

Company: St. Croix Operating, Inc.

Well: Pronghorn #1

Field: Wildcat

County: Washington State: Colorado

Platform Express

Compensated Neutron

Litho-Density

County: Washington
Field: Wildcat
Location: SE SE
Well: Pronghorn #1
Company: St. Croix Operating, Inc.

Location:	SE SE	Elev.:	K.B.	4666.60 ft
	900' FSL, 600FEL		G.L.	4648.00 ft
	LAT: 39.787700 , LONG: -103.084680		D.F.	4666.60 ft
	Permanent Datum:	Ground Level	Elev.:	4648.00 f
Log Measured From:	Drilling Measured From:	Kelly Bushing	18.60 ft	above Perm.Datum
		Kelly Bushing		
API Serial No.	Section:	Township:	Range:	
05-121-11082	4	T2S	R51W	

Logging Date 02-Jan-2019

Run Number ONE

Depth Driller 4200.00 ft

Schlumberger Depth 4198.00 ft

Bottom Log Interval 4198.00 ft

Top Log Interval 3100.00 ft

Casing Driller Size @ Depth 8.625 in @ 503.00 ft

Casing Schlumberger 502 ft

Bit Size 7.875 in

Type Fluid In Hole GEL POLYMER

Density 9.2 lbm/gal 35 s

Fluid Loss PH 9.5

MUD Source of Sample Active Tank

RM @ Meas Temp 0.2 ohm.m @ 68 degF

RMF @ Meas Temp 0.15 ohm.m @ 68 degF

RMC @ Meas Temp

Source RMF RMC Pressed

RM @ BHT RMF @ BHT 0.07 @ 212 0.05 @ 212

Max Recorded Temperatures 110 degF

Circulation Stopped 04-Jan-2019 23:00:05

Logger on Bottom 04-Jan-2019 16:00:00

Unit Number 9102 Fort Morgan

Recorded By Ali AlRamadhan / Evan Grzecki

Witnessed By Tom Thomas

Disclaimer

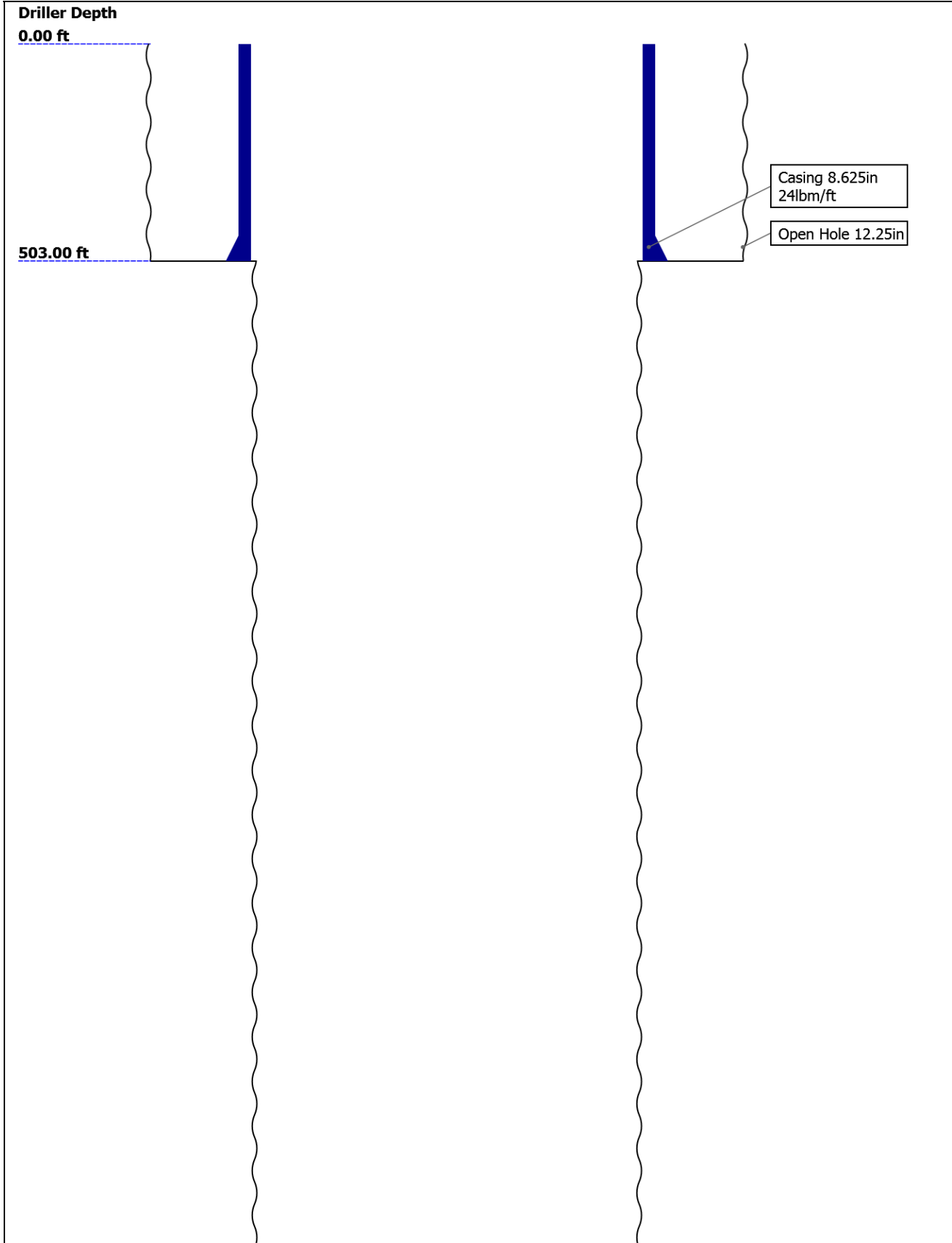
THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (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.

Contents

- 1. Header
- 2. Disclaimer
- 3. Contents
- 4. Well Sketch
- 5. Borehole Size/Casing/Tubing Record
- 6. Remarks and Equipment Summary
- 7. Depth Summary
- 8. ONE 5" Porosity
 - 8.1 Integration Summary
 - 8.2 Software Version
 - 8.3 Composite Summary
 - 8.4 Log (EMD 5in Porosity)
 - 8.5 Parameter Listing
- 9. ONE 5" Density
 - 9.1 Integration Summary
 - 9.2 Software Version
 - 9.3 Composite Summary

- 9.4 Log (EMD 5in Density)
- 9.5 Parameter Listing
- 10. ONE 5" Porosity
 - 10.1 Composite Summary
 - 10.2 Log (EMD 5in Porosity RA)
- 11. Tail

Well Sketch



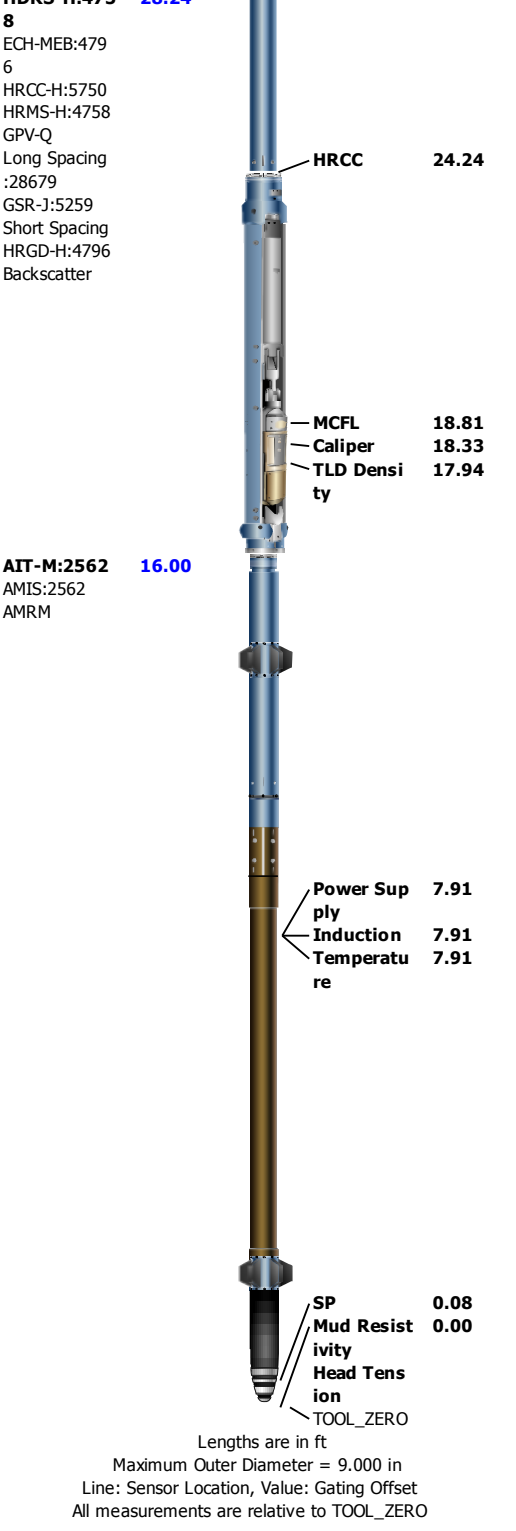


Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	12.25	7.875				
Top Driller (ft)	0	503				
Top Logger (ft)	0	503				
Bottom Driller (ft)	503	4200				
Bottom Logger (ft)	503	4200				
Casing						
Size (in)	8.625					
Weight (lbm/ft)	24					
Inner Diameter (in)	8.097					
Grade	J55					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	503					
Bottom Logger (ft)	502					

