

Company:Whiting Oil & Gas Corporation

Well:Horsetail 30E-3136

Field:Wildcat

County:WeldState:Colorado

County:Weld

Field:Wildcat

Location:SWNW Sec 30, T10N, R57W

Well:Horsetail 30E-3136

Company:Whiting Oil & Gas Corporation

Cement Bond Log

GR-CCL

SWNW Sec 30, T10N, R57W		Elev.:	K.B.	4738.70 ft
SHL: 2372' FNL x 689' FWL			G.L.	4717.70 ft
Latitude: 40.810567 Longitude: -103.800908			D.F.	4737.70 ft
Permanent Datum:		Ground Level	Elev.:	4717.70 f
Log Measured From:		Kelly Bushing	21.00 ft	above Perm.Datum
Drilling Measured From:		Kelly Bushing		
API Serial No.	Section:	Township:	Range:	
05-123-42873	30	10N	57W	

Logging Date	09-Nov-2016
Run Number	One
Depth Driller	13908.00 ft
Schlumberger Depth	13908.00 ft
Bottom Log Interval	5170.00 ft
Top Log Interval	0.00 ft
Casing Fluid Type	Water
Salinity	
Density	8.4 lbm/gal
Fluid Level	8.00 ft
BIT/CASING/TUBING STRING	
Bit Size	8.75 in
From	2080.50 ft
To	13908.00 ft
Casing/Tubing Size	5.5 in
Weight	20 lbm/ft
Grade	N/A
From	0.00 ft
To	13908.00 ft
Max Recorded Temperatures	189 degF
Logger on Bottom	09-Nov-2016 11:12:00
Unit Number	2161
Recorded By	Stephen Tang
Witnessed By	Bradd Kothe

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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8.4 Log (Sonic CBL with VDL)

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9.1 Integration Summary

9.2 Software Version

9.3 Composite Summary

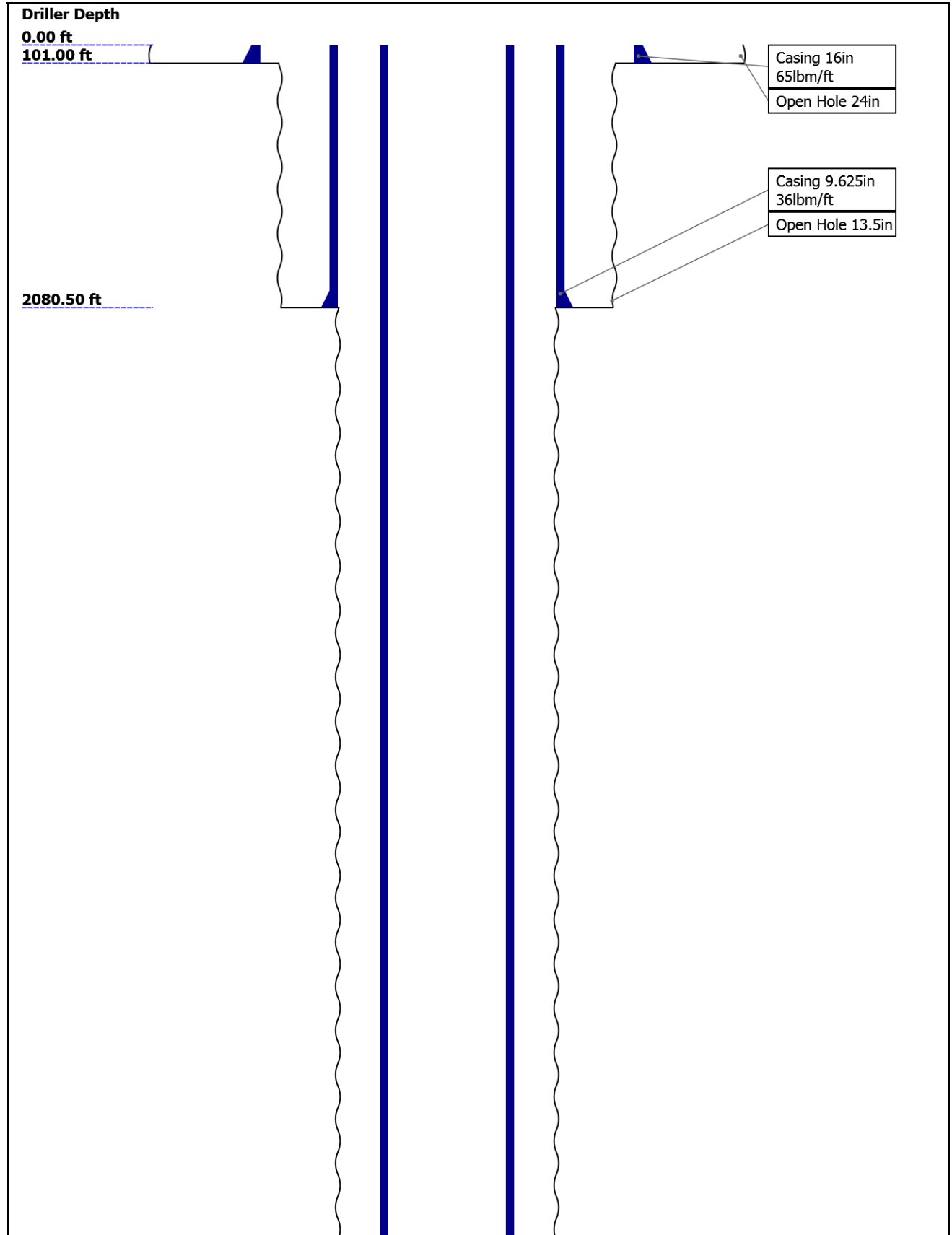
9.4 Log (Sonic CBL with VDL)

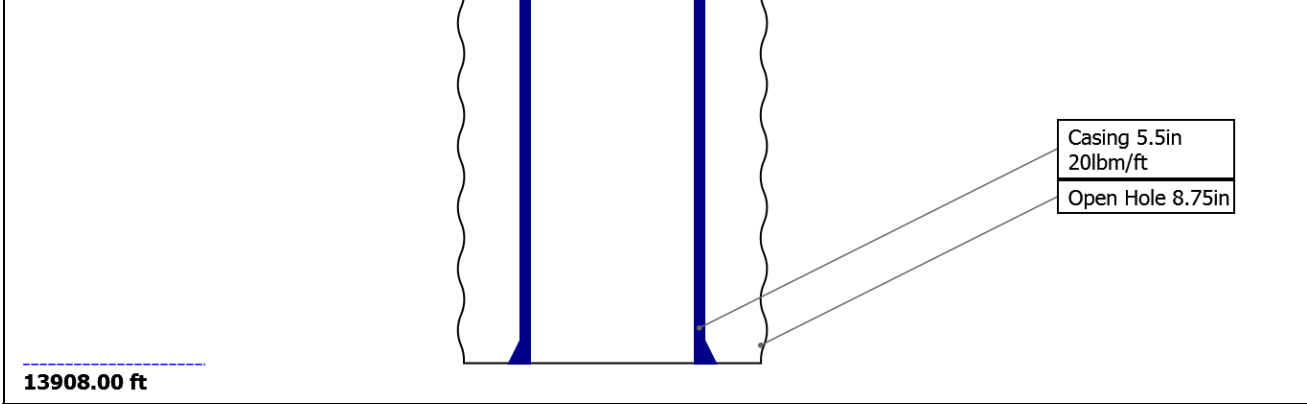
9.5 Parameter Listing

10. Calibration Report

11. Tail

Well Sketch






Borehole Size/Casing/Tubing Record

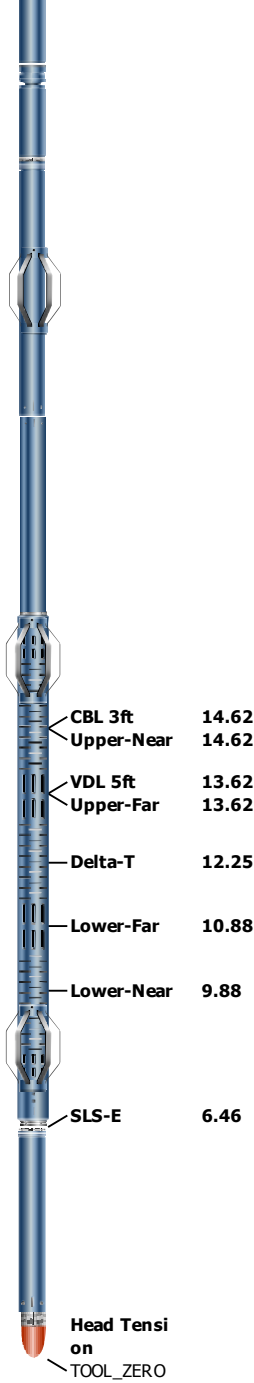
Bit						
Bit Size (in)	24	13.5	8.75			
Top Driller (ft)	0	101	2080.5			
Top Logger (ft)	0	101	2080.5			
Bottom Driller (ft)	101	2080.5	13908			
Bottom Logger (ft)	101	2080.5	13908			
Casing						
Size (in)	16	9.625	5.5			
Weight (lbm/ft)	65	36	20			
Inner Diameter (in)	15.25	8.921	4.778			
Grade	N/A	N/A	N/A			
Top Driller (ft)	0	0	0			
Top Logger (ft)	0	0	0			
Bottom Driller (ft)	101	2080.5	13908			
Bottom Logger (ft)	101	2080.5	13908			

Remarks and Equipment Summary

One: Toolstring				One: Remarks	
<div><div><div>Equip name</div><div>LEH-QT</div><div>LEH-QT</div></div><div><div>Length</div><div>46.01</div></div><div><div>MP name</div><div></div></div><div><div>Offset</div><div></div></div></div> <div></div>				Toolstring ran as per toolsketch.	
				Main pass logged with 1500 psi.	
				Repeat pass logged with 0 psi.	
<div><div><div>CAL-YA:666</div><div>CAL-YA:666</div></div><div><div>43.1</div></div><div><div></div></div><div><div>42.31</div></div></div>					
<div><div><div>DTC-H:8803</div><div>ECH-KC:10354</div><div>DTC-H:8803</div></div><div><div>39.6</div></div><div><div></div></div><div><div>38.7</div><div>0.00</div></div></div>					
<div><div><div>SGT-N:10249</div><div>SGH-K:3039</div><div>SGC-TB:10249</div><div>SGD-TAA:2170</div><div>0</div></div><div><div>36.6</div></div><div><div></div></div><div><div>36.6</div><div>36.6</div></div></div>					
<div><div><div>AH-184[2]:4</div><div></div></div><div><div>31.1</div></div><div><div></div></div><div><div></div></div></div>					

AH-184[1]:3 29.1
906

DSL-T-H:8150 27.1
ECH-KH:8150
DSL-C-H:8150
SLS-E:1185



Adaptor_Head 6.46

BNS-STD 0.46

Head Tension
TOOL_ZERO

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

One

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 Error	3		
Calibration Peak Error	4		

Logging Cable

Type	7-39P-LXS		
Serial Number			
Length	15000.00 ft		
Conveyance Type	Wireline		
Rig Type	Crane		

One:Depth Control Parameters

Depth Control Remarks

Log Sequence	First Log In the Well	All Schlumberger depth procedures followed.
Rig Up Length At Surface		IDW used as primar depth device.
Rig Up Length At Bottom		Z-Chart used as secondary depth device.
Rig Up Length Correction		Depth correlated to short joint at 5072.1 ft.
Stretch Correction		
Tool Zero Check At Surface		

One

1500 PSI Main 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[4]:Up	Up	62.37 ft	5172.37 ft	09-Nov-2016 5:15:30 PM	09-Nov-2016 6:40:15 PM	ON	1.29 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Whiting Oil & Gas Corporation

