Schlumberger

Company: Nighthawk Production LLC

Well: Big Sky 4-11

Field: Wildcat

County: Lincoln State: Colorado

Platform Express

Compensated Neutron Log

LithoDensity

County: Lincoln
Field: Wildcat
Location: NWNW
Well: Big Sky 4-11
Company: Nighthawk Production LLC

Location:				
NWNW SHL: 615' FNL X 622' FWL	Elev.	K.B.	5208.00 ft	
		G.L.	5193.00 ft	
		D.F.	5207.00 ft	
Permanent Datum:	Ground Level	Elev.:	5193.00 f	
Log Measured From:	Kelly Bushing	15.00 ft	above Perm.Datum	
Drilling Measured From:	Kelly Bushing			

API Serial No.	Section:	Township:	Range:
05-073-06523-0000	11	6S	54W

Logging Date			12-May-2013			
Run Number			1			
Depth Driller			8350.00 ft			
Schlumberger Depth			8342.00 ft			
Bottom Log Interval			8334.00 ft			
Top Log Interval			308.00 ft			
Casing Driller Size @ Depth			8.625 in @ 300.00 ft			
Casing Schlumberger			309 ft			
Bit Size			7.875 in			
Type Fluid In Hole			Fresh Water			
MUD	Density	Viscosity	9.2 lbm/gal	90 s		
	Fluid Loss	PH	8 cm3	7.3		
	Source of Sample		Active Tank			
RM @ Meas Temp			0.53 ohm.m @ 60 degF			
RMF @ Meas Temp			0.4 ohm.m @ 60 degF			
RMC @ Meas Temp			0.81 ohm.m @ 60 degF			
Source RMF	RMC		Calculated	Calculated		
RM @ BHT	RMF @ BHT		0.18 @ 190	0.14 @ 190		
Max Recorded Temperatures			190 degF			
Circulation Stopped	Time		11-May-2013	21:00:00		
Logger on Bottom	Time		12-May-2013	15:00:00		
Unit Number	Location:		2223	Fort Morgan		
Recorded By			Daniil Kholin			
Witnessed By			Anders Elgerd			

Disclaimer

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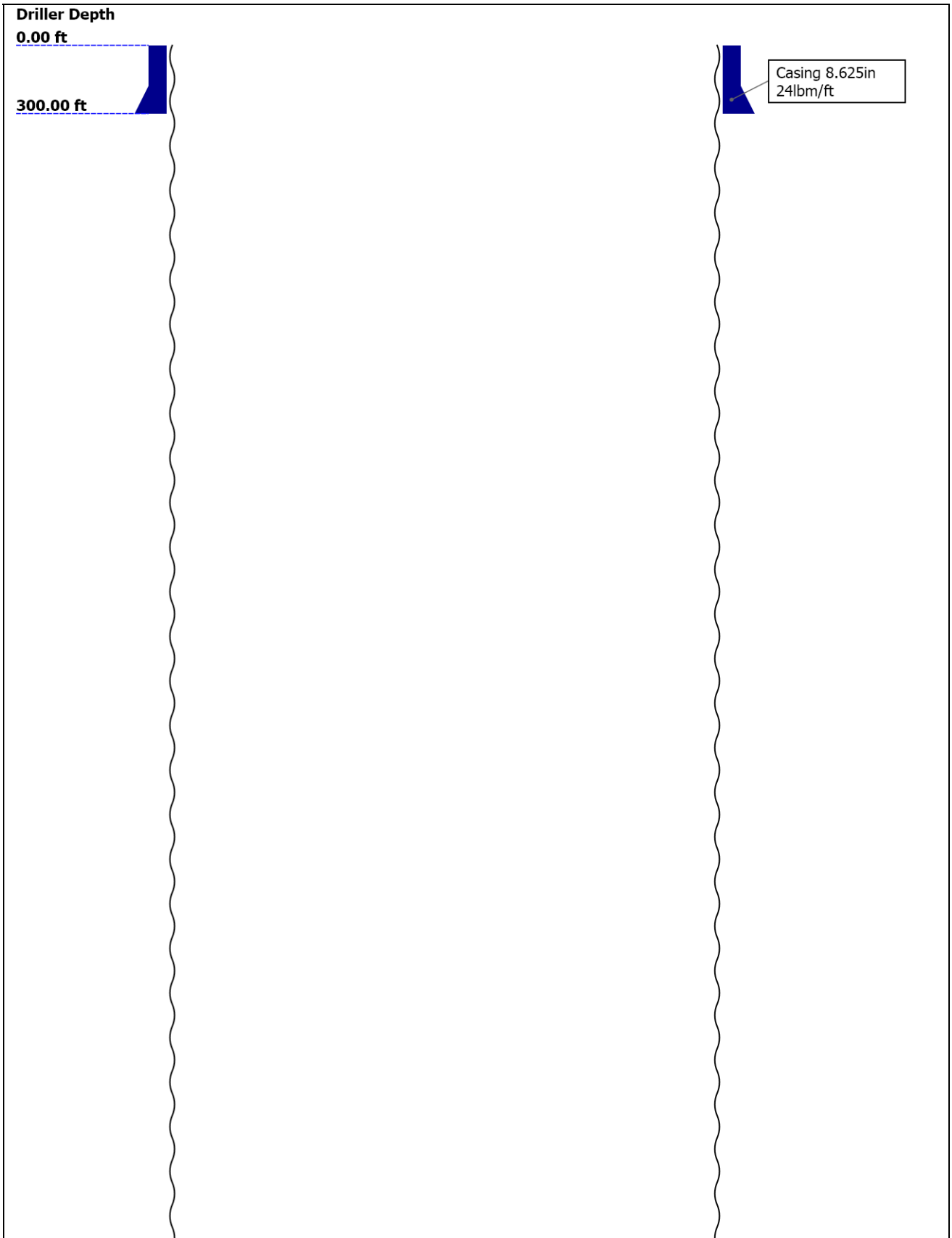
Contents

Well Sketch



Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	7.875					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	8350					
Bottom Logger (ft)	8342					
Casing						
Size (in)	8.625					
Weight (lbm/ft)	24					
Inner Diameter (in)	8.099					
Grade	N80					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	300					
Bottom Logger (ft)	309					

Remarks and Equipment Summary

1: Toolstring

Equip name	Length	MP name	Offset
LEH-QT:2493	**64.21**		
LEH-QT:2493			
DTC-H:10530	**61.29**		
ECH-KC		**CTEM**	**60.39**
DTC-H:10530		**HV**	**0.00**
		TelStatus	**58.29**
		ToolStatus	**58.29**
HGNS-H:863	**58.29**	**Temperature**	**58.26**
HGNH:2883			
NSR-F:5069		**GR**	**57.55**
NPV-N			
HGNS-H:863			
HMCA-H			
HACCZ-H:452			
		CNL Porosity	**51.21**
		HMCA	**48.88**
		HGNS	**48.88**
		Accelerometer	**0.00**
HDRS-H:1754	**48.88**		
ECH-MEB:1922			

1: Remarks

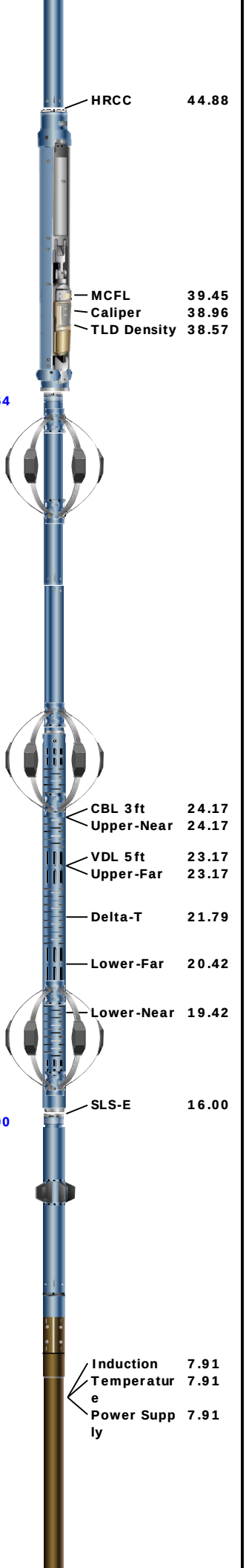
Toolstring run as per toolsketch.

HGNS run without bowspring as per client request due to hole conditions

Matrix: Limestone, 2.71 g/cc

Crew: Troy Ocanas, Jay Musgrave

HRCC-H:791
HRMS-H:1754
Short Spacing
GSR-J:5094
Long Spacing
HRGD-H:1849
GPV-Q
Backscatter



DSLT-H:8151 36.64
ECH-KH:8232
DSLC-H:8151
SLS-E:297

AIT-H:398 16.00
AHIS:398
AHRM:398

Lengths are in ft
Maximum Outer Diameter = 5.000 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	This is first run in the hole.		
Stretch Correction (ft)	6.12		
Rig Type	Land		
Depth Remark Parameters	**1**		
Depth Remark 1	All Schlumberger Depth Control		
Depth Remark 2	IDW used as primary depth control.		
Depth Remark 3	Z-chart used as secondary depth		
Depth Measuring Device	**1**		
Type	IDW-B		
Serial Number	1918		
Calibration Date	22-Apr-2013		
Calibration Cable Type	7-46 AXS		
Wheel Correction 1	-8		
Wheel Correction 2	-9		
Tension Device	**1**		
Type	CMTD-B/A		
Serial Number	1274		
Calibration Date	30-apr-2013		
Calibrator Serial Number	78135A		
Calibration Points	10		
Calibration RMS	36		
Calibration Peak Error	77		
Logging Cable	**1**		
Type	7-46A-XS		
Serial Number	U711126		
Logging Cable Length (ft)	24000.00		

1

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit

Software Version

Acquisition System	Version
MaxWell	3.1.9755.0
Application Patch	SP-20121102-3.1.9755.1422

Computation	Description	Version

HENVIR	Computation Ensemble for the HGNS Neutron environmental corrections	3.1.9755.0
DepthCorrection	DepthCorrection	3.1.9755.0

Tool Elements	Description	Software Version	Firmware Version
HRCC-H	HILT High-Resolution Control Cartridge, 150 degC	3.1.9755.0	2.0
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.1.9755.0	2.0
HRGD-H	HILT Resistivity Gamma-Ray Density Device, 150 degC	3.1.9755.0	3.0

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
1	Main[3]:Up	Up	208.80 ft	8359.06 ft	12-May-2013 3:21:28 PM	12-May-2013 5:46:55 PM	0.00 ft	

All depths are referenced to toolstring zero

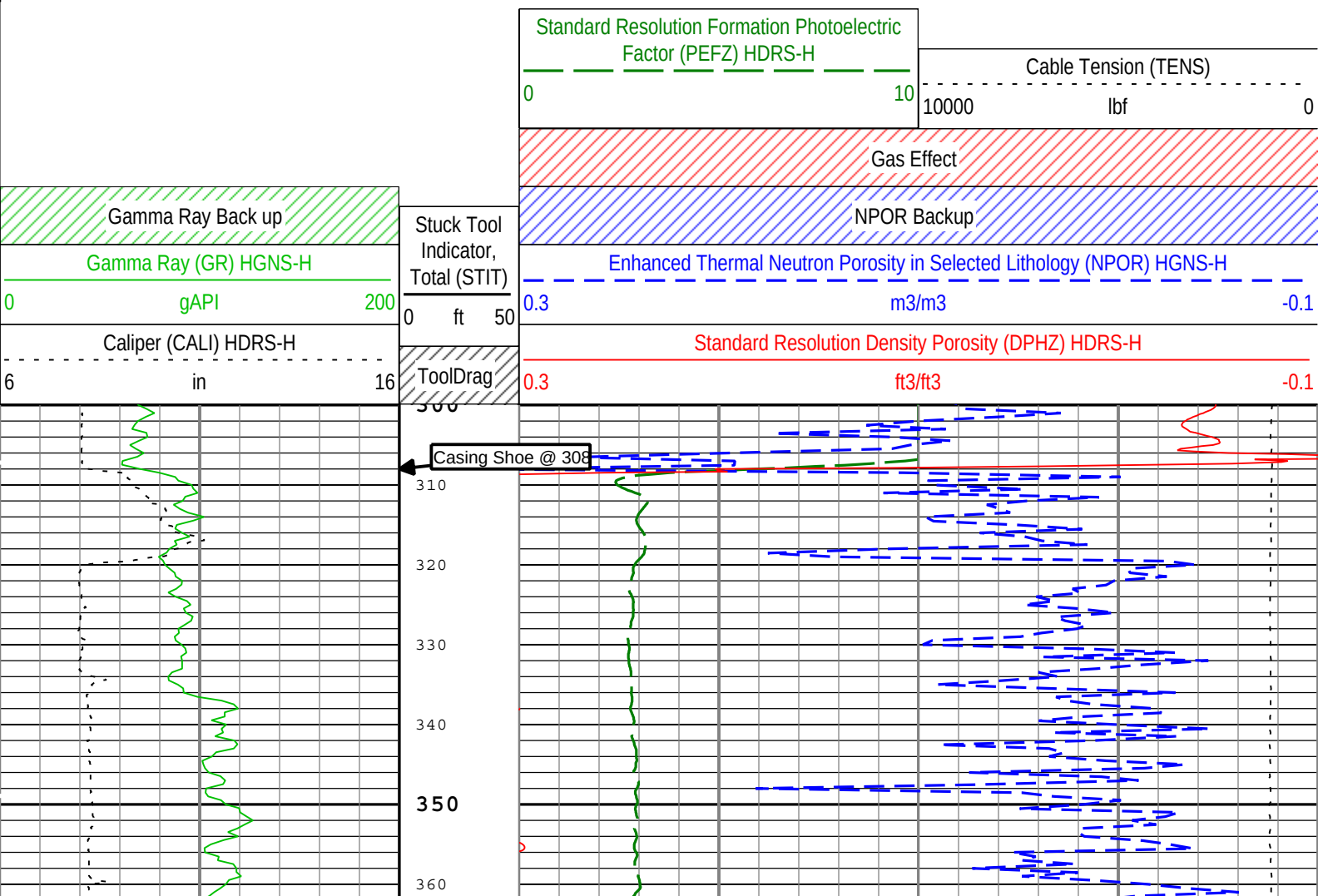
Log

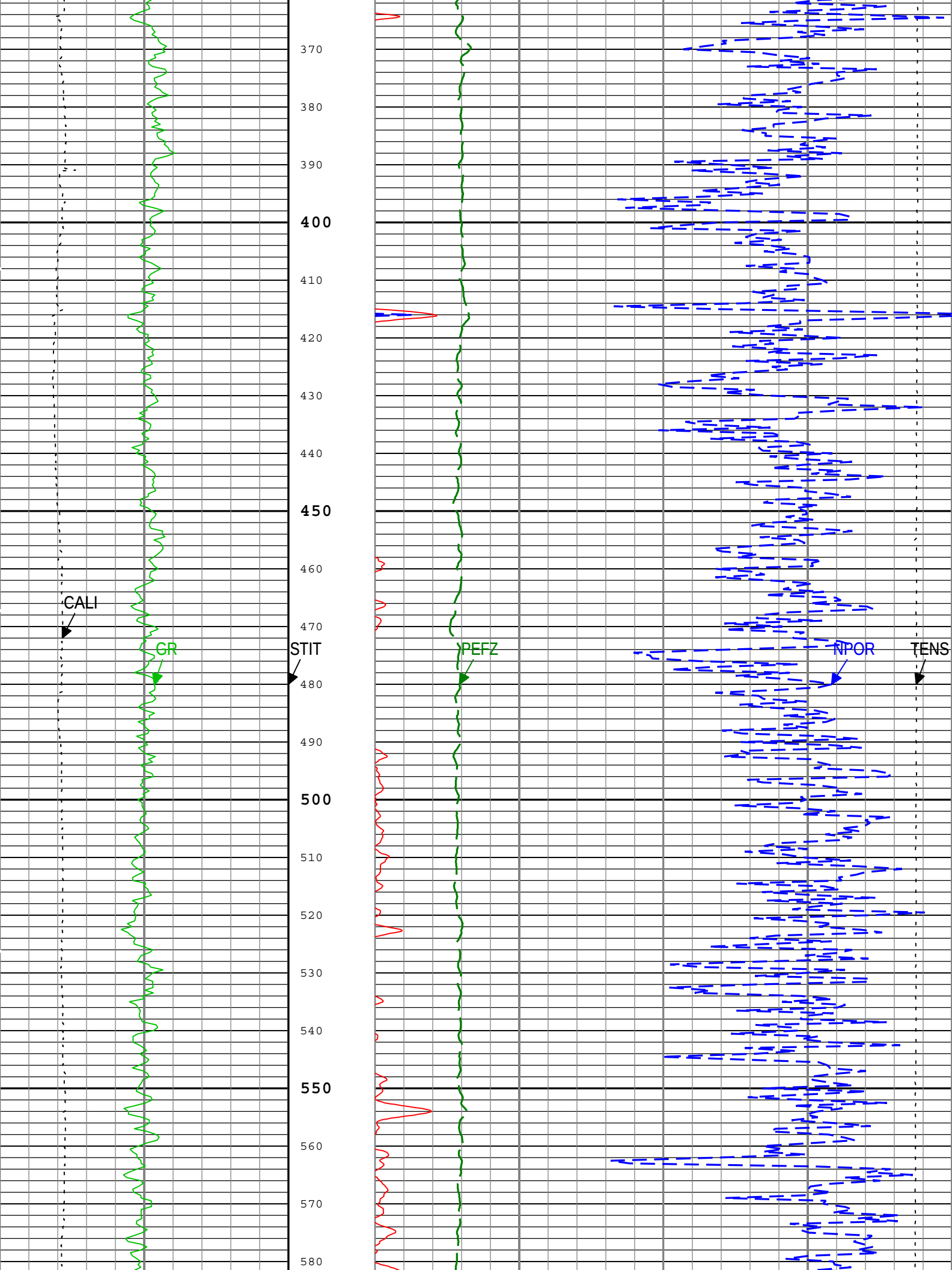
1: Main[3]:Up

Description: HGNS standard resolution porosities for Platform Express Format: Log (KM 5in Porosity) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 12-May-2013 18:48:06

Channel	Source	Sampling
CALI	HDRS-H:HRCC-H:HRCC-H	1in
DPHZ	HDRS-H:HRMS-H:HRGD-H	2in
GR	HGNS-H:HGNS-H:HGNS-H	6in
NPOR	HGNS-H:HGNS-H:HGNS-H	6in
PEFZ	HDRS-H:HRMS-H:HRGD-H	2in
STIT	DepthCorrection	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

TIME_1900 - Time Marked every 60.00 (s)

