

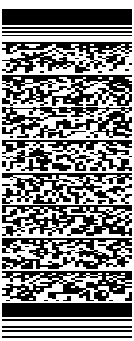


Company: Noble Energy										Well: Rohn State LD03-64HN										Field: Wattenberg										Country: Weld										State: Colorado										Country: USA																																																																					
SlimPulse - Gamma Ray																				1 in / 100 ft & 5 in / 100 ft Measured Depth																				Recorded Mode, Composite Log																				Schlumberger																																																											
Company:										Noble Energy										Well:										Rohn State LD03-64HN										Field:										Wattenberg										County:										Weld										State:										Colorado										Country:										USA									
Section:										04										UWID:										05-123-37467-00										Township:										09N										Rig Name:										H&P 277										Range:										58W										Rig Type:										Top Drive									
FL:										NAD 83 Colorado State Plane, Northern Zone, US Feet										FL 1:										Latitude: N 40° 46' 43.39" Northing: 1530726.76 ft US										FL2:										Longitude: W 103° 51' 40.86" Easting: 3453805.52 ft US																																																																					
Log Measured From: - Kelly Bushing: 4725.00 ft																				Drill Floor: 4701.00 ft																																																																																																			
Permanent Datum: - Mean Sea Level																																																																																																																							
Acquisition Dates:										03-Sep-2014 -- 09-Sep-2014										Other Services:																																																																																																			
Log Interval:										1236.00(ft) to 10220.00(ft)										Directional Drilling																																																																																																			
Index Types:										Measured Depth										Surveys / Continuous D&I																																																																																																			
Index Scales:										1:1200 1" / 100', 1:240 5" / 100'										Downhole Temperature																																																																																																			
Depth Source:										Driller's Depth										Downhole Shocks																																																																																																			
Depth Sensor:										PASON																																																																																																													
Print Type:										Final																																																																																																													
Spud Date:										02-Sep-2014																																																																																																													

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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10. Calibration Report
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Borehole Size/Casing Record

Bit						
Bit Size (in)	13.5	8.75	6.125			
Top Driller (ft)	0	1236	5991			
Bottom Driller (ft)	1236	5991	10220			
Casing						
Size (in)	9.625	7				
Weight (lbm/ft)	35	32				
Inner Diameter (in)	8.934	6.094				
Grade	J55	P110				
Top Driller (ft)	0	0				
Bottom Driller (ft)	1228	5978				

Operational Run Summary

Parameter (unit)	Run001	Run002	Run003			
Date Log Started	03-Sep-2014	05-Sep-2014	07-Sep-2014			
Time Log Started	11:01:58	09:37:32	07:36:57			
Date Log Finished	05-Sep-2014	06-Sep-2014	09-Sep-2014			
Time Log Finished	01:19:50	07:10:57	22:38:53			
Bit Size (in)	8.750	8.750	6.125			
Bit Start Depth (ft)	1236.00	4990.00	5991.00			
Bit Stop Depth (ft)	4990.00	5991.00	10220.00			
Top Log Interval (ft)	1184.00	4936.00	5932.00			
Bottom Log Interval (ft)	4936.00	5932.00	10154.00			
Max Hole Deviation (deg)	5.79	85.47	91.44			
Azimuth of Max Deviation (deg)	79.59	89.43	88.27			
Logging Unit Number	Command Center	Command Center	Command Center			
Logging Unit Location	Zone 2	Zone 2	Zone 2			
Recorded By	C. Welty	C. Welty	M. Valles			
Witnessed By	T. Pingle	M. Valles	C. Welty			
Service Order Number	14CCO0651	14CCO0651	14CCO0651			

Borehole Fluids

Parameter(unit)	Run001	Run002	Run003			
Fluid Type	Water	Water	Water			
Fluid Name	Salt Brine	Salt Brine	Salt Brine			
Max Recorded Temperatures (degF)	154.5	163.4	217.4			
Source of Sample	Active Tank	Active Tank	Active Tank			

Salinity (ppm)	1920	2400	2000			
Density (lbm/gal)	Zoned	Zoned	Zoned			
Funnel Viscosity (s)	53	46	37			
Fluid Loss (cm3)						
PH	9.5	9	11.3			
Source RMF						
RMC	Pressed	Pressed	Pressed			
RM @ Meas Temp (ohm.m@degF)	0.2 @ 68	0.2 @ 68	0.2 @ 68			
RMF @ Meas Temp (ohm.m@degF)	0.15 @ 68	0.15 @ 68	0.15 @ 68			
RMC @ Meas Temp (ohm.m@degF)						
RM @ BHT (ohm.m@degF)	0.07 @ 212	0.07 @ 212	0.07 @ 212			
RMF @ BHT (ohm.m@degF)	0.05 @ 212	0.05 @ 212	0.05 @ 212			
RMC @ BHT (ohm.m@degF)	NaN @ 212	NaN @ 212	NaN @ 212			
Total Solid (%)	7.3	11.7	4.9			
High Gravity Solids (%)	3.6	5.9	3			

Zoned Borehole Fluids

Run001

Parameter	Value	Start
Density	9.1	9/3/2014 11:01:58 AM
Density	9.8	9/4/2014 2:30:00 AM
Density	10.15	9/4/2014 2:30:00 PM

Run002

Parameter	Value	Start
Density	10	9/5/2014 9:37:32 AM
Density	10.1	9/5/2014 2:30:00 PM
Density	10.7	9/6/2014 2:30:00 AM

Run003

Parameter	Value	Start
Density	10.9	9/7/2014 7:36:57 AM
Density	9.4	9/7/2014 2:30:00 PM
Density	9.5	9/8/2014 2:30:00 AM
Density	10.55	9/8/2014 2:30:00 PM
Density	10.7	9/9/2014 2:30:00 AM

Remarks and Equipment Summary

Data presented is from tool memory and acquired while drilling from 1236.00 ft to 10220.00 ft.

Depth Reference: Driller's Depth

Environmental Corrections: Gamma Ray is corrected for bit size, mud weight, and tool collar thickness. Barite and Potassium in the mud affect Gamma Ray readings.

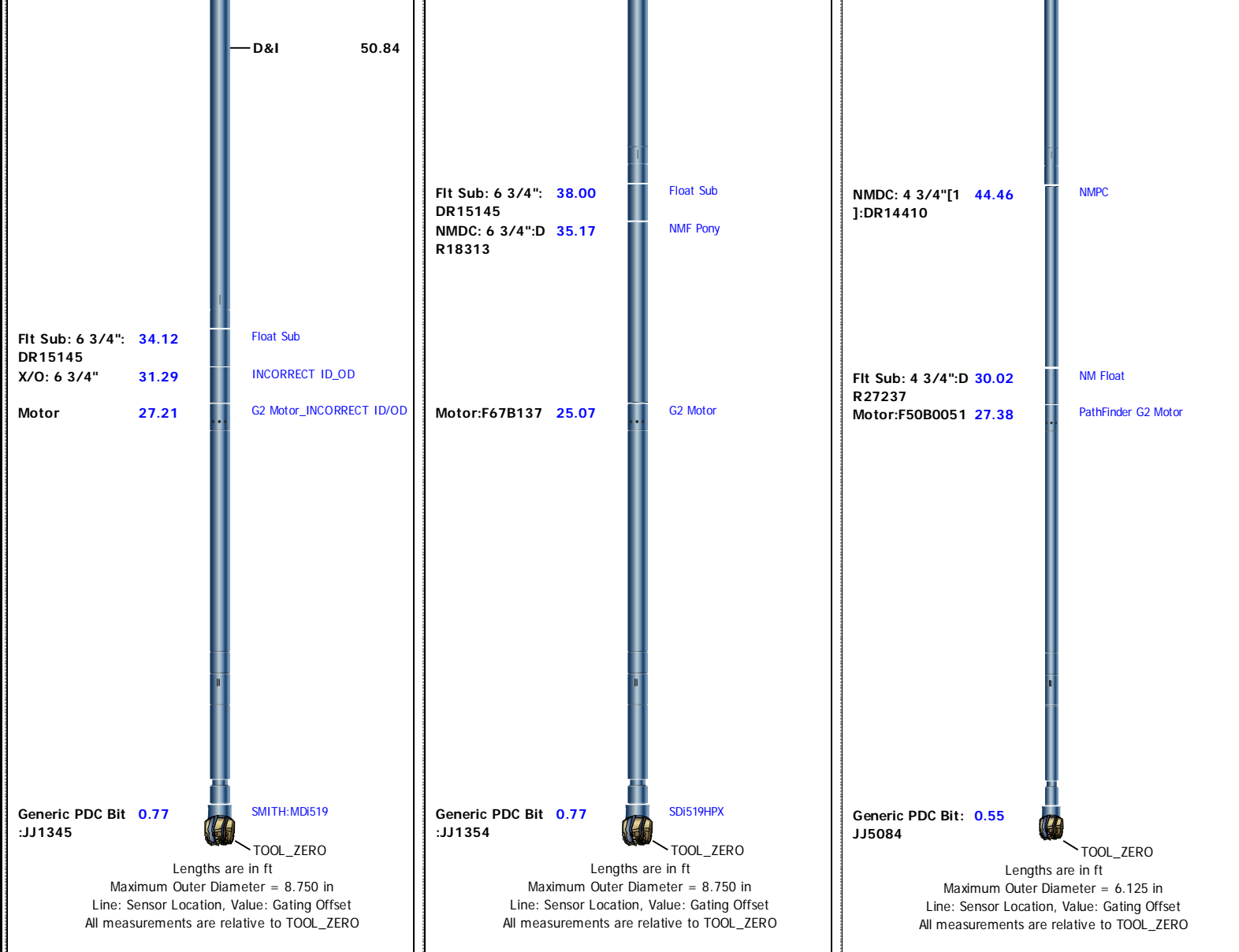
Run001: Remarks	Run002: Remarks	Run003: Remarks
Run Objective: Drill vertical to KOP	Run Objective: Drill curve to landing point	Run Objective: Drill lateral to well TD
Bit to Gamma Ray: 53.87 ft Bit to D&I: 50.84 ft	Bit to Gamma Ray: 58.67 ft Bit to D&I: 55.64 ft	Bit to Gamma Ray: 66.07 ft Bit to D&I: 63.04 ft
Drilled from: 1236.00 ft to 4989.00 ft Logged from: 1184.00 ft to 4936.00 ft	Drilled from: 4989.00 ft to 5991.00 ft Logged from: 4936.00 ft to 5934.00 ft	Drilled from: 5991.00 ft to 10220.00 ft Logged from: 5934.00 ft to 10154.00 ft
SlimPulse Software: v11.0C00 SlimPulse D&I calibrated on: 29-Jan-2014 SlimPulse GR calibrated on: 19-Jul-2014	SlimPulse Software: v11.0C00 SlimPulse D&I calibrated on: 15-Jul-2013 SlimPulse GR calibrated on: 27-Jun-2013	SlimPulse Software: v11.0C00 SlimPulse D&I calibrated on: 15-Jul-2013 SlimPulse GR calibrated on: 27-Jun-2013
PathFinder a Schlumberger Co. Personnel DD: Jordan Timbs & Ruben Guerrero	PathFinder a Schlumberger Co. Personnel: DD: Jordan Timbs & Ruben Guerrero	PathFinder a Schlumberger Co. Personnel: DD: Jordan Timbs & Mike Hicks

MWD: Chad Welty & Maria Valles

Reason for POOH: Well TD

Run003: Toolstring

Equip name	Length	MP name	Offset
Filtr Sub: 4 3/4": DR20585	143.79	Filter Sub	
NMDC: 4 3/4"[3]:DR10032	140.68	NMDC	
NMDC: 4 3/4"[2]	110.62		
SPULSE-GEN:DR 10660	80.4		
FLOWSUB:DR2209 7			
SPCOLLAR:DR1066 0			
SPMA			
SPEC			
SPBA			
UBHO:475U187			
		GR	66.07
		D&I	63.04



Composite 1

2 in / 100 ft Measured Depth Log

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Include Parallel Data
Run001	Drilling	Down	1236.25 ft	4990.17 ft	03-Sep-2014 1:46:26 PM	05-Sep-2014 1:19:50 AM	No
Run002	Drilling	Down	4950.17 ft	5991.00 ft	05-Sep-2014 12:13:09 PM	06-Sep-2014 7:10:57 AM	No
Run003	Drilling	Down	5900.42 ft	10222.42 ft	07-Sep-2014 10:54:14 AM	09-Sep-2014 10:38:53 PM	No

All depths are referenced to toolstring zero

Log

Company:Noble Energy

Well:Rohn State LD03-64HN

Composite 1:S099

Description: SlimPulse Gamma Ray 1 Format: Log (SlimPulse Gamma Ray Final MD) Index Scale: 1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 25-Sep-2014 16:00:34

└ TICKS_GR - Gamma Ray Tick Marks SlimPulse[1] RM

Gamma Ray (GR) SlimPulse[1] RM		
0	gAPI	150
Gamma Ray (GR) SlimPulse[1] RM		
150	gAPI	300
Gamma Ray (GR) SlimPulse[1] RM		

300gAPI450

Gamma Ray (GR) SlimPulse[1] RM

450gAPI600

Gamma Ray (GR) SlimPulse[1] RM

600gAPI750

Rate of penetration averaged over the last 5 ft
(1.5 m) (ROP5) RT

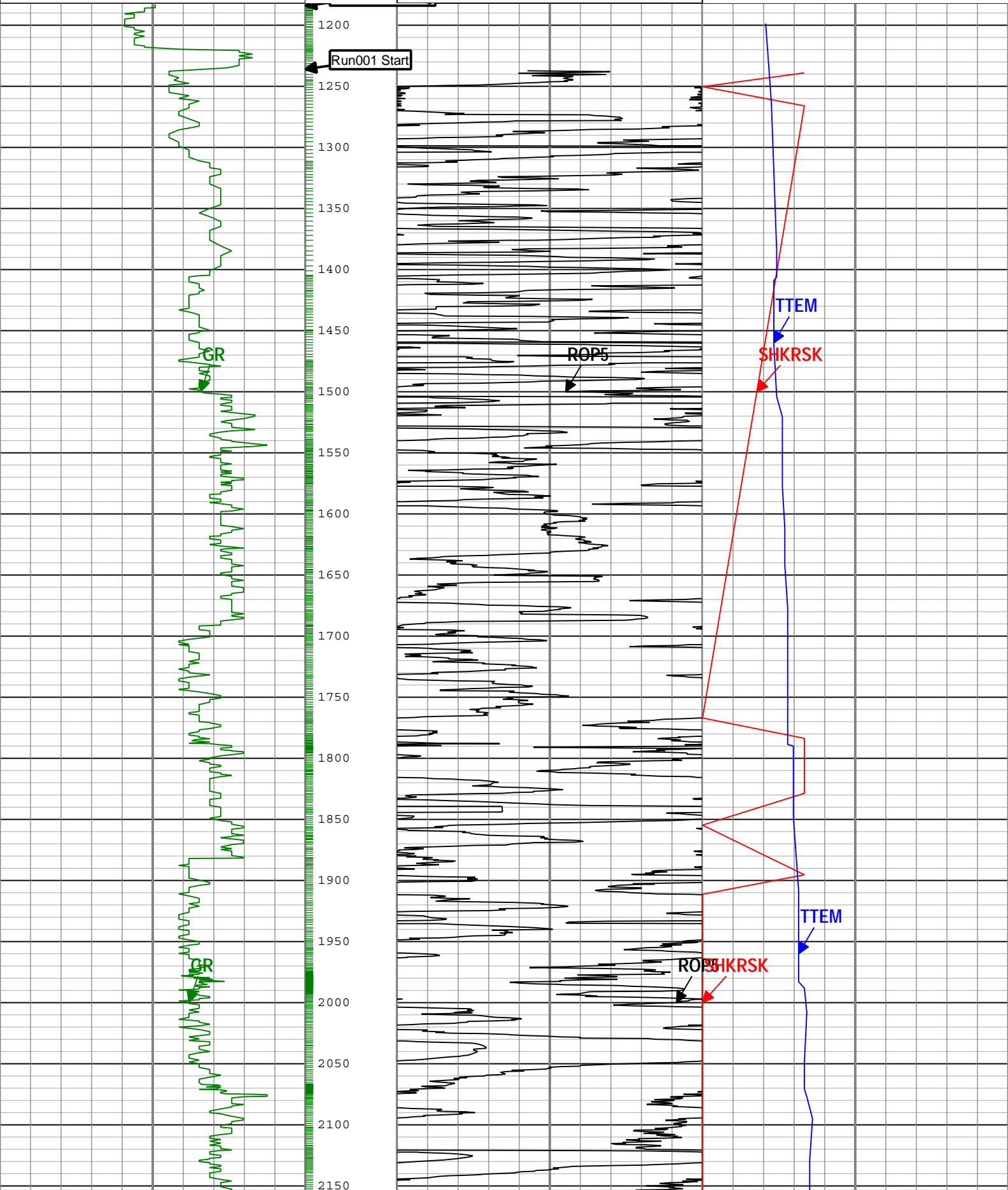
500ft/h150

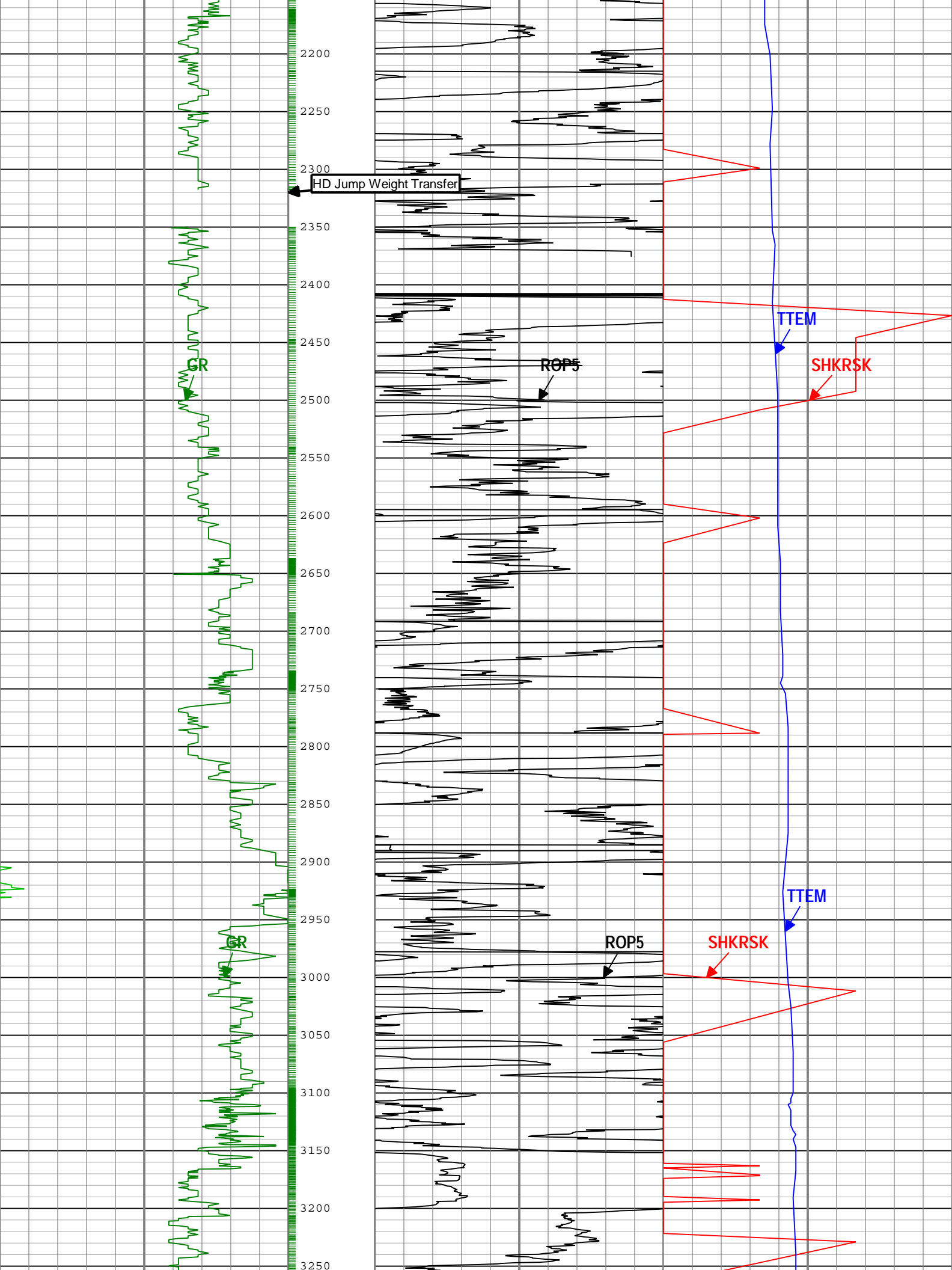
Shock Risk (SHKRSK) SlimPulse[1] RT

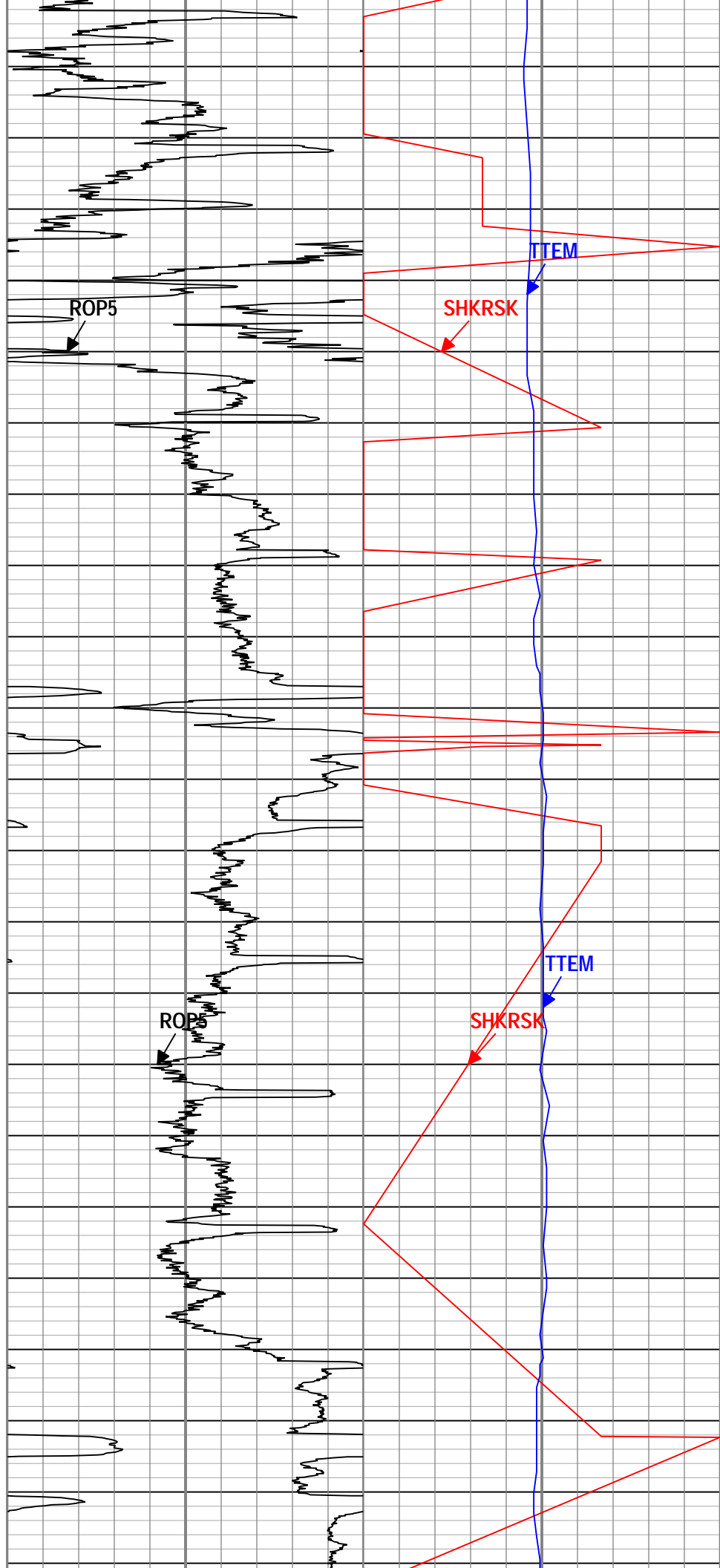
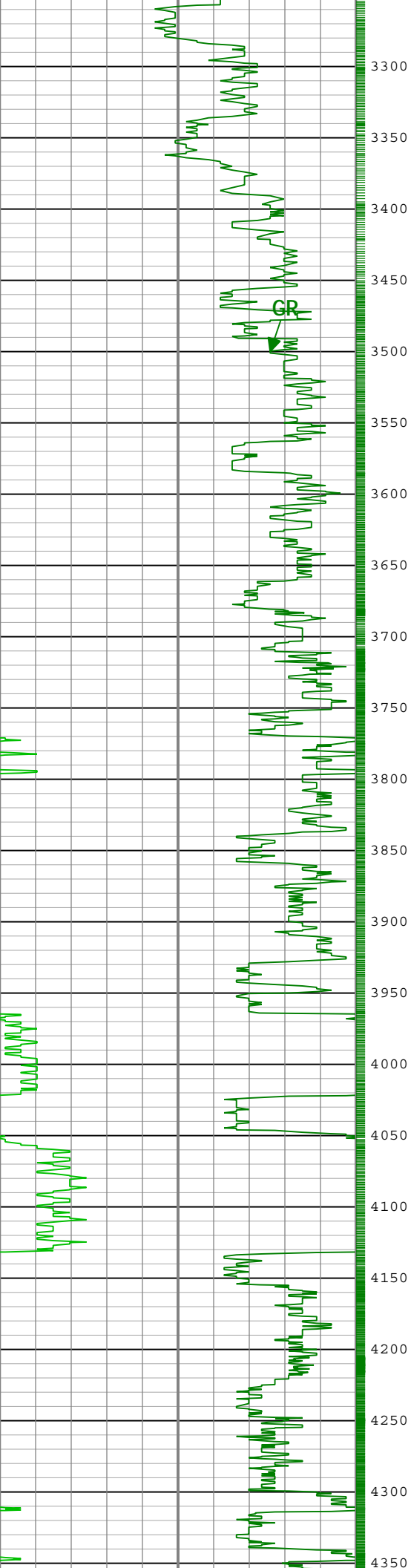
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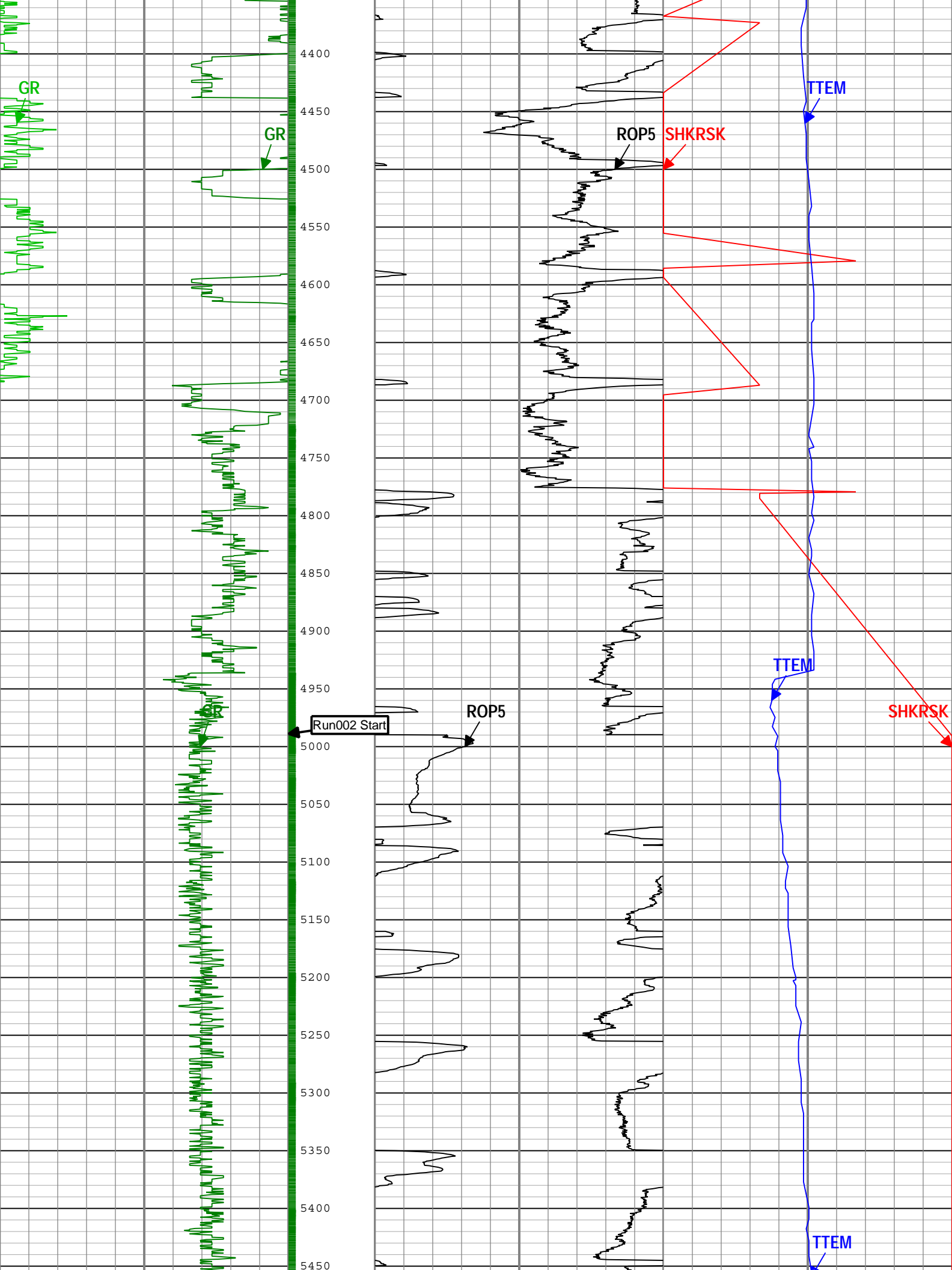
Tool Temperature (TTEM) SlimPulse[1] RM

