

Company: St. Croix Operating Inc.

Well: Jack Creek #2

Field: Wildcat

County: Washington State: Colorado

County: Washington
Field: Wildcat
Location: SESE Sec. 4, T2S, R51W
Well: Jack Creek #2
Company: St. Croix Operating Inc.

Platform Express
Compensated Neutron
Litho-Density

Location:	SESE Sec. 4, T2S, R51W	Elev.:	K.B.	4612.60 ft
	SHL: 900' FSL & 600' FEL		G.L.	4594.00 ft
	Lat/Long: 39.905070 / -103.089550		D.F.	4612.60 ft
	Permanent Datum:	Ground Level	Elev.:	4594.00 f
Log Measured From:		Kelly Bushing		18.60 ft
Drilling Measured From:		Kelly Bushing		above Perm.Datum
API Serial No.	Section:	Township:	Range:	
05-121-11079	4	2S	51W	

Logging Date	18-Dec-2018				
Run Number	ONE				
Depth Driller	4285.00 ft				
Schlumberger Depth	4285.00 ft				
Bottom Log Interval	4285.00 ft				
Top Log Interval	100.00 ft				
Casing Driller Size @ Depth	8.625 in @ 503.00 ft				
Casing Schlumberger	503.5 ft				
Bit Size	7.875 in				
Type Fluid In Hole	WBM				
Density	9.2 lbm/gal		55 s		
Fluid Loss	PH				
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		0.12 @ 118 0.09 @ 118		
Max Recorded Temperatures					
Circulation Stopped		Time		11:15:00	
Logger on Bottom		Time		14:53:00	
Unit Number	Location:		2161	Fort Morgan	
Recorded By	Ashley Rosacker				
Witnessed By	Phillip Wilcox				

Disclaimer

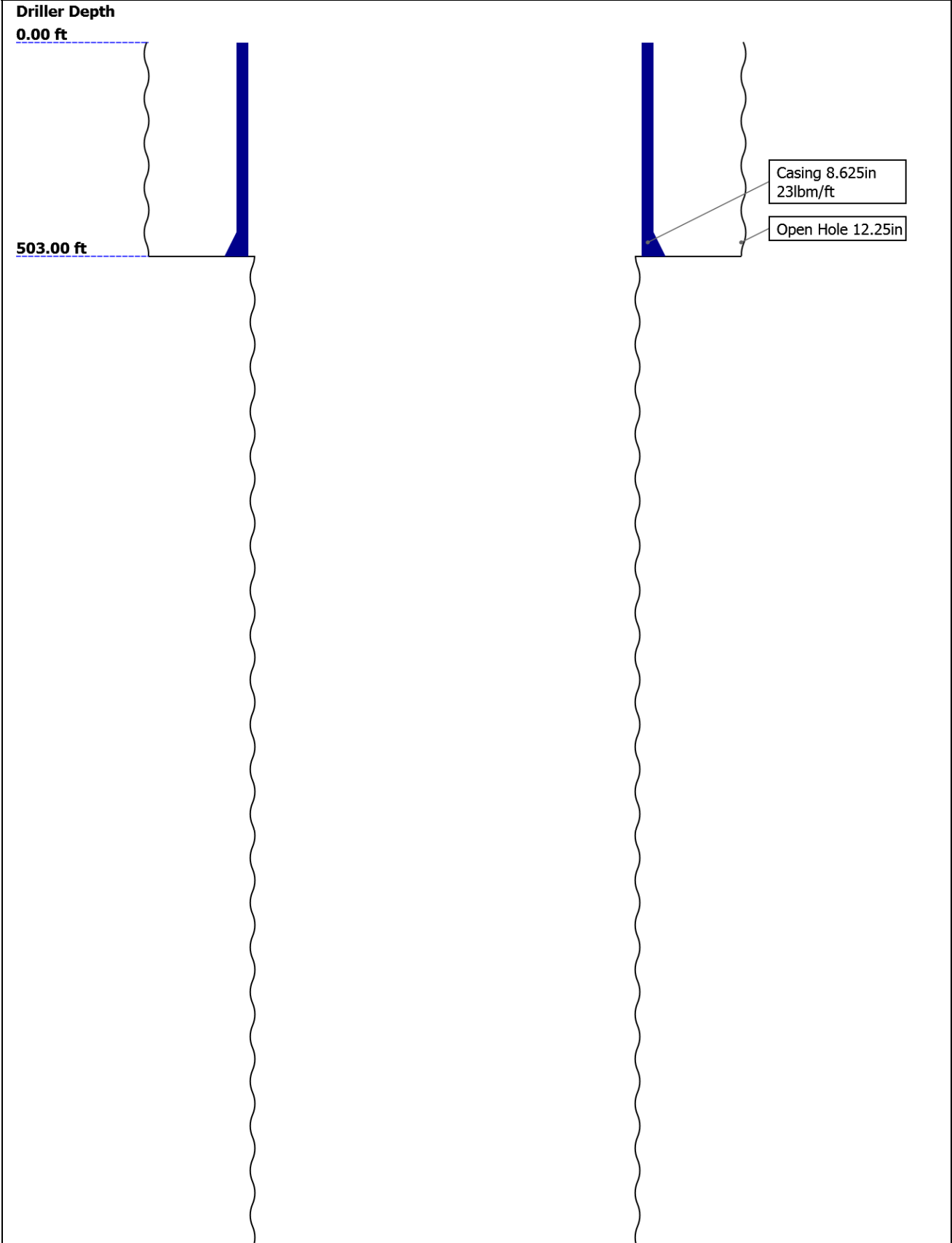
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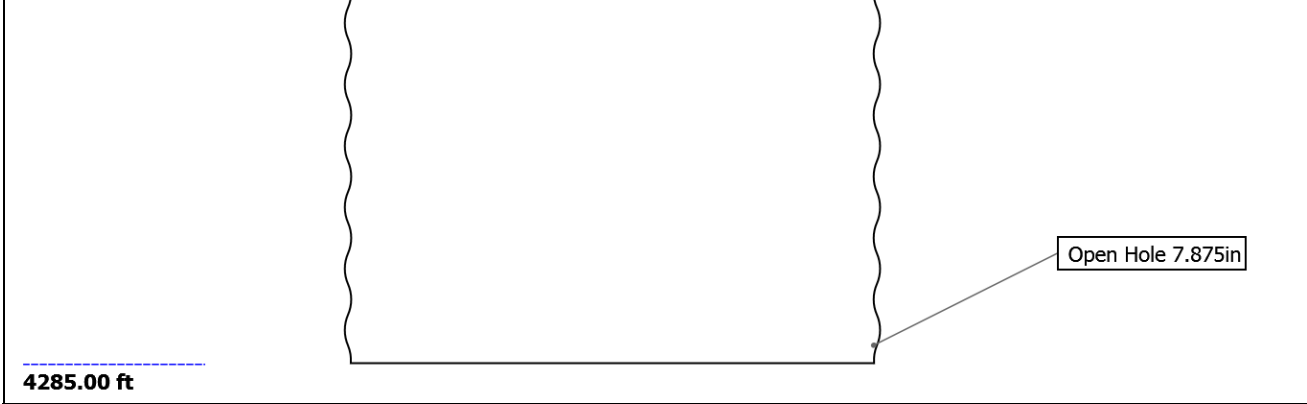
Contents

- 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 Composite Summary
 - 8.3 Log (Porosity-5)
 - 8.4 Parameter Listing
- 9. ONE 5" Density
 - 9.1 Integration Summary
 - 9.2 Composite Summary
 - 9.3 Log (Density-5)
 - 9.4 Parameter Listing

- 10. ONE 5" Porosity
 - 10.1 Composite Summary
 - 10.2 Log (Porosity-5 RA)
- 11. Calibration Report
- 12. Tail

Well Sketch




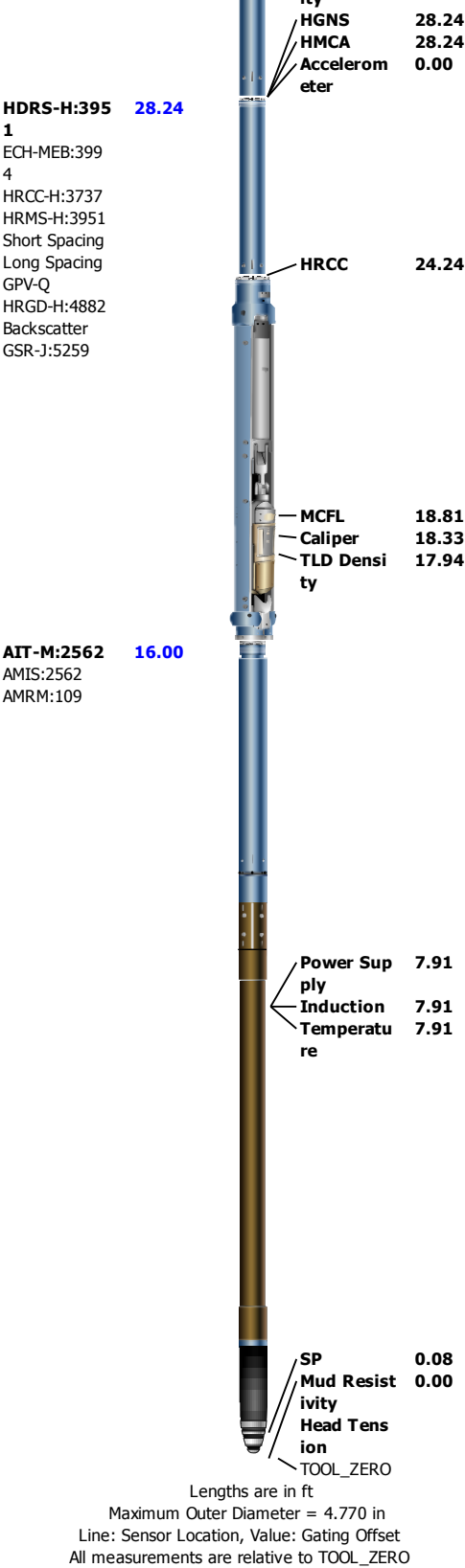


Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	12.25	7.875				
Top Driller (ft)	0	503				
Top Logger (ft)	0	503				
Bottom Driller (ft)	503	4285				
Bottom Logger (ft)	503	4285				
Casing						
Size (in)	8.625					
Weight (lbm/ft)	23					
Inner Diameter (in)	8.122					
Grade	X52					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	503					
Bottom Logger (ft)	503.5					

Remarks and Equipment Summary

ONE: Toolstring				ONE: Remarks	
Equip name LEH-QT:3076	Length 47.64	MP name	Offset	Thank you for choosing Schlumberger!	
				This is the first log in the well.	
				Toolstring run as per toolsketch and client logging program.	
				Requested to run the tool slick with no bowspring or standoffs.	
				Matrix: Sandstone - 2.65 from TD to 4050 Limestone - 2.71 from 4050 to CS.	
				BHT: 118 degF	
				TD: 4282.5 ft Casing Shoe: 503.5 ft	
EDTC-B:9038	44.15	CTEM	40.65		
EDTH-B:9046		ACCZ	0.00		
EDTG-B:7921		HV	0.00		
EDTC-B:9038		Gamma Ray	38.78		
		TelStatus	37.65		
		Temperature	37.62		
		GR	36.91		
HGNS-H:3730	37.65				
HGNH:2742					
NPV-N					
NSR-F:5068					
HMCA-H					
HGNS-H:3730					
HACCZ-H:1537					
		CNL Porosity	30.57		



Depth Summary

ONE

Depth Measuring Device

Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		

Wheel Correction 20

Tension Device

Type

Serial Number

Calibration Date

Calibrator Serial Number

Number of Calibration Points

CMTD-B/A

0

Logging Cable

Type

Serial Number

Length

Conveyance Type

Rig Type

7-46A-XS

24000.00 ft

Wireline

Land

ONE:Depth Control Parameters

Log Sequence

Rig Up Length At Surface

Rig Up Length At Bottom

Rig Up Length Correction

Stretch Correction

Tool Zero Check At Surface

First Log In the Well

Depth Control Remarks

All Schlumberger depth control policies followed.

