

Company: Crestone Peak Resources Operating LLC

Well: Lochbuie Land 2C-25H-D166

Field: Wattenberg

County: Weld State: Colorado

Digital Sonic Logging Tool

CBL with VDL

CBL with VDL

Location:	
NWNW	Elev.: K.B. 5091.00 ft
918 FNL 297 FWL	G.L. 5078.00 ft
	D.F. 5091.00 ft
Permanent Datum:	Ground Level
Log Measured From:	Kelly Bushing
Drilling Measured From:	Kelly Bushing
Elev.: 13.00 ft	5078.00 f
	above Perm.Datum
API Serial No.	Section:
05-123-47990	25
	Township:
	1N
	Range:
	66

Disclaimer

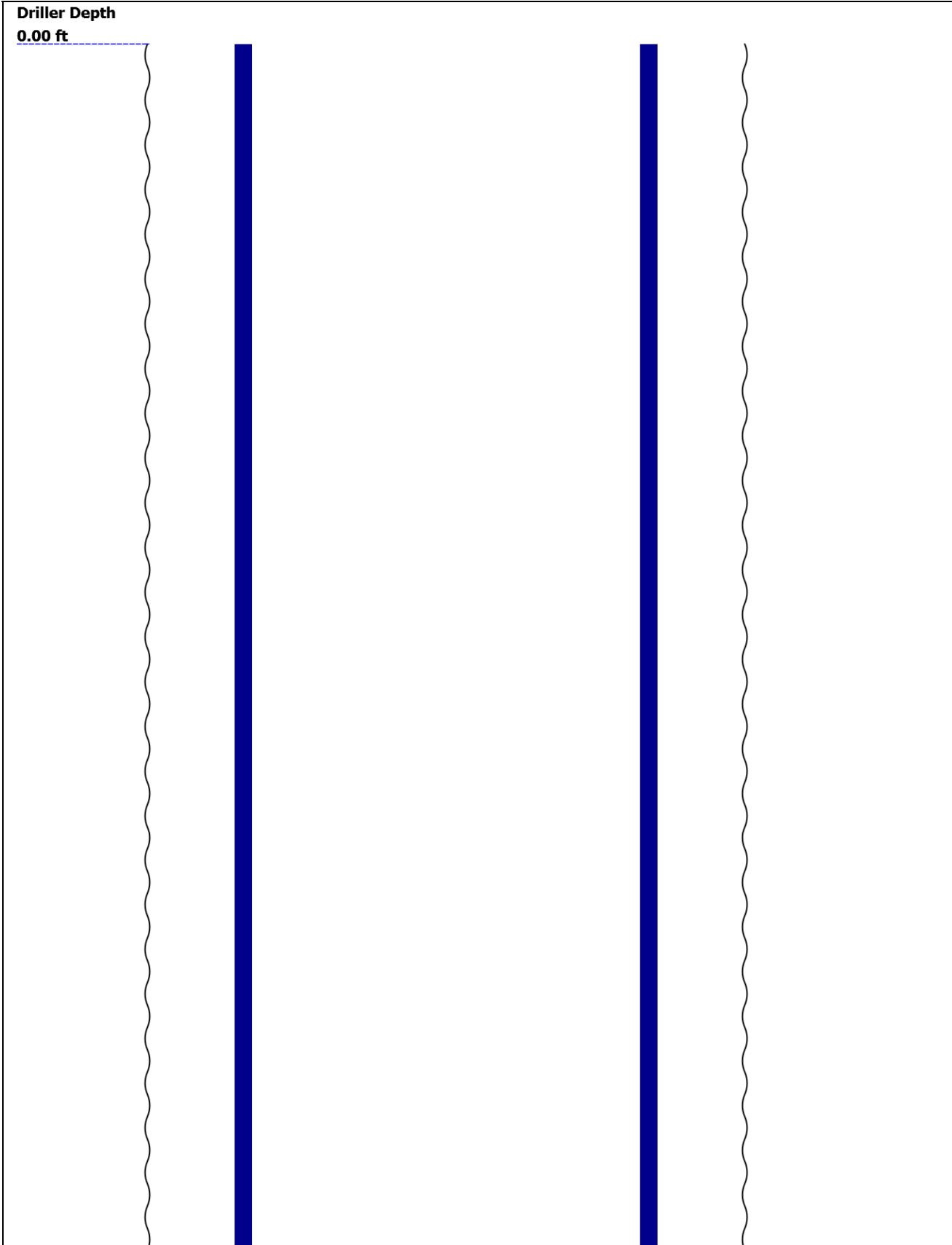
THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (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.

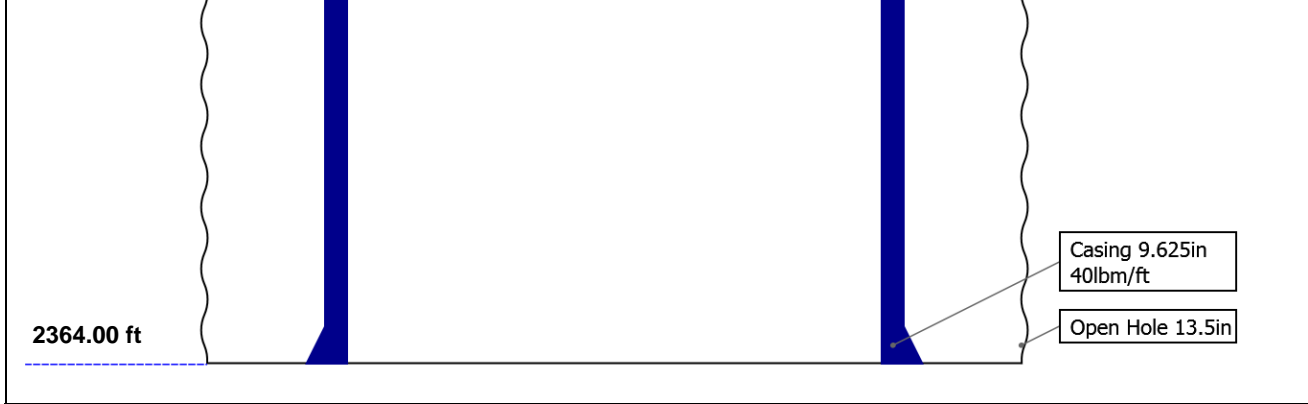
Contents

- 1. Header
- 2. Disclaimer
- 3. Contents
- 4. Well Sketch
- 5. Borehole Size/Casing/Tubing Record
- 6. Remarks and Equipment Summary
- 7. Depth Summary
- 8. One
 - 8.1 Integration Summary
 - 8.2 Software Version
 - 8.3 Composite Summary
 - 8.4 Log (Sonic CBL with VDL)
 - 8.5 Parameter Listing
- 9. Calibration Report
- 10. Tail

--	--

Well Sketch

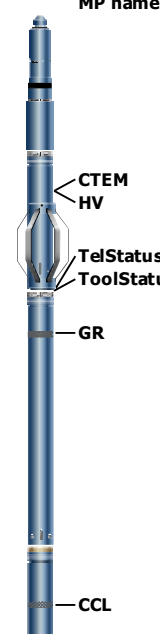


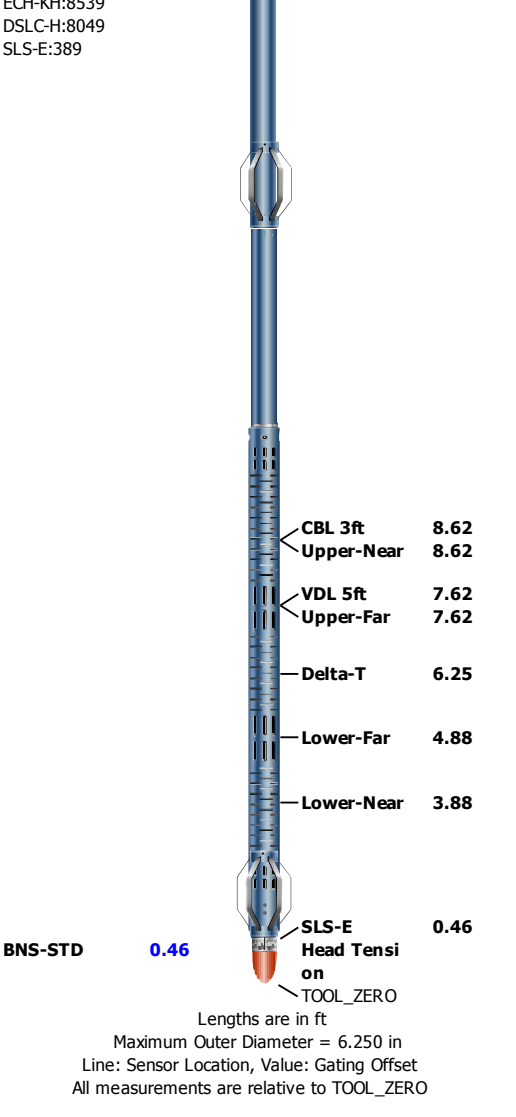


Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	13.5					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	2379					
Bottom Logger (ft)	2379					
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)	2379					
Bottom Logger (ft)	2379					

