

Company: Bonanza Creek

Well: State Seventy Holes J-18

Field: Wattenberg

County: Weld State: Colorado

Platform Express

Compensated Neutron Log

LithoDensity

County: Weld

Field: Wattenberg

Location: SESW, Sec18. T4N, R62W

Well: State Seventy Holes J-18

Company: Bonanza Creek

Location:

SESW, Sec18. T4N, R62W

SHL: 610FSL x 1455' FWL

Lat/Long: 40.306861/-104.371342

Elev.: K.B. 4577.50 ft

G.L. 4564.00 ft

D.F. 4576.50 ft

Permanent Datum:

Ground Level

Elev.: 4564.00 f

Log Measured From:

Kelly Bushing

13.50 ft

above Perm.Datum

Drilling Measured From:

Kelly Bushing

API Serial No.

05-123-41614

Section: 18

Township: 4N

Range: 62W

Logging Date

28-Sep-2016

Run Number	One		
Depth Driller	6800.00 ft		
Schlumberger Depth	6800.00 ft		
Bottom Log Interval	6798.00 ft		
Top Log Interval	1459.00 ft		
Casing Driller Size @ Depth	9.625 in @ 1465.00 ft		
Casing Schlumberger	1465 ft		
Bit Size	8.75 in		
Type Fluid In Hole	Water		
Density	9.7 lbm/gal	33 s	
Fluid Loss	PH 11.6 cm3	9.7	
MUD	Active Tank		
RM @ Meas Temp	2.24 ohm.m @ 75.3 degF		
RMF @ Meas Temp	2.11 ohm.m @ 75 degF		
RMC @ Meas Temp	2.52 ohm.m @ 75 degF		
Source RMF	RMC Calculated		
RM @ BHT	0.83 @ 216 0.77 @ 216		
Max Recorded Temperatures	216 degF		
Circulation Stopped	28-Sep-2016 04:30:00		
Logger on Bottom	28-Sep-2016 16:30:00		
Unit Number	9115	FtMorgan	
Recorded By	B Kesek		
Witnessed By	Tim Jayne		

Disclaimer

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

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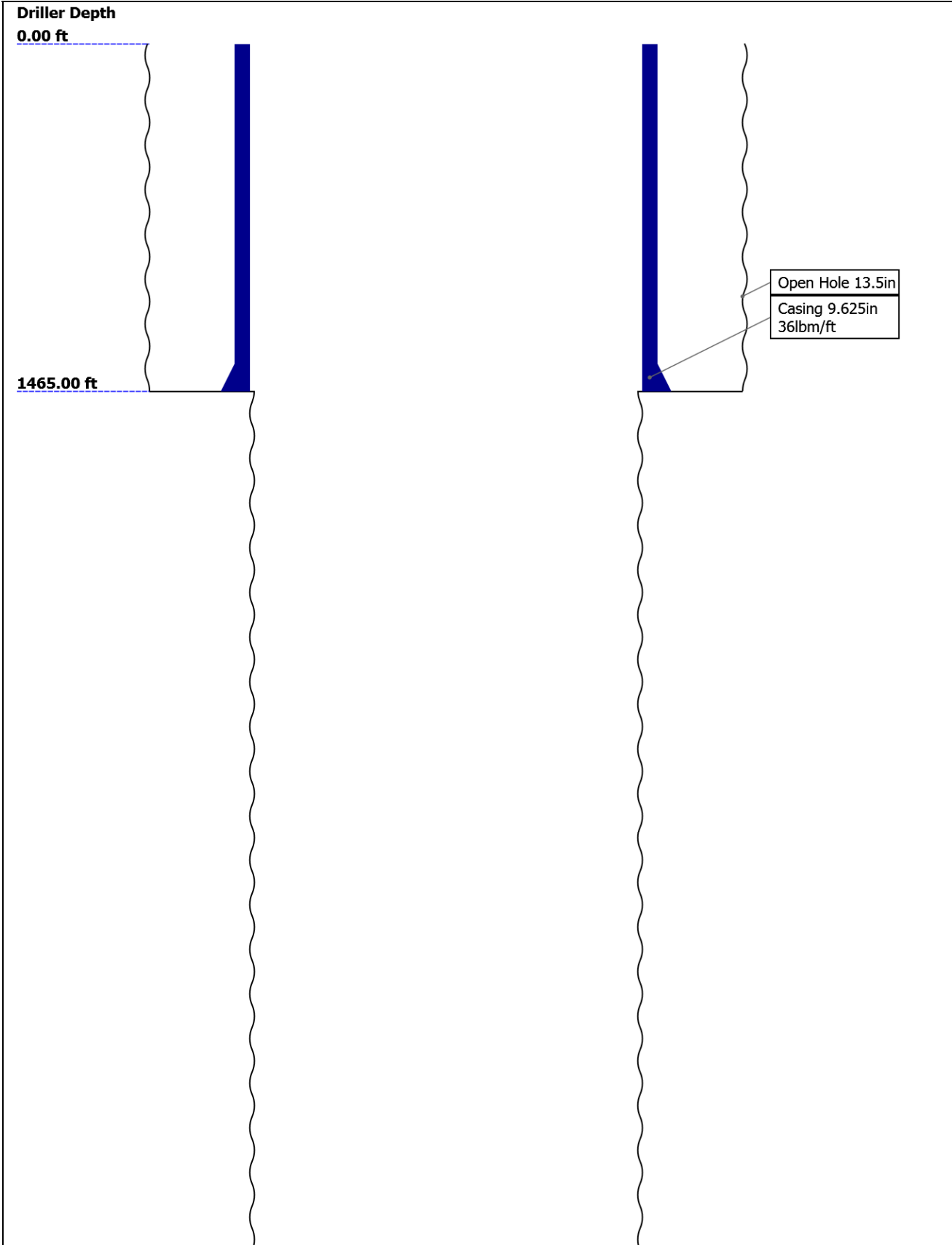
9.1 Composite Summary

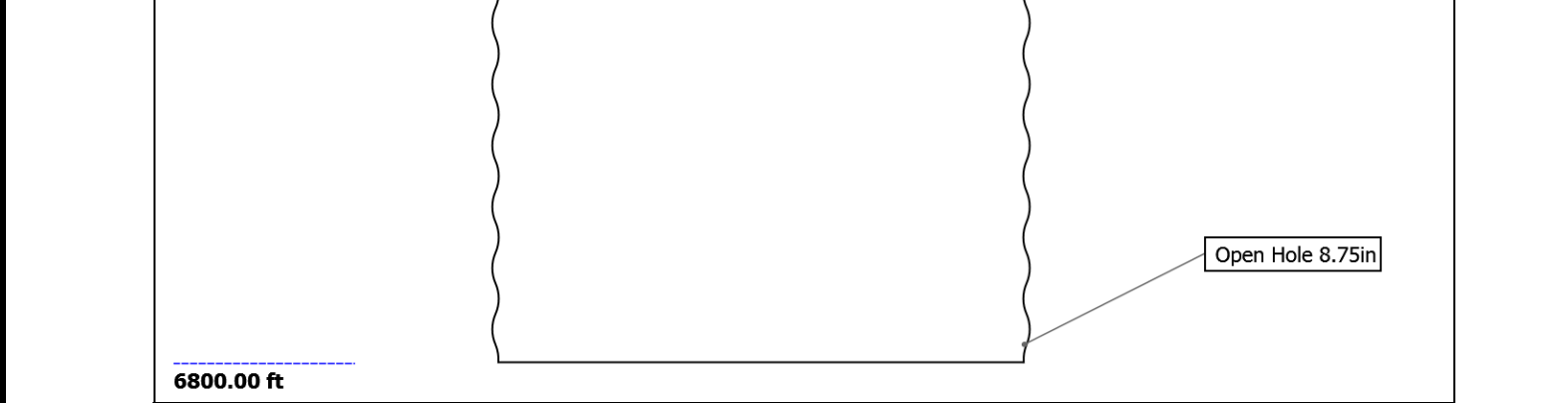
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- 10.1 Integration Summary
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- 10.3 Composite Summary
- 10.4 Log (KM 5in Density)
- 10.5 Parameter Listing
- 11. One 5" Density
 - 11.1 Composite Summary

Well Sketch



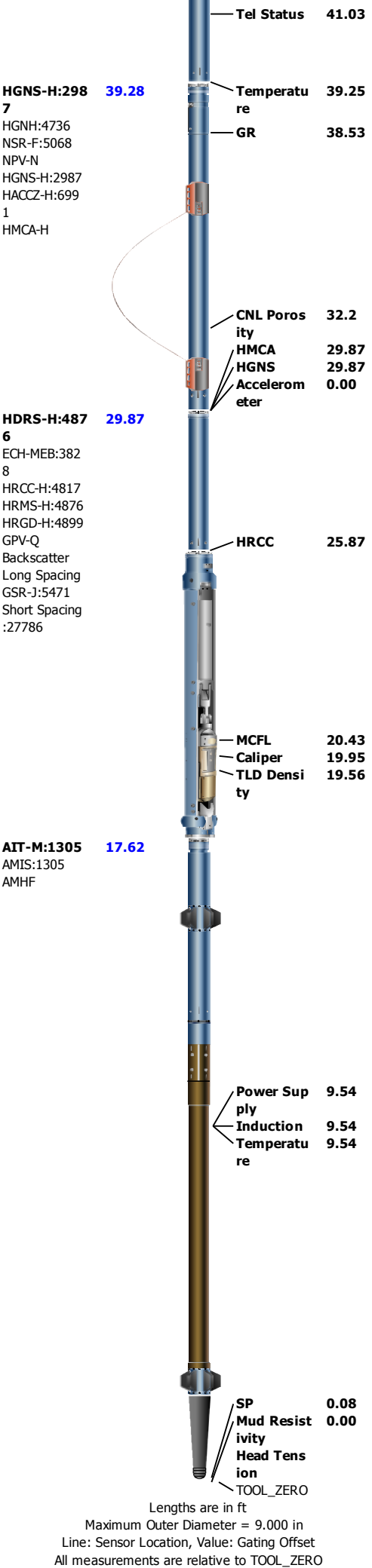


Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	13.5	8.75				
Top Driller (ft)	0	1465				
Top Logger (ft)	0	1465				
Bottom Driller (ft)	1465	6800				
Bottom Logger (ft)	1465	6800				
Casing						
Size (in)	9.625					
Weight (lbm/ft)	36					
Inner Diameter (in)	8.921					
Grade	N/A					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	1465					
Bottom Logger (ft)	1465					

Remarks and Equipment Summary

One: Toolstring				One: Remarks	
<div><div><div>Equip name</div><div>LEH-QT</div><div>LEH-QT</div></div><div><div>Length</div><div>56.88</div></div></div> <div><div><div>MP name</div><div>Offset</div></div></div>	This is the first run in the well.				
	Toolstring ran as per toolsketch.				
	Neutron corrections: Holesize, Standoff				
	Matrix: Limestone. MDen: 2.71g/cm3				
	Repeat pass performed below casing shoe due to adverse hole conditions at bottom.				
<div><div><div>DTC-H:8980</div><div>ECH-KC:1005</div><div>3</div><div>DTC-H:8980</div></div><div><div>Length</div><div>53.97</div></div></div> <div><div>CTEM</div><div>HV</div><div>TelStatus</div><div>ToolStatus</div></div> <div><div>MP name</div><div>Offset</div></div>	Caliper closed at: 6490-6464ft 5500-5494ft Due to adverse hole conditions. Discussed with company man.				
	Hole finder at the bottom of AIT used succesfully to get passed a bridge.				
<div><div><div>HNGS-BA:16</div><div>6</div><div>HEH-K:177</div><div>HNGS-BA:166</div></div><div><div>Length</div><div>50.97</div></div></div> <div><div>GR</div><div>47.98</div></div>					
<div><div><div>HNGC-B:108</div><div>HNGH-A:46</div><div>HNGC-B:108</div></div><div><div>Length</div><div>42.78</div></div></div>					



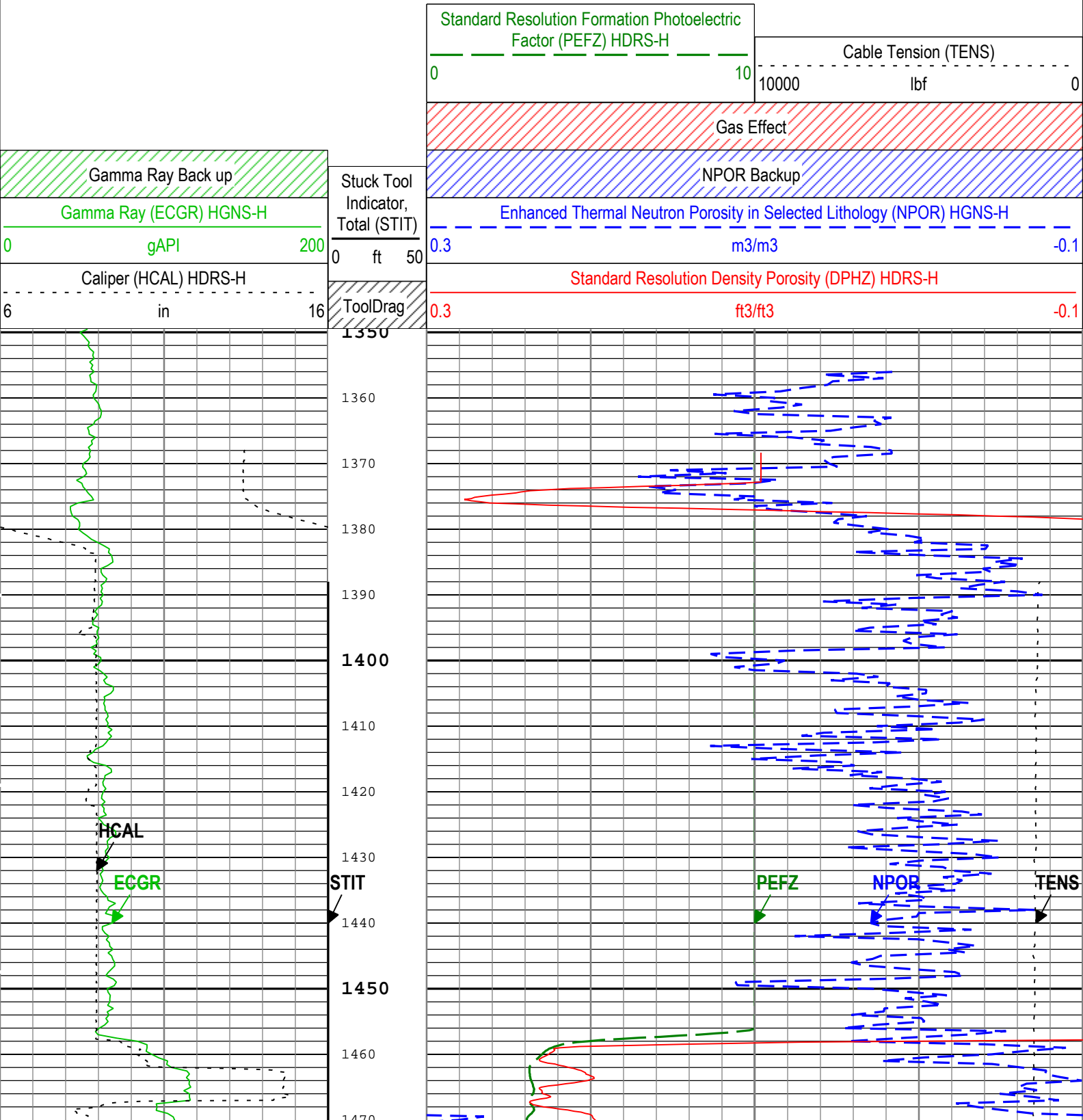
Depth Summary										
		One								
Depth Measuring Device										
Type		IDW-B								
Serial Number										
Calibration Date										
Calibrator Serial Number										
Calibration Cable Type		7-46axs								
Wheel Correction 1		0								
Wheel Correction 2		0								
Tension Device										
Type		CMTD-B/A								
Serial Number		146								
Calibration Date		26-Sep-2016								
Calibrator Serial Number										
Number of Calibration Points		10								
Calibration Root Mean Square Error		4								
Calibration Peak Error		7								
Logging Cable										
Type		7-46NT-XS								
Serial Number										
Length		24000.00 ft								
Conveyance Type		Wireline								
Rig Type										
One:Depth Control Parameters					Depth Control Remarks					
Log Sequence		First Log In the Well			All Schlumberger depth procedures followed.					
Rig Up Length At Surface					IDW used as primary depth control device.					
Rig Up Length At Bottom					Z-chart used as secondary depth control device.					
Rig Up Length Correction										
Stretch Correction										
Tool Zero Check At Surface										
One										
Software Version										
Acquisition System						Version				
Maxwell 2016 SP2						6.2.68624.3100				
Pass Summary										
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data	
One	Log[4]:Up	Up	1387.81 ft	6810.88 ft	28-Sep-2016 5:33:25 PM	28-Sep-2016 9:39:06 PM	ON	4.00 ft	Yes	
All depths are referenced to toolstring zero										
Log										
Company:Bonanza Creek Well:State Seventy Holes J-18										
One: Log[4]:Up:S003										
Description: UCNIS standard resolution, perpendicular to Platform Express. Format: Log (KM 5 in Persecity). Index Scale: 5 in per 100 ft. Index Unit: ft. Index										

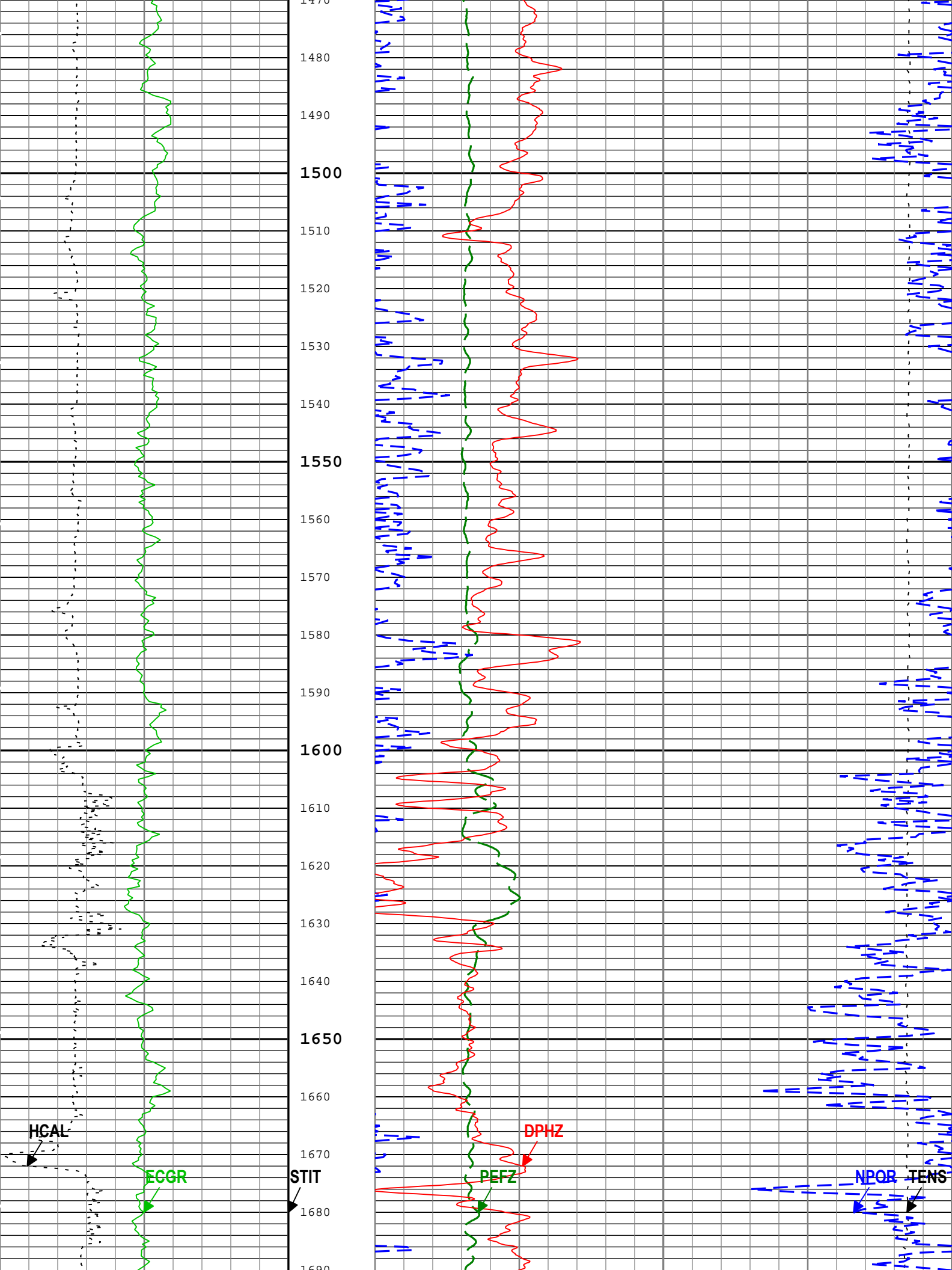
Description: HGNS standard resolution porosities for Platform Express
 Format: Log (KM 5in Porosity)
 Index Scale: 5 in per 100 ft
 Index

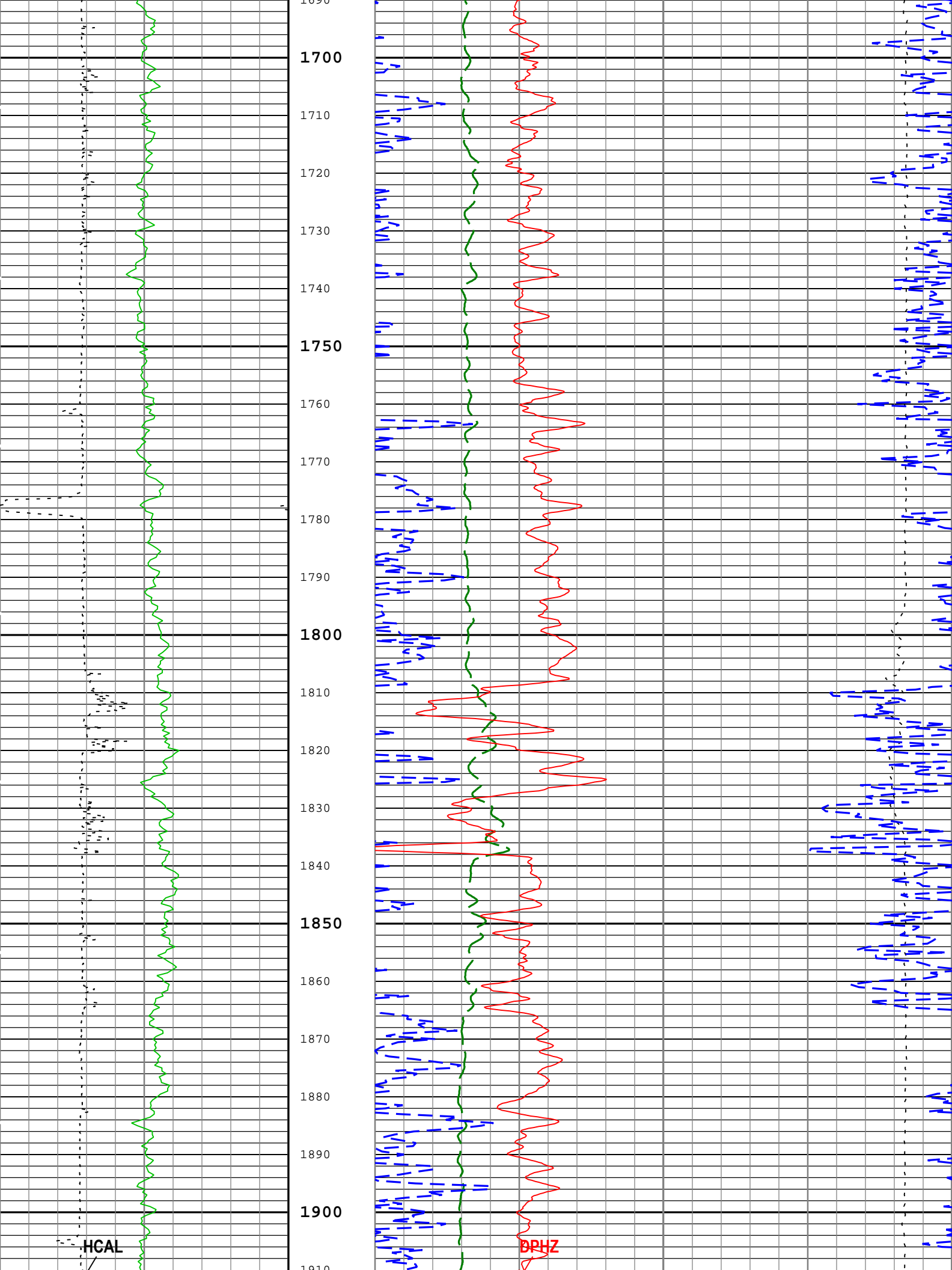
Type: Measured Depth
 Creation Date: 28-Sep-2016 22:55:43

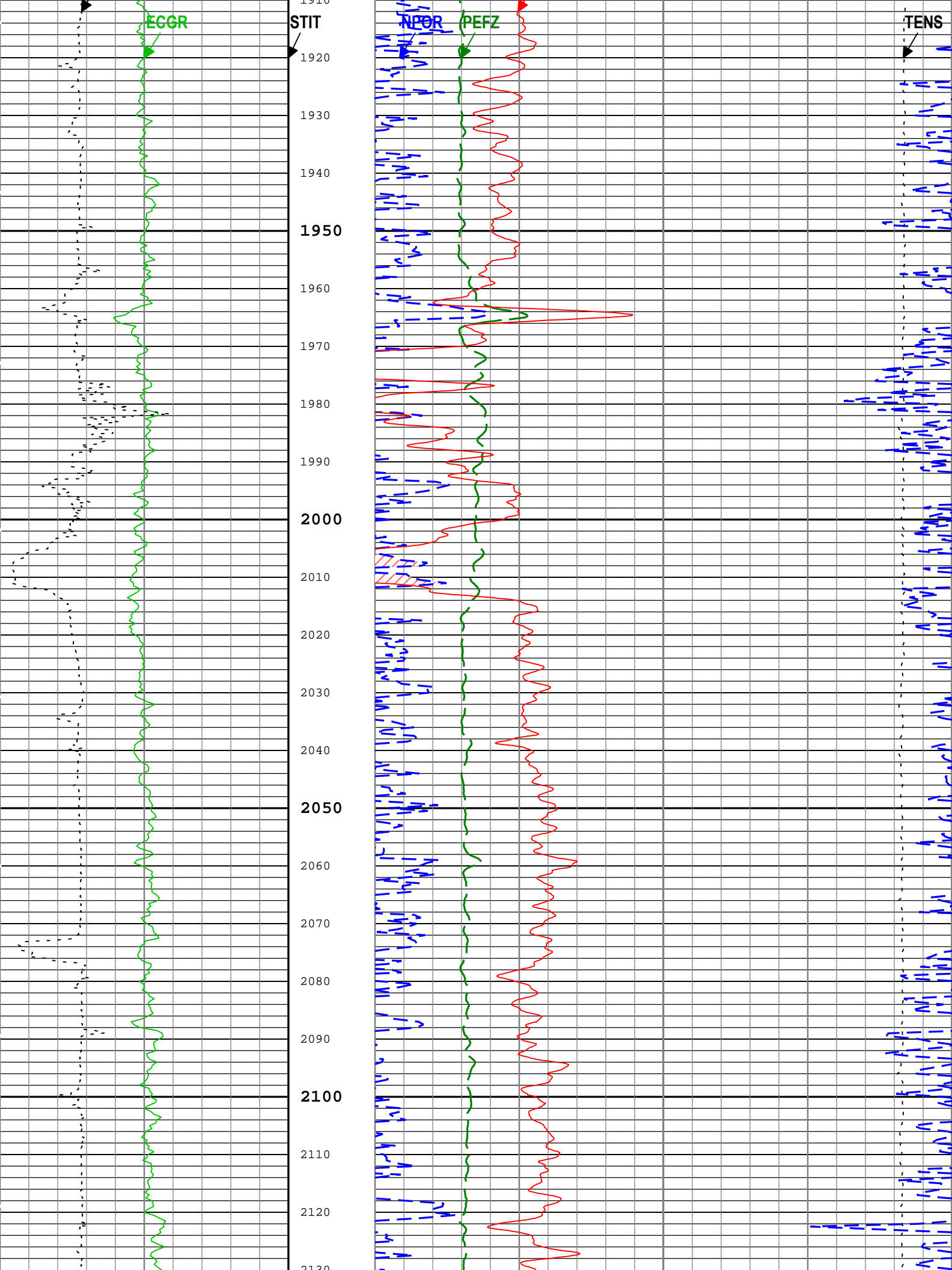
Channel	Source	Sampling
CALI	HDRS-H:HRCC-H:HRCC-H	1in
DPHZ	HDRS-H:HRMS-H:HRGD-H	2in
GR	HGNS-H:HGNS-H:HGNS-H	6in
NPOR	HGNS-H:HGNS-H:HGNS-H	6in
PEFZ	HDRS-H:HRMS-H:HRGD-H	2in
STIT	DepthCorrection	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

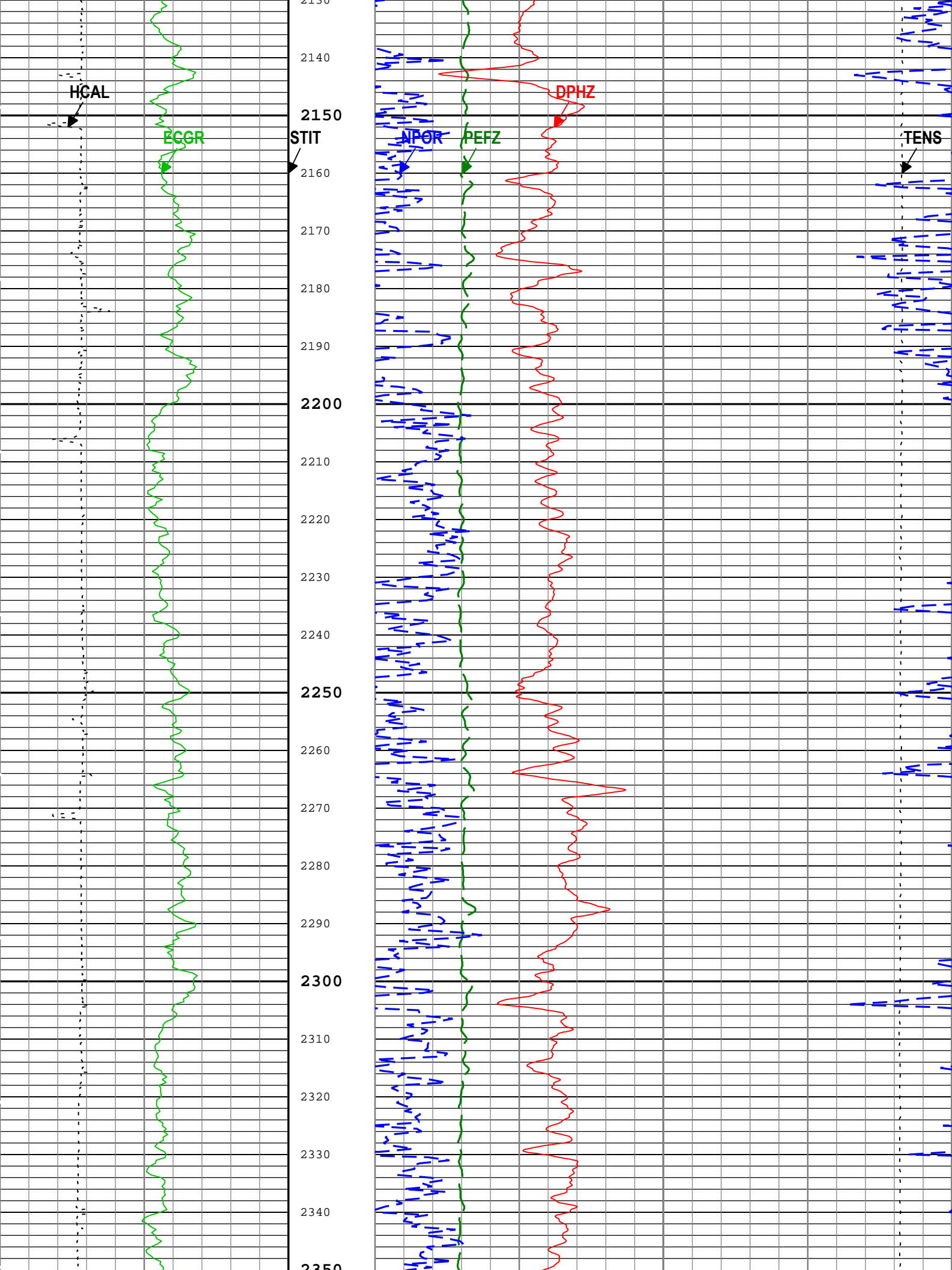
TIME_1900 - Time Marked every 60.00 (s)

