

Company: Noble Energy Inc.

Well: Upchurch State LD02-77-1BHN

Field: Wildcat

County: Weld State: Colorado

HGNS Porosity	Weld			
	Wildcat			
	SHL: SESW 615' FSL & 1567' FWL			
	Upchurch State LD02-77-1BHN			
Company: Noble Energy Inc.	Location:			
	SHL: SESW 615' FSL & 1567' FWL		Elev.: K.B. 4772.00 ft	
	Section 2, Township 9N, Range 58W		G.L. 4742.00 ft	
	Lat: 40.774980, Long: -103.835350		D.F. 4771.00 ft	
County: Weld	Permanent Datum:		Ground Level	
	Log Measured From:		Kelly Bushing	
	Drilling Measured From:		Kelly Bushing	
	API Serial No. 05-123-39817		Section: 2	
Company: Noble Energy Inc.	Township: 9N		Range: 58W	
	Elev.: 30.00 ft		above Perm. Datum	
	4742.00 f			

Logging Date	29-Jan-2015
Run Number	Run 1
Depth Driller	6030.00 ft
Schlumberger Depth	6030.00 ft
Bottom Log Interval	5850.00 ft
Top Log Interval	50.00 ft
Casing Fluid Type	Salt Brine
Salinity	
Density	8.4 lbm/gal
Fluid Level	0.00 ft
BIT/CASING/TUBING STRING	
Bit Size	8.75 in
From	0.00 ft
To	6030.00 ft
Casing/Tubing Size	7 in
Weight	26 lbm/ft
Grade	P110
From	0.00 ft
To	6020.00 ft
Max Recorded Temperatures	207 degF
Logger on Bottom	29-Jan-2015 08:30:00
Unit Number	3022
Recorded By	Max Pace
Witnessed By	Bill Mansfield

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.

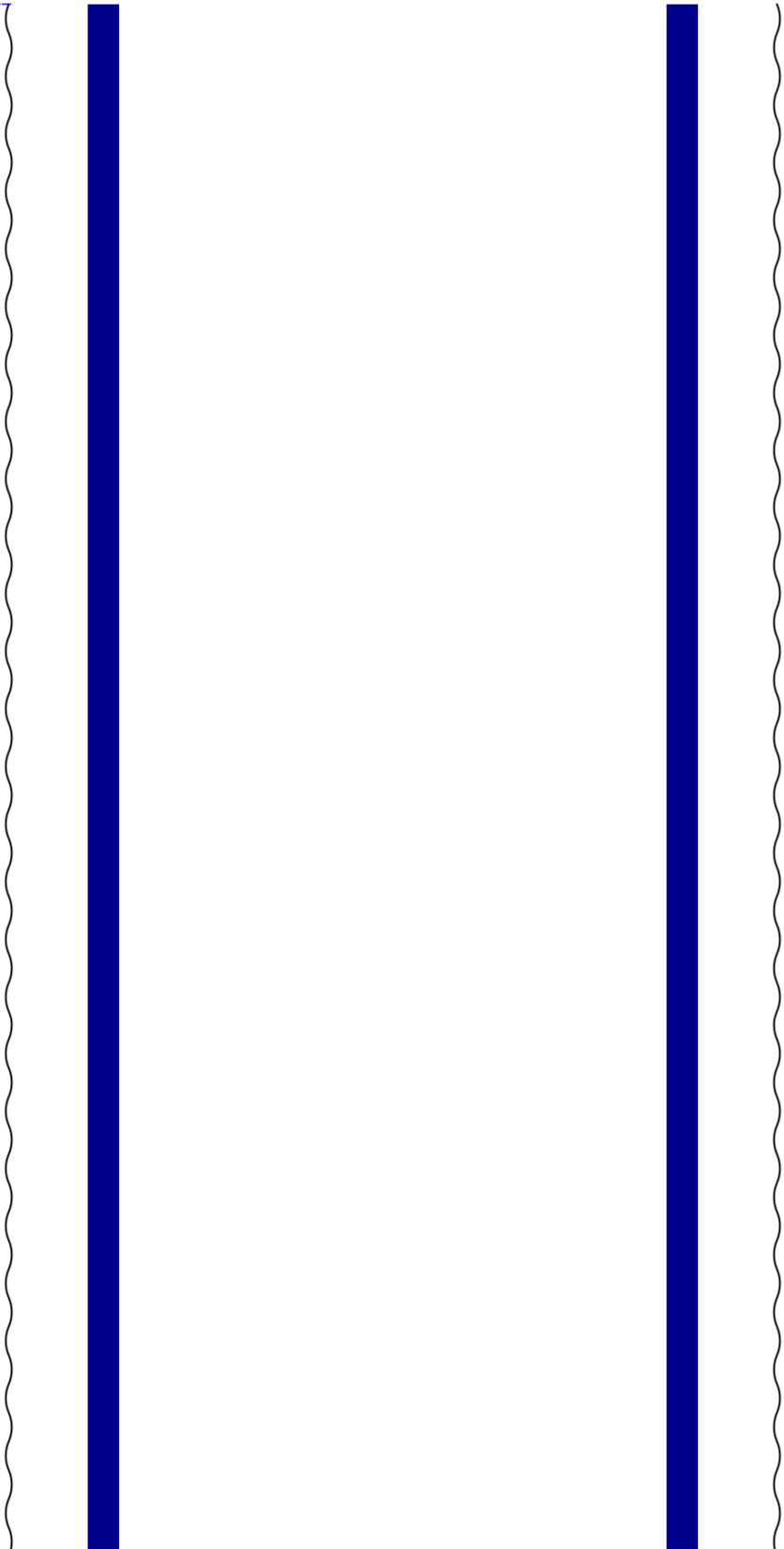
Contents

- 1. Header
- 2. Disclaimer
- 3. Contents
- 4. Well Sketch
- 5. Borehole Size/Casing/Tubing Record
- 6. Borehole Fluids
- 7. Remarks and Equipment Summary
- 8. Depth Summary
- 9. Run 1
 - 9.1 Integration Summary
 - 9.2 Software Version
 - 9.3 Composite Summary
 - 9.4 Log (PEX HGNS Porosity StdRes)
 - 9.5 Parameter Listing
- 10. Run 1
 - 10.1 Composite Summary
 - 10.2 Log (PEX HGNS Porosity StdRes RA)

- 11. Calibration Report
- 12. Tail

Well Sketch

Driller Depth
0.00 ft





Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	8.75					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	6030					
Bottom Logger (ft)	6030					
Casing						
Size (in)	7					
Weight (lbm/ft)	26					
Inner Diameter (in)	6.276					
Grade	P110					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	6020					
Bottom Logger (ft)	6020					

Borehole Fluids

Parameter(unit)	Run 1					
Fluid Type	Water					
Fluid Name	Salt Brine					
Max Recorded Temperatures (degF)	207					
Source of Sample	Active Tank					
Salinity (ppm)	0					
Density (lbm/gal)	8.4					
Funnel Viscosity (s)	26					
Fluid Loss (cm3)						
PH						
Date/Time Circulation Stopped	NaN					
Date Logger on Bottom	29-Jan-2015					
Time Logger on Bottom	08:30:00					
Source RMF						
RMC	Pressed					
RM @ Meas Temp (ohm.m@degF)	0.2 @ 68					
RME @ Meas Temp	0.15 @ 68					

RMC @ Meas Temp (ohm.m@degF)	0.15 @ 207					
RMC @ Meas Temp (ohm.m@degF)						
RM @ BHT (ohm.m@degF)	0.07 @ 207					
RMF @ BHT (ohm.m@degF)	0.05 @ 207					
RMC @ BHT (ohm.m@degF)	NaN @ 207					
Total Solid (%)						
High Gravity Solids (%)						

Remarks and Equipment Summary

Run 1: Toolstring	Run 1: Remarks
<div> <div> <div>Equip nameLength</div> <div>LEH-QT 44.16</div> <div>LEH-QT</div> </div> <div> <div>MP nameOffset</div> <div></div> <div></div> </div> </div> <div> <div> <div>DTC-H:8 41.24</div> <div>803</div> <div>ECH-KC: 10354</div> <div>DTC-H:8 803</div> <div>SGT-N:1 38.24</div> <div>0386</div> <div>SGH-K:31 64</div> <div>SGC-TB: 10386</div> <div>SGD-TAA :21892</div> </div> <div> <div> <div>HGNS-H 32.74</div> <div>HGNH</div> <div>NPV-N</div> <div>NSR-F:25 54</div> <div>HGNS-H</div> <div>HMCA-H</div> <div>HACCZ-H :6991</div> </div> <div> <div> <div>AH-184 23.34</div> <div>[2]</div> </div> <div> <div> <div>AH-184 21.34</div> <div>[1]</div> </div> <div> <div> <div>CME-AF 19.34</div> </div> <div> <div> <div>USIT-E:9 15.54</div> <div>92</div> <div>ECH-MFA :1964</div> <div>USAC-A: 992</div> <div>USIS-A:1 832</div> <div>USSC-B: 972</div> <div>USRS-B:7 79</div> <div>USL SEN</div> </div> </div> </div> <div> <div> <div>CTEM 40.35</div> <div>HV 0.00</div> <div>TelSta 38.24</div> <div>tus</div> <div>ToolSt 38.24</div> <div>atus</div> <div>GR 37.33</div> <div>Tempe 32.72</div> <div>rature</div> <div>GR 32.00</div> <div>CNL Po 25.67</div> <div>rosity</div> <div>HMCA 23.34</div> <div>HGNS 23.34</div> <div>Accele 0.00</div> <div>romete</div> <div>r</div> </div> <div> </div> </div> </div></div></div></div>	<div>BHT: 207 degF</div> <div>Top of Cement: 1130 feet</div> <div>Lead cement density: N/A</div> <div>Tail cement density: N/A</div> <div>Pressures: repeat (0), main (2500)</div>

<div>  <p>USI Se 0.38 nsor TOOL_ZERO Head Tension</p> <p>Lengths are in ft Maximum Outer Diameter = 4.645 in Line: Sensor Location, Value: Gating Offset All measurements are relative to TOOL_ZERO</p> </div>		
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Depth Summary									
		Run 1							
Depth Measuring Device									
Type		IDW-JA							
Serial Number		5896							
Calibration Date		13-Aug-2014							
Calibrator Serial Number									
Calibration Cable Type		7-39 PLXS							
Wheel Correction 1		-3							
Wheel Correction 2		-2							
Tension Device									
Type		CMTD-B/A							
Serial Number		1109							
Calibration Date		26-Dec-2014							
Calibrator Serial Number		441345A							
Number of Calibration Points		10							
Calibration Root Mean Square Error		5							
Calibration Peak Error		8							
Logging Cable									
Type		7-39P-LXS							
Serial Number									
Length		16500.00 ft							
Conveyance Type		Wireline							
Rig Type									
Run 1:Depth Control Parameters					Depth Control Remarks				
Log Sequence		First Log In the Well			All Schlumberger Depth control procedures followed IDW used as primary depth control Z-Chart used as secondary depth control				
Rig Up Length At Surface									
Rig Up Length At Bottom									
Rig Up Length Correction									
Stretch Correction									
Tool Zero Check At Surface									
Run 1									
Software Version									
Acquisition System						Version			
Maxwell						5.1.33858.3100			
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include

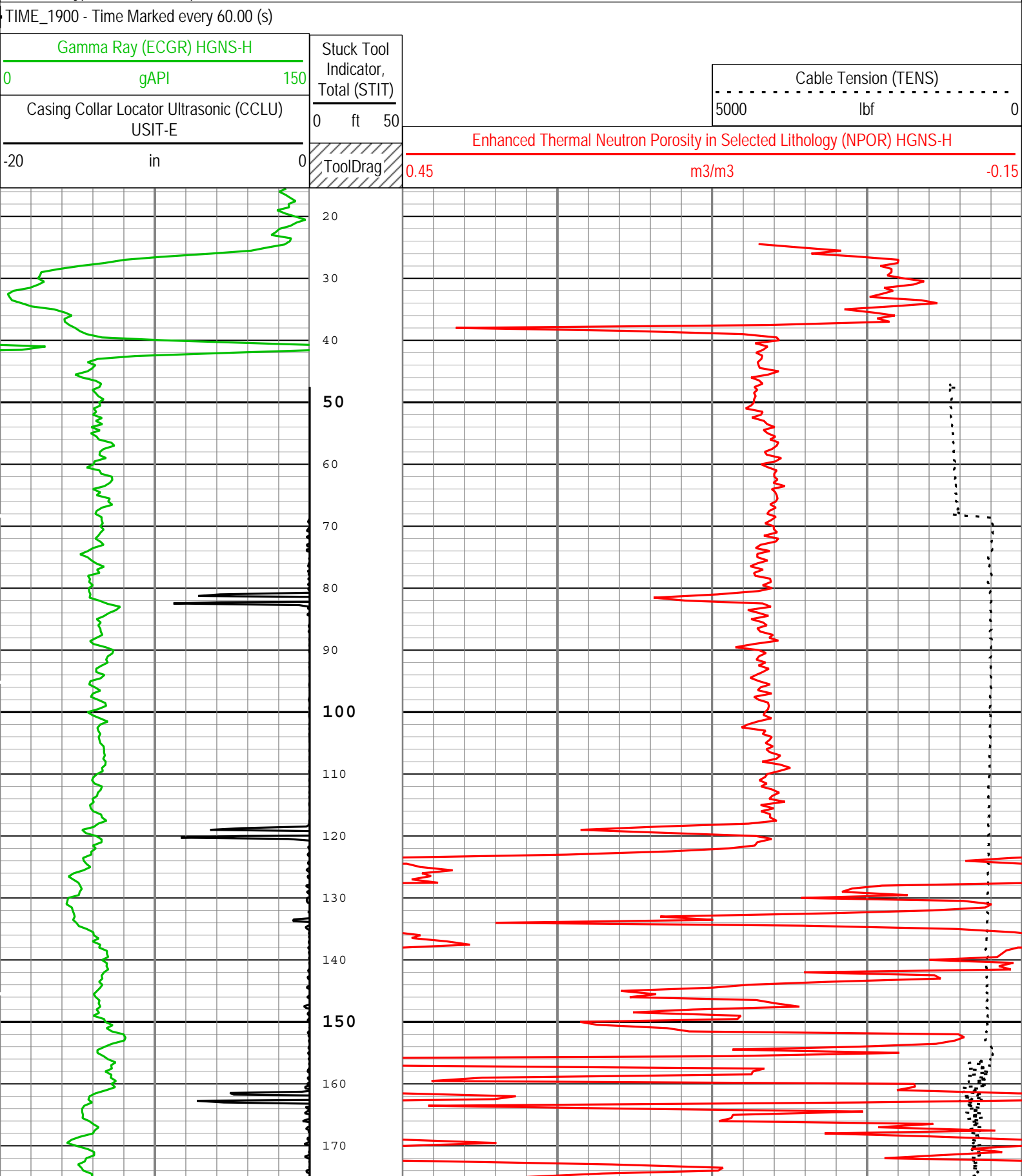
Run 1	Log[3]:Up	Up	47.03 ft	5849.73 ft	29-Jan-2015 8:52:31 AM	29-Jan-2015 10:29:53 AM	ON	1.15 ft	Yes
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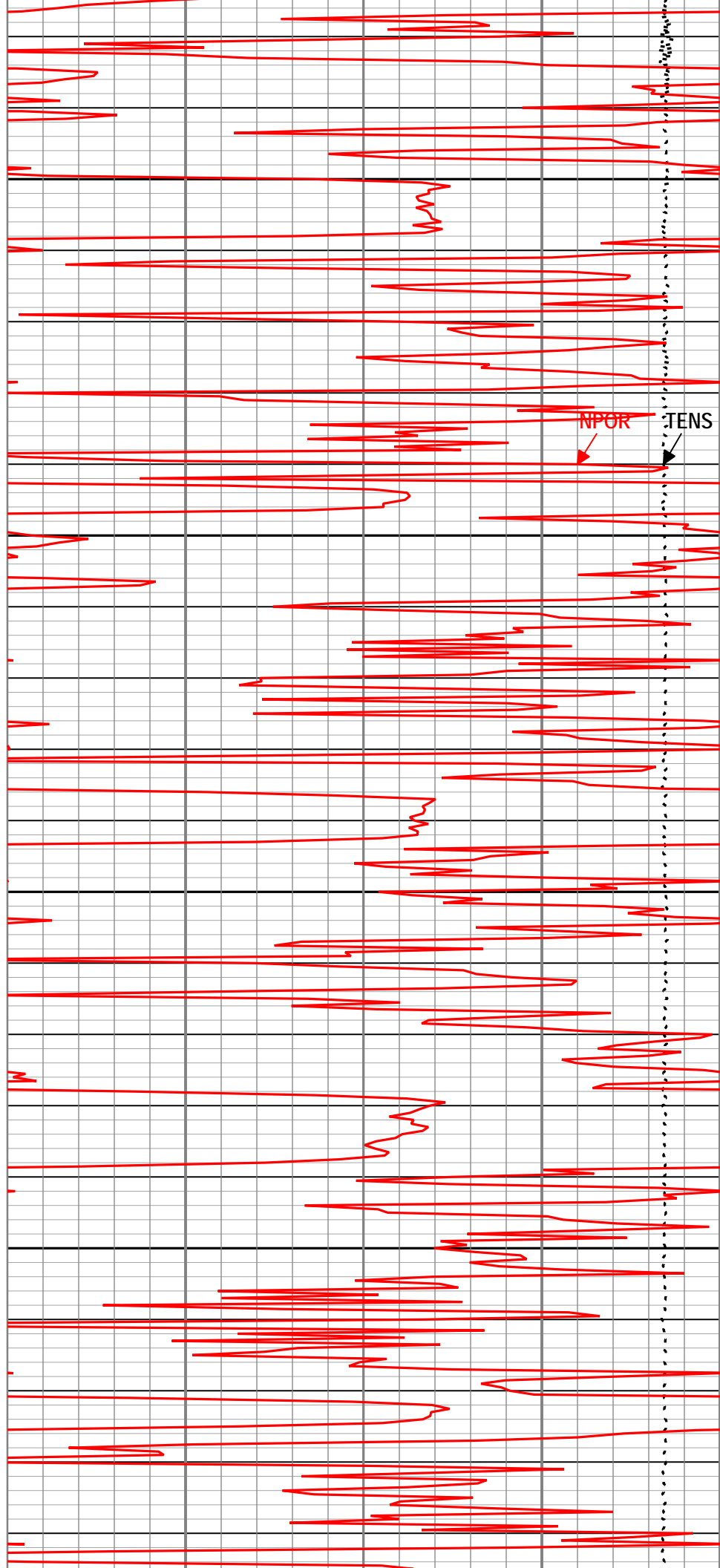
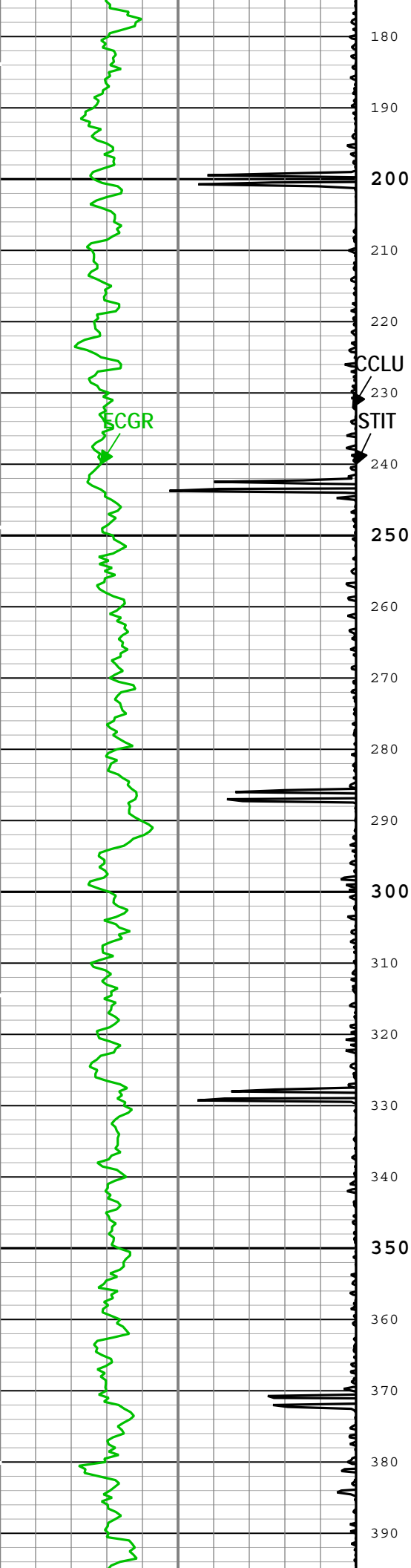
All depths are referenced to toolstring zero