Remarks and Equipment Summary

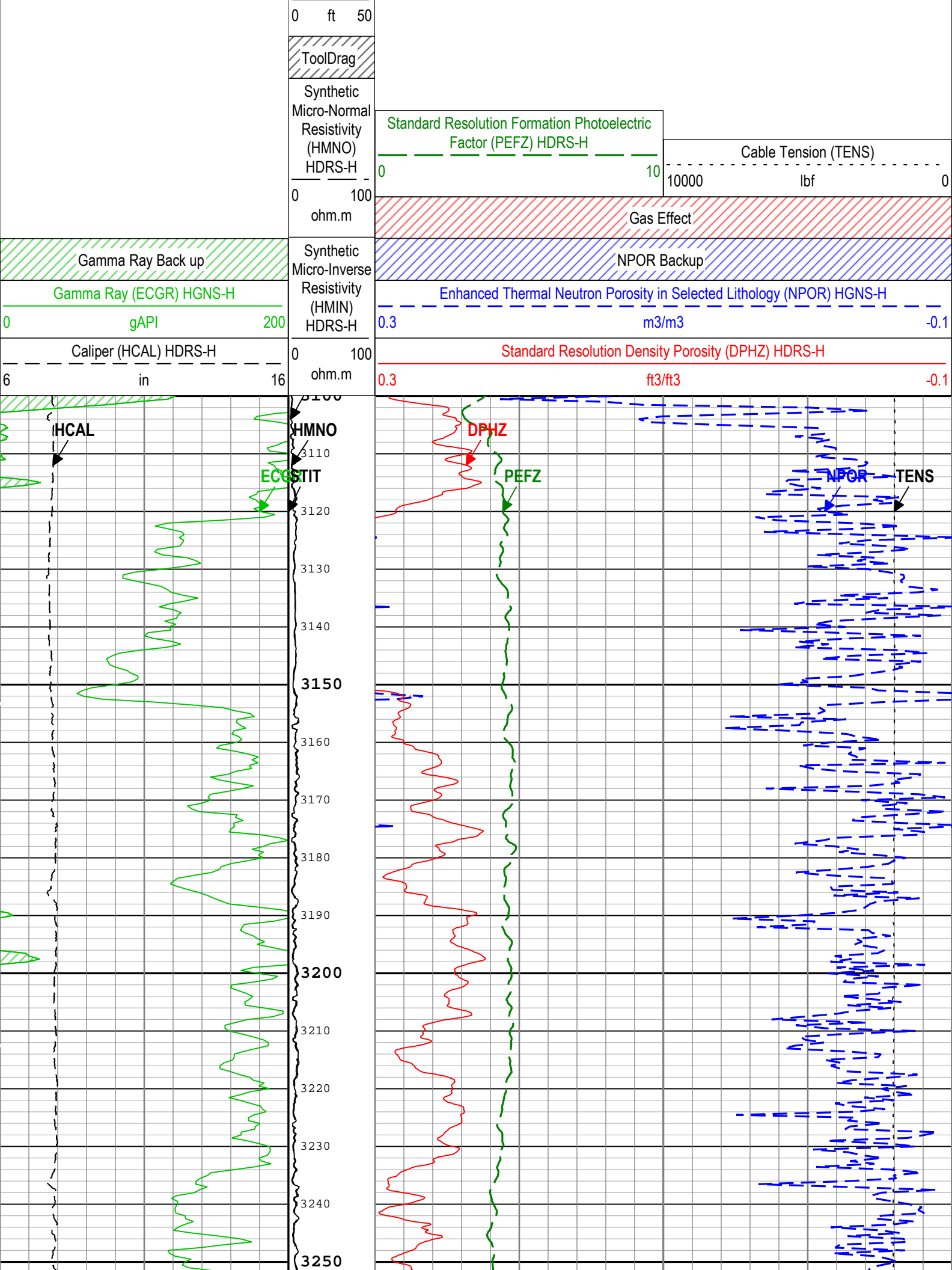
ONE: Toolstring				ONE: Remarks	
Equip name	Length	MP name	Offset	THANK YOU FOR CHOOSING SCHLUMBERGER!	
LEH-QT:2353	44.14			TOOLSTRING RUN AS PER TOOLSKETCH AND CLIENT LOGGING PROGRAM.	
LEH-QT:2353				REQUESTED TO RUN THE TOOL SLICK WITH NO BOWSPRING OR STANDOFFS.	
DTC-H:9486	40.65	CTEM HV	39.75 0.00	MATRIX: SANDSTONE: 2.65 FROM TD TO 4000 & LIMESTONE:2.71 2.65 FROM 4000 TO SC.	
ECH-KC:10585		TelStatus	37.65	TD: 4168 FT.	
DTC-H:9486		ToolStatus	37.65	BHT: 101.7 DEG F.	
HGNS-H:3730	37.65	Temperature	37.62		
HGNH:2742		GR	36.91		
NSR-F:5068					
NPV-N					
HMCA-H					
HACCZ-H:1537					
HGNS-H:3730					
		CNL Porosity	30.57		
		HGNS	28.24		
		HMCA	28.24		
		Accelerometer	0.00		
HDPS-H:475	28.24				