IDW used as primary depth reference.

Z-Chart used as secondary depth reference.

ONE

5" Porosity

Pass Summary

Run Name

Pass Objective

Direction

Top

Bottom

Start

Stop

DSC Mode

Depth Shift

Include Parallel Data

ONE

Log[3]:Up

Up

43.65 ft

4299.46 ft

18-Dec-2018 3:06:10 PM

18-Dec-2018 4:27:30 PM

ON

0.00 ft

No

All depths are referenced to toolstring zero

Log

Company:St. Croix Operating Inc.

Well:Jack Creek #2

ONE: Log[3]:Up:S005

Description: HGNS standard resolution porosities for Platform Express

Format: Log (Porosity-5)

Index Scale: 5 in per 100 ft

Index Unit: ft

Index Type:

Measured Depth

Creation Date: 18-Dec-2018 16:39:32

Channel

Source

Sampling

CALI

HDRS-H:HRCC-H:HRCC-H

1in

DPHZ

HDRS-H:HRMS-H:HRGD-H

2in

GR

EDTC-B:EDTC-B:EDTC-B

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

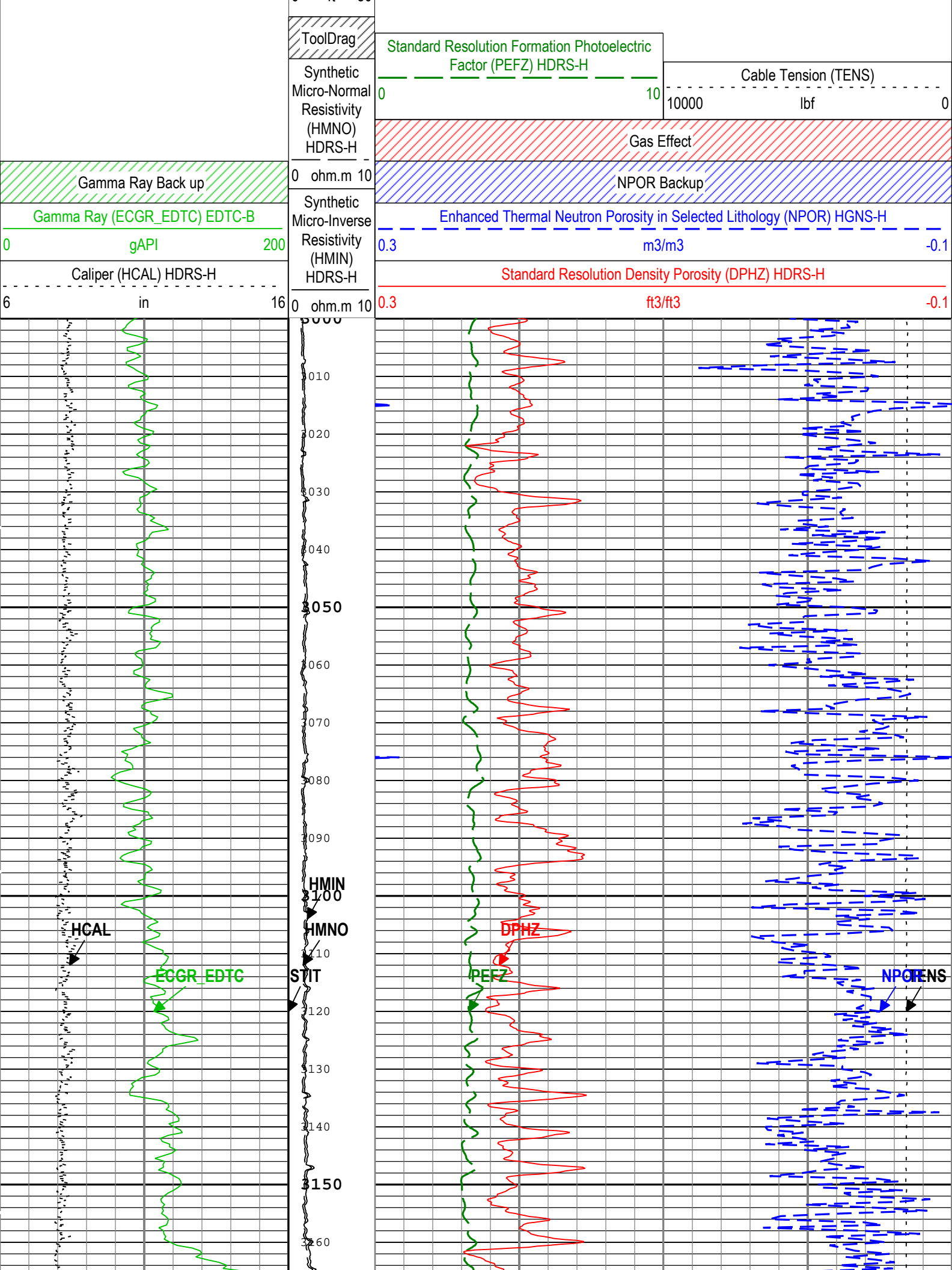
WLWorkflow

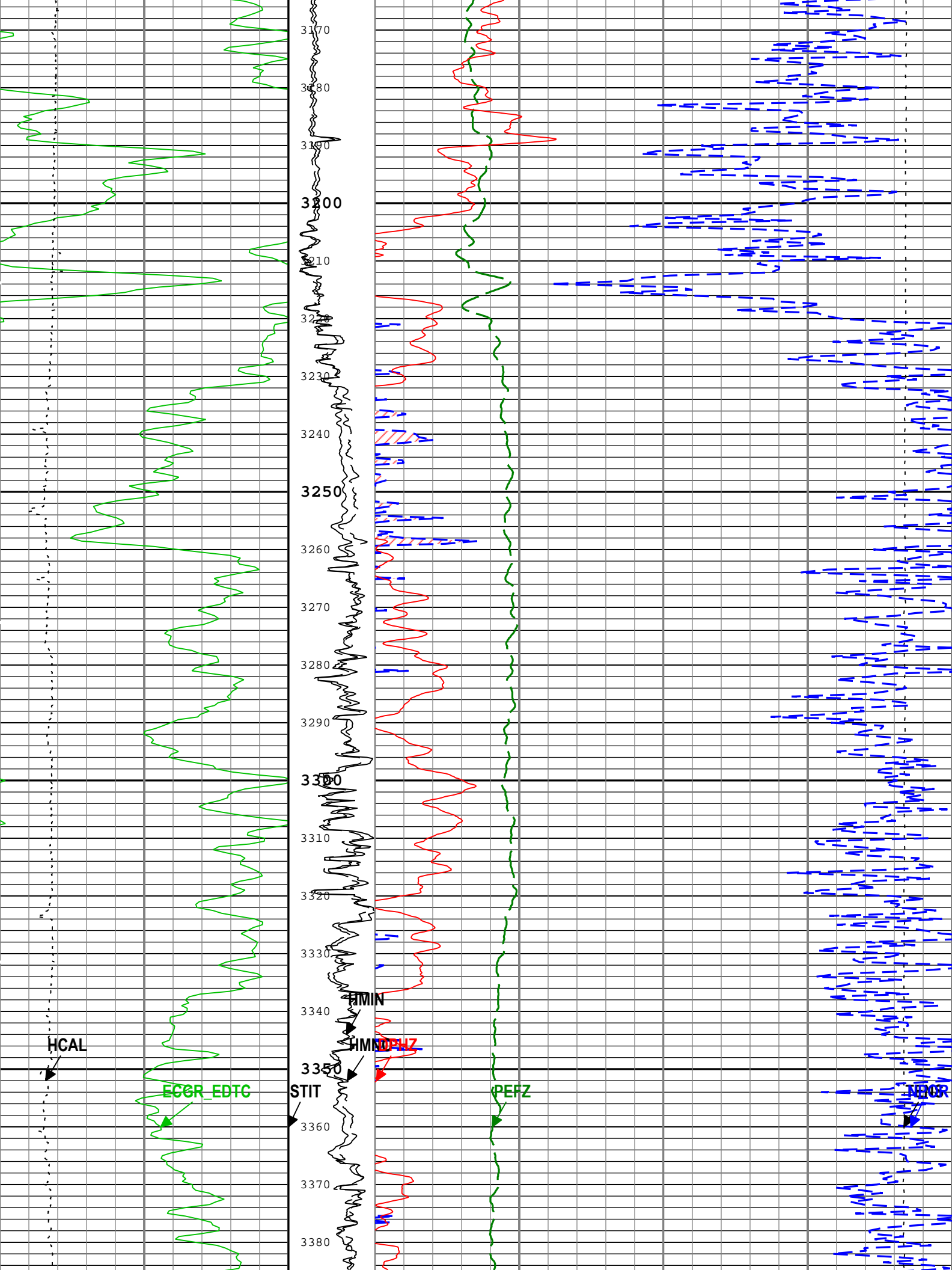
0.1in

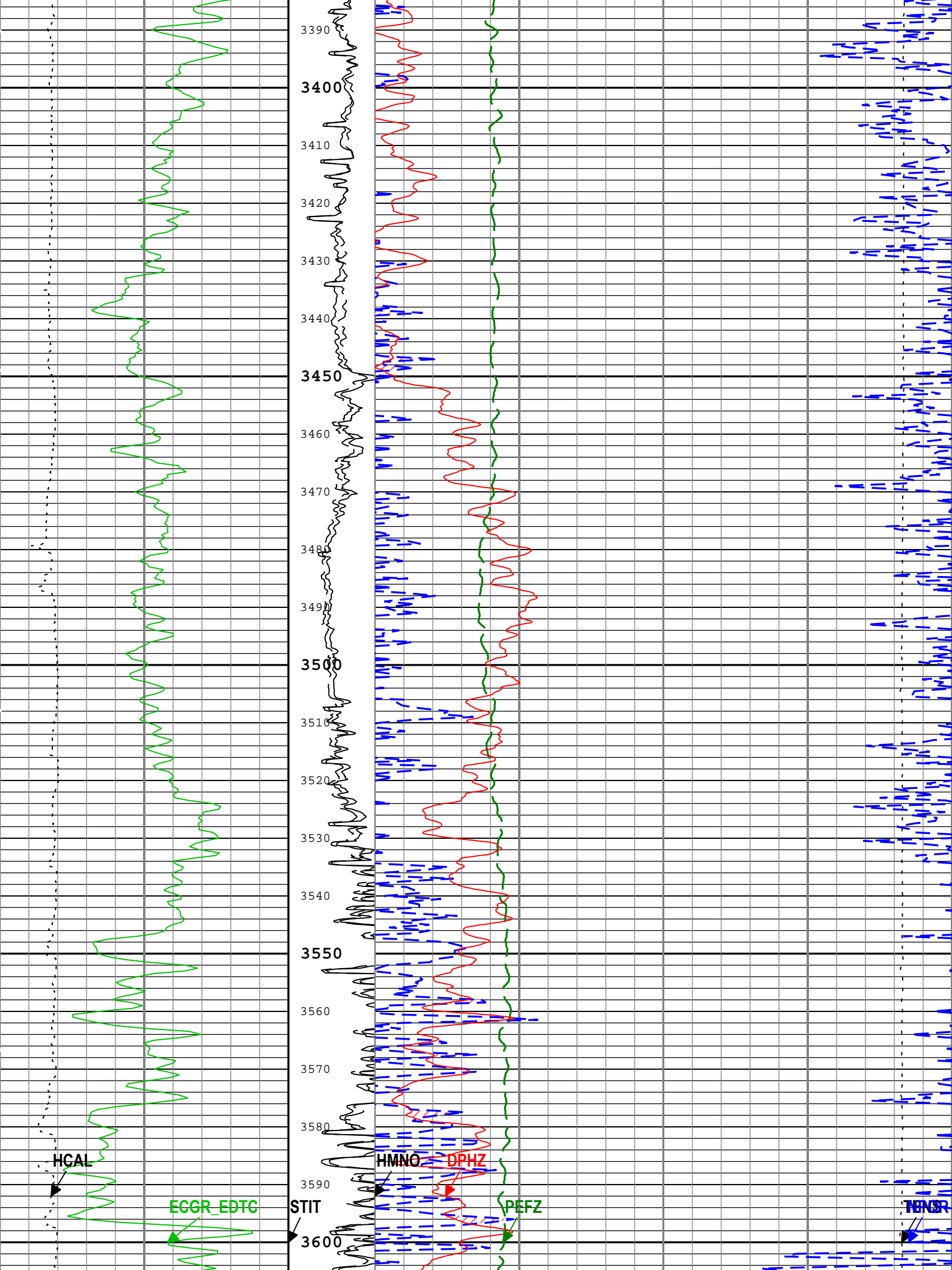
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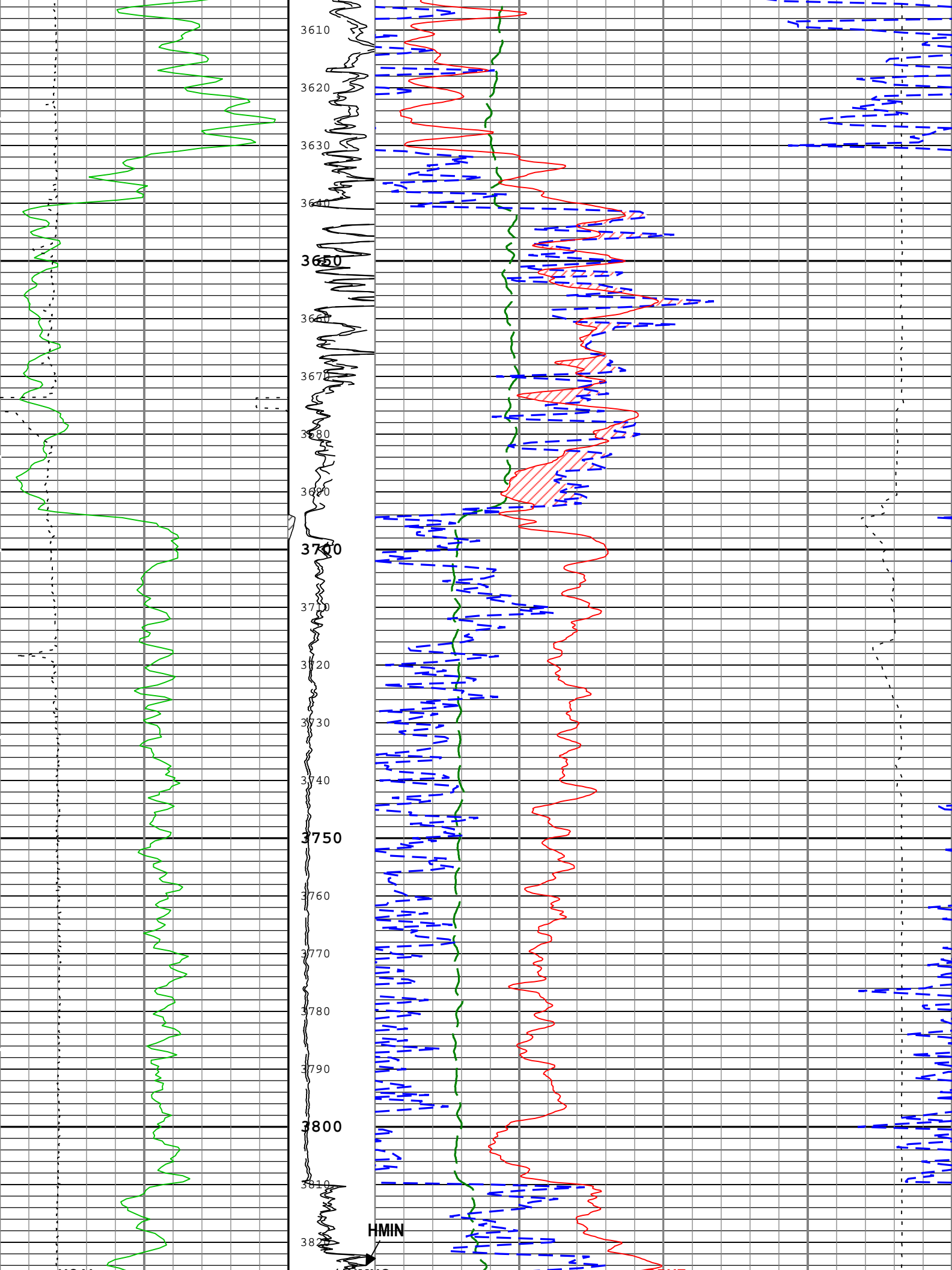
Stuck Tool Indicator, Total (STIT)