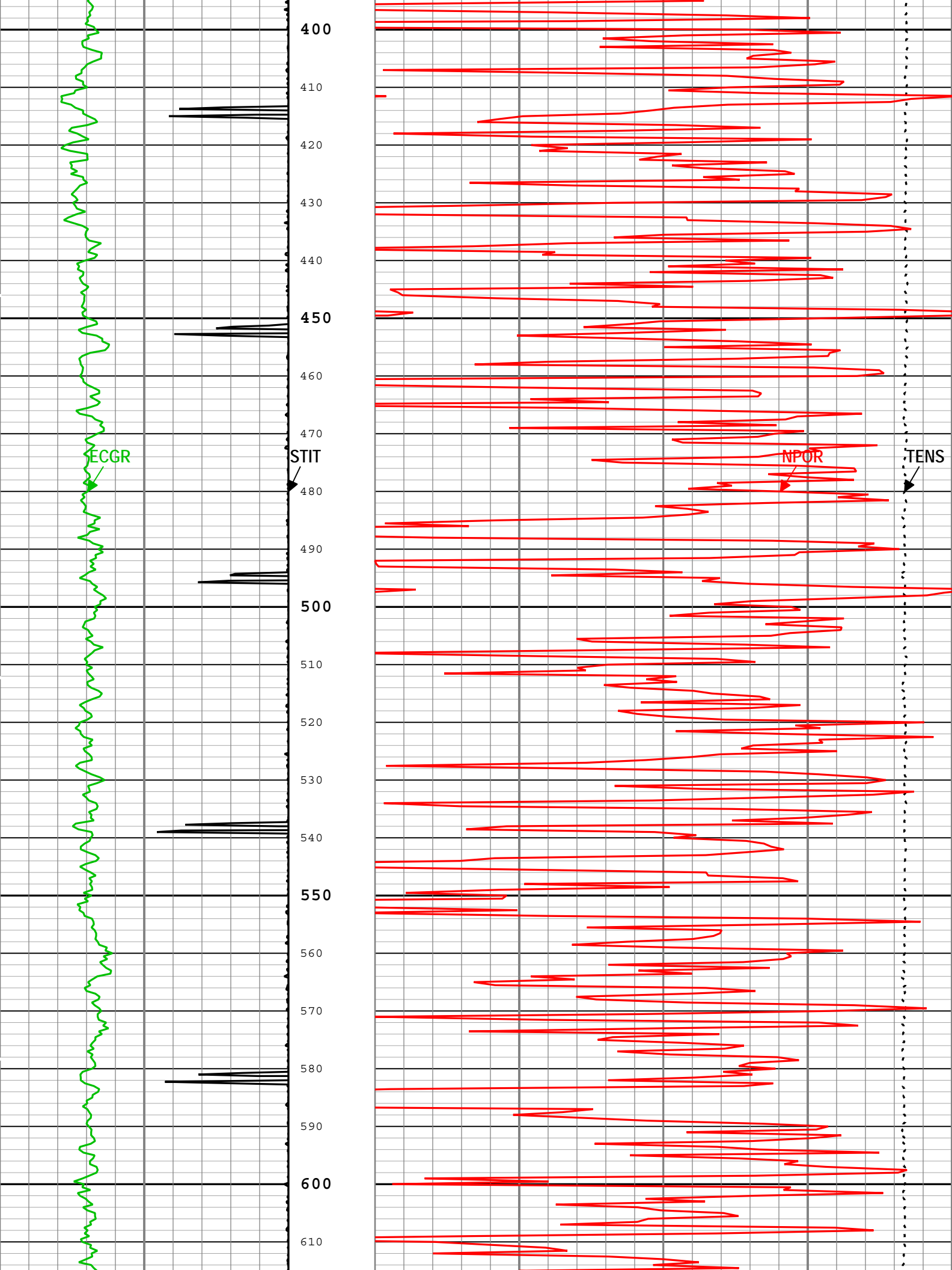
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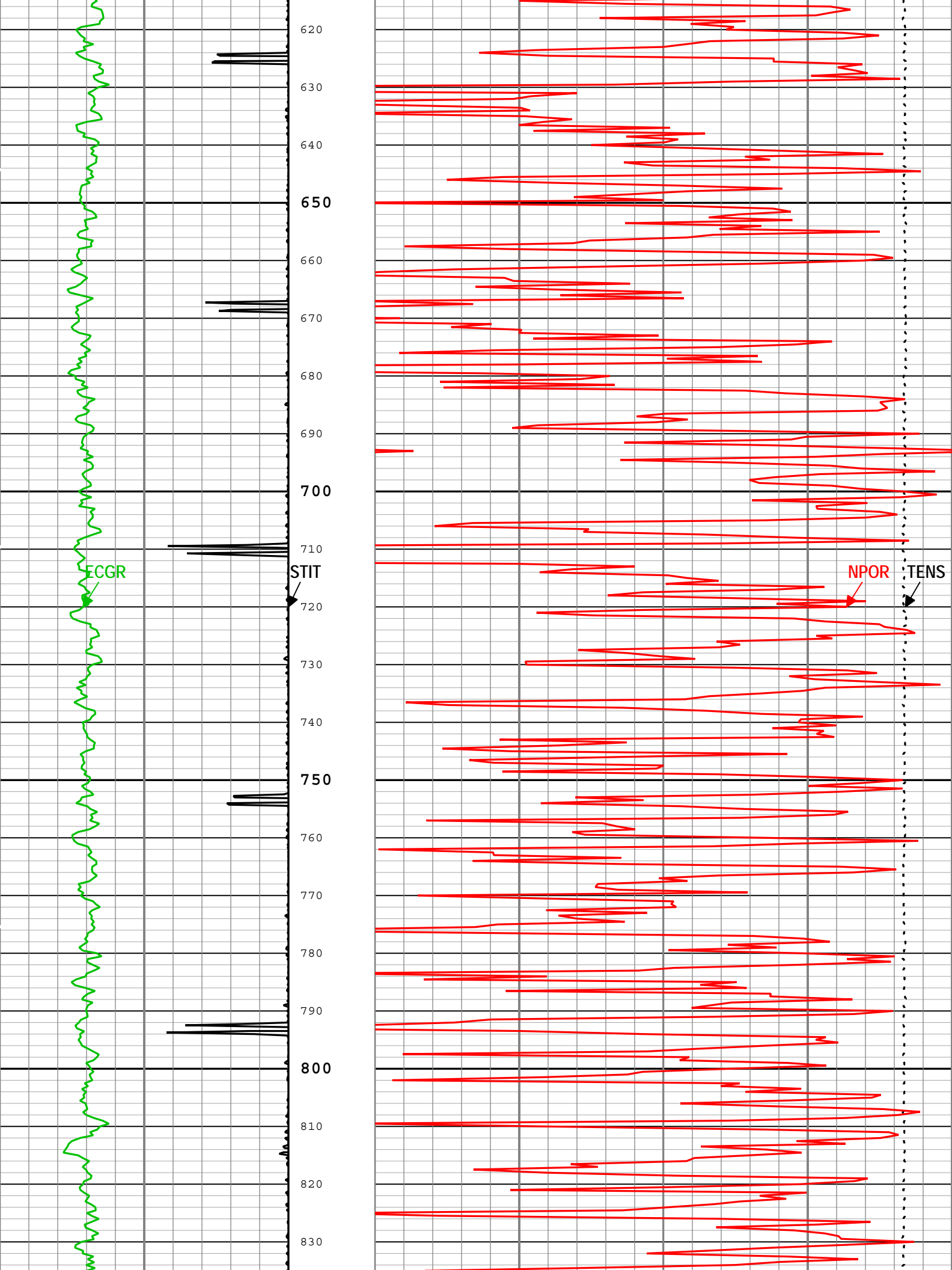
Company:Noble Energy Inc.
 Well:Upchurch State LD02-77-1BHN
 Run 1: Log[3]:Up:S013

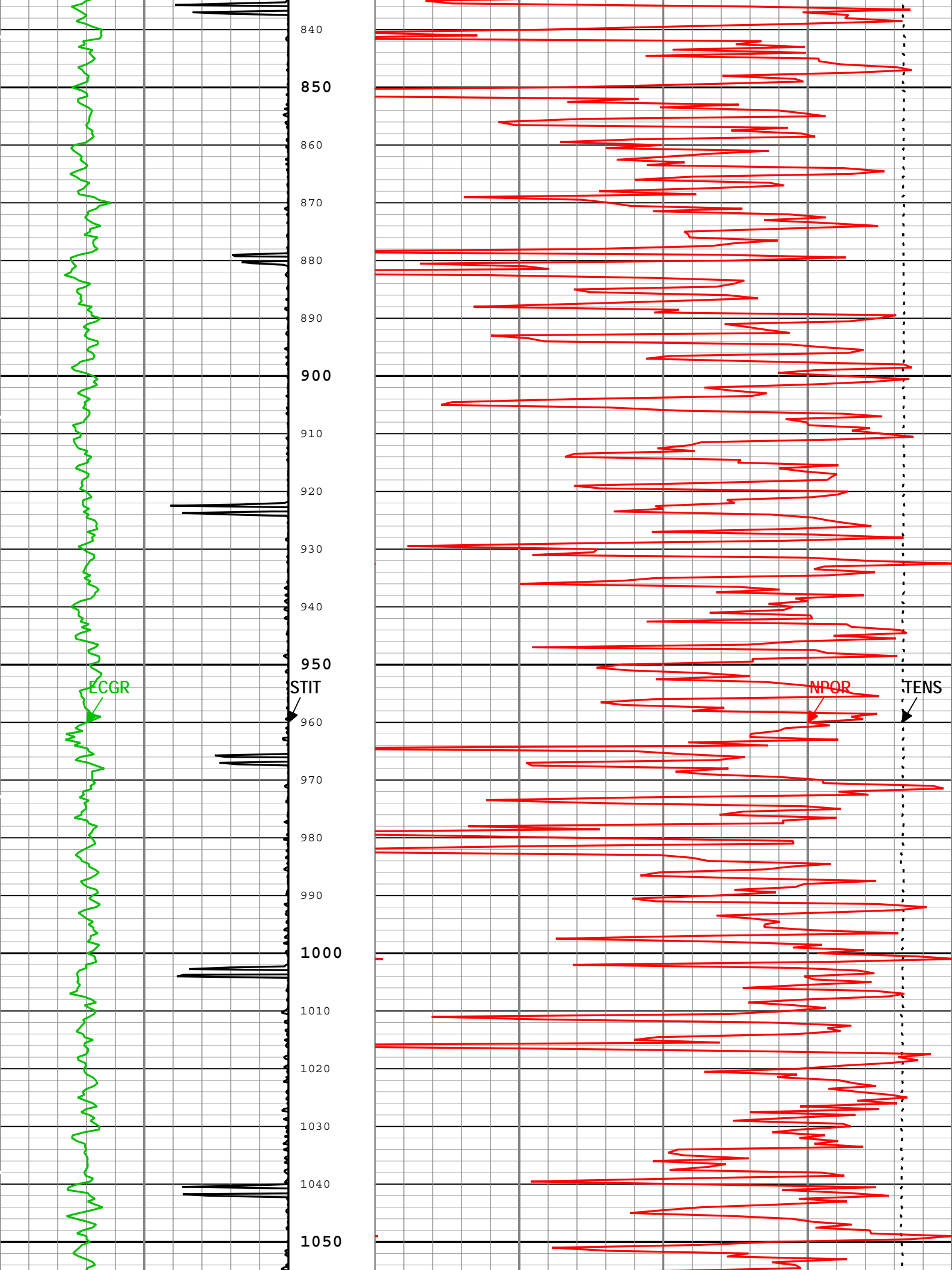
Description: HGNS standard resolution porosities for Platform Express
 Format: Log (PEX HGNS Porosity StdRes)
 Index Scale: 5 in per 100 ft
 Index Unit: ft
 Index Type: Measured Depth
 Creation Date: 29-Jan-2015 12:49:45

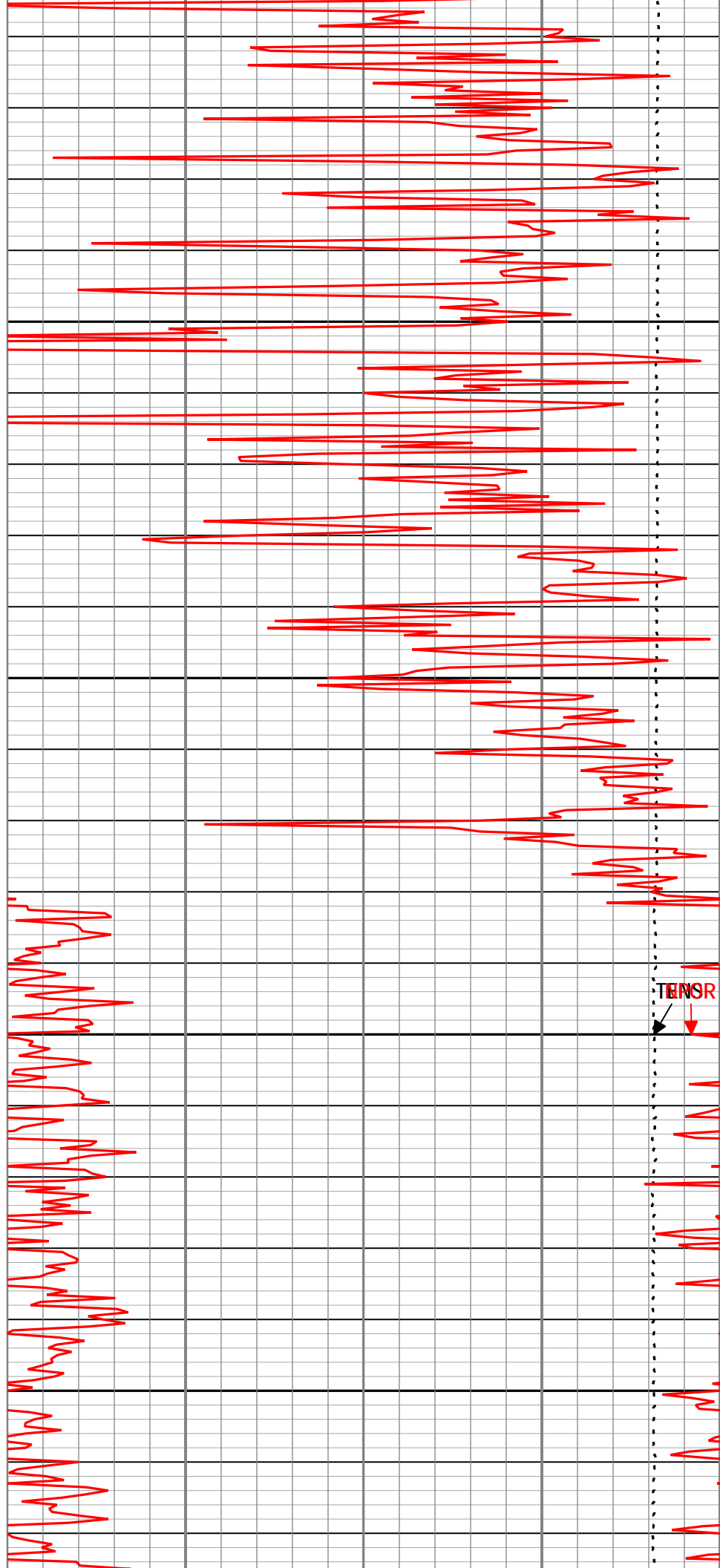
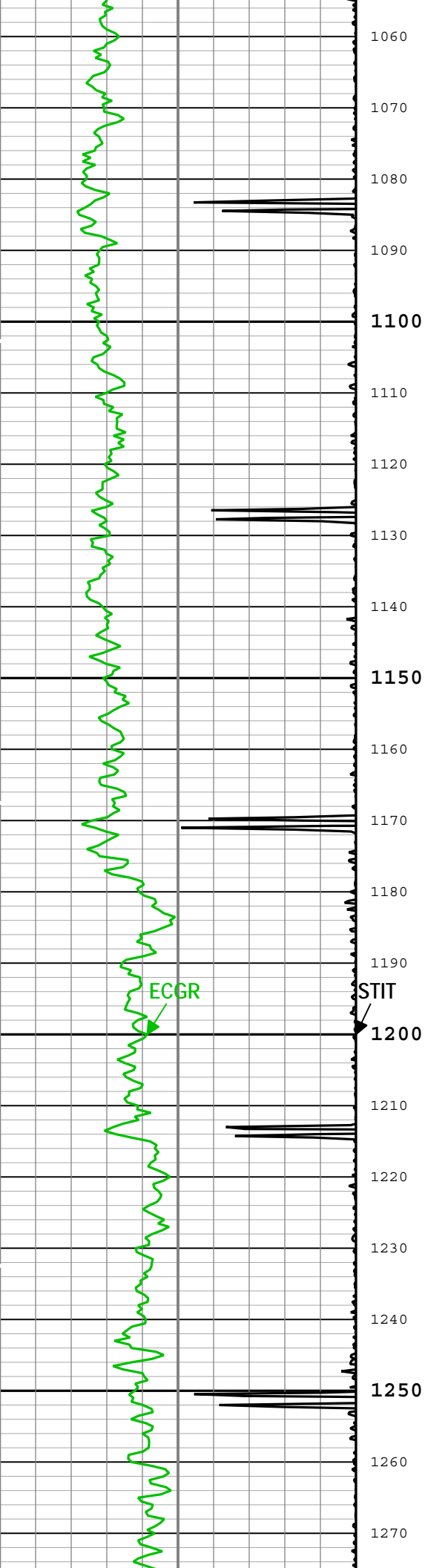