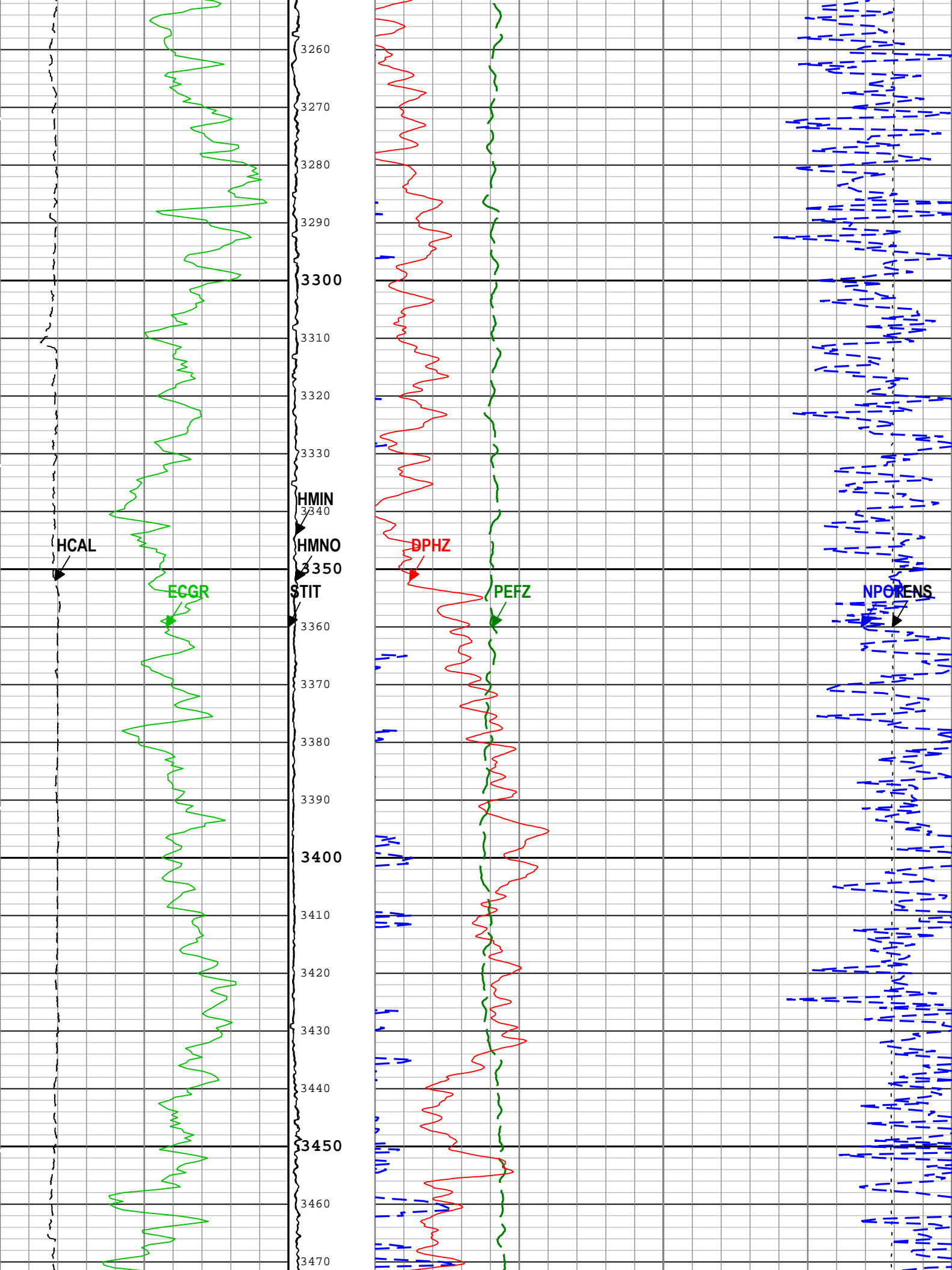


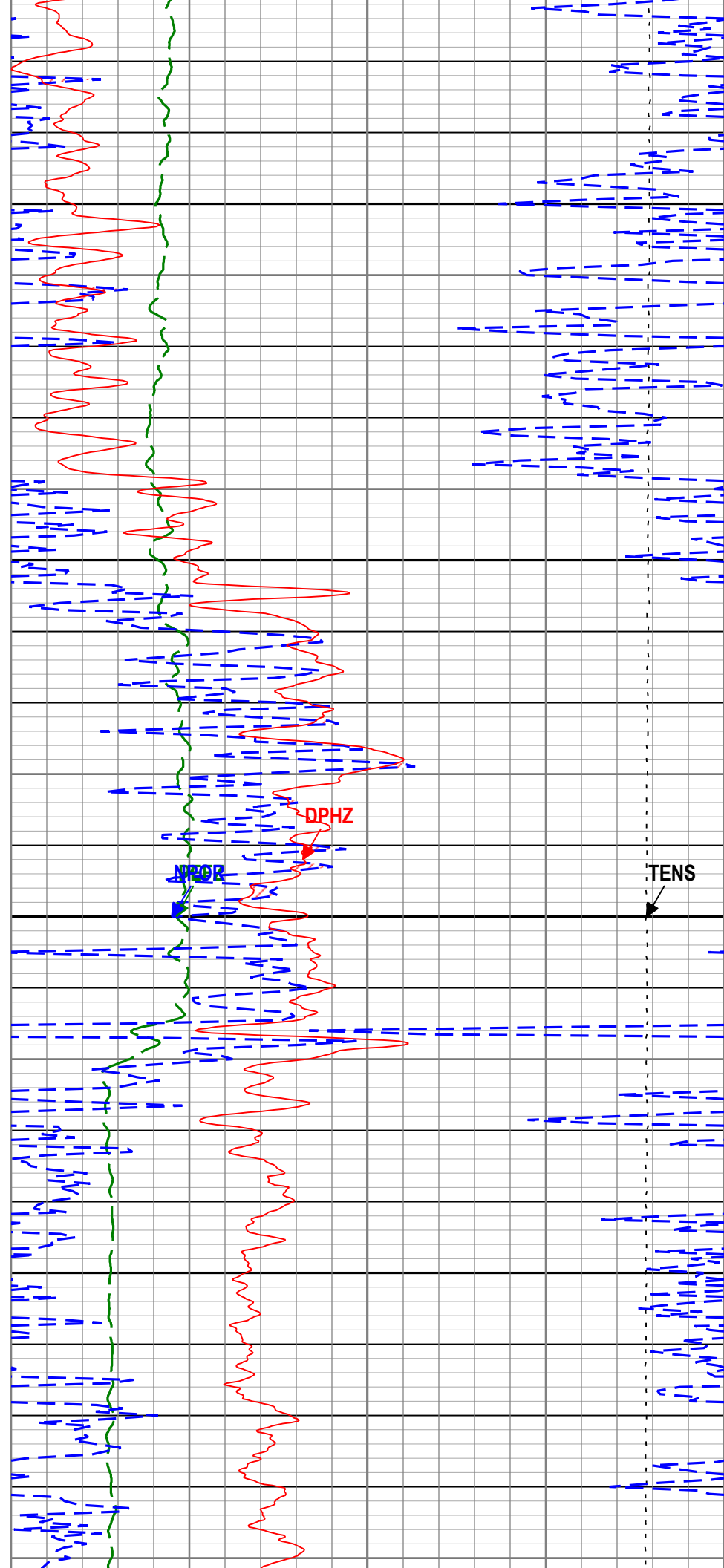
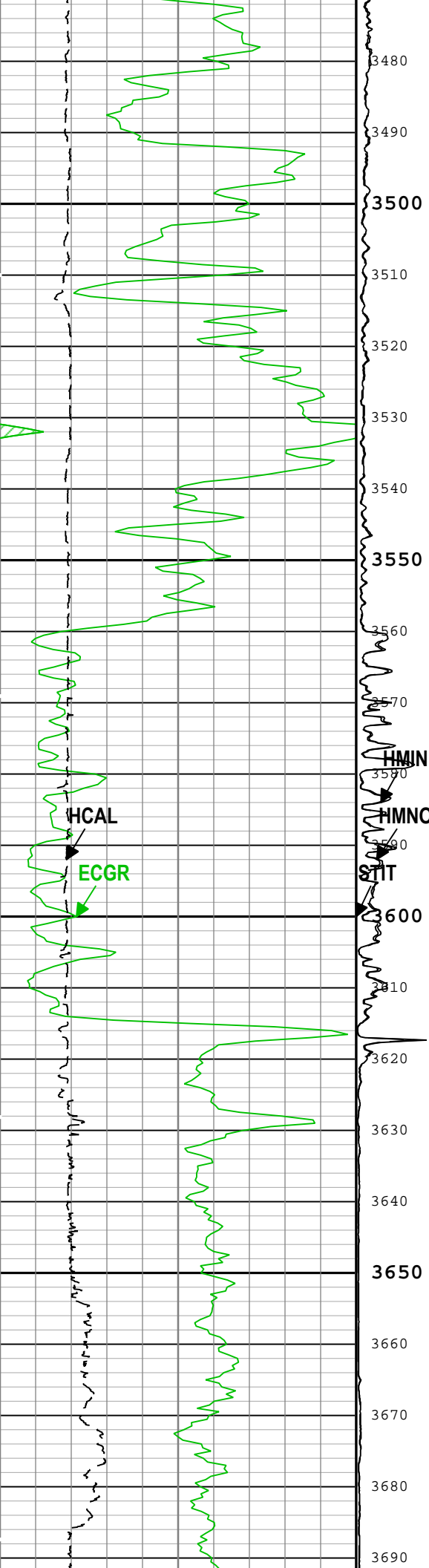
Depth Summary

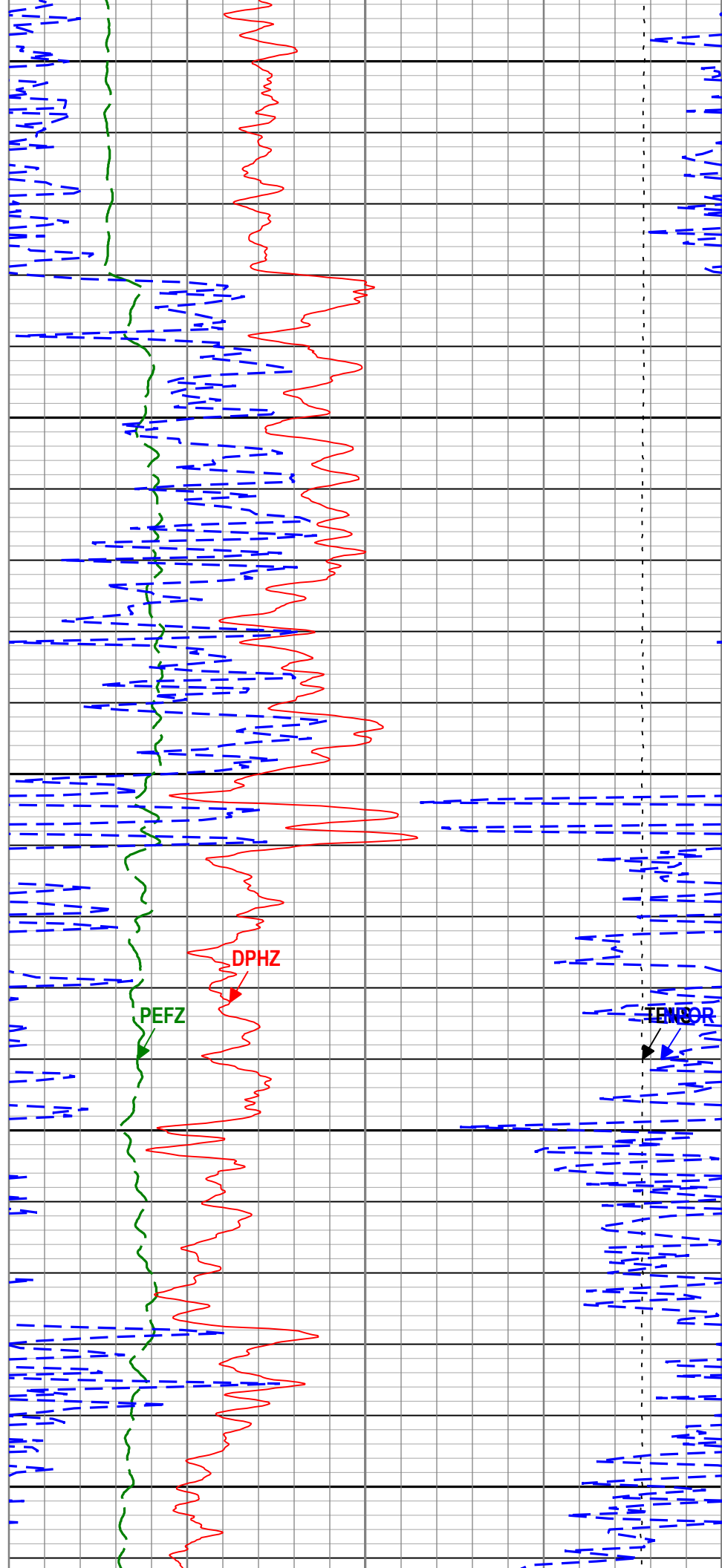
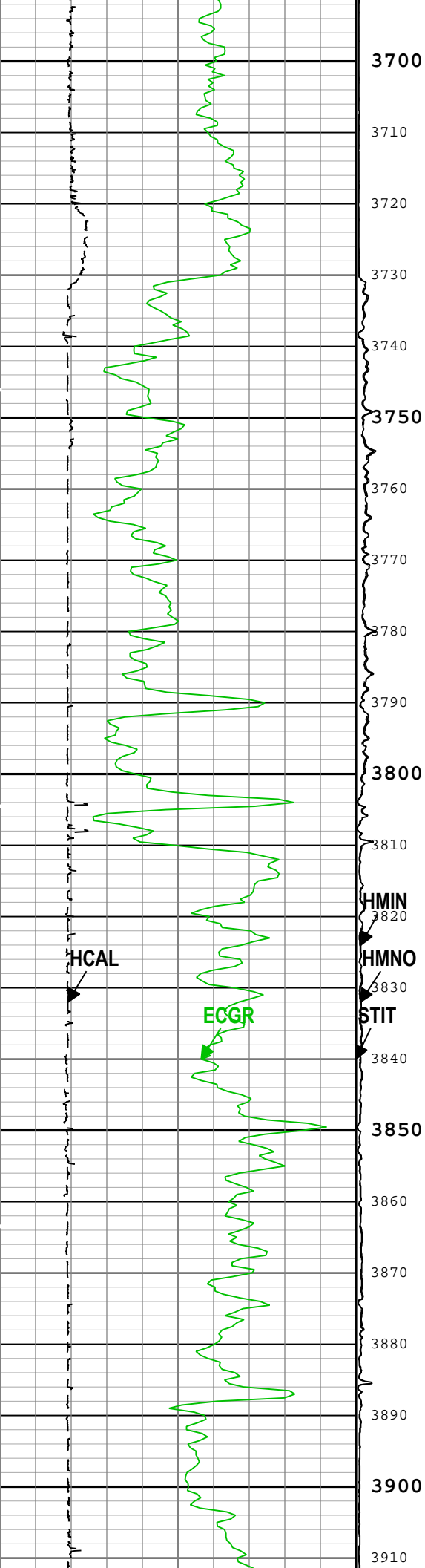
ONE			
Depth Measuring Device			
Type	IDW-B		
Serial Number	5822		
Calibration Date	14-aug-2018		
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	-2		
Wheel Correction 2	-2		
Tension Device			
Type	CMTD-B/A		

