Schlumberger

Company: EnCana Oil & Gas (USA) Inc.

Well: Shideler FEE 6-3AA (031E)

Field: Mamm Creek

County: Garfield State: Colorado

PLATFORM EXPRESS

COMPENSATED NEUTRON, LITHO-DENSITY

INDUCTION RESISTIVITY, GR, SP

County: Garfield
Field: Mamm Creek
Location: SHL: 165' FSL & 2073' FEL SWSE
Well: Shideler FEE 6-3AA (031E)
Company: EnCana Oil & Gas (USA) Inc.

Location:			
SHL: 165' FSL & 2073' FEL SWSE	Elev.	K.B.	7129.00 ft
BHL: 528' FNL & 2492' FEL		G.L.	7107.00 ft
		D.F.	7128.00 ft

Permanent Datum:	Ground Level	Elev.:	7107.00 f
Log Measured From:	Kelly Bushing	22.00 ft	above Perm.Datum
Drilling Measured From:	Kelly Bushing		

API Serial No.	Section:	Township:	Range:
05045217400000	31	7S	92W

Logging Date			01-Feb-2013			
Run Number			1			
Depth Driller			9711.00 ft			
Schlumberger Depth			9420.00 ft			
Bottom Log Interval			9420.00 ft			
Top Log Interval			1461.00 ft			
Casing Driller Size @ Depth			9.625 in @ 1436.00 ft			
Casing Schlumberger			1461 ft			
Bit Size			7.875 in			
Type Fluid In Hole			Water			
MUD	Density	Viscosity	10 lbm/gal	42 s		
	Fluid Loss	PH	6.5 cm3	9.6		
	Source of Sample		Active Tank			
RM @ Meas Temp			1.15 ohm.m @ 75 degF			
RMF @ Meas Temp			0.99 ohm.m @ 75 degF			
RMC @ Meas Temp			1.03 ohm.m @ 75 degF			
Source RMF	RMC		Calculated	Calculated		
RM @ BHT	RMF @ BHT		0.39 @ 237	0.33 @ 237		
Max Recorded Temperatures			237 degF			
Circulation Stopped	Time		31-Jan-2013	19:30:00		
Logger on Bottom	Time		01-Feb-2013	05:07:46		
Unit Number	Location:		2275	Vernal		
Recorded By			Curtis Schaaf			
Witnessed By			Unattended			

Disclaimer

Contents

11. Tail

Operational Run Summary

Parameter (unit)	1					
Date Log Started	01-Feb-2013					
Time Log Started	01:35:16					
Date Log Finished	01-Feb-2013					
Time Log Finished	07:31:54					
Top Log Interval (ft)	1461.00					
Bottom Log Interval (ft)	9420.00					
Total Depth (ft)	9420.00					
Max Hole Deviation (deg)	12.10					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	7.875					
Logging Unit Number	2275					
Logging Unit Location	Vernal					
Recorded By	Curtis Schaaf					
Witnessed By	Unattended					
Service Order Number	BY8P-00074					

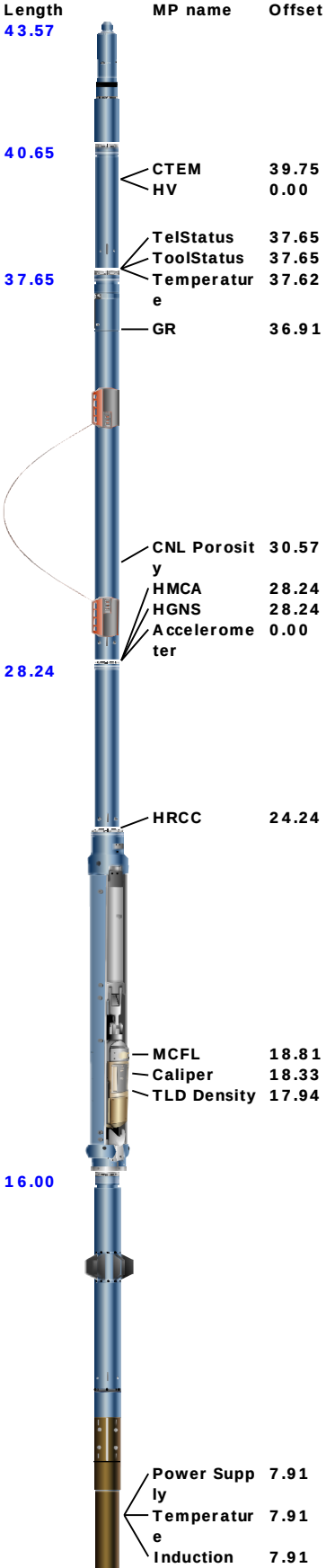
Borehole Fluids

Parameter(unit)	1					
Fluid Type	Water					
Max Recorded Temperatures (degF)	237					
Source of Sample	Active Tank					
Salinity (ppm)	1000					
Density (lbm/gal)	10					
Funnel Viscosity (s)	42					
Fluid Loss (cm3)	6.5					
PH	9.6					
Date/Time Circulation Stopped	31-Jan-2013 19:30:00					
Date Logger on Bottom	01-Feb-2013					
Time Logger on Bottom	05:07:46					
Source RMF	Calculated					
RMC	Calculated					
RM @ Meas Temp (ohm.m@degF)	1.15 @ 75					
RMF @ Meas Temp (ohm.m@degF)	0.99 @ 75					
RMC @ Meas Temp (ohm.m@degF)	1.03 @ 75					

RM @ BHT (ohm.m@degF)	0.39 @ 237					
RMF @ BHT (ohm.m@degF)	0.33 @ 237					
RMC @ BHT (ohm.m@degF)	0.32 @ 237					
Total Solid (%)						
High Gravity Solids (%)						

Remarks and Equipment Summary

1: Toolstring



Equip name	Length	MP name	Offset
LEH-QT:1202	**43.57**		
LEH-QT:1202			
DTC-H	**40.65**		
ECH-KC:9667		**CTEM**	**39.75**
DTC-H		**HV**	**0.00**
		TelStatus	**37.65**
		ToolStatus	**37.65**
HGNS-H:3846	**37.65**	**Temperature**	**37.62**
HGNH:4748			
NPV-N		**GR**	**36.91**
NSR-F:1260			
HACCZ-H:4665			
HMCA-H			
HGNS-H:3846			
		CNL Porosity	**30.57**
		HMCA	**28.24**
		HGNS	**28.24**
		Accelerometer	**0.00**
HDRS-H:3867	**28.24**		
ECH-MEB:3704			
HRCC-H:3889			
HRMS-H:3867			
GPV-Q			
Short Spacing:27692			
Backscatter		**HRCC**	**24.24**
Long Spacing:28706			
HRGD-H:3912			
GSR-J:5415			
		MCFL	**18.81**
		Caliper	**18.33**
		TLD Density	**17.94**
AIT-M:155	**16.00**		
AMIS:155			
AMRM:155			
		Power Supply	**7.91**
		Temperature	**7.91**
		Induction	**7.91**

1: Remarks

Tools run as per tool sketch.
Tools run eccentralized via bowspring and caliper.
Neutron corrected for bit size and standoff.
Density corrected for hole size.
MATRIX: Sandstone, DENSITY: 2.68g/cc
Maximum logging speed of 3600 ft/hr.
Bridged out at 5420' and logged out, per client request.
Cement volume calculated using future casing diameter of 4.5"
Maximum temperature of 237degF recorded by HGNS cartridge.
Maximum hole deviation of 12.1deg recorded by HGNS accelerometer.

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	First Run in Hole		
Rig Type	Land		
Depth Remark Parameters	**1**		
Depth Remark 1	All Schlumberger depth procedures followed.		
Depth Remark 2	IDW used as primary depth measurement device.		
Depth Remark 3	Z-Chart used as secondary depth reference.		
Depth Measuring Device	**1**		
Type	IDW-JA		
Serial Number	6516		
Calibration Date	07-Jun-2012		
Calibrator Serial Number	33		
Calibration Cable Type	7-46 AXS		
Wheel Correction 1	-8		
Wheel Correction 2	-7		
Tension Device	**1**		
Type	CMTD-B/A		
Serial Number	2206		
Calibration Date	31-Jan-2013		
Calibrator Serial Number	100518		
Calibration Points	10		
Calibration RMS	25		
Calibration Peak Error	48		
Logging Cable	**1**		
Type	7-46A-XS		
Serial Number	707038		
Logging Cable Length (ft)	17000.00		

1

MAIN PASS - 5 INCH

Integration Summary

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

IHV	Integrated Hole Volume	GCSE_UP_PASS	3366.96	ft3
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	2485.65	ft3

Software Version

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

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.1.9755.0
HENVIR	Computation Ensemble for the HGNS Neutron environmental corrections	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
AMIS	Array Induction Sonde - M	3.1.9755.1422	1

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
1	Main[3]:Up	Up	216.37 ft	9441.57 ft	01-Feb-2013 5:07:46 AM	01-Feb-2013 7:09:34 AM	8.00 ft	

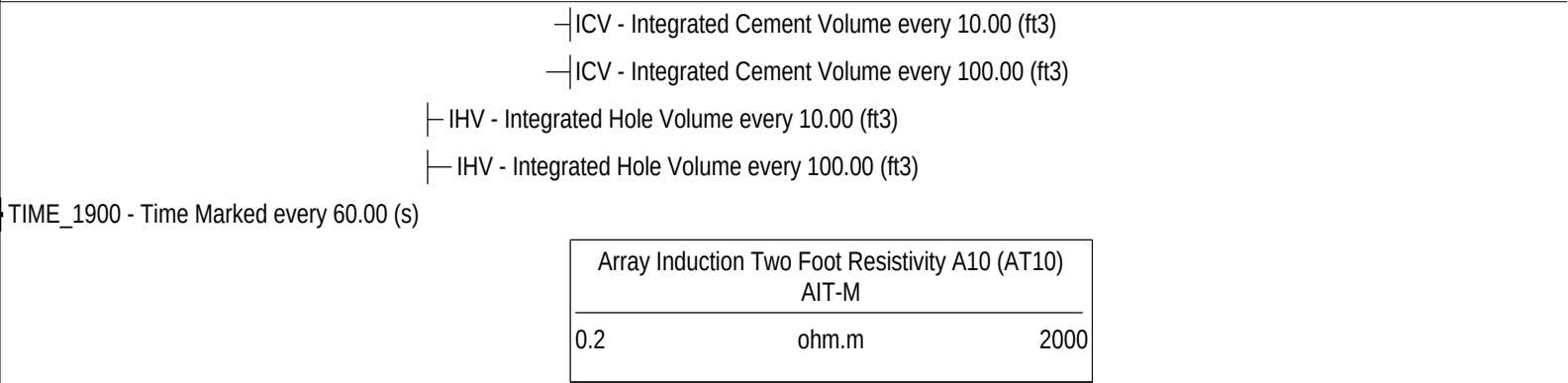
All depths are referenced to toolstring zero

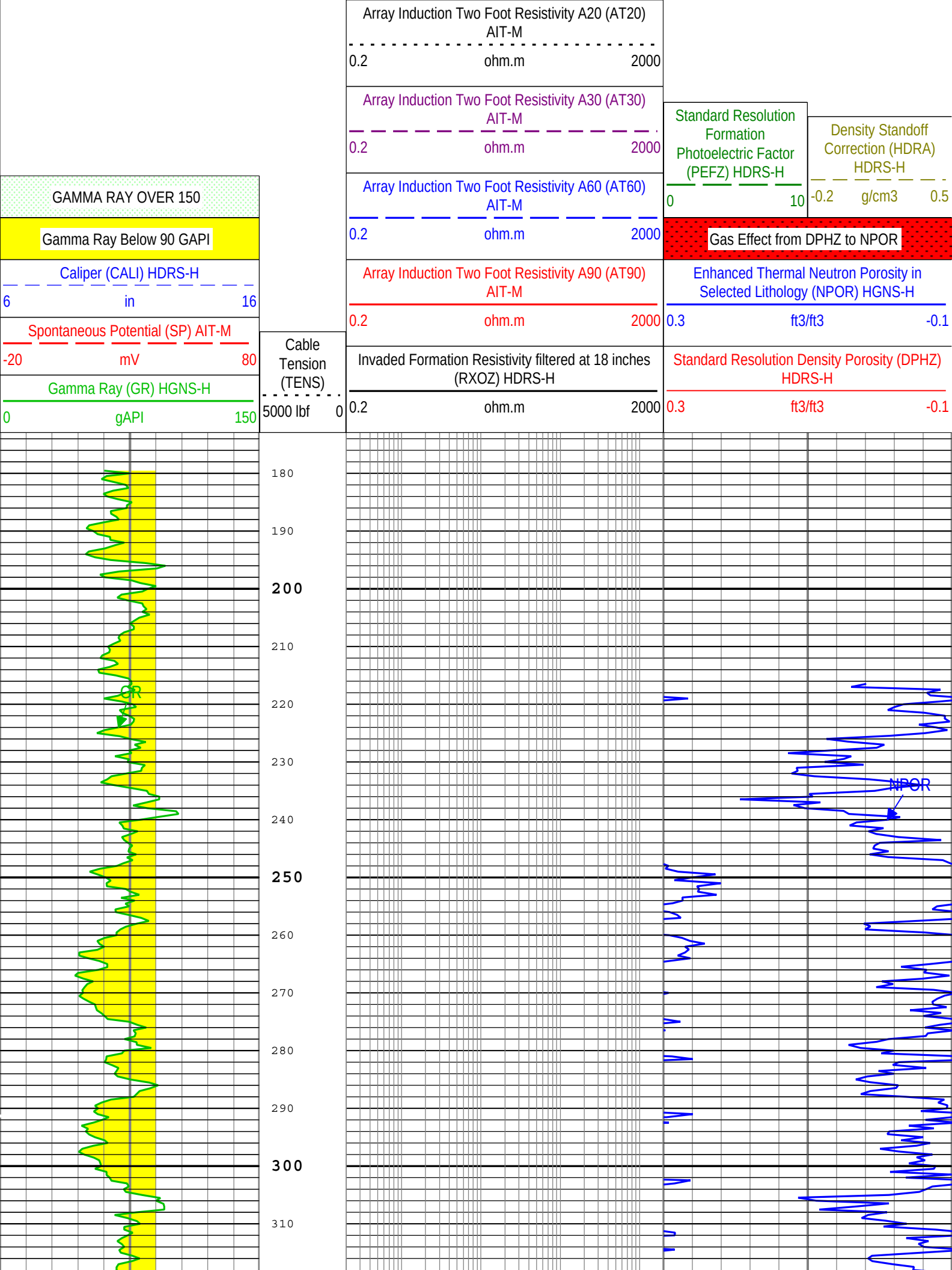
Log

1: Main[3]:Up

Description: Triple Combo standard resolution template for Platform Express Format: Log (PEX Triple Combo StdRes) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 01-Feb-2013 07:35:30

Channel	Source	Sampling
AT10	AIT-M:AMIS:AMIS	3in
AT20	AIT-M:AMIS:AMIS	3in
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
DPHZ	HDRS-H:HRMS-H:HRGD-H	2in
GR	HGNS-H:HGNS-H:HGNS-H	6in
HDRA	HDRS-H:HRMS-H:HRGD-H	2in
ICV	Borehole	6in
IHV	Borehole	6in
NPOR	HGNS-H:HGNS-H:HGNS-H	6in
PEFZ	HDRS-H:HRMS-H:HRGD-H	2in
RXOZ	HDRS-H:HRMS-H:HRGD-H	2in
SP	AIT-M:AMIS:AMIS	6in
TENS	WLWorkflow	1in
TIME_1900	WLWorkflow	0.1in