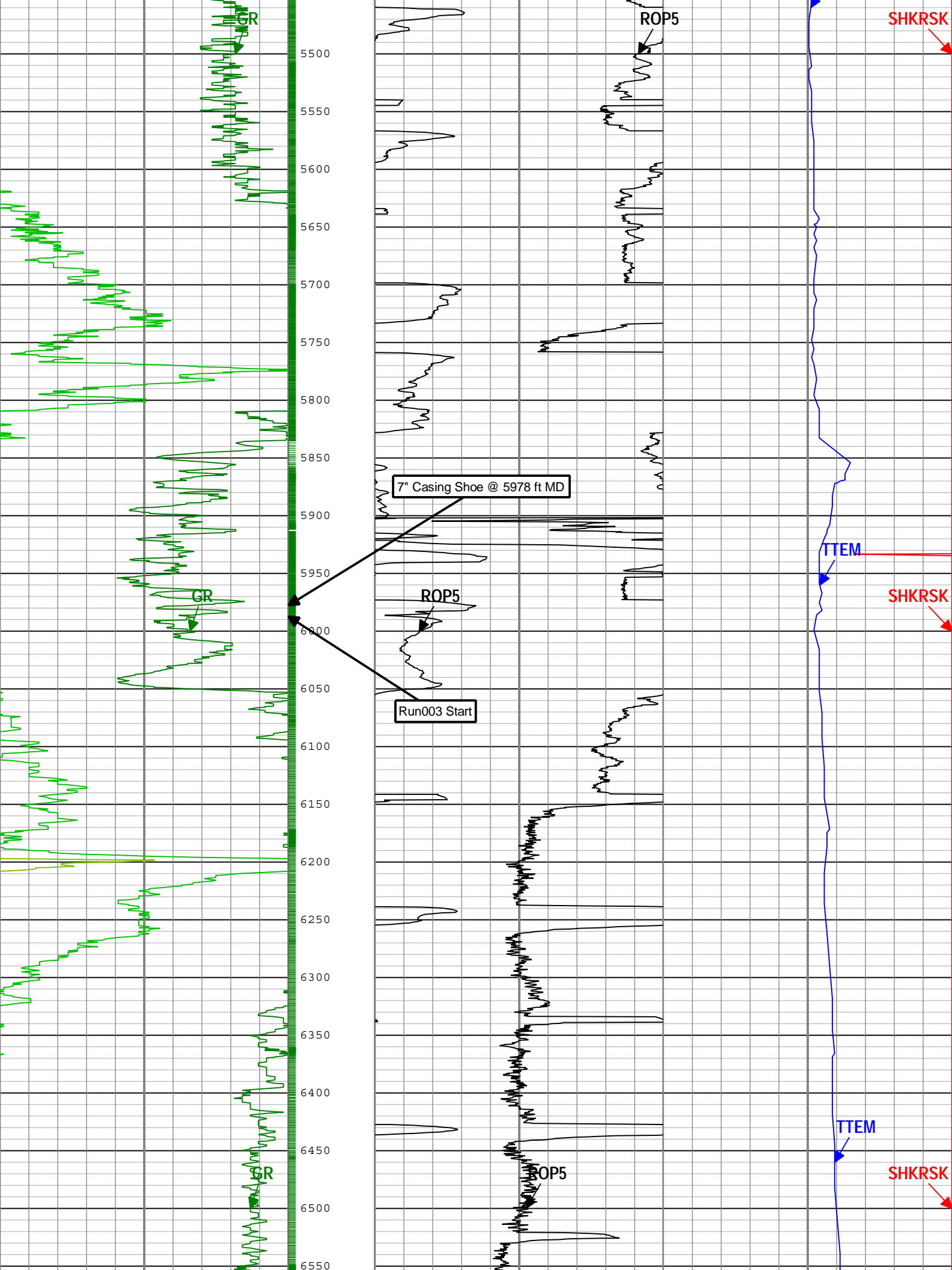
50degF250

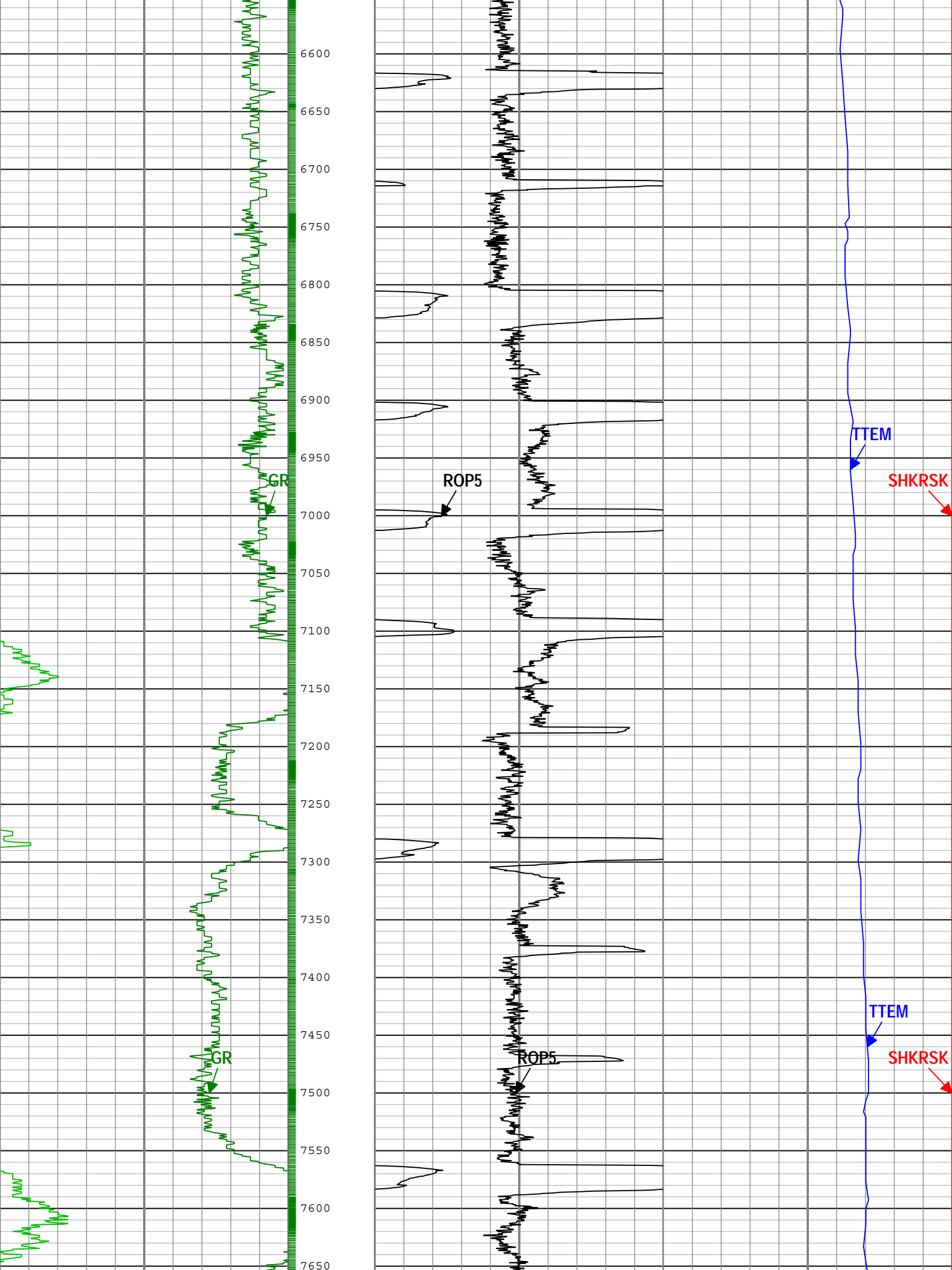


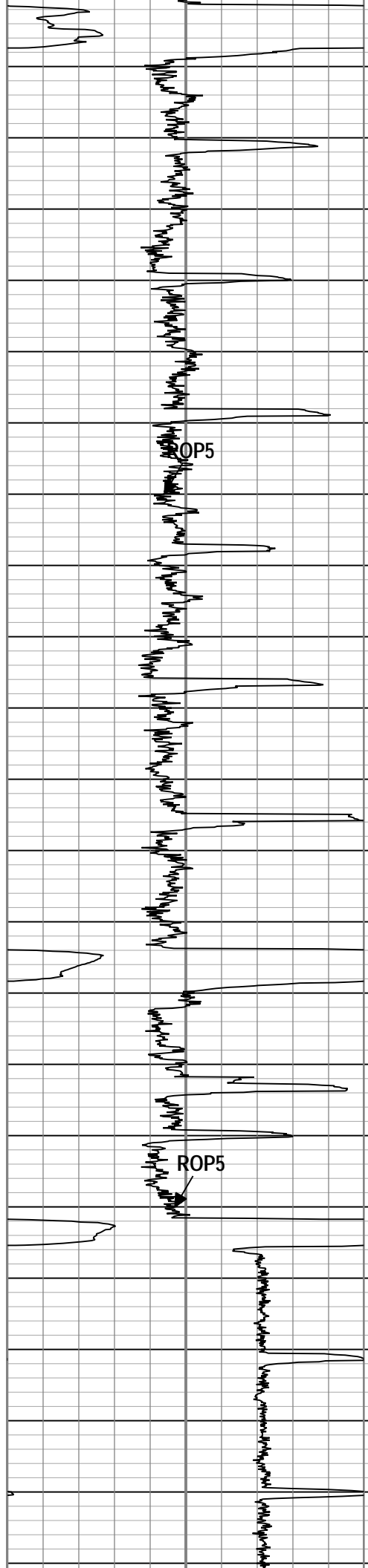
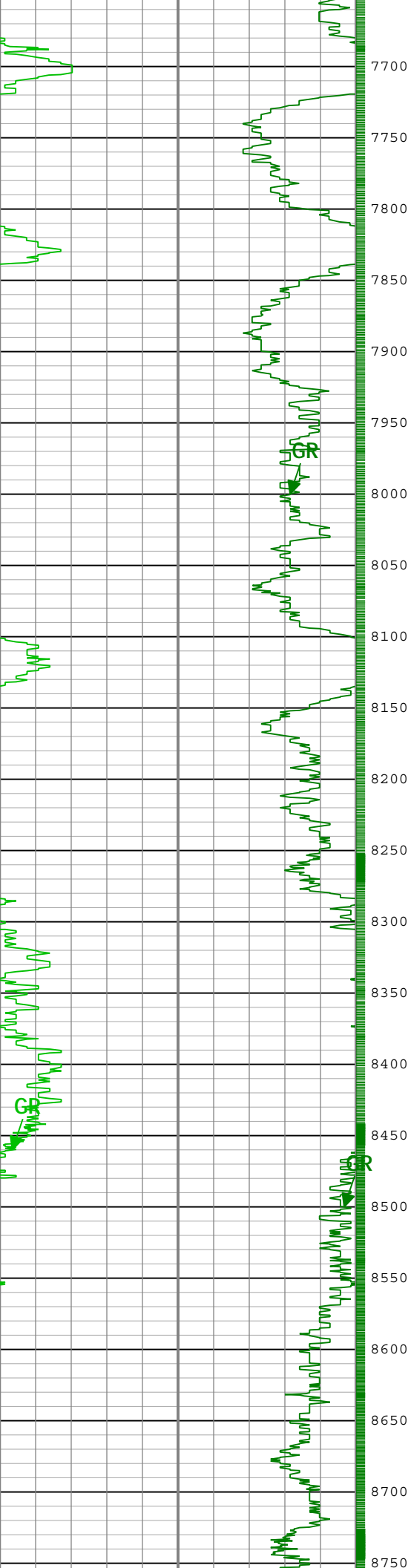


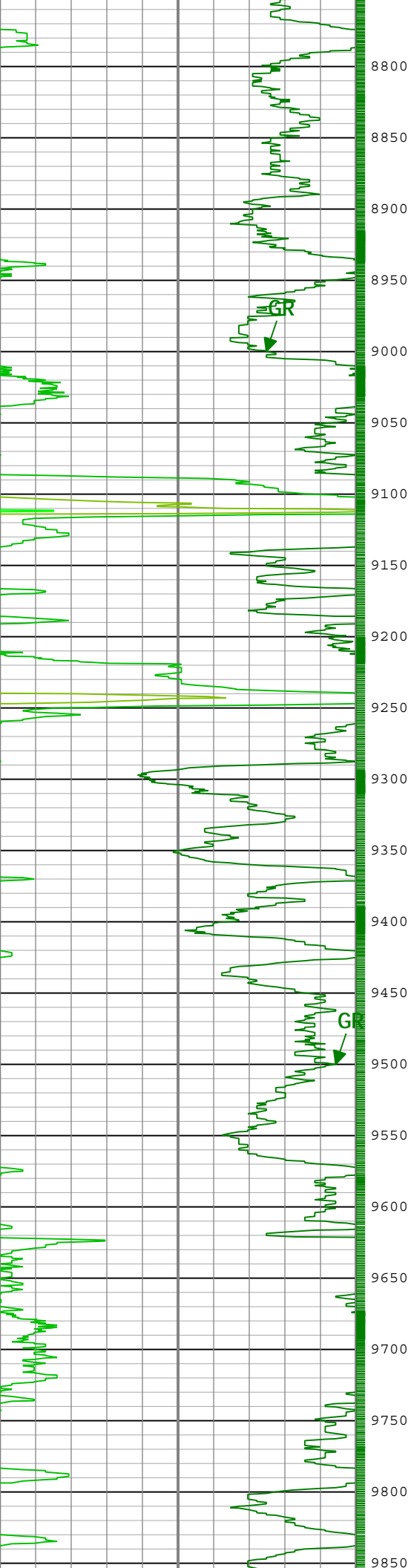




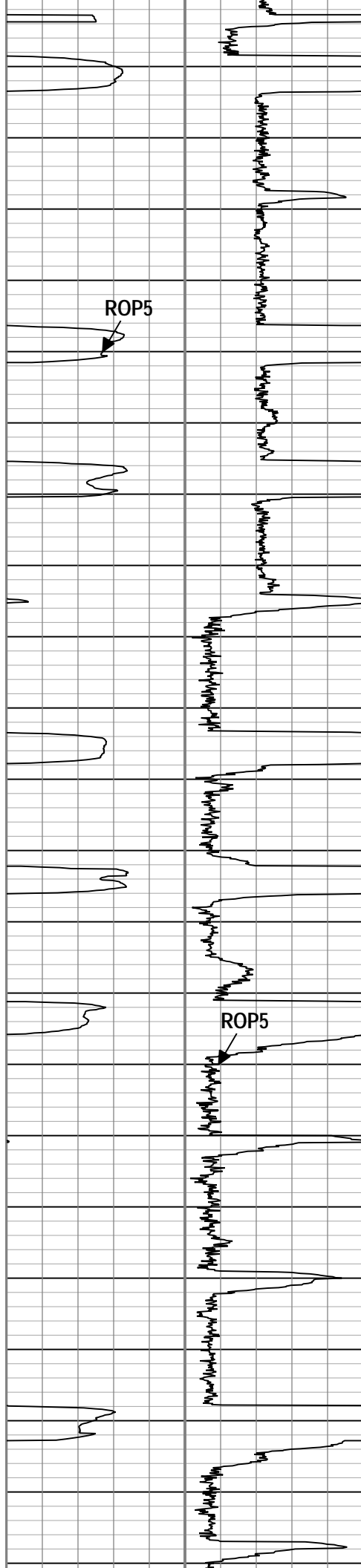








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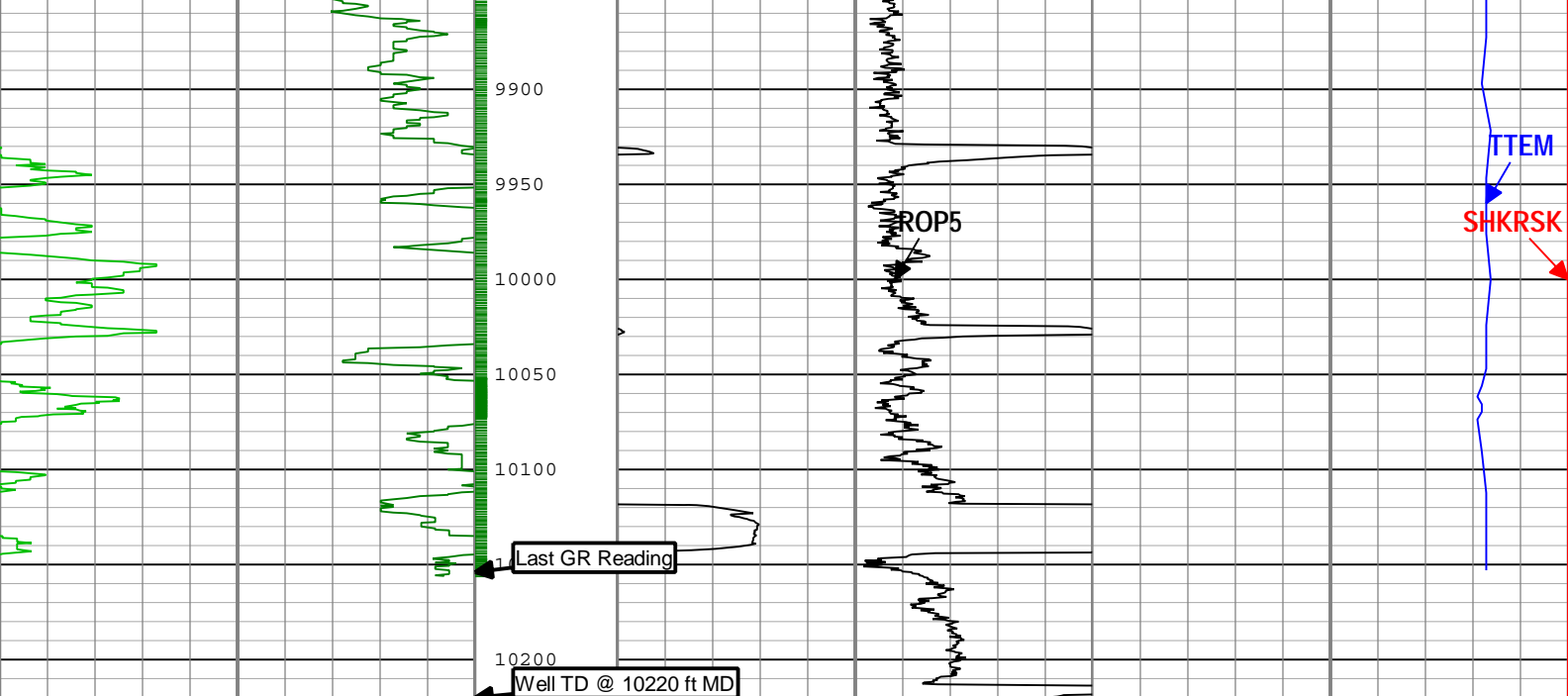


TTEM

SHKRSK

TTEM

SHKRSK



Gamma Ray (GR) SlimPulse[1] RM		
0	gAPI	150
Gamma Ray (GR) SlimPulse[1] RM		
150	gAPI	300
Gamma Ray (GR) SlimPulse[1] RM		
300	gAPI	450
Gamma Ray (GR) SlimPulse[1] RM		
450	gAPI	600
Gamma Ray (GR) SlimPulse[1] RM		
600	gAPI	750

Rate of penetration averaged over the last 5 ft (1.5 m) (ROP5) RT		
500	ft/h	150

Shock Risk (SHKRSK) SlimPulse[1] RT		
3		0
Tool Temperature (TTEM) SlimPulse[1] RM		
50	degF	250

└ TICKS_GR - Gamma Ray Tick Marks SlimPulse[1] RM

Description: SlimPulse Gamma Ray 1 Format: Log (SlimPulse Gamma Ray Final MD) Index Scale: 1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 25-Sep-2014 16:00:34

Channel Processing Parameters

Run001: Parameters

Parameter	Description	Tool	Value	Unit
BS	Bit Size	DNMSESSION	Depth Zoned	in
DFD	Drilling Fluid Density	Borehole	Time Zoned	lbm/gal
GR_SRC	GR Source Selection	SPULSE-GEN	GAMMA_EXT	

Run001Depth Zoned Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	13.5	1182.4	1236
BS	8.75	1236	4990.17

All depth are actual.

Run001Time Zoned Parameters

Pass Drilling

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
DFD	9.1	03-Sep-2014 13:46:26	04-Sep-2014 02:30:00	1236.25	3739.17
DFD	9.8	04-Sep-2014 02:30:00	05-Sep-2014 01:19:50	3739.17	4990.17

All depth are at tool zero.

Run002: Parameters

Parameter	Description	Tool	Value	Unit
BS	Bit Size	DNMSESSION	8.75	in
DFD	Drilling Fluid Density	Borehole	Time Zoned	lbm/gal
GR_SRC	GR Source Selection	SPULSE-GEN	GAMMA_EXT	

Run002Time Zoned Parameters

Pass Drilling

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
DFD	10	05-Sep-2014 12:13:09	05-Sep-2014 14:30:00	4950.17	5126.58
DFD	10.1	05-Sep-2014 14:30:00	06-Sep-2014 02:30:00	5126.58	5990.67
DFD	10.7	06-Sep-2014 02:30:00	06-Sep-2014 07:10:57	5990.67	5991

All depth are at tool zero.

Run003: Parameters

Parameter	Description	Tool	Value	Unit
BS	Bit Size	DNMSESSION	Depth Zoned	in
DFD	Drilling Fluid Density	Borehole	Time Zoned	lbm/gal
GR_SRC	GR Source Selection	SPULSE-GEN	GAMMA_EXT	

Run003Depth Zoned Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	8.75	5756.63	5991
BS	6.125	5991	10220

All depth are actual.

Run003Time Zoned Parameters

Pass Drilling

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
DFD	10.9	07-Sep-2014 10:54:14	07-Sep-2014 14:30:00	5900.42	6237.92
DFD	9.4	07-Sep-2014 14:30:00	08-Sep-2014 02:30:00	6237.92	8026.67
DFD	9.5	08-Sep-2014 02:30:00	08-Sep-2014 14:30:00	8026.67	8974.67
DFD	10.55	08-Sep-2014 14:30:00	09-Sep-2014 02:30:00	8974.67	10190.33
DFD	10.7	09-Sep-2014 02:30:00	09-Sep-2014 22:38:53	10190.33	10222.42

All depth are at tool zero.

Tool Control Parameters

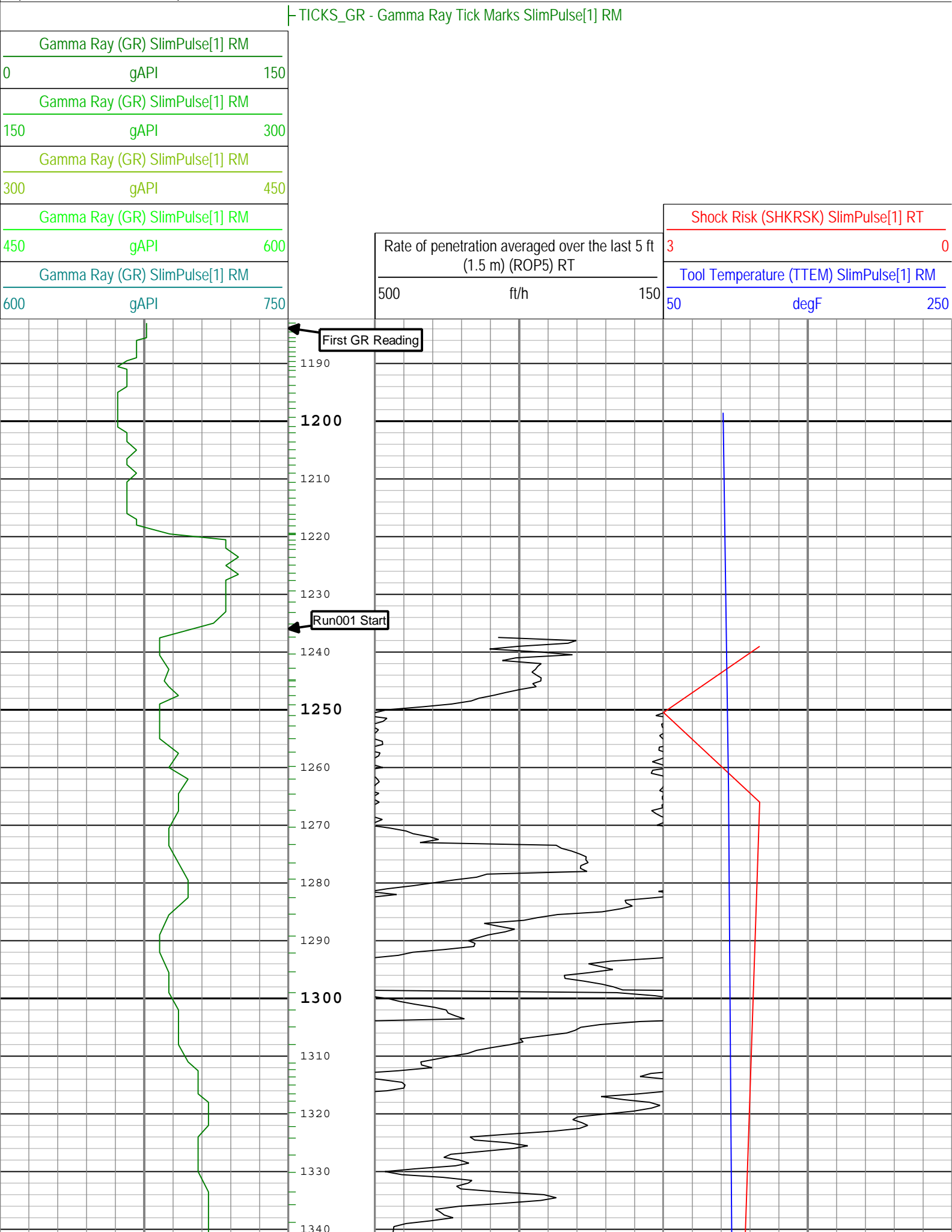
Composite 1

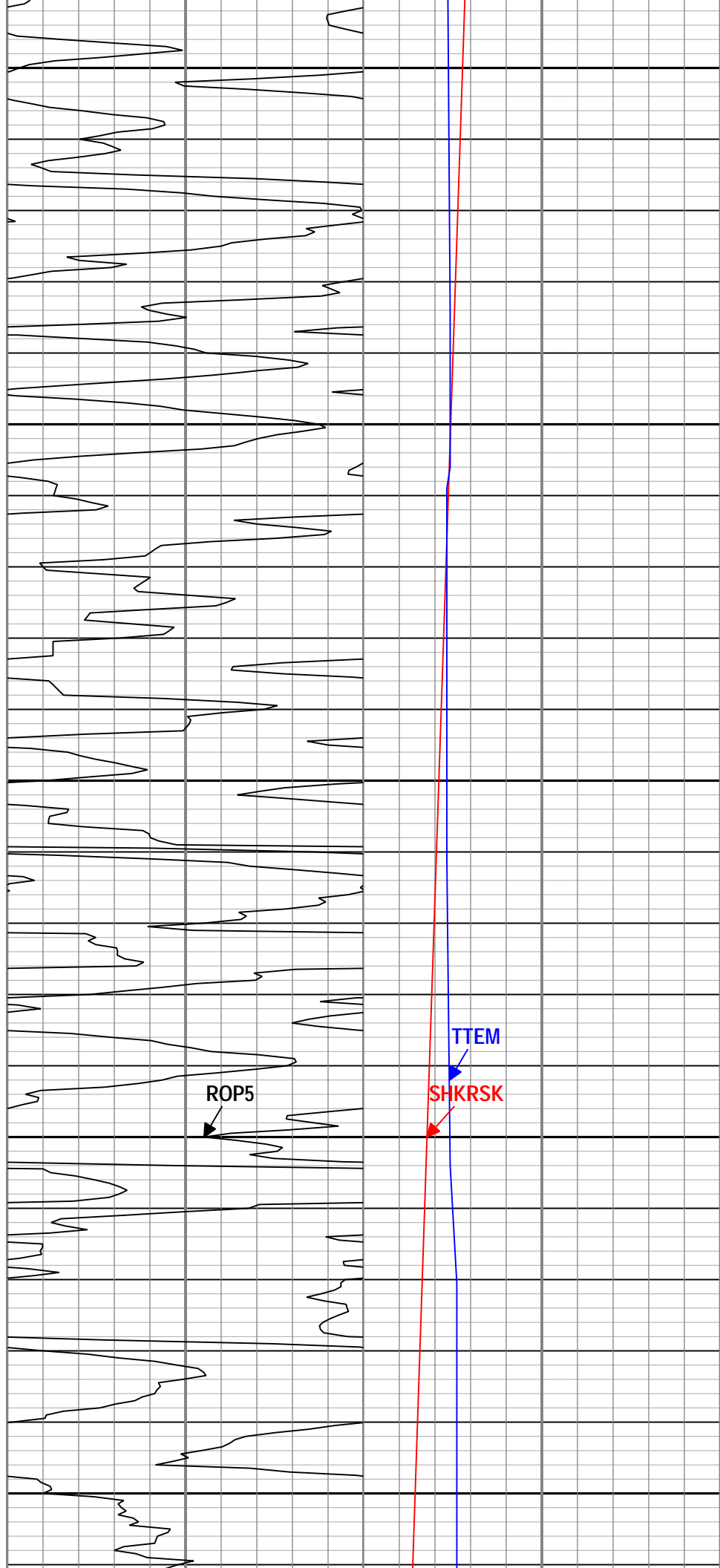
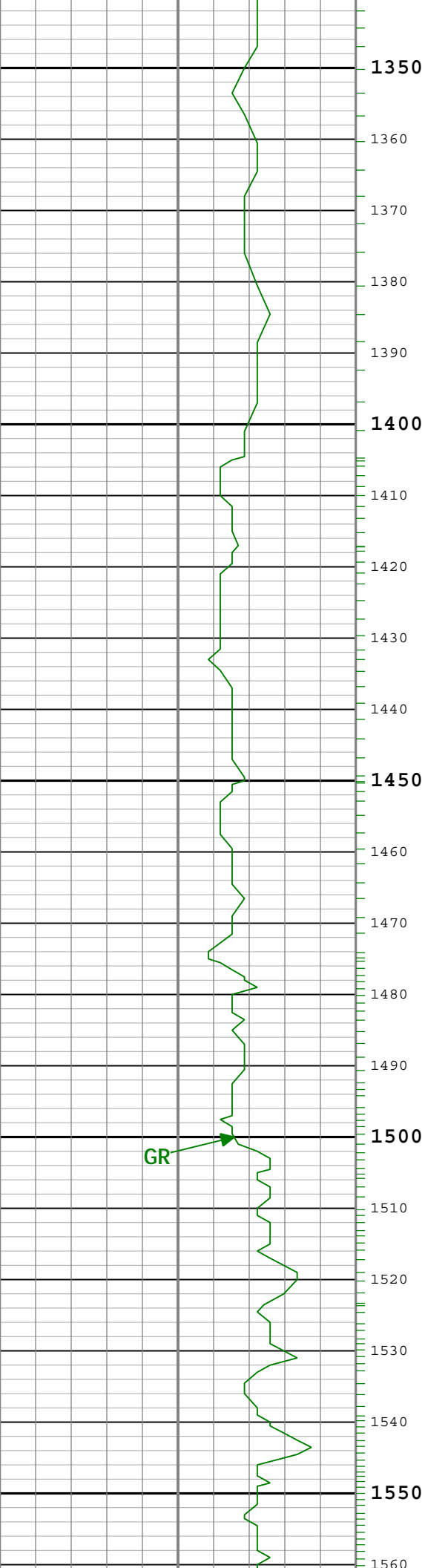
5 in / 100 ft Measured Depth