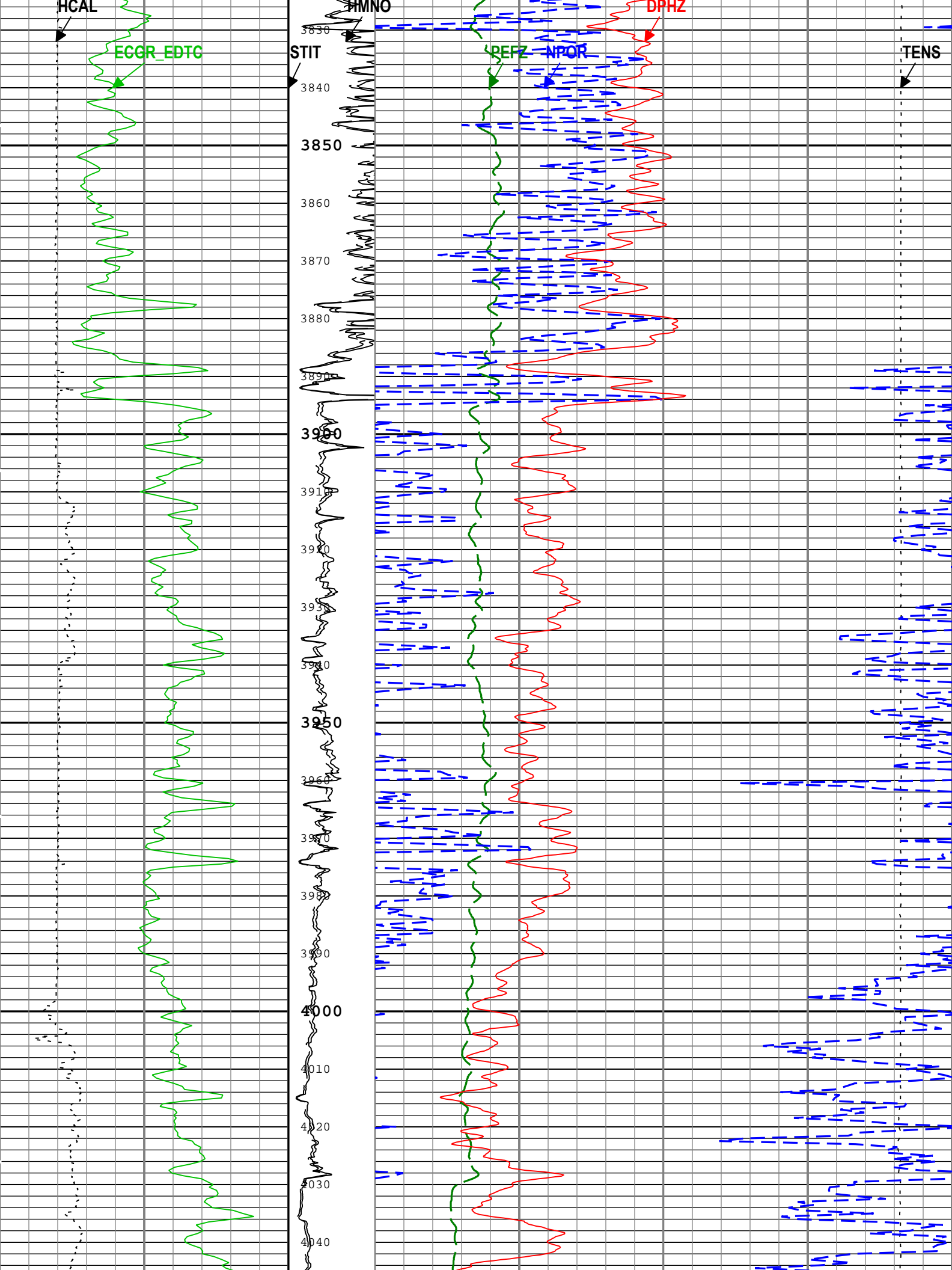
0ft50

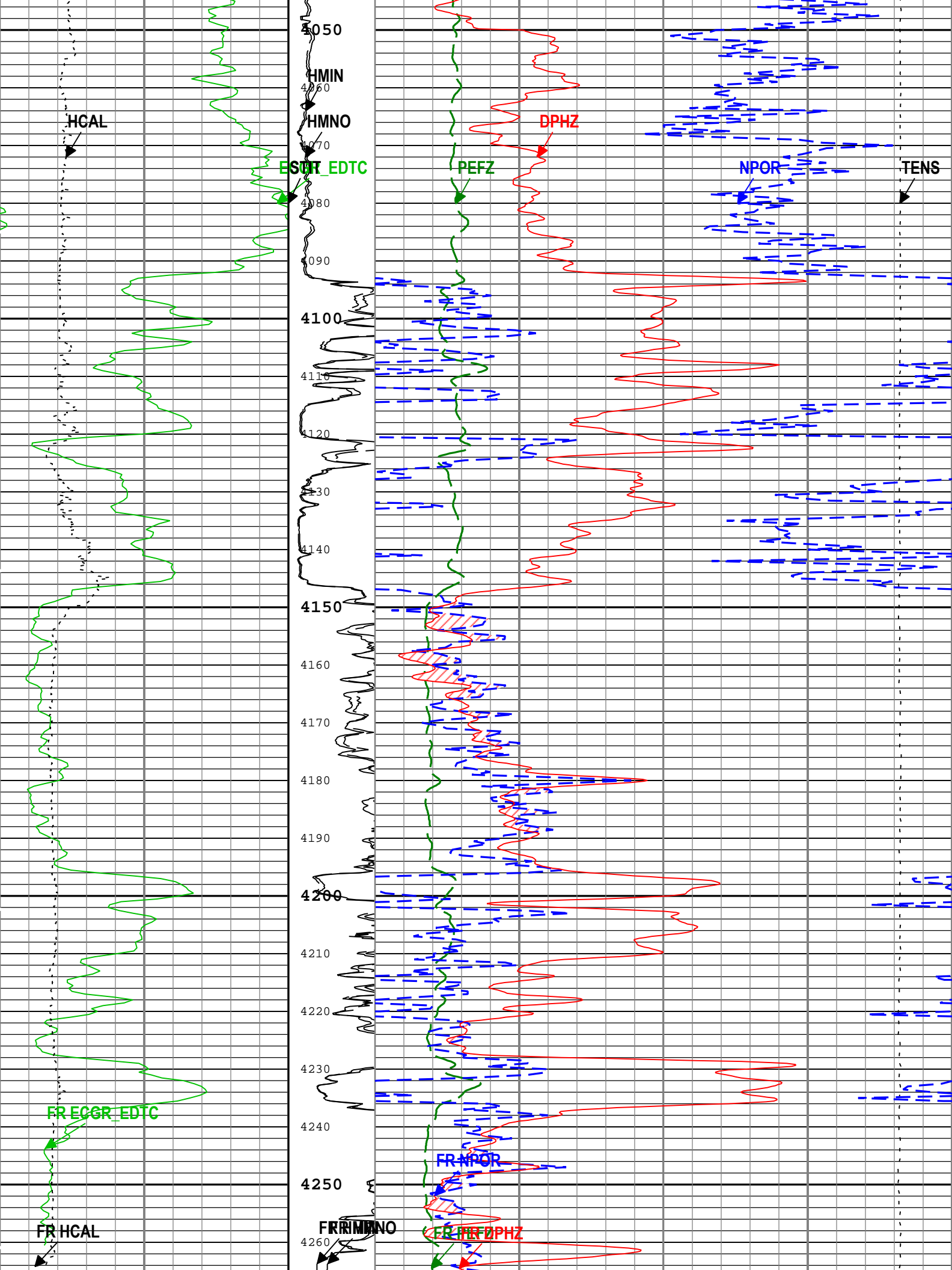


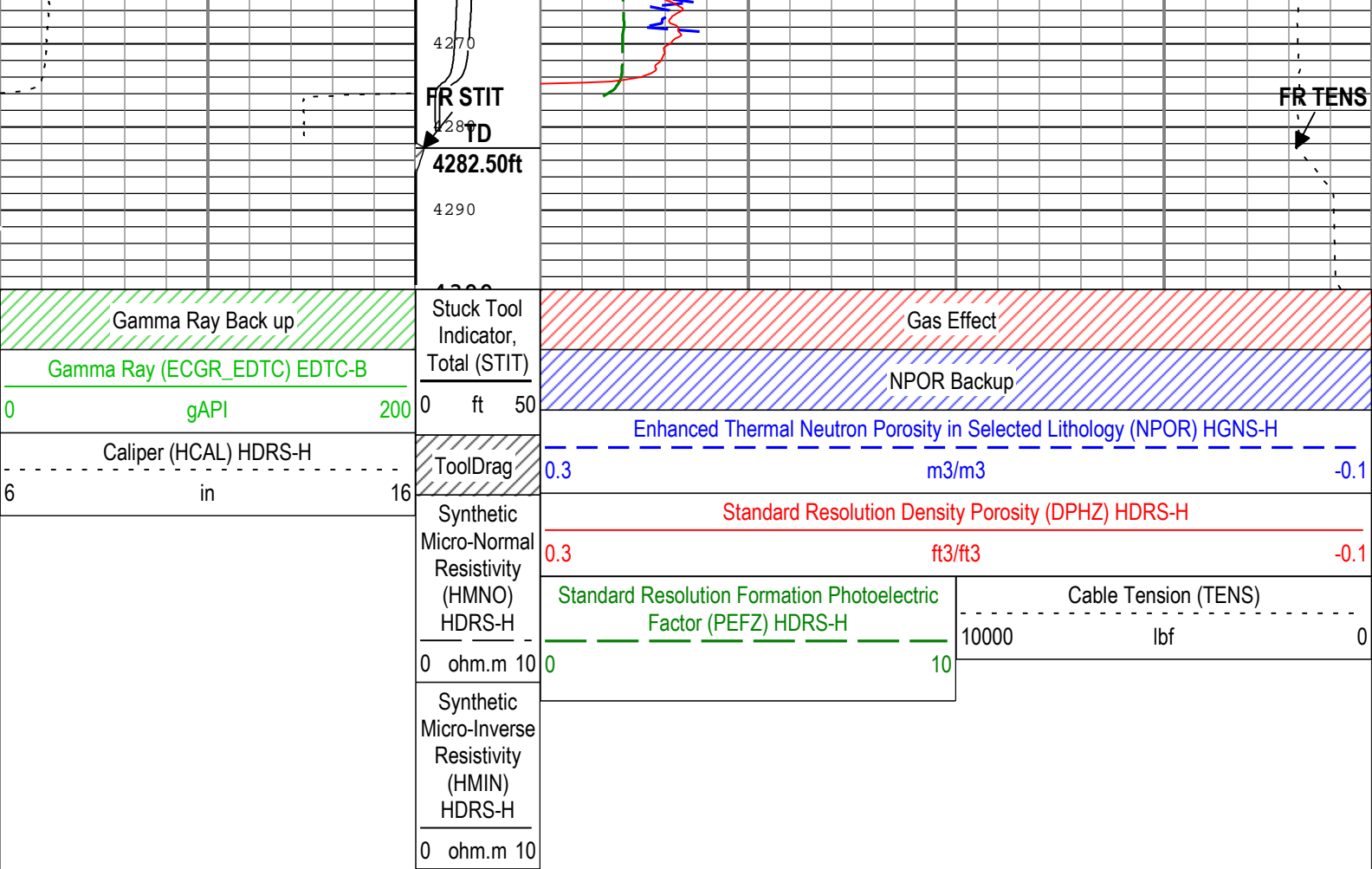












TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log (Porosity-5) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 18-Dec-2018 16:39:32

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	
BHT	Bottom Hole Temperature	Borehole	118	degF
BS	Bit Size	WLSESSION	7.875	in
BSAL	Borehole Salinity	Borehole	400	ppm
BSCO	Borehole Salinity Correction Option	HGNS-H	Yes	
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.516	in
CBLO	Casing Bottom (Logger)	WLSESSION	503.5	ft
CDEN	Cement Density	EDTC-B	2	g/cm3
DFD	Drilling Fluid Density	Borehole	9.2	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DFT_WATER	Drilling Fluid Water Type	Borehole	WBM	
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
MWCO	Mud Weight Correction Option	HGNS-H	Yes	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	0.15	ohm.m
TD	Total Measured Depth	Borehole	4282.5	ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
