Schlumberger

Company: **ENCANA OIL & GAS (USA) INC.**

Well: **SG 8508E−21 N22 496**

Field: **STORY GULCH**

County: **GARFIELD** State: **COLORADO**

County: GARFIELD
Field: NORTH PARACHUTE
Location: SHL: 1264' FSL & 1977' FWL
Well: SG 8508E−21 N22 496
Company: ENCANA OIL & GAS (USA) INC.

CEMENT BOND LOG
CBL − VDL
GAMMA RAY − CCL

LOCATION

SHL: 1264' FSL & 1977' FWL
BHL: 2564' FNL & 1310 FEL

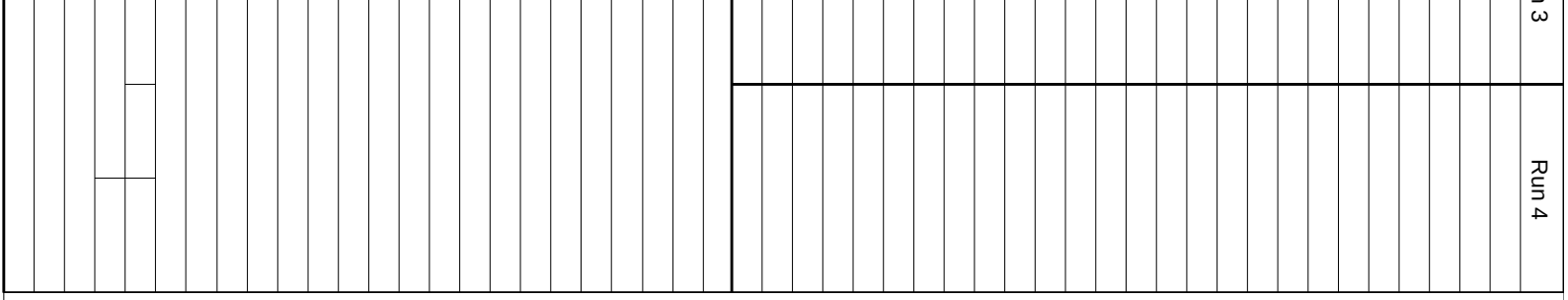
Elev.:		
	K.B.	7607.00 ft
	G.L.	7585.00 ft
	D.F.	7606.00 ft

Permanent Datum:	GROUND LEVEL	Elev.:	7585.00 ft
Log Measured From:	KELLY BUSHING	22.00 ft	above Perm. Datum
Drilling Measured From:	KELLY BUSHING		

API Serial No.	Section	Township	Range
05−045−20644−0000	21	4S	96W

Logging Date	29−Apr−2012		
Run Number	ONE		
Depth Driller	11915 ft		
Schlumberger Depth	11861 ft		
Bottom Log Interval	11853 ft		
Top Log Interval	200 ft		
Casing Fluid Type	WATER		
Salinity			
Density	8.4 lbm/gal		
Fluid Level	22 ft		
BIT/CASING/TUBING STRING			
Bit Size	8.750 in		
From	22 ft		
To	11915 ft		
Casing/Tubing Size	4.500 in		
Weight	11.6 lbm/ft		
Grade	P−110		
From	22 ft		
To	11861 ft		
Maximum Recorded Temperatures	284 degF		
Logger On Bottom / Time	29−Apr−2012	13:37	
Unit Number / Location	383	GRAND JUNCTION	
Recorded By	DAVID PATE		
Witnessed By	UNATTENDED		

	Run 1	Run 2	Run
PVT DATA: Oil Density			
PVT DATA: Water Salinity			
PVT DATA: Gas Gravity			
PVT DATA: Bo			
PVT DATA: Bw			
PVT DATA: 1/Bg			
PVT DATA: Bubble Point Pressure			
PVT DATA: Bubble Point Temperature			
Solution GOR			
Maximum Deviation			
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: 29−APR−2012 16:45:30

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW−B	Type:	CMTD−C	Type:	1−25ZT
Serial Number:	5873	Serial Number:	5006	Serial Number:	391
Calibration Date:	20−DEC−2011	Calibration Date:	31−MAR−201	Length:	16700 FT
Calibrator Serial Number:	33	Calibrator Serial Number:	174878		
Calibration Cable Type:	1−25ZT	Number of Calibration Points:	10	Conveyance Method:	Wireline
Wheel Correction 1:	−3	Calibration RMS:	5	Rig Type:	LAND
Wheel Correction 2:	−3	Calibration Peak Error:	9		

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	267.00 FT
Rig Up Length At Bottom:	266.00 FT
Rig Up Length Correction:	1.00 FT
Stretch Correction:	8.00 FT
Tool Zero Check At Surface:	1.10 FT

Depth Control Remarks

1. ALL SCHLUMBERGER DEPTH CONTROL PROCEDURES FOLLOWED
2. IDW USED AS PRIMARY DEPTH CONTROL.
3. Z−CHART USED AS SECONDARY DEPTH CONTROL
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	OTHER SERVICES2
OS1: NONE	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
THIS IS THE FIRST RUN IN THE HOLE.	
TOOL RAN AS PER TOOL SKETCH.	
TD TAGGED AT: 11861 FT	
MAXIMUM RECORDED PRESSURE AT TD: 4649 PSIA	
MAXIMUM RECORDED TEMPERATURE AT TD: 284 DEGF	

SHORT JOINTS: 7490 FT & 10410 FT

EXPECTED FREE PIPE AMPLITUDE: 80 mV

CYCLE SKIPING DUE TO GOOD BOND CAUSING TT TO READ HIGH

AFE: 1115579

THANK YOU FOR CHOOSING SCHLUMBERGER.

CREW: WALEED A. & CHRIS A.

RUN 1		RUN 2	
SERVICE ORDER #:	BIHS−00236	SERVICE ORDER #:	
PROGRAM VERSION:	18C0−147	PROGRAM VERSION:	
FLUID LEVEL:	22 ft	FLUID LEVEL:	

LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

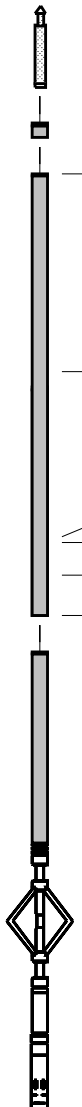
EQUIPMENT DESCRIPTION

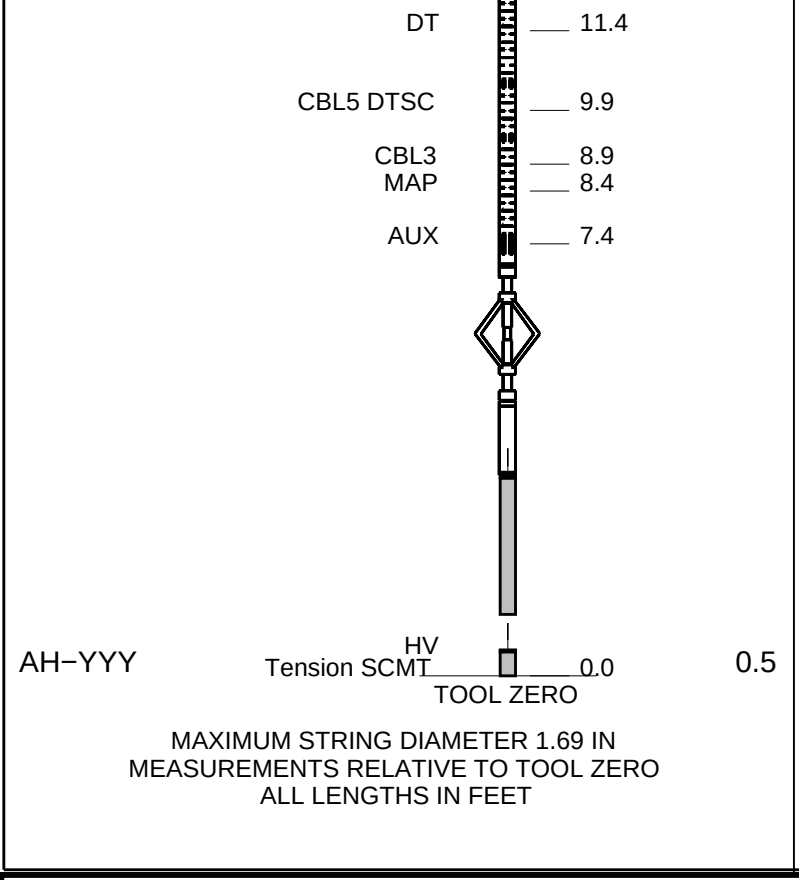
RUN 1 RUN 2

SURFACE EQUIPMENT

WITM−A 3412
PSC_16MHZ 3412

DOWNHOLE EQUIPMENT





MAXIMUM STRING DIAMETER 1.69 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Schlumberger

MAIN PASS 0 PSI

MAXIS Field Log

Company: ENCANA OIL & GAS (USA) INC. **Well: SG 8508E−21 N22 496**

Output DLIS Files

DEFAULT **SCMT_PSP_005LUP** **FN:4** **PRODUCER** **29−Apr−2012 13:42**

OP System Version: 18C0−147

SCMT−CB **HFE−4028−IFLEX** **PSPT** **HFE−4028−IFLEX**

PIP SUMMARY

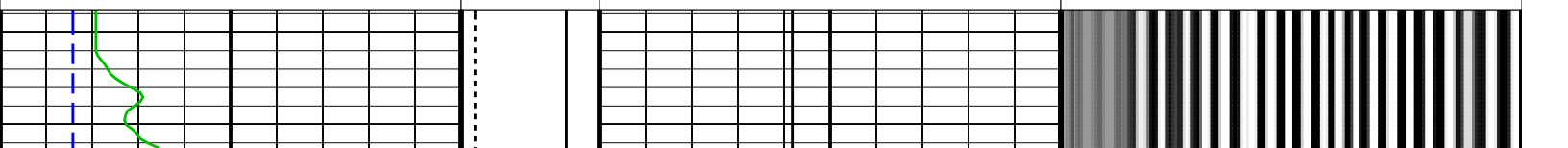
Time Mark Every 60 S

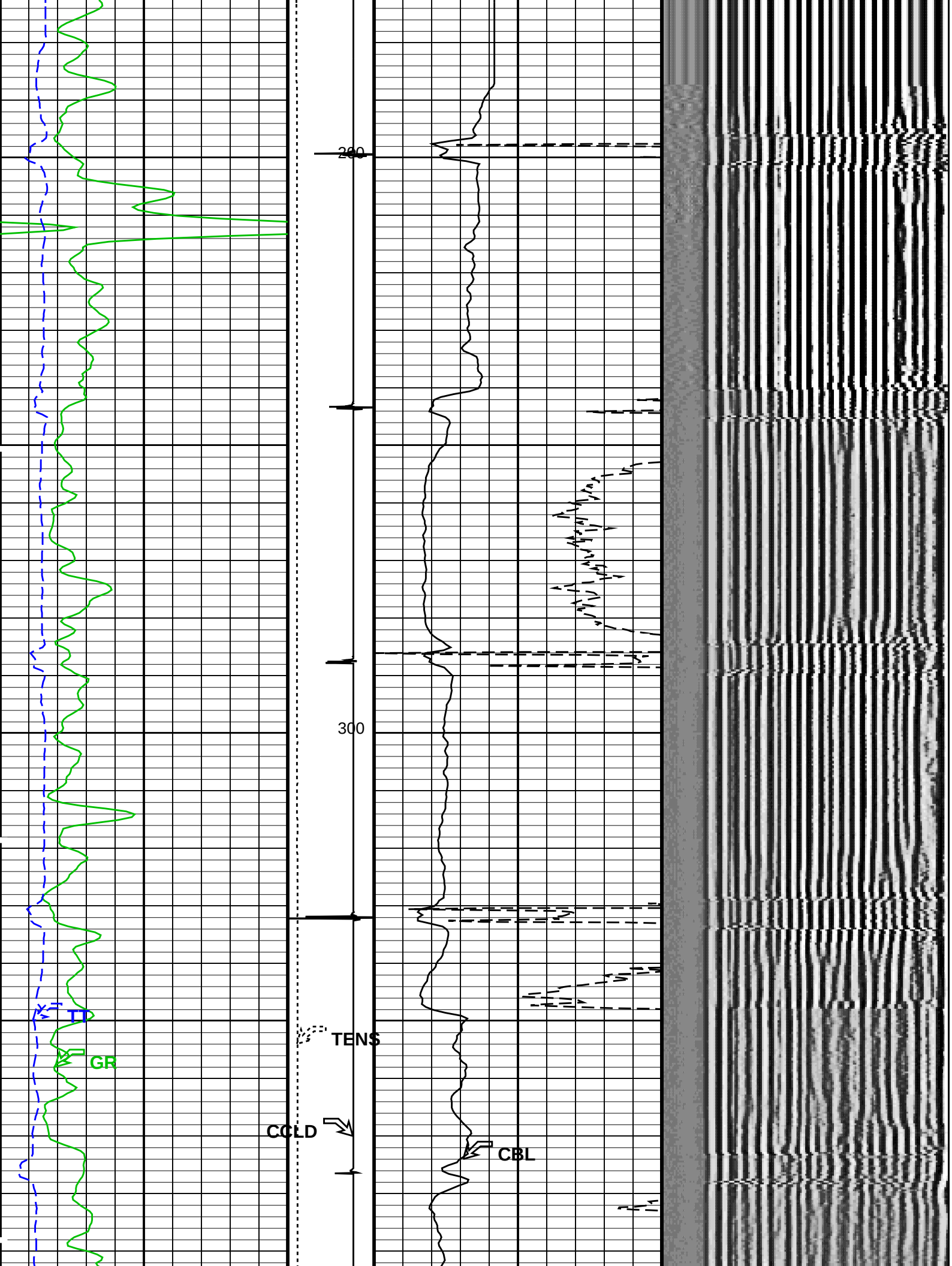
Transit Time (TT)	Discriminated CCL (CCLD)	CBL Amplitude (CBL)
260 (US) 160	3 (V) −1	0 (MV) 10
Gamma Ray (GR)	**Tension (TENS)**	**CBL Amplitude (CBL)**
0 (GAPI) 150	0 (LBF) 2000	0 (MV) 100

Min Amplitude Max

VDL VariableDensity (VDL)