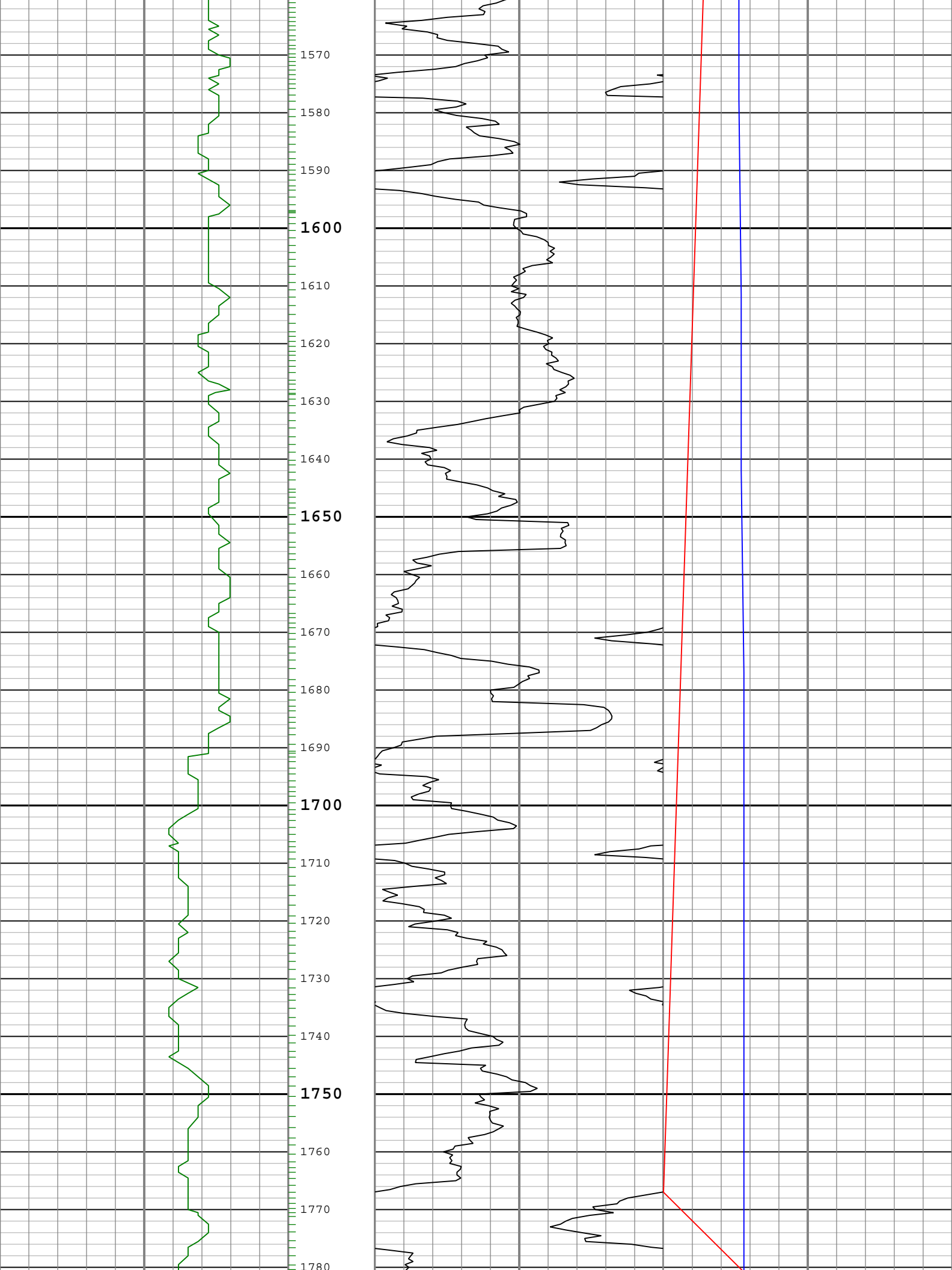
Composite Summary

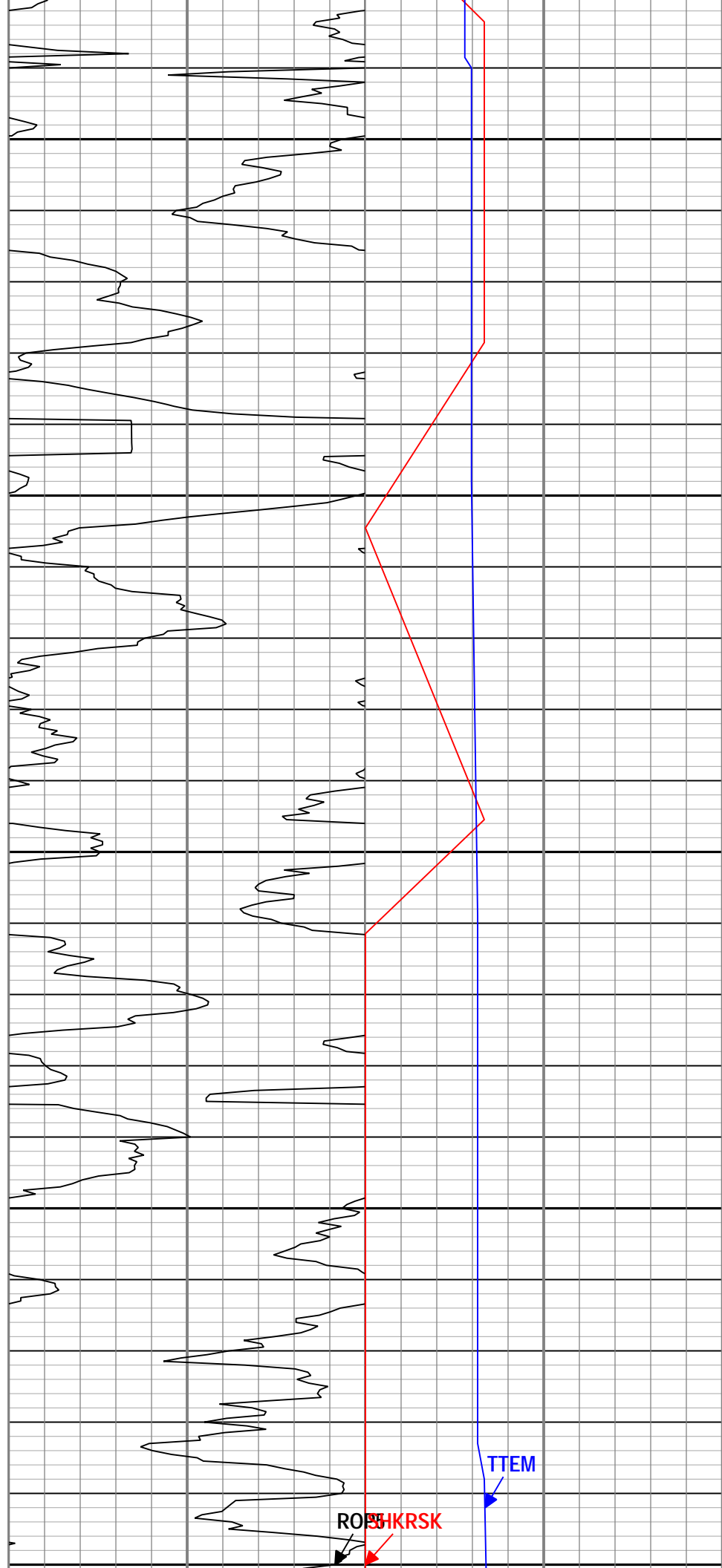
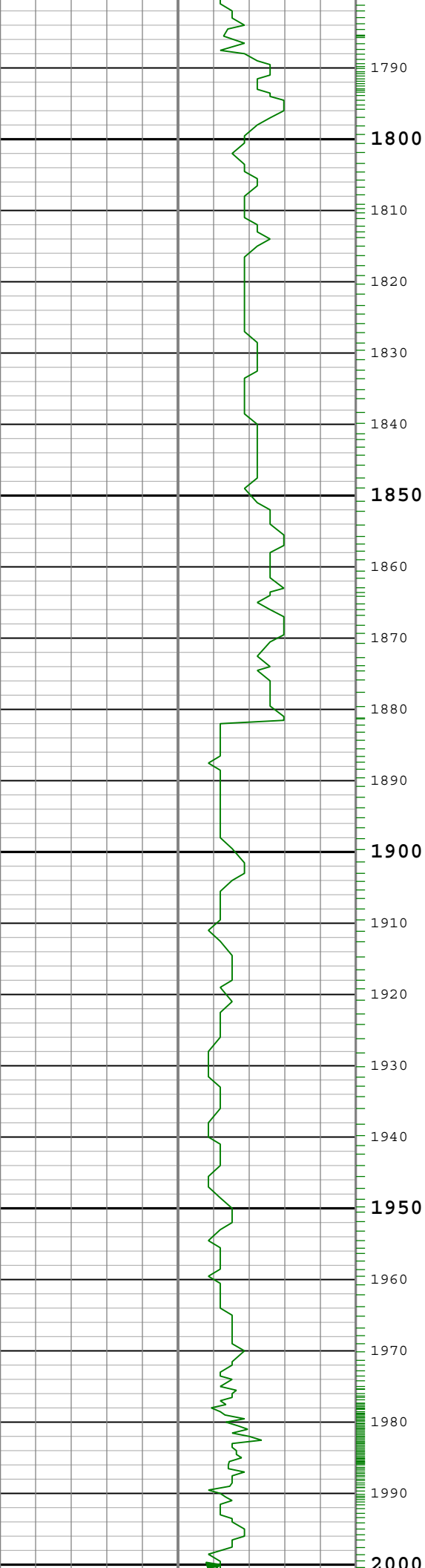
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Include Parallel Data
Run001	Drilling	Down	1236.25 ft	4990.17 ft	03-Sep-2014 1:46:26 PM	05-Sep-2014 1:19:50 AM	No
Run002	Drilling	Down	4950.17 ft	5991.00 ft	05-Sep-2014 12:13:09 PM	06-Sep-2014 7:10:57 AM	No
Run003	Drilling	Down	5900.42 ft	10222.42 ft	07-Sep-2014 10:54:14 AM	09-Sep-2014 10:38:53 PM	No

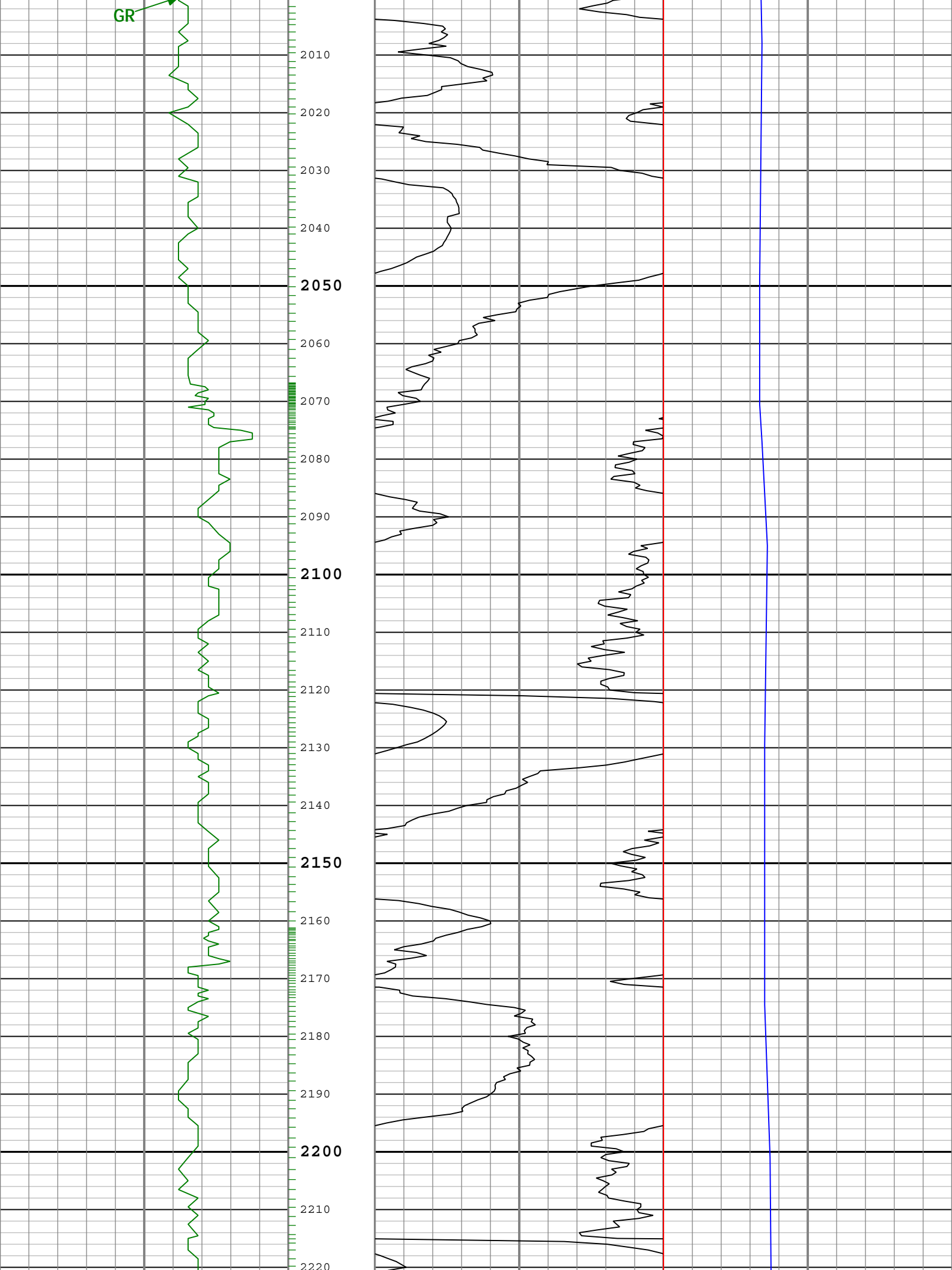
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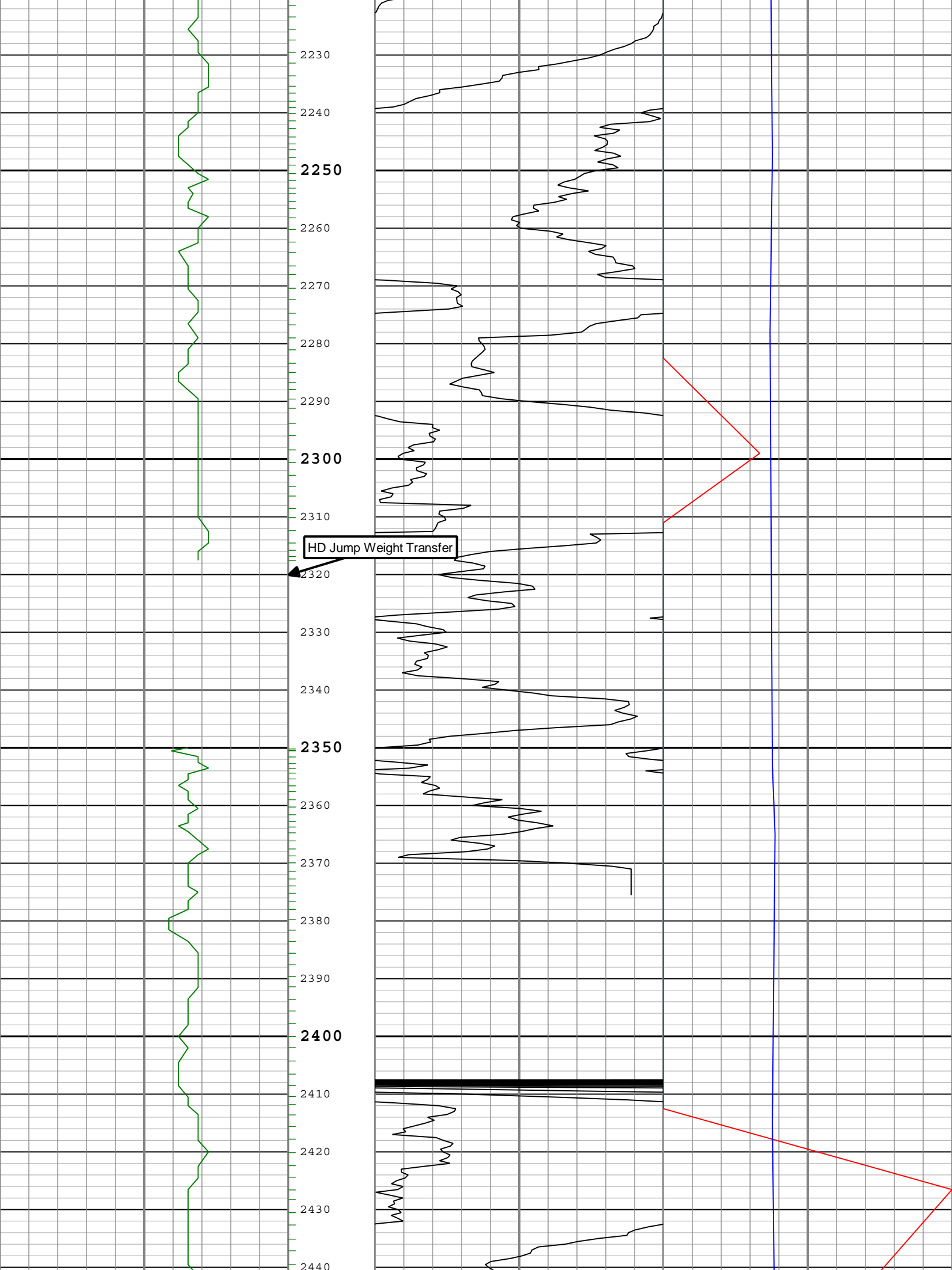


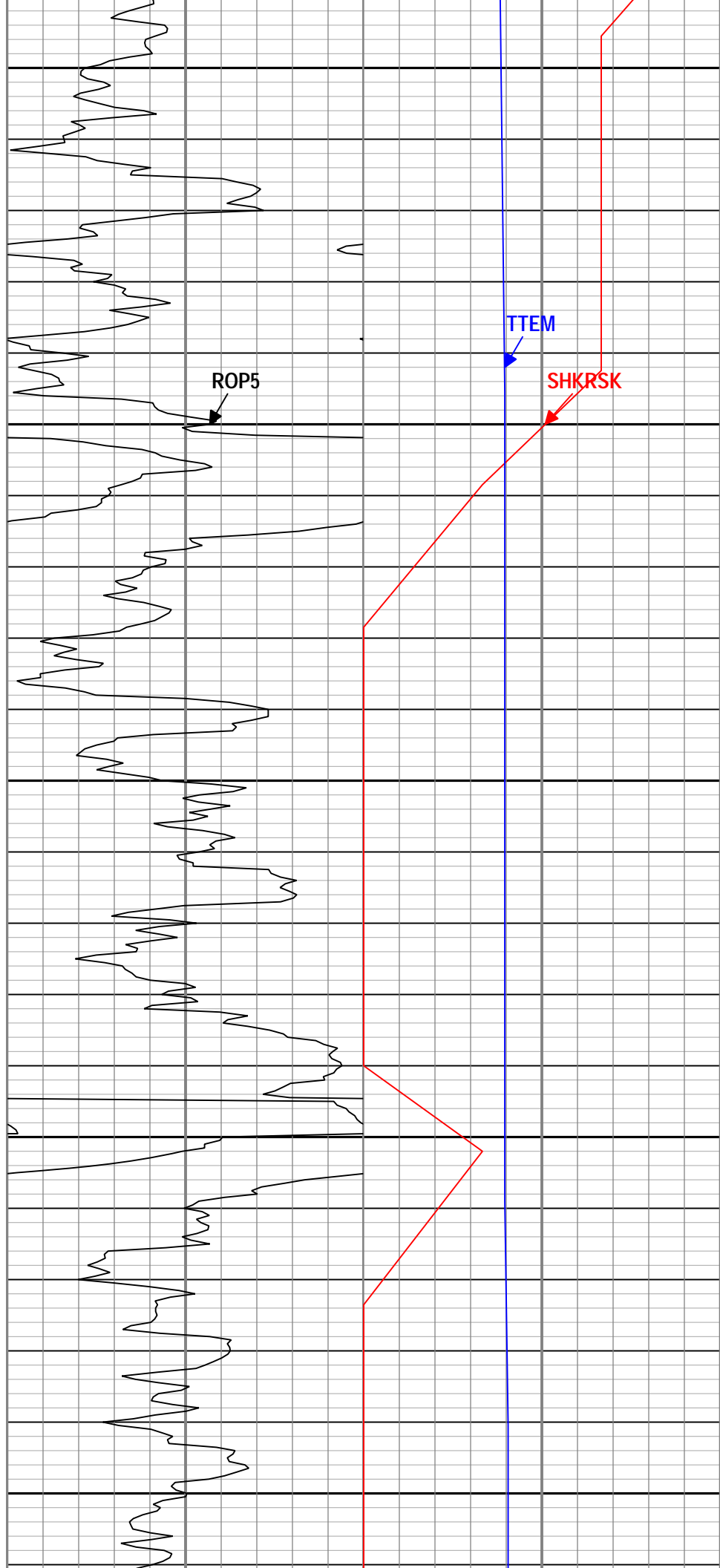
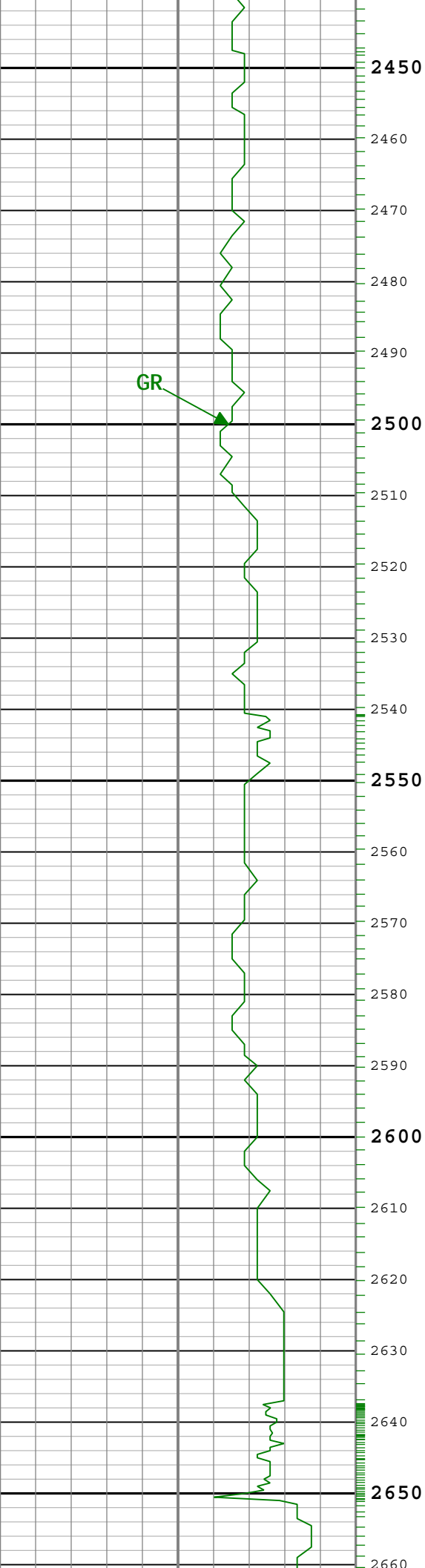