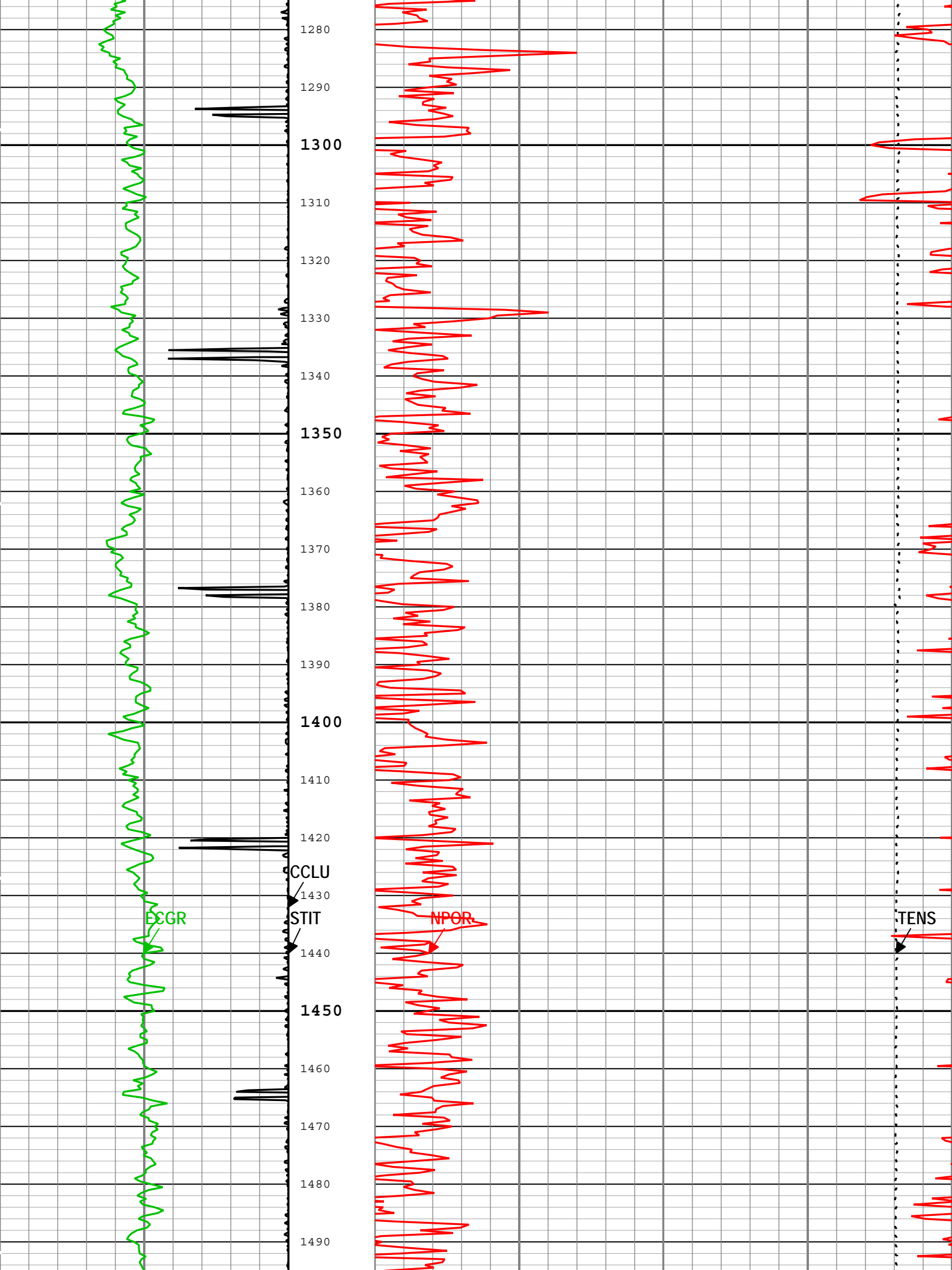


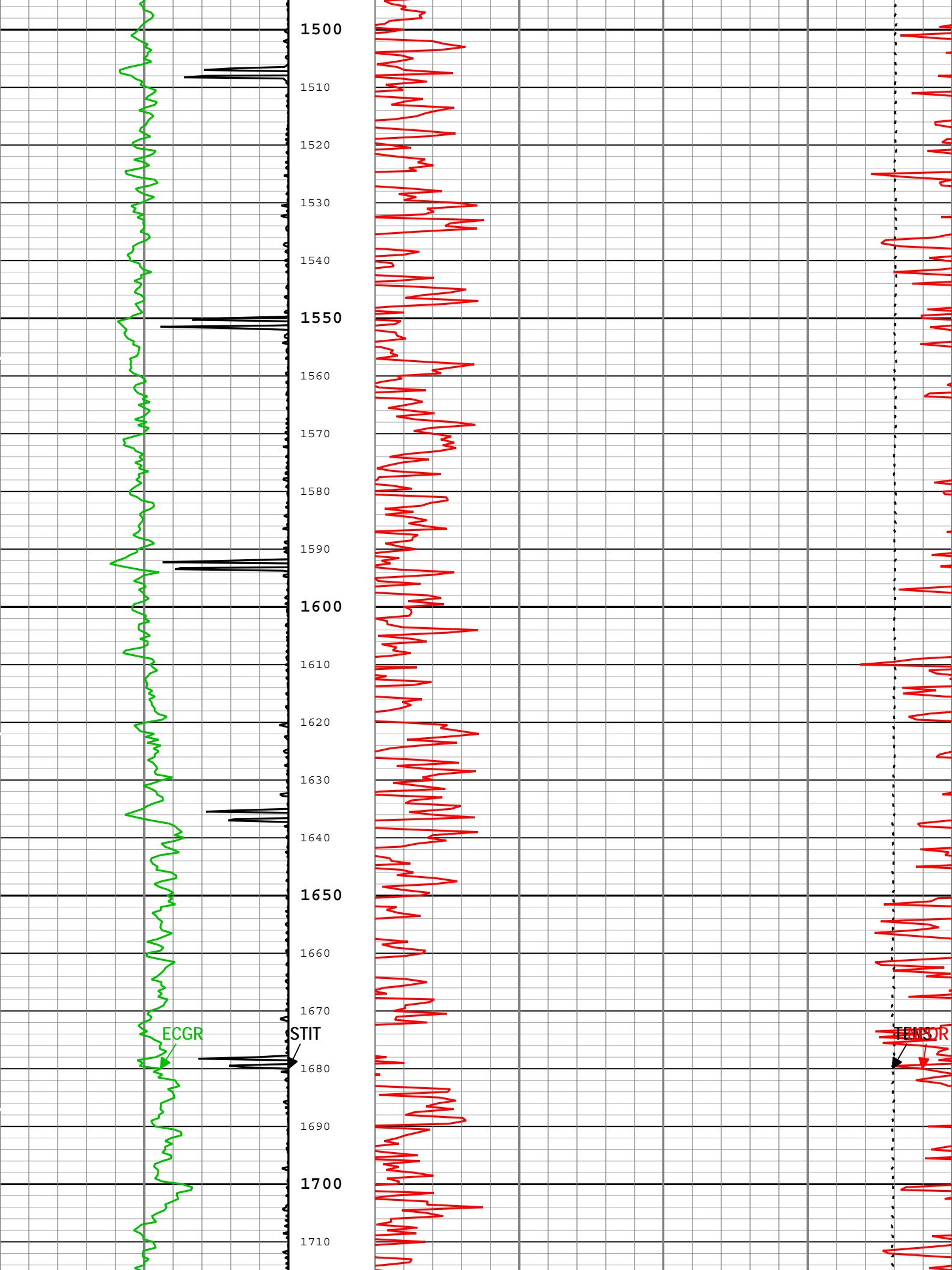


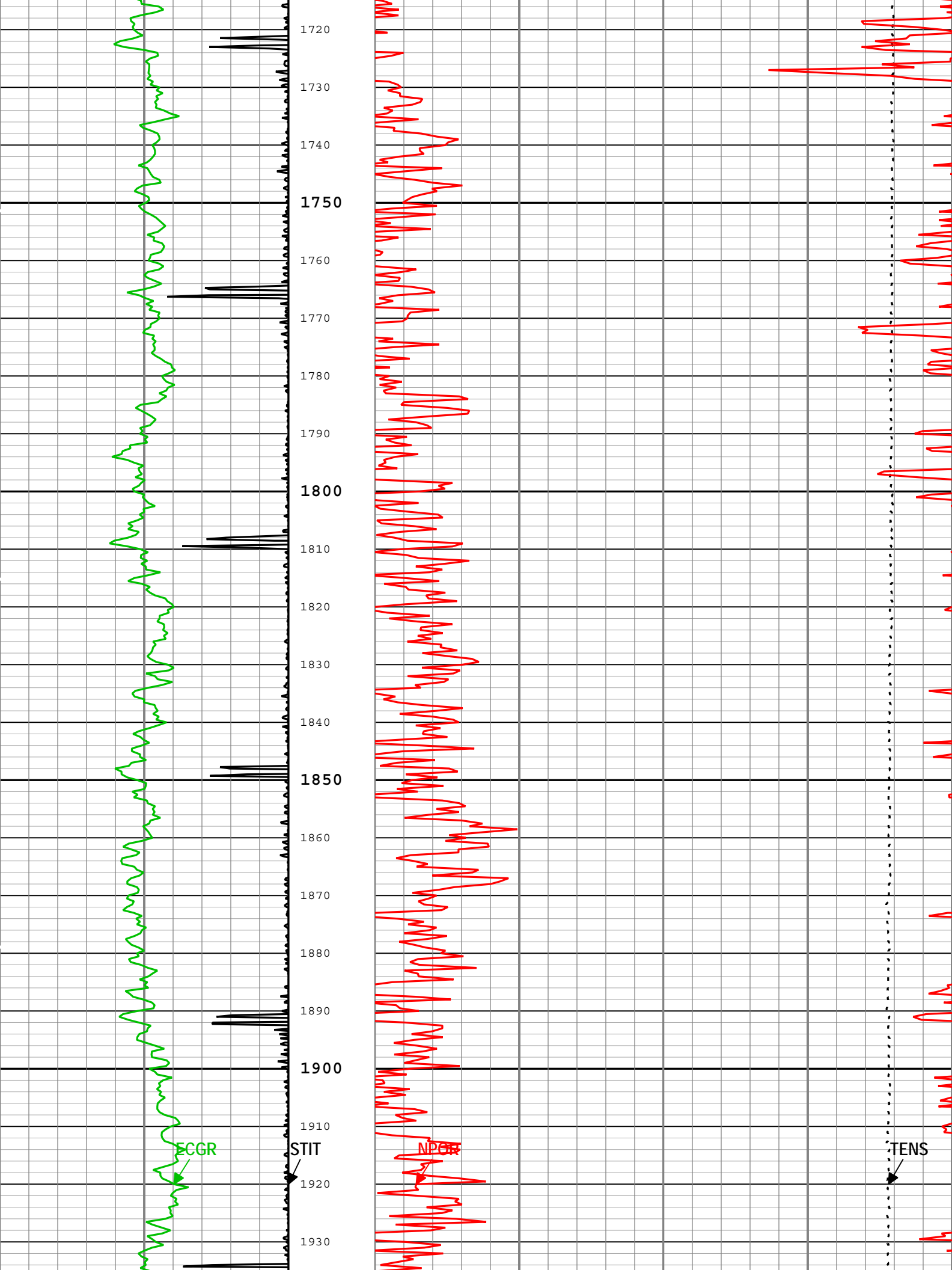


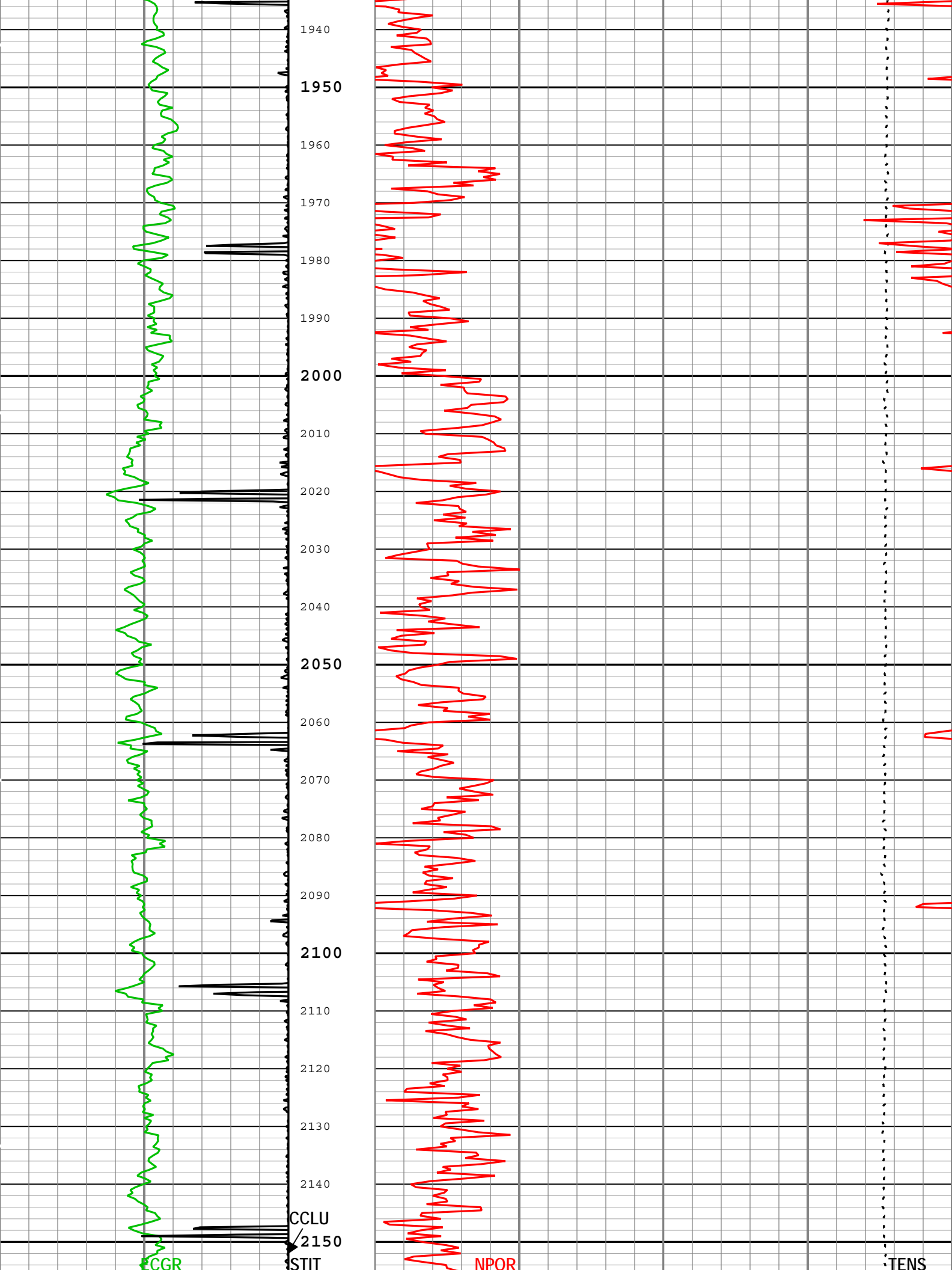


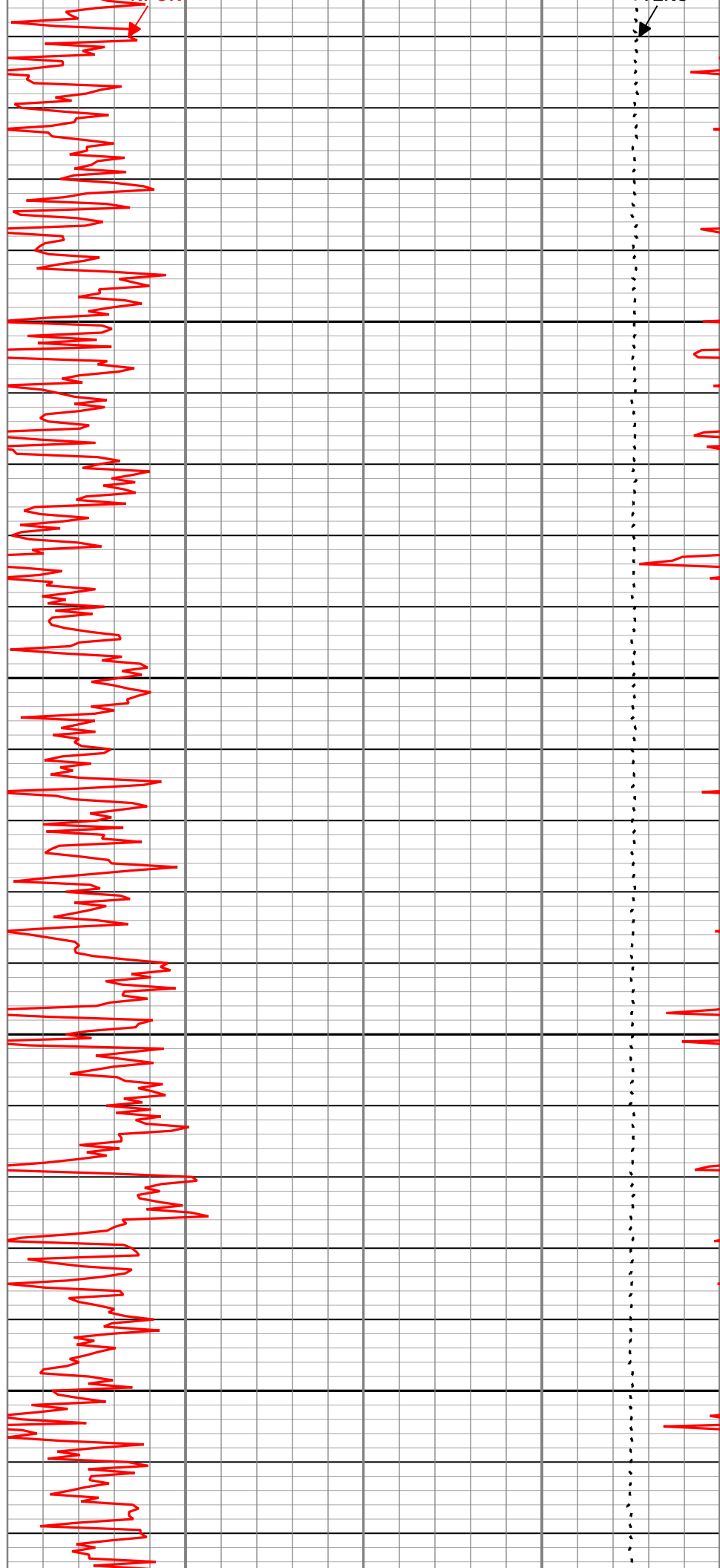
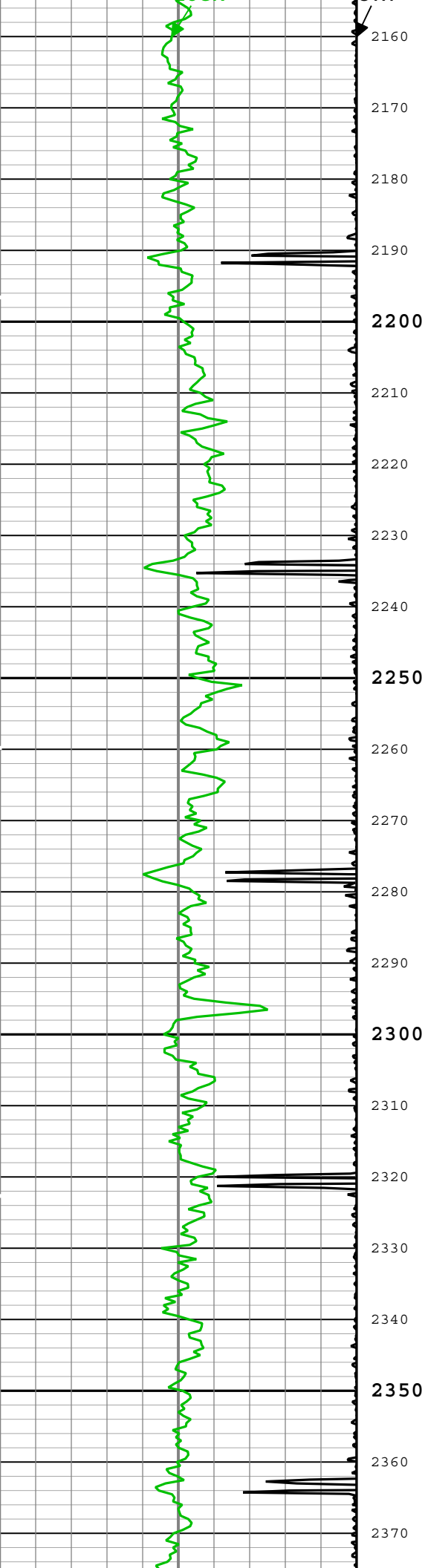


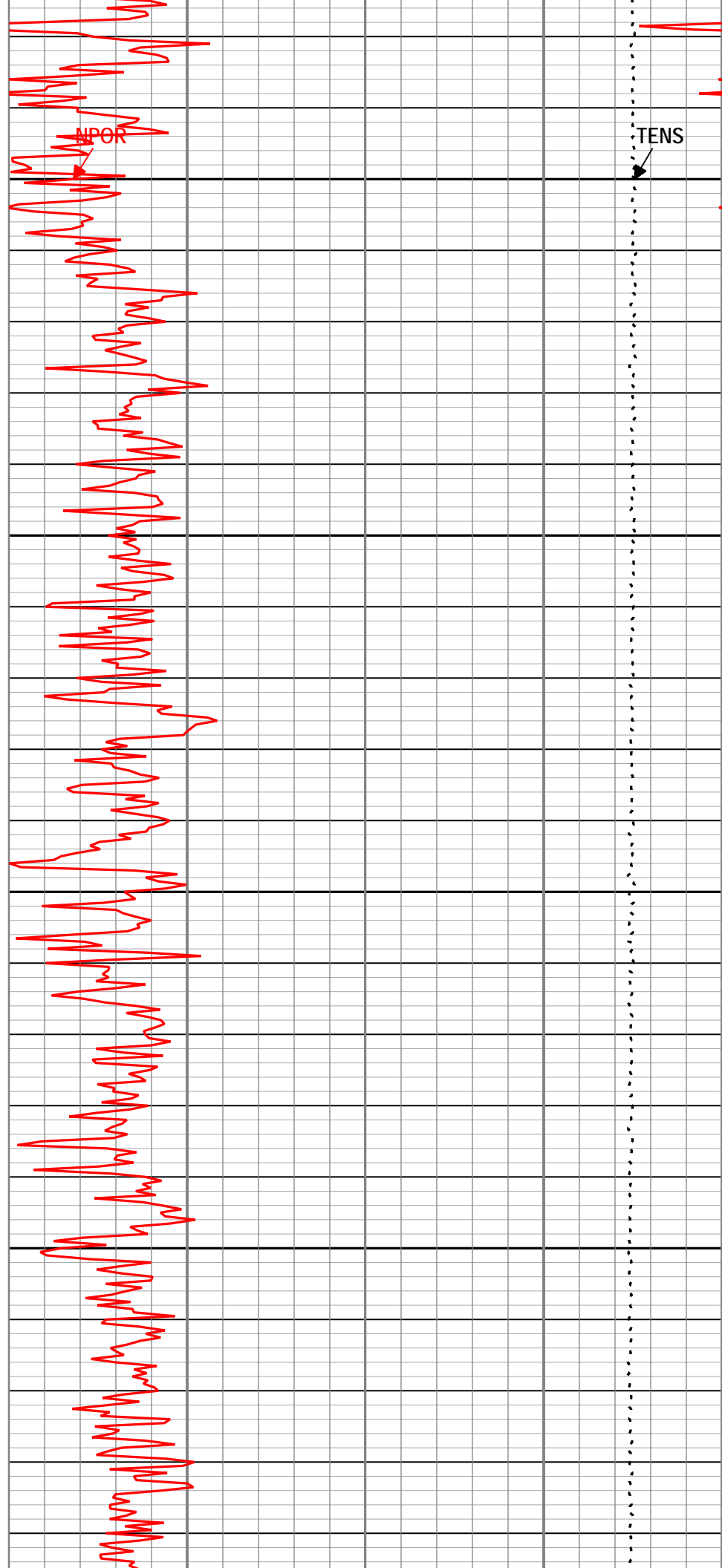
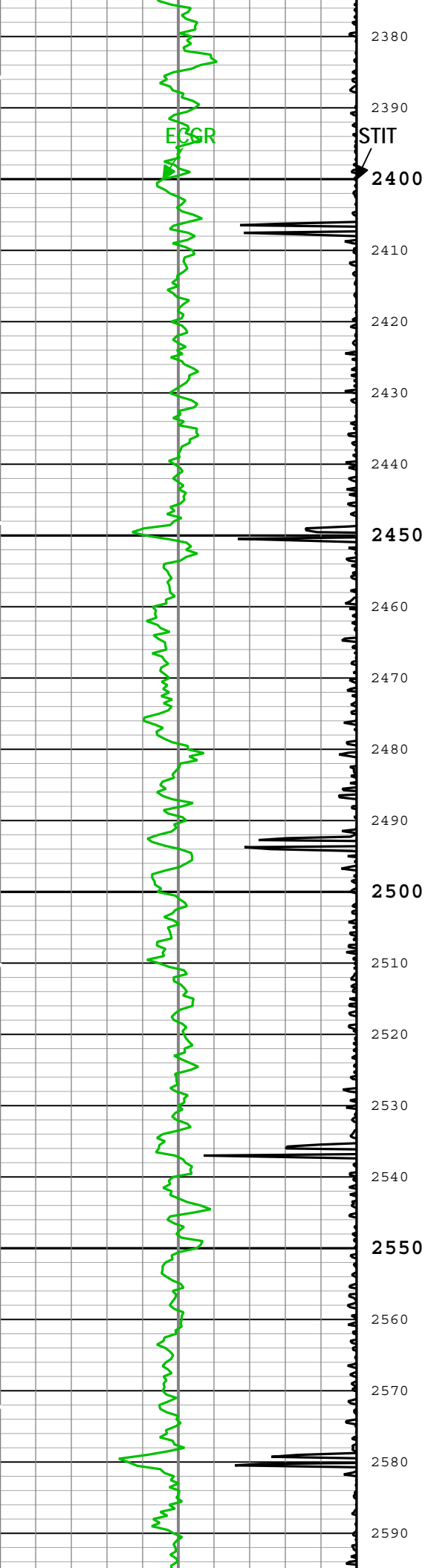