200 (US) 1200

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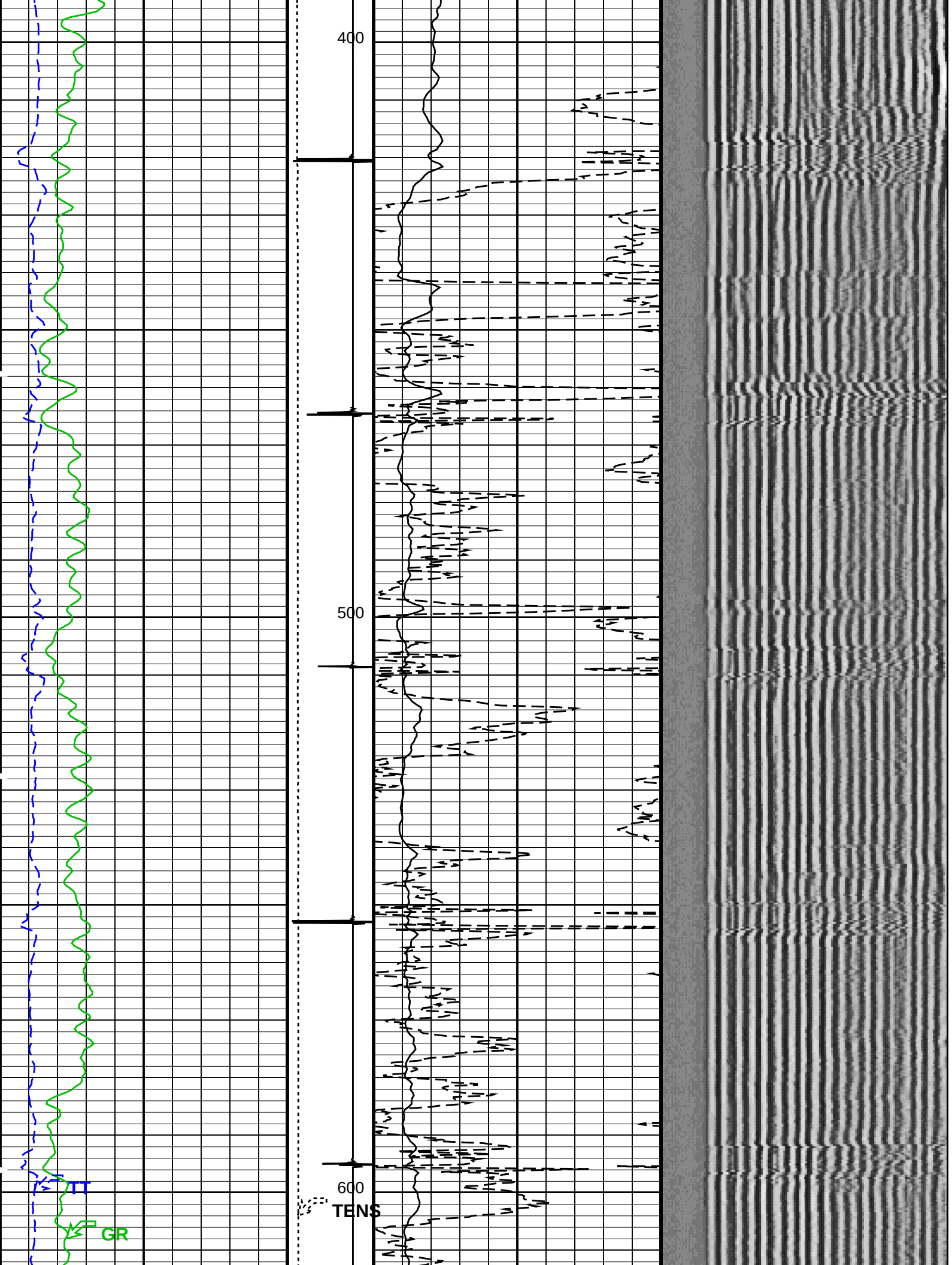
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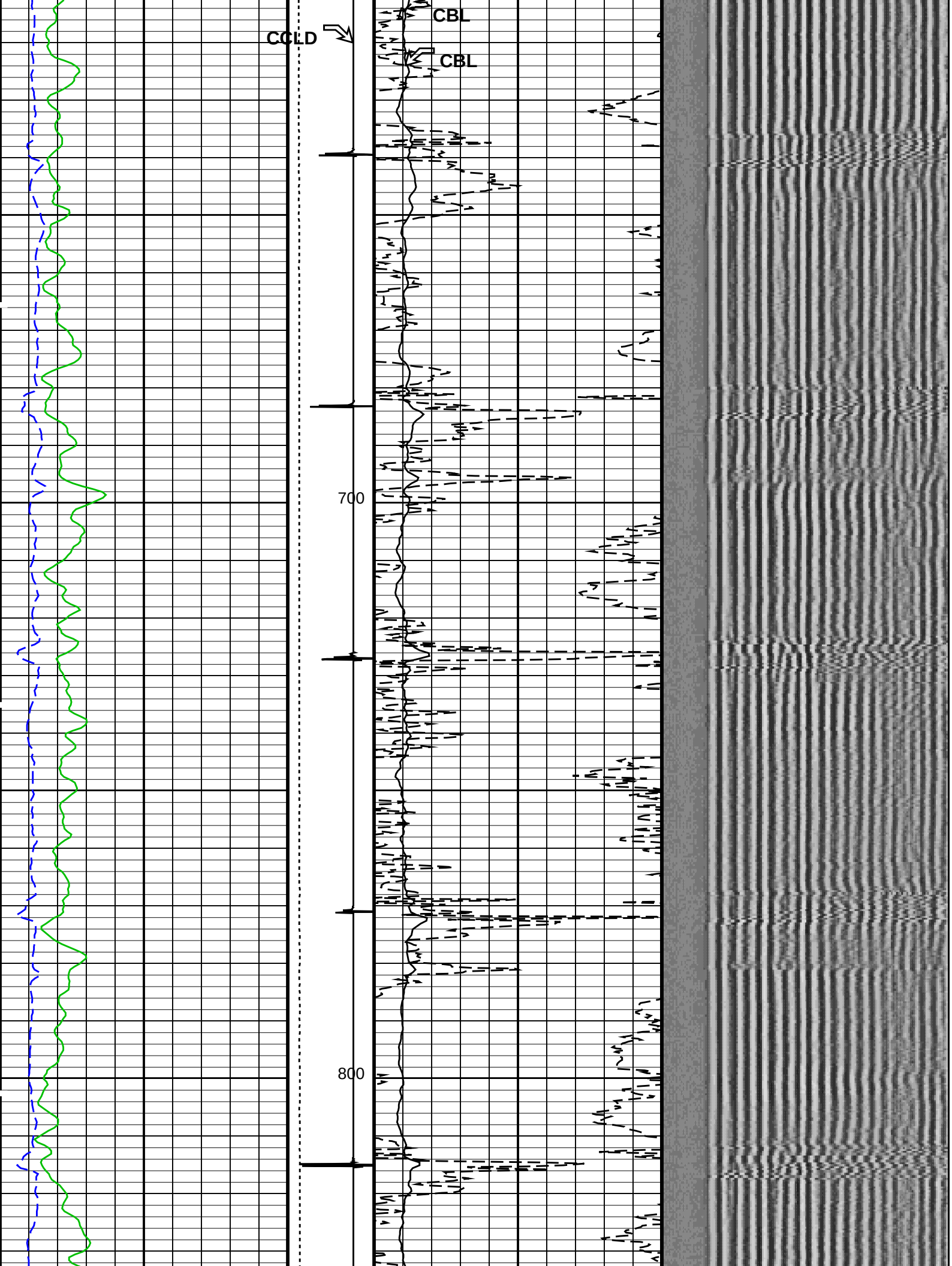
600
TT
GR
TENS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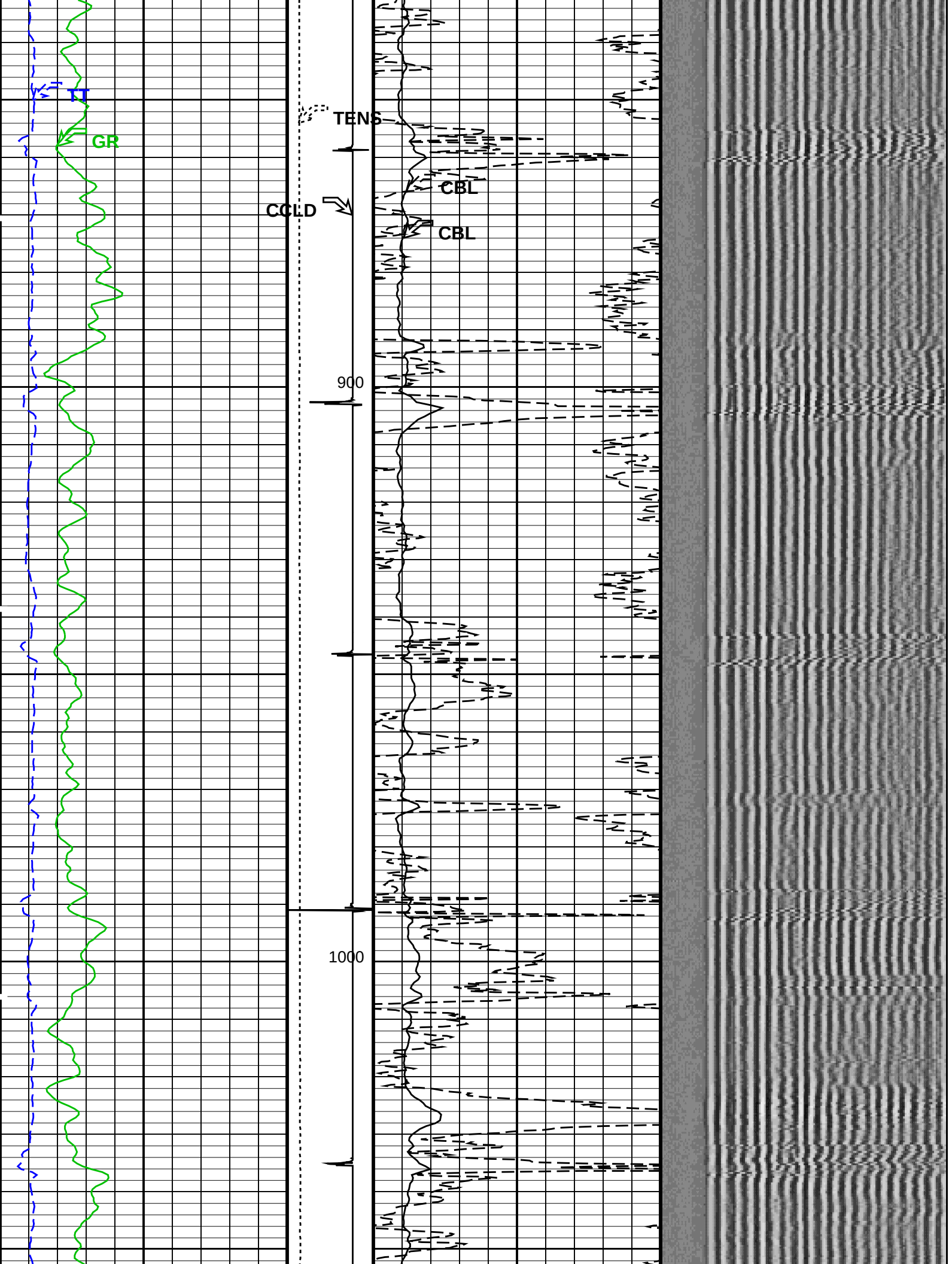
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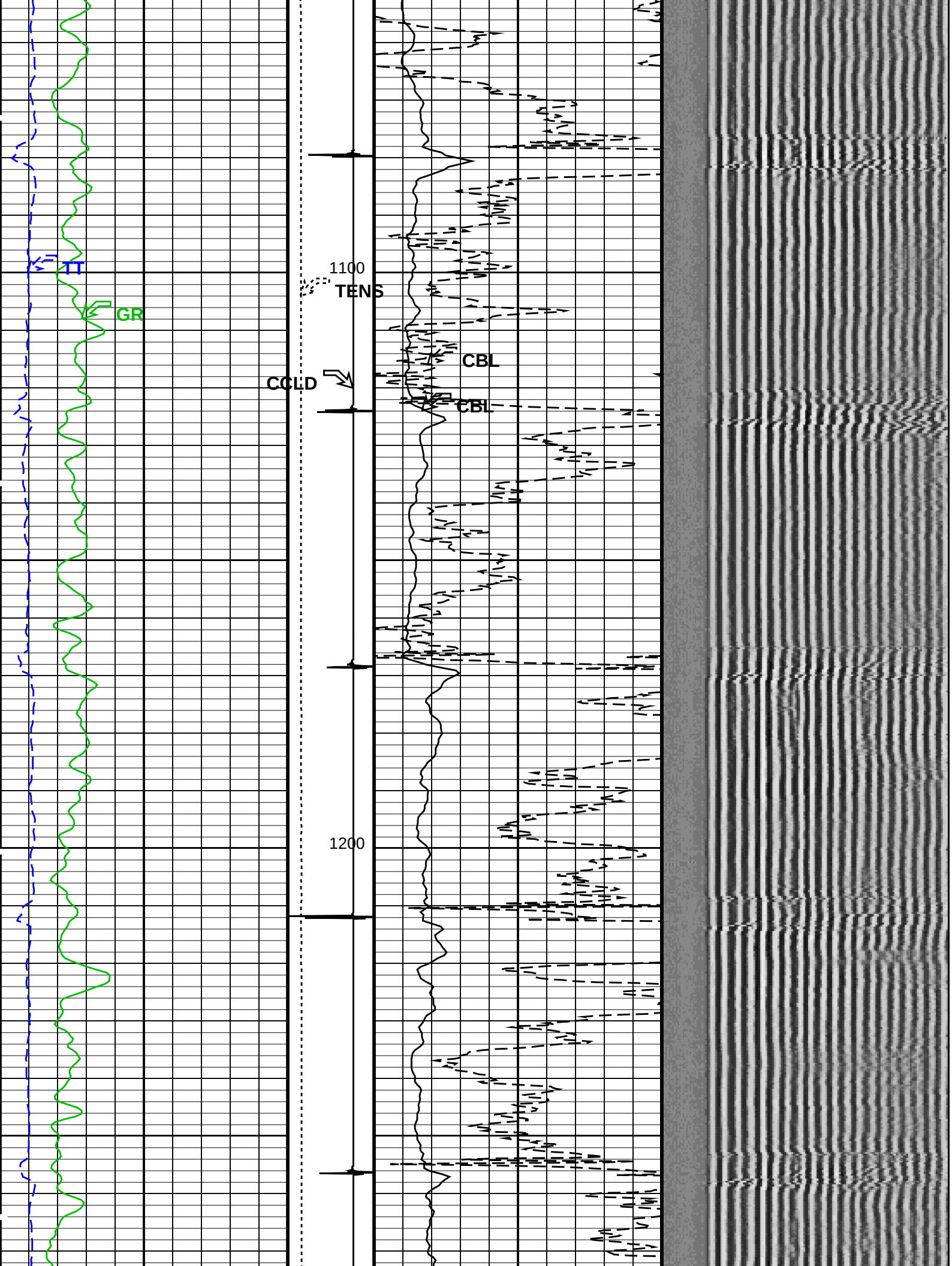
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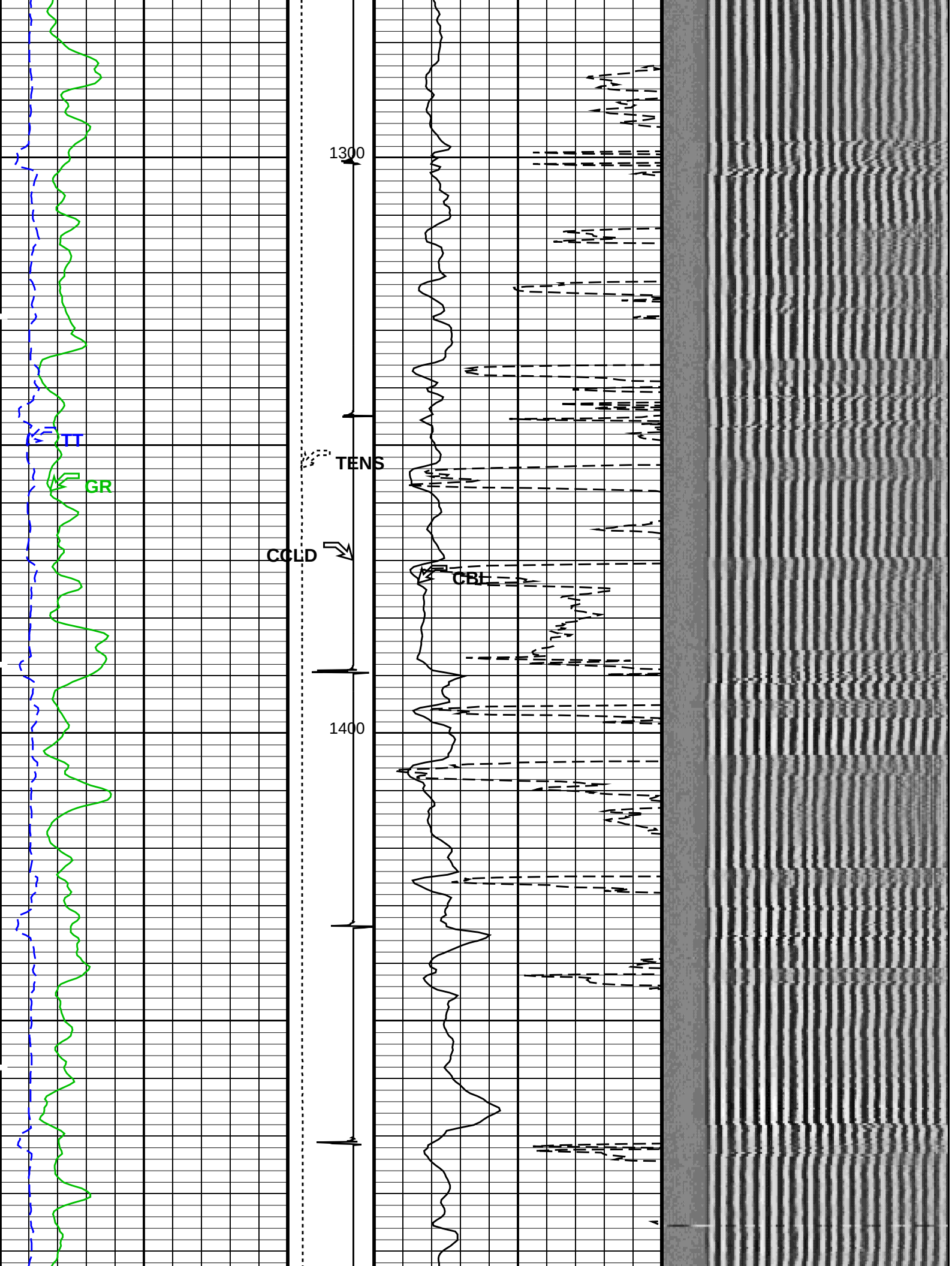
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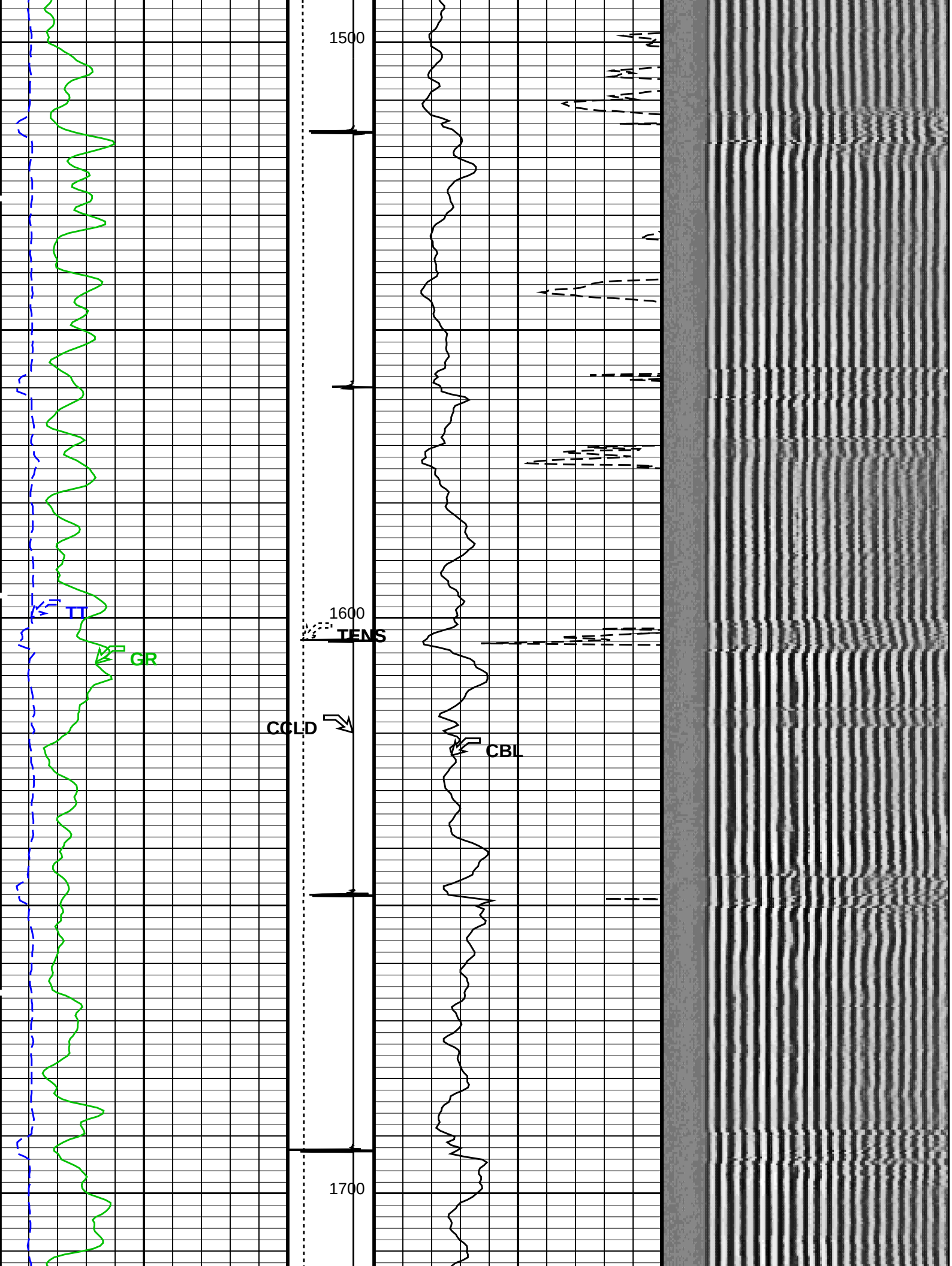
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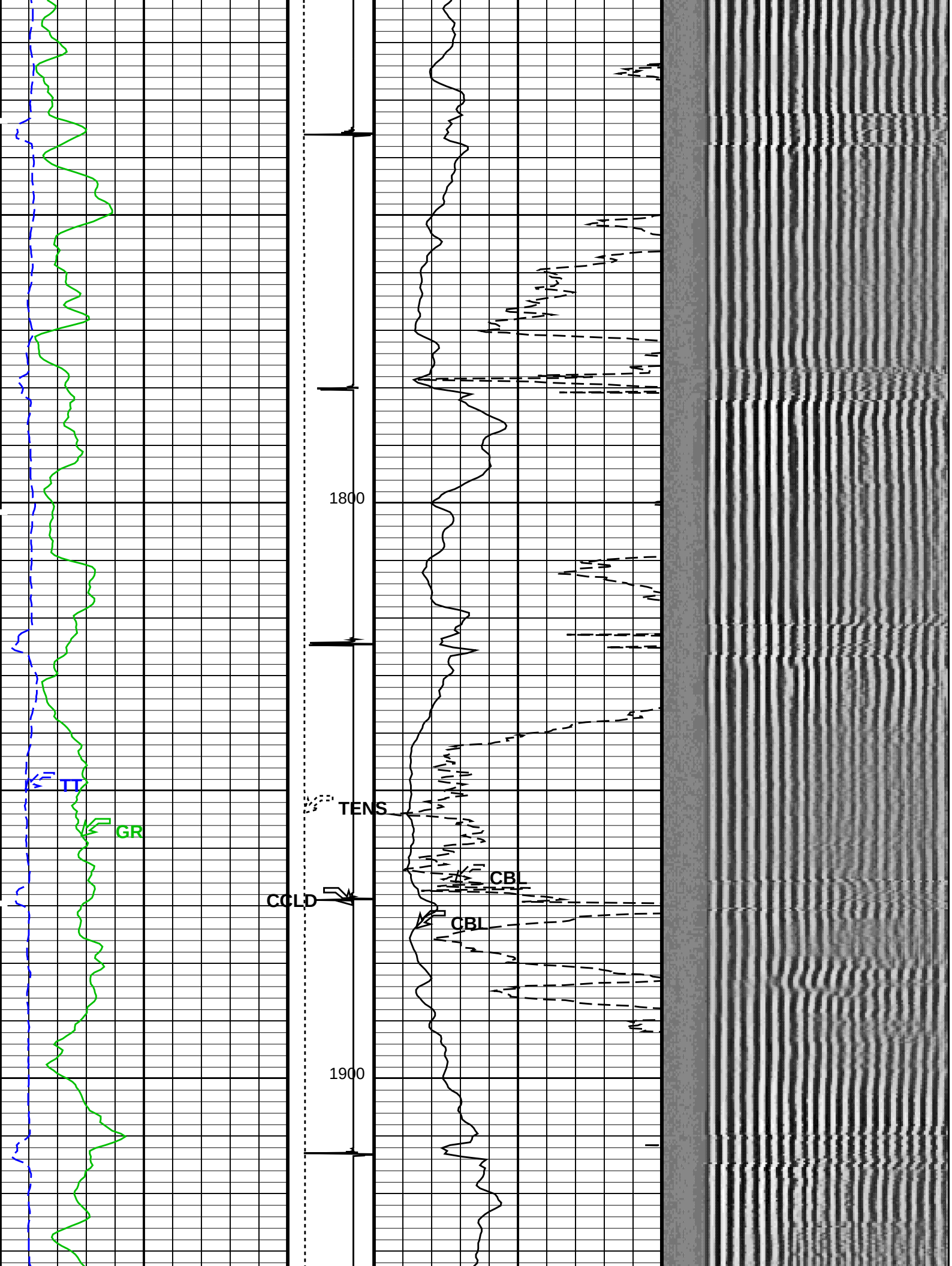
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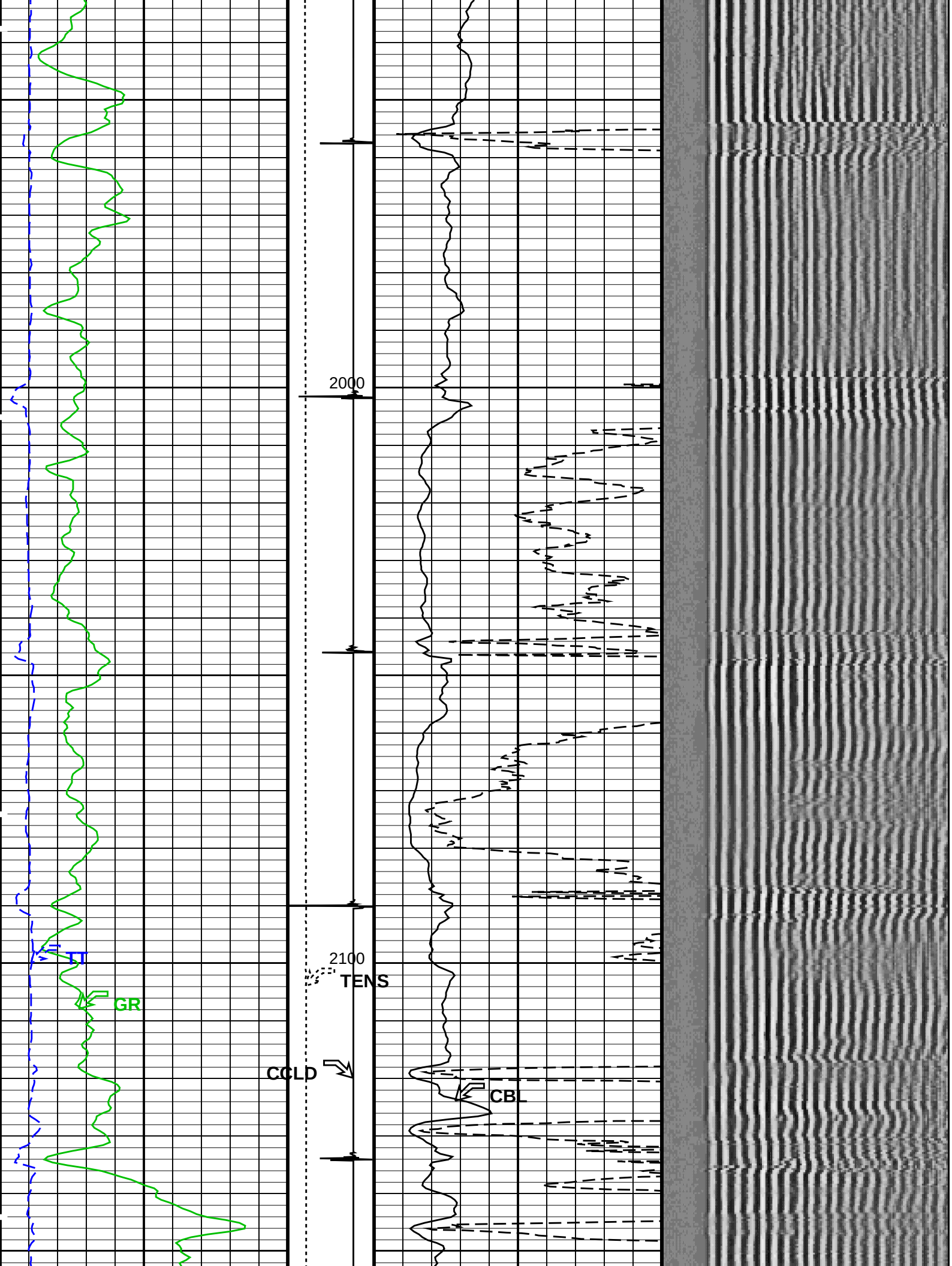
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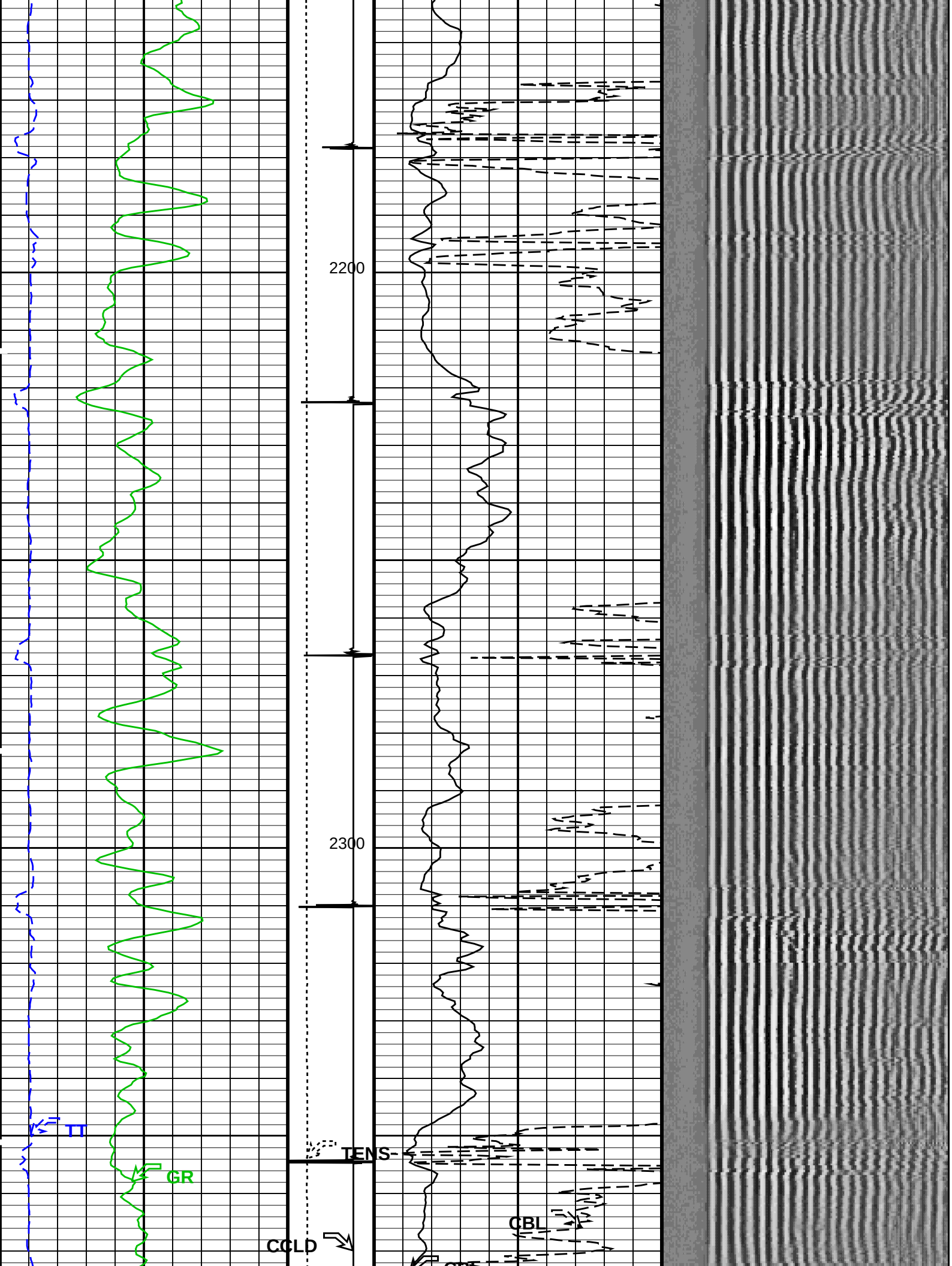
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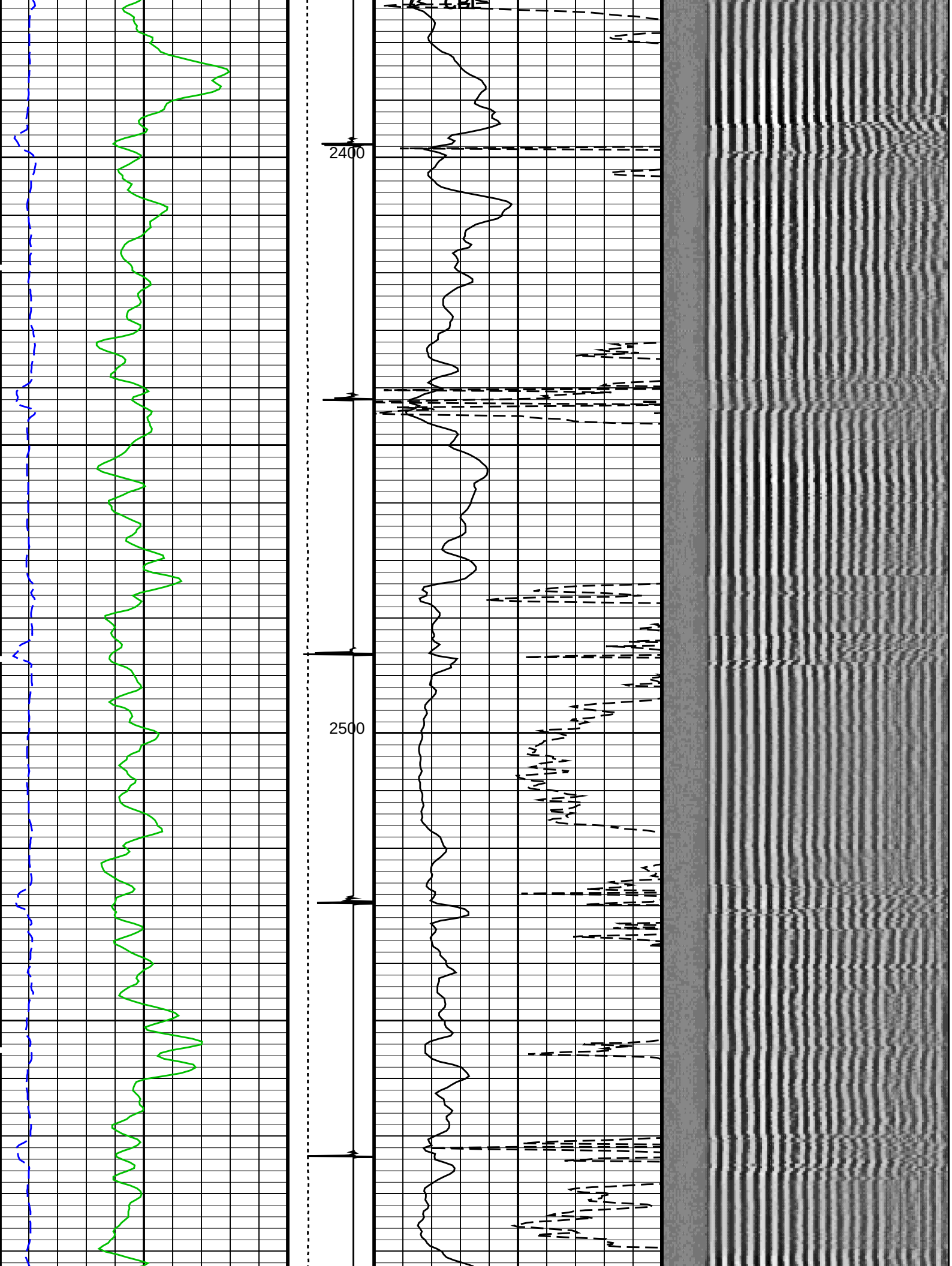
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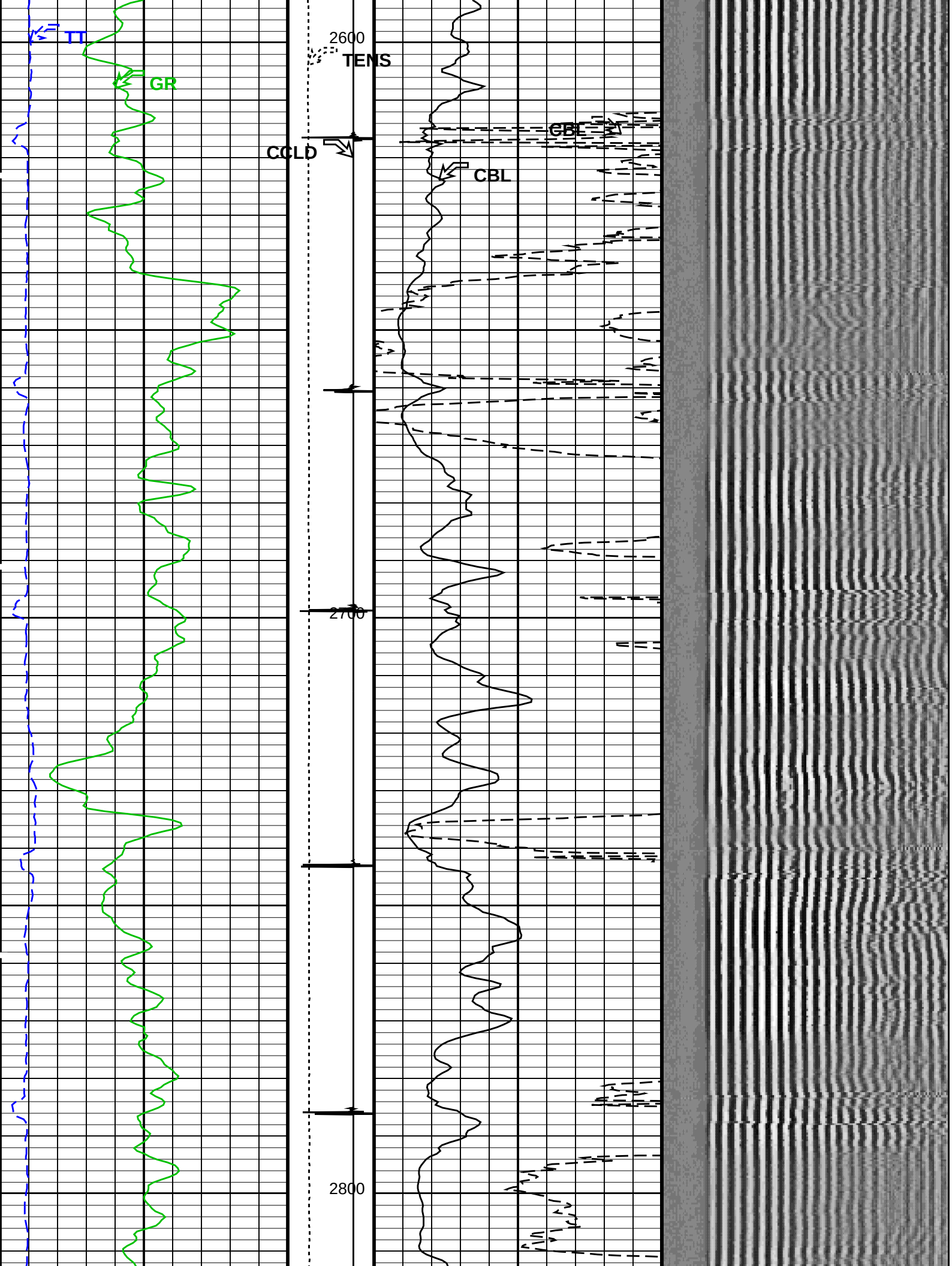
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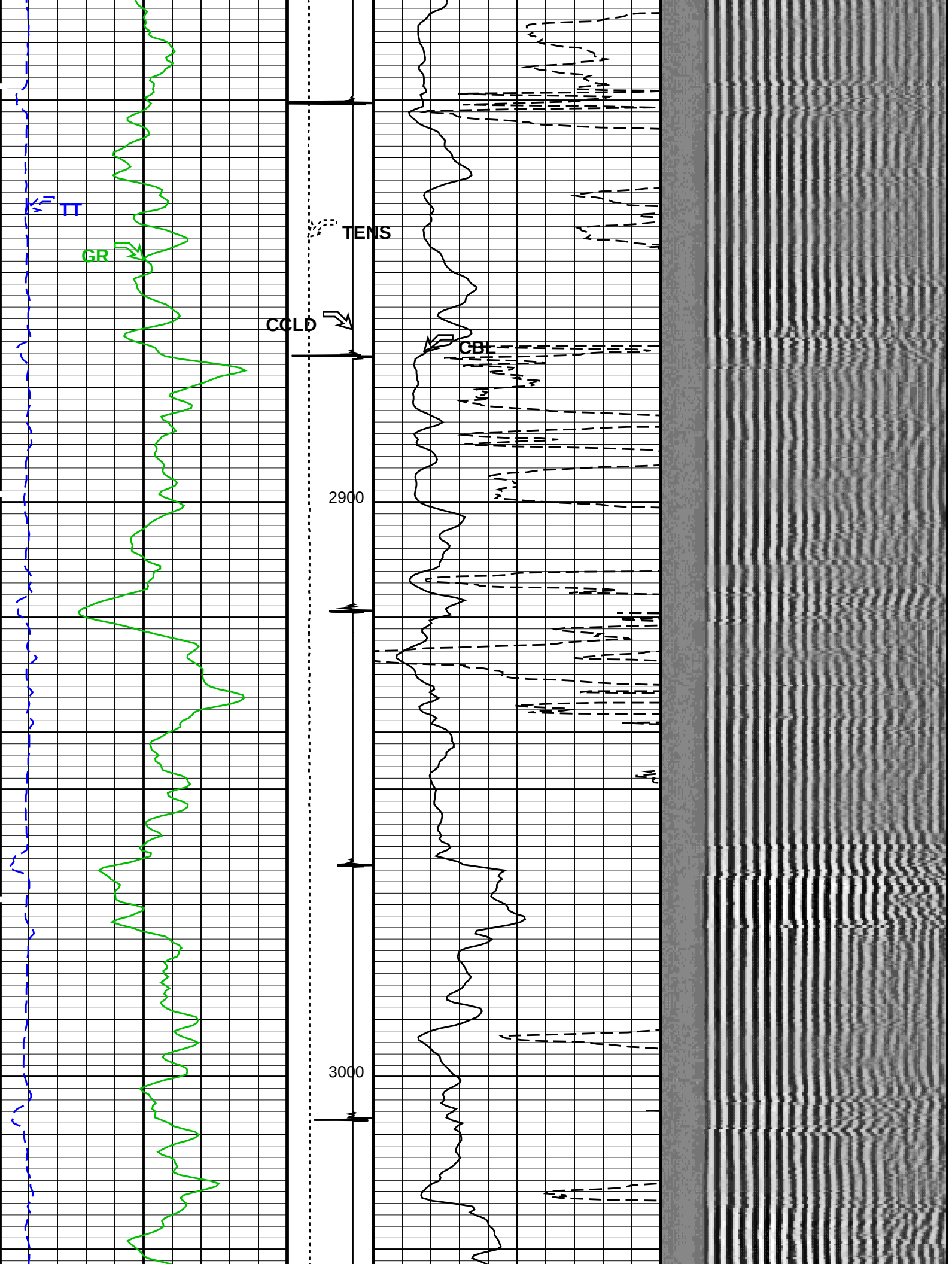
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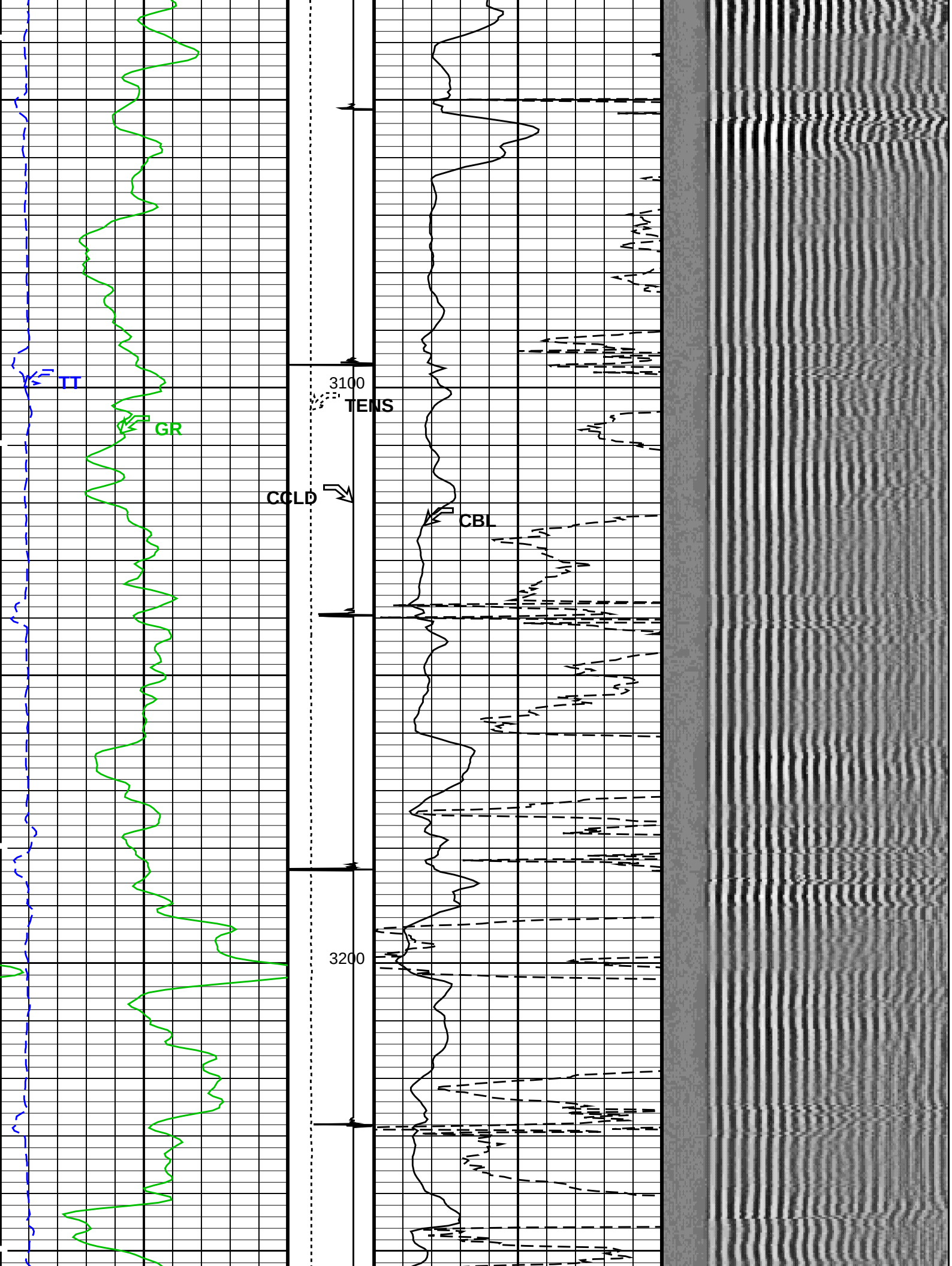
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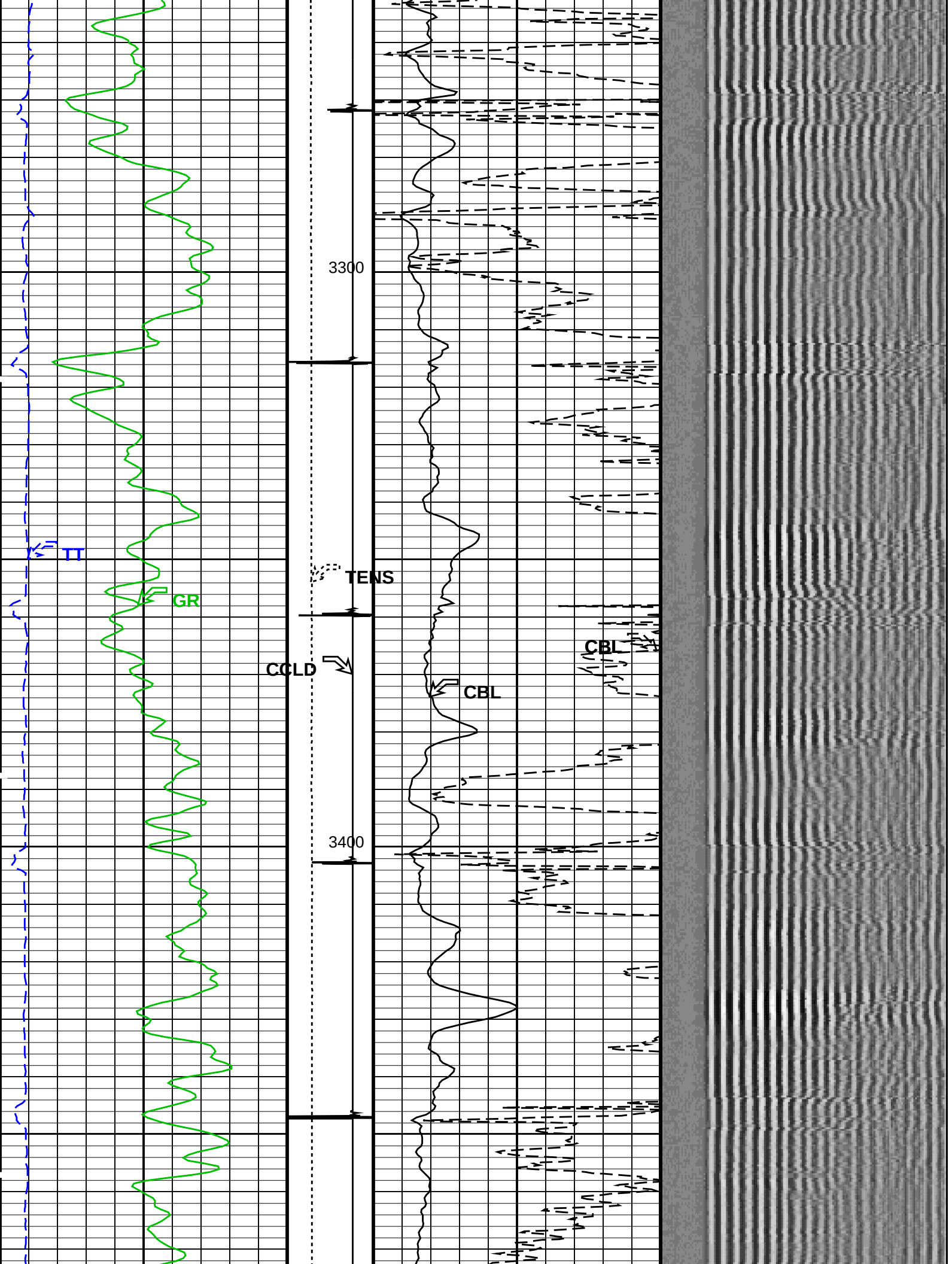
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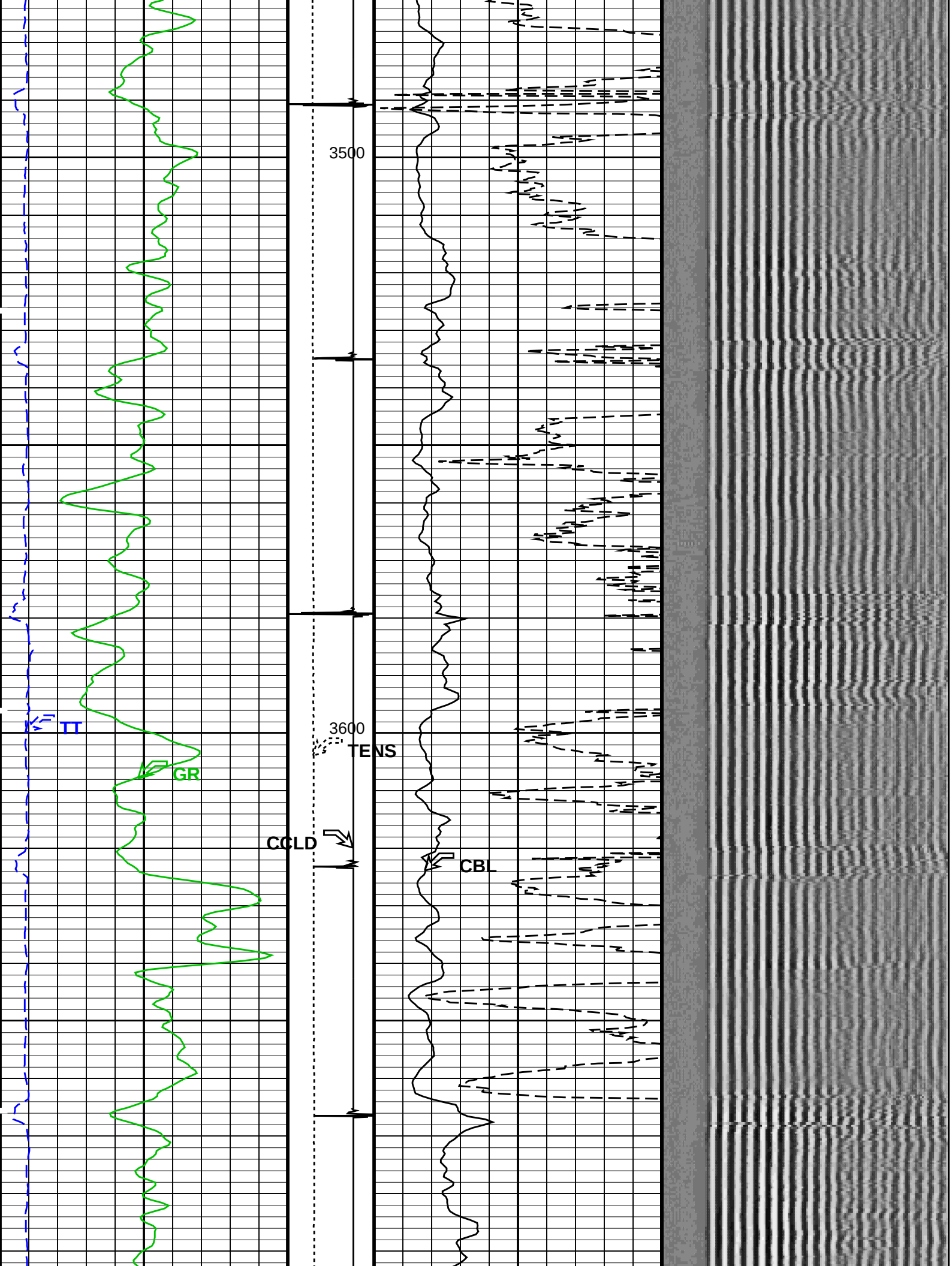
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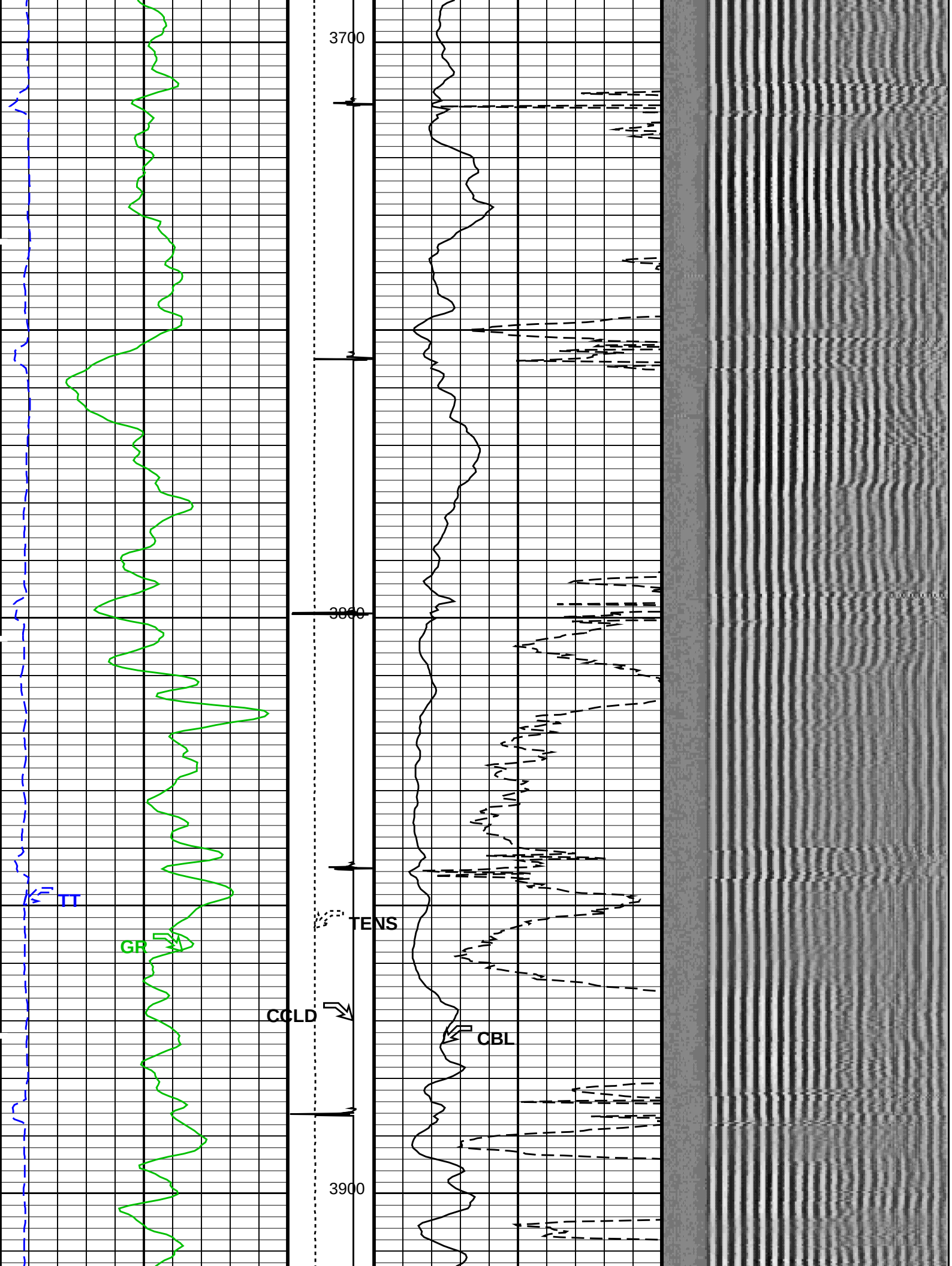
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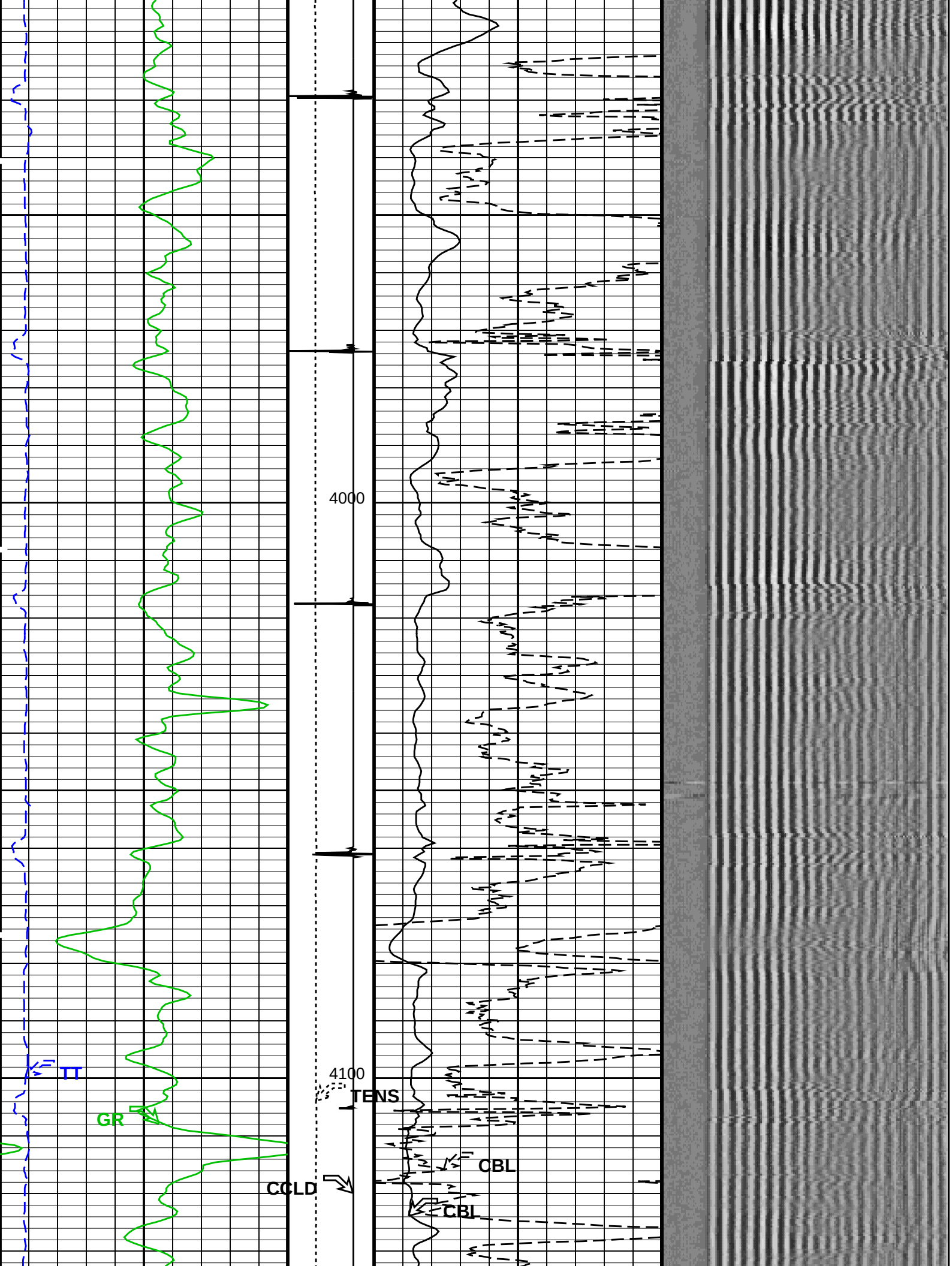
