Schlumberger

Company: Southern California Gas Company

Well: Standard Sesnon 4B

Field: Aliso Canyon

County: Los Angeles State: California

County: Los Angeles
Field: Aliso Canyon
Location: North: 34.314788
Well: Standard Sesnon 4B
Company: Southern California Gas Company

Cement Bond Log

Variable Density Log

Gamma Ray - CCL

Location:				
North: 34.314788		Elev.:	K.B.	2910.50 ft
West: 118.571823			G.L.	2888.00 ft
NAD 83			D.F.	
Permanent Datum:	Ground Level	Elev.:	2888.00 f	
Log Measured From:	Kelly Bushing	22.50 ft	above Perm.Datum	
Drilling Measured From:	Kelly Bushing			

API Serial No.	Section:	Township:	Range:
037-30460	27	3N	16W

Logging Date		02-Oct-2015		03-Oct-2015
Run Number		Two		Two
Depth Driller		8892.00 ft		8892.00 ft
Schlumberger Depth		8760.00 ft		8890.00 ft
Bottom Log Interval		8760.00 ft		8887.00 ft
Top Log Interval		28.00 ft		8760.00 ft
Casing Fluid Type		PolyTek+		PolyTek+
Salinity		15900 ppm		15900 ppm
Density		9 lbm/gal		9 lbm/gal
Fluid Level		28.00 ft		28.00 ft
BIT/CASING/TUBING STRING				
Bit Size		14.00 in		14.00 in
From		1436.00 ft		1436.00 ft
To		8760.00 ft		8890.00 ft
Casing/Tubing Size		9.625 in		9.625 in
Weight		47 lbm/ft		47 lbm/ft
Grade		N/A		N/A
From		22.50 ft		22.50 ft
To		8887.00 ft		8887.00 ft
Max Recorded Temperatures		165.6 degF		173.4 degF
Logger on Bottom	Time	02-Oct-2015 22:08:00		03-Oct-2015 14:19:00
Unit Number	Location:	2222 Long Beach		2222 Long Beach
Recorded By		Benjamin Kohner		Benjamin Kohner
Witnessed By		Kevin Katolas		Kevin Katolas

Disclaimer

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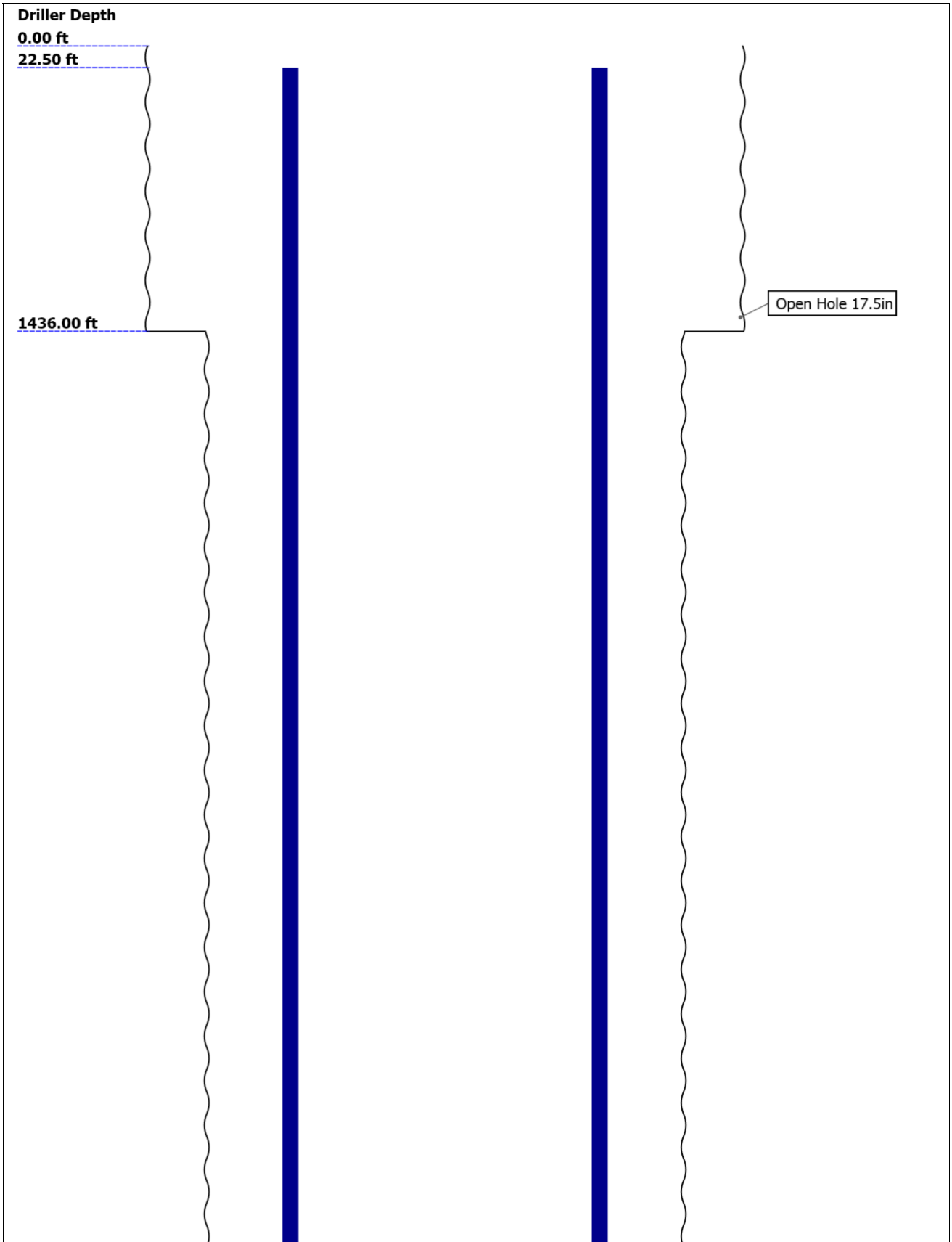
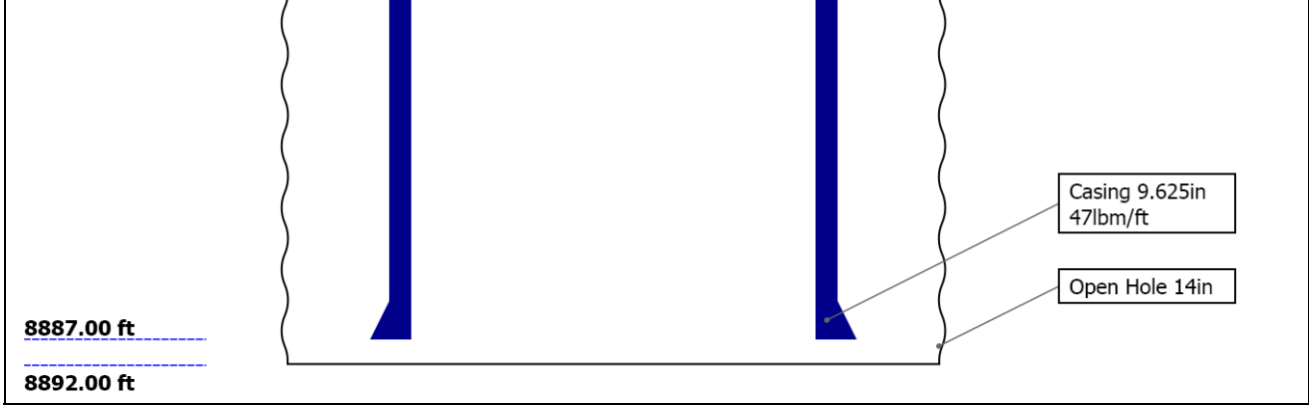
Well Sketch





Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	17.5	14				
Top Driller (ft)	0	1436				
Top Logger (ft)	0	1436				
Bottom Driller (ft)	1436	8892				
Bottom Logger (ft)	1436	8890				
Casing						
Size (in)	9.625					
Weight (lbm/ft)	47					
Inner Diameter (in)	8.681					
Grade	N/A					
Top Driller (ft)	22.5					
Top Logger (ft)	22.5					
Bottom Driller (ft)	8887					
Bottom Logger (ft)	8887					

Remarks and Equipment Summary

Rig: Ensign 587

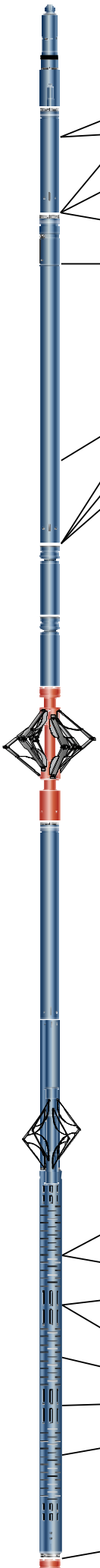
Toolstring ran as per toolsketch.

Log correlated to Schlumberger Platform Express dated 9/25/15.

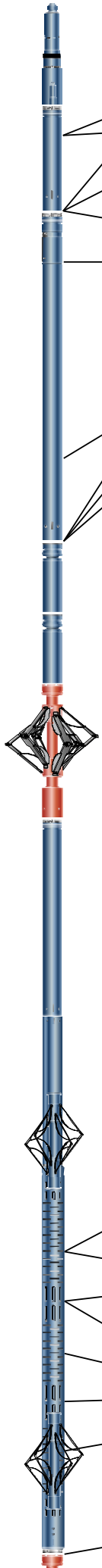
Two: Remarks	Two: Remarks
Two centralizers on USIS and two CME-Y used to centralize ultrasonic tool.	Two centralizers on USIS and one CME-Y used to centralize ultrasonic tool.
One CME-Y and two inline centralizers used to centralize CBL tool.	Two CME-Y and two inline centralizers used to centralize CBL tool.
USIT logged in 5 deg, 0.6 inch working mode.	Could not get to bottom in previous run with USRS-C (OD=6.69"). Ran back in with USRS-B (OD=5.18") and got to bottom.
ICE processing used with FVEL=AUTO, ZMUD=Free Pipe Adjustment done from 1400-1420 in gas pocket (Zannular=.01).	ICE processing used with FVEL=AUTO, ZMUD=Free Pipe Adjustment done from 1400-1420 in gas pocket (Zannular=.01).
Max recorded temperature: 165.6 degF.	Max. temperature: 173.4 degF.
Cement information: Lead 13.5 ppg Class G ETOL: 22 ft. Tail: 14.8 ppg Class G ETOT: 6,087 ft. Preflush: 8.5 ppg mud flush.	Cement information: Lead 13.5 ppg Class G ETOL: 22 ft. Tail: 14.8 ppg Class G ETOT: 6,087 ft. Preflush: 8.5 ppg mud flush.
	Several casing collapses observed from 8750-8860'.
Schlumberger crew: S. Alvarez, J. Chumley.	Schlumberger crew: S. Alvarez, J. Chumley.
Thank you for choosing Schlumberger!	Thank you for choosing Schlumberger!

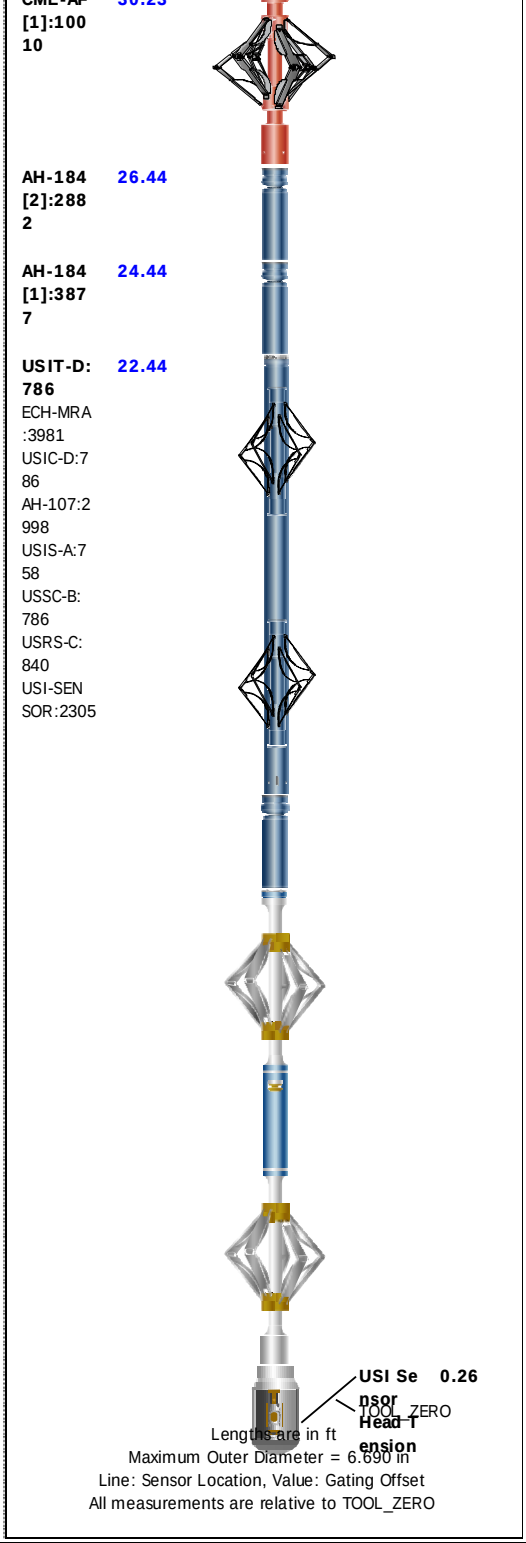
Two: Toolstring	Two: Toolstring

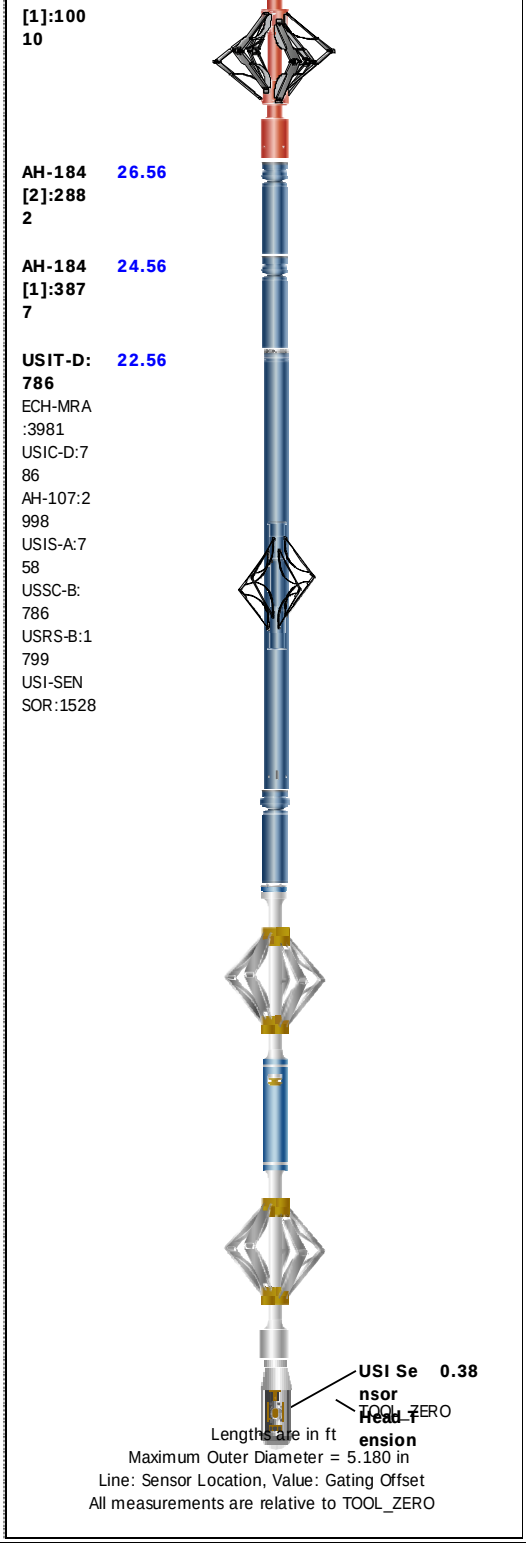
Equip name	Length	MP name	Offset
		Electrical Release	
LEH-QT: 3390 LEH-QT: 3390	73.98		
DTC-H:8577 ECH-KC: 1400 DTC-H:8577	71.07	CTEM	70.17
		HV	0.00
		TelStatus	68.07
		ToolStatus	68.07
HGNS-H:3923 HGNH:4819 NSR-F:5002 NPV-N HACCZ-H:3923 HMCA-H HGNS-H:3923	68.07	Temperature	68.04
		GR	67.33
		CNL Porosity	60.99
		HMCA	58.66
		HGNS	58.66
		Accelerometer	0.00
AH-184 [4]:2985	58.66		
AH-184 [3]:6735	56.66		
CME-AF [2]:5892	54.66		
DSLT-H: 8236 ECH-KH: 8678 DSLC-H: 8236 SLS-E:1206	50.87		
		CBL 3ft	38.4
		Upper-Near	38.4
		VDL 5 ft	37.4
		Upper-Far	37.4
		Delta-T	36.02
		Lower-Far	34.65
		Lower-Near	33.65
		SLS-E	30.23
CME-AF	30.23		



Equip name	Length	MP name	Offset
		Electrical Release	
LEH-QT: 3390 LEH-QT: 3390	74.11		
DTC-H:8577 ECH-KC: 1400 DTC-H:8577	71.19	CTEM	70.29
		HV	0.00
		TelStatus	68.19
		ToolStatus	68.19
HGNS-H:3923 HGNH:4819 NPV-N NSR-F:5002 HGNS-H:3923 HACCZ-H:3923 HMCA-H	68.19	Temperature	68.16
		GR	67.45
		CNL Porosity	61.11
		HMCA	58.78
		HGNS	58.78
		Accelerometer	0.00
AH-184 [4]:2985	58.78		
AH-184 [3]:6735	56.78		
CME-AF [2]:5892	54.78		
DSLT-H: 8236 ECH-KH: 8678 DSLC-H: 8236 SLS-E:1206	50.99		
		CBL 3ft	38.52
		Upper-Near	38.52
		VDL 5 ft	37.52
		Upper-Far	37.52
		Delta-T	36.14
		Lower-Far	34.77
		Lower-Near	33.77
		SLS-E	30.35
CME-AF	30.35		







Depth Summary

	Two	Two	
Depth Measuring Device			
Type	IDW-JA	IDW-JA	
Serial Number	6919	6919	
Calibration Date	25-Mar-2015	25-Mar-2015	
Calibrator Serial Number			
Calibration Cable Type	7-46 PXS	7-46 PXS	
Wheel Correction 1	-3	-3	
Wheel Correction 2	-3	-3	
Tension Device			
Type	CMTD-B/A	CMTD-B/A	
Serial Number	137	137	
Calibration Date	19-Aug-2015	19-Aug-2015	

Calibrator Serial Number	78138A	78138A	
Number of Calibration Points	10	10	
Calibration Root Mean Square Error	18	18	
Calibration Peak Error	32	32	

Logging Cable

Type	7-46P-XS	7-46P-XS	
Serial Number	U713010	U713010	
Length	23010.00 ft	23010.00 ft	
Conveyance Type	Wireline	Wireline	
Rig Type			

Two:Depth Control Parameters		Depth Control Remarks
Log Sequence	Subsequent Trip To the Well	All Schlumberger depth control procedures followed.
Reference Log Name	Platform Express	IDW used as primary depth reference, Z-Chart used as secondary.
Reference Log Run Number	One	
Reference Log Date	25-Sep-2015	
Subsequent Trip Down Log Correction		

Two:Depth Control Parameters		Depth Control Remarks
Log Sequence	Subsequent Trip To the Well	All Schlumberger depth control procedures followed.
Reference Log Name	Platform Express	IDW used as primary depth reference, Z-Chart used as secondary.
Reference Log Run Number	One	
Reference Log Date	25-Sep-2015	
Subsequent Trip Down Log Correction		

Two

Main Pass 5 in = 100 ft

Software Version

Acquisition System	Version
Maxwell	5.2.40401.3100

Computation	Description	Version
CEVAL	Sonic Cement Evaluation Computation Ensemble provides common Parameters and Channels	5.2.40401.3100

SoftwareVersion_Tool	SoftwareVersion_Run Version	SoftwareVersion_Build Version
WAFE-SEC	Synergy SV451EC version 9.10	Synergy SV451EC version 9.10
WAFE-FEC	Synergy SV451EC version 9.10	Synergy SV451EC version 9.10
WAFE-TMDI	Synergy SV451EC version 46.19	Synergy SV451EC version 46.19

Tool Elements	Description	Software Version	Firmware Version
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	5.2.40401.3100	2.0
SLS-E	Sonic Logging Sonde E supports 3'-5'BHC DT and CBL/VDL	5.2.40401.3100	4.0

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Two	Log[5]:Up	Up	17.60 ft	8762.49 ft	02-Oct-2015 10:09:30 PM	03-Oct-2015 1:07:34 PM	ON	12.00 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Southern California Gas Company Well:Standard Sesnon 4B

Two: Log[5]:Up:S016

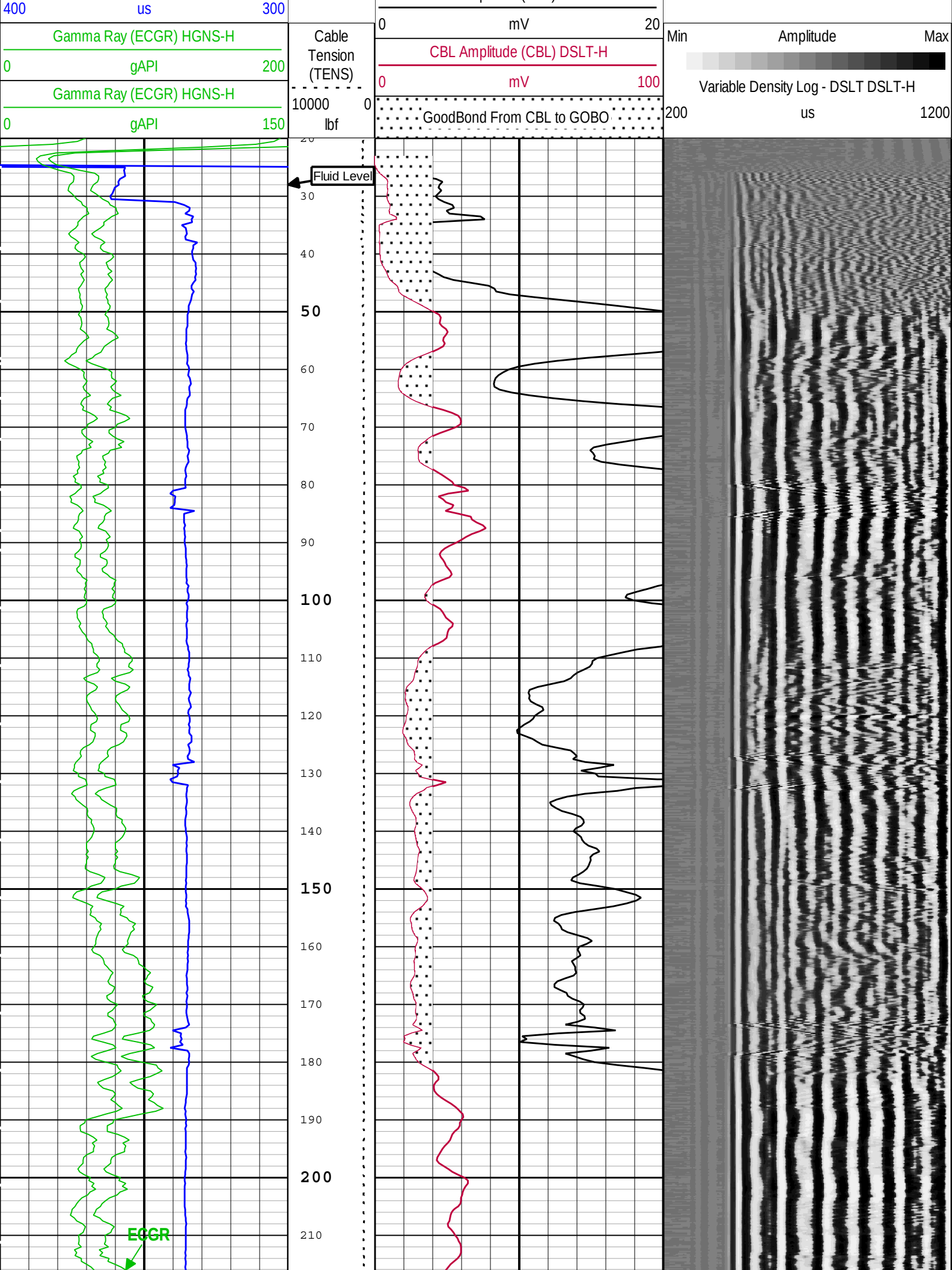
Description: Sonic CBL with VDL Format: Log (Sonic CBL with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 03-Oct-2015 19:22:15

