

Company: Caerus Operating LLC

Well: NPR 15A-10 596

Field: NPR

County: Garfield State: Colorado

Cement Bond Log
RST Sigma Log
Gamma Ray - Collar Locator LogCounty: Garfield
Field: NPR
Location: K10-596
Well: NPR 15A-10 596
Company: Caerus Operating LLC

K10-596	Location:		Elev.: K.B. 6733.00 ft G.L. 6709.00 ft D.F. 6733.00 ft
	Permanent Datum:	Ground Level	Elev.: 6709.00 f
Log Measured From:		Kelly Bushing	24.00 ft above Perm.Datum
Drilling Measured From:		Kelly Bushing	
API Serial No.	Section:	Township:	Range:
05045237800000	10	5S	96W

Logging Date 14-Sep-2018

Run Number One

Depth Driller 9522.00 ft

Schlumberger Depth 9474.00 ft

Bottom Log Interval 9463.00 ft

Top Log Interval 1900.00 ft

Casing Fluid Type 2% KCL Water

Salinity

Density 8.5 lbm/gal

Fluid Level 8.00 ft

BIT/CASING/TUBING STRING

Bit Size 8.75 in

From 2050.00 ft

To 9522.00 ft

Casing/Tubing Size 4.5 in

Weight 11.6 lbm/ft

Grade P110

From 0.00 ft

To 9522.00 ft

Max Recorded Temperatures 275 degF

Logger on Bottom 14-Sep-2018 07:58:00

Unit Number 3007 Location: Evanson, WY

Recorded By Roma Shalia/Albert Ng

Witnessed By Trent Ray

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.

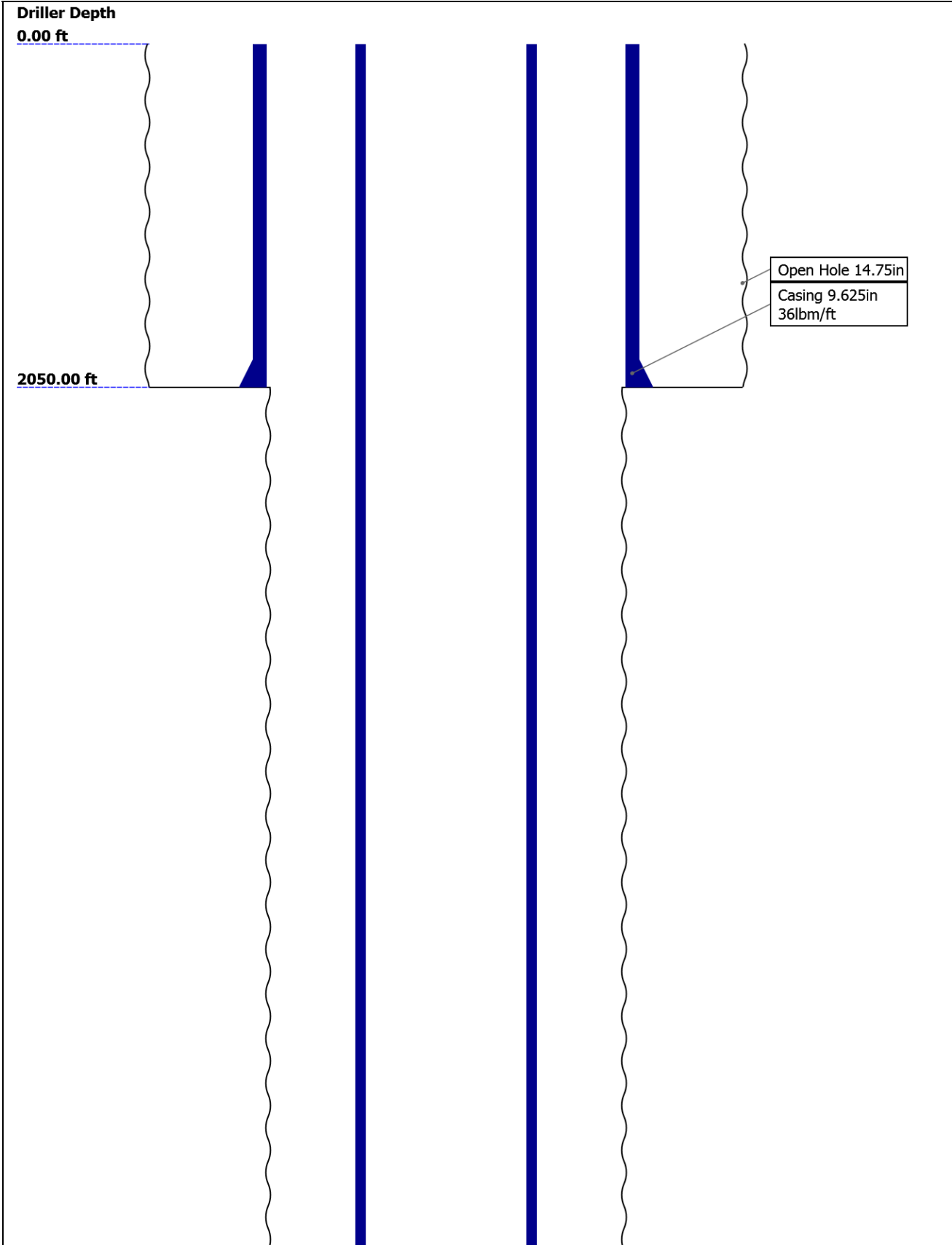
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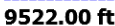
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Well Sketch





One: Toolstring				One: Remarks
Equip name PEH-E	Length 61.66	MP name	Offset	Toolstring run as per toolsketch.
				RST Mode: Sigma
				Matrix: Sandstone
AH-38 PSTP-B:282 6	59.98 59.7	GR PSTC PSTC Tool String Bot tom	55.99 55.7 0.00	Max Recorded Temp: 275degF
PSC-A PSTC-A PBMS-B:2826		Temperatu re CQG Press ure CCL PBMS	52.94 52.6 52.18 51.43	SLB Depth: 9474FT
RST-C:578 RSCH-A:437 RSC-E:551 RSS-A:488 MNTR-F:1352 -51352 RSXH-A RSX-E:578	51.43			Thank you for choosing Schlumberger!
		RSC-E	45.07	

— Far 42.31
— Near 41.81

PPAT-A 28.41 RSX-E 28.41
744

SCMT-HC:82 26.49
25
UDFH-RMC:8
220
SCMC-HC:822
5
SCME-K
SCMS-CA:822
5
UDFH-RMT
SCMX-HC


— DT 14.03

< CBL5 12.53
DTSC 12.53

— CBL3 11.53
— MAP 11.03

— AUX 10.03

SCMT 5.71

<div><div><div>BNS-P</div><div>0.14</div></div><div>TOOL_ZERO</div><div>Lengths are in ft Maximum Outer Diameter = 2.065 in Line: Sensor Location, Value: Gating Offset All measurements are relative to TOOL_ZERO</div></div>							
Depth Summary							
		One					
Depth Measuring Device							
Type		IDW-JA					
Serial Number		5979					
Calibration Date		10-JUN-2017					
Calibrator Serial Number		IDWC-C-57					
Calibration Cable Type		1-25ZA-XXS					
Wheel Correction 1		-3					
Wheel Correction 2		-3					
Tension Device							
Type		CMTD-B/A					
Serial Number		5036					
Calibration Date		10-Sep-2018					
Calibrator Serial Number		112544A					
Number of Calibration Points		10					
Calibration Root Mean Square Error		21					
Calibration Peak Error		10					
Logging Cable							
Type		1-25ZA					
Serial Number		112140					
Length		16800.00 ft					
Conveyance Type		Wireline					
Rig Type		Crane					
One:Depth Control Parameters				Depth Control Remarks			
Log Sequence		First Log In the Well		All Schlumberger Depth Control policies followed. IDW used as primary depth control. Z-Chart used as secondary depth control. Logs correlated to downlog.			
Rig Up Length At Surface							
Rig Up Length At Bottom							
Rig Up Length Correction							
Stretch Correction							
Tool Zero Check At Surface							
One							
Main Pass							
Software Version							
Acquisition System				Version			
Maxwell 2017 SP3				7.3.92069.3100			
Application Patch				Wireline_Hotfix-RTDLIS-2017SP3_7.3.92363			
				Wireline_Hotfix-SML-2017SP3_7.3.101161			
Pass Summary							

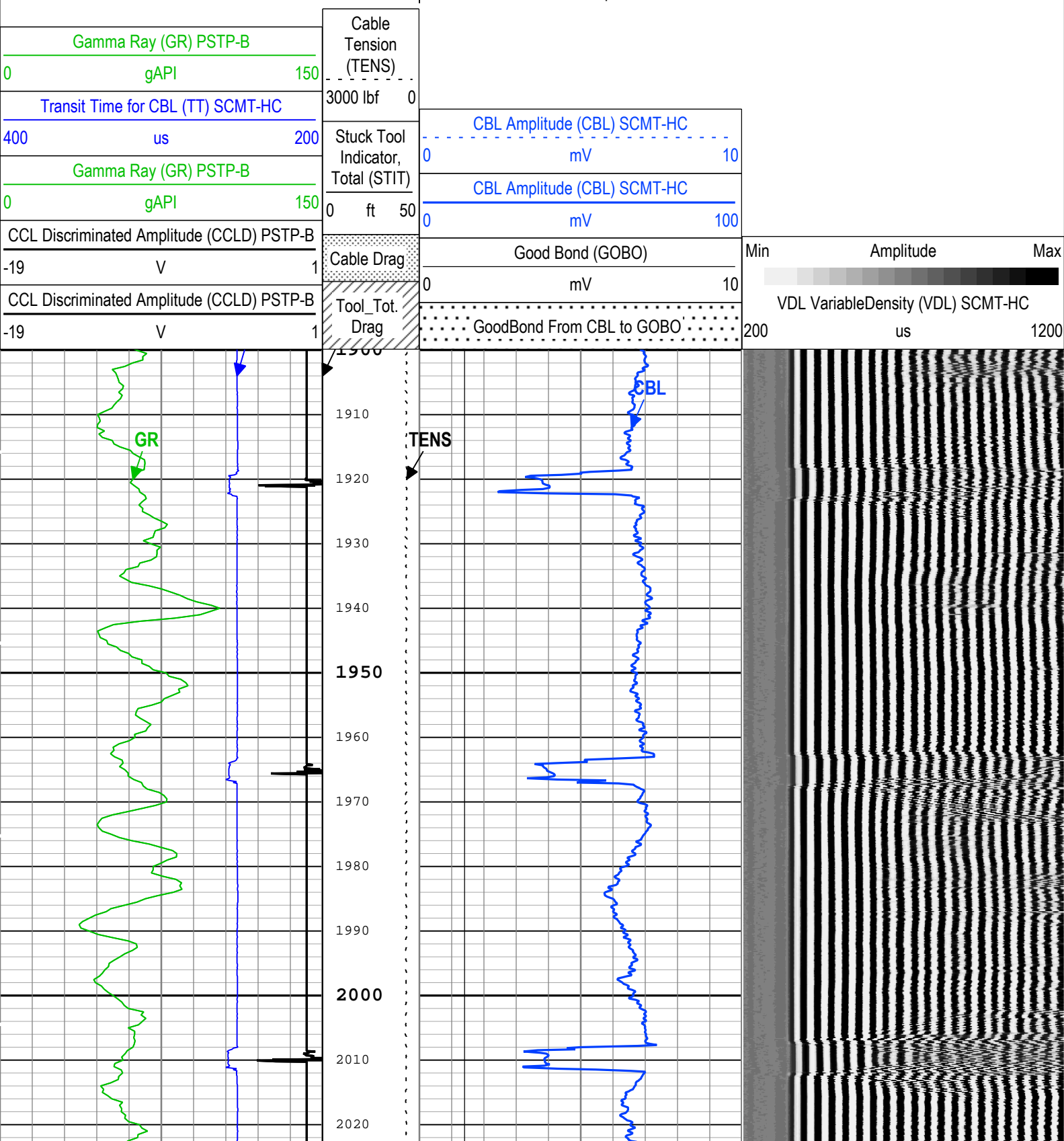
All depths are referenced to toolstring zero

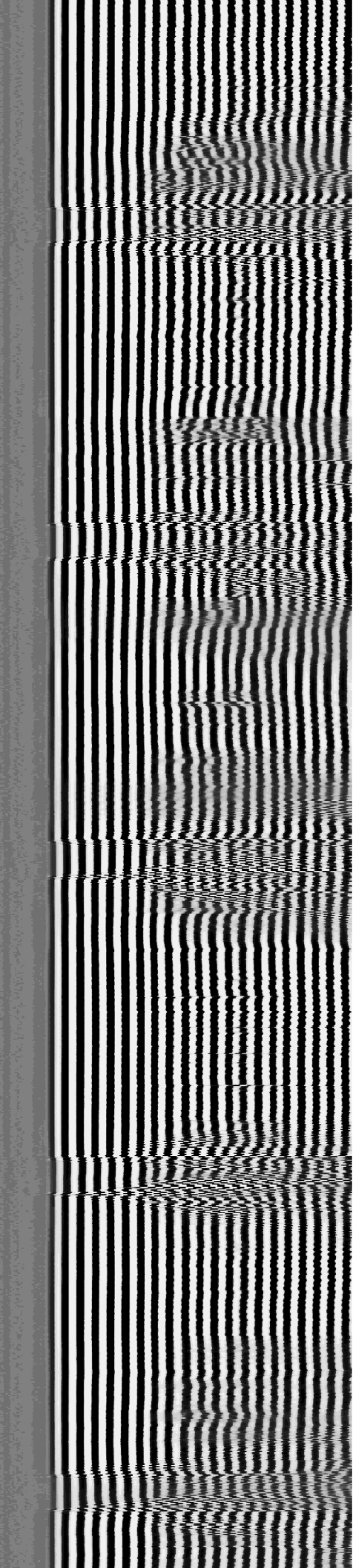
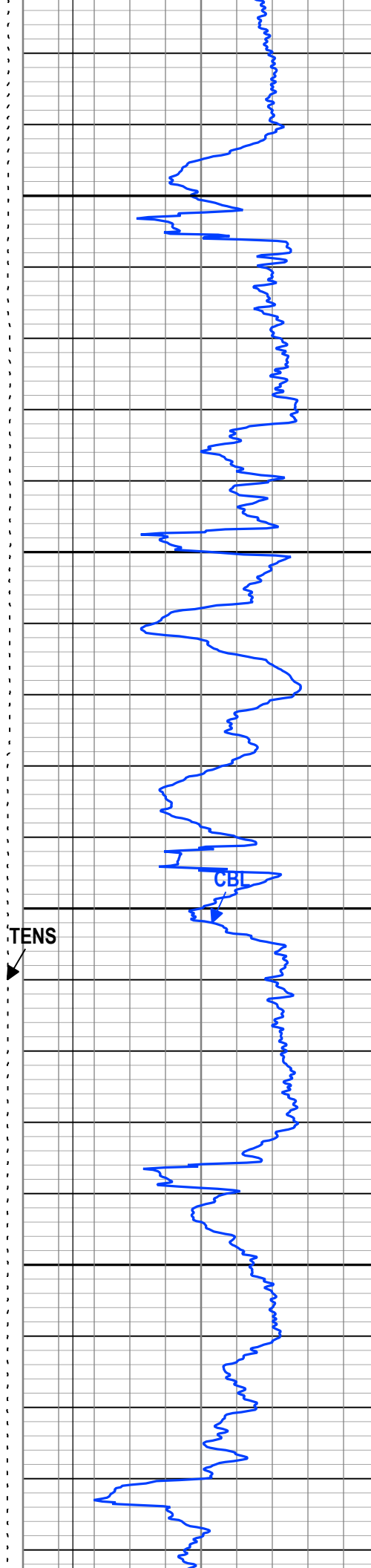
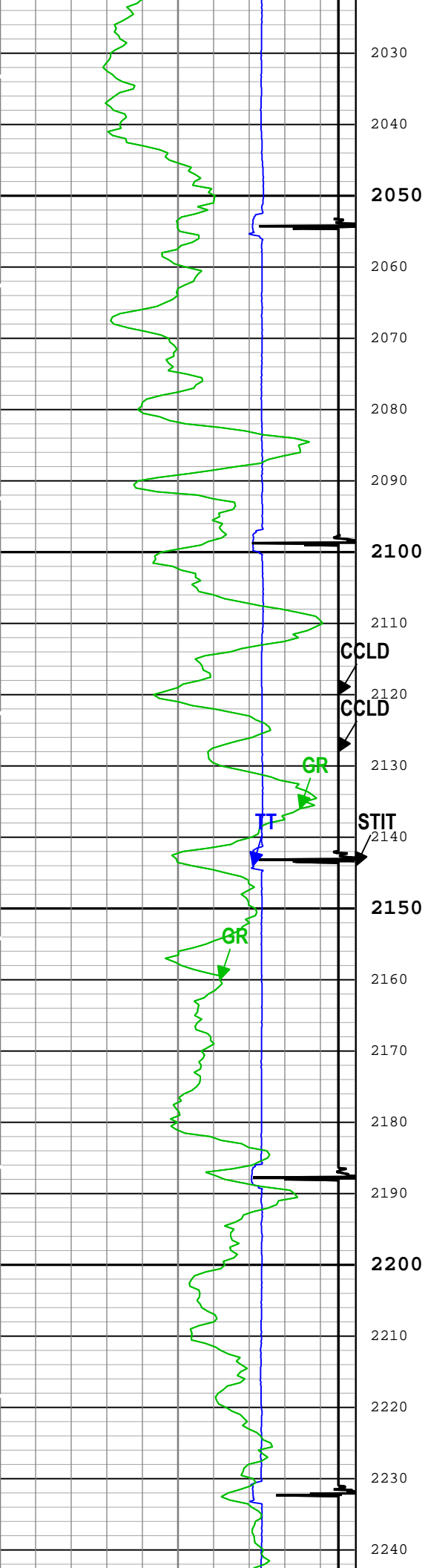
One: Log[3]:Up:S002

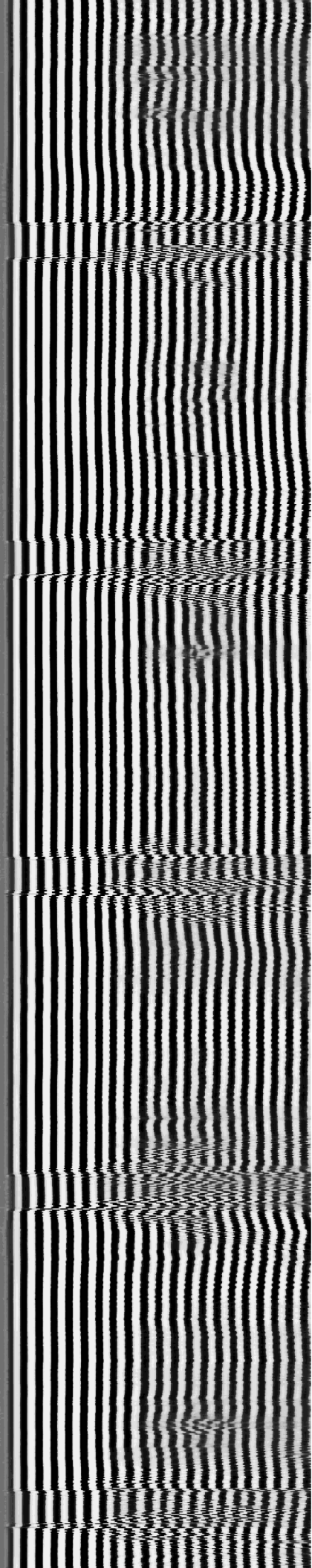
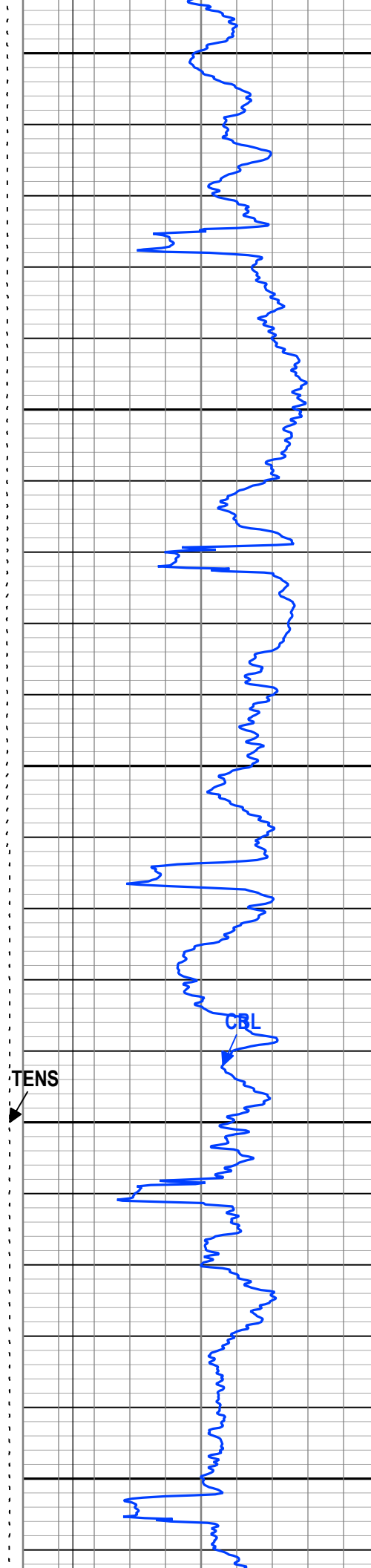
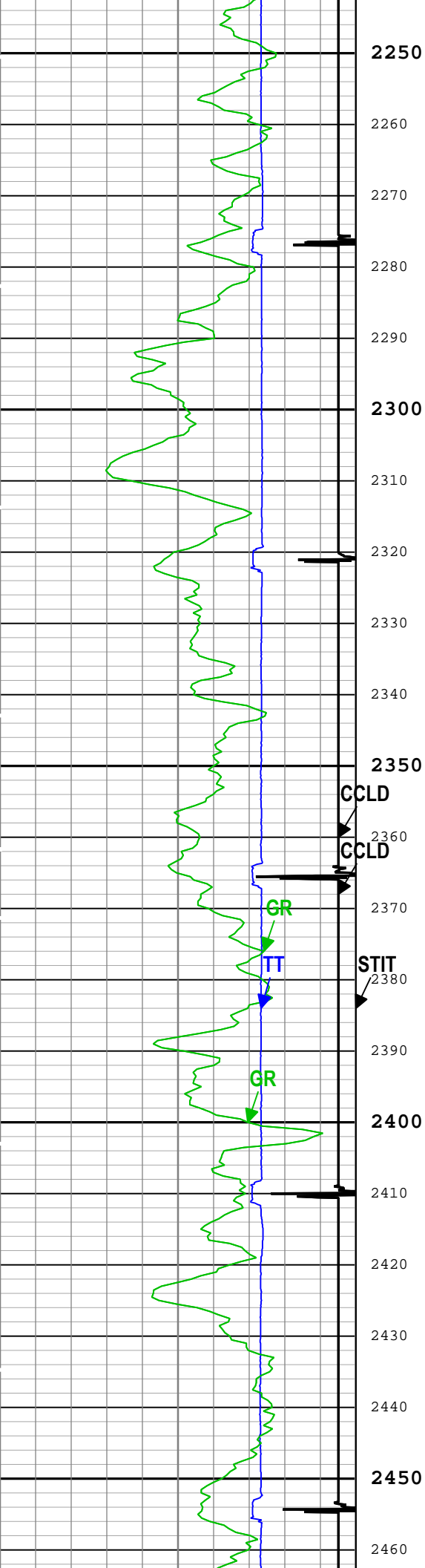
Description: Sonic CBL with VDL Format: Log (Sonic CBL with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 14-Sep-2018 16:28:33

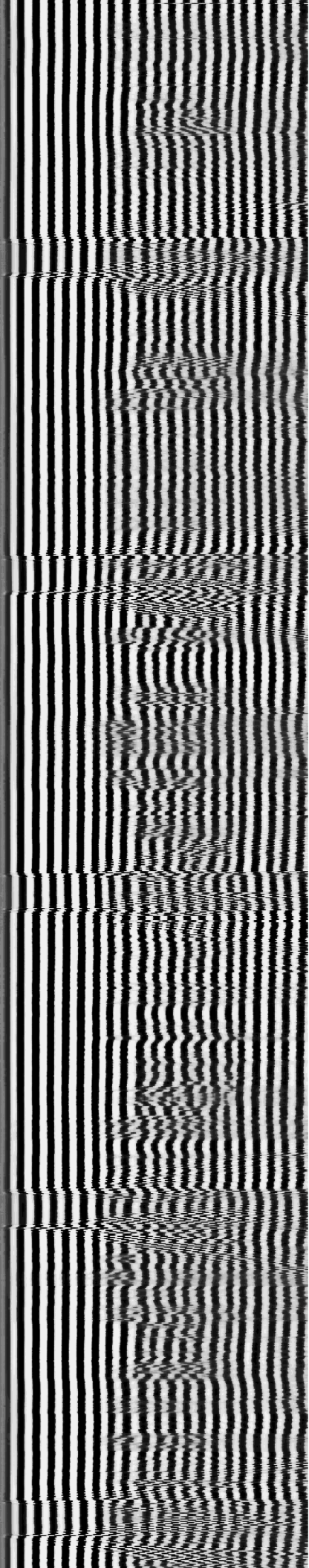
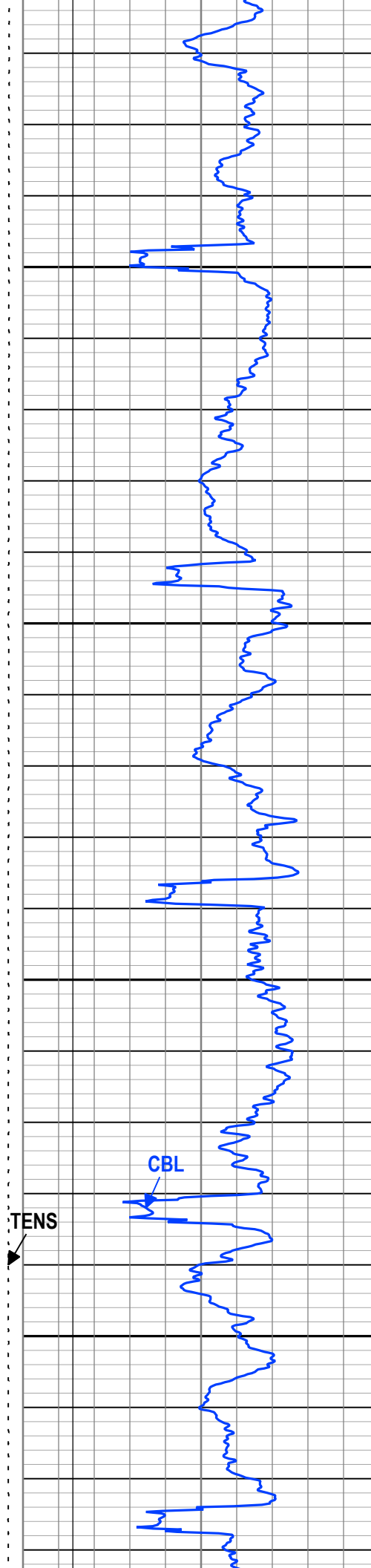
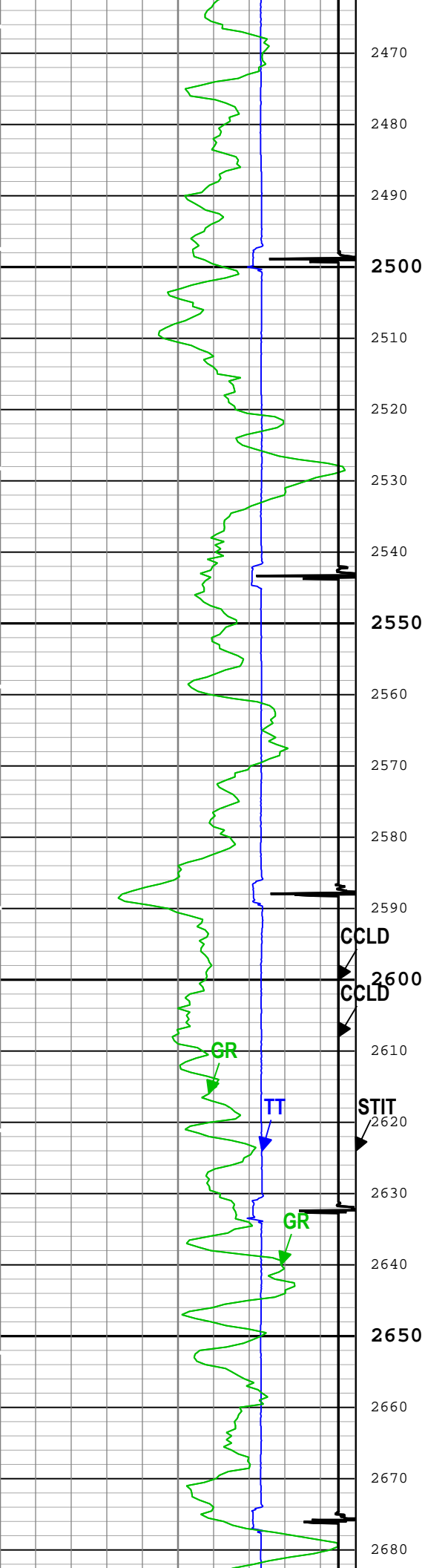
TIME_1900 - Time Marked every 60.00 (s)

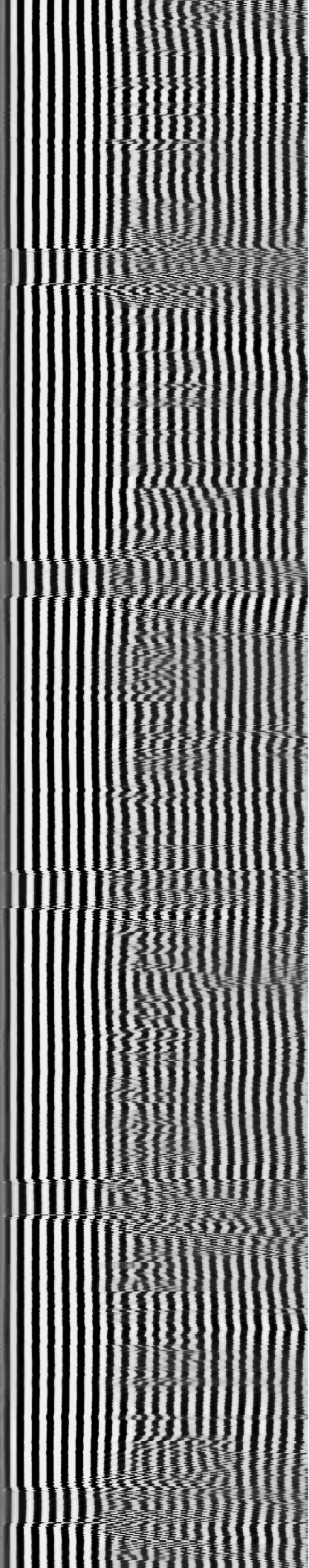
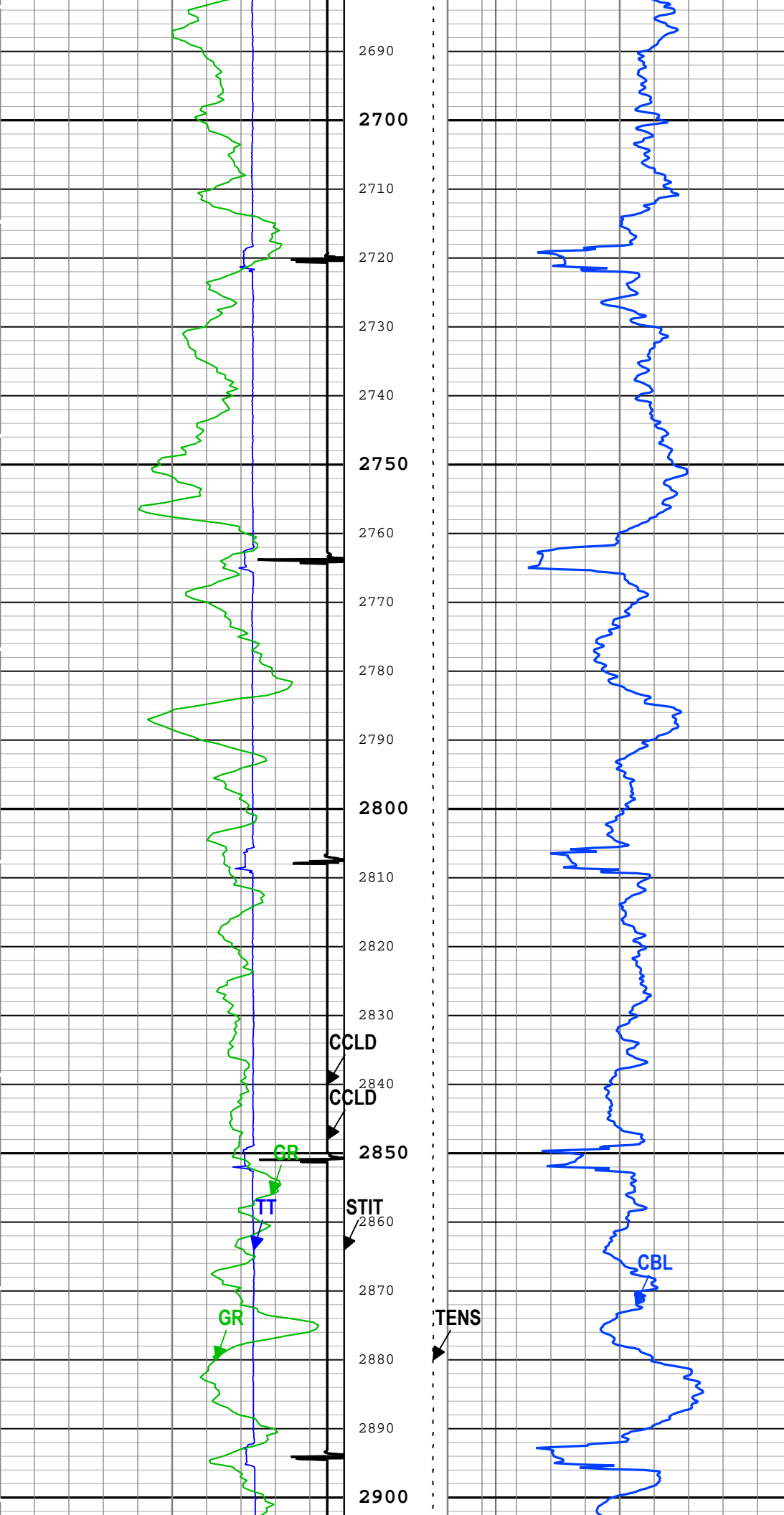
■ BIEP - Bond Index Event Pips SCMT-HC

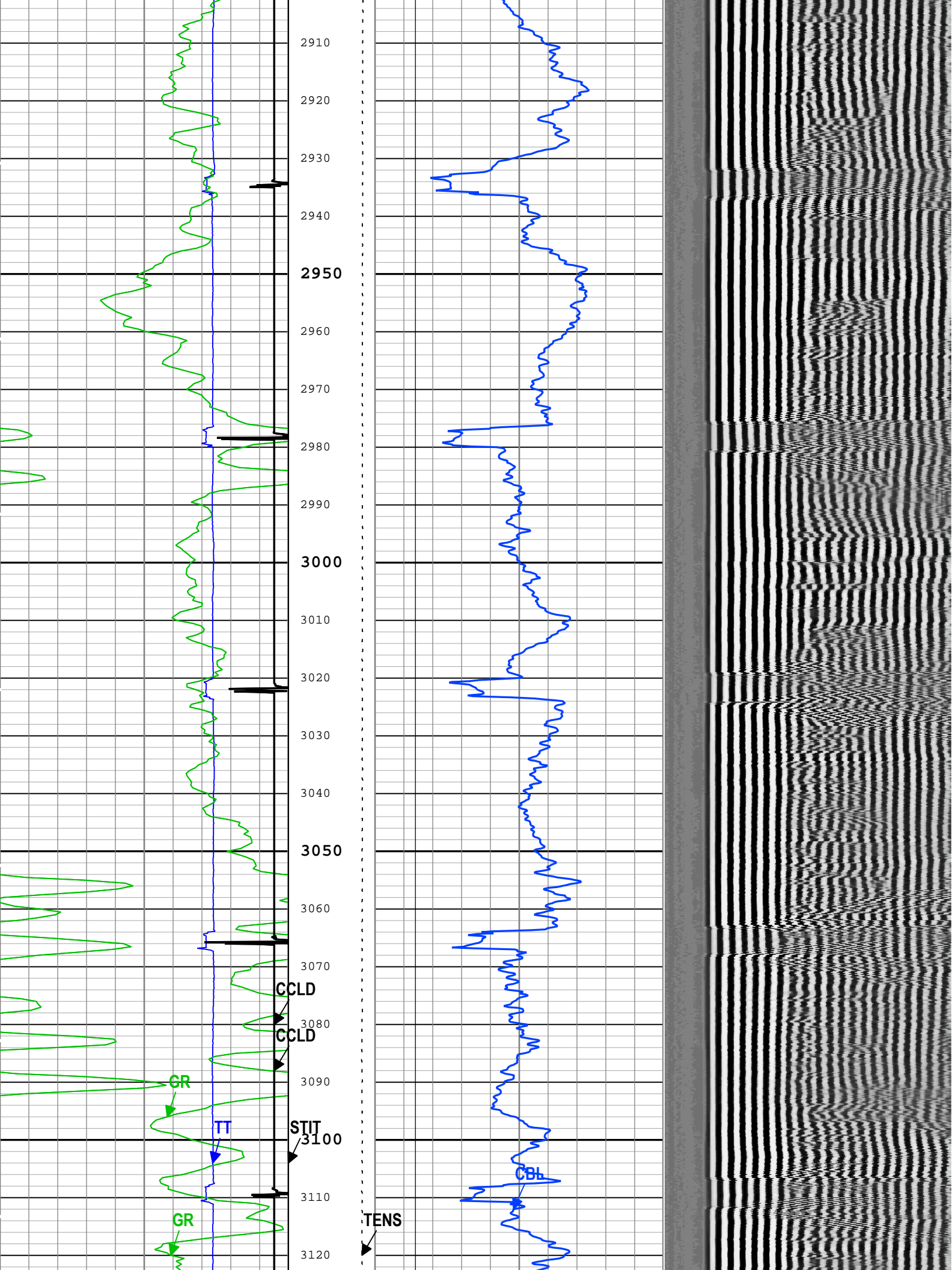


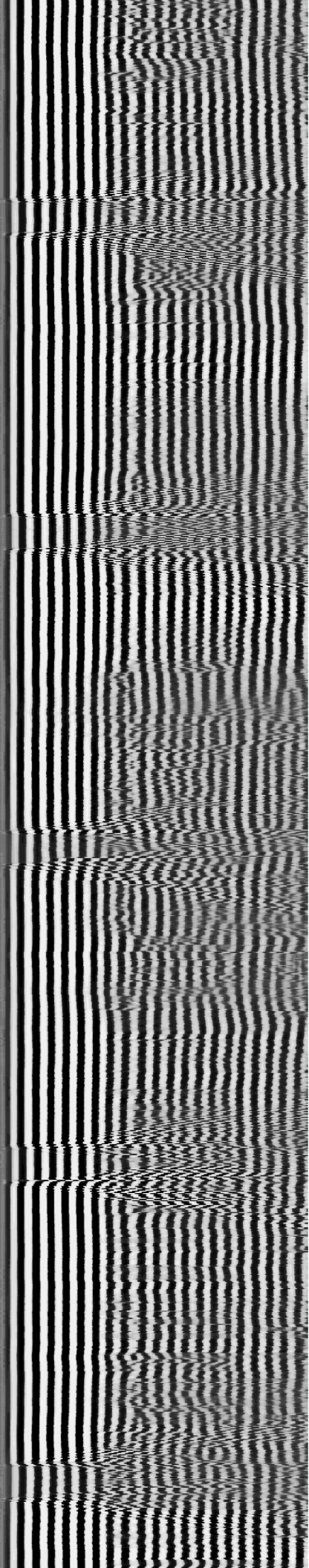
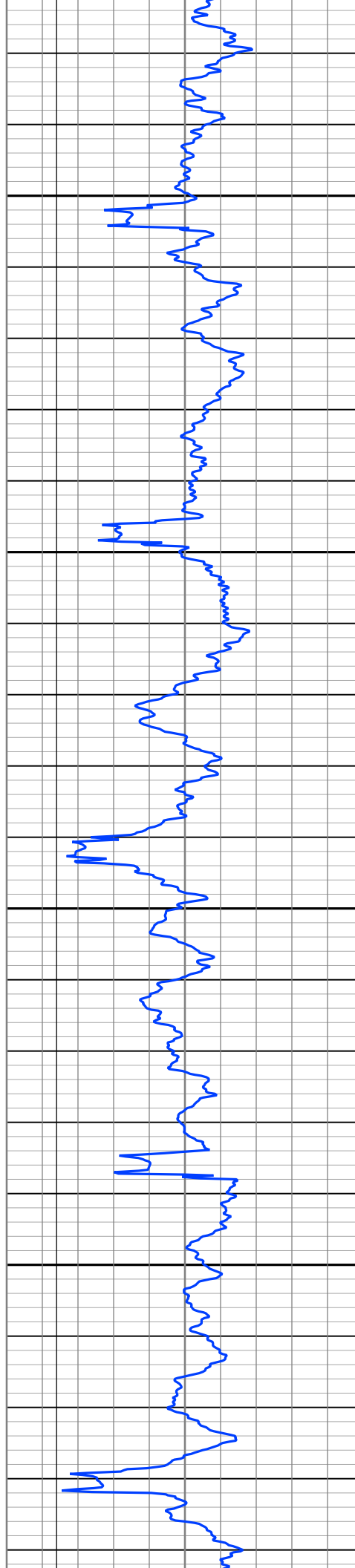
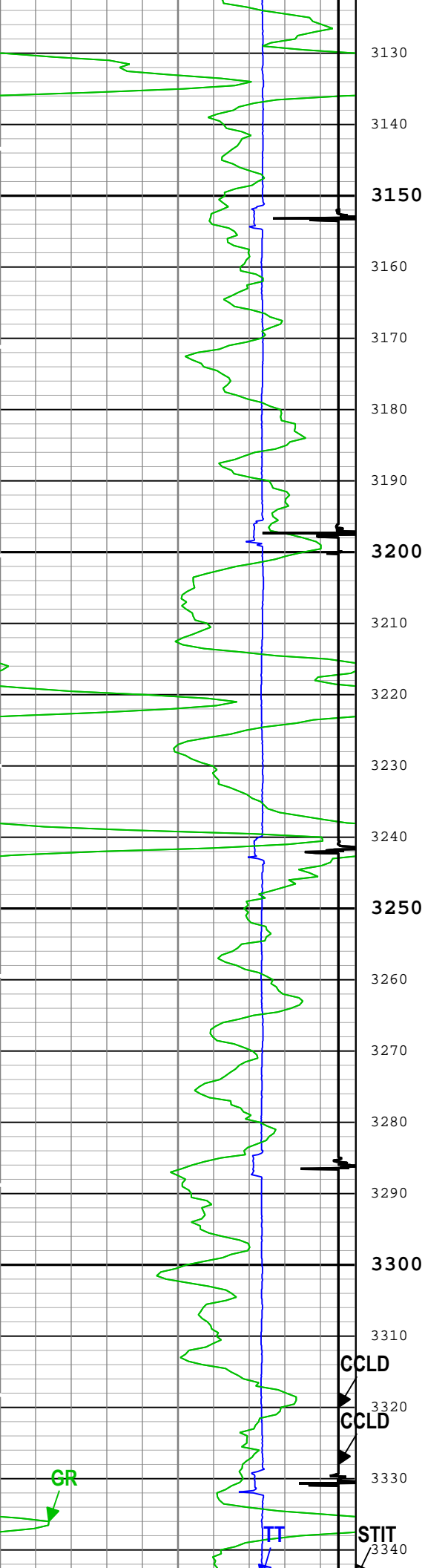


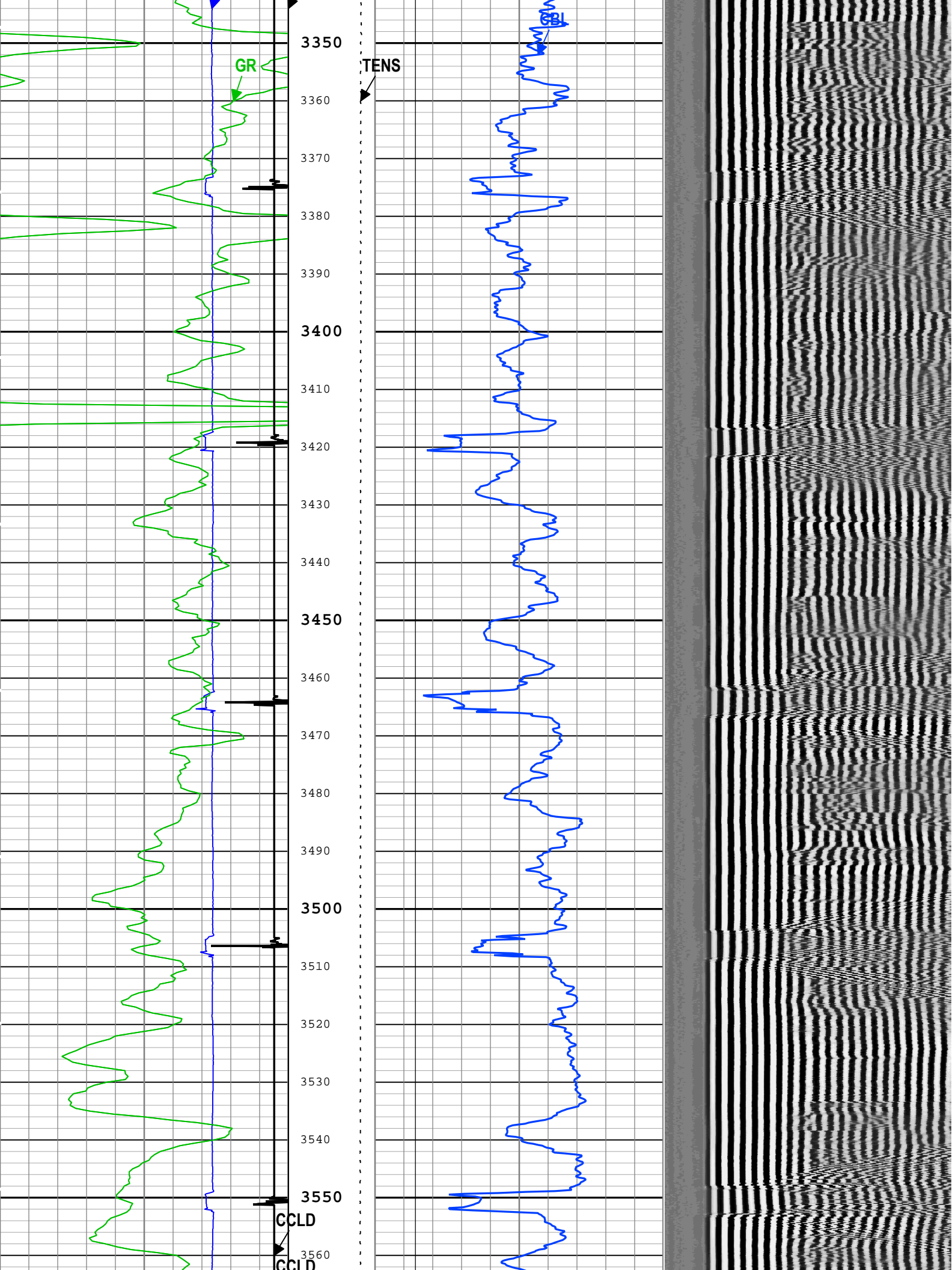


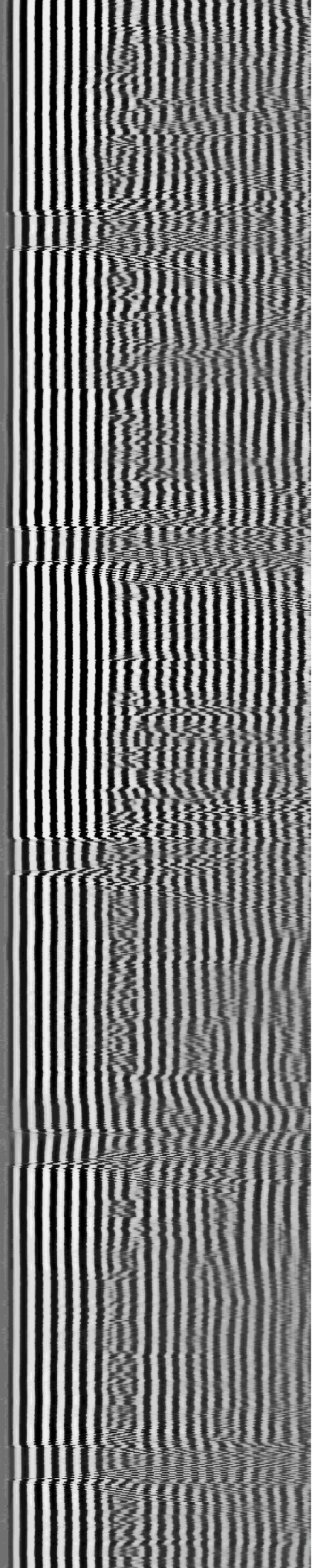
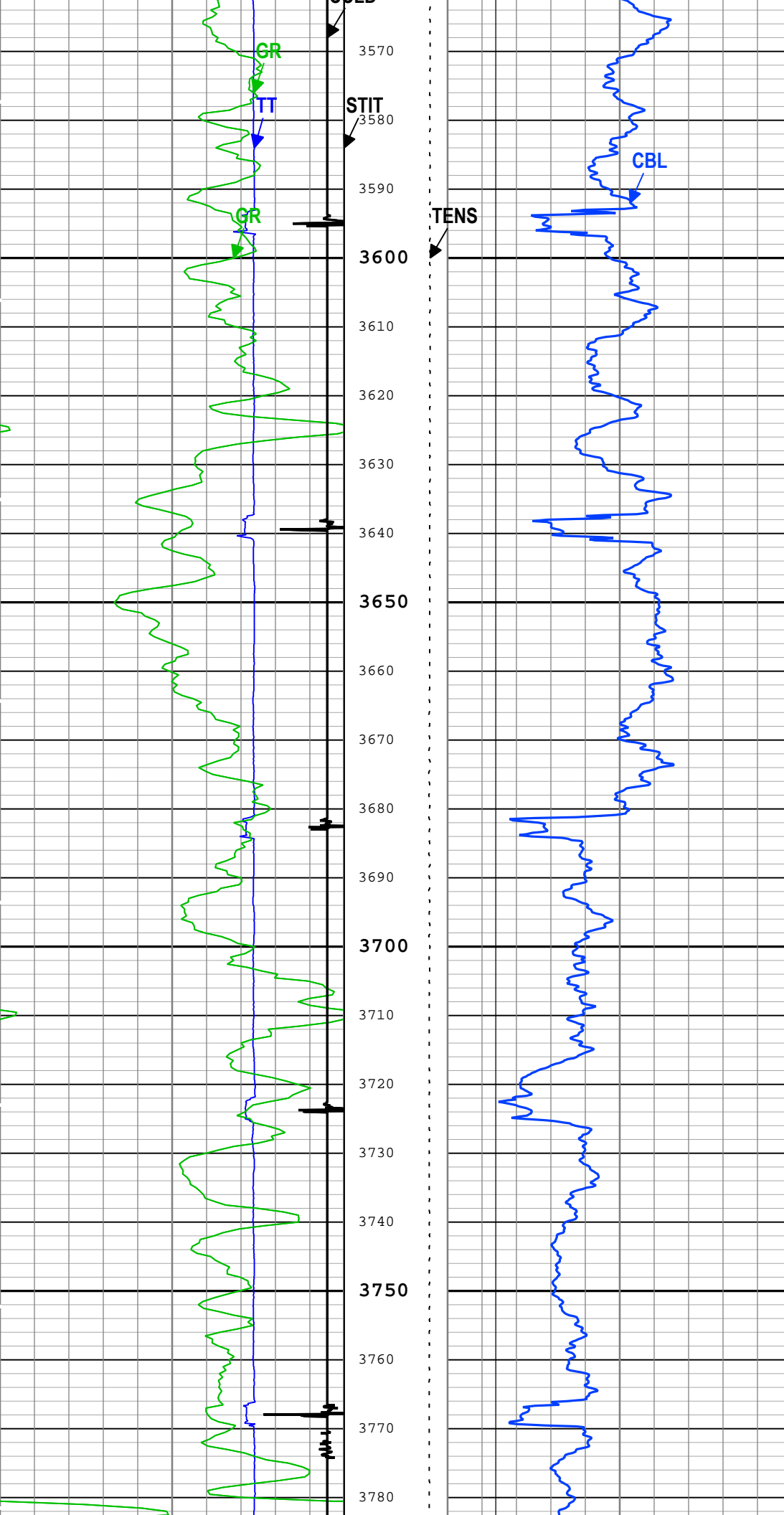