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 Schlumberge!	
				Log run for cement evaluation.	
				Toolstring run as per tool sketch.	
				Log run under no pressure.	
				Tool zero at KB at 13ft.	
				Crew: T. Ludgate, A. Schaab	
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:8530	21.1				



Depth Summary

	One		
--	-----	--	--

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									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[3]:Up	Up	24.65 ft	2281.58 ft	08-Jan-2019 3:30:31 PM	08-Jan-2019 4:08:55 PM	ON	-3.20 ft	No

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[3]:Up	Up	24.65 ft	2281.58 ft	08-Jan-2019 3:30:31 PM	08-Jan-2019 4:08:55 PM	ON	-3.20 ft	No

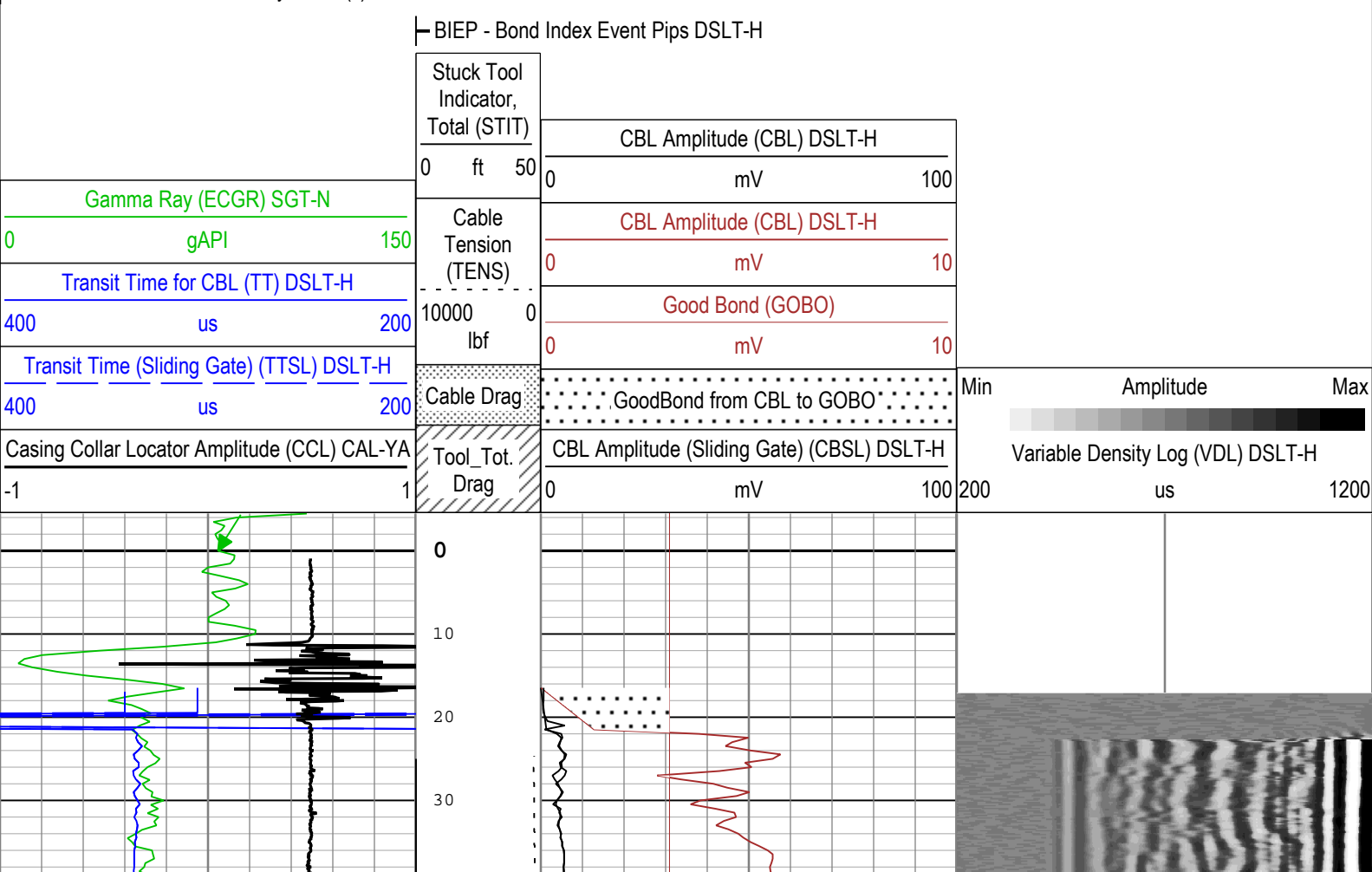
Log	Company:Crestone Peak Resources Operating LLC	Well:Lochbuie Land 2C-25H-D166
		One: Log[3]:Up:S004

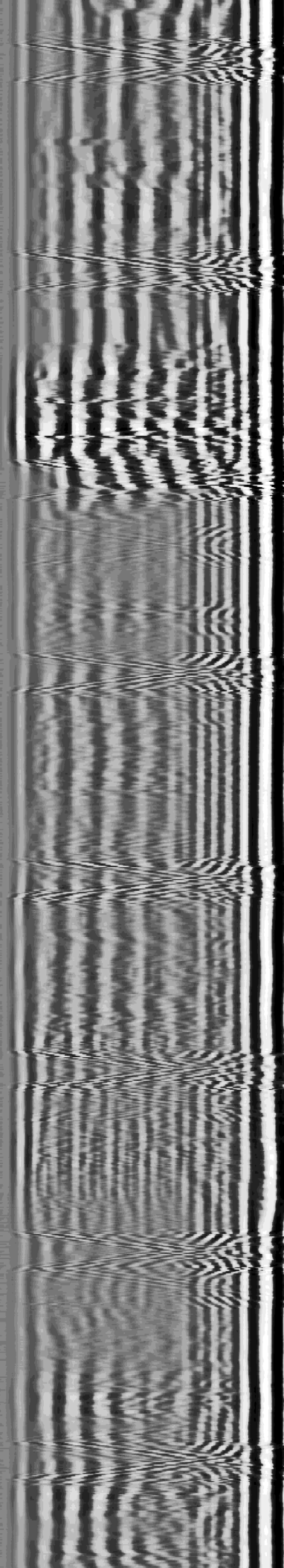
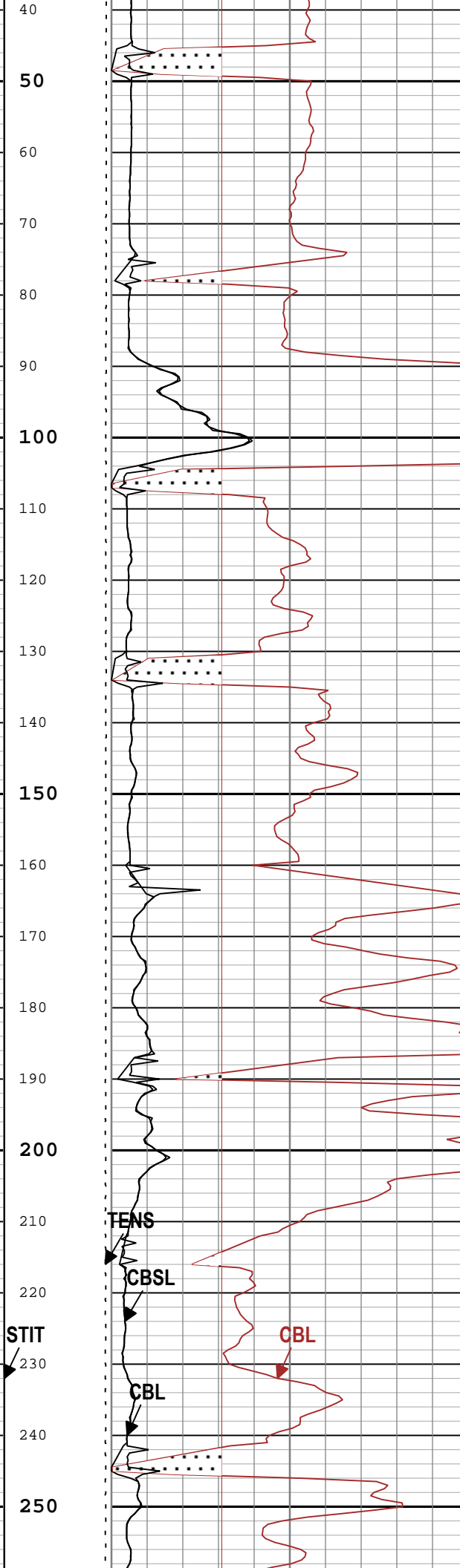
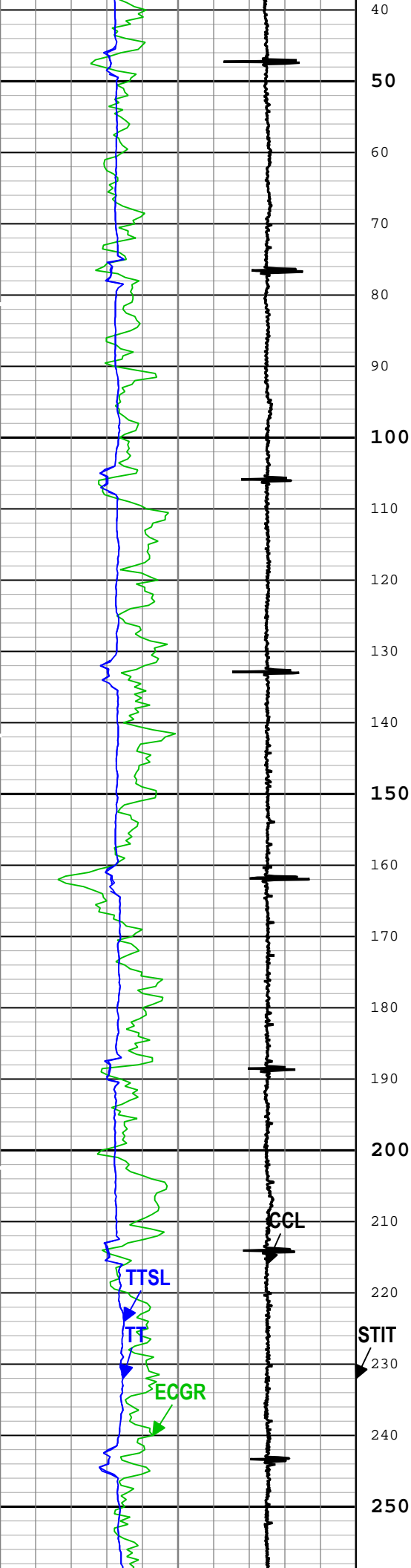
Log