Well:Horsetail 30E-3136

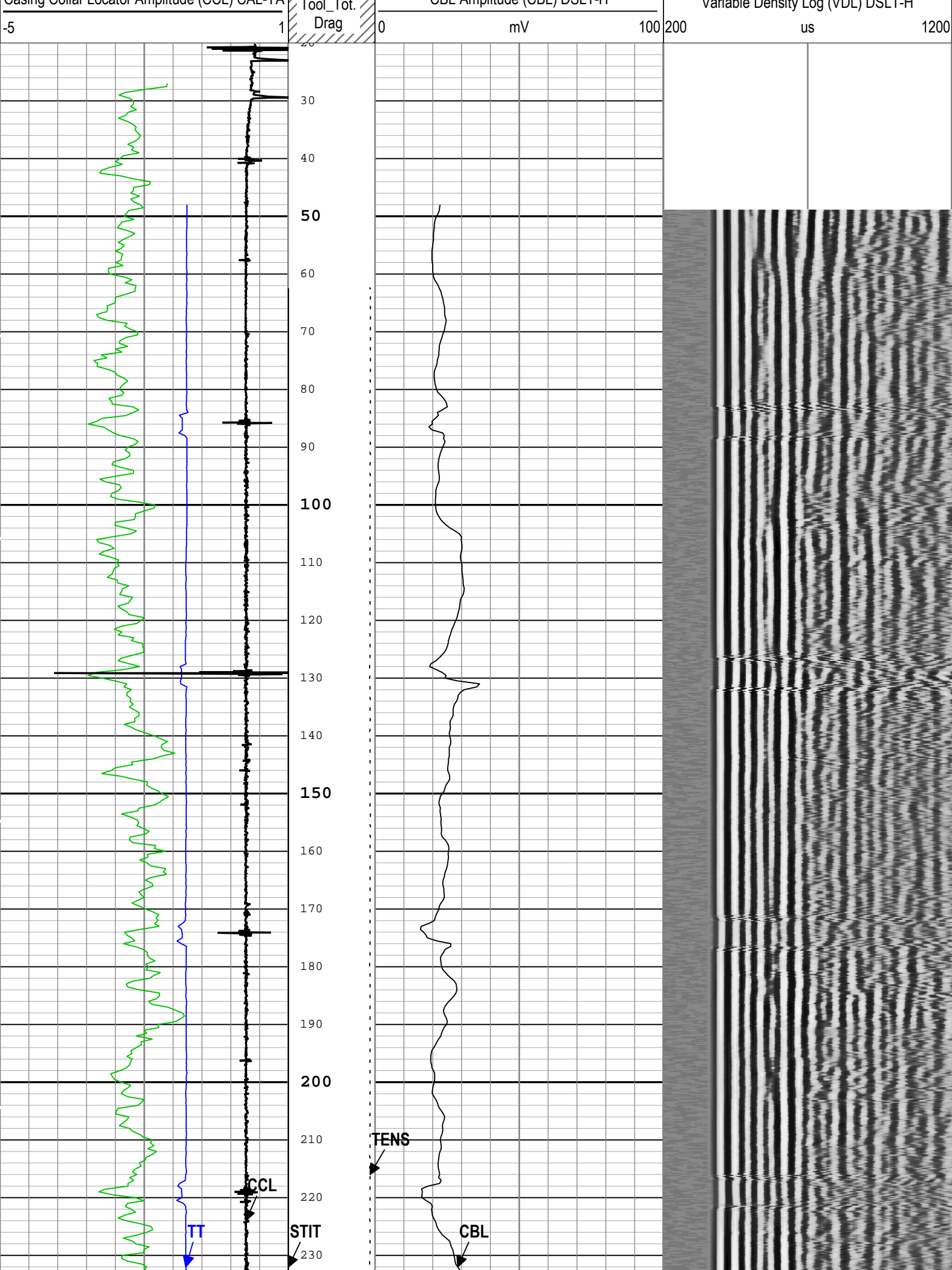
One: Log[4]:Up:S015

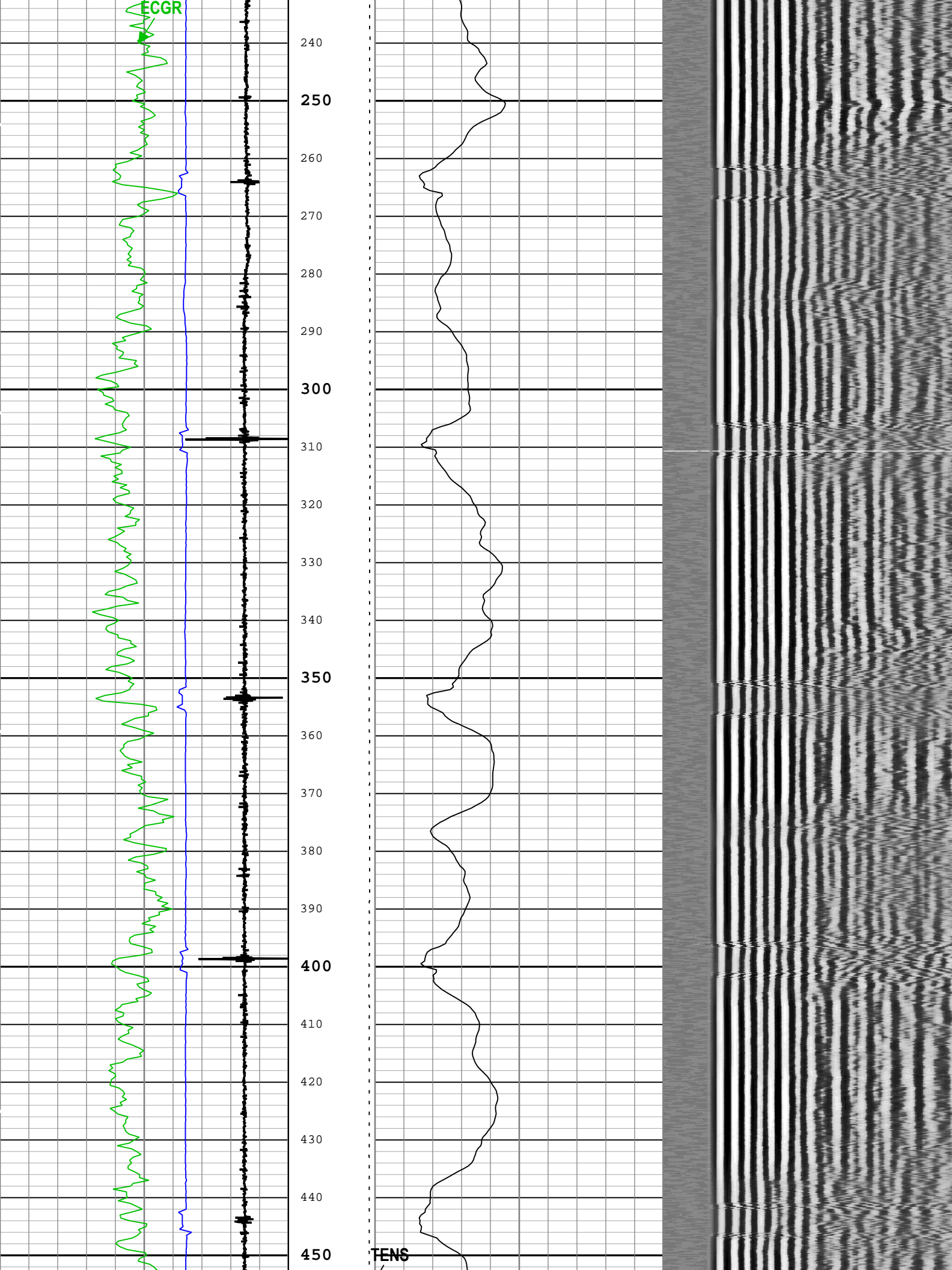
Description: CBL_VDL Format: Log (Sonic CBL with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-Nov-2016 15:02:42

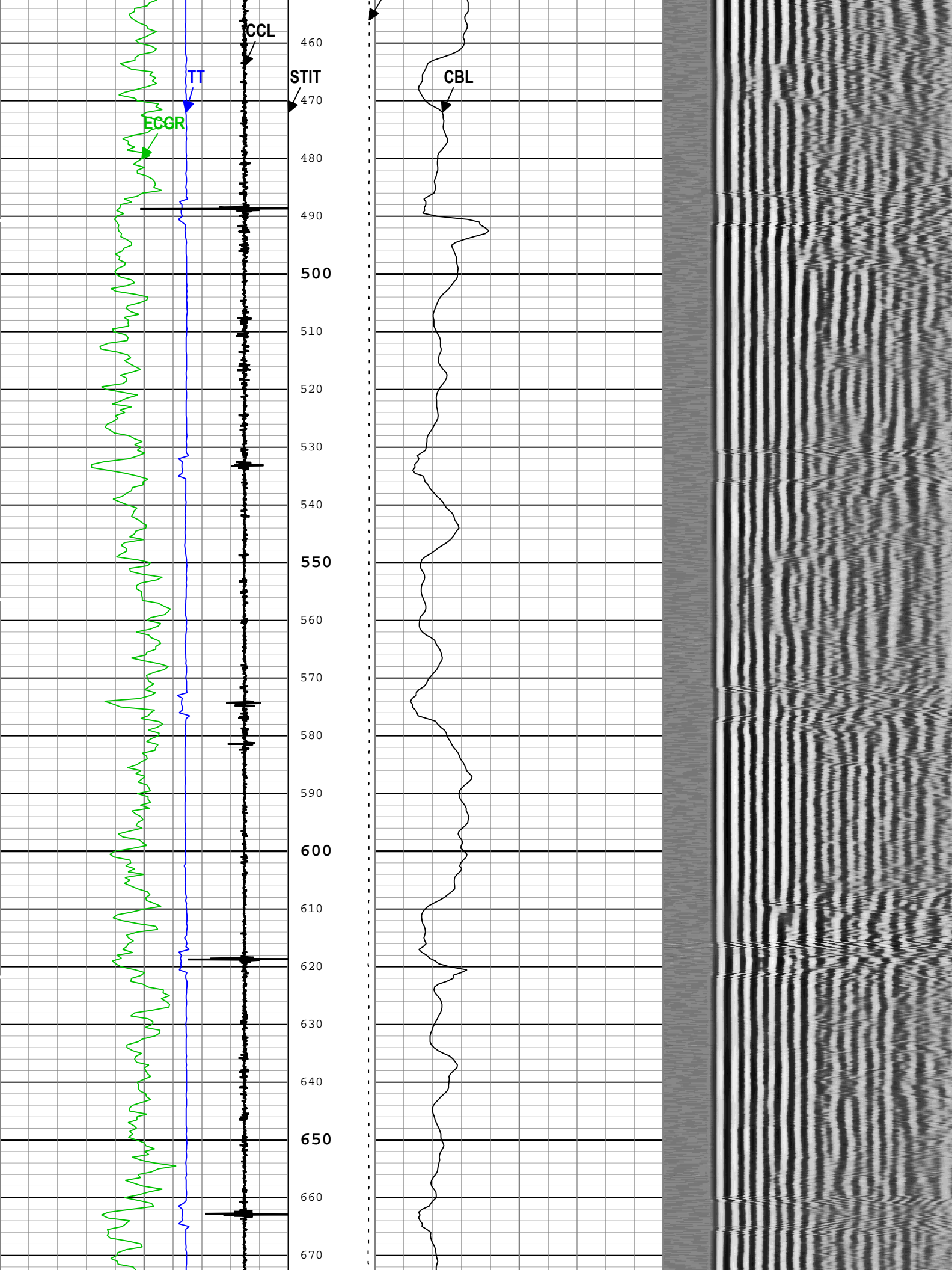
BIEP - Bond Index Event Pips DSLT-H

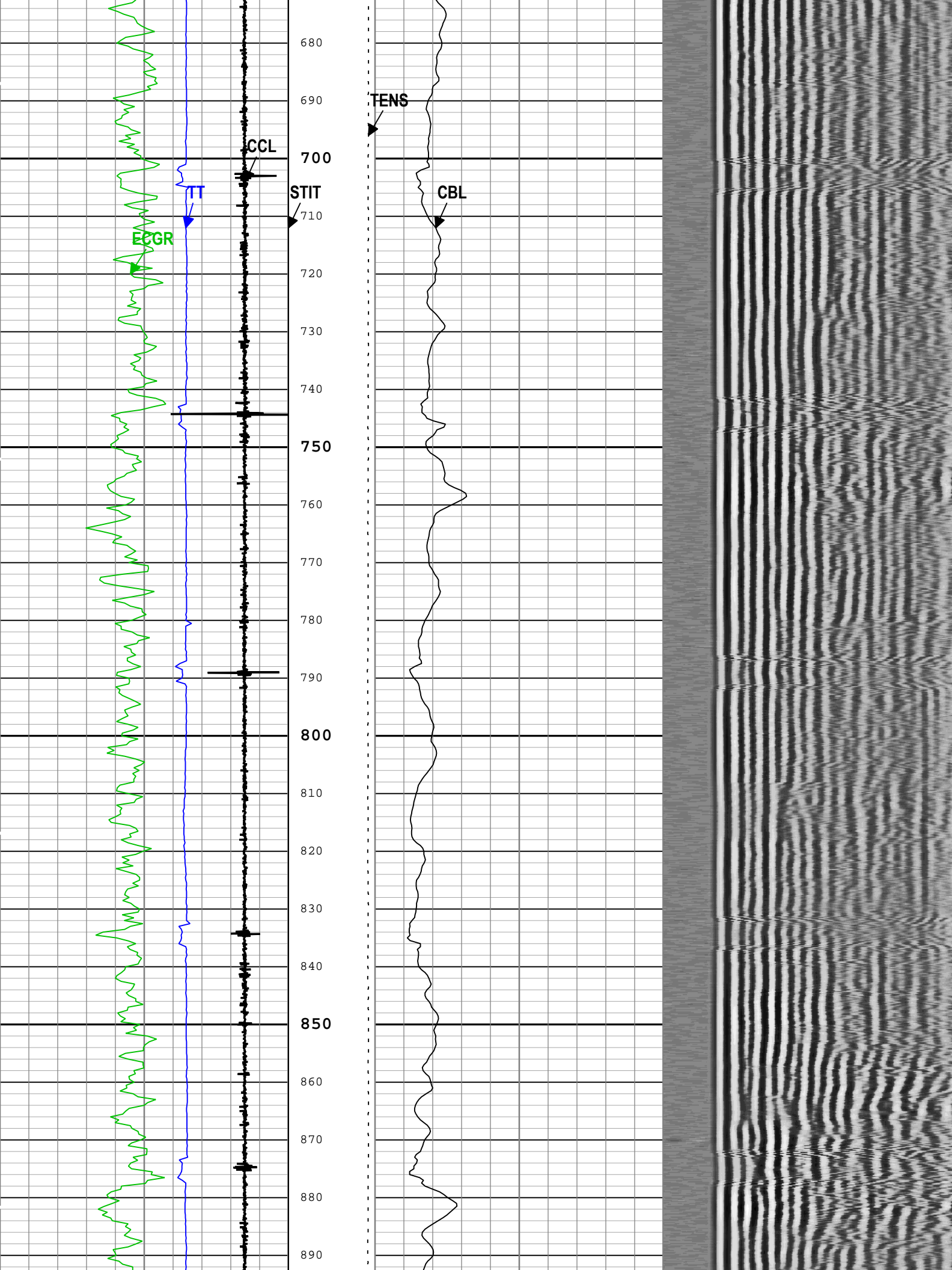
TIME_1900 - Time Marked every 60.00 (s)