TIME_1900 - Time Marked every 60.00 (s)

BIEP - Bond Index Event Pips DSLT-H

Transit Time for CBL (TT) DSLT-H

CBL Amplitude (CBL) DSLT-H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10000
0
lbf
0
mV
20
CBL Amplitude (CBL) DSLT-H
0
mV
100
GoodBond From CBL to GOBO
Min
Amplitude
Max
Variable Density Log - DSLT DSLT-H
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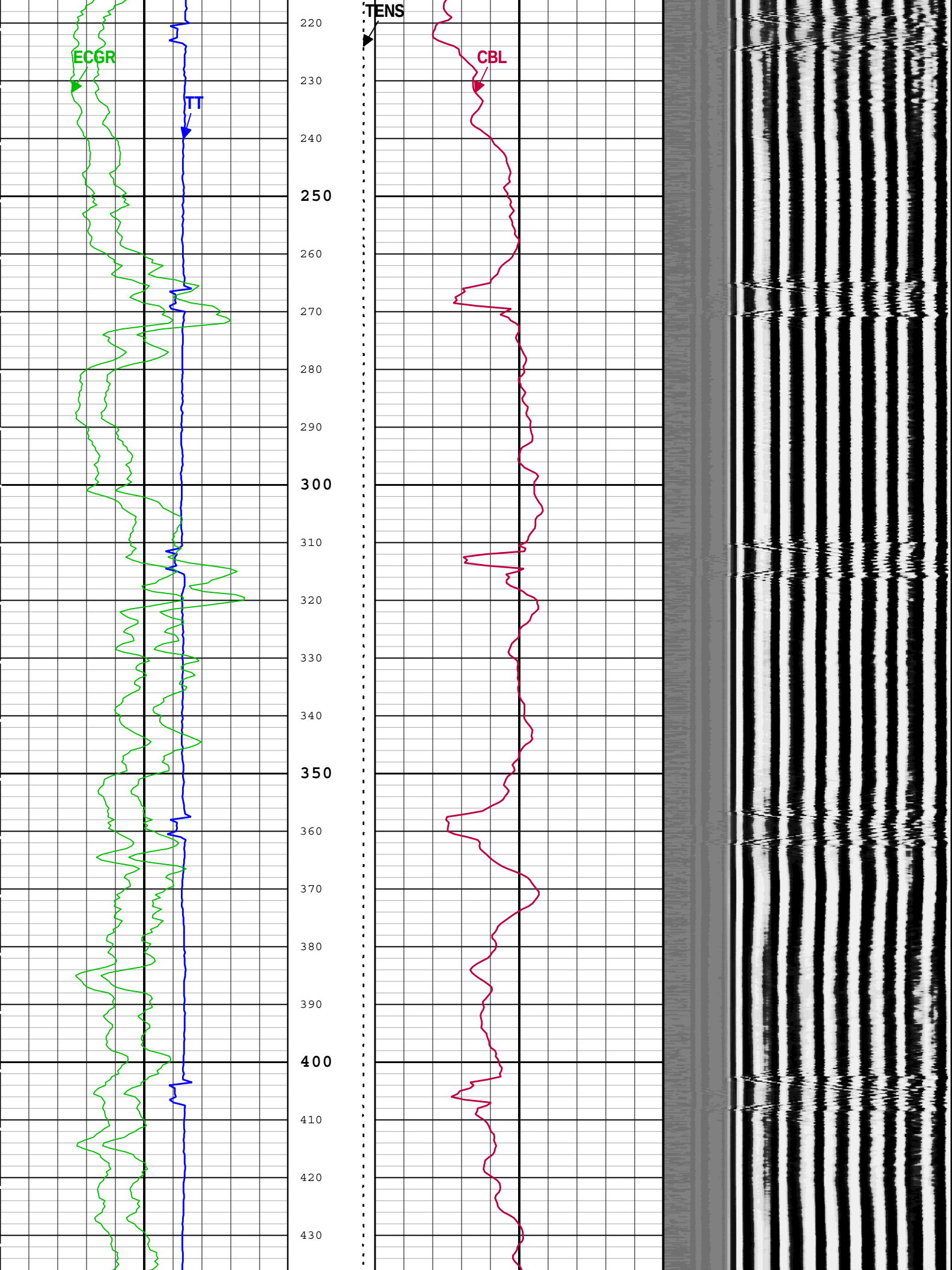
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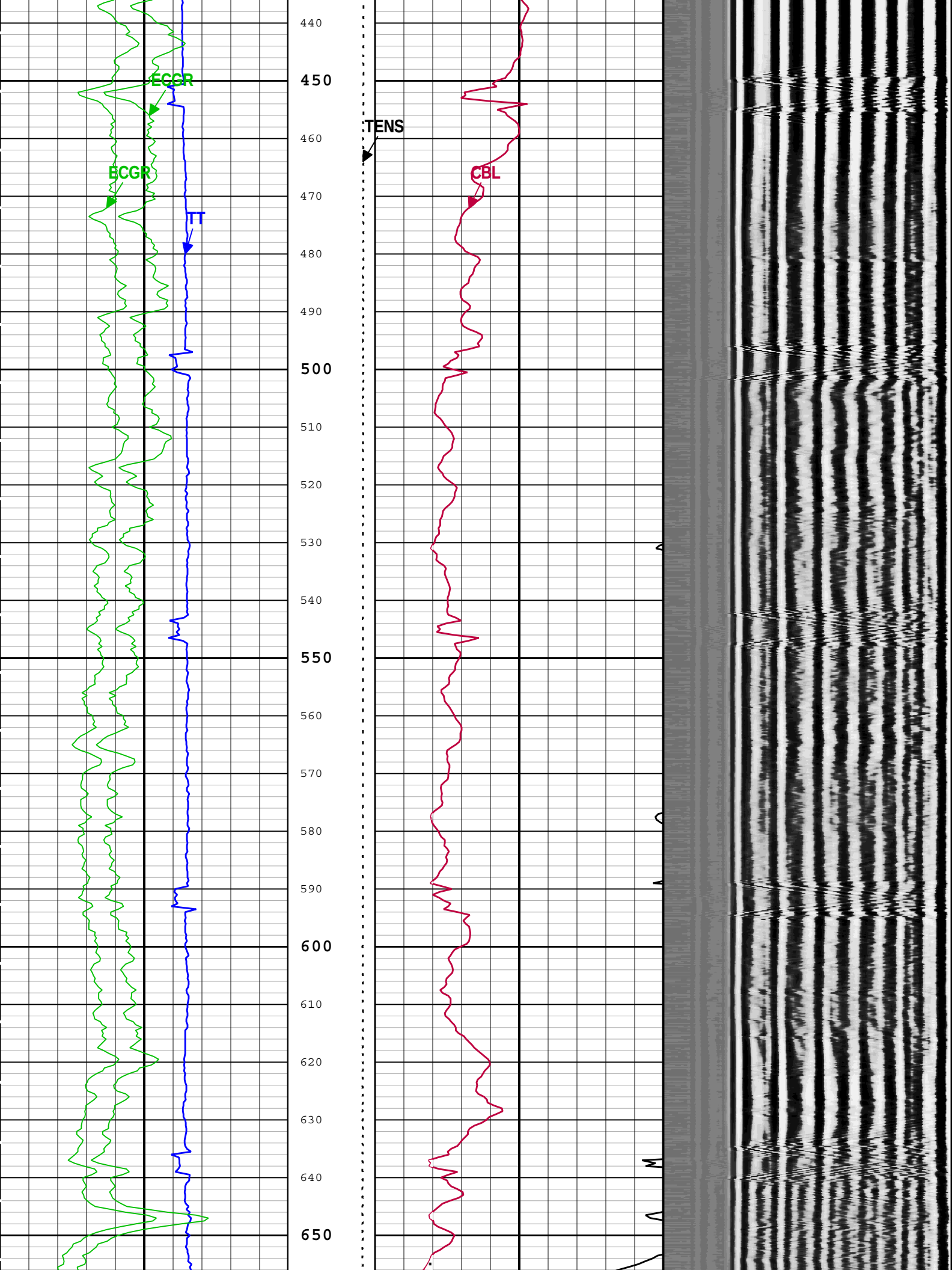
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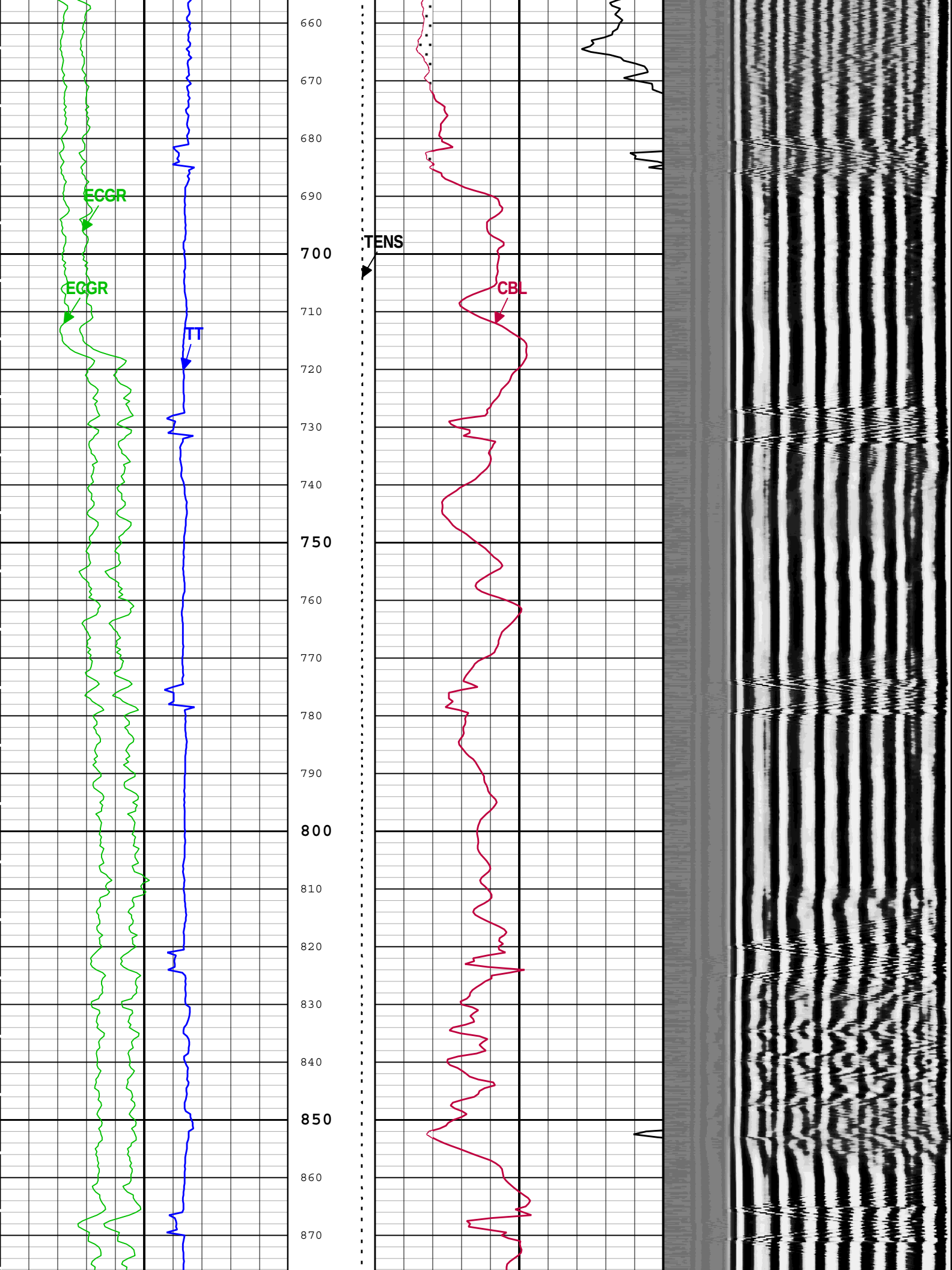
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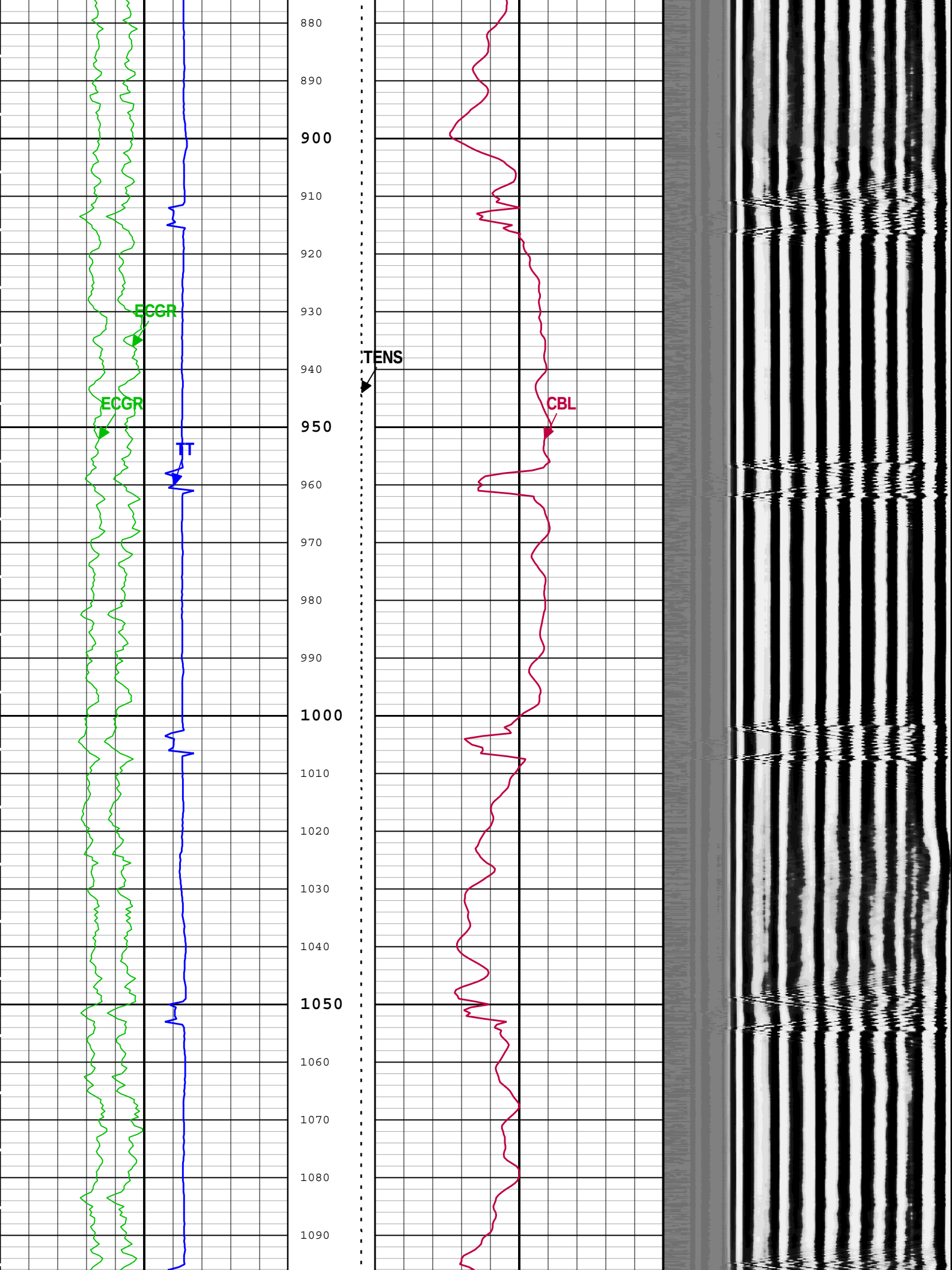