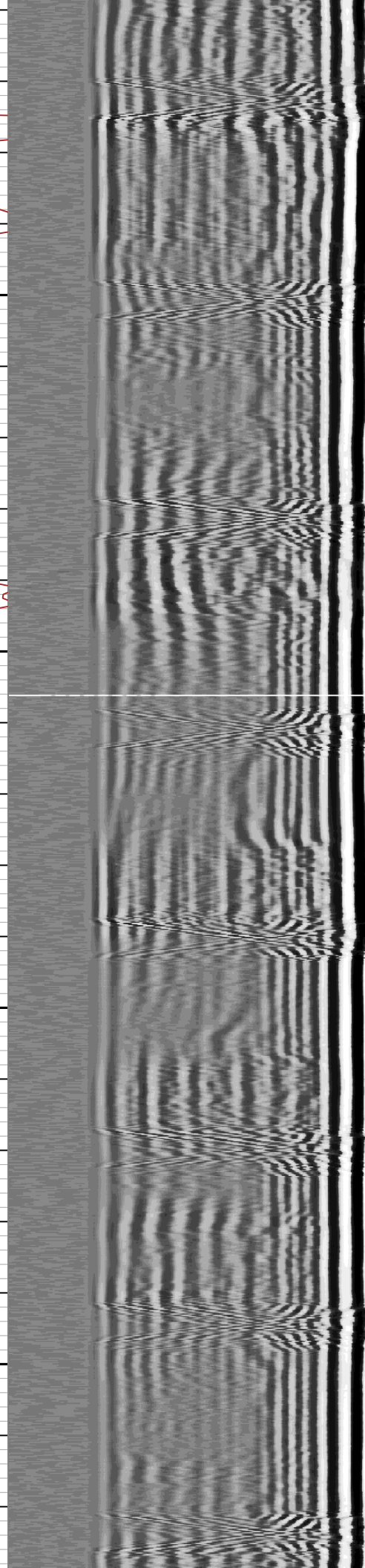
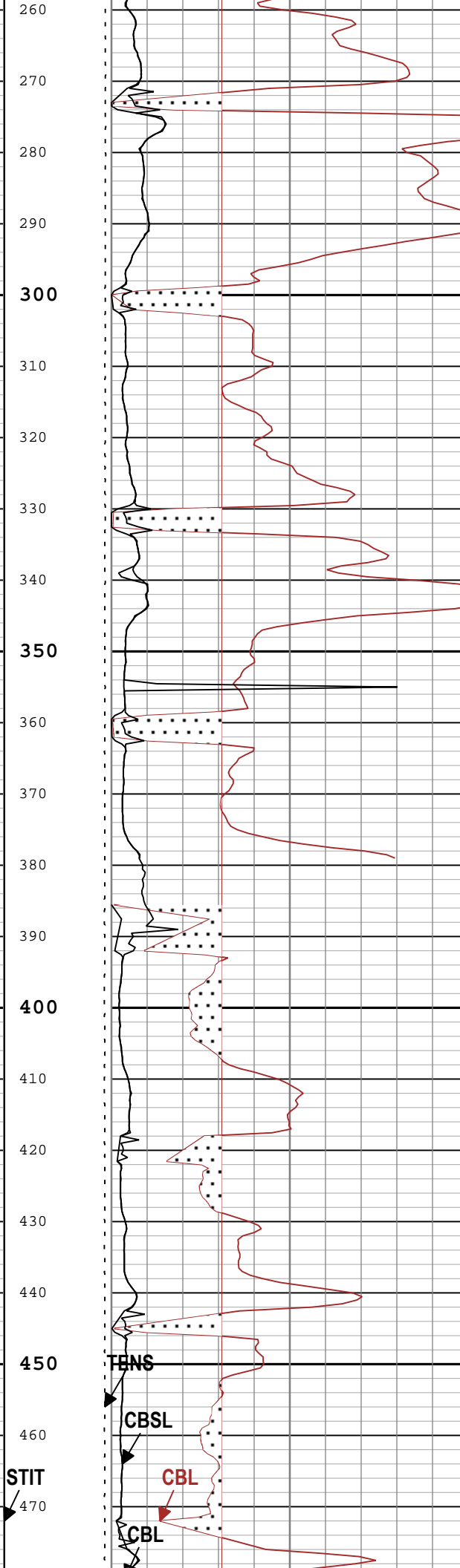
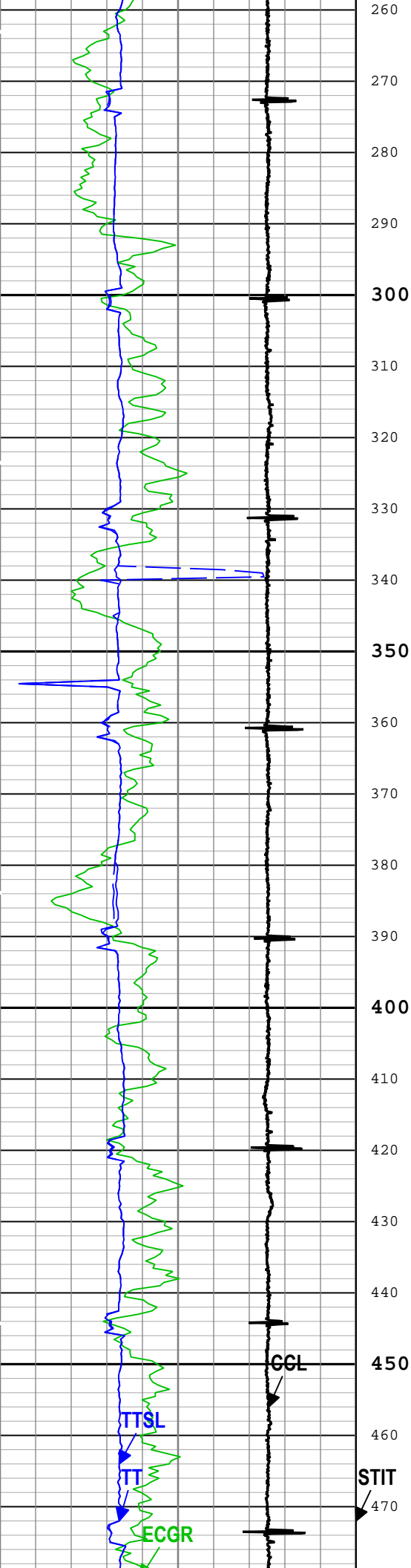
Well:Lochbuie Land 2C-25H-D166

