

Company: Crestone Peak Resources Operating LLC

Well: Lochbuie Land 2F-25H-D166

Field: Wattenberg

County: Weld State: Colorado

Digital Sonic Logging Tool

CBL with VDL

County:	Weld
Field:	Wattenberg
Location:	NWNW
Well:	Lochbuie Land 2F-25H-D166
Company:	Crestone Peak Resources Operating LLC
Location:	
NWNW	Elev.: K.B. 5090.00 ft
948 FNL 297 FWL	G.L. 5077.00 ft
	D.F. 5090.00 ft
Permanent Datum:	Ground Level
Log Measured From:	Kelly Bushing
Drilling Measured From:	Kelly Bushing
API Serial No.	Section: 25
05-123-47985	Township: 1N
	Range: 66

Logging Date	08-Jan-2019
Run Number	One
Depth Driller	2389.00 ft
Schlumberger Depth	2389.00 ft
Bottom Log Interval	2335.00 ft
Top Log Interval	22.00 ft
Casing Fluid Type	Water
Salinity	
Density	8.34 lbm/gal
Fluid Level	8.00 ft
BIT/CASING/TUBING STRING	
Bit Size	13.50 in
From	0.00 ft
To	2389.00 ft
Casing/Tubing Size	9.625 in
Weight	40 lbm/ft
Grade	N/A
From	0.00 ft
To	2374.00 ft
Max Recorded Temperatures	106.3 degF
Logger on Bottom	08-Jan-2019
Unit Number	Time 18:47:00
Recorded By	OSL-CAR1 2215 Ft. Morgan, CO
Witnessed By	Z. Hamidaddin / A. Voyage
	Ryan Rensink

Disclaimer

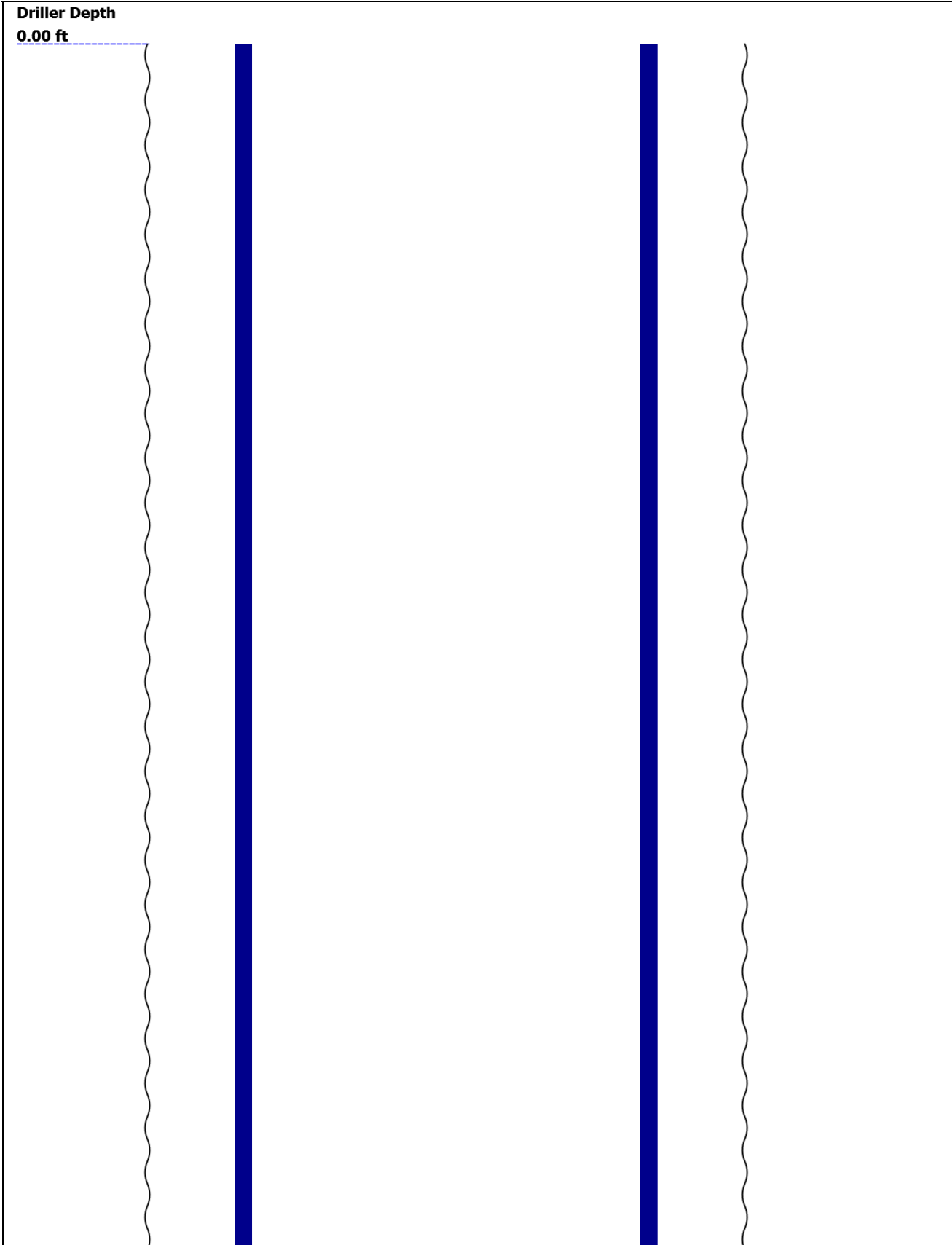
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Well Sketch	
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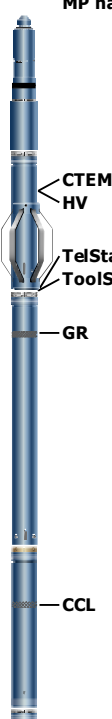


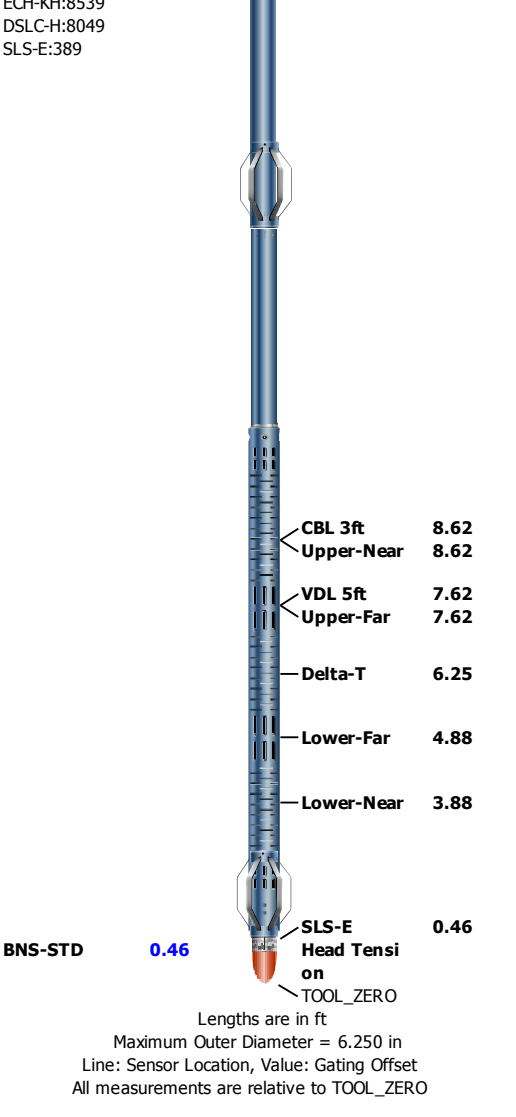


Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	13.5					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	2389					
Bottom Logger (ft)	2389					
Casing						
Size (in)	9.625					
Weight (lbm/ft)	40					
Inner Diameter (in)	8.835					
Grade	N/A					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	2389					
Bottom Logger (ft)	2389					

Remarks and Equipment Summary

One: Toolstring				One: Remarks		
Equip name LEH-QT:2148 LEH-QT:2148	Length 36.58	MP name	Offset	Thank you for choosing Schlumberger!		
				Log run for cement evaluation		
				Toolstring ran as per tool sketch		
				Log run under no pressure		
				Tool zero at KB = 13ft		
				Crew: Alex Schaab, Timothy Ludgate		
DTC-H:8602 ECH-KC:9680 DTC-H:8602	33.1	CTEM HV	32.2 0.00			
SGT-N SGH-K:2605 SGC-TB SGD-TAA	30.1	TelStatus ToolStatus	30.1 30.1			
		GR	29.18			
CAL-YA:213 CAL-YA:213	24.6	CCL	23.81			
DSLT-H:8049 ESL-KL:8520	21.1					