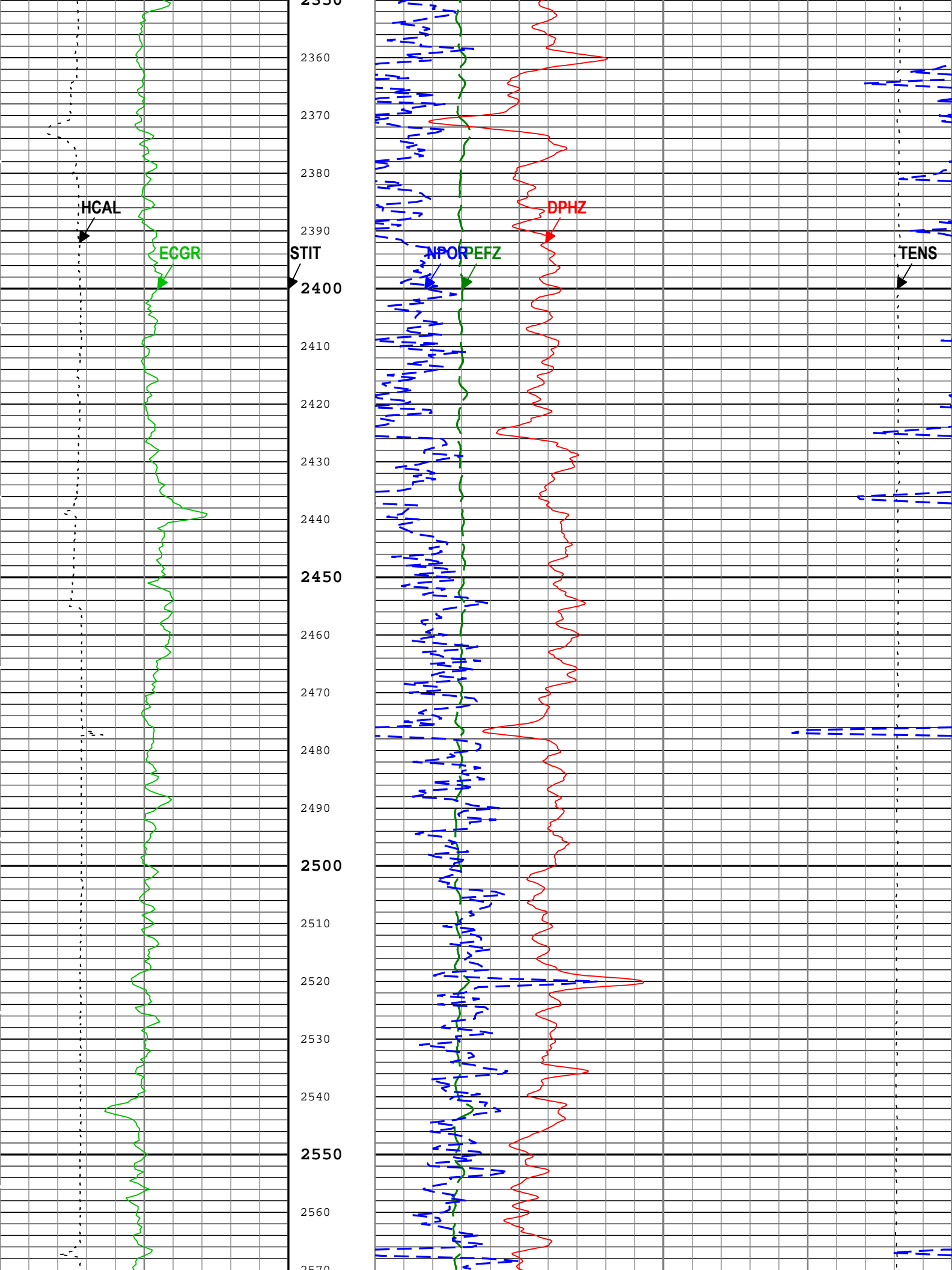


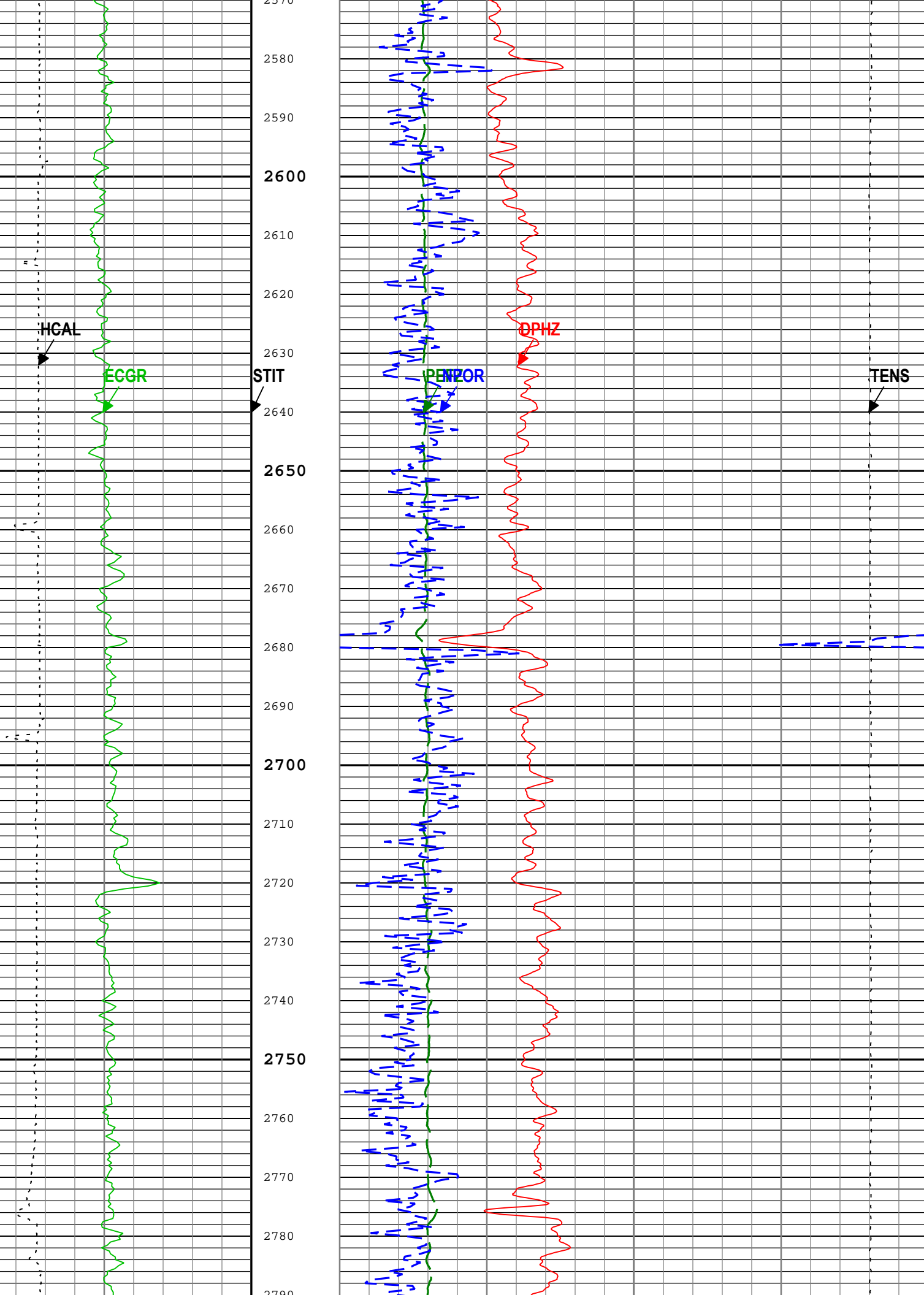


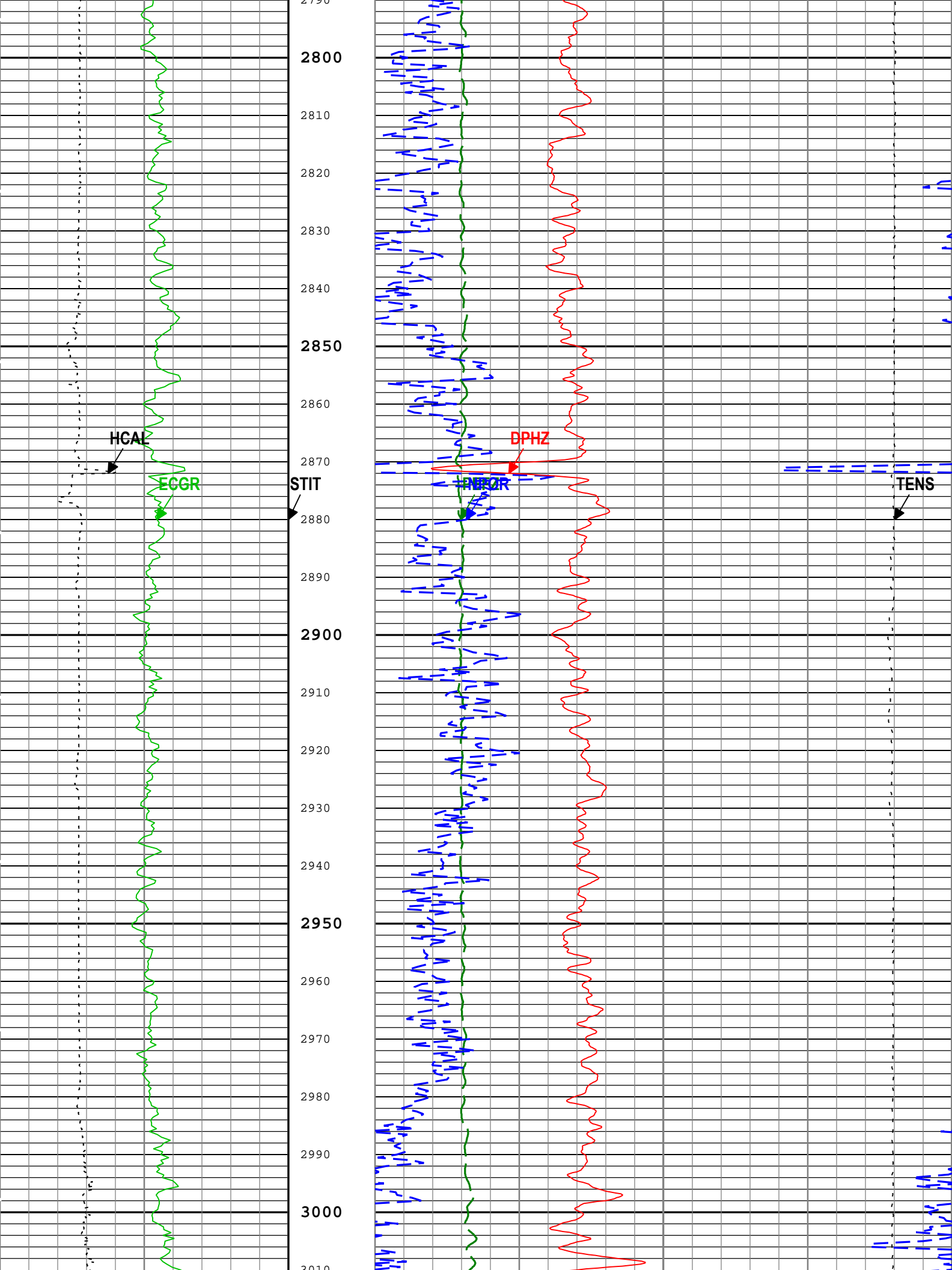


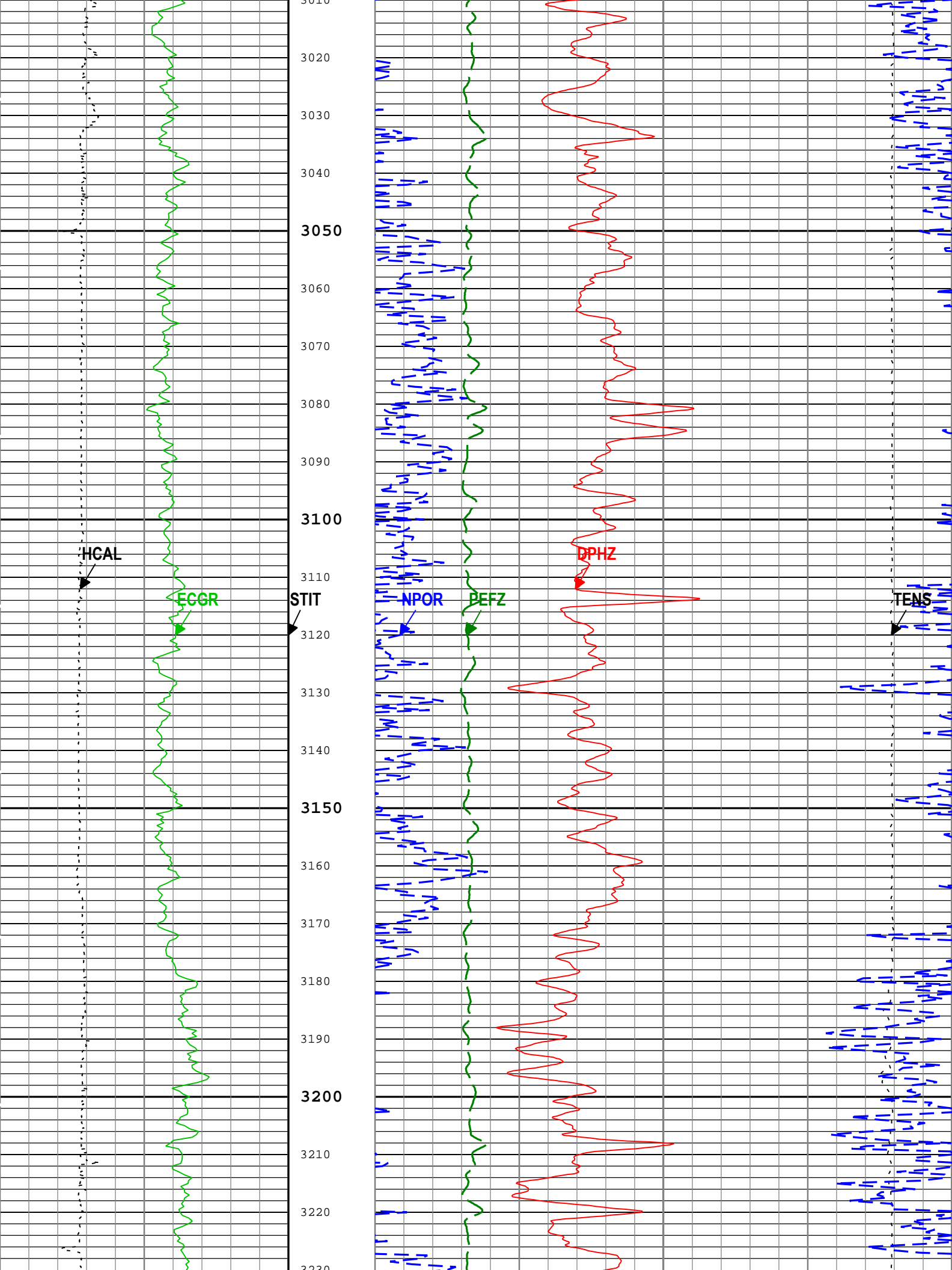


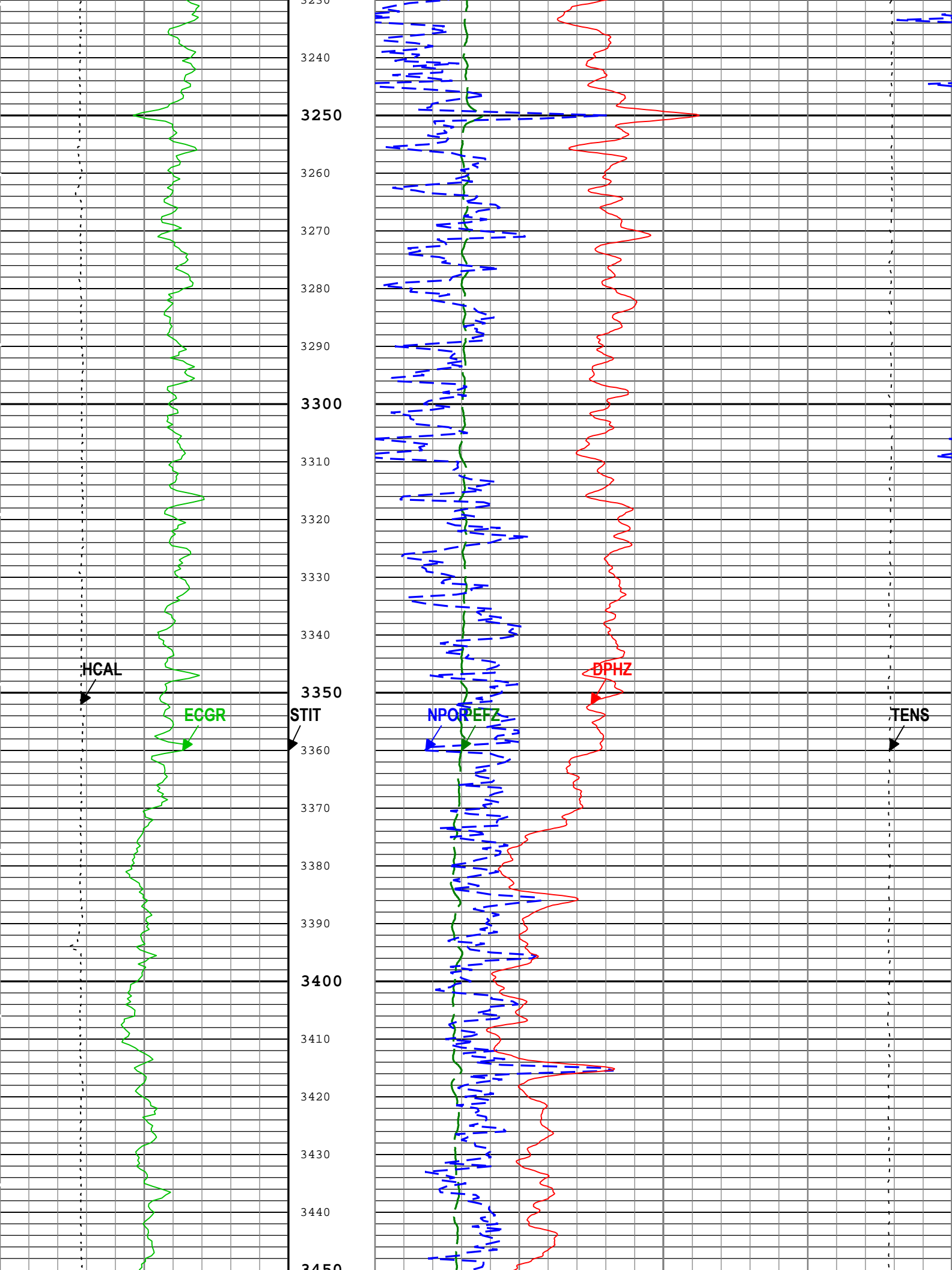


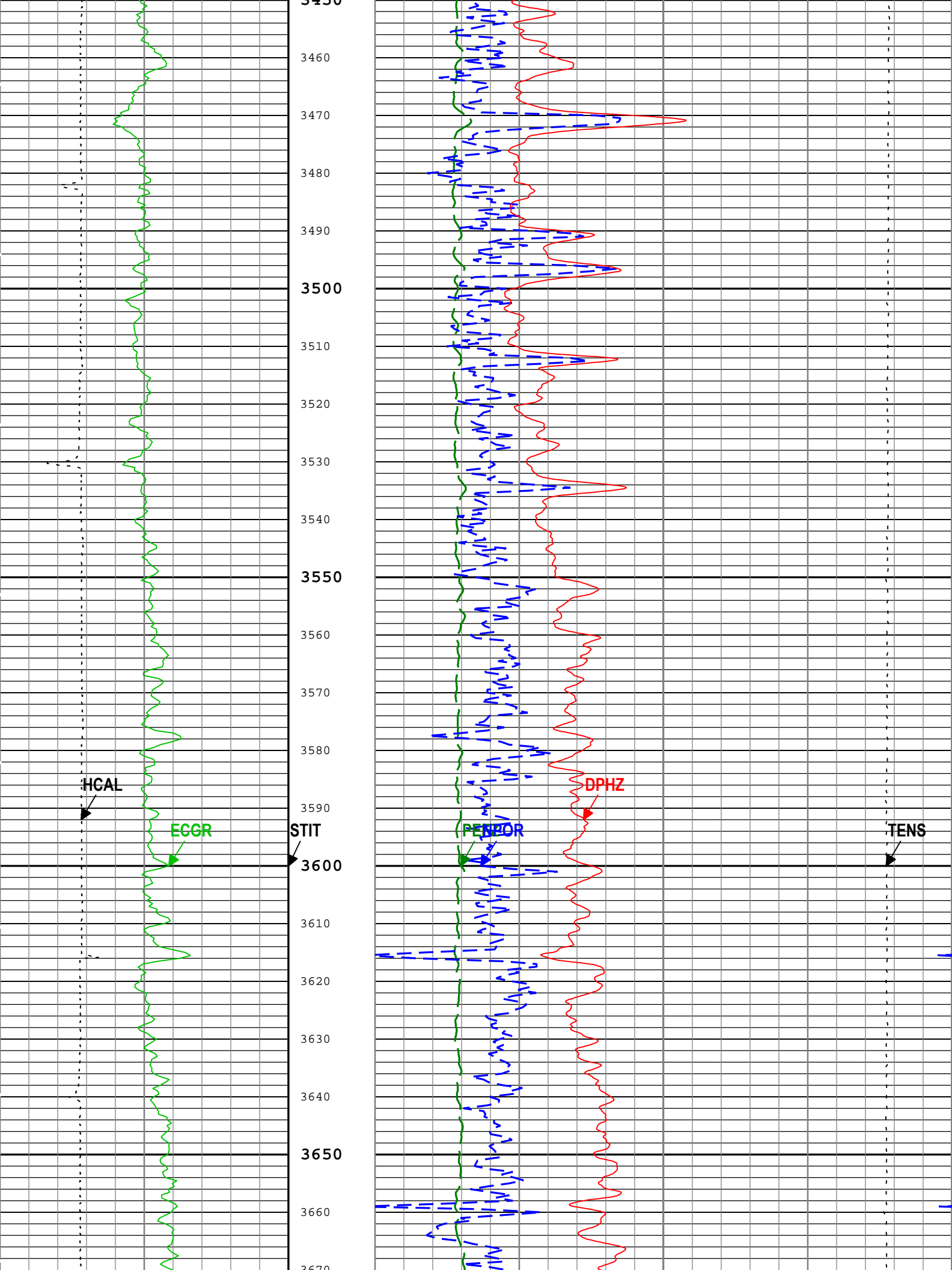


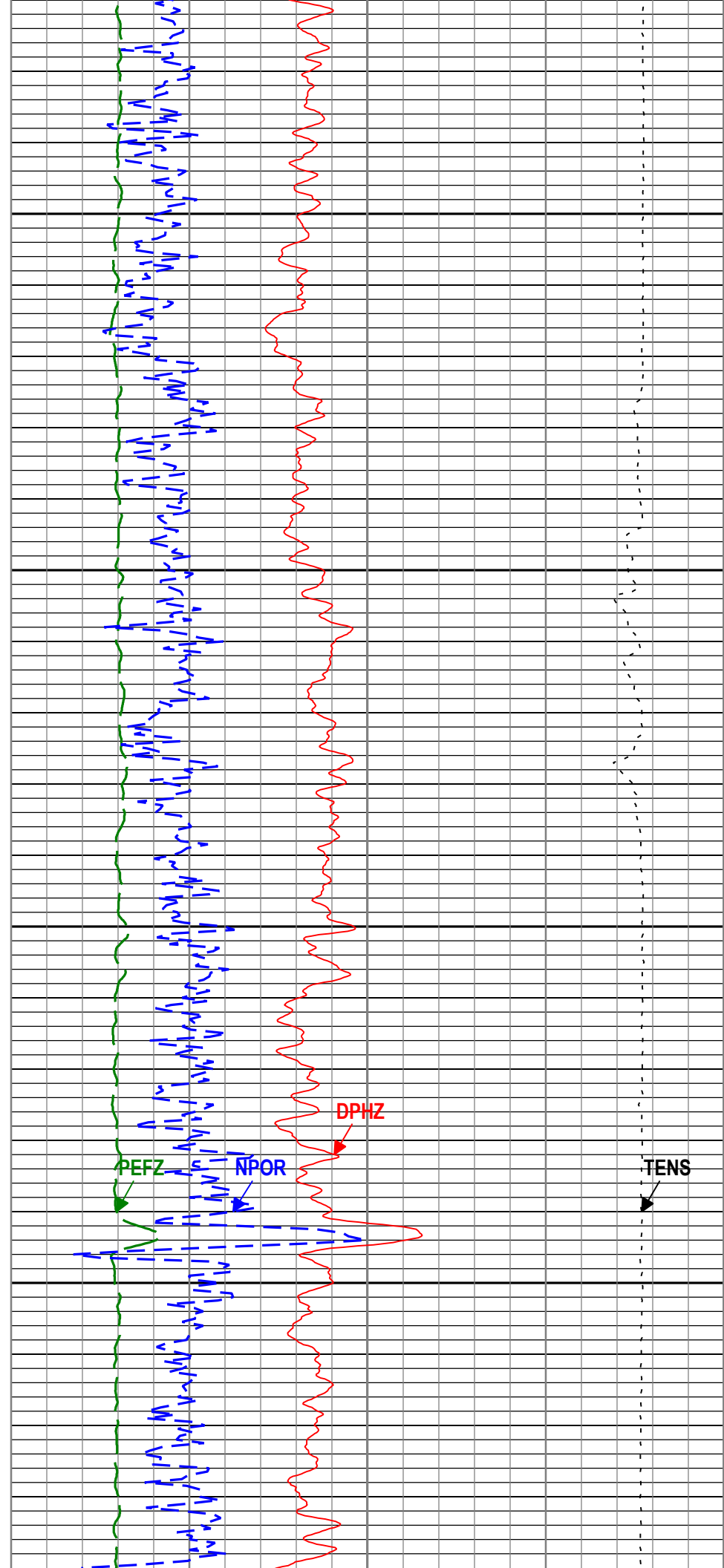
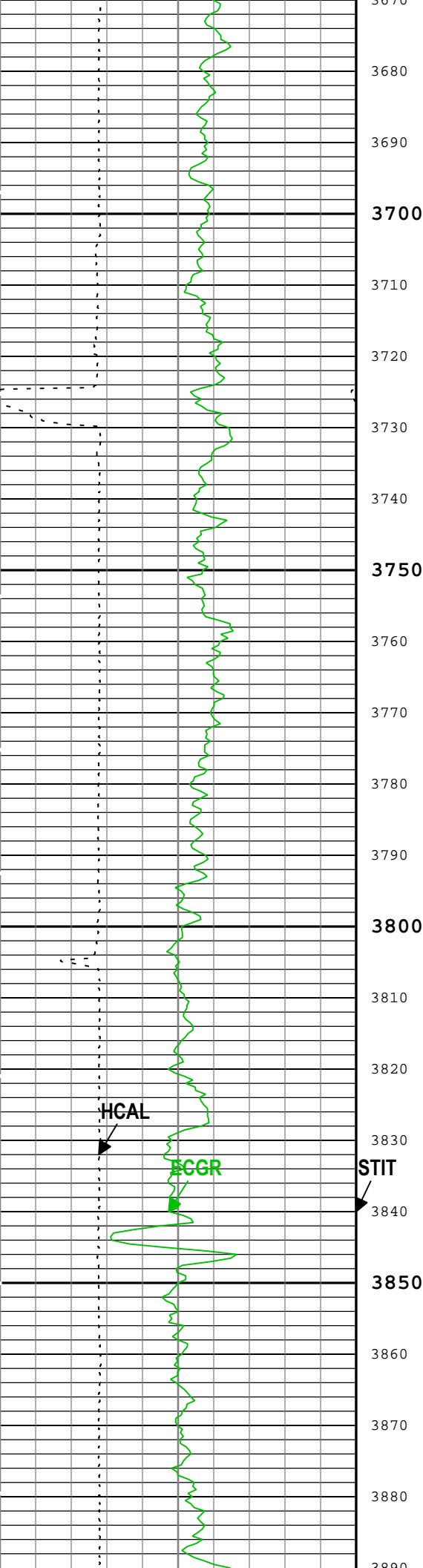