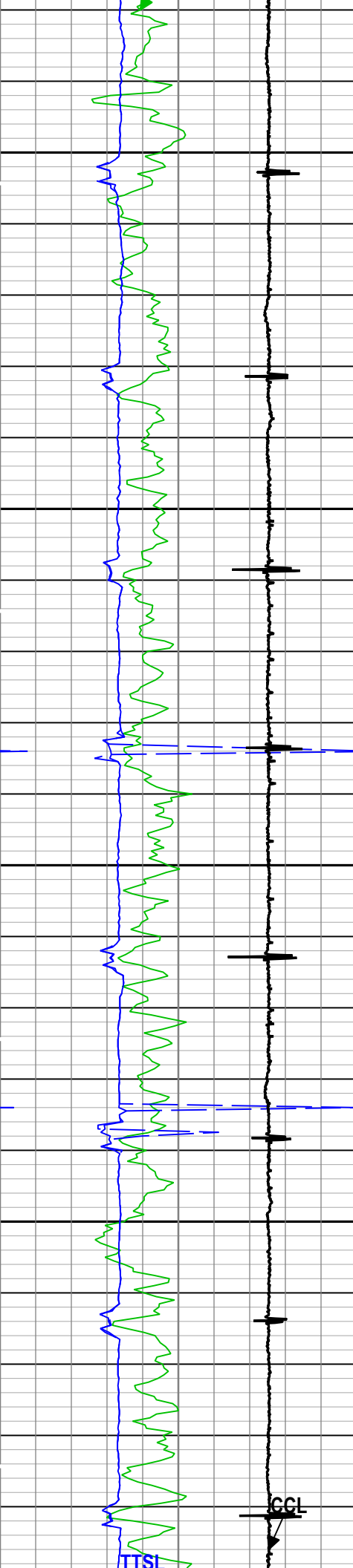
One: Log[3]:Up:S004

TIME_1900 - Time Marked every 60.00 (s)

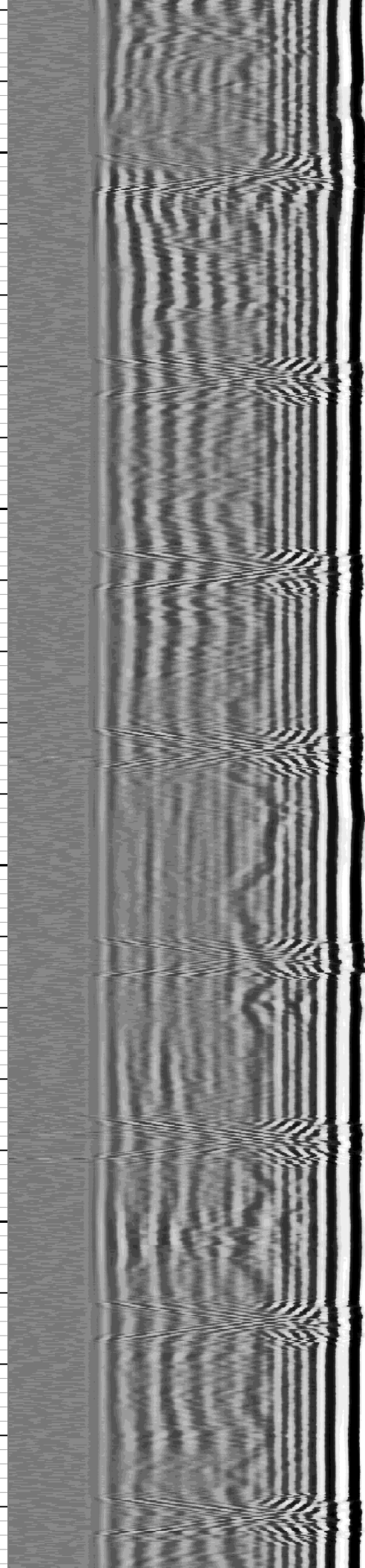
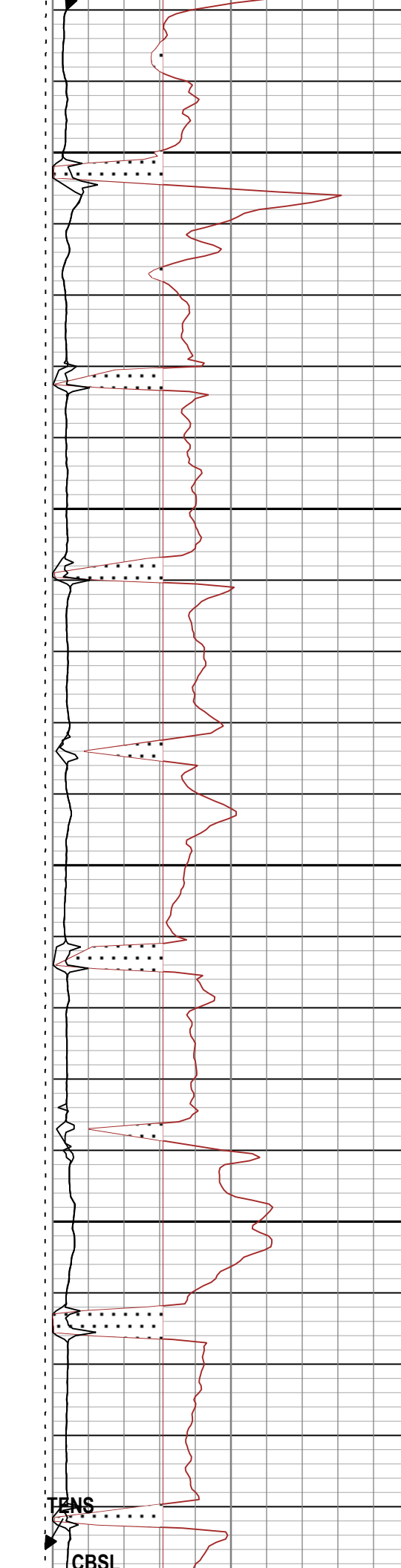


