



CEMENT BOND LOG W/  
VARIABLE DENSITY,  
GAMMA RAY, CCL

Company ST. CROIX OPERATING, INC.  
Well PRONGHORN 1  
Field WILDCAT  
County WASHINGTON State CO

Location: API #: 05-121-11082

SWSW SEC 15 TWN 3S RGE 51W

Other Services  
N/A

Company ST. CROIX OPERATING, INC.  
Well PRONGHORN 1  
Field WILDCAT  
County WASHINGTON  
State CO

Permanent Datum GL  
Log Measured From KB  
Drilling Measured From KB

Elevation 4648'  
K.B. 4666.5'  
D.F. 4665'  
G.L. 4648'

Date 13-JAN-2019

Run Number	ONE
Depth Driller	4200'
Depth Logger	4126'
Bottom Logged Interval	4125'
Top Log Interval	SURFACE
Open Hole Size	7 7/8"
Type Fluid	WATER
Density / Viscosity	8.4 PPG
Max. Recorded Temp.	N/A
Estimated Cement Top	2416'
Time Well Ready	08:00AM
Time Logger on Bottom	08:45AM
Equipment Number	40
location	PLATTEVILLE
Recorded By	C. SCHAAF
Witnessed By	R. PAPE

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String				
Prot. String				
Production String	5.5"	15.5#	SURFACE	4200'
Liner				

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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

TOOLS RUN AS PER TOOL STRING DIAGRAM  
TOOLSTRING CENTRALIZED VIA 2 X GEMCO CENTRALIZERS  
APPROXIMATE TOP OF CEMENT AT 2416"  
TOOLS TAGGED AT 4126"

LOG CORRELATED TO SLB'S TRIPLE COMBO LOG RAN 2-JAN-2019  
GAMMA RAY PEAKS @ 4072', 4108', 4028', 3932'

