Schlumberger

Company: SWEPI, LP

Well: LHW-8118

Field: COLORADO OIL SHALE

County: RIO BLANCO State: COLORADO

CEMENT BOND LOG
GAMMA RAY

County: RIO BLANCO
Field: COLORADO OIL SHALE
Location: SHL: 1773' FNL & 2359' FWL
Well: LHW-8118
Company: SWEPI, LP

LOCATION

SHL: 1773' FNL & 2359' FWL
LAT: 39.907713. LONG: -108.396994

Elev.:		
	K.B.	6650.70 ft
	G.L.	6622.70 ft
	D.F.	6649.70 ft

Permanent Datum: GROUND LEVEL — Elev.: 6622.70 ft
Log Measured From: KELLY BUSHING — 28.00 ft above Perm. Datum
Drilling Measured From: KELLY BUSHING

API Serial No.	Section	Township	Range
05-103-82065-00	4	2S	98W

	Run 1	Run 2
PVT DATA: Oil Density		
Water Salinity		
Gas Gravity		
Bo		
Bw		
1/Bg		
Bubble Point Pressure		
Bubble Point Temperature		
Solution GOR		
Maximum Deviation	92 deg	
CEMENTING DATA		
Primary/Squeeze	Primary	
Casing String No		
Lead Cement Type	LITECRETE	
Volume	221 ft3	
Density	9.5 lbm/gal	
Water Loss		
Additives		
Tail Cement Type	EASYBLOK	
Volume	43.8 ft3	
Density	15.8 lbm/gal	
Water Loss		
Additives		
Expected Cement Top	350 ft	

Logging Date	8-Sep-2013	
Run Number	1	
Depth Driller	2902 ft	
Schlumberger Depth	2853 ft	
Bottom Log Interval	2853 ft	
Top Log Interval	0 ft	
Casing Fluid Type	WATER	
Salinity		
Density	8.5 lbm/gal	
Fluid Level	0 ft	
BIT/CASING/TUBING STRING		
Bit Size	12.250 in	
From	0 ft	
To	2902 ft	
Casing/Tubing Size	9.625 in	
Weight	40 lbm/ft	
Grade	K55	
From	0 ft	
To	2853 ft	
Maximum Recorded Temperatures		
Logger On Bottom — Time	8-Sep-2013 — 23:30	
Unit Number — Location	9108 — VERNAL	
Recorded By	CURTIS SCHAAF	
Witnessed By	NILESH KADAM	

Logging Date		
Run Number		
Depth Driller		
Schlumberger Depth		
Bottom Log Interval		
Top Log Interval		
Casing Fluid Type		
Salinity		
Density		
Fluid Level		
BIT/CASING/TUBING STRING		
Bit Size		
From		
To		
Casing/Tubing Size		
Weight		
Grade		
From		
To		
Maximum Recorded Temperatures		
Logger On Bottom — Time		
Unit Number — Location		
Recorded By		
Witnessed By		

Run 3

Run 4

DEPTH SUMMARY LISTING

Date Created: 8-SEP-2013 22:05:18

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW -JA	Type:	CMTD-B/A	Type:	7-46A-XS
Serial Number:		Serial Number:	147	Serial Number:	
Calibration Date:		Calibration Date:	03-SEP-2013	Length:	24000 FT
Calibrator Serial Number:		Calibrator Serial Number:	100818	Conveyance Method:	Wireline
Calibration Cable Type:	7-46A-XS	Number of Calibration Points:	0	Rig Type:	LAND
Wheel Correction 1:	-7				
Wheel Correction 2:	-6				

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	181.20 FT
Rig Up Length At Bottom:	181.30 FT
Rig Up Length Correction:	-0.10 FT
Stretch Correction:	
Tool Zero Check At Surface:	0.30 FT

Depth Control Remarks

1. ALL SCHLUMBERGER DEPTH PROCEDURES FOLLOWED
2. IDW USED AS PRIMARY DEPTH MEASUREMENT DEVICE
3. Z-CHART USED AS SECONDARY DEPTH REFERENCE
4. LOGS CORRELATED TO MWD GAMMA RAY
5.
6.

DISCLAIMER

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE OF AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

OTHER SERVICES1	OTHER SERVICES2
OS1: ISOLATION SCANNER	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:

REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
TOOLS RUN AS PER TOOLSKETCH	
TOOLS CENTRALIZED VIA TWO (2) INLINE CENTRALIZERS, THREE (3) GEMCOS	
AND THREE (3) KNUCKLES	
NO PRESSURE APPLIED FROM SURFACE	
WELL FILLED WITH FRESH WATER	
LEAD CEMENT: 9.5 PPG LITECRETE	
TAIL CEMENT: 15.8 PPG EASYBLOK	
MAXIMUM DEVIATION: 92 DEGREES, TOOLS TRACTORED IN LATERAL SECTION	
CREW: C.SCHAAF, T. TOMPKINS, J. CHILD, D. JONES	
THANK YOU FOR CHOOSING SCHLUMBERGER!	

RUN 1		RUN 2	
SERVICE ORDER #:	CL4I-00022	SERVICE ORDER #:	
PROGRAM VERSION:	19C1-222	PROGRAM VERSION:	
FLUID LEVEL:	0 ft	FLUID LEVEL:	

LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

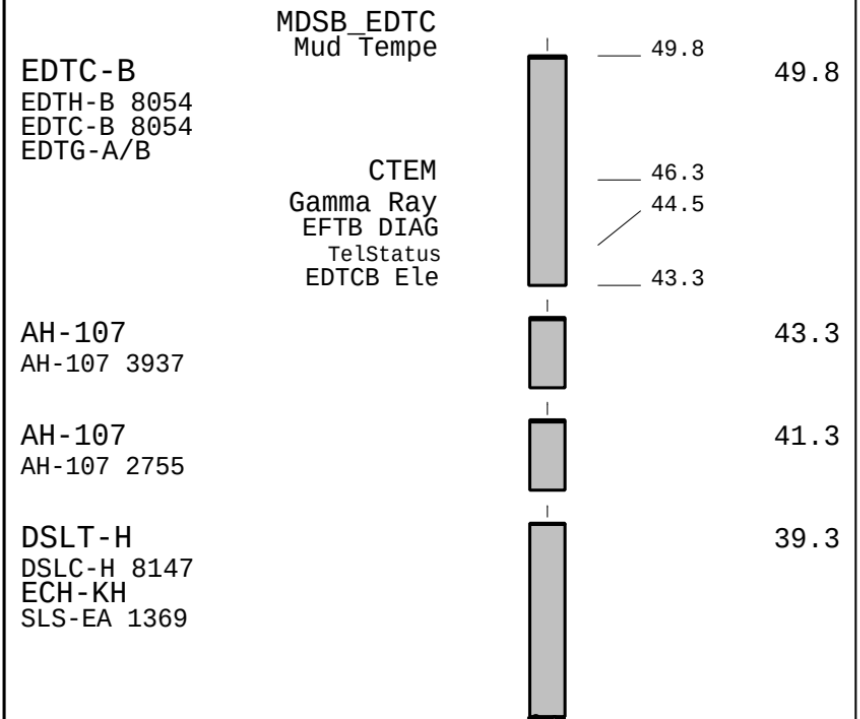
EQUIPMENT DESCRIPTION

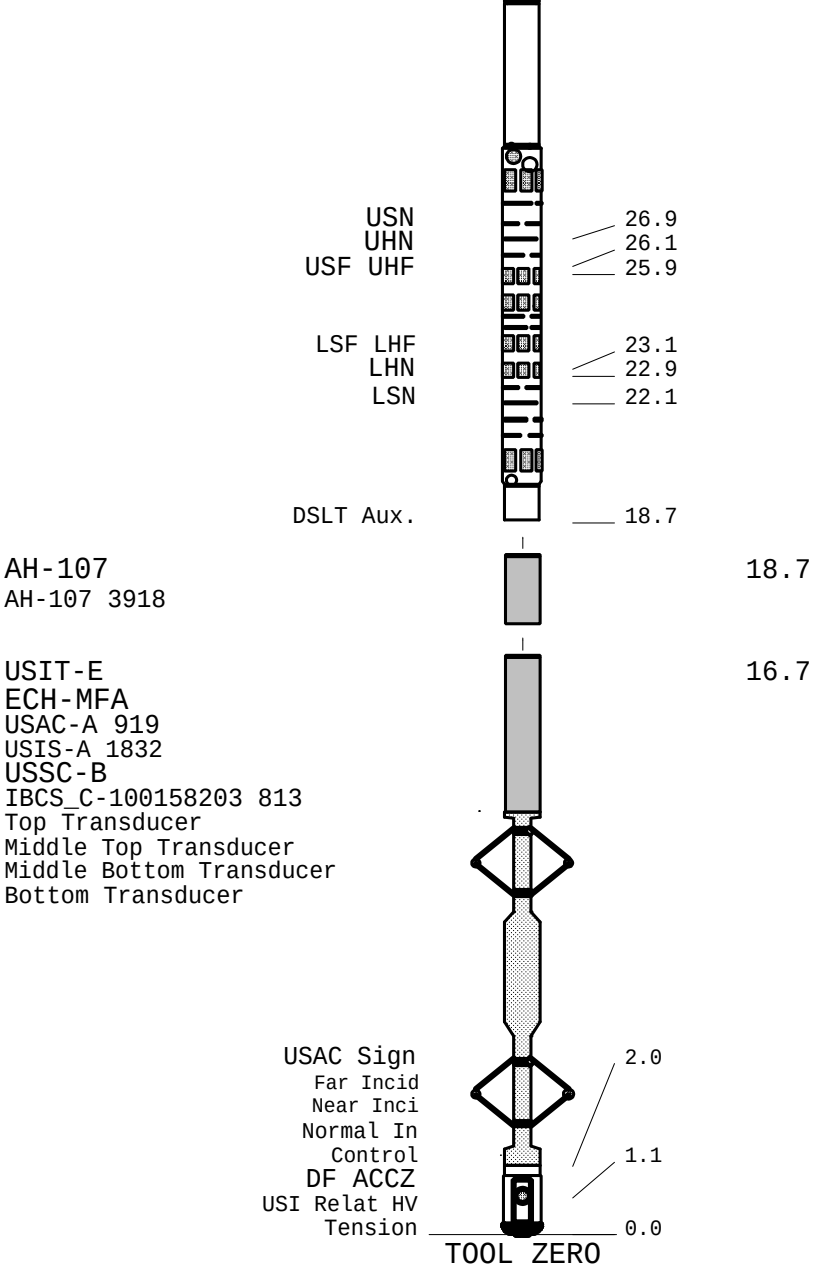
RUN 1 | RUN 2

SURFACE EQUIPMENT

WITM (EDTS)-A

DOWNHOLE EQUIPMENT





MAXIMUM STRING DIAMETER 6.66 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Schlumberger