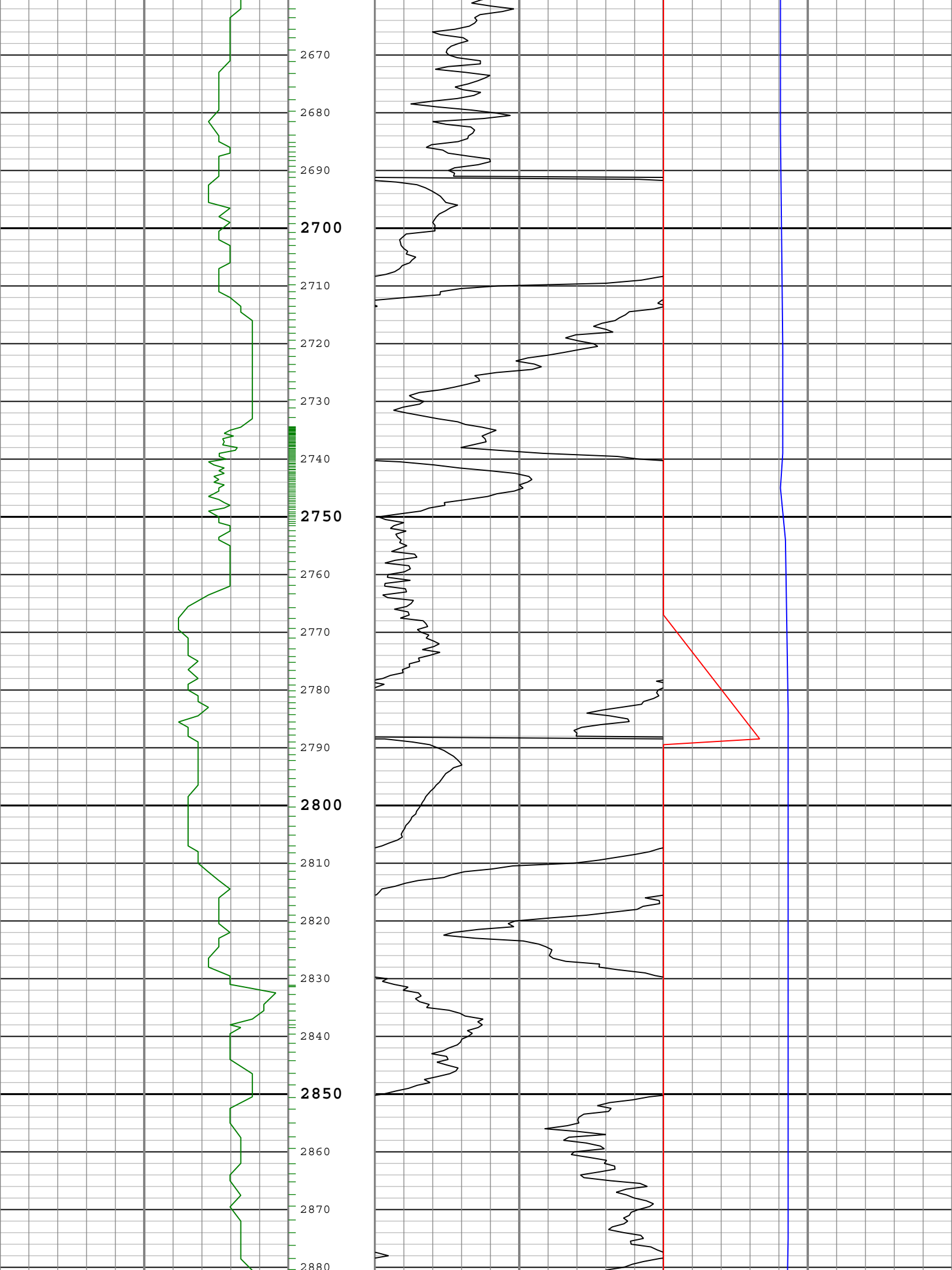


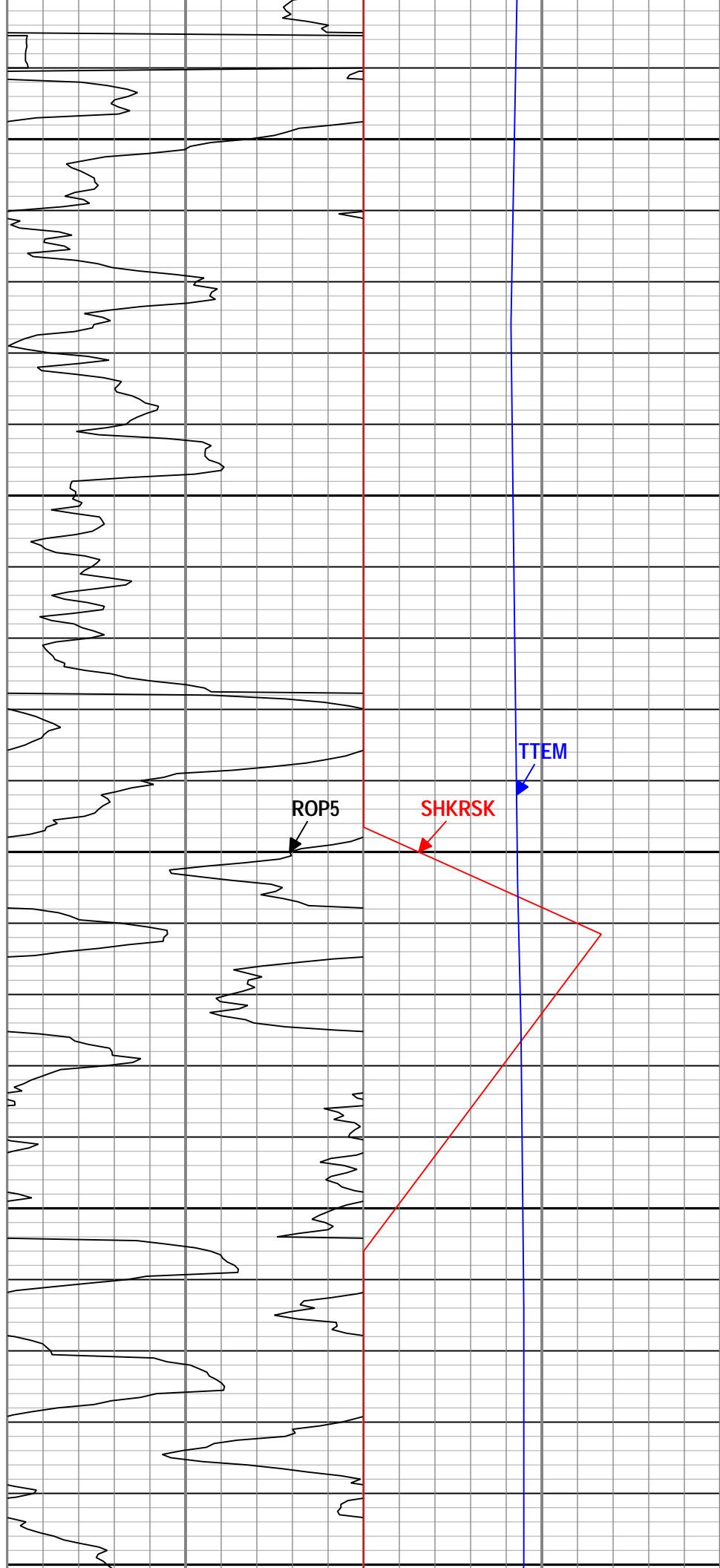
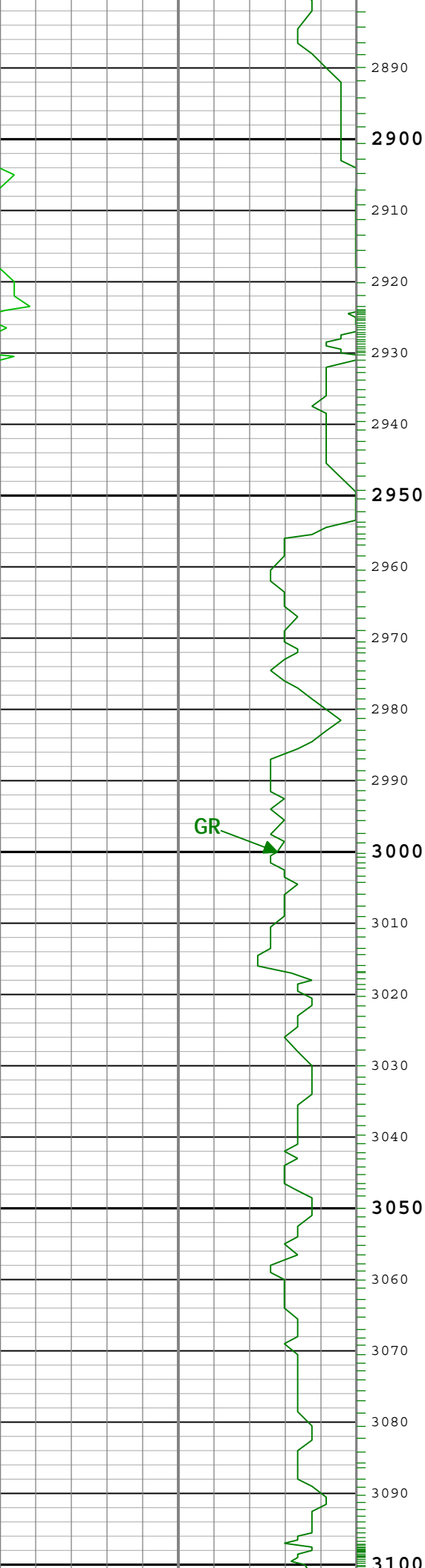


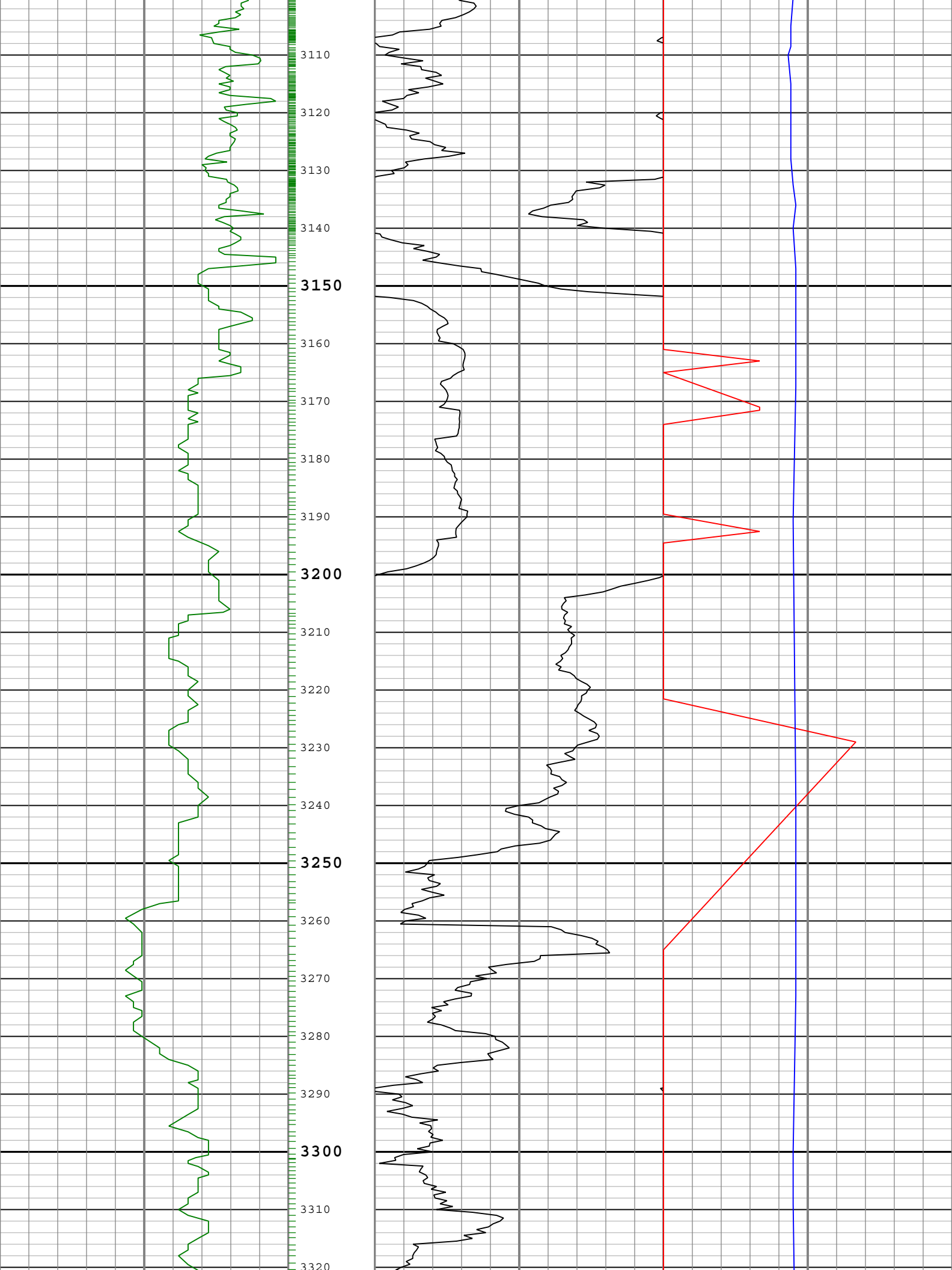


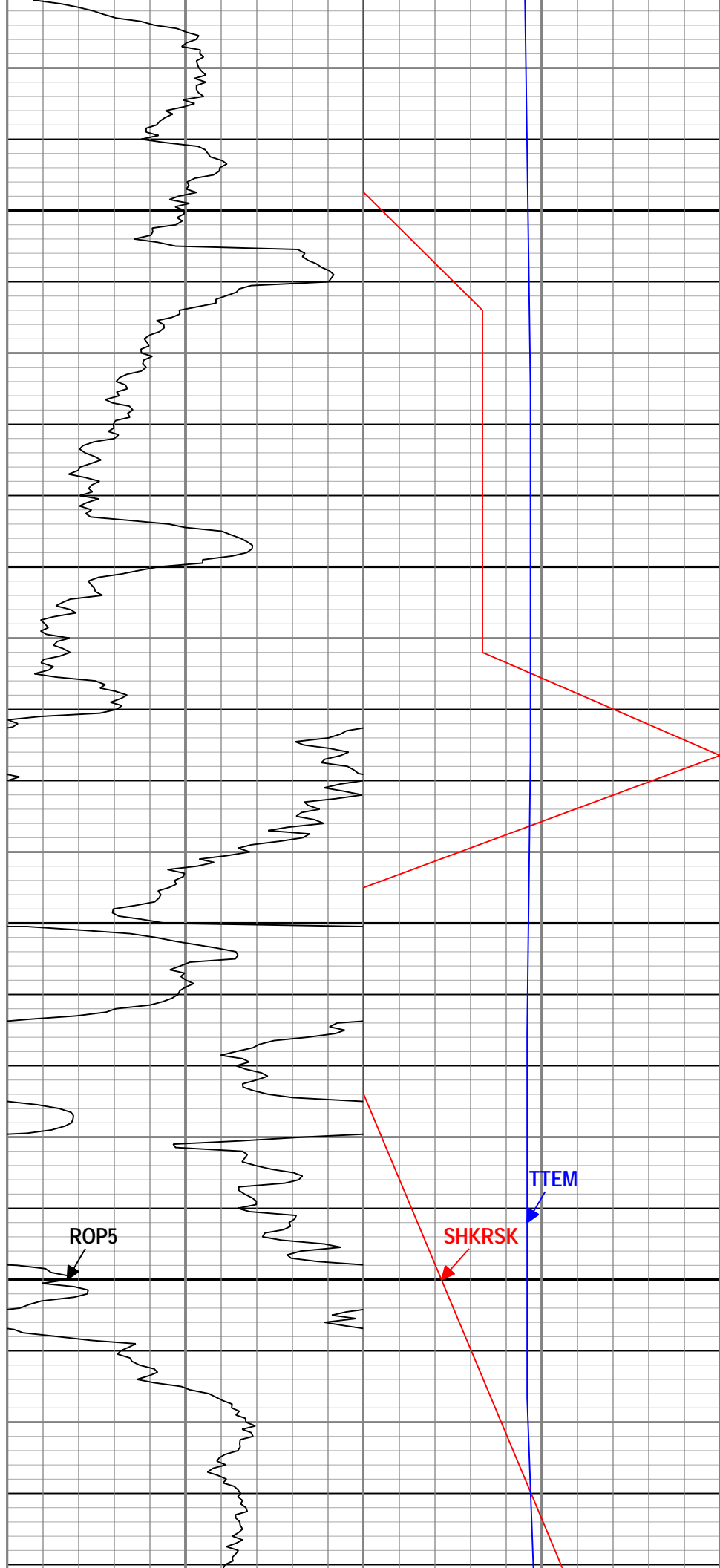
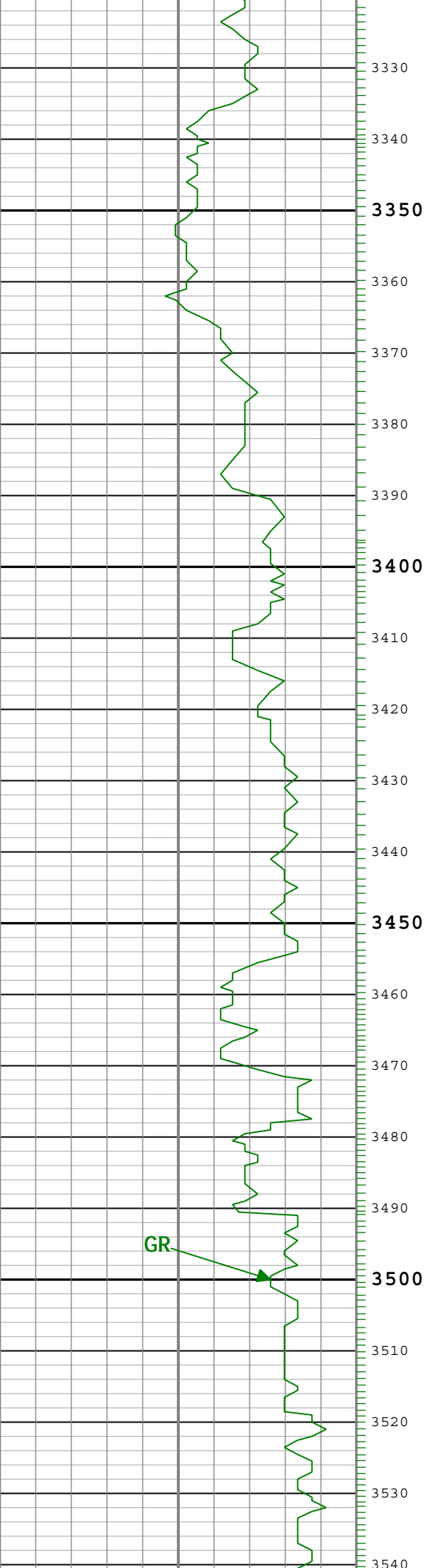


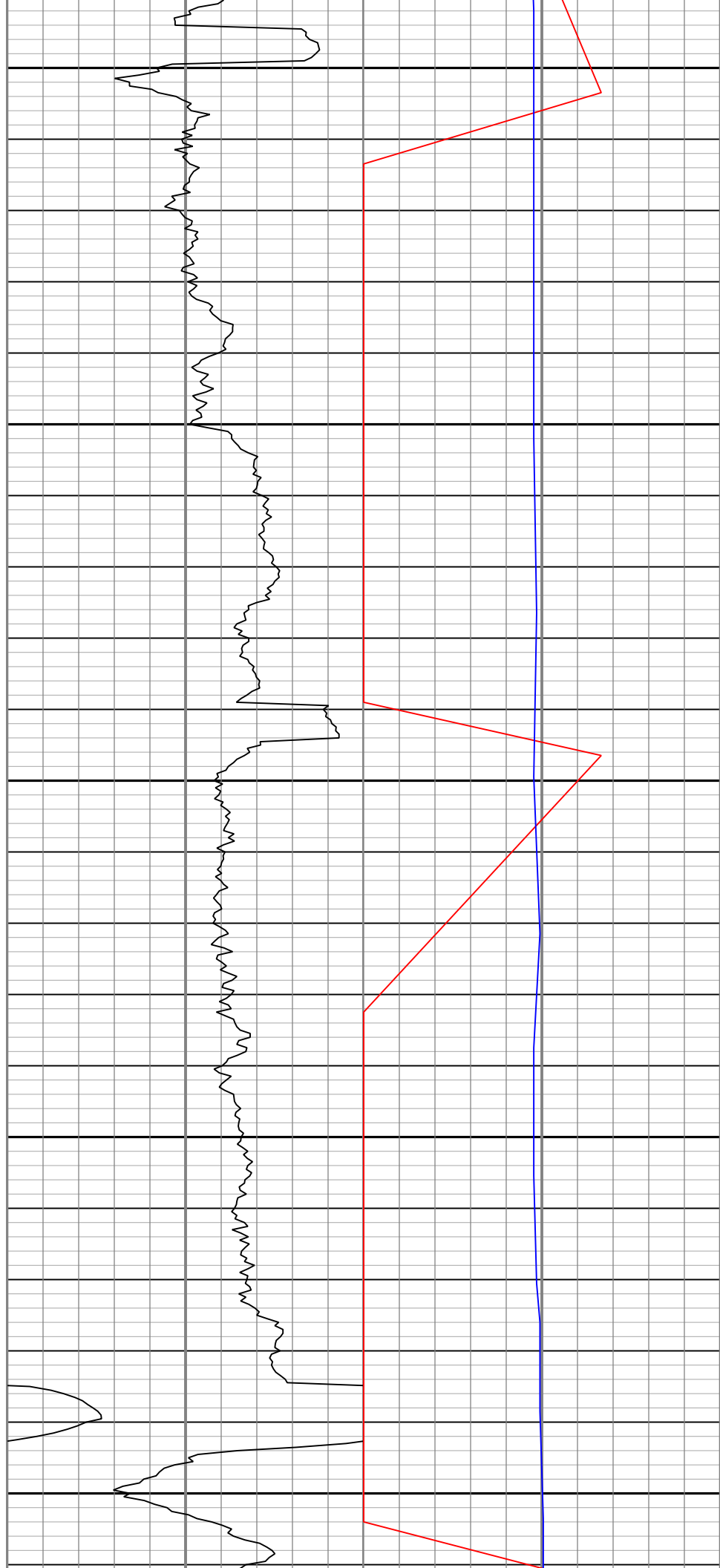
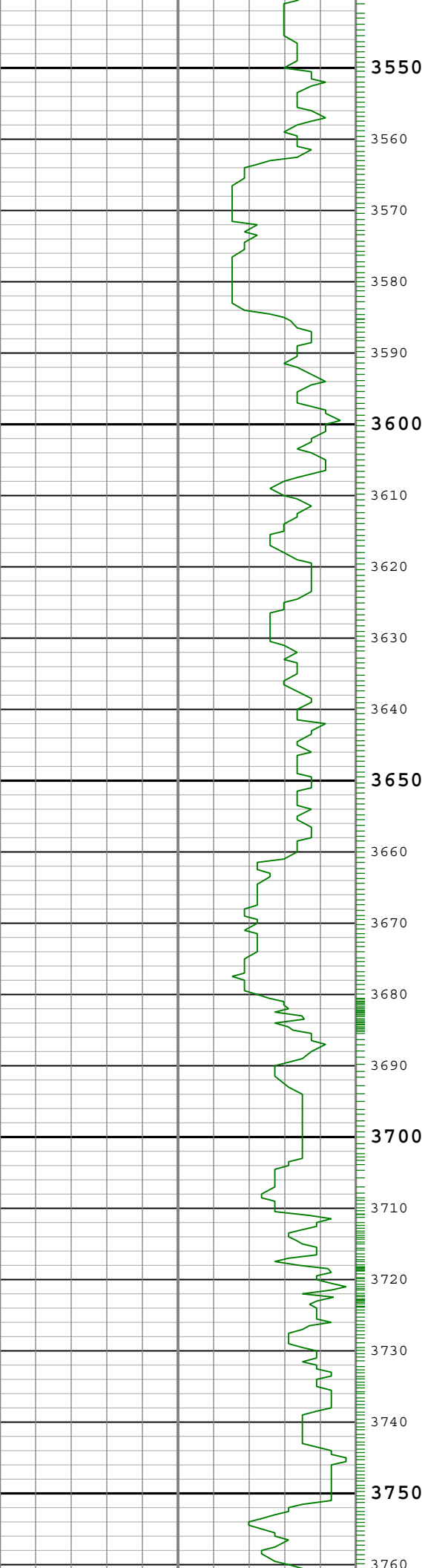


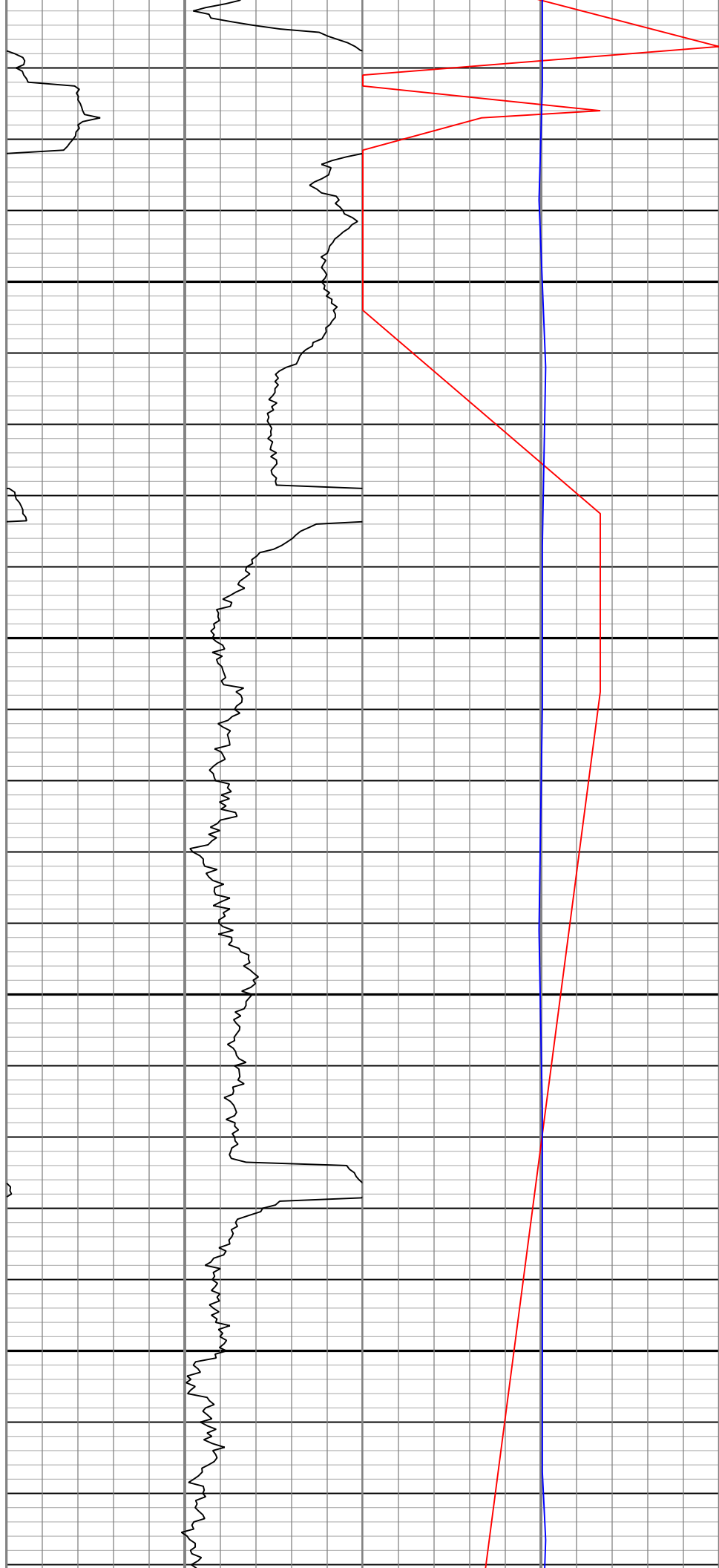
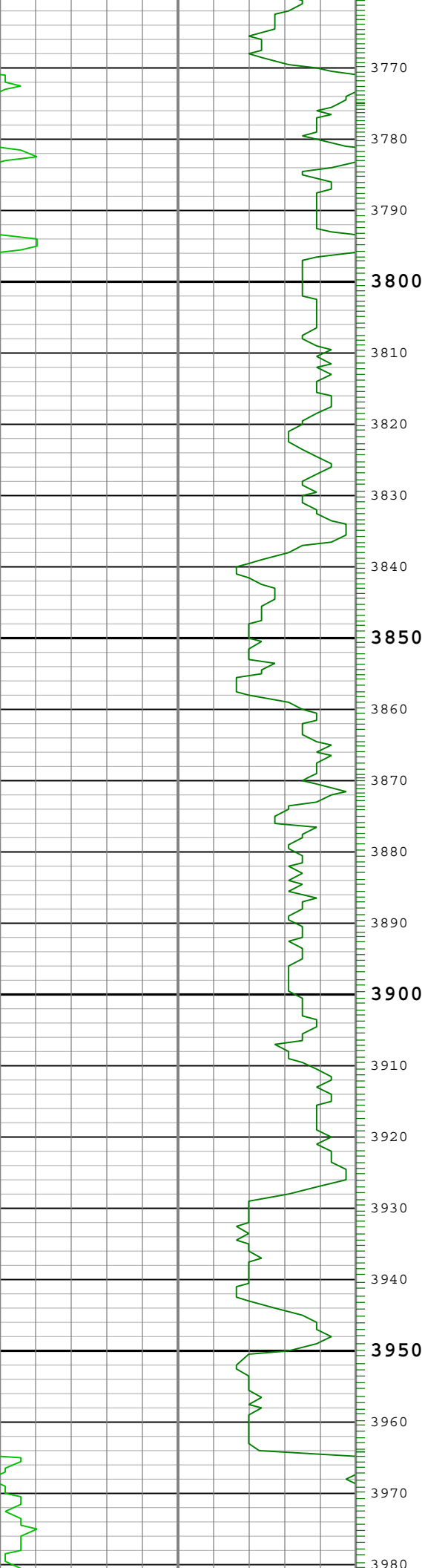