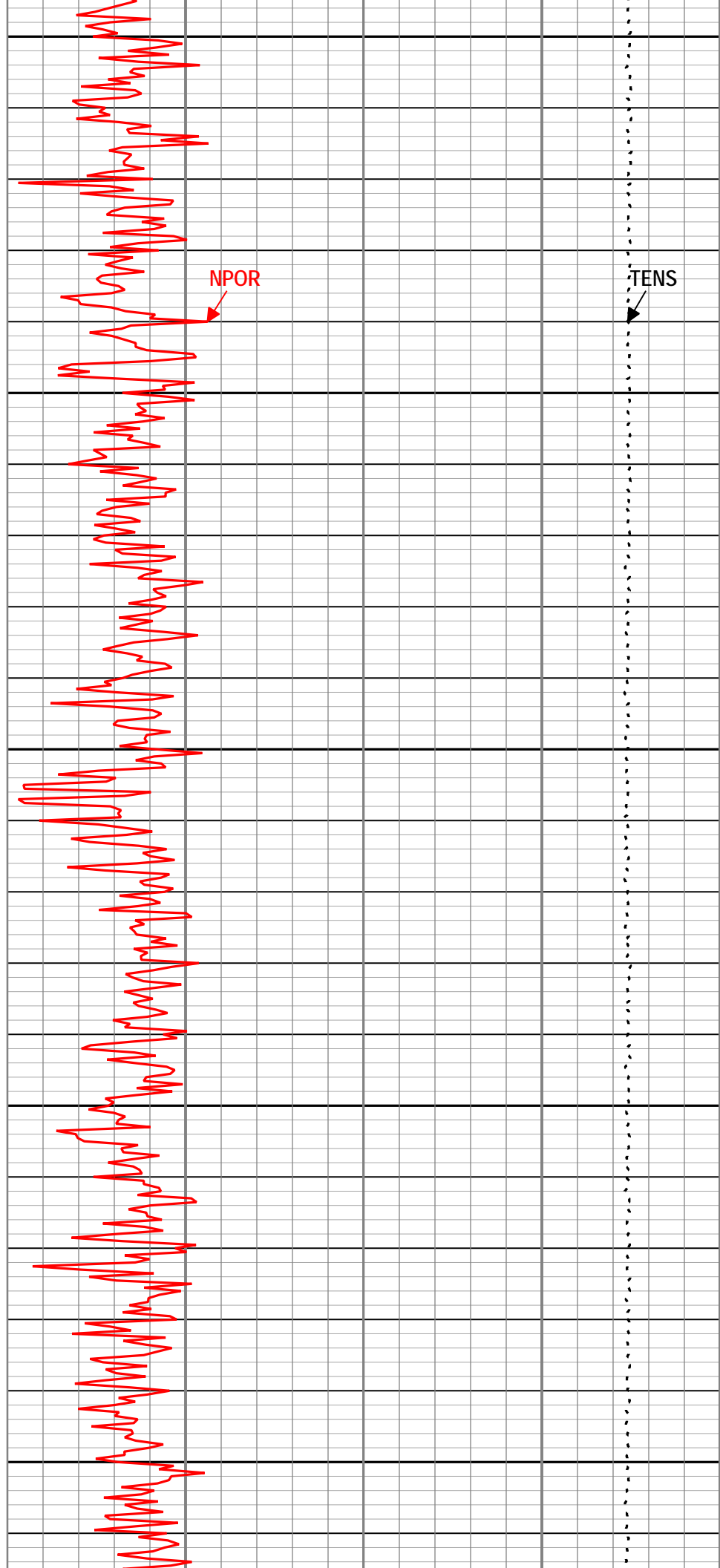
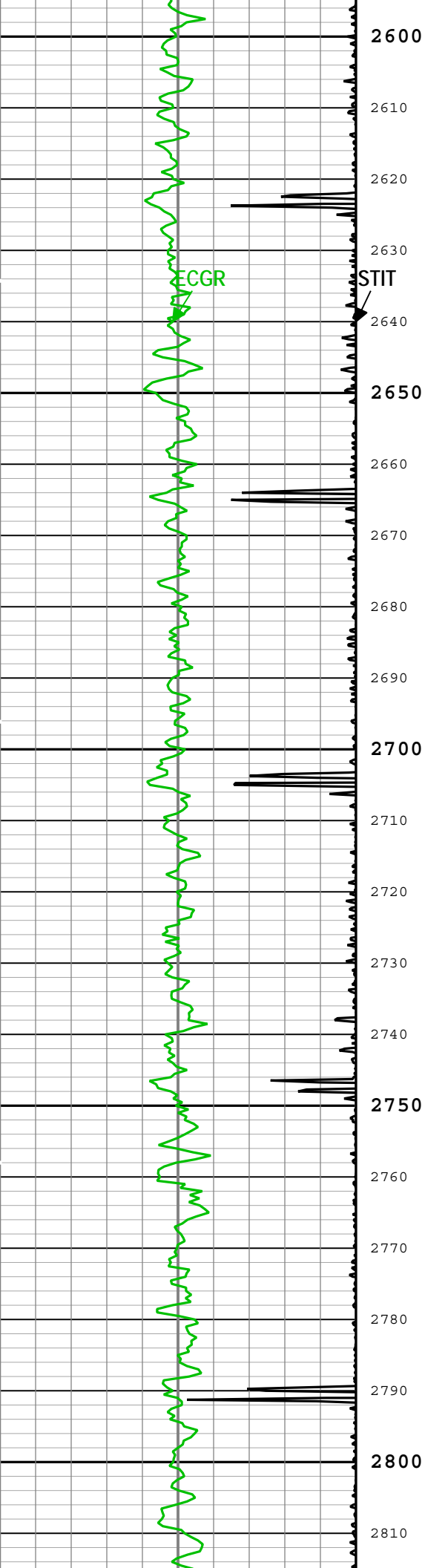


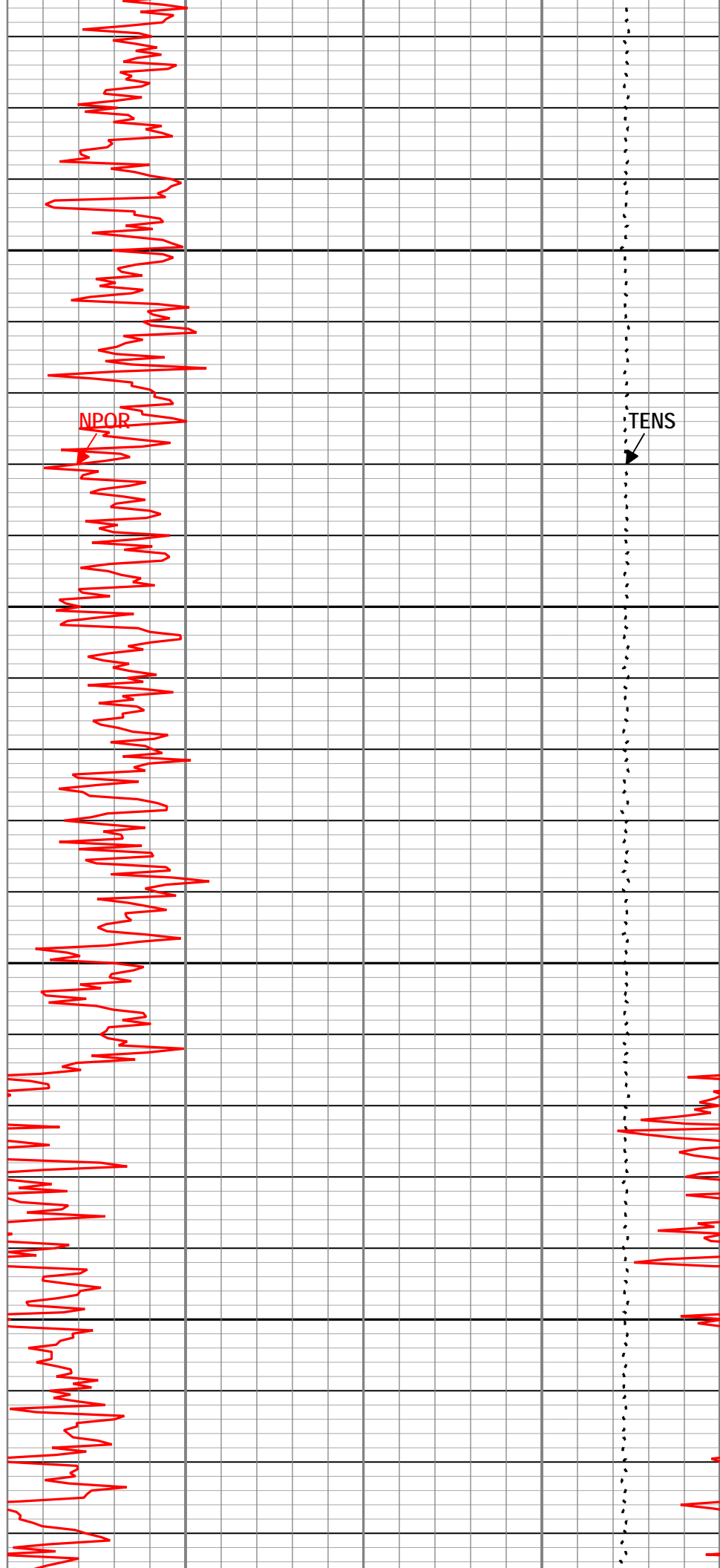
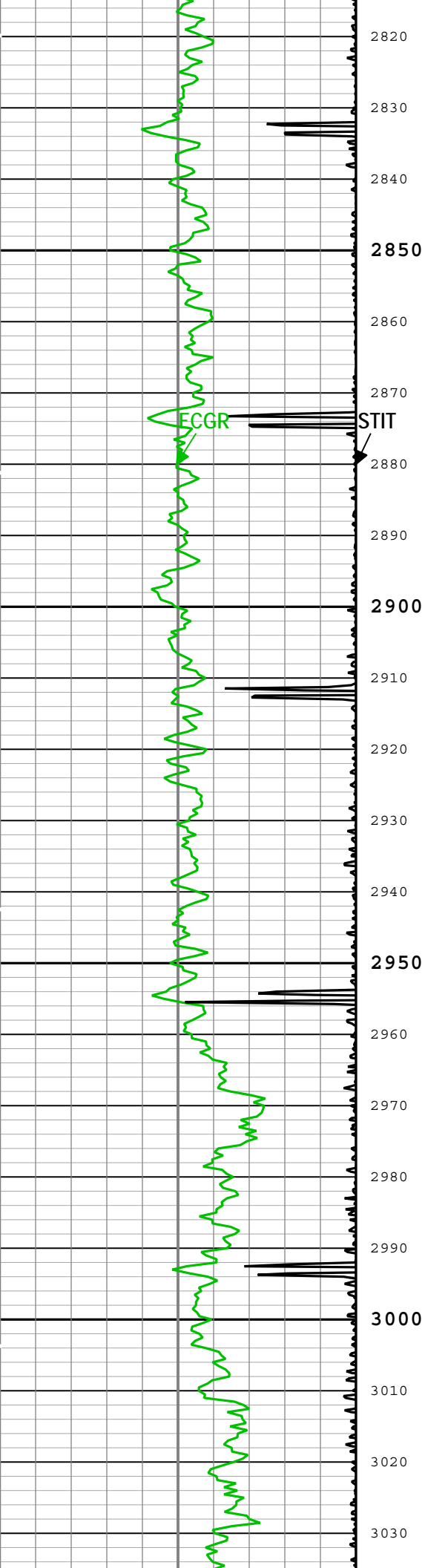


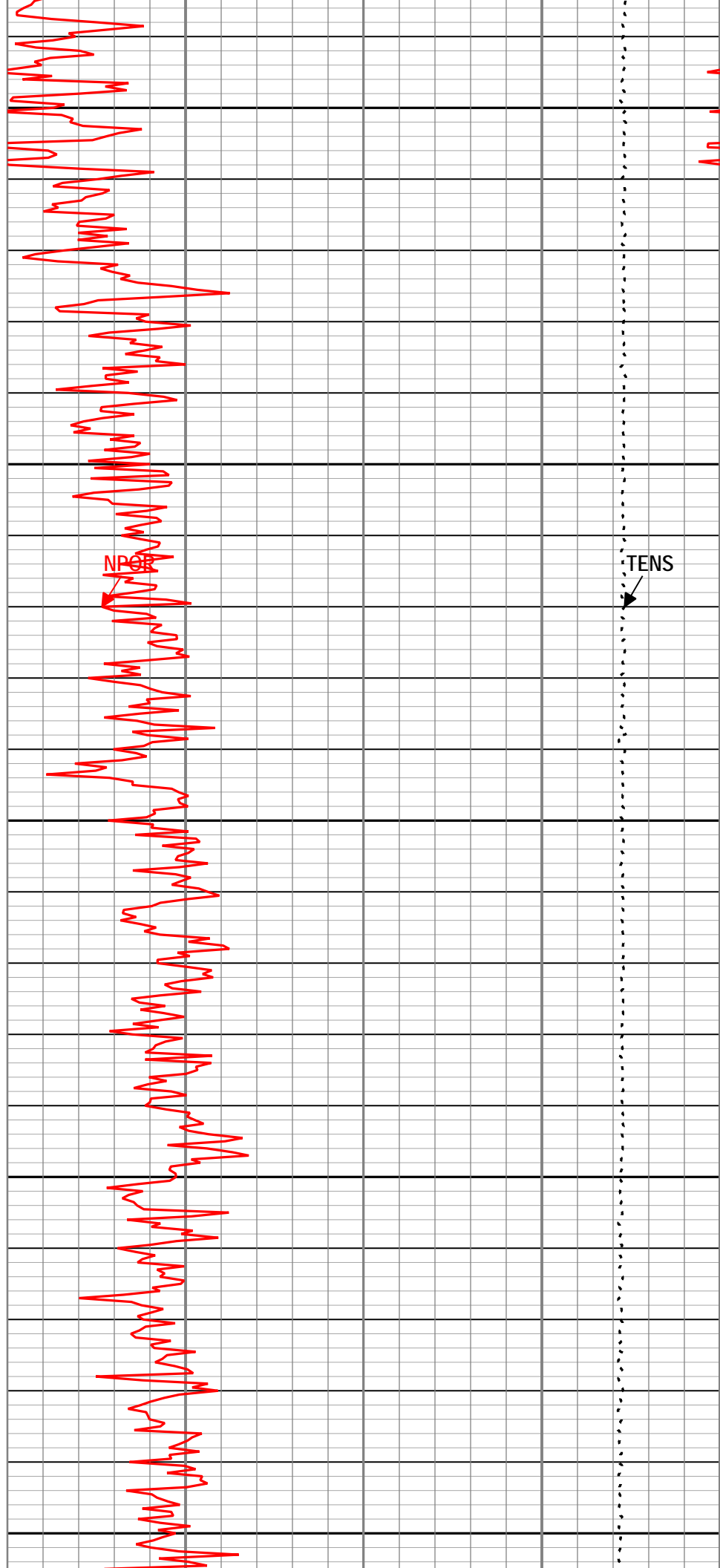
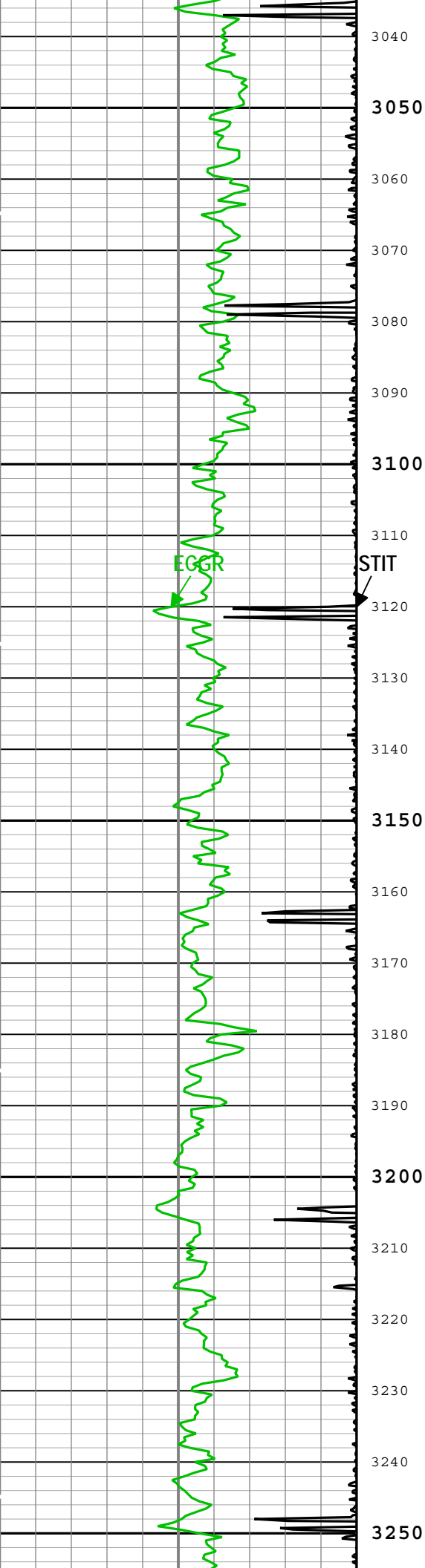