GAMMA RAY OVER 150
Gamma Ray Below 90 GAPI
Caliper (CALI) HDRS-H
6
in
16
Spontaneous Potential (SP) AIT-M
-20
mV
80
Gamma Ray (GR) HGNS-H
0
gAPI
150
Cable Tension (TENS)
5000 lbf
0
Array Induction Two Foot Resistivity A20 (AT20) AIT-M
0.2
ohm.m
2000
Array Induction Two Foot Resistivity A30 (AT30) AIT-M
0.2
ohm.m
2000
Array Induction Two Foot Resistivity A60 (AT60) AIT-M
0.2
ohm.m
2000
Array Induction Two Foot Resistivity A90 (AT90) AIT-M
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ohm.m
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Invaded Formation Resistivity filtered at 18 inches (RXOZ) HDRS-H
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ohm.m
2000
Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H
0
10
Density Standoff Correction (HDRA) HDRS-H
-0.2
g/cm3
0.5
Gas Effect from DPHZ to NPOR
Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H
0.3
ft3/ft3
-0.1
Standard Resolution Density Porosity (DPHZ) HDRS-H
0.3
ft3/ft3
-0.1
GR
NPOR
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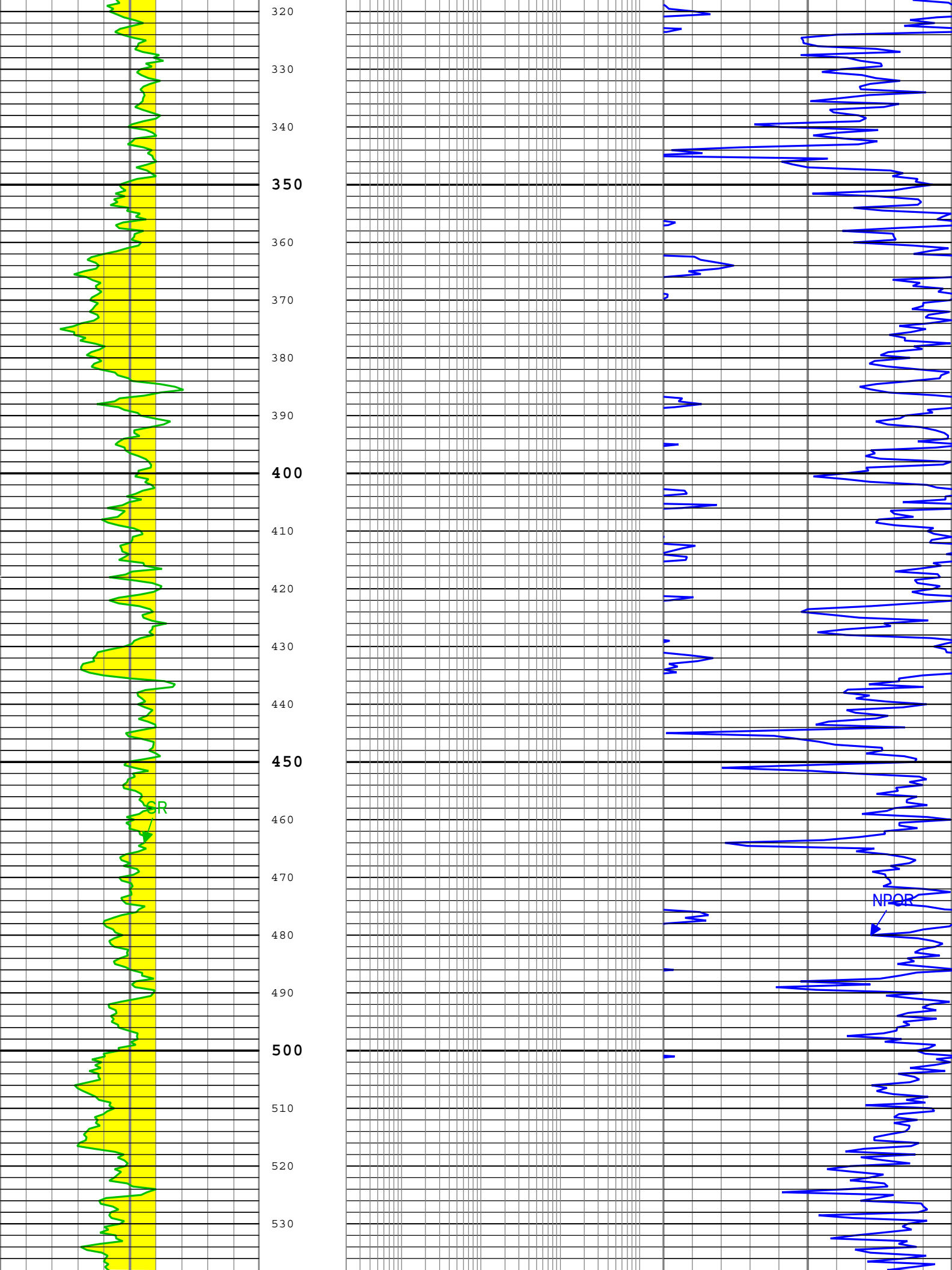
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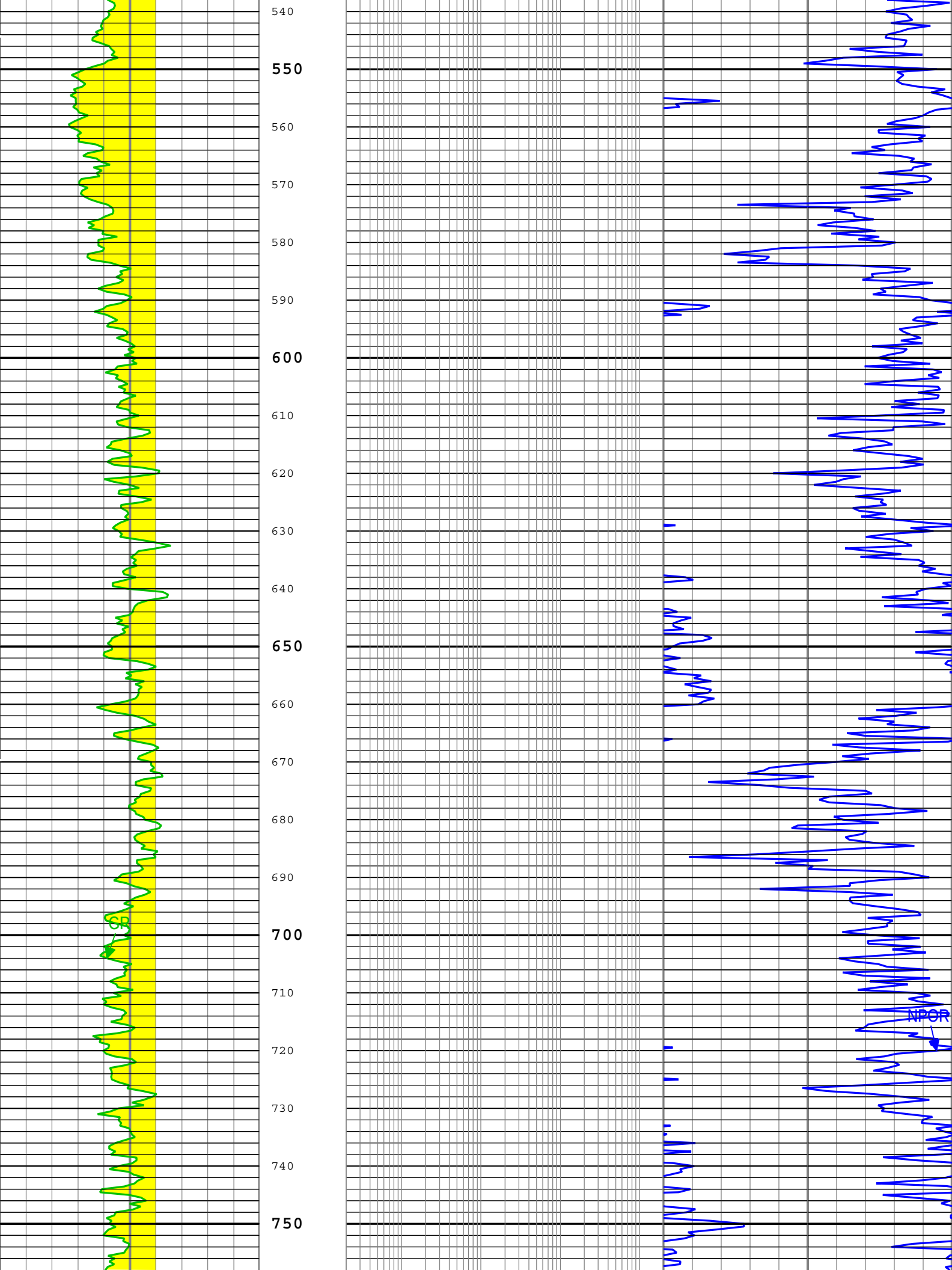
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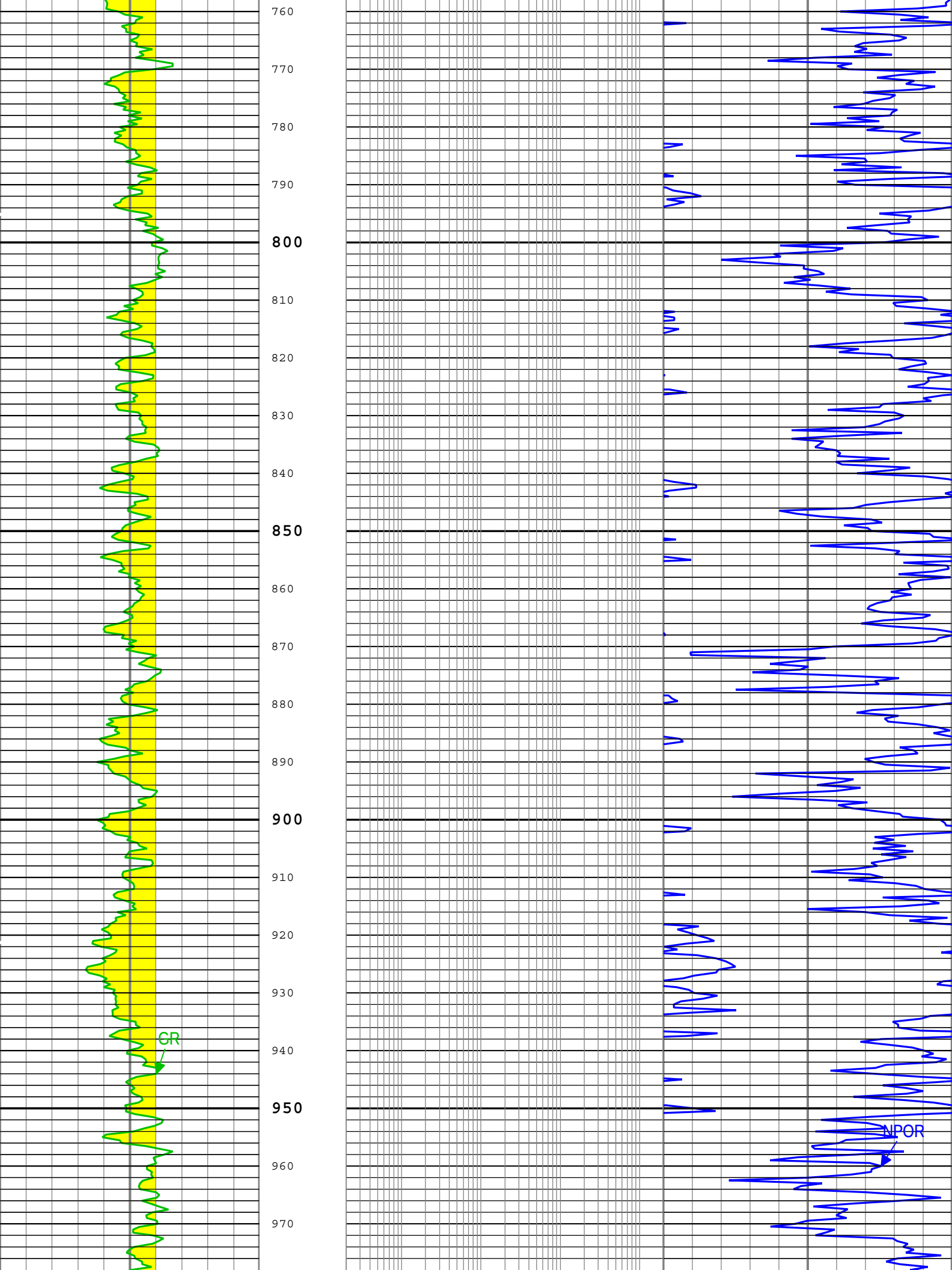
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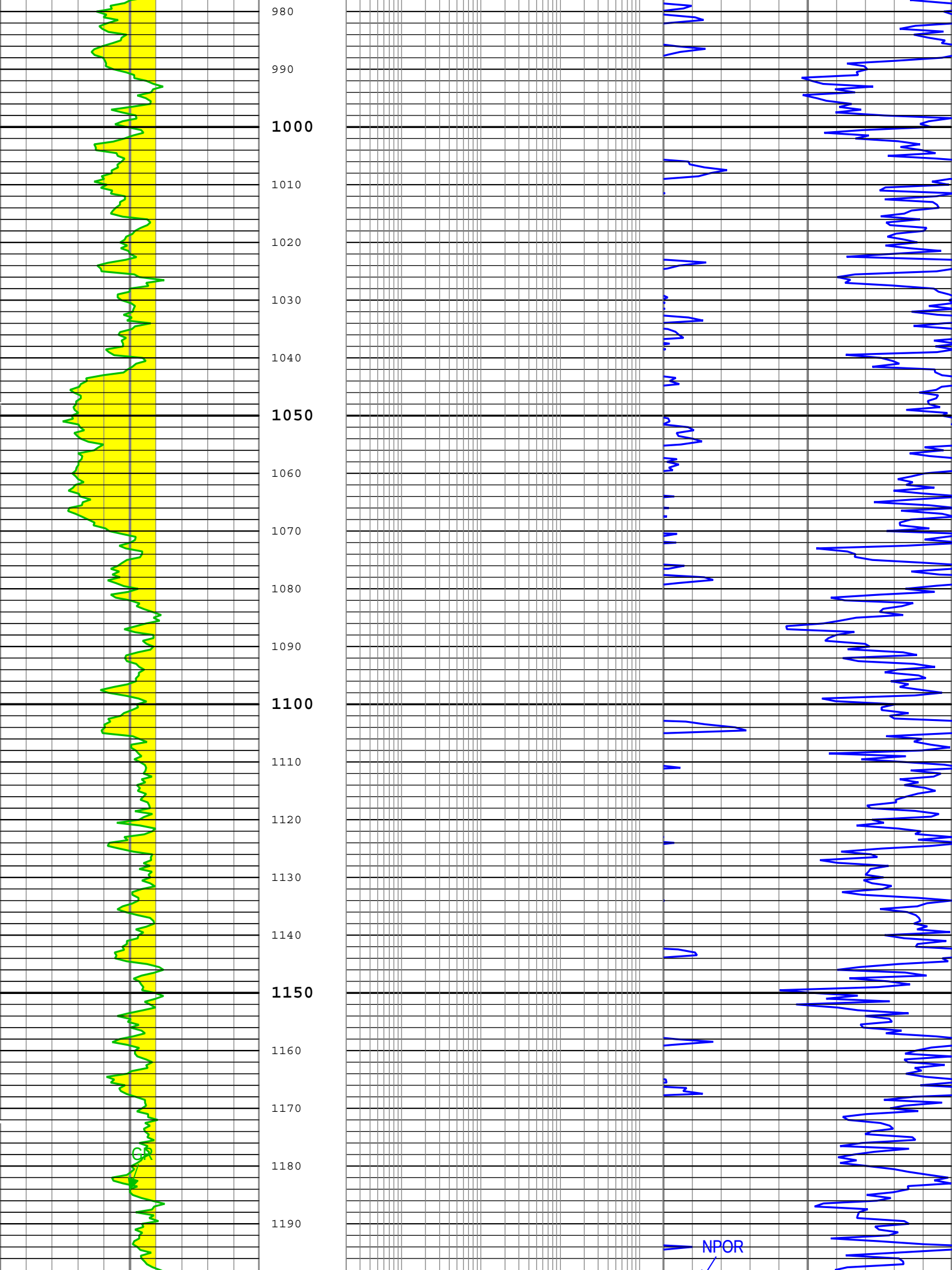
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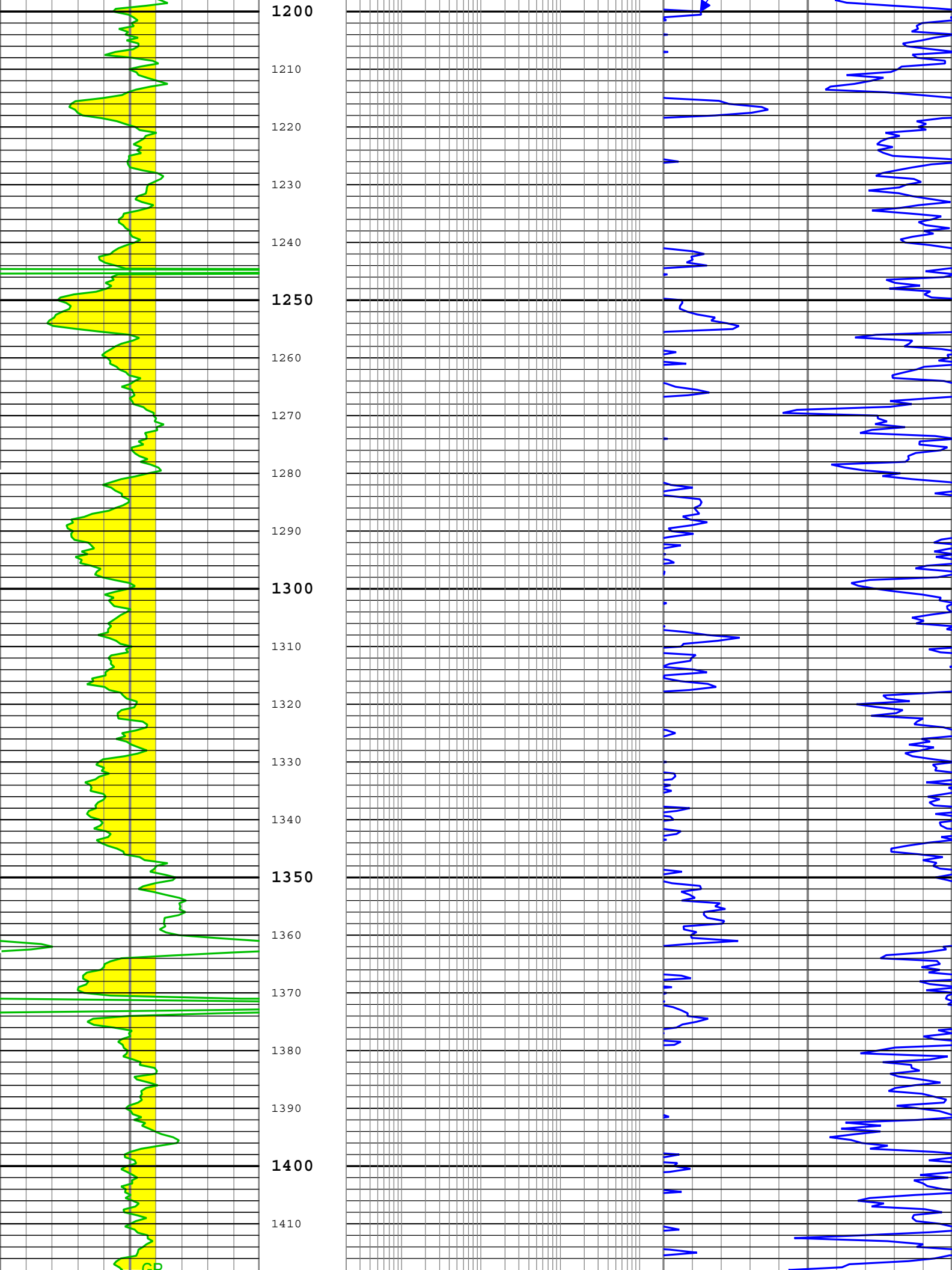
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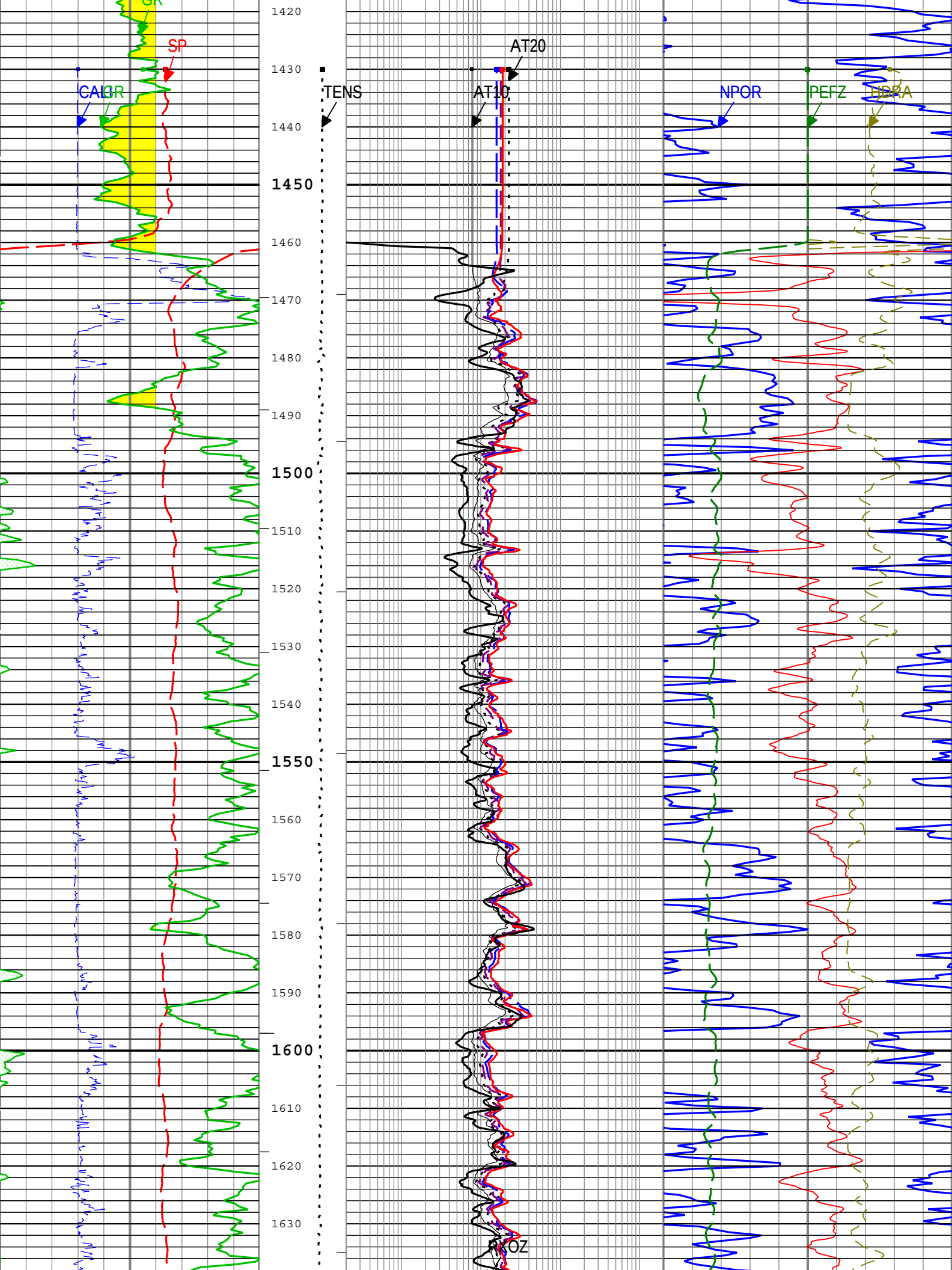
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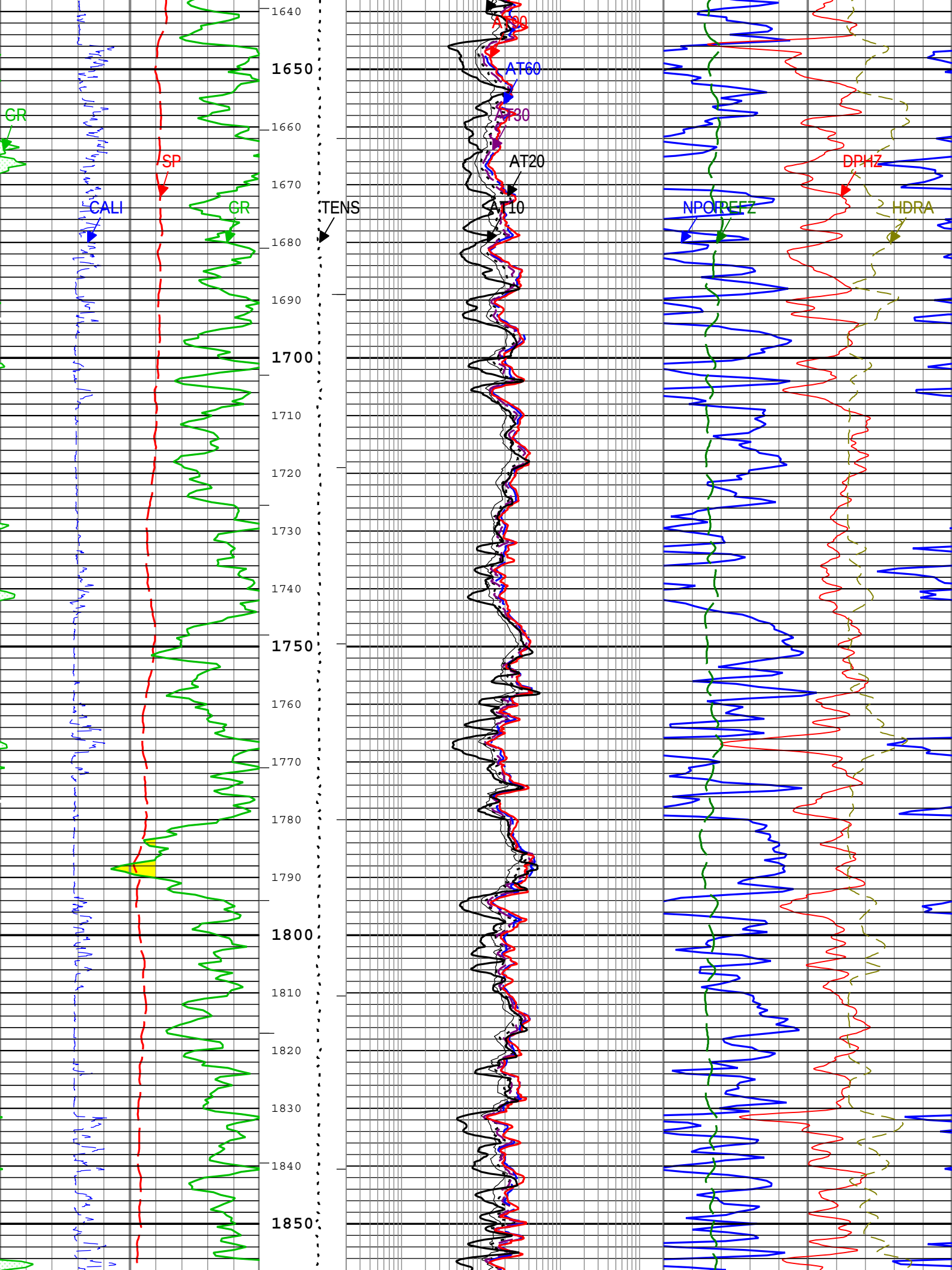
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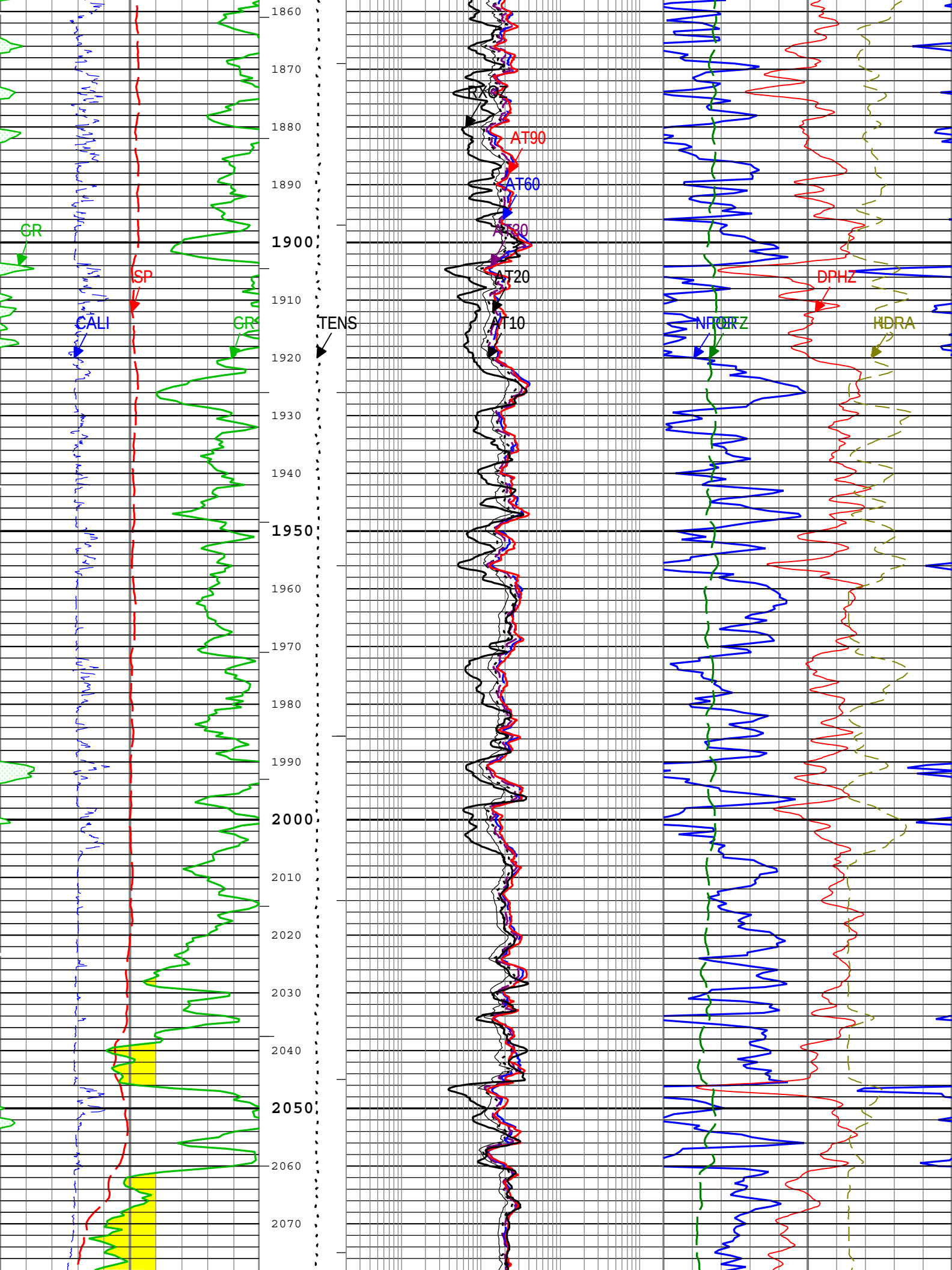
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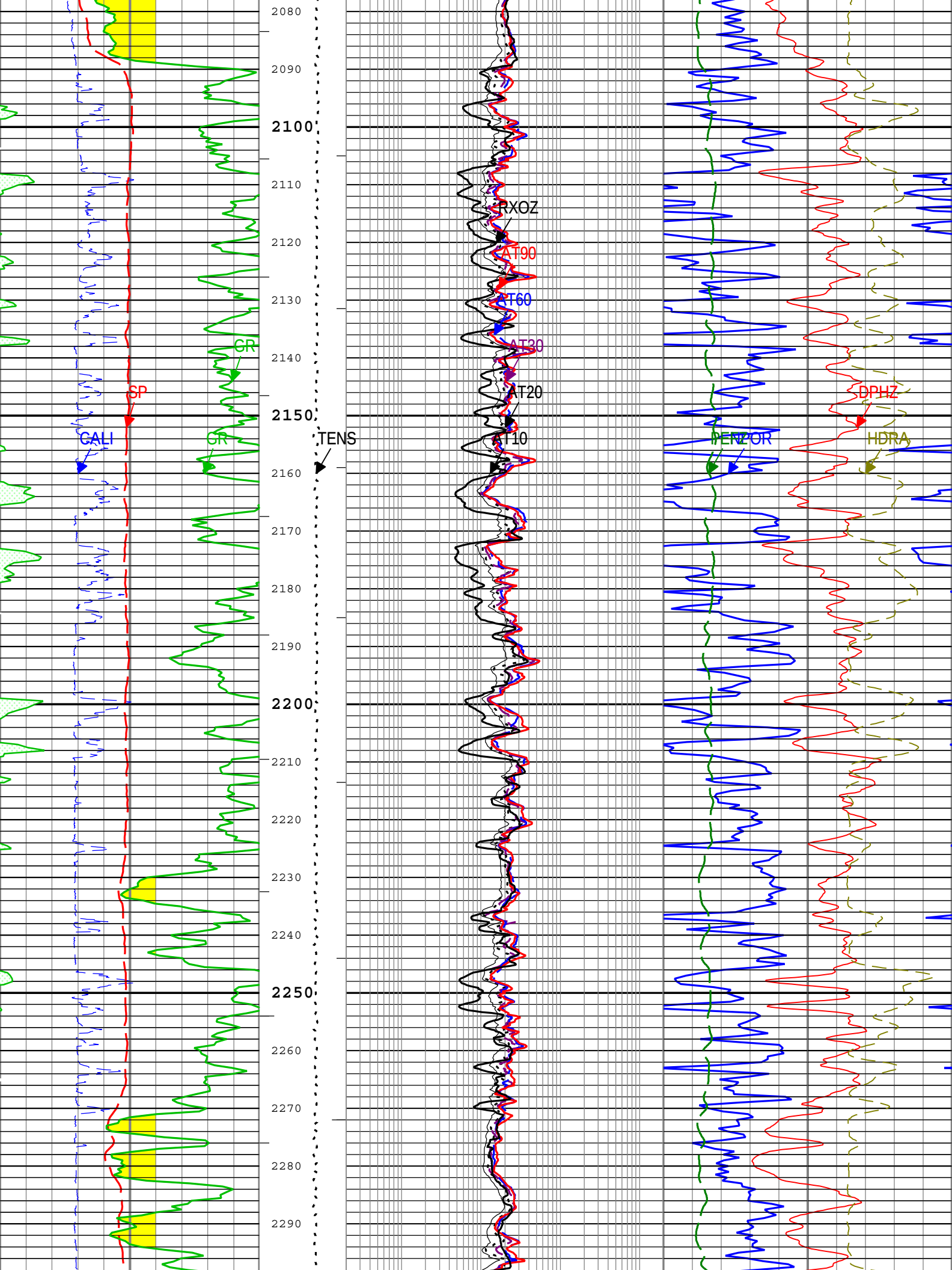
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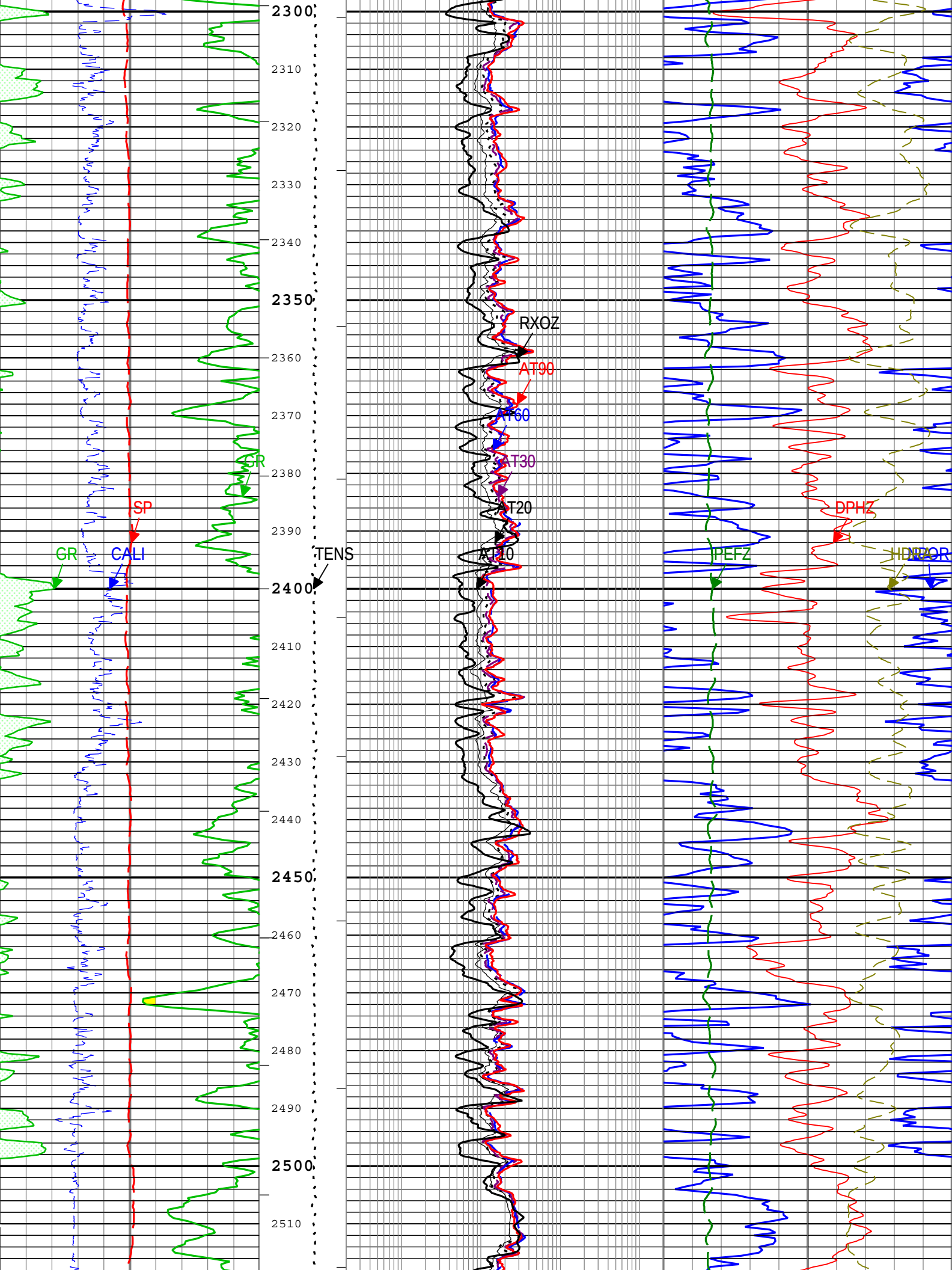
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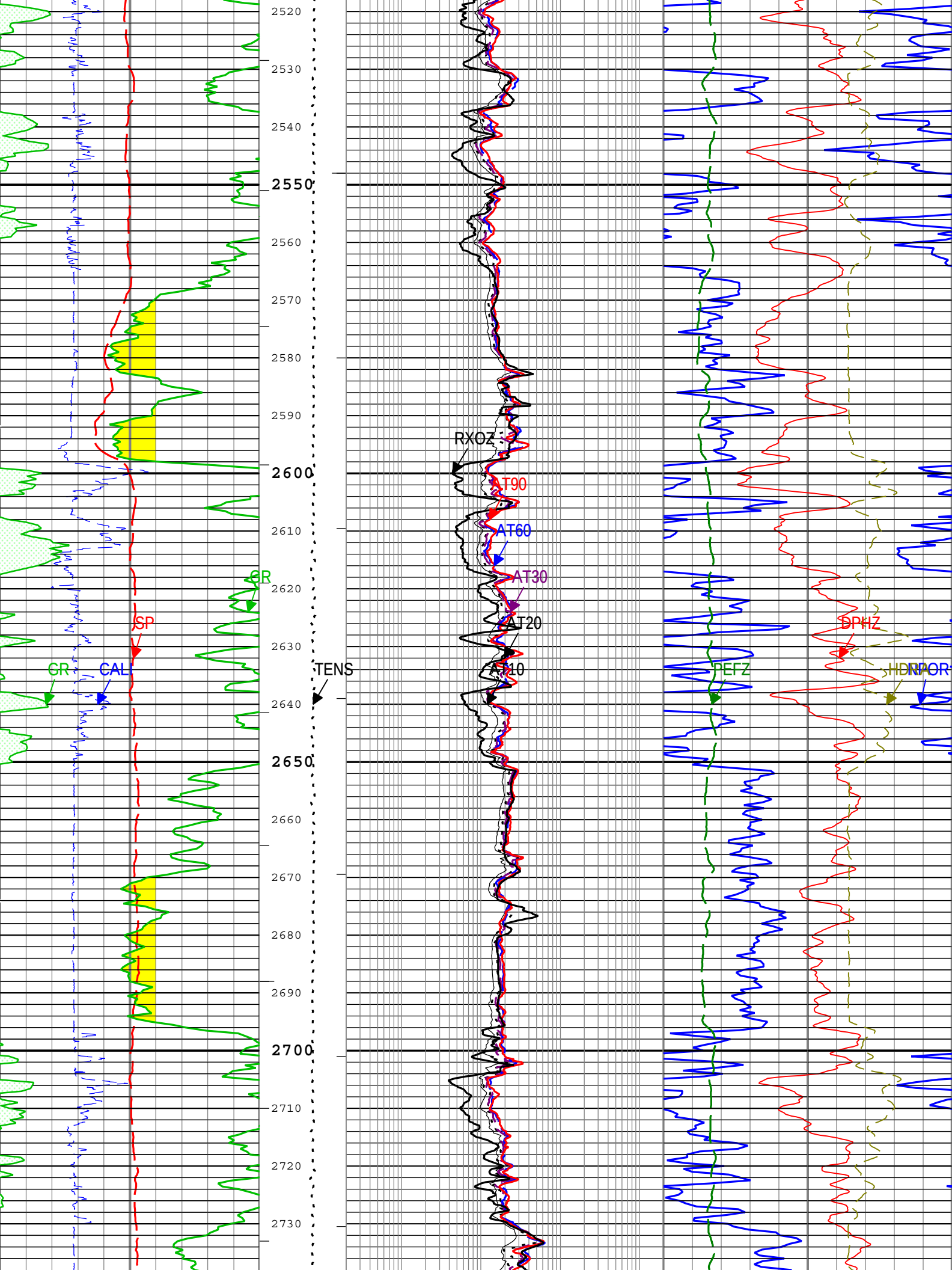