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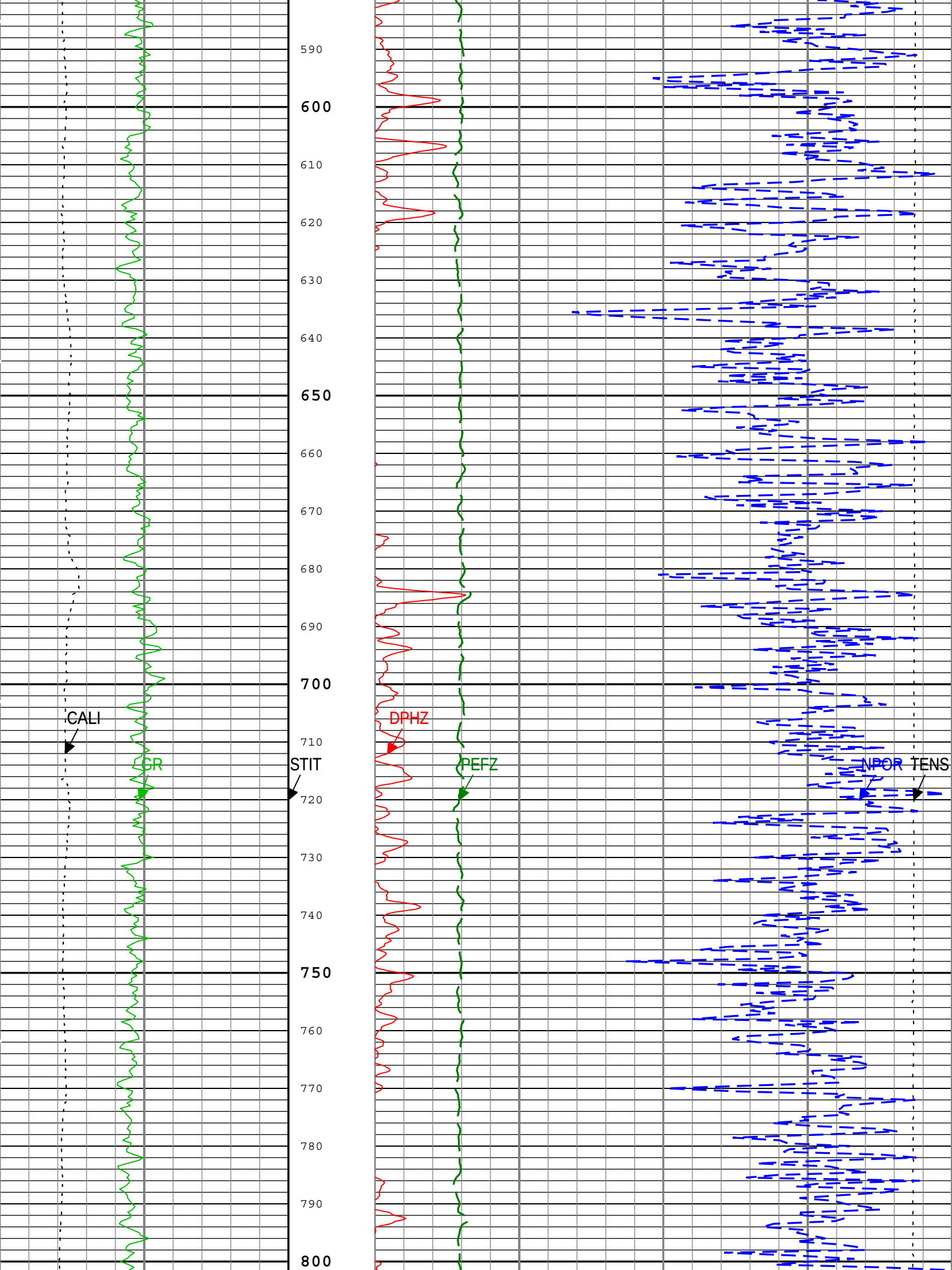
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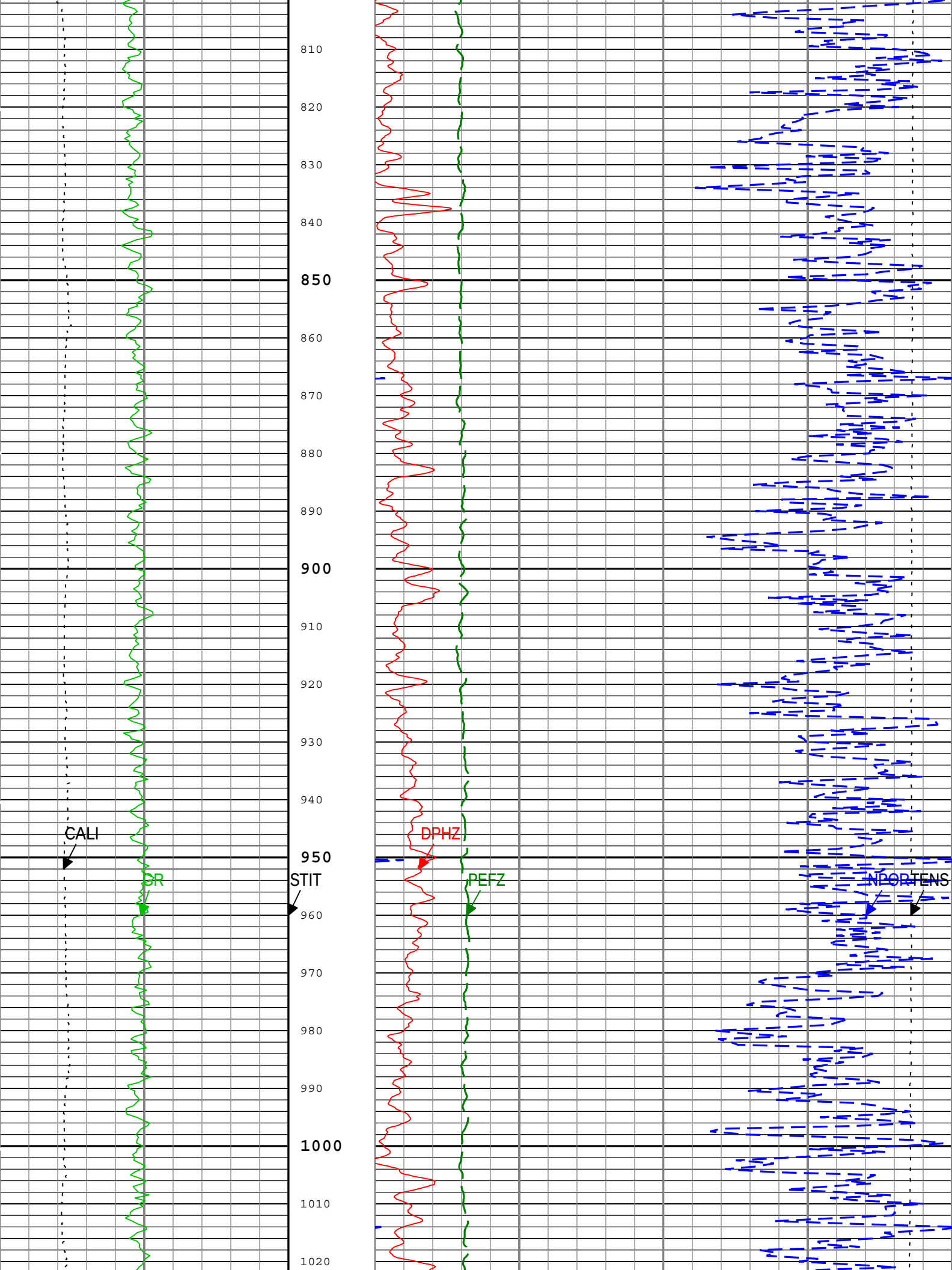
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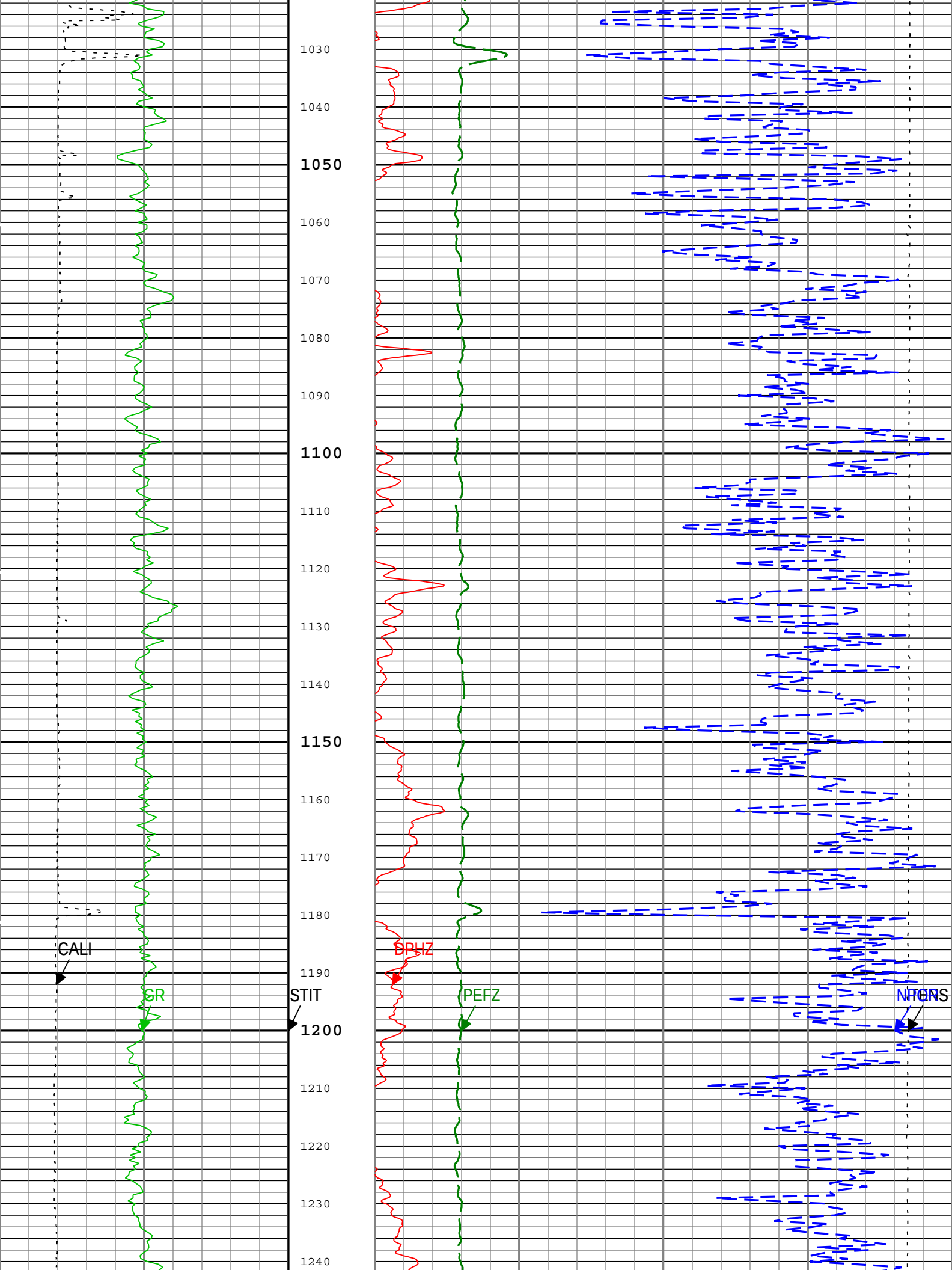
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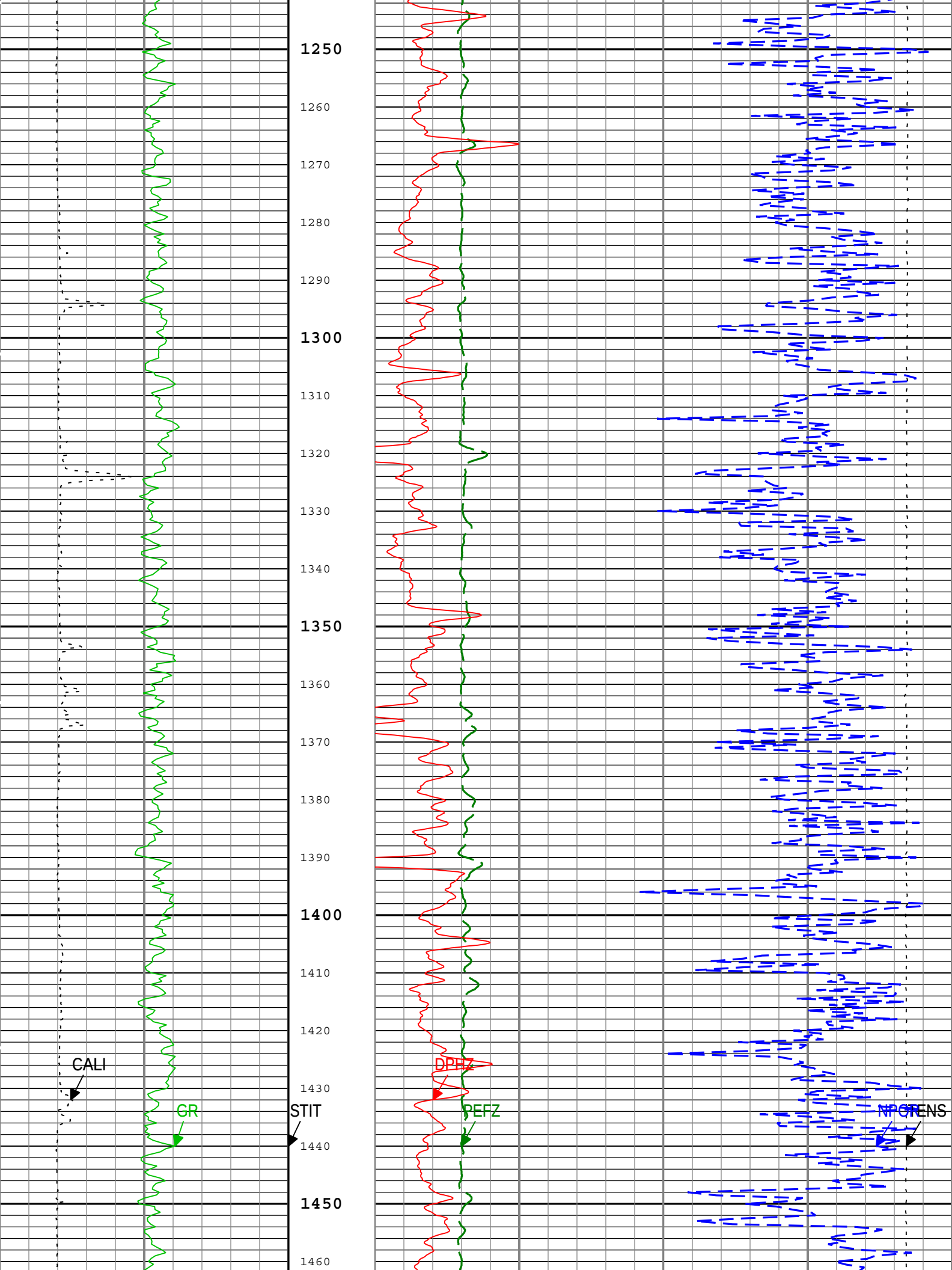
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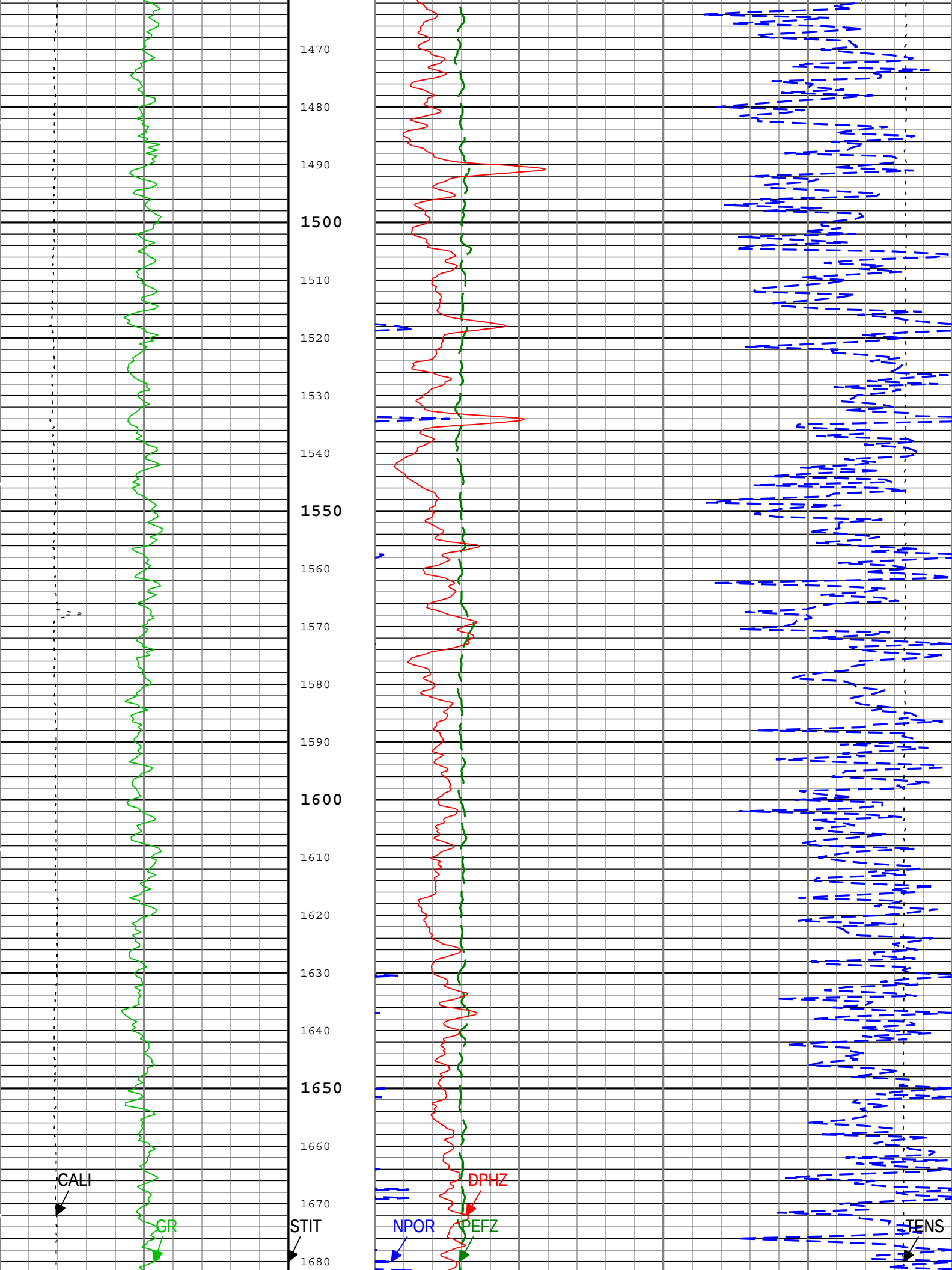
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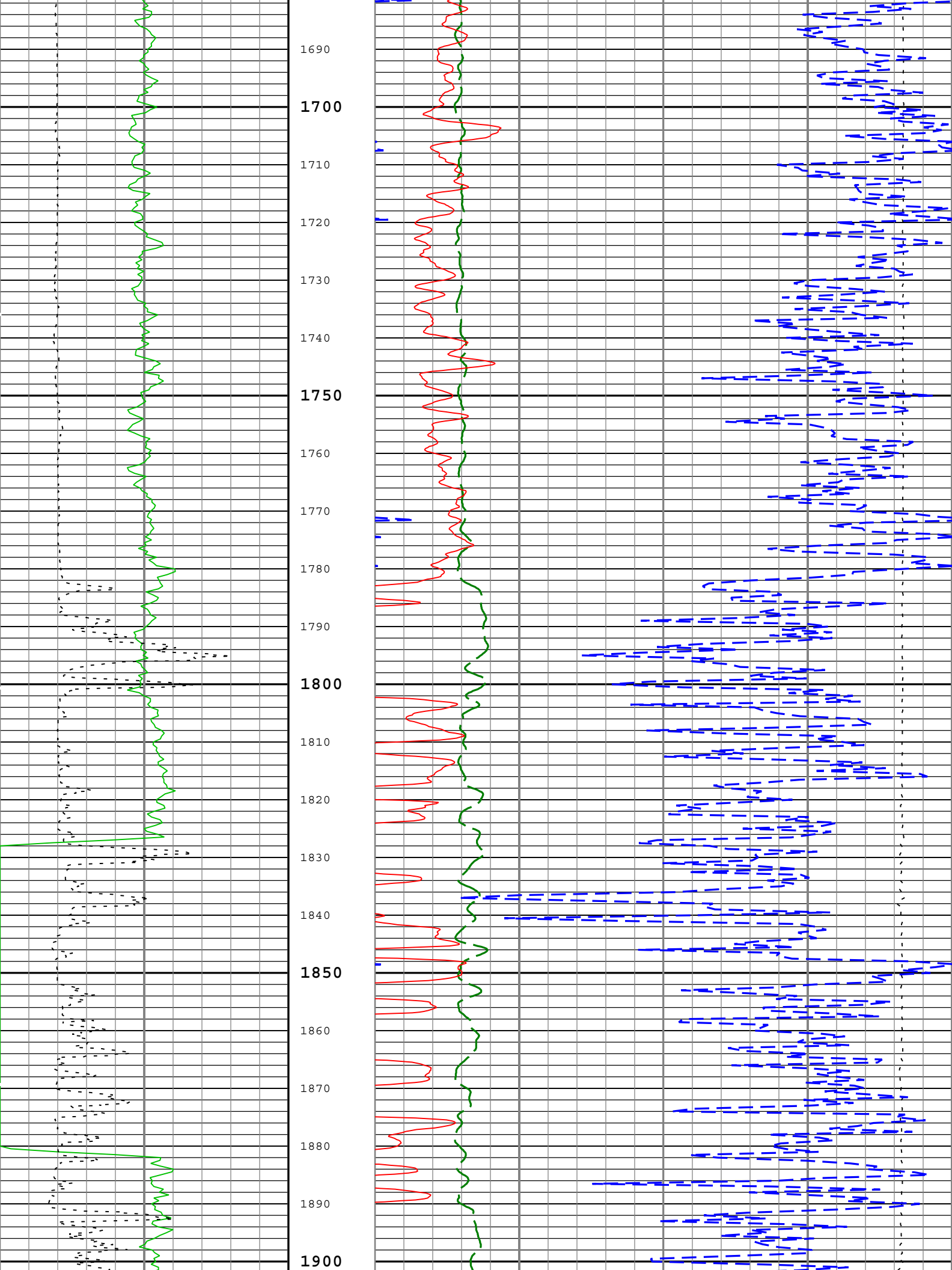
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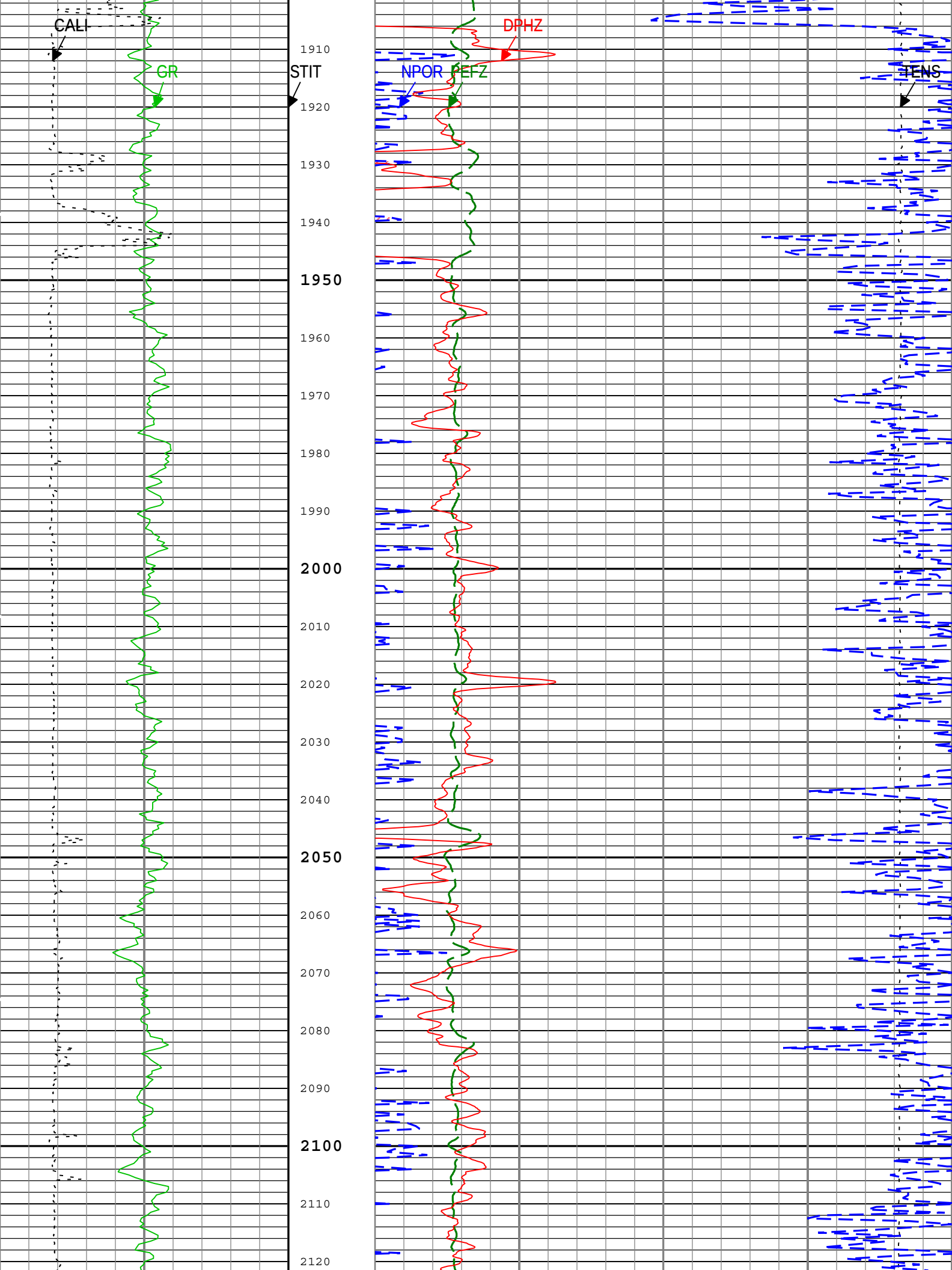
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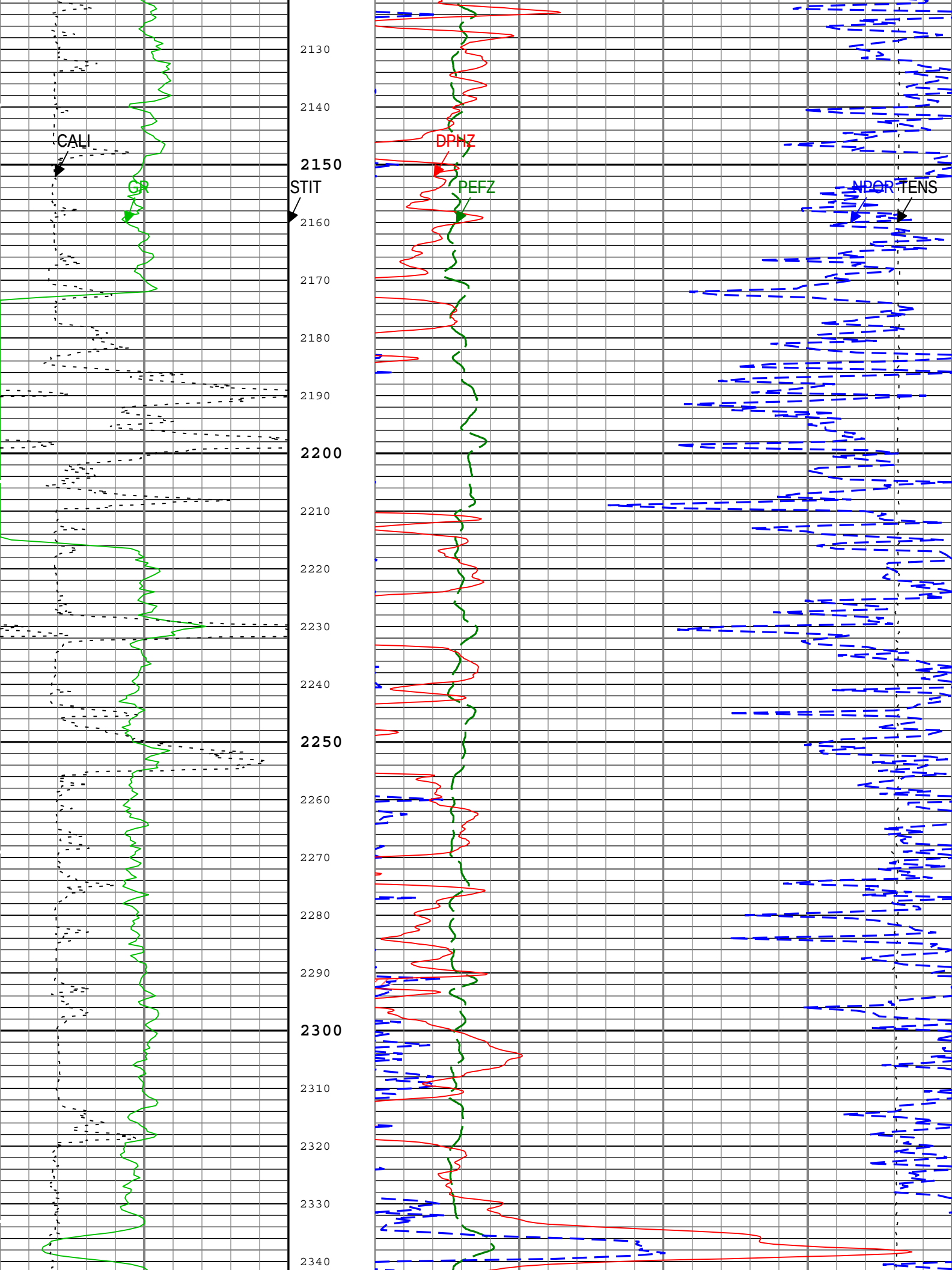
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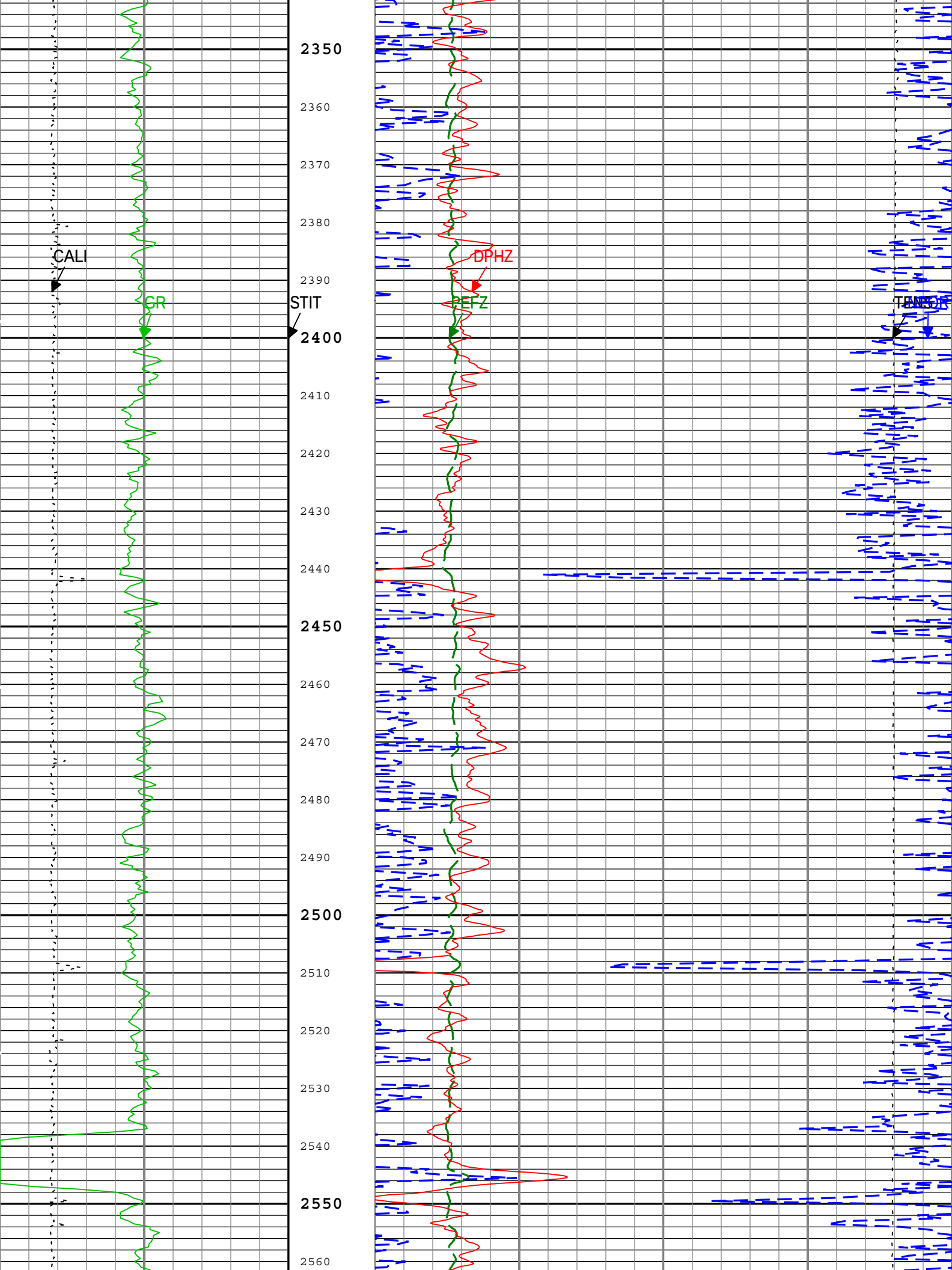
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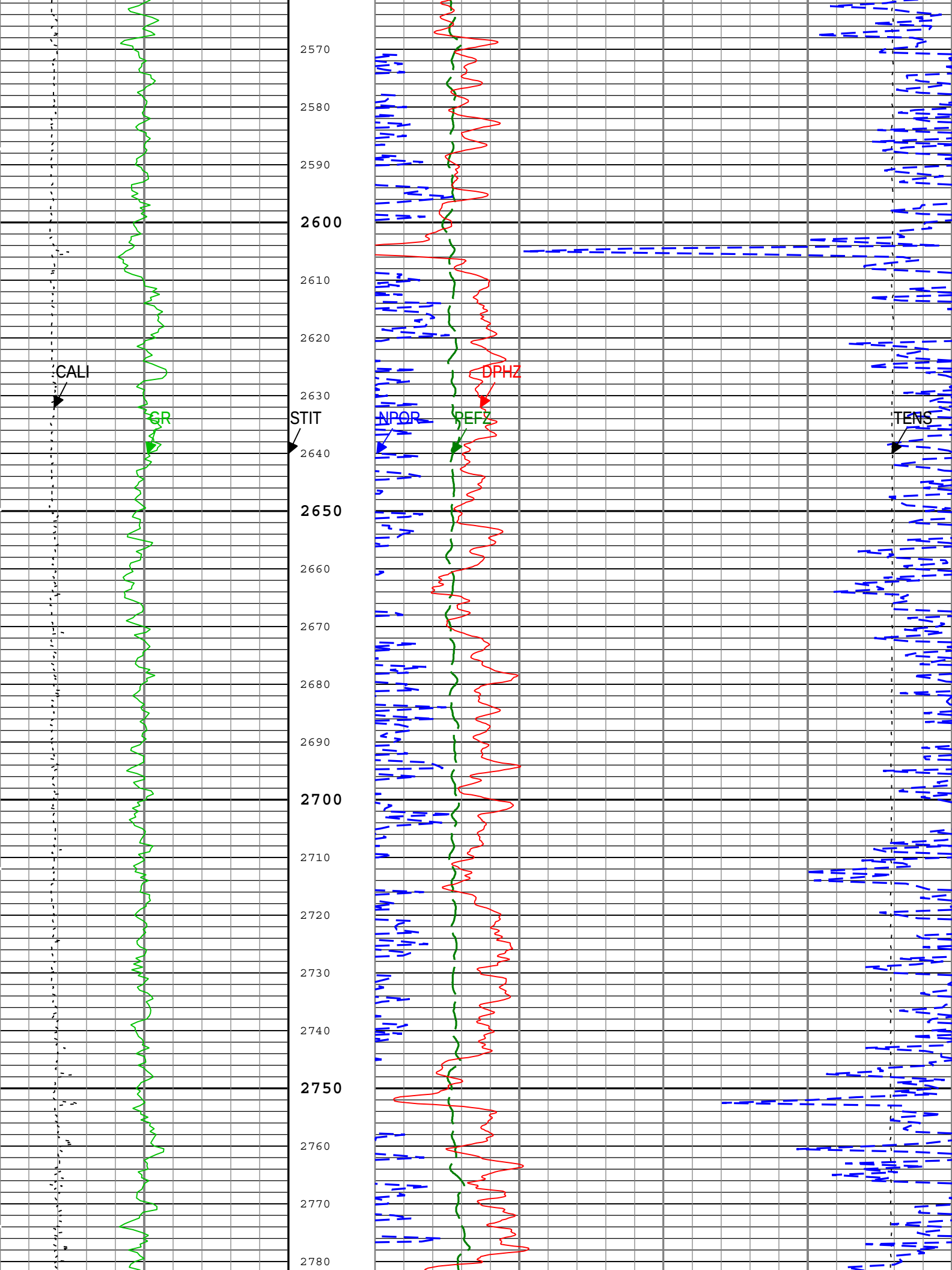
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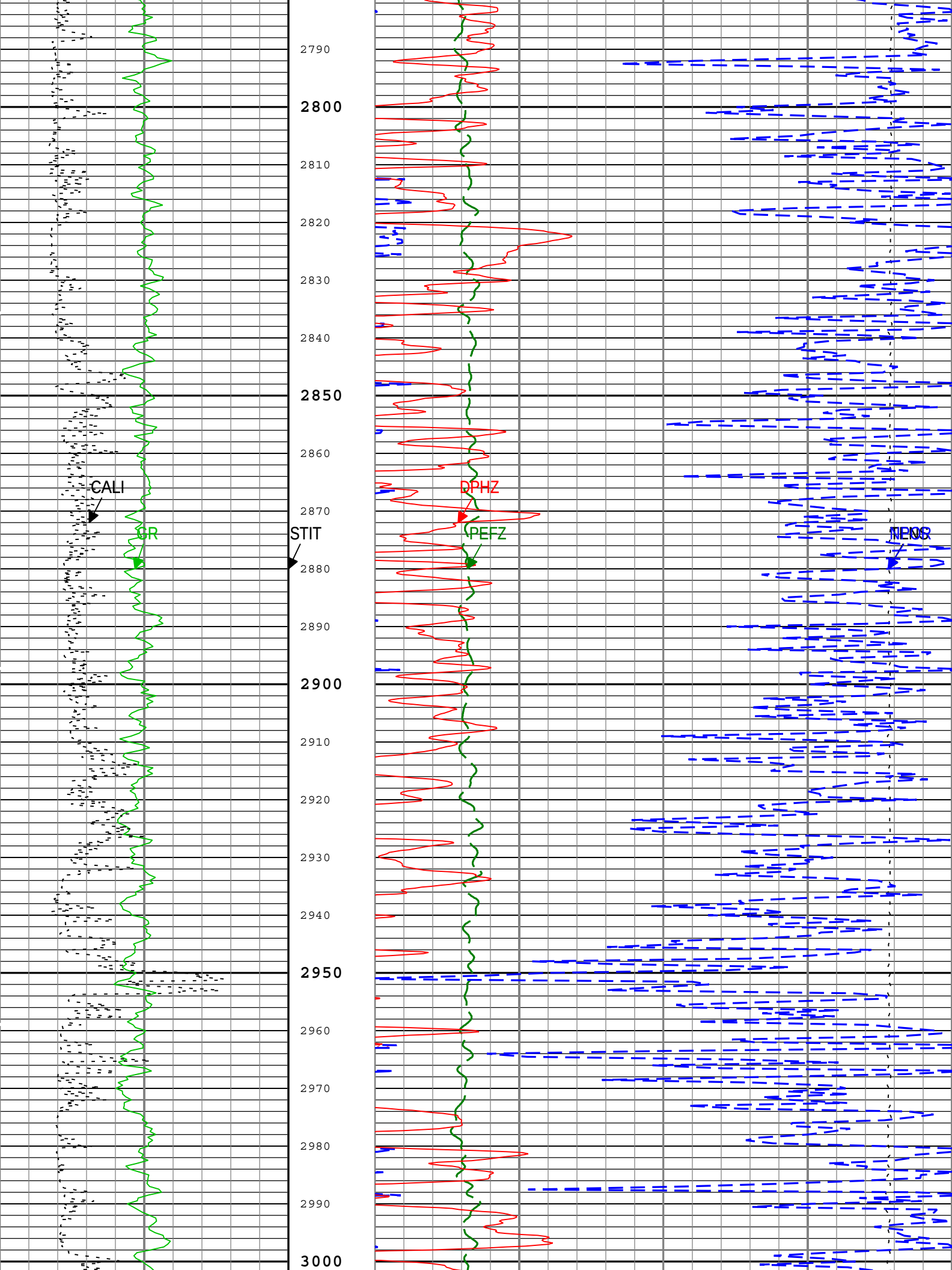
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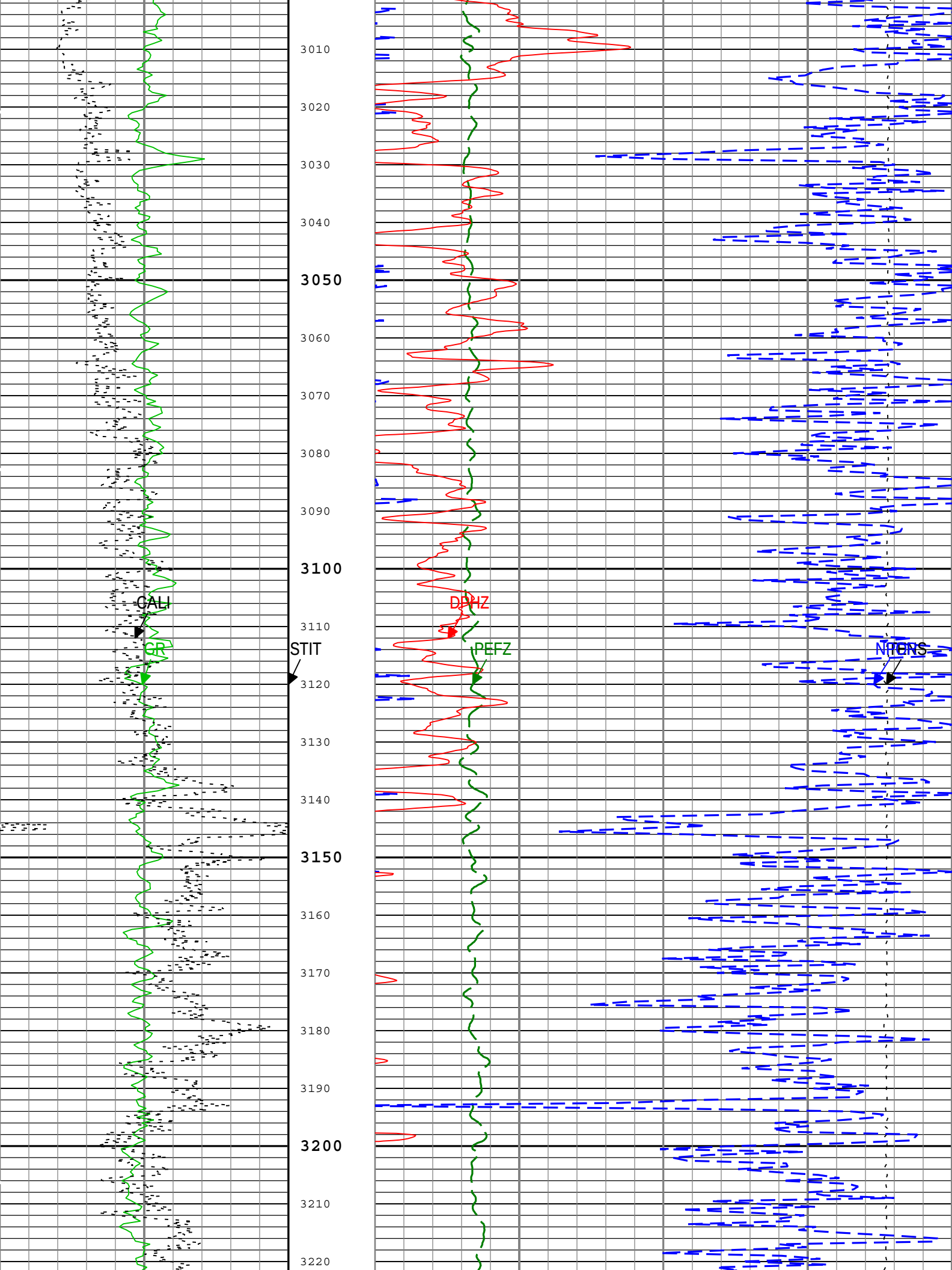
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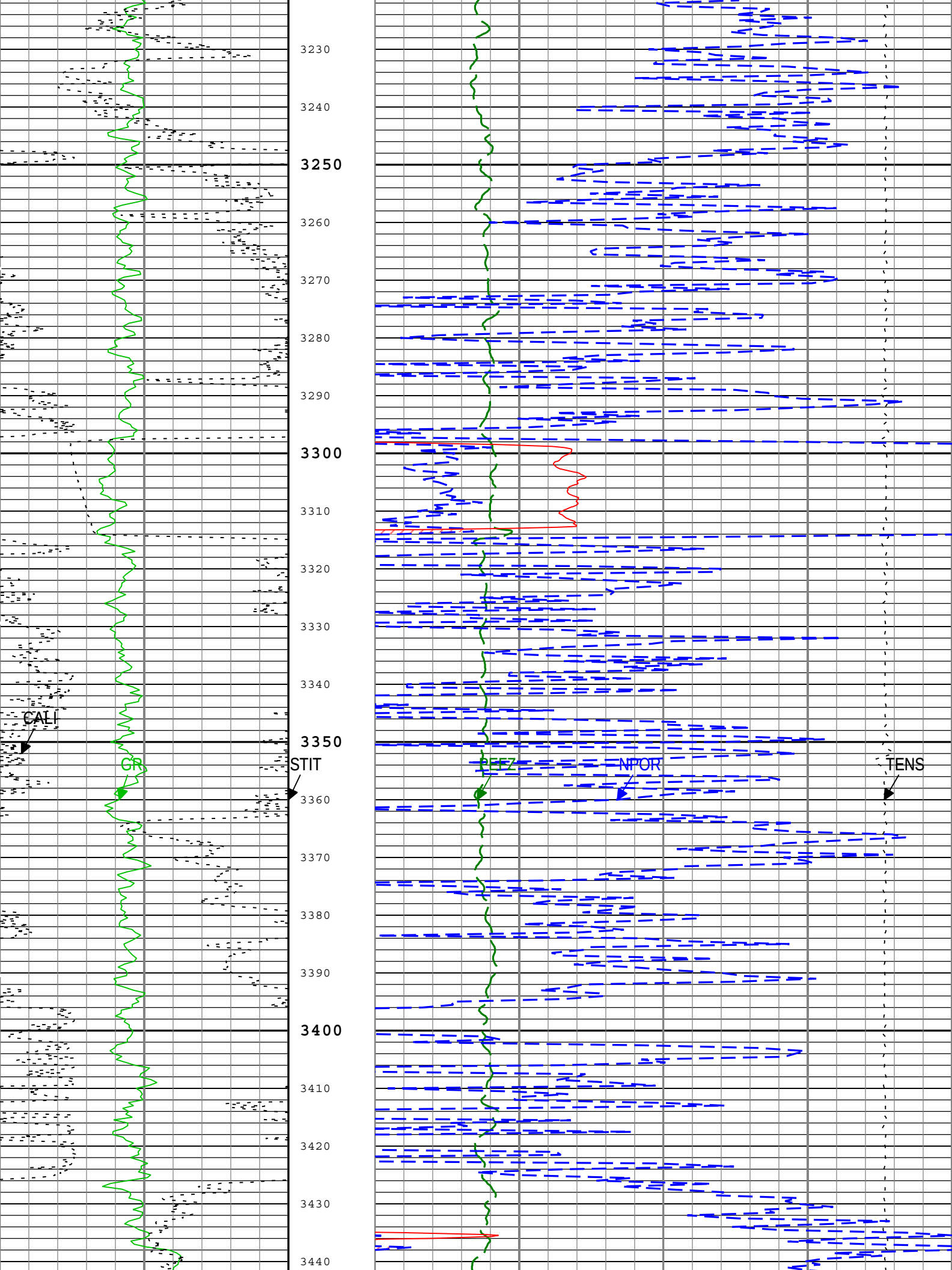
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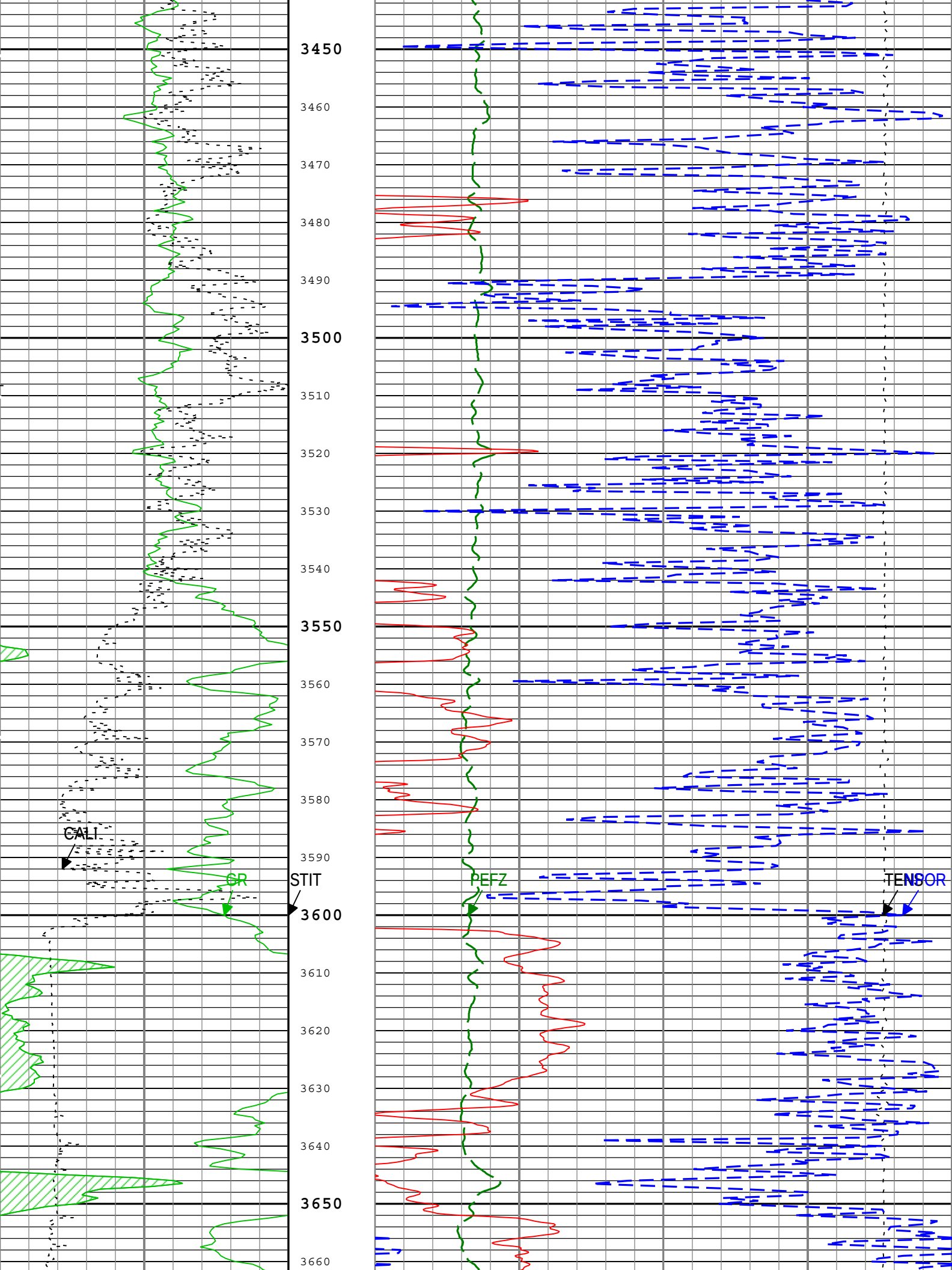
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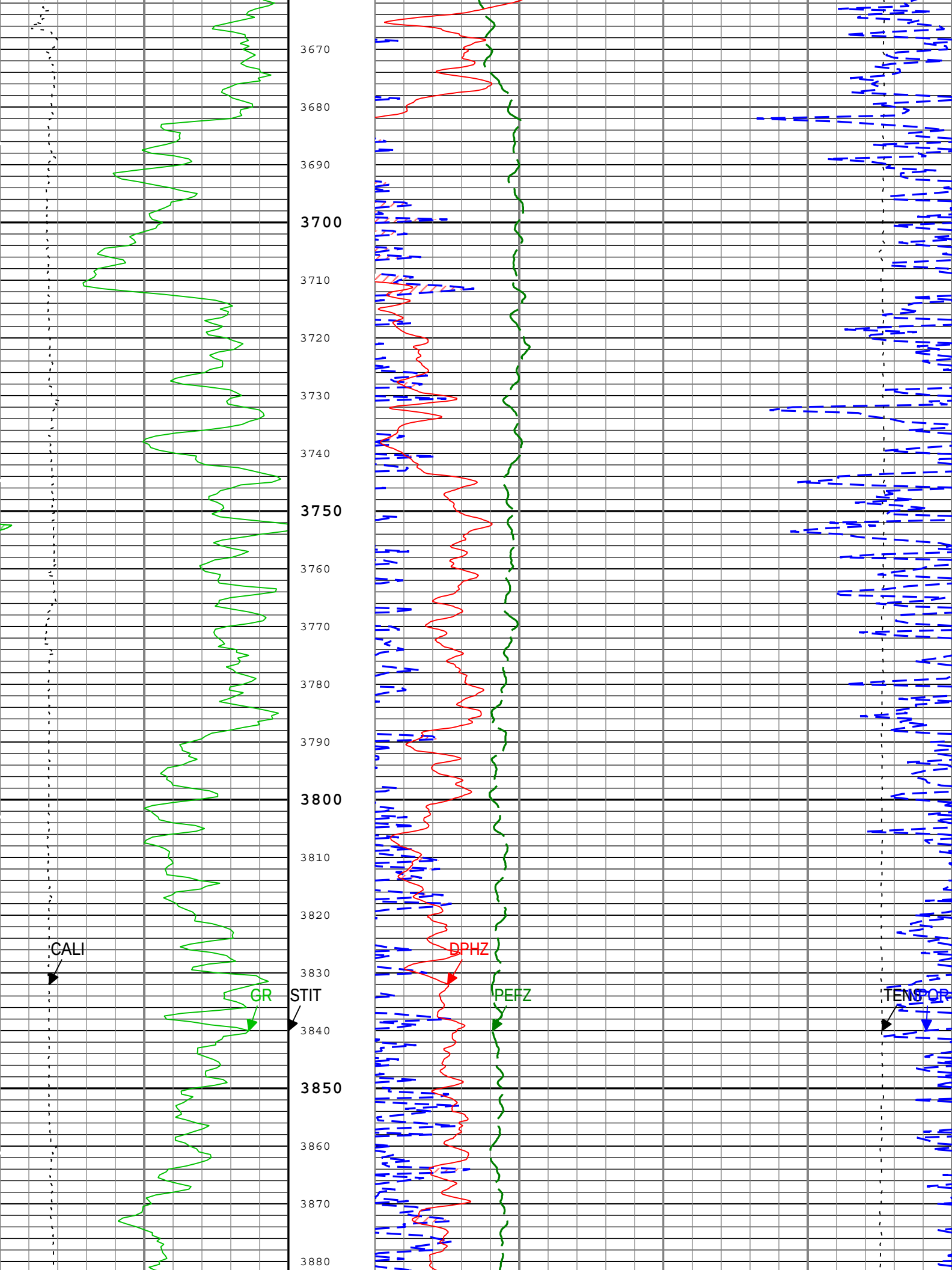
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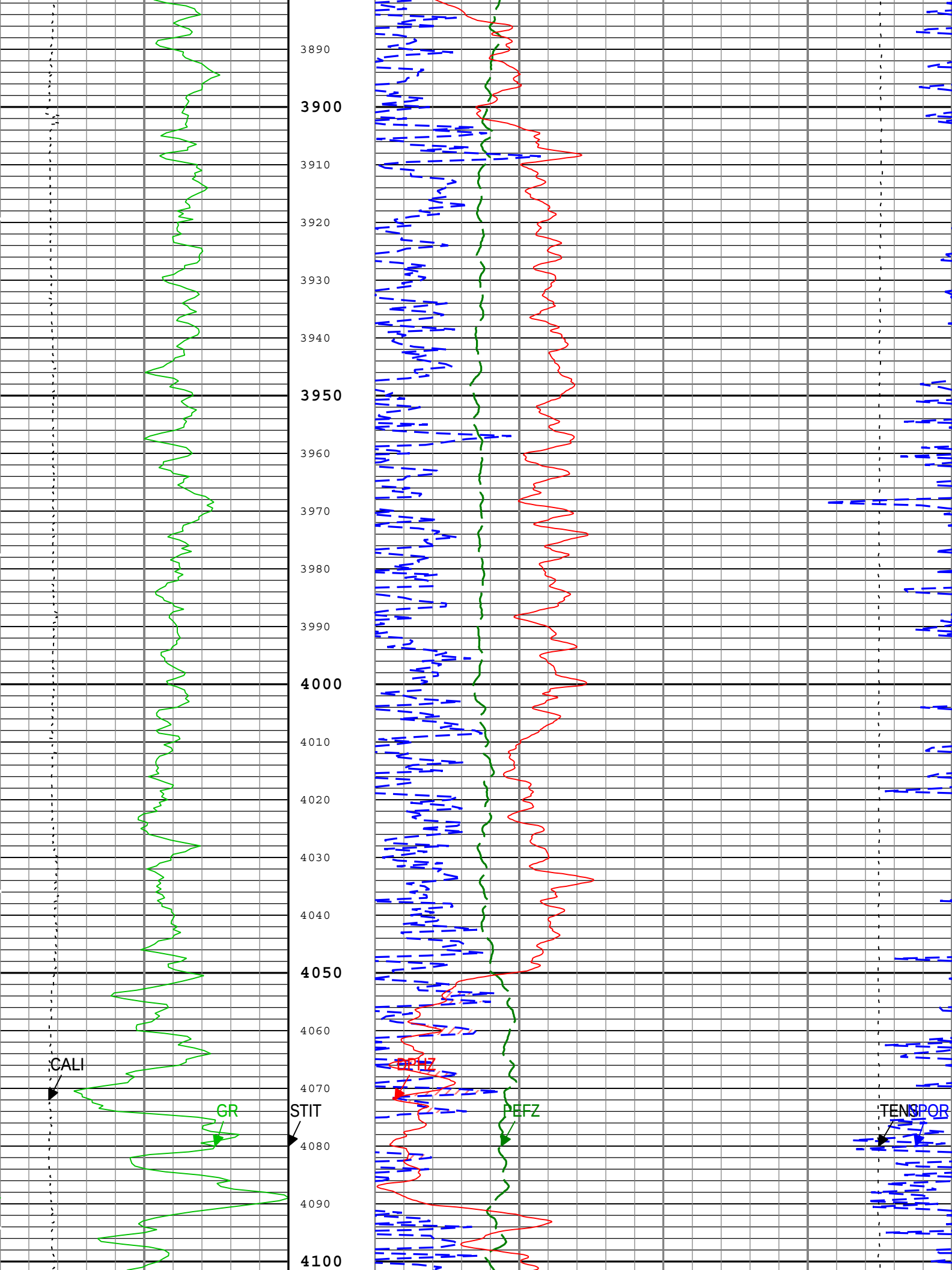
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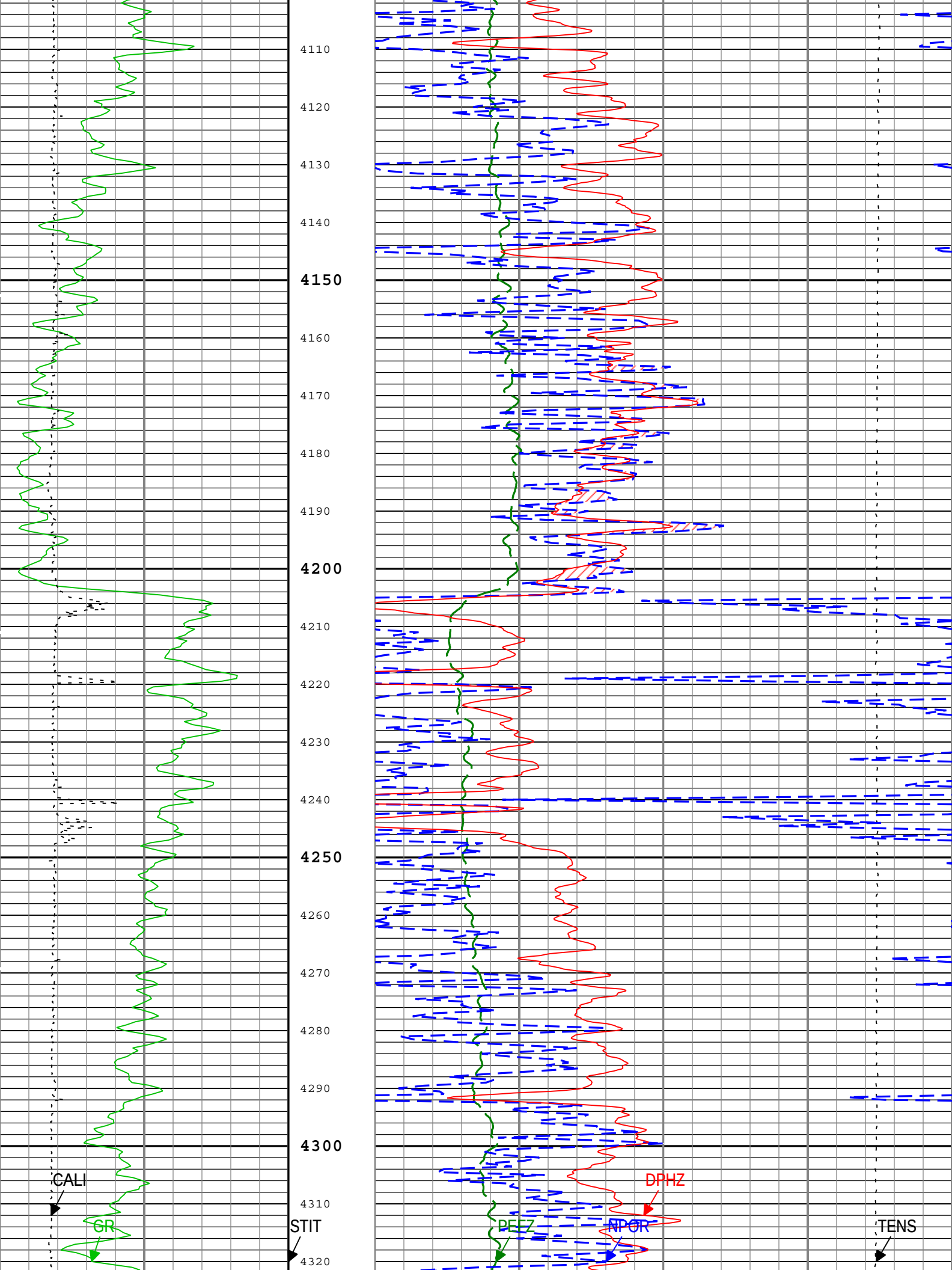
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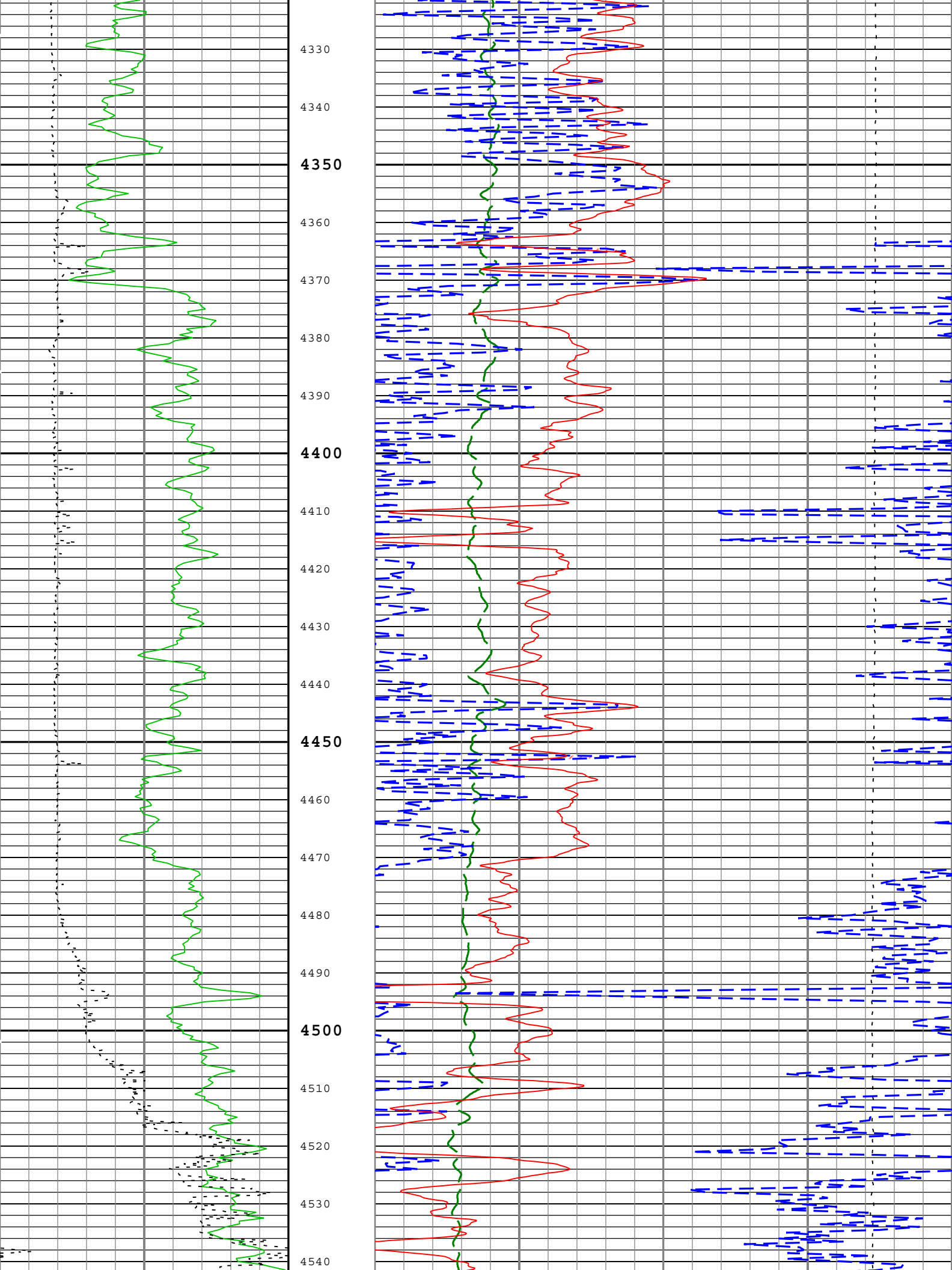