Depth Summary

	One		
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Depth Measuring Device

Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		

Tension Device

Type	CMTD-B/A		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0		

Logging Cable

Type	7-46NT-XS		
Serial Number			
Length	24000.00 ft		
Conveyance Type	Wireline		

One:Depth Control Parameters	Depth Control Remarks
Log Sequence	
First Log In the Well	
Rig Up Length At Surface	
Rig Up Length At Bottom	
Rig Up Length Correction	
Stretch Correction	
Tool Zero Check At Surface	

Software Version

Pass Summary	
1	100%
2	100%
3	100%
4	100%
5	100%
6	100%
7	100%
8	100%
9	100%
10	100%
11	100%
12	100%
13	100%
14	100%
15	100%
16	100%
17	100%
18	100%
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89	100%
90	100%
91	100%
92	100%
93	100%
94	100%
95	100%
96	100%
97	100%
98	100%
99	100%
100	100%

Pass Summary

All depths are referenced to toolstring zero

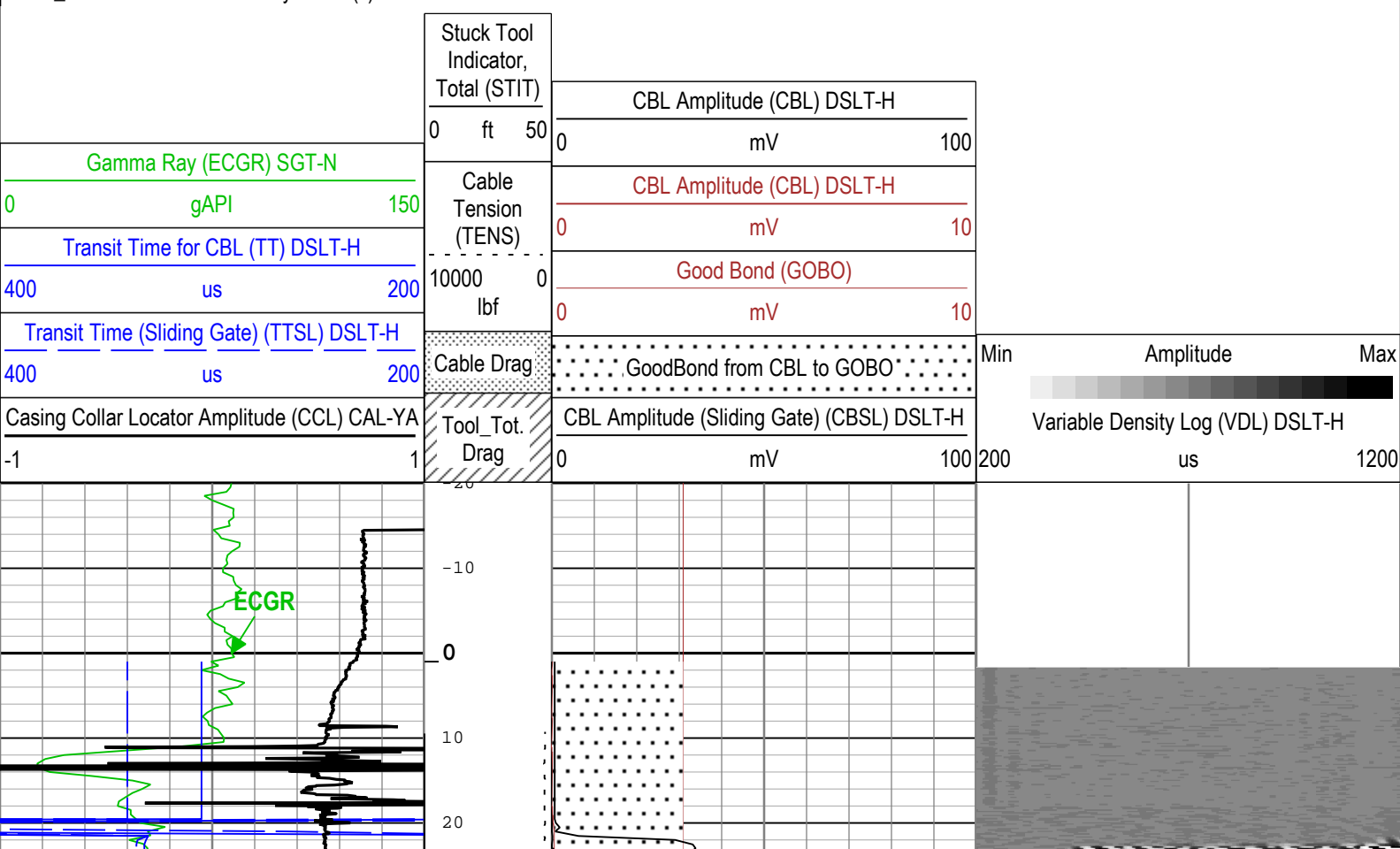
Log

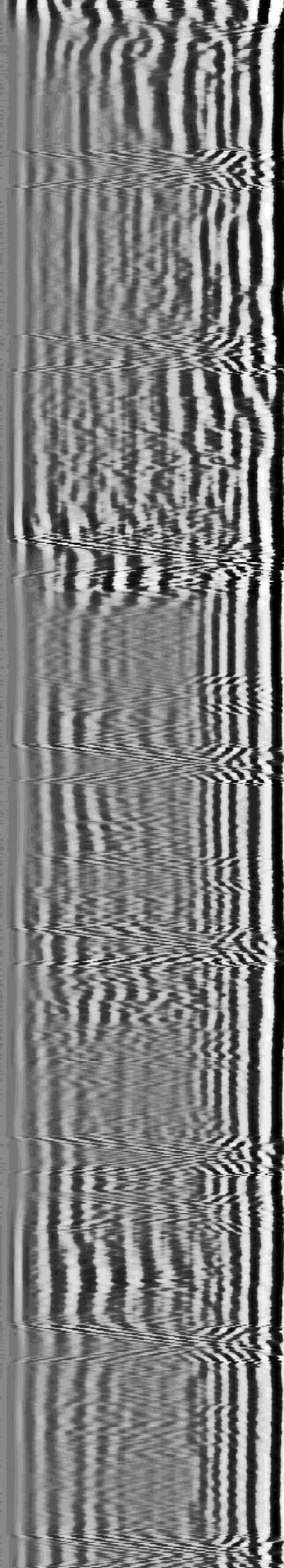
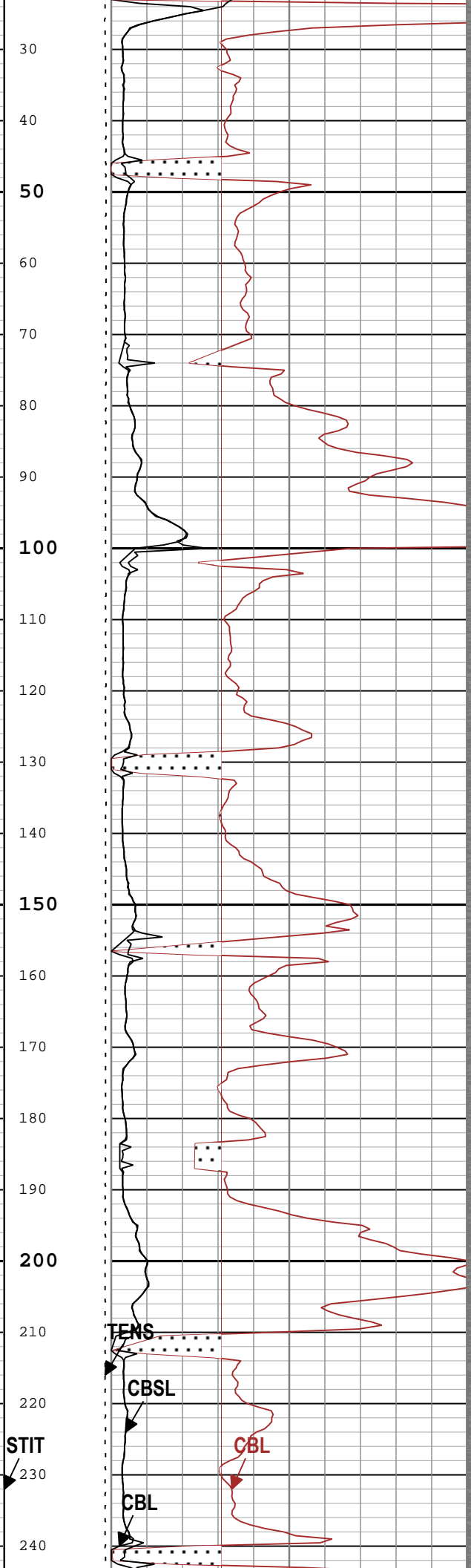
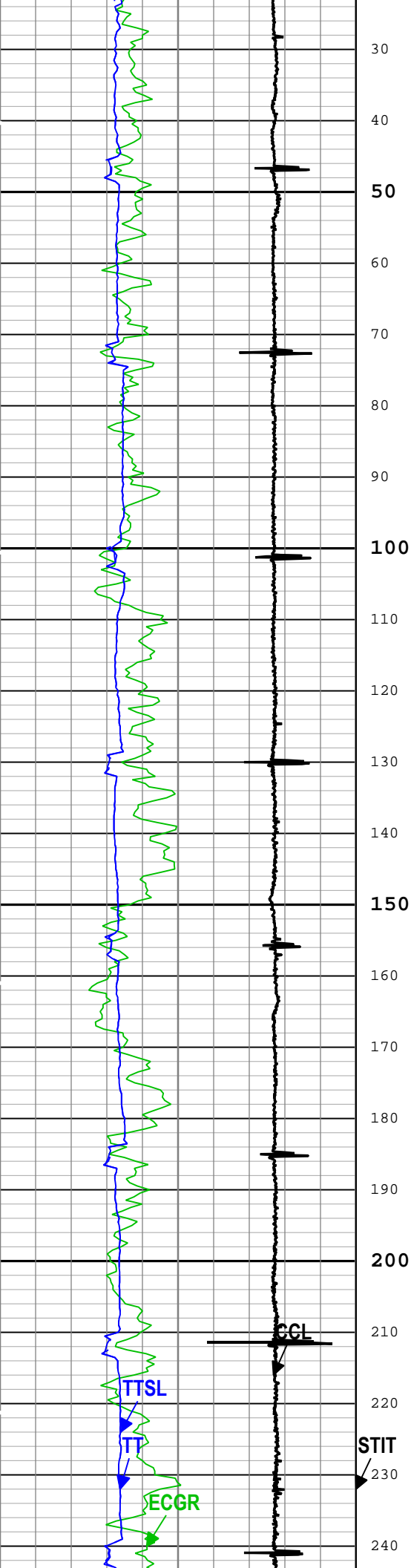
One: Log[2]:Up:S004

