

Company: Nemaha Oil and Gas, LLC

Well: Lampson #2A-23-32-9 SWD

Field: Hylton

County: Chautauqua State: Kansas

**PLATFORM EXPRESS
COMPENSATED NEUTRON
LITHOLOGY DENSITY**

County: Chautauqua
Field: Hylton
Location: 135' FNL & 405' FEL
Well: Lampson #2A-23-32-9 SWD
Company: Nemaha Oil and Gas, LLC

Location:		135' FNL & 405' FEL	Elev.:	K.B. 1076.00 ft G.L. 1060.00 ft D.F. 1075.00 ft
Permanent Datum:	Ground Level		Elev.:	1060.00 f
Log Measured From:	Kelly Bushing			16.00 ft above Perm. Datum
Drilling Measured From:	Kelly Bushing			
API Serial No.:	Section:	23	Township:	32
15-019-27282				Range: 9

Logging Date	28-Feb-2013			
Run Number	One			
Depth Driller	3315.00 ft			
Schlumberger Depth	3278.00 ft			
Bottom Log Interval	3278.00 ft			
Top Log Interval	526.00 ft			
Casing Driller Size @ Depth	9.625 in @ 513.00 ft			
Casing Schlumberger	526 ft			
Bit Size	8.75 in			
Type Fluid In Hole	Water			
Density	8.7 lbm/gal	Viscosity	32 s	
Fluid Loss	0 cm3	PH	8	
Source of Sample	Flowline			
RM @ Meas Temp	1.28 ohm.m	@	46 degF	
RMF @ Meas Temp	1.09 ohm.m	@	46 degF	
RMC @ Meas Temp	1.79 ohm.m	@	46 degF	
Source RMF	Calculated		Calculated	
RM @ BHT	0.53 @ 120		0.45 @ 120	
Max Recorded Temperatures	120 degF		120	
Circulation Stopped	28-Feb-2013		00:00:00	
Logger on Bottom	28-Feb-2013		07:45:00	
Unit Number	2281	Location:	Elk City, OK	
Recorded By	Ahmad Kojo			
Witnessed By	Mr. Don Myers			

Disclaimer

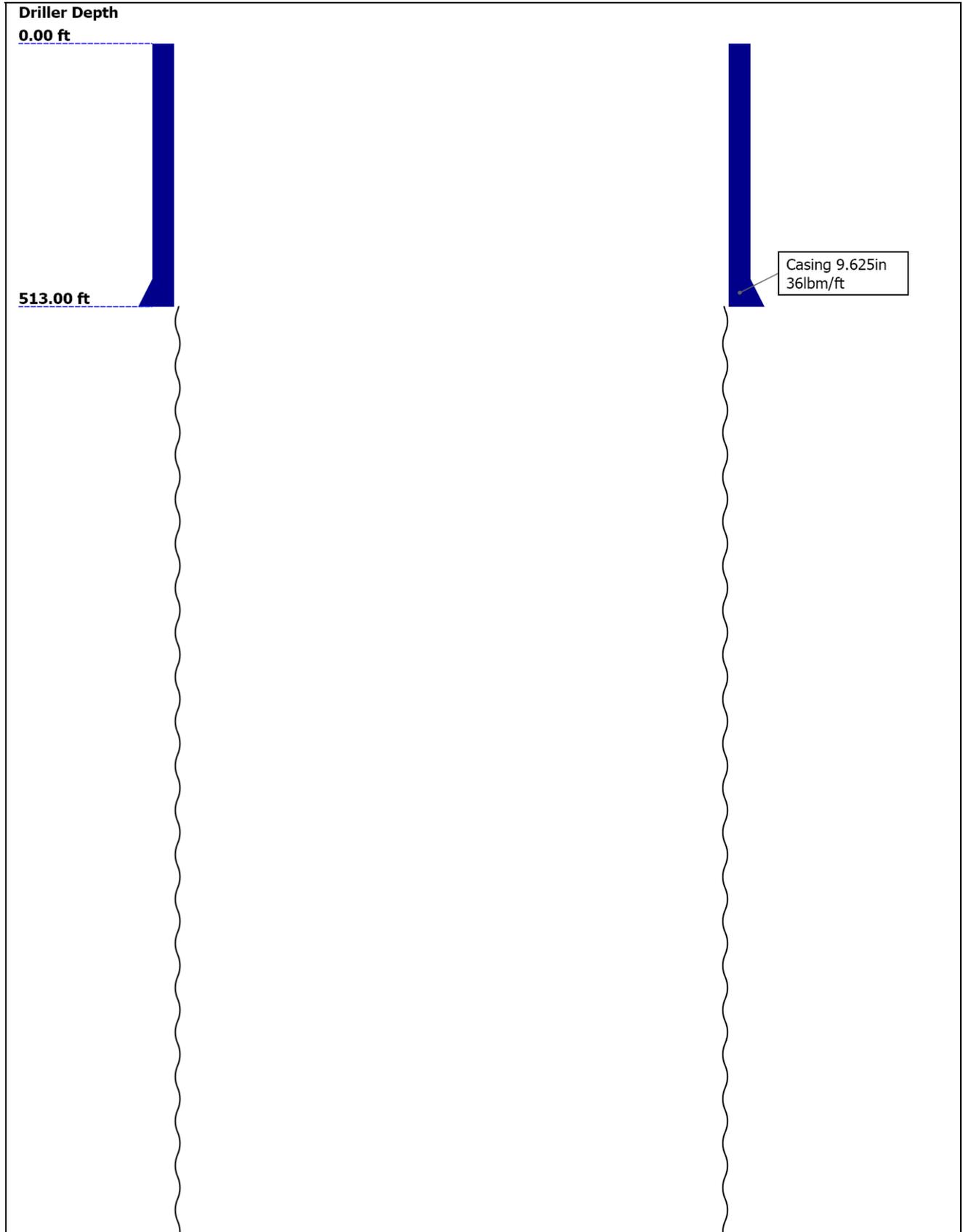
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- 11.5 Parameter Listing
- 12. One High Resolution Porosity 10" = 100'
- 12.1 Integration Summary
- 12.2 Software Version

Well Sketch



3315.00 ft

Open Hole 8.75in

Borehole Size/Casing/Tubing Record

Bit					
Bit Size (in)	8.75				
Top Driller (ft)	513				
Top Logger (ft)	526				
Bottom Driller (ft)	3315				
Bottom Logger (ft)	3278				
Casing					
Size (in)	9.625				
Weight (lbm/ft)	36				
Inner Diameter (in)	8.914				
Grade	J55				
Top Driller (ft)	0				
Top Logger (ft)	0				
Bottom Driller (ft)	513				
Bottom Logger (ft)	526				

Operational Run Summary

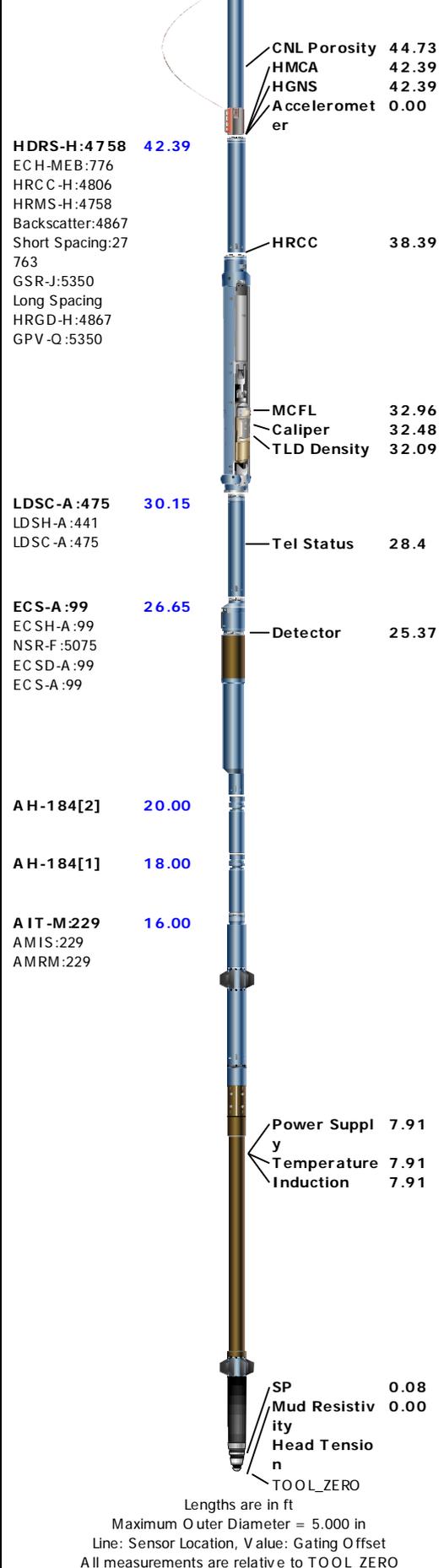
Parameter (unit)	One				
Date Log Started	28-Feb-2013				
Time Log Started	05:51:19				
Date Log Finished	28-Feb-2013				
Time Log Finished	09:35:38				
Top Log Interval (ft)	526.00				
Bottom Log Interval (ft)	3278.00				
Total Depth (ft)	3278.00				
Max Hole Deviation (deg)	0.00				
Azimuth of Max Deviation (deg)	0.00				
Bit Size (in)	8.750				
Logging Unit Number	2281				
Logging Unit Location	Elk City, OK				
Recorded By	Ahmad Kojo				
Witnessed By	Mr. Don Myers				
Casing Code Number	RYTC 00007				

Borehole Fluids

Parameter(unit)	One				
Fluid Type	Water				
Max Recorded Temperatures (degF)	120				
Source of Sample	Flowline				
Salinity (ppm)	6527.74				
Density (lbm/gal)	8.7				
Funnel Viscosity (s)	32				
Fluid Loss (cm3)	0				
PH	8				
Date/Time Circulation Stopped	28-Feb-2013 00:00:00				
Date Logger on Bottom	28-Feb-2013				
Time Logger on Bottom	07:45:00				
Source RMF	Calculated				
RMC	Calculated				
RM @ Meas Temp (ohm.m@degF)	1.28 @ 46				
RMF @ Meas Temp (ohm.m@degF)	1.09 @ 46				
RMC @ Meas Temp (ohm.m@degF)	1.79 @ 46				
RM @ BHT (ohm.m@degF)	0.53 @ 120				
RMF @ BHT (ohm.m@degF)	0.45 @ 120				
RMC @ BHT (ohm.m@degF)	0.75 @ 120				
Total Solid (%)					
High Gravity Solids (%)					

Remarks and Equipment Summary

One: Toolstring				One: Remarks
Equip name LEH-QT:2519 LEH-QT:2519	Length 69.41	MP name	Offset	Toolstring ran as per tool sketch
				All logs and scales are as per client's request
				Maximum recorded temperature was 120 degF
DTC-H:8497 ECH-KC:9614 DTC-H:8497				All logs are computed on Limestone Matrix (MDEN = 2.71 g/cc and DT = 47.6 us/ft)
HNGS-BA:236 HEH-K:1018 HNGS-BA:236				Hole-Cement Volume computed using a future casing diameter of 7 inches
GR				Repeat Pass logged from 2500' to 2100' as per client's request
HNGC-B:46 HNGH-A:46 HNGC-B:46				Main Pass logged from TD to CS for PEX. Hi-Res, ECS, and HNGS logged from 2675' to 1675' as per client's request
HNGC-B:46				Thank you for choosing Schlumberger of Elk City, OK -- 580-225-4300
HNGS-H:3819 HGNH:2844 NPV-N:5226 NSR-F:5226 HGNS-H:3819 HACCZ-H:2102 HMCA-H				Your crew today was: Marlon, Ryan, and Kojo
Tel Status				
Temperature				
GR				



Depth Summary

Depth Control Parameters	One		
Conveyance Type	Wireline		
Log Sequence	First Trip to Wellsite		
Rig Up Length at Surface (ft)	145.80		
Estimated Length (ft)	145.80		

Rig Up Length at Bottom (ft)	145.50		
Rig Up Length Correction (ft)	0.30		
Stretch Correction (ft)	1.00		
Tool Zero Reference Check at Surface (ft)	0.30		
Rig Type	Land		
Depth Remark Parameters	One		
Depth Remark 1	All Schlumberger depth control policies and procedures were followed		
Depth Remark 2	IDW used as primary depth control		
Depth Remark 3	Z-Chart used as secondary depth control		
Depth Remark 4	First Trip to Wellsite, Main Pass correlated to Down Log		
Depth Measuring Device	One		
Type	IDW-B		
Serial Number	5904		
Calibration Date	13-Nov-2012		
Calibrator Serial Number	NA		
Calibration Cable Type	7-46A XS		
Wheel Correction 1	-8		
Wheel Correction 2	-6		
Tension Device	One		
Type	CMTD-B/A		
Serial Number	2576		
Calibration Date	08-Feb-2013		
Calibrator Serial Number	1018		
Calibration Points	10		
Calibration RMS	7		
Calibration Peak Error	1446		
Logging Cable	One		
Type	7-46A-XS		
Serial Number	U711103		
Logging Cable Length (ft)	17800.00		

One

Repeat Pass Porosity 5" = 100'

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	612.38	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	1350.25	ft3

Software Version

Acquisition System	Version
MaxWell	3.1.9755.0
Application Patch	SP-20120723-3.1.9755.1112 EXP_APL-MAST-3.1.9755.1419 EXP_APL-NEXTA-3.1.9755.1340

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
HRGD-H	HILT Resistivity Gamma-Ray Density Device, 150 degC	3.1.9755.0	3.0
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.1.9755.0	2.0

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
One	Log[5]:Up	Up	468.98 ft	3288.06 ft	28-Feb-2013 7:51:04 AM	28-Feb-2013 9:32:53 AM	0.30 ft	

All depths are referenced to toolstring zero

Log

One: Log[5]:Up

Description: Nuclear standard resolution template for Platform Express Format: Log (Porosity 5 inch) Index Scale: 5 in per 100 ft Index Unit: ft Index Type:

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
HDRA	HDRS-H:HRMS-H:HRGD-H	2in
ICV	Borehole	6in
IHV	Borehole	6in
PEF8	HDRS-H:HRMS-H:HRGD-H	2in
SMIN	HDRS-H:HRMS-H:HRGD-H	2in
SMNO	HDRS-H:HRMS-H:HRGD-H	2in
TENS	WLWorkflow	1in
TNPH	HGNS-H:HGNS-H:HGNS-H	6in

—ICV - Integrated Cement Volume every 10.00 (ft3)

—IHV - Integrated Hole Volume every 100.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

—IHV - Integrated Hole Volume every 10.00 (ft3)

—ICV - Integrated Cement Volume every 100.00 (ft3)

Possible Permeability
Synthetic Micro-Normal Resistivity (SMNO) HDRS-H
0 ohm.m 80
Synthetic Micro-Inverse Resistivity (SMIN) HDRS-H
0 ohm.m 80

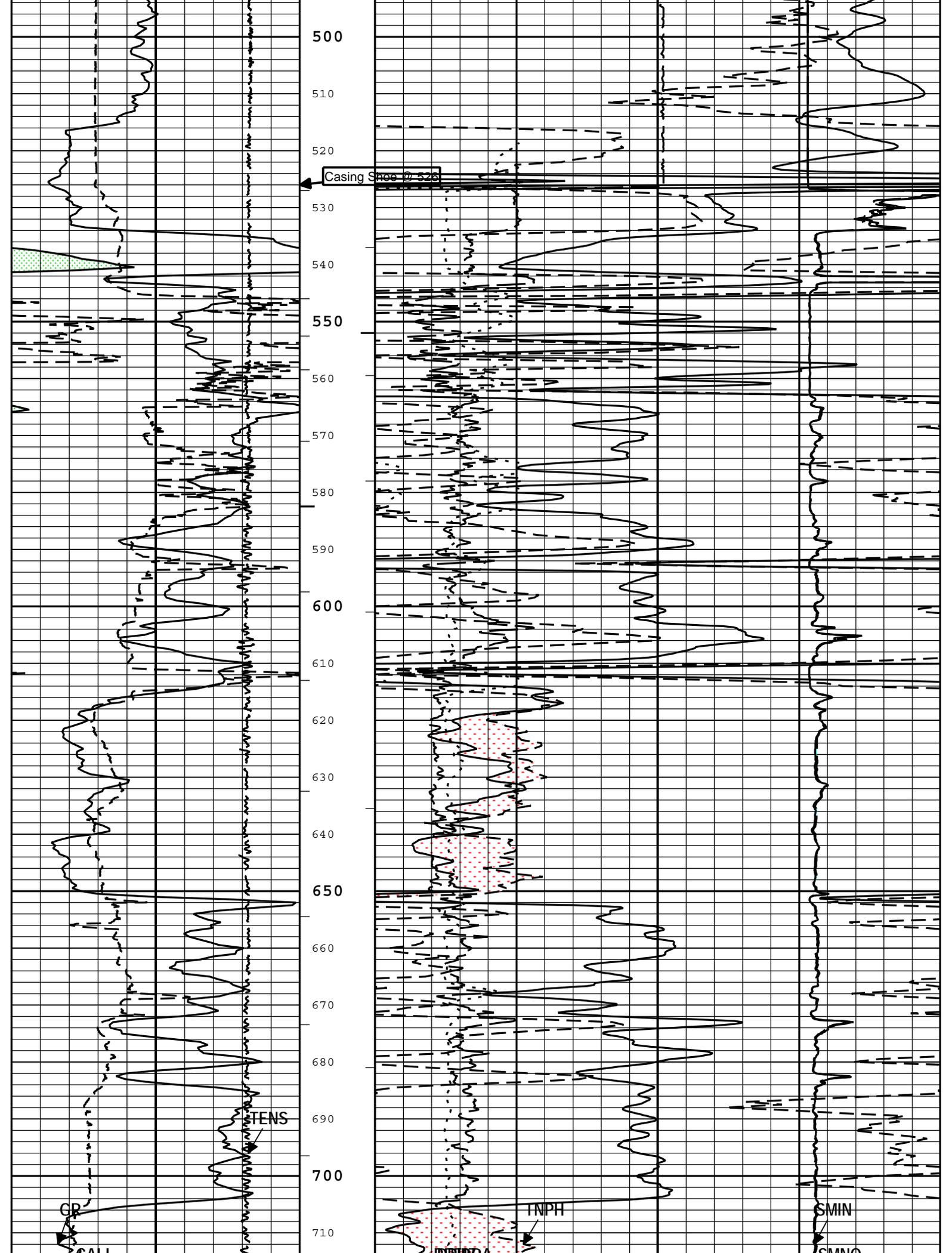
Density Standoff Correction (HDRA) HDRS-H
-0.25 g/cm3 0.25

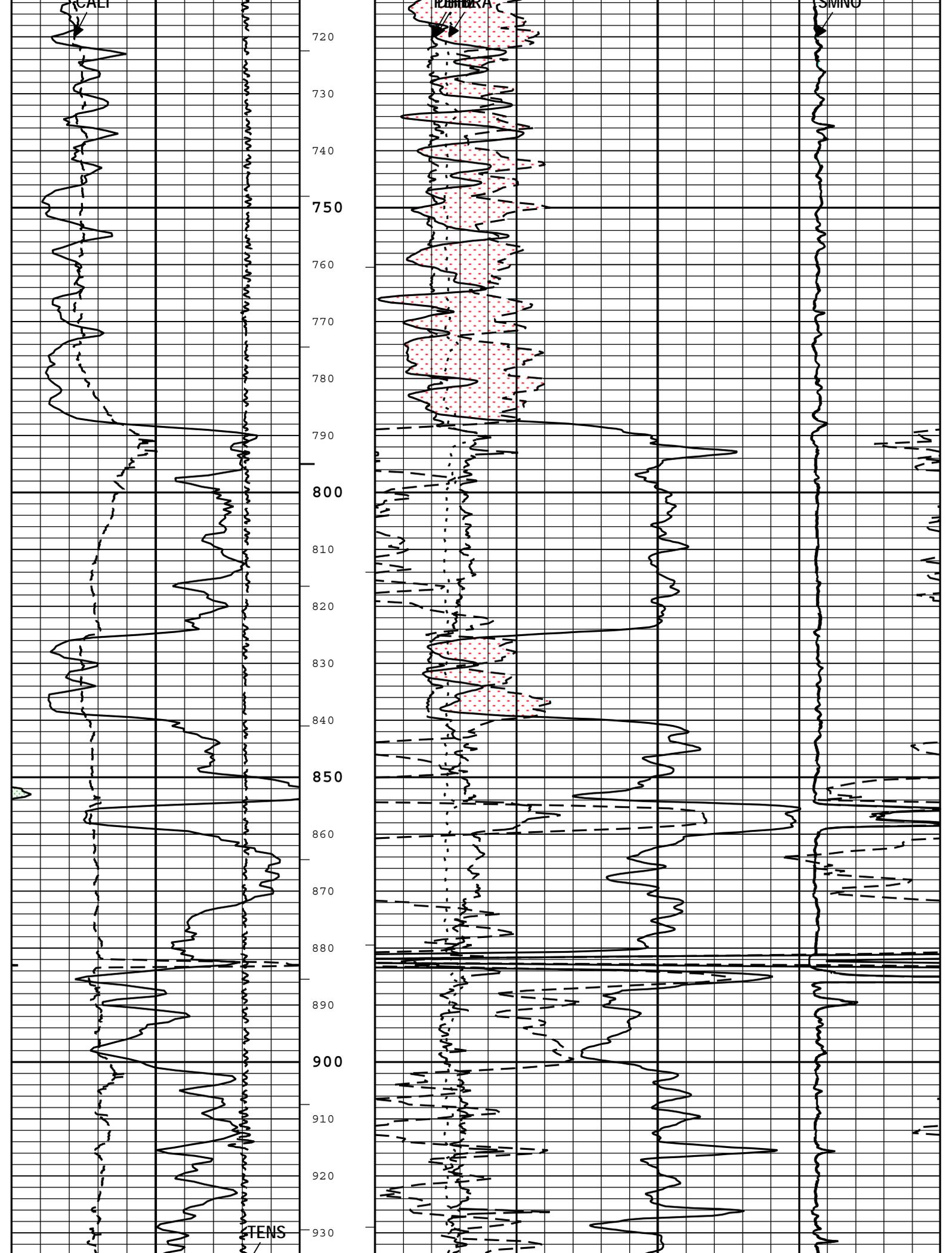
High Resolution Formation Photoelectric Factor (PEF8) HDRS-H
0 10

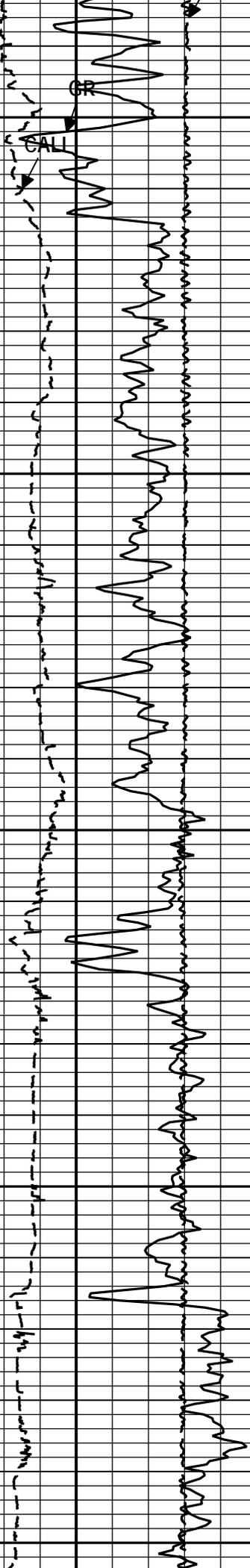
Backup Gamma Ray		
Caliper (CALI) HDRS-H		
6	in	16
Gamma Ray (GR) HGNS-H		
0	gAPI	150
Gamma Ray (GR) HGNS-H		
150	gAPI	300
Cable Tension (TENS)		
8000	lbf	0

Gas		
Standard Resolution Density Porosity (DPHZ) HDRS-H		
0.3	ft3/ft3	-0.1
Thermal Neutron Porosity (Ratio Method) in Selected Lithology (TNPH) HGNS-H		
0.3	ft3/ft3	-0.1

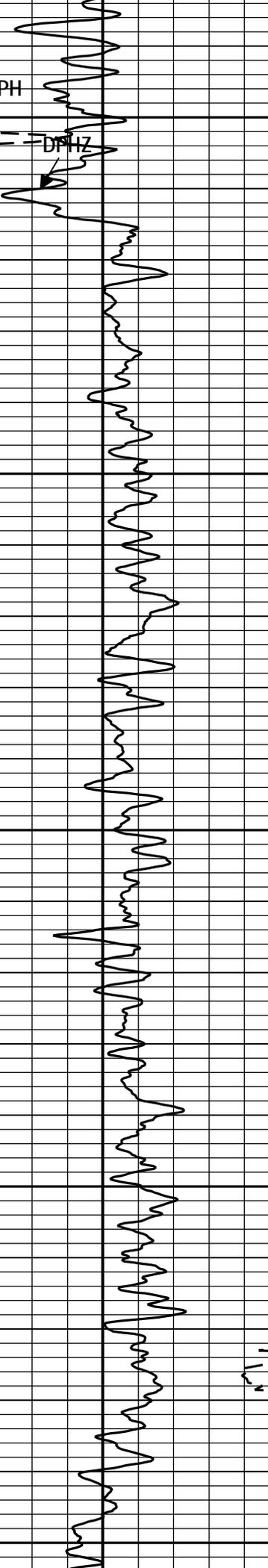
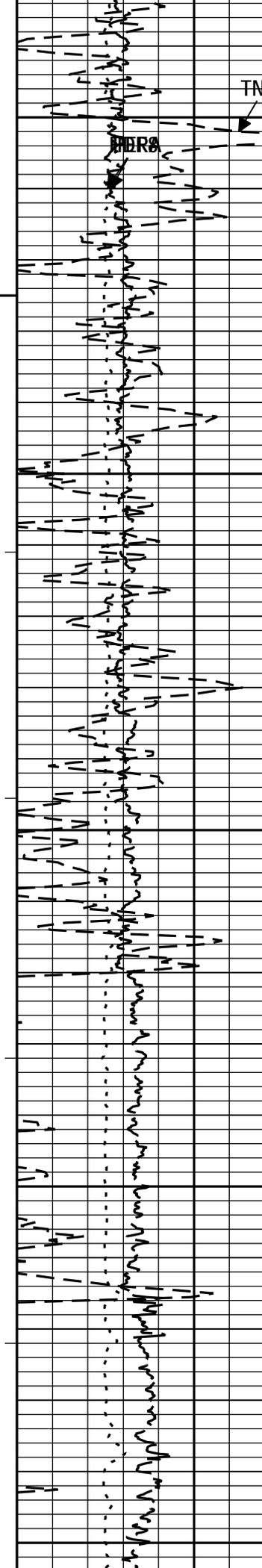
Limestone Matrix, 2.71 g/cc







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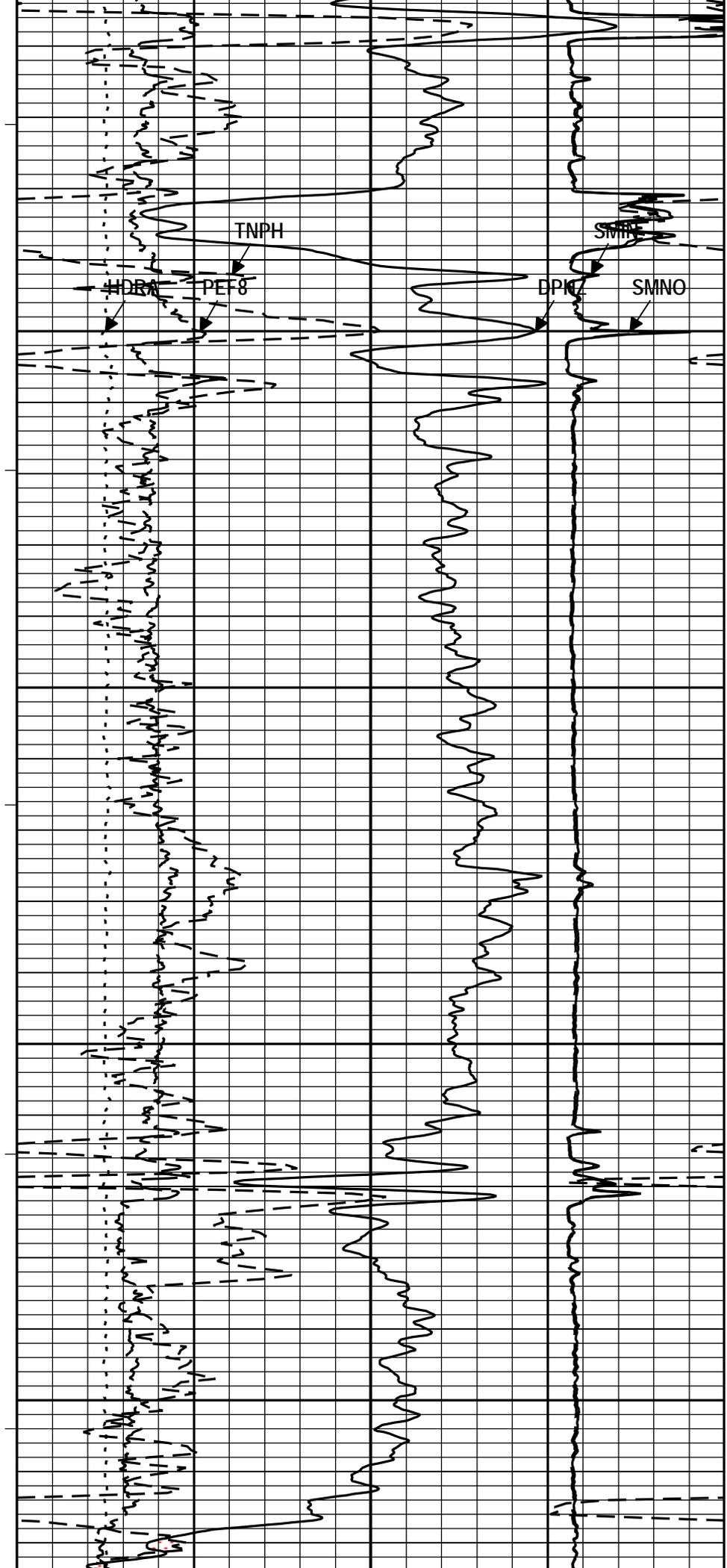
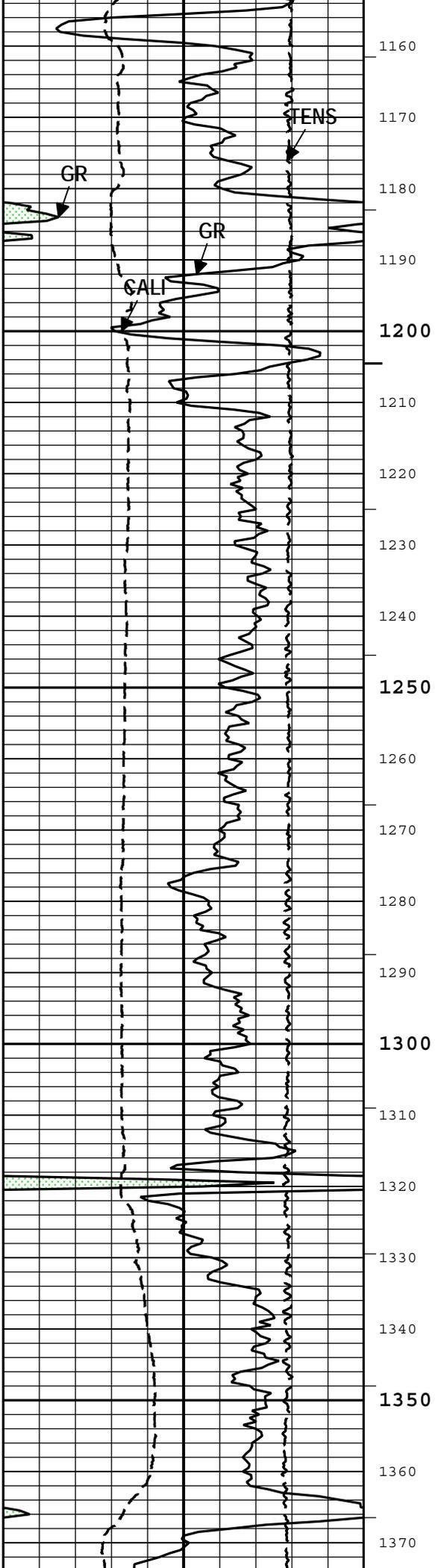
TNPH