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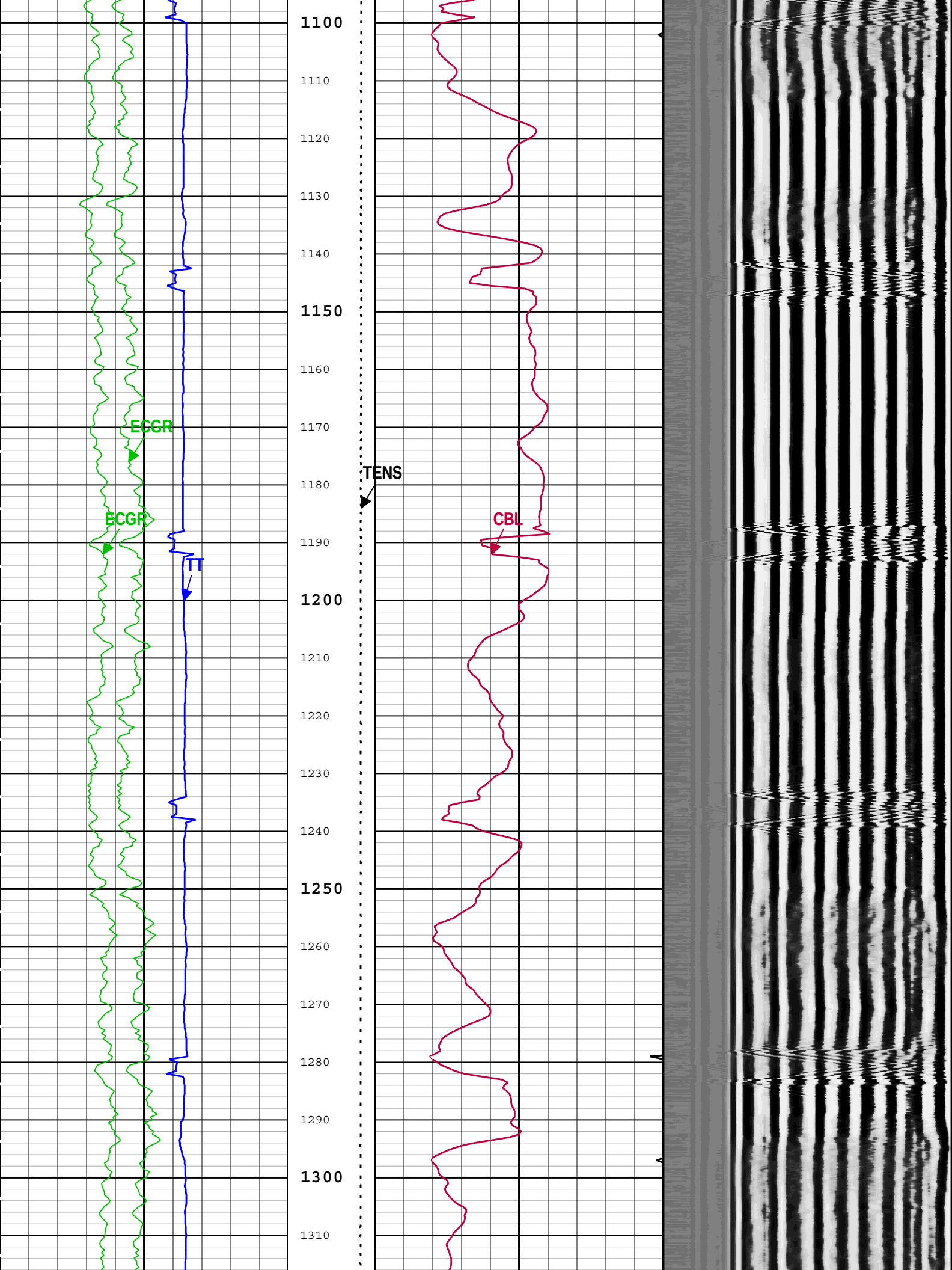
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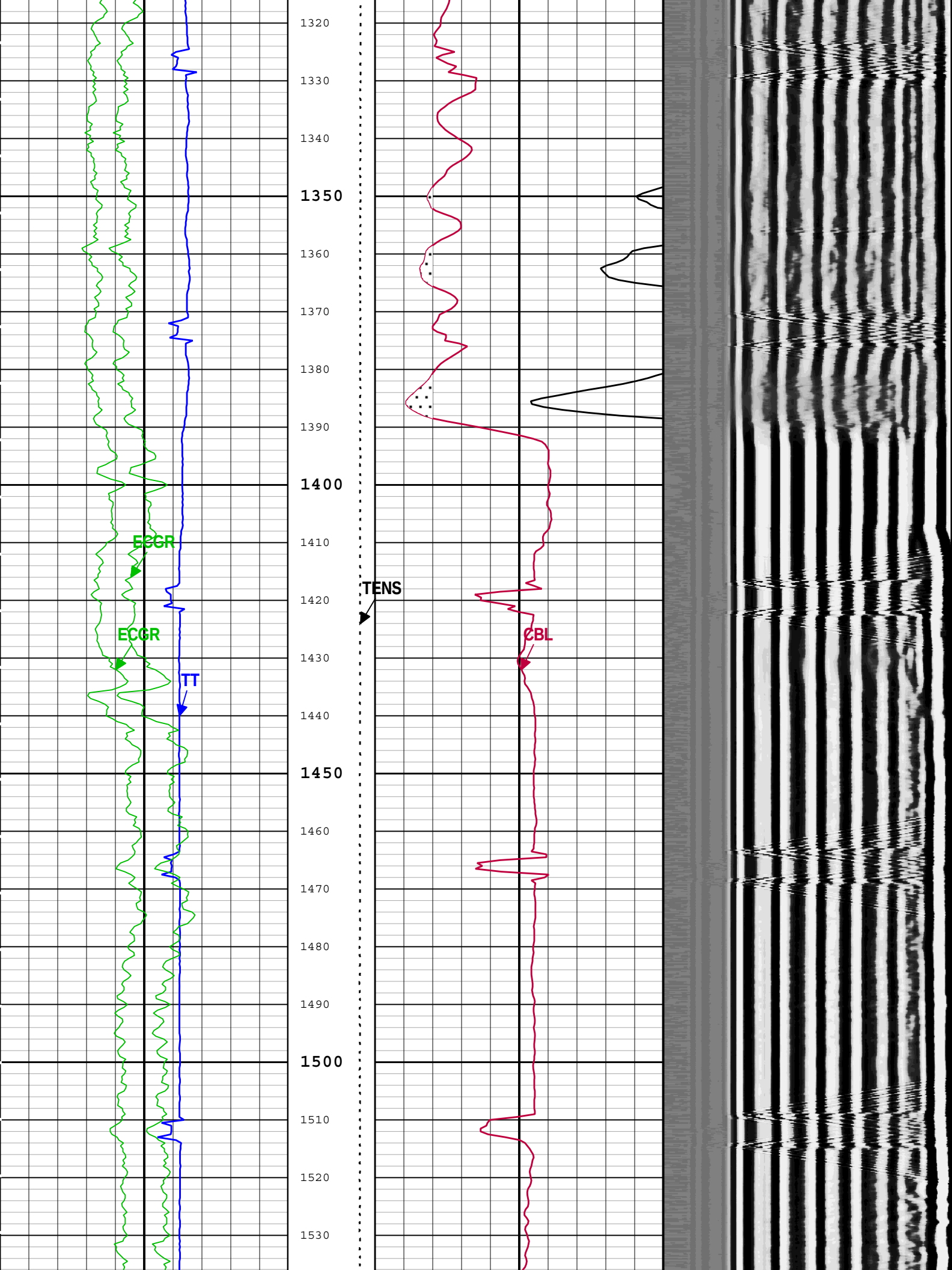
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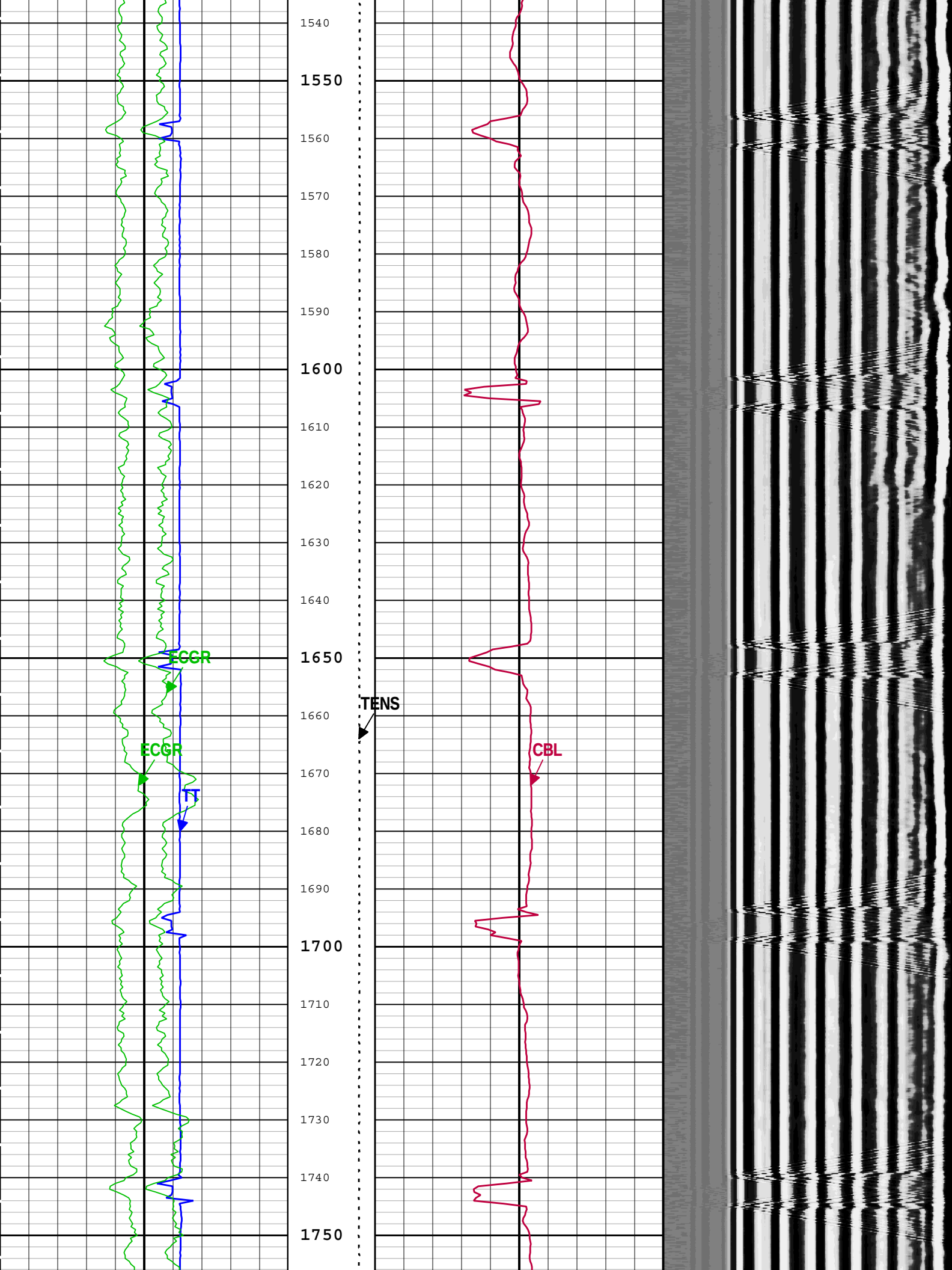
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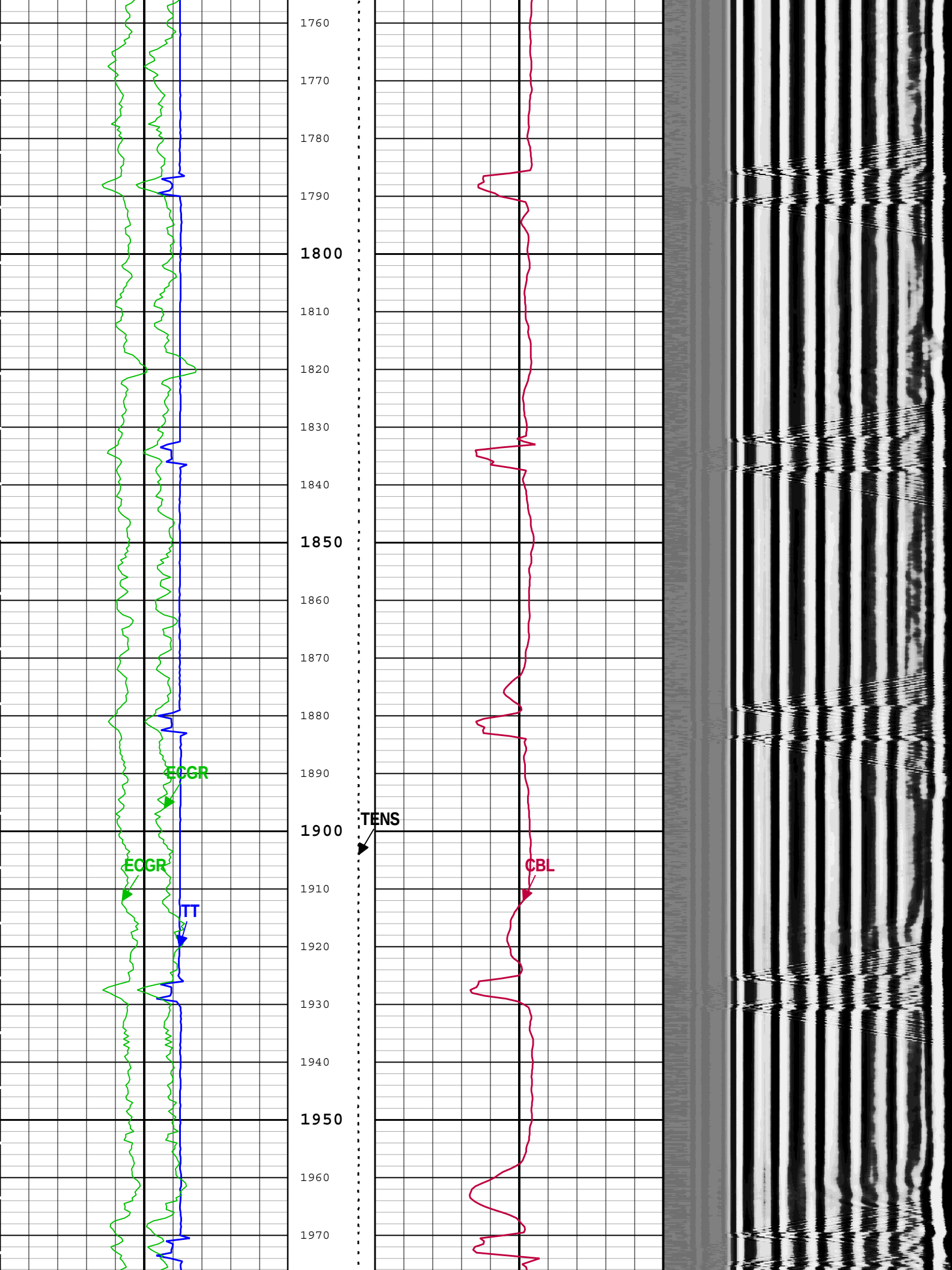
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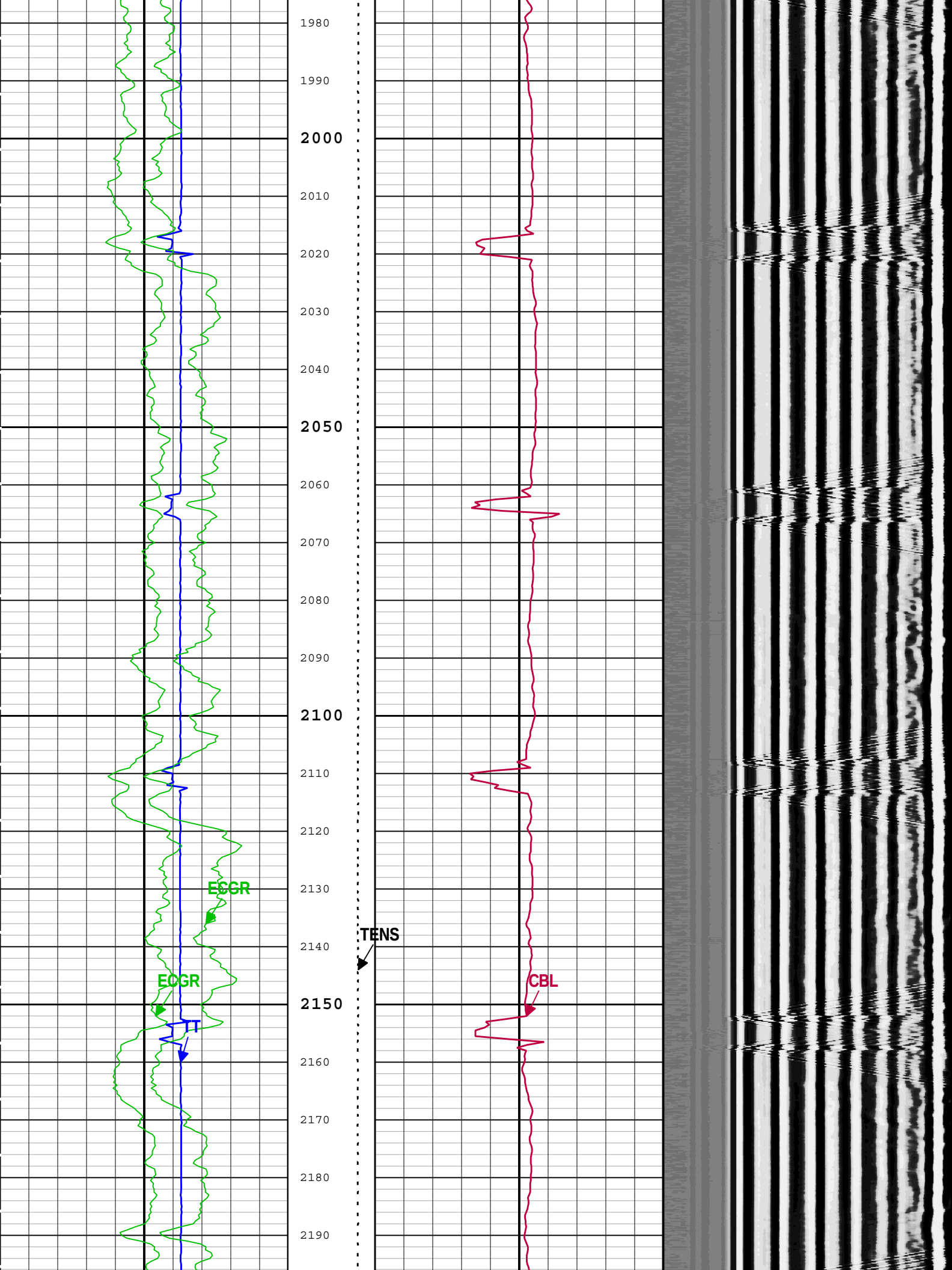
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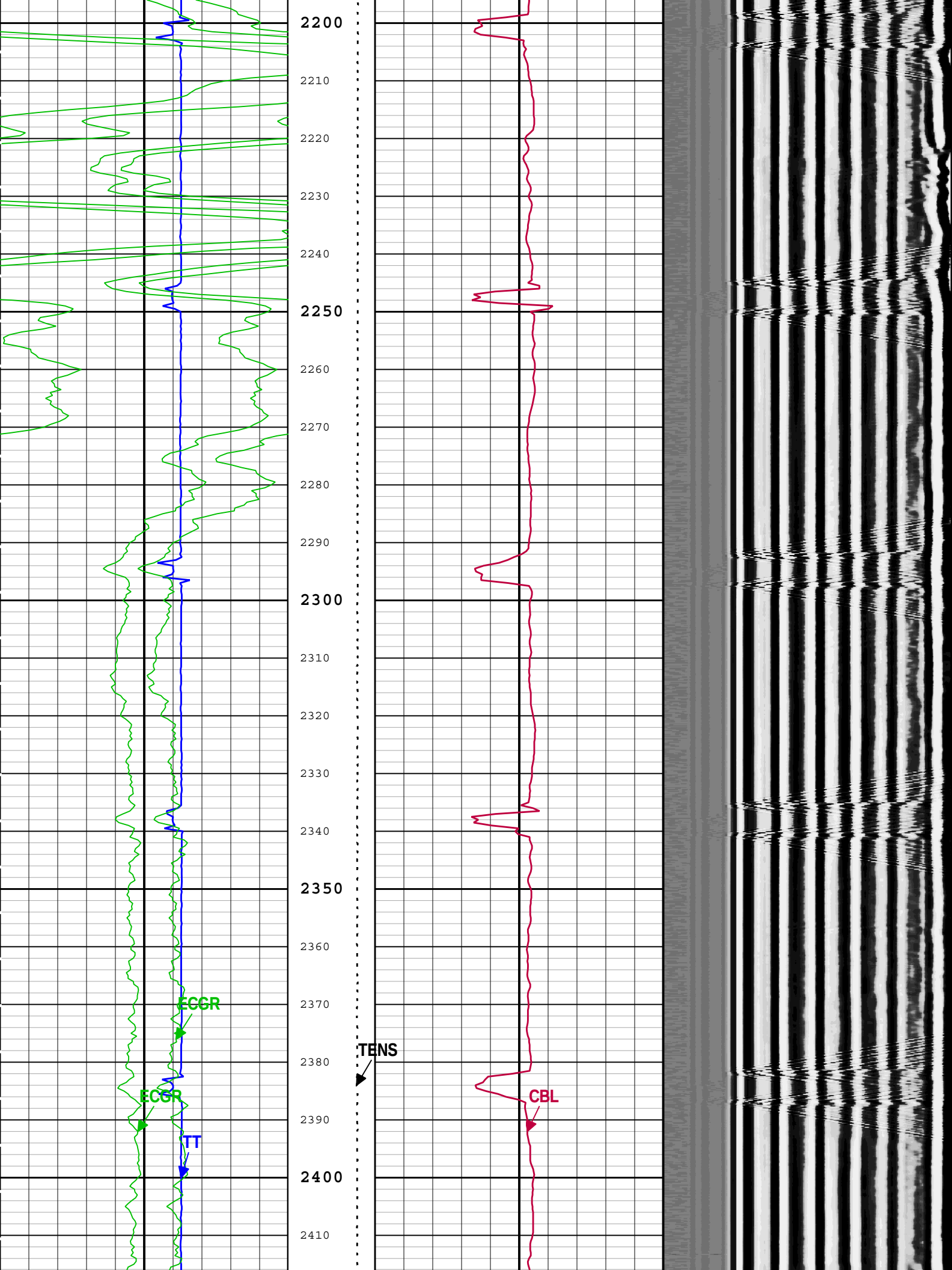
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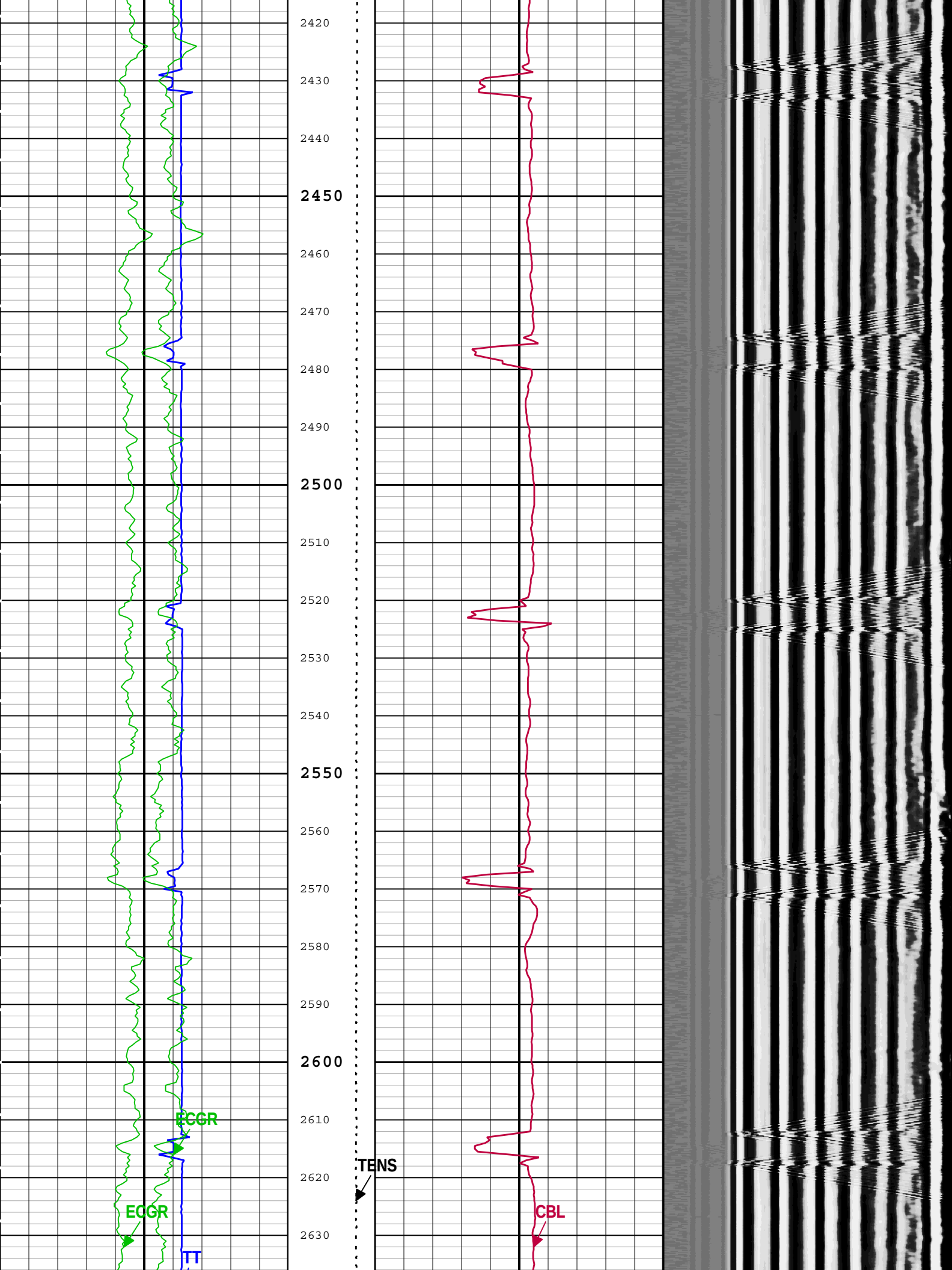