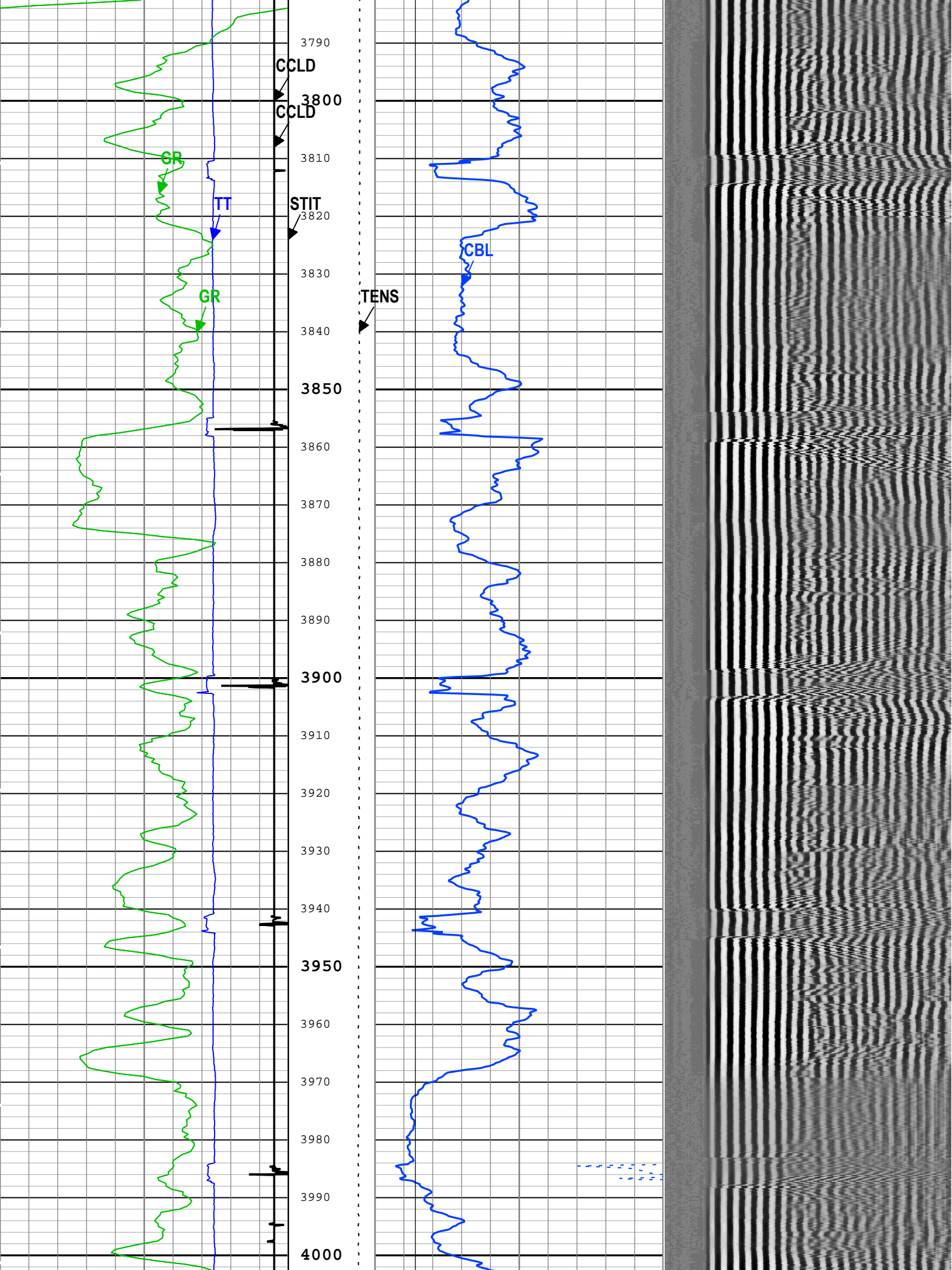


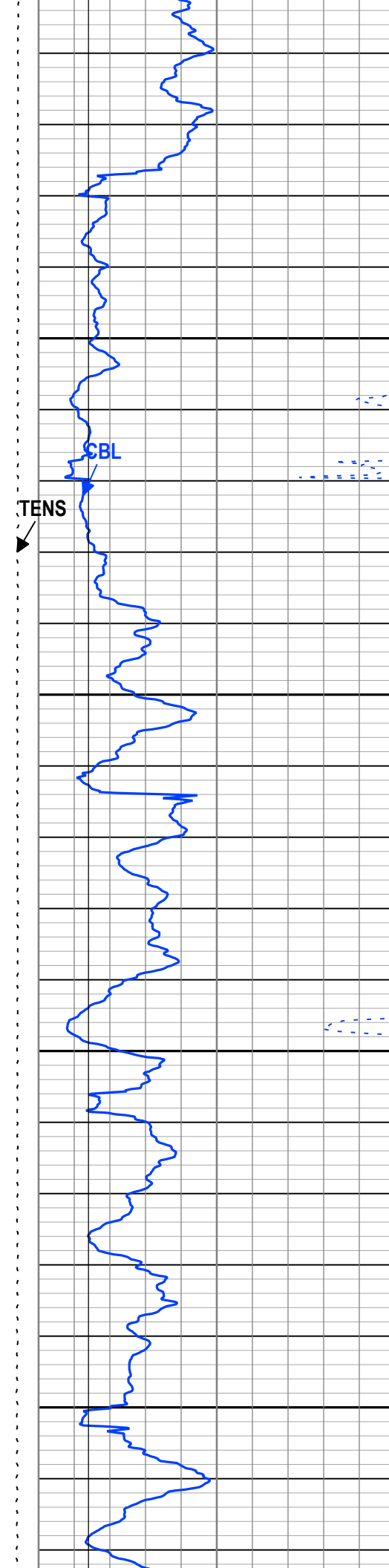
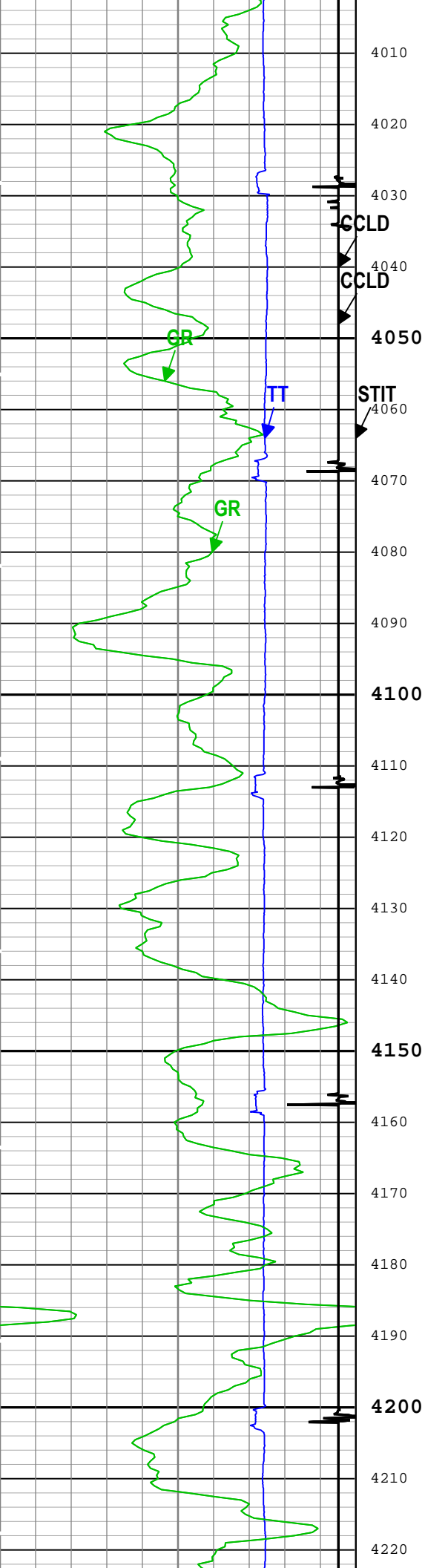


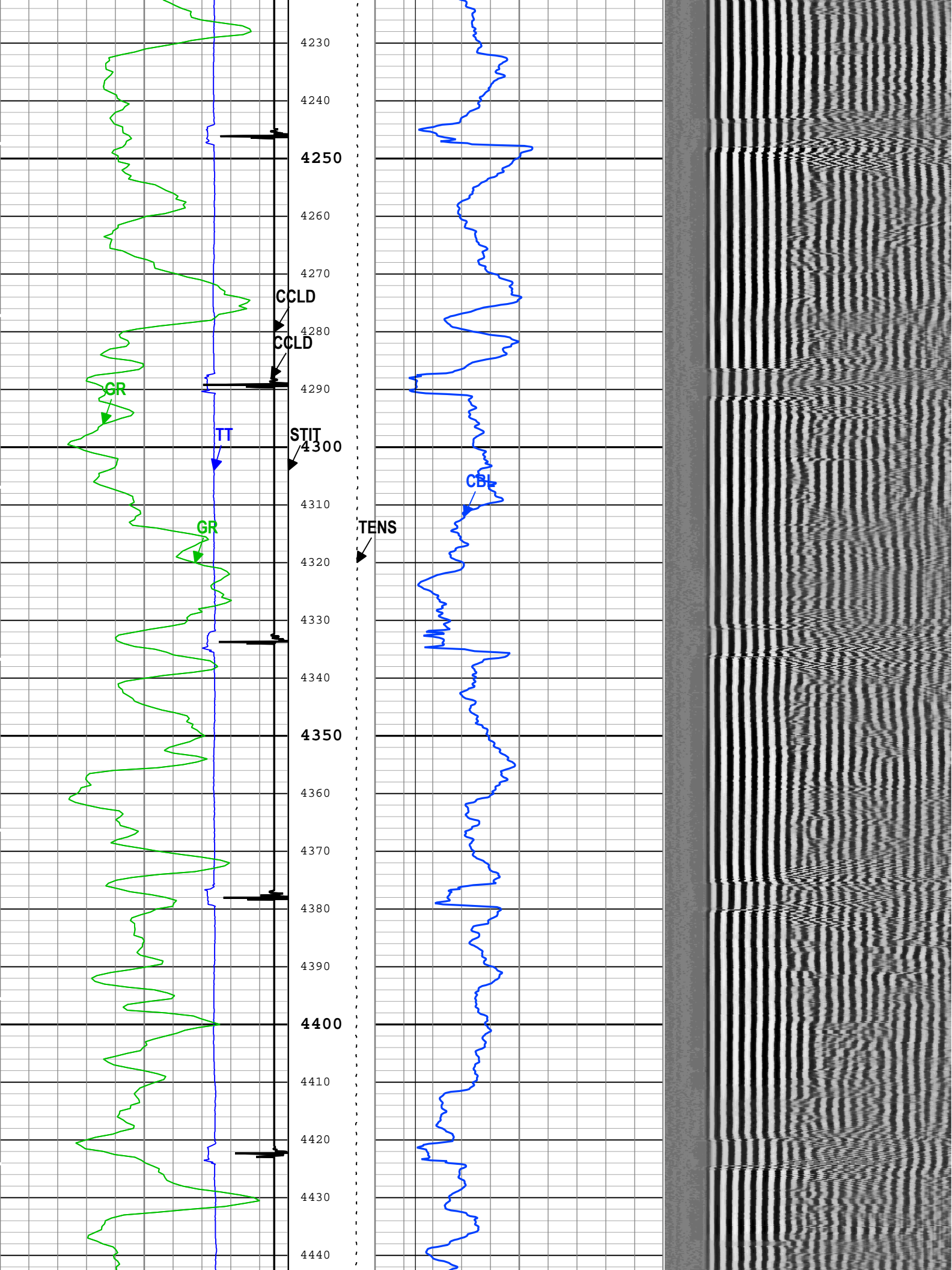


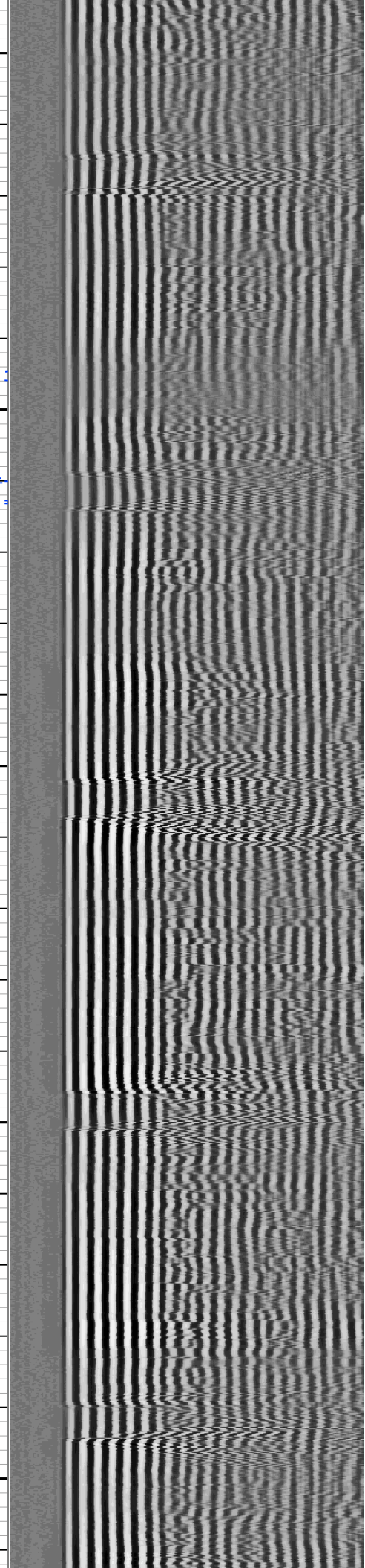
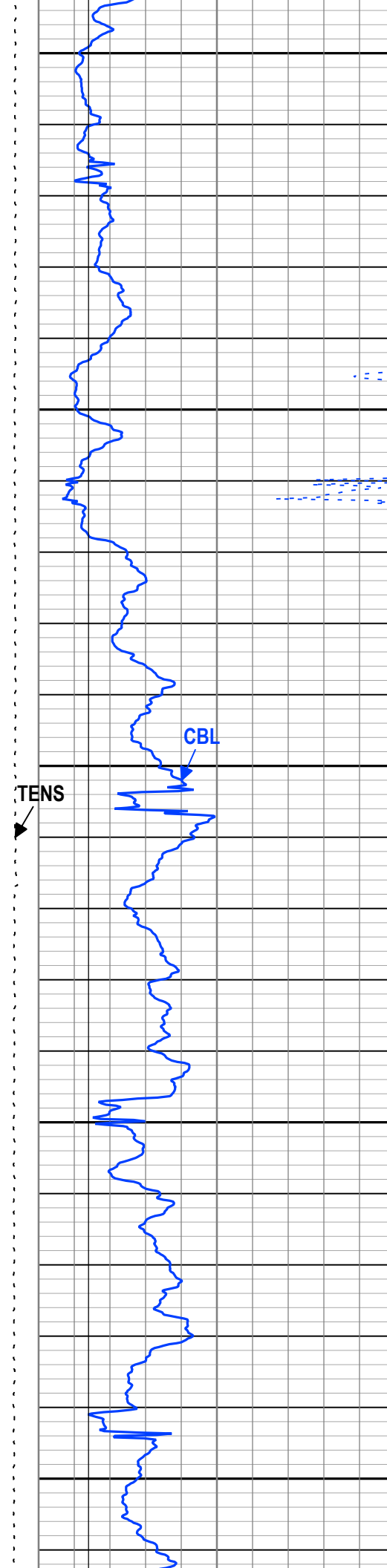
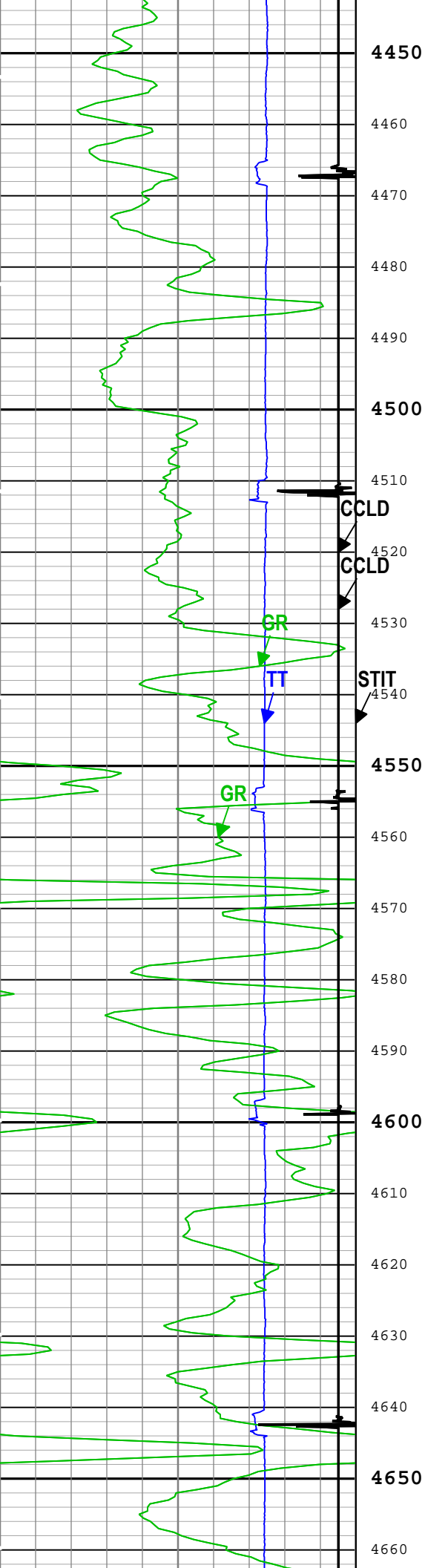


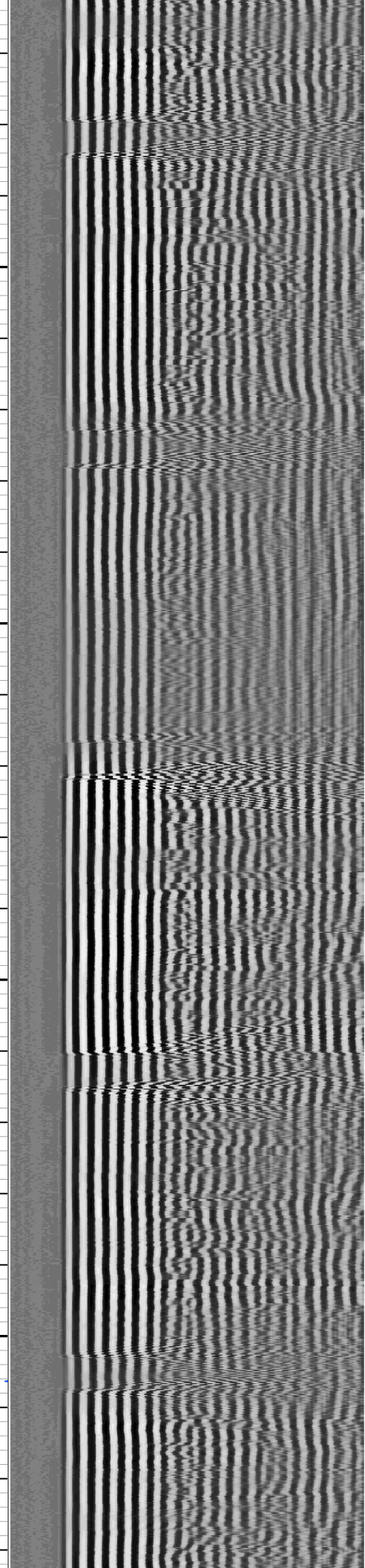
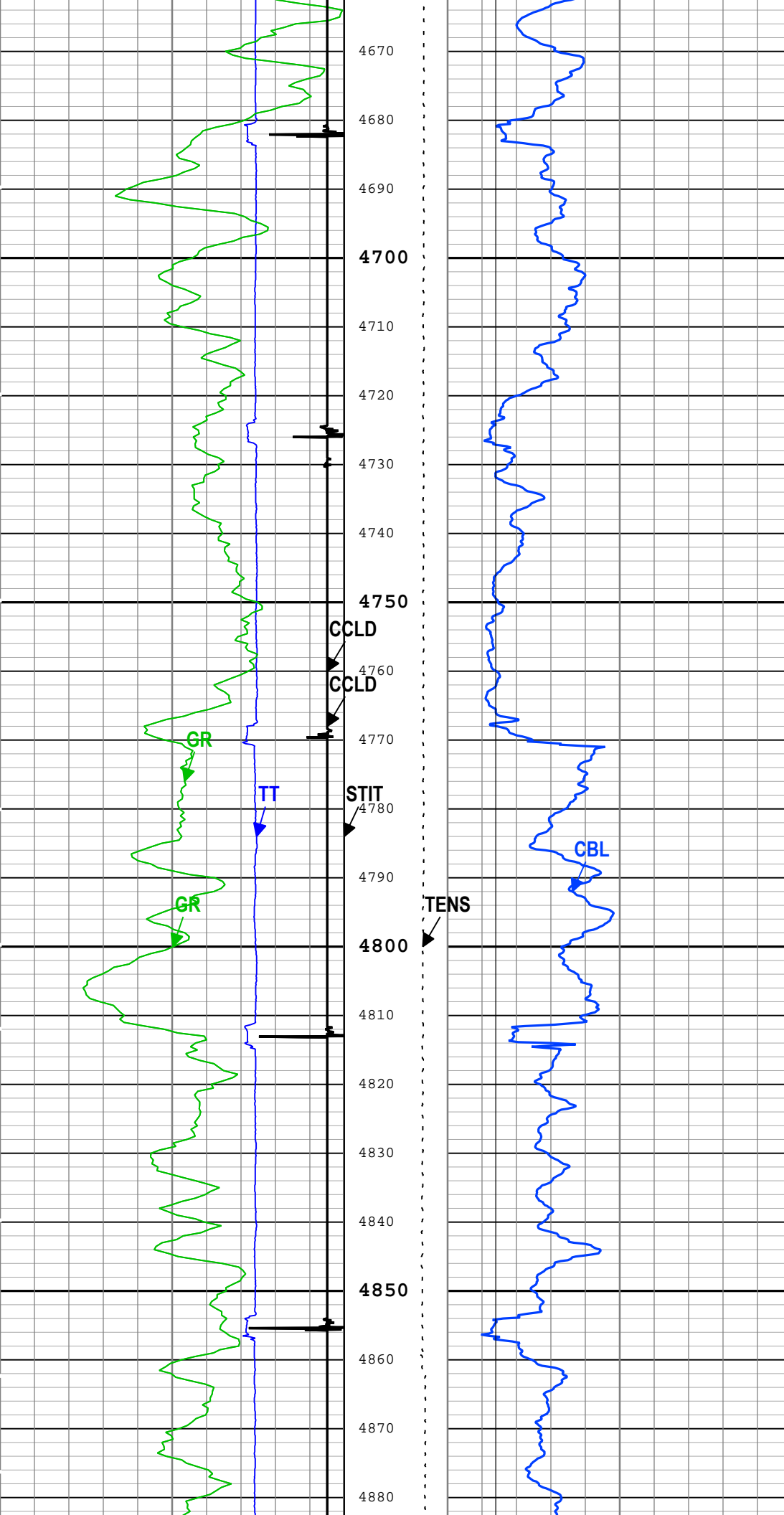


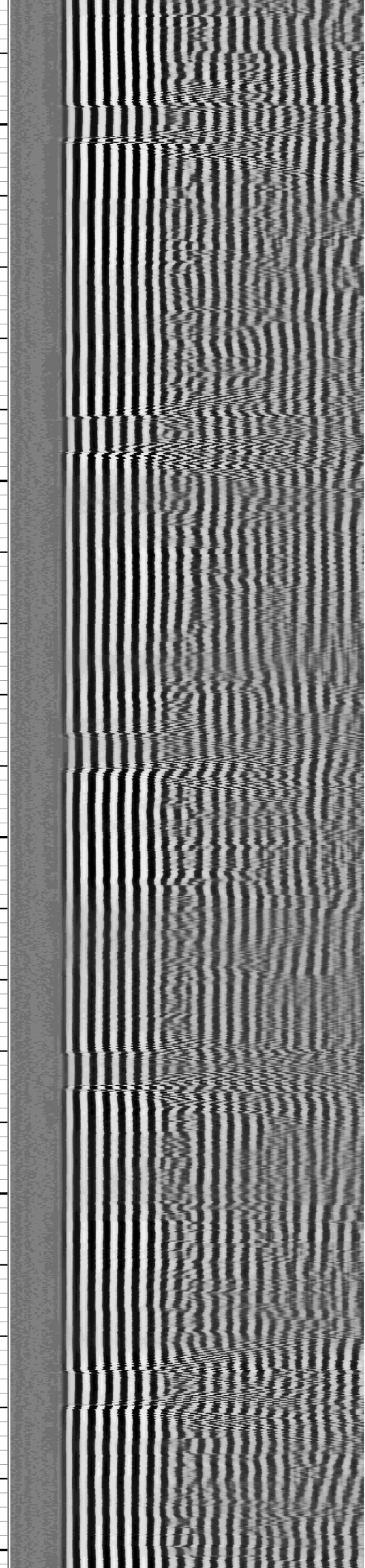
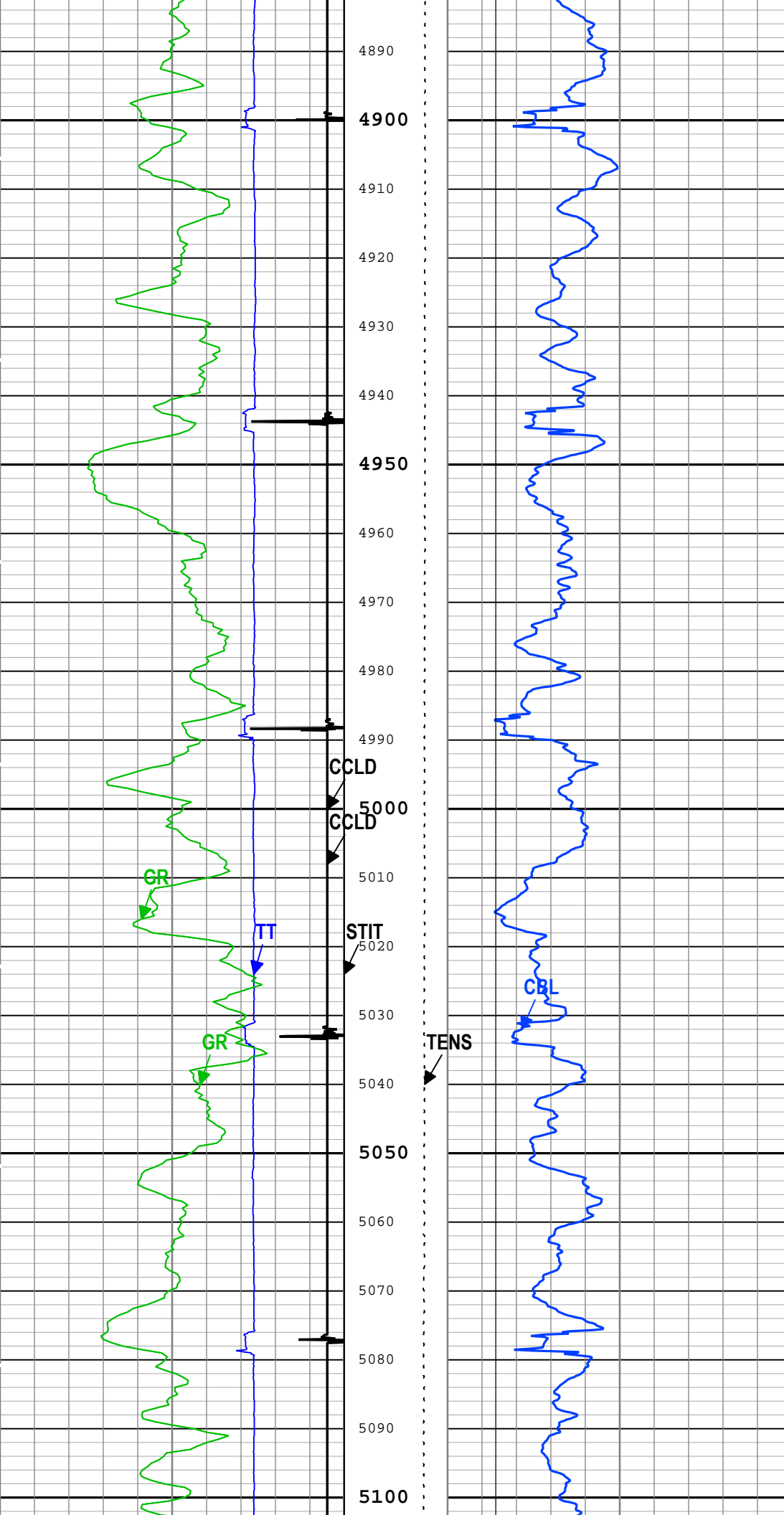


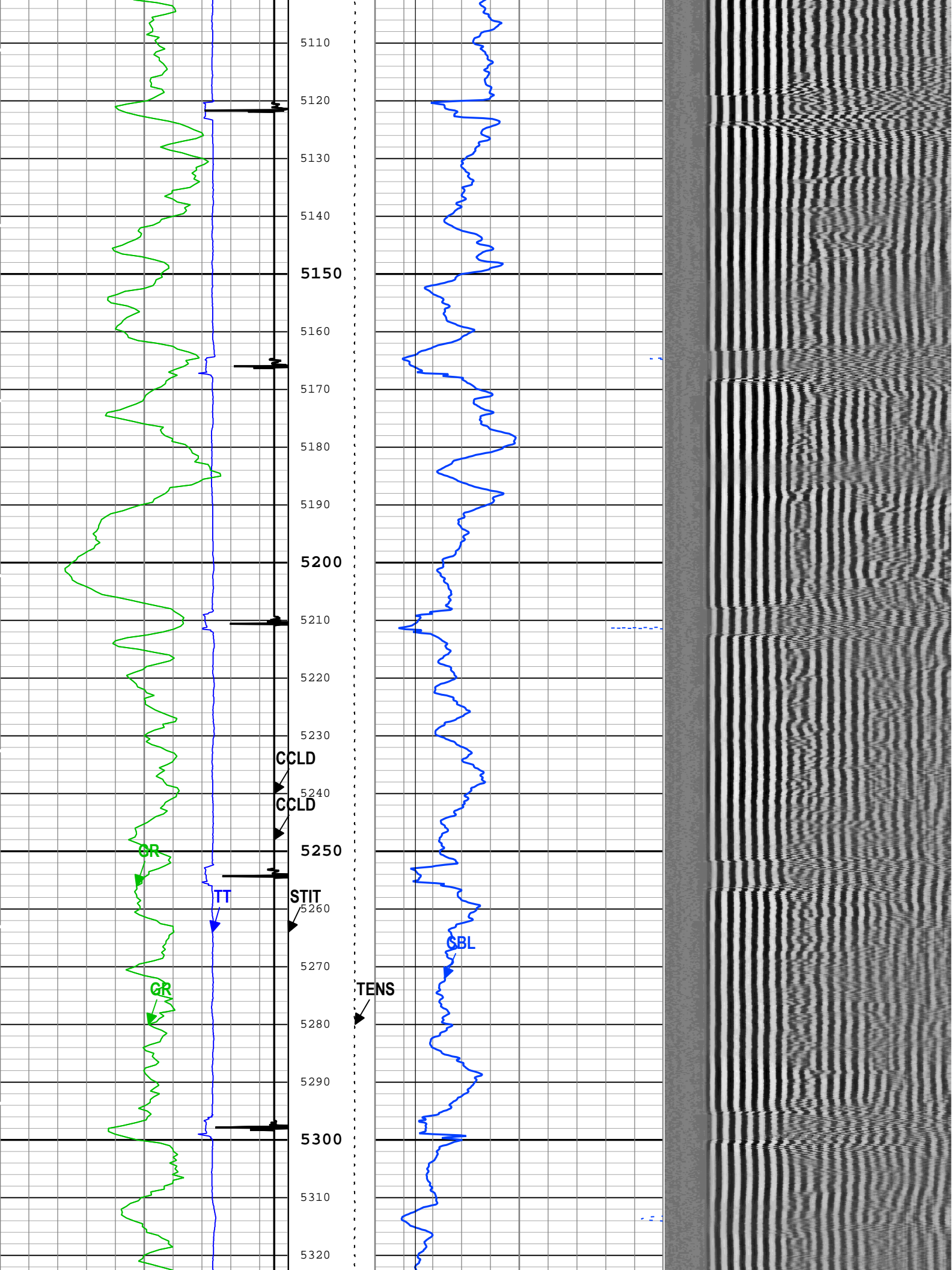


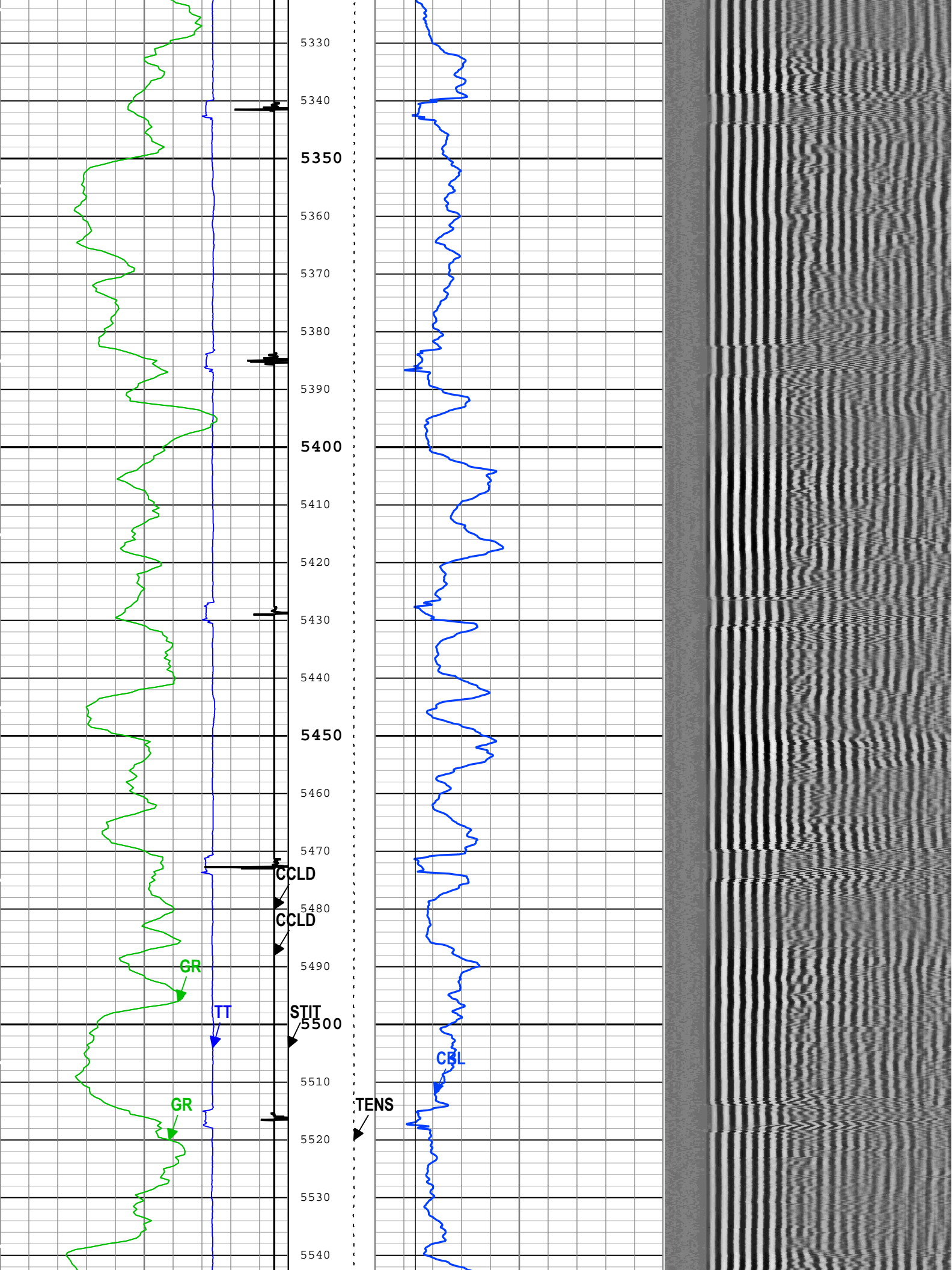


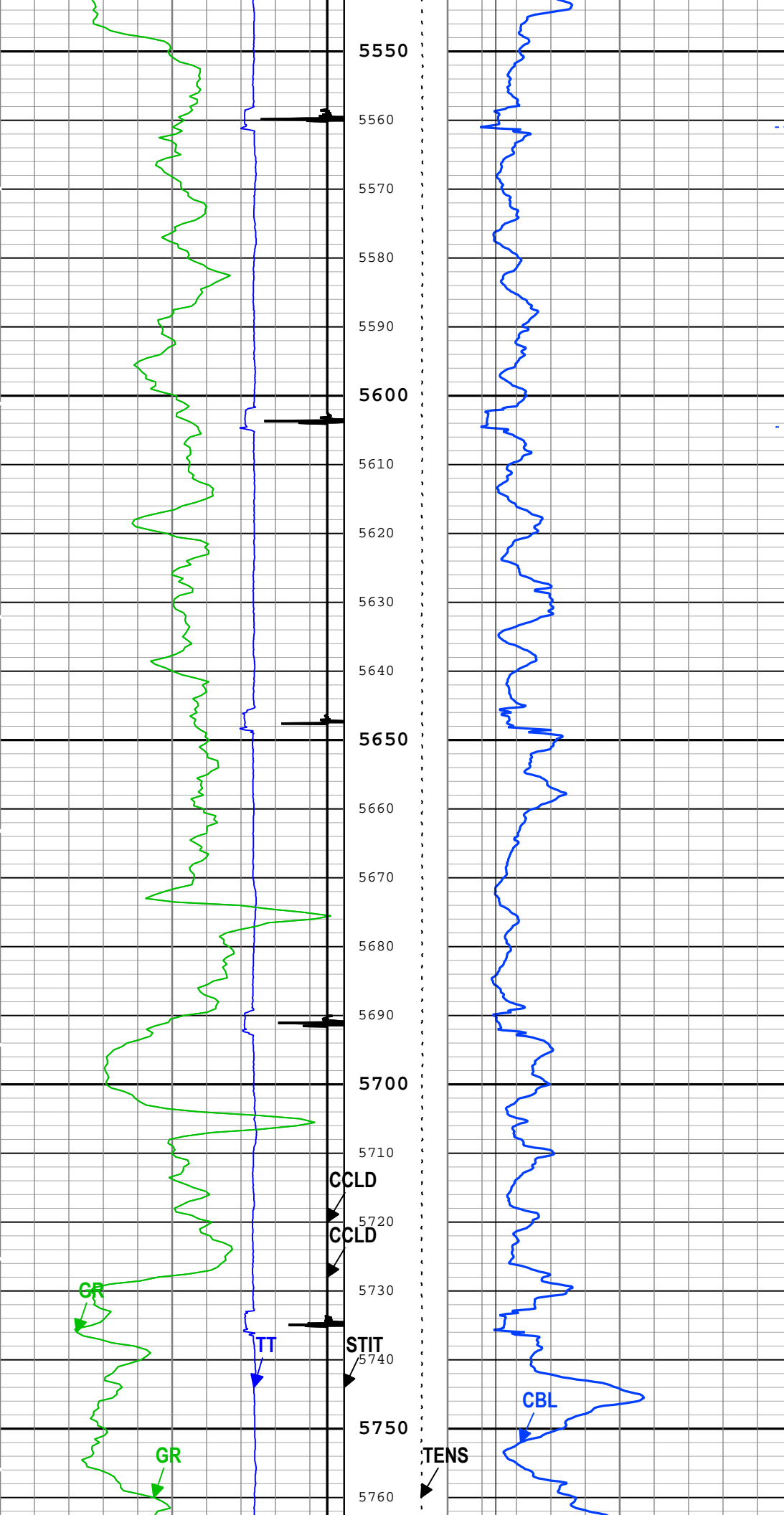


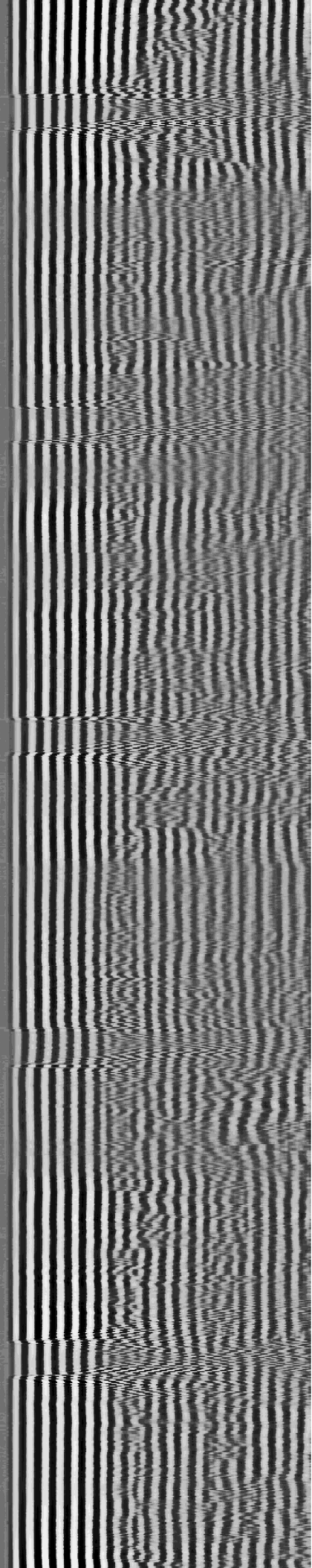
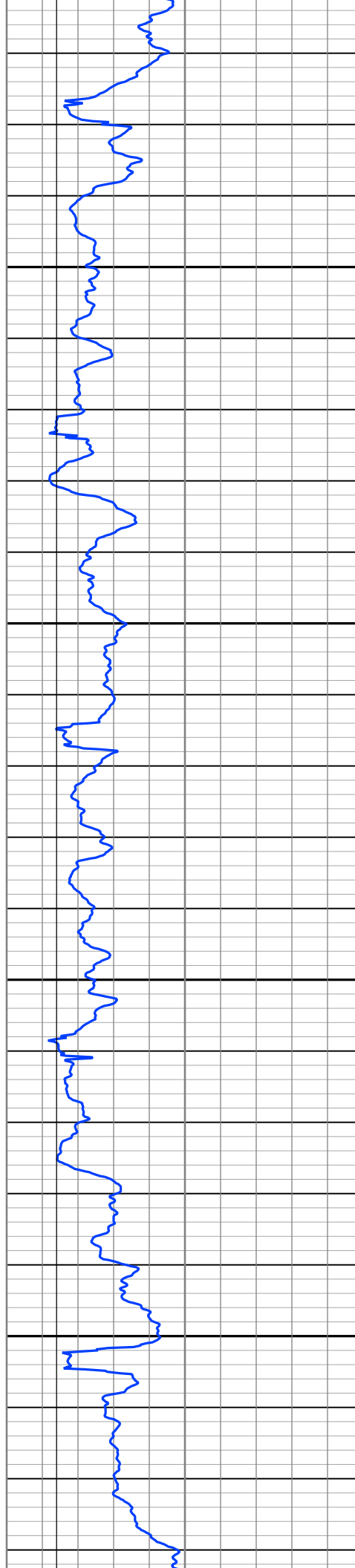
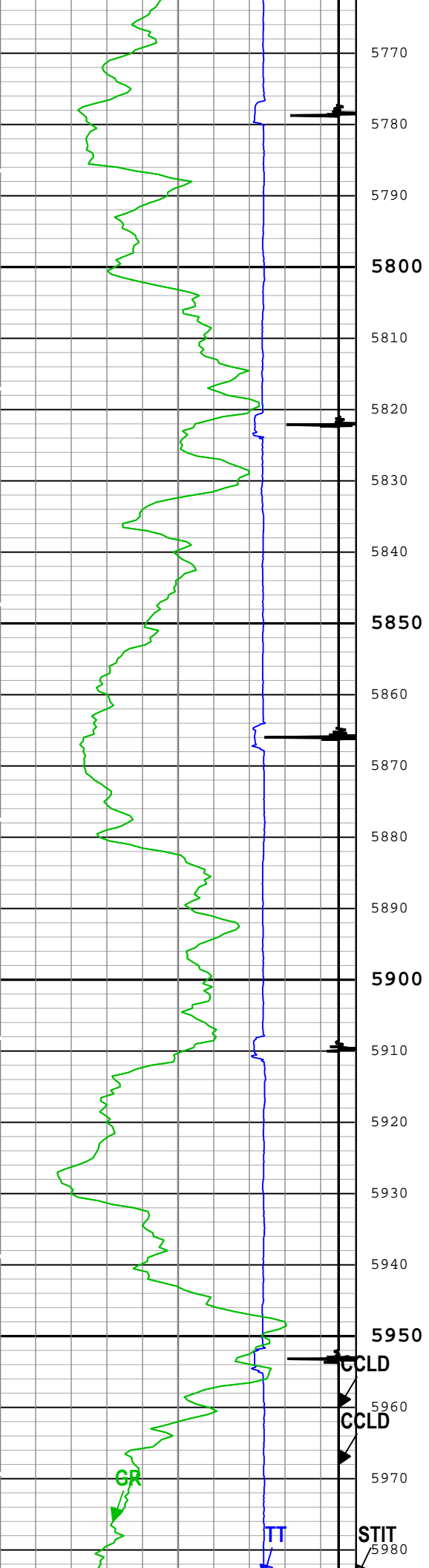