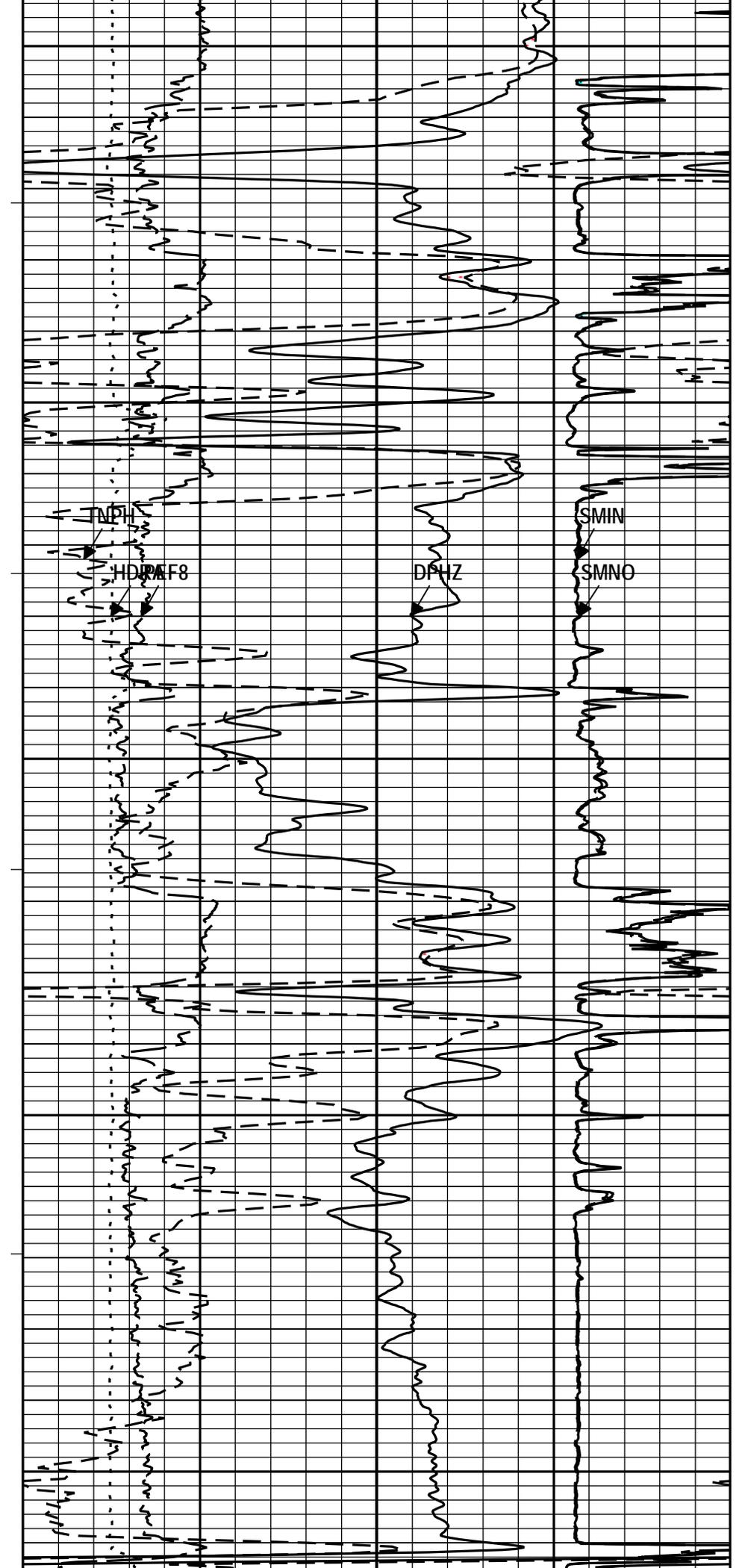
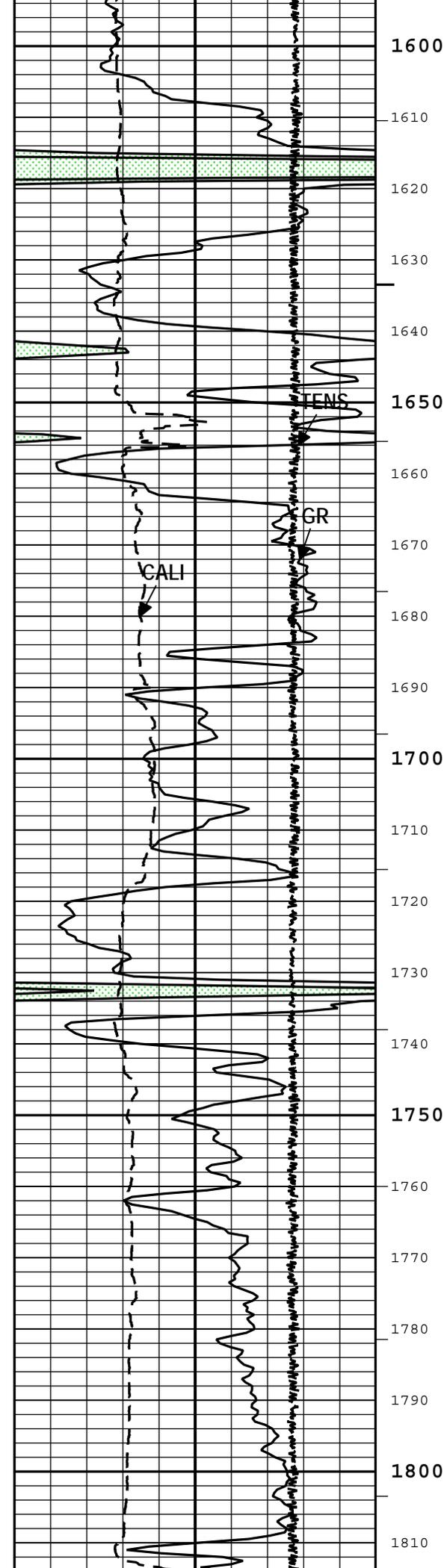
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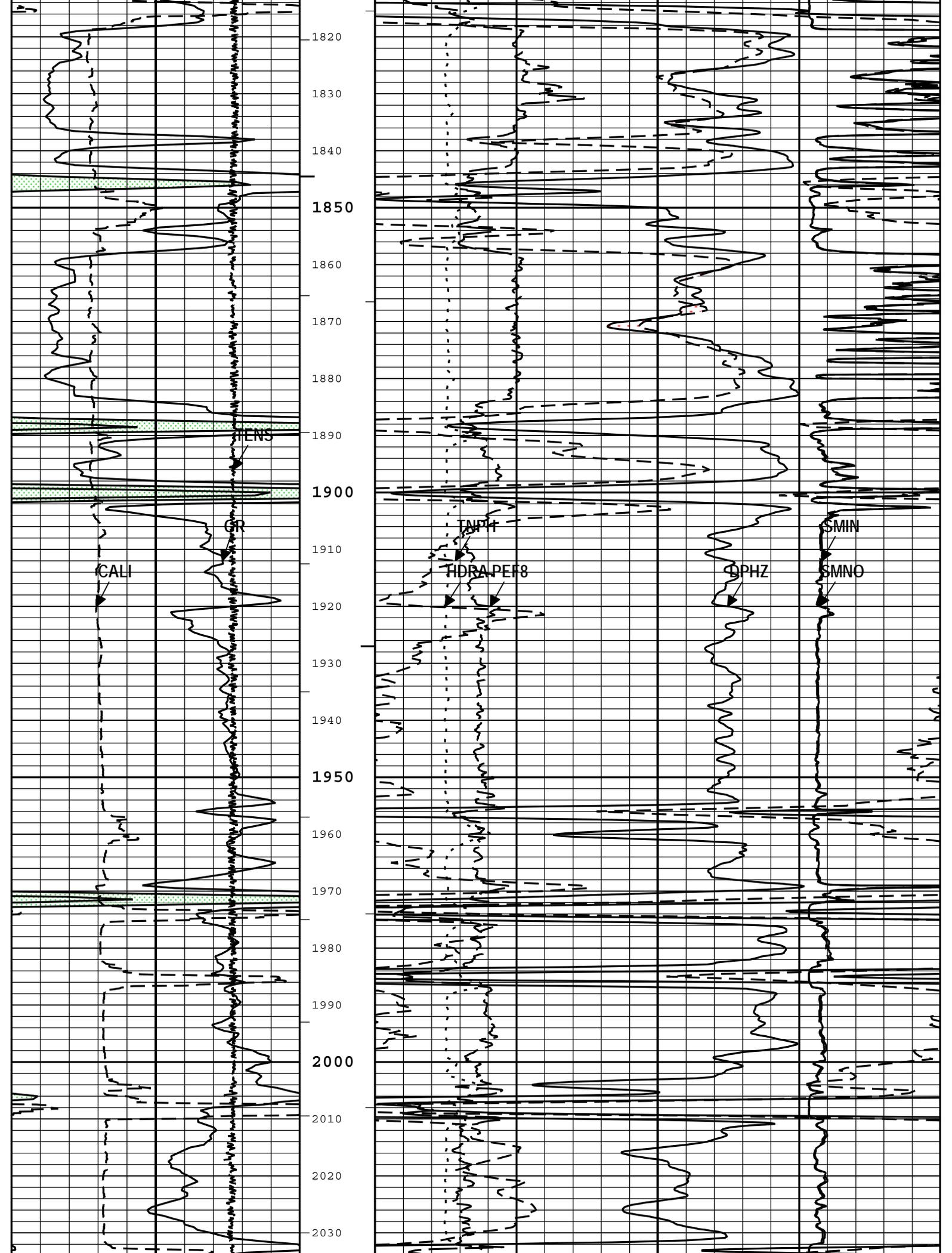
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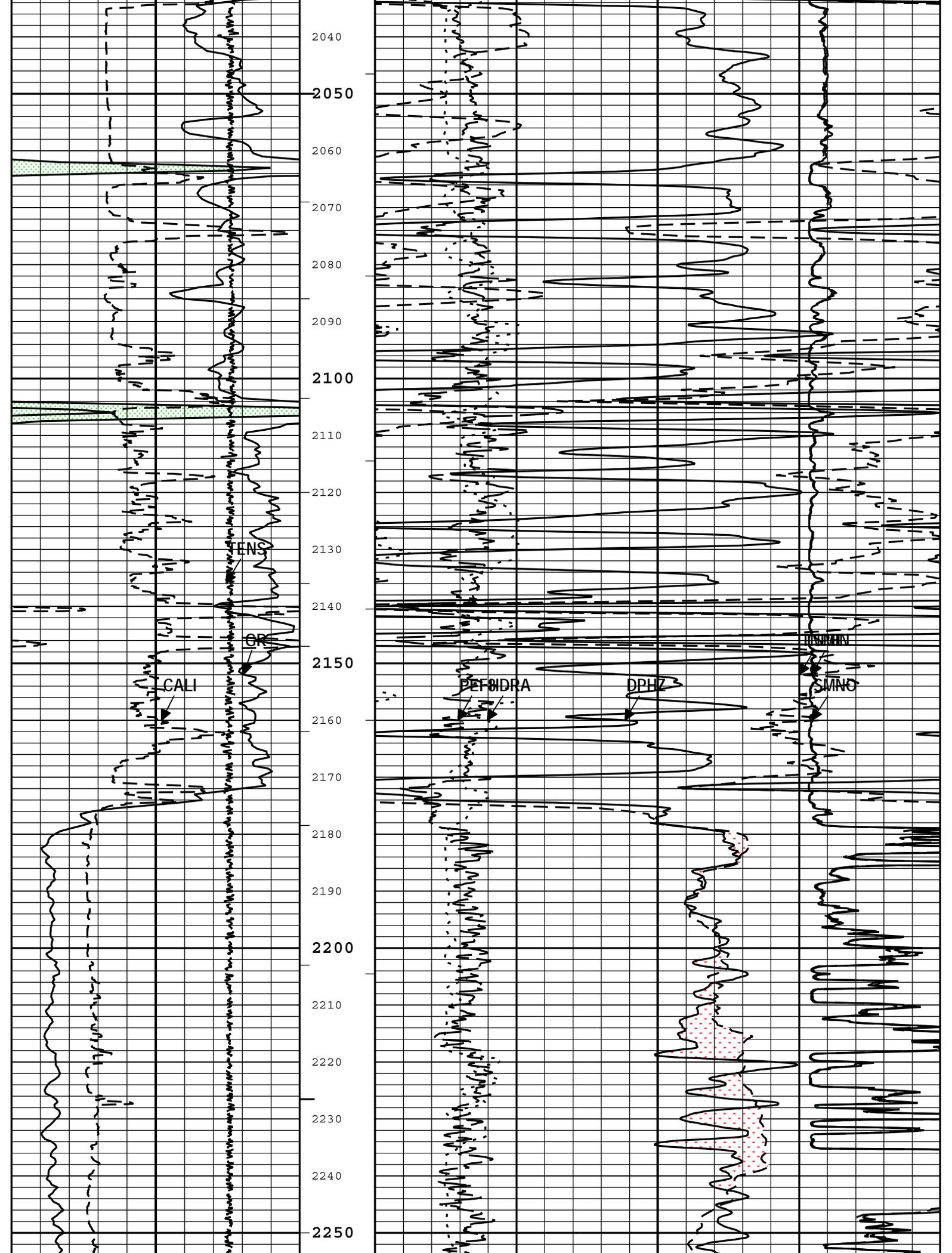
SMINO

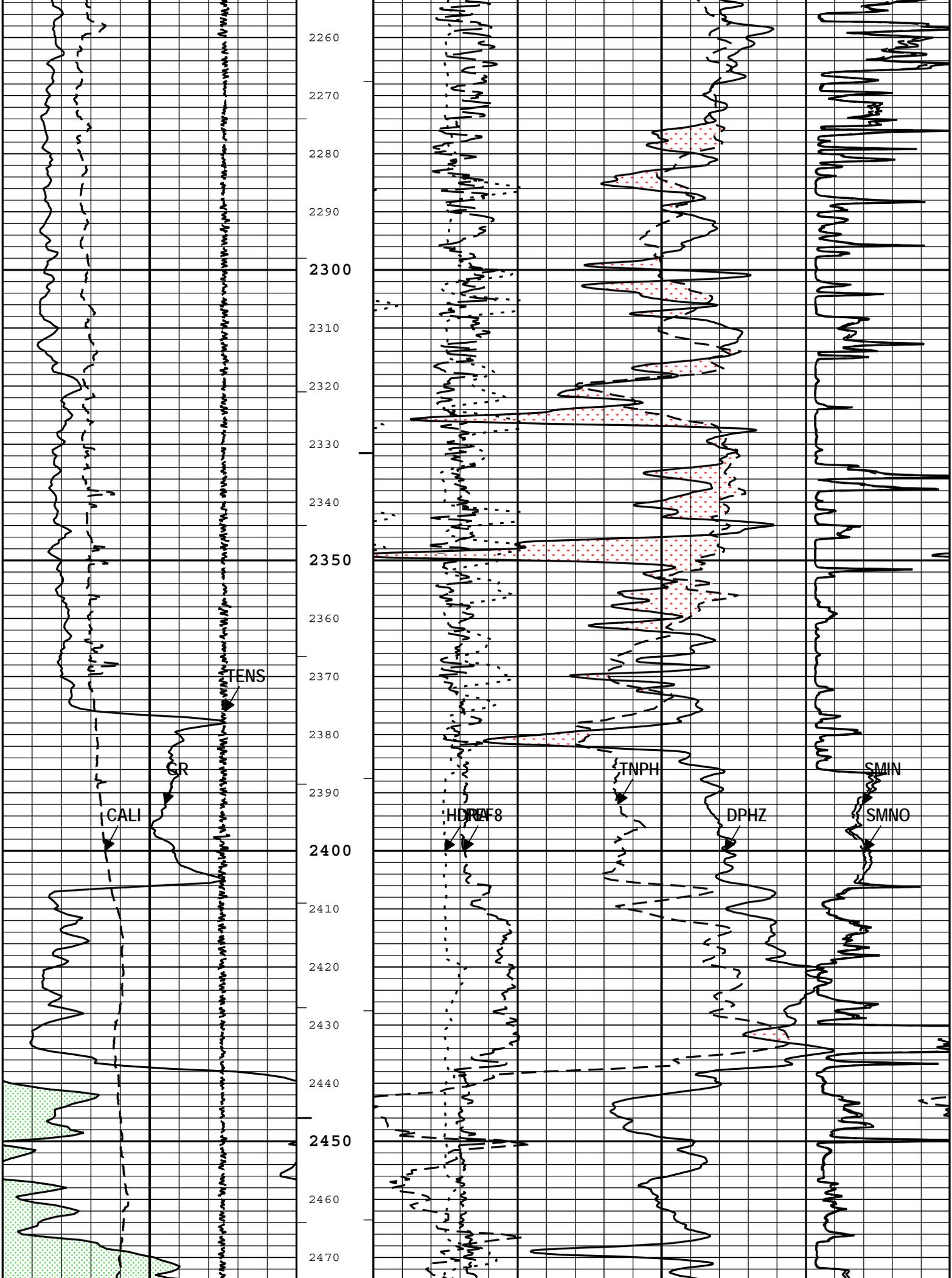
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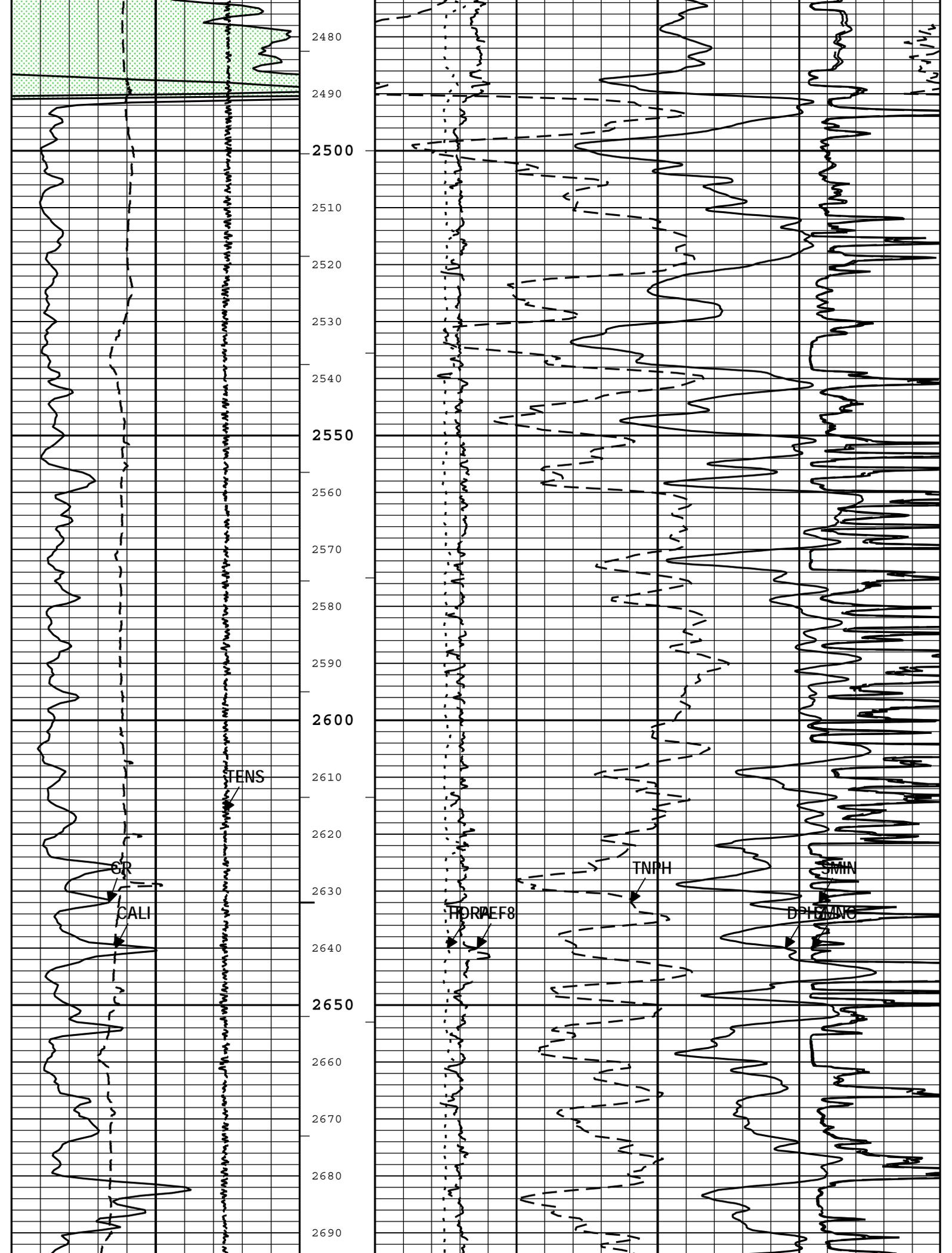




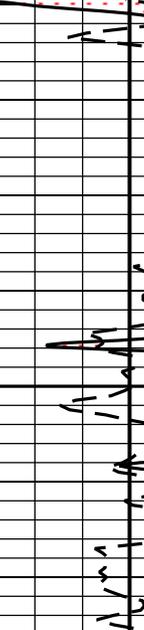
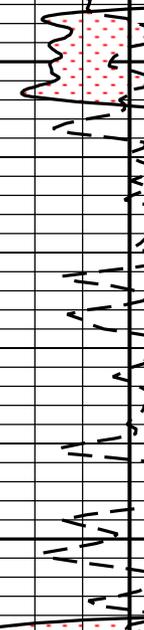
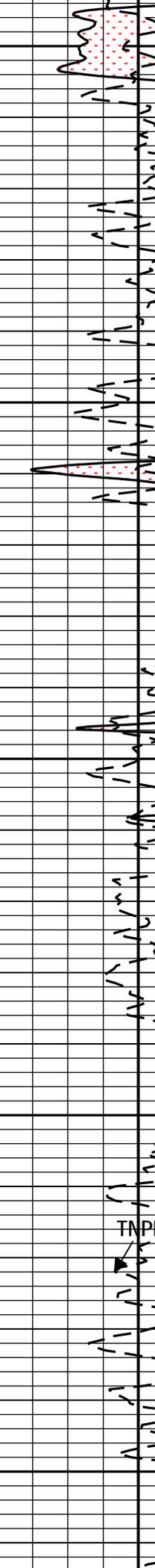
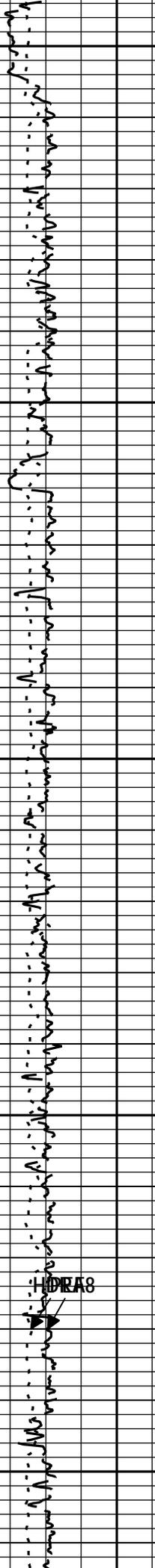
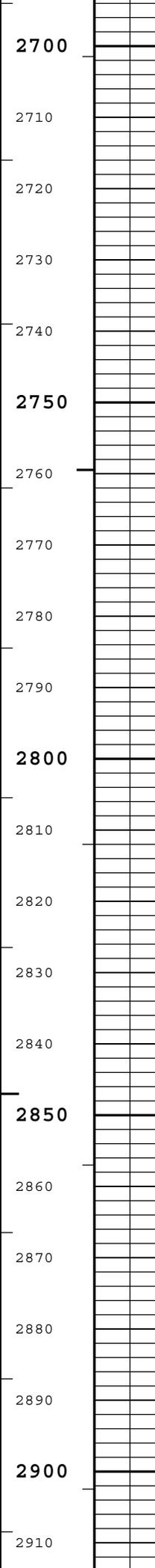
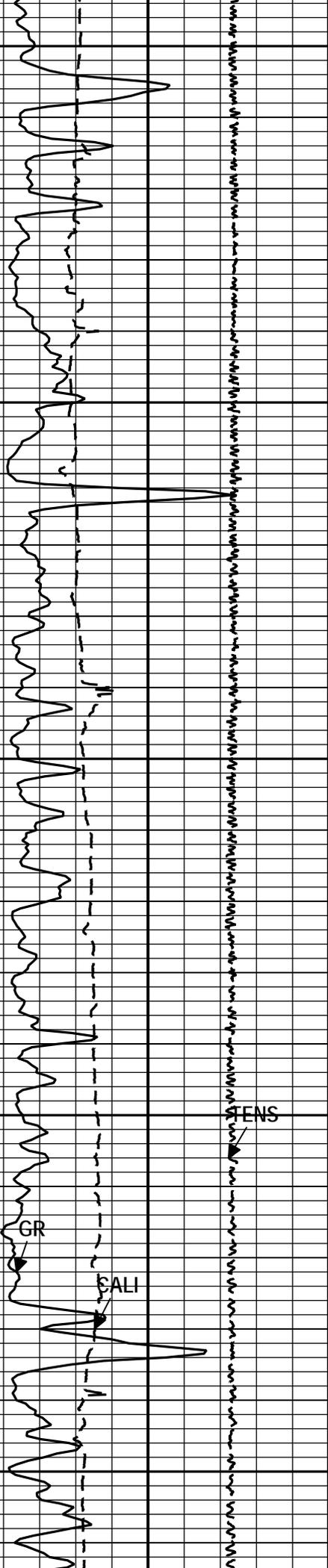


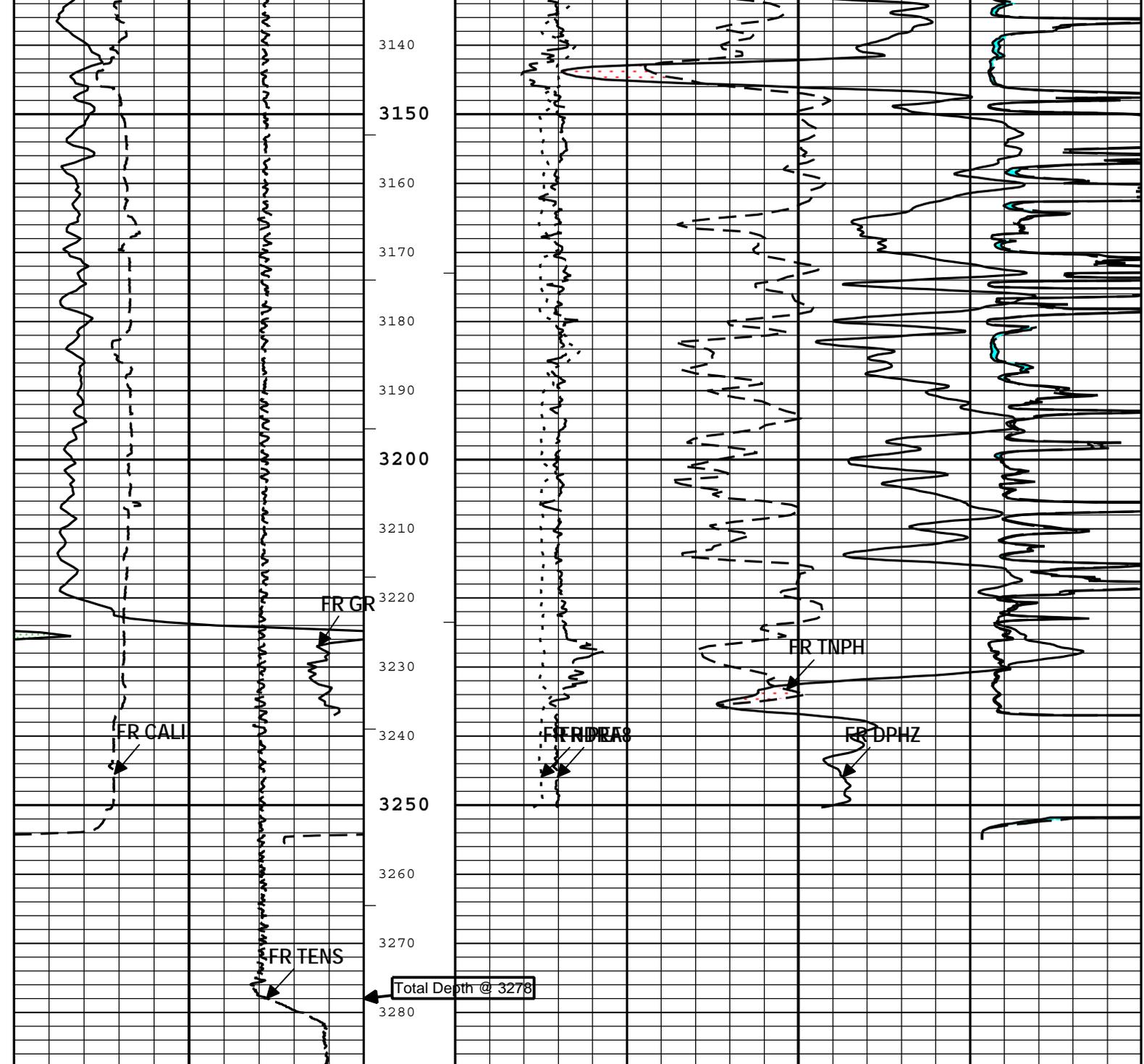






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2910





Limestone Matrix, 2.71 g/cc

Backup Gamma Ray		
Caliper (CALI) HDRS-H		
6	in	16
Gamma Ray (GR) HGNS-H		
0	gAPI	150
Gamma Ray (GR) HGNS-H		
150	gAPI	300
Cable Tension (TENS)		
8000	lbf	0

Gas		
Standard Resolution Density Porosity (DPHZ) HDRS-H		
0.3	ft ³ /ft ³	-0.1
Thermal Neutron Porosity (Ratio Method) in Selected Lithology (TNPH) HGNS-H		
0.3	ft ³ /ft ³	-0.1
High Resolution Formation Photoelectric Factor (PEF8) HDRS-H		
0		10
Density Standoff Correction (HDRA) HDRS-H		
-0.25	g/cm ³	0.25
		Possible Permeability
		Synthetic Micro-Normal Resistivity (SMNO) HDRS-H
0	ohm.m	80

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

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

TIME_1900 - Time Marked every 60.00 (s)

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

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

Description: Nuclear standard resolution template for Platform Express Format: Log (Porosity 5 inch) Index Scale: 5 in per 100 ft Index Unit: ft Index Type:

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	Depth Zoned	in
BSAL	Borehole Salinity	Borehole	6527.73	ppm
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.05	in
CBLO	Casing Bottom (Logger)	WLSESSION	526	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	9.625	in
DFD	Drilling Fluid Density	Borehole	8.7	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DHC	Density Hole Correction	HDRS-H	Bit Size	
FCD	Future Casing (Outer) Diameter	WLSESSION	7	in
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	46	degF
NPRM	HRDD Nuclear Processing Mode	HDRS-H	High Resolution	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	1.09	ohm.m
SOCO	Standoff Correction Option	HGNS-H	Yes	

Depth Zone Parameters			
Parameter	Value	Start (ft)	Stop (ft)
BS	0	490	526
BS	8.75	526	3288.08

All depth are actual.