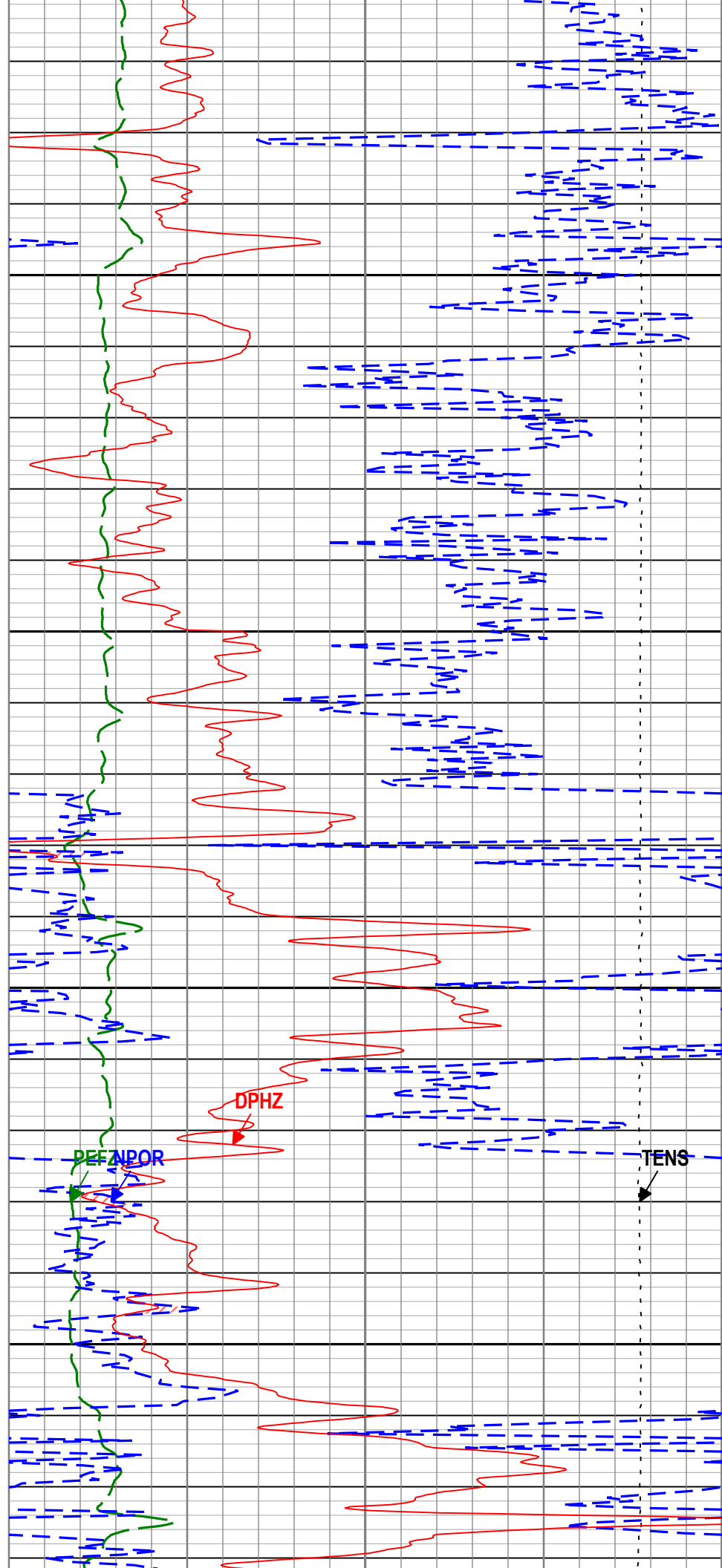
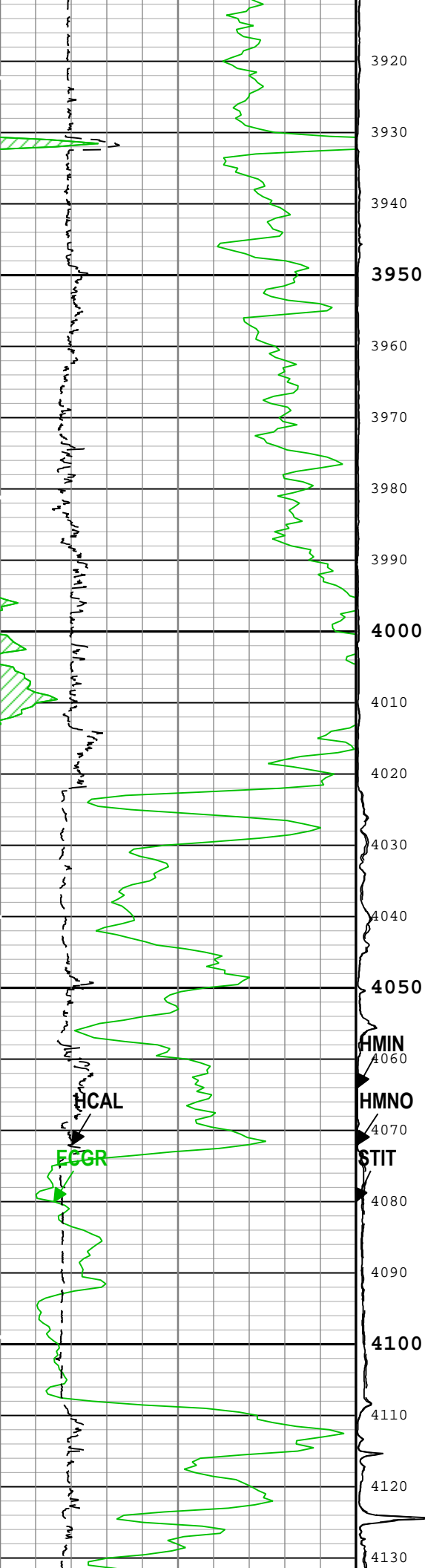
Serial Number									
Calibration Date									
Calibrator Serial Number									
Number of Calibration Points	0								
Logging Cable									
Type	7-46NT-XS								
Serial Number									
Length	24000.00 ft								
Conveyance Type	Wireline								
Rig Type	LAND								
ONE:Depth Control Parameters		Depth Control Remarks							
Log Sequence	First Log In the Well	ALL SCHLUMBERGER DEPTH PROCRDURES FOLLOWED.							
Rig Up Length At Surface		IDW IS USED AS PRIMARY DEPTH CONTROL.							
Rig Up Length At Bottom		Z-CHART USED AS SECONDARY DEPTH CONTROL							
Rig Up Length Correction									
Stretch Correction	1.40 ft								
Tool Zero Check At Surface									
ONE									
5" Porosity									
Software Version									
Acquisition System		Version							
Maxwell 2018 SP2		8.2.104493.3100							
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[8]:Up	Up	13.12 ft	4210.87 ft	04-Jan-2019 4:32:05 AM	04-Jan-2019 6:03:08 AM	ON	1.44 ft	No
All depths are referenced to toolstring zero									
Log	Company:St. Croix Operating, Inc. Well:Pronghorn #1 ONE: Log[8]:Up:S011								
Description: HGNS standard resolution porosities for Platform Express Format: Log (EMD 5in Porosity) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Jan-2019 06:32:49									
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							
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>Stuck Tool Indicator, Total (STIT)</div>									

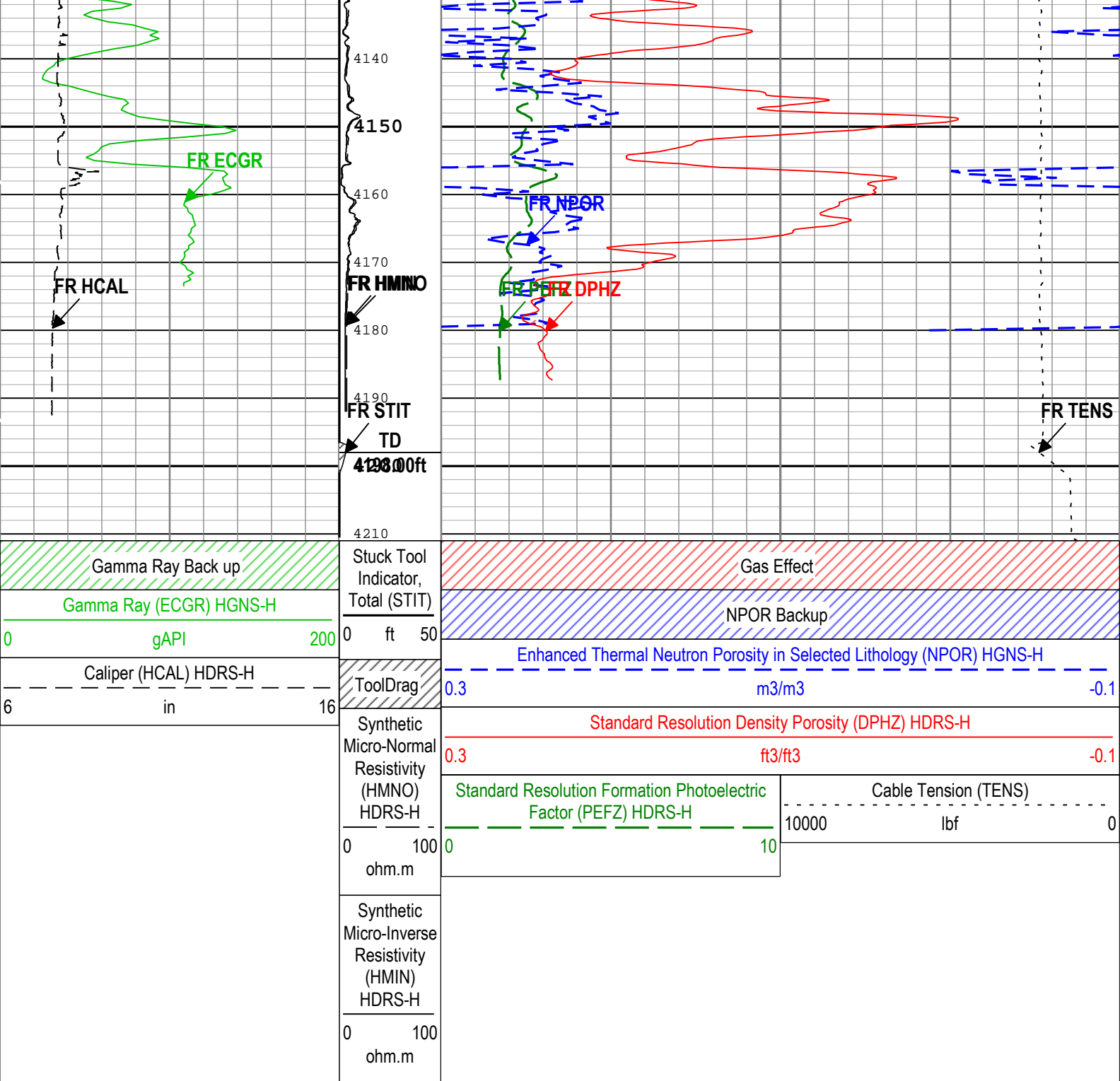












TIME_1900 - Time Marked every 60.00 (s)				
Description: HGNS standard resolution porosities for Platform Express Format: Log (EMD 5in Porosity) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Jan-2019 06:32:49				

Channel Processing Parameters				
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
BAR(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BHT	Bottom Hole Temperature	Borehole	212	degF
BS	Bit Size	WLSESSION	7.875	in
BSAL	Borehole Salinity	Borehole	500	ppm
BSCO	Borehole Salinity Correction Option	HGNS-H	Yes	
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	-0.152	in

CBLO	Casing Bottom (Logger)	WLSESSION	502	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.2	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DFT_WATER	Drilling Fluid Water Type	Borehole	GEL POLYMER	
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	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	Depth Zoned	
MDEN	Matrix Density for Density Porosity	Borehole	Depth Zoned	g/cm3
MFST	Mud Filtrate Sample Temperature	Borehole	68	degF
MPOF	MCFL Processing Operation Mode	HDRS-H	On	
NPRM	HRDD Nuclear Processing Mode	HDRS-H	Standard Resolution	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	0.15	ohm.m
SOCO	Standoff Correction Option	HGNS-H	Yes	
TD	Total Measured Depth	Borehole	4198	ft

Depth Zone Parameters			
Parameter	Value	Start (ft)	Stop (ft)
MATR	LIMESTONE	3100	4000
MATR	SANDSTONE	4000	4211
MDEN	2.71	3100	4000
MDEN	2.65	4000	4211

All depth are actual.