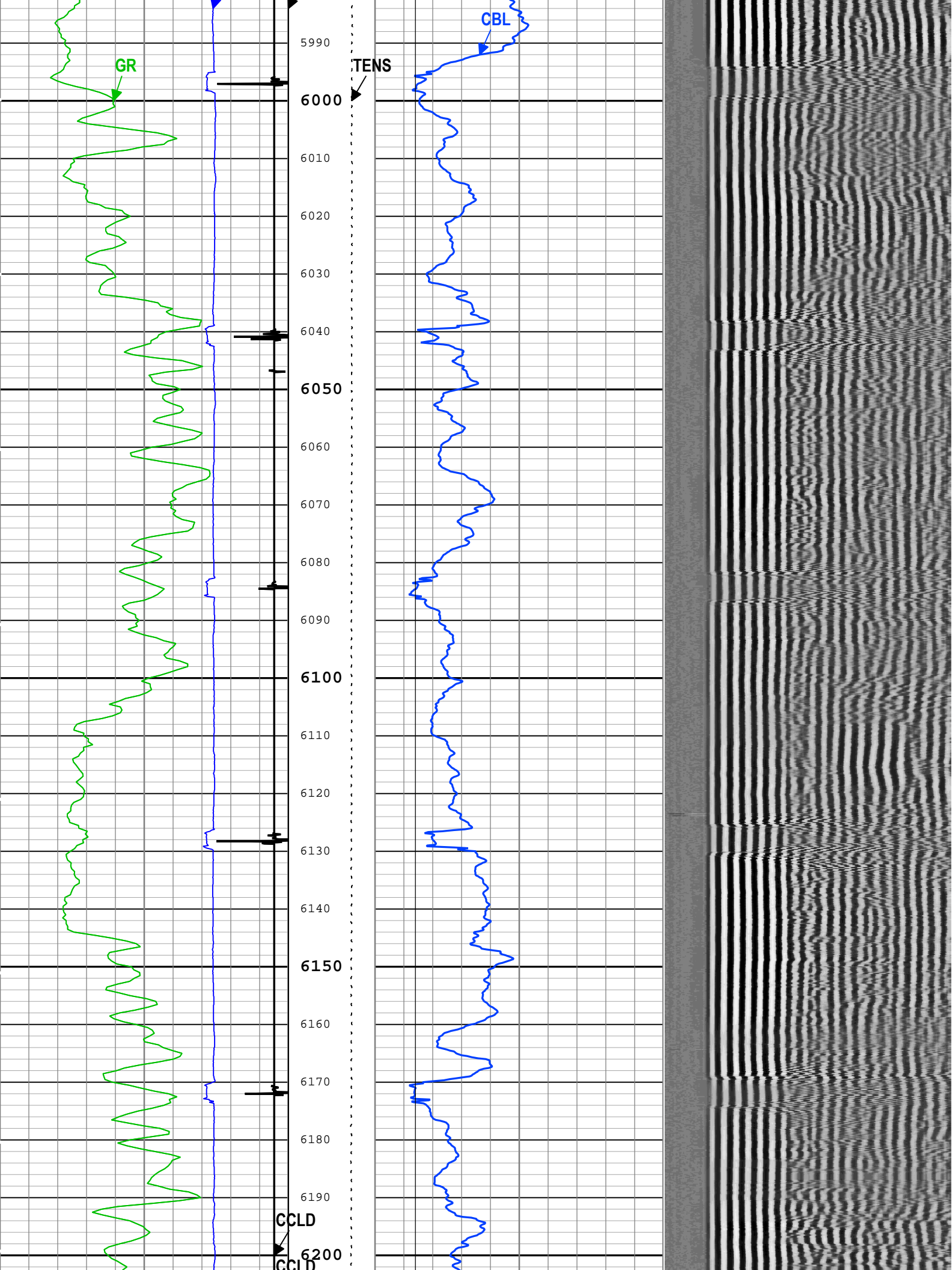


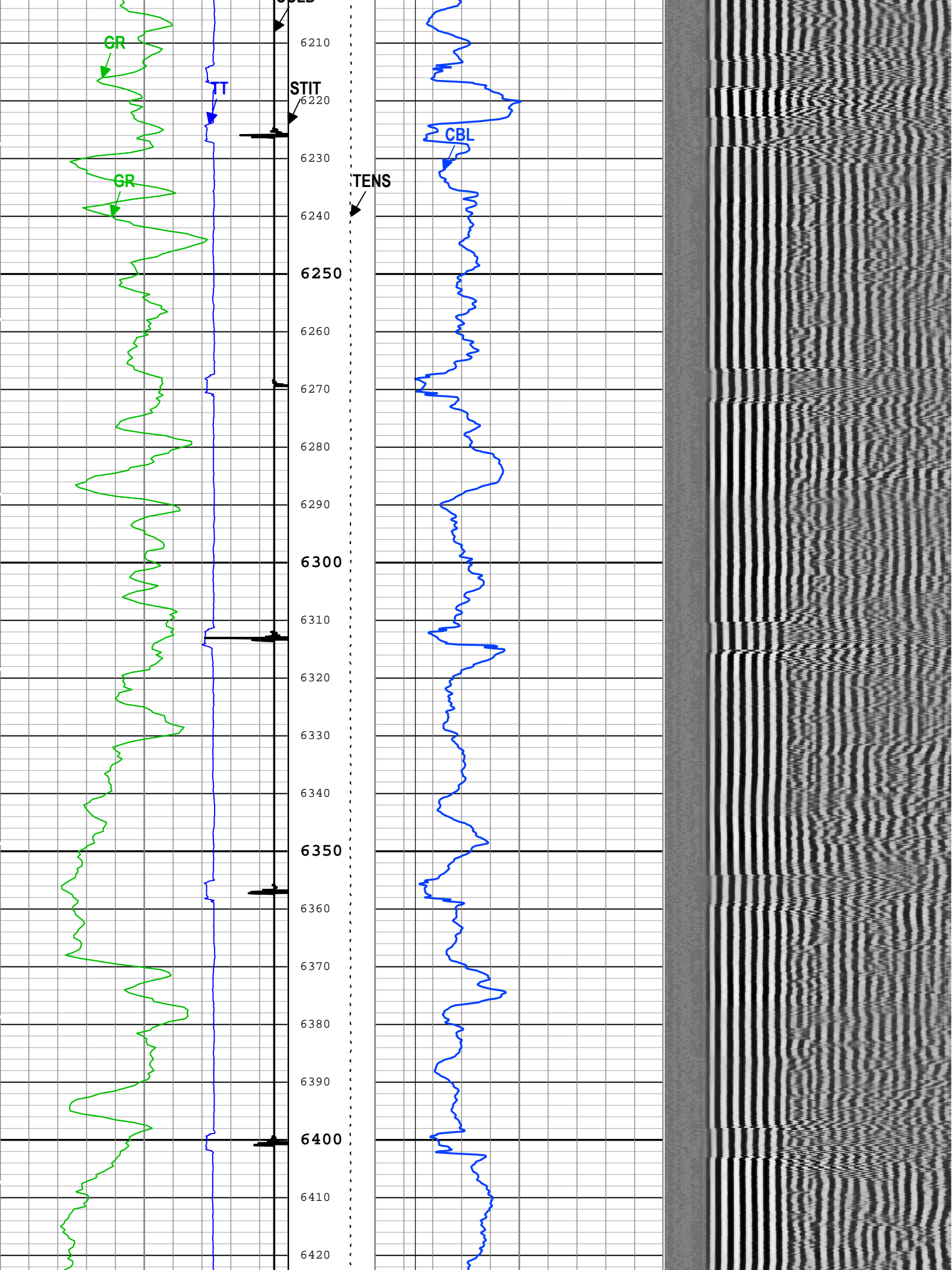


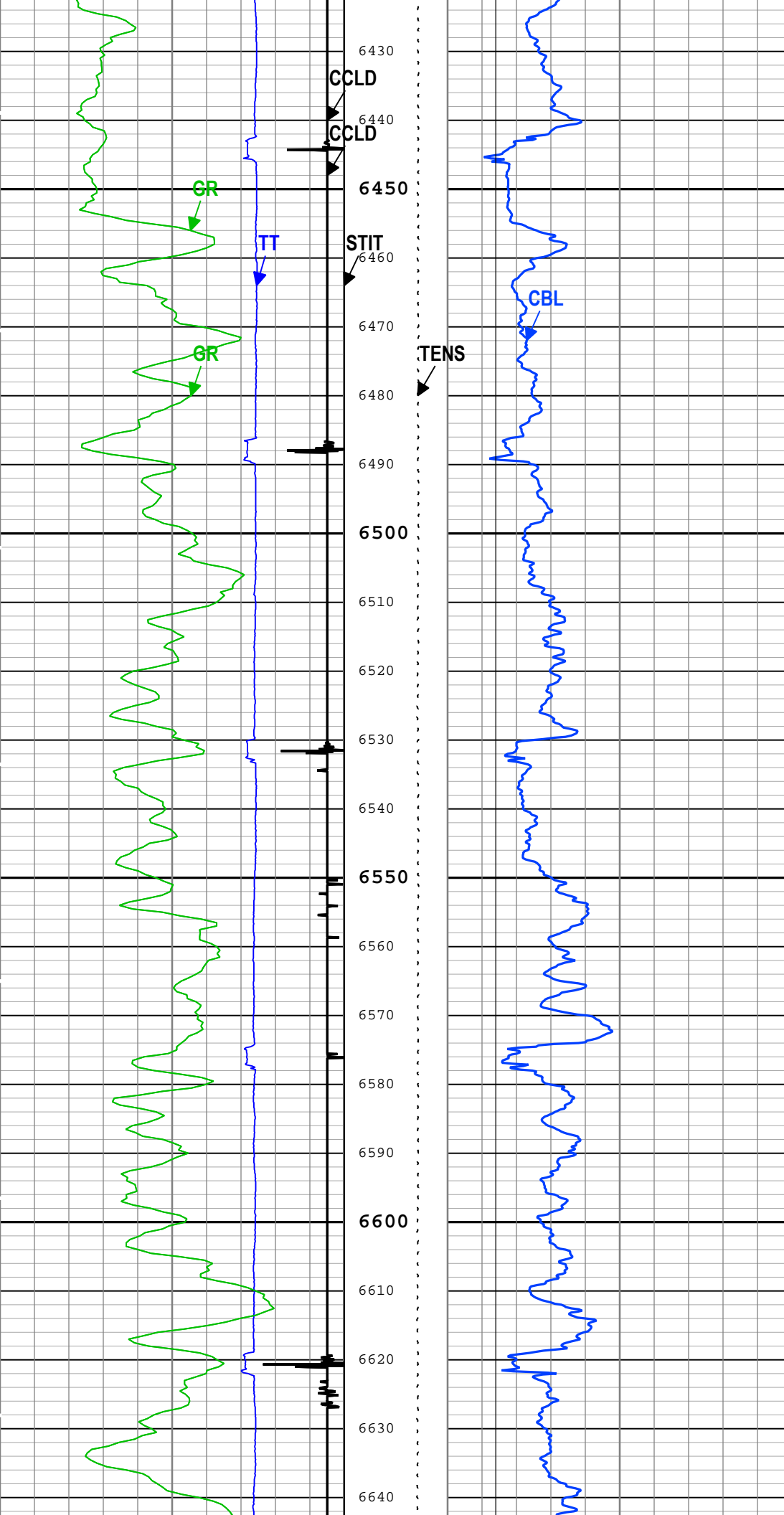


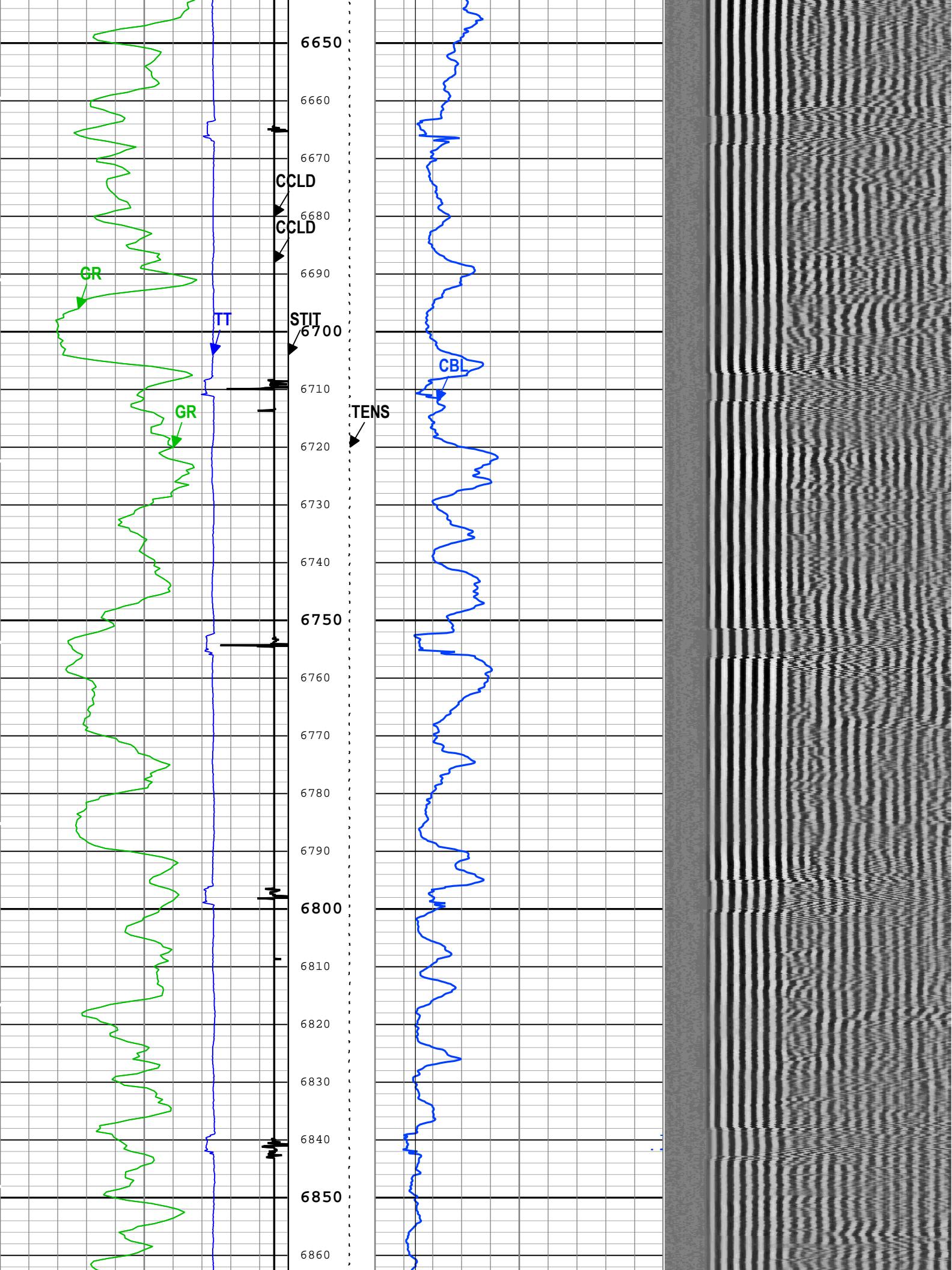


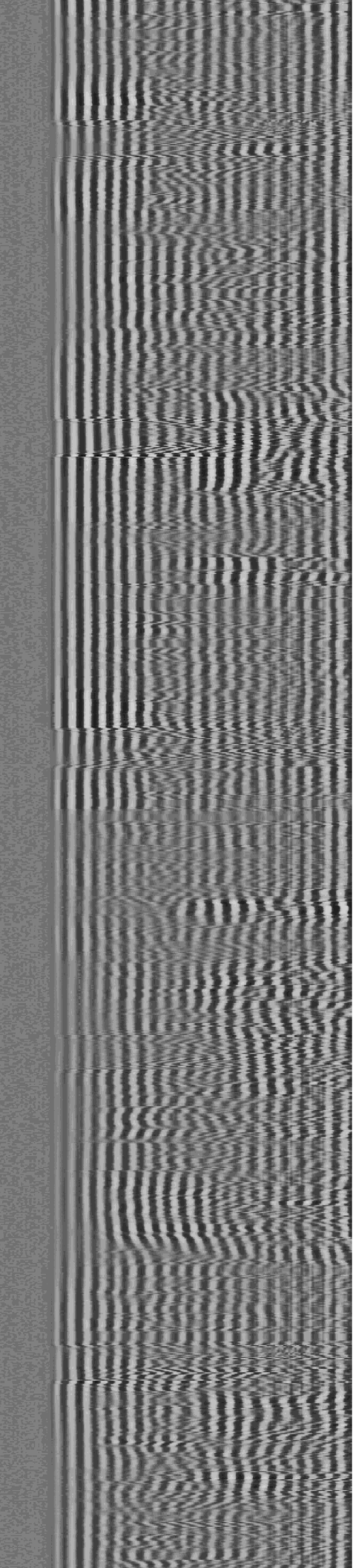
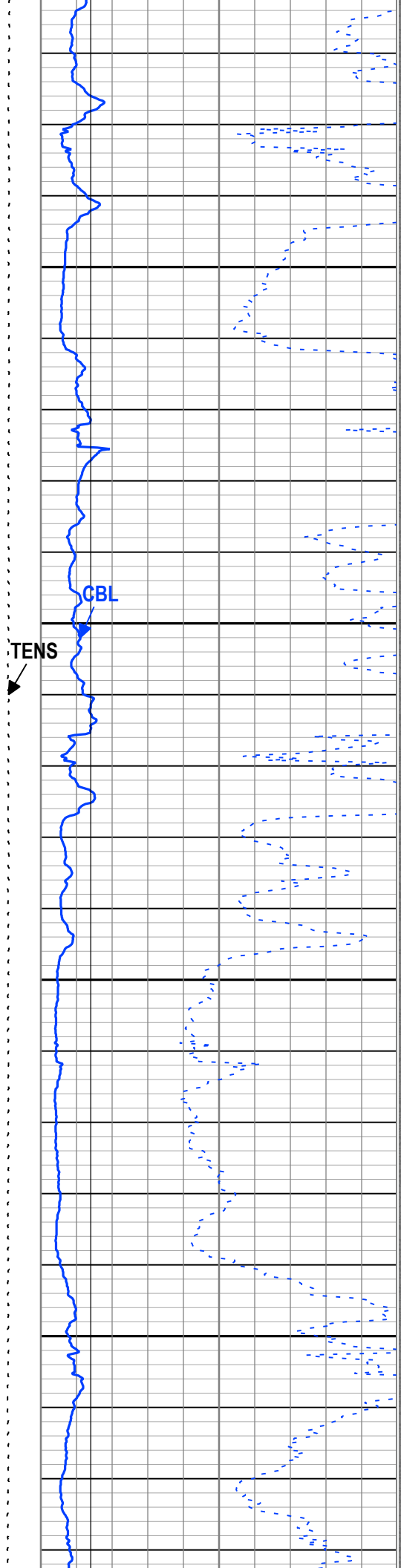
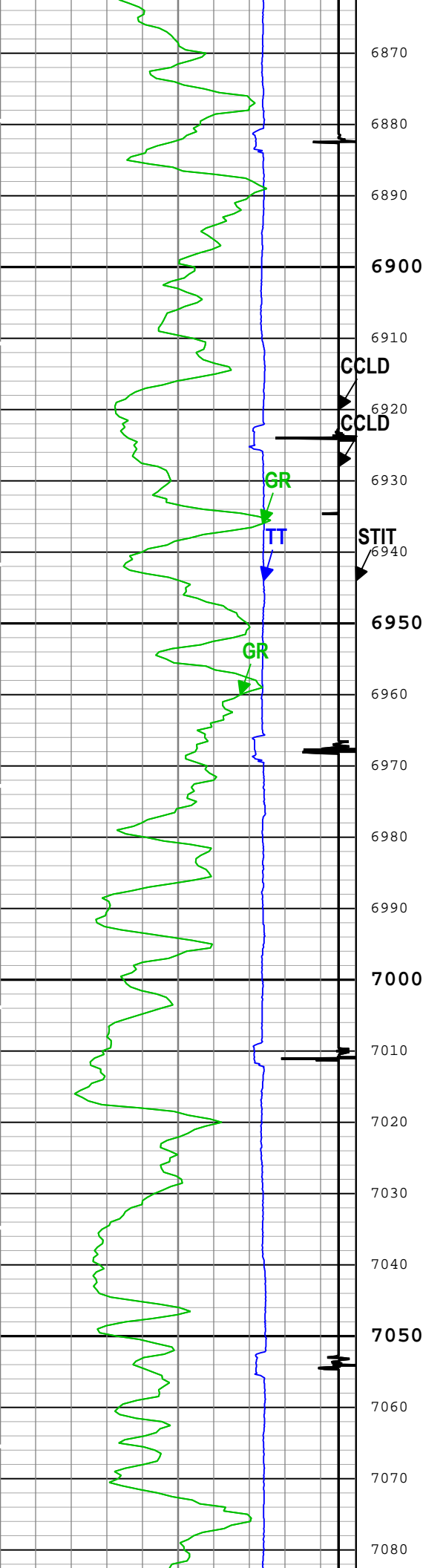


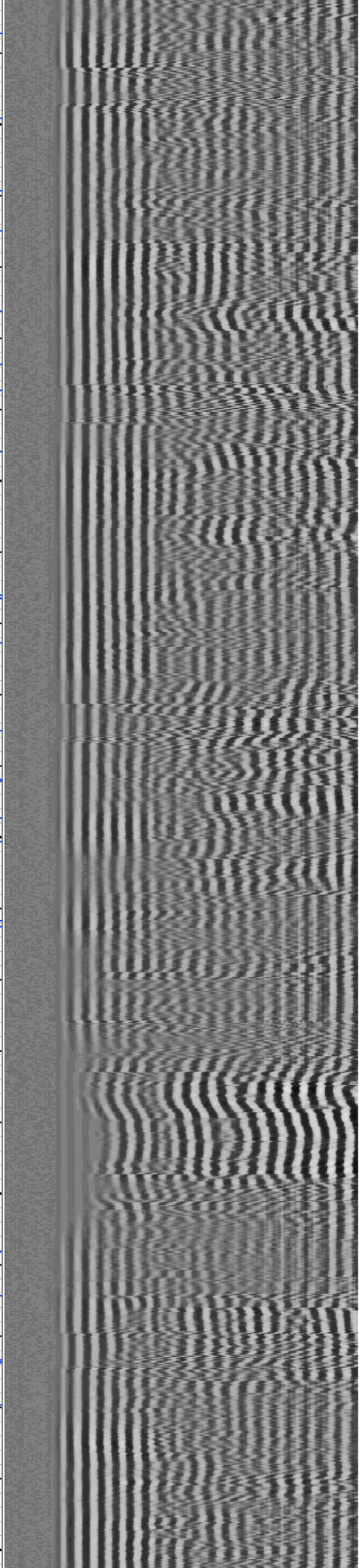
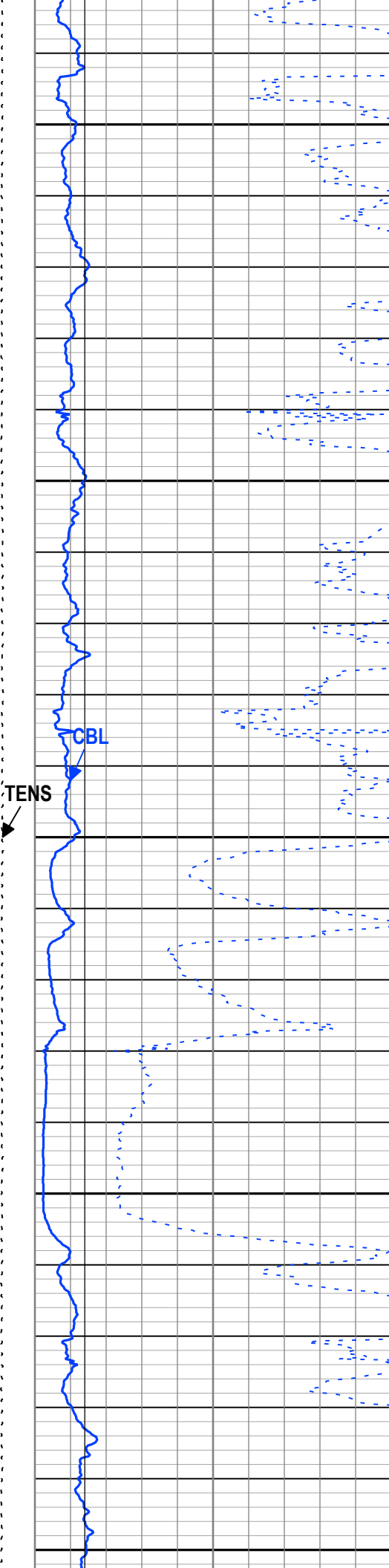
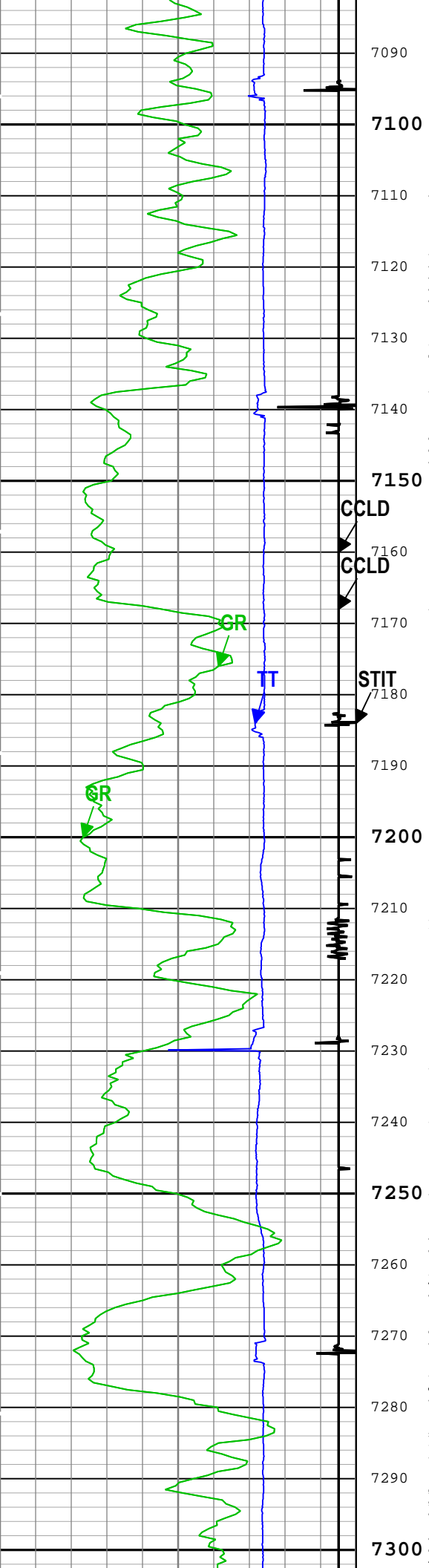


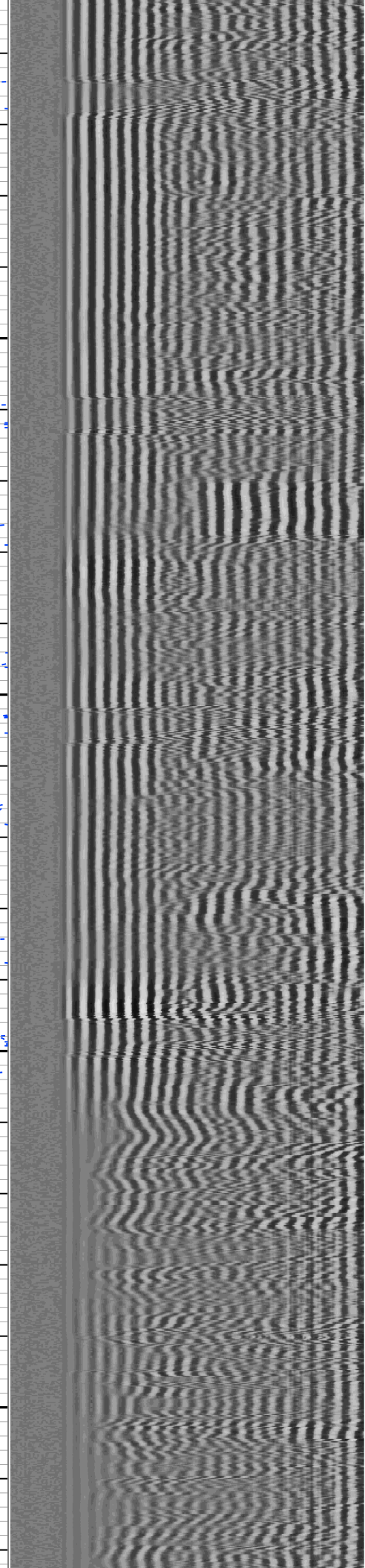
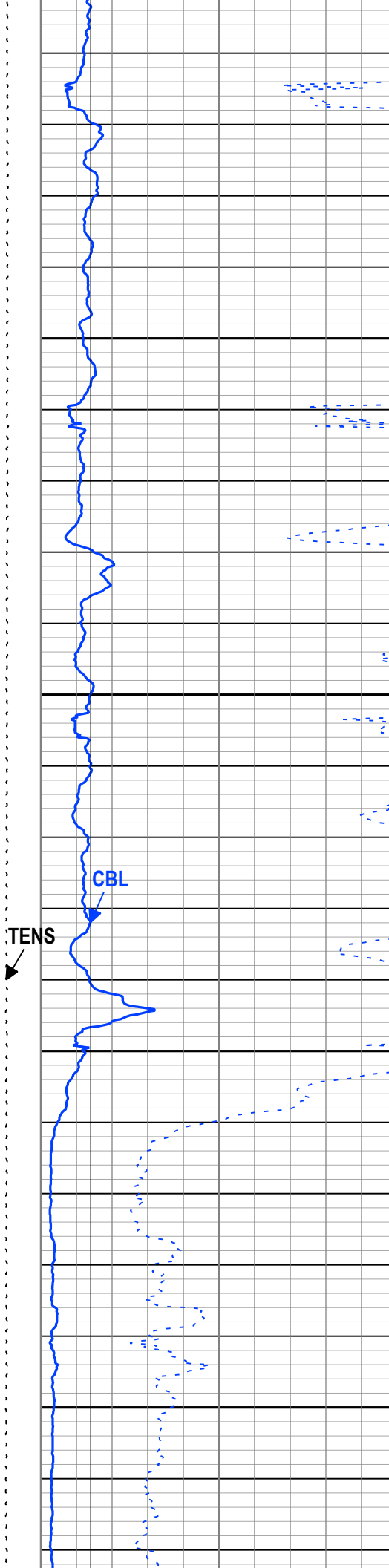
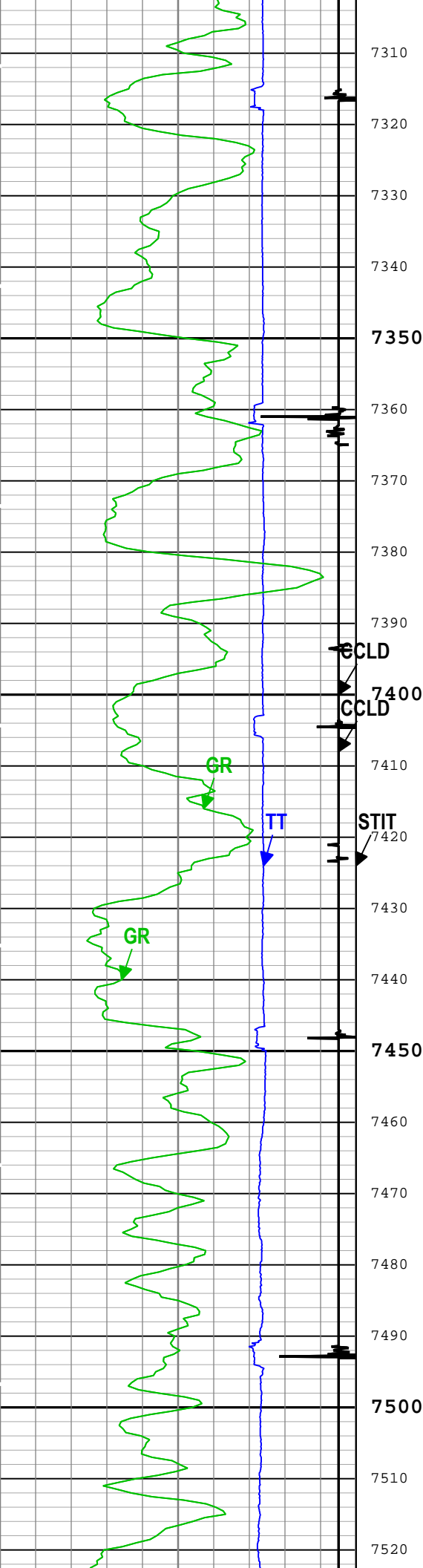


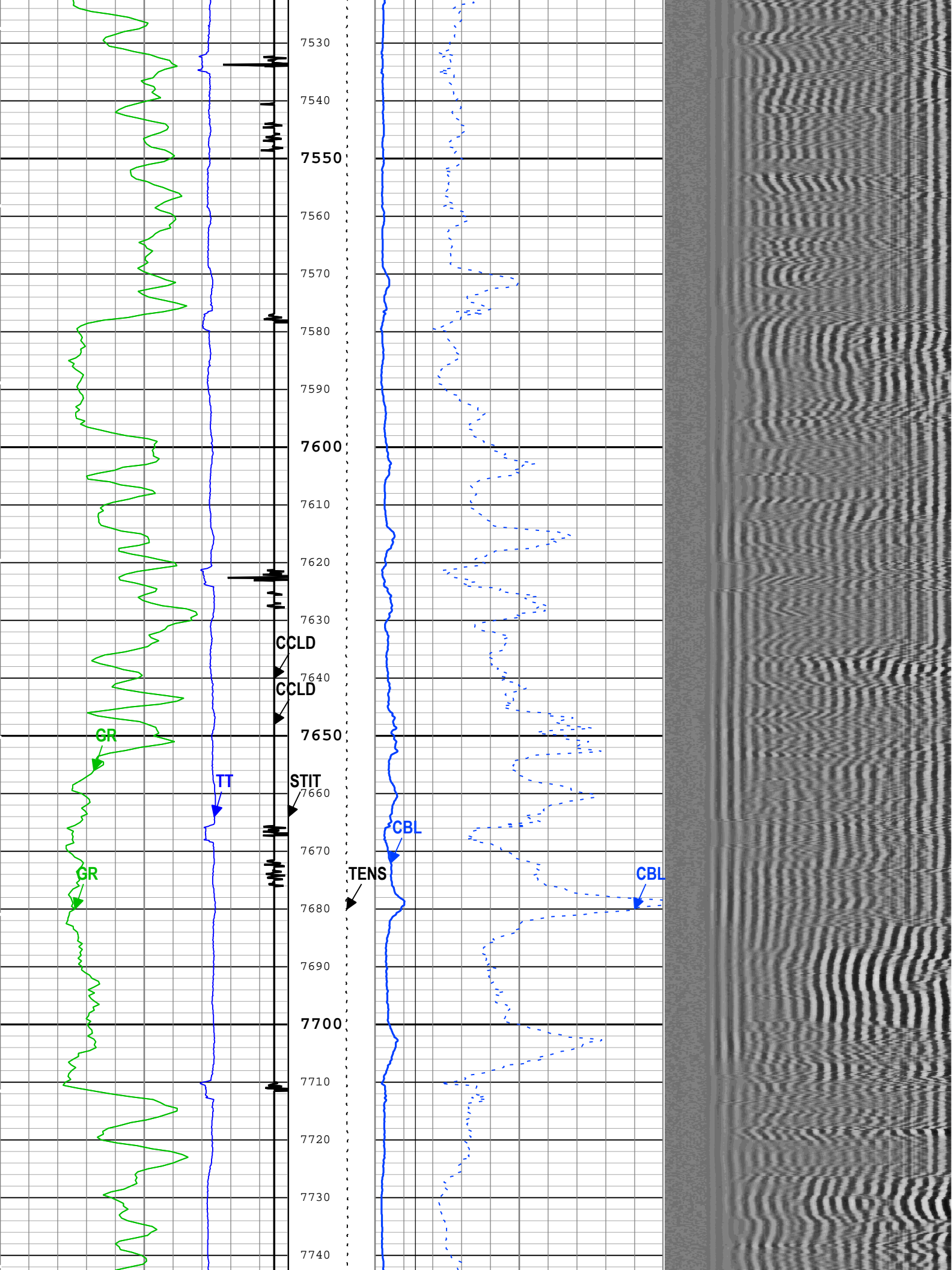


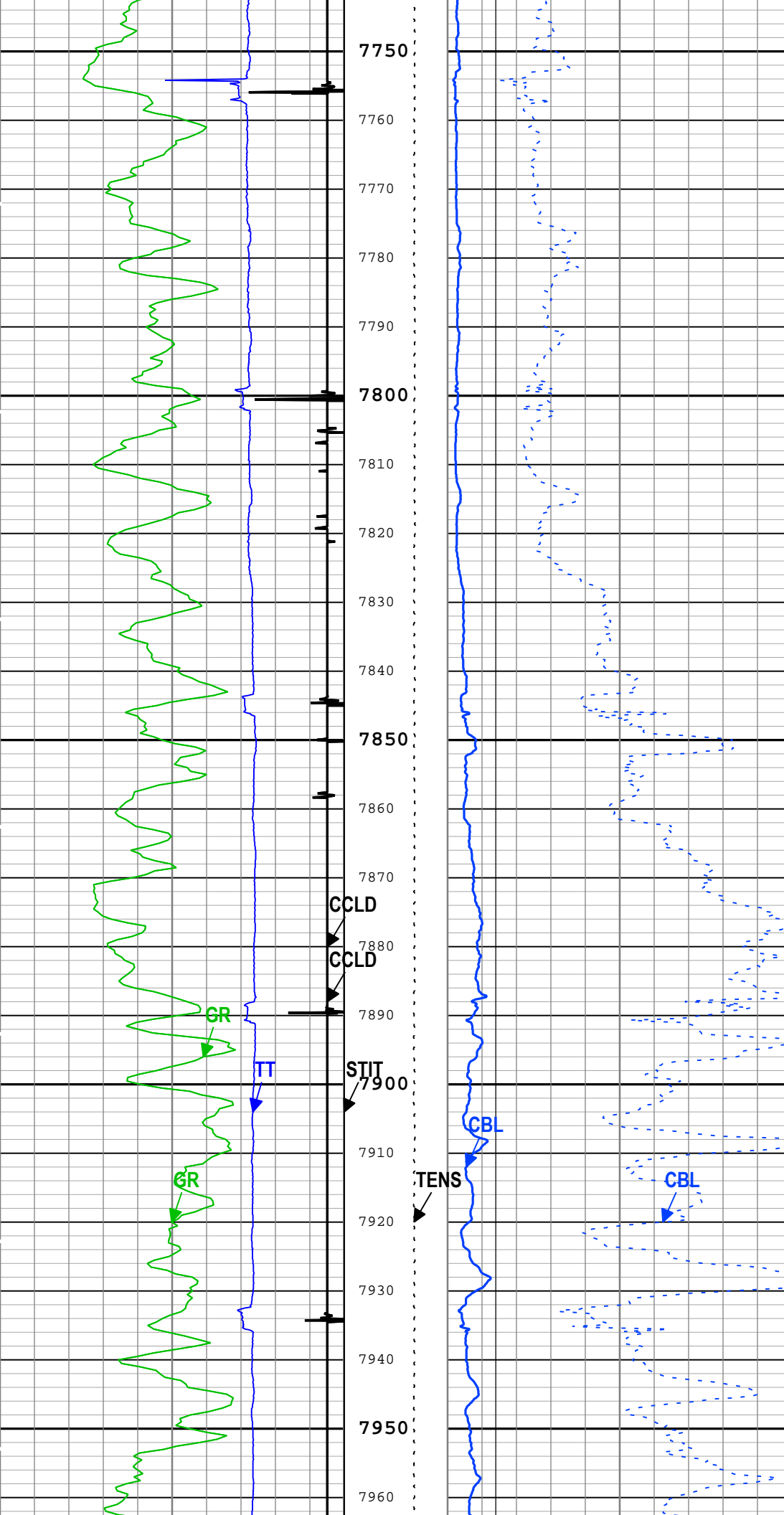


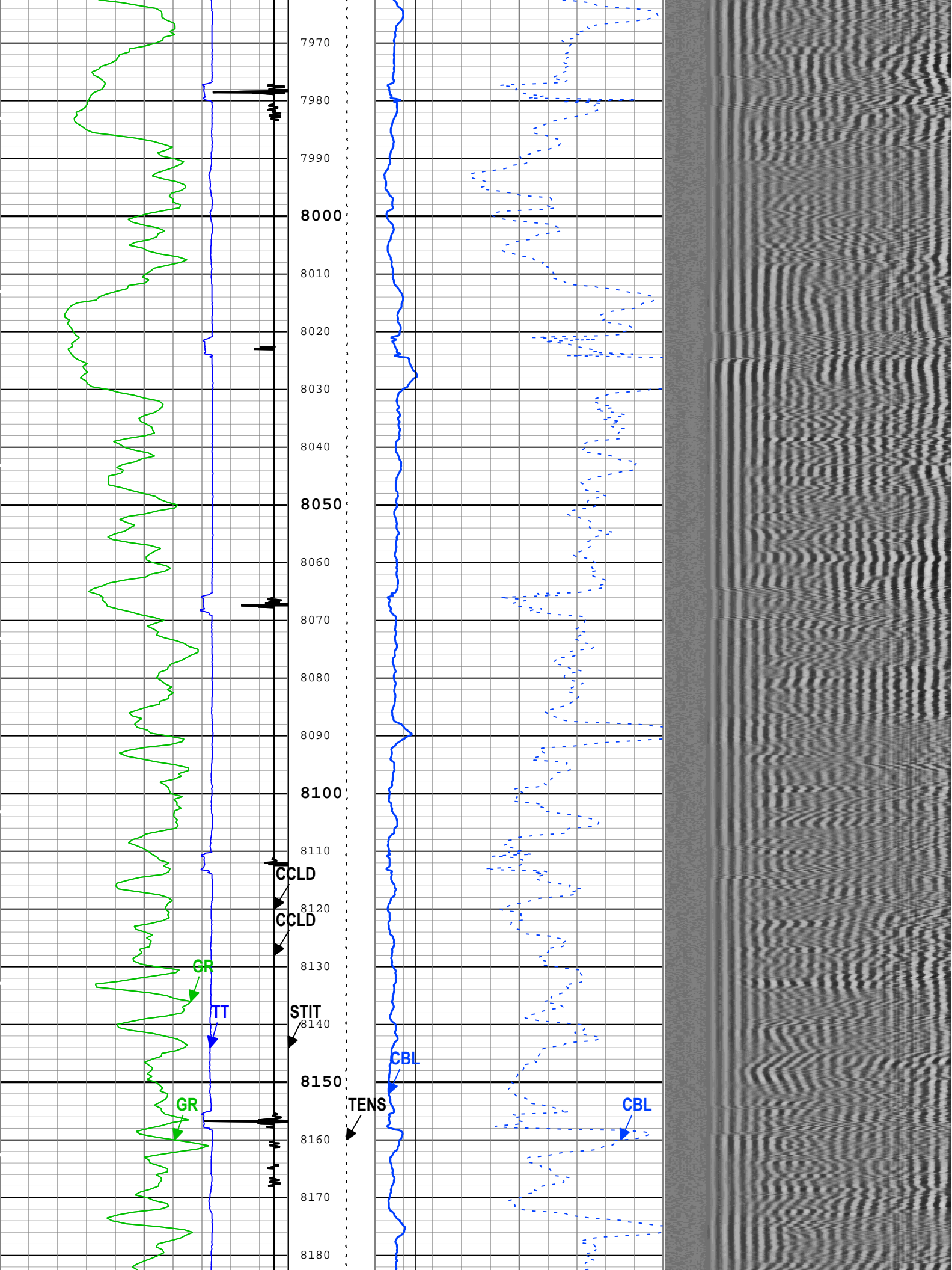


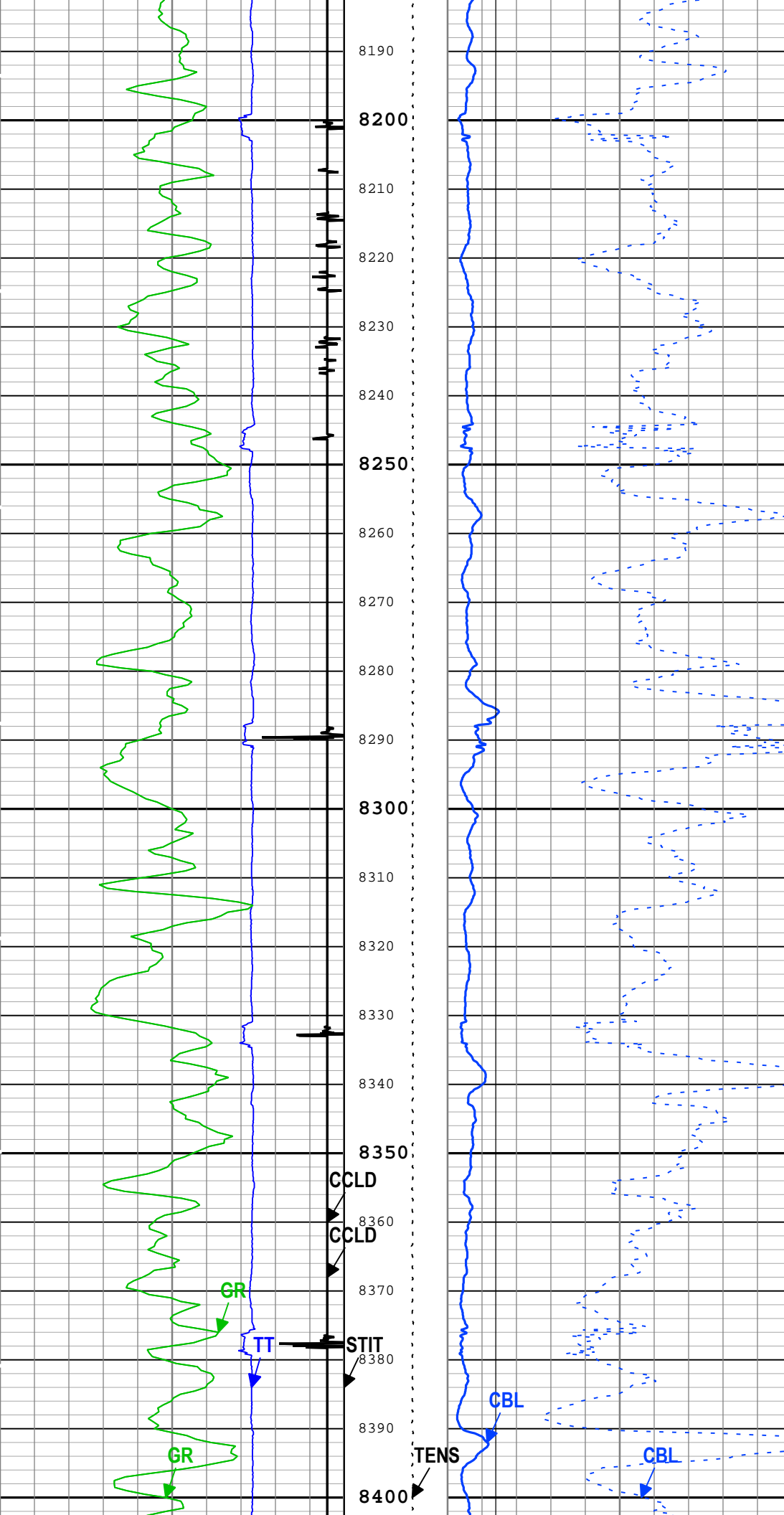


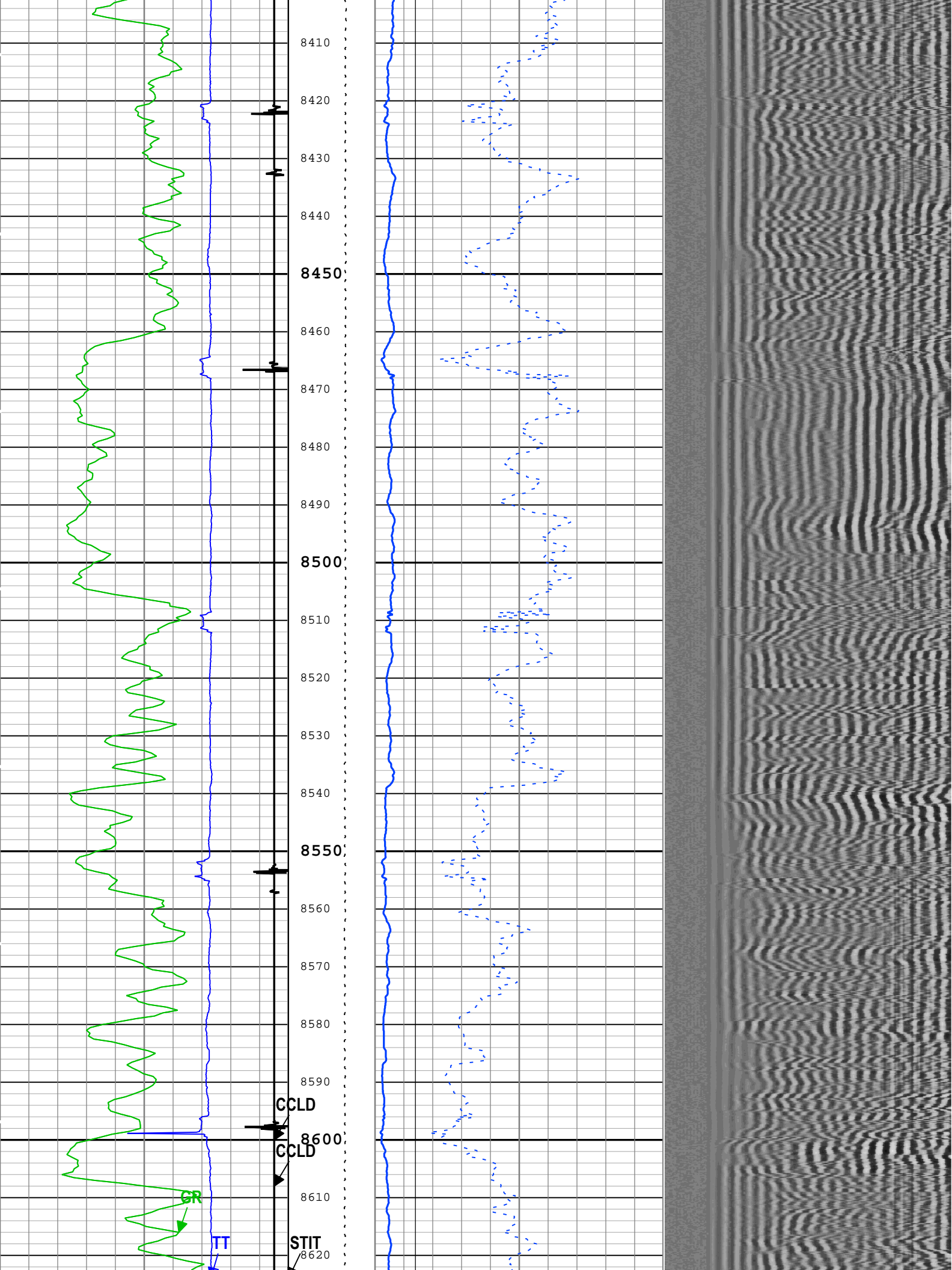


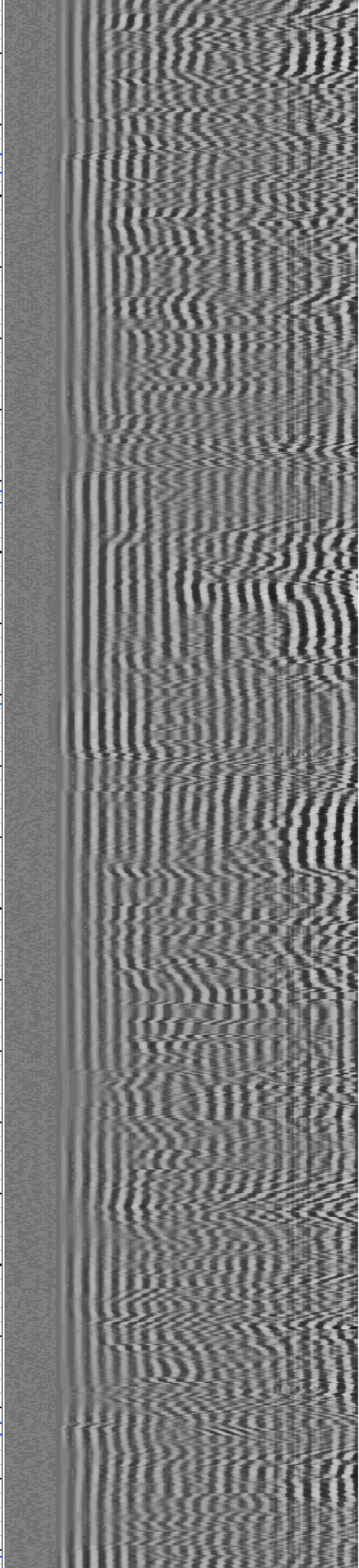
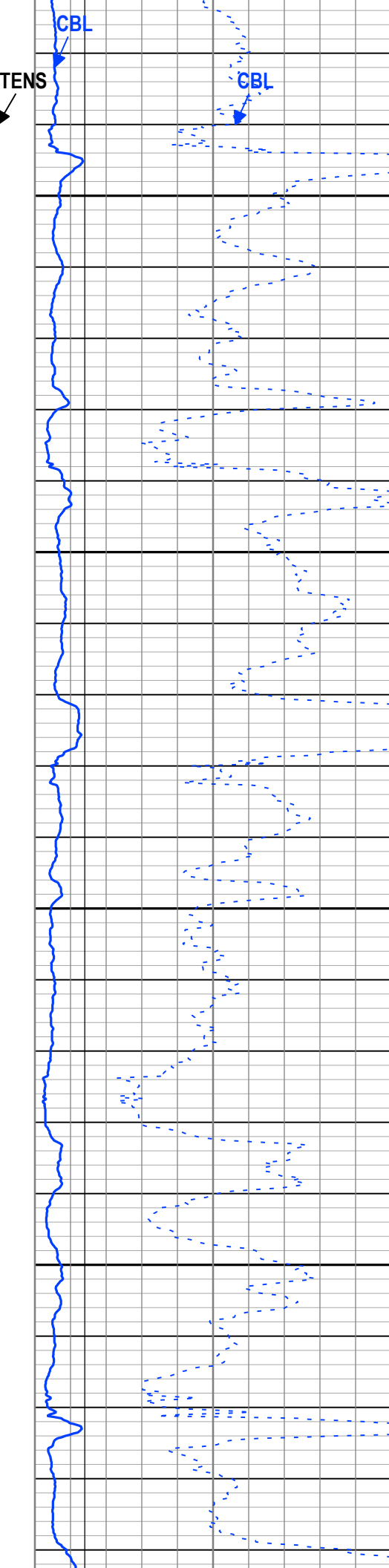
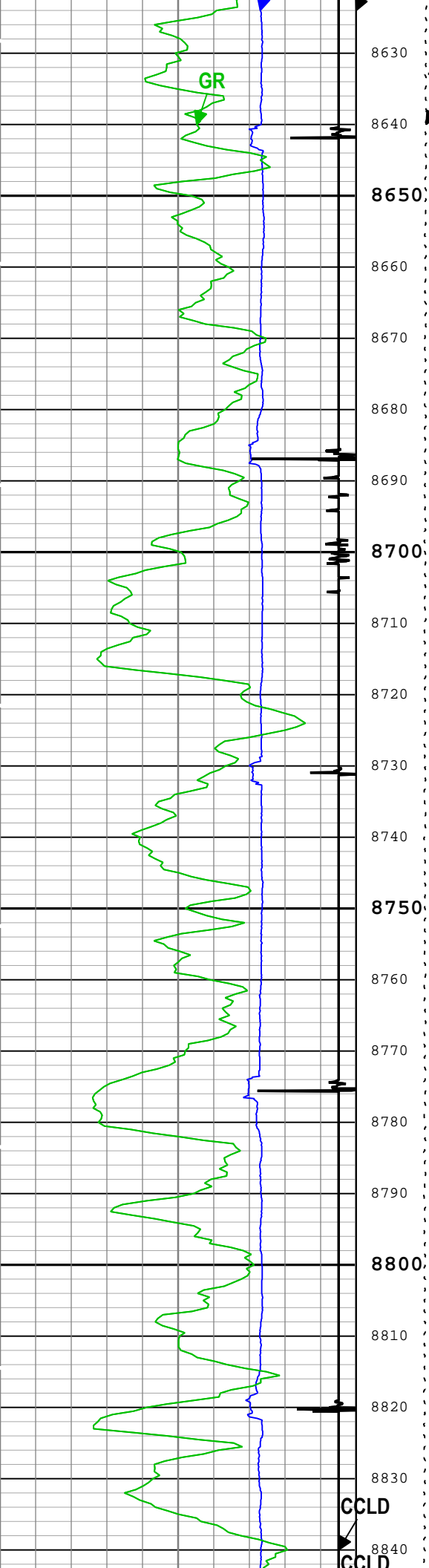