MAIN PASS
5 INCH

MAXIS Field Log

Company: SWEPI, LP | Well: LHW-8118

Input DLIS Files

DEFAULT	USI_SONIC_016LUP	FN:15	PRODUCER	08-Sep-2013 23:02	2664.5 FT	36.7 FT

Output DLIS Files

DEFAULT	USI_SONIC_021PUP	FN:20	PRODUCER	09-Sep-2013 01:04	2664.5 FT	37.0 FT

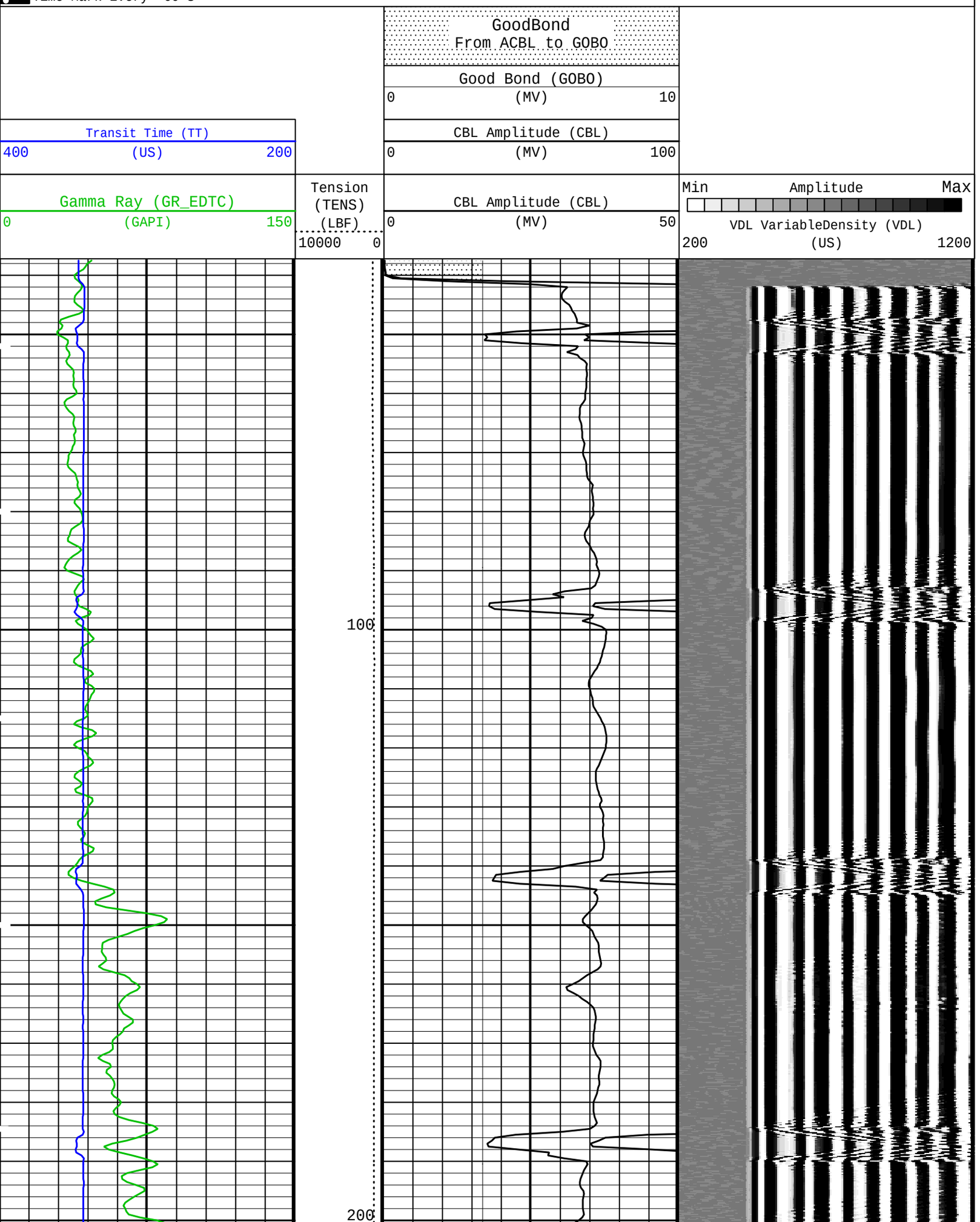