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	1800	ft/h

Main Pass Porosity 5" = 100'

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	88.42	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	189.98	ft3

Software Version

Acquisition System	Version
MaxWell	3.1.9755.0
Application Patch	SP-20120723-3.1.9755.1112 EXP_APL-MAST-3.1.9755.1419 EXP_APL-NEXTA-3.1.9755.1340

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
HRGD-H	HILT Resistivity Gamma-Ray Density Device, 150 degC	3.1.9755.0	3.0
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.1.9755.0	2.0

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
One	Log[3]:Up	Up	2016.75 ft	2598.28 ft	28-Feb-2013 6:59:28 AM	28-Feb-2013 7:29:22 AM	0.00 ft	

All depths are referenced to toolstring zero

Log

One: Log[3]:Up

Description: Nuclear standard resolution template for Platform Express Format: Log (Porosity 5 inch) Index Scale: 5 in per 100 ft Index Unit: ft Index Type:

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
HDRA	HDRS-H:HRMS-H:HRGD-H	2in
ICV	Borehole	6in
IHV	Borehole	6in
PEF8	HDRS-H:HRMS-H:HRGD-H	2in
SMIN	HDRS-H:HRMS-H:HRGD-H	2in
SMNO	HDRS-H:HRMS-H:HRGD-H	2in
TENS	WLWorkflow	1in
TNPH	HGNS-H:HGNS-H:HGNS-H	6in

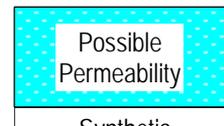
—|ICV - Integrated Cement Volume every 10.00 (ft3)

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

TIME_1900 - Time Marked every 60.00 (s)

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

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



Synthetic
Micro-Normal
Resistivity (SMNO)
HDRS-H
0 ohm.m 80

Synthetic
Micro-Inverse
Resistivity (SMIN)
HDRS-H
0 ohm.m 80

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

High Resolution Formation Photoelectric Factor
(PEF8) HDRS-H
0 10

Gas

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

Thermal Neutron Porosity (Ratio Method) in Selected Lithology (TNPH) HGNS-H
0.3 ft3/ft3 -0.1

Backup Gamma Ray

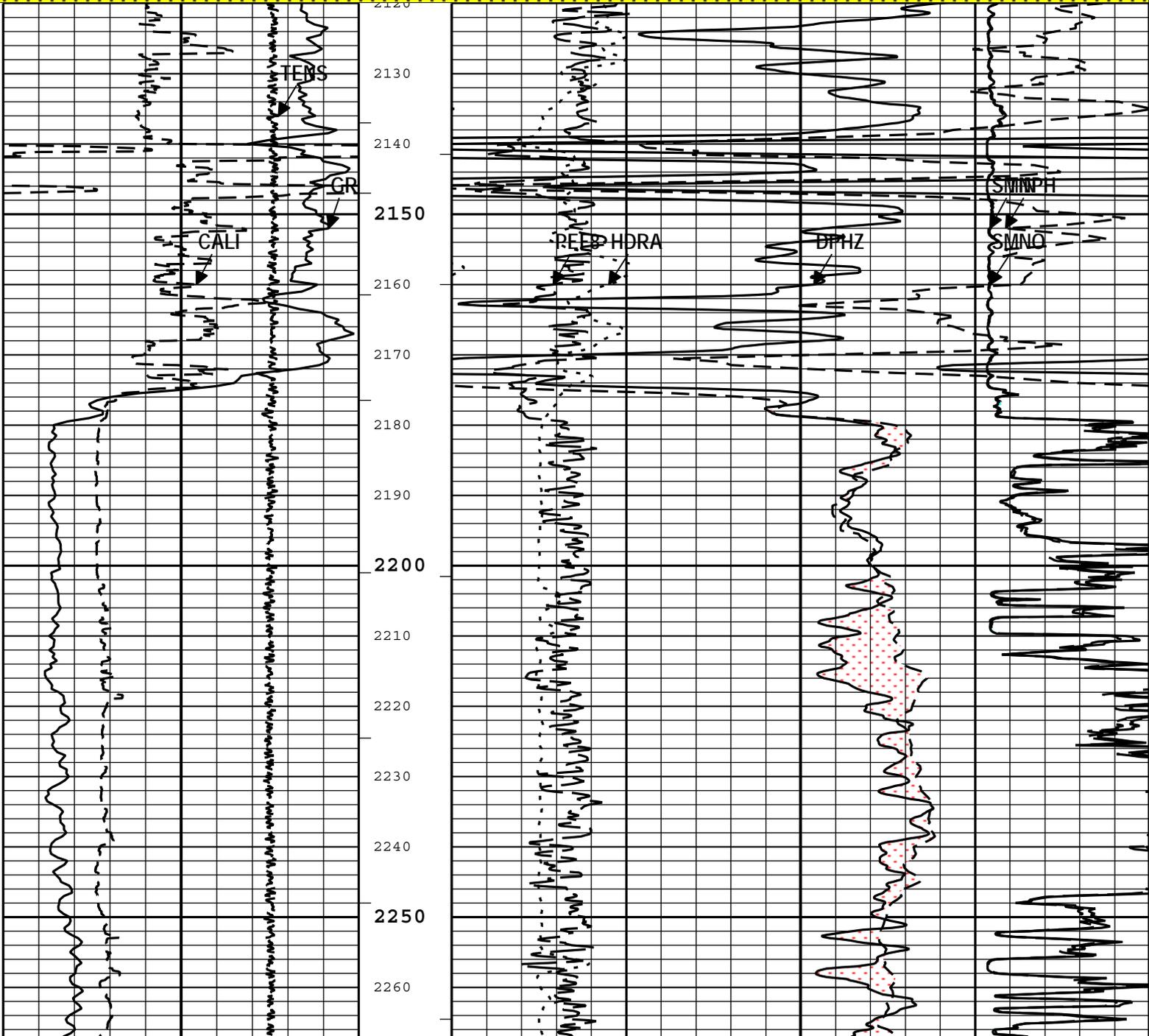
Caliper (CALI) HDRS-H
6 in 16

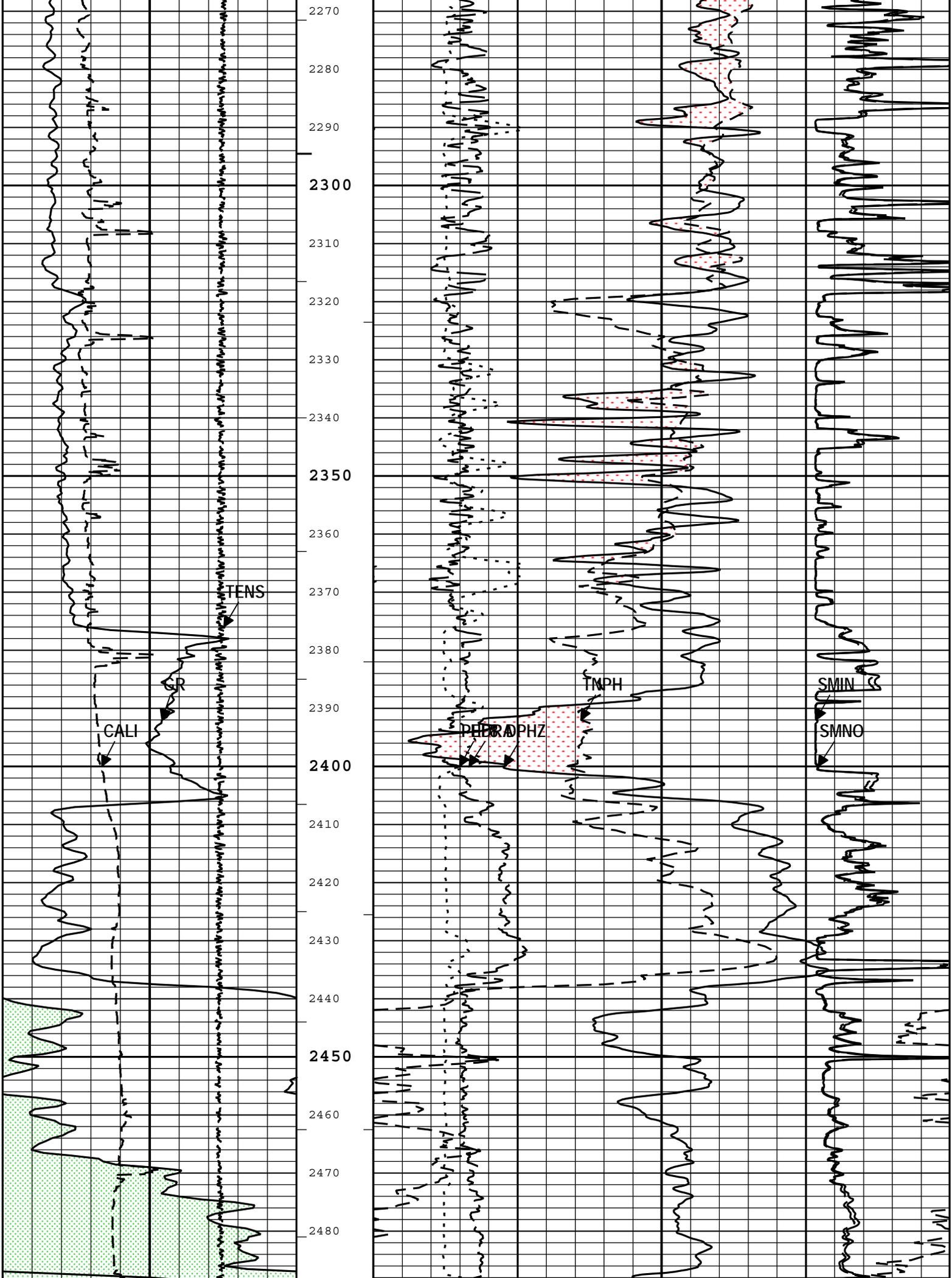
Gamma Ray (GR) HGNS-H
0 gAPI 150

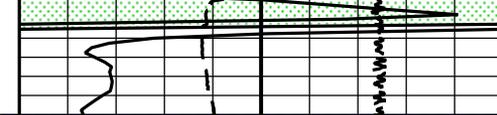
Gamma Ray (GR) HGNS-H
150 gAPI 300

Cable Tension (TENS)
8000 lbf 0

Limestone Matrix, 2.71 g/cc







2490



Limestone Matrix, 2.71 g/cc

Backup Gamma Ray		
Caliper (CALI) HDRS-H		
6	in	16
Gamma Ray (GR) HGNS-H		
0	gAPI	150
Gamma Ray (GR) HGNS-H		
150	gAPI	300
Cable Tension (TENS)		
8000	lbf	0

Gas		
Standard Resolution Density Porosity (DPHZ) HDRS-H		
0.3	ft ³ /ft ³	-0.1
Thermal Neutron Porosity (Ratio Method) in Selected Lithology (TNPH) HGNS-H		
0.3	ft ³ /ft ³	-0.1

High Resolution Formation Photoelectric Factor (PEF8) HDRS-H		
0		10

Density Standoff Correction (HDRA) HDRS-H		
-0.25	g/cm ³	0.25

Possible Permeability		
Synthetic Micro-Normal Resistivity (SMNO) HDRS-H		
0	ohm.m	80
Synthetic Micro-Inverse Resistivity (SMIN) HDRS-H		
0	ohm.m	80

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

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

TIME_1900 - Time Marked every 60.00 (s)

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

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

Description: Nuclear standard resolution template for Platform Express Format: Log (Porosity 5 inch) Index Scale: 5 in per 100 ft Index Unit: ft Index Type:

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	8.75	in
BSAL	Borehole Salinity	Borehole	6527.73	ppm
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.05	in
CBLO	Casing Bottom (Logger)	WLSESSION	526	ft
CDEN	Cement Density	HGNS-H	2	g/cm ³
DFD	Drilling Fluid Density	Borehole	8.7	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DHC	Density Hole Correction	HDRS-H	Bit Size	
FCD	Future Casing (Outer) Diameter	WLSESSION	7	in
FD	Fluid Density	Borehole	1	g/cm ³
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	46	degF
NPRM	HRDD Nuclear Processing Mode	HDRS-H	High Resolution	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	1.09	ohm.m
SOCO	Standoff Correction Option	HGNS-H	Yes	

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	1800	ft/h

One

High Resolution Porosity 10" = 100'

Integration Summary

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

Acquisition System	Version
MaxWell	3.1.9755.0
Application Patch	SP-20120723-3.1.9755.1112
	EXP_APL-MAST-3.1.9755.1419
	EXP_APL-NEXTA-3.1.9755.1340

Computation	Description	Version
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
HRGD-H	HILT Resistivity Gamma-Ray Density Device, 150 degC	3.1.9755.0	3.0
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.1.9755.0	2.0

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
One	Log[5]:Up	Up	468.98 ft	3288.06 ft	28-Feb-2013 7:51:04 AM	28-Feb-2013 9:32:53 AM	0.30 ft	

All depths are referenced to toolstring zero

Log

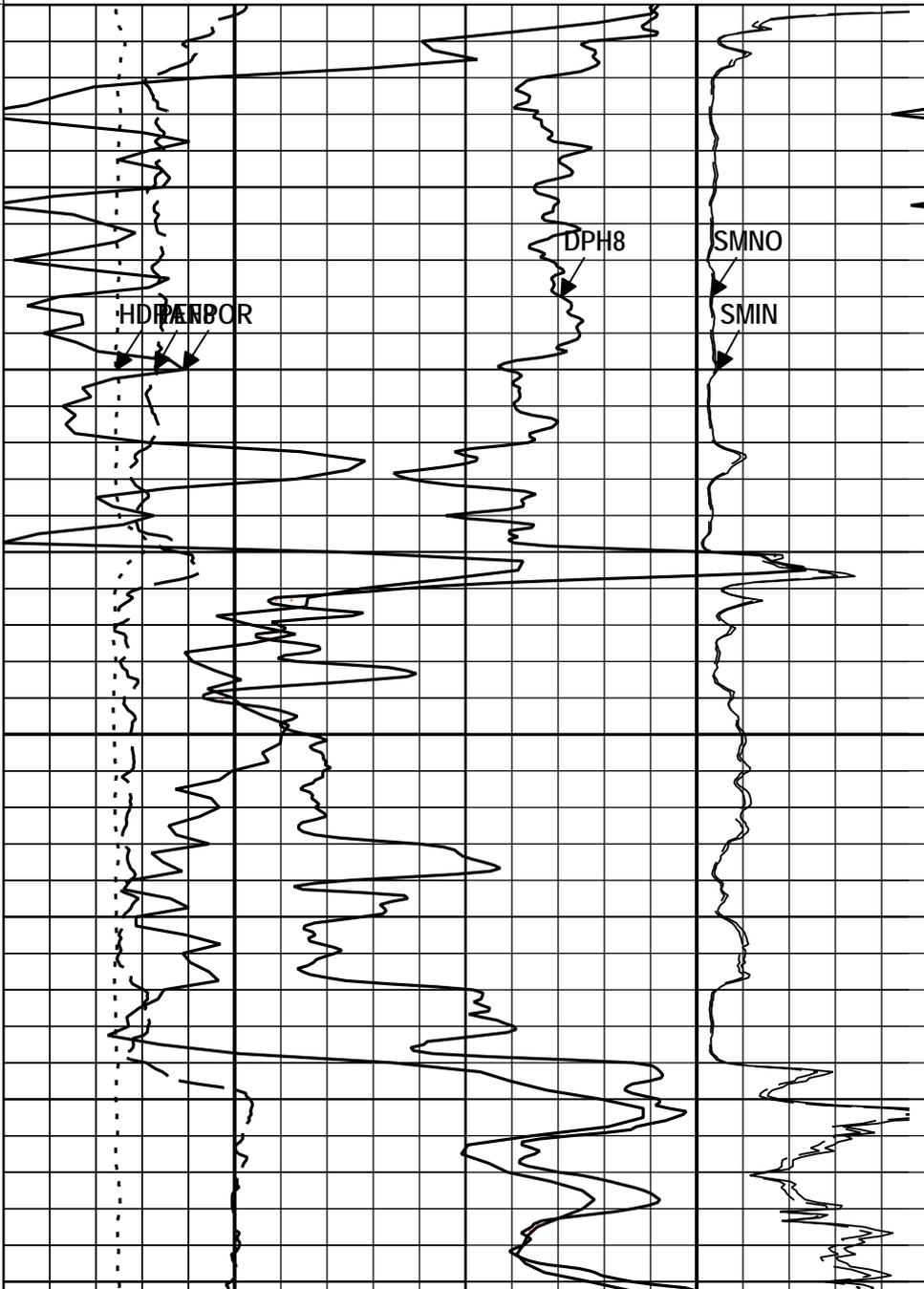
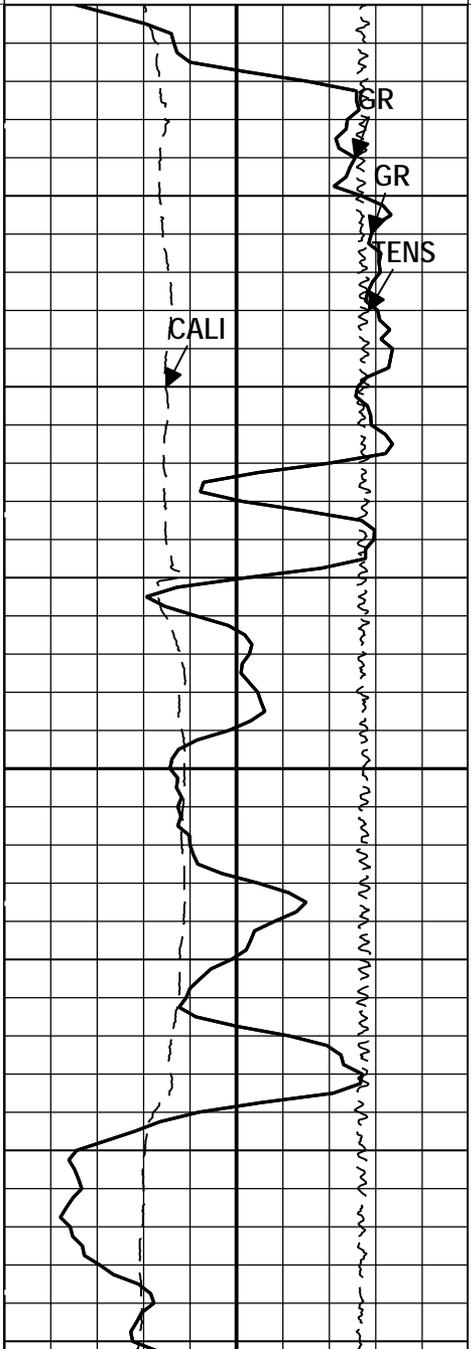
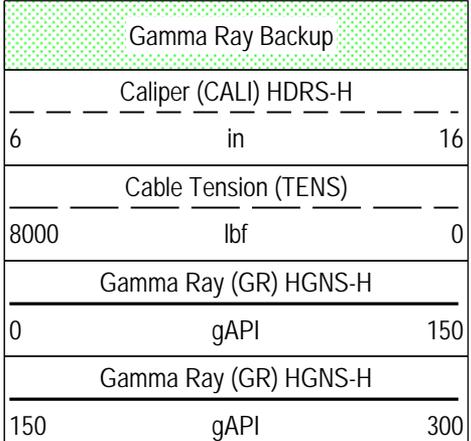
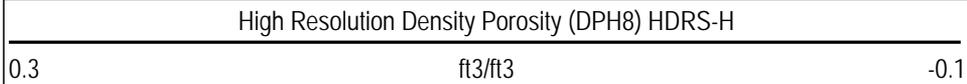
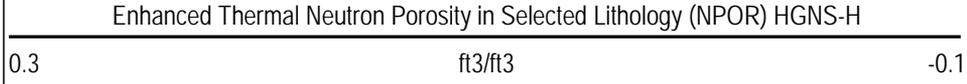
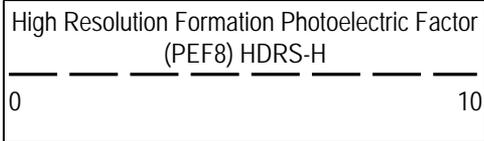
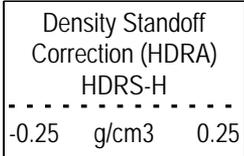
One: Log[5]:Up

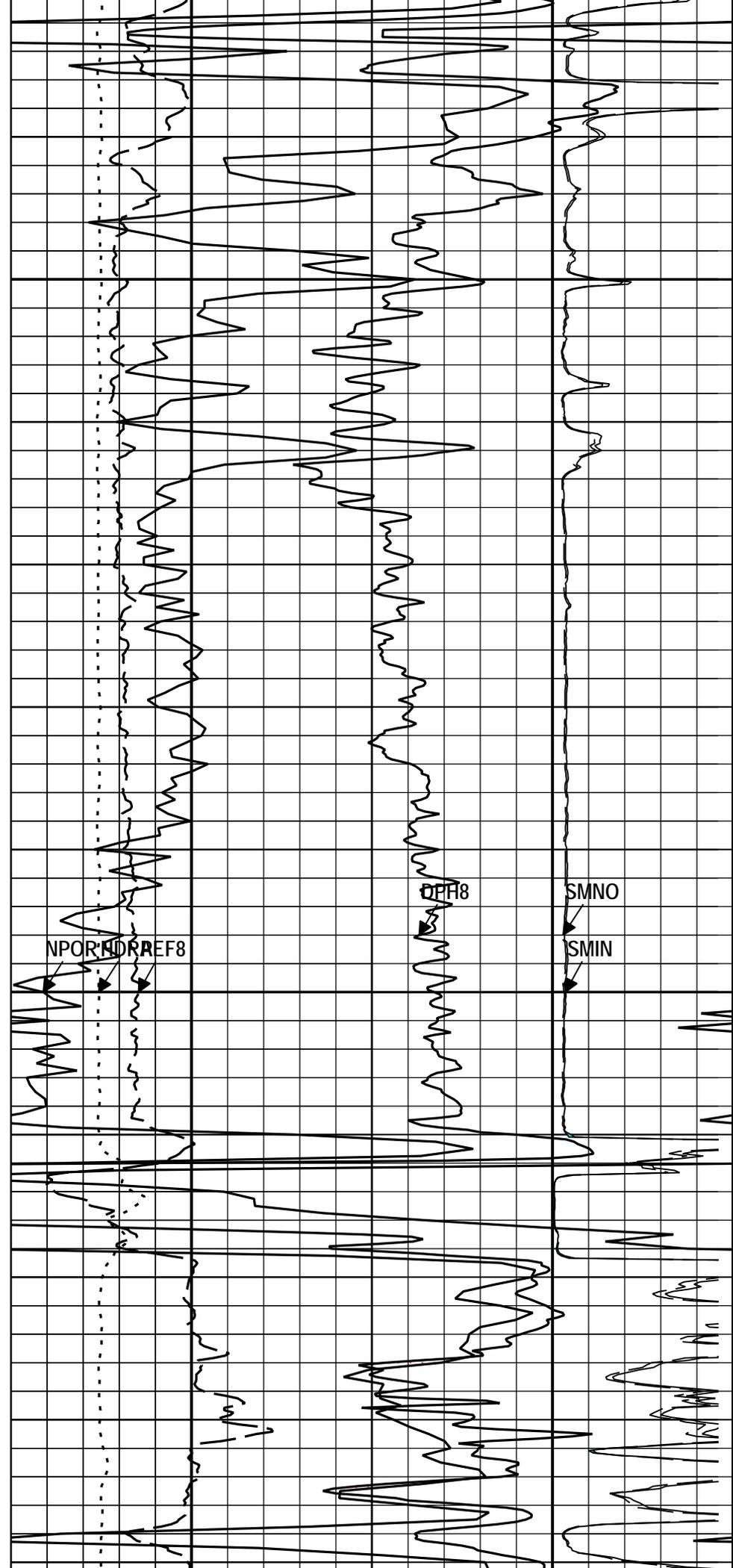
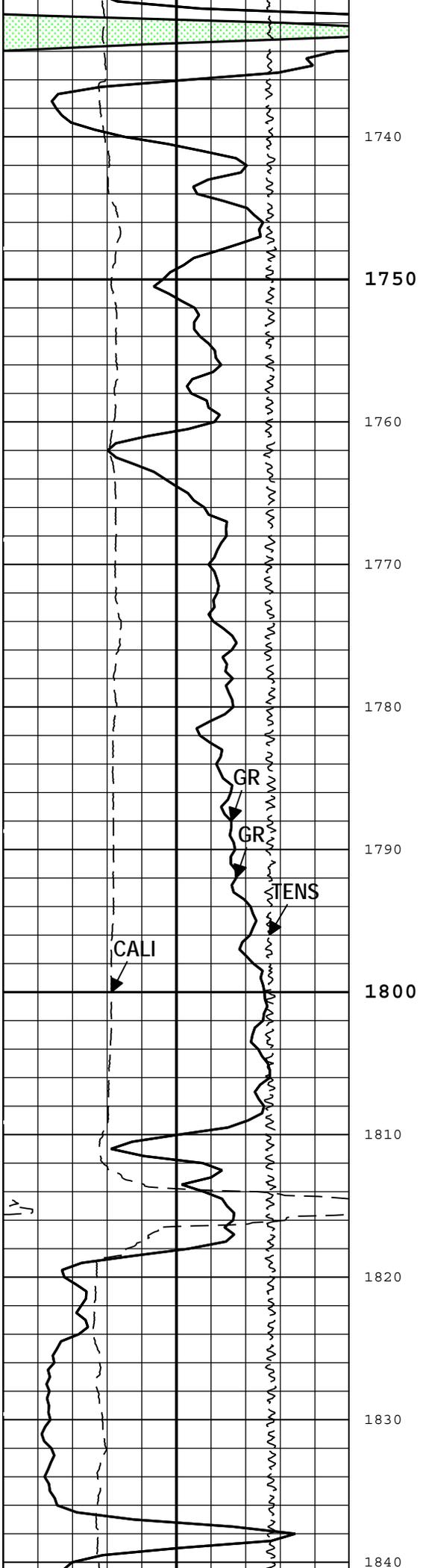
Description: Monosensor densities for Platform Express Format: Log (Density 2 in) Index Scale: 10 in per 100 ft Index Unit: ft Index Type: Measured
 Depth Creation Date: 28-Feb-2013 10:59:18

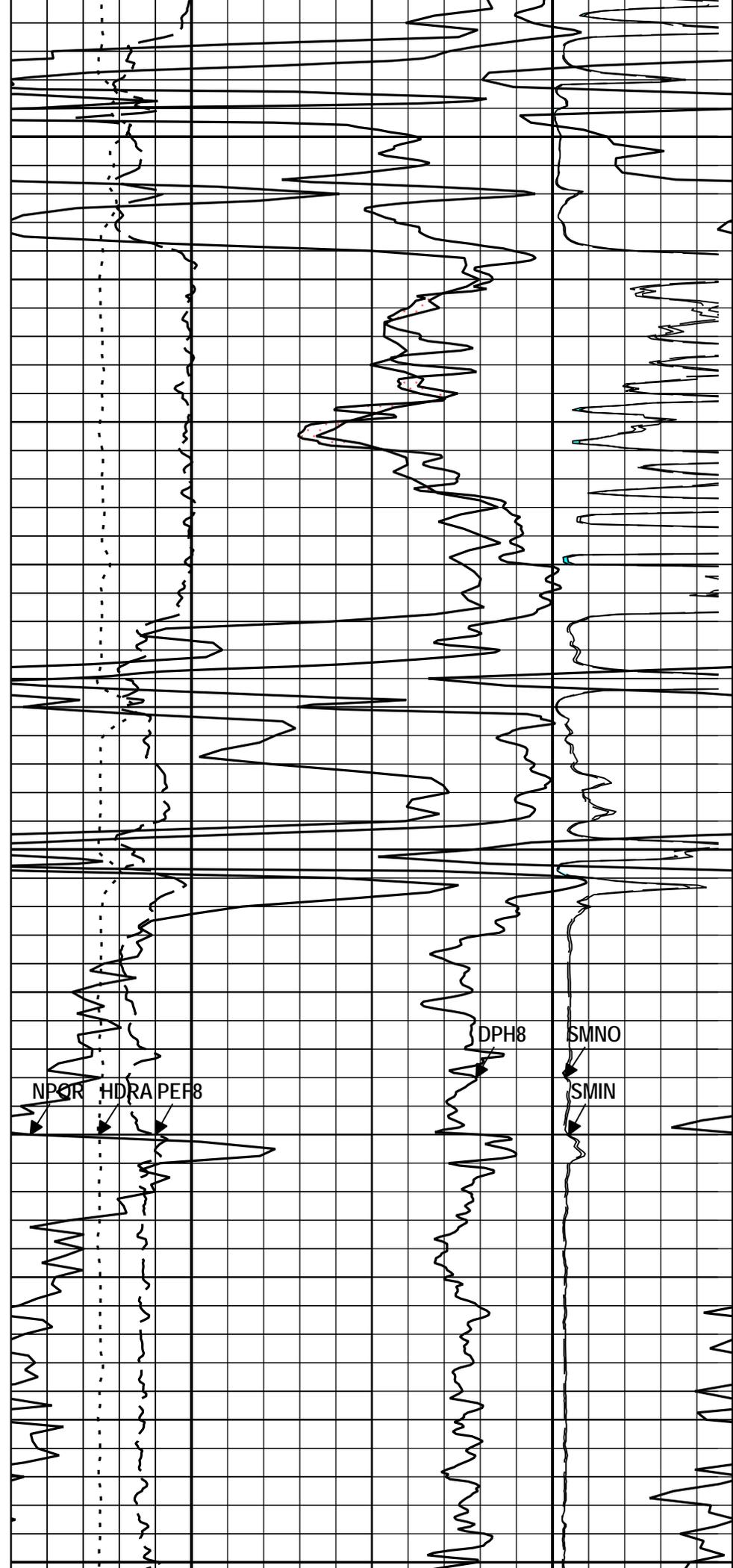
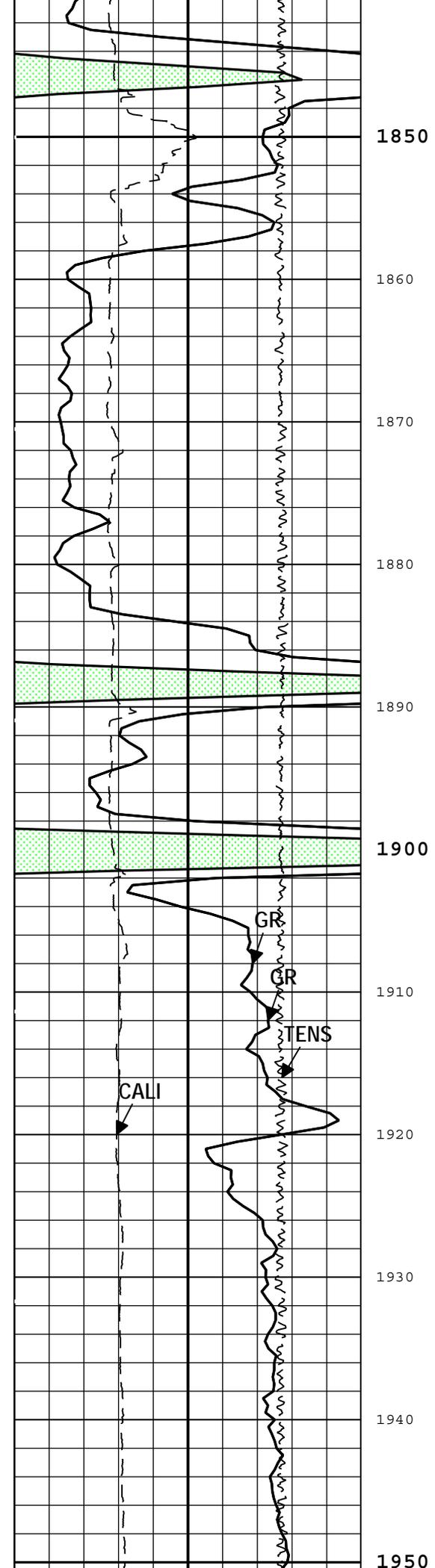
Channel	Source	Sampling
CALI	HDRS-H:HRCC-H:HRCC-H	1in
DPH8	HDRS-H:HRMS-H:HRGD-H	2in
GR	HGNS-H:HGNS-H:HGNS-H	6in
HDRA	HDRS-H:HRMS-H:HRGD-H	2in
NPOR	HGNS-H:HGNS-H:HGNS-H	6in
PEF8	HDRS-H:HRMS-H:HRGD-H	2in
SMIN	HDRS-H:HRMS-H:HRGD-H	2in
SMNO	HDRS-H:HRMS-H:HRGD-H	2in
TENS	WLWorkflow	1in
TIME_1900	WLWorkflow	0.1in