MATR	LIMESTONE	3000	4050
MATR	SANDSTONE	4050	4299.5
MDEN	2.71	3000	4050
MDEN	2.65	4050	4299.5

All depth are actual.

Tool Control Parameters

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
NPUC	Nuclear Pile-Up Correction	HDRS-H	On	

ONE

5" Density

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[3]:Up	Up	43.65 ft	4299.46 ft	18-Dec-2018 3:06:10 PM	18-Dec-2018 4:27:30 PM	ON	0.00 ft	No

All depths are referenced to toolstring zero

Log	Company:St. Croix Operating Inc. Well:Jack Creek #2 ONE: Log[3]:Up:S005
-----	---

Description: HGNS standard resolution porosities for Platform Express Format: Log (Density-5) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 18-Dec-2018 16:39:34

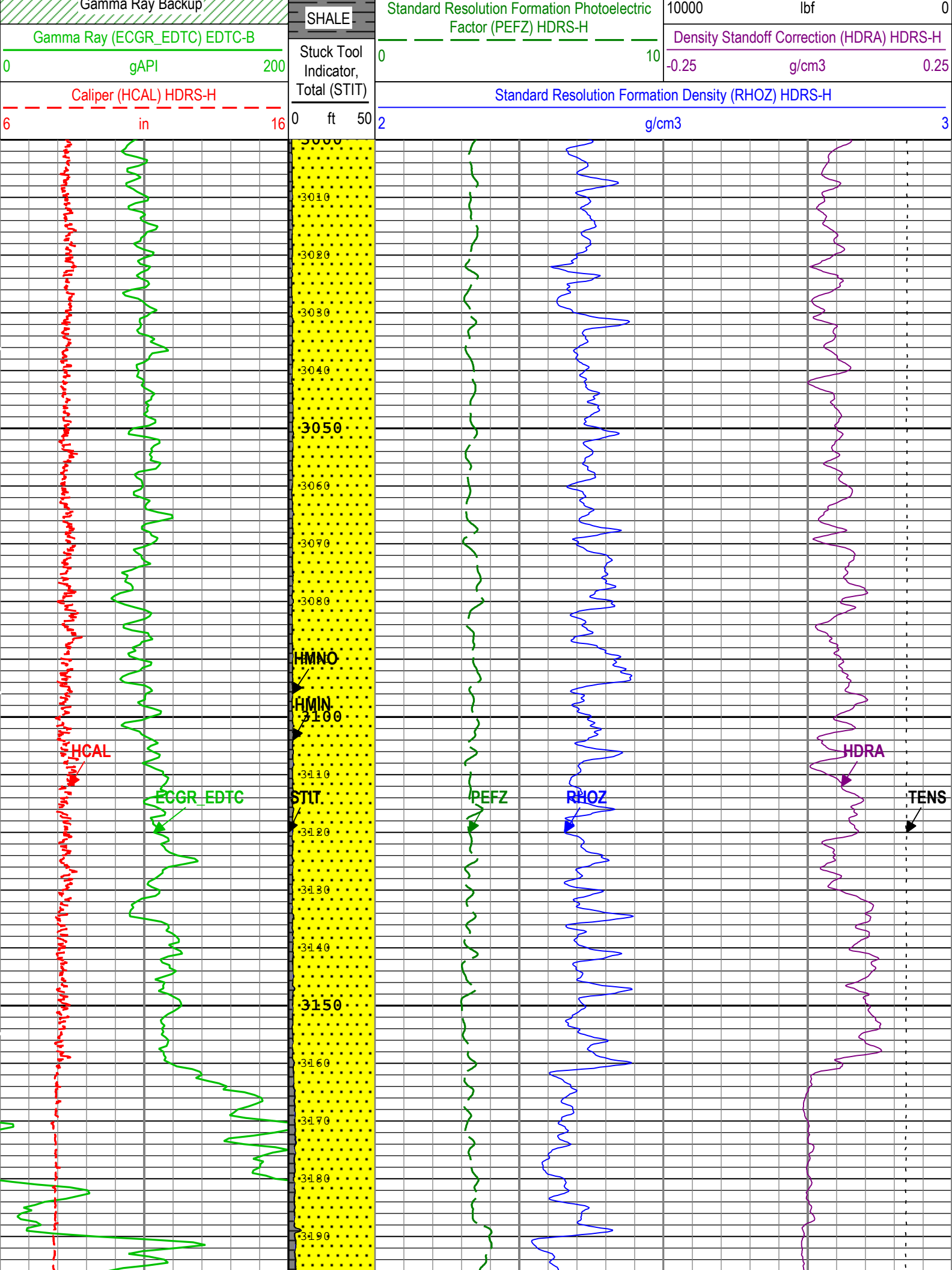
Channel	Source	Sampling
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR	EDTC-B:EDTC-B:EDTC-B	6in
HDRA	HDRS-H:HRMS-H:HRGD-H	2in
PEFZ	HDRS-H:HRMS-H:HRGD-H	2in
RHOZ	HDRS-H:HRMS-H:HRGD-H	2in
SMIN	HDRS-H:HRMS-H:HRGD-H	2in
SMNO	HDRS-H:HRMS-H:HRGD-H	2in
STIT	DepthCorrection	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