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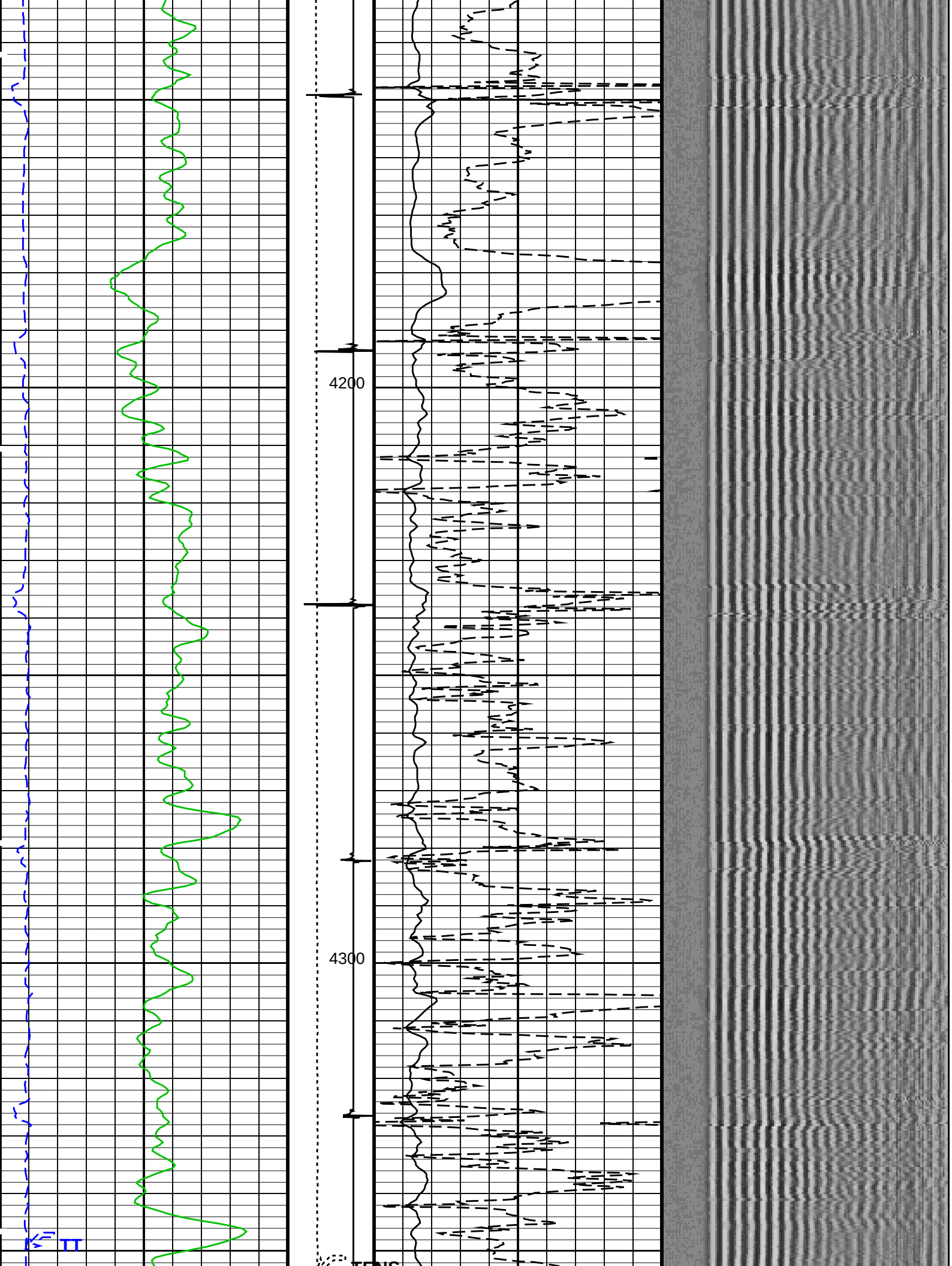
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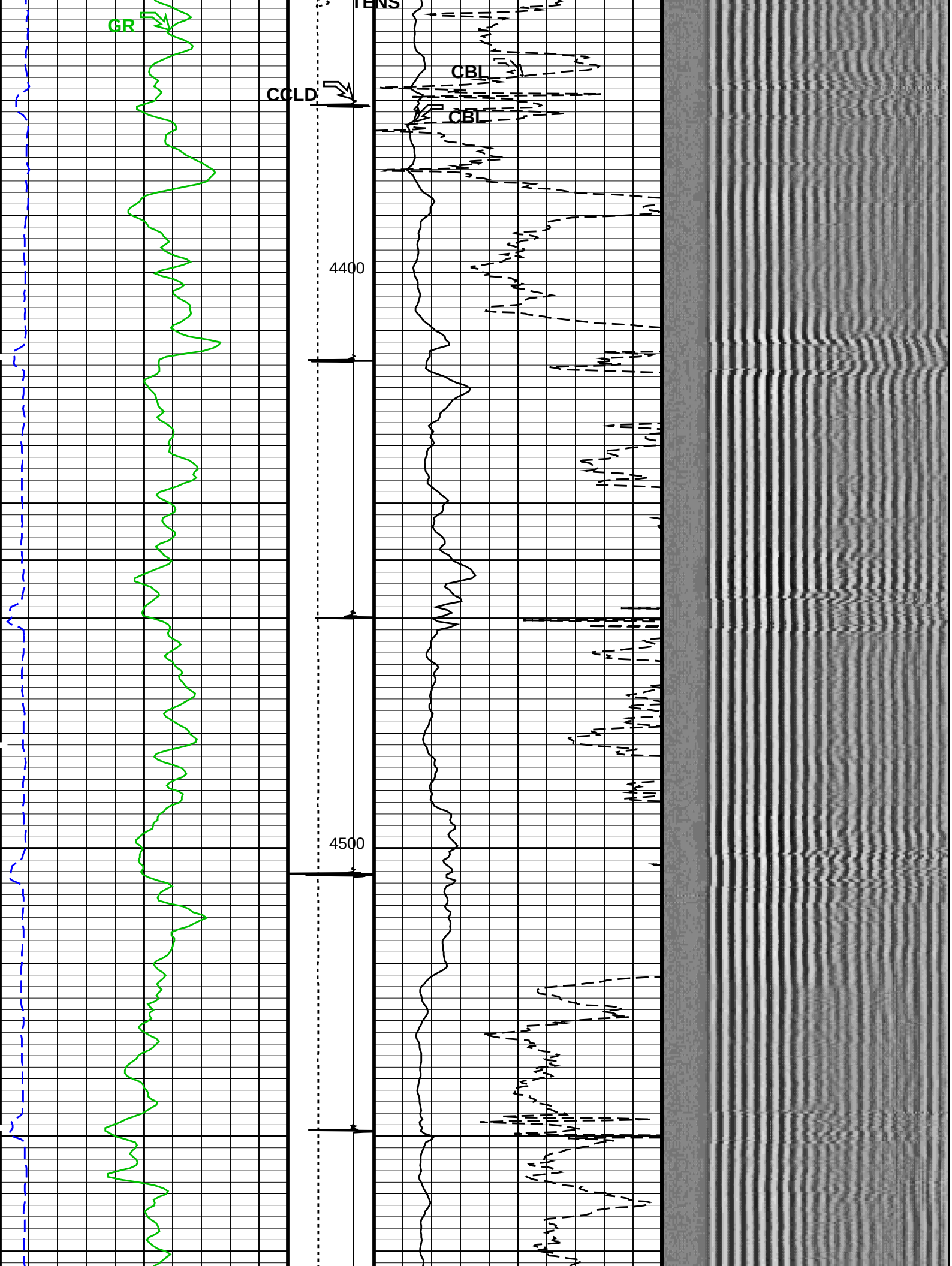
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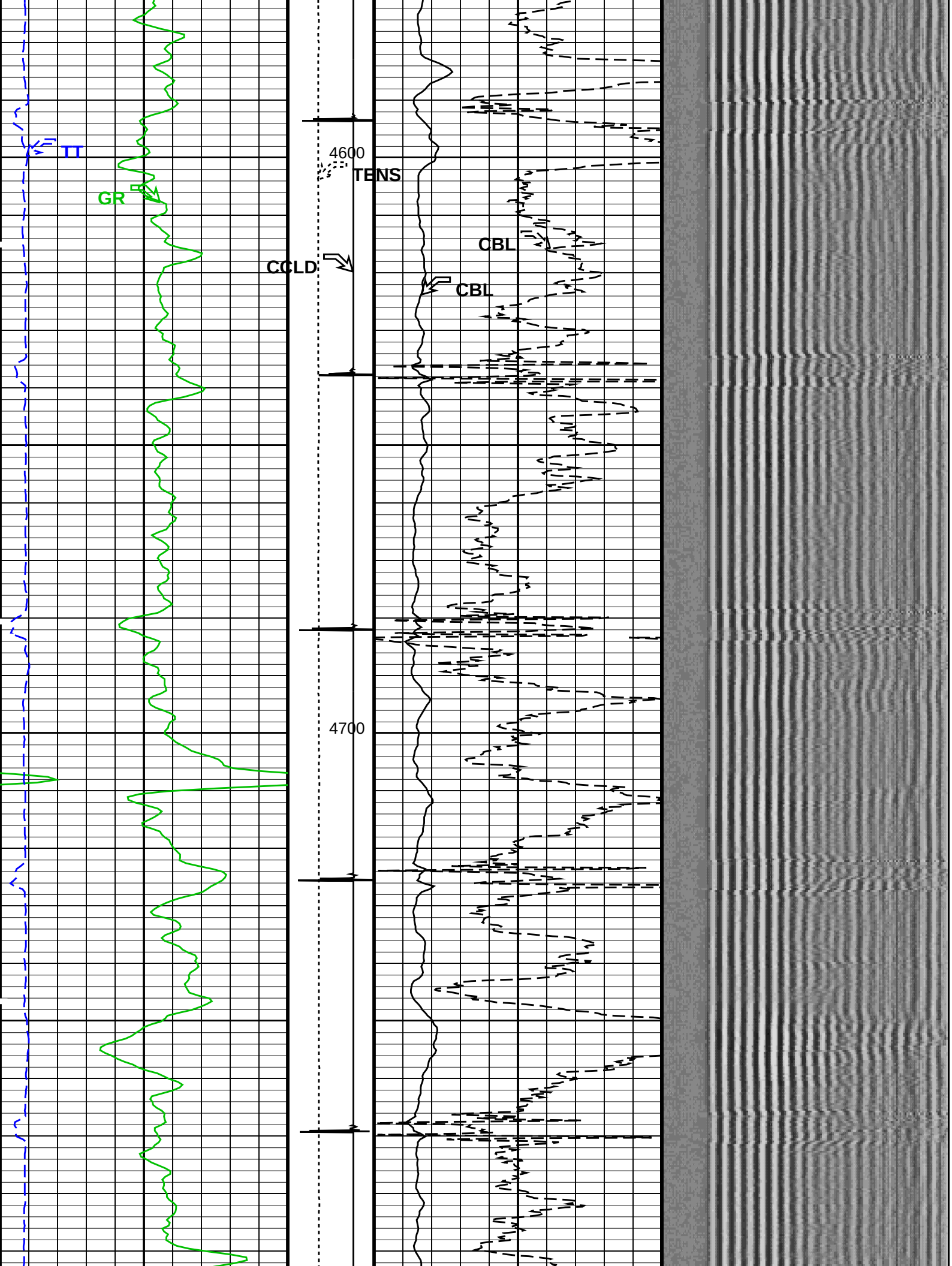
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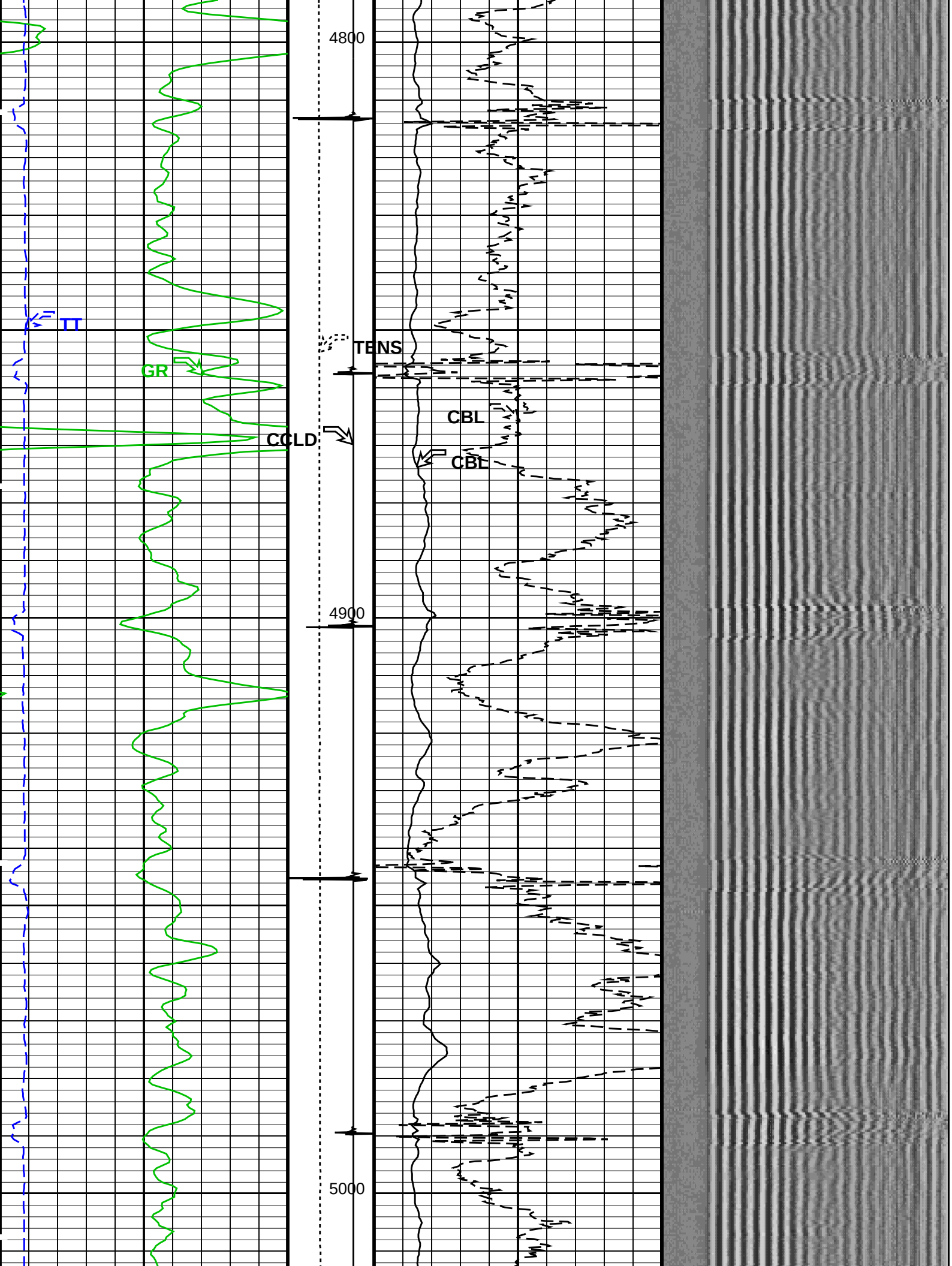
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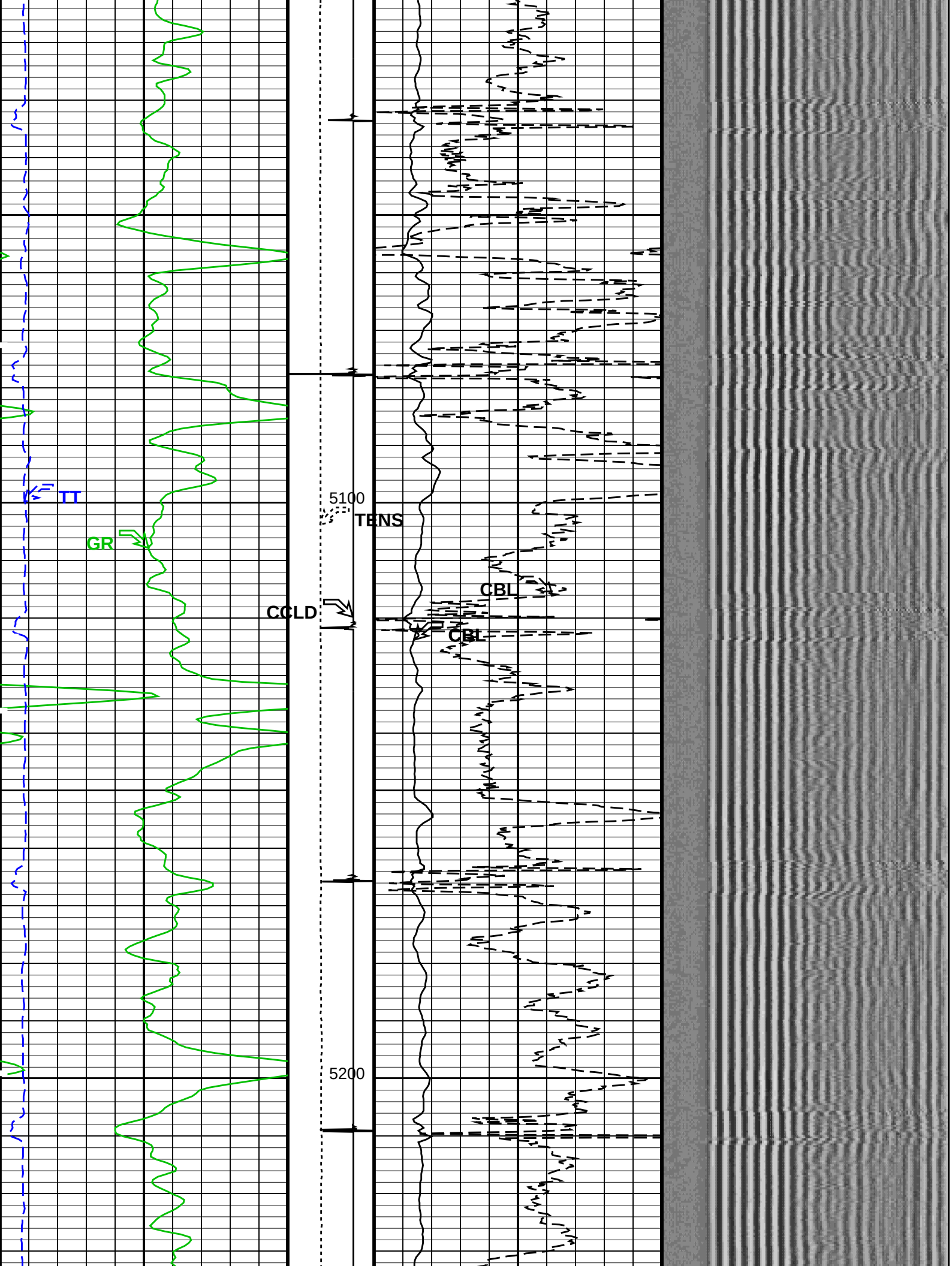
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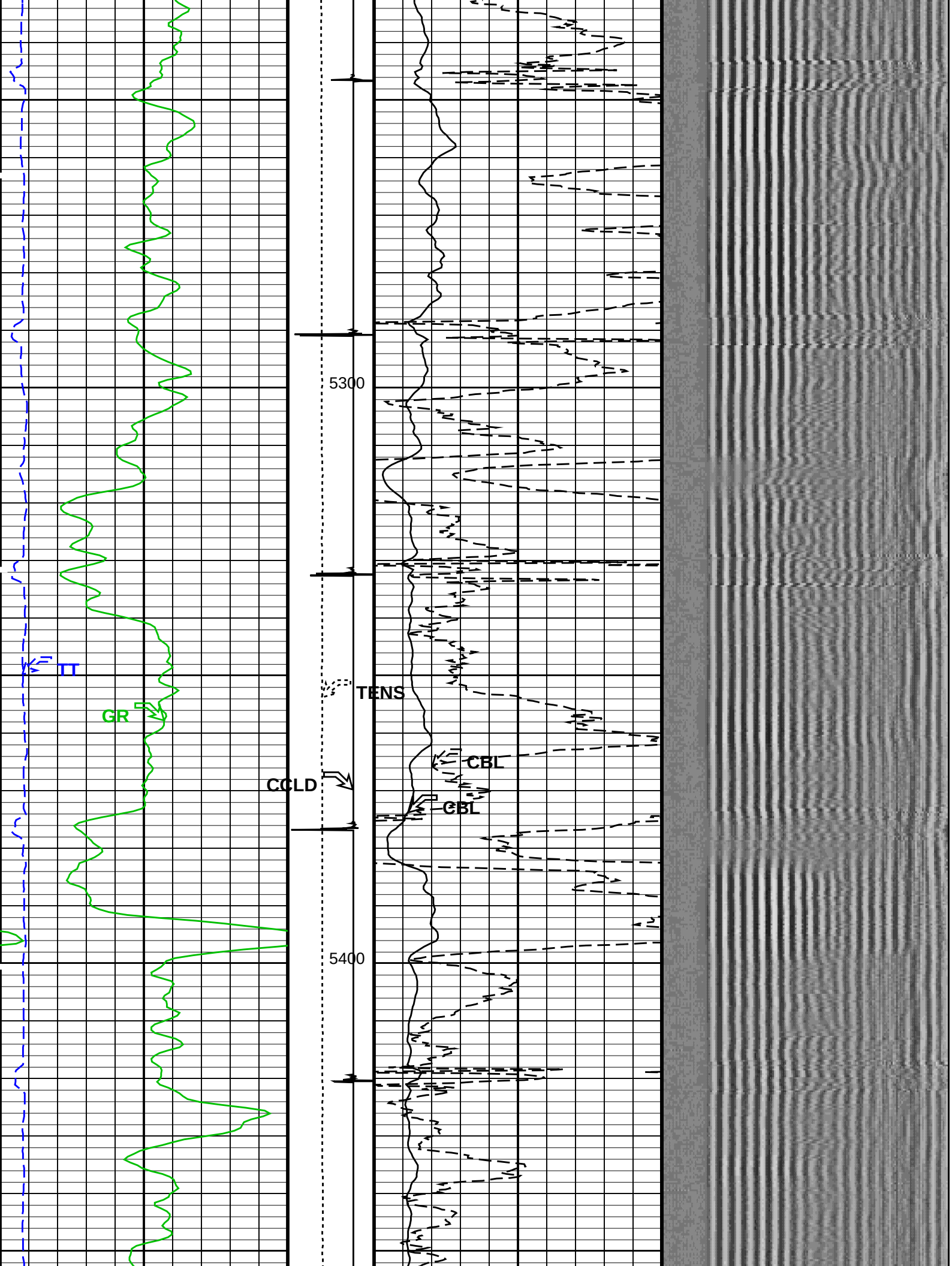
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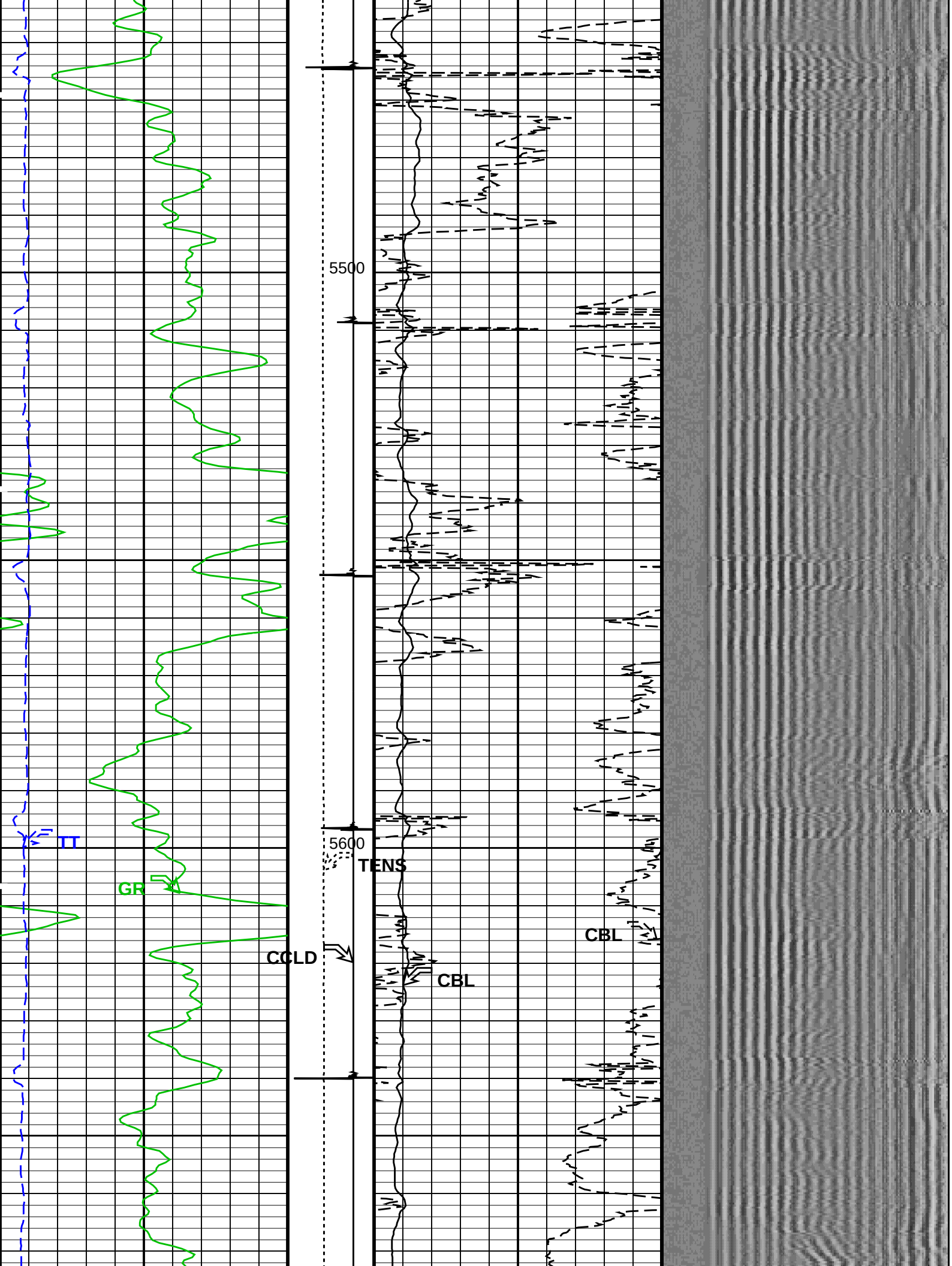
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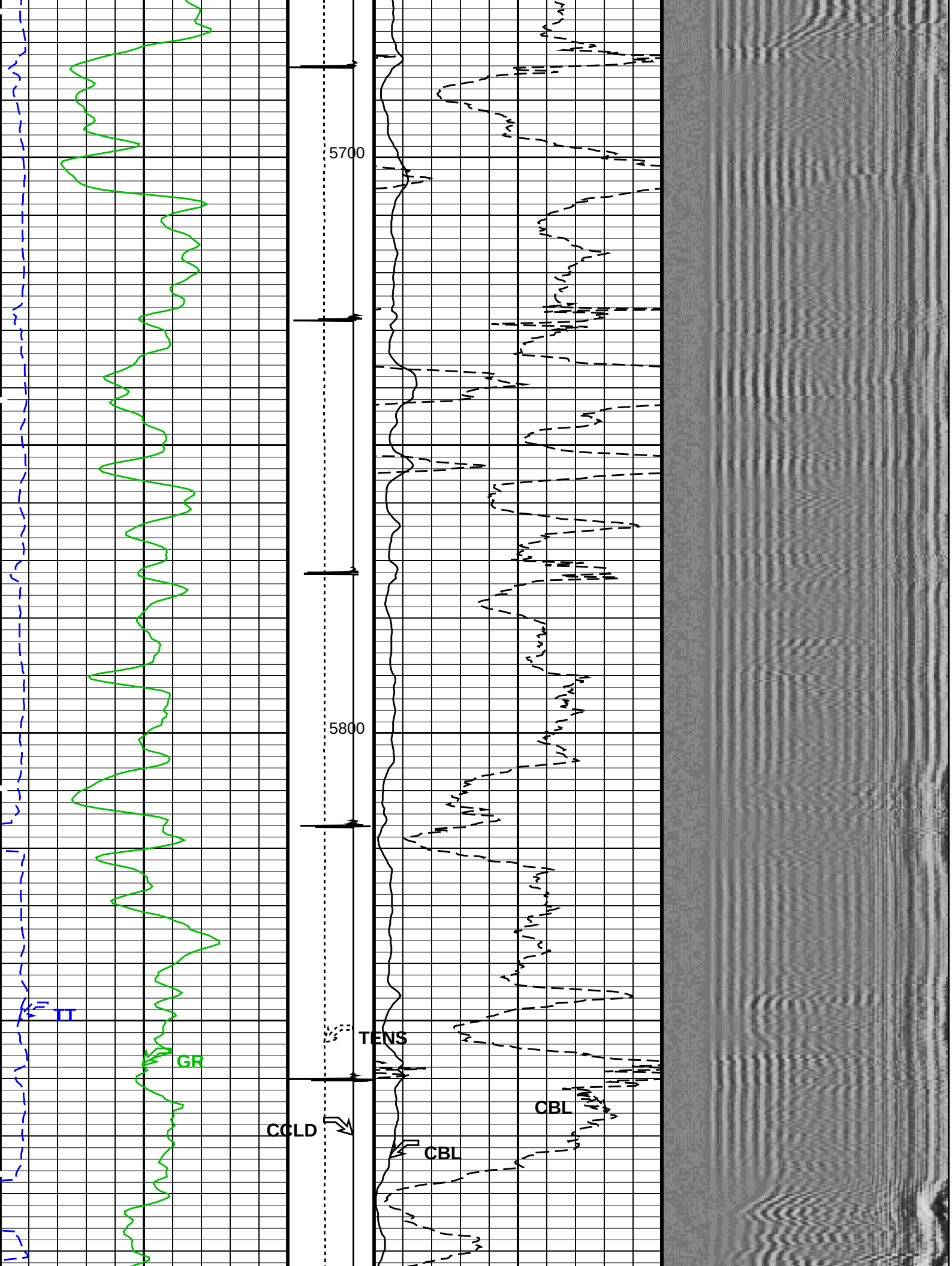
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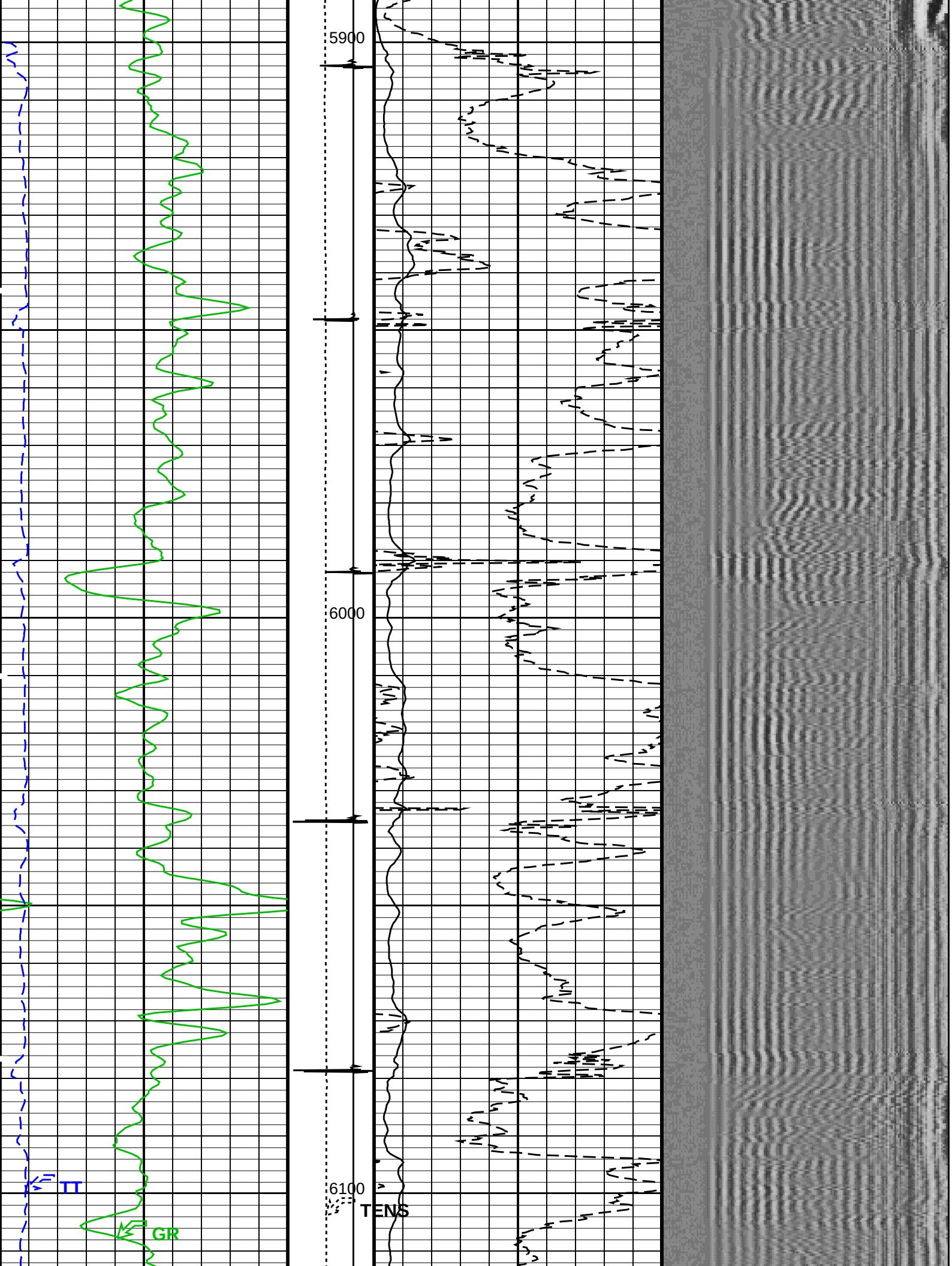
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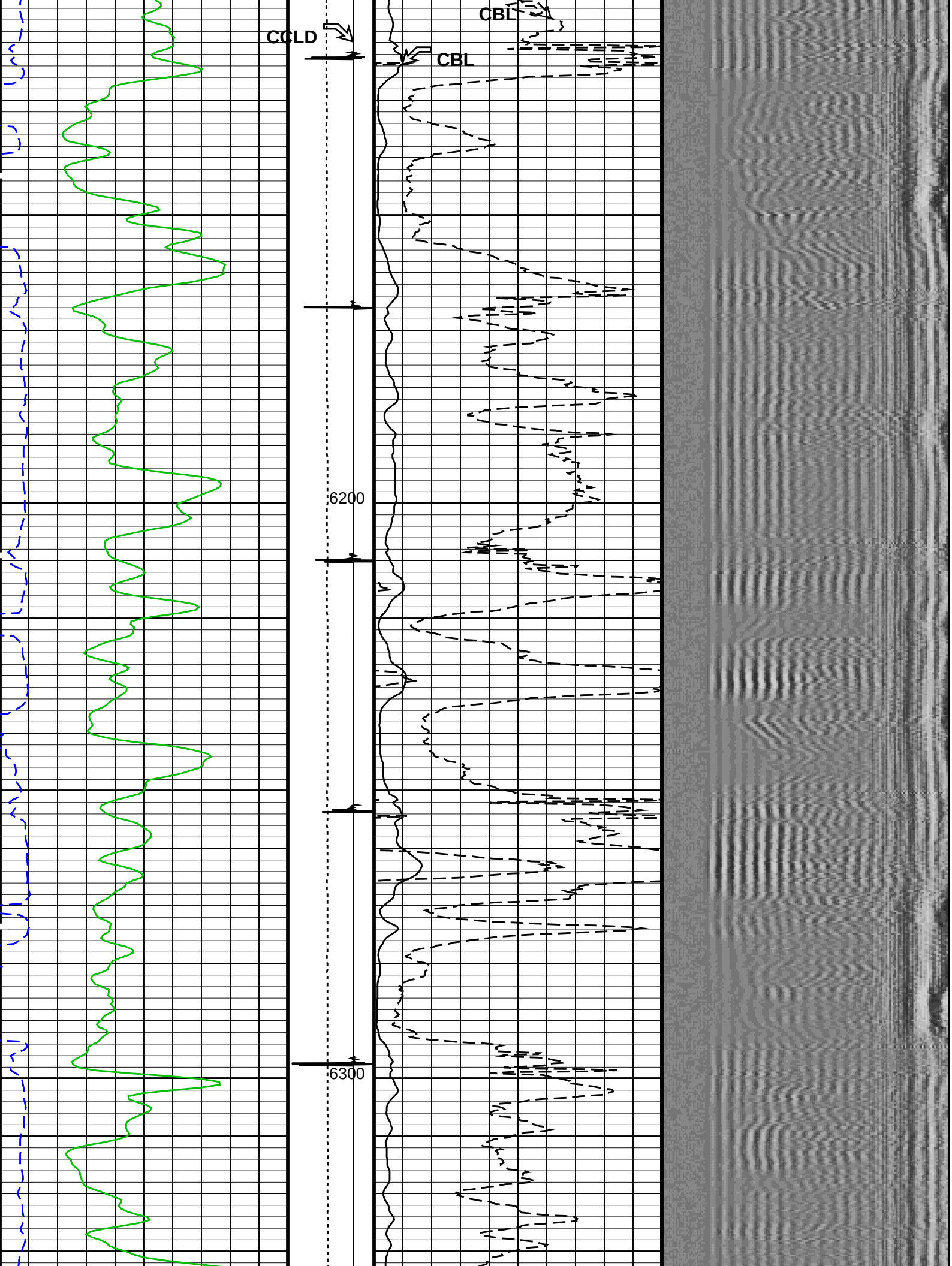
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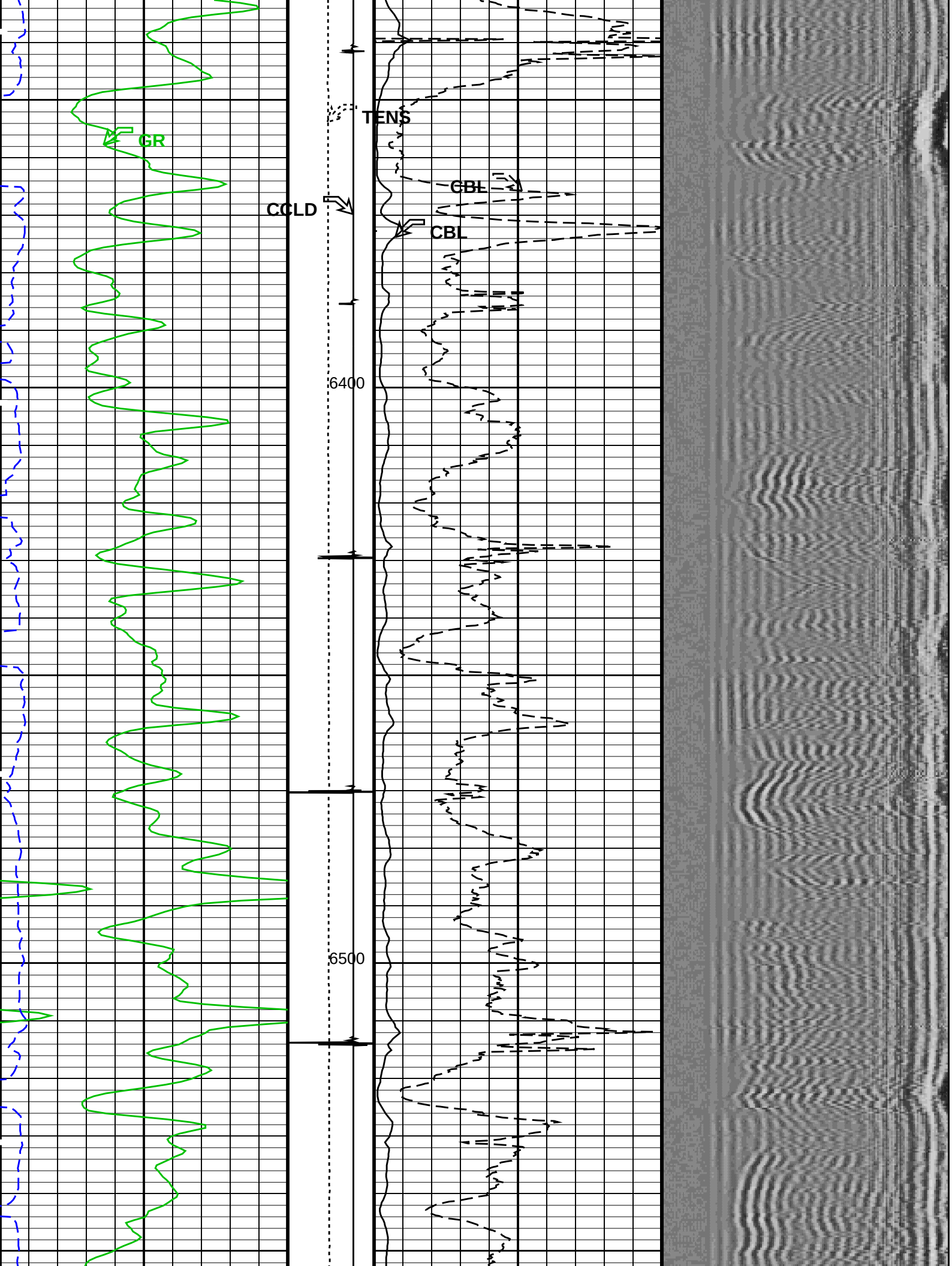
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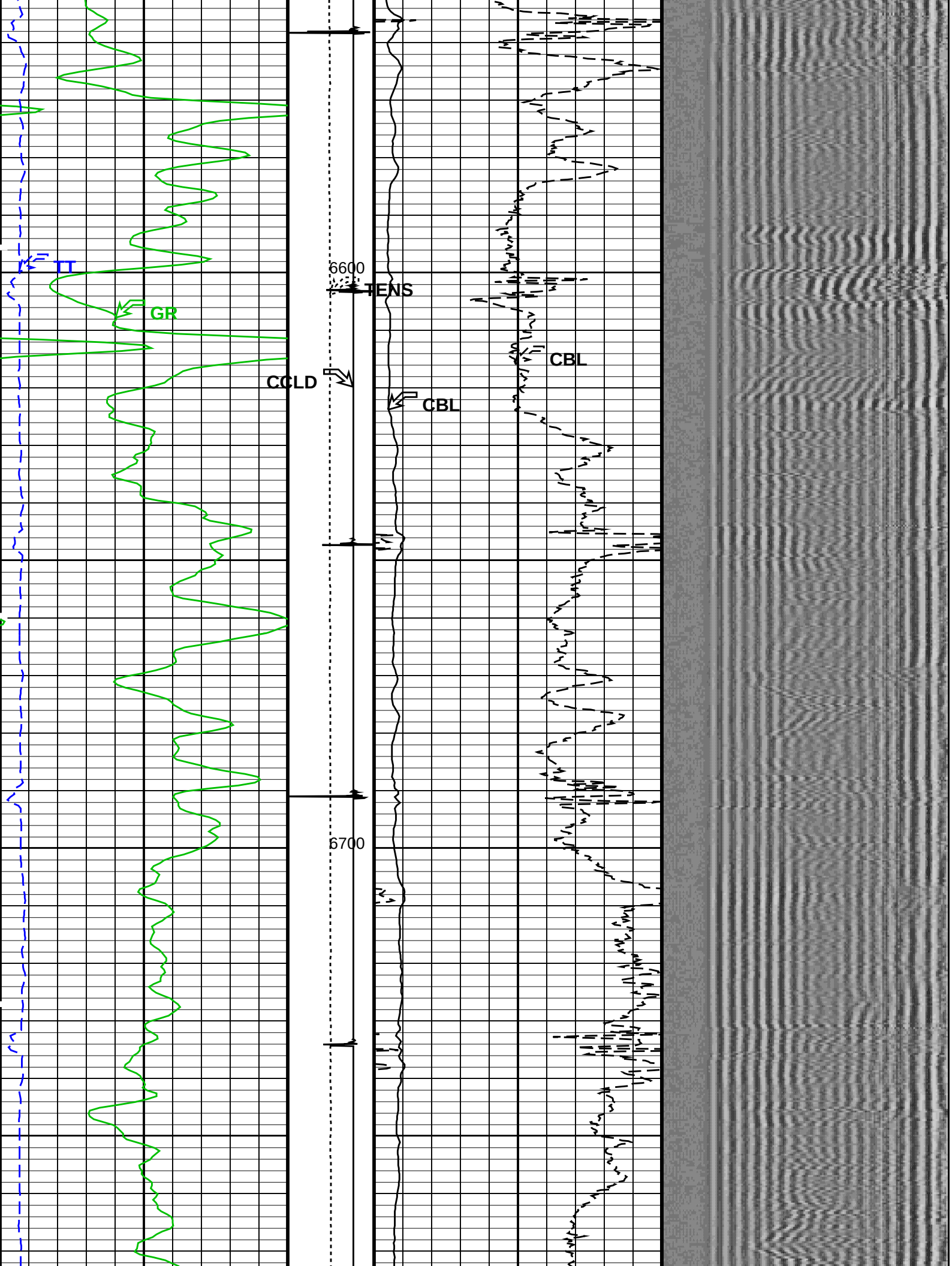
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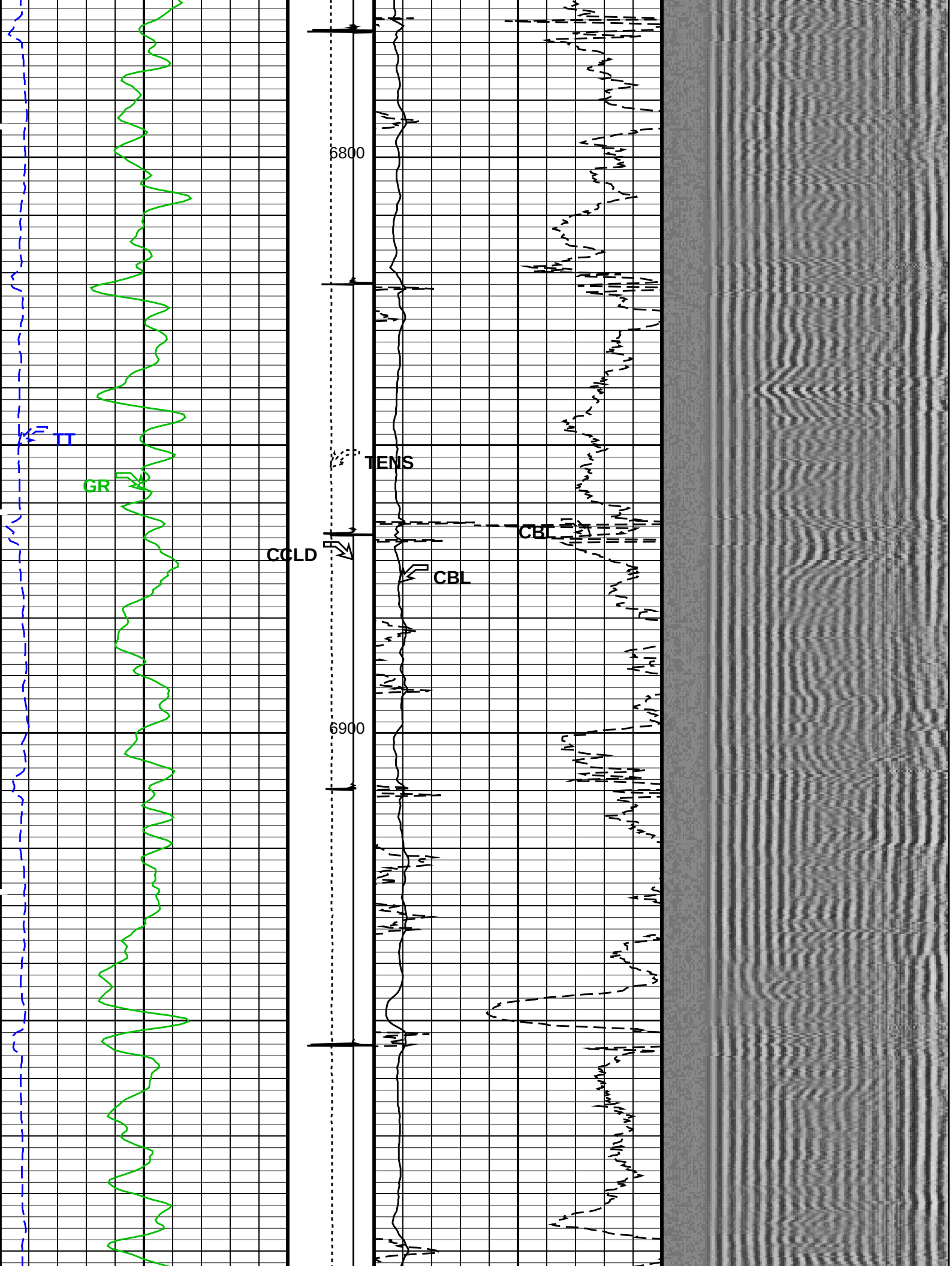
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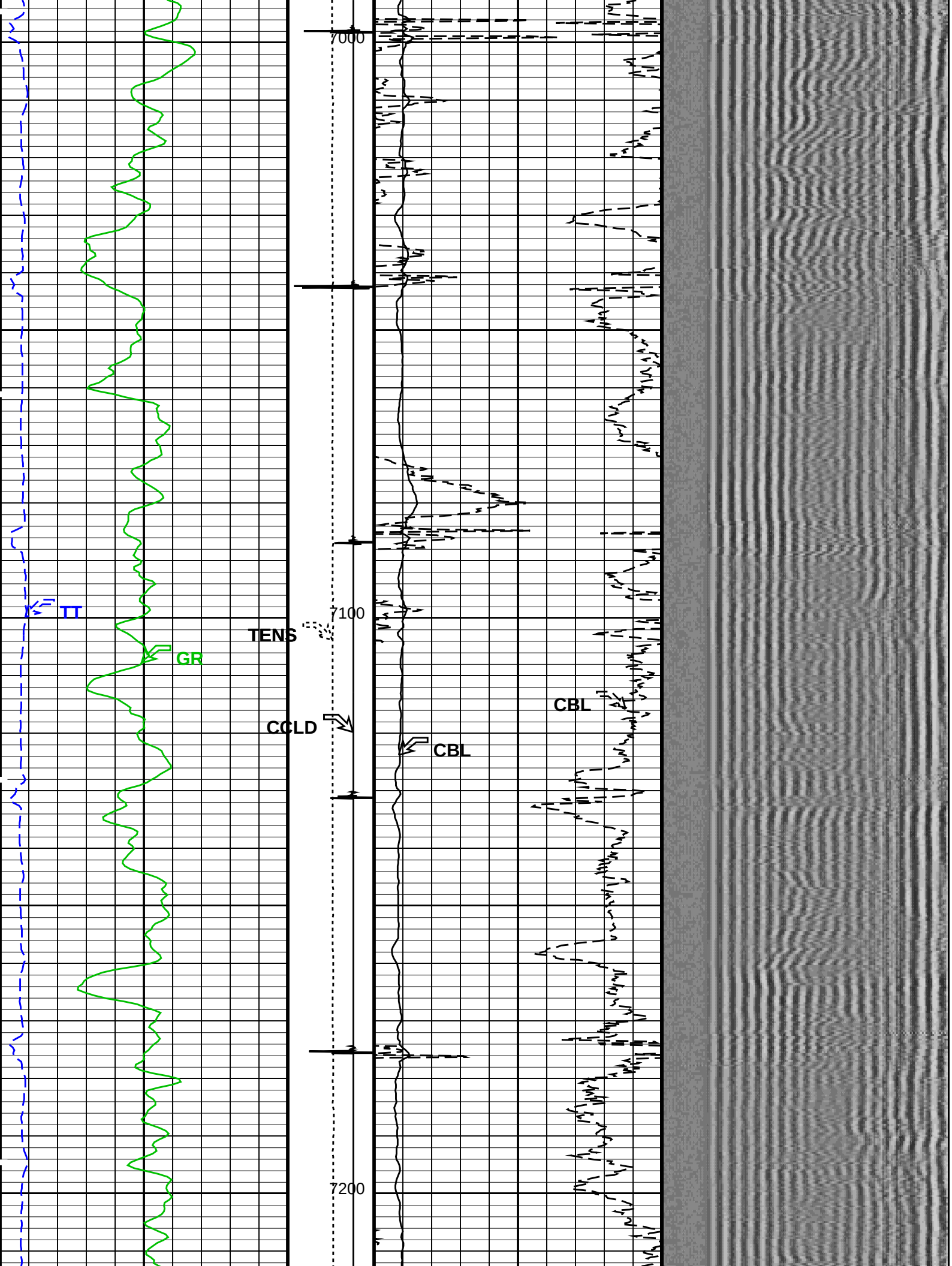
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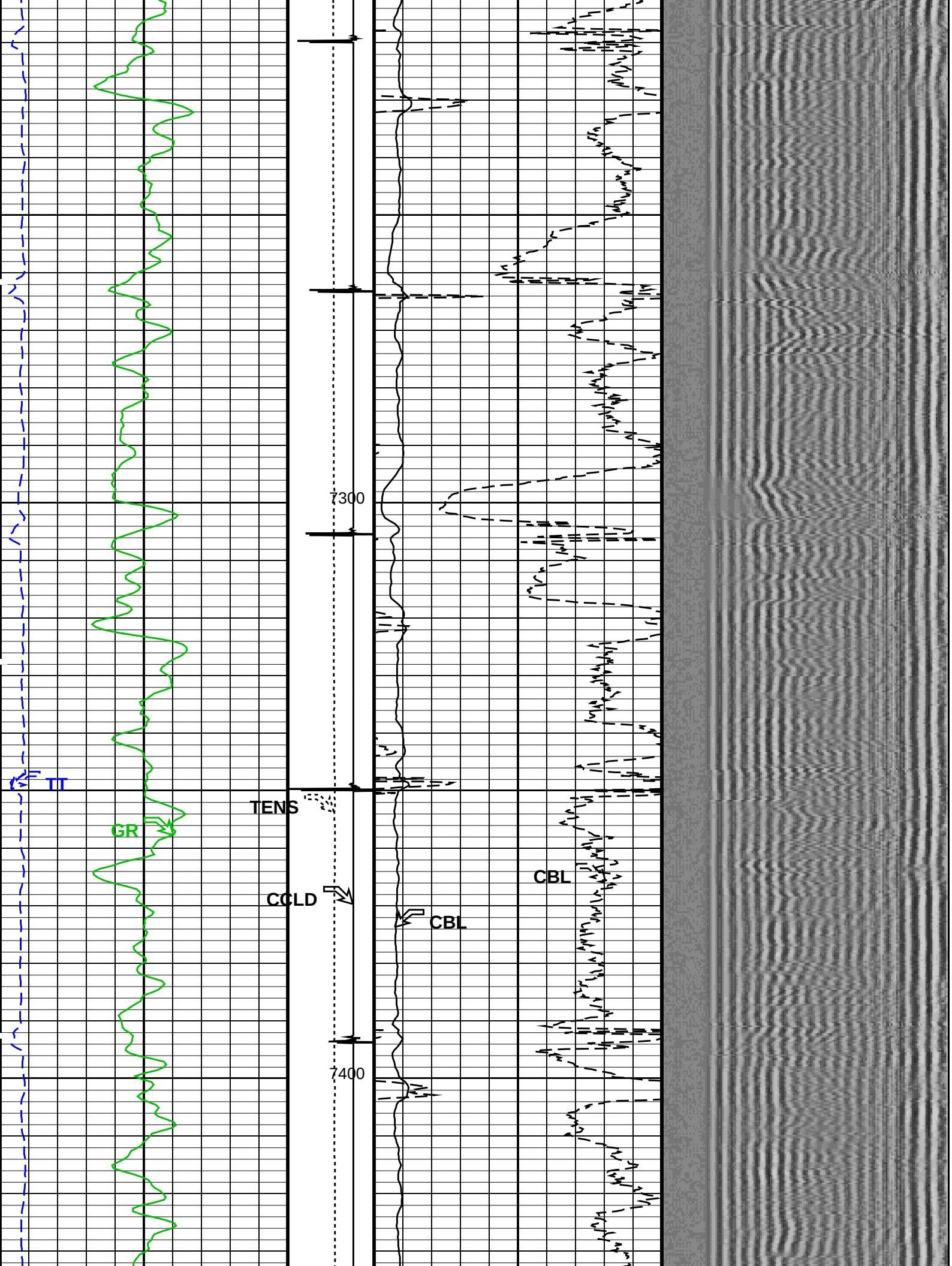
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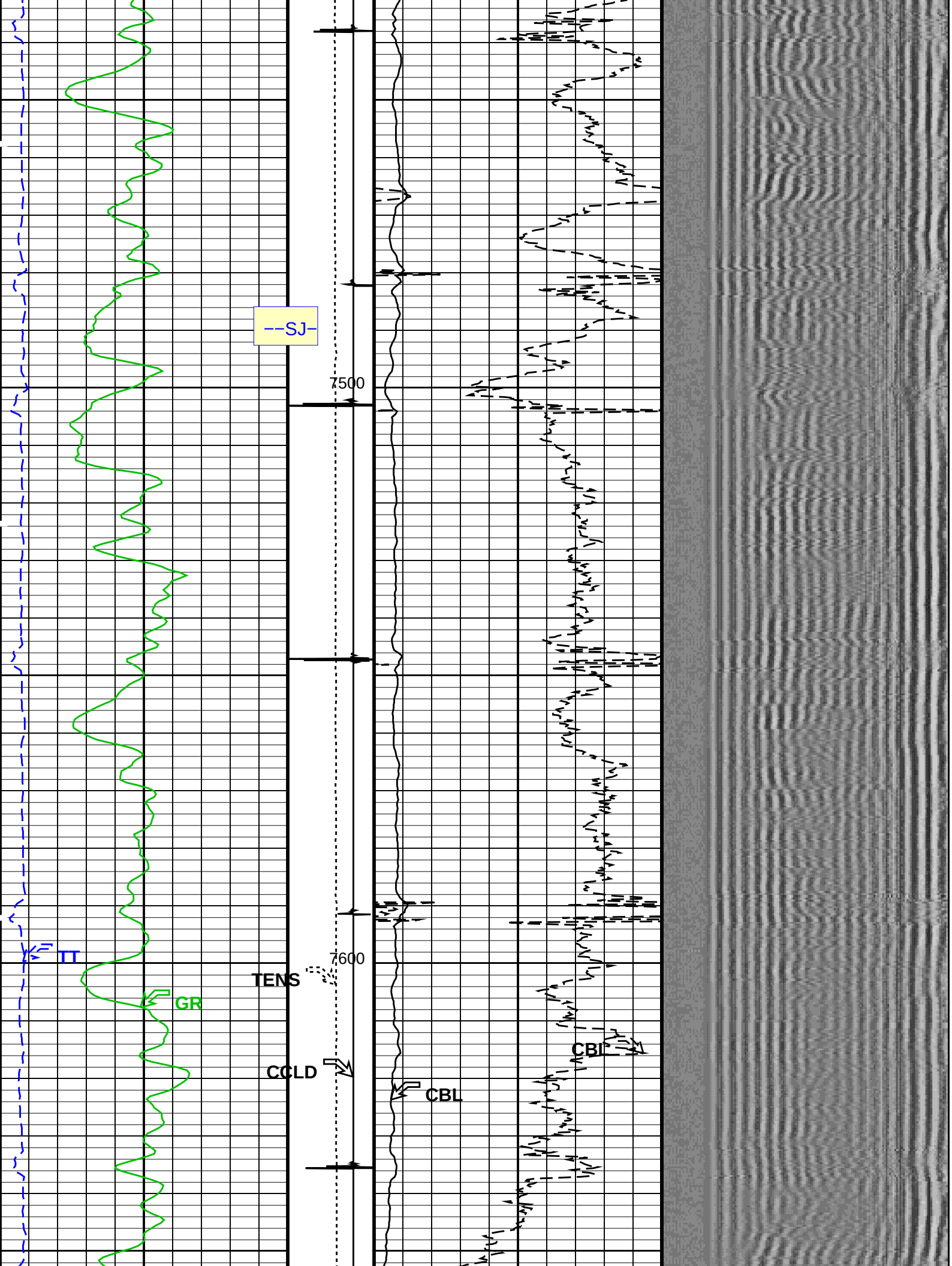
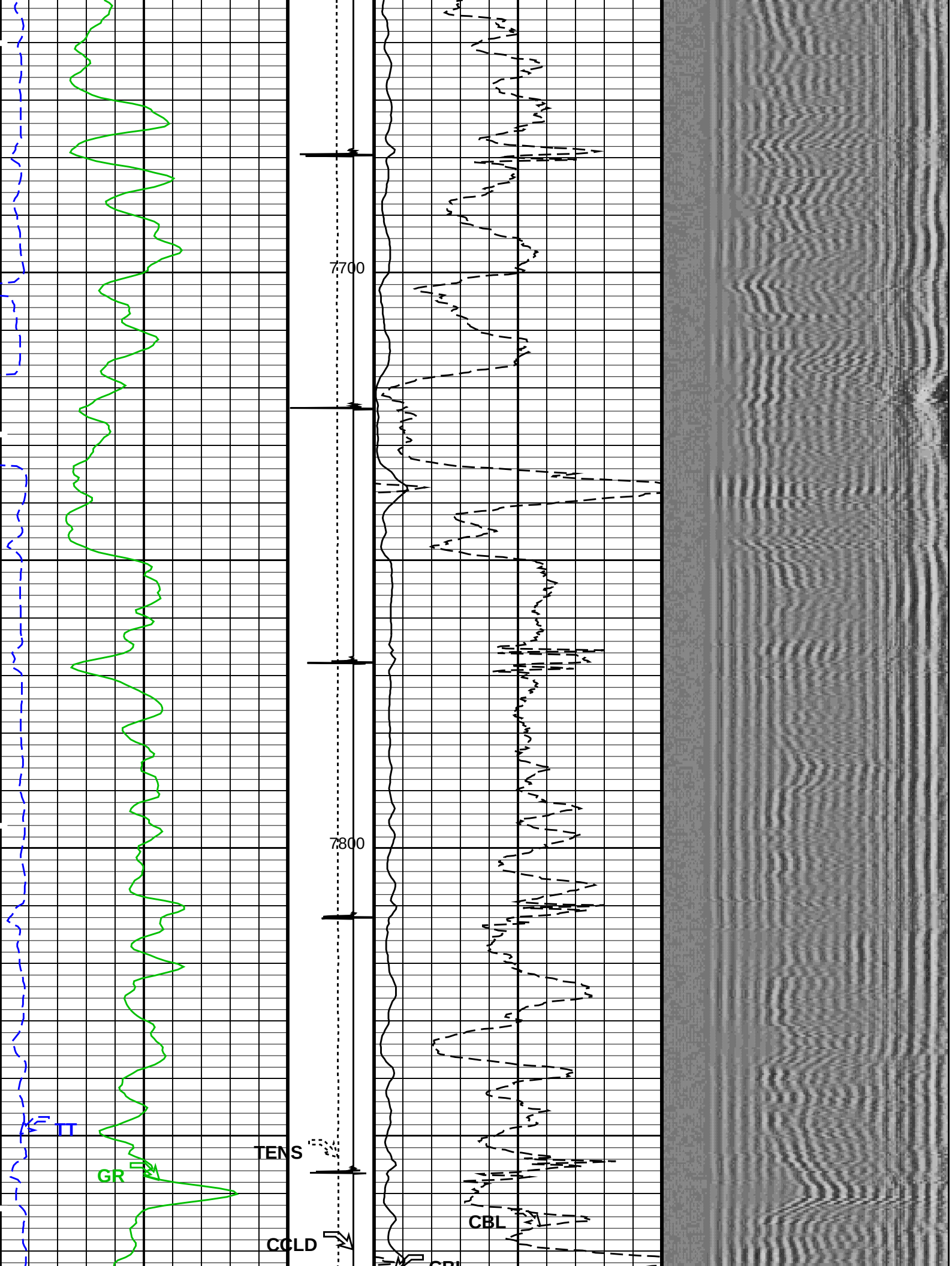