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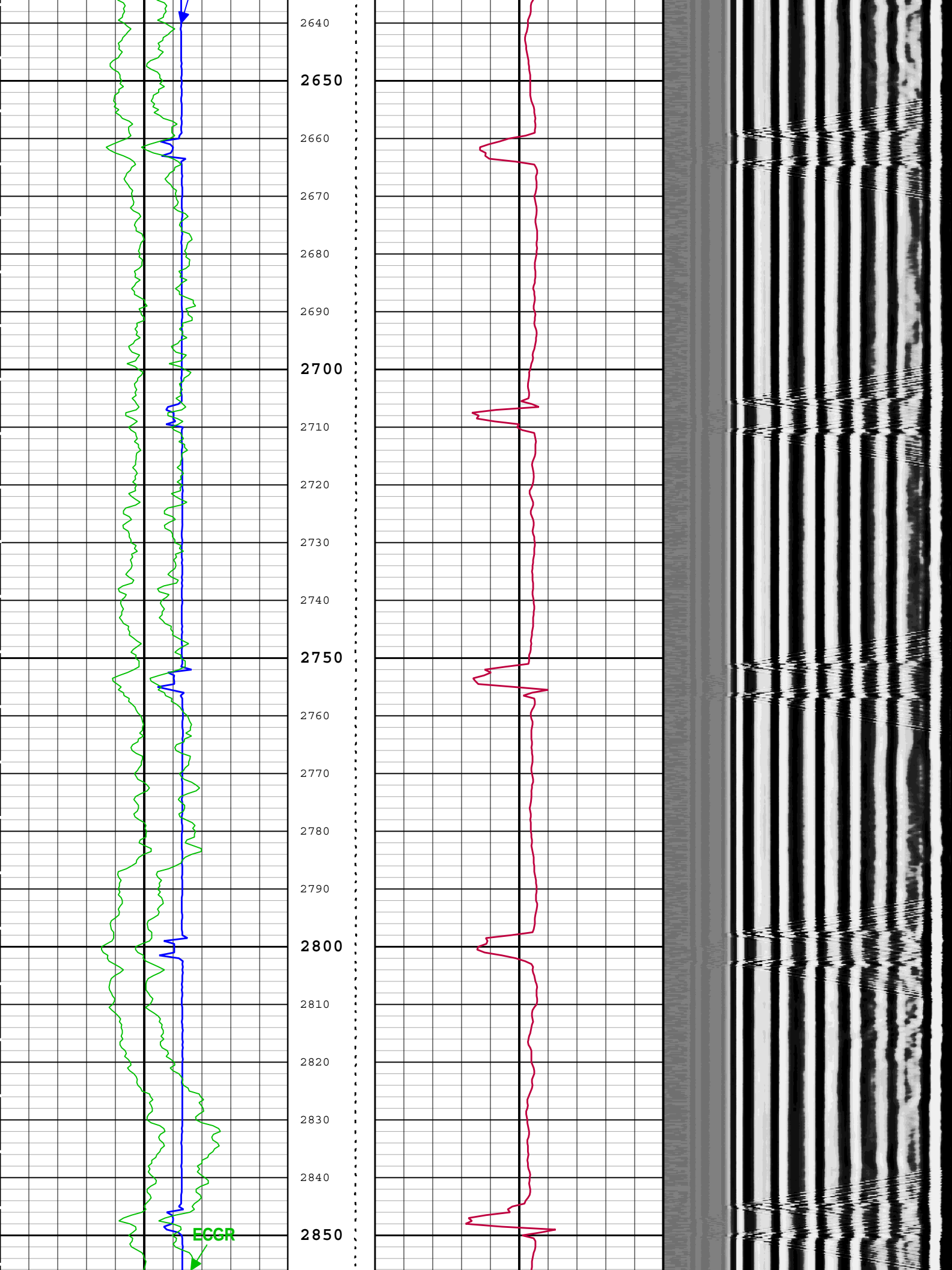
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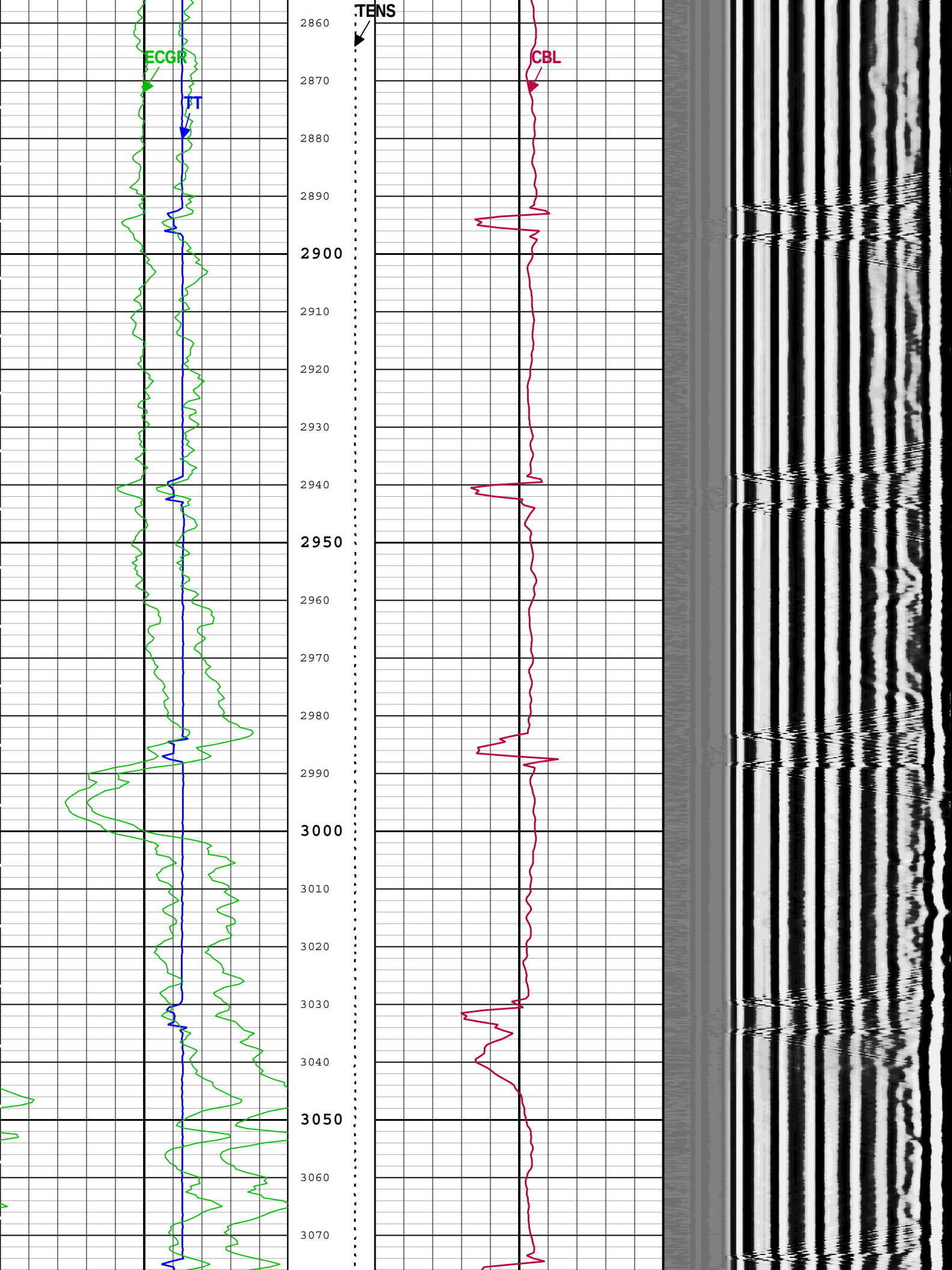
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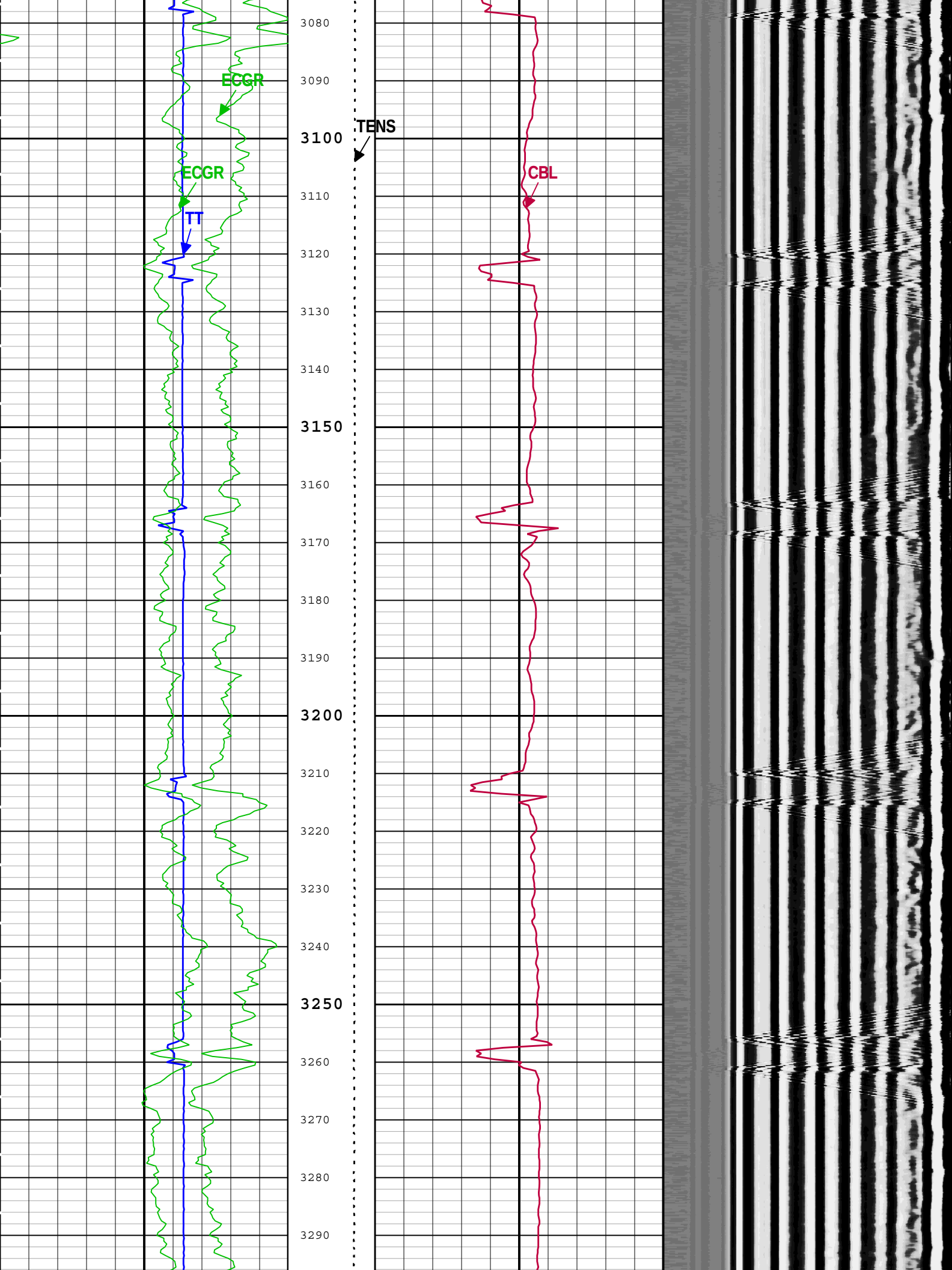
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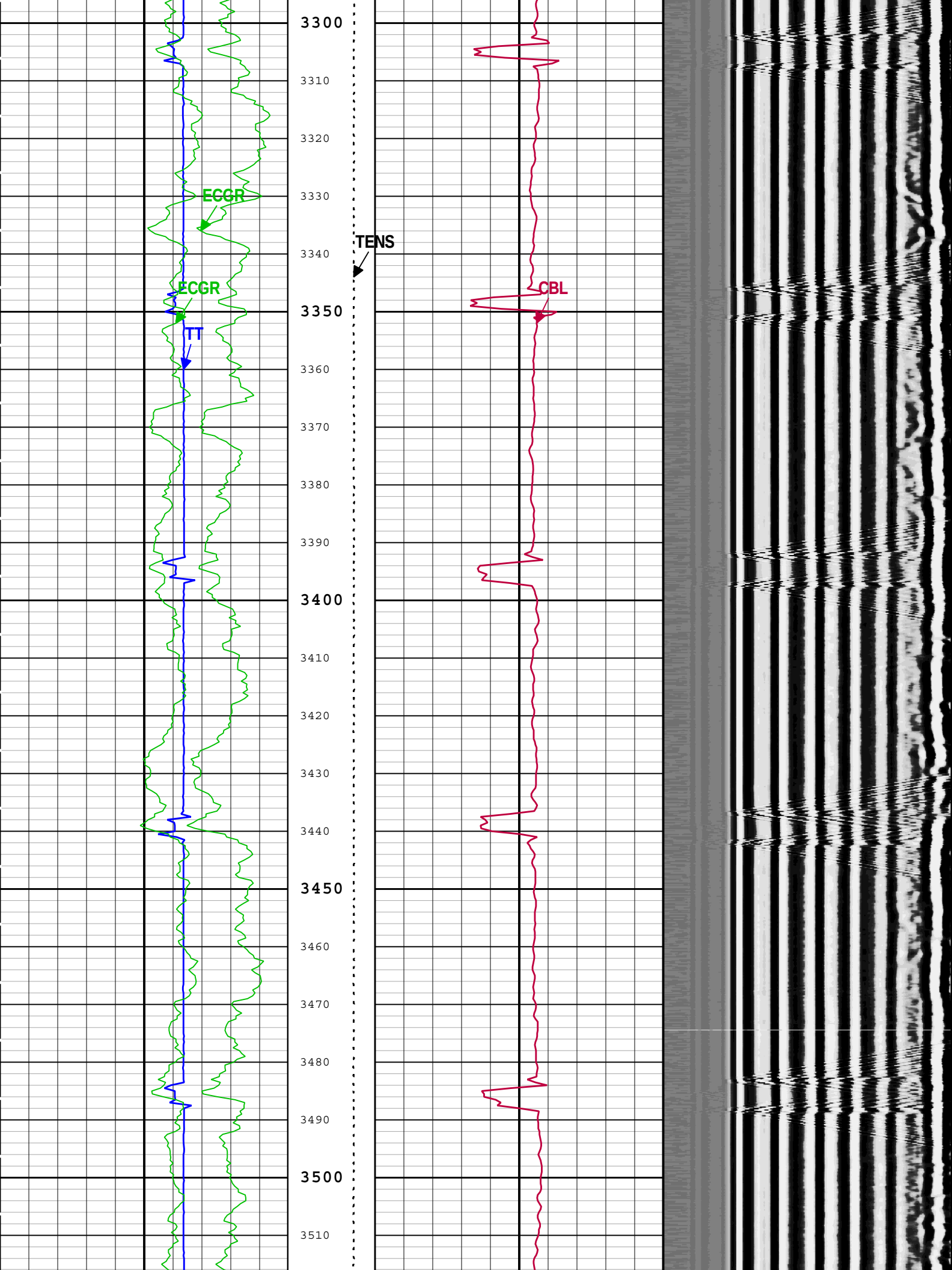
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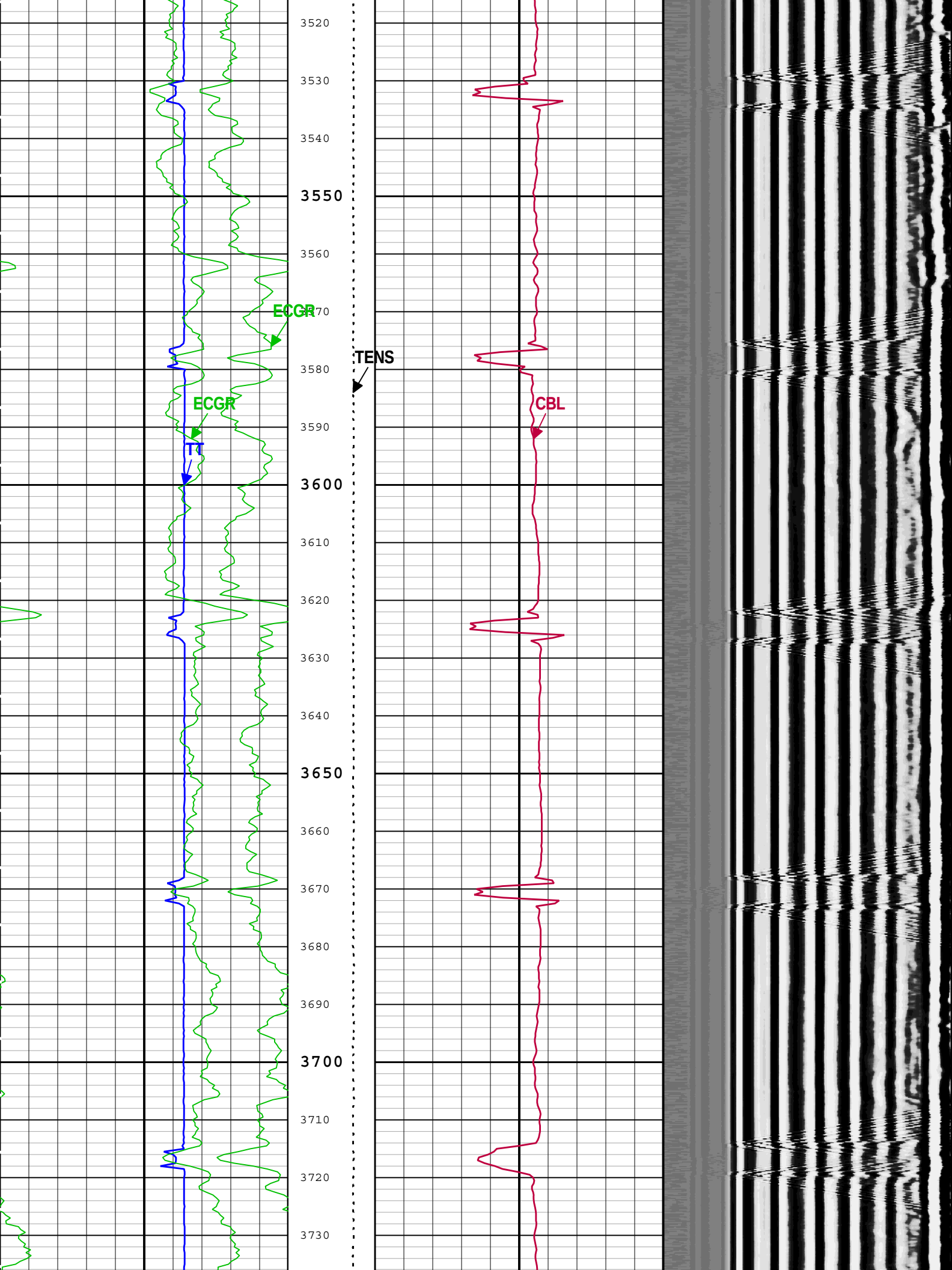
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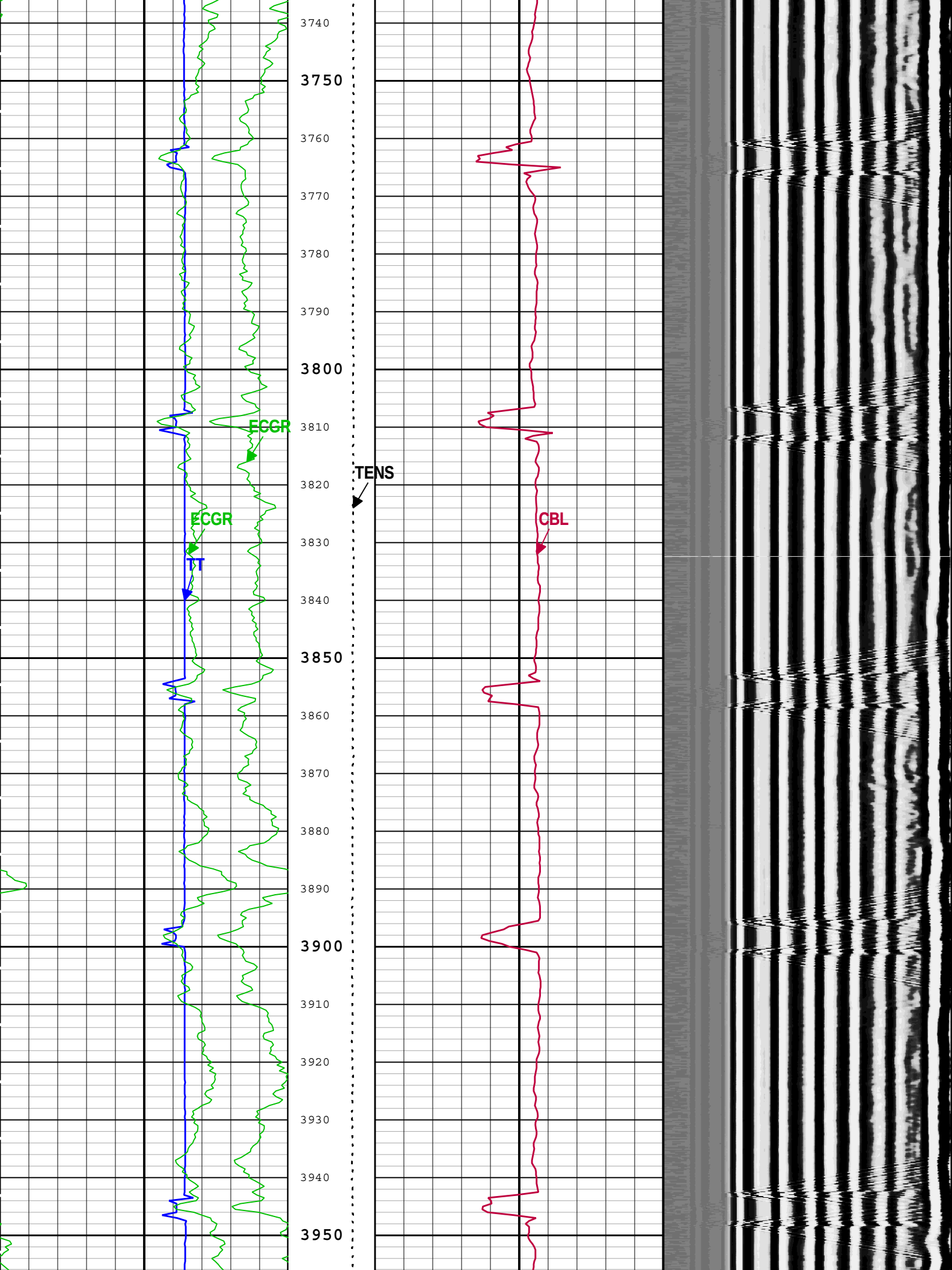
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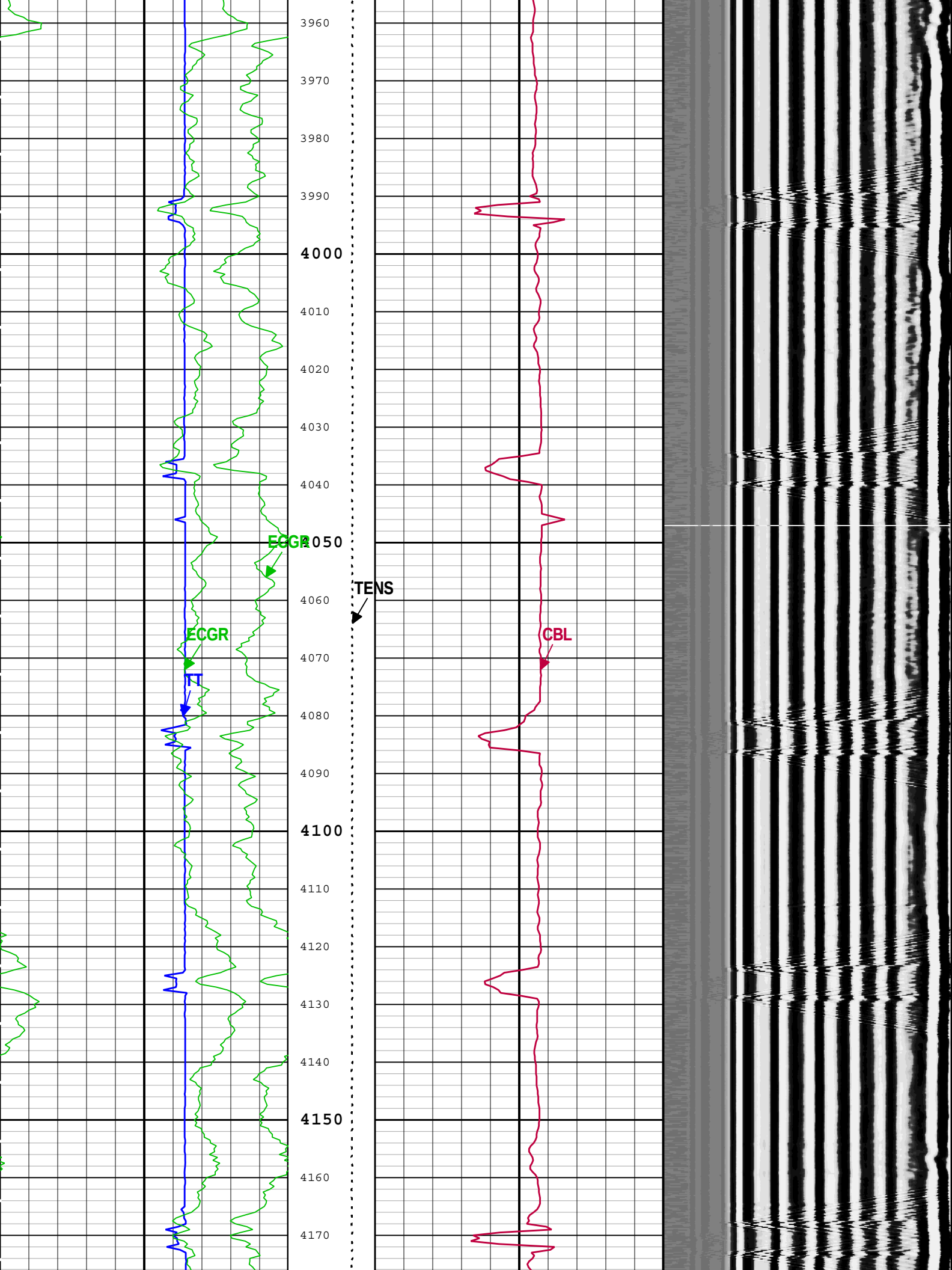
