

Company: Whiting Oil & Gas Corporation

Well: Razor 25N-2437

Field: Wildcat

County: Weld State: Colorado

Cement Bond Log

GR-CCL

County:	Weld		
Field:	Wildcat		
Location:	SESW Sec 25, T10N, R58W		
Well:	Razor 25N-2437		
Company:	Whiting Oil & Gas Corporation		
Location:	SESW Sec 25, T10N, R58W	Elev.: K.B. 4725.00 ft	
	SHL: 305' FSL X 1980' FWL	G.L. 4704.00 ft	
	Lat/Long: 40.803275/-103.815286	D.F. 4724.00 ft	
	Permanent Datum:	Ground Level	Elev.: 4704.00 f
	Log Measured From:	Kelly Bushing	21.00 ft above Perm.Datum
Drilling Measured From:		Kelly Bushing	
API Serial No.	Section:	Township:	Range:
05-123-42653-0000	25	10N	58W
Logging Date	01-Sep-2016		

Run Number	One		
Depth Driller	15712.00 ft		
Schlumberger Depth	15712.00 ft		
Bottom Log Interval	5745.00 ft		
Top Log Interval	60.00 ft		
Casing Fluid Type	Brine		
Salinity			
Density	8.4 lbm/gal		
Fluid Level	8.00 ft		
BIT/CASING/TUBING STRING			
Bit Size	8.50 in		
From	2050.00 ft		
To	15712.00 ft		
Casing/Tubing Size	5.5 in		
Weight	20 lbm/ft		
Grade	P110		
From	0.00 ft		
To	15706.00 ft		
Max Recorded Temperatures	209 degF		
Logger on Bottom	01-Sep-2016	14:45:00	
Unit Number	Location:	FtMorgan	
Recorded By	Avery Becker		
Witnessed By	Kelly Lewis		

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 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.

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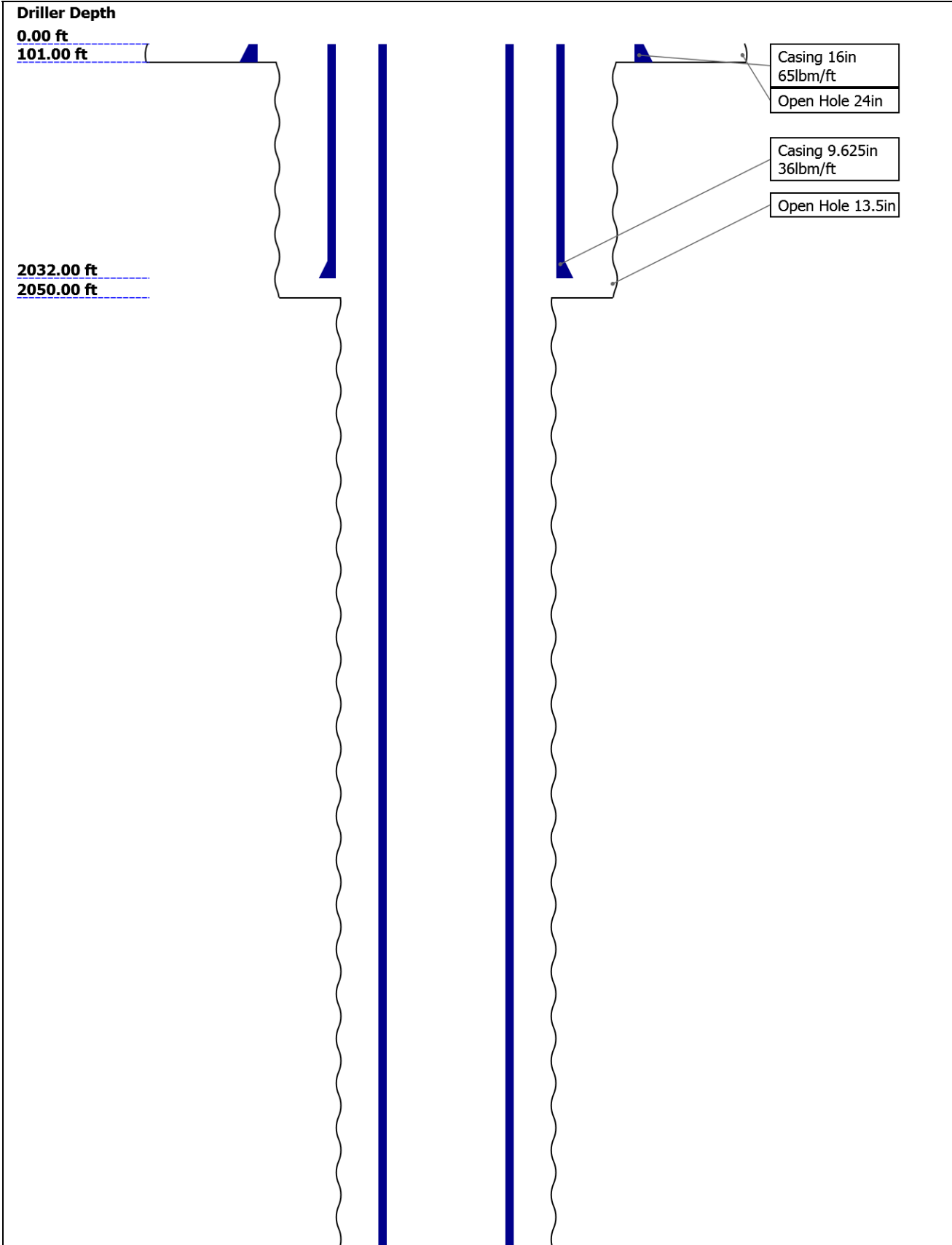
9.4 Log (Sonic CBL with VDL)

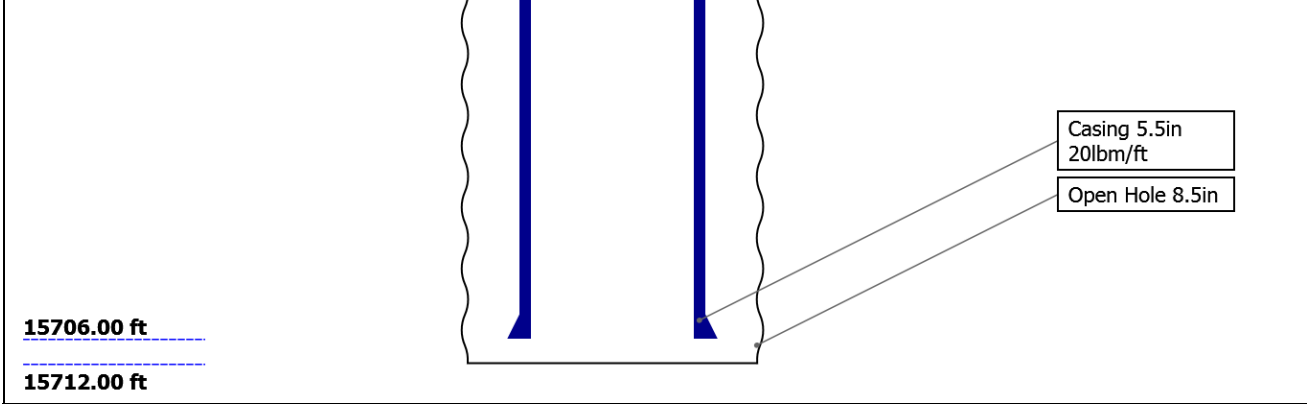
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Well Sketch






Borehole Size/Casing/Tubing Record

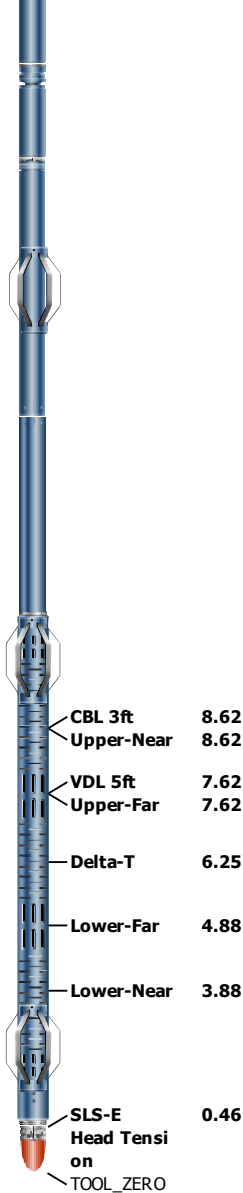
Bit						
Bit Size (in)	24	13.5	8.5			
Top Driller (ft)	0	101	2050			
Top Logger (ft)	0	101	2050			
Bottom Driller (ft)	101	2050	15712			
Bottom Logger (ft)	101	2050	15712			
Casing						
Size (in)	16	9.625	5.5			
Weight (lbm/ft)	65	36	20			
Inner Diameter (in)	15.25	8.921	4.778			
Grade	N/A	N/A	P110			
Top Driller (ft)	0	0	0			
Top Logger (ft)	0	0	0			
Bottom Driller (ft)	101	2032	15706			
Bottom Logger (ft)	101	2032	15706			

Remarks and Equipment Summary

One: Toolstring				One: Remarks	
Equip name LEH-QT LEH-QT	Length 40.01	MP name	Offset	Toolstring run as per tool sketch	
				Main pass recorded under 1500 psi, repeat under 0 psi	
				No free pipe detected, normalization used from offset well	
				Crew: Tim Ludgate & Patrick Sullivan	
				Thank you for choosing Schlumberger	
DTC-H:8803 ECH-KC:10354 DTC-H:8803	33.6	CTEM HV	32.7 0.00		
SGT-N:10210 SGH-K:2996 SGD-TAA:2166 1 SGC-TB:10210	30.6	TelStatus ToolStatus	30.6 30.6		
AH-184[2]:4 200	25.1	GR	29.68		

AH-184[1]:3 23.1
906

DSLTH:8318 21.1
ECH-KH:8373
DSLCH:8318
SLS-E:1650



BNS-STD 0.46

Lengths are in ft
Maximum Outer Diameter = 6.250 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

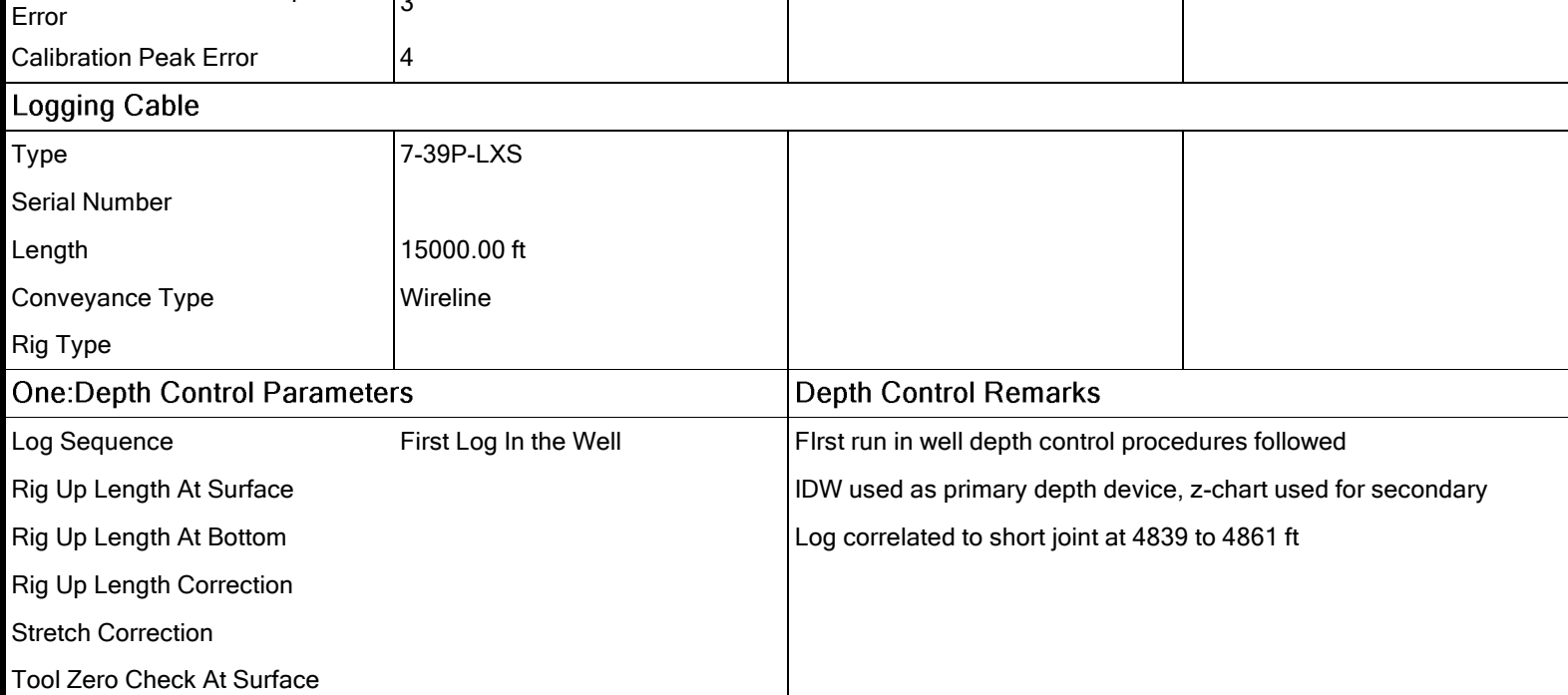
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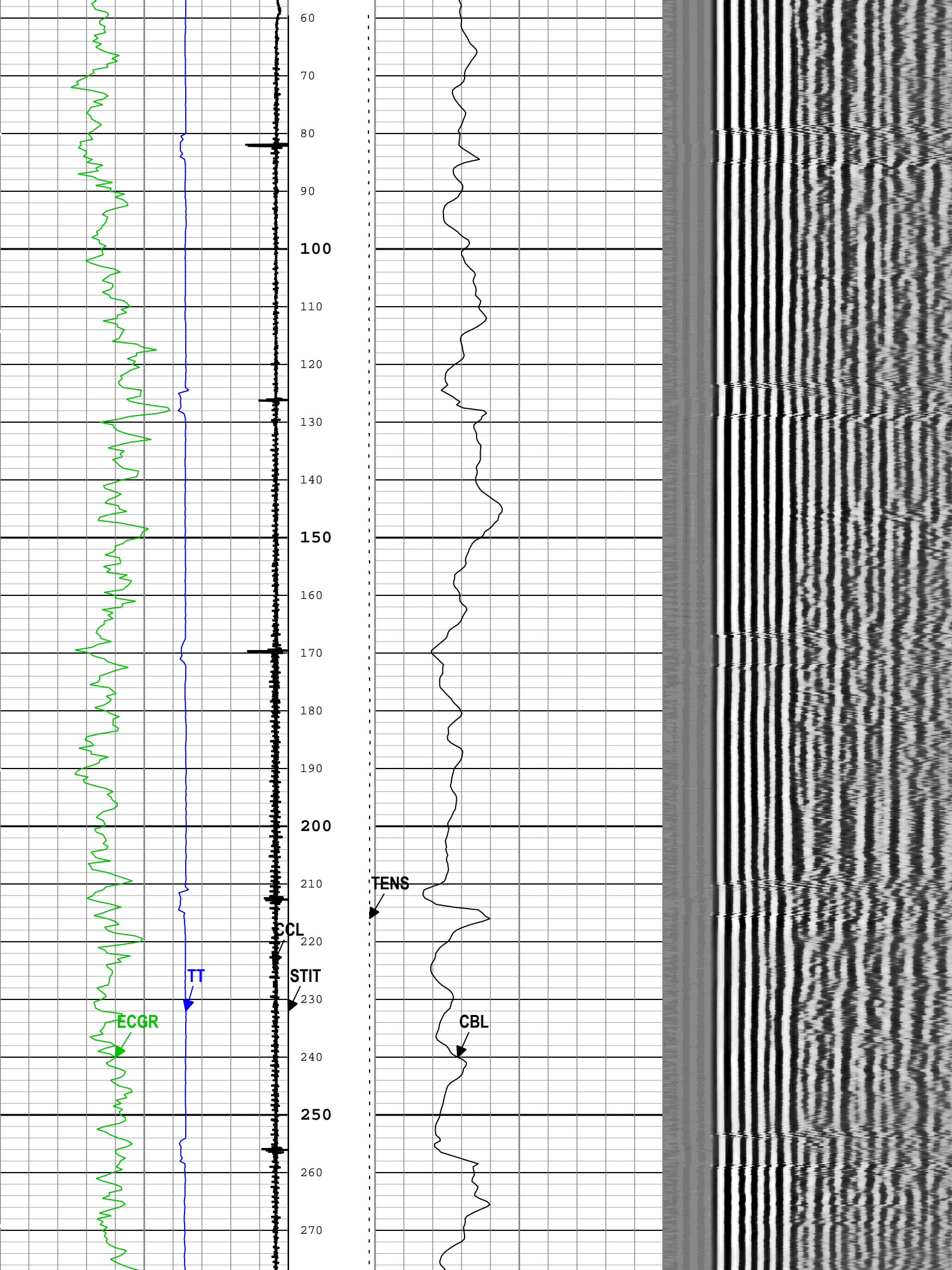
Depth Measuring Device