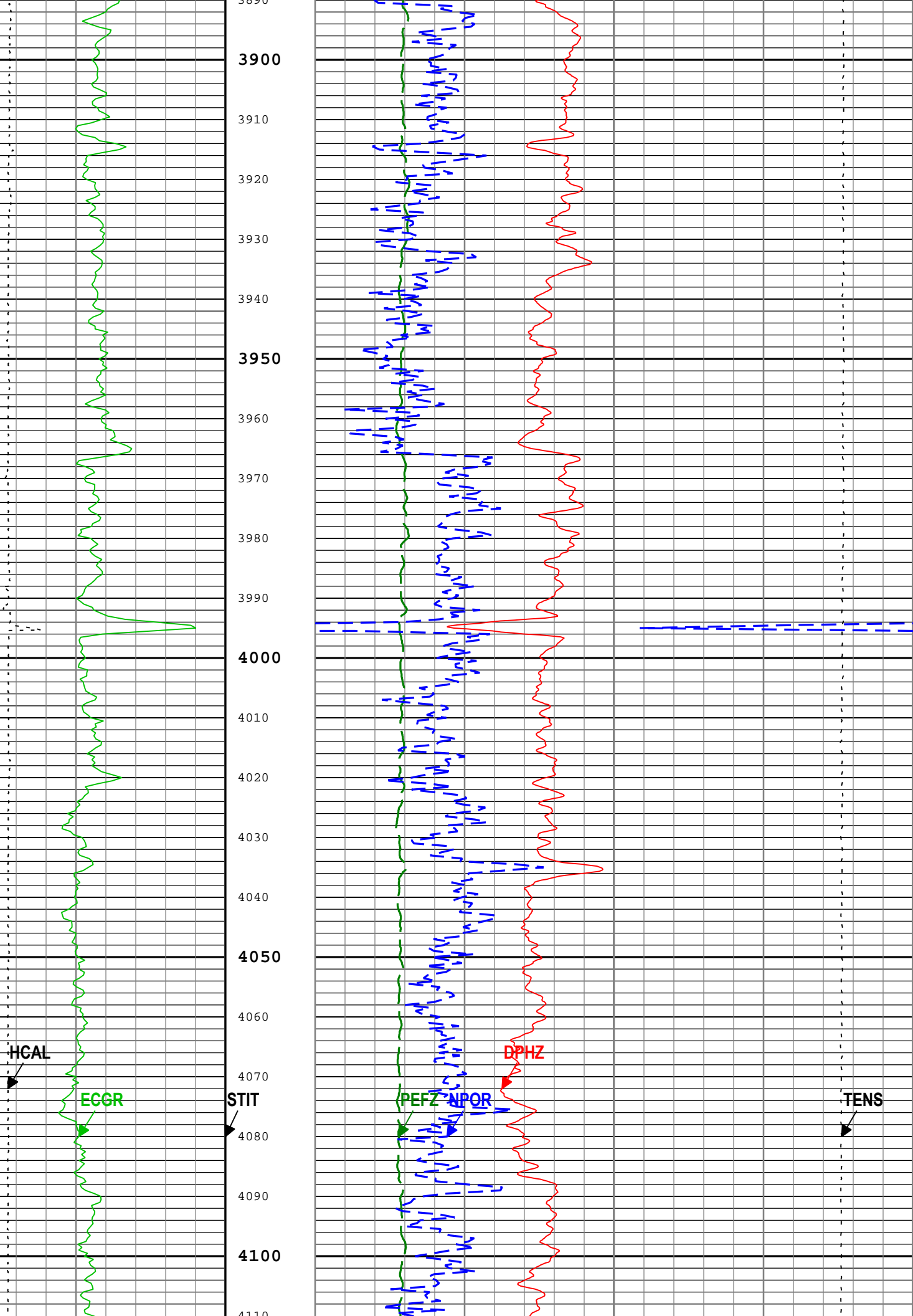


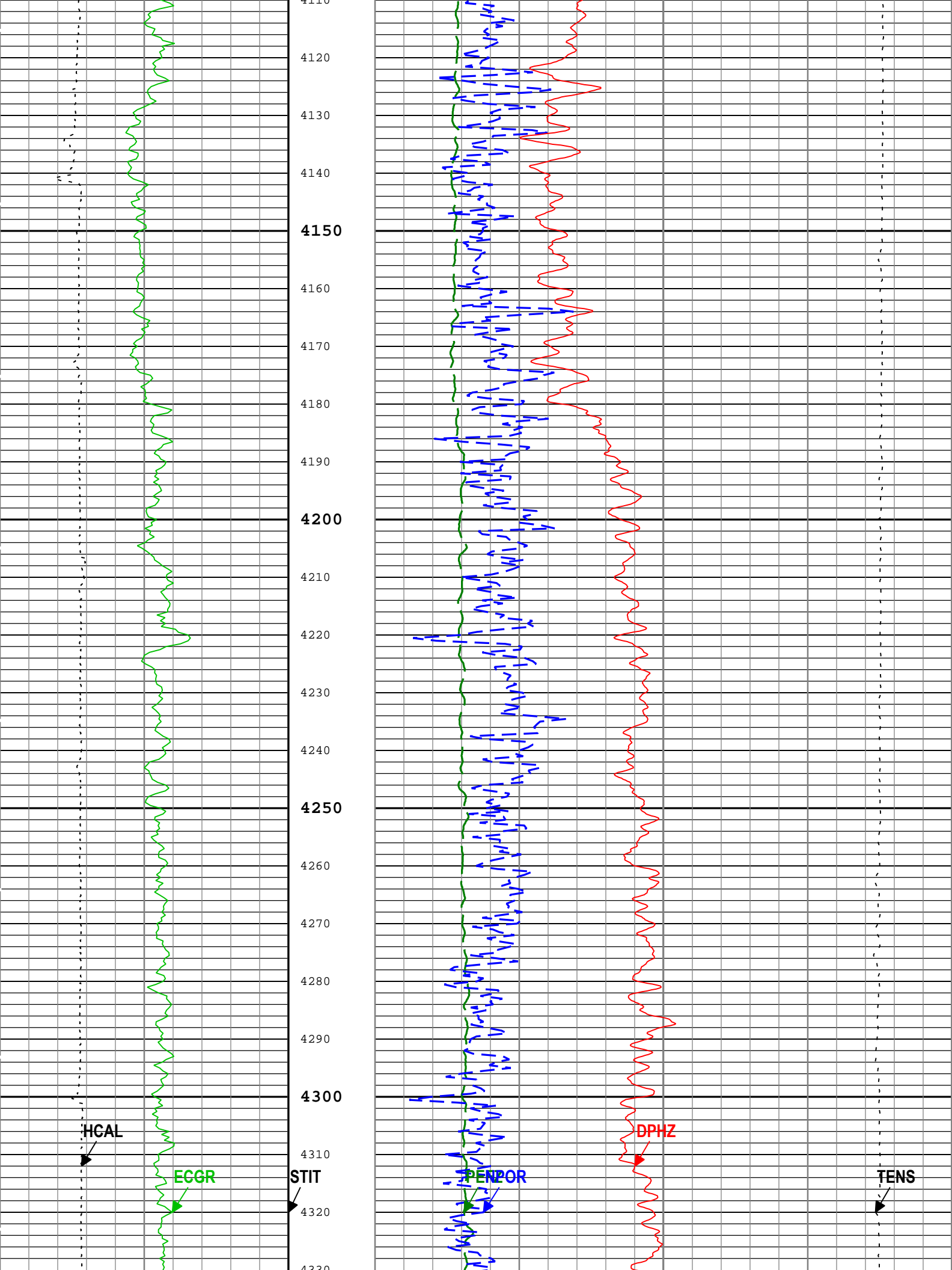


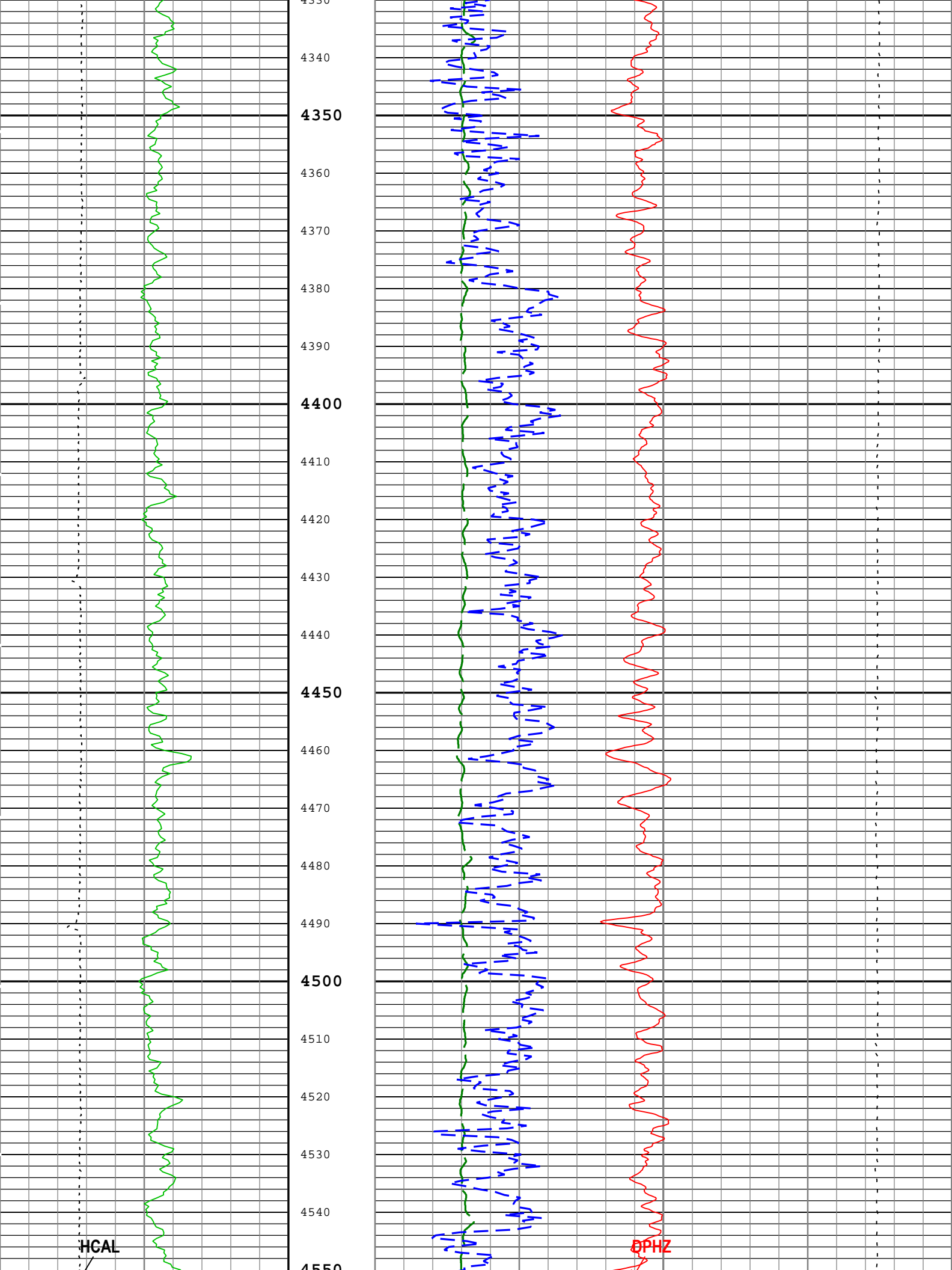


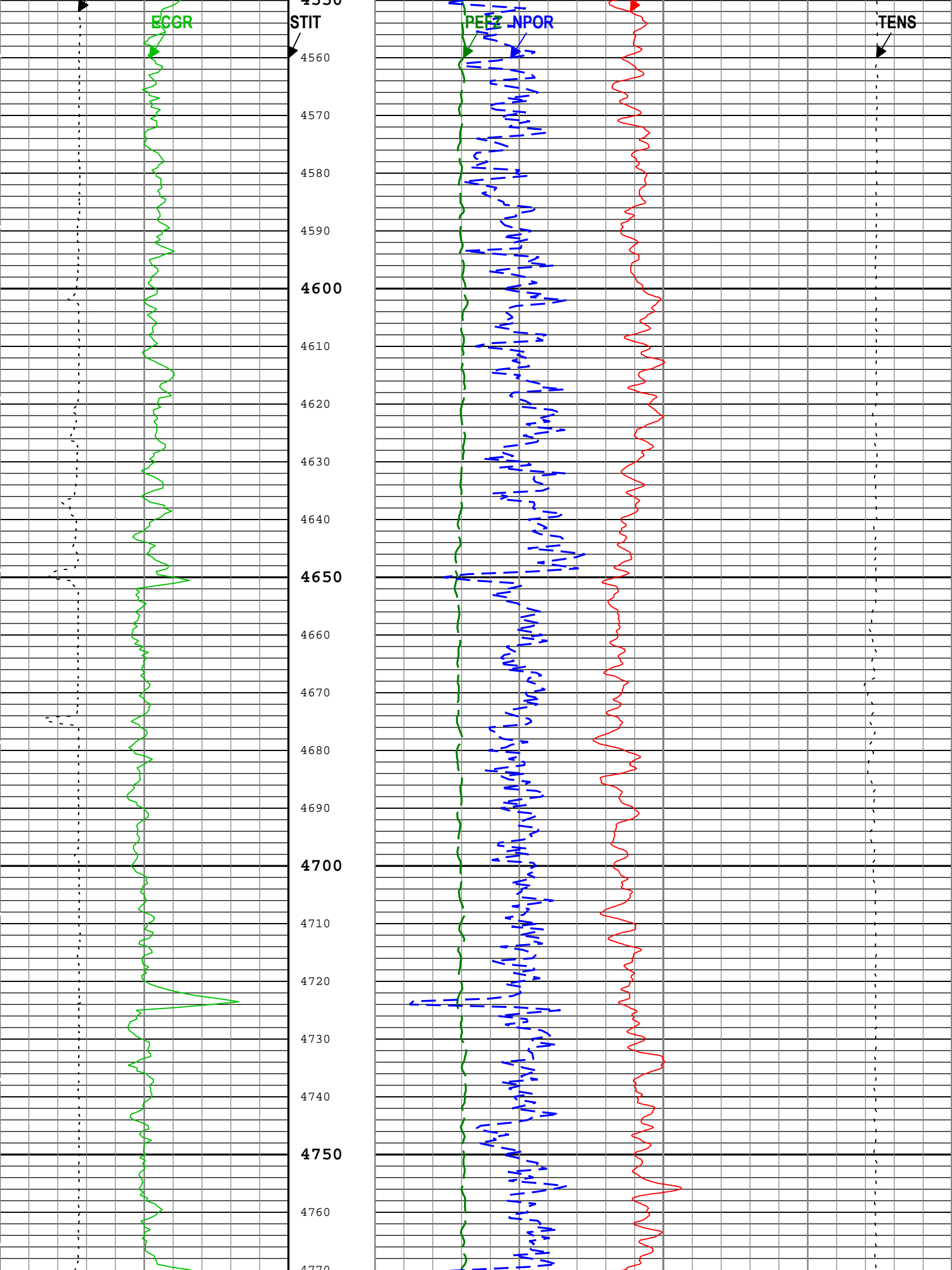


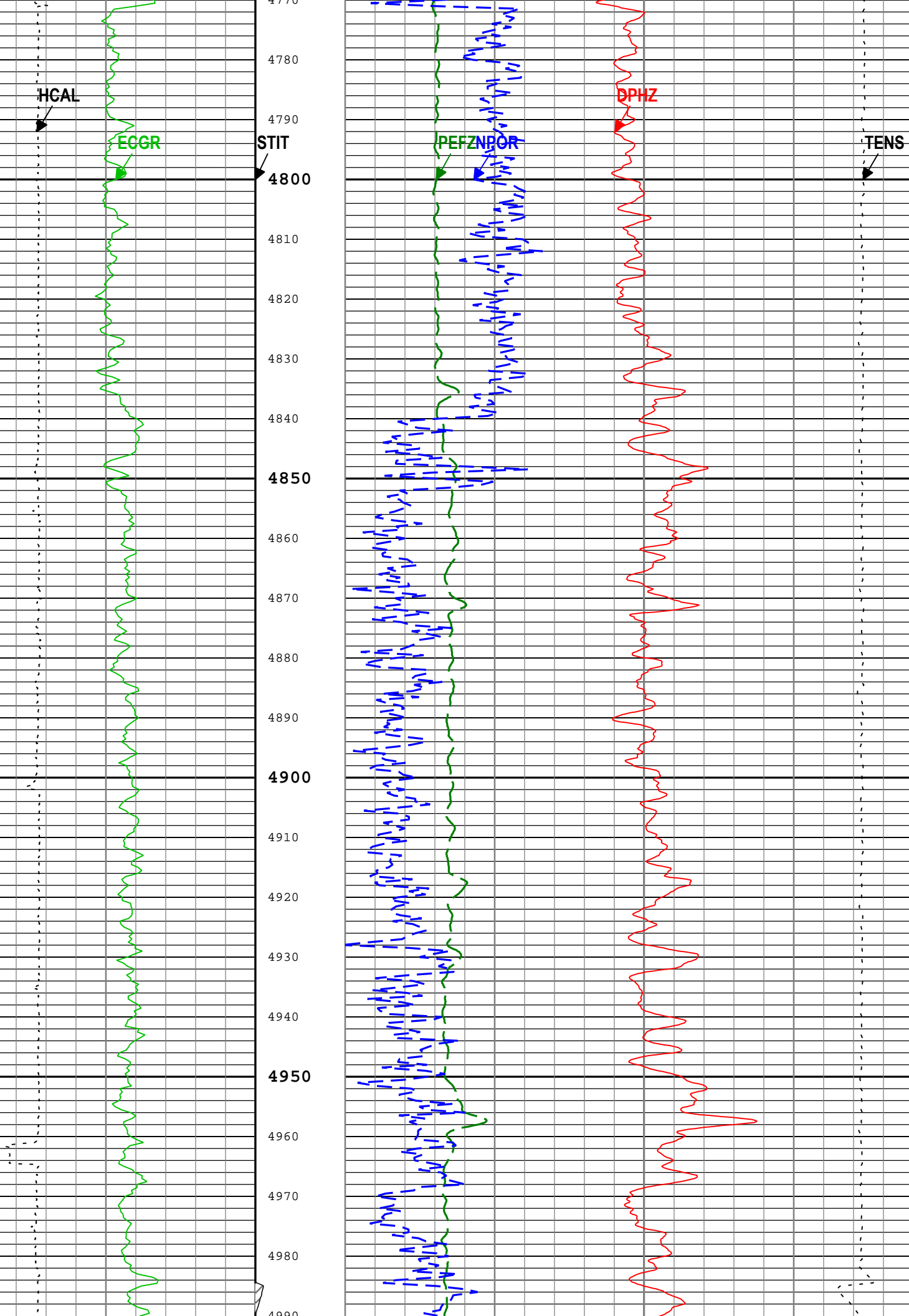


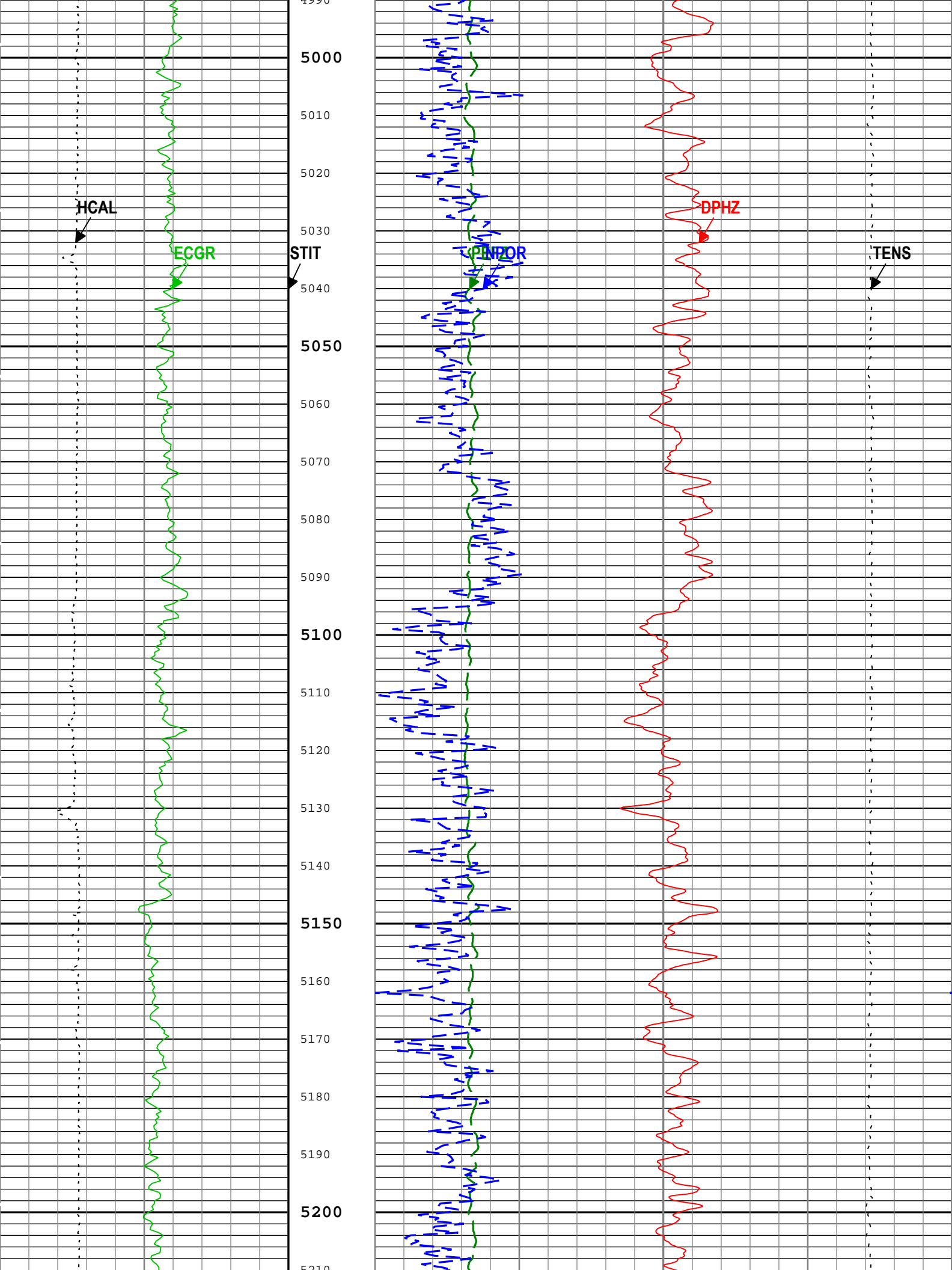


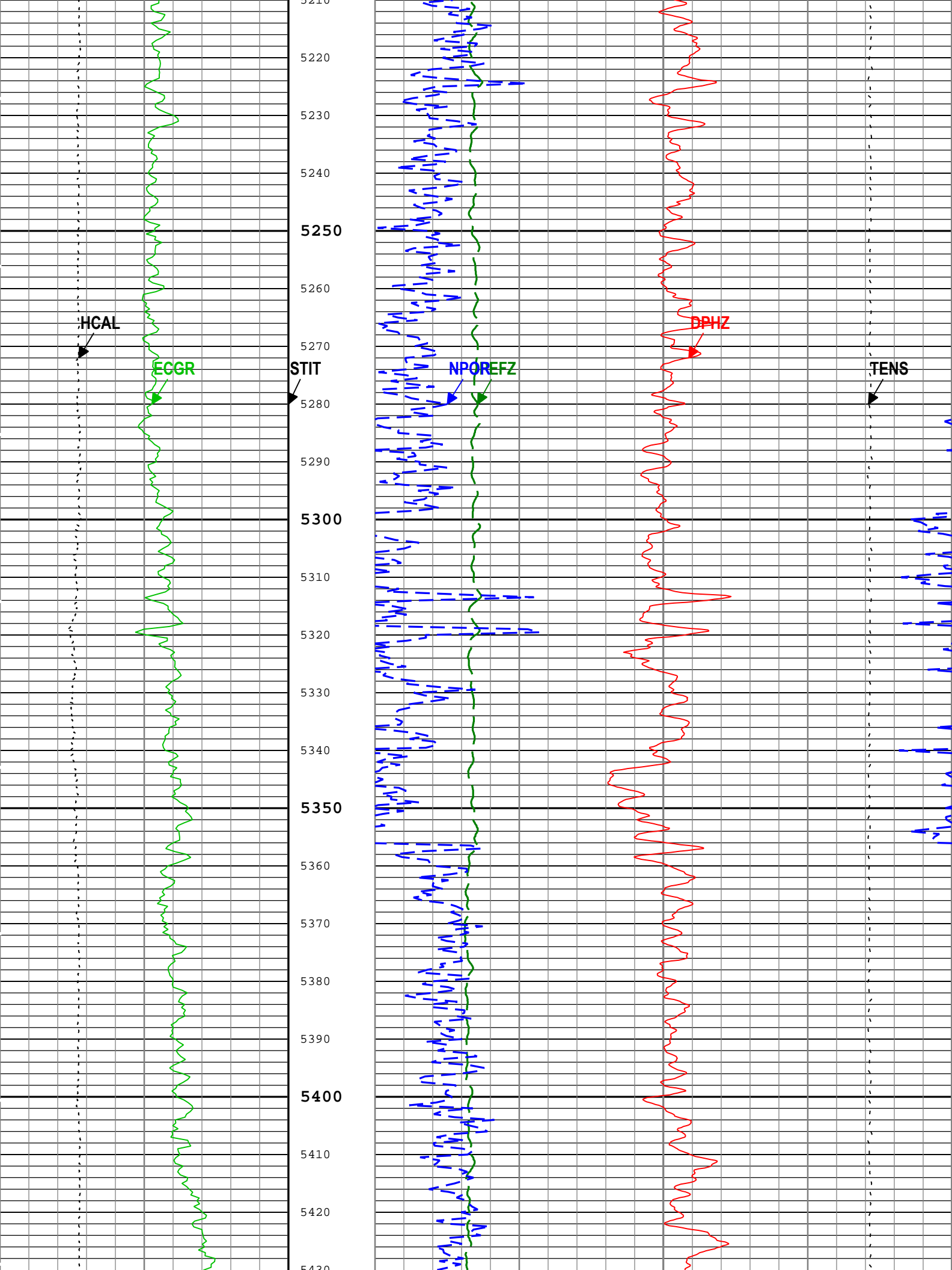


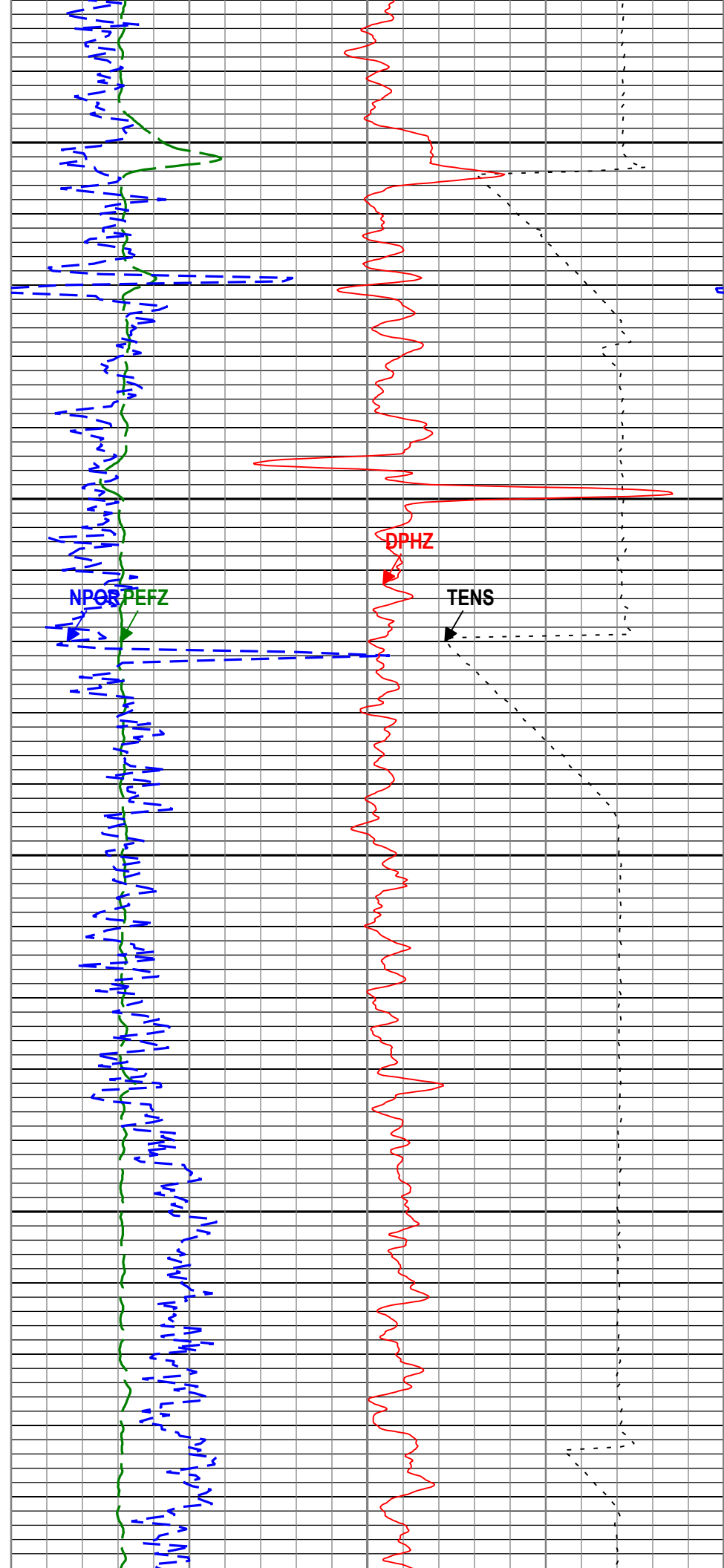
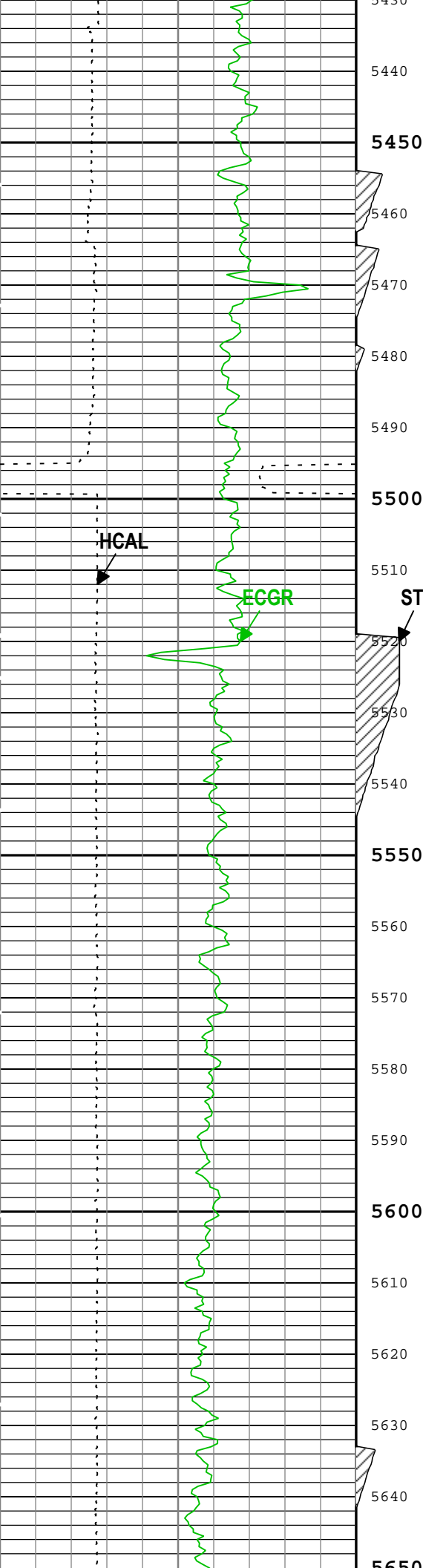