OP System Version: 19C1-222

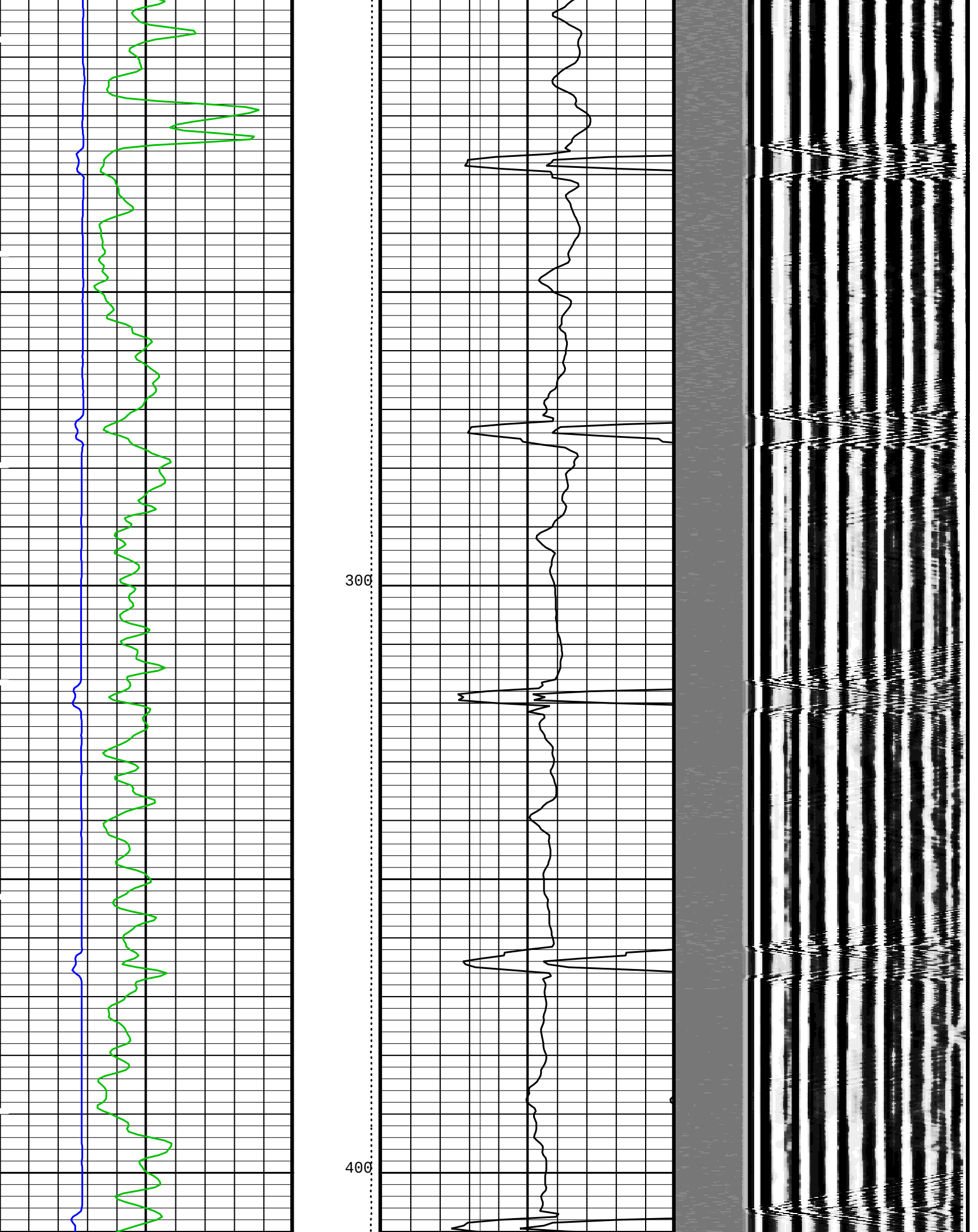
eWAFE Version: 1.186

USIT-E	19C1-222	DSLT-H	19C1-222
EDTC-B	19C1-222		

PIP SUMMARY

Time Mark Every 60 S

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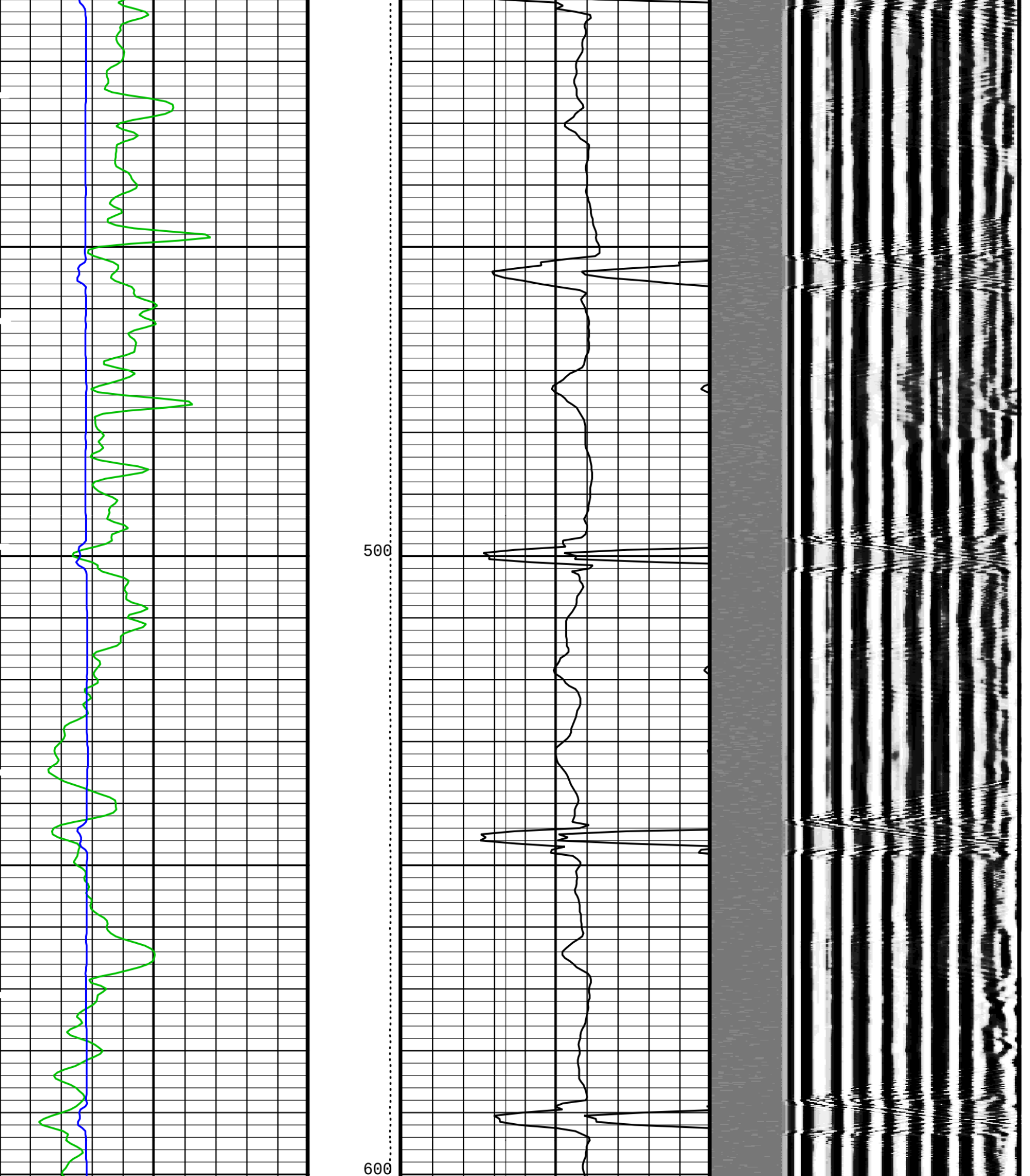