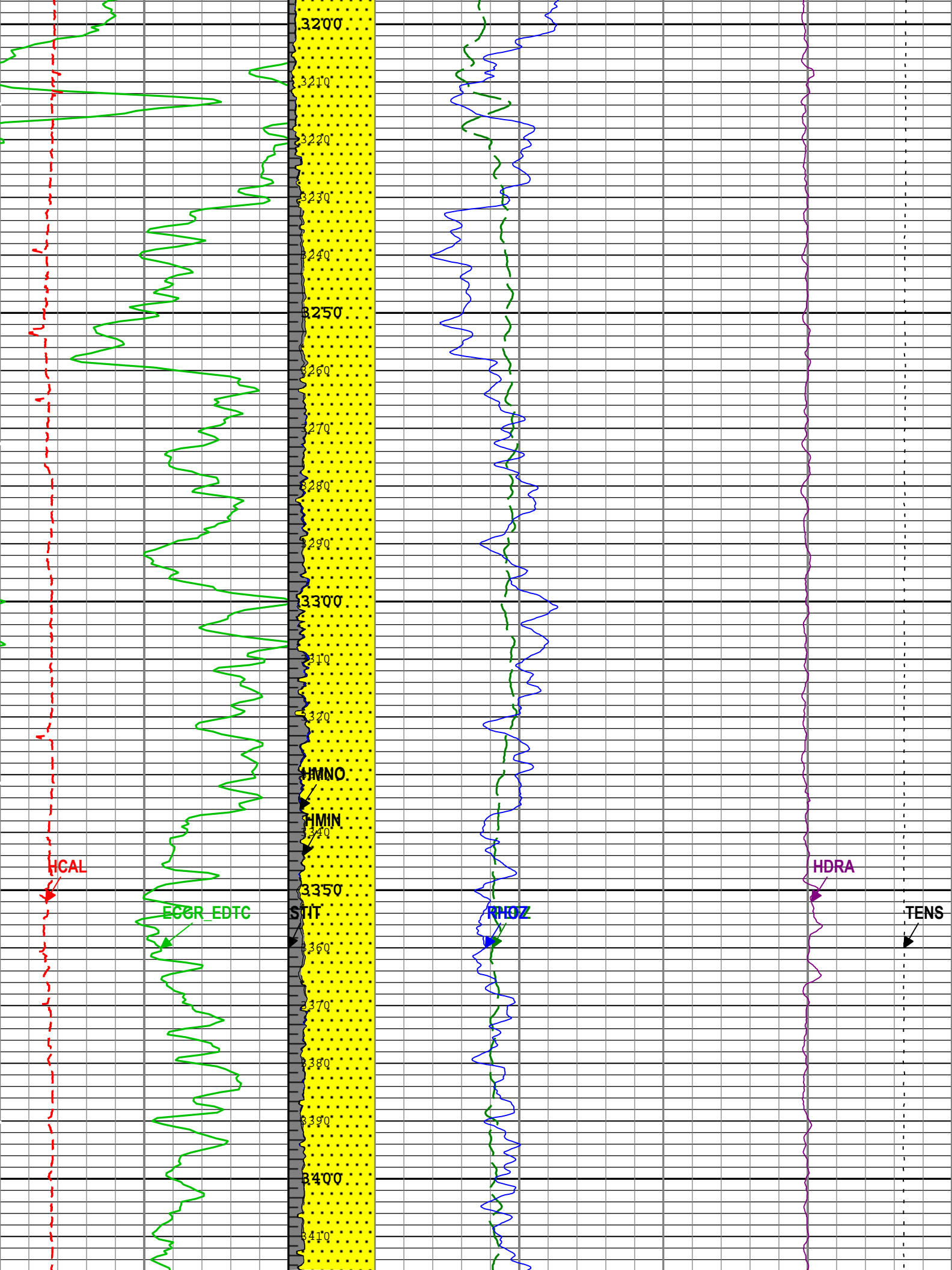
TIME_1900 - Time Marked every 60.00 (s)