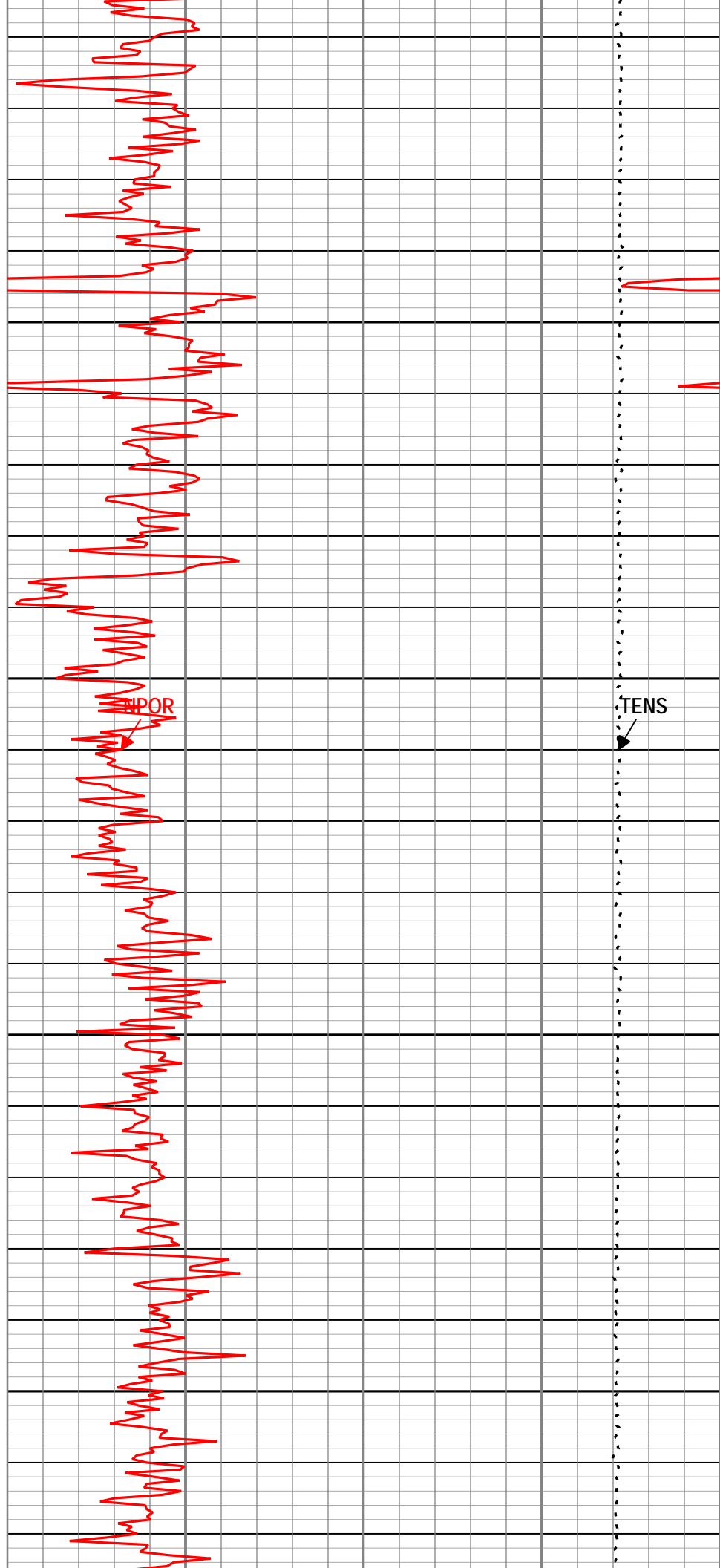
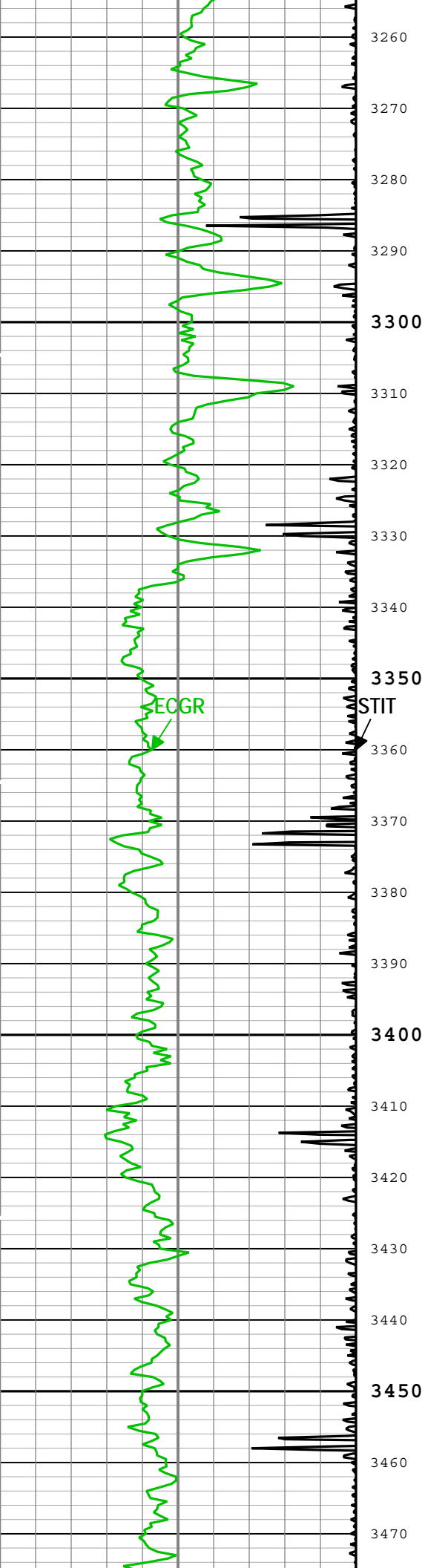


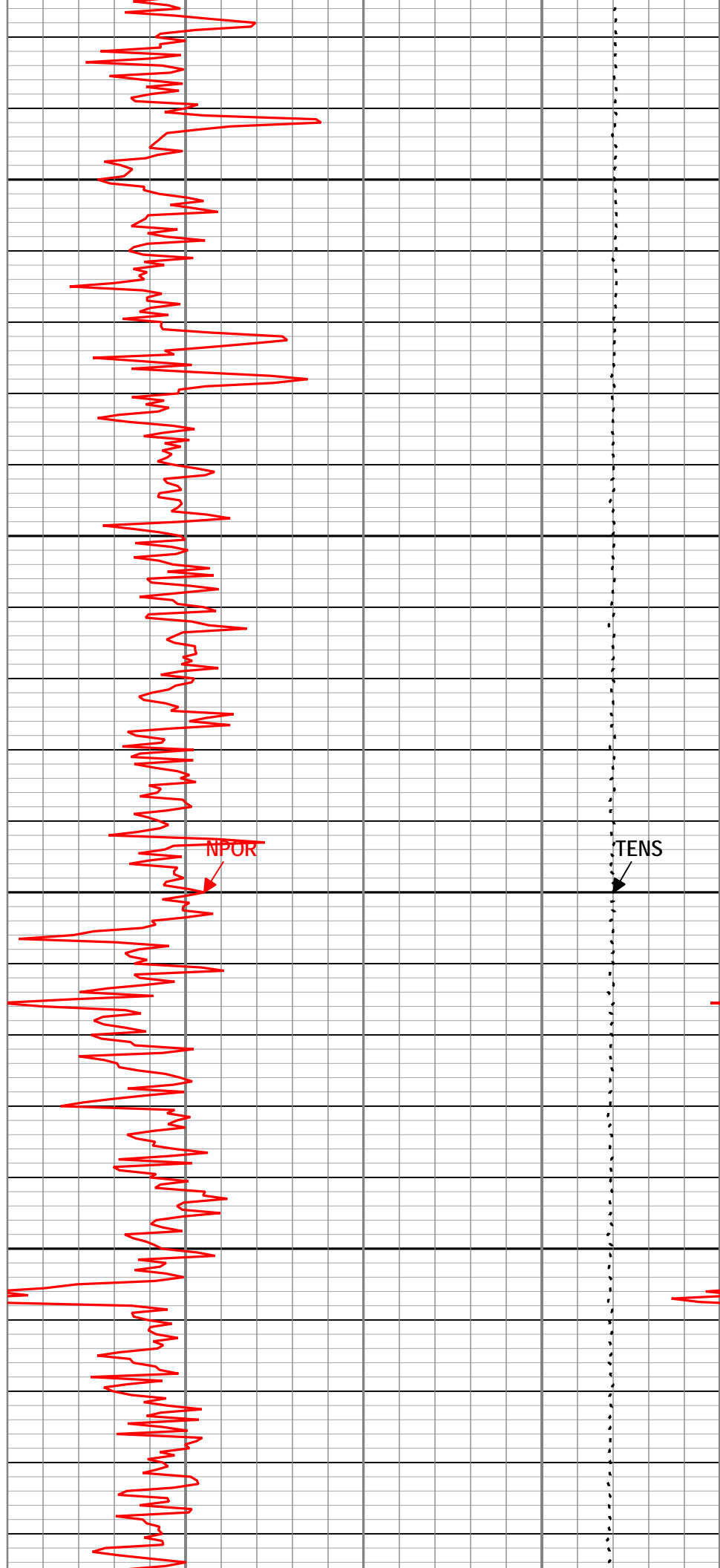
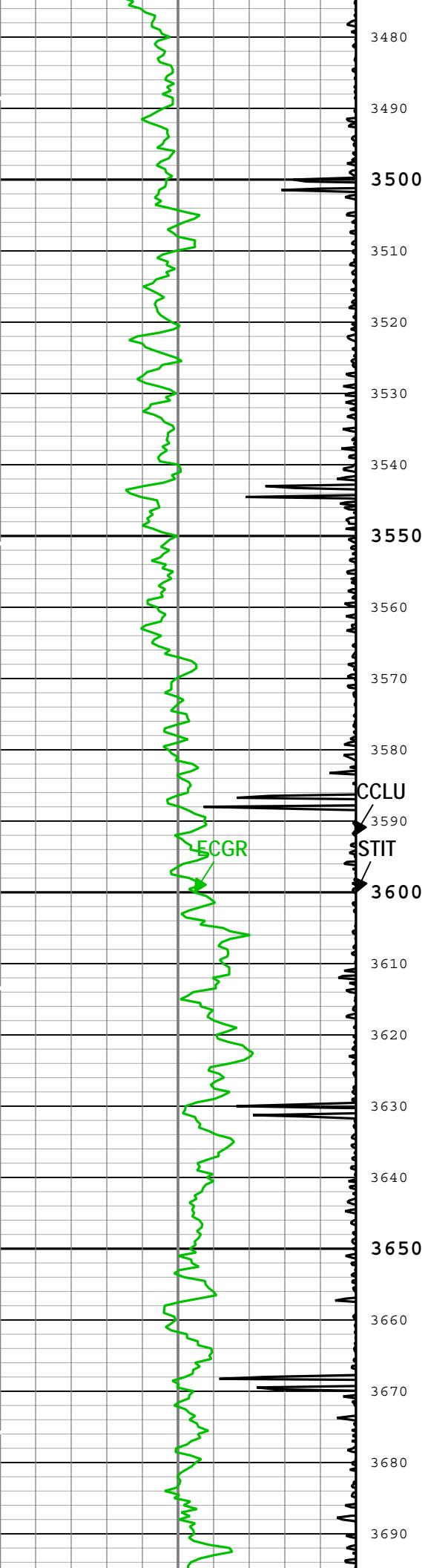


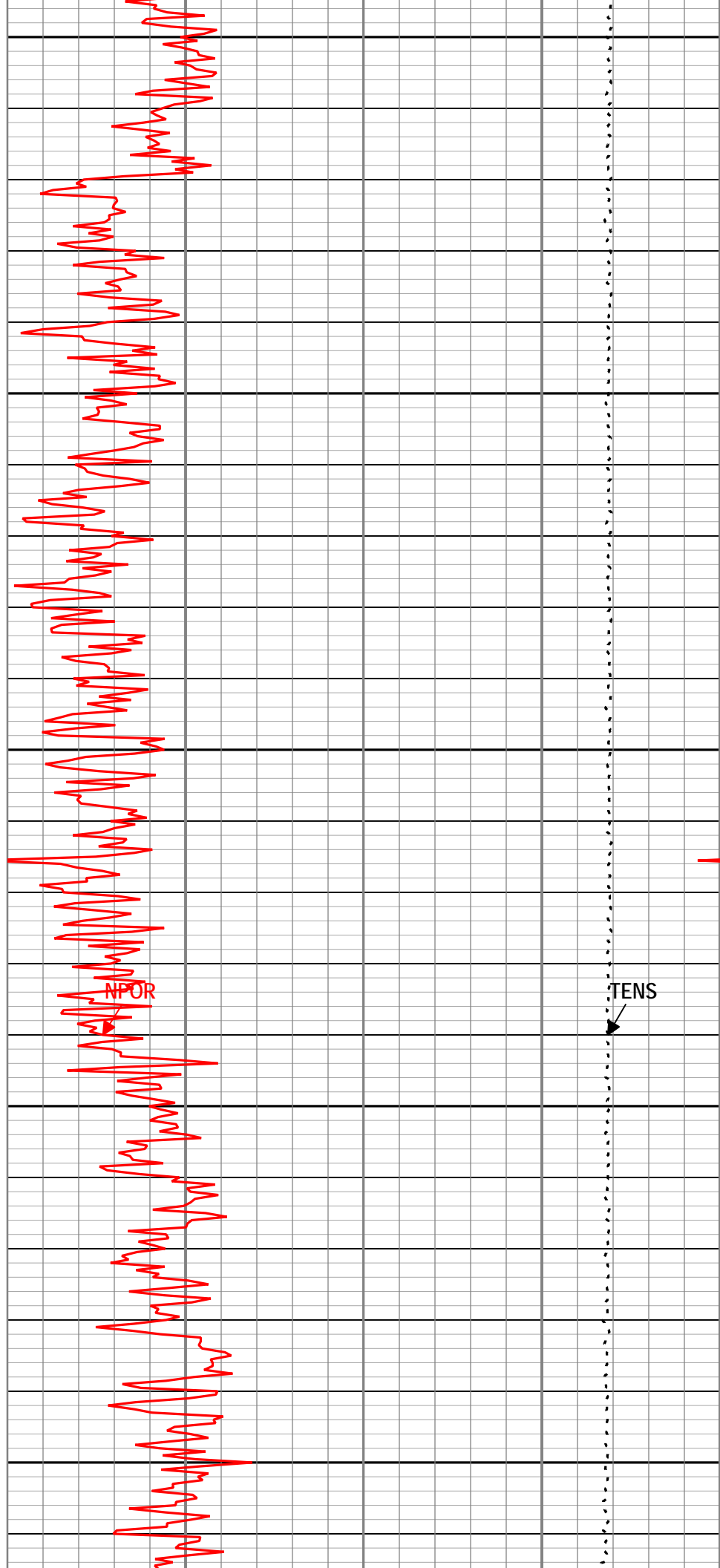
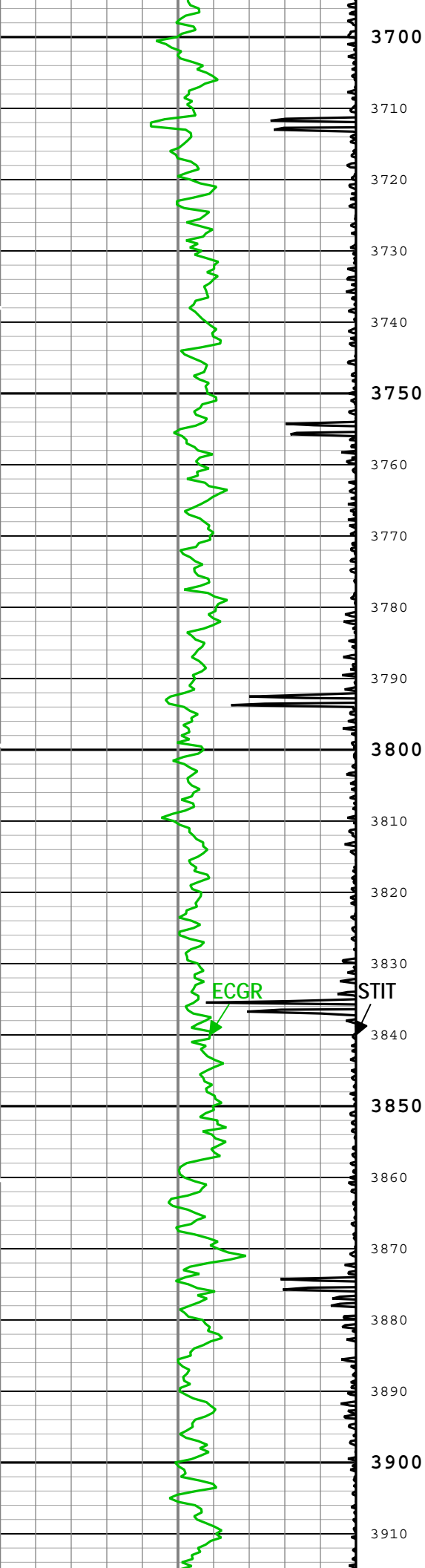


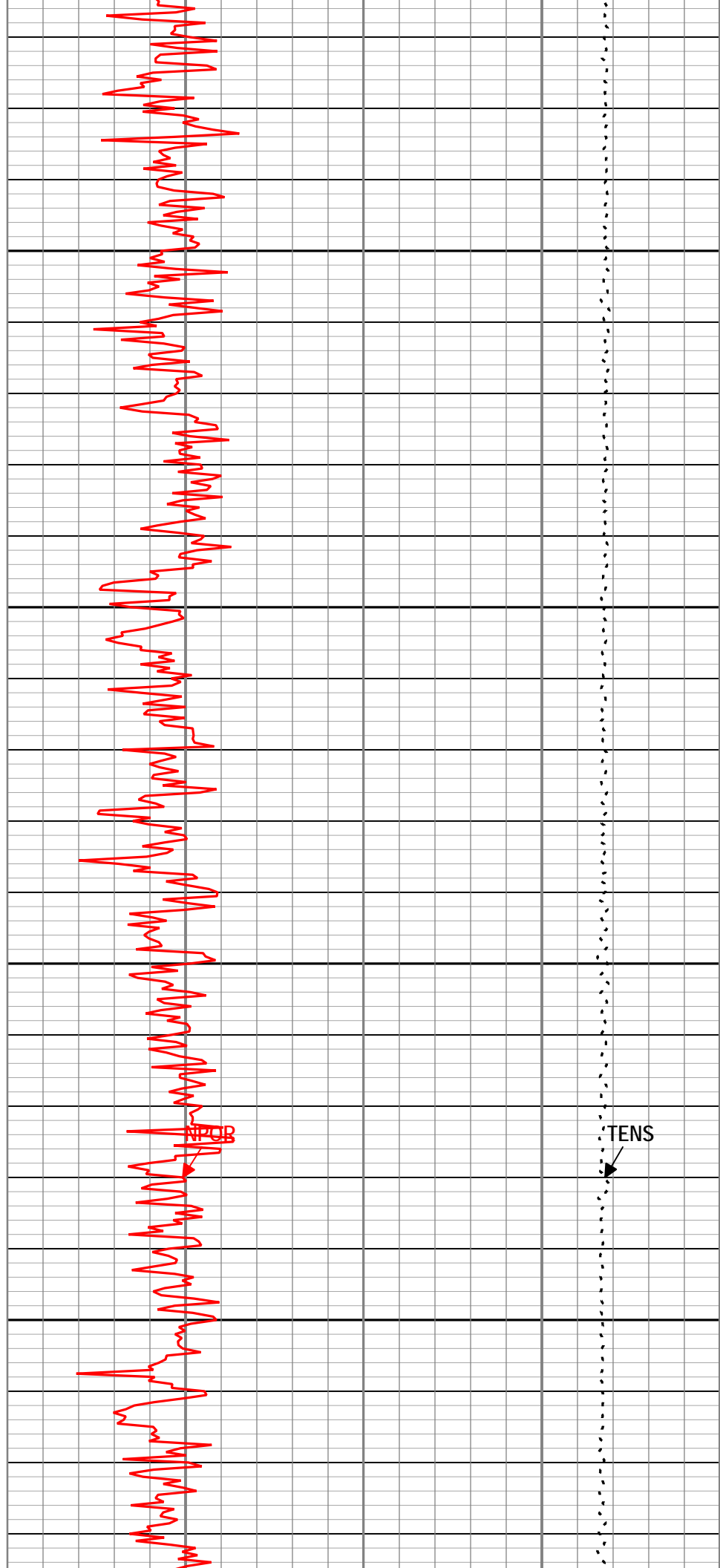
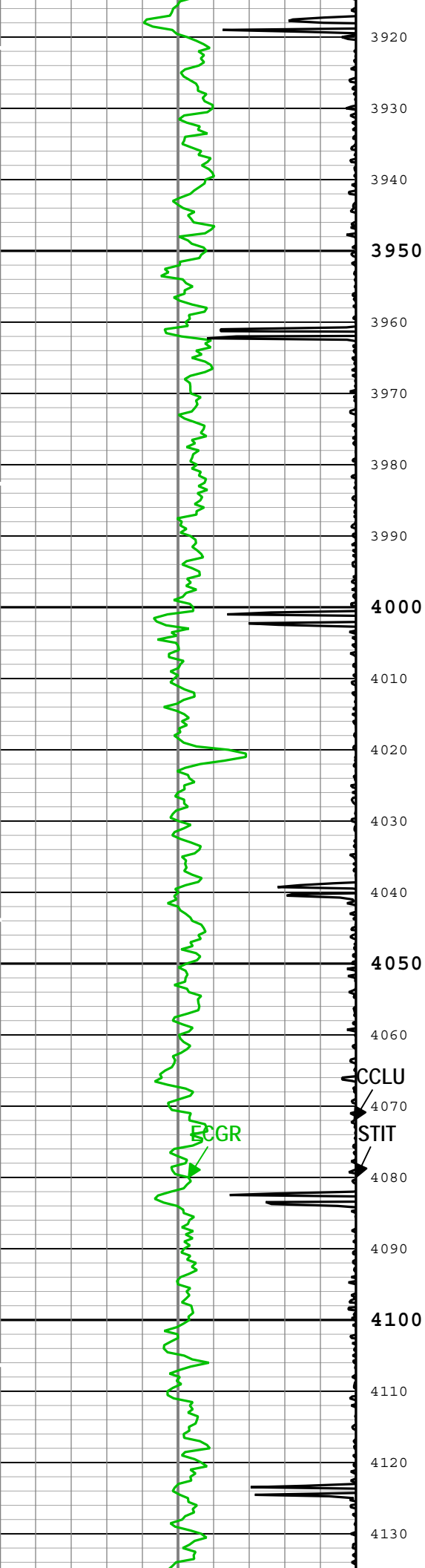