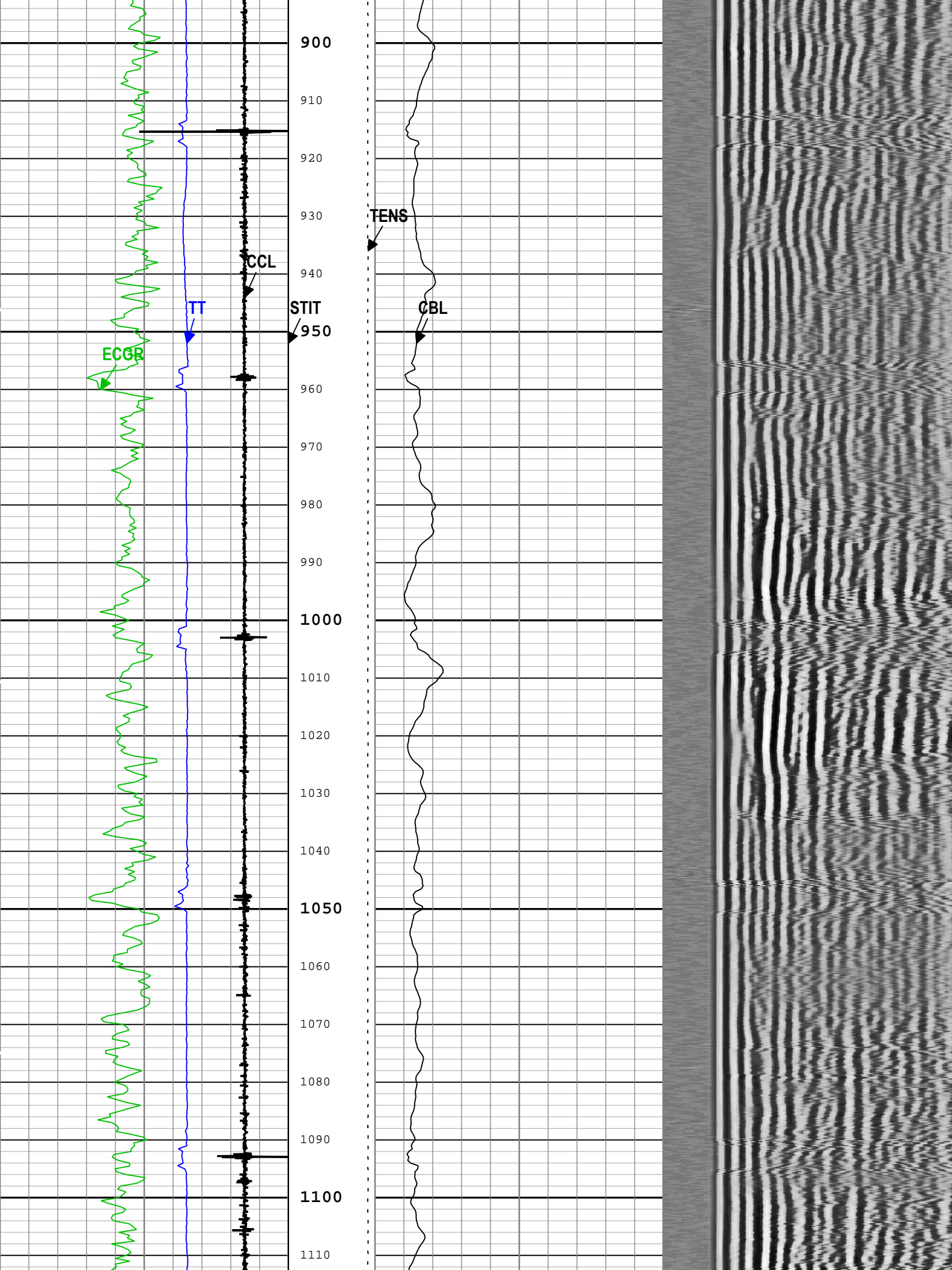
		Stuck Tool Indicator, Total (STIT)		
		0 ft 50		
		Cable Tension (TENS)		
Gamma Ray (ECGR) SGT-N				
0	gAPI	10000 lbf	0	
Transit Time for CBL (TT) DSLT-H			CBL Amplitude (CBL) DSLT-H	
400	us	200	0	10
Casing Collar Locator Amplitude (CCL) CAL-YA			CBL Amplitude (CBL) DSLT-H	
			Variable Density Log (VDL)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