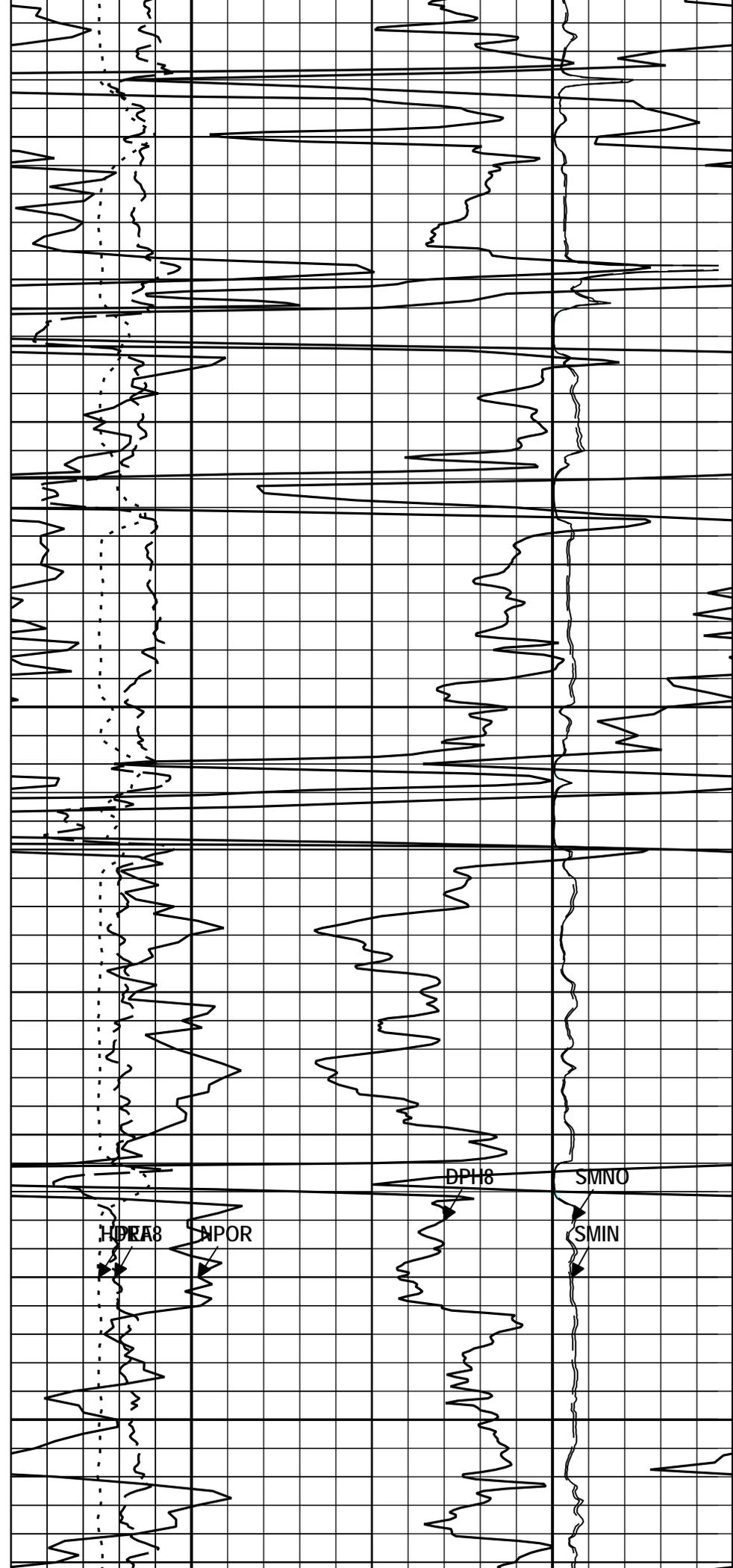
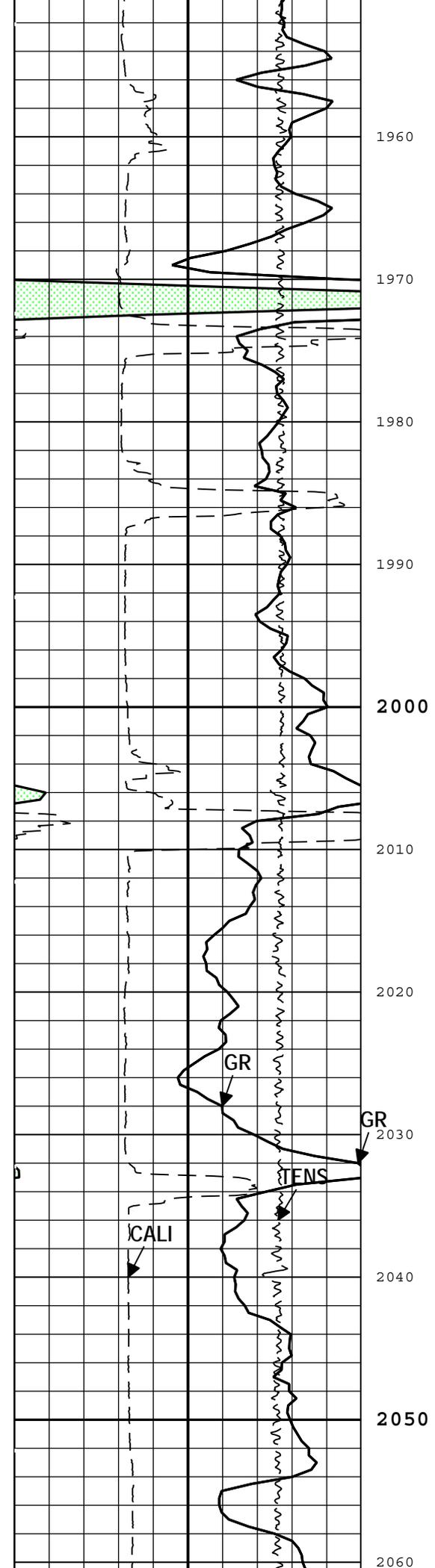
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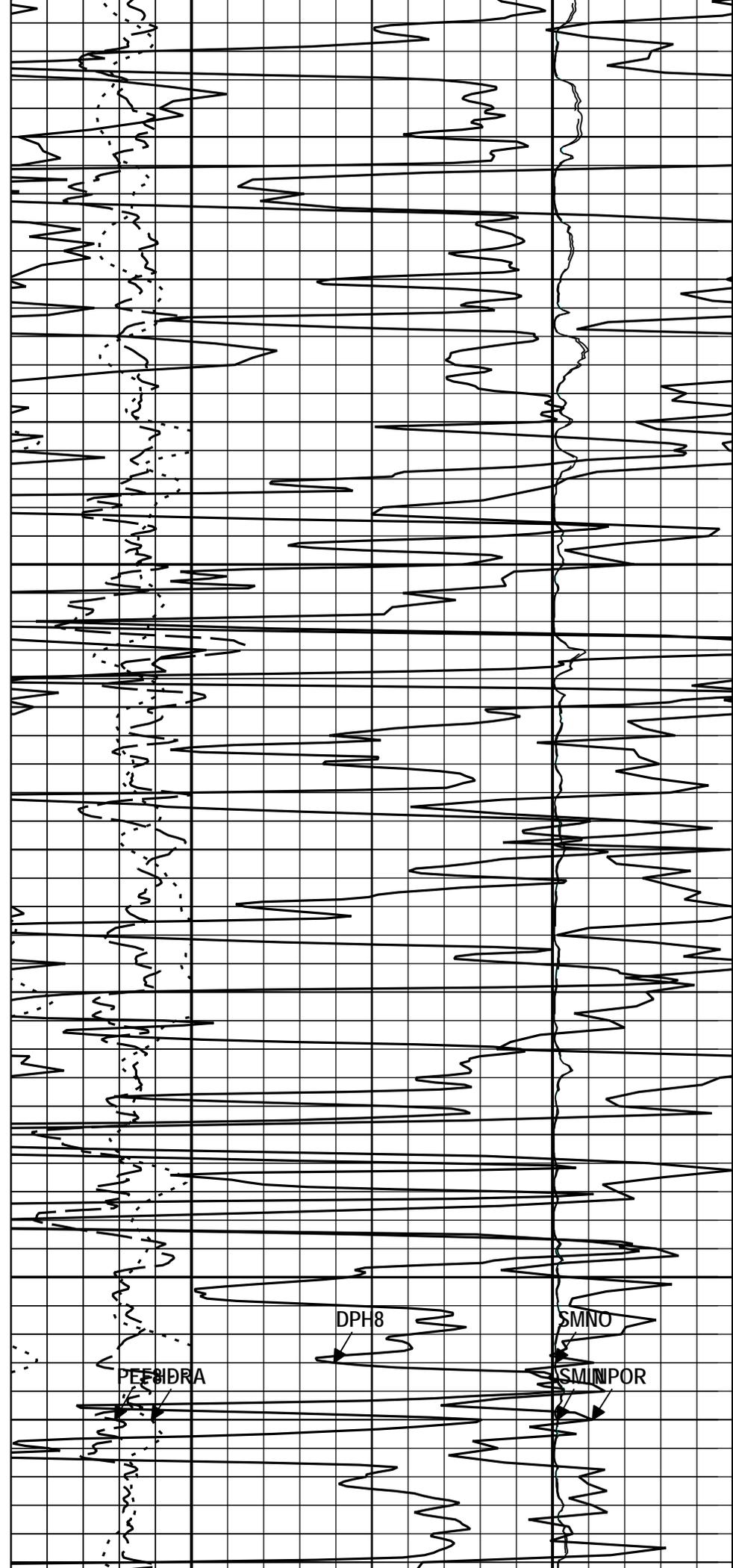
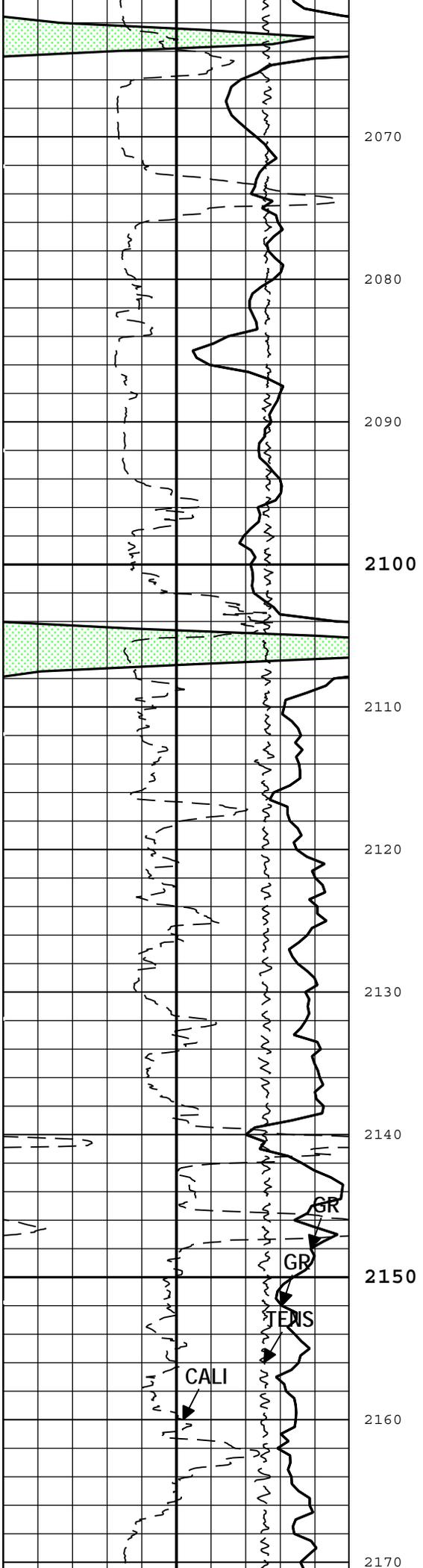
Possible Permeability		
Synthetic Micro-Inverse Resistivity (SMIN) HDRS-H		
0	ohm.m	80
Synthetic Micro-Normal Resistivity (SMNO) HDRS-H		
0	ohm.m	80

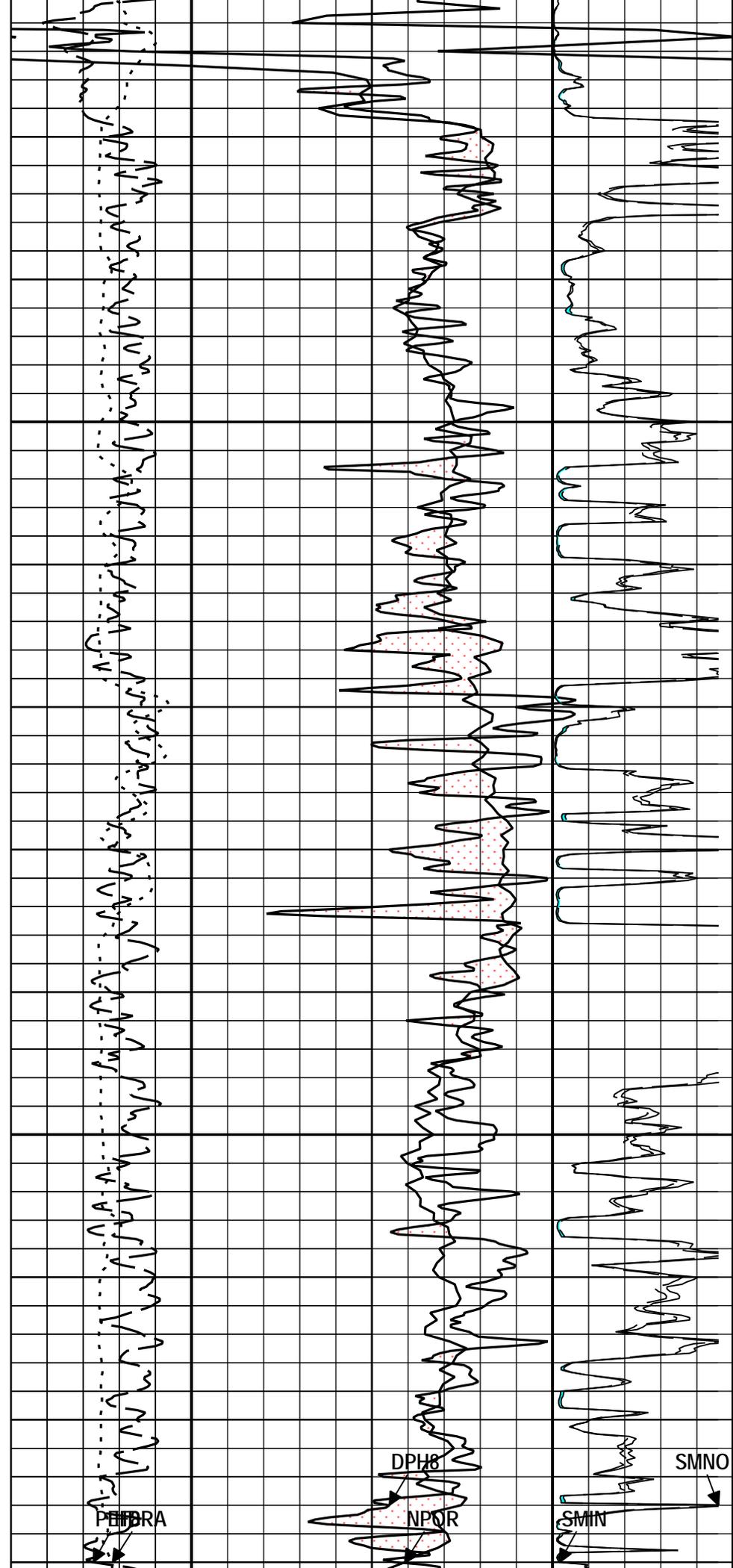
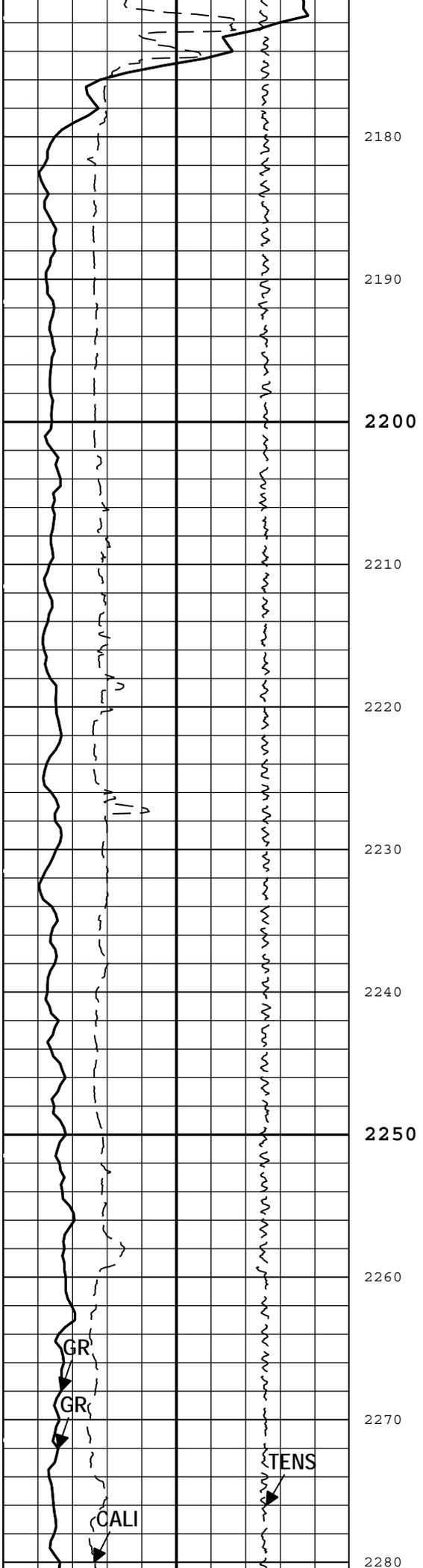


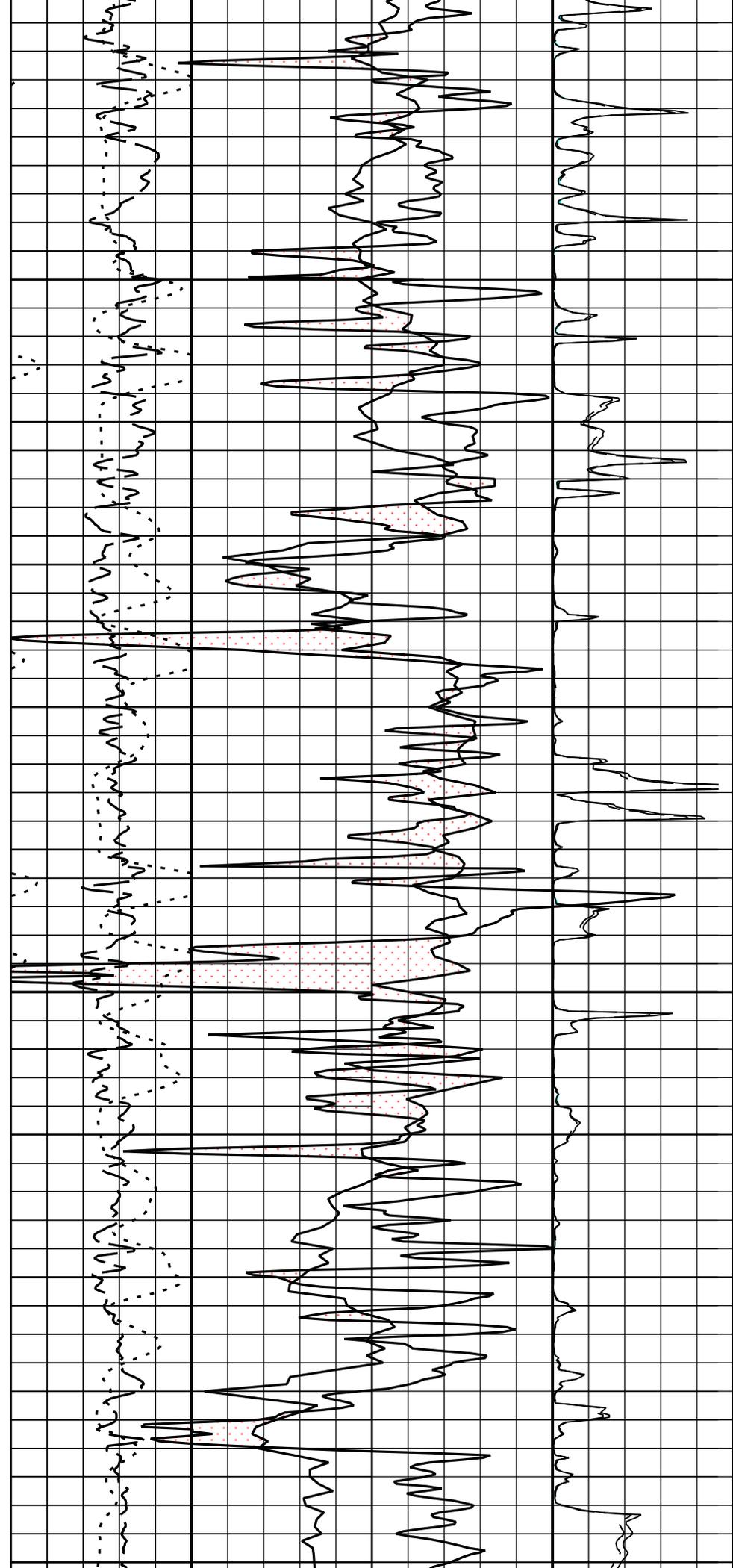
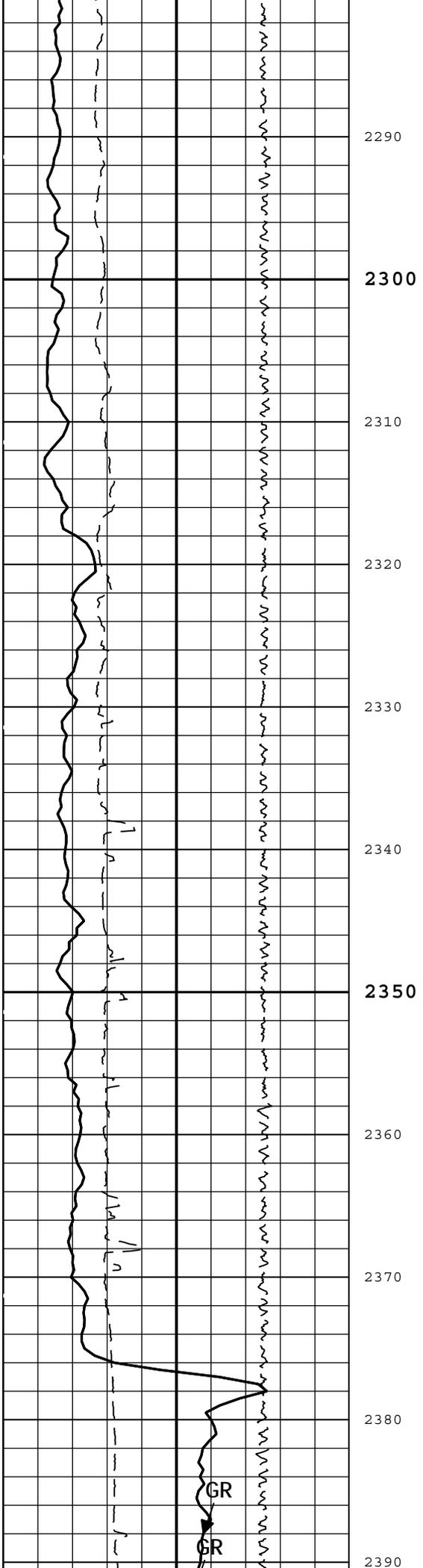


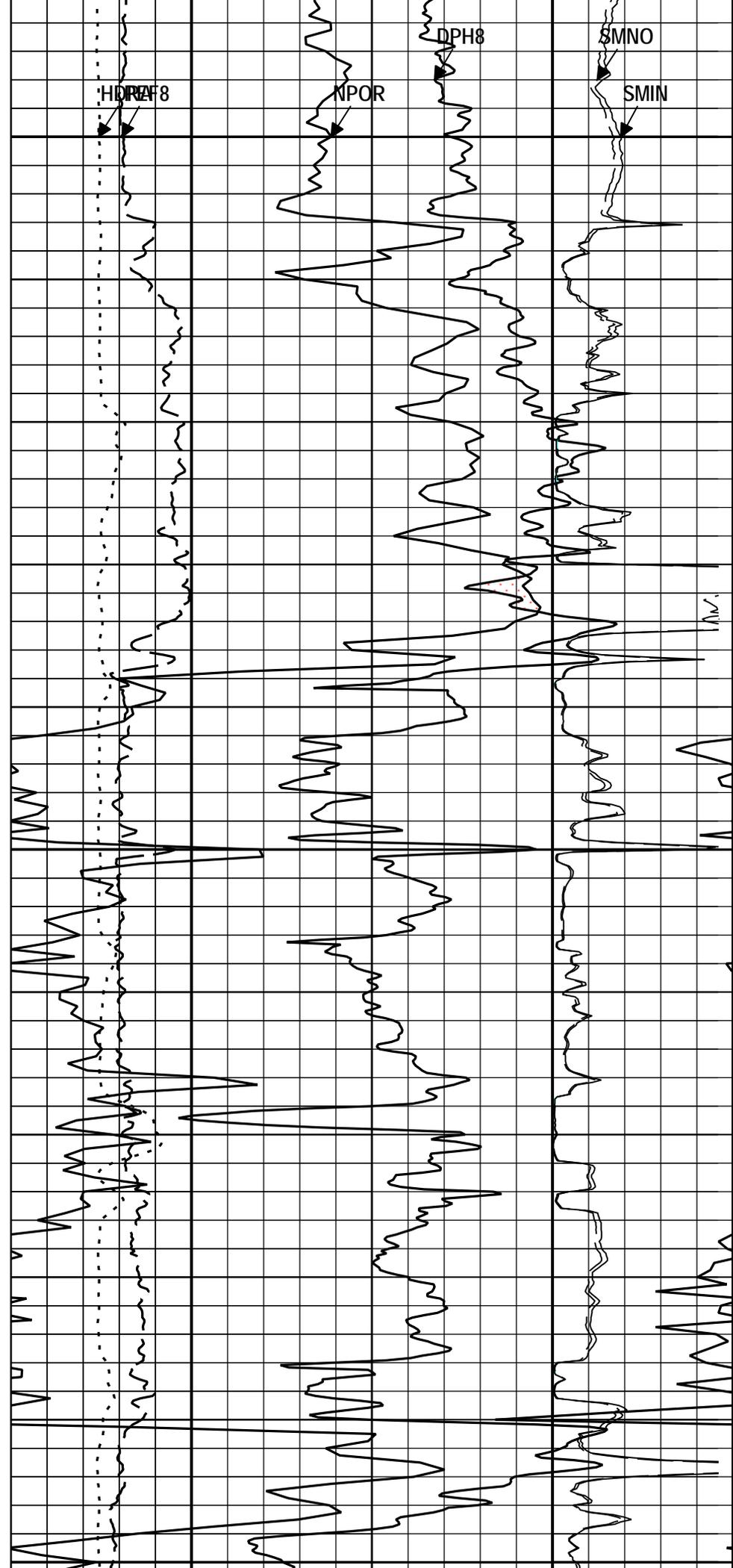
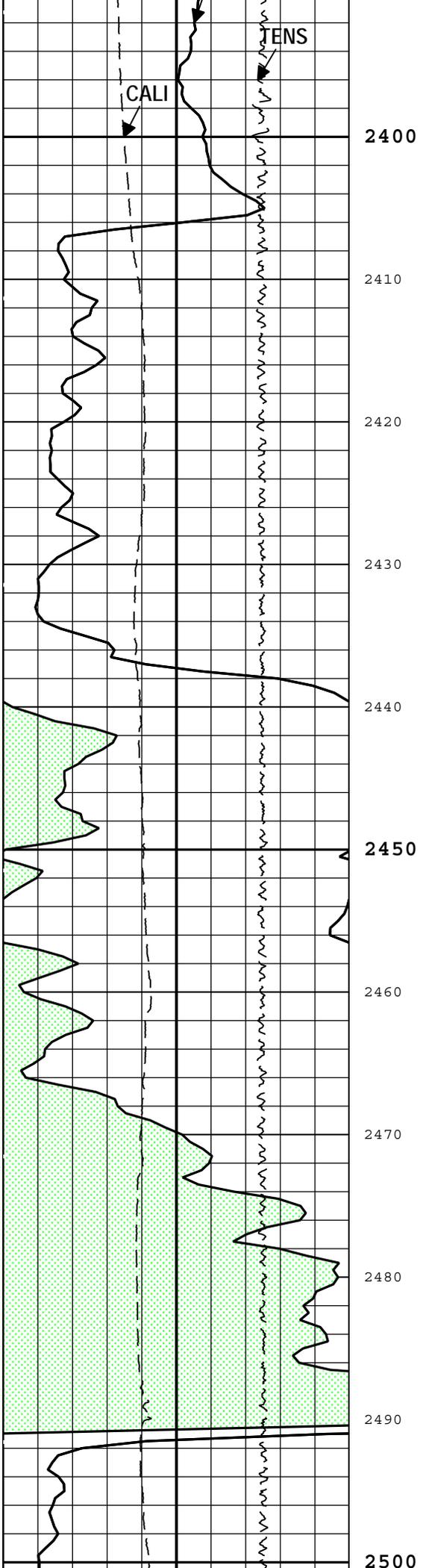