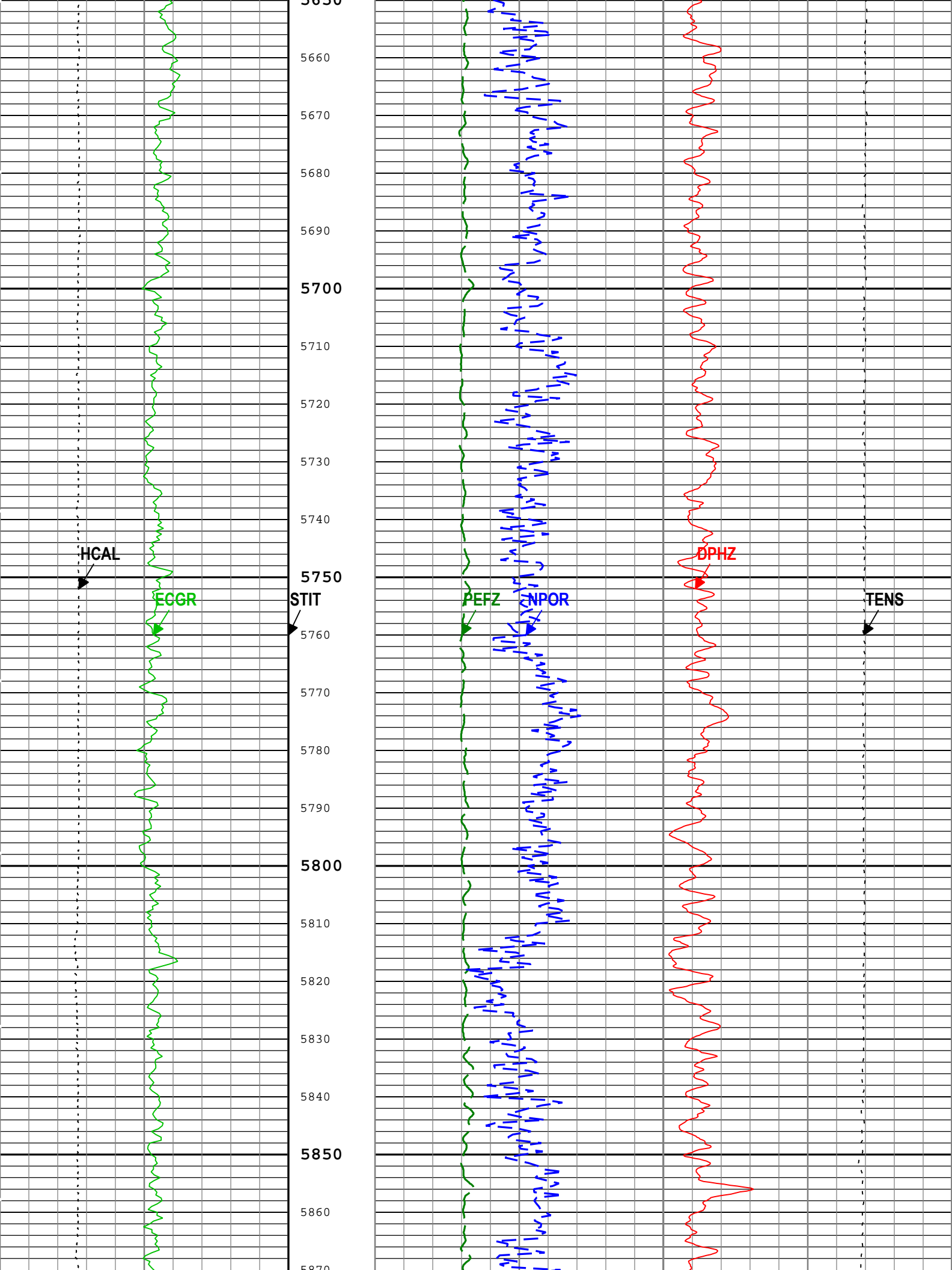


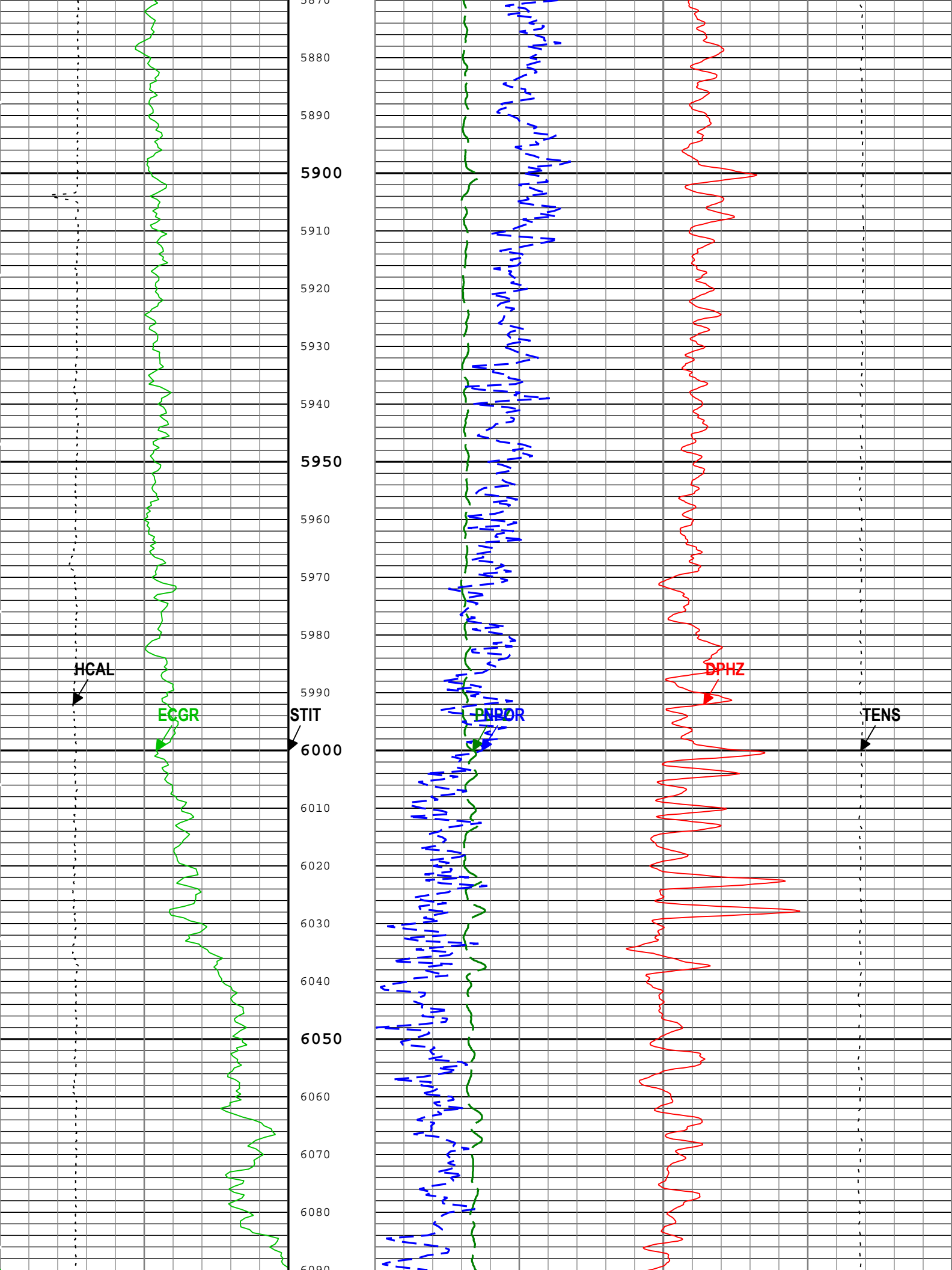


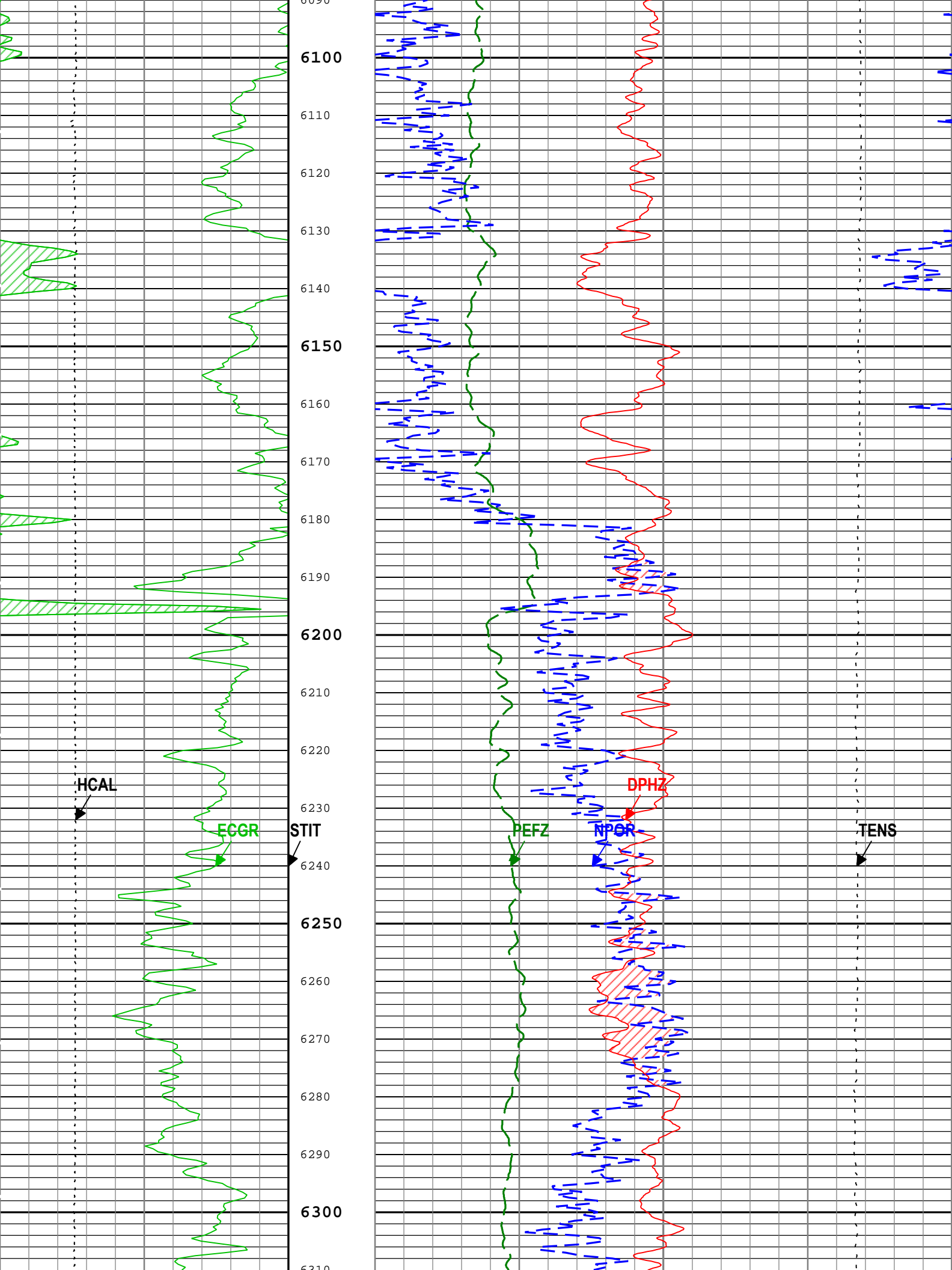


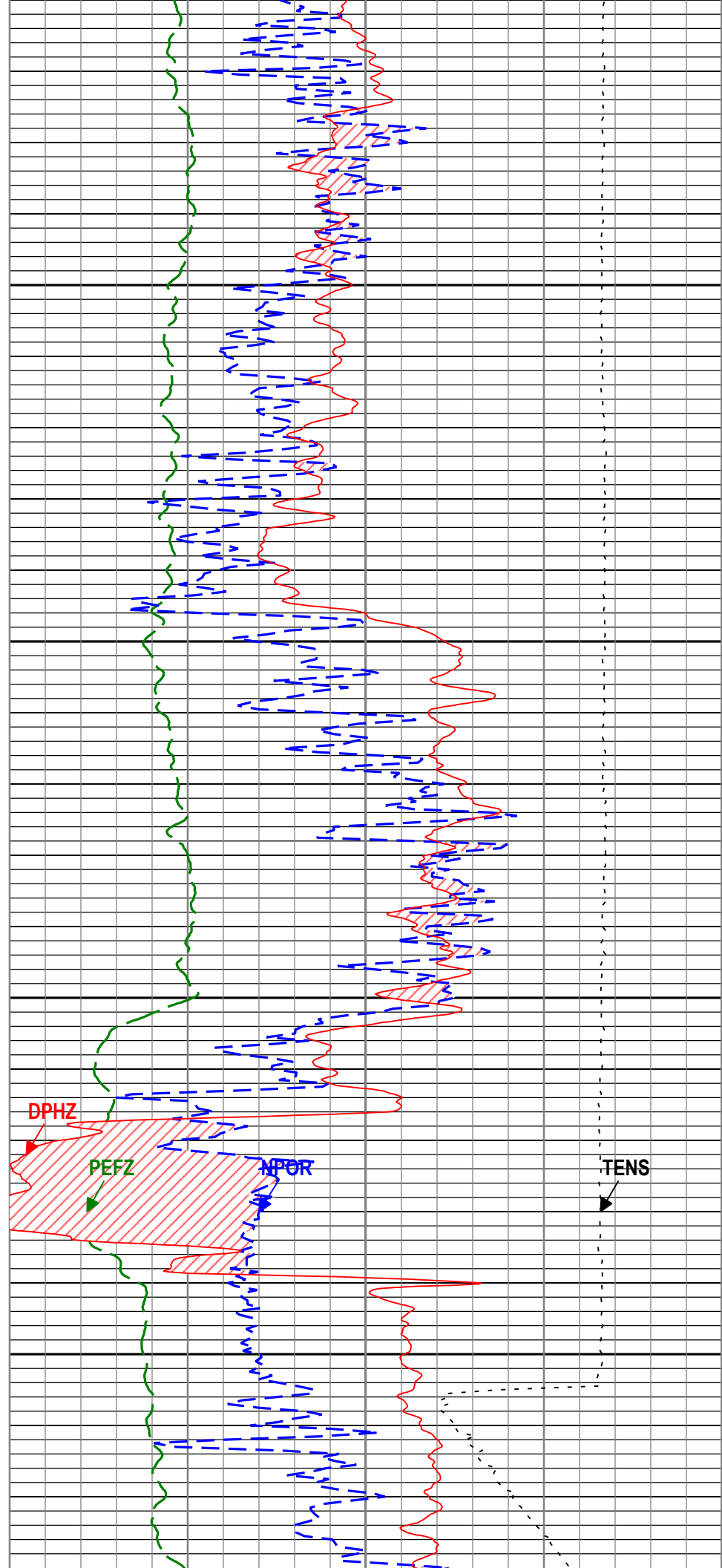
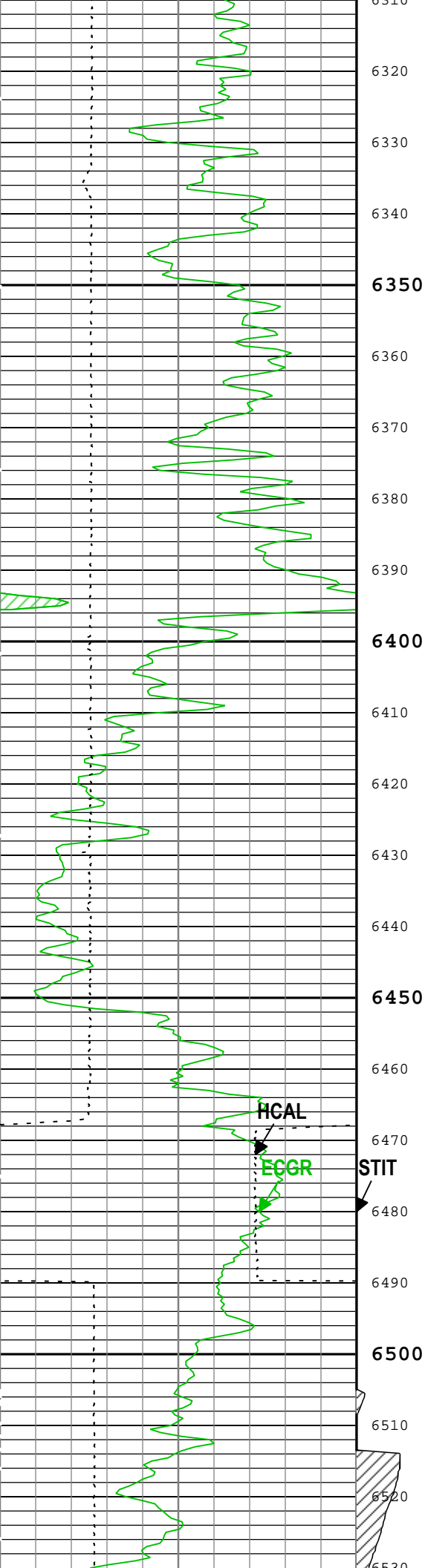


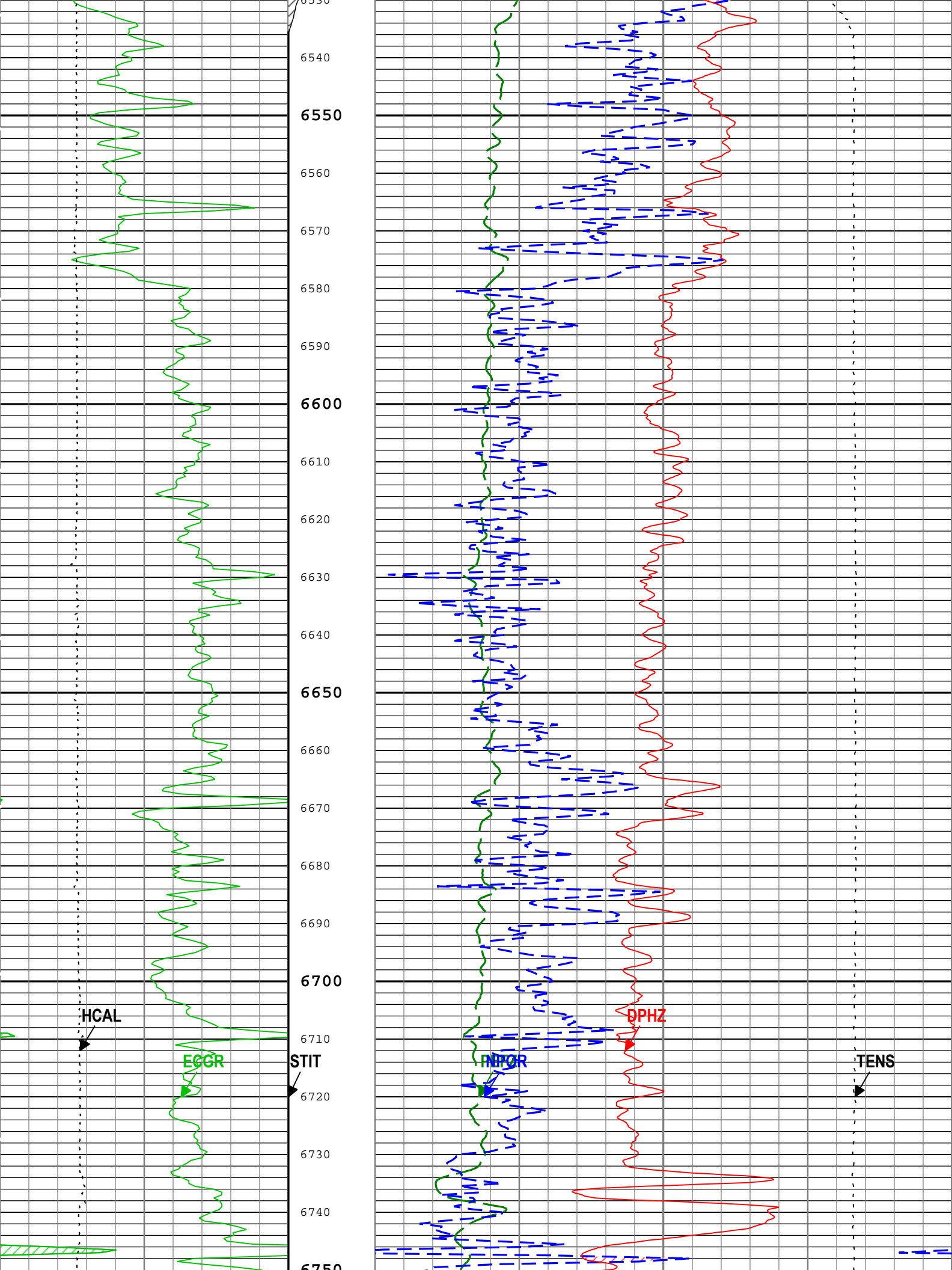


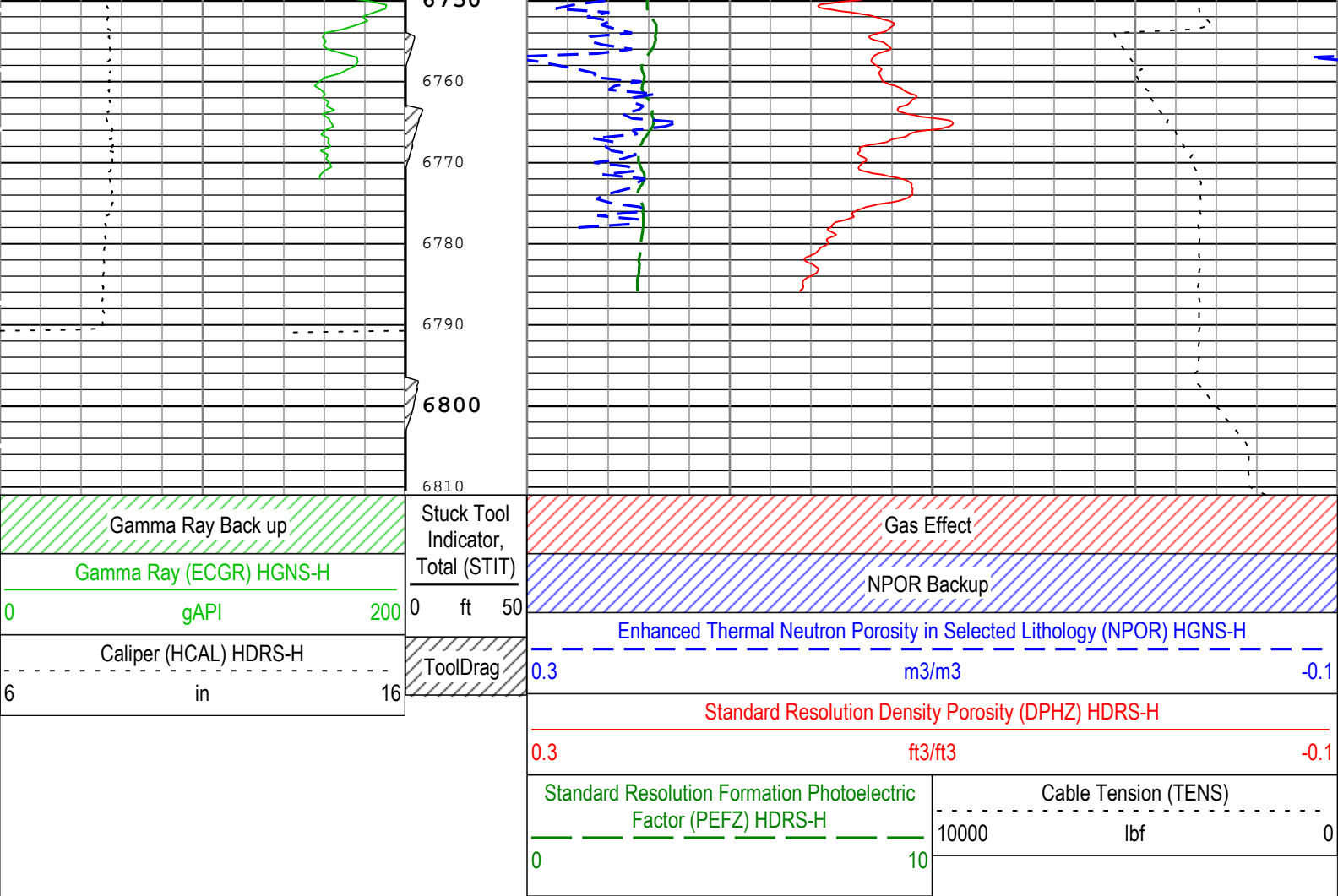












TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log (KM 5in Porosity) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Sep-2016 22:55:43

Channel Processing Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BHT	Bottom Hole Temperature	Borehole	216	degF
BS	Bit Size	WLSESSION	Depth Zoned	in
BSAL	Borehole Salinity	Borehole	0	ppm
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	-0.8	in
CBLO	Casing Bottom (Logger)	WLSESSION	1465	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.7	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(RT)	
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	REMS(RT)	
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	75	degF
MST	Mud Sample Temperature	Borehole	75.3	degF
NPRM	HRDD Nuclear Processing Mode	HDRS-H	Standard Resolution	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	2.11	ohm.m
RMS	Resistivity of Mud Sample	Borehole	2.24	ohm.m
SOCO	Standoff Correction Option	HGNS-H	Yes	

Depth Zone Parameters			
Parameter	Value	Start (ft)	Stop (ft)
BS	13.5	1349.5	1465
BS	8.75	1465	6800
All depth are actual.			

Tool Control Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
HRGD_BOARD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	1800	ft/h
One				

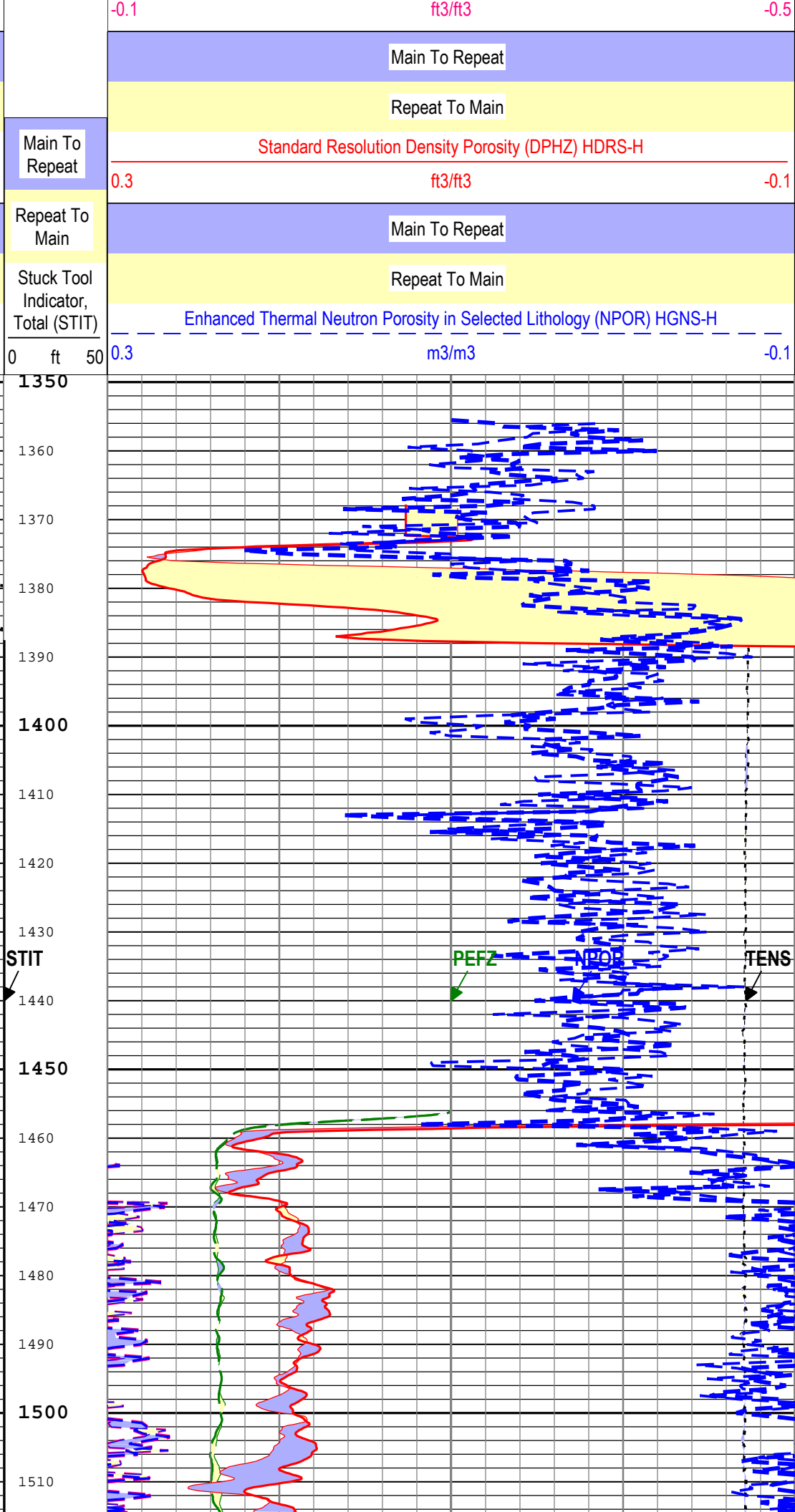
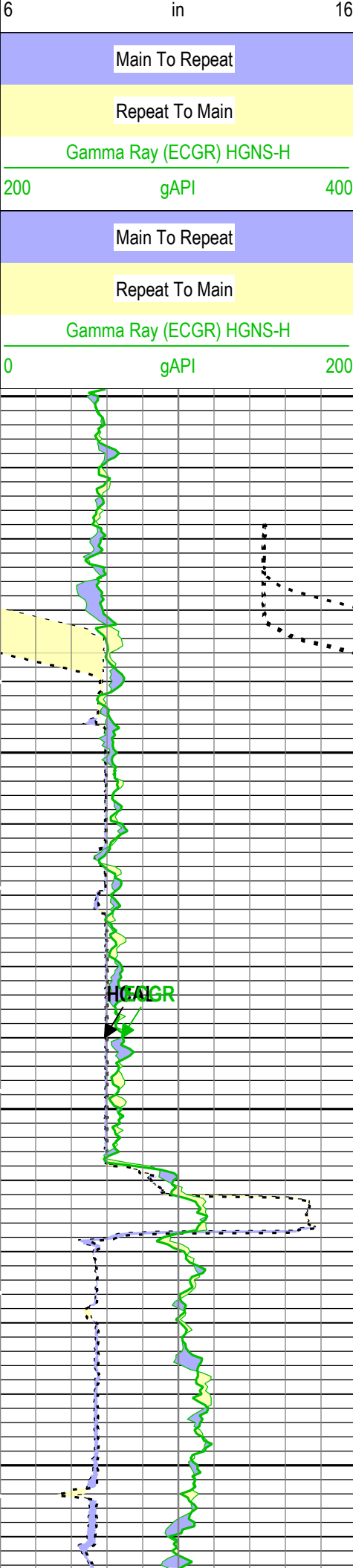
Software Version	
Acquisition System	Version
Maxwell 2016 SP2	6.2.68624.3100