Tool Control Parameters	
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ONE: Parameters				
Parameter	Description	Tool	Value	Unit
HMCA_BOARD_TYPE	HMCA Board Type	HGNS-H	1	
HRGD_BOARD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h

ONE

5" Density

Software Version	
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Acquisition System	Version
Maxwell 2018 SP2	8.2.104493.3100

Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[8]:Up	Up	13.12 ft	4210.87 ft	04-Jan-2019 4:32:05 AM	04-Jan-2019 6:03:08 AM	ON	1.44 ft	No

All depths are referenced to toolstring zero

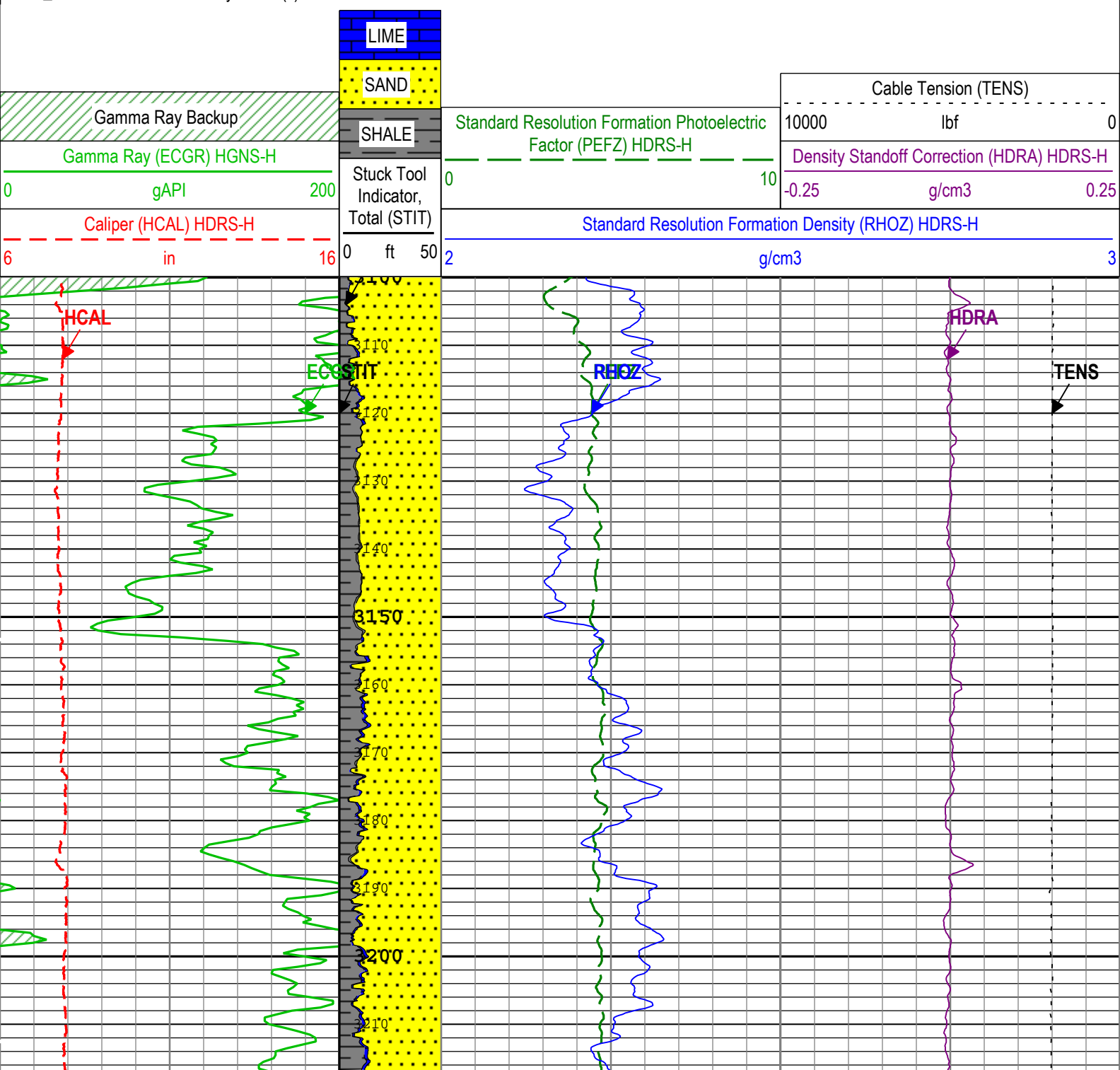
Log	Company:St. Croix Operating, Inc. Well:Pronghorn #1
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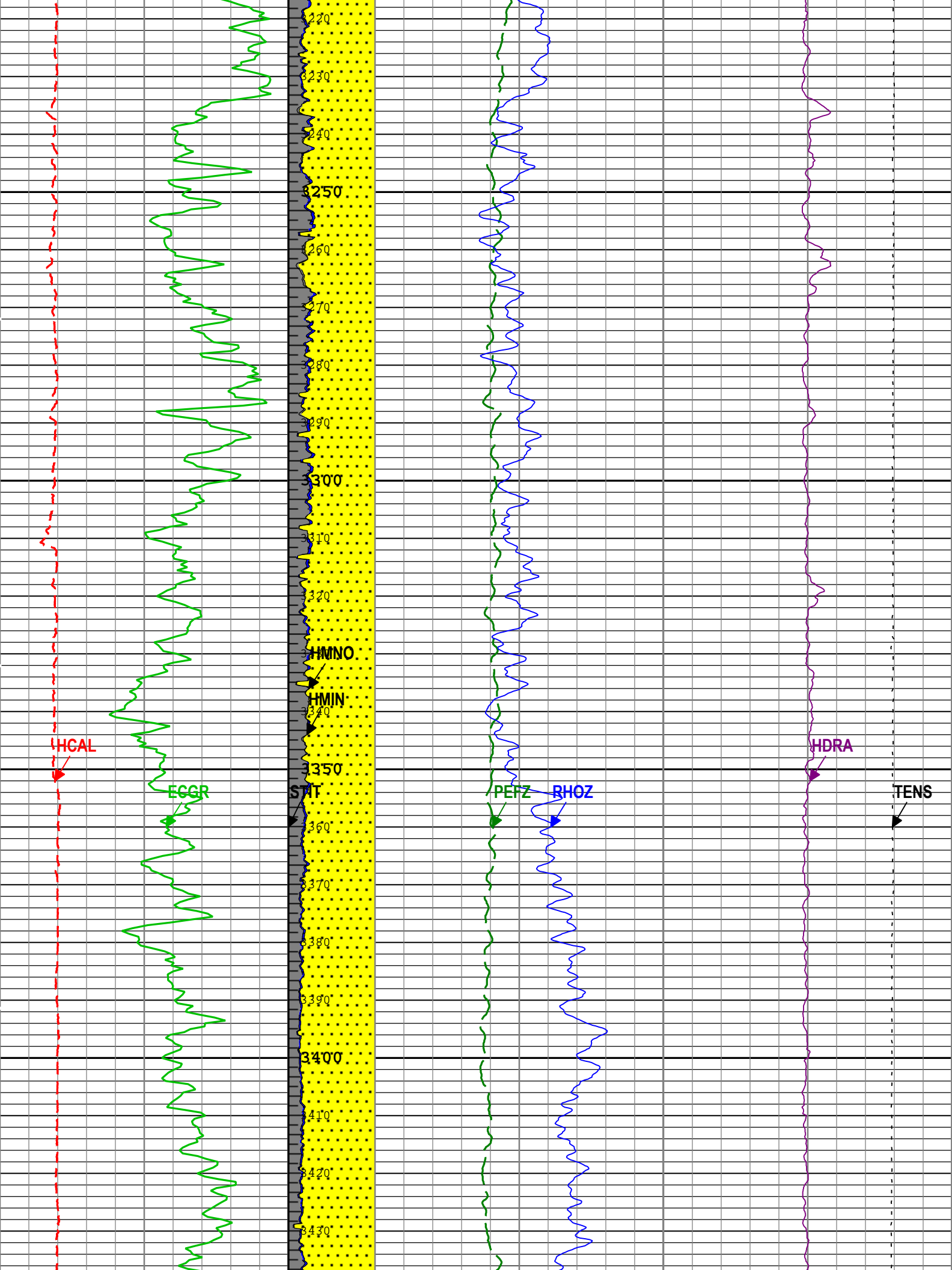
Description: HGNS standard resolution porosities for Platform Express Format: Log (EMD 5in Density) Index Scale: 5 in per 100 ft Index Unit: ft Index

