Schlumberger

Company: FIDELITY EXPLORATION & PRODUCTION COMPANY

Well: EDAM 15-22H

Field: WILDCAT

County: RICHLAND State: MONTANA

County: RICHLAND
Field: WILDCAT
Location: NENW
Well: EDAM 15-22H
Company: FIDELITY EXPLORATION & PRODUCTION CO

PLATFORM EXPRESS

ARRAY INDUCTION TOOL

GAMMA RAY

Location:		Elev.		
NENW 250.3' FNL & 1348.5' FWL			K.B.	2330.70 ft
			G.L.	2305.70 ft
			D.F.	2330.70 ft
Permanent Datum:	Ground Level	Elev.:		2305.70 f
Log Measured From:	Kelly Bushing	25.00 ft		above Perm.Datum
Drilling Measured From:	Kelly Bushing			

API Serial No.	Section:	Township:	Range:
25-083-22920	15	21 N	57 E

Logging Date		09-May-2012			
Run Number		1			
Depth Driller		1734.00 ft			
Schlumberger Depth		10405.00 ft			
Bottom Log Interval		10405.00 ft			
Top Log Interval		1734.00 ft			
Casing Driller Size @ Depth		9.625 in @ 1734.00 ft			
Casing Schlumberger		1734 ft			
Bit Size		8.75 in			
Type Fluid In Hole		Oil			
MUD Density	Viscosity	9.55 lbm/gal	68 s		
MUD Fluid Loss	PH				
MUD Source of Sample		N/A			
RM @ Meas Temp		N/A			
RMF @ Meas Temp		N/A			
RMC @ Meas Temp		N/A			
Source RMF	RMC	N/A	N/A		
RM @ BHT	RMF @ BHT	N/A	N/A		
Max Recorded Temperatures		210 degF			
Circulation Stopped	Time	09-May-2012	04:00:00		
Logger on Bottom	Time	09-May-2012	20:53:53		
Unit Number	Location:	2105	WILLISTON		
Recorded By		Sneh Williams			
Witnessed By		John Merkel			

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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Remarks and Equipment Summary

1: Toolstring

Equip name	Length	MP name	Offset
LEH-QT:2600 LEH-QT:2600	**117.4**		
EDTC-B:8102 EDTH-B:8102 EDTG-A EDTC-B:8102	**114.48**		
		CTEM	**110.98**
		ACCZ	**0.00**
		HV	**0.00**
		Gamma Ray	**109.11**
		TelStatus	**107.98**
PPC-B[2]:8194 PPC-B:8194	**107.98**		
		PPC-B Calipers	**106.84**
MAST-B:8432 ECH-SF:8055 MAPC-BA:8055 MAMS-BA:8432 MASS-BA:8079 MAXS-BA:8355	**101.47**		
		MAMS	**86.07**

1: Remarks

THANK YOU FOR CHOOSING SCHLUMBERGER

ALL LOGS RECORDED IN CENTRAL STANDARD TIME

SCHLUMBERGER CREW: MATT FERNANDEZ, MILES GERVAIS

TOOLSTRING RUN AS PER TOOLSKETCH

PPC USED FOR CENTRALIZATION OF THE SONIC SCANNER

CME-Z'S USED TO HELP CENTRALIZE THE SONIC SCANNER

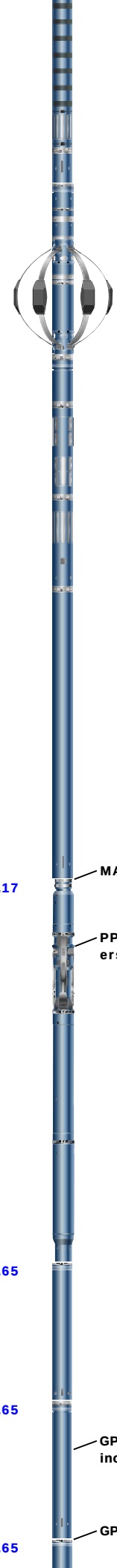
NON-MAGNETIC HOUSING PLACED ABOVE AND BELOW THE GPIT

2 KNUCKLE JOINTS PLACED ABOVE THE NEUTRON TOOL TO DECOUPLE THE NEUTRON

HOLE SIZE AND STAND-OFF CORRECTION APPLIED TO THE NEUTRON TOOL

CEMENT AND HOLE VOLUME CALCULATED ASSUMING A FUTURE CASING DIAMETER OF 7 INCHES

STANDOFFS PLACED ON THE SONDE OF THE RESISTIVITY TOOL


MAXS 60.17
PPC-B[1]:8046 60.17
PPC-B:8046
PPC-B Calipers 59.02
Adaptor_Head [2]:1973 53.65
GPIT-F:1707 49.65
GPIH-B:2865
DHRU-F
GPIC-F:1707
GPIT-F Inclinometer 48.23
GPIT 0.00
Adaptor_Head [1]:1775 45.65

AH-107[2]:711 41.65

AH-107[1]:925 39.65

HGNS-H:4985 37.65
HGNH:4838
NSR-F:1653
NPV-N
HMCA-H
HACCZ-H:8100
HGNS-H:4985

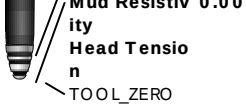
- **Temperature** 37.62
- **GR** 36.91
- **CNL Porosity** 30.57
- **HGNS** 28.24
- **HMCA** 28.24
- **Accelerometer** 0.00

HDRS-H:4849 28.24
ECH-MEB:2798
HRCC-H:3768
HRMS-H:4849
GPV-Q
Backscatter:41211
Long Spacing:43162
Short Spacing:42231
HRGD-H:4957
GSR-J:5088

- **HRCC** 24.24
- **MCFL** 18.81
- **Caliper** 18.33
- **TLD Density** 17.94

AIT-M:155 16.00
AMIS:155
AMRM:155

- **Temperature** 7.91
- **Power Supply** 7.91
- **Induction** 7.91
- **SP** 0.08



Lengths are in ft
Maximum Outer Diameter = 9.000 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

Depth Control Parameters	**1**		
Conveyance Type	Wireline		
Log Sequence	FIRST RUN IN HOLE		
Stretch Correction (ft)	7.29		
Tool Zero Reference Check at Surface (ft)	0.34		
Depth Remark Parameters	**1**		
Depth Remark 1	ALL PROCEDURES FOLLOWED AS PER SCHLUMBERGER DEPTH CONTROL POLICY		
Depth Remark 2	IDW USED AS PRIMARY DEPTH CONTROL DEVICE.		
Depth Remark 3	Z-CHART USED AS SECONDARY DEPTH CONTROL		
Depth Measuring Device	**1**		
Type	IDW-B		
Serial Number	6067		
Calibration Date	01-JAN-2012		
Calibration Cable Type	7-46 P-XS		
Wheel Correction 1	-6		
Wheel Correction 2	-6		
Tension Device	**1**		
Type	CMTD-B/A		
Serial Number	1194		
Calibration Date	20-APR-2012		
Calibrator Serial Number	1148		
Calibration Points	10		
Calibration RMS	10		
Calibration Peak Error	16		
Logging Cable	**1**		
Type	7-46P-XS		
Logging Cable Length (ft)	14300.00		

Composite 2

Main Pass 2"/100'

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, GCSE_DOWN_PASS:1, FCD	1135.97	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS, GCSE_DOWN_PASS:1	3457.09	ft3

Software Version

Acquisition System	Version
MaxWell	3.0.9609.0
Application Patch	EXP_APL-SEC-3.0.9609.1645
	EXP_APL-ADT-3.0.9609.1558

	SP-20120409-3.0.9609.1919
	EXP_APL-OPElevation-3.0.9609.1966

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.0.9609.1919

Tool Elements	Description	Software Version	Firmware Version
HRCC-H	HILT High-Resolution Control Cartridge, 150 degC	3.0.9609.0	2.0
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.0.9609.1919	2.0
AMIS	Array Induction Sonde - M	3.0.9609.1274	1

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
1	Log[2]:Down	Down	1406.56 ft	10418.61 ft	09-May-2012 9:10:54 PM	09-May-2012 10:14:10 PM	0.00 ft	true
1	Log[4]:Up	Up	2040.57 ft	10418.51 ft	09-May-2012 11:00:32 PM	10-May-2012 4:16:09 AM	0.00 ft	true

All depths are referenced to toolstring zero

Log

Composite 2 8A2470F8-F550-4566-9F85-6803F912CC6B

Description: AIT Basic Log Two Format: Log (AIT 2 Inch) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-May-2012 09:38:19

Channel	Source	Sampling
AT10	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
AT20	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
AT30	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
AT60	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
AT90	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
BS	Borehole	6in
CALI	HDRS[1]:HRCC-H[1]:HRCC-H[1]	1in
GR	HGNS[1]:HGNS-H[1]:HGNS-H[1]	6in
ICV	Borehole	6in
IHV	Borehole	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

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)

Cable Tension (TENS)

10000 lbf 0

Array Induction Two Foot Resistivity A10 (AT10) AIT_SpliceGroup[1]

0.2 ohm.m 2000

Array Induction Two Foot Resistivity A20 (AT20) AIT_SpliceGroup[1]

0.2 ohm.m 2000

Array Induction Two Foot Resistivity A30 (AT30) AIT_SpliceGroup[1]

0.2 ohm.m 2000

Array Induction Two Foot Resistivity A60 (AT60) AIT_SpliceGroup[1]

0.2 ohm.m 2000

Array Induction Two Foot Resistivity A90 (AT90) AIT_SpliceGroup[1]

0.2 ohm.m 2000

Gamma Ray (GR) HGNS[1]

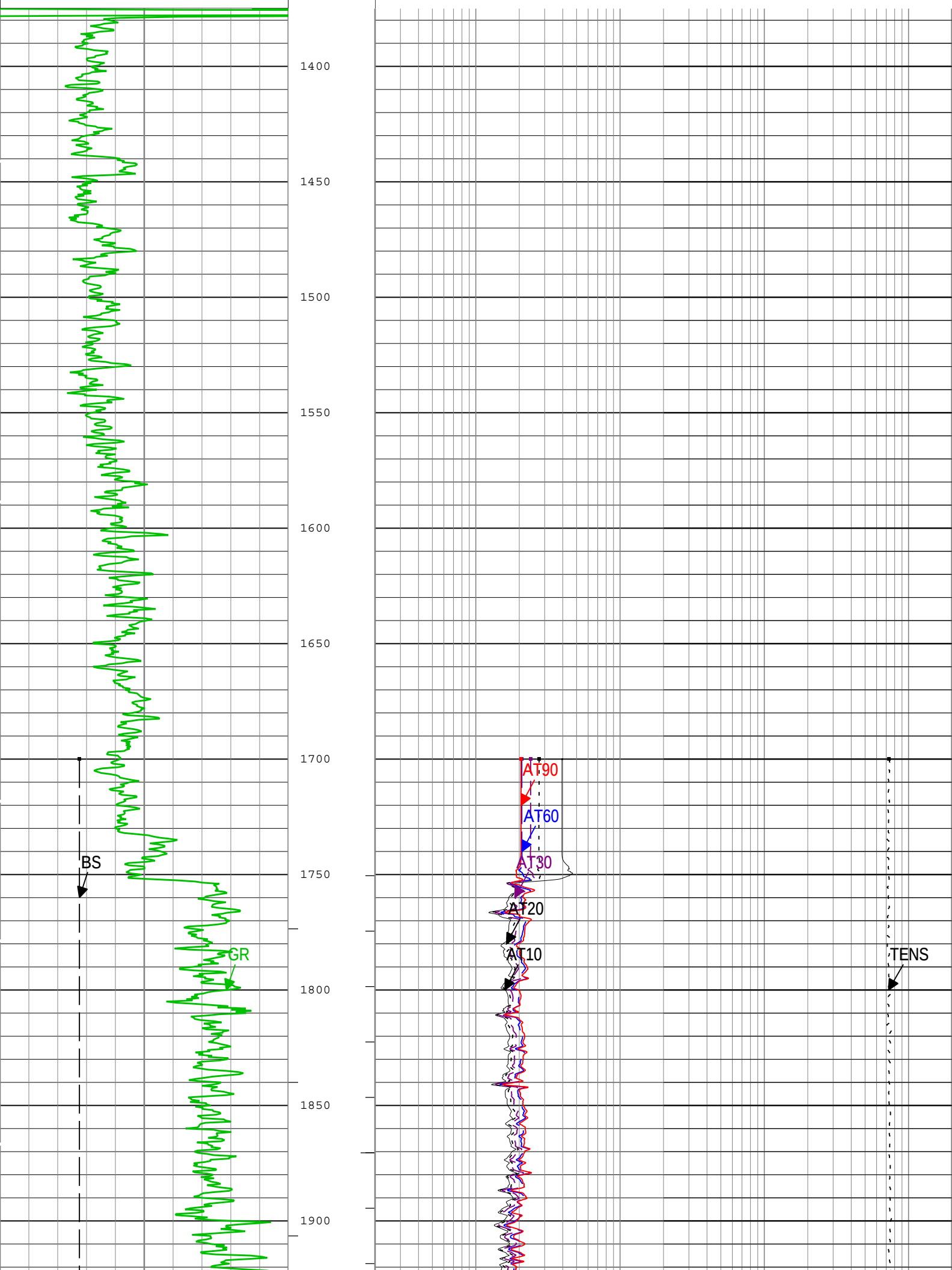
0 gAPI 150

Caliper (CALI) HDRS[1]

6 in 16

Bit Size (BS)