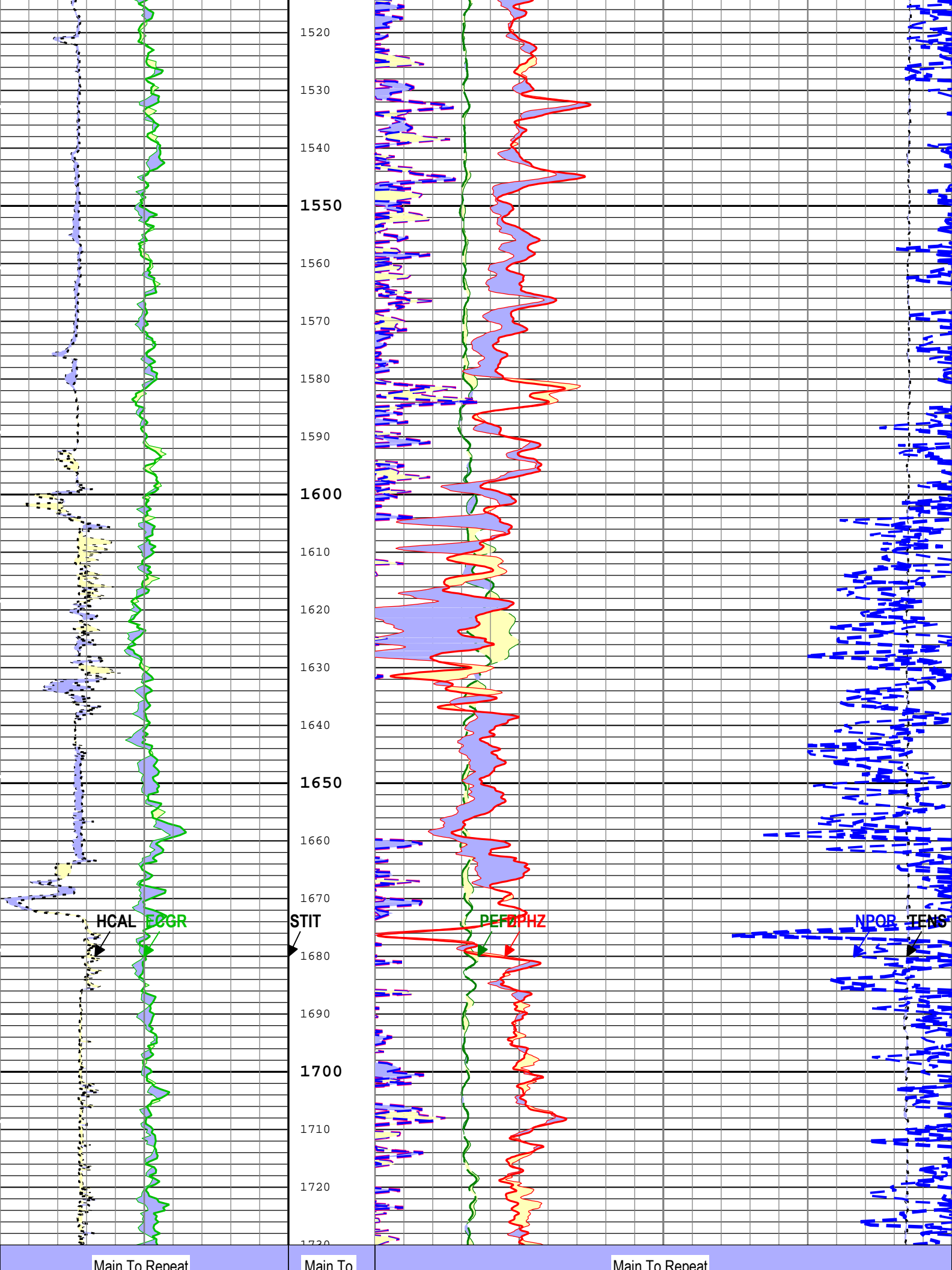
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[4]:Up	Up	1387.81 ft	6810.88 ft	28-Sep-2016 5:33:25 PM	28-Sep-2016 9:39:06 PM	ON	4.00 ft	Yes
One	Log[5]:Up	Up	1387.33 ft	1776.64 ft	28-Sep-2016 9:43:34 PM	28-Sep-2016 9:57:15 PM	ON	4.10 ft	Yes
All depths are referenced to toolstring zero									

Log	Company:Bonanza Creek Well:State Seventy Holes J-18 One: Log[4]:Up:S003
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Description: HGNS standard resolution porosities for Platform Express Format: Log (KM 5in Porosity RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Sep-2016 22:55:47

TIME_1900 - Time Marked every 60.00 (s)			
		<div> <div>Main To Repeat</div> <div>Repeat To Main</div> <div>Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H</div> <div> <div>0</div> <div>10</div> </div> </div>	<div> <div>Main To Repeat</div> <div>Repeat To Main</div> <div>Cable Tension (TENS)</div> <div> <div>10000</div> <div>lbf</div> <div>0</div> </div> </div>
<div> <div>Main To Repeat</div> <div>Repeat To Main</div> <div>Caliper (HCAL) HDRS-H</div> <div>-----</div> </div>		<div> <div>Main To Repeat</div> <div>Repeat To Main</div> <div>Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H</div> <div>-----</div> </div>	





TIME_1900 - Time Marked every 60.00 (s)					
Description: HGNS standard resolution porosities for Platform Express		Format: Log (KM 5in Porosity RA)	Index Scale: 5 in per 100 ft	Index Unit: ft	Index
Type: Measured Depth	Creation Date: 28-Sep-2016 22:55:47				

One: Parameters

MFST	Mud Filtrate Sample Temperature	Borehole	75	degF
MST	Mud Sample Temperature	Borehole	75.3	degF
NPRM	HRDD Nuclear Processing Mode	HDRS-H	Standard Resolution	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	2.11	ohm.m
RMS	Resistivity of Mud Sample	Borehole	2.24	ohm.m
SOCO	Standoff Correction Option	HGNS-H	Yes	

Depth Zone Parameters			
Parameter	Value	Start (ft)	Stop (ft)
BS	13.5	1349	1465
BS	8.75	1465	1730
All depth are actual.			

Tool Control Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
HRGD_BOARD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	1800	ft/h

One				
5" Density				

Software Version				
Acquisition System			Version	
Maxwell 2016 SP2			6.2.68624.3100	

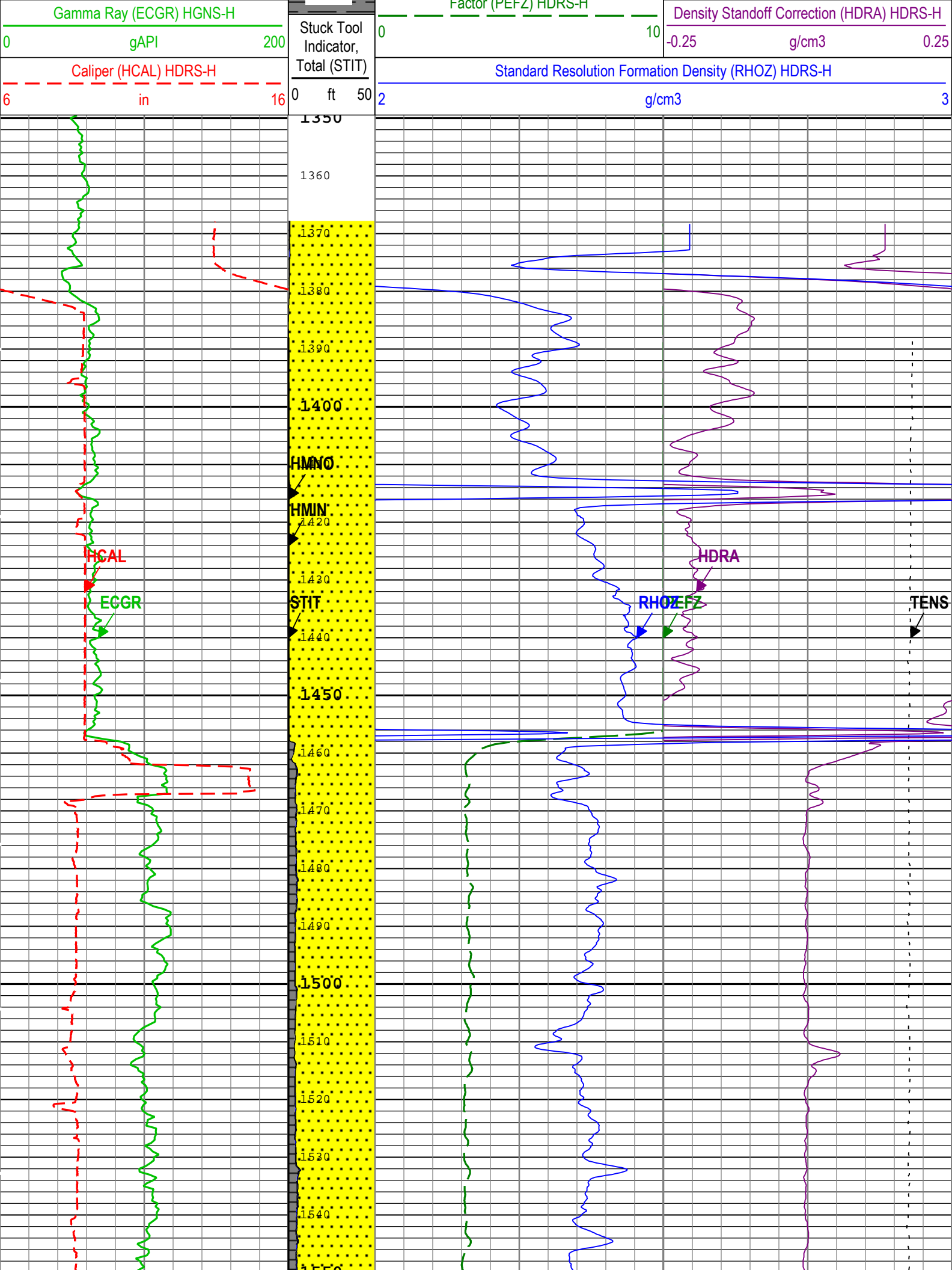
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[4]:Up	Up	1387.81 ft	6810.88 ft	28-Sep-2016 5:33:25 PM	28-Sep-2016 9:39:06 PM	ON	4.00 ft	Yes
All depths are referenced to toolstring zero									

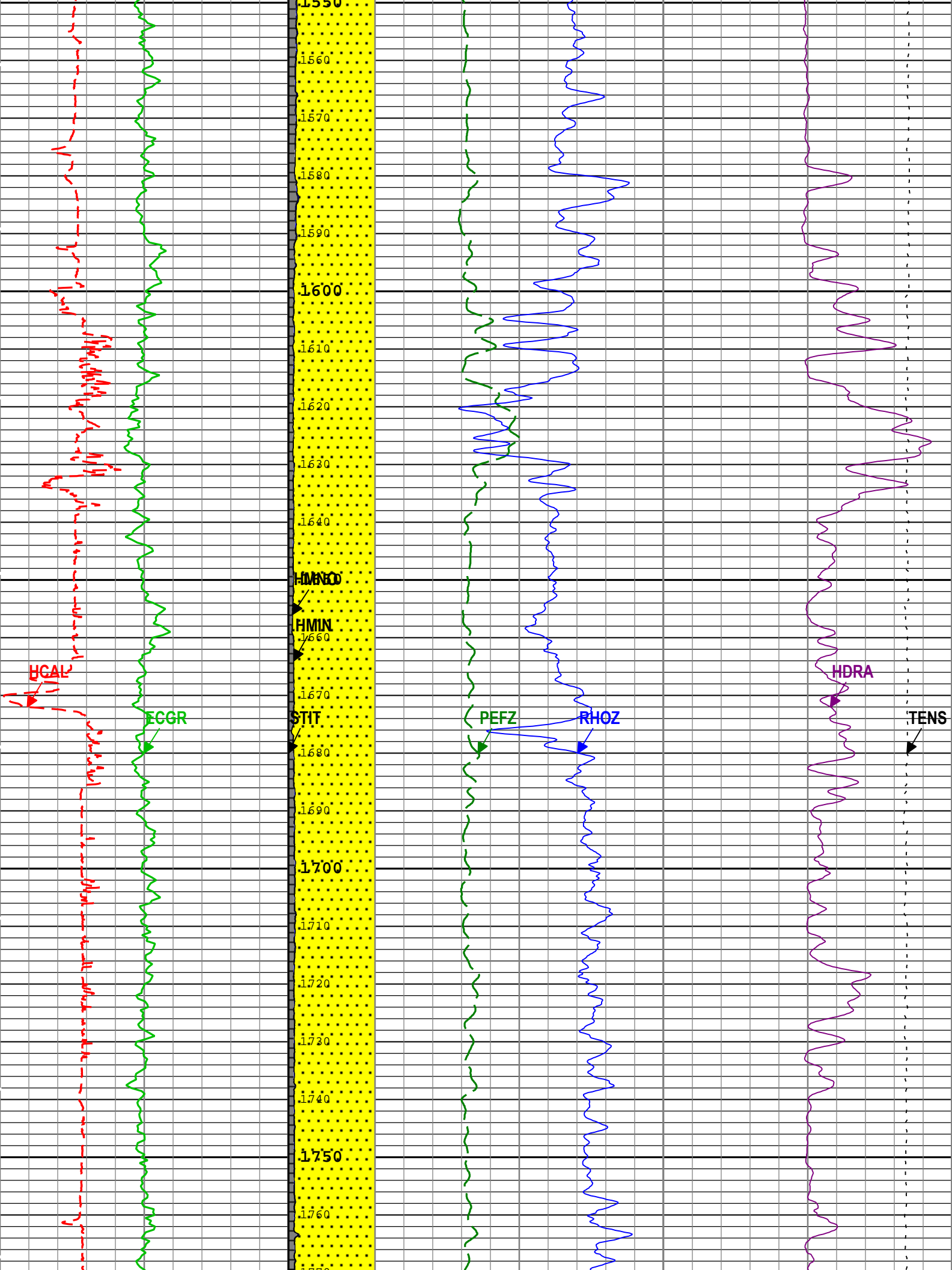
Log	<div> <div>Company:Bonanza Creek</div> <div>Well:State Seventy Holes J-18</div> <div>One: Log[4]:Up:S003</div> </div>								
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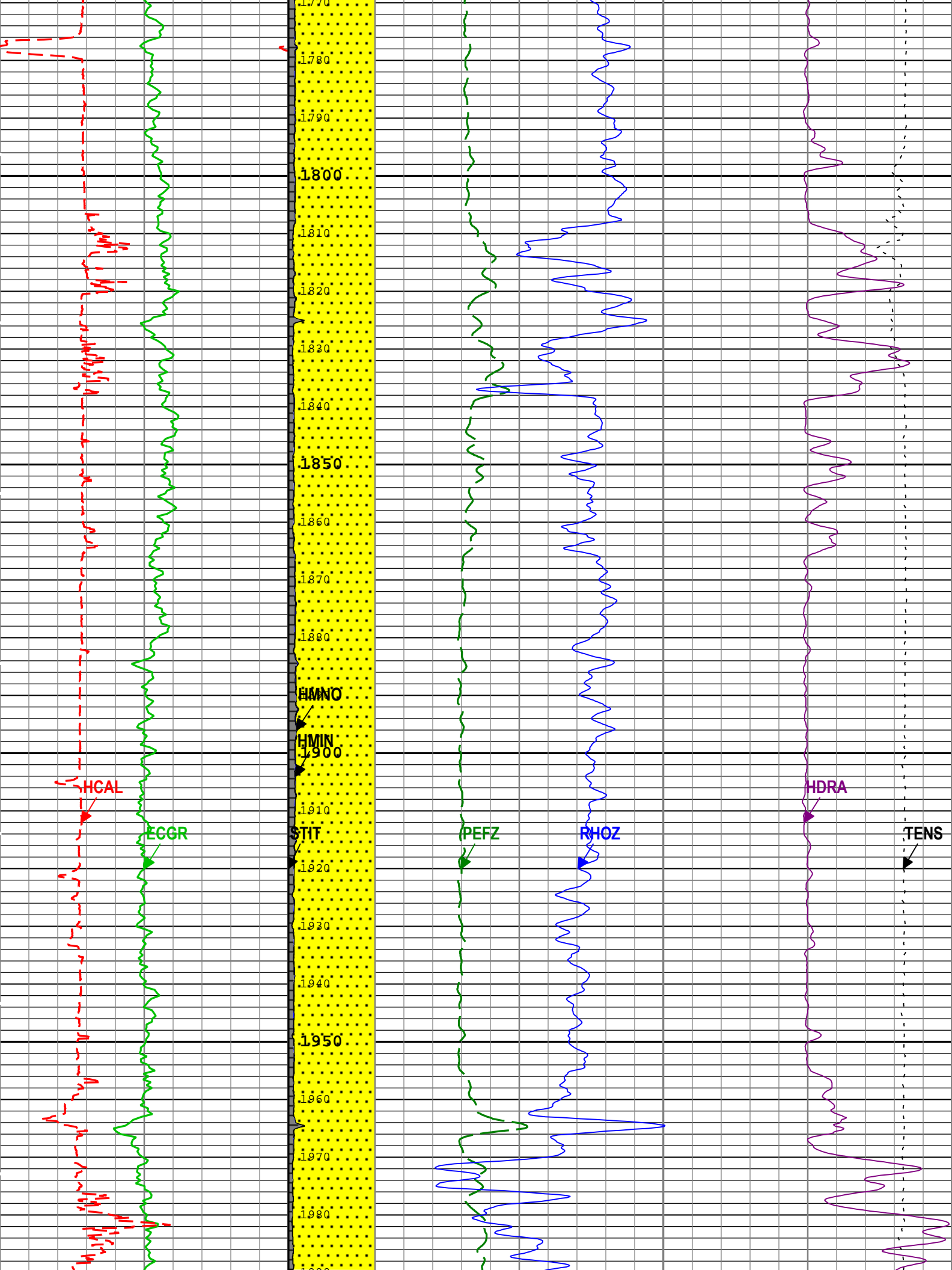
Description: HGNS standard resolution porosities for Platform Express
 Format: Log (KM 5in Density)
 Index Scale: 5 in per 100 ft
 Index Unit: ft
 Index Type: Measured Depth
 Creation Date: 28-Sep-2016 22:55:49

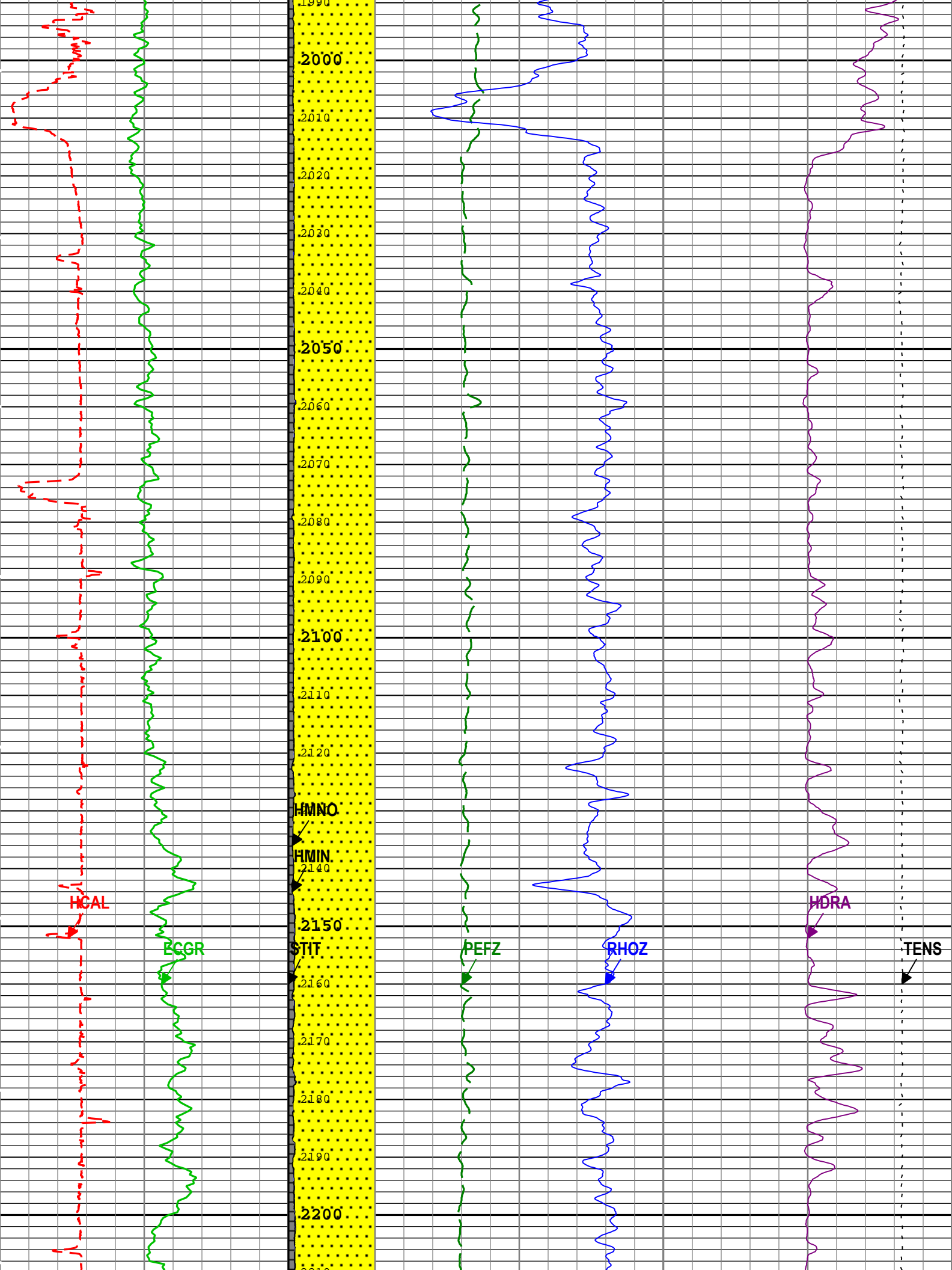
Channel	Source	Sampling
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR	HGNS-H:HGNS-H:HGNS-H	6in
HDRA	HDRS-H:HRMS-H:HRGD-H	2in
PEFZ	HDRS-H:HRMS-H:HRGD-H	2in
RHOZ	HDRS-H:HRMS-H:HRGD-H	2in
SMIN	HDRS-H:HRMS-H:HRGD-H	2in
SMNO	HDRS-H:HRMS-H:HRGD-H	2in
STIT	DepthCorrection	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

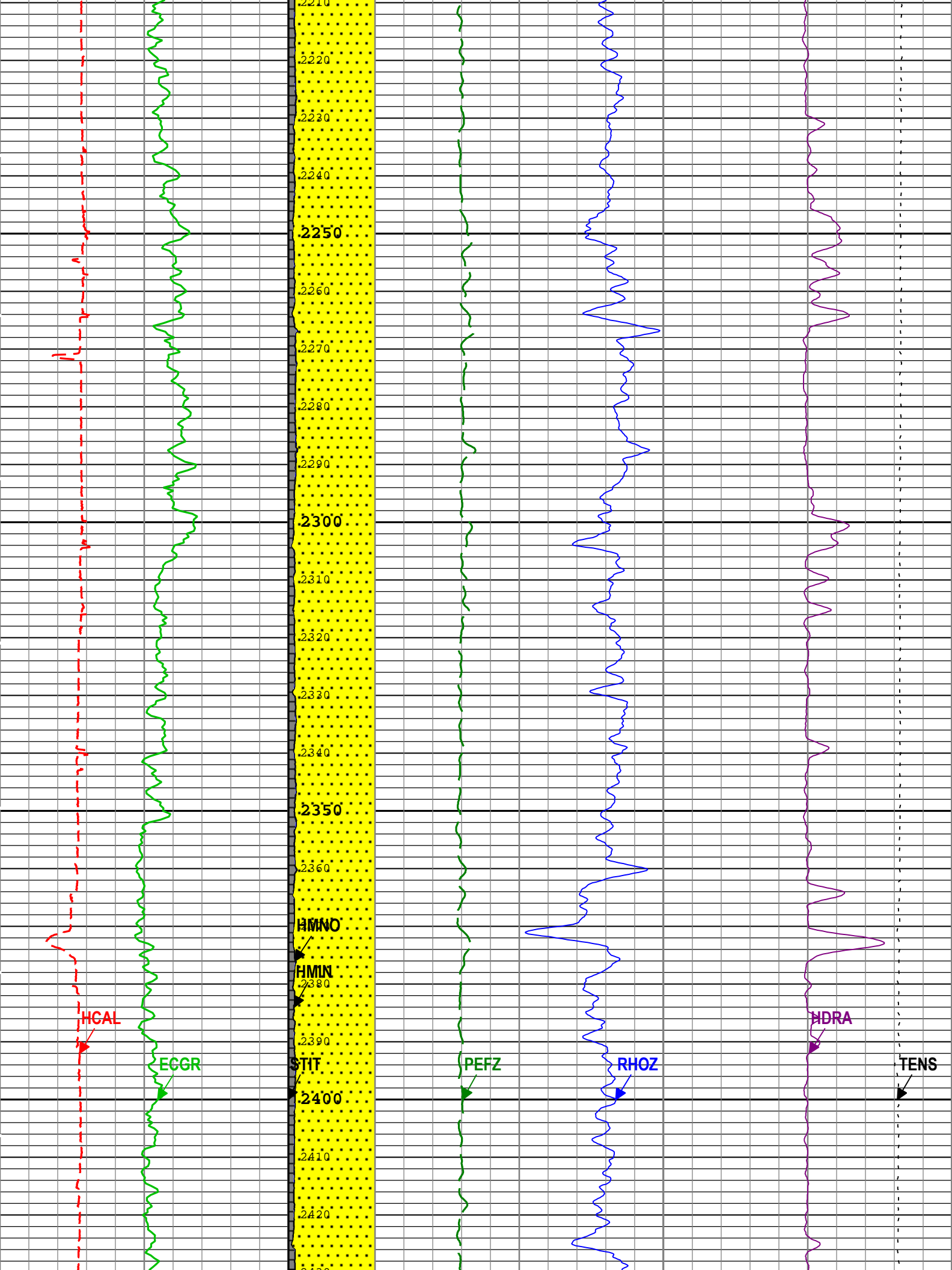
TIME_1900 - Time Marked every 60.00 (s)				
<div> <div>Gamma Ray Backup</div> </div>		<div> <div>LIME</div> <div>SAND</div> <div>SHALE</div> </div>	<div> <div>Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H</div> </div>	<div> <div>Cable Tension (TENS)</div> <div>10000</div> <div>lb</div> <div>0</div> </div>