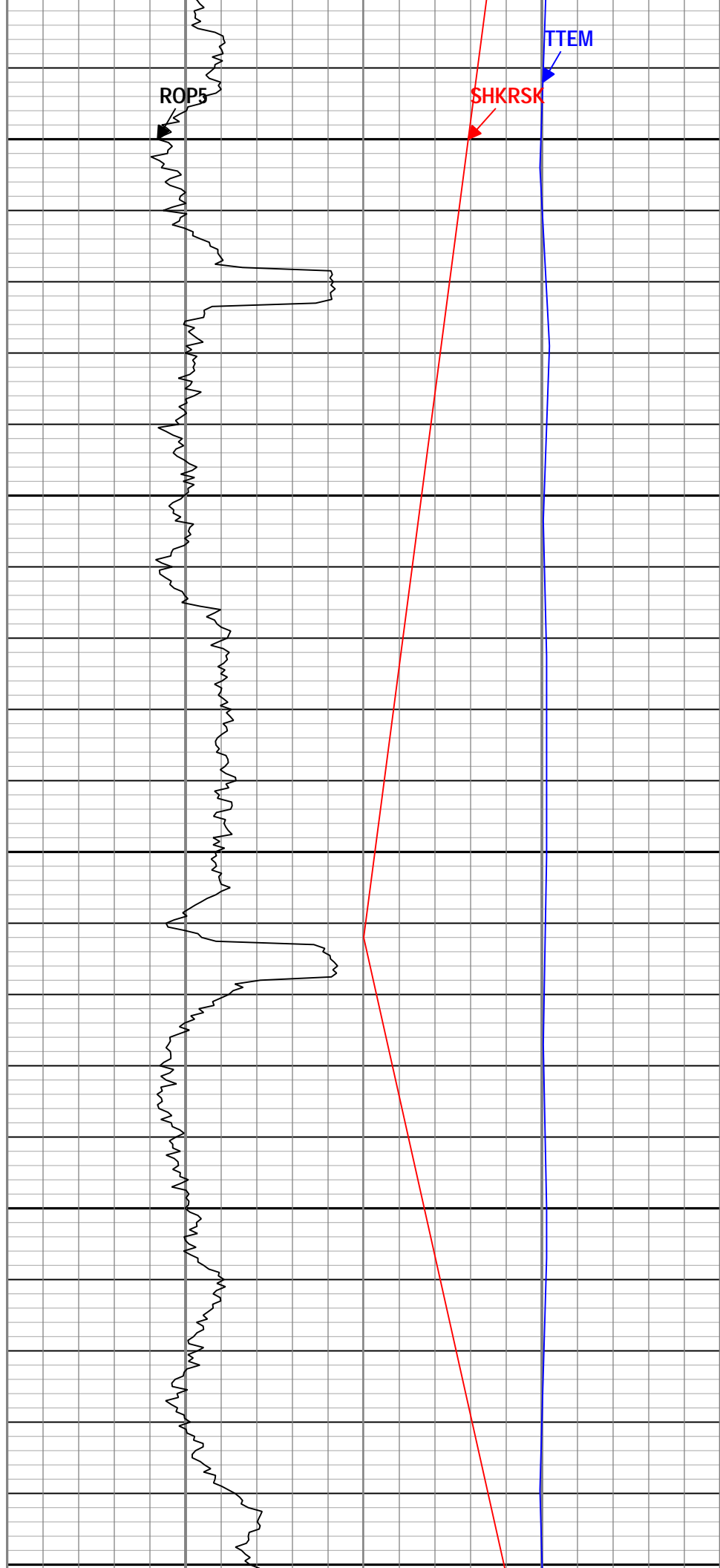
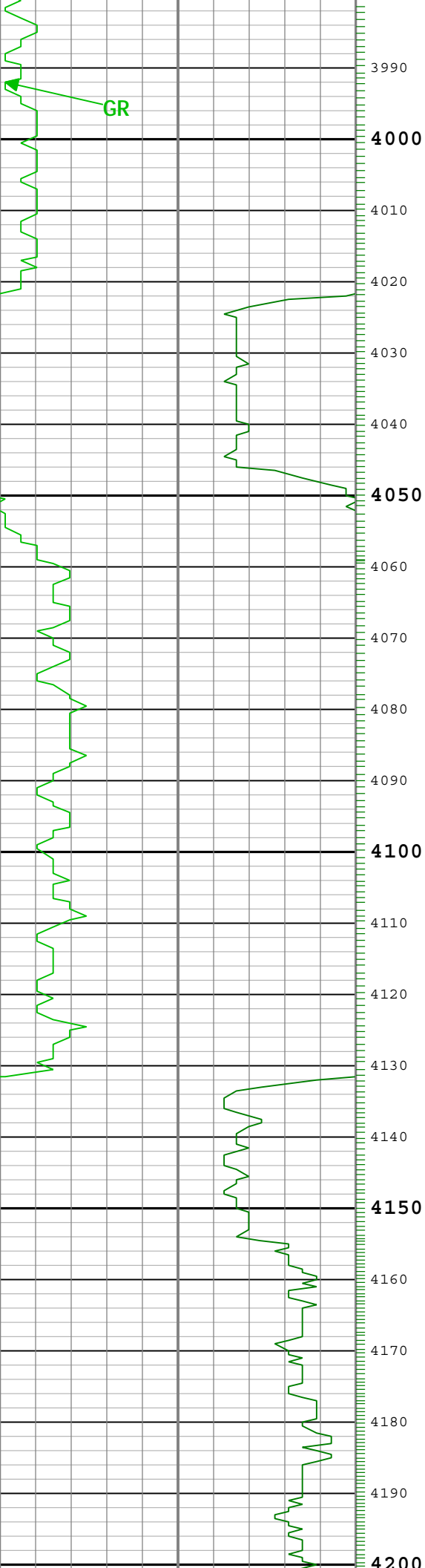


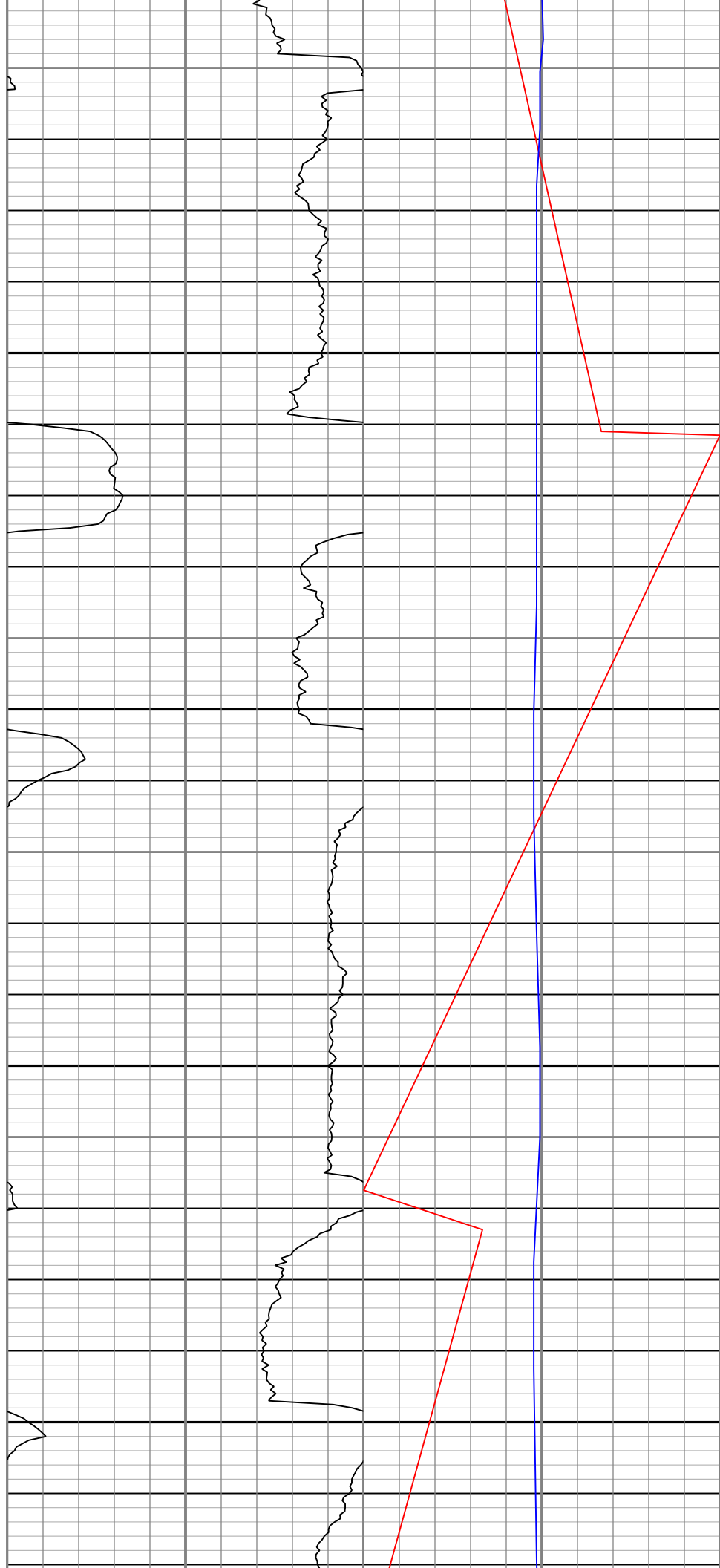
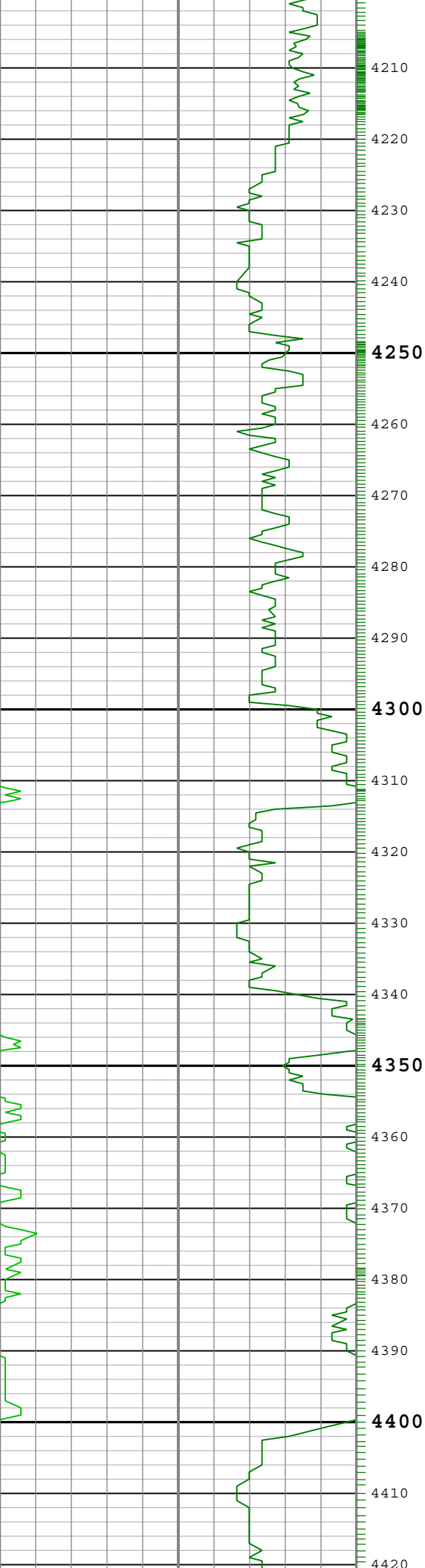


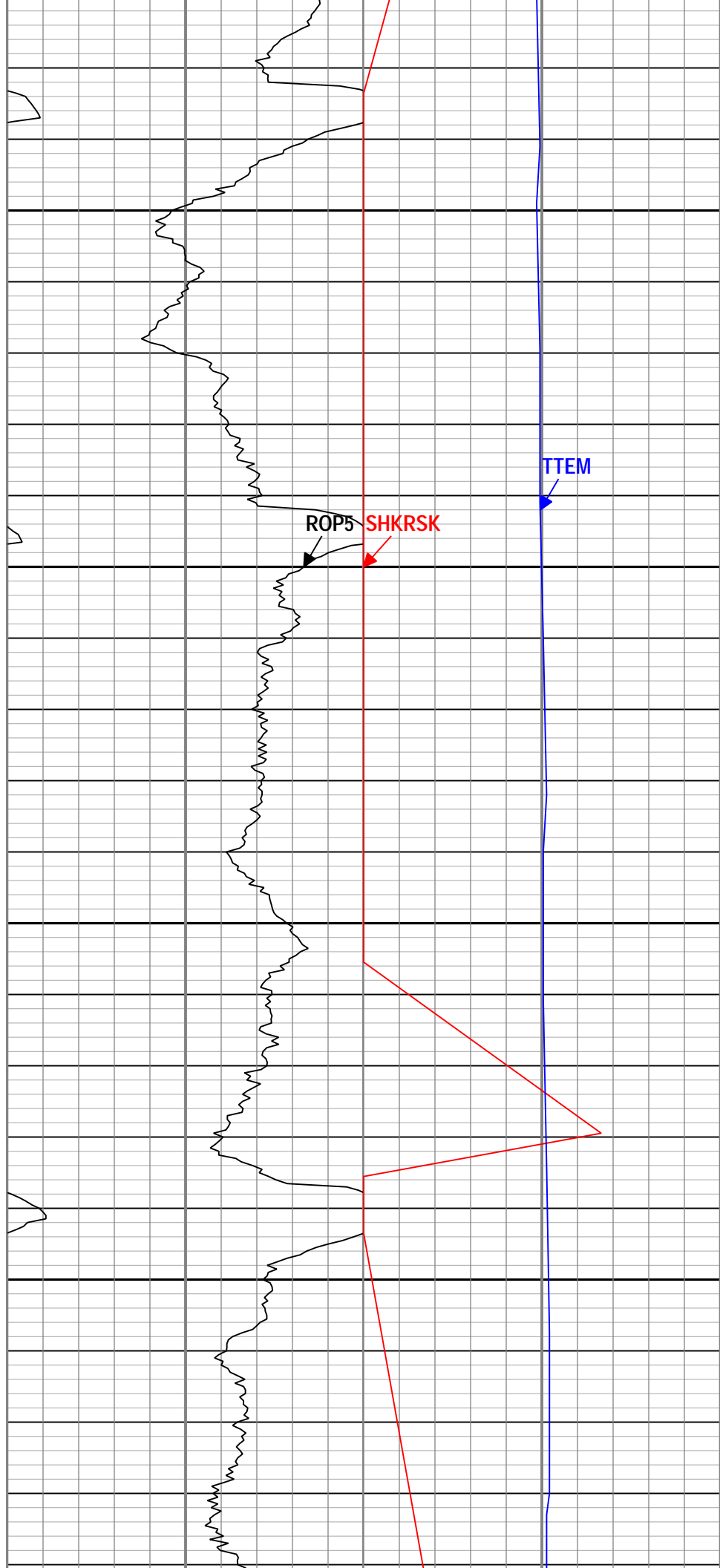
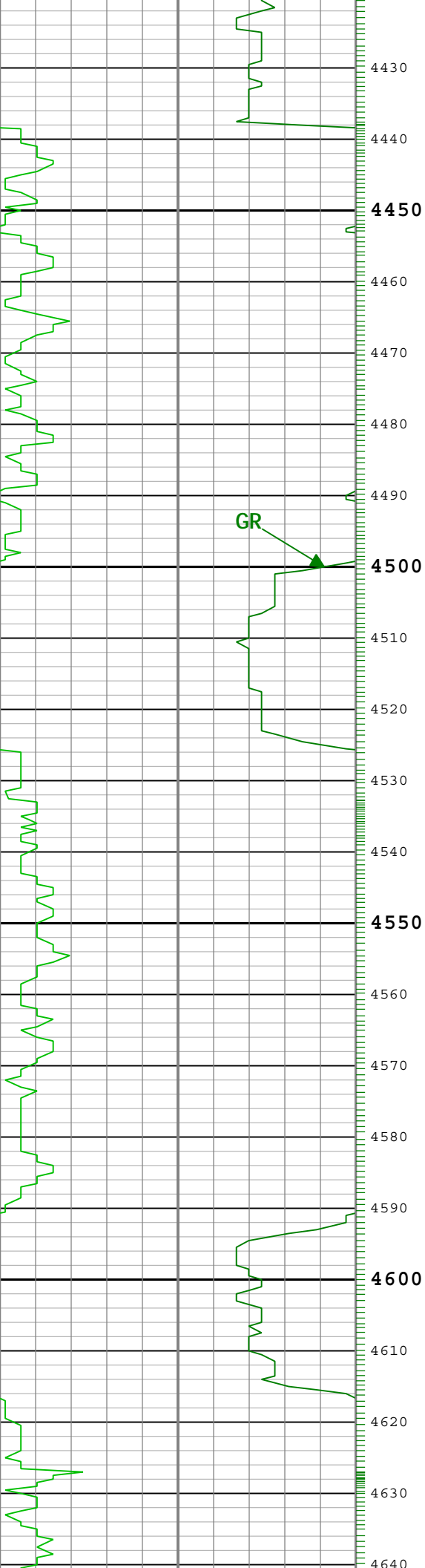


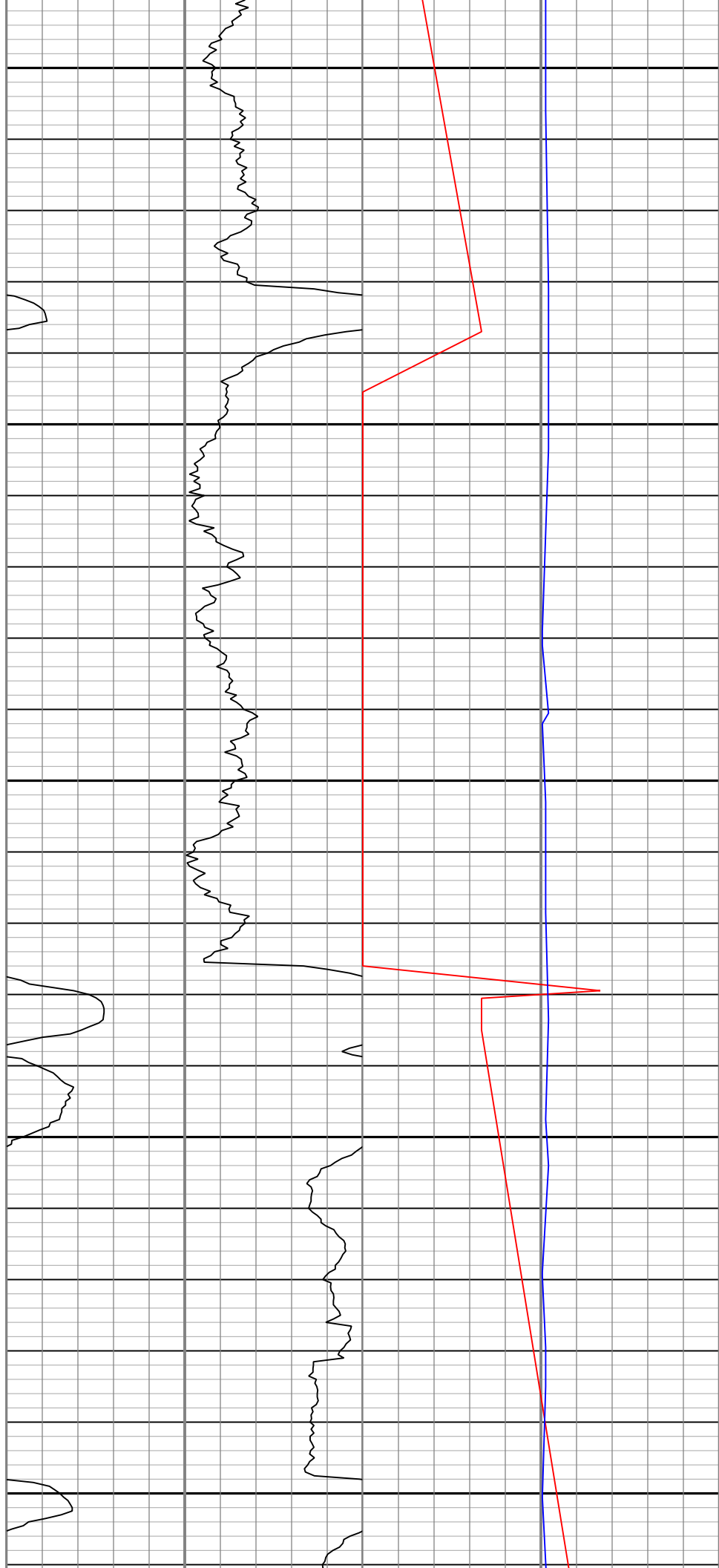
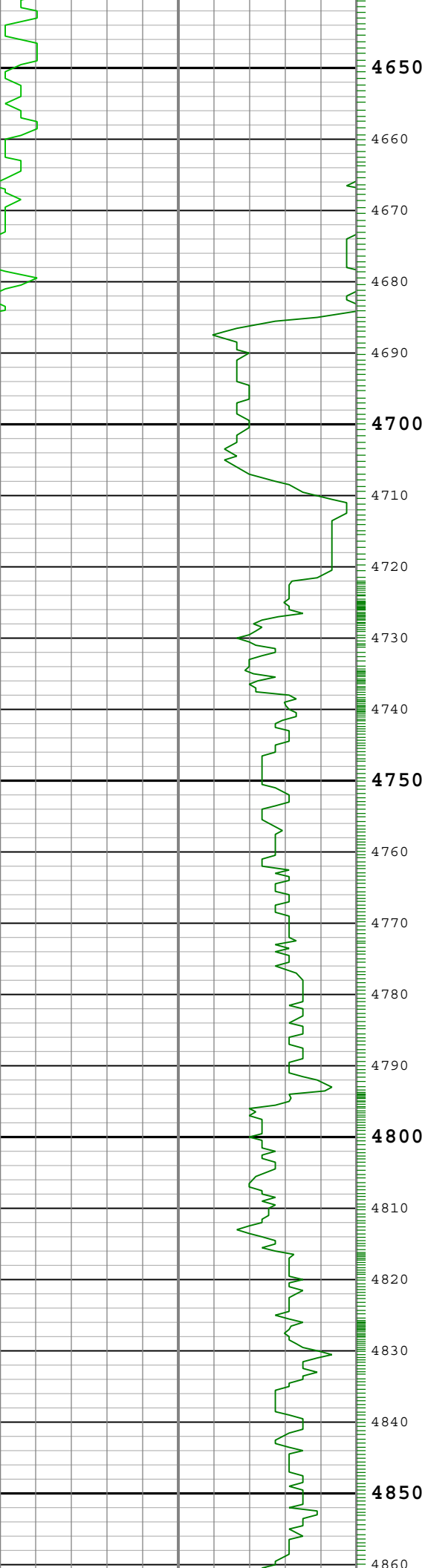