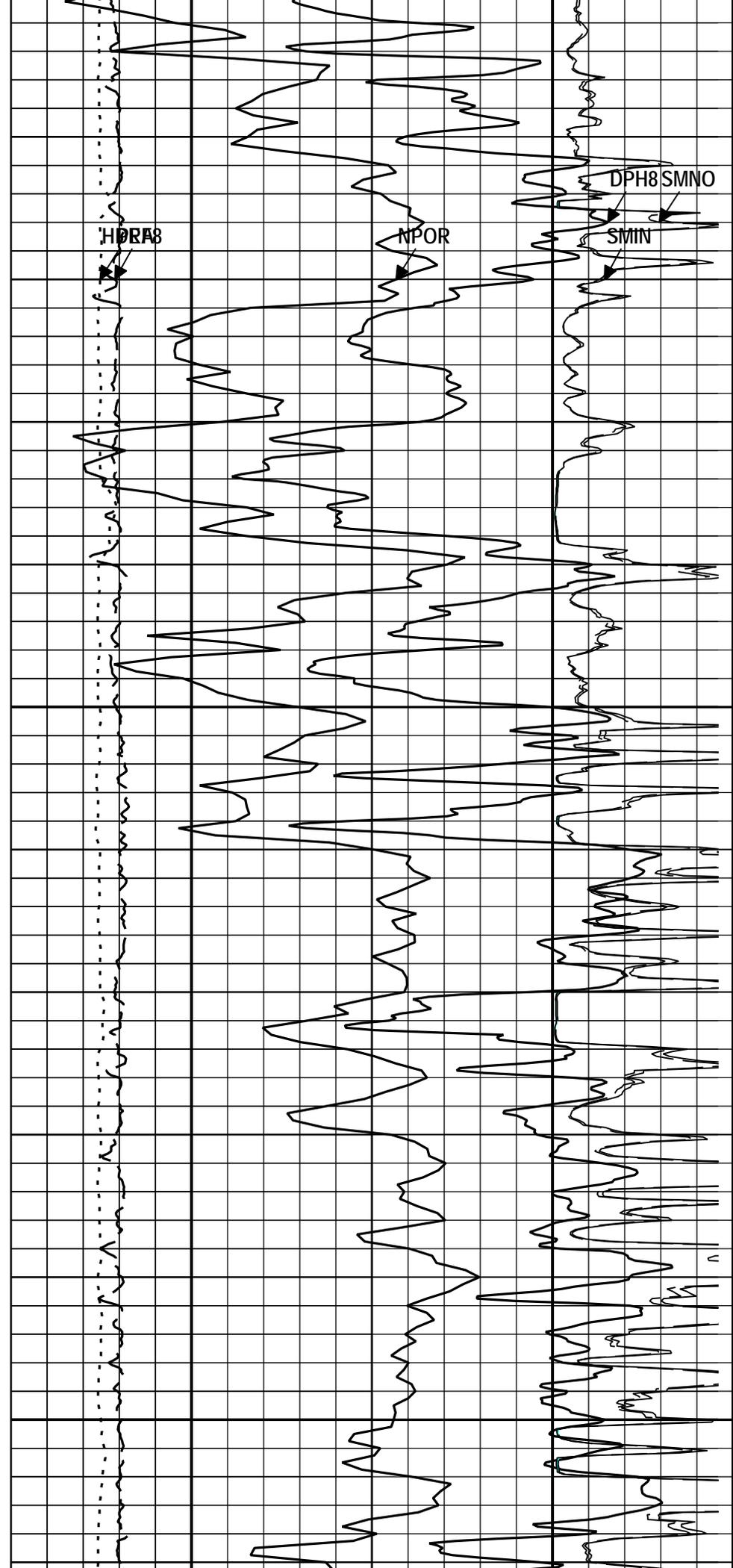
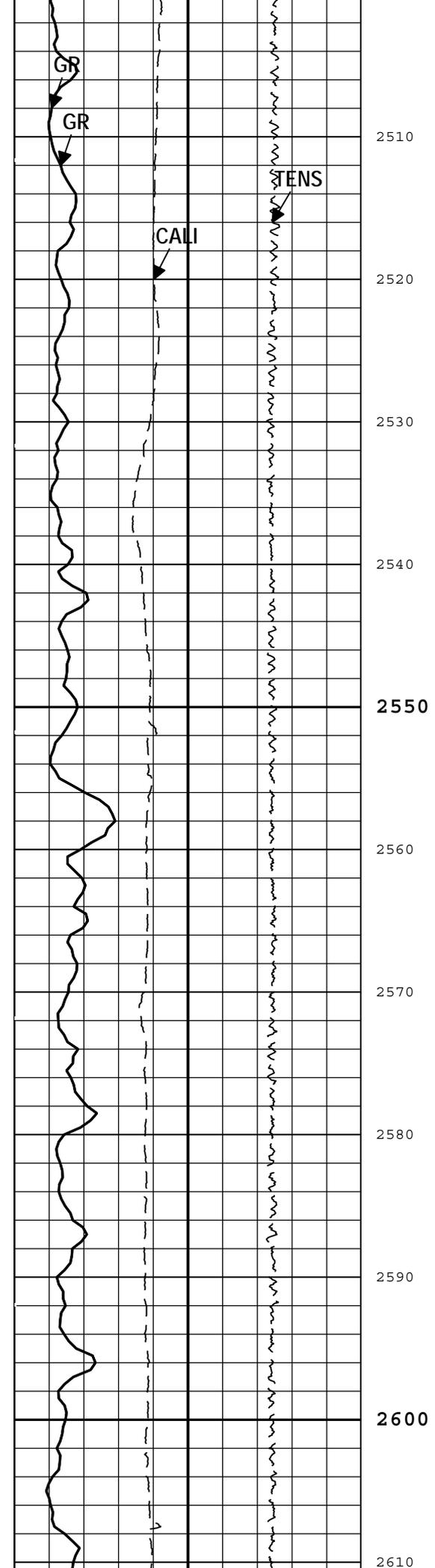


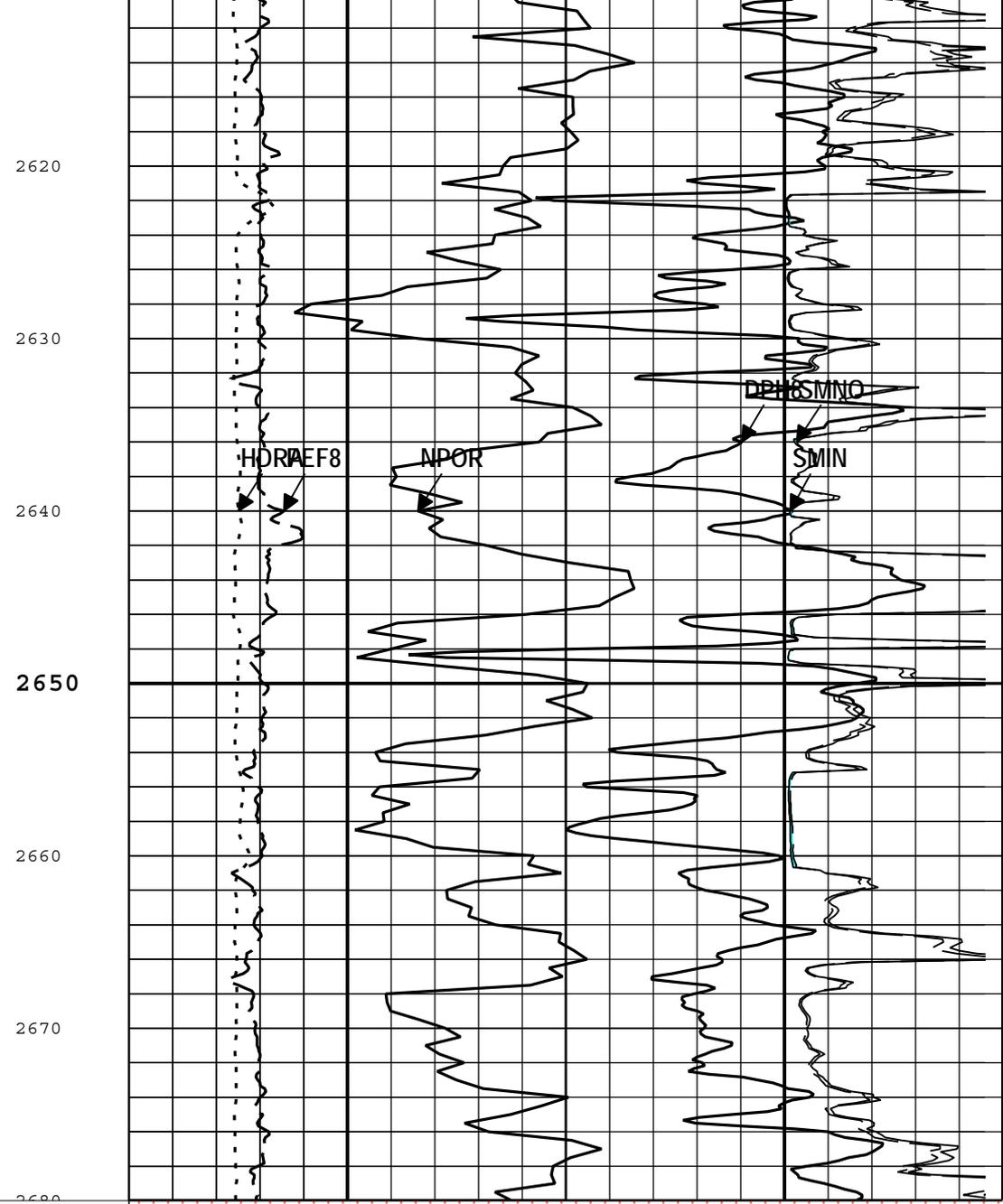
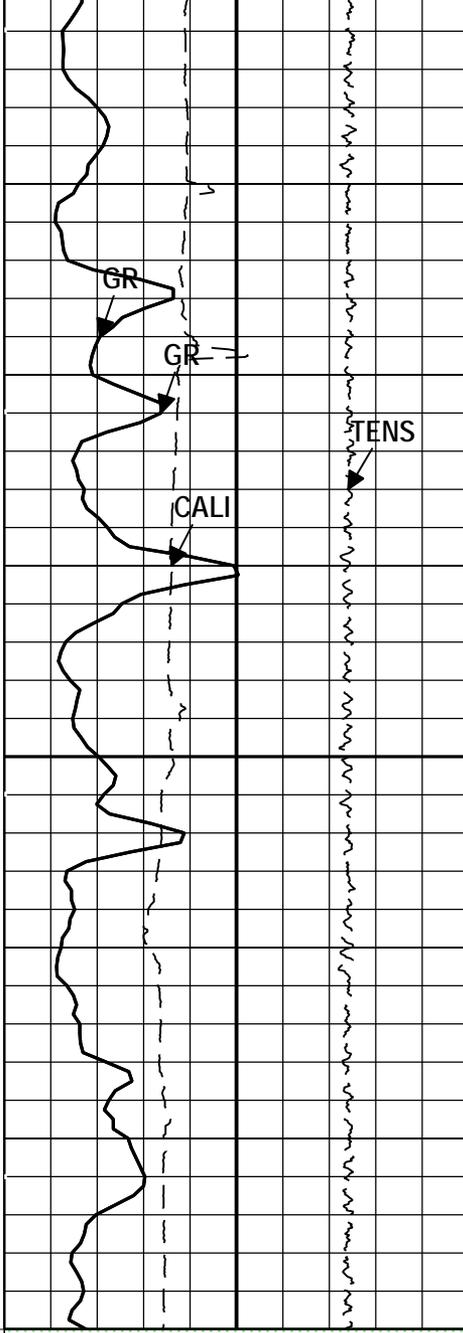












Gamma Ray Backup		
Caliper (CALI) HDRS-H		
6	in	16
Cable Tension (TENS)		
8000	lbf	0
Gamma Ray (GR) HGNS-H		
0	gAPI	150
Gamma Ray (GR) HGNS-H		
150	gAPI	300

Gas		
Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H		
0.3	ft3/ft3	-0.1
High Resolution Density Porosity (DPH8) HDRS-H		
0.3	ft3/ft3	-0.1
High Resolution Formation Photoelectric Factor (PEF8) HDRS-H		
0		10

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

Possible Permeability		
Synthetic Micro-Inverse Resistivity (SMIN) HDRS-H		
0	ohm.m	80
Synthetic Micro-Normal Resistivity (SMNO) HDRS-H		
0	ohm.m	80

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	8.75	in
BSAL	Borehole Salinity	Borehole	6527.73	ppm
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.05	in
CBLO	Casing Bottom (Logger)	WLSESSION	526	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
DFD	Drilling Fluid Density	Borehole	8.7	lbm/gal
DFT	Drilling Fluid Type	Borehole	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	46	degF
NPRM	HRDD Nuclear Processing Mode	HDRS-H	High Resolution	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	1.09	ohm.m
SOCO	Standoff Correction Option	HGNS-H	Yes	

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	1800	ft/h

One

Repeat Analysis

Pass Summary								
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
One	Log[3]:Up	Up	2016.75 ft	2598.28 ft	28-Feb-2013 6:59:28 AM	28-Feb-2013 7:29:22 AM	0.00 ft	
One	Log[5]:Up	Up	468.98 ft	3288.06 ft	28-Feb-2013 7:51:04 AM	28-Feb-2013 9:32:53 AM	0.30 ft	

All depths are referenced to toolstring zero

Log	One: Log[5]:Up
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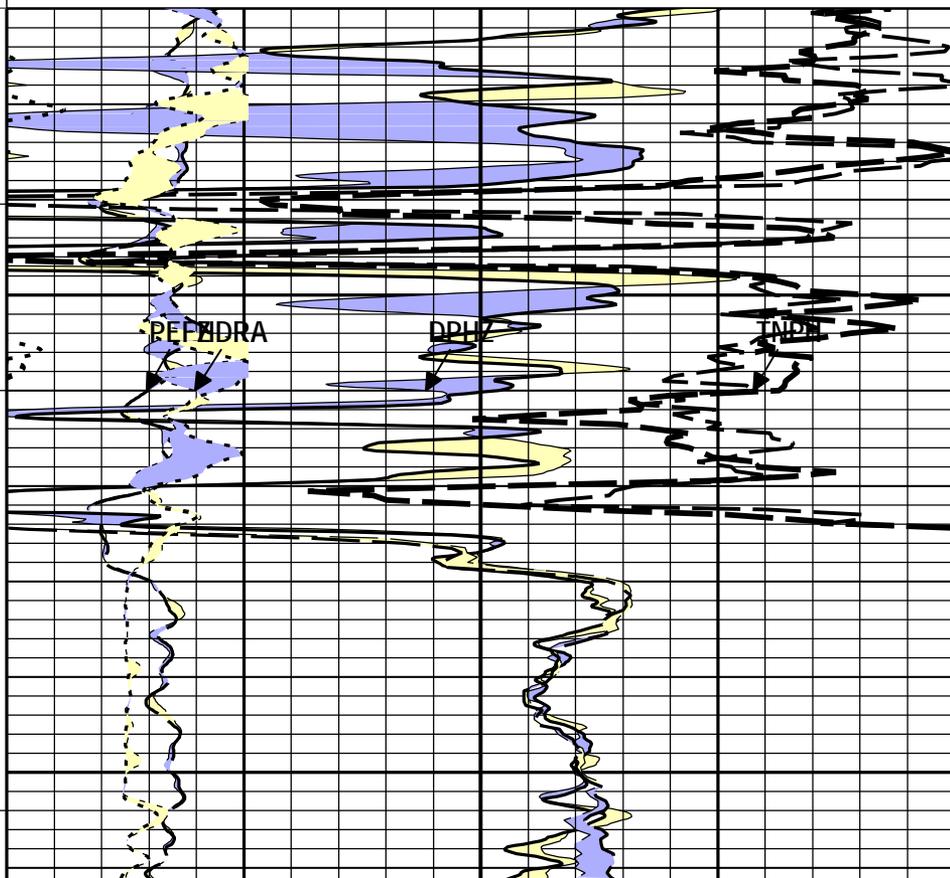
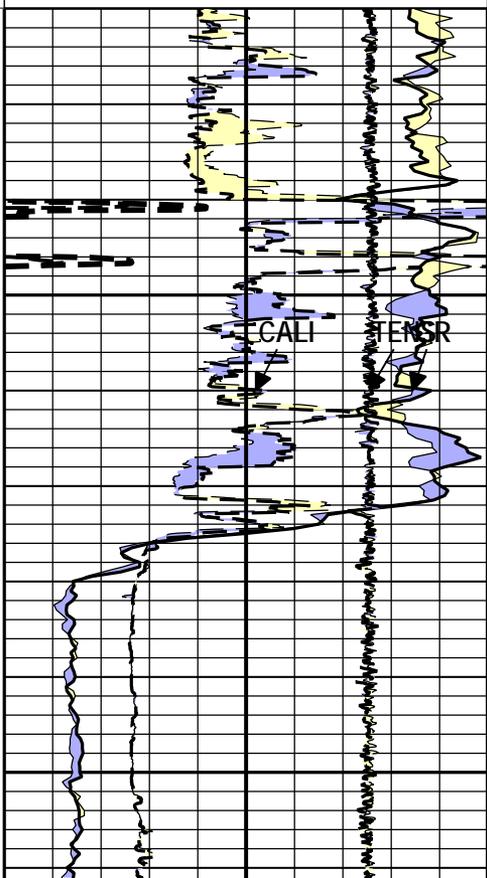
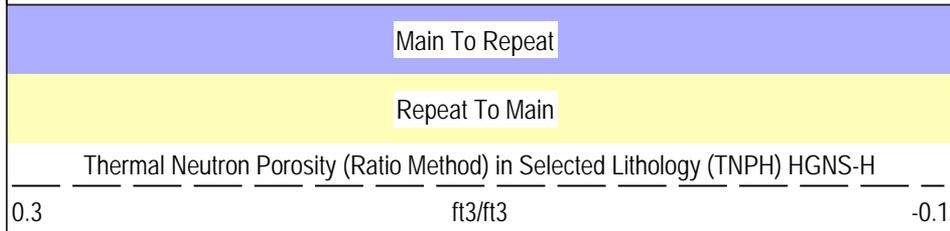
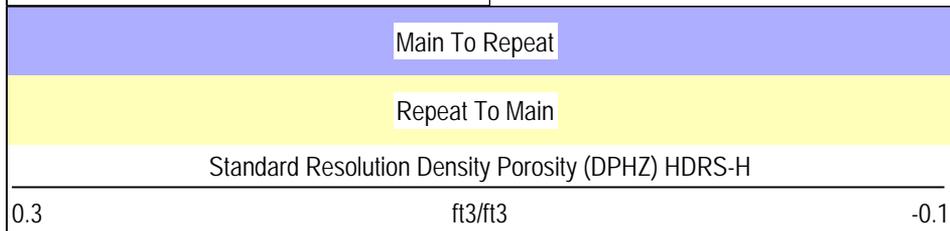
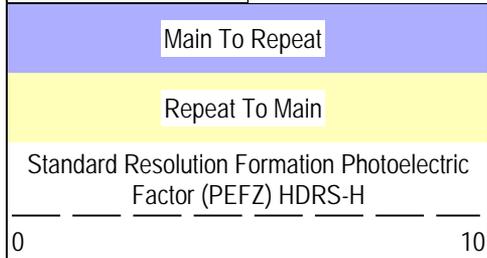
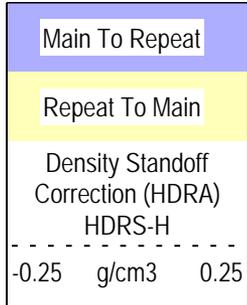
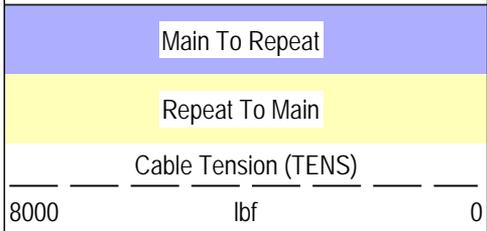
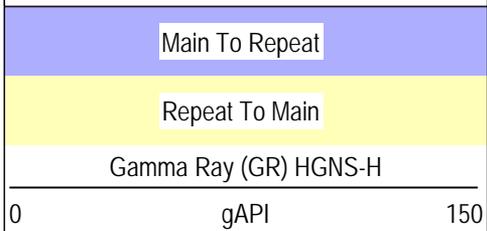
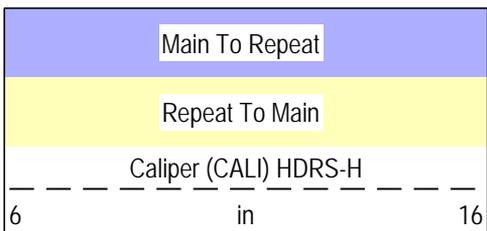
Channel	Source	Sampling
ICV	Borehole	6in
IHV	Borehole	6in

—ICV - Integrated Cement Volume every 10.00 (ft3)

—IHV - Integrated Hole Volume every 100.00 (ft3)

—IHV - Integrated Hole Volume every 10.00 (ft3)

—ICV - Integrated Cement Volume every 100.00 (ft3)

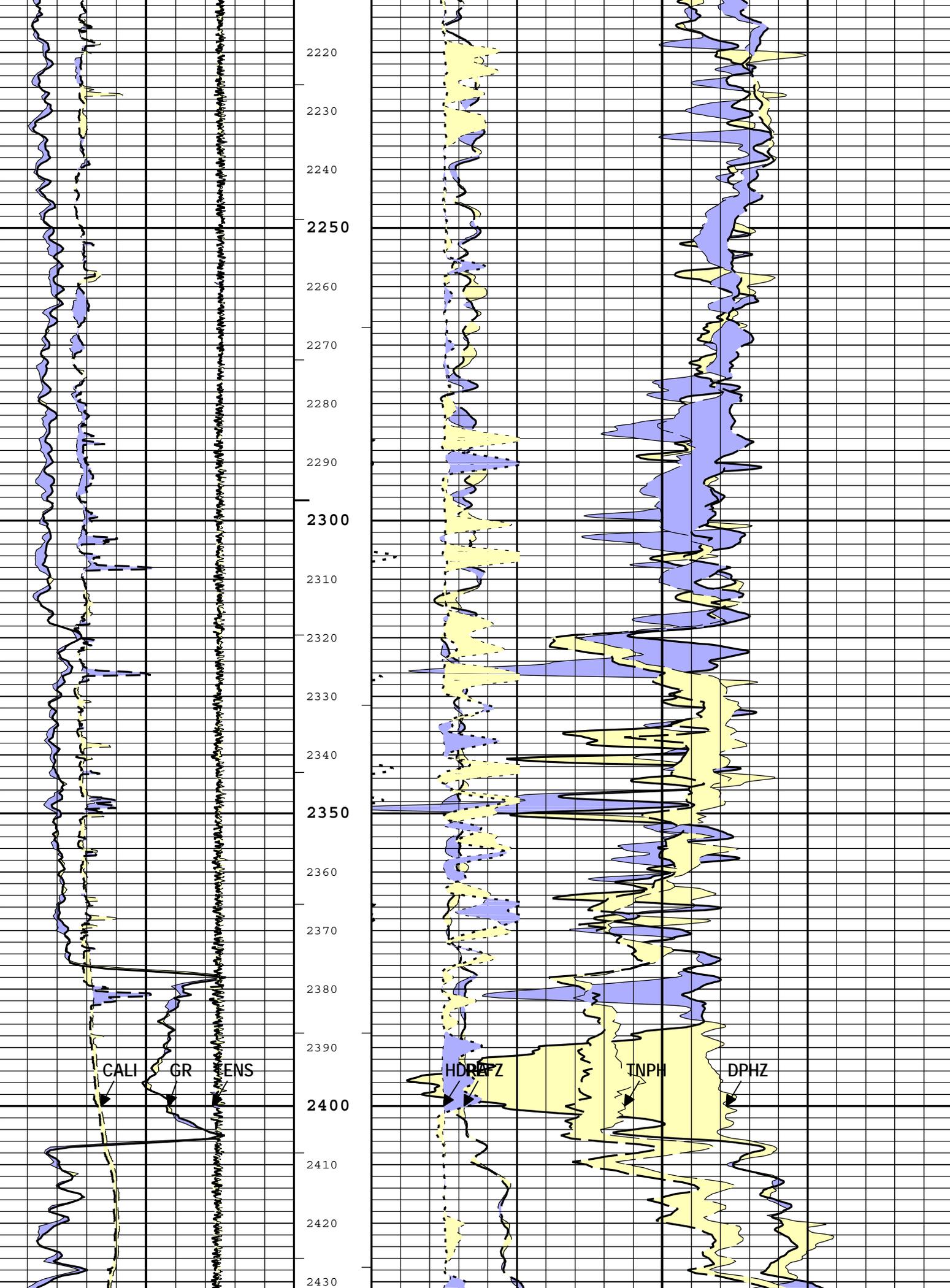


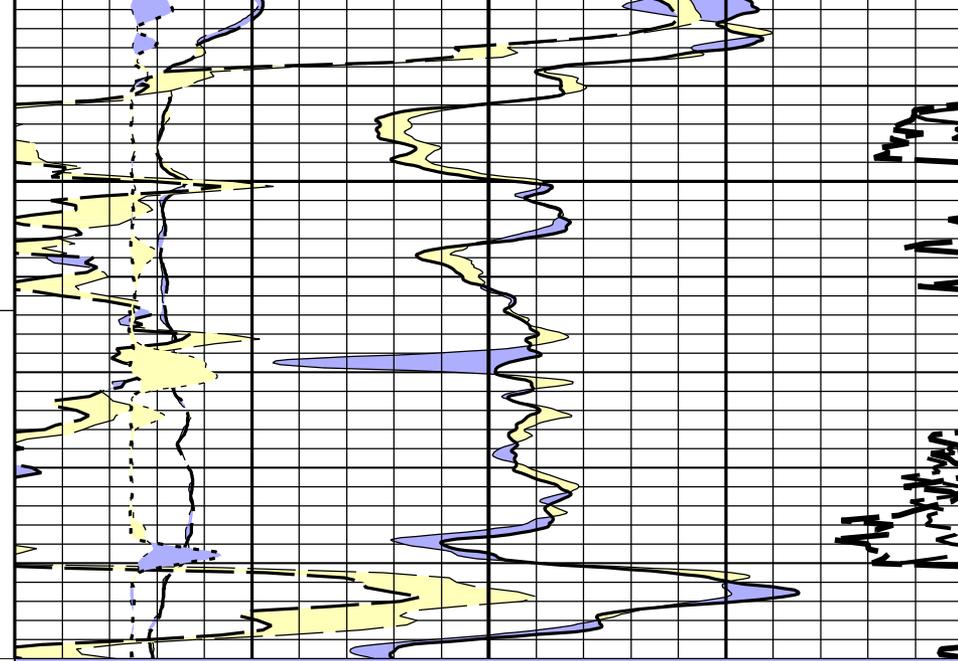
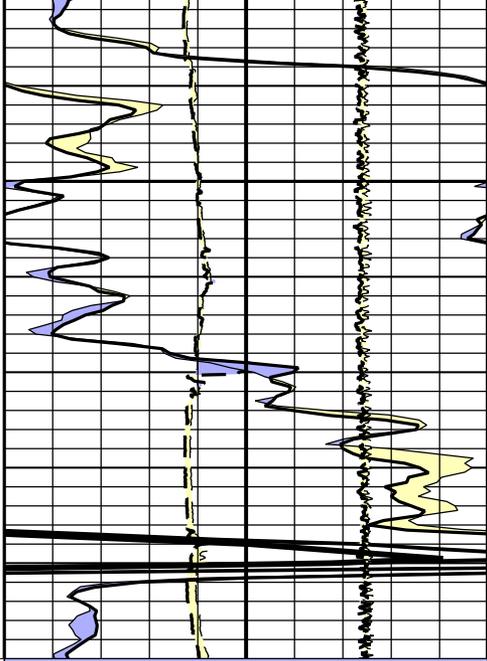
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2280
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2300
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2340
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2360
2370
2380
2390
2400
2410
2420
2430

CALI GR ENS

HDREZ INPH DPHZ





Main To Repeat

Repeat To Main

Caliper (CALI) HDRS-H

6 in 16

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

Gamma Ray (GR) HGNS-H

0 gAPI 150

Main To Repeat

Repeat To Main

Thermal Neutron Porosity (Ratio Method) in Selected Lithology (TNPH) HGNS-H

0.3 ft3/ft3 -0.1

Main To Repeat

Repeat To Main

Gamma Ray (GR) HGNS-H

150 gAPI 300

Main To Repeat

Repeat To Main

Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H

0 10

Main To Repeat

Repeat To Main

Cable Tension (TENS)

8000 lbf 0

Main To Repeat

Repeat To Main

Density Standoff Correction (HDRA) HDRS-H

-0.25 g/cm3 0.25

- ICV - Integrated Cement Volume every 100.00 (ft3)
- | IHV - Integrated Hole Volume every 10.00 (ft3)
- | IHV - Integrated Hole Volume every 100.00 (ft3)
- ICV - Integrated Cement Volume every 10.00 (ft3)

Description: Nuclear standard resolution template for Platform Express Format: Log (Porosity 5 inch RA_1) Index Scale: 5 in per 100 ft Index Unit: ft
 Index Type: Measured Depth Creation Date: 28-Feb-2013 10:59:20

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
IHV	Integrated Hole Volume	GCSE_UP_PASS	1350.25	ft3
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	612.38	ft3

Software Version

Acquisition System	Version
MaxWell	3.1.9755.0
Application Patch	SP-20120723-3.1.9755.1112
	EXP_APL-MAST-3.1.9755.1419
	EXP_APL-NEXTA-3.1.9755.1340

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	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
HRGD-H	HILT Resistivity Gamma-Ray Density Device, 150 degC	3.1.9755.0	3.0
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.1.9755.0	2.0

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
One	Log[5]:Up	Up	468.98 ft	3288.06 ft	28-Feb-2013 7:51:04 AM	28-Feb-2013 9:32:53 AM	0.30 ft	

All depths are referenced to toolstring zero

Log

One: Log[5]:Up

Description: Nuclear standard resolution template for Platform Express Format: Log (Bulk Density_5 Inch) Index Scale: 5 in per 100 ft Index Unit: ft
 Index Type: Measured Depth Creation Date: 28-Feb-2013 10:59:21

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
ICV	Borehole	6in
IHV	Borehole	6in
PEFZ	HDRS-H:HRMS-H:HRGD-H	2in
RHOZ	HDRS-H:HRMS-H:HRGD-H	2in
TENS	WLWorkflow	6in

TIME_1900 - Time Marked every 60.00 (s)

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

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

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

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

Backup Gamma Ray

Caliper (CALI) HDRS-H

6 in 16

Cable Tension (TENS)

8000 lbf 0

Gamma Ray (GR) HGNS-H

0 gAPI 150

Gamma Ray (GR) HGNS-H

Density Standoff
Correction (HDRA)
HDRS-H

-0.25 g/cm3 0.25

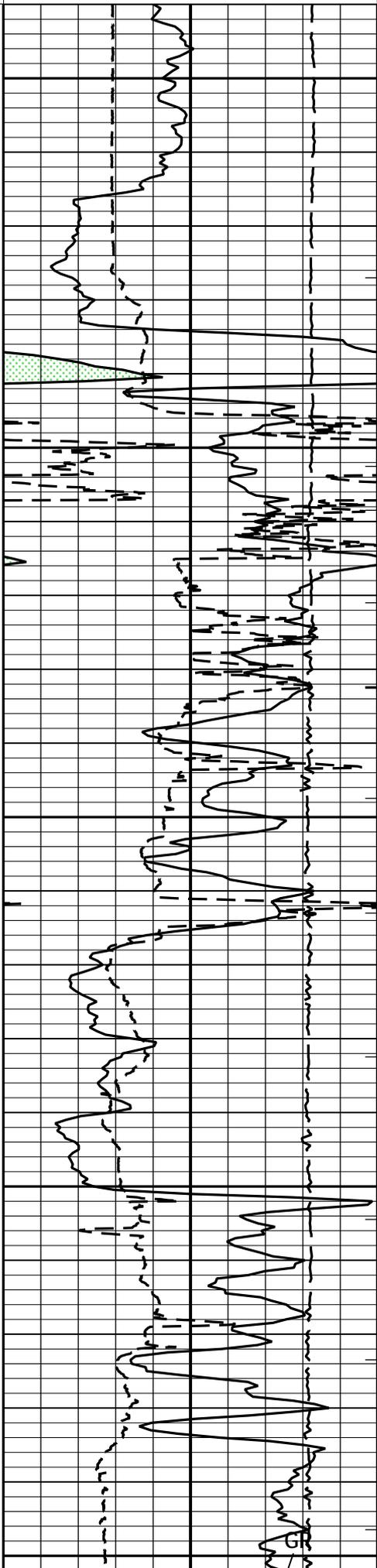
Standard Resolution Formation Photoelectric
Factor (PEFZ) HDRS-H