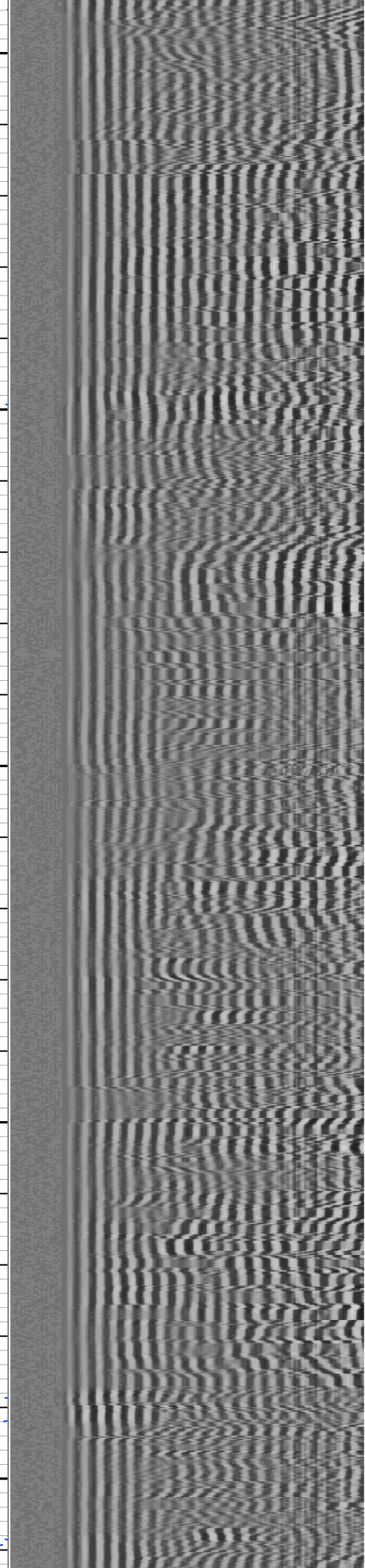
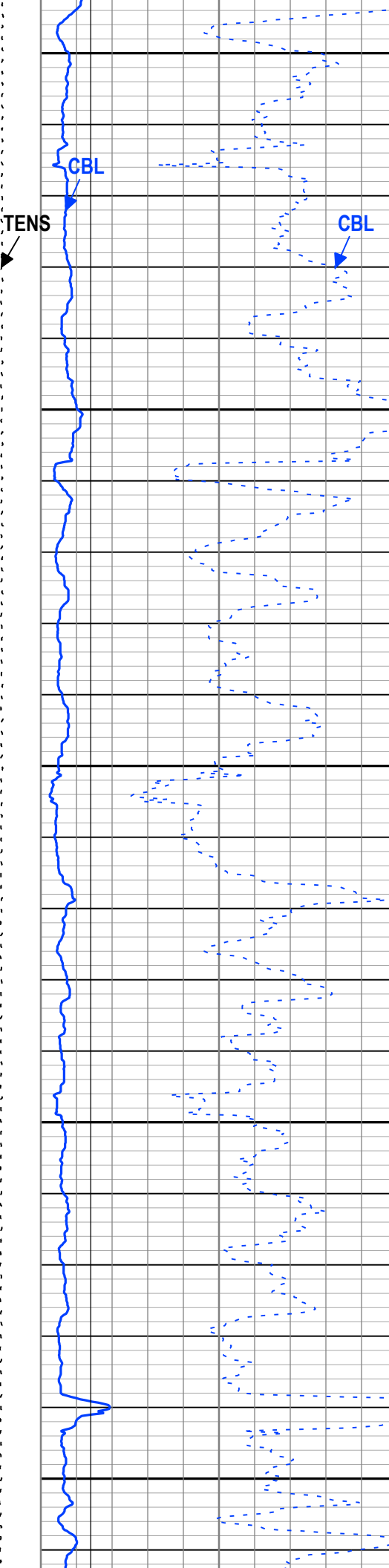
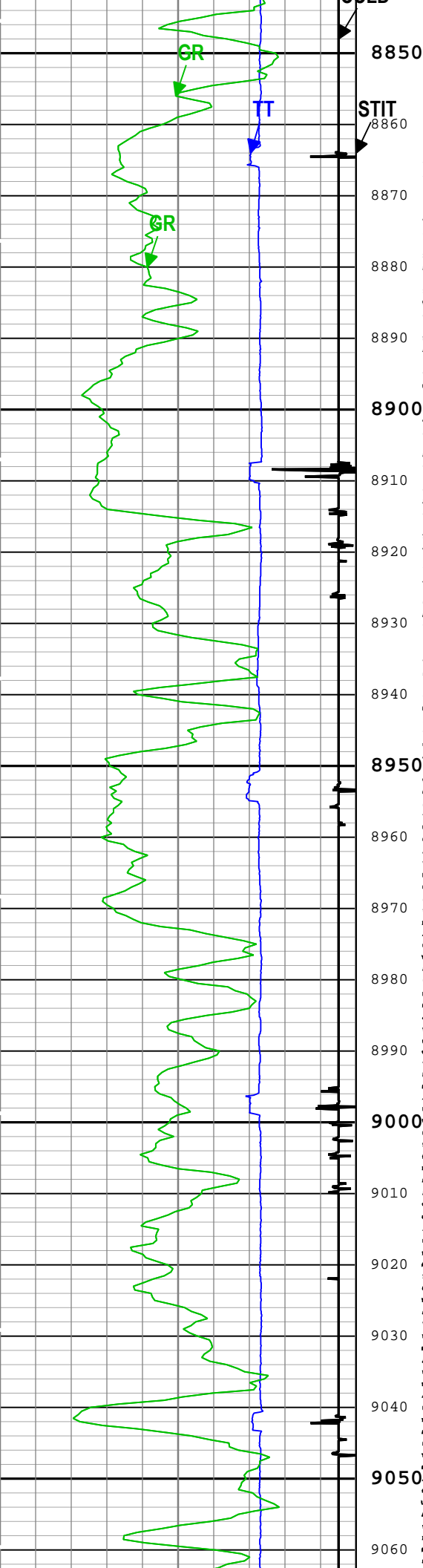


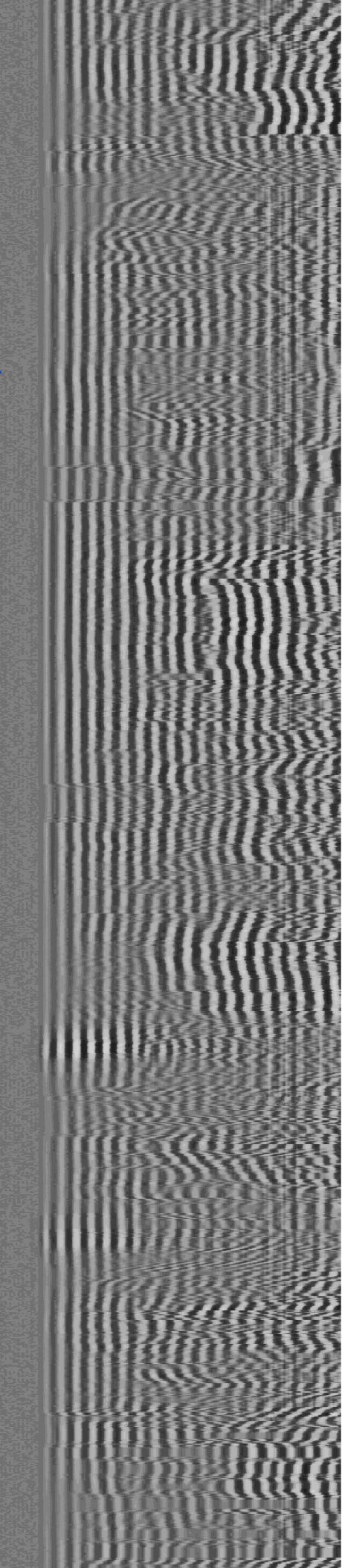
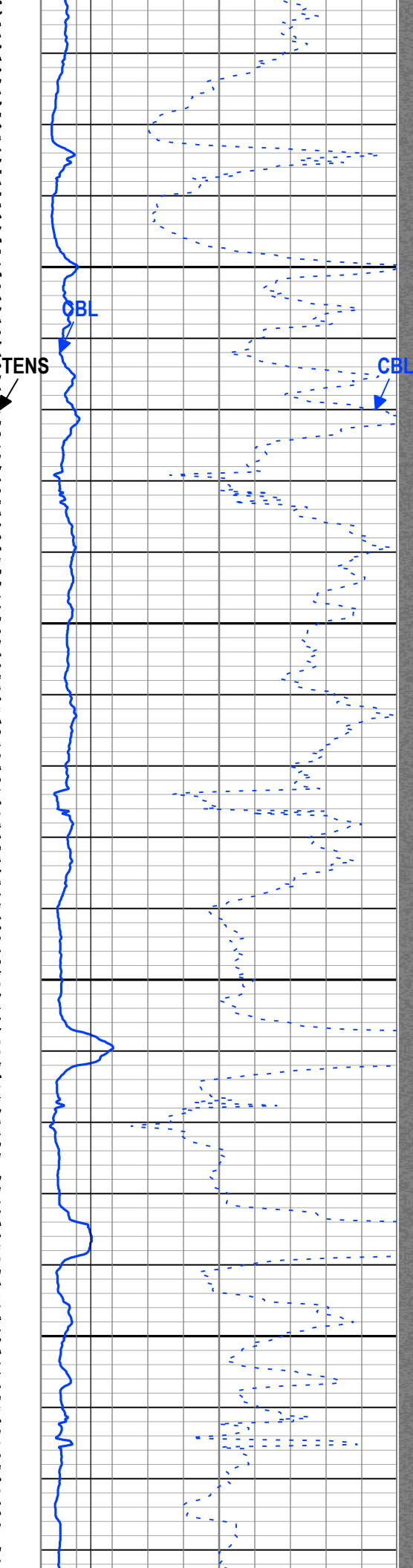
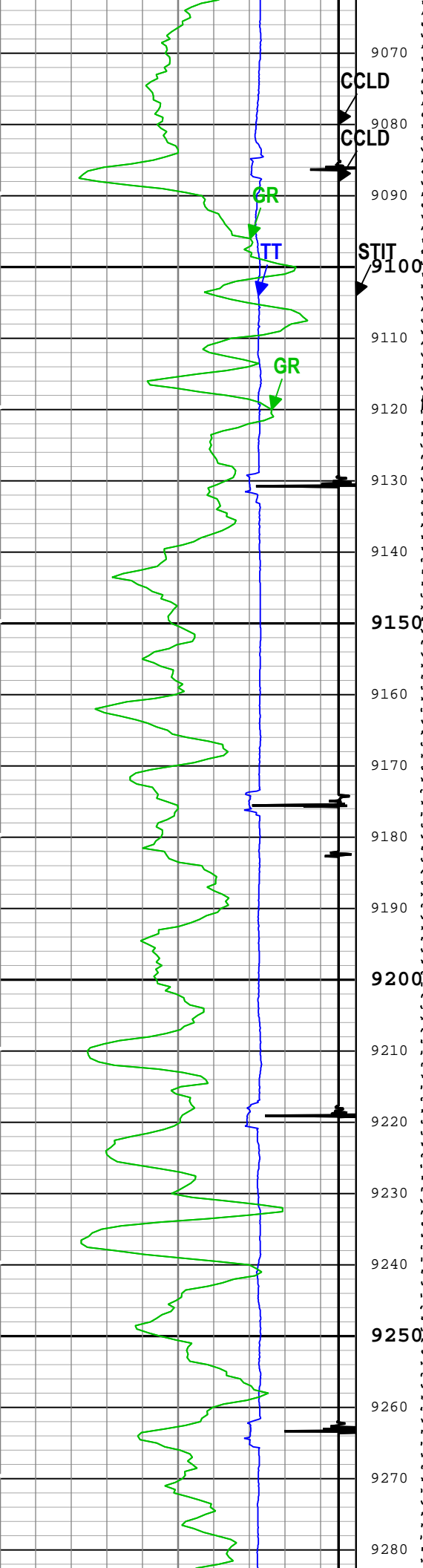


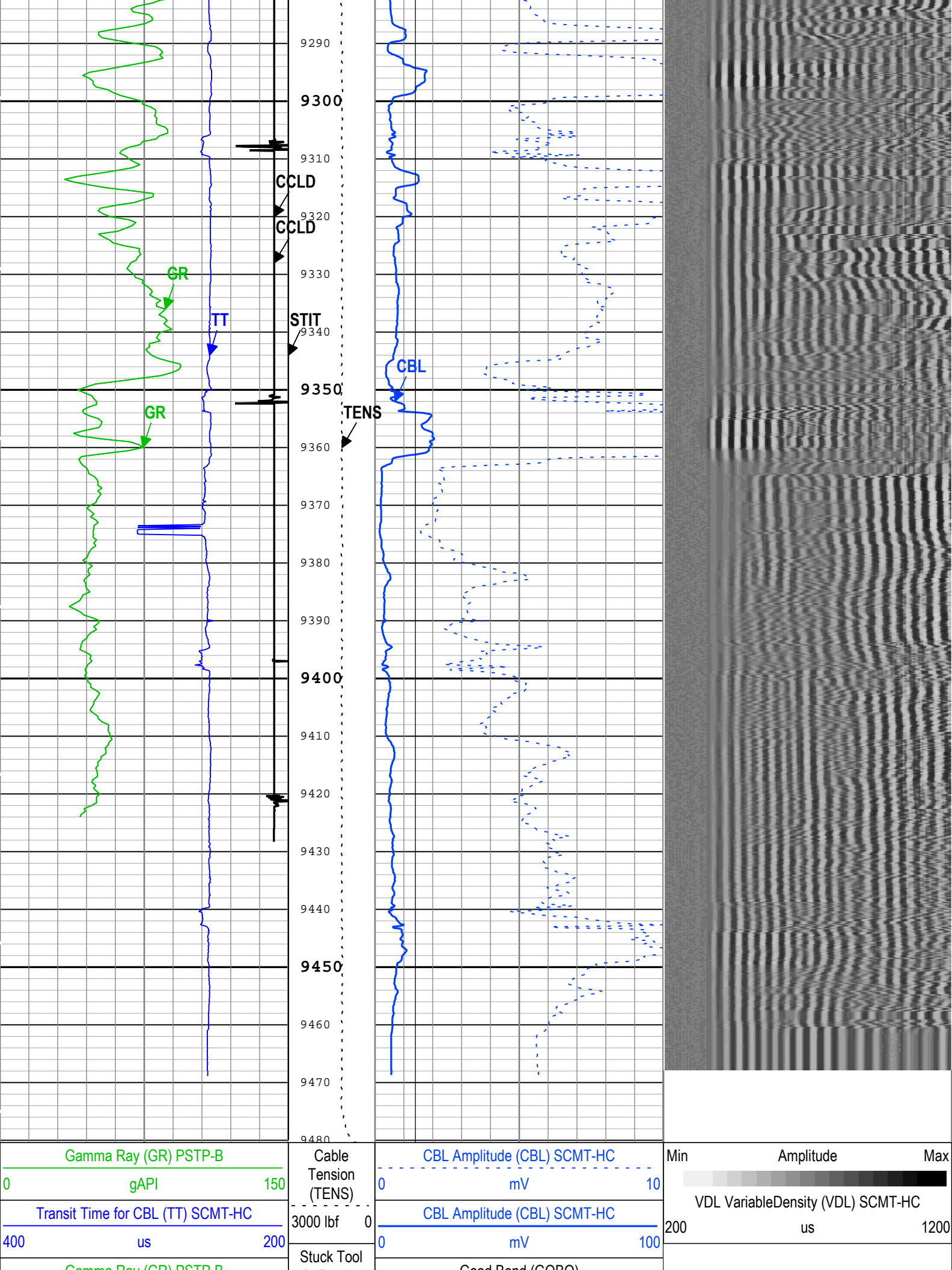


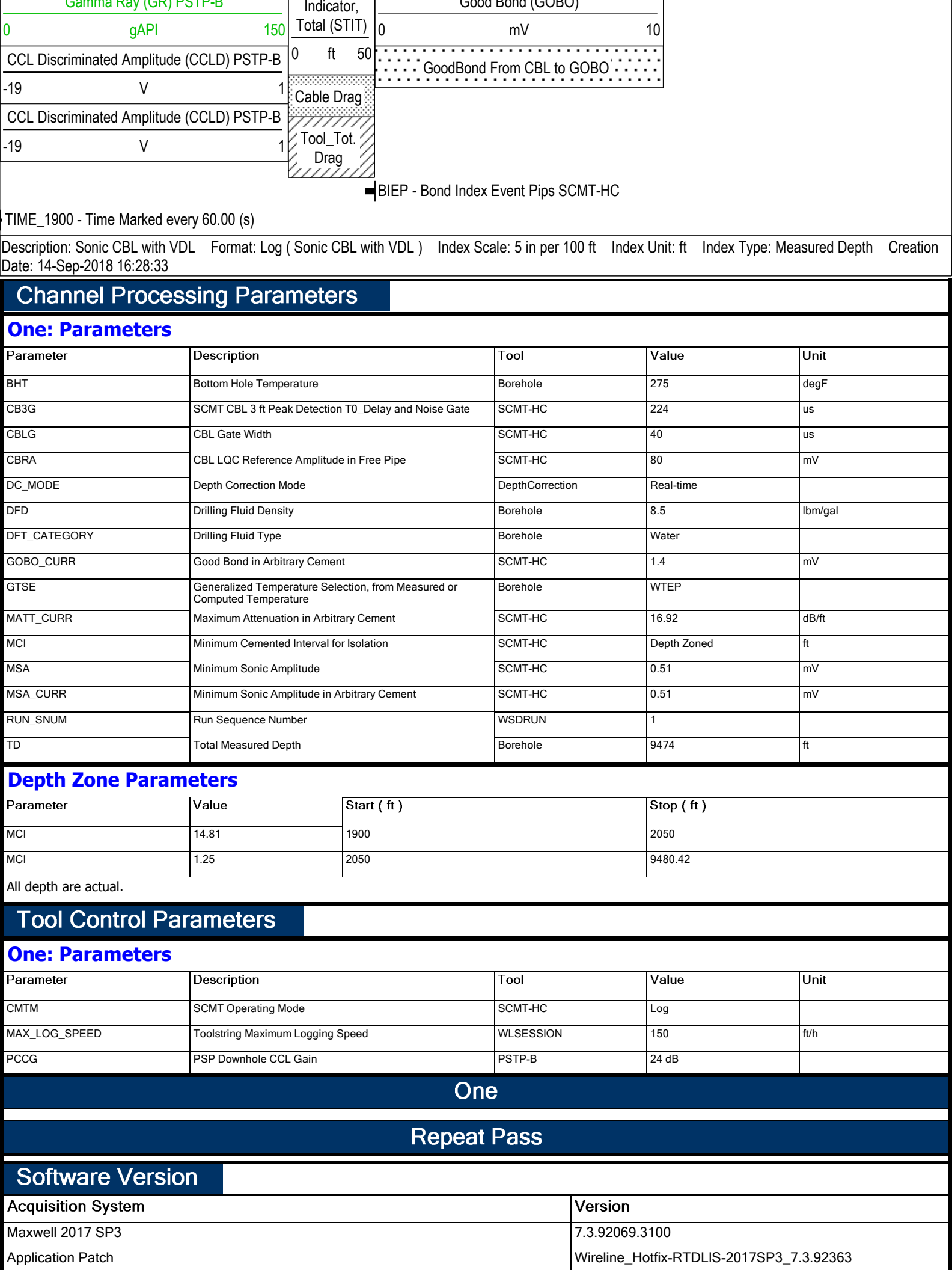












Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[2]:Up	Up	9053.45 ft	9487.42 ft	14-Sep-2018 8:47:14 AM	14-Sep-2018 9:04:51 AM	ON	6.10 ft	No

All depths are referenced to toolstring zero

Log

Company:Caerus Operating LLC

Well:NPR 15A-10 596

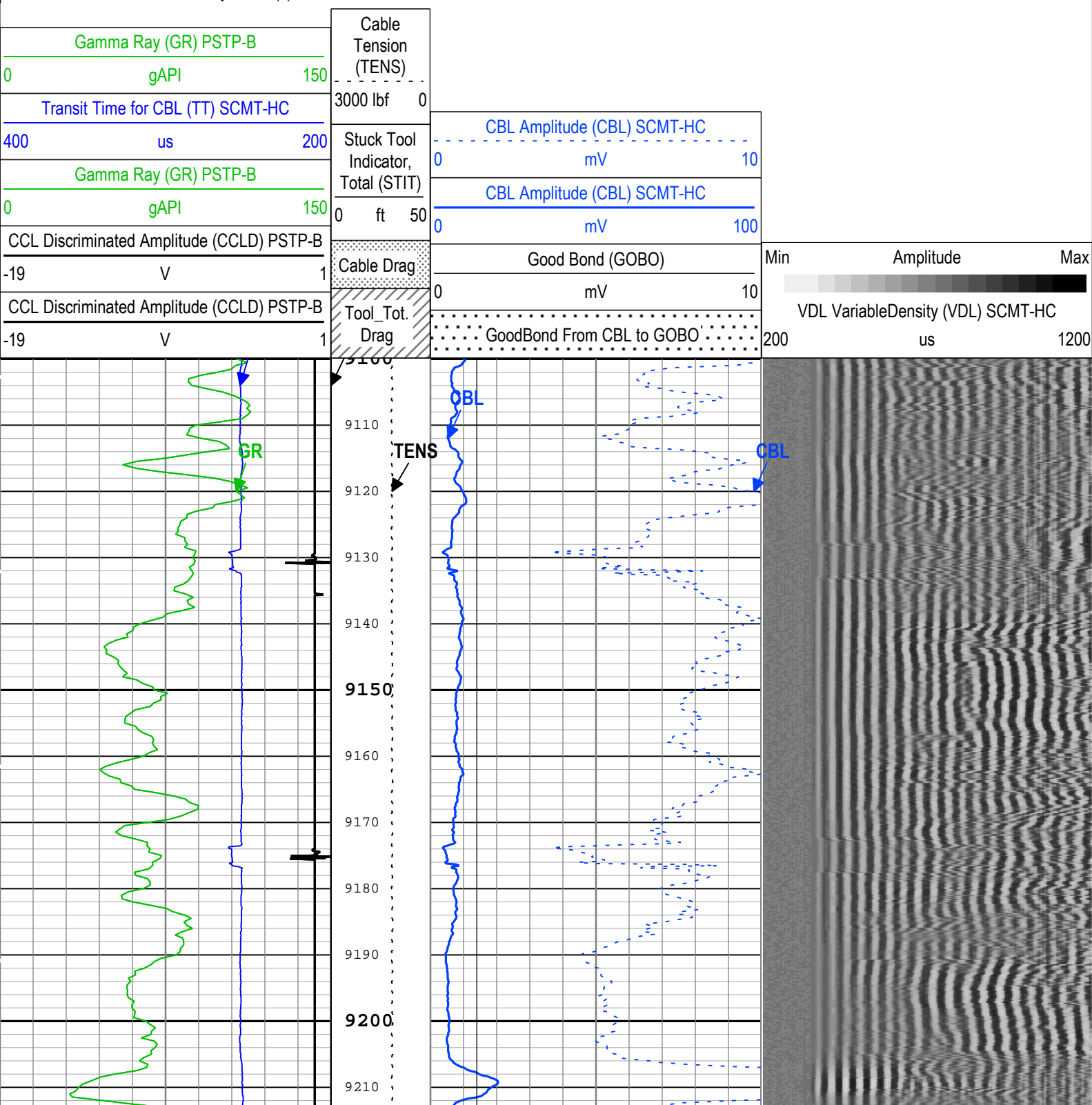
One: Log[2]:Up:S002

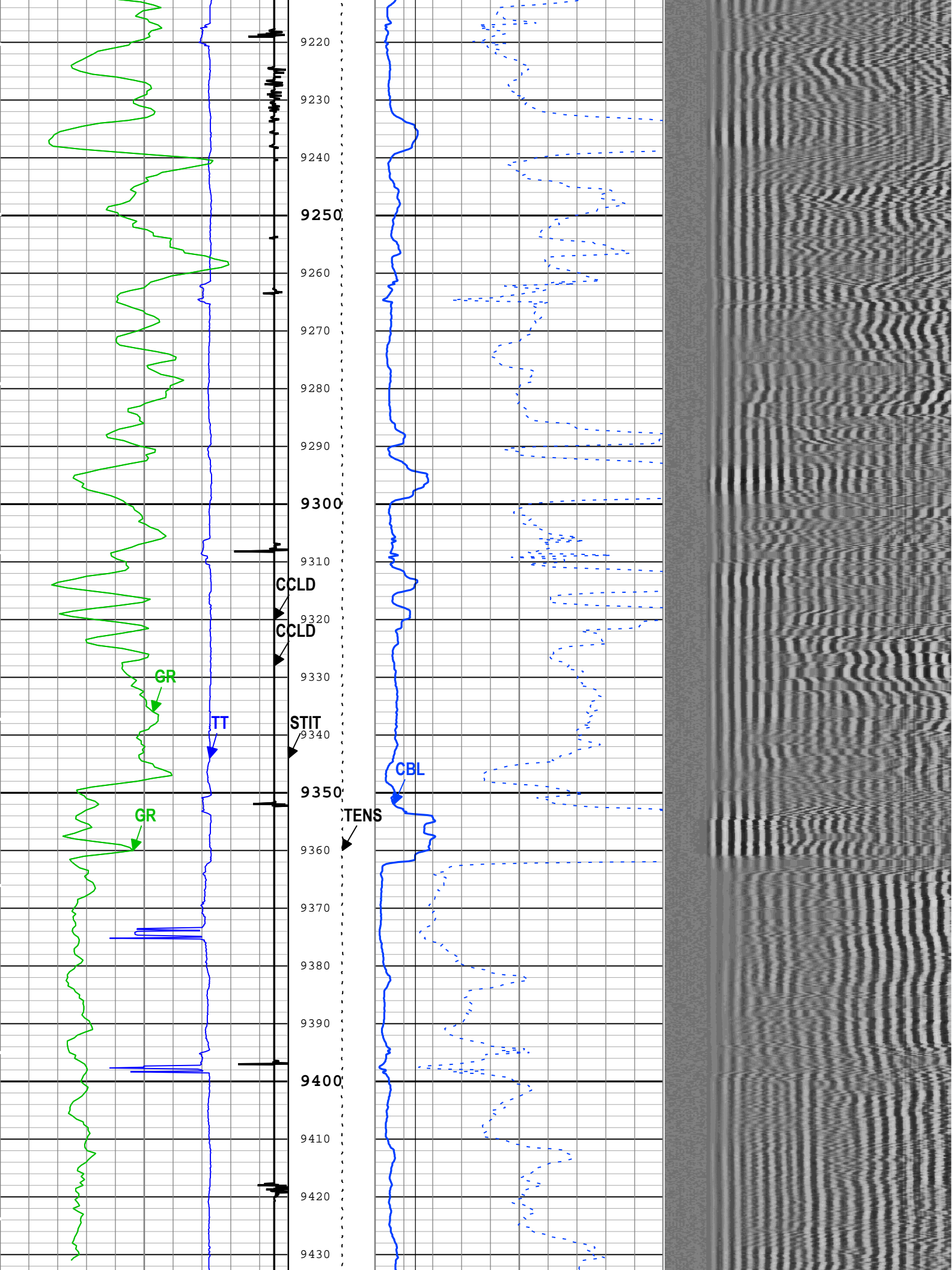
Description: Sonic CBL with VDL Format: Log (Sonic CBL with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation

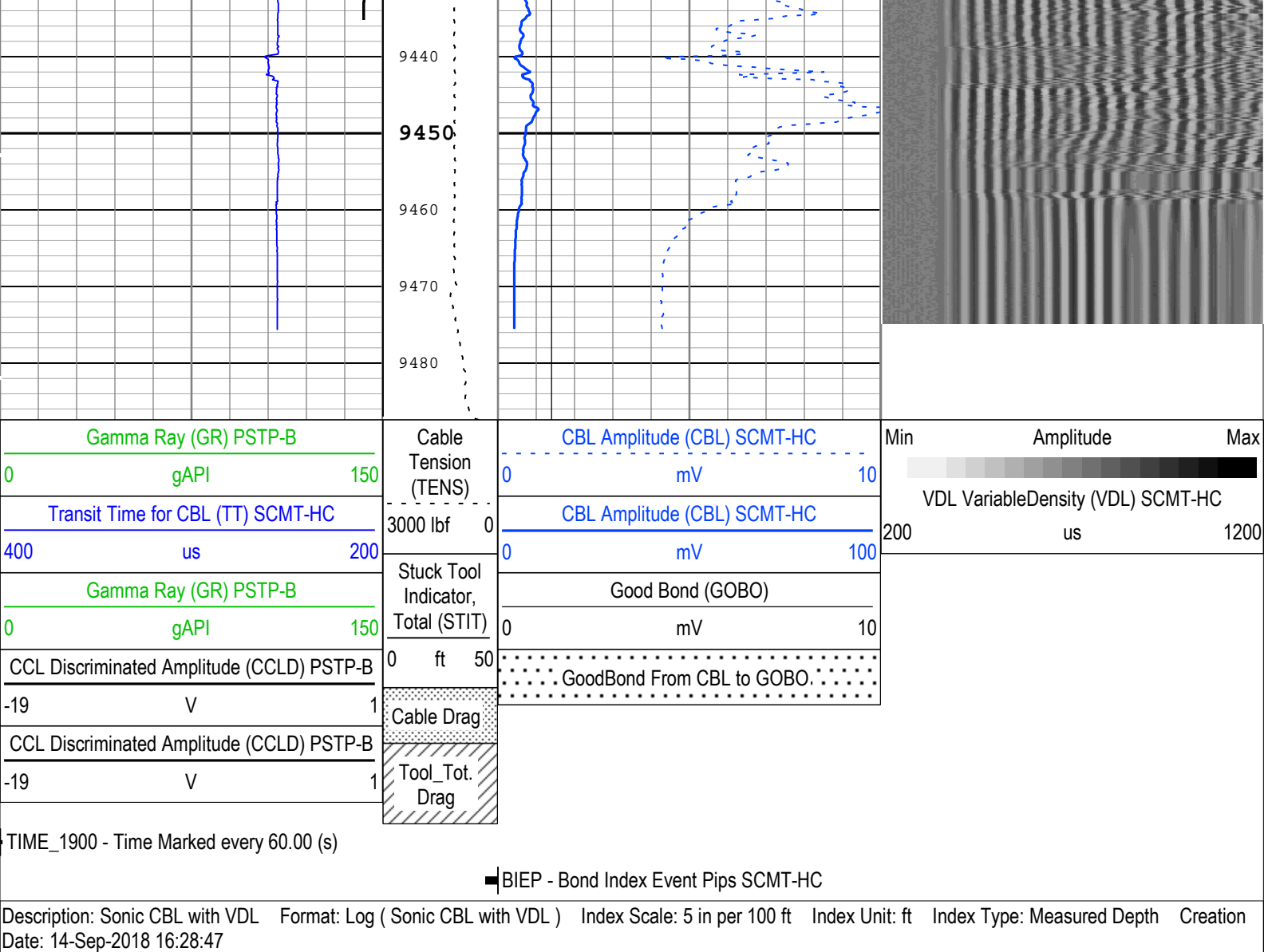
Date: 14-Sep-2018 16:28:47

■ BIEP - Bond Index Event Pips SCMT-HC

TIME_1900 - Time Marked every 60.00 (s)







Channel Processing Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
BHT	Bottom Hole Temperature	Borehole	275	degF
CB3G	SCMT CBL 3 ft Peak Detection T0_Delay and Noise Gate	SCMT-HC	224	us
CBLG	CBL Gate Width	SCMT-HC	40	us
CBRA	CBL LQC Reference Amplitude in Free Pipe	SCMT-HC	80	mV
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.5	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
GOBO_CURR	Good Bond in Arbitrary Cement	SCMT-HC	1.4	mV
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	WTEP	
MATT_CURR	Maximum Attenuation in Arbitrary Cement	SCMT-HC	16.92	dB/ft
MCI	Minimum Cemented Interval for Isolation	SCMT-HC	1.25	ft
MSA	Minimum Sonic Amplitude	SCMT-HC	0.51	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	SCMT-HC	0.51	mV
RUN_SNUM	Run Sequence Number	WSDRUN	1	
TD	Total Measured Depth	Borehole	9474	ft

Tool Control Parameters				
One: Parameters				

TIME_1900 - Time Marked every 60.00 (s)

—| IHV - Integrated Hole Volume every 10.00 (ft3)

—| IHV - Integrated Hole Volume every 100.00 (ft3)

—| ICV - Integrated Cement Volume every 10.00 (ft3)

—| ICV - Integrated Cement Volume every 100.00 (ft3)

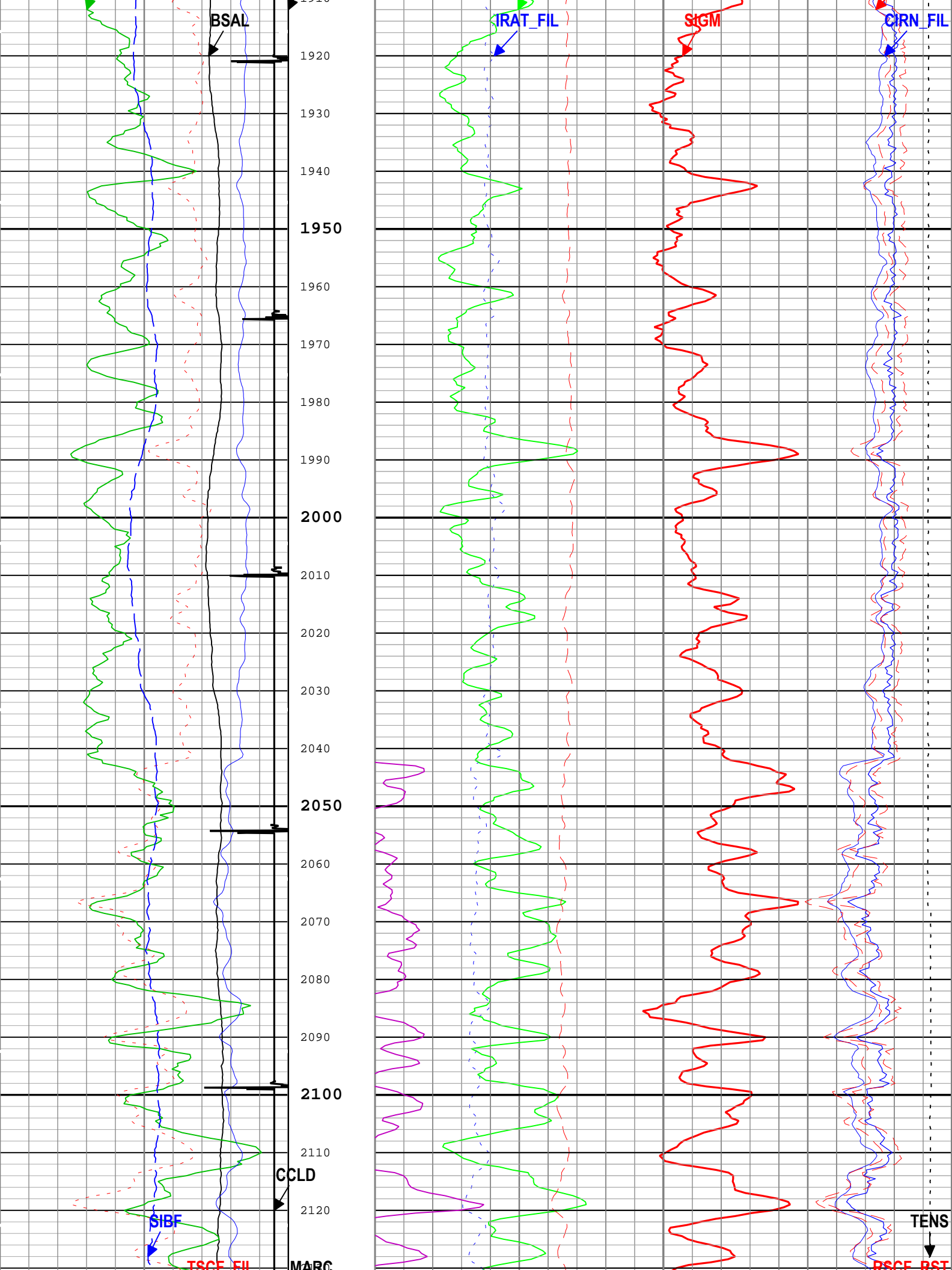
Borehole Salinity (BSAL) RST-C	Stuck Tool Indicator, Total (STIT)	Capture to Inelastic Ratio Near Filtered (CIRN_FIL) RST-C
450 ppk -50	0 ft 50	2.5
Gamma Ray (GR) PSTP-B	Cable Drag From STIA to STIT	Capture to Inelastic Ratio Far Filtered (CIRF_FIL) RST-C
0 gAPI 150		5
Total Selected Count Rate Near Detector Filtered (TSCN_FIL) RST-C	Tool_Tot. Drag From D3T to STIT	Near Detector Effective Unregulated Capture Count Rate (RSCN_RST) RST-C
30000 1/s 0		45
Total Selected Count Rate Far Detector Filtered (TSCF_FIL) RST-C	Minitron Arc Count (MARC) RST-C	Far Detector Effective Unregulated Capture Count Rate (RSCF_RST) RST-C
12000 1/s 0	0 5	45
Sigma Borehole Fluid (SIBF) RST-C		Cable Tension (TENS)
100 cu 0		5000 lbf
CCL Discriminated Amplitude (CCLD) PSTP-B		Formation Sigma (Neutron Capture Cross Section) (SIGM) RST-C
-19 V 1		60 cu
		Weighted Inelastic Ratio (WINR_RST) RST-C
		0 0.4