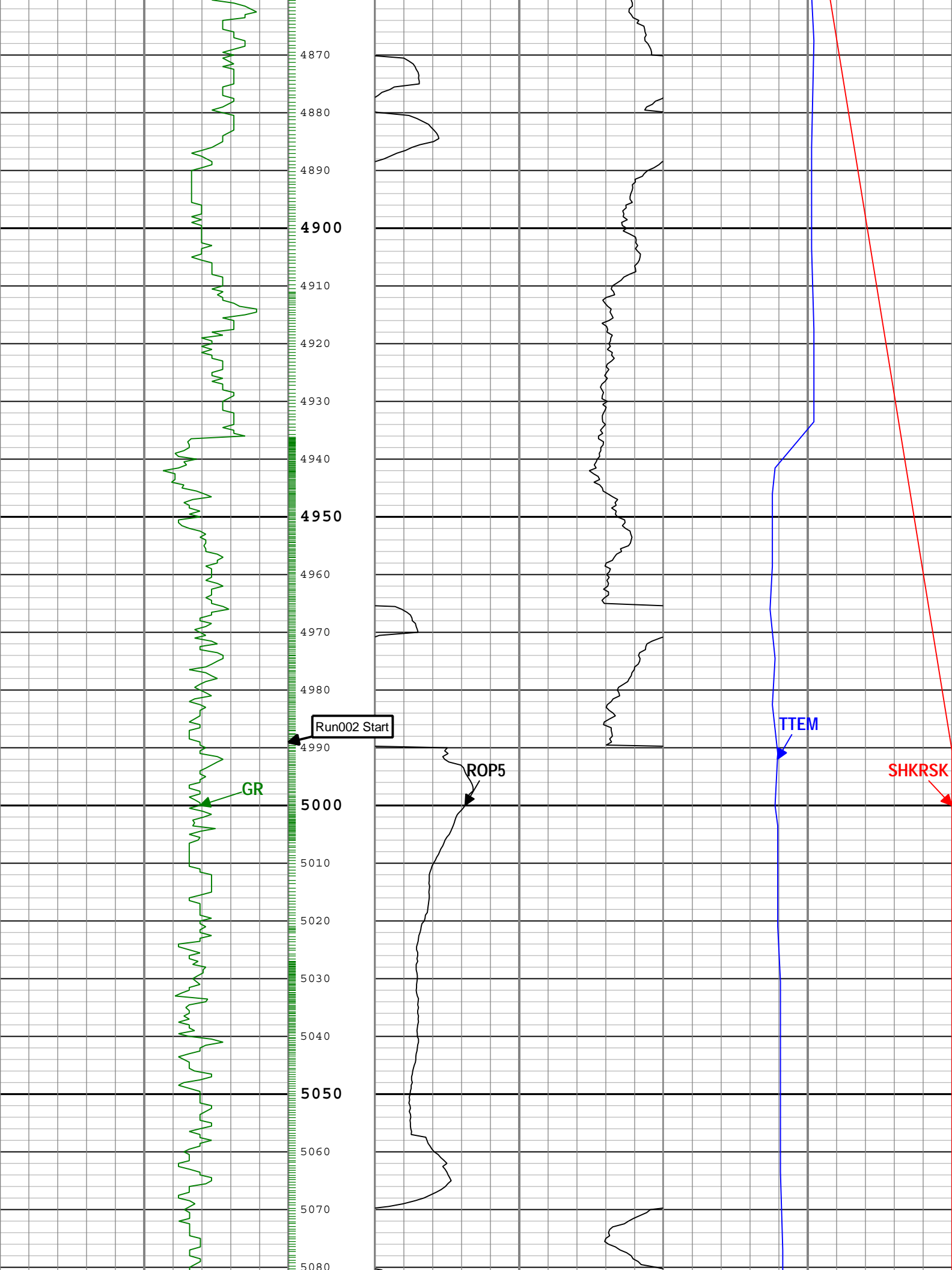


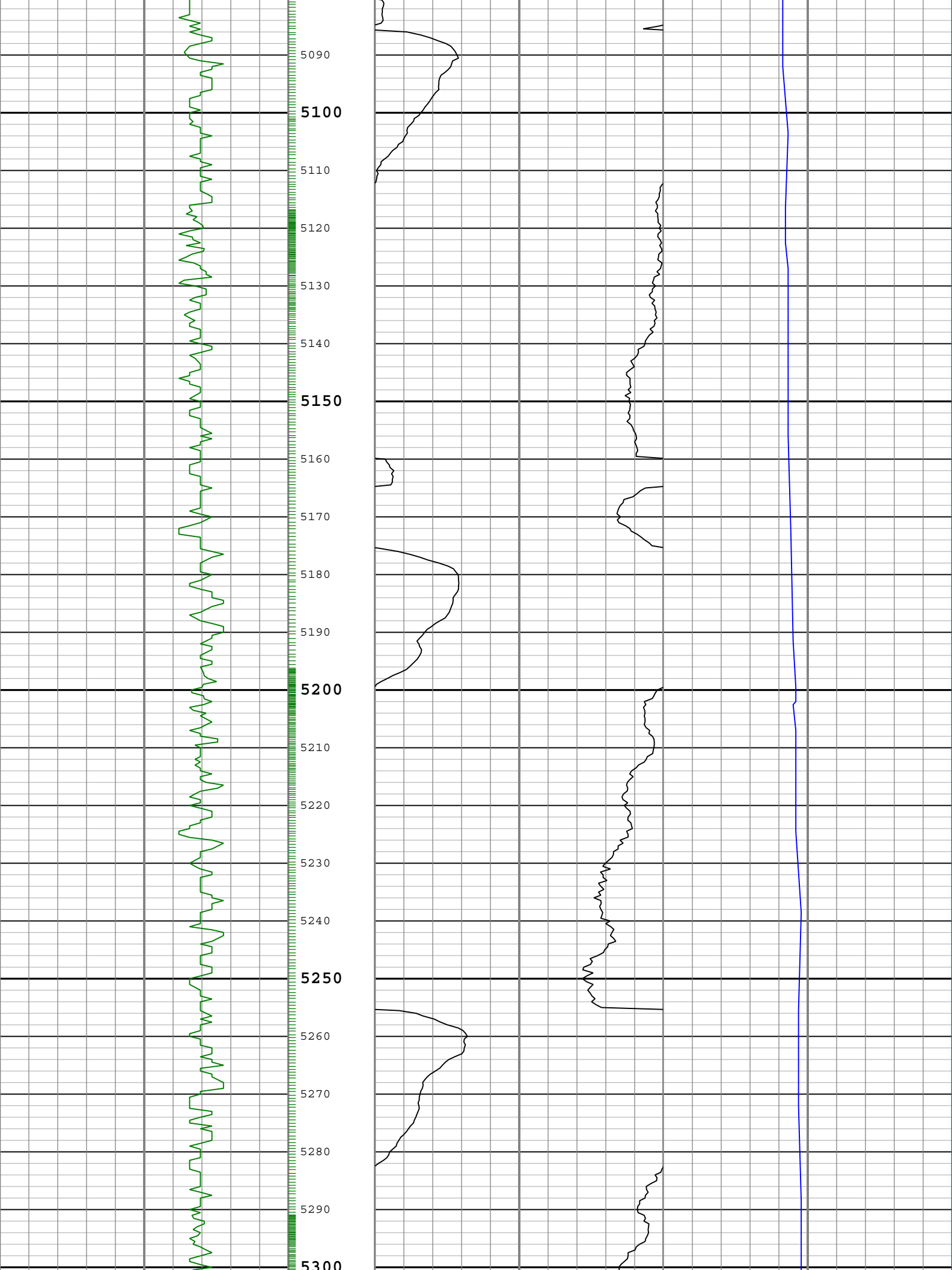


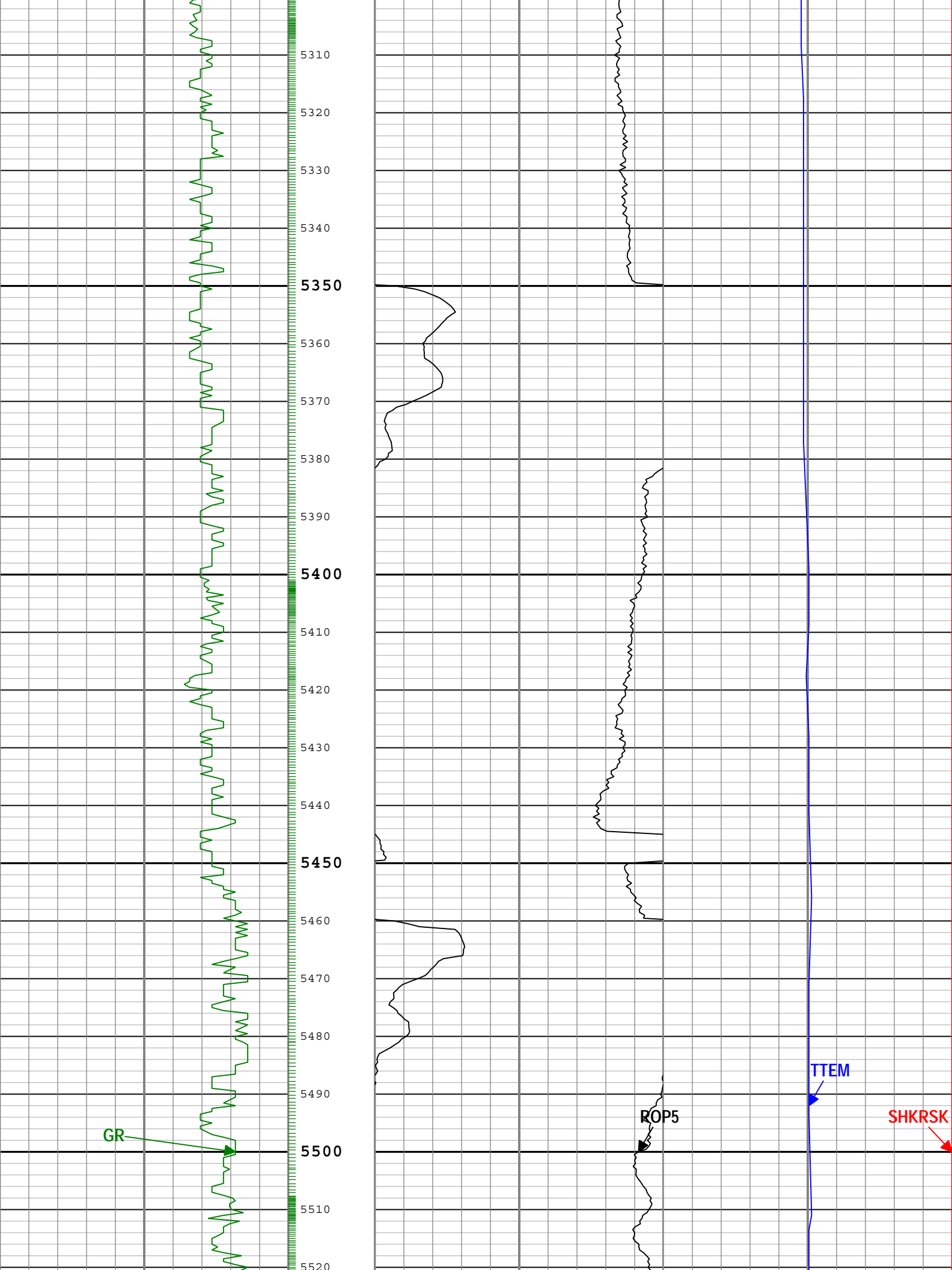


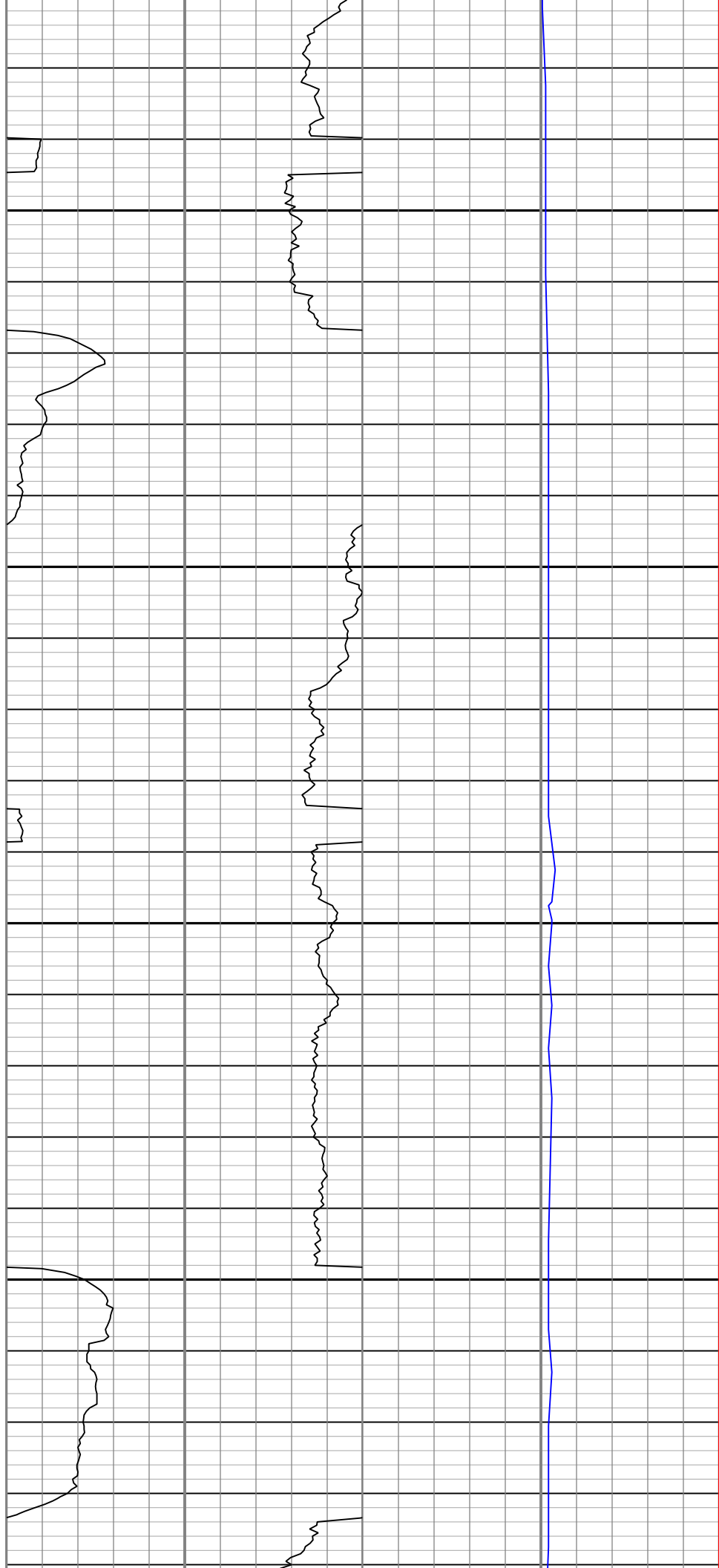


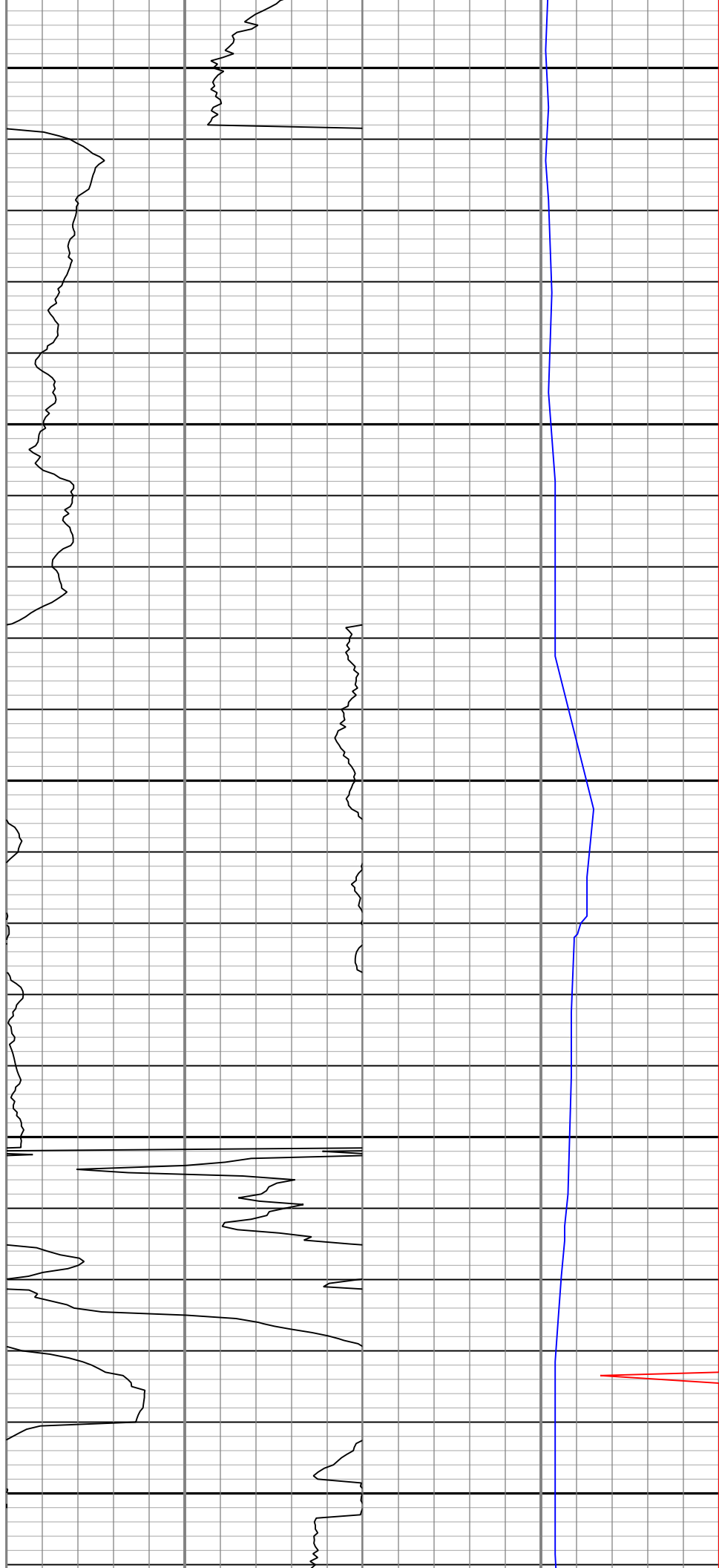
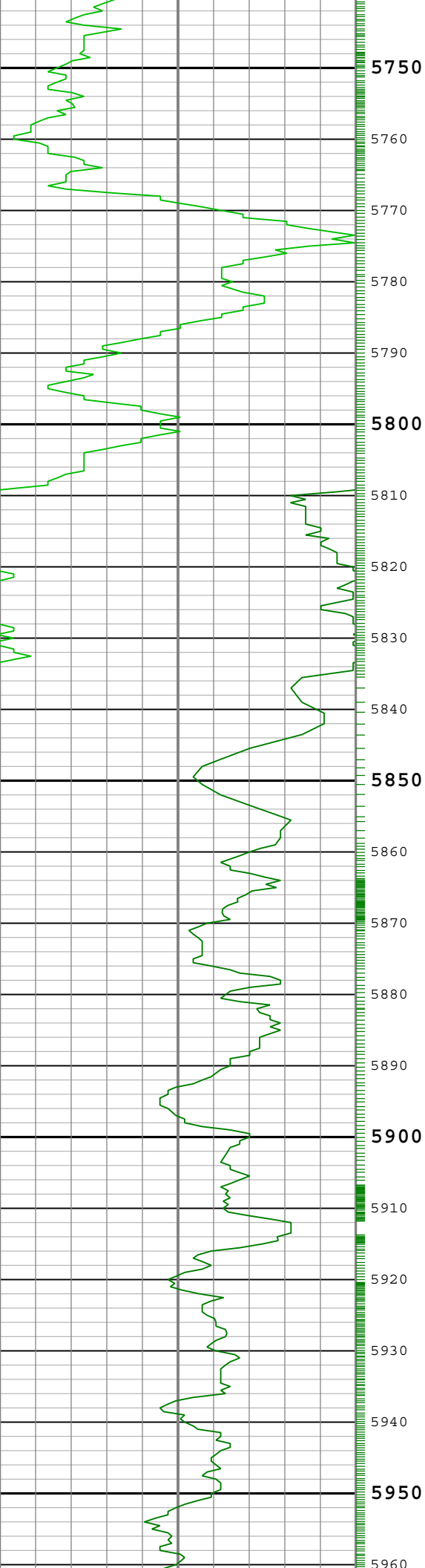


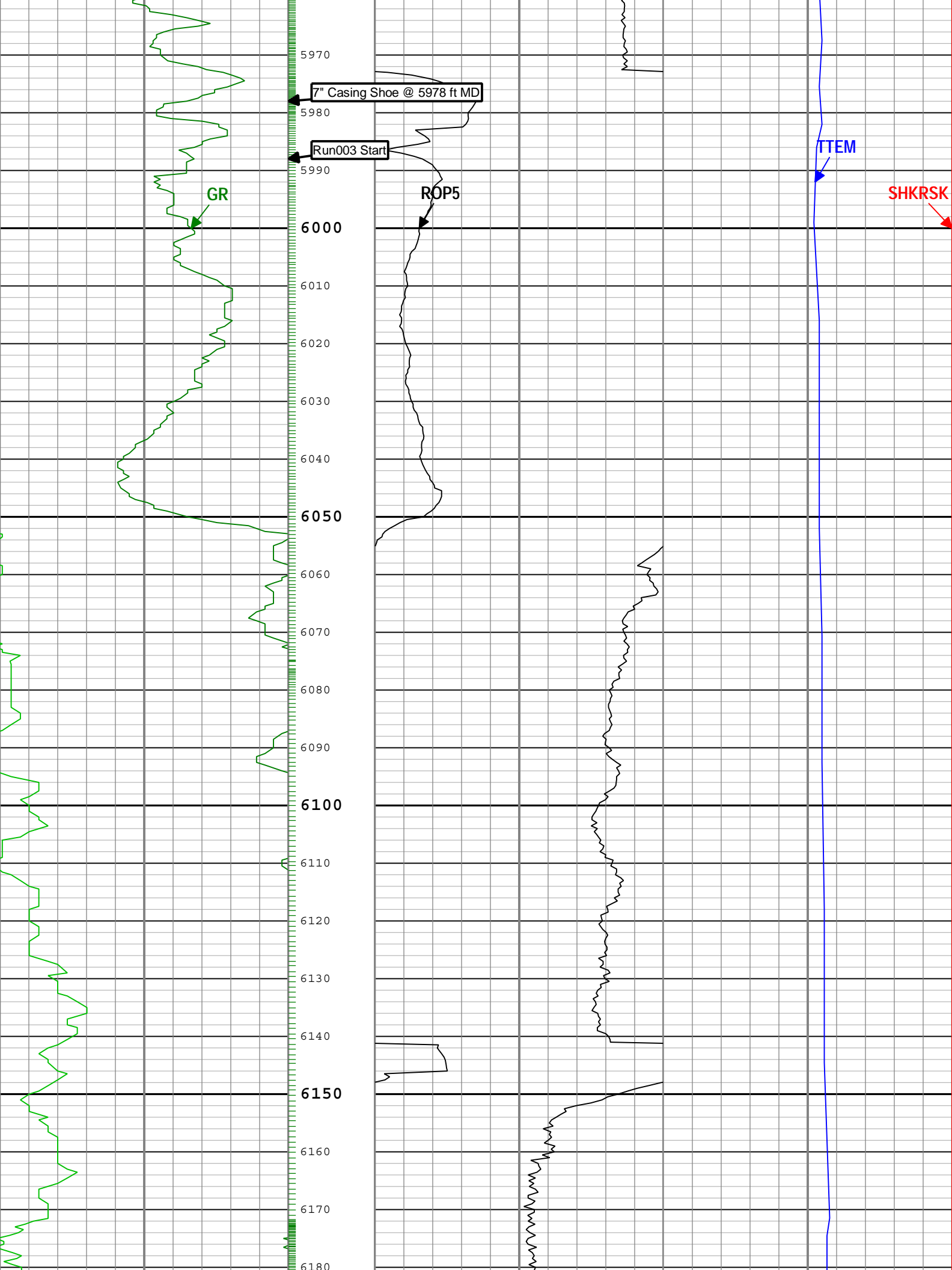


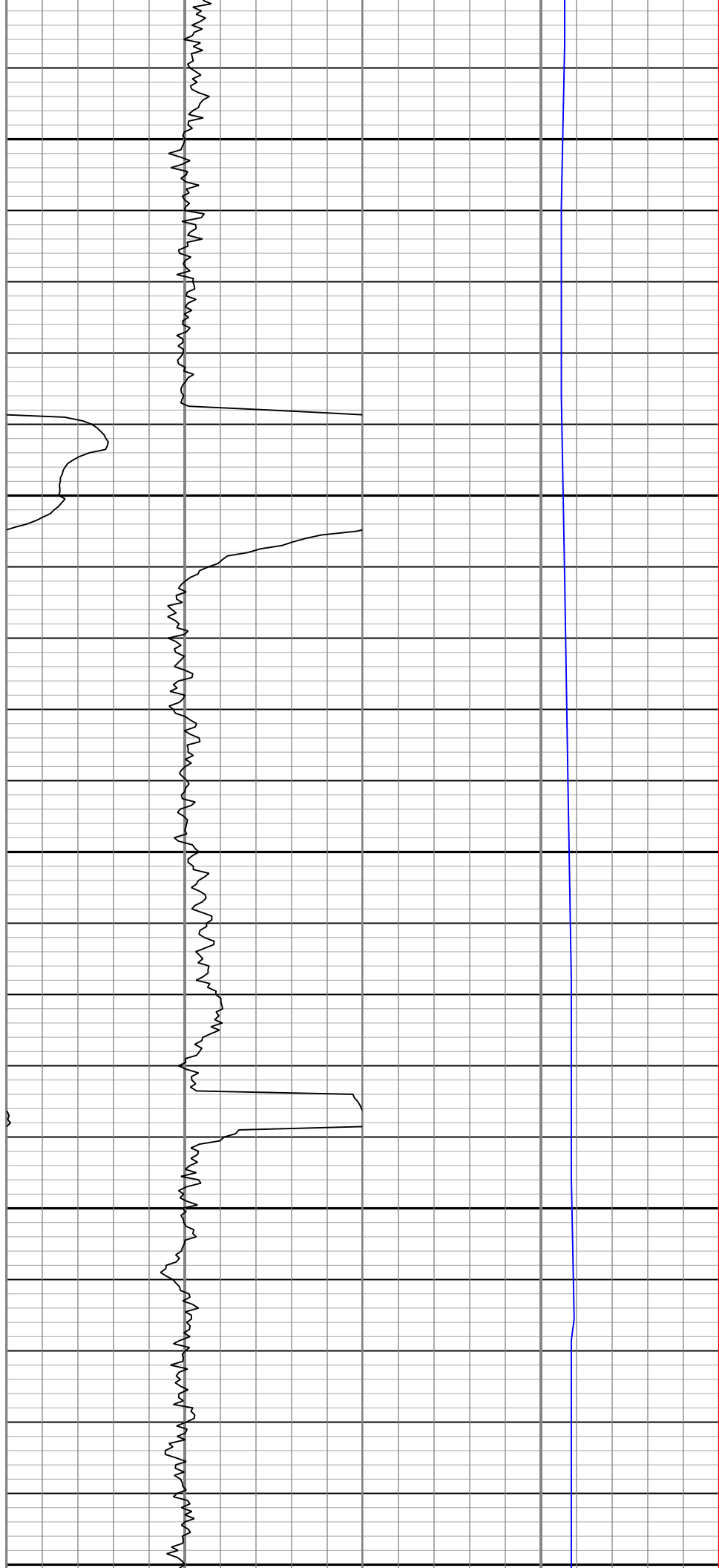
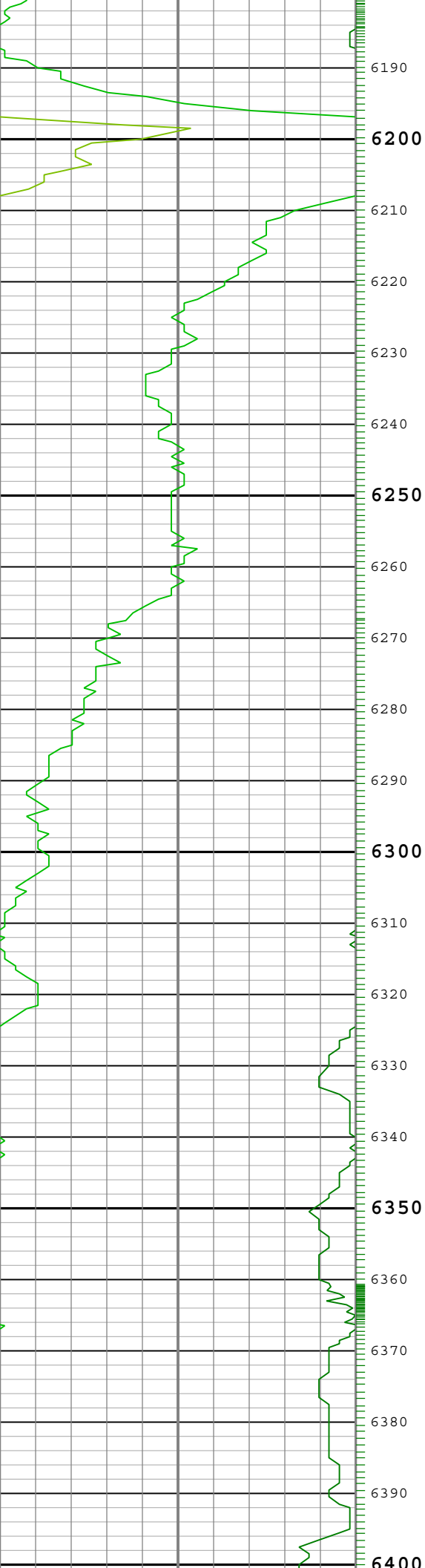


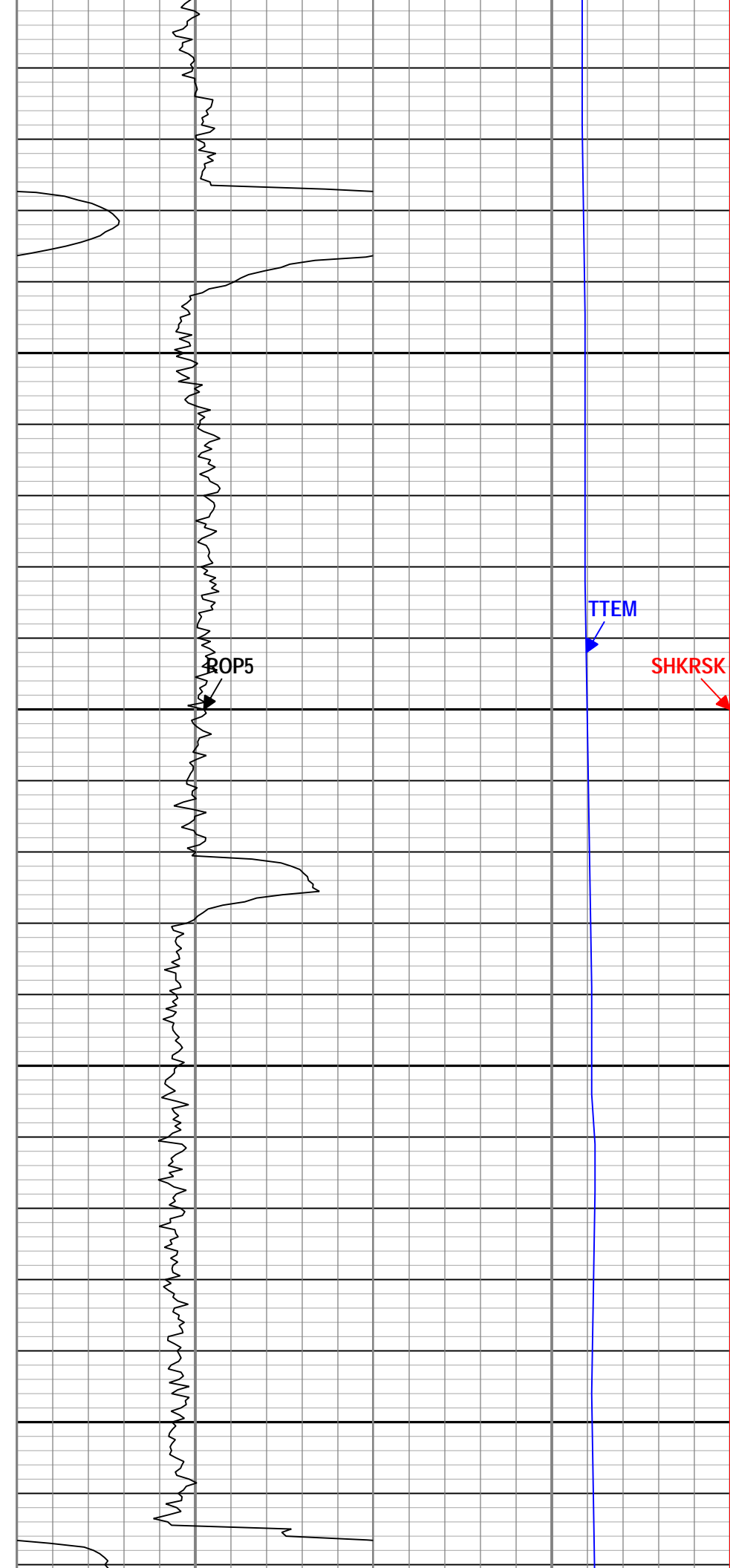
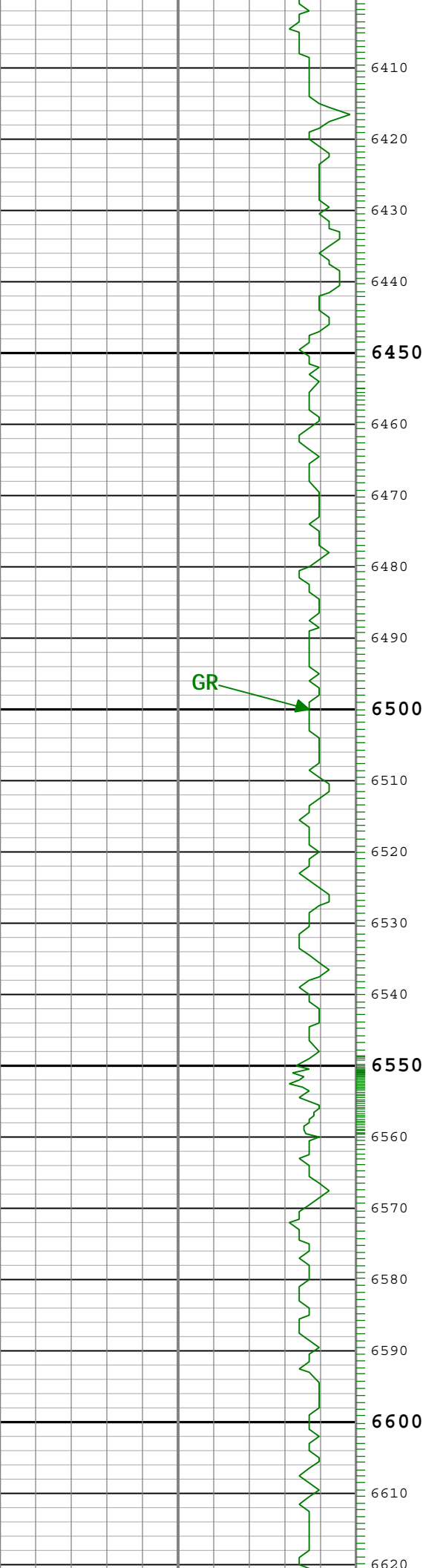