0 10

Standard Resolution Formation Density (RHOZ) HDRS-H

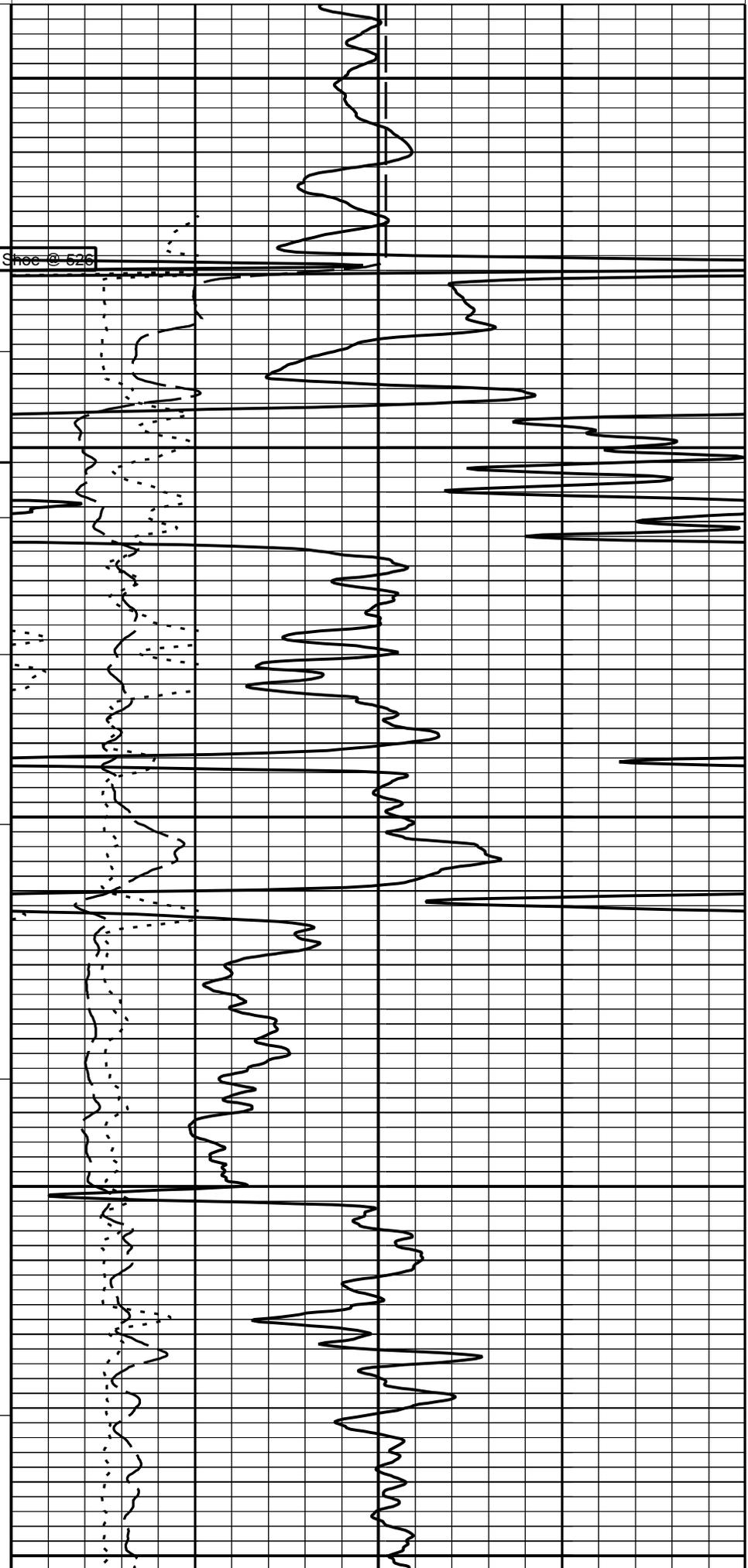
150 gAPI 300

2 g/cm3 3

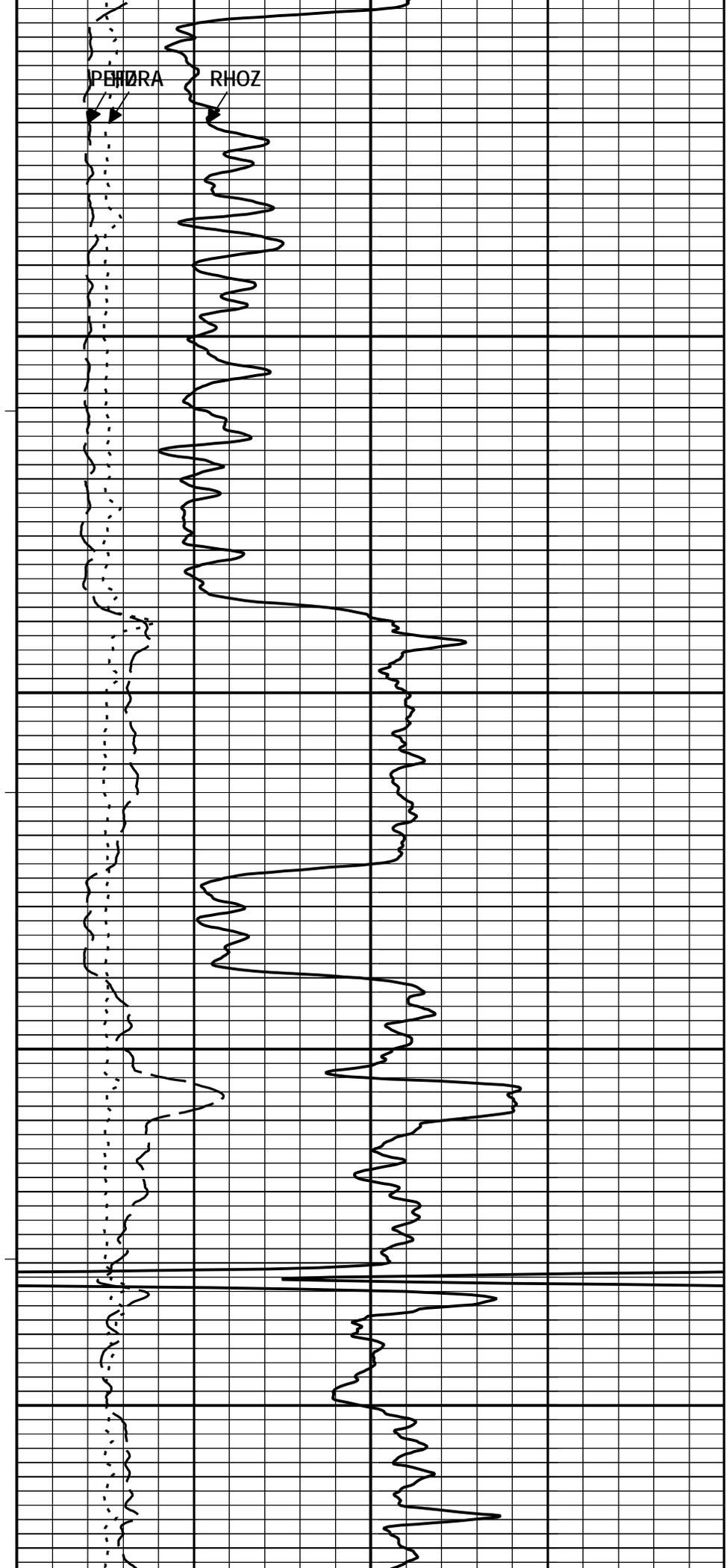
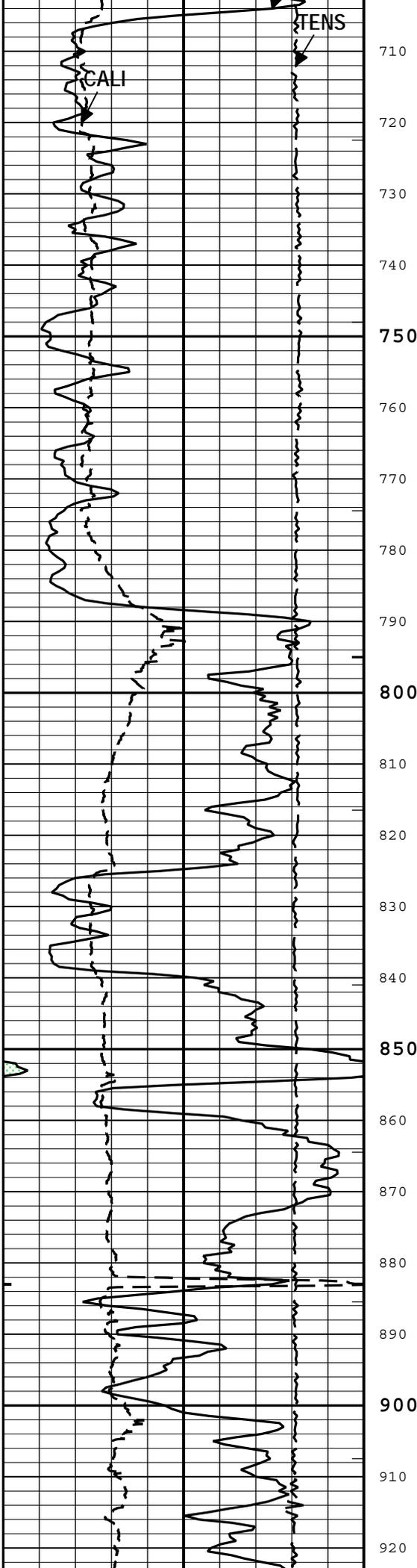


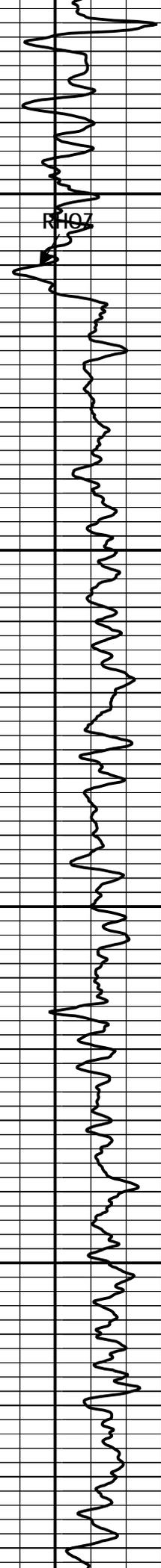
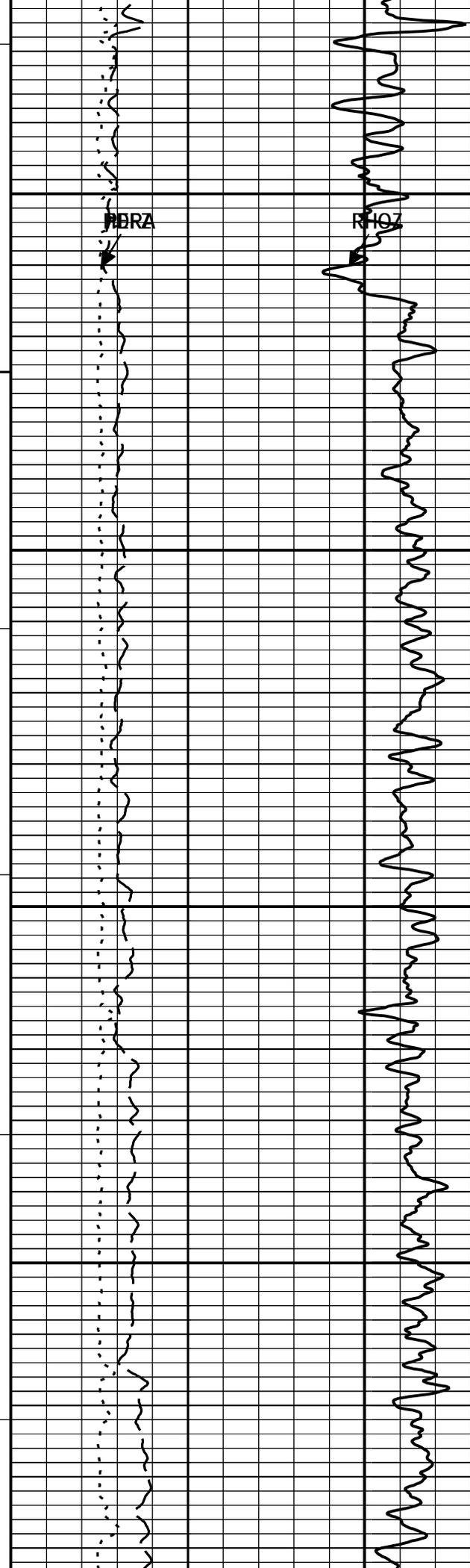
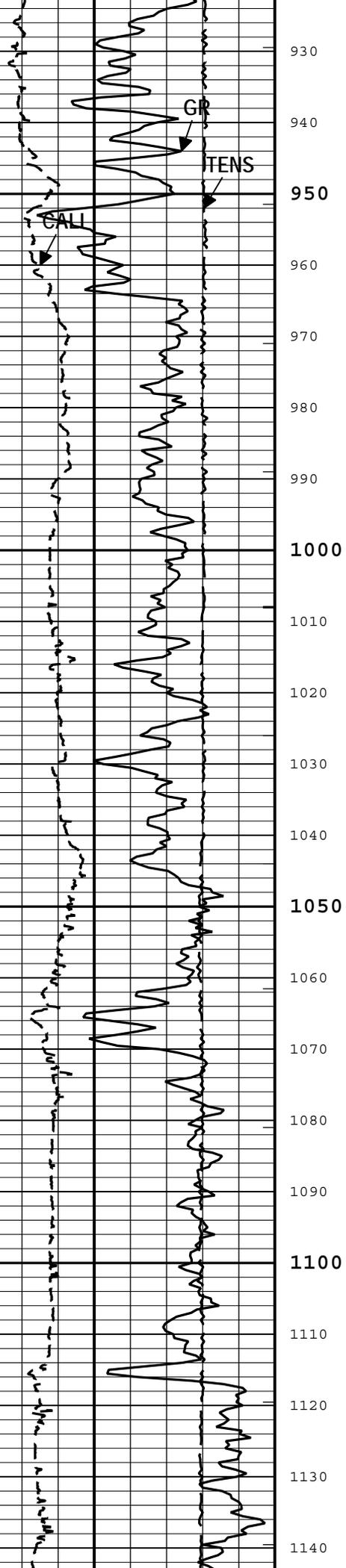
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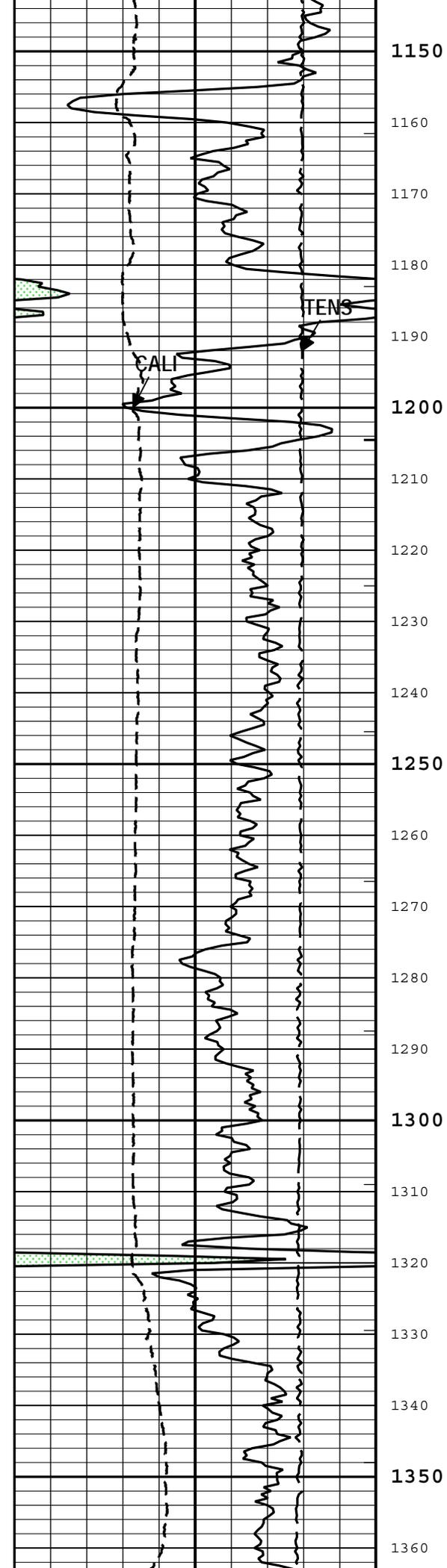
Casing Shoe @ 526



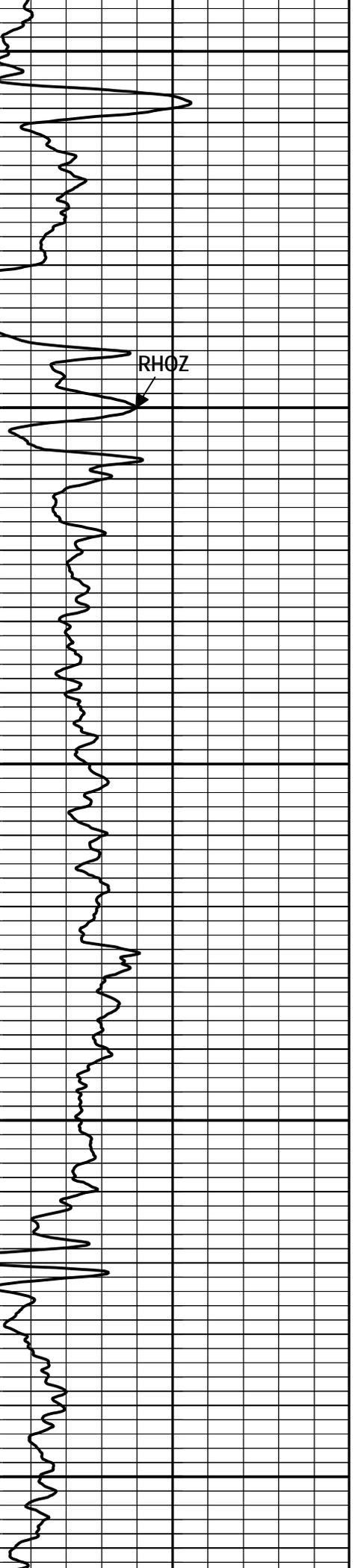
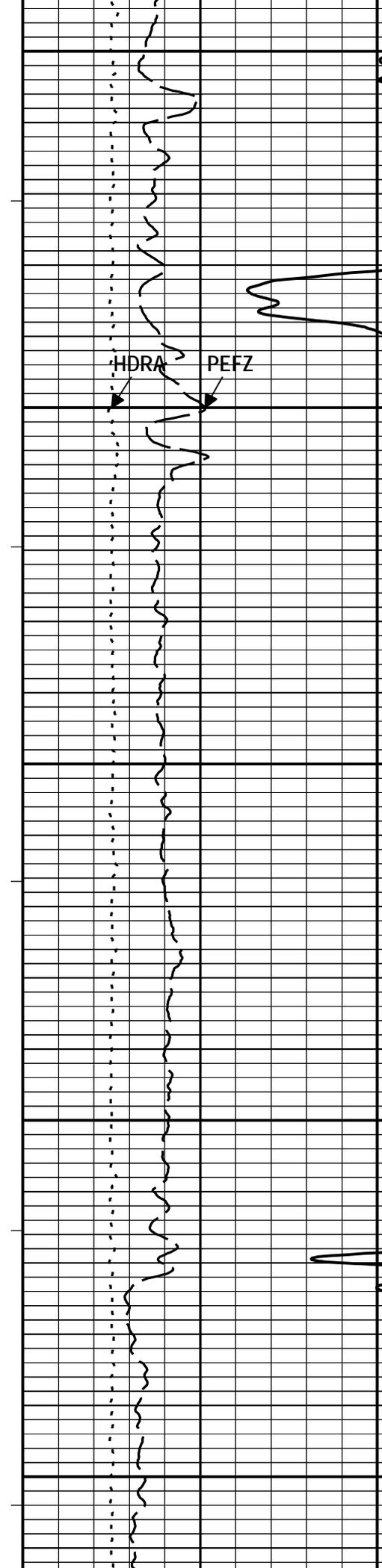
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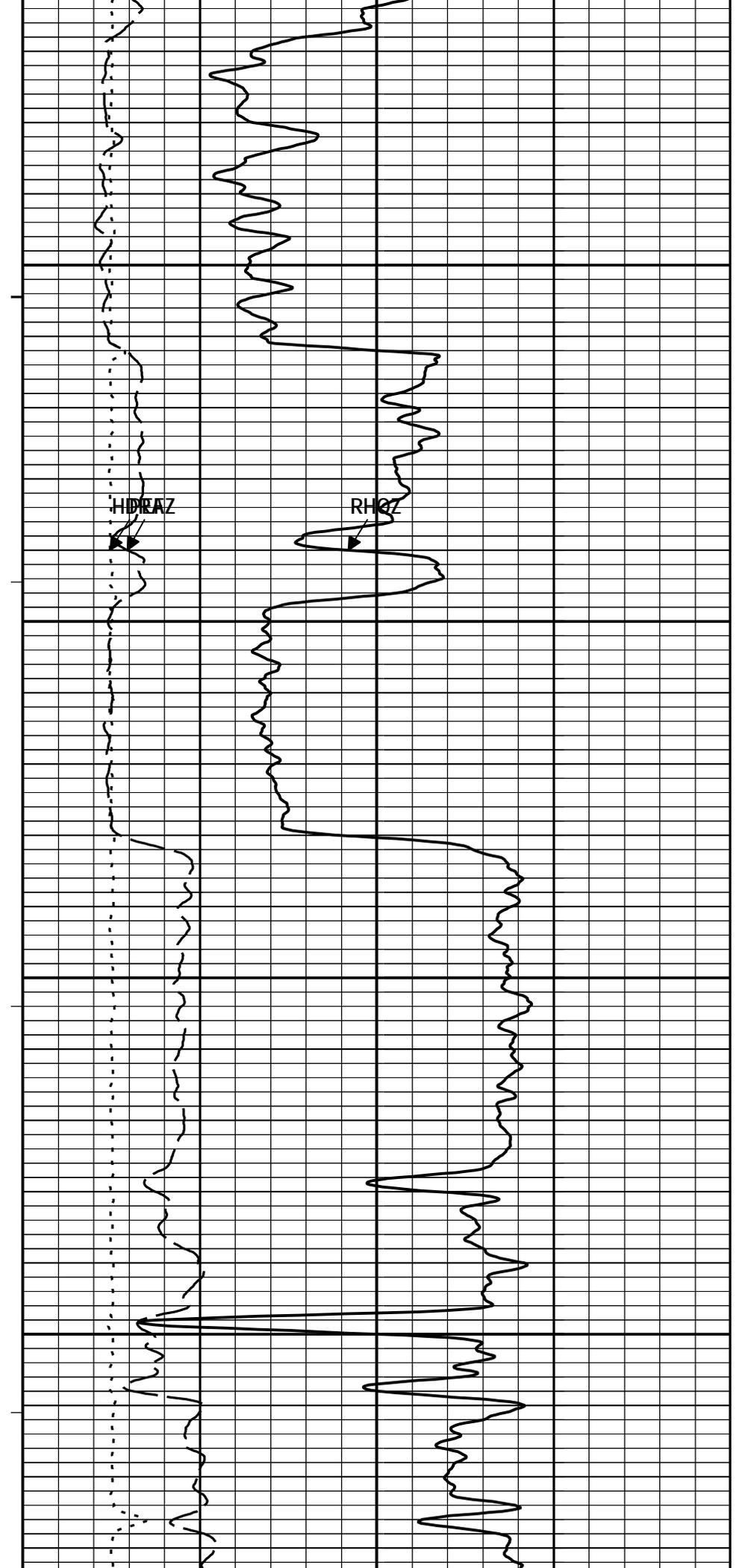
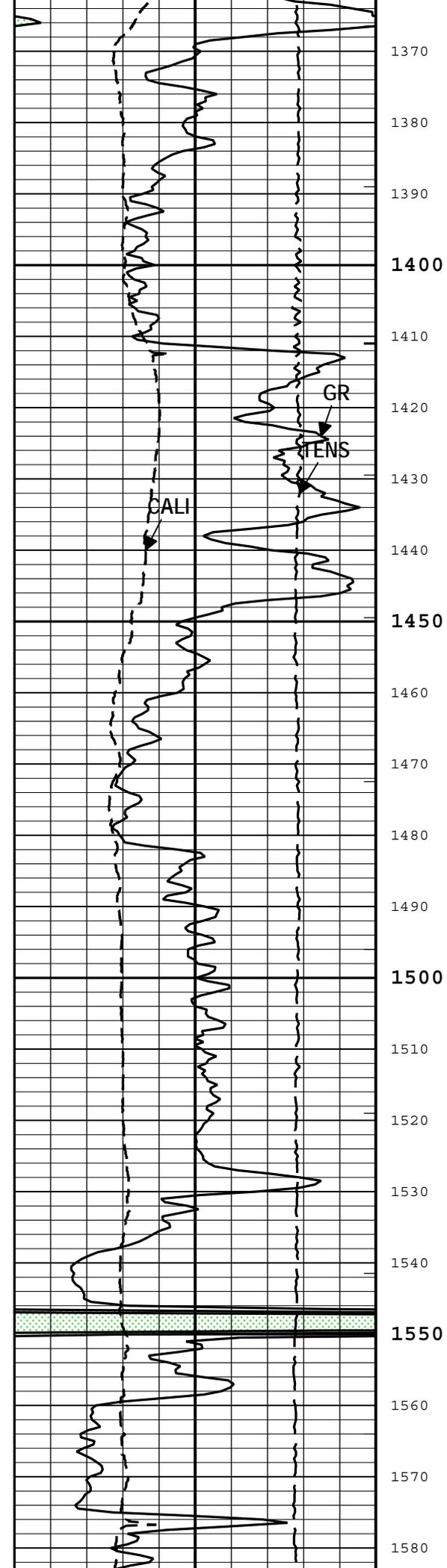
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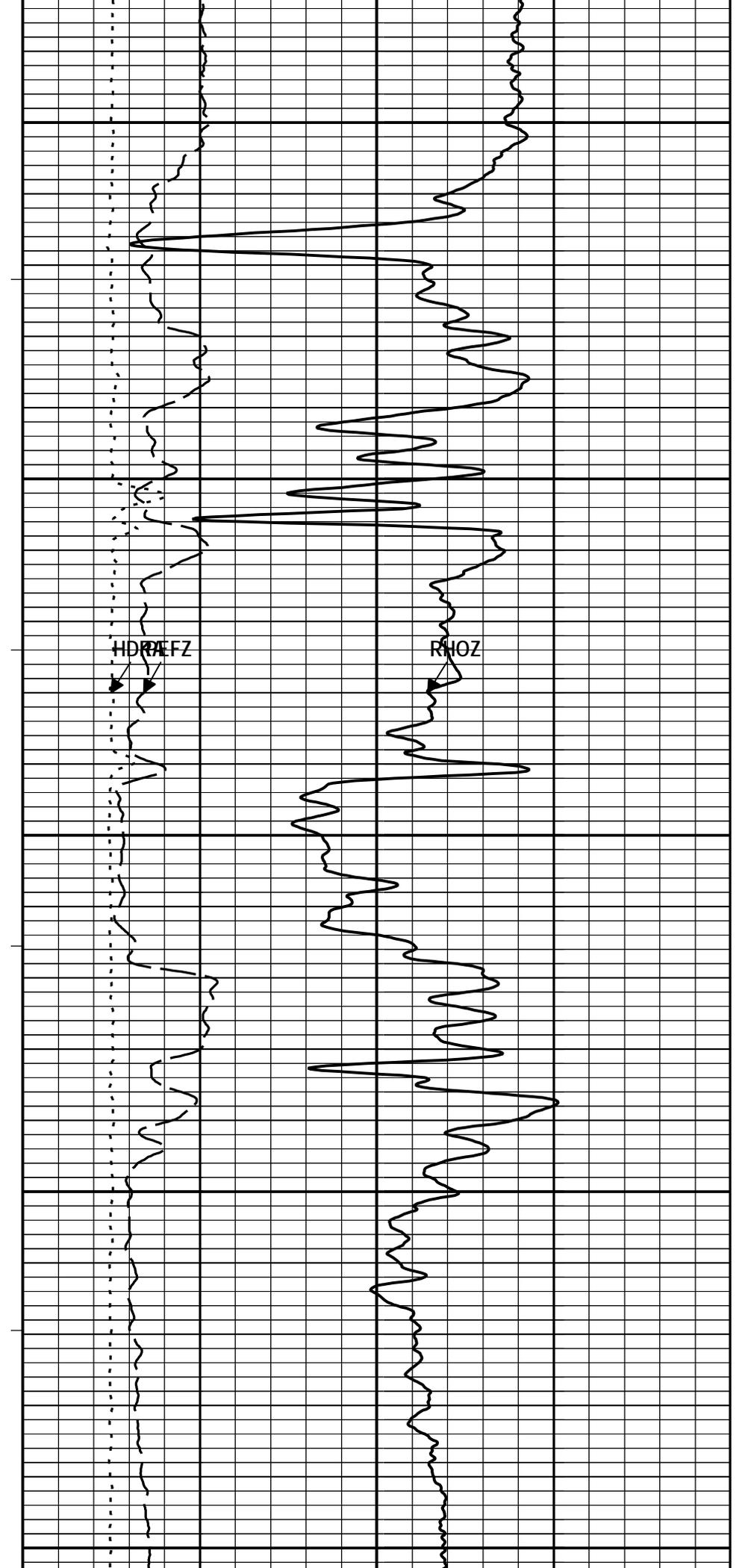
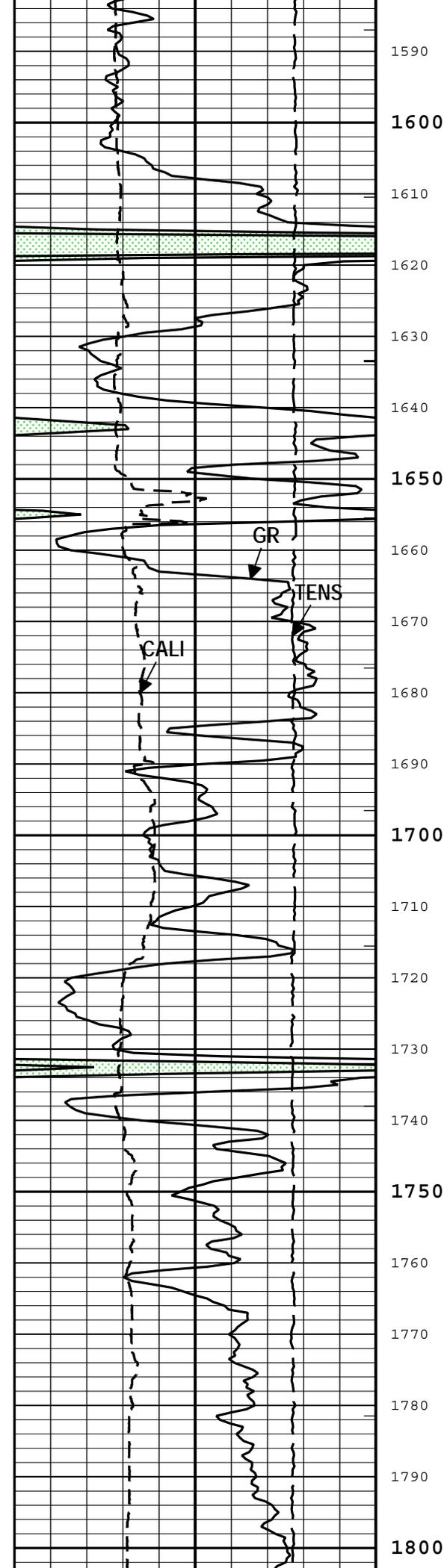
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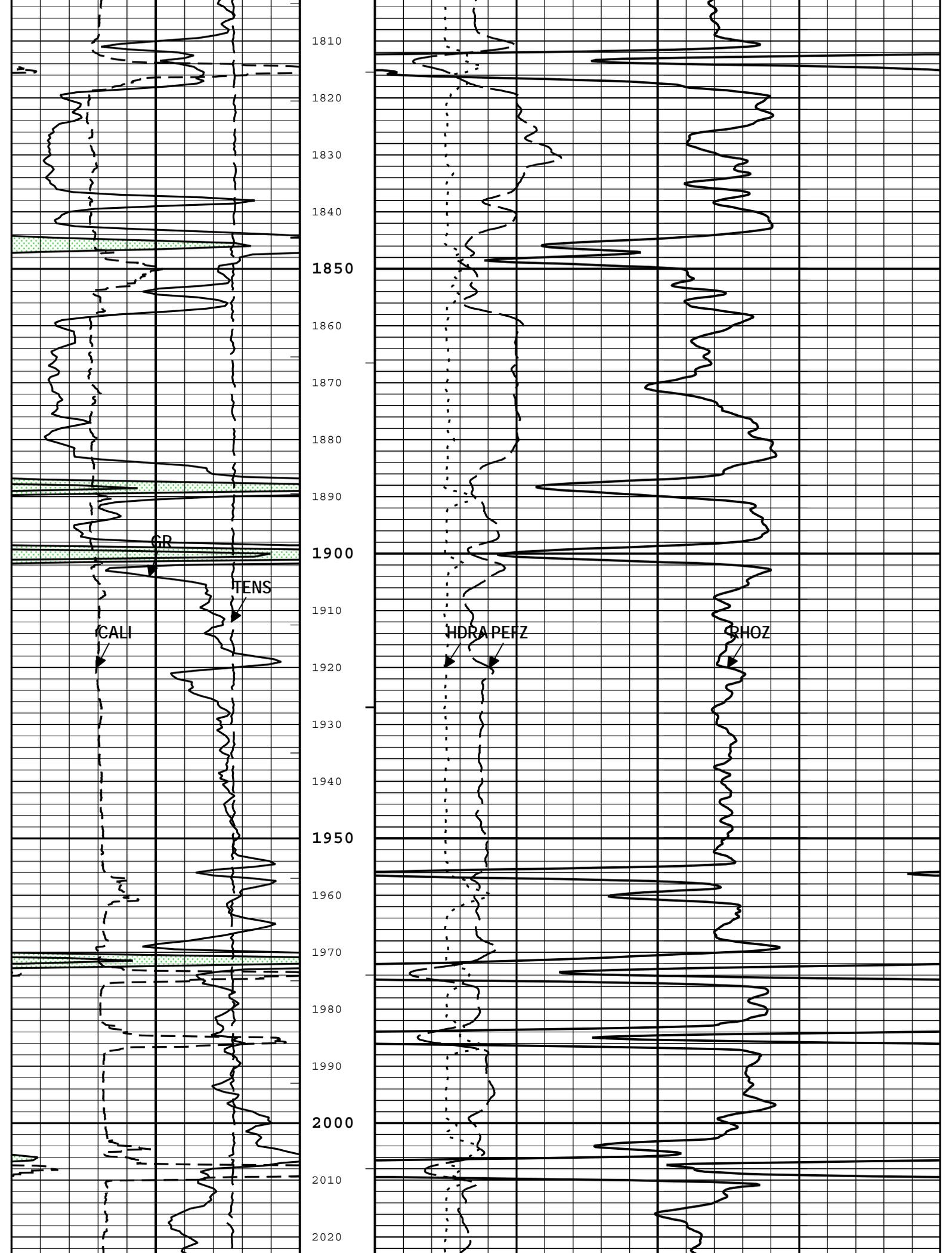
RHOZ