--SJ-
7500
7600
TT
GR
TENS
CCLD
CBL
CBL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TENS
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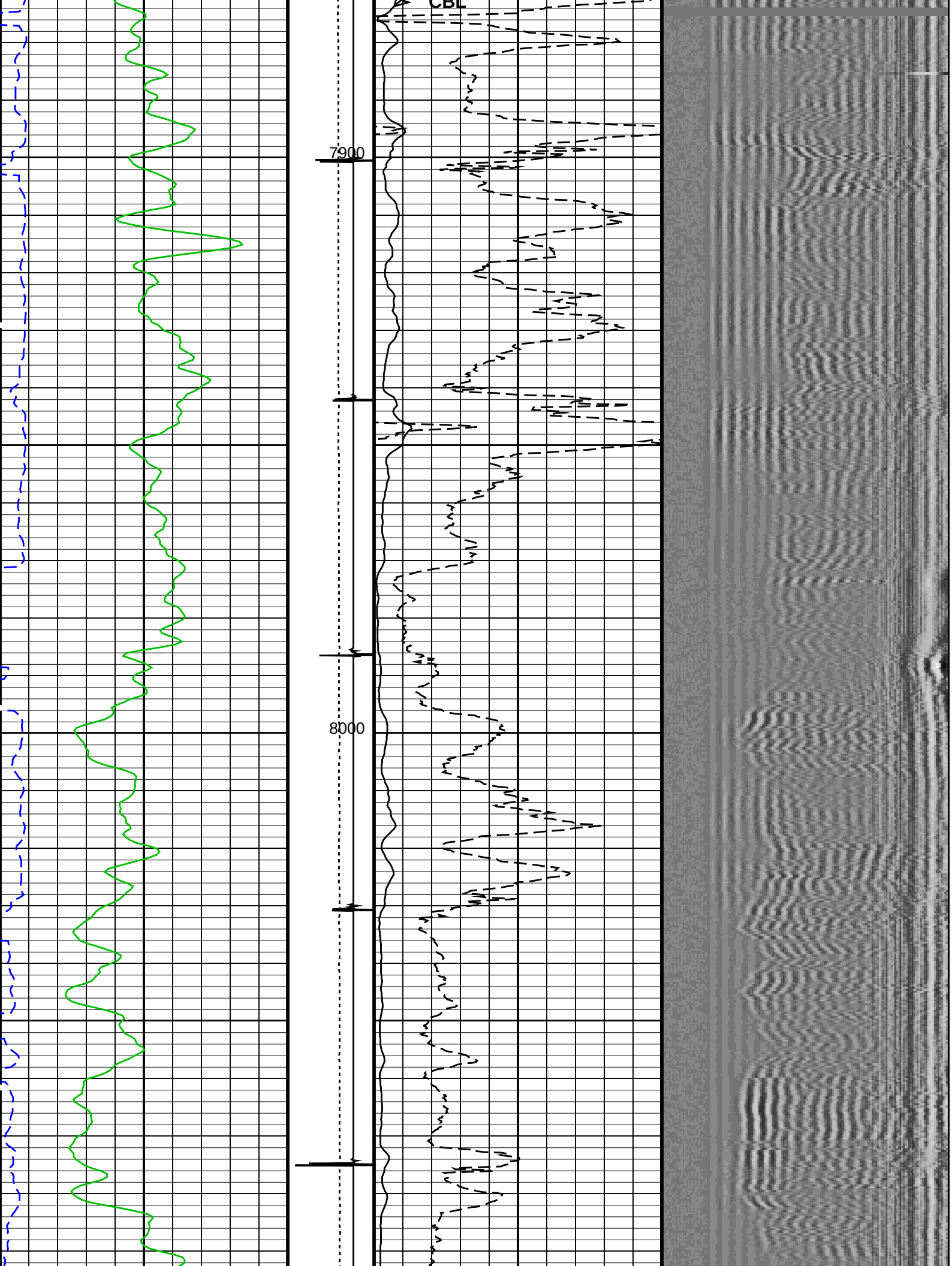
CBL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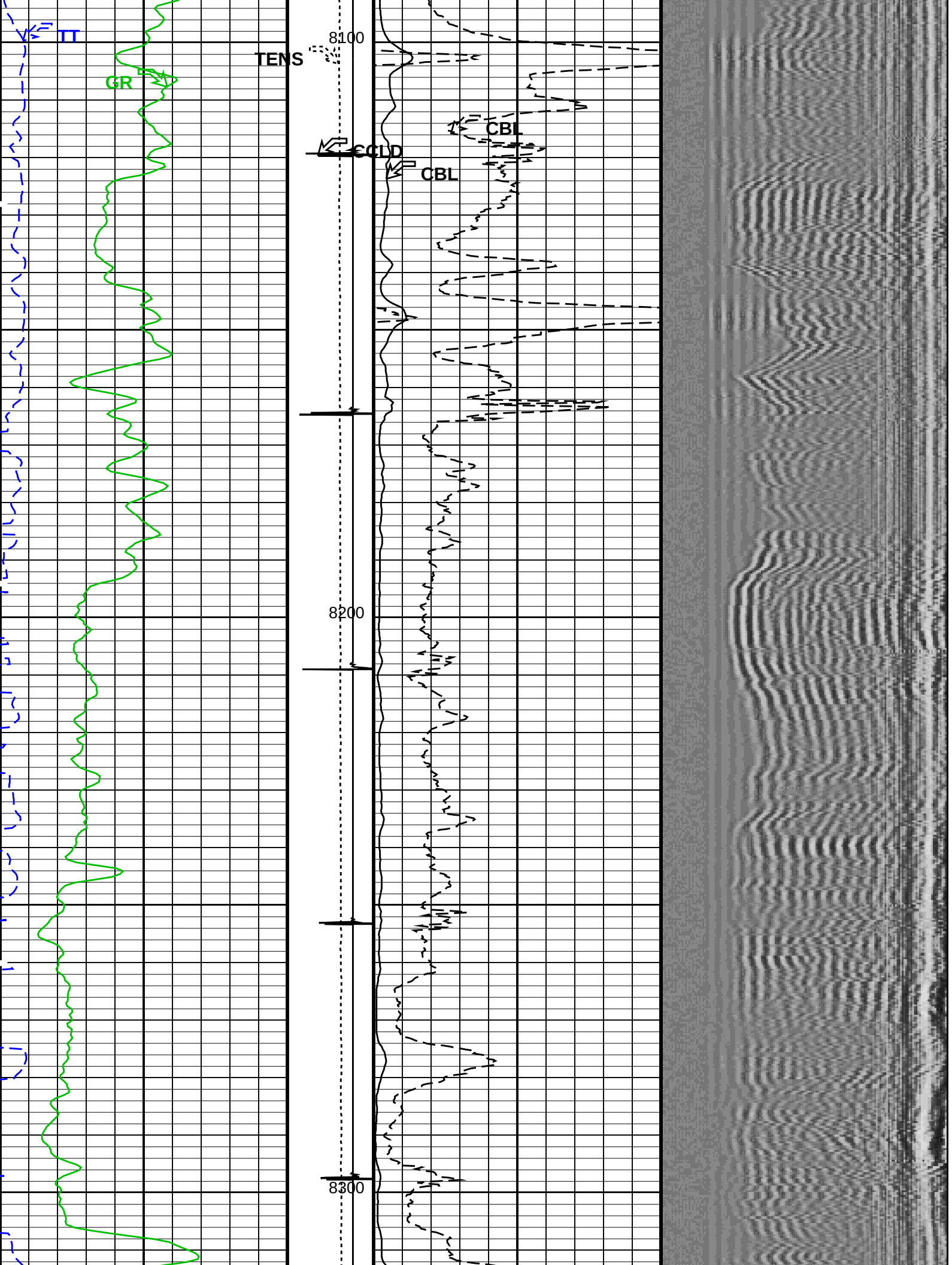
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GR
TENS
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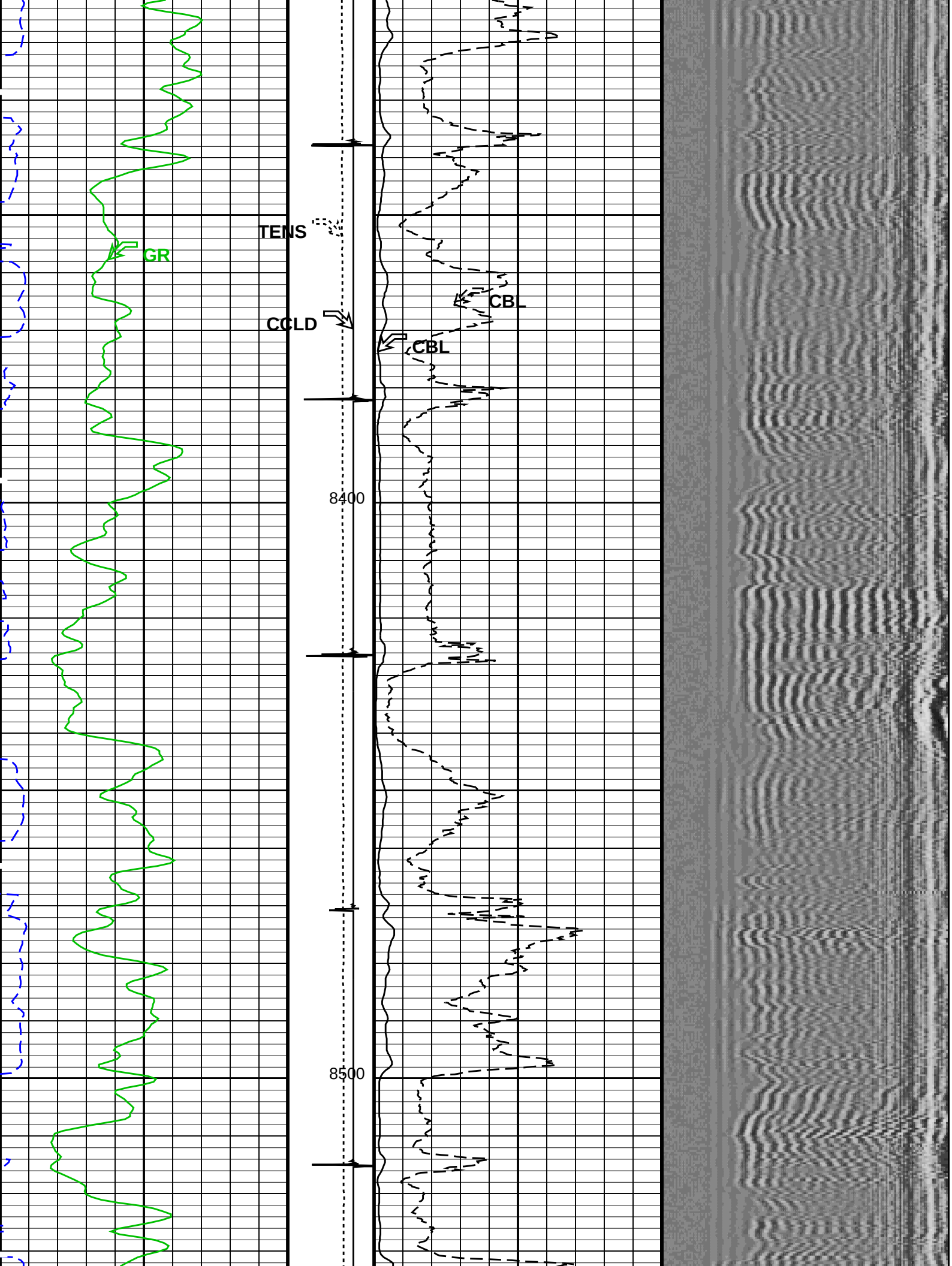
CBL
CCLD
CBL
8200
8300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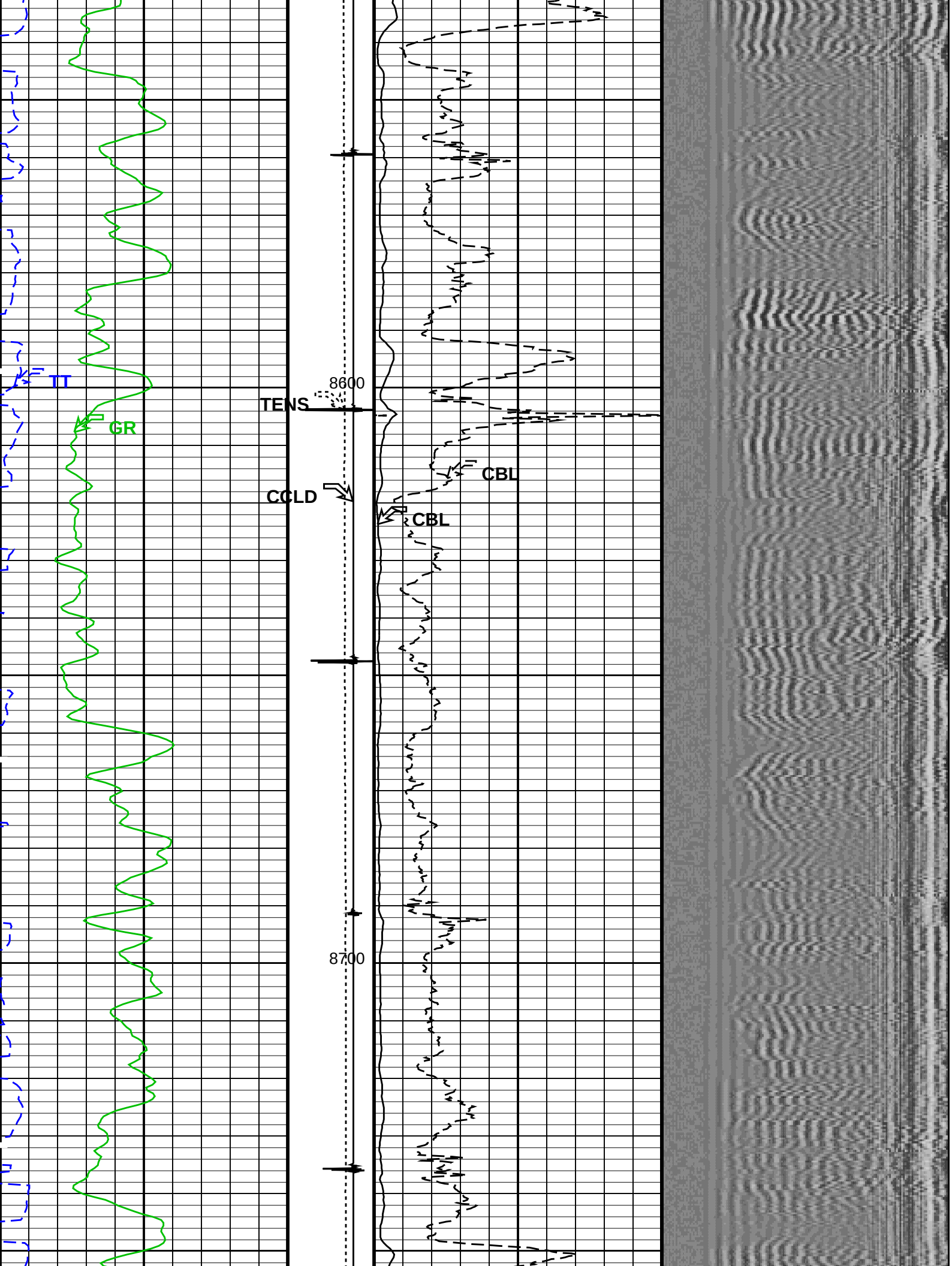
GR
CCLD
CBL
CBL
8400
8500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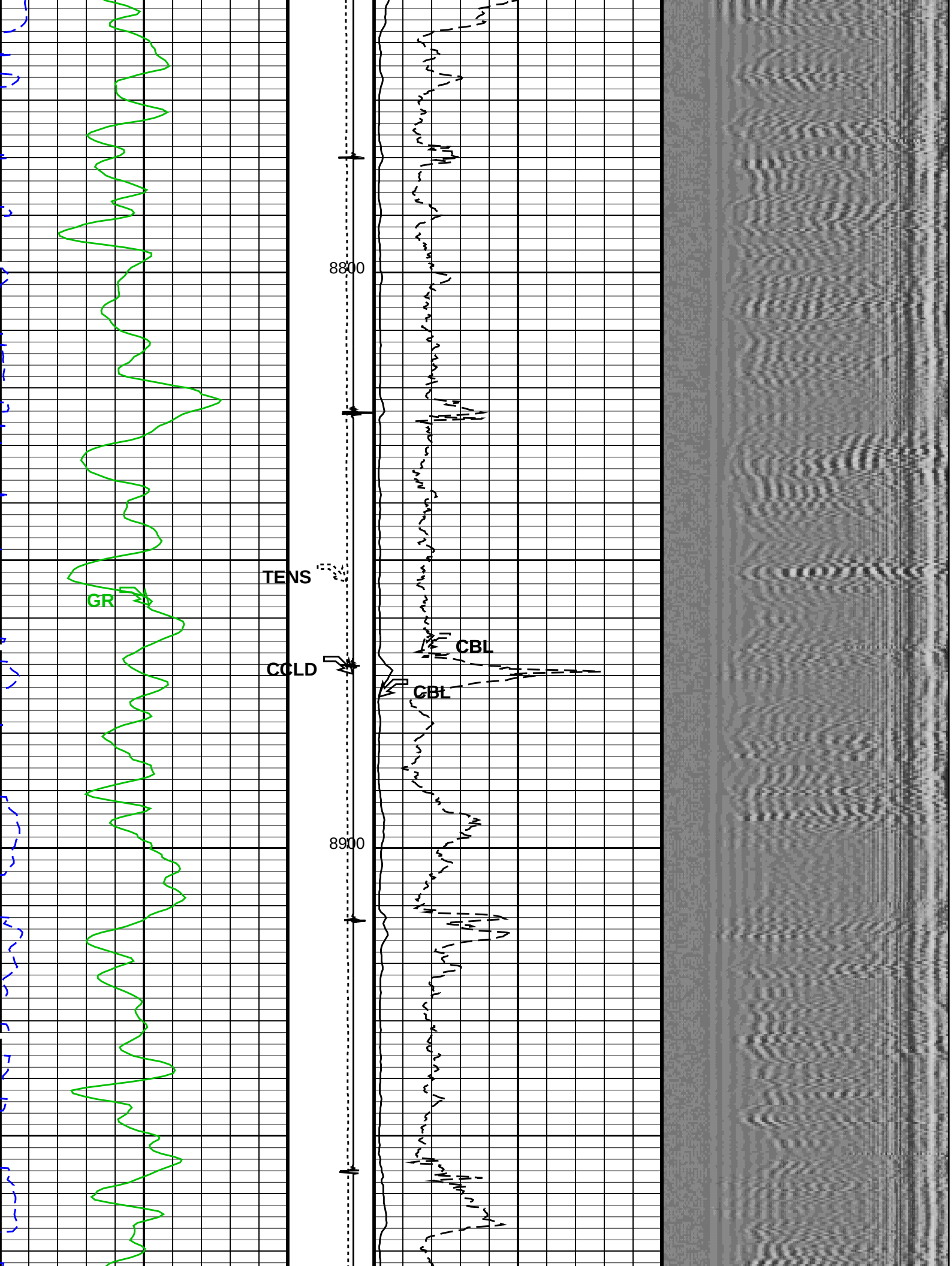
GR
8600
TENS
CBL
CCLD
CBL
8700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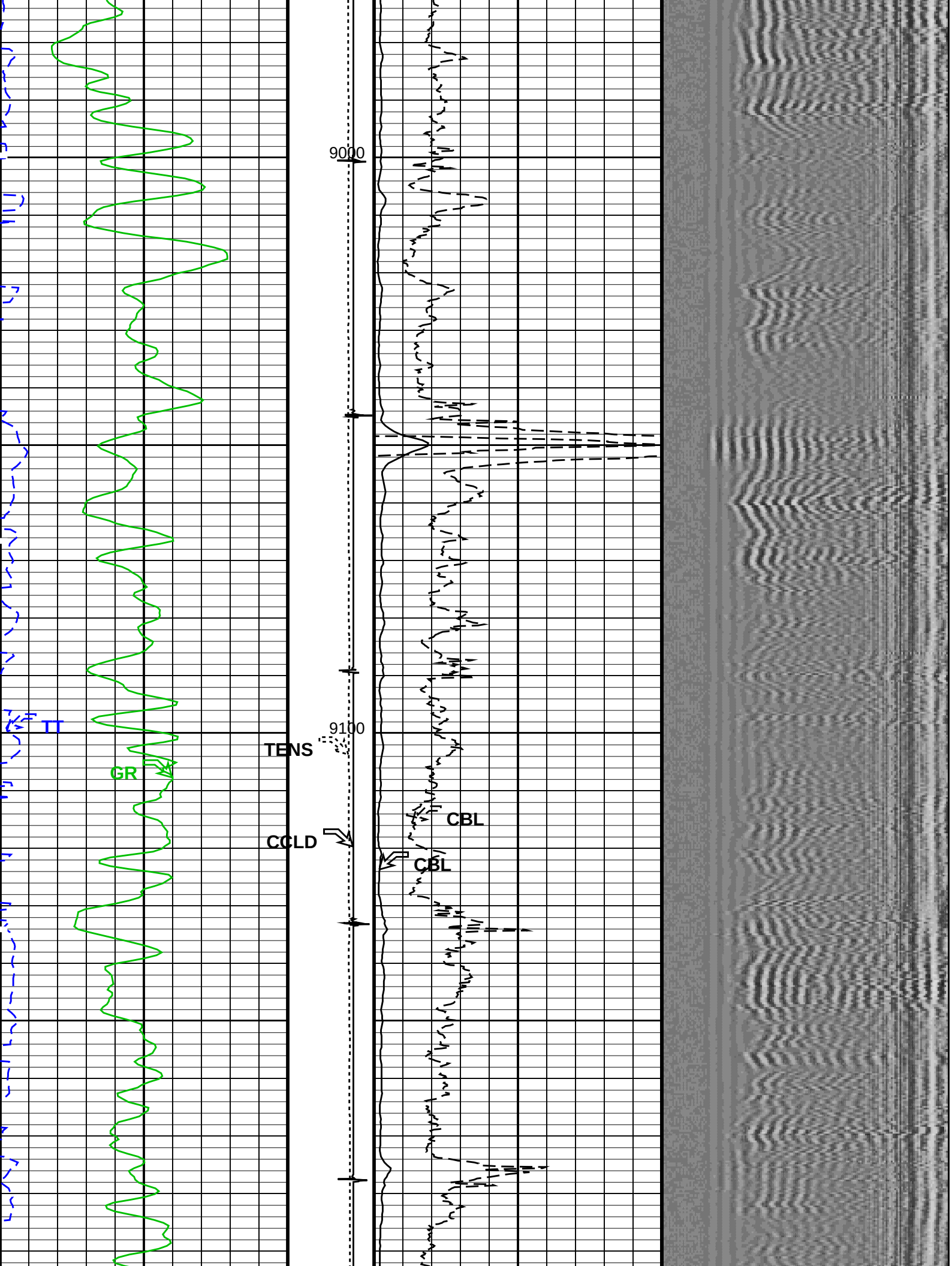
TENS
GR
CBL
CCLD
CBL
8900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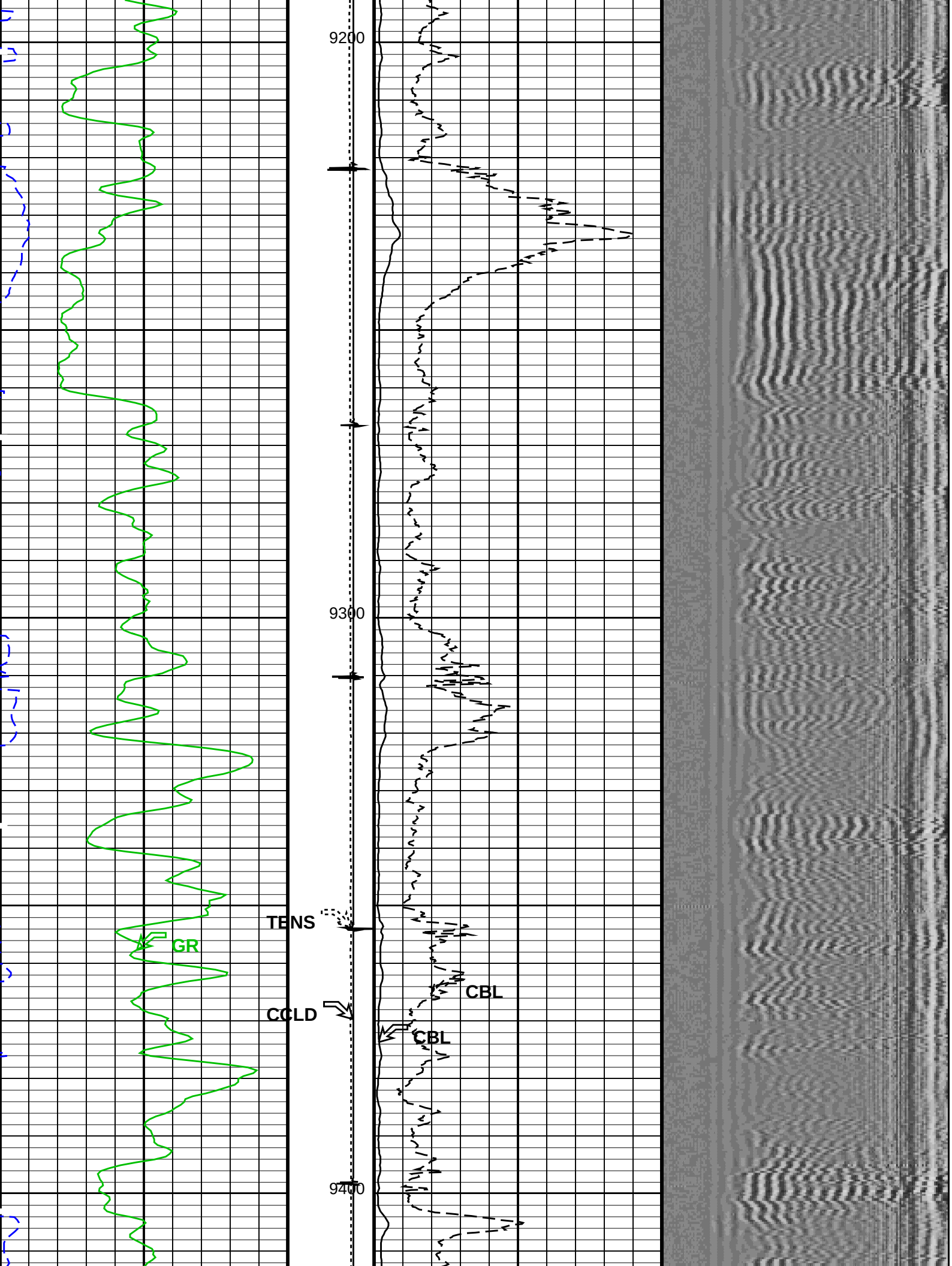
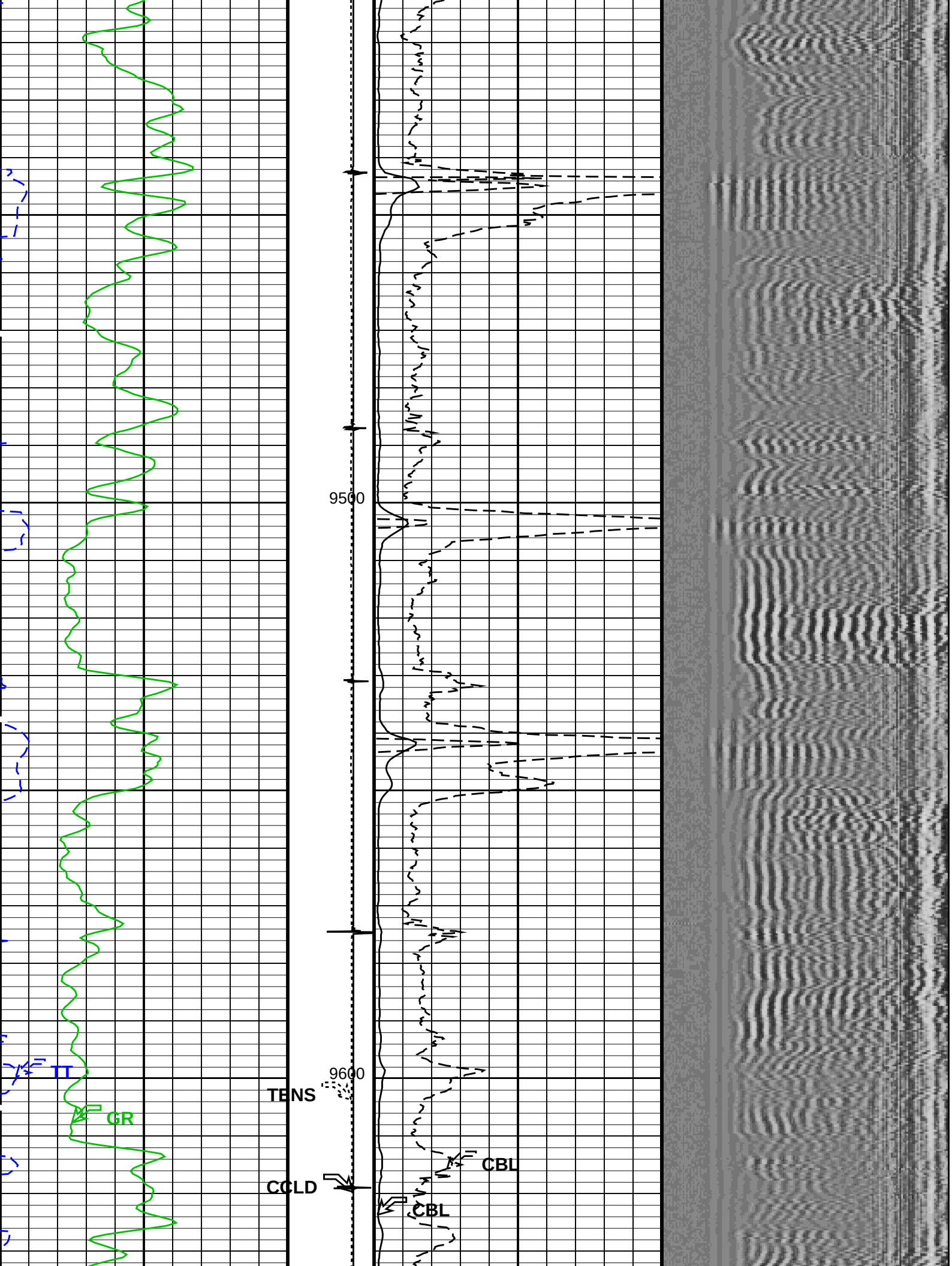
9100
TT
GR
TENS
CCLD
CBL
CBL