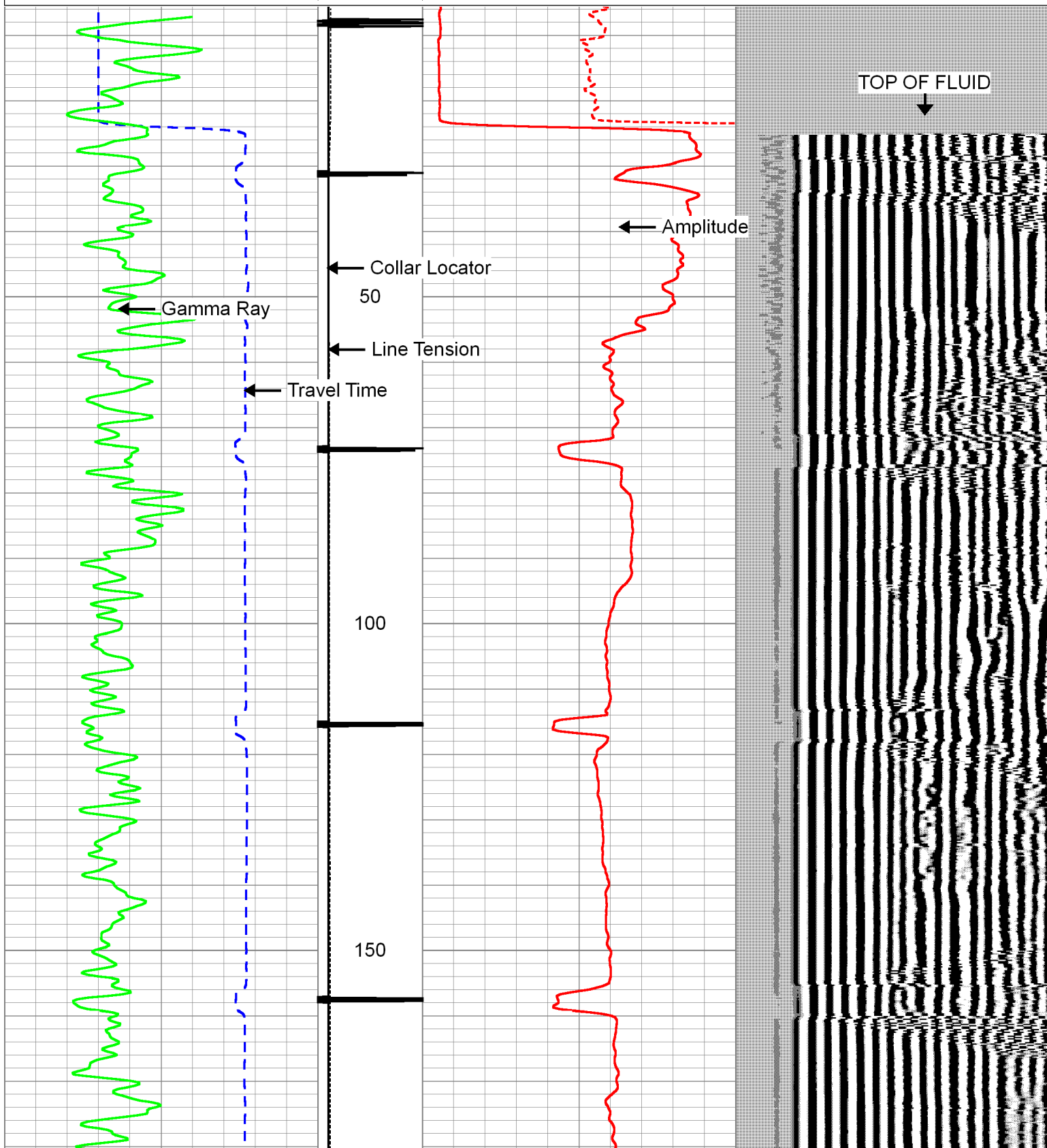


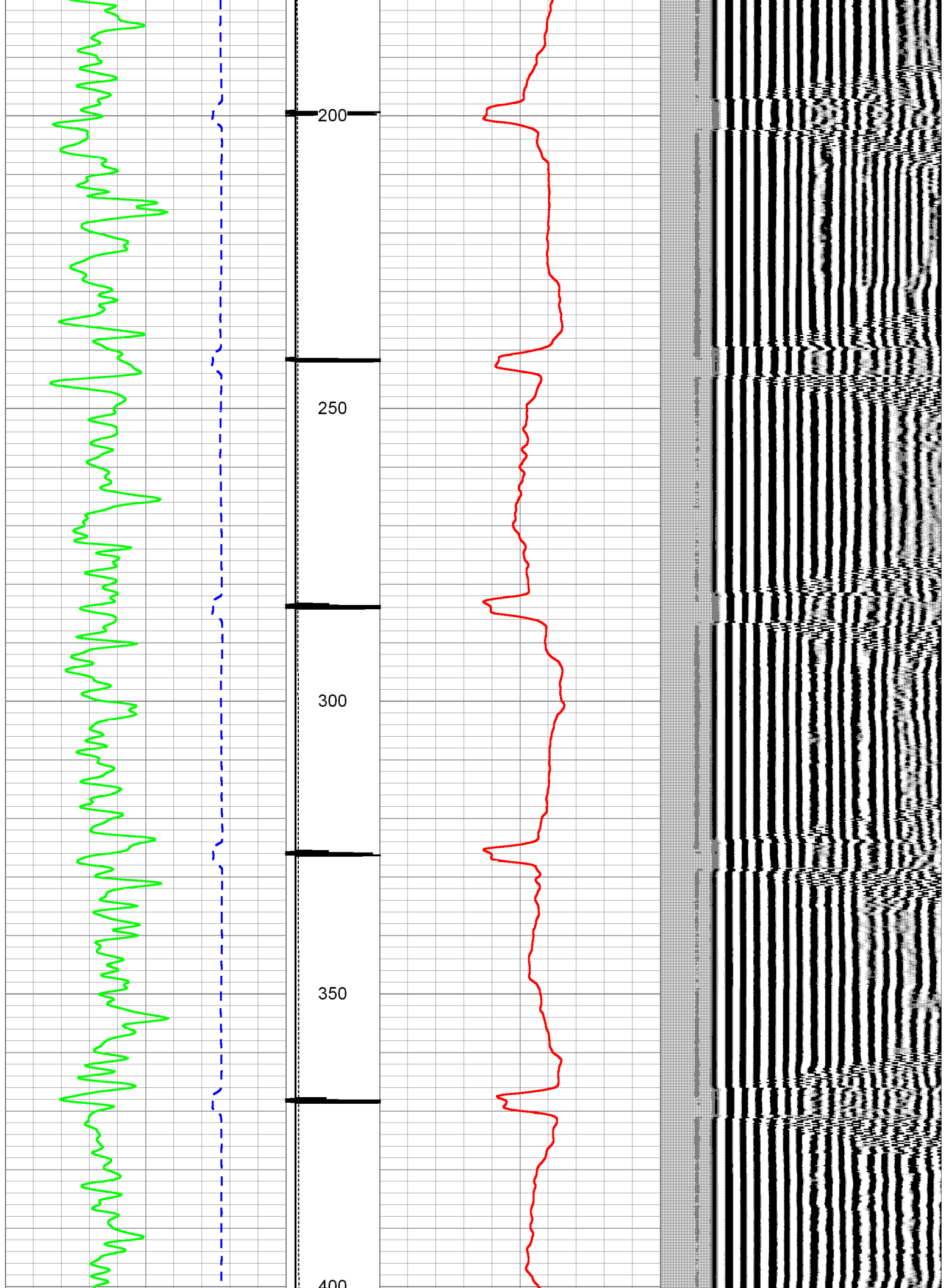
MAIN PASS - 5 INCH

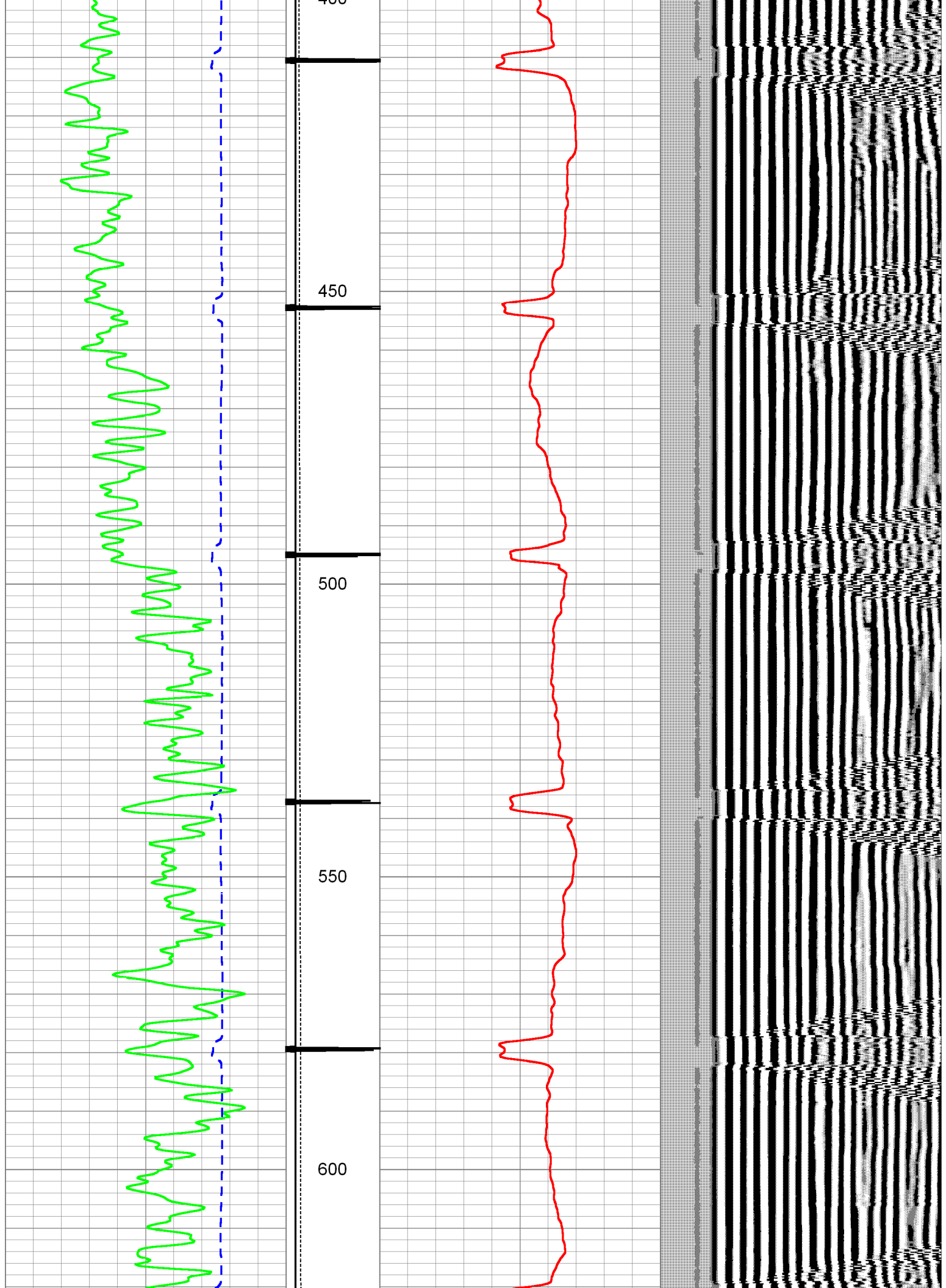
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Dataset Pathname: pass8  
Presentation Format: cbl\_cs  
Dataset Creation: Sun Jan 13 08:49:07 2019 by Log 0  
Charted by: Depth in Feet scaled 1:240

420	Travel Time (usec)	220	Collar Locato	0	Amplified Amplitude (mV)	10	200	VDL	1200
0	Gamma Ray (GAPI)	150	-1	9	0	Amplitude (mV)	100		