6 in 16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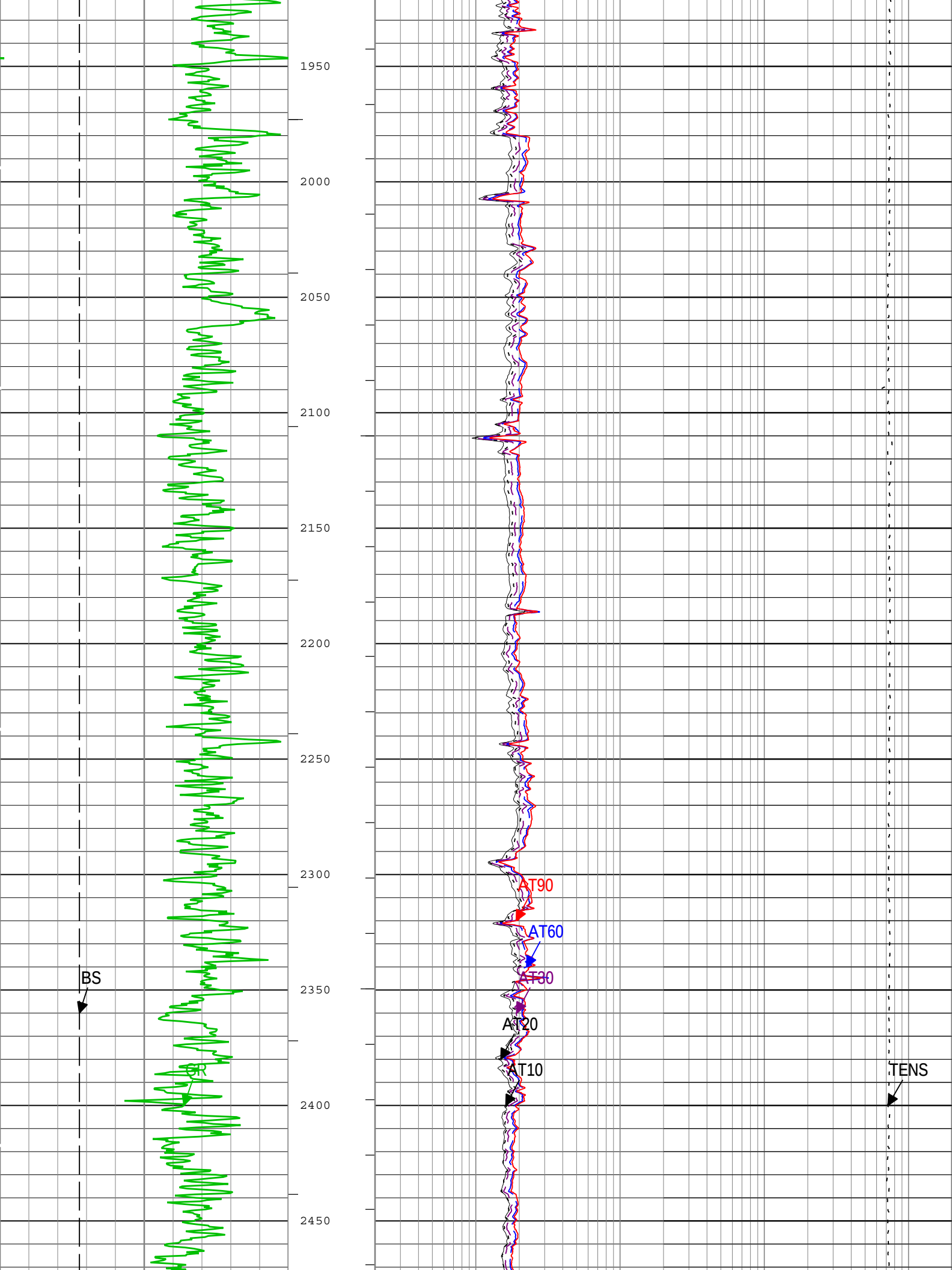
AT20
AT10
TENS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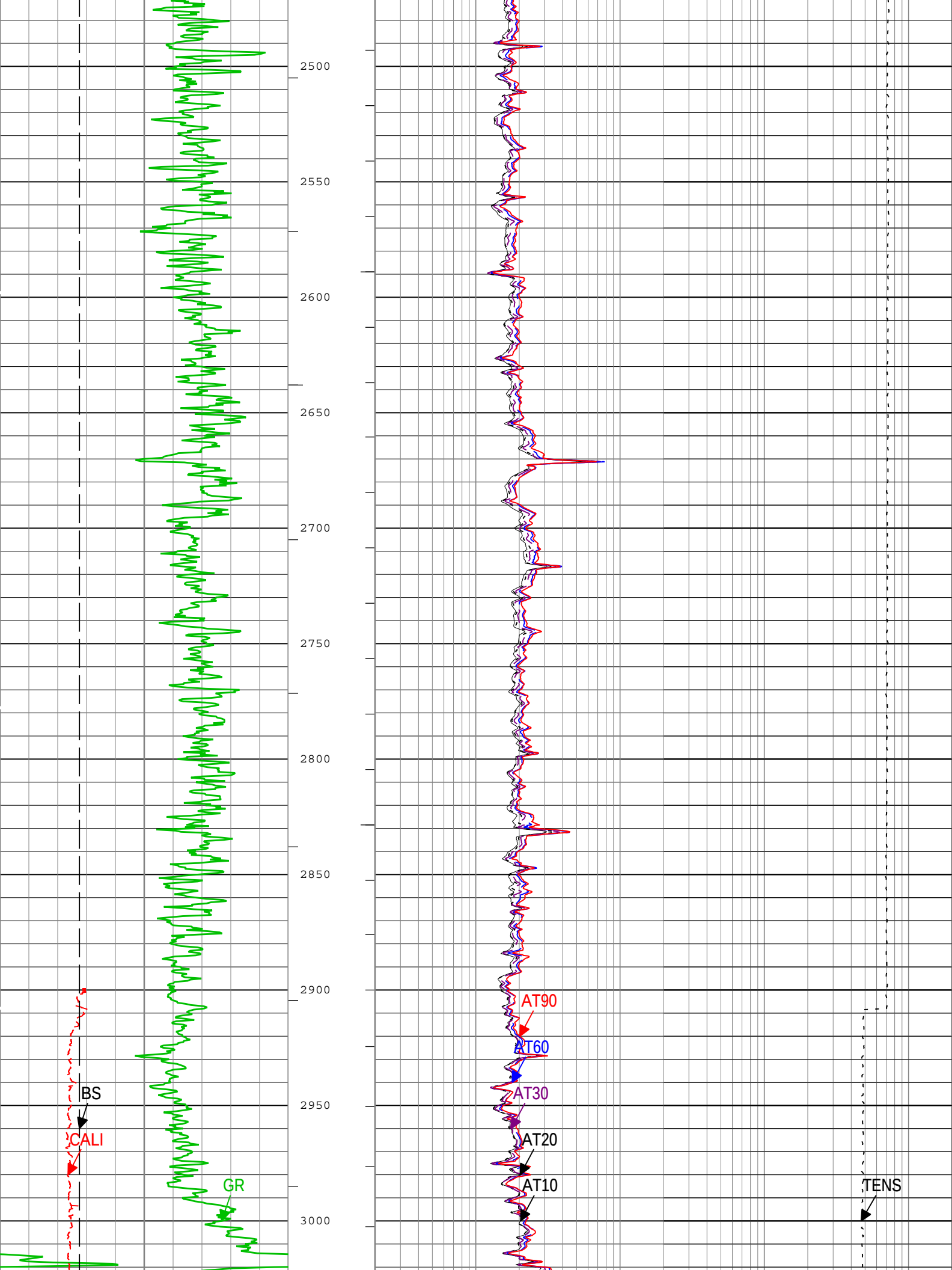
AT10
TENS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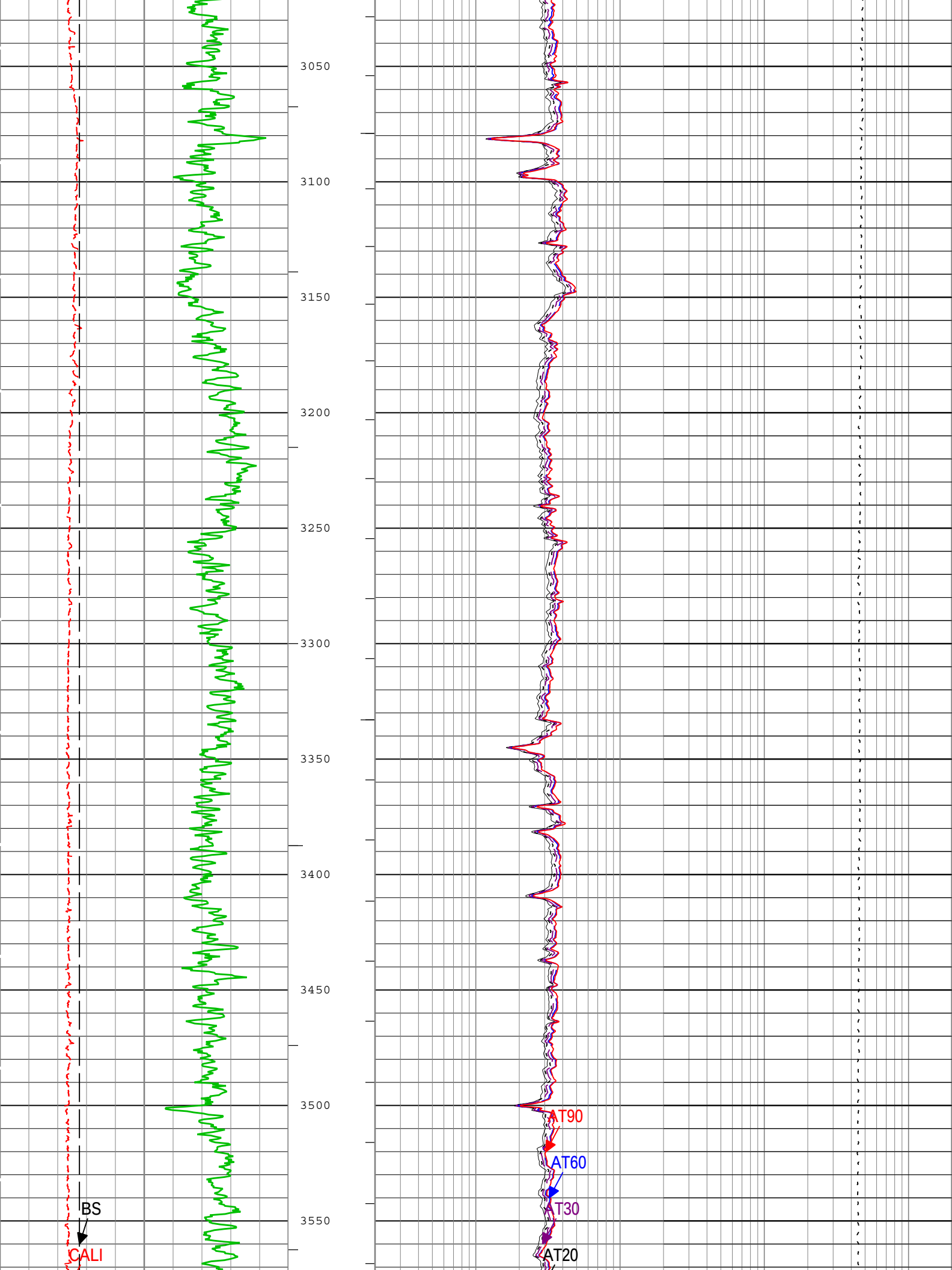
AT30
AT20
AT10
TENS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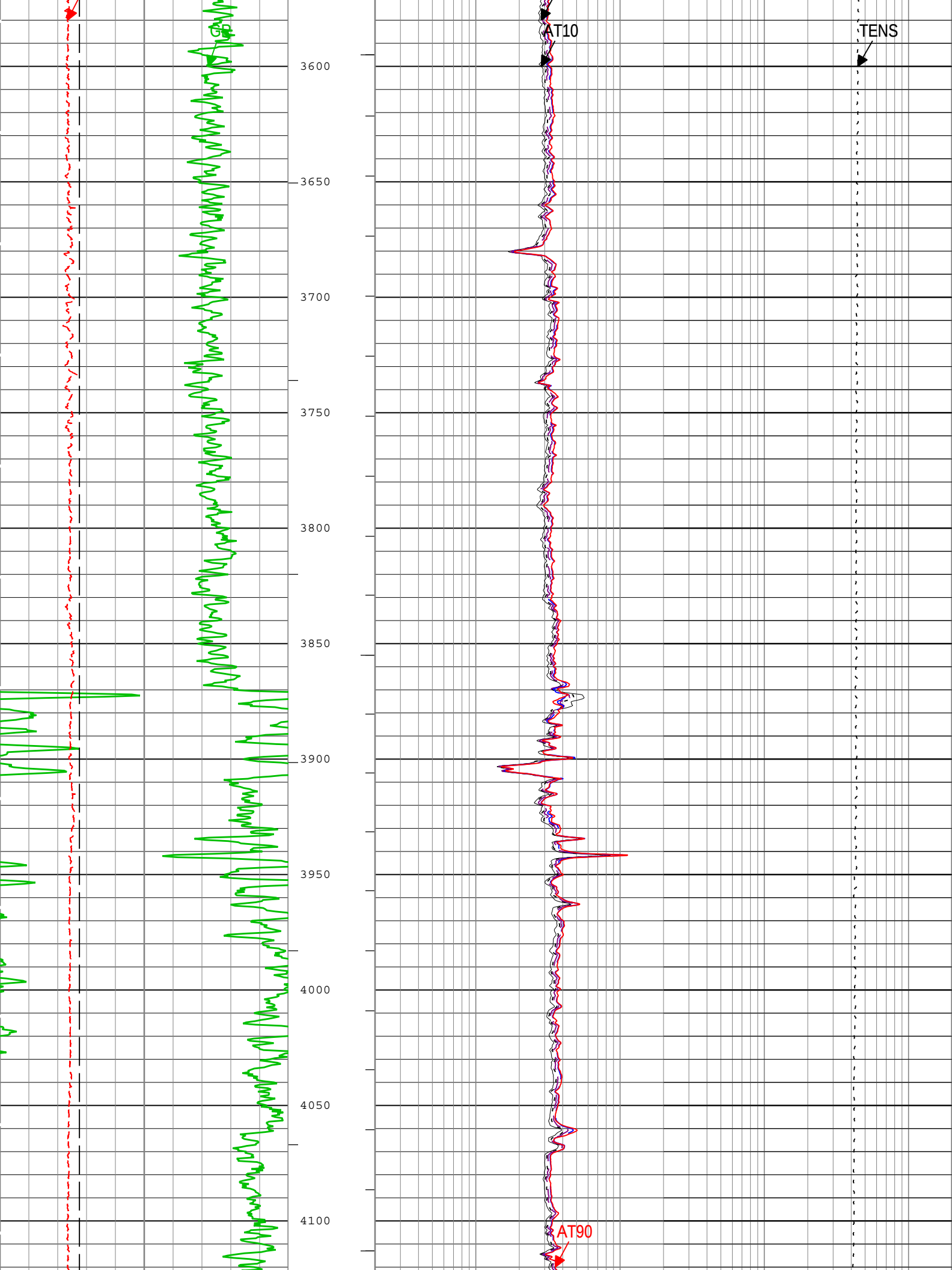
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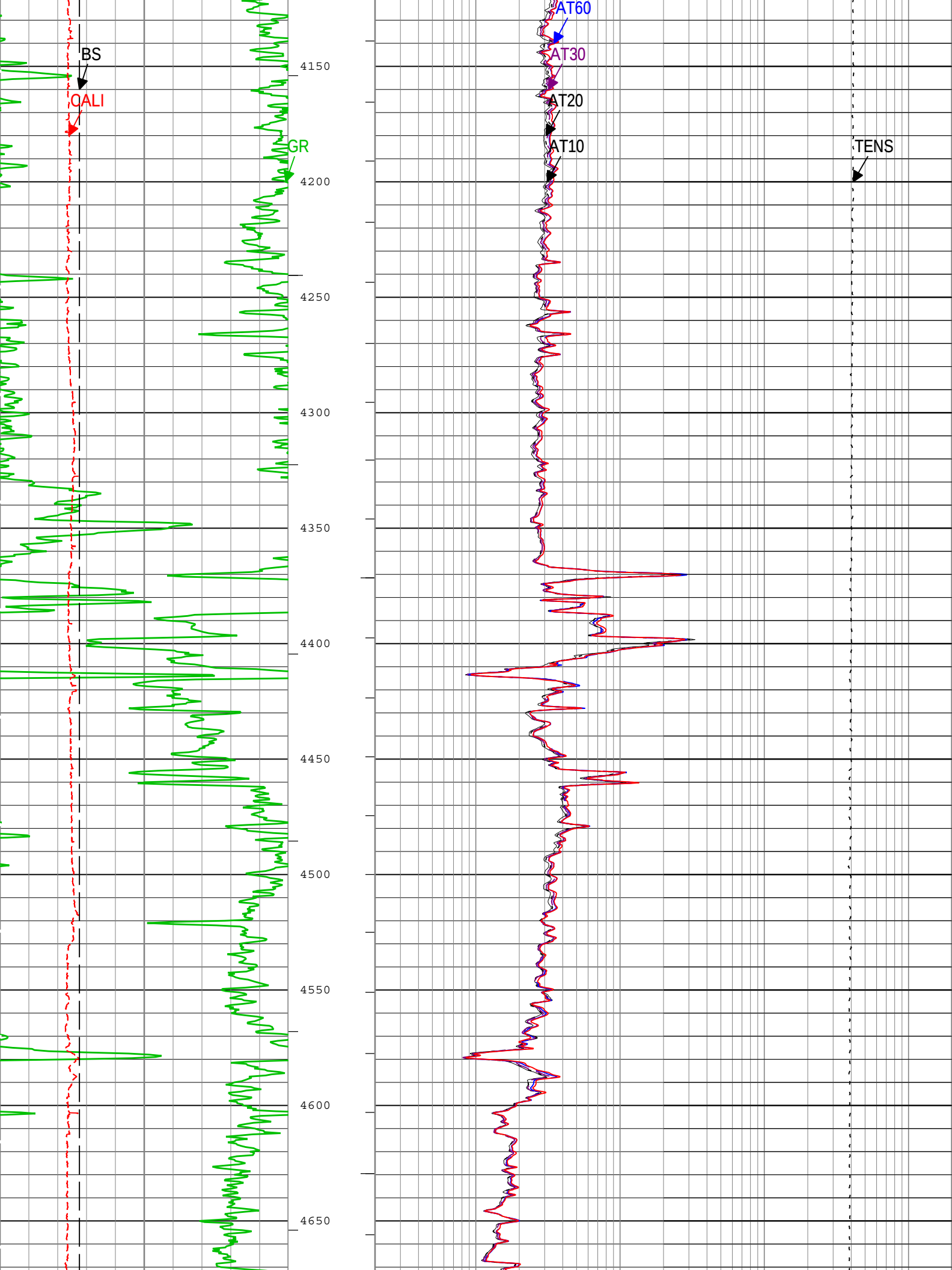
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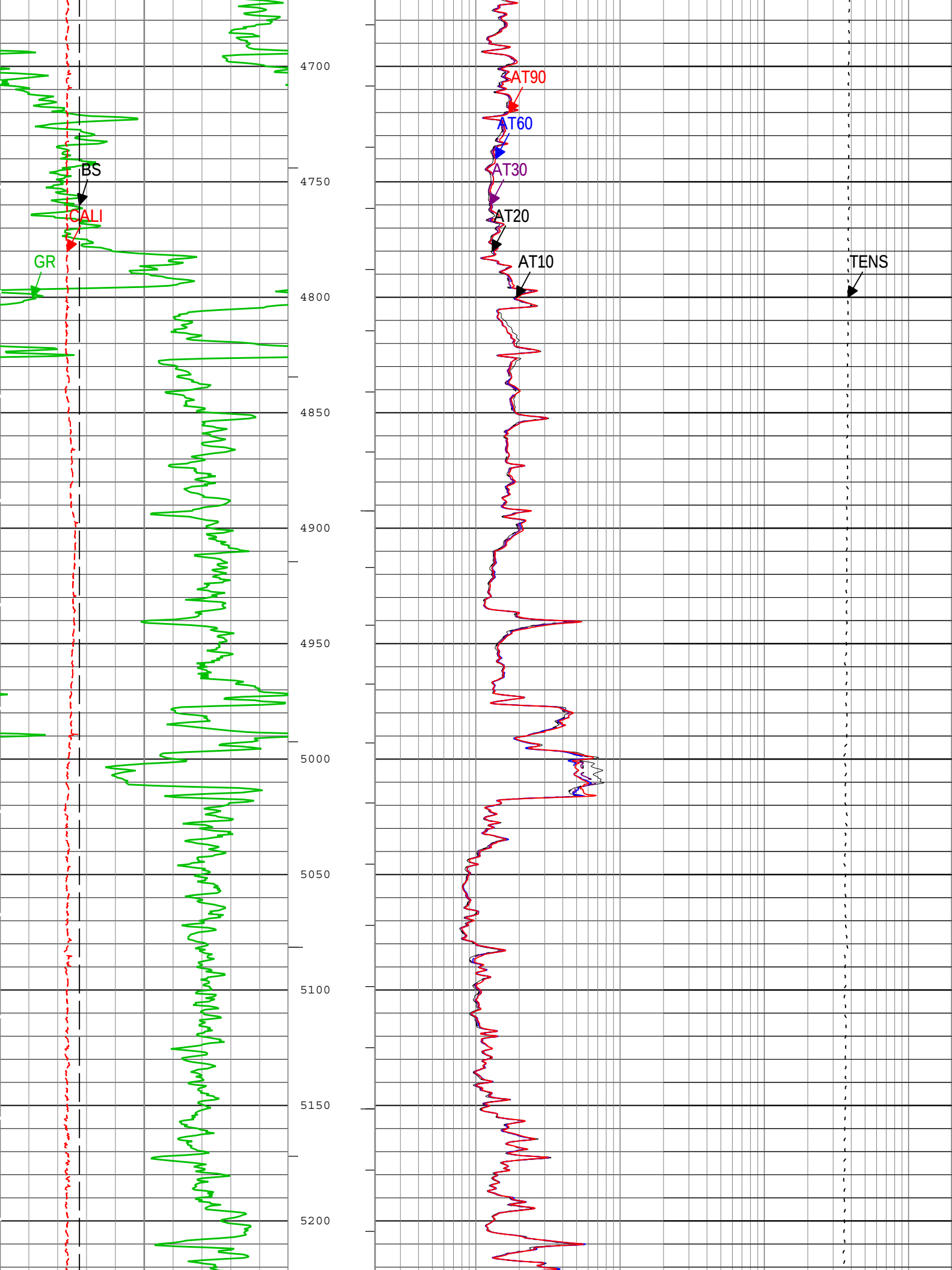
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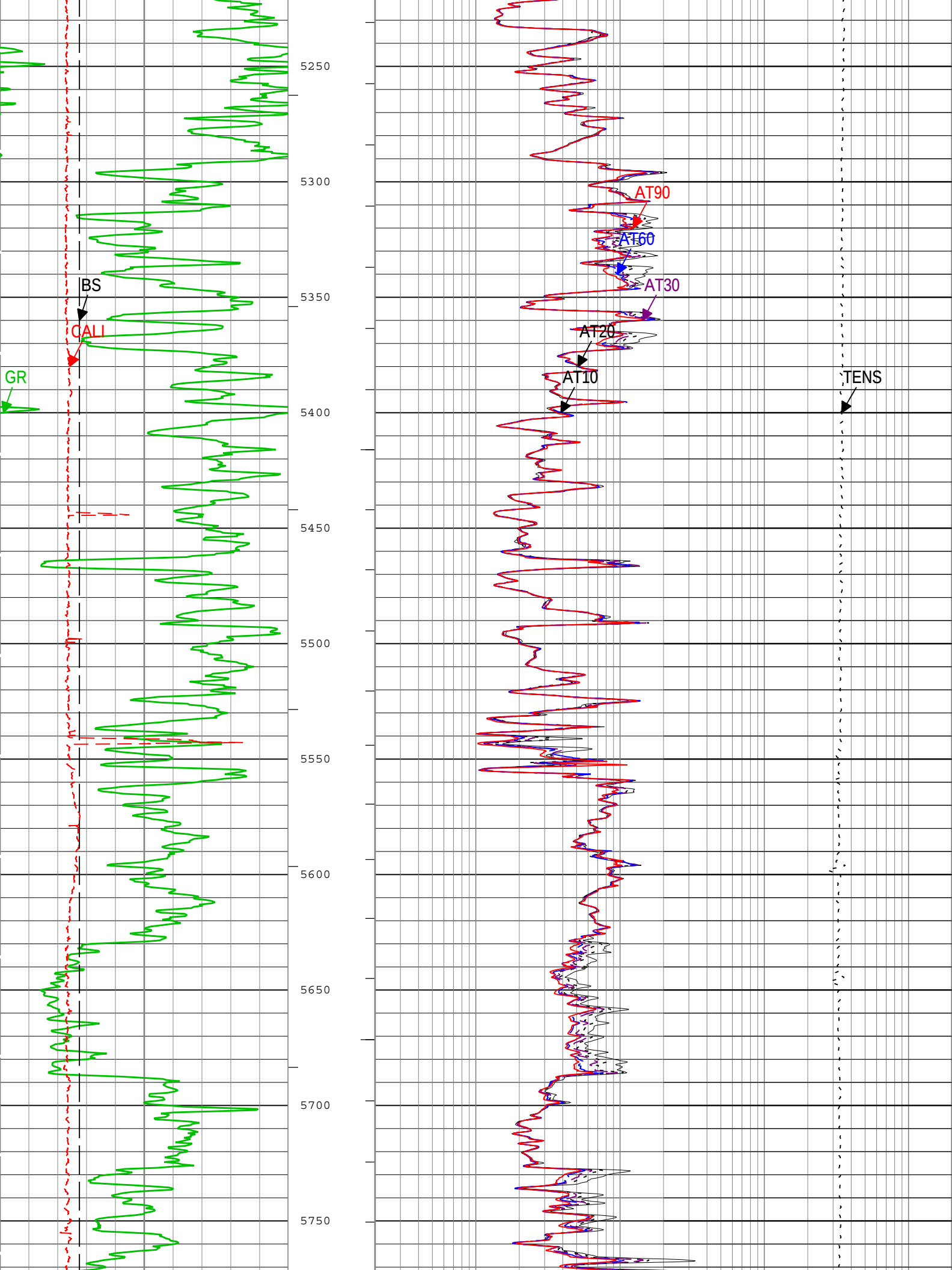
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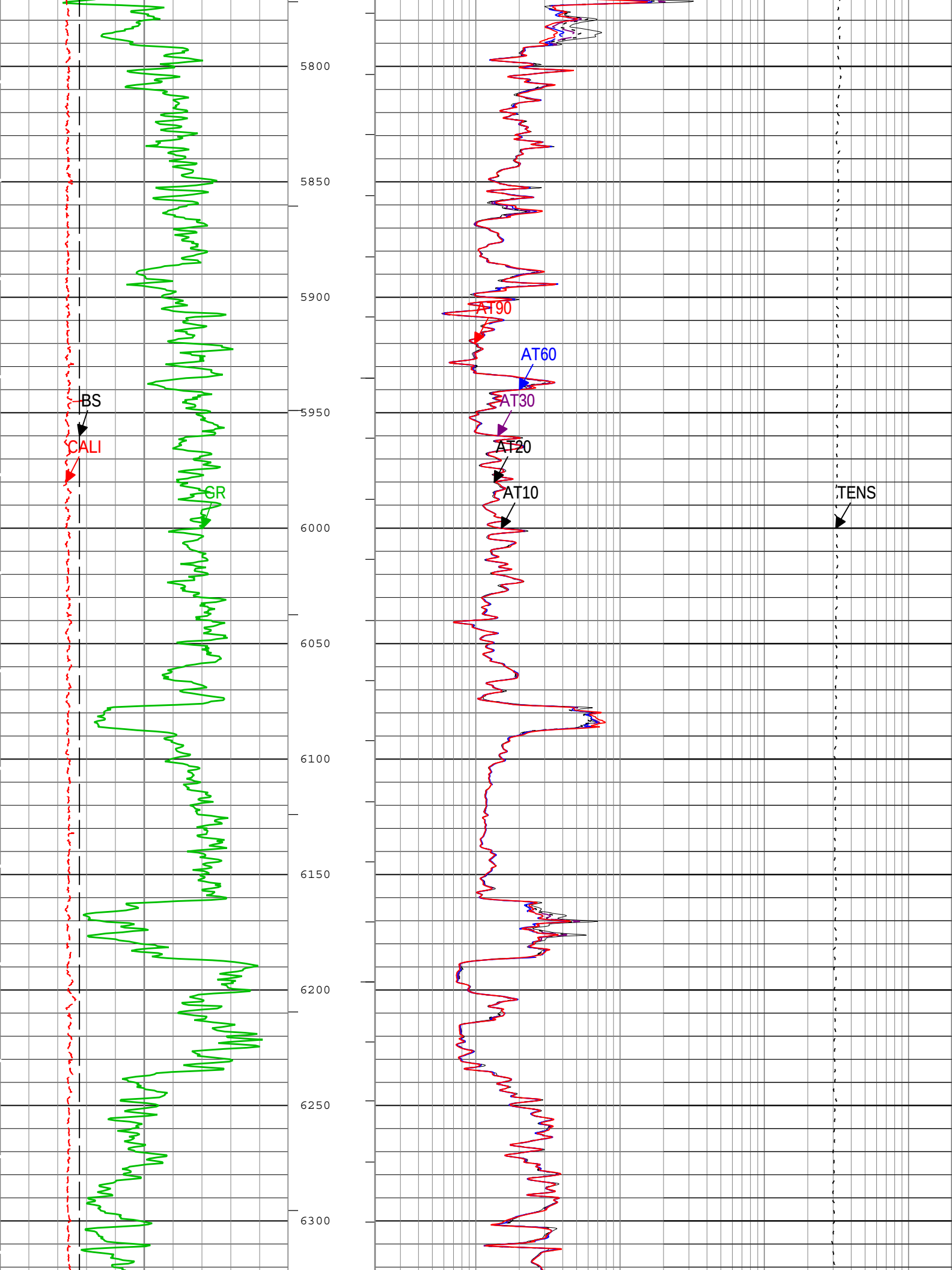
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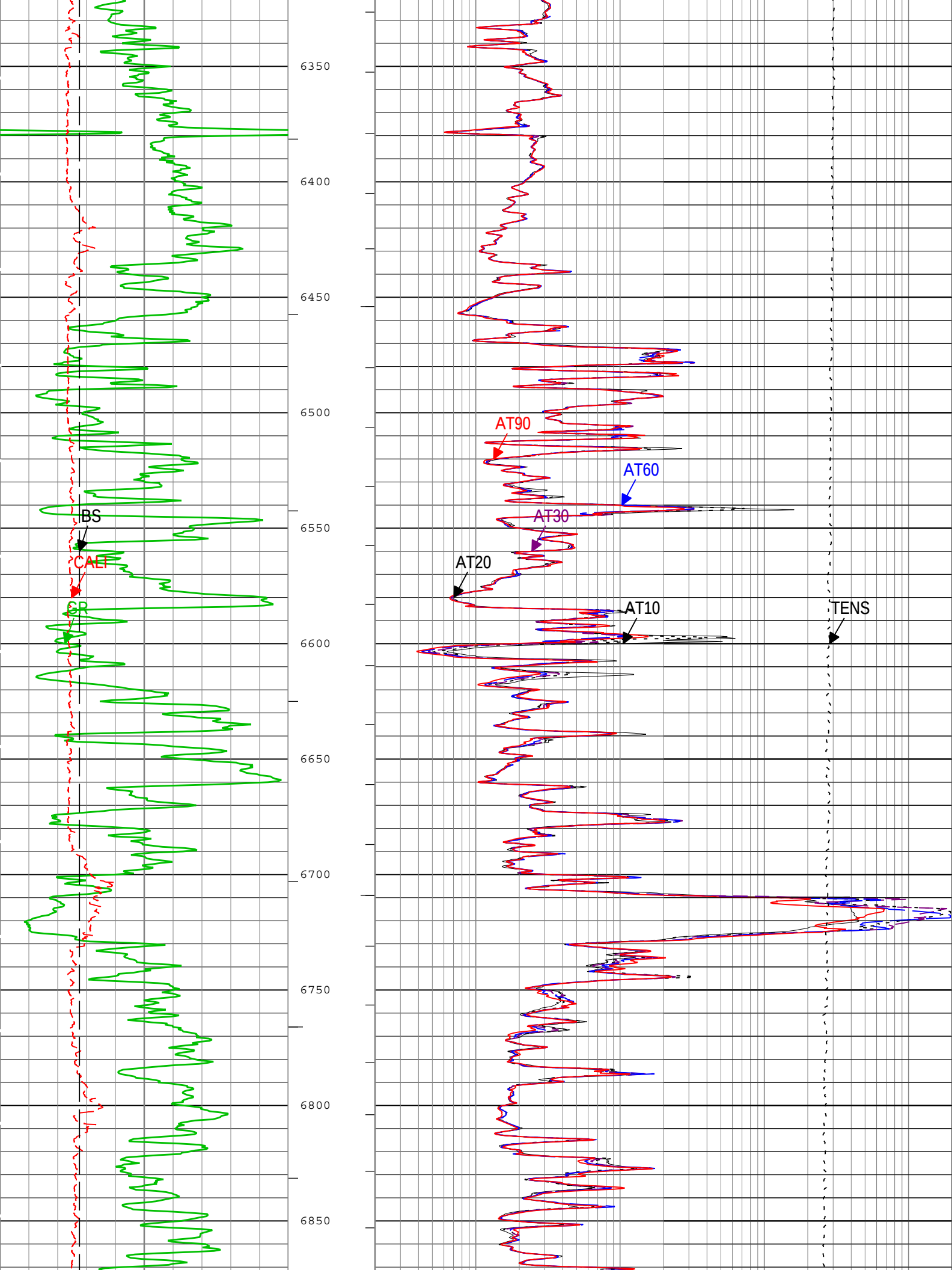
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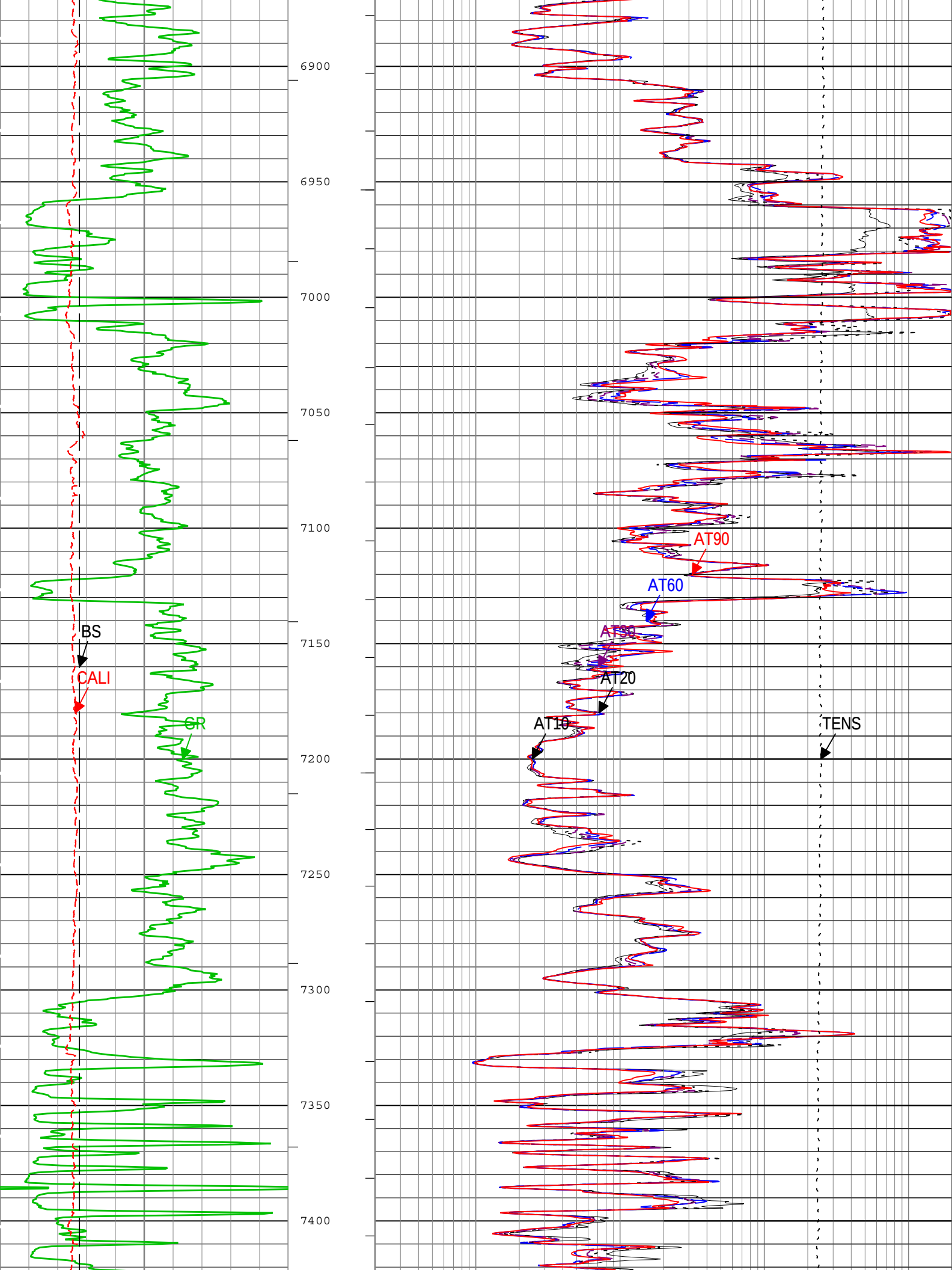
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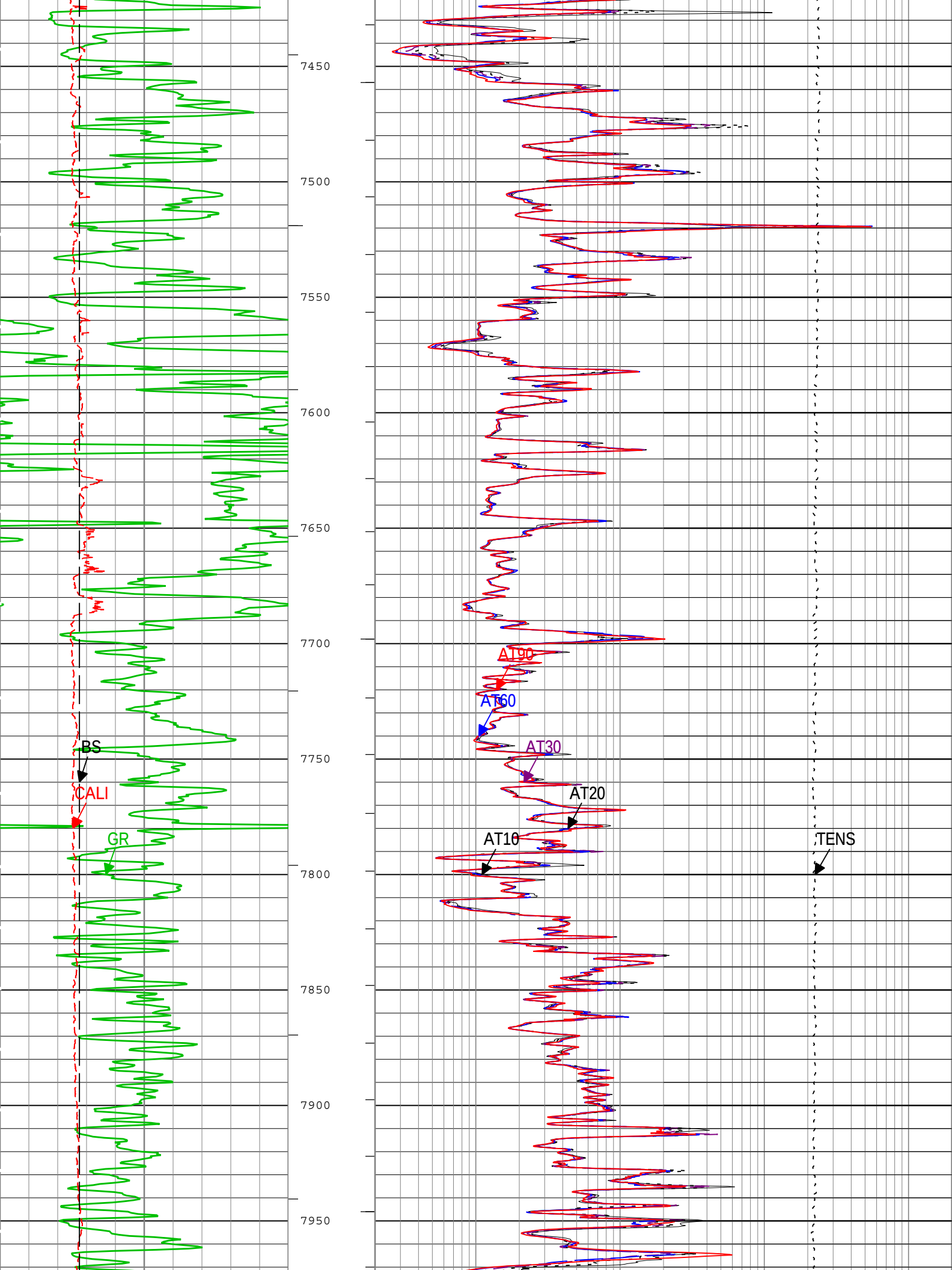
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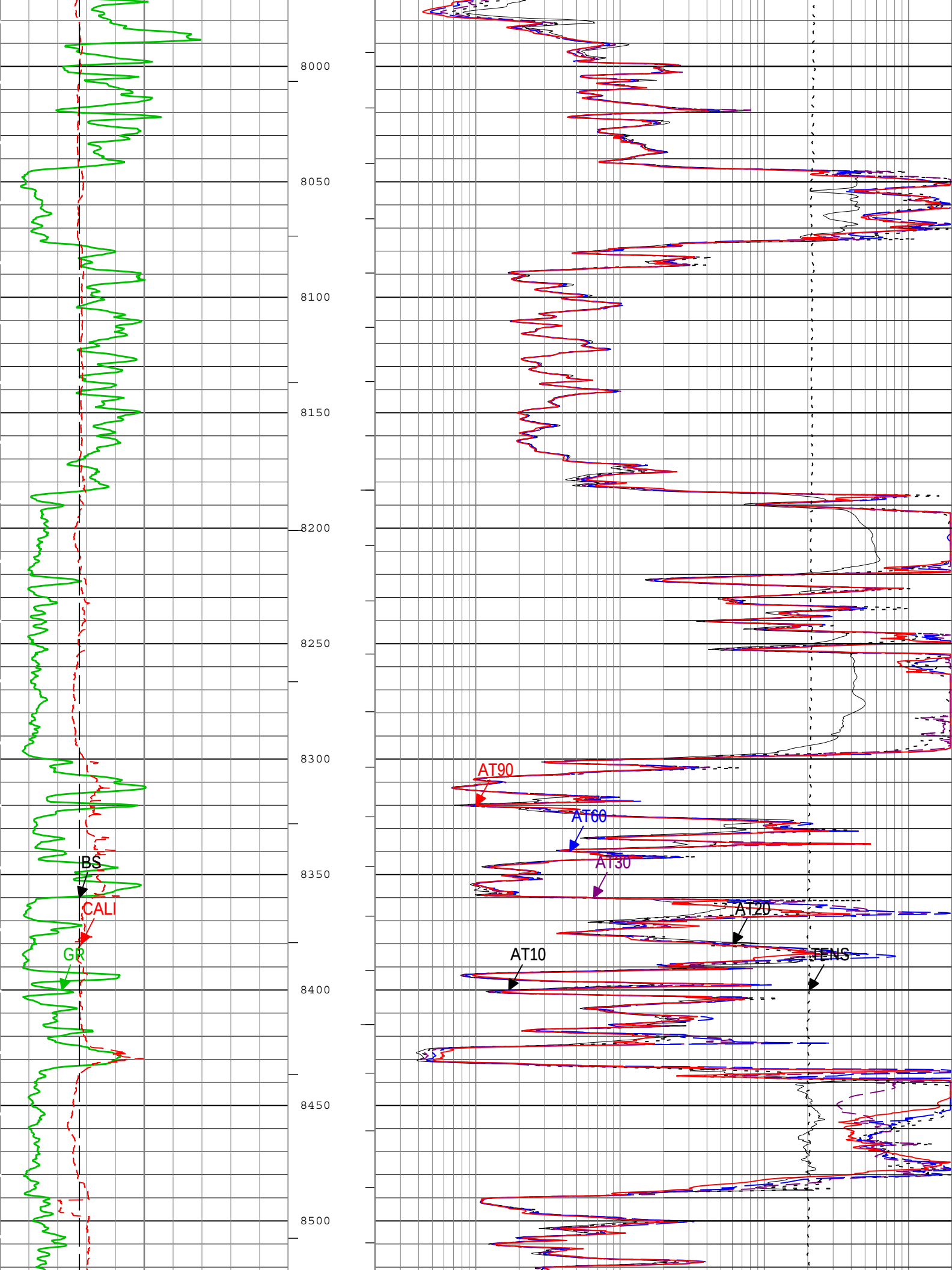
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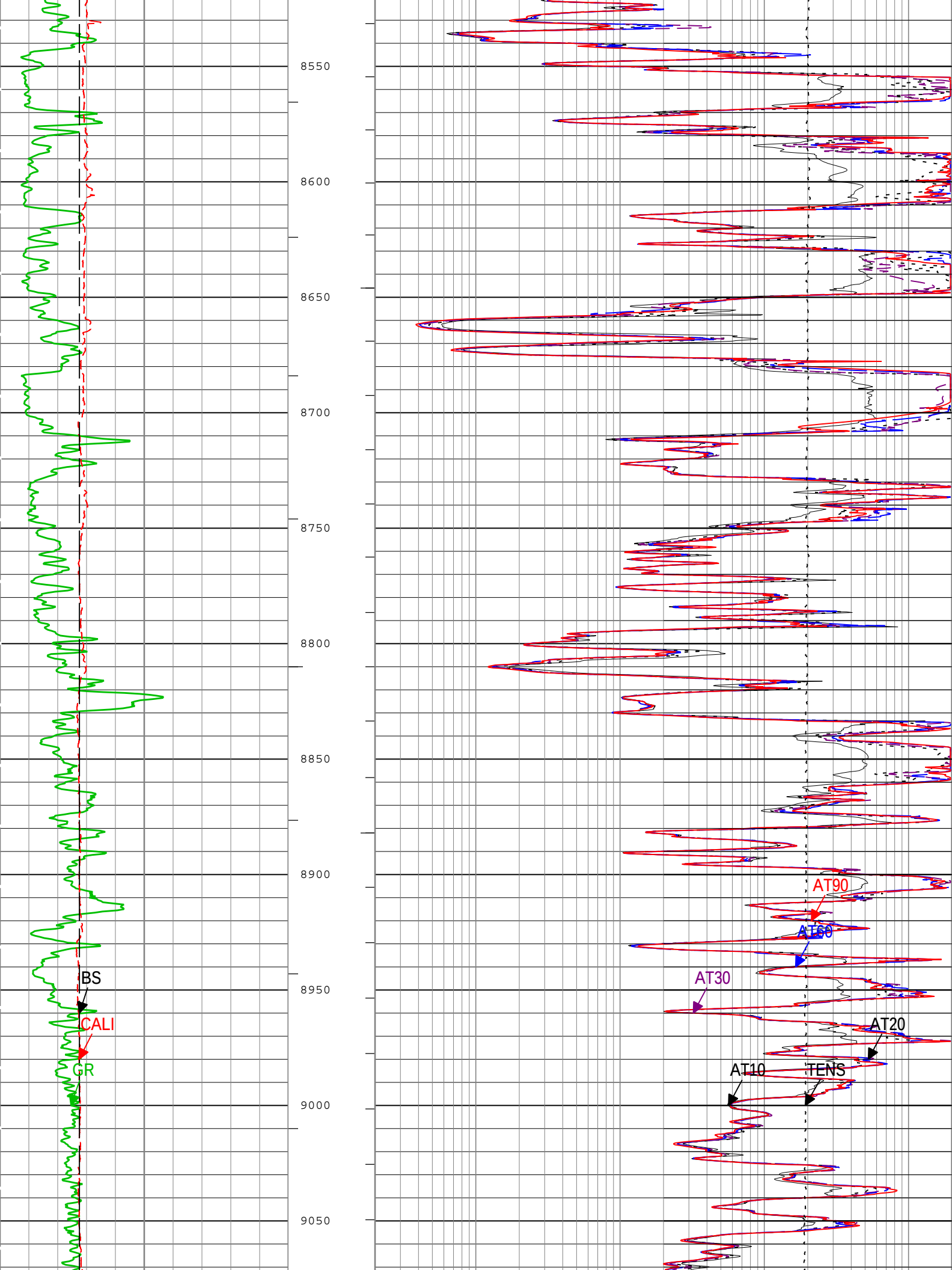
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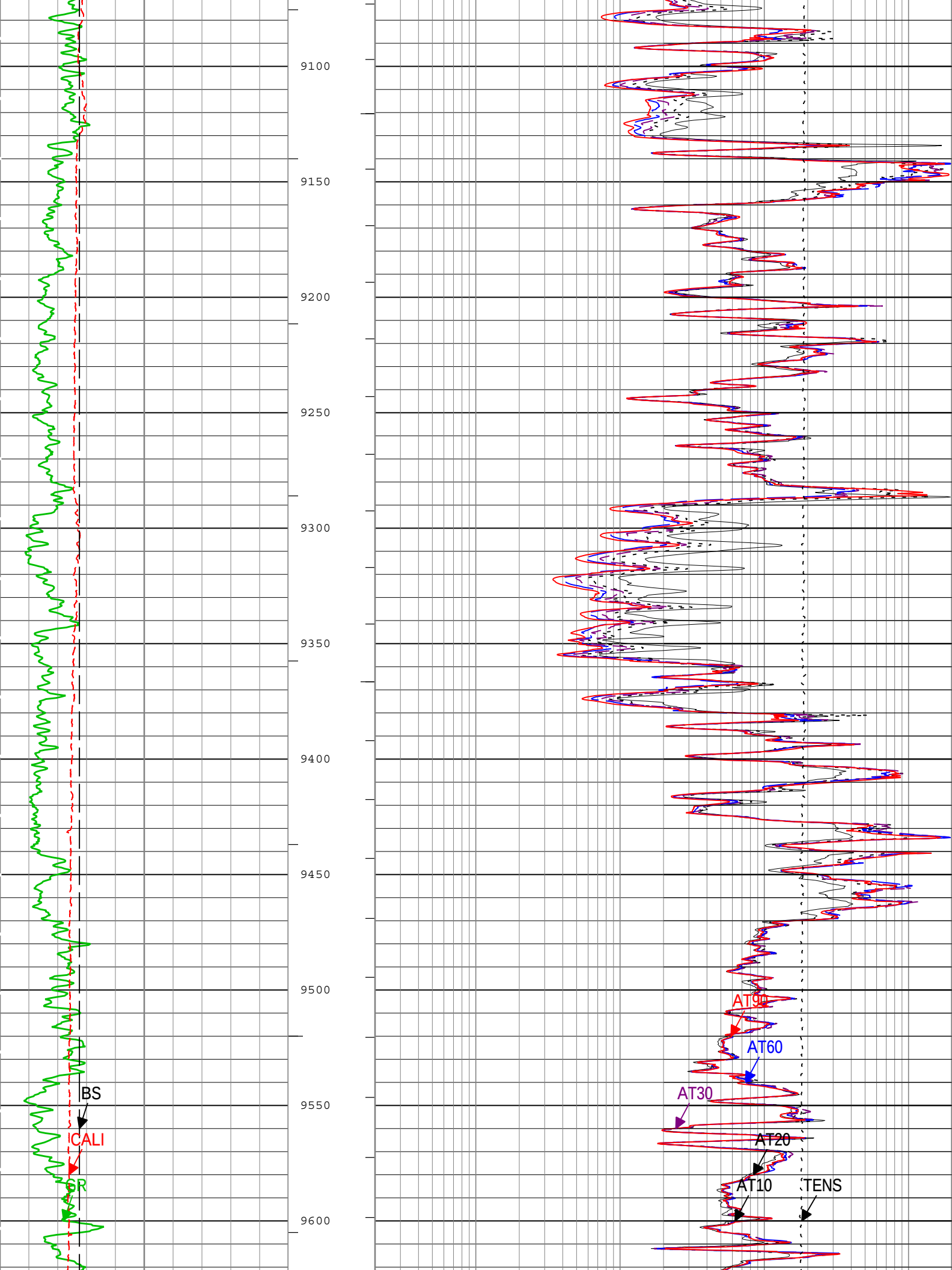
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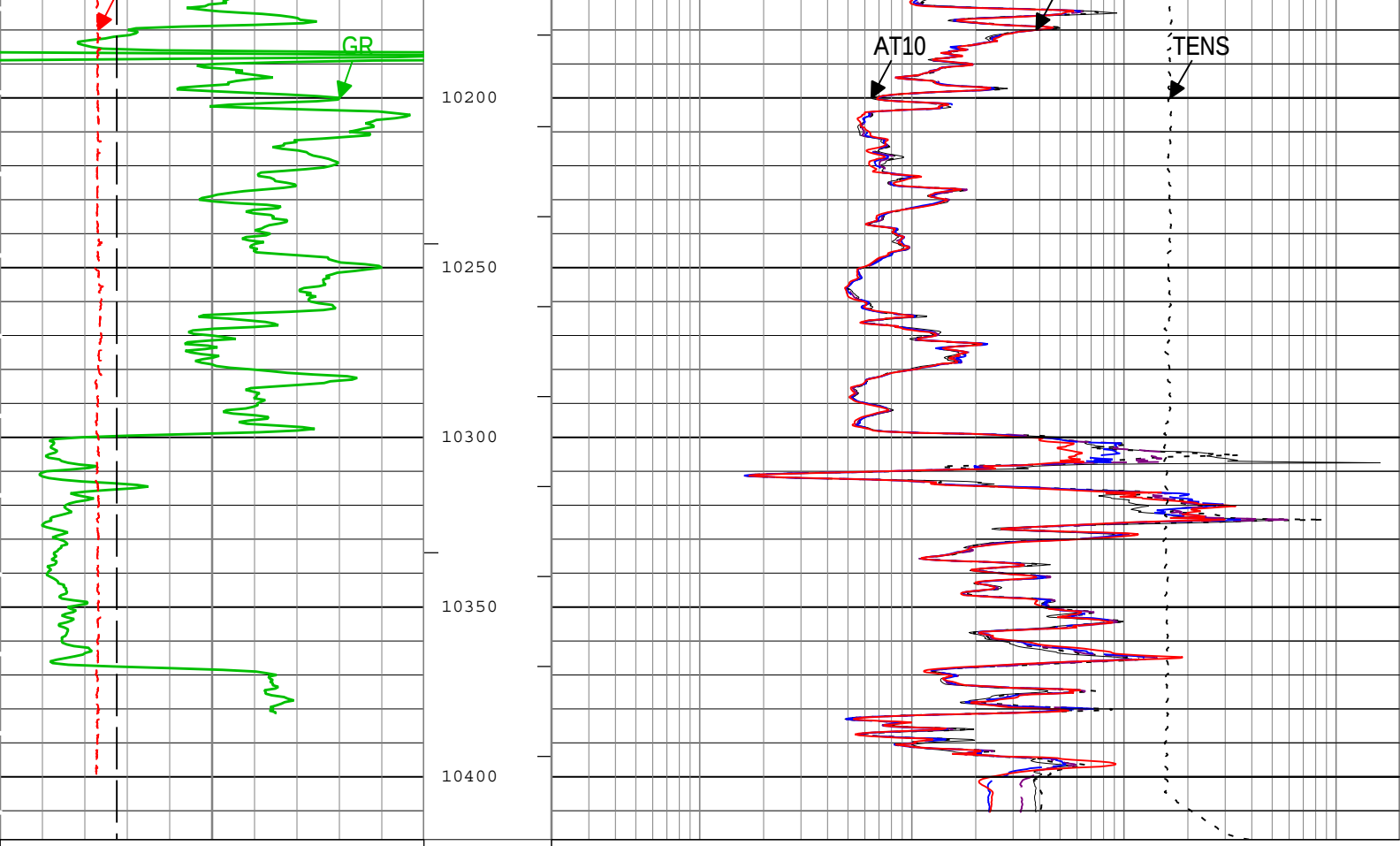