9200
9300
9400
TENS
GR
CCLD
CBL
CBL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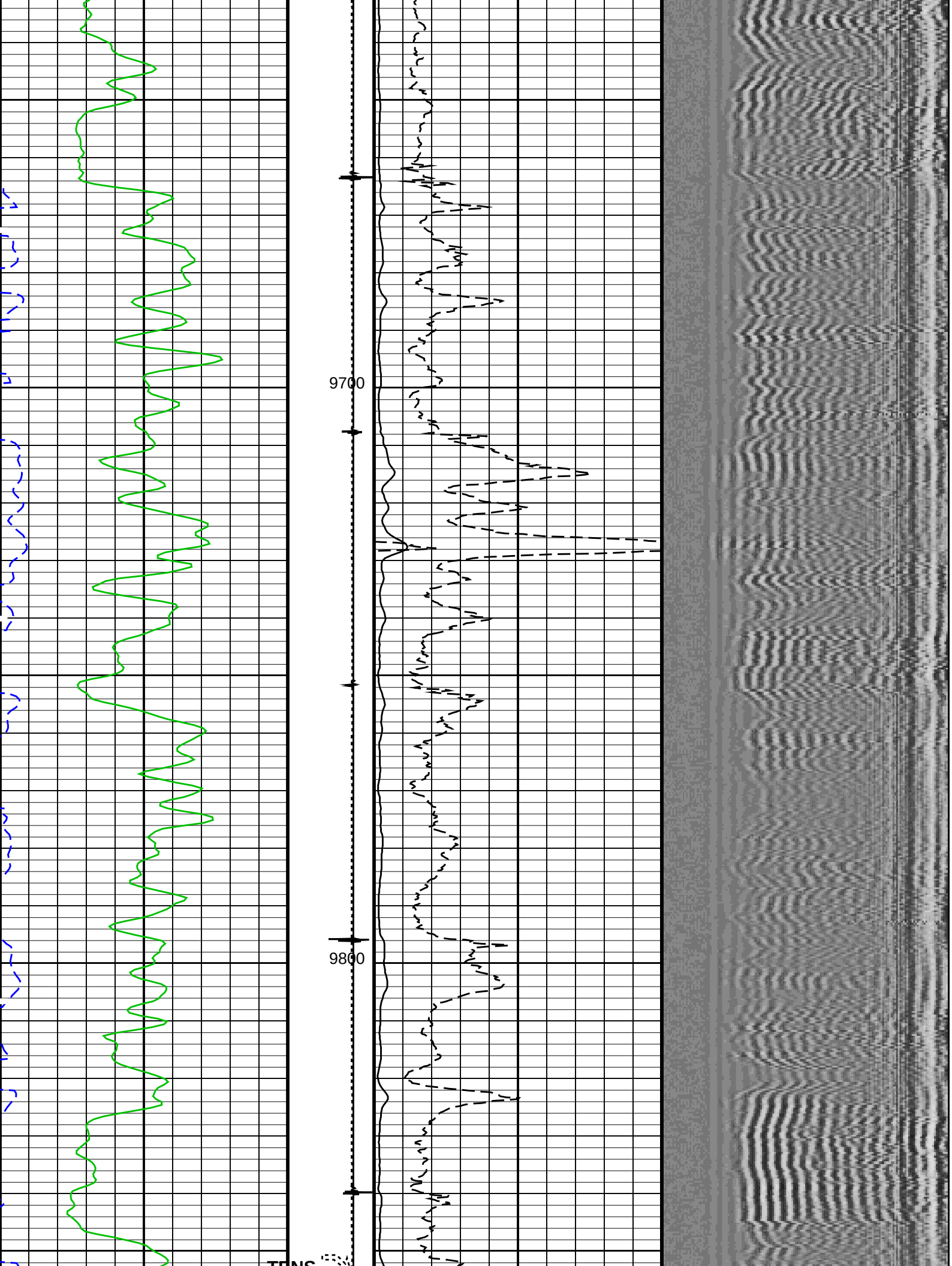
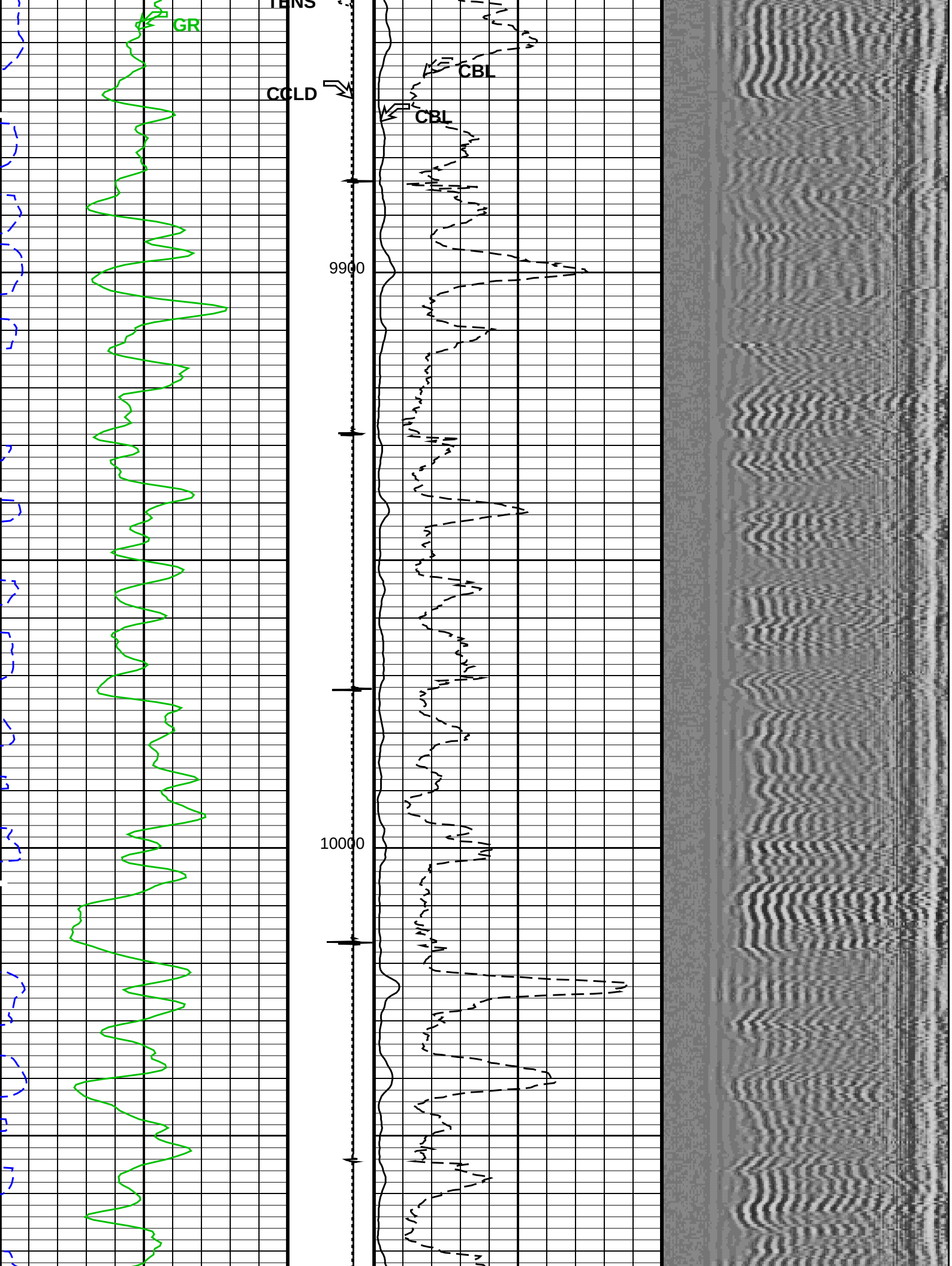
9600
TT
GR
TENS
CCLD
CBL
CBL