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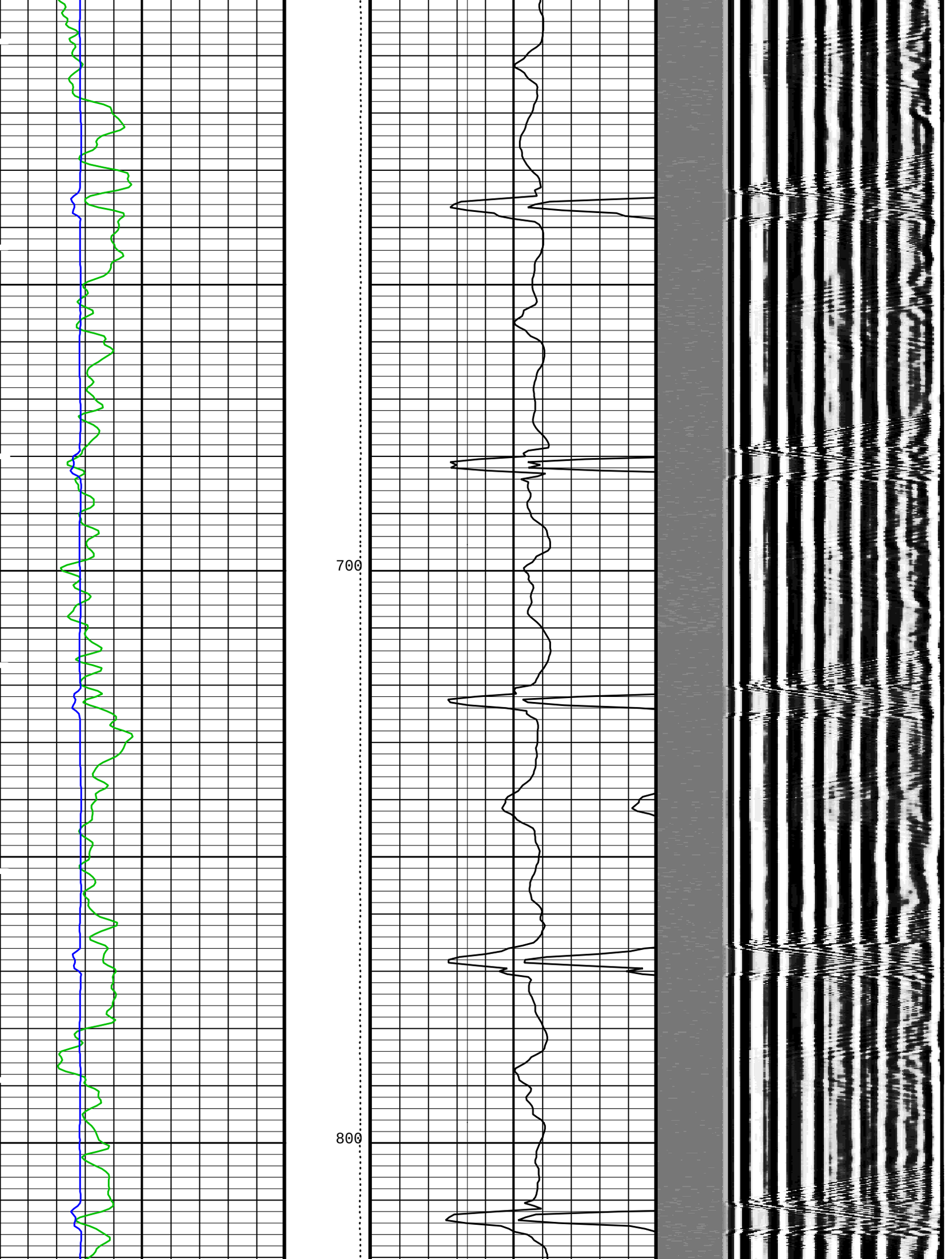
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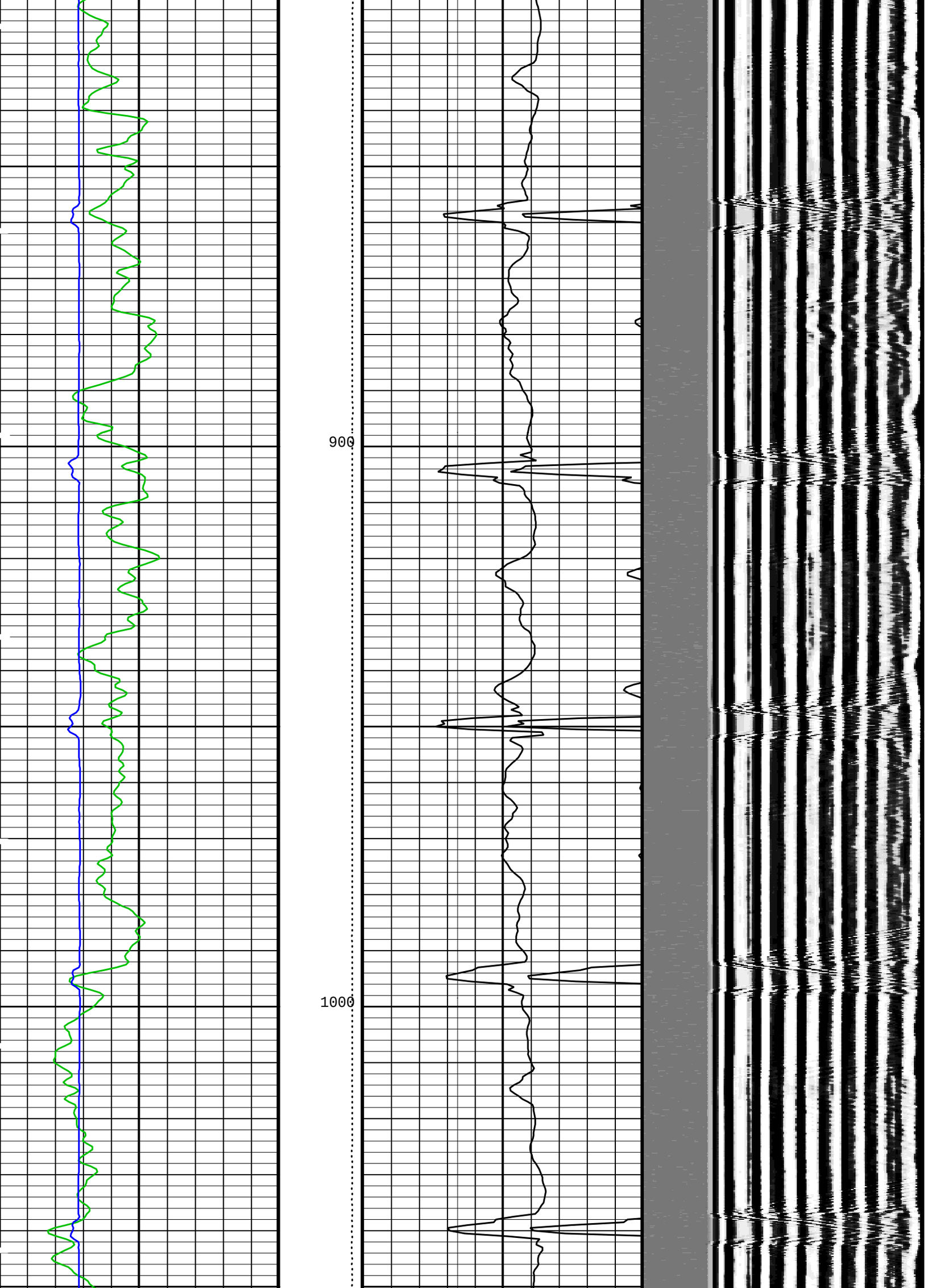
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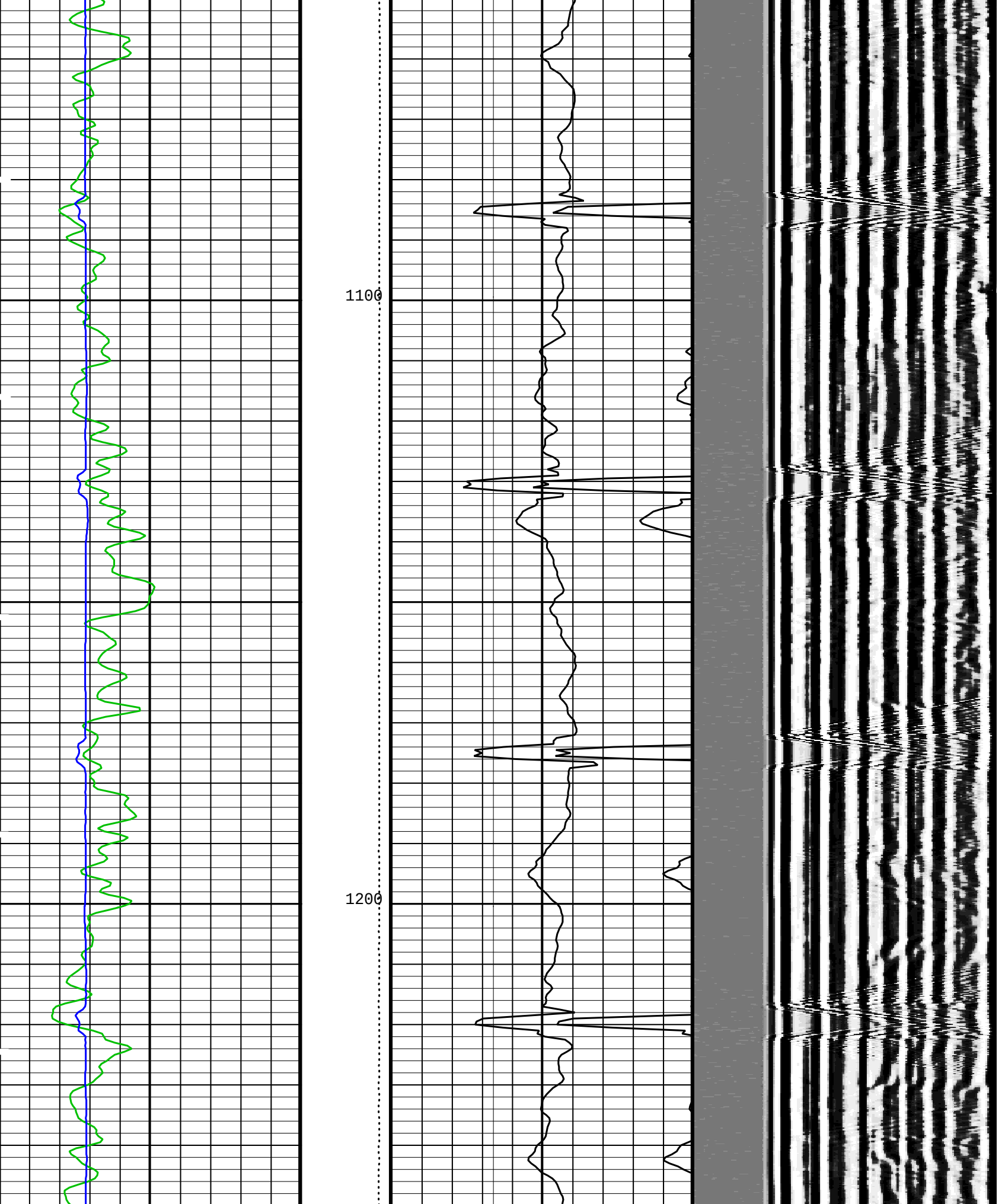
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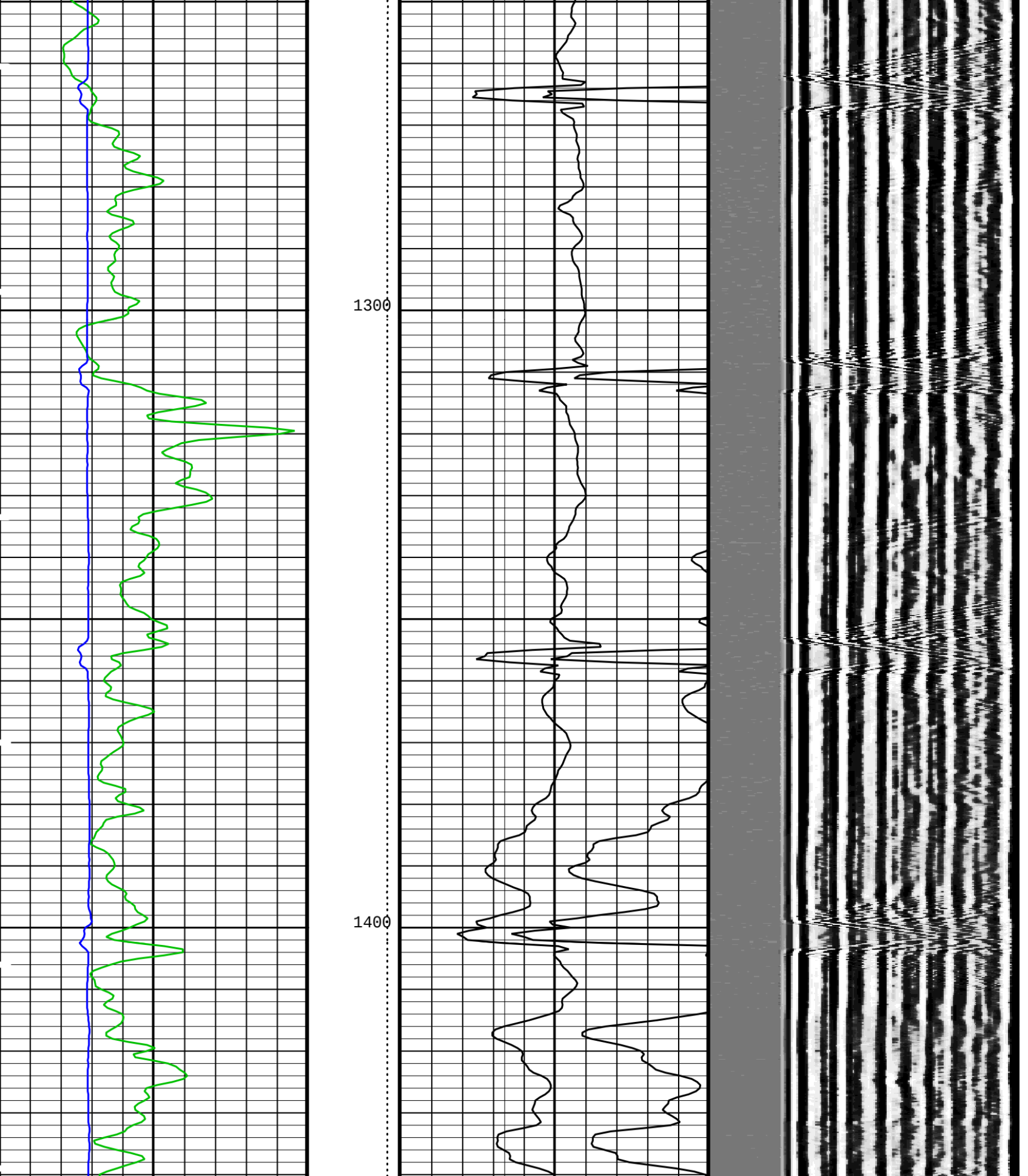