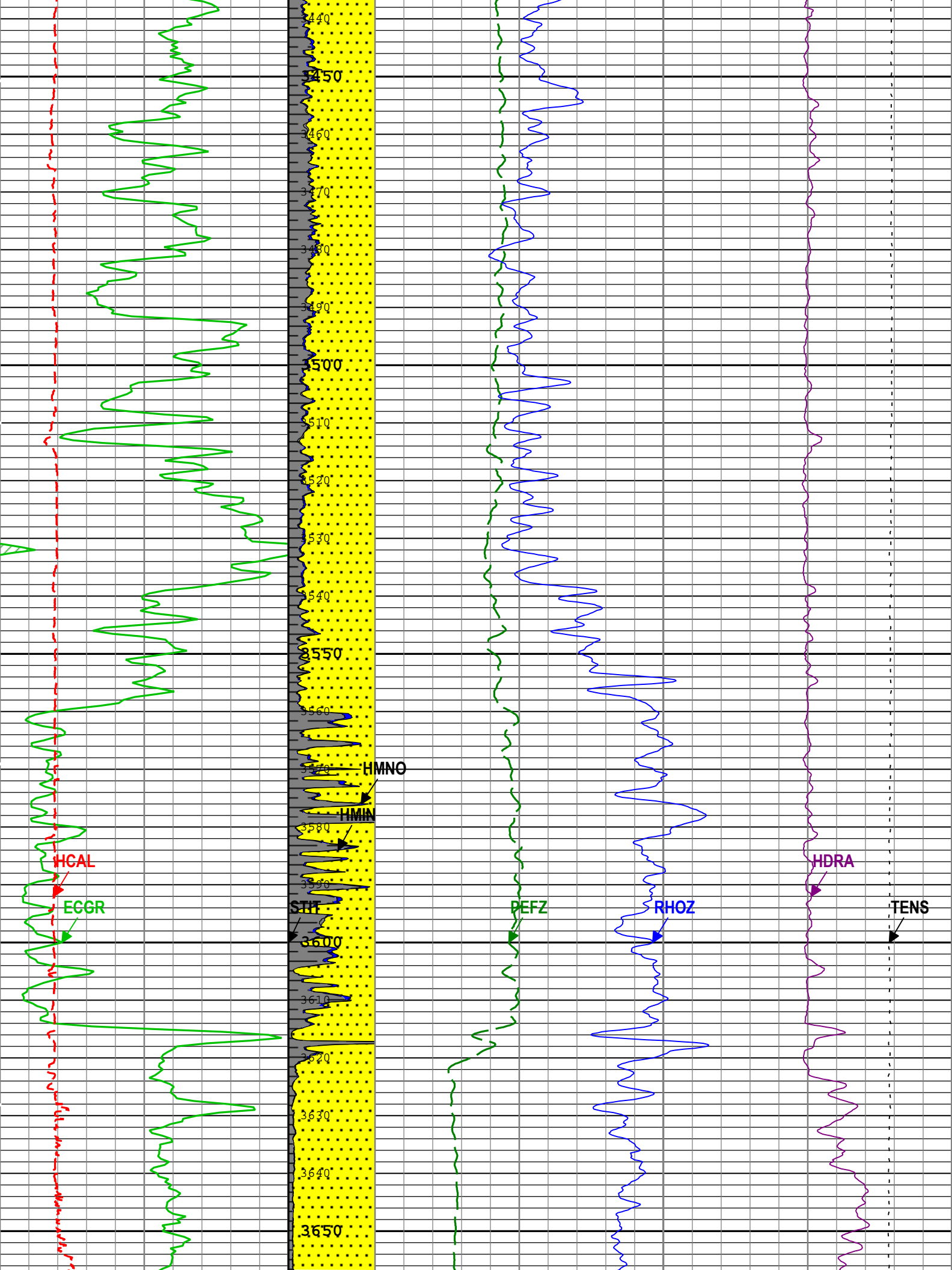
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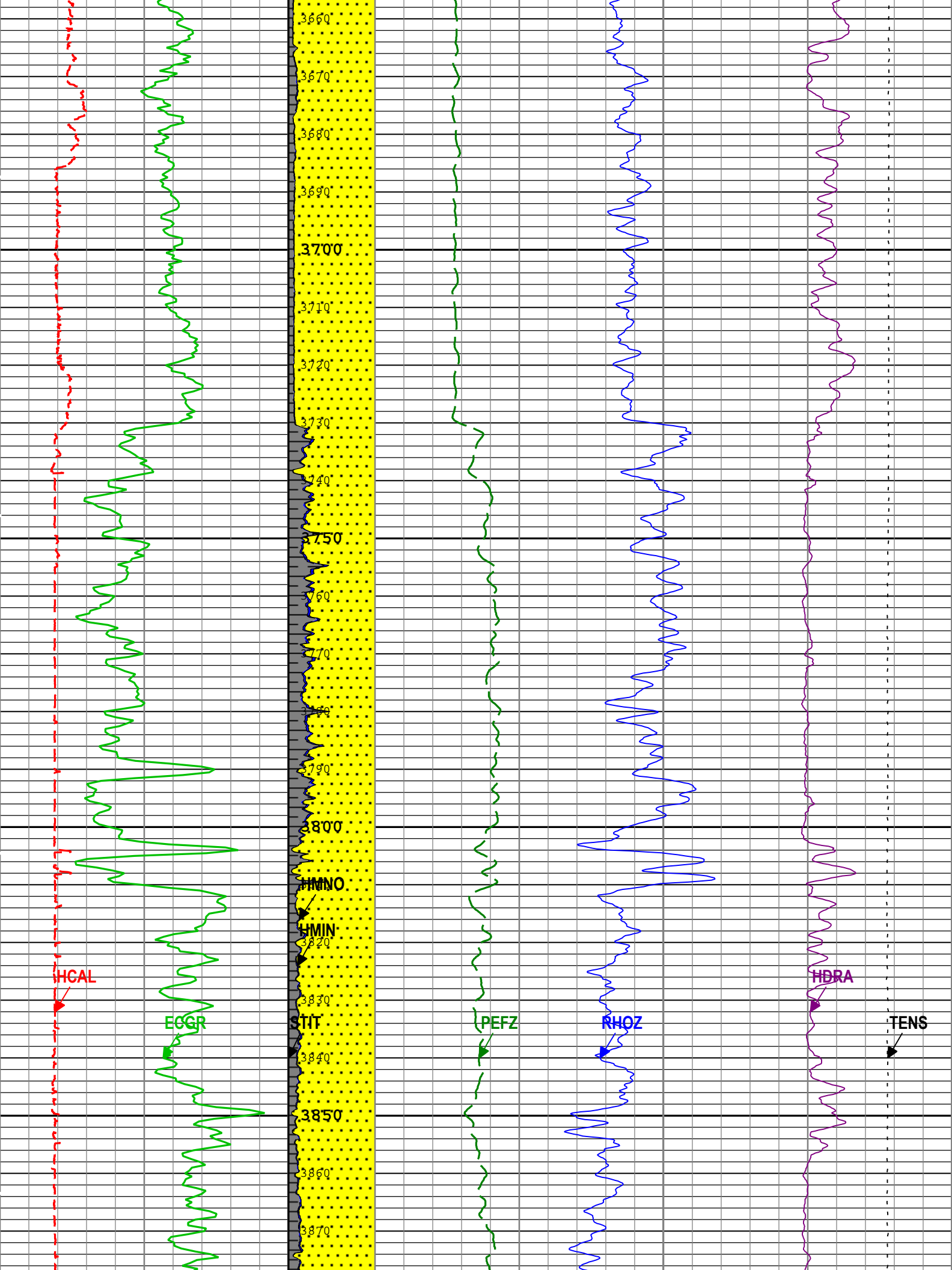
Channel	Source	Sampling
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR	HGNS-H:HGNS-H:HGNS-H	6in
HDRA	HDRS-H:HRMS-H:HRGD-H	2in
PEFZ	HDRS-H:HRMS-H:HRGD-H	2in
RHOZ	HDRS-H:HRMS-H:HRGD-H	2in
SMIN	HDRS-H:HRMS-H:HRGD-H	2in
SMNO	HDRS-H:HRMS-H:HRGD-H	2in
STIT	DepthCorrection	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

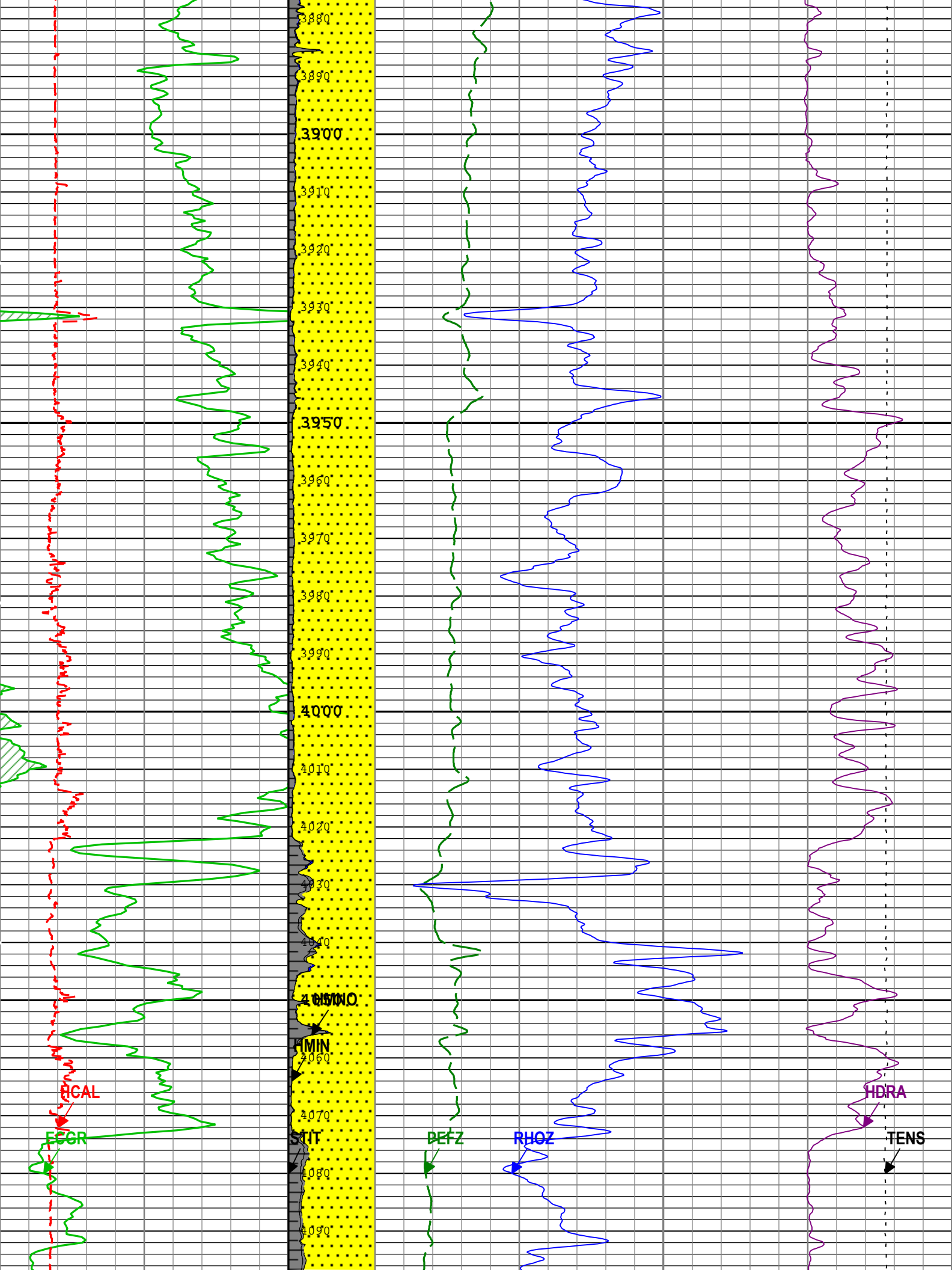
TIME_1900 - Time Marked every 60.00 (s)