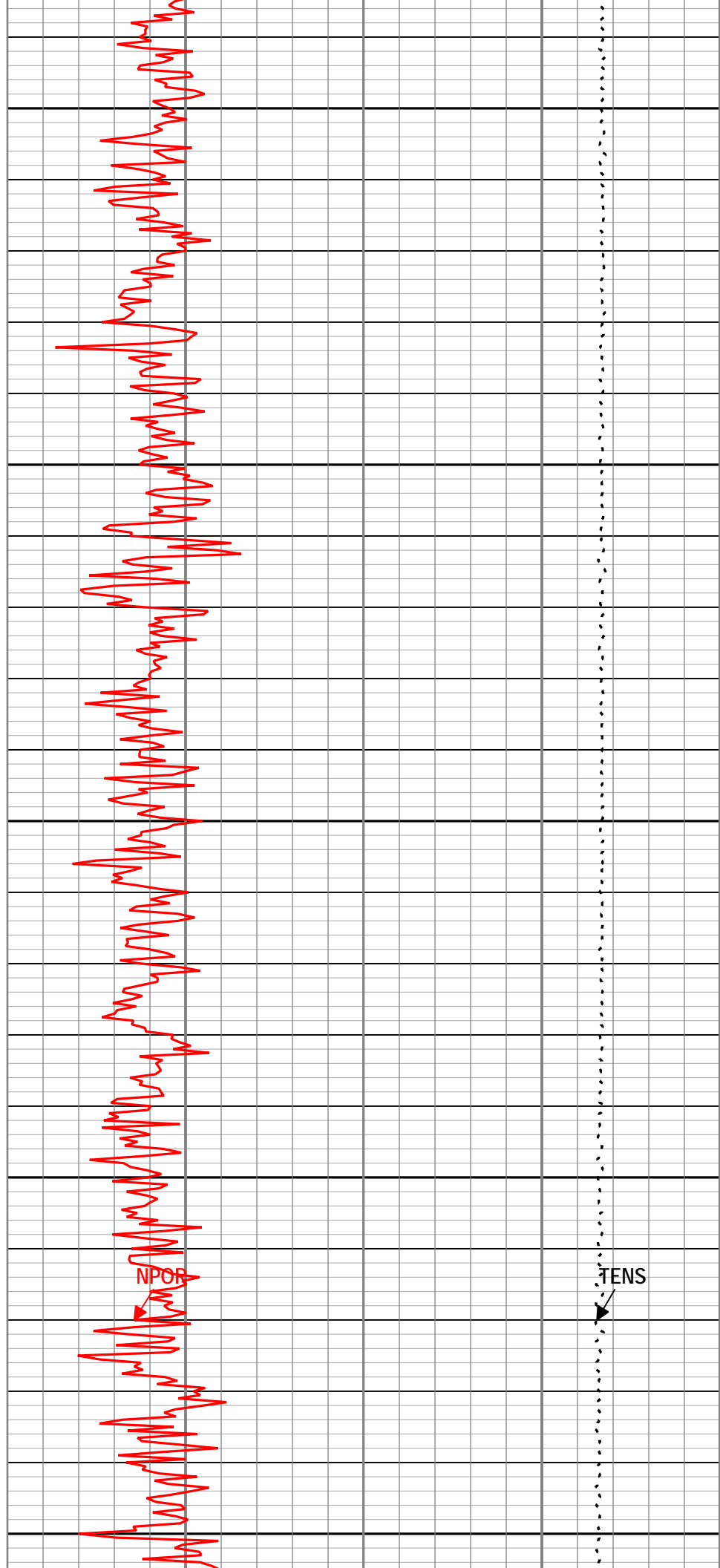
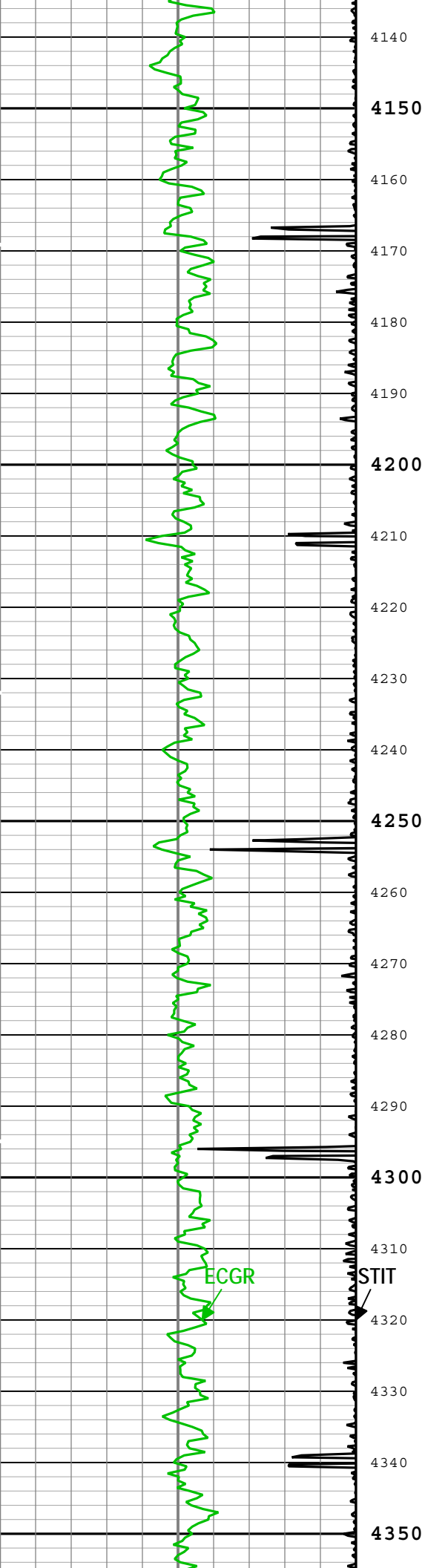


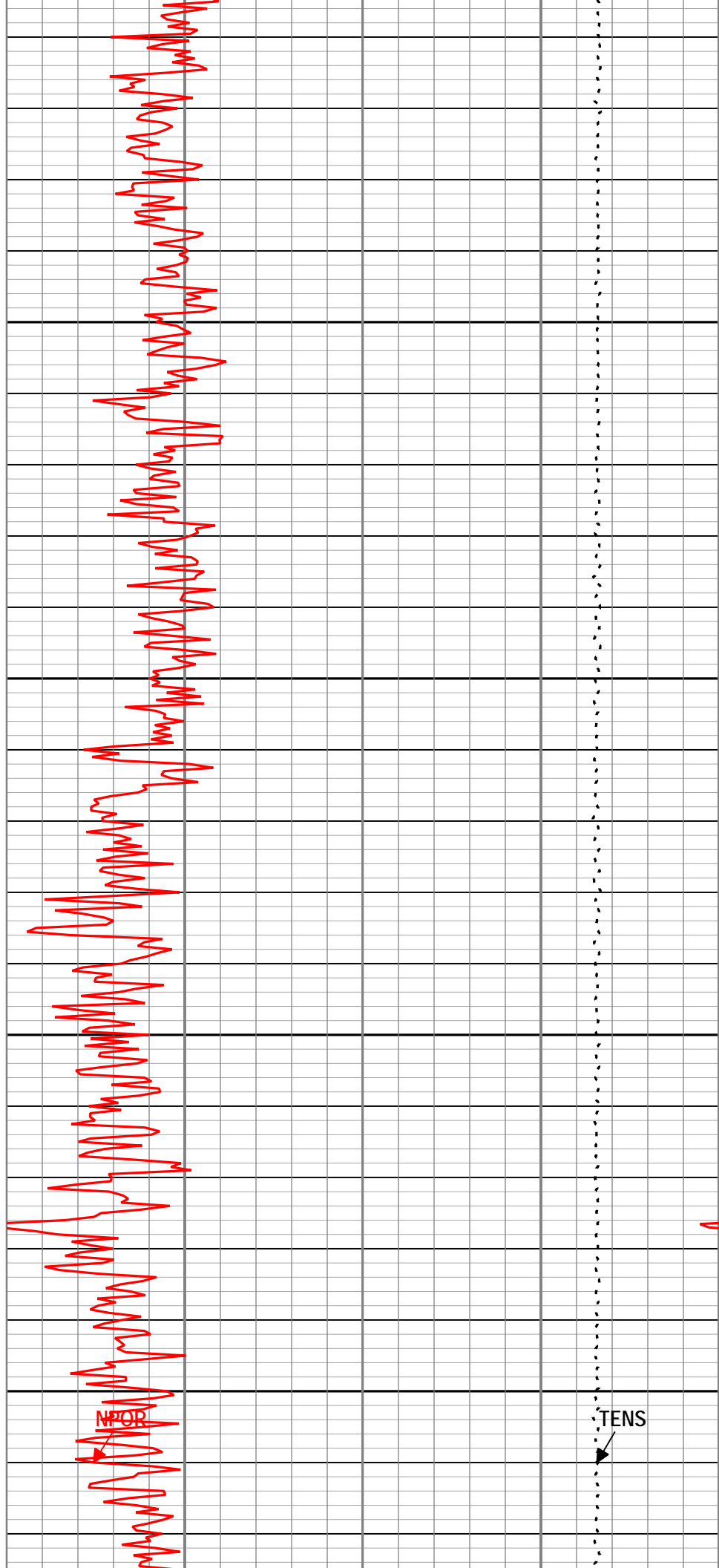
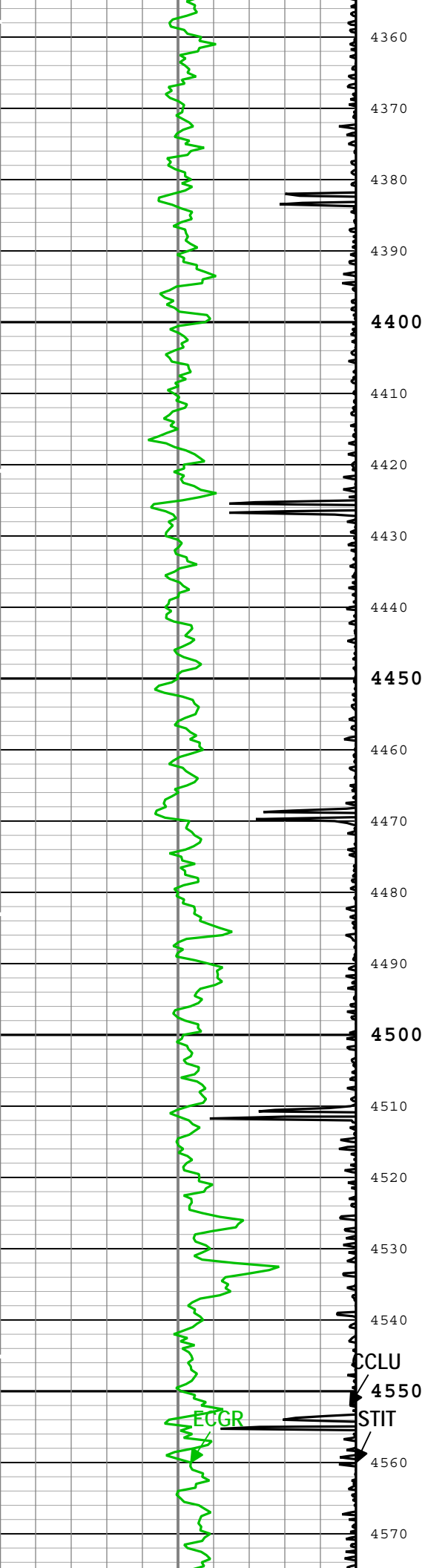


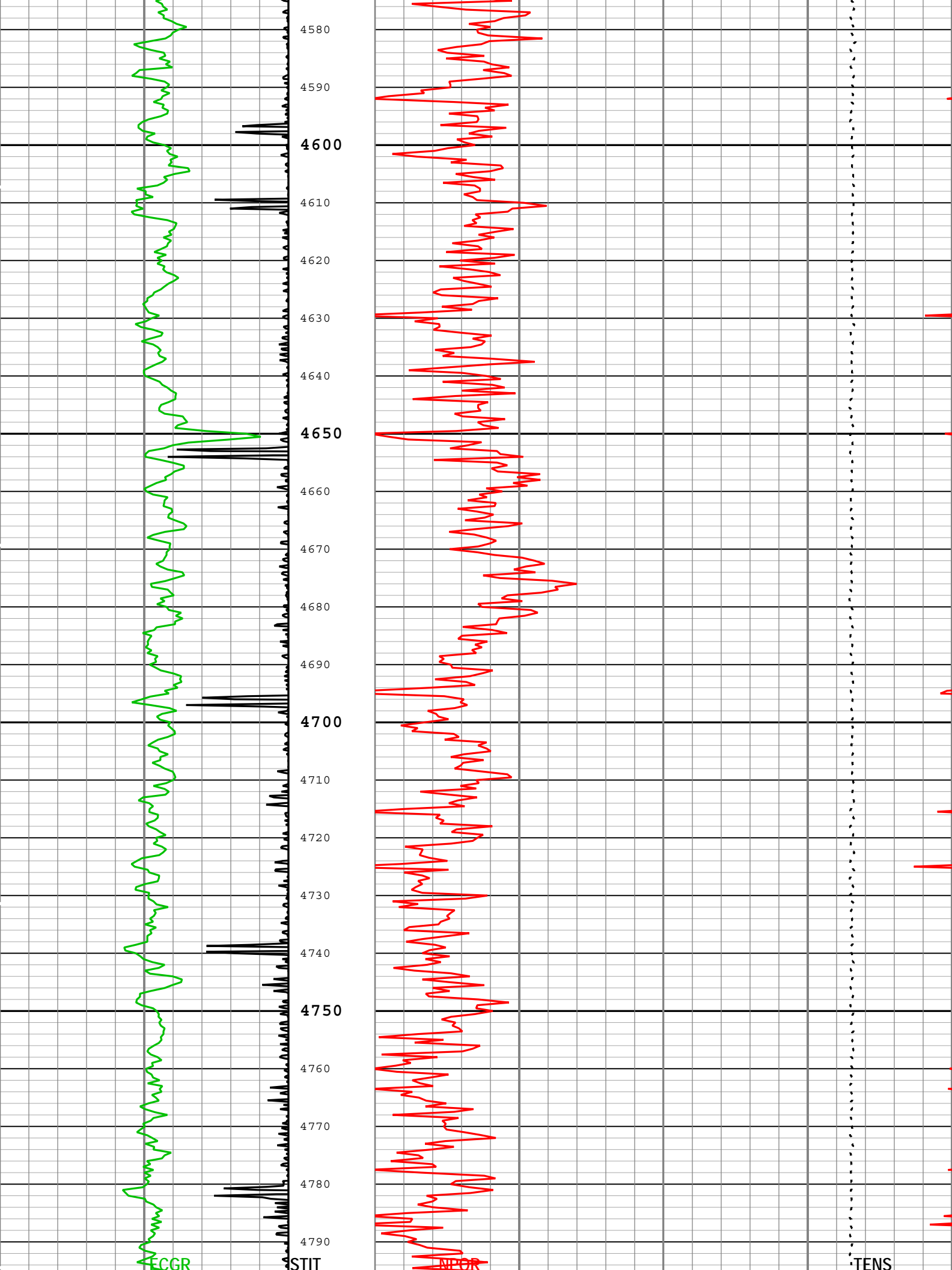


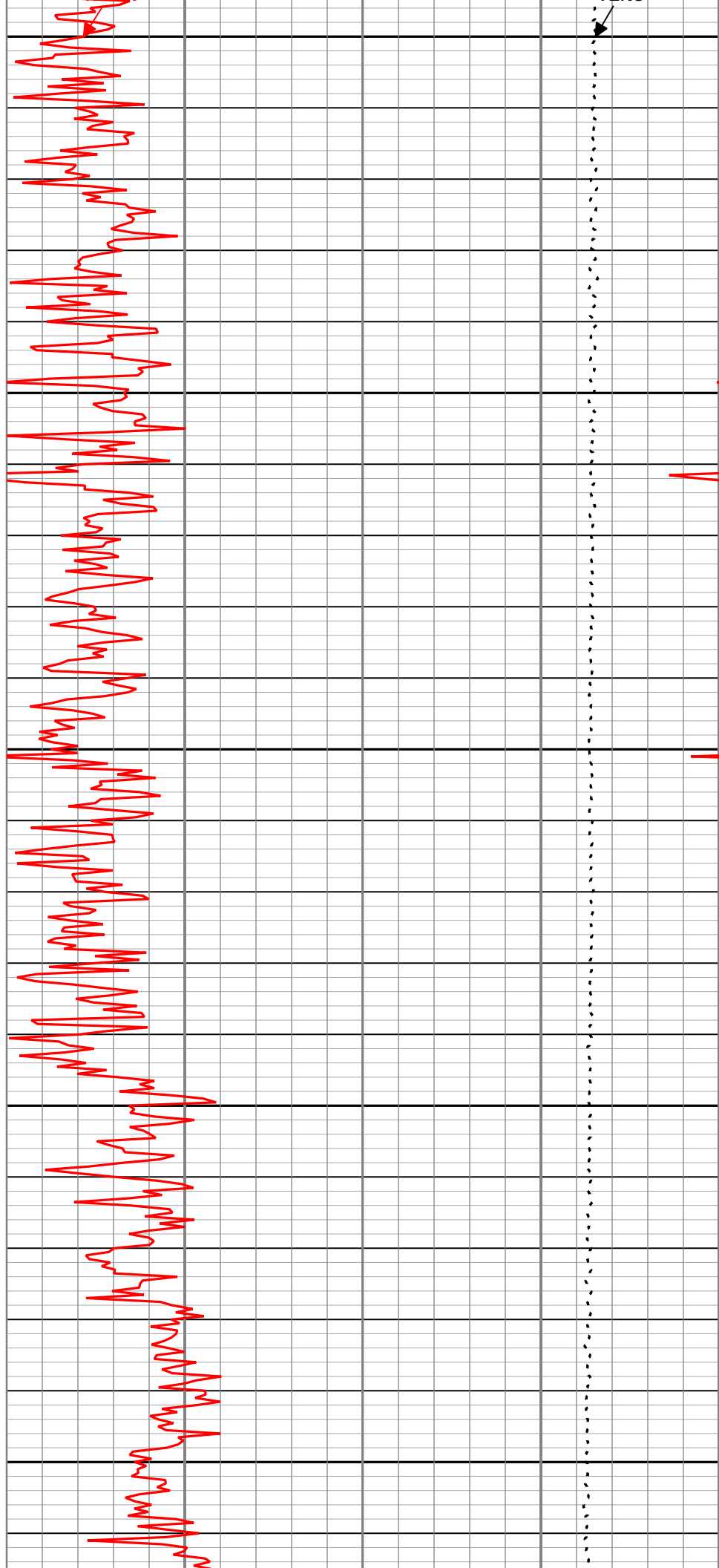
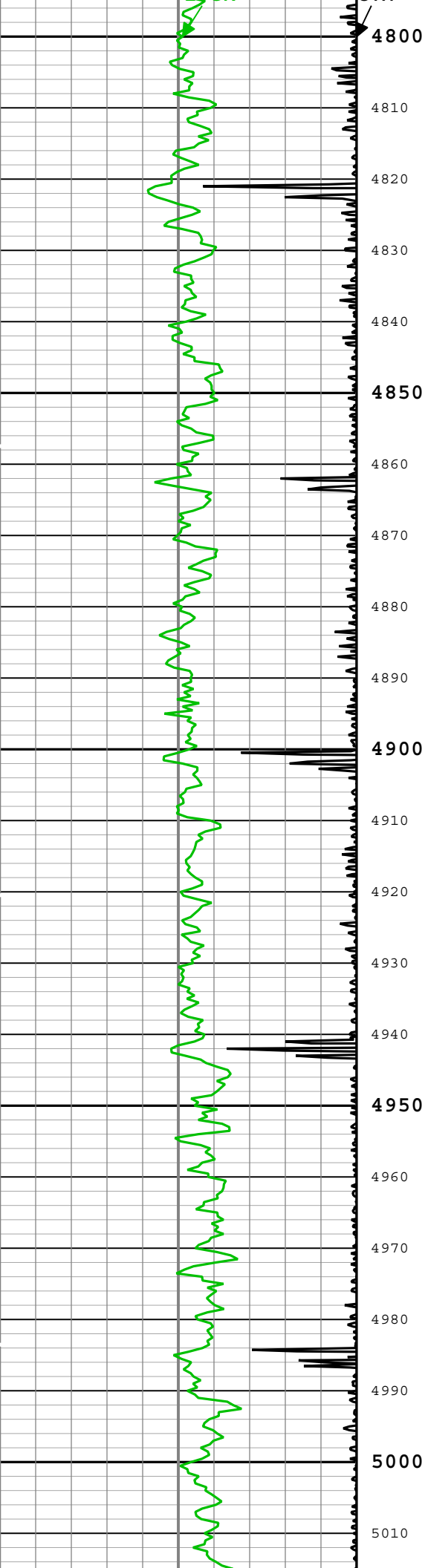