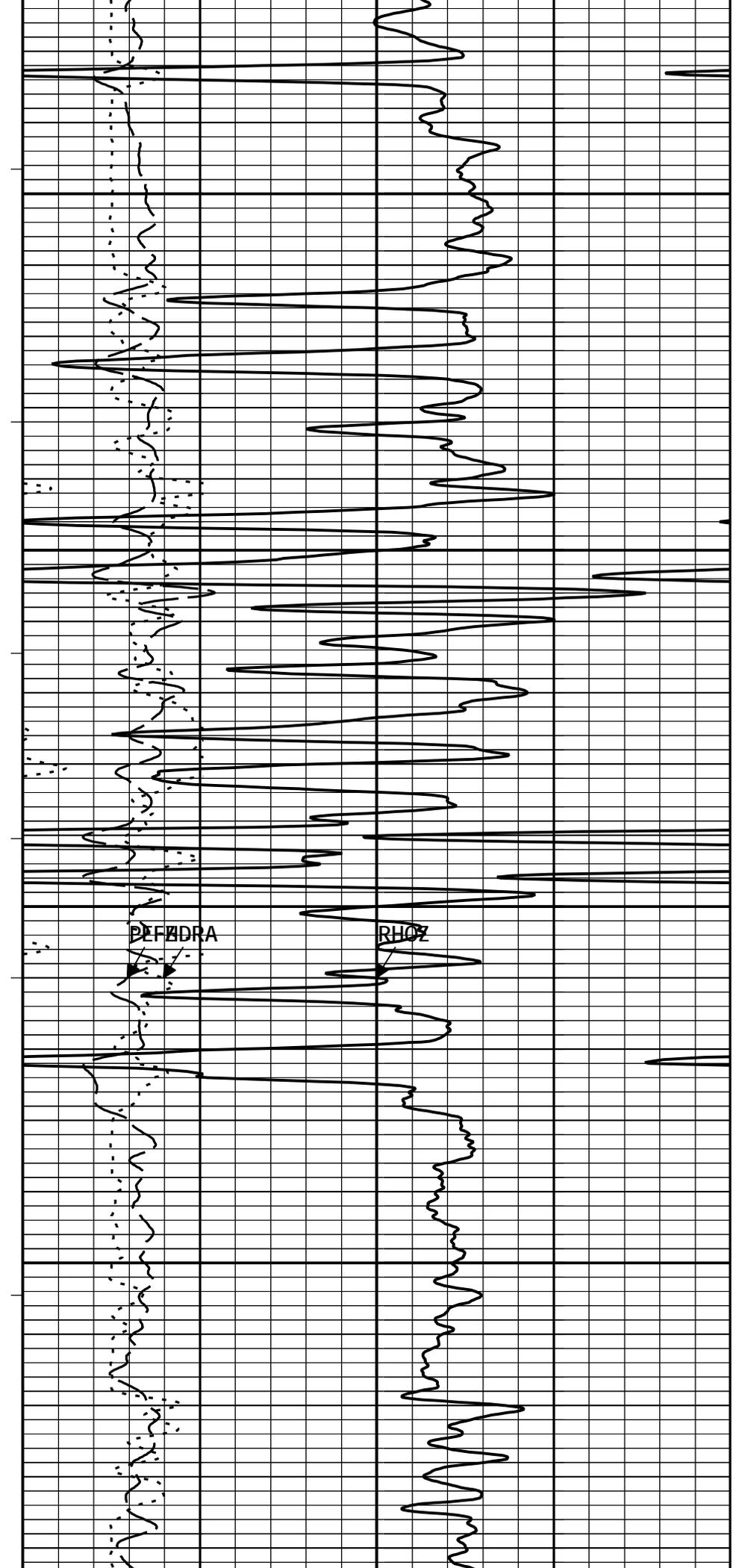
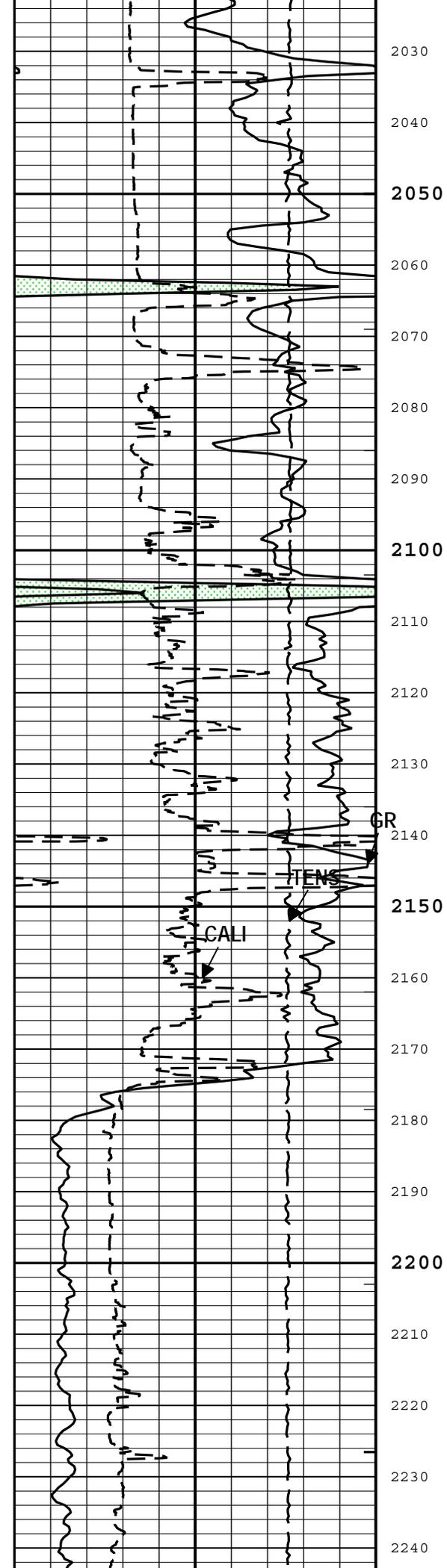
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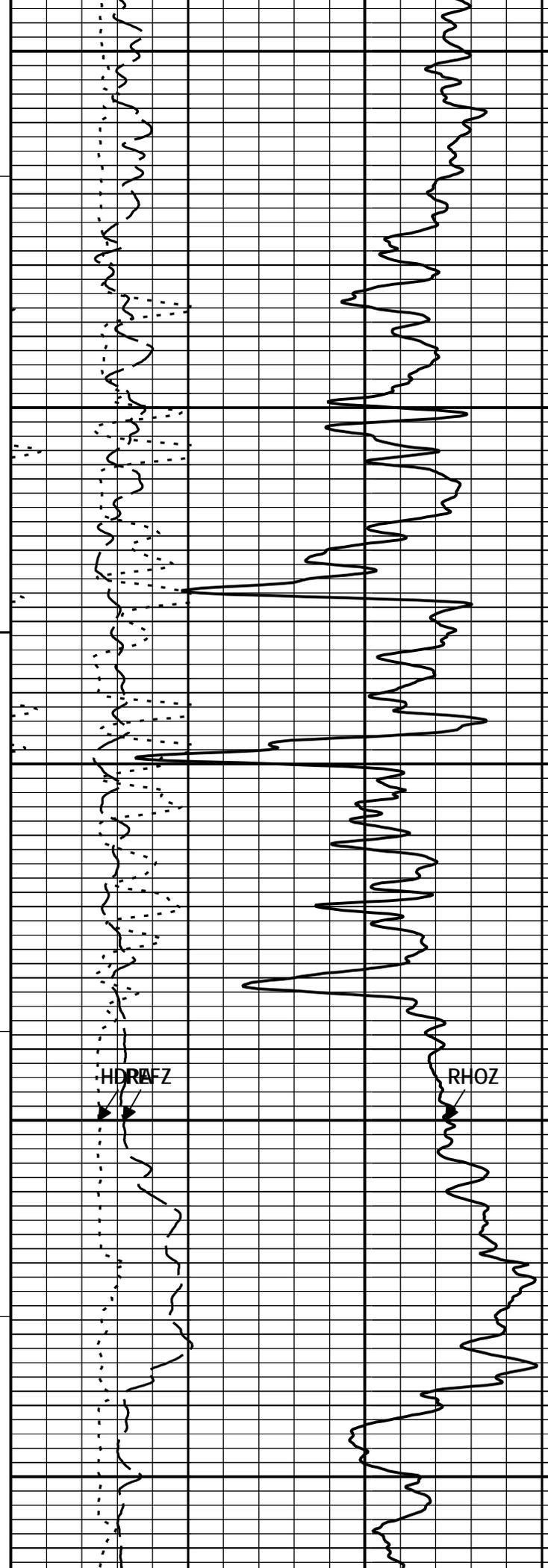
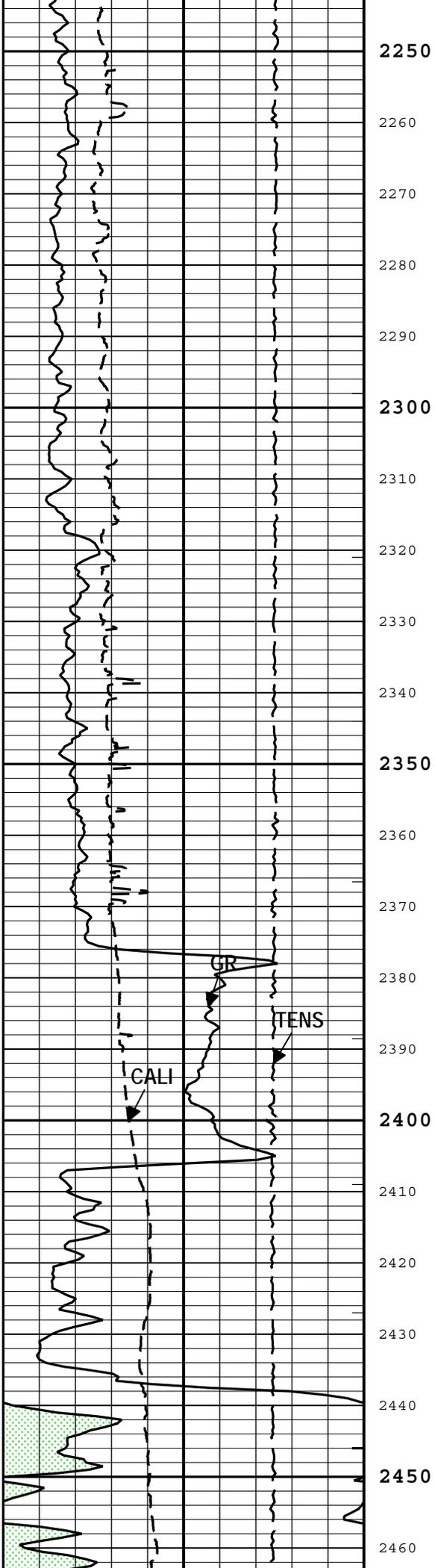
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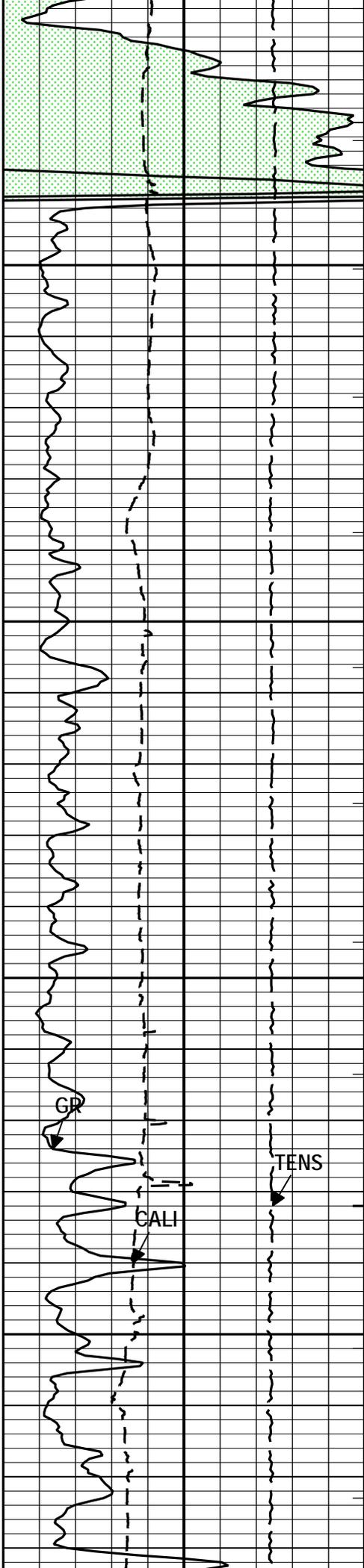




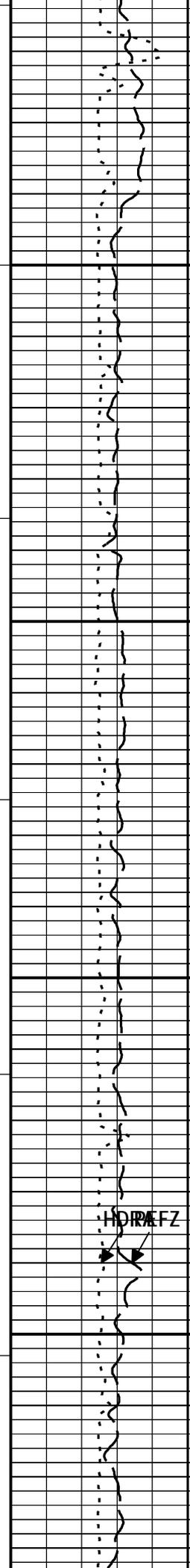




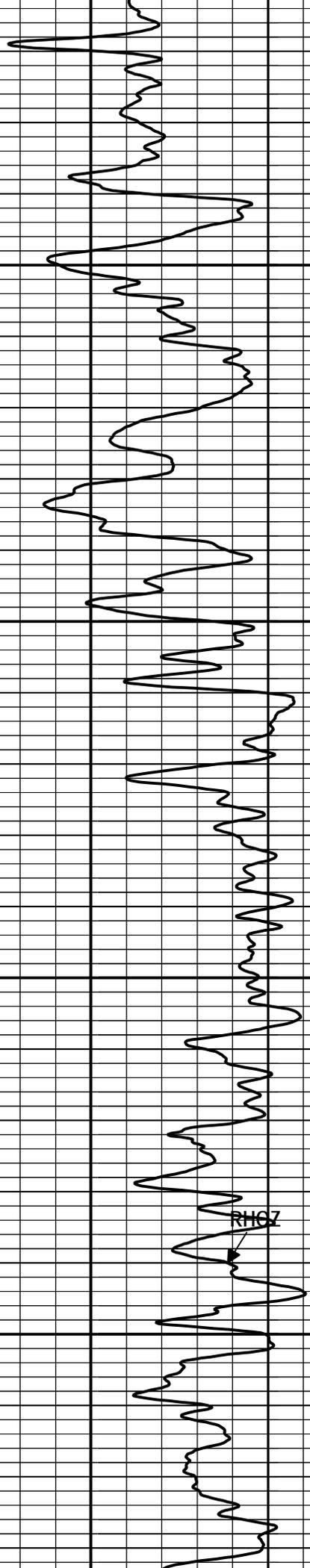




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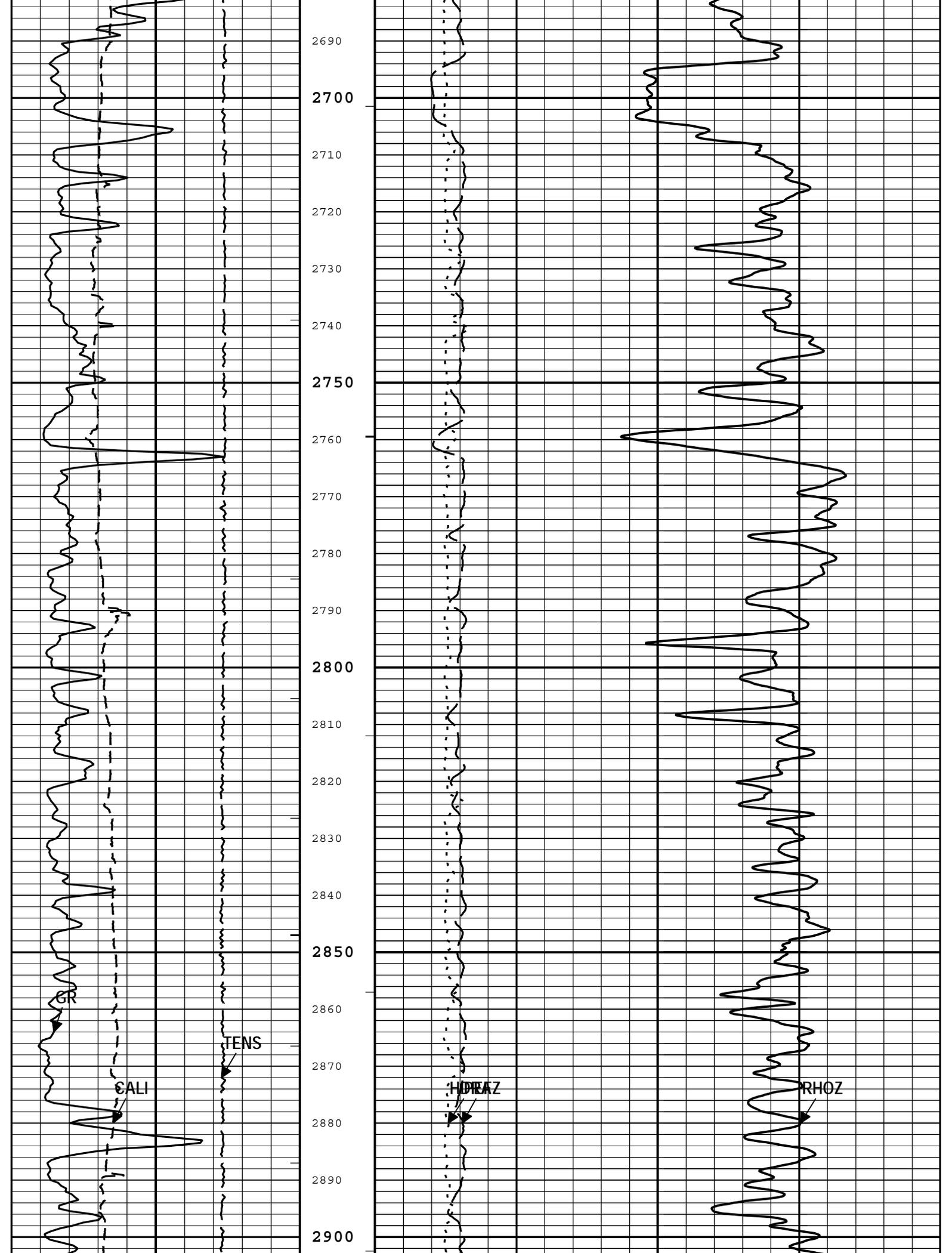
CALI

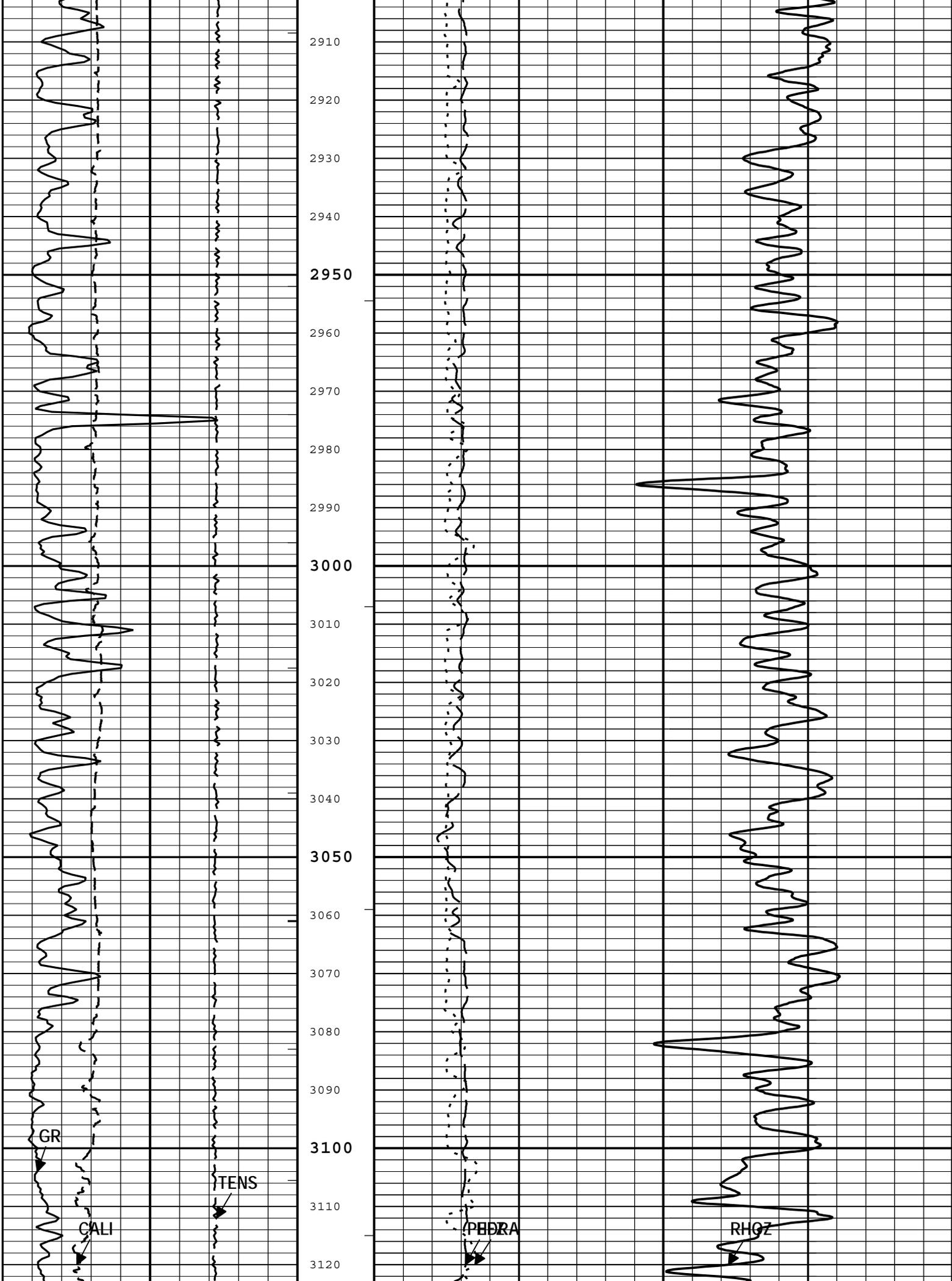
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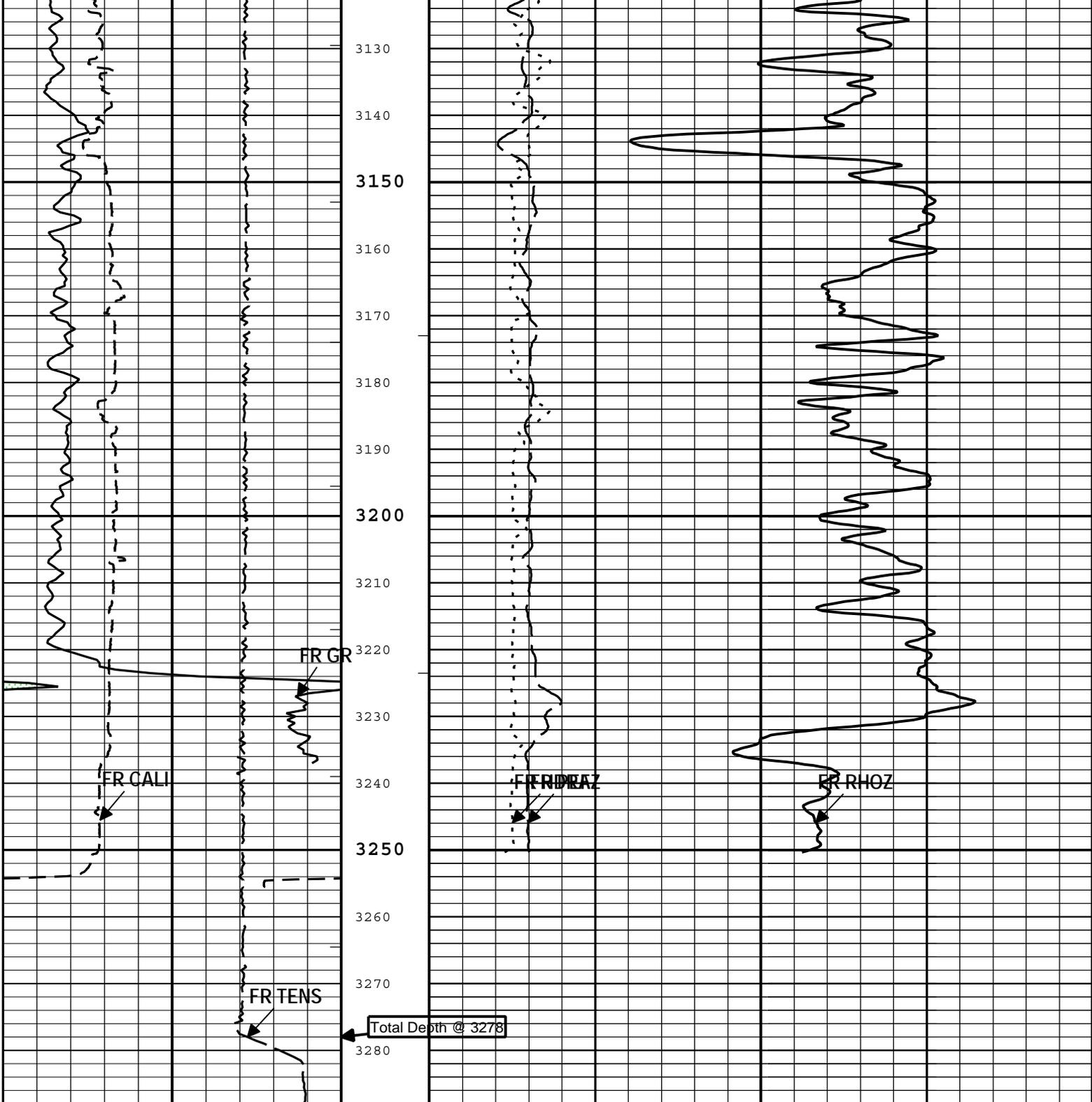
CALI

HIRAEZ

RHOZ







Backup Gamma Ray		
Caliper (CALI) HDRS-H		
6	in	16
Cable Tension (TENS)		
8000	lbf	0
Gamma Ray (GR) HGNS-H		
0	gAPI	150
Gamma Ray (GR) HDRS-H		
150	gAPI	300

Standard Resolution Formation Density (RHOZ) HDRS-H		
2	g/cm3	3
Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H		
0		10
Density Standoff Correction (HDRA) HDRS-H		
-0.25	g/cm3	0.25

-IHV - Integrated Hole Volume every 100.00 (ft3)

-ICV - Integrated Cement Volume every 10.00 (ft3)

—IHV - Integrated Hole Volume every 10.00 (ft3)

—ICV - Integrated Cement Volume every 100.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

Description: Nuclear standard resolution template for Platform Express Format: Log (Bulk Density_5 Inch) Index Scale: 5 in per 100 ft Index Unit: ft
 Index Type: Measured Depth Creation Date: 28-Feb-2013 10:59:21

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	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.05	in
CBLO	Casing Bottom (Logger)	WLSESSION	526	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	9.625	in
DFD	Drilling Fluid Density	Borehole	8.7	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DHC	Density Hole Correction	HDRS-H	Bit Size	
FCD	Future Casing (Outer) Diameter	WLSESSION	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	
NPRM	HRDD Nuclear Processing Mode	HDRS-H	High Resolution	
SOCO	Standoff Correction Option	HGNS-H	Yes	

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	0	490	526
BS	8.75	526	3288

All depth are actual.