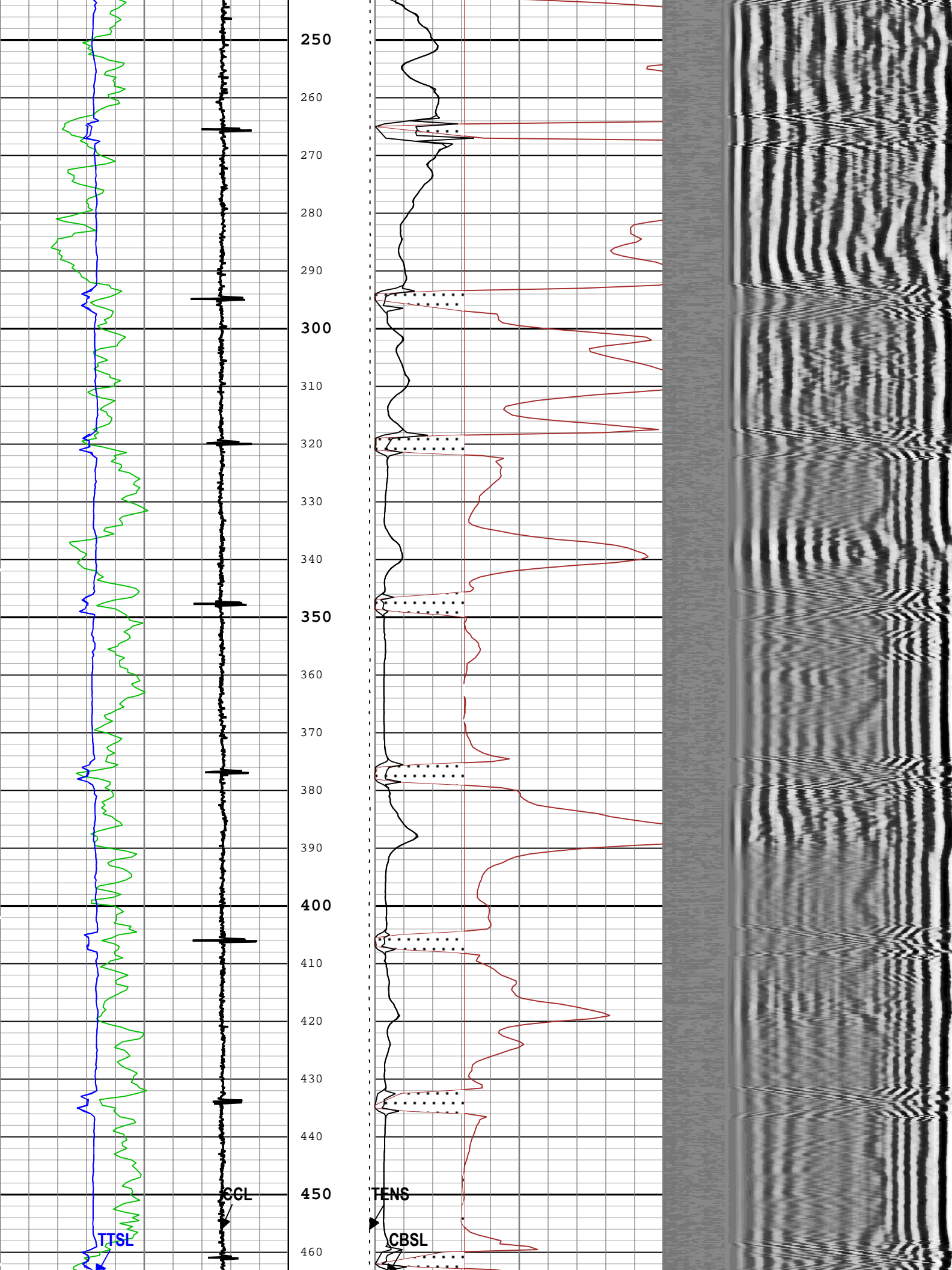
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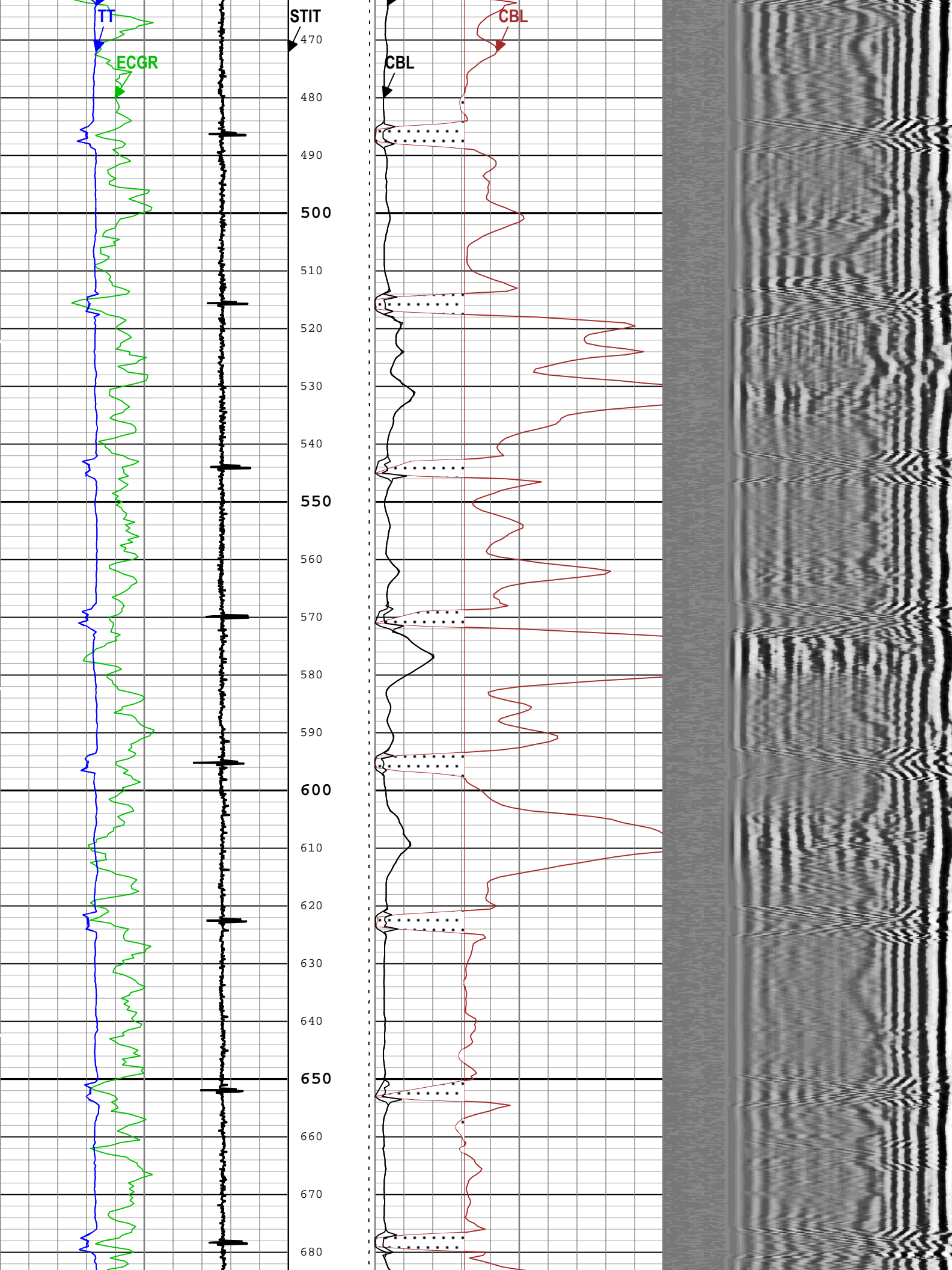
└ BIEP - Bond Index Event Pips DSLT-H