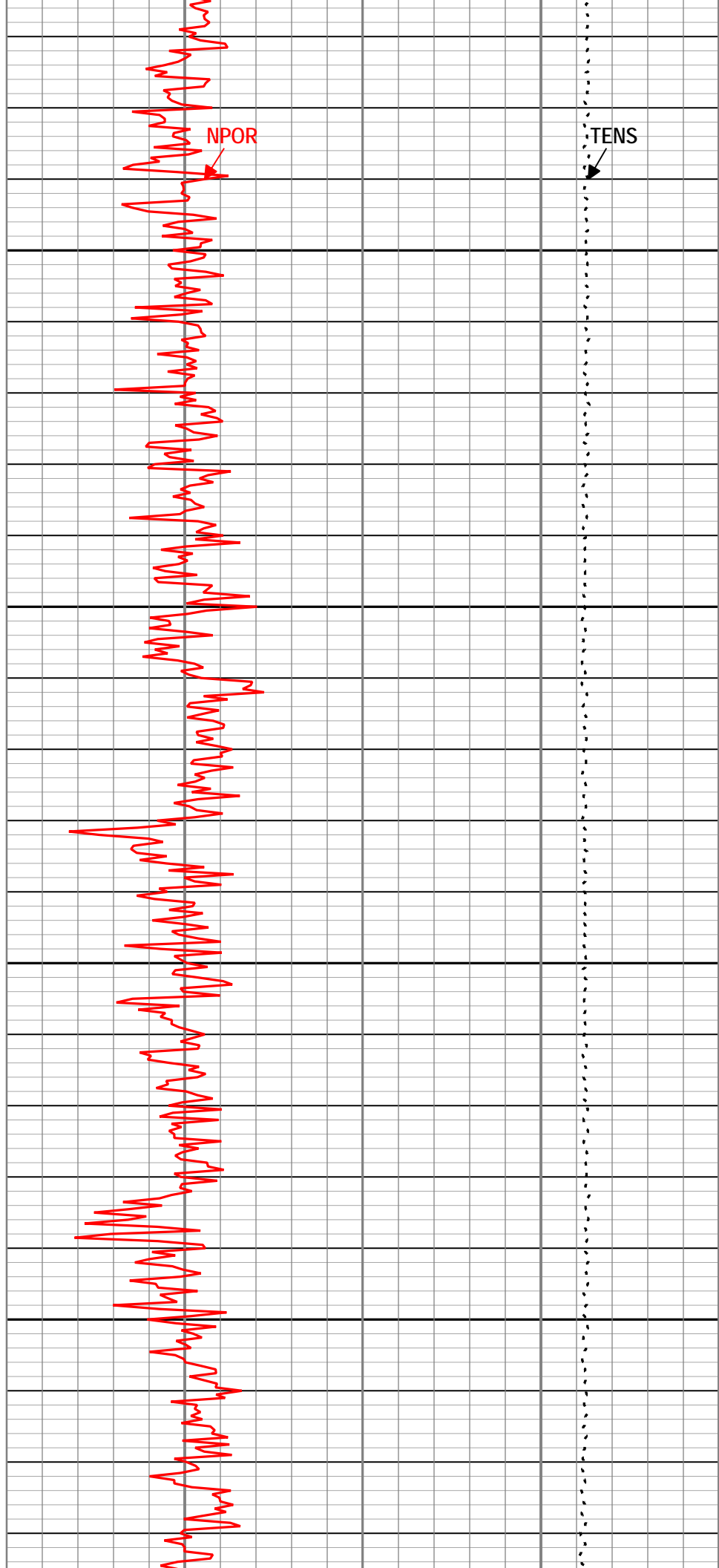
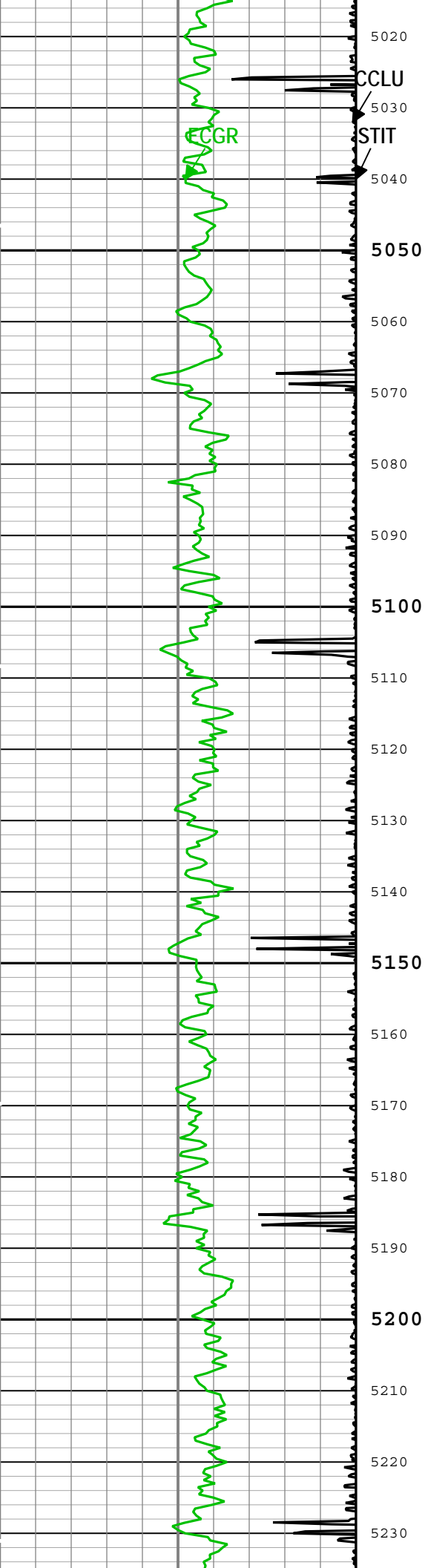


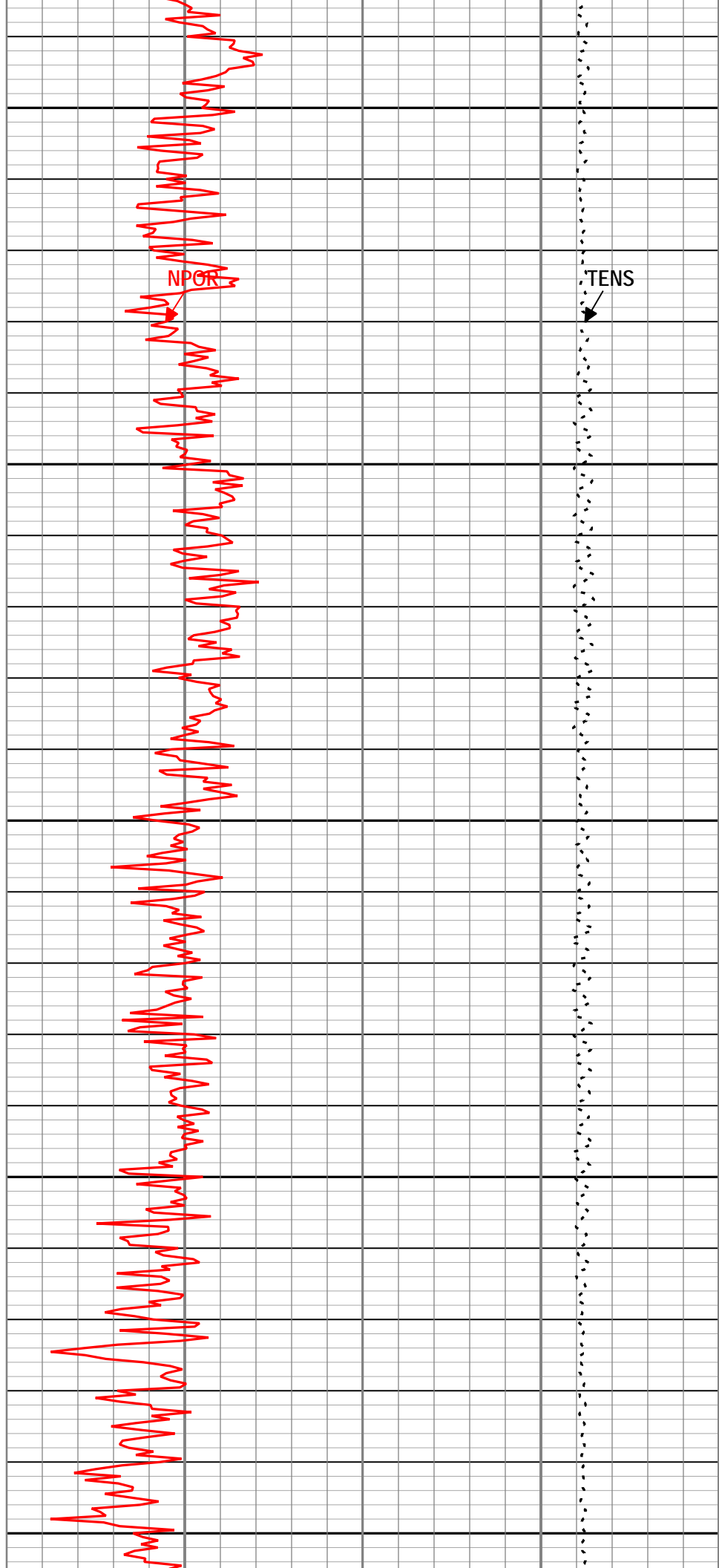
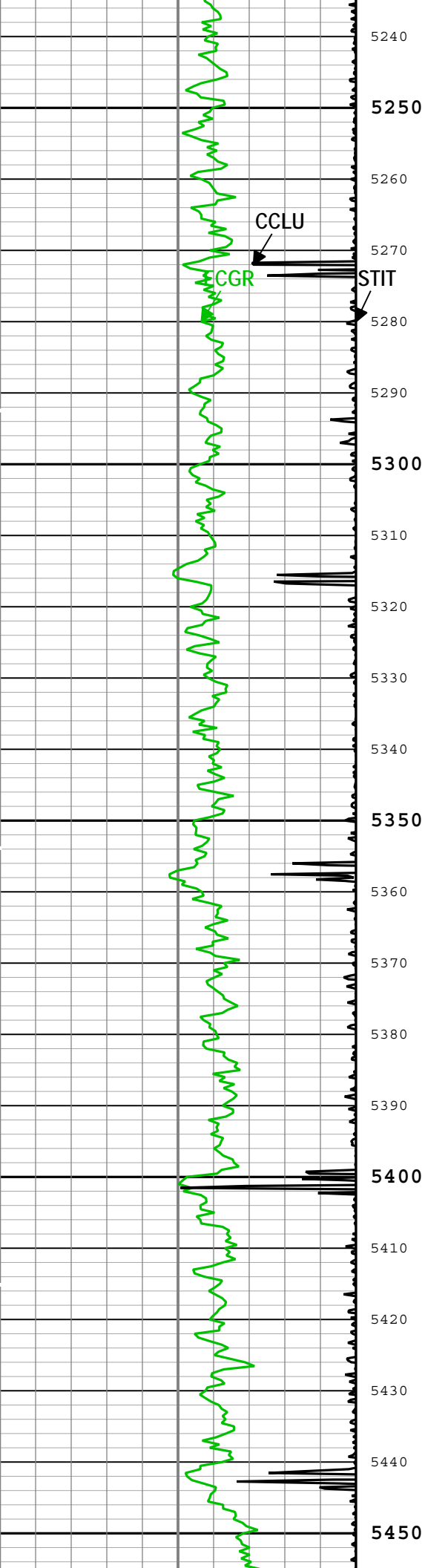


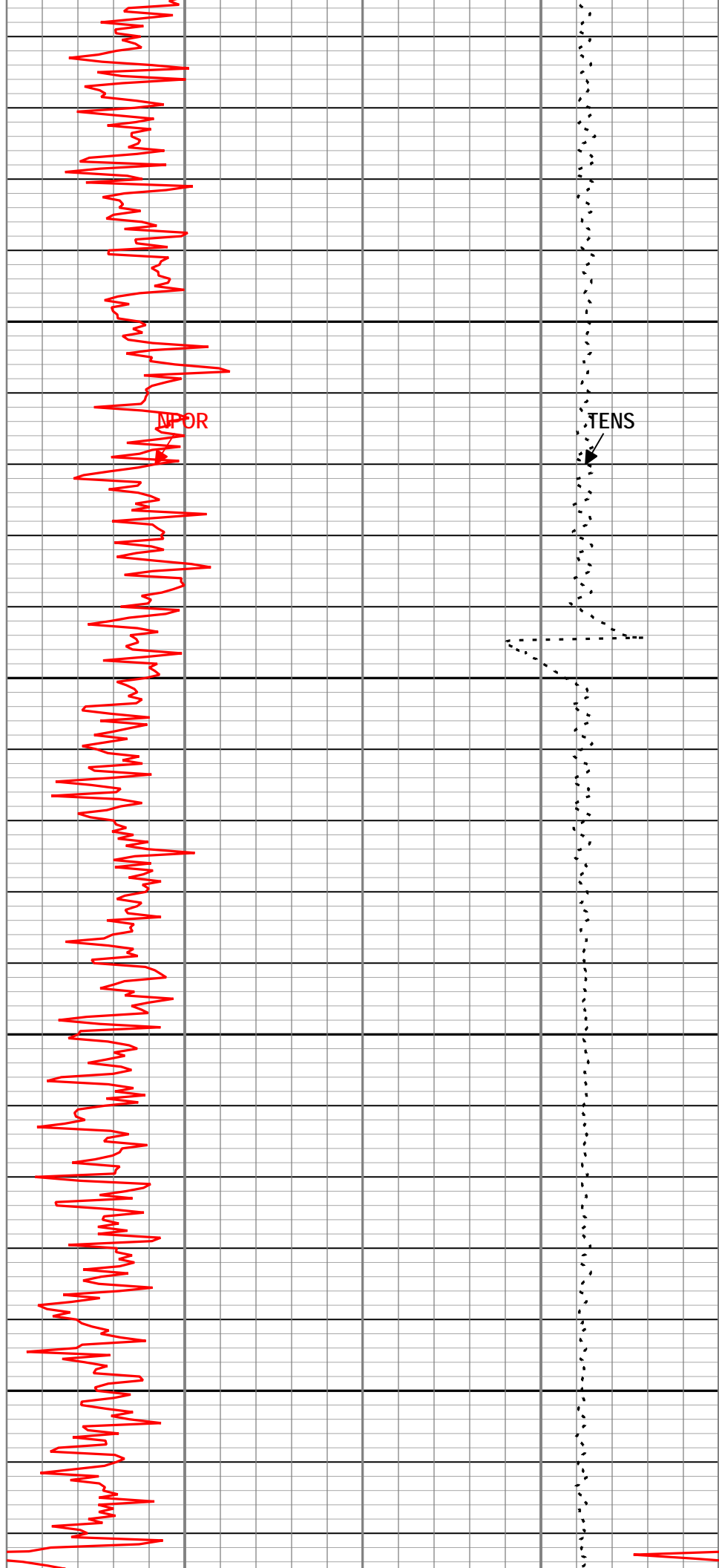
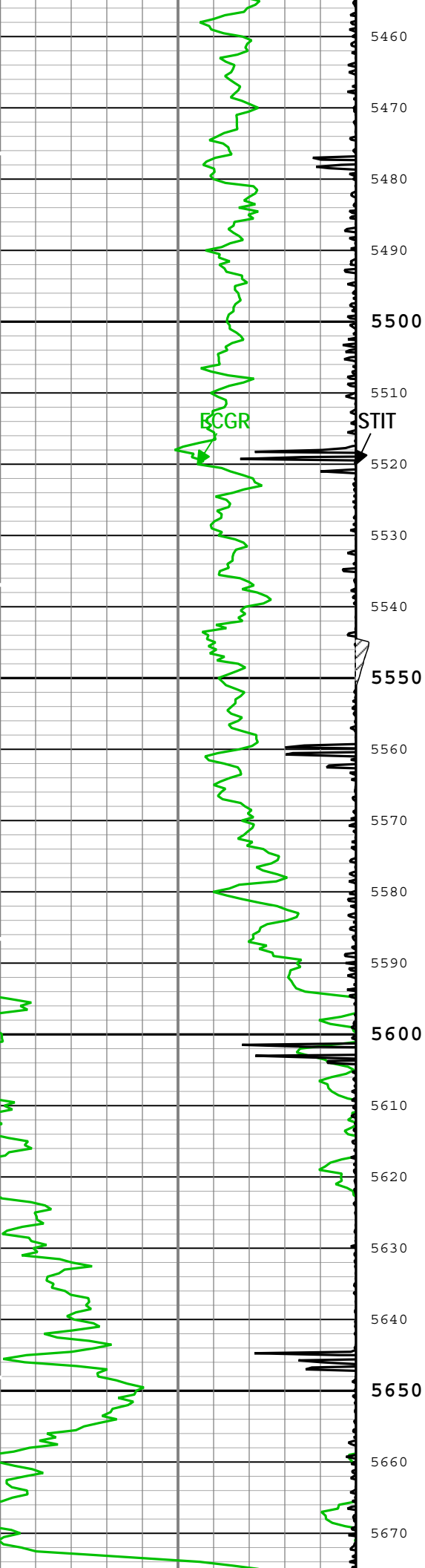