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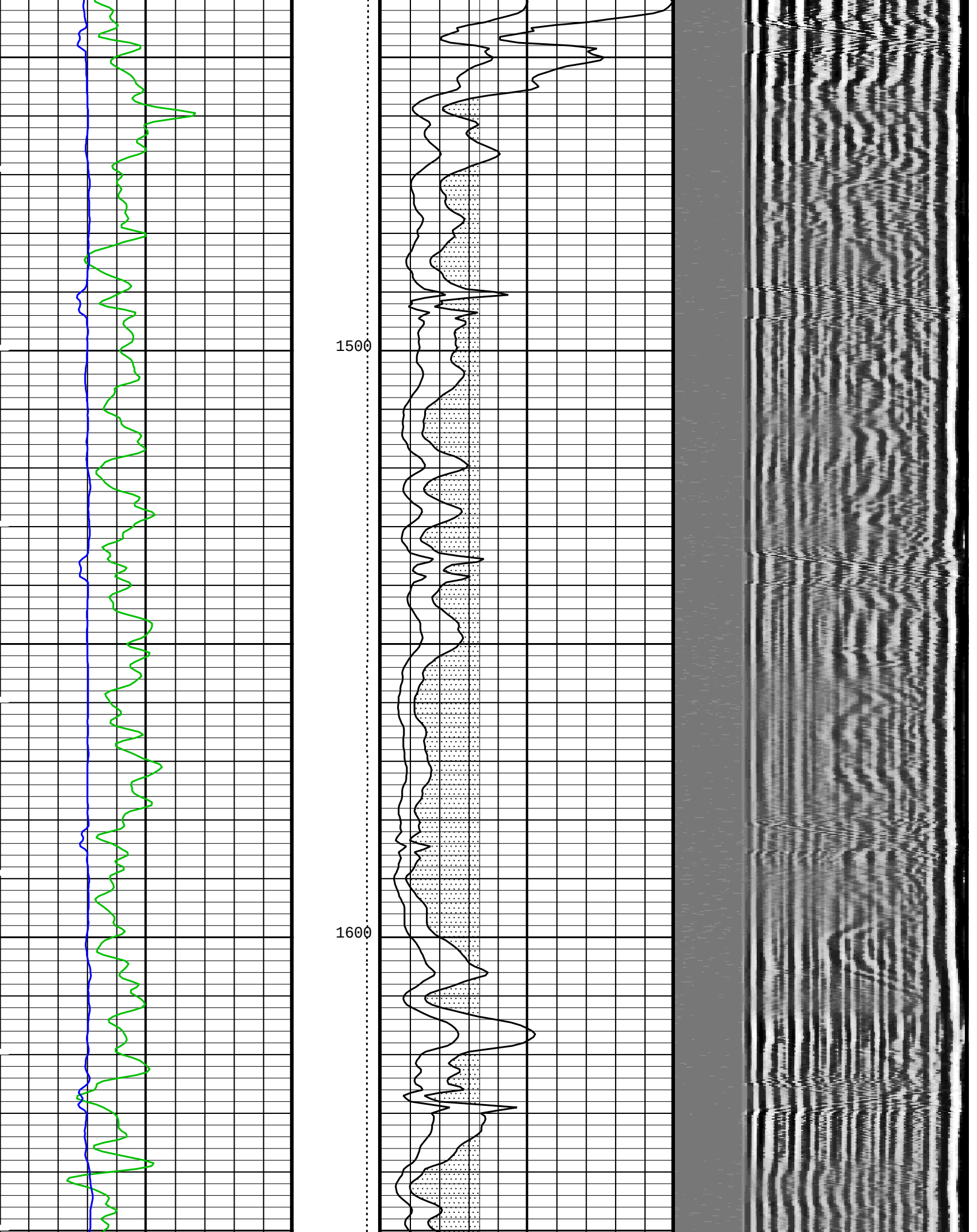
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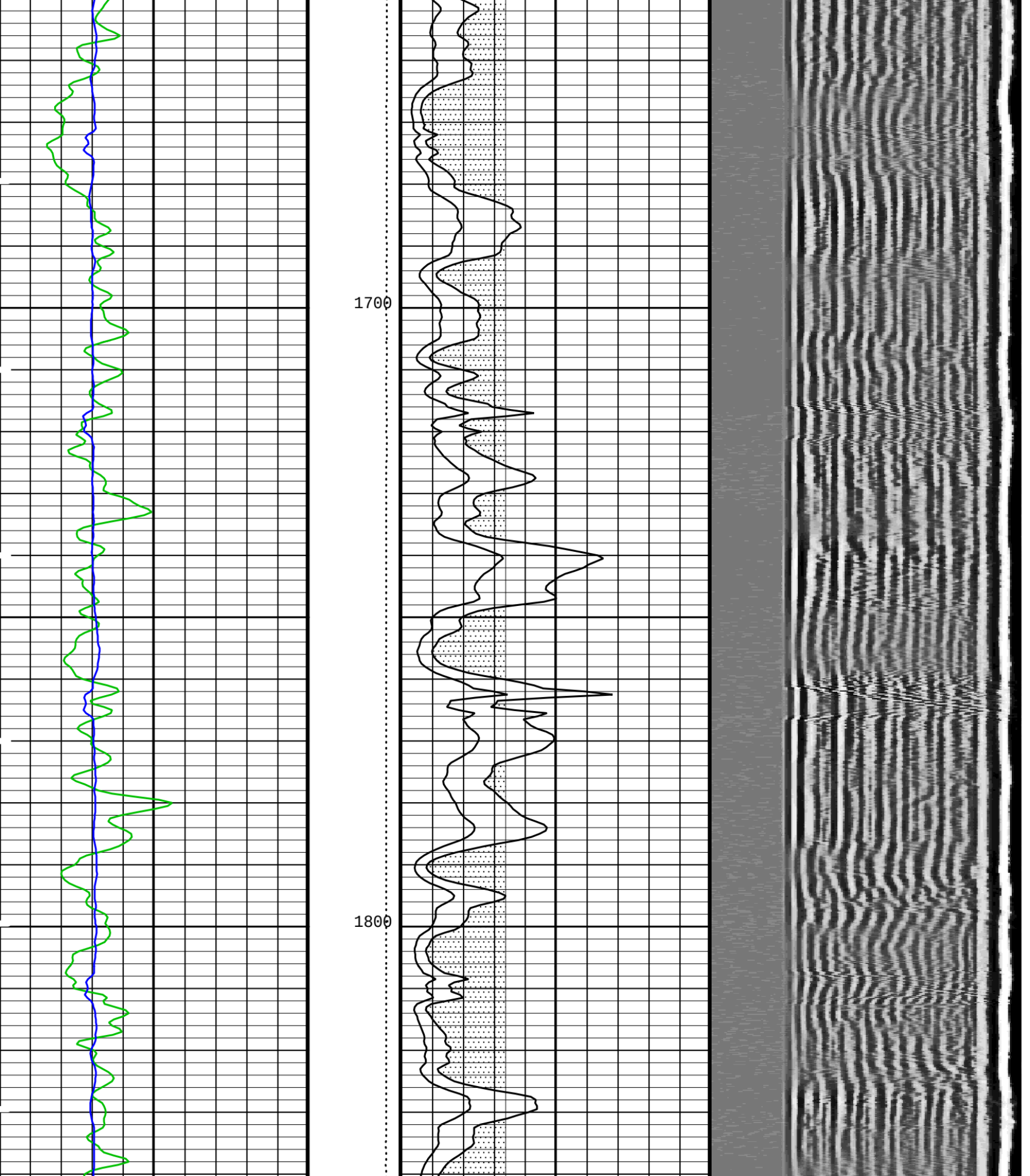
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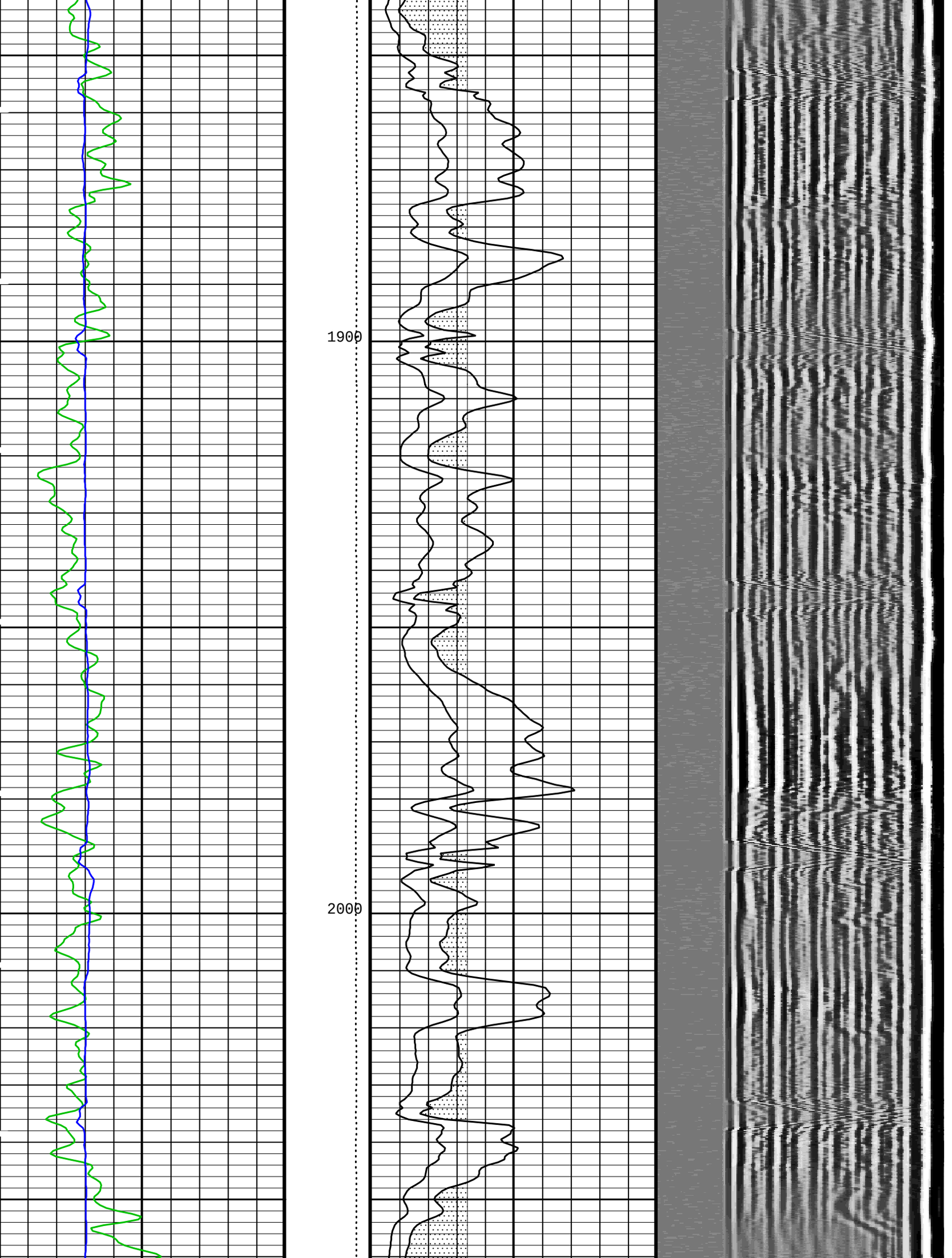