Tool Control Parameters

Parameter	Description	Tool	Value	Unit
HRGD_BRD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	1800	ft/h

Calibration Report

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

Primary Equipment :

Array Induction Sonde - M AMIS 229

Auxiliary Equipment :

AITM Rm/SP Bottom Nose AMRM 229

AIT Sonde Calibration - Test Loop Gain

Master (EEPROM): 17:03:59 28-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Test Loop Gain - 0		Master	1.000	0.950	1.012	1.050	
Test Loop Phase - 0	deg	Master	0	-3.000	0.537	3.000	
Test Loop Gain - 1		Master	1.000	0.950	1.014	1.050	
Test Loop Phase - 1	deg	Master	0	-3.000	0.814	3.000	
Test Loop Gain - 2		Master	1.000	0.950	1.014	1.050	
Test Loop Phase - 2	deg	Master	0	-3.000	0.082	3.000	
Test Loop Gain - 3		Master	1.000	0.950	1.011	1.050	
Test Loop Phase - 3	deg	Master	0	-3.000	0.185	3.000	
Test Loop Gain - 4		Master	1.000	0.950	0.993	1.050	
Test Loop Phase - 4	deg	Master	0	-3.000	0.502	3.000	

Test Loop Gain - 5		Master	1.000	0.950	0.988	1.050	
Test Loop Phase - 5	deg	Master	0	-3.000	-0.220	3.000	
Test Loop Gain - 6		Master	1.000	0.950	0.995	1.050	
Test Loop Phase - 6	deg	Master	0	-3.000	0.445	3.000	
Test Loop Gain - 7		Master	1.000	0.950	1.008	1.050	
Test Loop Phase - 7	deg	Master	0	-3.000	0.524	3.000	

AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM):		17:03:59 28-Jan-2013					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Sonde Error Correction Real - 0	mS/m	Master	----	-231.000	-94.661	119.000	
Sonde Error Correction Quad - 0		Master	----	-2250.000	-1104.161	2250.000	
Sonde Error Correction Real - 1	mS/m	Master	----	114.000	161.446	204.000	
Sonde Error Correction Quad - 1		Master	----	-625.000	184.156	625.000	
Sonde Error Correction Real - 2	mS/m	Master	----	66.000	108.432	156.000	
Sonde Error Correction Quad - 2		Master	----	-350.000	-142.362	350.000	
Sonde Error Correction Real - 3	mS/m	Master	----	39.000	49.712	89.000	
Sonde Error Correction Quad - 3		Master	----	-250.000	-19.018	250.000	
Sonde Error Correction Real - 4	mS/m	Master	----	15.000	26.930	35.000	
Sonde Error Correction Quad - 4		Master	----	-63.000	0.104	63.000	
Sonde Error Correction Real - 5	mS/m	Master	----	4.000	13.238	24.000	
Sonde Error Correction Quad - 5		Master	----	-50.000	-2.098	50.000	
Sonde Error Correction Real - 6	mS/m	Master	----	5.000	9.598	15.000	
Sonde Error Correction Quad - 6		Master	----	-30.000	8.018	30.000	
Sonde Error Correction Real - 7	mS/m	Master	----	-5.000	-0.916	5.000	
Sonde Error Correction Quad - 7		Master	----	-30.000	-2.883	30.000	

AIT Mud Calibration - Mud Calibration Gain

Master (EEPROM):		17:03:59 28-Jan-2013					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Coarse Gain		Master	1.000	0.800	1.031	1.200	
Fine Gain		Master	1.000	0.800	1.026	1.200	

AIT Electronics Check - Thru Calibration Check

Master (EEPROM):		17:03:59 28-Jan-2013		Before (Measured):		10:45:34 27-Feb-2013		After:	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit			
Thru Cal Mag - 0	V	Master	----	0.366	0.613	0.854			
		Before	----	0.366	0.613	0.854			
		After	----	----	----	----			
		Before-Master	----	----	0.000	----			
		After-Before	----	----	----	----			
Thru Cal Phase - 0	deg	Master	----	137.000	-178.174	-103.000			
		Before	----	137.000	-169.310	-103.000			
		After	----	----	----	----			
		Before-Master	----	----	8.864	----			
		After-Before	----	----	----	----			
Thru Cal Mag - 1	V	Master	----	0.762	1.257	1.778			
		Before	----	0.762	1.257	1.778			
		After	----	----	----	----			
		Before-Master	----	----	0.000	----			
		After-Before	----	----	----	----			
Thru Cal Phase - 1	deg	Master	----	136.000	-179.243	-104.000			
		Before	----	136.000	-170.378	-104.000			
		After	----	----	----	----			
		Before-Master	----	----	8.865	----			
		After-Before	----	----	----	----			
Thru Cal Mag - 2	V	Master	----	0.372	0.622	0.868			
		Before	----	0.372	0.622	0.868			
		After	----	----	----	----			
		Before-Master	----	----	0.000	----			
		After-Before	----	----	----	----			
Thru Cal Phase - 2	deg	Master	----	132.000	177.201	-108.000			
		Before	----	132.000	-173.933	-108.000			
		After	----	----	----	----			
		Before-Master	----	----	-351.134	----			
		After-Before	----	----	----	----			
Thru Cal Mag - 3	V	Master	----	0.420	0.703	0.980			
		Before	----	0.420	0.703	0.980			

		After	----	----	----	----			
		Before-Master	----	----	0.000	----			
		After-Before	----	----	----	----			
Thru Cal Phase - 3	deg	Master	----	131.000	176.440	-109.000			
		Before	----	131.000	-174.696	-109.000			
		After	----	----	----	----			
		Before-Master	----	----	-351.136	----			
		After-Before	----	----	----	----			
Thru Cal Mag - 4	V	Master	----	0.804	1.315	1.876			
		Before	----	0.804	1.315	1.876			
		After	----	----	----	----			
		Before-Master	----	----	0.000	----			
		After-Before	----	----	----	----			
Thru Cal Phase - 4	deg	Master	----	125.000	170.314	-115.000			
		Before	----	125.000	179.192	-115.000			
		After	----	----	----	----			
		Before-Master	----	----	8.878	----			
		After-Before	----	----	----	----			
Thru Cal Mag - 5	V	Master	----	1.176	1.916	2.744			
		Before	----	1.176	1.915	2.744			
		After	----	----	----	----			
		Before-Master	----	----	-0.001	----			
		After-Before	----	----	----	----			
Thru Cal Phase - 5	deg	Master	----	122.000	168.664	-118.000			
		Before	----	122.000	177.549	-118.000			
		After	----	----	----	----			
		Before-Master	----	----	8.885	----			
		After-Before	----	----	----	----			
Thru Cal Mag - 6	V	Master	----	1.176	1.913	2.744			
		Before	----	1.176	1.911	2.744			
		After	----	----	----	----			
		Before-Master	----	----	-0.002	----			
		After-Before	----	----	----	----			
Thru Cal Phase - 6	deg	Master	----	121.000	168.703	-119.000			
		Before	----	121.000	177.592	-119.000			
		After	----	----	----	----			
		Before-Master	----	----	8.889	----			
		After-Before	----	----	----	----			
Thru Cal Mag - 7	V	Master	----	0.846	1.379	1.974			
		Before	----	0.846	1.378	1.974			
		After	----	----	----	----			
		Before-Master	----	----	-0.001	----			
		After-Before	----	----	----	----			
Thru Cal Phase - 7	deg	Master	----	115.000	167.865	-125.000			
		Before	----	115.000	176.845	-125.000			
		After	----	----	----	----			
		Before-Master	----	----	8.980	----			
		After-Before	----	----	----	----			
SPA Zero	mV	Master	----	-50.000	-0.103	50.000			
		Before	----	-50.000	-0.079	50.000			
		After	----	----	----	----			
		Before-Master	----	----	0.024	----			
		After-Before	----	----	----	----			
SPA Plus	mV	Master	----	941.000	994.784	1040.000			
		Before	----	941.000	994.836	1040.000			
		After	----	----	----	----			
		Before-Master	----	----	0.052	----			
		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	0.922	0.960			
		Before	----	0.870	0.922	0.960			
		After	----	----	----	----			
		Before-Master	----	----	0.000	----			
		After-Before	----	----	----	----			

ECS-A (Elemental Capture Spectroscopy Tool) Calibration - Run One

Primary Equipment :

The ECS sonde is used to measure elemental concentrations. ECS-A 99

Auxiliary Equipment :

The gamma ray BGO detector is used to detect prompt capture gamma rays for spectroscopy measurement. ECSD-A 99

Litho-Density Spectroscopy Cartridge LDSC-A 475

Housing for the LDSC LDSC-A 441

Housing to contain the ECS Sonde Assembly ECSD-A 99

The AmBe source provides neutrons for the prompt capture spectroscopy measurement. NSR-F 5075

ECS Background Measurement Check - ECS Calibration Check

Master (EEPROM): 22:23:09 18-Aug-2011 Before (Measured): 11:07:13 27-Feb-2013 After:
Expired by 194 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Detector resolution (20 DegC)	%	Master	----	----	----	----	
		Before	13.000	11.200	11.794	14.000	
		After	13.000	11.200	NOT DONE	14.000	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	

ECS Spectral Calibration - ECS Spectral Calibration

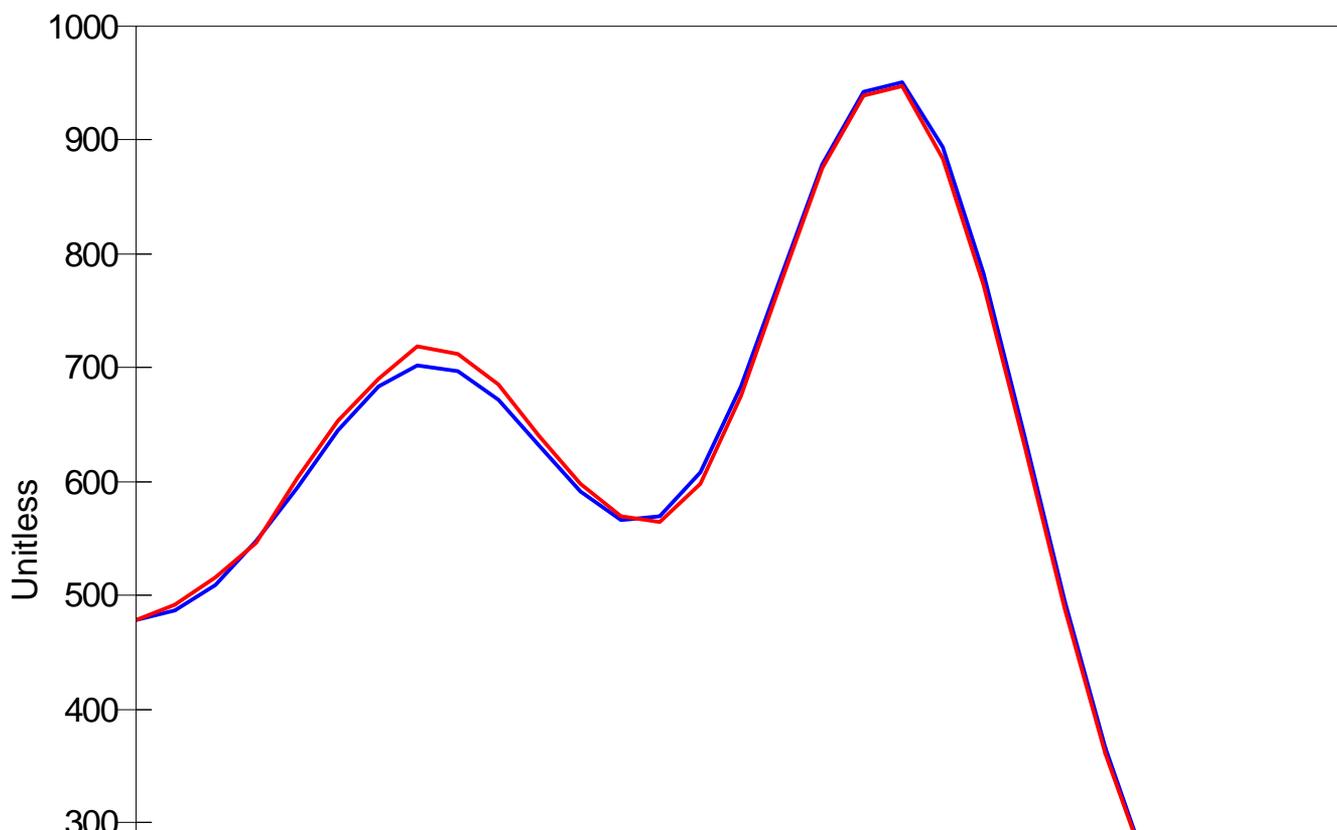
Master (EEPROM): 06:20:16 28-Feb-2013

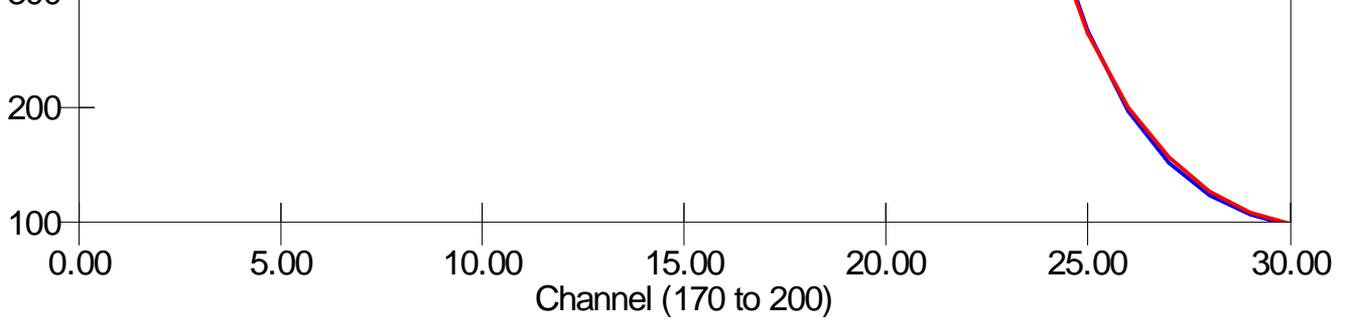
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Spectral Shift Factor		Master	1.000	-0.500	-0.046	1.500	

Spectrum Without Shift Plot

SHOP

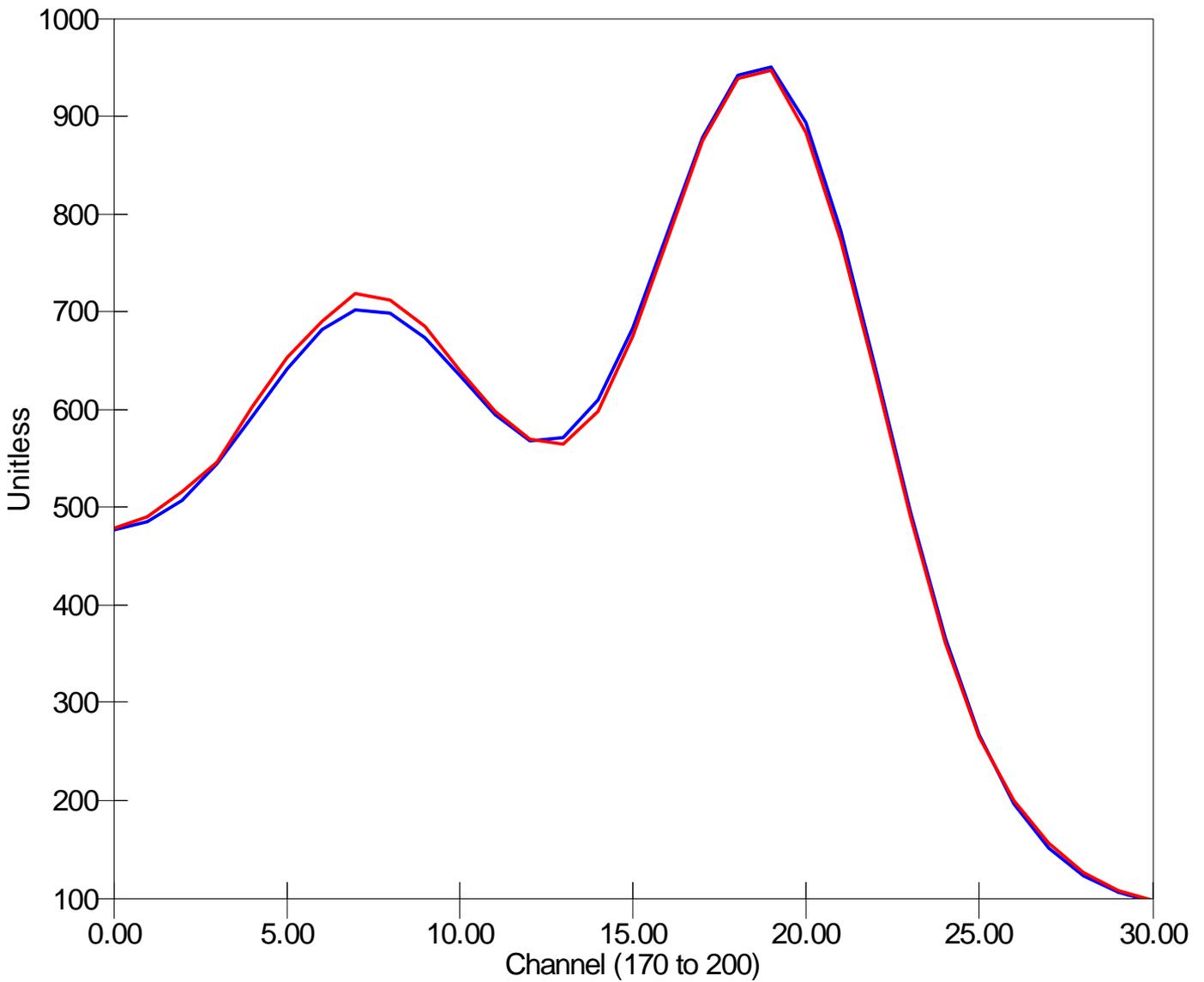
— FITTED_SPEC (FITTED_SPEC)
— DATA_SPEC (DATA_SPEC)





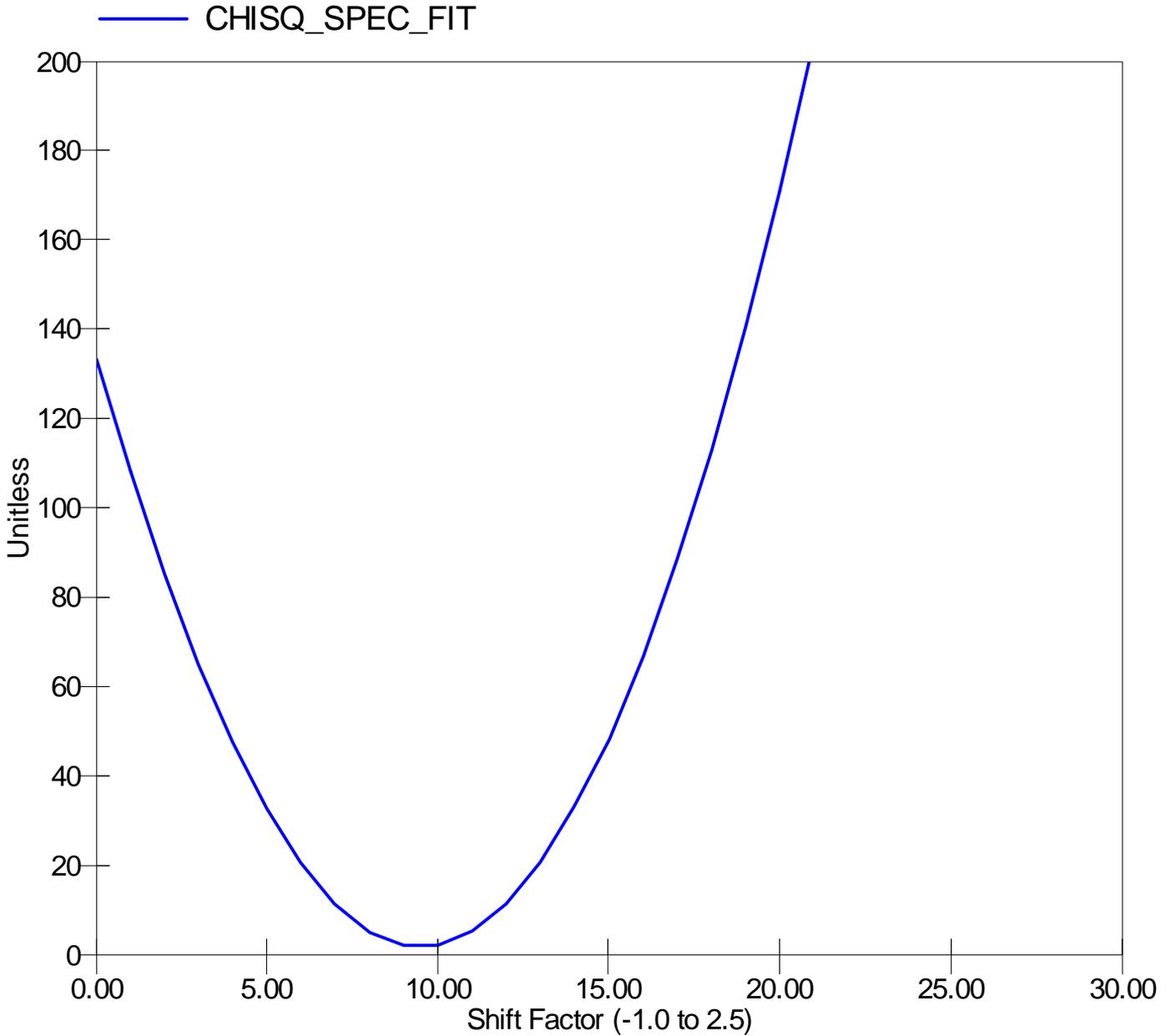
Spectrum With Shift Plot SHOP

— FITTED_SPEC_SF (FITTED_SPEC_SF)
— DATA_SPEC_SF (DATA_SPEC_SF)



Chi Square for Spectral Fit Plot

SHOP



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

Primary Equipment :

HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	4806
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H	4867

Auxiliary Equipment :

HRDD Backscatter Detector	Backscatter	4867
HRDD Short Spacing Detector	Short Spacing	27763
Cesium 137 Gamma-Ray Logging Source	GSR-J	5350
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	4806
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	4758

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): 10:52:03 27-Feb-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Small Ring	in	Before	8.00	6.00	7.69	10.00	
Large Ring	in	Before	12.00	9.00	12.00	15.00	

HDRS Density Calibration - Inversion Results

Master (EEPROM): 15:12:48 29-Jan-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	2.551	2.670	
Pe Magnesium		Master	2.650	2.550	2.643	2.750	

HDRS Density Calibration - Deviation Summary

Master (EEPROM): 15:12:48 29-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Average Deviation	%	Master	0	-0.6000	0.2328	0.6000	
BS Max Deviation	%	Master	0	-1.6000	0.5312	1.6000	
SS Average Deviation	%	Master	0	-1.0000	0.3689	1.0000	
SS Max Deviation	%	Master	0	-2.5000	0.7307	2.5000	
LS Average Deviation	%	Master	0	-1.5000	0.5328	1.5000	
LS Max Deviation	%	Master	0	-3.5000	1.2546	3.5000	

HDRS Density Calibration - Background Summary

Master (EEPROM): 15:12:48 29-Jan-2013

Before (Measured):

11:07:29 27-Feb-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Window Ratio		Master	1.0000		0.7433		
		Before	0.7433	0.7062	0.7442	0.7805	
		Before-Master	----	----	0.0009	----	
BS Window Sum	1/s	Master	1		29581		
		Before	29581	28102	29486	31061	
		Before-Master	----	----	-95	----	
SS Window Ratio		Master	1.0000		0.4835		
		Before	0.4835	0.4593	0.4815	0.5077	
		Before-Master	----	----	-0.0020	----	
SS Window Sum	1/s	Master	1		12309		
		Before	12309	11693	12258	12924	
		Before-Master	----	----	-51	----	
LS Window Ratio		Master	1.0000		0.2964		
		Before	0.2964	0.2816	0.3007	0.3112	
		Before-Master	----	----	0.0043	----	
LS Window Sum	1/s	Master	1		1341		
		Before	1341	1274	1327	1408	
		Before-Master	----	----	-14	----	

HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM): 15:12:48 29-Jan-2013

Before (Measured):

11:07:29 27-Feb-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS PM High Voltage	V	Master		1000	1564	2400	
		Before		1000	1554	2400	
		Before-Master	----	-100	-10	100	
SS PM High Voltage	V	Master		1000	1588	2400	
		Before		1000	1608	2400	
		Before-Master	----	-100	20	100	
LS PM High Voltage	V	Master		1000	1562	2400	
		Before		1000	1570	2400	
		Before-Master	----	-100	8	100	

HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM): 15:12:48 29-Jan-2013

Before (Measured):

11:07:29 27-Feb-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Crystal Resolution	%	Master		5.00	11.67	25.00	
		Before		5.00	11.35	25.00	
		Before-Master	----	-1.00	-0.32	1.00	

SS Crystal Resolution	%	Master Before Before-Master	-----	5.00 5.00 -1.00	9.39 9.80 0.41	20.00 20.00 1.00	
LS Crystal Resolution	%	Master Before Before-Master	-----	5.00 5.00 -1.00	8.48 8.51 0.03	20.00 20.00 1.00	

HDRS MCFL Calibration - MCFL Accumulations

Before (Measured): 10:45:07 27-Feb-2013							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Main Resistivity	ohm.m	Before	3875	3565	3925	4185	
Deep Resistivity	ohm.m	Before	3830	3524	3834	4136	
Shallow Resistivity	ohm.m	Before	3830	3524	3827	4136	

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

Primary Equipment :			
HILT Gamma-Ray and Neutron Sonde, 150 degC		HGNS-H	3819
Auxiliary Equipment :			
HGNS Accelerometer, 150 degC		HACCZ-H	2102
AmBe Neutron Logging Source		NSR-F	5226
Calibration Parameter :			
Water Temperature			
Housing Size			
JIG-BKG (Jig minus background reference)		160	

HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured): 05:52:20 28-Feb-2013							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	32.2	32.8	

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM): 00:00:00 15-Feb-2003							
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	-----	-----	-2847.000	-----	
Accelerometer Coefficients - 1		Master	-----	-----	13.547	-----	
Accelerometer Coefficients - 2		Master	-----	-----	-0.002	-----	
Accelerometer Coefficients - 3		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 4		Master	-----	-----	2.752	-----	
Accelerometer Coefficients - 5		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 6		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 7		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 8		Master	-----	-----	299.200	-----	
Accelerometer Coefficients - 9		Master	-----	-----	1.004	-----	

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 13:09:40 11-Feb-2013		Before (Measured): 11:05:42 27-Feb-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Near Zero Measurement	1/s	Master	0	5.0	26.1	40.0	
		Before	0	5.0	27.5	40.0	
		After	-----	-----	-----	-----	
		Before-Master	-----	-3.9	1.4	3.9	
		After-Before	-----	-----	-----	-----	
Far Zero Measurement	1/s	Master	0	5.0	28.6	40.0	
		Before	0	5.0	27.0	40.0	
		After	-----	-----	-----	-----	
		Before-Master	-----	-4.3	-1.6	4.3	
		After-Before	-----	-----	-----	-----	
Near Plus Measurement - 0	1/s	Master	6031.0	4700.0	5040.0	6900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	

		Before-Master After-Before	----	----	----	----	
Far Plus Measurement - 0	1/s	Master Before After Before-Master After-Before	2793.0 ---- ---- ---- ----	1900.0 ---- ---- ---- ----	2061.0 ---- ---- ---- ----	2900.0 ---- ---- ---- ----	
Near Corrected Plus Measurement - 0	1/s	Master Before After Before-Master After-Before	---- ---- ---- ---- ----	4700.0 ---- ---- ---- ----	5112.0 ---- ---- ---- ----	6900.0 ---- ---- ---- ----	
Far Corrected Plus Measurement - 0	1/s	Master Before After Before-Master After-Before	---- ---- ---- ---- ----	1900.0 ---- ---- ---- ----	2095.0 ---- ---- ---- ----	2900.0 ---- ---- ---- ----	

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured):		11:13:18 27-Feb-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RGR Zero Measurement	gAPI	Before After After-Before	30.0 ---- ----	0 ---- ----	21.2 ---- ----	120.0 ---- ----	
RGR Plus Measurement	gAPI	Before After After-Before	179.8 ---- ----	152.4 ---- ----	179.1 NOT DONE ----	200.0 ---- ----	
GR Calibration Gain		Before After After-Before	0.89 ---- ----	0.80 ---- ----	0.89 ---- ----	1.05 ---- ----	

HNGS-BA (Hostile-environment Natural Gamma-ray Sonde) Calibration - Run One

Primary Equipment :			
HNGS Sonde Element	HNGS-BA	236	
Auxiliary Equipment :			
HNGS Housing Element	HEH-K	1018	
		114	
Hostile Natural Gamma Ray Cartridge	HNGC-B	46	
Housing for the HNGC	HNGH-A	46	

HNGS Background and Na22 Set Point Determination - Detector 1 Check

Master (EEPROM):		11:28:21 08-Feb-2013		Before (Measured):		11:06:58 27-Feb-2013		After:	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit			
Na 511 Peak Location		Master Before After Before-Master After-Before	40.000 ---- ---- ---- ----	37.500 ---- ---- ---- ----	37.628 37.578 ---- -0.050 ----	42.500 ---- ---- ---- ----			
Na 511 Peak Resolution	%	Master Before After Before-Master After-Before	15.500 ---- ---- ---- ----	12.000 ---- ---- ---- ----	15.331 15.616 ---- 0.285 ----	19.000 ---- ---- ---- ----			
High Voltage DAC Value	V	Master Before After Before-Master After-Before	1150.000 ---- ---- ---- ----	850.000 ---- ---- ---- ----	1191.324 1165.384 ---- -25.940 ----	1600.000 ---- ---- ---- ----			
Na 1785 Peak Location		Master Before After Before-Master After-Before	142.650 ---- ---- ---- ----	135.000 ---- ---- ---- ----	136.685 137.053 ---- 0.368 ----	150.300 ---- ---- ---- ----			
Na 1785 Peak Resolution	%	Master Before	8.500	7.000	8.782 7.648	11.000			

		After	----	----	----	----	
		Before-Master	----	----	-1.134	----	
		After-Before	----	----	----	----	
Temperature	degF	Master	----	----	----	----	
		Before	59.900	-20.002	51.081	140.000	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Na Count Rate	CPS	Master	45.000	10.000	16.724	100.000	
		Before	45.000	10.000	15.865	100.000	
		After	----	----	----	----	
		Before-Master	----	----	-0.859	----	
		After-Before	----	----	----	----	

HNGS Background and Na22 Set Point Determination - Detector 2 Check

Master (EEPROM): 11:28:21 08-Feb-2013		Before (Measured): 11:06:58 27-Feb-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Location		Master			38.648		
		Before	40.000	37.500	38.634	42.500	
		After	----	----	----	----	
		Before-Master	----	----	-0.014	----	
		After-Before	----	----	----	----	
Na 511 Peak Resolution	%	Master			15.034		
		Before	15.500	12.000	15.242	19.000	
		After	----	----	----	----	
		Before-Master	----	----	0.208	----	
		After-Before	----	----	----	----	
High Voltage DAC Value	V	Master			1174.987		
		Before	1150.000	850.000	1152.076	1600.000	
		After	----	----	----	----	
		Before-Master	----	----	-22.911	----	
		After-Before	----	----	----	----	
Na 1785 Peak Location		Master			138.685		
		Before	142.650	135.000	138.245	150.300	
		After	----	----	----	----	
		Before-Master	----	----	-0.440	----	
		After-Before	----	----	----	----	
Na 1785 Peak Resolution	%	Master			9.167		
		Before	8.500	7.000	8.632	11.000	
		After	----	----	----	----	
		Before-Master	----	----	-0.535	----	
		After-Before	----	----	----	----	
Temperature	degF	Master	----	----	----	----	
		Before	59.900	-20.002	51.008	140.000	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Na Count Rate	CPS	Master	45.000	10.000	16.678	100.000	
		Before	45.000	10.000	15.831	100.000	
		After	----	----	----	----	
		Before-Master	----	----	-0.847	----	
		After-Before	----	----	----	----	

HNGS Background and Na22 Set Point Determination - Ratio of Detector 1 to Detector 2

Master (EEPROM): 11:28:21 08-Feb-2013		Before (Measured): 11:06:58 27-Feb-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Coincidence Count Rate Ratio		Master			1.001		
		Before	1.000	0.950	1.003	1.050	
		After	----	----	----	----	
		Before-Master	----	----	0.002	----	
		After-Before	----	----	----	----	

HNGS Background and Na22 Set Point Determination - Detector 1 Calibration

Master (EEPROM): 11:28:21 08-Feb-2013		Before (Measured): 11:06:58 27-Feb-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Th Peak Location - 0		Master	209.630	201.000	206.961	218.250	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	

Th Peak Resolution - 0	%	After-Before	7.000	5.000	7.420	9.000	
		Master	7.000	5.000	7.420	9.000	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Background Count Rate	CPS	Master	142.500	10.000	86.921	265.000	
		Before	142.500	10.000	69.360	265.000	
		After	----	----	----	----	
		Before-Master	----	----	-17.561	----	
		After-Before	----	----	----	----	
Gain Ratio - 0		Master	1.000	0.940	1.046	1.060	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	

HNGS Background and Na22 Set Point Determination - Detector 2 Calibration

Master (EEPROM): 11:28:21 08-Feb-2013		Before (Measured): 11:06:58 27-Feb-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Th Peak Location - 0		Master	209.630	201.000	210.150	218.250	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Th Peak Resolution - 0	%	Master	7.000	5.000	7.291	9.000	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Background Count Rate	CPS	Master	142.500	10.000	83.340	265.000	
		Before	142.500	10.000	68.231	265.000	
		After	----	----	----	----	
		Before-Master	----	----	-15.109	----	
		After-Before	----	----	----	----	
Gain Ratio - 0		Master	1.000	0.940	1.034	1.060	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	

HNGS Background and Na22 Set Point Determination - Detector 1 Calibration

Master (EEPROM): 11:28:21 08-Feb-2013		Before (Measured): 11:06:58 27-Feb-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Set Point - 0		Master	40.000	38.000	39.000	43.500	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	

HNGS Background and Na22 Set Point Determination - Detector 2 Calibration

Master (EEPROM): 11:28:21 08-Feb-2013		Before (Measured): 11:06:58 27-Feb-2013		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Set Point - 0		Master	40.000	38.000	40.000	43.500	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	

Company: Nemaha Oil and Gas, LLC

Well: Lampson #2A-23-32-9 SWD

Field: Hylton



PLATFORM EXPRESS
COMPENSATED NEUTRON
LITHOLOGY DENSITY