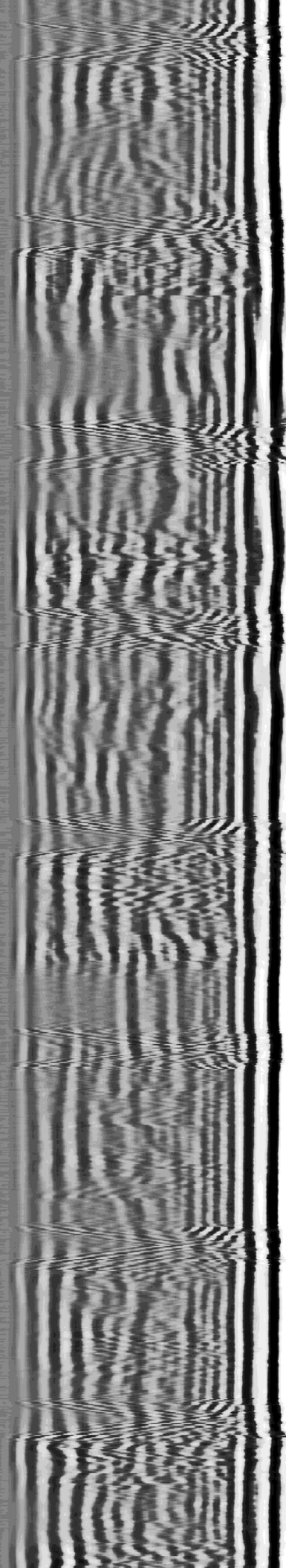
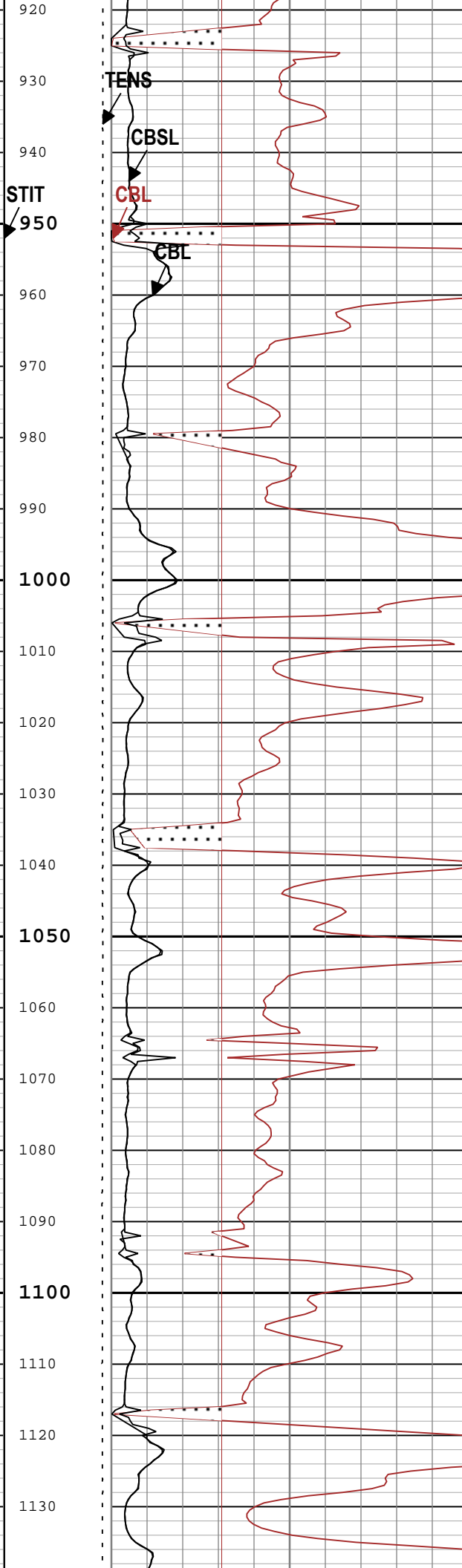
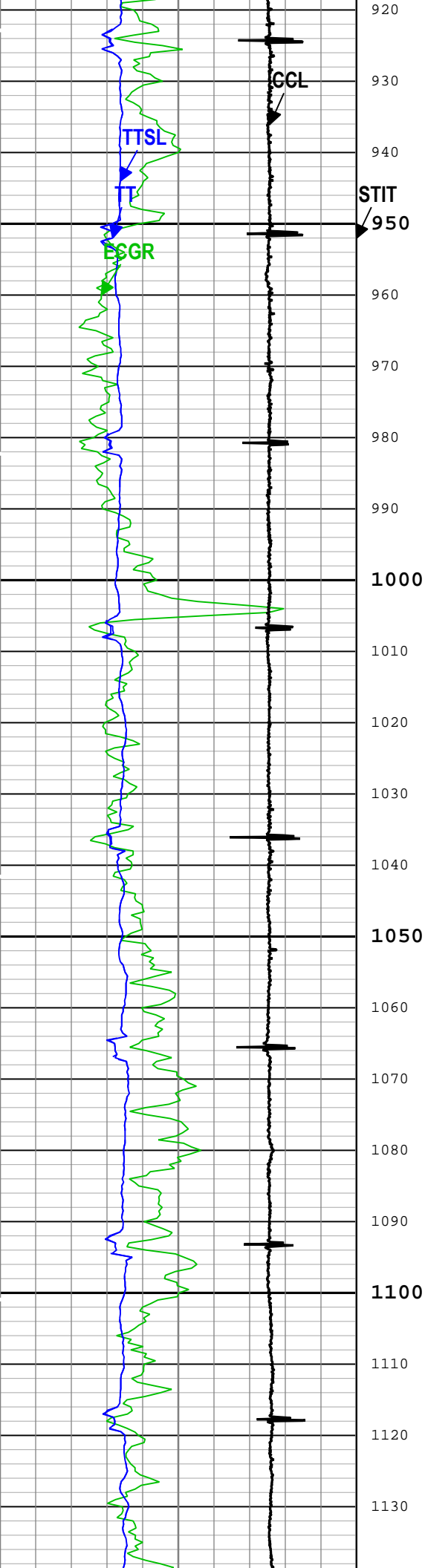


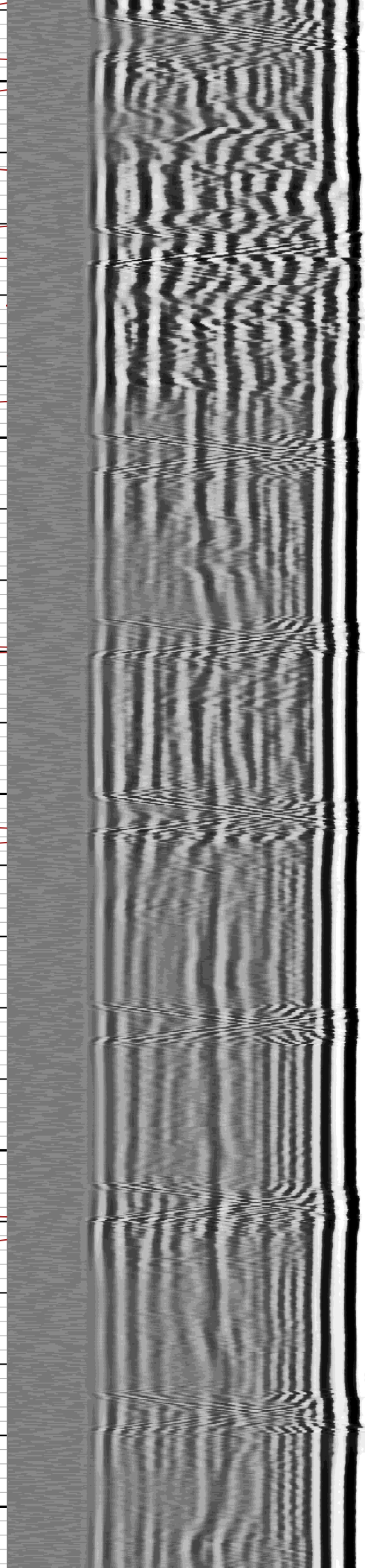
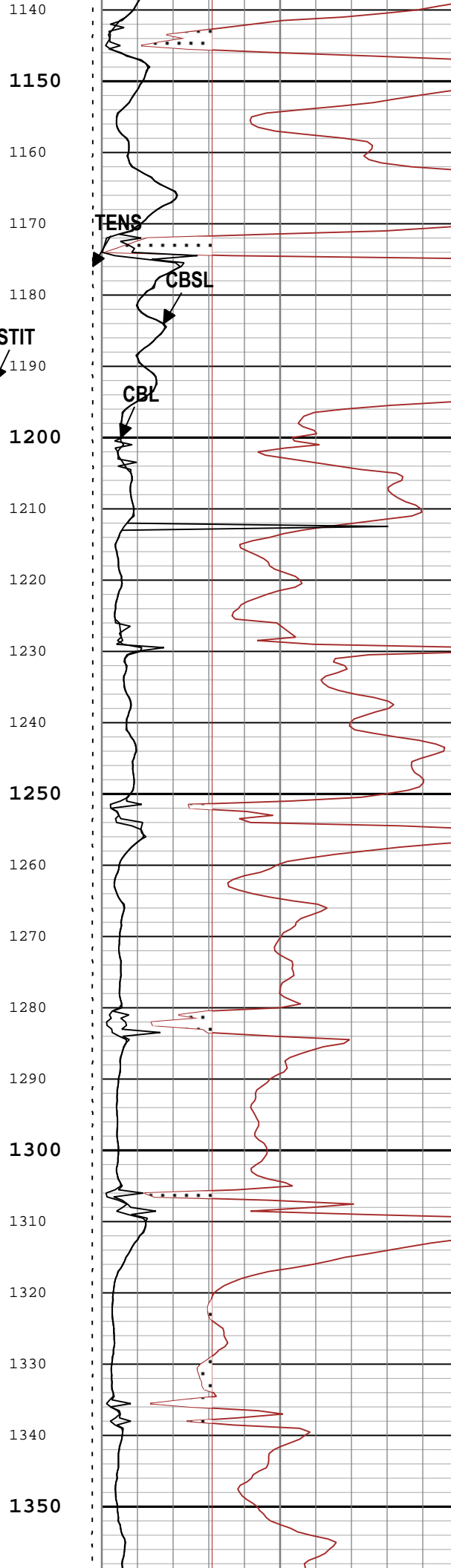
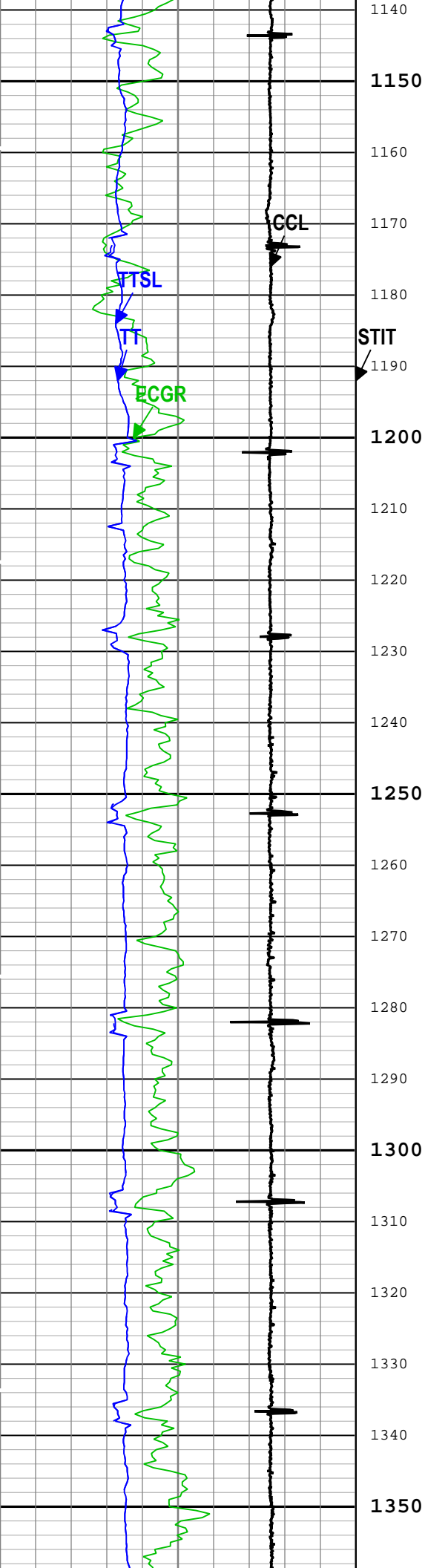