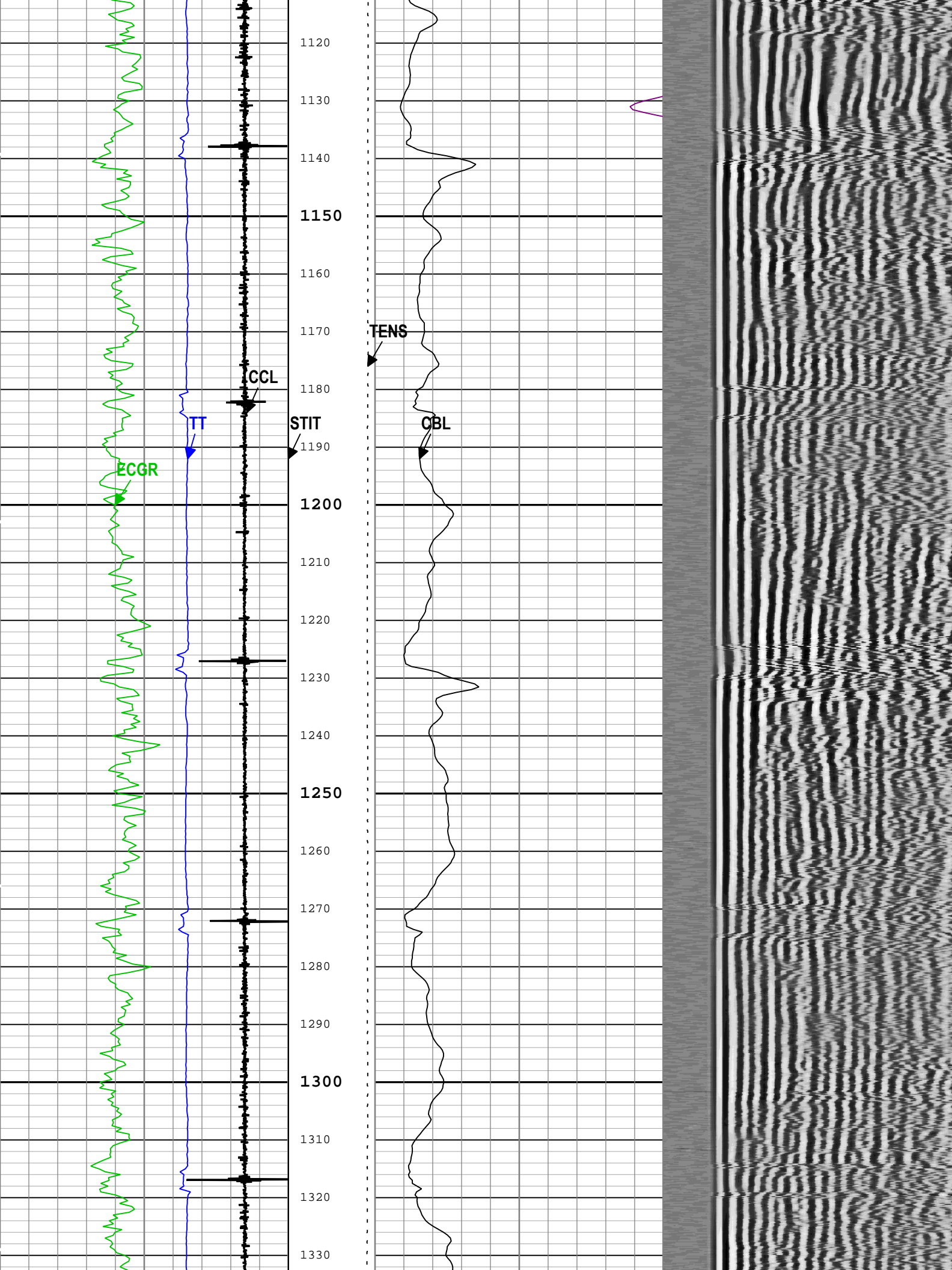


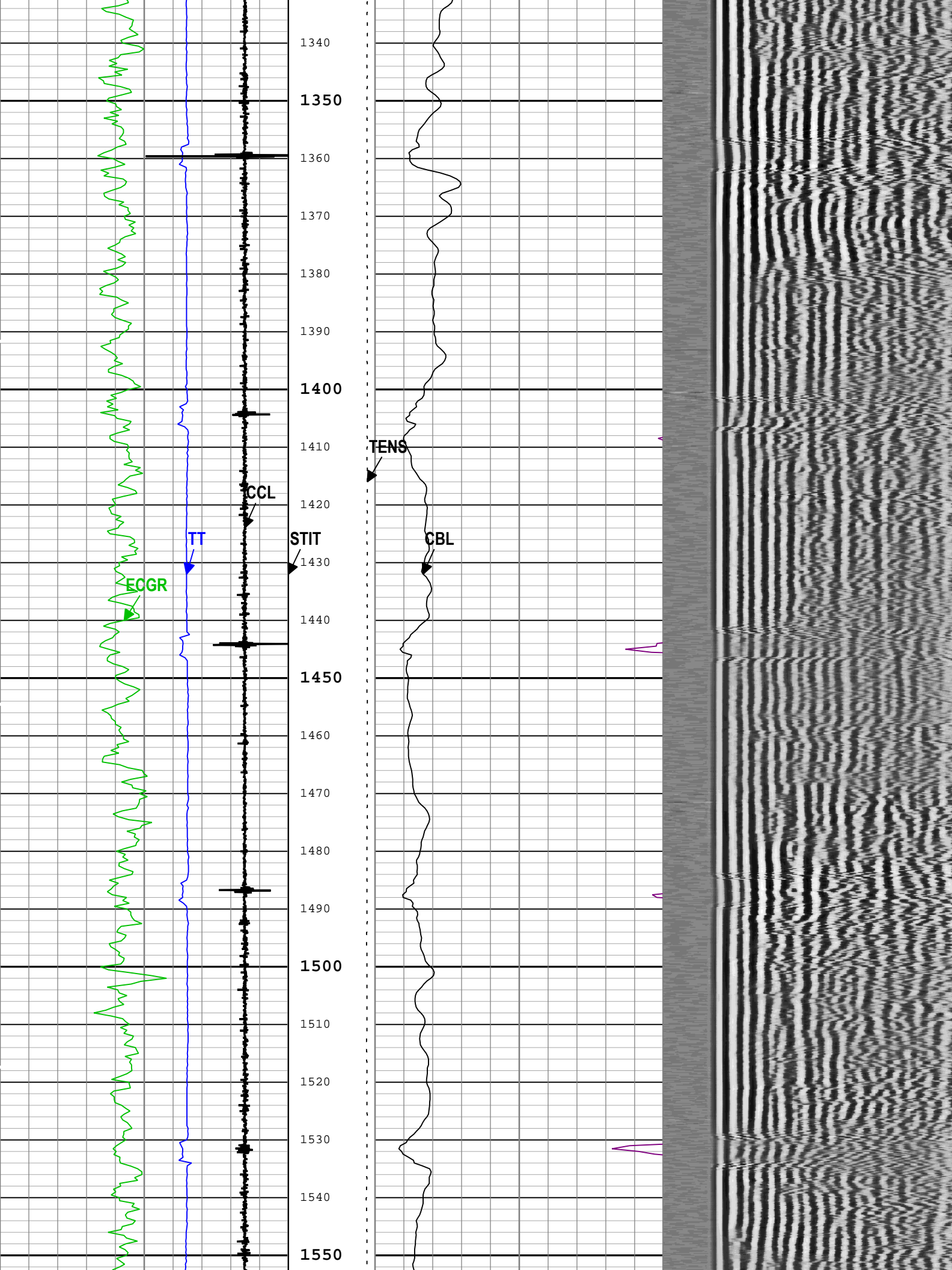


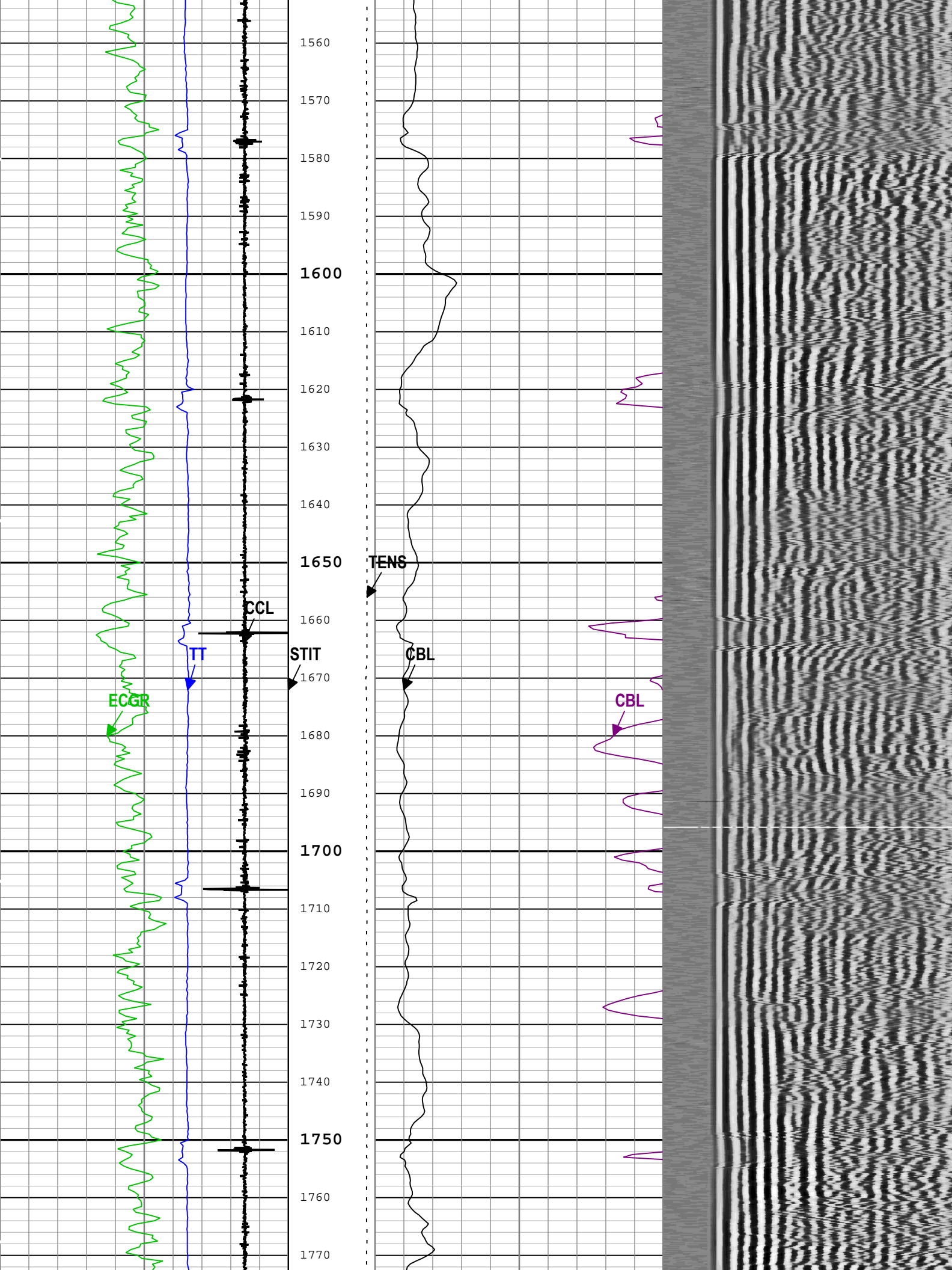


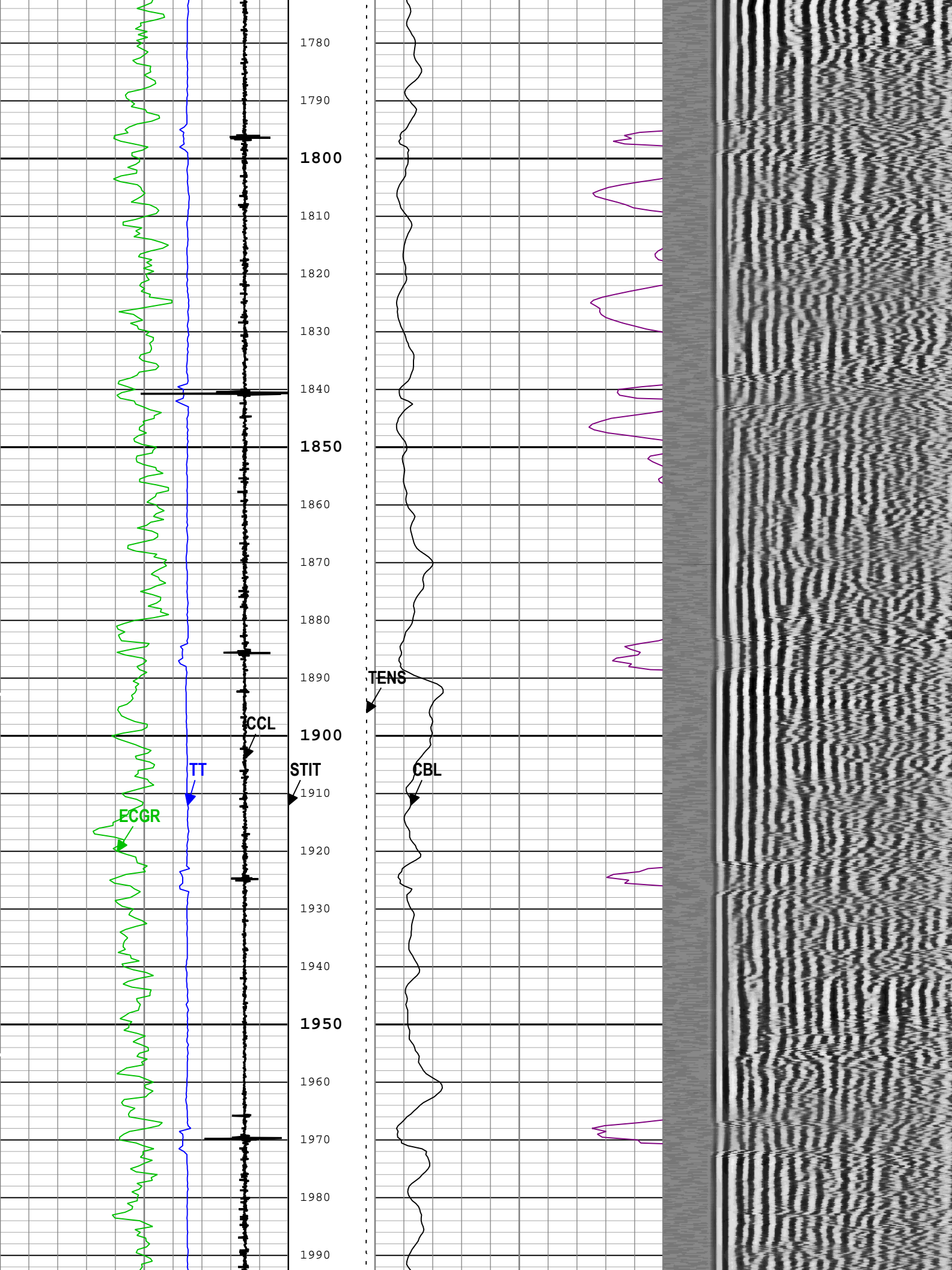


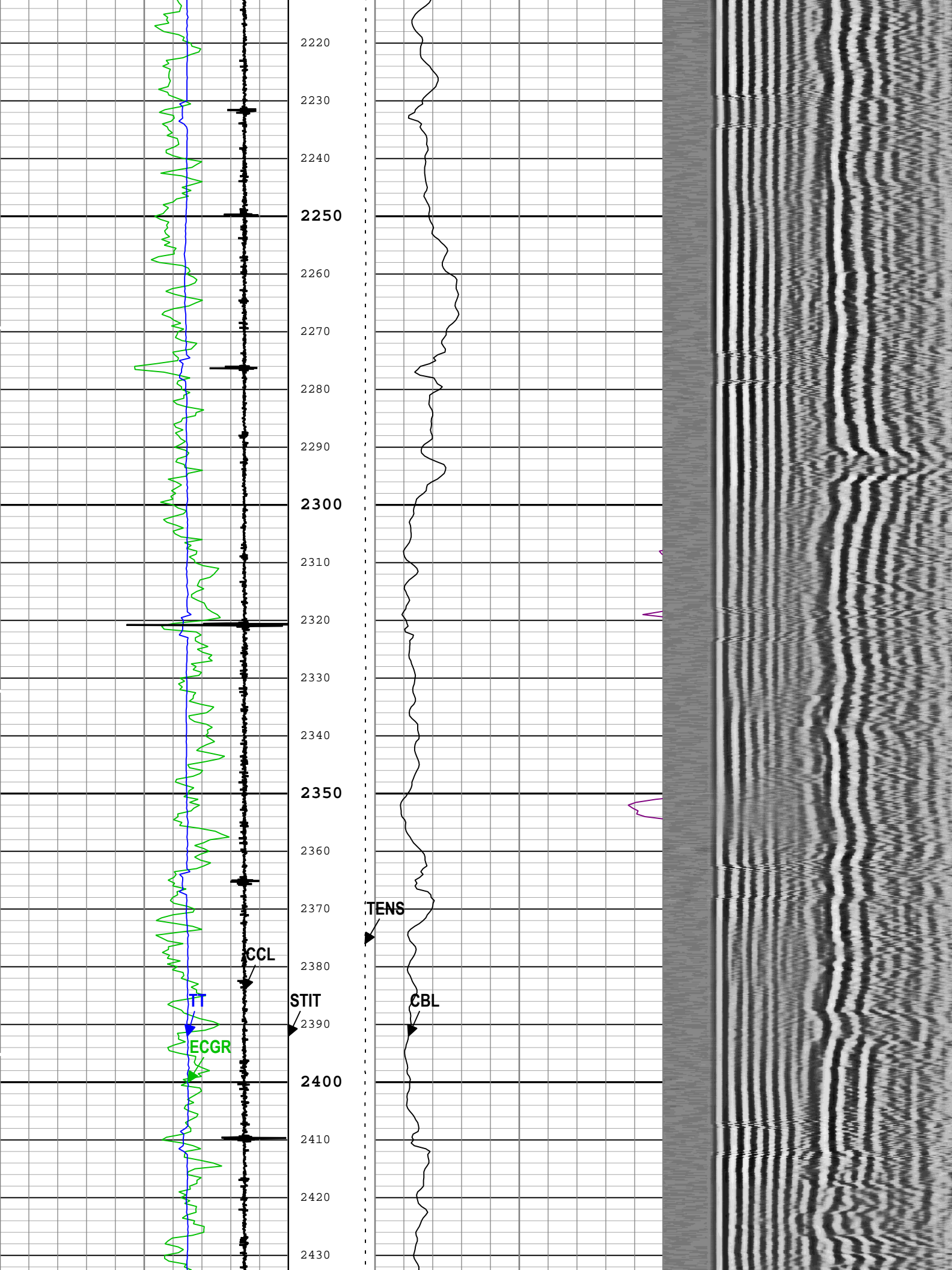


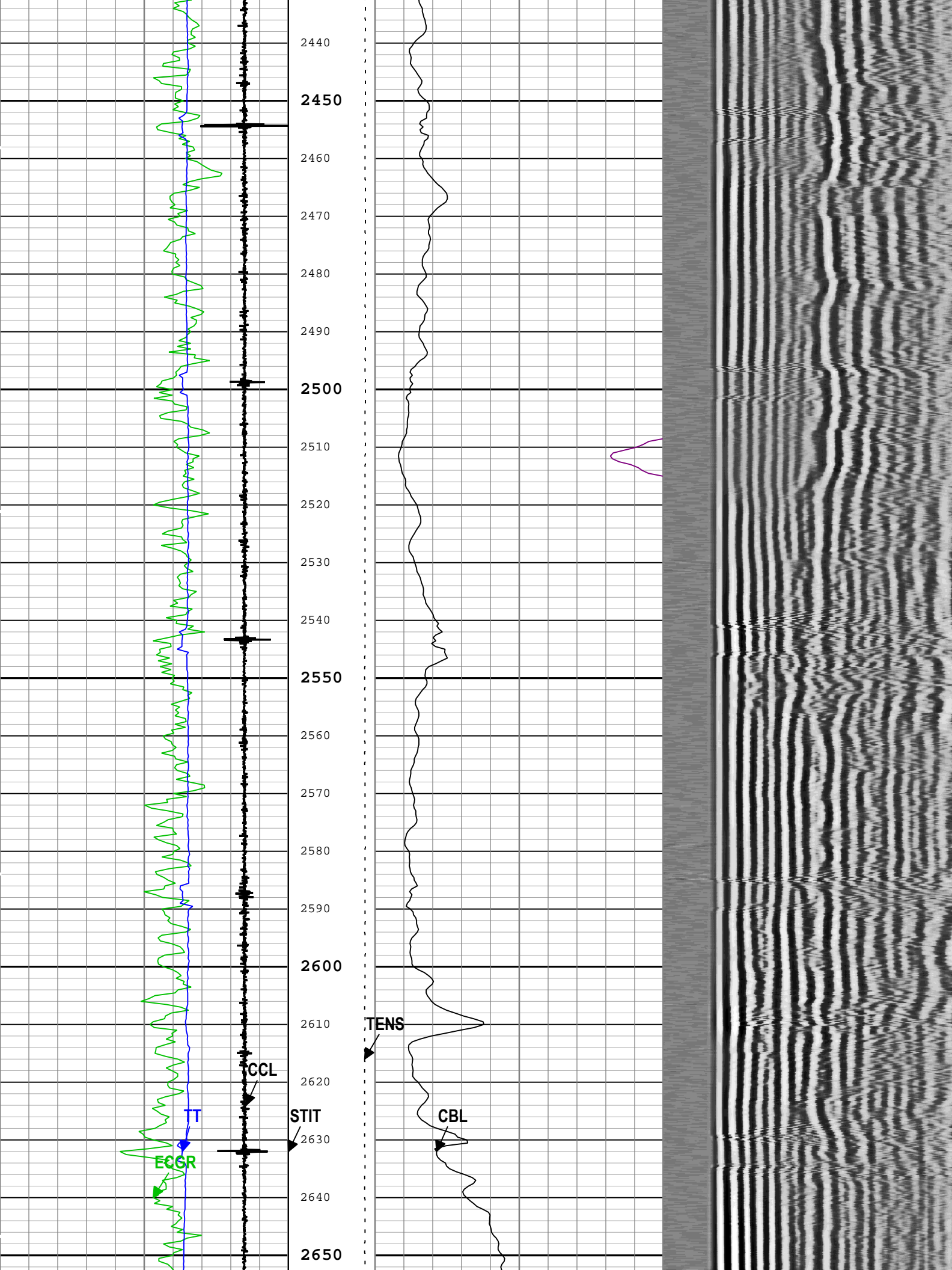


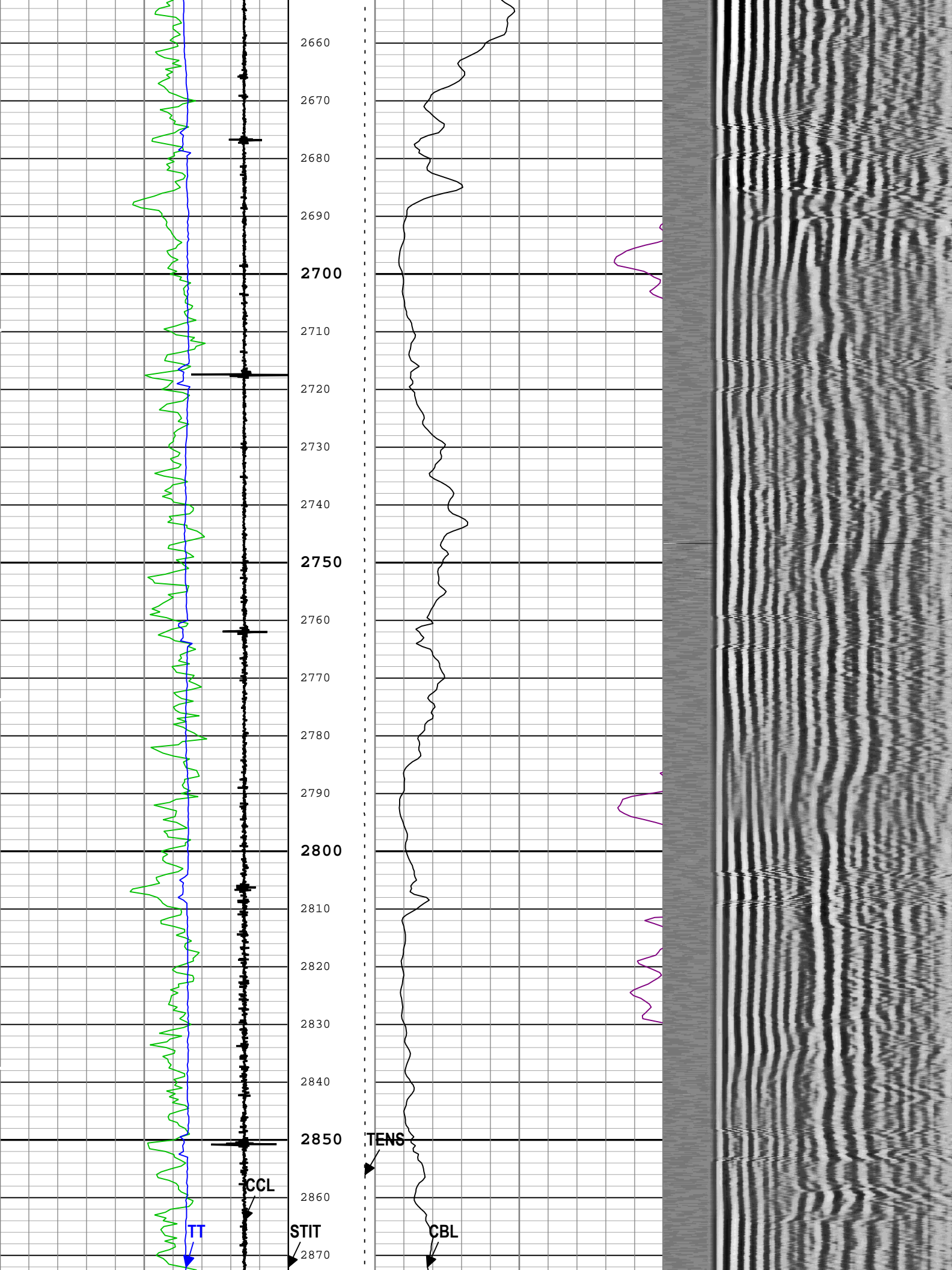