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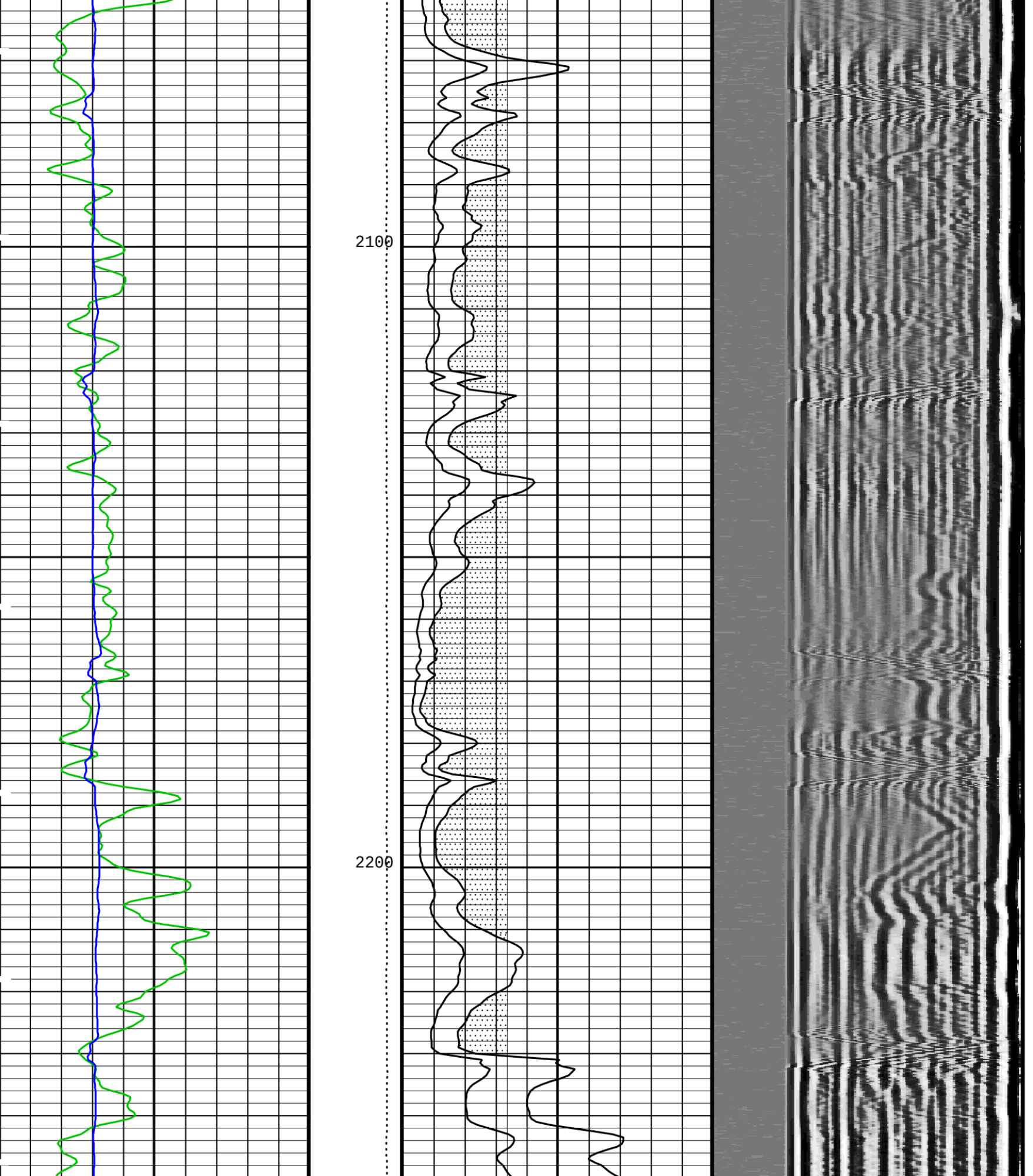
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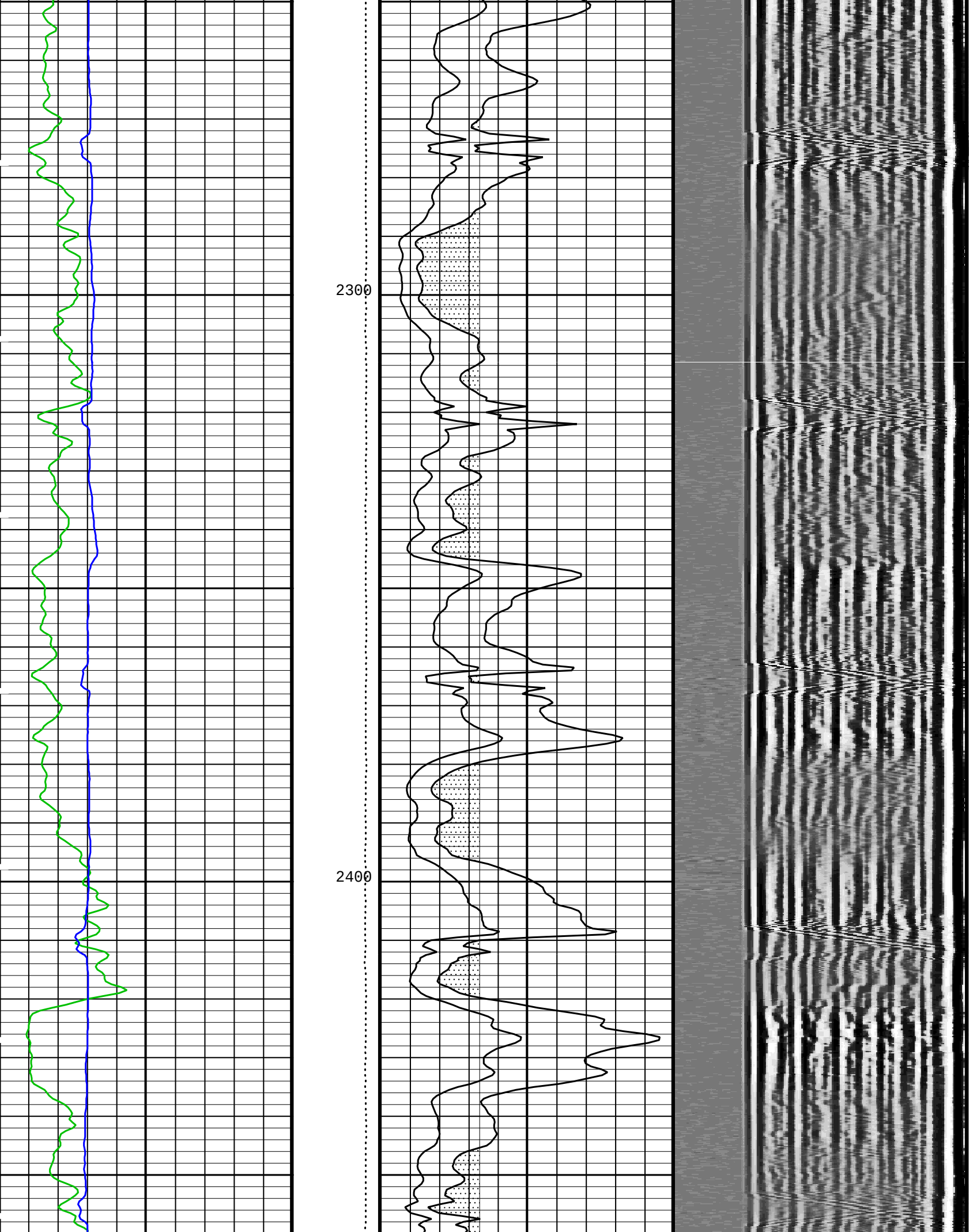
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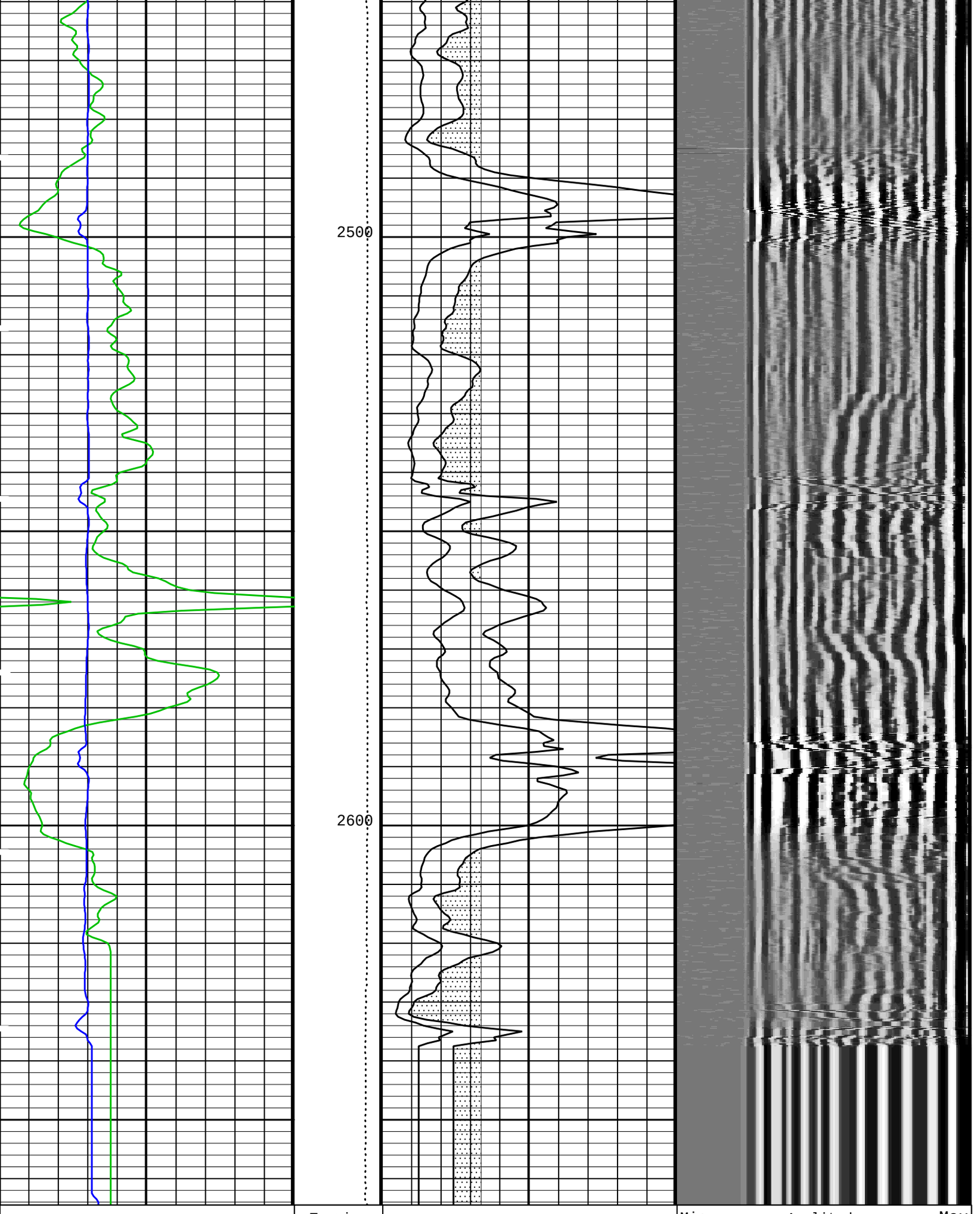