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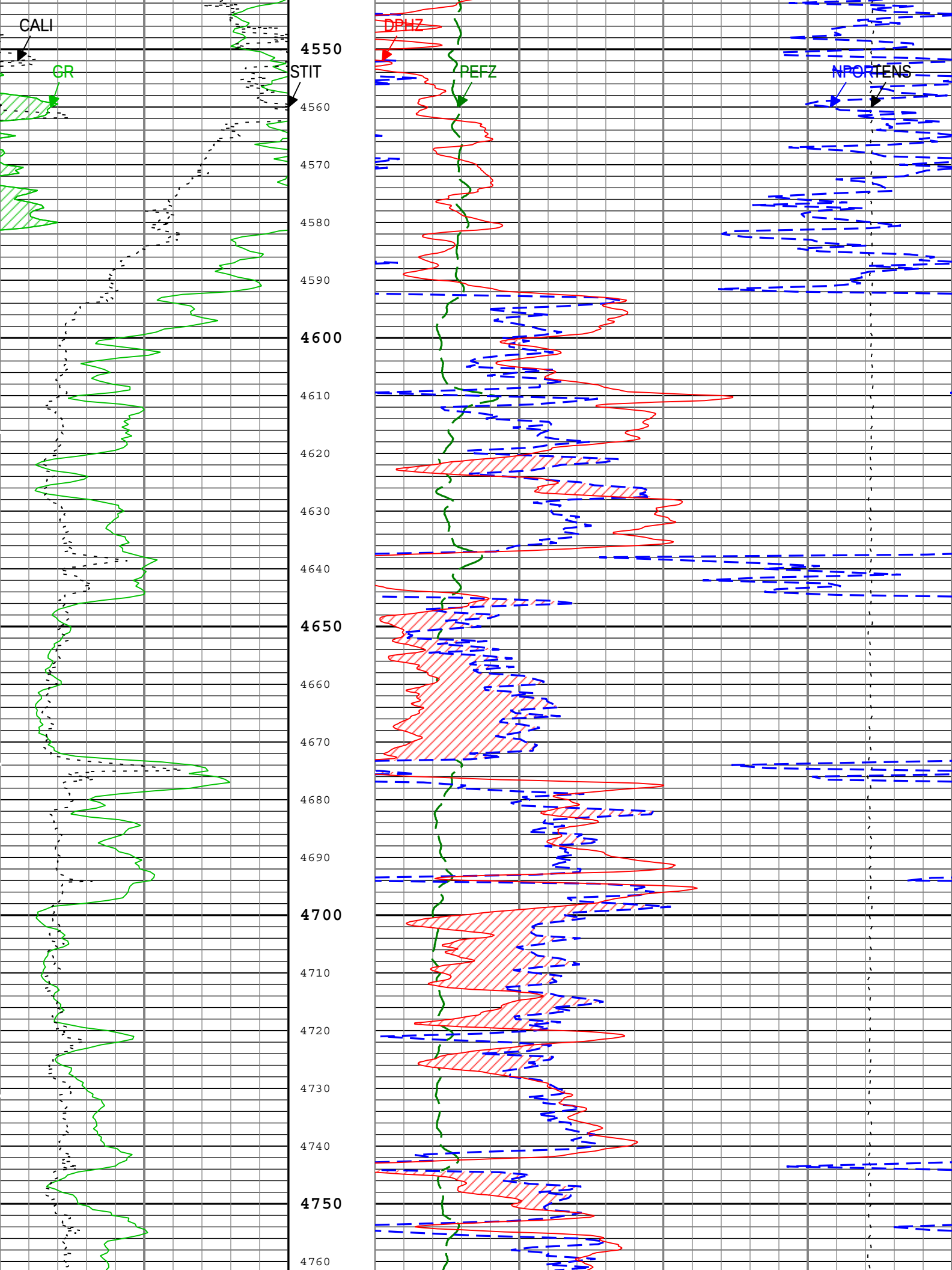
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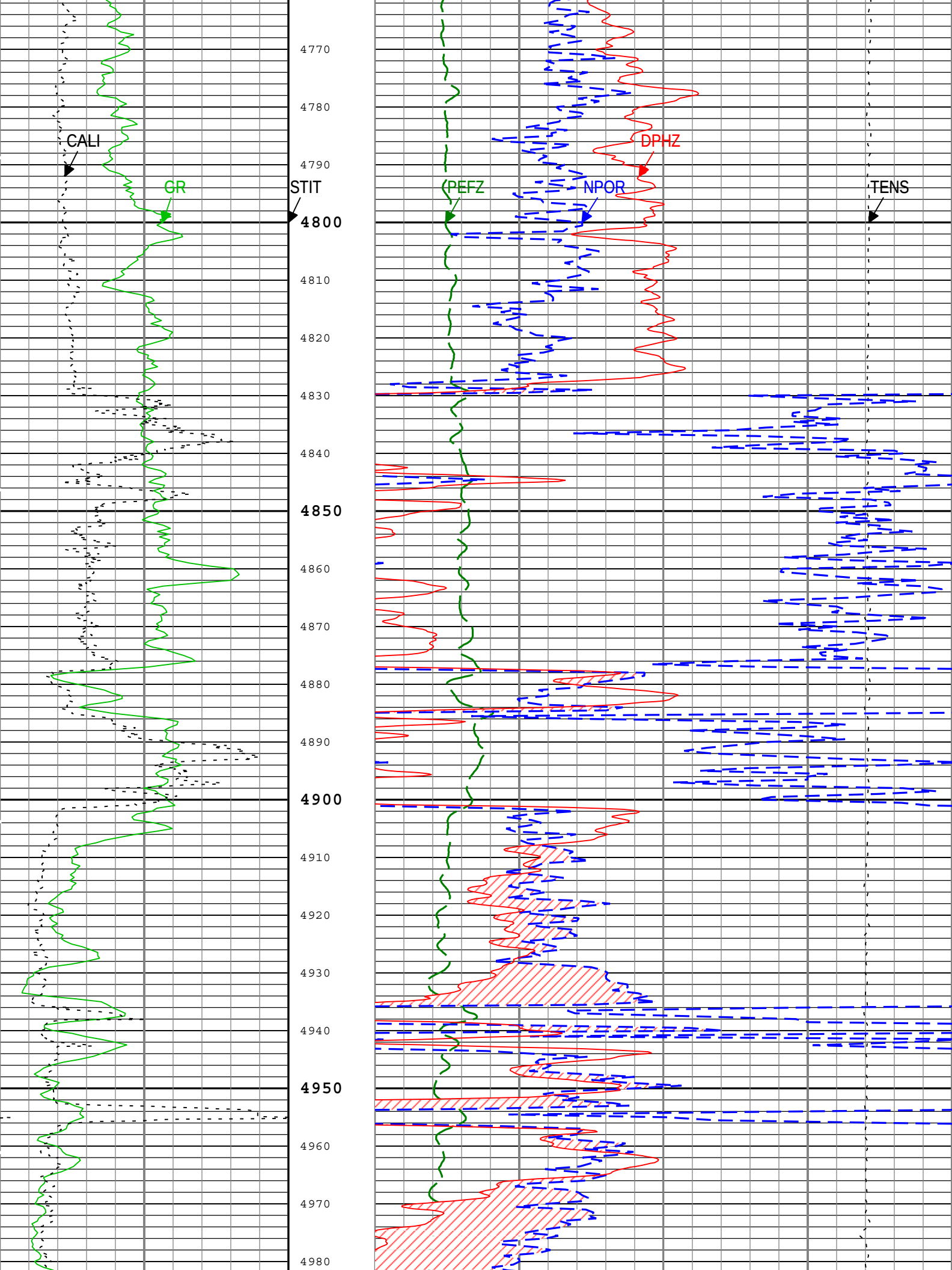
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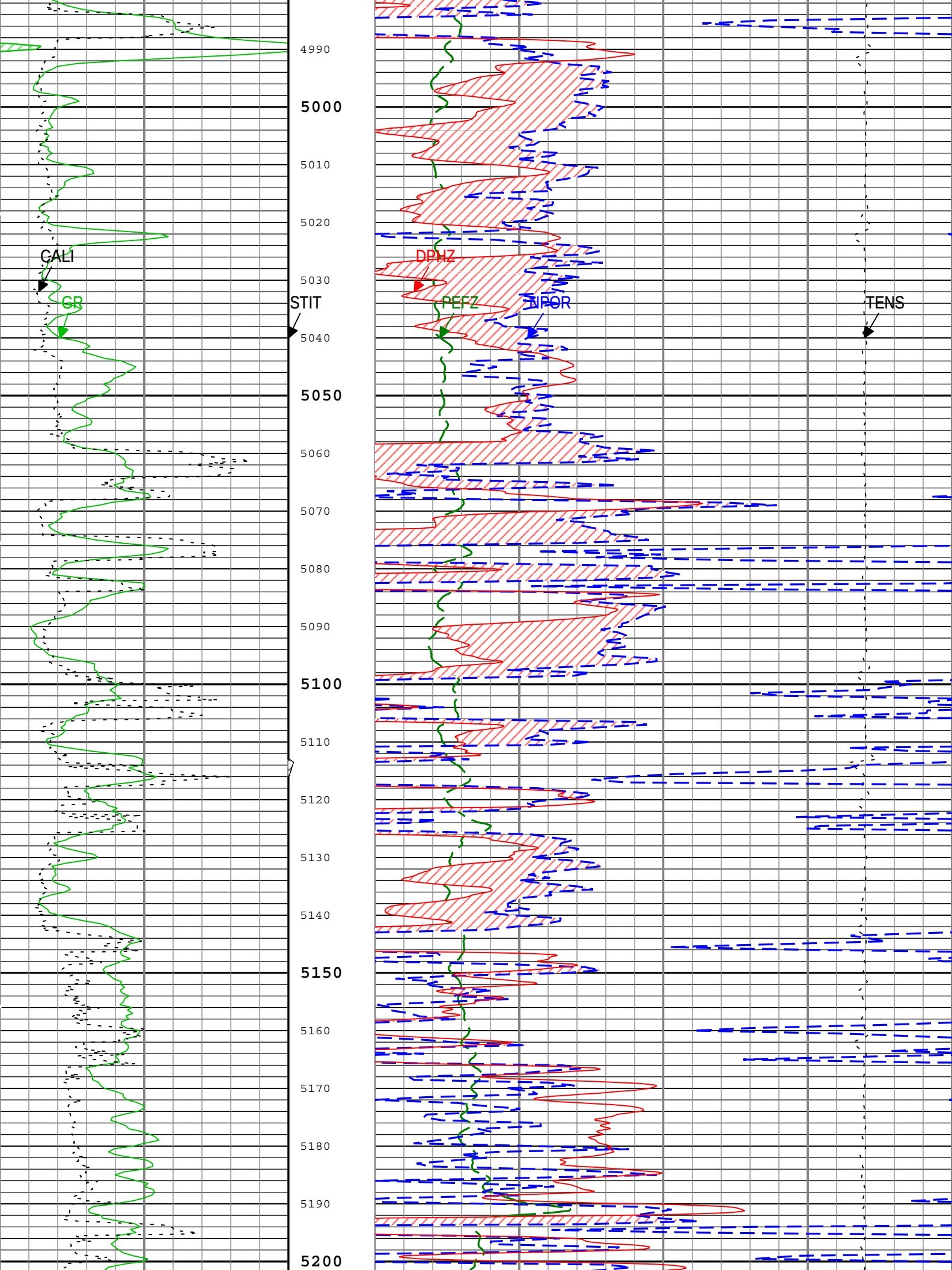
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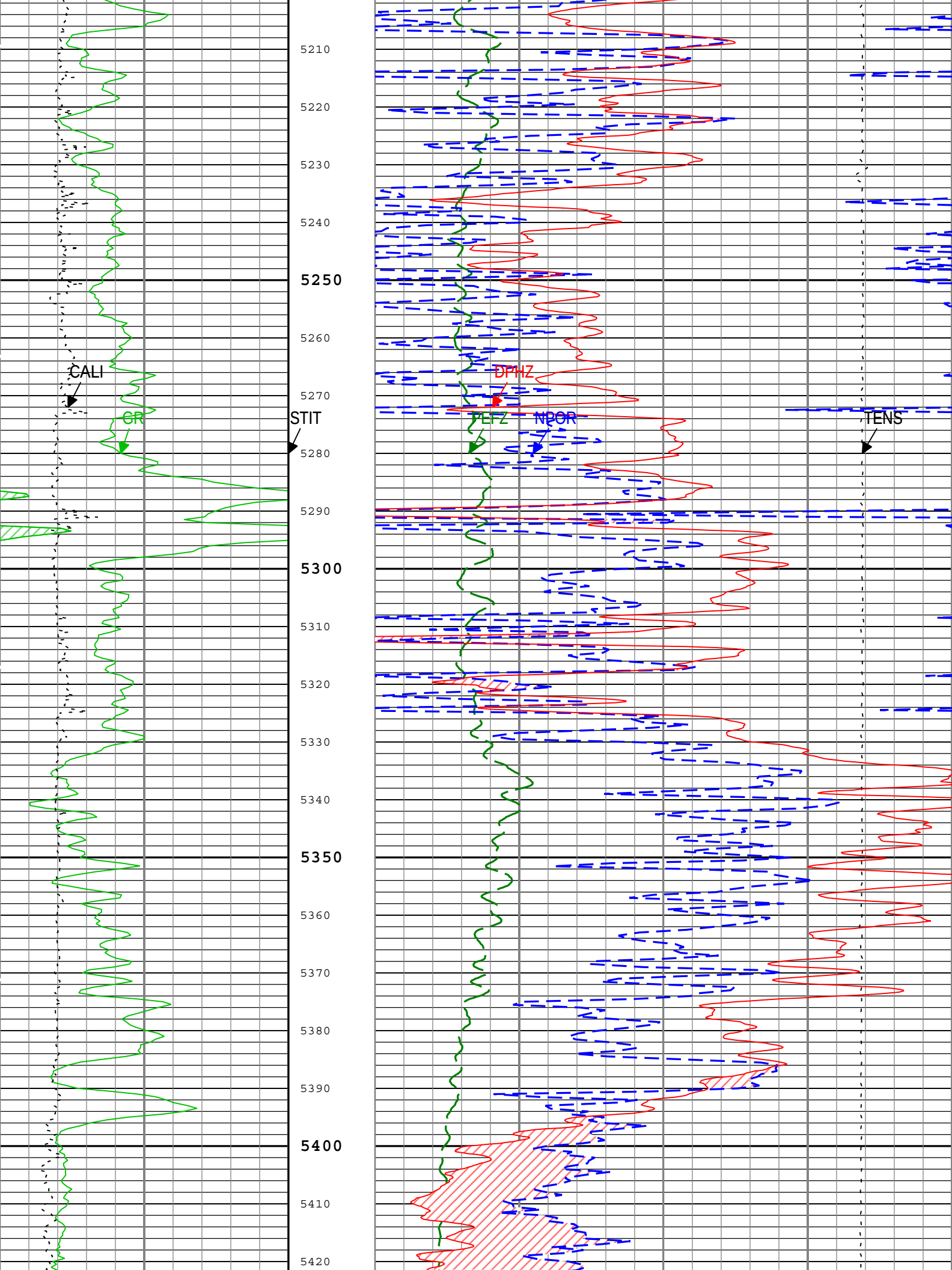
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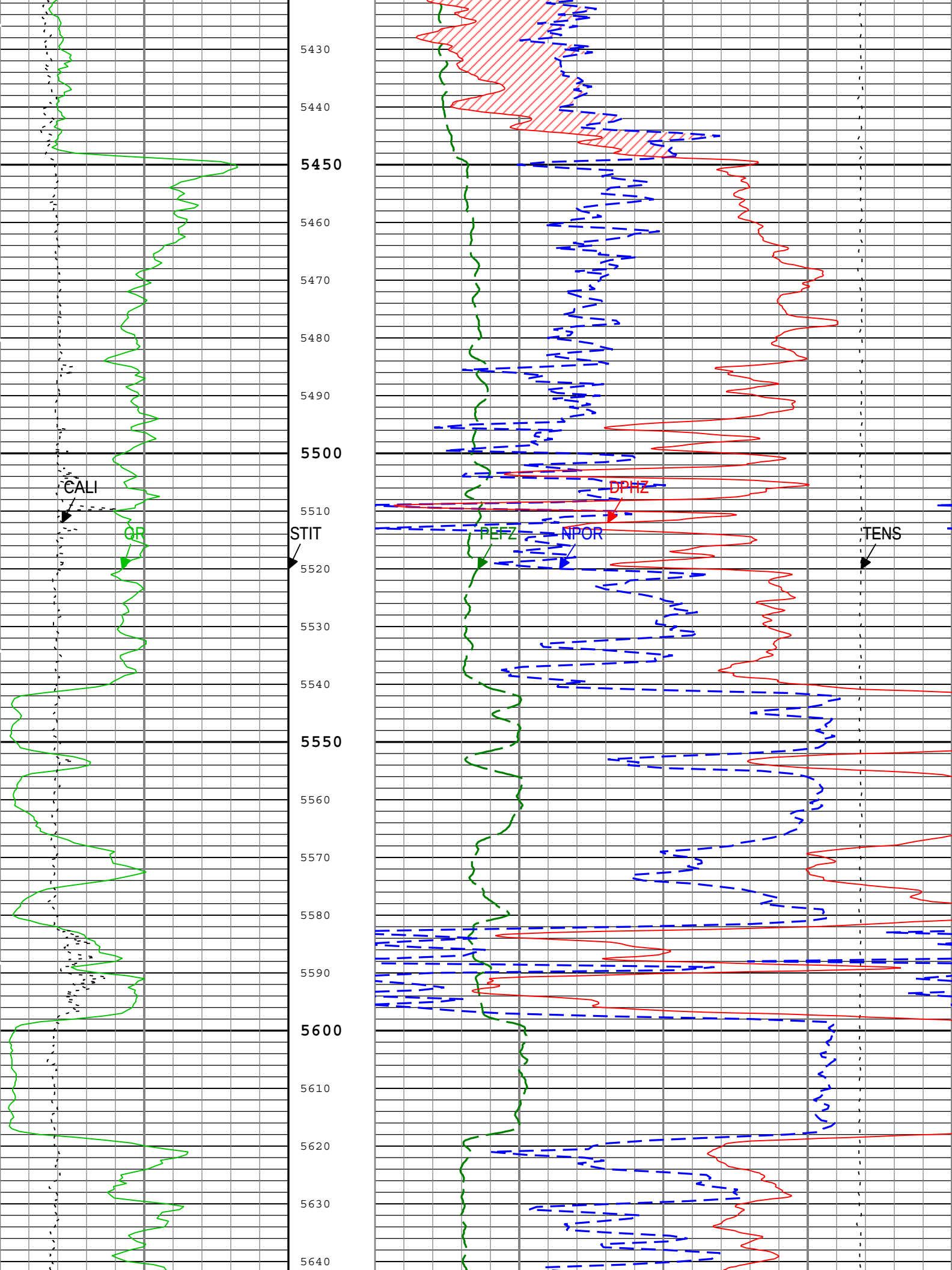
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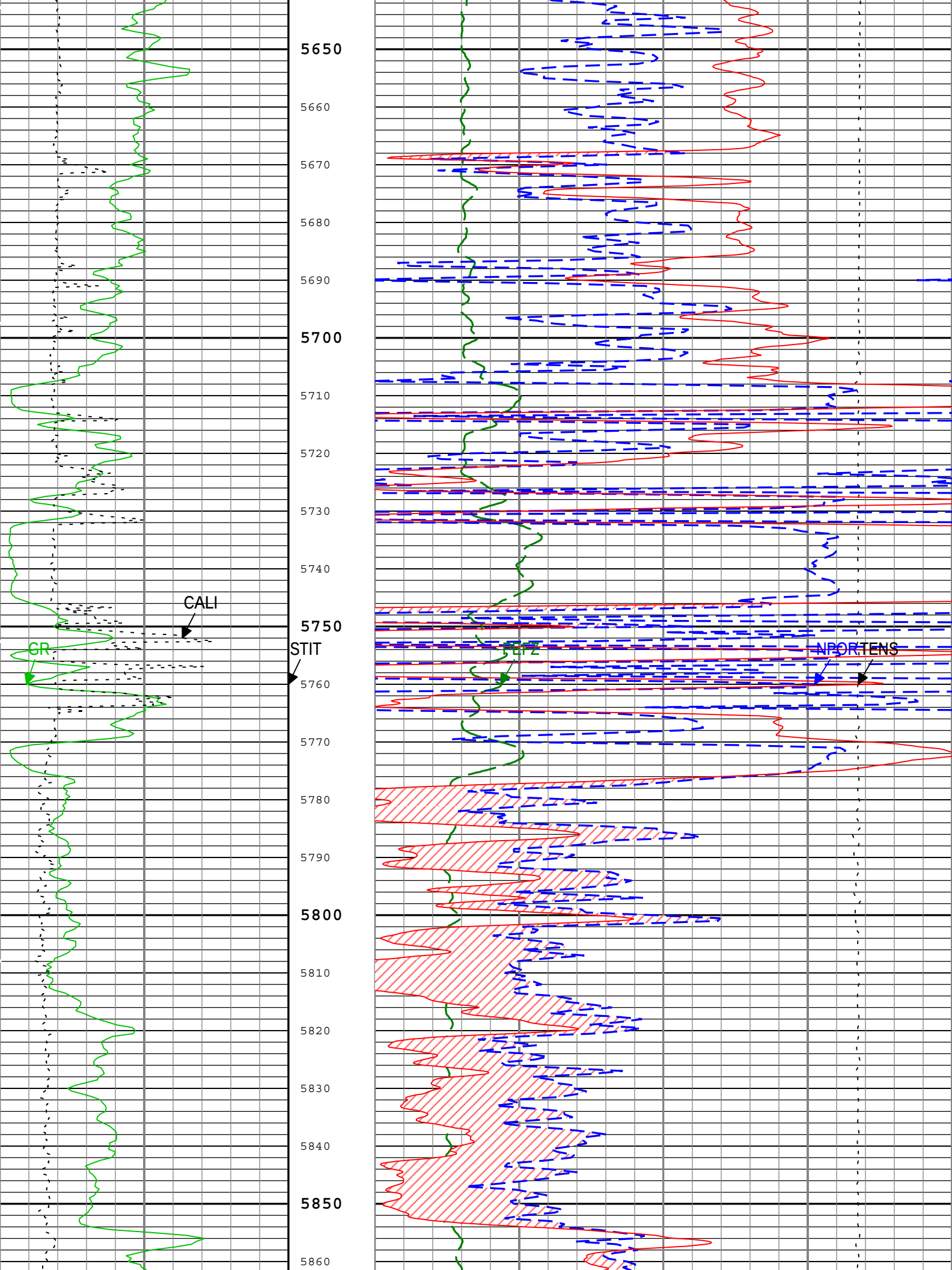
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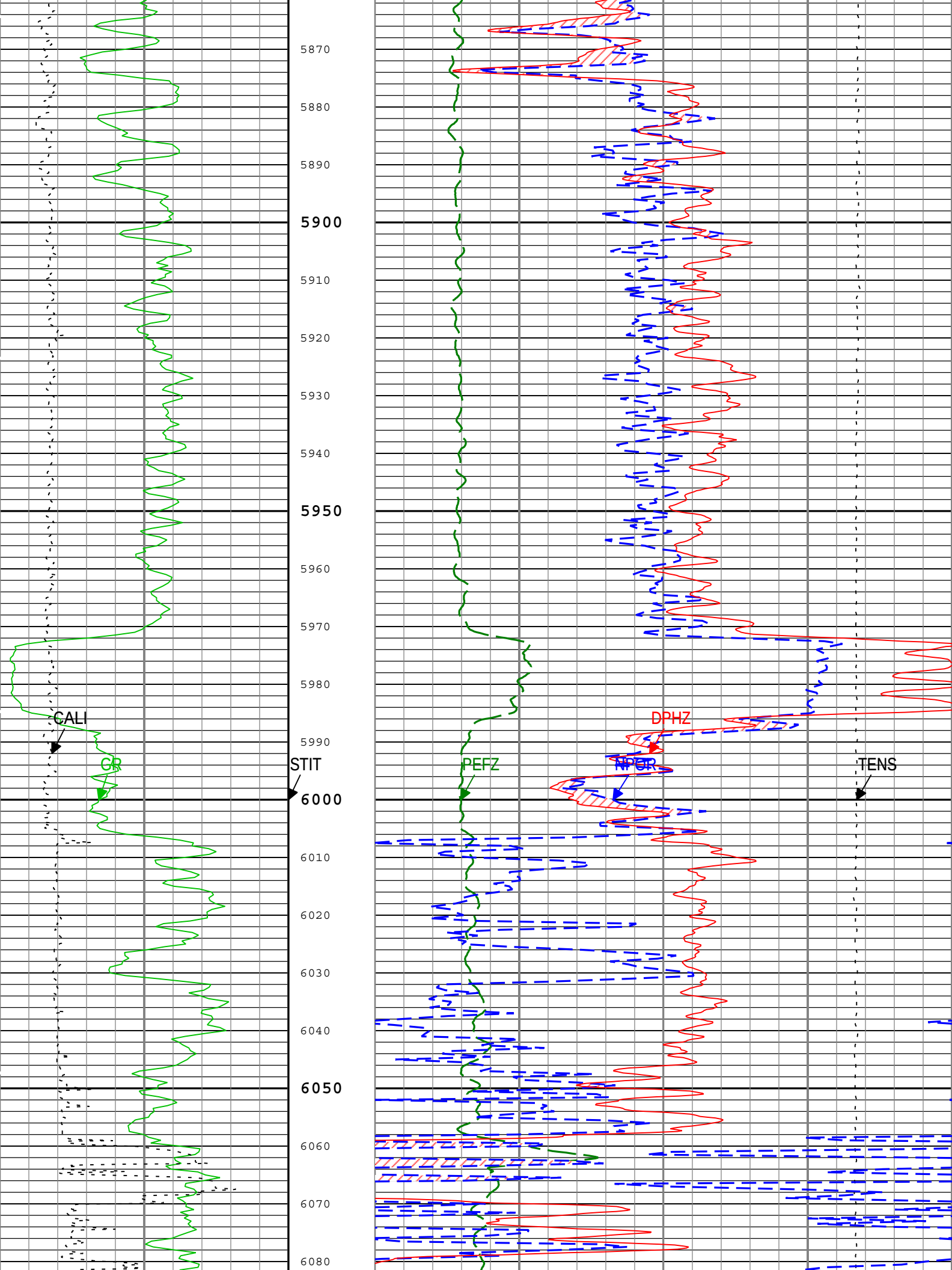
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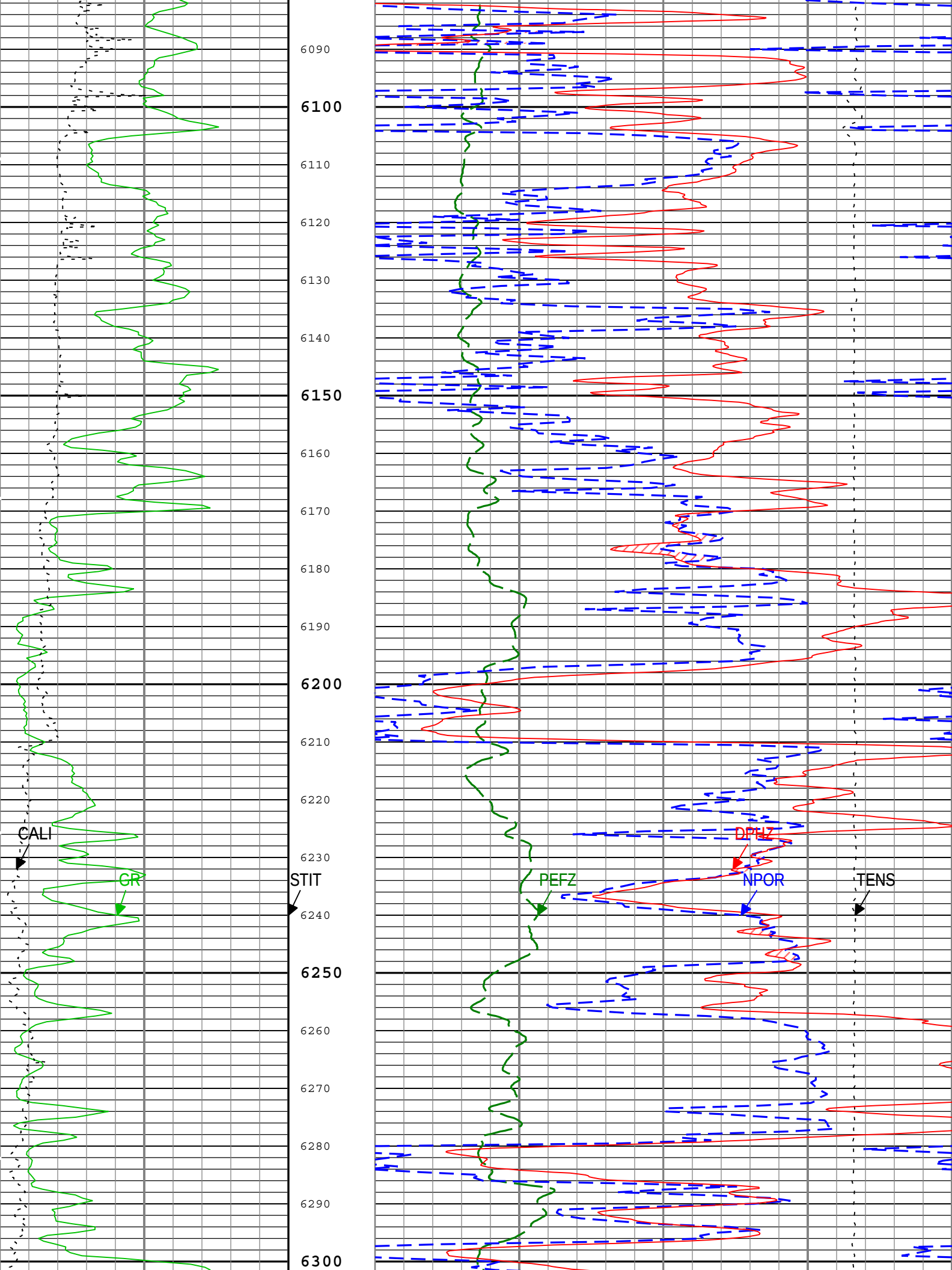
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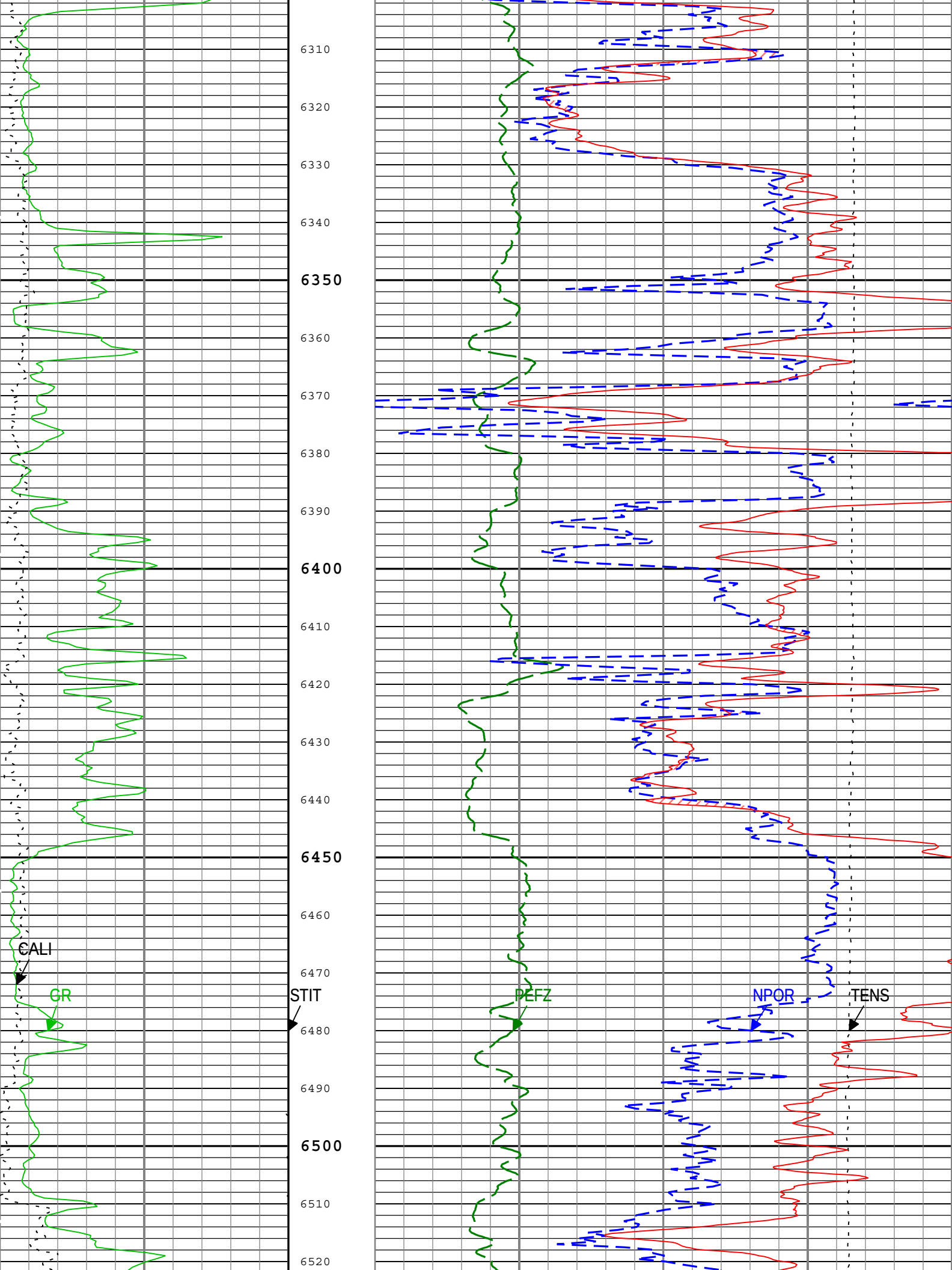
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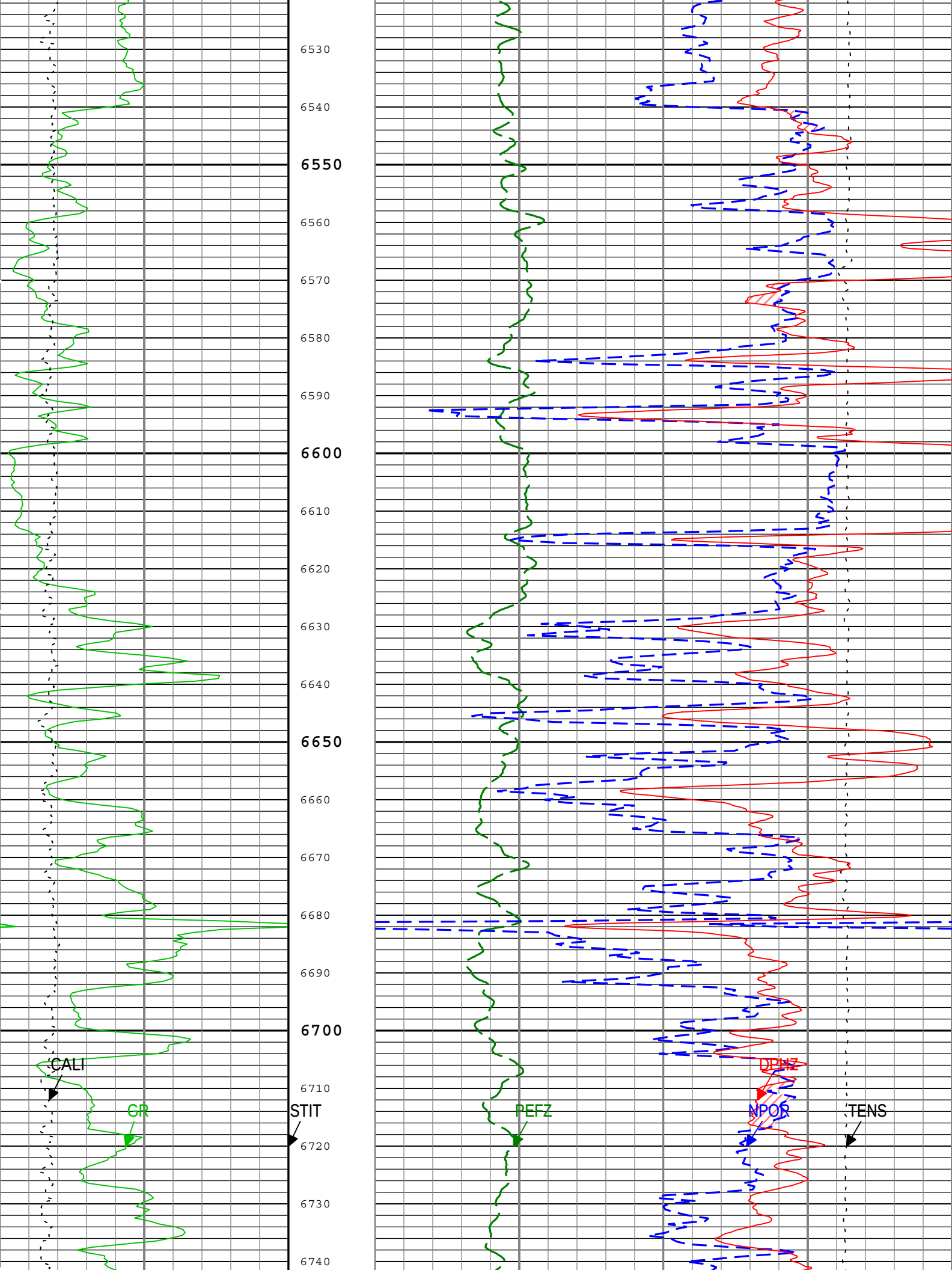
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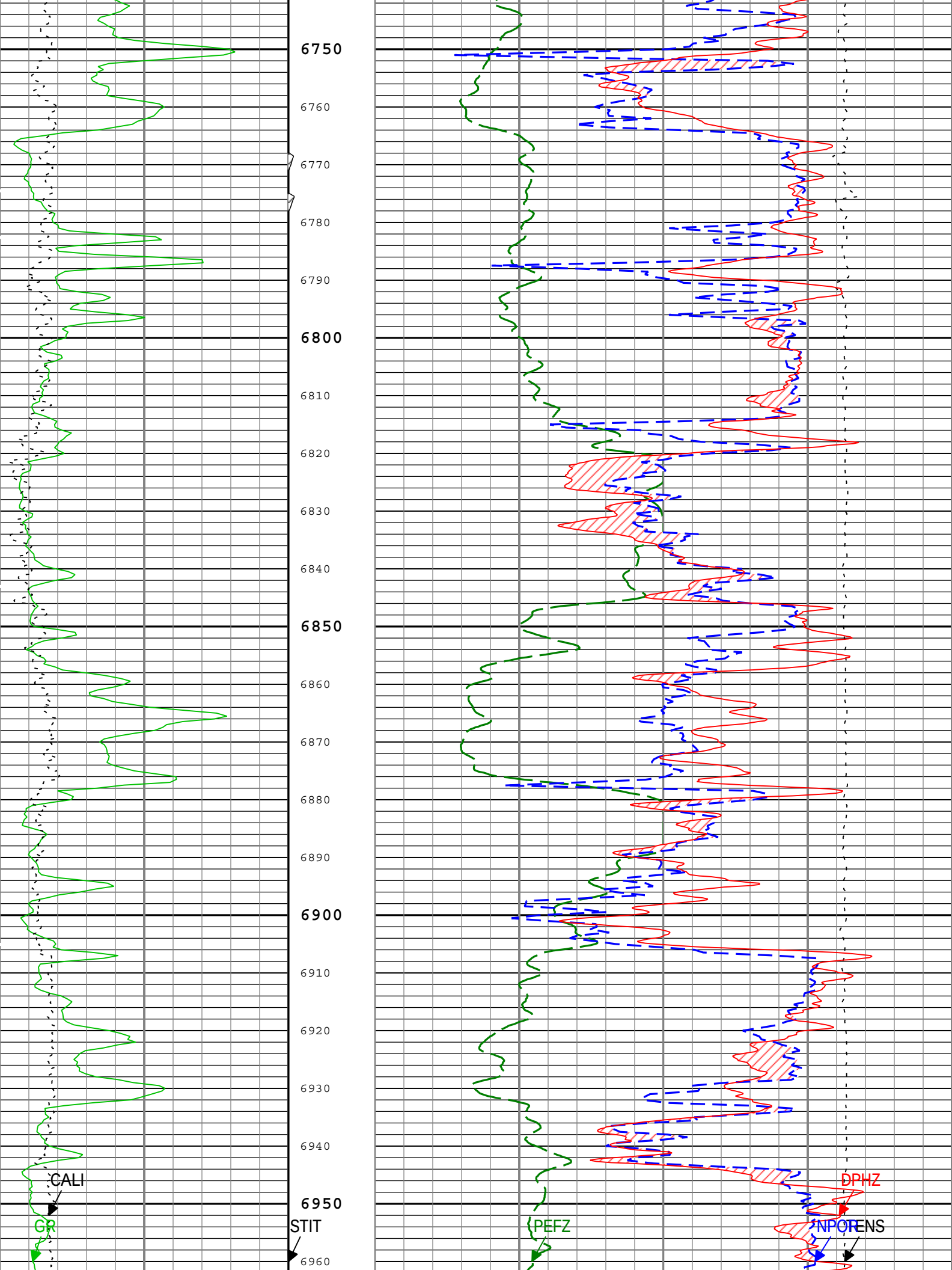
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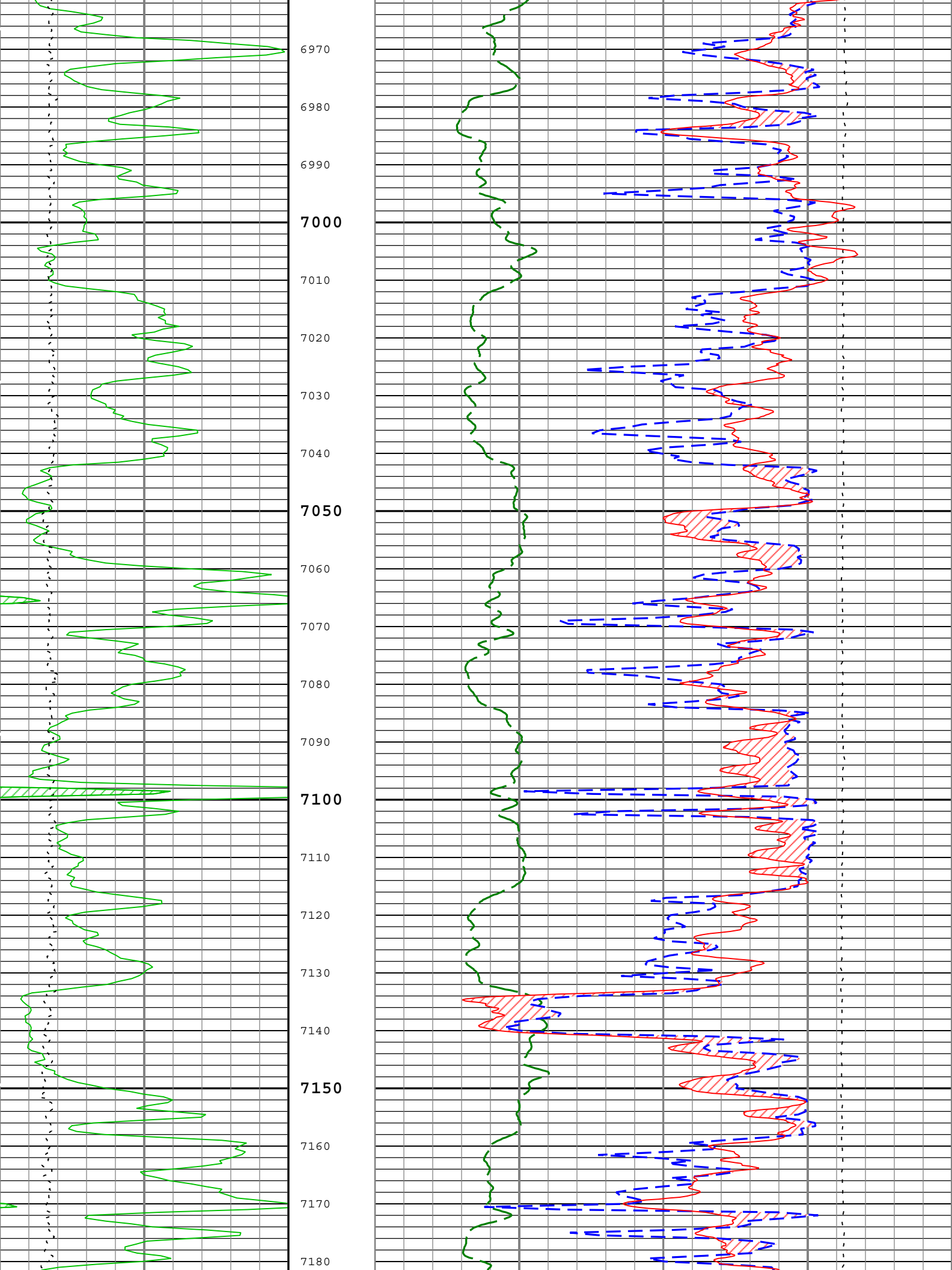
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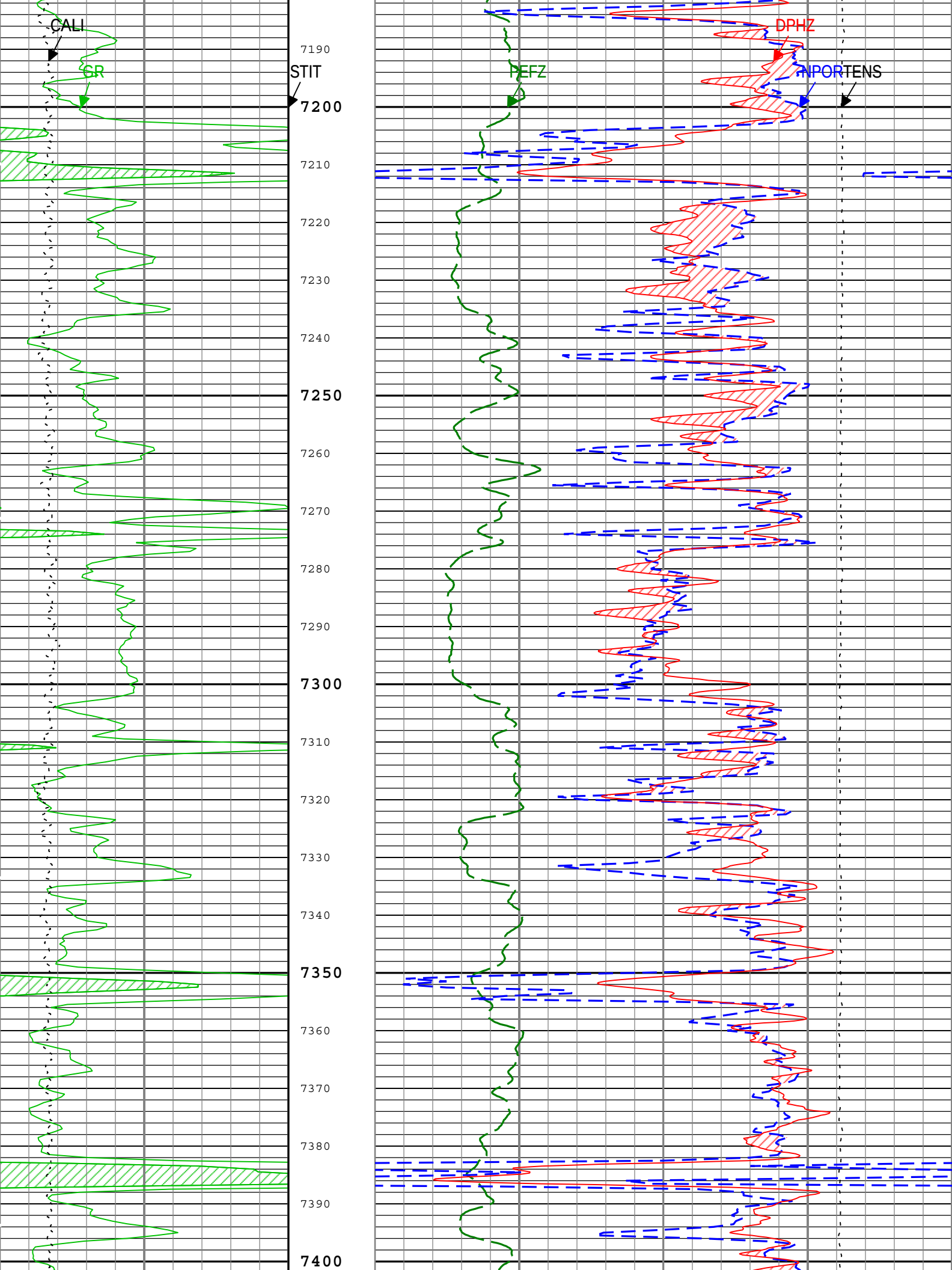
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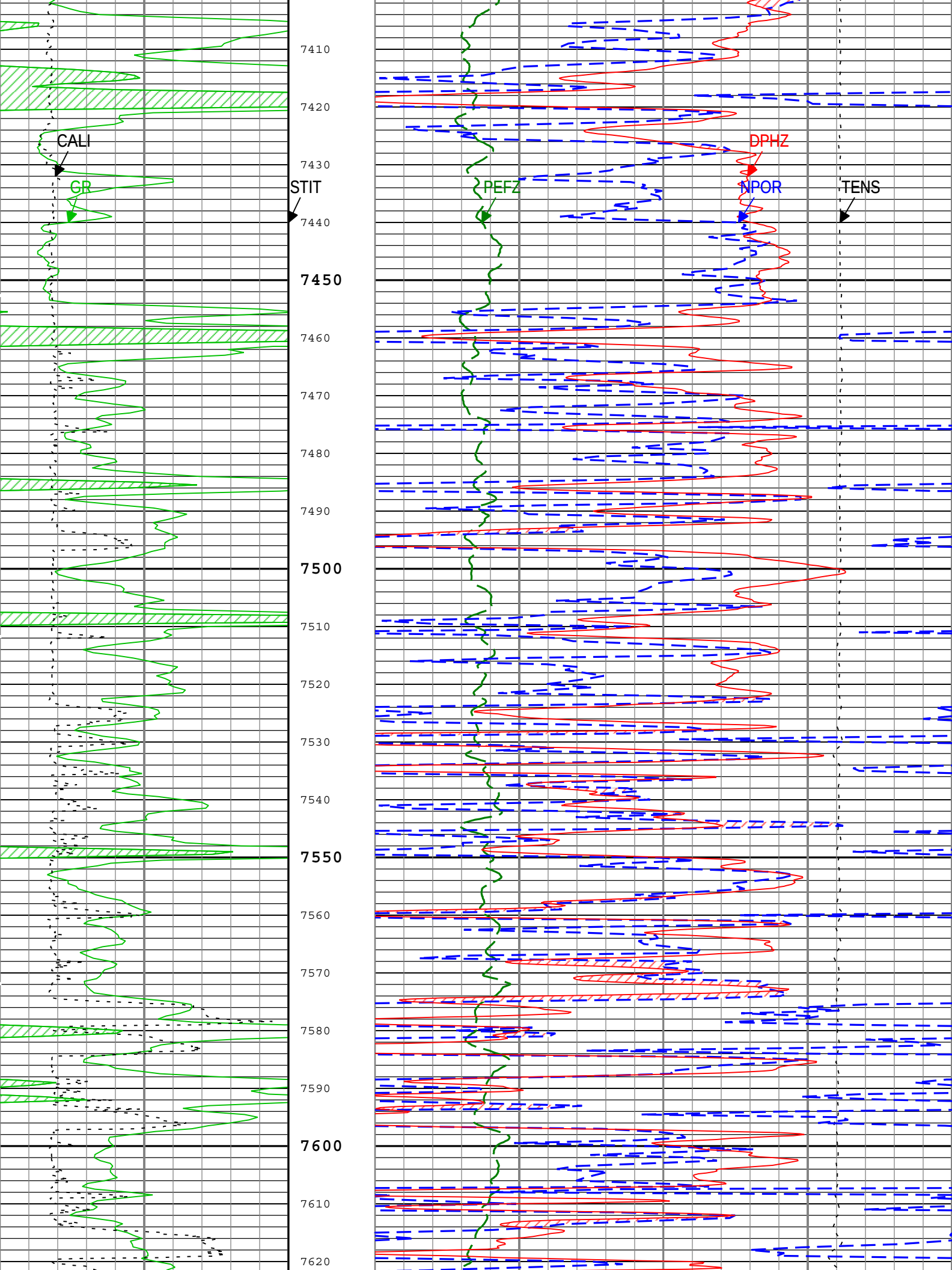
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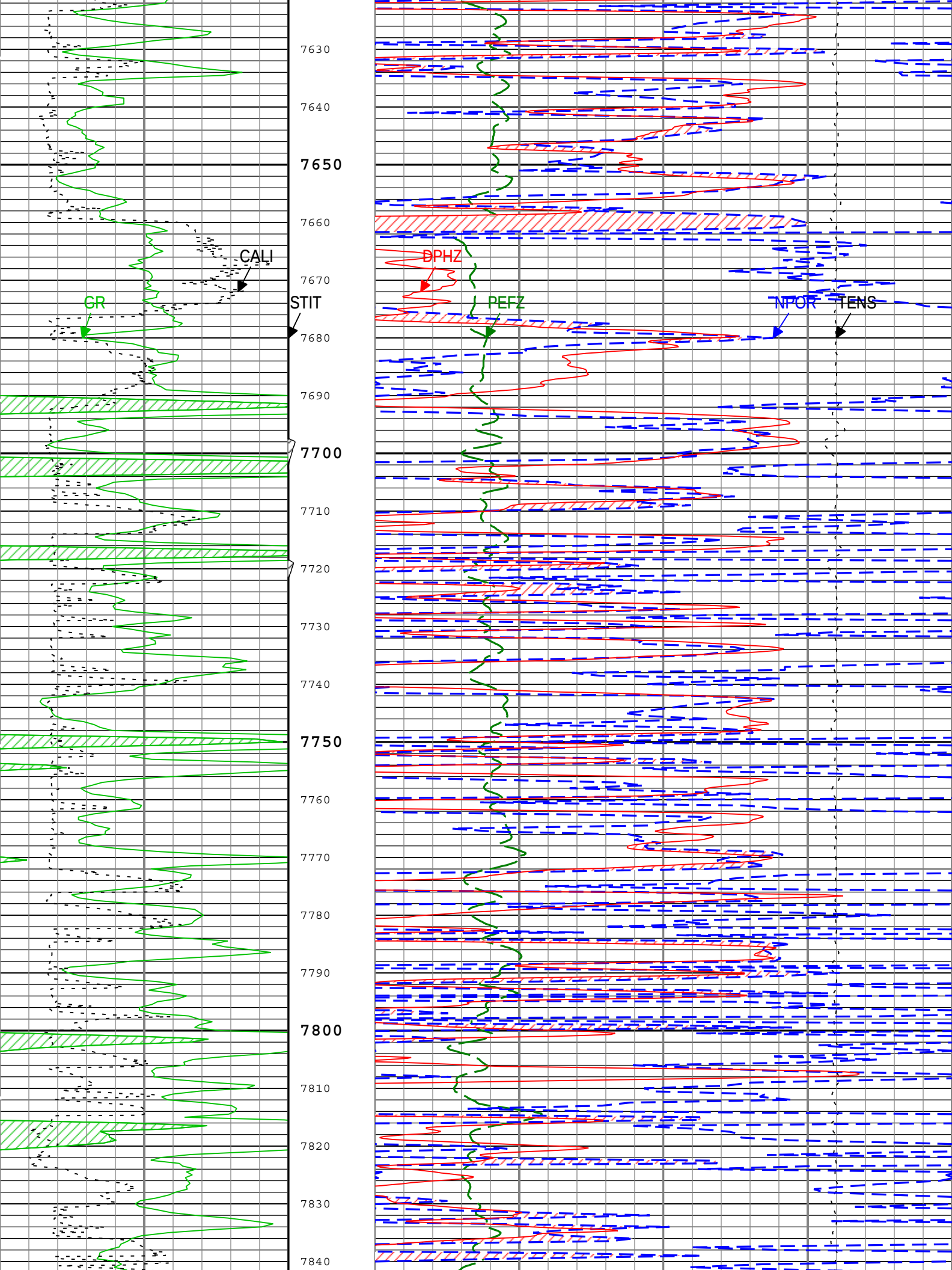
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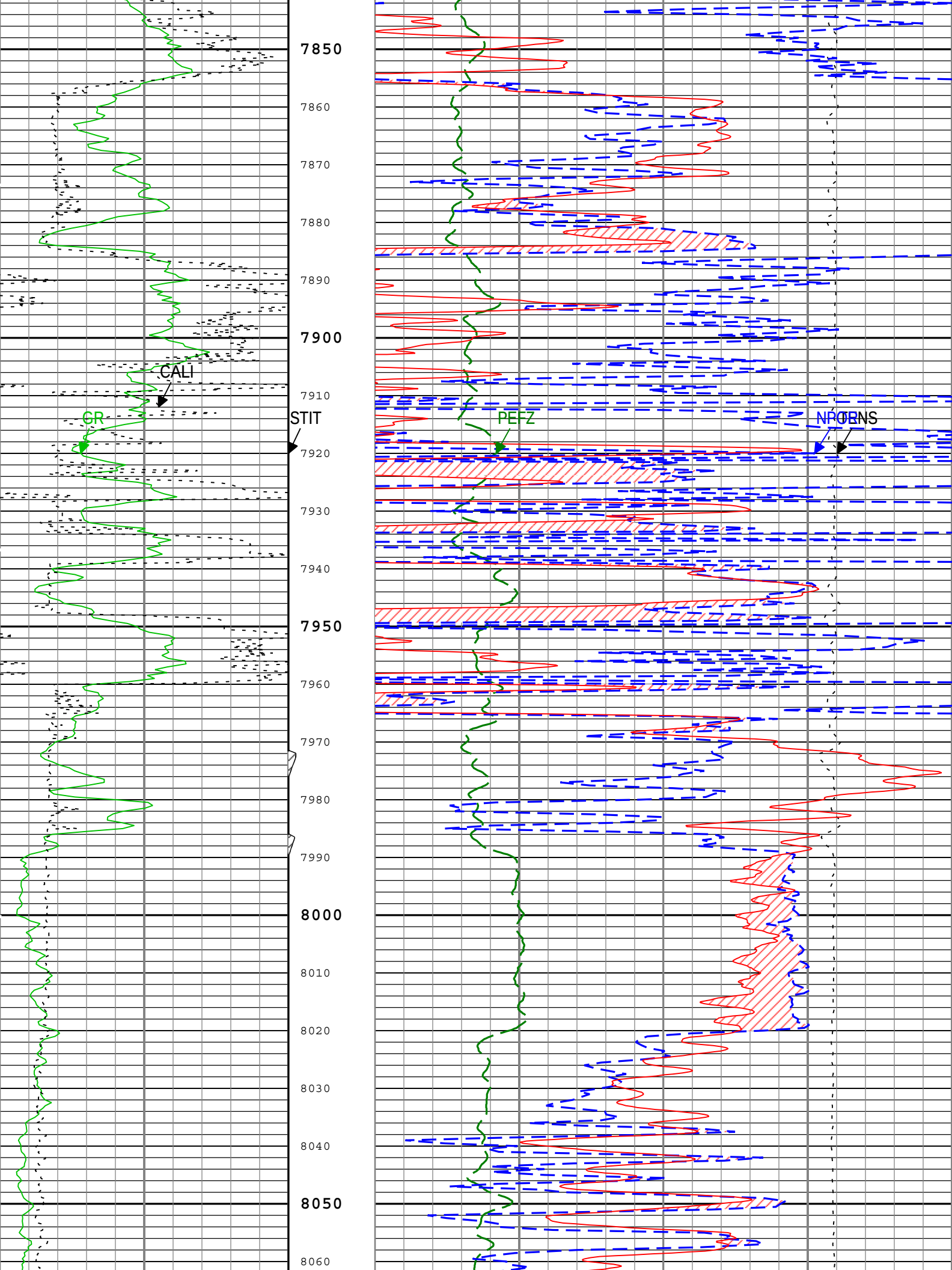
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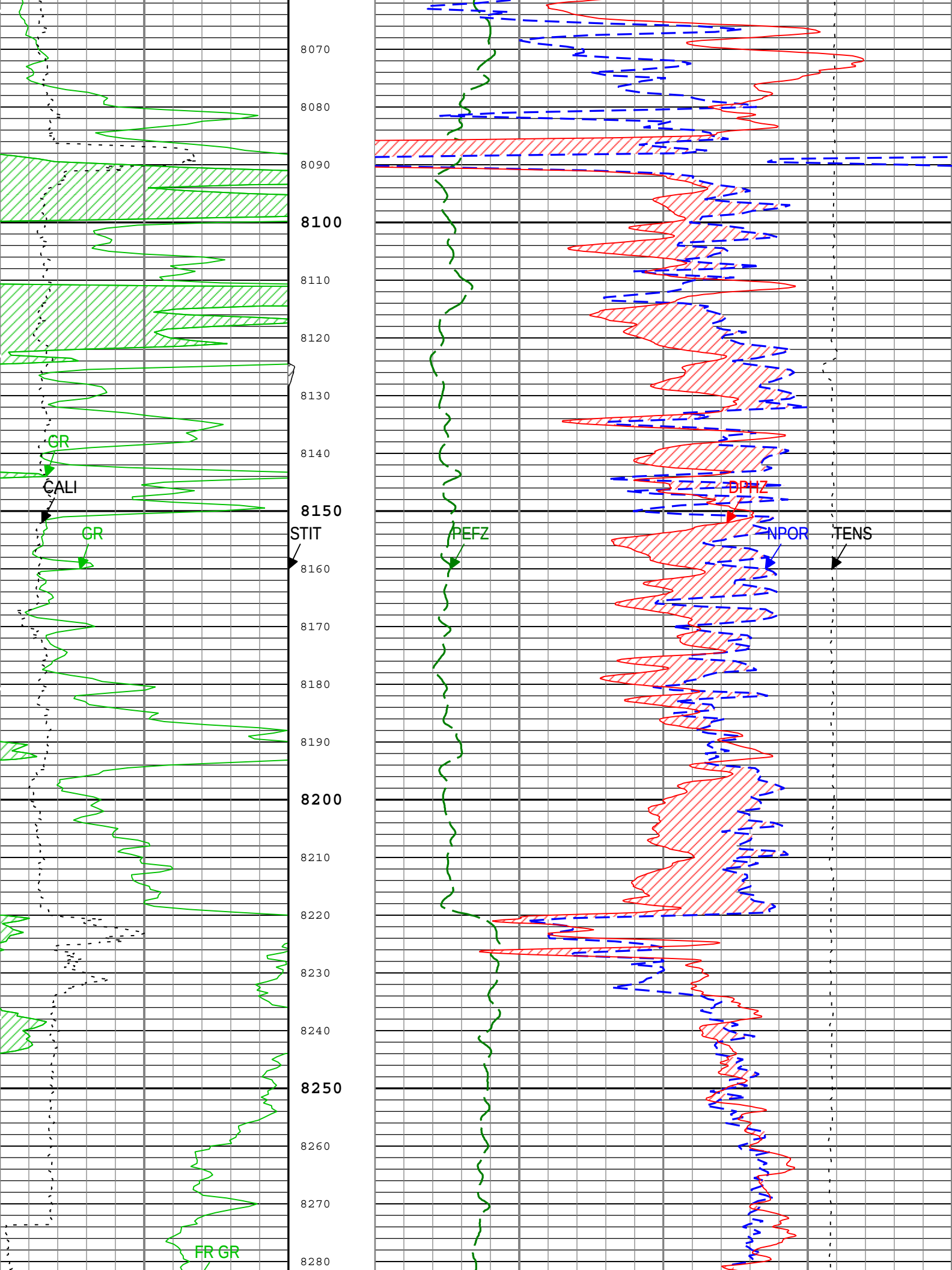
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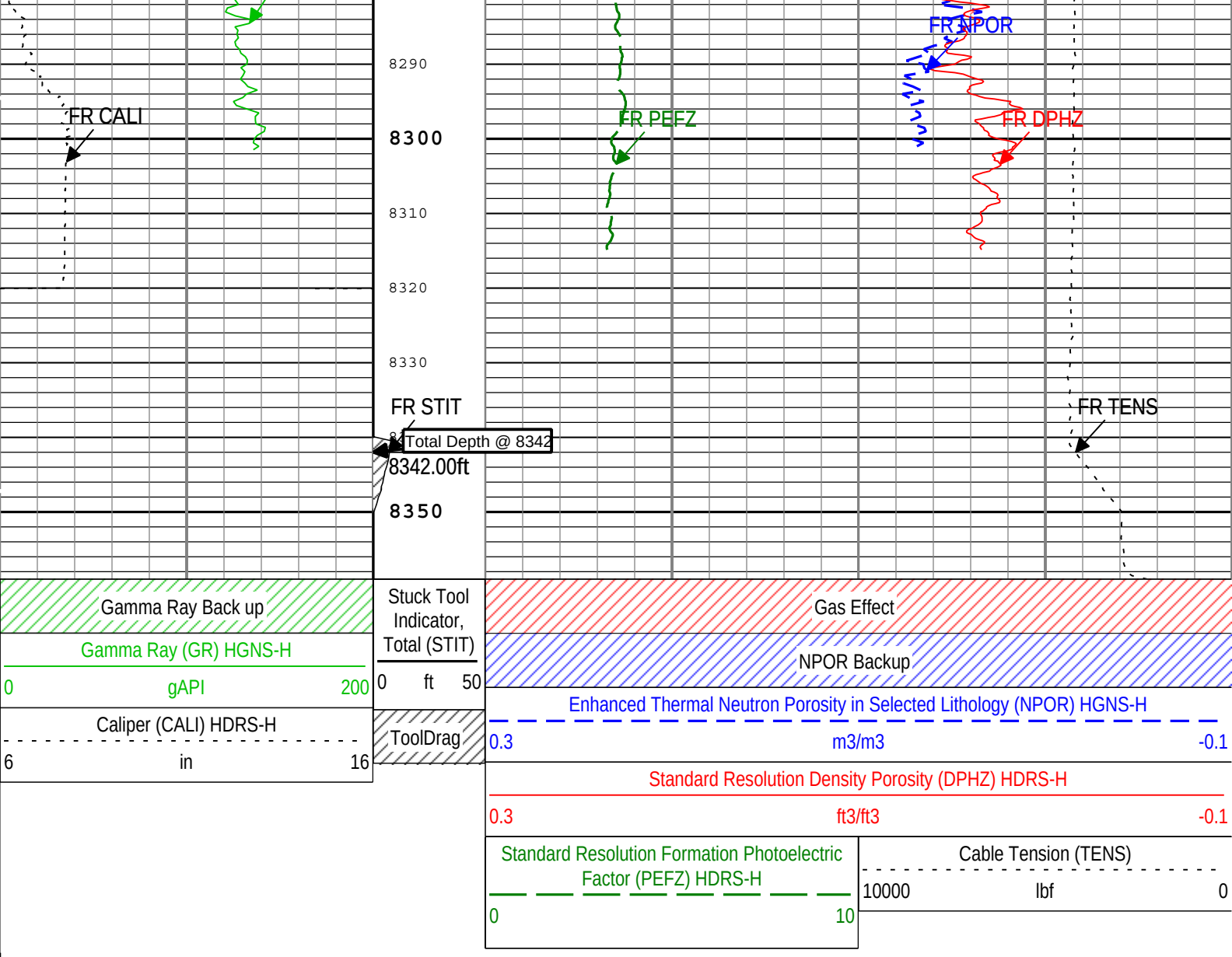


TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log (KM 5in Porosity) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 12-May-2013 18:48:06

Channel Processing Parameters

Parameter	Description	Tool	Value	Unit
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	7.875	in
BSAL	Borehole Salinity	Borehole	13556.39	ppm
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0	in
CBLO	Casing Bottom (Logger)	WLSESSION	309	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.2	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DFT_WATER	Drilling Fluid Water Type	Borehole	Fresh Water	
DHC	Density Hole Correction	HDRS-H	Bit Size	
FD	Fluid Density	Borehole	1	g/cm3
FSAL	Formation Salinity	Borehole	0	ppm
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	

GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	CTEM	
HSCO	Hole Size Correction Option	HGNS-H	Yes	
MATR	Rock Matrix for Neutron Porosity Corrections	Borehole	LIMESTONE	
MDEN	Matrix Density for Density Porosity	Borehole	2.71	g/cm3
MFST	Mud Filtrate Sample Temperature	Borehole	60	degF
RMFS	Resistivity of Mud Filtrate Sample	Borehole	0.4	ohm.m
SOCO	Standoff Correction Option	HGNS-H	Yes	
TD	Total Measured Depth	Borehole	8342	ft

Tool Control Parameters

Parameter	Description	Tool	Value	Unit
HMCA_BRD_TYPE	HMCA Board Type	HGNS-H	0	
HRGD_BRD_TYPE	HRGD Board Type	HDRS-H	WITHOUT_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
STSO_HRDD	Temperature Source for the Density Algorithm	HDRS-H	Decaytime algorithm	

1

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
1	Repeat[2]:Up	Up	7571.19 ft	8360.03 ft	12-May-2013 3:00:14 PM	12-May-2013 3:14:09 PM	6.12 ft	
1	Main[3]:Up	Up	208.80 ft	8359.06 ft	12-May-2013 3:21:28 PM	12-May-2013 5:46:55 PM	0.00 ft	

All depths are referenced to toolstring zero

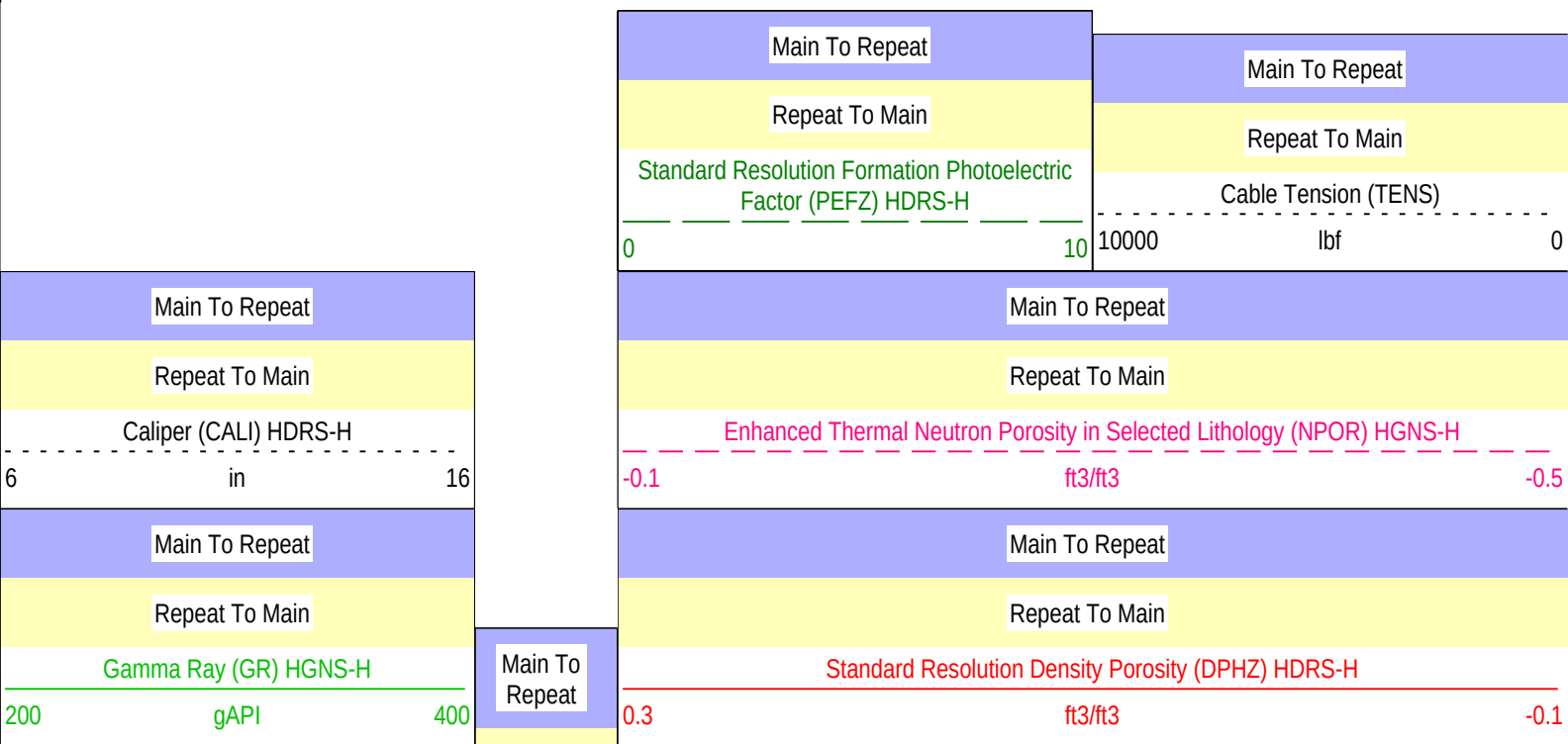
Log

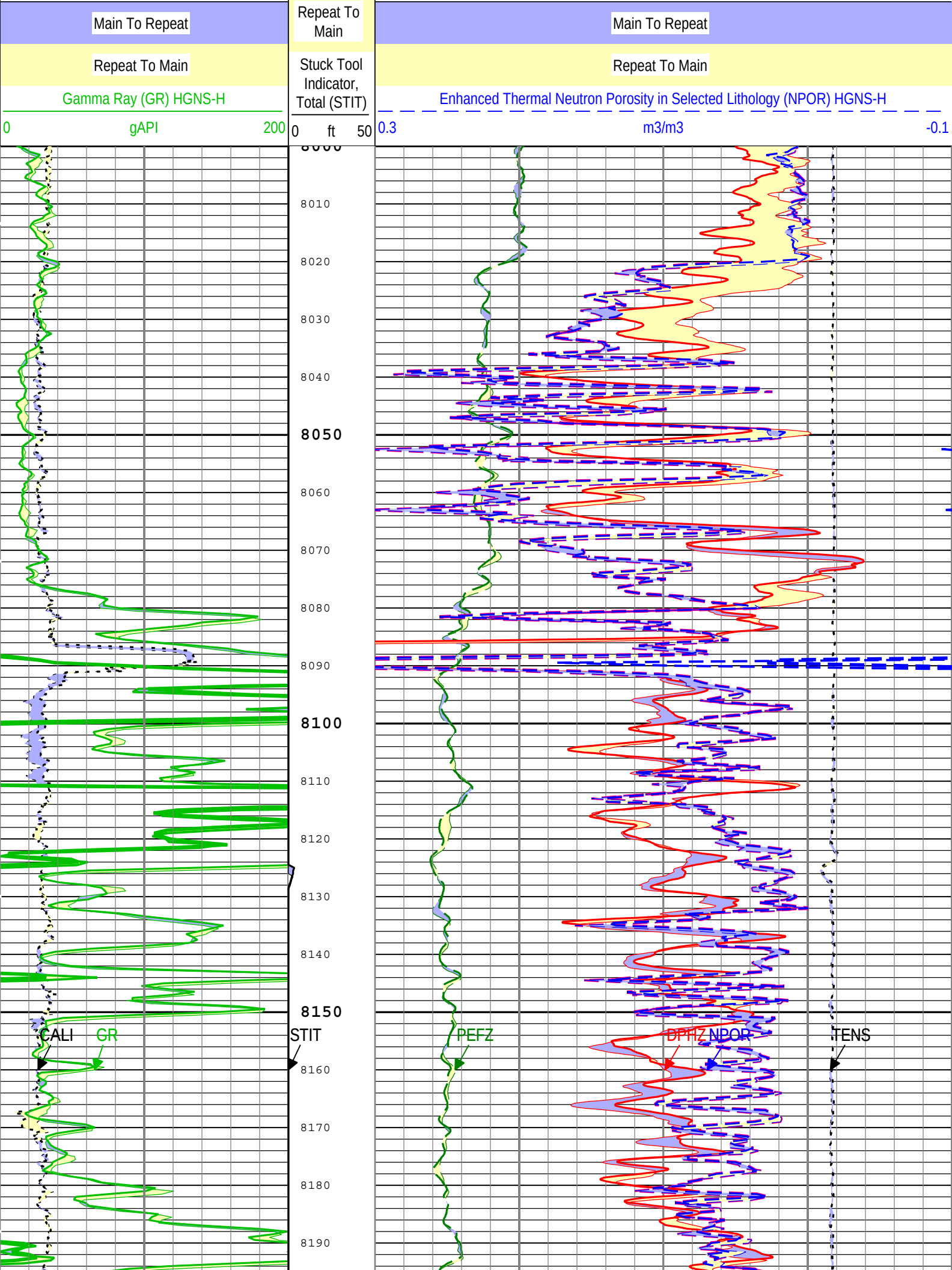
1: Repeat[2]:Up

Description: HGNS standard resolution porosities for Platform Express Format: Log (KM 5in Porosity RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 12-May-2013 18:48:19