Line Tension  
(lb)  
0 1500









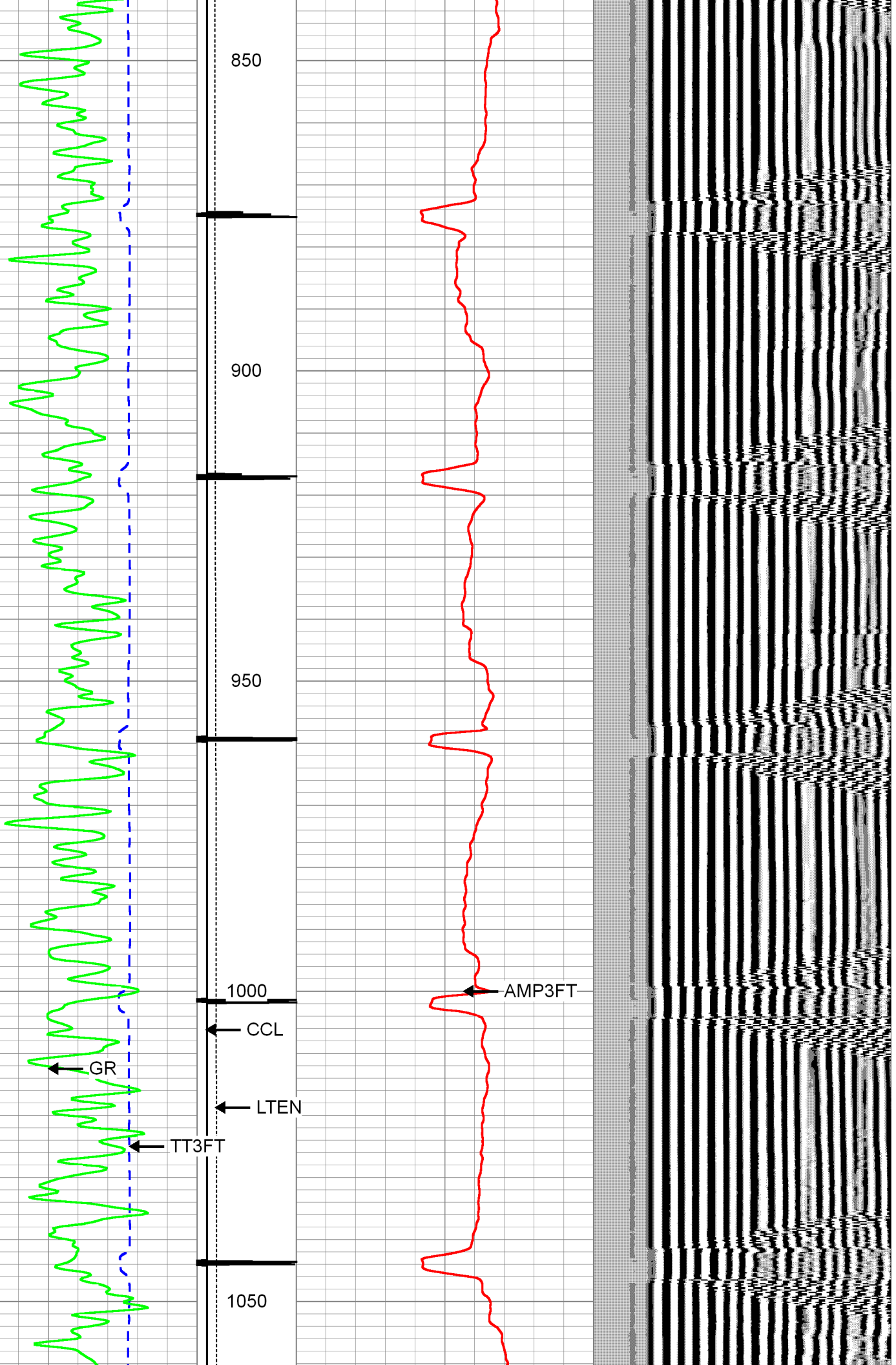
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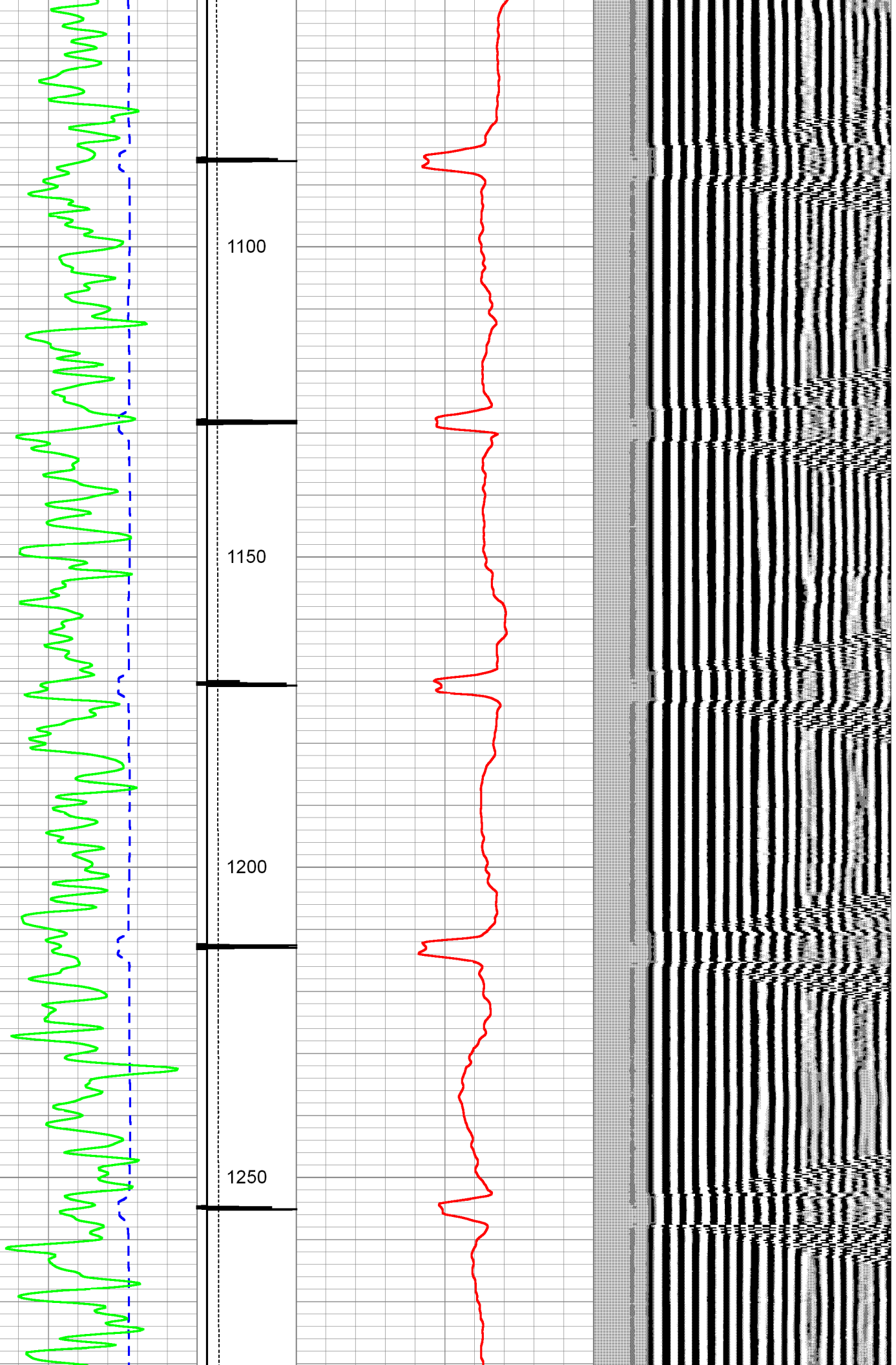
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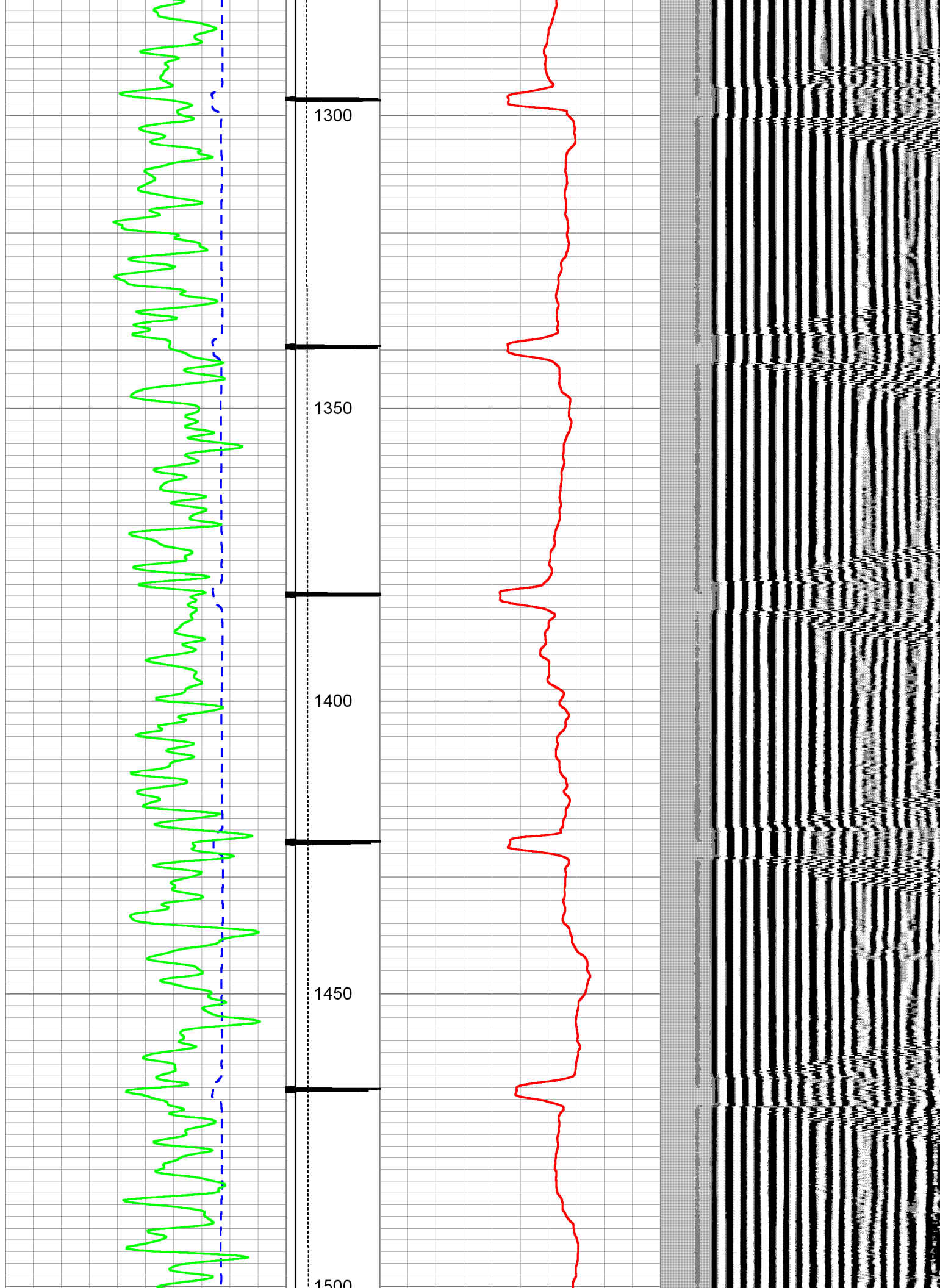
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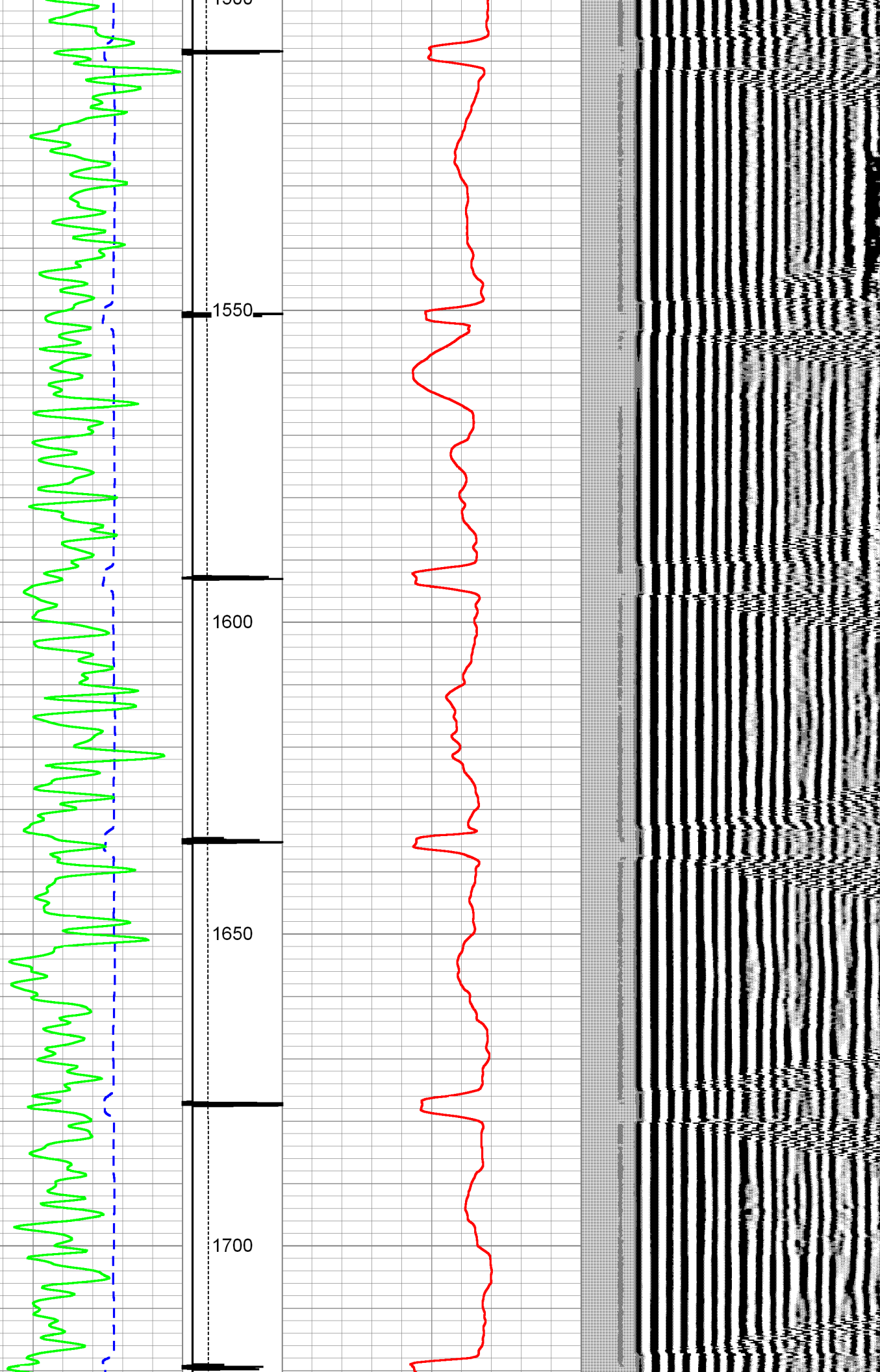
800











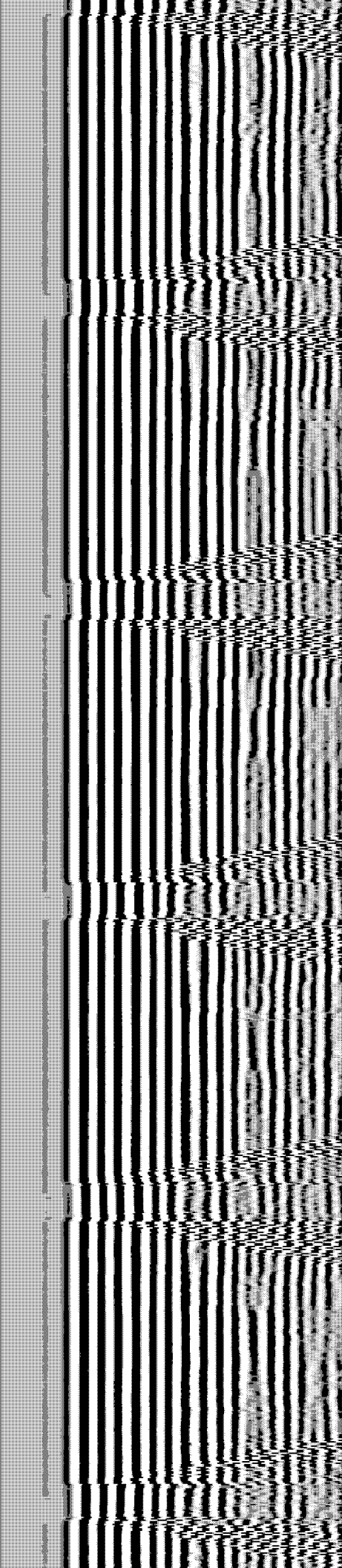
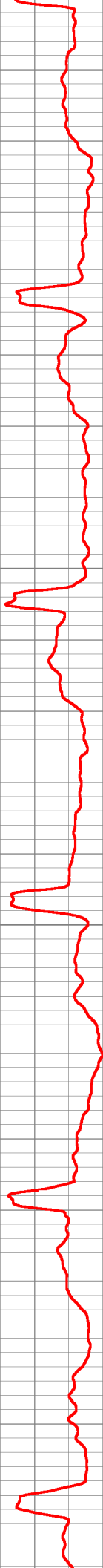