9700
9800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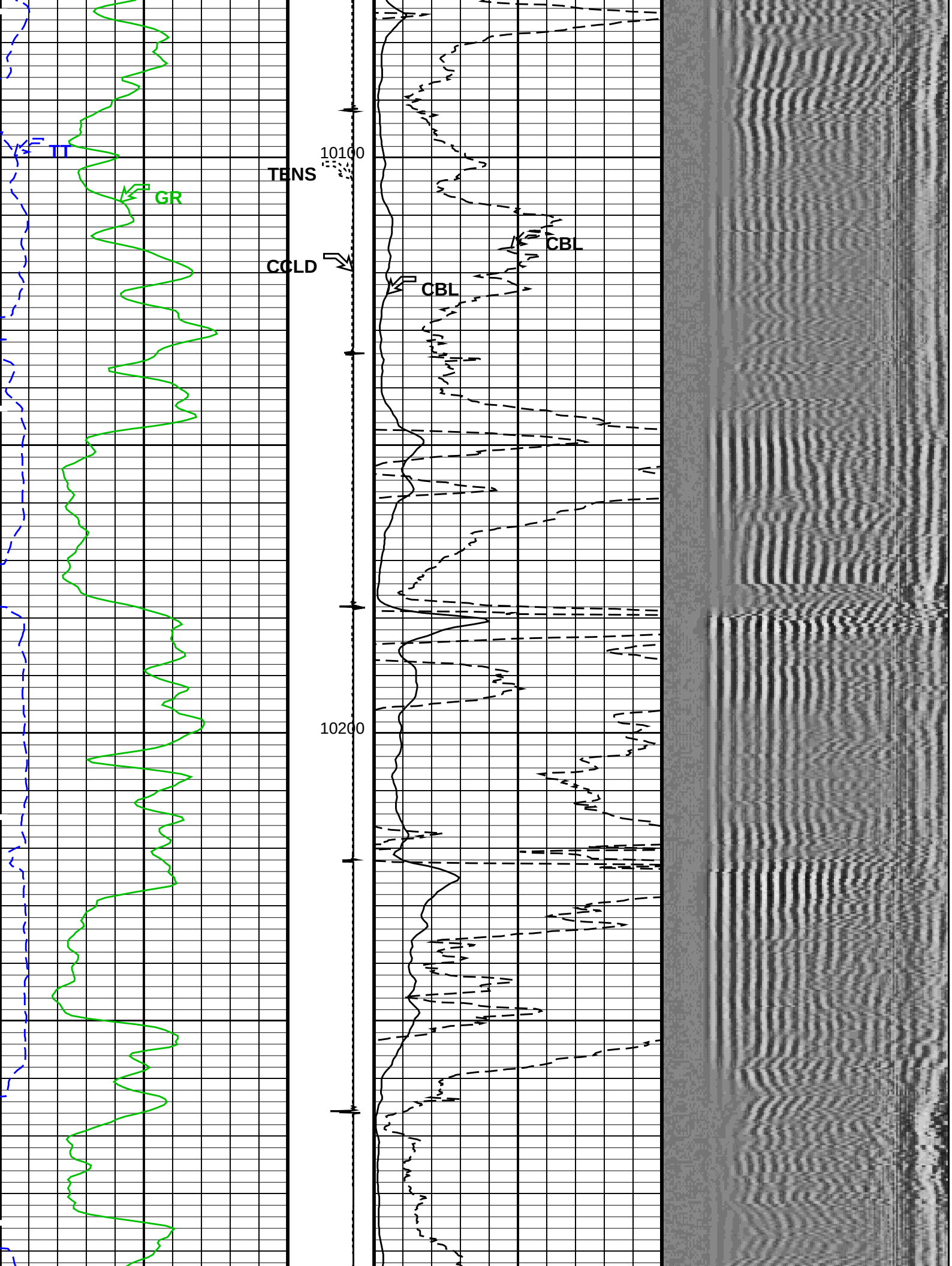
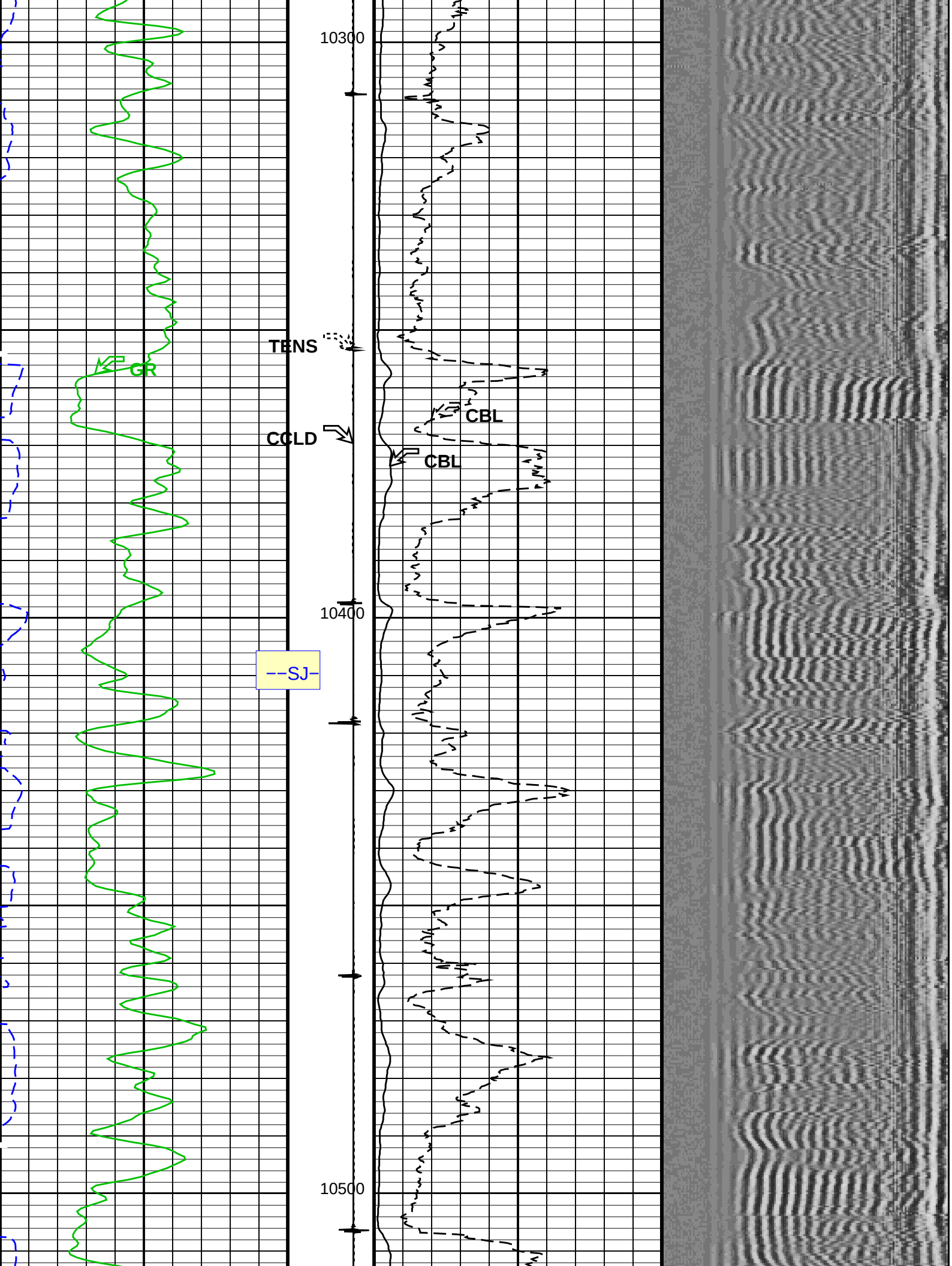
THNS
CCLD
CBL
CBL
9900
10000