Channel	Source	Sampling
TIME_1900	WLWorkflow	0.1in

TIME_1900 - Time Marked every 60.00 (s)




Main To Repeat
Repeat To Main
Gamma Ray (GR) HGNS-H
0
gAPI
200
Repeat To Main
Stuck Tool Indicator, Total (STIT)
0
ft
50
Main To Repeat
Repeat To Main
Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H
0.3
m3/m3
-0.1
8010
8020
8030
8040
8050
8060
8070
8080
8090
8100
8110
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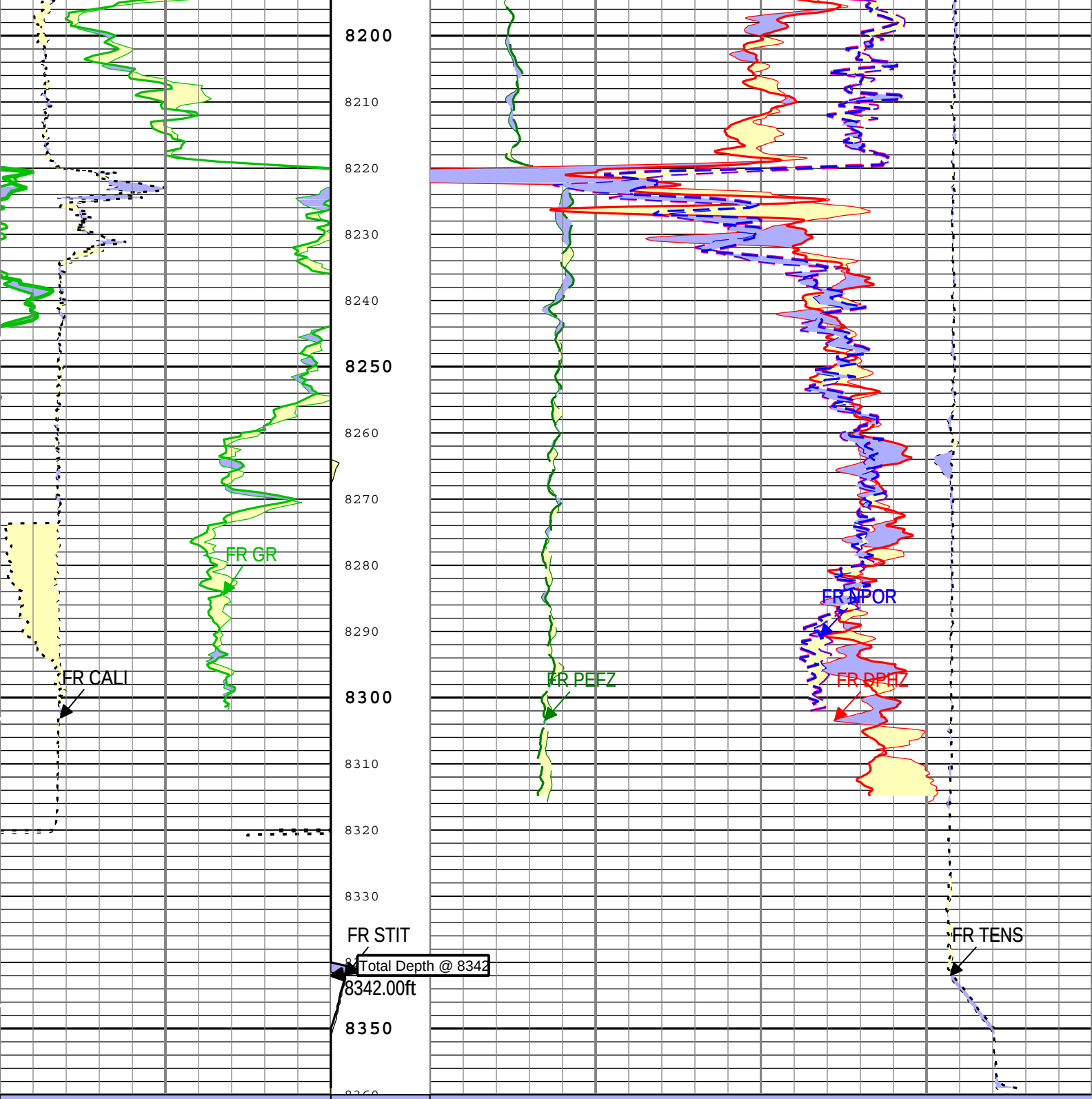
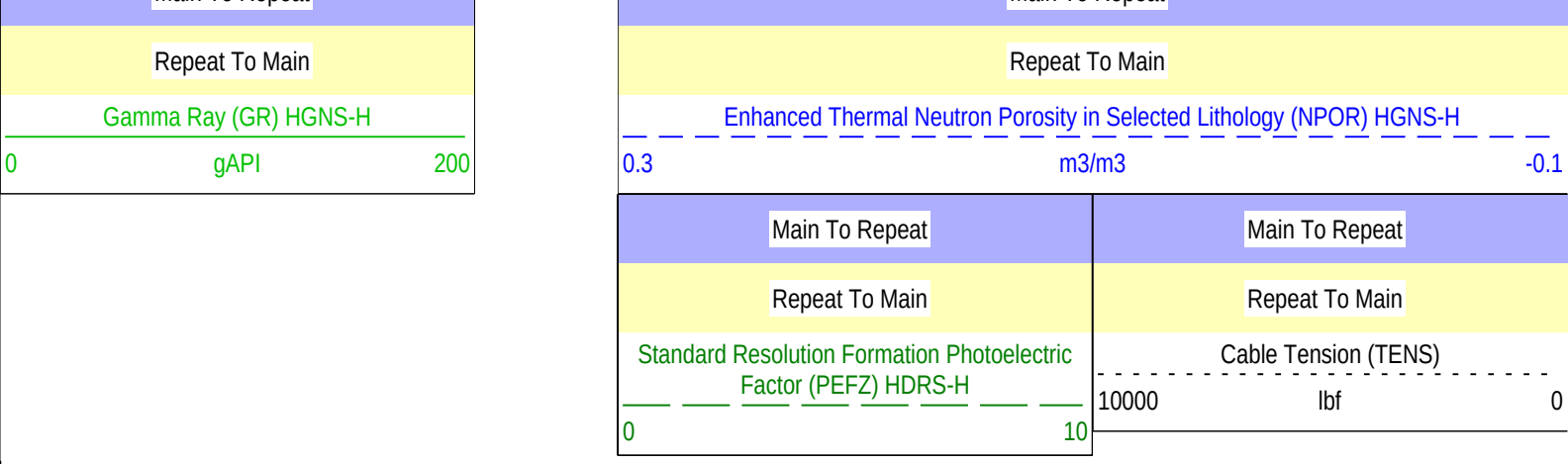
DPHZ
NPOR
TENS



Main To Repeat	Main To Repeat	Main To Repeat
Repeat To Main	Repeat To Main	Repeat To Main
Caliper (CALI) HDRS-H		Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H
6 in 16		-0.1 ft3/ft3 -0.5
Main To Repeat	Stuck Tool Indicator, Total (STIT)	Main To Repeat
Repeat To Main	0 ft 50	Repeat To Main
Gamma Ray (GR) HGNS-H		Standard Resolution Density Porosity (DPHZ) HDRS-H
200 gAPI 400		0.3 ft3/ft3 -0.1
Main To Repeat		Main To Repeat



Description: HGNS standard resolution porosities for Platform Express Format: Log (KM 5in Porosity RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 12-May-2013 18:48:19

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5" Density

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit

Software Version

Acquisition System	Version
MaxWell	3.1.9755.0
Application Patch	SP-20121102-3.1.9755.1422

Computation	Description	Version
DepthCorrection	DepthCorrection	3.1.9755.0

Tool Elements	Description	Software Version	Firmware Version
HRCC-H	HILT High-Resolution Control Cartridge, 150 degC	3.1.9755.0	2.0
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.1.9755.0	2.0
HRGD-H	HILT Resistivity Gamma-Ray Density Device, 150 degC	3.1.9755.0	3.0

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
1	Main[3]:Up	Up	208.80 ft	8359.06 ft	12-May-2013 3:21:28 PM	12-May-2013 5:46:55 PM	0.00 ft	

All depths are referenced to toolstring zero

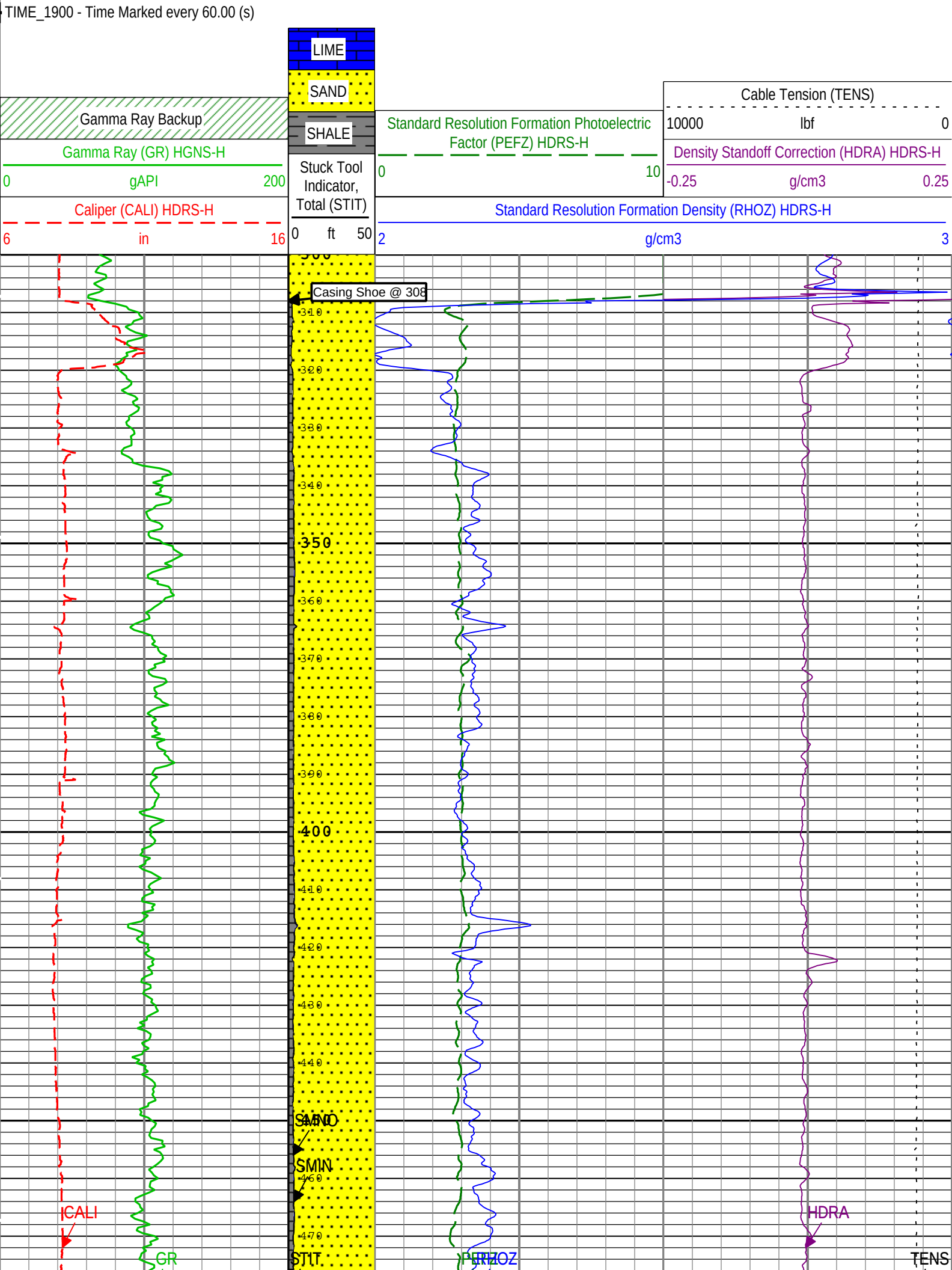
Log

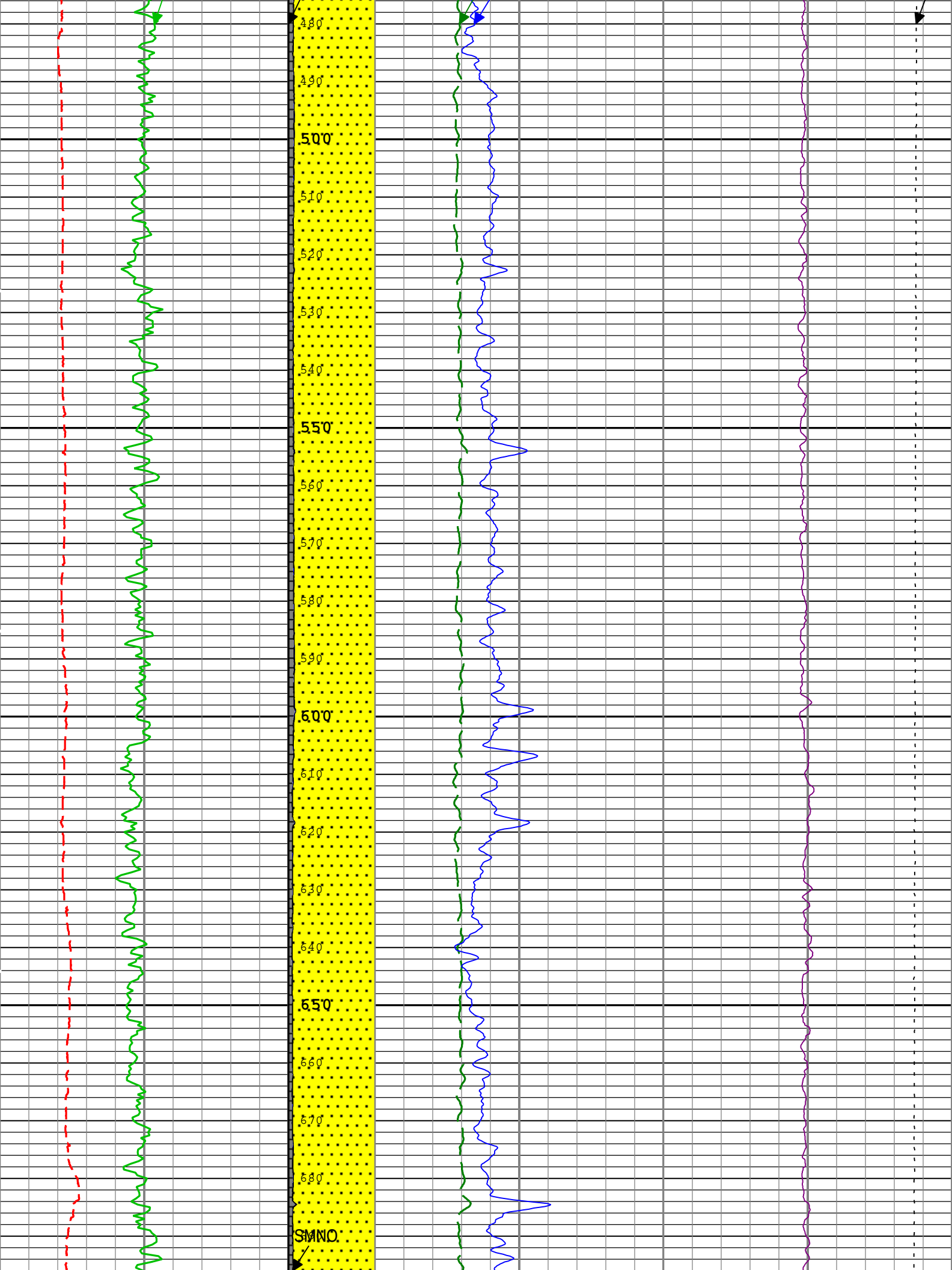
1: Main[3]:Up

Description: HGNS standard resolution porosities for Platform Express Format: Log (KM 5in Density) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 12-May-2013 18:48:22

Channel	Source	Sampling
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR	HGNS-H:HGNS-H:HGNS-H	6in
HDRA	HDRS-H:HRMS-H:HRGD-H	2in
PEFZ	HDRS-H:HRMS-H:HRGD-H	2in
RHOZ	HDRS-H:HRMS-H:HRGD-H	2in
SMIN	HDRS-H:HRMS-H:HRGD-H	2in
SMNO	HDRS-H:HRMS-H:HRGD-H	2in
STIT	DepthCorrection	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

TIME_1900 - Time Marked every 60.00 (s)