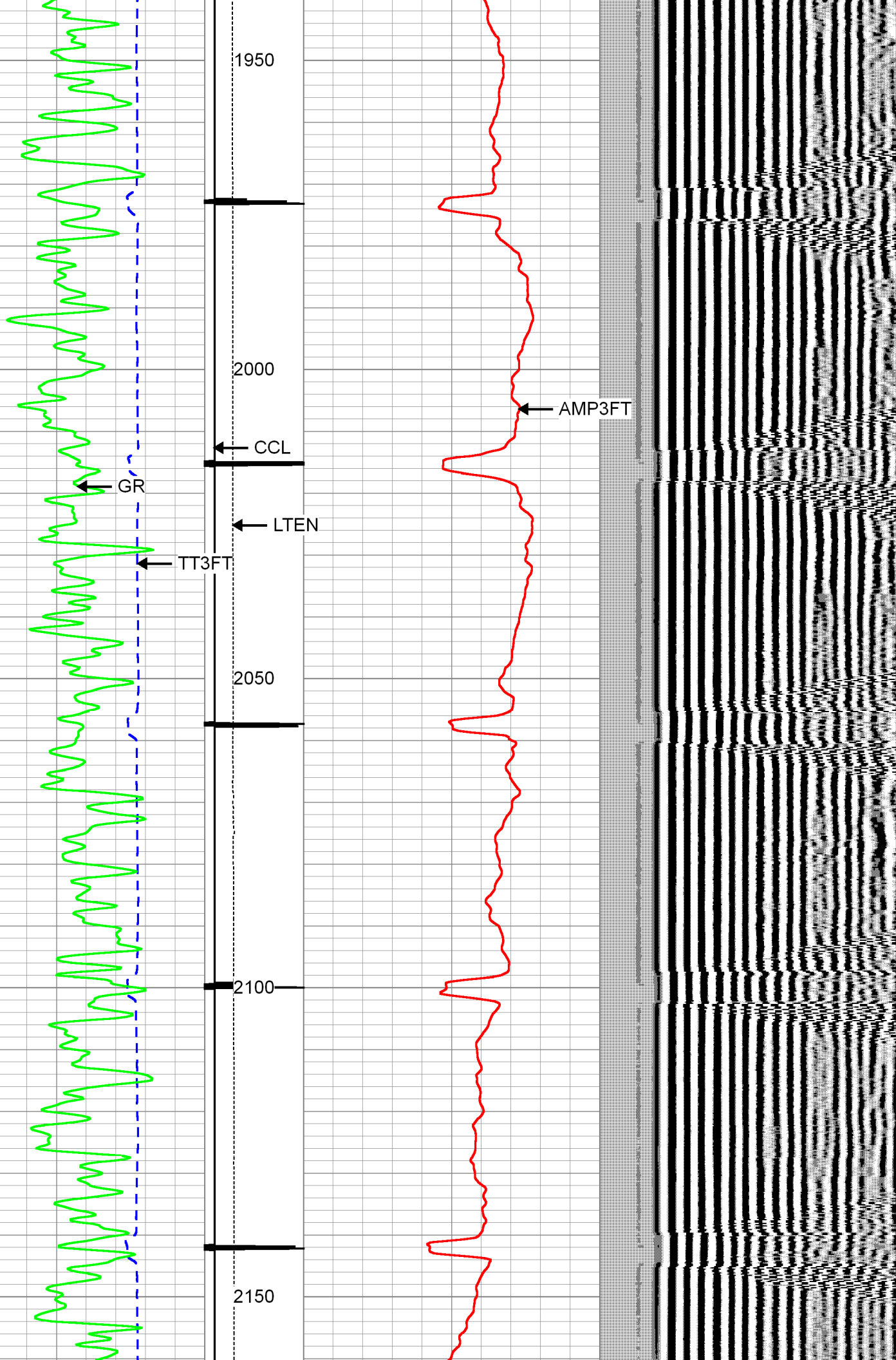
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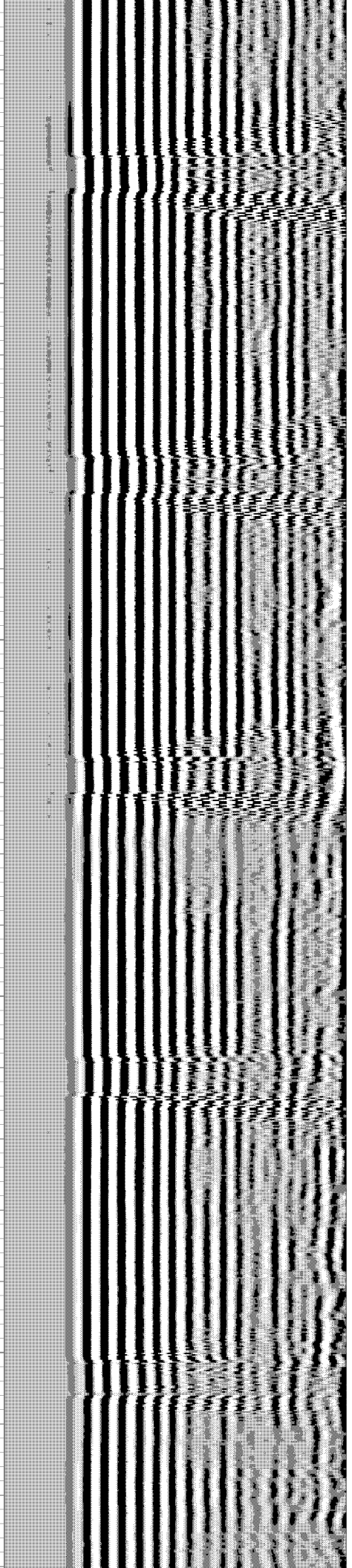
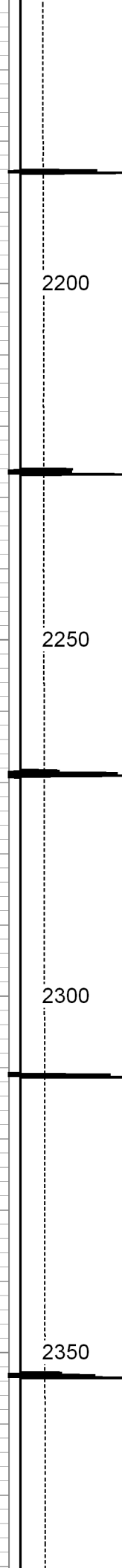
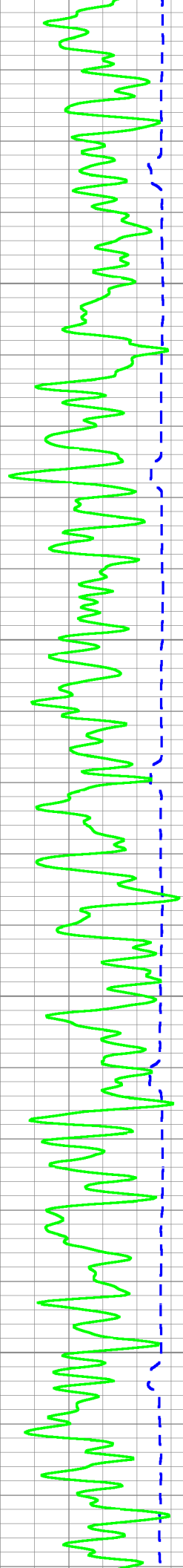
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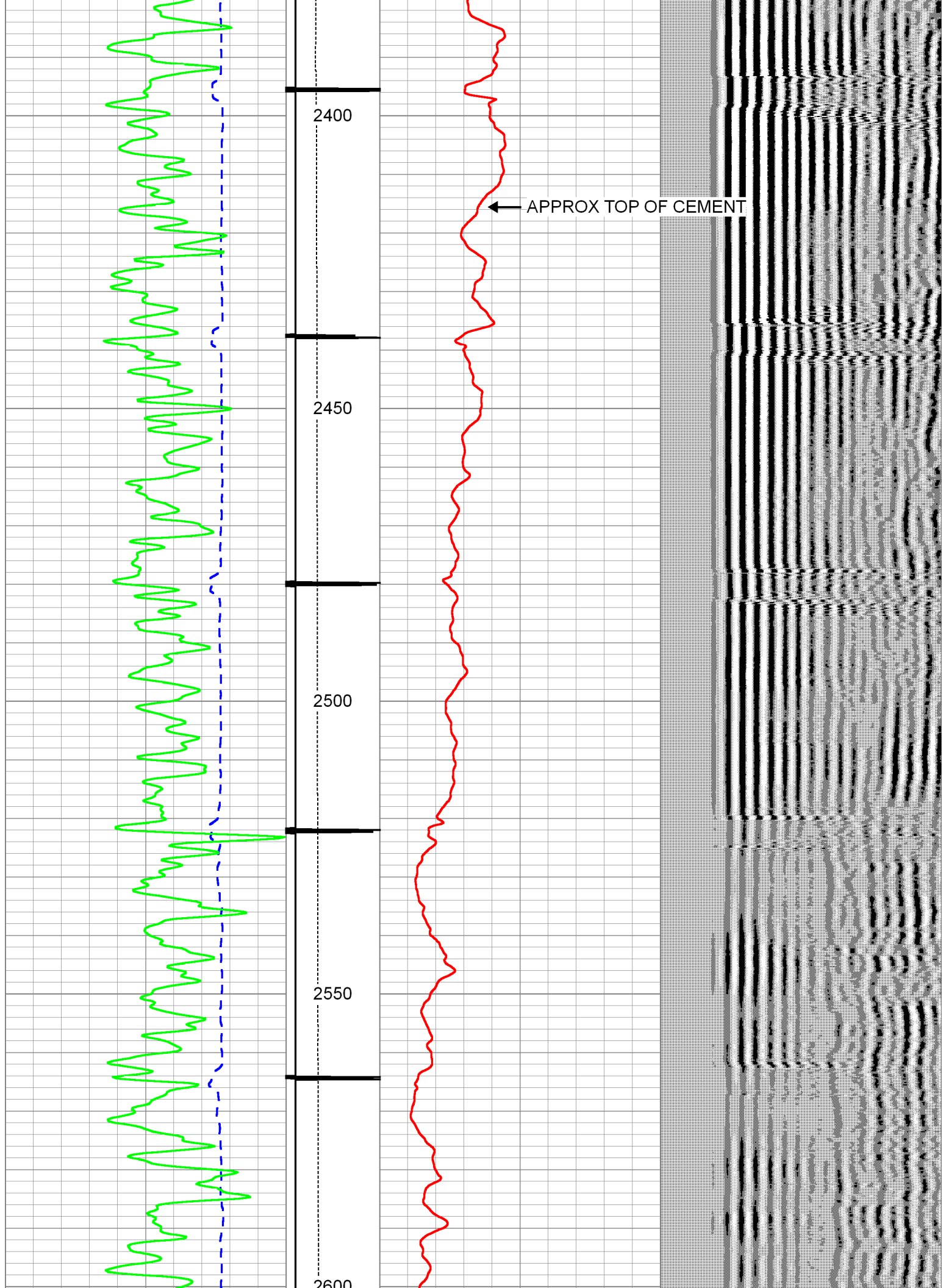
