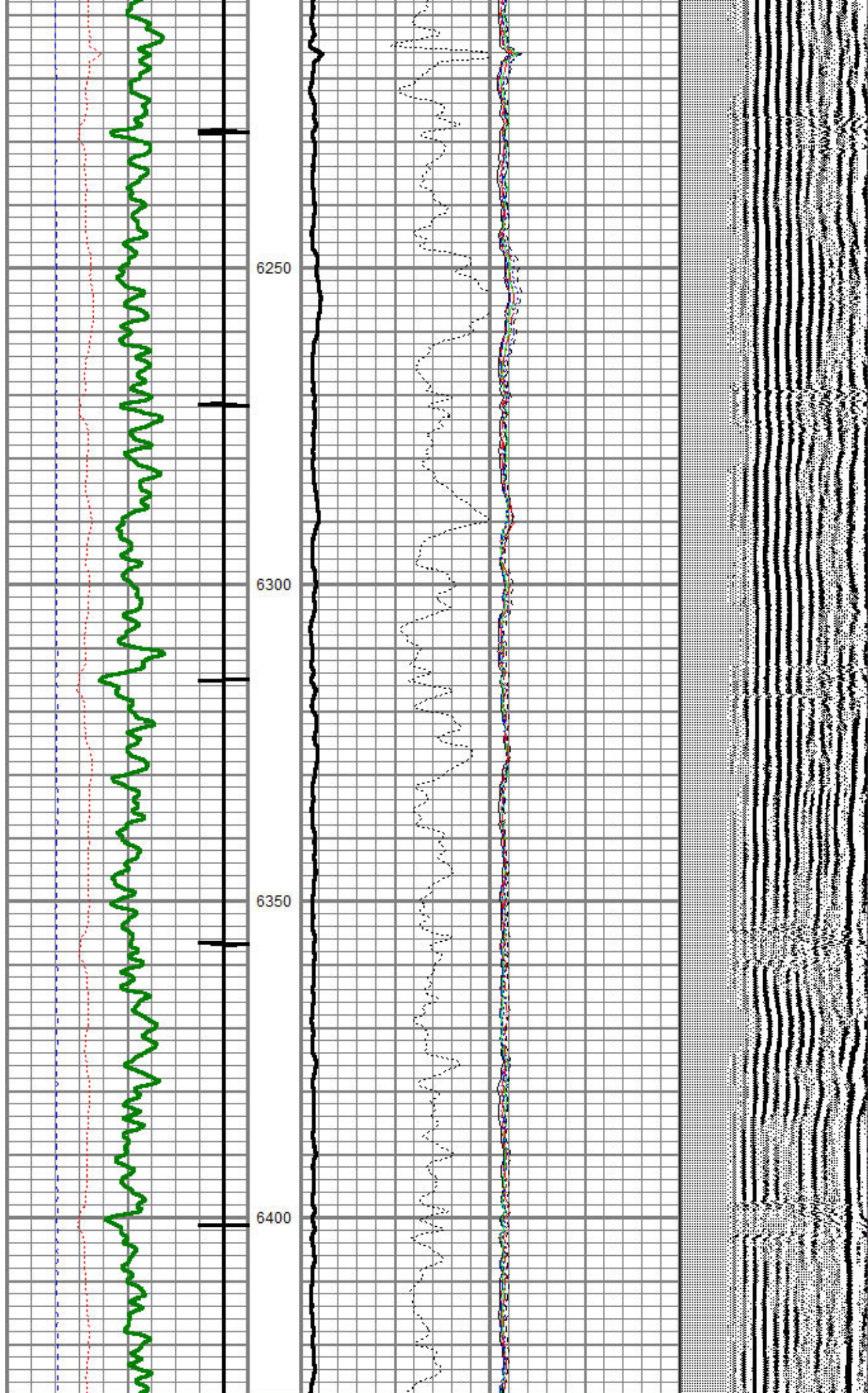


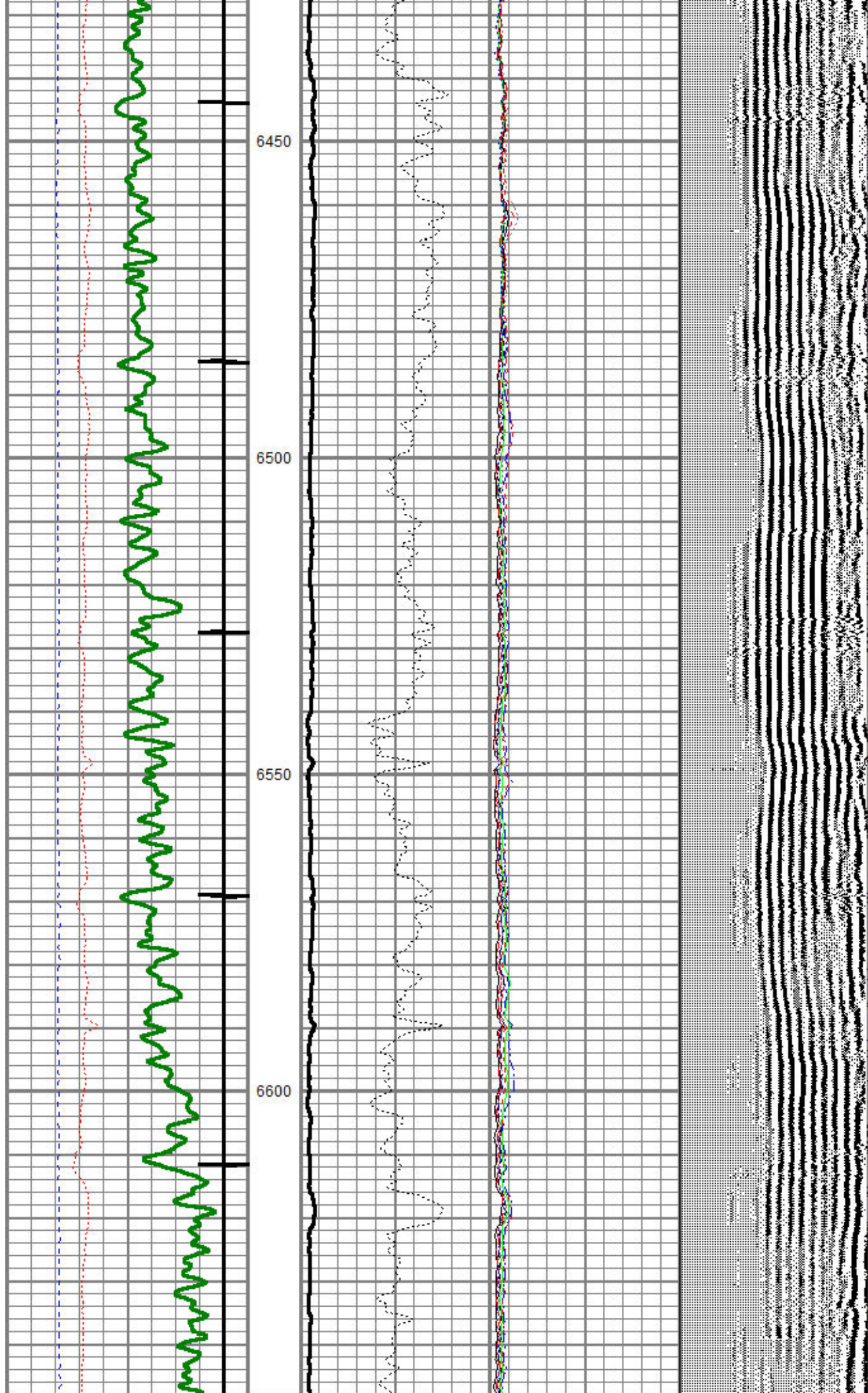


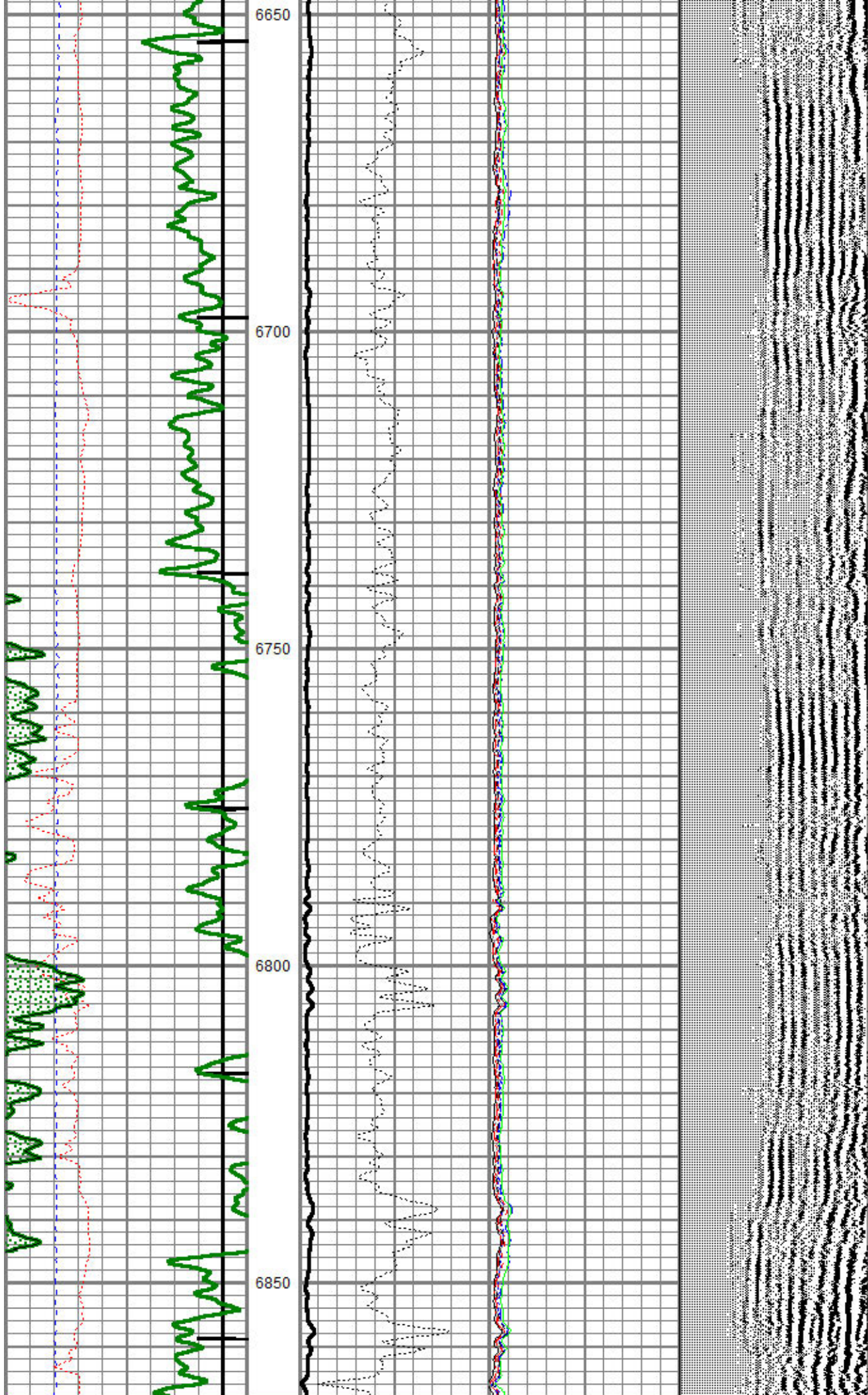


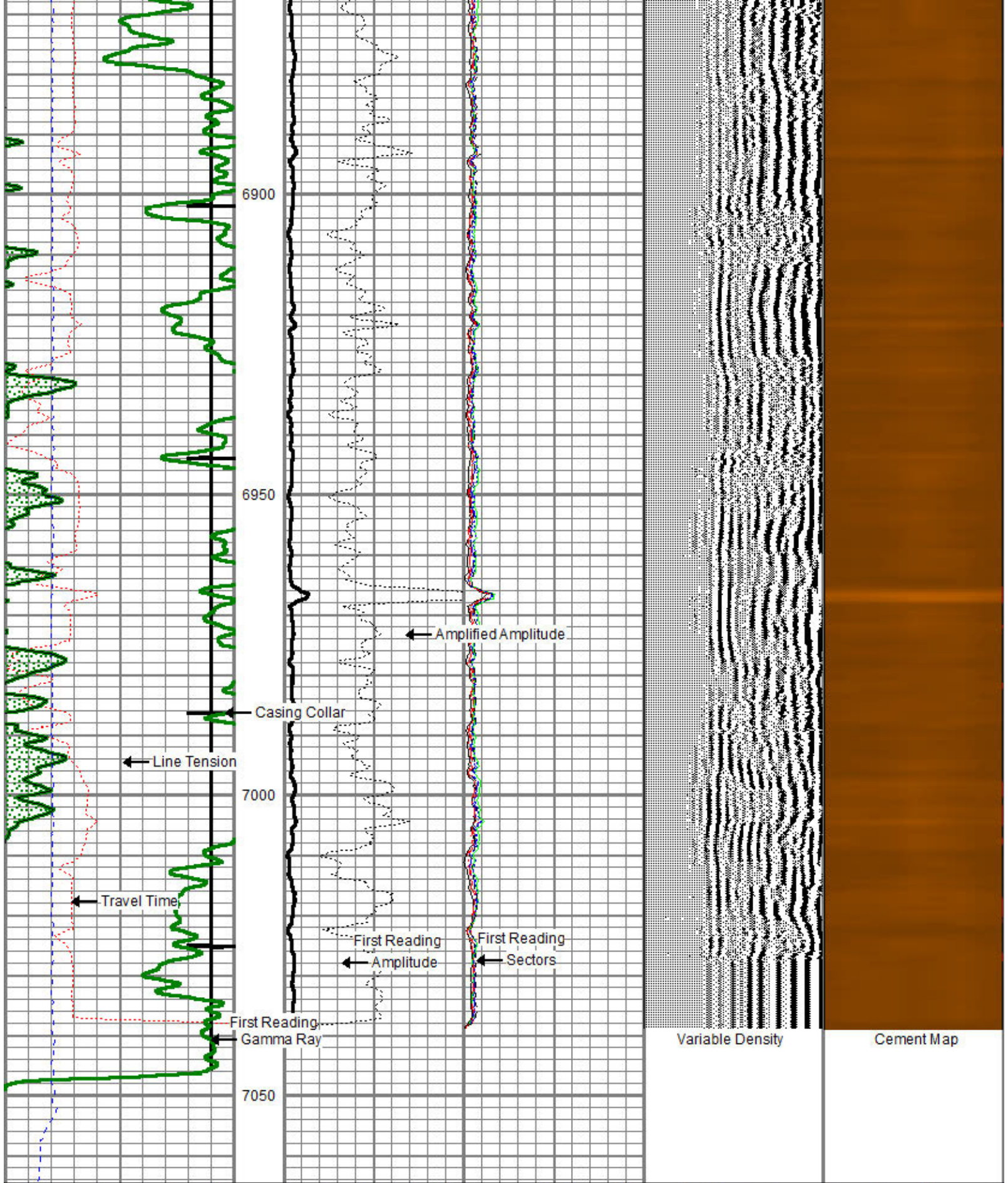












400	Travel Time (usec)	200
9	Casing Collar	-1
0	Gamma Ray (GAPI)	150
0	Line Tension (lb)	5000

0	Amplitude (mV)	100
-5	Amplified Amplitude	150
0	(mV)	10
-5	AMPS1	150
-5	AMPS2	150
-5	AMPS3	150
-5	AMPS4	150
-5	AMPS5	150
5	AMPS6	150

Variable Density	1	Cement Map	8
