

Company: St. Croix Operating Inc.

Well: Armstrong #1

Field: Wildcat

County: Washington

State:

Colorado

Platform Express

High Resolution Laterolog Array

County: Washington
Field: Wildcat
Location: 600' FSL & 2040' FEL
Well: Armstrong #1
Company: St. Croix Operating Inc.

Location:	600' FSL & 2040' FEL	Elev.:	K.B.	4675.00 ft
			G.L.	4667.00 ft
			D.F.	4674.00 ft
	Permanent Datum:	Ground Level	Elev.:	4667.00 f
Log Measured From:		Kelly Bushing	8.00 ft	above Perm.Datum
Drilling Measured From:		Kelly Bushing		
API Serial No.	Section:	Township:	Range:	
05-121-11088	21	51W	3S	

Logging Date 04-Nov-2019

Run Number 1A

Depth Driller 4200.00 ft

Schlumberger Depth 4205.00 ft

Bottom Log Interval 4205.00 ft

Top Log Interval

Casing Driller Size @ Depth 8.625 in @ 506.00 ft

Casing Schlumberger 506 ft

Bit Size 7.875 in

Type Fluid In Hole Water

Density 9 lbm/gal

Fluid Loss PH 44 s

MUD

Source of Sample Active Tank

RM @ Meas Temp 0.2 ohm.m @ 68 degF

RMF @ Meas Temp 0.15 ohm.m @ 68 degF

RMC @ Meas Temp

Source RMF RMC

RM @ BHT RMF @ BHT

Max Recorded Temperatures 122 degF

Circulation Stopped Time 04-Nov-2019 15:30:00

Logger on Bottom Time 04-Nov-2019 18:00:00

Unit Number 9115

Location:

Time

Fort Morgan

Caroline I.

Tom Thomas

Disclaimer

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Contents

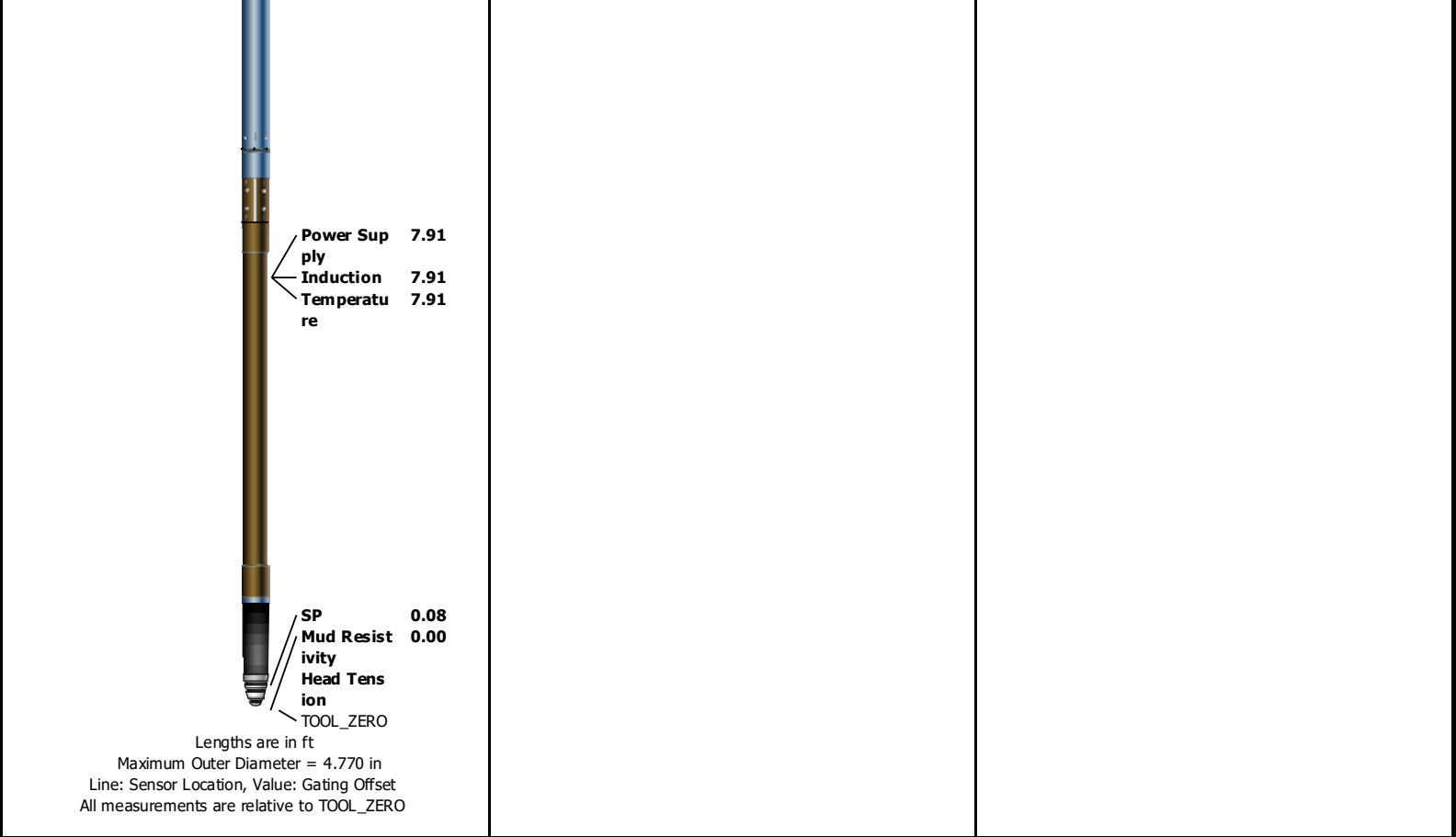
- Header
- Disclaimer
- Contents
- Remarks and Equipment Summary
- Depth Summary
- 1A Main Pass 2"=100'
 - Integration Summary
 - Composite Summary
 - Log (HRLA_5_Inch)
 - Parameter Listing
- 1A Main Pass 5"=100'
 - Integration Summary
 - Composite Summary
 - Log (HRLA_5_Inch)
 - Parameter Listing
- 1A Main Pass 5"=100'
 - Integration Summary

- No Data Assignment Main Pass 1"=100'
 - Log (HRLA_1_inch)

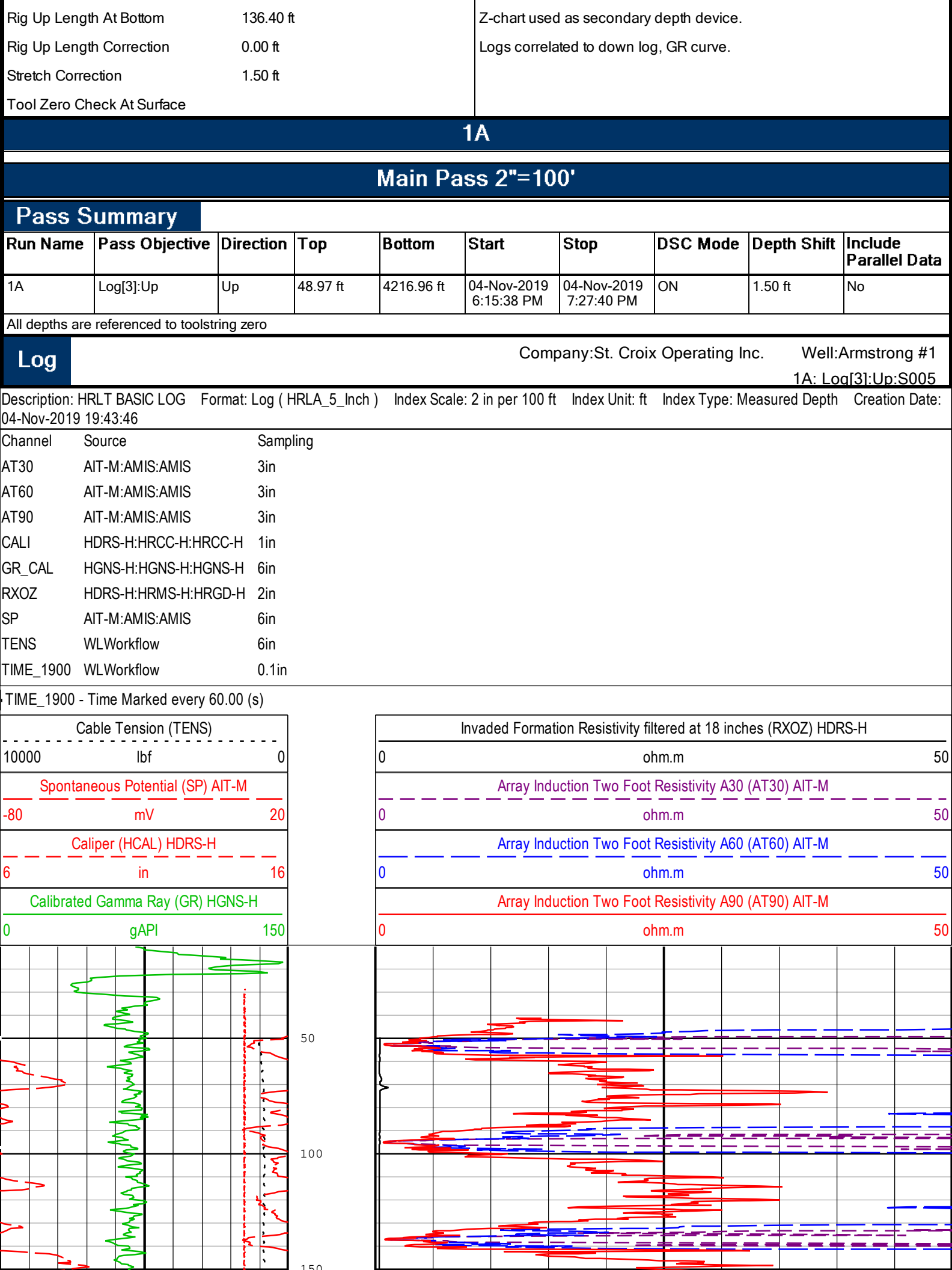
- 8.2 Software Version
- 8.3 Composite Summary
- 8.4 Log (HRLA_2_inch)
- 9. No Data Assignment Repeat Analysis 5"=100'
- 9.1 Log (HRLA_5_Inch RA)
- 10. Calibration Report
- 11. Tail

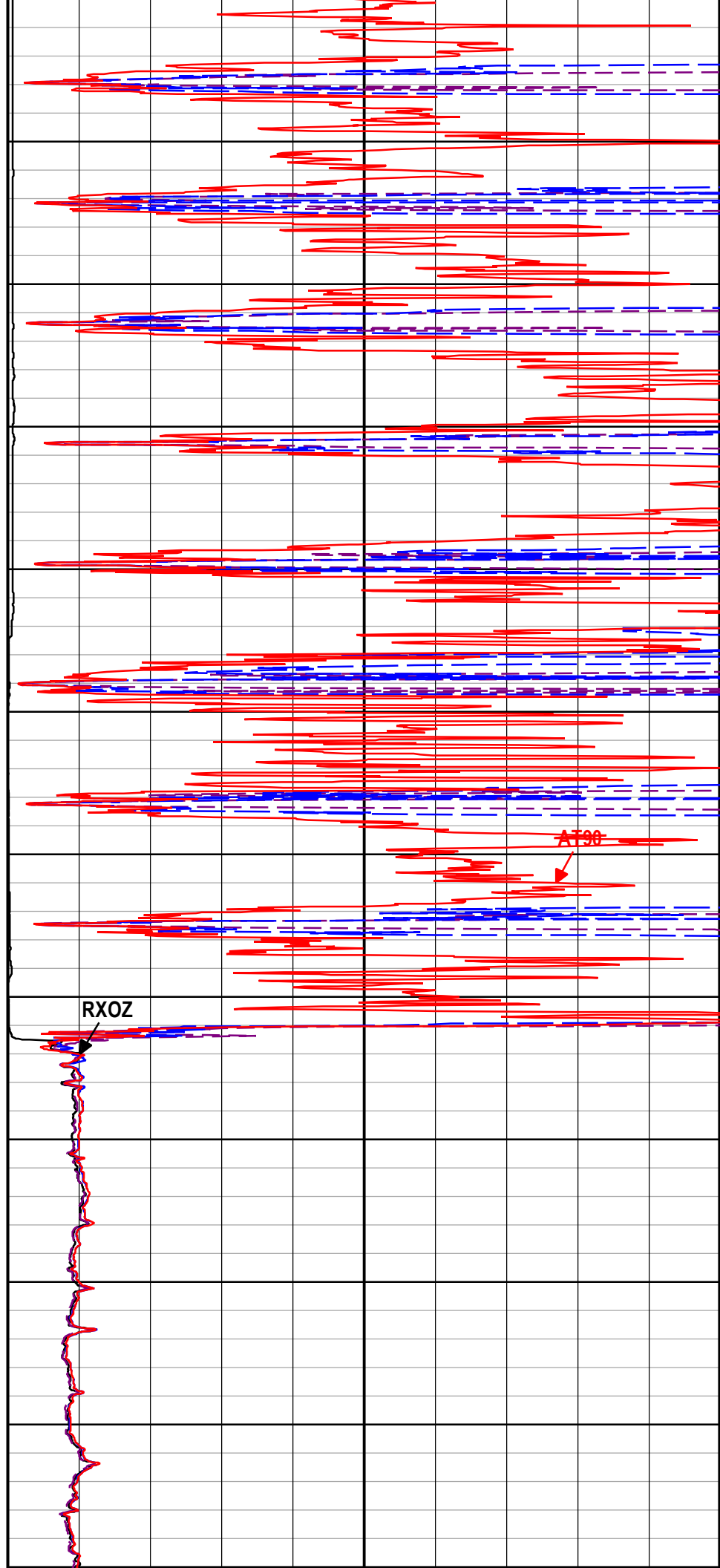
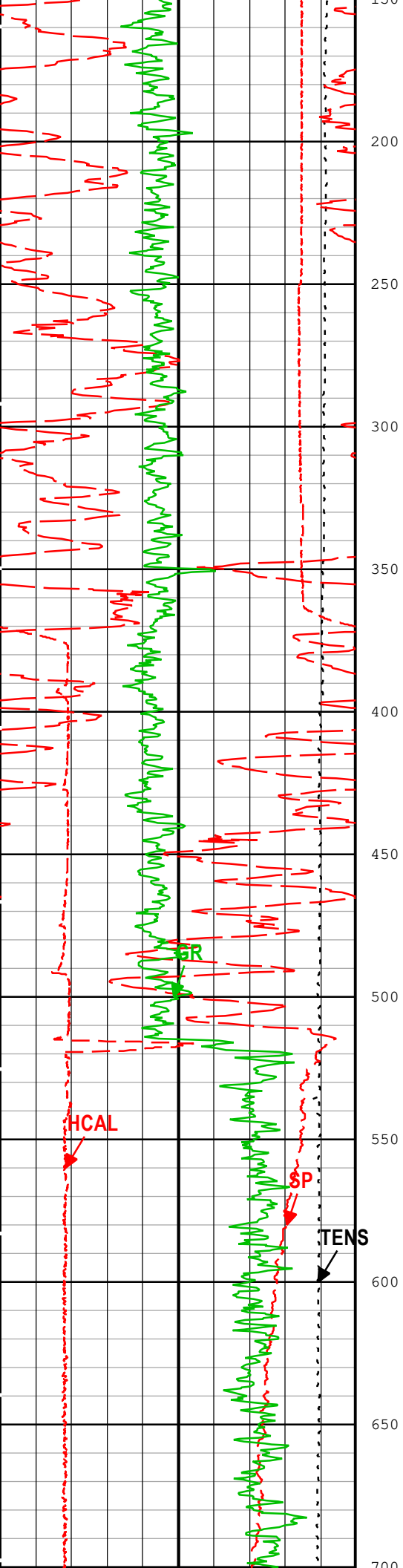
Remarks and Equipment Summary

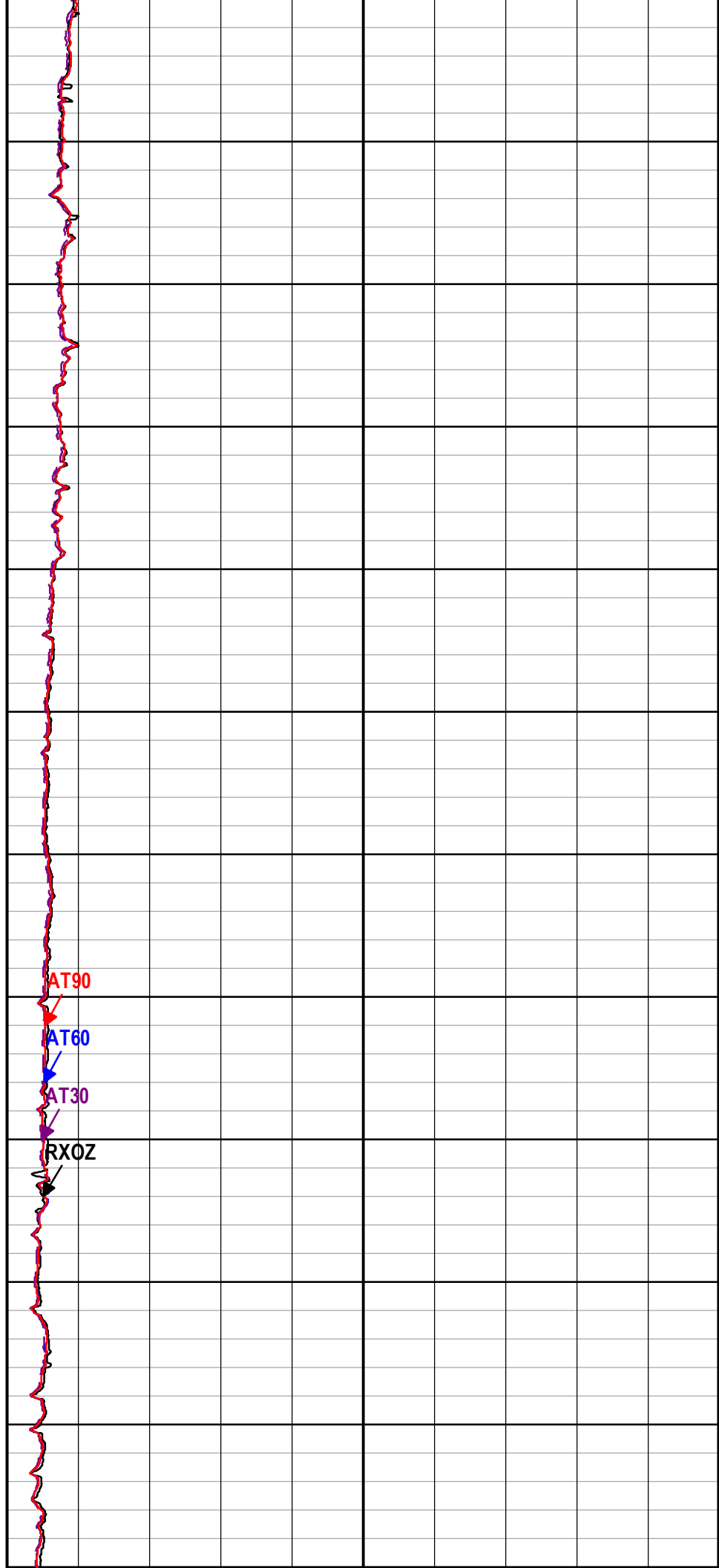
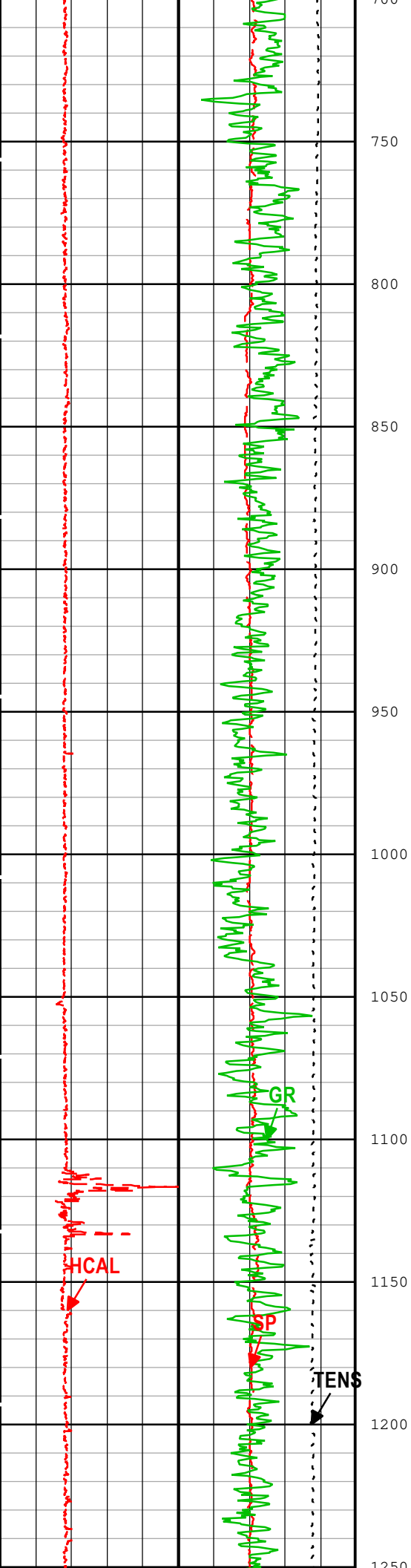
1A: Toolstring				1A: Remarks
Equip name LEH-QT LEH-QT	Length 51.14	MP name	Offset	
		CTEM	46.9	
EDTC-H EDTH-H EDTC-H	47.65			
		HV	0.00	
		ACCZ	0.00	
		Gamma Ra	41.22	
		y		
		Edtch Statu s	39.65	
		TelStatus	39.65	
		Temperatu re	39.62	
HGNS-H HGNH NSR-F:5203 NPV-N HMCA-H HGNS-H HACCZ-H:153 7	39.65	GR	38.91	
		CNL Porosity	32.58	
		HGNS	30.24	
		HMCA	30.24	
		Accelerometer	0.00	
HDRS-H ECH-MEB HRCC-H HRMS-H Short Spacing :27732 Backscatter GSR-J:5259 GPV-Q HRGD-H:3921 Long Spacing	30.24	HRCC	26.24	
		MCFL	20.81	
		Caliper	20.32	
		TLD Density	19.94	
AH-184	18.00			
AIT-M:129 AMIS:129 AMRM	16.00			

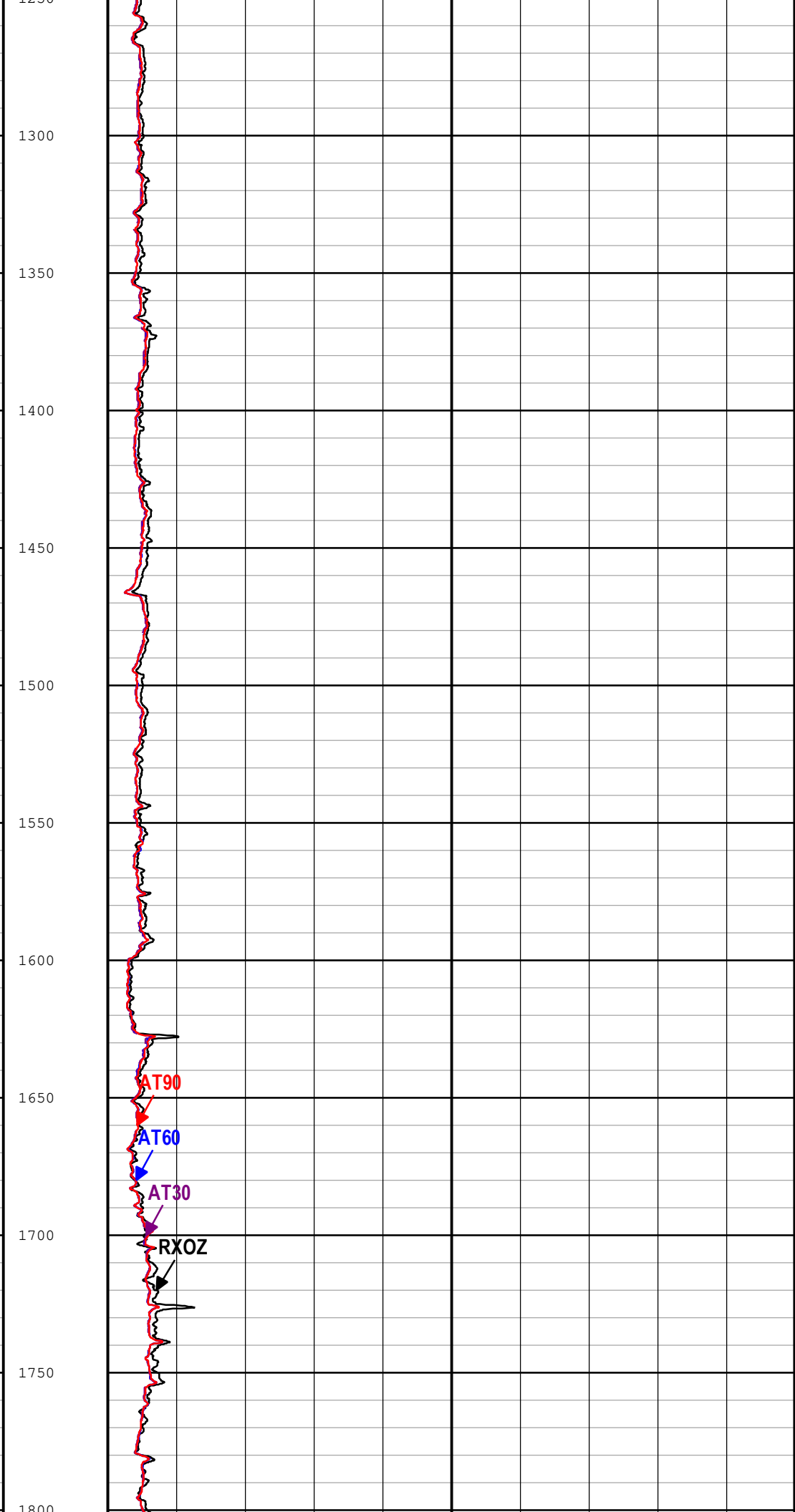
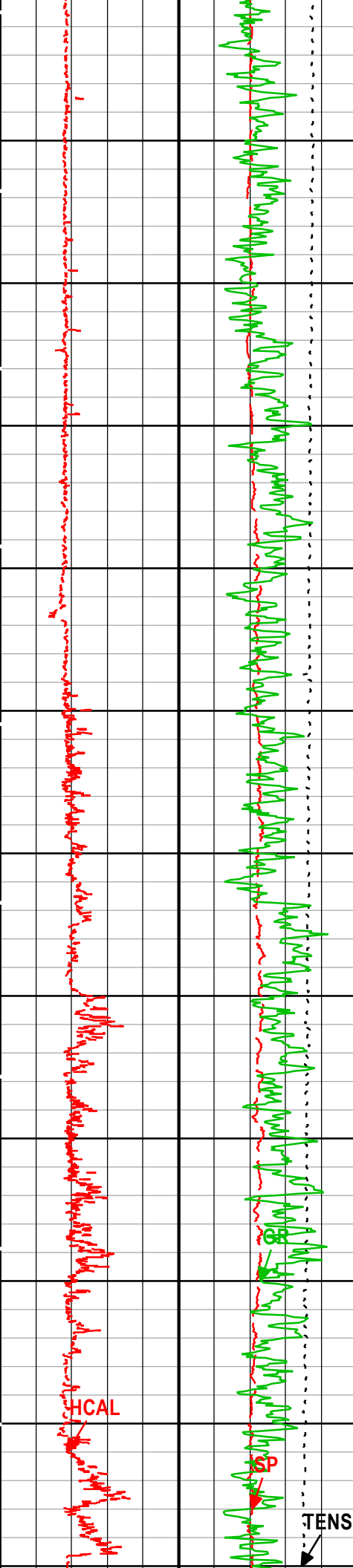


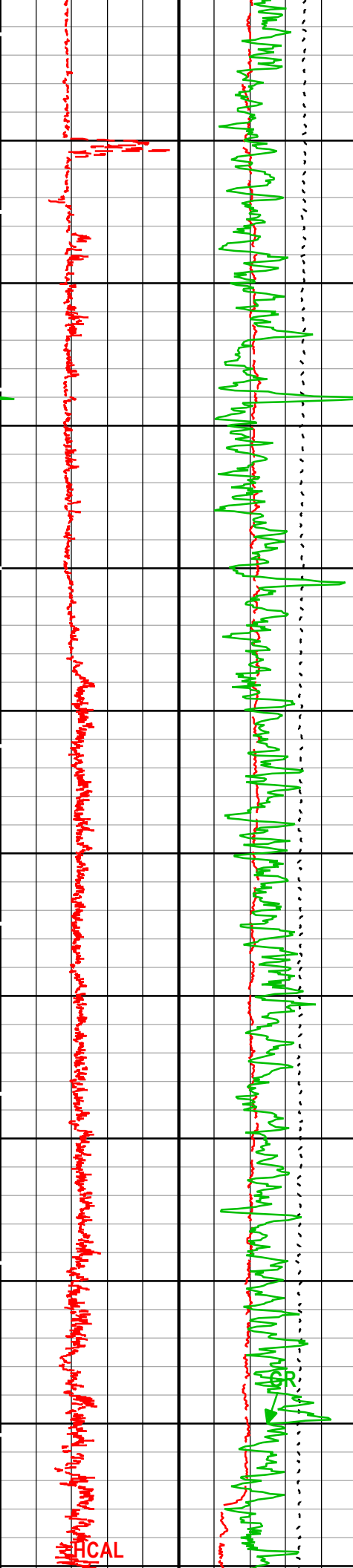
Depth Summary			
	1A		
Depth Measuring Device			
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		
Tension Device			
Type	CMTD-B/A		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0		
Logging Cable			
Type	7-46NT-XS		
Serial Number			
Length	24000.00 ft		
Conveyance Type	Wireline		
Rig Type			
1A:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well	All Schlumberger depth control procedures followed.	
Rig Up Length At Surface	136.00 ft	IDW used as primary depth device.	