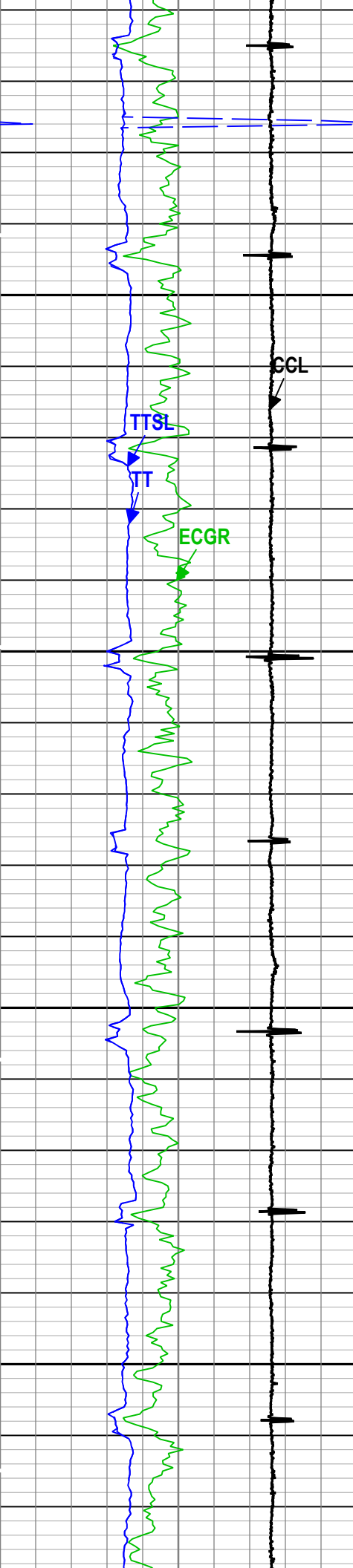


480
490
500
510
520
530
540
550
560
570
580
590
600
610
620
630
640
650
660
670
680
690

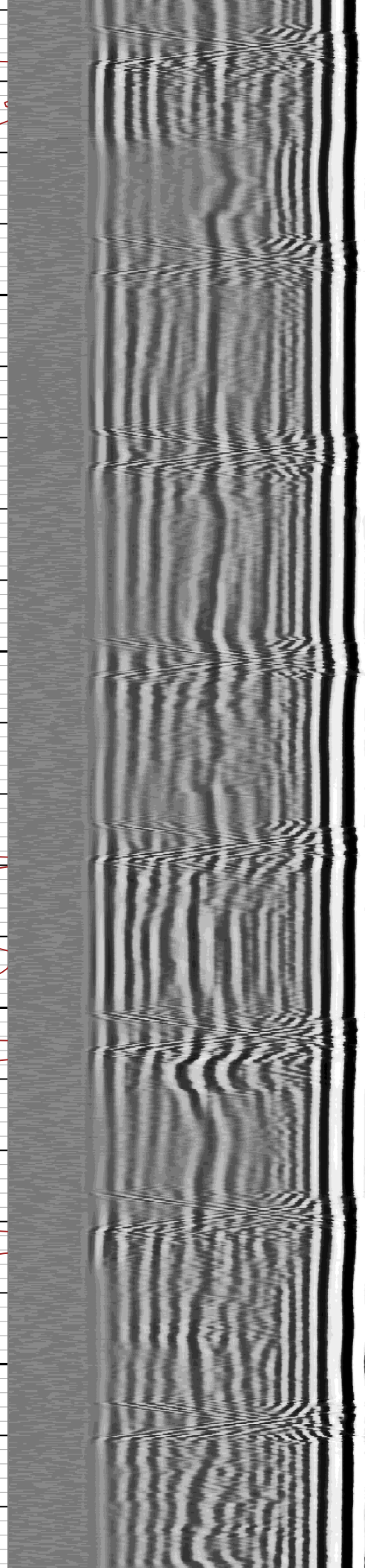
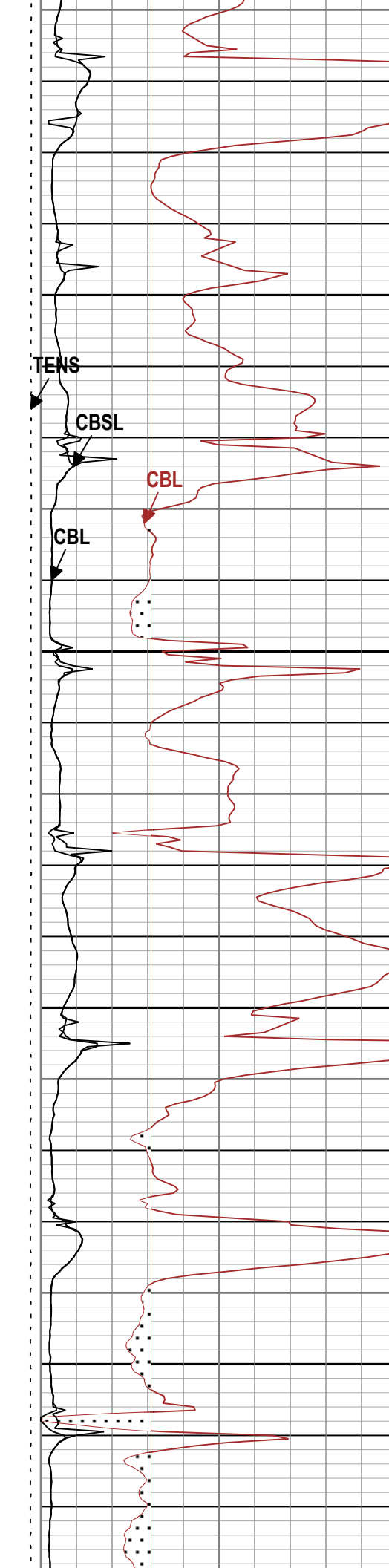