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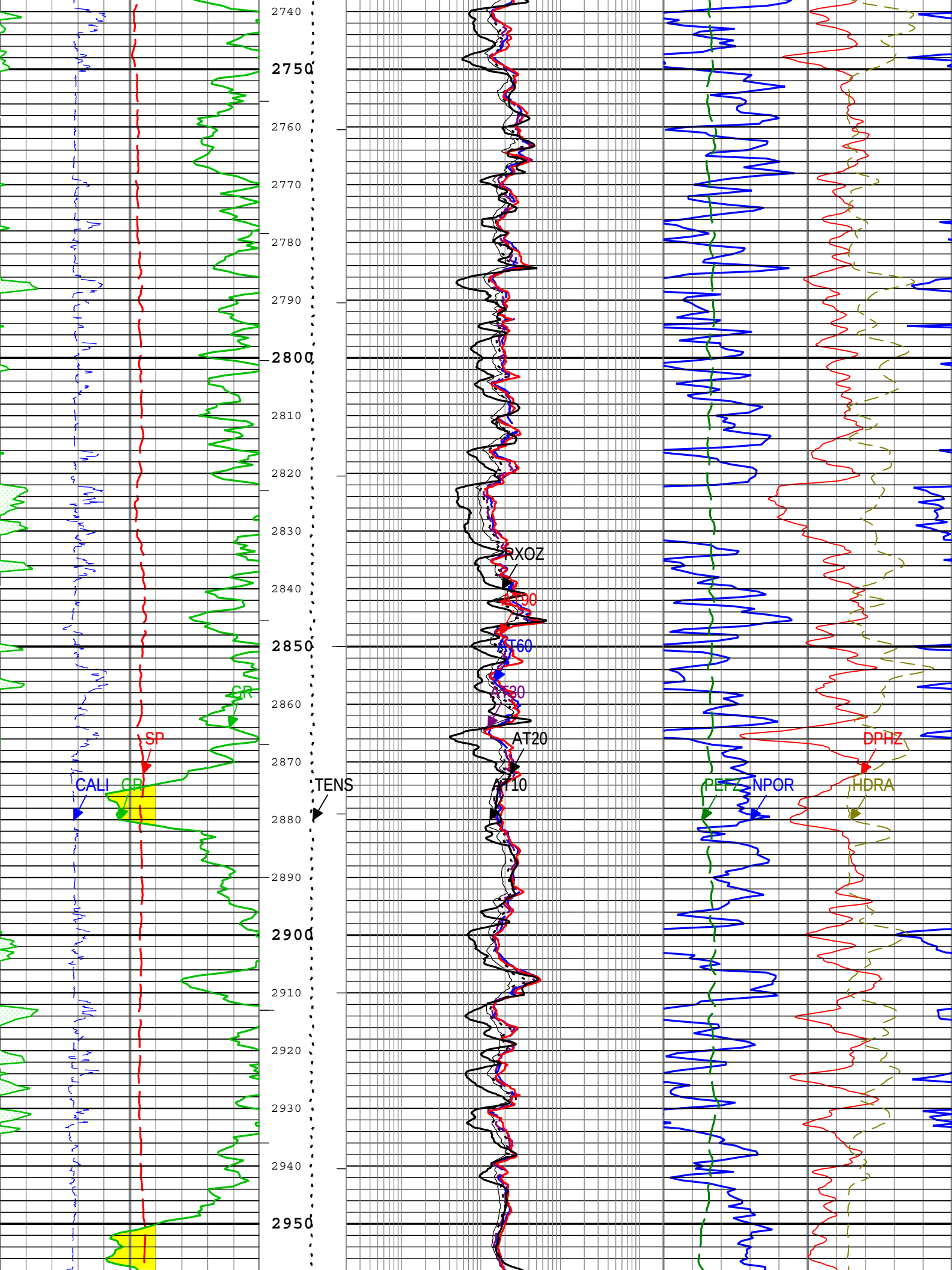
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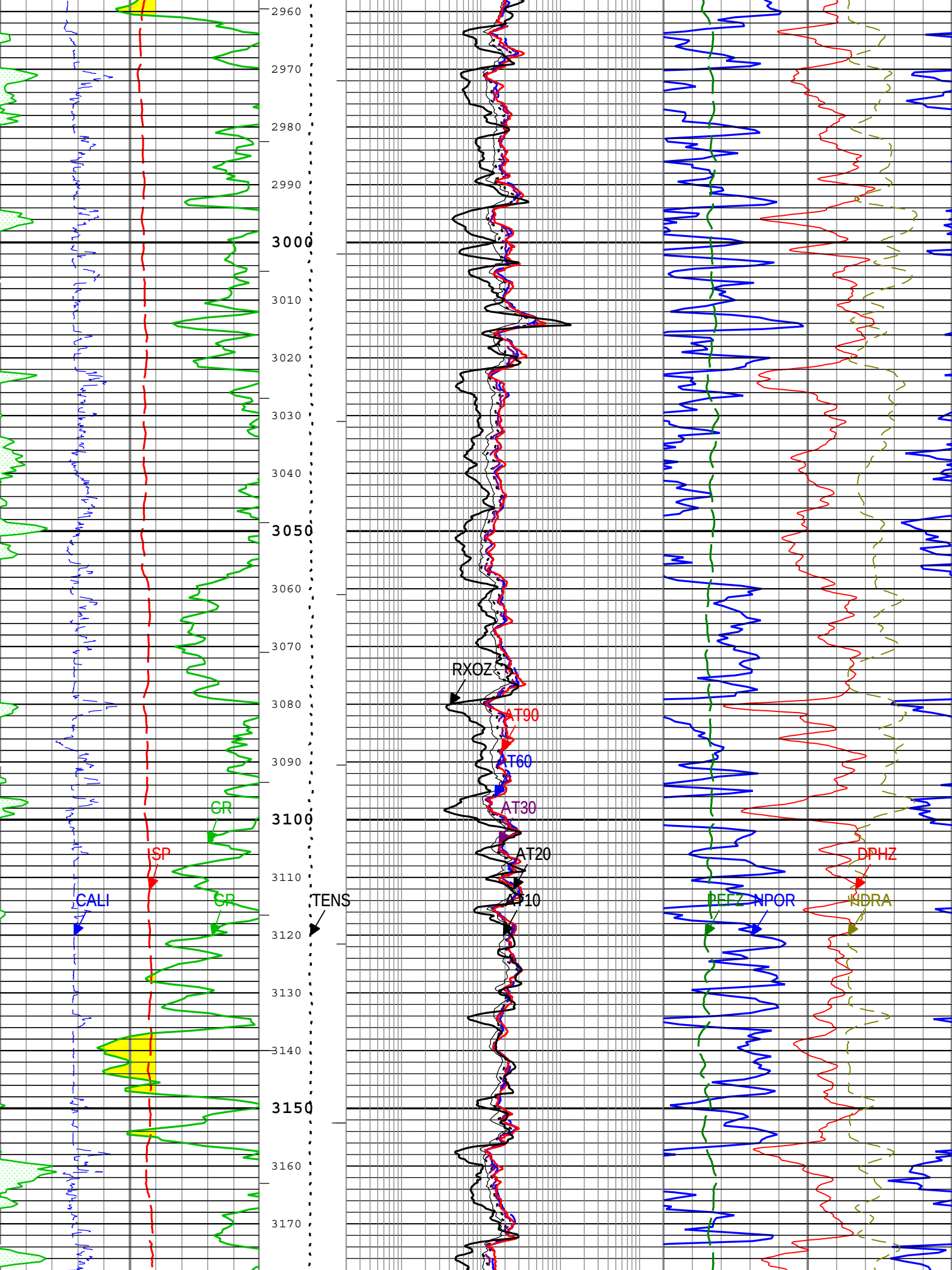
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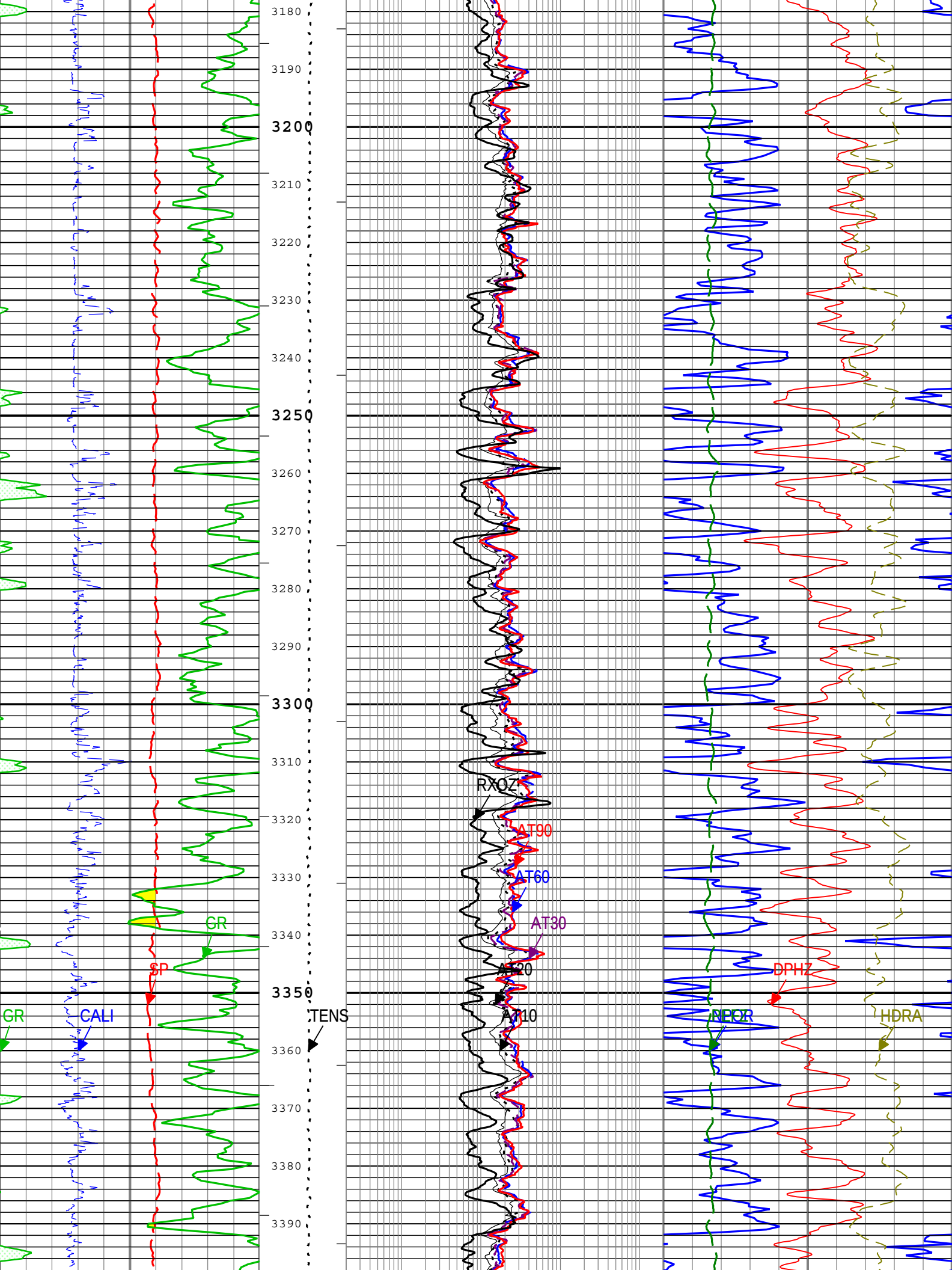
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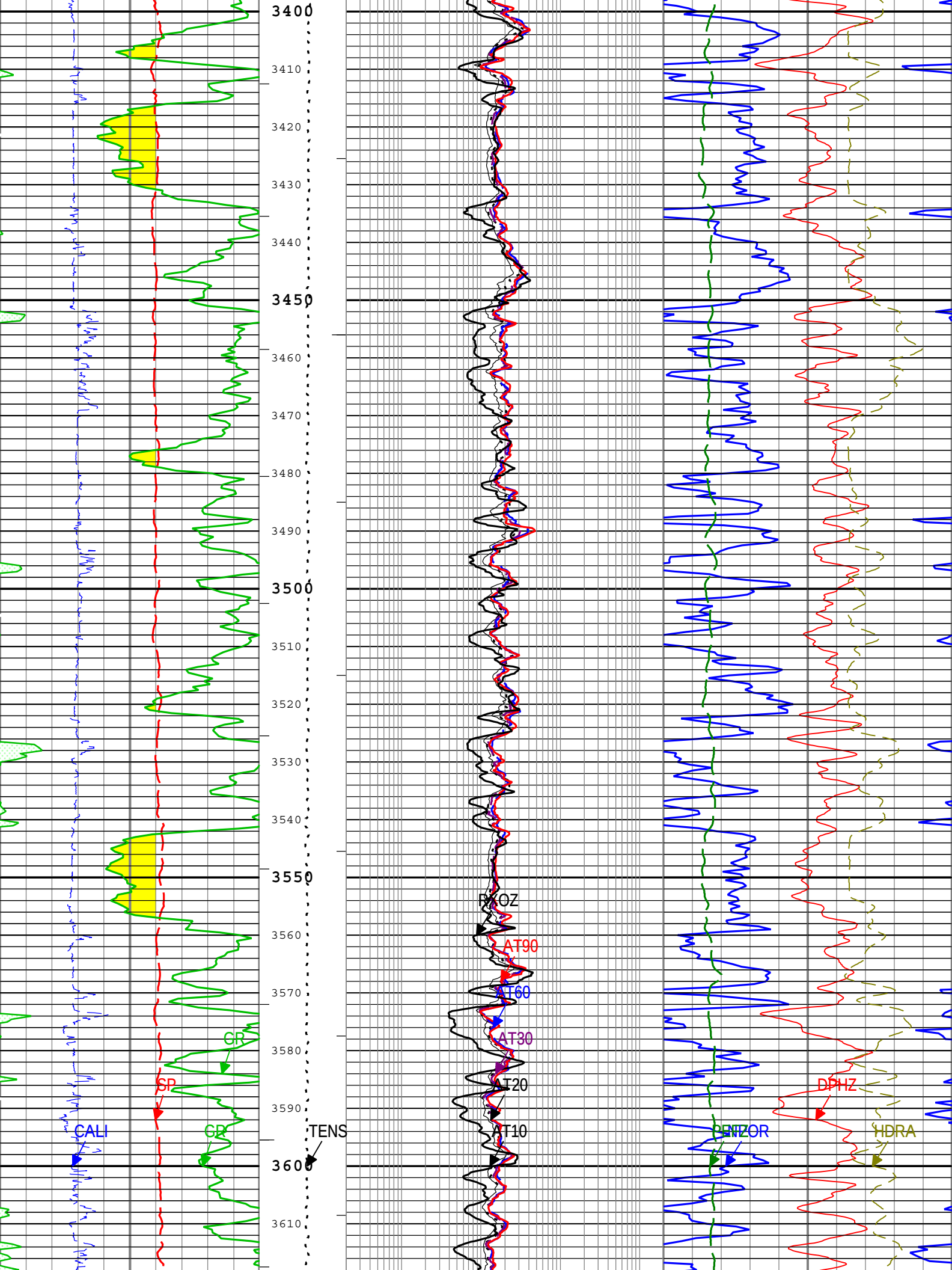
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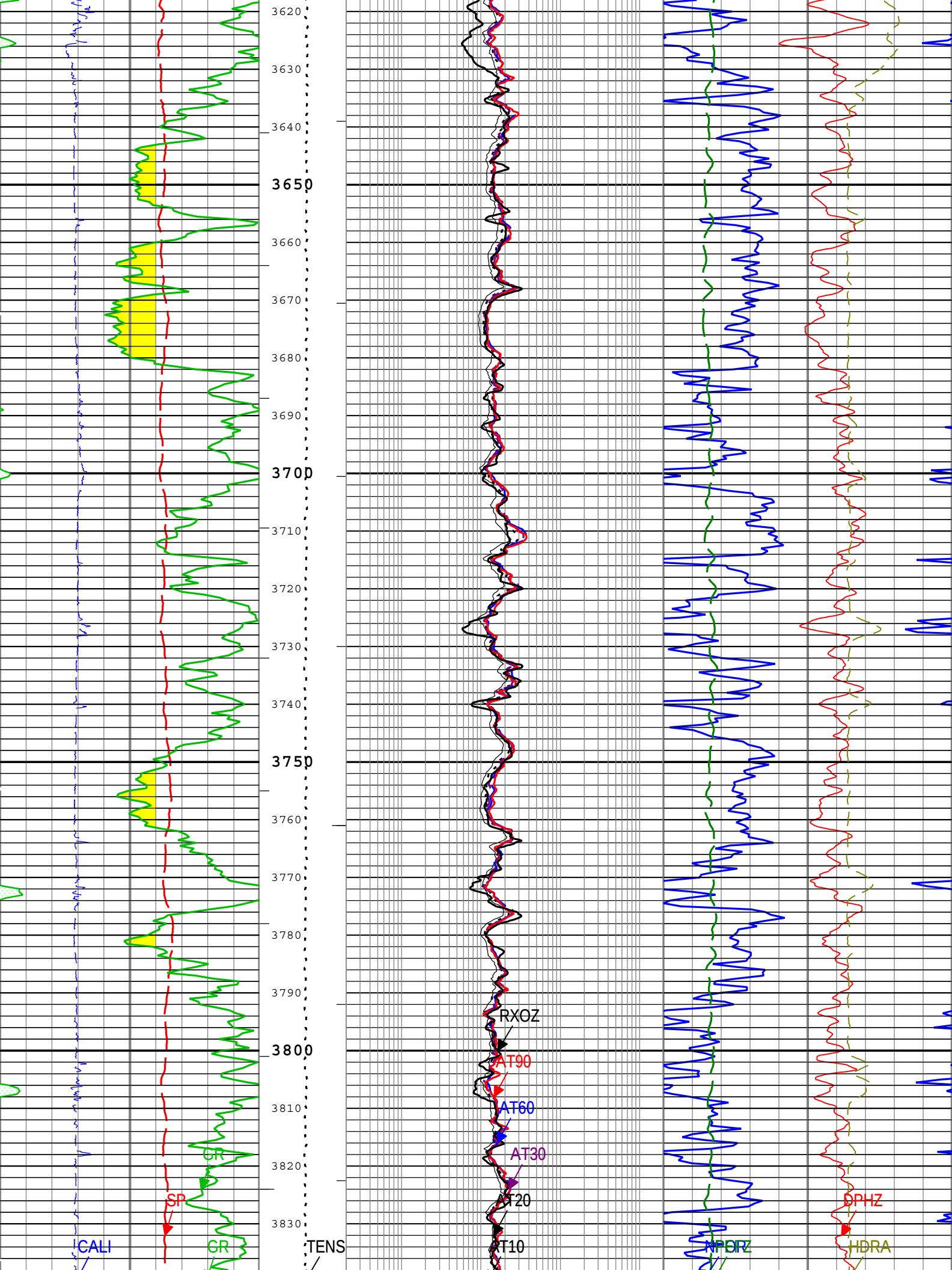
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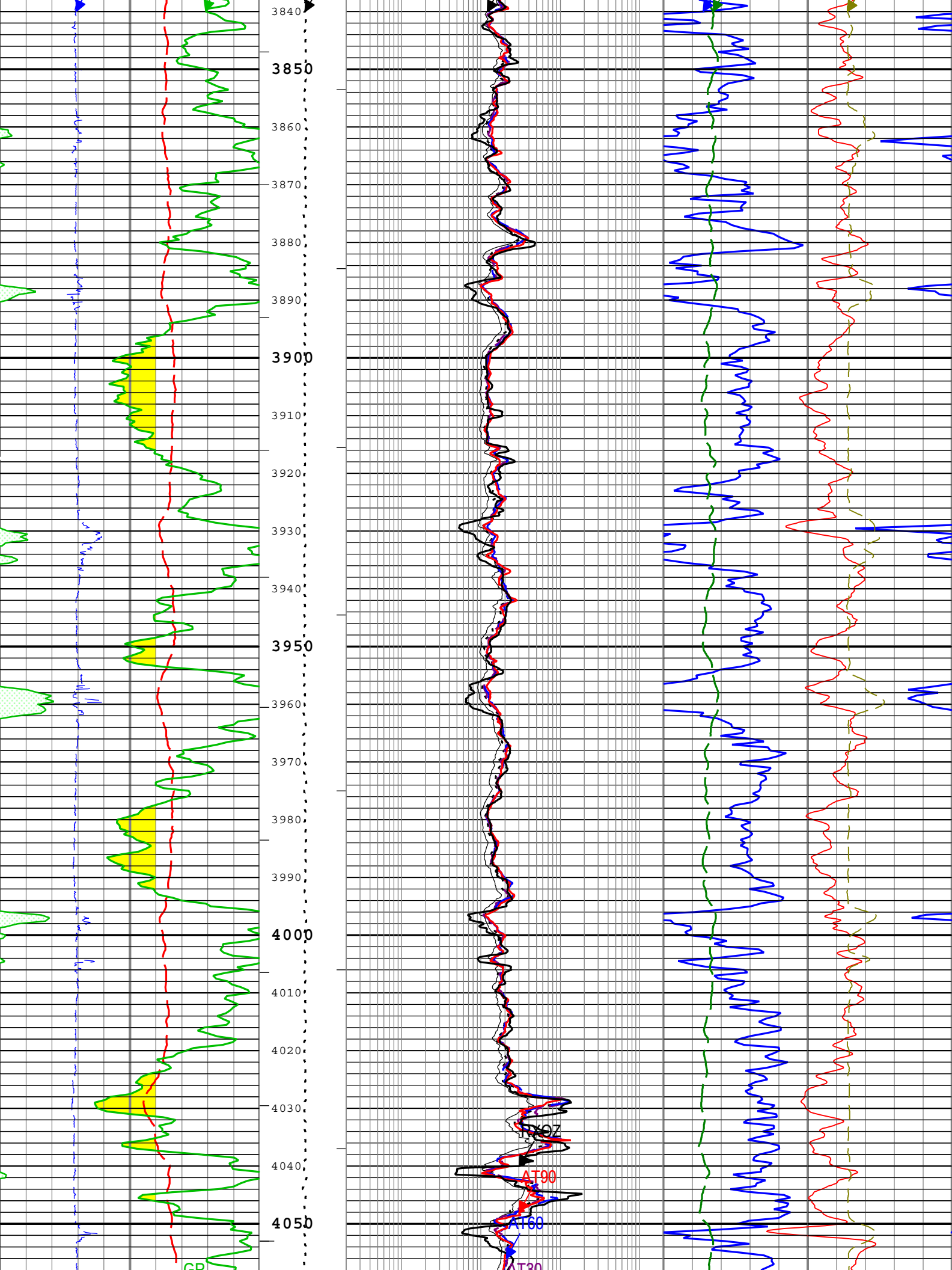
NPHIRZ
DPHZ
HDRA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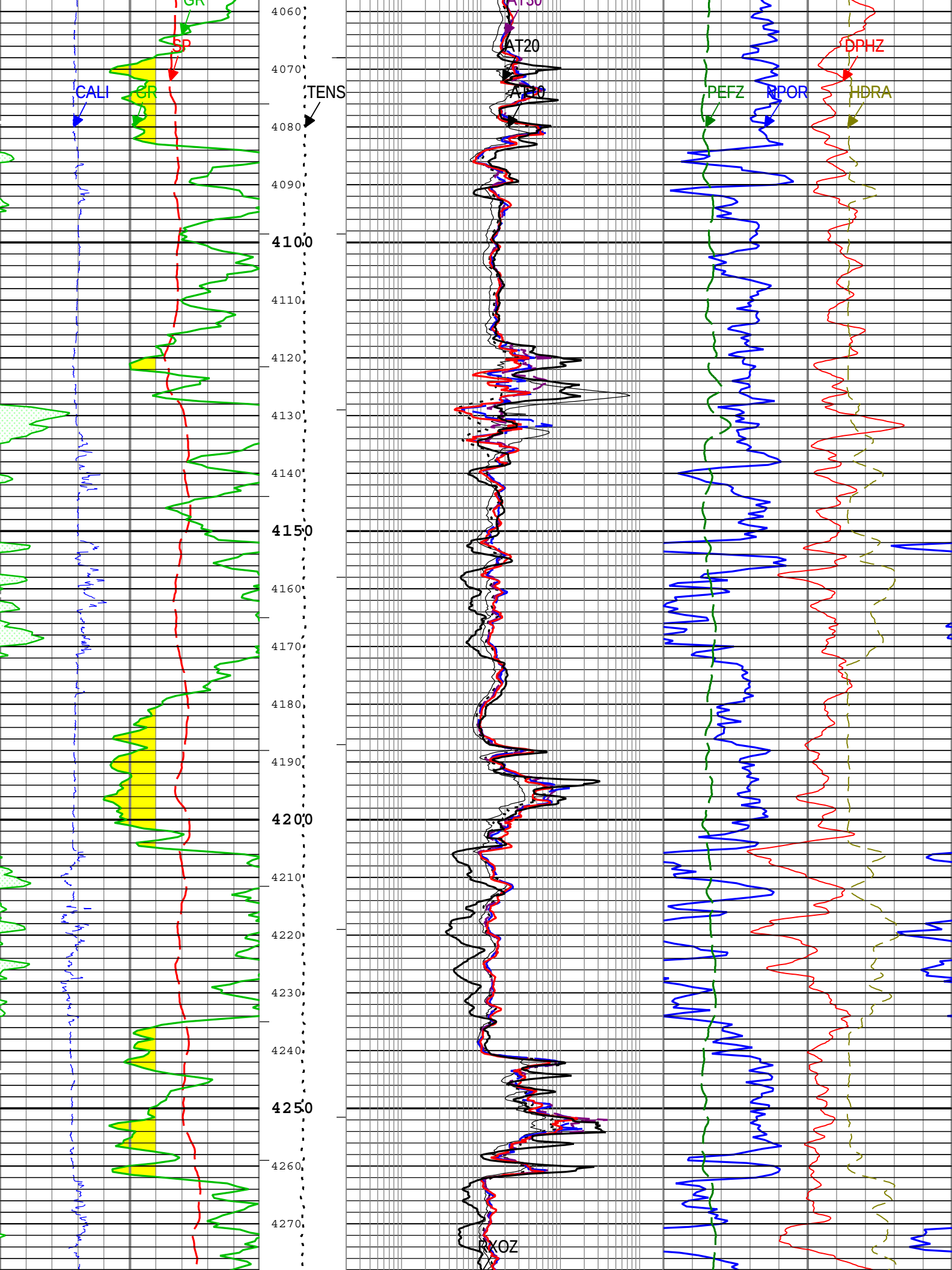
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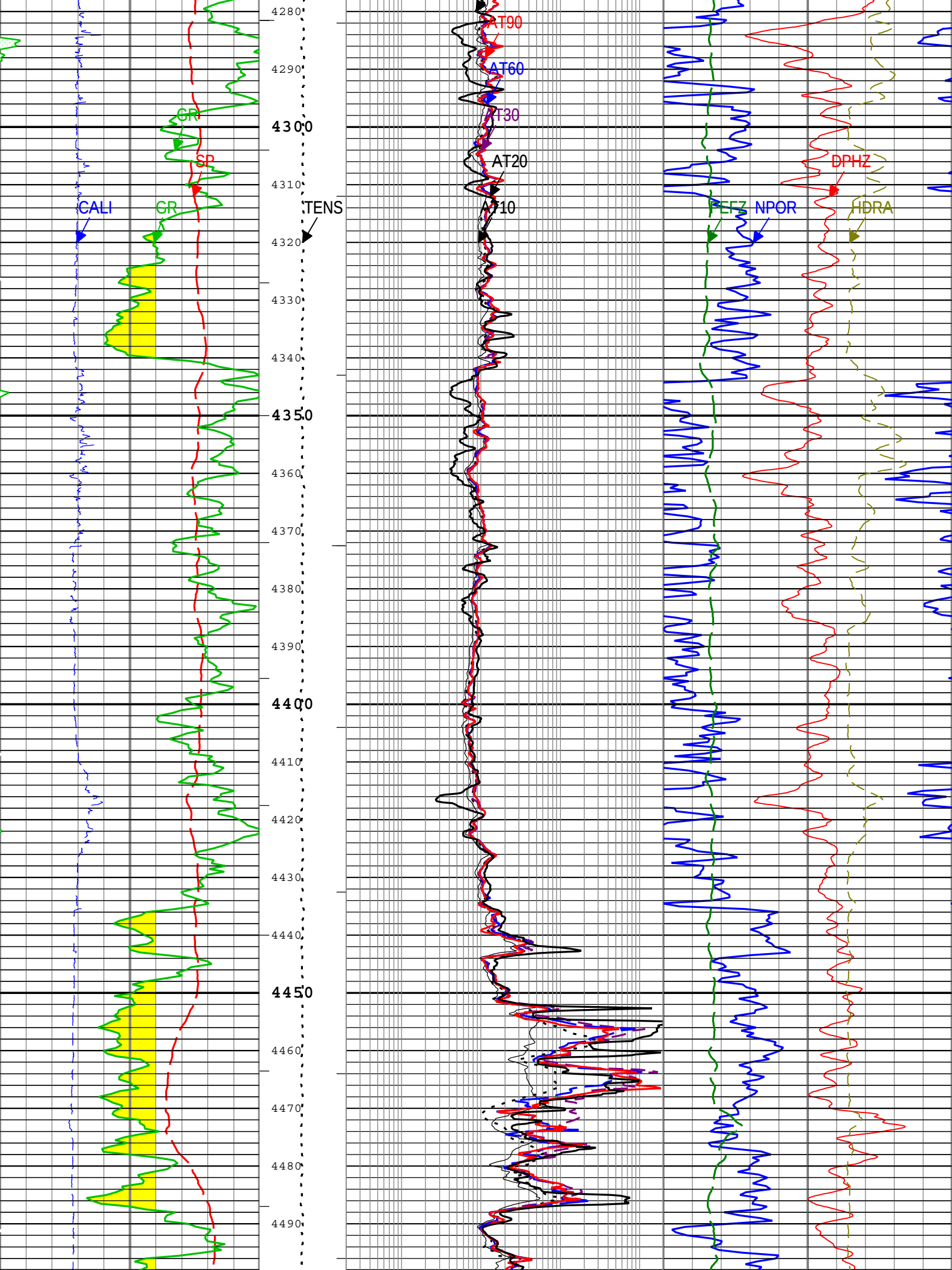
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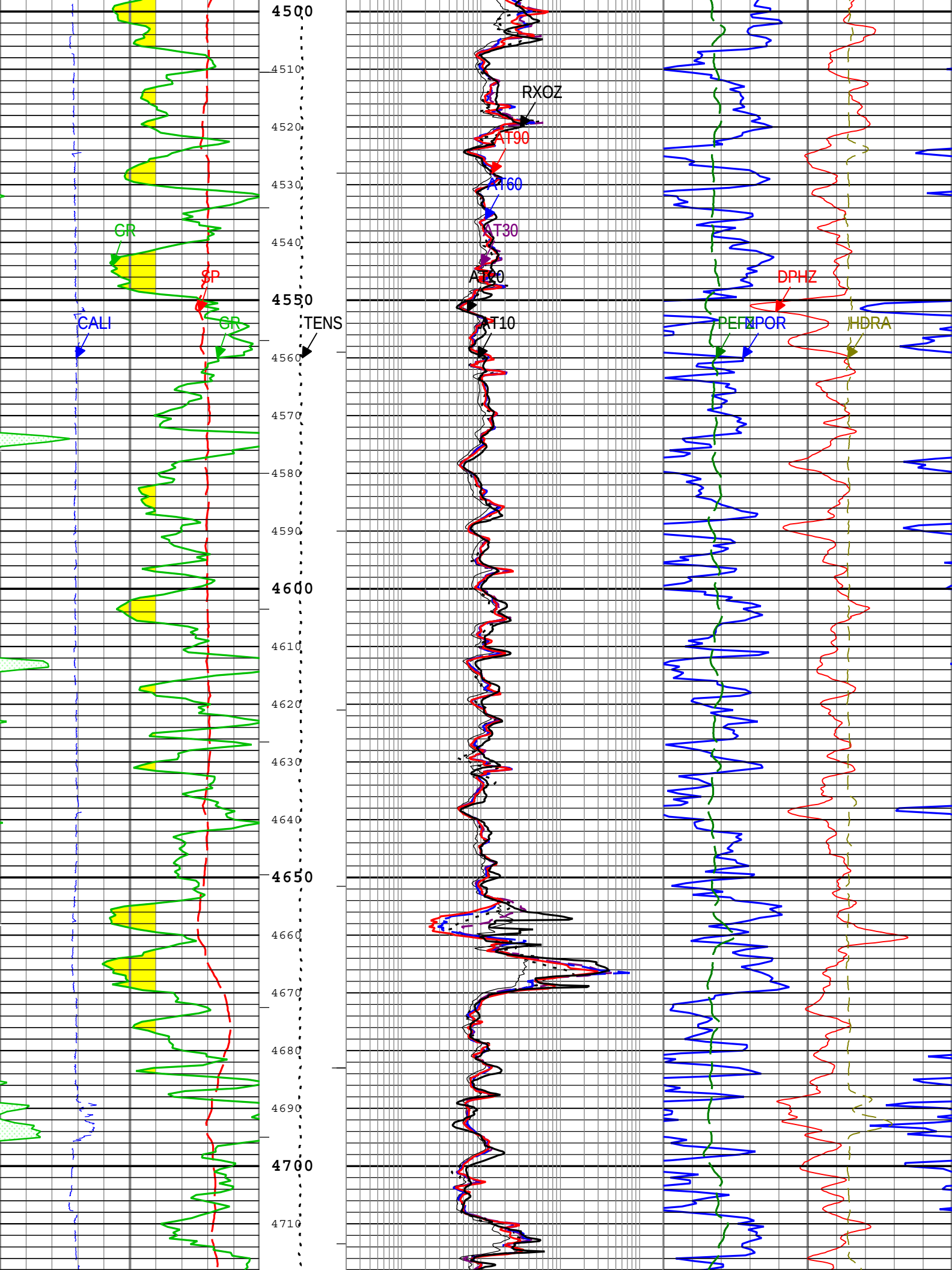
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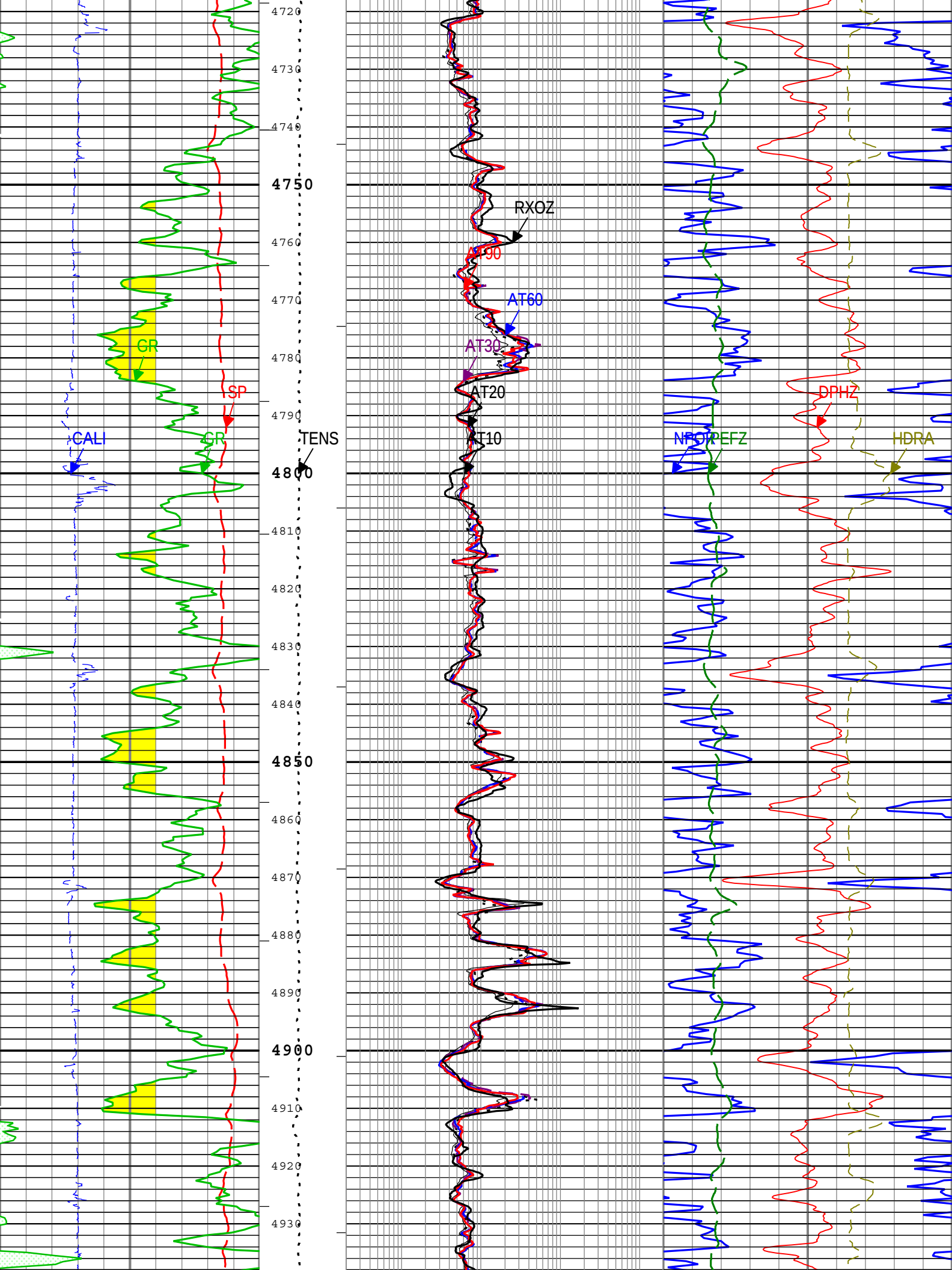