200	1200	0	100

-5	AMPS7	150
-5	AMPS8	150

Calibration Report

Database File: noble reliance e23-62-1hn.db
 Dataset Pathname: merge5
 Dataset Creation: Fri Mar 20 13:48:59 2015

60 Arm Multi Sensor Caliper Calibration Report

Serial Number: FW1408-57
 Tool Model: 60_INCL
 Performed: Thu Mar 19 18:17:53 2015

Ref ID:	5.00	6.00	7.00	8.00	9.00	in
Arm1	2.45	2.92	3.42	3.92	4.42	
Arm2	2.49	2.96	3.44	3.92	4.40	
Arm3	2.46	2.93	3.43	3.93	4.44	
Arm4	2.46	2.93	3.42	3.92	4.43	
Arm5	2.43	2.91	3.45	4.00	4.51	
Arm6	2.44	2.91	3.41	3.91	4.42	
Arm7	2.46	2.93	3.42	3.91	4.42	
Arm8	2.47	2.94	3.45	3.97	4.48	
Arm9	2.40	2.85	3.38	3.94	4.49	
Arm10	2.47	2.94	3.43	3.92	4.42	
Arm11	2.44	2.90	3.42	3.95	4.46	
Arm12	2.46	2.93	3.42	3.91	4.42	
Arm13	2.41	2.89	3.42	3.96	4.47	
Arm14	2.48	2.95	3.45	3.95	4.46	
Arm15	2.46	2.93	3.42	3.92	4.43	
Arm16	2.42	2.88	3.41	3.98	4.52	
Arm17	2.45	2.92	3.39	3.88	4.40	
Arm18	2.41	2.89	3.39	3.88	4.37	
Arm19	2.48	2.94	3.43	3.93	4.45	
Arm20	2.45	2.92	3.41	3.93	4.46	
Arm21	2.45	2.93	3.44	3.97	4.46	
Arm22	2.49	2.96	3.45	3.95	4.45	
Arm23	2.45	2.92	3.41	3.91	4.42	
Arm24	2.42	2.90	3.42	3.95	4.47	
Arm25	2.44	2.92	3.40	3.90	4.41	
Arm26	2.42	2.90	3.39	3.90	4.41	
Arm27	2.45	2.93	3.42	3.92	4.42	
Arm28	2.50	2.99	3.48	3.98	4.48	
Arm29	2.49	2.98	3.47	3.98	4.48	
Arm30	2.44	2.92	3.41	3.91	4.42	