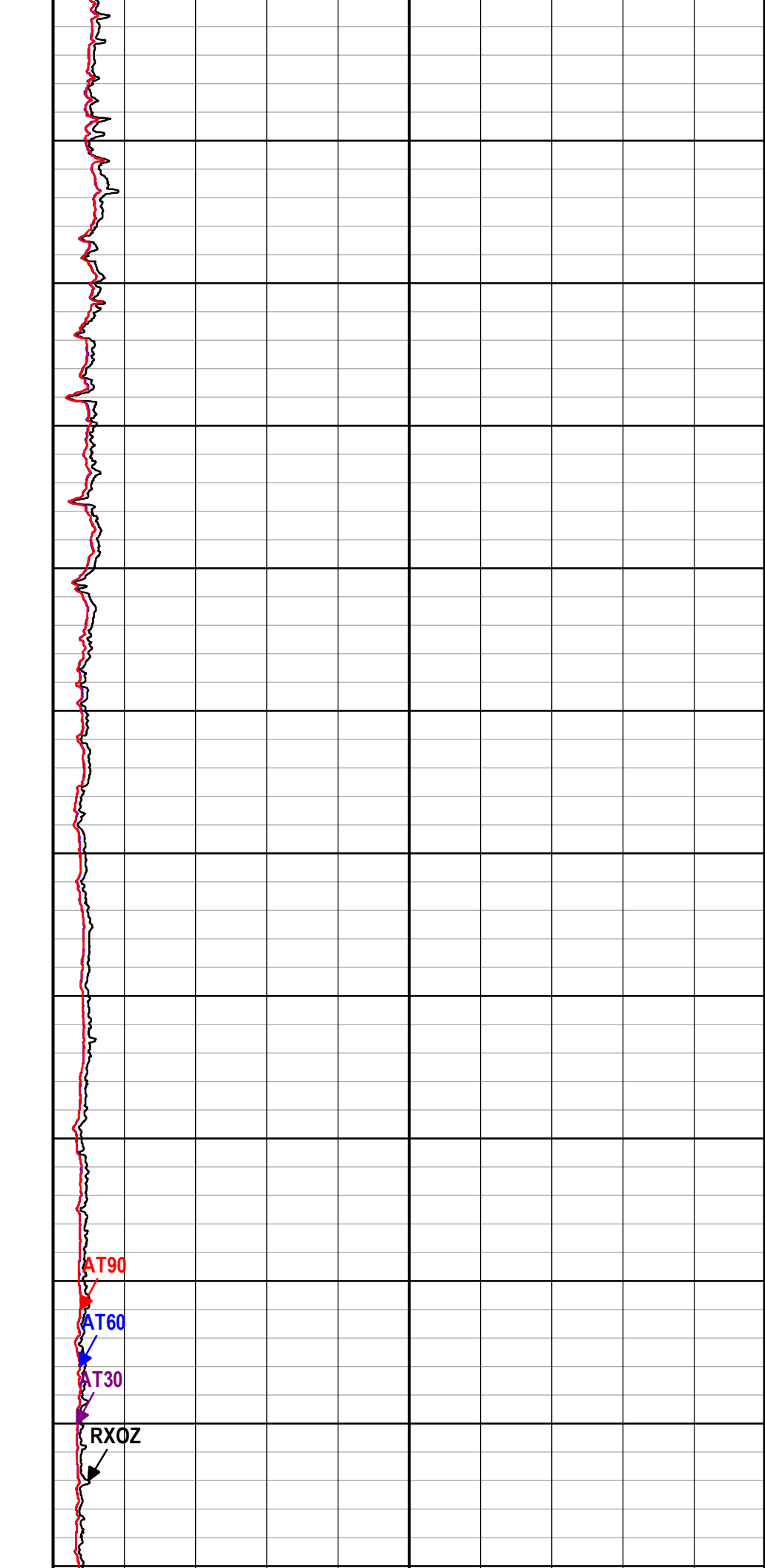


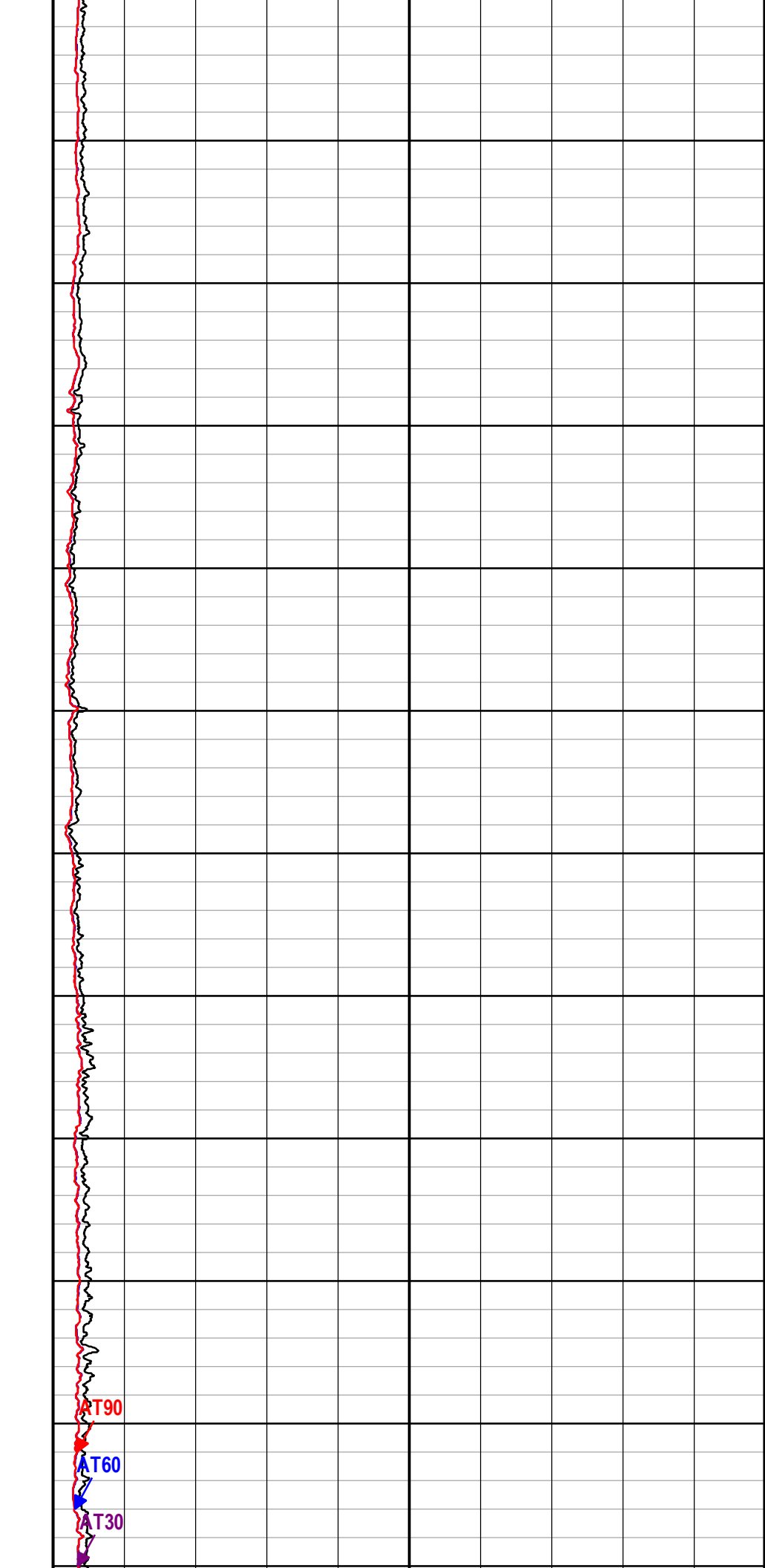
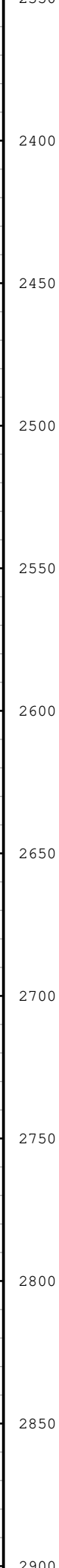
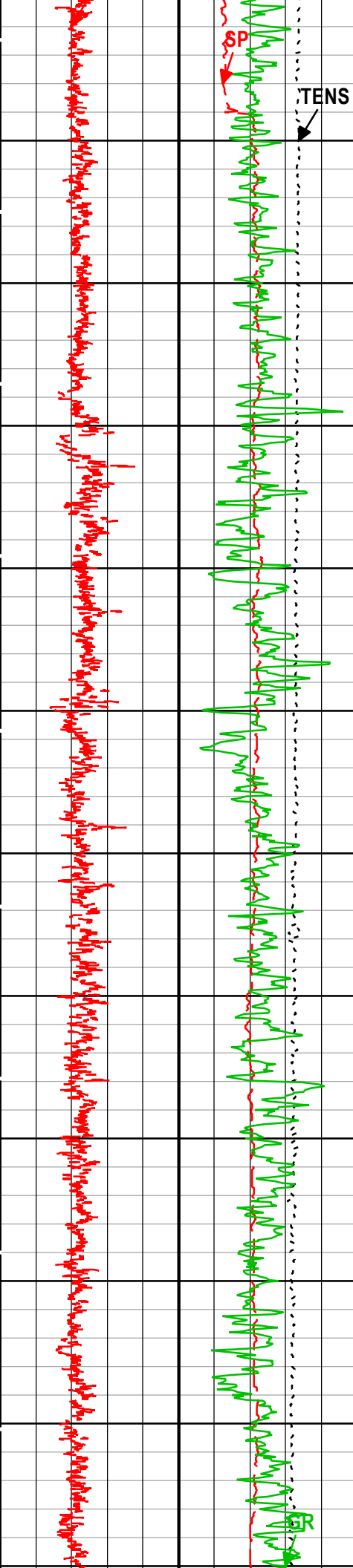


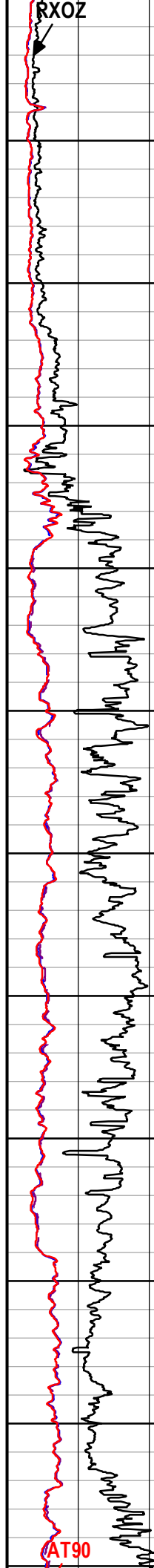
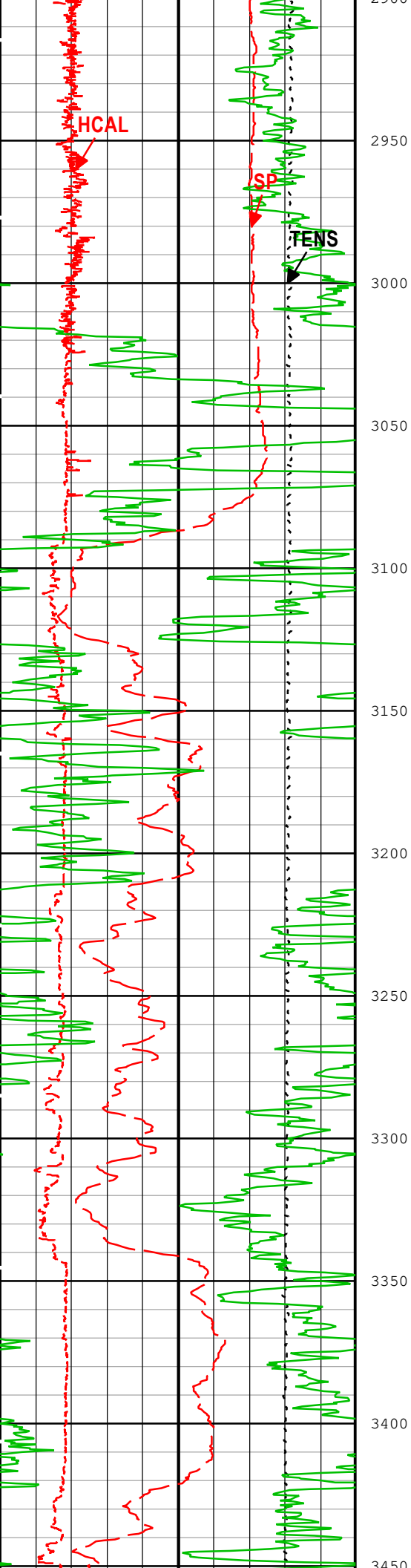


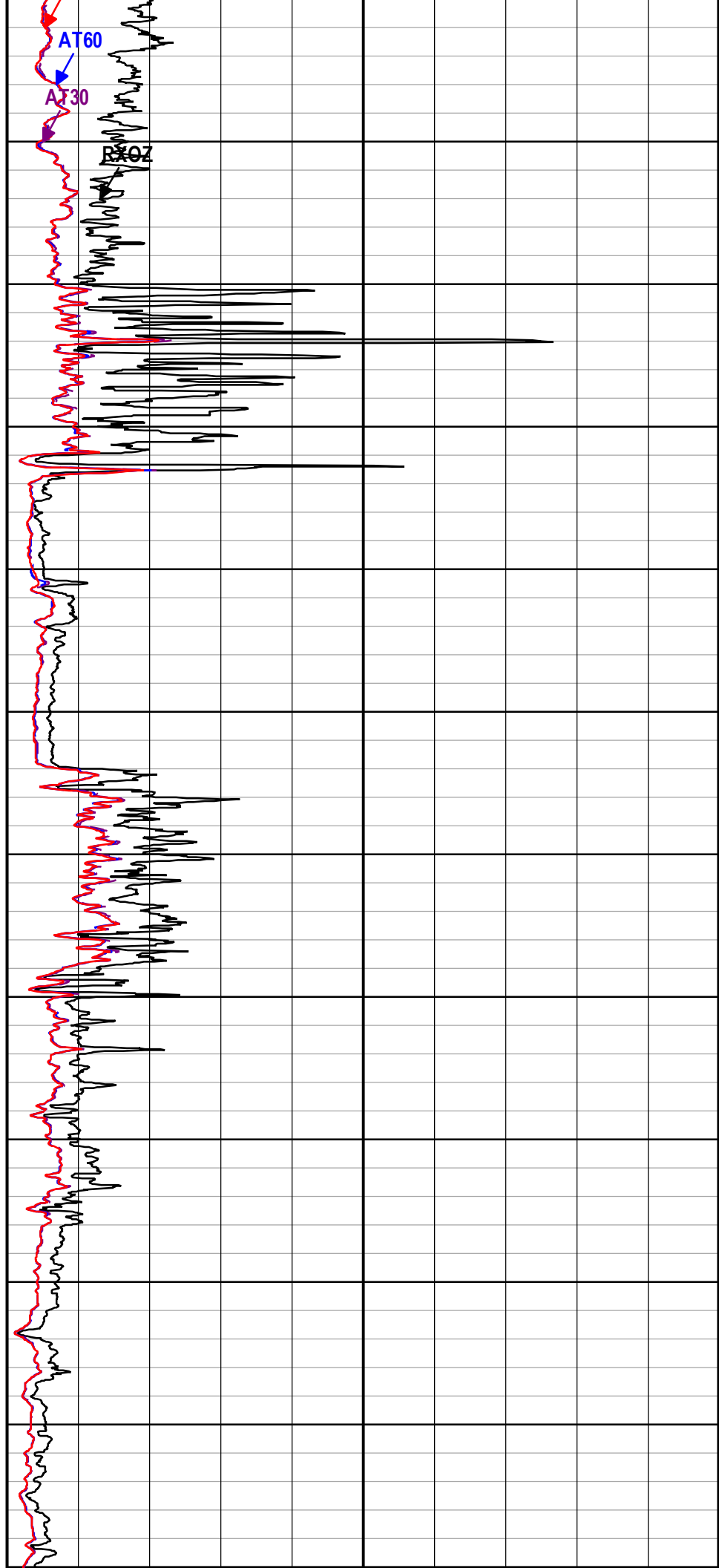
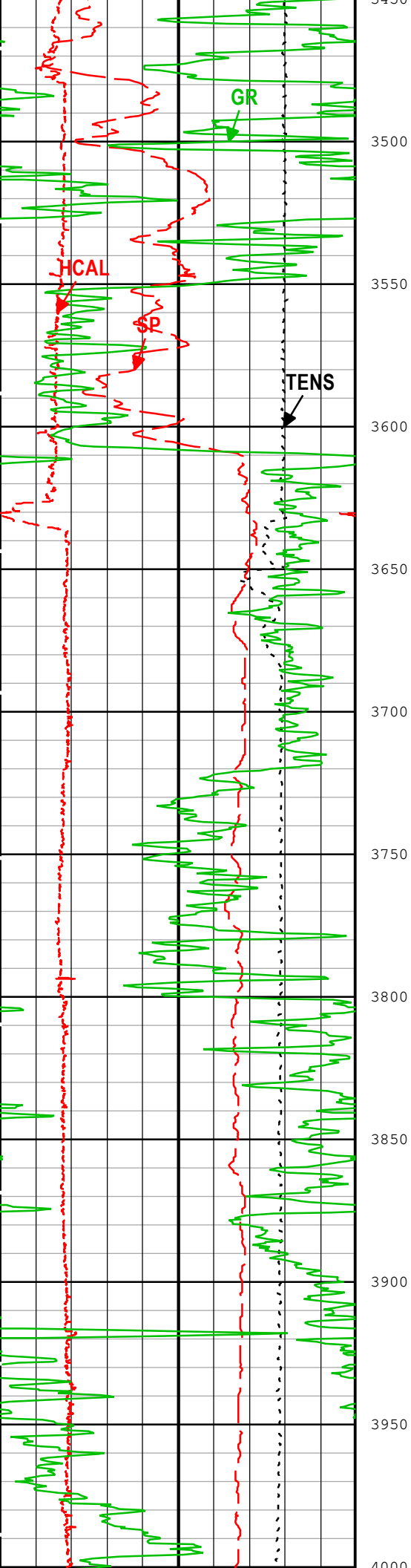


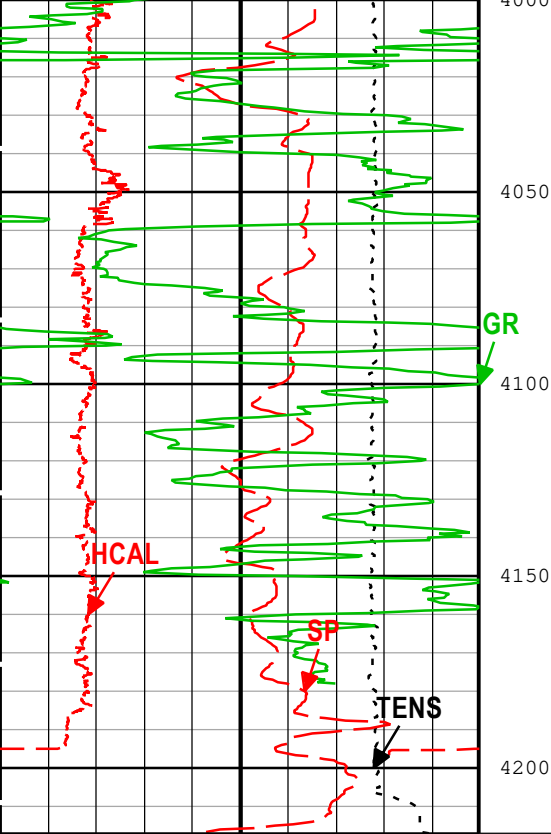
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2200
2250
2300
2350







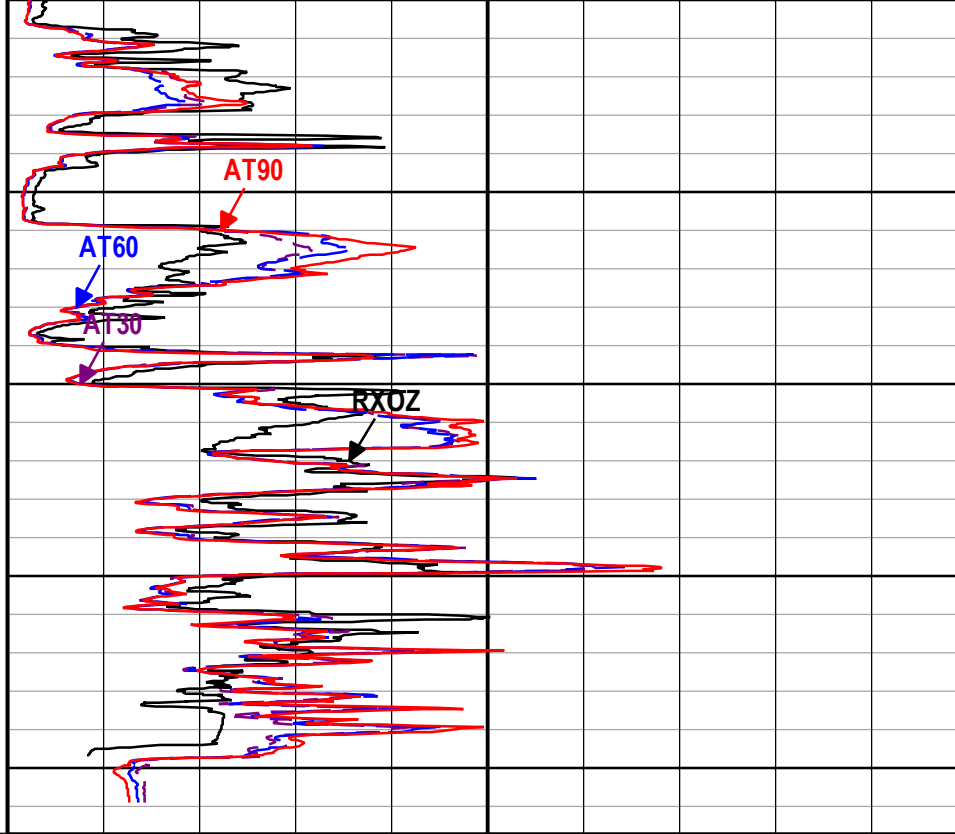




Cable Tension (TENS)	
10000	lbf
0	
Spontaneous Potential (SP) AIT-M	
-80	mV
20	
Caliper (HCAL) HDRS-H	
6	in
16	
Calibrated Gamma Ray (GR) HGNS-H	
0	gAPI
150	

TIME_1900 - Time Marked every 60.00 (s)

Description: HRLT BASIC LOG Format: Log (HRLA_5_Inch) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Nov-2019 19:43:46



Invaded Formation Resistivity filtered at 18 inches (RXOZ) HDRS-H	
0	ohm.m
50	
Array Induction Two Foot Resistivity A30 (AT30) AIT-M	
0	ohm.m
50	
Array Induction Two Foot Resistivity A60 (AT60) AIT-M	
0	ohm.m
50	
Array Induction Two Foot Resistivity A90 (AT90) AIT-M	
0	ohm.m
50	

Channel Processing Parameters

1A: Parameters

Parameter	Description	Tool	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M	Compute Standoff	
ASTA	Array Induction Tool Standoff	AIT-M	0.6	in
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BHT	Bottom Hole Temperature	Borehole	122	degF
BS	Bit Size	WLSESSION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0	in
CBLO	Casing Bottom (Logger)	WLSESSION	506	ft
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
EDF	Elevation of Derrick Floor Above Permanent Datum	WLSESSION	7	ft
EPD	Elevation of Permanent Datum (PDAT) above Mean Sea Level	WLSESSION	4667	ft
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	CALI	
GGRD	Geothermal Gradient	Borehole	1	0.01 degF/ft
GRD	Generalized Mud Resistivity Selection from Measured Log	Borehole	100	

GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	CTEM	
MST	Mud Sample Temperature	Borehole	68	degF
PDAT	Permanent Datum	WLSESSION	GL	
RMS	Resistivity of Mud Sample	Borehole	0.2	ohm.m
SHT	Surface Hole Temperature	Borehole	68	degF
SPDR	SP Drift Per Foot	AIT-M	0	mV/ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	12.25	10.5	506
BS	7.875	506	4205

All depth are actual.

Tool Control Parameters

1A: Parameters

Parameter	Description	Tool	Value	Unit
HMCA_BOARD_TYPE	HMCA Board Type	HGNS-H	1	
HRGD_BOARD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h

1A

Main Pass 5"=100'

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
1A	Log[3]:Up	Up	48.97 ft	4216.96 ft	04-Nov-2019 6:15:38 PM	04-Nov-2019 7:27:40 PM	ON	1.50 ft	No

All depths are referenced to toolstring zero

Log

Company:St. Croix Operating Inc. Well:Armstrong #1
1A: Log[3]:Up:S005

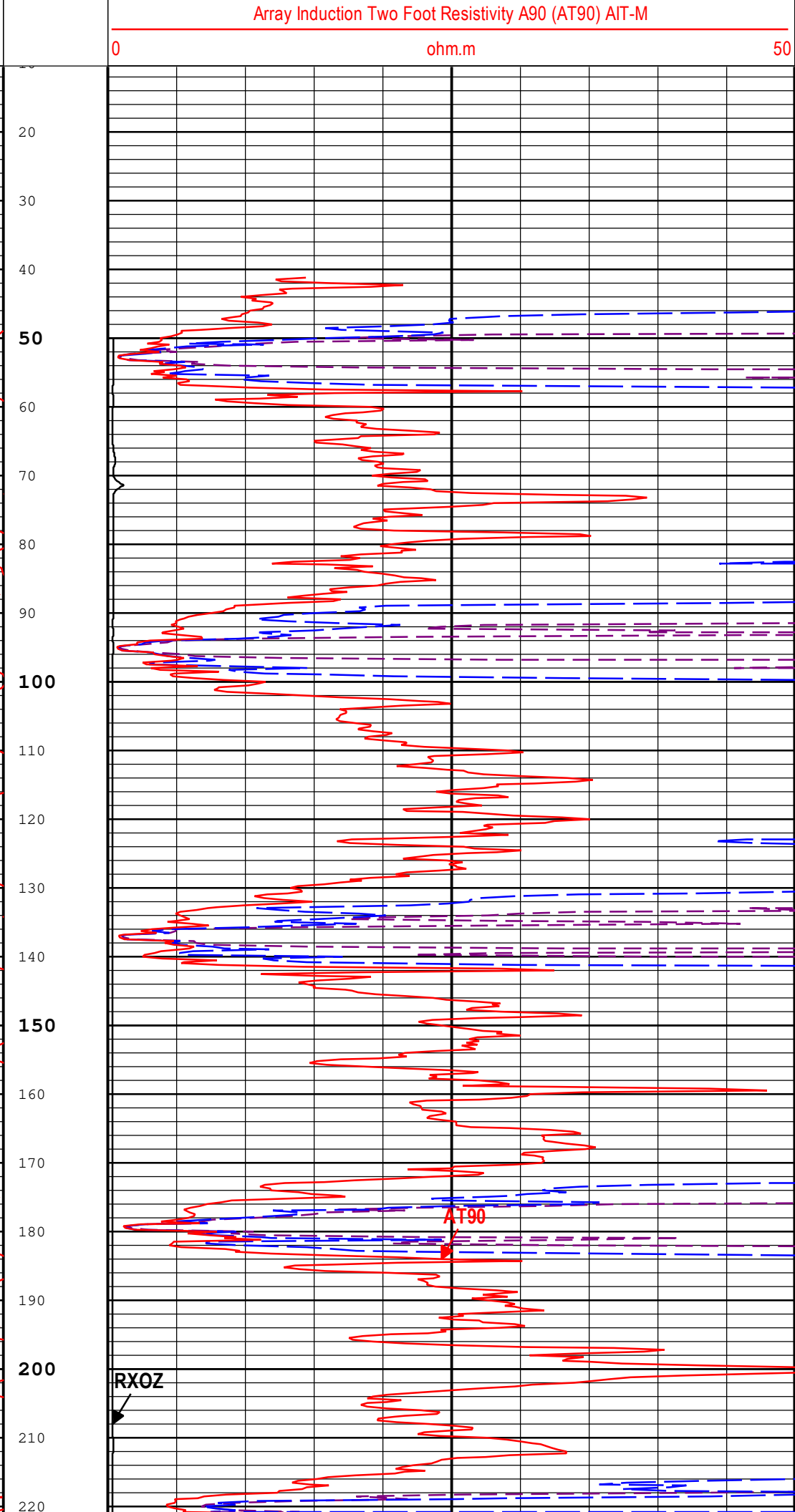
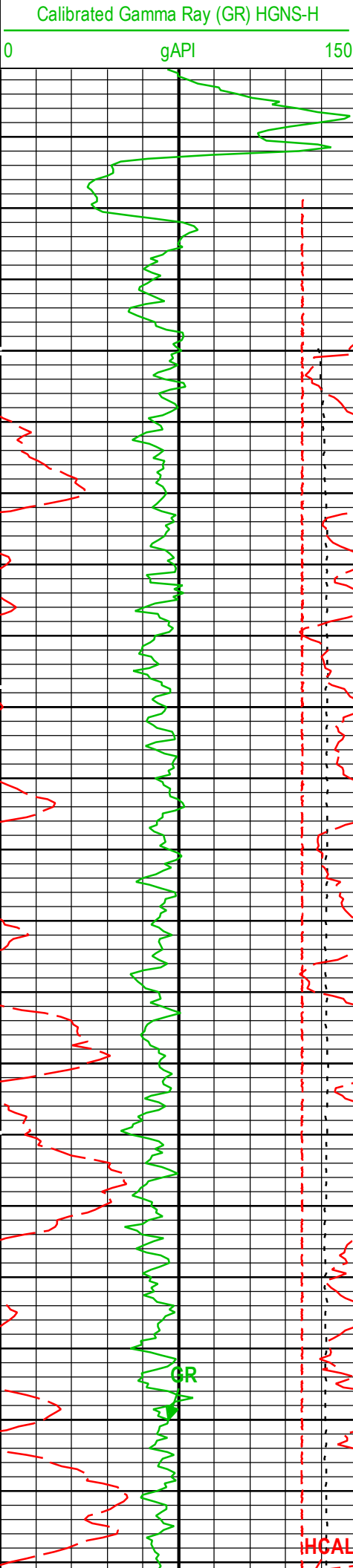
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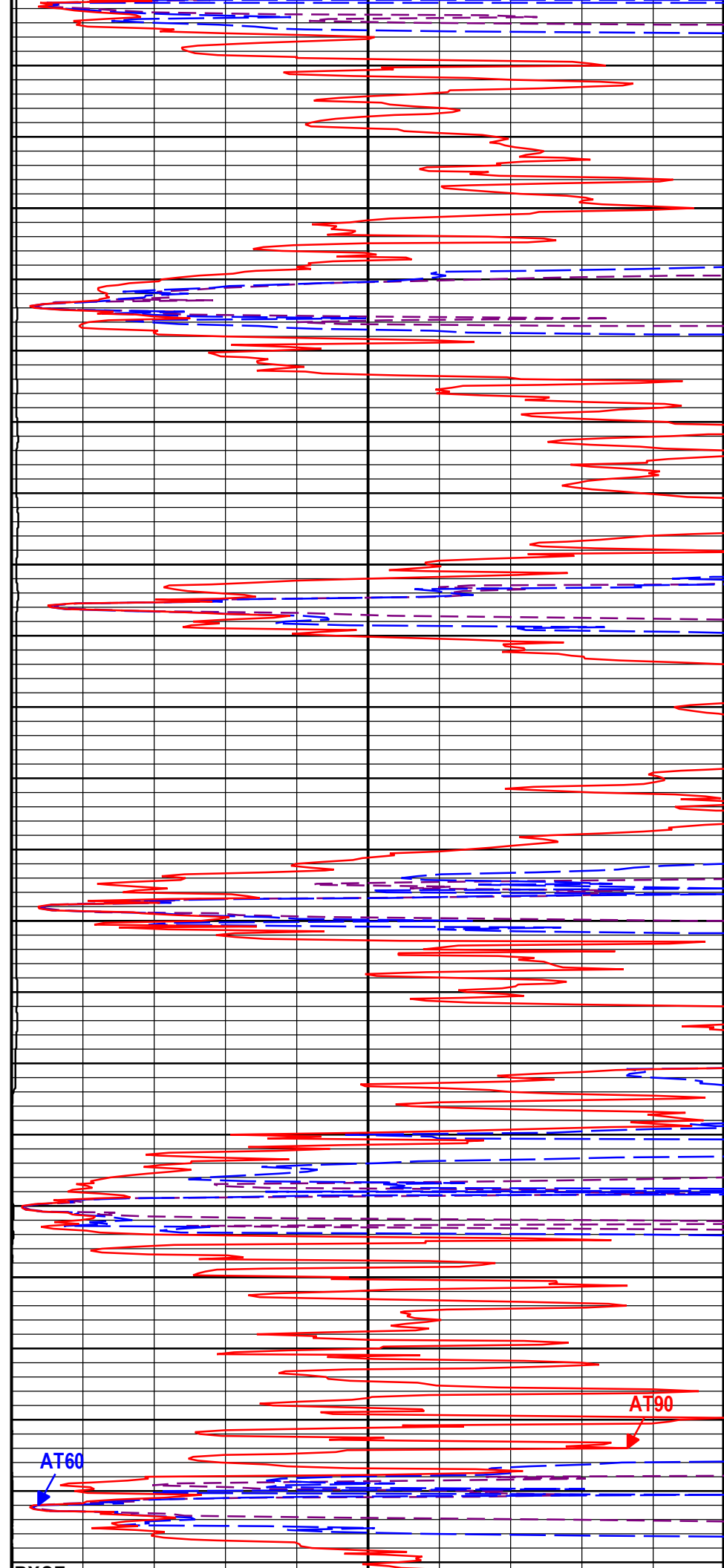
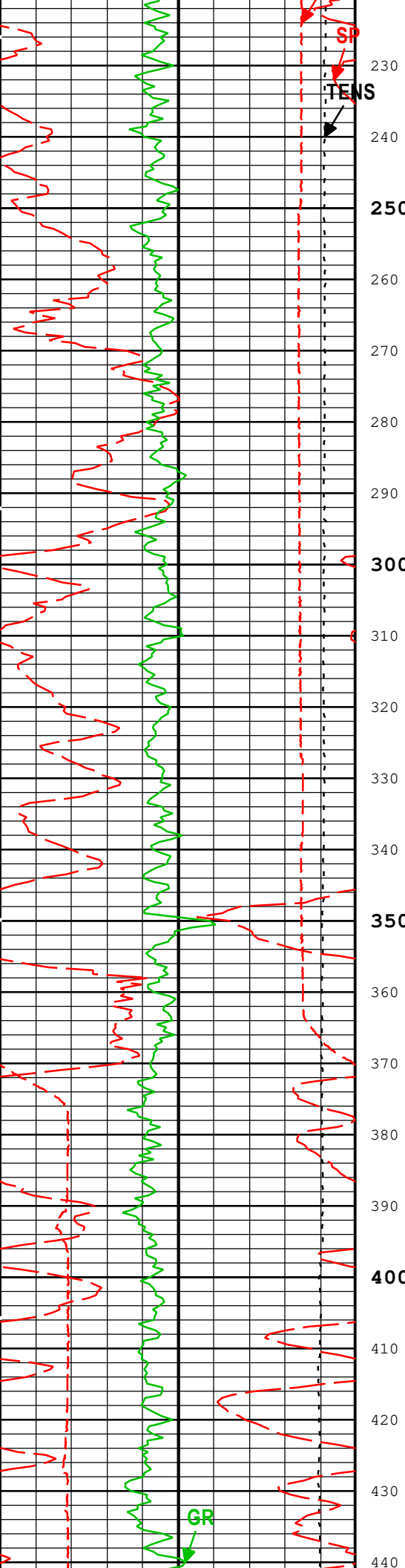
Channel	Source	Sampling
AT30	AIT-M:AMIS:AMIS	3in
AT60	AIT-M:AMIS:AMIS	3in
AT90	AIT-M:AMIS:AMIS	3in
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR_CAL	HGNS-H:HGNS-H:HGNS-H	6in
RXOZ	HDRS-H:HRMS-H:HRGD-H	2in
SP	AIT-M:AMIS:AMIS	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

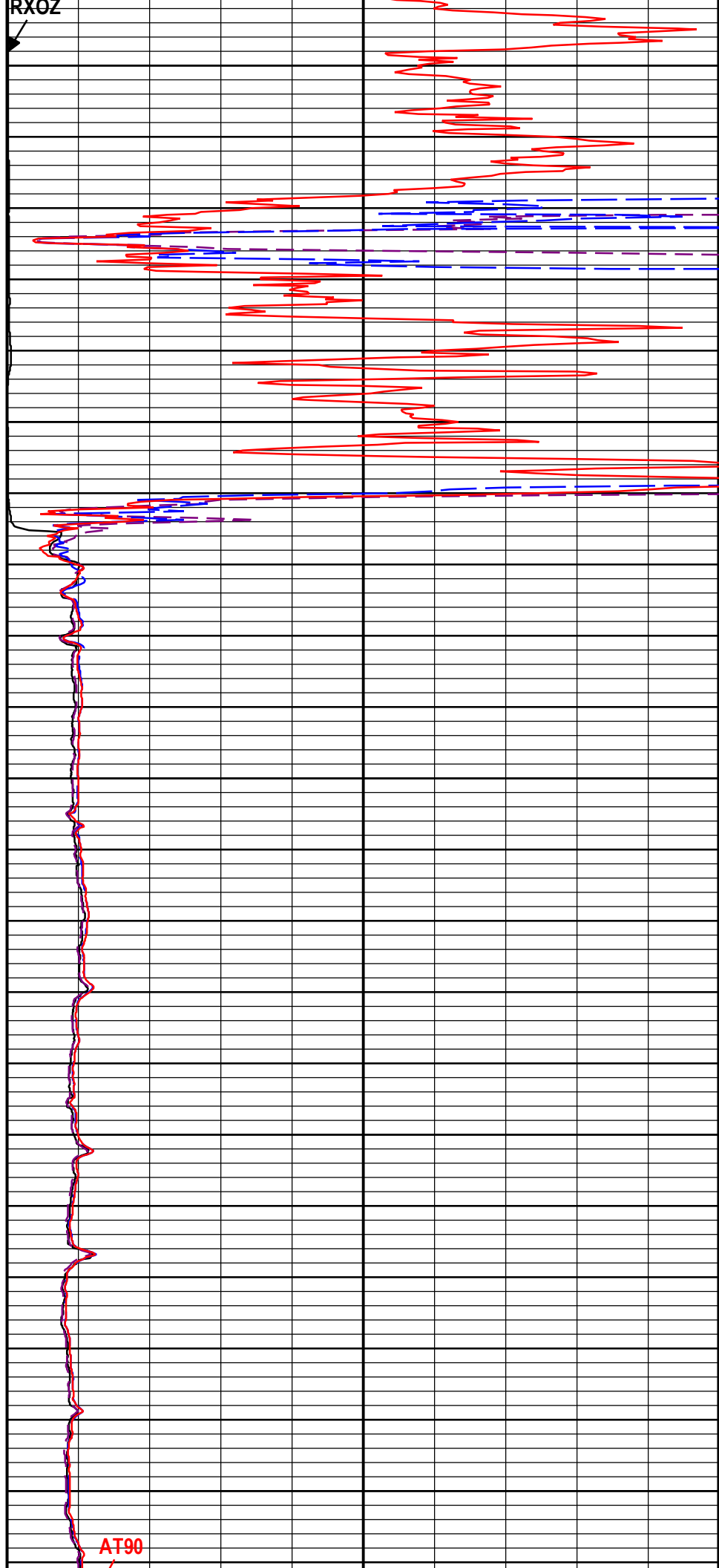
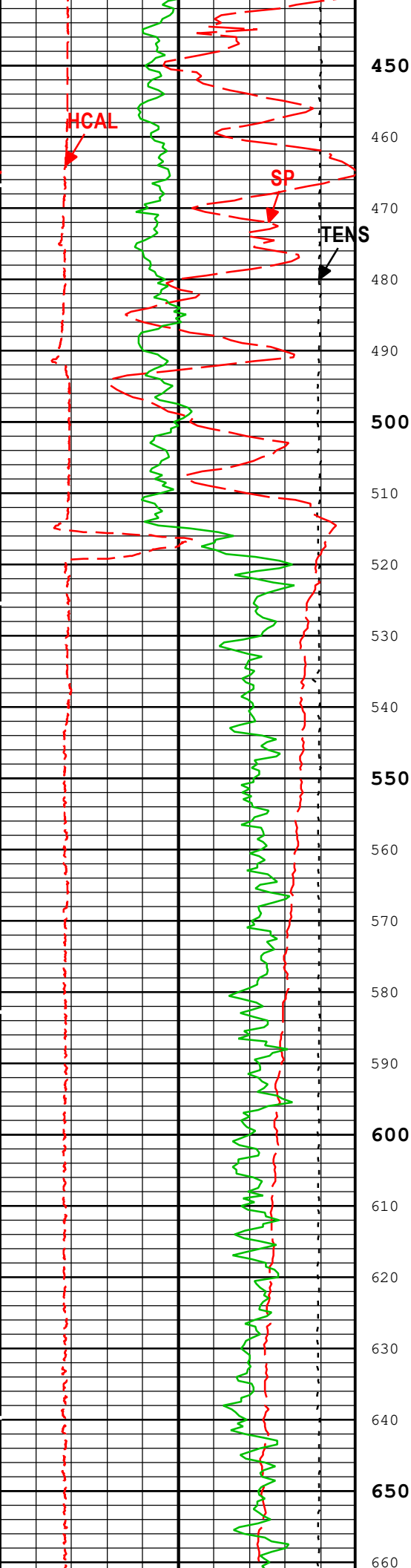
TIME_1900 - Time Marked every 60.00 (s)