TT
GR
TENS
10100
CCLD
CBL
CBL
10200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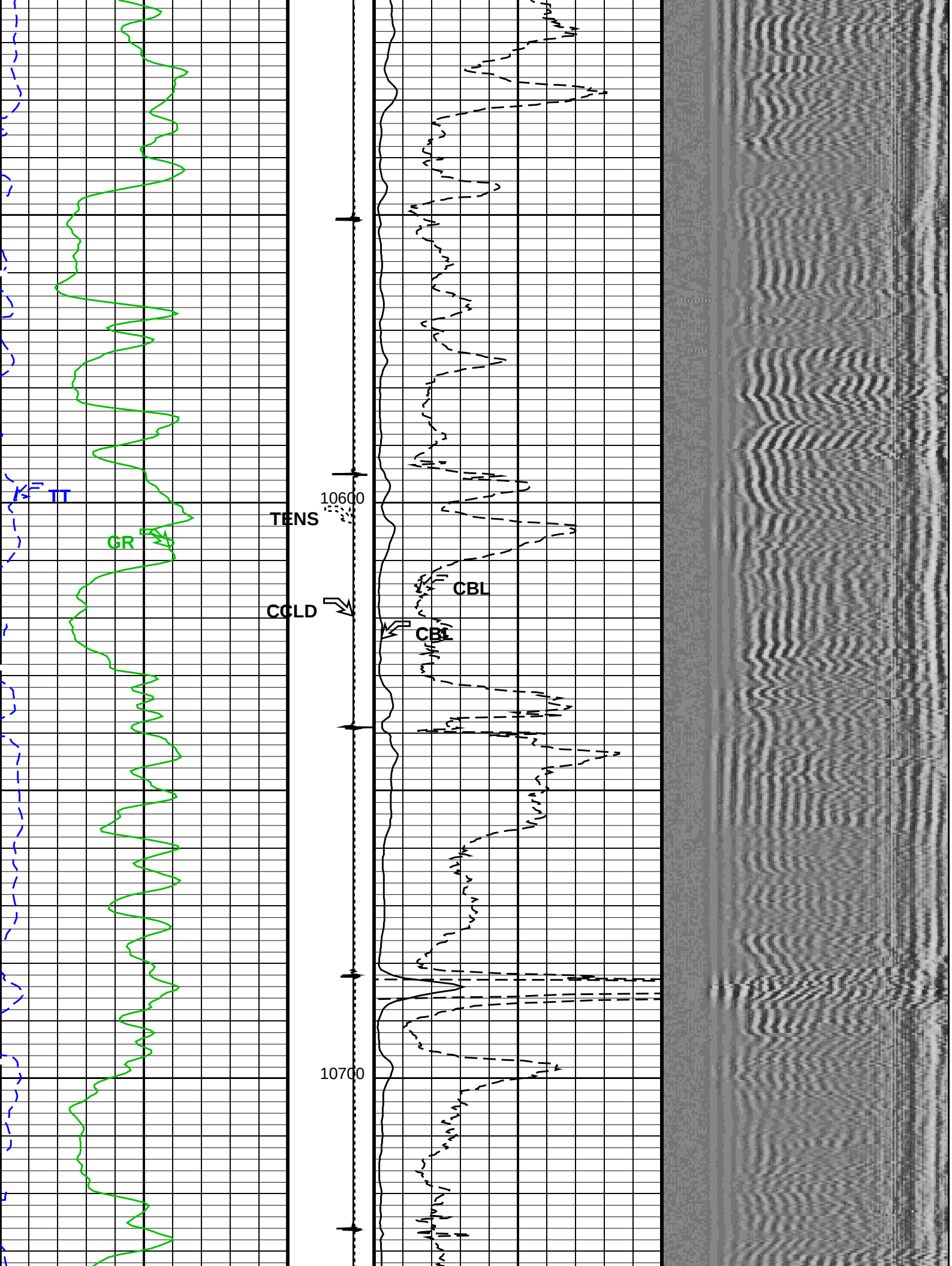
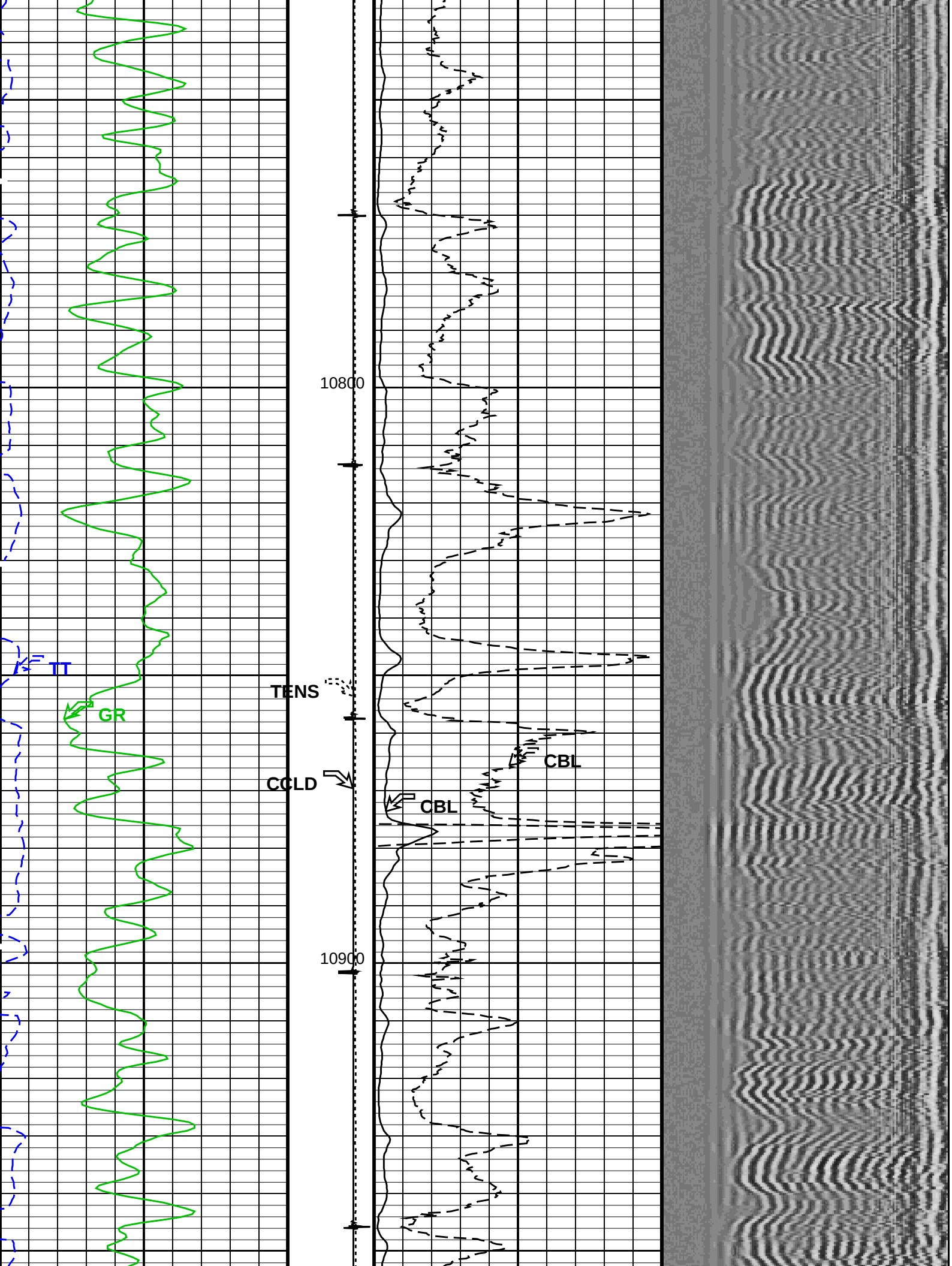
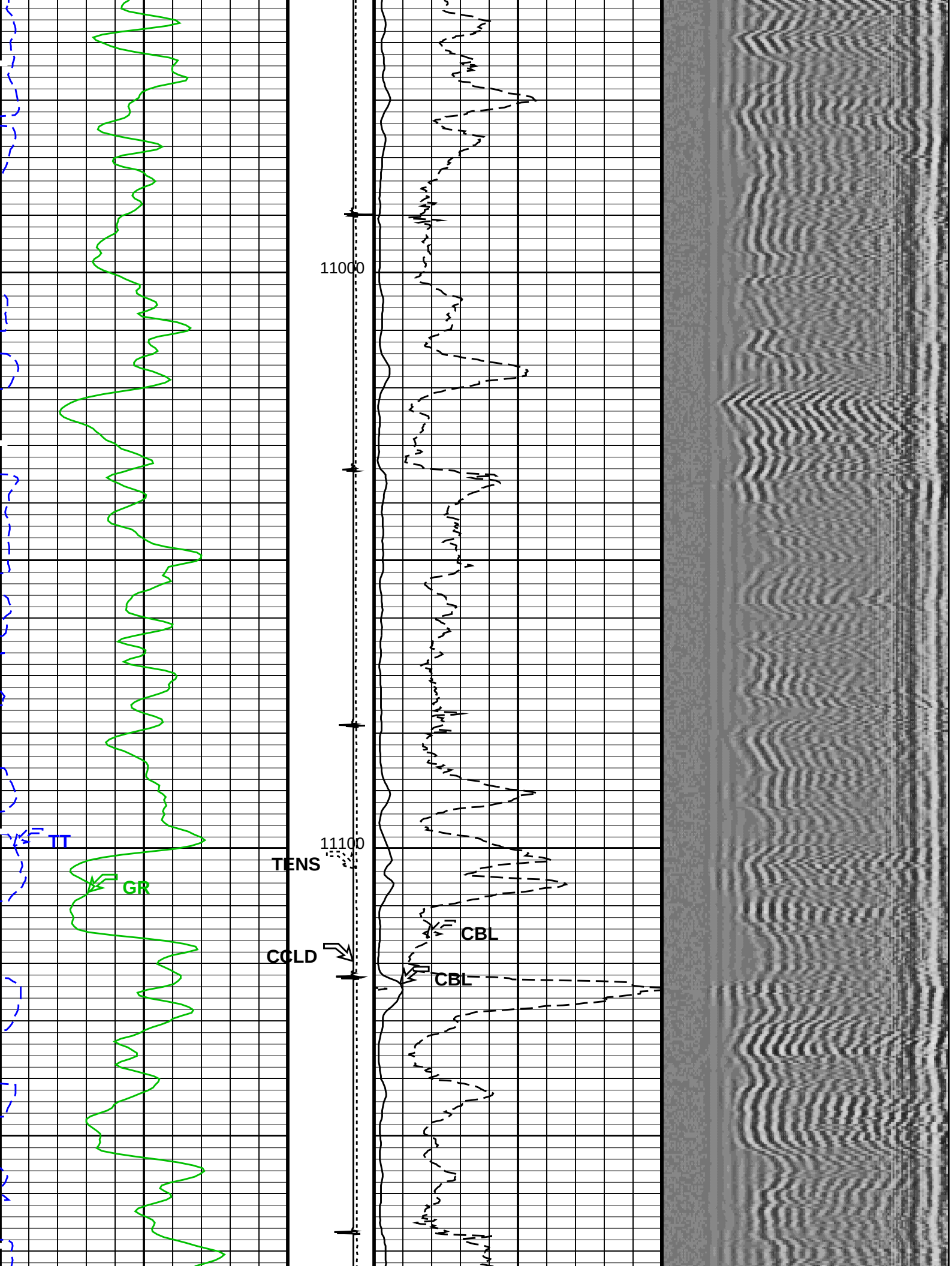
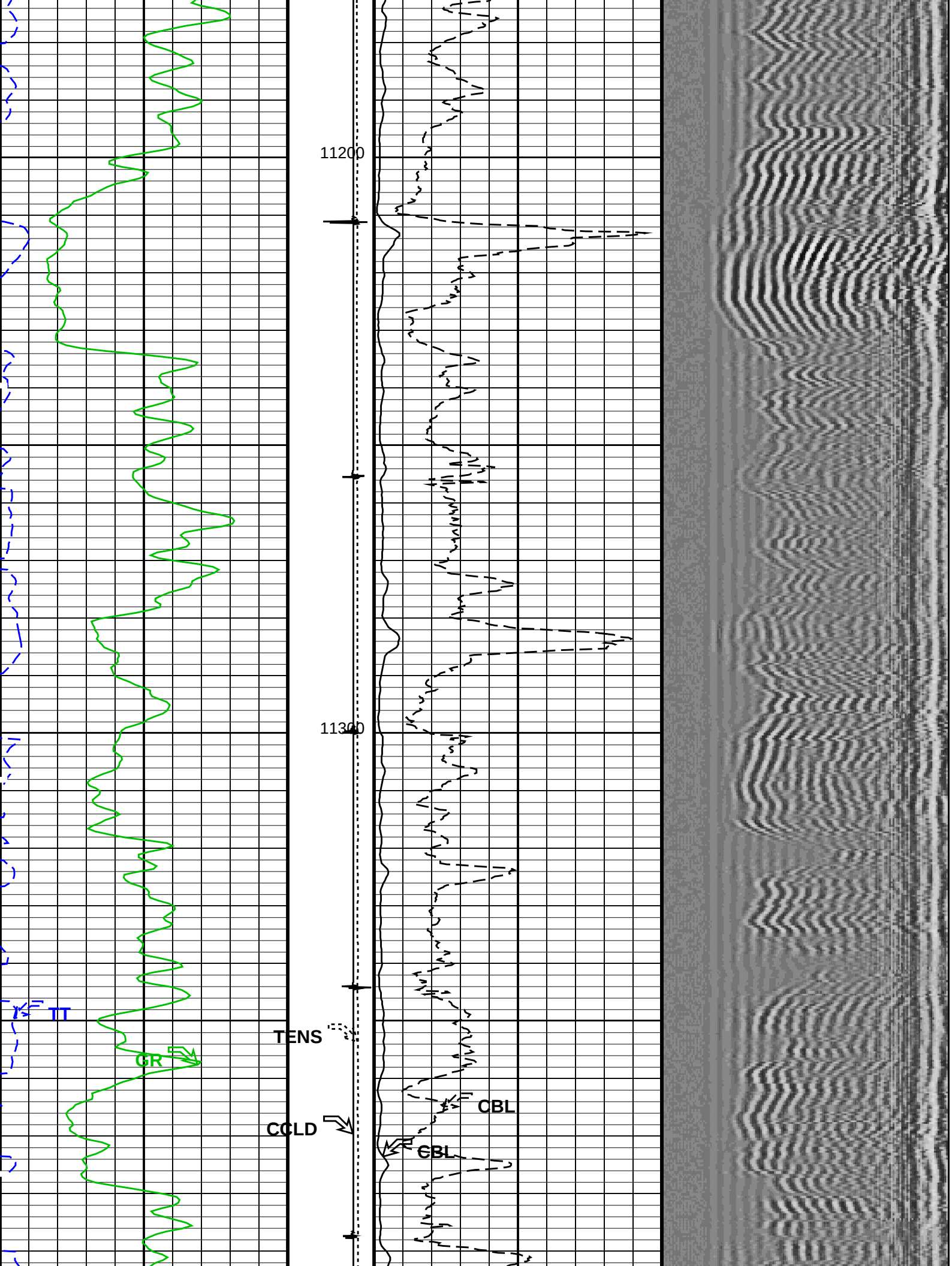
TENS
GR
CBL
CCLD
CBL
10400
--SJ-
10500


TT
GR
TENS
CCLD
CBL
CBL
10600
10700


10800
10900
TT
GR
TENS
CCLD
CBL
CBL


11000
11100
TT
GR
TENS
CCLD
CBL
CBL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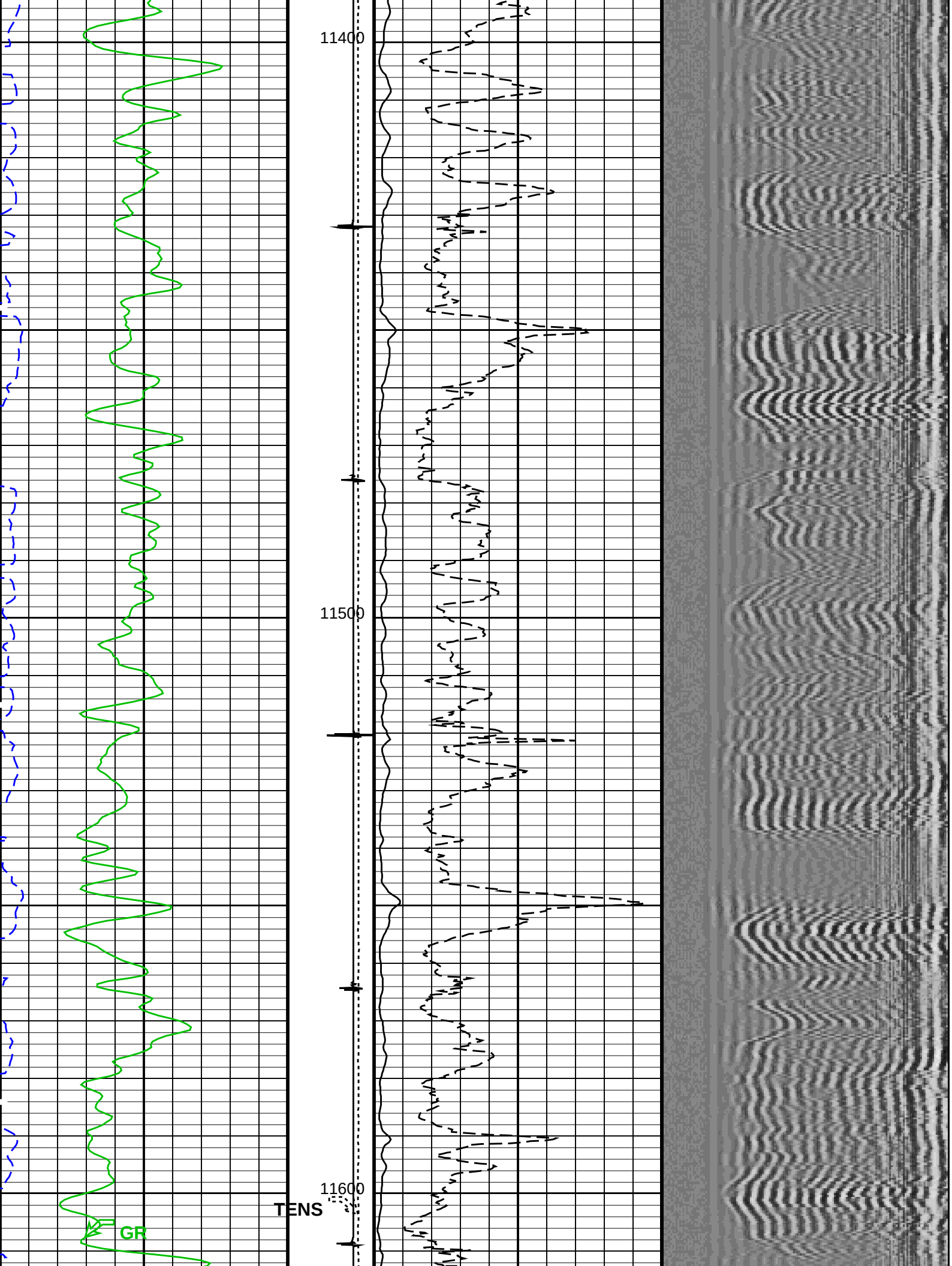
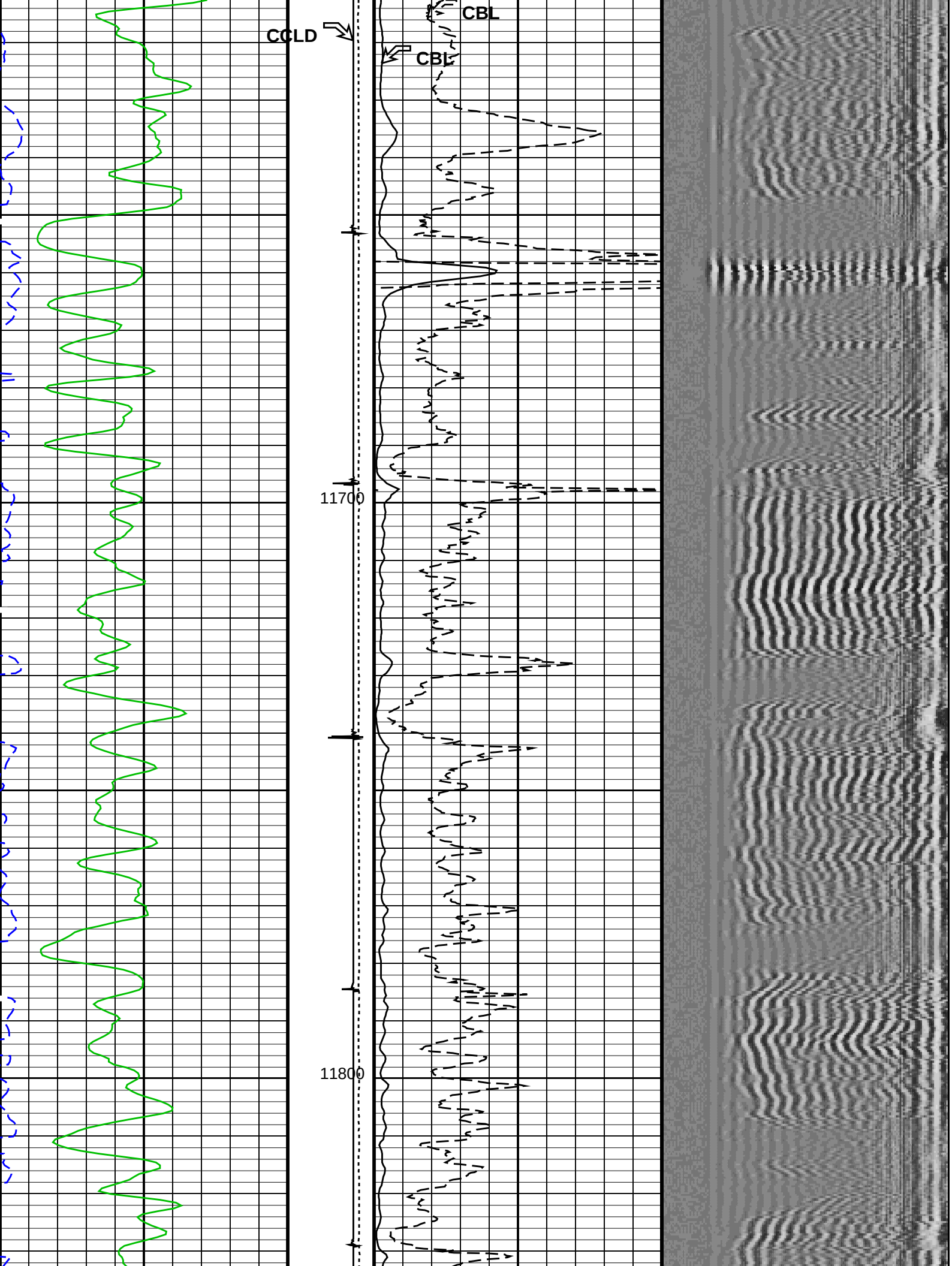
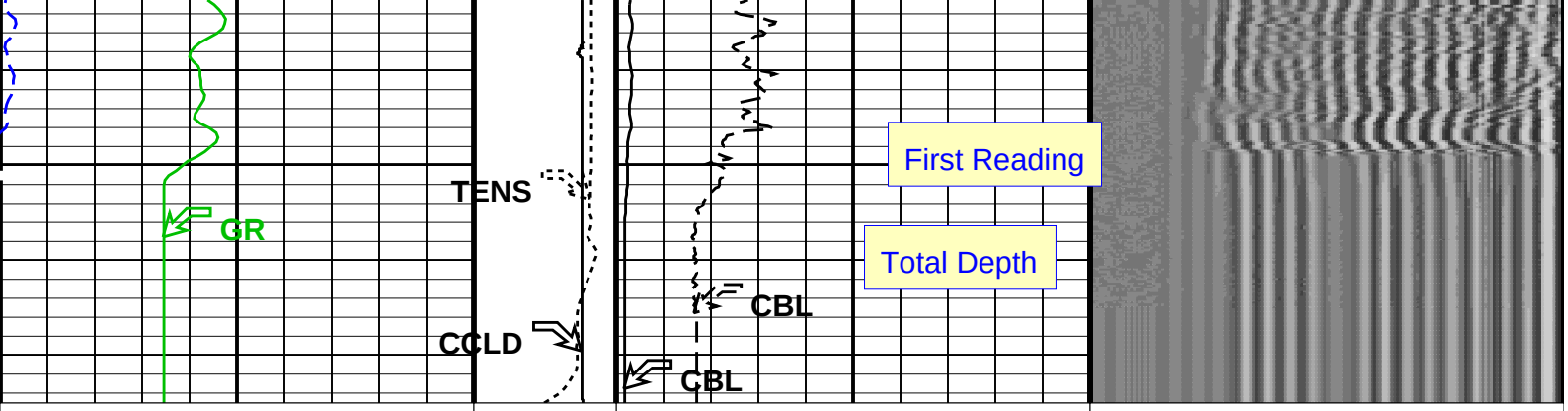
11300
TT
GR
TENS
CCLD
CBL
CBL