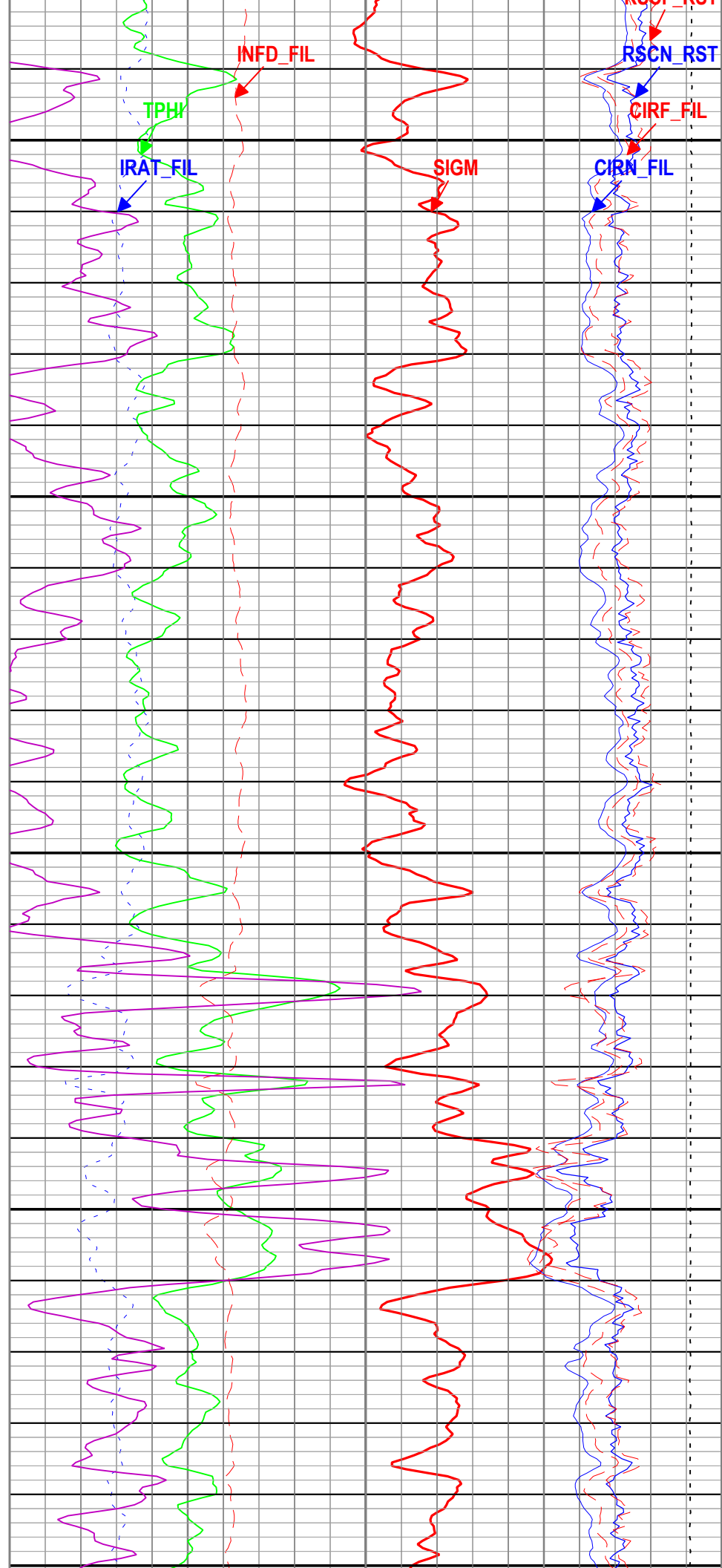
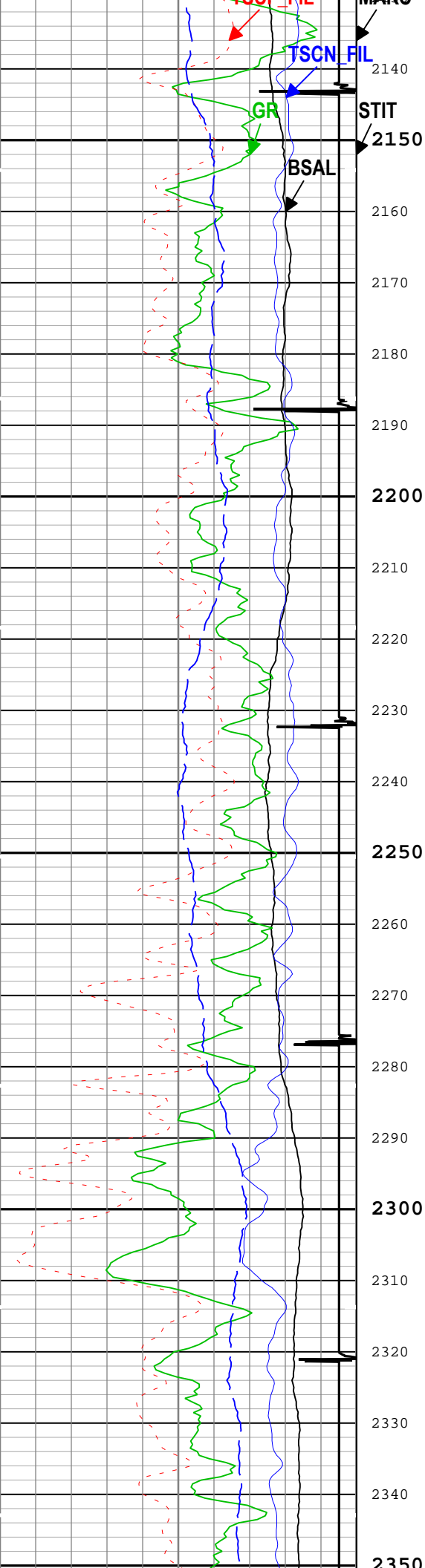
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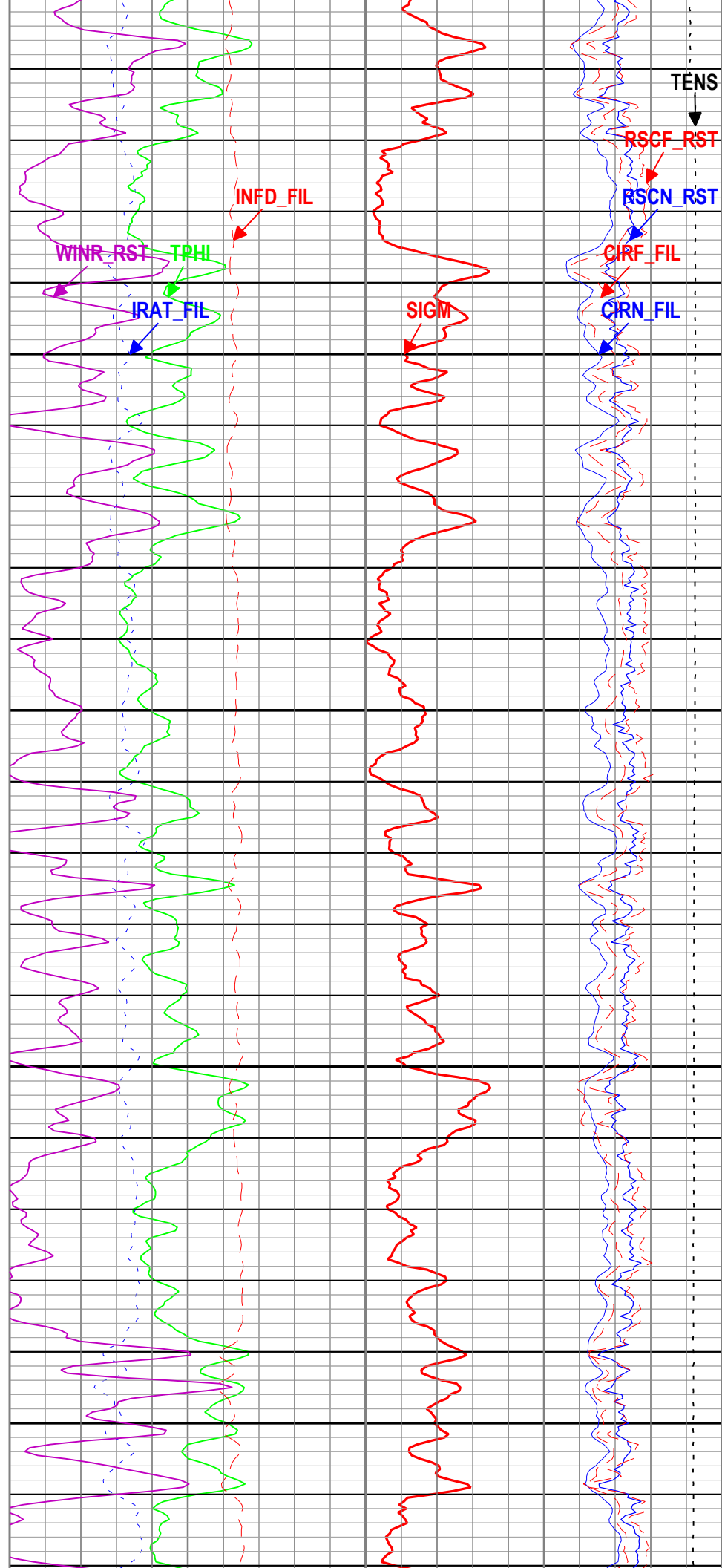
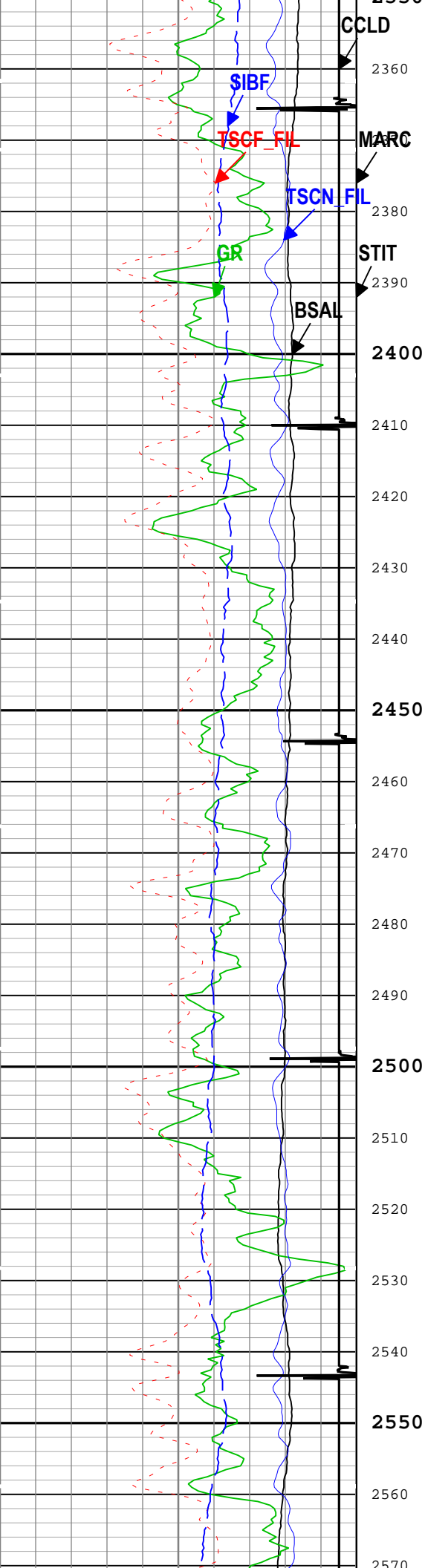
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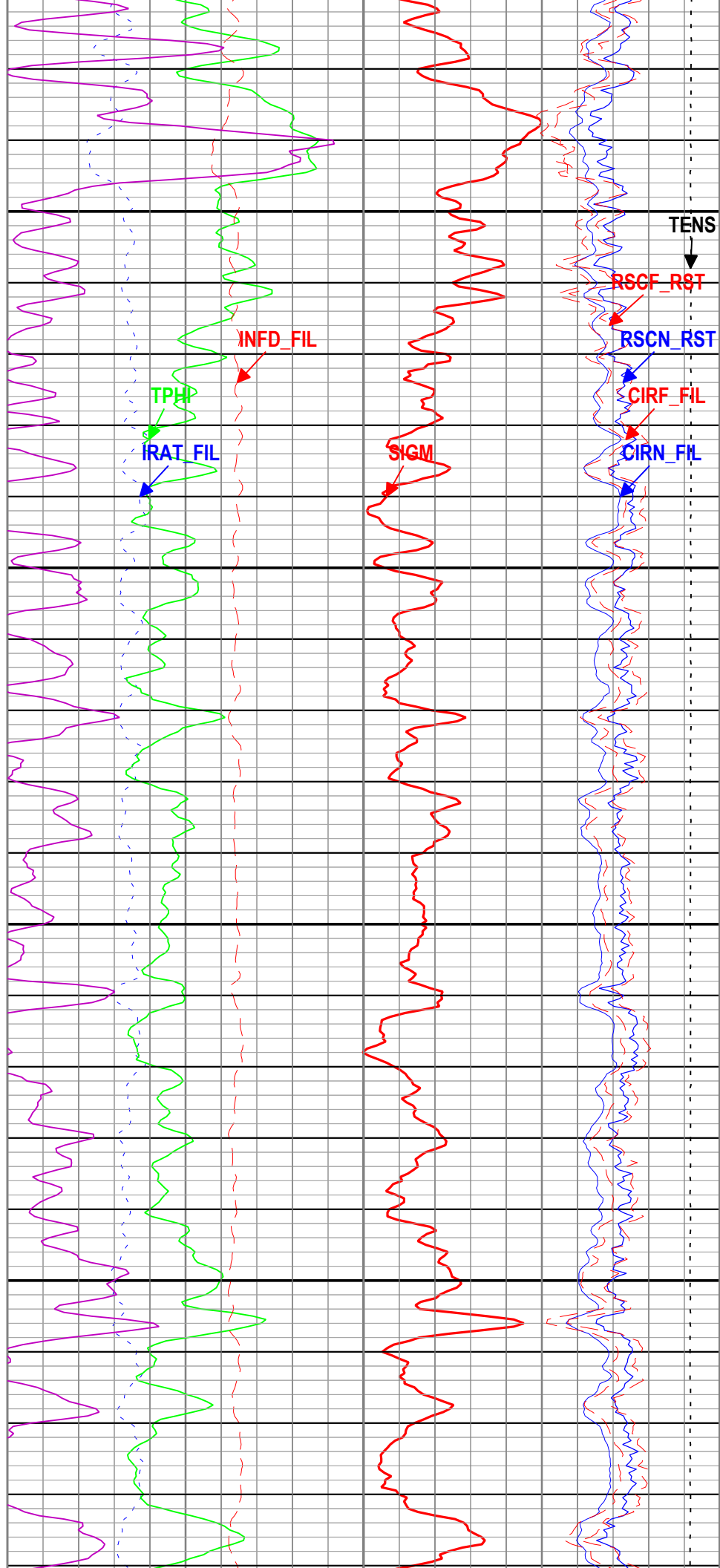
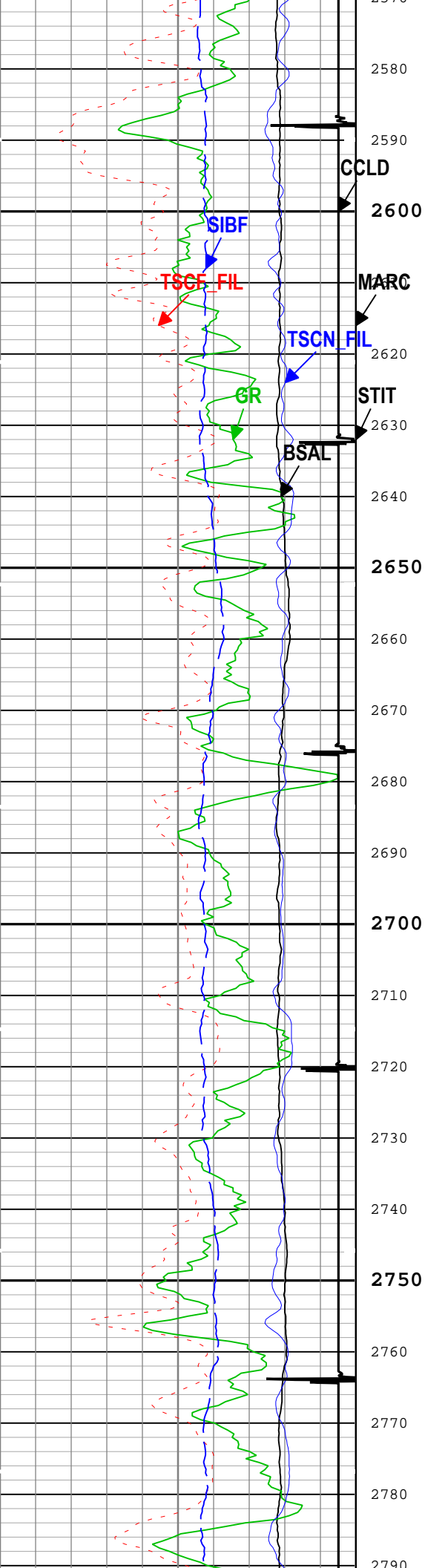
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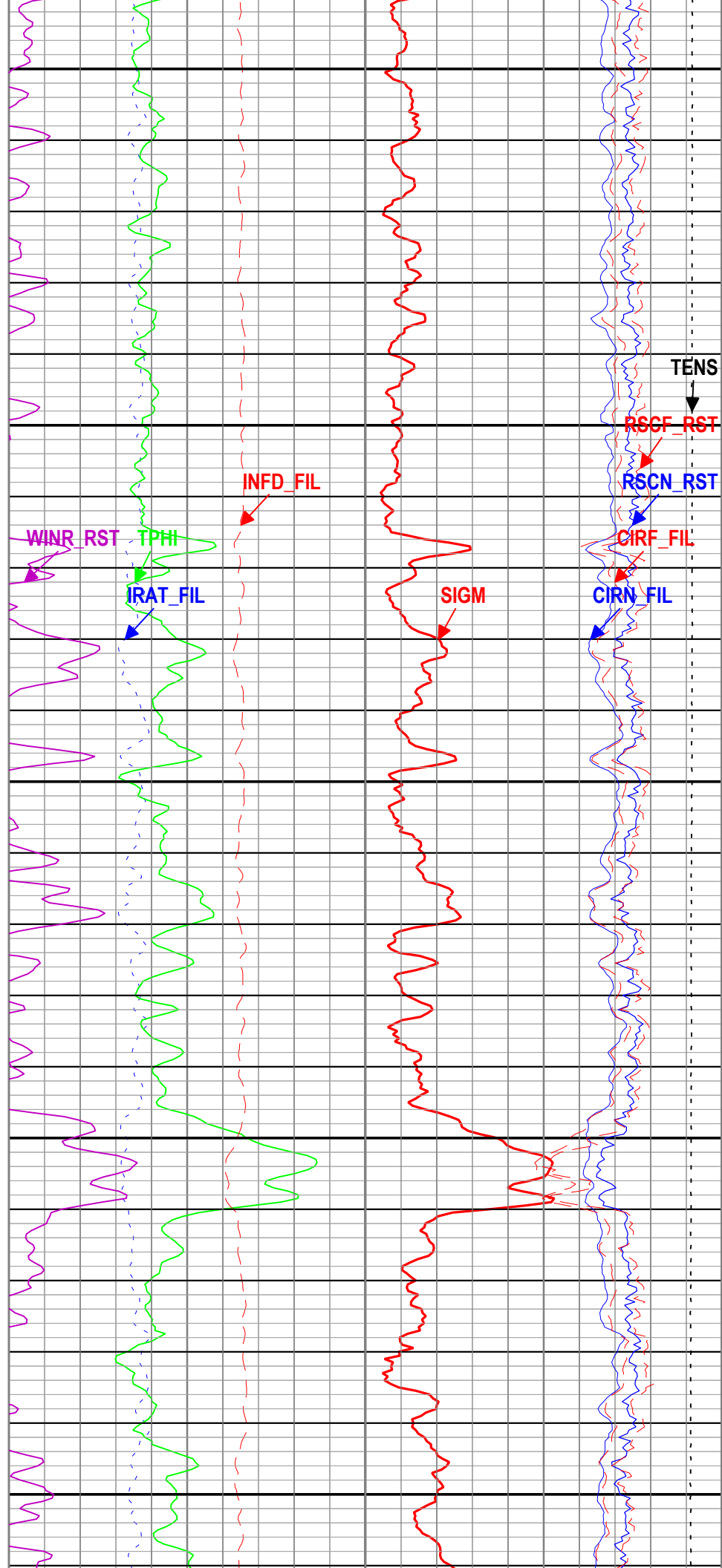
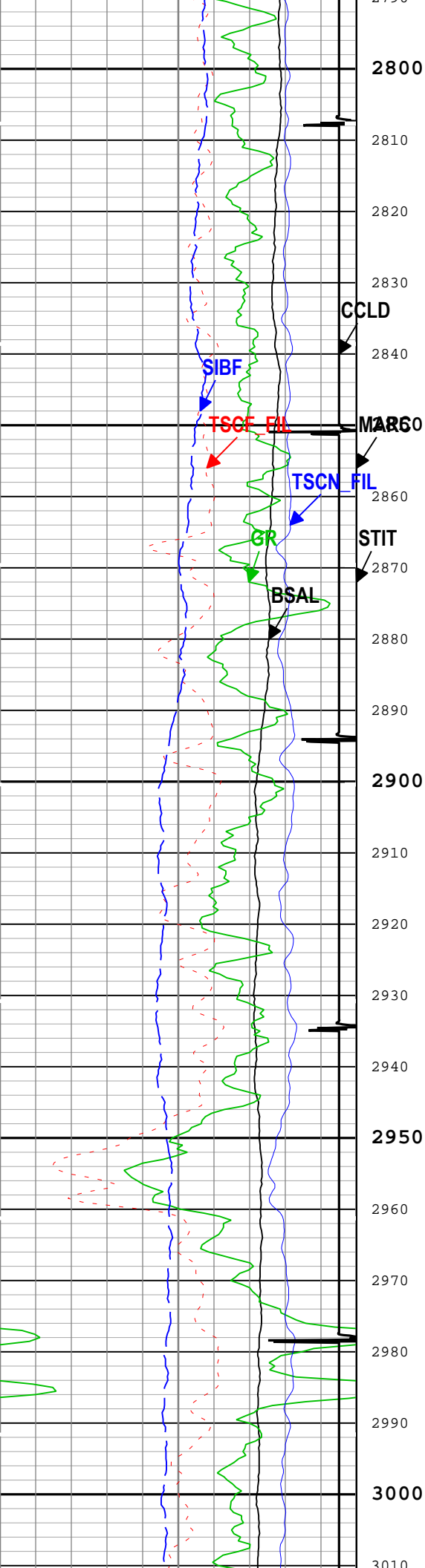
CIRF_FIL

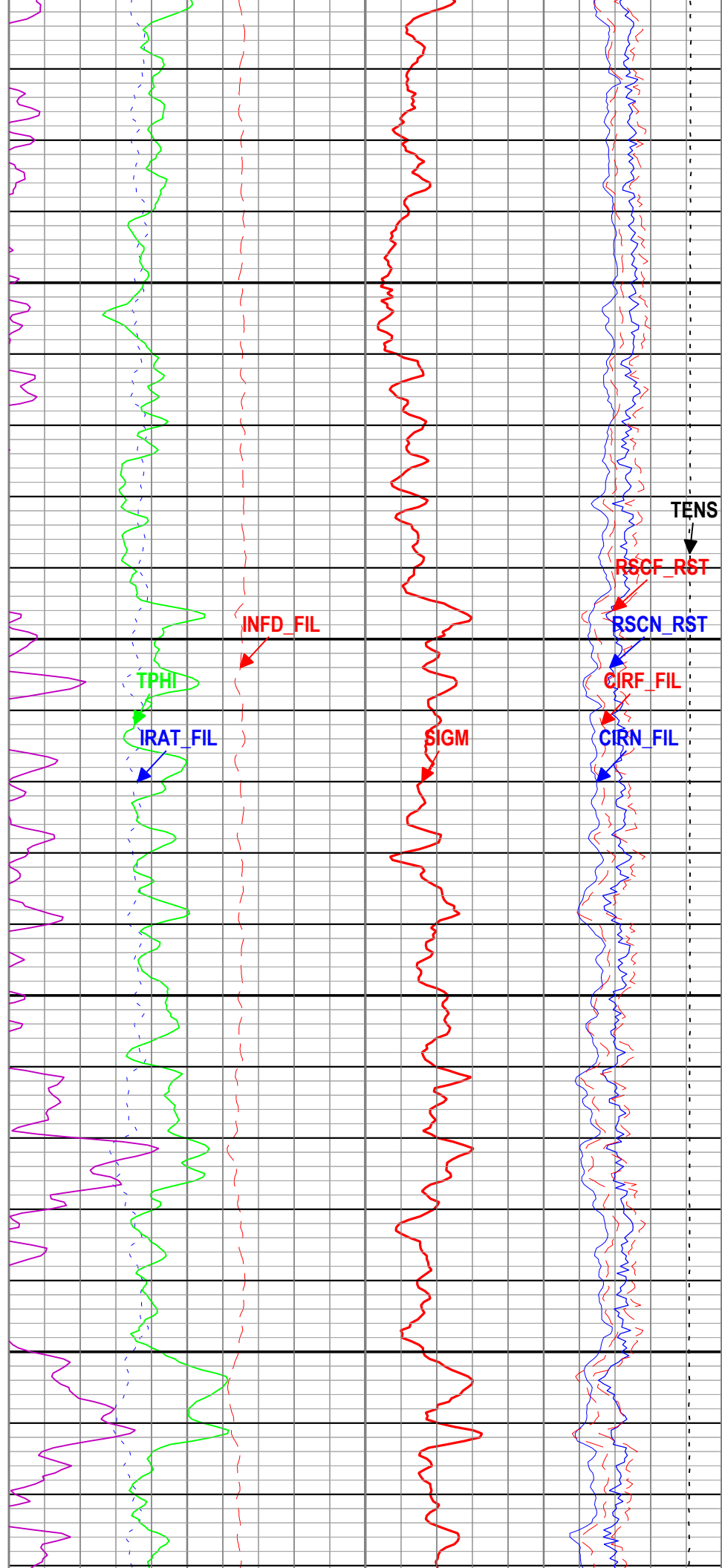
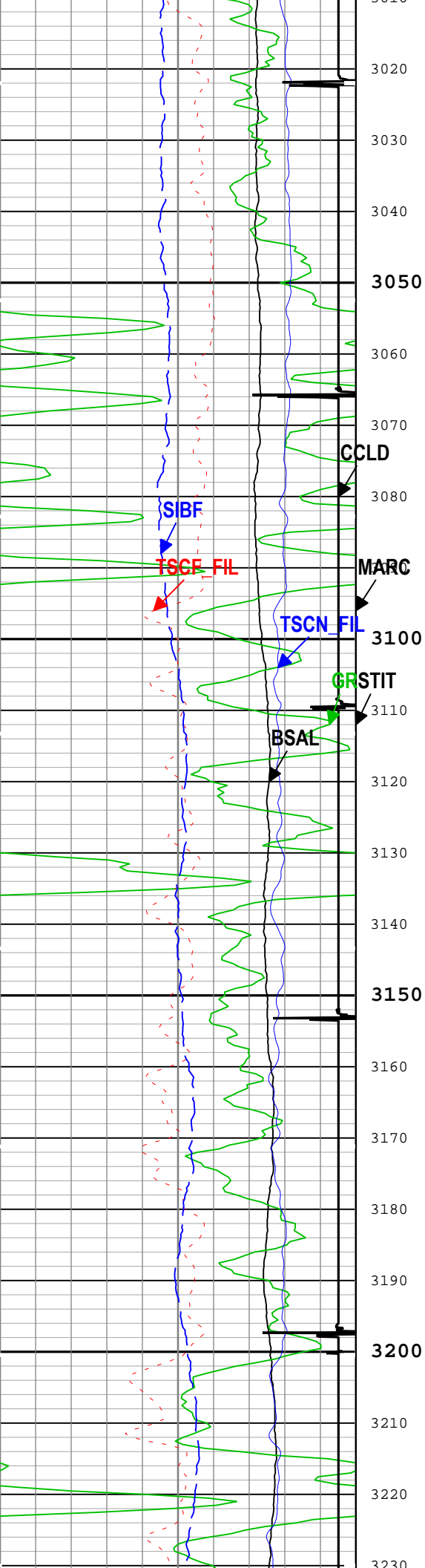


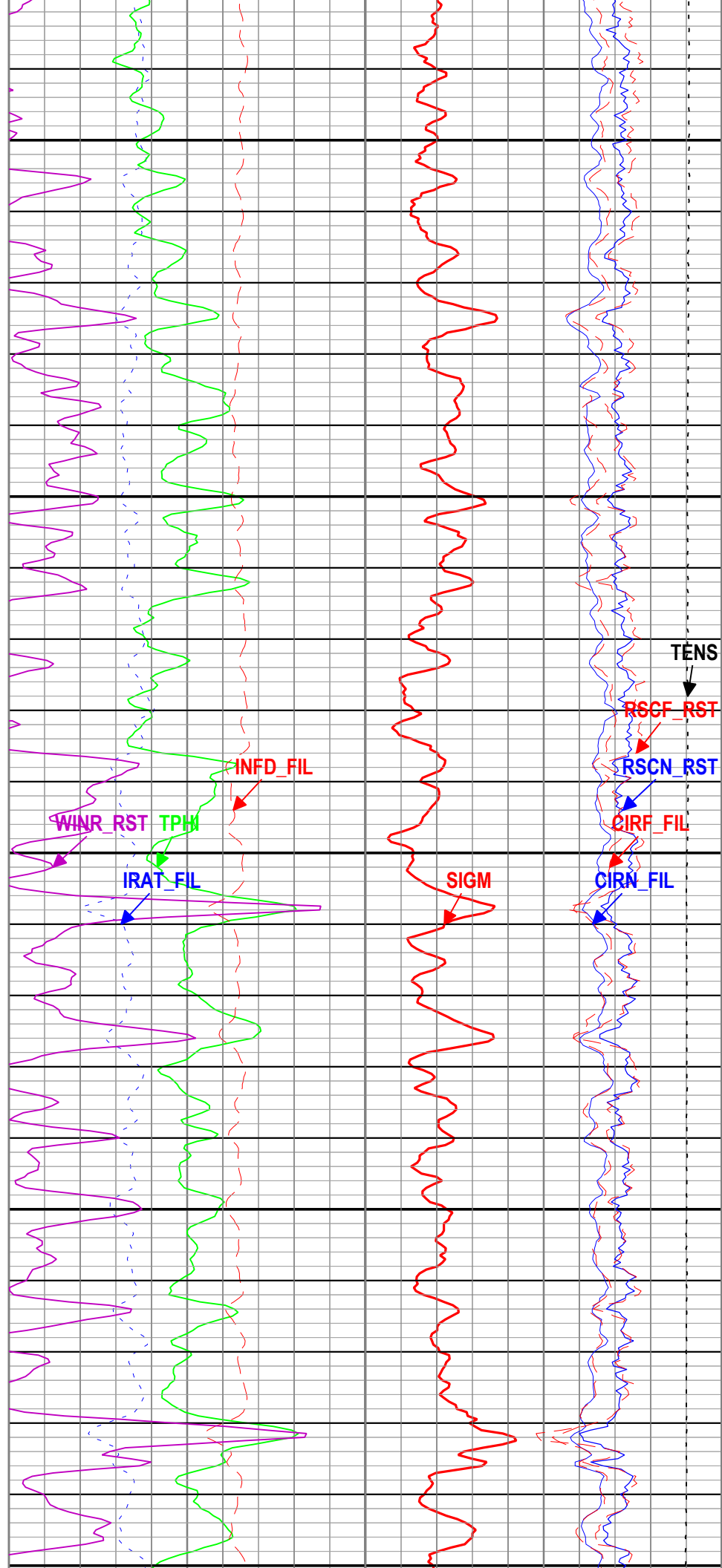
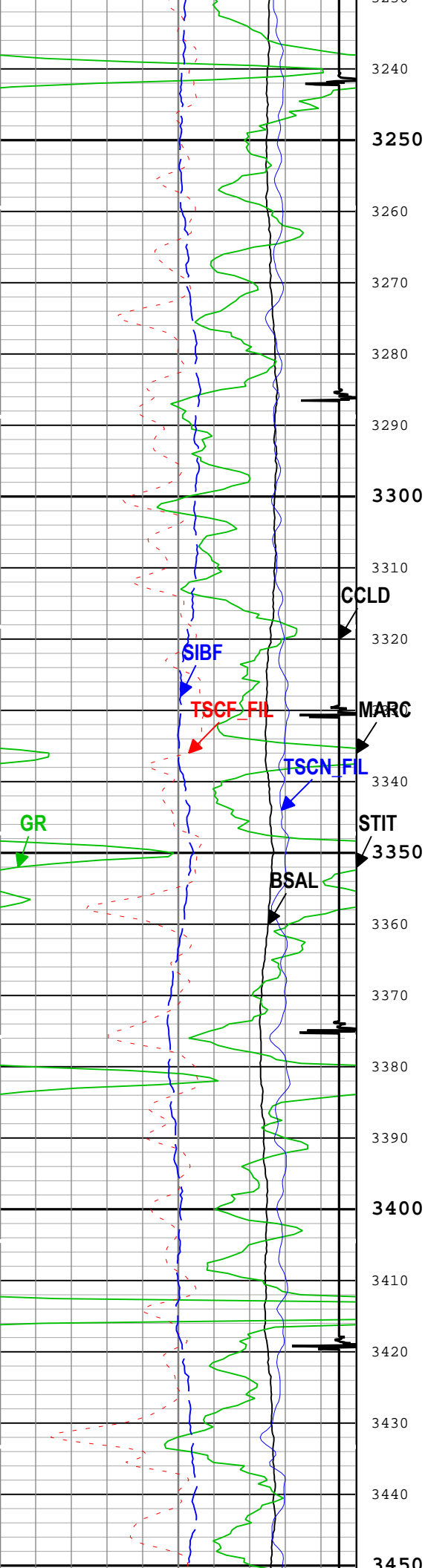


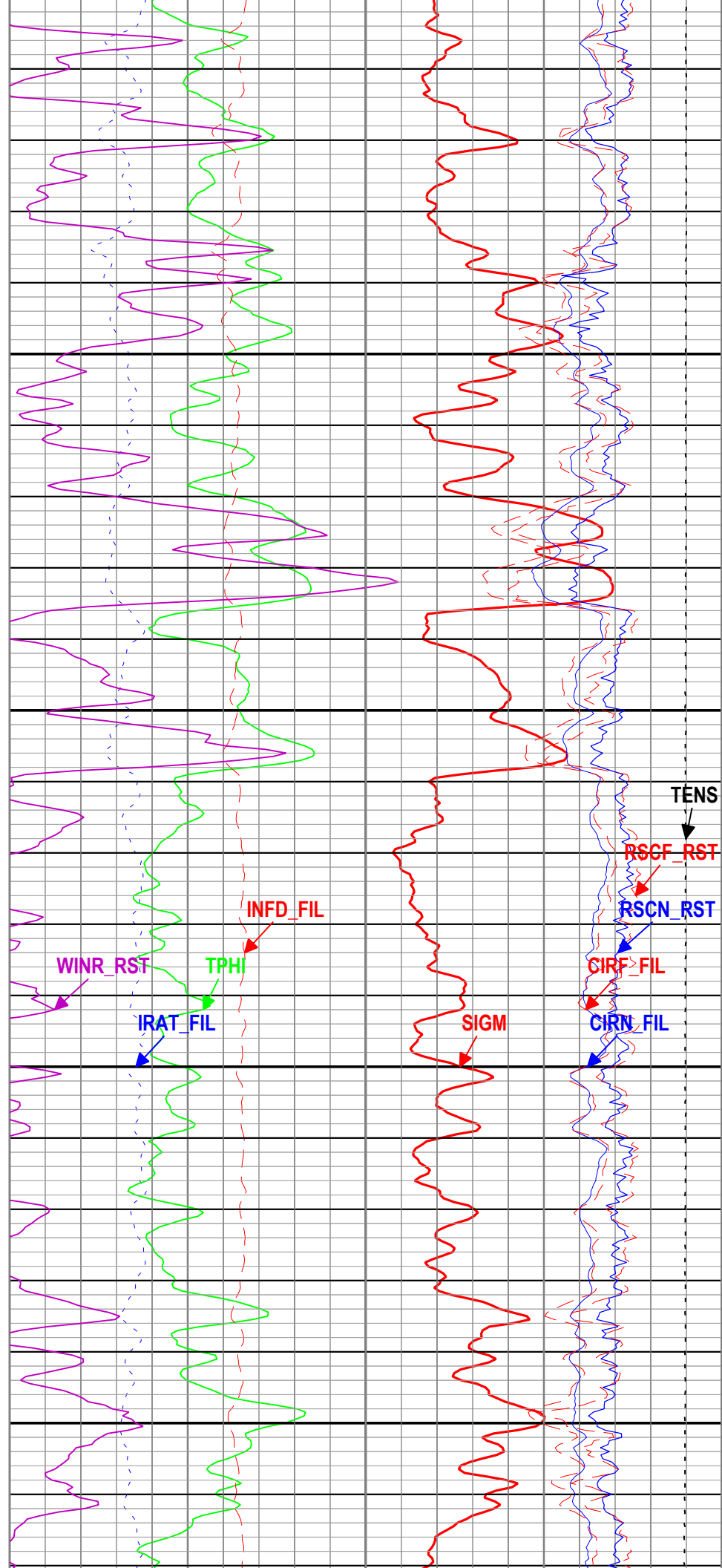
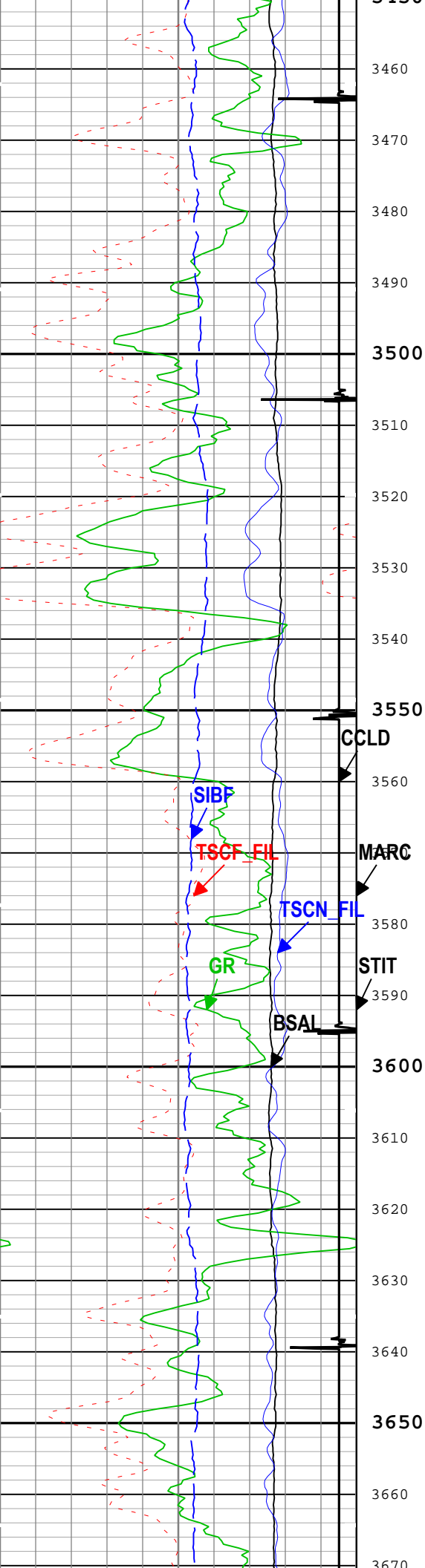


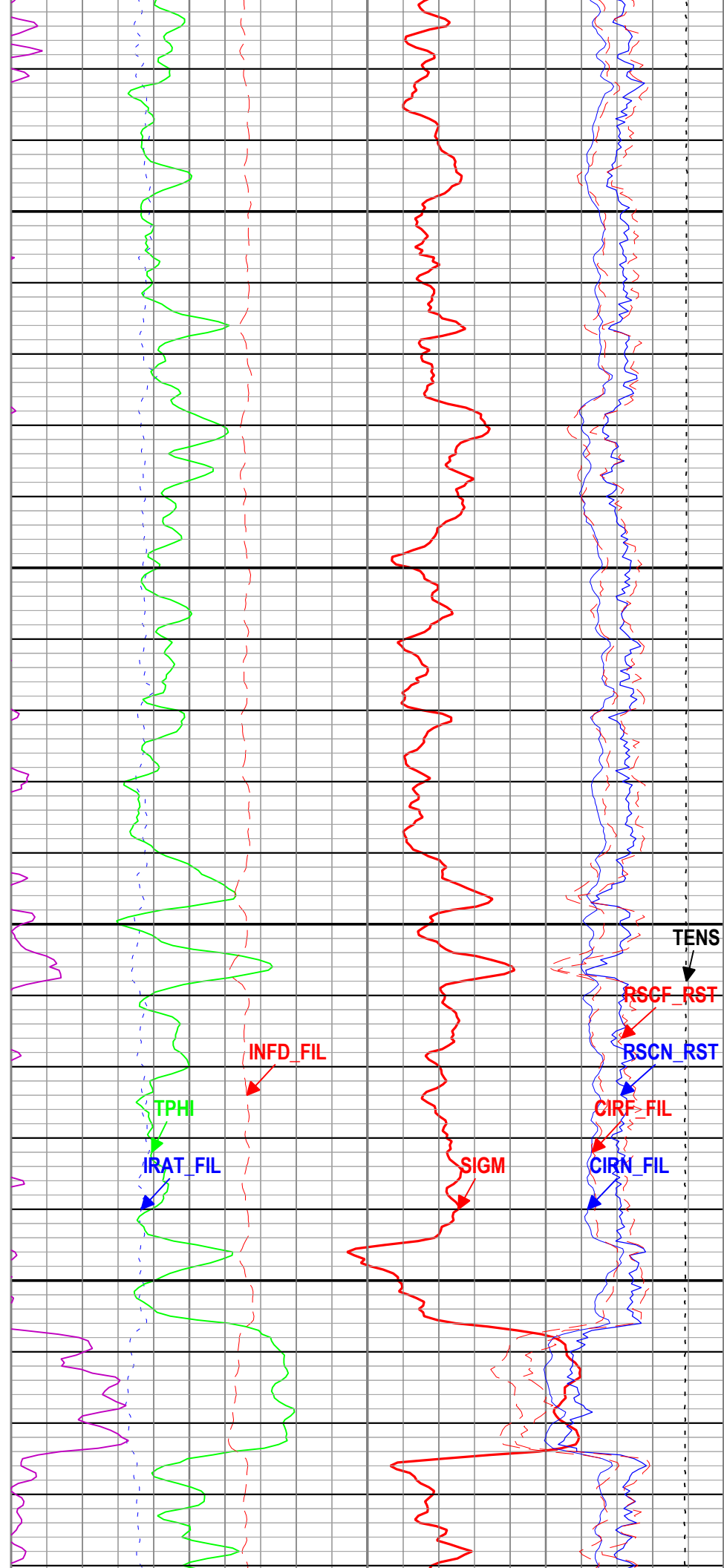
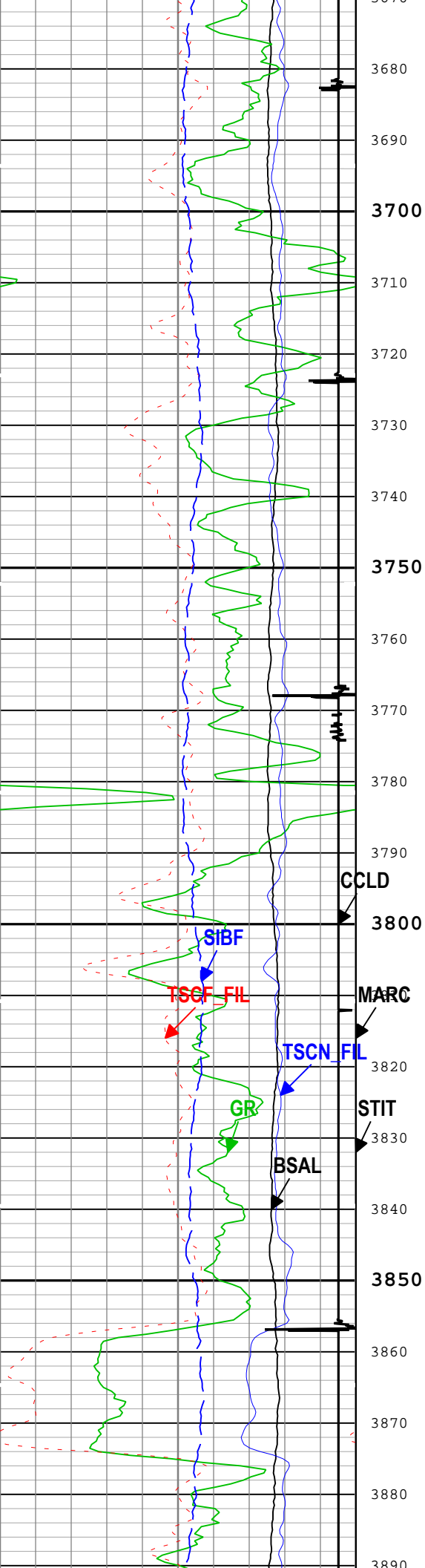


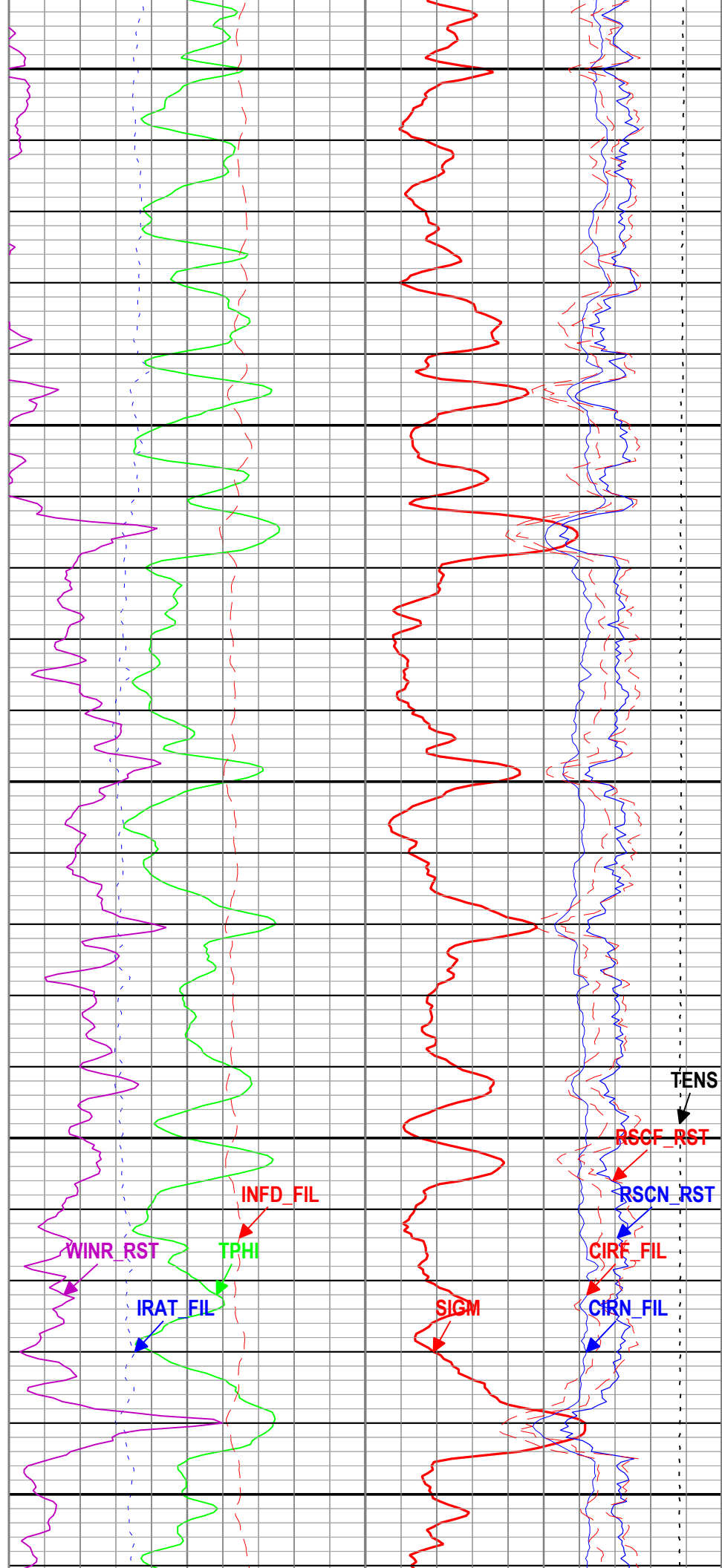
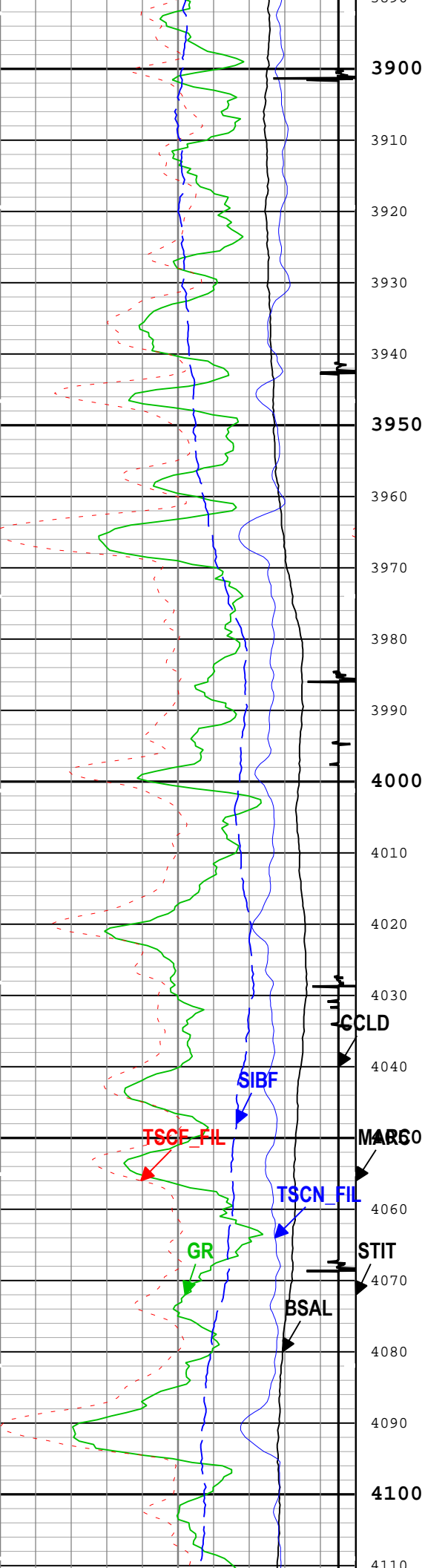


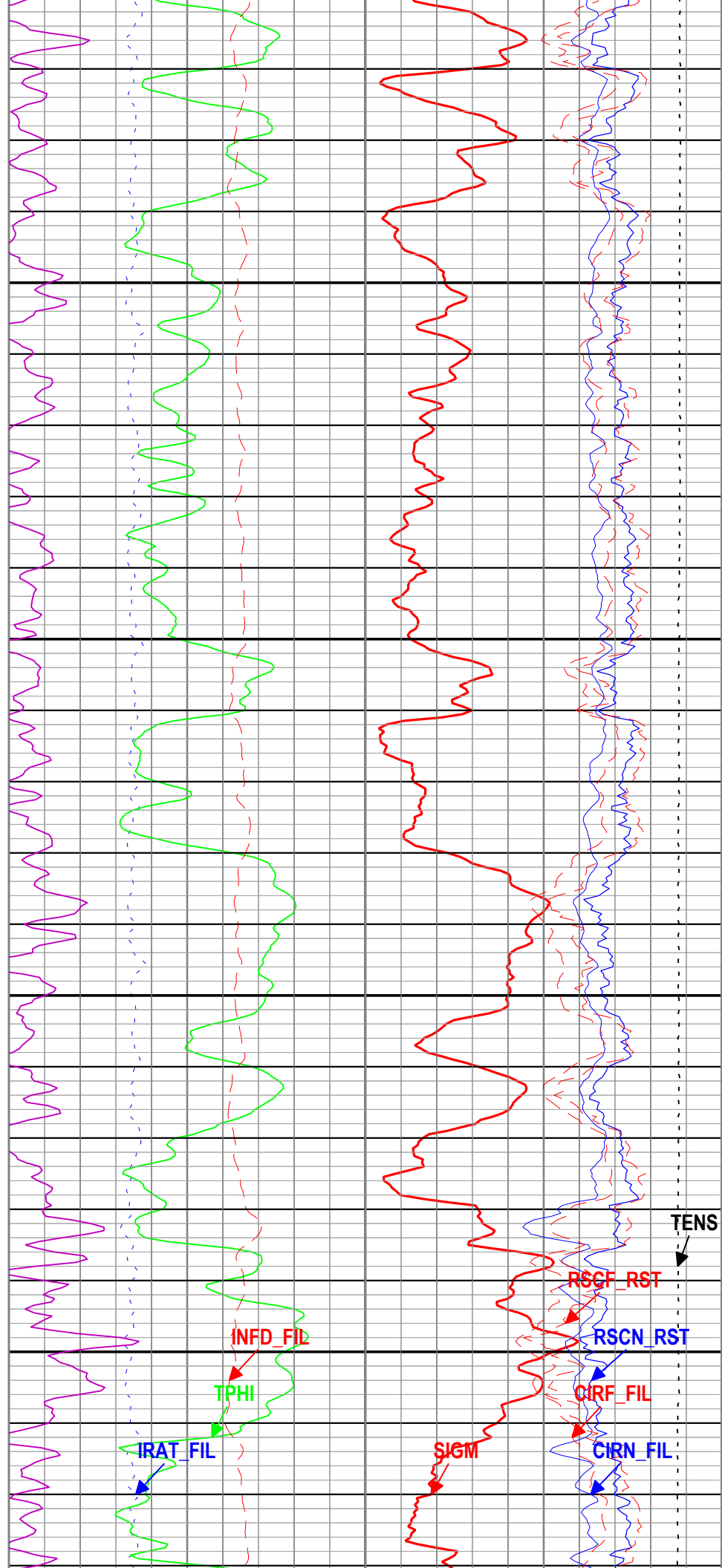
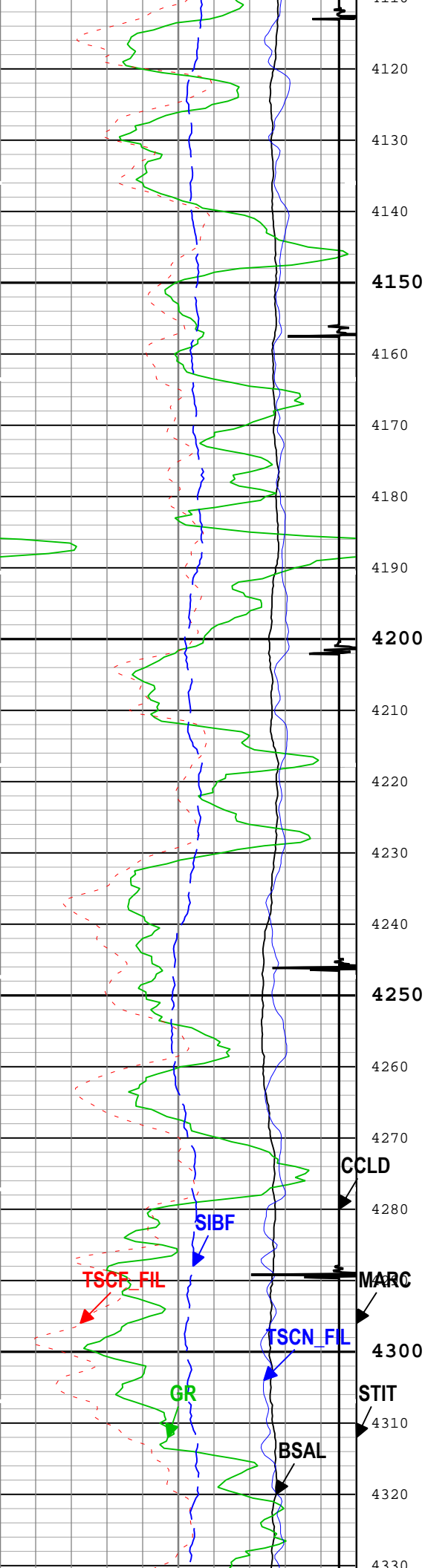