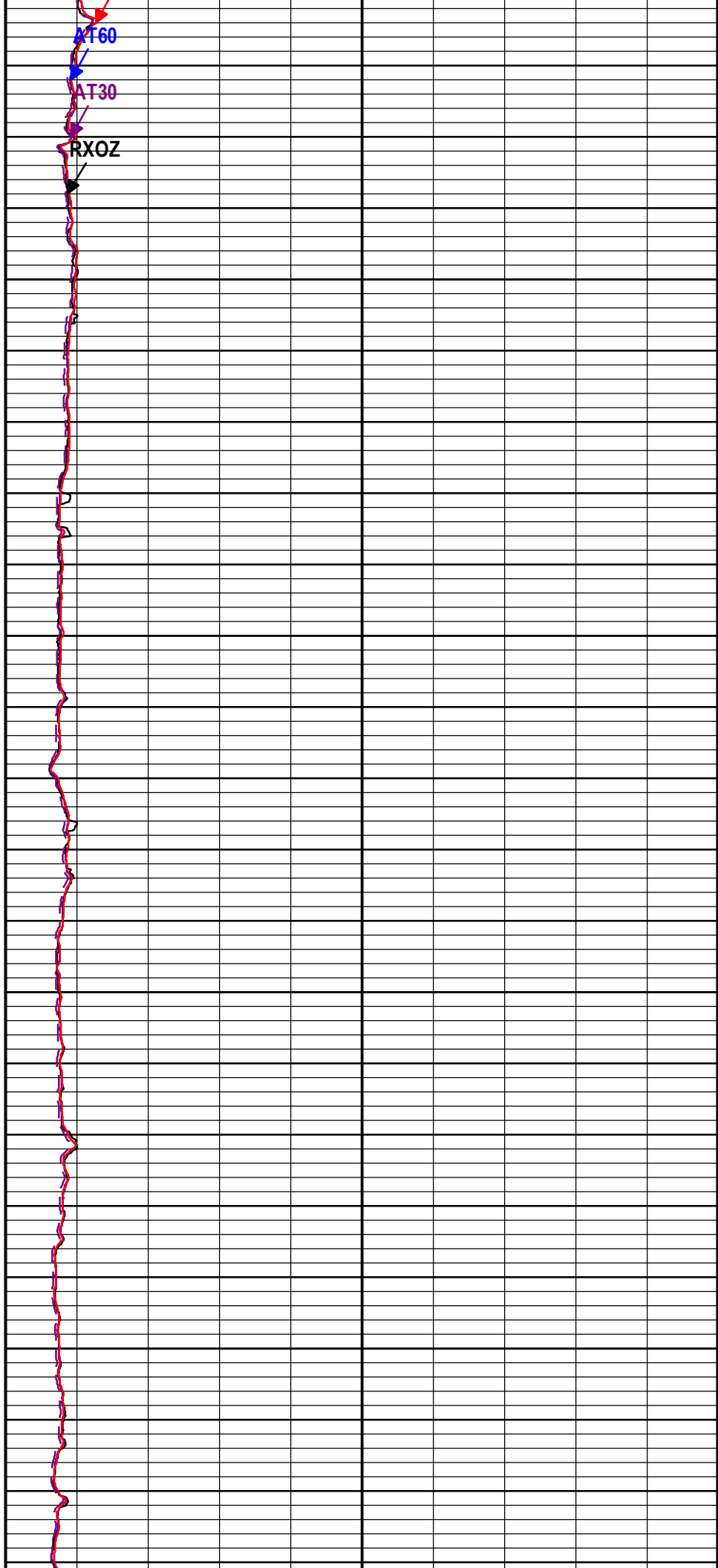
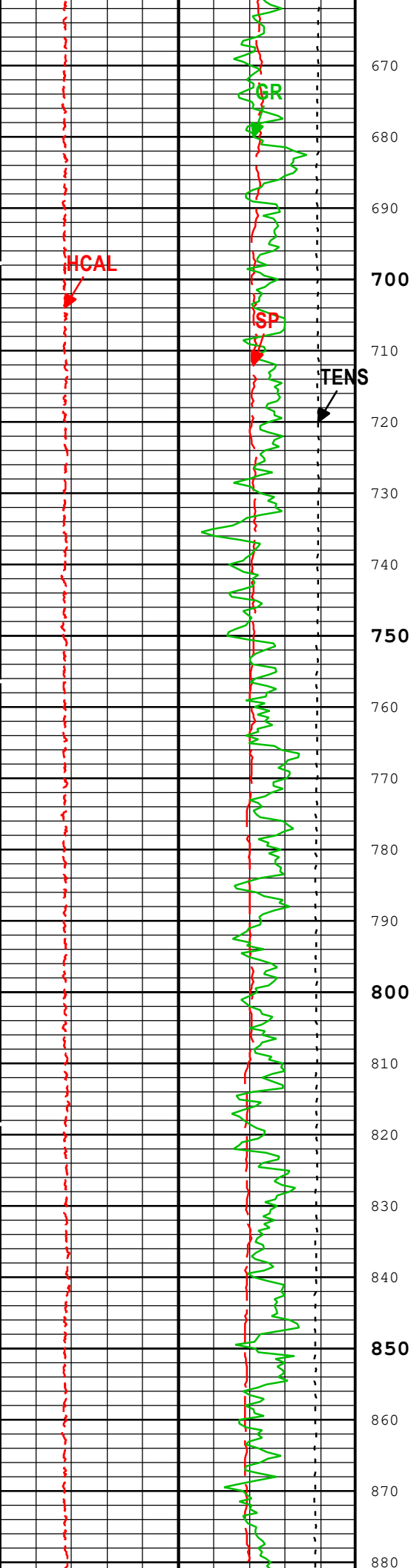
Cable Tension (TENS)		
10000	lbf	0
Spontaneous Potential (SP) AIT-M		
-80	mV	20
Caliper (HCAL) HDRS-H		
6	in	16

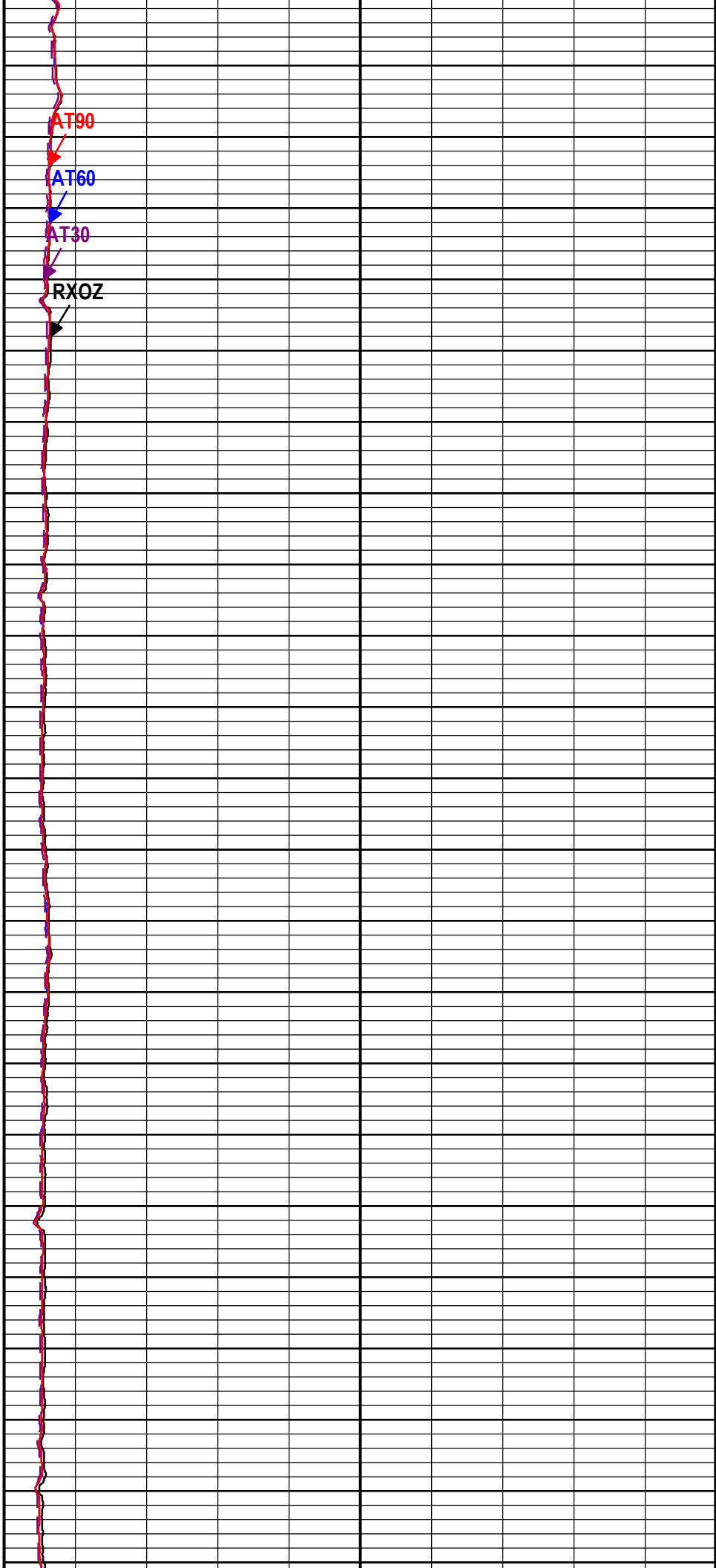
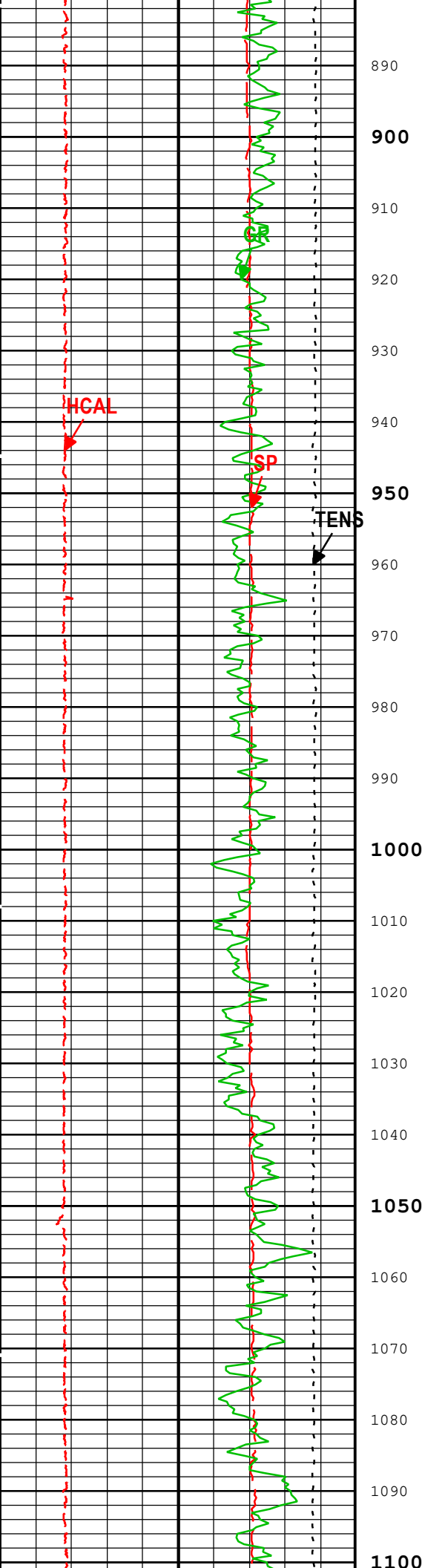
Invaded Formation Resistivity filtered at 18 inches (RXOZ) HDRS-H		
0	ohm.m	50
Array Induction Two Foot Resistivity A30 (AT30) AIT-M		
0	ohm.m	50
Array Induction Two Foot Resistivity A60 (AT60) AIT-M		
0	ohm.m	50

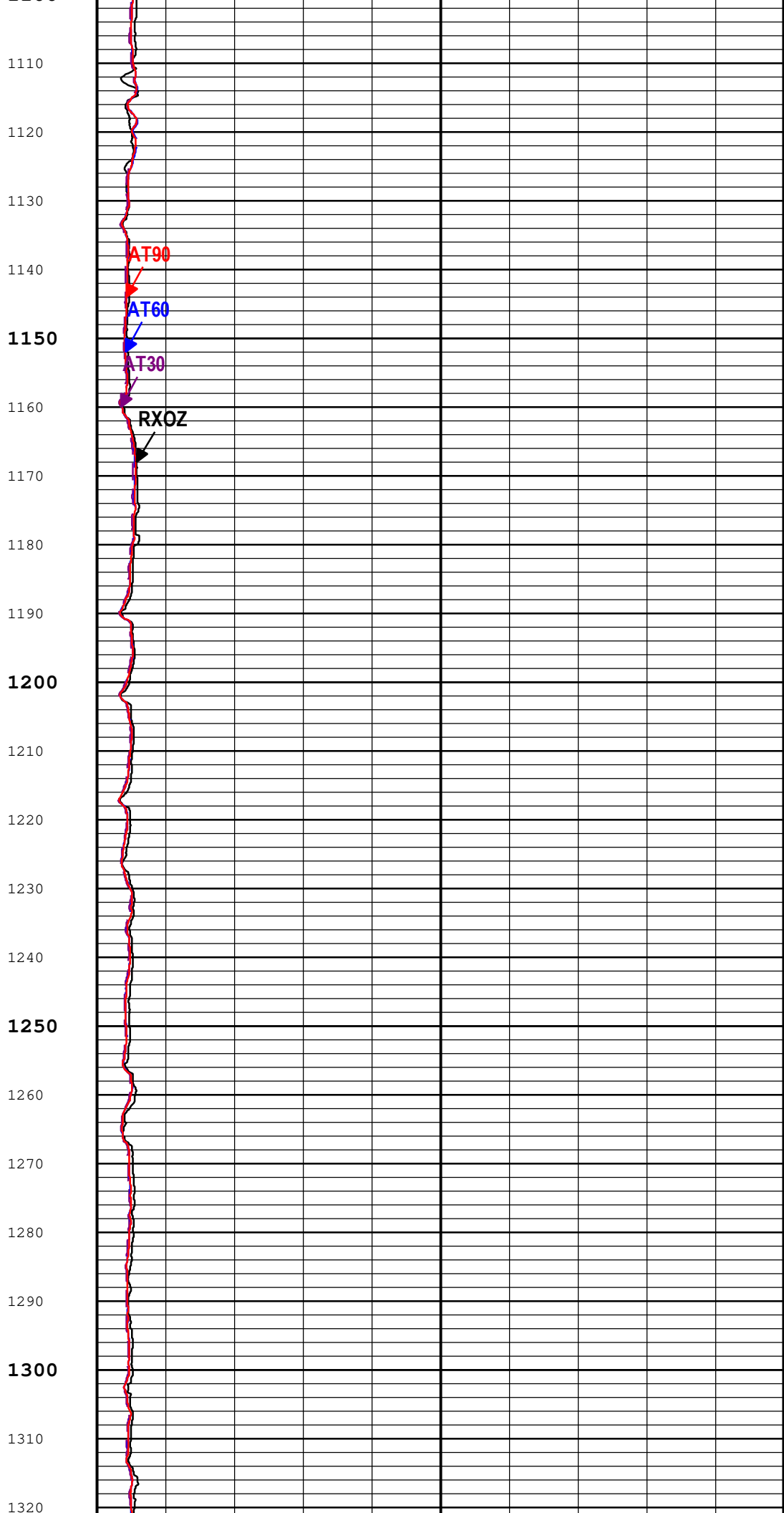
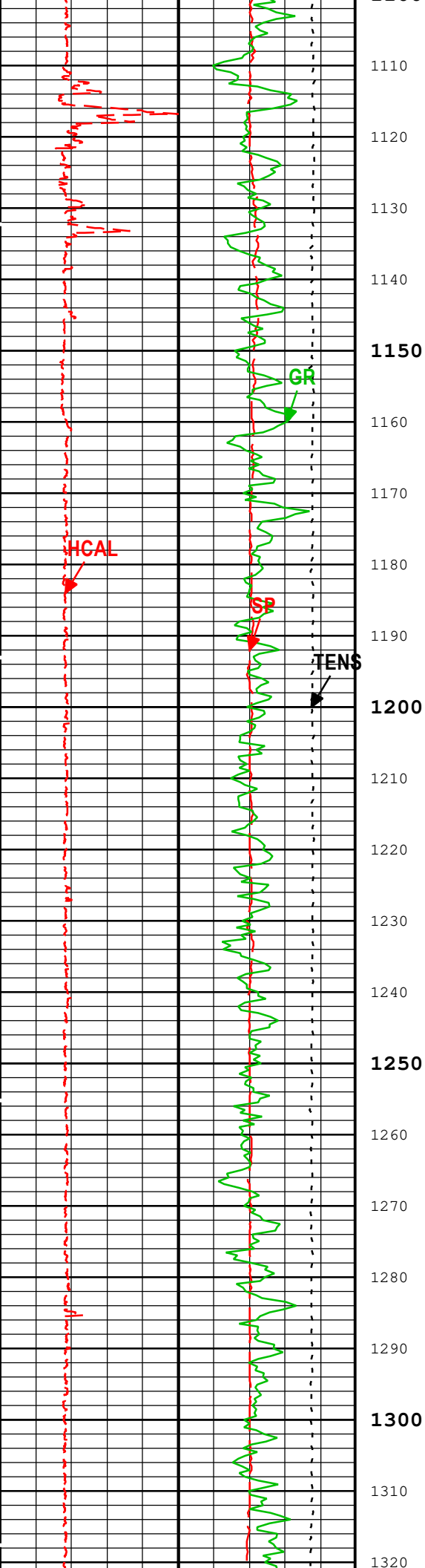


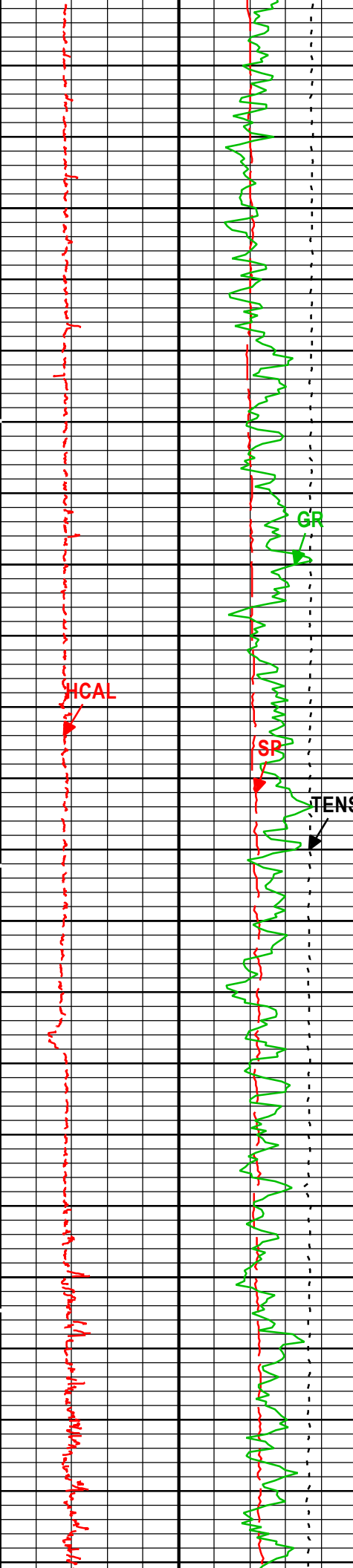




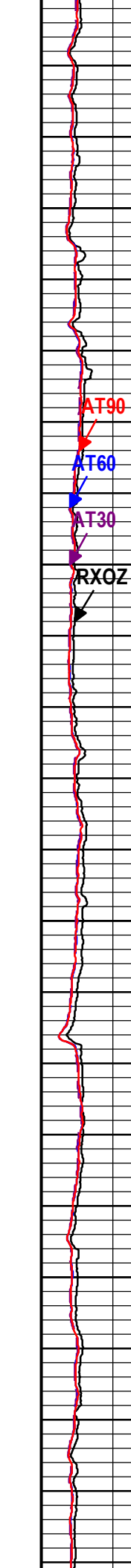


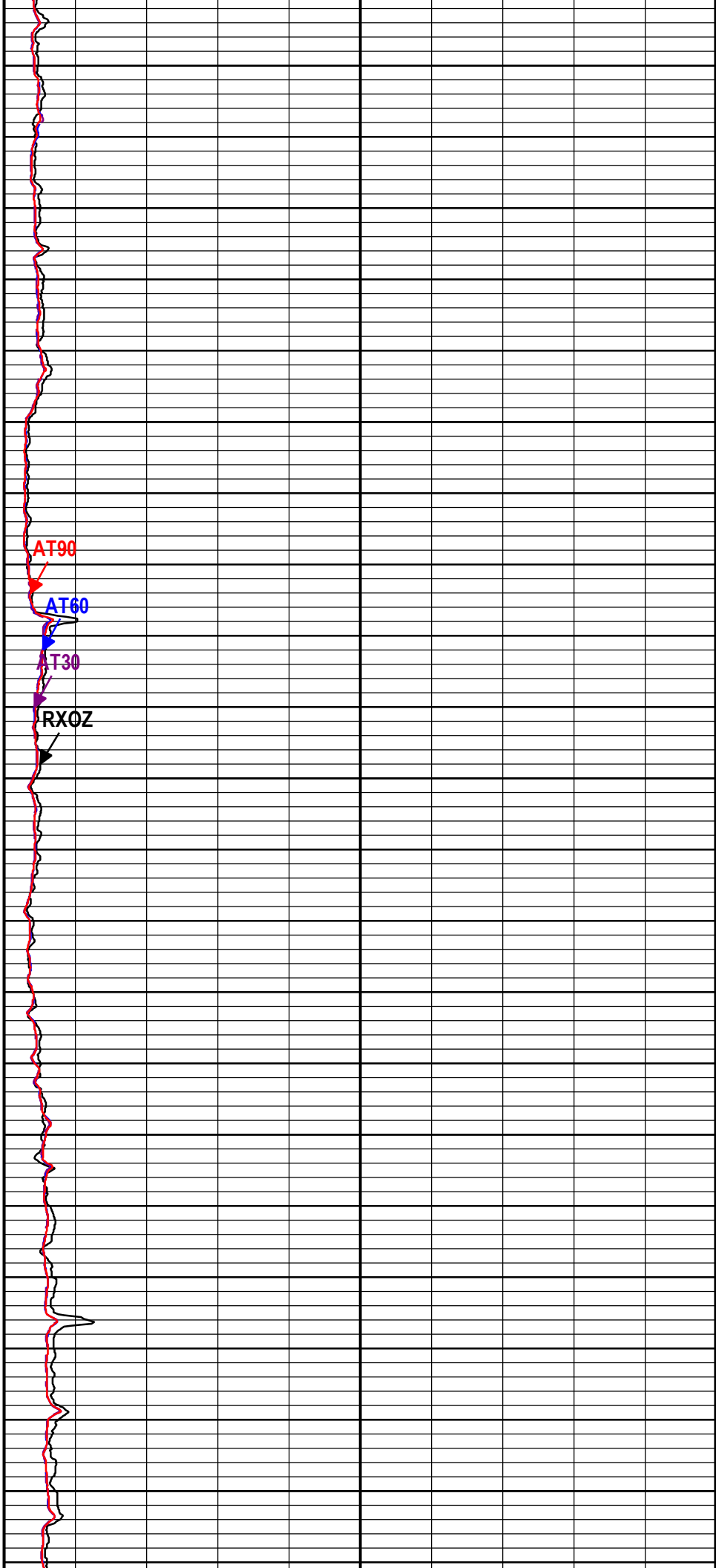
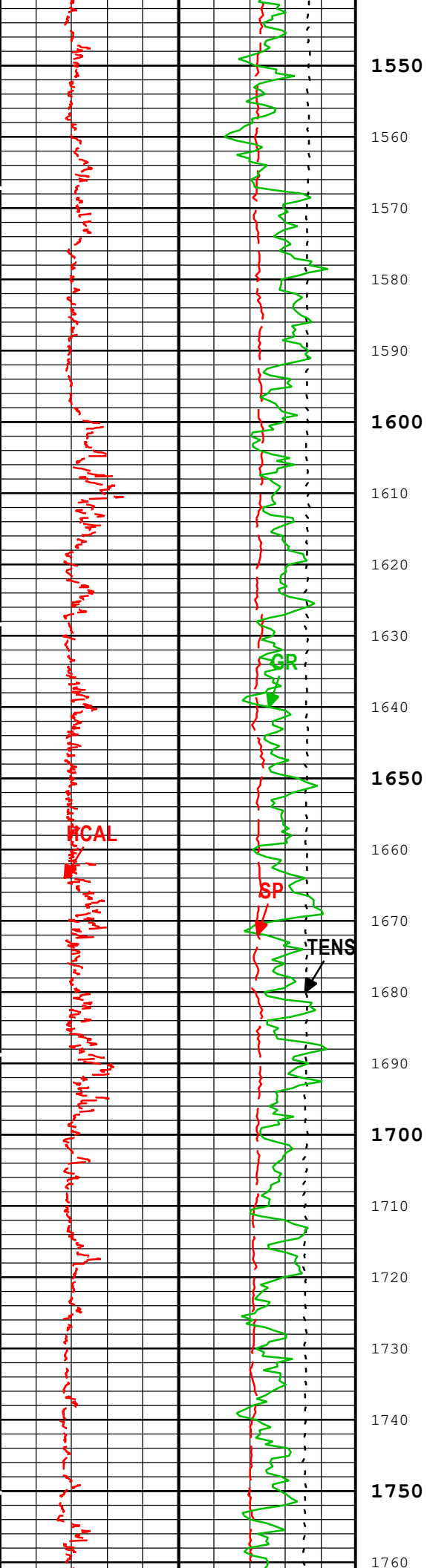


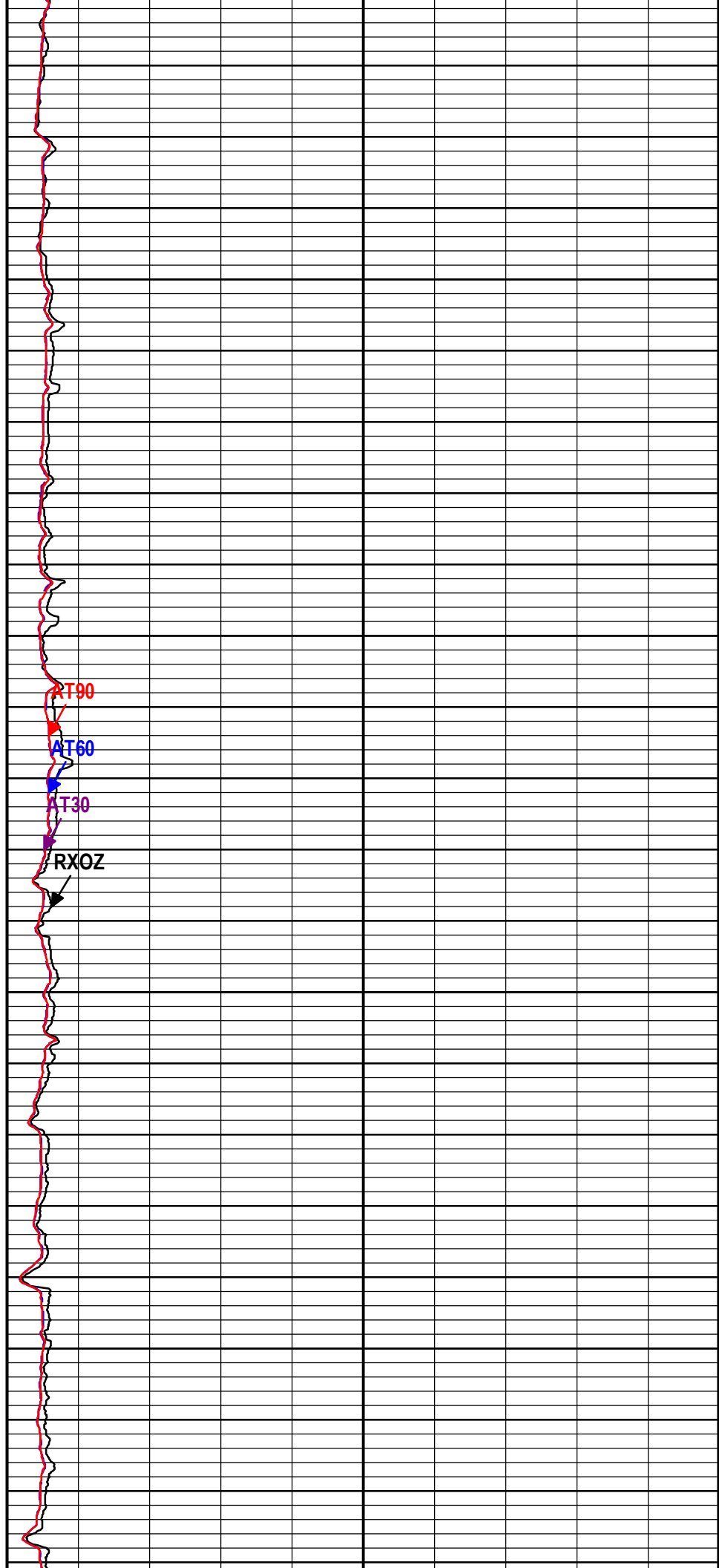
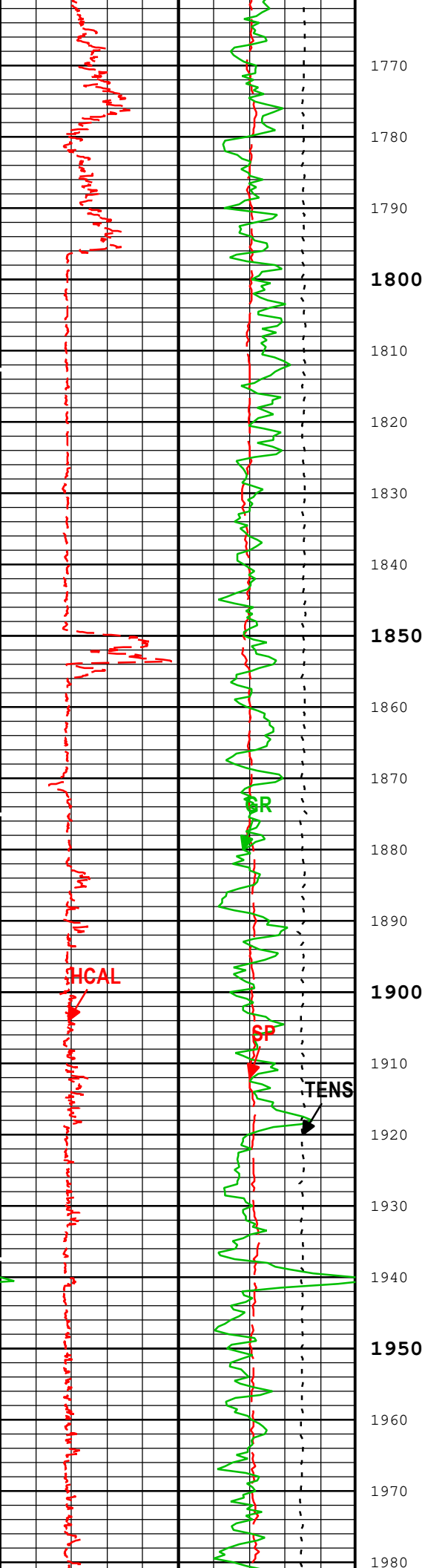