Gamma Ray (GR) HGNS[1]
0 gAPI 150

Caliper (CALI) HDRS[1]
6 in 16

Bit Size (BS)
6 in 16

Array Induction Two Foot Resistivity A10 (AT10) AIT_SpliceGroup[1]
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A20 (AT20) AIT_SpliceGroup[1]
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A30 (AT30) AIT_SpliceGroup[1]
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A60 (AT60) AIT_SpliceGroup[1]
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A90 (AT90) AIT_SpliceGroup[1]
0.2 ohm.m 2000

Cable Tension (TENS)
10000 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)

Description: AIT Basic Log Two Format: Log (AIT 2 Inch) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-May-2012 09:38:19

Channel Processing Parameters

1: Parameters

Parameter	Description	ToolPath	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M:AMIS:AMIS	Compute Mud Resistivity	
ABLM	Array Induction Basic Logs Mode	AIT-M:AMIS:AMIS	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M:AMIS:AMIS	Yes	

BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	COMPLETION	8.75	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H:HRCC-H:HRCC-H	0	in
CBLO	Casing Bottom (Logger)	COMPLETION	1734	ft
CDEN	Cement Density	HGNS-H:HGNS-H:HGNS-H	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	COMPLETION	9.625	in
DFD	Drilling Fluid Density	Borehole	9.55	lbm/gal
FCD	Future Casing (Outer) Diameter	COMPLETION	7	in
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	CALI	
SOCO	Standoff Correction Option	HGNS-H:HGNS-H:HGNS-H	Yes	

Tool Control Parameters

1: Parameters

Parameter	Description	ToolPath	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed		Time Zoned	ft/h

1Time Zoned Parameters

Pass Log[2]:Down

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
MAX_LOG_SPEED	2473	09-May-2012 21:11:37	09-May-2012 22:14:10	1400.74	2913.24

Pass Log[4]:Up

MAX_LOG_SPEED	1800	09-May-2012 23:00:37	10-May-2012 04:16:09	10418.51	2040.57

All depth are at tool zero.

Composite 2

MAIN PASS 5 INCH

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, GCSE_DOWN_PASS:1, FCD	1135.97	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS, GCSE_DOWN_PASS:1	3457.09	ft3

Software Version

Acquisition System	Version
MaxWell	3.0.9609.0
Application Patch	EXP_APL-SEC-3.0.9609.1645
	EXP_APL-ADT-3.0.9609.1558
	SP-20120409-3.0.9609.1919
	EXP_APL-OPElevation-3.0.9609.1966

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.0.9609.1919

Tool Elements	Description	Software Version	Firmware Version
HRCC-H	HILT High-Resolution Control Cartridge, 150 degC	3.0.9609.0	2.0
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.0.9609.1919	2.0
AMIS	Array Induction Sonde - M	3.0.9609.1274	1

Composite Summary

Run	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth	Include

Name							Shift	Parallel Data
1	Log[2]:Down	Down	1406.56 ft	10418.61 ft	09-May-2012 9:10:54 PM	09-May-2012 10:14:10 PM	0.00 ft	true
1	Log[4]:Up	Up	2040.57 ft	10418.51 ft	09-May-2012 11:00:32 PM	10-May-2012 4:16:09 AM	0.00 ft	true

All depths are referenced to toolstring zero

Log

Composite 2 8A2470F8-F550-4566-9F85-6803F912CC6B

Description: AIT Basic Log Two Format: Log (AIT 5 Inch) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-May-2012 09:38:28

Channel	Source	Sampling
AT10	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
AT20	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
AT30	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
AT60	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
AT90	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
BS	Borehole	6in
CALI	HDRS[1]:HRCC-H[1]:HRCC-H[1]	1in
GR	HGNS[1]:HGNS-H[1]:HGNS-H[1]	6in
ICV	Borehole	6in
IHV	Borehole	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

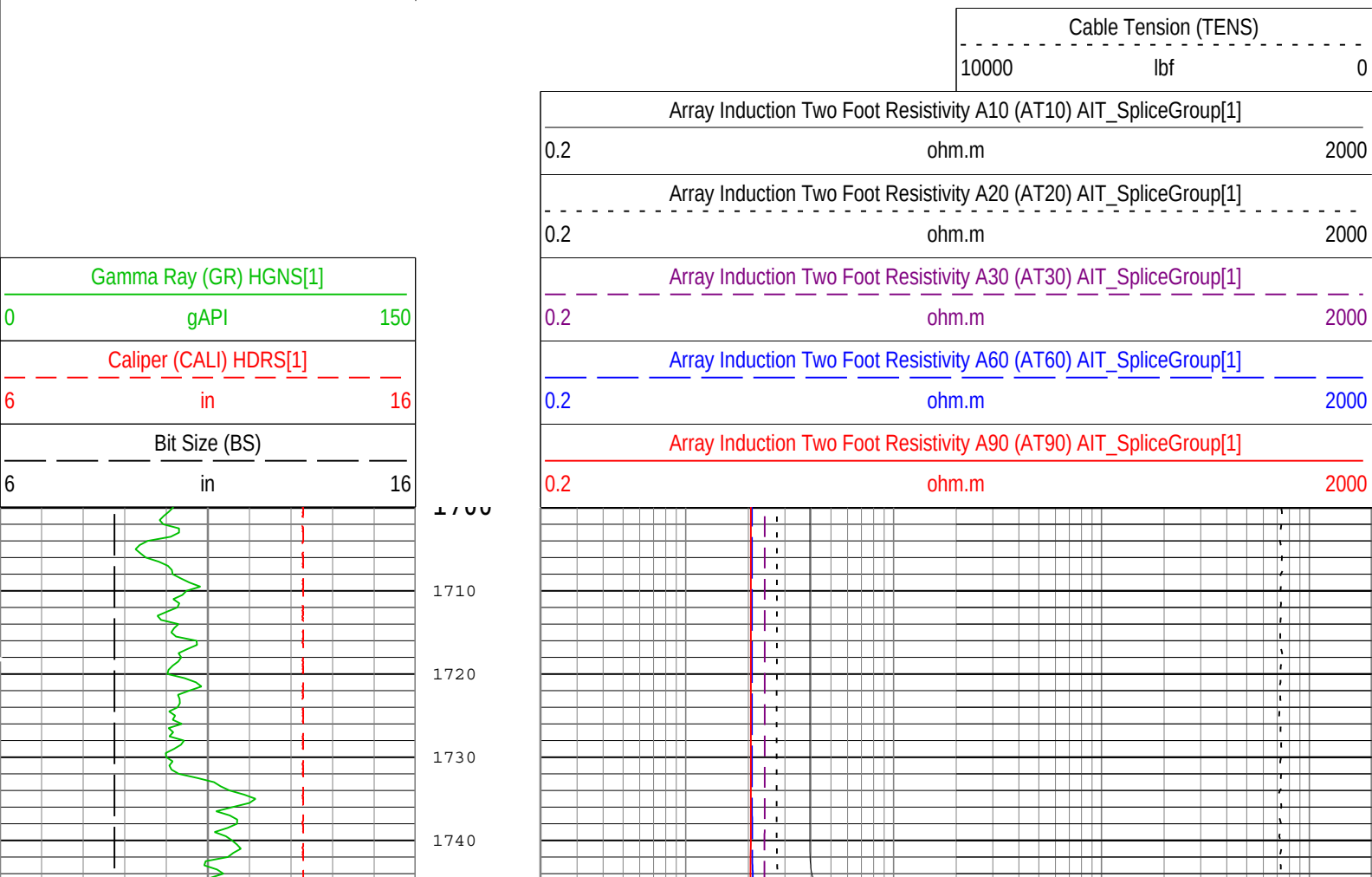
TIME_1900 - Time Marked every 60.00 (s)

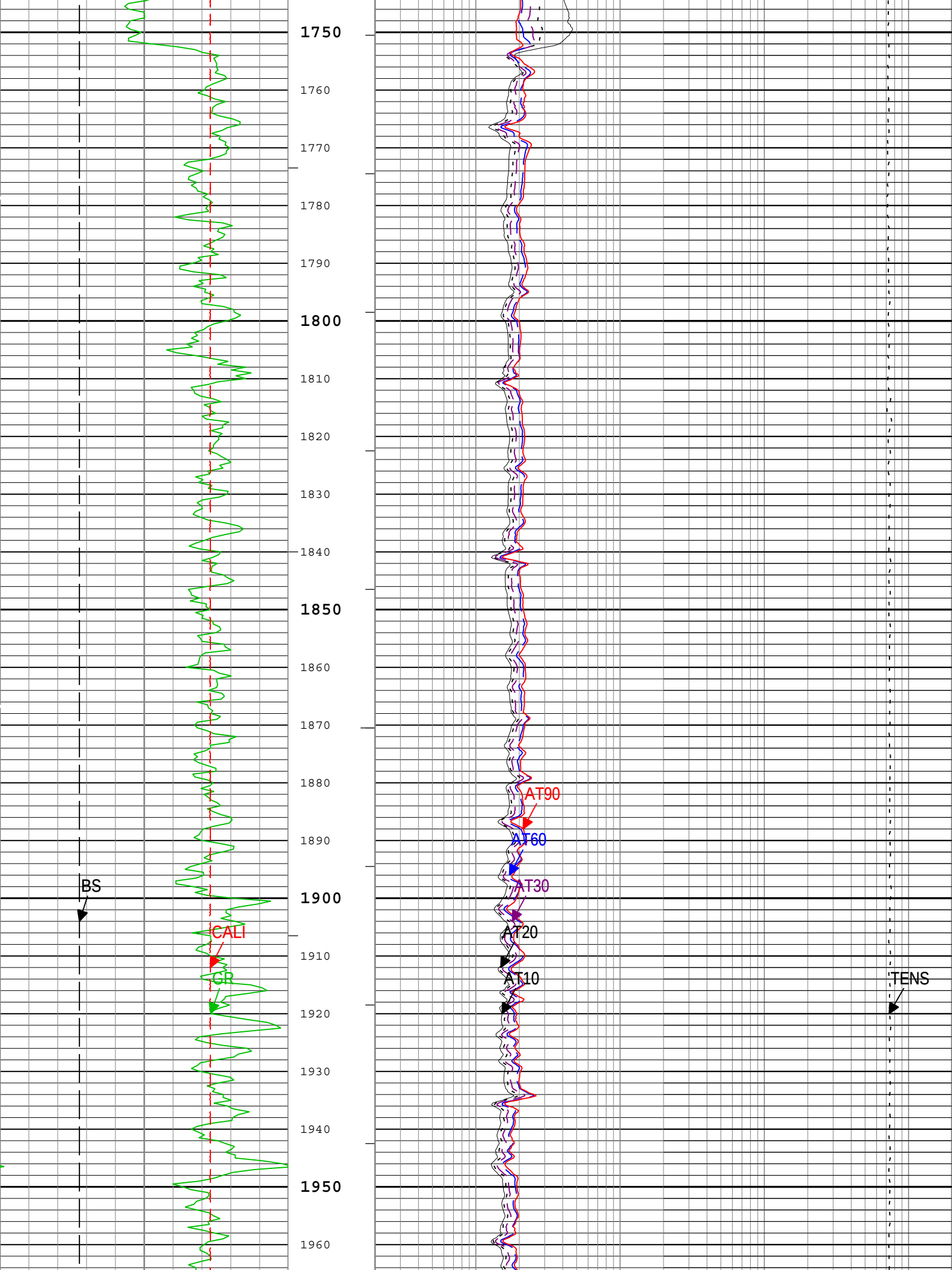
IHV - Integrated Hole Volume every 10.00 (ft3)

IHV - Integrated Hole Volume every 100.00 (ft3)

ICV - Integrated Cement Volume every 10.00 (ft3)

ICV - Integrated Cement Volume every 100.00 (ft3)