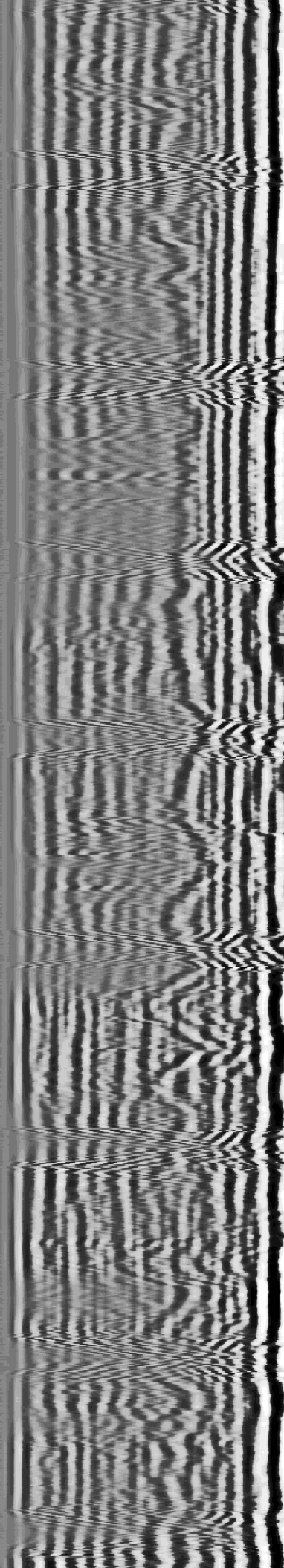
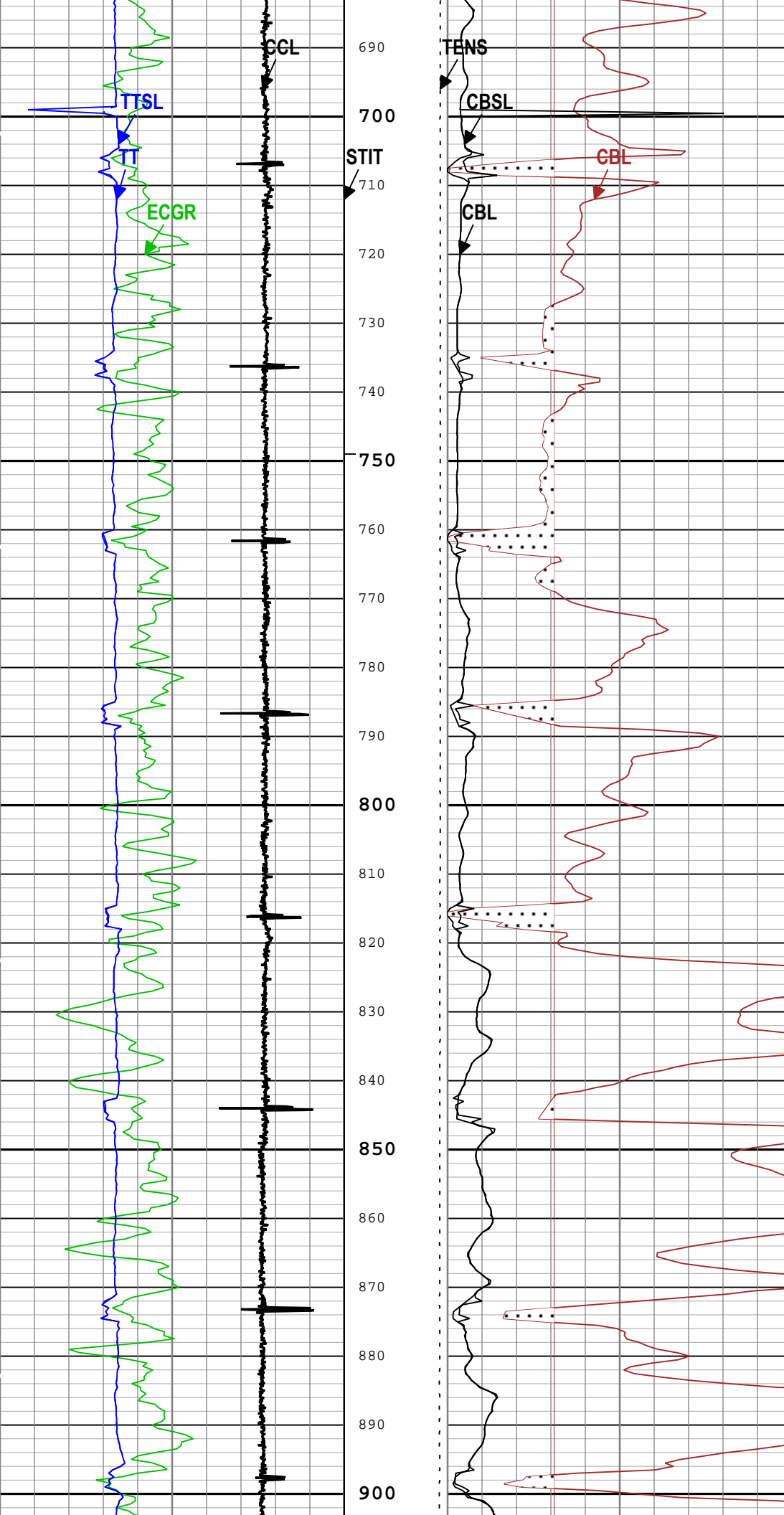
TIME_1900 - Time Marked every 60.00 (s)