* Bad

Ref ID:	5.00	6.00	7.00	8.00	9.00	in
Arm31	2.42	2.91	3.40	3.91	4.42	
Arm32	2.45	2.93	3.41	3.93	4.44	
Arm33	2.43	2.92	3.41	3.91	4.41	
Arm34	2.43	2.92	3.42	3.93	4.44	
Arm35	2.43	2.92	3.42	3.95	4.45	
Arm36	2.46	2.95	3.43	3.92	4.41	
Arm37	2.40	2.89	3.41	3.98	4.50	
Arm38	2.45	2.94	3.42	3.92	4.42	
Arm39	2.45	2.94	3.44	3.94	4.44	
Arm40	2.43	2.94	3.46	4.00	4.50	
Arm41	2.45	2.94	3.43	3.95	4.46	
Arm42	2.40	2.88	3.40	3.94	4.46	
Arm43	2.41	2.90	3.40	3.92	4.43	
Arm44	2.46	2.96	3.47	3.98	4.49	
Arm45	2.43	2.91	3.42	3.96	4.48	
Arm46	2.44	2.93	3.43	3.94	4.44	
Arm47	2.44	2.93	3.43	3.93	4.43	
Arm48	2.43	2.94	3.43	3.93	4.43	

Arm49	2.44	2.93	3.42	3.91	4.41
Arm50	2.44	2.92	3.44	3.96	4.48
Arm51	2.36	2.85	3.38	3.94	4.45
Arm52	2.42	2.90	3.41	3.93	4.45
Arm53	2.44	2.92	3.42	3.93	4.42
Arm54	2.47	2.96	3.46	3.97	4.47
Arm55	2.42	2.90	3.40	3.91	4.43
Arm56	2.45	2.93	3.43	3.93	4.44
Arm57	2.40	2.88	3.40	3.93	4.45
Arm58	2.49	2.95	3.43	3.93	4.44
Arm59	2.44	2.91	3.42	3.93	4.44
Arm60	2.45	2.93	3.44	3.96	4.47

* Bad

PROBE verifications Calibration Report

Performed:	Pre Verification Fri Mar 20 08:01:11 2015		Post Verification		Casing Check	
Ref ID:	7.00		0.00		0.00	in
Min.	7.05		0.00		0.00	in
Max.	7.14		0.00		0.00	in
Avg.	7.09		0.00		0.00	in
Dia1	7.05		0.00		0.00	in
Dia2	7.09		0.00		0.00	in
Dia3	7.06		0.00		0.00	in
Dia4	7.12		0.00		0.00	in
Dia5	7.07		0.00		0.00	in
Dia6	7.13		0.00		0.00	in
Dia7	7.06		0.00		0.00	in
Dia8	7.10		0.00		0.00	in
Dia9	7.09		0.00		0.00	in
Dia10	7.11		0.00		0.00	in
Dia11	7.08		0.00		0.00	in
Dia12	7.10		0.00		0.00	in
Dia13	7.08		0.00		0.00	in
Dia14	7.08		0.00		0.00	in
Dia15	7.06		0.00		0.00	in
Dia16	7.13		0.00		0.00	in
Dia17	7.06		0.00		0.00	in
Dia18	7.11		0.00		0.00	in
Dia19	7.09		0.00		0.00	in
Dia20	7.14		0.00		0.00	in
Dia21	7.08		0.00		0.00	in
Dia22	7.12		0.00		0.00	in
Dia23	7.08		0.00		0.00	in
Dia24	7.08		0.00		0.00	in
Dia25	7.09		0.00		0.00	in
Dia26	7.12		0.00		0.00	in
Dia27	7.06		0.00		0.00	in
Dia28	7.12		0.00		0.00	in
Dia29	7.07		0.00		0.00	in
Dia30	7.13		0.00		0.00	in