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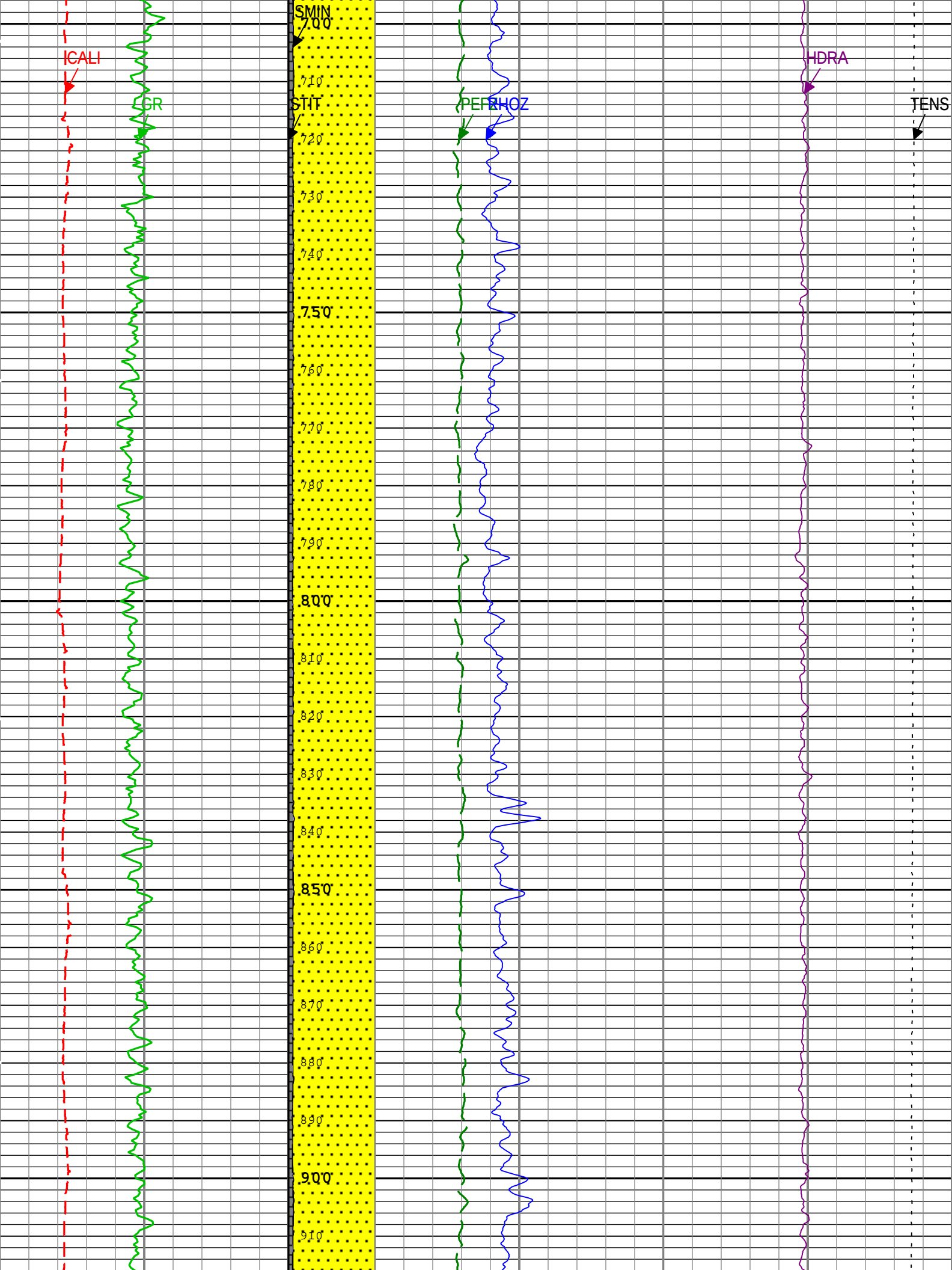
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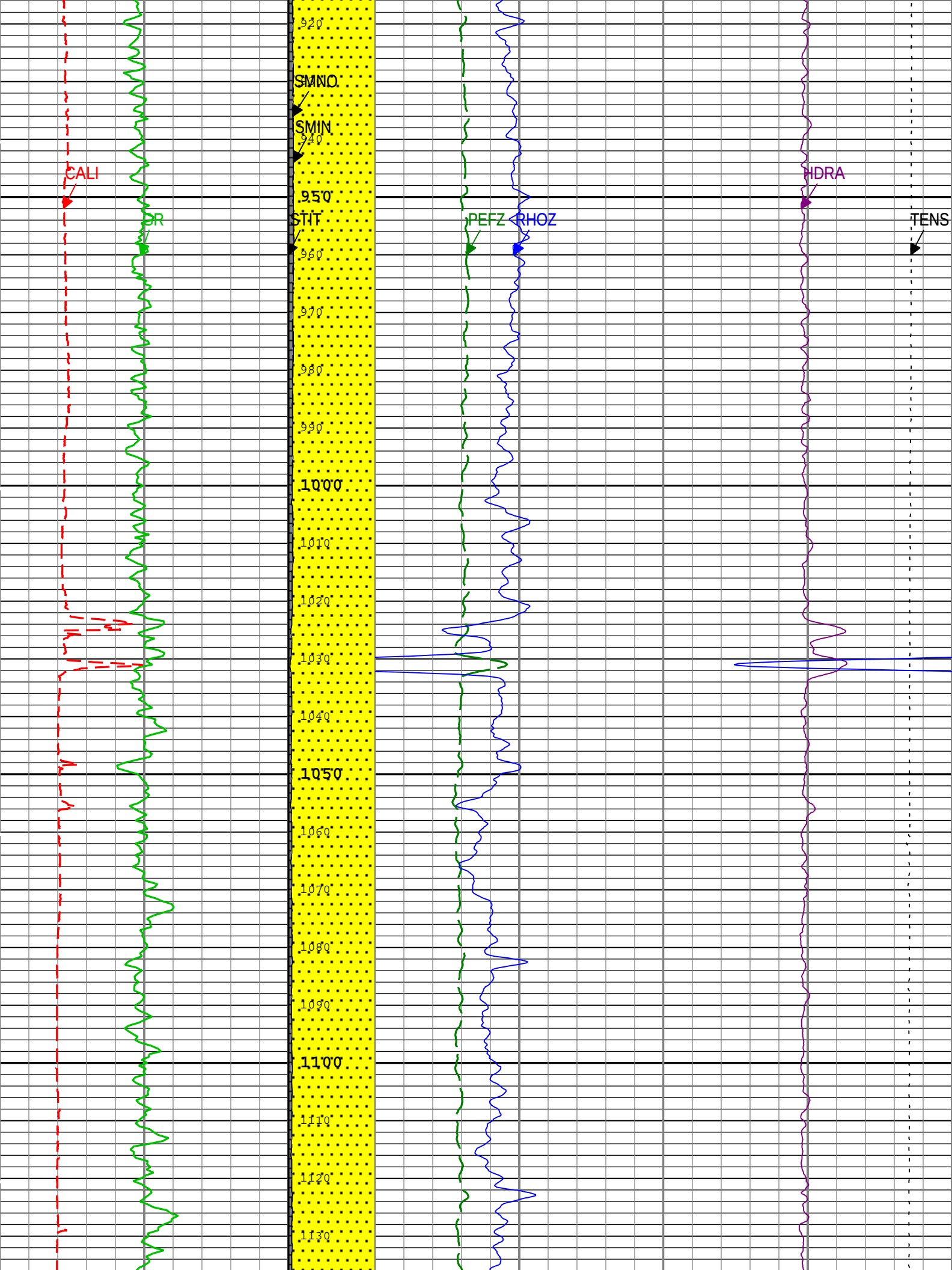
PEFZ
RHOZ
HDRA
TENS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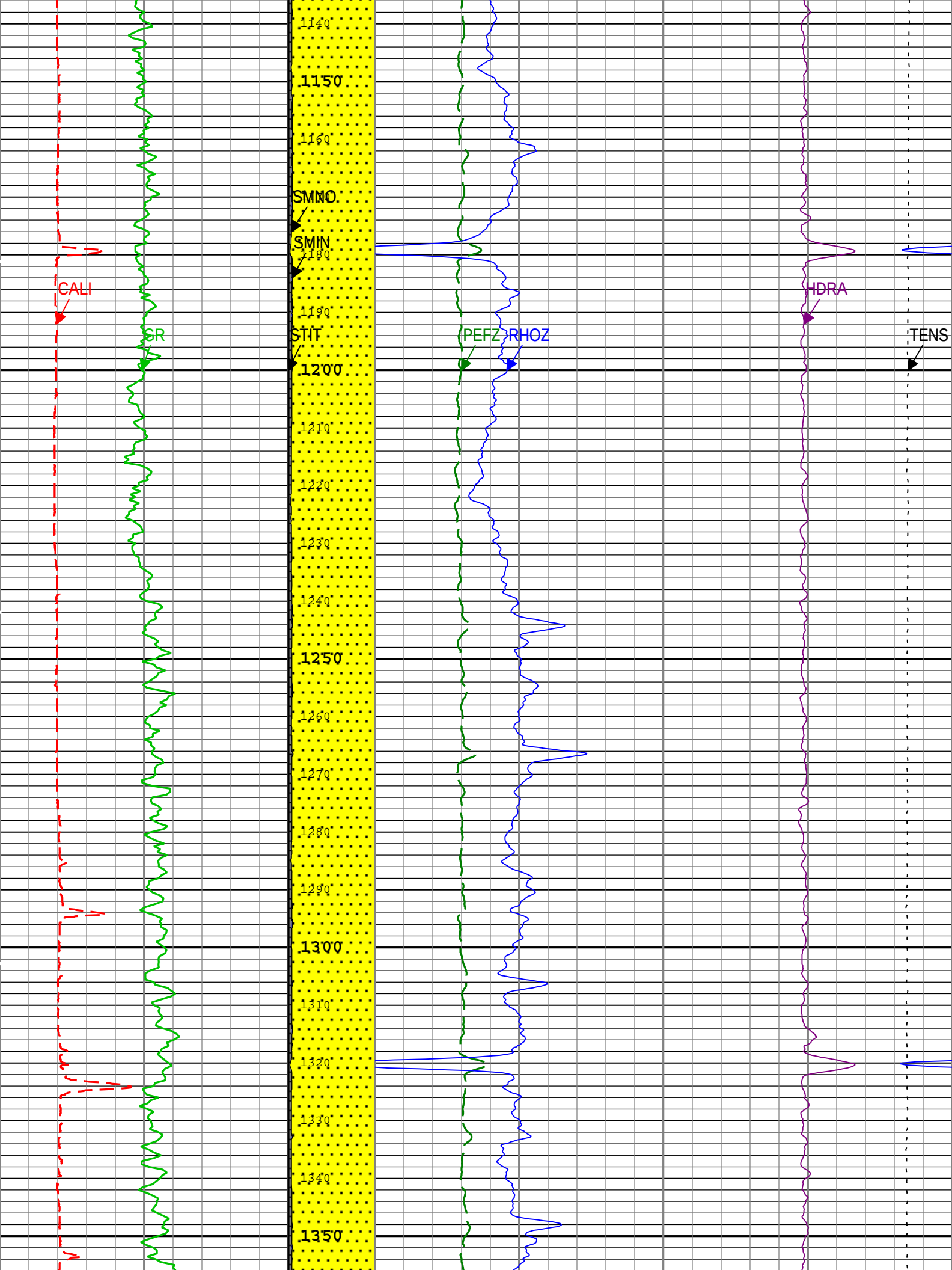
1130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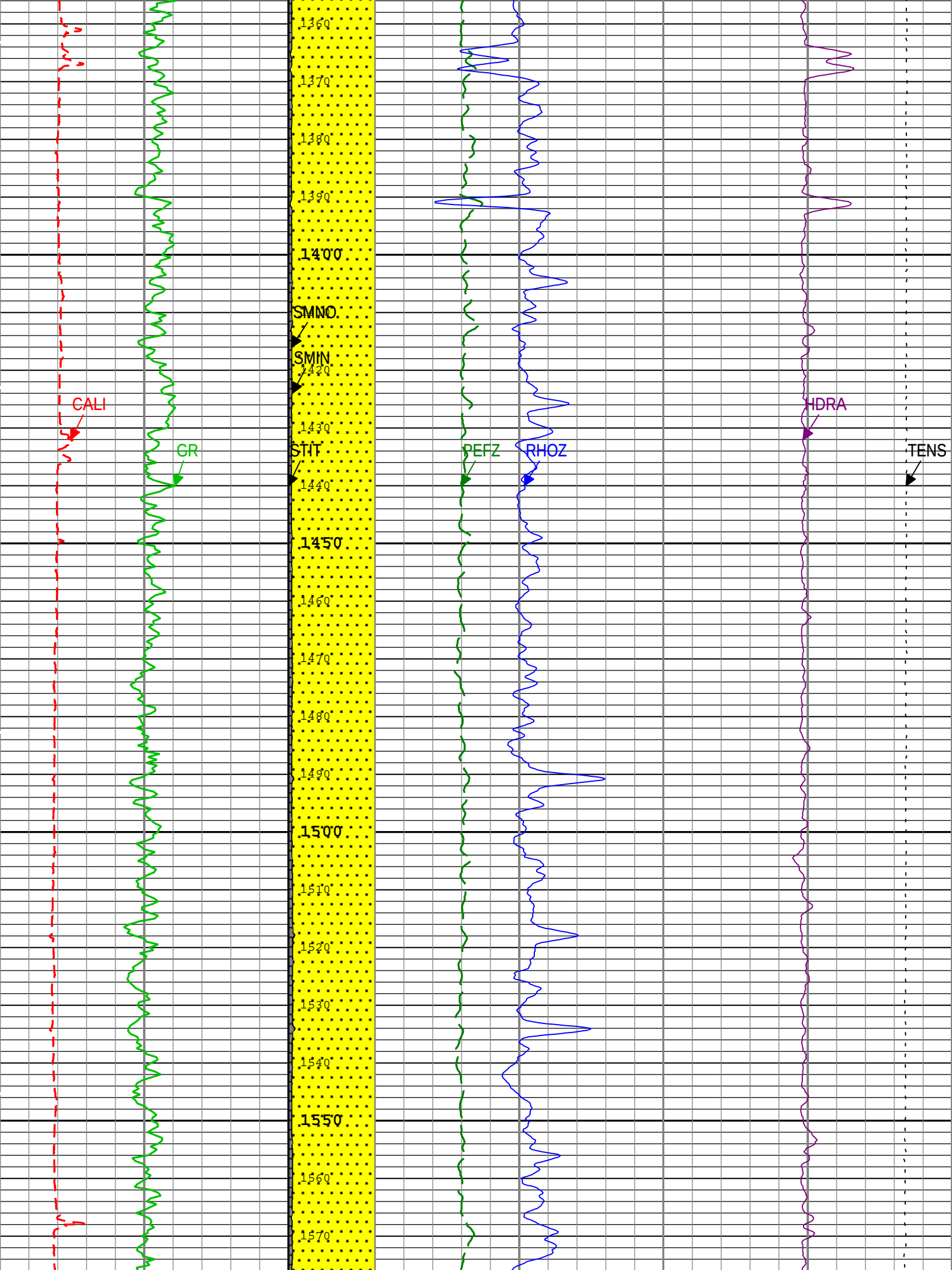
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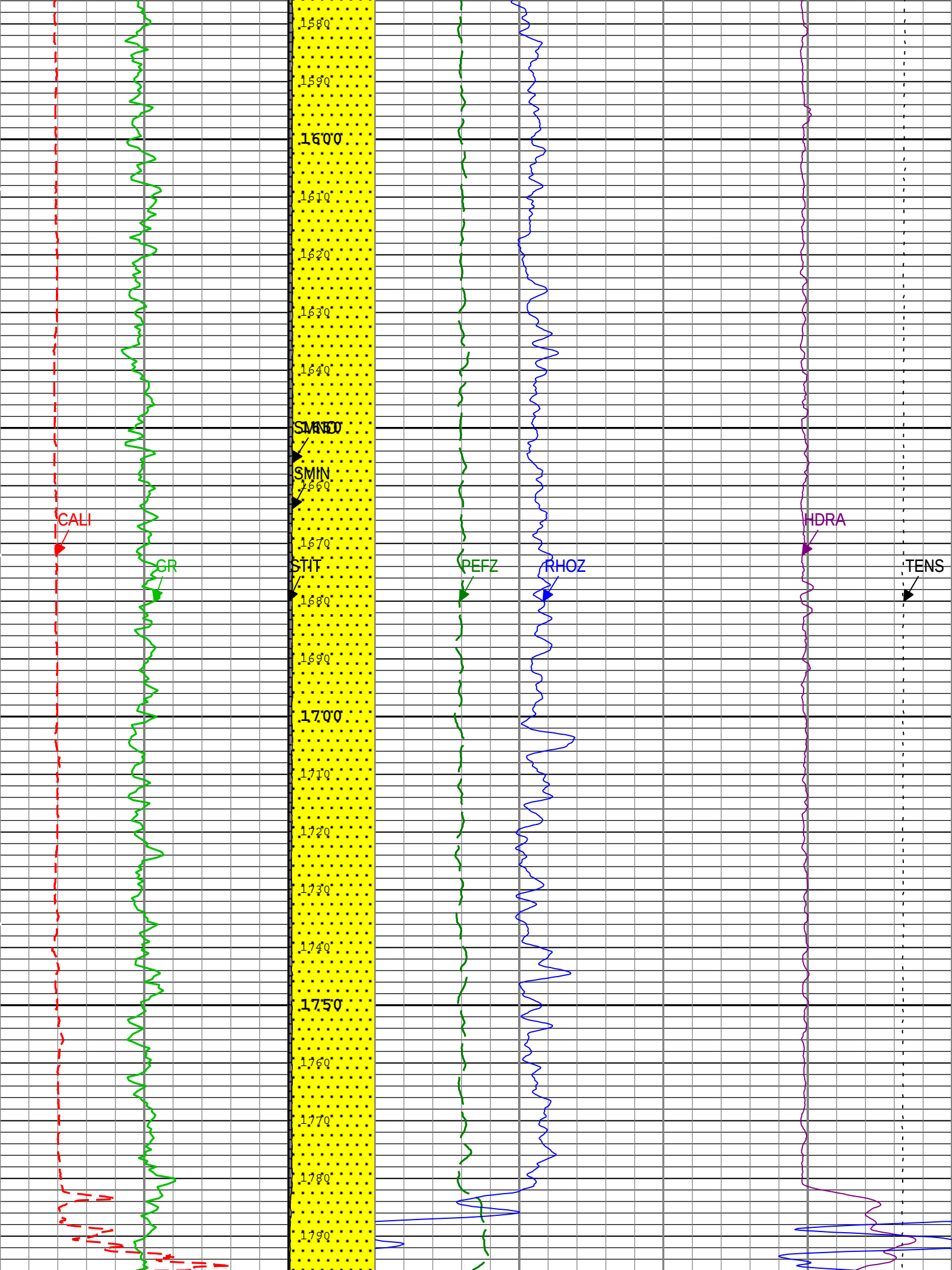
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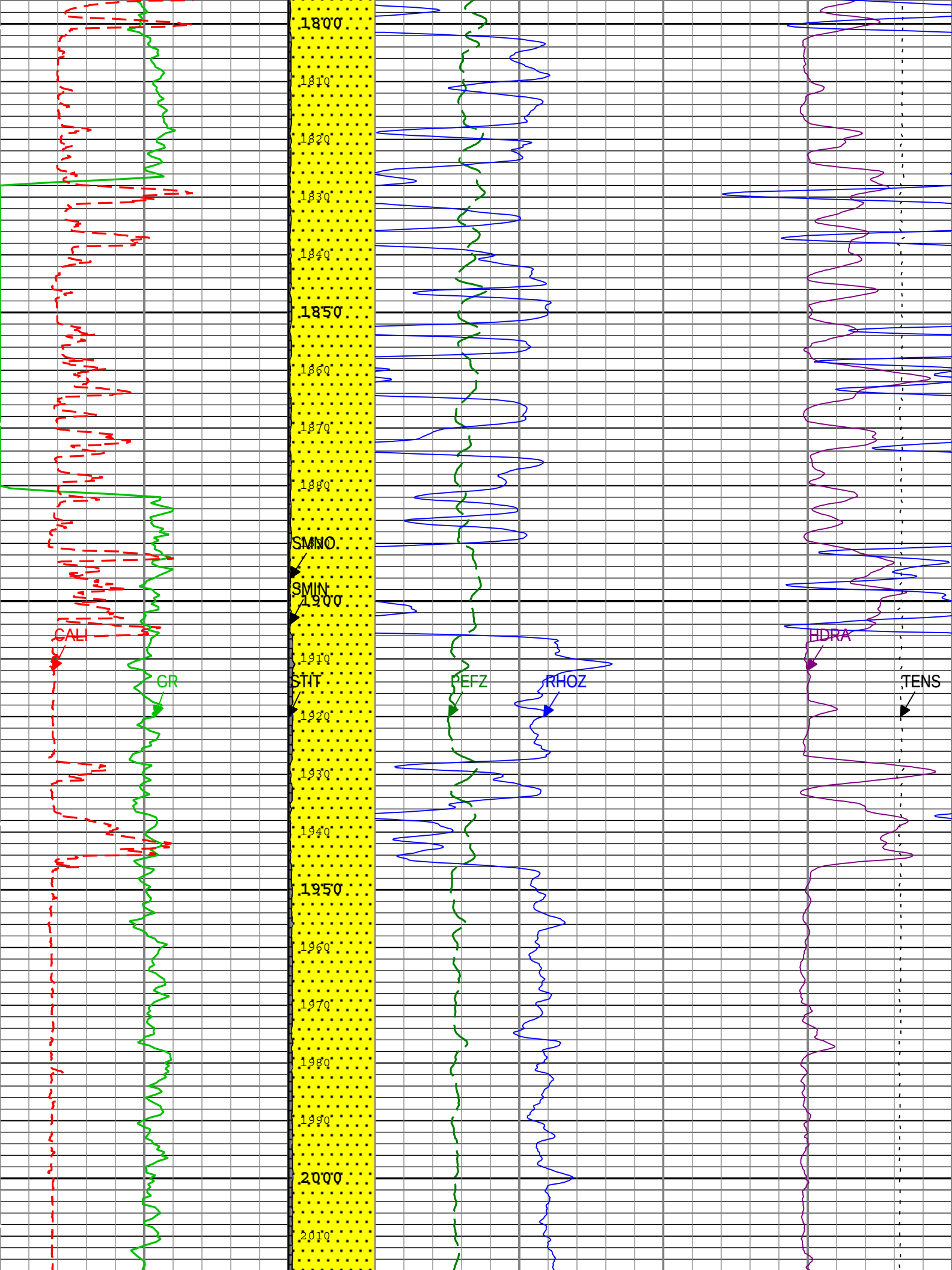
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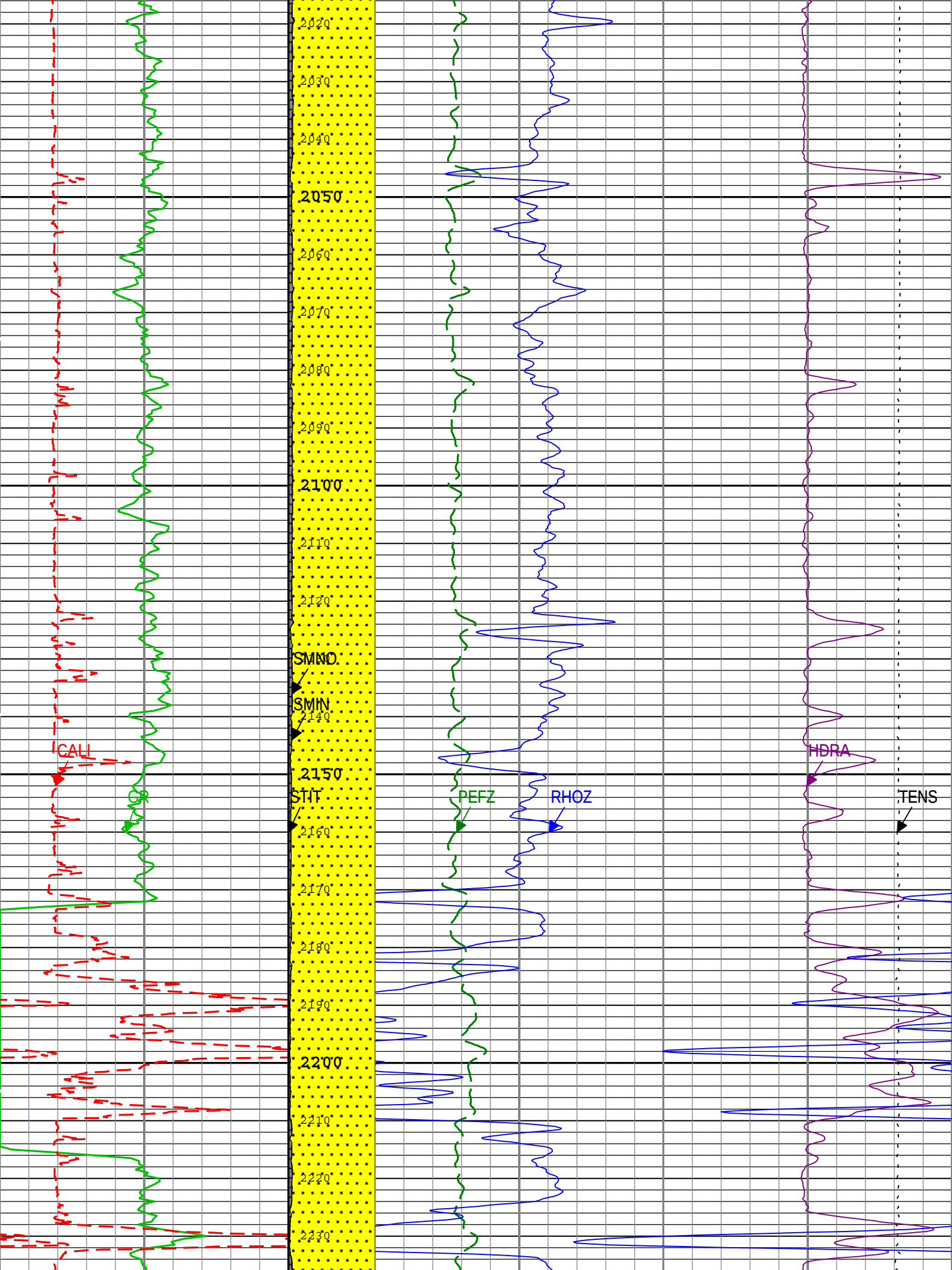
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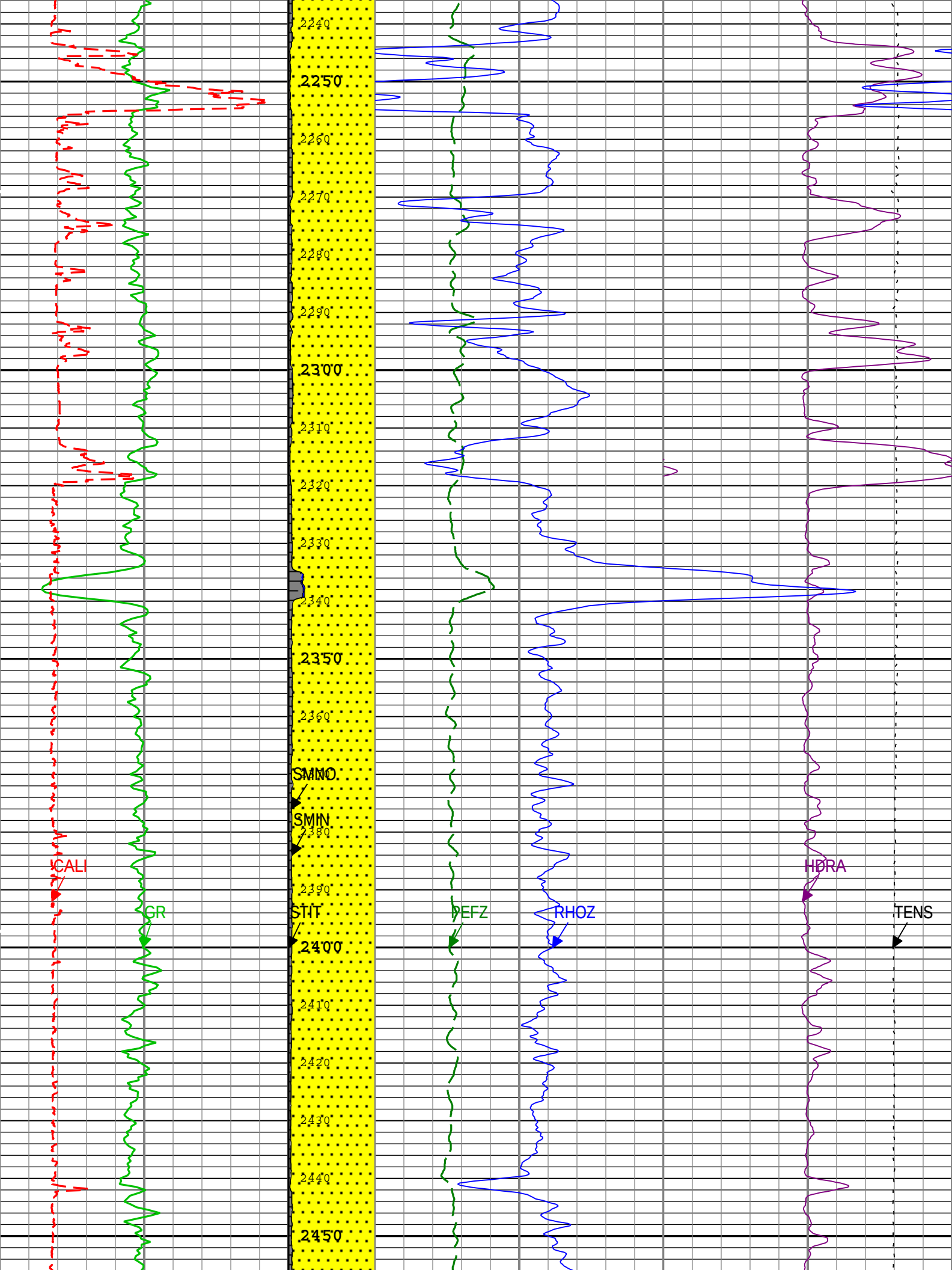
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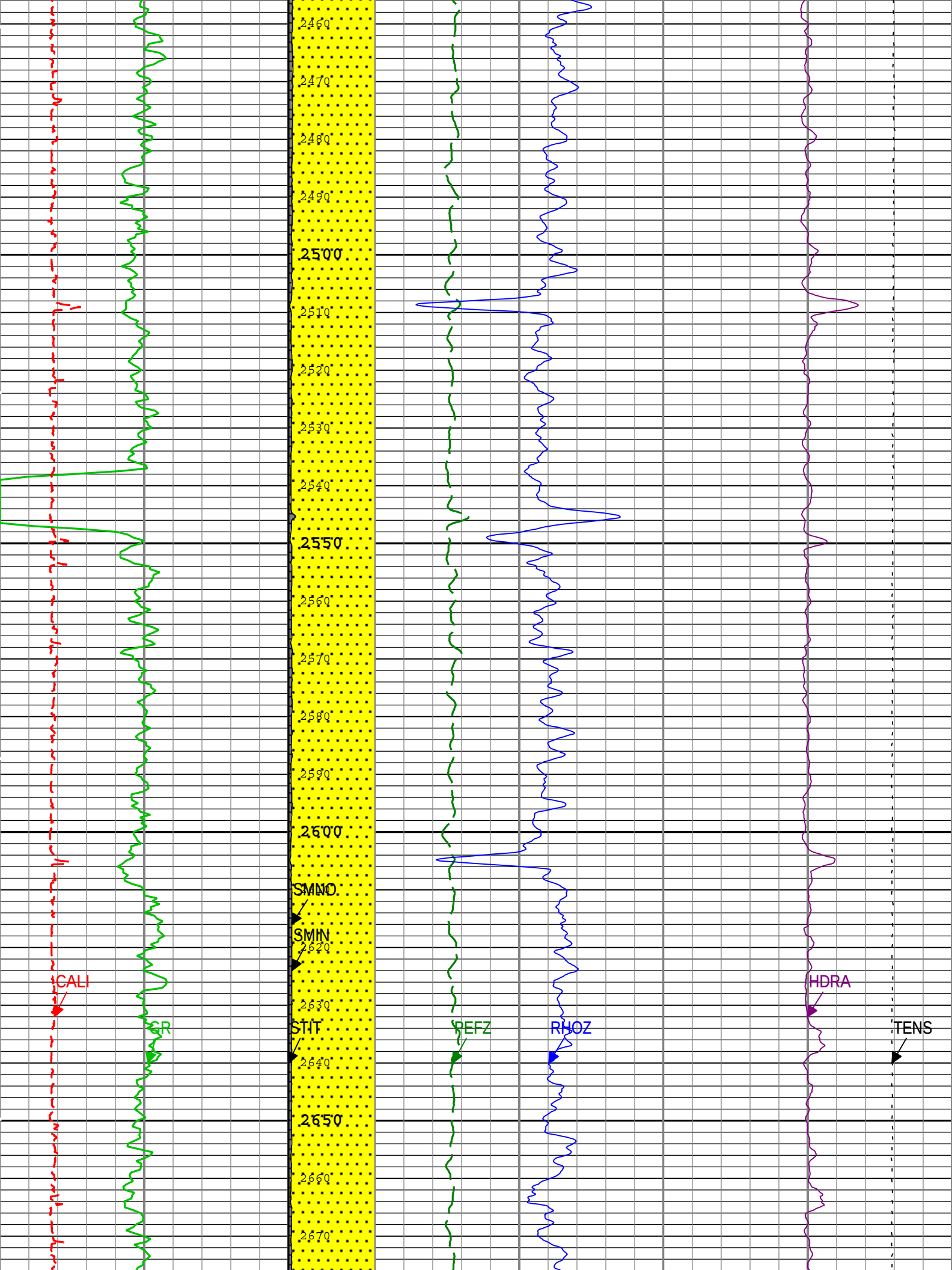
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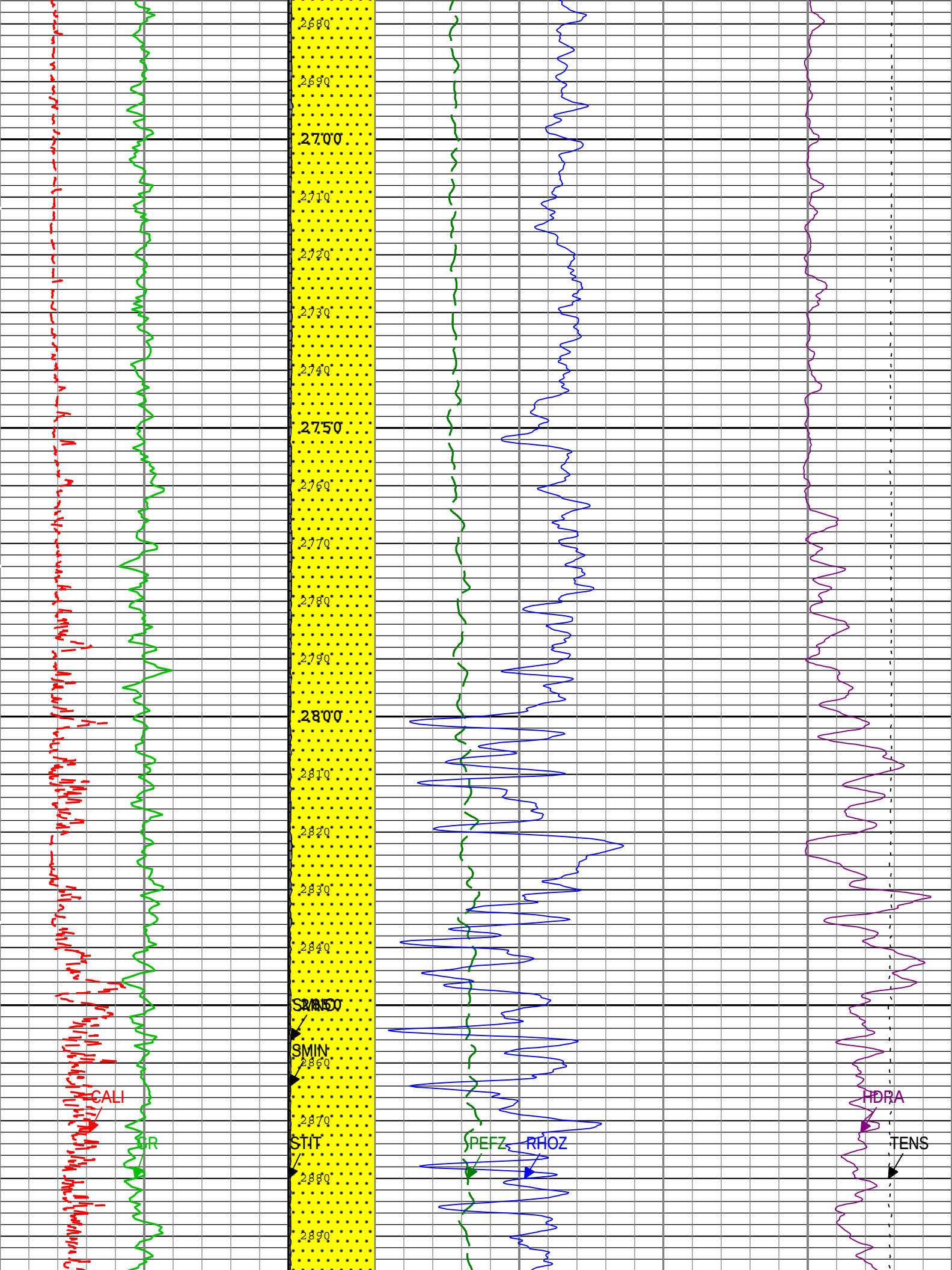
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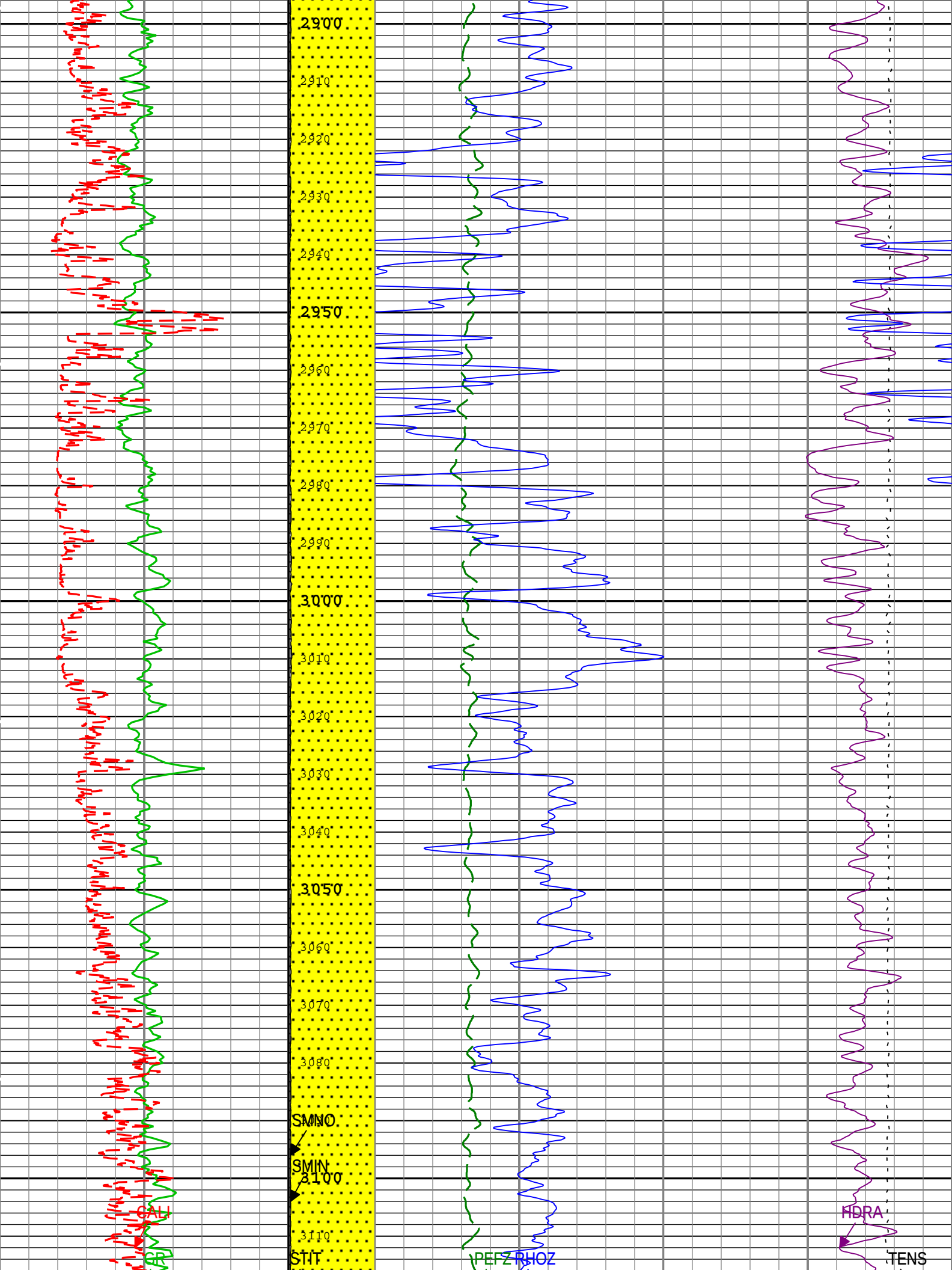
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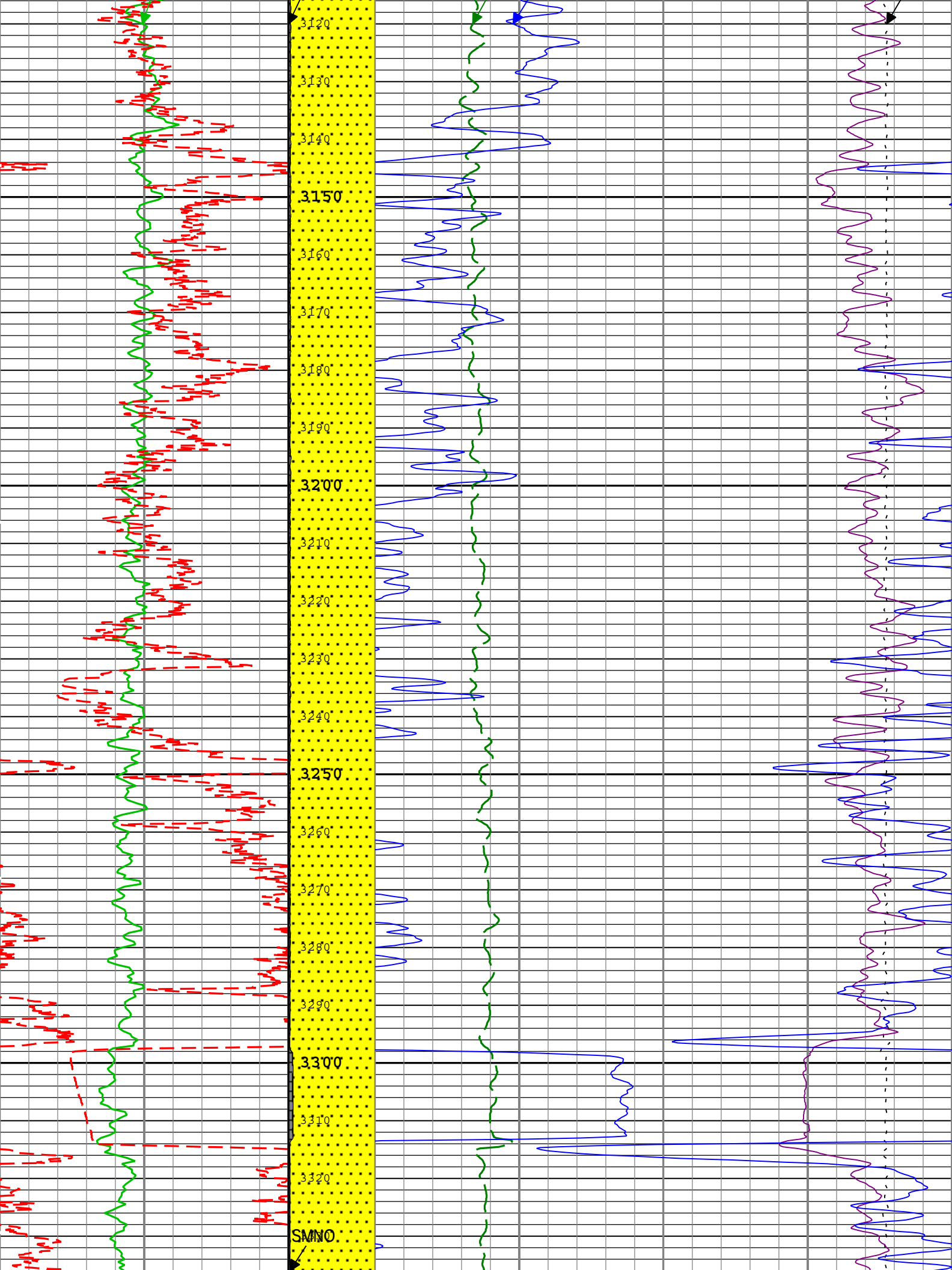
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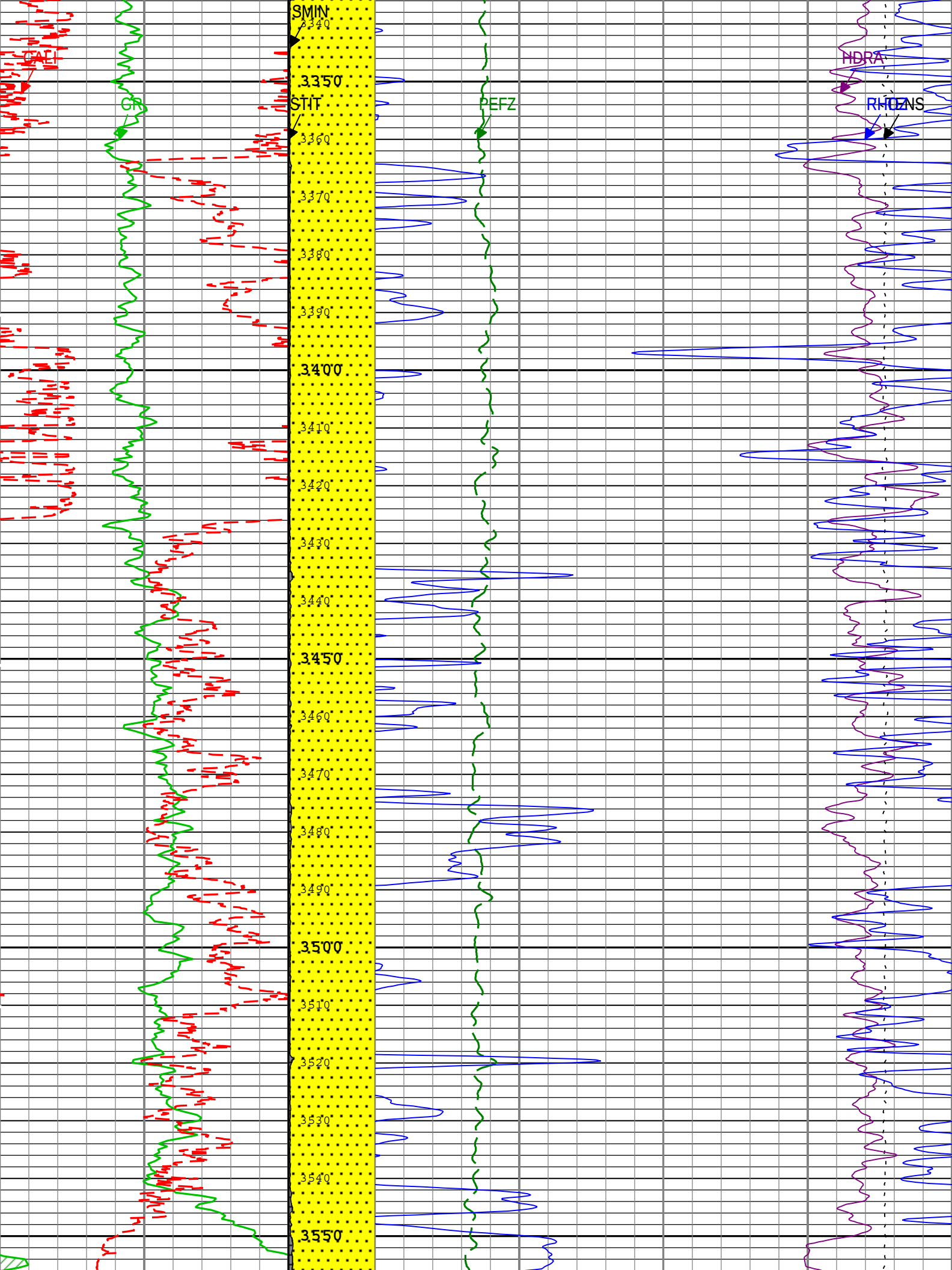
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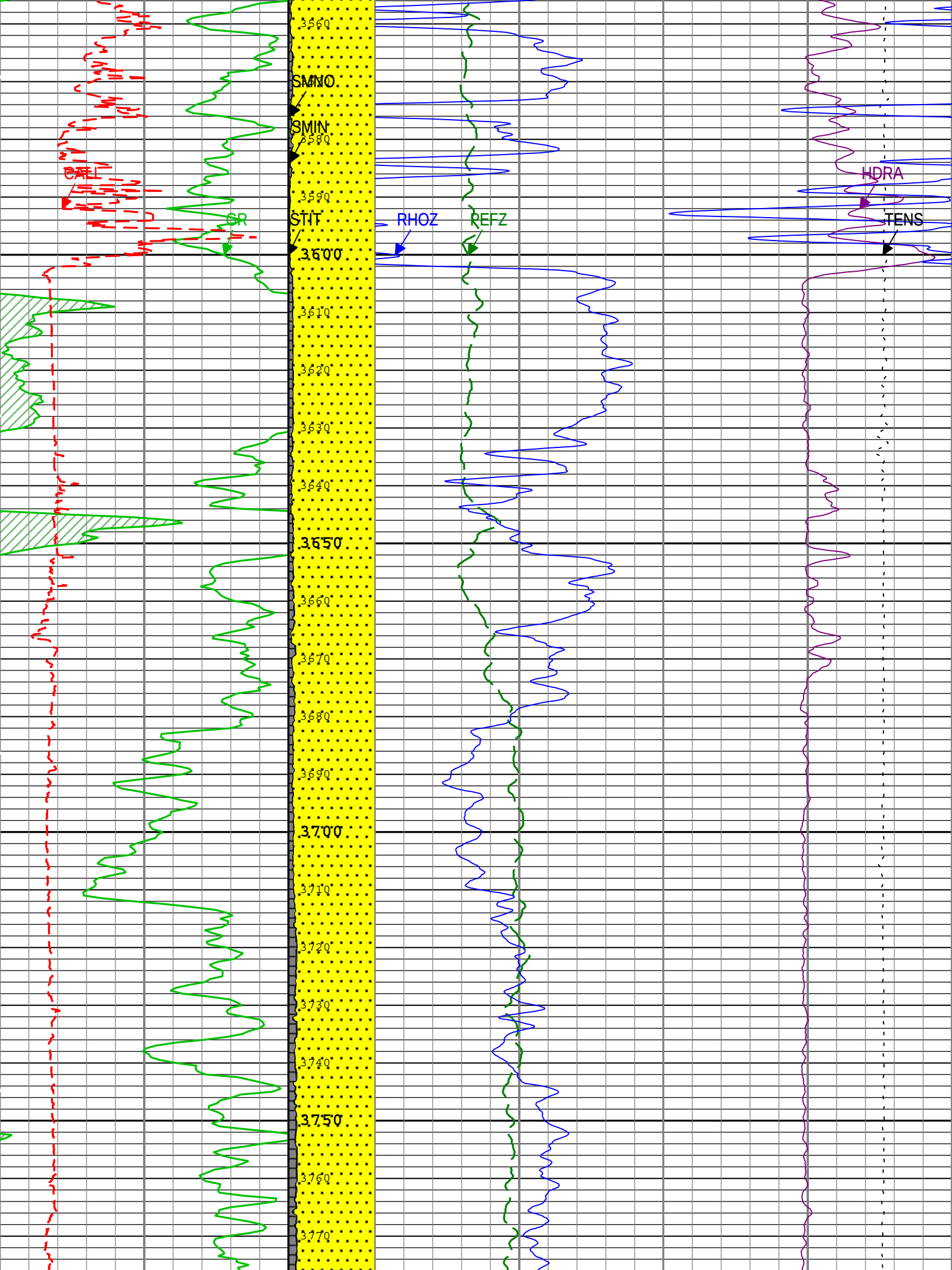
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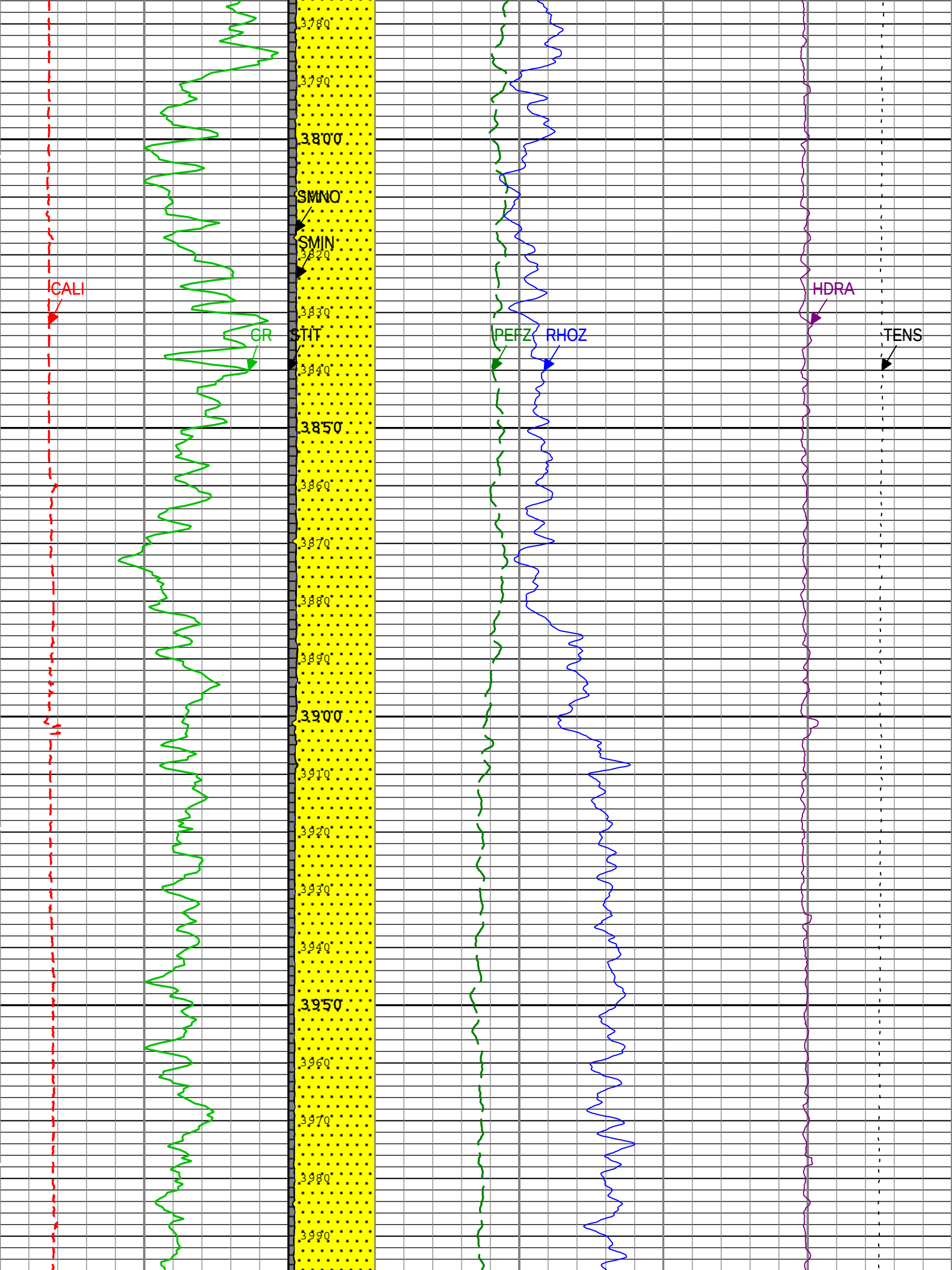
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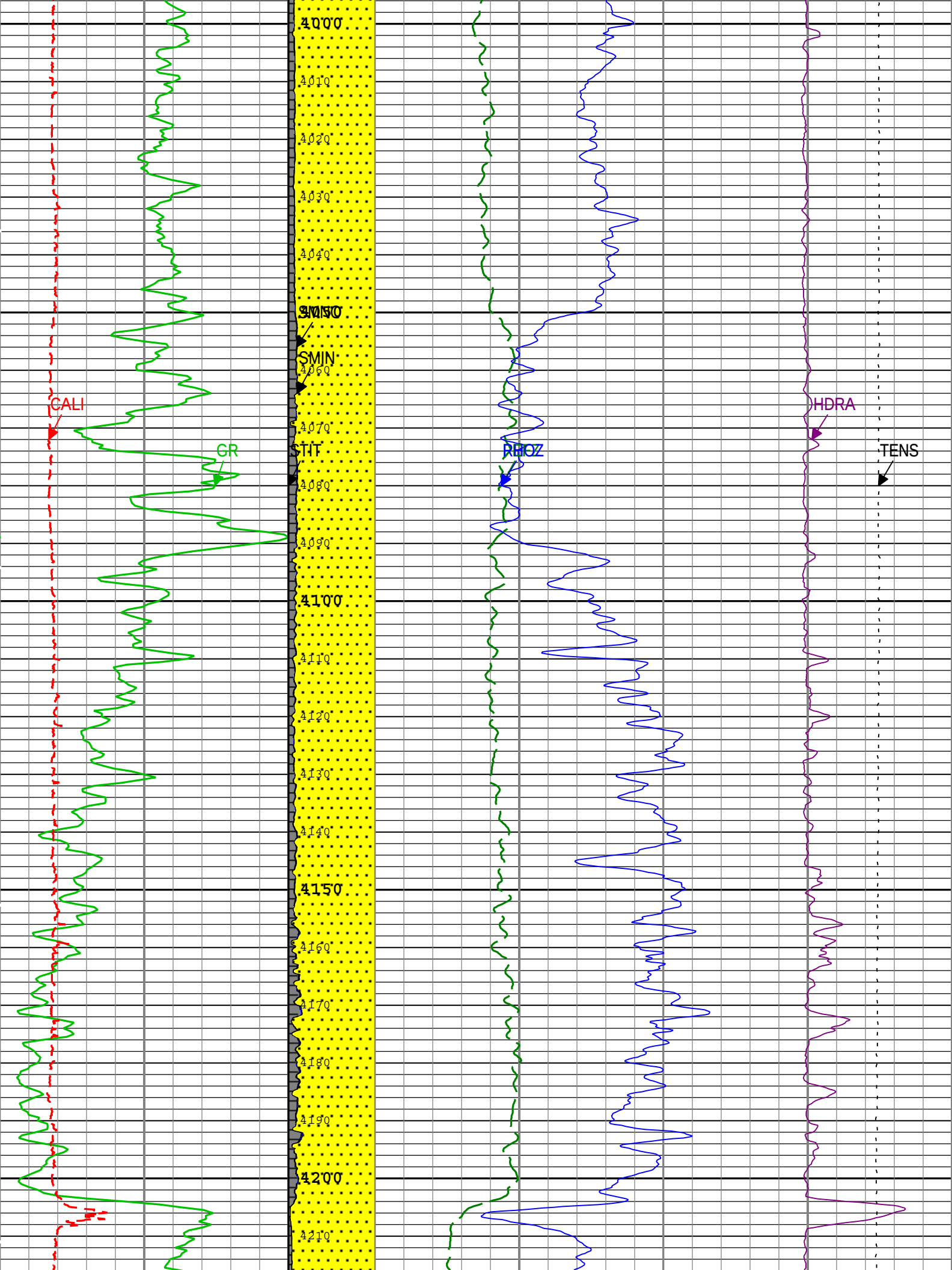
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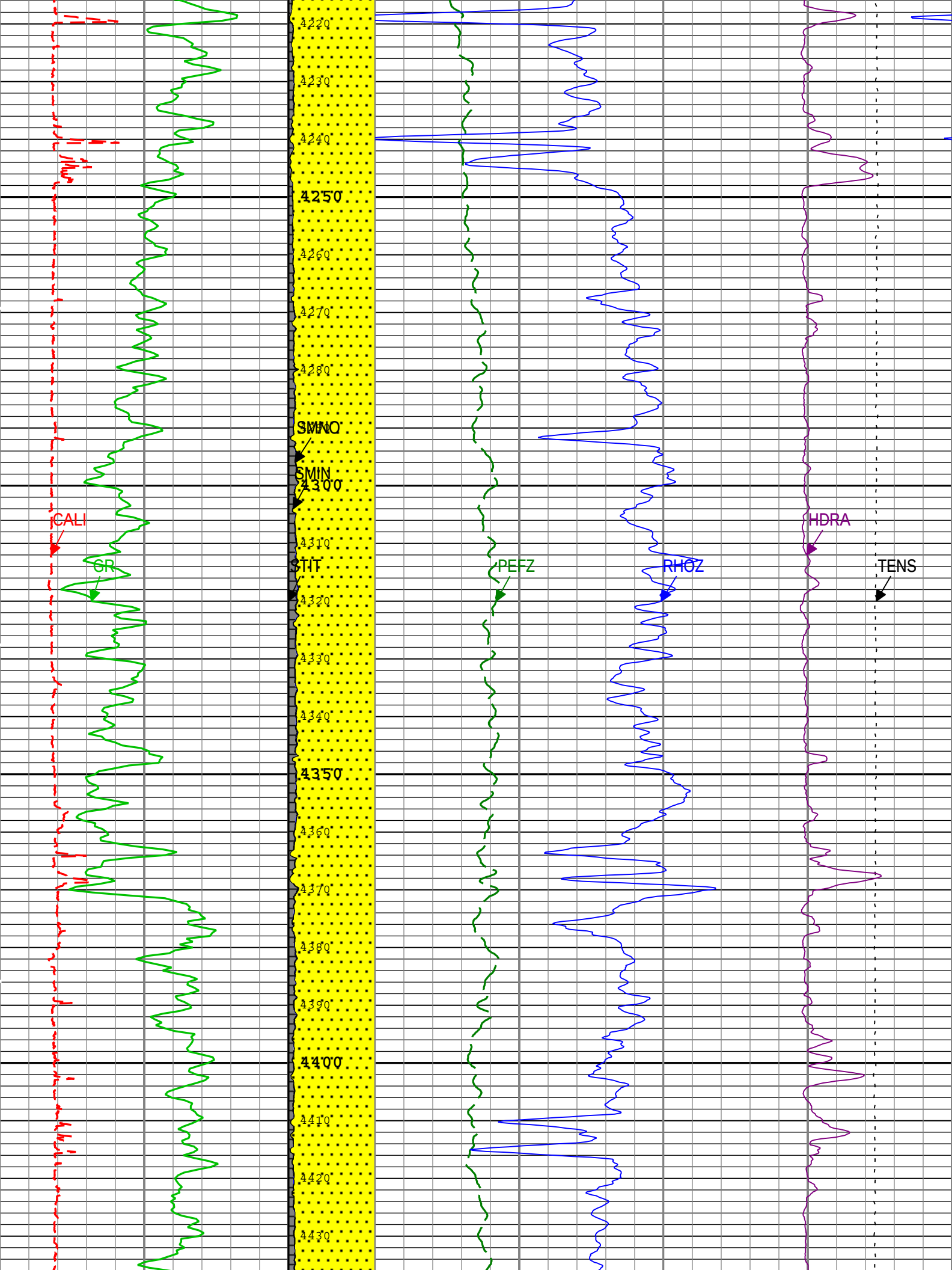