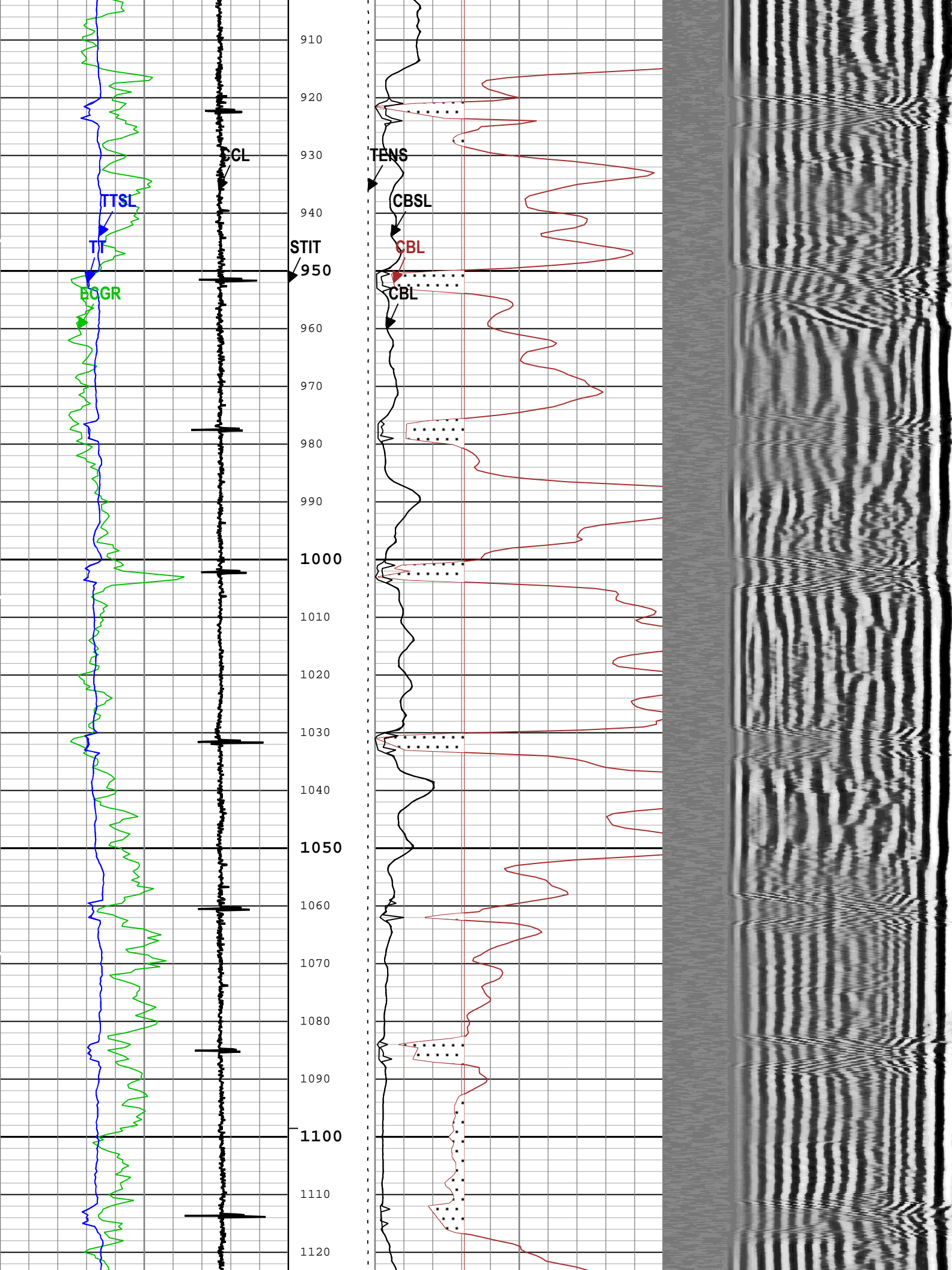


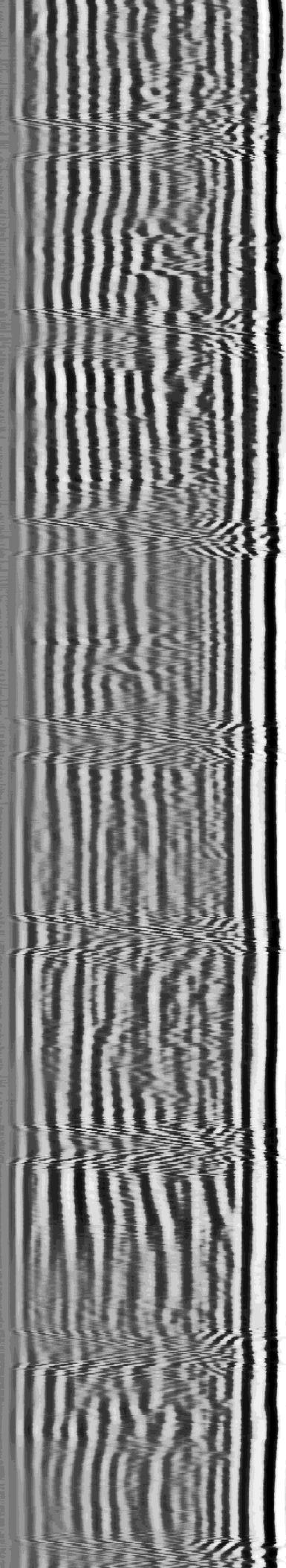
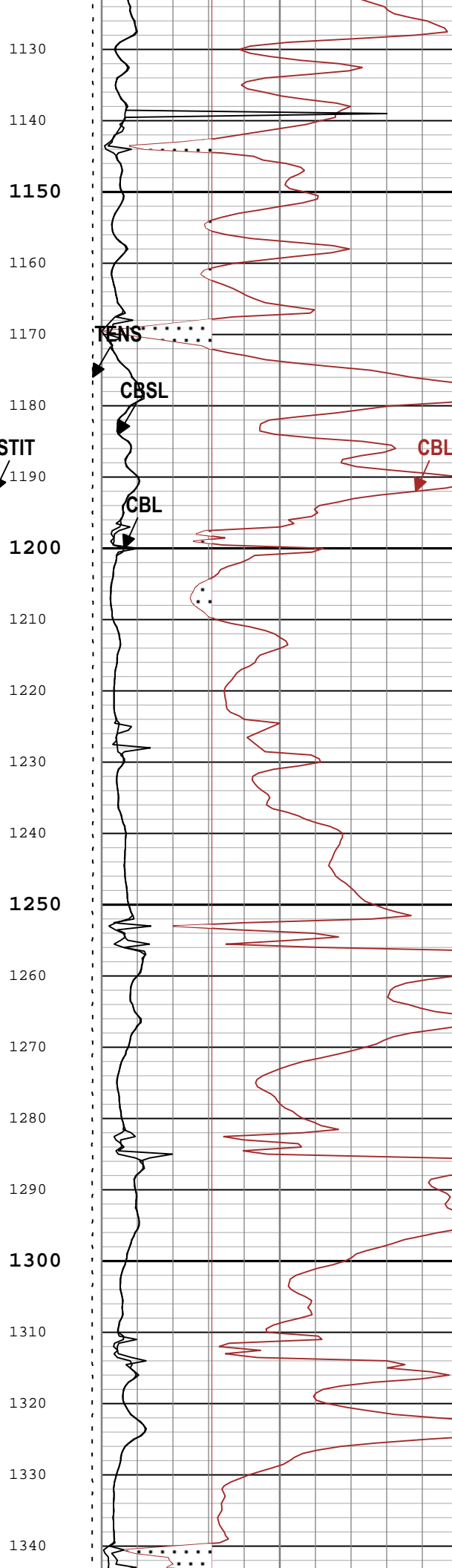
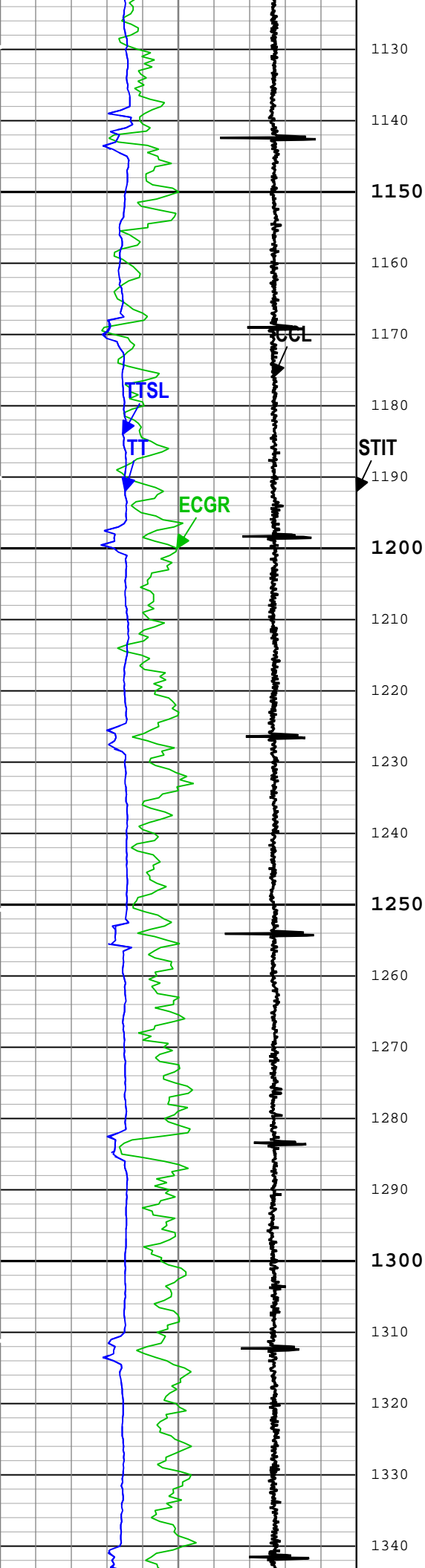