2500
2600
Gamma Ray (GR_EDTC)
0 (GAPI) 150
Transit Time (TT)
400 (US) 200
Tension
(TENS)
(LBF)
10000 0
CBL Amplitude (CBL)
0 (MV) 50
CBL Amplitude (CBL)
0 (MV) 100
Min Amplitude Max
VDL VariableDensity (VDL)
200 (US) 1200

Good Bond (GOBO)		
0	(MV)	10

GoodBond
From ACBL to GOBO

PIP SUMMARY

Time Mark Every 60 S

Format: CBL_VDL Vertical Scale: 5" per 100' Graphics File Created: 09-Sep-2013 01:04

OP System Version: 19C1-222

eWAFE Version: 1.186

USIT-E	19C1-222	DSLT-H	19C1-222
EDTC-B	19C1-222		

Information for DSLT Sonde Status and Casing Features

Sonde Type	SLS-W/E
Sonde Serial Number	1369
Casing Size (CSIZ)	9.62500 IN
Casing Weight (CWEI)	40.0 LB/F
Expected CBL Amplitude in Free Pipe Section (CBRA)	52.0 MV
Minimum Sonic Amplitude (MSA : 100% Cement)	1.66785 MV
Minimum Sonic Amplitude (MSA : 80% Cement)	3.31839 MV
Date of Master Calibration	5-SEP-2013
CBL Correction Factor (Master Calibration)	3.94479
Depth of Before Calibration (BDEP)	Not Recorded
CBL Adjustment Factor (CBAF : Before Calibration)	1.0

Parameters

DLIS Name	Description	Value	
	USIT-E: Ultrasonic Imaging - E		
	T^3 Processing Length for FPM	26.648	US
	Corrosion range maximum	0.076	IN
	Corrosion range minimum	-0.076	IN
	DSLT-H: Digitizing Sonic Logging Tool		
	DSLT Firing Mode	CBL_W	
	Telemetry Mode	DSLC_FTB	
AMSG	Auxiliary Minimum Sliding Gate	120	US
CBAF	CBL Adjustment Factor	1	
CBLG	CBL Gate Width	78	US
DDEL	Digitizing Delay	0	US
DRCS	DSLT DLIS Recording Size	120	
DSIN	Digitizing Sample Interval	10	
DTFS	DSLC Telemetry Frame Size	236	
DWCO	Digitizing Word Count	120	
GAI	Manual Gain	40	
GOBO	Good Bond	3.31839	MV
MAHTR	Manual High Threshold Reference	40	
MGAI	Maximum Gain	1000	
MNHTR	Minimum High Threshold Reference	30	
NMSG	Near Minimum Sliding Gate	291	US
NMXG	Near Maximum Sliding Gate	750	US
RATE	Firing Rate	R7	
SFAF	Sonic Formation Attenuation Factor	0	DB/F
SGCL	Sliding Gate Closing Delta-T	250	US/F
SGDT	Sliding Gate Delta-T	57	US/F
SGW	Sliding Gate Width	80	US
SLEV	Signal Level for AGC	5000	
VDLG	VDL Manual Gain	5	
WAGC	Waveform AGC Allow/Disallow	OFF	
WMOD	Waveform Firing Mode	FULL	
	System and Miscellaneous		
DO	Depth Offset for Playback	0.0	FT
PP	Playback Processing	RECOMPUTE	