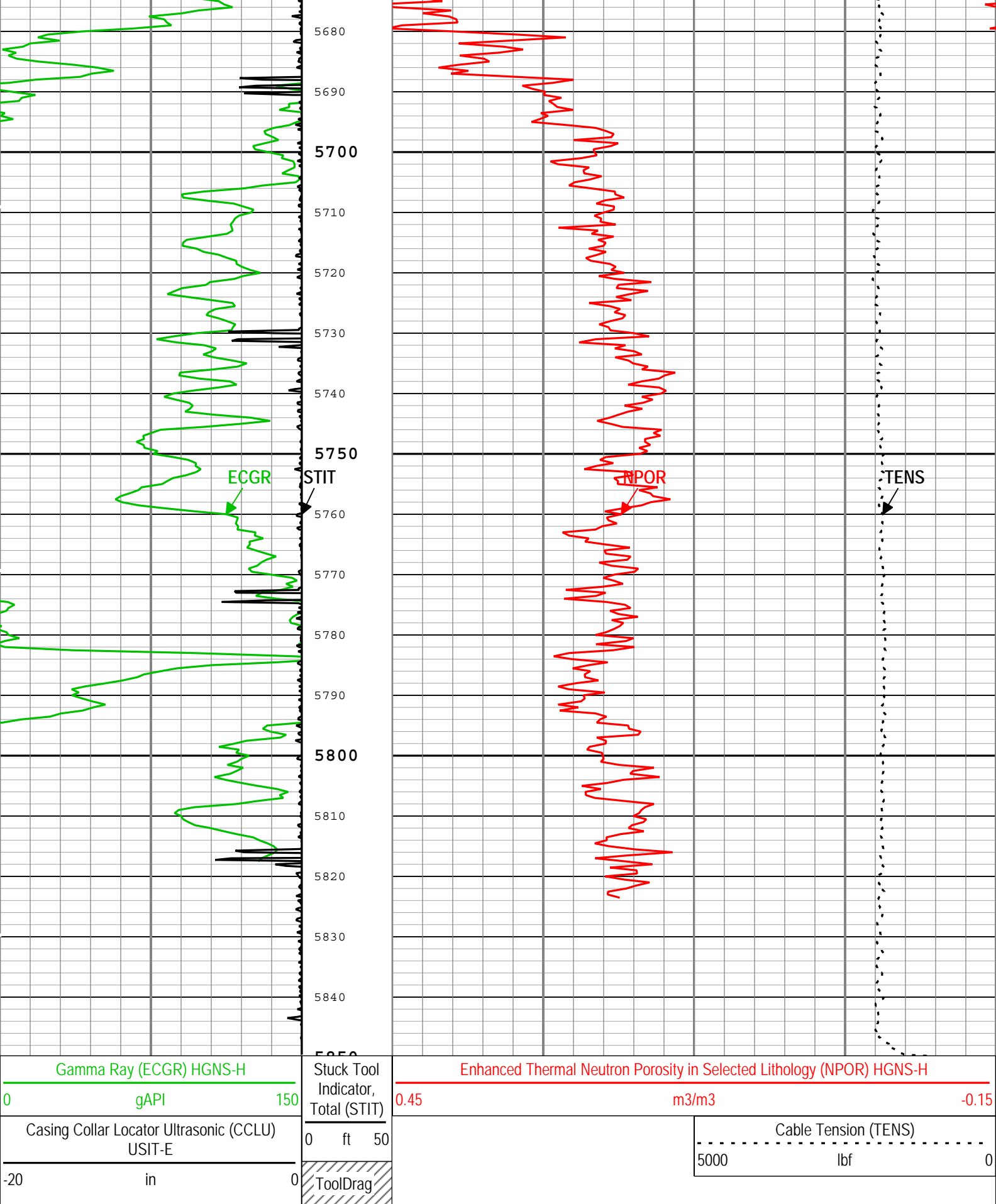












Channel Processing Parameters

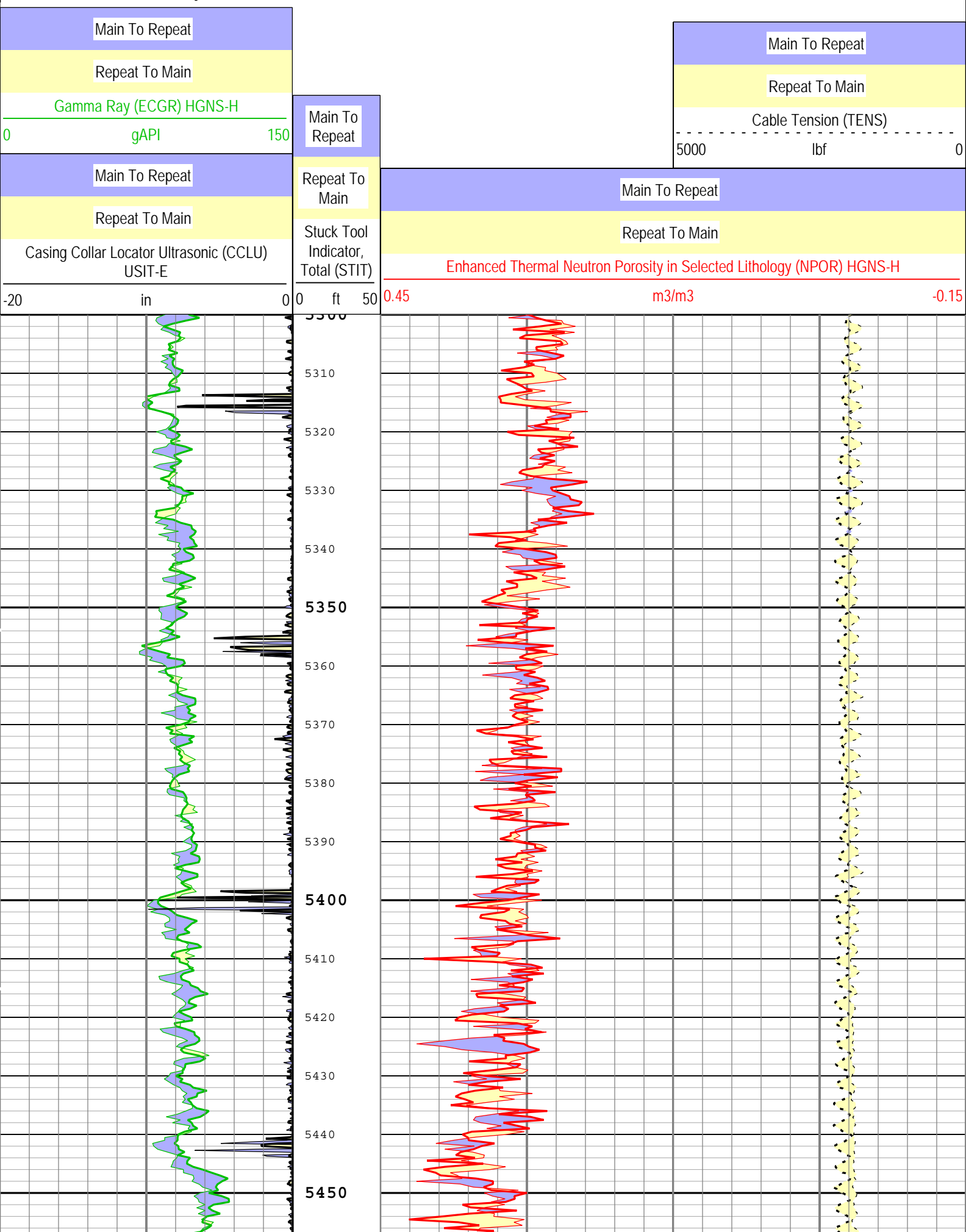
Run 1: Parameters

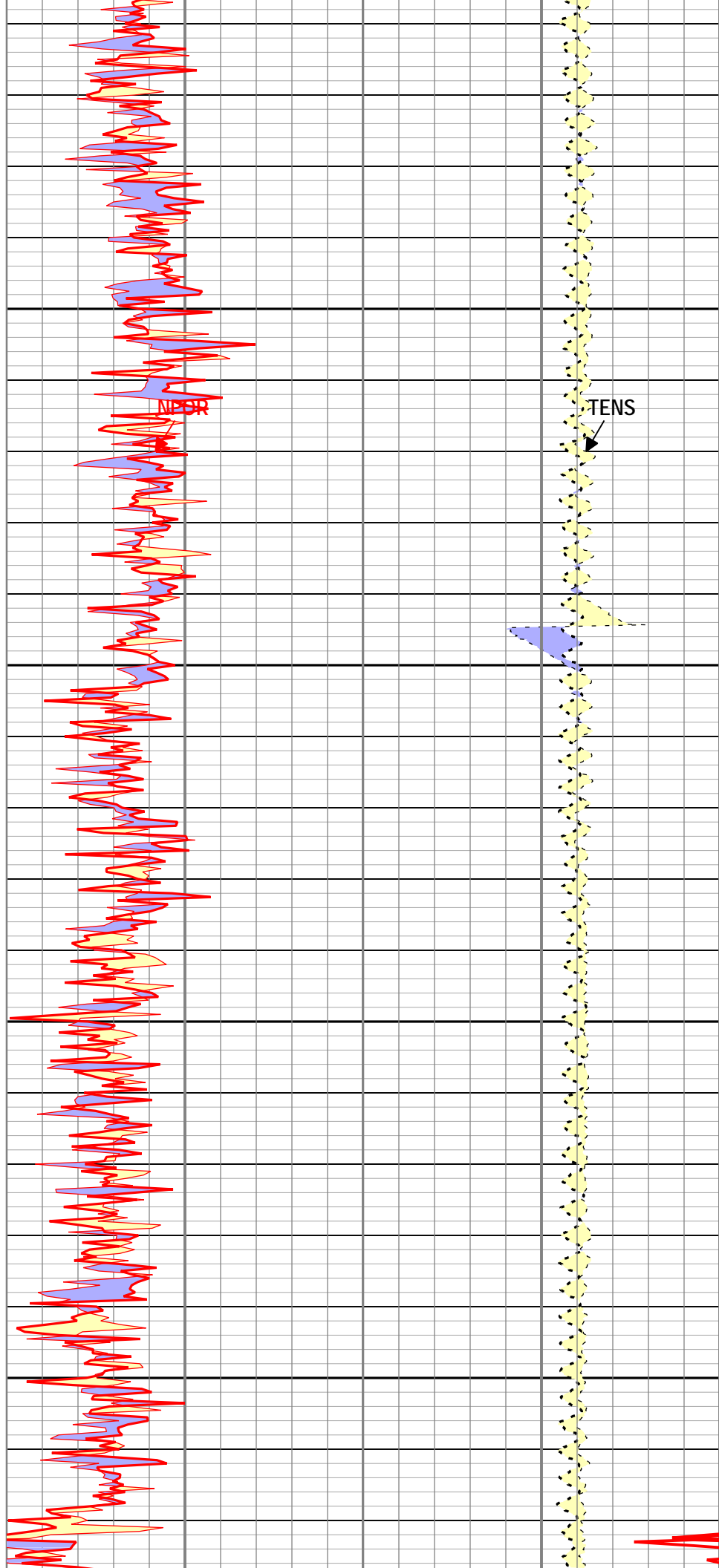
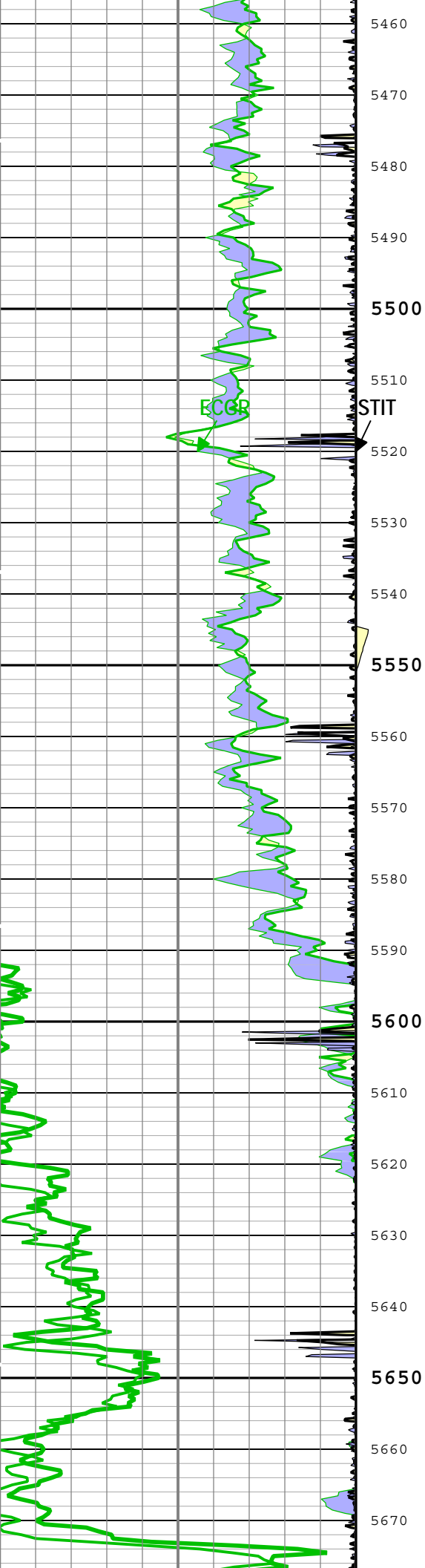
Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BHT	Bottom Hole Temperature	Borehole	207	degF
BS	Bit Size	WLSESSION	8.75	in
BSAL	Borehole Salinity	Borehole	0	ppm
CBLO	Casing Bottom (Logger)	WLSESSION	6020	ft
CCCO	Casing & Cement Thickness Correction Option	HGNS-H	Yes	
CDEN	Cement Density	HGNS-H	12.8	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Light Cement	
THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.362	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DFT_WATER	Drilling Fluid Water Type	Borehole	Salt Brine	
DTMD	Borehole Fluid Slowness	Borehole	190	us/ft
FD	Fluid Density	USIT-E	9.8	lbm/gal
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
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	BS	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	REMS	
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	CTEM	
HEMA	Hematite Presence Flag	Borehole	No	
HSCO	Hole Size Correction Option	HGNS-H	Yes	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MATR	Rock Matrix for Neutron Porosity Corrections	Borehole	SANDSTONE	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.5	us
MFST	Mud Filtrate Sample Temperature	Borehole	68	degF
MST	Mud Sample Temperature	Borehole	68	degF
RMFS	Resistivity of Mud Filtrate Sample	Borehole	0.15	ohm.m
RMS	Resistivity of Mud Sample	Borehole	0.2	ohm.m
TD	Total Measured Depth	Borehole	5850	ft
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0	Mrayl
UFGDE	Fiberglass Density	USIT-E	16.27	lbm/gal
UFGPS	Fiberglass Processing Selection	USIT-E	No	
UFGVL	Fiberglass Velocity	USIT-E	9678.48	ft/s
USI_FSOD	USIT USI Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF	
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-E	Automatic	
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	Manual	
ZMUD	Acoustic Impedance of Mud	Borehole	Depth Zoned	Mrayl

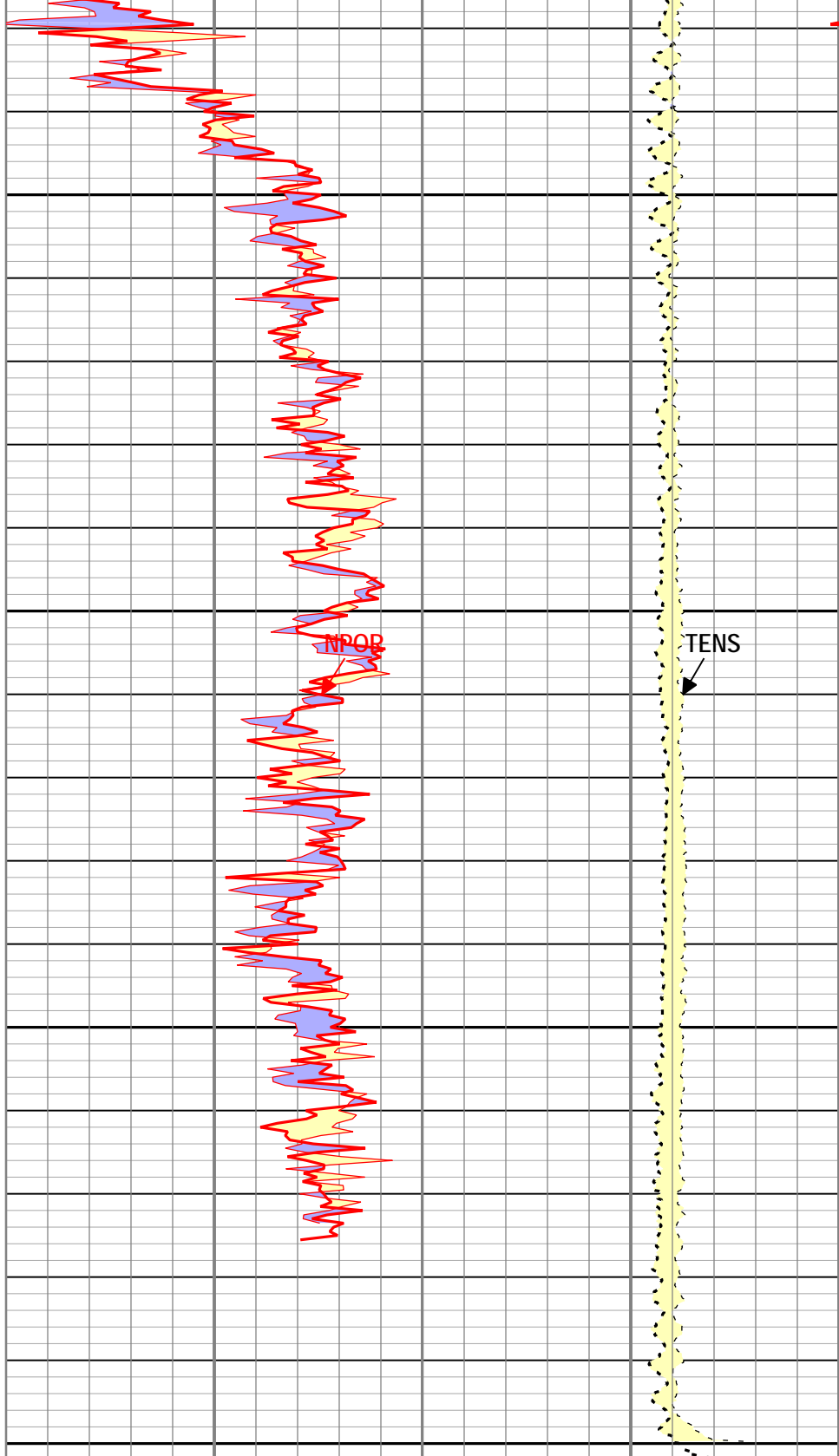
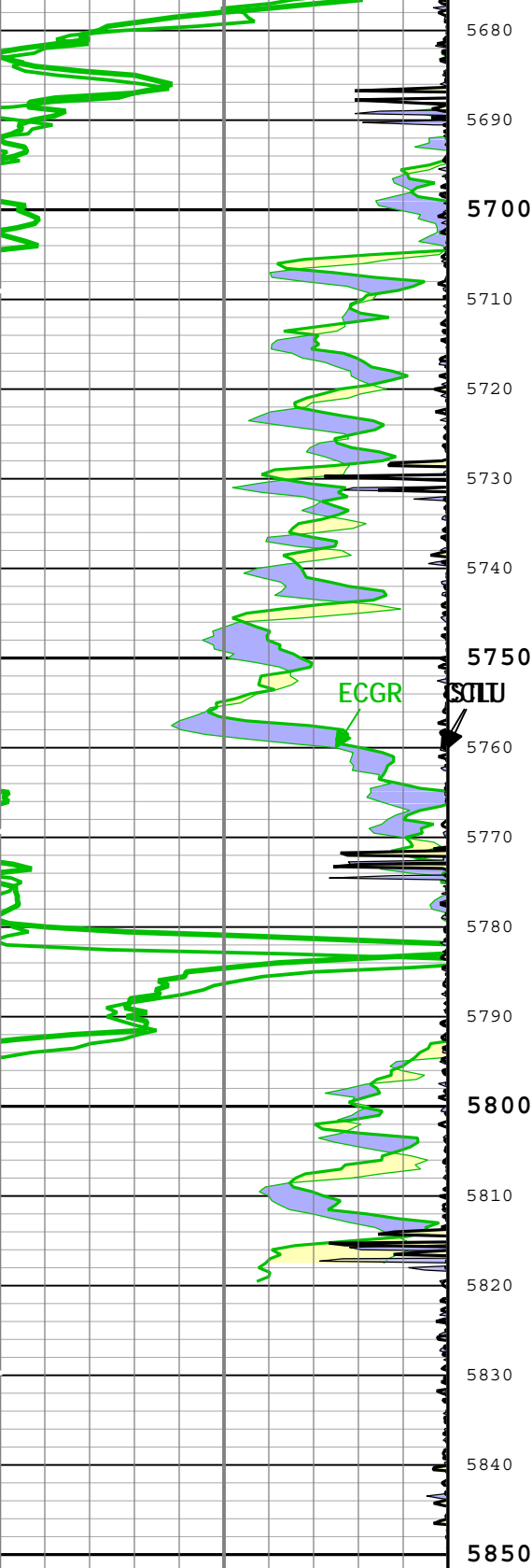
Depth Zone Parameters			
Parameter	Value	Start (ft)	Stop (ft)
ZMUD	1.69	15.5	134
ZMUD	2.1	134	209
ZMUD	2.09	209	384
ZMUD	1.67	384	1000

D	I	H	HONOR	I	I	I	I	H		H	6	D	16	F		F		I	(DEY HONOR D	#	QUD	DA\	I	I	9	I	FI	100\$	I	I
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TIME_1900 - Time Marked every 60.00 (s)







Main To Repeat	Main To Repeat
Repeat To Main	Repeat To Main
Gamma Ray (ECGR) HGNS-H	Stuck Tool Indicator, Total (STIT)
0 gAPI 150	0 ft 50
Main To Repeat	
Repeat To Main	
Casing Collar Locator Ultrasonic (CCLU)	

Main To Repeat	Main To Repeat
Repeat To Main	Repeat To Main
Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H	Cable Tension (TENS)
0.45 m3/m3 -0.15	
Main To Repeat	
Repeat To Main	

TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log (PEX HGNS Porosity StdRes RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 29-Jan-2015 12:49:47

Calibration Report

HGNS-H (HILT Gamma-Ray and Neutron Sonde, 150 degC) Calibration - Run 1

Primary Equipment :			
	HILT Gamma-Ray and Neutron Sonde, 150 degC	HGNS-H	
Auxiliary Equipment :			
	HGNS Accelerometer, 150 degC	HACCZ-H	6991
	AmBe Neutron Logging Source	NSR-F	2554
Calibration Parameter :			
	Water Temperature (Calibration Tank Water Temperature)	42.8	
	Housing Size (Thermal Housing Size)	3.36	
	JIG-BKG (Jig minus background reference)	165	

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM):		00:00:00 15-May-2007					
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):		16:56:48 16-Jan-2015					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Near Zero Measurement	1/s	Master	0	5.0	28.2	40.0	
Far Zero Measurement	1/s	Master	0	5.0	27.7	40.0	
Near Plus Measurement	1/s	Master	6031.0	4700.0	5579.0	6900.0	
Far Plus Measurement	1/s	Master	2793.0	1900.0	2301.0	2900.0	
Near Corrected Plus Measurement	1/s	Master		4700.0	5613.0	6900.0	
Far Corrected Plus Measurement	1/s	Master		1900.0	2307.0	2900.0	

Company:	Noble Energy Inc.	Schlumberger
Well:	Upchurch State LD02-77-1BHN	
Field:	Wildcat	
County:	Weld	
State:	Colorado	
HGNS		
Porosity		