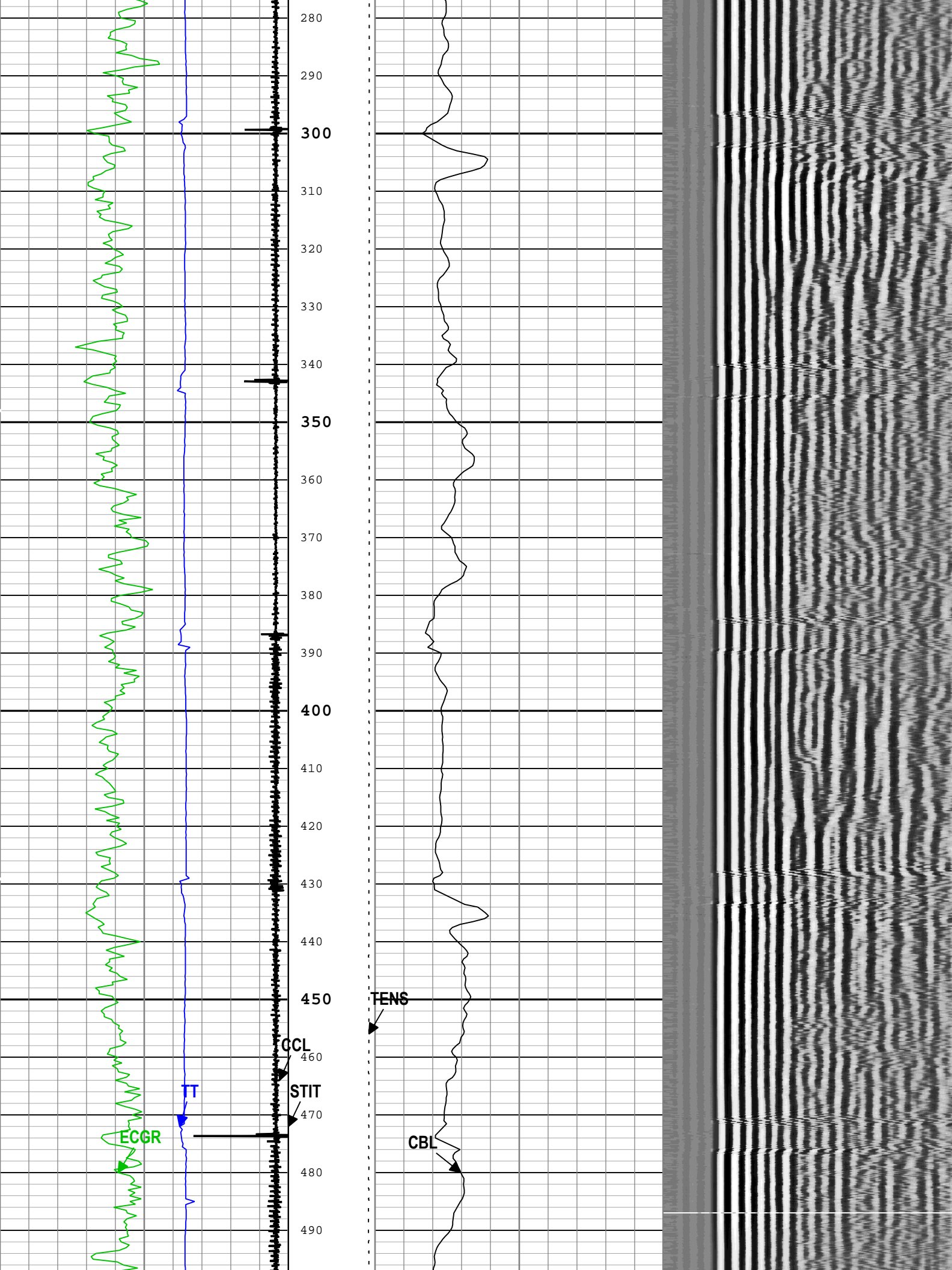
Type	IDW-JA
Serial Number	5896
Calibration Date	29-Apr-2016
Calibrator Serial Number	
Calibration Cable Type	7-39P-LXS
Wheel Correction 1	-1
Wheel Correction 2	-3

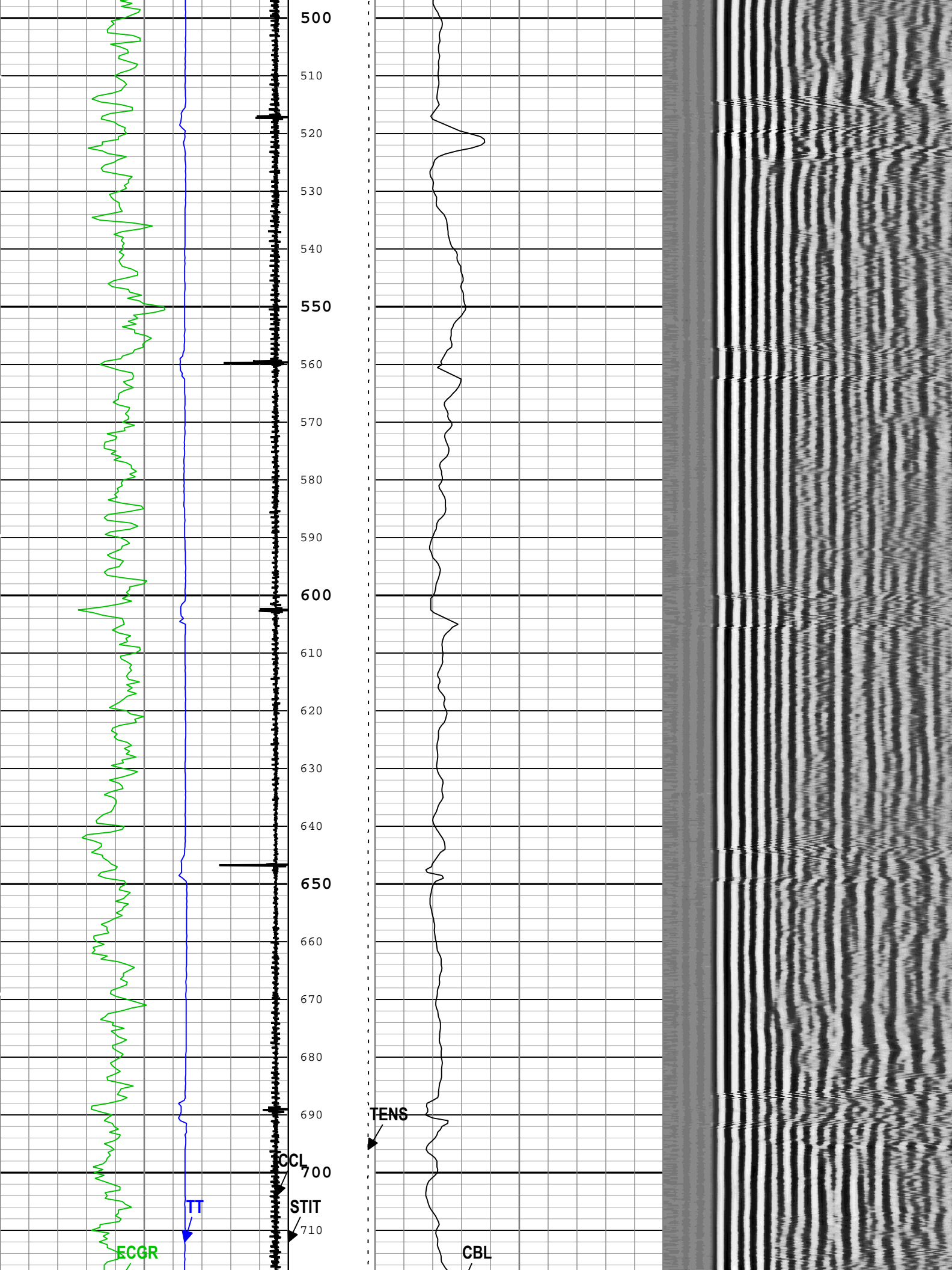
Tension Device

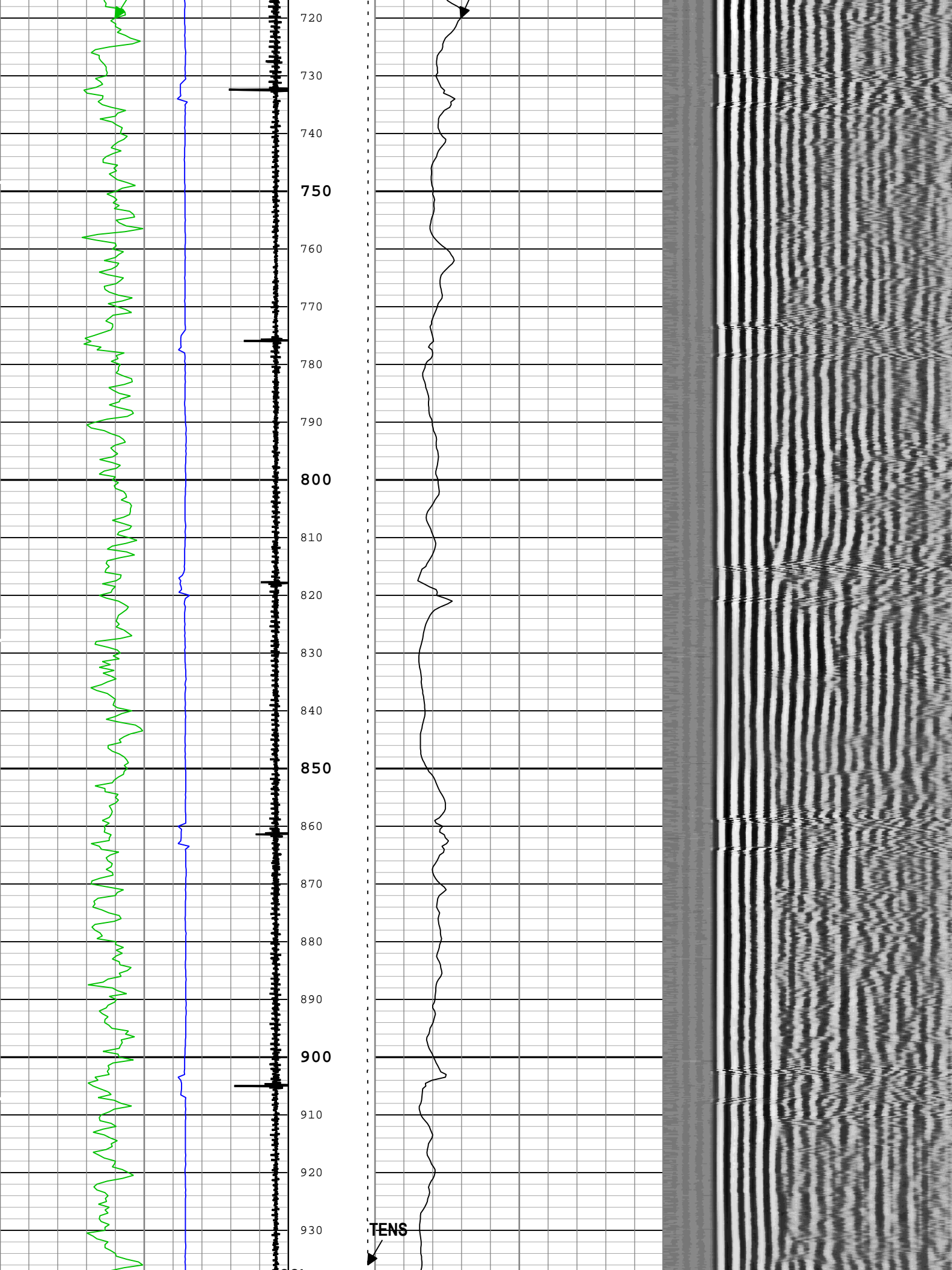
Type	CMTD-B/A
Serial Number	1109
Calibration Date	
Calibrator Serial Number	441435A
Number of Calibration Points	10
Calibration Root Mean Square	2