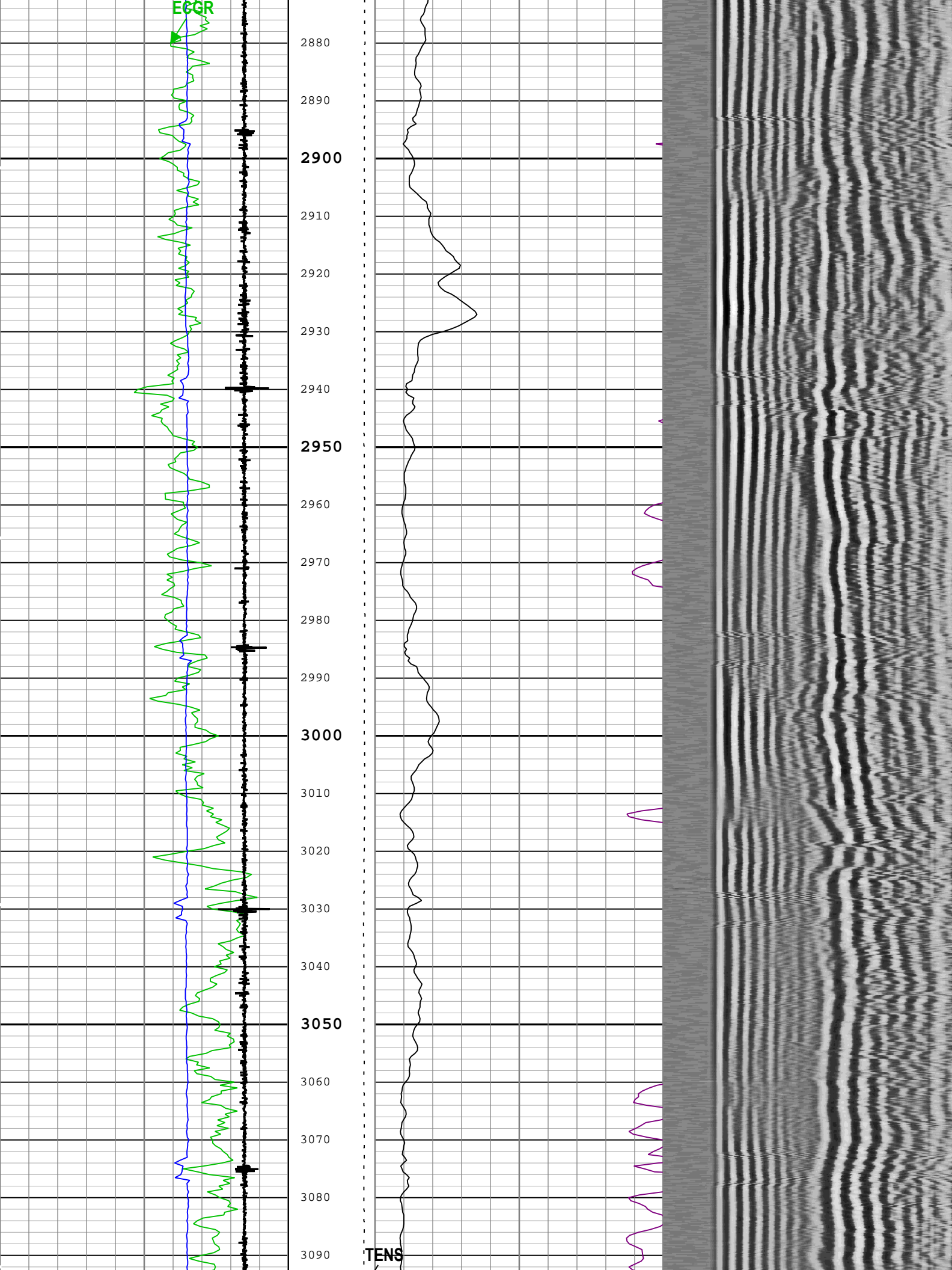


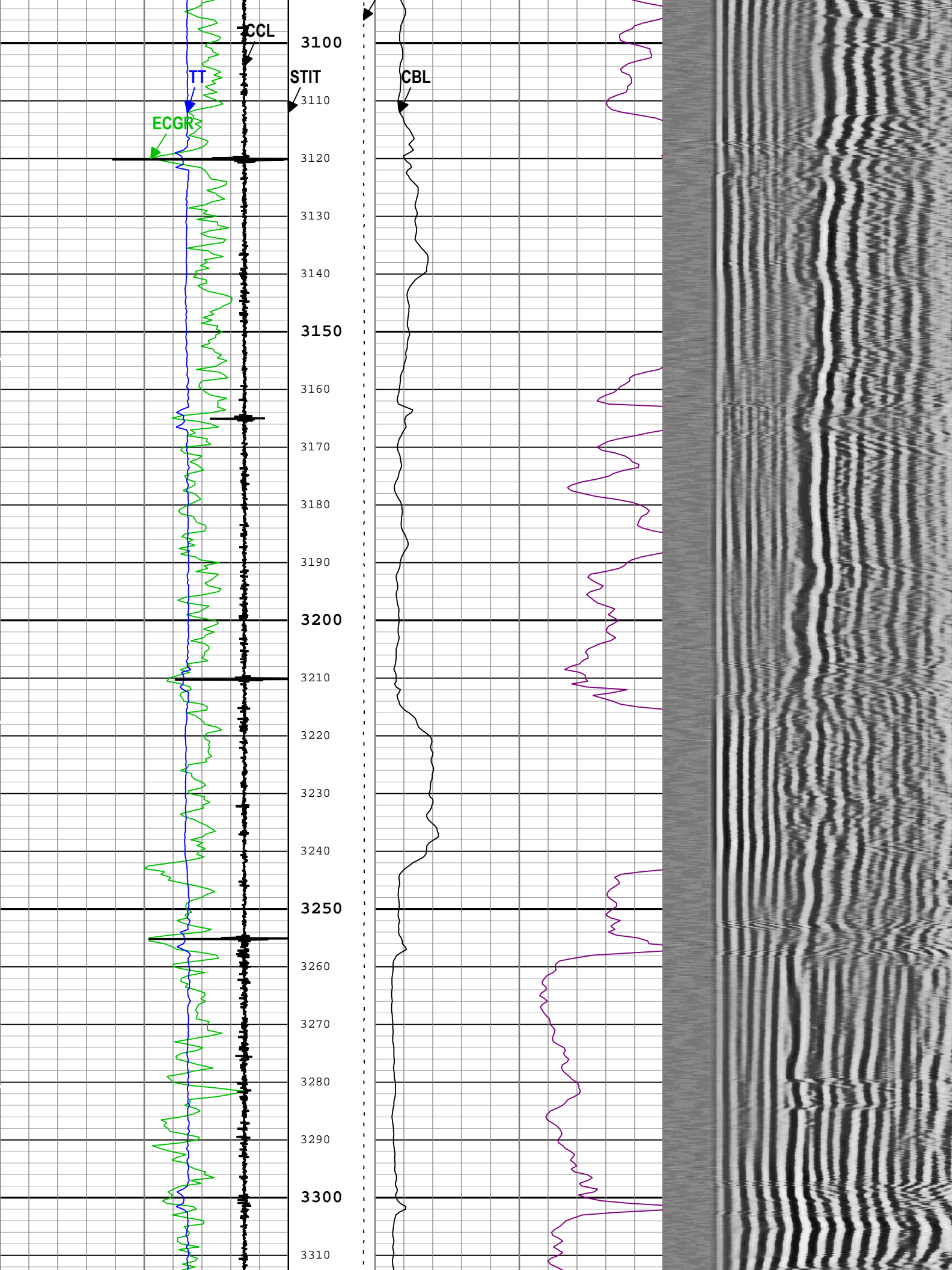


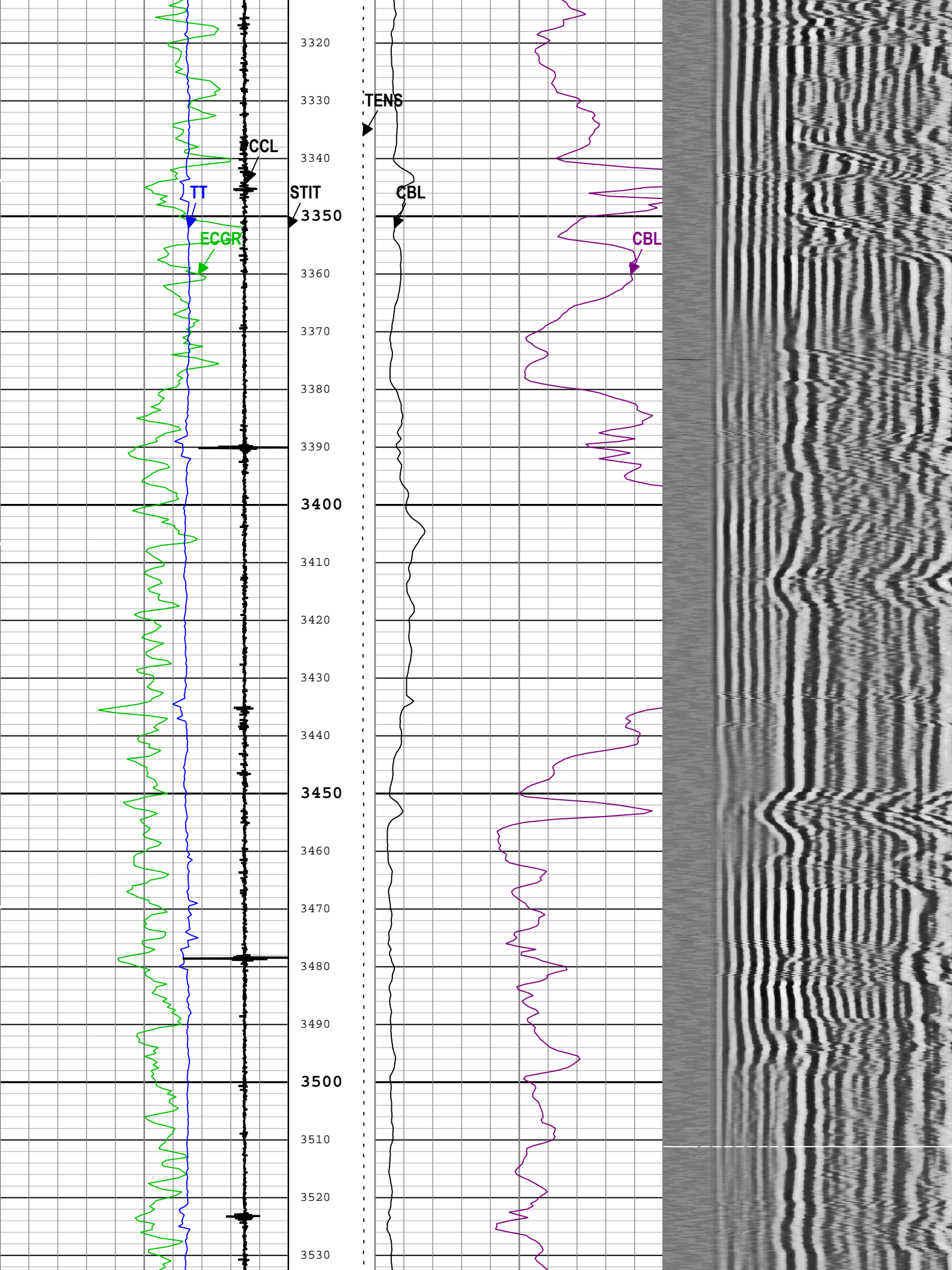


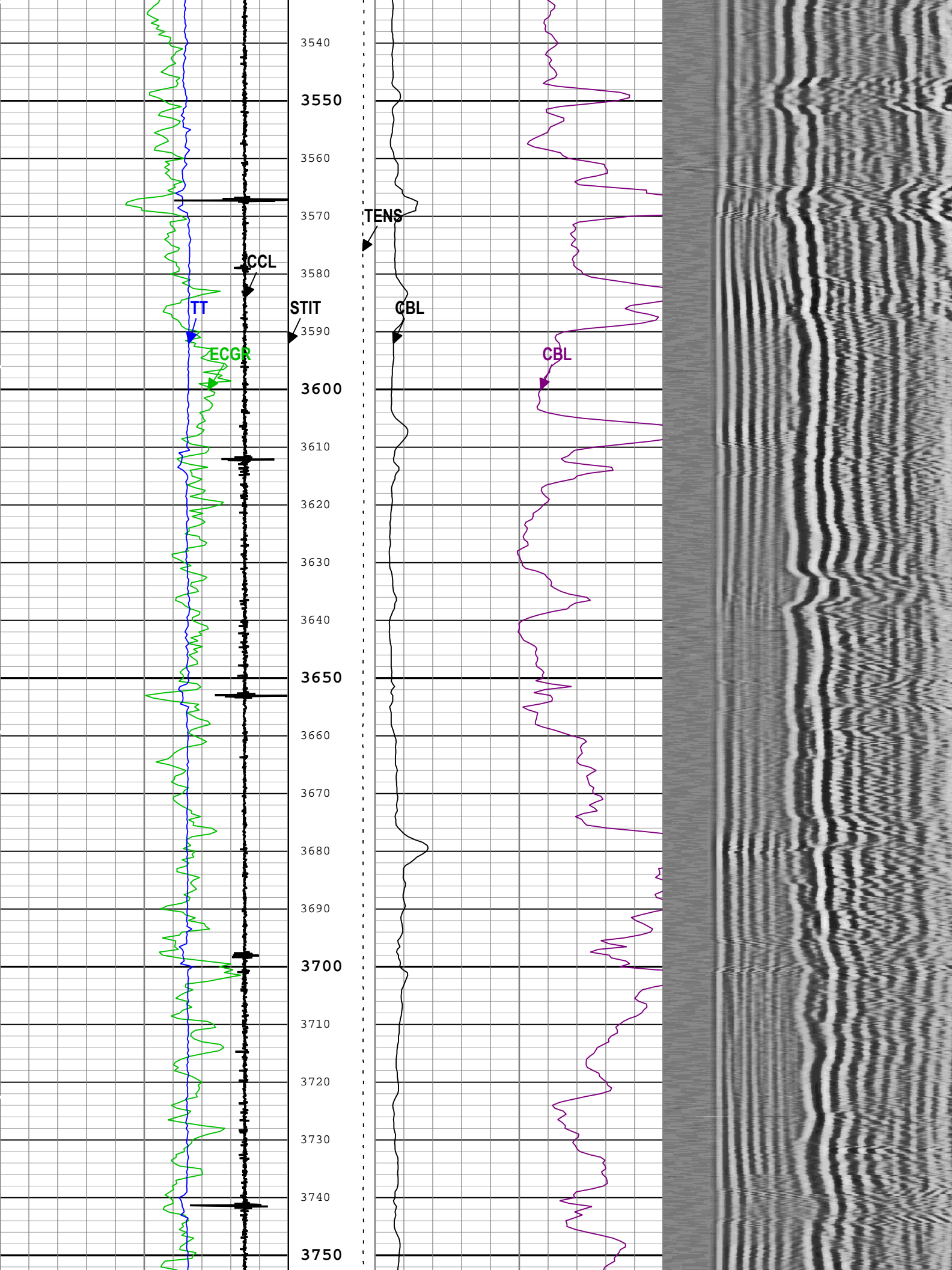


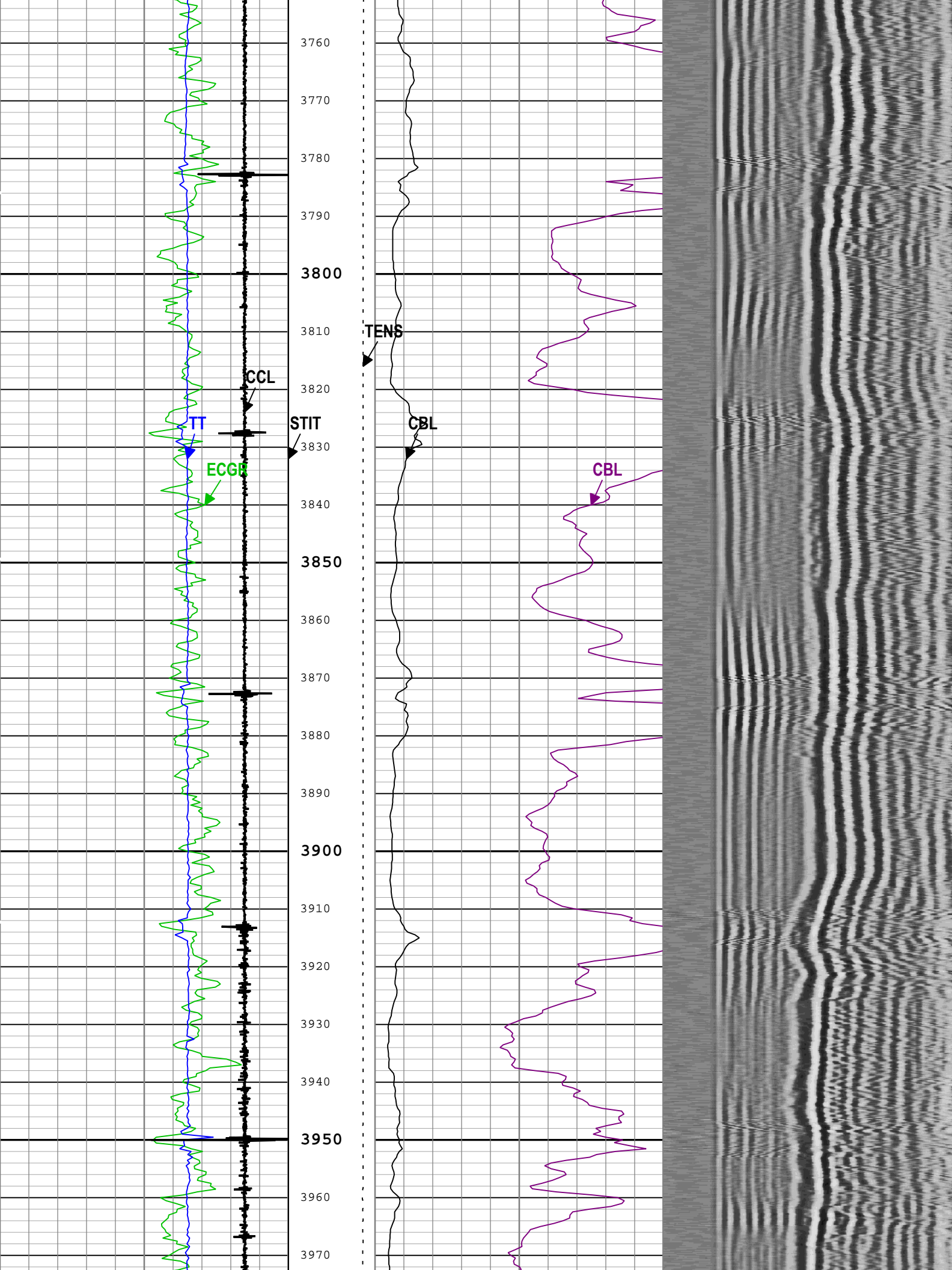


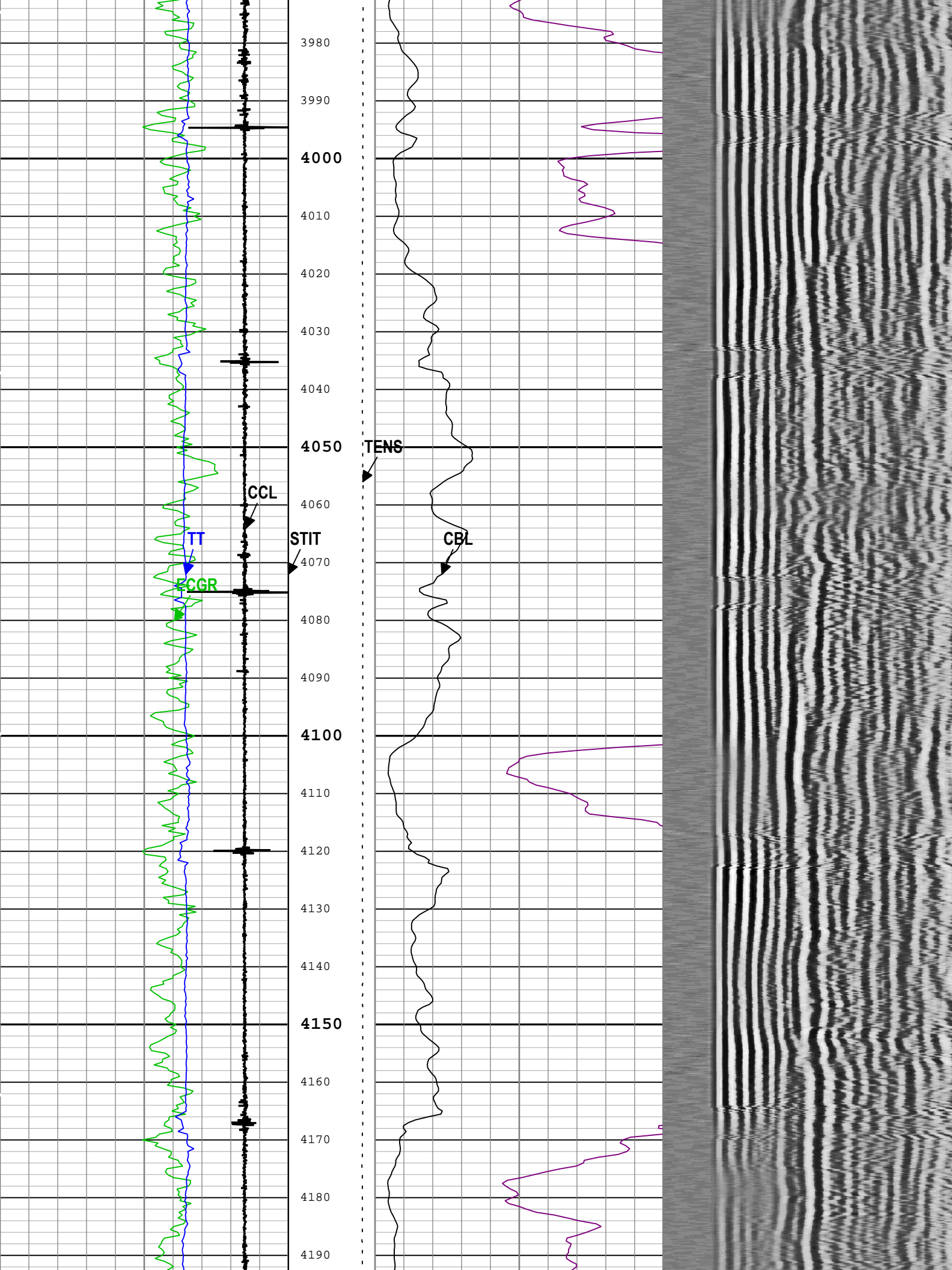


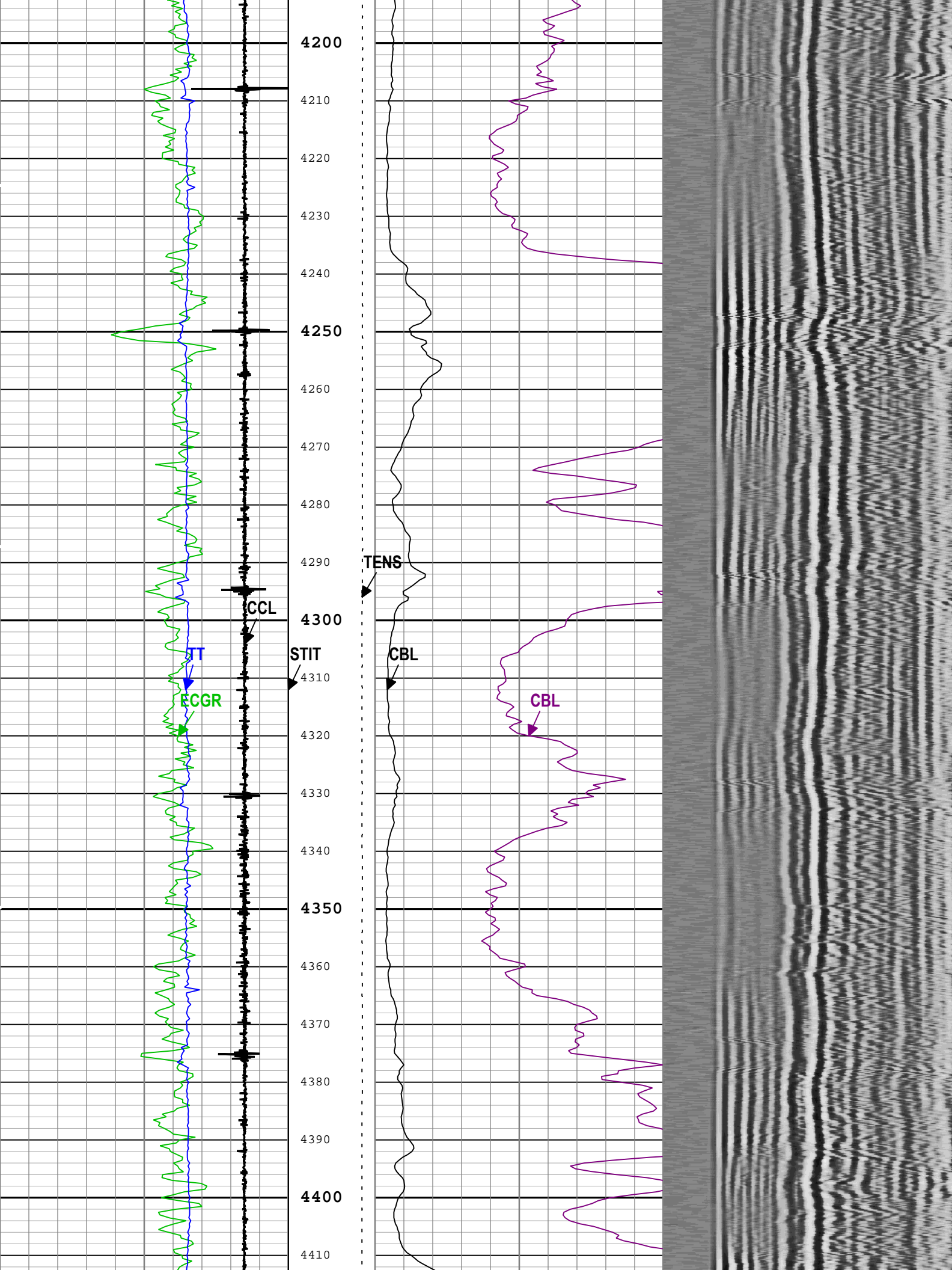