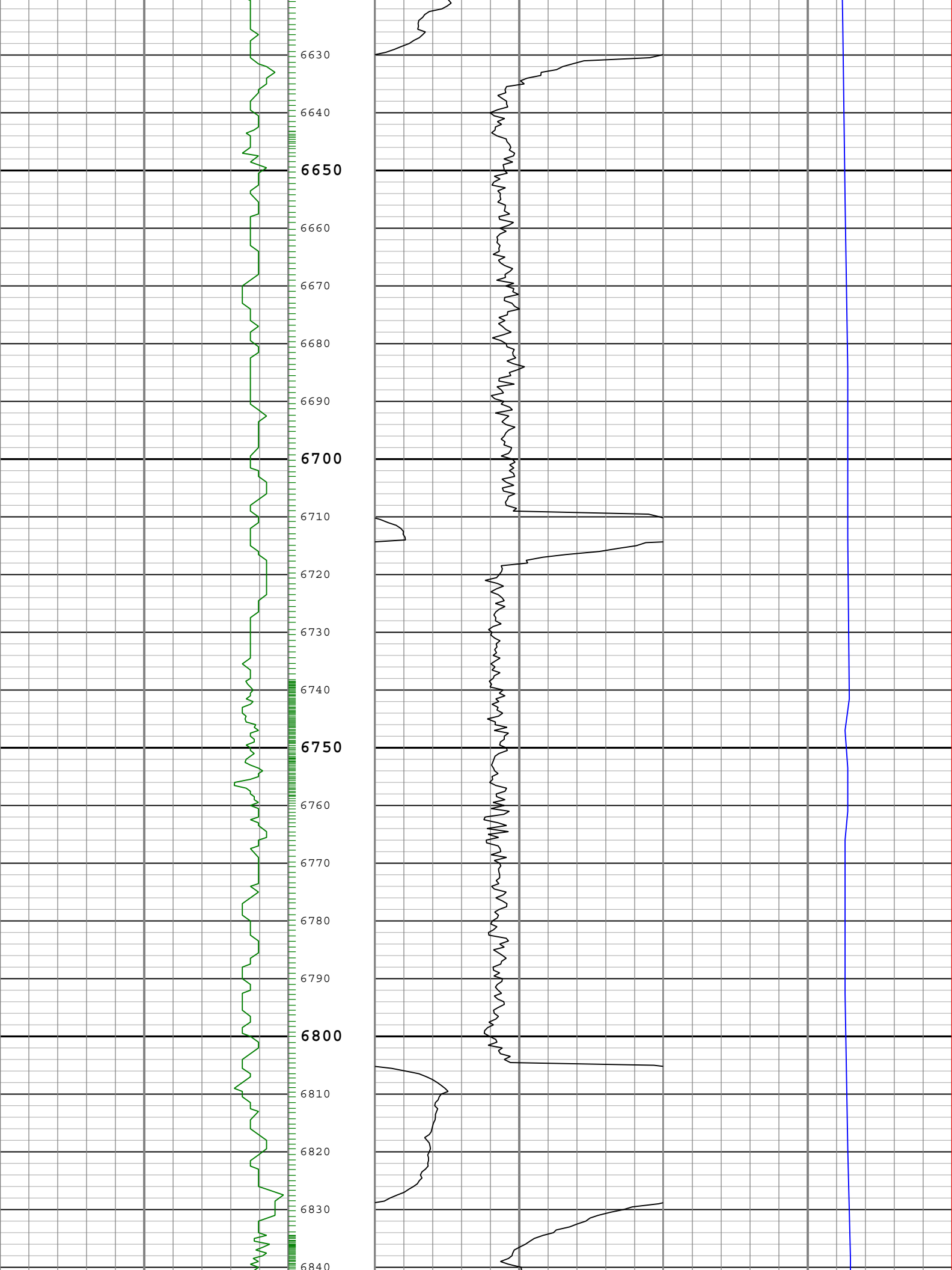


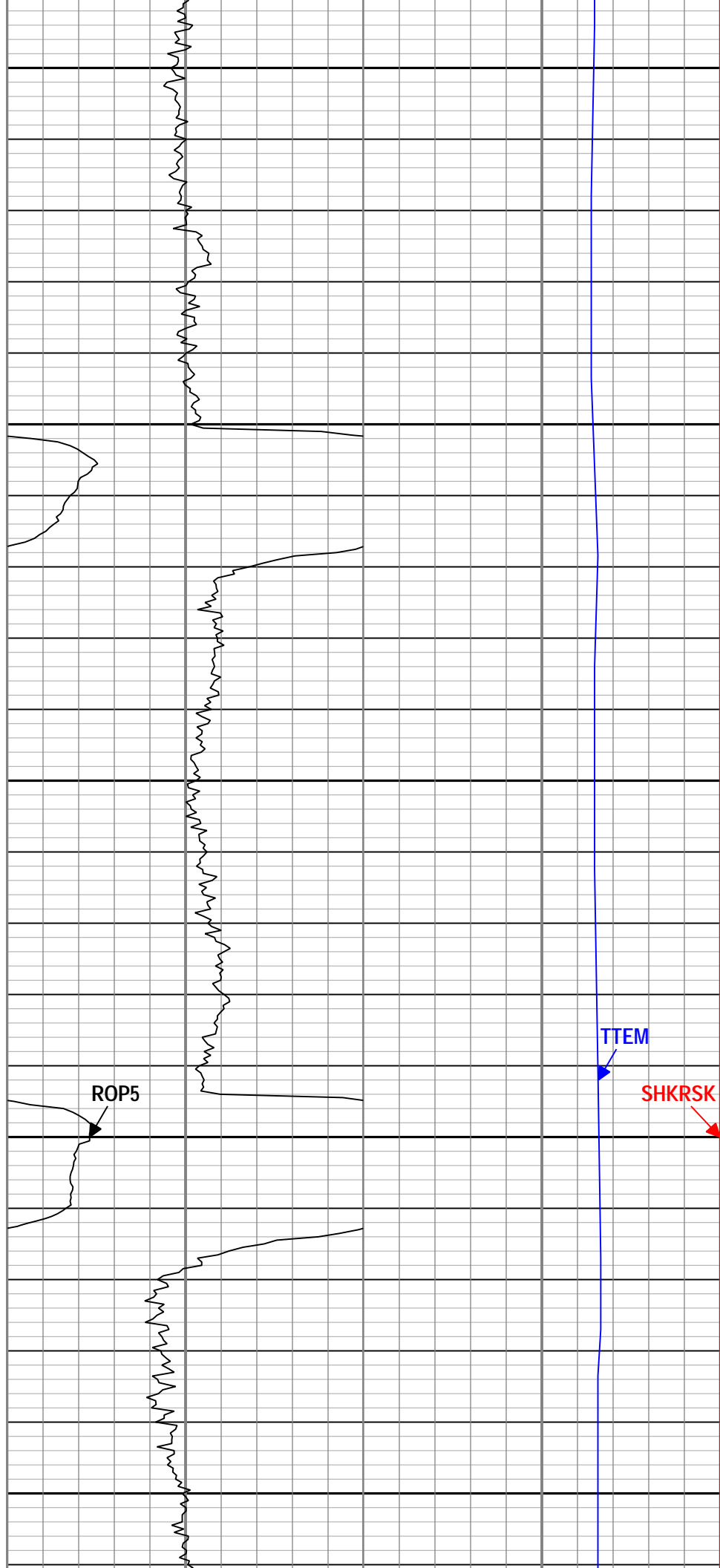
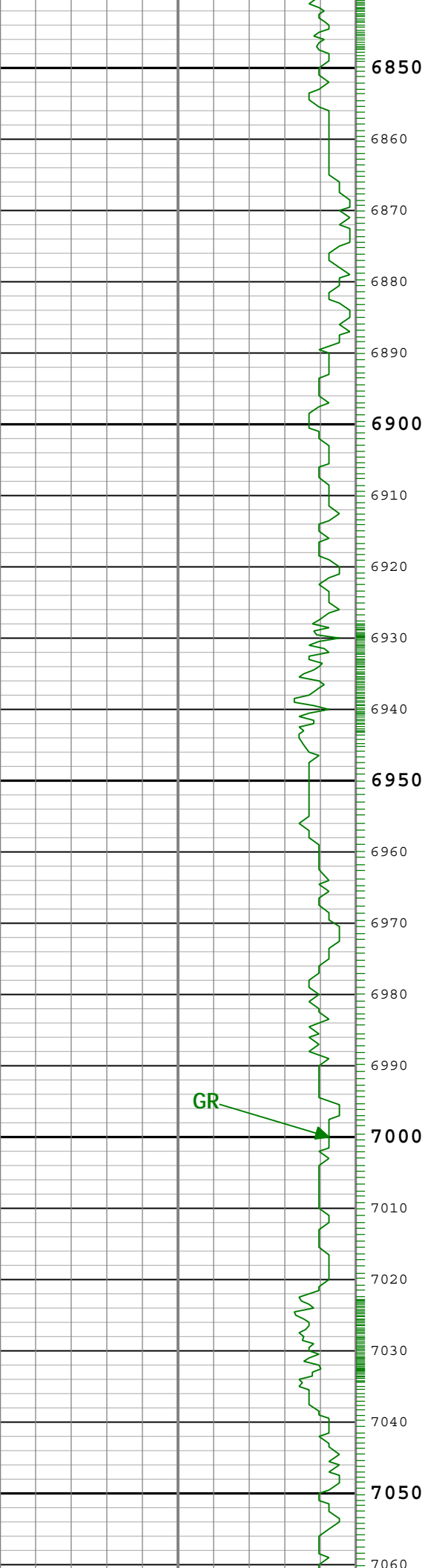


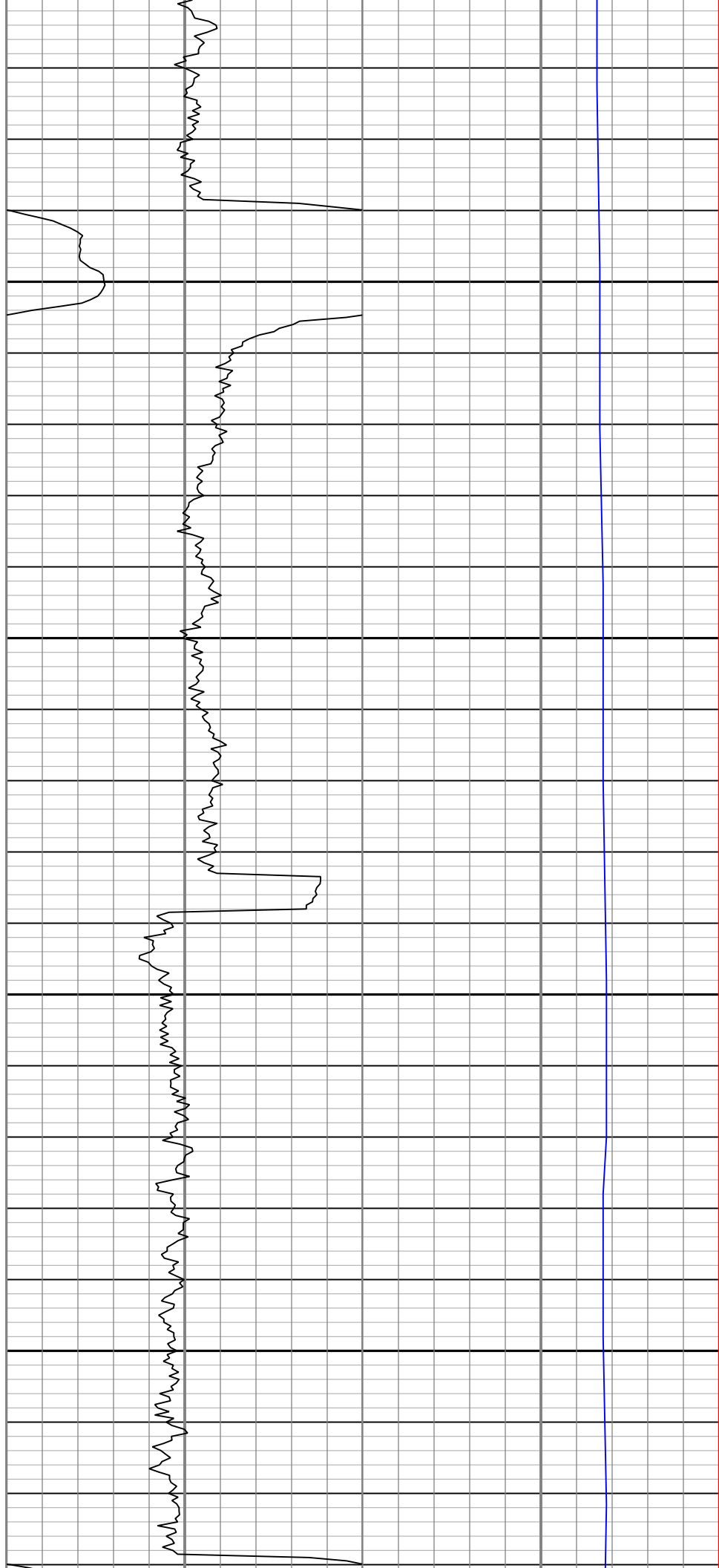
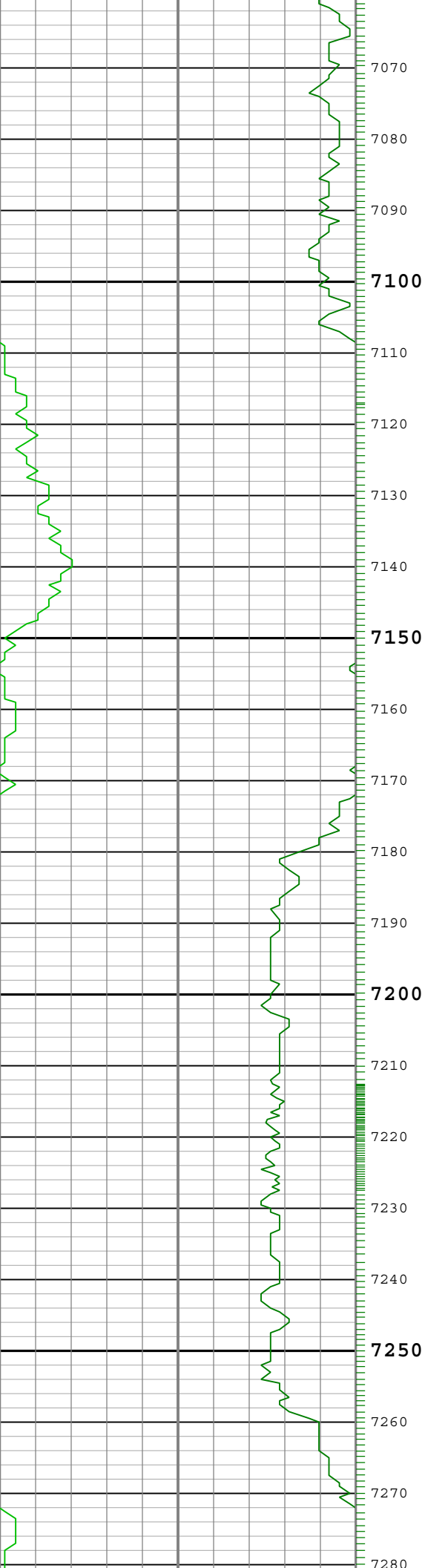


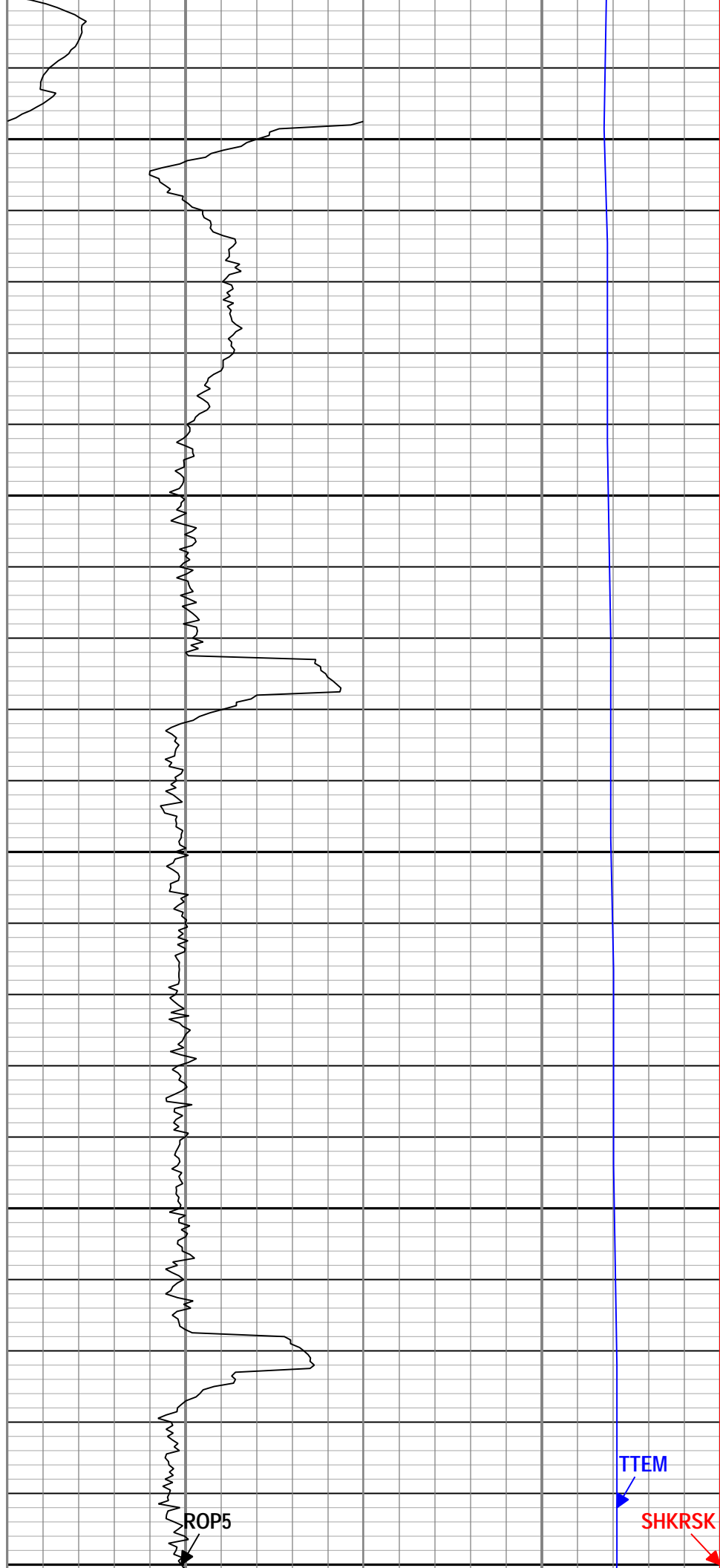
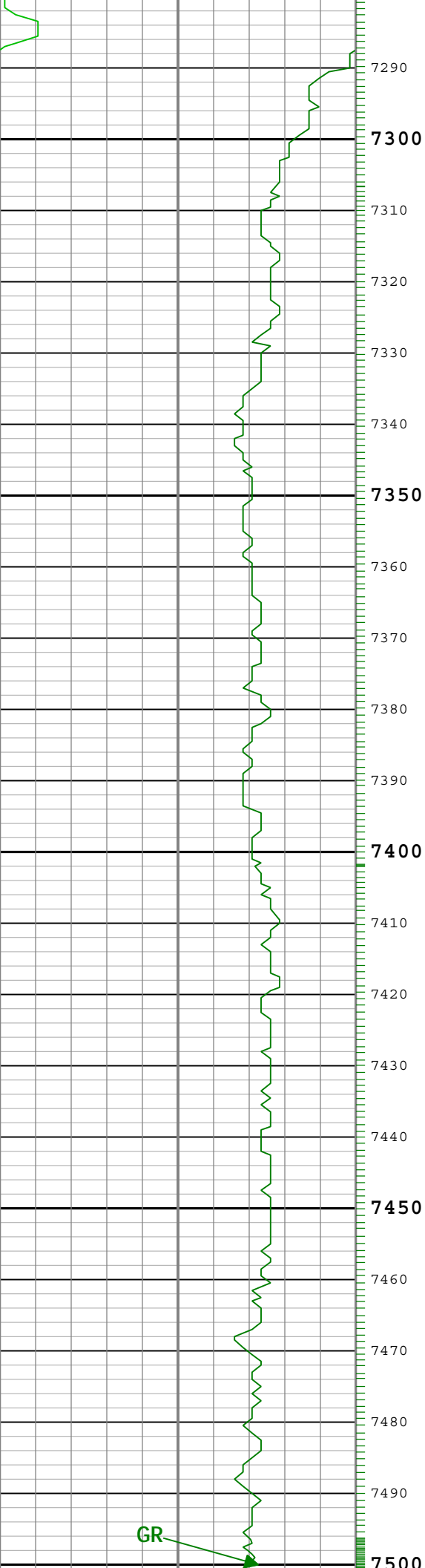


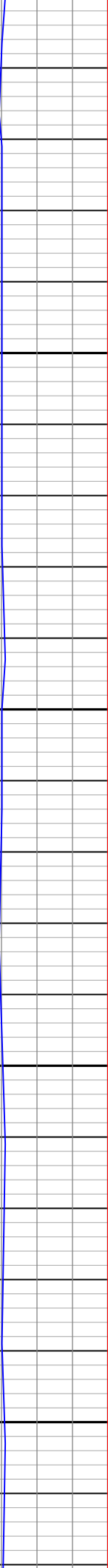
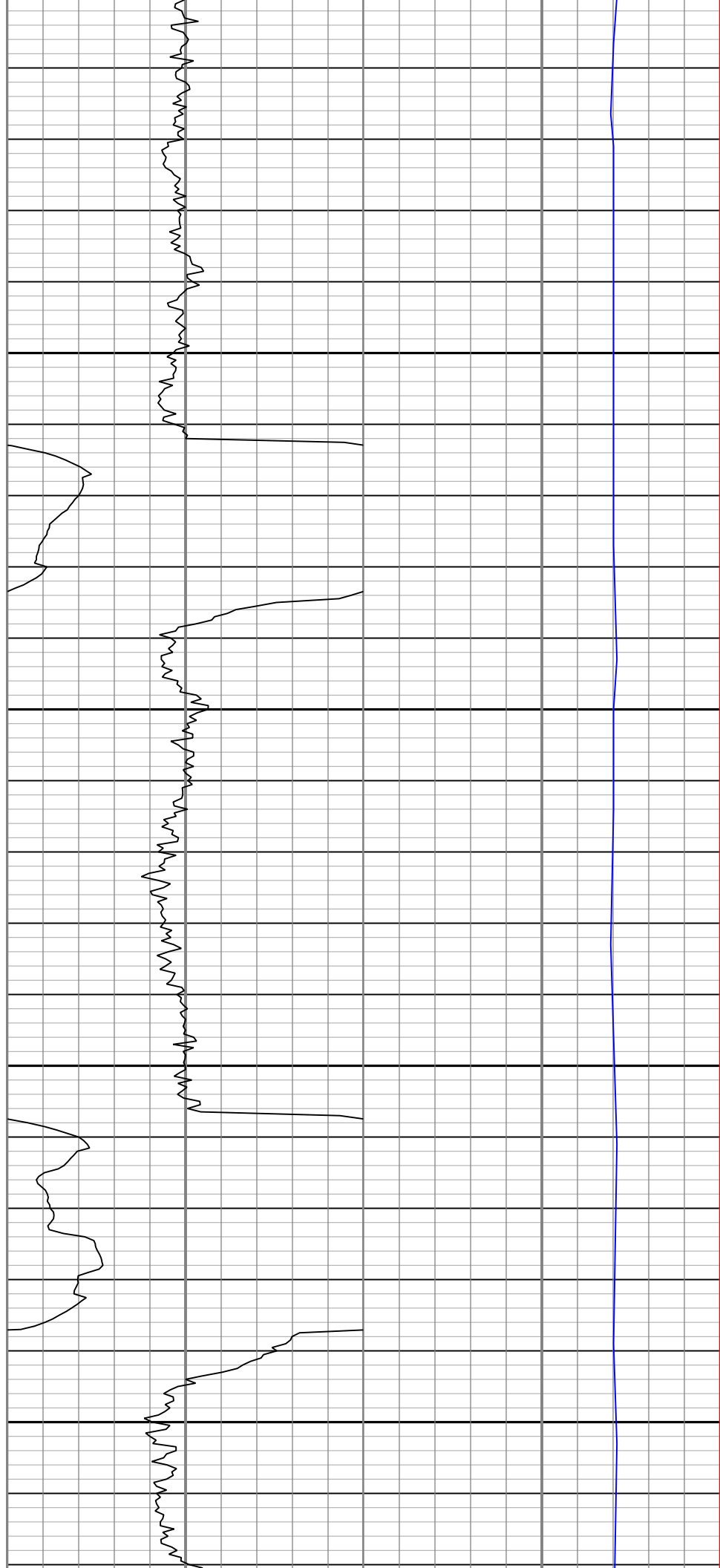
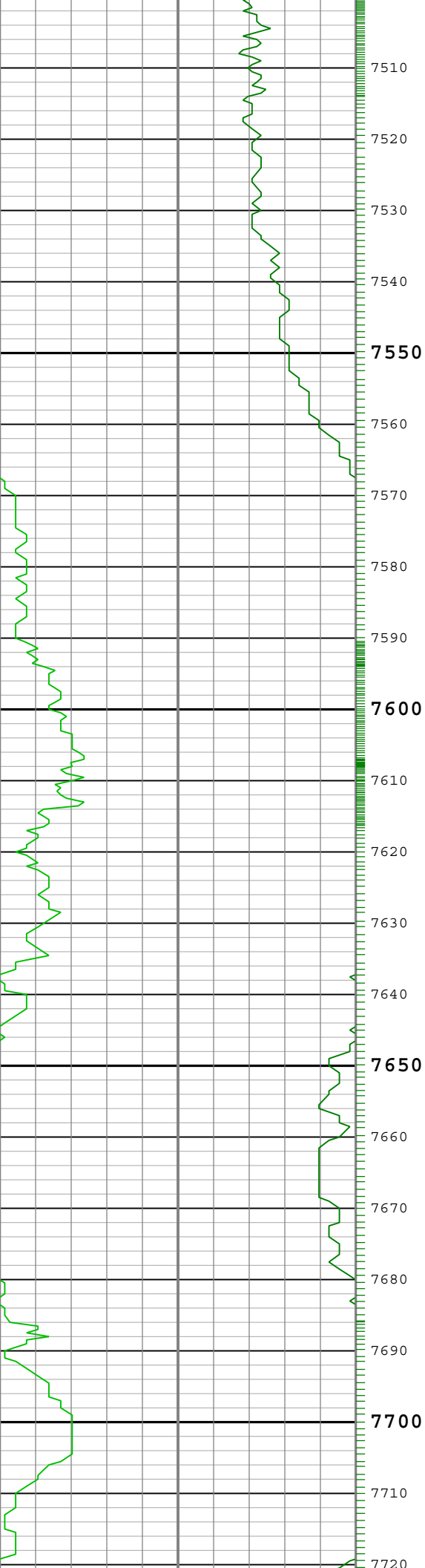