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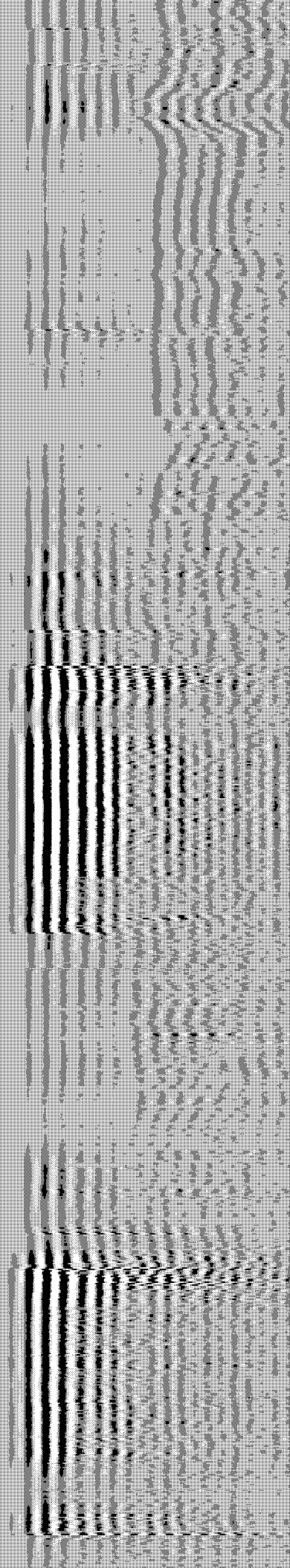
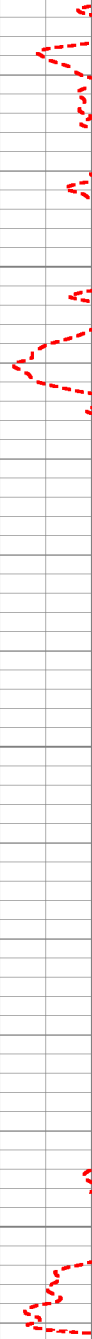
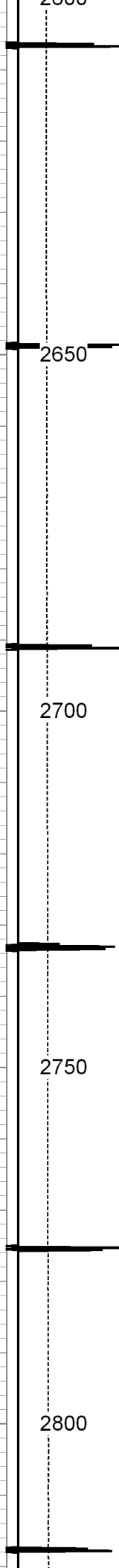
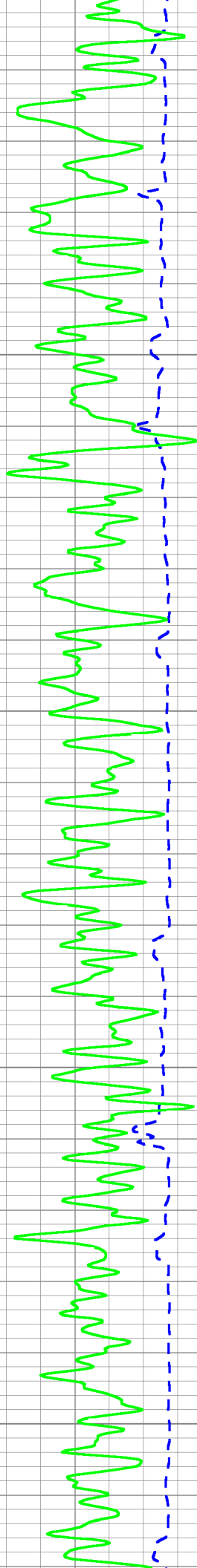
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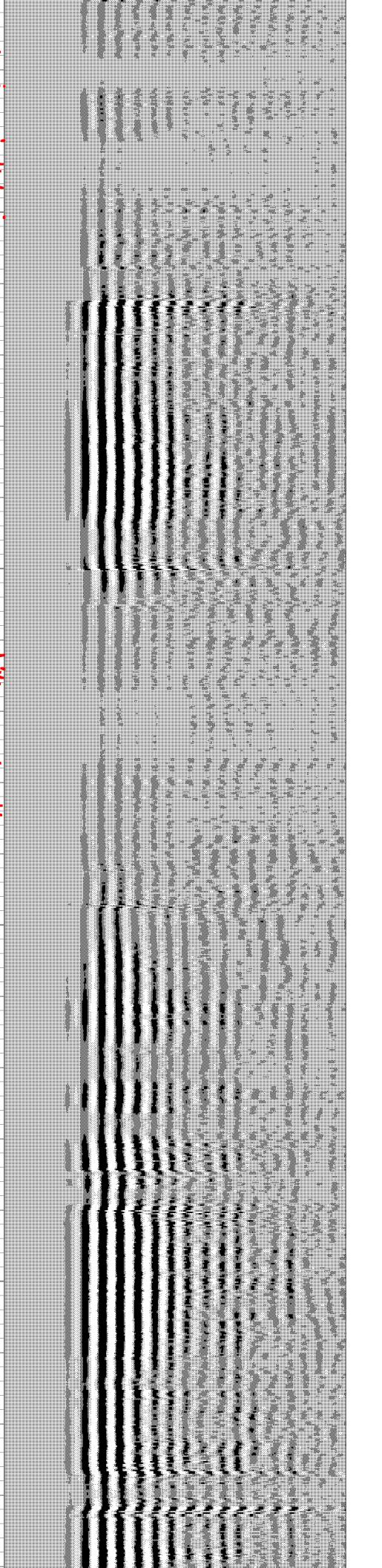
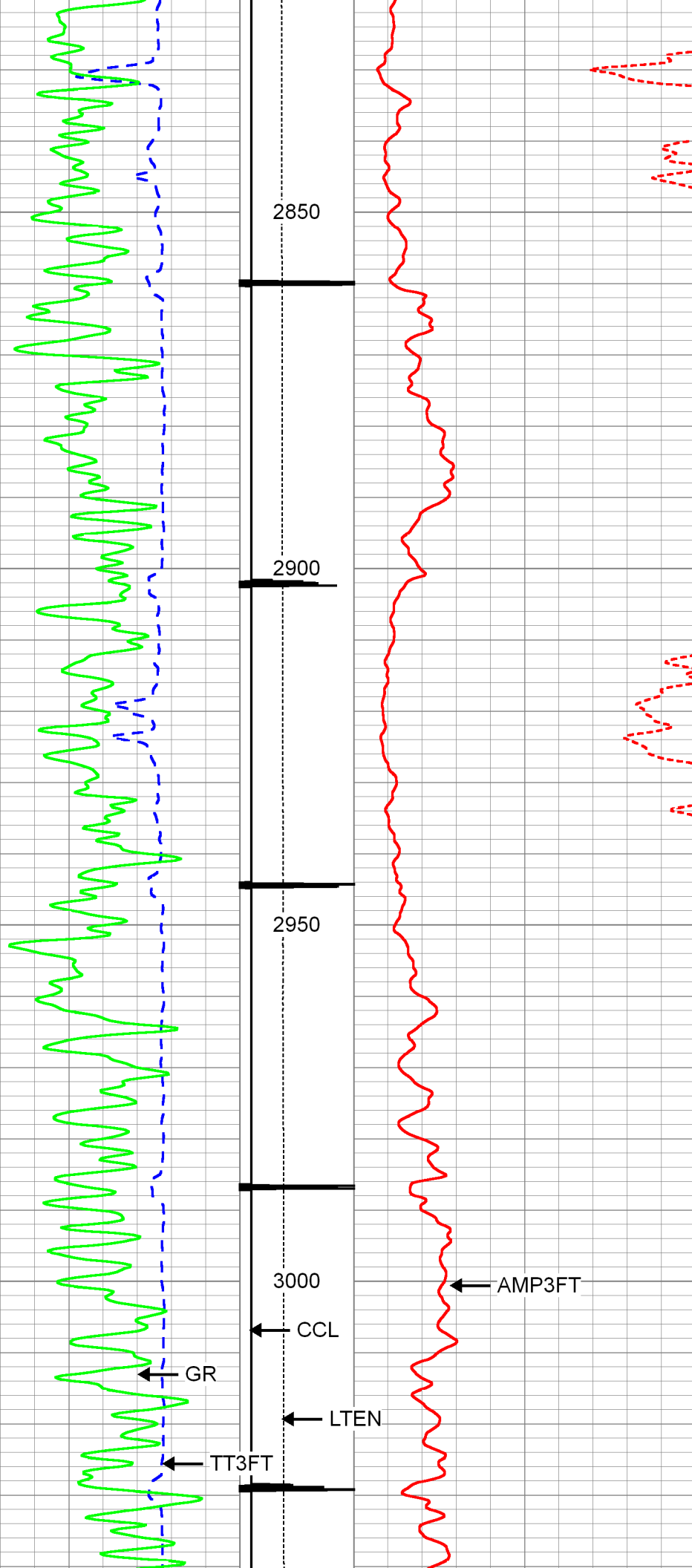