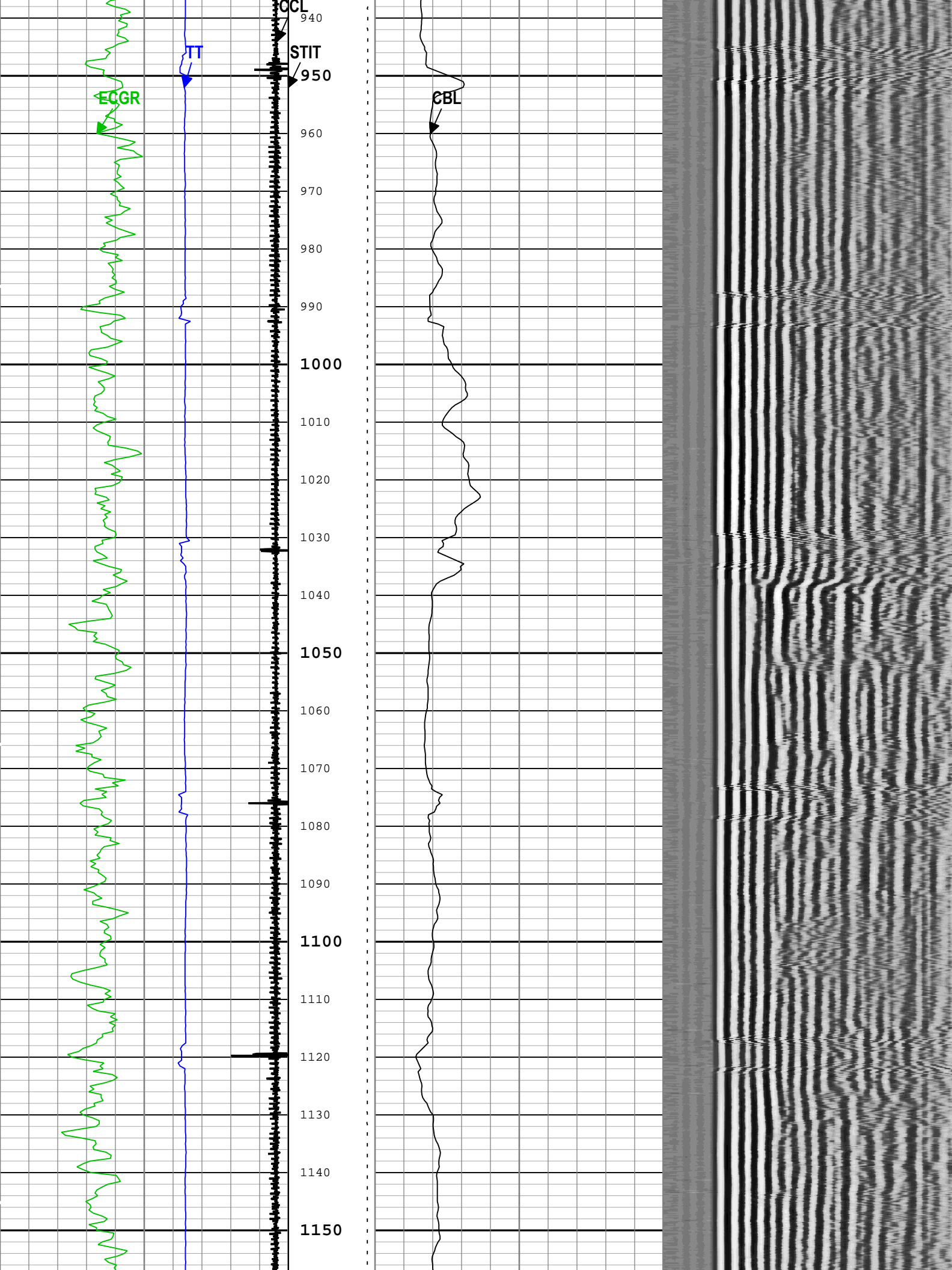


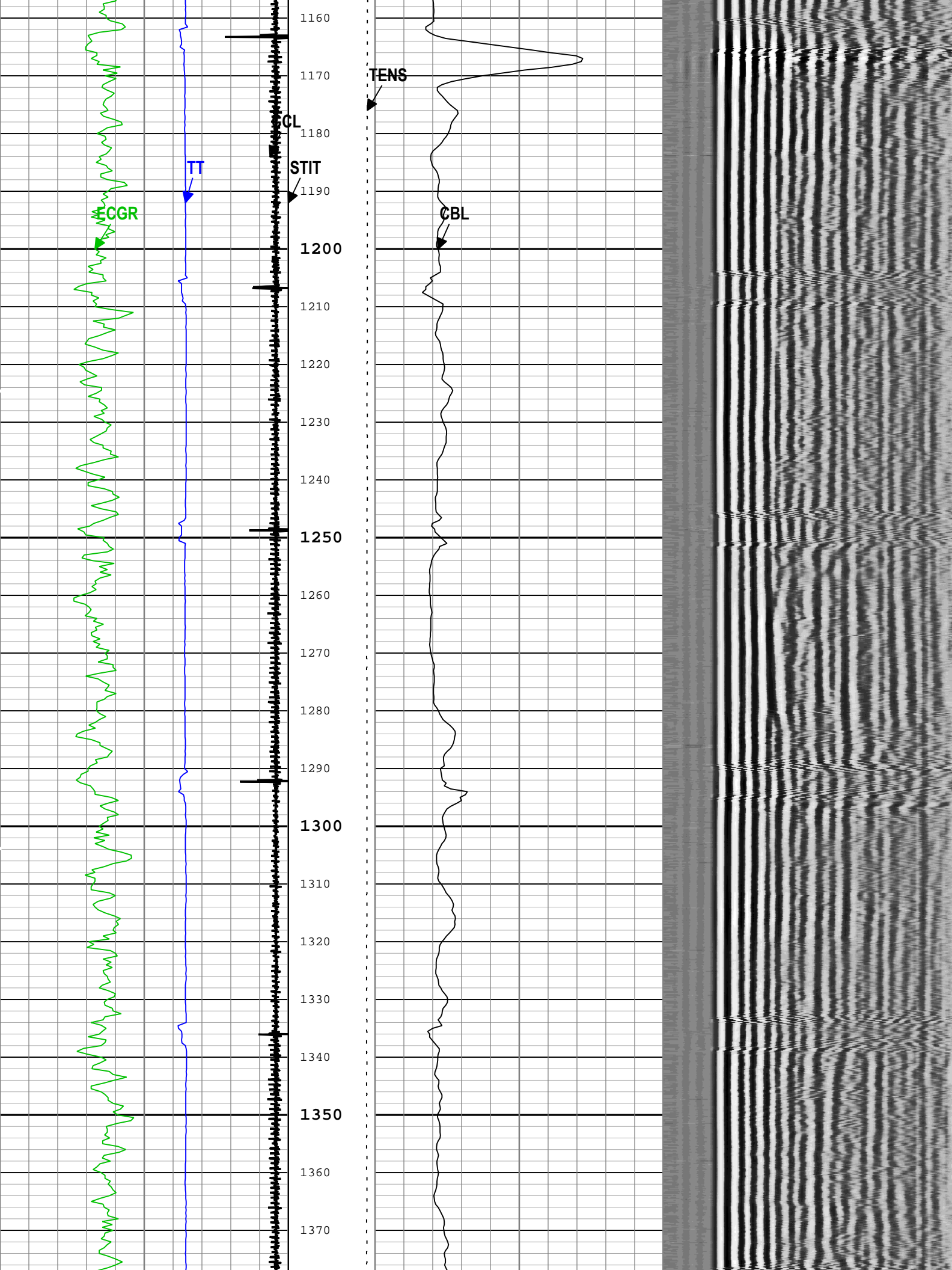


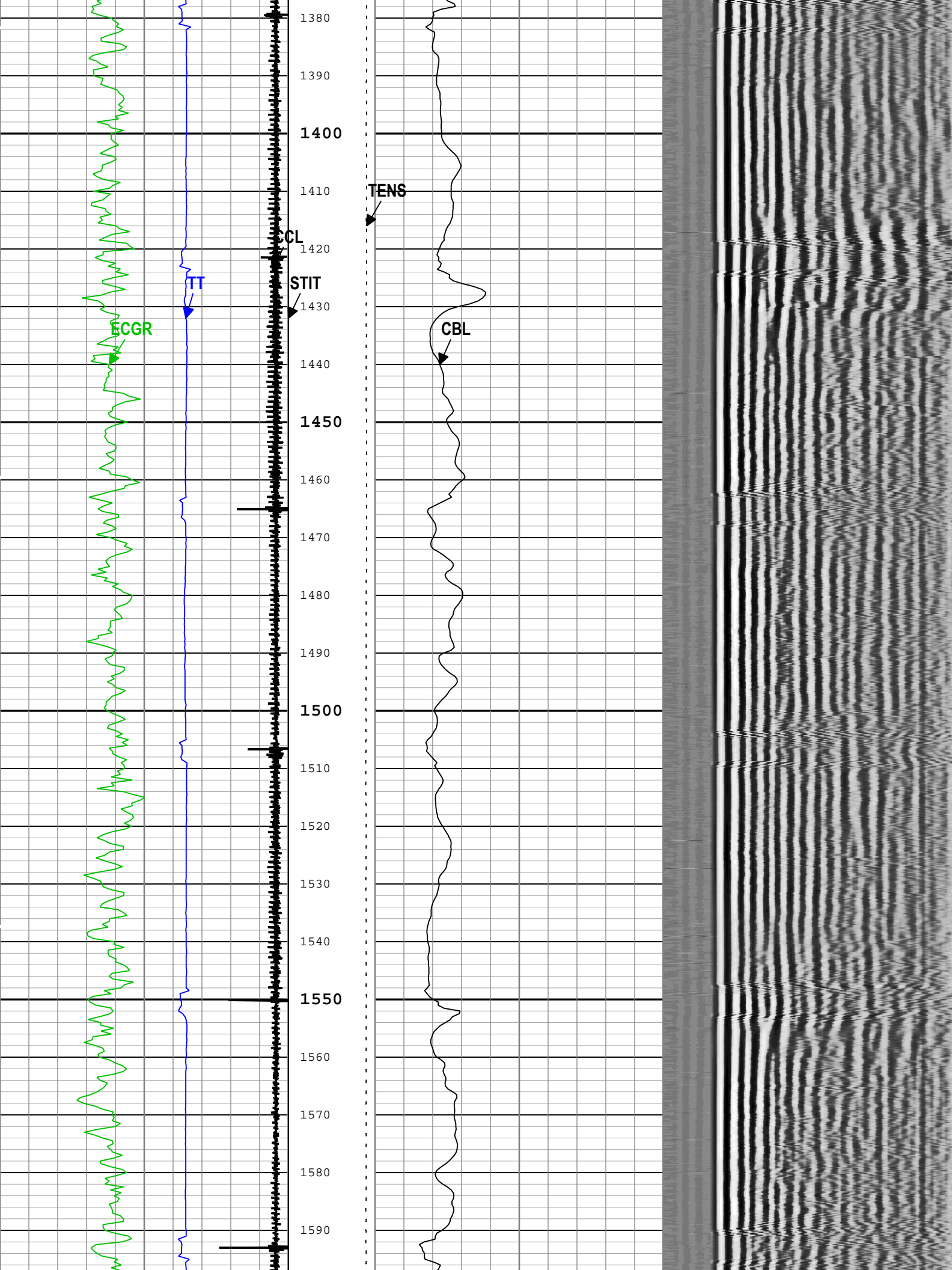


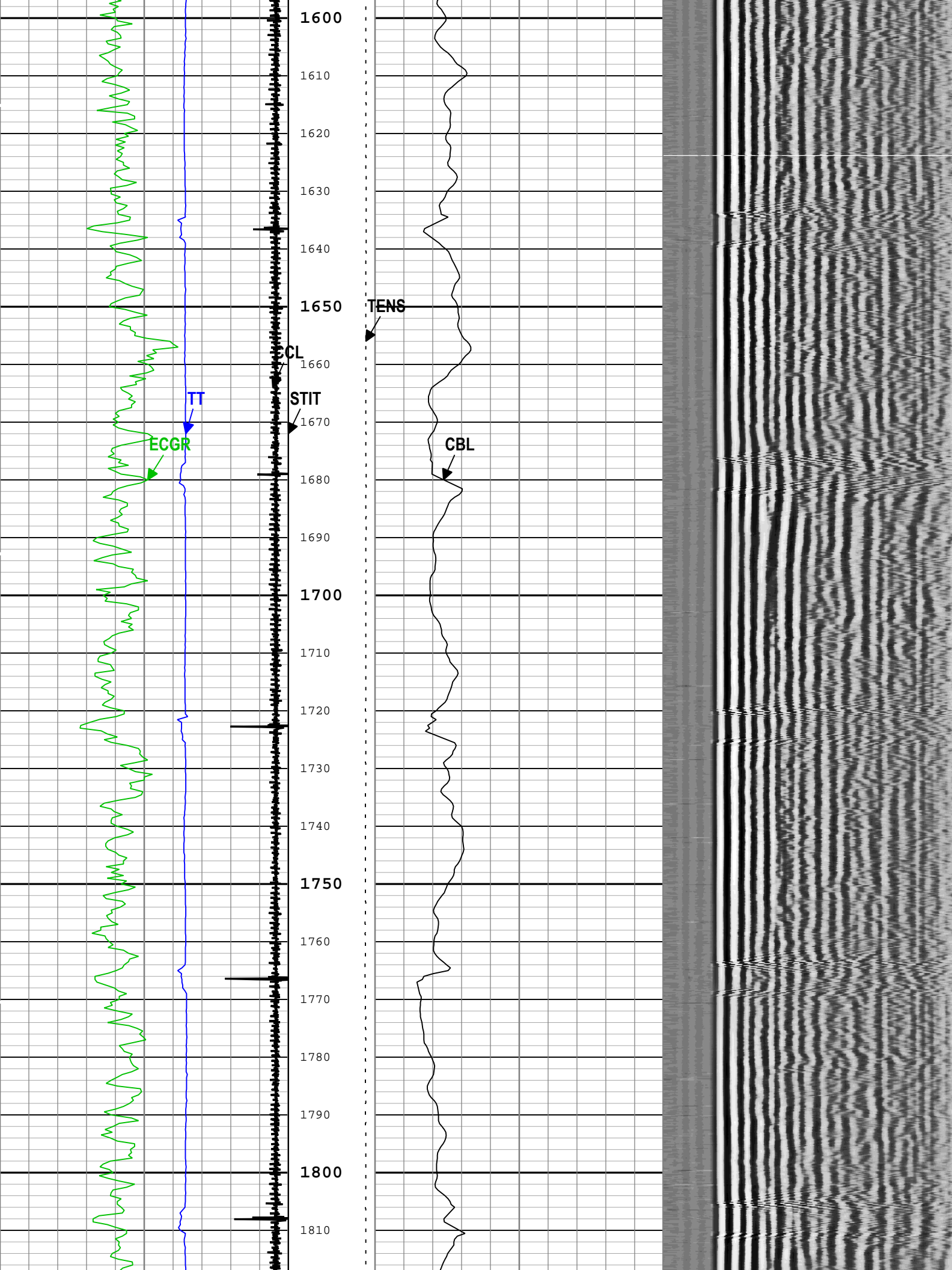


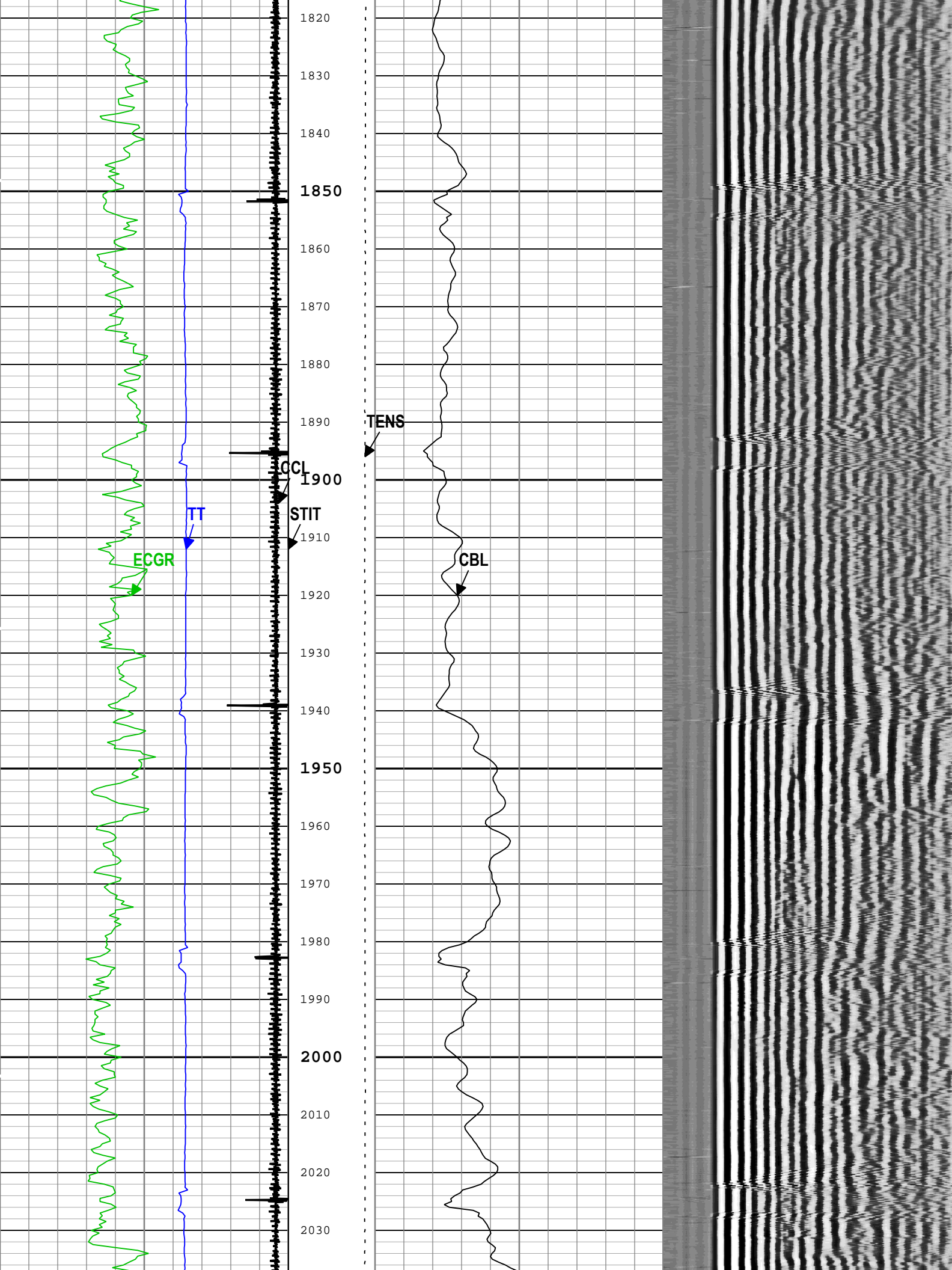


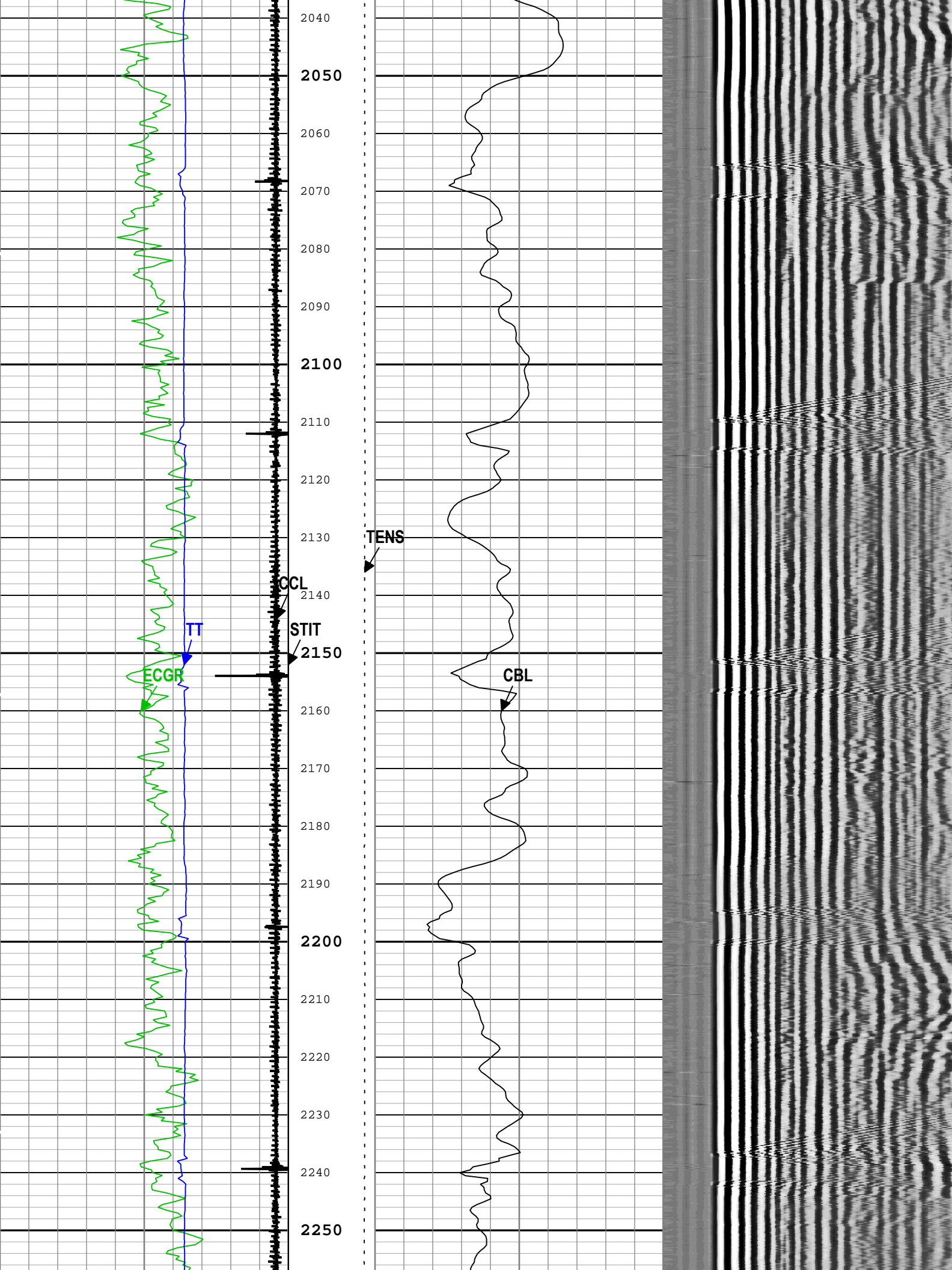


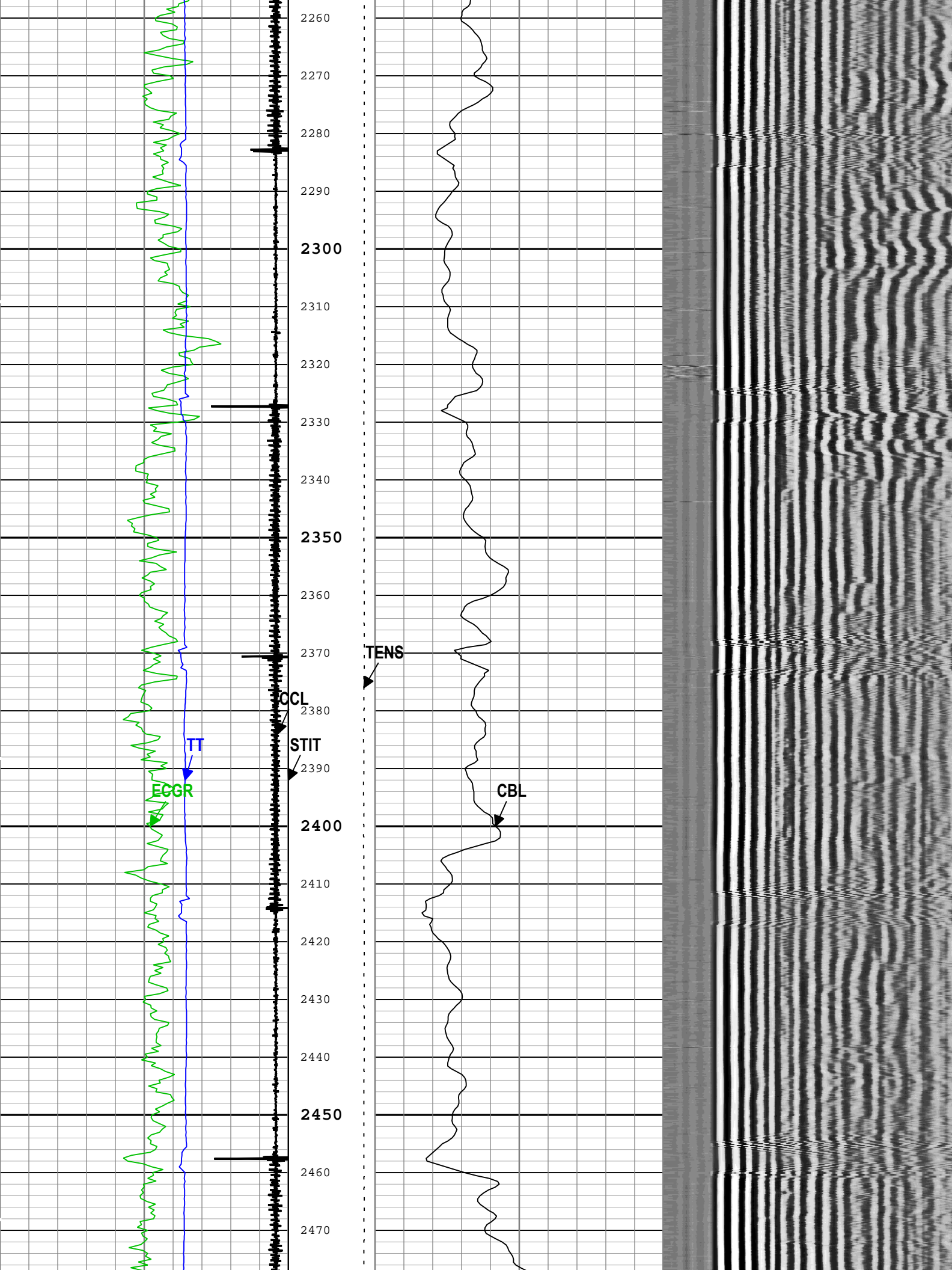


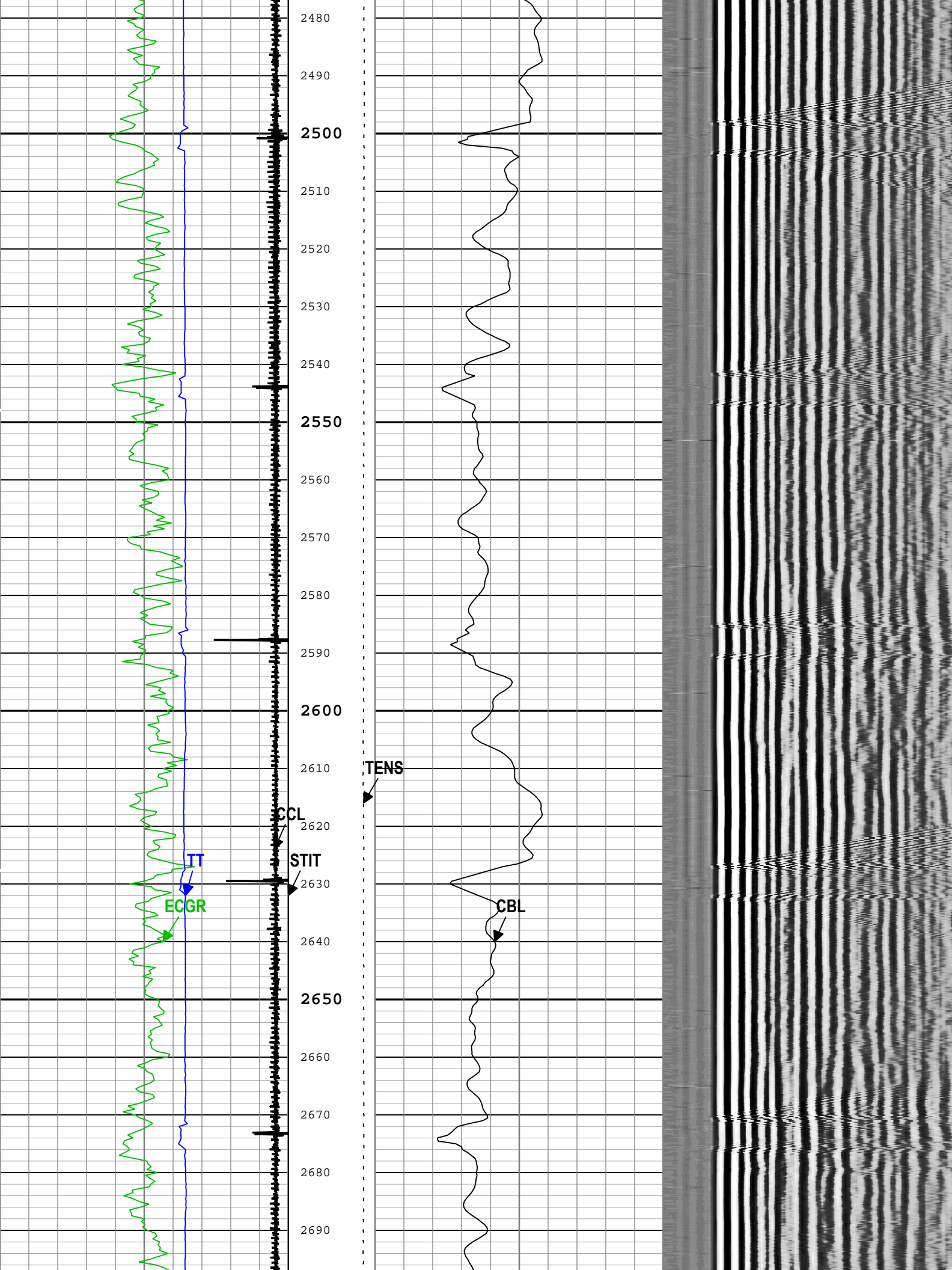


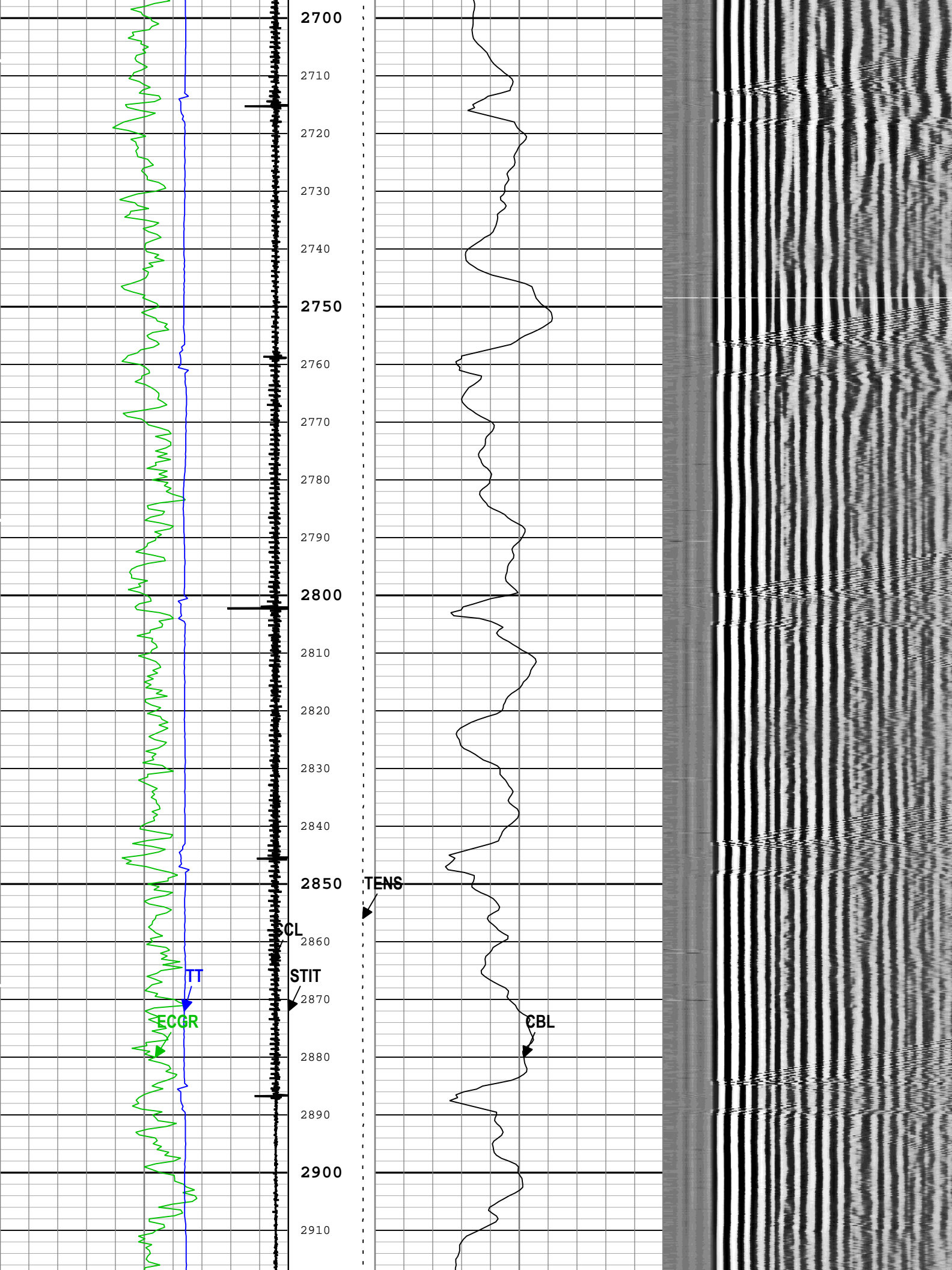


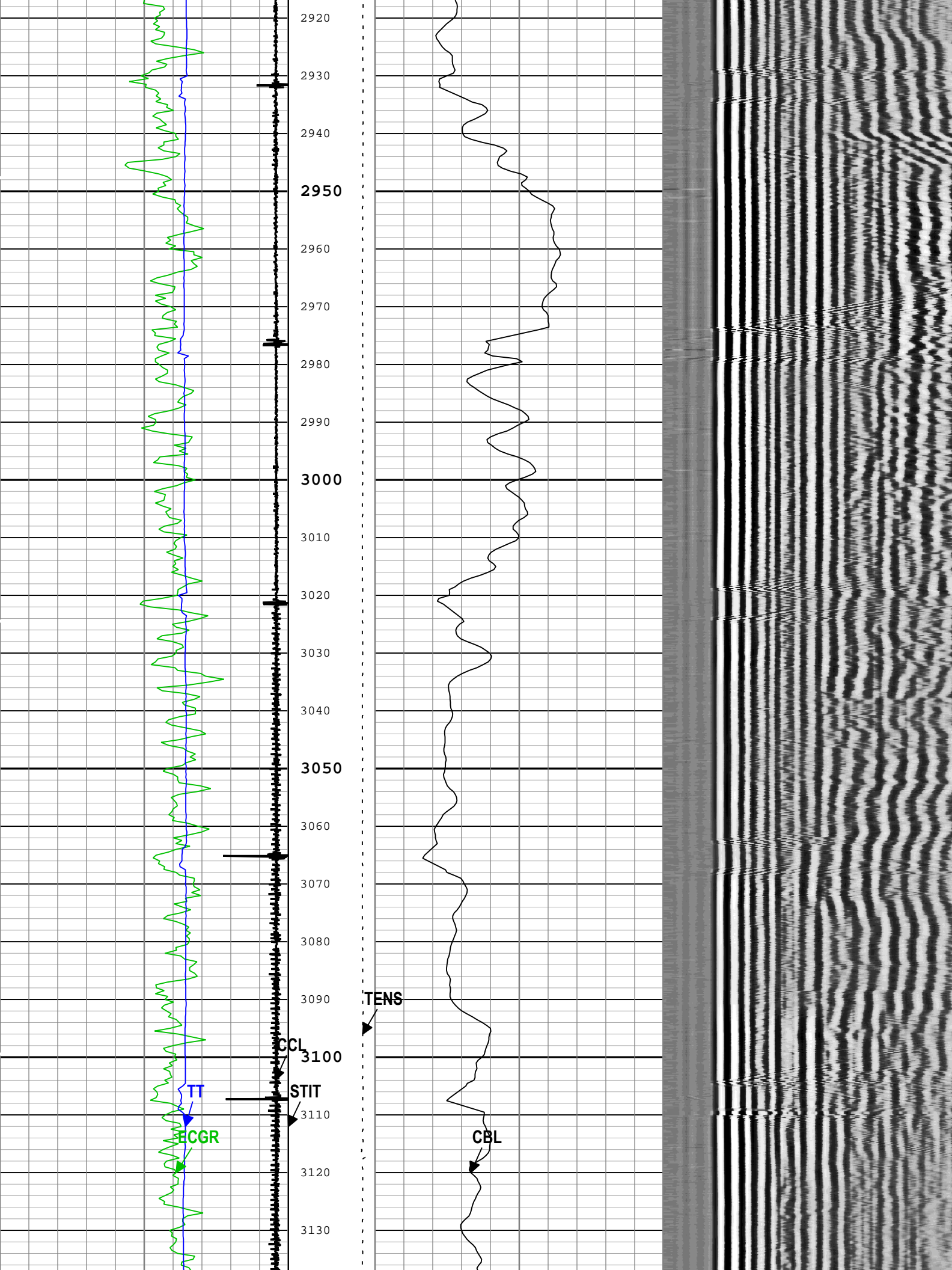


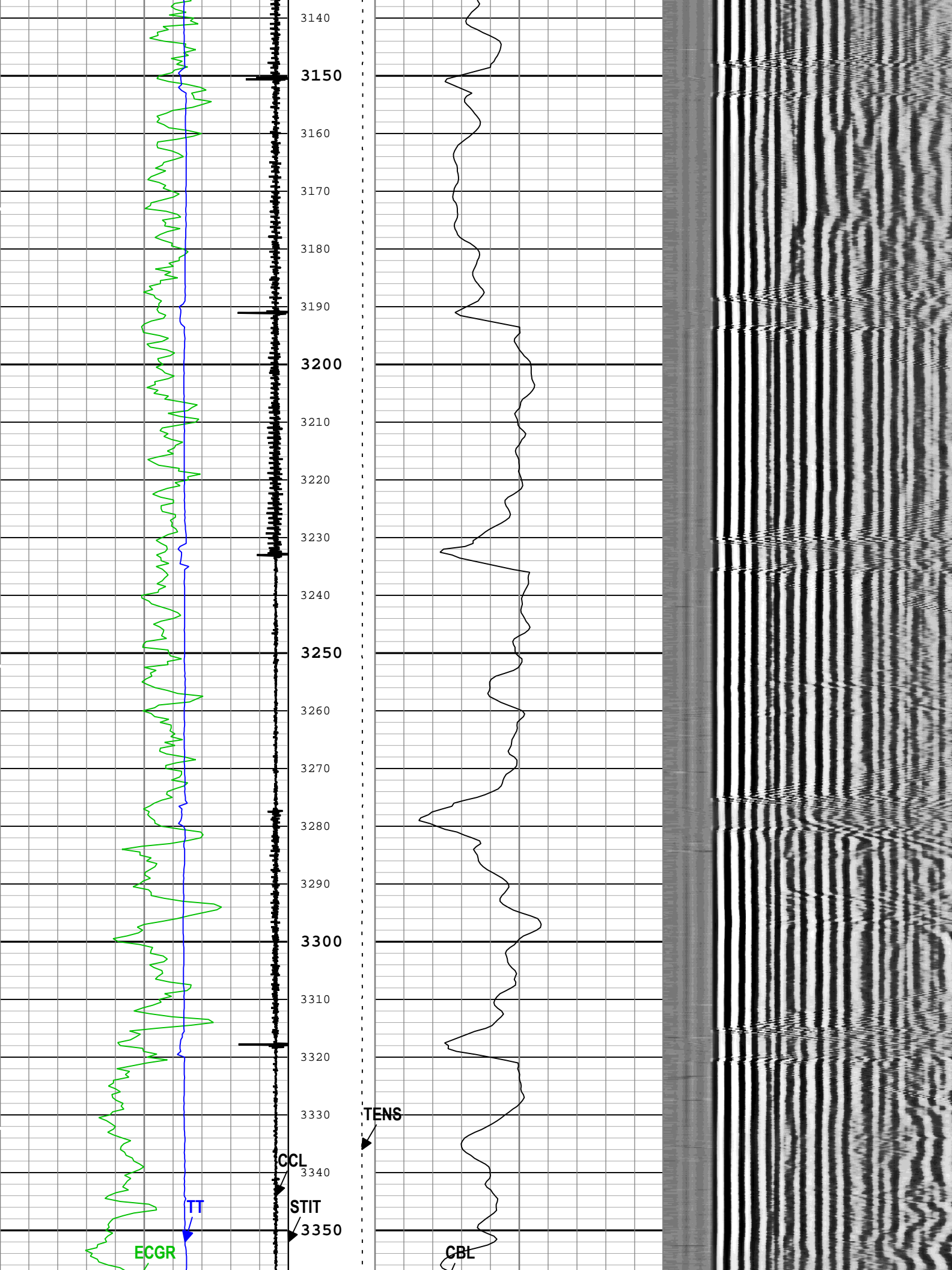


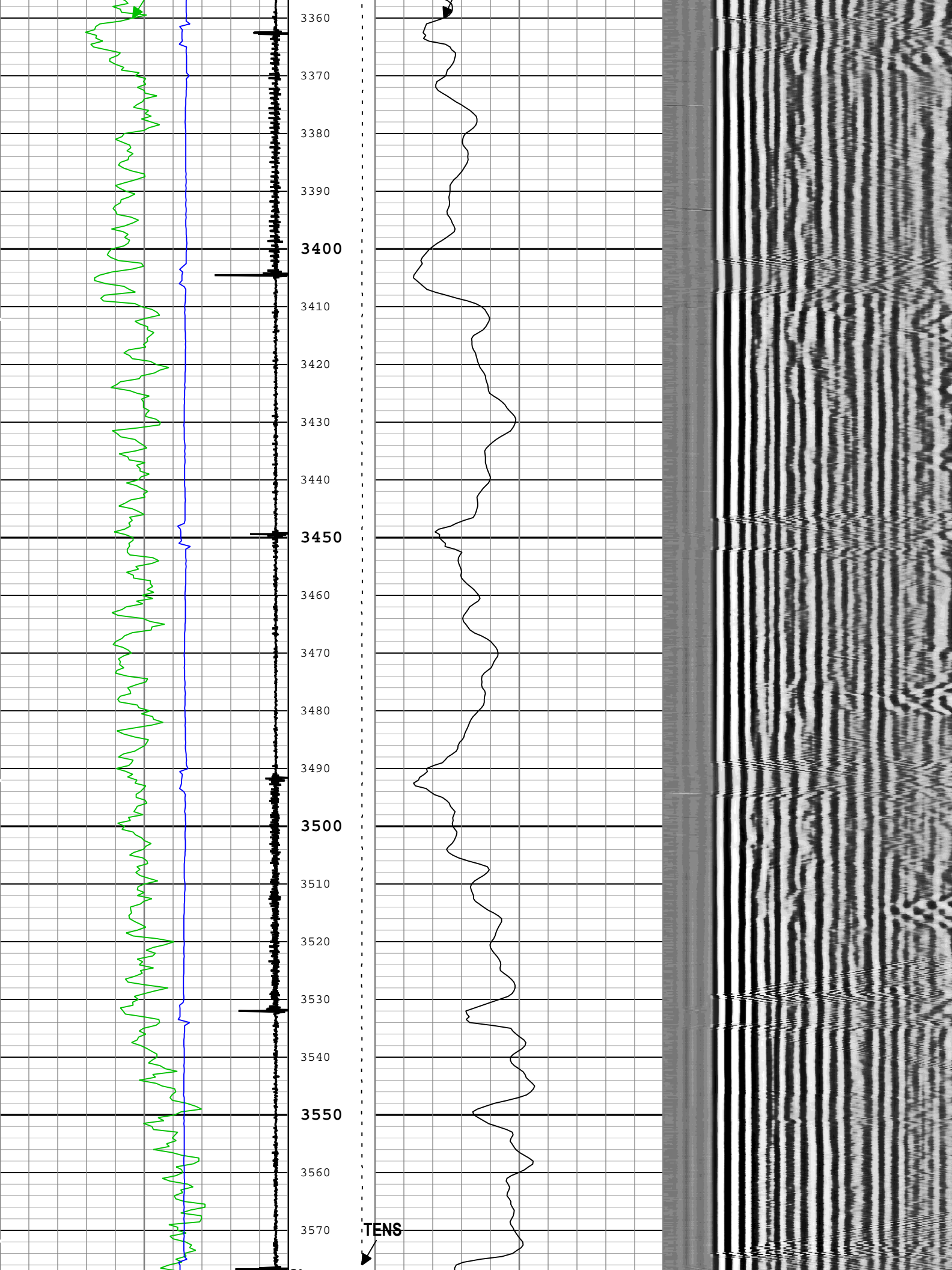


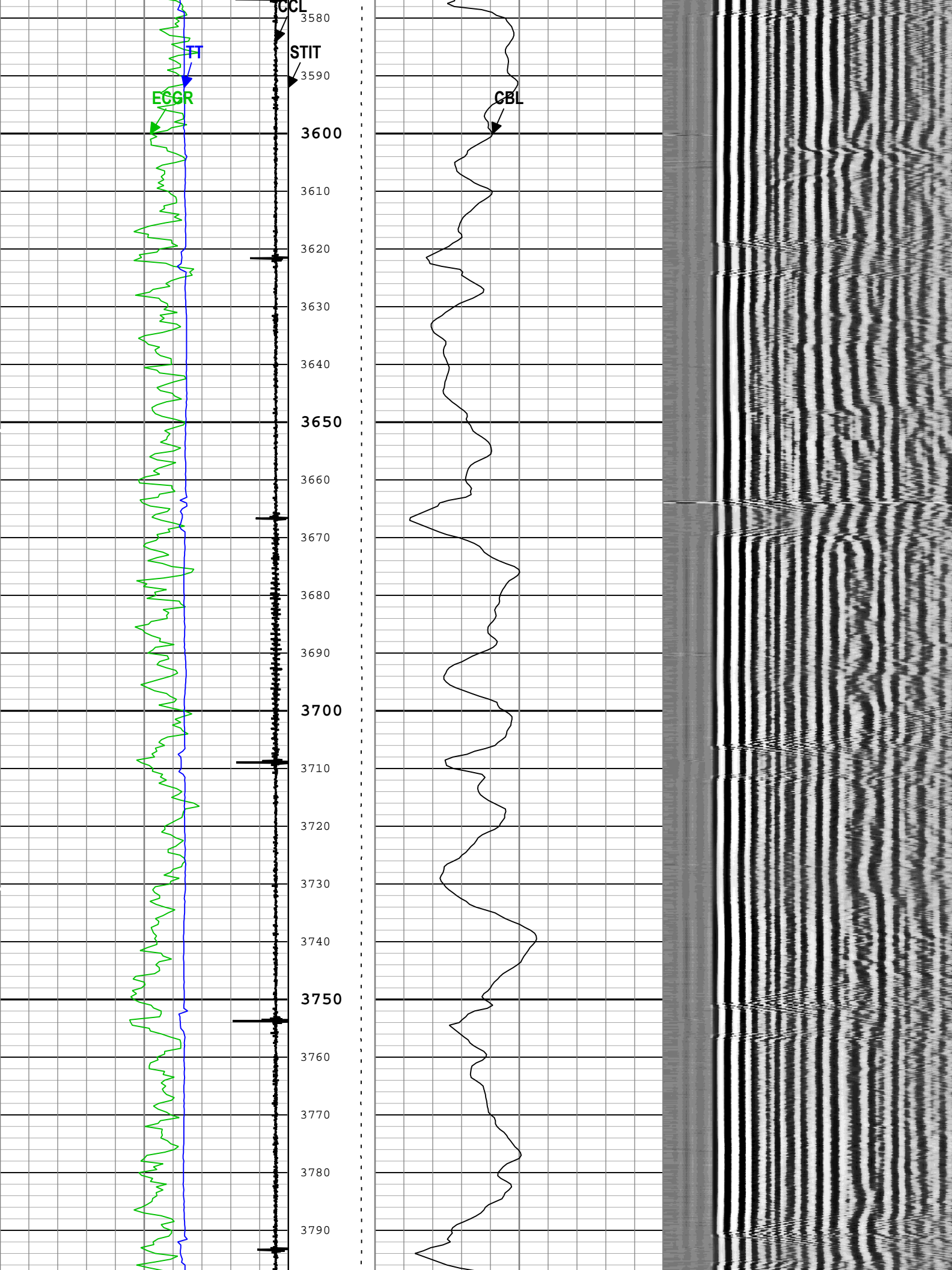