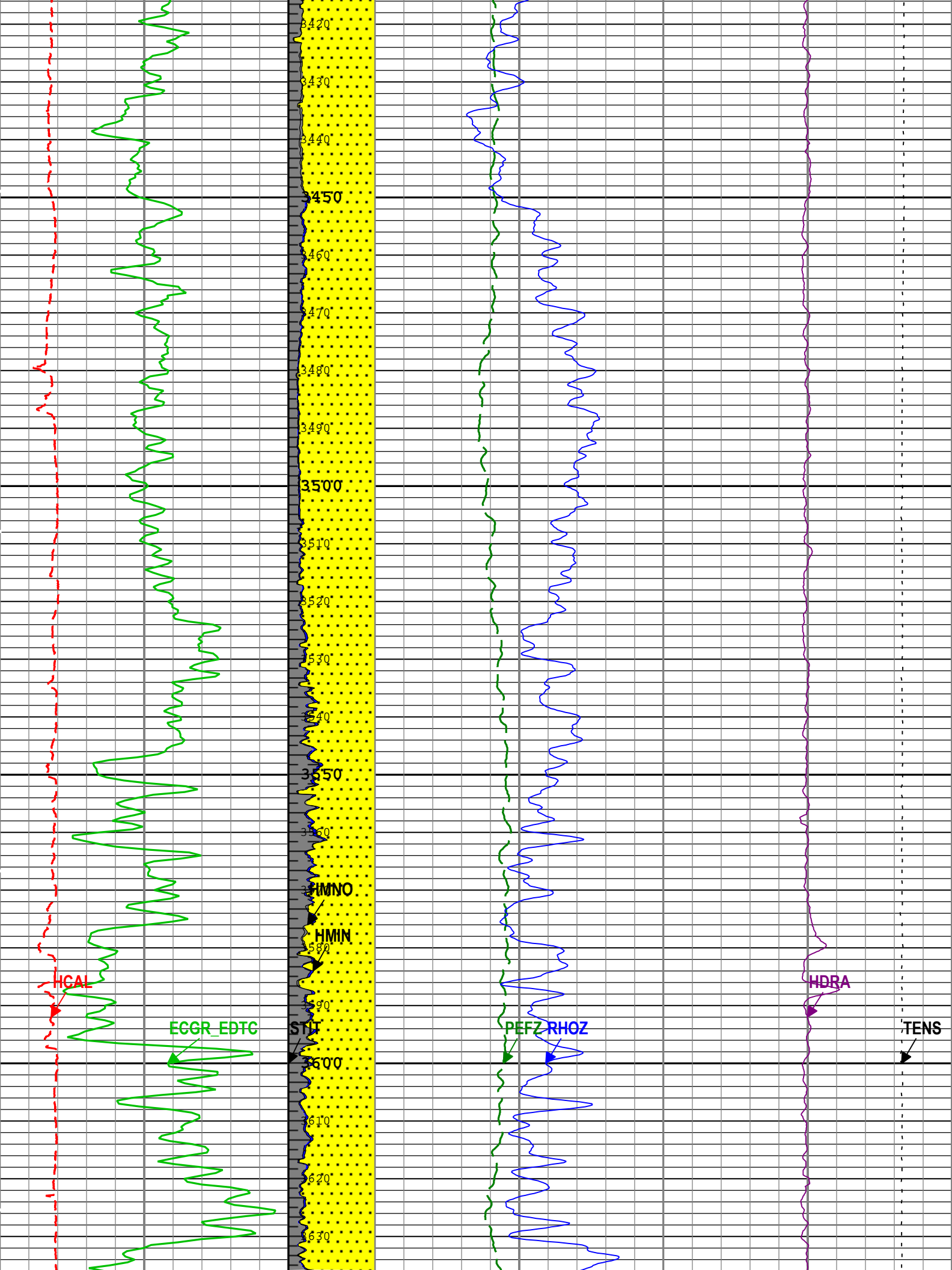
LIME

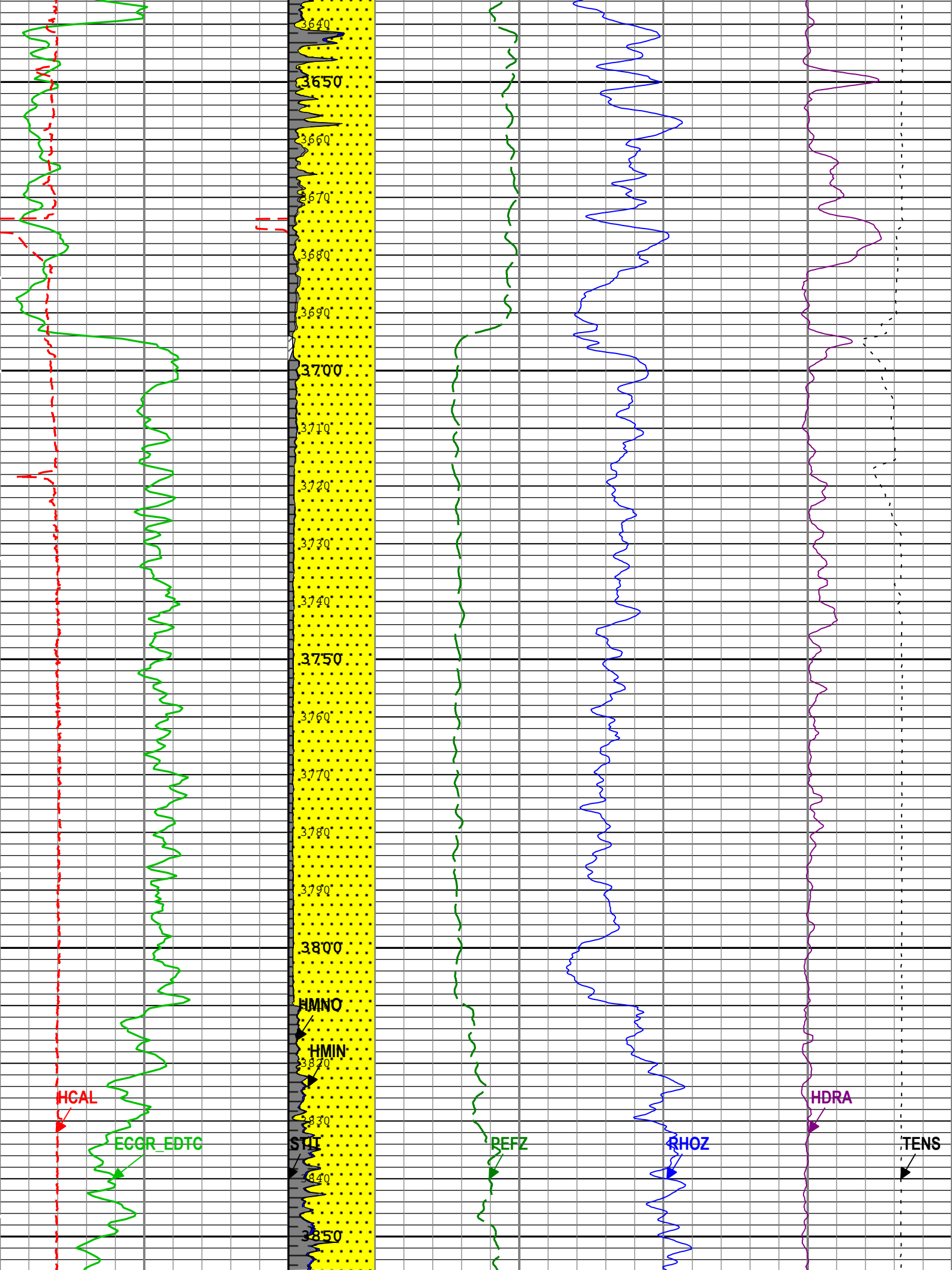
SAND

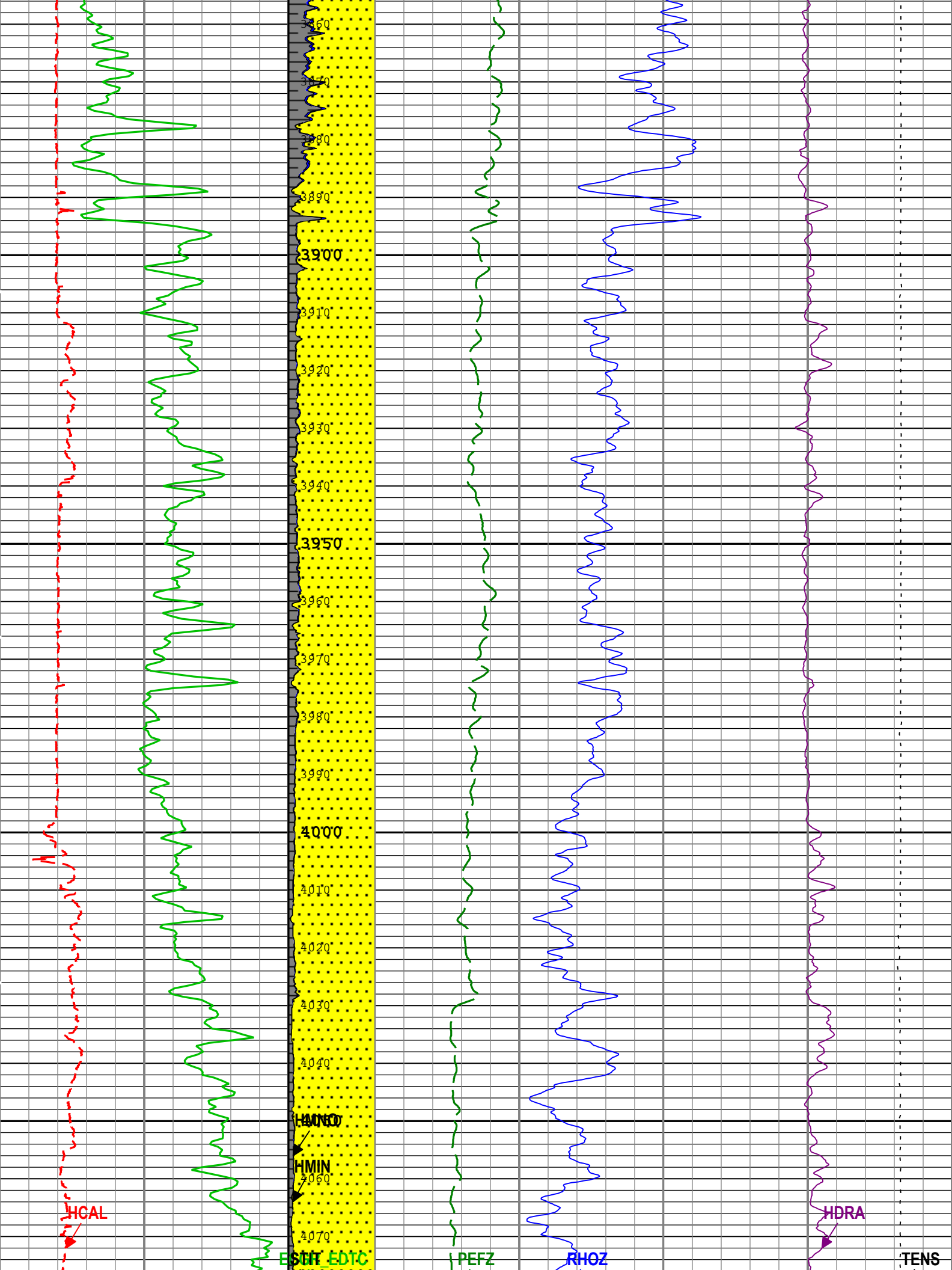
Cable Tension (TENS)