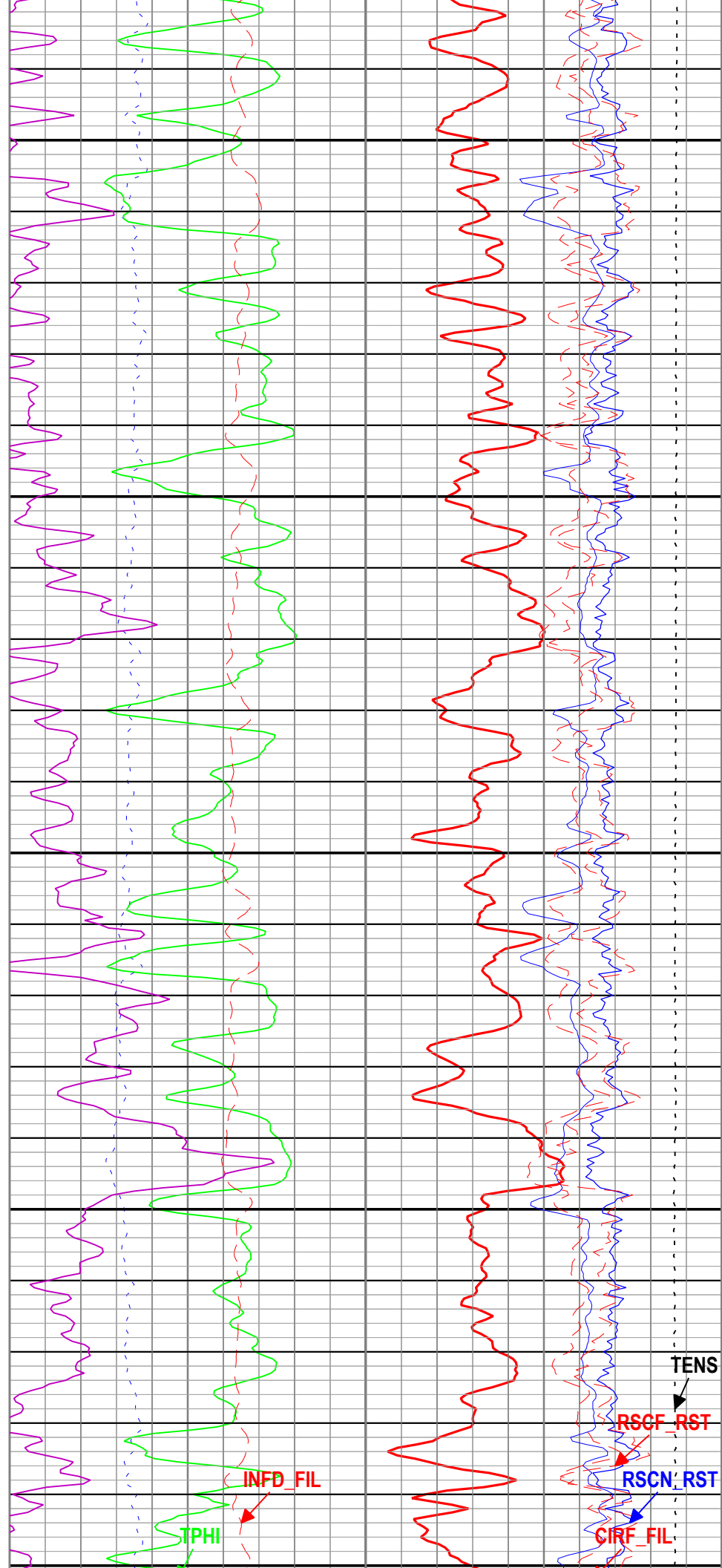
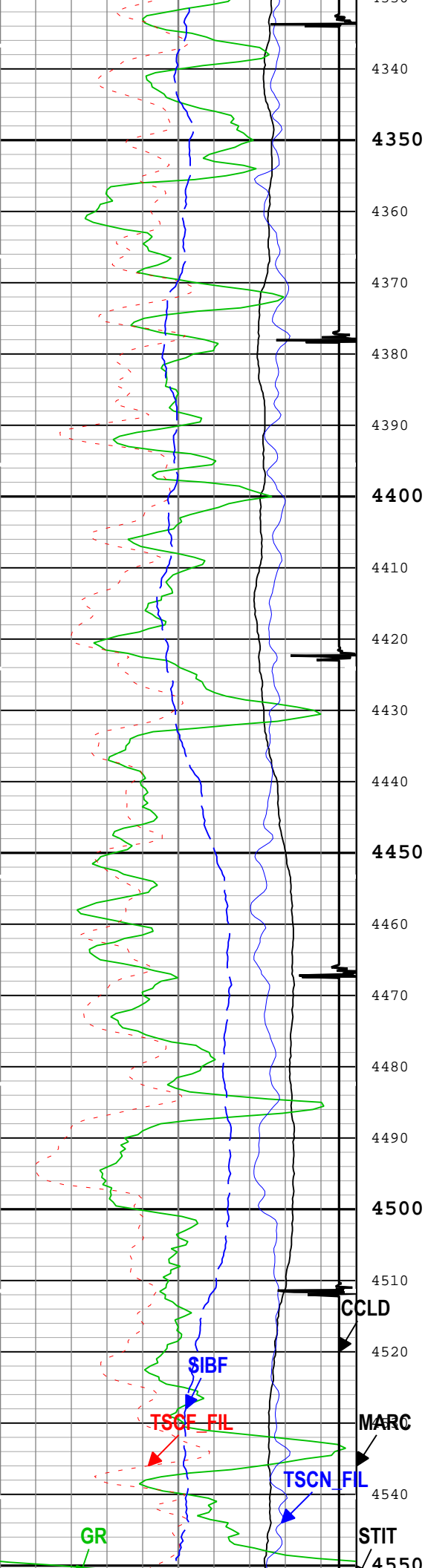


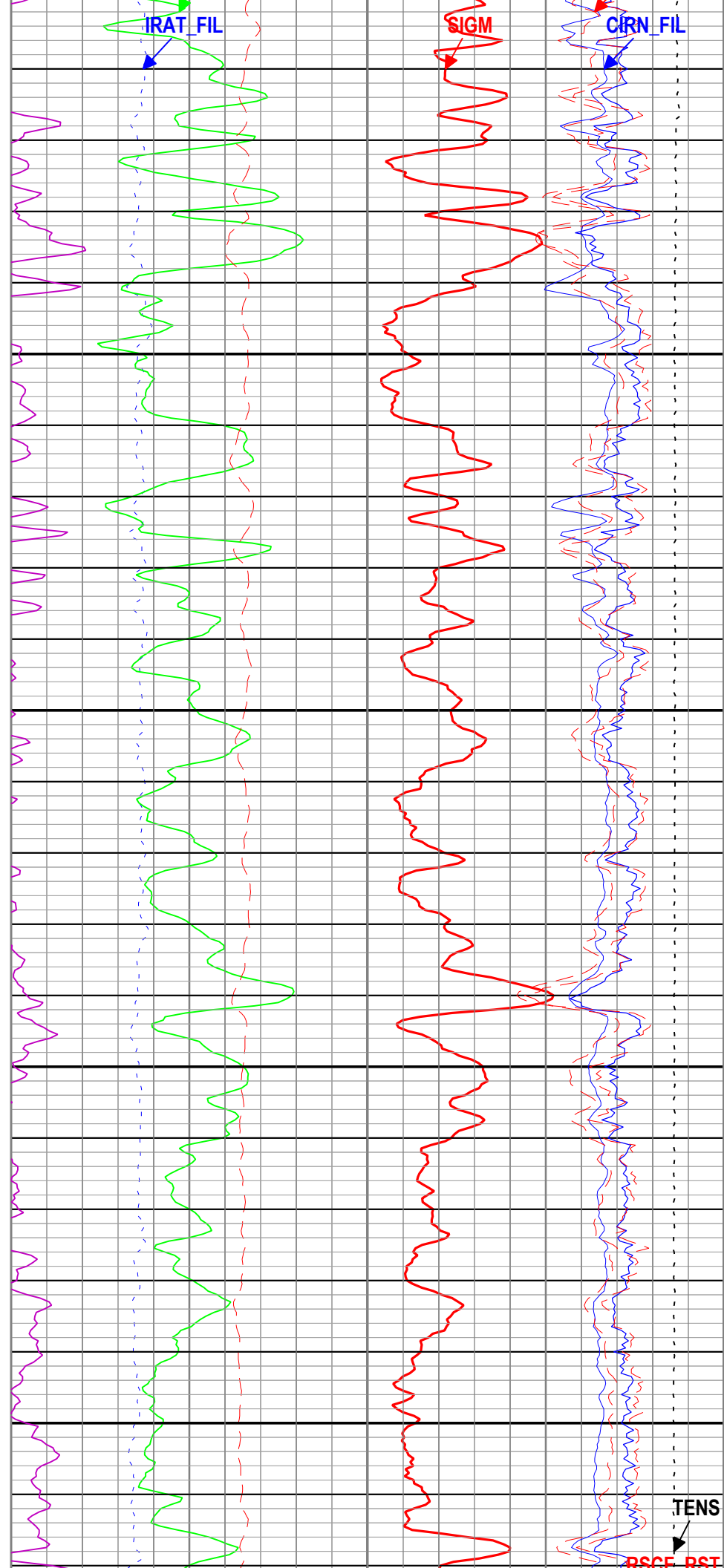
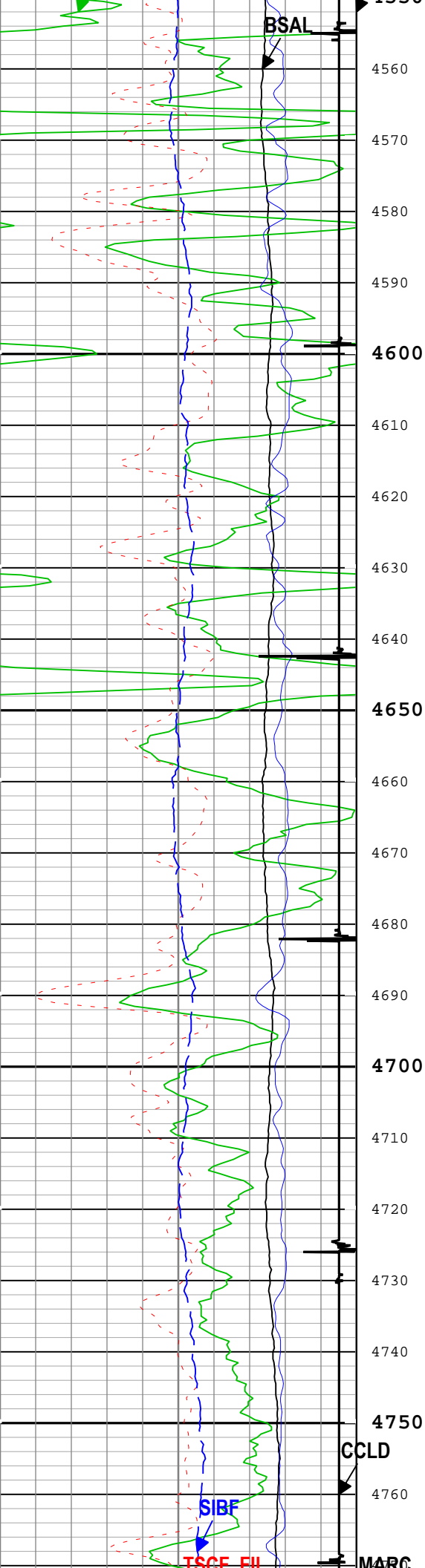


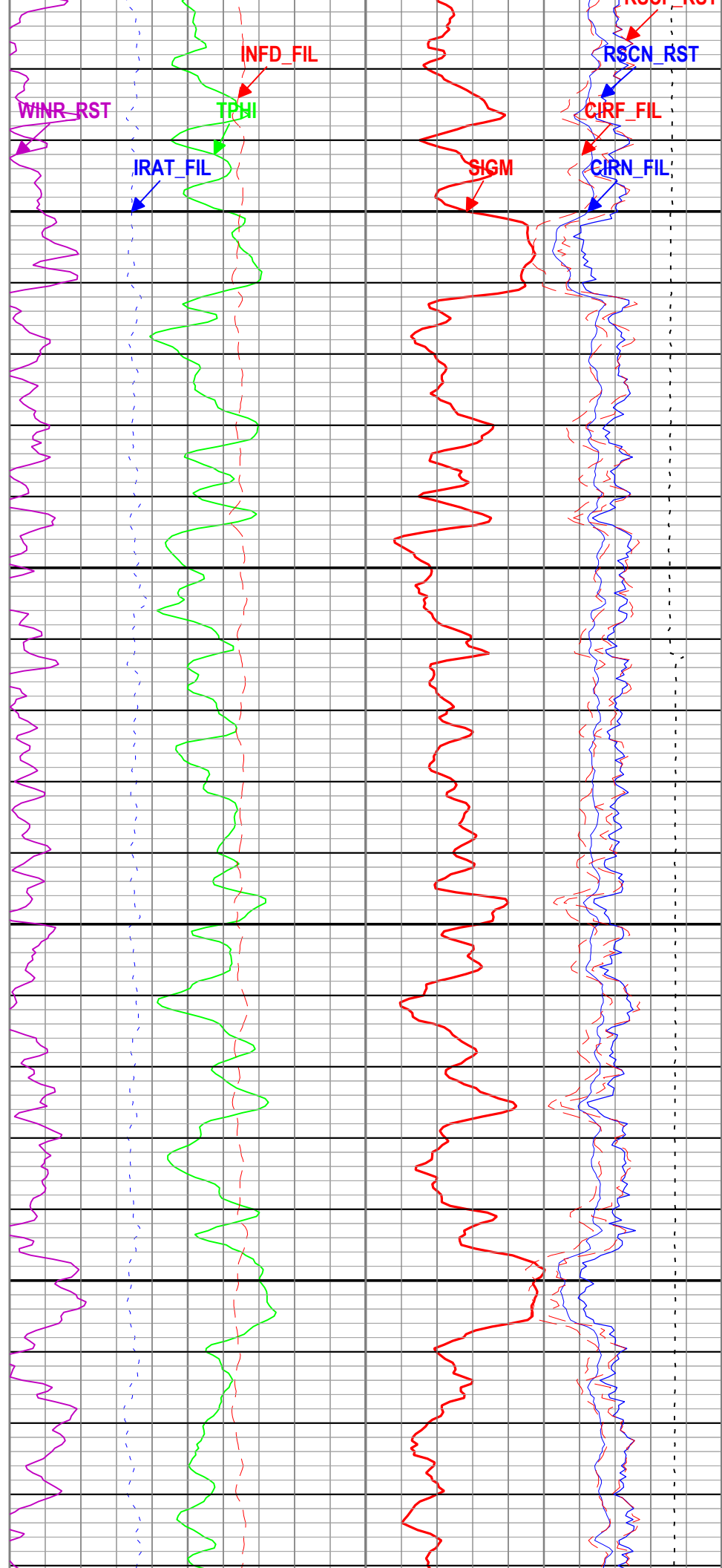
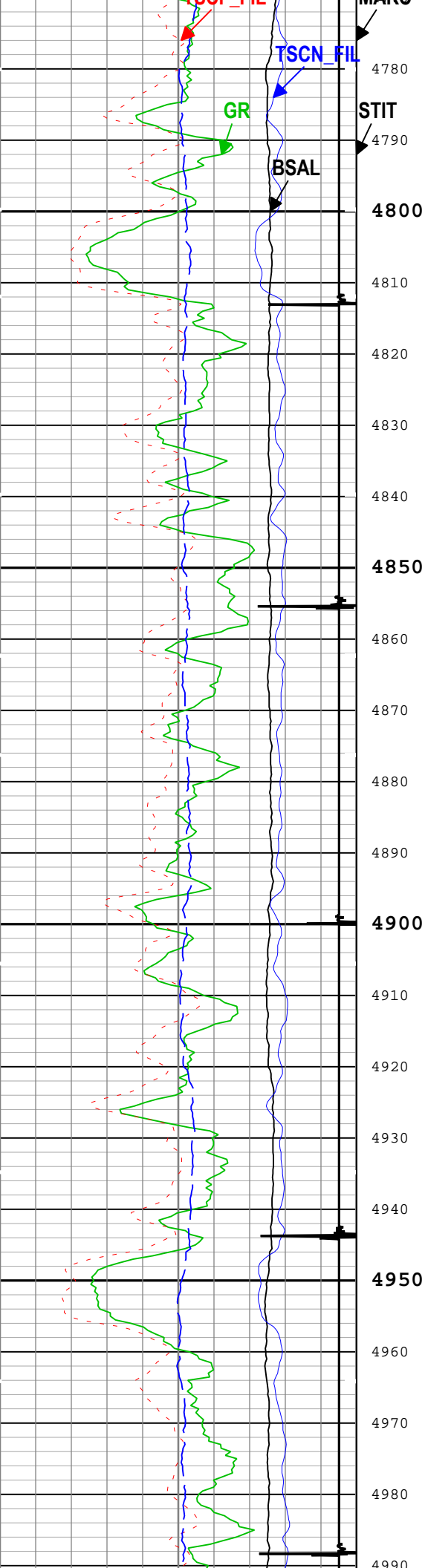


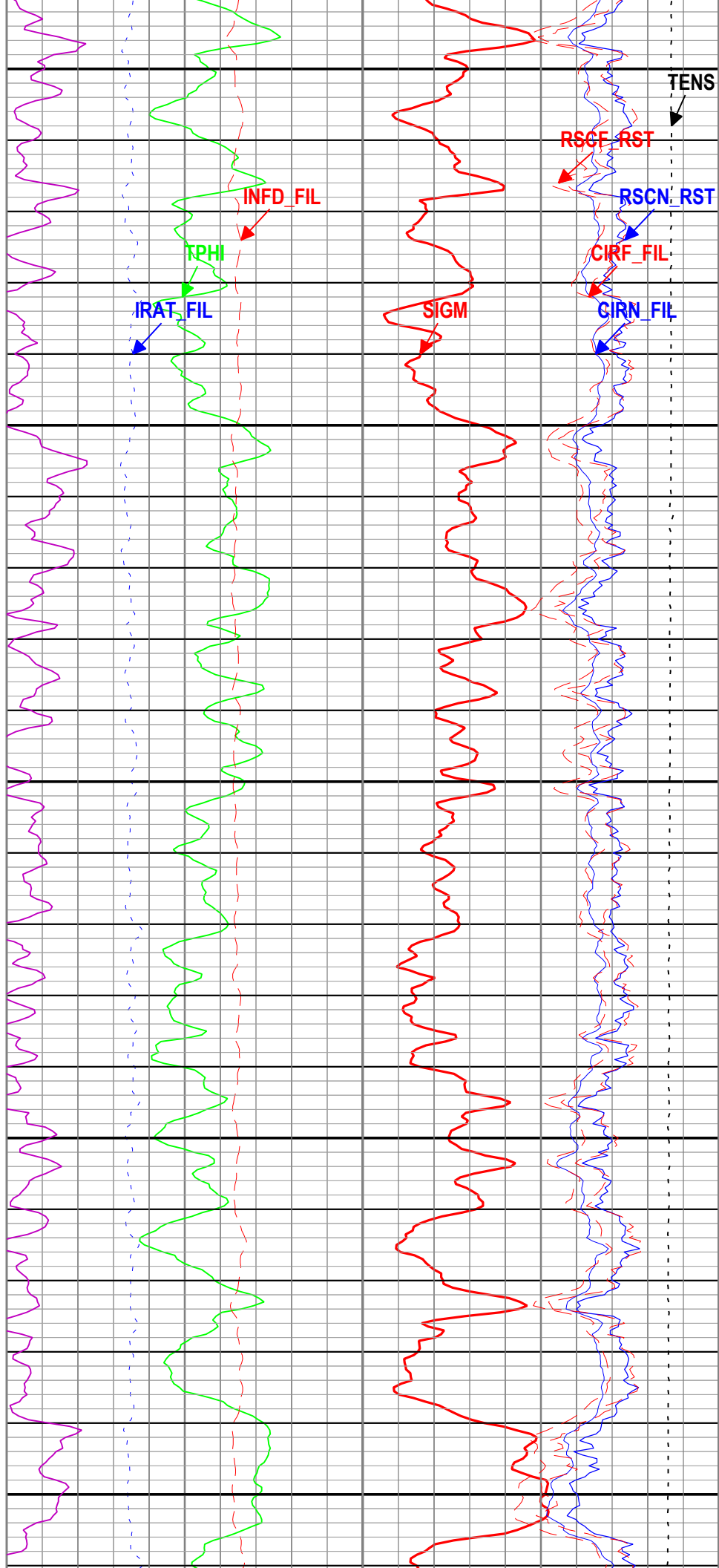
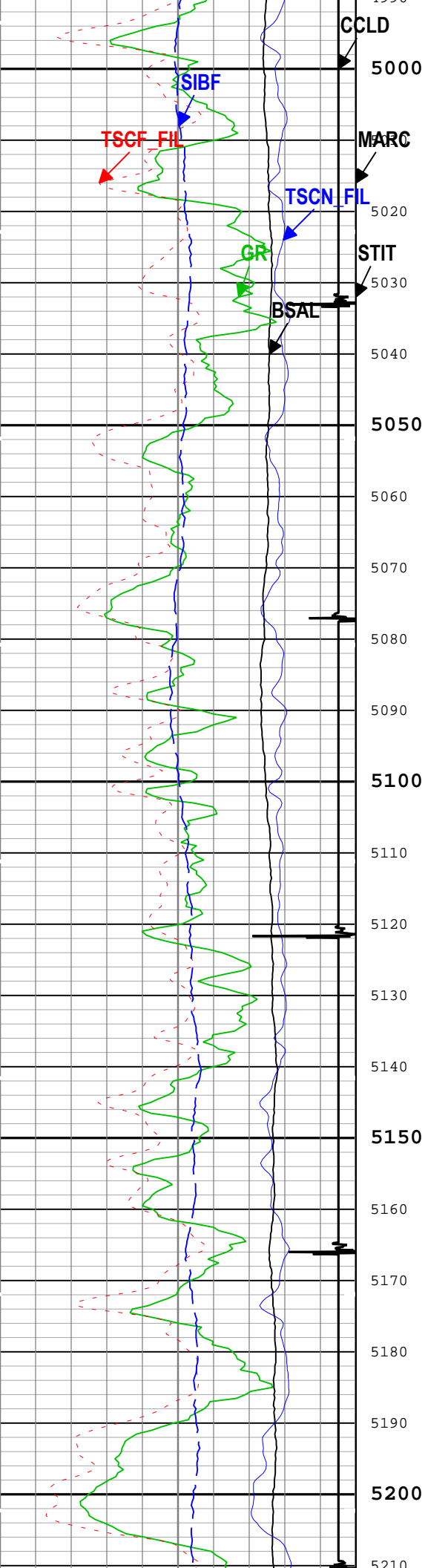


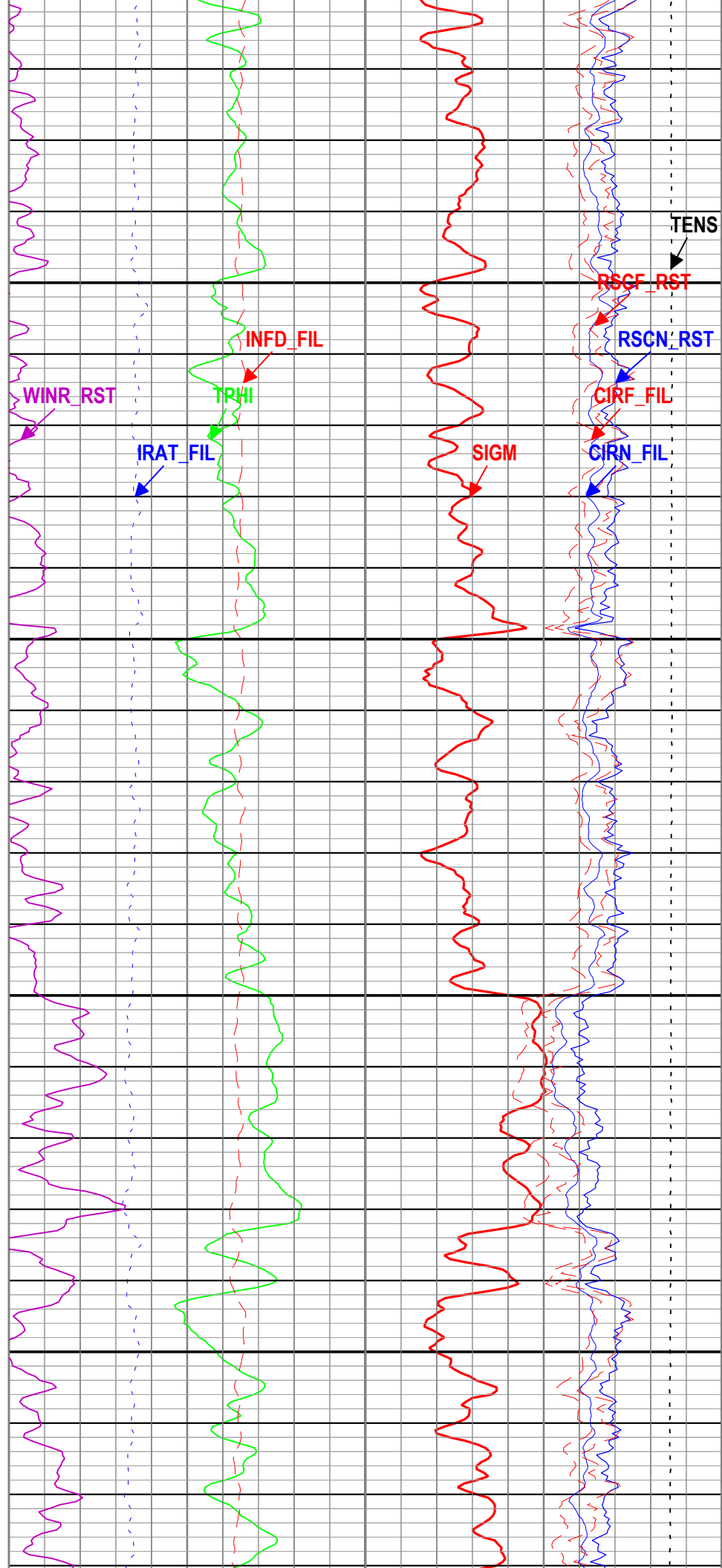
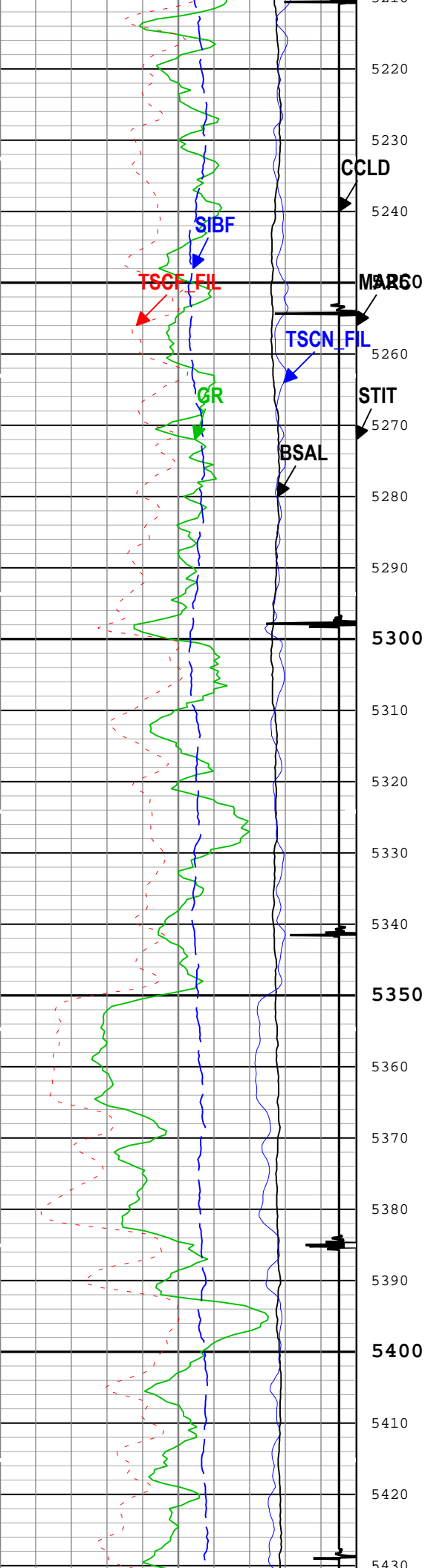


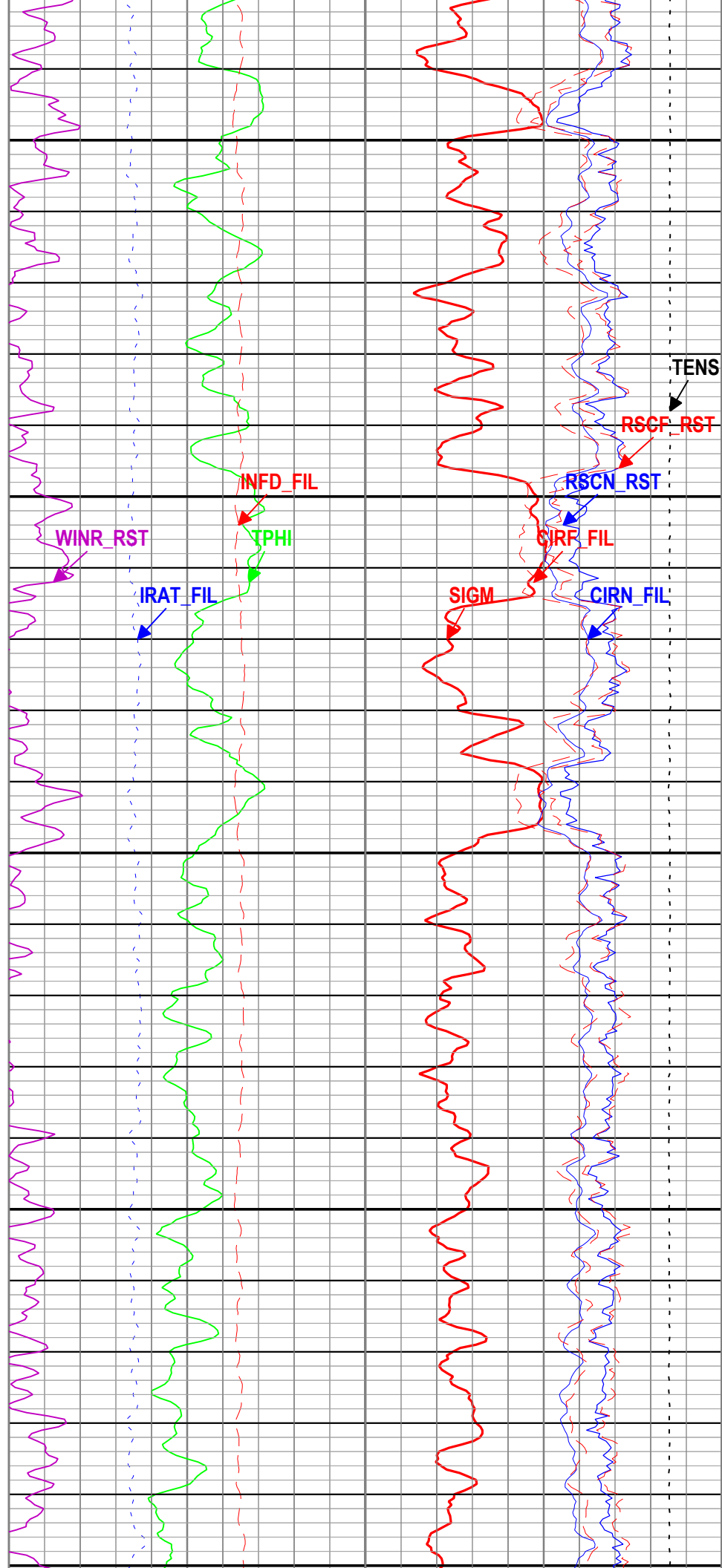
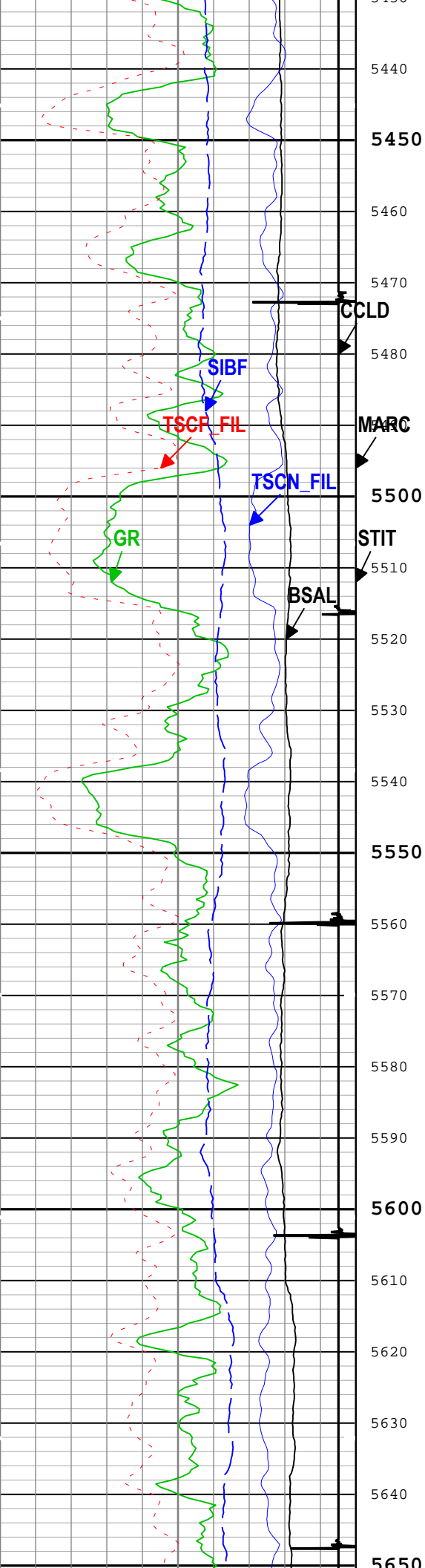


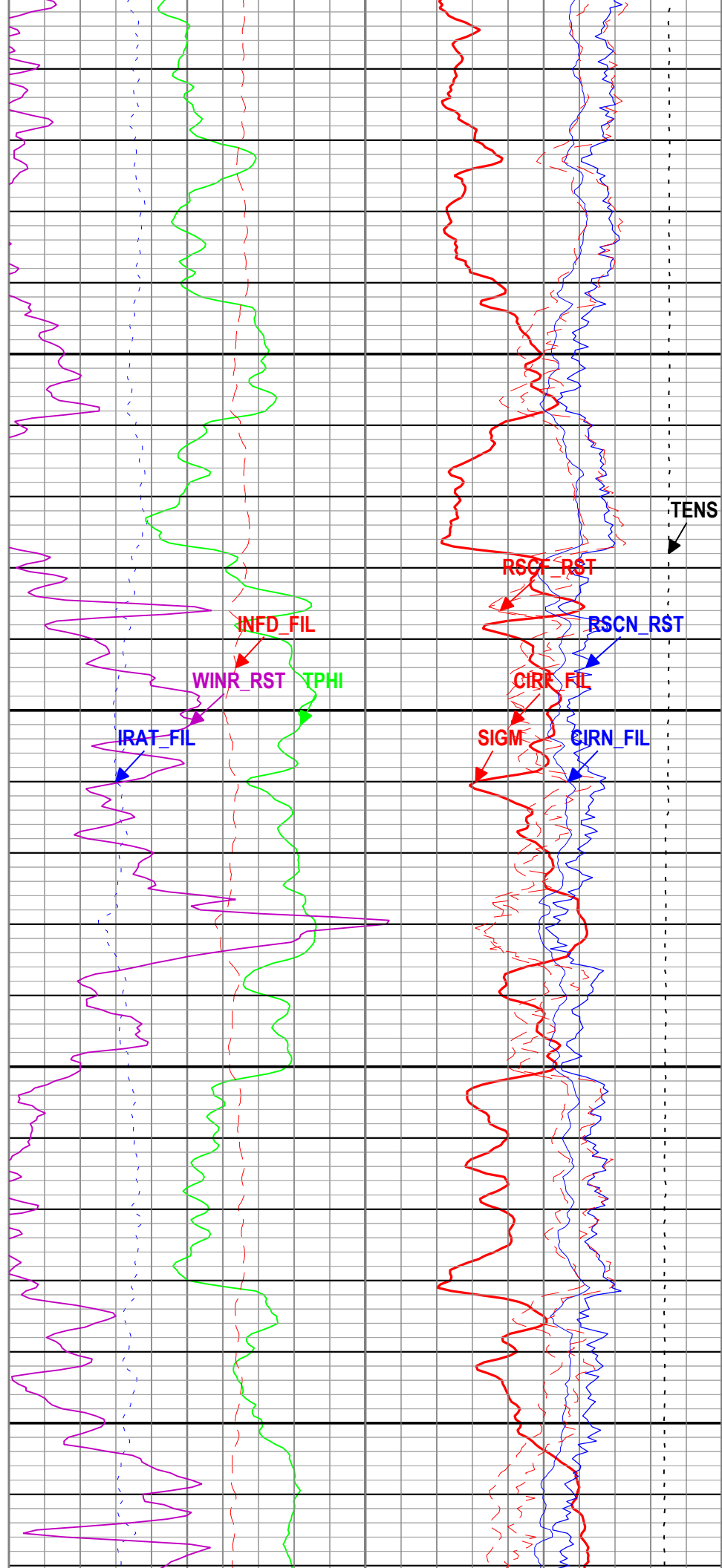
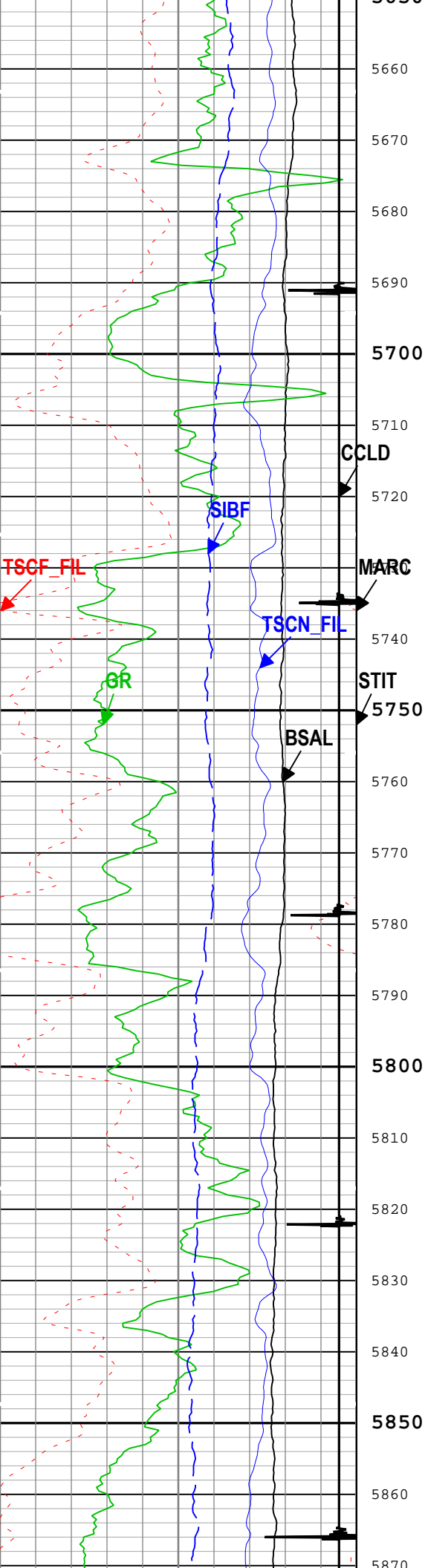


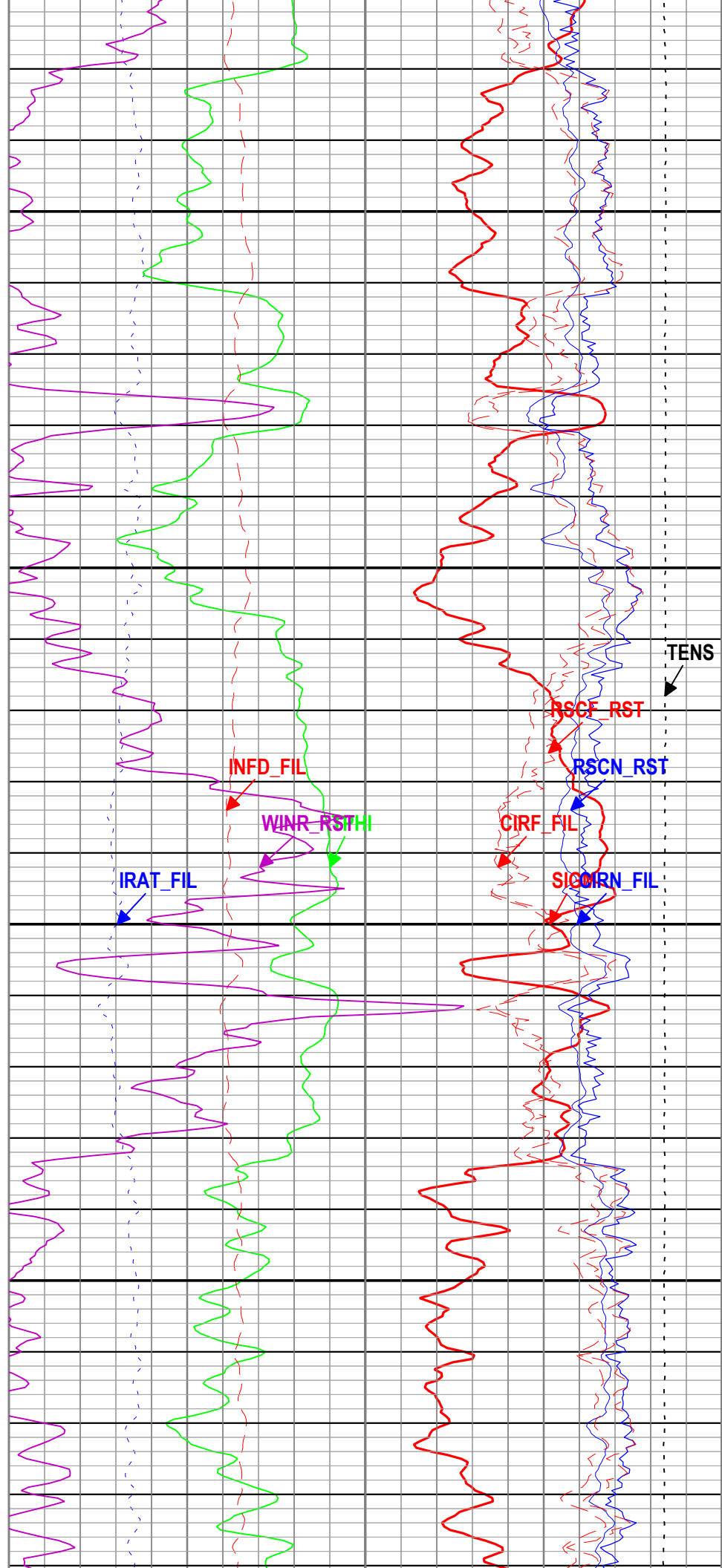
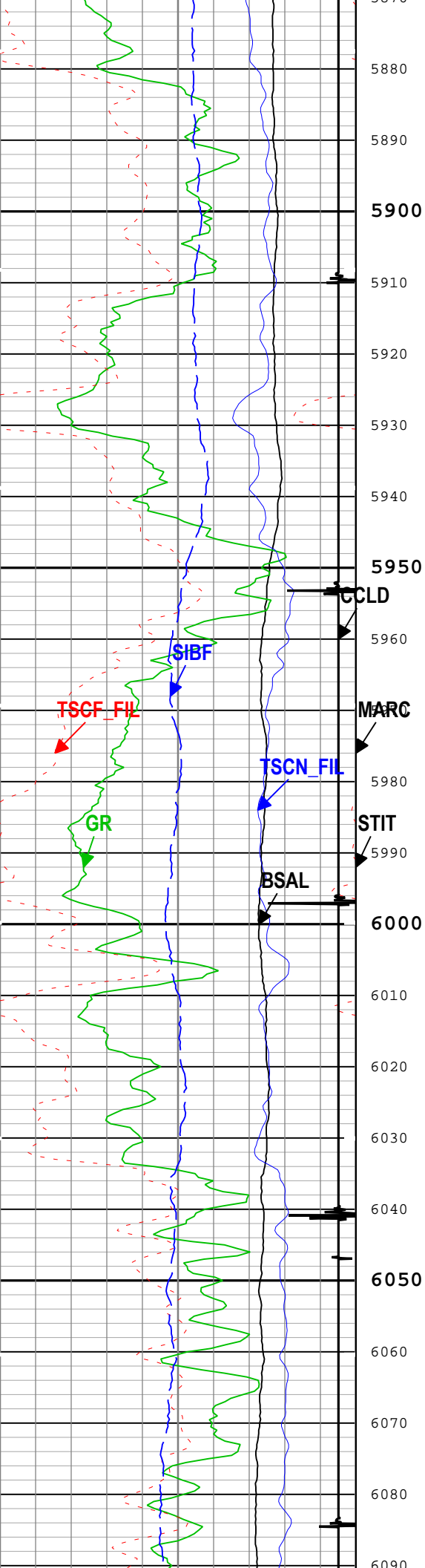


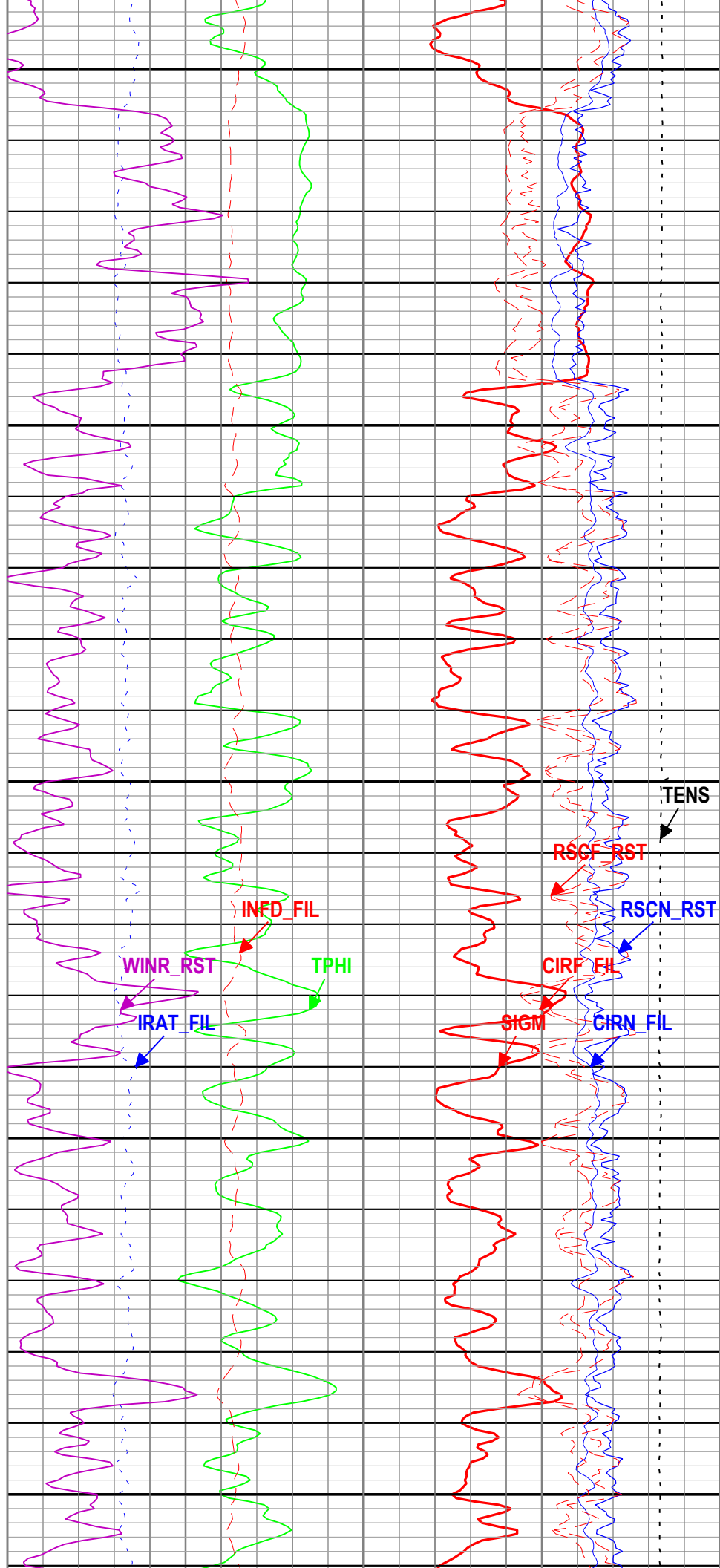
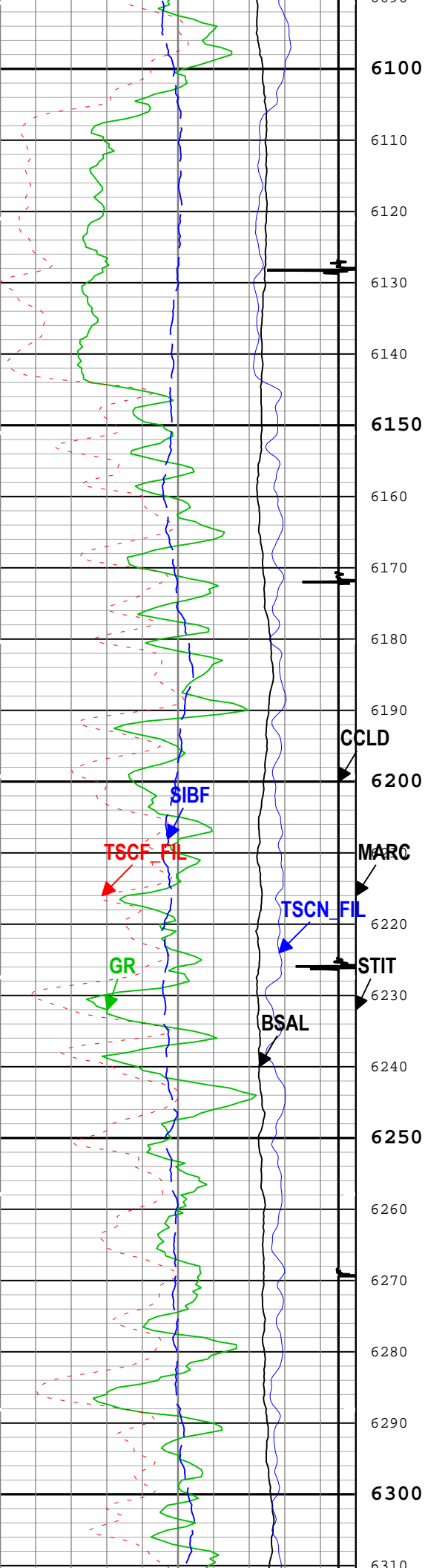