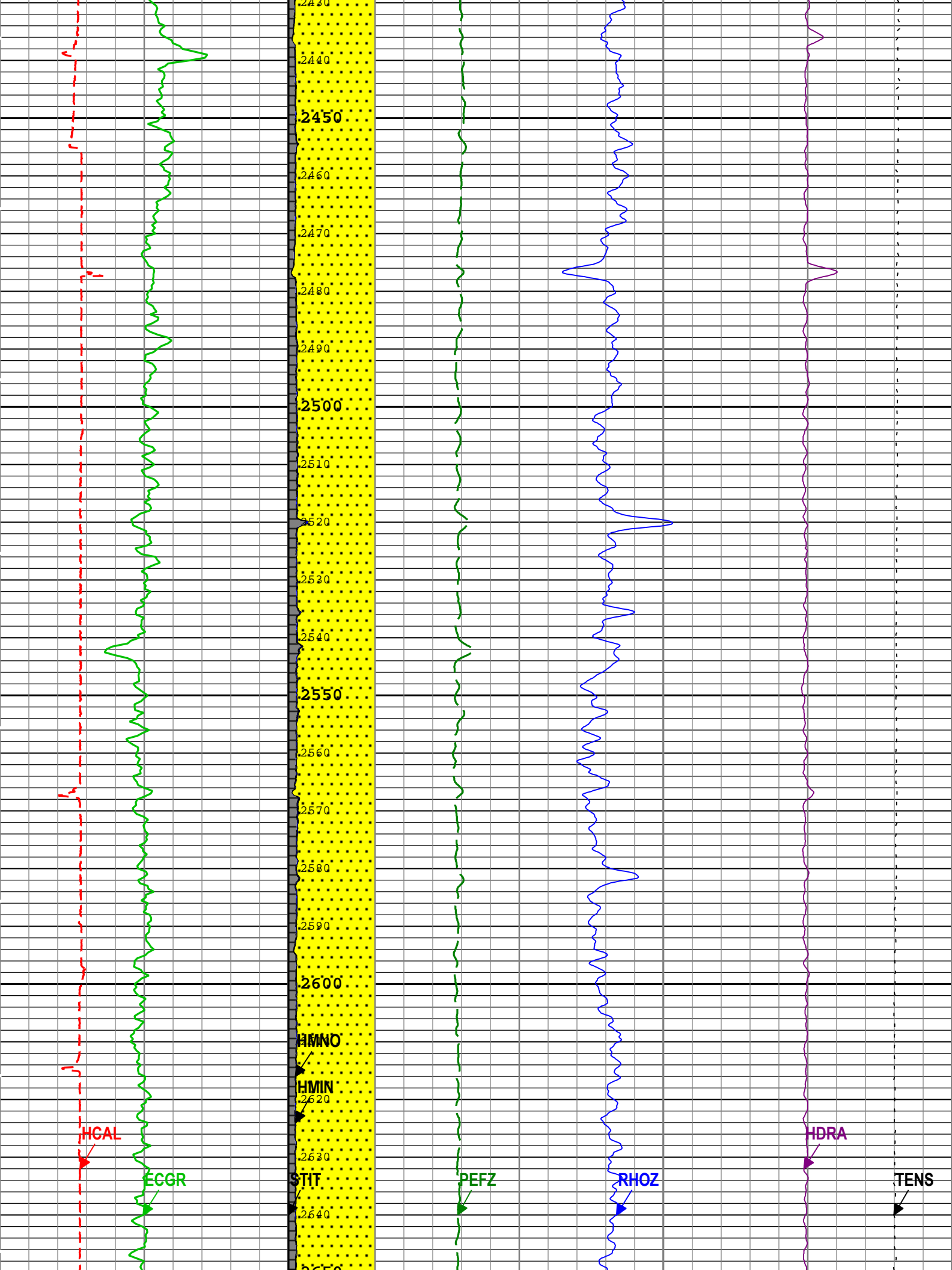


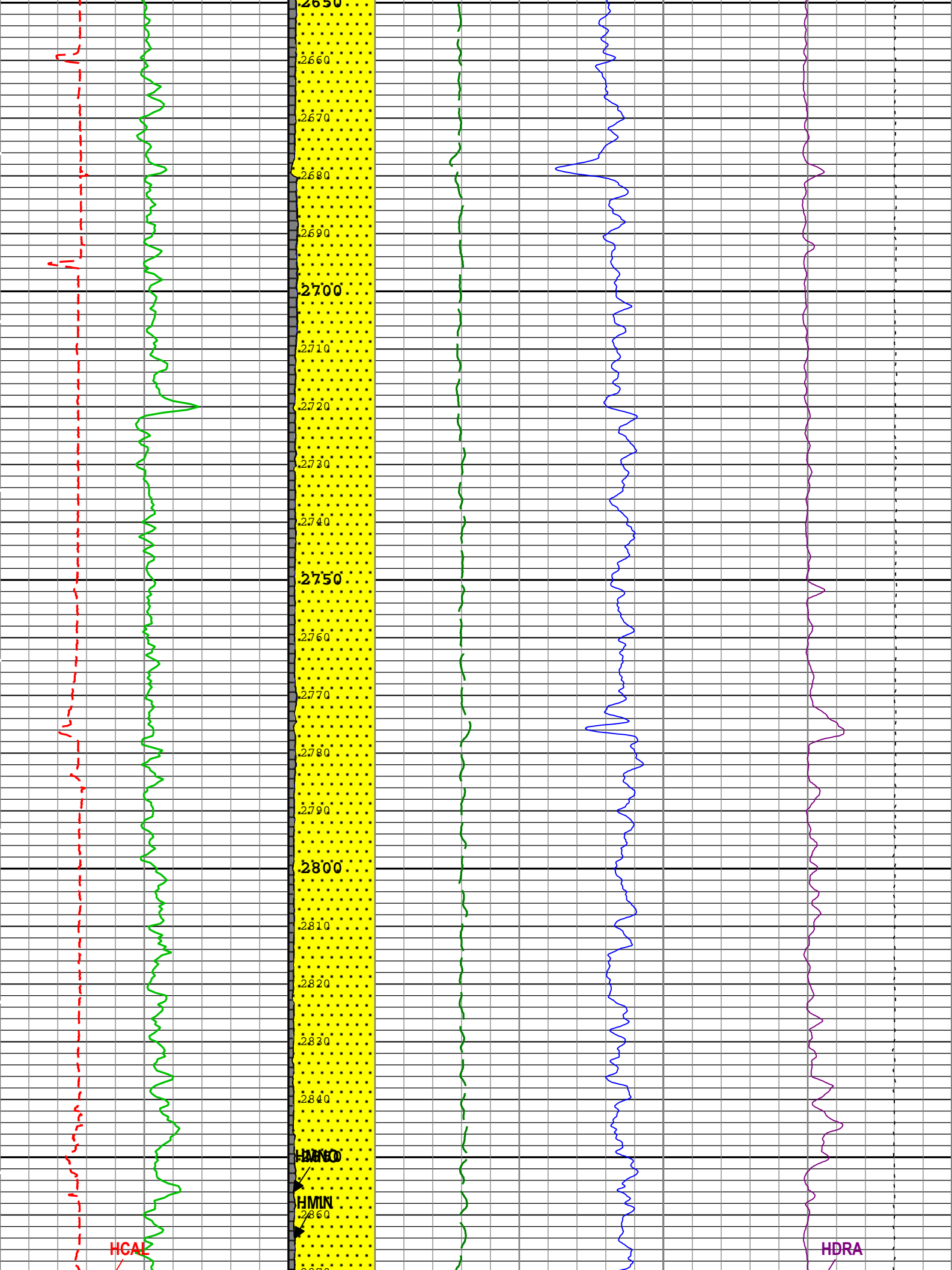


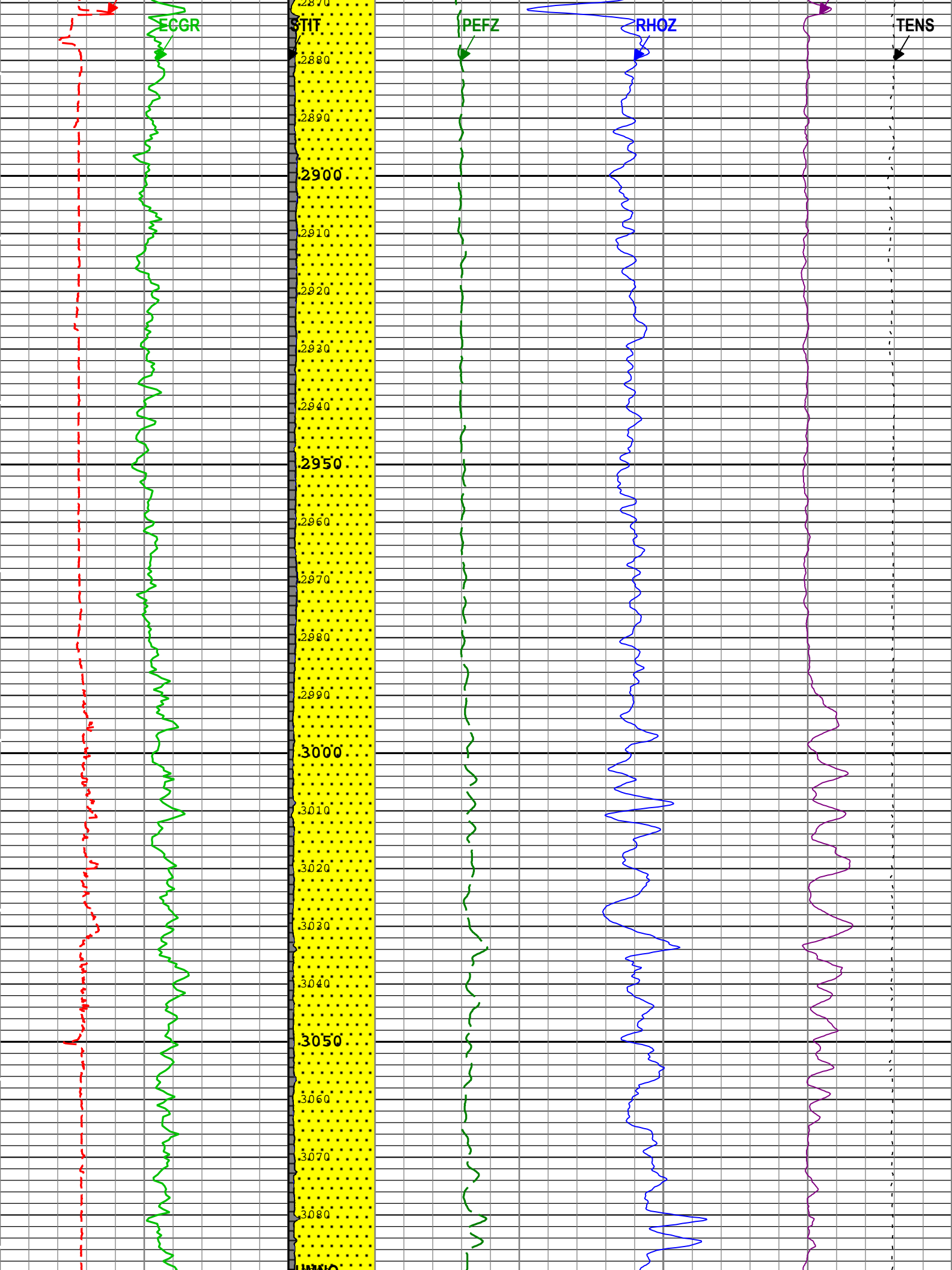


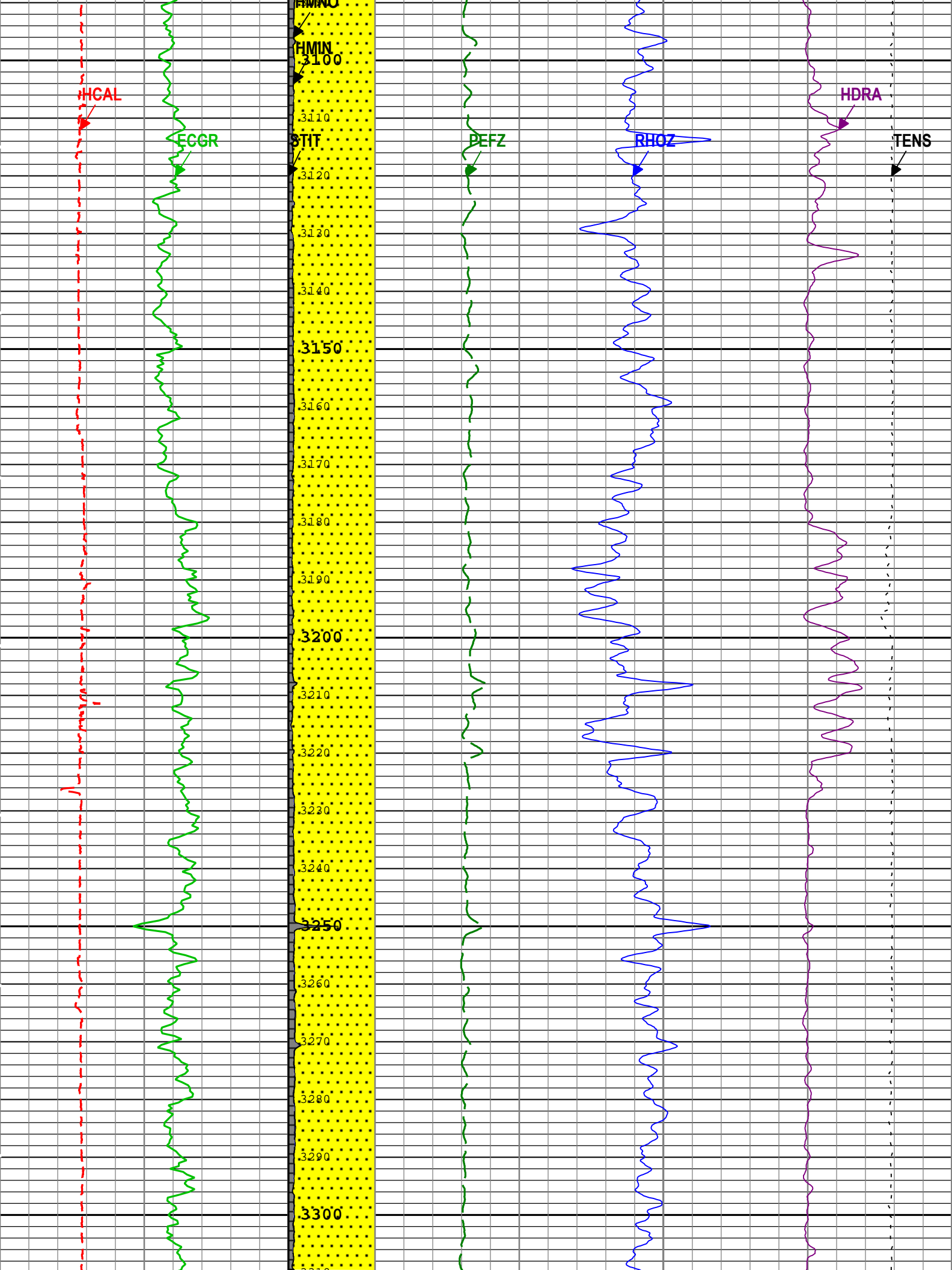


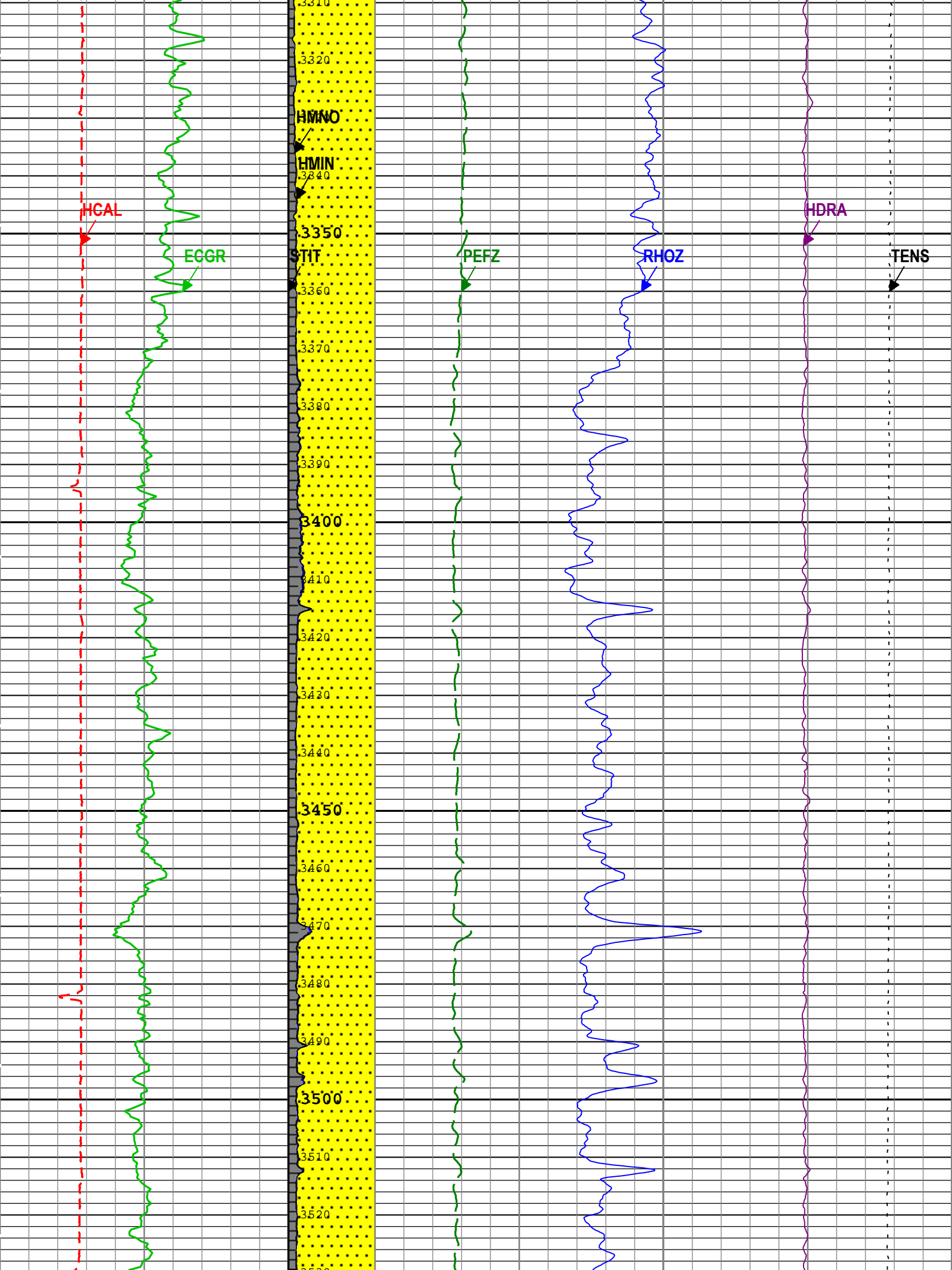


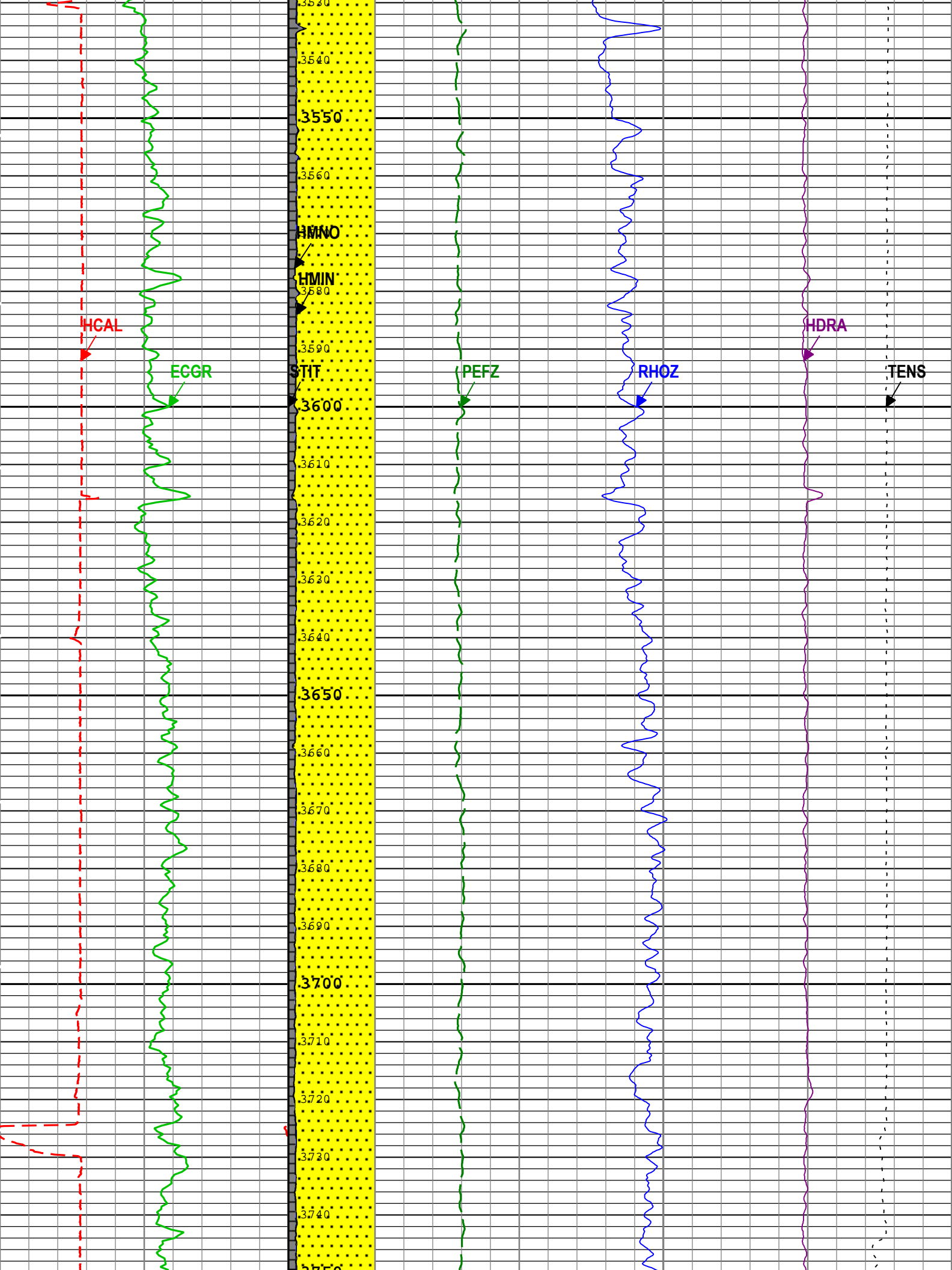


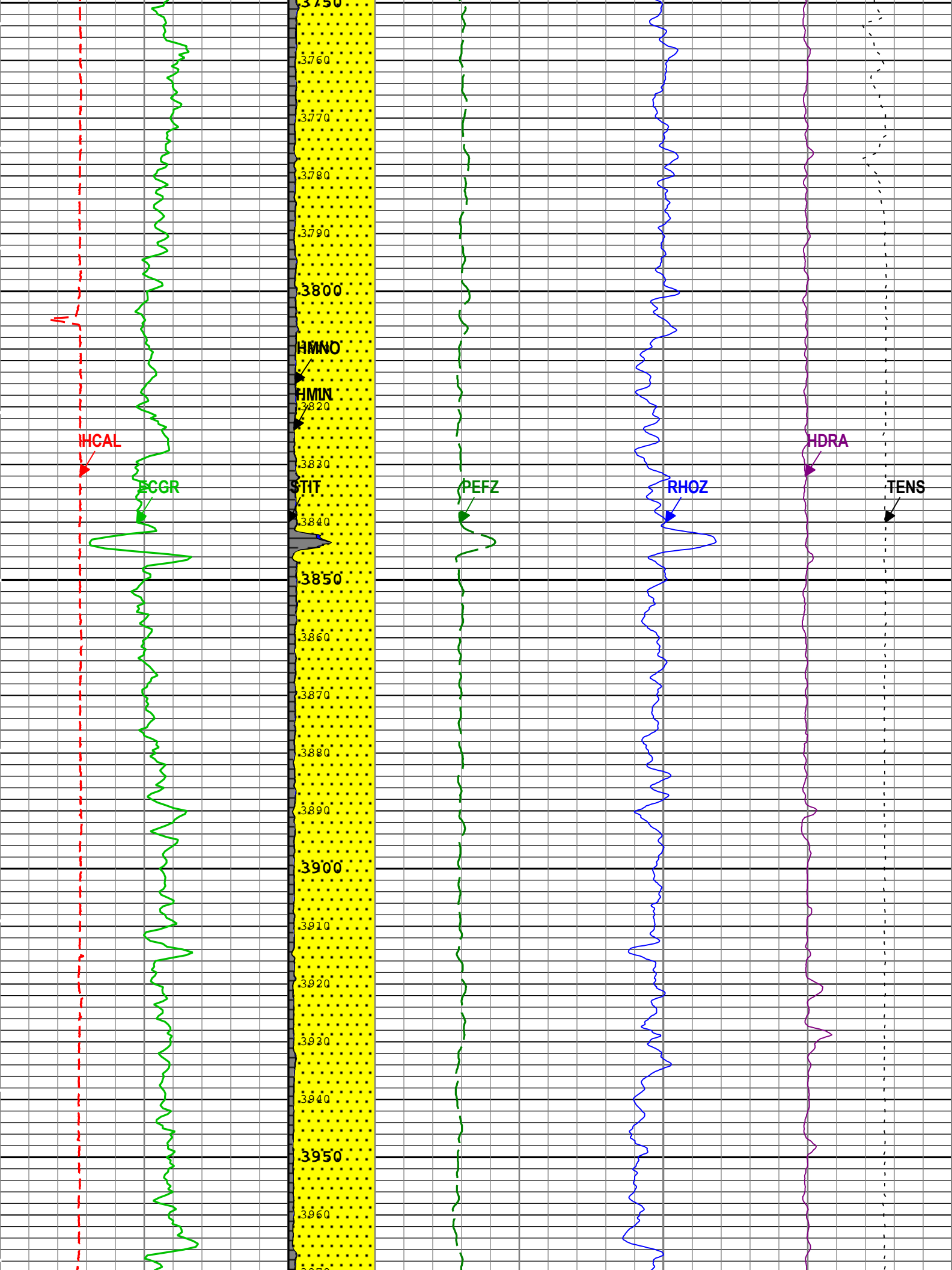


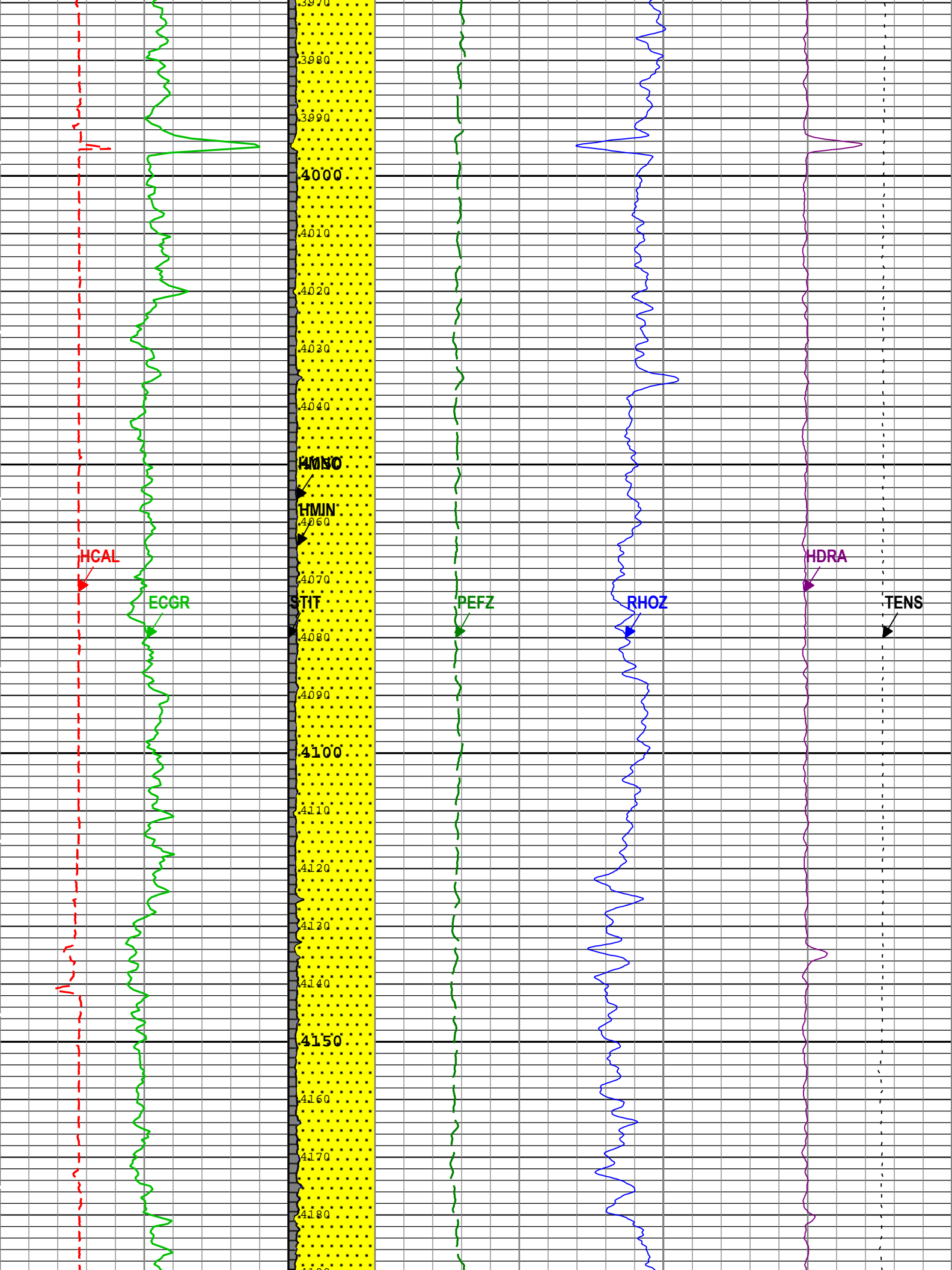


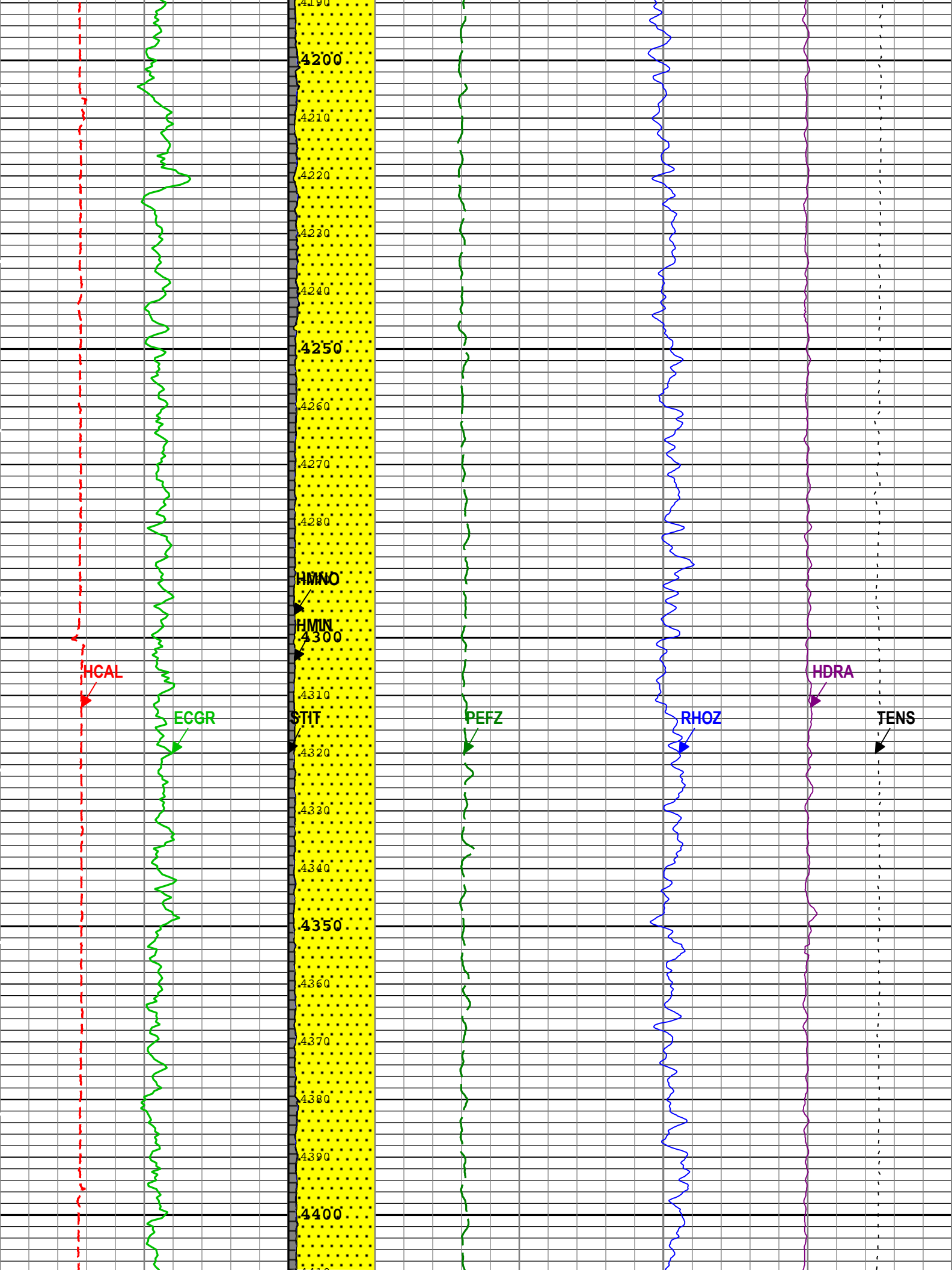


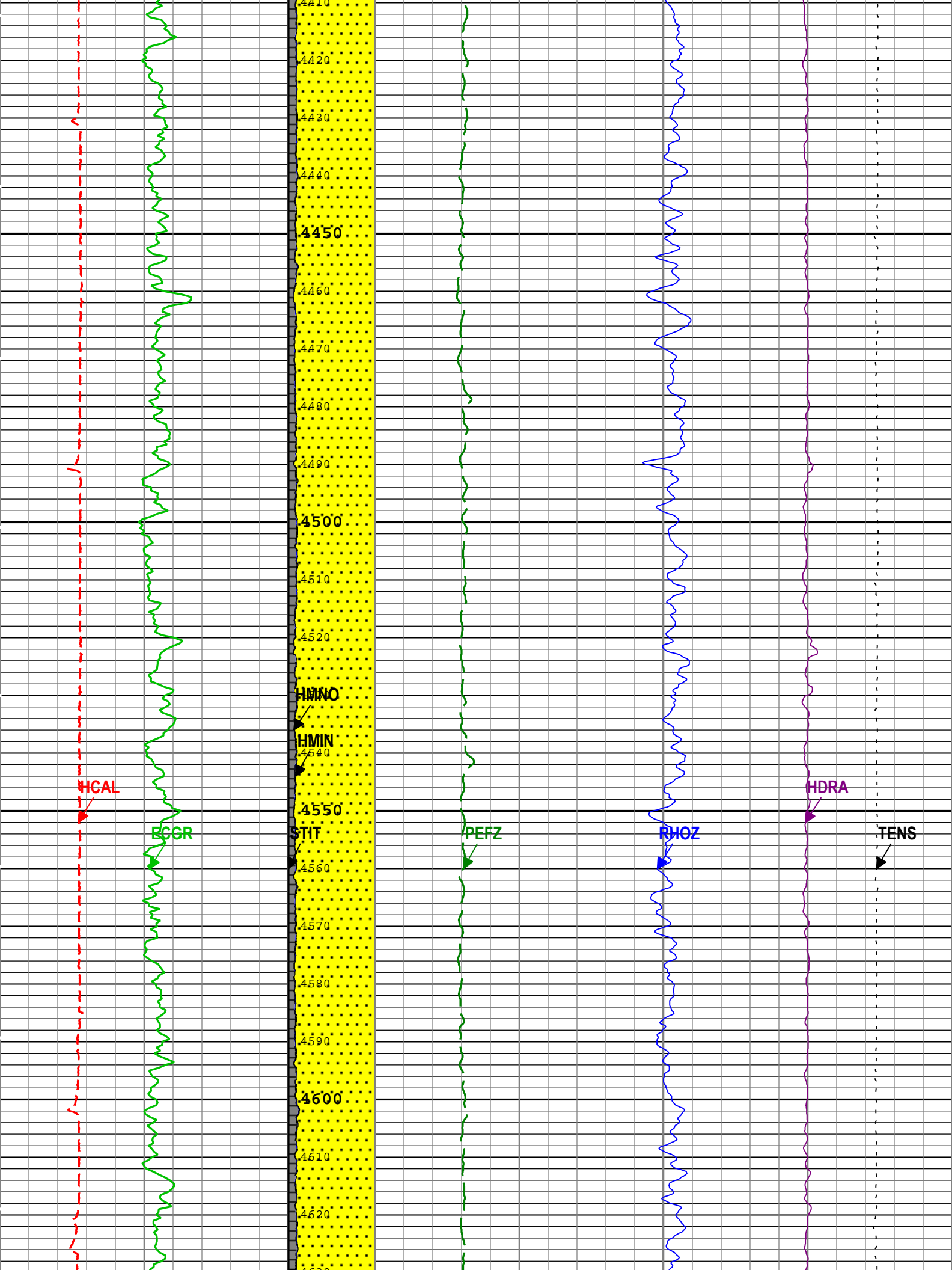


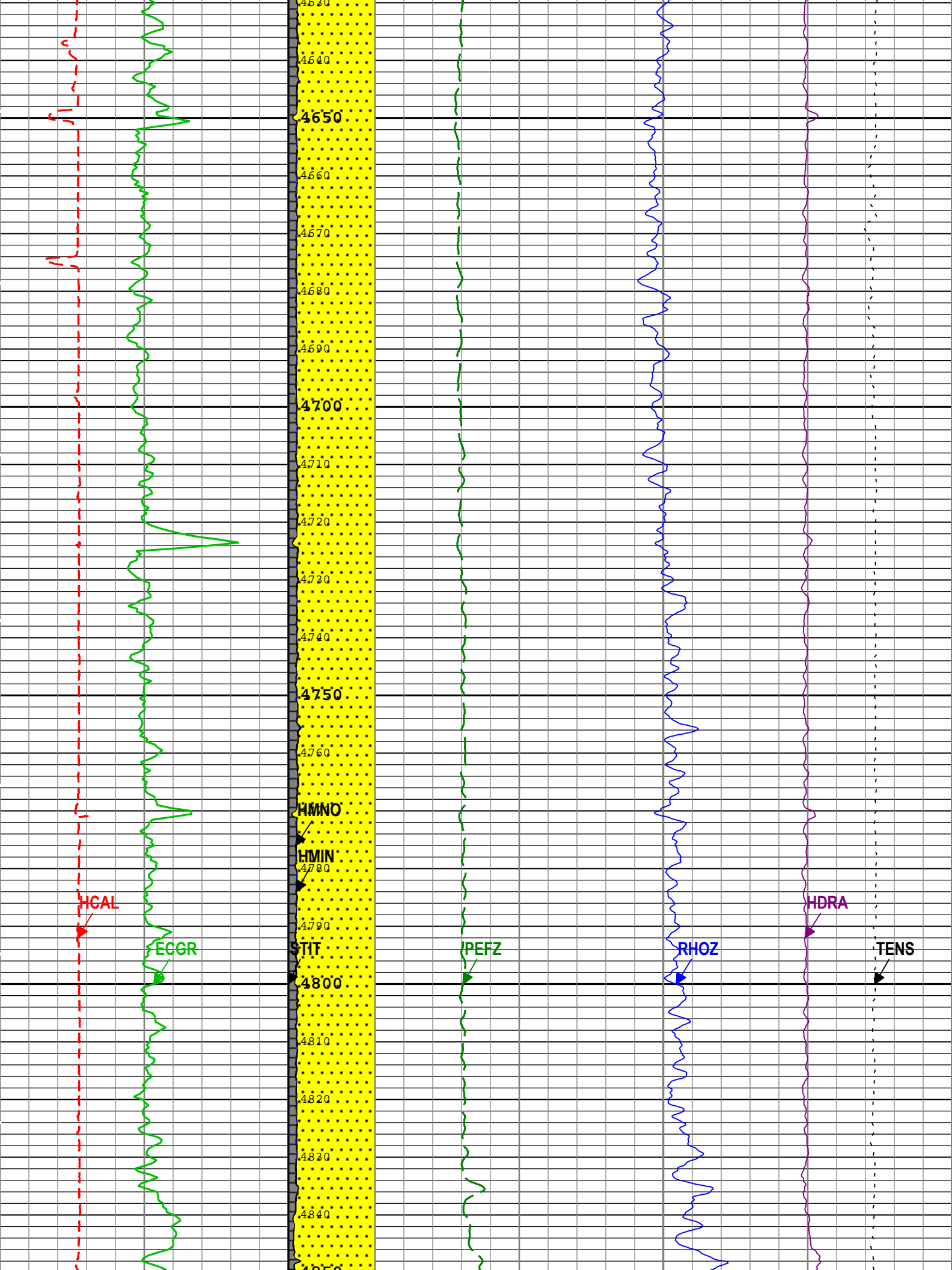


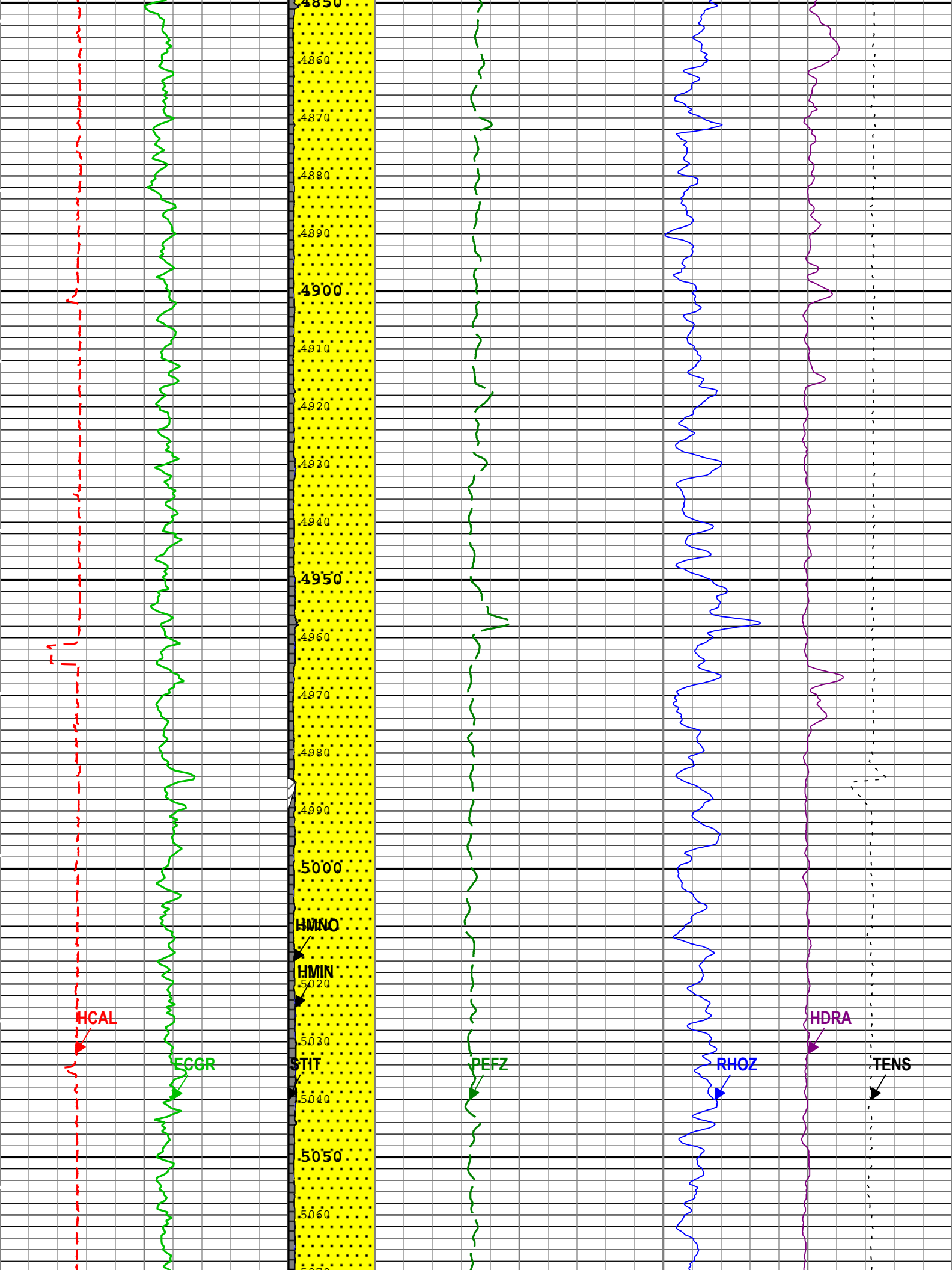


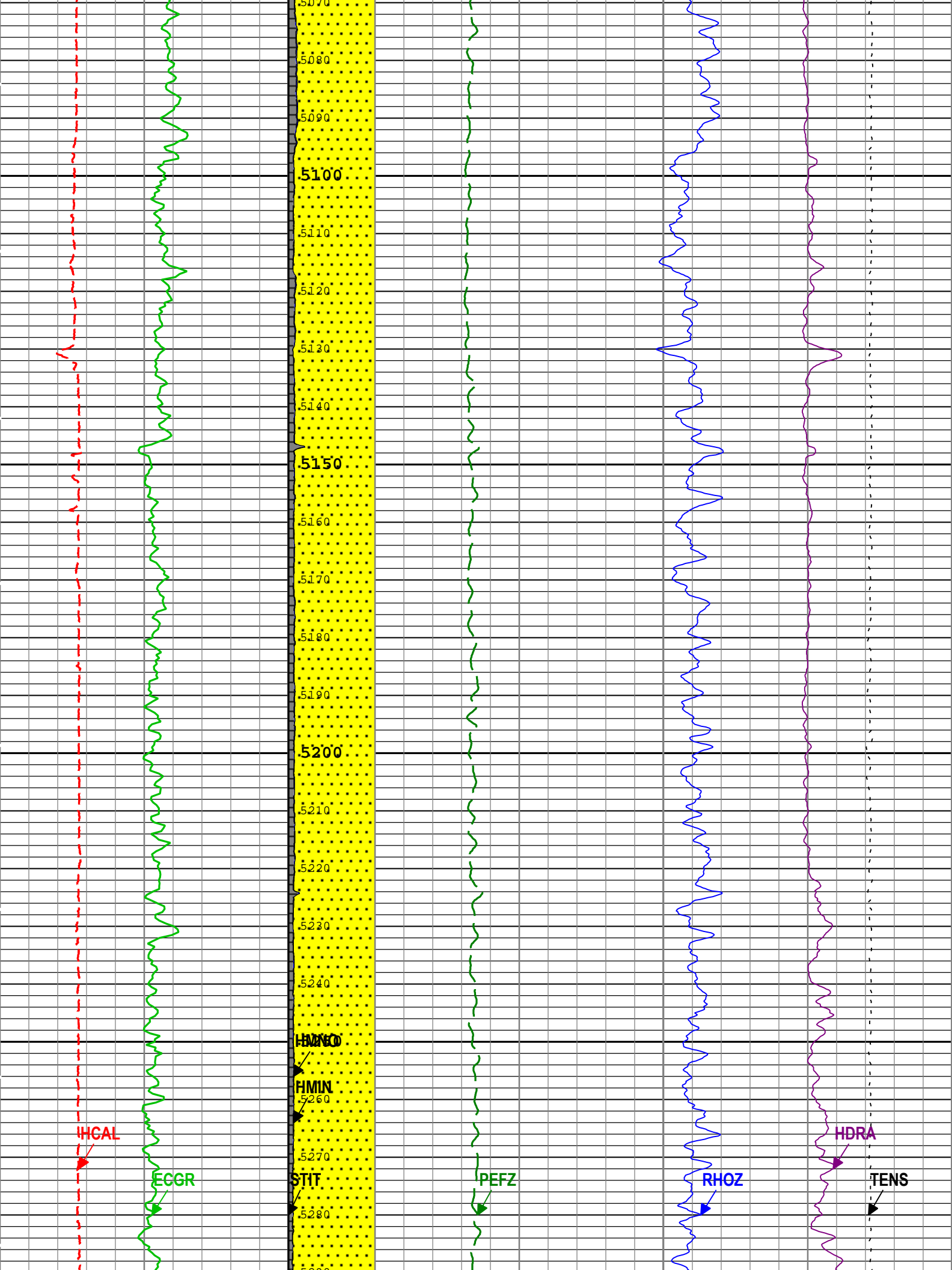


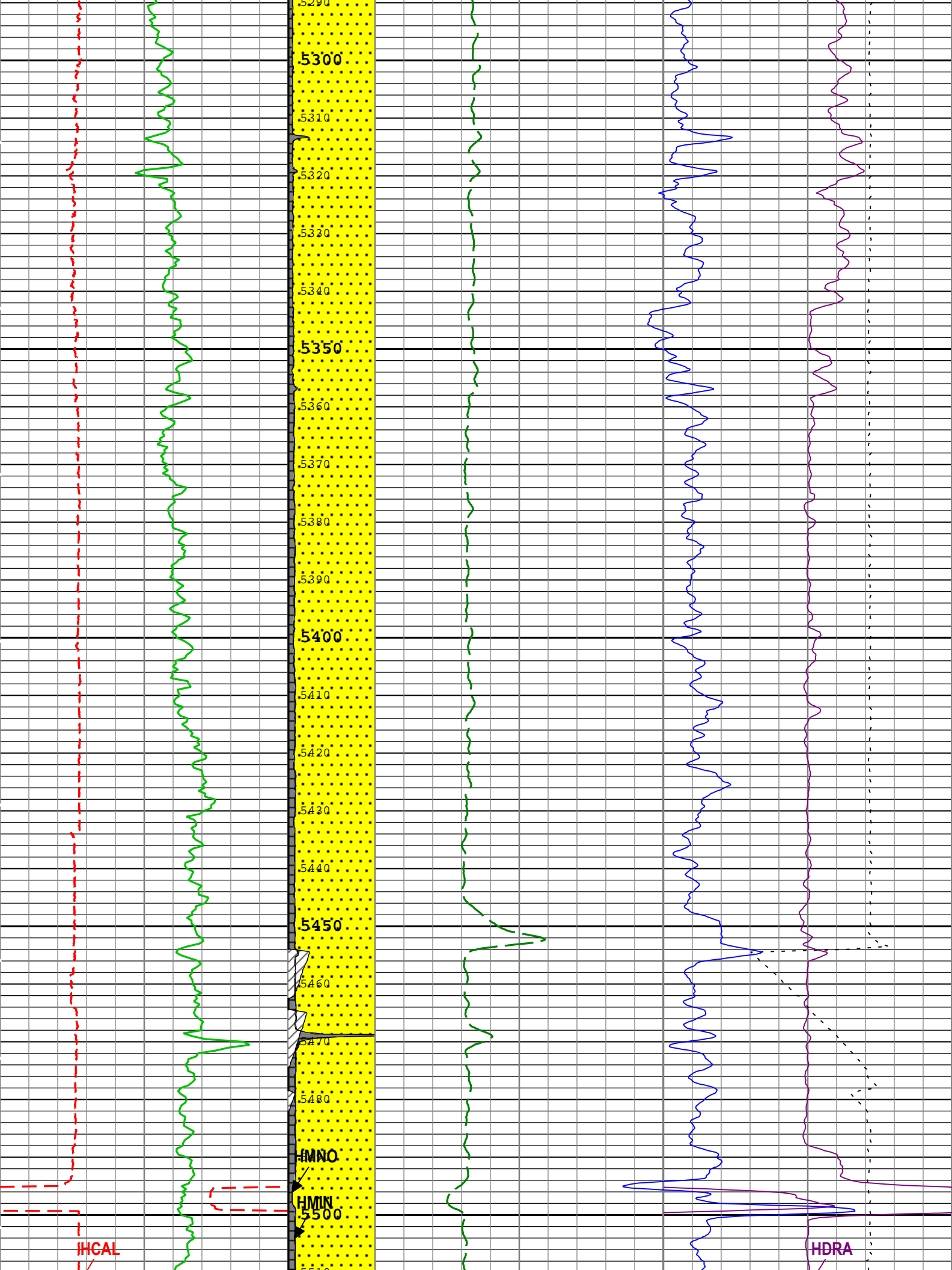


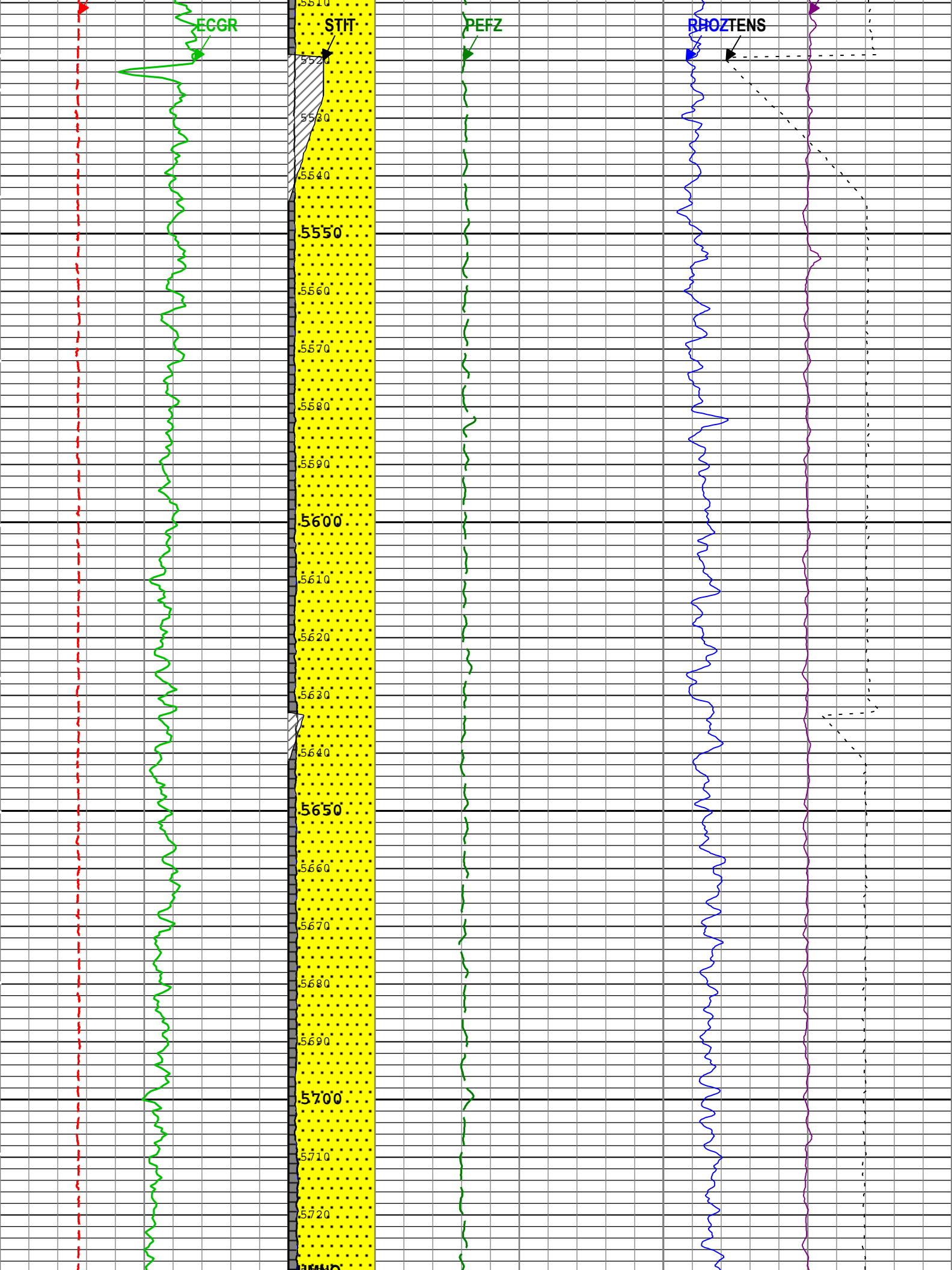


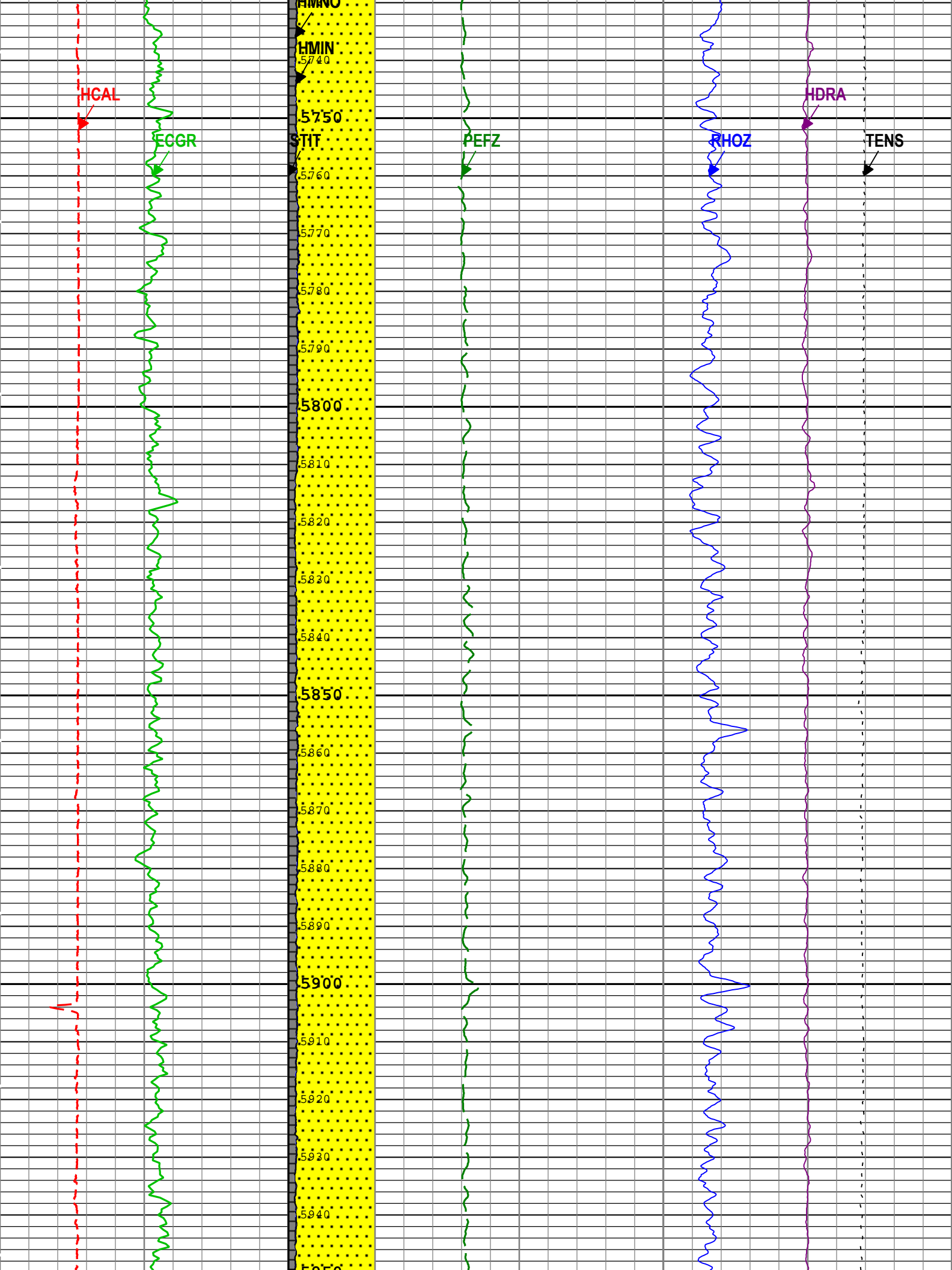


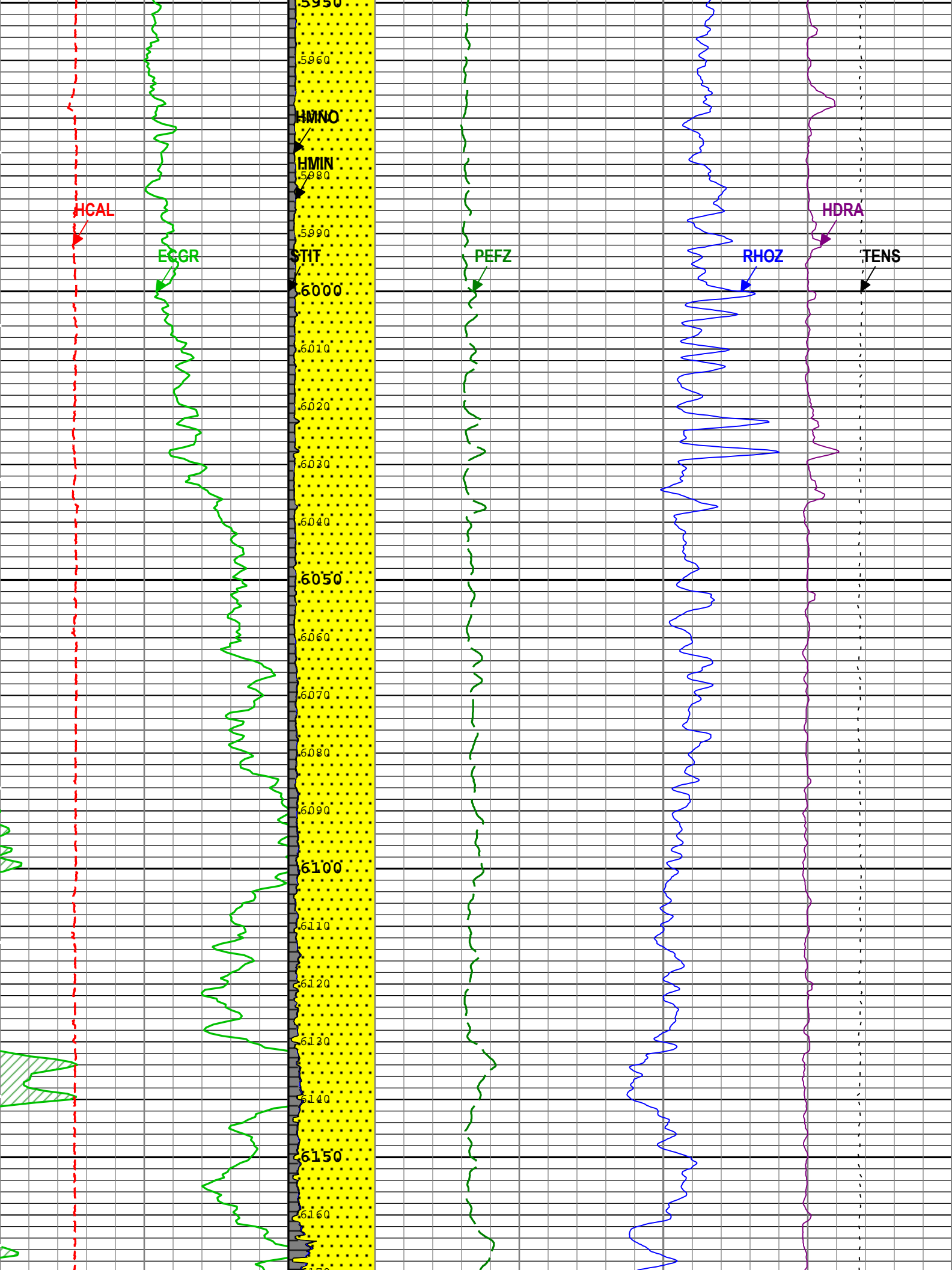


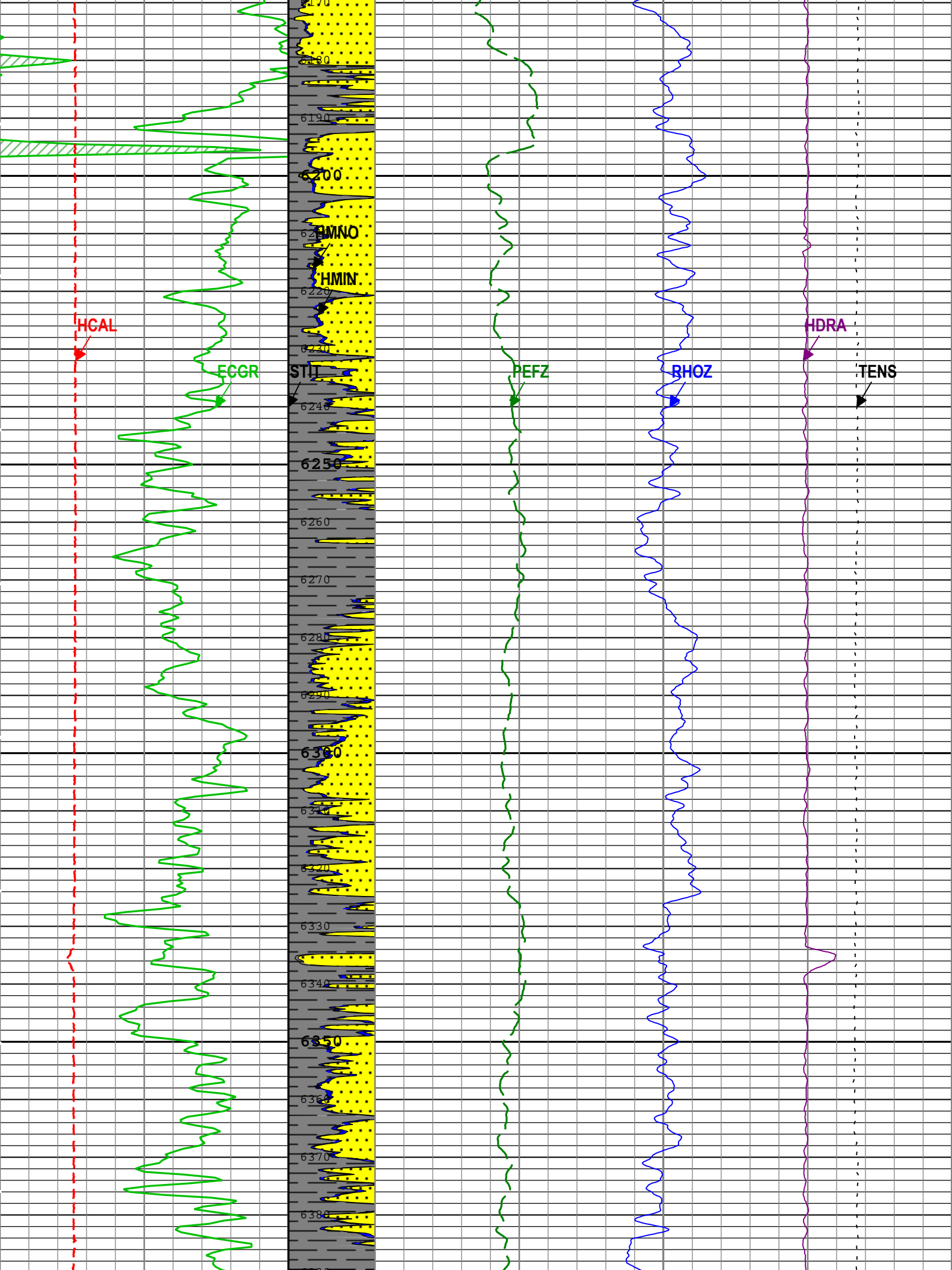


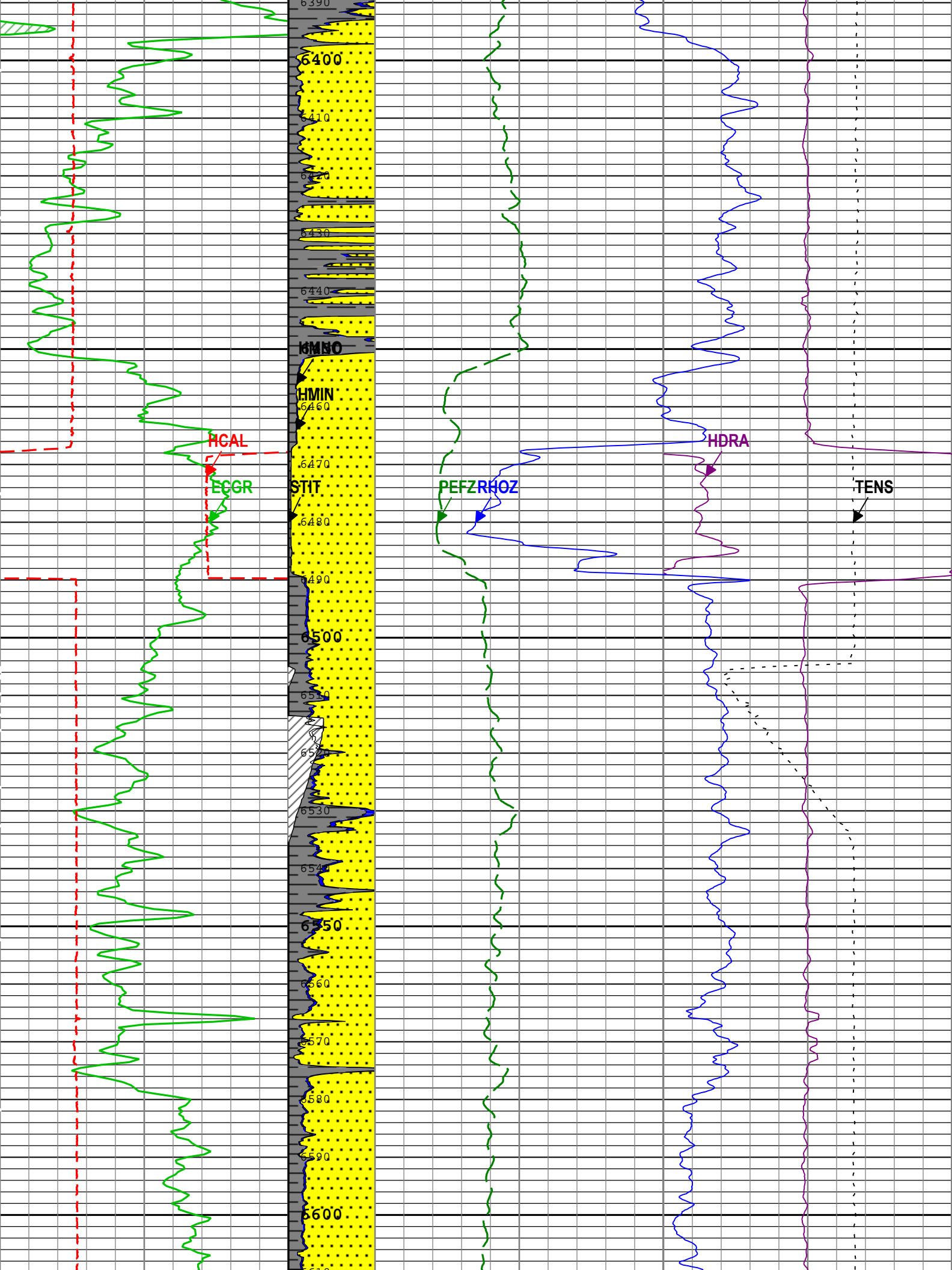


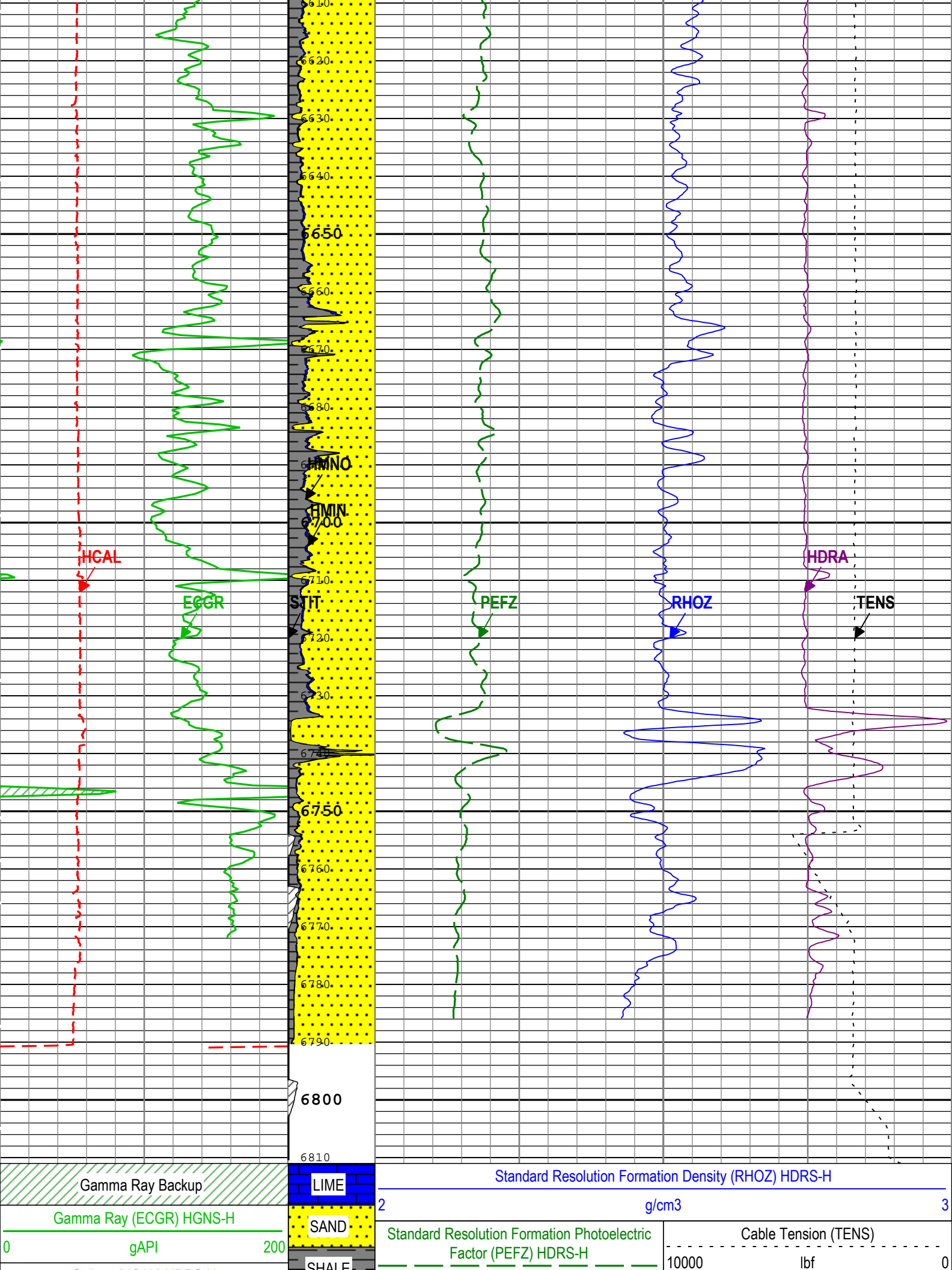












Caliper (HCAL) HDRS-H			Stuck Tool Indicator, Total (STIT)		Density Standoff Correction (HDRA) HDRS-H	
6	in	16	0	ft	50	-0.25 g/cm3 0.25
TIME_1900 - Time Marked every 60.00 (s)						
Description: HGNS standard resolution porosities for Platform Express Format: Log (KM 5in Density) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Sep-2016 22:55:49						

Channel Processing Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BHT	Bottom Hole Temperature	Borehole	216	degF
BS	Bit Size	WLSESSION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	-0.8	in
CBLO	Casing Bottom (Logger)	WLSESSION	1465	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.7	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DHC	Density Hole Correction	HDRS-H	Bit Size	
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
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	REMS(RT)	
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	CTEM	
MPOF	MCFL Processing Operation Mode	HDRS-H	On	
MST	Mud Sample Temperature	Borehole	75.3	degF
NPRM	HRDD Nuclear Processing Mode	HDRS-H	Standard Resolution	
RMS	Resistivity of Mud Sample	Borehole	2.24	ohm.m
SOCO	Standoff Correction Option	HGNS-H	Yes	

Depth Zone Parameters			
Parameter	Value	Start (ft)	Stop (ft)
BS	13.5	1349.5	1465
BS	8.75	1465	6800
All depth are actual.			

Tool Control Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
HRGD_BOARD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	1800	ft/h
One				
5" Density				

Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[4]:Un	Un	1387.81 ft	6810.88 ft	28-Sep-2016	28-Sep-2016	ON	4.00 ft	Yes

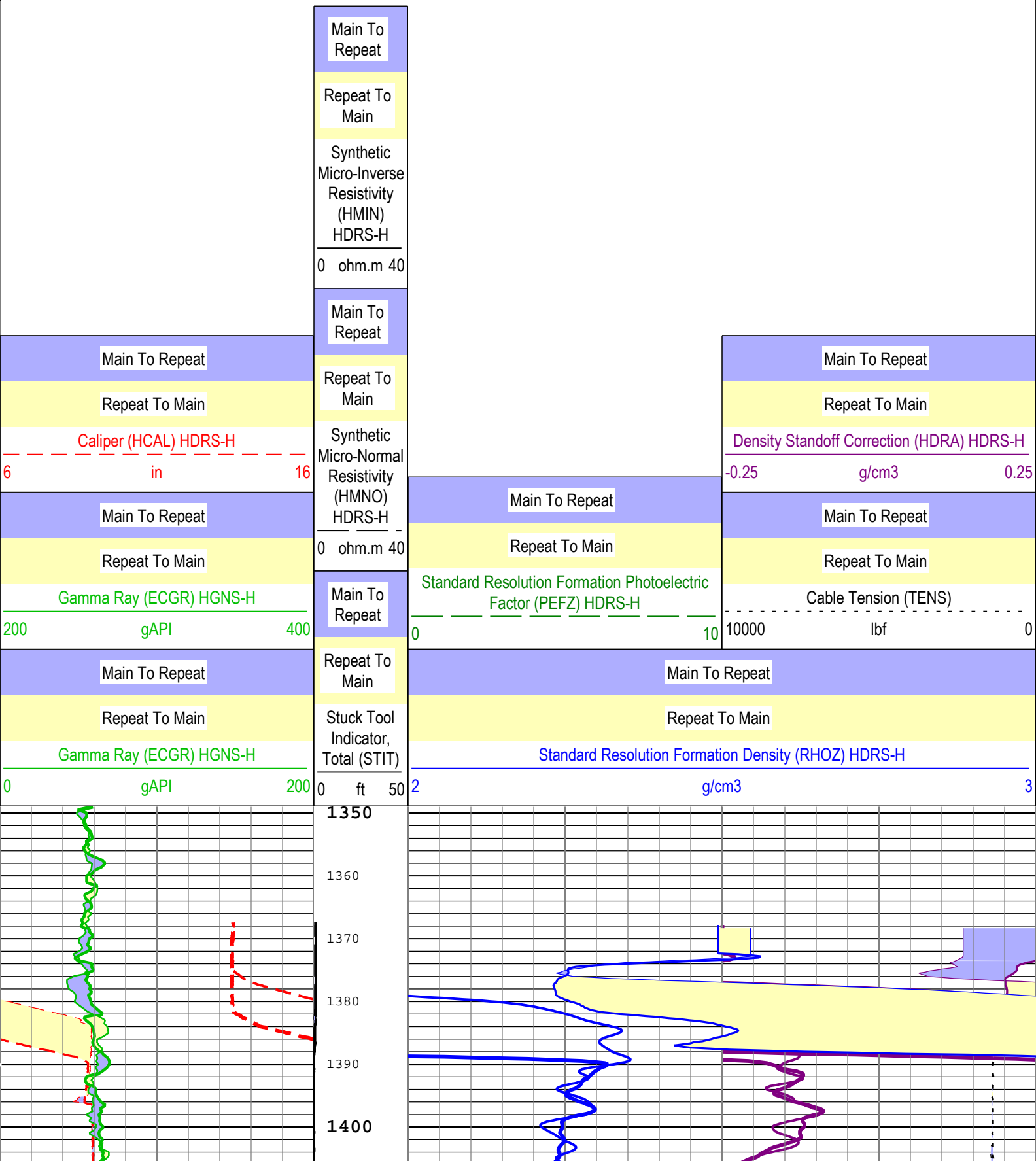
One	Log[5]:Up	Up	1387.33 ft	1776.64 ft	28-Sep-2016 9:43:34 PM	28-Sep-2016 9:57:15 PM	ON	4.10 ft	Yes
-----	-----------	----	------------	------------	------------------------	------------------------	----	---------	-----

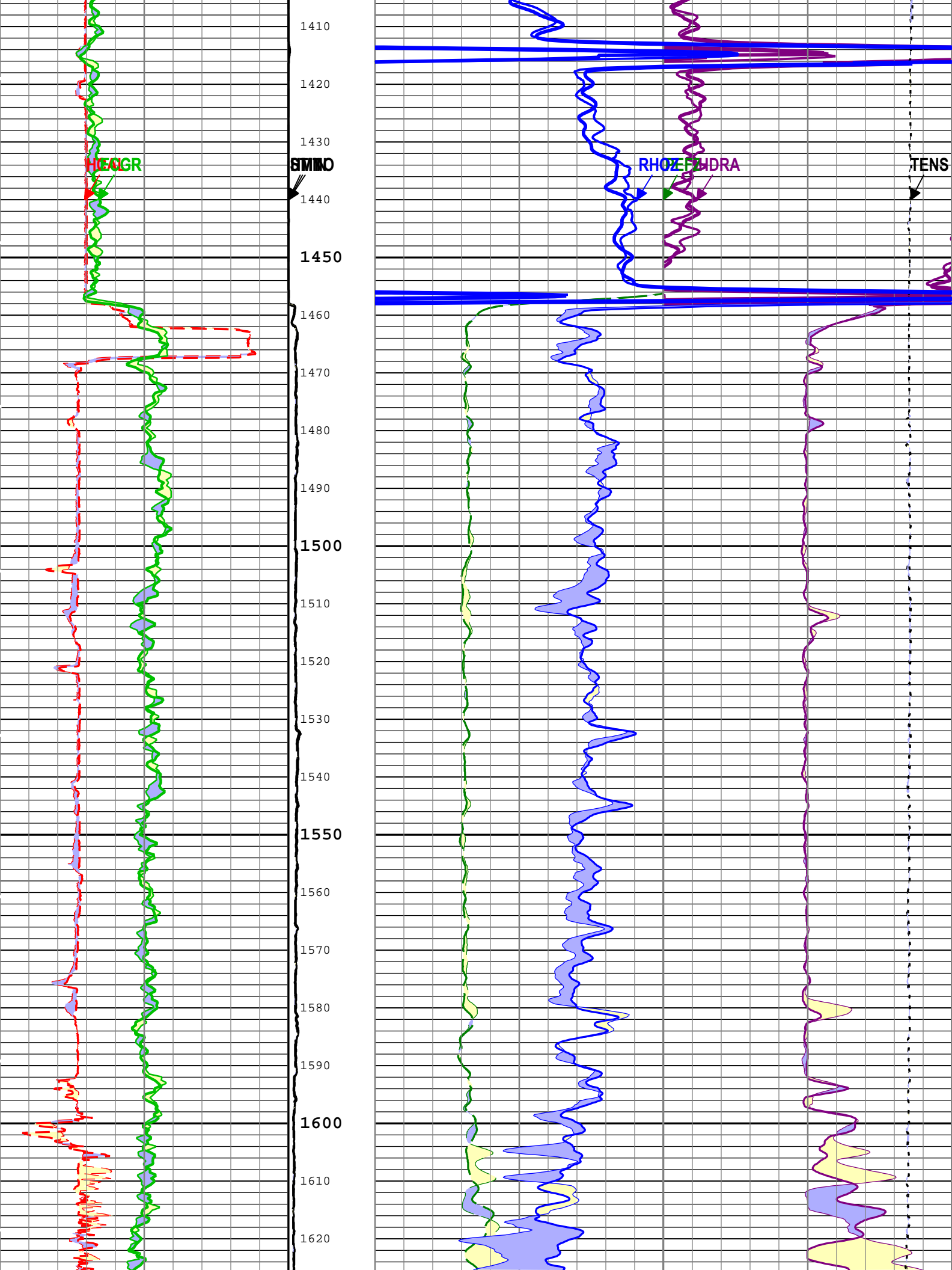
All depths are referenced to toolstring zero

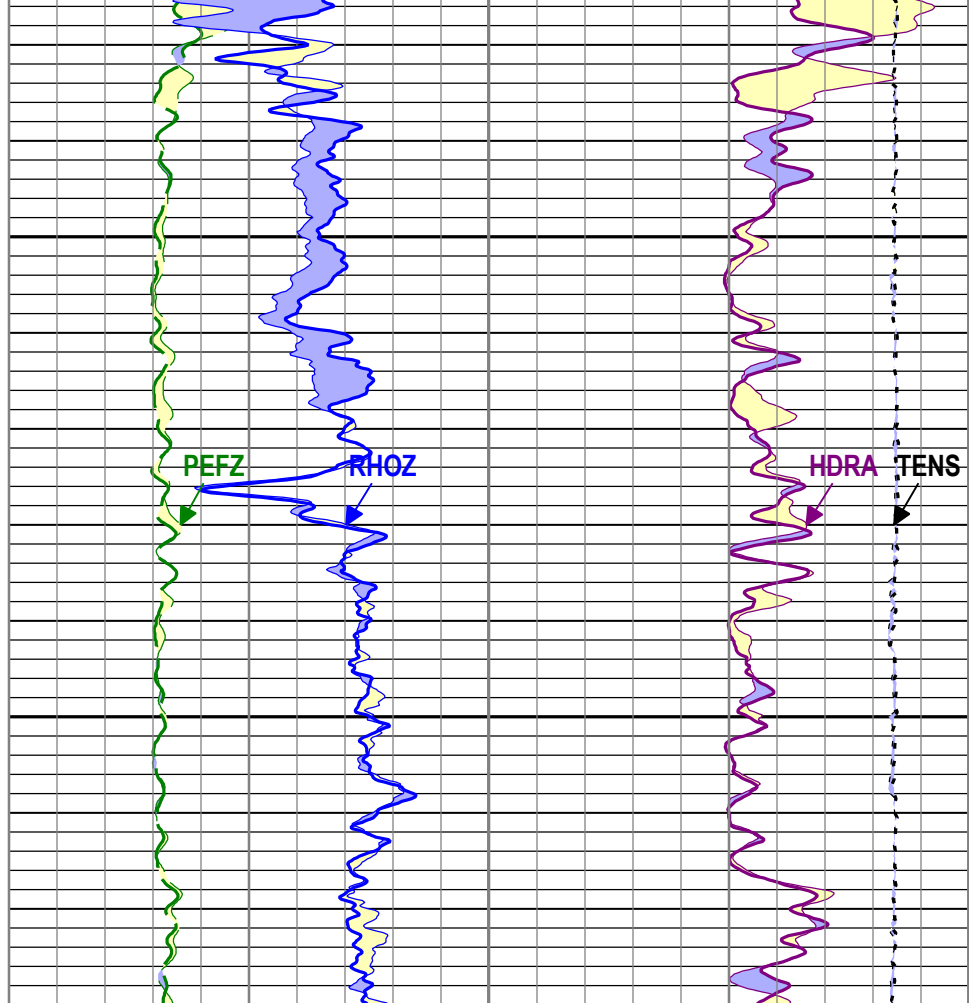
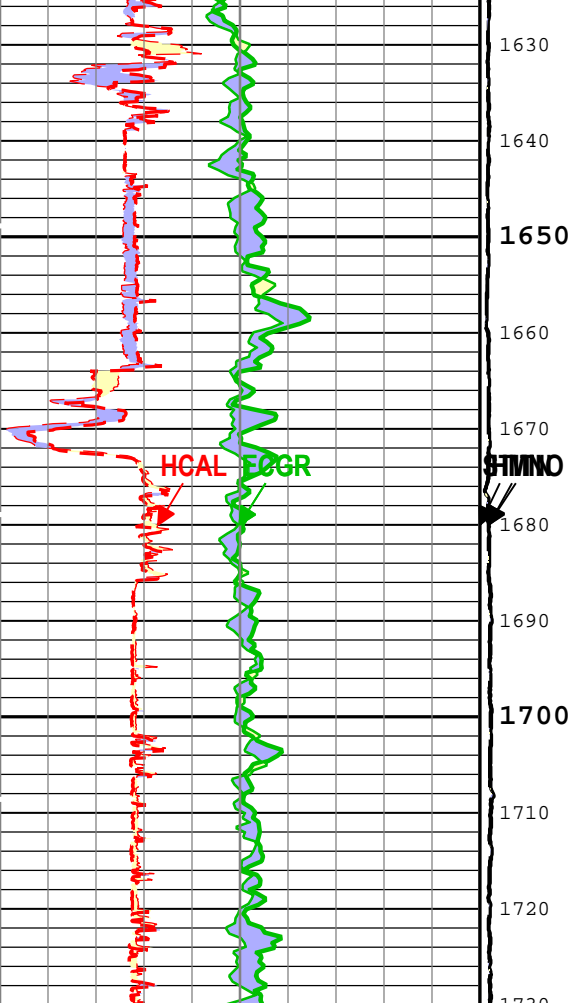
Log	Company:Bonanza Creek	Well:State Seventy Holes J-18
		One: Log[4]:Up:S003

Description: HGNS standard resolution porosities for Platform Express Format: Log (Import of KM 5in Density RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Sep-2016 22:55:53

TIME_1900 - Time Marked every 60.00 (s)







Main To Repeat		Main To Repeat
Repeat To Main		Repeat To Main
Caliper (HCAL) HDRS-H		
6	in	16
Main To Repeat		Synthetic Micro-Inverse Resistivity (HMIN) HDRS-H
Repeat To Main		
Gamma Ray (ECGR) HGNS-H		0 ohm.m 40
200	gAPI	400
Main To Repeat		Main To Repeat
Repeat To Main		Repeat To Main
Gamma Ray (ECGR) HGNS-H		Synthetic Micro-Normal Resistivity (HMNO) HDRS-H
0	gAPI	
		0 ohm.m 40
		Main To Repeat
		Repeat To Main
		Stuck Tool

Main To Repeat	
Repeat To Main	
Standard Resolution Formation Density (RHOZ) HDRS-H	
2	g/cm3 3
Main To Repeat	Main To Repeat
Repeat To Main	Repeat To Main
Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H	Density Standoff Correction (HDRA) HDRS-H
-0.25 0.25	g/cm3