11400
11500
11600
TENS
GR


CCLD
CBL
CBL
11700
11800



Gamma Ray (GR)	Tension (TENS)	CBL Amplitude (CBL)	Min Amplitude Max
0 (GAPI) 150	(LBF) 0 2000	0 (MV) 100	VDL VariableDensity (VDL) 200 (US) 1200
Transit Time (TT) 260 (US) 160	Discriminated CCL (CCLD) 3 (V) −1	CBL Amplitude (CBL) 0 (MV) 10	

PIP SUMMARY

Time Mark Every 60 S

Format: CBL_VDL Vertical Scale: 5" per 100' Graphics File Created: 29−Apr−2012 13:42

OP System Version: 18C0−147

SCMT−CB	HFE−4028−IFLEX	PSPT	HFE−4028−IFLEX

<<<SCMT Cement Evaluation Information Summary>>>

Sonde Serial Number	SCMS−CB 8317		
Current Casing Size	4.50000 IN		
Casing Weight	11.6000 LB/F		
Expected CBL Amplitude in Free Pipe Section	80 MV	Minimum Sonic Amplitude	0.573313 MV (100% Cement) 1.53933 MV (80% Cement)
		MAP Minimum Sonic Amplitude	4.27928 MV (100% Cement) 8.03705 MV (80% Cement)
Master Calibration (Normalization)		Before Calibration (Adjustment)	
Date of Master Calibration	6−MAR−2012		
CBL Correction Factor	0.0689824	CBL Adjustment Factor (CBAF)	1.0
MAP 1 Correction Factor	0.107072	MAP Adjustment Factor (MPAF)	1.0
MAP 2 Correction Factor	0.128400		
MAP 3 Correction Factor	0.135634		
MAP 4 Correction Factor	0.115019		
MAP 5 Correction Factor	0.108562		
MAP 6 Correction Factor	0.113017		
MAP 7 Correction Factor	0.117769		
MAP 8 Correction Factor	0.123422		

Parameters

DLIS Name	Description	Value	
	SCMT−CB: Slim Cement Mapping Tool, 1−11/16 OD		
BILI	Bond Index Level for Zone Isolation	0.8	
CB3D	SCMT CBL 3 ft Peak Detection Mode	PEAK	
CB3G	SCMT CBL 3 ft Peak Detection T0_Delay and Noise Gate	228.052	US
CB3T	SCMT CBL 3 ft Fixed Threshold Level	20	MV
CB5D	SCMT CBL 5 ft Peak Detection Mode	PEAK	

CB5G	SCMT CBL 5 ft Peak Detection T0_Delay and Noise Gate	342.052	US
CB5T	SCMT CBL 5 ft Fixed Threshold Level	20	MV
CBLG	CBL Gate Width	40	US
CBRA	CBL LQC Reference Amplitude in Free Pipe	80	MV
CMCF	CBL Cement Type Compensation Factor	1	
CMTC	SCMT Slow Channel Multiplexer Mode	SCAN	
CMTM	SCMT Operating Mode	LOG	
CSCS	SCMT Slow Channel Index	VCC	
CTHI	Casing Thickness	0.255617	IN
DTF	Delta−T Fluid	203	US/F
FATT	Acoustic Attenuation due to Fluid	0	DB/F
FCF	CBL Fluid Compensation Factor	0.992742	
GOBO	Good Bond	1.53933	MV
MAPD	SCMT MAP Peak Detection Mode	PEAK	
MAPG	SCMT MAP Peak Detection T0_Delay and Noise Gate	171.052	US
MAPT	SCMT MAP Fixed Threshold Level	30	MV
MATT	Maximum Attenuation	16.5449	DB/F
MCCF	MAP Cement Type Compensation Factor	1	
MCI	Minimum Cemented Interval for Isolation	1.25	FT
MMSA	MAP Minimum Sonic Amplitude	4.27928	MV
MSA	Minimum Sonic Amplitude	0.573313	MV
PEDE	Peak Detection On/Off Switch in Playback	OFF	
VDLG	VDL Manual Gain	5	
ZCMT	Acoustic Impedance of Cement	6.8	MRAY
System and Miscellaneous			
CSIZ	Current Casing Size	4.500	IN
CWEI	Casing Weight	11.60	LB/F
DFD	Drilling Fluid Density	8.40	LB/G
DORL	Depth Offset for Repeat Analysis	0.0	FT
TD	Total Depth	−50000	FT

Output DLIS Files

DEFAULT	SCMT_PSP_005LUP	FN:4	PRODUCER	29−Apr−2012 13:42	

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REPEAT ANALYSIS

MAXIS Field Log

Company: ENCANA OIL & GAS (USA) INC. **Well: N33 QUAD 4 & 5**

Input DLIS Files

DEFAULT	SCMT_PSP_004PUP	FN:3	PRODUCER	29−Apr−2012 13:42	11876.5 FT	11566.5 FT

Output DLIS Files

DEFAULT	SCMT_PSP_005LUP	FN:4	PRODUCER	29−Apr−2012 13:42	

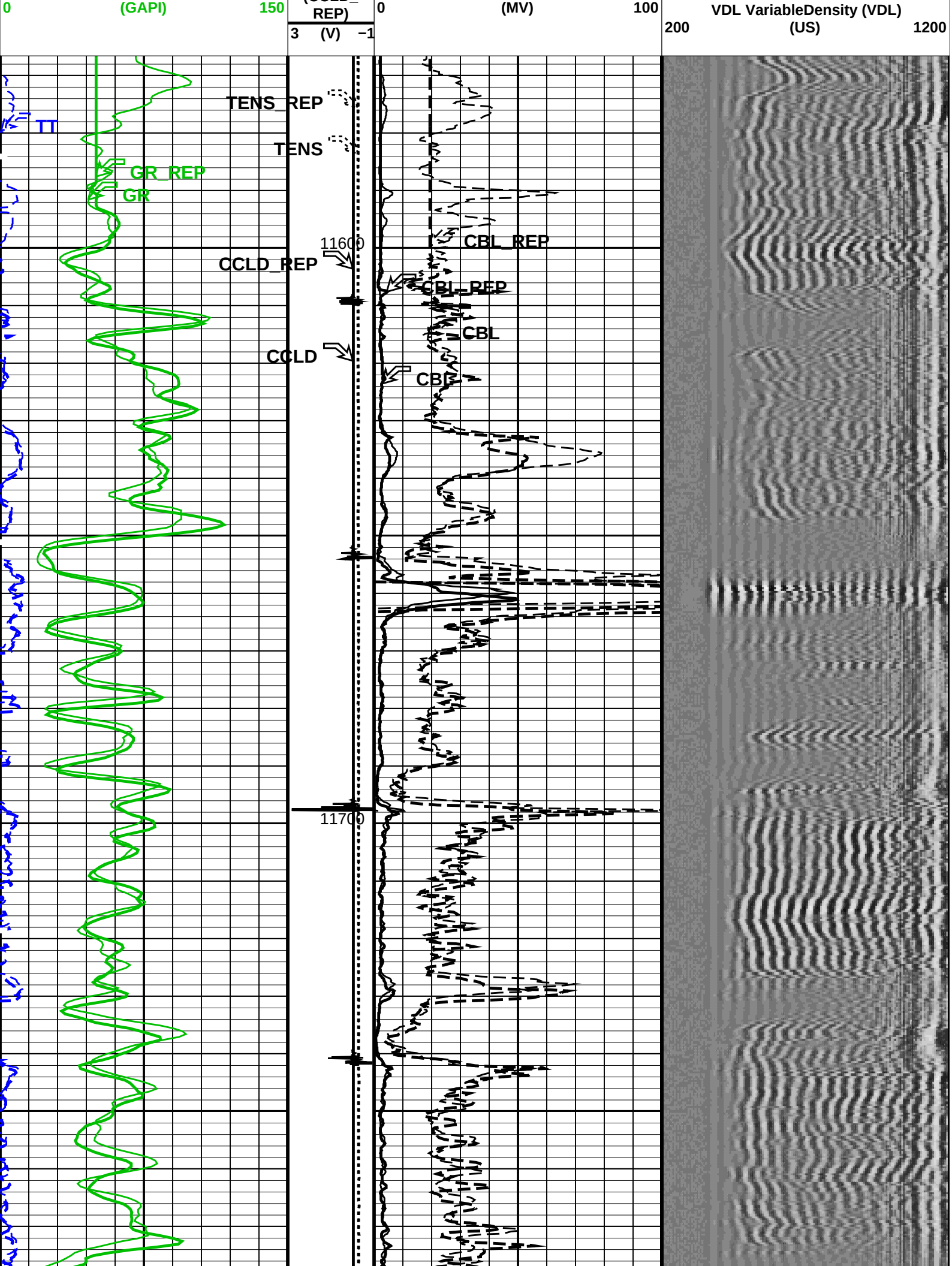
OP System Version: 18C0−147

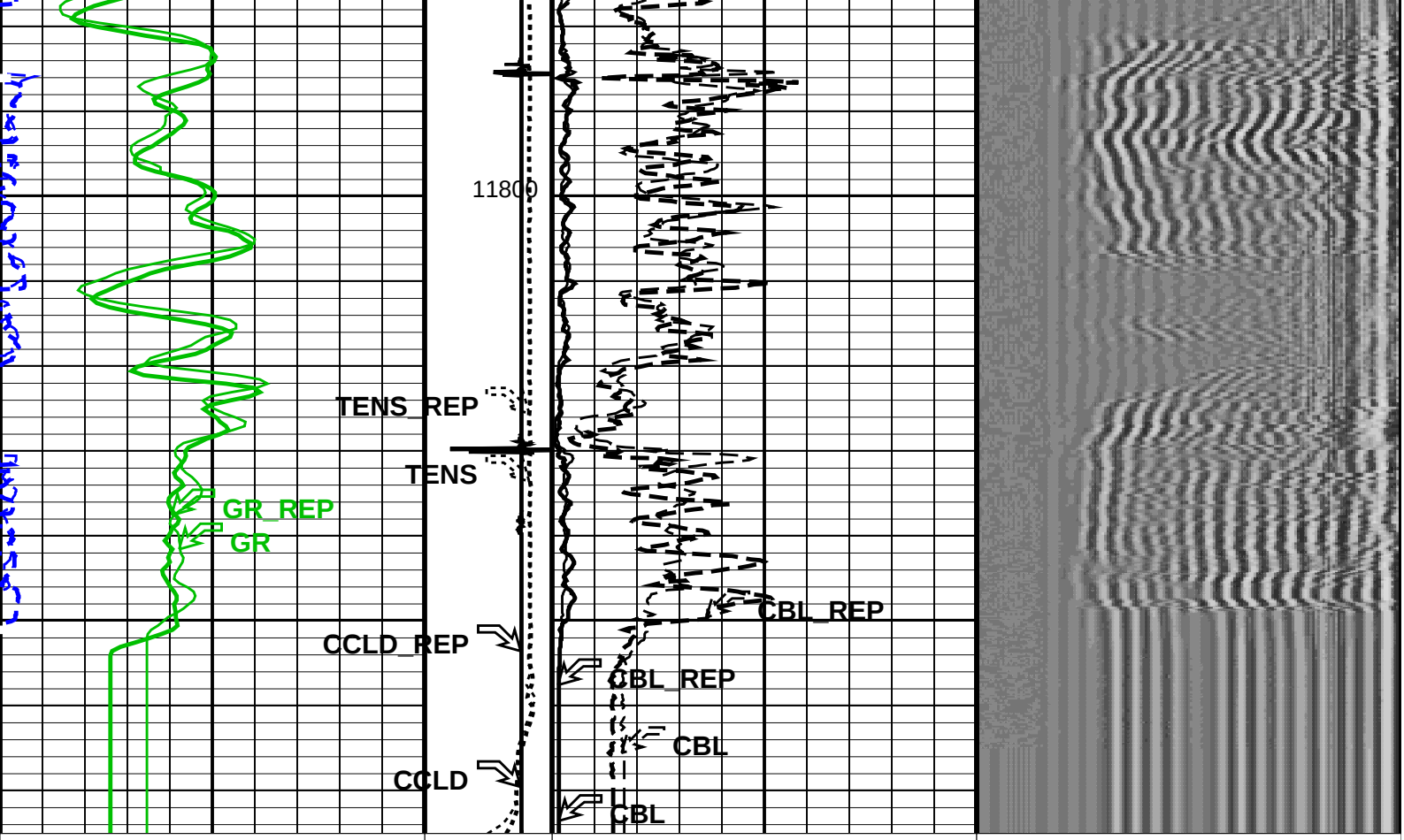
SCMT−CB	HFE−4028−IFLEX	PSPT	HFE−4028−IFLEX

PIP SUMMARY

Time Mark Every 60 S

TT_REP Curve (TT_REP) 260 (US) 160	TENS_REP Curve (TENS_REP) (LBF) 0 2000	CBL_1_REP Curve (CBL_REP) 0 (MV) 10	
GR_REP Curve (GR_REP)	CCLD_REP Curve (CCLD	CBL_REP Curve (CBL_REP)	Min Amplitude Max


0
(GAPI)
150
REP)
3
(V)
−1
0
(MV)
100
VDL VariableDensity (VDL)
200
(US)
1200
TT
GR_REP
GR
TENS_REP
TENS
CCLD_REP
CCLD
11600
11700
CBL_REP
CBL_REP
CBL
CBL



GR_REP Curve (GR_REP)	CCLD_REP Curve (CCLD_REP)	CBL_REP Curve (CBL_REP)	Min Amplitude Max
0 (GAPI) 150	3 (V) −1	0 (MV) 100	VDL VariableDensity (VDL) 200 (US) 1200
TT_REP Curve (TT_REP)	TENS_REP Curve (TENS_REP) (LBF)	CBL_1_REP Curve (CBL_REP)	
260 (US) 160	0 2000	0 (MV) 10	

PIP SUMMARY

Time Mark Every 60 S

Format: CBL_VDL_REP Vertical Scale: 5" per 100' Graphics File Created: 29−Apr−2012 13:42

OP System Version: 18C0−147

SCMT−CB	HFE−4028−IFLEX	PSPT	HFE−4028−IFLEX

<<<SCMT Cement Evaluation Information Summary>>>

Sonde Serial Number	SCMS−CB 8317		
Current Casing Size	4.50000 IN		
Casing Weight	11.6000 LB/F		
Expected CBL Amplitude in Free Pipe Section	80 MV	Minimum Sonic Amplitude	0.573313 MV (100% Cement) 1.53933 MV (80% Cement)
		MAP Minimum Sonic Amplitude	4.27928 MV (100% Cement) 8.03705 MV (80% Cement)
Master Calibration (Normalization)		Before Calibration (Adjustment)	
Date of Master Calibration	6−MAR−2012		
CBL Correction Factor	0.0689824	CBL Adjustment Factor (CBAF)	1.0

MAP 1 Correction Factor	0.107072	MAP Adjustment Factor (MPAF)	1.0
MAP 2 Correction Factor	0.128400		
MAP 3 Correction Factor	0.135634		
MAP 4 Correction Factor	0.115019		
MAP 5 Correction Factor	0.108562		
MAP 6 Correction Factor	0.113017		
MAP 7 Correction Factor	0.117769		
MAP 8 Correction Factor	0.123422		

Parameters

DLIS Name	Description	Value	
	SCMT−CB: Slim Cement Mapping Tool, 1−11/16 OD		
BILI	Bond Index Level for Zone Isolation	0.8	
CB3D	SCMT CBL 3 ft Peak Detection Mode	PEAK	
CB3G	SCMT CBL 3 ft Peak Detection T0_Delay and Noise Gate	228.052	US
CB3T	SCMT CBL 3 ft Fixed Threshold Level	20	MV
CB5D	SCMT CBL 5 ft Peak Detection Mode	PEAK	
CB5G	SCMT CBL 5 ft Peak Detection T0_Delay and Noise Gate	342.052	US
CB5T	SCMT CBL 5 ft Fixed Threshold Level	20	MV
CBLG	CBL Gate Width	40	US
CBRA	CBL LQC Reference Amplitude in Free Pipe	80	MV
CMCF	CBL Cement Type Compensation Factor	1	
CMTC	SCMT Slow Channel Multiplexer Mode	SCAN	
CMTM	SCMT Operating Mode	LOG	
CSCS	SCMT Slow Channel Index	VCC	
CTHI	Casing Thickness	0.255617	IN
DTF	Delta−T Fluid	203	US/F
FATT	Acoustic Attenuation due to Fluid	0	DB/F
FCF	CBL Fluid Compensation Factor	0.992742	
GOBO	Good Bond	1.53933	MV
MAPD	SCMT MAP Peak Detection Mode	PEAK	
MAPG	SCMT MAP Peak Detection T0_Delay and Noise Gate	171.052	US
MAPT	SCMT MAP Fixed Threshold Level	30	MV
MATT	Maximum Attenuation	16.5449	DB/F
MCCF	MAP Cement Type Compensation Factor	1	
MCI	Minimum Cemented Interval for Isolation	1.25	FT
MMSA	MAP Minimum Sonic Amplitude	4.27928	MV
MSA	Minimum Sonic Amplitude	0.573313	MV
PEDE	Peak Detection On/Off Switch in Playback	OFF	
VDLG	VDL Manual Gain	5	
ZCMT	Acoustic Impedance of Cement	6.8	MRAY
	System and Miscellaneous		
CSIZ	Current Casing Size	4.500	IN
CWEI	Casing Weight	11.60	LB/F
DFD	Drilling Fluid Density	8.40	LB/G
DORL	Depth Offset for Repeat Analysis	0.0	FT
TD	Total Depth	−50000	FT

Input DLIS Files

DEFAULT	SCMT_PSP_004PUP	FN:3	PRODUCER	29−Apr−2012 13:42	11876.5 FT	11566.5 FT

Output DLIS Files

DEFAULT	SCMT_PSP_005LUP	FN:4	PRODUCER	29−Apr−2012 13:42

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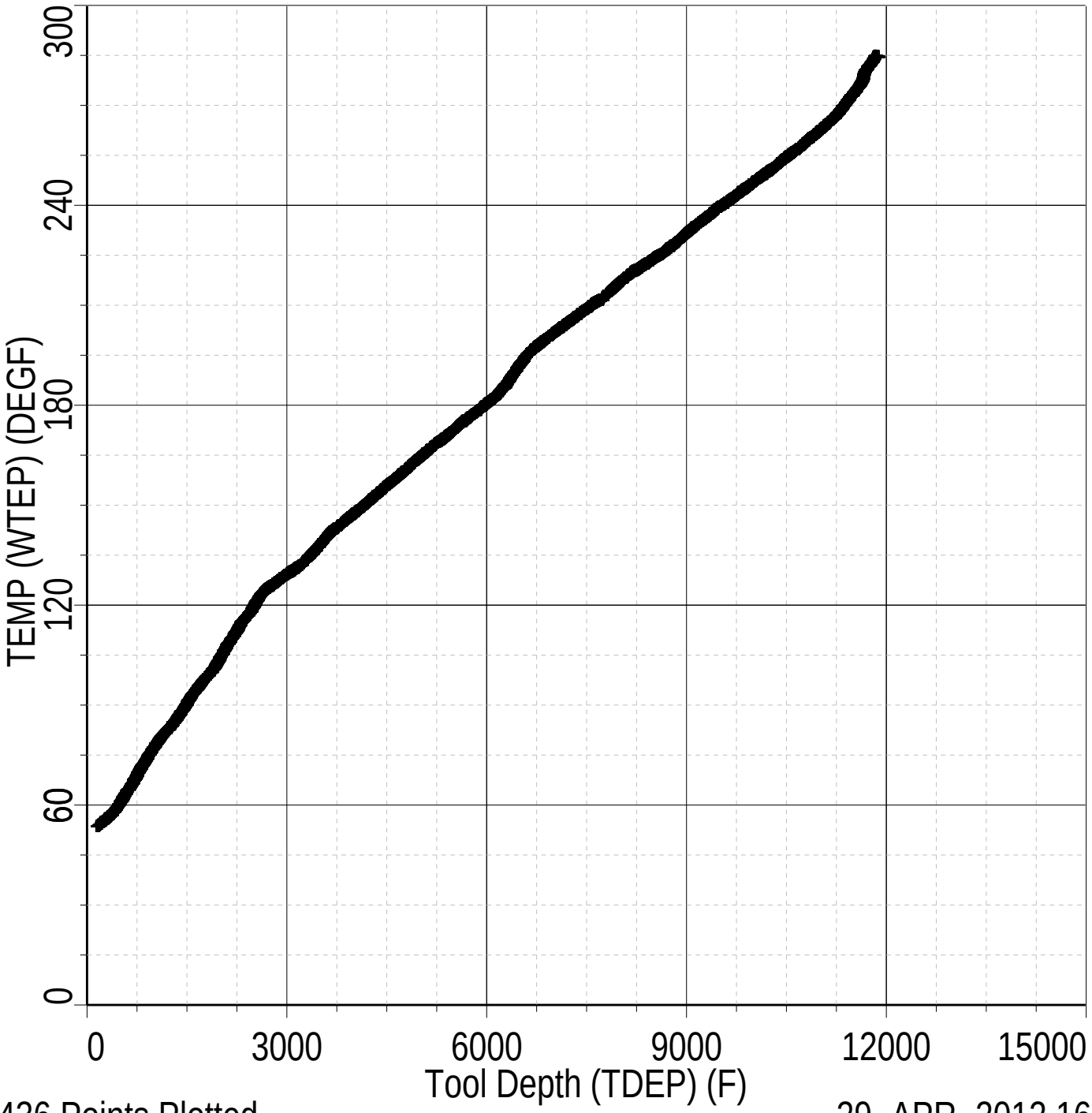
TEMPERATURE PLOT

MAXIS Field Log

Index: 11875.0 – 157.5 FT

Index: 11875.0 - 137.5 FT



23436 Points Plotted

29-APR-2012 16:37

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COEFFICIENTS

MAXIS Field Log

Client:	**ENCANA OIL & GAS (USA) INC.**	**Tool:**	**PSP**
Field:	**NORTH PARACHUTE**	**Sub Type:**	**PBMS**
Well:	**N33 QUAD 4 & 5**	**Sensor:**	**Clock Model**
Run date:	**29-Apr-2012**		

PBMS Digitalization Clock

Sonde Serial NB	
Sensor Serial NB	**3779**
Calib Date ddmmyy	**090107**
Matrix Size	**16**
Coeff CRC	**D285**

Clock Coeff

	Temp**0	Temp**1	Temp**2
Temp0**	**−.210501098404E+03**	**−.537713340627E+01**	**−.752421519422E−01**

	Temp**3	Temp**4	Temp**5
Temp0**	**+.630273975887E−03**	**+.266728381738E−05**	**0.0**

Client:	**ENCANA OIL & GAS (USA) INC.**	**Tool:**	**PSP**
Field:	**NORTH PARACHUTE**	**Sub Type:**	**PBMS**
Well:	**N33 QUAD 4 & 5**	**Sensor:**	**Sapphire**
Run date:	**29−Apr−2012**		

PBMS Sapphire 10kPsi Gauge

Sonde Serial NB	**COEFFICIENTS FOR SAPPHIRE PBMS−A.3779 S/N:**
Sensor Serial NB	**3779**
Calib Date ddmmyy	**090107**
Matrix Size	**66**
Coeff CRC	**4C82**

Pres Coeff

	Tt**0	Tt**1	Tt**2
Tp0**	**−.611876617639E+04**	**+.471061007964E+04**	**−.216447354932E+04**
Tp1**	**+.371836126905E+04**	**−.234756196935E+04**	**+.129149325686E+04**
Tp2**	**+.193143980957E+02**	**−.189348218853E+01**	**−.341812471126E+01**
Tp3**	**−.568815065386E+01**	**+.200079683569E+01**	**0.0**
Tp4**	**0.0**	**0.0**	**0.0**
Tp5**	**0.0**	**0.0**	**0.0**

	Tt**3	Tt**4	Tt**5

Tp**0	+.380249508124E+03	−.247683004908E+02	0.0
Tp**1	−.227135245080E+03	+.146352372057E+02	0.0
Tp**2	0.0	0.0	0.0
Tp**3	0.0	0.0	0.0
Tp**4	0.0	0.0	0.0
Tp**5	0.0	0.0	0.0

PBMS Sapphire 10kPsi Gauge

Sonde Serial NB	:
Sensor Serial NB	3779
Calib Date ddmmyy	090107
Matrix Size	66
Coeff CRC	C39E

Temp Coeff

	Tp**0	Tp**1	Tp**2
Tt**0	−.278275571347E+03	+.251216271916E+01	−.820715649824E+00
Tt**1	+.598349067015E+02	−.107326373545E+01	+.652890183203E−01
Tt**2	+.109160002120E+02	+.262812193556E+00	−.450134240377E−02
Tt**3	−.673302171285E+00	−.213772918779E−01	0.0
Tt**4	0.0	0.0	0.0
Tt**5	0.0	0.0	0.0

	Tp**3	Tp**4	Tp**5
Tt**0	+.151507143209E+00	−.592670012996E−02	0.0
Tt**1	+.127486538512E−01	−.437897076104E−02	0.0
Tt**2	0.0	0.0	0.0
Tt**3	0.0	0.0	0.0
Tt**4	0.0	0.0	0.0
Tt**5	0.0	0.0	0.0

Client:	ENCANA OIL & GAS (USA) INC.	Tool:	PSP
Field:	NORTH PARACHUTE	Sub Type:	PBMS
Well:	N33 QUAD 4 & 5	Sensor:	GR
Run date:	29−Apr−2012		

PBMS Gamma Ray

PBMS Gamma Ray

Sonde Serial NB	RESISTORS FOR GR SENSOR N.34552,TOOL PBMS−AA3779. SENSOR S/N:
Sensor Serial NB	34552
Calib Date ddmmyy	030606
Matrix Size	12
Coeff CRC	3AE5

GR HV Rt

	Rt**0	Rt**1
Rt**0	+.200000000000e+04	+.214000000000e+04

Client:	ENCANA OIL & GAS (USA) INC.	Tool:	PSP
Field:	NORTH PARACHUTE	Sub Type:	PBMS
Well:	N33 QUAD 4 & 5	Sensor:	WellTemp RTD
Run date:	29−Apr−2012		

PBMS RTD Well Thermometer

Sonde Serial NB	COEFFICIENTS FOR RTD THERMOMETER PBMS−A.3779 S/N:
Sensor Serial NB	3779
Calib Date ddmmyy	090107
Matrix Size	16
Coeff CRC	3846

WTemp Coeff

	Tt**0	Tt**1	Tt**2
Tt**0	+.492135102627E+02	−.278827553804E+03	+.142867554561E+03

	Tt**3	Tt**4	Tt**5
Tt**0	−.233378392336E+02	+.145553494493E+01	0.0

Company: **ENCANA OIL & GAS (USA) INC.**

Schlumberger

Well: **SG 8508E−21 N22 496**
Field: **STORY GULCH**
County: **GARFIELD**
State: **COLORADO**

CEMENT BOND LOG
CBL − VDL
GAMMA RAY − CCL