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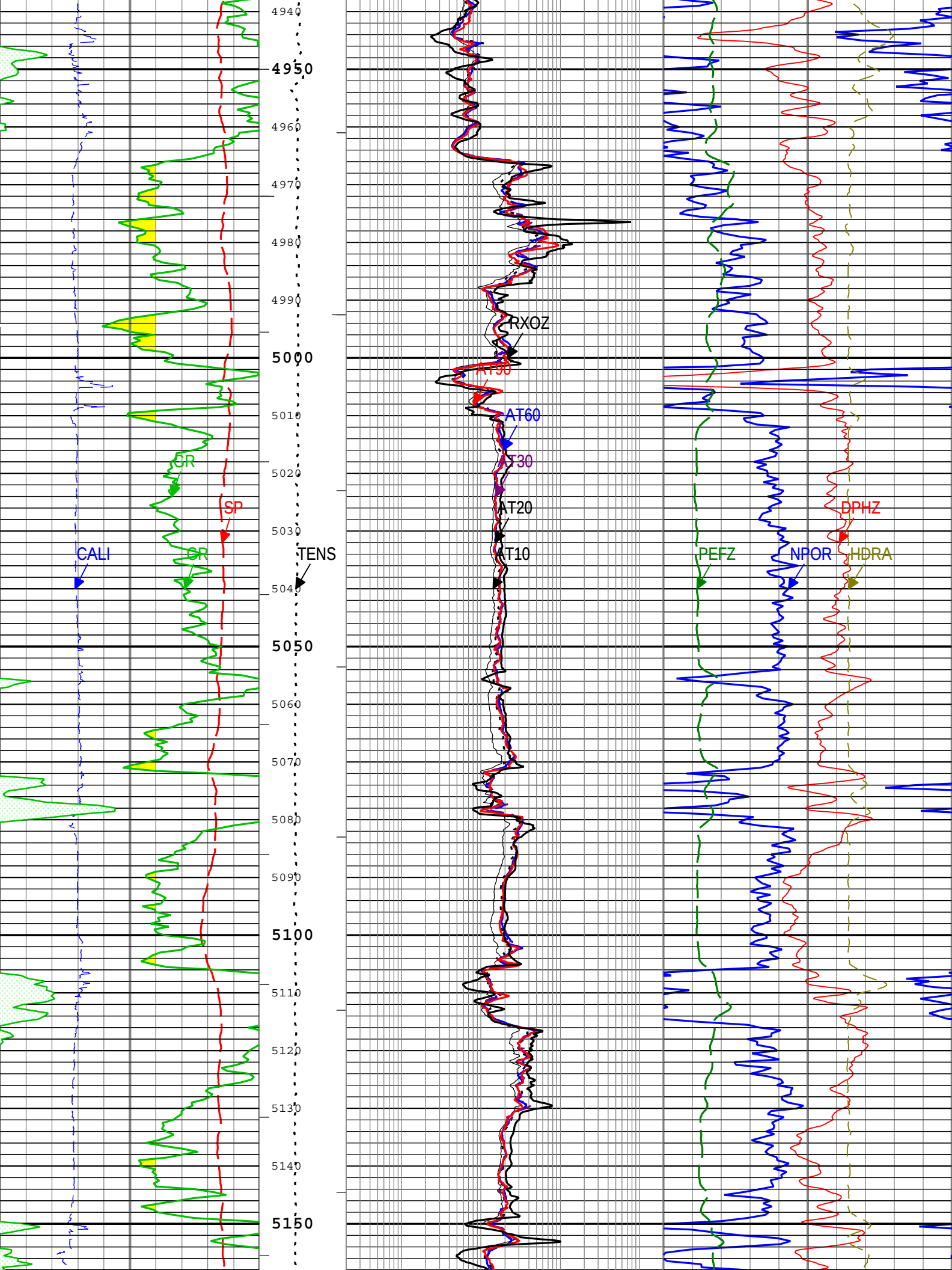
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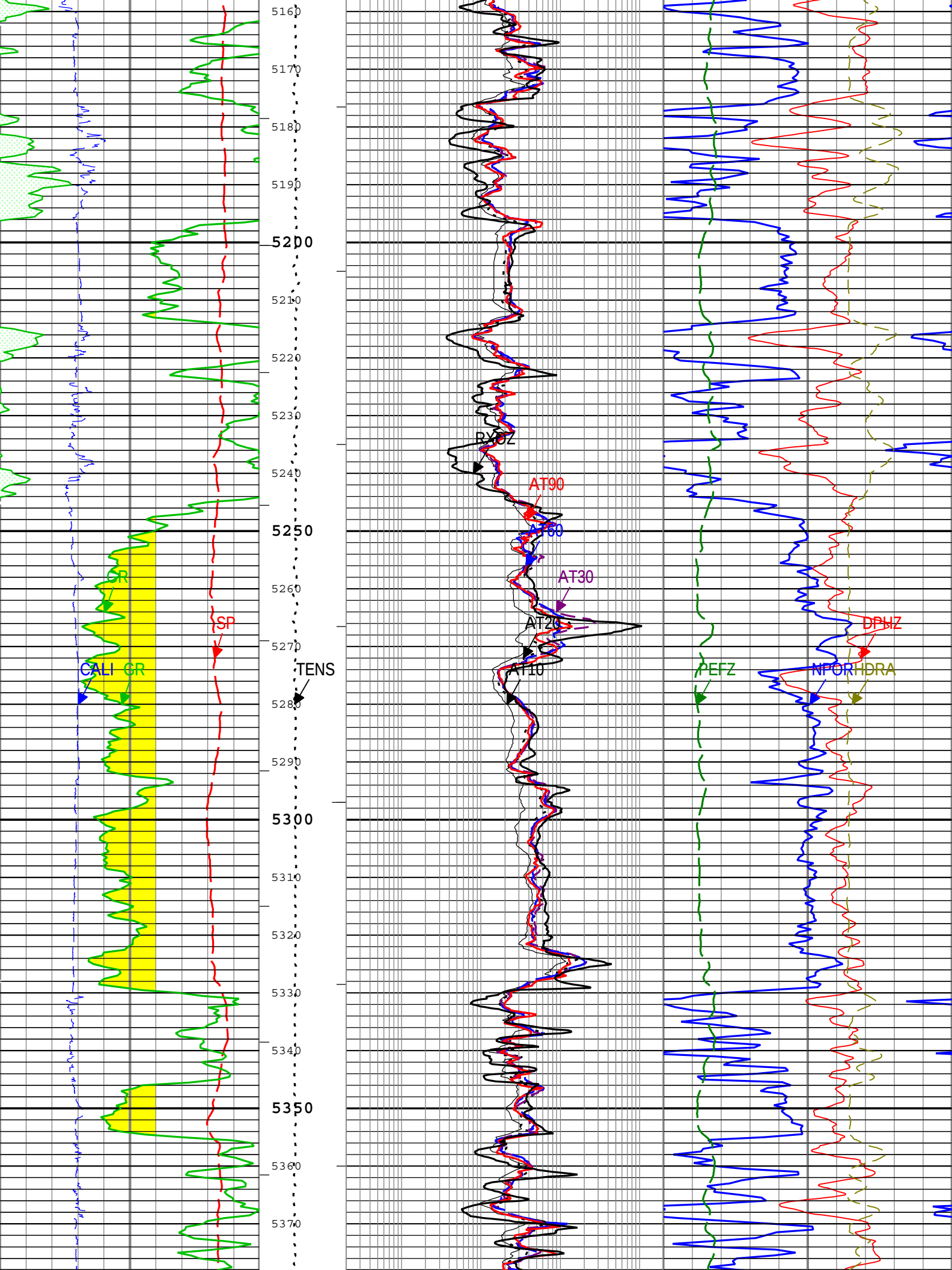
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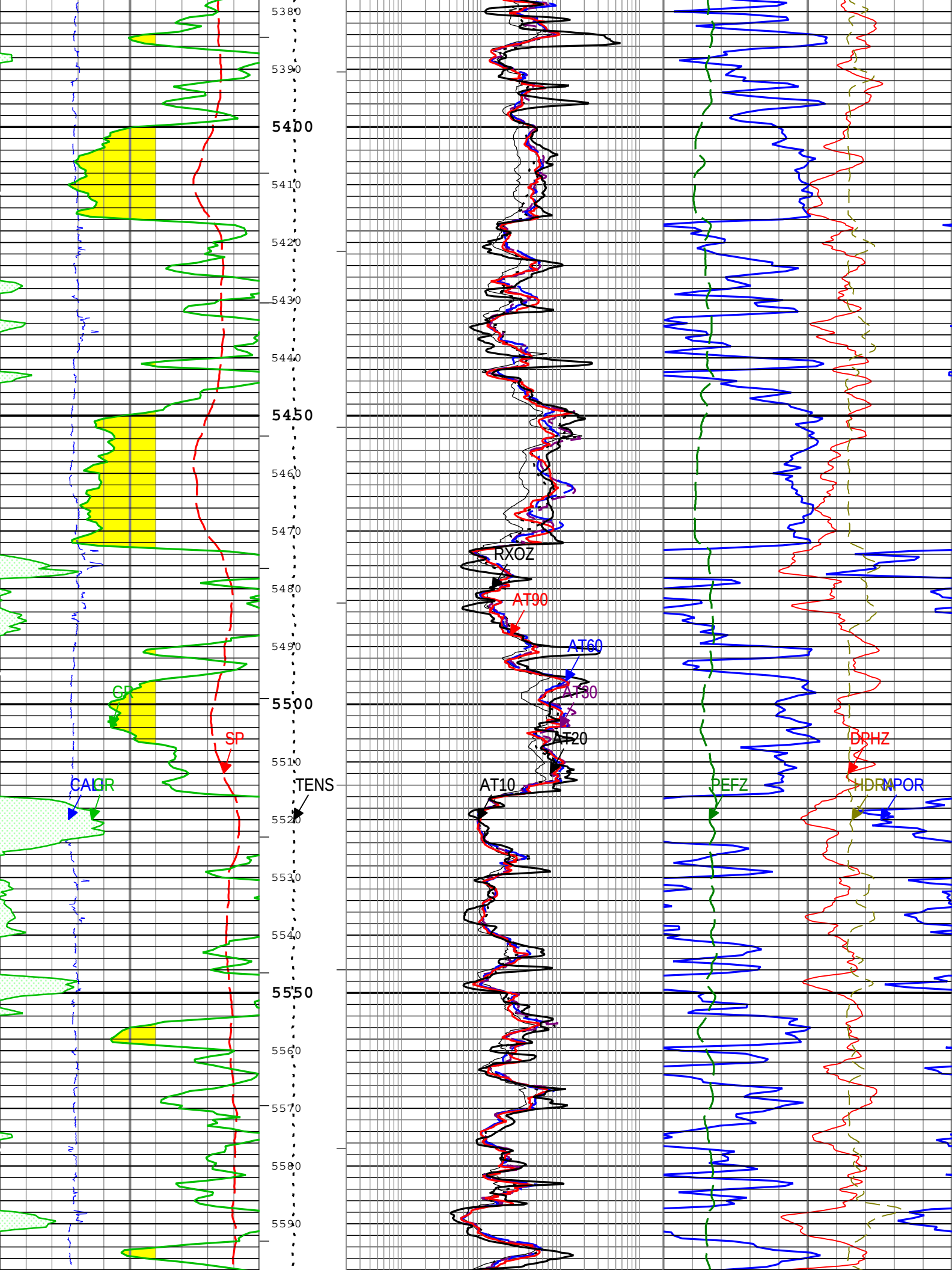
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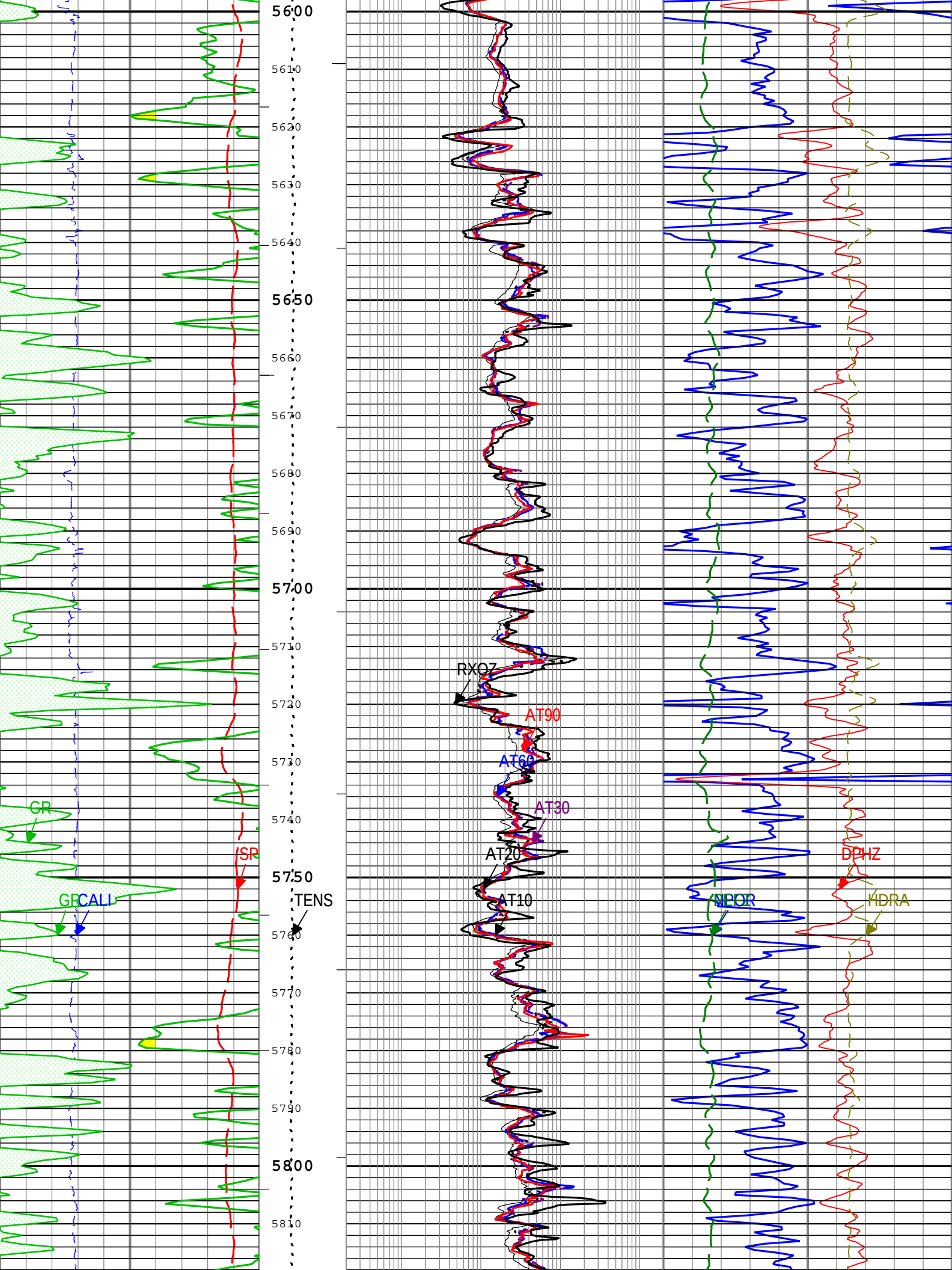
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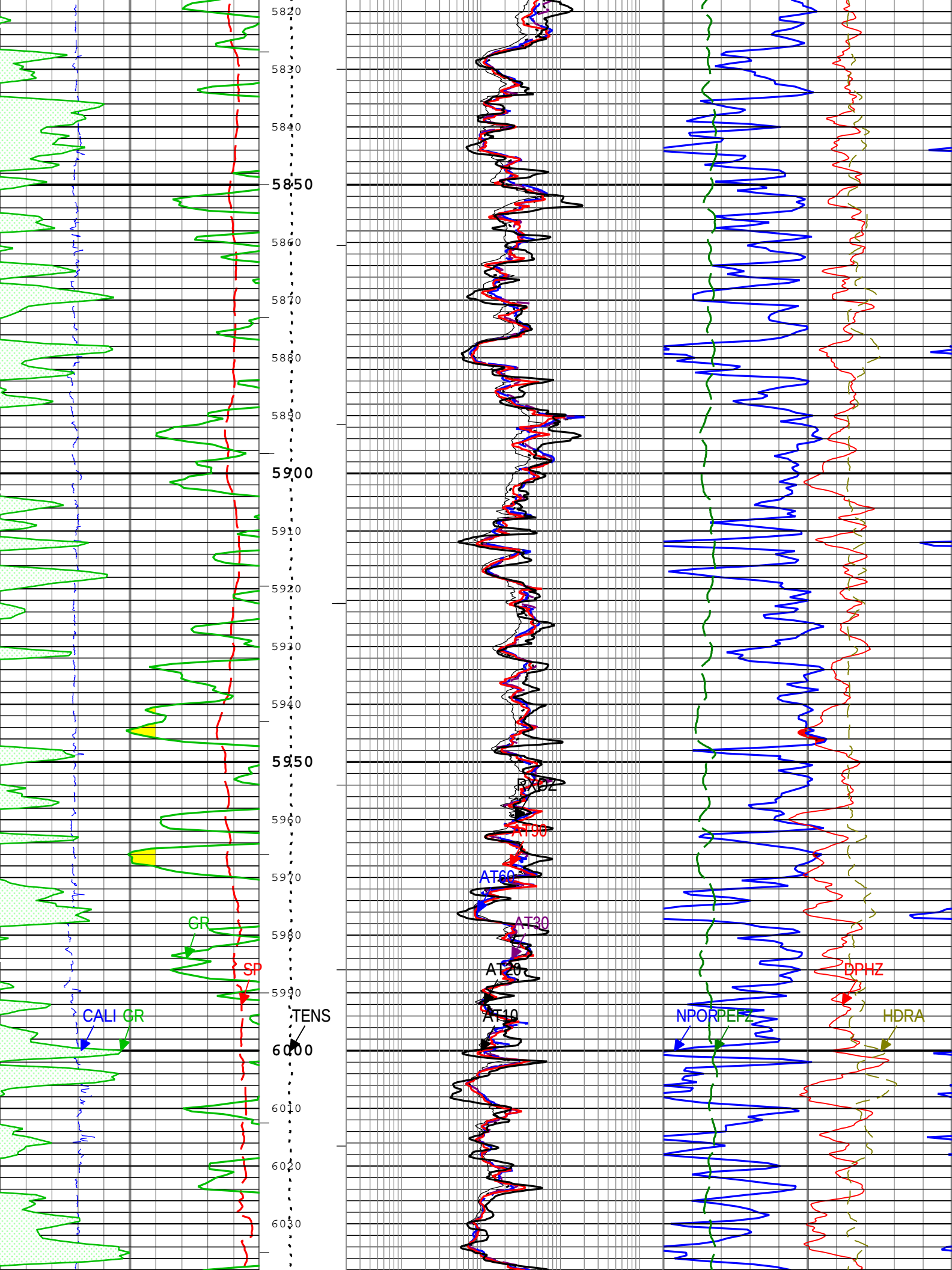
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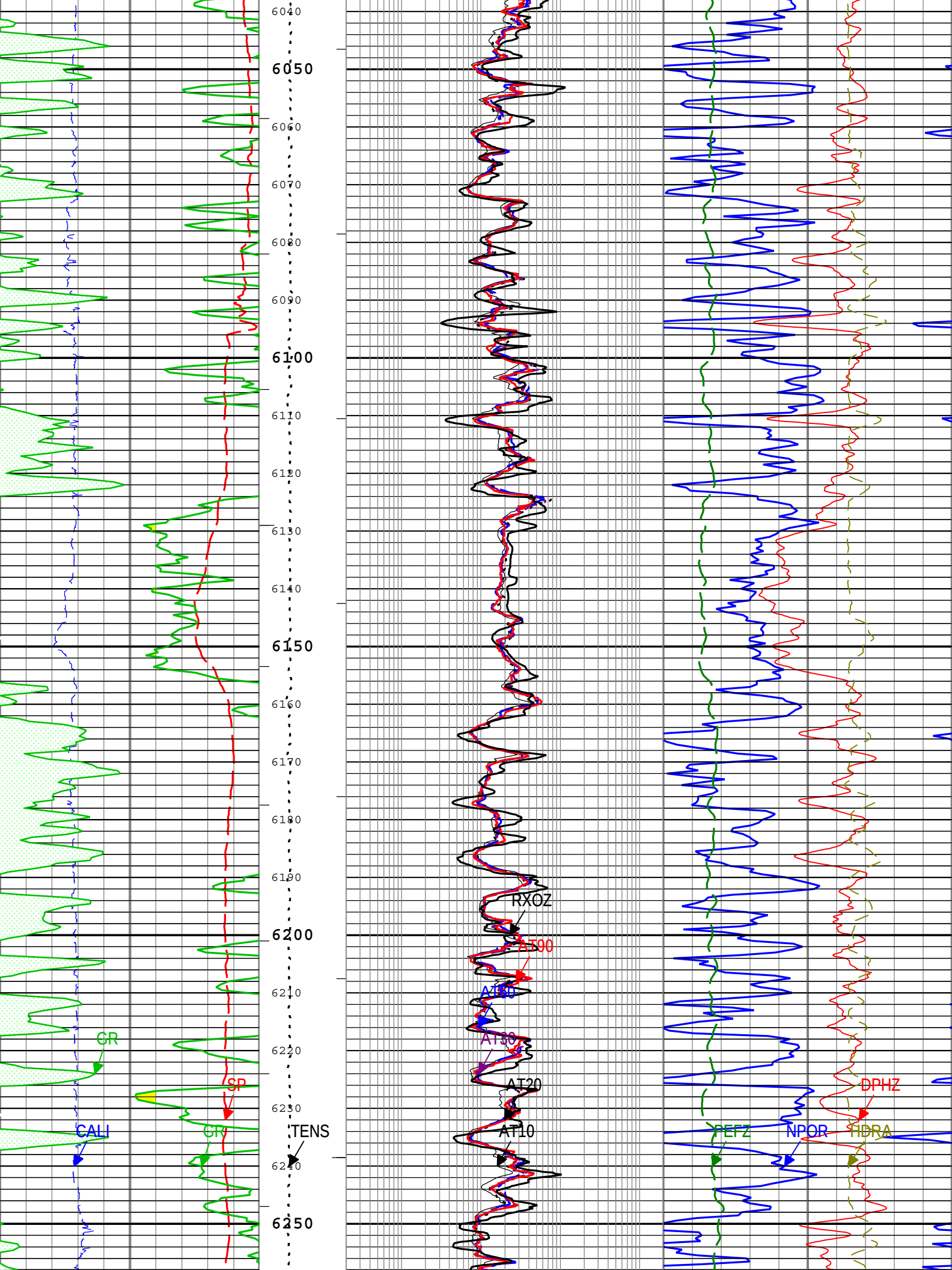
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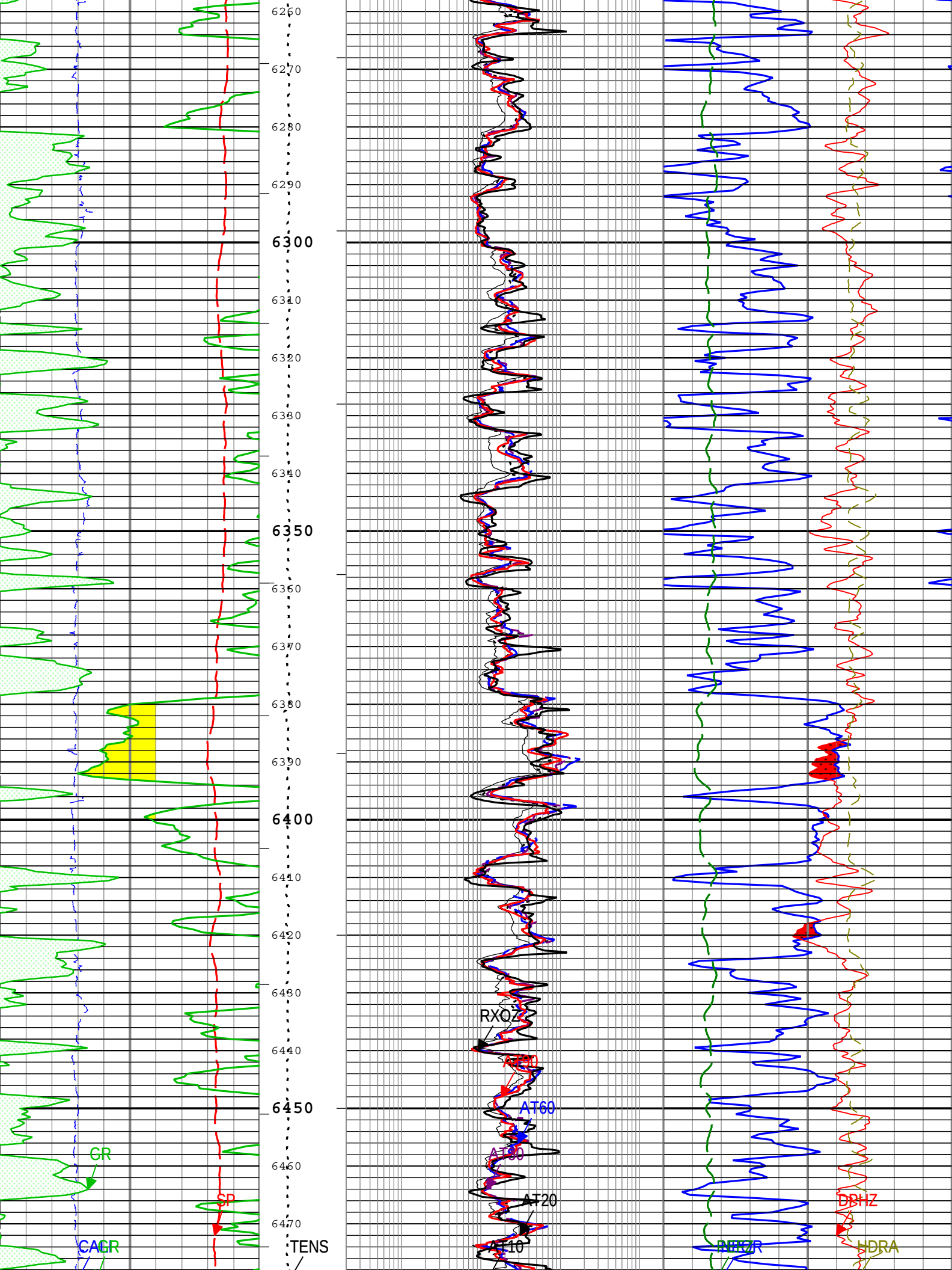
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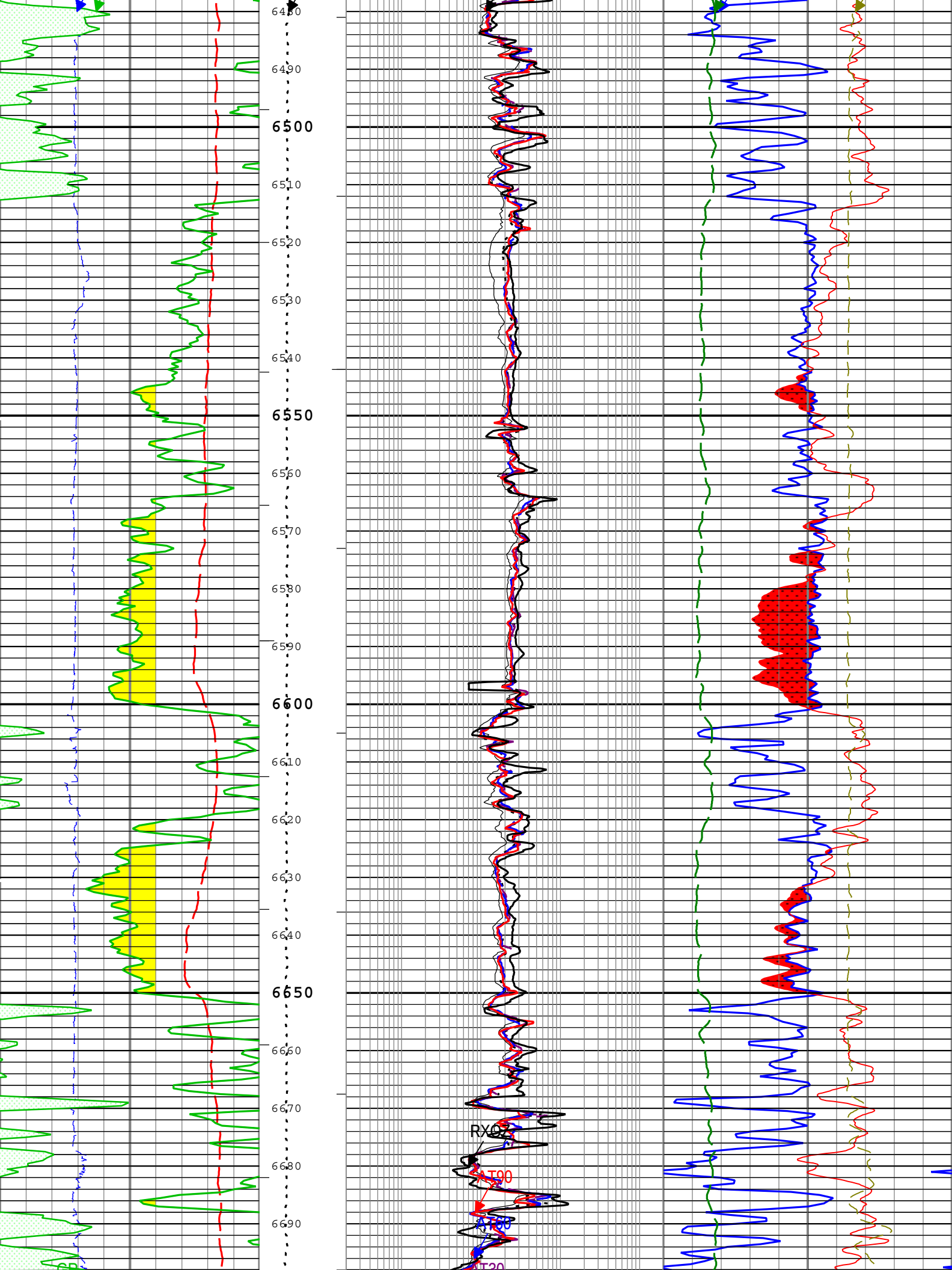
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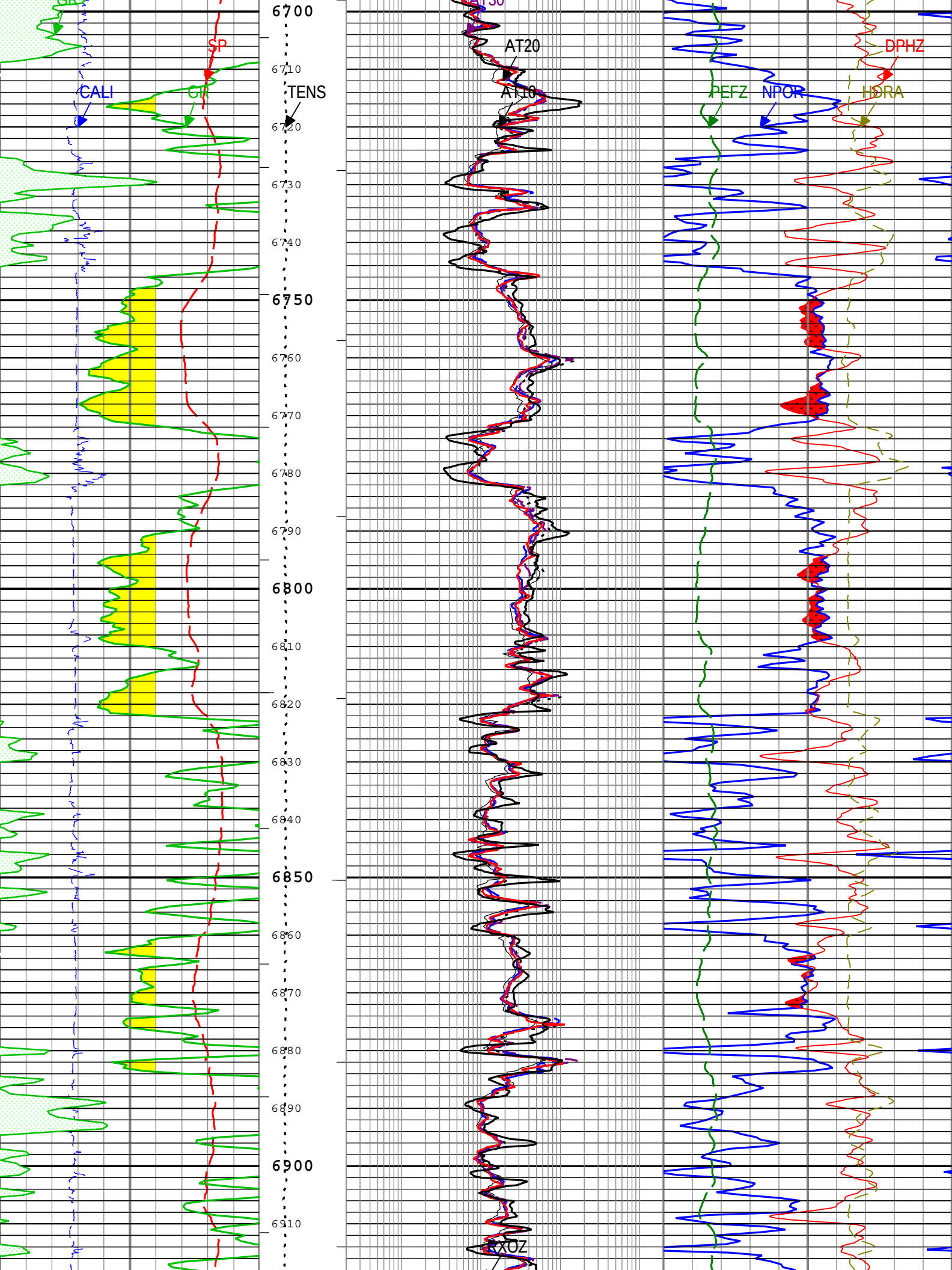
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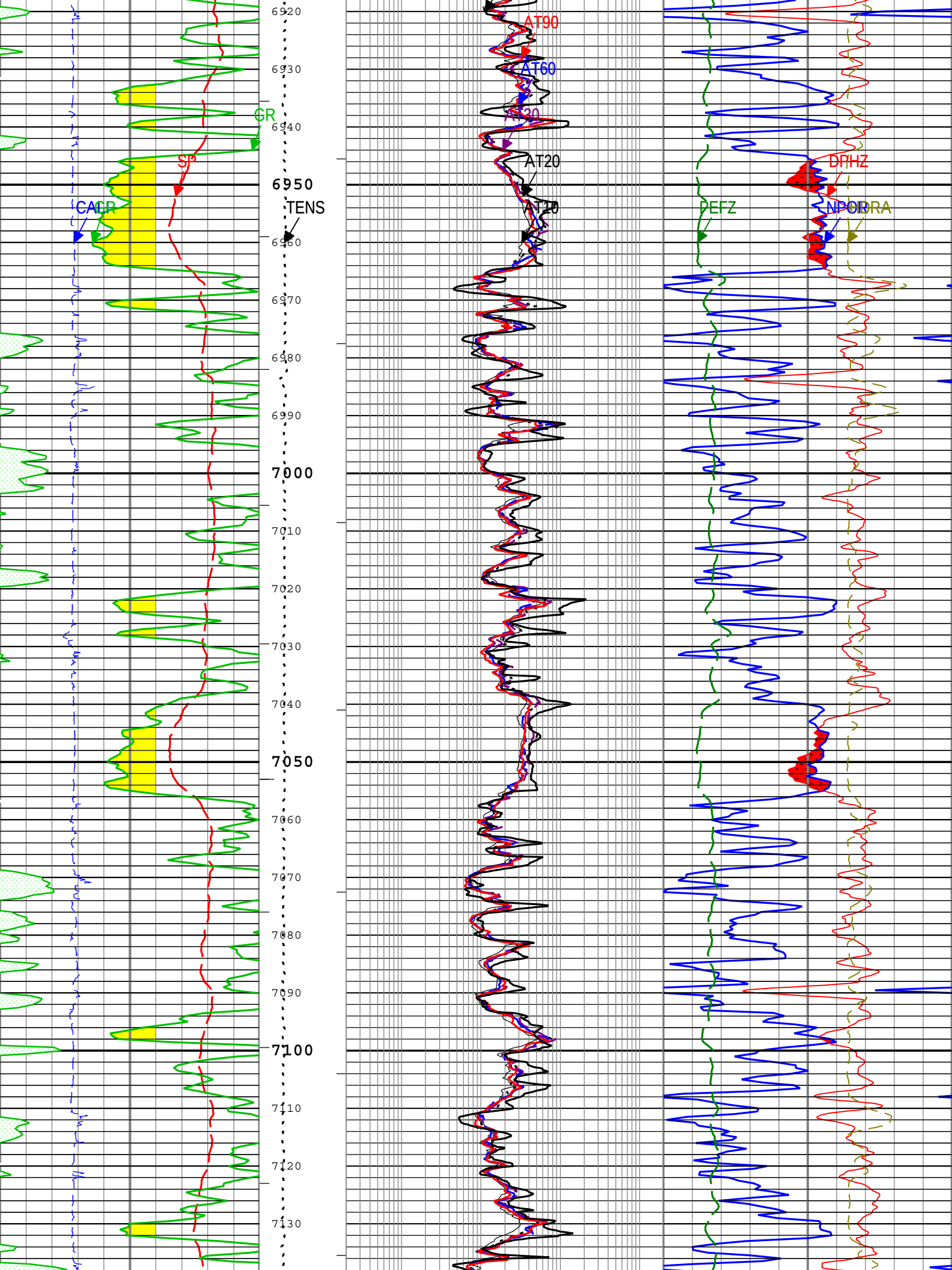
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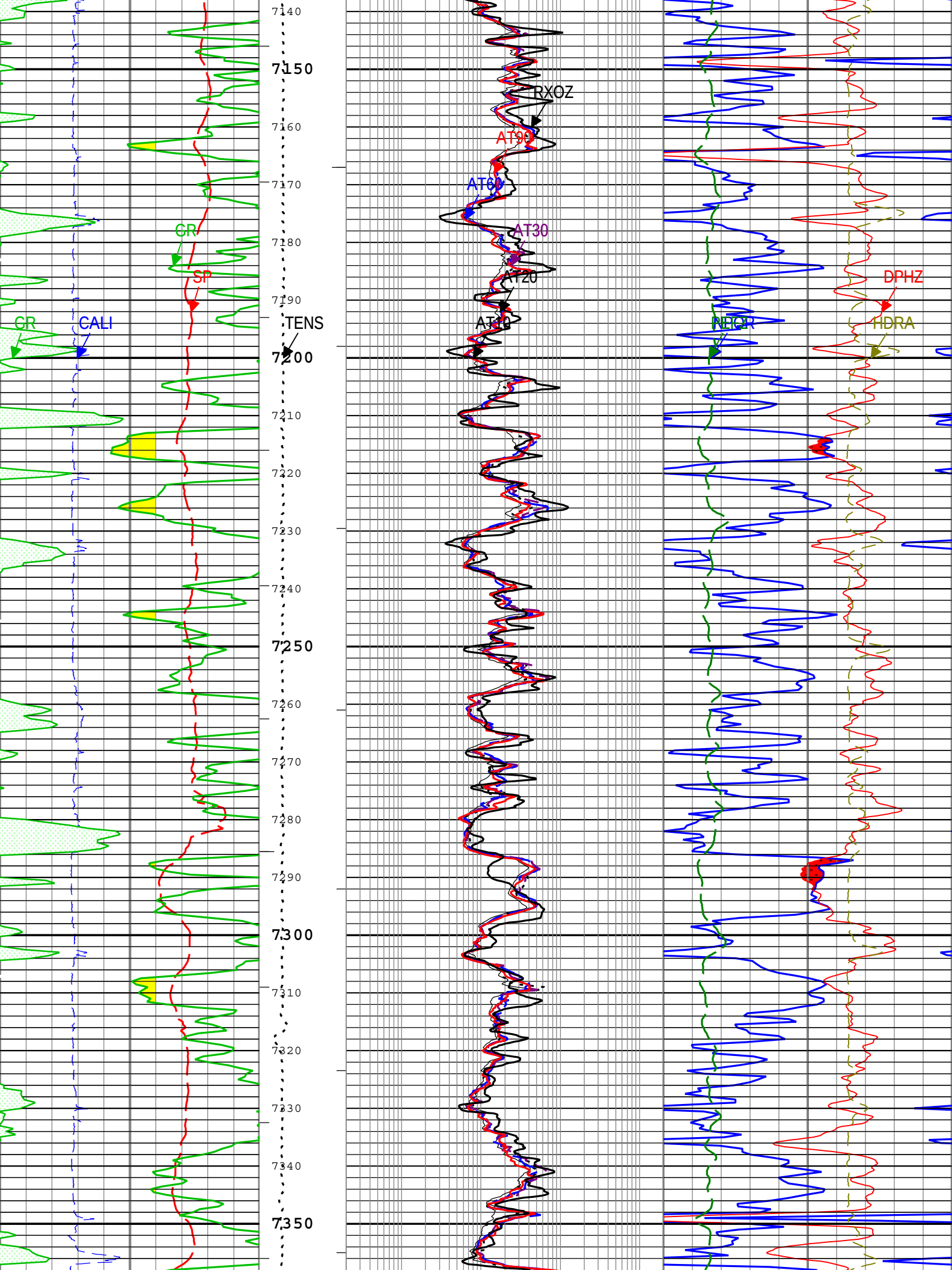