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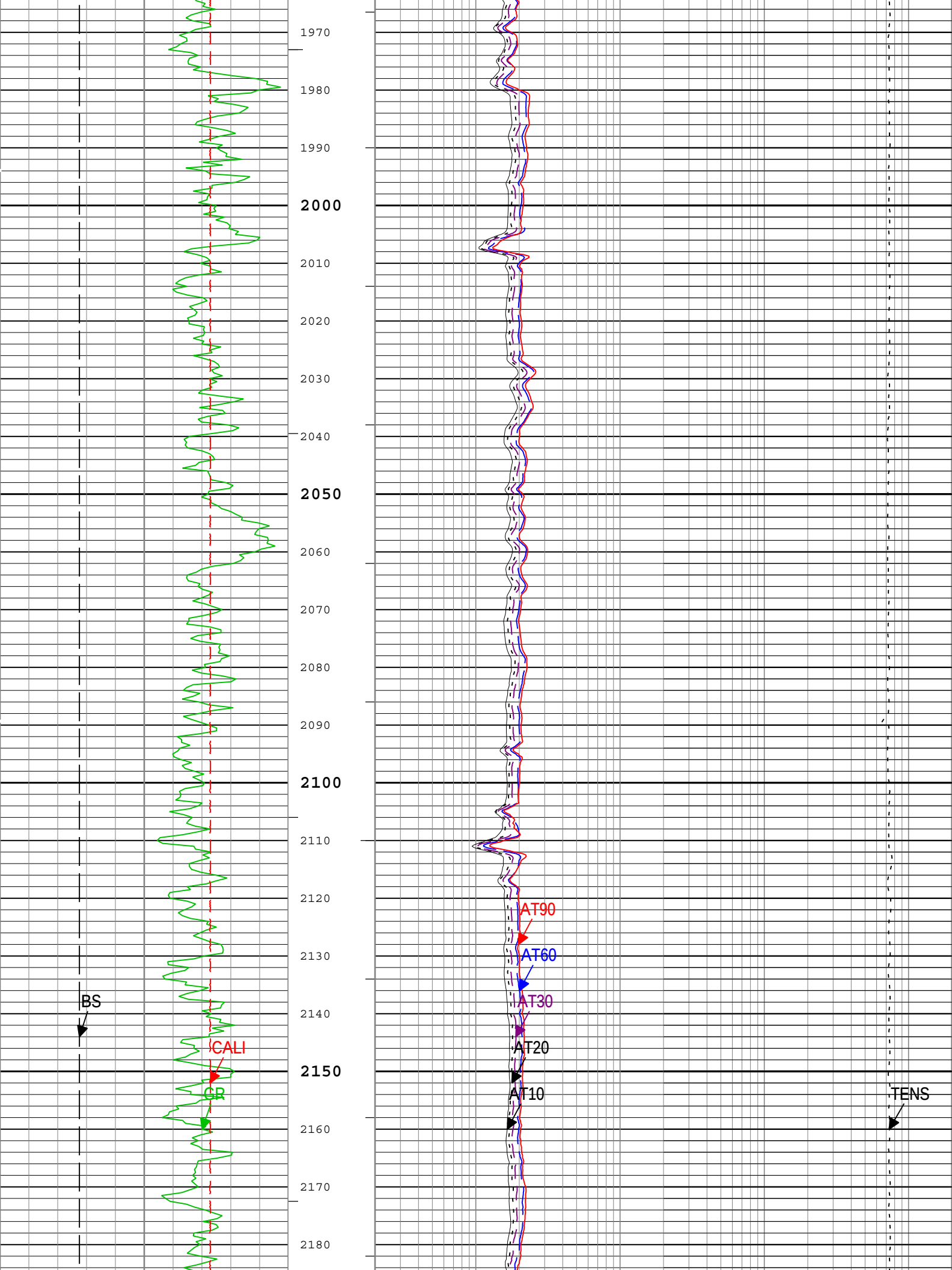
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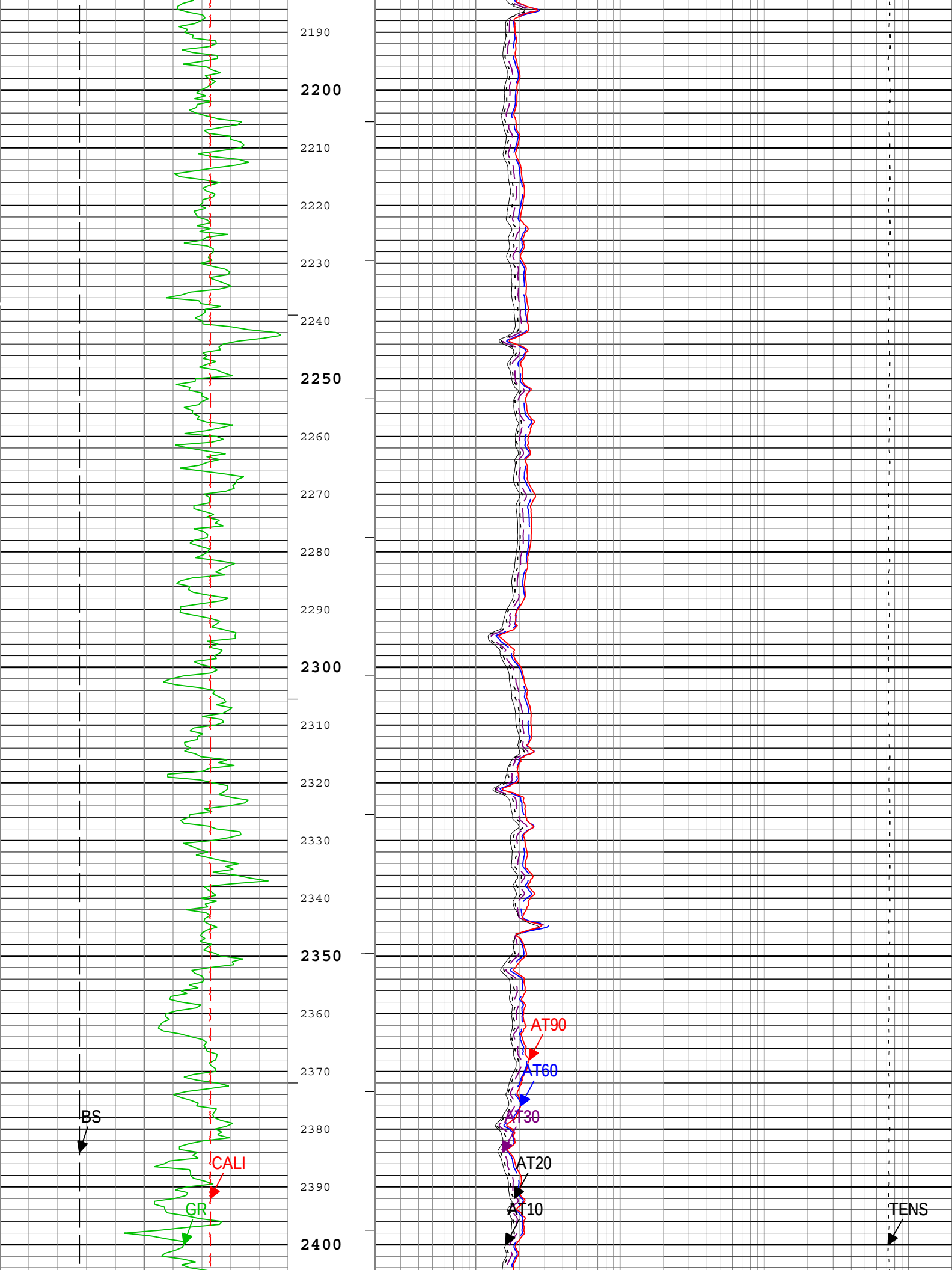
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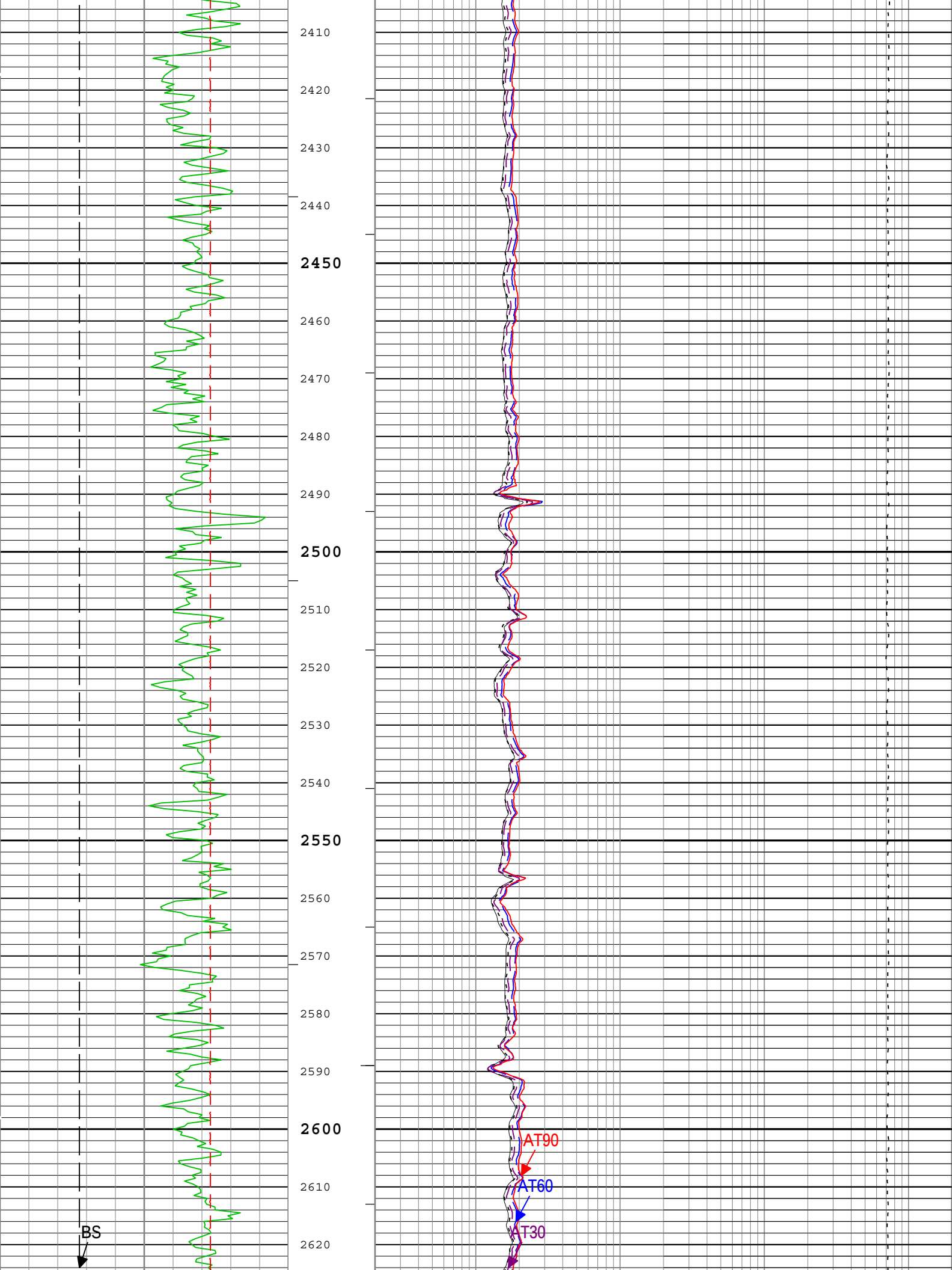
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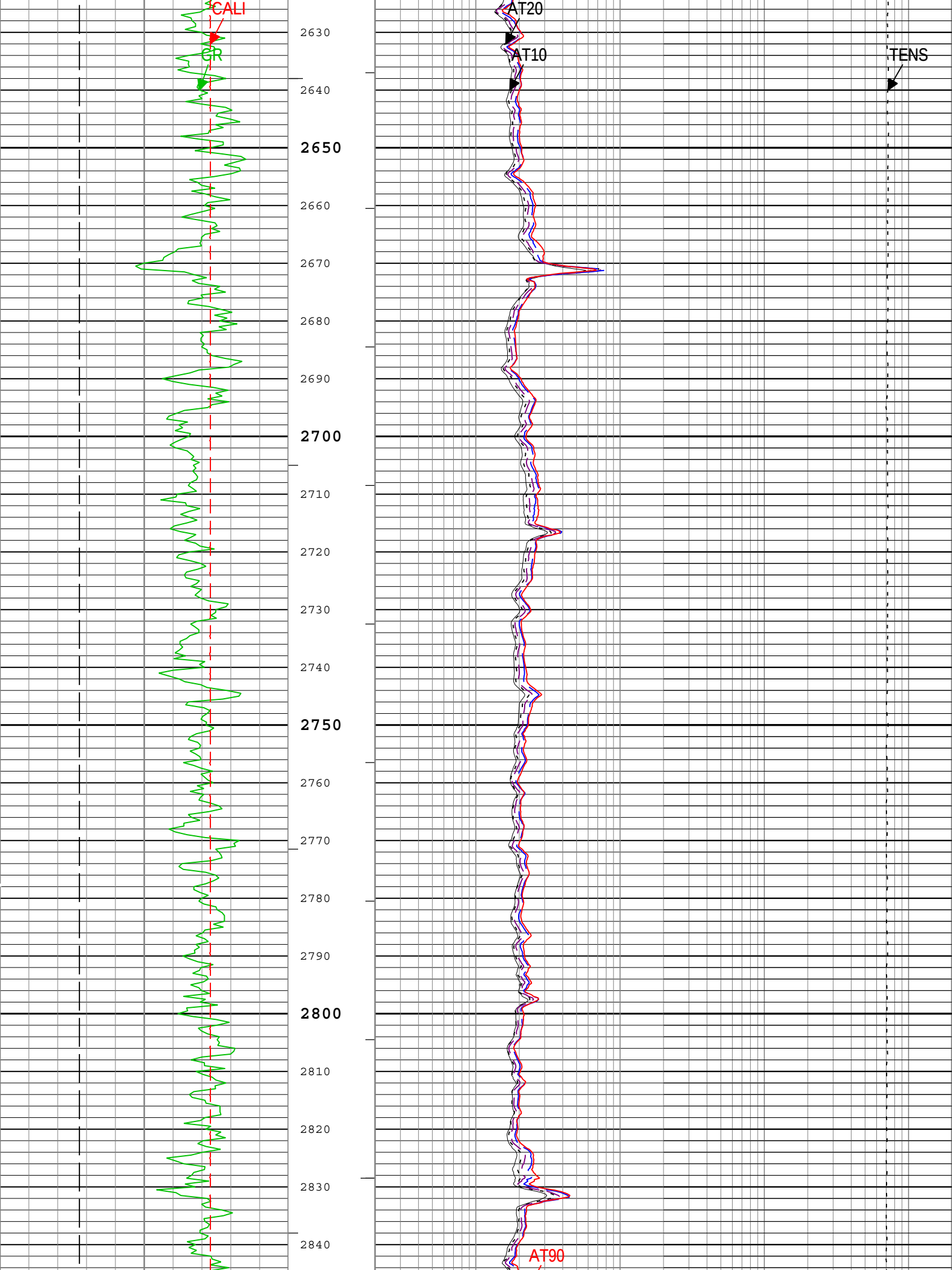
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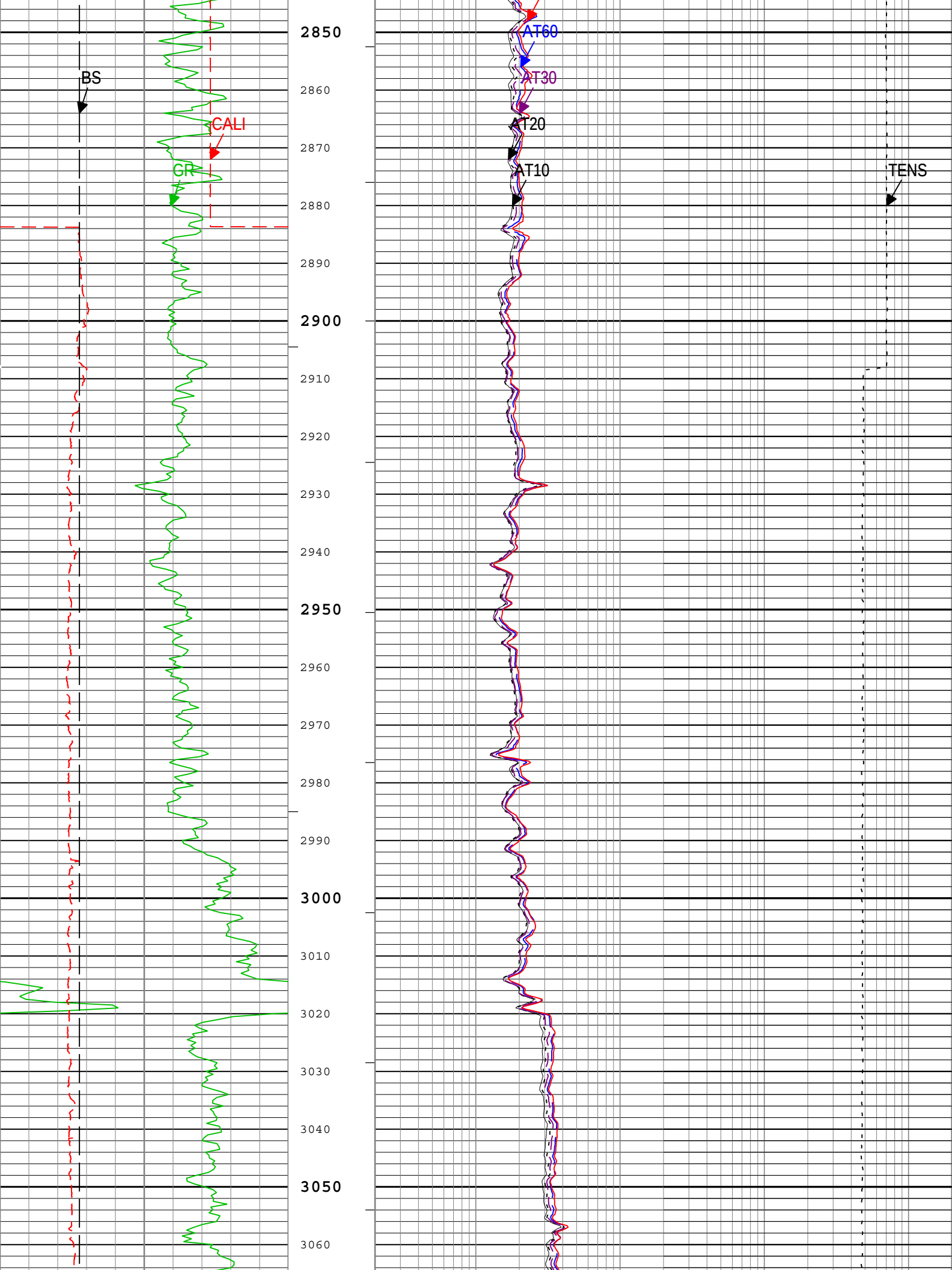
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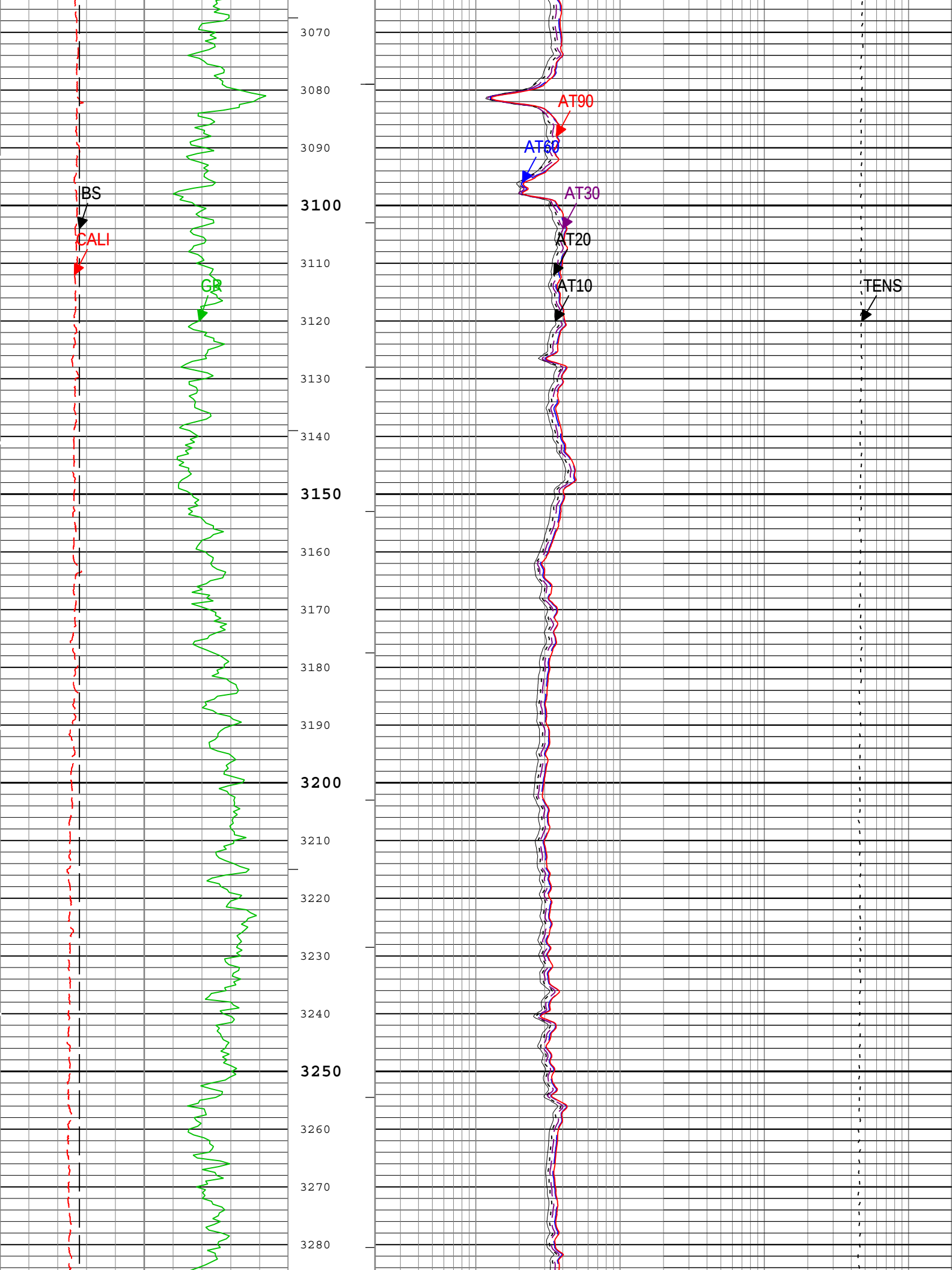
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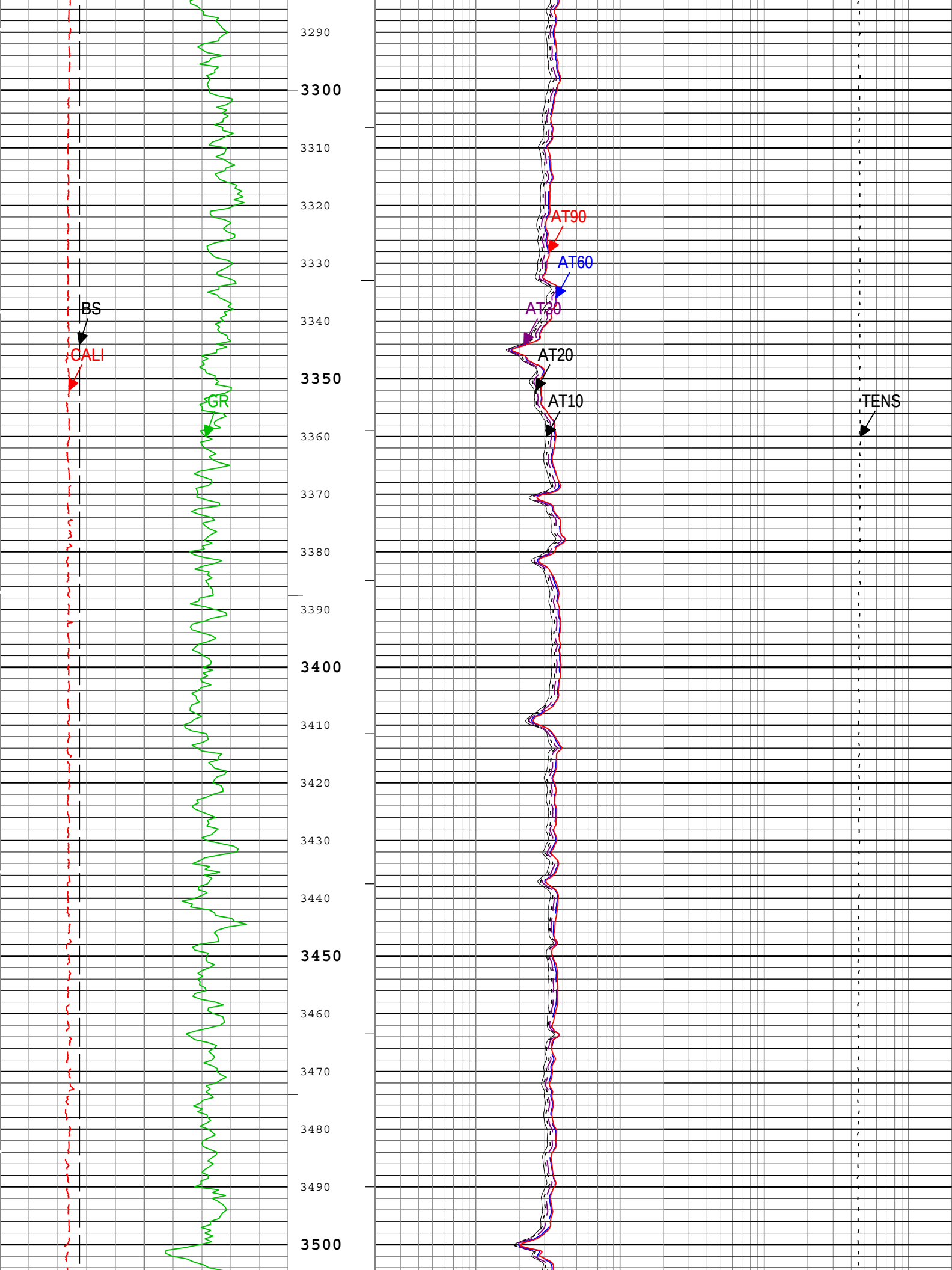
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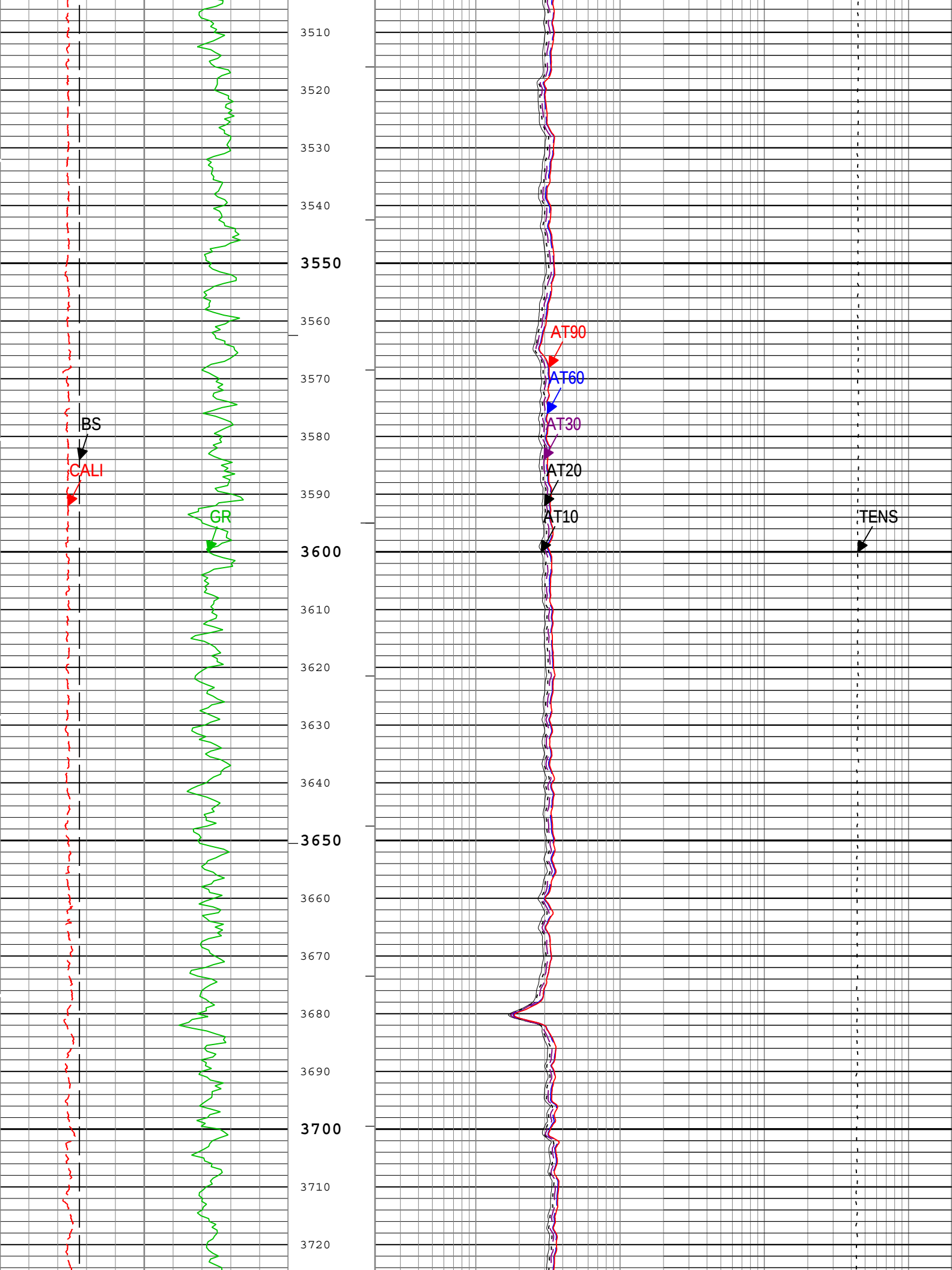
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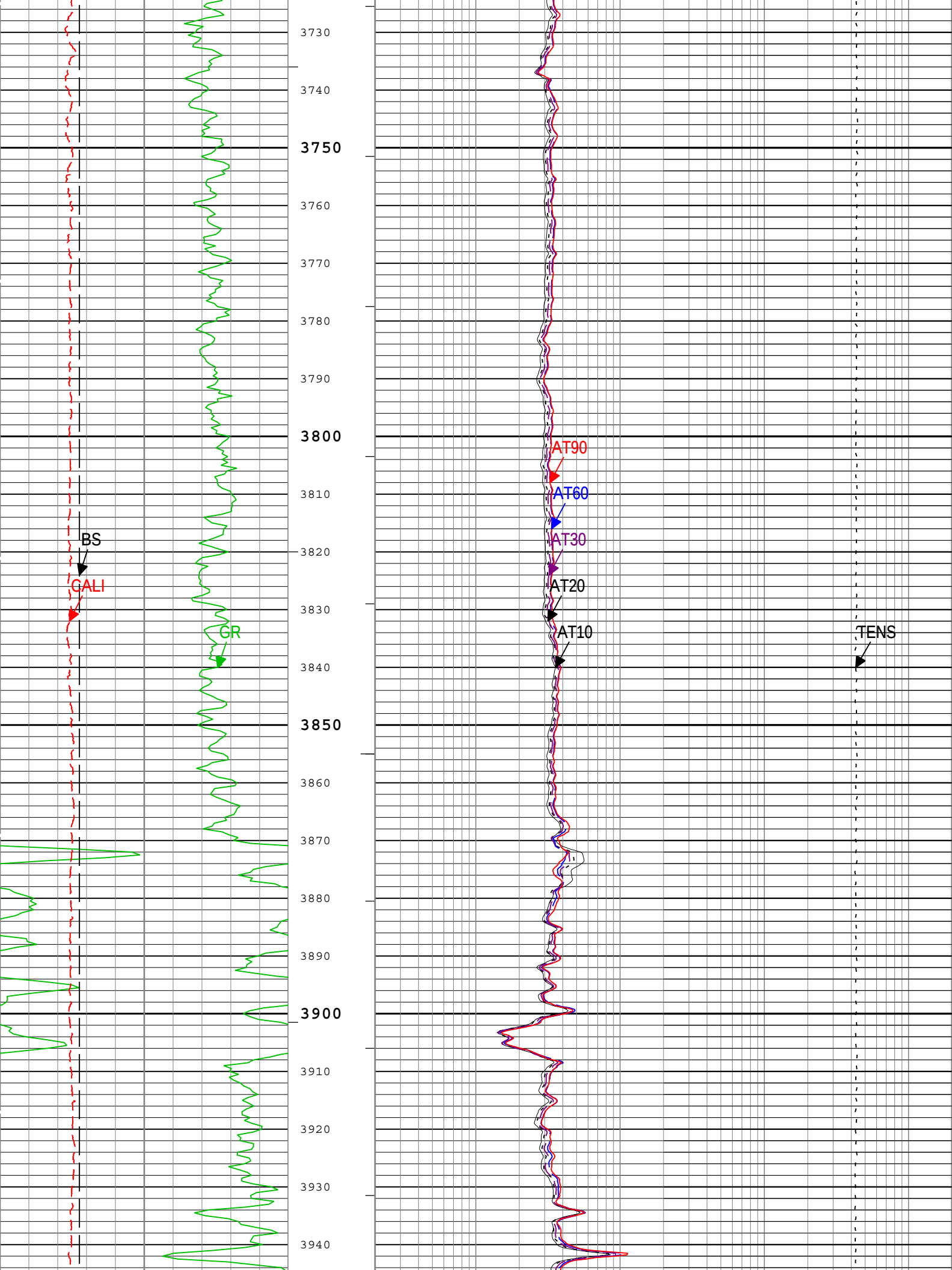
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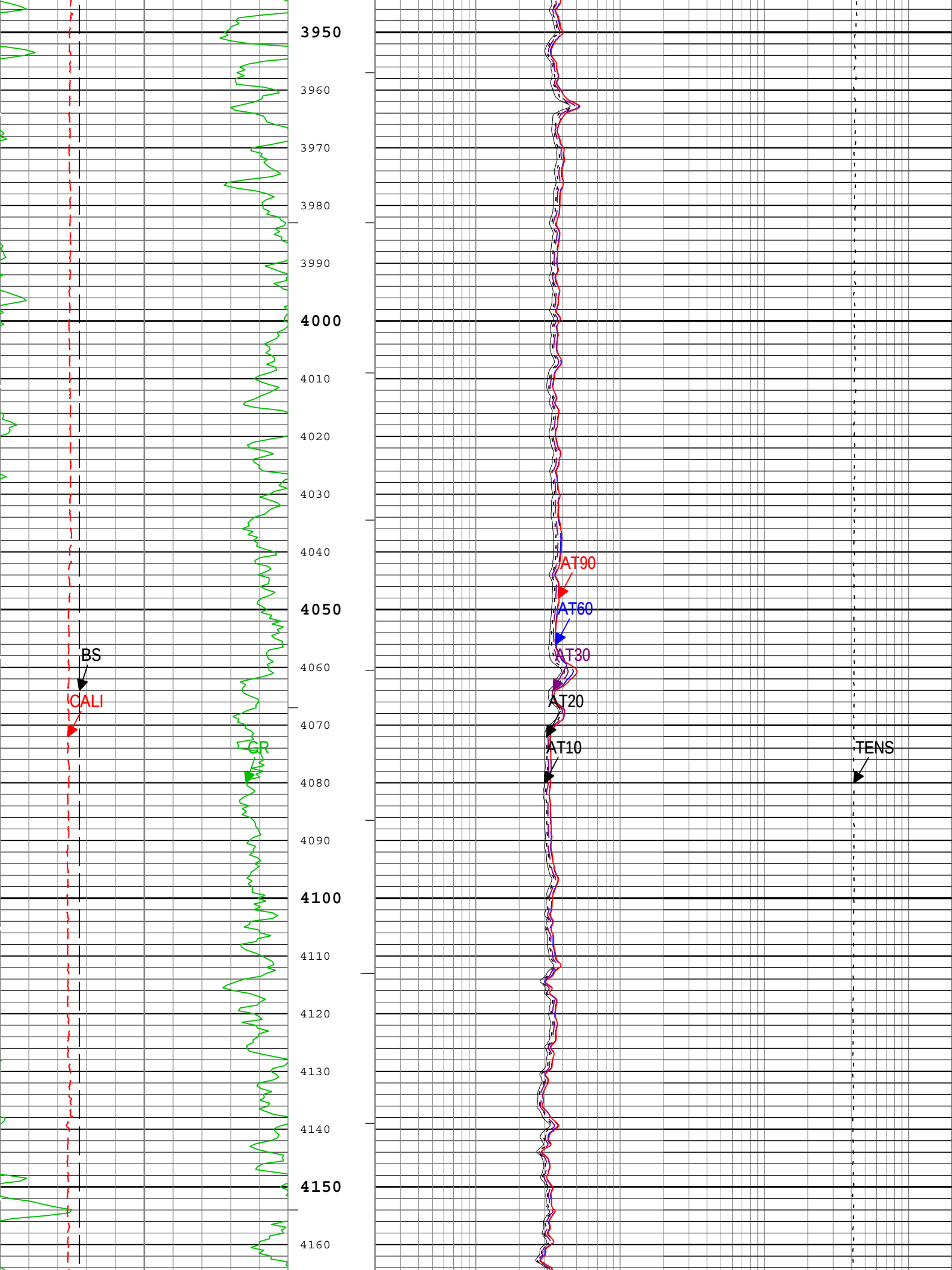