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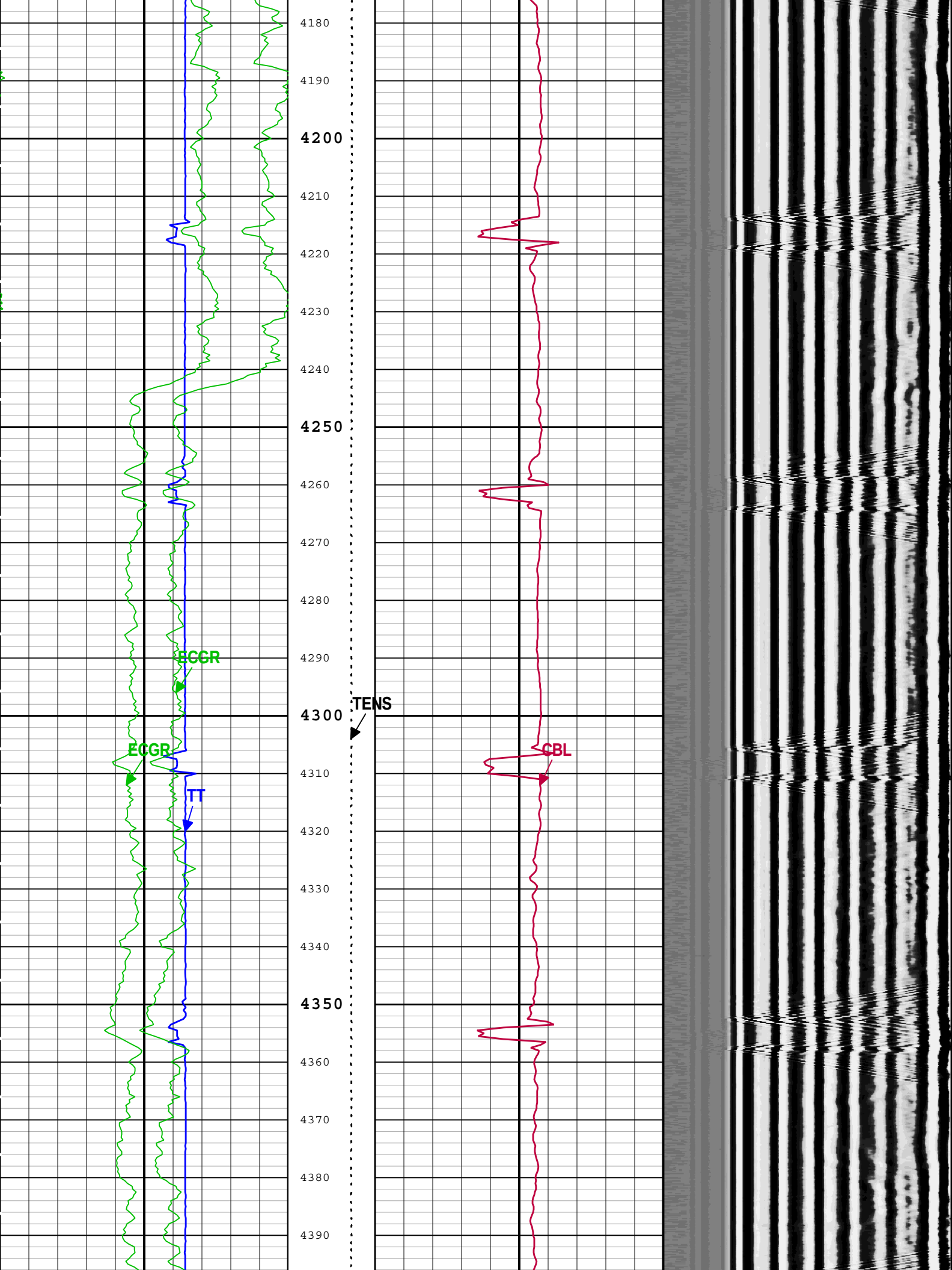
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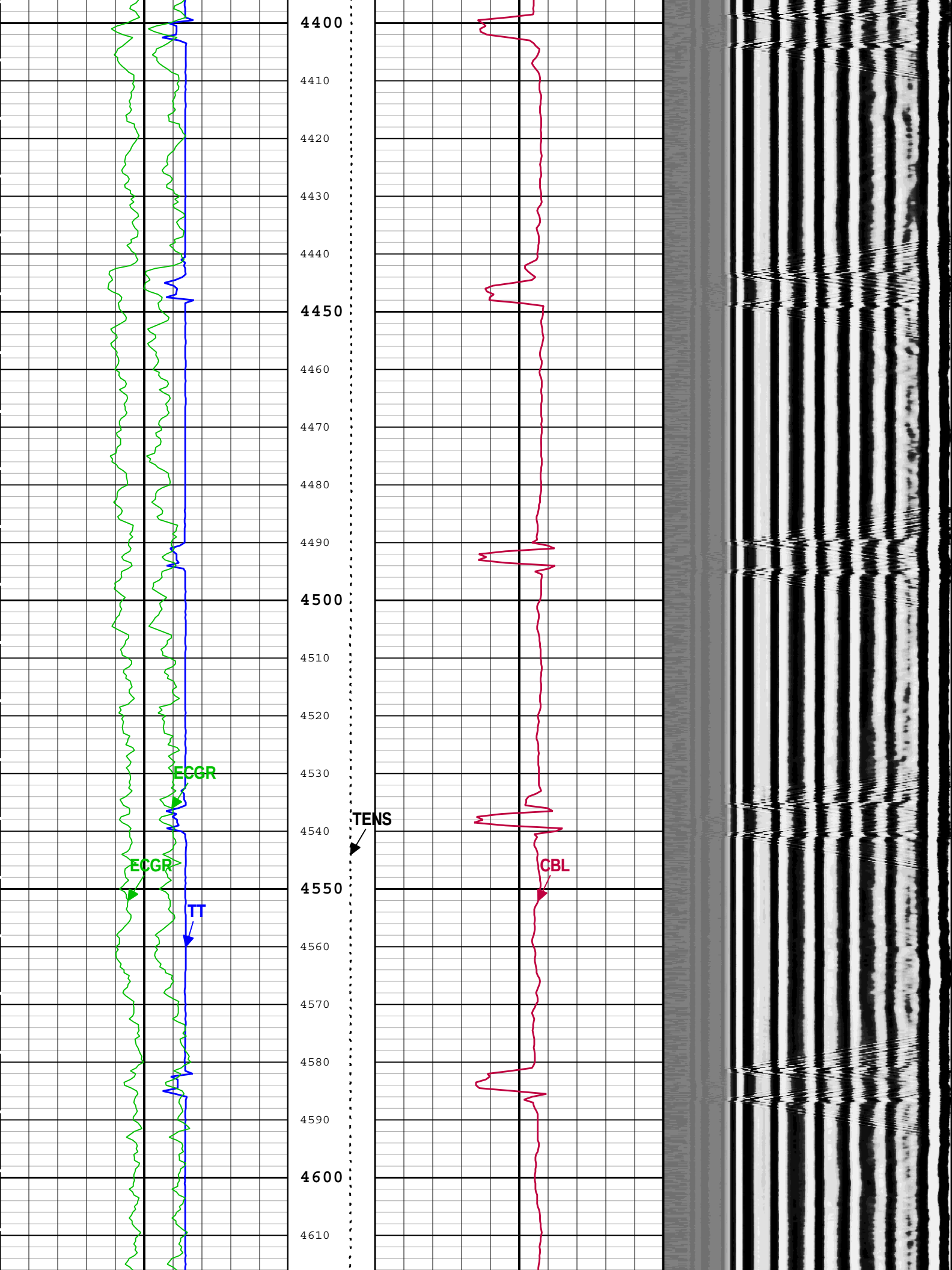
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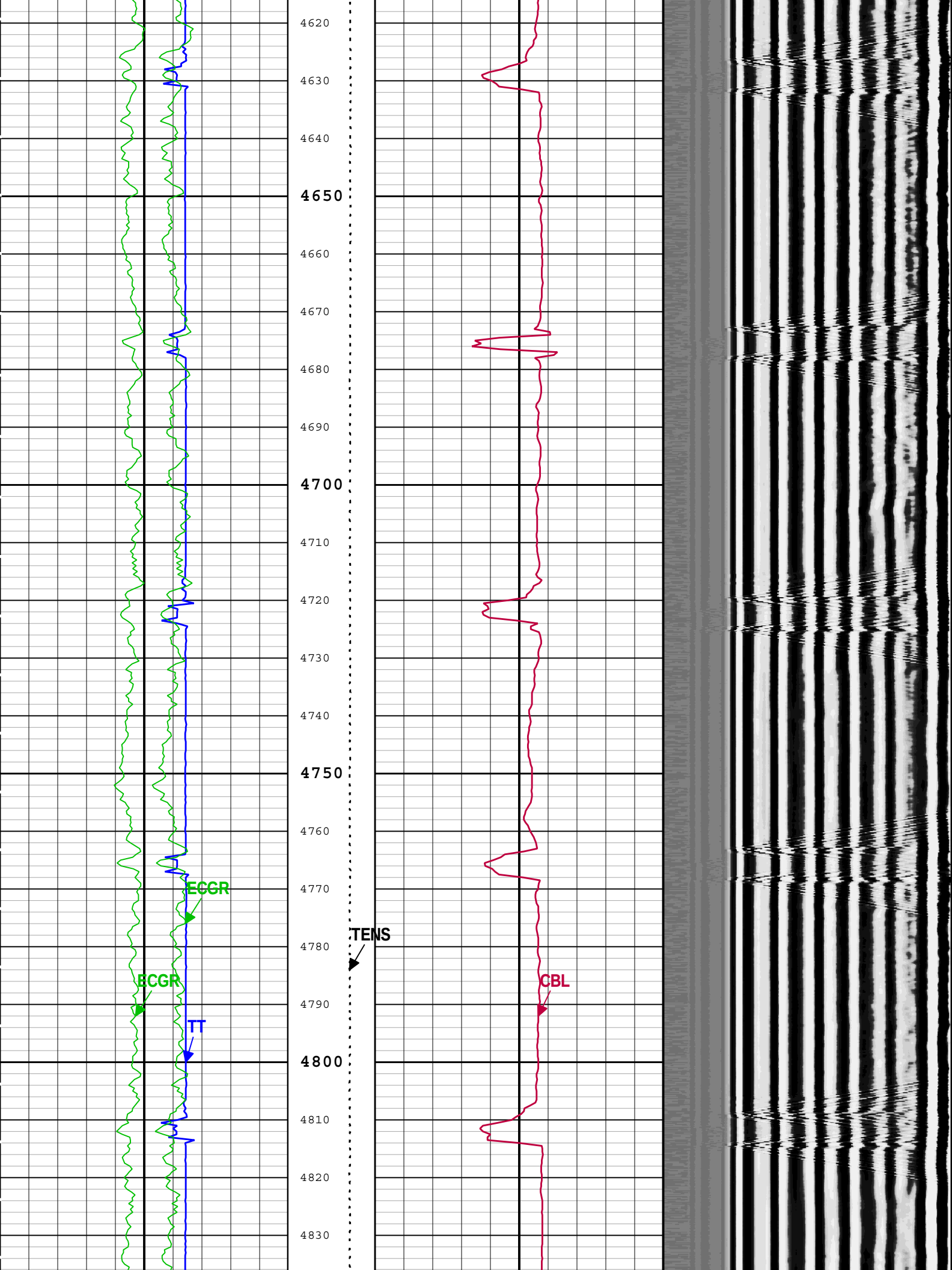
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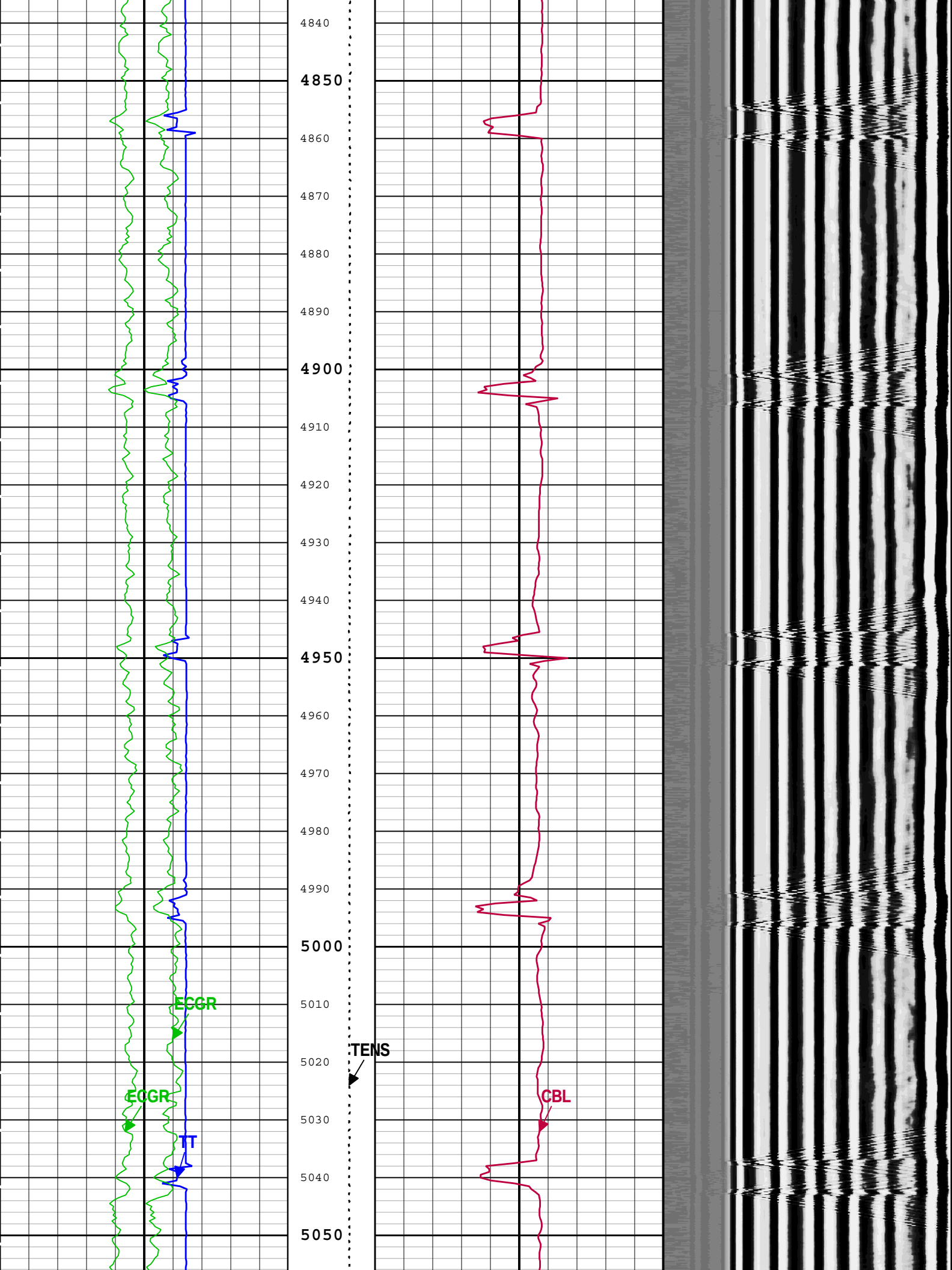
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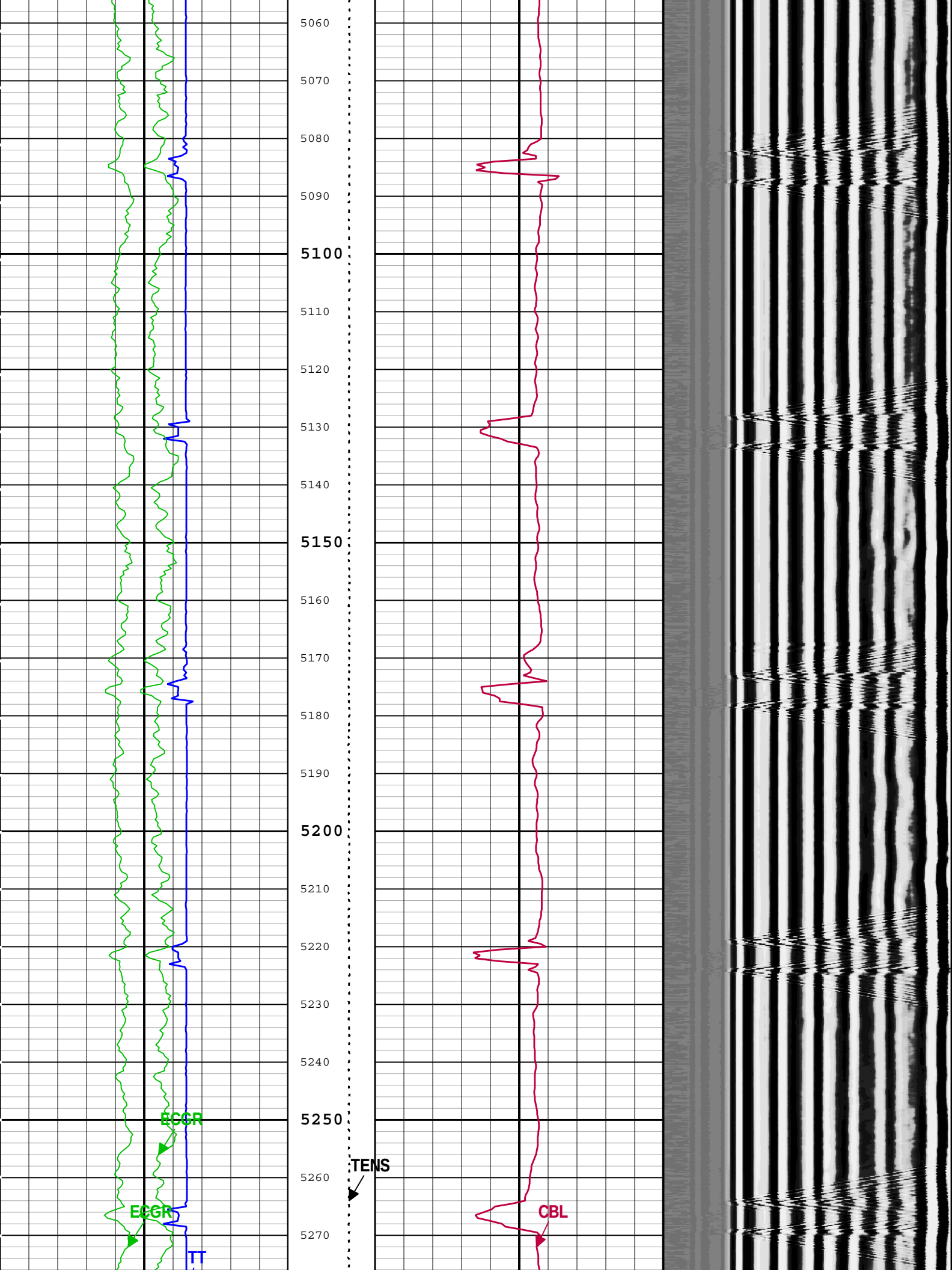
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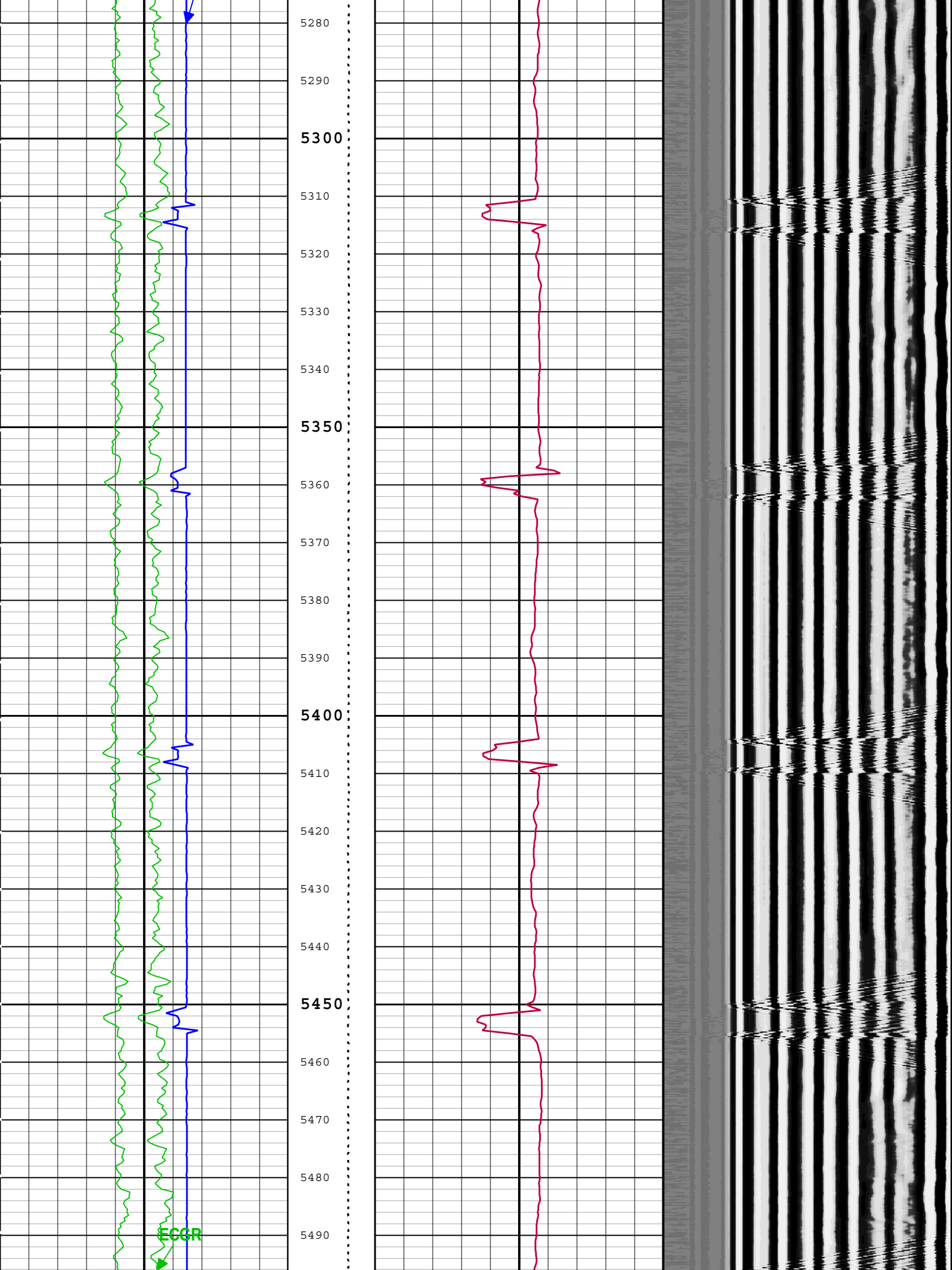
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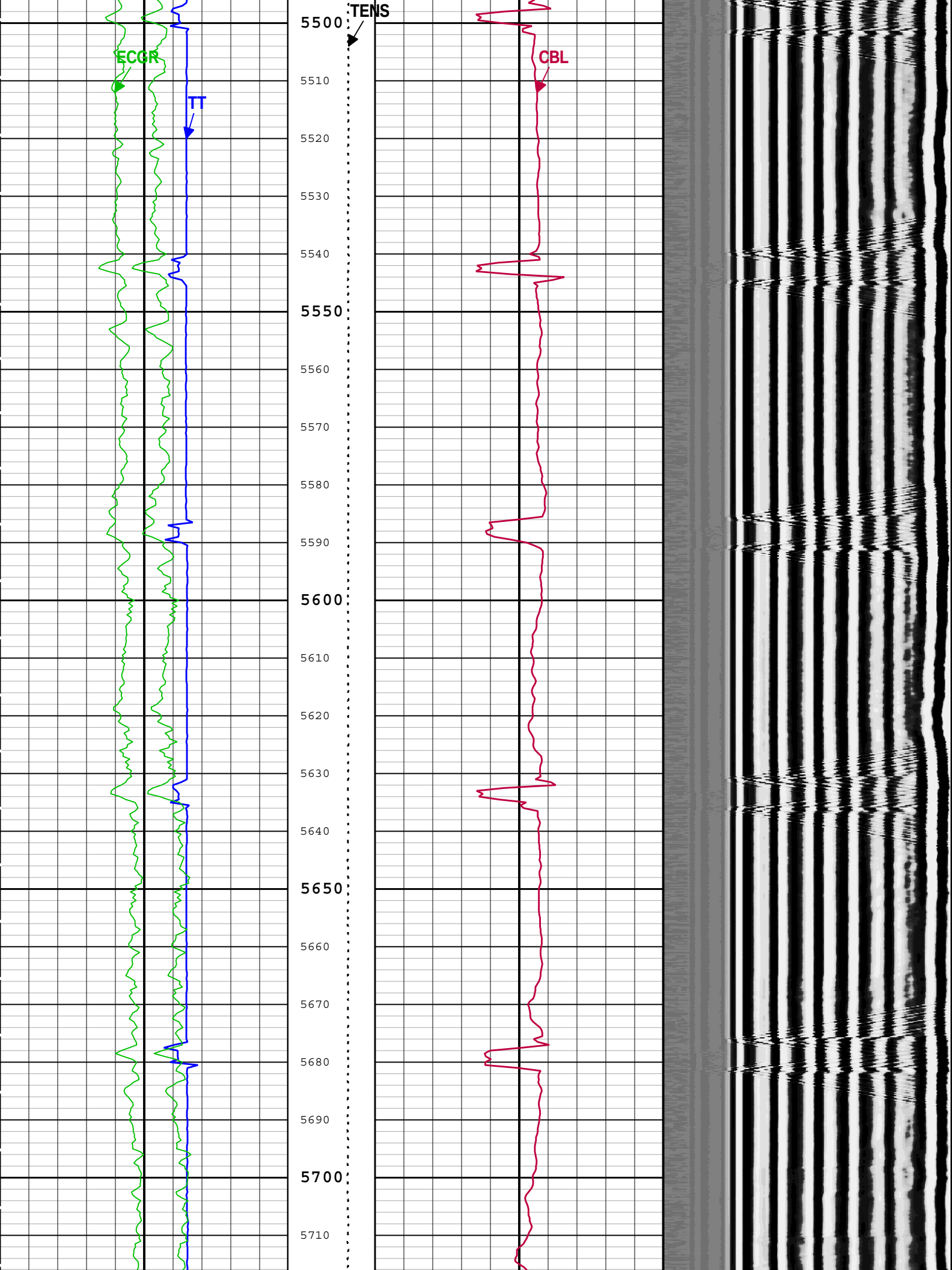