Inclinometer Calibration Report

Performed:	Fri Mar 20 08:12:34 2015					
	Low Read.	High Read.		Low Ref.	High Ref.	
X Accelerometer	-3696.00	3852.00		-1.00	1.00	gee
Y Accelerometer	-4404.00	3672.00		-1.00	1.00	gee
Z Accelerometer	17.27	3651.70		0.00	1.00	gee

Gamma Ray Calibration Report			
Serial Number:	FW1408-35		
Tool Model:	Probe275		
Performed:	Fri Mar 20 07:45:03 2015		
Calibrator Value:	1022.0	GAPI	
Background Reading:	109.6	cps	
Calibrator Reading:	1299.5	cps	
Sensitivity:	0.8589	GAPI/cps	

Segmented Cement Bond Log Calibration Report			
Serial Number:	FW1406-126		
Tool Model:	RBTC3		
Calibration Casing Diameter:	7.000	in	
Calibration Depth:	987.633	ft	

Master Calibration, performed Fri Mar 20 08:51:32 2015:						
	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.014	0.499	2.000	62.165	124.052	0.209
CAL	0.015	1.008				
5'	0.014	0.589	2.000	62.165	104.615	0.519
SUM						
S1	0.018	0.484	0.000	100.000	214.495	-3.828
S2	0.014	0.525	0.000	100.000	195.897	-2.817
S3	0.014	0.531	0.000	100.000	193.490	-2.797
S4	0.016	0.520	0.000	100.000	198.305	-3.142
S5	0.014	0.498	0.000	100.000	206.493	-2.884
S6	0.014	0.481	0.000	100.000	214.198	-3.051
S7	0.014	0.472	0.000	100.000	218.652	-3.120
S8	0.014	0.477	0.000	100.000	216.005	-3.109


Internal Reference Calibration, performed Wed Dec 31 17:00:00 1969:						
	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.015	1.008	1.000	0.000

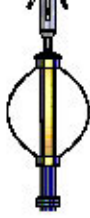
Air Zero Calibration, performed Wed Dec 31 17:00:00 1969:			
	Raw (v)		Results
	Zero	Zero	Offset
3'	0.000	0.000	0.000
5'	0.000	0.000	0.000
SUM			
S1	0.000	0.000	0.000
S2	0.000	0.000	0.000
S3	0.000	0.000	0.000
S4	0.000	0.000	0.000
S5	0.000	0.000	0.000
S6	0.000	0.000	0.000
S7	0.000	0.000	0.000
S8	0.000	0.000	0.000

Temperature Calibration Report	
Serial Number:	FW1406-126

Tool Model: RBTC3
 Performed: Sun Jun 13 13:33:21 1993

	Reference	Reading
Low Reference:	0.00 degF	0.00
High Reference:	1.00 degF	1.00
Gain:	40.00	
Offset:	0.00	
Delta Spacing	1	

Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
						
			PTS275	2.83	2.75	
WVF3FT	26.53					
WVFCAL	26.53					
WVFS1	26.53					
WVFS2	26.53					
WVFS3	26.53					
WVFS4	26.53					
WVFS5	26.53					
WVFS6	26.53					
WVFS7	26.53					
WVFS8	26.53					
WVF5FT	25.53					
TEMP	22.91					
CCL	18.54					
GR	17.21					
			RBT-RBTC3 (FW1406-126)	8.92	2.75	90.00
			PTS275	2.83	2.75	
			GR-Probe275 (FW1408-35) Probe 2 3/4" Logging Gamma Ray	4.78	2.75	57.00
			PTS275	2.83	2.75	
ACCX	7.83					
ACCY	7.83					
ACCZ	7.83					
ETEMP	5.33					
Meas	4.50					
			Probe_MFCAL-60_INCL (FW1408-57)	9.00	3.62	85.00



PTS275

2.83

2.75

Dataset:	noble reliance e23-62-1hn.db: field/well/run1/merge5
Total Length:	34.03 ft
Total Weight:	232.00 lb
O.D.	3.62 in