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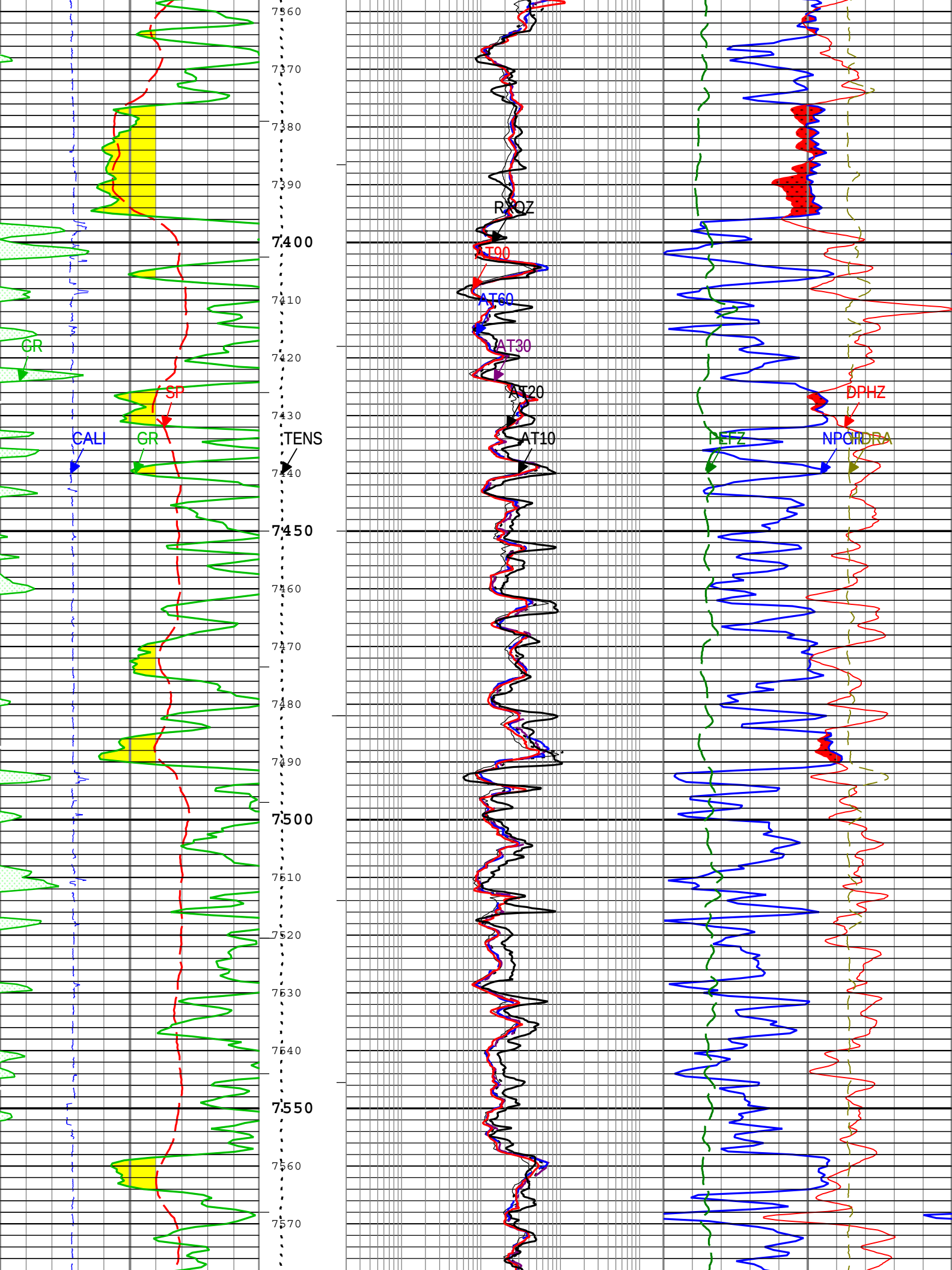
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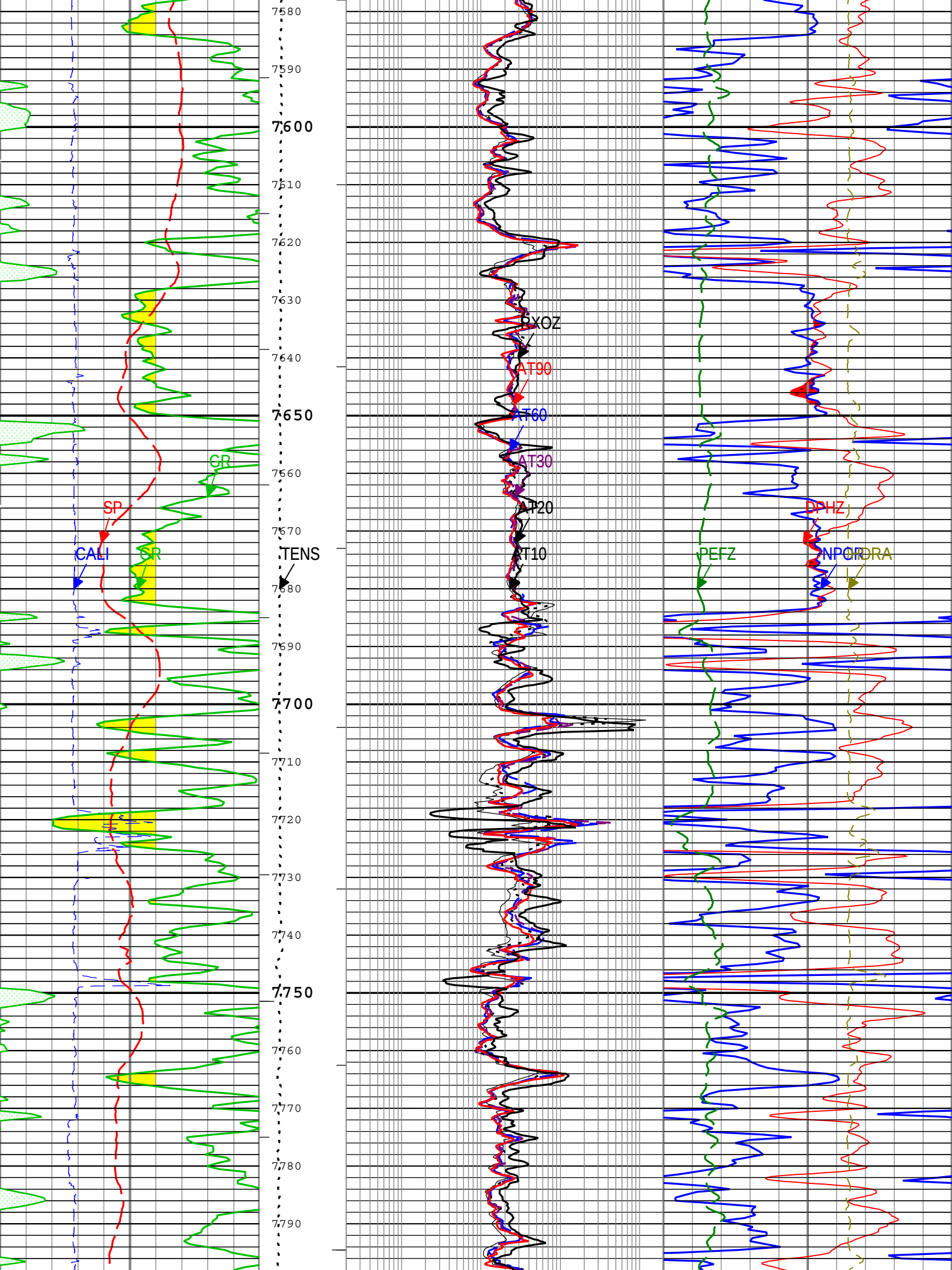
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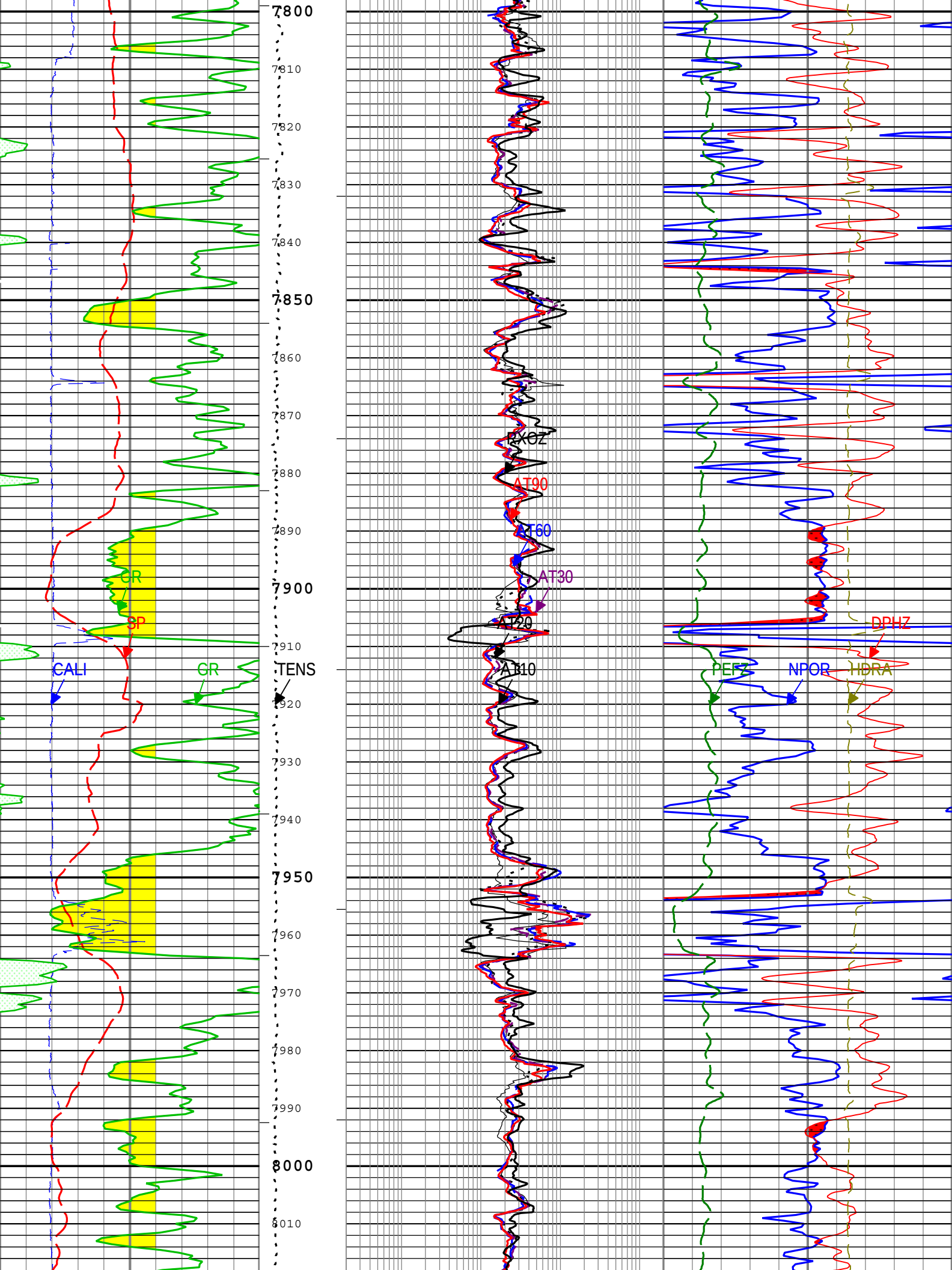
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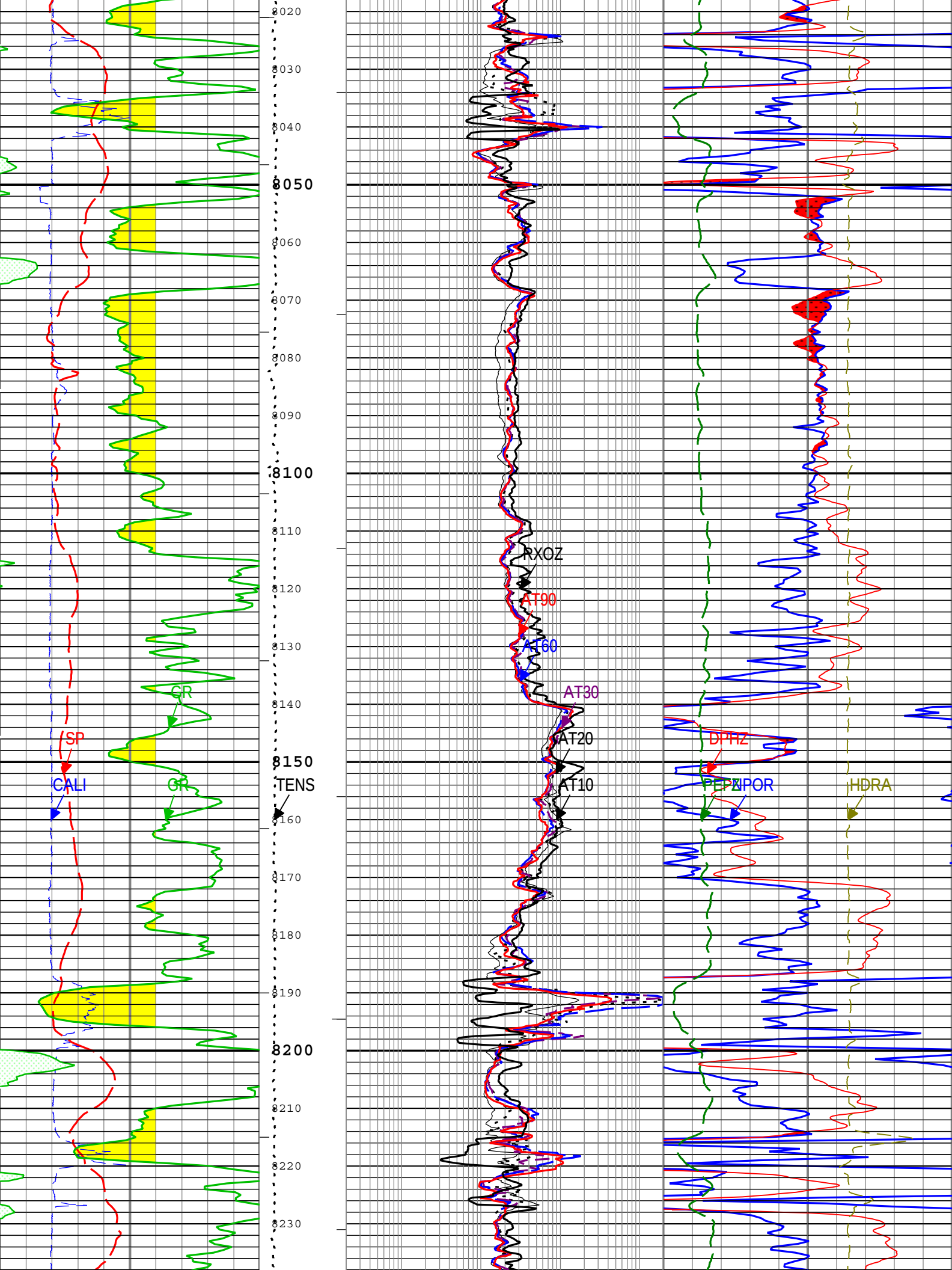
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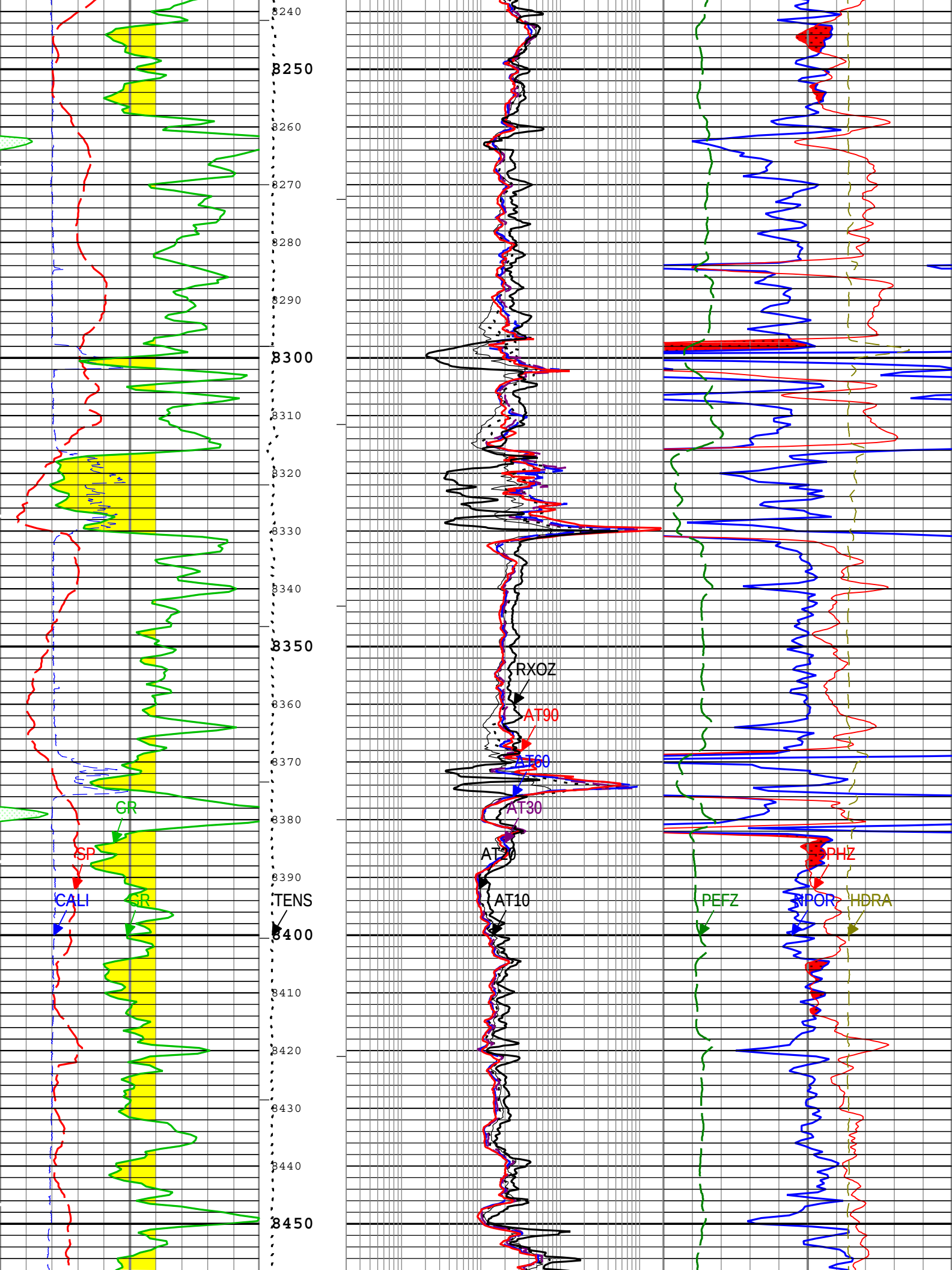
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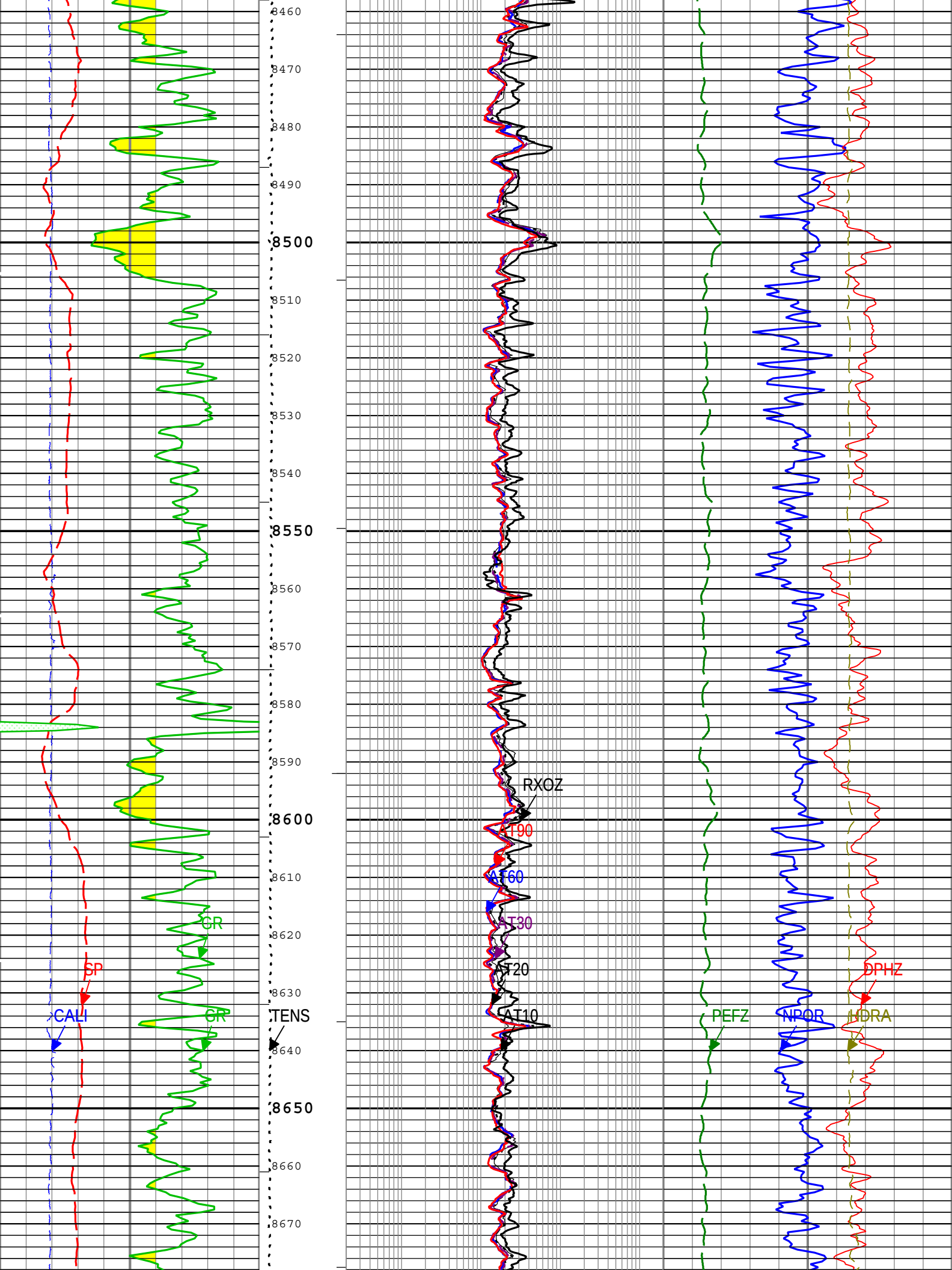
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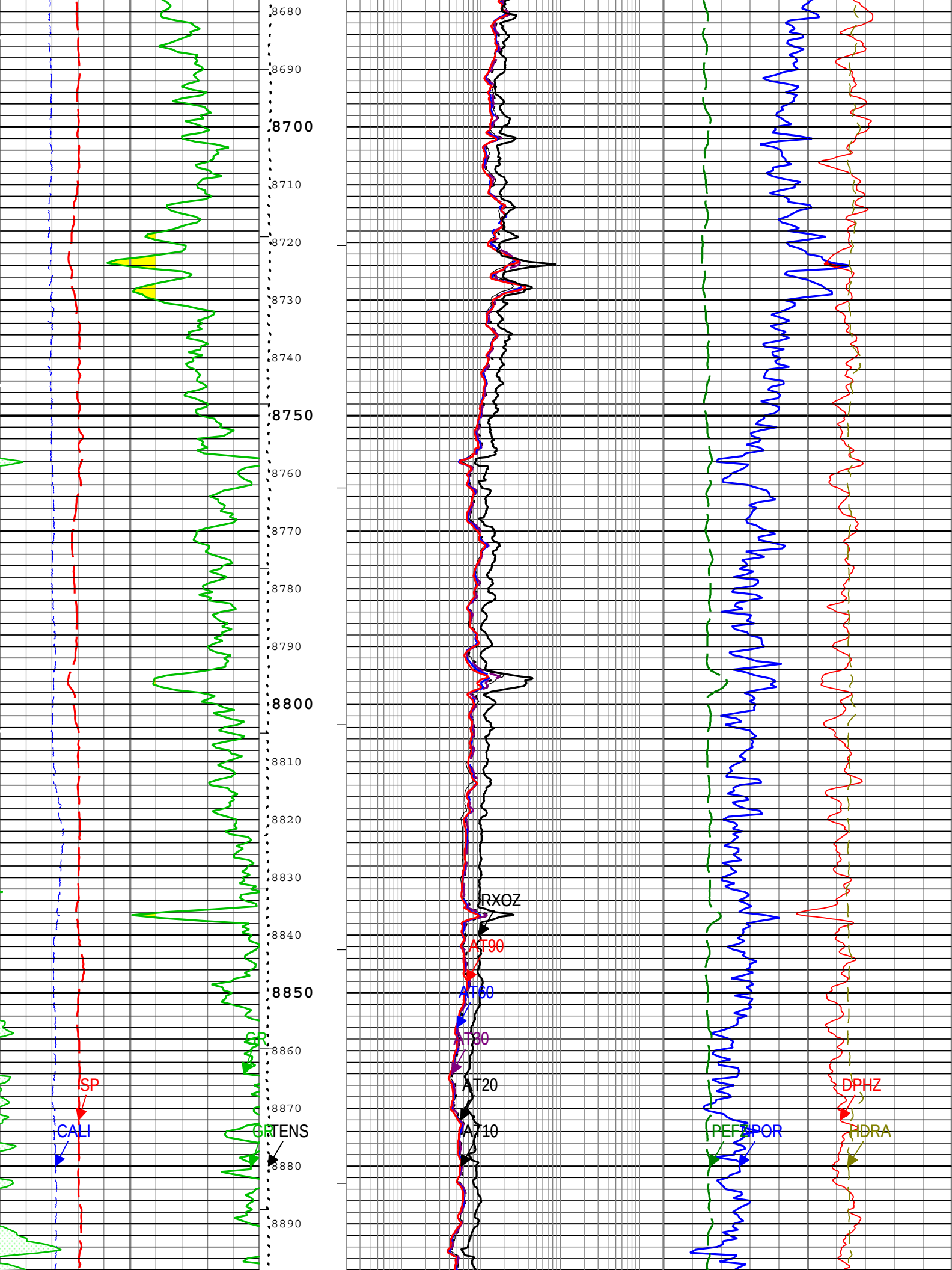
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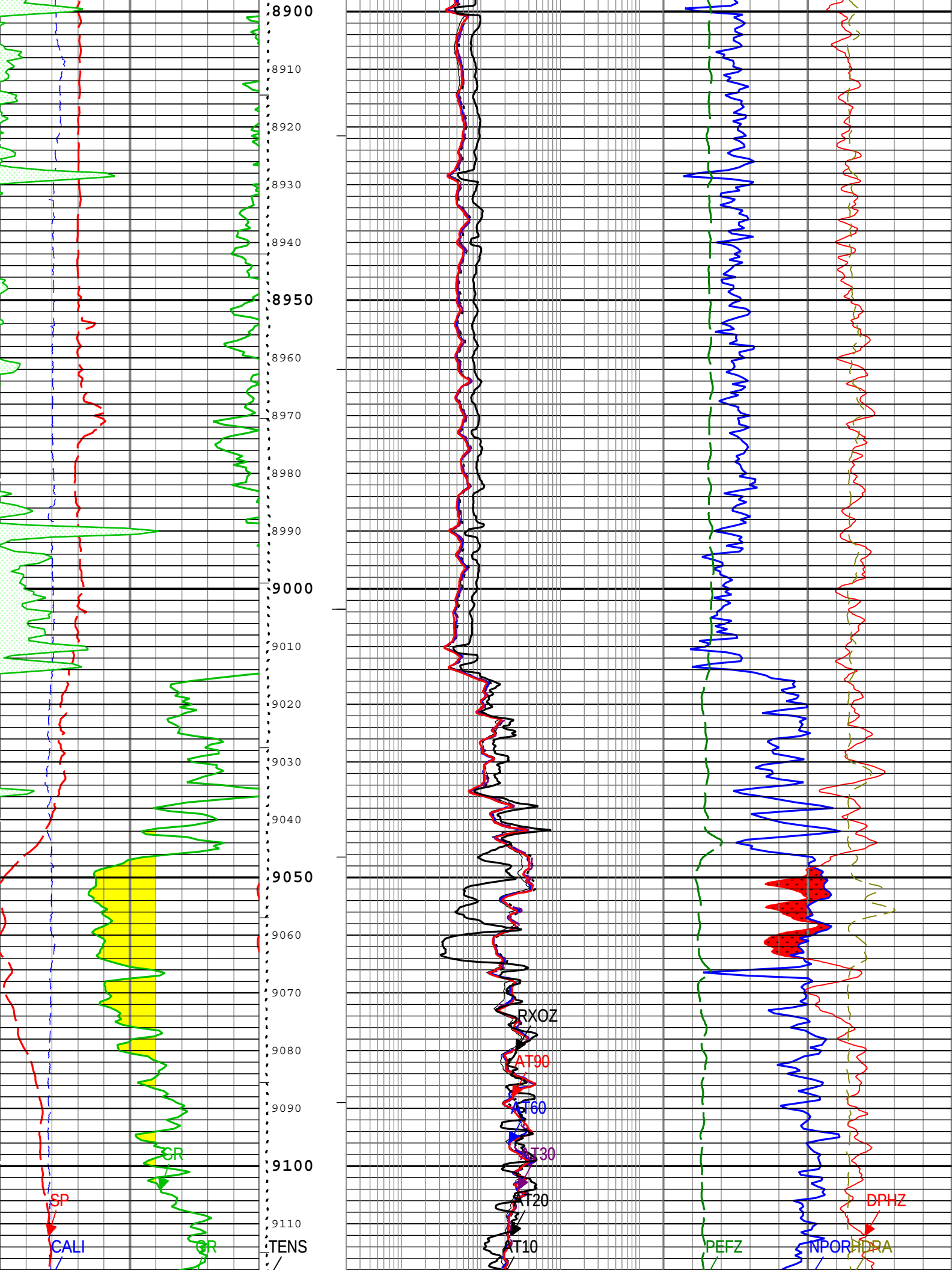
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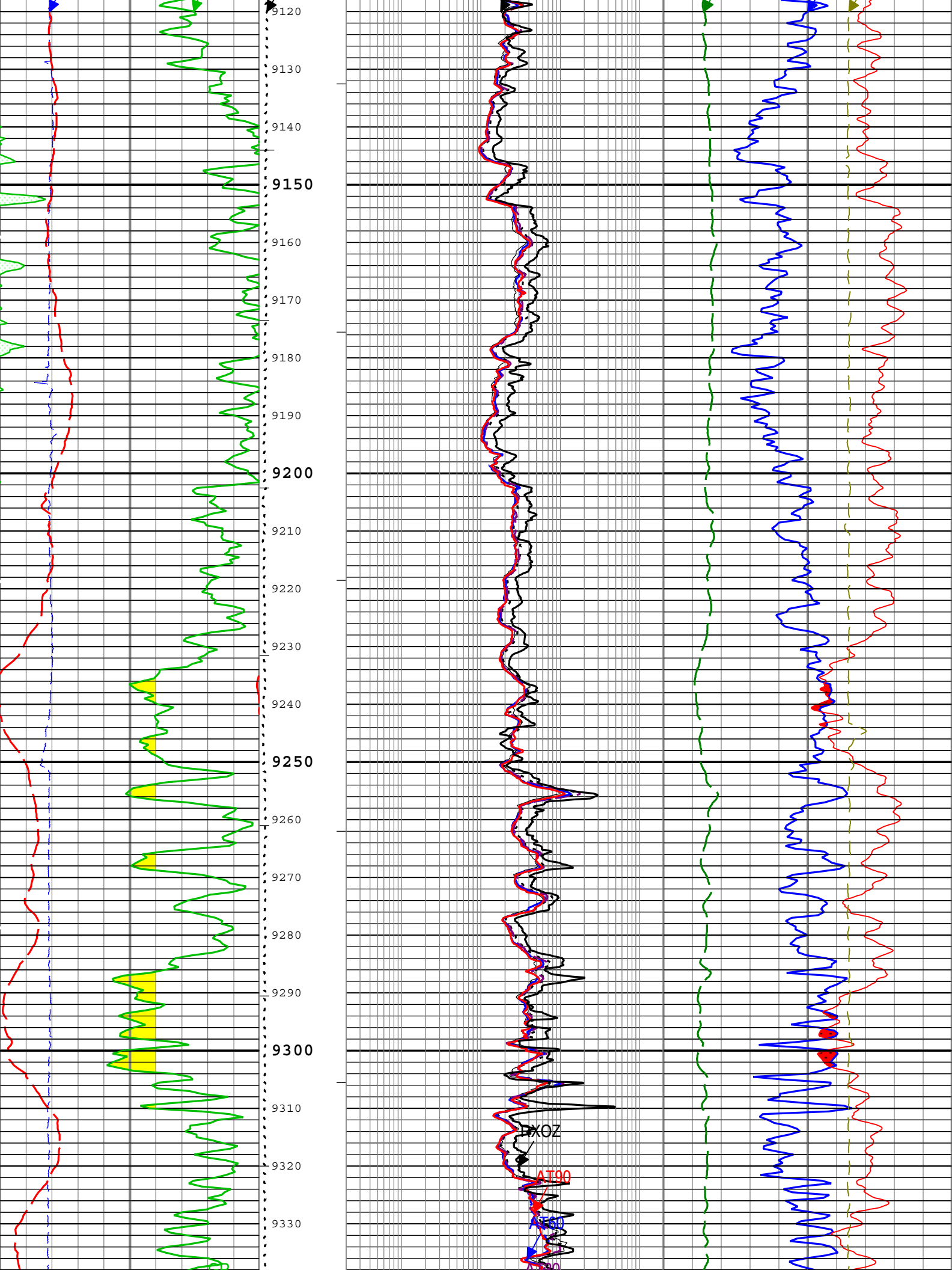
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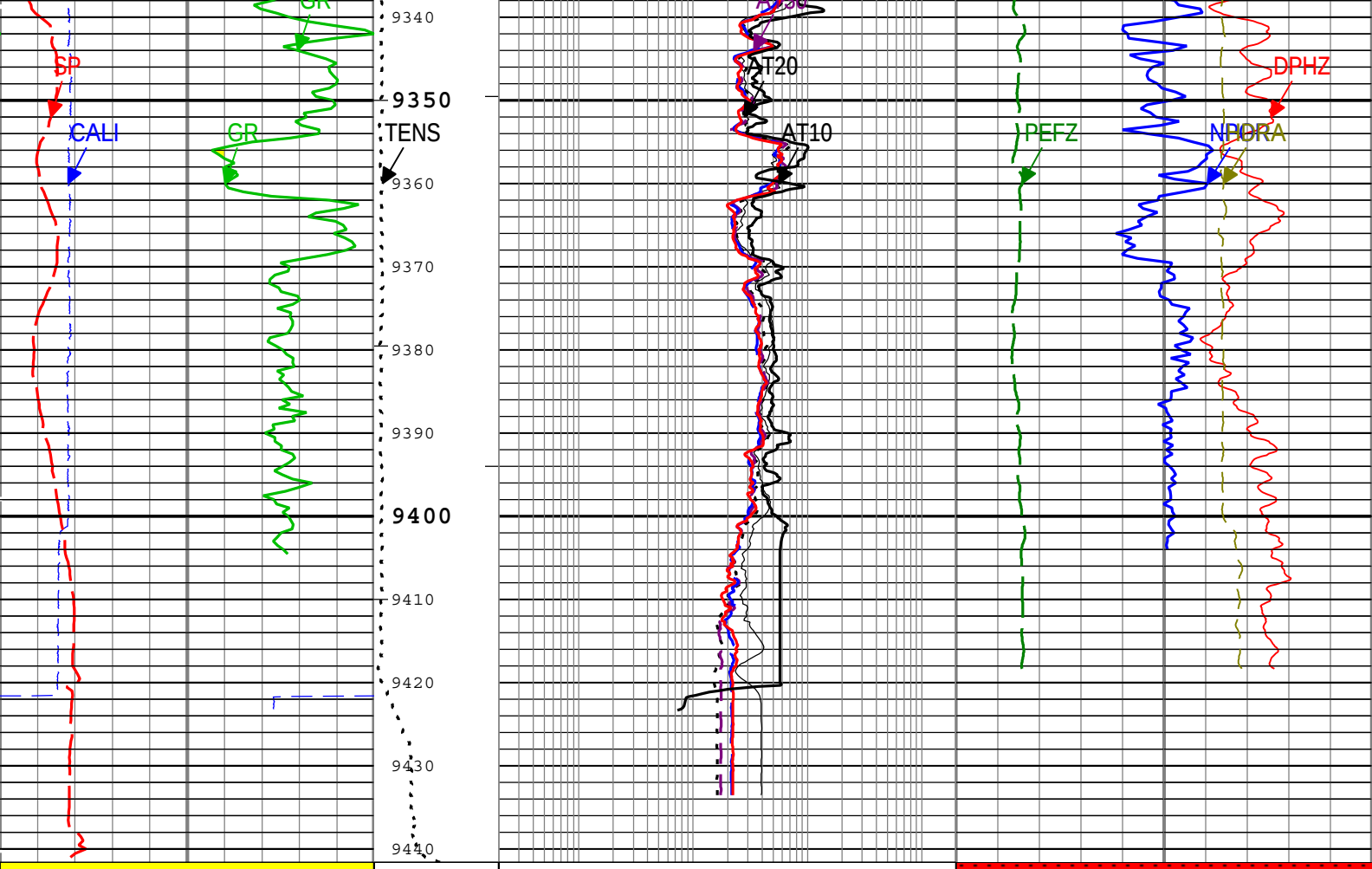