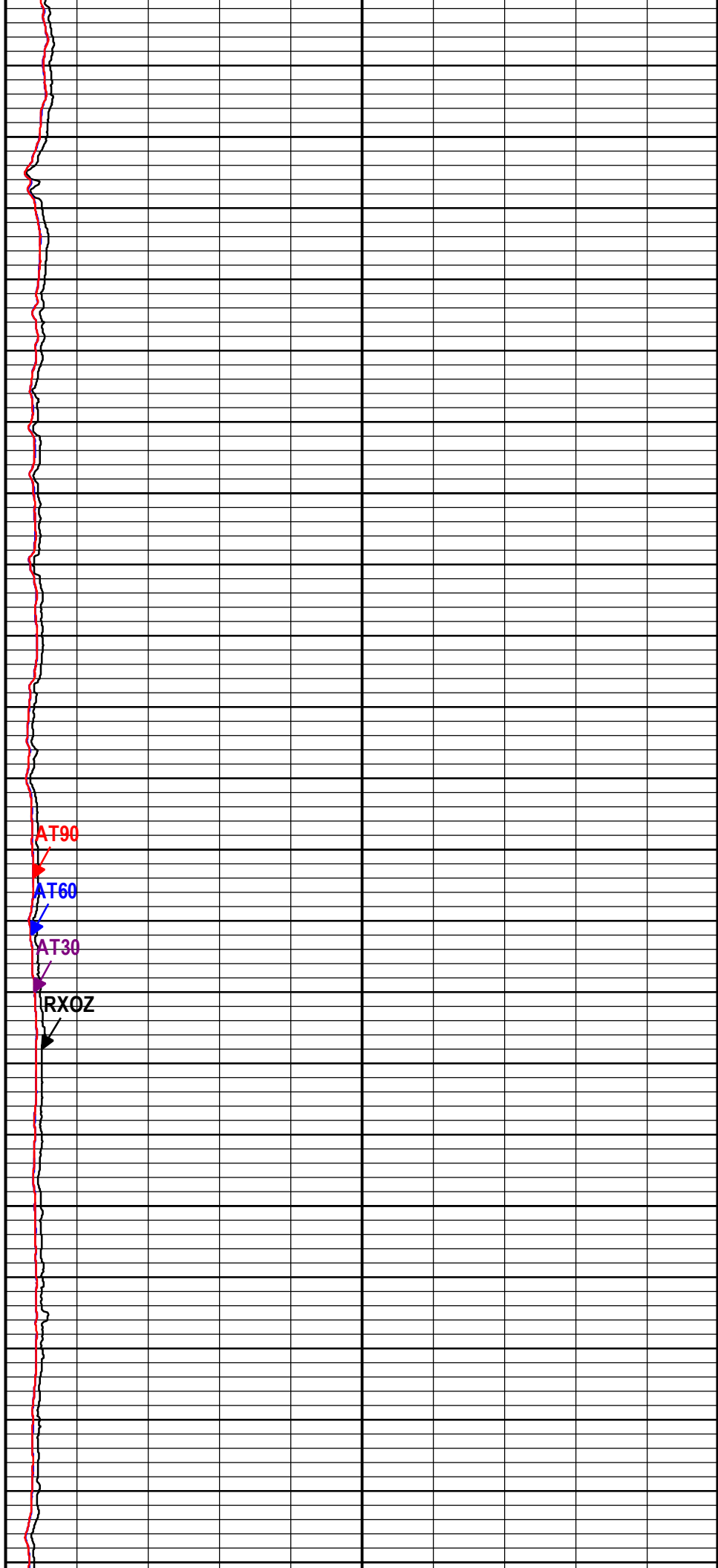
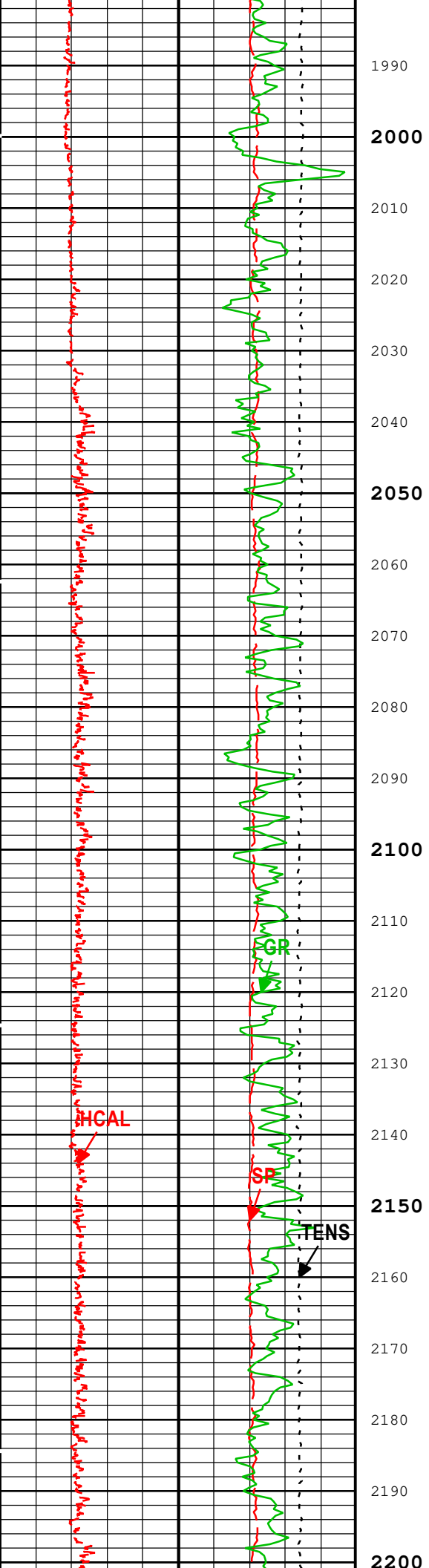


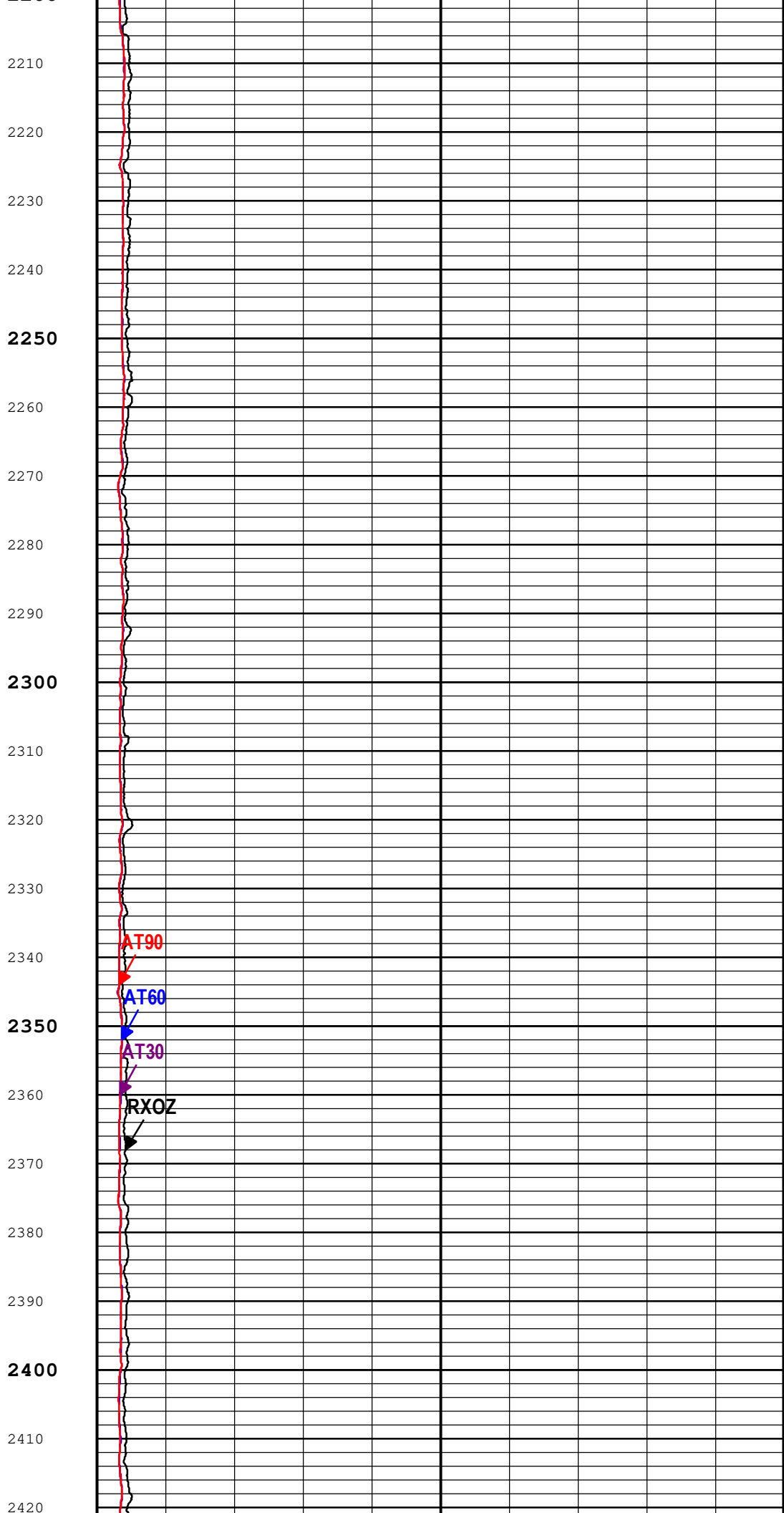
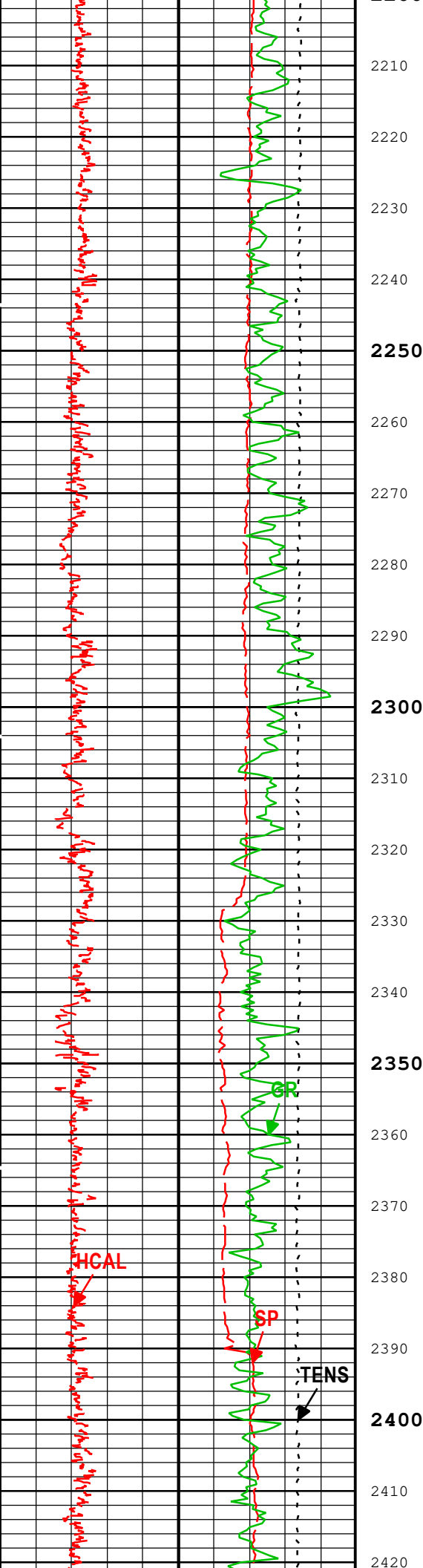
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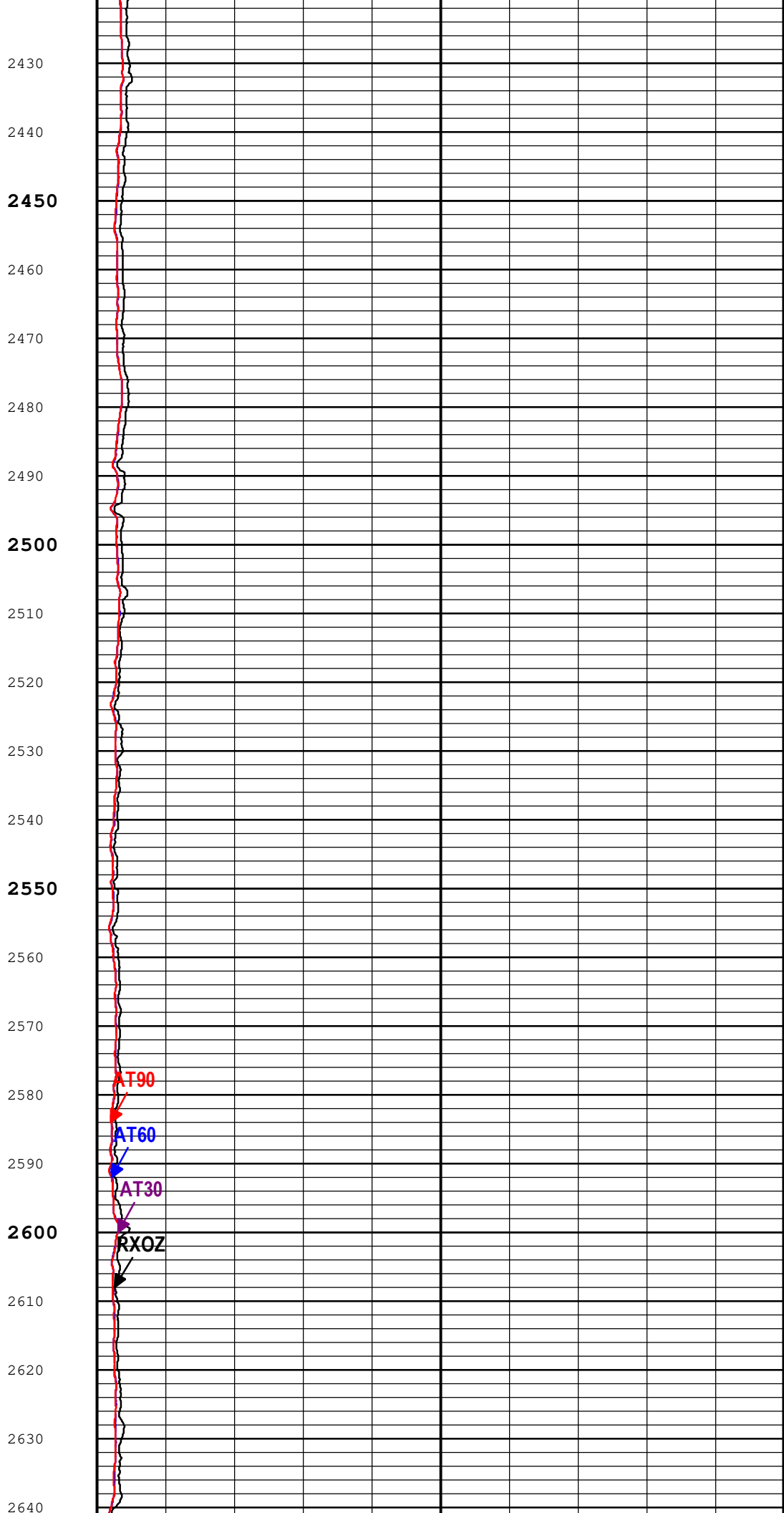
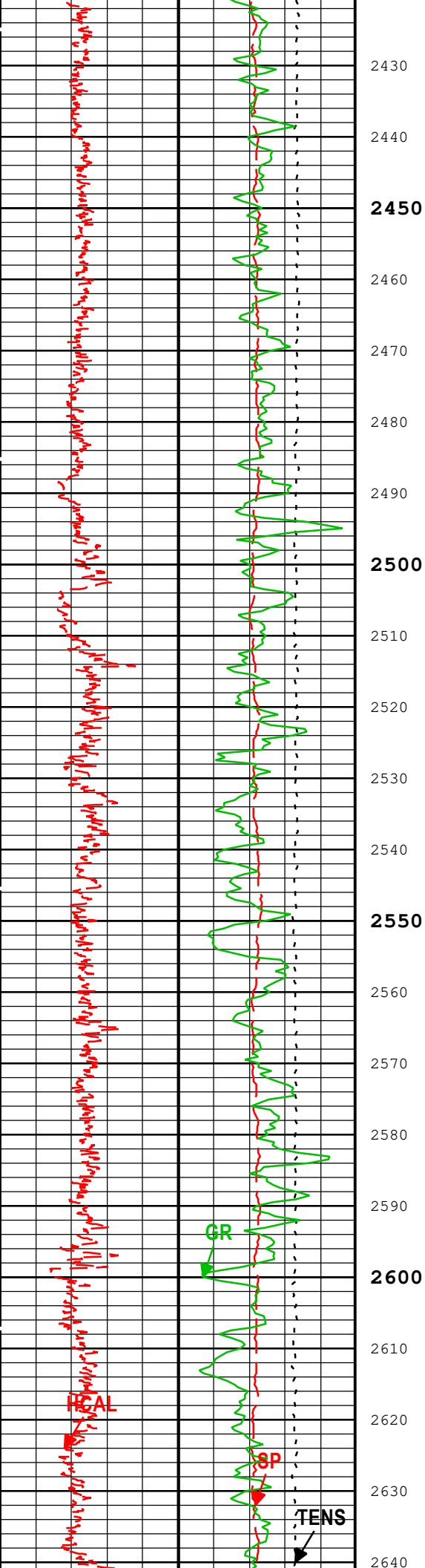


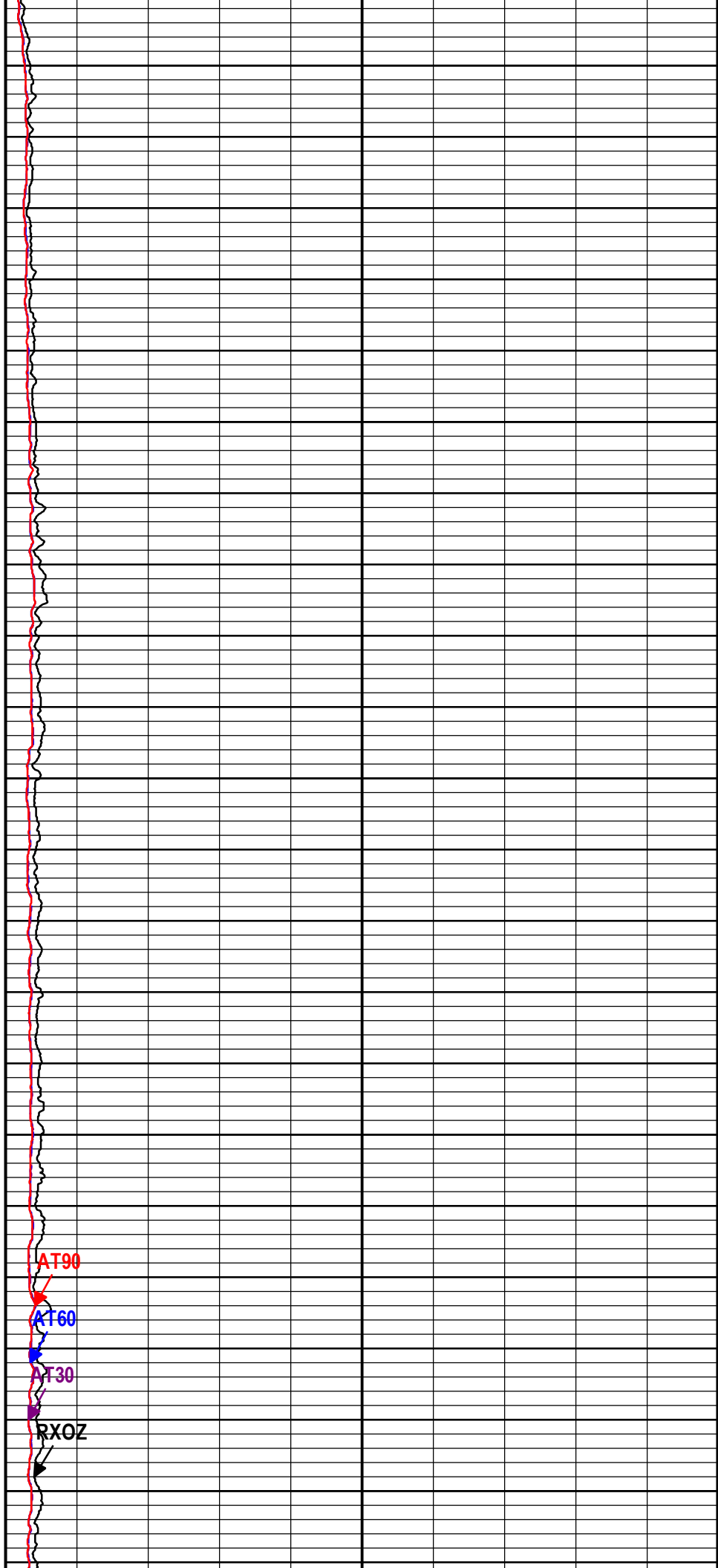
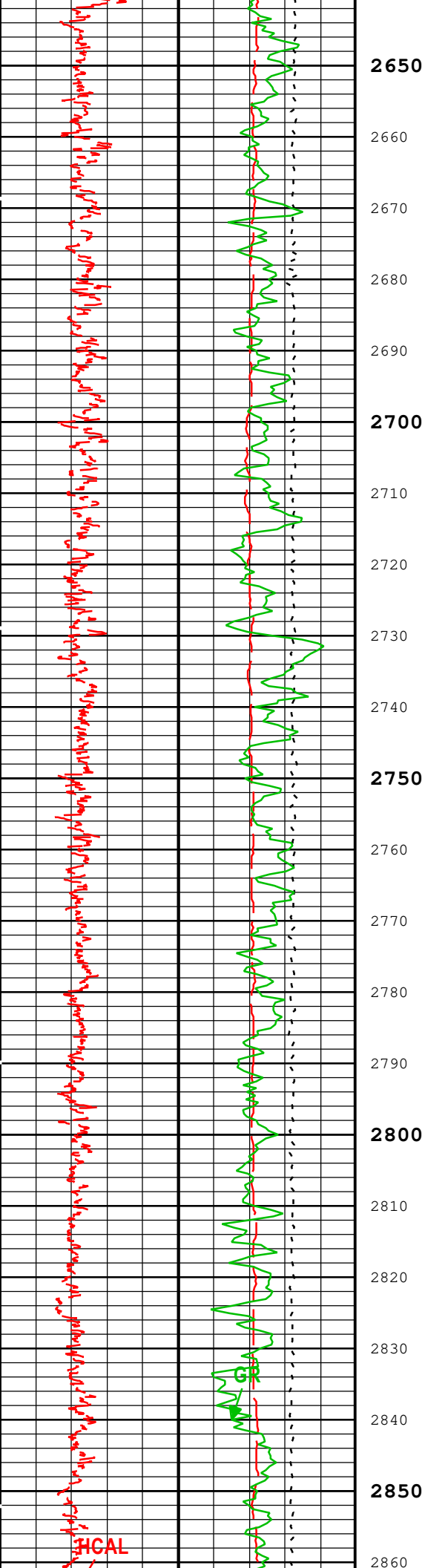


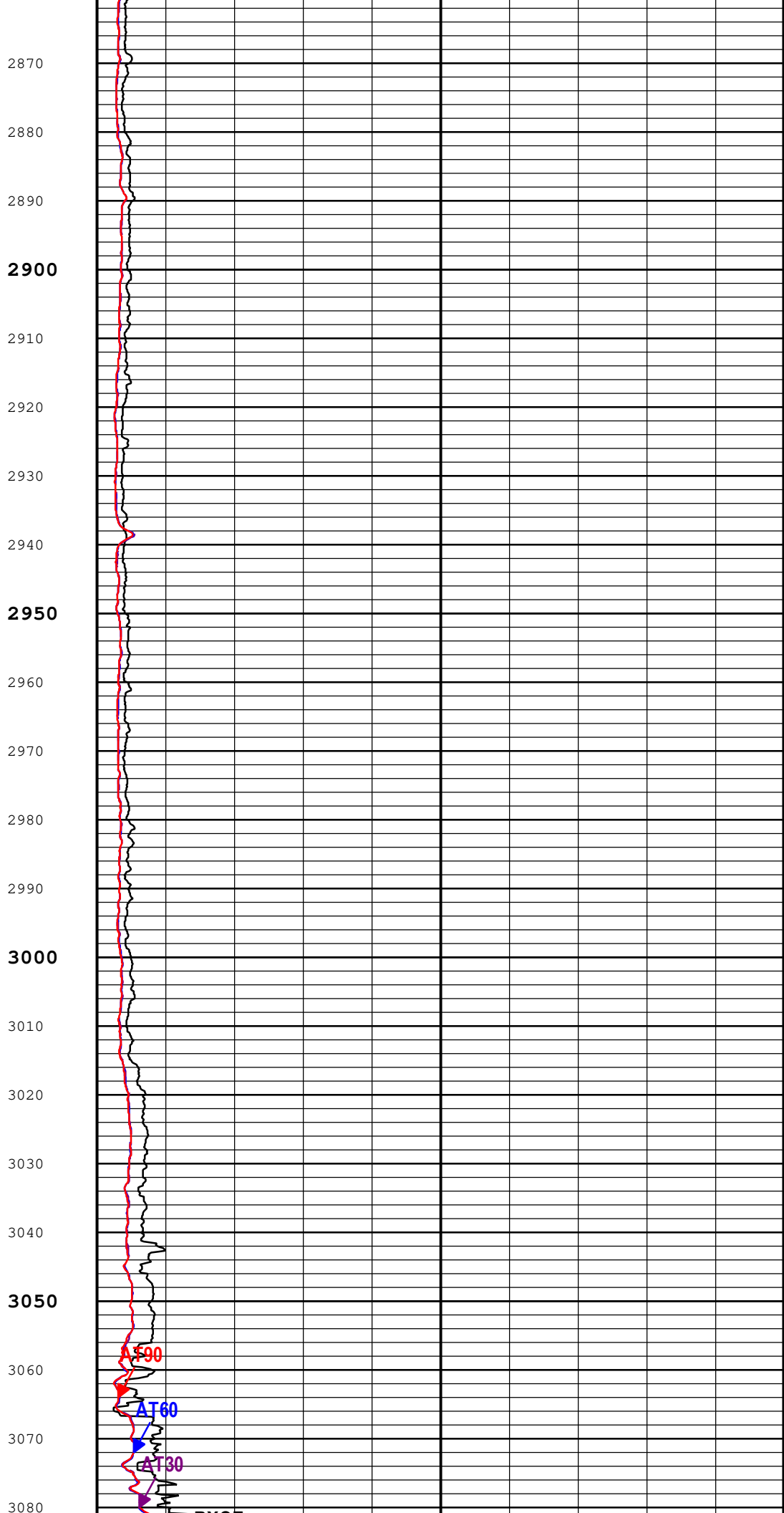
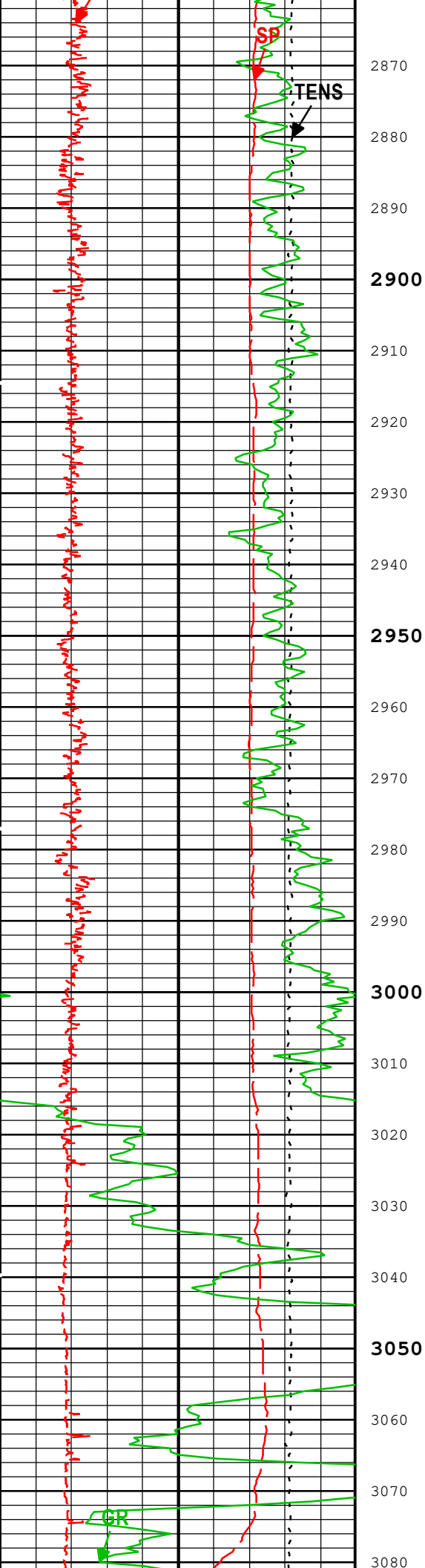


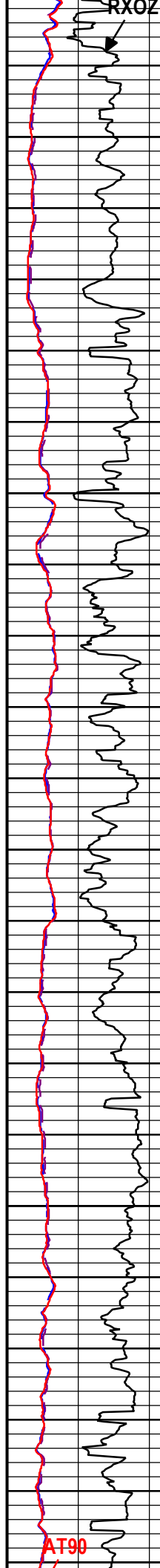
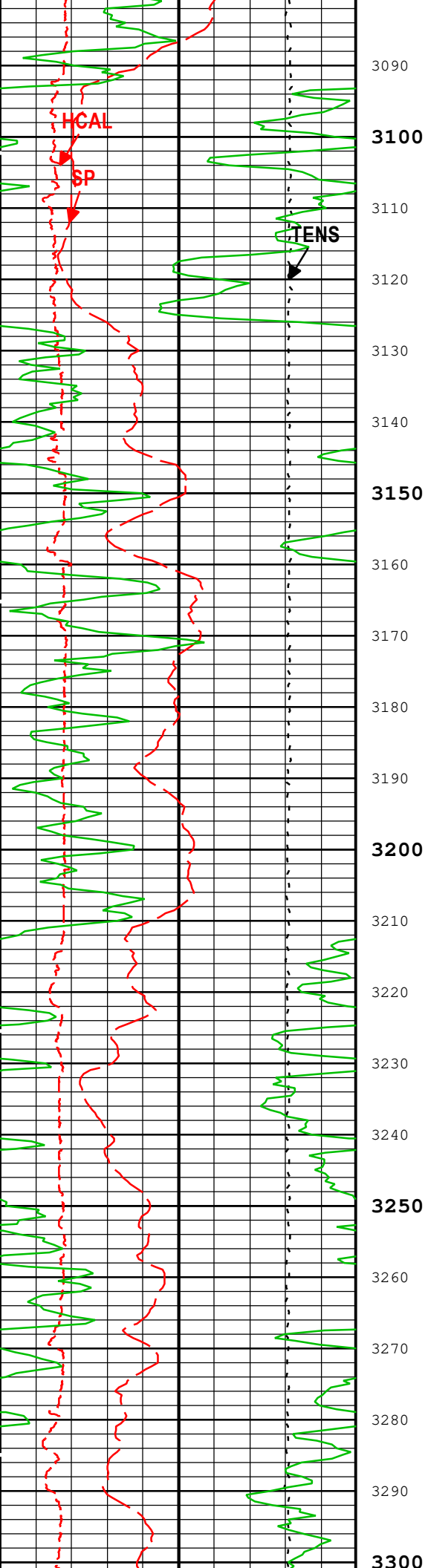


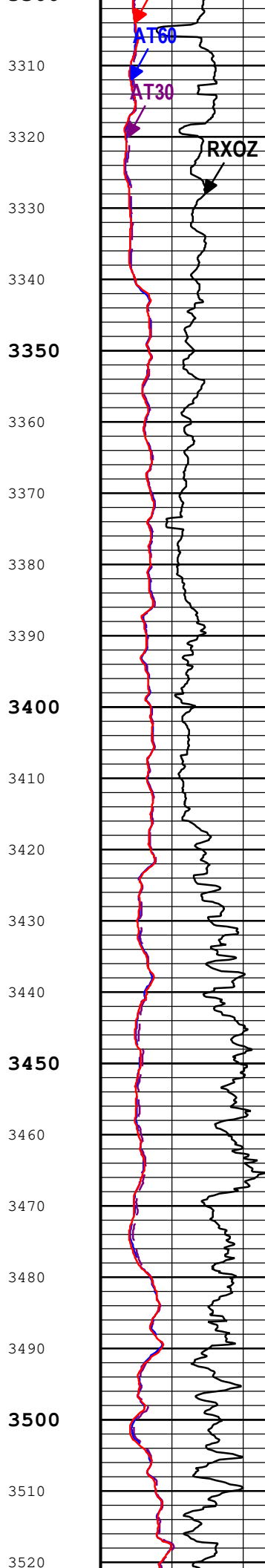
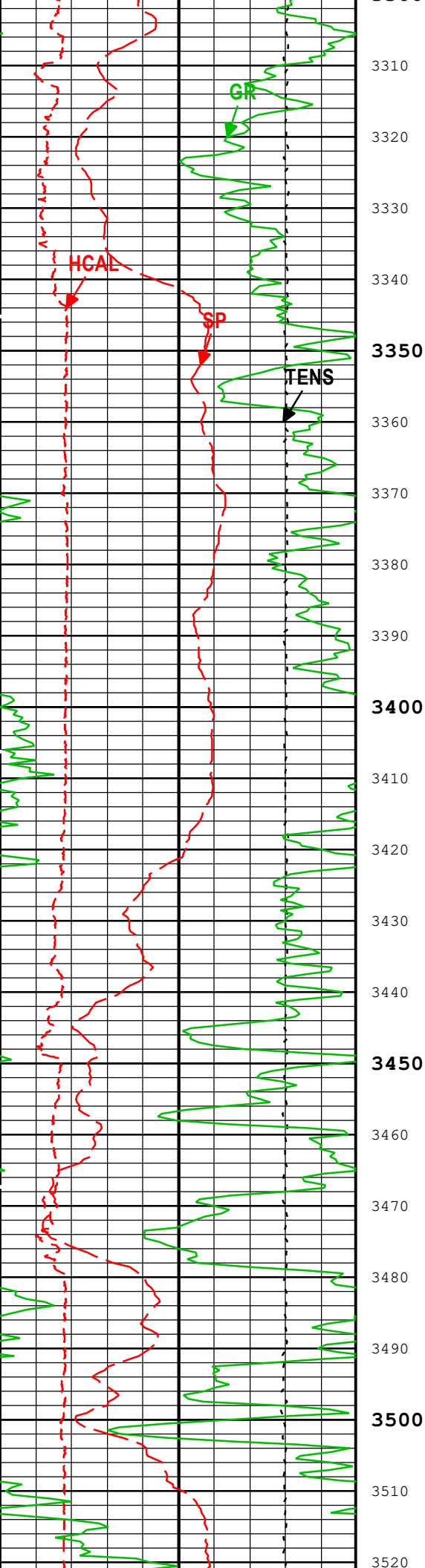