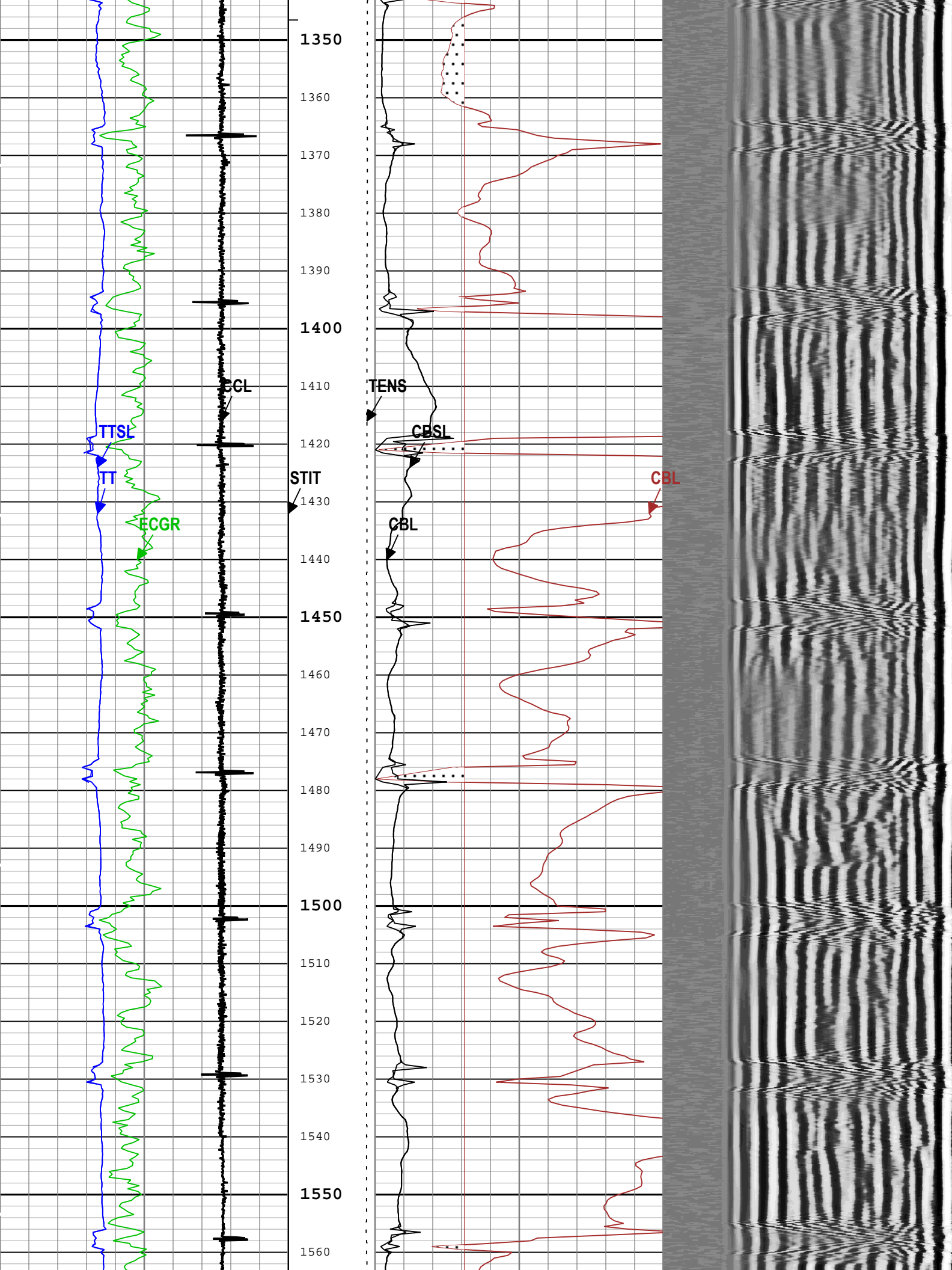


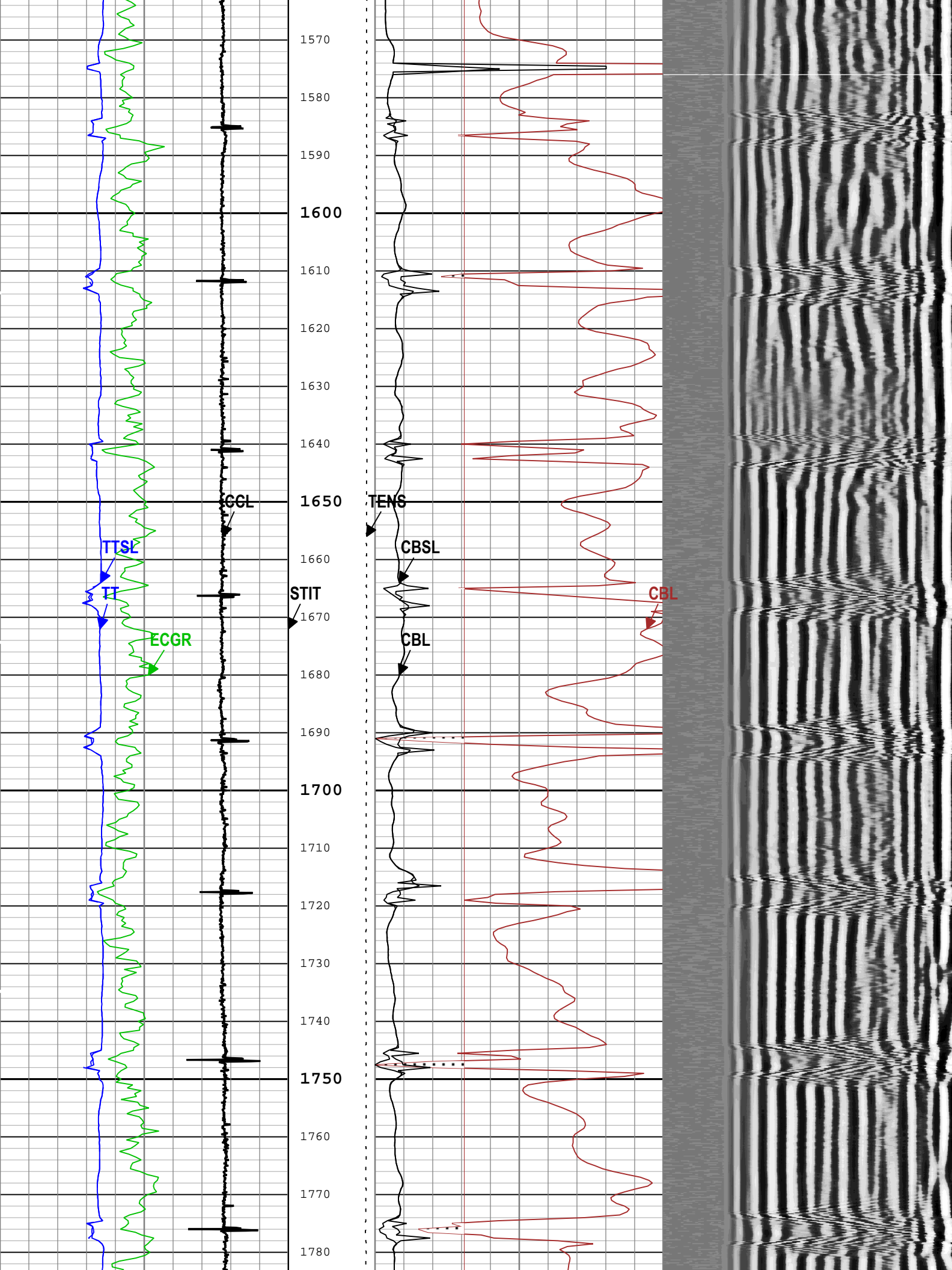