Input DLIS Files

DEFAULT	USI_SONIC_016LUP	FN:15	PRODUCER	08-Sep-2013 23:02	2664.5 FT	36.7 FT

Output DLIS Files

DEFAULT	USI_SONIC_021PUP	FN:20	PRODUCER	09-Sep-2013 01:04

Schlumberger

REPEAT PASS
5 INCH

MAXIS Field Log

Company: SWEPI, LP

Well: LHW-8118

Input DLIS Files

DEFAULT	USI_SONIC_017LUP	FN:16	PRODUCER	09-Sep-2013 00:36	1300.0 FT	1099.1 FT

Output DLIS Files

DEFAULT	USI_SONIC_020PUP	FN:19	PRODUCER	09-Sep-2013 01:02	1300.0 FT	1099.5 FT

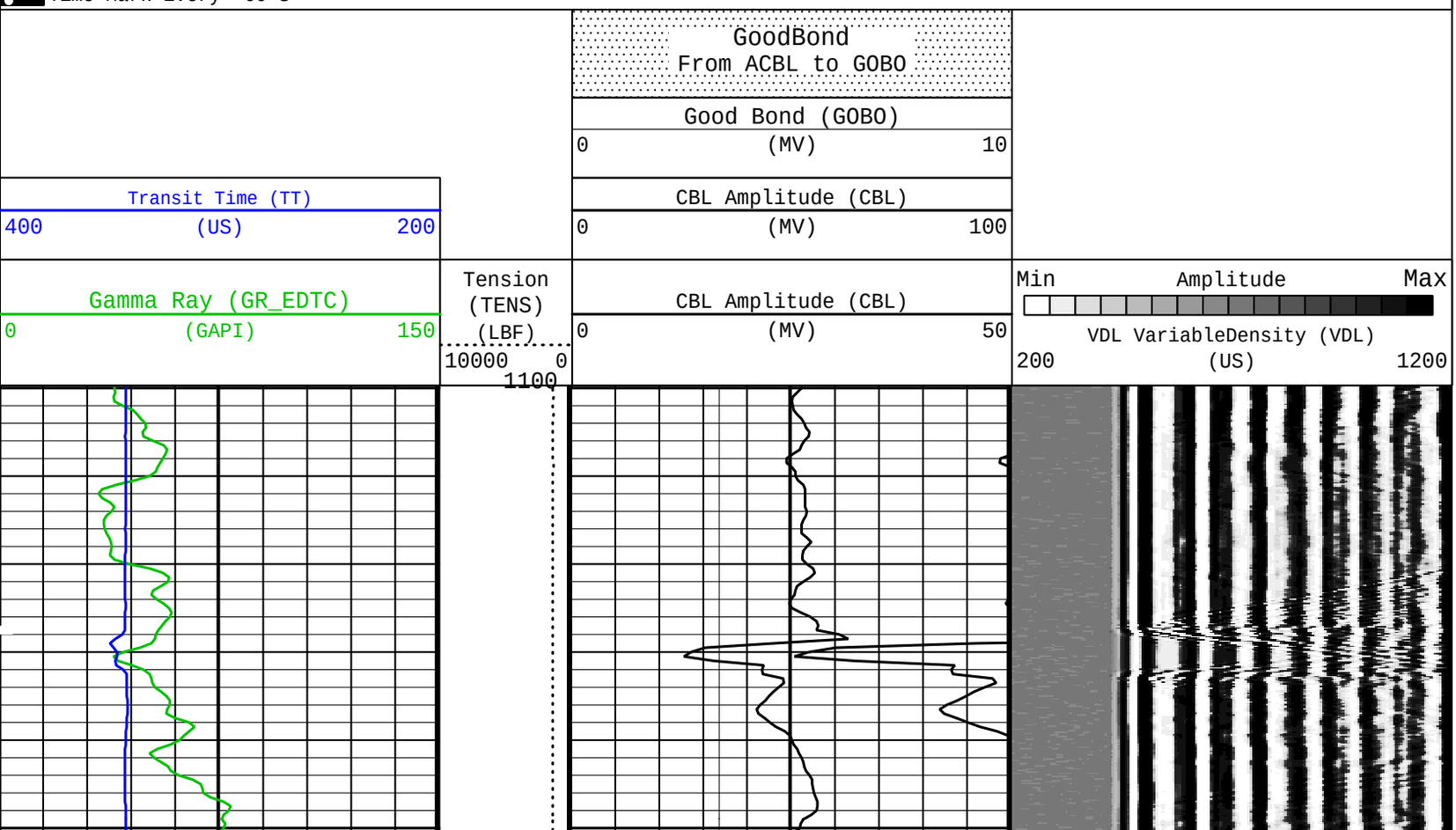
OP System Version: 19C1-222

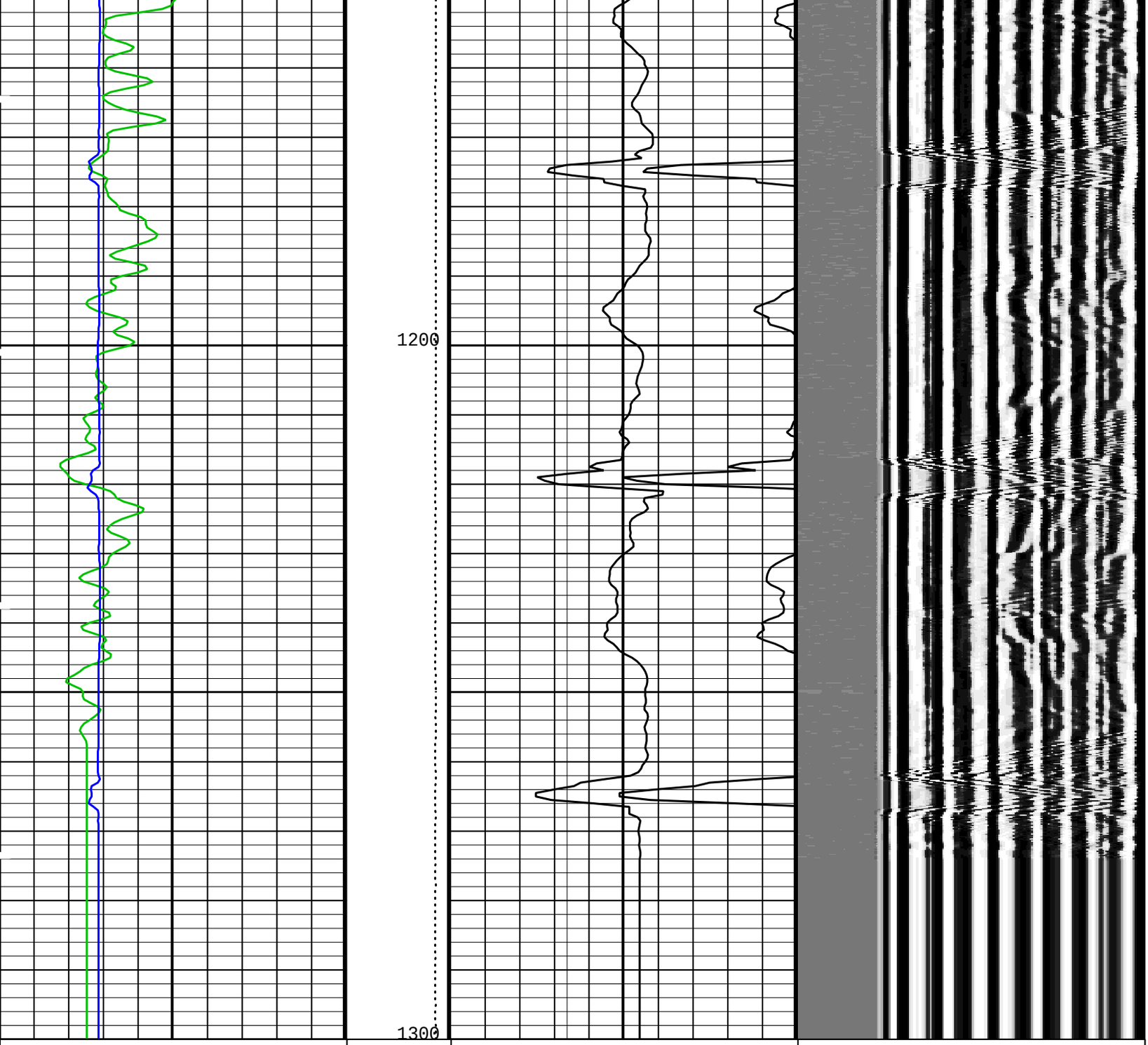
eWAFE Version: 1.186

USIT-E	19C1-222	DSLT-H	19C1-222
EDTC-B	19C1-222		

PIP SUMMARY

Time Mark Every 60 S





Gamma Ray (GR_EDTC)	Tension (TENS)	CBL Amplitude (CBL)	Min Amplitude Max
0 (GAPI) 150	(LBF) 10000 0	0 (MV) 50	VDL VariableDensity (VDL) 200 (US) 1200
Transit Time (TT) 400 (US) 200		CBL Amplitude (CBL) 0 (MV) 100	
		Good Bond (GOBO) 0 (MV) 10	
		GoodBond From ACBL to GOBO	

PIP SUMMARY

Time Mark Every 60 S

Format: CBL_VDL Vertical Scale: 5" per 100' Graphics File Created: 09-Sep-2013 01:03

OP System Version: 19C1-222

eWAFE Version: 1.186

USIT-E	19C1-222	DSLT-H	19C1-222
EDTC-B	19C1-222		

Information for DSLT Sonde Status and Casing Features

Sonde Type	SLS-W/E
Sonde Serial Number	1369
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Casing Weight (CWEI)	40.0 LB/F
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Minimum Sonic Amplitude (MSA : 100% Cement)	1.66785 MV
Minimum Sonic Amplitude (MSA : 80% Cement)	3.31839 MV
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CBL Correction Factor (Master Calibration)	3.94479
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CBL Adjustment Factor (CBAF : Before Calibration)	1.0

Parameters

DLIS Name	Description	Value	
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	Corrosion range minimum	-0.076	IN
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	DSLT Firing Mode	CBL_W	
	Telemetry Mode	DSLC_FTB	
AMSG	Auxiliary Minimum Sliding Gate	120	US
CBAF	CBL Adjustment Factor	1	
CBLG	CBL Gate Width	78	US
DDEL	Digitizing Delay	0	US
DRCS	DSLT DLIS Recording Size	120	
DSIN	Digitizing Sample Interval	10	
DTFS	DSLC Telemetry Frame Size	236	
DWCO	Digitizing Word Count	120	
GAI	Manual Gain	40	
GOBO	Good Bond	3.31839	MV
MAHTR	Manual High Threshold Reference	40	
MGAI	Maximum Gain	1000	
MNHTR	Minimum High Threshold Reference	30	
NMSG	Near Minimum Sliding Gate	291	US
NMXG	Near Maximum Sliding Gate	750	US
RATE	Firing Rate	R7	
SFAF	Sonic Formation Attenuation Factor	0	DB/F
SGCL	Sliding Gate Closing Delta-T	250	US/F
SGDT	Sliding Gate Delta-T	57	US/F
SGW	Sliding Gate Width	80	US
SLEV	Signal Level for AGC	5000	
VDLG	VDL Manual Gain	5	
WAGC	Waveform AGC Allow/Disallow	OFF	
WMOD	Waveform Firing Mode	FULL	
	System and Miscellaneous		
DO	Depth Offset for Playback	0.0	FT
PP	Playback Processing	NORMAL	

Input DLIS Files

DEFAULT	USI_SONIC_017LUP	FN:16	PRODUCER	09-Sep-2013 00:36	1300.0 FT	1099.1 FT

Output DLIS Files

DEFAULT	USI_SONIC_020PUP	FN:19	PRODUCER	09-Sep-2013 01:02

Company: SWEPI, LP

Schlumberger

Well: LHW-8118

Field: COLORADO OIL SHALE

County: RIO BLANCO

State: COLORADO

CEMENT BOND LOG
GAMMA RAY