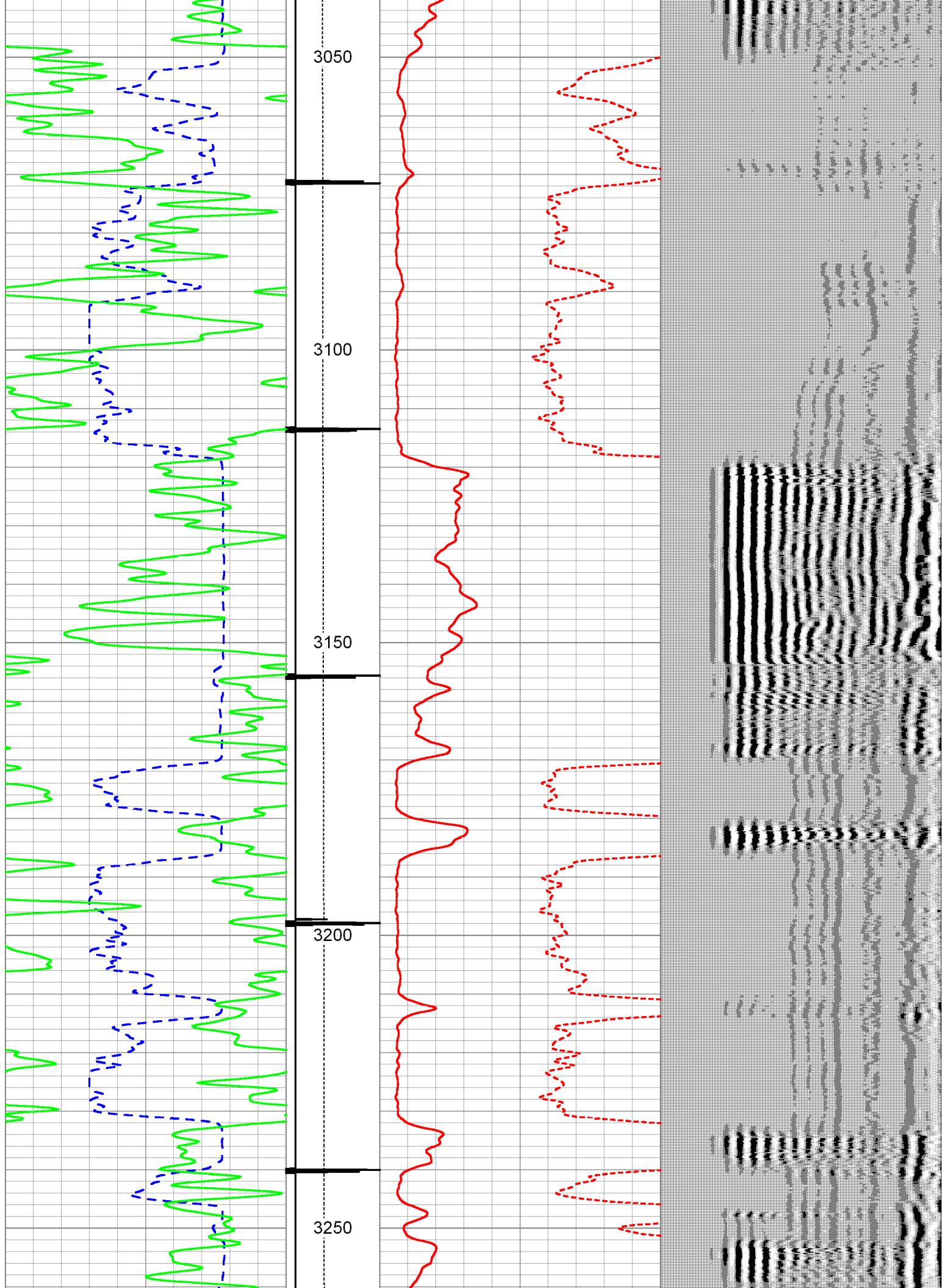


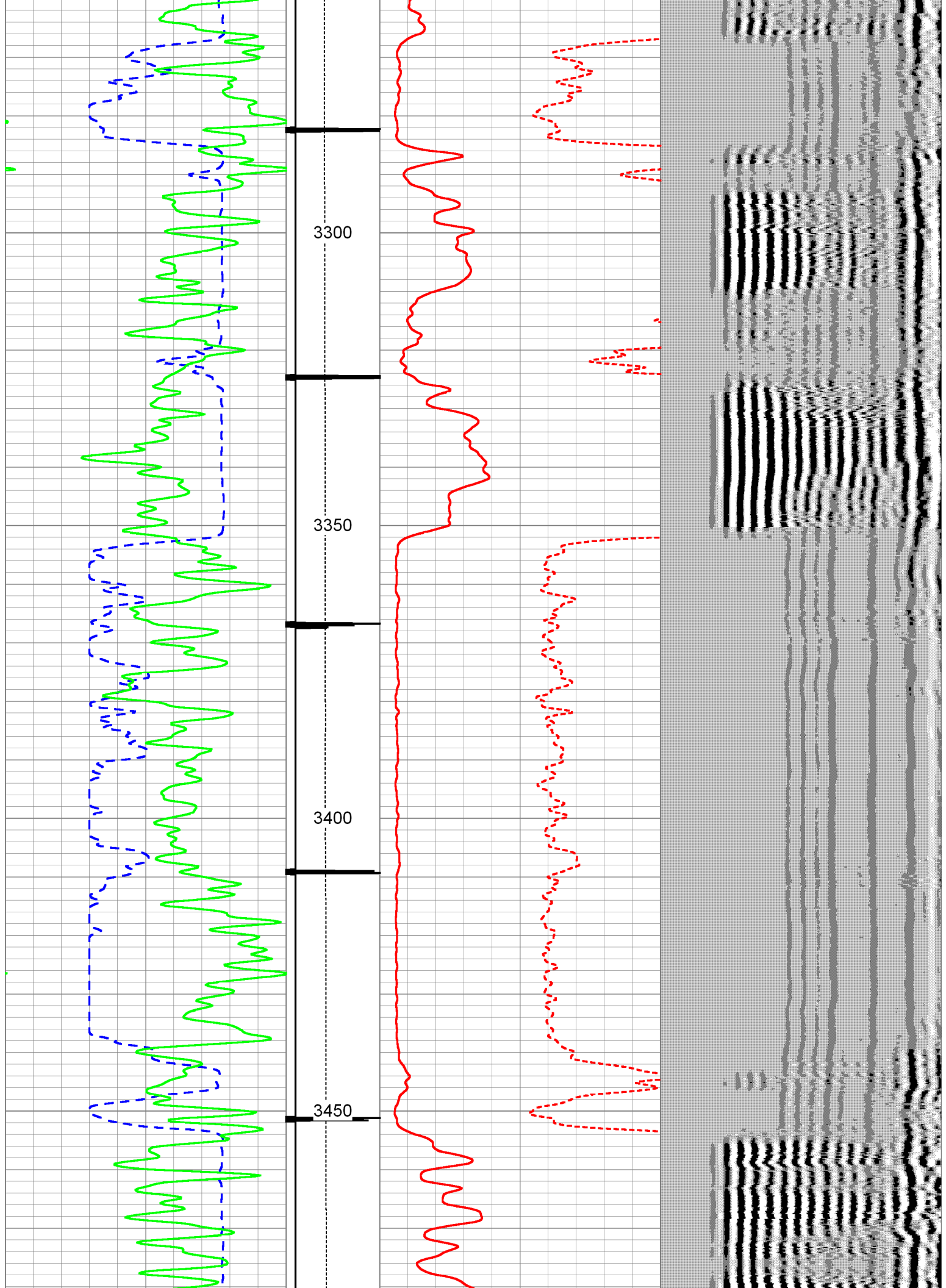


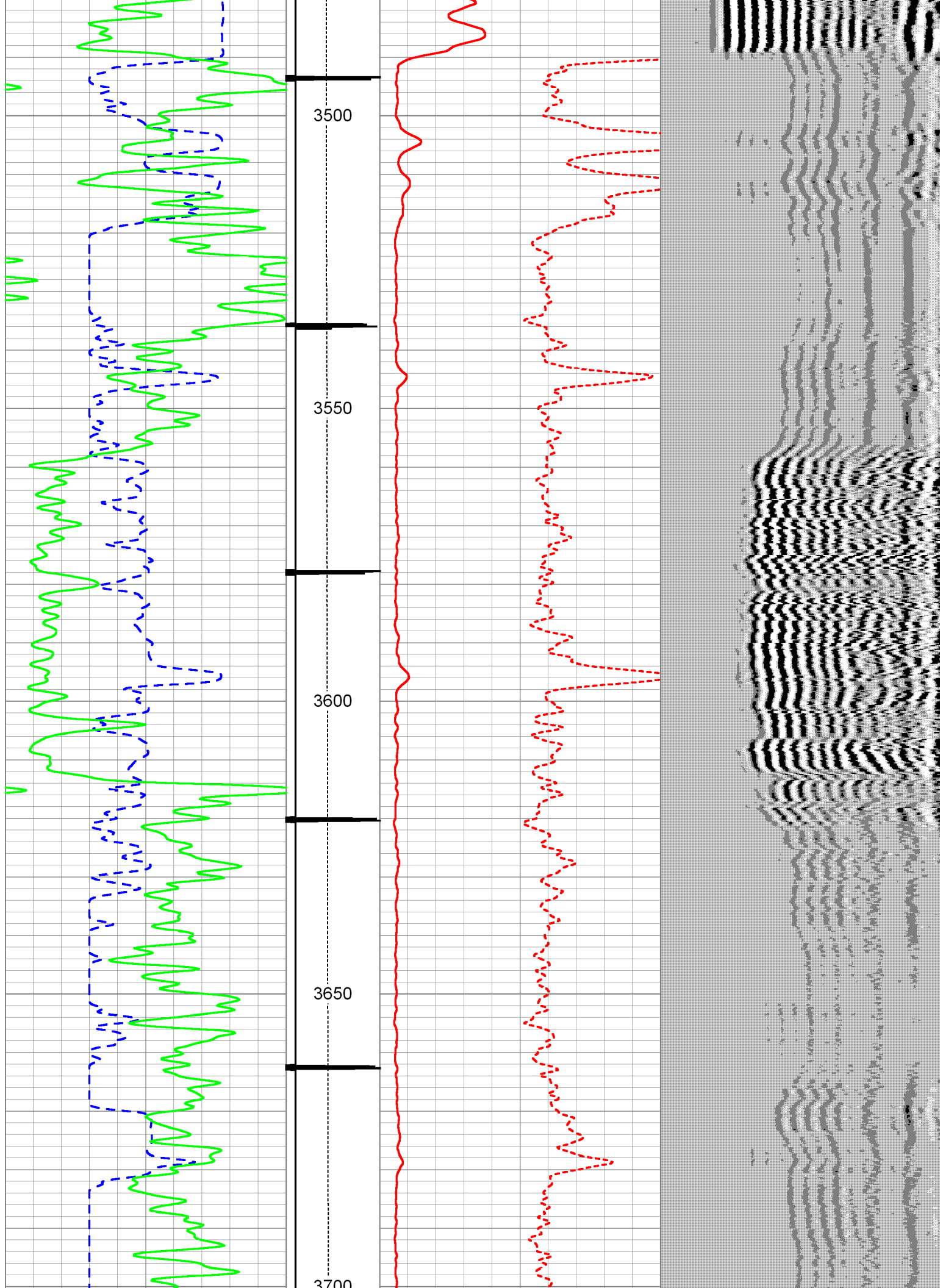


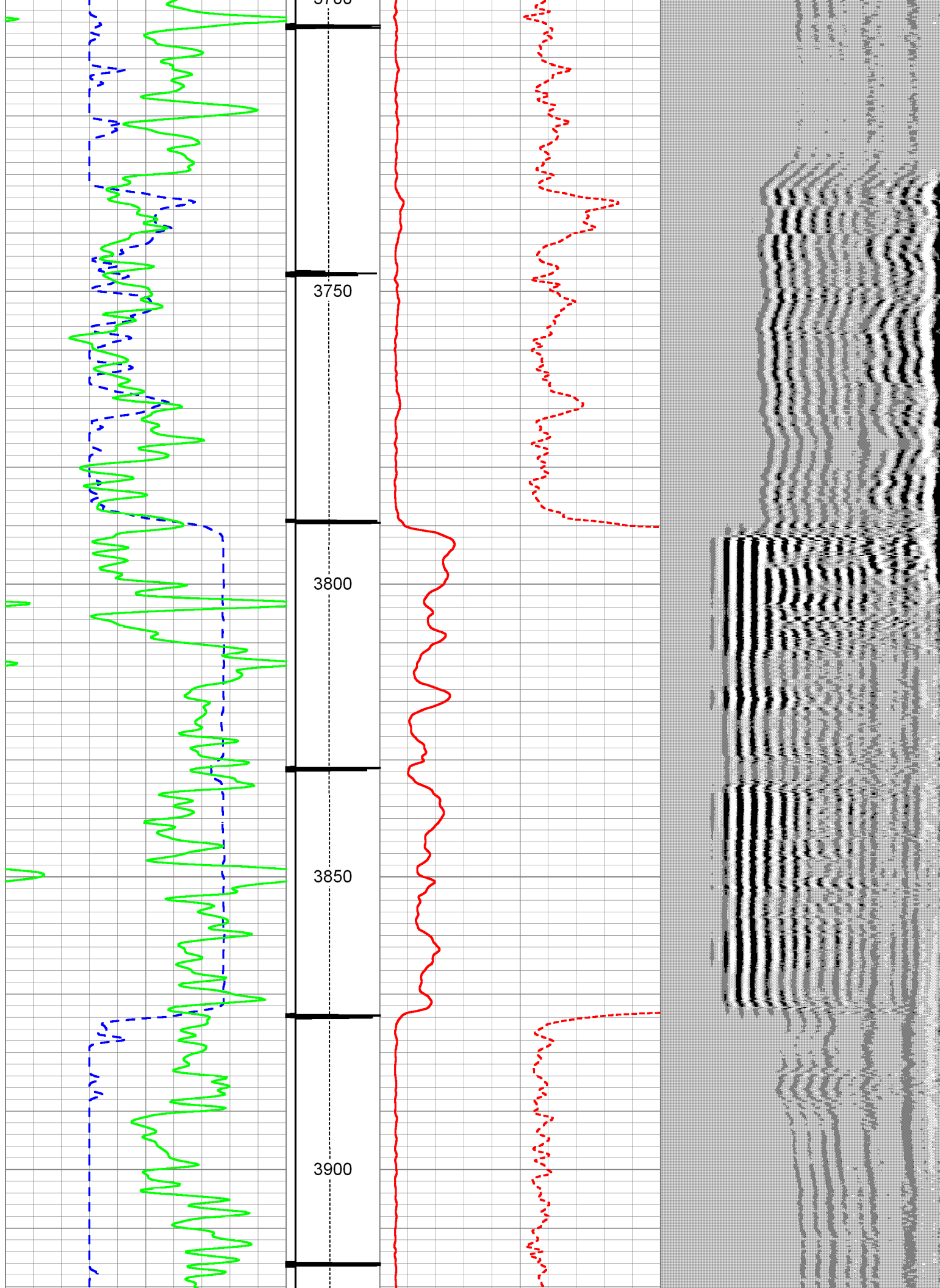


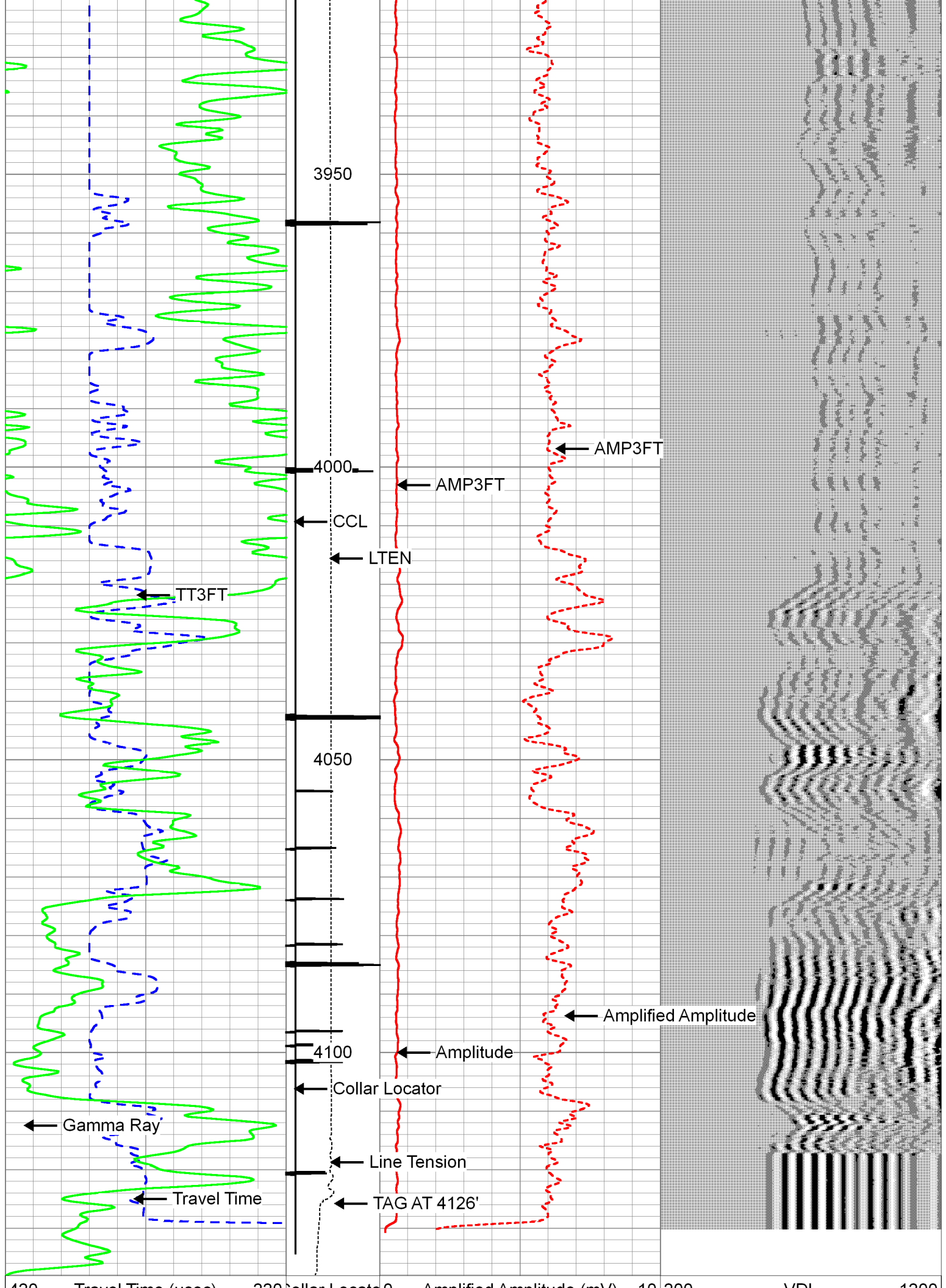












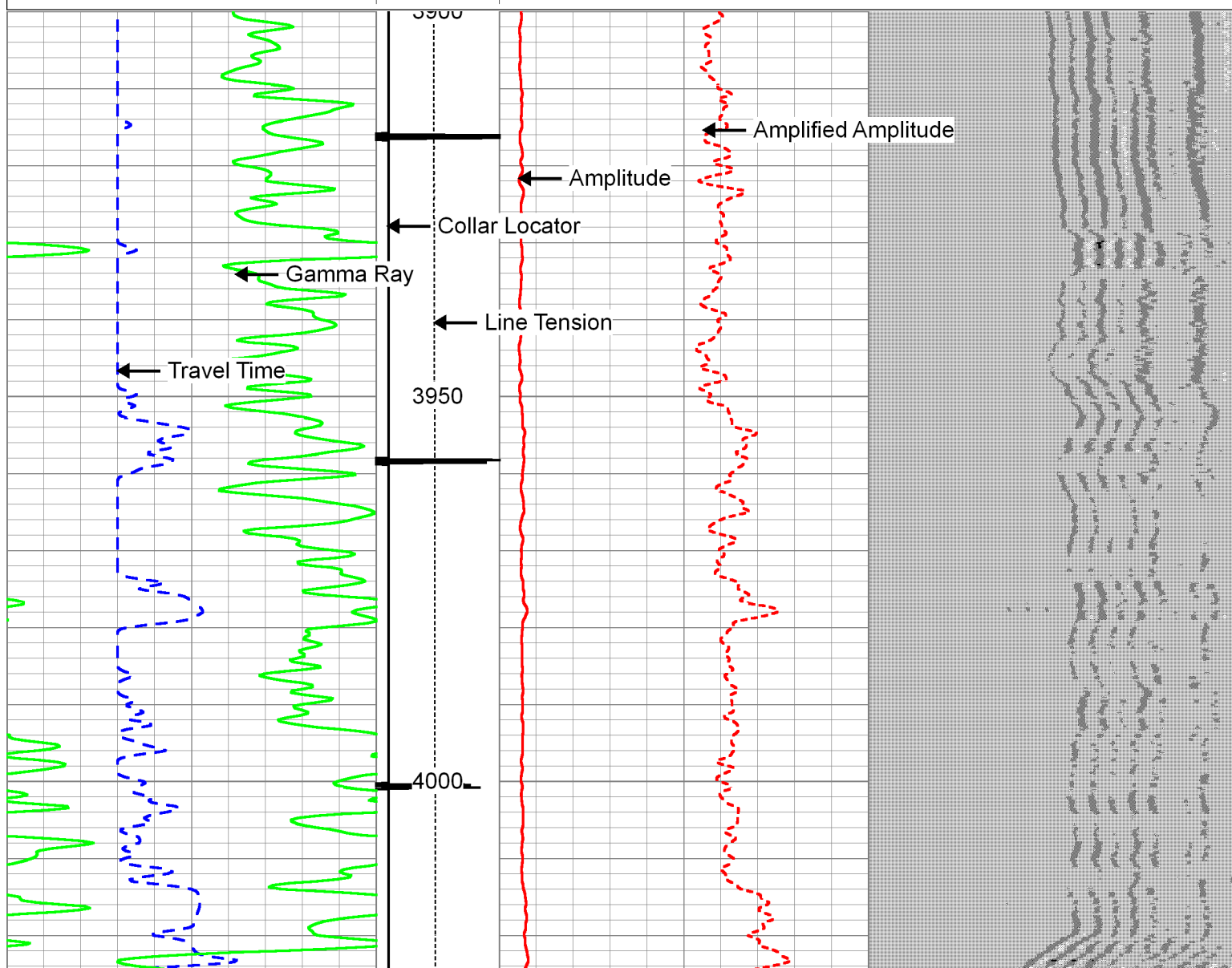
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0	Gamma Ray (GAPI)	150	-1	9	0	Amplitude (mV)	100		
			Line Tension (lb)						
			0		1500				

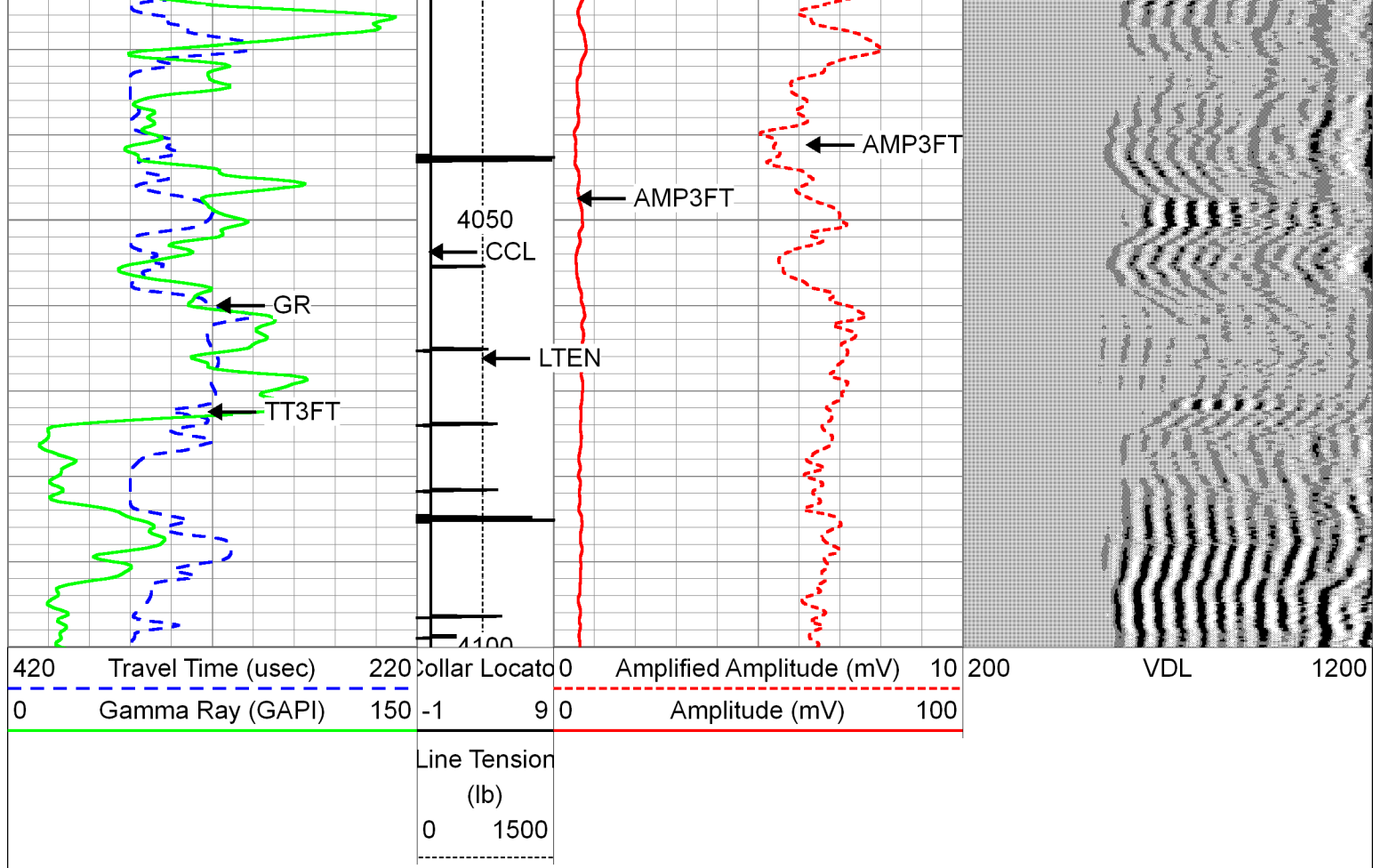


# REPEAT PASS - 5 INCH

Database File: stcroix\_011319.db  
 Dataset Pathname: pass7  
 Presentation Format: cbl\_cs  
 Dataset Creation: Sun Jan 13 08:43:51 2019 by Log 0  
 Charted by: Depth in Feet scaled 1:240

420	Travel Time (usec)	220	Collar Locator	0	Amplified Amplitude (mV)	10	200	VDL	1200
0	Gamma Ray (GAPI)	150	-1	9	0	Amplitude (mV)	100		
			Line Tension (lb)						
			0		1500				





## Log Variables

Database: C:\Warrior\Data\stcroix\_011319.db  
Dataset: field/well/run1/pass9

### Top - Bottom

XXXX	PPT usec	CASEWGHT lb/ft	MAXAMPL mV	MINAMPL mV	MINATTN db/ft	SRFTEMP degF
0	0	15.5	71.9	1	0.8	0
CASEOD in	PERFS	TDEPTH ft	BOTTEMP degF	BOREID in		