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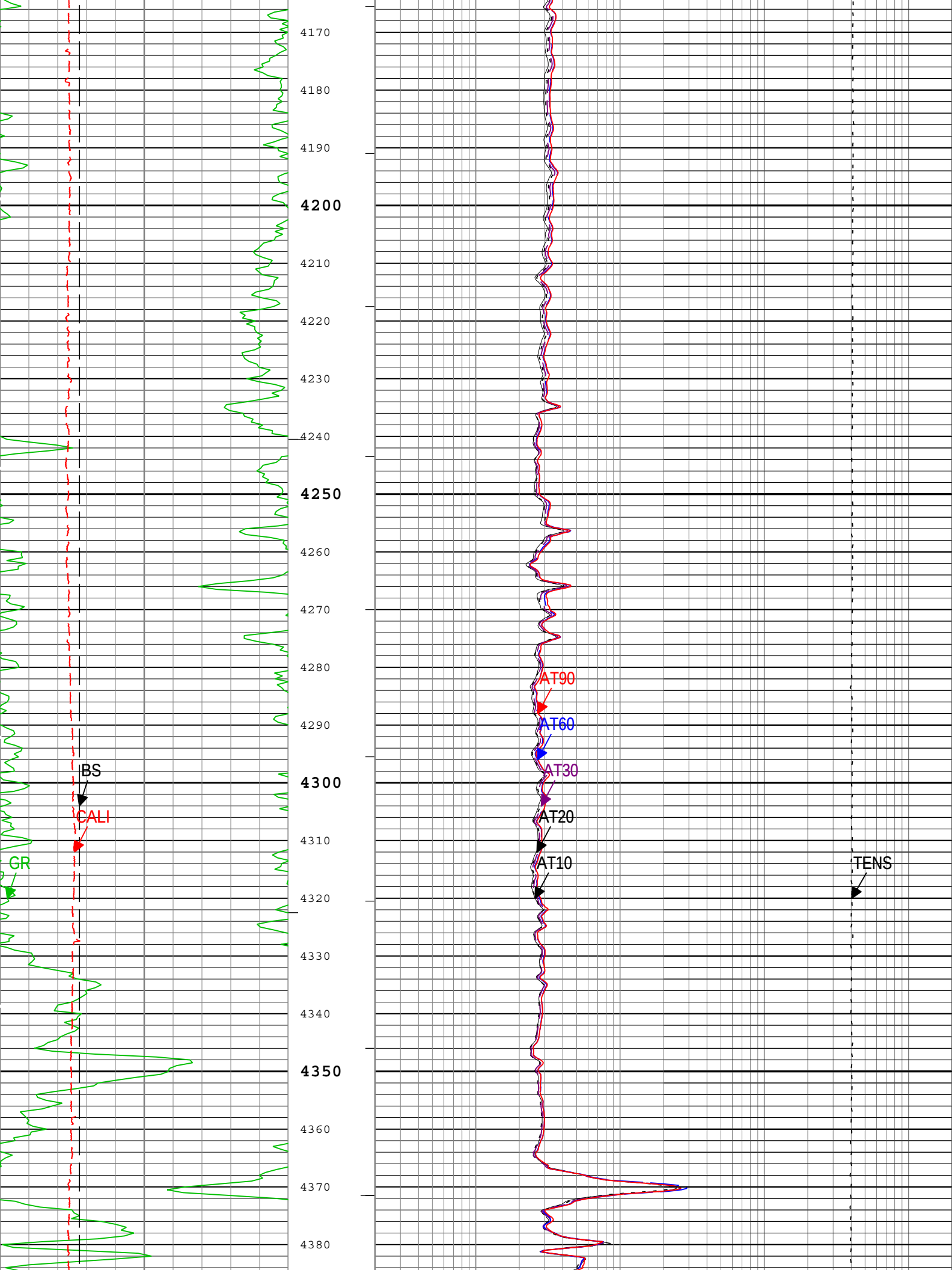
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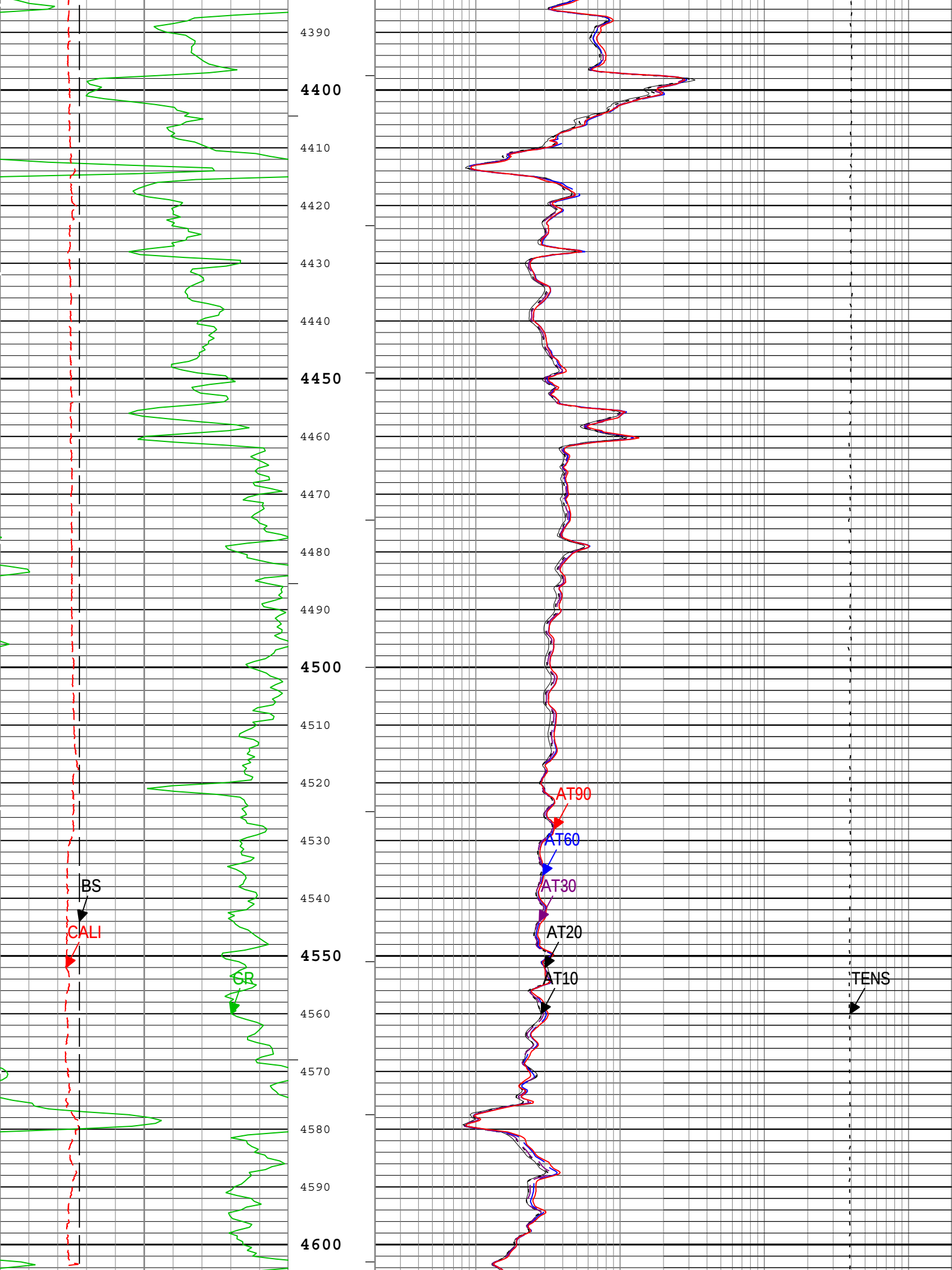
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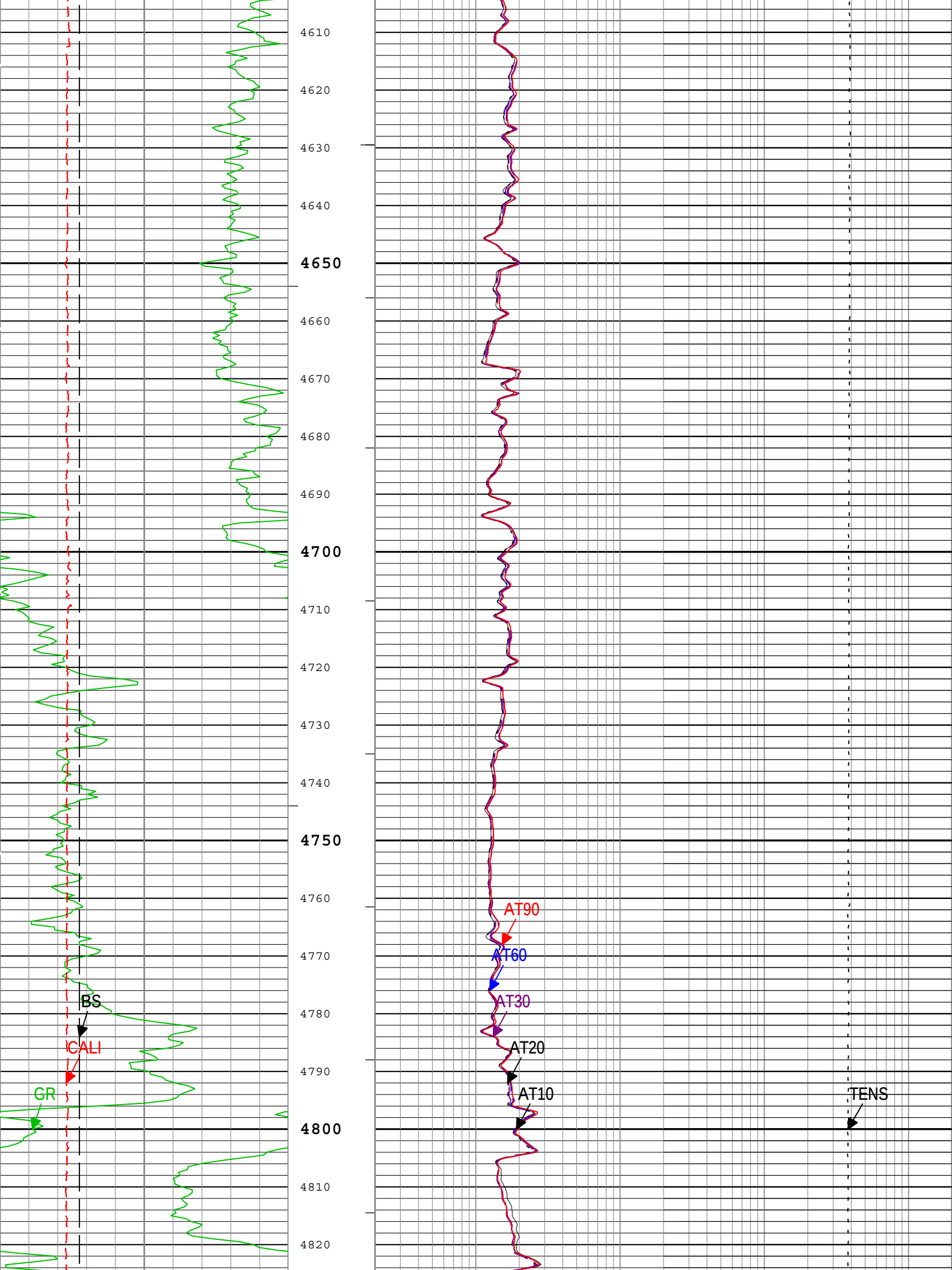
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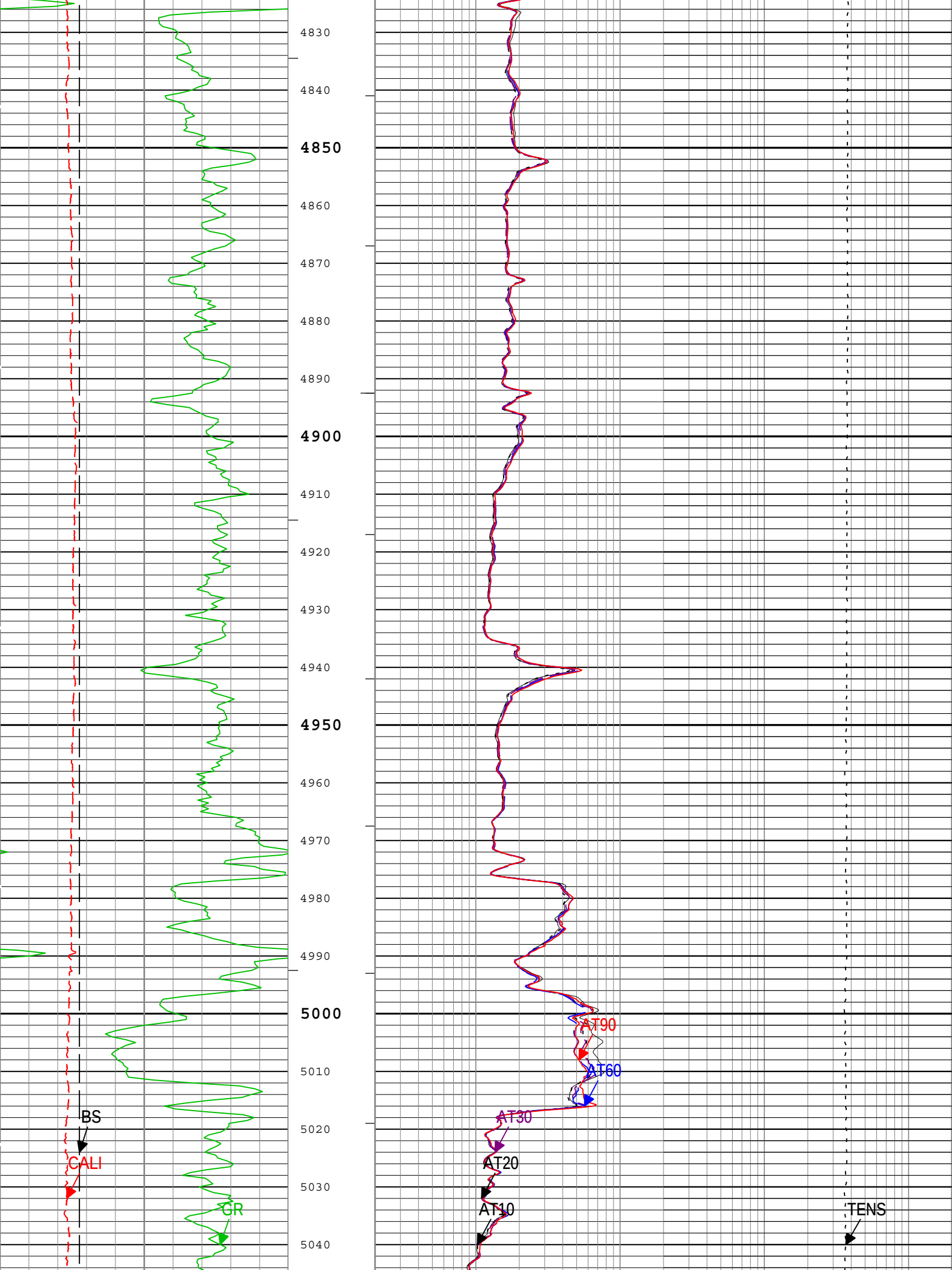
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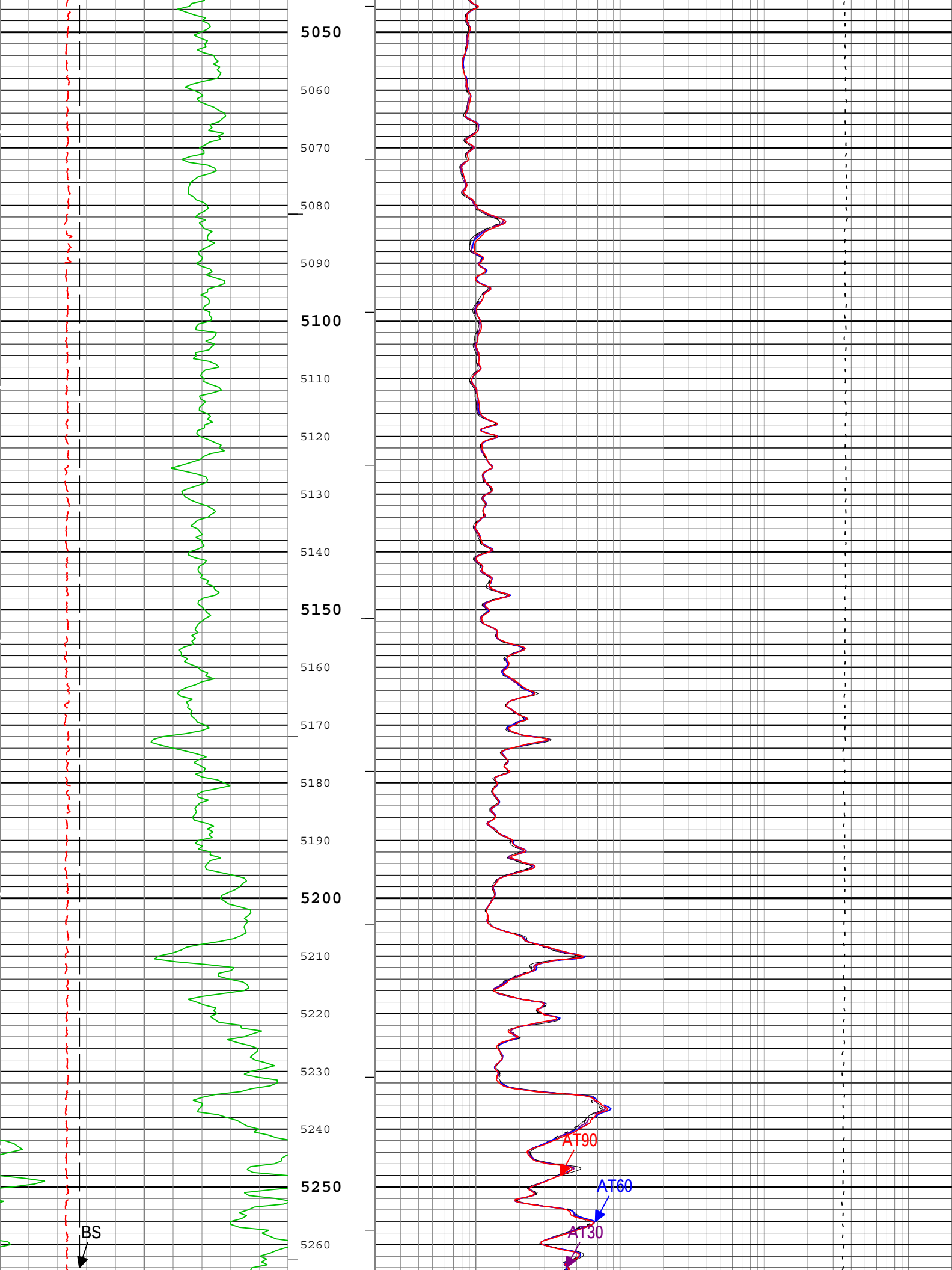
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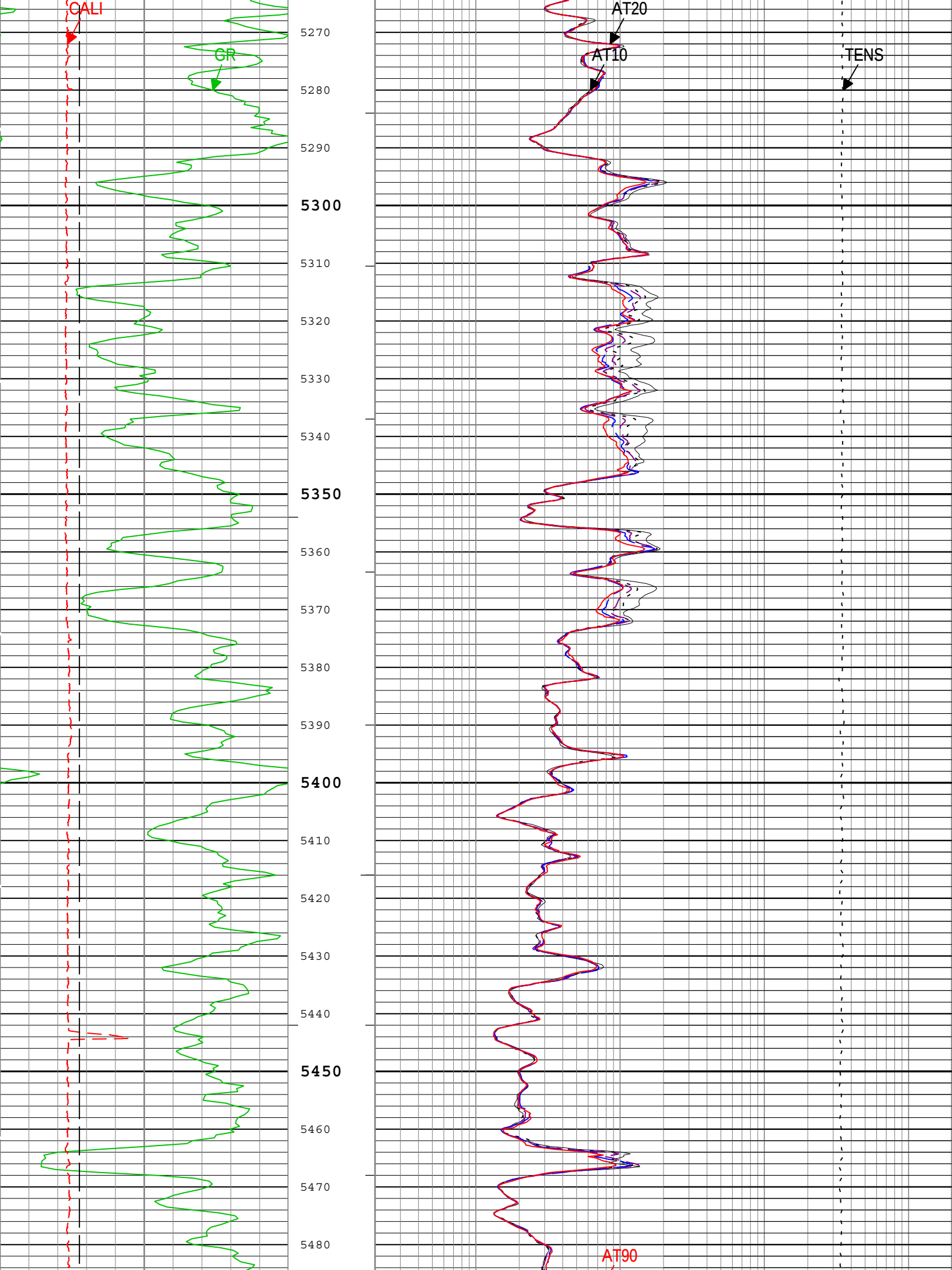
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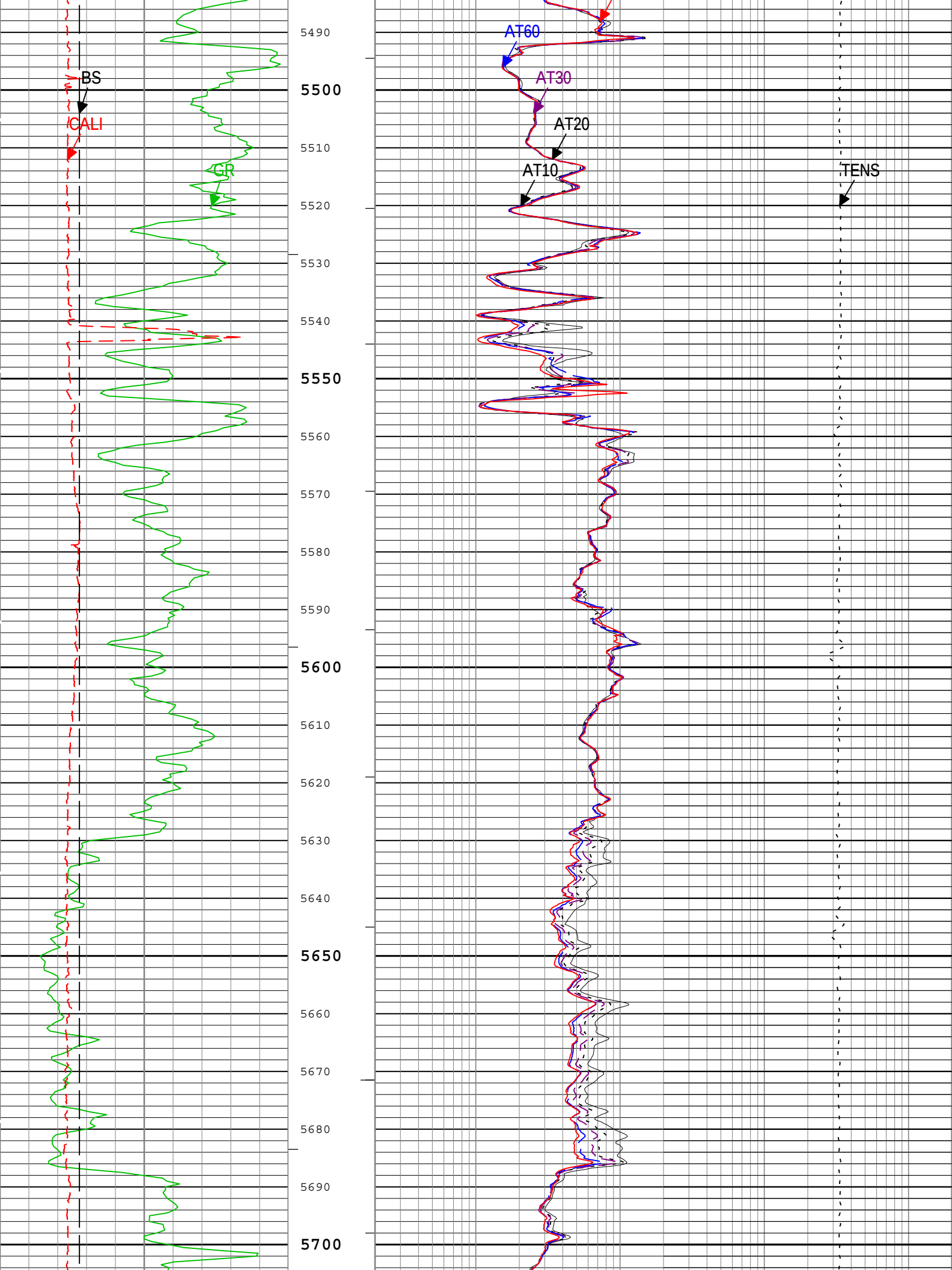
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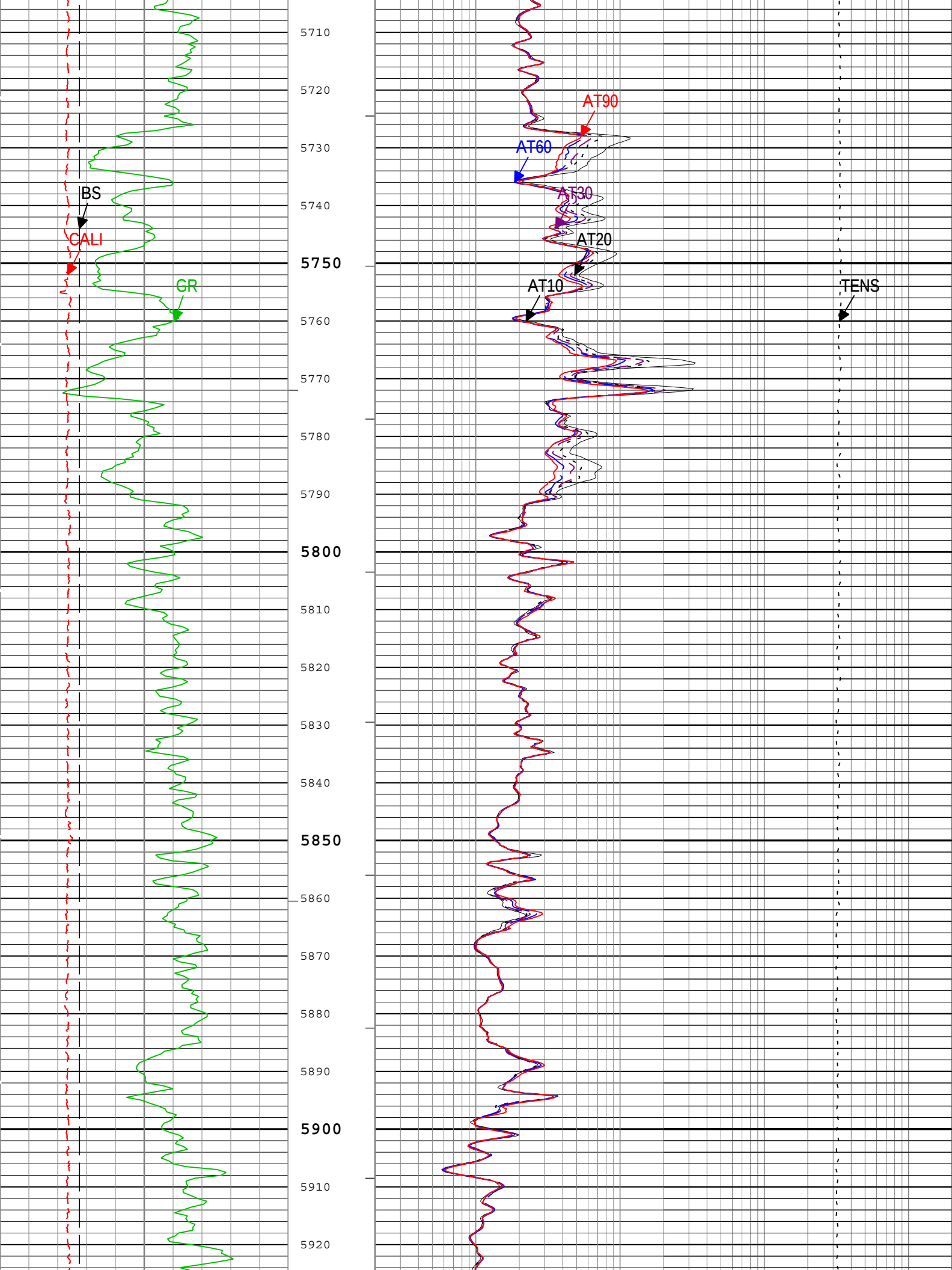
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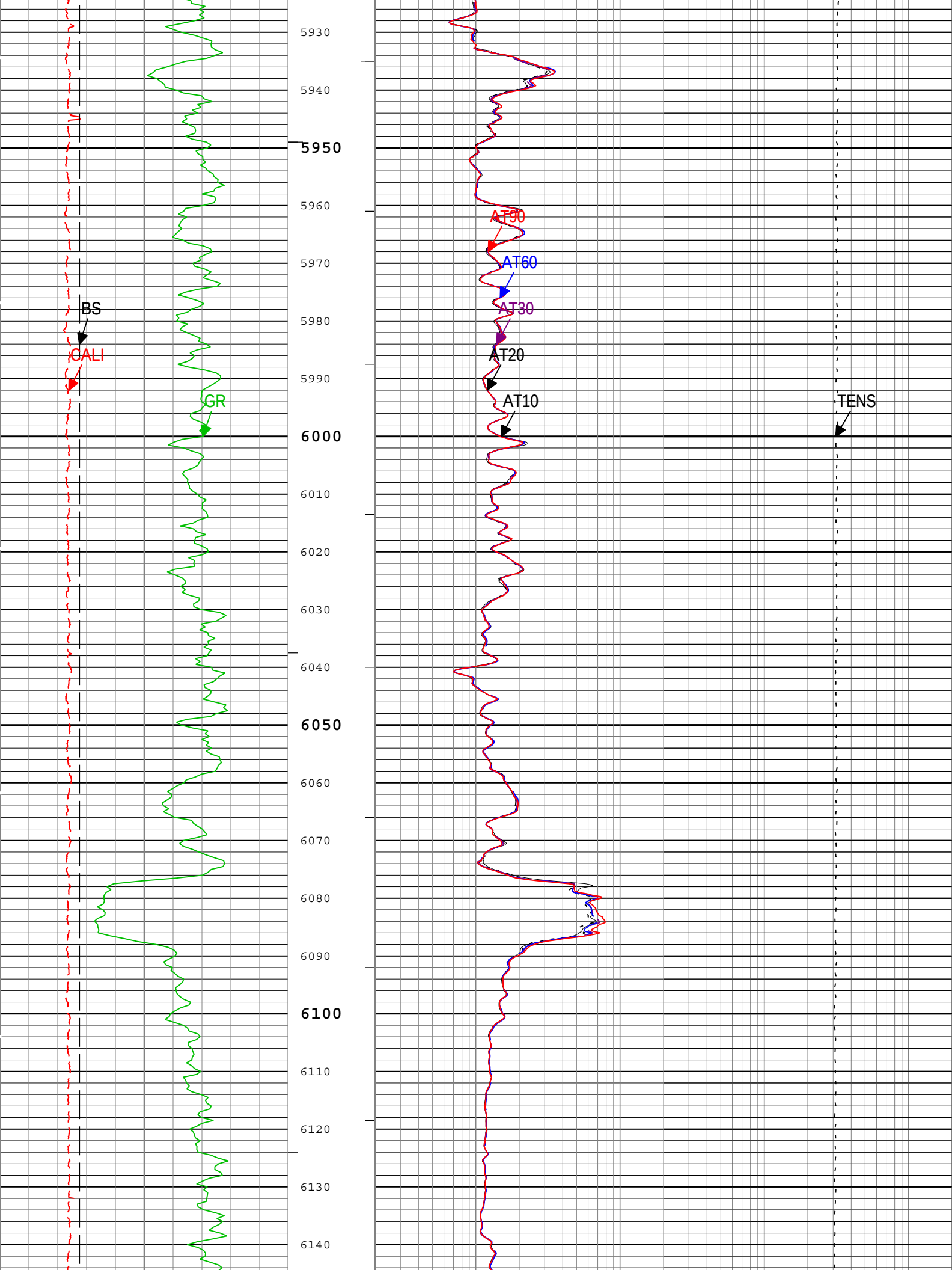
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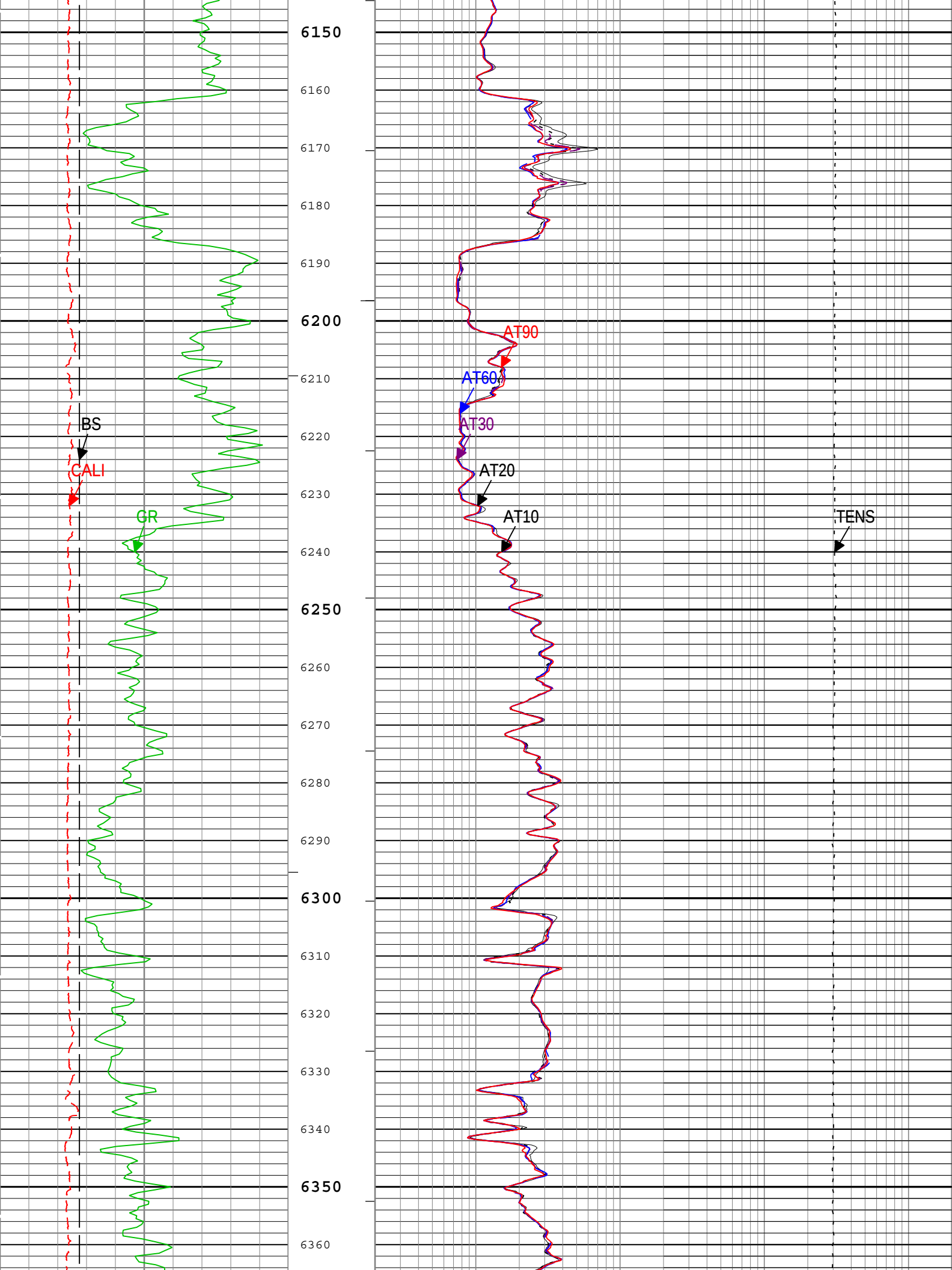