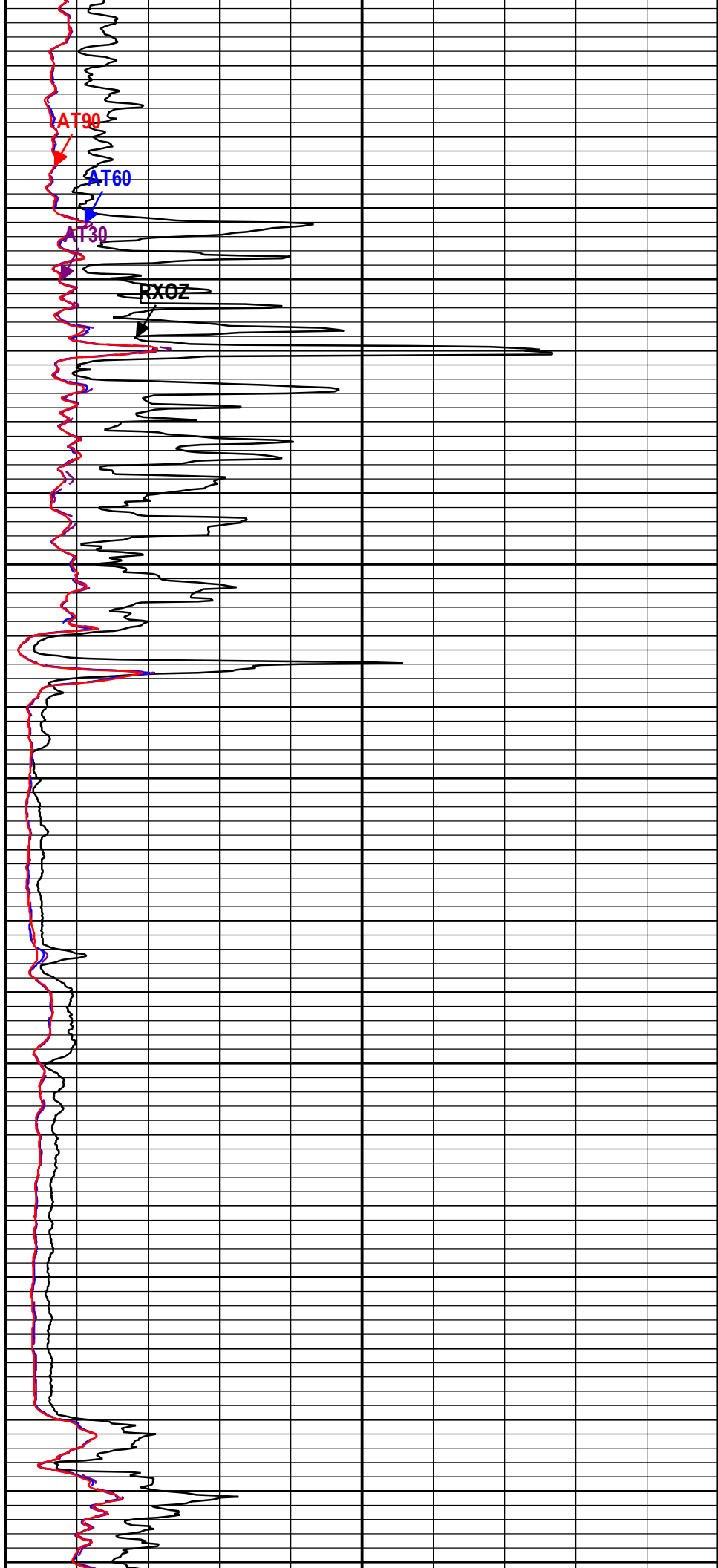
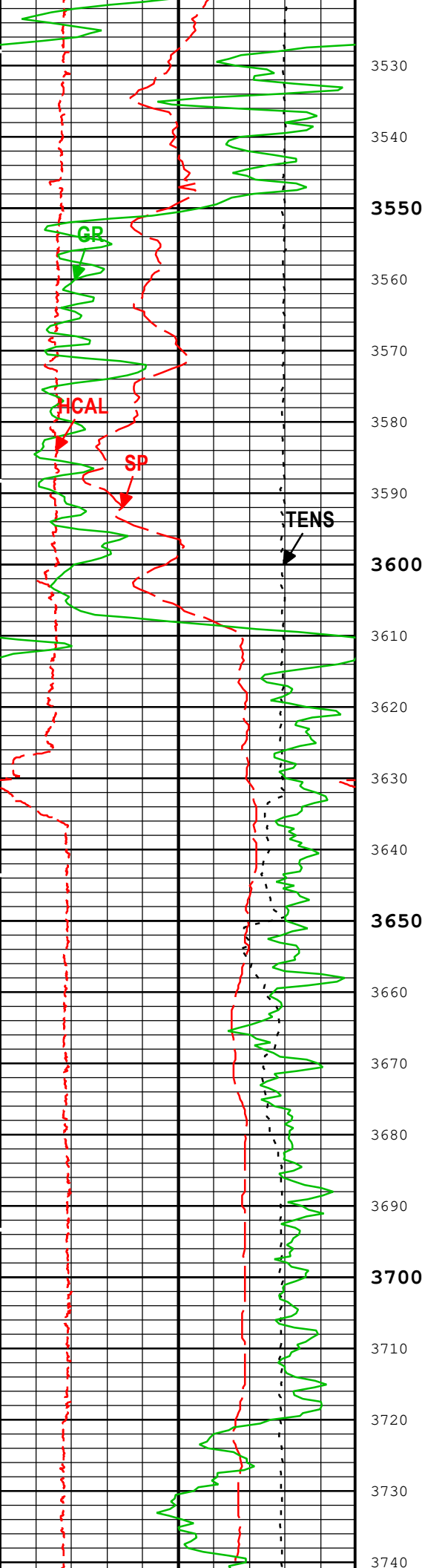


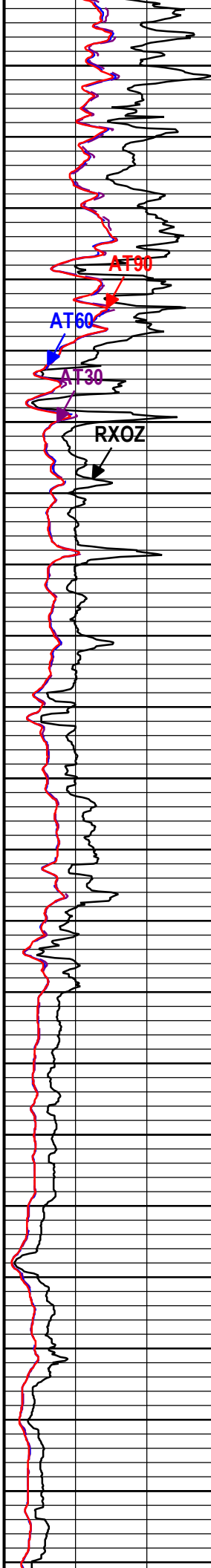
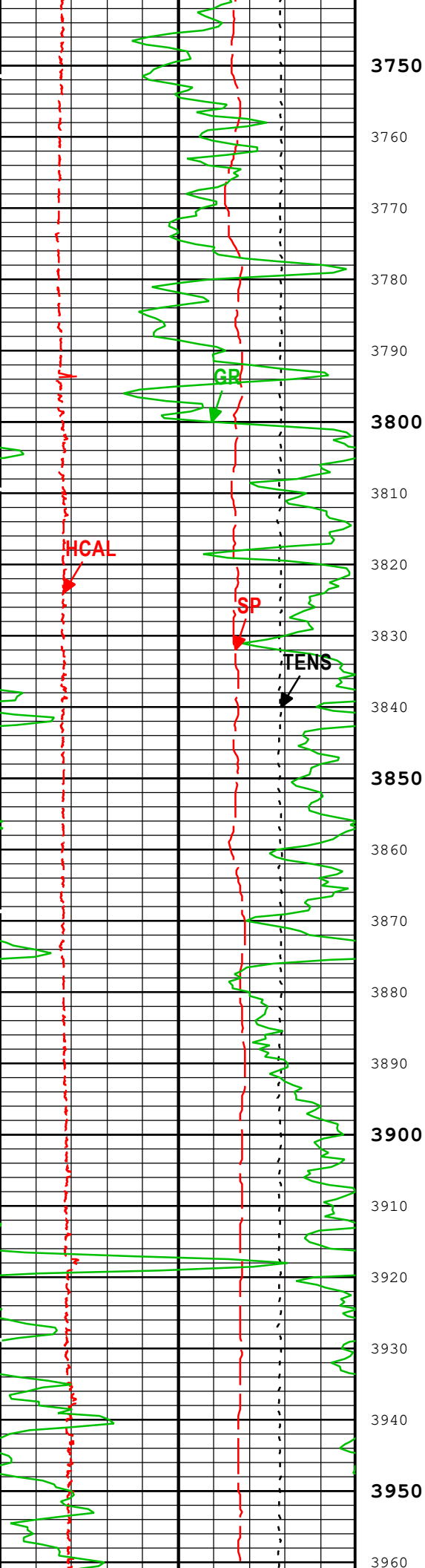


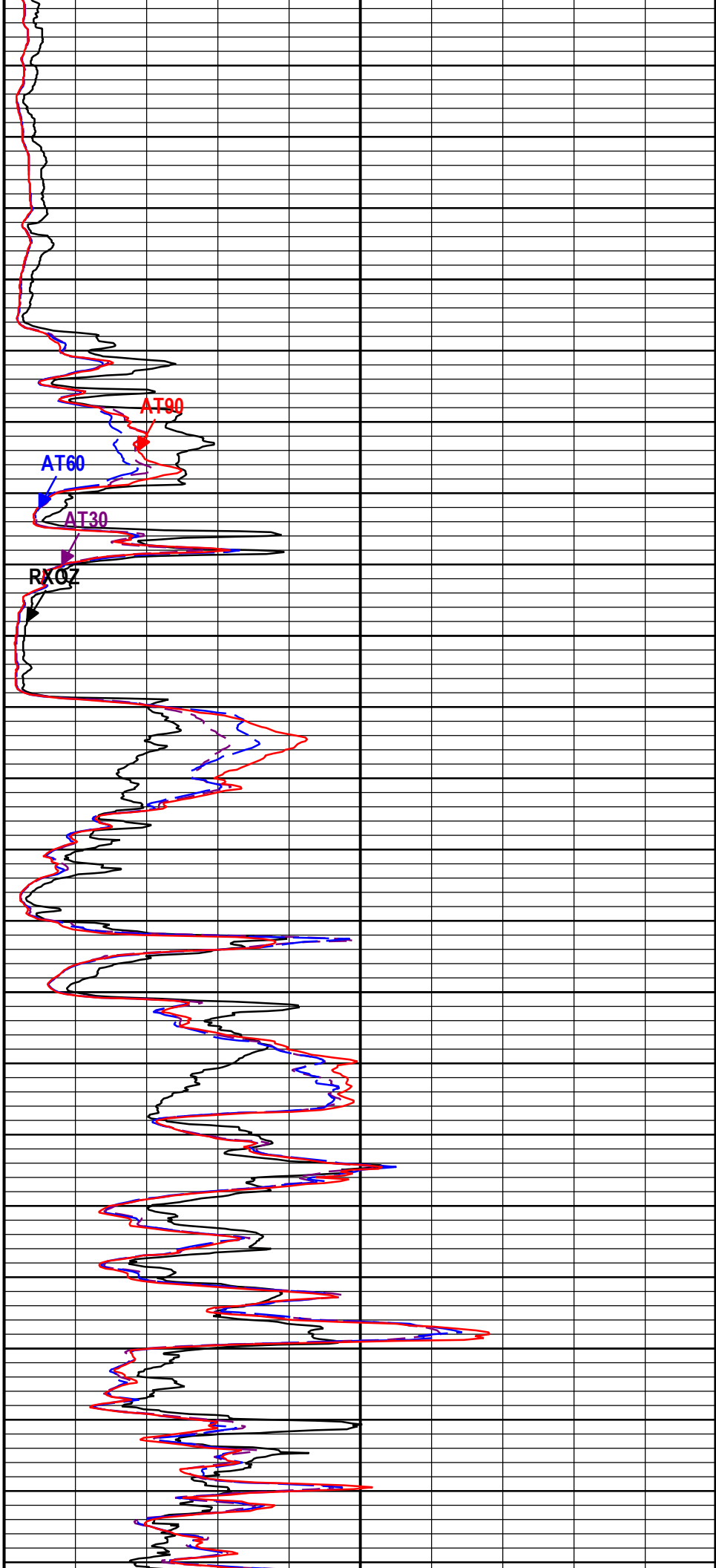
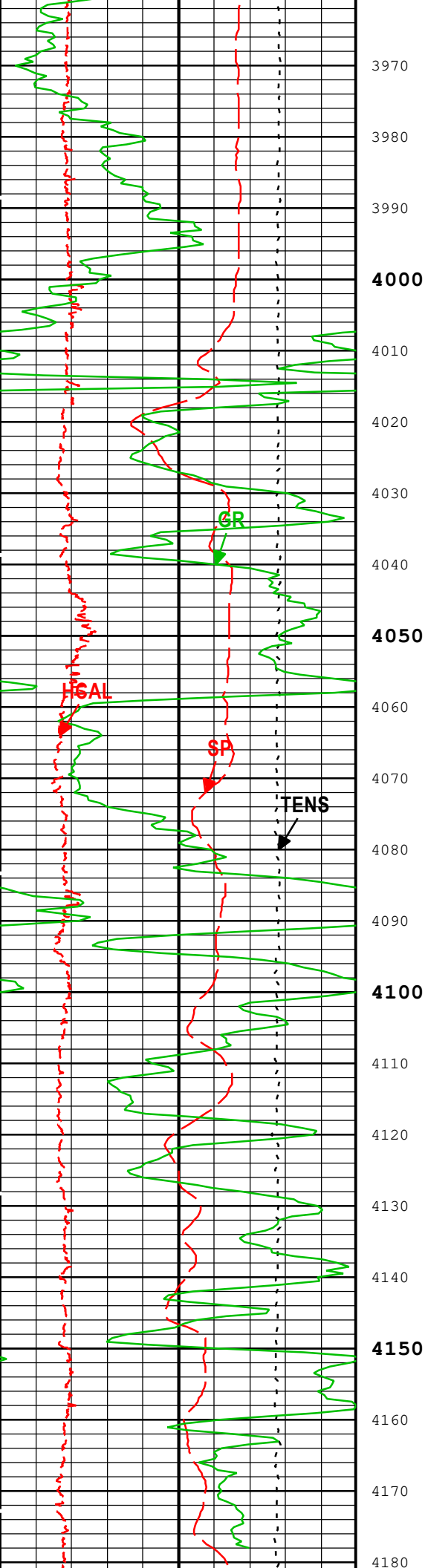


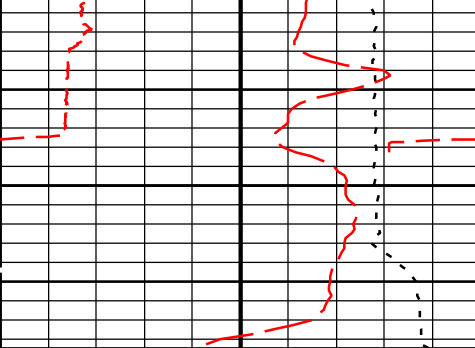




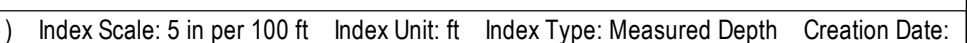
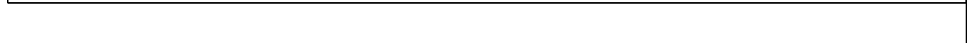
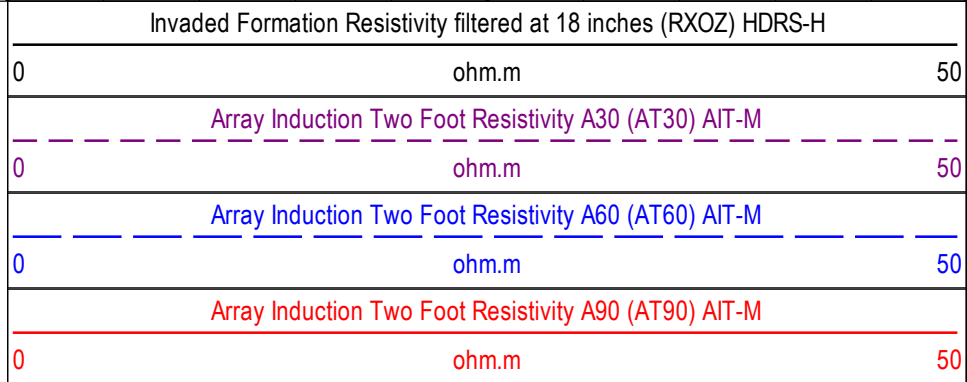
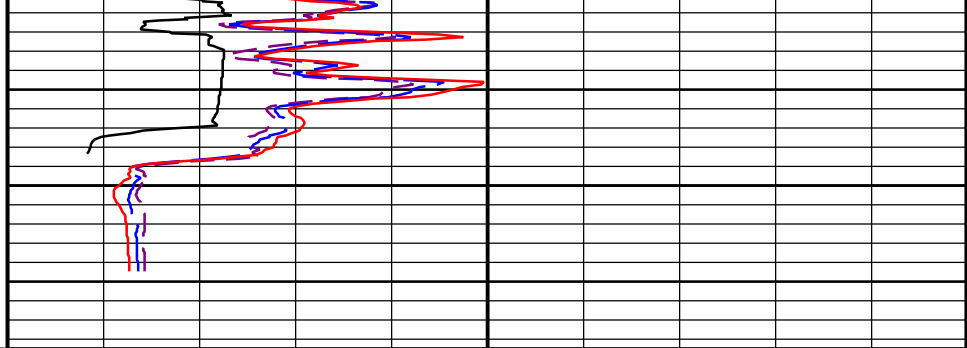
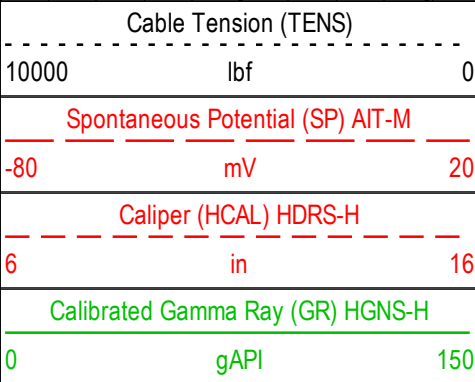








4190
4200
4210



TIME_1900 - Time Marked every 60.00 (s)

Description: HRLT BASIC LOG Format: Log (HRLA_5_Inch) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Nov-2019 19:43:50

Channel Processing Parameters

1A: Parameters

Parameter	Description	Tool	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M	Compute Standoff	
ASTA	Array Induction Tool Standoff	AIT-M	0.6	in
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BHT	Bottom Hole Temperature	Borehole	122	degF
BS	Bit Size	WLSESSION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0	in
CBLO	Casing Bottom (Logger)	WLSESSION	506	ft
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
EDF	Elevation of Derrick Floor Above Permanent Datum	WLSESSION	7	ft
EPD	Elevation of Permanent Datum (PDAT) above Mean Sea Level	WLSESSION	4667	ft
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	CALI	
GGRD	Geothermal Gradient	Borehole	1	0.01 degF/ft
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	CTEM	
MST	Mud Sample Temperature	Borehole	68	degF
PDAT	Permanent Datum	WLSESSION	GL	
RMS	Resistivity of Mud Sample	Borehole	0.2	ohm.m
SHT	Surface Hole Temperature	Borehole	68	degF
SPDR	SP Drift Per Foot	AIT-M	0	mV/ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	12.25	10.5	506
BS	7.875	506	4205

All depth are actual.

Tool Control Parameters

1A: Parameters

Parameter	Description	Tool	Value	Unit
HMCA_BOARD_TYPE	HMCA Board Type	HGNS-H	1	
HRGD_BOARD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h

1A

Main Pass 5"=100'

Software Version

Acquisition System	Version
Maxwell 2019.2	9.2.113335.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
1A	Log[3]:Up	Up	48.97 ft	4216.96 ft	04-Nov-2019 6:15:38 PM	04-Nov-2019 7:27:40 PM	ON	1.50 ft	No

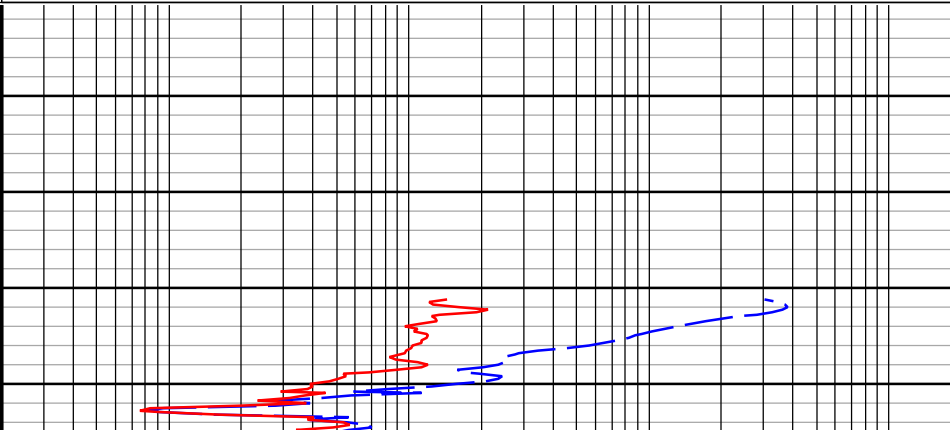
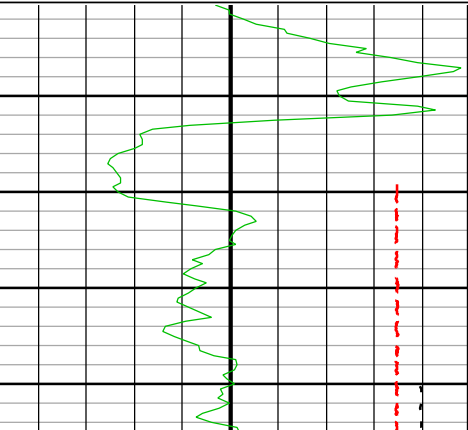
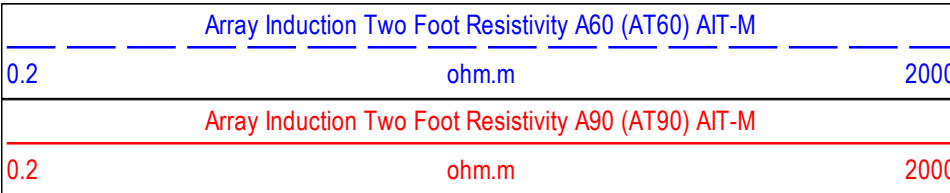
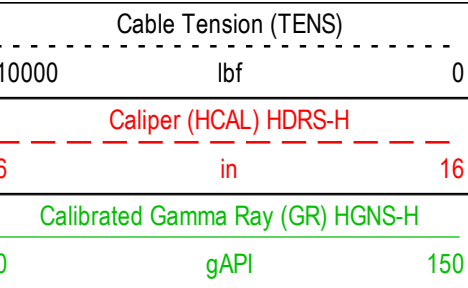
All depths are referenced to toolstring zero

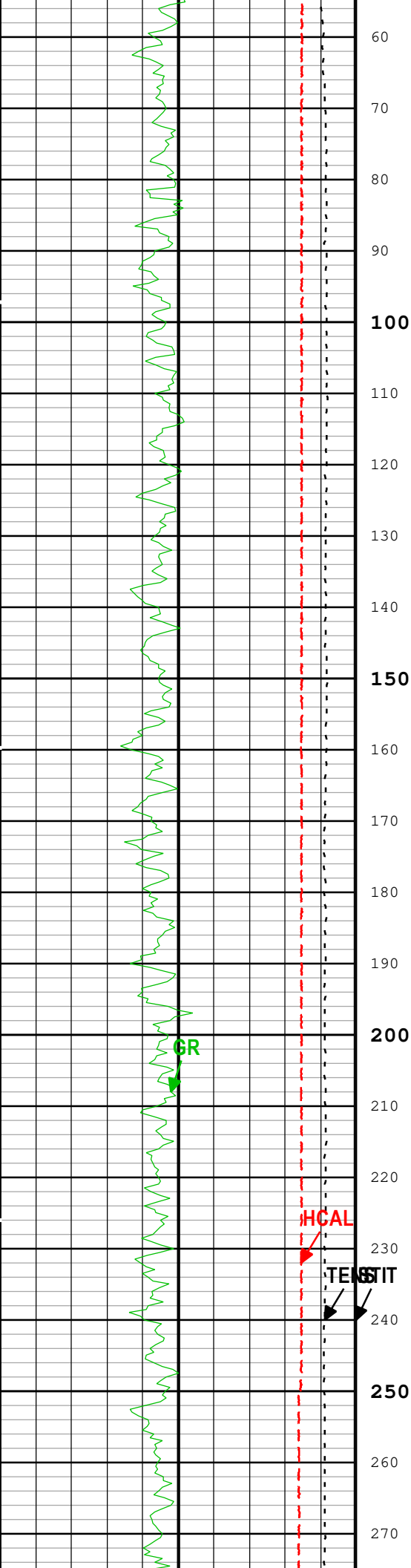
Log	Company:St. Croix Operating Inc. Well:Armstrong #1 1A: Log[3]:Up:S005
-----	---

Description: HRLT BASIC LOG Format: Log (HRLA_2_inch) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Nov-2019 19:43:54

Channel	Source	Sampling
AT60	AIT-M:AMIS:AMIS	3in
AT90	AIT-M:AMIS:AMIS	3in
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR_CAL	HGNS-H:HGNS-H:HGNS-H	6in
STIT	DepthCorrection	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

TIME_1900 - Time Marked every 60.00 (s)