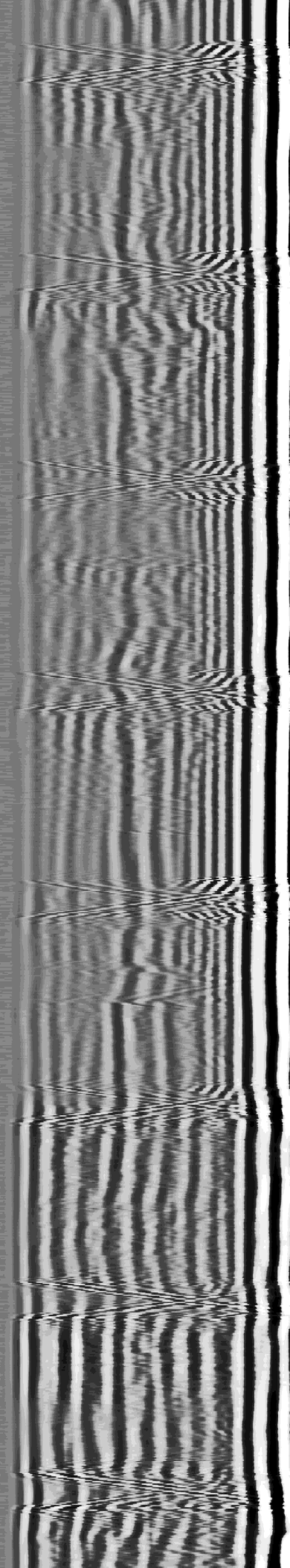
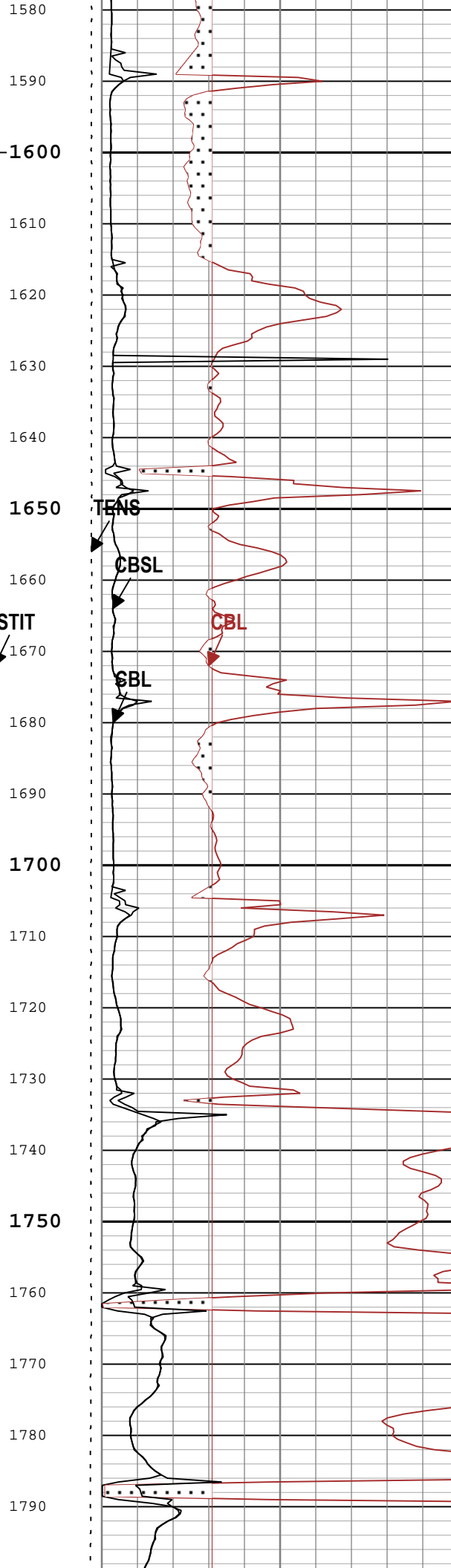
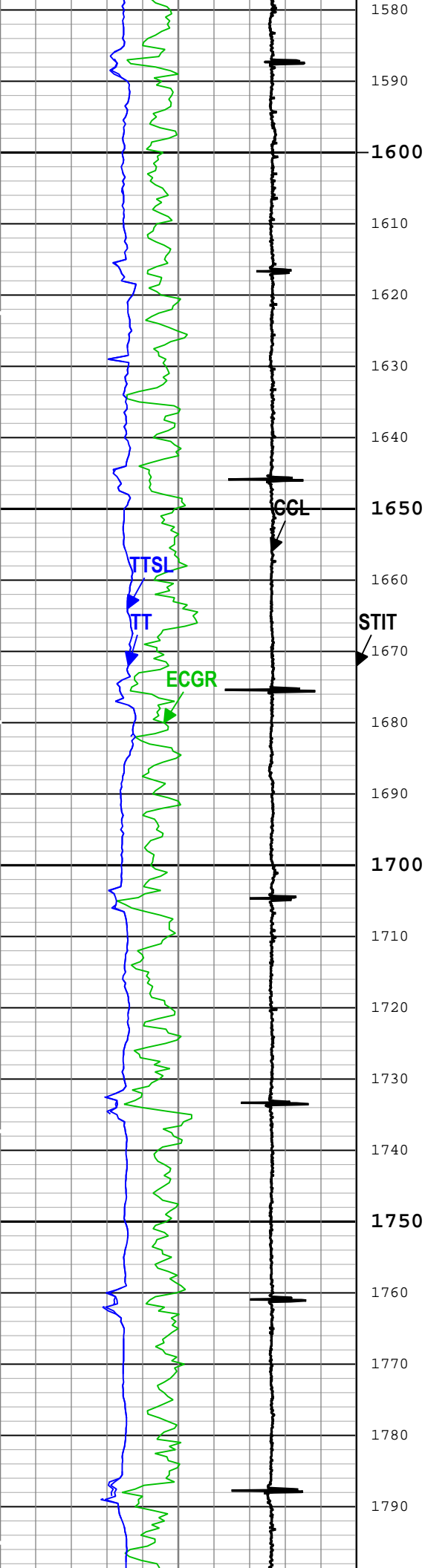