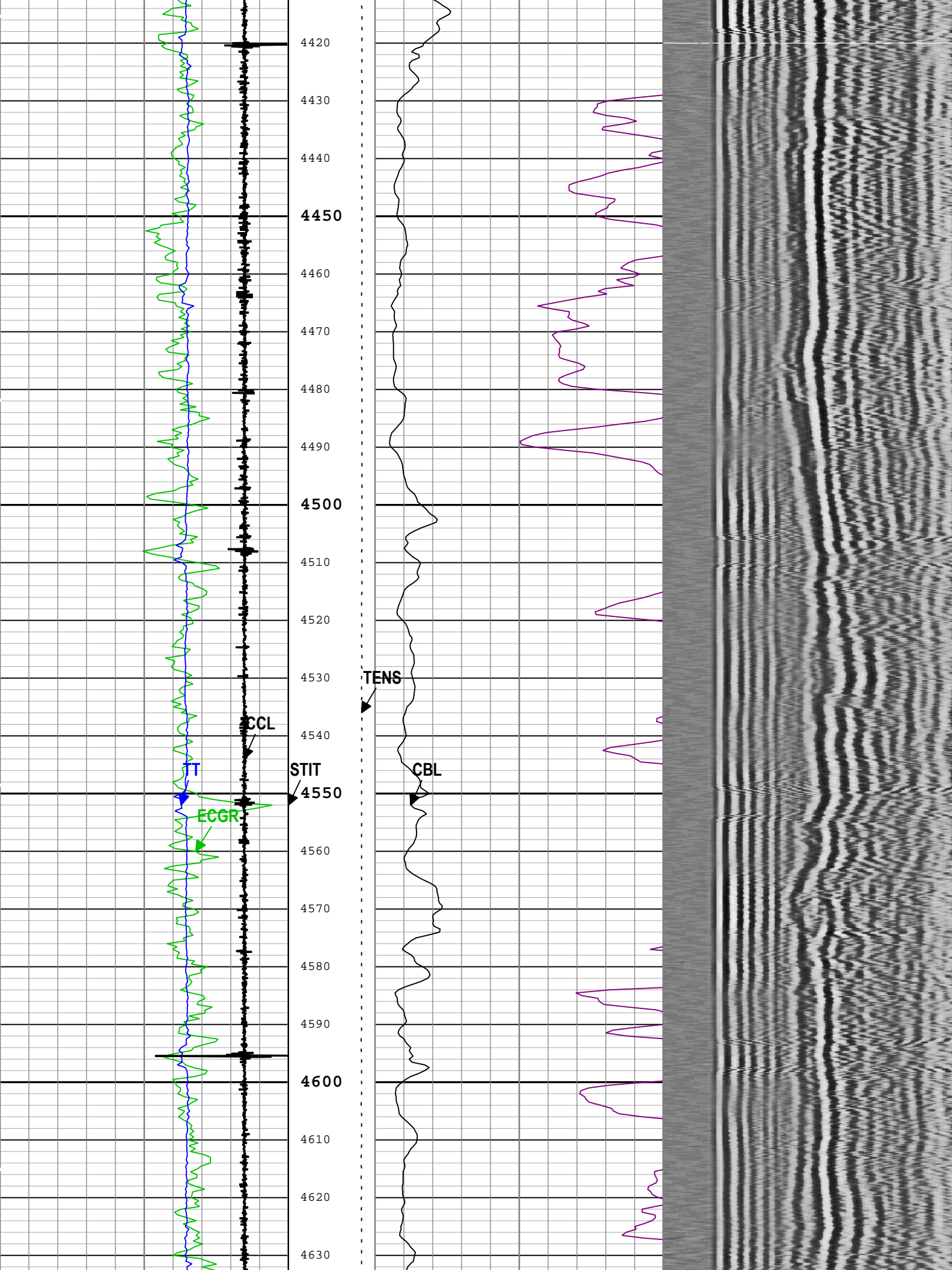


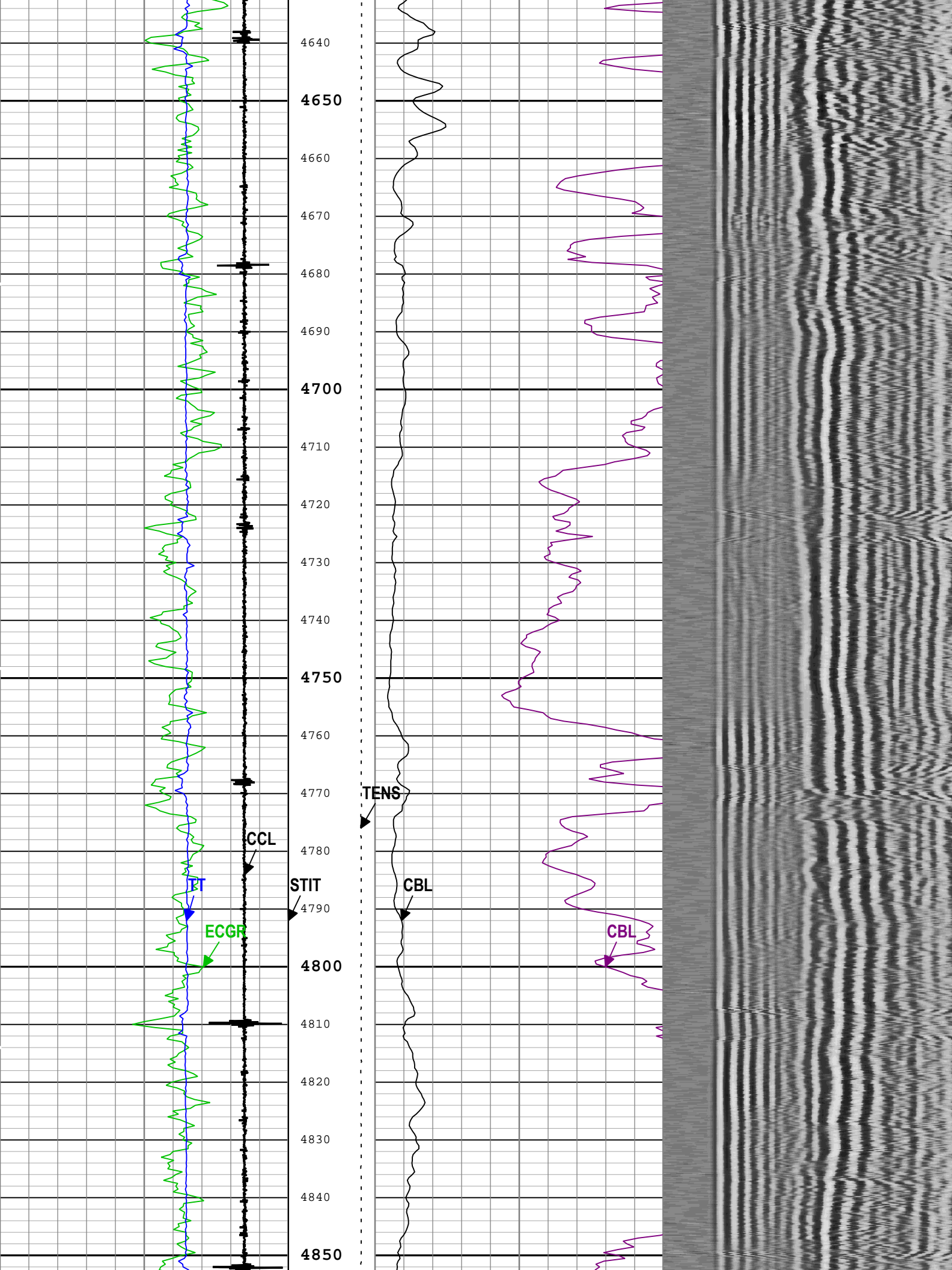


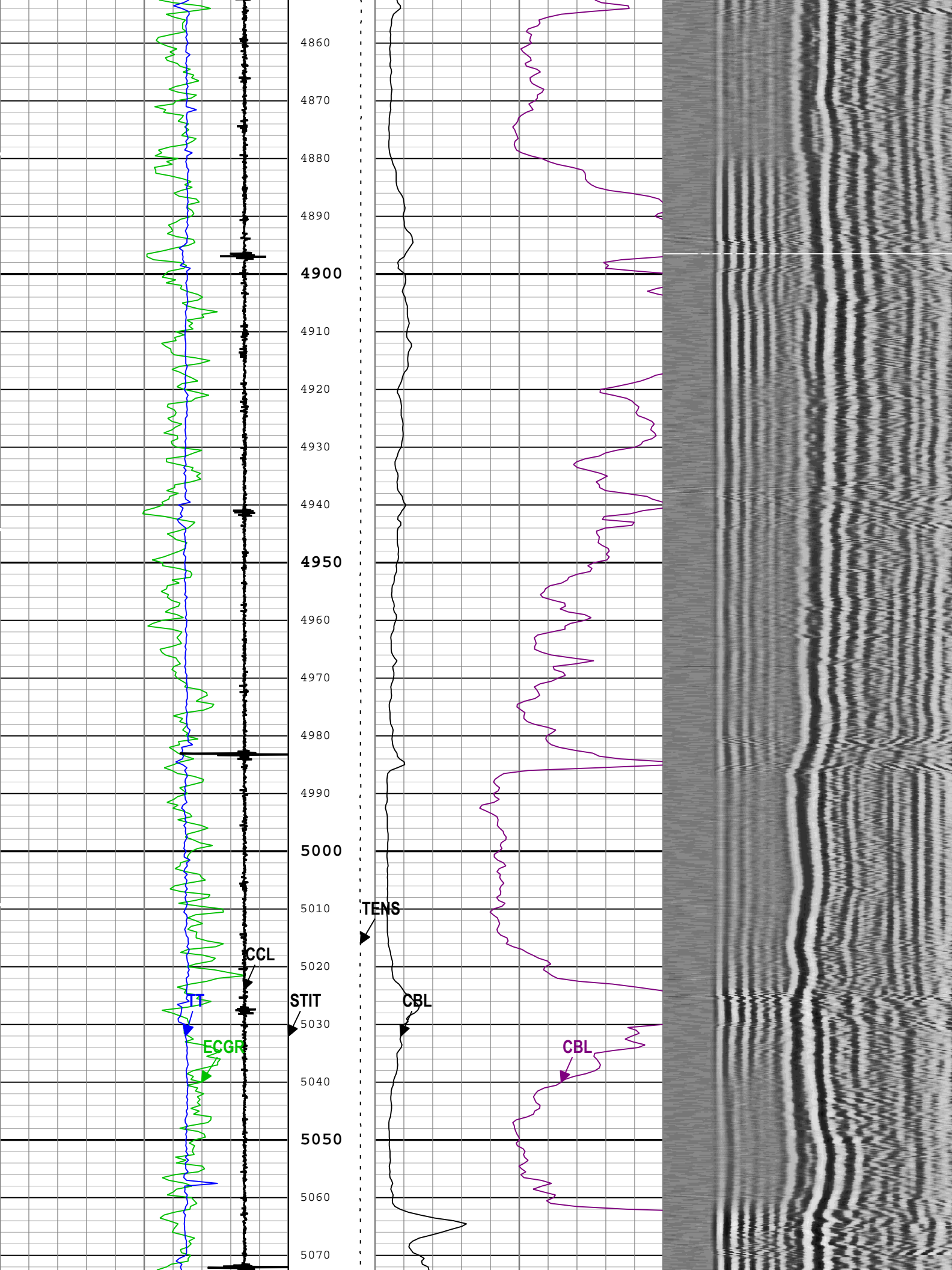


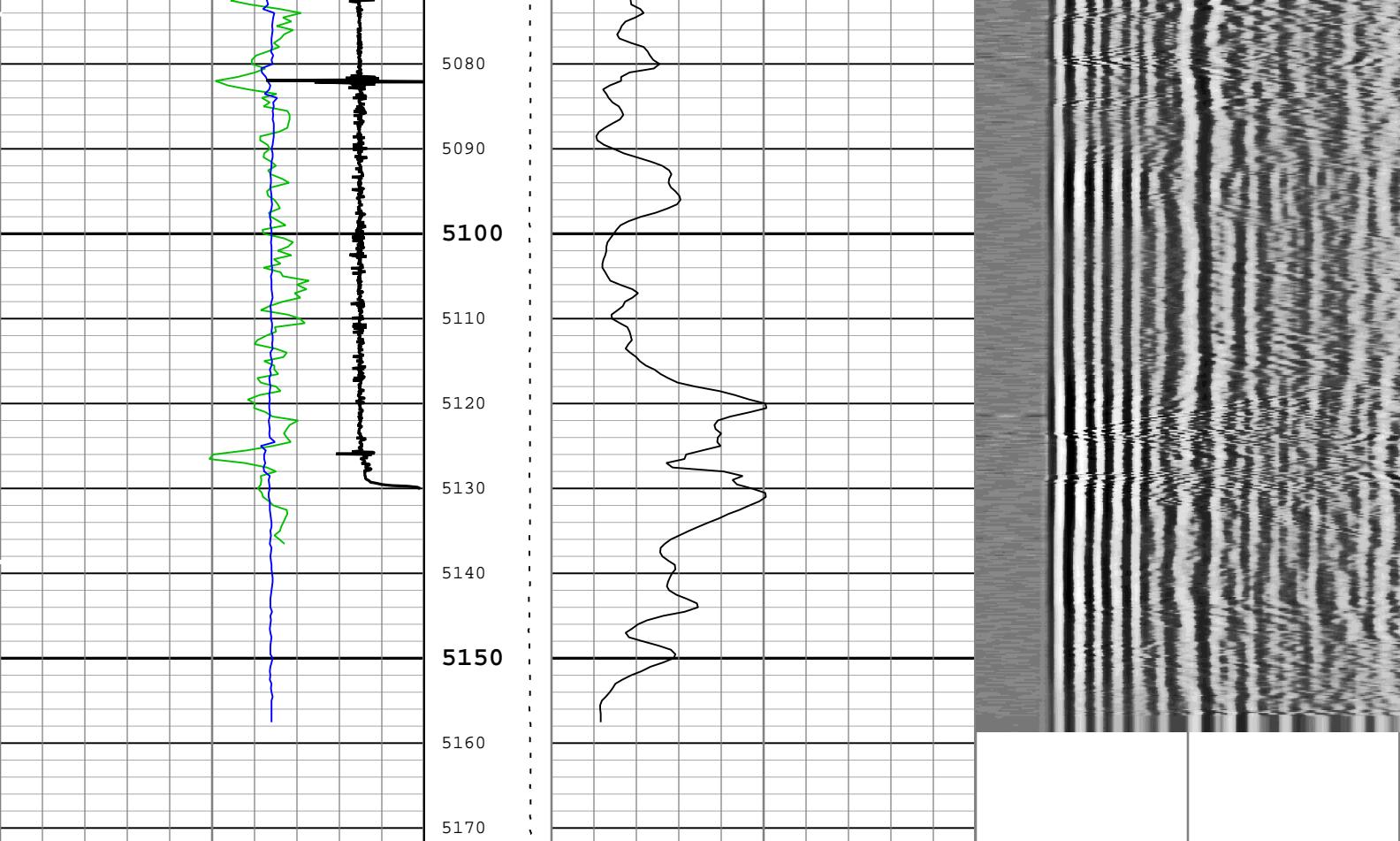












Gamma Ray (ECGR) SGT-N	Stuck Tool Indicator, Total (STIT)	CBL Amplitude (CBL) DSLT-H	Min	Amplitude	Max
0 gAPI 150	0 ft 50	0 mV 10			
Transit Time for CBL (TT) DSLT-H	Cable Tension (TENS)	CBL Amplitude (CBL) DSLT-H		Variable Density Log (VDL) DSLT-H	
400 us 200	10000 lbf 0	0 mV 100	200	us	1200
Casing Collar Locator Amplitude (CCL) CAL-YA	Cable Drag				
-5 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: 10-Nov-2016 15:02:42