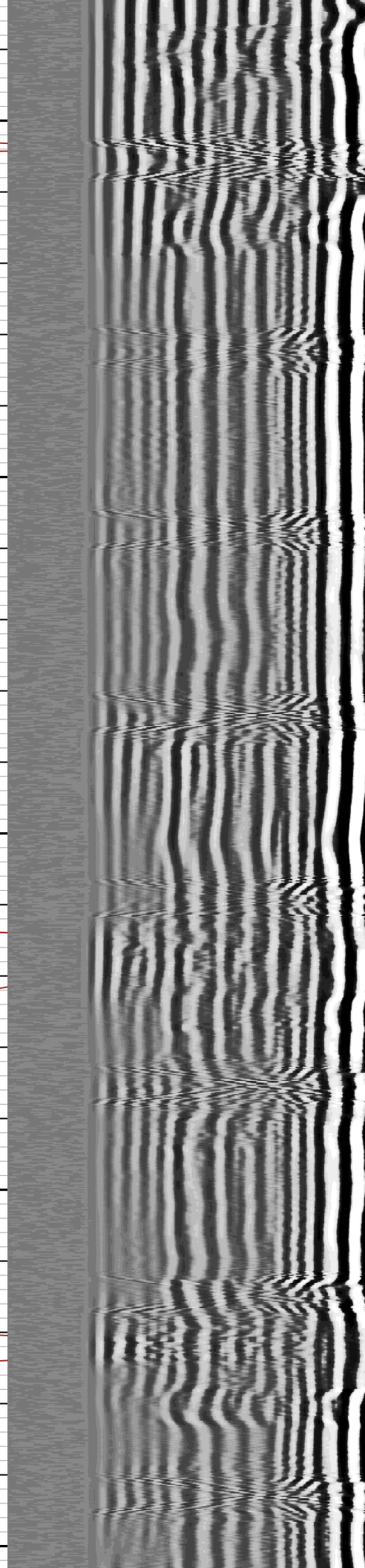
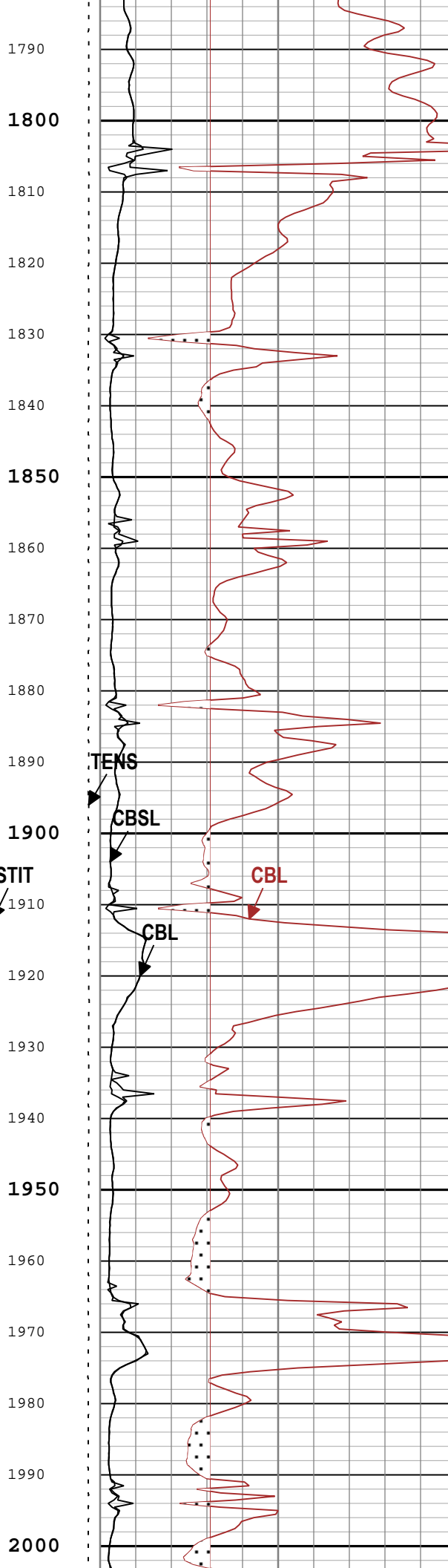
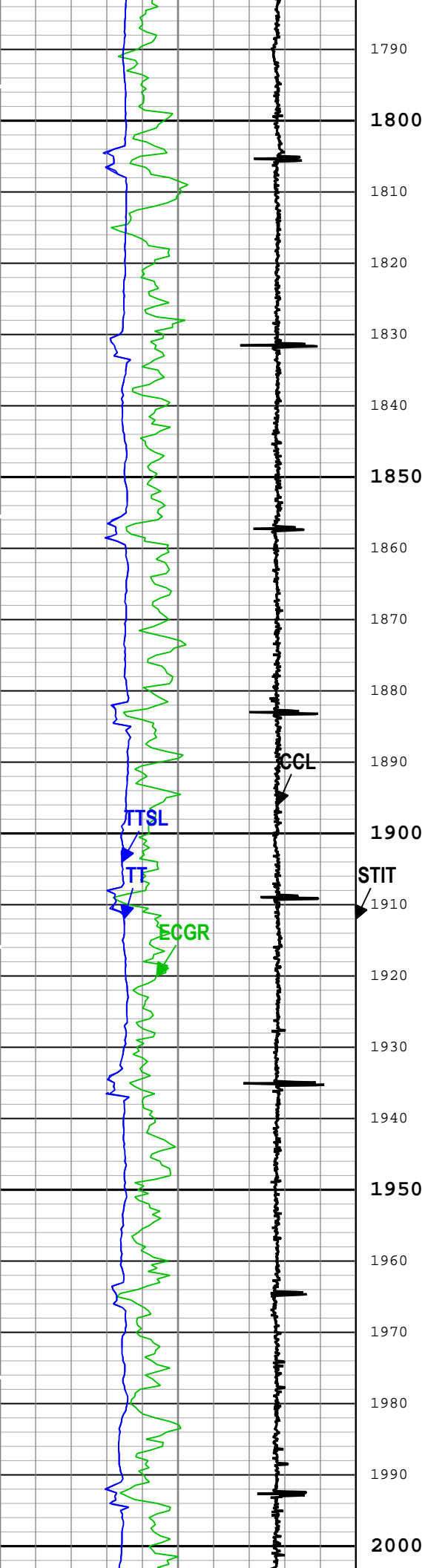