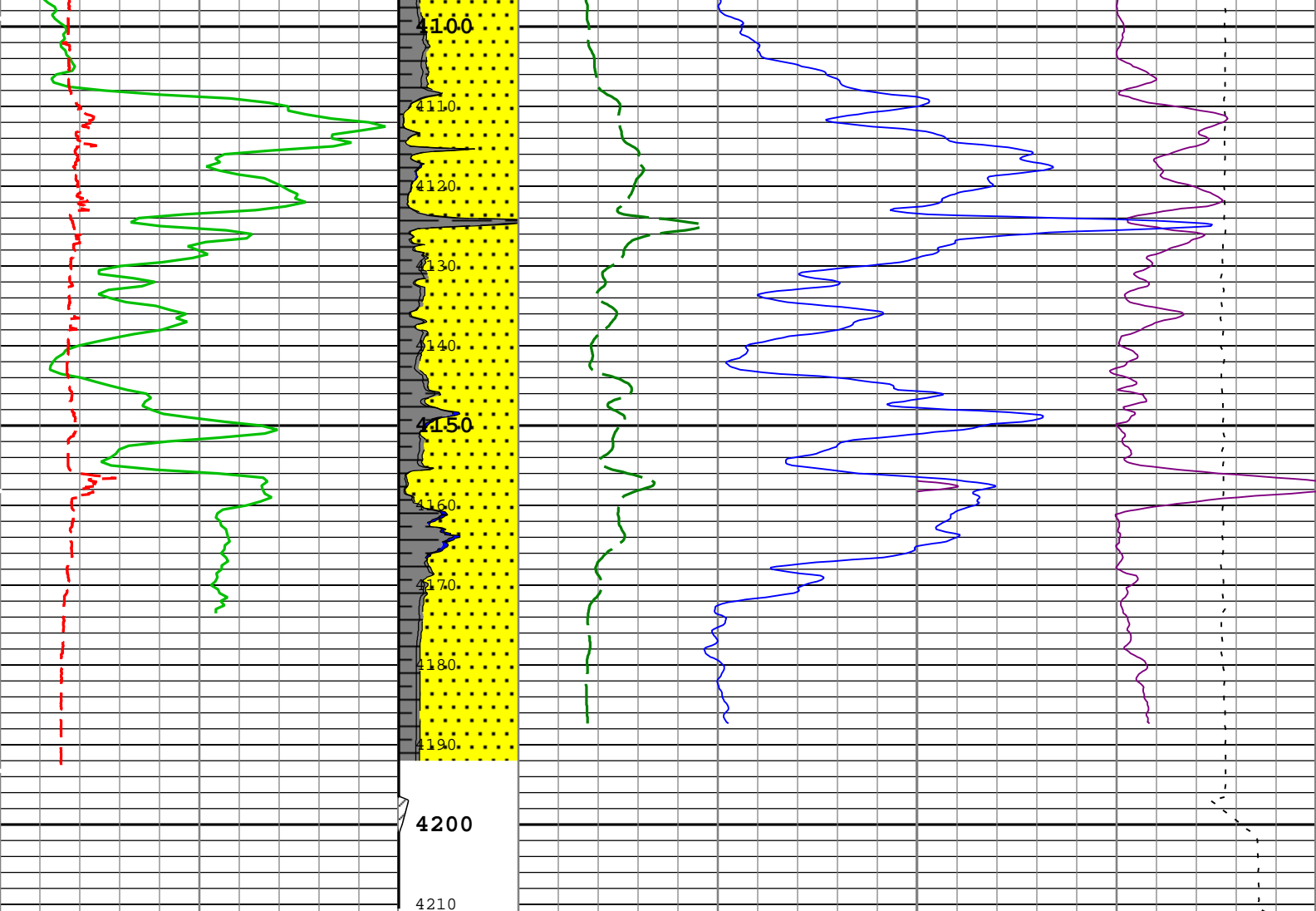












Gamma Ray Backup		Standard Resolution Formation Density (RHOZ) HDRS-H	
Gamma Ray (ECGR) HGNS-H		g/cm3	
0	gAPI	2	3
Caliper (HCAL) HDRS-H		Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H	
6	in	0	10
Stuck Tool Indicator, Total (STIT)		Cable Tension (TENS)	
0	ft	50	10000
		Density Standoff Correction (HDRA) HDRS-H	
		-0.25 g/cm3 0.25	

TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log (EMD 5in Density) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Jan-2019 06:32:51

Channel Processing Parameters				
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
BARI(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	7.875	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	-0.152	in
CBLO	Casing Bottom (Logger)	WLSESSION	502	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.2	lbm/gal
DFT_CATEGORY	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	AMF	
MPOF	MCFL Processing Operation Mode	HDRS-H	On	
NPRM	HRDD Nuclear Processing Mode	HDRS-H	Standard Resolution	
SOCO	Standoff Correction Option	HGNS-H	Yes	
TD	Total Measured Depth	Borehole	4198	ft

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	3600	ft/h

ONE

5" Porosity

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[7]:Up	Up	3775.68 ft	4211.63 ft	04-Jan-2019 4:14:09 AM	04-Jan-2019 4:25:24 AM	ON	1.30 ft	No
ONE	Log[8]:Up	Up	13.12 ft	4210.87 ft	04-Jan-2019 4:32:05 AM	04-Jan-2019 6:03:08 AM	ON	1.44 ft	No

All depths are referenced to toolstring zero

Log

Company:St. Croix Operating, Inc.

Well:Pronghorn #1

ONE: Log[8]:Up:S011

Description: HGNS standard resolution porosities for Platform Express

Format: Log (EMD 5in Porosity RA)