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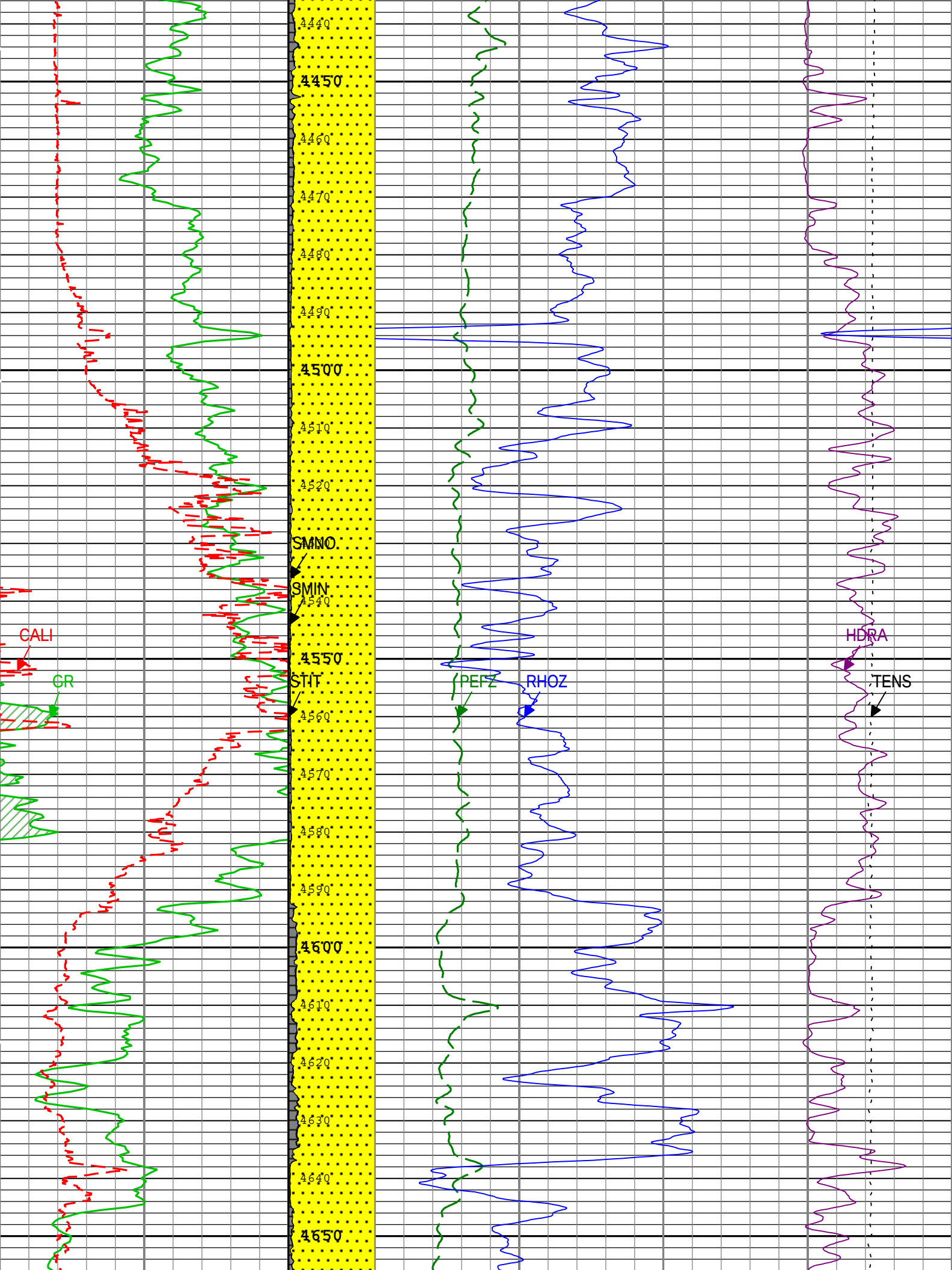
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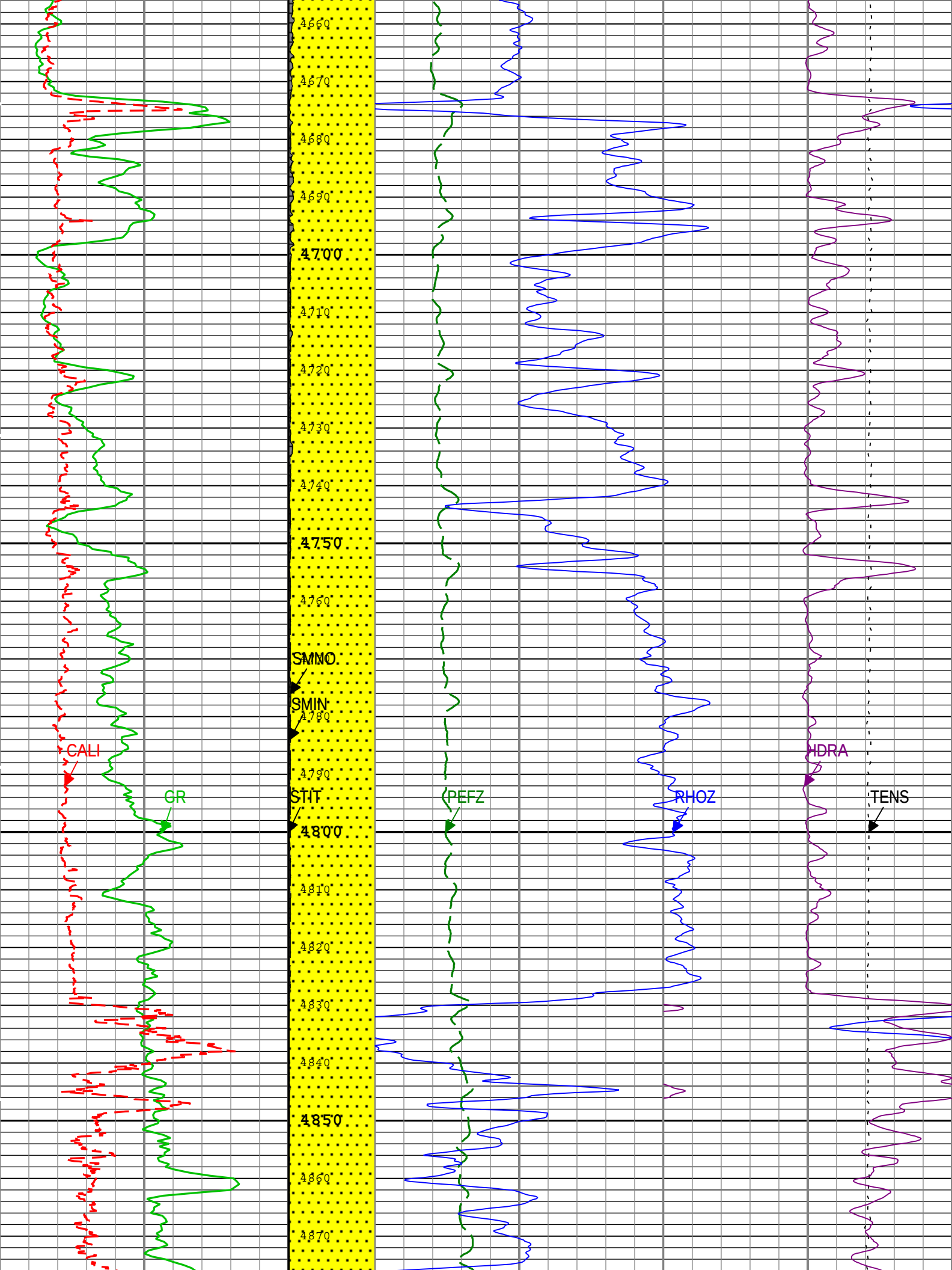
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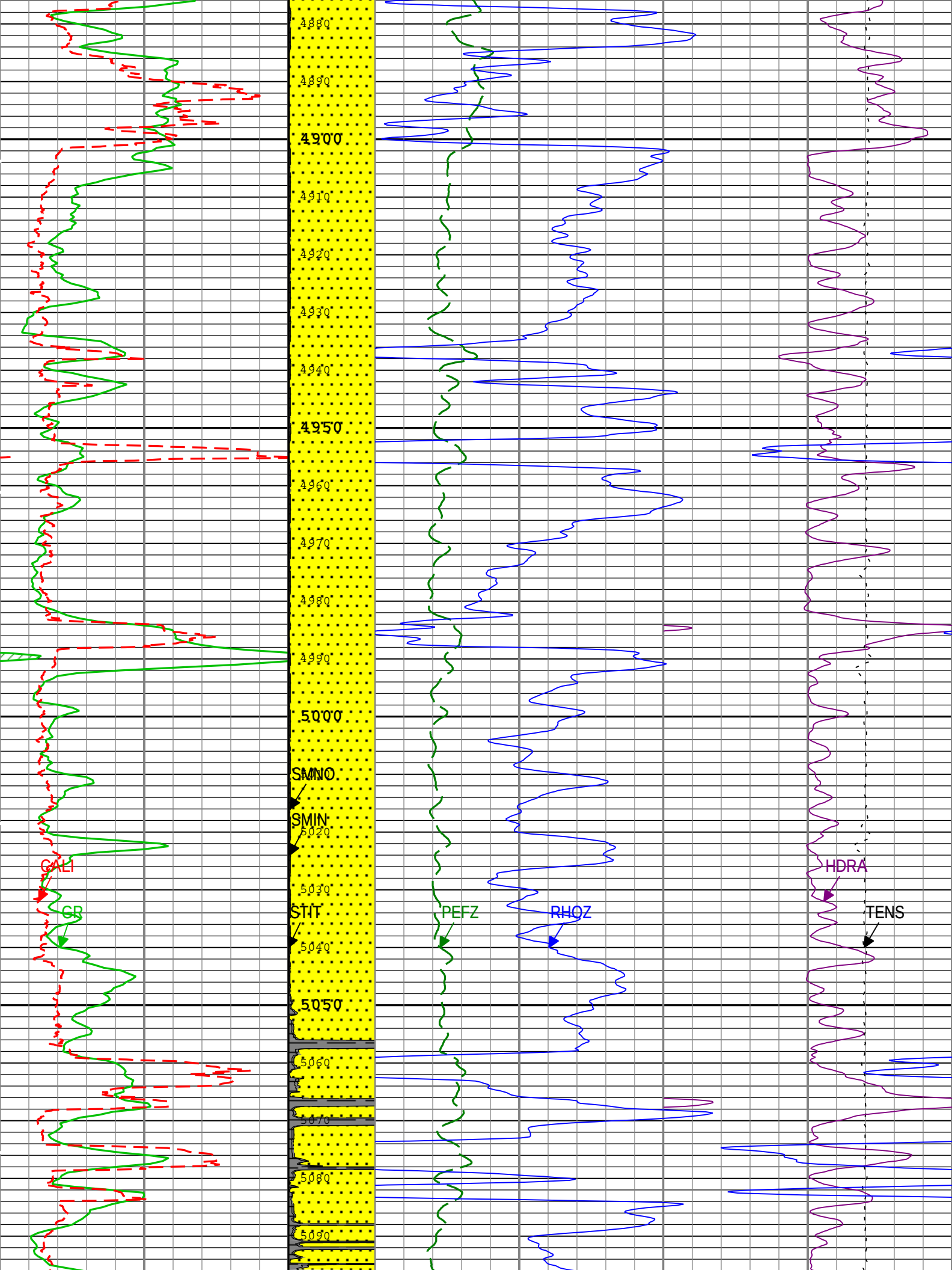
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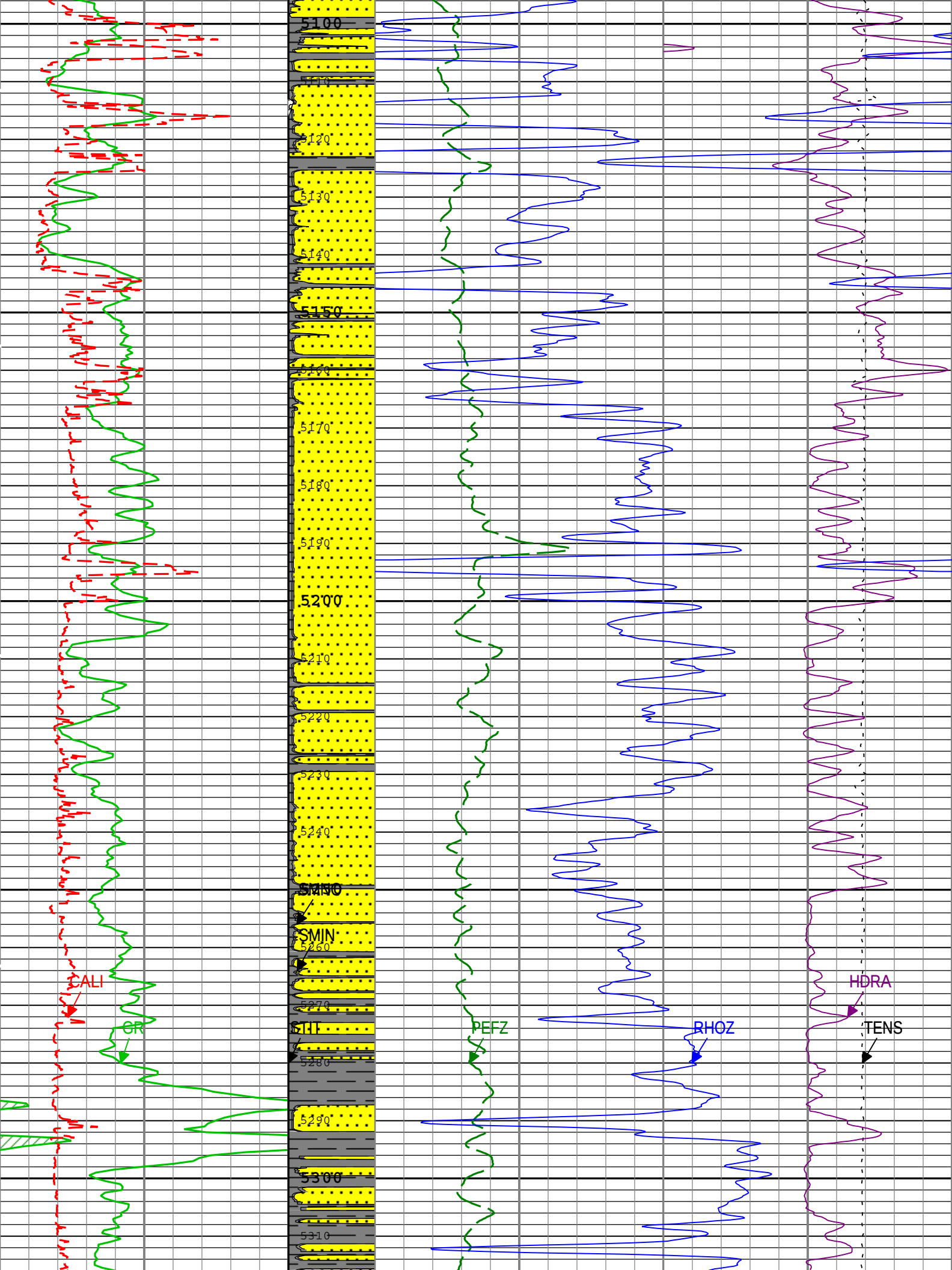
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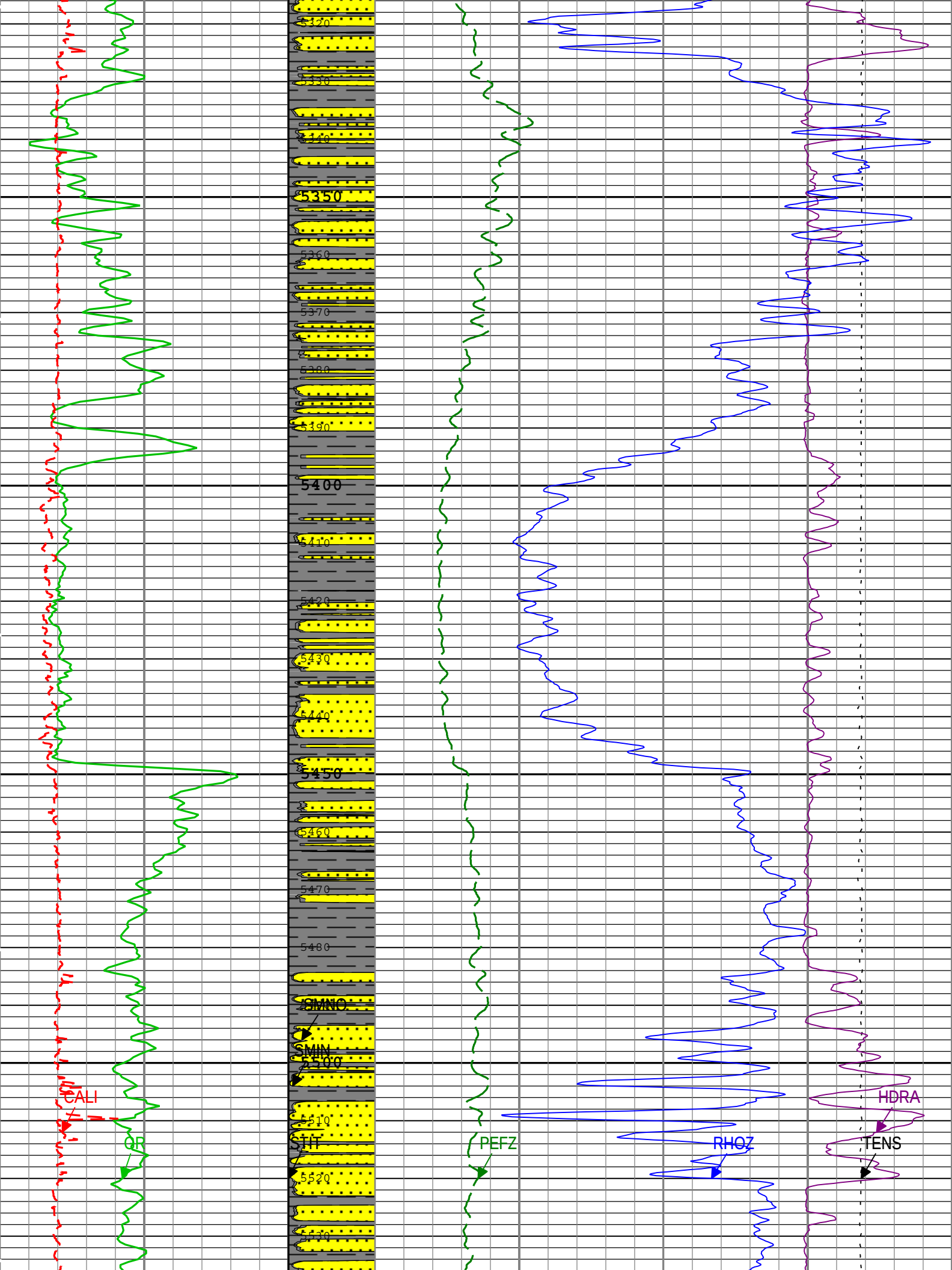
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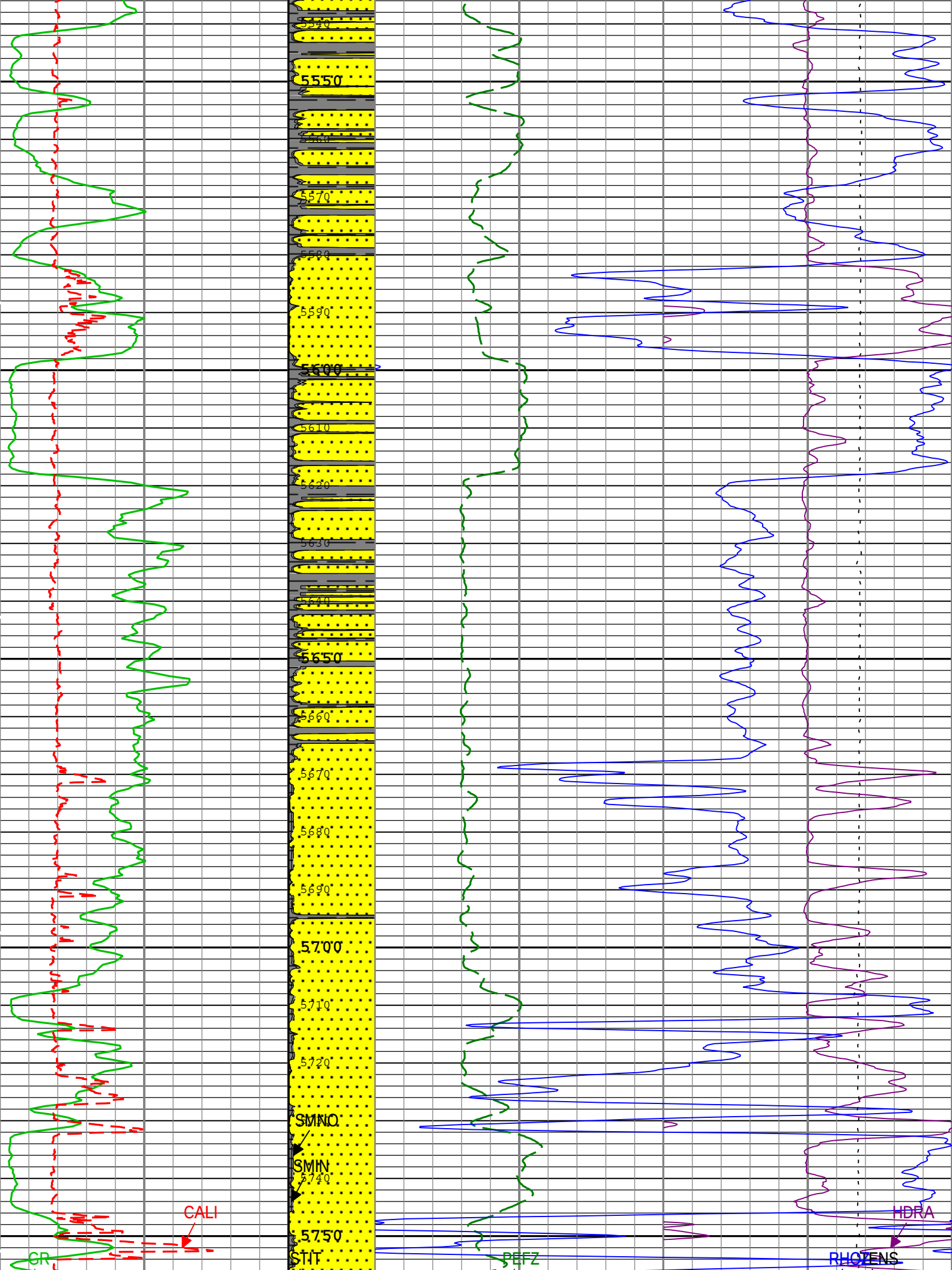
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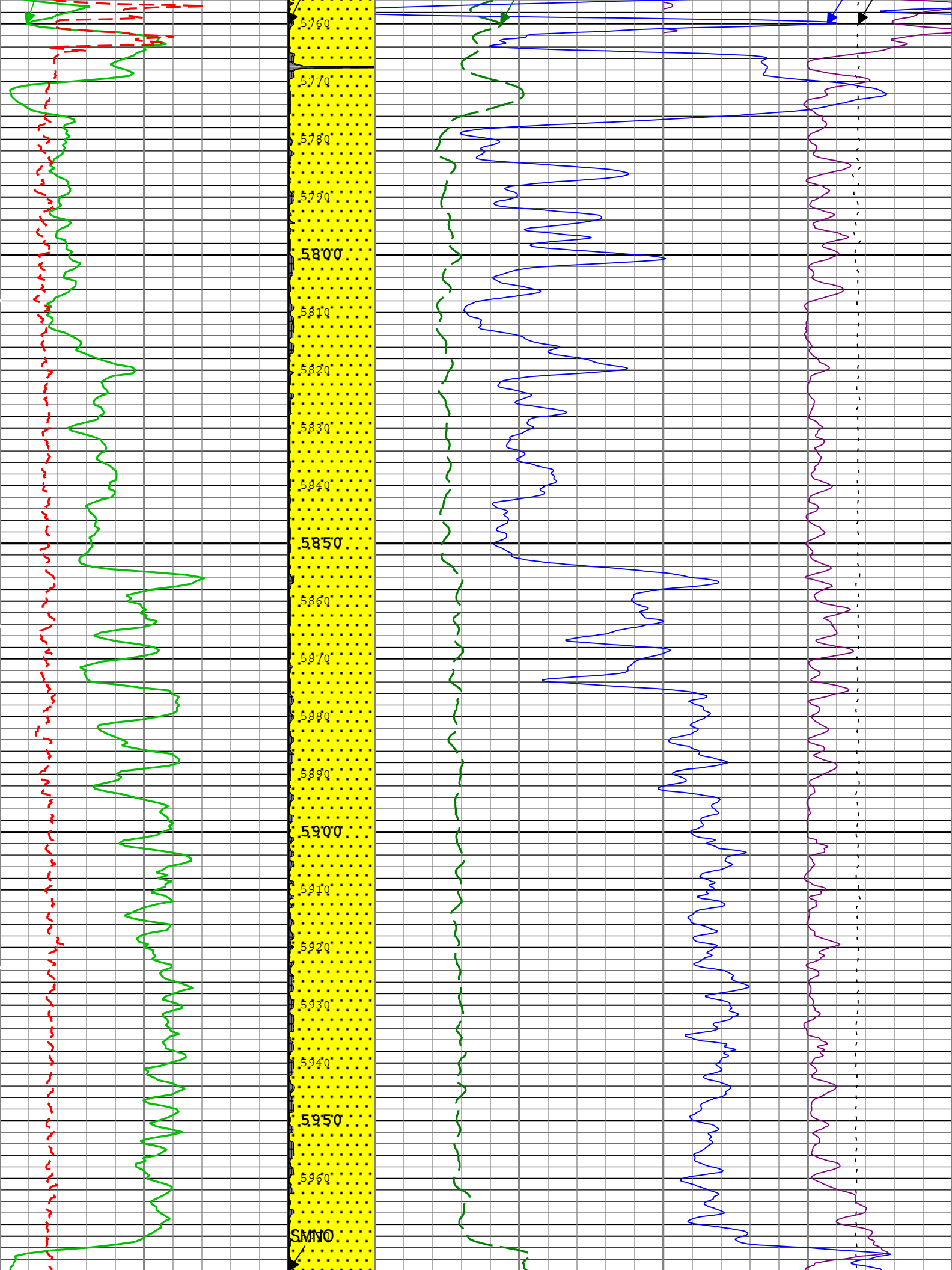
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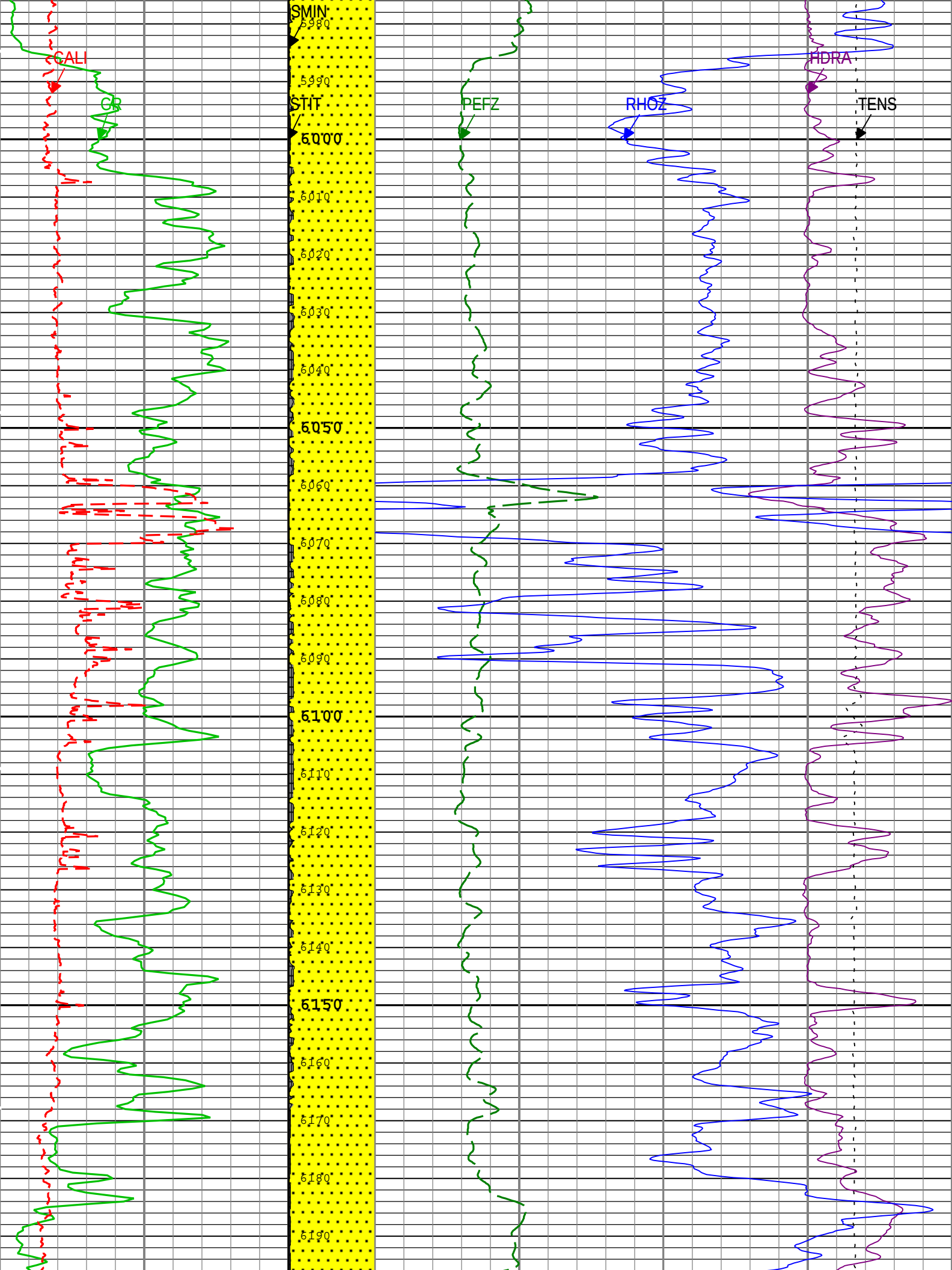
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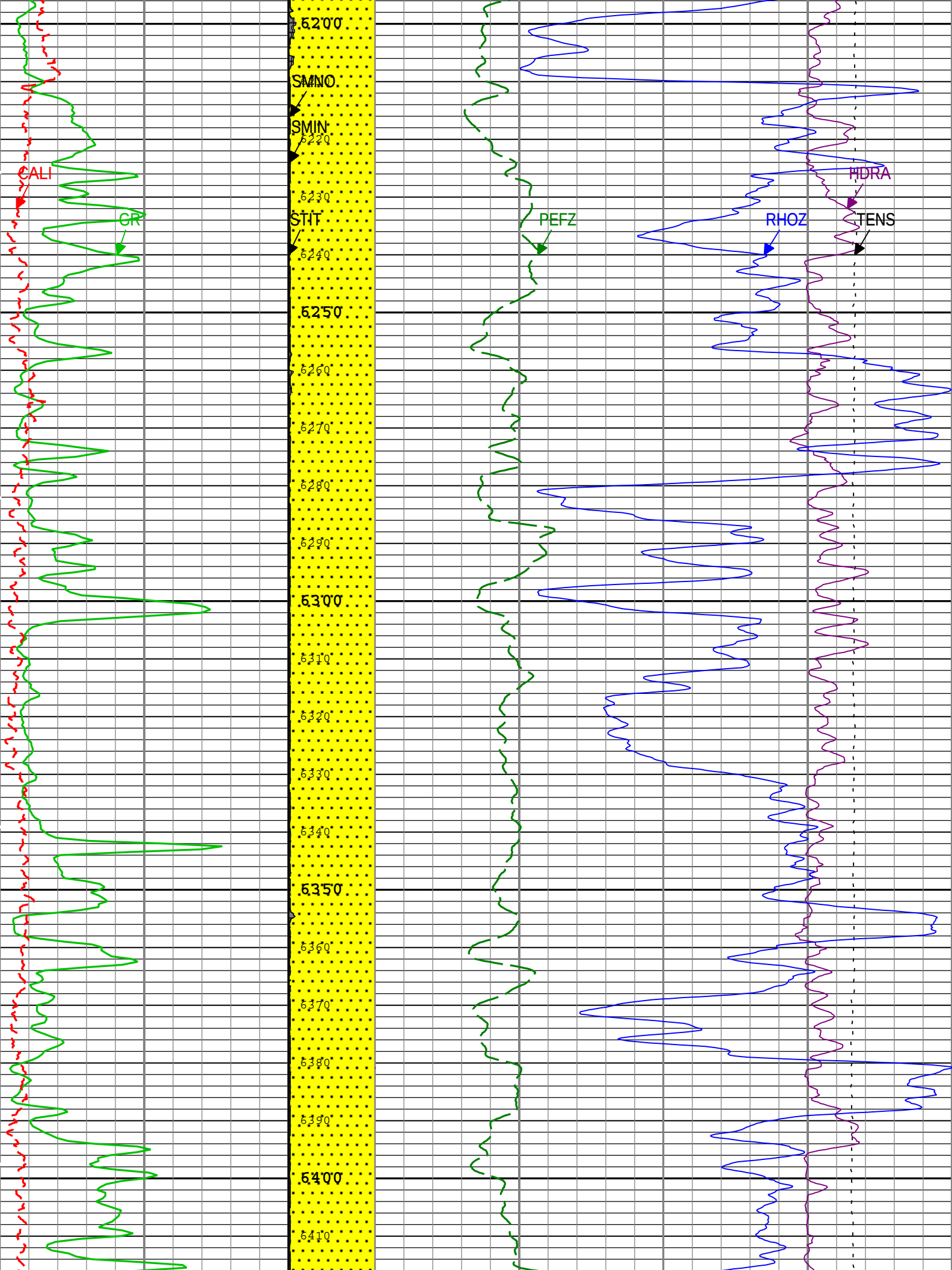
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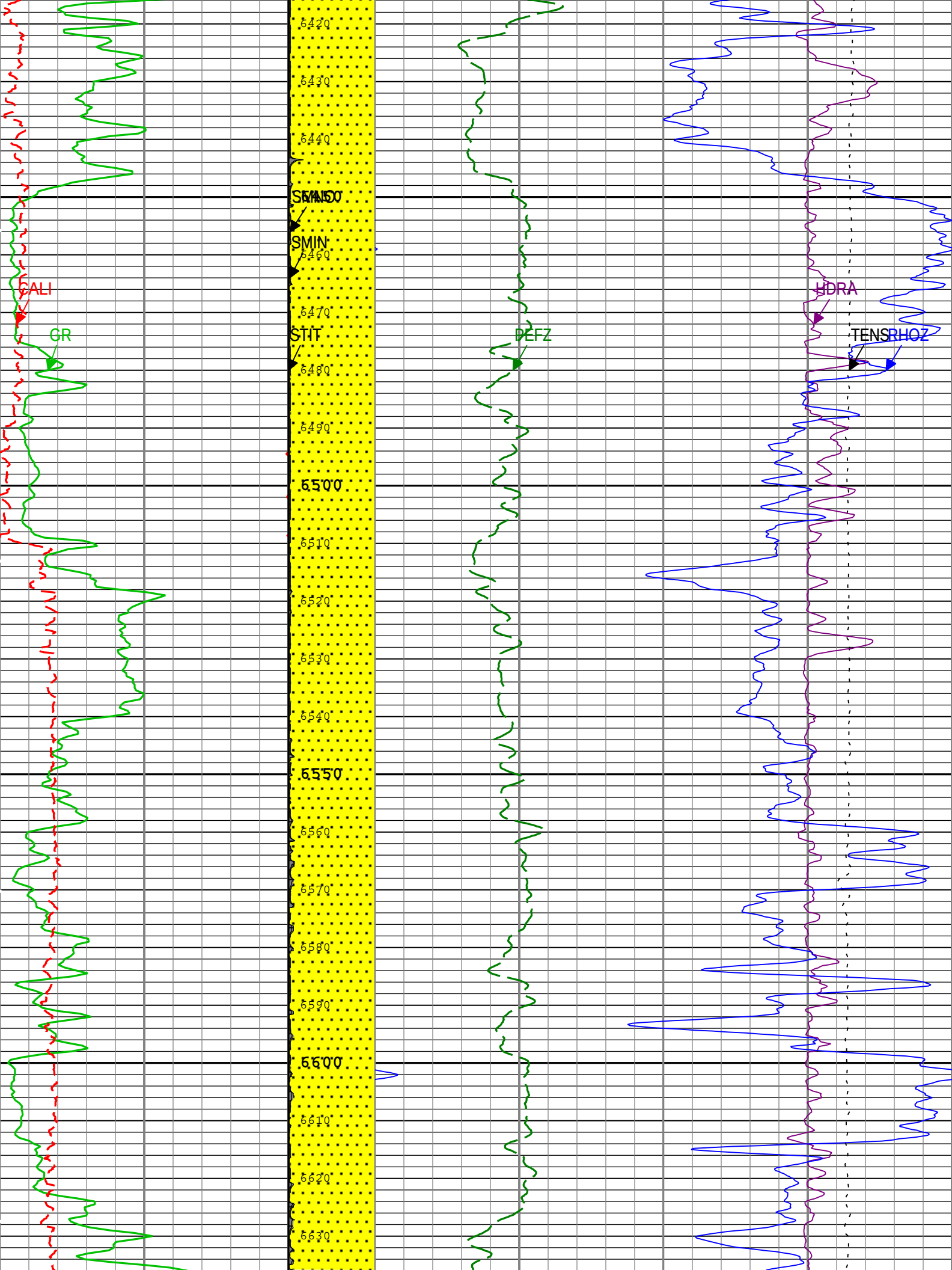
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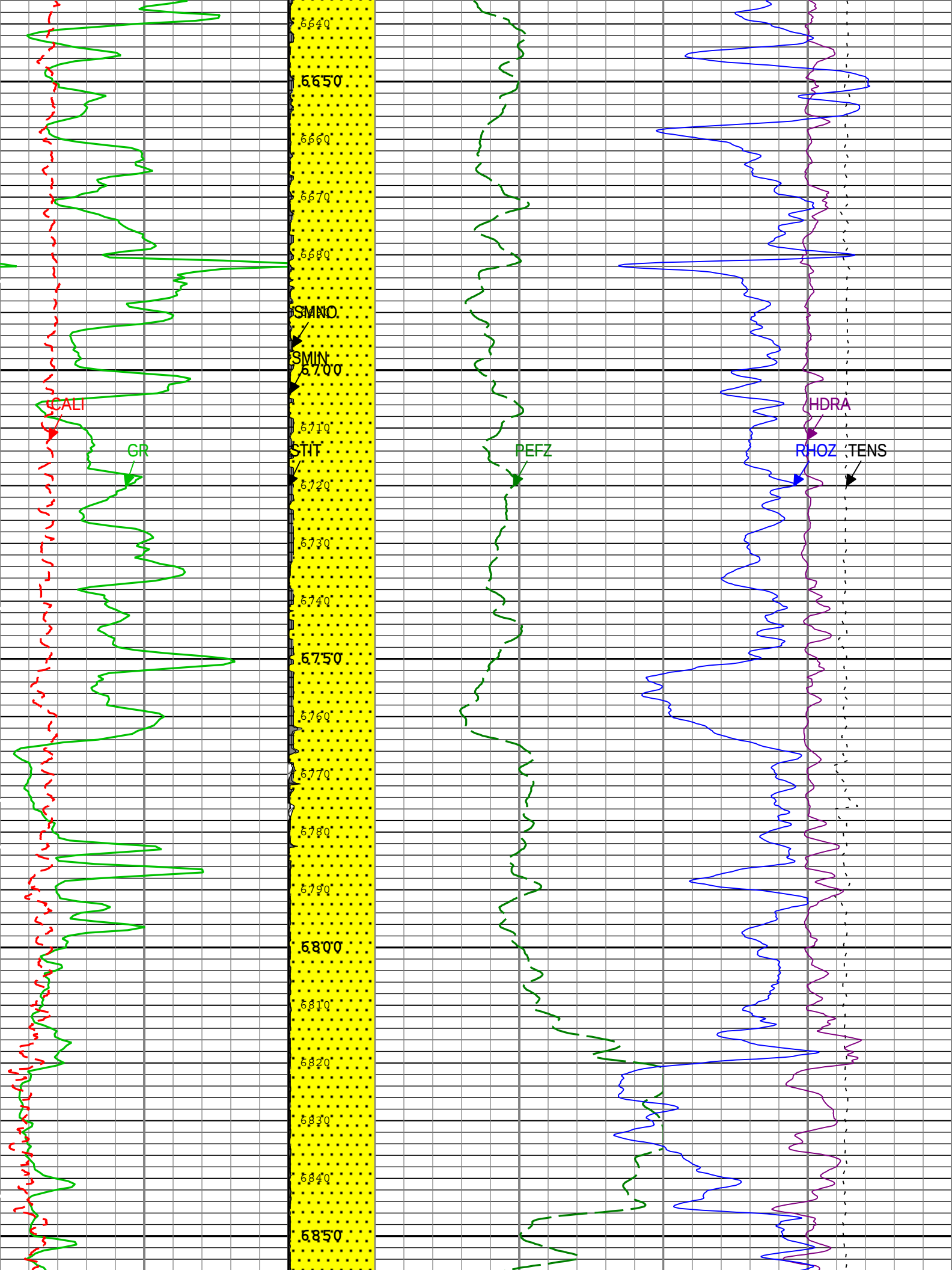
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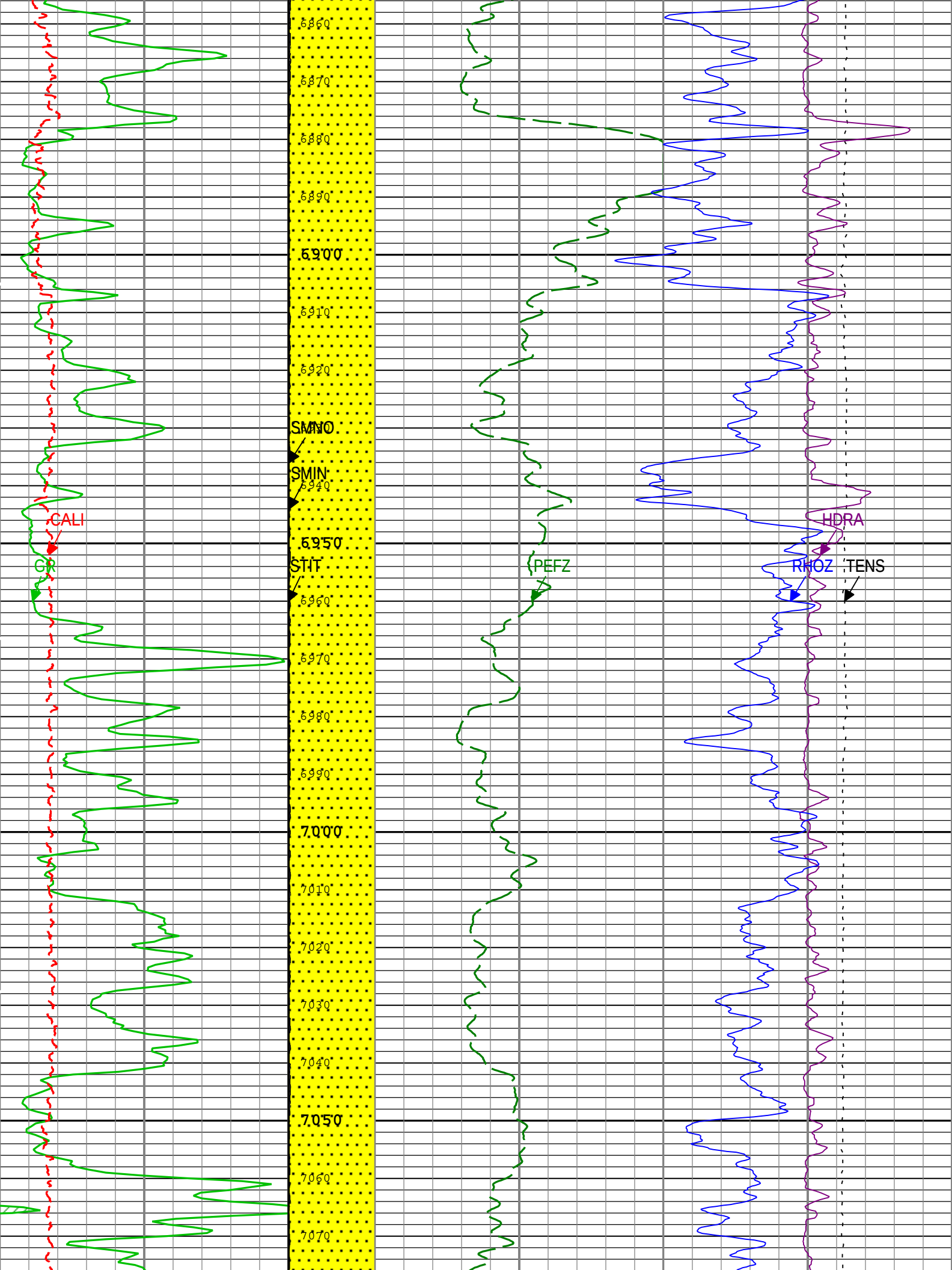
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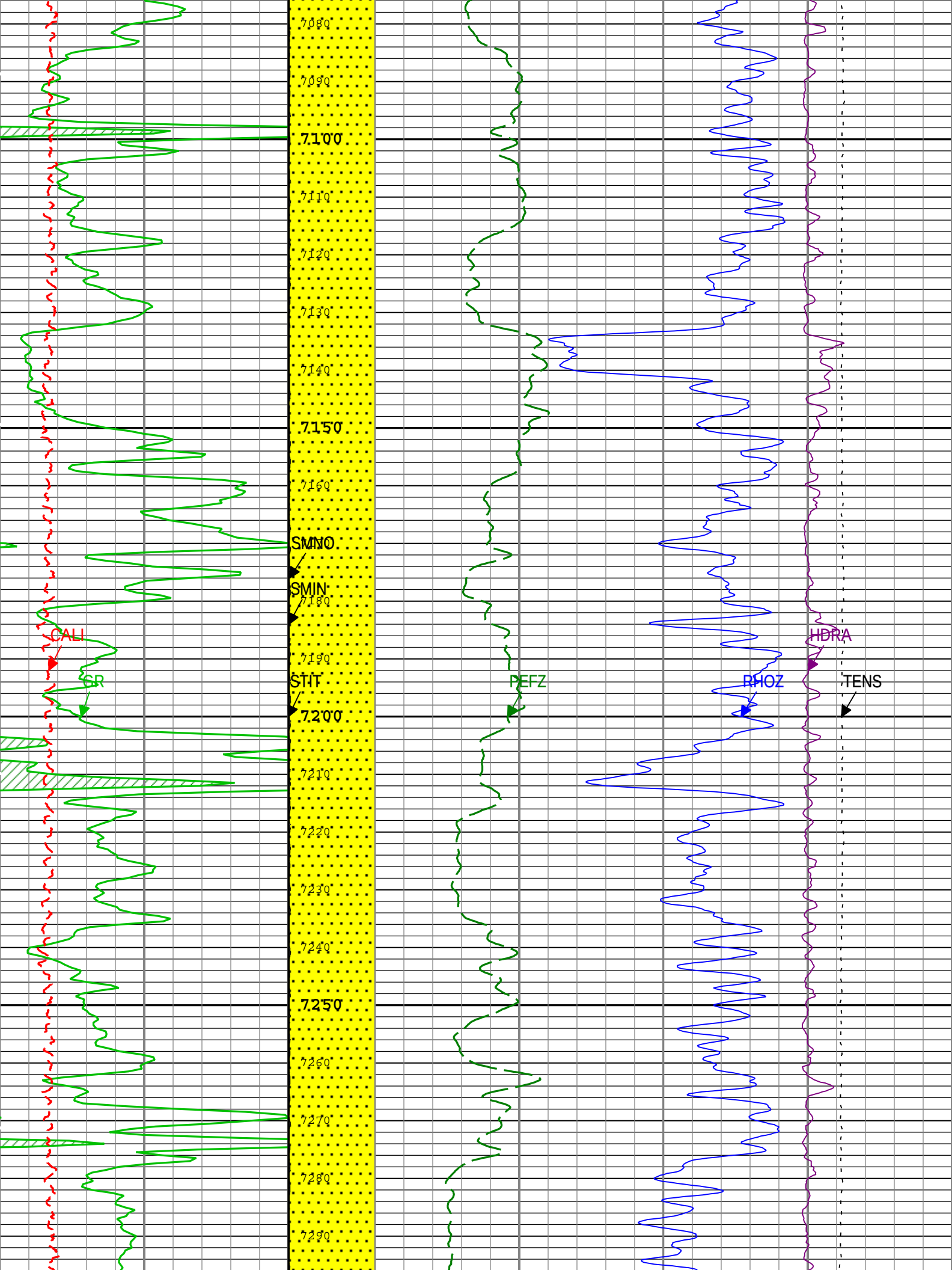
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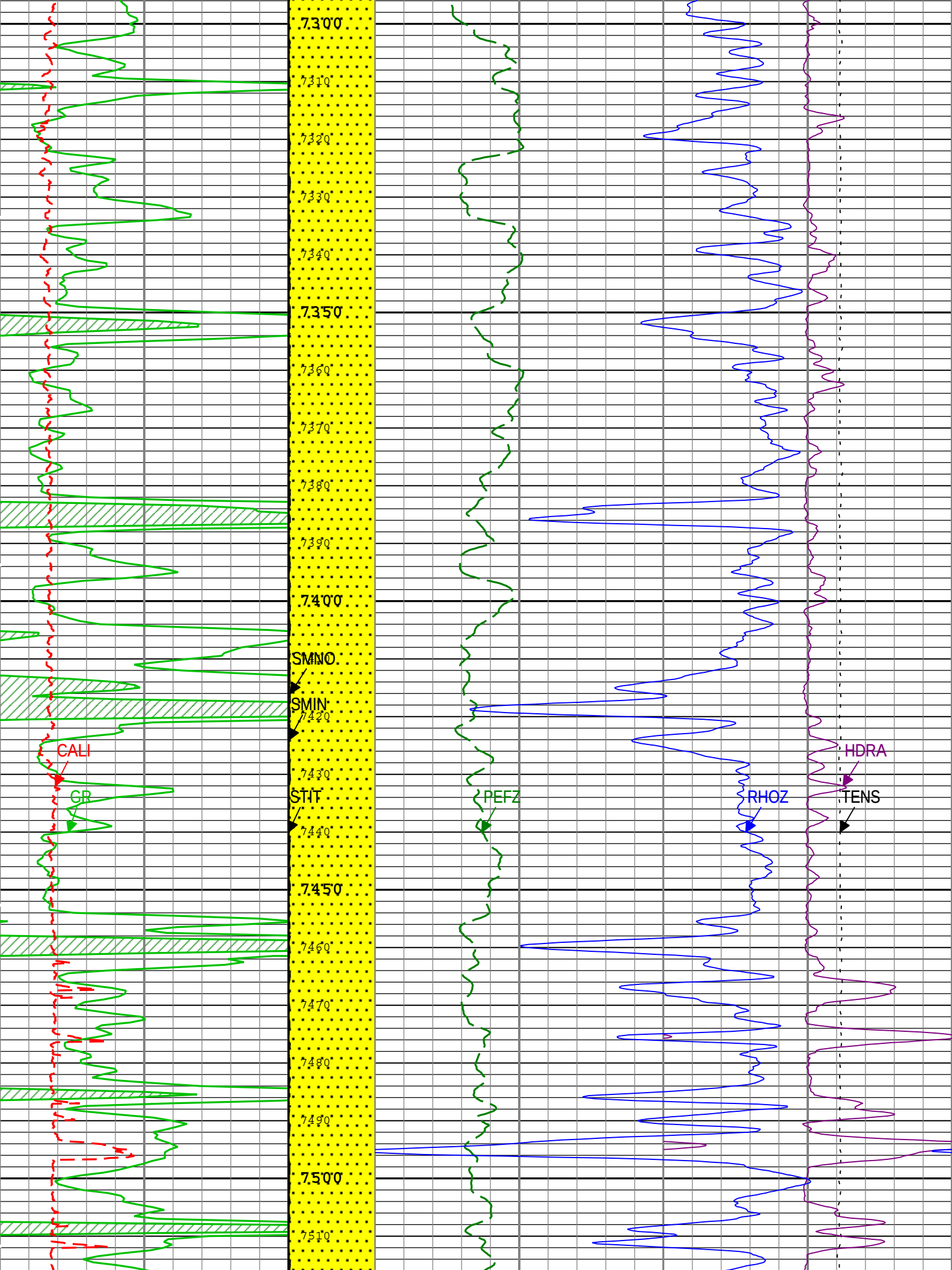
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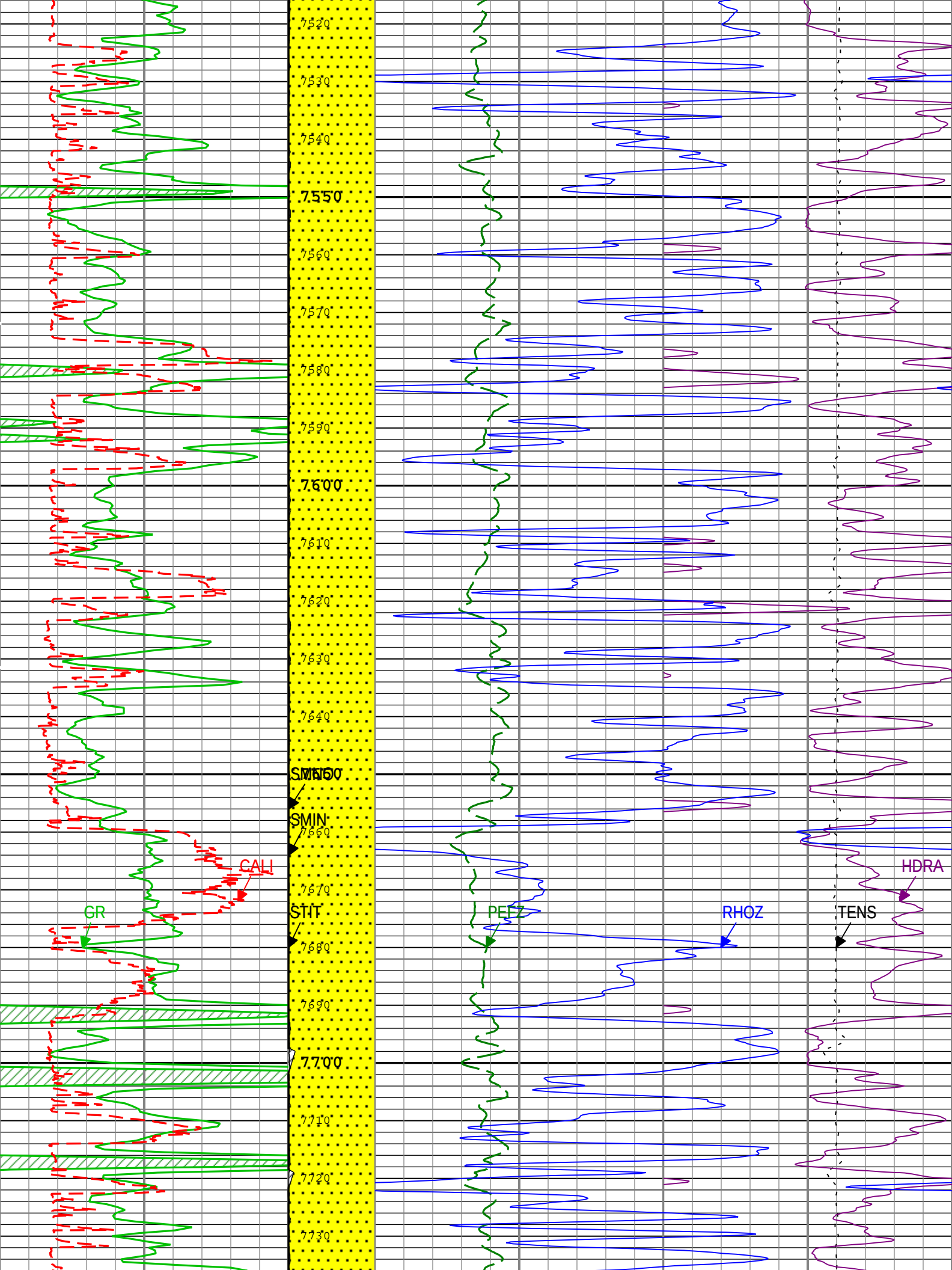
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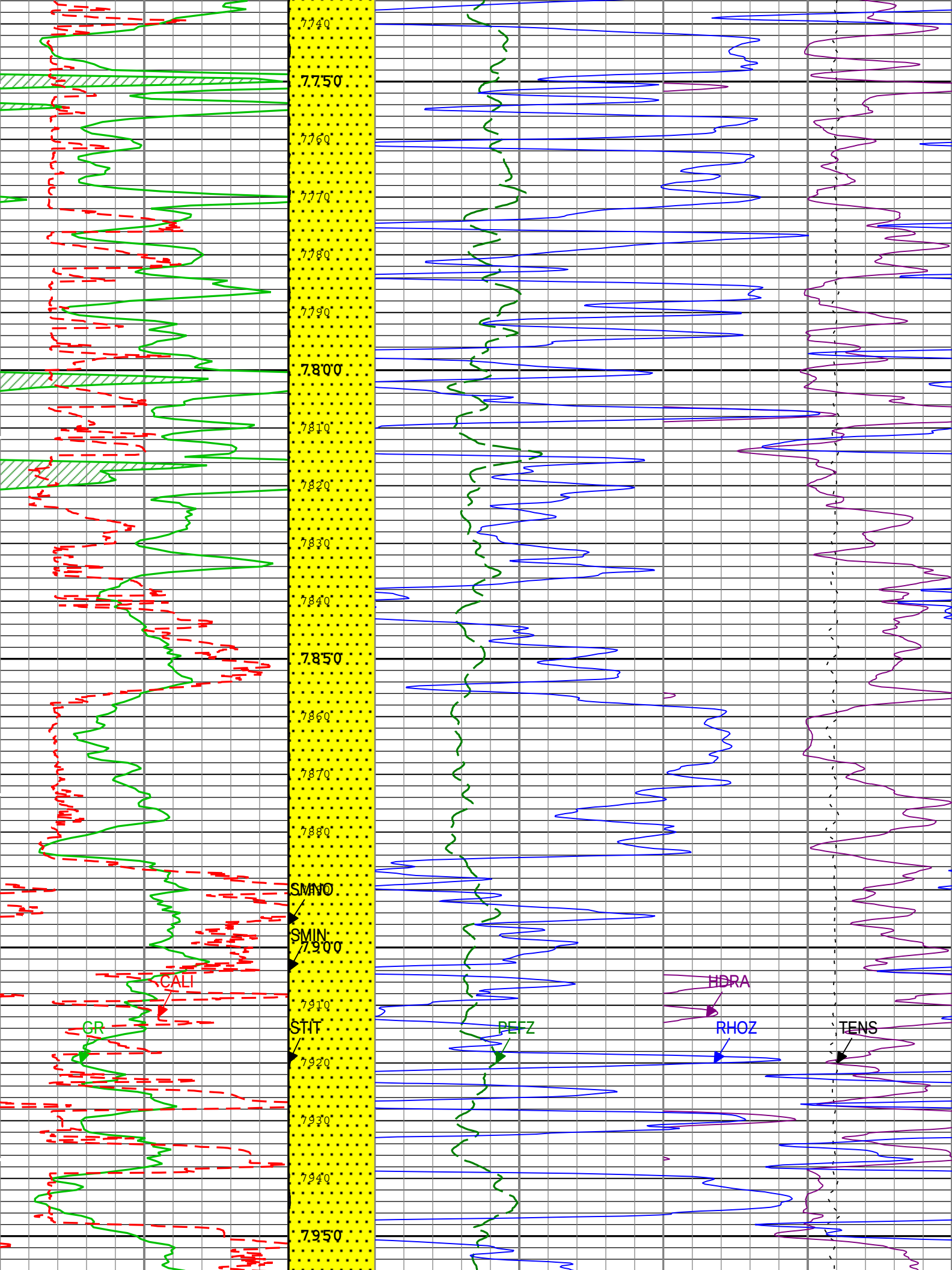
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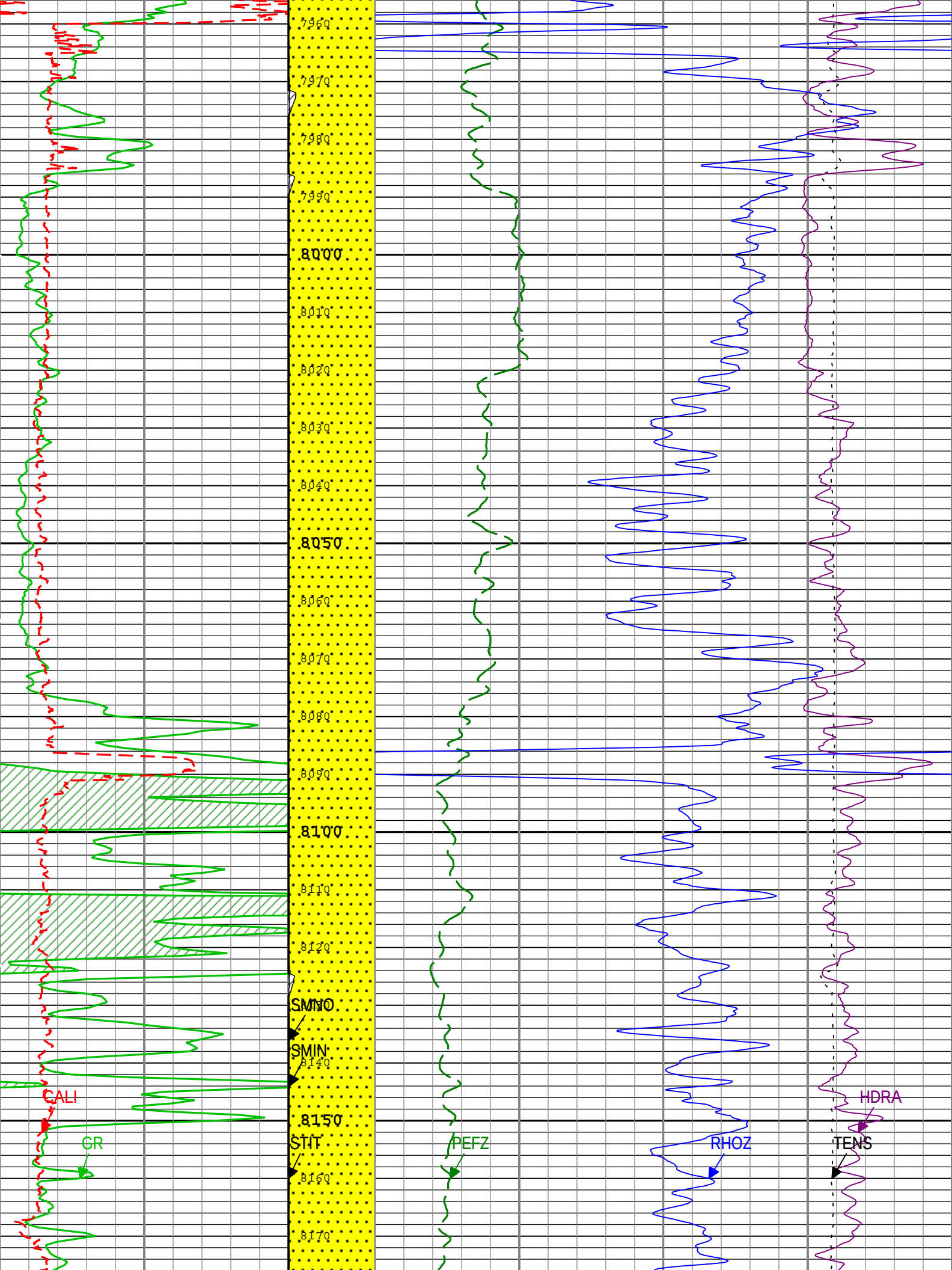
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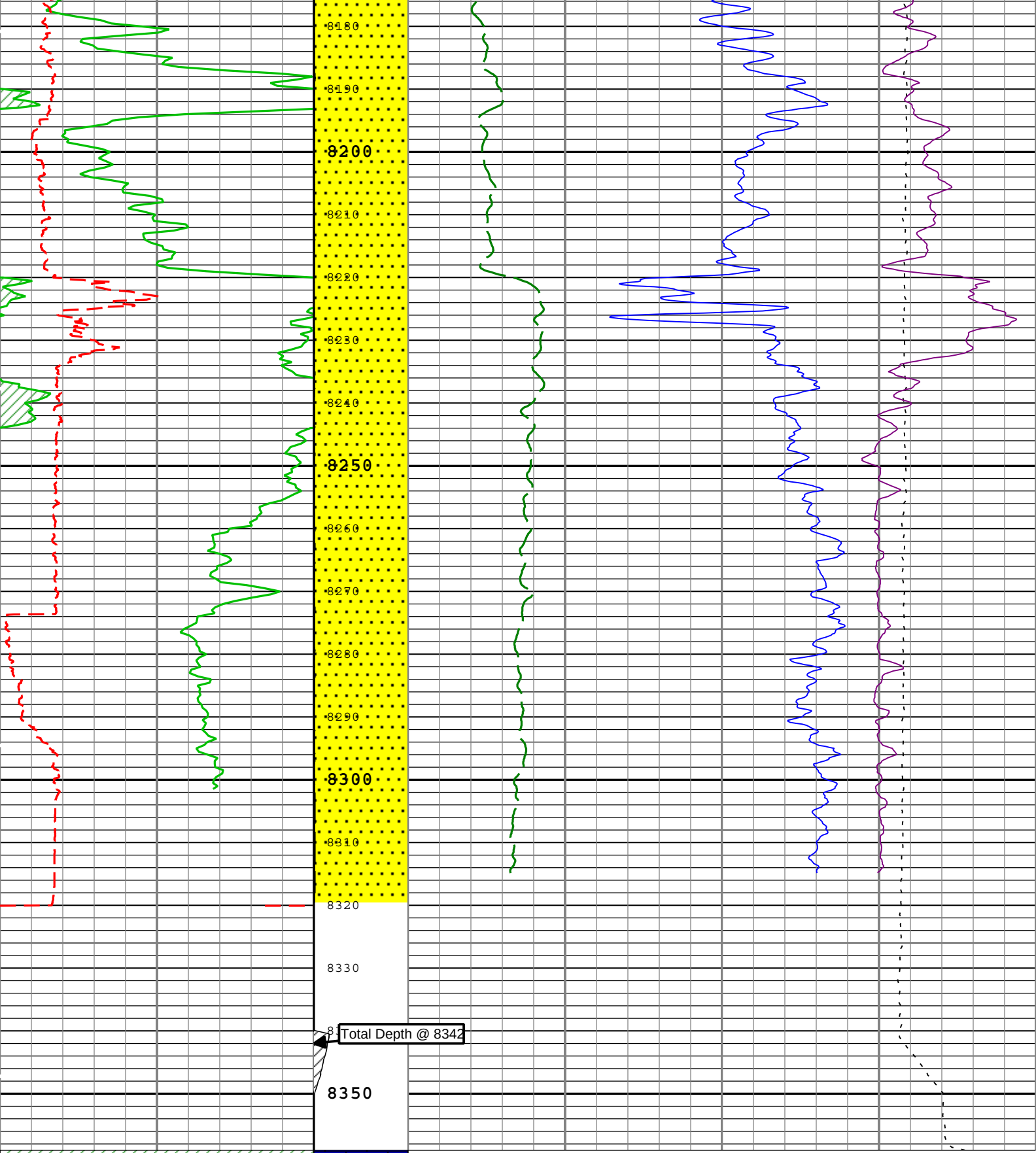