0 10	
	Main To Repeat
	Repeat To Main
	Cable Tension (TENS)
10000	lbf 0

Indicator, Total (STIT)
0 ft 50

TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log (Import of KM 5in Density RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Sep-2016 22:55:53

Calibration Report

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

Primary Equipment :							
	HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	4817				
	HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H	4899				
Auxiliary Equipment :							
	HRDD Backscatter Detector	Backscatter					
	HRDD Long Spacing Detector	Long Spacing					
	HRDD Short Spacing Detector	Short Spacing	27786				
	Cesium 137 Gamma-Ray Logging Source	GSR-J	5471				
	HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	4817				
	HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	4876				
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):		06:42:22 28-Sep-2016					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Small Ring	in	Before	8.00	6.00	6.98	10.00	
Large Ring	in	Before	12.00	9.00	10.77	15.00	

HDRS Density Calibration - Inversion Results

Master (EEPROM):		13:05:16 19-Sep-2016					
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	1.685	1.696	
Pe Aluminum		Master	2.570	2.470	2.555	2.670	
Pe Magnesium		Master	2.650	2.550	2.632	2.750	

HDRS Density Calibration - Deviation Summary

Master (EEPROM):		13:05:16 19-Sep-2016					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Average Deviation	%	Master	0	-0.6000	0.2429	0.6000	
BS Max Deviation	%	Master	0	-1.6000	0.6364	1.6000	
SS Average Deviation	%	Master	0	-1.0000	0.2258	1.0000	
SS Max Deviation	%	Master	0	-2.5000	0.8880	2.5000	
LS Average Deviation	%	Master	0	-1.5000	0.6466	1.5000	
LS Max Deviation	%	Master	0	-3.5000	1.9468	3.5000	

HDRS Density Calibration - Background Summary

Master (EEPROM):		13:05:16 19-Sep-2016		Before (Measured):		06:31:28 28-Sep-2016	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Window Ratio		Master	1.0000		0.7367		
		Before	0.7367	0.6999	0.7363	0.7735	
		Before-Master	-----	-----	-0.0004	-----	
BS Window Sum	1/s	Master	1		25558		
		Before	25558	24280	25473	26836	
		Before-Master	-----	-----	-85	-----	
SS Window Ratio		Master	1.0000		0.4811		
		Before	0.4811	0.4571	0.4803	0.5052	
		Before-Master	-----	-----	-0.0008	-----	

SS Window Sum	1/s	Master Before Before-Master	1 11029 -----	10478 -----	11029 11009 -20	11580 -----	<div><div></div><div></div><div></div><div></div></div>
LS Window Ratio		Master Before Before-Master	1.0000 0.3006 -----	0.2856 -----	0.3006 0.3039 0.0033	0.3156 -----	<div><div></div><div></div><div></div><div></div></div>
LS Window Sum	1/s	Master Before Before-Master	1 1229 -----	1168 -----	1229 1231 2	1291 -----	<div><div></div><div></div><div></div><div></div></div>

HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM): 13:05:16 19-Sep-2016		Before (Measured): 06:31:28 28-Sep-2016					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div></div>
BS PM High Voltage	V	Master		1000	1447	2400	<div><div></div><div></div><div></div><div></div></div>
		Before		1000	1451	2400	<div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-100	4	100	<div><div></div><div></div><div></div><div></div></div>
SS PM High Voltage	V	Master		1000	1401	2400	<div><div></div><div></div><div></div><div></div></div>
		Before		1000	1411	2400	<div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-100	10	100	<div><div></div><div></div><div></div><div></div></div>
LS PM High Voltage	V	Master		1000	1469	2400	<div><div></div><div></div><div></div><div></div></div>
		Before		1000	1472	2400	<div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-100	3	100	<div><div></div><div></div><div></div><div></div></div>

HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM): 13:05:16 19-Sep-2016		Before (Measured): 06:31:28 28-Sep-2016					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div></div>