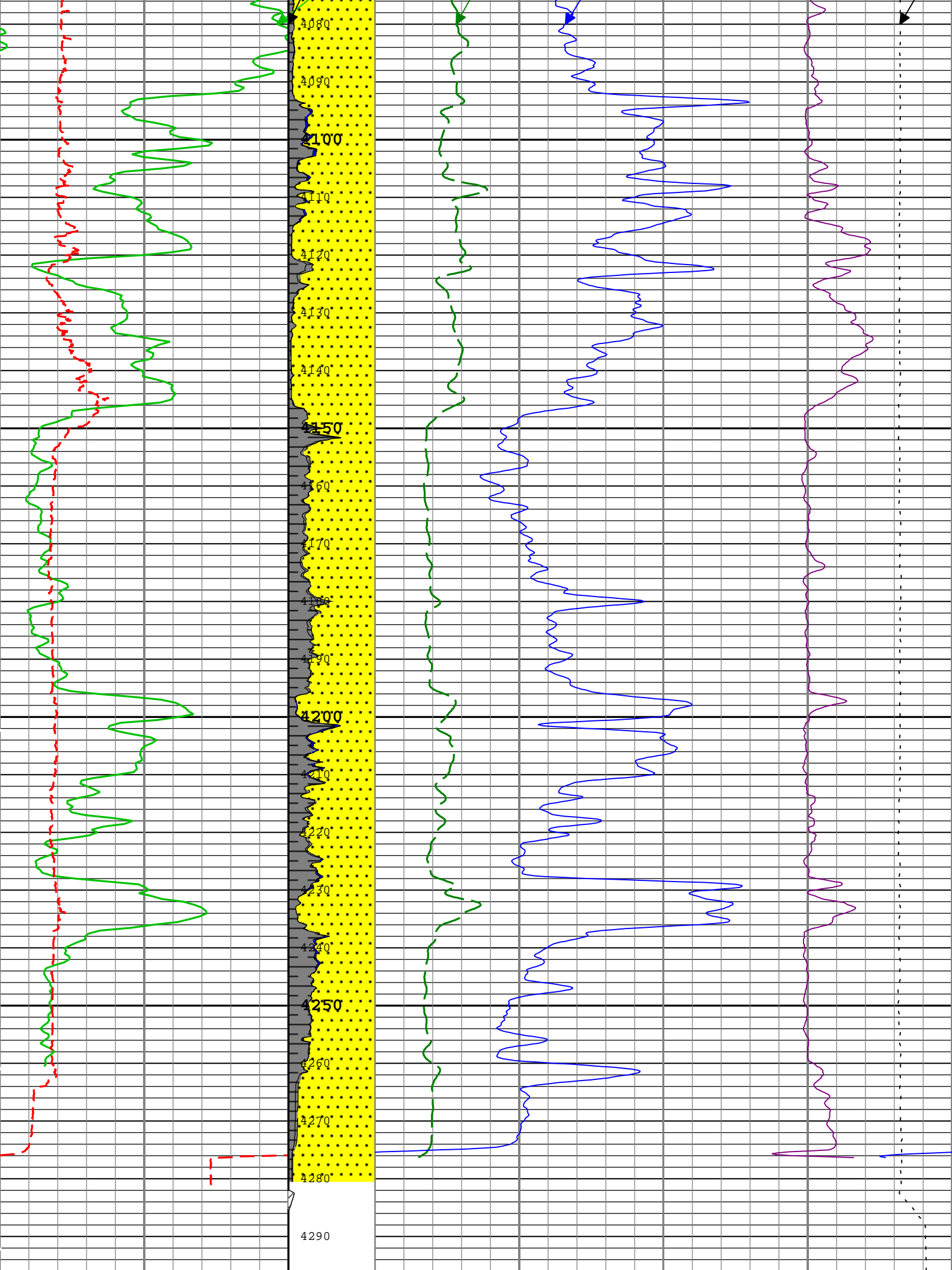






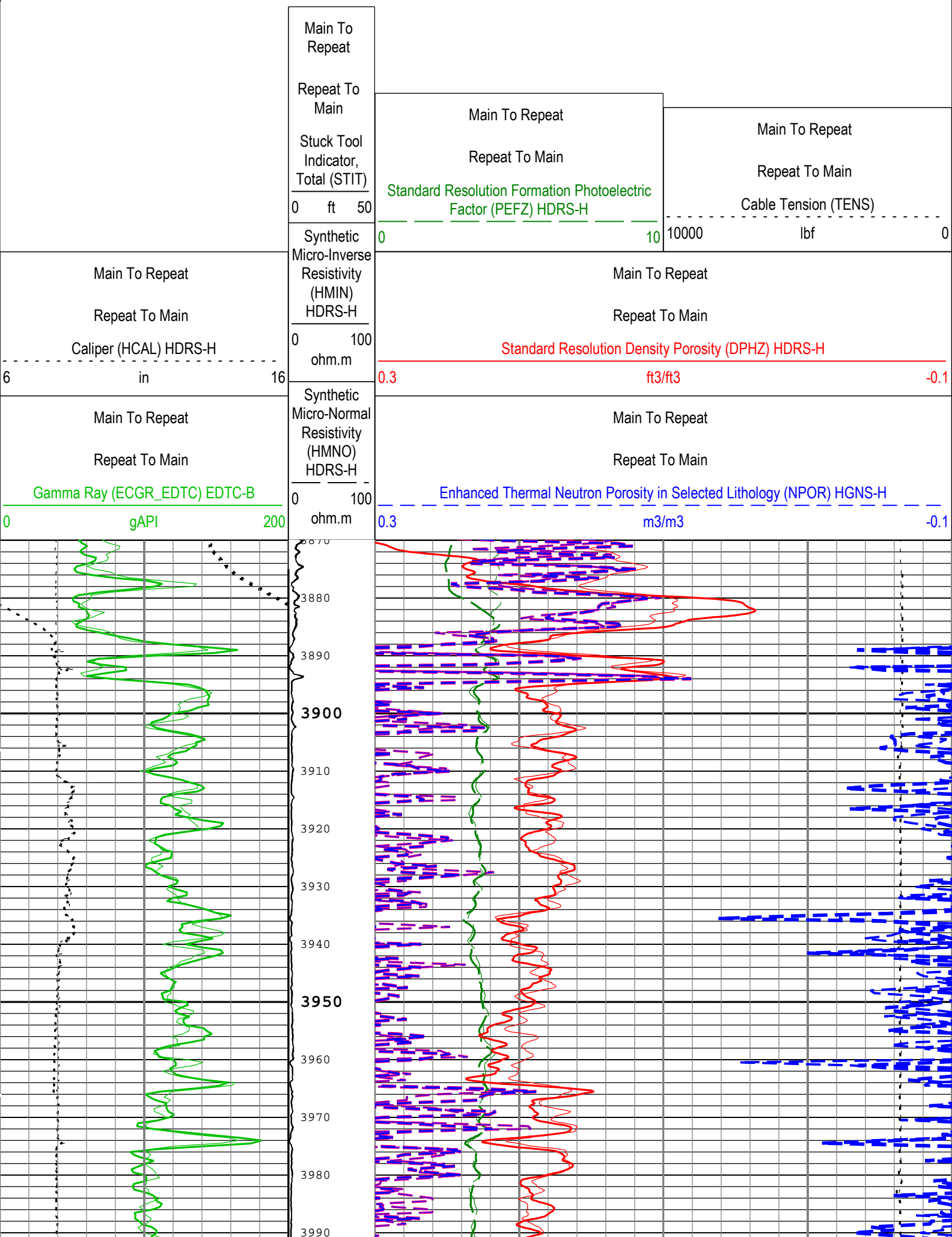


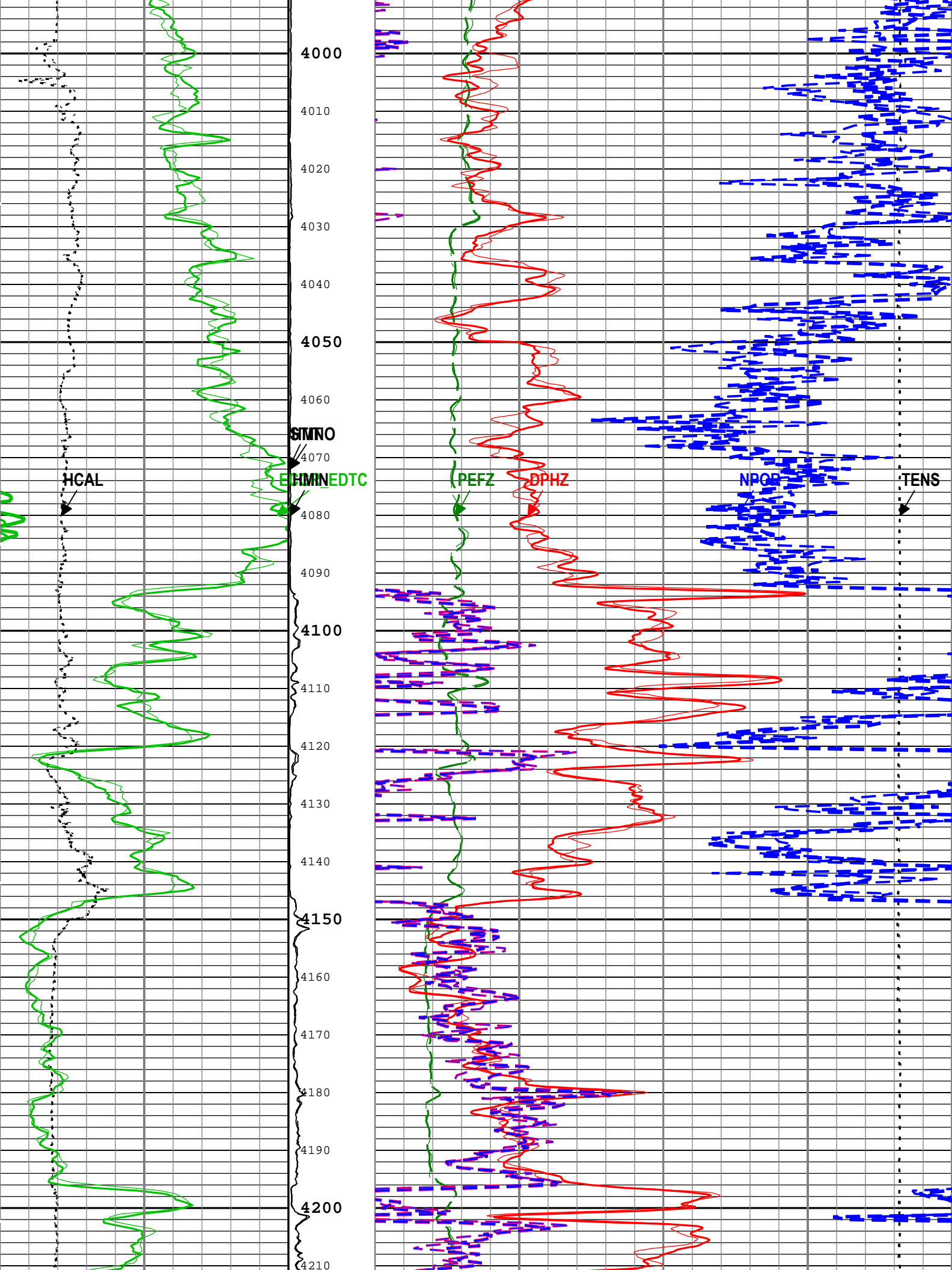


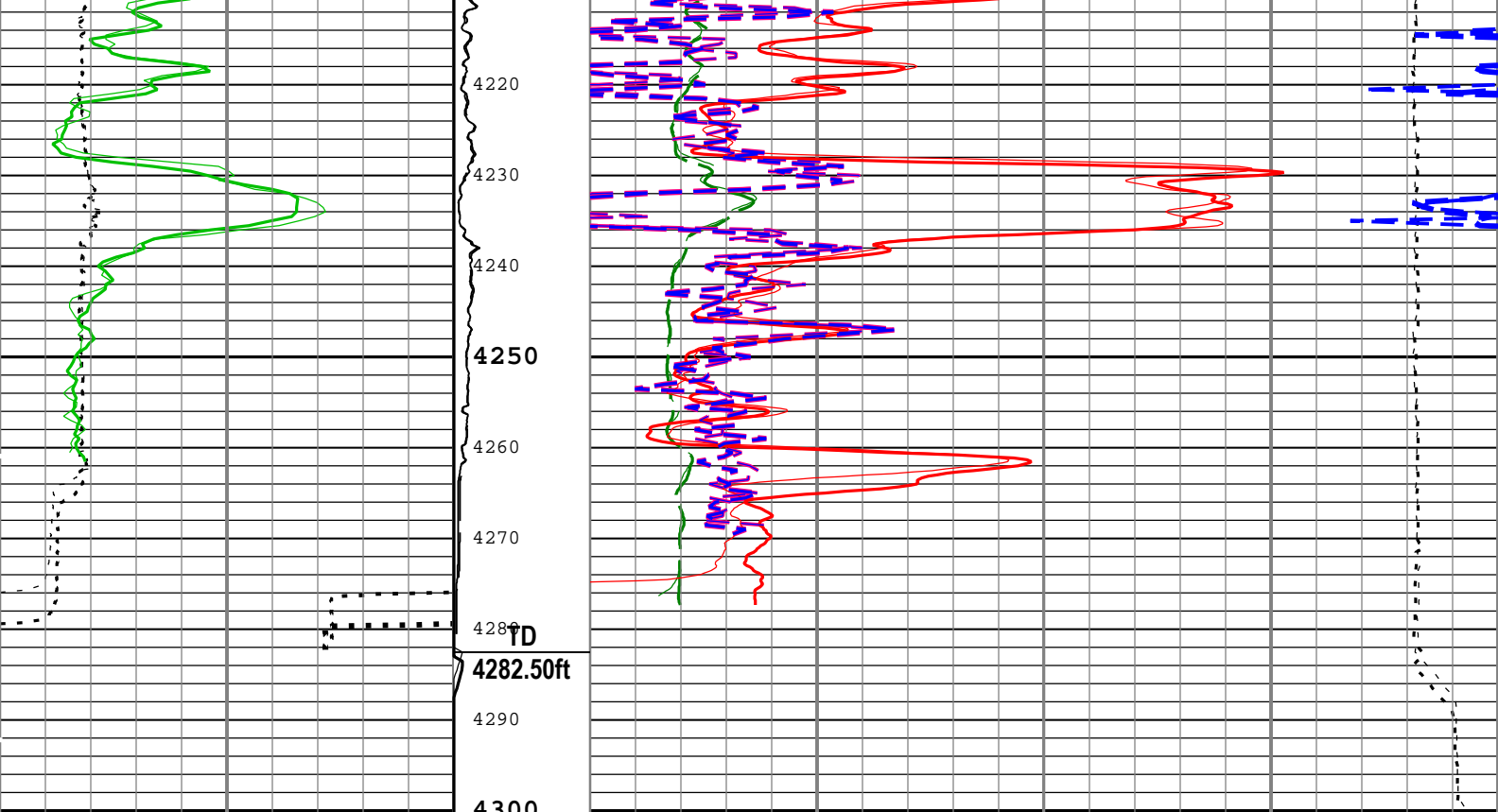


Description: HGNS standard resolution porosities for Platform Express Format: Log (Porosity-5 RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 18 Dec 2018 16:39:37

TIME_1900 - Time Marked every 60.00 (s)







Main To Repeat Repeat To Main Caliper (HCAL) 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 (ECGR_EDTC) EDTC-B 0 gAPI 200		Main To Repeat Repeat To Main Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H 0.3 m3/m3 -0.1	
Main To Repeat Repeat To Main Synthetic Micro-Inverse Resistivity (HMIN) HDRS-H 0 100 ohm.m		Main To Repeat Repeat To Main Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H 0 10	
Main To Repeat Repeat To Main Synthetic Micro-Normal Resistivity (HMNO) HDRS-H 0 100 ohm.m		Main To Repeat Repeat To Main Cable Tension (TENS) 10000 lbf 0	

TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log (Porosity-5 RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 18-Dec-2018 16:39:37

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	

BHT	Bottom Hole Temperature	Borehole	118	degF
BS	Bit Size	WLSESSION	7.875	in
BSAL	Borehole Salinity	Borehole	400	ppm
BSCO	Borehole Salinity Correction Option	HGNS-H	Yes	
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.516	in
CBLO	Casing Bottom (Logger)	WLSESSION	503.5	ft
CDEN	Cement Density	EDTC-B	2	g/cm3
DFD	Drilling Fluid Density	Borehole	9.2	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DFT_WATER	Drilling Fluid Water Type	Borehole	WBM	
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
MWCO	Mud Weight Correction Option	HGNS-H	Yes	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	0.15	ohm.m
TD	Total Measured Depth	Borehole	4282.5	ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
MATR	LIMESTONE	3870	4050
MATR	SANDSTONE	4050	4300.5
MDEN	2.71	3870	4050
MDEN	2.65	4050	4300.5

All depth are actual.