5.5	0	4200	180	7.875		

### Calibration Report

Database File: stcroix\_011319.db  
Dataset Pathname: pass8  
Dataset Creation: Sun Jan 13 08:49:07 2019 by Log 0

### Gamma Ray Calibration Report

Serial Number: 080220  
Tool Model: Probe  
Performed: Sun Jun 13 13:33:21 1993

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps  
Calibrator Reading: 1.0 cps

Sensitivity: 1.0000 GAPI/cps

## Segmented Cement Bond Log Calibration Report

Serial Number: FW1808-069  
 Tool Model: Probe LT Radii  
 Calibration Casing Diameter: 5.500 in  
 Calibration Depth: 2024.292 ft

Master Calibration, performed Sun Jan 13 08:32:44 2019:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.008	0.539	1.000	71.921	129.754	1.976
CAL	-0.003	0.868				
5'	-0.001	0.488	1.000	71.921	144.917	1.168
SUM						
S1	-0.000	0.649	0.000	71.921	110.866	0.004
S2	-0.013	0.540	0.000	71.921	130.113	1.626
S3	-0.003	0.561	0.000	71.921	127.655	0.340
S4	-0.004	0.534	0.000	71.921	133.770	0.506
S5	-0.005	0.501	0.000	71.921	142.248	0.646
S6	-0.007	0.489	0.000	71.921	144.804	1.045
S7	-0.011	0.495	0.000	71.921	142.162	1.539