Channel Processing Parameters

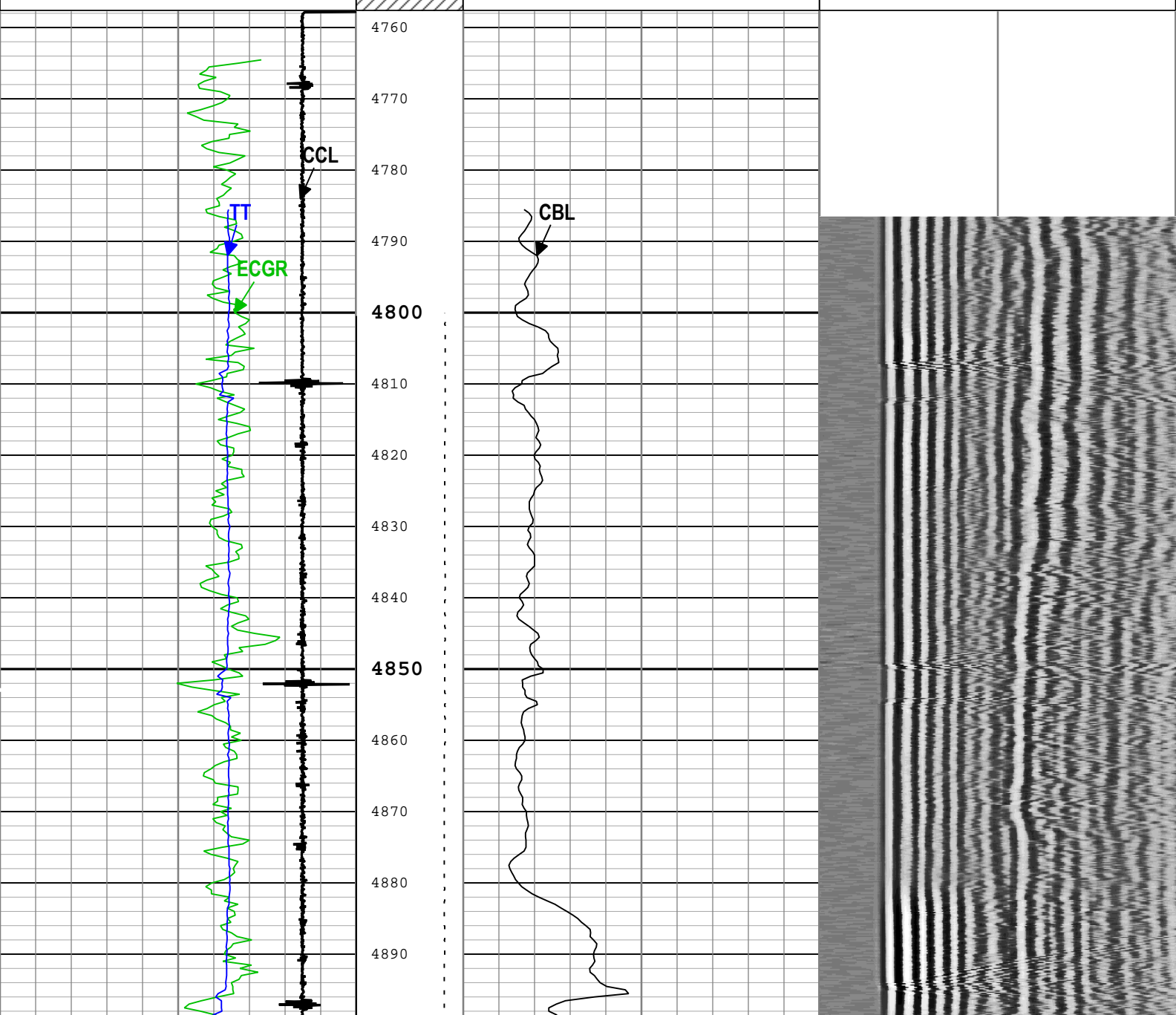
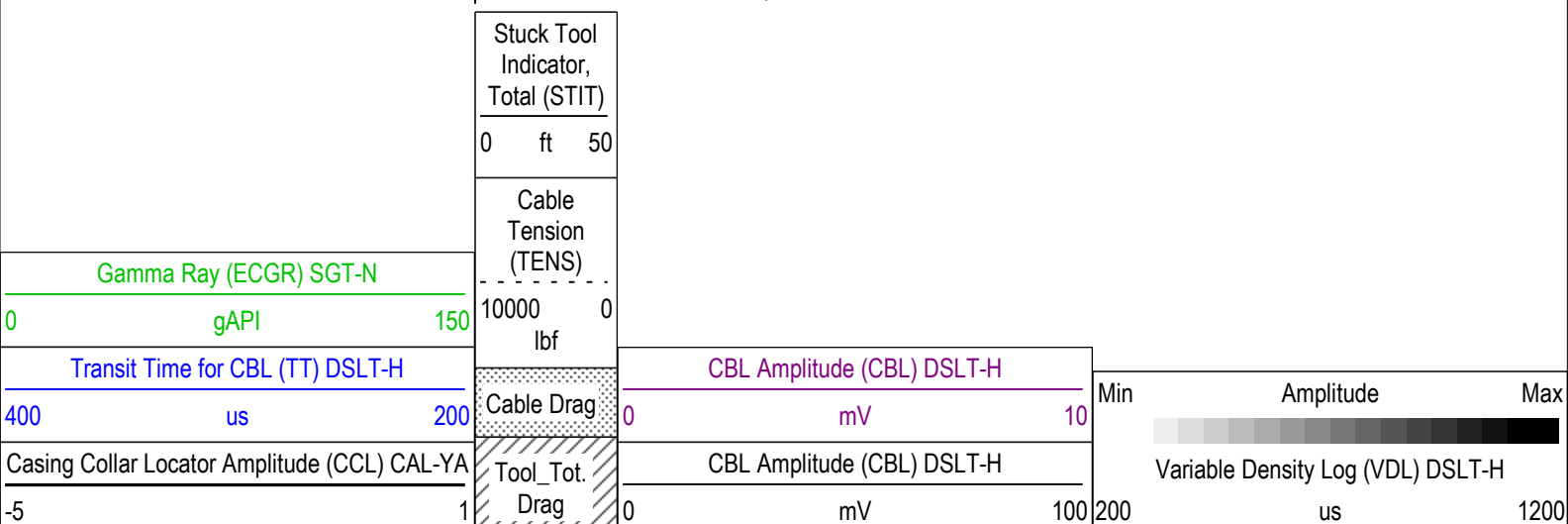
One: Parameters

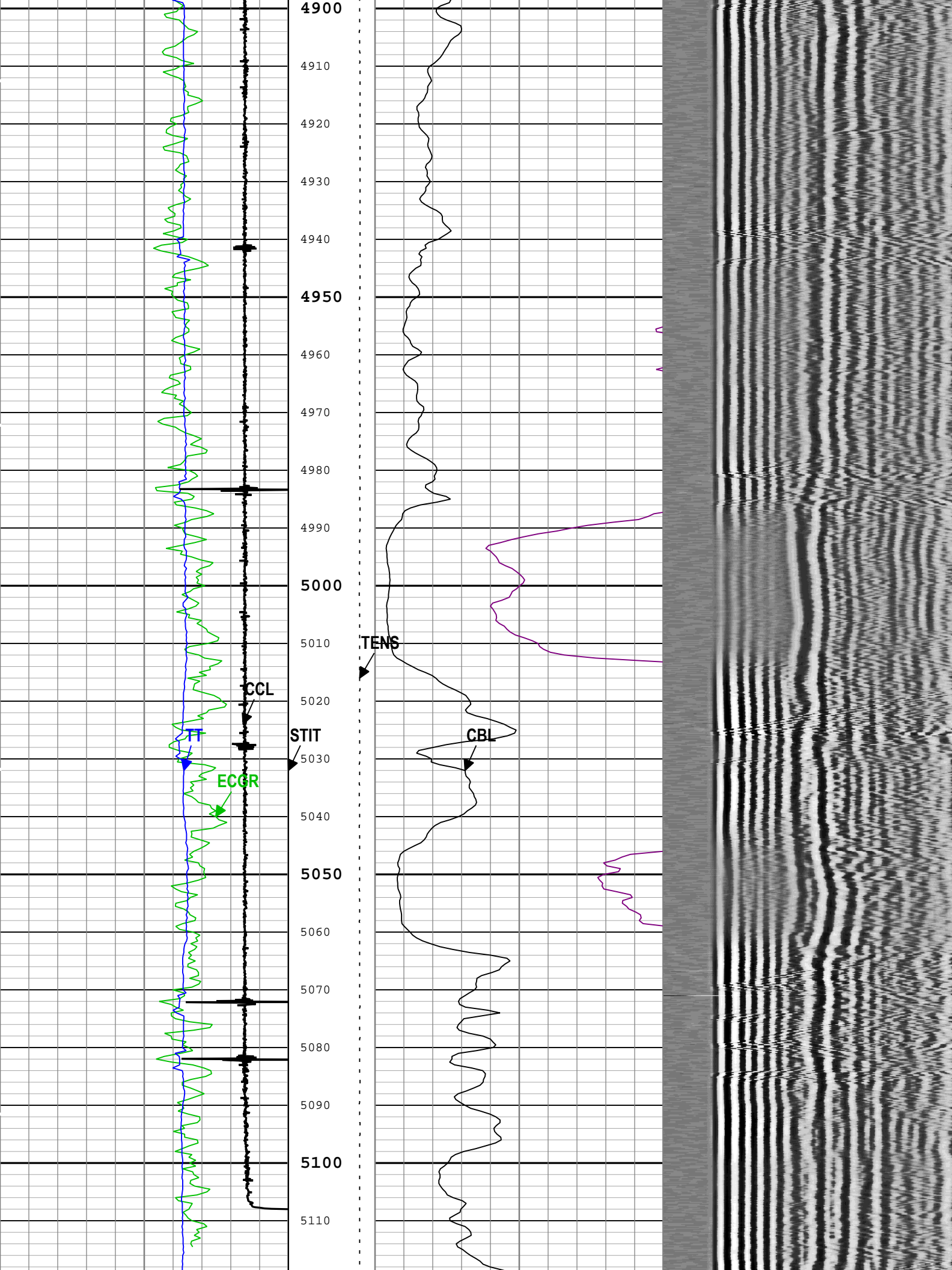
Parameter	Description	Tool	Value	Unit
AMSG	Auxiliary Minimum Sliding Gate	DSL-T-H	241	us
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	Depth Zoned	in
CBLG	CBL Gate Width	DSL-T-H	70	us
CBLO	Casing Bottom (Logger)	WLSESSION	13908	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSL-T-H	72	mV

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: 10-Nov-2016 15:02:47

TIME_1900 - Time Marked every 60.00 (s)

BIEP - Bond Index Event Pips DSLT-H





MMXG	Near Maximum Sliding Gate	DSLT-H	207	us
SGAD	Sliding Gate Status	DSLT-H	Off	
SGDT	Sliding Gate Delta-T	DSLT-H	57	us/ft
VDLG	VDL Manual Gain	DSLT-H	3.94	

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

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 1185

CBL Free Pipe Adjustment - Free Pipe Measurement

Before (Manual Entry): 07:57:57 10-Nov-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): 07:57:57 10-Nov-2016

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
CBL Adjustment Factor		Before	1.000	0.200	0.787	5.000	
Depth of Before Calibration	ft	Before			104.50		

SGT-N (Scintillation Gamma-Ray Tool) Calibration - Run One

Primary Equipment :

Scintillation Gamma Cartridge SGC-TB 10249

Calibration Parameter :

Plus Reference (Jig minus background reference) 165

SGT-N Gamma-Ray Calibration - Gamma Ray Coefficients

Before (Measured): 10:57:13 08-Nov-2016

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Gamma Ray Gain		Before			1.135		

SGT-N Gamma-Ray Calibration - Gamma Ray Accumulations

Before (Measured): 10:57:13 08-Nov-2016

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RGR Zero Measurement	gAPI	Before		0	67.925	120.000	
RGR Plus Measurement	gAPI	Before	145.340	132.128	145.340	158.553	

SGT-N Gamma-Ray Plateau Check - Gamma Ray Plateau Check

Before (Measured): 10:59:50 08-Nov-2016

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RGR Plus Plateau Measurement	gAPI	Before			215.418		
RGR Minus Plateau Measurement	gAPI	Before			209.727		

Company: Whiting Oil & Gas Corporation

Schlumberger

Well: Horsetail 30E-3136

Field:	Wildcat
County:	Weld
State:	Colorado

Cement Bond Log

GR-CCL