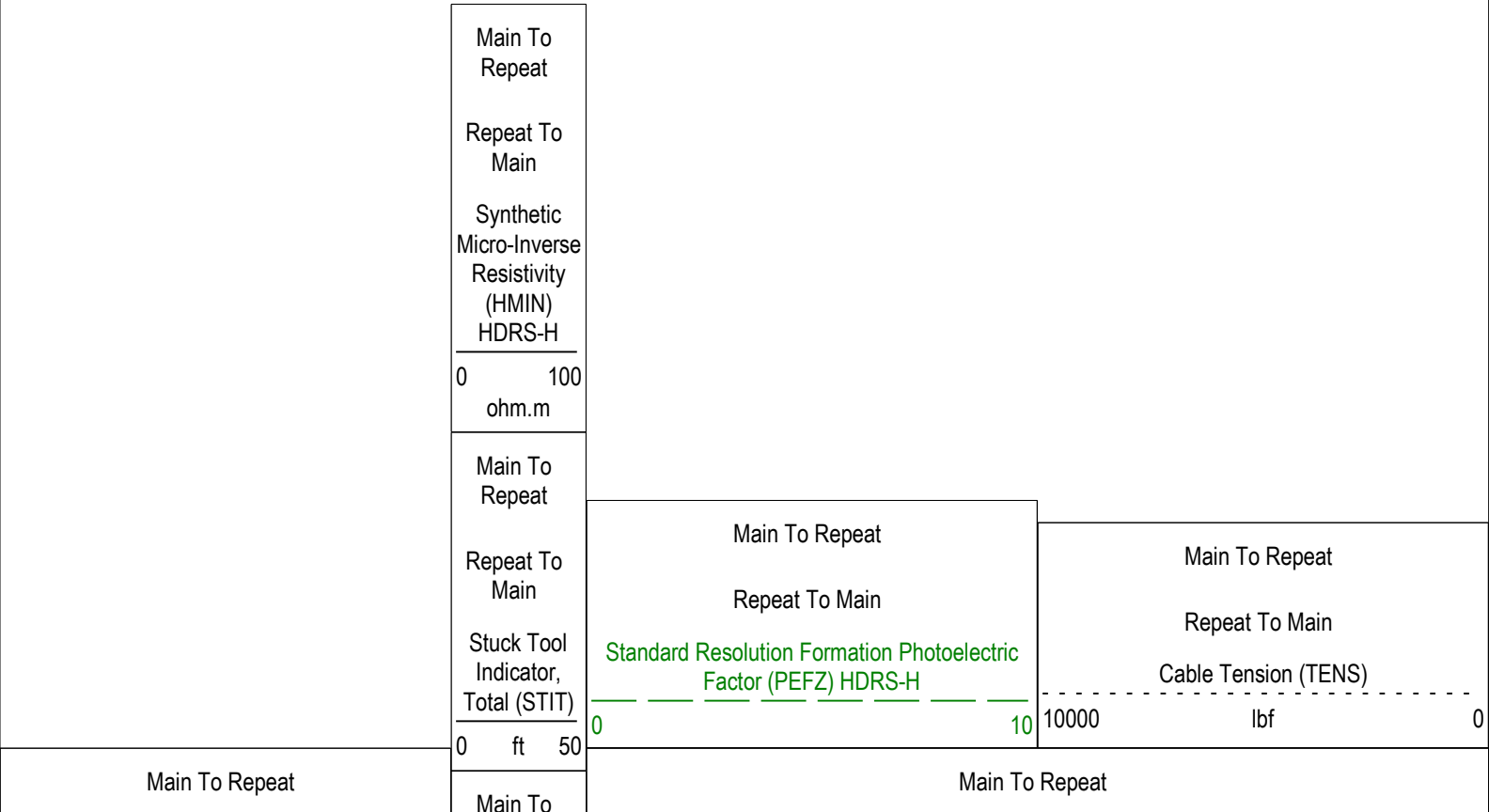
Index Scale: 5 in per 100 ft

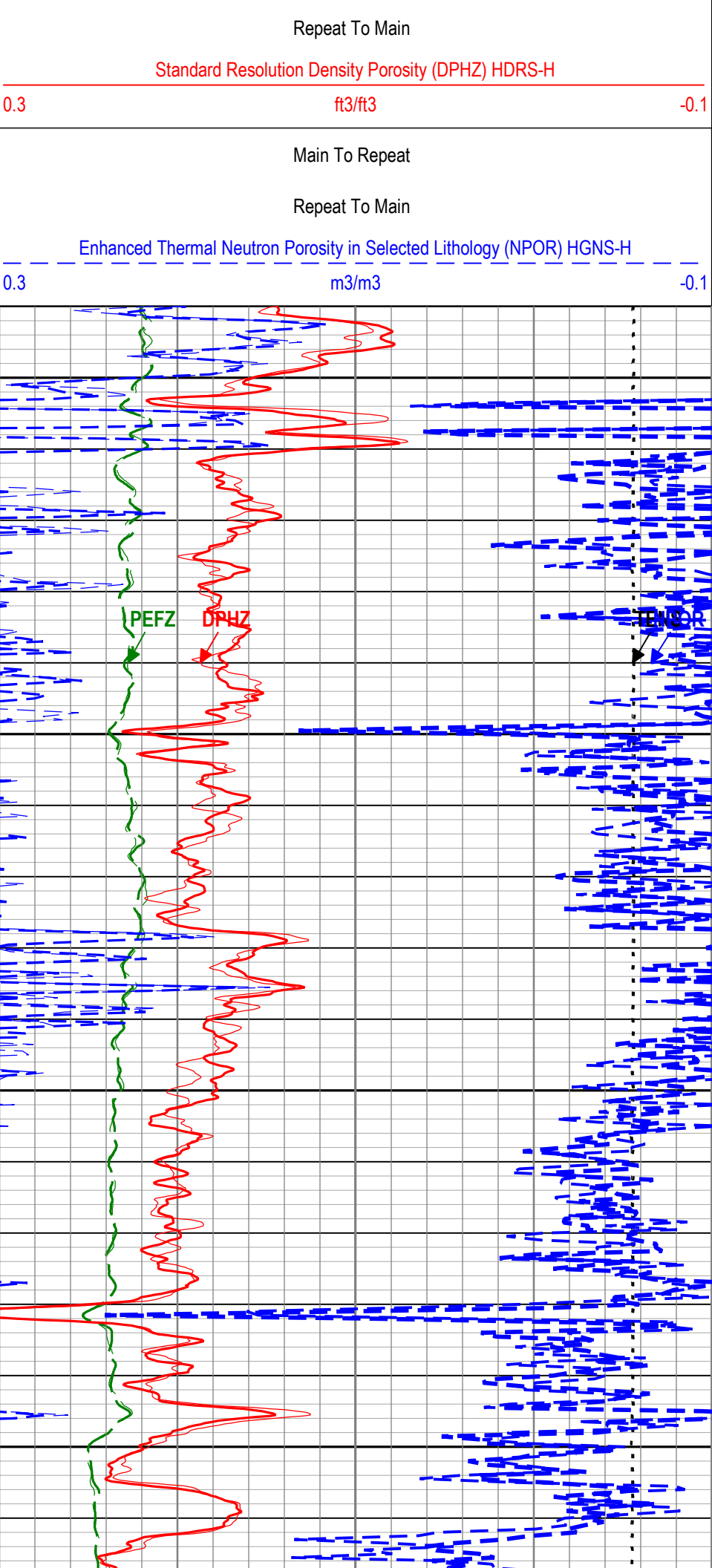
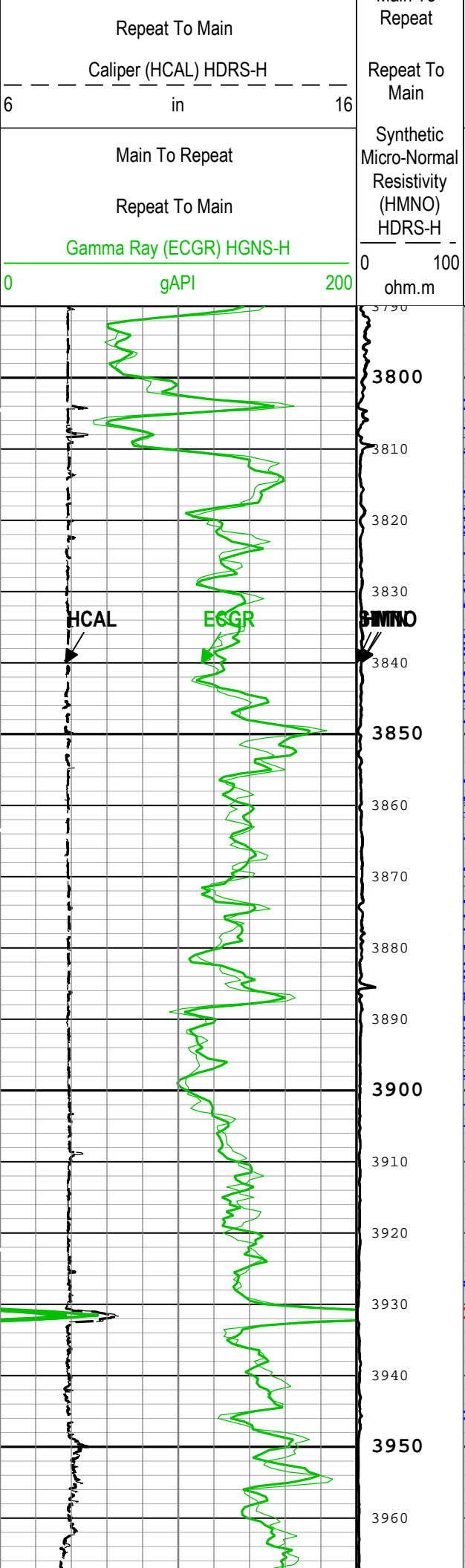
Index Unit: ft

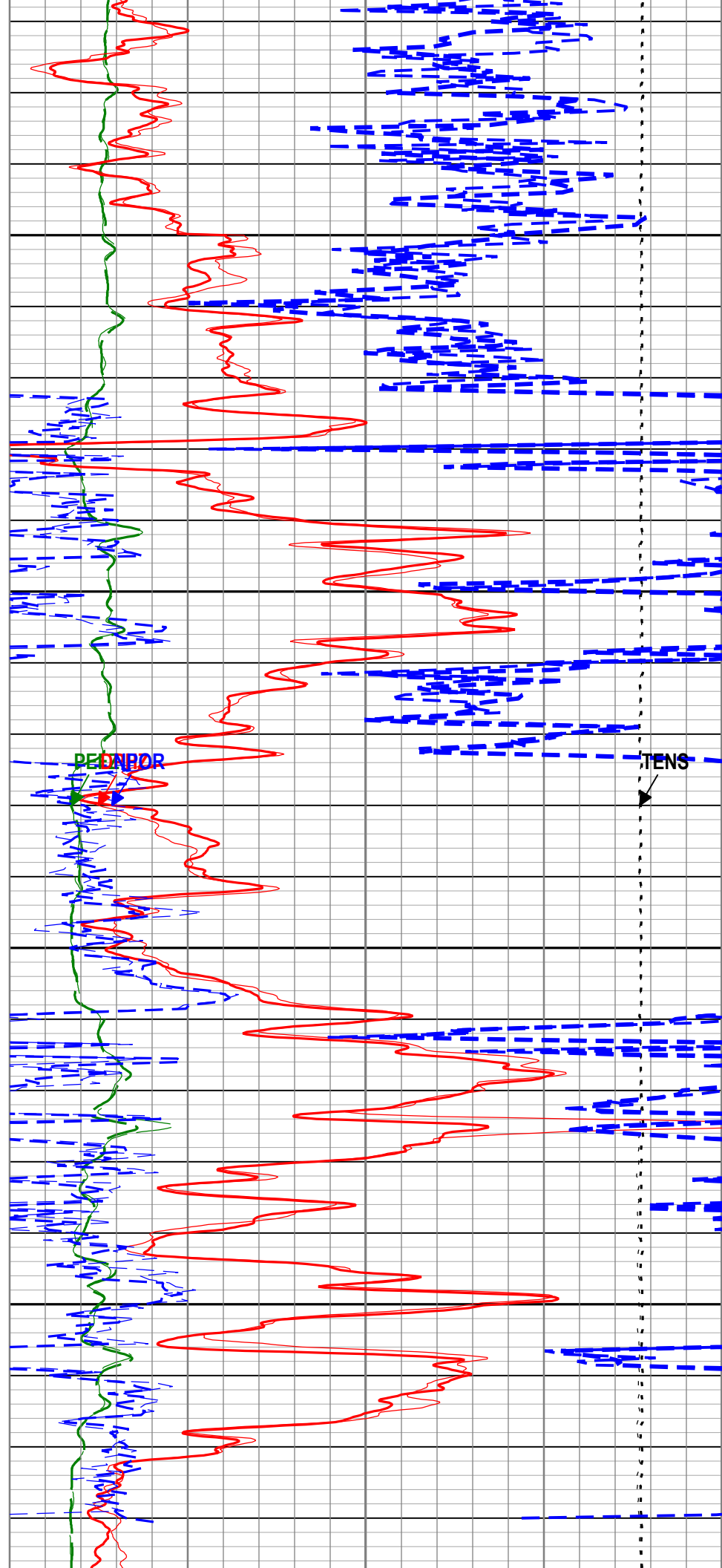
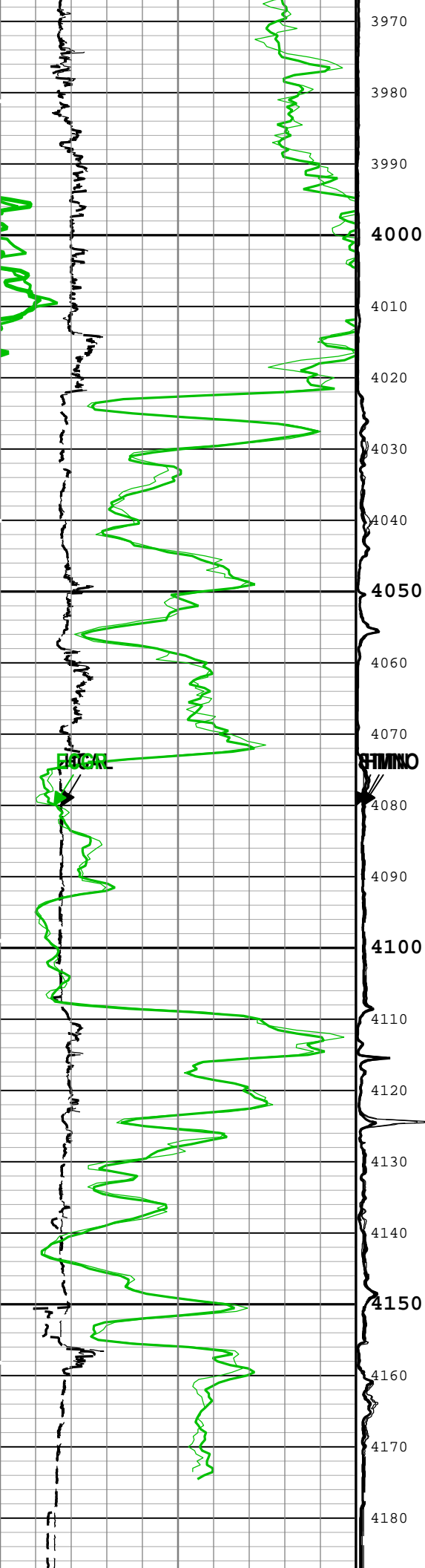
Index Type: Measured Depth

Creation Date: 04-Jan-2019 06:32:53

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 (EMD 5in Porosity RA)	Index Scale: 5 in per 100 ft	Index Unit: ft
Index Type: Measured Depth		Creation Date: 04-Jan-2019 06:32:53		

Company:	St. Croix Operating, Inc.	Schlumberger
Well:	Pronghorn #1	
Field:	Wildcat	
County:	Washington	
State:	Colorado	
Platform Express		
Compensated Neutron		
Litho-Density		