BS Crystal Resolution	%	Master		5.00	11.77	25.00	<div><div></div><div></div><div></div><div></div></div>
		Before		5.00	11.75	25.00	<div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-1.00	-0.02	1.00	<div><div></div><div></div><div></div><div></div></div>
SS Crystal Resolution	%	Master		5.00	10.16	20.00	<div><div></div><div></div><div></div><div></div></div>
		Before		5.00	10.46	20.00	<div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-1.00	0.30	1.00	<div><div></div><div></div><div></div><div></div></div>
LS Crystal Resolution	%	Master		5.00	8.17	20.00	<div><div></div><div></div><div></div><div></div></div>
		Before		5.00	7.75	20.00	<div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-1.00	-0.42	1.00	<div><div></div><div></div><div></div><div></div></div>

HDRS MCFL Calibration - MCFL Accumulations

Before (Measured): 06:32:50 28-Sep-2016							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div></div>
Main Resistivity	ohm.m	Before	3875	3565	3884	4185	<div><div></div><div></div><div></div><div></div></div>
Deep Resistivity	ohm.m	Before	3830	3524	3782	4136	<div><div></div><div></div><div></div><div></div></div>
Shallow Resistivity	ohm.m	Before	3830	3524	3691	4136	<div><div></div><div></div><div></div><div></div></div>

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	2987
Auxiliary Equipment :			
HGNS Accelerometer, 150 degC		HACCZ-H	6991
AmBe Neutron Logging Source		NSR-F	5068
Calibration Parameter :			
Water Temperature			
Housing Size			
JIG-BKG (Jig minus background reference)		165	

HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured): 16:10:31 28-Sep-2016							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div></div>
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	32.1	32.8	<div><div></div><div></div><div></div><div></div></div>

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

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	----	----	-4298.000	----	
Accelerometer Coefficients - 1		Master	----	----	50.180	----	
Accelerometer Coefficients - 2		Master	----	----	-0.002	----	
Accelerometer Coefficients - 3		Master	----	----	0.000	----	
Accelerometer Coefficients - 4		Master	----	----	2.754	----	
Accelerometer Coefficients - 5		Master	----	----	0.000	----	
Accelerometer Coefficients - 6		Master	----	----	0.000	----	
Accelerometer Coefficients - 7		Master	----	----	0.000	----	
Accelerometer Coefficients - 8		Master	----	----	300.500	----	
Accelerometer Coefficients - 9		Master	----	----	0.994	----	

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 15:25:00 19-Jul-2016		Before (Measured):		06:28:08 28-Sep-2016			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Near Zero Measurement	1/s	Master	0	5.0	27.6	40.0	
		Before	0	5.0	27.9	40.0	
		Before-Master	----	-4.1	0.3	4.1	
Far Zero Measurement	1/s	Master	0	5.0	29.5	40.0	
		Before	0	5.0	29.5	40.0	
		Before-Master	----	-4.4	0.0	4.4	
Near Plus Measurement	1/s	Master	6031.0	4700.0	5290.0	6900.0	
		Before	----	----	----	----	
		Before-Master	----	----	----	----	
Far Plus Measurement	1/s	Master	2793.0	1900.0	2194.0	2900.0	
		Before	----	----	----	----	
		Before-Master	----	----	----	----	
Near Corrected Plus Measurement	1/s	Master		4700.0	5156.0	6900.0	
		Before	----	----	----	----	
		Before-Master	----	----	----	----	
Far Corrected Plus Measurement	1/s	Master		1900.0	2097.0	2900.0	
		Before	----	----	----	----	
		Before-Master	----	----	----	----	

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured): 06:32:43 28-Sep-2016							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RGR Zero Measurement	gAPI	Before	30.0	0	83.7	120.0	
RGR Plus Measurement	gAPI	Before	185.4	157.1	180.0	206.3	
GR Calibration Gain		Before	0.89	0.80	0.92	1.05	

Company: Bonanza Creek

Schlumberger

Well: State Seventy Holes J-18

Field: Wattenberg

County:	Weld
State:	Colorado
Platform Express	
Compensated Neutron Log	
LithoDensity	