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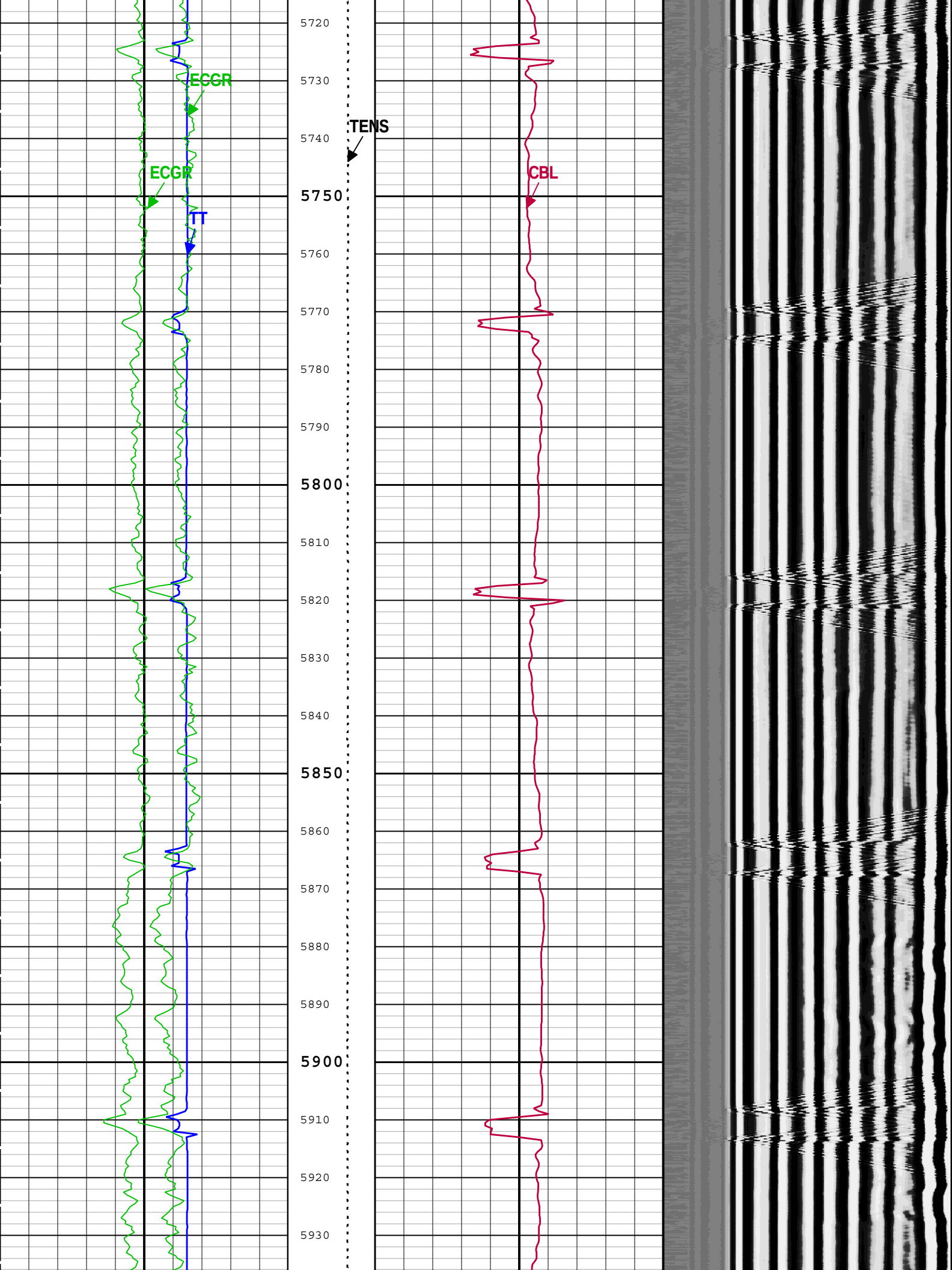
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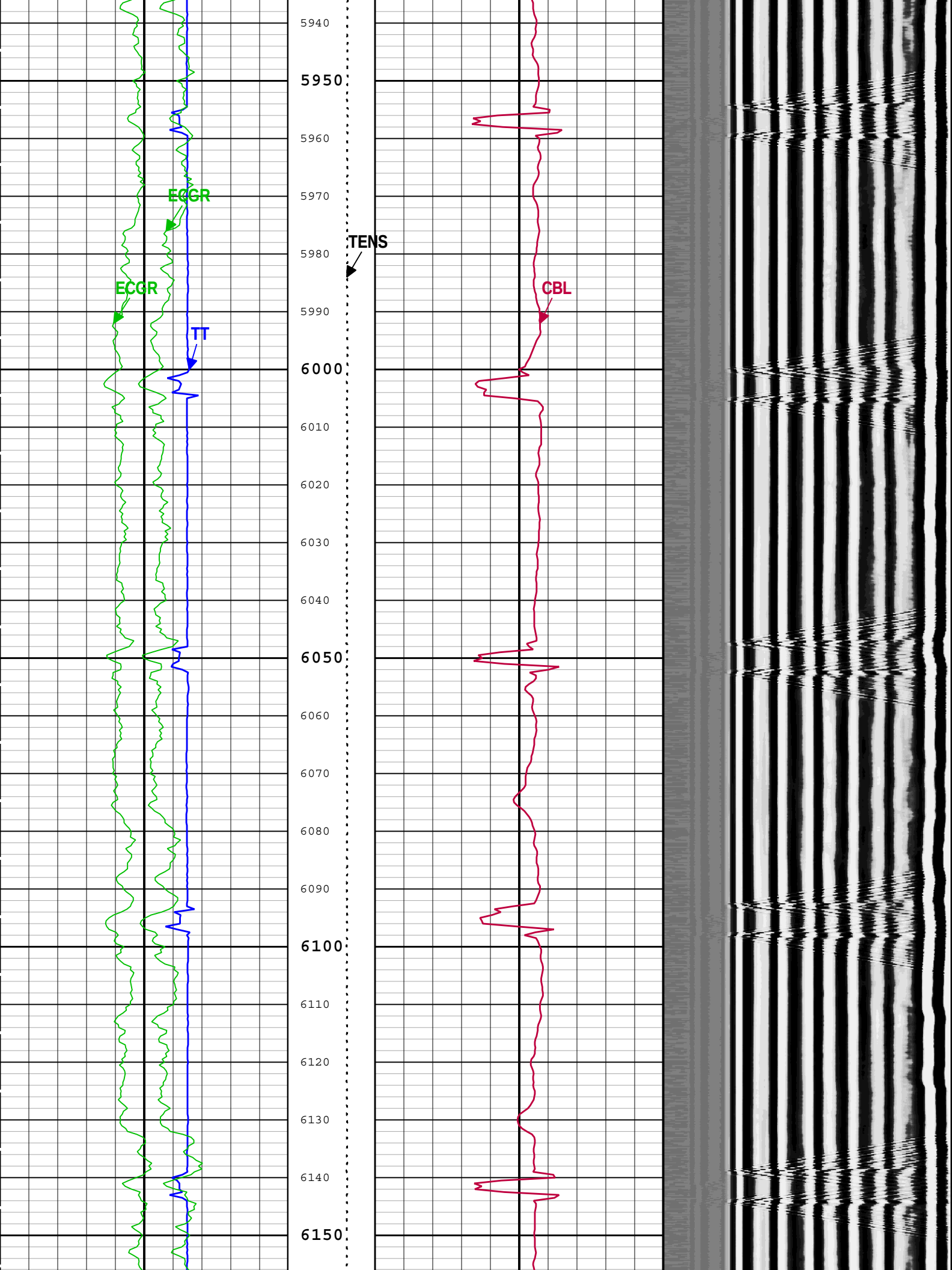
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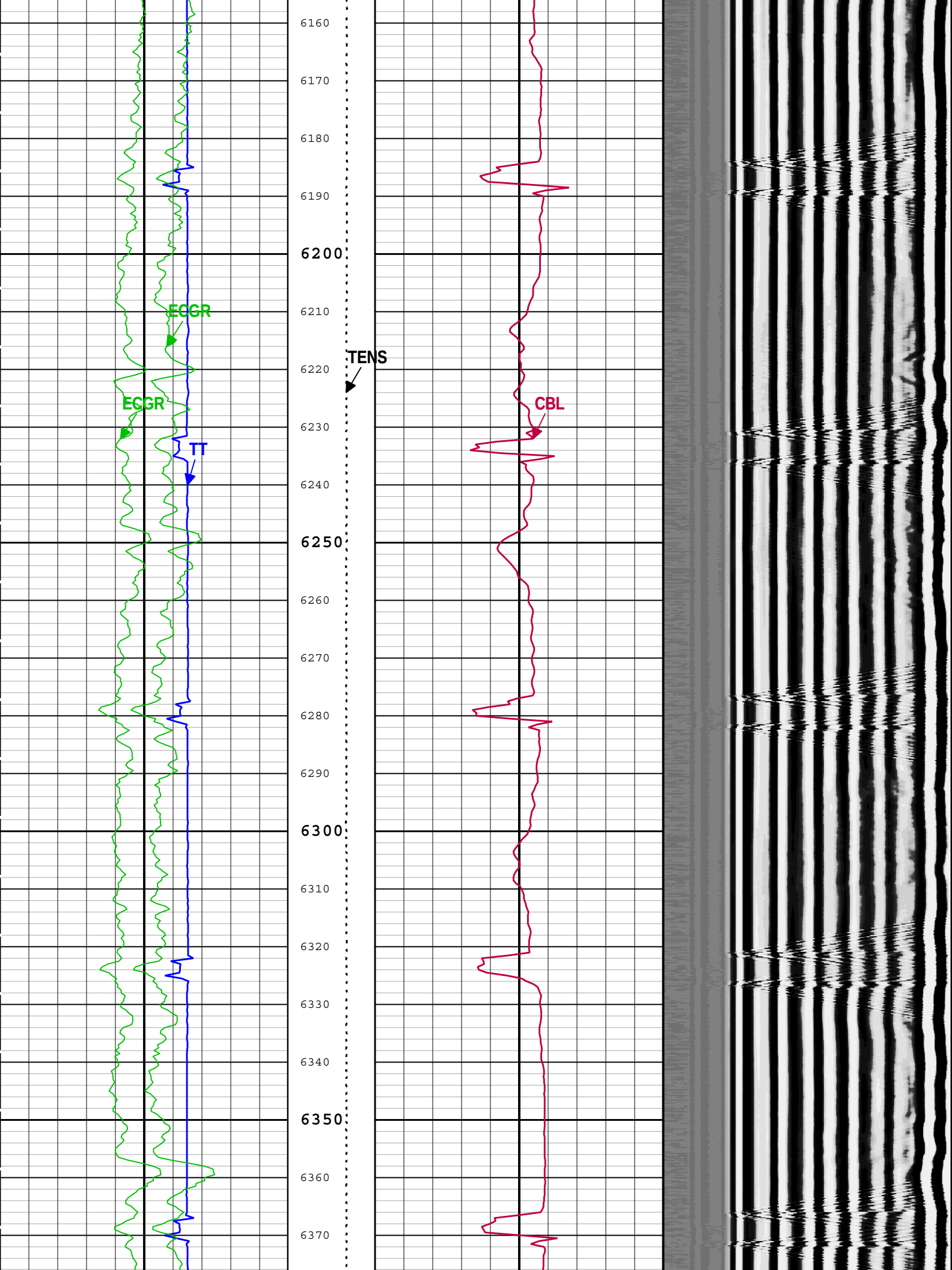
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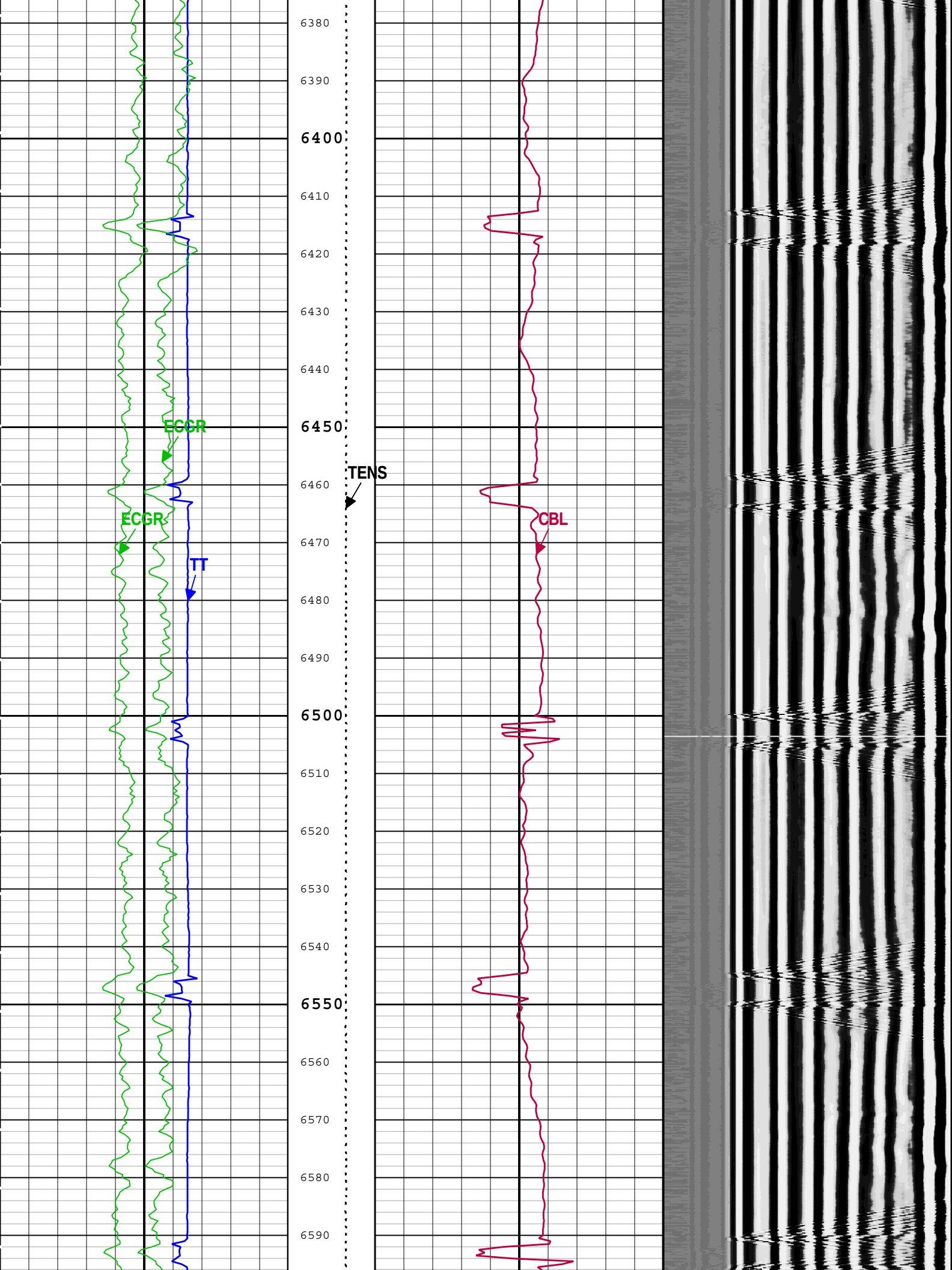
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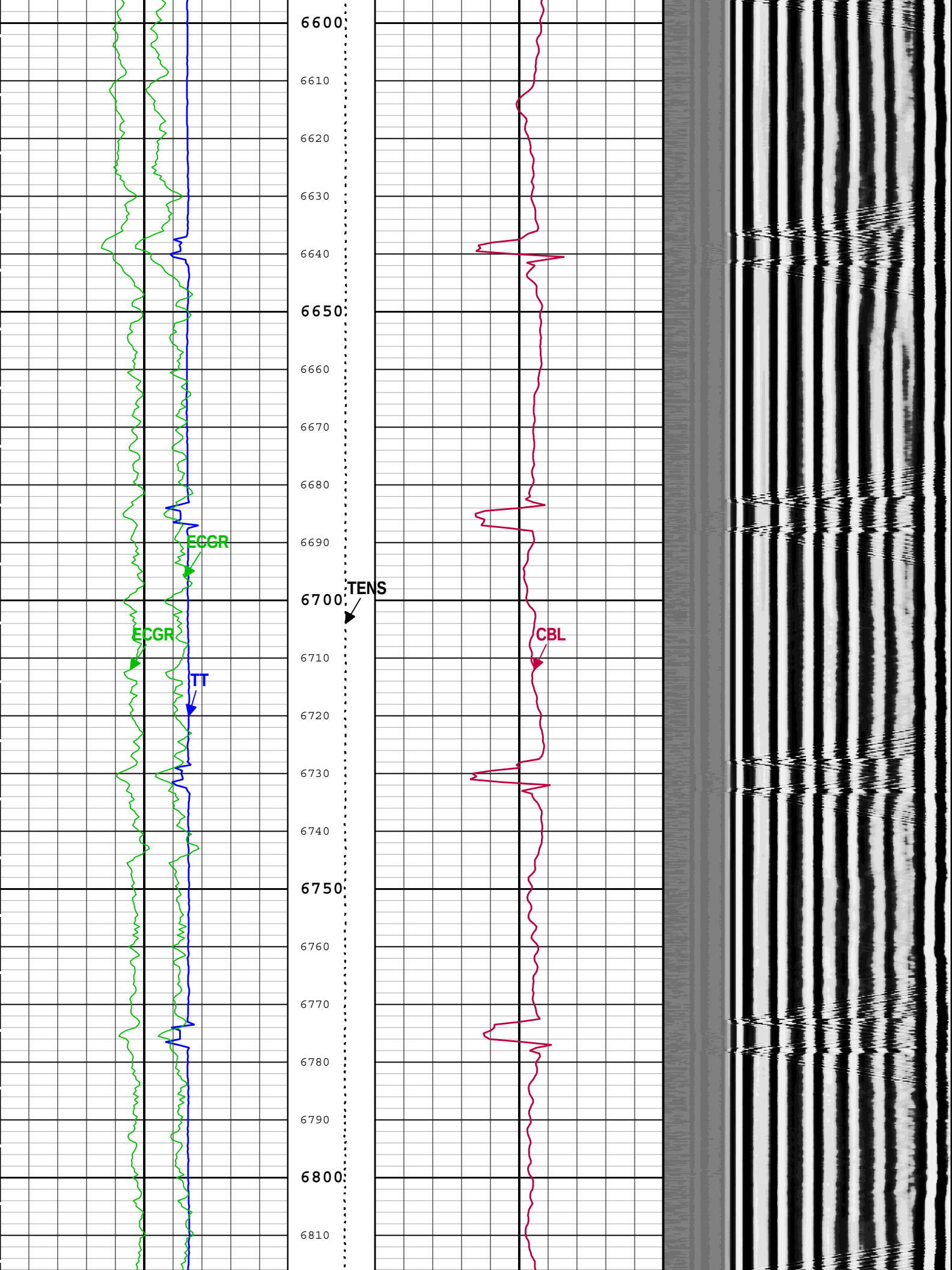
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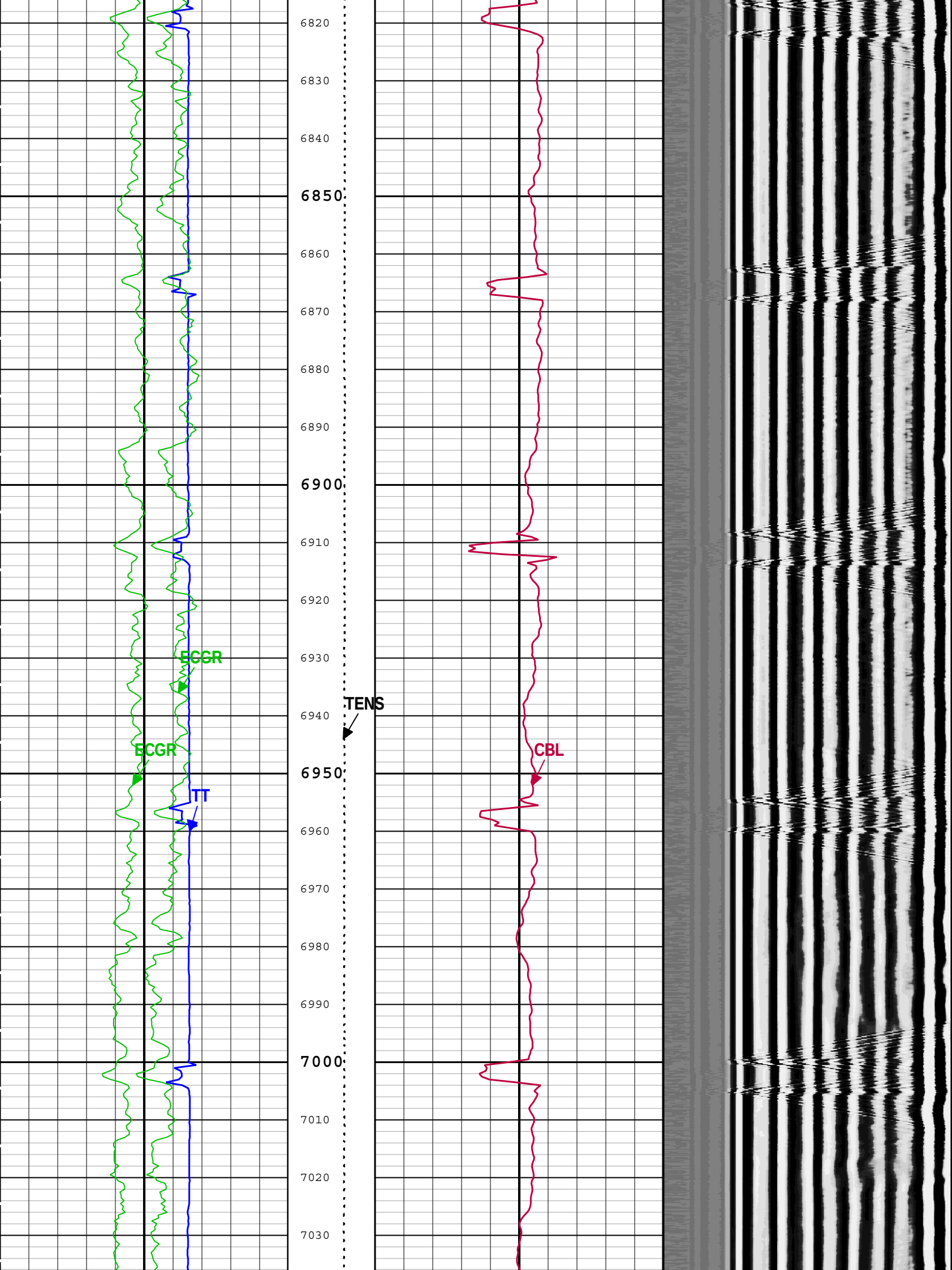
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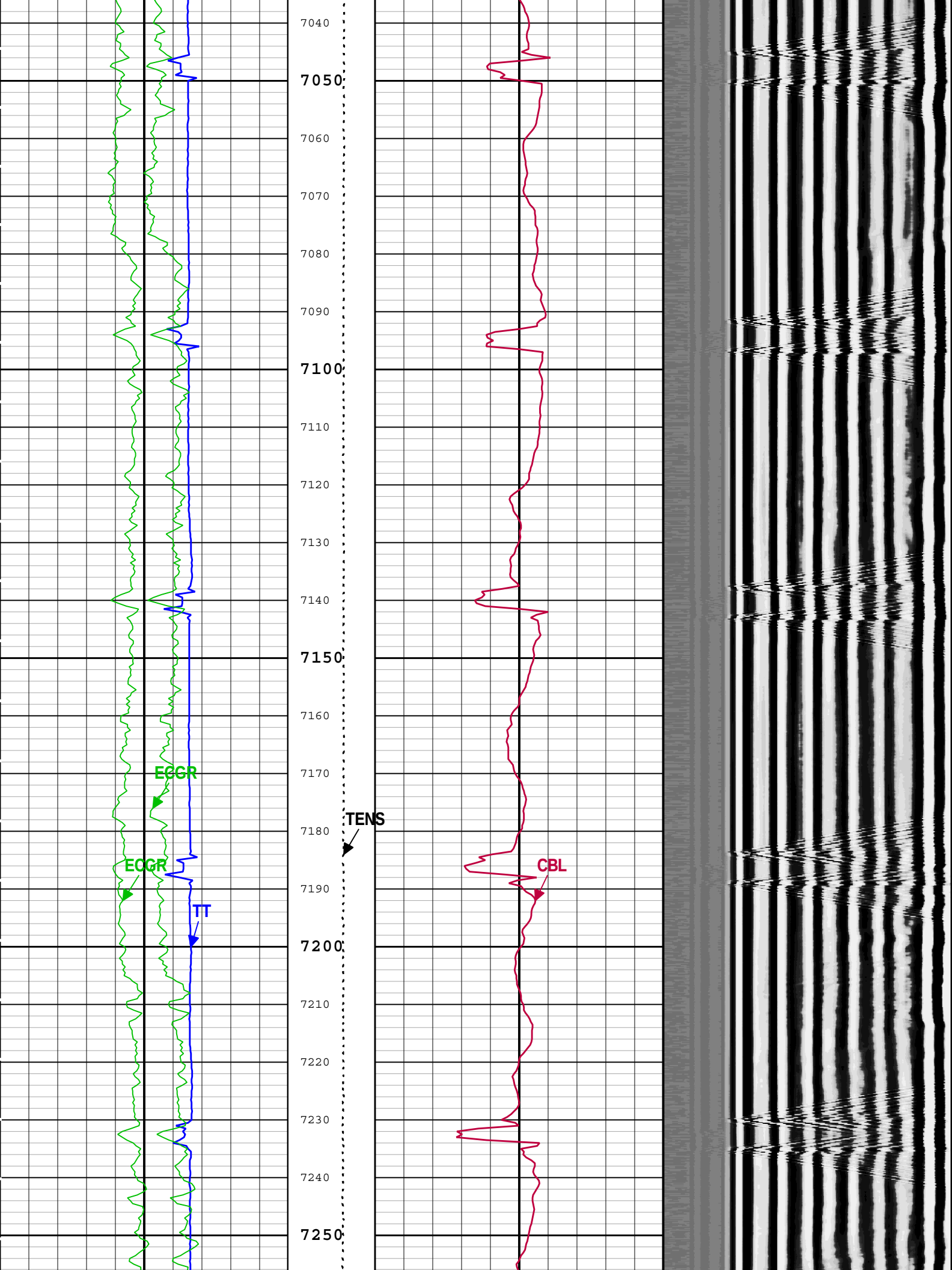