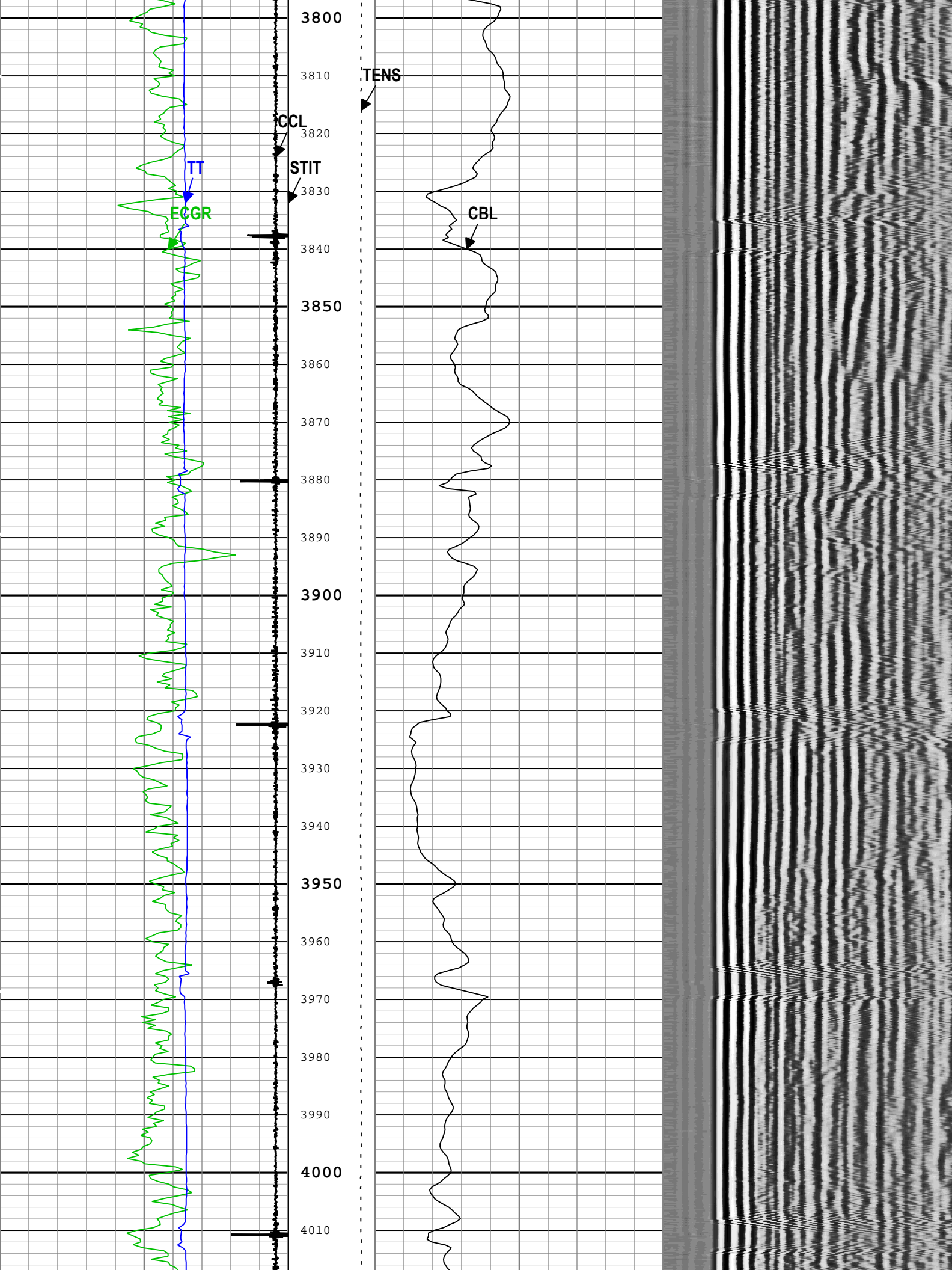


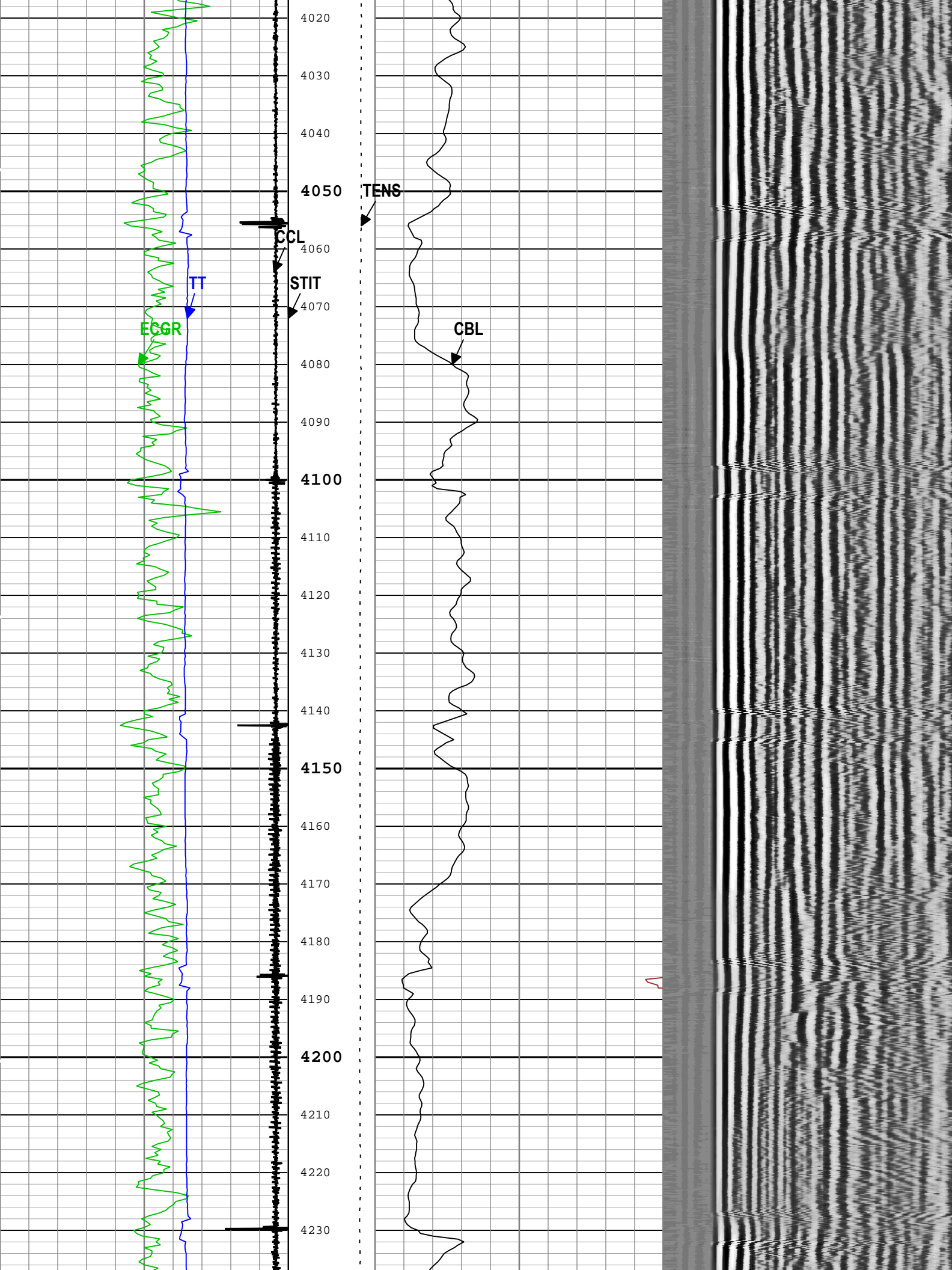


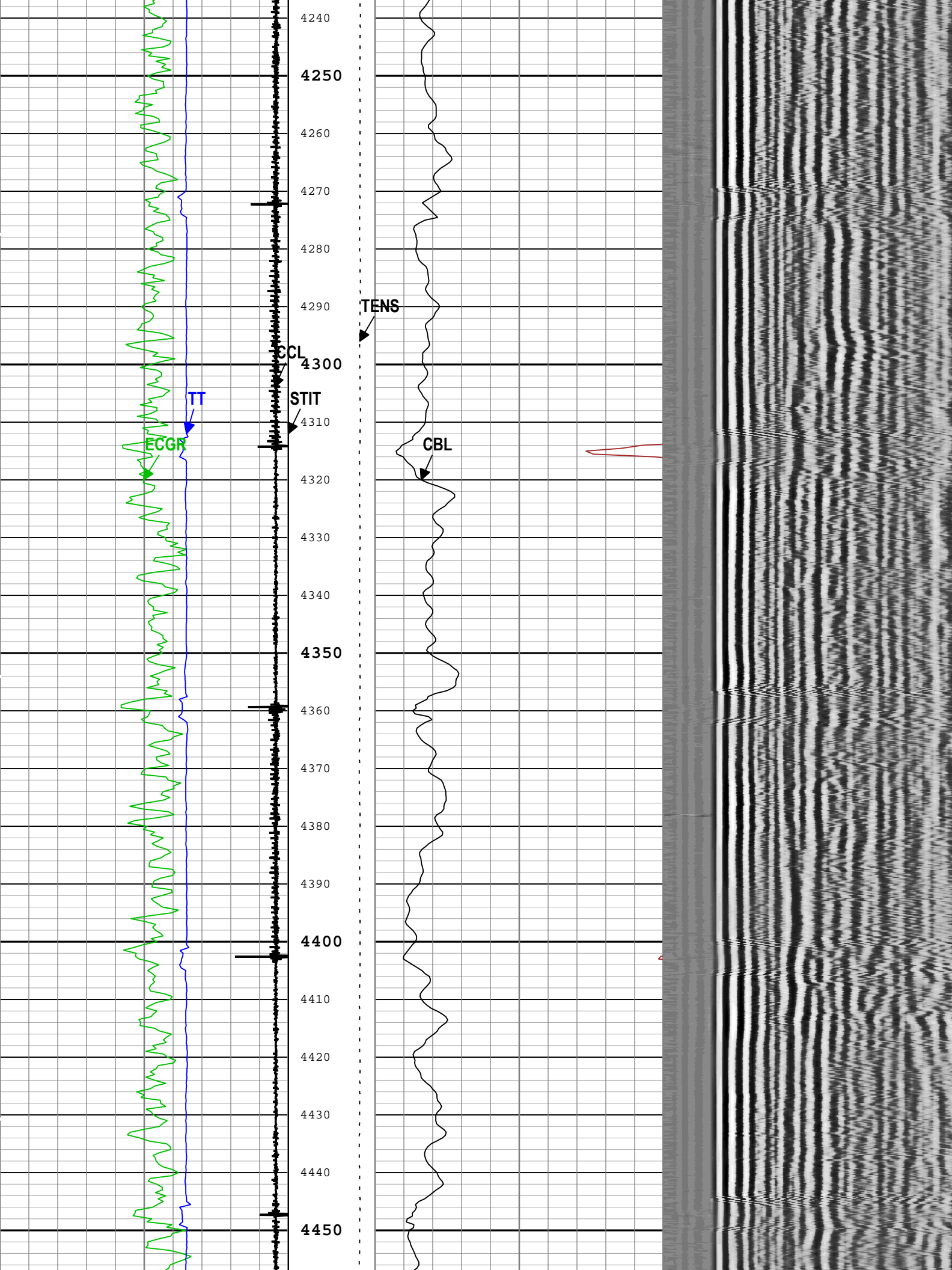


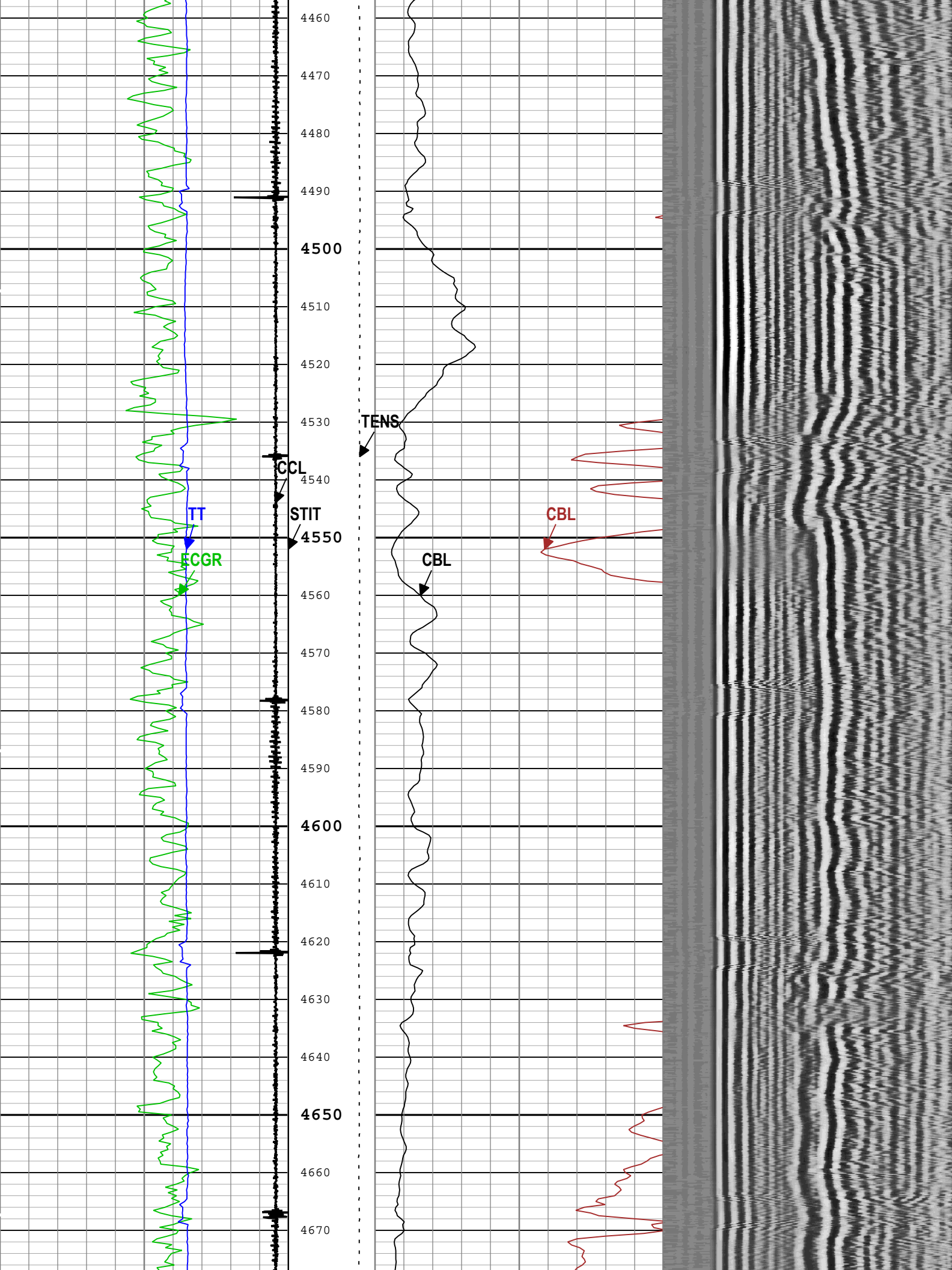


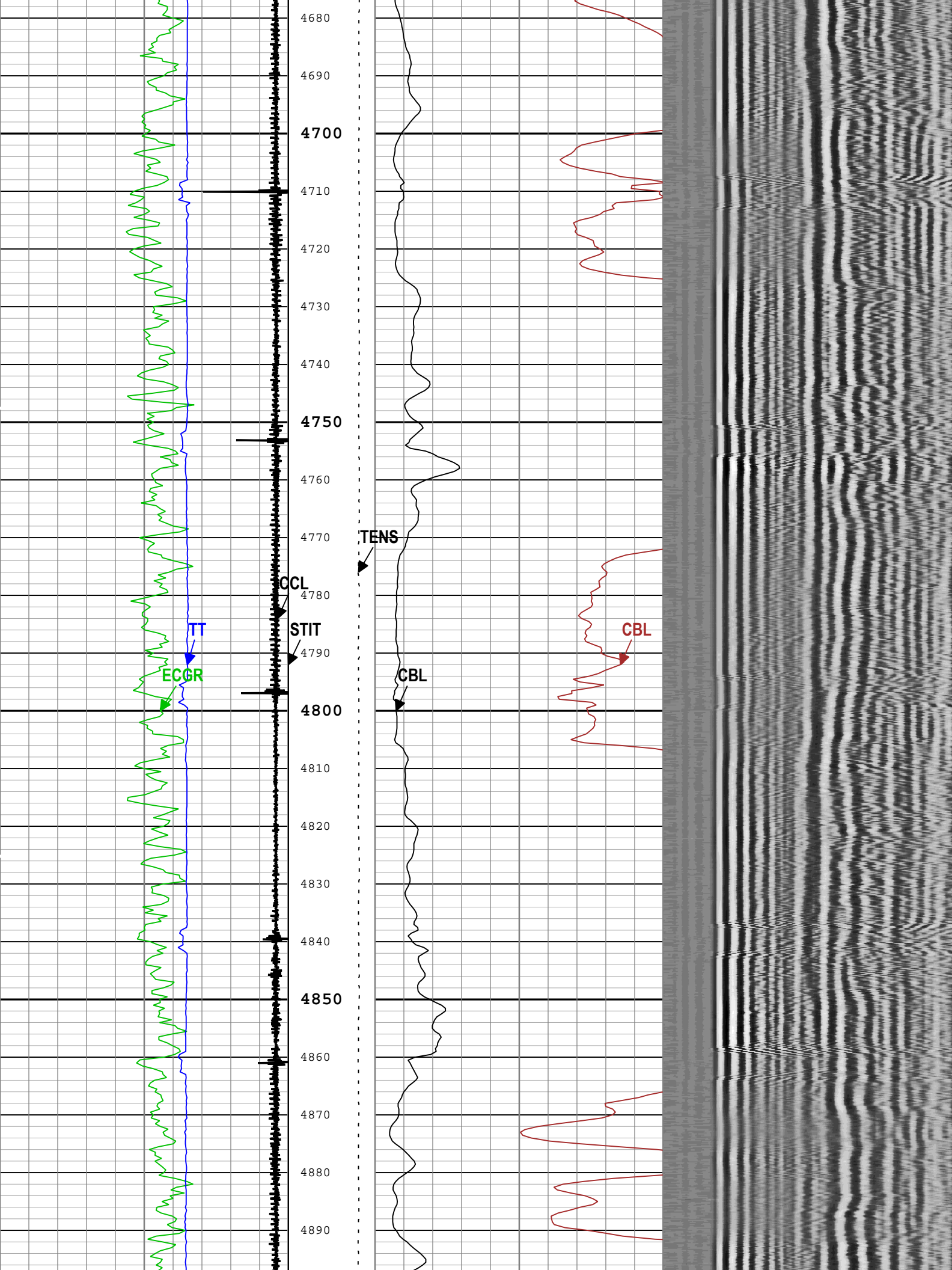


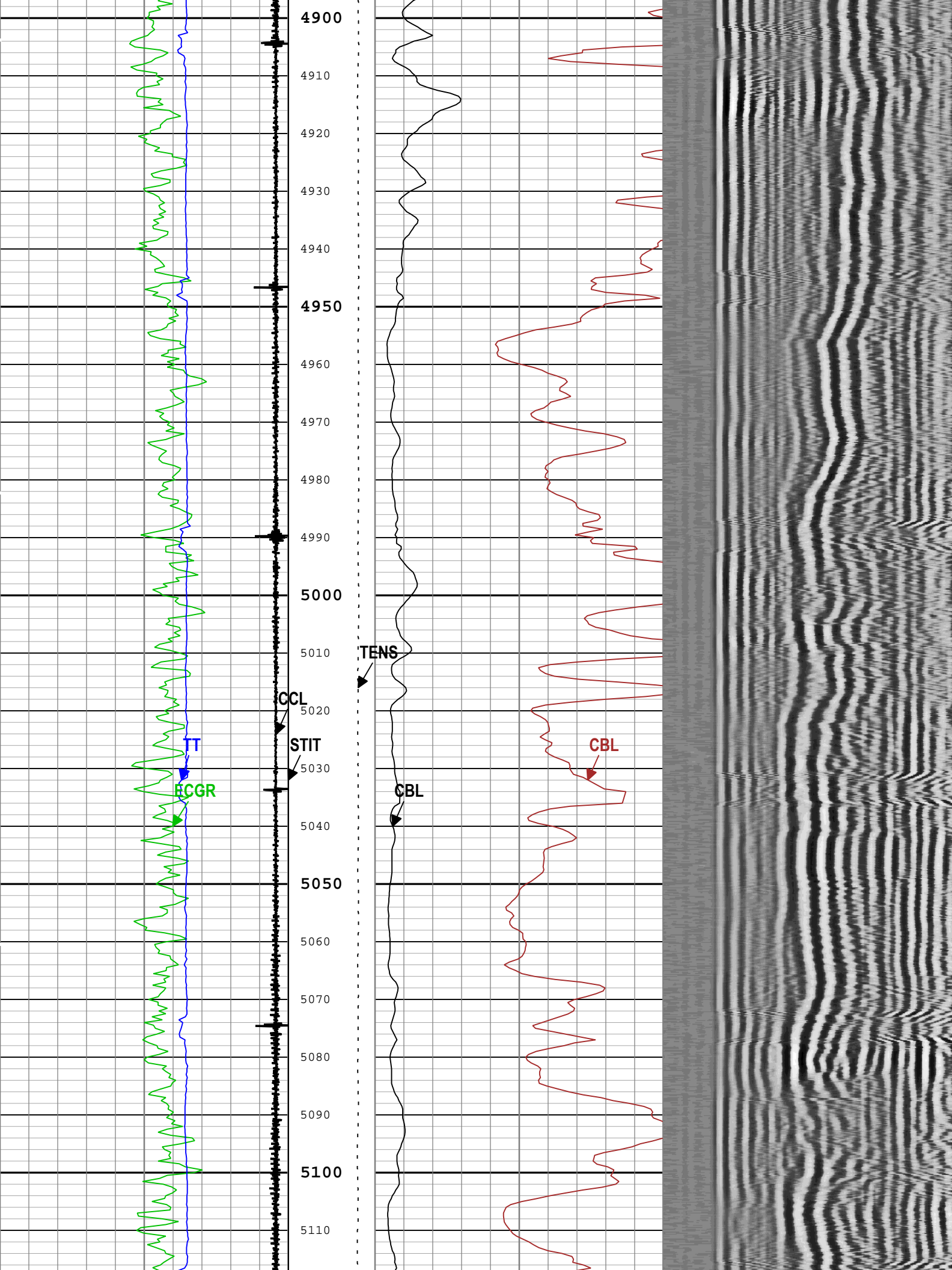


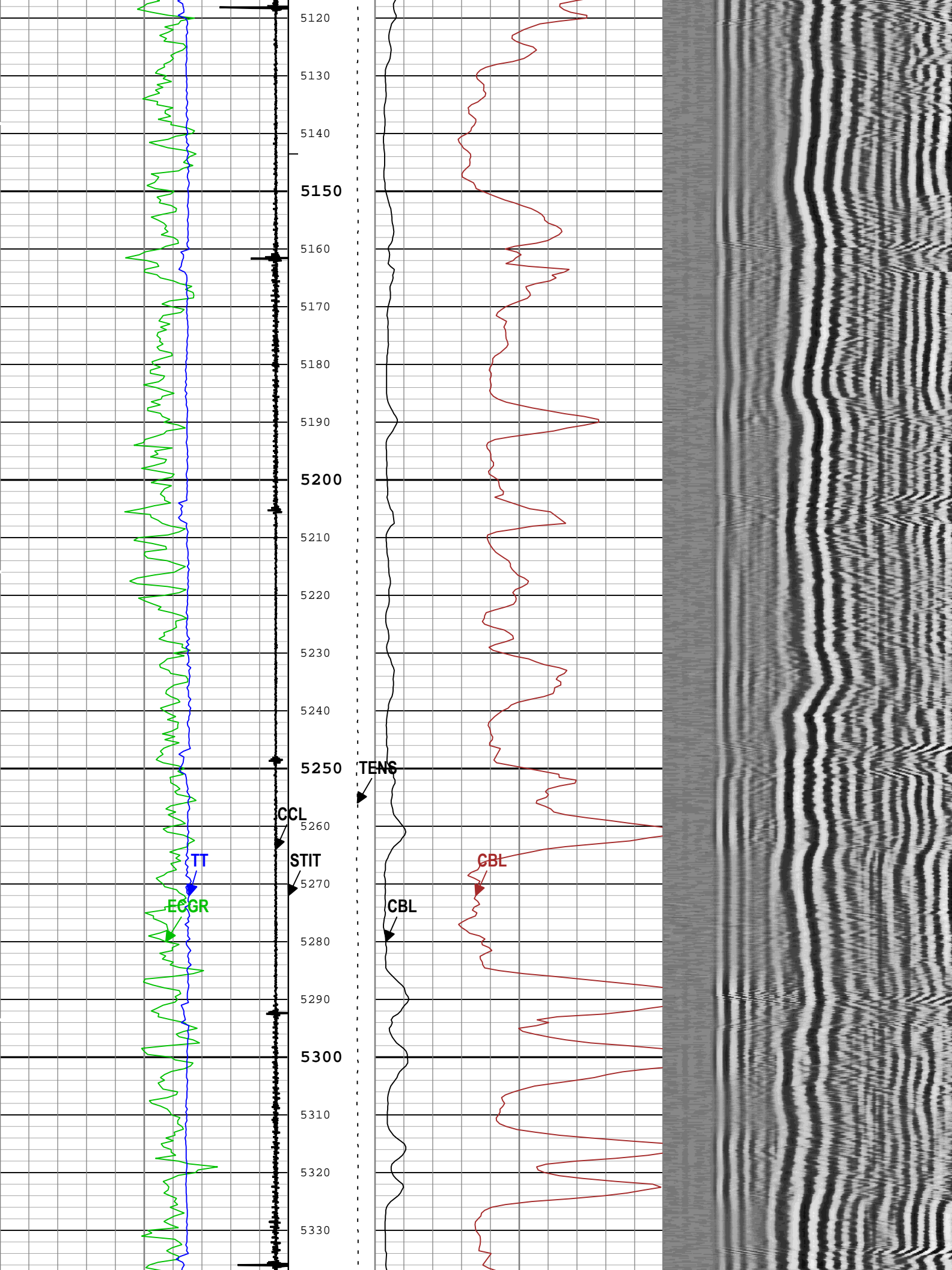


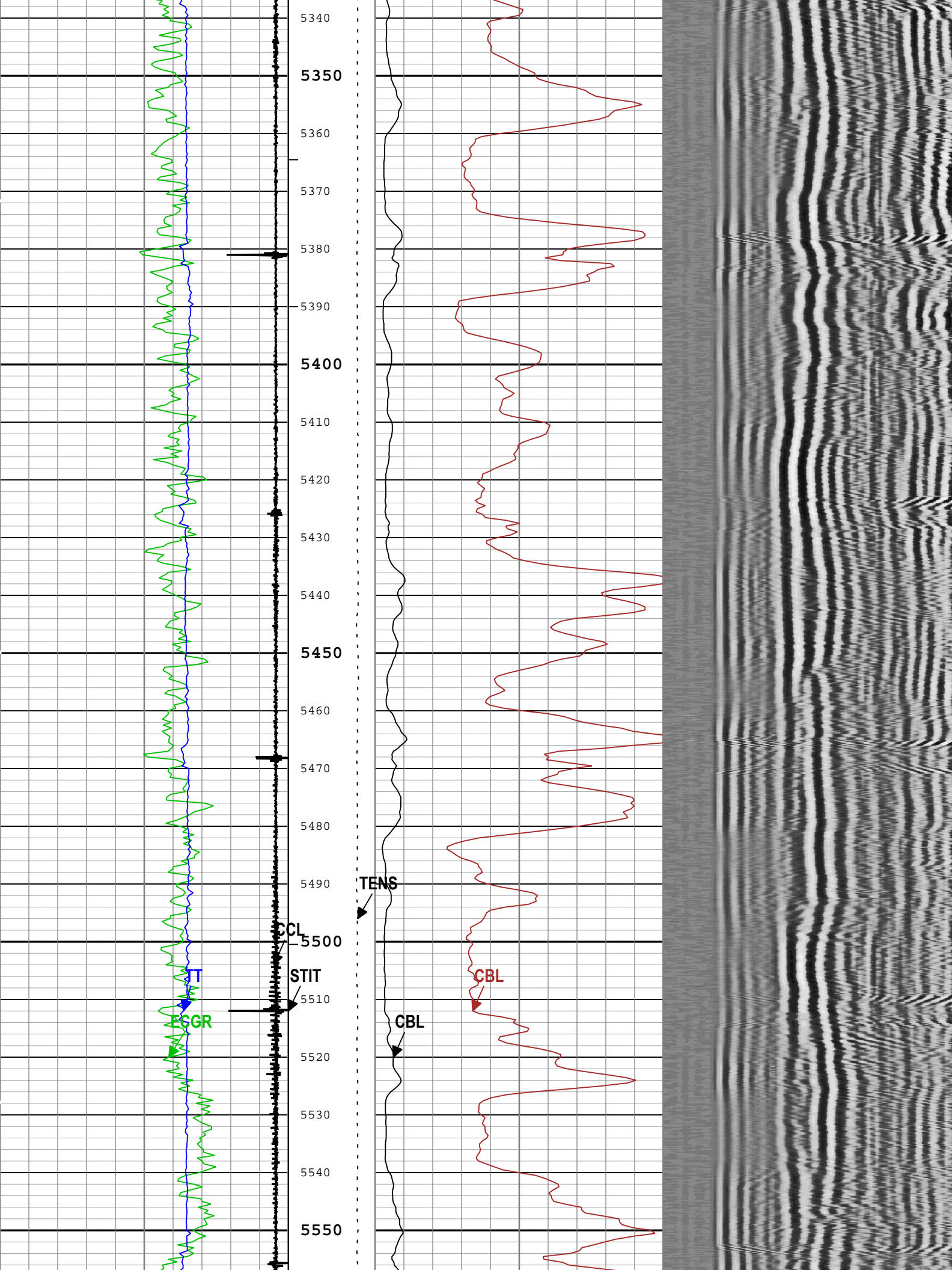


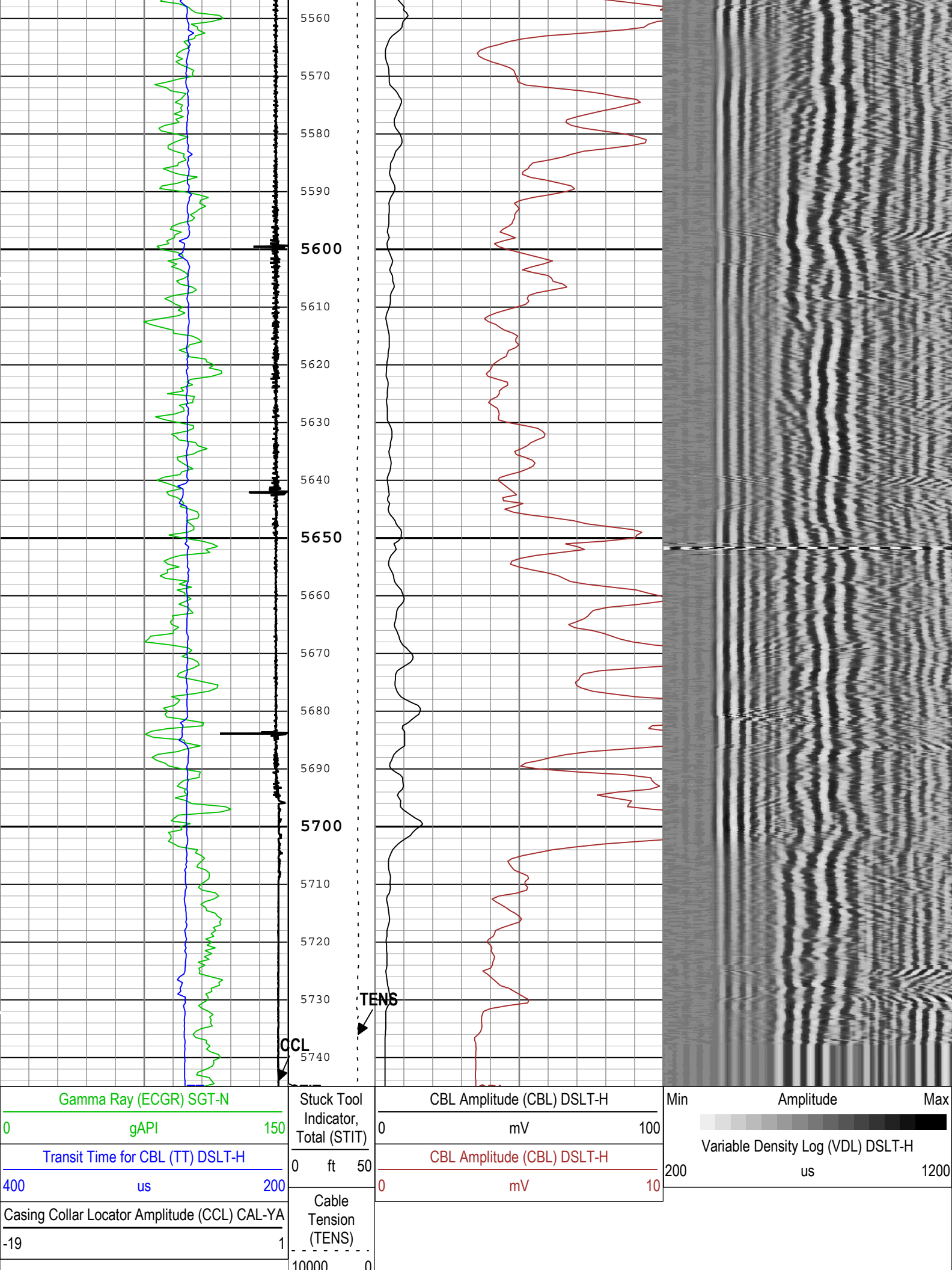












Gamma Ray (ECGR) SGT-N		
0	gAPI	150
Transit Time for CBL (TT) DSLT-H		
400	us	200
Casing Collar Locator Amplitude (CCL) CAL-YA		
-19		1

Stuck Tool Indicator, Total (STIT)		