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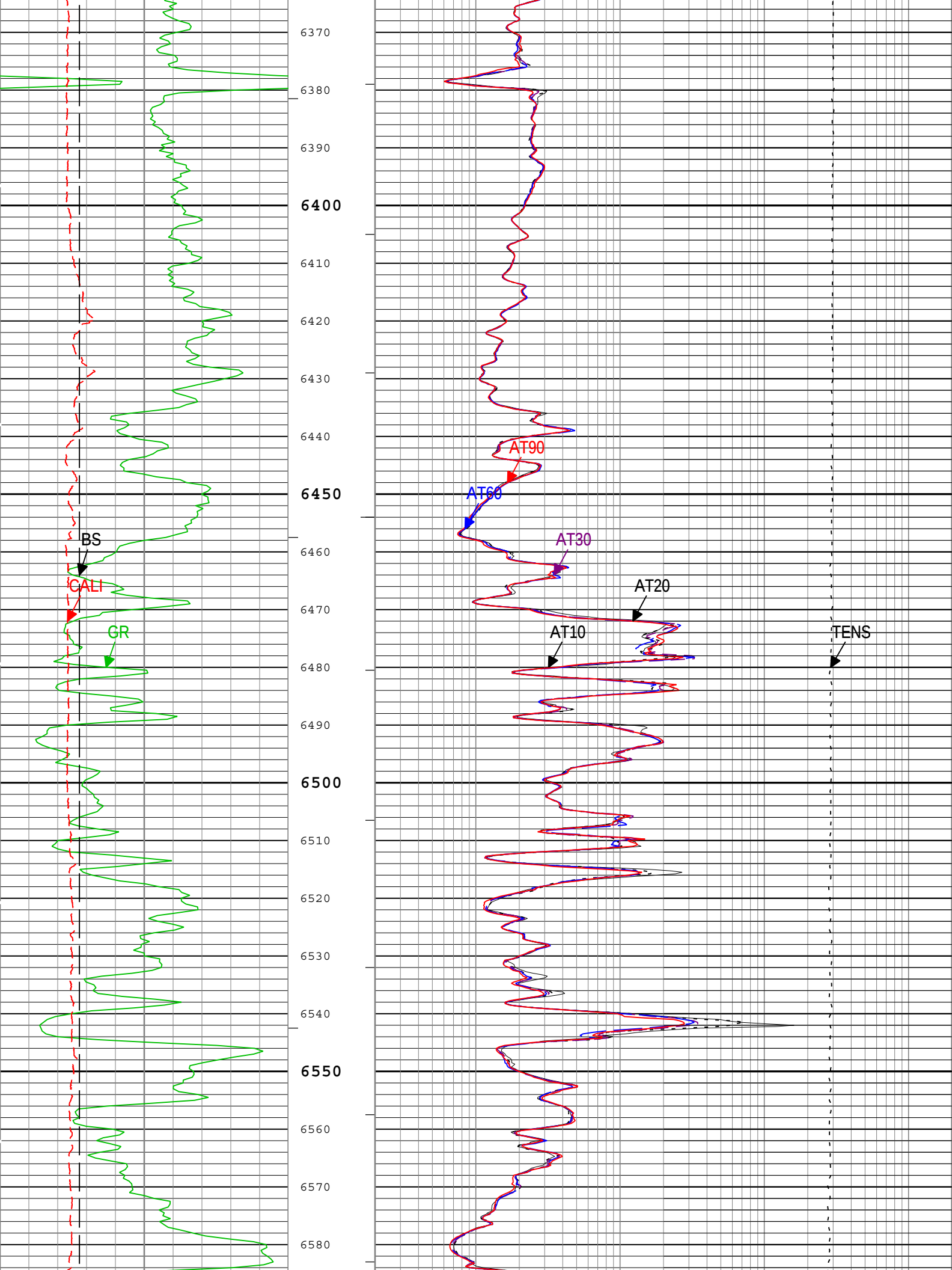
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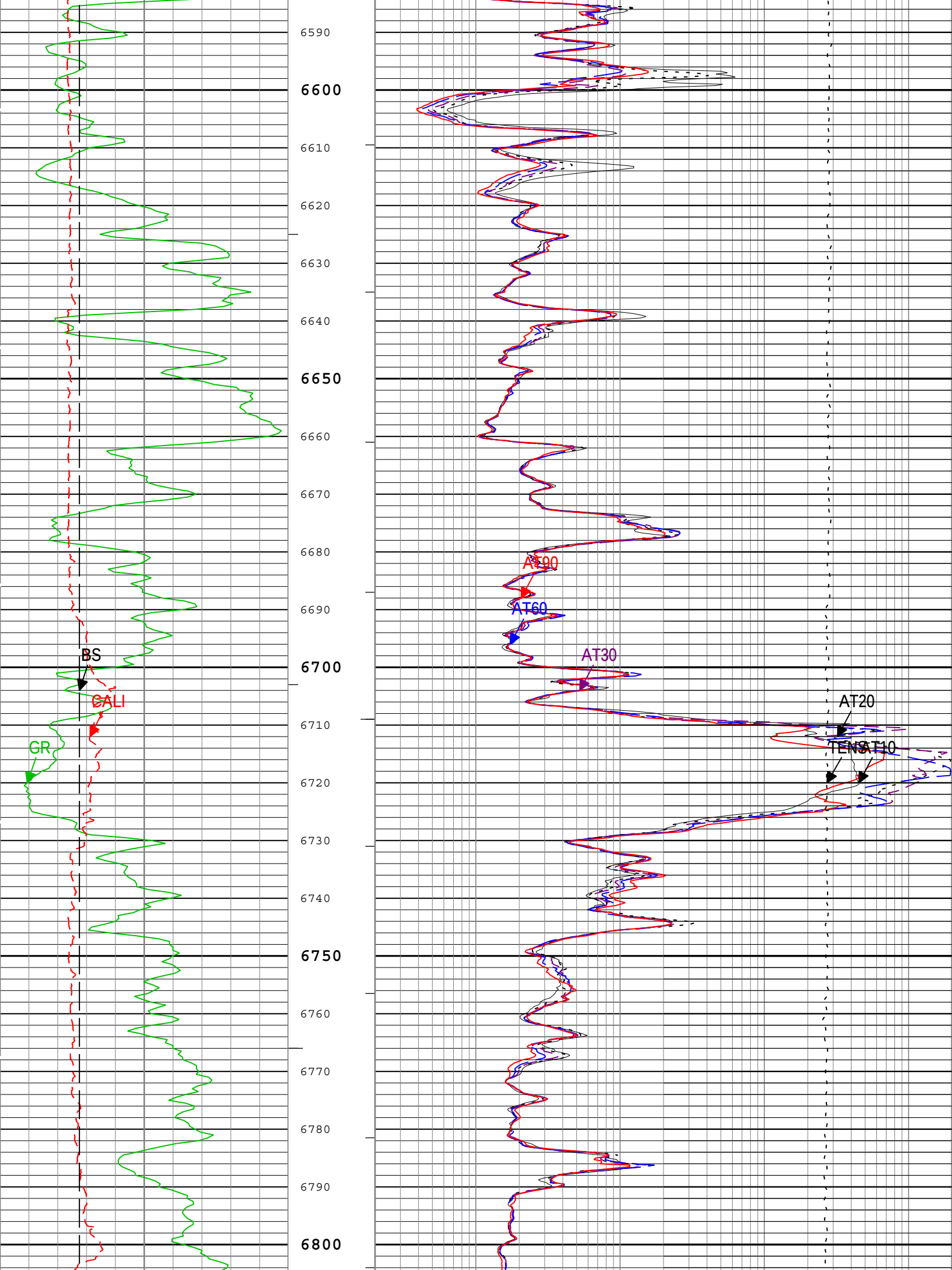
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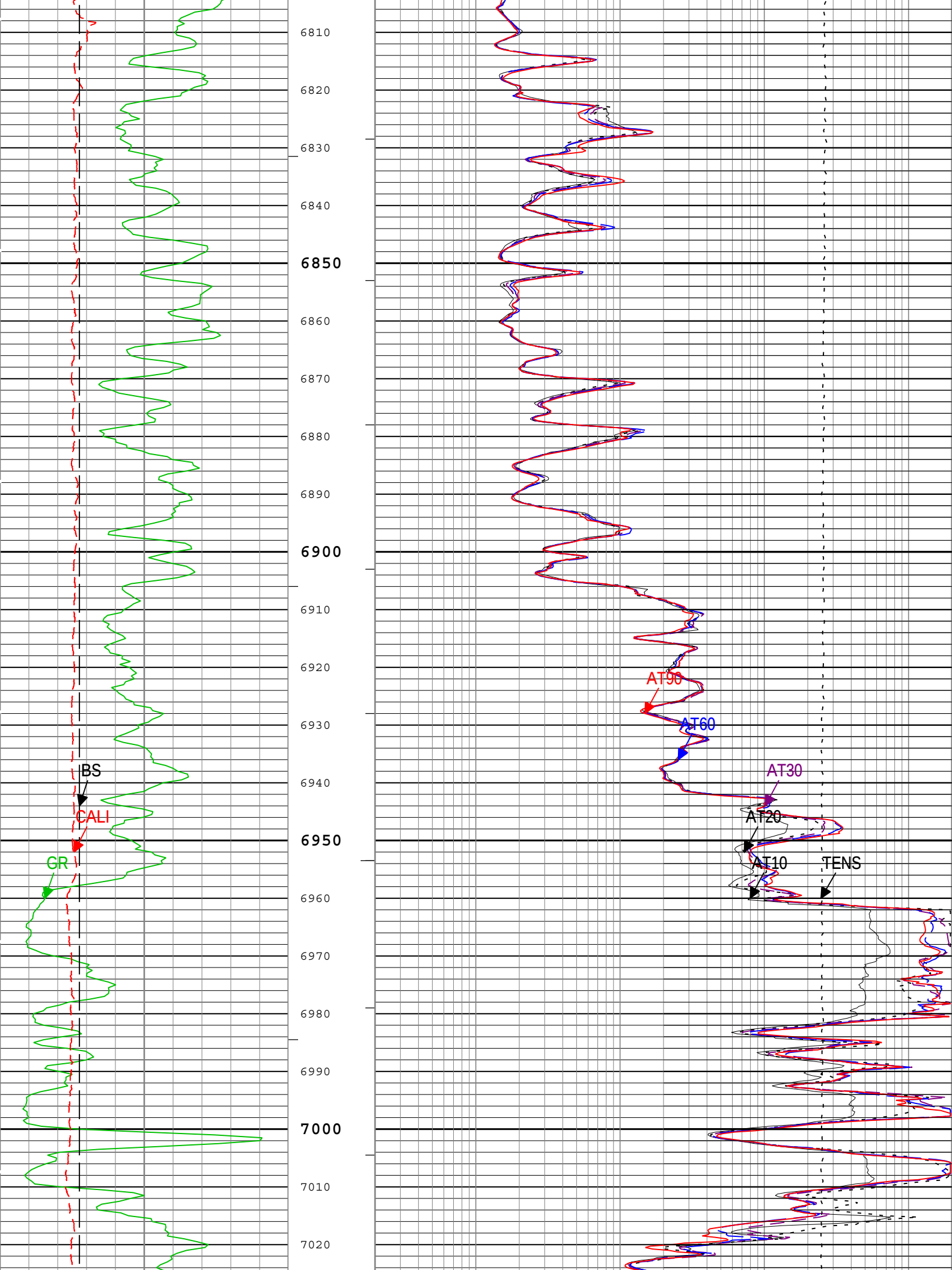
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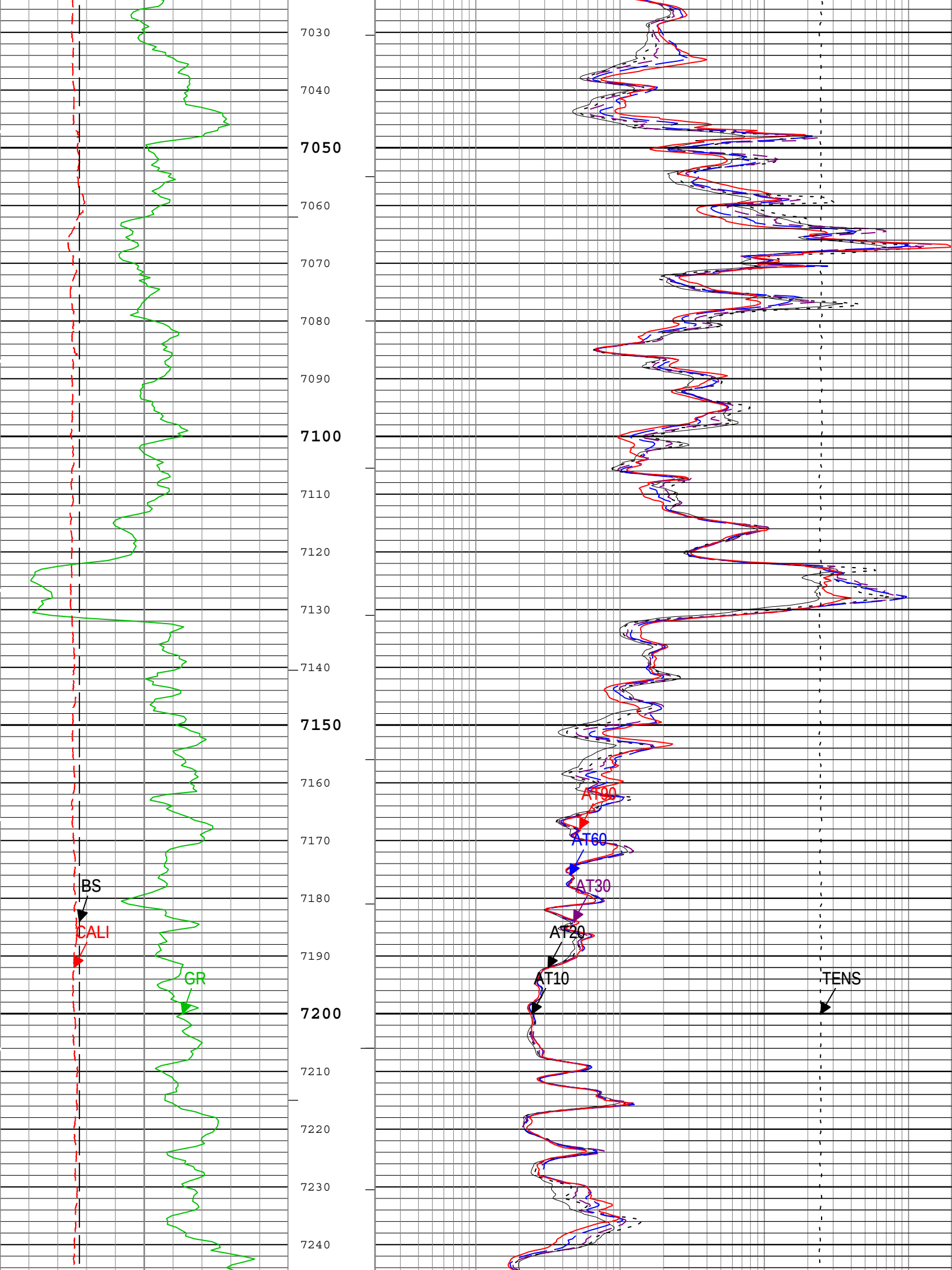
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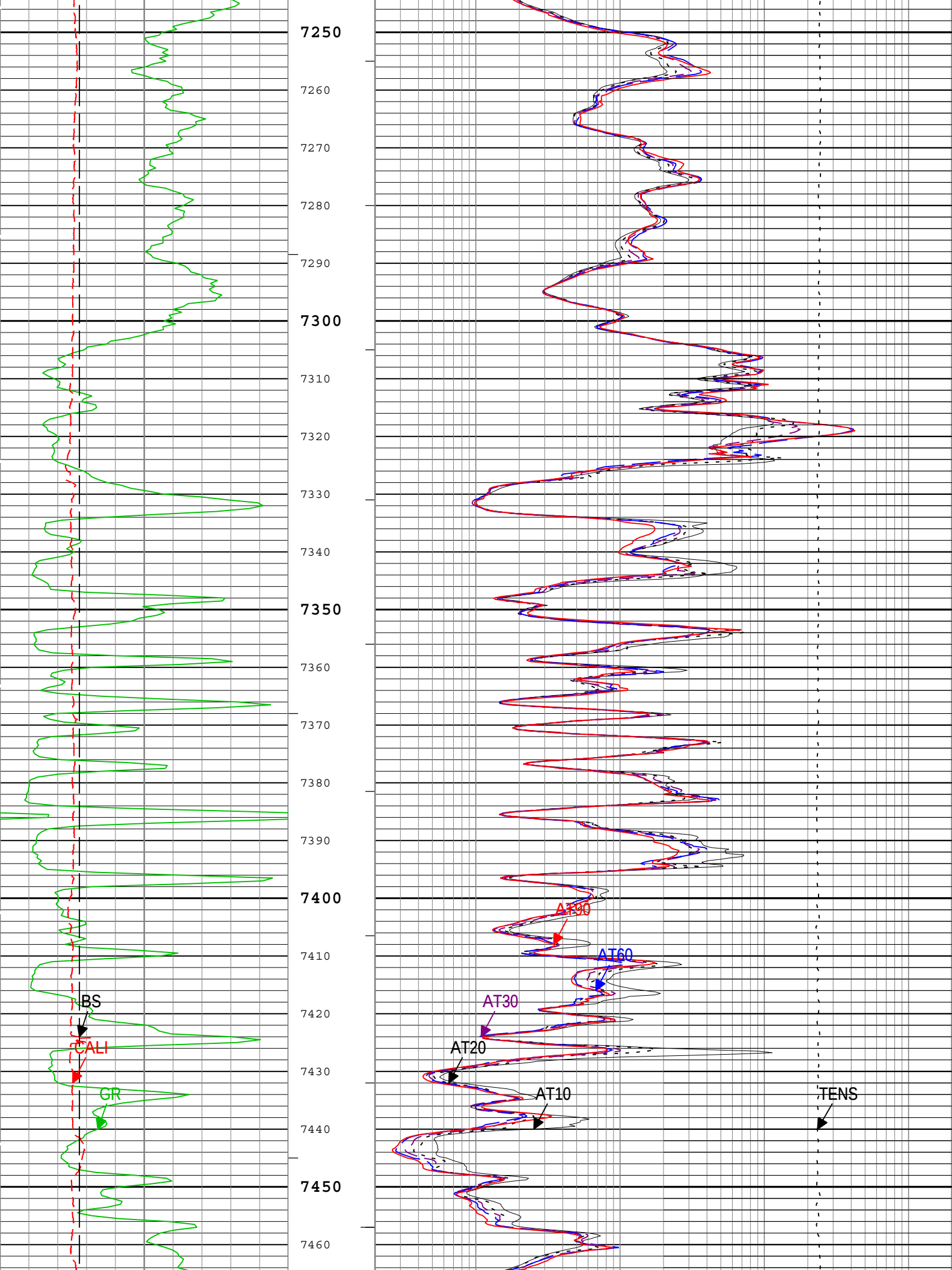
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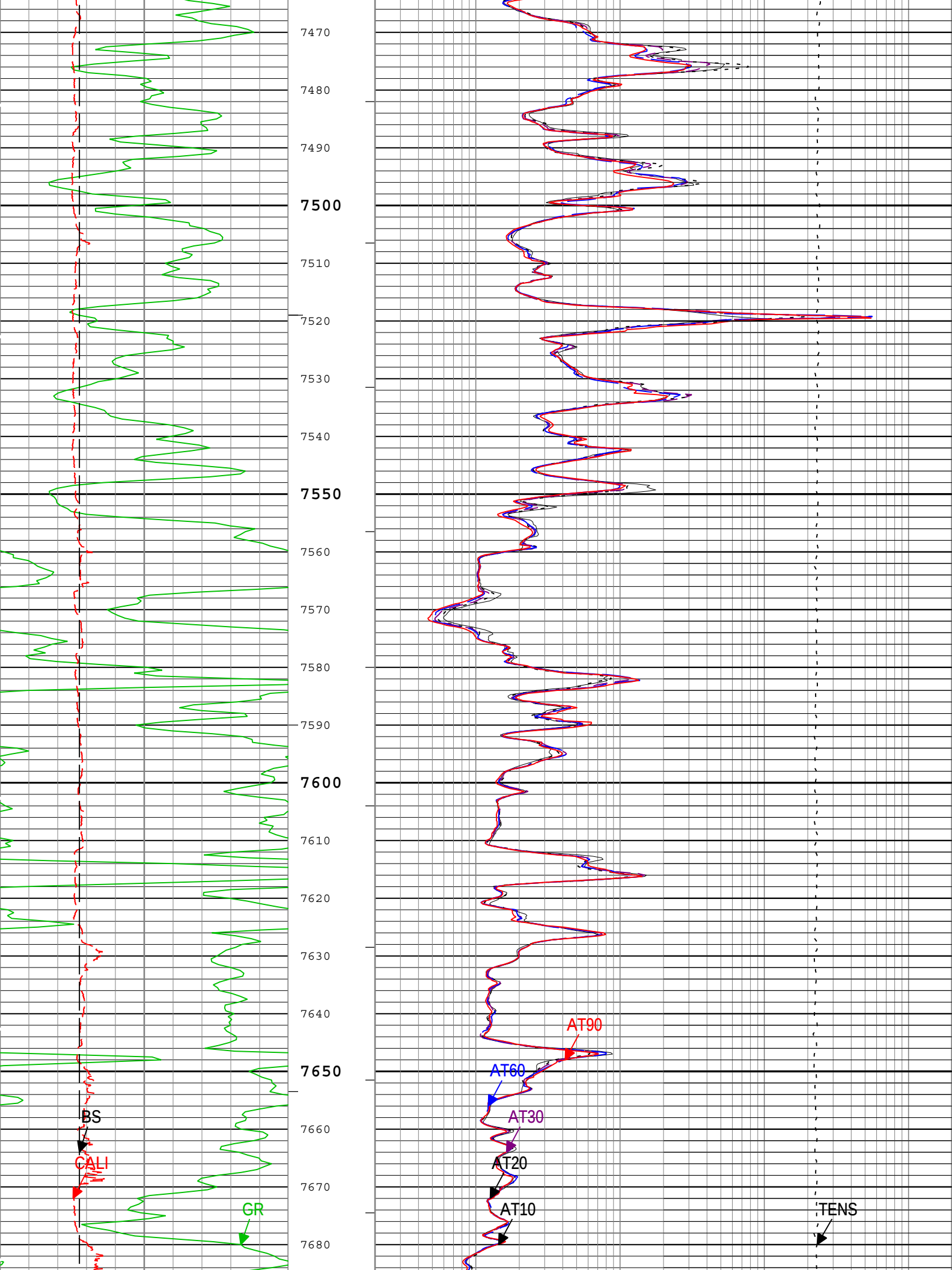
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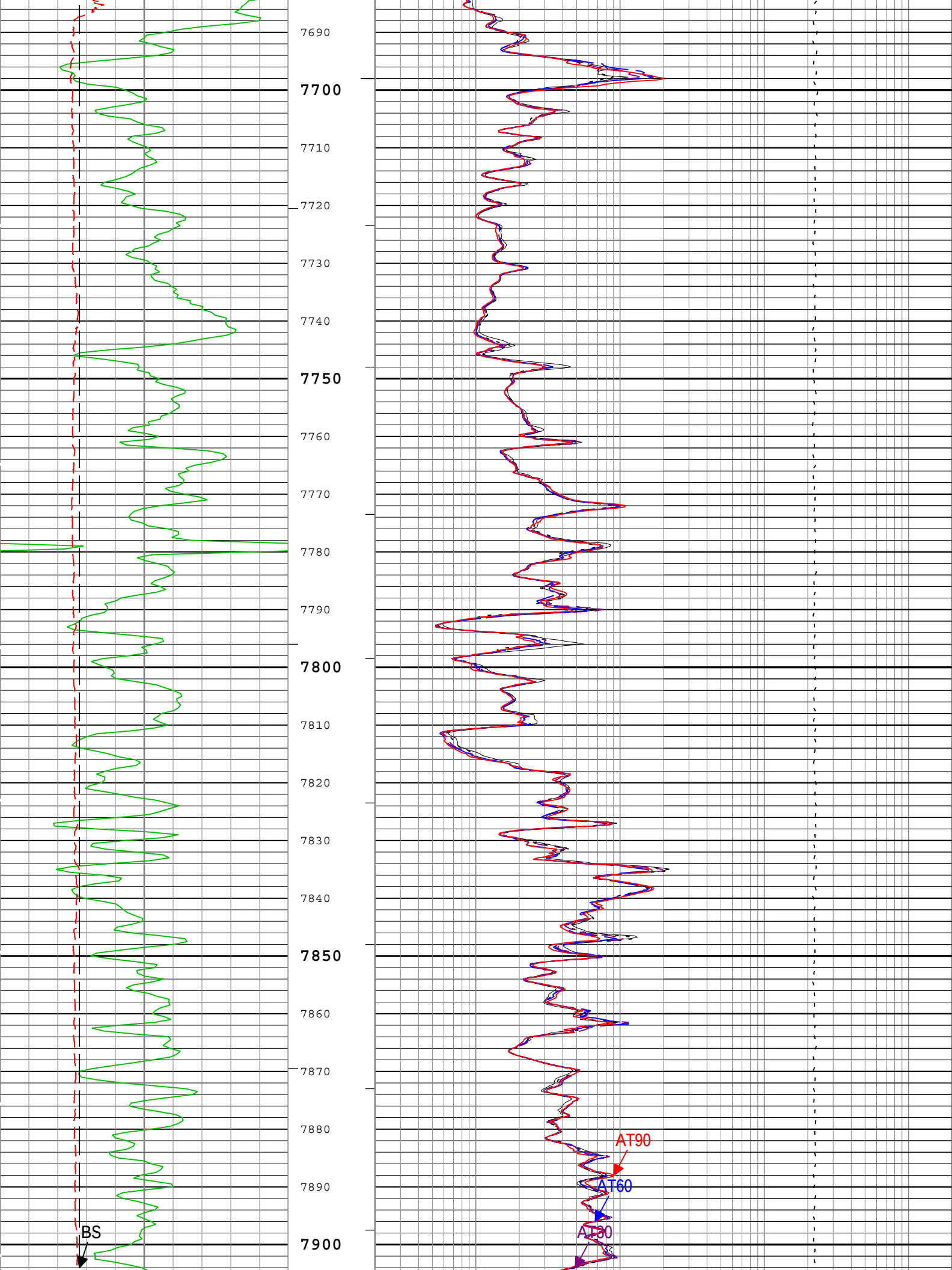
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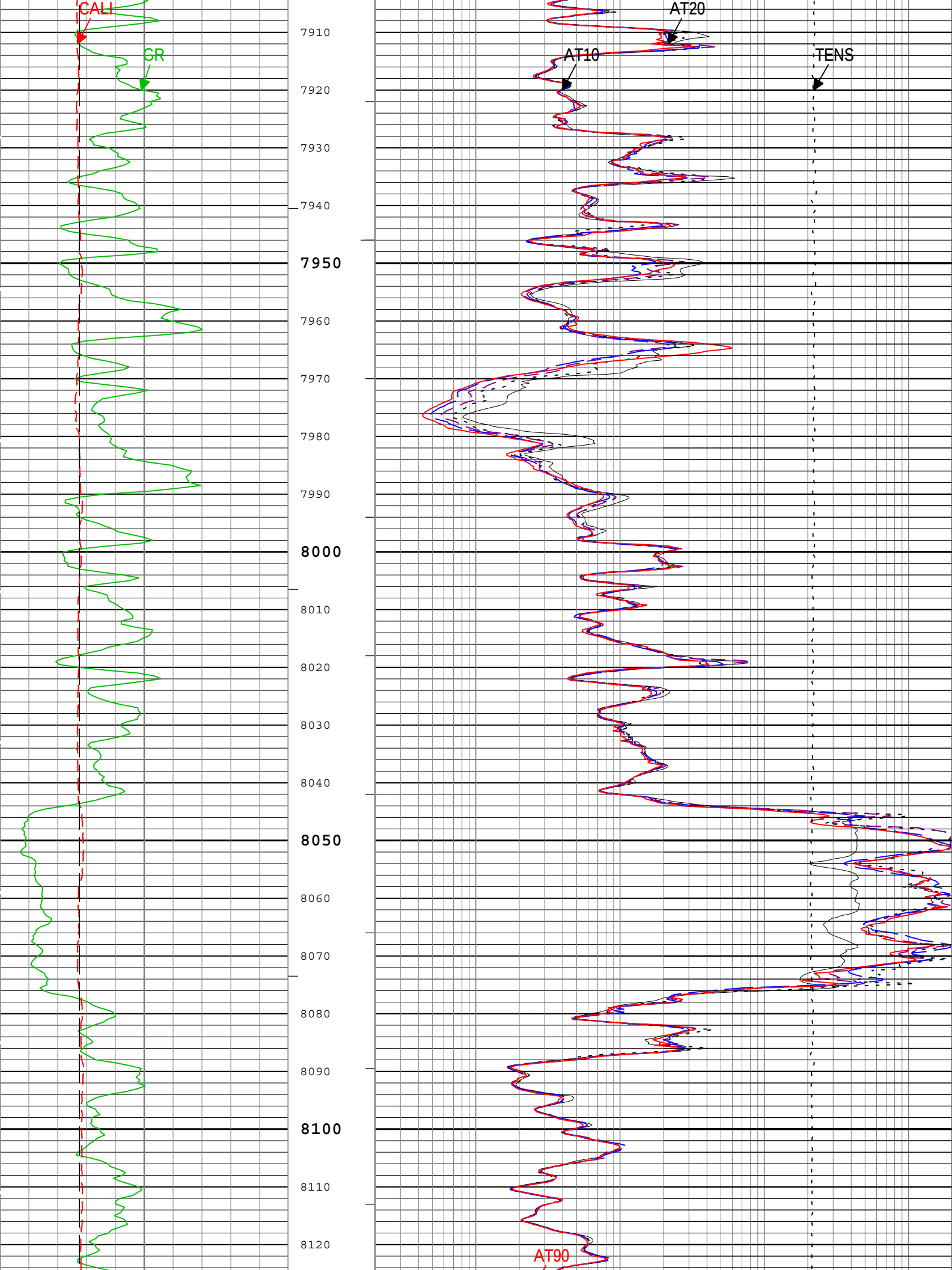
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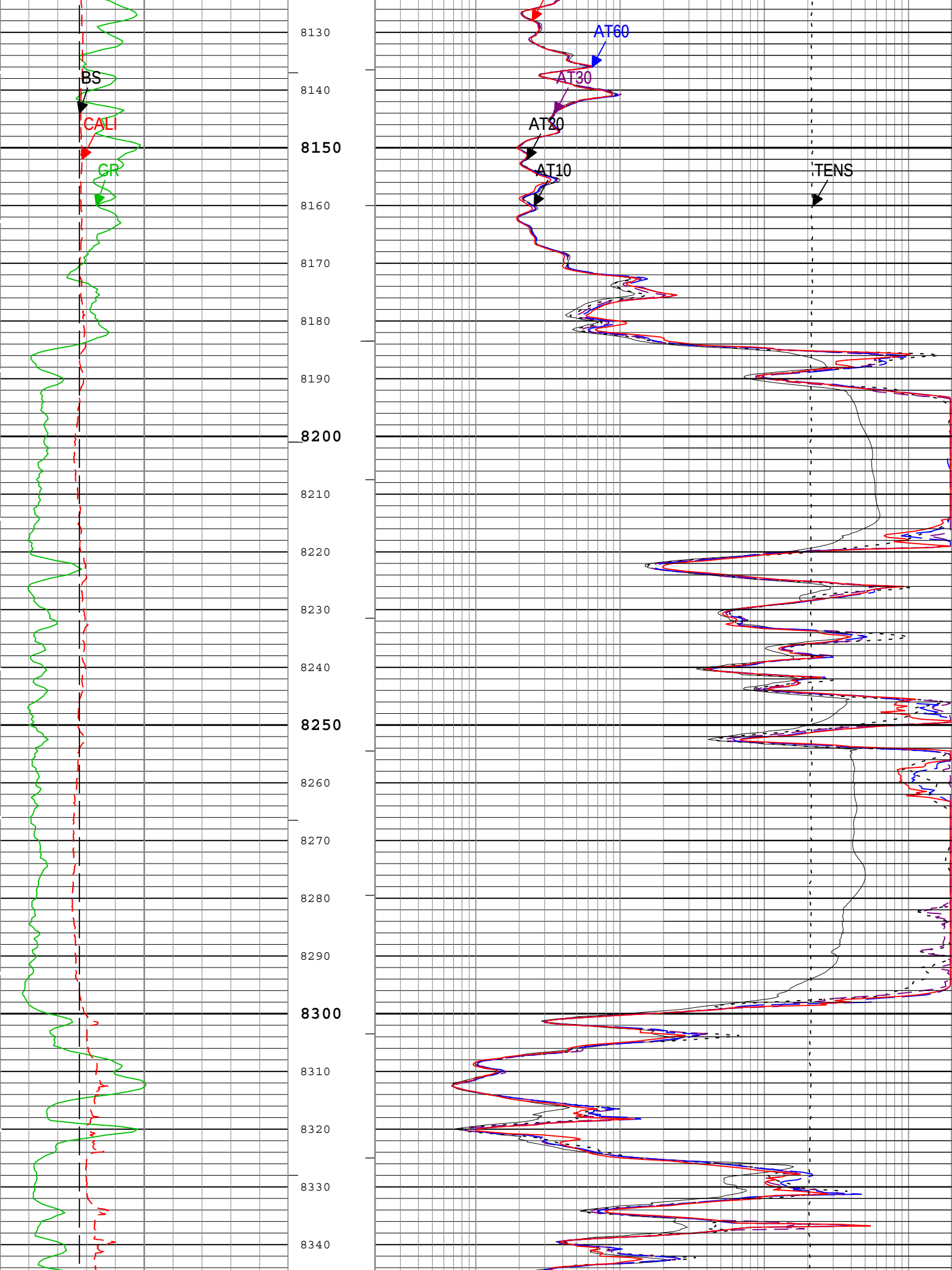