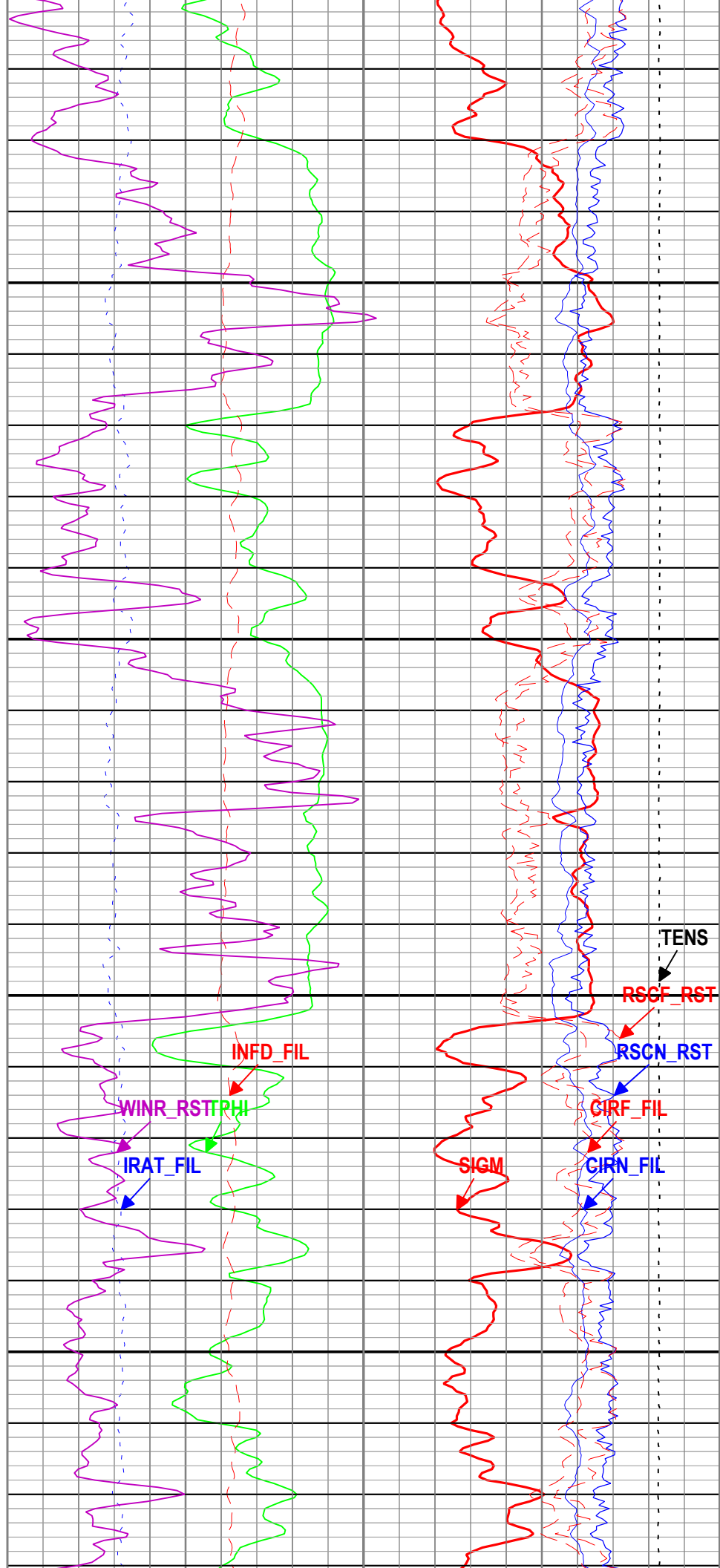
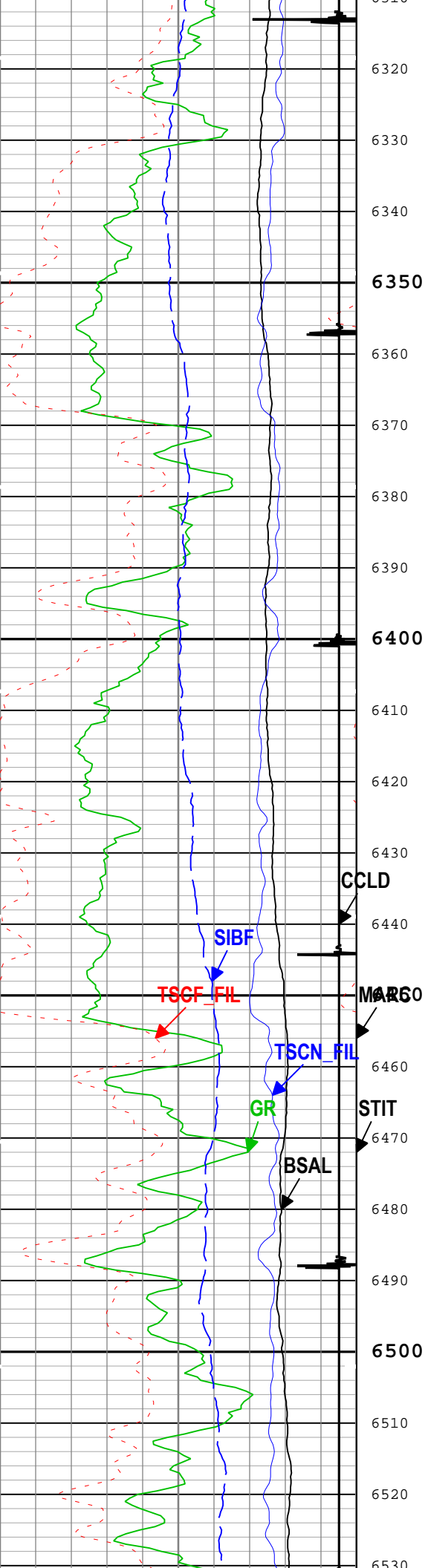


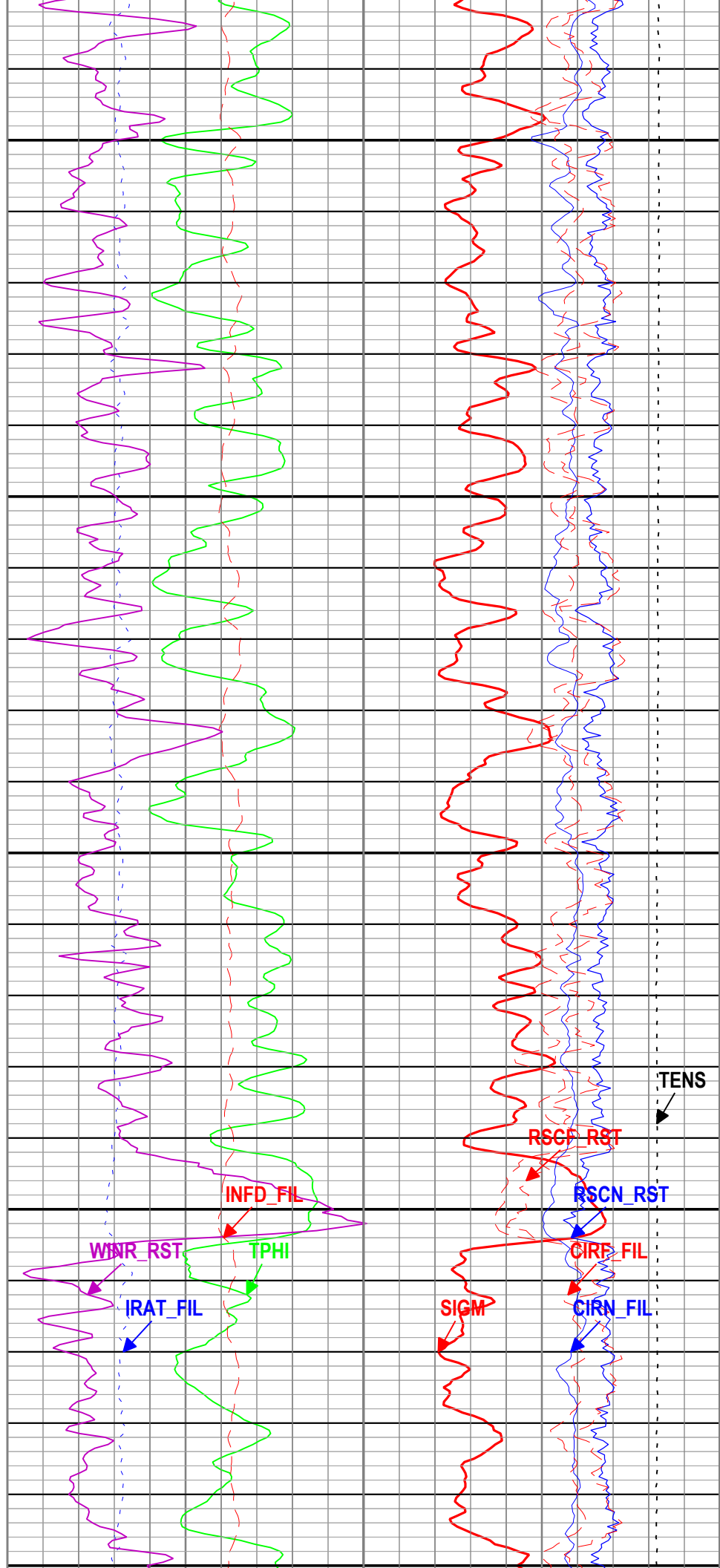
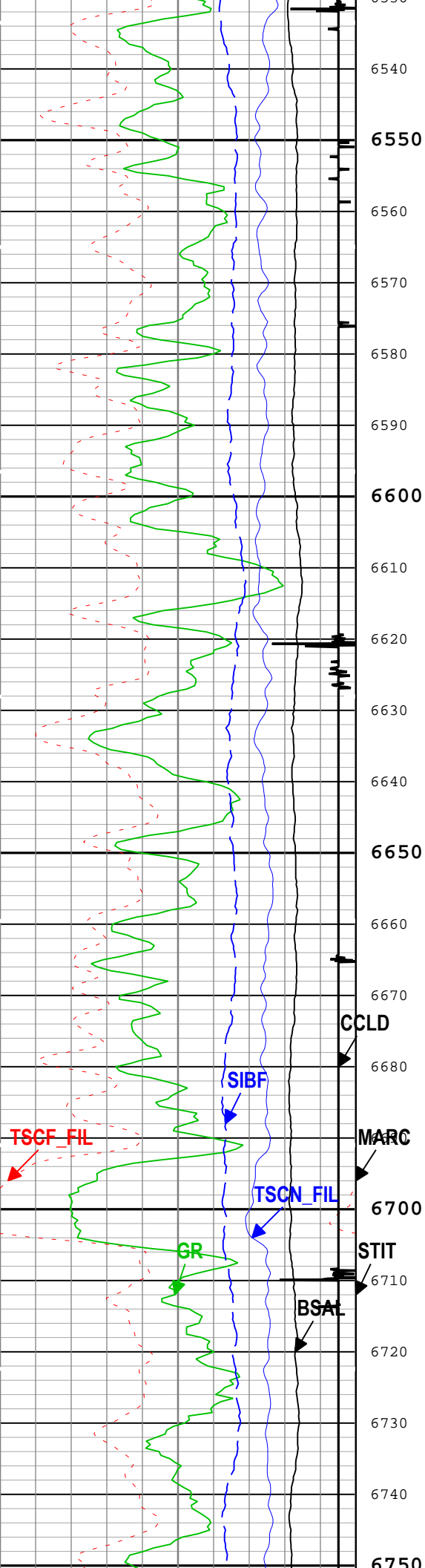


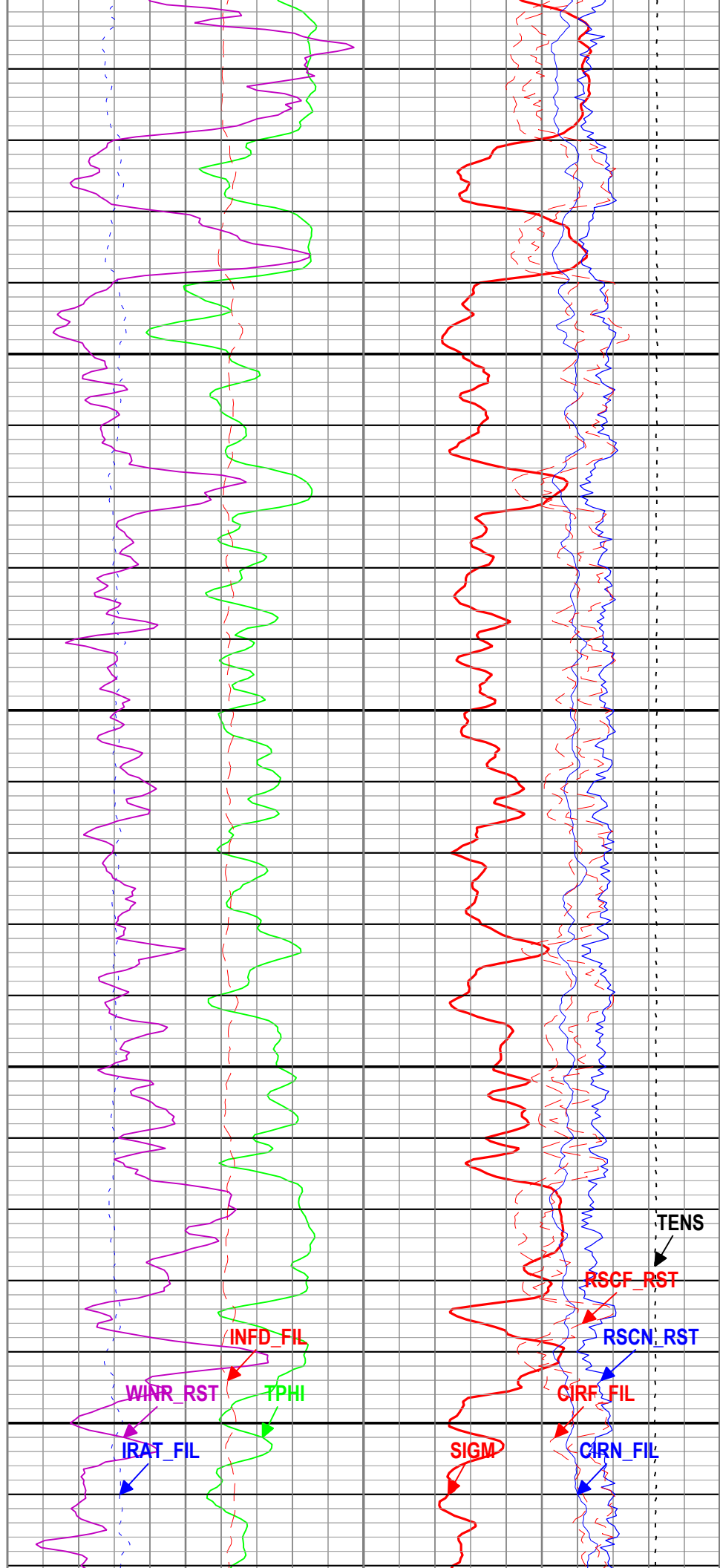
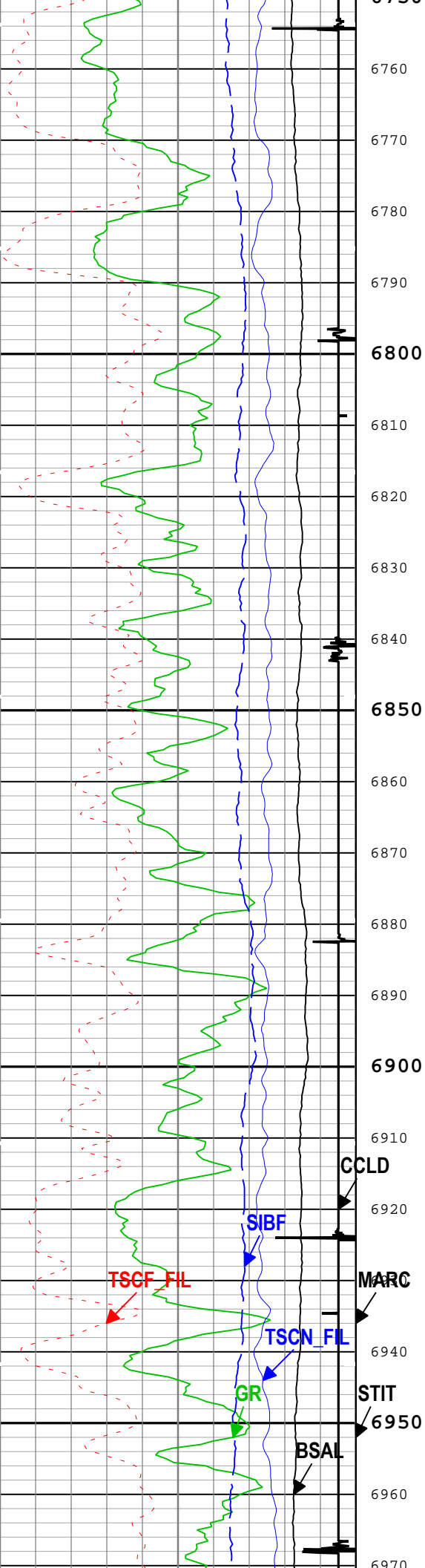


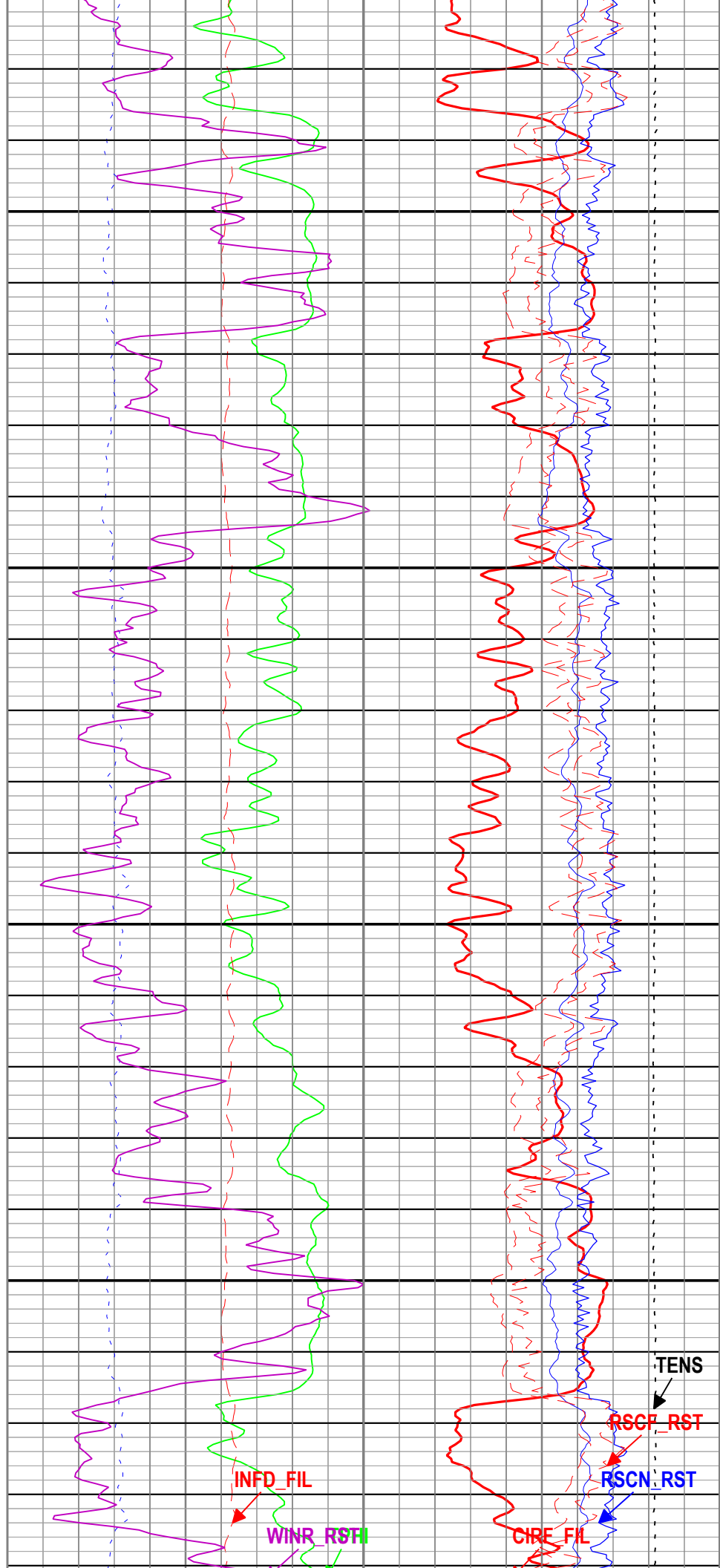
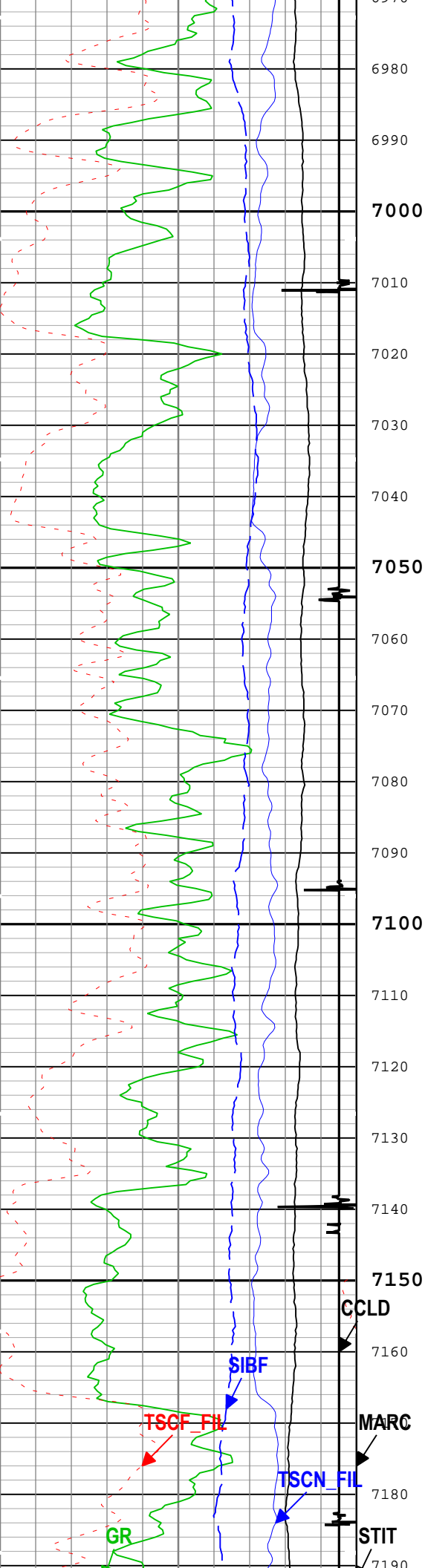


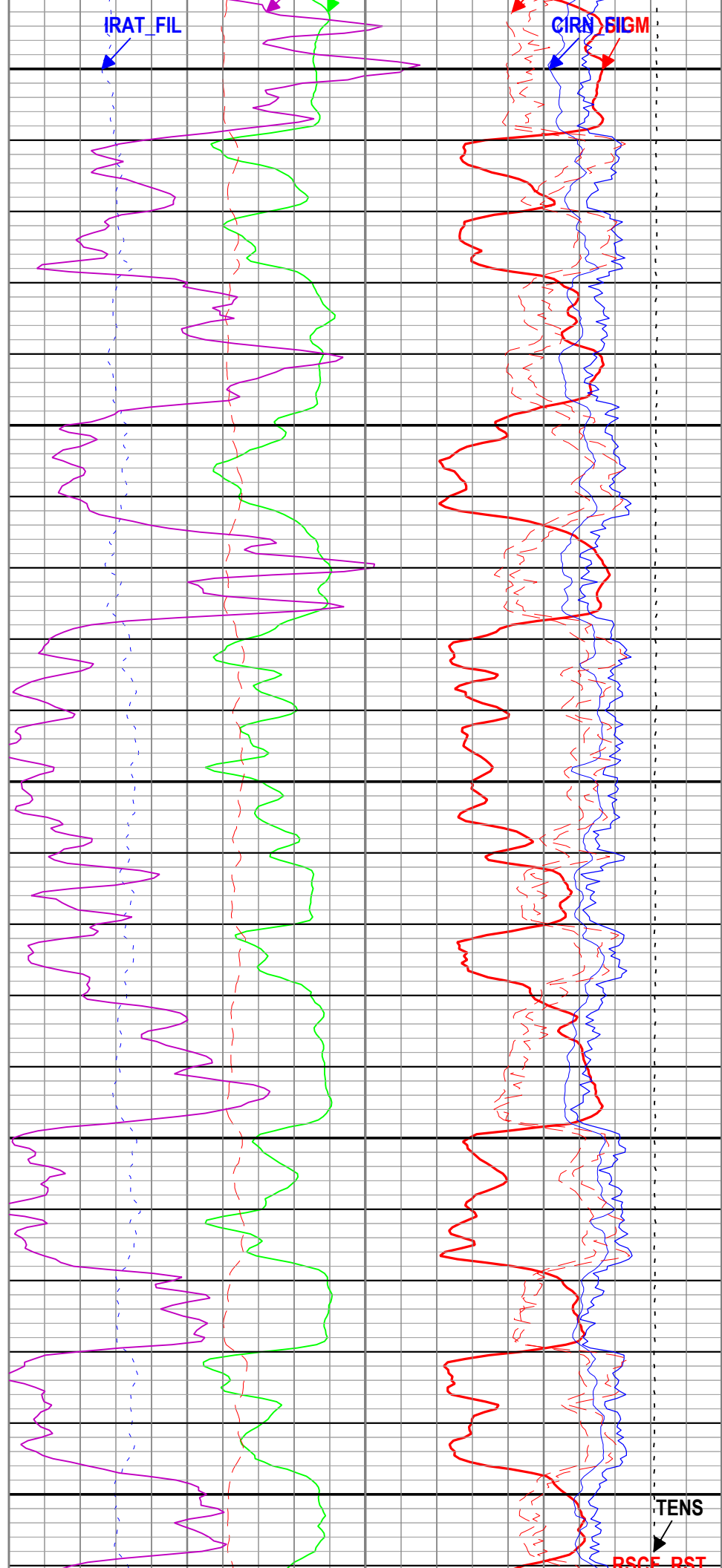
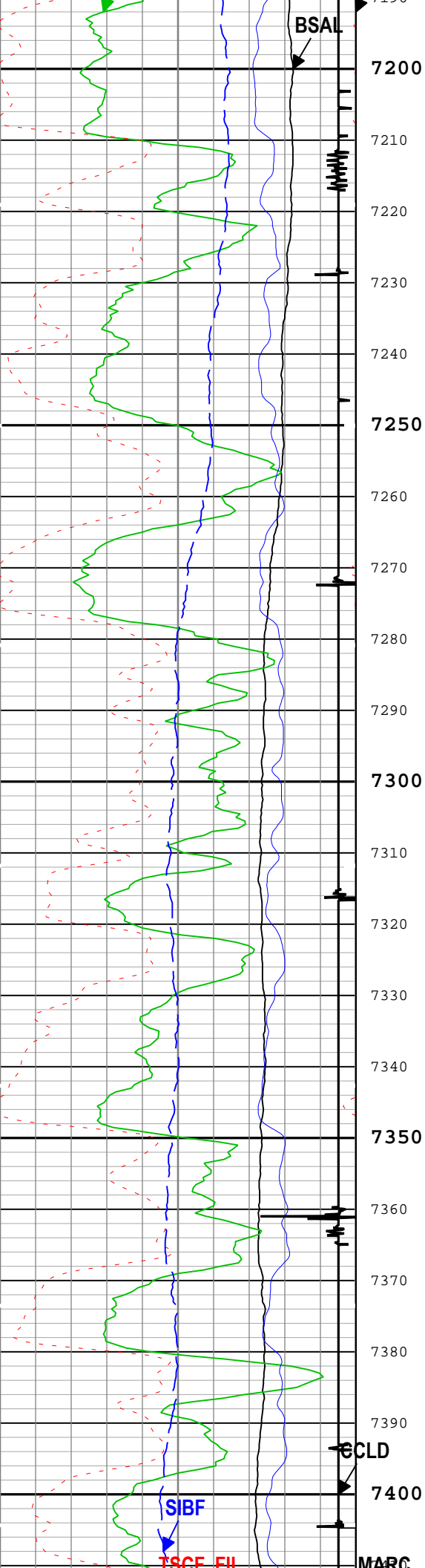


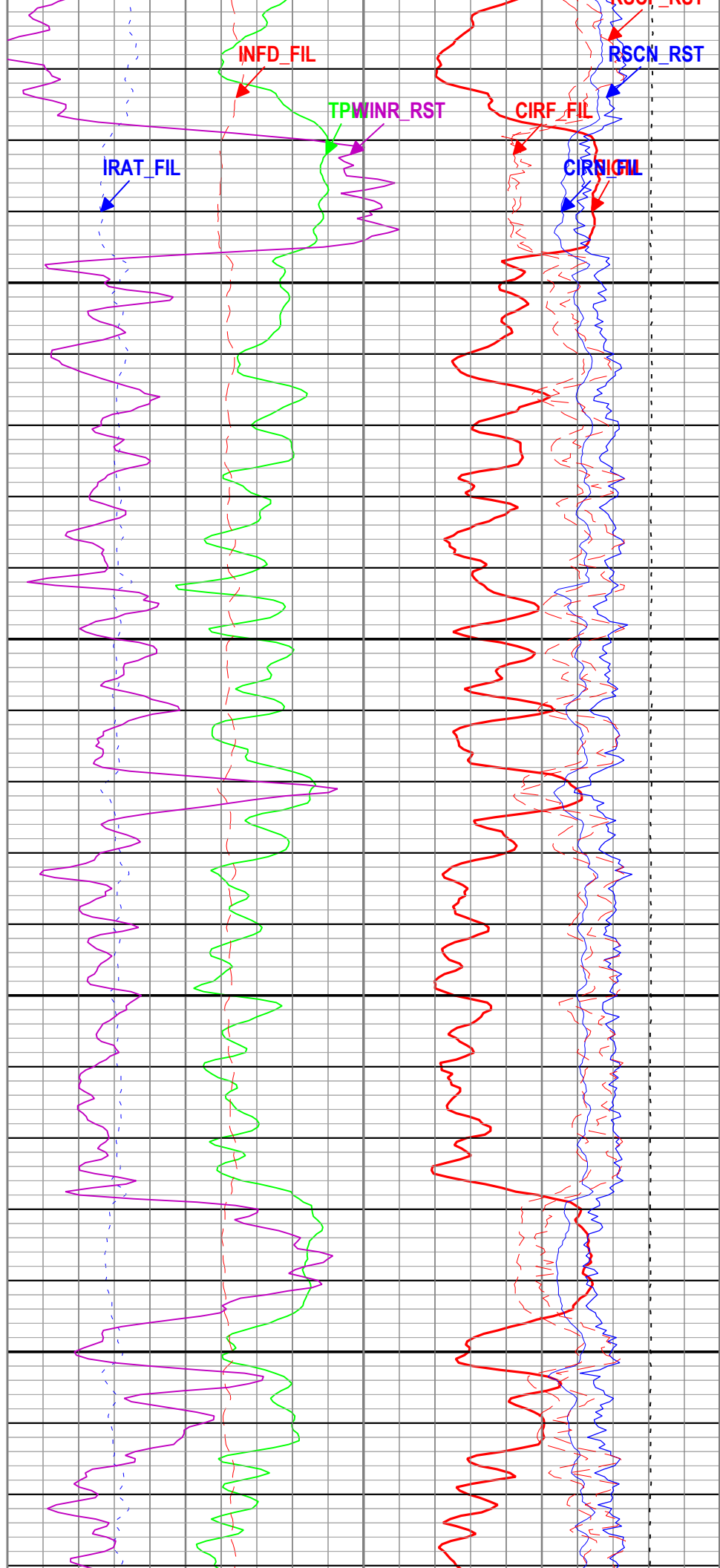
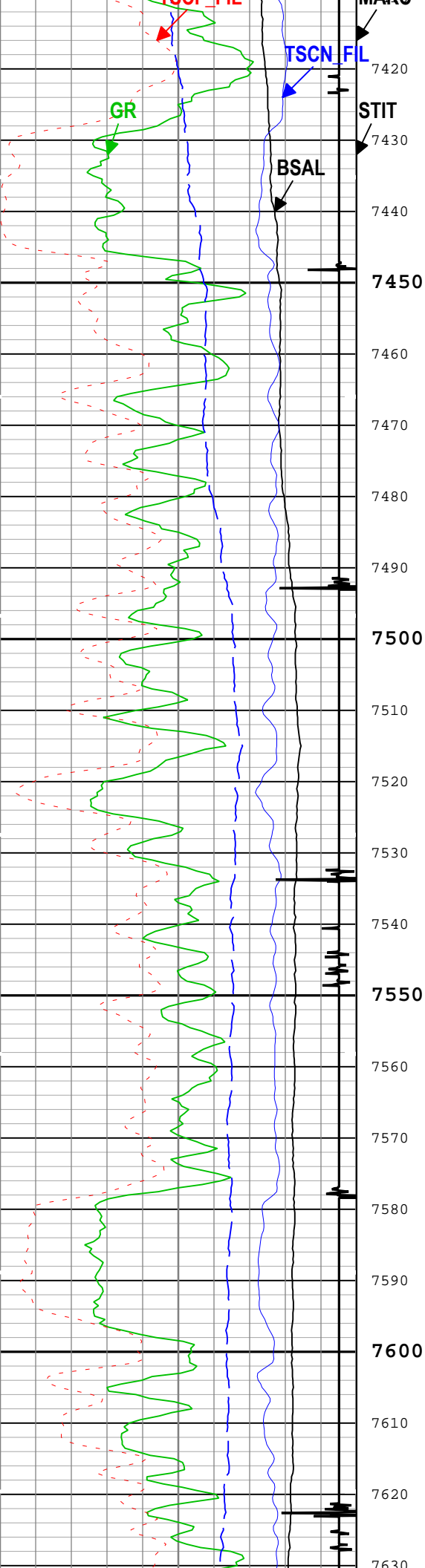


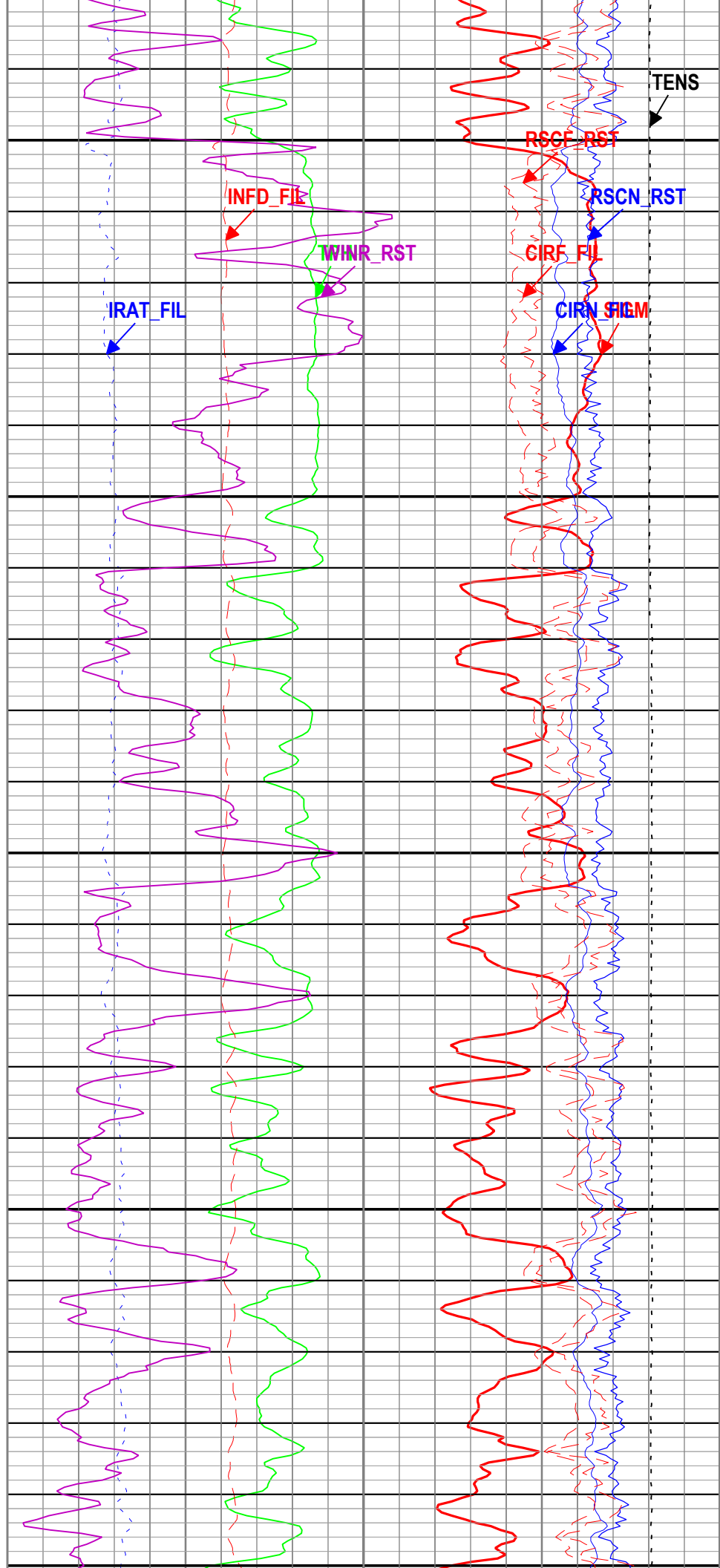
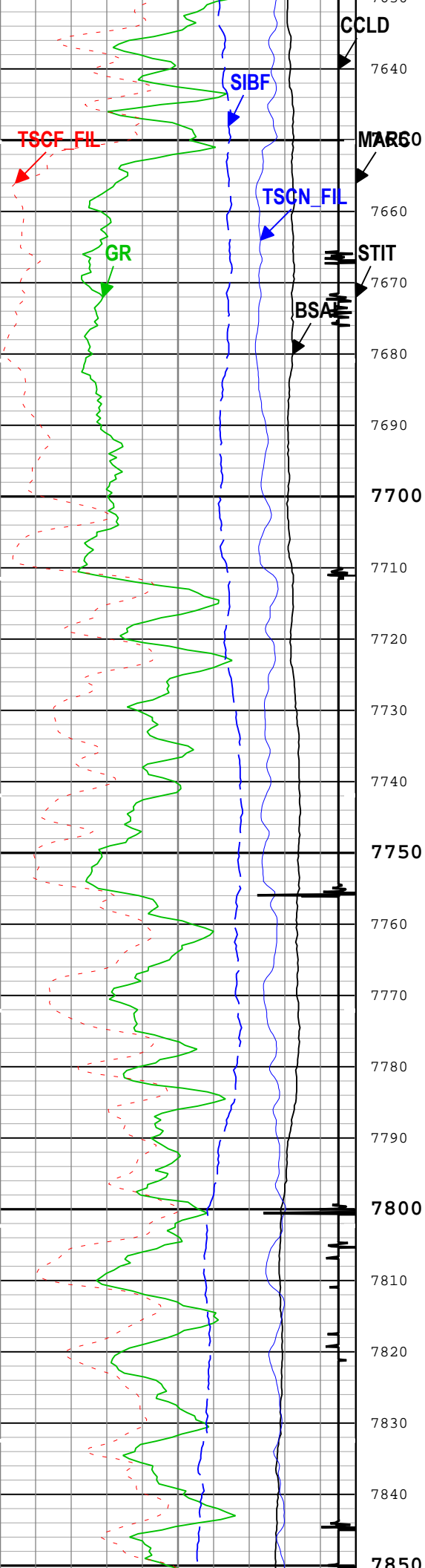


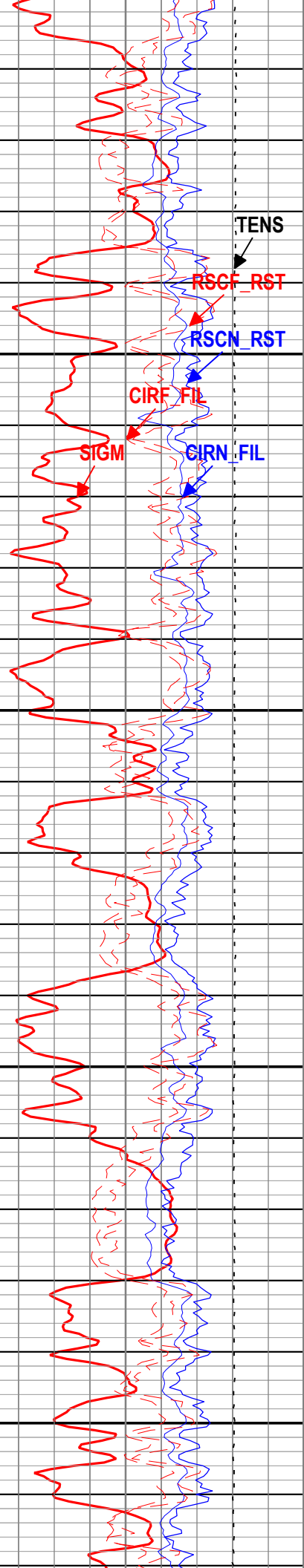
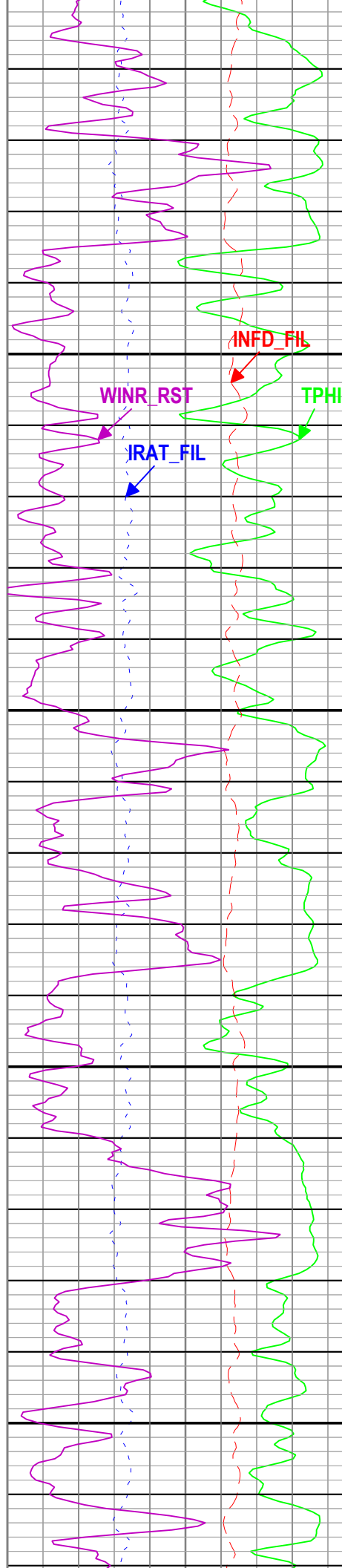
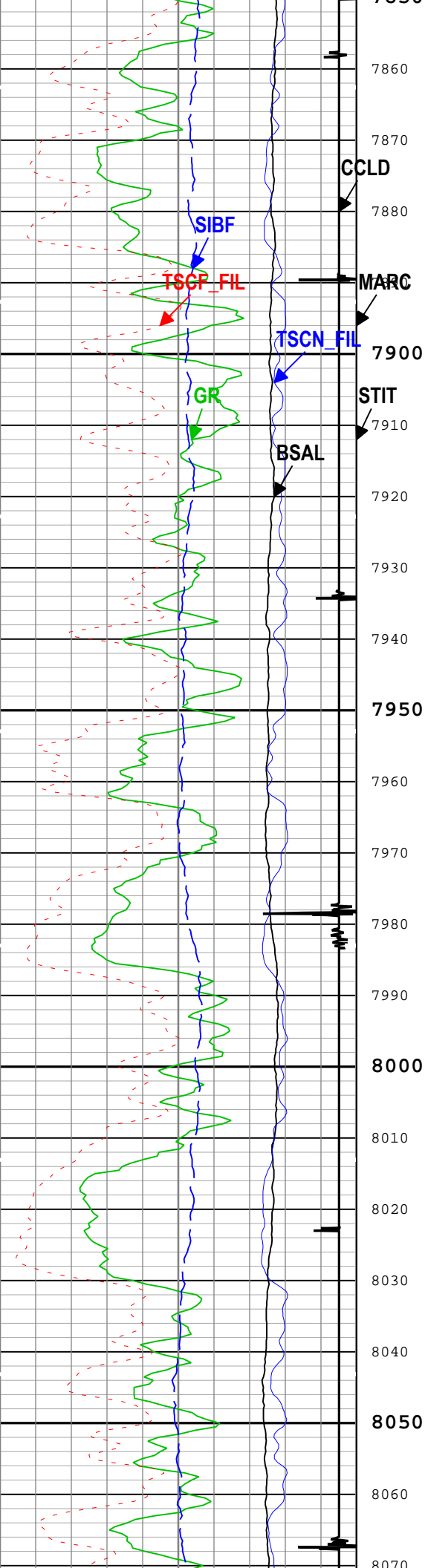


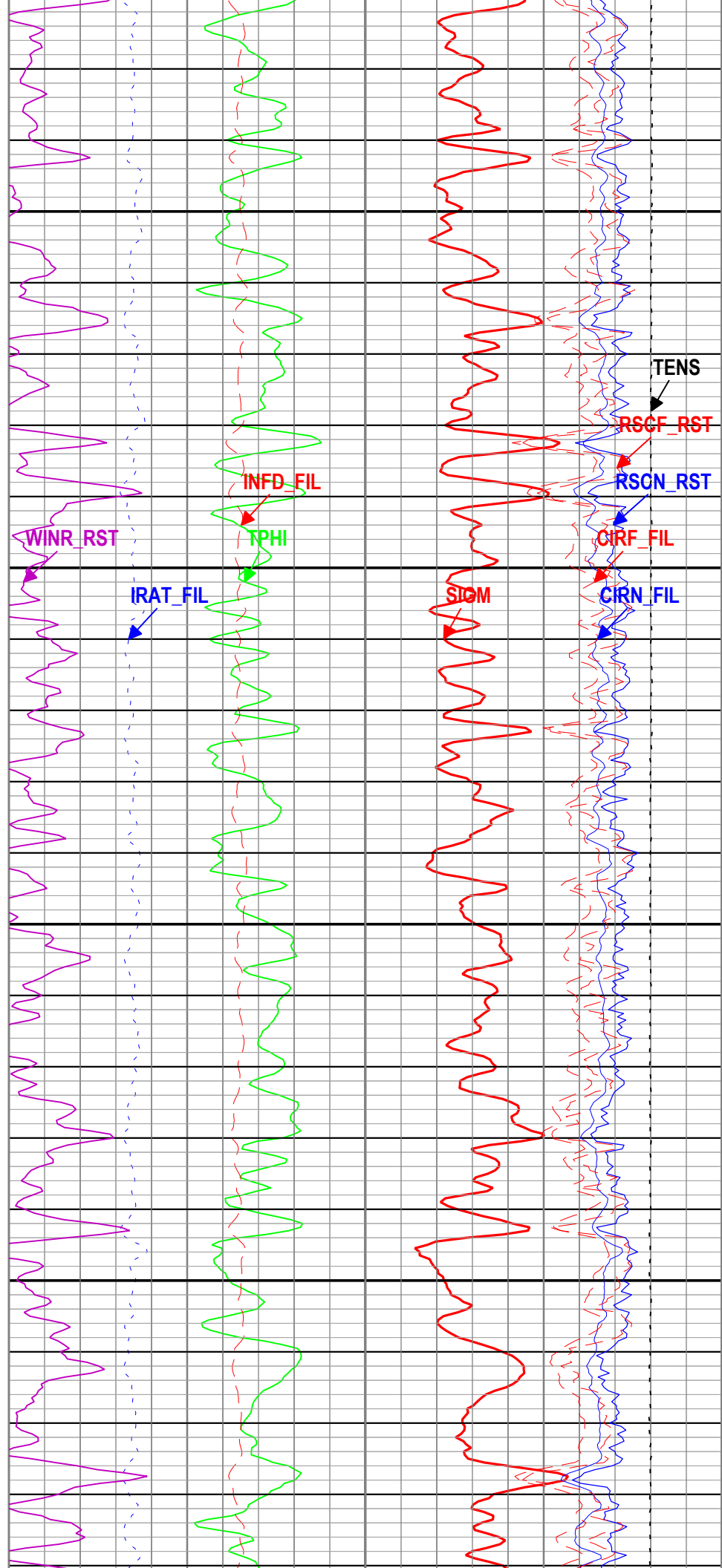
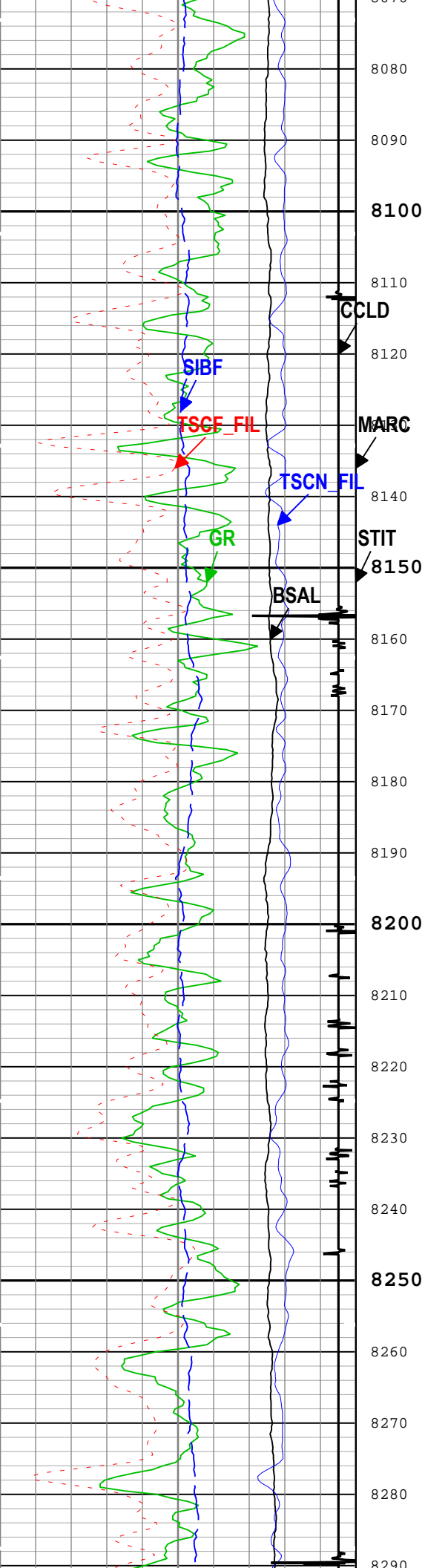