0	ft	50
Cable Tension (TENS)		
10000		0

CBL Amplitude (CBL) DSLT-H		
0	mV	100
CBL Amplitude (CBL) DSLT-H		
0	mV	10

Min	Amplitude	Max
Variable Density Log (VDL) DSLT-H		
200	us	1200

10000

lbf

Cable Drag

Tool_Tot.
Drag

BIEP - Bond Index Event Pips DSLT-H

TIME_1900 - Time Marked every 60.00 (s)

Description: CBL_VDL Format: Log (Sonic CBL with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 01-Sep-2016 16:13:06

Channel Processing Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
AMSG	Auxiliary Minimum Sliding Gate	DSLTH	261	us
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	Depth Zoned	in
CBLG	CBL Gate Width	DSLTH	24	us
CBLO	Casing Bottom (Logger)	WLSESSION	15706	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSLTH	72	mV
CCL_MULTIPLIER	Casing Collar Locator Multiplier	CAL-YA	5	
CDEN	Cement Density	SGT-N	2	g/cm3
DETE	Delta-T Detection	DSLTH	E1	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
GOBO_CURR	Good Bond in Arbitrary Cement	DSLTH	3.42	mV
MAHTR	Manual High Threshold Reference for first arrival detection	DSLTH	120	
MATT_CURR	Maximum Attenuation in Arbitrary Cement	DSLTH	11.85	dB/ft
MCI	Minimum Cemented Interval for Isolation	DSLTH	Depth Zoned	ft
MNHTR	Minimum High Threshold Reference for first arrival detection	DSLTH	100	
MSA	Minimum Sonic Amplitude	DSLTH	1.6	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	DSLTH	1.6	mV
NMSG	Near Minimum Sliding Gate	DSLTH	266	us
SGAD	Sliding Gate Status	DSLTH	Off	
SGDT	Sliding Gate Delta-T	DSLTH	57	us/ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	24	45	101
BS	13.5	101	2050
BS	8.5	2050	5745
MCI	26.48	45	101
MCI	14.81	101	2032
MCI	4.75	2032	5745

All depth are actual.