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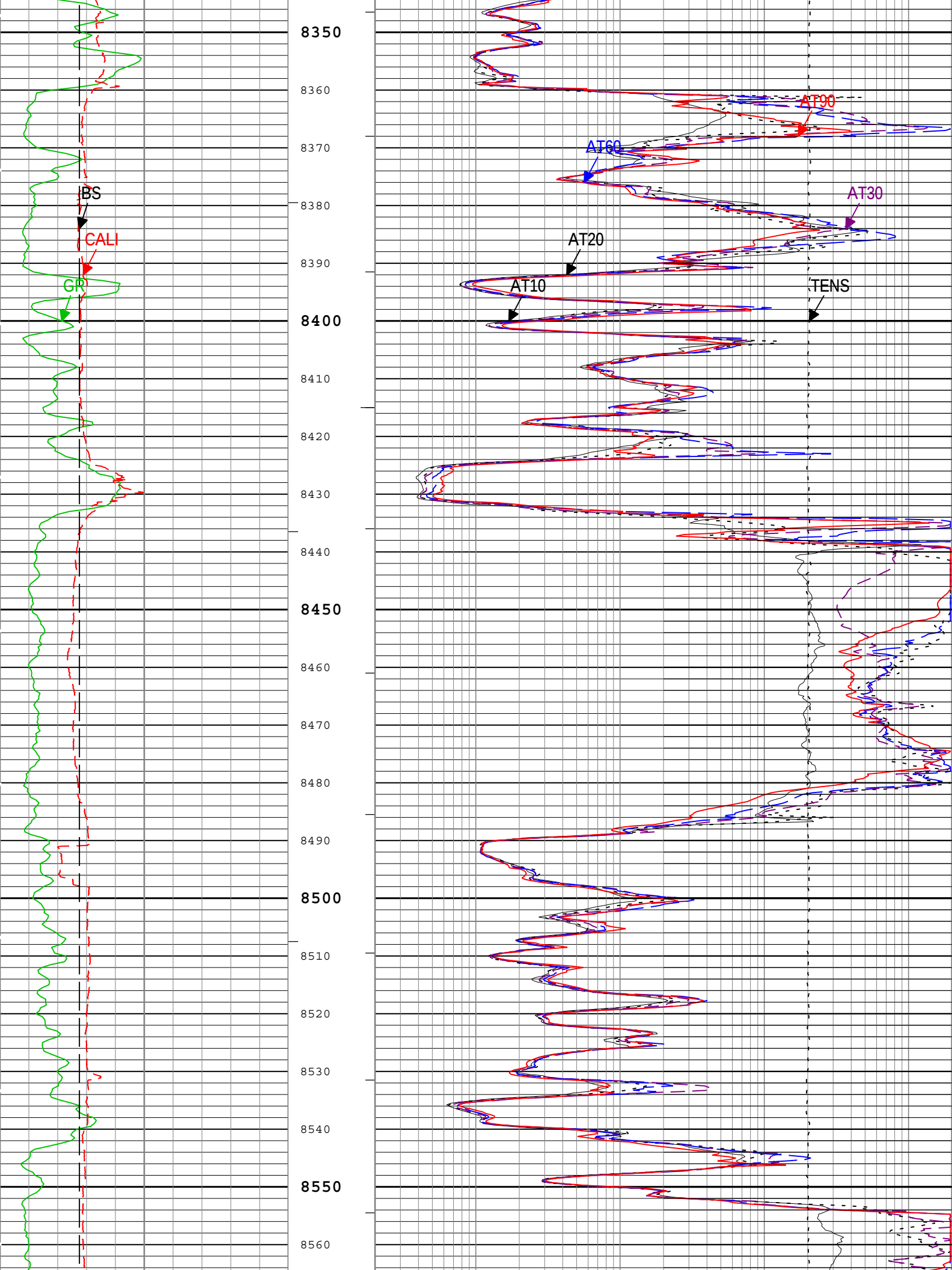
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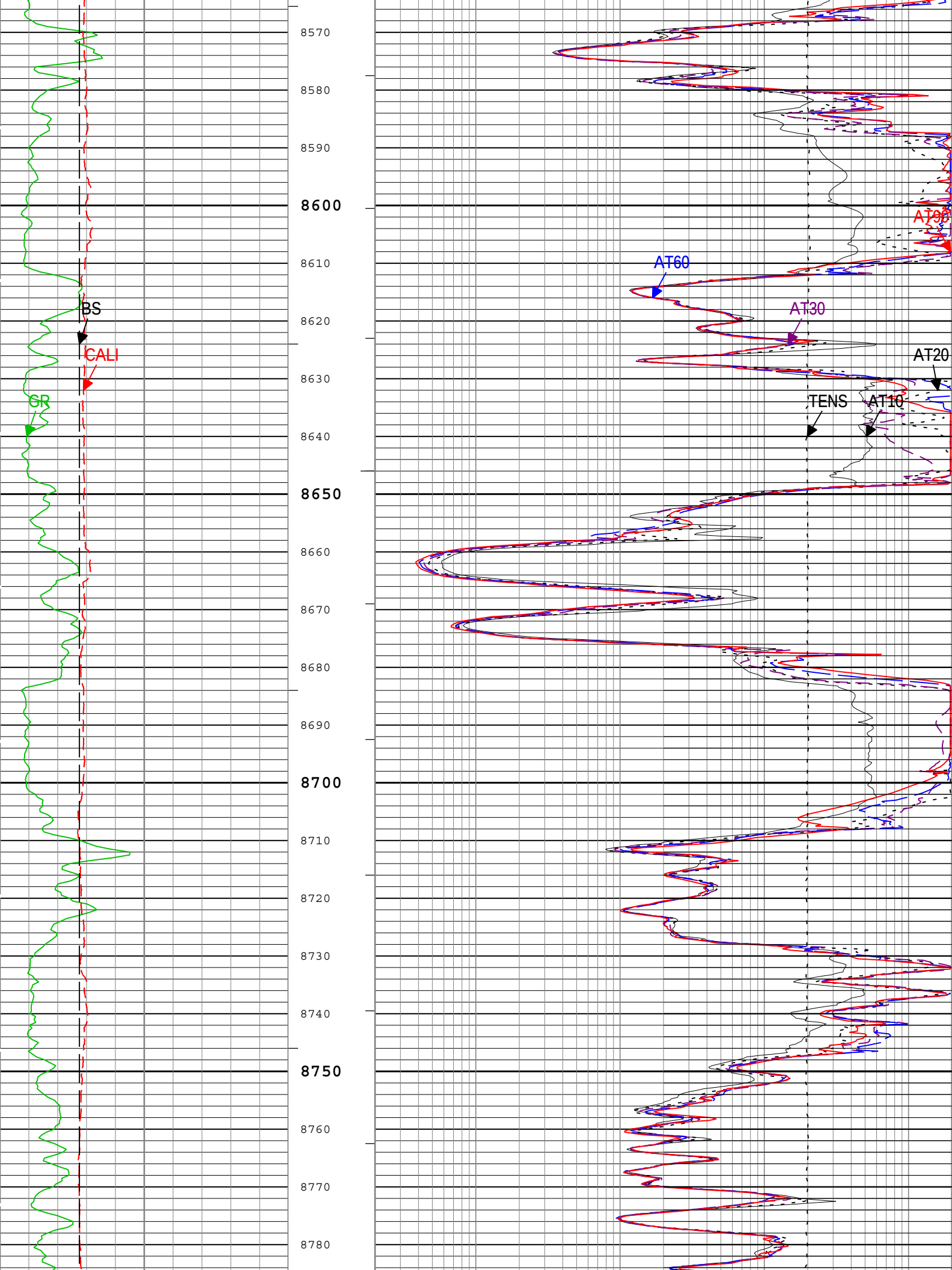
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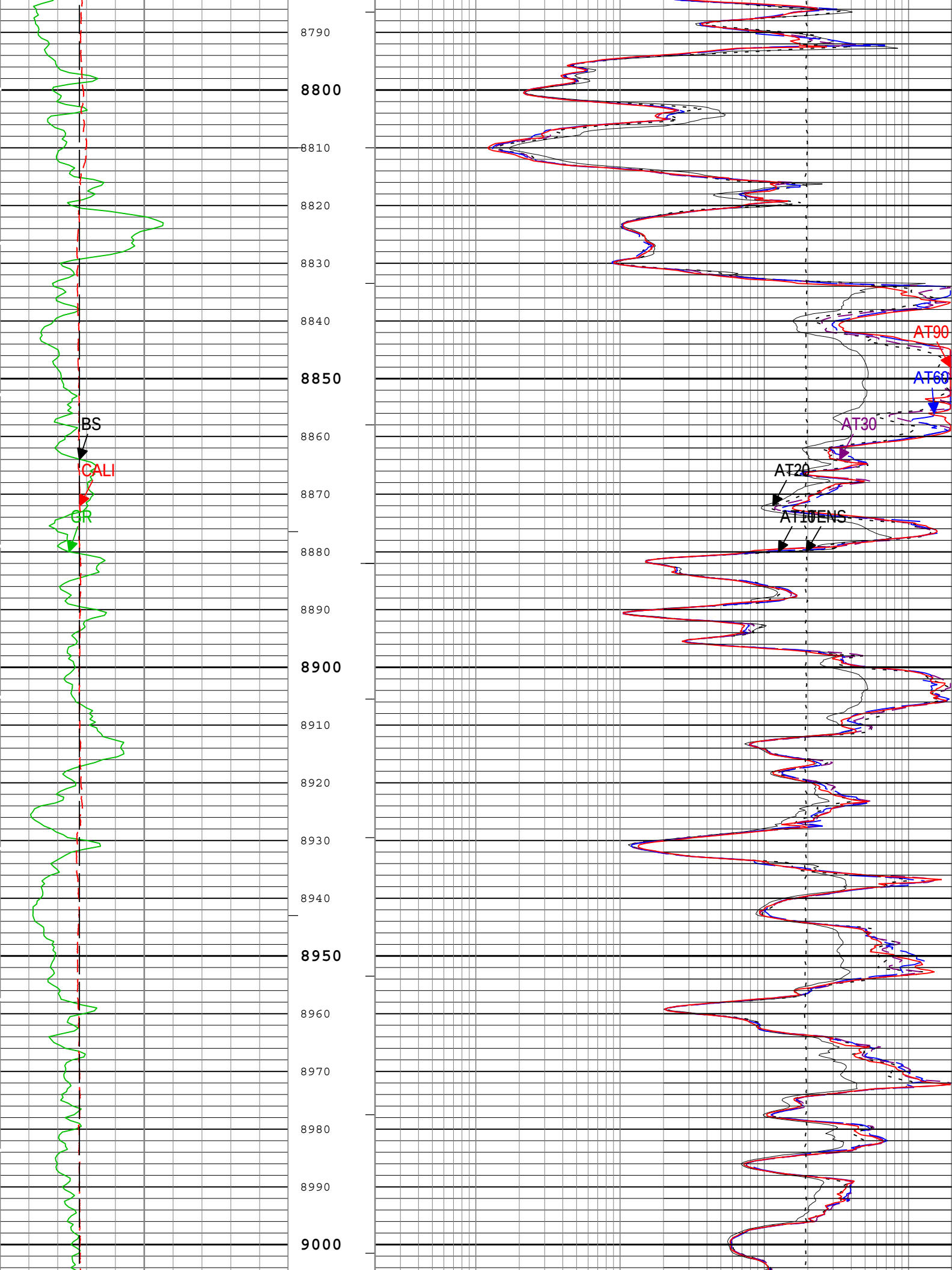
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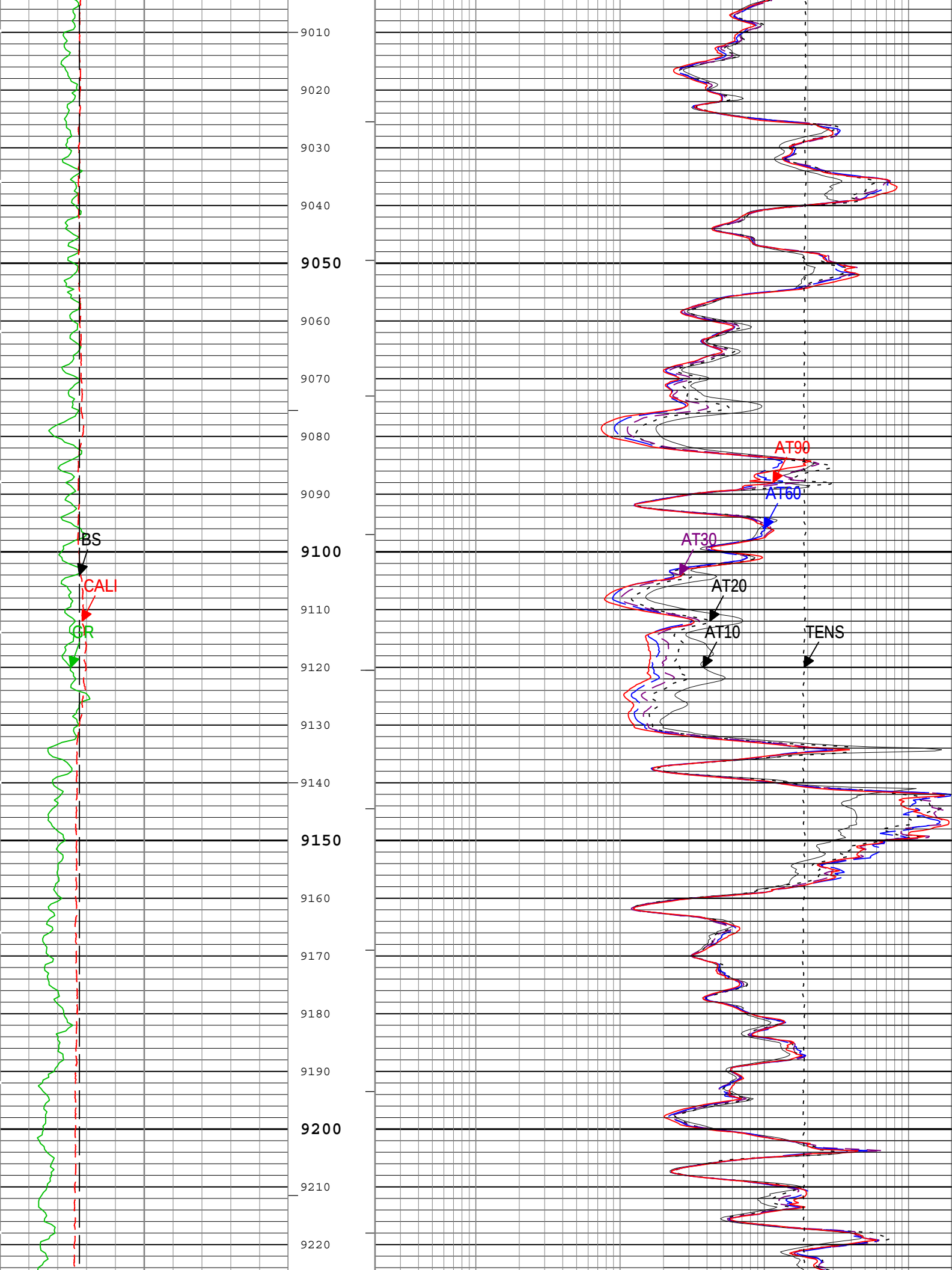
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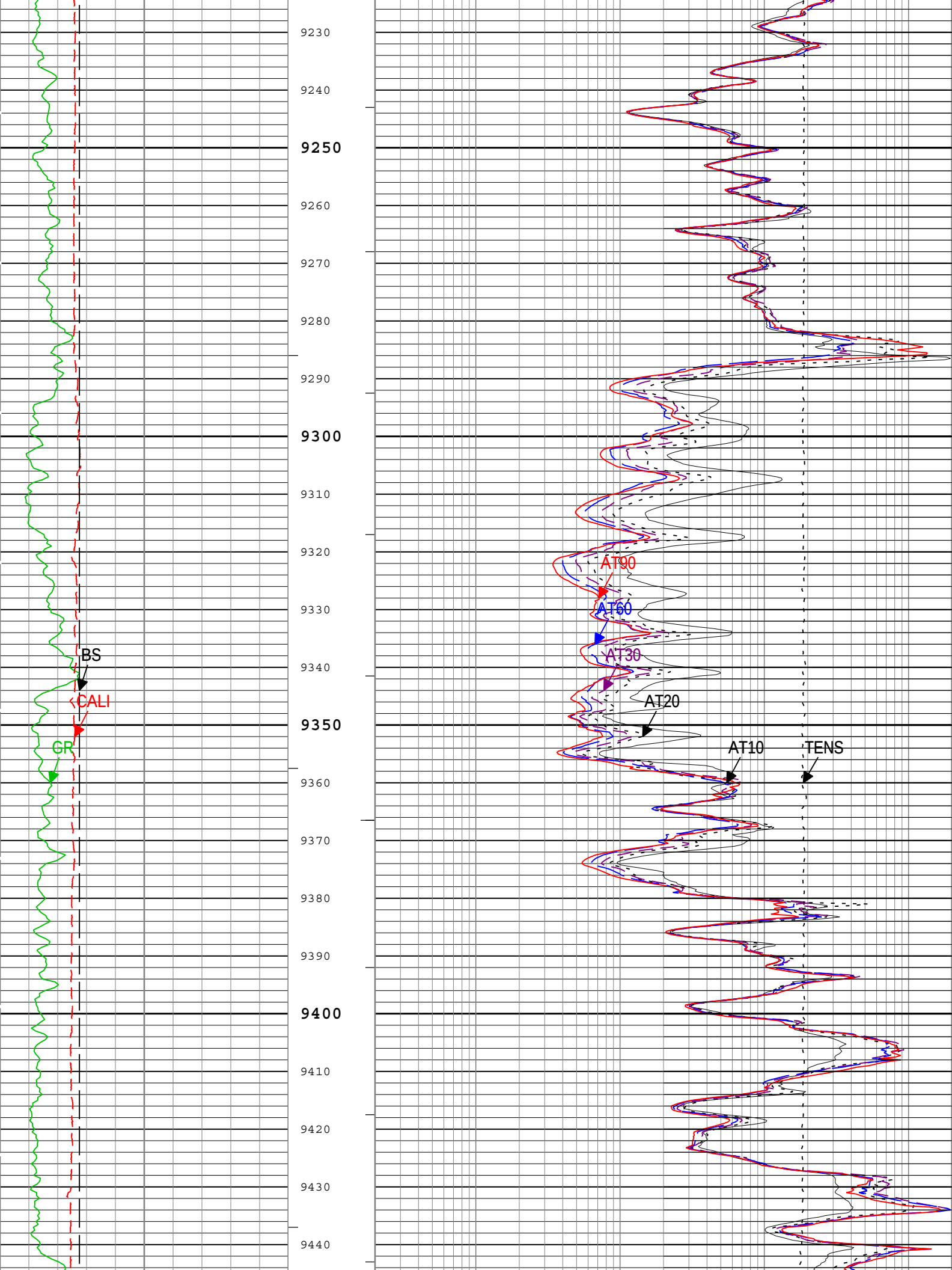
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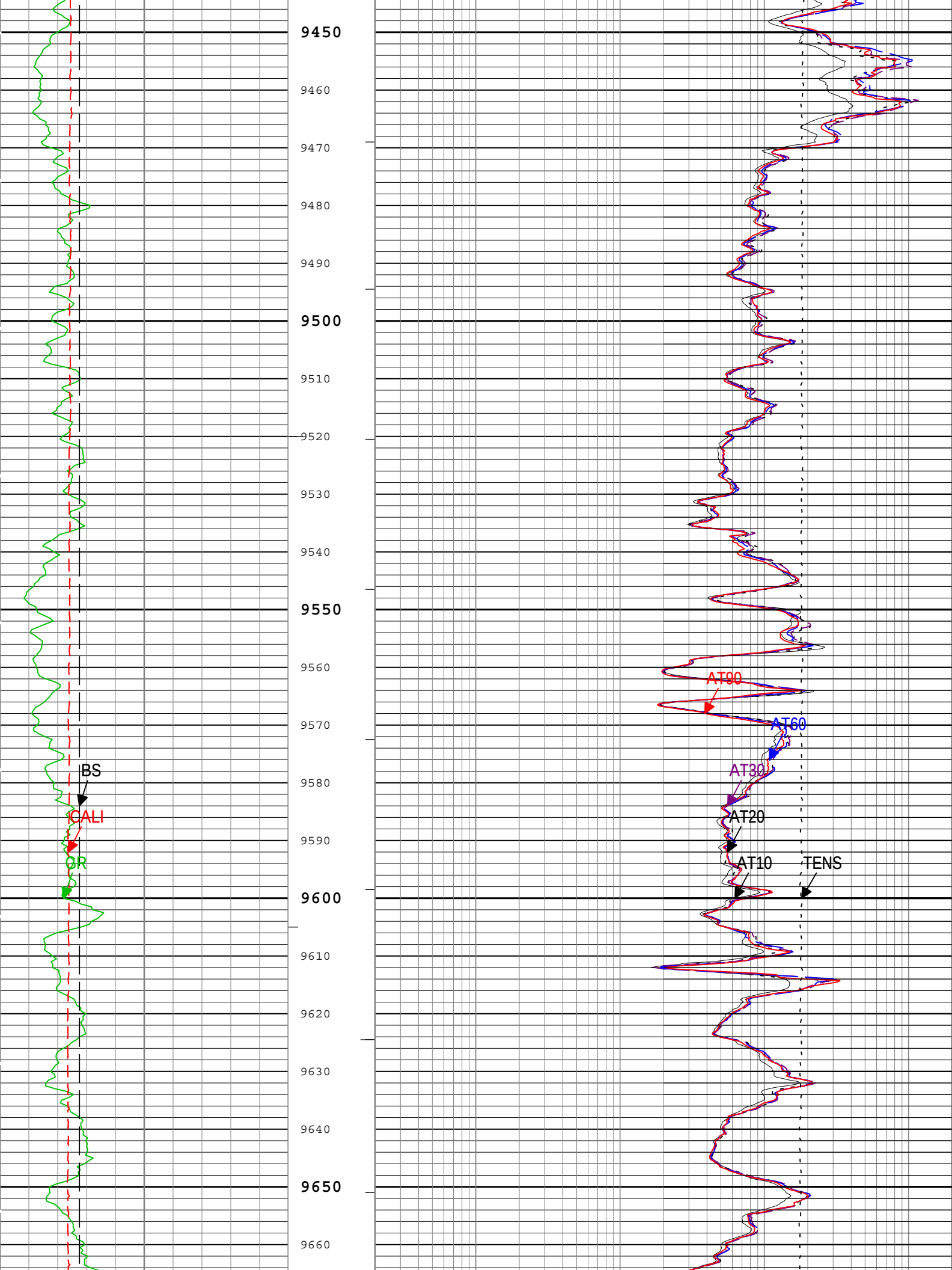
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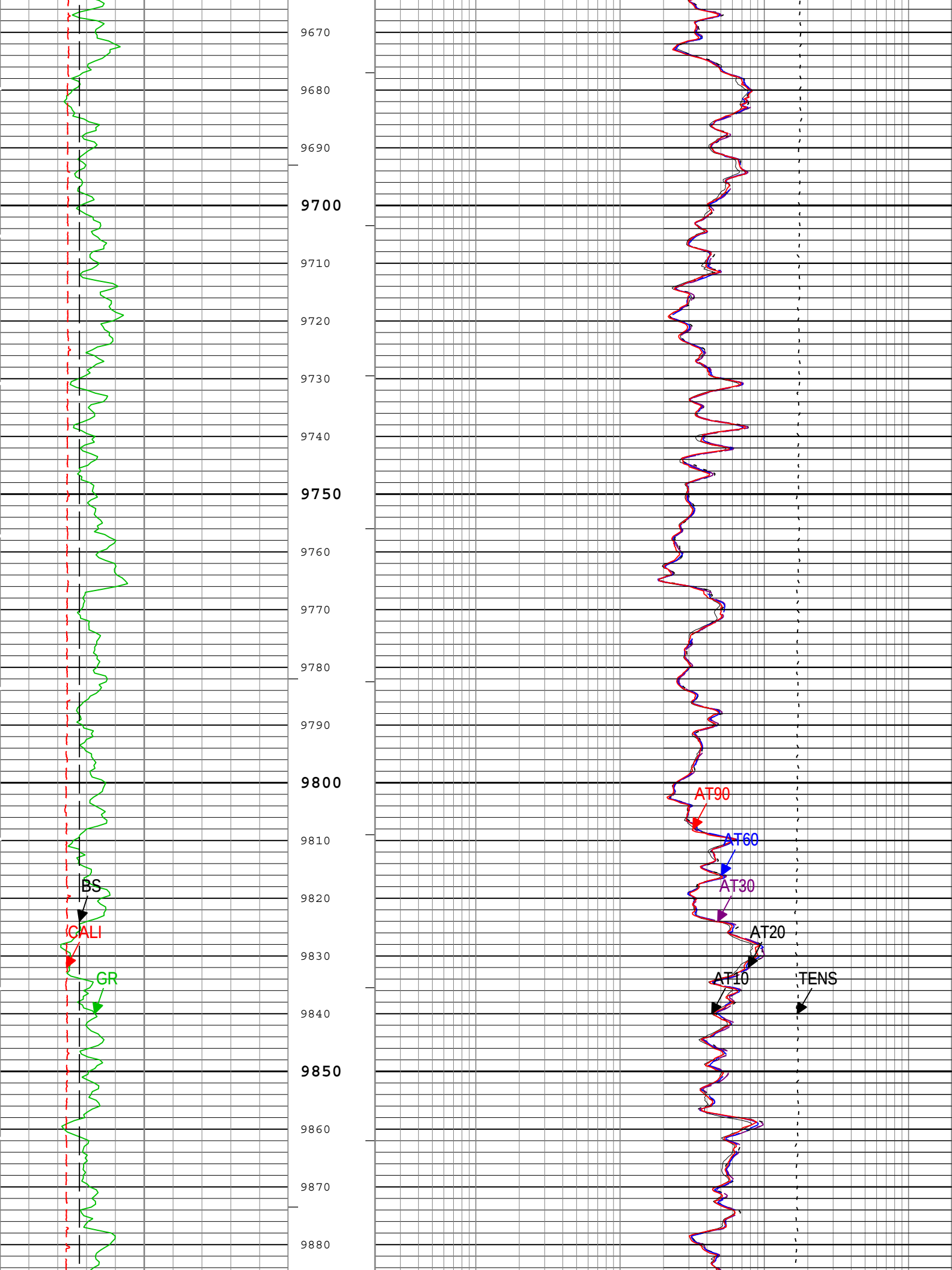
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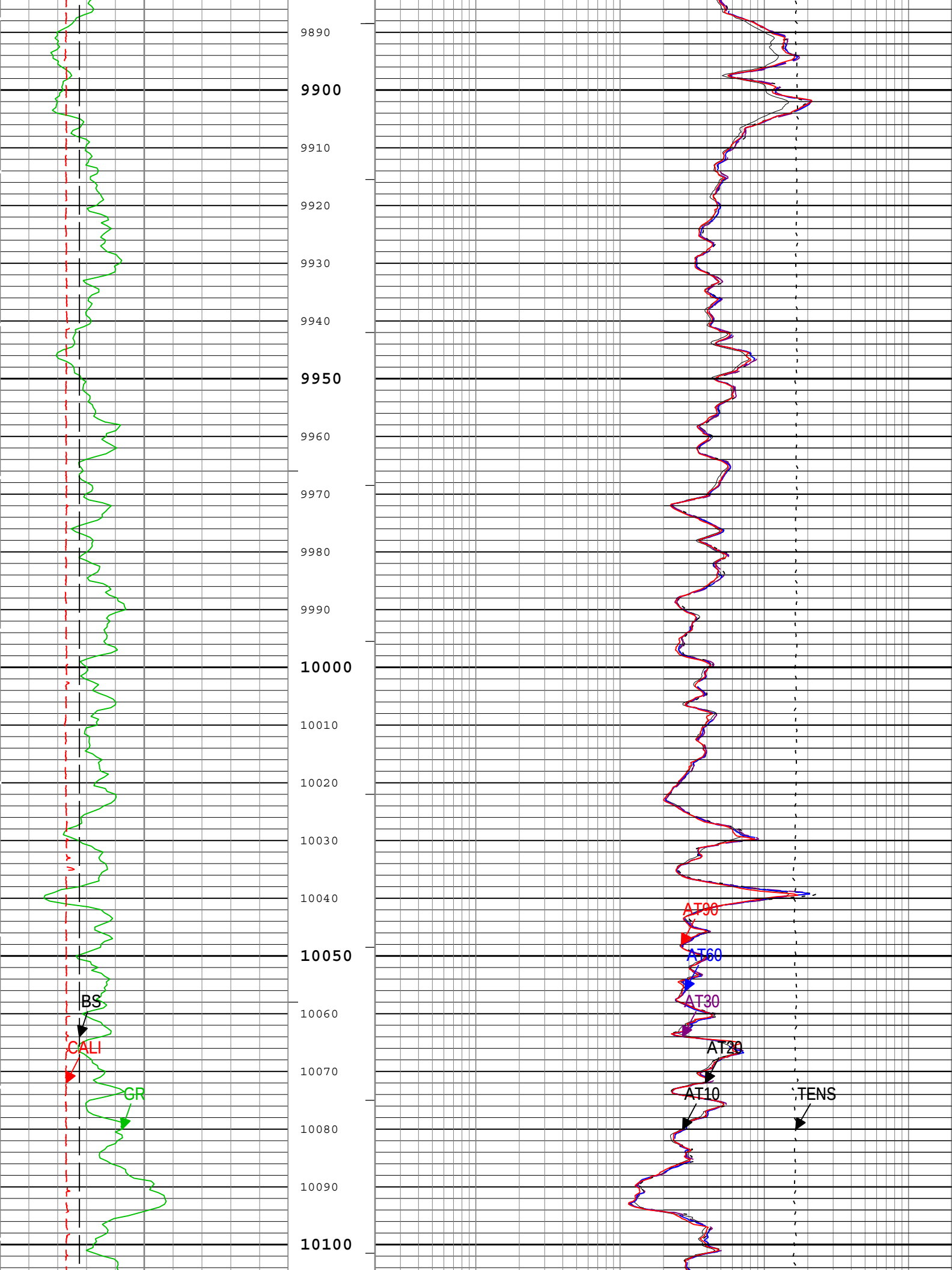
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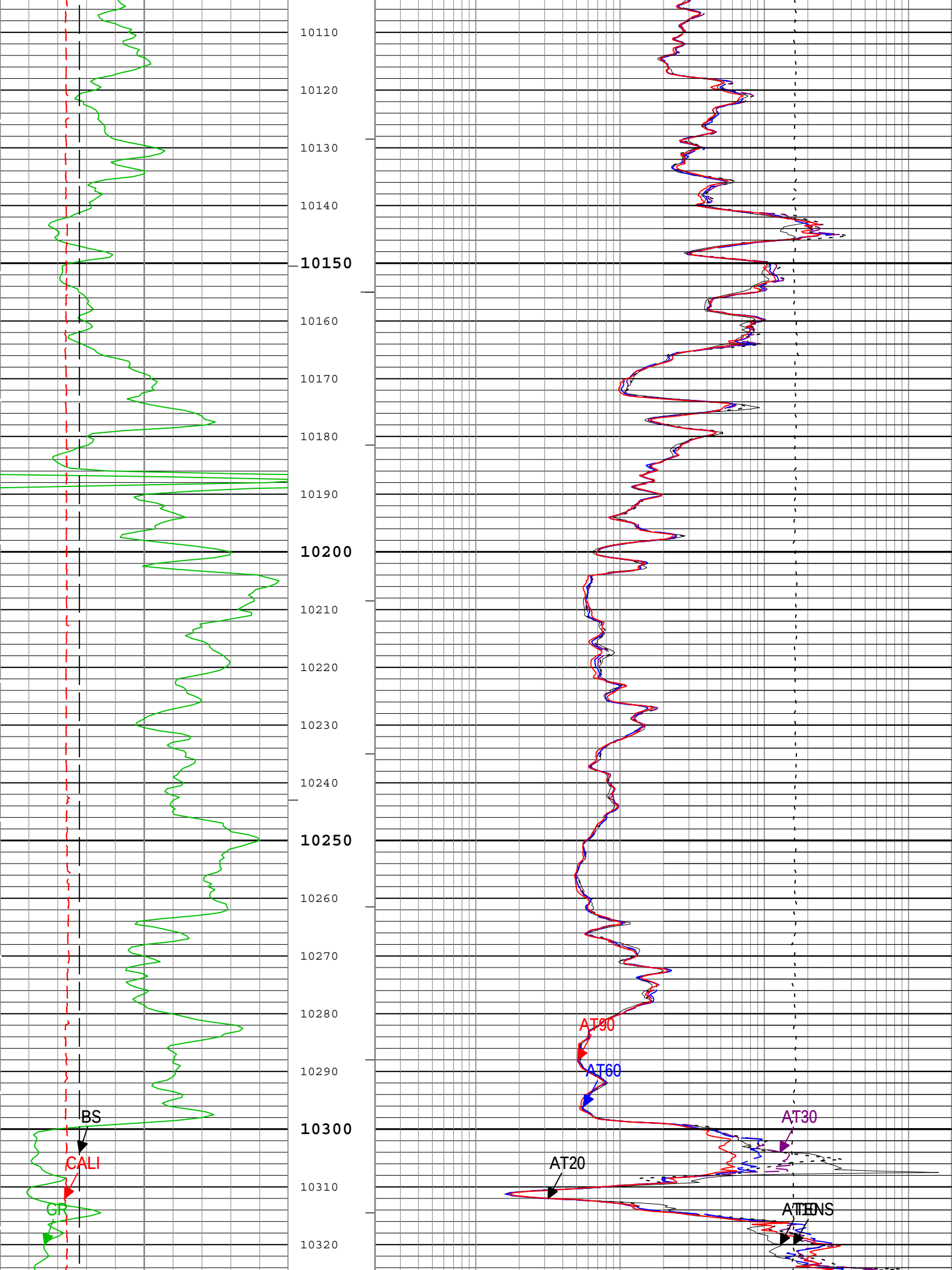
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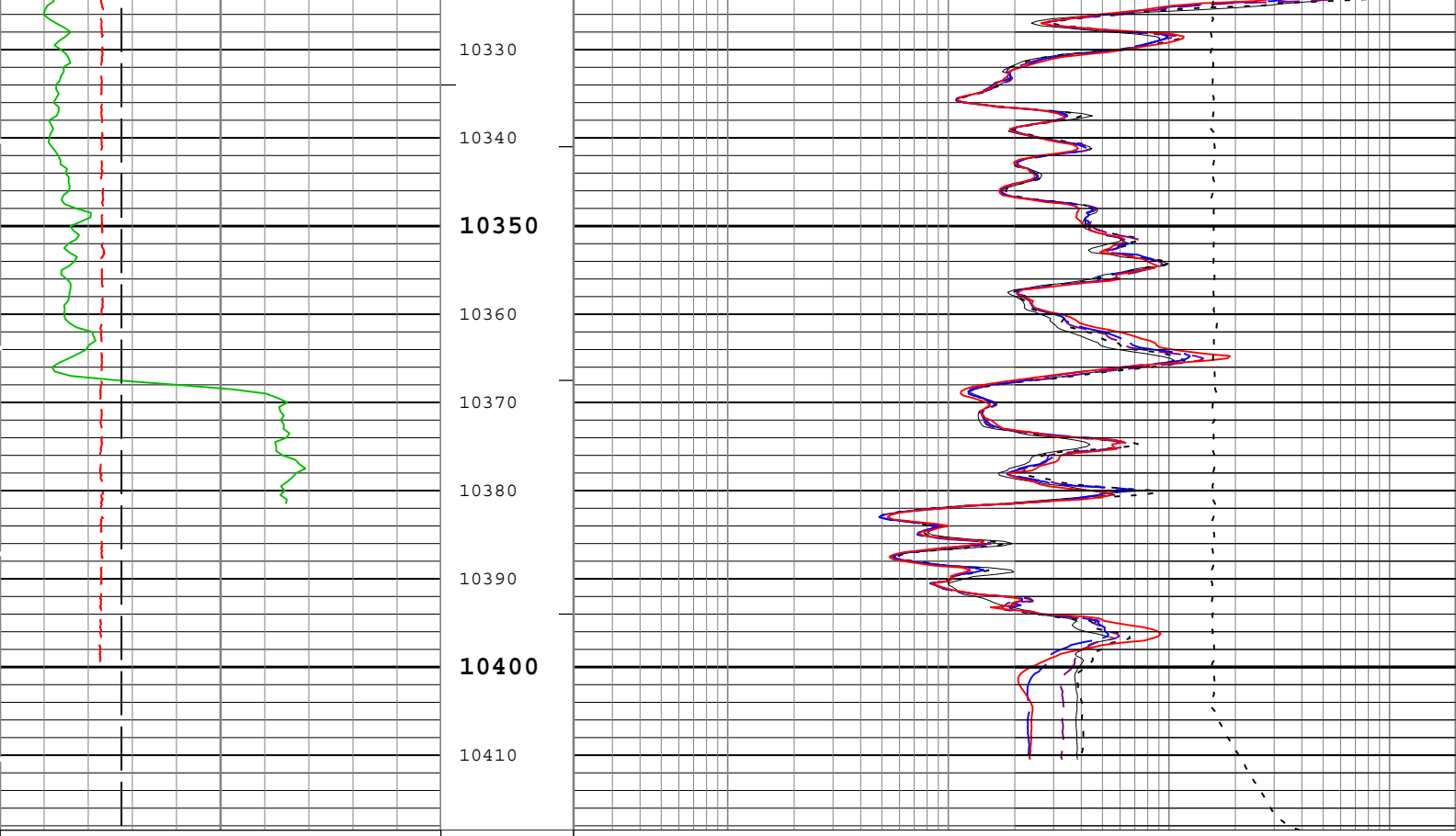