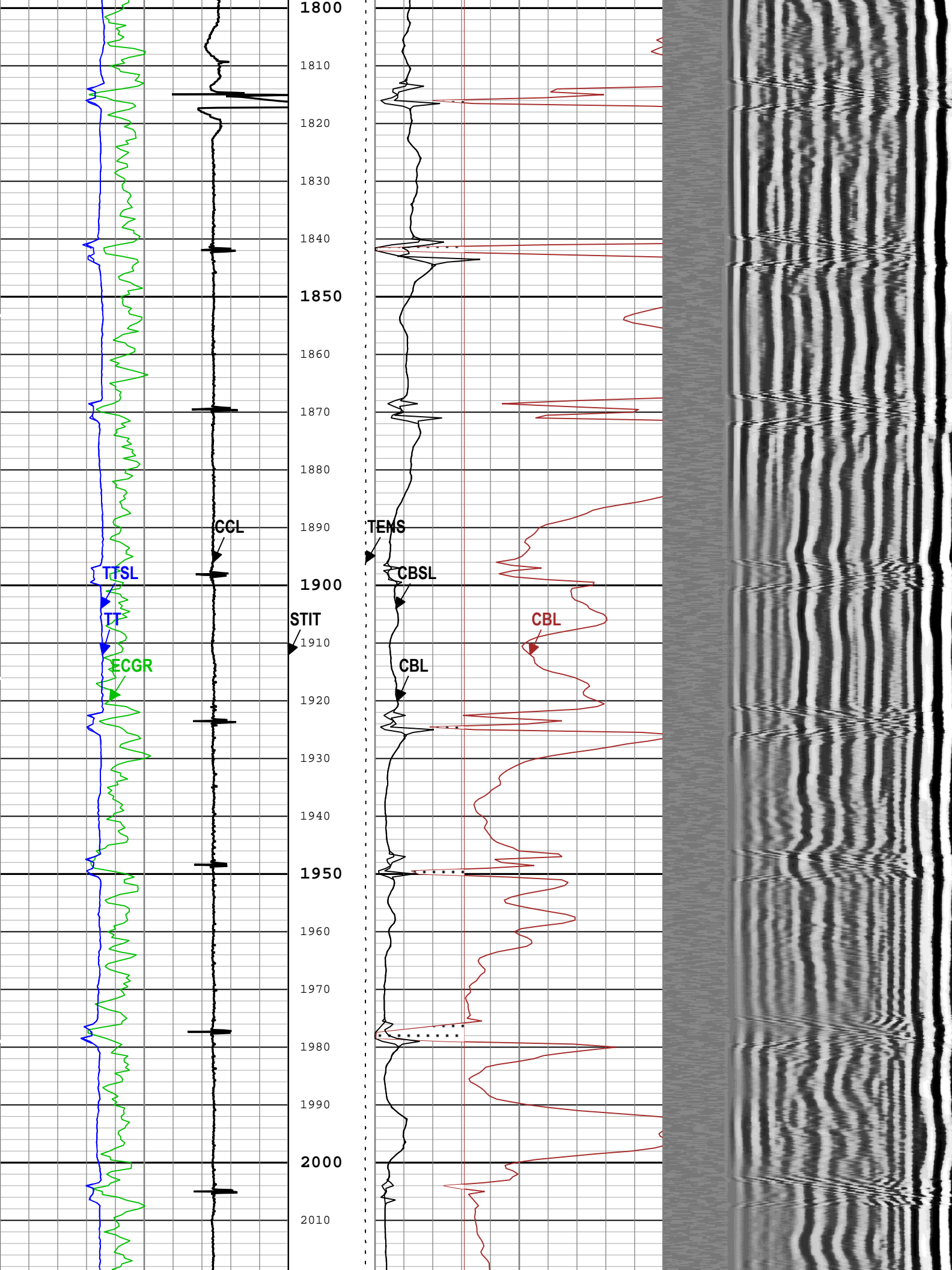


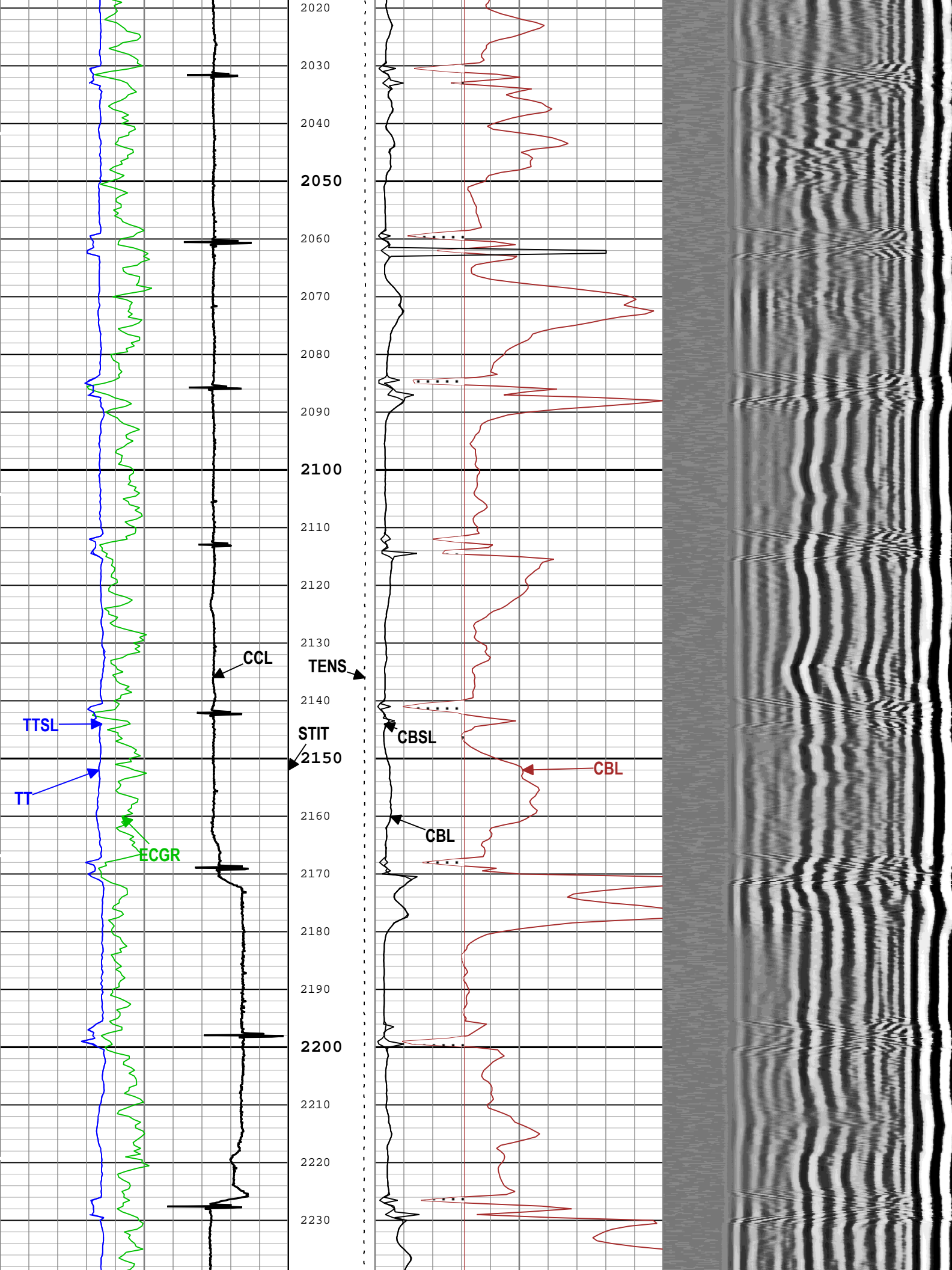


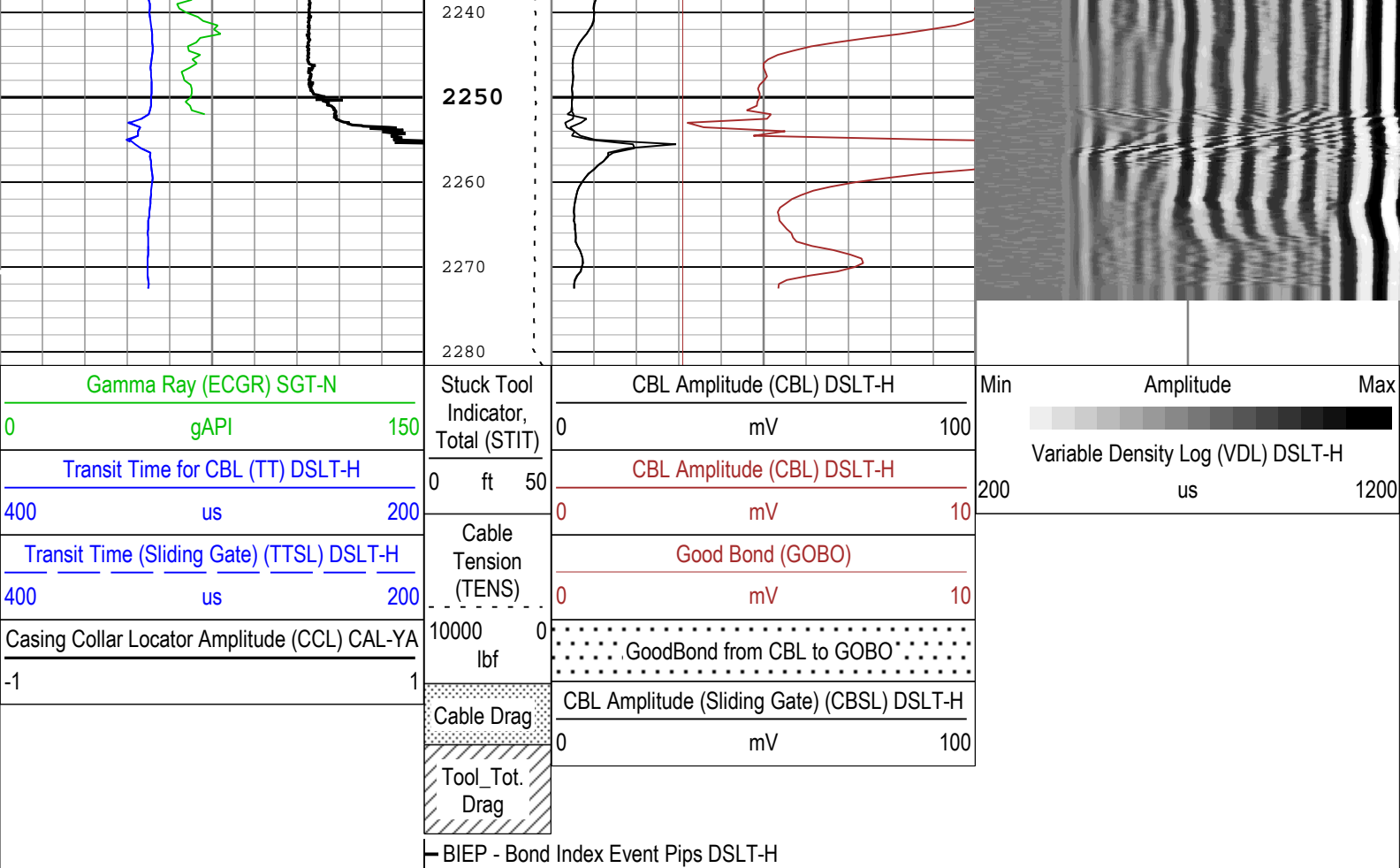
1360
1370
1380
1390
1400
1410
1420
1430
1440
1450
1460
1470
1480
1490
1500
1510
1520
1530
1540
1550
1560
1570











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-Jan-2008 00:17:06

Channel Processing Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
BARI(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	2379	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		
Upper Near Raw Amplitude	mV	Master	33.000	27.000	31.807	43.000	
Lower Far Amplitude		Master	4200.0	3200.0	3601.3		
Lower Near Raw Amplitude	mV	Master	46.000	27.000	38.403	68.000	

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	
CBL Correction Factor for LT		Master	2.500	1.700	3.021	4.300	
VDL Ratio between UT and LT for CBLB Mode		Master	1.000		0.946		

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	-----	-----	-----	-----	
CBL Reference Amplitude (CBRA) - 0	mV	Before	-----	-----	-----	-----	
Measurement Depth - 0	ft	Before	-----	-----	-----	-----	

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		

Company: Crestone Peak Resources Operating LLC

Schlumberger

Well: Lochbuie Land 2C-25H-D166

Field: Wattenberg

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