Tool Control Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
MODE	DSLTH Acquisition Mode	DSLTH	CBL	

RATE	DSLTL Firing Rate	DSLTL-H	15 Hz	
DTFS	DSLTL Telemetry Frame Size	DSLTL-H	536	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
SGAI	Selectable Acquisition Gain	DSLTL-H	x1	

One

0 PSI Repeat Pass

Software Version

Acquisition System	Version
Maxwell 2016 SP2	6.2.68624.3100

Pass Summary

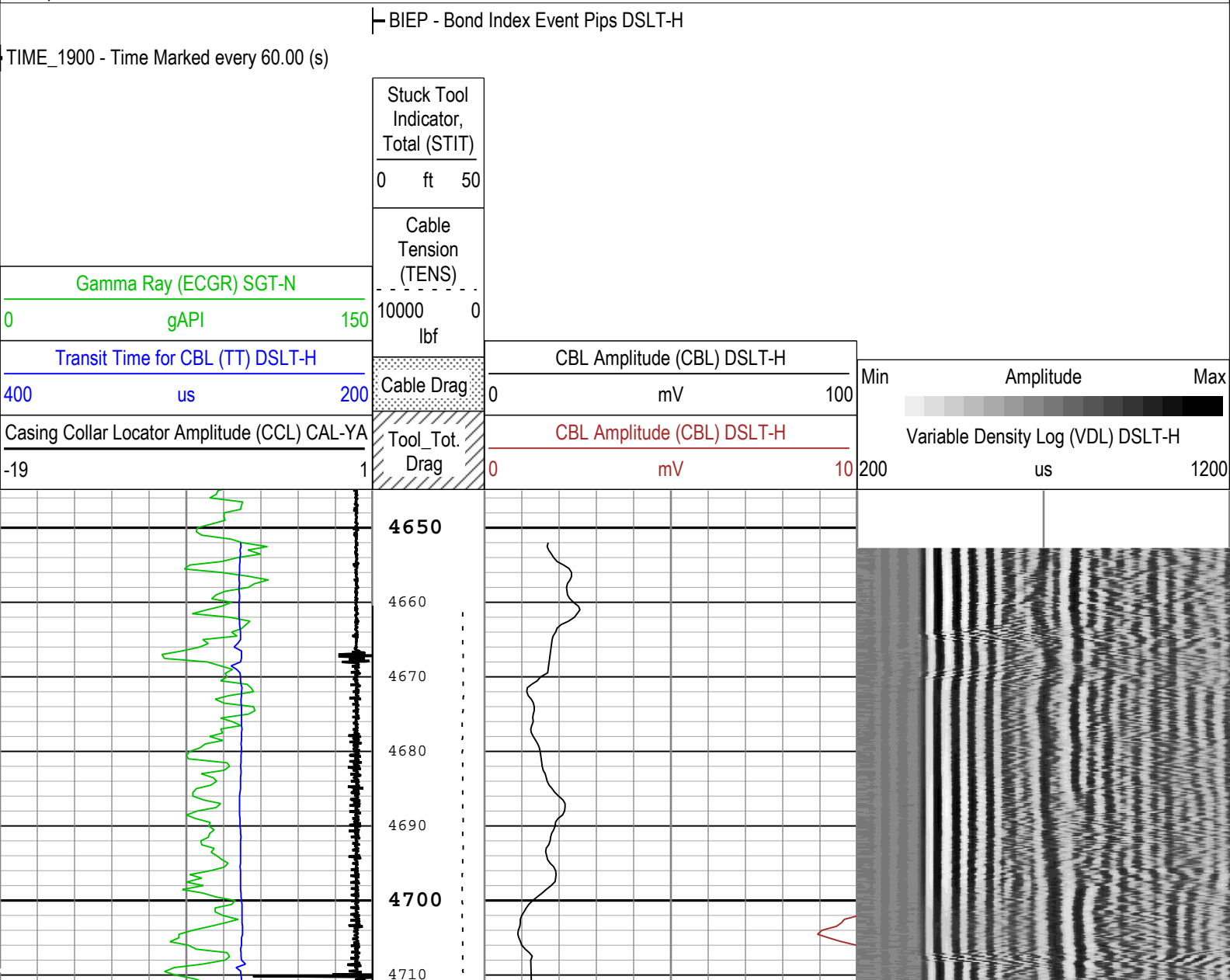
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[3]:Up	Up	4660.14 ft	5014.28 ft	01-Sep-2016 2:38:44 PM	01-Sep-2016 2:43:37 PM	ON	4.77 ft	No

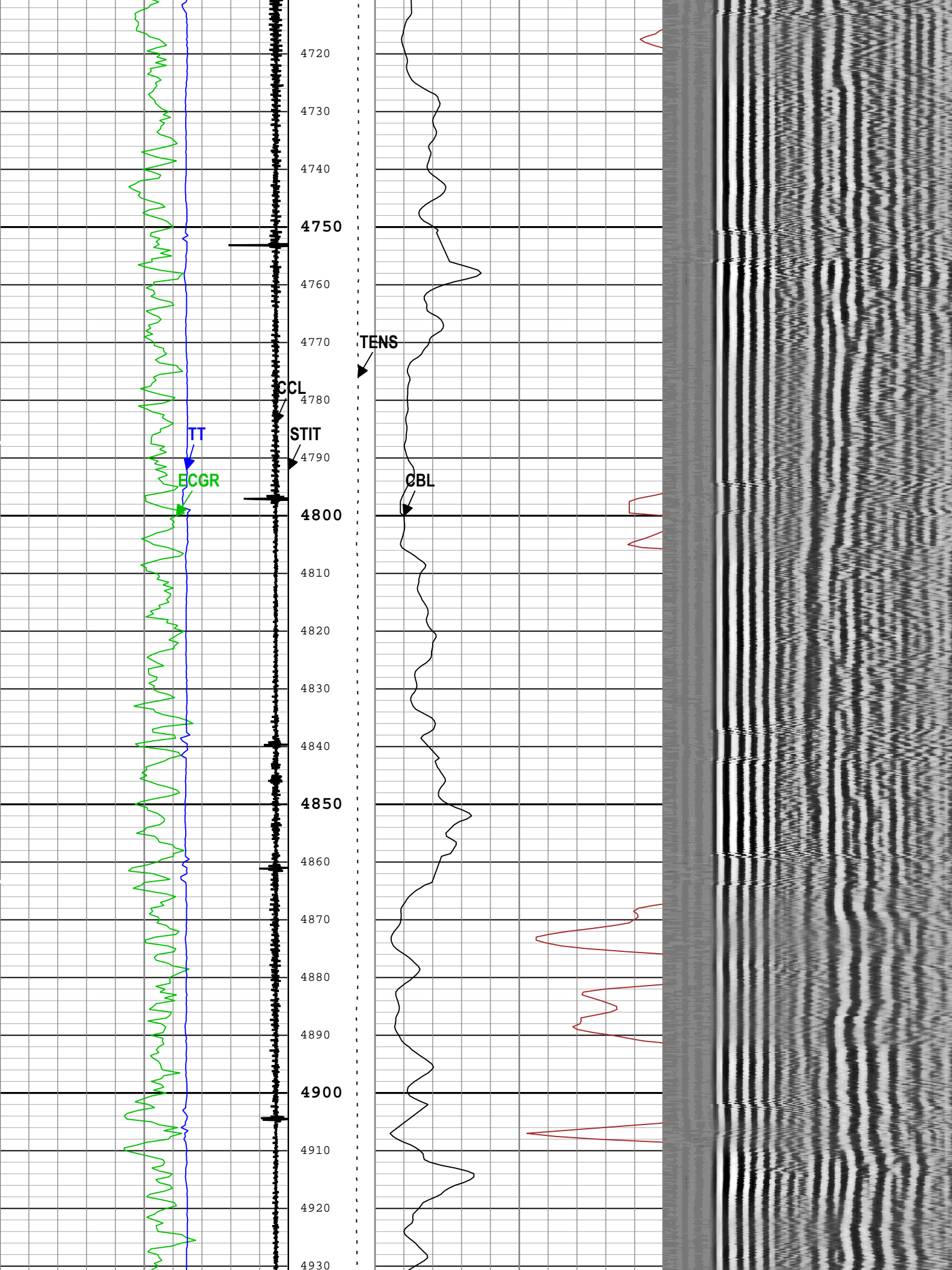
All depths are referenced to toolstring zero

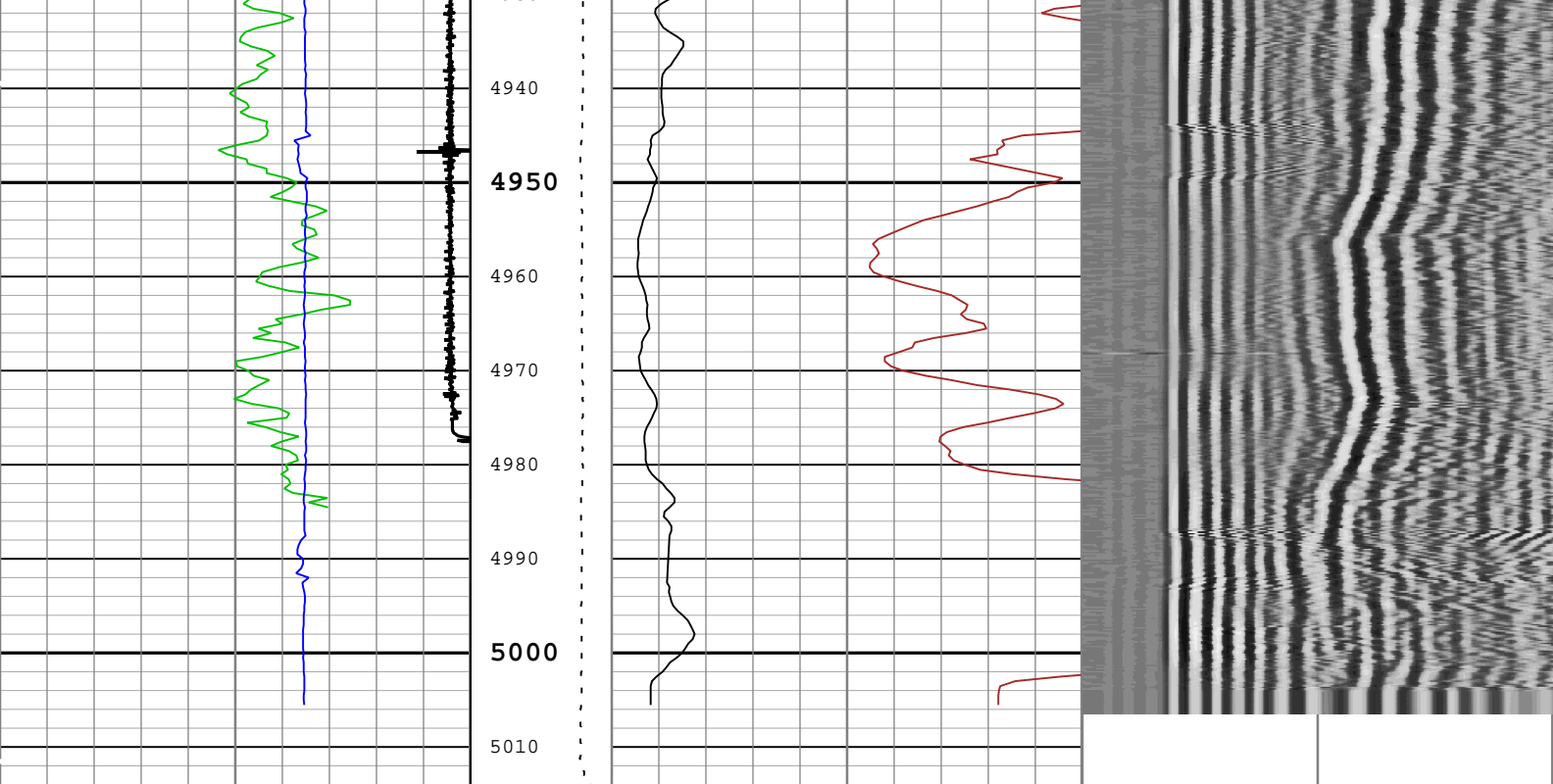
Log

Company:Whiting Oil & Gas Corporation Well:Razor 25N-2437
One: Log[3]:Up:S007

Description: CBL_VDL Format: Log (Sonic CBL with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 01-Sep-2016 16:13:12







Gamma Ray (ECGR) SGT-N	Stuck Tool Indicator, Total (STIT)	CBL Amplitude (CBL) DSLT-H	Min	Amplitude	Max
0 gAPI 150	0 ft 50	0 mV 100			
Transit Time for CBL (TT) DSLT-H	Cable Tension (TENS)	CBL Amplitude (CBL) DSLT-H		Variable Density Log (VDL) DSLT-H	
400 us 200	10000 0 lbf	0 mV 10	200	us	1200
Casing Collar Locator Amplitude (CCL) CAL-YA	Cable Drag				
-19 1	Tool_Tot. Drag				

TIME_1900 - Time Marked every 60.00 (s)

— BIEP - Bond Index Event Pips DSLT-H

Description: CBL_VDL Format: Log (Sonic CBL with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 01-Sep-2016 16:13:12

Channel Processing Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
AMSG	Auxiliary Minimum Sliding Gate	DSLTH	261	us
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	8.5	in
CBLG	CBL Gate Width	DSLTH	20	us
CBLO	Casing Bottom (Logger)	WLSESSION	15706	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSLTH	72	mV
CCL_MULTIPLIER	Casing Collar Locator Multiplier	CAL-YA	5	
CDEN	Cement Density	SGT-N	2	g/cm3
DETE	Delta-T Detection	DSLTH	E1	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal

GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
GOBO_CURR	Good Bond in Arbitrary Cement	DSLT-H	3.42	mV
MAHTR	Manual High Threshold Reference for first arrival detection	DSLT-H	120	
MATT_CURR	Maximum Attenuation in Arbitrary Cement	DSLT-H	11.85	dB/ft
MCI	Minimum Cemented Interval for Isolation	DSLT-H	4.75	ft
MNHTR	Minimum High Threshold Reference for first arrival detection	DSLT-H	100	
MSA	Minimum Sonic Amplitude	DSLT-H	1.6	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	DSLT-H	1.6	mV
NMSG	Near Minimum Sliding Gate	DSLT-H	266	us
SGAD	Sliding Gate Status	DSLT-H	Off	
SGDT	Sliding Gate Delta-T	DSLT-H	57	us/ft

Tool Control Parameters

One: 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	3600	ft/h
SGAI	Selectable Acquisition Gain	DSLT-H	x1	

Calibration Report

DSLT-H (Digitizing Sonic Logging Tool - H) Calibration - Run One

Primary Equipment :			
Sonic Logging Sonde E supports 3'-5'BHC DT and CBL/VDL		SLS-E	1650

CBL Free Pipe Adjustment - Free Pipe Measurement

Before (Manual Entry):		14:27:29 01-Sep-2016					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
CBL Amplitude - 0	mV	Before	----	----	----	----	
CBL Reference Amplitude (CBRA) - 0	mV	Before	----	----	----	----	
Measurement Depth - 0	ft	Before	----	----	----	----	

CBL Free Pipe Adjustment - CBL Amplitude Coefficient

Before (Manual Entry):		14:27:29 01-Sep-2016					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
CBL Adjustment Factor		Before	1.000	0.200	0.996	5.000	
Depth of Before Calibration	ft	Before			60.00		

Company: Whiting Oil & Gas Corporation

Schlumberger

Well: Razor 25N-2437

Field: Wildcat

County: Weld

State: Colorado

Cement Bond Log

GR-CCL