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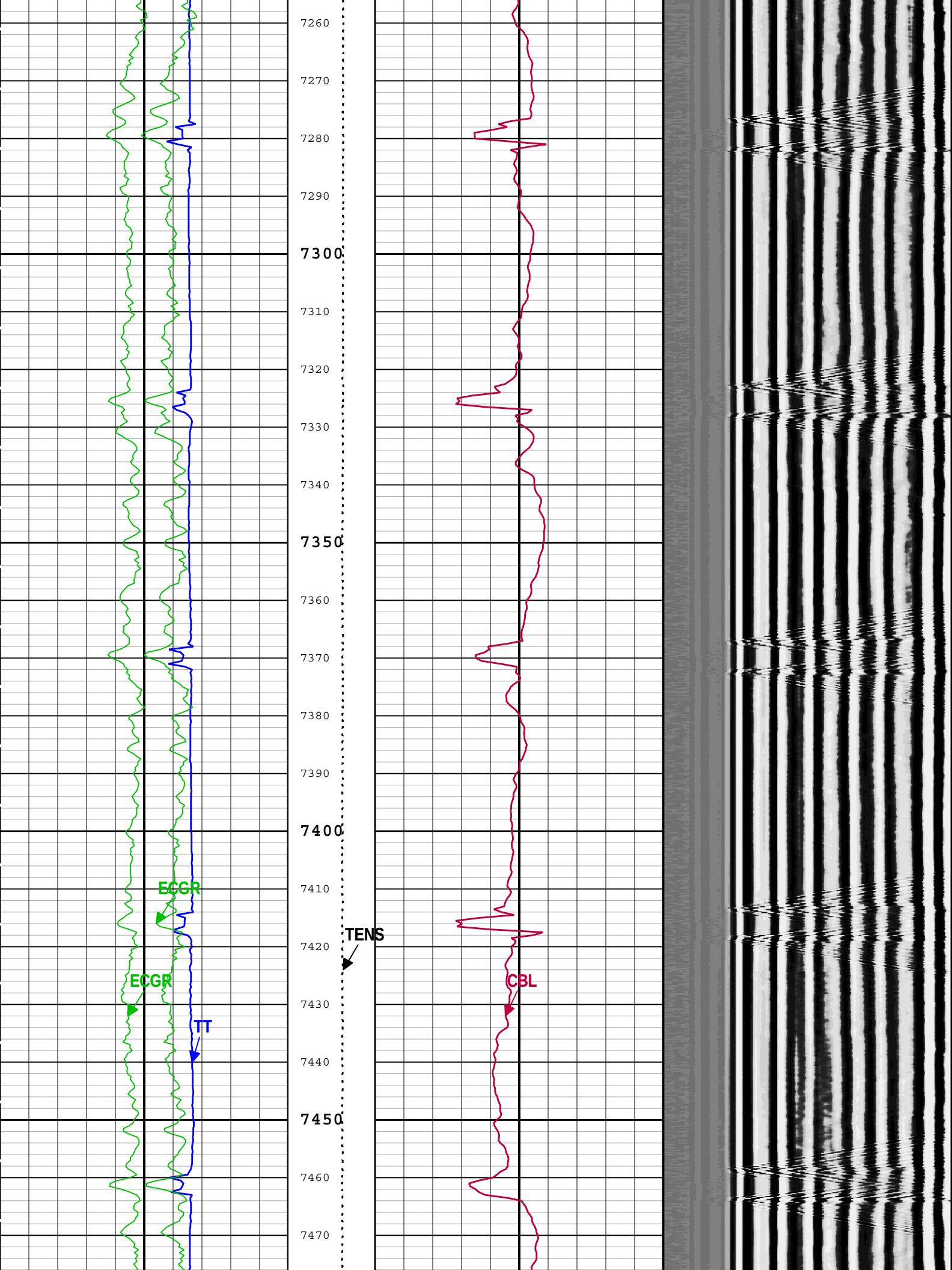
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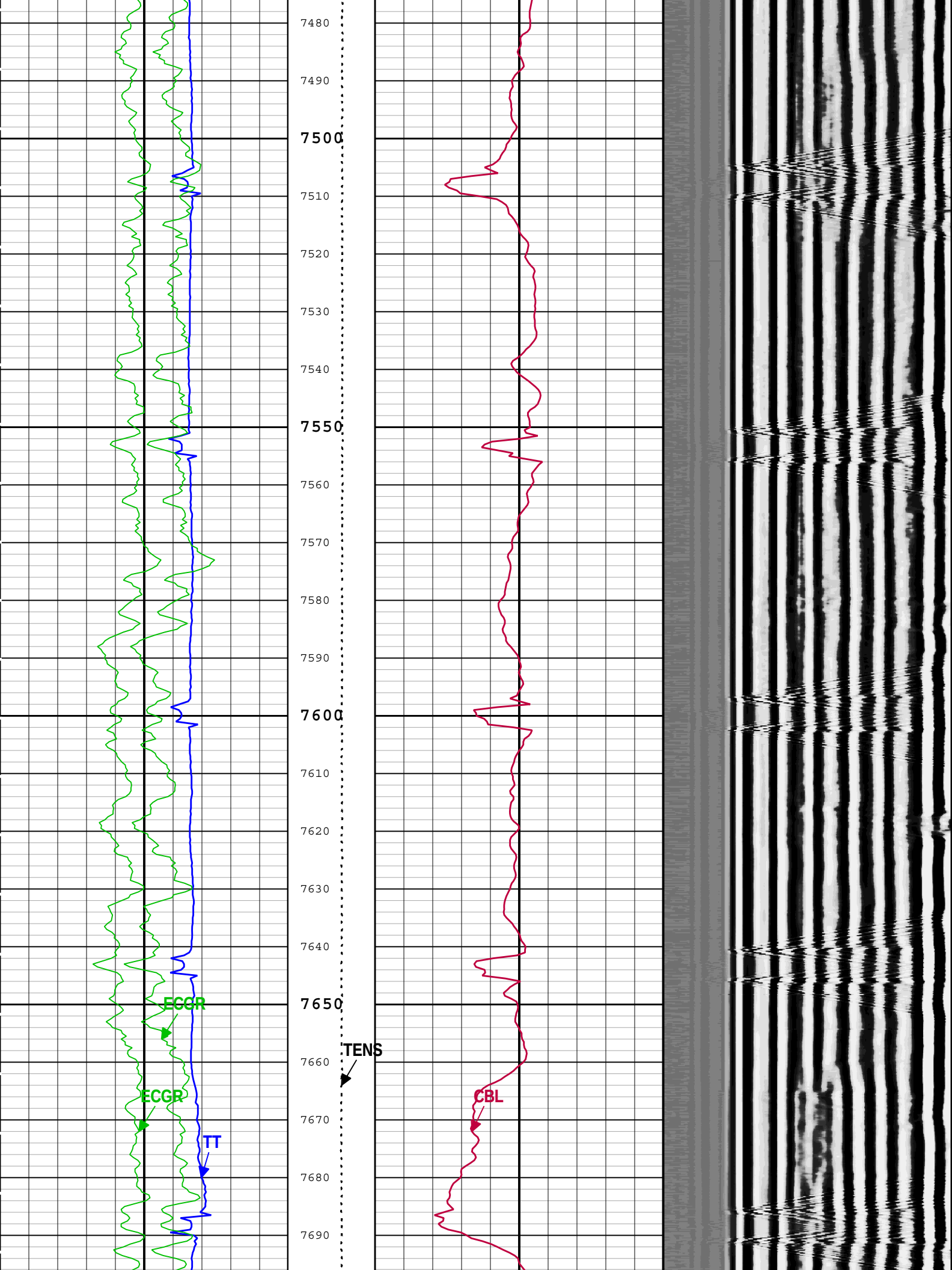
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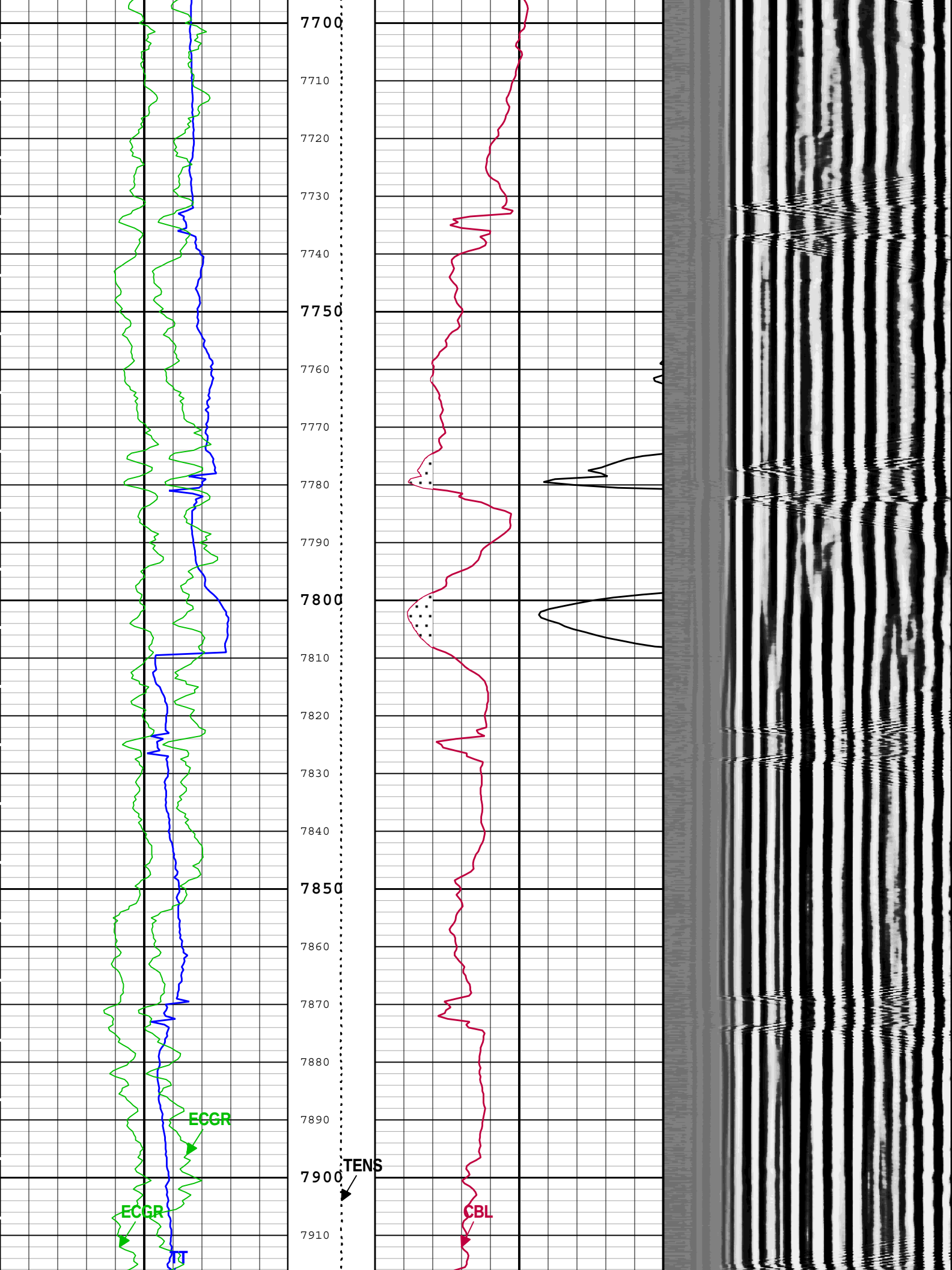
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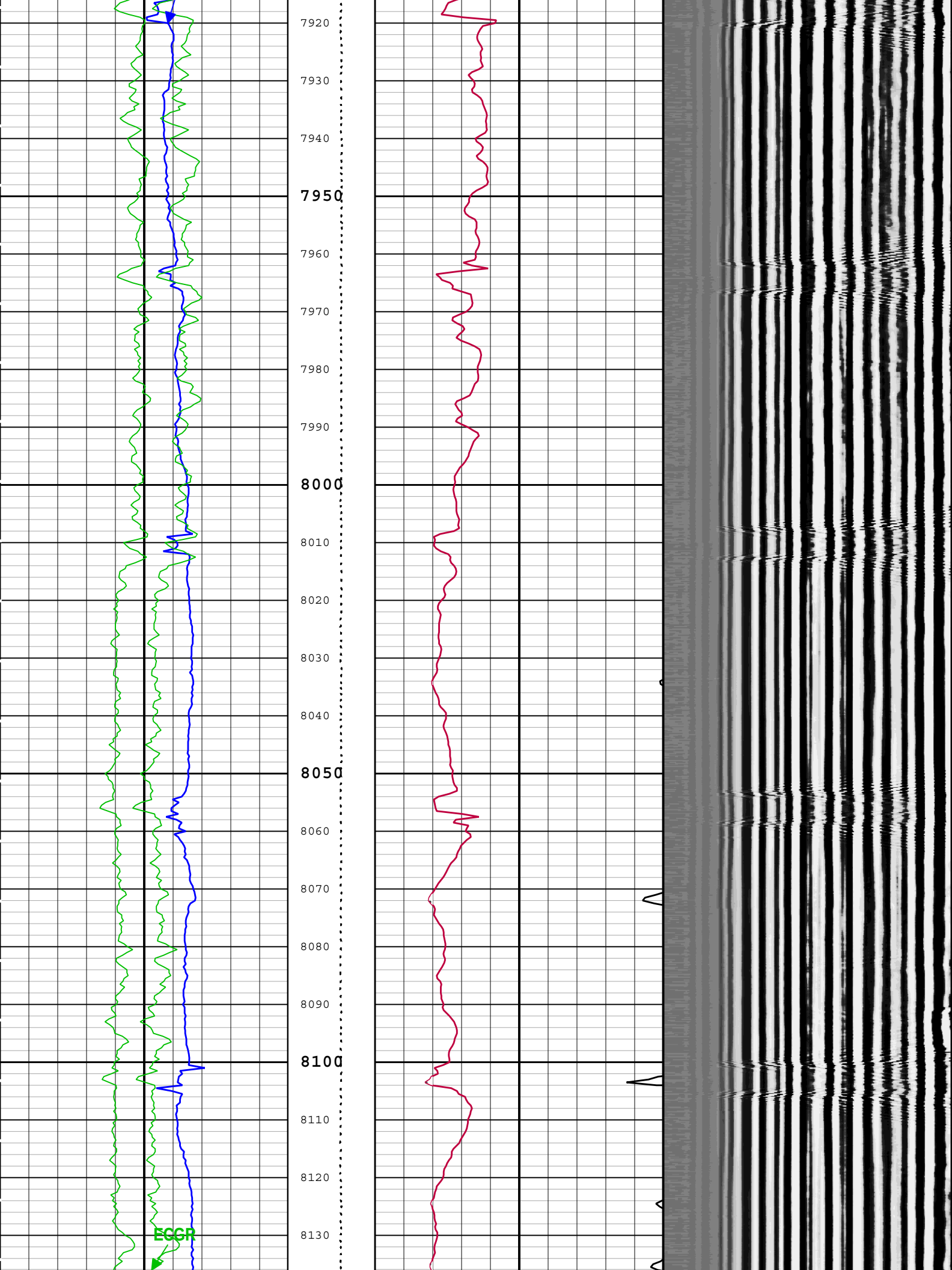
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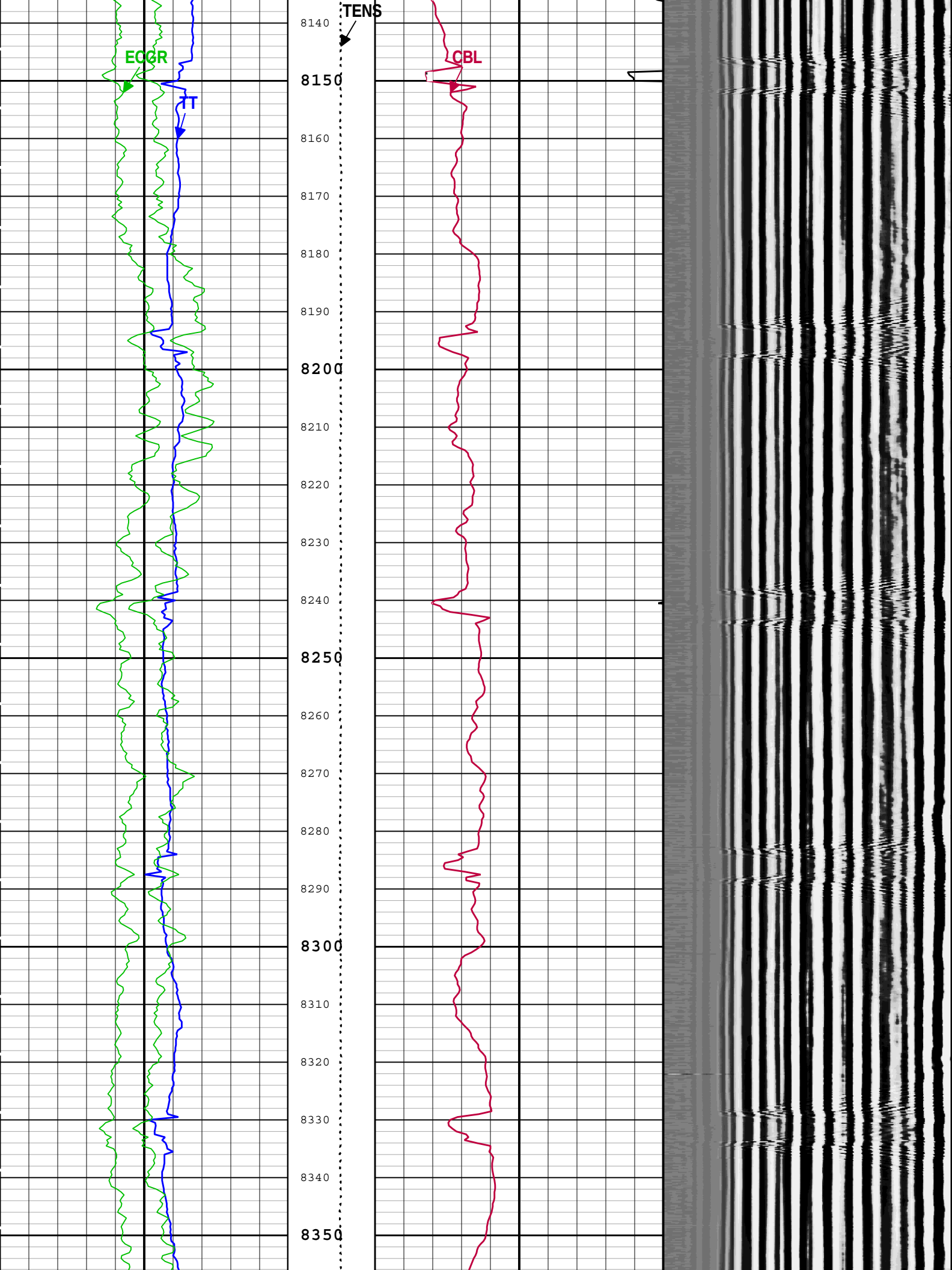
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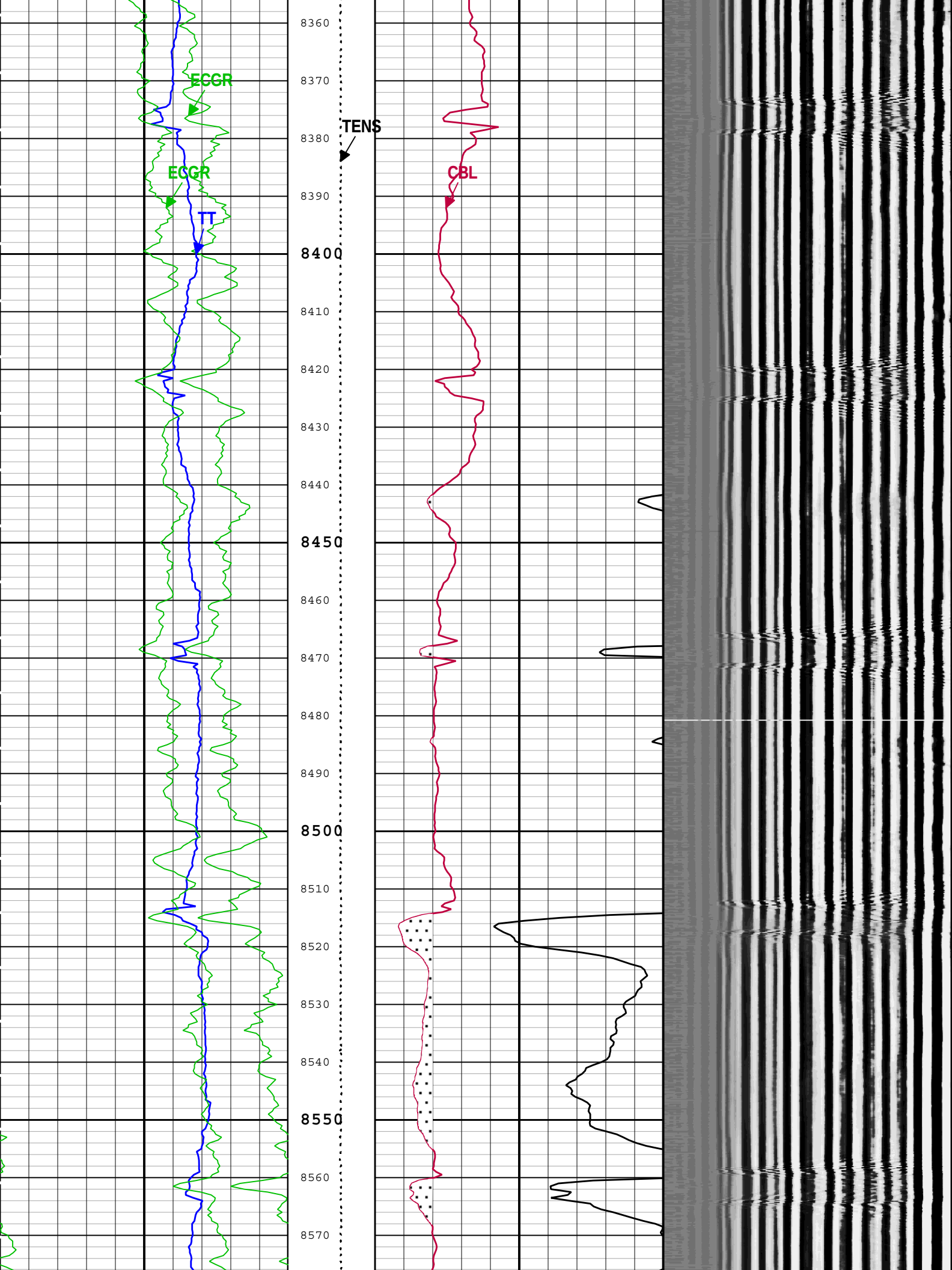
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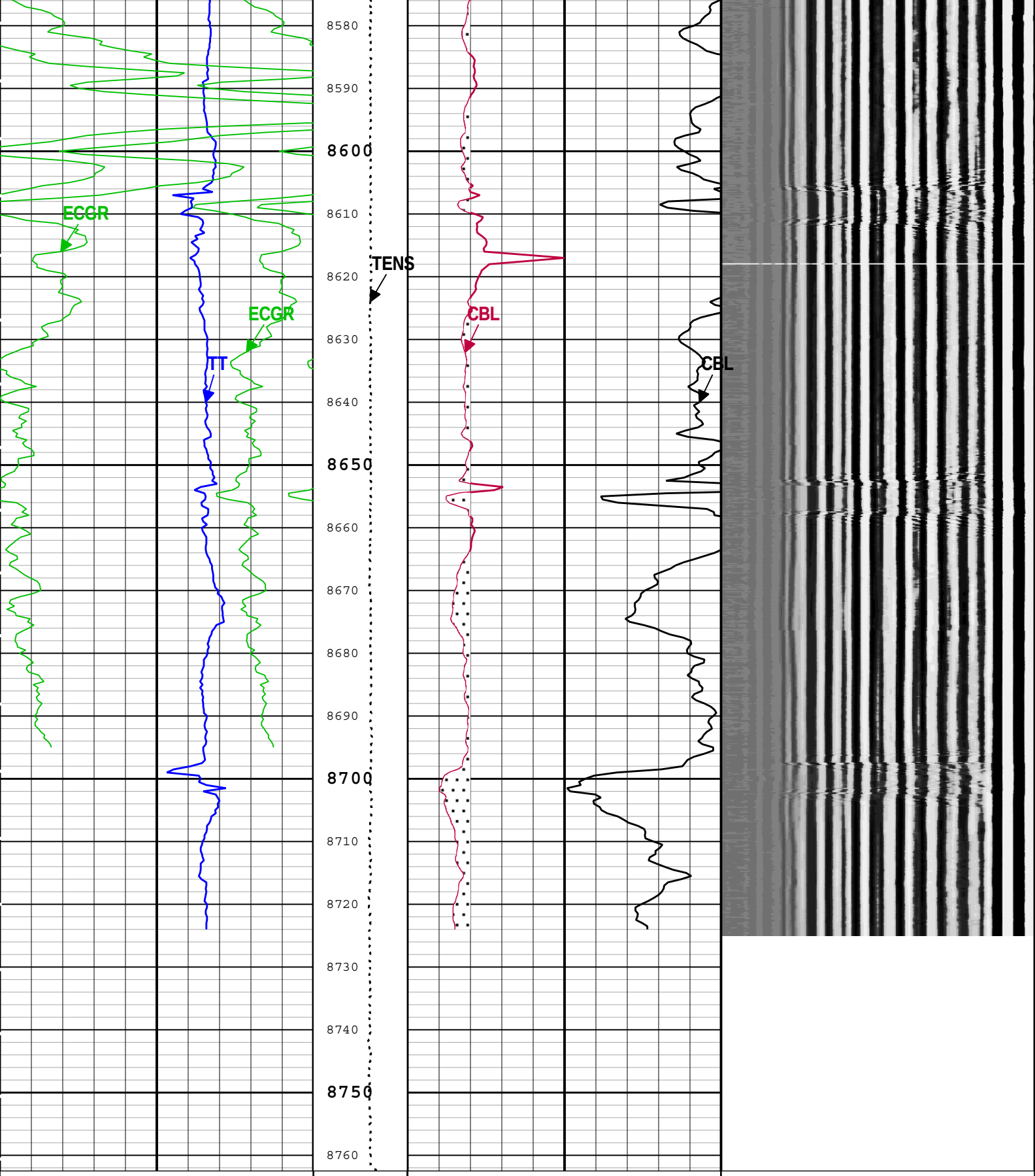