Gamma Ray Backup

Gamma Ray (GR) HGNS-H
0 gAPI 200

Caliper (CALI) HDRS-H
6 in 16

LIME
SAND
SHALE

Stuck Tool Indicator, Total (STIT)
0 ft 50

Standard Resolution Formation Density (RHOZ) HDRS-H
2 g/cm3 3

Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H
0 10

Cable Tension (TENS)
10000 lbf 0

Density Standoff Correction (HDRA) HDRS-H
-0.25 g/cm3 0.25

TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log (KM 5in Density) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 12-May-2013 18:48:22

Channel Processing Parameters

Parameter	Description	Tool	Value	Unit
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	7.875	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0	in
CBLO	Casing Bottom (Logger)	WLSESSION	309	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.2	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DHC	Density Hole Correction	HDRS-H	Bit Size	
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	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
SOCO	Standoff Correction Option	HGNS-H	Yes	
TD	Total Measured Depth	Borehole	8342	ft

Tool Control Parameters

Parameter	Description	Tool	Value	Unit
HRGD_BRD_TYPE	HRGD Board Type	HDRS-H	WITHOUT_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
STSO_HRDD	Temperature Source for the Density Algorithm	HDRS-H	Decaytime algorithm	

Calibration Report

HDRS-H (HILT Density and Rxo Sonde, 150 degC) Calibration - Run 1

Primary Equipment :

HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	791
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H	1849

Auxiliary Equipment :

HRDD Backscatter Detector	Backscatter	
HRDD Long Spacing Detector	Long Spacing	
HRDD Short Spacing Detector	Short Spacing	
Cesium 137 Gamma-Ray Logging Source	GSR-J	5094
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	791
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	1754

Calibration Parameter :

Small Ring Size (Caliper Calibration Small Ring)	8.00
Large Ring Size (Caliper Calibration Large Ring)	12.00

HDRS Caliper Calibration - Caliper Accumulations

Before (Measured): 11:52:01 08-May-2013 Expired by 3 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Small Ring	in	Before	8.00	6.00	8.04	10.00
Large Ring	in	Before	12.00	9.00	12.18	15.00

HDRS Density Calibration - Inversion Results

Master (EEPROM): 12:34:00 24-Apr-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Rho Aluminum	g/cm3	Master	2.596	2.586	2.598	2.606

Rho Magnesium	g/cm3	Master	1.686	1.676	1.687	1.696
Pe Aluminum		Master	2.570	2.470	2.567	2.670
Pe Magnesium		Master	2.650	2.550	2.624	2.750

HDRS Density Calibration - Deviation Summary

Master (EEPROM): 12:34:00 24-Apr-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Average Deviation	%	Master	0	-0.6000	0.4251	0.6000
BS Max Deviation	%	Master	0	-1.6000	0.9510	1.6000
SS Average Deviation	%	Master	0	-1.0000	0.3236	1.0000
SS Max Deviation	%	Master	0	-2.5000	1.1867	2.5000
LS Average Deviation	%	Master	0	-1.5000	0.4979	1.5000
LS Max Deviation	%	Master	0	-3.5000	1.0172	3.5000

HDRS Density Calibration - Background Summary

Master (EEPROM): 12:34:00 24-Apr-2013 Before (Measured): 10:00:05 08-May-2013 Expired by 3 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Window Ratio		Master	1.0000		0.7367	
		Before	0.7367	0.6999	0.7370	0.7735
		Before-Master	-----	-----	0.0003	-----
BS Window Sum	1/s	Master	1		9479	
		Before	9479	9005	9466	9953
		Before-Master	-----	-----	-13	-----
SS Window Ratio		Master	1.0000		0.4951	
		Before	0.4951	0.4704	0.4949	0.5199
		Before-Master	-----	-----	-0.0002	-----
SS Window Sum	1/s	Master	1		9110	
		Before	9110	8655	9098	9566
		Before-Master	-----	-----	-12	-----
LS Window Ratio		Master	1.0000		0.2989	
		Before	0.2989	0.2840	0.2942	0.3139
		Before-Master	-----	-----	-0.0047	-----
LS Window Sum	1/s	Master	1		1063	
		Before	1063	1010	1058	1116
		Before-Master	-----	-----	-5	-----

HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM): 12:34:00 24-Apr-2013 Before (Measured): 10:00:05 08-May-2013 Expired by 3 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS PM High Voltage	V	Master		1000	1625	2400
		Before		1000	1608	2400
		Before-Master	-----	-100	-17	100
SS PM High Voltage	V	Master		1000	1690	2400
		Before		1000	1679	2400
		Before-Master	-----	-100	-11	100
LS PM High Voltage	V	Master		1000	1599	2400
		Before		1000	1579	2400
		Before-Master	-----	-100	-20	100

HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM): 12:34:00 24-Apr-2013 Before (Measured): 10:00:05 08-May-2013 Expired by 3 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Crystal Resolution	%	Master		5.00	11.81	25.00
		Before		5.00	11.91	25.00
		Before-Master	-----	-1.00	0.10	1.00
SS Crystal Resolution	%	Master		5.00	10.21	20.00
		Before		5.00	10.26	20.00
		Before-Master	-----	-1.00	0.05	1.00
LS Crystal Resolution	%	Master		5.00	9.63	20.00
		Before		5.00	9.44	20.00
		Before-Master	-----	-1.00	-0.19	1.00

HDRS MCFL Calibration - MCFL Accumulations

Before (Measured): 09:56:35 08-May-2013 Expired by 3 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Main Resistivity	ohm.m	Before	3875	3565	3829	4185
Deep Resistivity	ohm.m	Before	3830	3524	3794	4136
Shallow Resistivity	ohm.m	Before	3830	3524	3821	4136

HGNS-H (HILT Gamma-Ray and Neutron Sonde, 150 degC) Calibration - Run 1

Primary Equipment :

HILT Gamma-Ray and Neutron Sonde, 150 degC	HGNS-H	863

Auxiliary Equipment :

HGNS Accelerometer, 150 degC	HACCZ-H	452
AmBe Neutron Logging Source	NSR-F	5069

Calibration Parameter :

Water Temperature	
Housing Size	
JIG-BKG (Jig minus background reference)	165

HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured): 13:41:59 09-May-2013 Expired by 2 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	31.8	32.8

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM): 00:00:00 15-Dec-1996

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Accelerometer Manufacturer		Master			Sunstrand	
Accelerometer Reference Temperature	degF	Master		30.2	68.0	122.0
Accelerometer Coefficients - 0		Master	-----	-----	51.000	-----
Accelerometer Coefficients - 1		Master	-----	-----	11.800	-----
Accelerometer Coefficients - 2		Master	-----	-----	0.011	-----
Accelerometer Coefficients - 3		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 4		Master	-----	-----	2.182	-----
Accelerometer Coefficients - 5		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 6		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 7		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 8		Master	-----	-----	293.400	-----
Accelerometer Coefficients - 9		Master	-----	-----	0.997	-----

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 10:38:08 25-Feb-2013 Before (Measured): 09:56:39 08-May-2013 Expired by 3 days After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Near Zero Measurement	1/s	Master	0	5.0	27.8	40.0
		Before	0	5.0	27.6	40.0
		After	-----	-----	-----	-----
		Before-Master	-----	-4.2	-0.2	4.2
		After-Before	-----	-----	-----	-----
Far Zero Measurement	1/s	Master	0	5.0	31.8	40.0
		Before	0	5.0	30.1	40.0
		After	-----	-----	-----	-----
		Before-Master	-----	-4.8	-1.7	4.8
		After-Before	-----	-----	-----	-----
Near Plus Measurement - 0	1/s	Master	6031.0	4700.0	4914.0	6900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Far Plus Measurement - 0	1/s	Master	2793.0	1900.0	2076.0	2900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Near Corrected Plus Measurement - 0	1/s	Master		4700.0	4881.0	6900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Far Corrected Plus Measurement - 0	1/s	Master		1900.0	2041.0	2900.0
		Before	-----	-----	-----	-----

		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured): 11:48:36 08-May-2013 Expired by 3 days After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
RGR Zero Measurement	gAPI	Before	30.0	0	74.9	120.0
		After	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
RGR Plus Measurement	gAPI	Before	185.4	157.1	172.3	206.3
		After			NOT DONE	
		After-Before	-----	-----	-----	-----
GR Calibration Gain		Before	0.89	0.80	0.96	1.05
		After	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----

Company: Nighthawk Production LLC

Schlumberger

Well: Big Sky 4-11

Field: Wildcat

County: Lincoln

State: Colorado

Platform Express

Compensated Neutron Log

LithoDensity