Tool Control Parameters

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
NPUC	Nuclear Pile-Up Correction	HDRS-H	On	

Calibration Report

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

Primary Equipment :			
File code for AIT-MA Sonde Tool Element	AMIS	2562	
Auxiliary Equipment :			
AITM Rm/SP Bottom Nose	AMRM	109	

AIT Sonde Calibration - Test Loop Gain

Master (EEPROM):		21:49:28 10-Mar-2018						
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
Test Loop Gain - 0		Master	1.000	0.950	1.014	1.050		

Test Loop Phase - 0	deg	Master	0	-3.000	0.524	3.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 1		Master	1.000	0.950	1.013	1.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 1	deg	Master	0	-3.000	0.644	3.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 2		Master	1.000	0.950	1.015	1.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 2	deg	Master	0	-3.000	0.108	3.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 3		Master	1.000	0.950	1.009	1.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 3	deg	Master	0	-3.000	0.144	3.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 4		Master	1.000	0.950	0.993	1.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 4	deg	Master	0	-3.000	0.110	3.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 5		Master	1.000	0.950	0.989	1.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 5	deg	Master	0	-3.000	-0.056	3.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 6		Master	1.000	0.950	1.000	1.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 6	deg	Master	0	-3.000	0.278	3.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 7		Master	1.000	0.950	1.014	1.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 7	deg	Master	0	-3.000	-0.041	3.000	<div><div></div><div></div><div></div><div></div><div></div></div>

AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM): 21:49:28 10-Mar-2018							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 0	mS/m	Master	-----	-231.000	-90.511	119.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 0		Master	-----	-2250.000	-12.770	2250.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 1	mS/m	Master	-----	114.000	165.326	204.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 1		Master	-----	-625.000	-75.327	625.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 2	mS/m	Master	-----	66.000	104.659	156.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 2		Master	-----	-350.000	63.282	350.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 3	mS/m	Master	-----	39.000	55.423	89.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 3		Master	-----	-250.000	51.642	250.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 4	mS/m	Master	-----	15.000	26.570	35.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 4		Master	-----	-63.000	-29.986	63.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 5	mS/m	Master	-----	4.000	11.103	24.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 5		Master	-----	-50.000	-16.905	50.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 6	mS/m	Master	-----	5.000	6.462	15.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 6		Master	-----	-30.000	-8.061	30.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 7	mS/m	Master	-----	-5.000	-4.924	5.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 7		Master	-----	-30.000	-0.292	30.000	<div><div></div><div></div><div></div><div></div><div></div></div>

AIT Mud Calibration - Mud Calibration Gain

Master (EEPROM): 21:49:28 10-Mar-2018							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
Coarse Gain		Master	1.000	0.800	1.024	1.200	<div><div></div><div></div><div></div><div></div><div></div></div>
Fine Gain		Master	1.000	0.800	1.030	1.200	<div><div></div><div></div><div></div><div></div><div></div></div>

AIT Electronics Check - Thru Calibration Check

Master (EEPROM): 21:49:28 10-Mar-2018							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 0	V	Master	-----	0.366	0.641	0.854	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 0	deg	Master	-----	137.000	-175.189	-103.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 1	V	Master	-----	0.762	1.314	1.778	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 1	deg	Master	-----	136.000	-176.305	-104.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 2	V	Master	-----	0.372	0.651	0.868	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 2	deg	Master	-----	132.000	-179.892	-108.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 3	V	Master	-----	0.420	0.736	0.980	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 3	deg	Master	-----	131.000	179.337	-109.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 4	V	Master	-----	0.804	1.375	1.876	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 4	deg	Master	-----	125.000	173.125	-115.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 5	V	Master	-----	1.176	2.005	2.744	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 5	deg	Master	-----	122.000	171.443	-118.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 6	V	Master	-----	1.176	2.005	2.744	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 6	deg	Master	-----	121.000	171.455	-119.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 7	V	Master	-----	0.846	1.442	1.974	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 7	deg	Master	-----	115.000	170.747	-125.000	<div><div></div><div></div><div></div><div></div><div></div></div>
SPA Zero	mV	Master		-50.000	0.350	50.000	<div><div></div><div></div><div></div><div></div><div></div></div>
SPA Plus	mV	Master		941.000	990.193	1040.000	<div><div></div><div></div><div></div><div></div><div></div></div>

Temperature Plus	V	Master		-0.050	0.000	0.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Temperature Zero	V	Master		-0.050	0.000	0.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Temperature Plus	V	Master		0.870	0.918	0.960	<div><div></div><div></div><div></div><div></div><div></div></div>

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

Primary Equipment :

HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	3737
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H	4882

Auxiliary Equipment :

HRDD Backscatter Detector	Backscatter	
HRDD Long Spacing Detector	Long Spacing	
HRDD Short Spacing Detector	Short Spacing	
Cesium 137 Gamma-Ray Logging Source	GSR-J	5259
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	3737
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	3951

Calibration Parameter :

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

HDRS Density Calibration - Inversion Results

Master (EEPROM): 15:52:40 09-Dec-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
Rho Aluminum	g/cm3	Master	2.596	2.586	2.597	2.606	<div><div></div><div></div><div></div><div></div><div></div></div>
Rho Magnesium	g/cm3	Master	1.686	1.676	1.686	1.696	<div><div></div><div></div><div></div><div></div><div></div></div>
Pe Aluminum		Master	2.570	2.470	2.541	2.670	<div><div></div><div></div><div></div><div></div><div></div></div>
Pe Magnesium		Master	2.650	2.550	2.641	2.750	<div><div></div><div></div><div></div><div></div><div></div></div>

HDRS Density Calibration - Deviation Summary

Master (EEPROM): 15:52:40 09-Dec-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
BS Average Deviation	%	Master	0	-0.6000	0.4193	0.6000	<div><div></div><div></div><div></div><div></div><div></div></div>
BS Max Deviation	%	Master	0	-1.6000	0.9056	1.6000	<div><div></div><div></div><div></div><div></div><div></div></div>
SS Average Deviation	%	Master	0	-1.0000	0.4058	1.0000	<div><div></div><div></div><div></div><div></div><div></div></div>
SS Max Deviation	%	Master	0	-2.5000	1.0526	2.5000	<div><div></div><div></div><div></div><div></div><div></div></div>
LS Average Deviation	%	Master	0	-1.5000	0.6786	1.5000	<div><div></div><div></div><div></div><div></div><div></div></div>
LS Max Deviation	%	Master	0	-3.5000	1.5928	3.5000	<div><div></div><div></div><div></div><div></div><div></div></div>

HDRS Density Calibration - Background Summary

Master (EEPROM): 15:52:40 09-Dec-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
BS Window Ratio		Master	1.0000		0.7416		<div><div></div><div></div><div></div><div></div><div></div></div>
BS Window Sum	1/s	Master	1		27426		<div><div></div><div></div><div></div><div></div><div></div></div>
SS Window Ratio		Master	1.0000		0.4741		<div><div></div><div></div><div></div><div></div><div></div></div>
SS Window Sum	1/s	Master	1		10068		<div><div></div><div></div><div></div><div></div><div></div></div>
LS Window Ratio		Master	1.0000		0.2938		<div><div></div><div></div><div></div><div></div><div></div></div>
LS Window Sum	1/s	Master	1		1135		<div><div></div><div></div><div></div><div></div><div></div></div>

HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM): 15:52:40 09-Dec-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
BS PM High Voltage	V	Master		1000	1493	2400	<div><div></div><div></div><div></div><div></div><div></div></div>
SS PM High Voltage	V	Master		1000	1484	2400	<div><div></div><div></div><div></div><div></div><div></div></div>
LS PM High Voltage	V	Master		1000	1739	2400	<div><div></div><div></div><div></div><div></div><div></div></div>

HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM): 15:52:40 09-Dec-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
BS Crystal Resolution	%	Master		5.00	10.59	25.00	<div><div></div><div></div><div></div><div></div><div></div></div>
SS Crystal Resolution	%	Master		5.00	8.79	20.00	<div><div></div><div></div><div></div><div></div><div></div></div>
LS Crystal Resolution	%	Master		5.00	9.28	20.00	<div><div></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		3730			
Auxiliary Equipment :							
HGNS Accelerometer, 150 degC		HACCZ-H		1537			
AmBe Neutron Logging Source		NSR-F		5068			
Calibration Parameter :							
Water Temperature (Calibration Tank Water Temperature)		65.0					
Housing Size (Thermal Housing Size)		3.37					
JIG-BKG							
HGNS Accelerometer EEPROM - Accelerometer EEPROM Read							
Master (EEPROM):		00:00:00 15-Mar-2002					
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	----	----	-530.200	----	
Accelerometer Coefficients - 1		Master	----	----	-13.060	----	
Accelerometer Coefficients - 2		Master	----	----	-0.001	----	
Accelerometer Coefficients - 3		Master	----	----	0.000	----	
Accelerometer Coefficients - 4		Master	----	----	2.722	----	
Accelerometer Coefficients - 5		Master	----	----	0.000	----	
Accelerometer Coefficients - 6		Master	----	----	0.000	----	
Accelerometer Coefficients - 7		Master	----	----	0.000	----	
Accelerometer Coefficients - 8		Master	----	----	298.900	----	
Accelerometer Coefficients - 9		Master	----	----	1.007	----	
HGNS Neutron Calibration - HGNS Neutron Accumulations							
Master (EEPROM):		21:32:32 07-Nov-2018					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Near Zero Measurement	1/s	Master	0	5.0	28.5	40.0	
Far Zero Measurement	1/s	Master	0	5.0	27.4	40.0	
Near Plus Measurement	1/s	Master	6031.0	4700.0	5307.0	6900.0	
Far Plus Measurement	1/s	Master	2793.0	1900.0	2180.0	2900.0	
Near Corrected Plus Measurement	1/s	Master		4700.0	5299.0	6900.0	
Far Corrected Plus Measurement	1/s	Master		1900.0	2163.0	2900.0	
EDTC-B (Enhanced Digital Telemetry Cartridge - Version B) Calibration - Run ONE							
Primary Equipment :							
EDTC-B		EDTC-B		9038			
Calibration Parameter :							
Plus Reference							
EDTC-B Memory Data - EDTC-B Memory Data							
Master (EEPROM):		14:30:48 18-Dec-2018					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Initial PMT HV	V	Master			1574.000		
Accelerometer Serial Number		Master			1206		
Accelerometer Coefficients - 0		Master	----	----	2.970E+000	----	
Accelerometer Coefficients - 1		Master	----	----	1.998E-004	----	
Accelerometer Coefficients - 2		Master	----	----	6.002E-007	----	
Accelerometer Coefficients - 3		Master	----	----	-3.225E-008	----	
Accelerometer Coefficients - 4		Master	----	----	8.128E-010	----	
Accelerometer Coefficients - 5		Master	----	----	-6.221E-012	----	
Accelerometer Coefficients - 6		Master	----	----	1.615E-014	----	
Accelerometer Coefficients - 7		Master	----	----	-4.416E-003	----	

Accelerometer Coefficients - 8		Master	----	----	4.347E-005	----		
Accelerometer Coefficients - 9		Master	----	----	-4.540E-008	----		
Accelerometer Coefficients - 10		Master	----	----	5.842E-013	----		
Accelerometer Coefficients - 11		Master	----	----	-1.668E-012	----		
Gamma-Ray Detector Serial Number		Master			79215			

Company:	St. Croix Operating Inc.	Schlumberger
Well:	Jack Creek #2	
Field:	Wildcat	
County:	Washington	
State:	Colorado	
Platform Express		
Compensated Neutron		
Litho-Density		