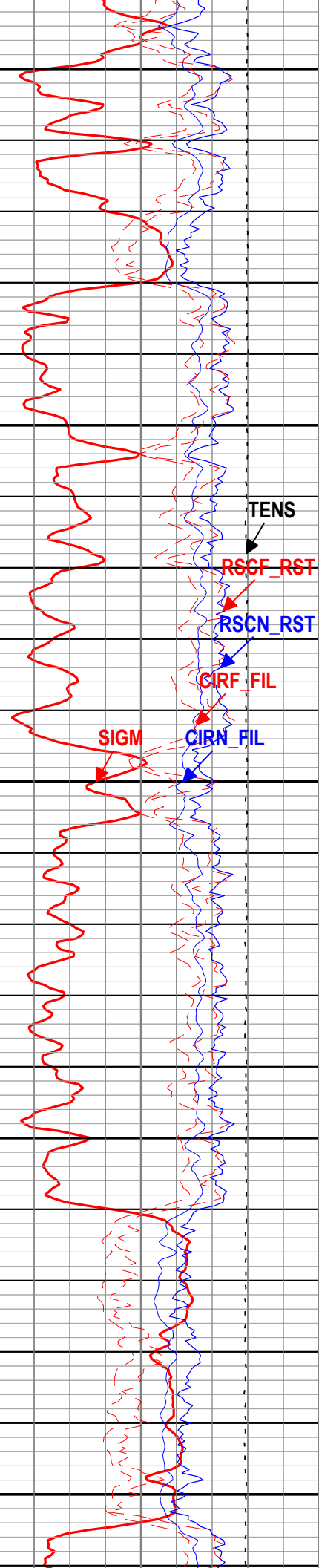
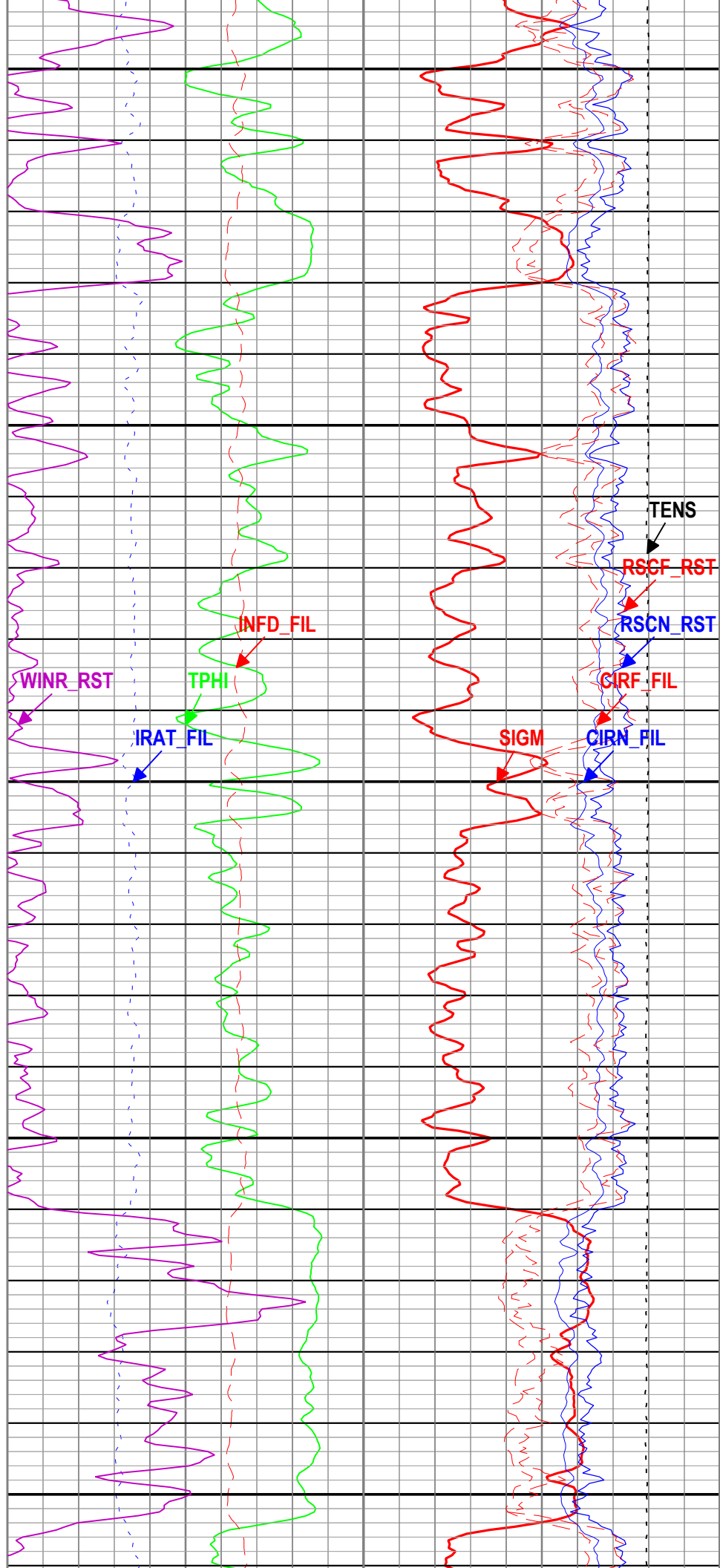
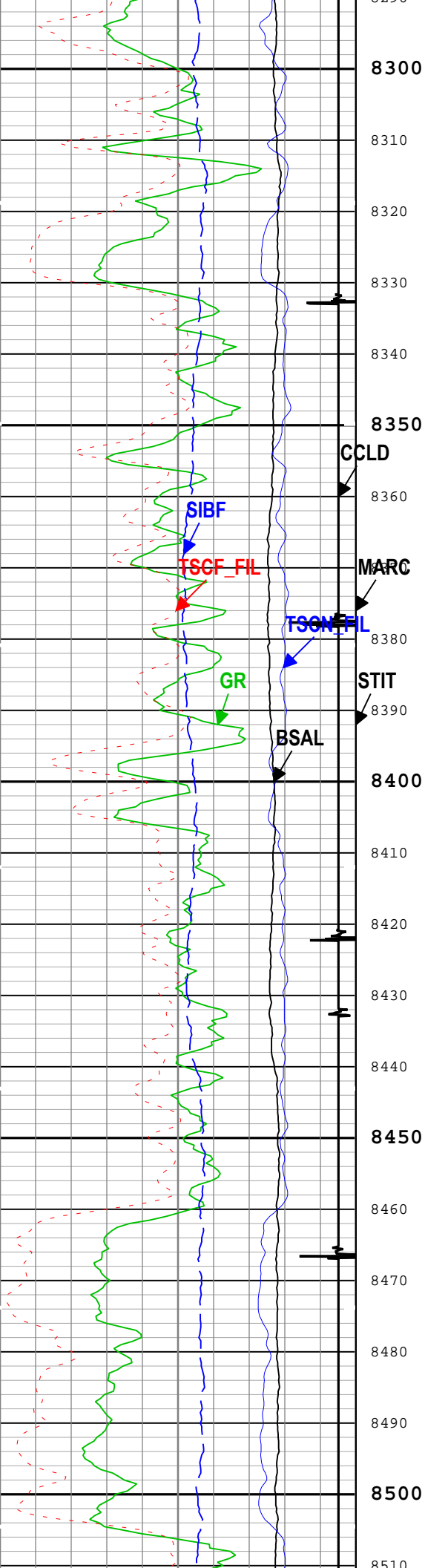


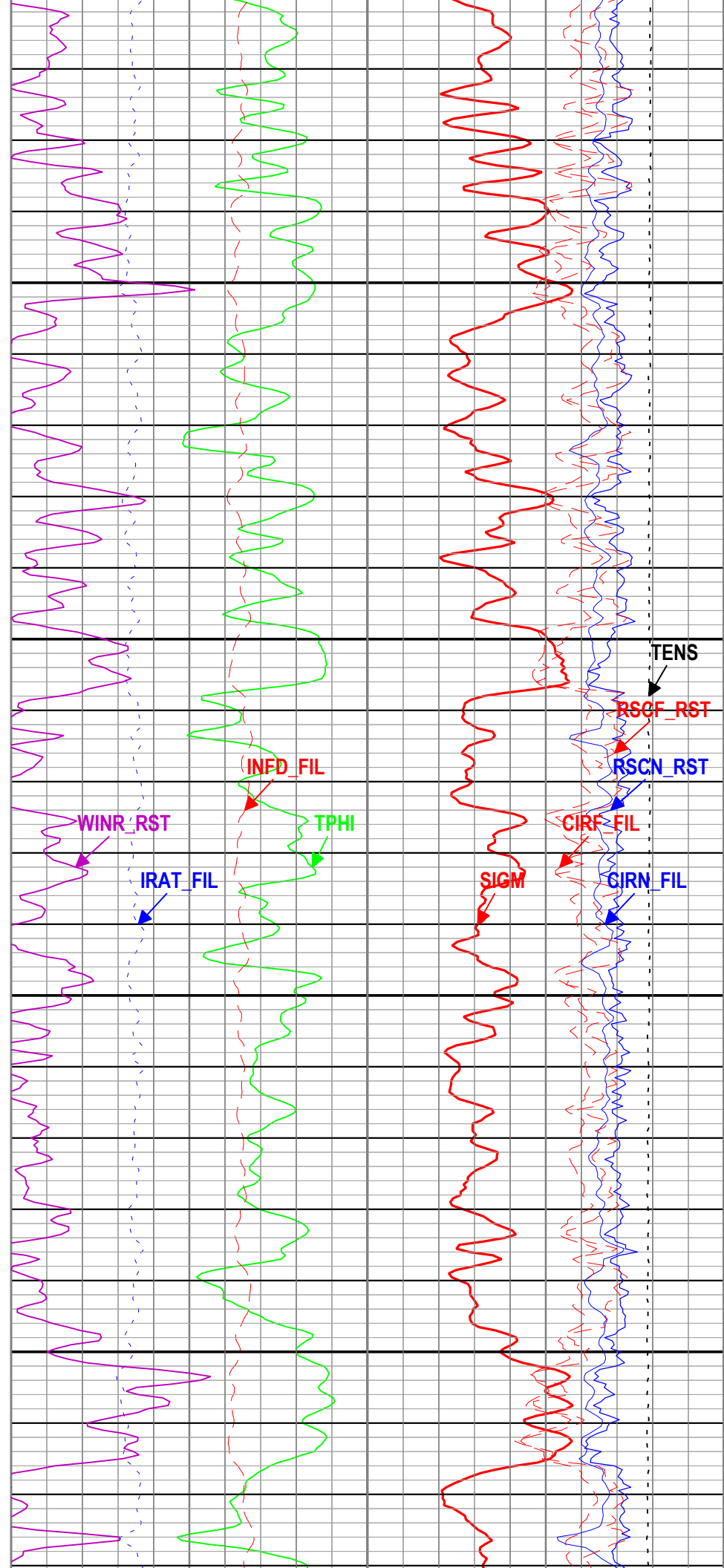
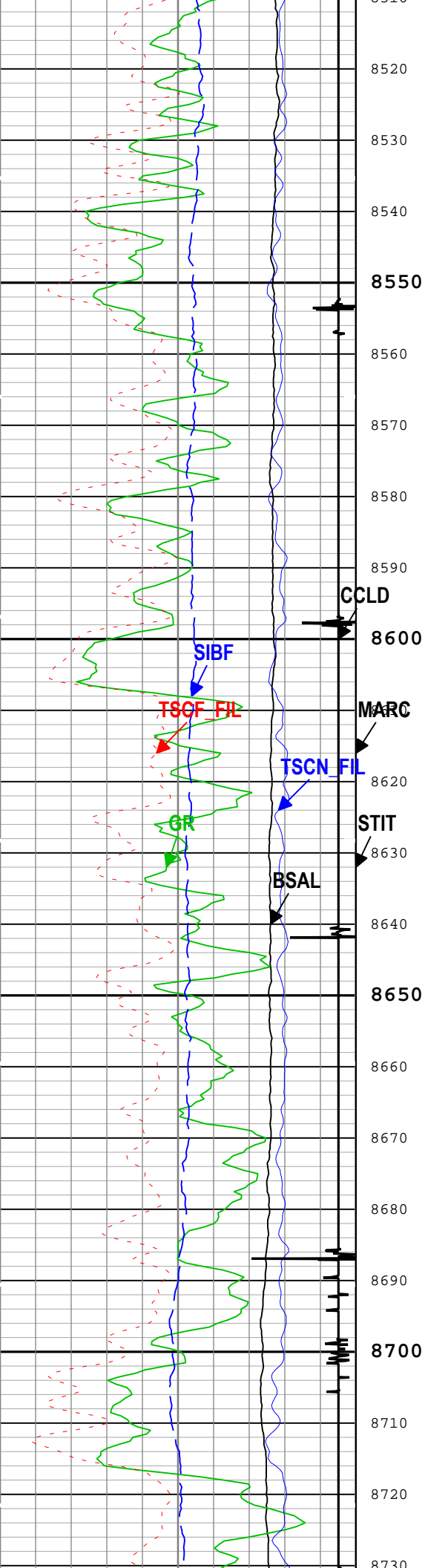


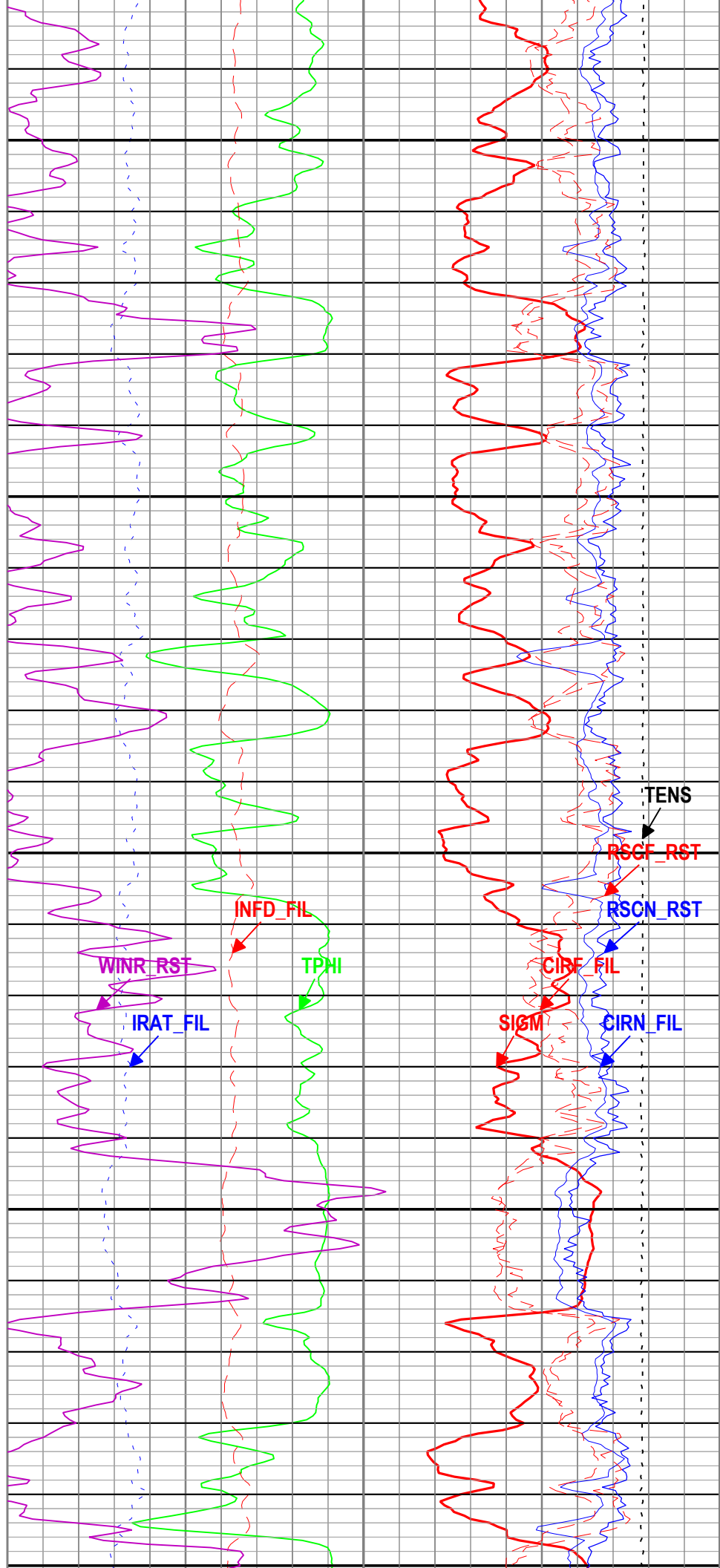
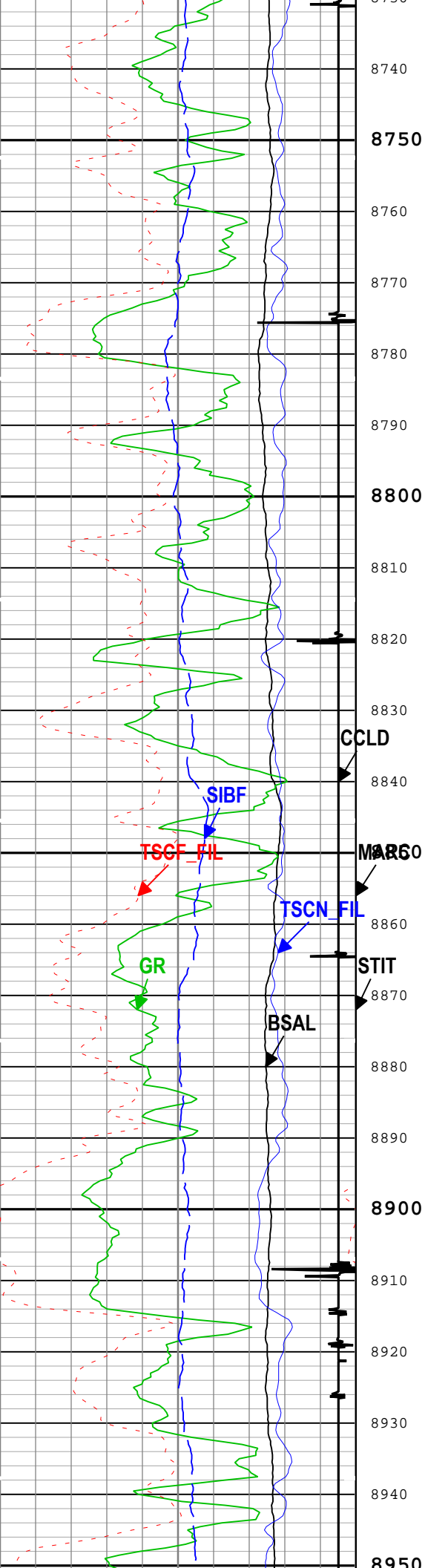


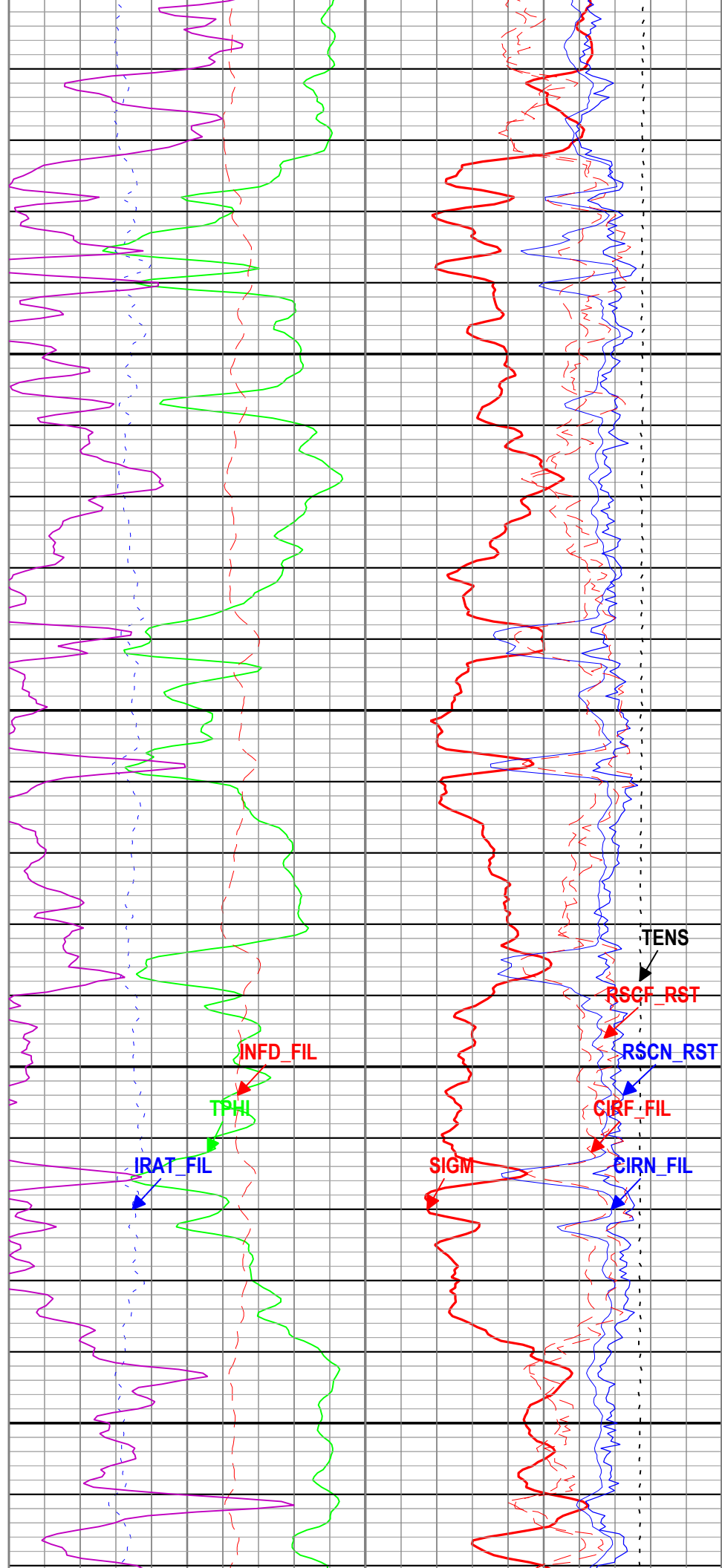
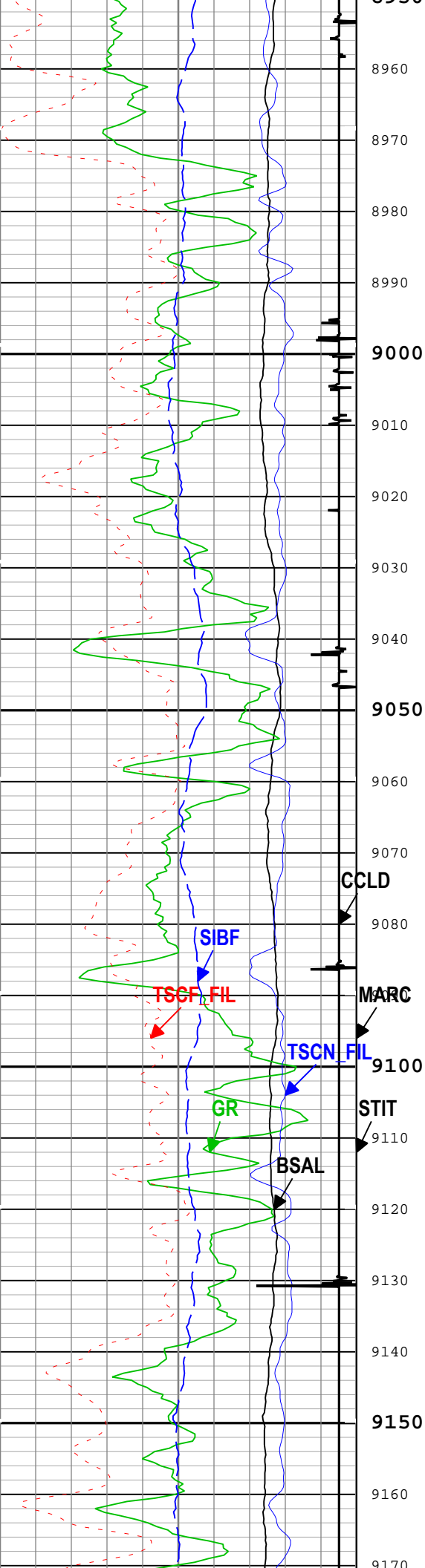


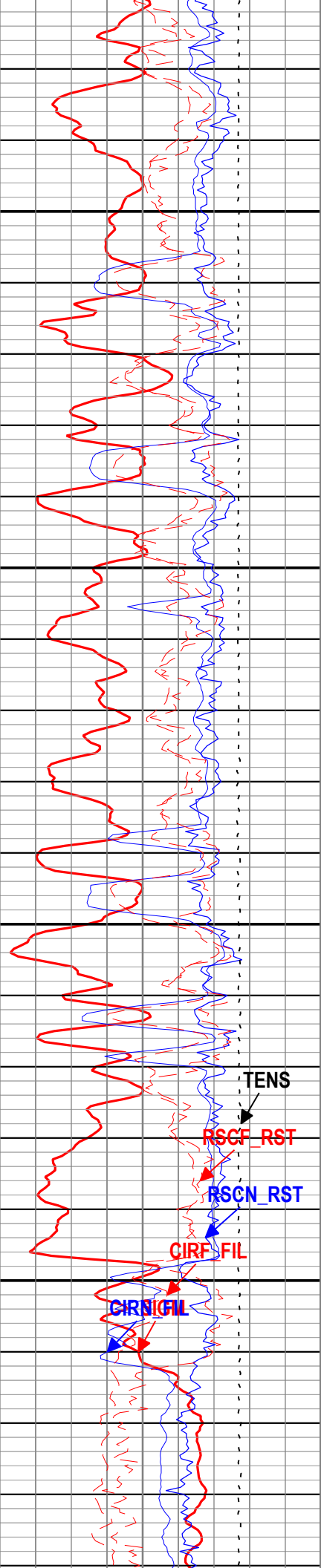
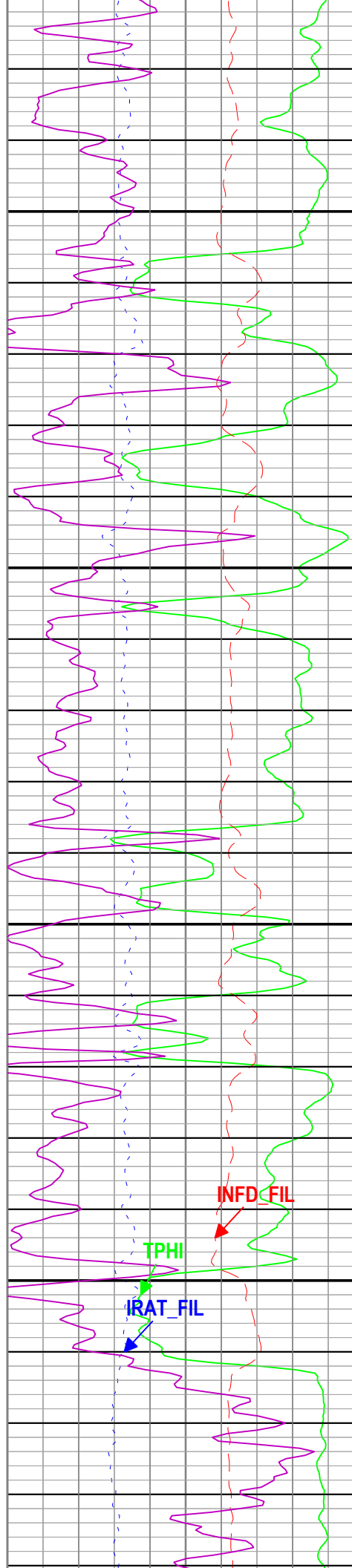
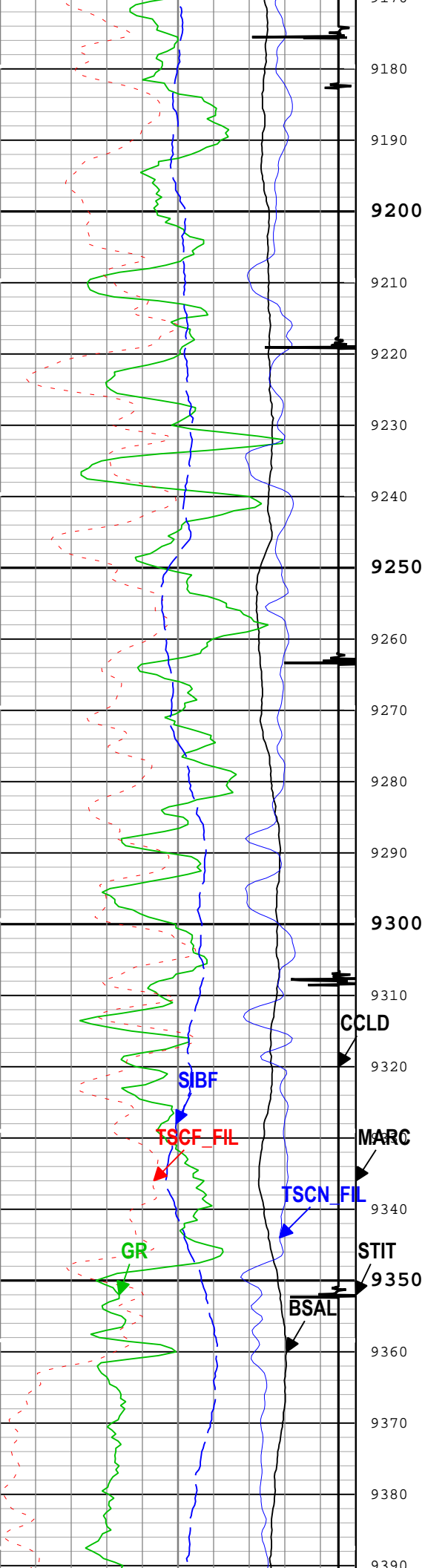


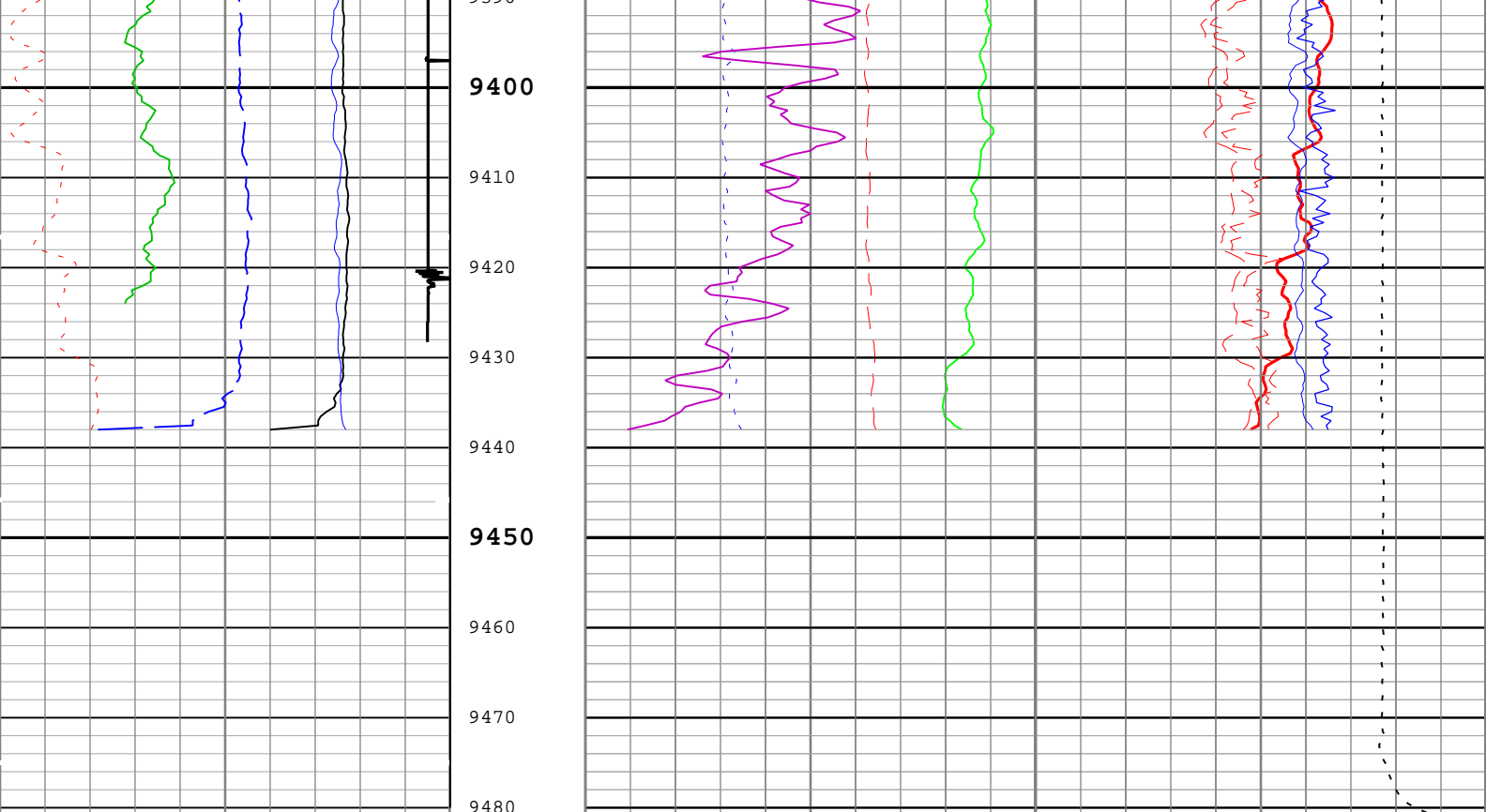












Borehole Salinity (BSAL) RST-C			Stuck Tool Indicator, Total (STIT)			Formation Sigma (Neutron Capture Cross Section) (SIGM) RST-C		
450	ppk	-50	0	ft	50	60	cu	0
Gamma Ray (GR) PSTP-B			Cable Drag From STIA to STIT			Weighted Inelastic Ratio (WINR_RST) RST-C		
0	gAPI	150	Tool_Tot. Drag From D3T to STIT			0		0.4
Total Selected Count Rate Near Detector Filtered (TSCN_FIL) RST-C			Minitron Arc Count (MARC) RST-C			Inelastic Ratio Filtered (IRAT_FIL) RST-C		
30000	1/s	0	0		5	0.75		0
Total Selected Count Rate Far Detector Filtered (TSCF_FIL) RST-C						Capture to Inelastic Ratio Near Filtered (CIRN_FIL) RST-C		
12000	1/s	0				2.5		0
Sigma Borehole Fluid (SIBF) RST-C						Capture to Inelastic Ratio Far Filtered (CIRF_FIL) RST-C		
100	cu	0				5		0
CCL Discriminated Amplitude (CCLD) PSTP-B						Near Detector Effective Unregulated Capture Count Rate (RSCN_RST) RST-C		
-19	V	1				45		0
						Far Detector Effective Unregulated Capture Count Rate (RSCF_RST) RST-C		
						45		0
						Cable Tension (TENS)		
						5000	lbf	0

—ICV - Integrated Cement Volume every 100.00 (ft3)
—ICV - Integrated Cement Volume every 10.00 (ft3)
—IHV - Integrated Hole Volume every 100.00 (ft3)
—IHV - Integrated Hole Volume every 10.00 (ft3)
—TIME_1900 - Time Marked every 60.00 (s)
—TIME_1900 - Elapsed time since midnight, 30 December 1899 every 60.00 (s)

Description: RST SIGMA Answer Format: Log (RST SIGMA Answer) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 2018-09-16 16:28:52

Parameter	Description	Tool	Value	Unit
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	Depth Zoned	in
BSAL	Borehole Salinity	Borehole	0	ppm
BSALOPT	Borehole Salinity Option	RST-C	Unknown	
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
MATR	Rock Matrix for Neutron Porosity Corrections	Borehole	SANDSTONE	
TD	Total Measured Depth	Borehole	9474	ft

Depth Zone Parameters				
Parameter	Value	Start (ft)	Stop (ft)	
BS	14.75	1900	2050	
BS	8.75	2050	9480.5	
All depth are actual.				

Tool Control Parameters				
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One: Parameters				
Parameter	Description	Tool	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	150	ft/h
PCCG	PSP Downhole CCL Gain	PSTP-B	24 dB	
RST_DLM	Depth Log Mode	RST-C	Sigma	

One				
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Repeat Pass				
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Software Version				
Acquisition System		Version		
Maxwell 2017 SP3		7.3.92069.3100		
Application Patch		Wireline_Hotfix-RTDLIS-2017SP3_7.3.92363		
		Wireline_Hotfix-SML-2017SP3_7.3.101161		

Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[2]:Up	Up	9053.45 ft	9487.42 ft	14-Sep-2018 8:47:14 AM	14-Sep-2018 9:04:51 AM	ON	6.10 ft	No

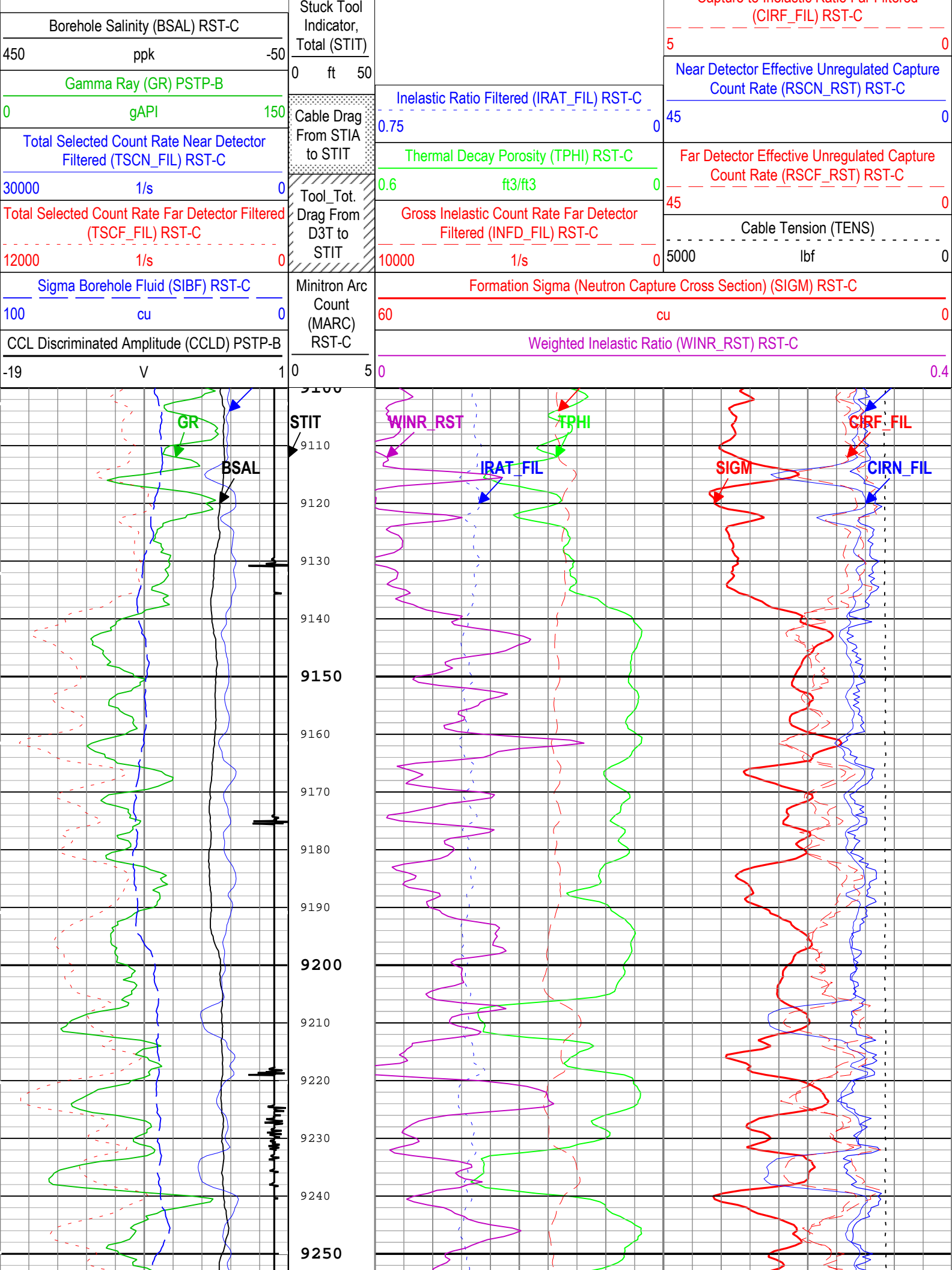
All depths are referenced to toolstring zero									
--	--	--	--	--	--	--	--	--	--

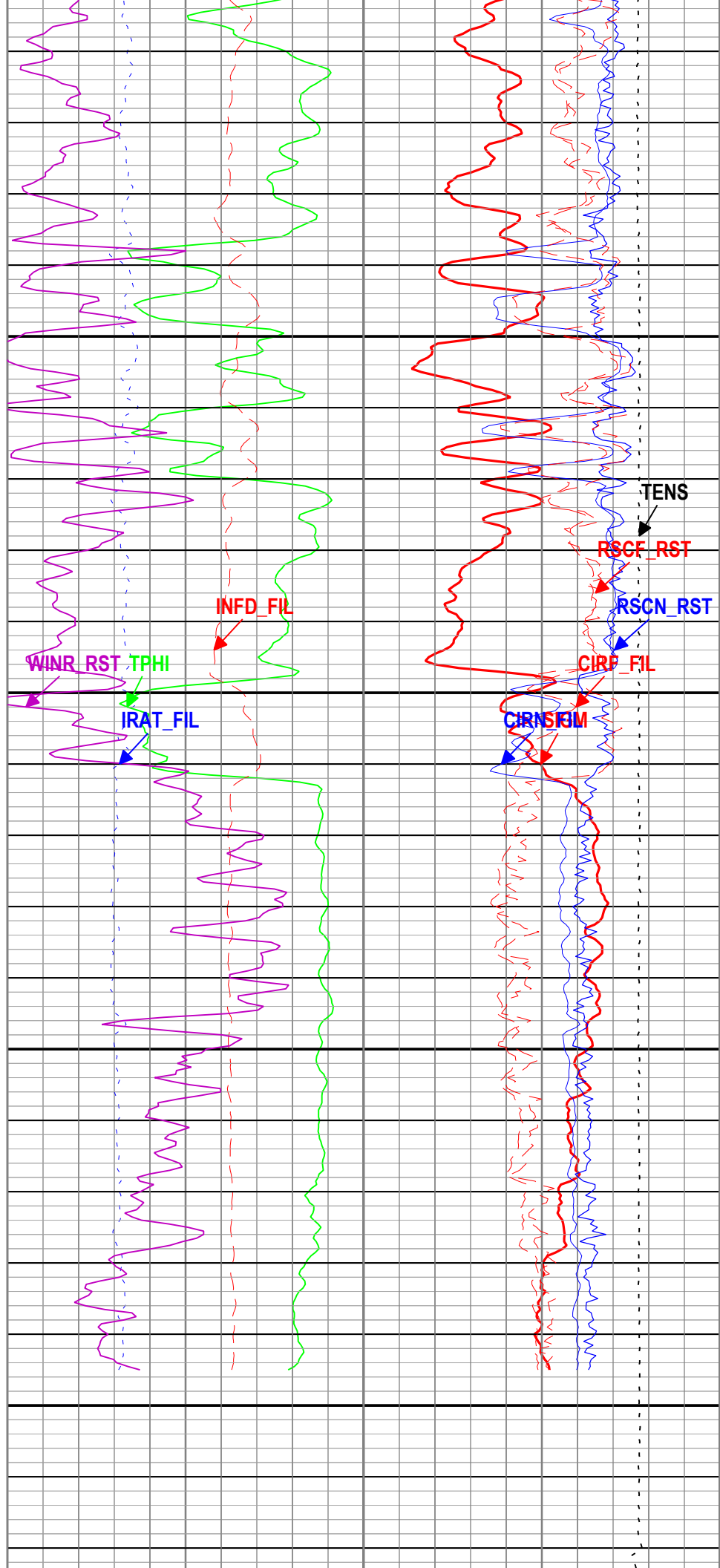
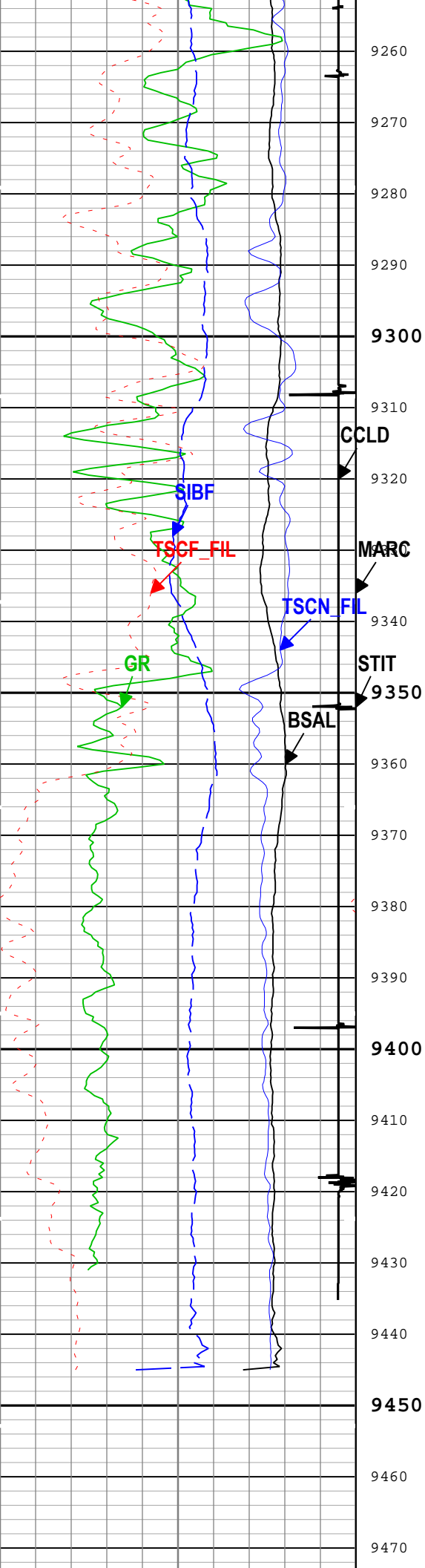
Log	<div>Company:Caerus Operating LLC Well:NPR 15A-10 596</div> <div>One: Log[2]:Up:S002</div>								
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Description: RST SIGMA Answer Format: Log (RST SIGMA Answer) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 14-Sep-2018 16:29:01
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<div> <div>TIME_1900 - Elapsed time since midnight, 30 December 1899 every 60.00 (s)</div> <div> <div>—IHV - Integrated Hole Volume every 10.00 (ft3)</div> <div>—IHV - Integrated Hole Volume every 100.00 (ft3)</div> <div>—ICV - Integrated Cement Volume every 10.00 (ft3)</div> </div> </div> <div>TIME_1900 - Time Marked every 60.00 (s)</div> <div> <div>—ICV - Integrated Cement Volume every 100.00 (ft3)</div> </div>
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<div>Capture to Inelastic Ratio Near Filtered (CIRN_FIL) RST-C</div> <div>2.5</div> <div>Capture to Inelastic Ratio Far Filtered</div>		0
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	└─ ICV - Integrated Cement Volume every 100.00 (ft3)
TIME_1900 - Time Marked every 60.00 (s)	└─ ICV - Integrated Cement Volume every 10.00 (ft3)
	└─ IHV - Integrated Hole Volume every 100.00 (ft3)
	└─ IHV - Integrated Hole Volume every 10.00 (ft3)
	─ TIME_1900 - Elapsed time since midnight, 30 December 1899 every 60.00 (s)

Description: RST SIGMA Answer	Format: Log (RST SIGMA Answer)	Index Scale: 5 in per 100 ft	Index Unit: ft	Index Type: Measured Depth	Creation Date: 14-Sep-2018 16:29:01
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Channel Processing Parameters	
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One: Parameters

Parameter	Description	Tool	Value	Unit
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	8.75	in
BSAL	Borehole Salinity	Borehole	0	ppm
BSALOPT	Borehole Salinity Option	RST-C	Unknown	
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
MATR	Rock Matrix for Neutron Porosity Corrections	Borehole	SANDSTONE	
TD	Total Measured Depth	Borehole	9474	ft

Tool Control Parameters	
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One: Parameters

Parameter	Description	Tool	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	150	ft/h
PCCG	PSP Downhole CCL Gain	PSTP-B	24 dB	
RST_DLM	Depth Log Mode	RST-C	Sigma	

Company: Caerus Operating LLC

Schlumberger

Well: NPR 15A-10 596

Field:	NPR
County:	Garfield
State:	Colorado

Cement Bond Log

RST Sigma Log

Gamma Ray - Collar Locator Log