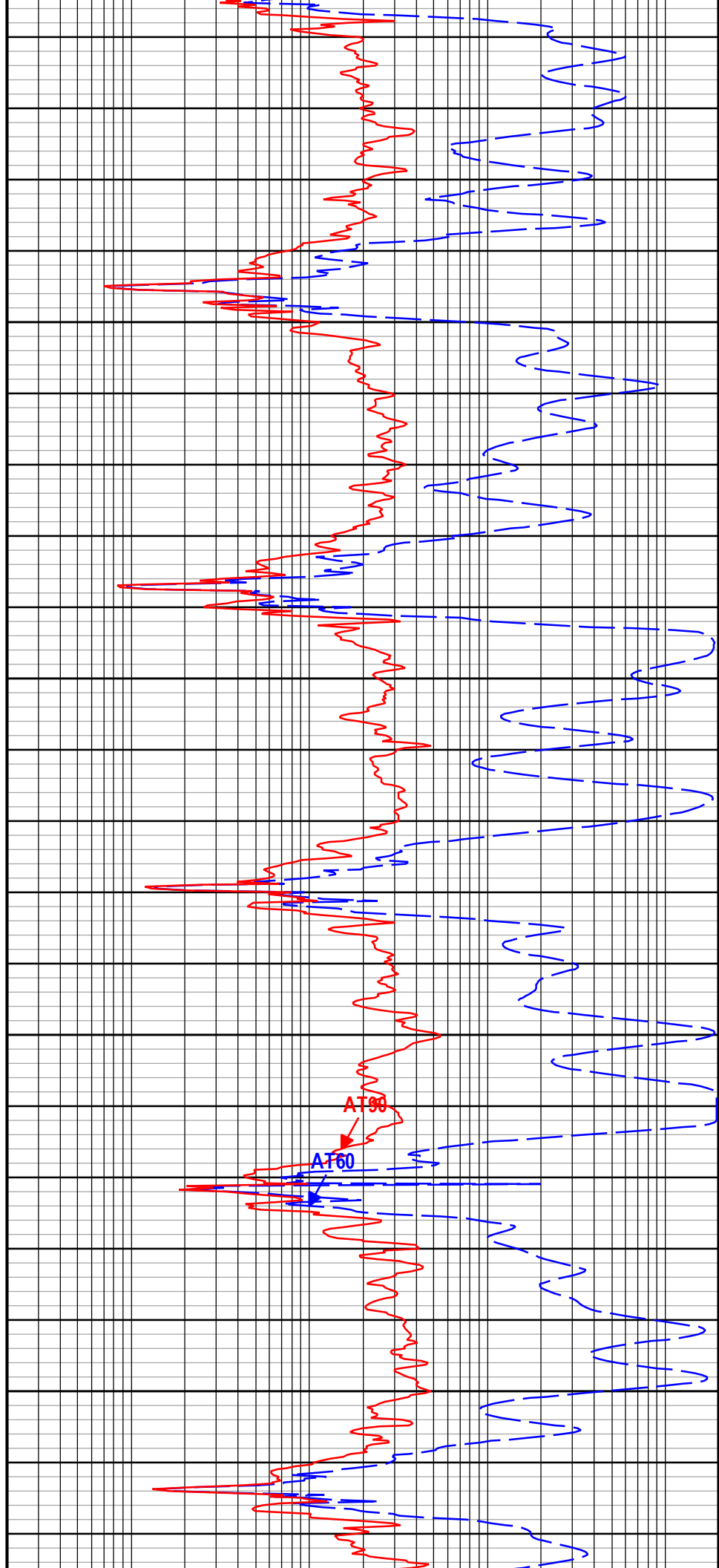


100

150

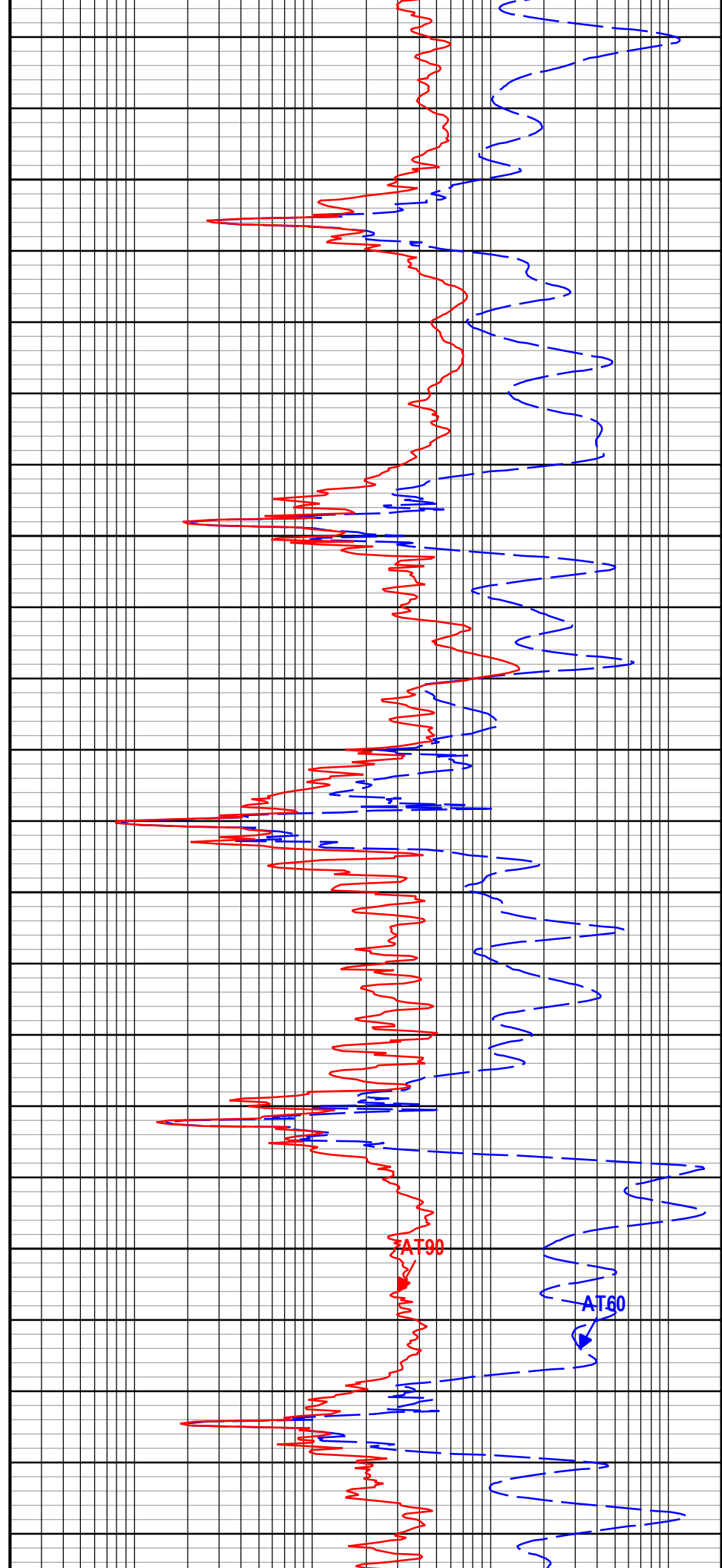
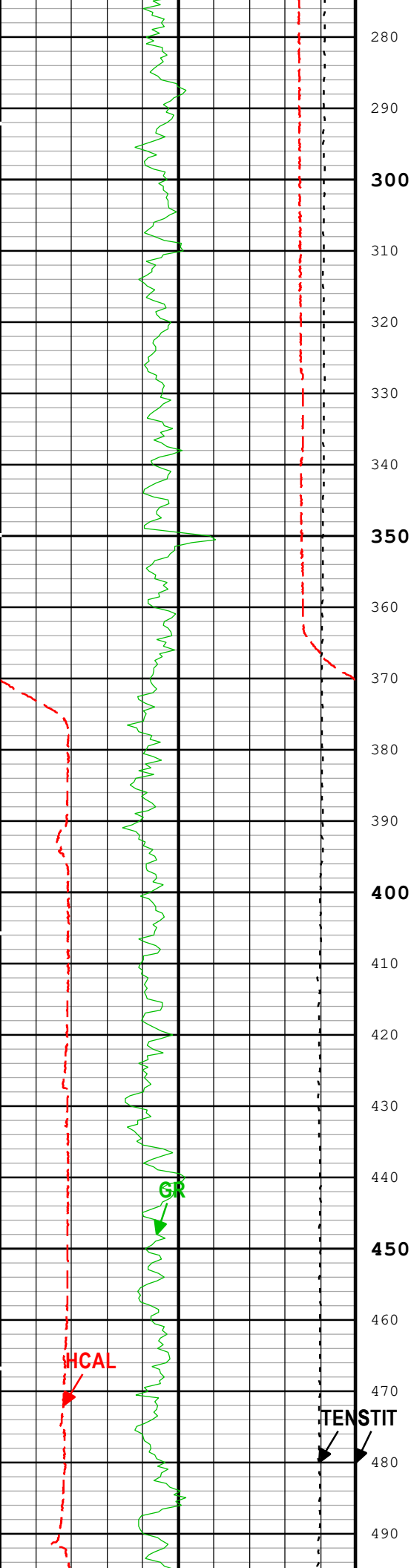
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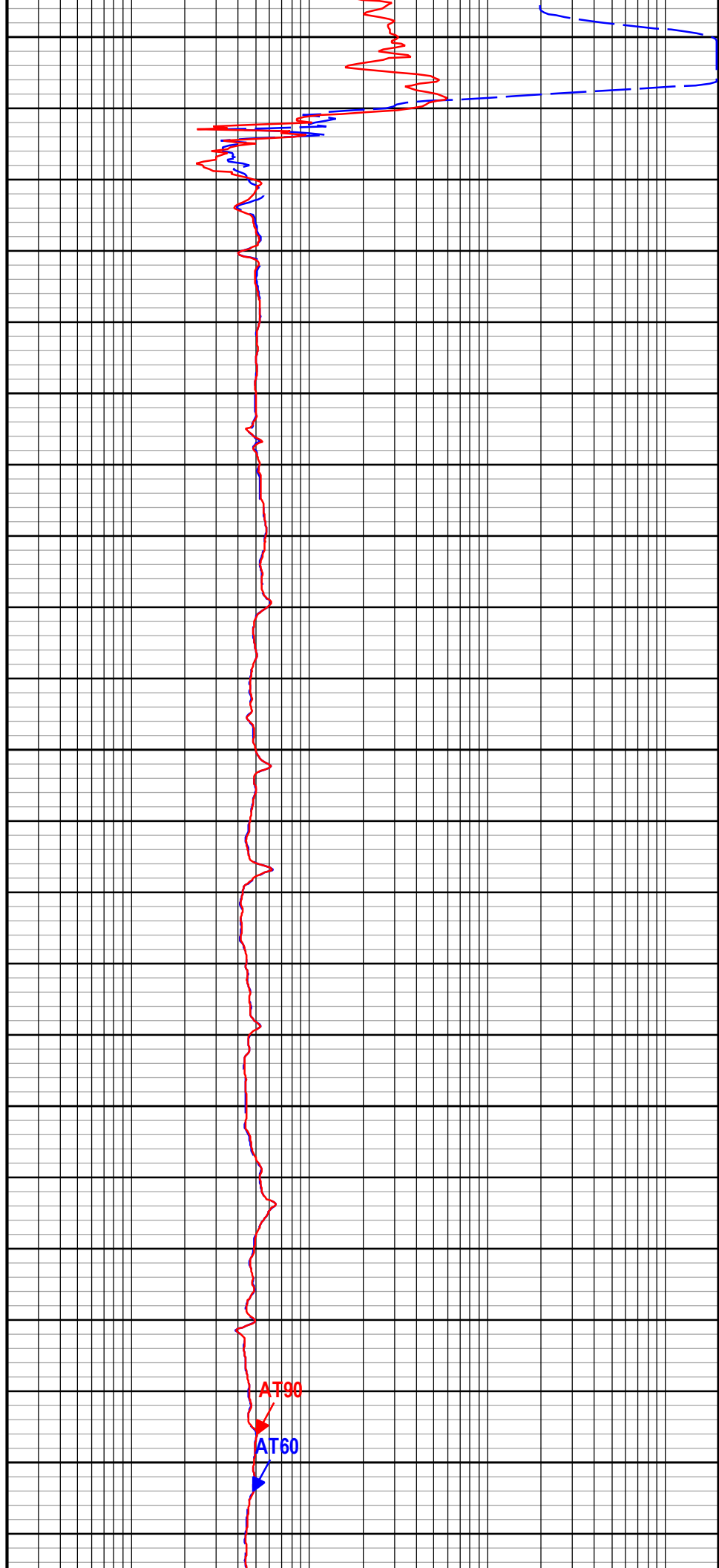
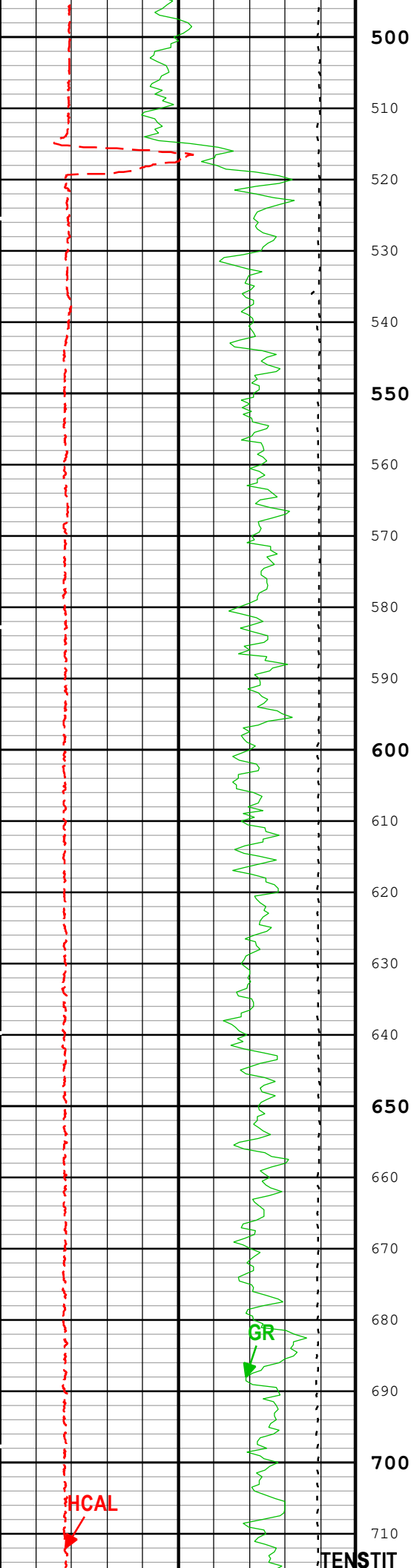
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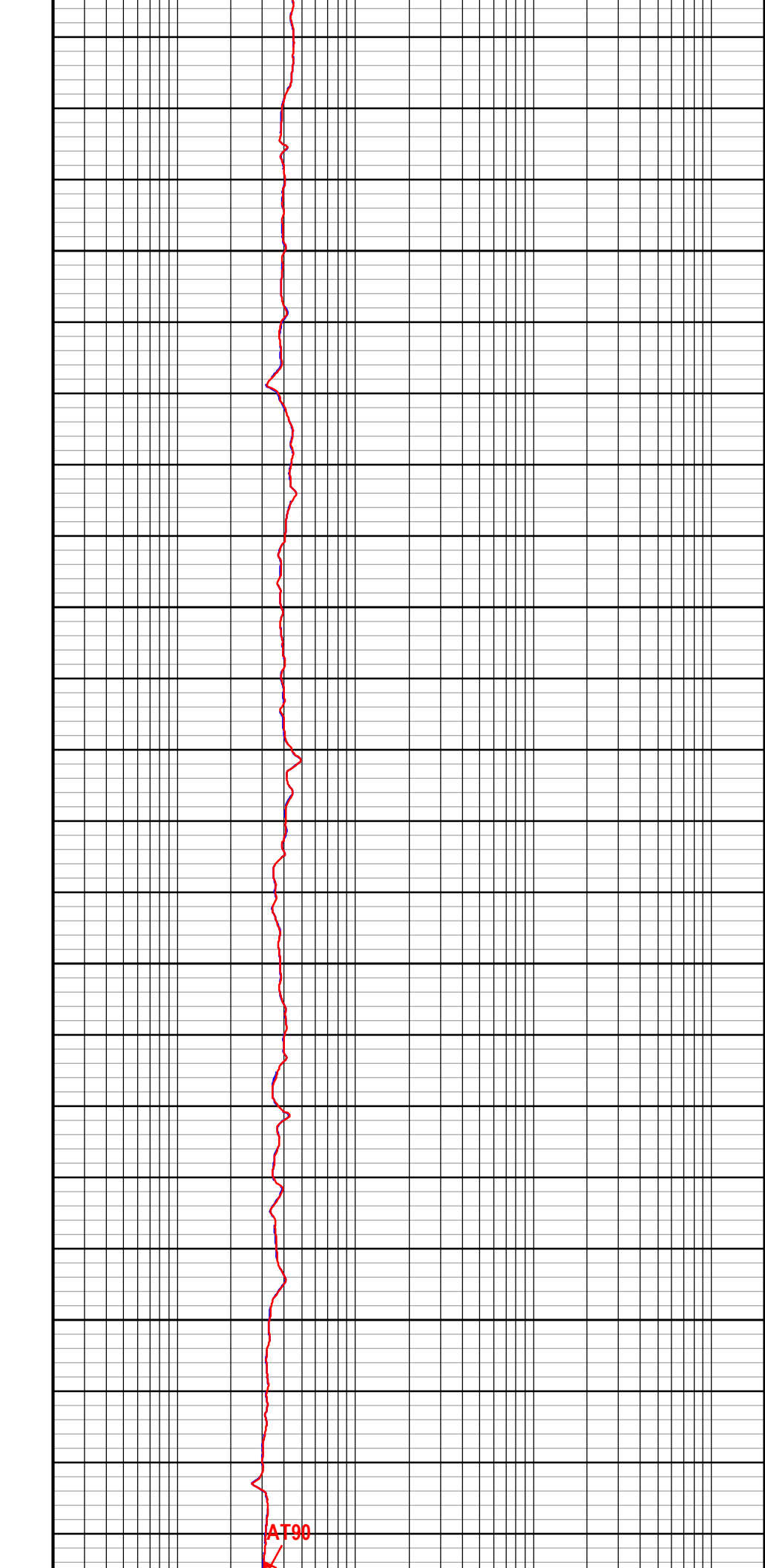
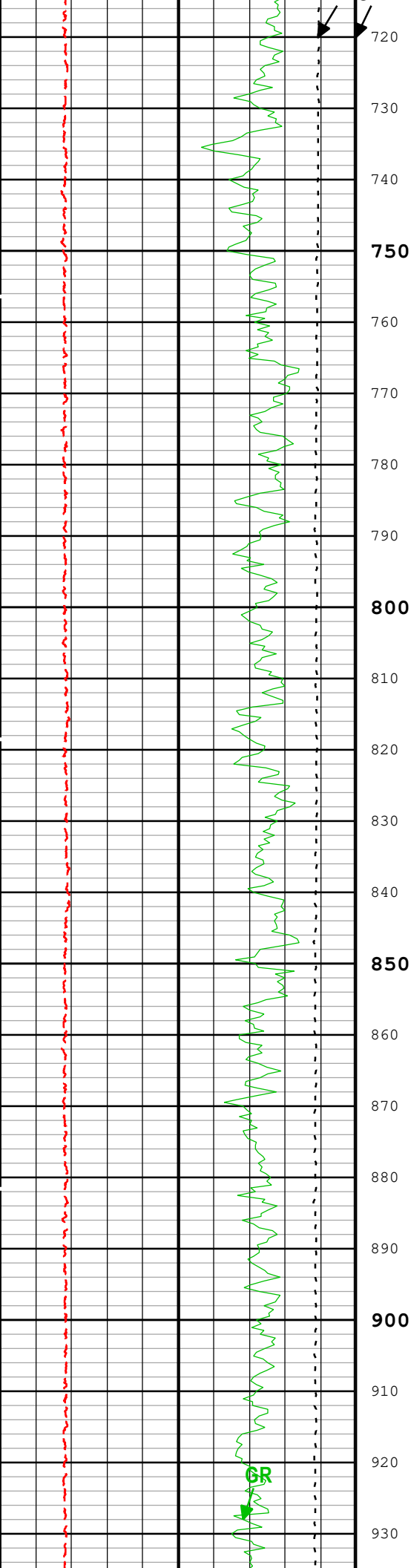


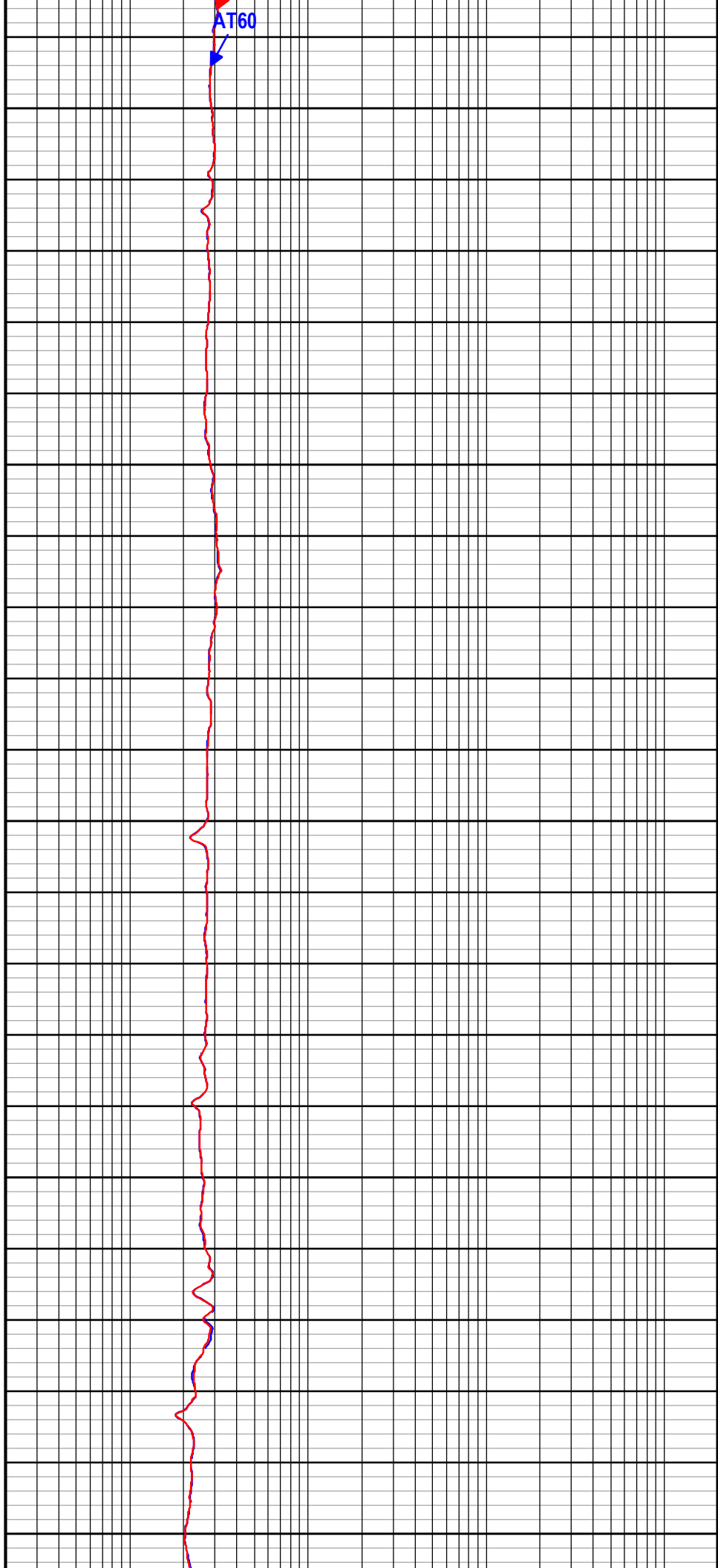
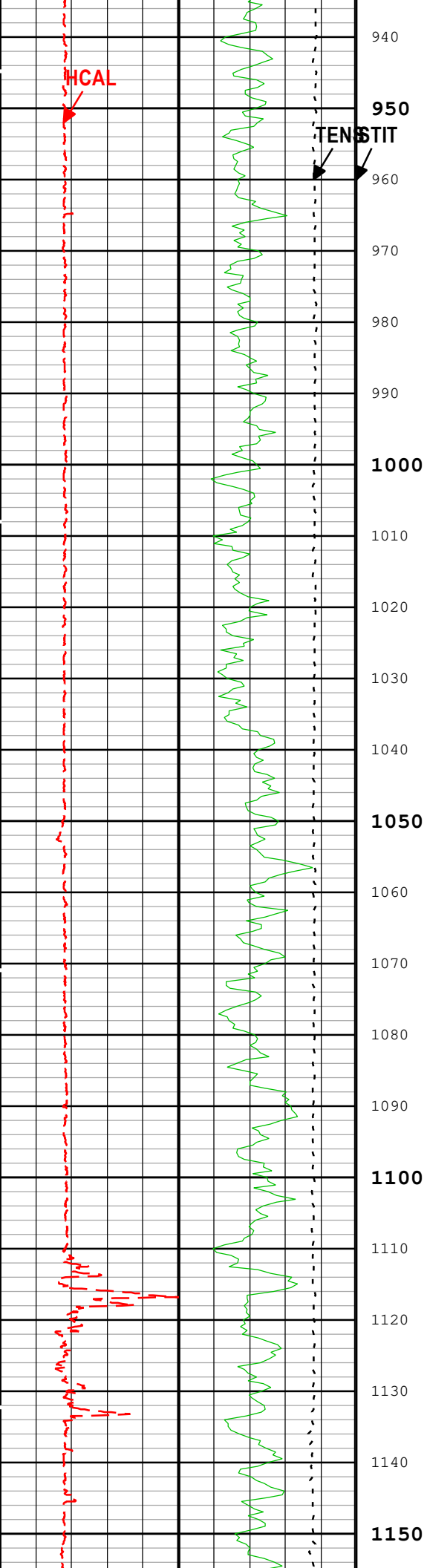
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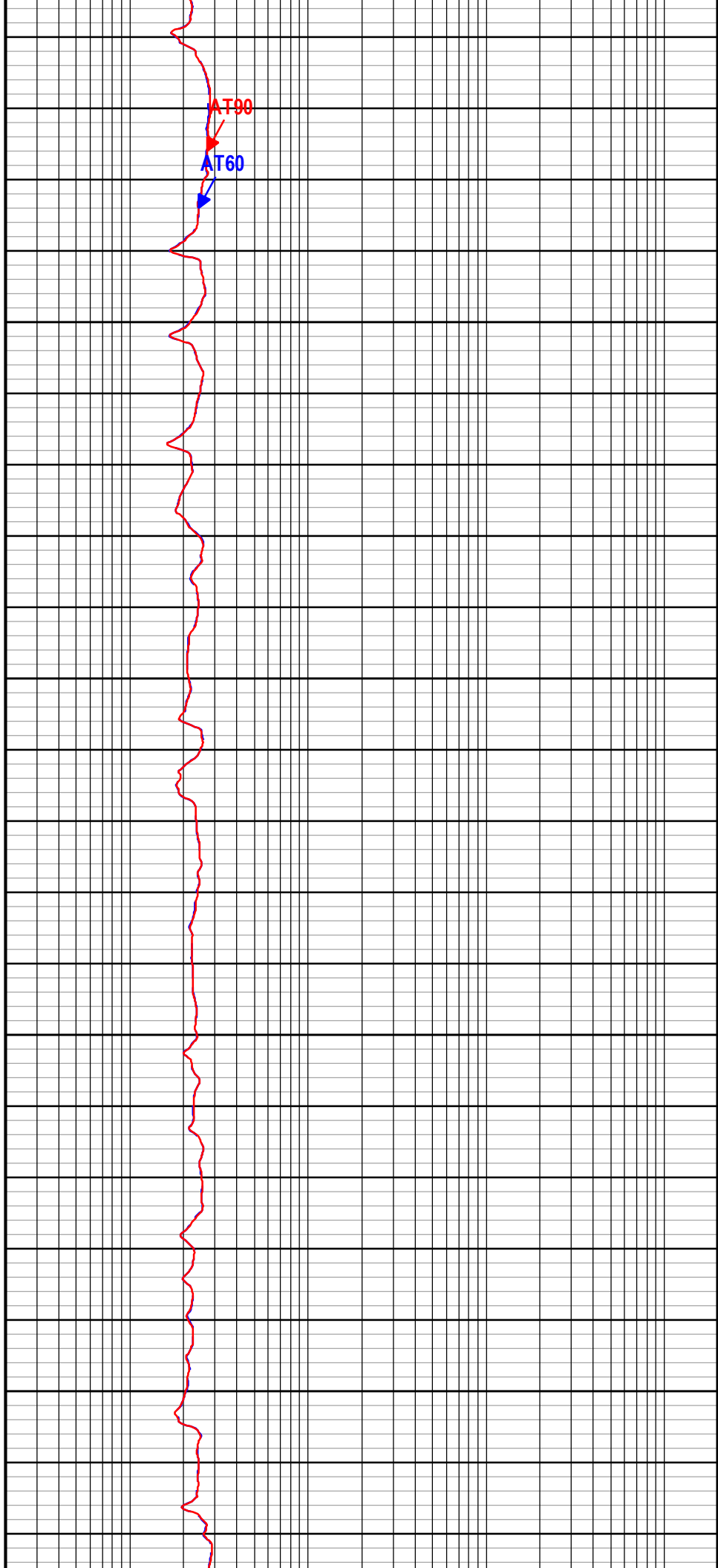
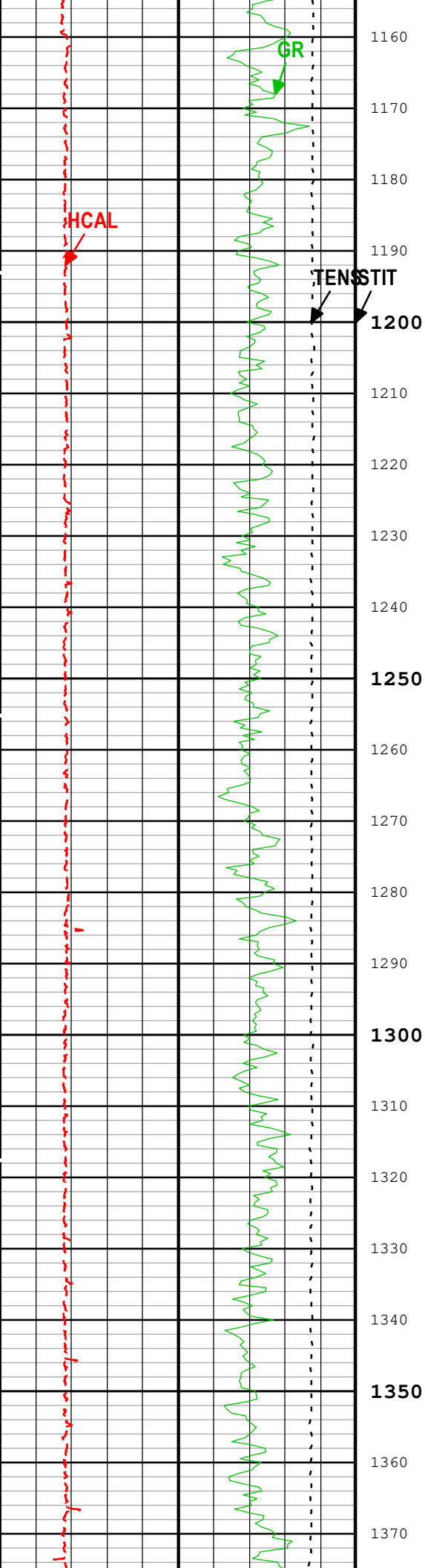
AT60

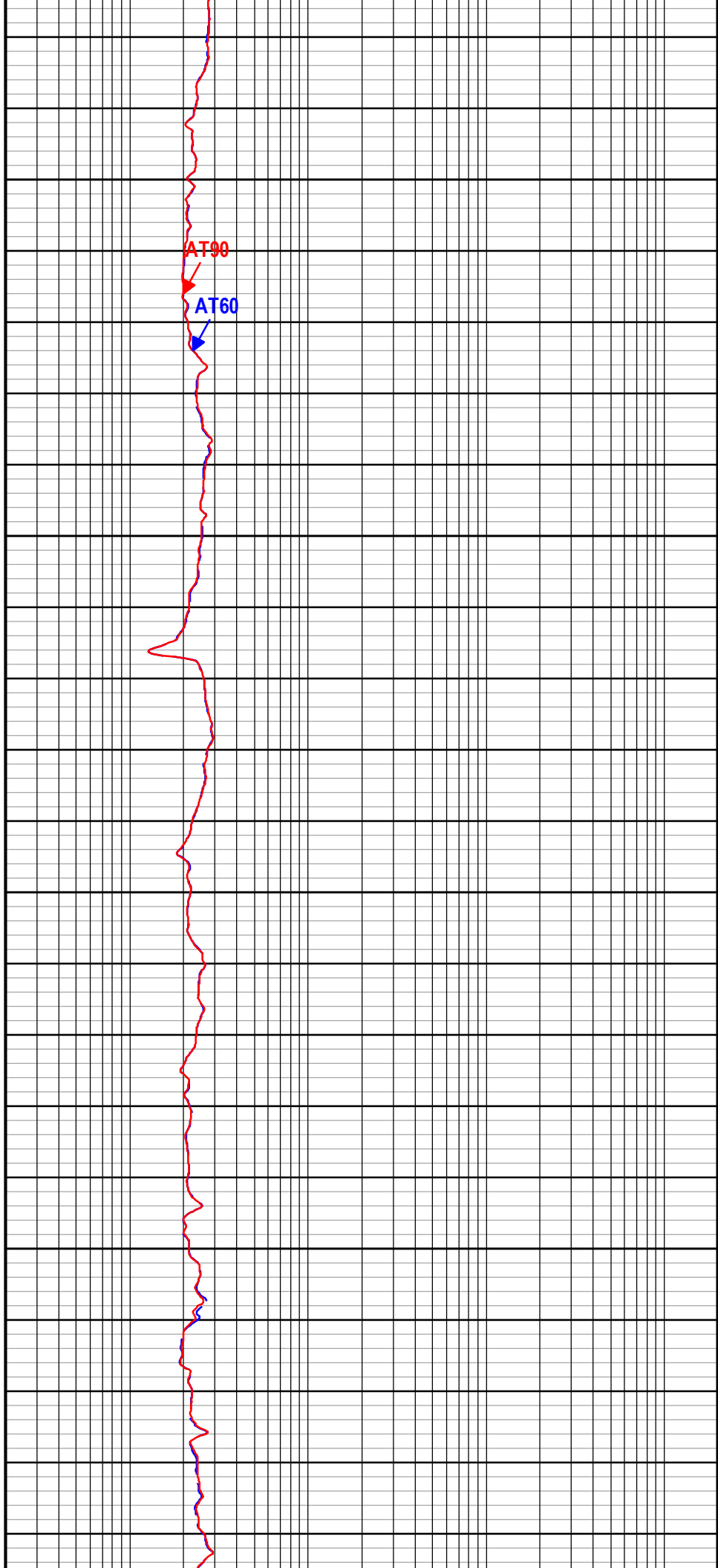
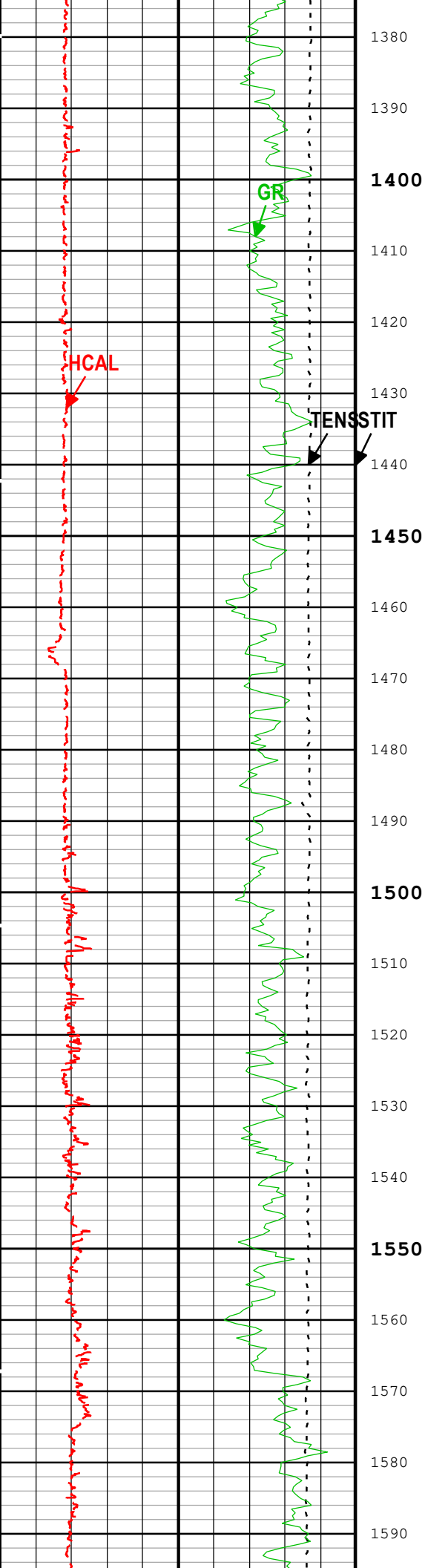


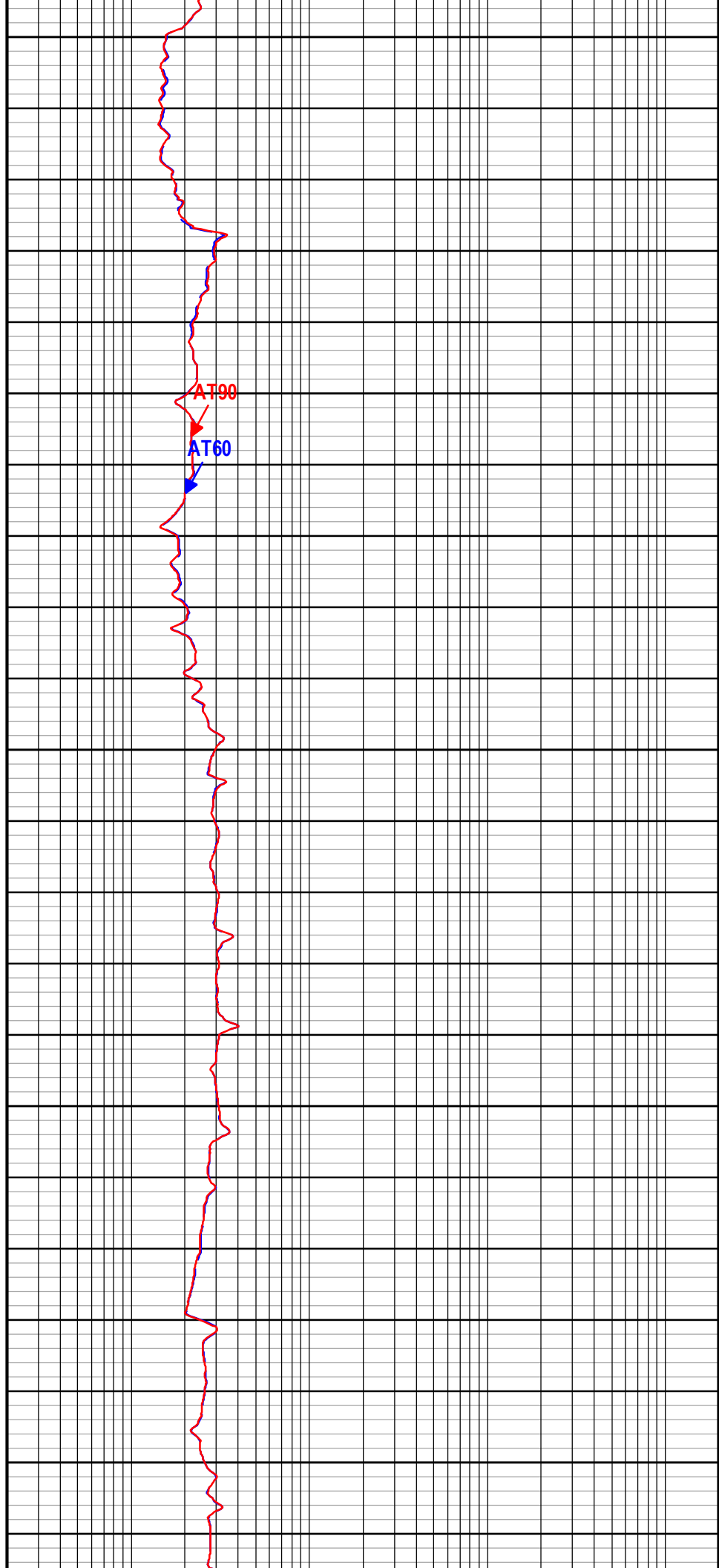
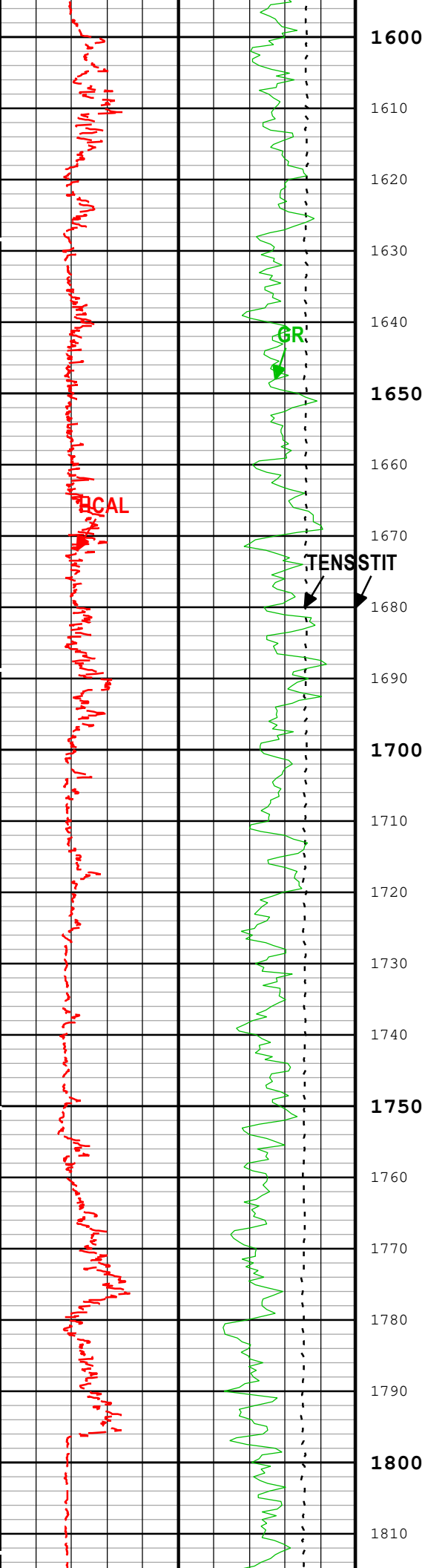