Transit Time for CBL (TT) DSLT-H	Cable Tension (TENS)	CBL Amplitude (CBL) DSLT-H
400 us 300	10000 0 lbf	0 mV 20
Gamma Ray (ECGR) HGNS-H		CBL Amplitude (CBL) DSLT-H
0 gAPI 200		0 mV 100
Gamma Ray (ECGR) HGNS-H		GoodBond From CBL to GOBO
0 gAPI 150		

Min Amplitude Max

Variable Density Log - DSLT DSLT-H

200 us 1200

BIEP - Bond Index Event Pips DSLT-H

TIME_1900 - Time Marked every 60.00 (s)

Description: Sonic CBL with VDL Format: Log (Sonic CBL with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 03-Oct-2015 19:22:15

Channel Processing Parameters

Two: Parameters

Parameter	Description	Tool	Value	Unit
AMSG	Auxiliary Minimum Sliding Gate	DSLT-H	140	us
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BILI	Bond Index Level for Zone Isolation	DSLT-H	0.8	
BS	Bit Size	WLSESSION	Depth Zoned	in
CBLG	CBL Gate Width	DSLT-H	60	us
CBLO	Casing Bottom (Logger)	WLSESSION	8887	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSLT-H	Depth Zoned	mV
CDEN	Cement Density	HGNS-H	2	g/cm3
CMCF	CBL Cement Type Compensation Factor	DSLT-H	1	
CMTY(U-USIT_CEMT)	Cement Type	USIT-D	Regular Cement	
DETE	Delta-T Detection	DSLT-H	E1	
DFD	Drilling Fluid Density	Borehole	9	lbm/gal
FCF	CBL Fluid Compensation Factor	DSLT-H	0.89	
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS	
GOBO_CURR	Good Bond in Arbitrary Cement	DSLT-H	Depth Zoned	mV
GR_MULTIPLIER	Gamma Ray Multiplier	HGNS-H	1	
IMAR	Image Rotation	USIT-D	Off	
MAHTR	Manual High Threshold Reference for first arrival detection	DSLT-H	120	
MATT_CURR	Maximum Attenuation in Arbitrary Cement	DSLT-H	Depth Zoned	dB/ft
MCI	Minimum Cemented Interval for Isolation	DSLT-H	Depth Zoned	ft
MNHTR	Minimum High Threshold Reference for first arrival detection	DSLT-H	100	
MSA	Minimum Sonic Amplitude	DSLT-H	Depth Zoned	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	DSLT-H	Depth Zoned	mV
NMSG	Near Minimum Sliding Gate	DSLT-H	315	us
NMXG	Near Maximum Sliding Gate	DSLT-H	950	us
NUMP	Number of Detection Passes	DSLT-H	2	
RCTH	Reference Calibrator Thickness	USIT-D	0.295	in
SFAF	Sonic Formation Attenuation Factor	DSLT-H	3.25	dB/ft
SGAD	Sliding Gate Status	DSLT-H	Off	
SGCL	Sliding Gate Closing Delta-T	DSLT-H	130	us/ft
SGCW	Sliding Gate Closing Width	DSLT-H	25	us
SGDT	Sliding Gate Delta-T	DSLT-H	57	us/ft
SGW	Sliding Gate Width	DSLT-H	110	us
SLEV	Signal Level for AGC	DSLT-H	5000	mV
SOCN	Standoff Distance	HGNS-H	0.125	in
SOCO	Standoff Correction Option	HGNS-H	Yes	
TCUB	T^3 Processing Level	USIT-D	Loop	
THDH	Maximum Search Thickness (percentage of nominal)	USIT-D	130	%
THDL	Minimum Search Thickness (percentage of nominal)	USIT-D	70	%
HISC	Tool Position: Centered or Eccentered	HGNS-H	Eccentered	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-D	0.01	Mrayl

UFGDE	Fiberglass Density	USIT-D	1.95	g/cm3
UFGPS	Fiberglass Processing Selection	USIT-D	No	
UFGVL	Fiberglass Velocity	USIT-D	9678.48	ft/s
USI_FSOD	USIT USI Fluid Slowness Fits Casing Outer Diameter	USIT-D	0_OFF	
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-D	Automatic	
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-D	FreePipe Norm.	
THDP	Thickness Detection Policy	USIT-D	Fundamental	
VCAS	Ultrasonic Transversal Velocity in Casing	USIT-D	51.4	us/ft
VDLG	VDL Manual Gain	DSLT-H	5	
ZCAS	Acoustic Impedance of Casing	USIT-D	46.25	Mrayl
ZCMT	Acoustic Impedance of Cement	DSLT-H	6.8	Mrayl
ZCMT_NEAT	Acoustic Impedance of Cement in Neat Cement	DSLT-H	6.8	Mrayl

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	17.5	20	1436
BS	14	1436	8760
CBRA	0	20	22.5
CBRA	52	22.5	8762.5
GOBO_CURR	0	20	22.5
GOBO_CURR	4.78	22.5	8762.5
MATT_CURR	0	20	22.5
MATT_CURR	9.3	22.5	8762.5
MCI	0	20	22.5
MCI	14.81	22.5	8762.5
MSA	0	20	22.5
MSA	2.63	22.5	8762.5
MSA_CURR	0	20	22.5
MSA_CURR	2.63	22.5	8762.5

All depth are actual.

Tool Control Parameters

Two: Parameters

Parameter	Description	Tool	Value	Unit
DDEL	Digitizing Delay	DSLT-H	0	us
MODE	DSLT Acquisition Mode	DSLT-H	CBL	
RATE	DSLT Firing Rate	DSLT-H	15 Hz	
DTFS	DSLT Telemetry Frame Size	DSLT-H	536	
DWCO	Digitizer Word Count	DSLT-H	250	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	675	ft/h
SDTH	Switch Down Threshold	DSLT-H	20000	
SGAI	Selectable Acquisition Gain	DSLT-H	x1	
SUTH	Switch Up Threshold	DSLT-H	1000	
ULOG	Logging Objective	USIT-D	MEASUREMENT	
UMFR	Modulation Frequency	USIT-D	333333	Hz
UPAT	USIT Emission Pattern	USIT-D	Pattern 300 KHz	
UWKM	USIT Working Mode	USIT-D	Uncompressed 5 deg at 0.6 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-D	2000	ft
VRES	Vertical Resolution	USIT-D	0.6 in	
WINB	Window Begin Time	USIT-D	41.86	us
WINE	Window End Time	USIT-D	81.86	us

WINE	Window End Time	USH-D	81.86	us
WMOD	Waveform Firing Mode	DSLT-H	Full	

Two

Bottom Section 5 in = 100 ft

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Two	Log[2]:Up	Up	8563.26 ft	8904.38 ft	03-Oct-2015 2:39:08 PM	03-Oct-2015 3:13:51 PM	ON	16.20 ft	Yes

All depths are referenced to toolstring zero

Log

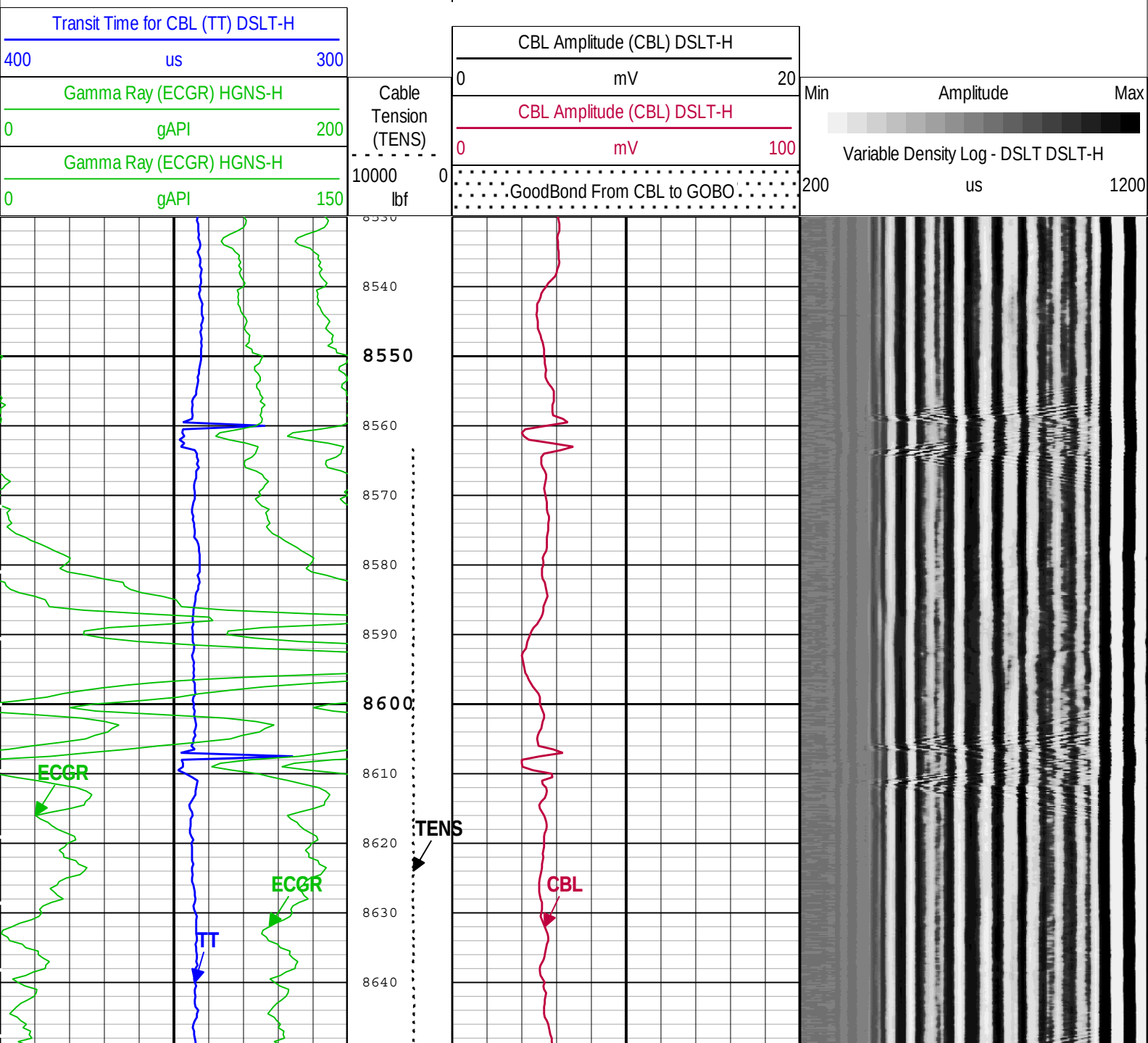
Company:Southern California Gas Company Well:Standard Sesnon 4B

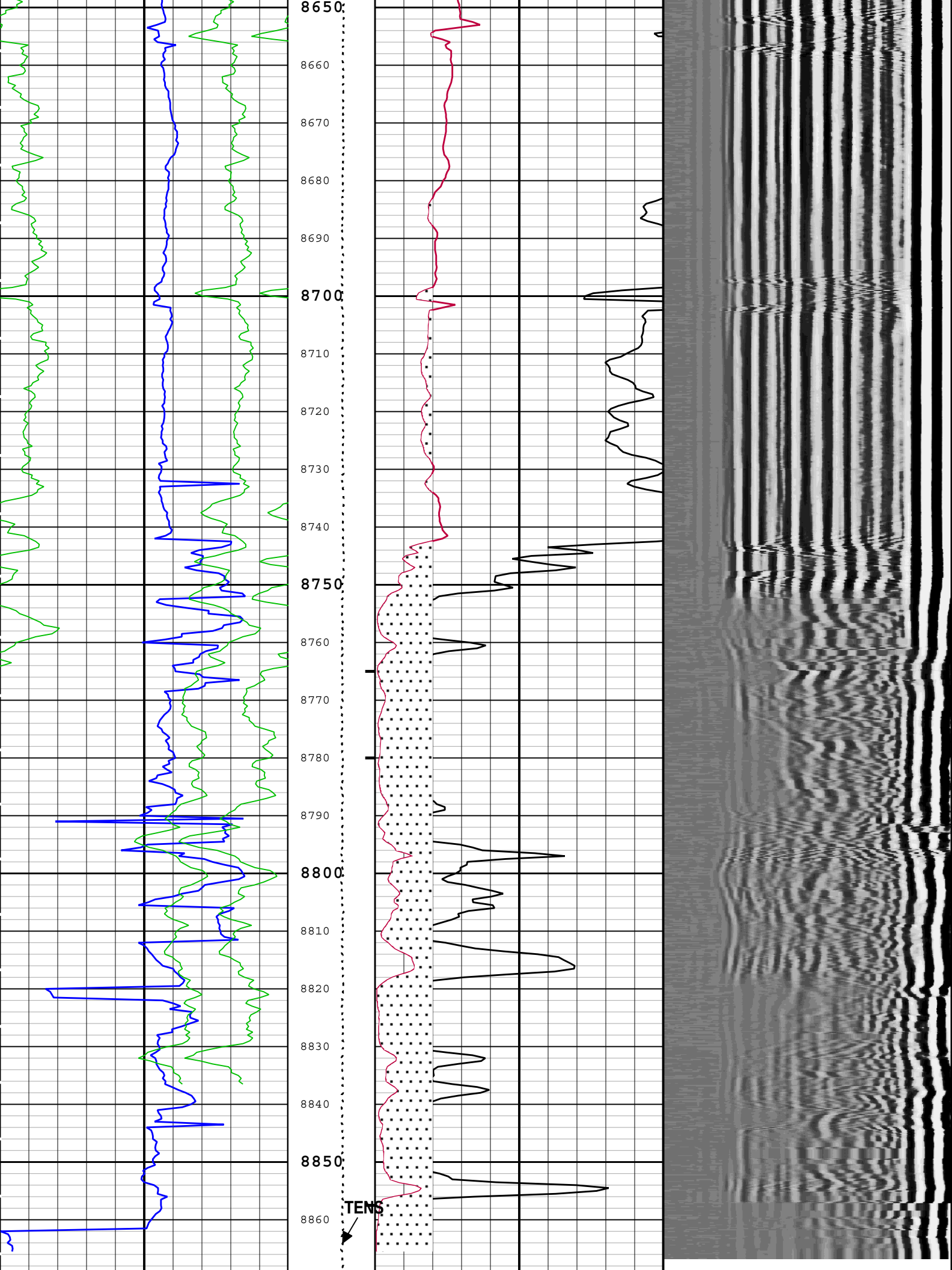
Two: Log[2]:Up:S016

Description: Sonic CBL with VDL Format: Log (Sonic CBL with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 03-Oct-2015 19:22:21

TIME_1900 - Time Marked every 60.00 (s)

BIEP - Bond Index Event Pips DSLT-H

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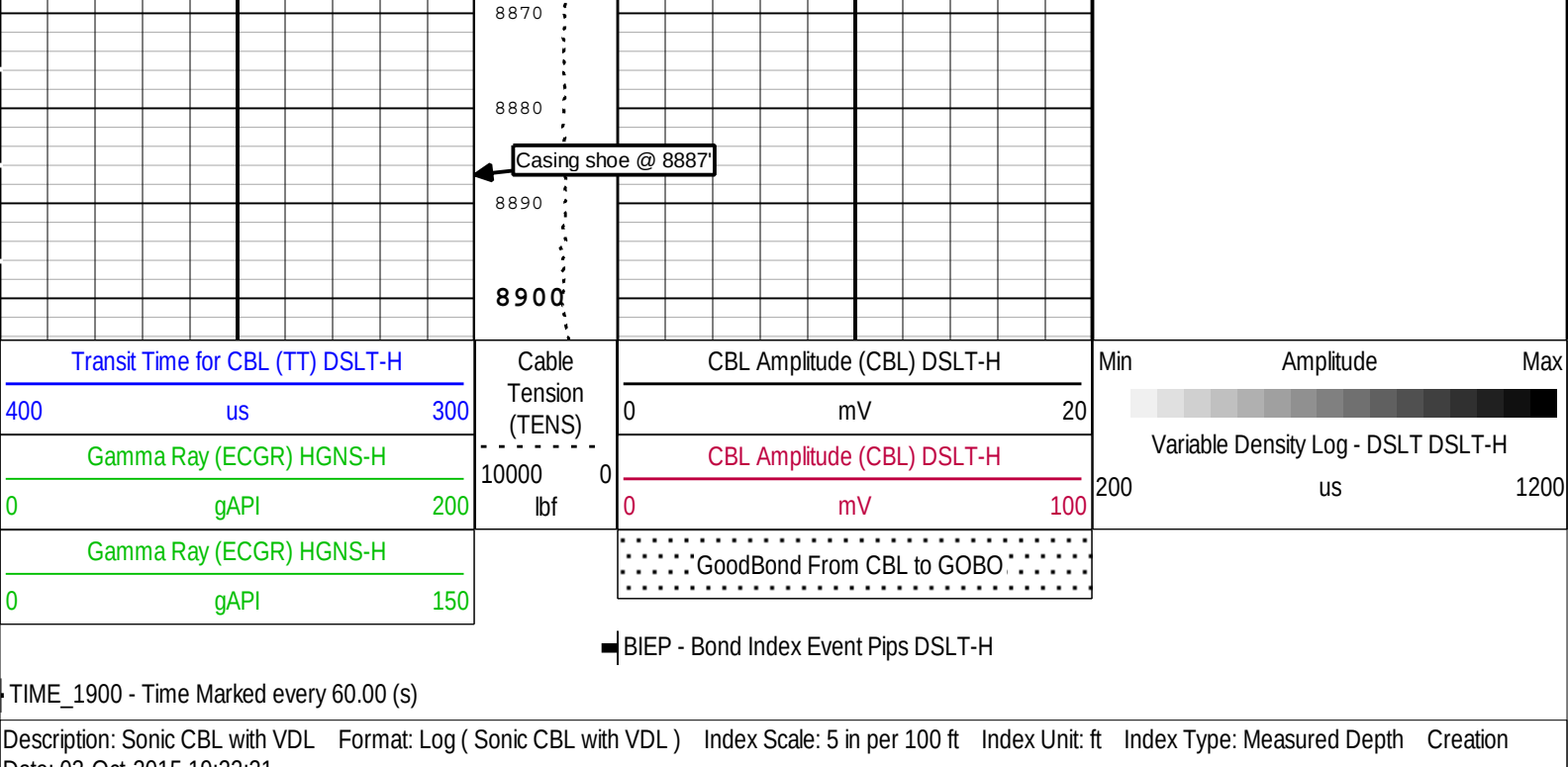
8860
TENS



Description: Sonic CBL with VDL Format: Log (Sonic CBL with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 03-Oct-2015 19:22:21

Channel Processing Parameters

Two: Parameters

Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	14	in
CBLG	CBL Gate Width	DSLT-H	60	us
CBLO	Casing Bottom (Logger)	WLSESSION	8887	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSLT-H	Depth Zoned	mV
CDEN	Cement Density	HGNS-H	2	g/cm3
CMTY(U-USIT_CEMT)	Cement Type	USIT-D	Regular Cement	
DETE	Delta-T Detection	DSLT-H	E1	
DFD	Drilling Fluid Density	Borehole	9	lbm/gal
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS	
GOBO_CURR	Good Bond in Arbitrary Cement	DSLT-H	Depth Zoned	mV
IMAR	Image Rotation	USIT-D	Off	
MAHTR	Manual High Threshold Reference for first arrival detection	DSLT-H	120	
MATT_CURR	Maximum Attenuation in Arbitrary Cement	DSLT-H	Depth Zoned	dB/ft
MCI	Minimum Cemented Interval for Isolation	DSLT-H	Depth Zoned	ft
MNHTR	Minimum High Threshold Reference for first arrival detection	DSLT-H	100	
MSA	Minimum Sonic Amplitude	DSLT-H	Depth Zoned	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	DSLT-H	Depth Zoned	mV
NMSG	Near Minimum Sliding Gate	DSLT-H	315	us
SGAD	Sliding Gate Status	DSLT-H	Off	
SGDT	Sliding Gate Delta-T	DSLT-H	57	us/ft
SOCO	Standoff Correction Option	HGNS-H	Yes	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-D	0.01	Mrayl
UFGDE	Fiberglass Density	USIT-D	1.95	g/cm3
UFGPS	Fiberglass Processing Selection	USIT-D	No	

UFGVL	Fiberglass Velocity	USIT-D	9678.48	ft/s
USI_FSOD	USIT USI Fluid Slowness Fits Casing Outer Diameter	USIT-D	0_OFF	
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-D	Automatic	
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-D	FreePipe Norm.	

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
CBRA	52	8530	8887
CBRA	0	8887	8904.42
GOBO_CURR	4.78	8530	8887
GOBO_CURR	0	8887	8904.42
MATT_CURR	9.3	8530	8887
MATT_CURR	0	8887	8904.42
MCI	14.81	8530	8887
MCI	0	8887	8904.42
MSA	2.63	8530	8887
MSA	0	8887	8904.42
MSA_CURR	2.63	8530	8887
MSA_CURR	0	8887	8904.42

All depth are actual.

Tool Control Parameters

Two: Parameters

Parameter	Description	Tool	Value	Unit
MODE	DSLT Acquisition Mode	DSLT-H	CBL	
RATE	DSLT Firing Rate	DSLT-H	15 Hz	
DTFS	DSLT Telemetry Frame Size	DSLT-H	536	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	675	ft/h
SGAI	Selectable Acquisition Gain	DSLT-H	x1	
ULOG	Logging Objective	USIT-D	MEASUREMENT	
UMFR	Modulation Frequency	USIT-D	333333	Hz
UPAT	USIT Emission Pattern	USIT-D	Pattern 300 KHz	
UWKM	USIT Working Mode	USIT-D	Uncompressed 5 deg at 0.6 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-D	2000	ft
VRES	Vertical Resolution	USIT-D	0.6 in	
WINB	Window Begin Time	USIT-D	74.36	us
WINE	Window End Time	USIT-D	114.36	us

Well:	Standard Sesnon 4B
Field:	Aliso Canyon
County:	Los Angeles
State:	California

Cement Bond Log
Variable Density Log
Gamma Ray - CCL