S8	-0.011	0.488	0.000	71.921	144.194	1.552

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	-0.003	0.868	1.000	0.000

Air Zero Calibration, performed Wed Dec 31 17:00:00 1969:


	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	

## Temperature Calibration Report

Serial Number: FW1808-069  
 Tool Model: Probe LT Radii  
 Performed: Sat Jan 12 12:12:44 2019

	Reference		Reading	
Low Reference:	0.00	degF	0.00	cps
High Reference:	1.00	degF	100.00	cps

Gain: 0.01  
Offset: 0.00  
Delta Spacing 1

Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
WVF3FT	8.83		RBT-Probe LT Radii (FW1808-069) RADII LT w/ temp	8.92	2.75	106.50
WVFCAL	8.83					
WVFS1	8.83					
WVFS2	8.83					
WVFS3	8.83					
WVFS4	8.83					
WVFS5	8.83					
WVFS6	8.83					
WVFS7	8.83					
WVFS8	8.83					
WVF5FT	7.83					
TEMP	4.58					
CCL	3.64					
GR	0.90		GR-Probe (080220) Probe 2.75" 4 Channel Pulse	4.58	2.75	30.00

Dataset:	stcroix_011319.db: field/well/run1/pass8
Total Length:	13.50 ft
Total Weight:	136.50 lb
O.D.	2.75 in



Company	ST. CROIX OPERATING, INC.		
Well	PRONGHORN 1		
Field	WILDCAT		
County	WASHINGTON		
State	CO	Country	USA