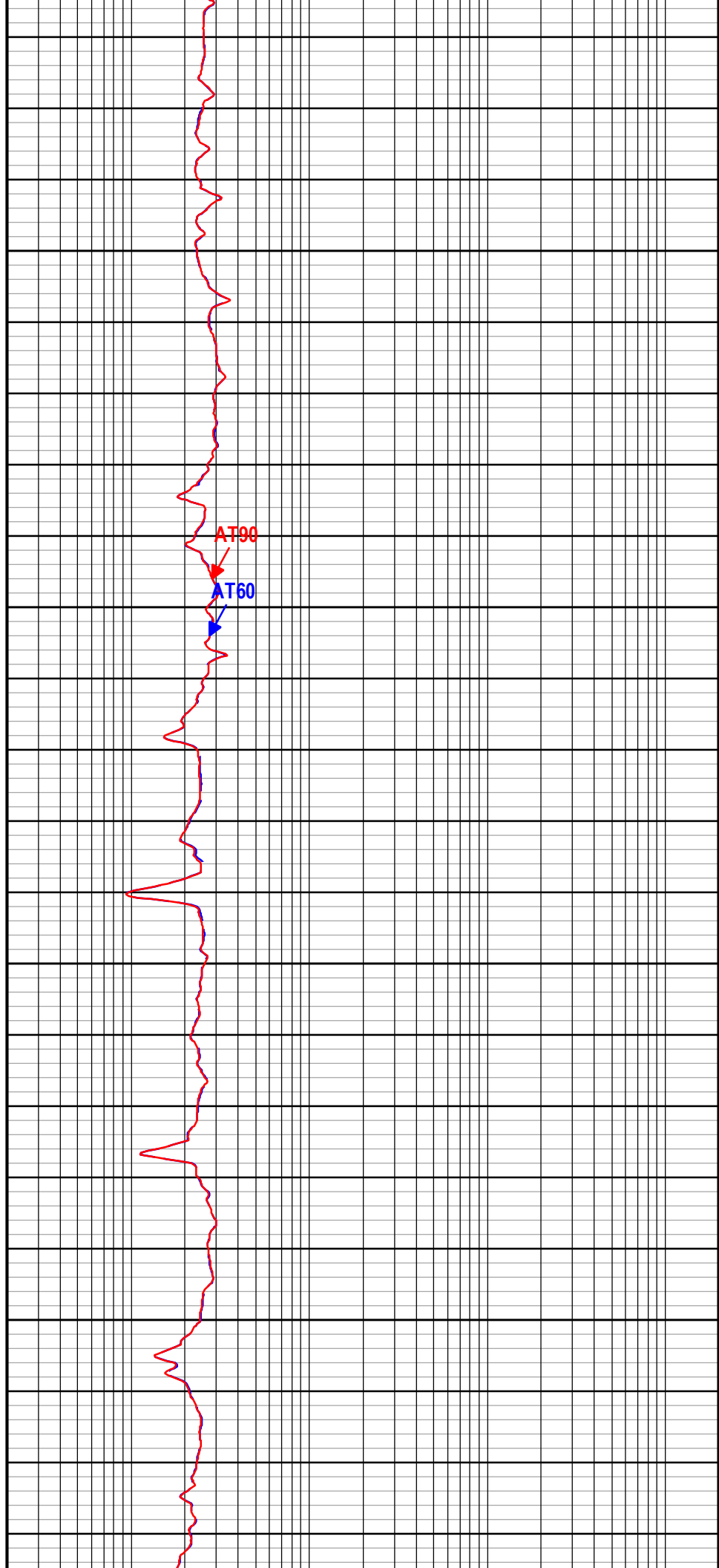
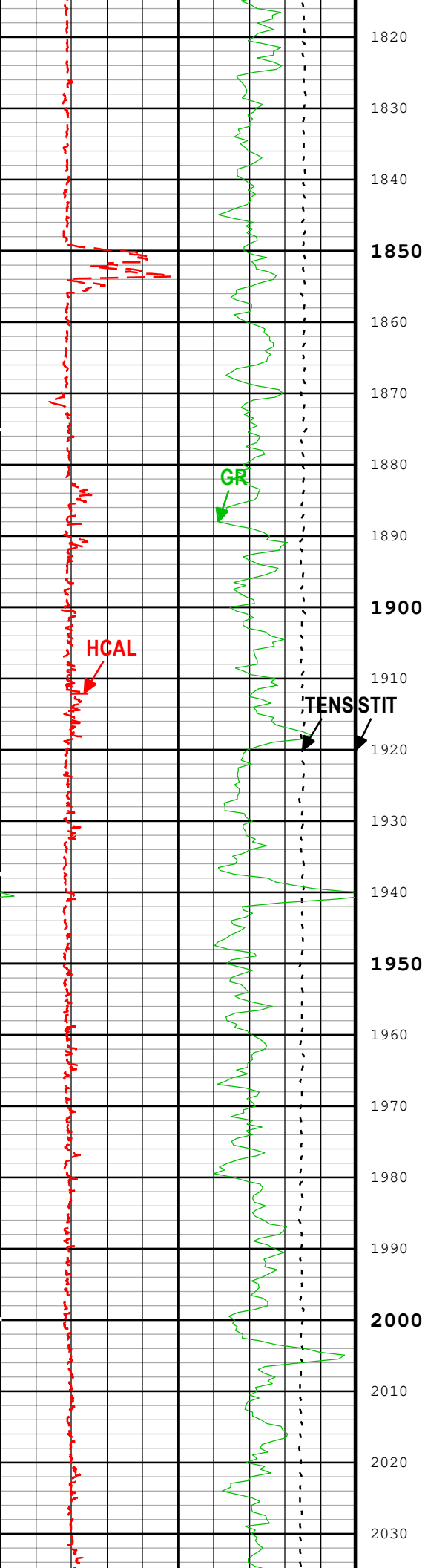


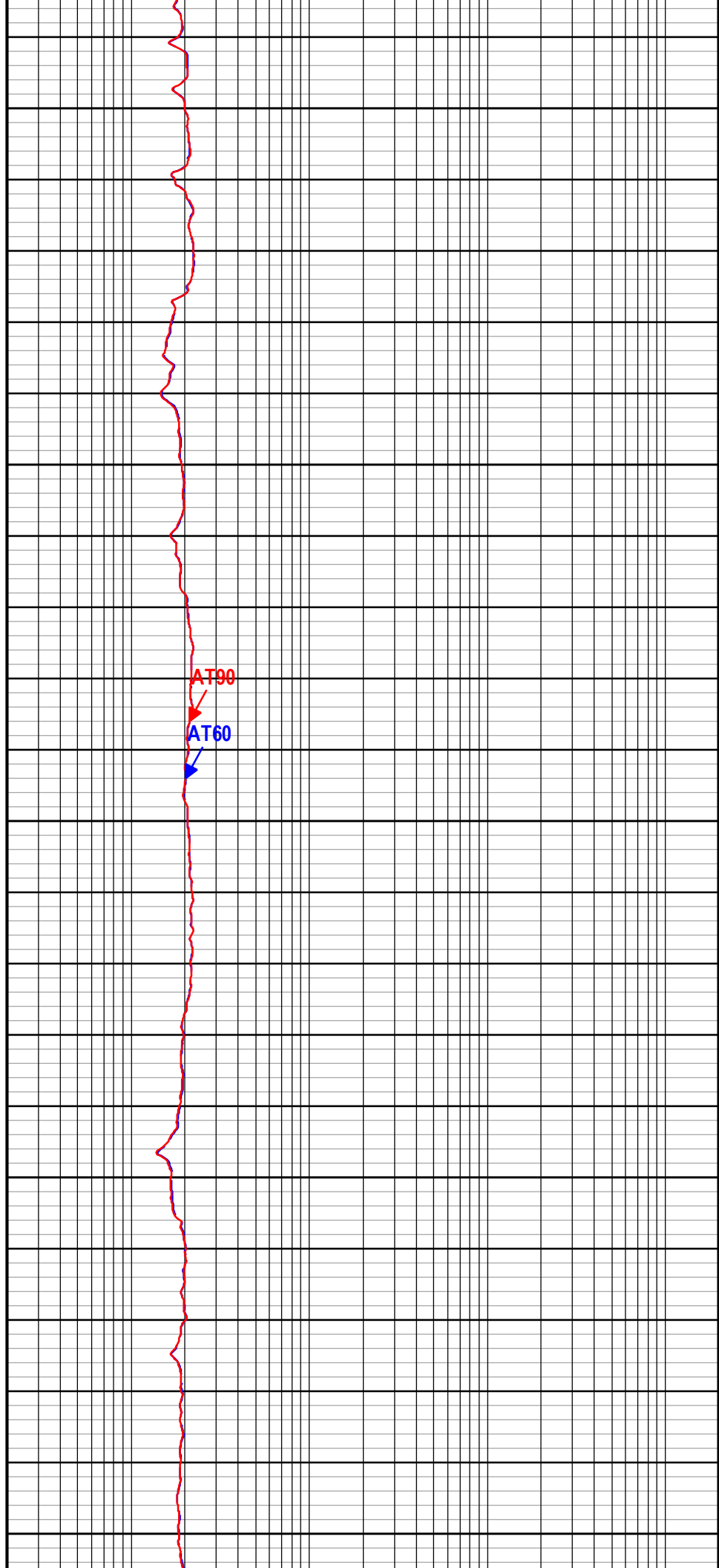
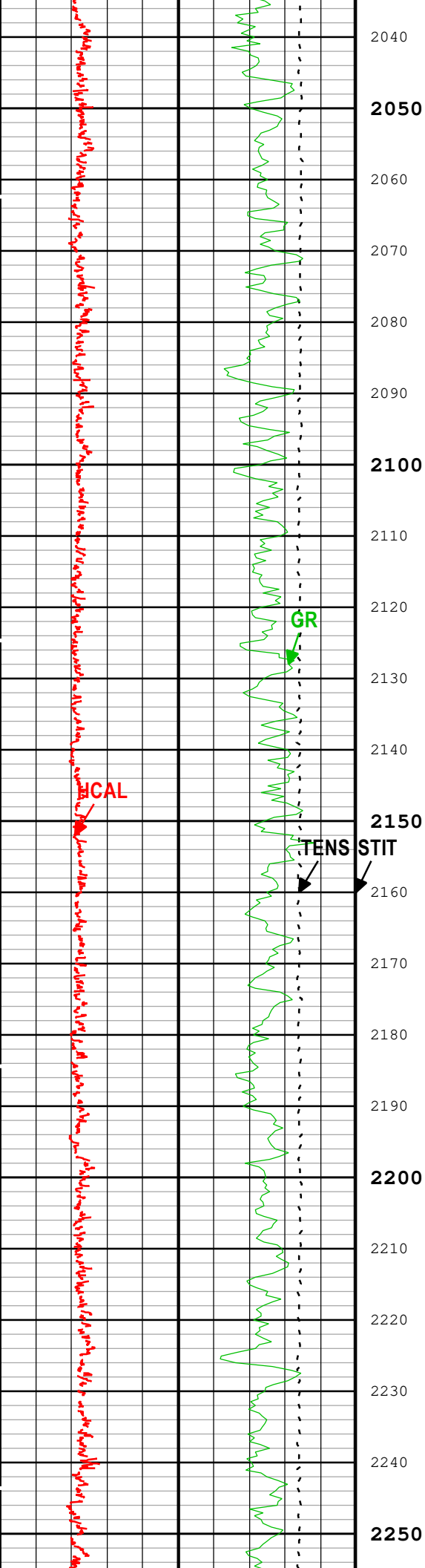


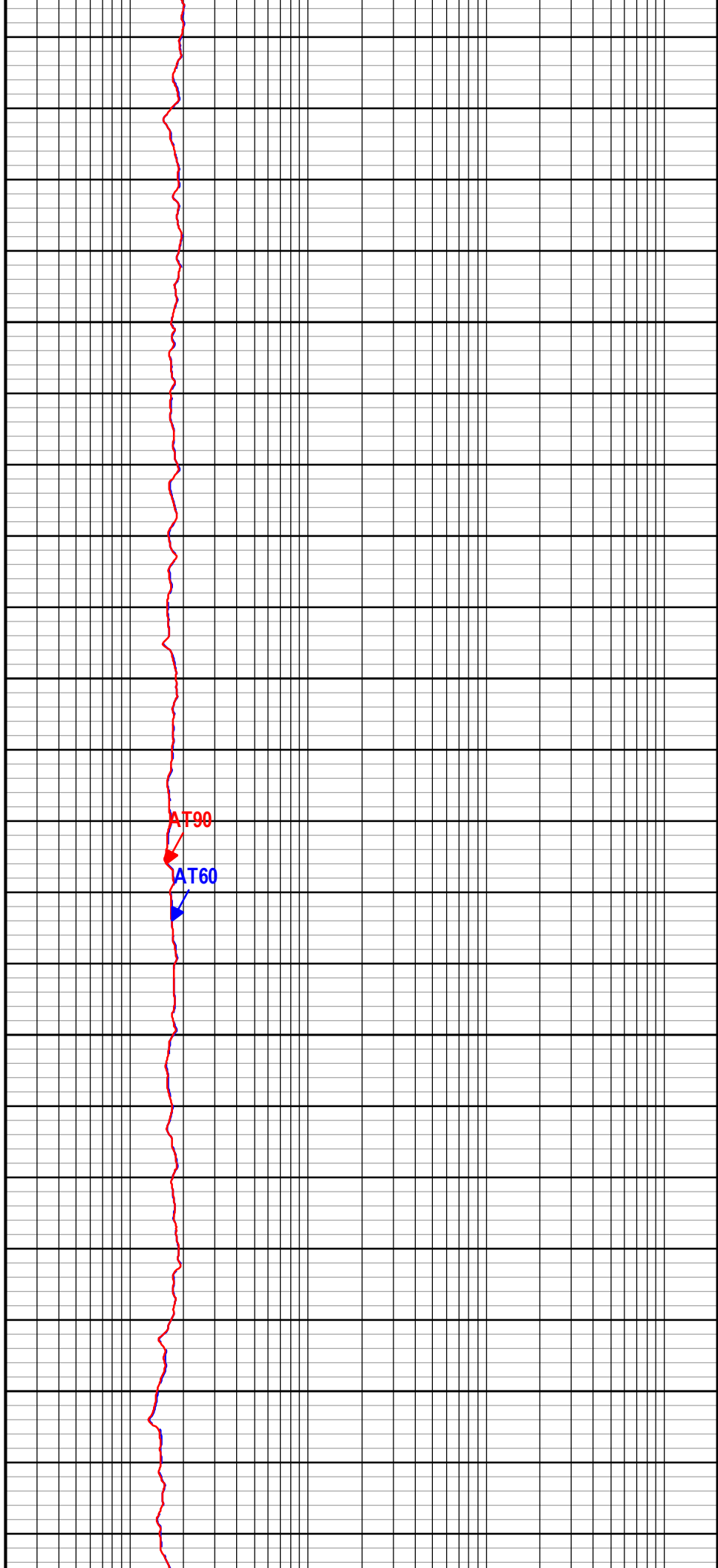
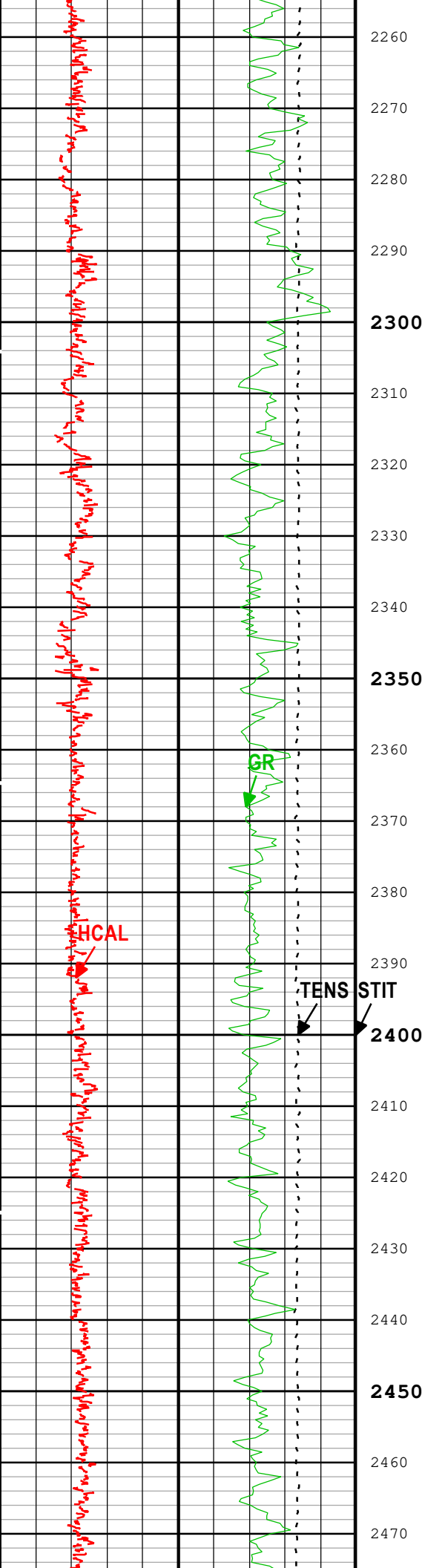


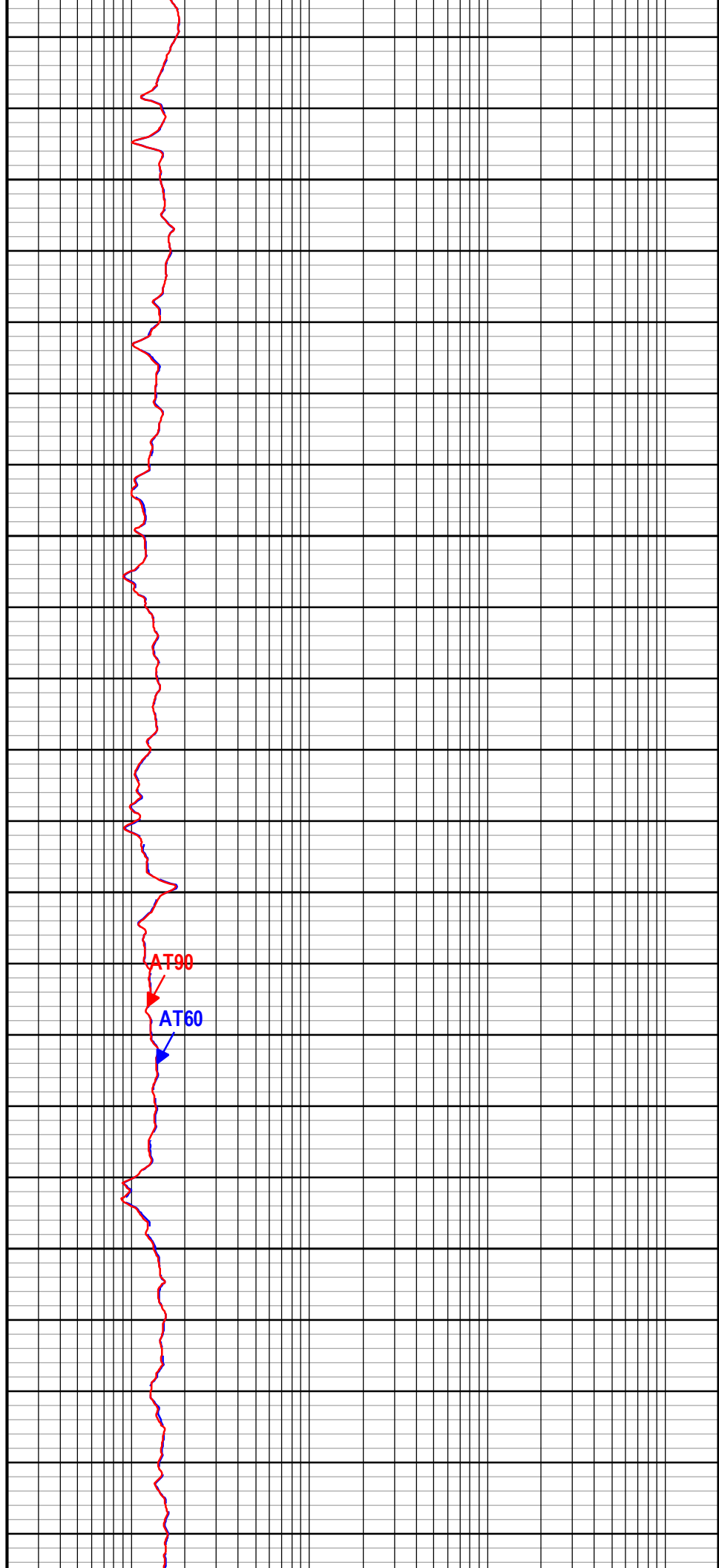
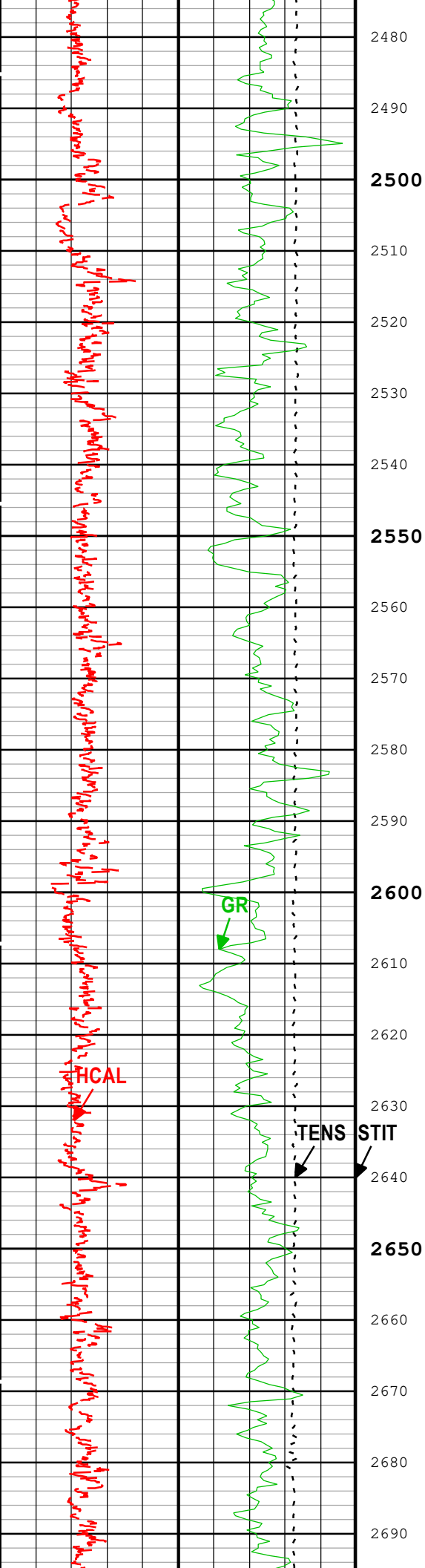


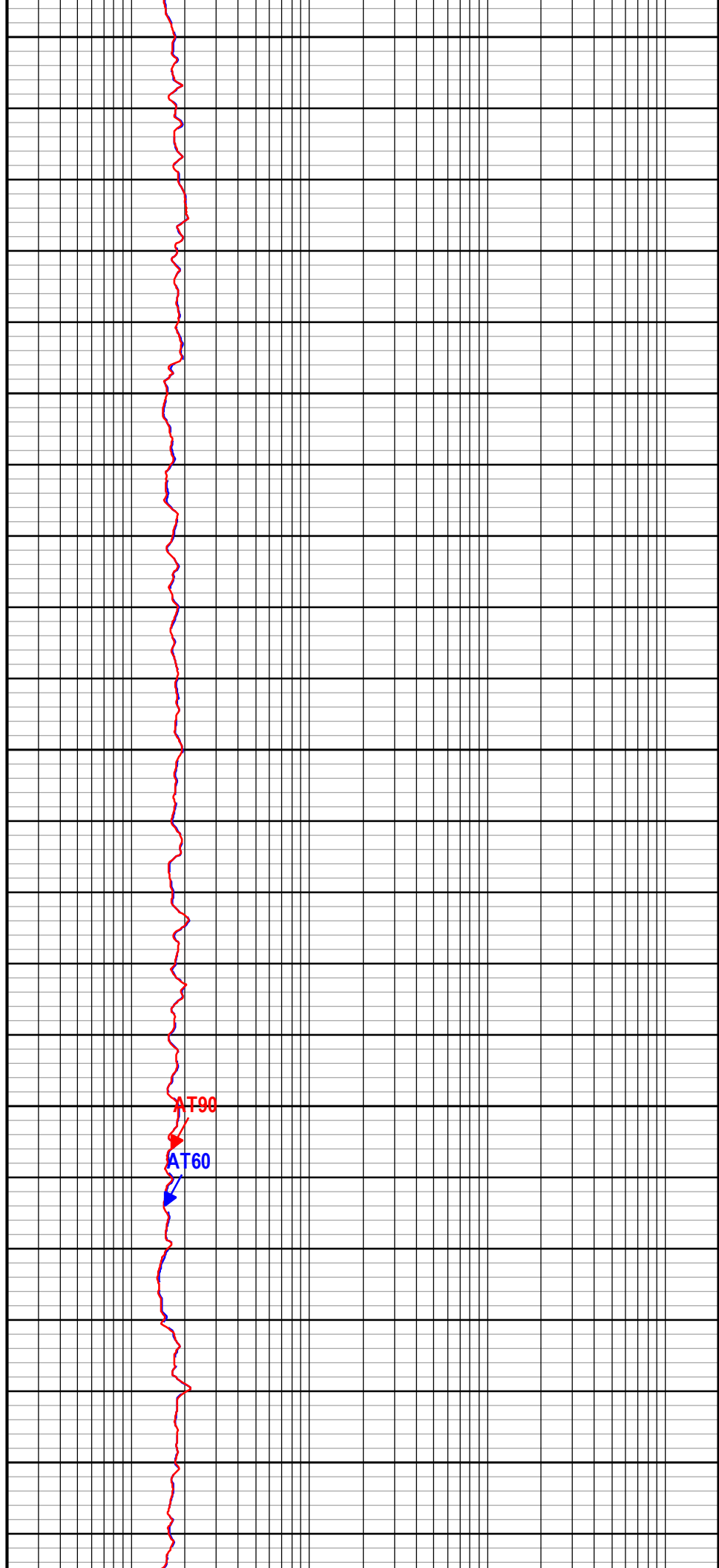
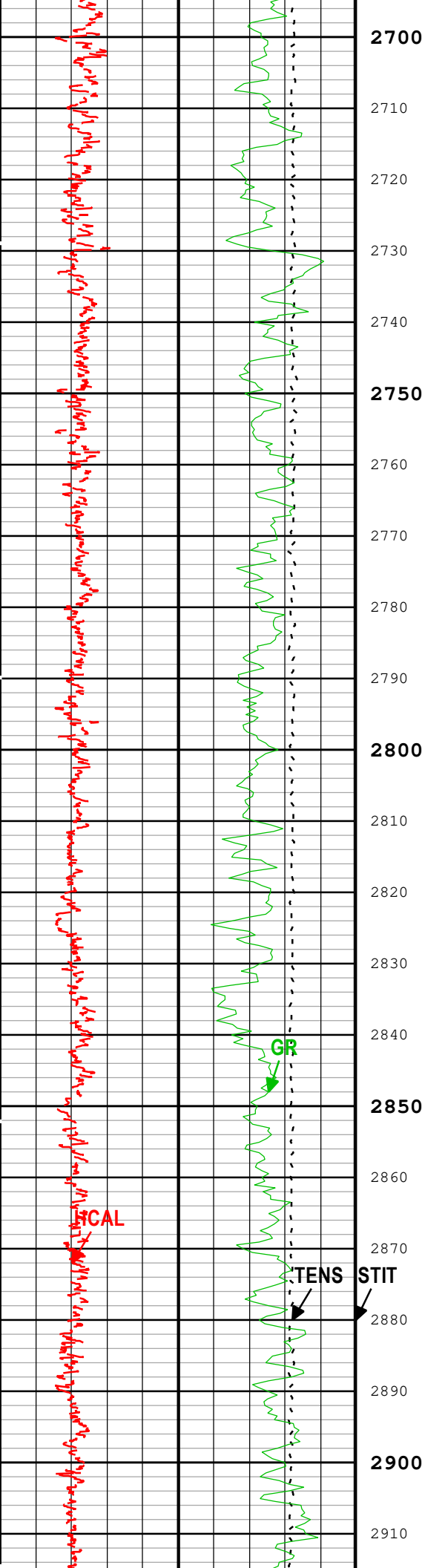


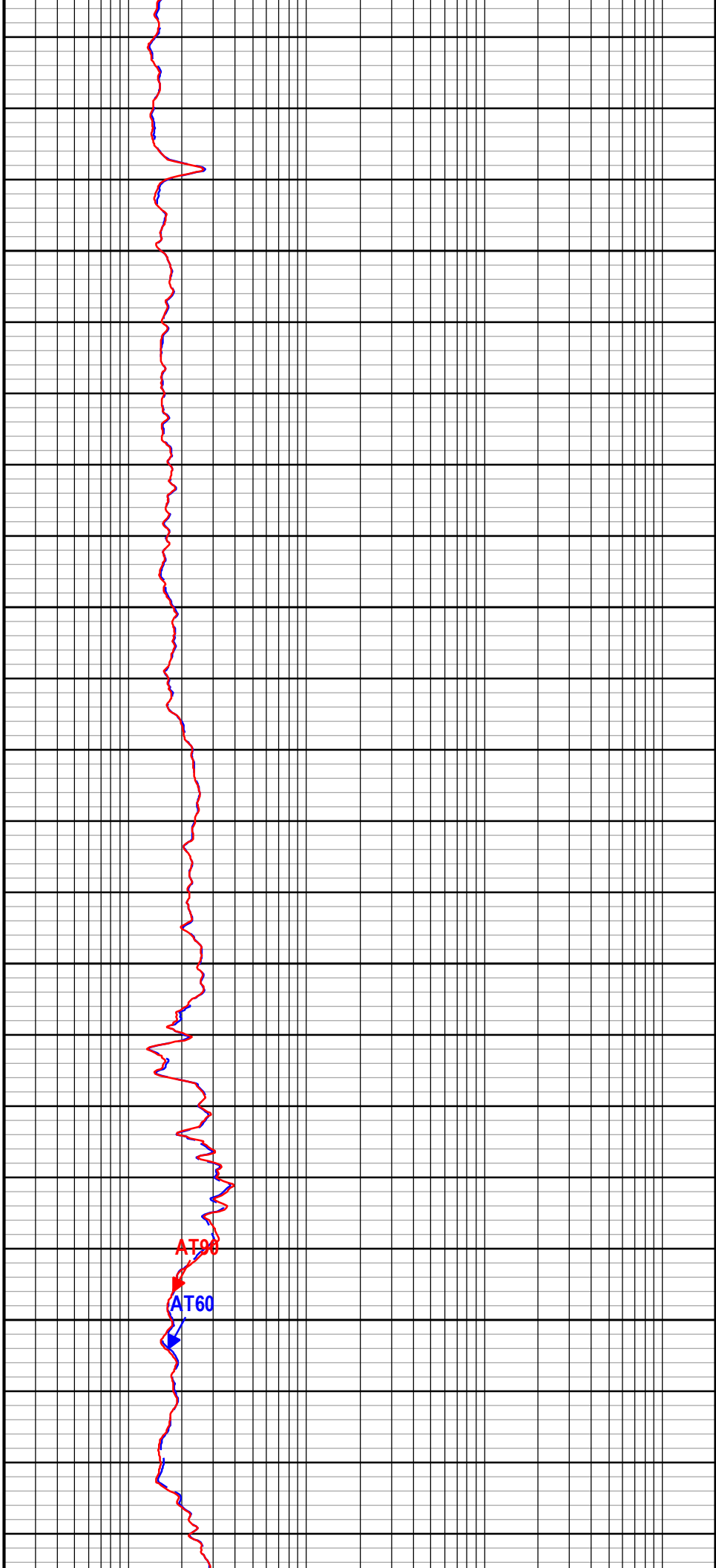
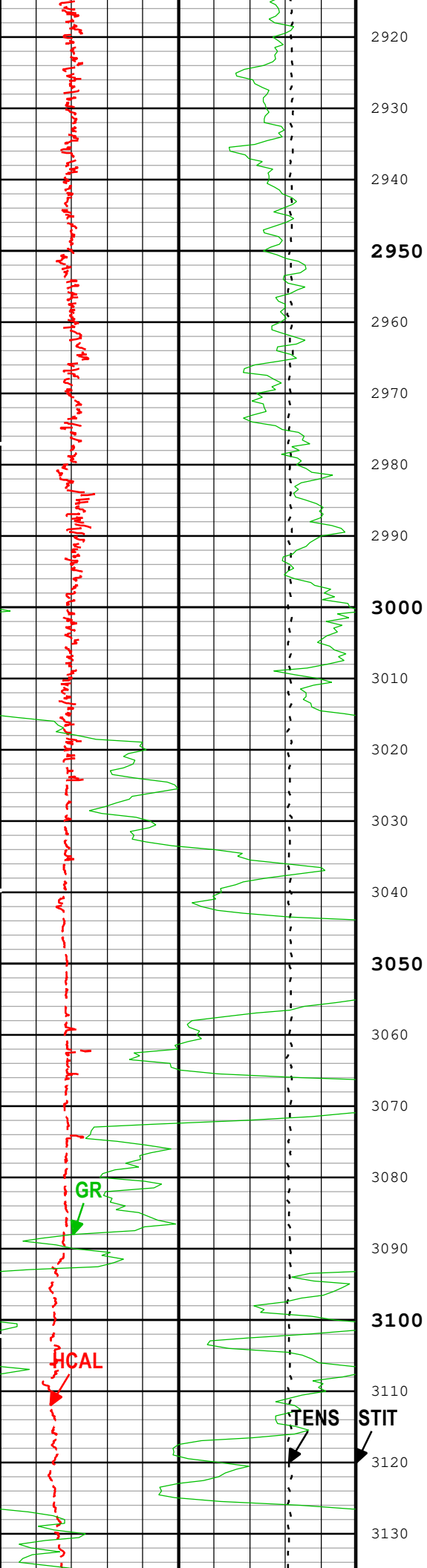