Gamma Ray (GR) HGNS[1]
0 gAPI 150

Caliper (CALI) HDRS[1]
6 in 16

Bit Size (BS)
6 in 16

Array Induction Two Foot Resistivity A10 (AT10) AIT_SpliceGroup[1]
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A20 (AT20) AIT_SpliceGroup[1]
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A30 (AT30) AIT_SpliceGroup[1]
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A60 (AT60) AIT_SpliceGroup[1]
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A90 (AT90) AIT_SpliceGroup[1]
0.2 ohm.m 2000

Cable Tension (TENS)
10000 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)

Description: AIT Basic Log Two Format: Log (AIT 5 Inch) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-May-2012 09:38:28

Channel Processing Parameters

1: Parameters

Parameter	Description	ToolPath	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M:AMIS:AMIS	Compute Mud Resistivity	
ABLM	Array Induction Basic Logs Mode	AIT-M:AMIS:AMIS	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M:AMIS:AMIS	Yes	
BARI	Barite Mud Presence Flag	Borehole	No	

BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	COMPLETION	8.75	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H:HRCC-H:HRCC-H	0	in
CBLO	Casing Bottom (Logger)	COMPLETION	1734	ft
CDEN	Cement Density	HGNS-H:HGNS-H:HGNS-H	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	COMPLETION	9.625	in
DFD	Drilling Fluid Density	Borehole	9.55	lbm/gal
FCD	Future Casing (Outer) Diameter	COMPLETION	7	in
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	CALI	
SOCO	Standoff Correction Option	HGNS-H:HGNS-H:HGNS-H	Yes	

Tool Control Parameters

1: Parameters

Parameter	Description	ToolPath	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed		Time Zoned	ft/h

1Time Zoned Parameters

Pass Log[2]:Down

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
MAX_LOG_SPEED	2473	09-May-2012 21:11:37	09-May-2012 22:14:10	1400.74	2913.24

Pass Log[4]:Up

MAX_LOG_SPEED	1800	09-May-2012 23:00:37	10-May-2012 04:16:09	10418.51	2040.57

All depth are at tool zero.

1

REPEAT ANALYSIS

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
1	Log[3]:Up	Up	10107.35 ft	10415.28 ft	09-May-2012 10:32:25 PM	09-May-2012 10:45:52 PM	7.29 ft	true
1	Log[4]:Up	Up	2040.57 ft	10418.51 ft	09-May-2012 11:00:32 PM	10-May-2012 4:16:09 AM	0.00 ft	true

All depths are referenced to toolstring zero

Log

1: Log[3]:Up 00268AD1-AEE1-4FF9-A0D1-13875141C99B

Description: AIT Basic Log Two Format: Log (AIT 5 Inch RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-May-2012 09:38:34

Channel	Source	Sampling
ICV	Borehole	6in
IHV	Borehole	6in
TIME_1900	WLWorkflow	0.1in

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)

TIME_1900 - Time Marked every 60.00 (s)

Main To Repeat

Repeat To Main

Repeat To Main

Cable Tension (TENS)

10000 lbf 0

Main To Repeat

Repeat To Main

Array Induction Two Foot Resistivity A90 (AT90) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Array Induction Two Foot Resistivity A10 (AT10) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Array Induction Two Foot Resistivity A60 (AT60) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Caliper (CALI) HDRS-H

6 in 16

Main To Repeat

Repeat To Main

Array Induction Two Foot Resistivity A30 (AT30) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Gamma Ray (GR) HGNS-H

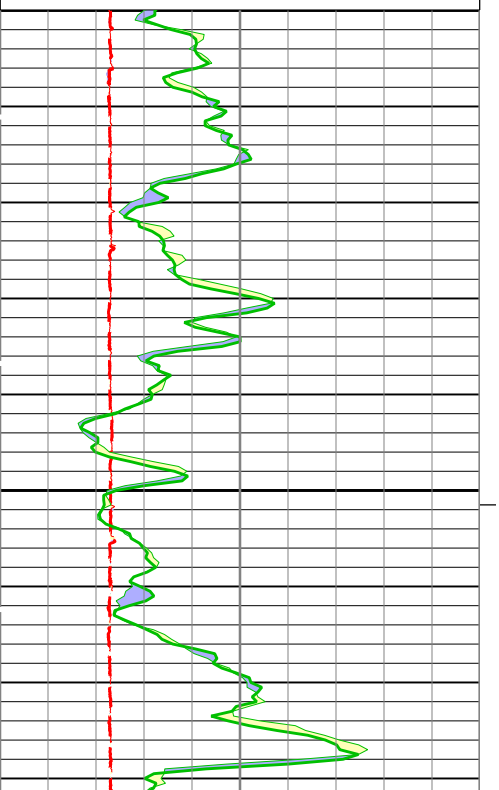
0 gAPI 150

Main To Repeat

Repeat To Main

Array Induction Two Foot Resistivity A20 (AT20) AIT-M

0.2 ohm.m 2000



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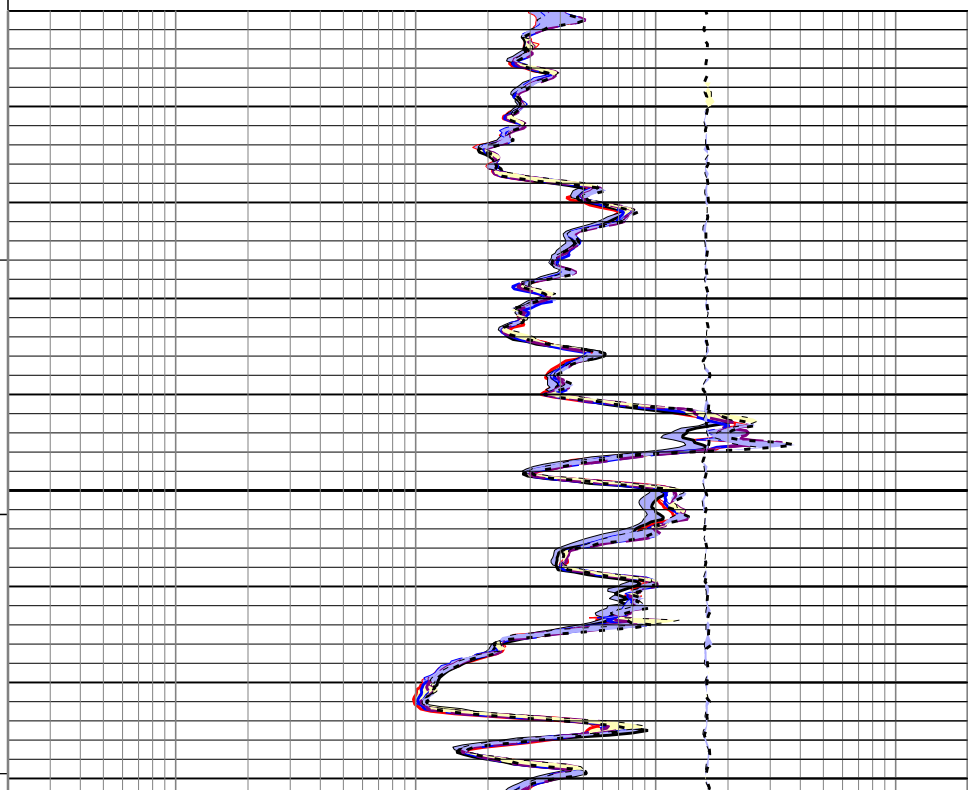
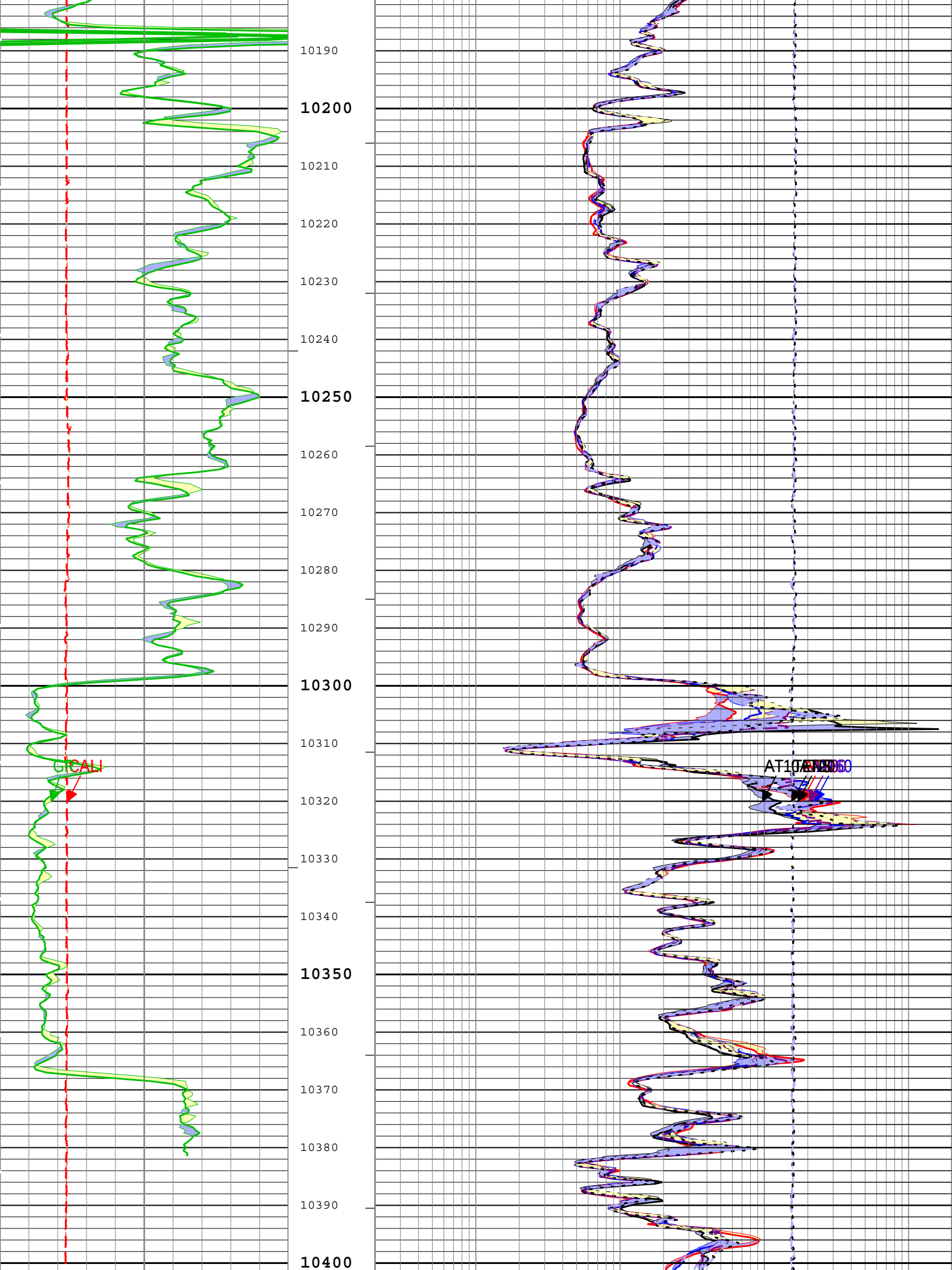
10180

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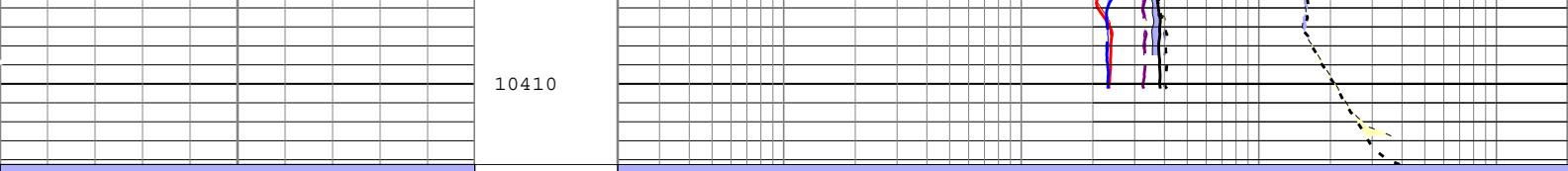

Main To Repeat

Repeat To Main

Caliper (CALI) HDRS-H

6 in 16

Main To Repeat

Repeat To Main

Gamma Ray (GR) HGNS-H

0 gAPI 150

Main To Repeat

Repeat To Main

Array Induction Two Foot Resistivity A90 (AT90) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Array Induction Two Foot Resistivity A10 (AT10) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Array Induction Two Foot Resistivity A60 (AT60) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Array Induction Two Foot Resistivity A30 (AT30) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Array Induction Two Foot Resistivity A20 (AT20) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Cable Tension (TENS)

10000 lbf 0

TIME_1900 - Time Marked every 60.00 (s)

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)

Description: AIT Basic Log Two Format: Log (AIT 5 Inch RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-May-2012 09:38:34

Calibration Report

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

Primary Equipment :

Array Induction Sonde - M	AMIS	155

AIT Sonde Calibration - Test Loop Gain

Master (EEPROM): 10:55:36 19-Mar-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Test Loop Gain - 0		Master	1.000	0.950	1.021	1.050
Test Loop Phase - 0	deg	Master	0	-3.000	0.566	3.000
Test Loop Gain - 1		Master	1.000	0.950	1.021	1.050
Test Loop Phase - 1	deg	Master	0	-3.000	0.648	3.000
Test Loop Gain - 2		Master	1.000	0.950	1.022	1.050
Test Loop Phase - 2	deg	Master	0	-3.000	0.085	3.000
Test Loop Gain - 3		Master	1.000	0.950	1.016	1.050
Test Loop Phase - 3	deg	Master	0	-3.000	0.119	3.000
Test Loop Gain - 4		Master	1.000	0.950	1.003	1.050
Test Loop Phase - 4	deg	Master	0	-3.000	0.061	3.000
Test Loop Gain - 5		Master	1.000	0.950	0.988	1.050
Test Loop Phase - 5	deg	Master	0	-3.000	-0.125	3.000
Test Loop Gain - 6		Master	1.000	0.950	1.000	1.050
Test Loop Phase - 6	deg	Master	0	-3.000	0.222	3.000
Test Loop Gain - 7		Master	1.000	0.950	1.008	1.050
Test Loop Phase - 7	deg	Master	0	-3.000	-0.081	3.000

AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM): 10:55:36 19-Mar-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Sonde Error Correction Real - 0	mS/m	Master	-----	-231.000	-21.005	119.000
Sonde Error Correction Quad - 0		Master	-----	-2250.000	313.886	2250.000
Sonde Error Correction Real - 1	mS/m	Master	-----	114.000	144.583	204.000
Sonde Error Correction Quad - 1		Master	-----	-625.000	283.047	625.000
Sonde Error Correction Real - 2	mS/m	Master	-----	66.000	108.098	156.000
Sonde Error Correction Quad - 2		Master	-----	-350.000	-69.441	350.000
Sonde Error Correction Real - 3	mS/m	Master	-----	39.000	60.745	89.000
Sonde Error Correction Quad - 3		Master	-----	-250.000	-2.619	250.000
Sonde Error Correction Real - 4	mS/m	Master	-----	15.000	23.857	35.000
Sonde Error Correction Quad - 4		Master	-----	-63.000	-15.741	63.000
Sonde Error Correction Real - 5	mS/m	Master	-----	4.000	14.266	24.000
Sonde Error Correction Quad - 5		Master	-----	-50.000	-3.844	50.000
Sonde Error Correction Real - 6	mS/m	Master	-----	5.000	9.184	15.000
Sonde Error Correction Quad - 6		Master	-----	-30.000	-6.971	30.000
Sonde Error Correction Real - 7	mS/m	Master	-----	-5.000	-1.908	5.000
Sonde Error Correction Quad - 7		Master	-----	-30.000	-3.891	30.000

AIT Mud Calibration - Mud Calibration Gain

Master (Manual Entry): 01:31:10 09-Jan-2012 Expired by 31 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Coarse Gain		Master	1.000	0.800	0.848	1.200
Fine Gain		Master	1.000	0.800	0.848	1.200

AIT Electronics Check - Thru Calibration Check

Master (EEPROM): 10:55:36 19-Mar-2012 Before (Measured): 20:04:49 08-May-2012 Expired by 1 days After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Thru Cal Mag - 0	V	Master	-----	0.366	0.615	0.854
		Before	-----	0.366	0.615	0.854
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 0	deg	Master	-----	137.000	-167.891	-103.000
		Before	-----	137.000	-154.211	-103.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	13.680	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 1	V	Master	-----	0.762	1.261	1.778
		Before	-----	0.762	1.261	1.778
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 1	deg	Master	-----	136.000	-168.988	-104.000
		Before	-----	136.000	-155.304	-104.000

		After	-----	-----	-----	-----
		Before-Master	-----	-----	13.684	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 2	V	Master	-----	0.372	0.624	0.868
		Before	-----	0.372	0.625	0.868
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.001	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 2	deg	Master	-----	132.000	-172.616	-108.000
		Before	-----	132.000	-158.929	-108.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	13.687	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 3	V	Master	-----	0.420	0.706	0.980
		Before	-----	0.420	0.706	0.980
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 3	deg	Master	-----	131.000	-173.403	-109.000
		Before	-----	131.000	-159.717	-109.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	13.686	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 4	V	Master	-----	0.804	1.320	1.876
		Before	-----	0.804	1.320	1.876
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 4	deg	Master	-----	125.000	-179.674	-115.000
		Before	-----	125.000	-165.984	-115.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	13.690	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 5	V	Master	-----	1.176	1.924	2.744
		Before	-----	1.176	1.924	2.744
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 5	deg	Master	-----	122.000	178.652	-118.000
		Before	-----	122.000	-167.654	-118.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-346.306	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 6	V	Master	-----	1.176	1.923	2.744
		Before	-----	1.176	1.923	2.744
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 6	deg	Master	-----	121.000	178.674	-119.000
		Before	-----	121.000	-167.632	-119.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-346.306	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 7	V	Master	-----	0.846	1.378	1.974
		Before	-----	0.846	1.378	1.974
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 7	deg	Master	-----	115.000	177.965	-125.000
		Before	-----	115.000	-168.264	-125.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-346.229	-----
		After-Before	-----	-----	-----	-----
SPA Zero	mV	Master	-----	-50.000	-0.137	50.000
		Before	-----	-50.000	-0.110	50.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.027	-----
		After-Before	-----	-----	-----	-----

SPA Plus	mV	Master	-----	941.000	991.684	1040.000
		Before	-----	941.000	991.766	1040.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.082	-----
		After-Before	-----	-----	-----	-----
Temperature Zero	V	Master	-----	-0.050	0.000	0.050
		Before	-----	-0.050	0.000	0.050
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Temperature Plus	V	Master	-----	0.870	0.919	0.960
		Before	-----	0.870	0.919	0.960
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----

Company: FIDELITY EXPLORATION & PRODUCTION COMP

Schlumberger

Well: EDAM 15-22H

Field: WILDCAT

County: RICHLAND

State: MONTANA

PLATFORM EXPRESS

ARRAY INDUCTION TOOL

GAMMA RAY