Gamma Ray Below 90 GAPI

Caliper (CALI) HDRS-H
6 in 16

Spontaneous Potential (SP) AIT-M
-20 mV 80

Gamma Ray (GR) HGNS-H
0 gAPI 150

GAMMA RAY OVER 150

Cable Tension (TENS)
5000 lbf 0

Array Induction Two Foot Resistivity A10 (AT10) AIT-M
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A20 (AT20) AIT-M
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A30 (AT30) AIT-M
0.2 ohm.m 2000

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

Invaded Formation Resistivity filtered at 18 inches (RXOZ) HDRS-H
0.2 ohm.m 2000

Gas Effect from DPHZ to NPOR

Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H
0.3 ft3/ft3 -0.1

Standard Resolution Density Porosity (DPHZ) HDRS-H
0.3 ft3/ft3 -0.1

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

Density Standoff Correction (HDRA) HDRS-H
-0.2 g/cm3 0.5

TIME_1900 - Time Marked every 60.00 (s)

IHV - Integrated Hole Volume every 100.00 (ft3)

IHV - Integrated Hole Volume every 10.00 (ft3)

ICV - Integrated Cement Volume every 100.00 (ft3)

ICV - Integrated Cement Volume every 10.00 (ft3)

Description: Triple Combo standard resolution template for Platform Express Format: Log (PEX Triple Combo StdRes) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 01-Feb-2013 07:35:30

Channel Processing Parameters

Parameter	Description	Tool	Value	Unit
AAPL	Array Induction Answer Product Level(Depth Log/View only)	AIT-M	Radial	
ABHM	Array Induction Borehole Correction Mode	AIT-M	Compute Standoff	
ABLM	Array Induction Basic Logs Mode	AIT-M	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M	Yes	
ACEN	Array Induction Tool Centering Flag (in Borehole)	AIT-M	Eccentered	
AMRF	Array Induction Mud Resistivity Factor	AIT-M	1	
ASTA	Array Induction Tool Standoff	AIT-M	1.7	in
ATSE	Array Induction Temperature Selection(Sonde Error Correction)	AIT-M	Internal	
AZ_ENABLE	Z-Axis Acceleration Channel Enabled for Real-Time Depth Correction	DepthCorrection	No	
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	1000	ppm
BSCO	Borehole Salinity Correction Option	HGNS-H	No	
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0	in
CBLO	Casing Bottom (Logger)	WLSESSION	1461	ft
CCCO	Casing & Cement Thickness Correction Option	HGNS-H	No	
CDEN	Cement Density	HGNS-H	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	9.625	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DC_RT_ENABLE	Depth Correction Real-Time Enabled	DepthCorrection	No	
DFD	Drilling Fluid Density	Borehole	10	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DHC	Density Hole Correction	HDRS-H	Bit Size	
FCD	Future Casing (Outer) Diameter	WLSESSION	4.5	in
FD	Fluid Density	Borehole	1	g/cm3
FSAL	Formation Salinity	Borehole	0	ppm
FSCO	Formation Salinity Correction Option	HGNS-H	No	
GCLF	Coal-Like Formation	HDRS-H	No	
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	
GR_MULTIPLIER	Gamma Ray Multiplier	HGNS-H	1	
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	
HVCS	Integrated Hole Volume Caliper Selection	Borehole	Compute Area from GHD	
IHVC	Integrated Hole Volume Control	Borehole	Start	
MATR	Rock Matrix for Neutron Porosity Corrections	Borehole	SANDSTONE	
MCCO	Mud Cake Correction Option	HGNS-H	No	
MDEN	Matrix Density for Density Porosity	Borehole	2.68	g/cm3
MFST	Mud Filtrate Sample Temperature	Borehole	75	degF
MHCC	Switch to select MCFL High Contrast Correction	HDRS-H	No	
MPOF	MCFL Processing Operation Mode	HDRS-H	On	
MWCO	Mud Weight Correction Option	HGNS-H	No	
NAAC	Switch for the correction of formation activation by the APS	HDRS-H	Off	
NPRM	HRDD Nuclear Processing Mode	HDRS-H	Standard Resolution	

NTCO	HRDD Nuclear Temperature Correction Option	HDRS-H	On	
PTCO	Pressure Temperature Correction Option	HGNS-H	No	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	0.99	ohm.m
SOCN	Standoff Distance	HGNS-H	0.125	in
SOCO	Standoff Correction Option	HGNS-H	Yes	
SPDR	SP Drift Per Foot	AIT-M	0	mV/ft
TPOS	Tool Position: Centered or Eccentered	HGNS-H	Eccentered	

Tool Control Parameters

Parameter	Description	Tool	Value	Unit
HMCA_BRD_TYPE	HMCA Board Type	HGNS-H	1	
HRGD_BRD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
NDTC	Nuclear Dead Time Correction	HDRS-H	On	
NPUC	Nuclear Pile-Up Correction	HDRS-H	Off	
STSO_HRDD	Temperature Source for the Density Algorithm	HDRS-H	HET data channel	

1

REPEAT PASS - 5 INCH

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
1	Main[3]:Up	Up	216.37 ft	9441.57 ft	01-Feb-2013 5:07:46 AM	01-Feb-2013 7:09:34 AM	8.00 ft	
1	Repeat[4]:Up	Up	3249.69 ft	3628.51 ft	01-Feb-2013 7:15:23 AM	01-Feb-2013 7:29:14 AM	1.95 ft	

All depths are referenced to toolstring zero

Log

1: Main[3]:Up

Description: Triple Combo standard resolution template for Platform Express Format: Log (PEX Triple Combo StdRes RA) Index Scale: 5 in per 100 ft
Index Unit: ft Index Type: Measured Depth Creation Date: 01-Feb-2013 07:35:37