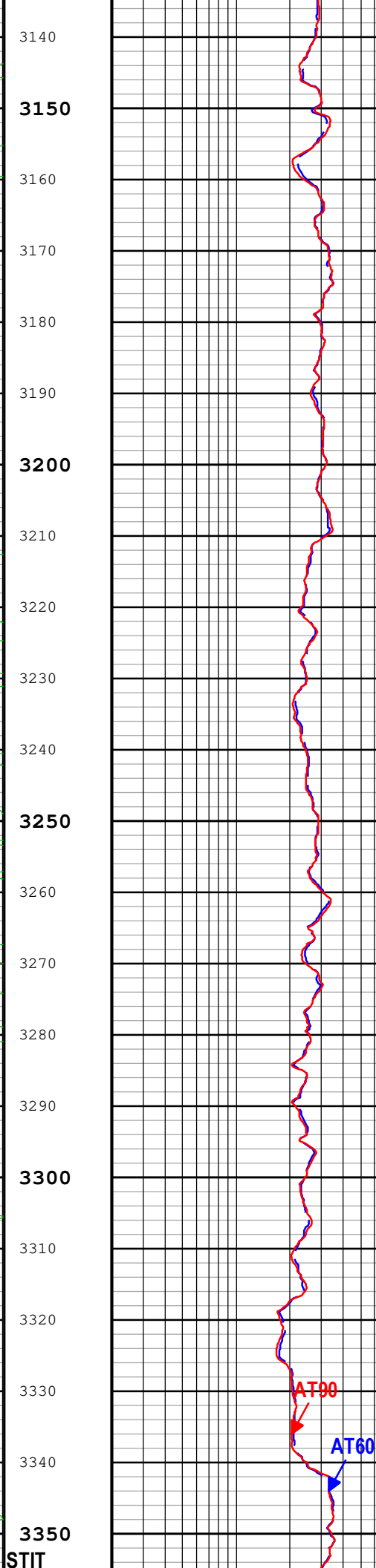
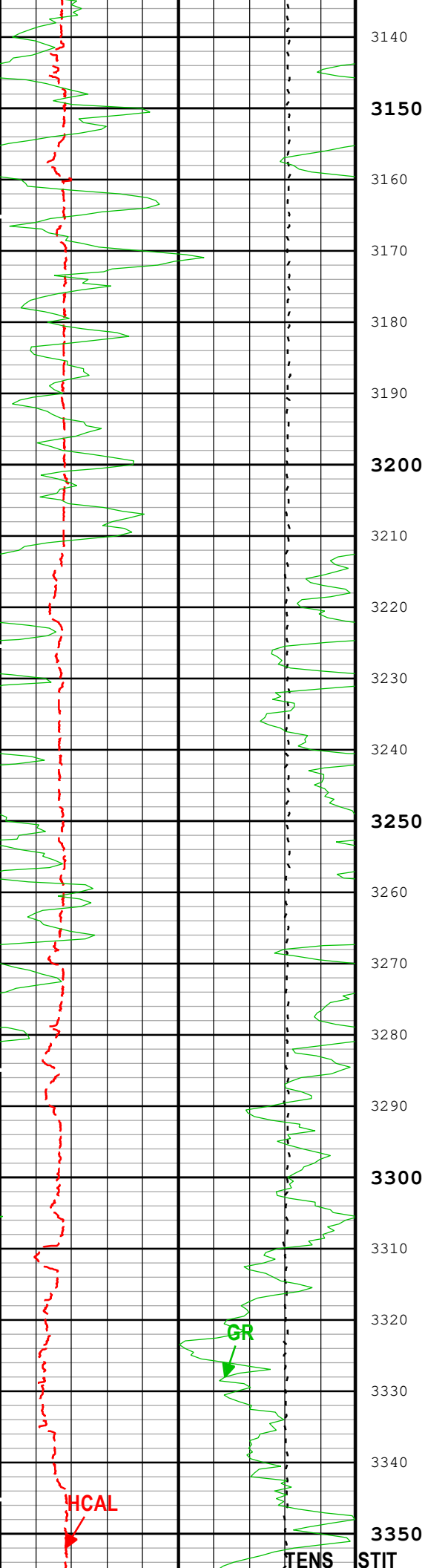


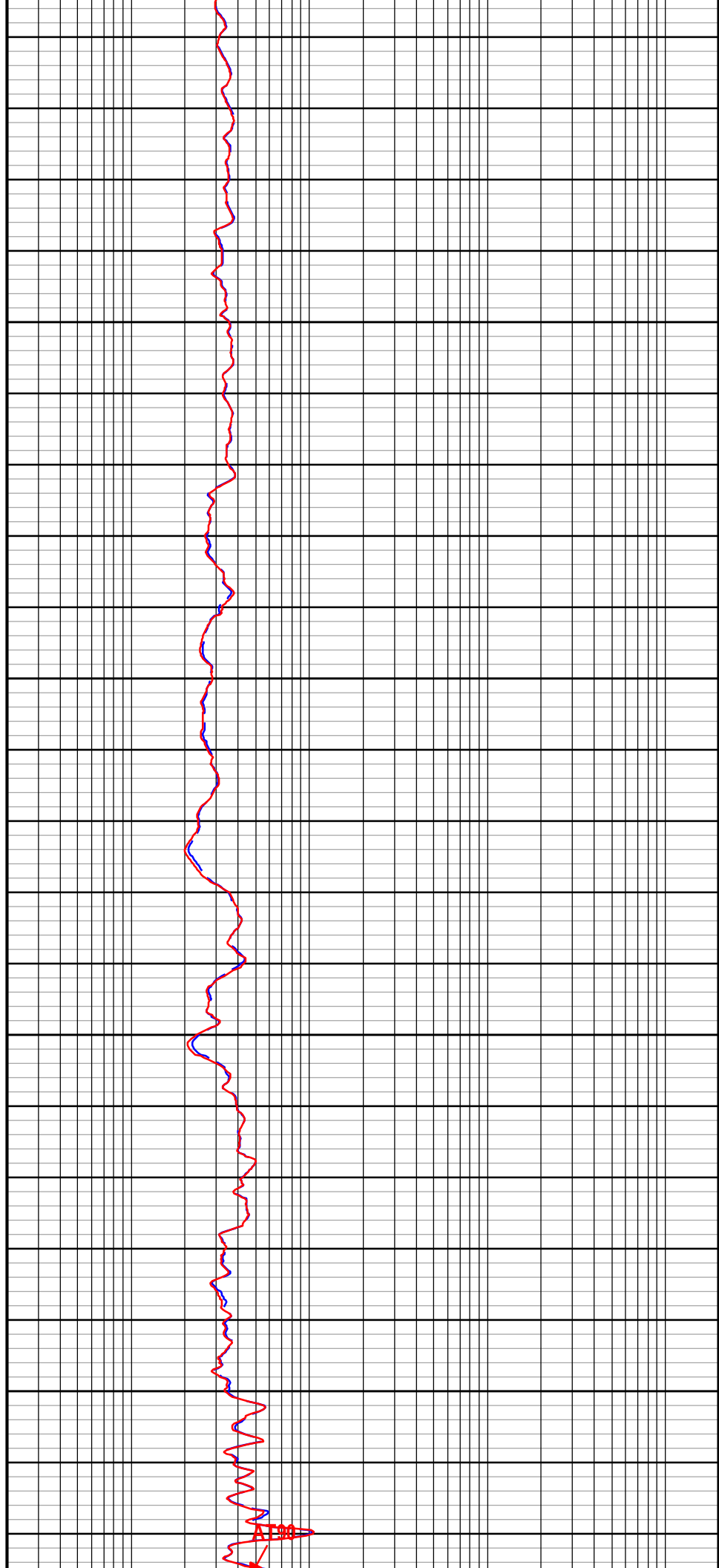
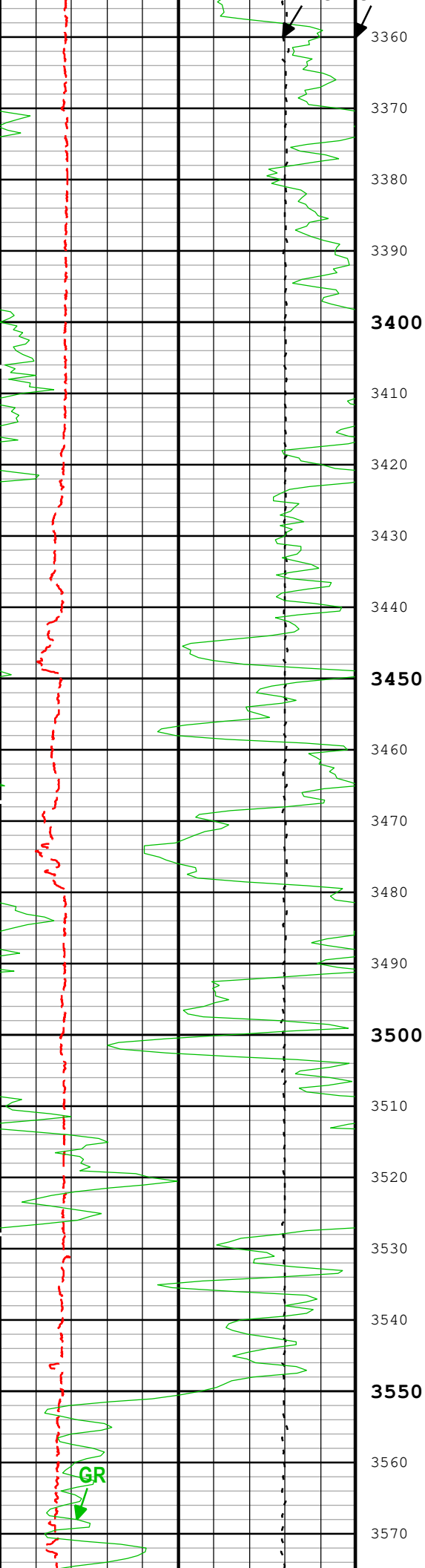


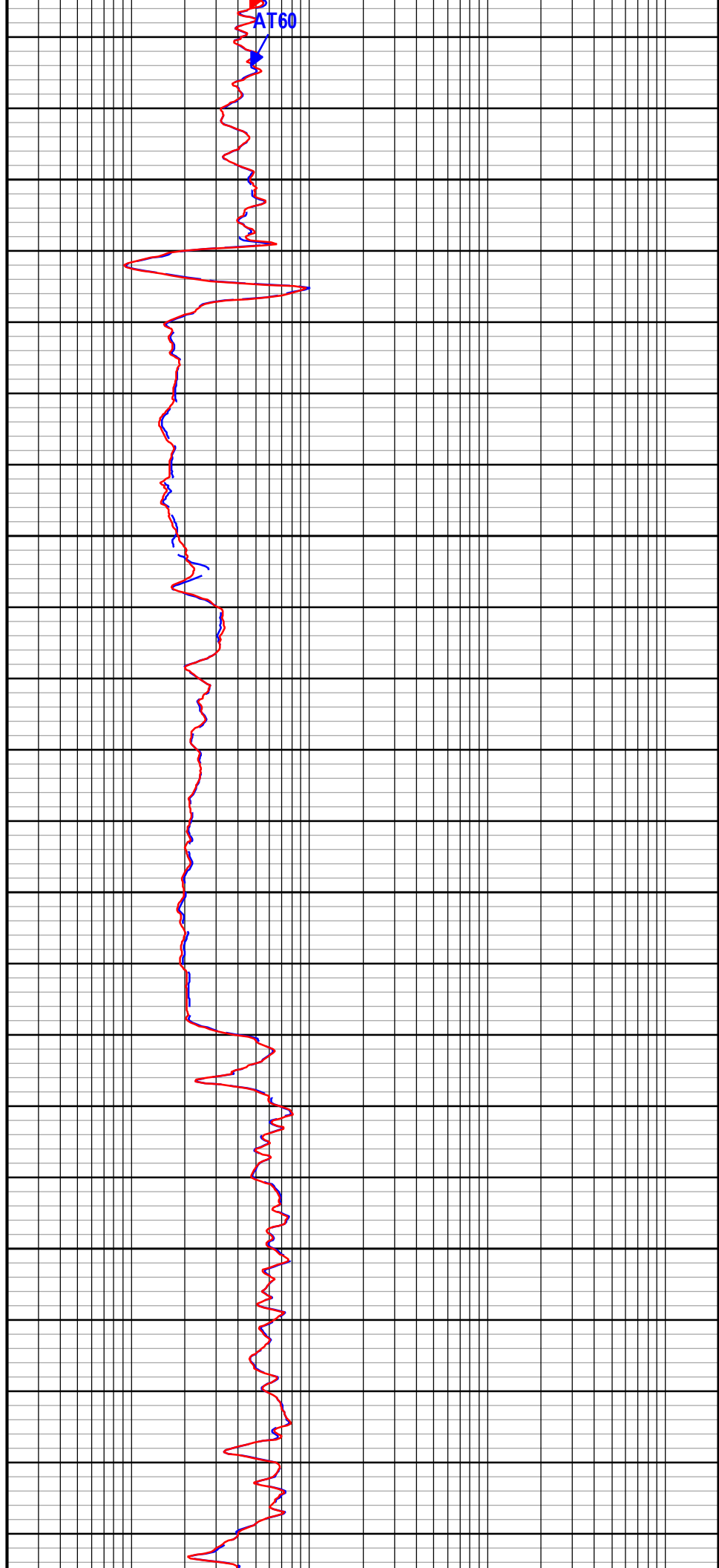
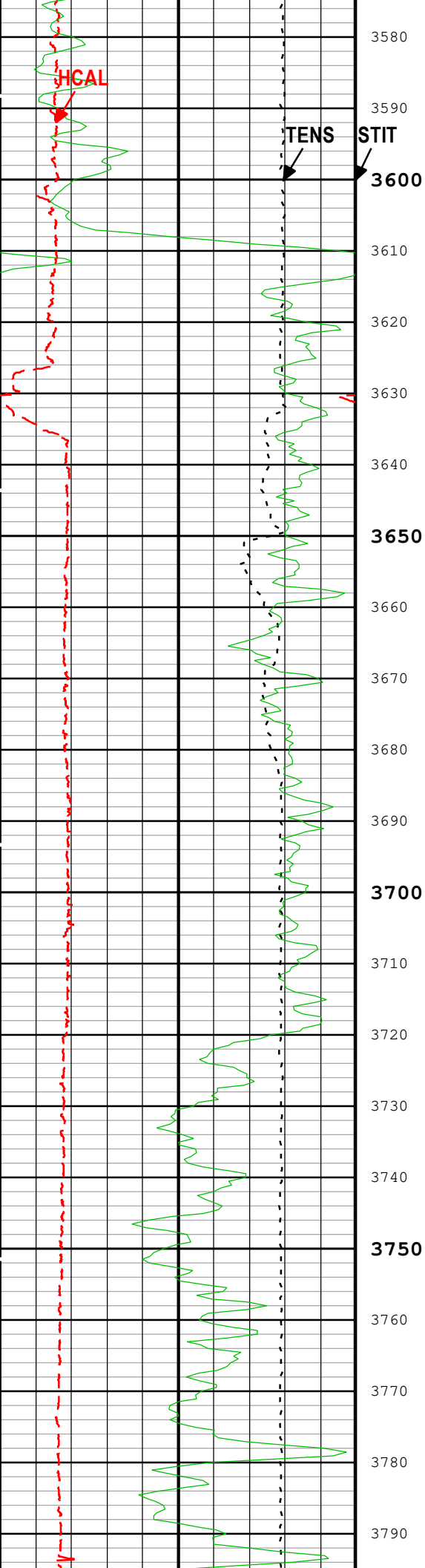


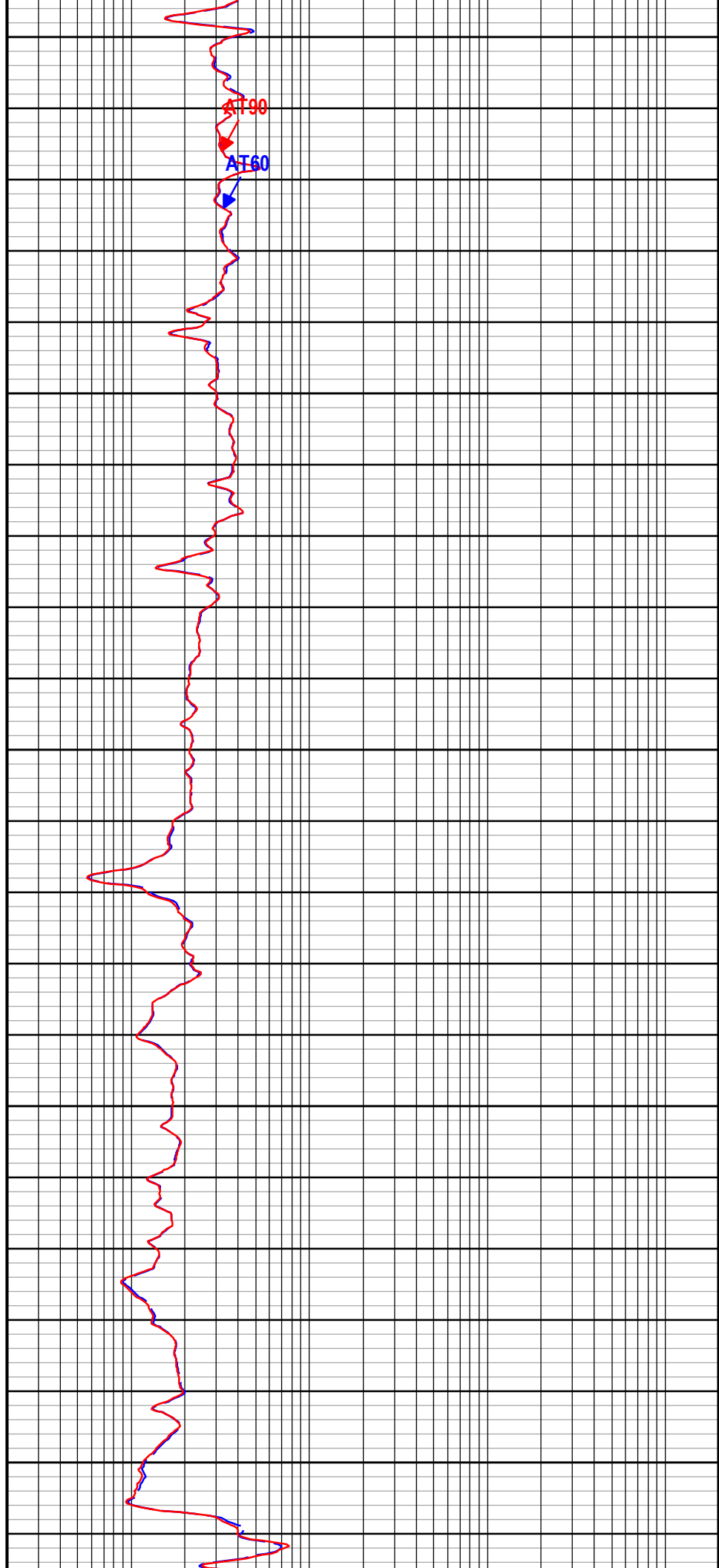
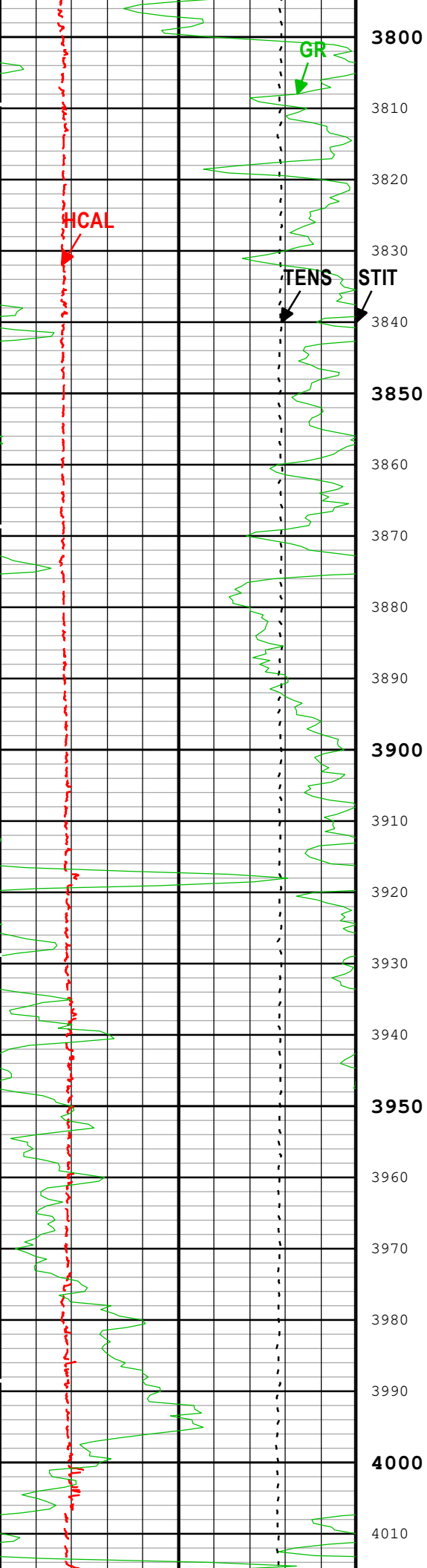


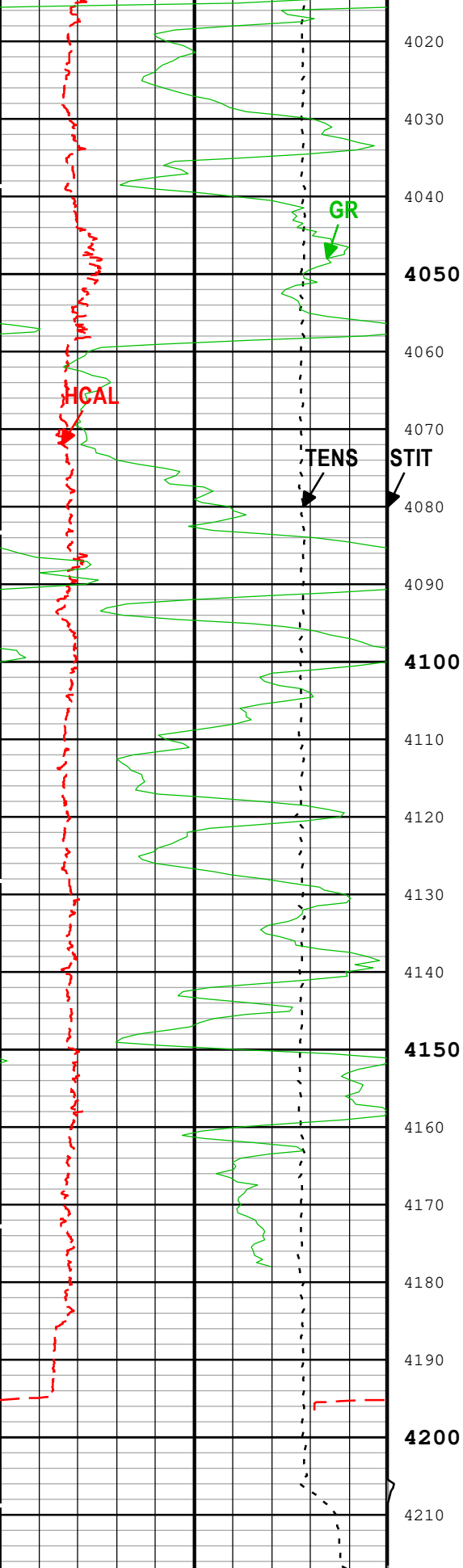






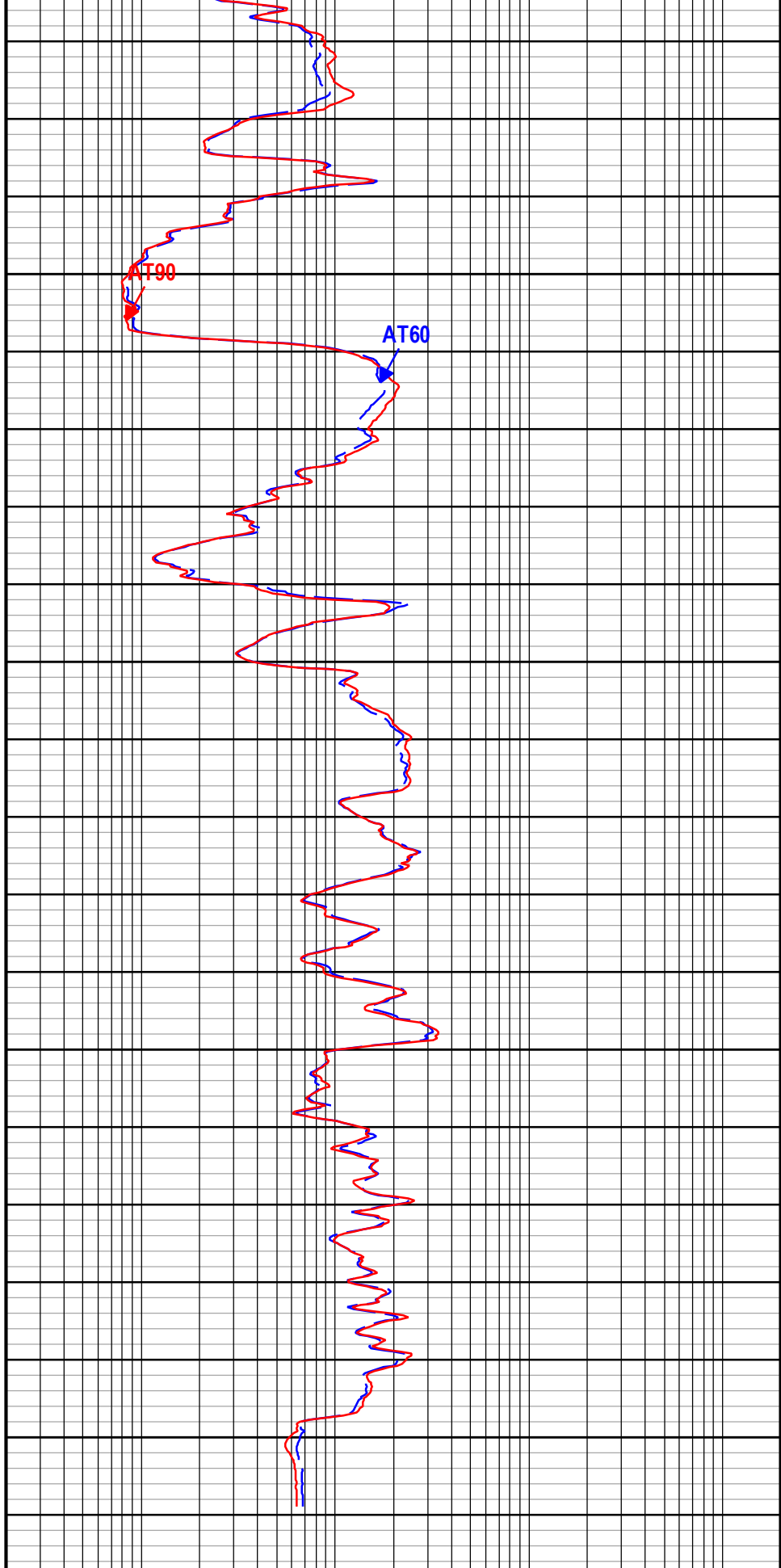






Cable Tension (TENS)
10000 lbf 0

Caliper (HCAL) HDRS-H
6 in 16



Array Induction Two Foot Resistivity A60 (AT60) AIT-M
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A90 (AT90) AIT-M
0.2 ohm.m 2000

Calibrated Gamma Ray (GR) HGNS-H

gAPI

TIME_1900 - Time Marked every 60.00 (s)

Description: HRLT BASIC LOG	Format: Log (HRLA_2_inch)	Index Scale: 5 in per 100 ft	Index Unit: ft	Index Type: Measured Depth	Creation Date: 04-Nov-2019 19:43:54
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No Data Assignment

Repeat Analysis 5"=100'

Log

Description: HRLT BASIC LOG	Format: Log (HRLA_5_Inch RA)	Index Scale: 5 in per 100 ft	Index Unit: ft	Index Type: Measured Depth	Creation
Date: 04-Nov-2019 19:43:59					

[illegible]

Description: HRLT BASIC LOG	Format: Log (HRLA_5_Inch RA)	Index Scale: 5 in per 100 ft	Index Unit: ft	Index Type: Measured Depth	Creation
Date: 04-Nov-2019 19:43:59					

Calibration Report

AIT-M (Array Induction Tool - M) Calibration - Run 1A

Primary Equipment :

File code for AIT-MA Sonde Tool Element

AMIS

129

Auxiliary Equipment:

AITM Rm/SP Bottom Nose

AMRM

AIT Sonde Calibration - Test Loop Gain

Master (EEPROM): 19:35:50 21-Jan-2019

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div></div>
Test Loop Gain - 0		Master	1.000	0.950	1.039	1.050	<div><div></div></div>
Test Loop Phase - 0	deg	Master	0	-3.000	0.539	3.000	<div><div></div></div>
Test Loop Gain - 1		Master	1.000	0.950	1.042	1.050	<div><div></div></div>
Test Loop Phase - 1	deg	Master	0	-3.000	0.669	3.000	<div><div></div></div>
Test Loop Gain - 2		Master	1.000	0.950	1.016	1.050	<div><div></div></div>
Test Loop Phase - 2	deg	Master	0	-3.000	0.045	3.000	<div><div></div></div>
Test Loop Gain - 3		Master	1.000	0.950	1.010	1.050	<div><div></div></div>
Test Loop Phase - 3	deg	Master	0	-3.000	0.112	3.000	<div><div></div></div>
Test Loop Gain - 4		Master	1.000	0.950	0.992	1.050	<div><div></div></div>
Test Loop Phase - 4	deg	Master	0	-3.000	0.072	3.000	<div><div></div></div>
Test Loop Gain - 5		Master	1.000	0.950	0.982	1.050	<div><div></div></div>
Test Loop Phase - 5	deg	Master	0	-3.000	-0.077	3.000	<div><div></div></div>
Test Loop Gain - 6		Master	1.000	0.950	0.990	1.050	<div><div></div></div>
Test Loop Phase - 6	deg	Master	0	-3.000	0.284	3.000	<div><div></div></div>
Test Loop Gain - 7		Master	1.000	0.950	1.011	1.050	<div><div></div></div>
Test Loop Phase - 7	deg	Master	0	-3.000	-0.005	3.000	<div><div></div></div>

AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM): 19:35:50 21-Jan-2019

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div></div>
Sonde Error Correction Real - 0	mS/m	Master	-----	-231.000	-83.167	119.000	<div><div></div></div>
Sonde Error Correction Quad - 0		Master	-----	-2250.000	-316.754	2250.000	<div><div></div></div>
Sonde Error Correction Real - 1	mS/m	Master	-----	114.000	167.806	204.000	<div><div></div></div>
Sonde Error Correction Quad - 1		Master	-----	-625.000	110.009	625.000	<div><div></div></div>
Sonde Error Correction Real - 2	mS/m	Master	-----	66.000	107.589	156.000	<div><div></div></div>
Sonde Error Correction Quad - 2		Master	-----	-350.000	-82.171	350.000	<div><div></div></div>
Sonde Error Correction Real - 3	mS/m	Master	-----	39.000	58.227	89.000	<div><div></div></div>
Sonde Error Correction Quad - 3		Master	-----	-250.000	20.054	250.000	<div><div></div></div>
Sonde Error Correction Real - 4	mS/m	Master	-----	15.000	25.302	35.000	<div><div></div></div>
Sonde Error Correction Quad - 4		Master	-----	-63.000	7.066	63.000	<div><div></div></div>
Sonde Error Correction Real - 5	mS/m	Master	-----	4.000	11.986	24.000	<div><div></div></div>
Sonde Error Correction Quad - 5		Master	-----	-50.000	10.548	50.000	<div><div></div></div>

Sonde Error Correction Real - 6	mS/m	Master	-----	5.000	9.775	15.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 6		Master	-----	-30.000	-2.755	30.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 7	mS/m	Master	-----	-5.000	-1.574	5.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 7		Master	-----	-30.000	-10.719	30.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>

AIT Mud Calibration - Mud Calibration Gain							
Master (EEPROM):		19:35:50 21-Jan-2019					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Coarse Gain		Master	1.000	0.800	0.815	1.200	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Fine Gain		Master	1.000	0.800	0.815	1.200	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>

AIT Electronics Check - Thru Calibration Check							
Master (EEPROM):		19:35:50 21-Jan-2019		Before (Measured):		11:21:52 04-Nov-2019	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 0	V	Master	-----	0.366	0.622	0.854	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	0.366	0.622	0.854	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	0.000	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 0	deg	Master	-----	137.000	-174.143	-103.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	137.000	-174.306	-103.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-0.163	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 1	V	Master	-----	0.762	1.276	1.778	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	0.762	1.276	1.778	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	0.000	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 1	deg	Master	-----	136.000	-175.242	-104.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	136.000	-175.407	-104.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-0.165	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 2	V	Master	-----	0.372	0.632	0.868	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	0.372	0.632	0.868	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	0.000	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 2	deg	Master	-----	132.000	-178.822	-108.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	132.000	-178.989	-108.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-0.167	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 3	V	Master	-----	0.420	0.715	0.980	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	0.420	0.715	0.980	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	0.000	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 3	deg	Master	-----	131.000	-179.595	-109.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	131.000	-179.762	-109.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-0.167	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 4	V	Master	-----	0.804	1.338	1.876	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	0.804	1.339	1.876	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	0.001	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 4	deg	Master	-----	125.000	174.179	-115.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	125.000	174.007	-115.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-0.172	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 5	V	Master	-----	1.176	1.945	2.744	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	1.176	1.946	2.744	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	0.001	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 5	deg	Master	-----	122.000	172.534	-118.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	122.000	172.358	-118.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-0.176	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 6	V	Master	-----	1.176	1.942	2.744	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	1.176	1.943	2.744	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	0.001	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 6	deg	Master	-----	121.000	172.576	-119.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	121.000	172.403	-119.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-0.173	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 7	V	Master	-----	0.846	1.396	1.974	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	0.846	1.396	1.974	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	0.000	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 7	deg	Master	-----	115.000	171.775	-125.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	115.000	171.597	-125.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-0.178	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
SPA Zero	mV	Master		-50.000	-0.117	50.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before		-50.000	-0.106	50.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>

SPA Plus	mV	Before-Master	-----	-----	0.011	-----	
		Master		941.000	990.569	1040.000	
		Before		941.000	990.770	1040.000	
		Before-Master	-----	-----	0.201	-----	
Temperature Zero	V	Master		-0.050	0.000	0.050	
		Before		-0.050	0.000	0.050	
		Before-Master	-----	-----	0.000	-----	
Temperature Plus	V	Master		0.870	0.918	0.960	
		Before		0.870	0.918	0.960	
		Before-Master	-----	-----	0.000	-----	

Company:	St. Croix Operating Inc.	Schlumberger
Well:	Armstrong #1	
Field:	Wildcat	
County:	Washington	
State:	Colorado	

Platform Express
High Resolution Laterolog Array

No Data Assignment

Main Pass 1"=100'

Log

Description: HRLT BASIC LOG Format: Log (HRLA_1_inch) Index Scale: 1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Nov-2019 19:44:03

Description: HRLT BASIC LOG Format: Log (HRLA_1_inch) Index Scale: 1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Nov-2019 19:44:03