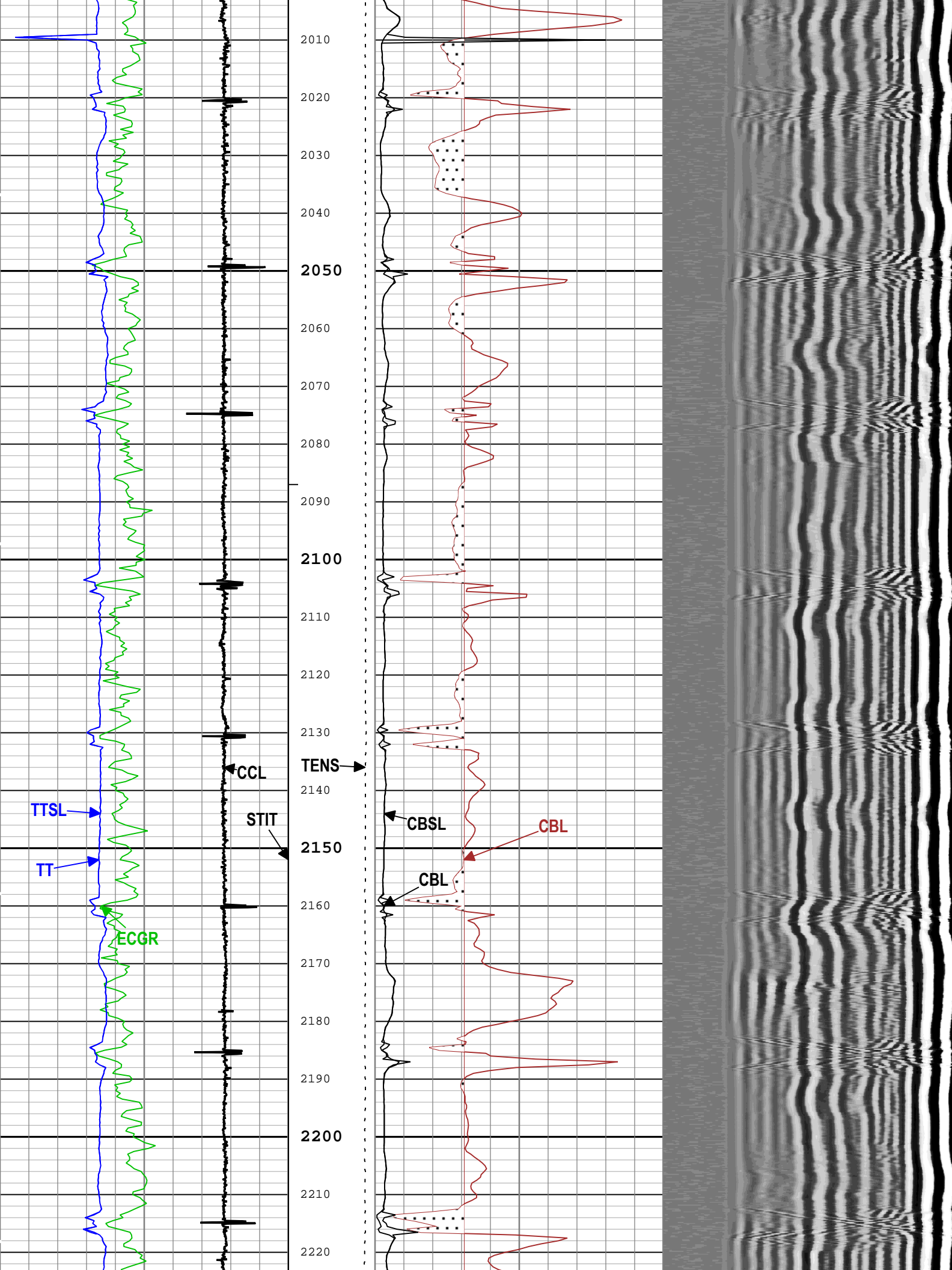


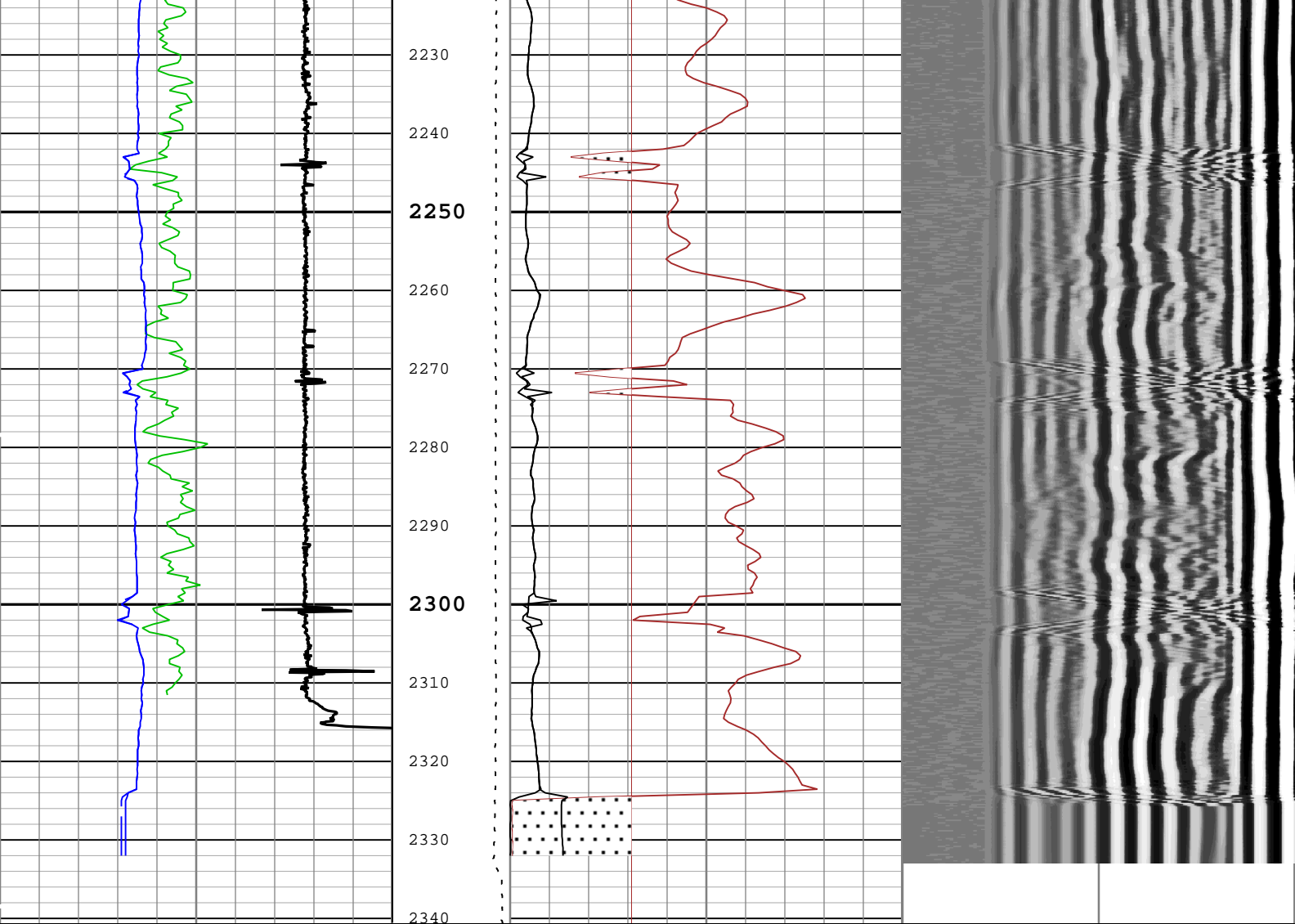












Gamma Ray (ECGR) SGT-N	Stuck Tool Indicator, Total (STIT)	CBL Amplitude (CBL) DSLT-H	Min	Amplitude	Max
0 gAPI 150	0 ft 50	0 mV 100			
Transit Time for CBL (TT) DSLT-H	Cable Tension (TENS)	CBL Amplitude (CBL) DSLT-H		Variable Density Log (VDL) DSLT-H	
400 us 200	10000 lbf 0	0 mV 10	200	us	1200
Transit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

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-Jan-2008 00:23:38

Channel Processing Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
BAR(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	13.5	in

CBLO	Casing Bottom (Logger)	WLSESSION	2389	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSLTH	52	mV
CCL_MULTIPLIER	Casing Collar Locator Multiplier	CAL-YA	15	
CDEN	Cement Density	SGT-N	2	g/cm3
DETE	Delta-T Detection	DSLTH	E1	
DFD	Drilling Fluid Density	Borehole	8.34	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	3.09	mV
MAHTR	Manual High Threshold Reference for first arrival detection	DSLTH	120	
MATT_CURR	Maximum Attenuation in Arbitrary Cement	DSLTH	10.91	dB/ft
MCI	Minimum Cemented Interval for Isolation	DSLTH	14.81	ft
MNHTR	Minimum High Threshold Reference for first arrival detection	DSLTH	100	
MSA	Minimum Sonic Amplitude	DSLTH	1.53	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	DSLTH	1.53	mV
NMSG	Near Minimum Sliding Gate	DSLTH	305	us
SGAD	Sliding Gate Status	DSLTH	Off	
SGDT	Sliding Gate Delta-T	DSLTH	57	us/ft
VDLG	VDL Manual Gain	DSLTH	6.5	

Tool Control Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
MODE	DSLTH Acquisition Mode	DSLTH	CBL	
RATE	DSLTH Firing Rate	DSLTH	15 Hz	
DTFS	DSLTH Telemetry Frame Size	DSLTH	536	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
SGAI	Selectable Acquisition Gain	DSLTH	x1	

Calibration Report

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

Primary Equipment :

Sonic Logging Sonde E supports 3'-5'BHC DT and CBL/VDL SLS-E 389

CBL Normalization - CBL Accumulations

Master (Measured):		15:00:27 27-Mar-2018					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Upper Far Amplitude		Master	4200.0	3200.0	3805.0		<div><div></div></div>
Upper Near Raw Amplitude	mV	Master	33.000	27.000	31.807	43.000	<div><div></div></div>
Lower Far Amplitude		Master	4200.0	3200.0	3601.3		<div><div></div></div>
Lower Near Raw Amplitude	mV	Master	46.000	27.000	38.403	68.000	<div><div></div></div>

CBL Normalization - CBL/VDL Coefficients

Master (Measured):		15:00:27 27-Mar-2018					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
CBL Correction Factor for UT		Master	3.500	2.700	3.647	4.300	<div><div></div></div>
CBL Correction Factor for LT		Master	2.500	1.700	3.021	4.300	<div><div></div></div>
VDL Ratio between UT and LT for CBLB Mode		Master	1.000		0.946		<div><div></div></div>

CBL Free Pipe Adjustment - Free Pipe Measurement

Before (Manual Entry):		14:17:39 08-Jan-2019					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
CBL Amplitude - 0	mV	Before	----	----	----	----	<div><div></div></div>
CBL Reference Amplitude (CBRA) - 0	mV	Before	----	----	----	----	<div><div></div></div>
Measurement Depth - 0	ft	Before	----	----	----	----	<div><div></div></div>

CBL Free Pipe Adjustment - CBL Amplitude Coefficient

Before (Manual Entry): 14:17:39 08-Jan-2019							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
CBL Adjustment Factor		Before	1.000	0.200	1.290	5.000	
Depth of Before Calibration	ft	Before			1.00		

County:	Weld
State:	Colorado
Digital Sonic Logging Tool	
CBL with VDL	