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

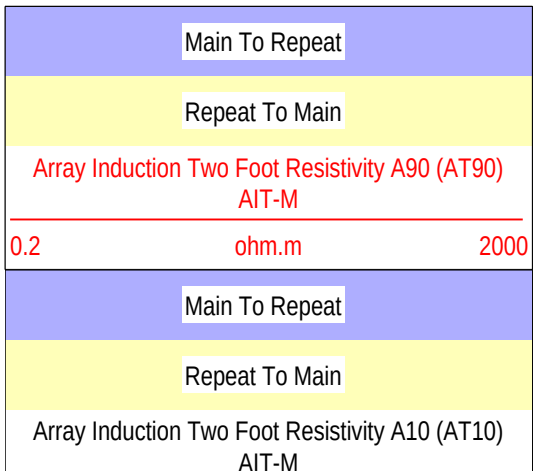
ICV - Integrated Cement Volume every 10.00 (ft3)

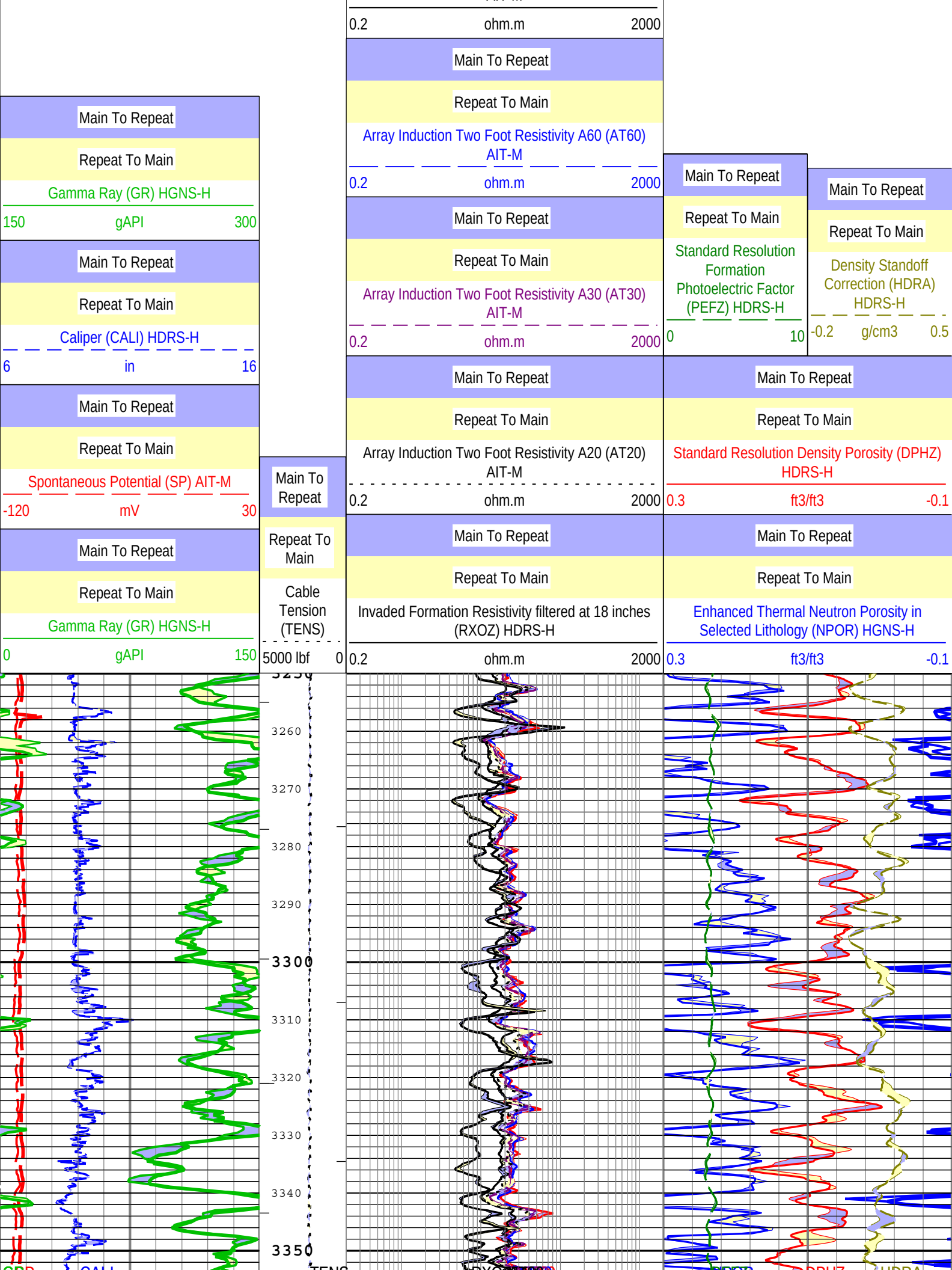
ICV - Integrated Cement Volume every 100.00 (ft3)

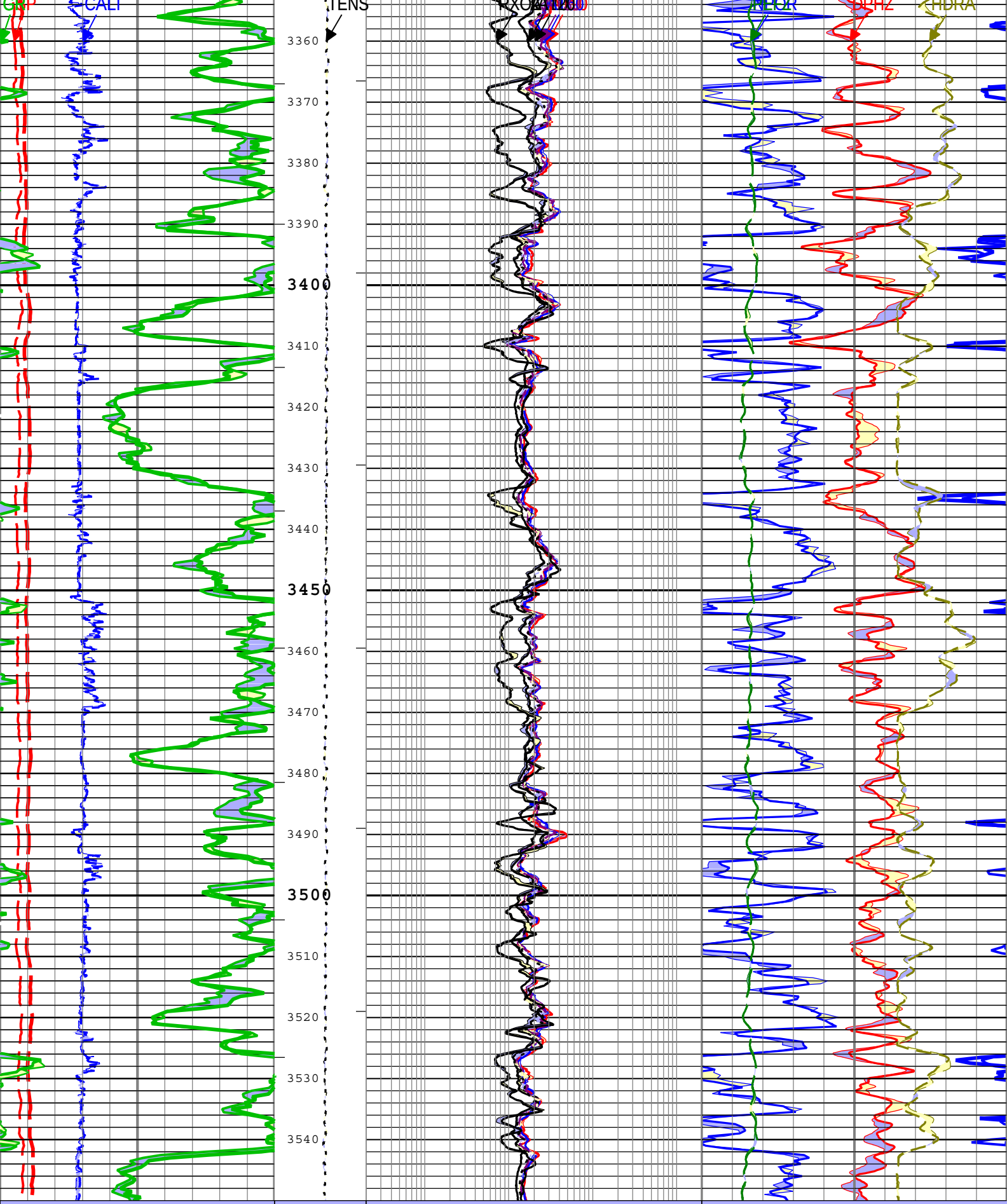
IHV - Integrated Hole Volume every 10.00 (ft3)

IHV - Integrated Hole Volume every 100.00 (ft3)

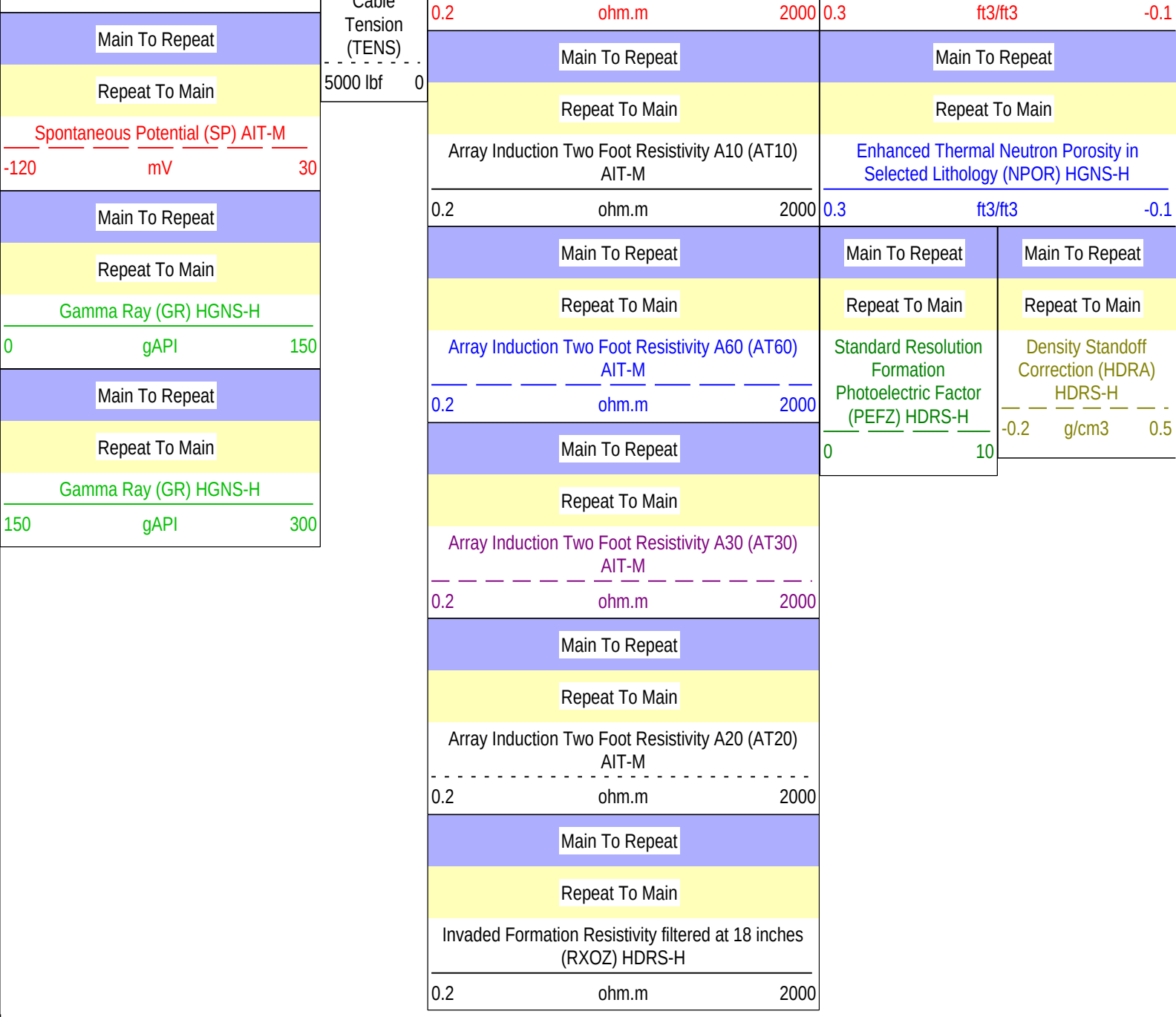
TIME_1900 - Time Marked every 60.00 (s)




Main To Repeat
Repeat To Main
Gamma Ray (GR) HGNS-H
150 gAPI 300
Main To Repeat
Repeat To Main
Caliper (CALI) HDRS-H
6 in 16
Main To Repeat
Repeat To Main
Spontaneous Potential (SP) AIT-M
-120 mV 30
Main To Repeat
Repeat To Main
Gamma Ray (GR) HGNS-H
0 gAPI 150
Main To Repeat
Repeat To Main
Cable Tension (TENS)
5000 lbf 0
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
Invaded Formation Resistivity filtered at 18 inches (RXOZ) HDRS-H
0.2 ohm.m 2000
Main To Repeat
Repeat To Main
Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H
0 10
Main To Repeat
Repeat To Main
Density Standoff Correction (HDRA) HDRS-H
-0.2 g/cm3 0.5
Main To Repeat
Repeat To Main
Standard Resolution Density Porosity (DPHZ) HDRS-H
0.3 ft3/ft3 -0.1
Main To Repeat
Repeat To Main
Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H
0.3 ft3/ft3 -0.1
3250
3260
3270
3280
3290
3300
3310
3320
3330
3340
3350
GR
CALI
TENS
RXOZ
DPHZ
HDRA



Main To Repeat	Main To Repeat	Main To Repeat	Main To Repeat
Repeat To Main	Repeat To Main	Repeat To Main	Repeat To Main
Caliper (CALI) HDRS-H		Array Induction Two Foot Resistivity A90 (AT90) AIT-M	Standard Resolution Density Porosity (DPHZ) HDRS-H
6 in 16			



Description: Triple Combo standard resolution template for Platform Express Format: Log (PEX Triple Combo StdRes RA) Index Scale: 5 in per 100 ft
Index Unit: ft Index Type: Measured Depth Creation Date: 01-Feb-2013 07:35:37

Calibration Report

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

Primary Equipment :

Array Induction Sonde - M	AMIS	155

Auxiliary Equipment :

AITM Rm/SP Bottom Nose	AMRM	155

AIT Sonde Calibration - Test Loop Gain

Master (EEPROM): 15:17:32 27-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Test Loop Gain - 0		Master	1.000	0.950	1.022	1.050
Test Loop Phase - 0	deg	Master	0	-3.000	0.628	3.000

Test Loop Gain - 1		Master	1.000	0.950	1.021	1.050
Test Loop Phase - 1	deg	Master	0	-3.000	0.696	3.000
Test Loop Gain - 2		Master	1.000	0.950	1.021	1.050
Test Loop Phase - 2	deg	Master	0	-3.000	0.073	3.000
Test Loop Gain - 3		Master	1.000	0.950	1.015	1.050
Test Loop Phase - 3	deg	Master	0	-3.000	0.117	3.000
Test Loop Gain - 4		Master	1.000	0.950	1.001	1.050
Test Loop Phase - 4	deg	Master	0	-3.000	0.063	3.000
Test Loop Gain - 5		Master	1.000	0.950	0.992	1.050
Test Loop Phase - 5	deg	Master	0	-3.000	-0.146	3.000
Test Loop Gain - 6		Master	1.000	0.950	1.005	1.050
Test Loop Phase - 6	deg	Master	0	-3.000	0.225	3.000
Test Loop Gain - 7		Master	1.000	0.950	1.013	1.050
Test Loop Phase - 7	deg	Master	0	-3.000	-0.130	3.000

AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM): 15:17:32 27-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Sonde Error Correction Real - 0	mS/m	Master	-----	-231.000	-18.525	119.000
Sonde Error Correction Quad - 0		Master	-----	-2250.000	291.304	2250.000
Sonde Error Correction Real - 1	mS/m	Master	-----	114.000	147.804	204.000
Sonde Error Correction Quad - 1		Master	-----	-625.000	279.739	625.000
Sonde Error Correction Real - 2	mS/m	Master	-----	66.000	109.786	156.000
Sonde Error Correction Quad - 2		Master	-----	-350.000	-60.214	350.000
Sonde Error Correction Real - 3	mS/m	Master	-----	39.000	62.458	89.000
Sonde Error Correction Quad - 3		Master	-----	-250.000	-1.576	250.000
Sonde Error Correction Real - 4	mS/m	Master	-----	15.000	24.829	35.000
Sonde Error Correction Quad - 4		Master	-----	-63.000	-13.101	63.000
Sonde Error Correction Real - 5	mS/m	Master	-----	4.000	15.000	24.000
Sonde Error Correction Quad - 5		Master	-----	-50.000	-3.715	50.000
Sonde Error Correction Real - 6	mS/m	Master	-----	5.000	9.889	15.000
Sonde Error Correction Quad - 6		Master	-----	-30.000	-6.498	30.000
Sonde Error Correction Real - 7	mS/m	Master	-----	-5.000	-2.202	5.000
Sonde Error Correction Quad - 7		Master	-----	-30.000	-4.038	30.000

AIT Mud Calibration - Mud Calibration Gain

Master (EEPROM): 15:17:32 27-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Coarse Gain		Master	1.000	0.800	0.962	1.200
Fine Gain		Master	1.000	0.800	0.964	1.200

AIT Electronics Check - Thru Calibration Check

Master (EEPROM): 15:17:32 27-Jan-2013 Before (Measured): 20:22:52 28-Mar-2013 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Thru Cal Mag - 0	V	Master	-----	0.366	0.616	0.854
		Before	-----	0.366	0.616	0.854
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 0	deg	Master	-----	137.000	-166.868	-103.000
		Before	-----	137.000	-167.045	-103.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.177	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 1	V	Master	-----	0.762	1.262	1.778
		Before	-----	0.762	1.262	1.778
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 1	deg	Master	-----	136.000	-167.963	-104.000
		Before	-----	136.000	-168.138	-104.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.175	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 2	V	Master	-----	0.372	0.625	0.868
		Before	-----	0.372	0.625	0.868
		After	-----	-----	-----	-----

		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 2	deg	Master	-----	132.000	-171.582	-108.000
		Before	-----	132.000	-171.761	-108.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.179	-----
		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	-172.370	-109.000
		Before	-----	131.000	-172.548	-109.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.178	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 4	V	Master	-----	0.804	1.321	1.876
		Before	-----	0.804	1.321	1.876
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 4	deg	Master	-----	125.000	-178.631	-115.000
		Before	-----	125.000	-178.813	-115.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.182	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 5	V	Master	-----	1.176	1.924	2.744
		Before	-----	1.176	1.925	2.744
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.001	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 5	deg	Master	-----	122.000	179.705	-118.000
		Before	-----	122.000	179.521	-118.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.184	-----
		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	179.727	-119.000
		Before	-----	121.000	179.543	-119.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.184	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 7	V	Master	-----	0.846	1.379	1.974
		Before	-----	0.846	1.381	1.974
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.002	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 7	deg	Master	-----	115.000	179.094	-125.000
		Before	-----	115.000	178.892	-125.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.202	-----
		After-Before	-----	-----	-----	-----
SPA Zero	mV	Master		-50.000	-0.118	50.000
		Before				
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
SPA Plus	mV	Master		941.000	991.728	1040.000
		Before				
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Temperature Zero	V	Master		-0.050	0.000	0.050

		Before					
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Temperature Plus	V	Master		0.870	0.919	0.960	
		Before					
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

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

Primary Equipment :

HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	3889
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H	3912

Auxiliary Equipment :

HRDD Backscatter Detector	Backscatter	
HRDD Long Spacing Detector	Long Spacing	28706
HRDD Short Spacing Detector	Short Spacing	27692
Cesium 137 Gamma-Ray Logging Source	GSR-J	5415
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	3889
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	3867

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): 11:03:45 27-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Small Ring	in	Before	8.00	6.00	8.38	10.00
Large Ring	in	Before	12.00	9.00	12.57	15.00

HDRS Density Calibration - Inversion Results

Master (EEPROM): 16:12:48 31-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Rho Aluminum	g/cm3	Master	2.596	2.586	2.601	2.606
Rho Magnesium	g/cm3	Master	1.686	1.676	1.688	1.696
Pe Aluminum		Master	2.570	2.470	2.603	2.670
Pe Magnesium		Master	2.650	2.550	2.583	2.750

HDRS Density Calibration - Deviation Summary

Master (EEPROM): 16:12:48 31-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Average Deviation	%	Master	0	-0.6000	0.2912	0.6000
BS Max Deviation	%	Master	0	-1.6000	0.6675	1.6000
SS Average Deviation	%	Master	0	-1.0000	0.5681	1.0000
SS Max Deviation	%	Master	0	-2.5000	1.3597	2.5000
LS Average Deviation	%	Master	0	-1.5000	0.7227	1.5000
LS Max Deviation	%	Master	0	-3.5000	2.2501	3.5000

HDRS Density Calibration - Background Summary

Master (EEPROM): 16:12:48 31-Jan-2013 Before (Measured): 10:58:39 27-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Window Ratio		Master	1.0000		0.7487	
		Before	0.7495	0.7120	0.7473	0.7870
		Before-Master	-----	-----	-0.0014	-----
BS Window Sum	1/s	Master	1		24463	
		Before	24177	22968	24460	25386
		Before-Master	-----	-----	-3	-----
SS Window Ratio		Master	1.0000		0.4797	
		Before	0.4774	0.4535	0.4791	0.5012
		Before-Master	-----	-----	-0.0006	-----
SS Window Sum	1/s	Master	1		11378	
		Before	11397	10827	11381	11967

		Before-Master	-----	-----	3	-----
LS Window Ratio		Master	1.0000		0.3009	
		Before	0.3022	0.2871	0.3044	0.3173
		Before-Master	-----	-----	0.0035	-----
LS Window Sum	1/s	Master	1		1233	
		Before	1236	1174	1231	1298
		Before-Master	-----	-----	-2	-----

HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM): 16:12:48 31-Jan-2013 Before (Measured): 10:58:39 27-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS PM High Voltage	V	Master		1000	1952	2400
		Before				
		Before-Master	-----	-----	-----	-----
SS PM High Voltage	V	Master		1000	1881	2400
		Before				
		Before-Master	-----	-----	-----	-----
LS PM High Voltage	V	Master		1000	1593	2400
		Before				
		Before-Master	-----	-----	-----	-----

HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM): 16:12:48 31-Jan-2013 Before (Measured): 10:58:39 27-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Crystal Resolution	%	Master		5.00	11.12	25.00
		Before				
		Before-Master	-----	-----	-----	-----
SS Crystal Resolution	%	Master		5.00	10.02	20.00
		Before				
		Before-Master	-----	-----	-----	-----
LS Crystal Resolution	%	Master		5.00	8.77	20.00
		Before				
		Before-Master	-----	-----	-----	-----

HDRS MCFL Calibration - MCFL Accumulations

Before (Measured): 01:38:20 01-Feb-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Main Resistivity	ohm.m	Before	3875	3565	3866	4185
Deep Resistivity	ohm.m	Before	3830	3524	3784	4136
Shallow Resistivity	ohm.m	Before	3830	3524	3811	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	3846

Auxiliary Equipment :

HGNS Accelerometer, 150 degC	HACCZ-H	4665
AmBe Neutron Logging Source	NSR-F	1260

Calibration Parameter :

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

HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured): 01:36:46 01-Feb-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	32.3	32.8

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM): 00:00:00 15-Jan-2009

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Accelerometer Manufacturer		Master			QAT_160	
Accelerometer Reference Temperature	degF	Master		30.2	77.0	122.0
Accelerometer Coefficients - 0		Master	-----	-----	3418.000	-----

Accelerometer Coefficients - 1	Master	-----	-----	11.746	-----	
Accelerometer Coefficients - 2	Master	-----	-----	-0.011	-----	
Accelerometer Coefficients - 3	Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 4	Master	-----	-----	2.742	-----	
Accelerometer Coefficients - 5	Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 6	Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 7	Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 8	Master	-----	-----	298.700	-----	
Accelerometer Coefficients - 9	Master	-----	-----	0.996	-----	

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 17:44:40 05-Jan-2013 Before (Measured): 10:55:51 27-Jan-2013 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Near Zero Measurement	1/s	Master	0	5.0	26.9	40.0
		Before	0	5.0	27.4	40.0
		After	-----	-----	-----	-----
		Before-Master	-----	-4.0	0.5	4.0
		After-Before	-----	-----	-----	-----
Far Zero Measurement	1/s	Master	0	5.0	29.8	40.0
		Before	0	5.0	29.9	40.0
		After	-----	-----	-----	-----
		Before-Master	-----	-4.5	0.1	4.5
		After-Before	-----	-----	-----	-----
Near Plus Measurement - 0	1/s	Master	6031.0	4700.0	5524.0	6900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Far Plus Measurement - 0	1/s	Master	2793.0	1900.0	2294.0	2900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Near Corrected Plus Measurement - 0	1/s	Master		4700.0	5491.0	6900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Far Corrected Plus Measurement - 0	1/s	Master		1900.0	2261.0	2900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured): 11:04:38 27-Jan-2013 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
RGR Zero Measurement	gAPI	Before	30.0	0	45.4	120.0
		After	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
RGR Plus Measurement	gAPI	Before	185.4	157.1	162.2	206.3
		After			NOT DONE	
		After-Before	-----	-----	-----	-----
GR Calibration Gain		Before	0.89	0.80	1.02	1.05
		After	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----

Company: EnCana Oil & Gas (USA) Inc.

Schlumberger

Well: Shideler FEE 6-3AA (031E)

Field: Mamm Creek

County:	Garfield
State:	Colorado

PLATFORM EXPRESS

COMPENSATED NEUTRON, LITHO-DENSITY

INDUCTION RESISTIVITY, GR, SP