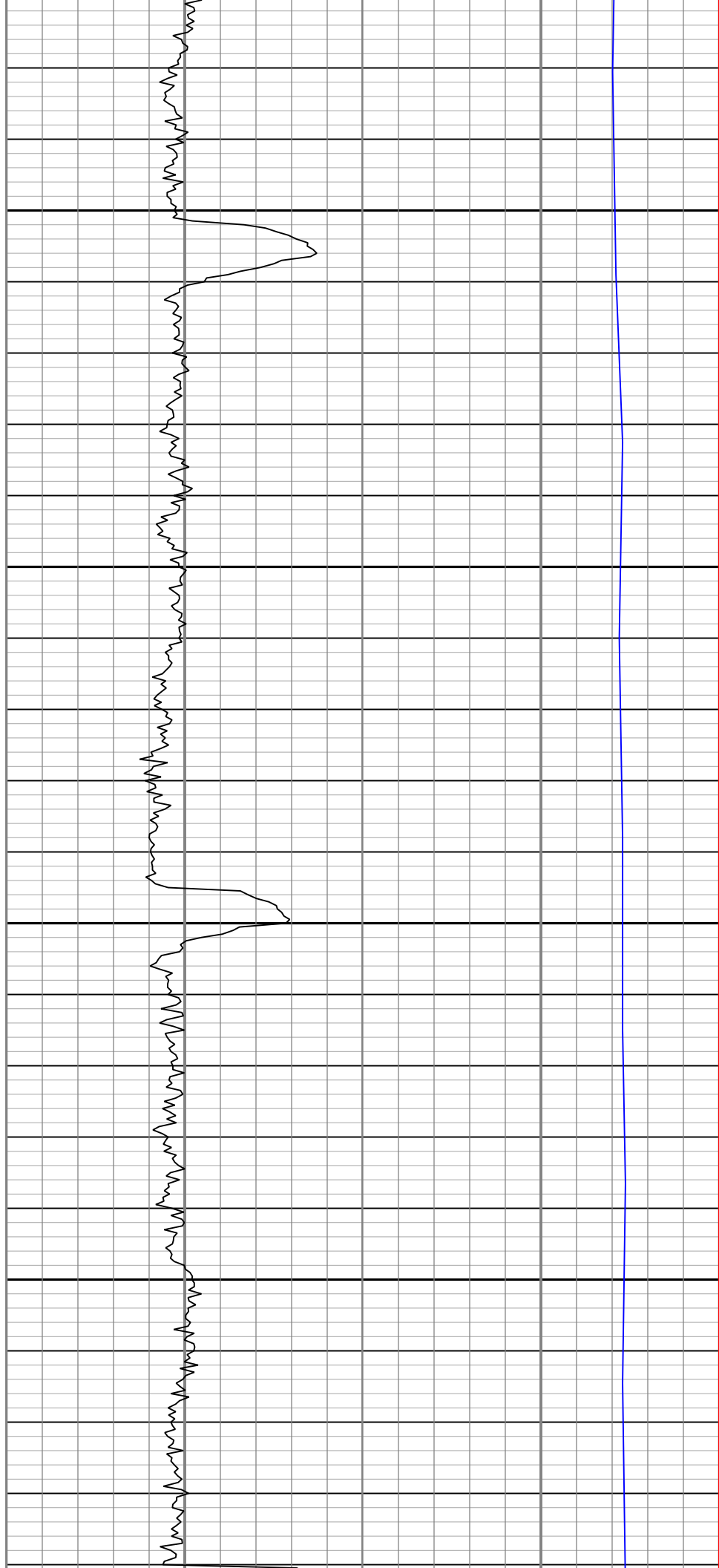
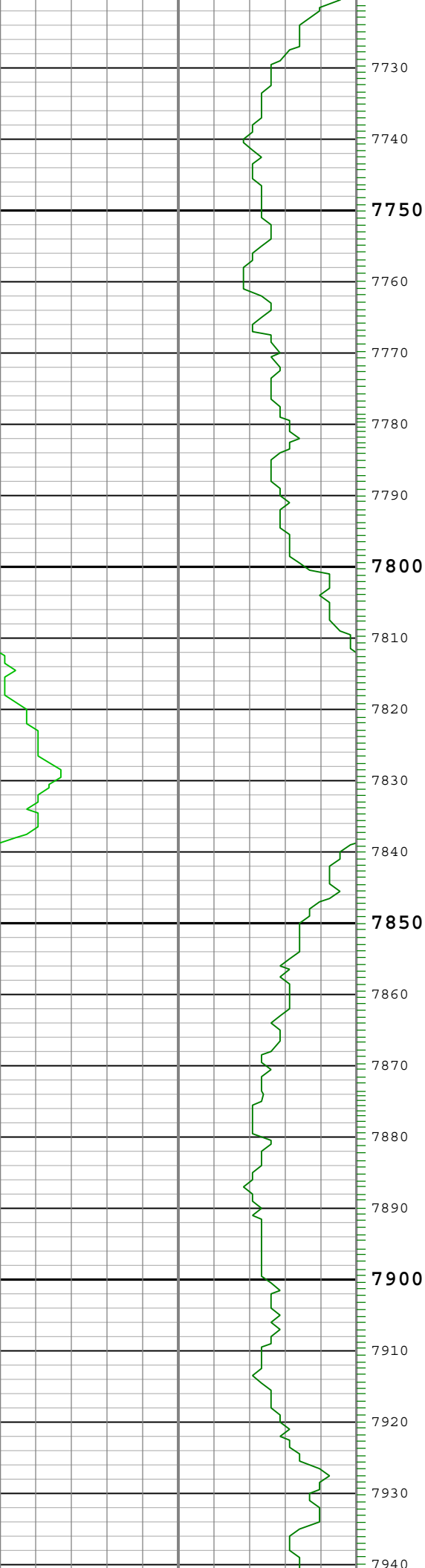


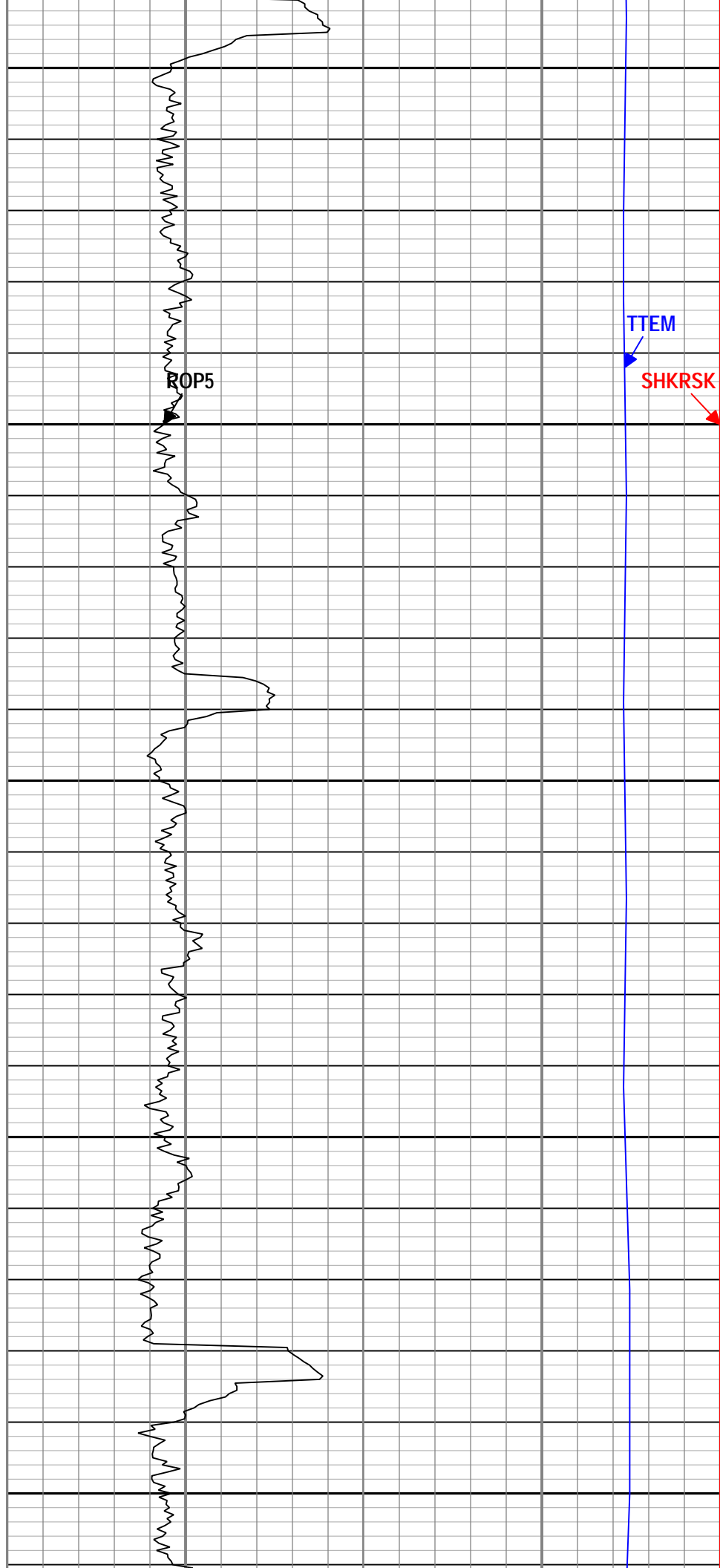
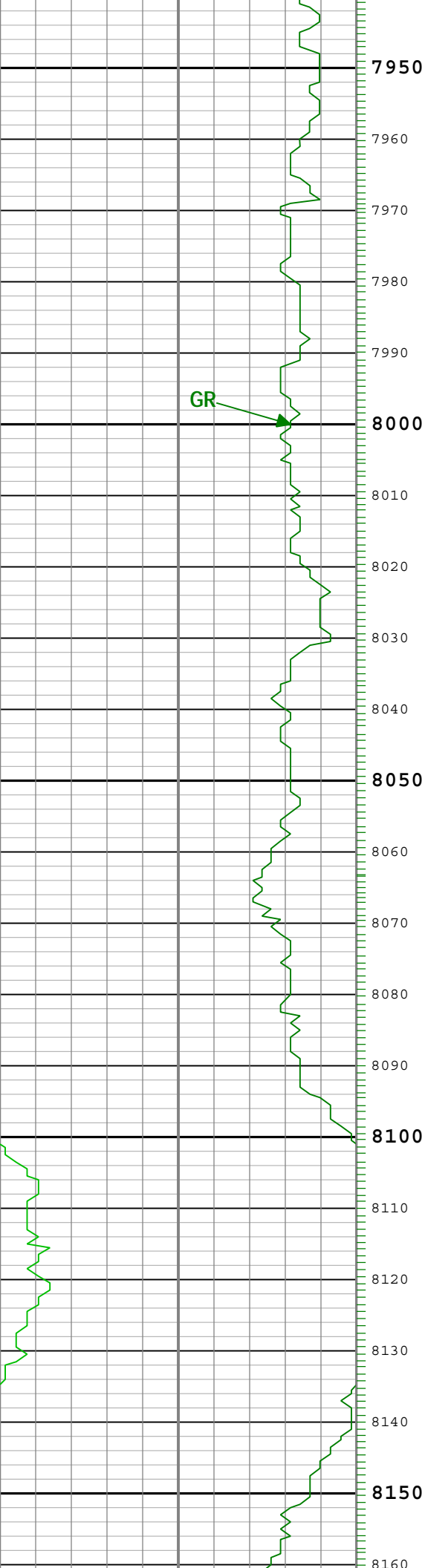


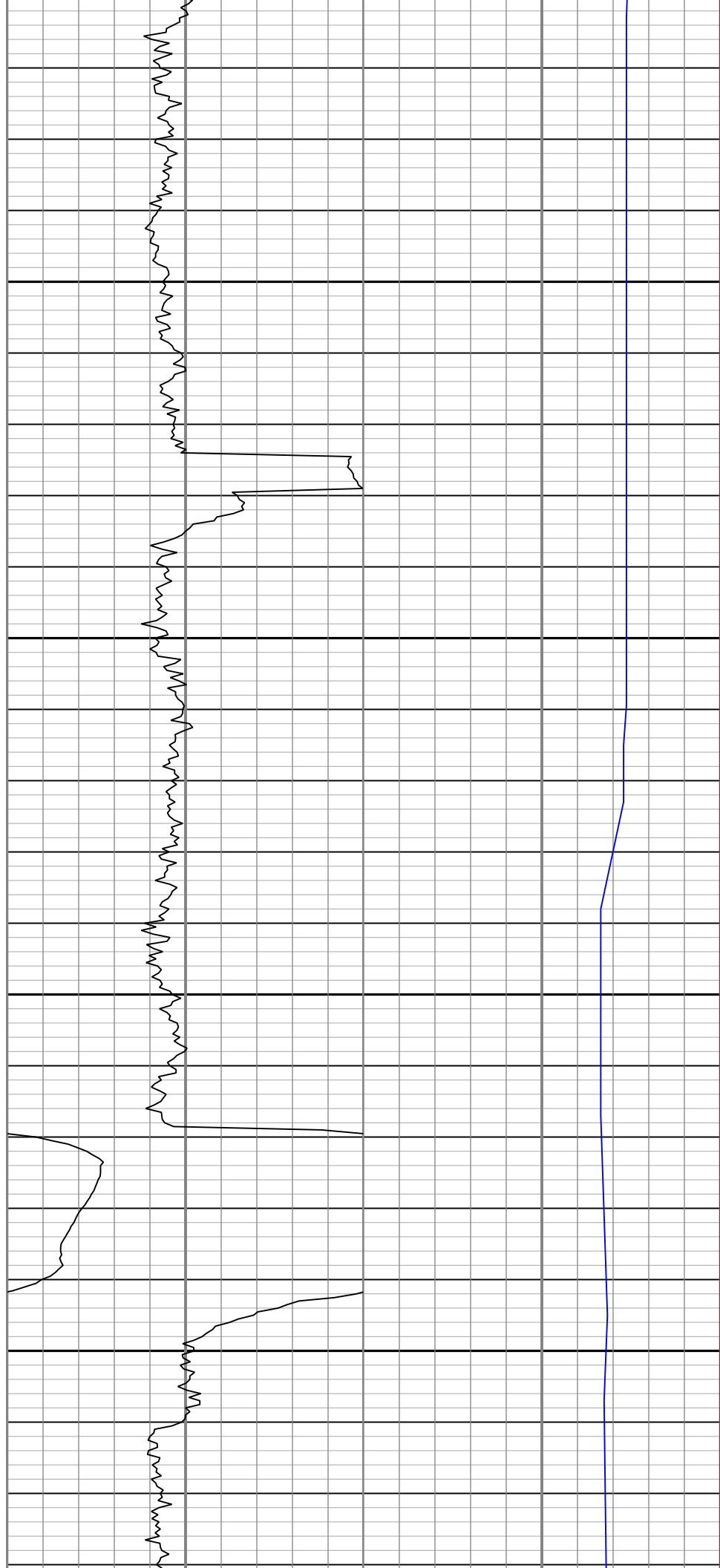
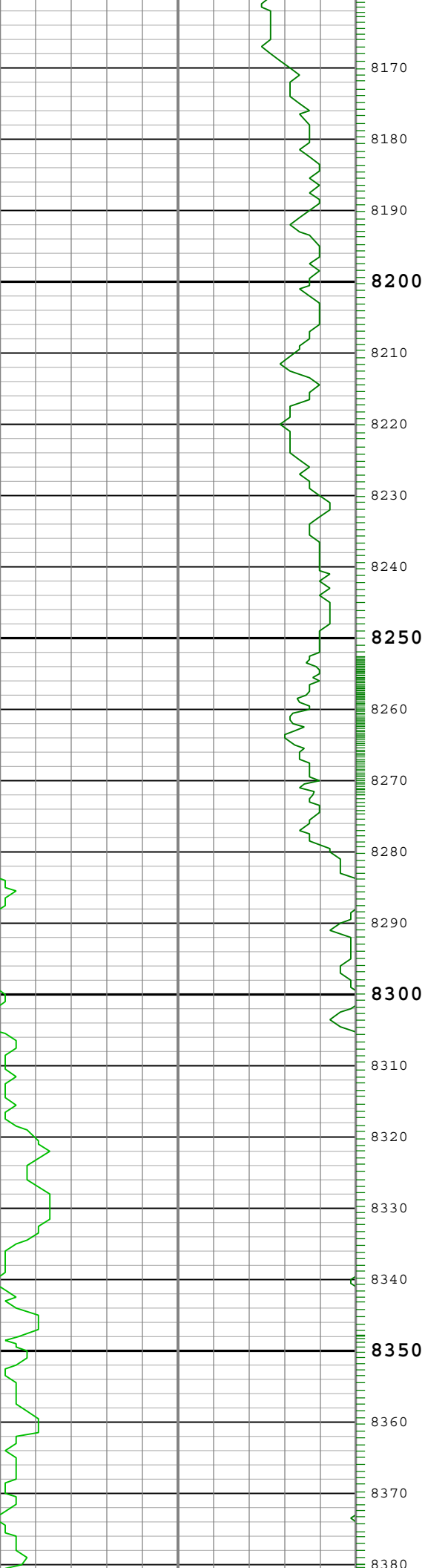


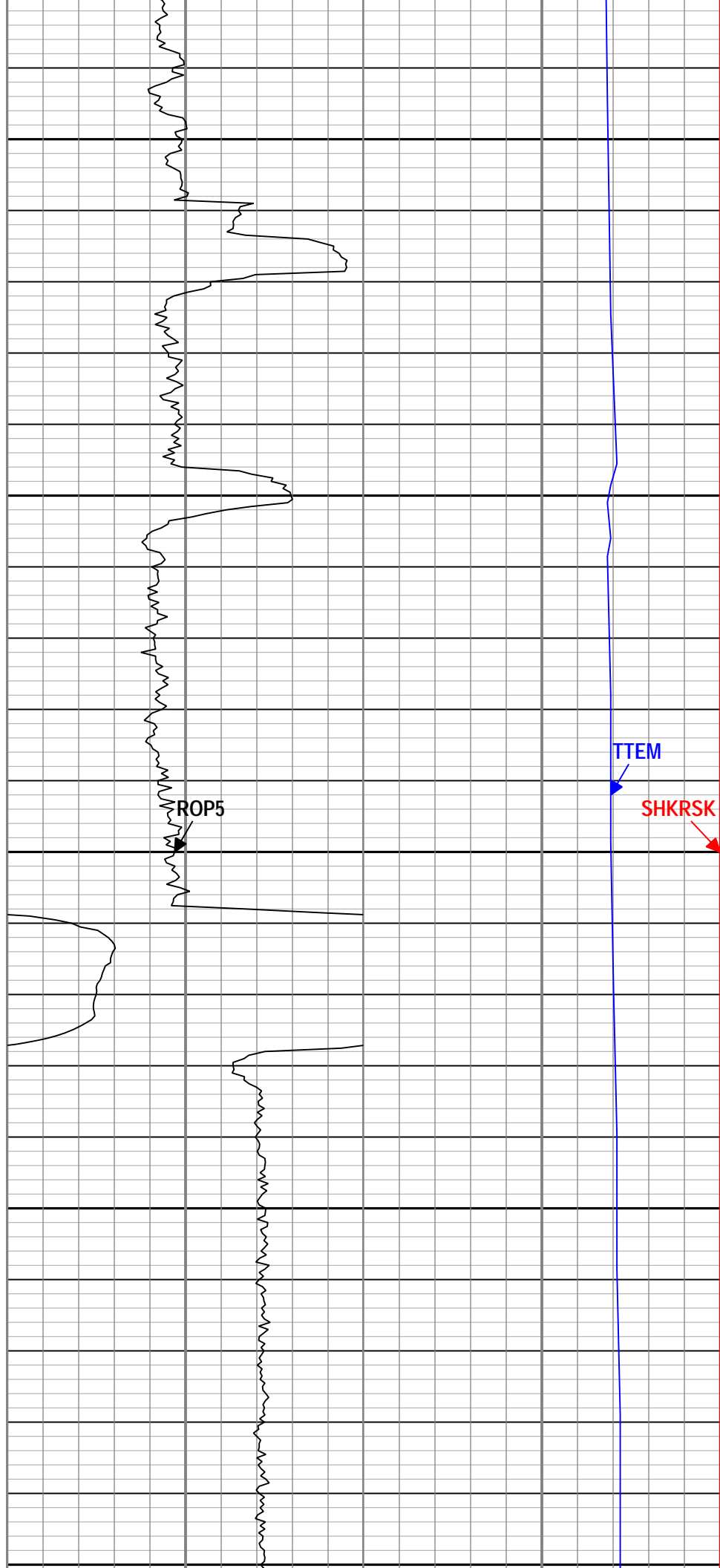
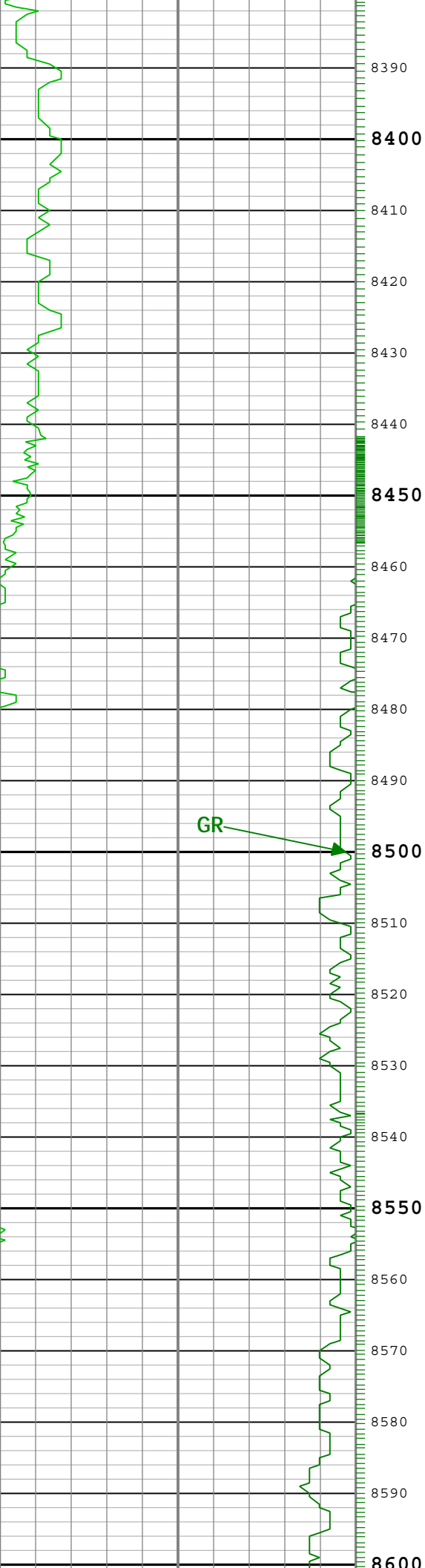


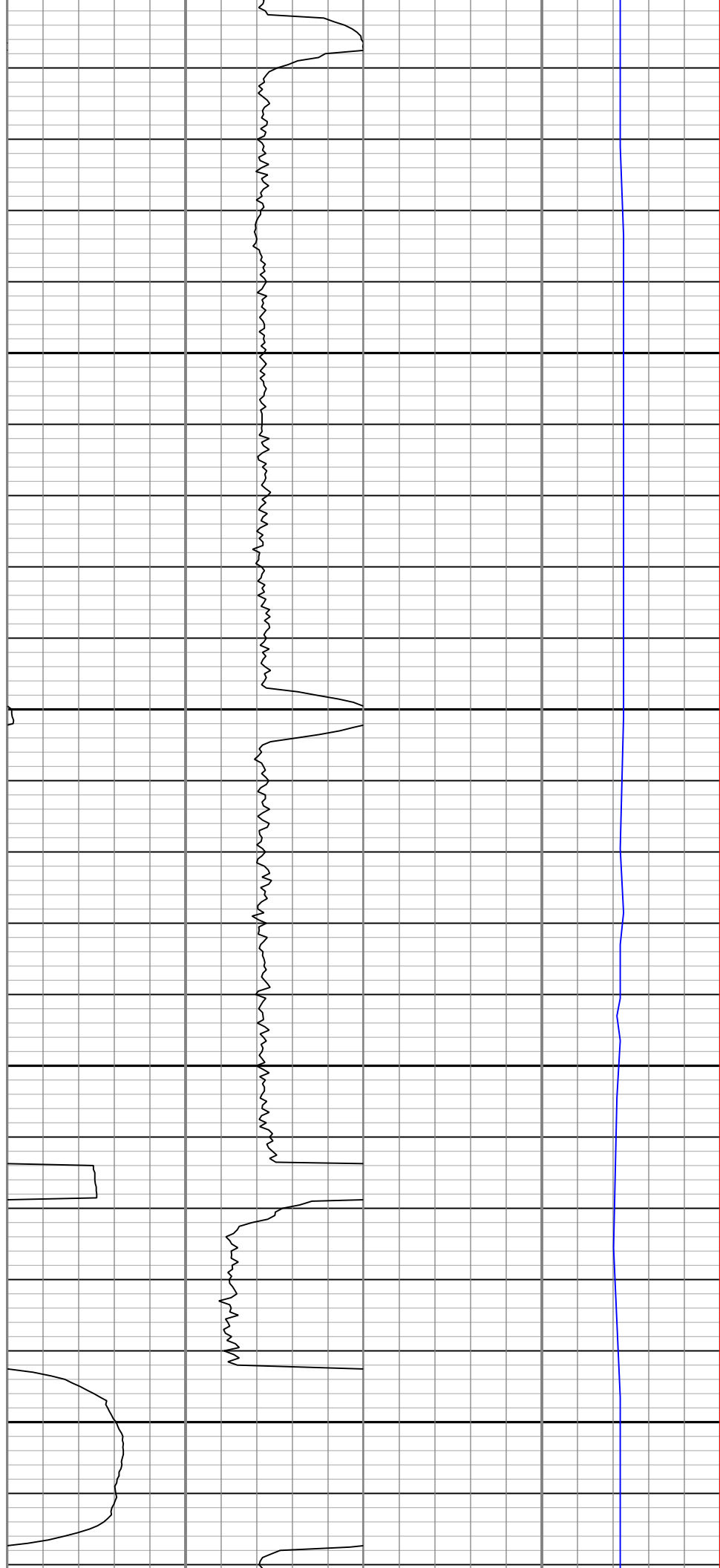


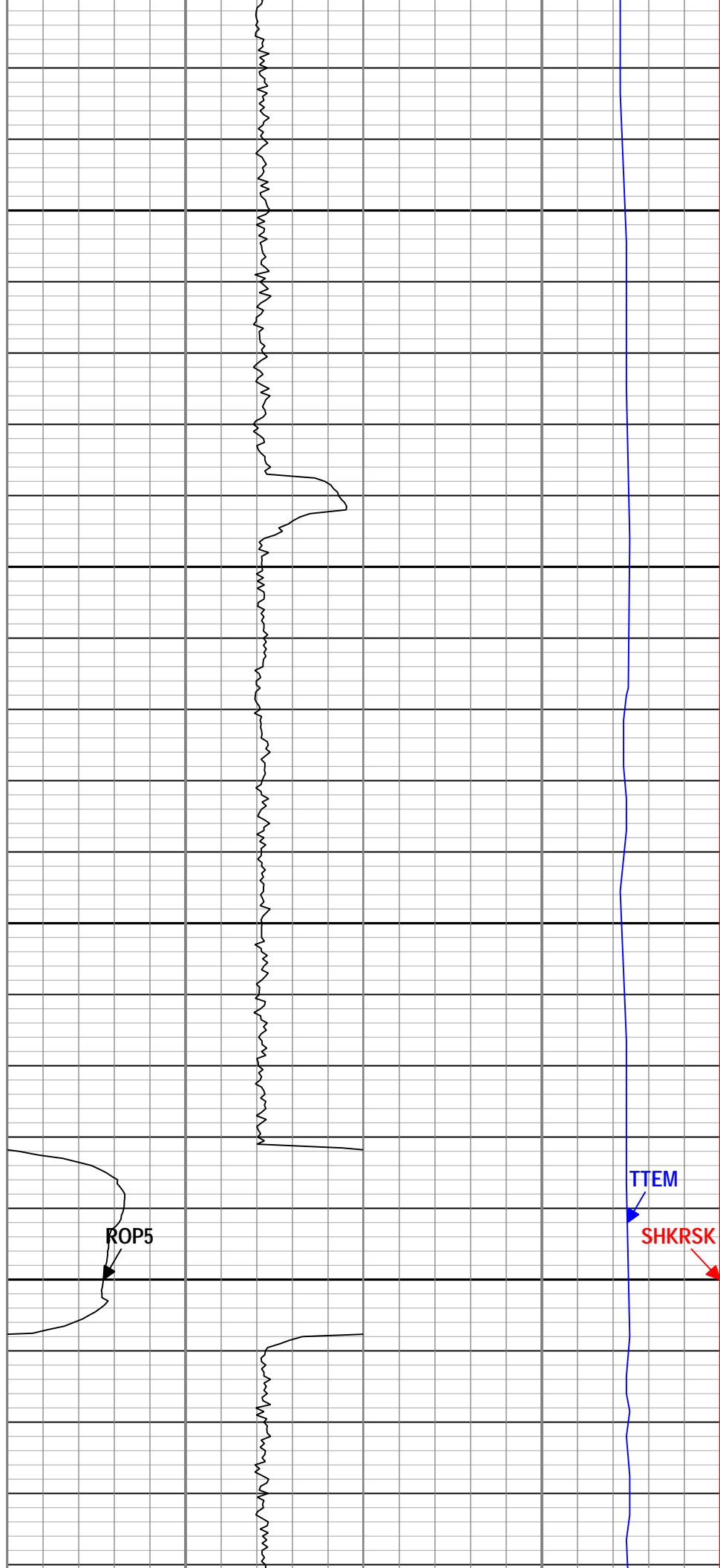


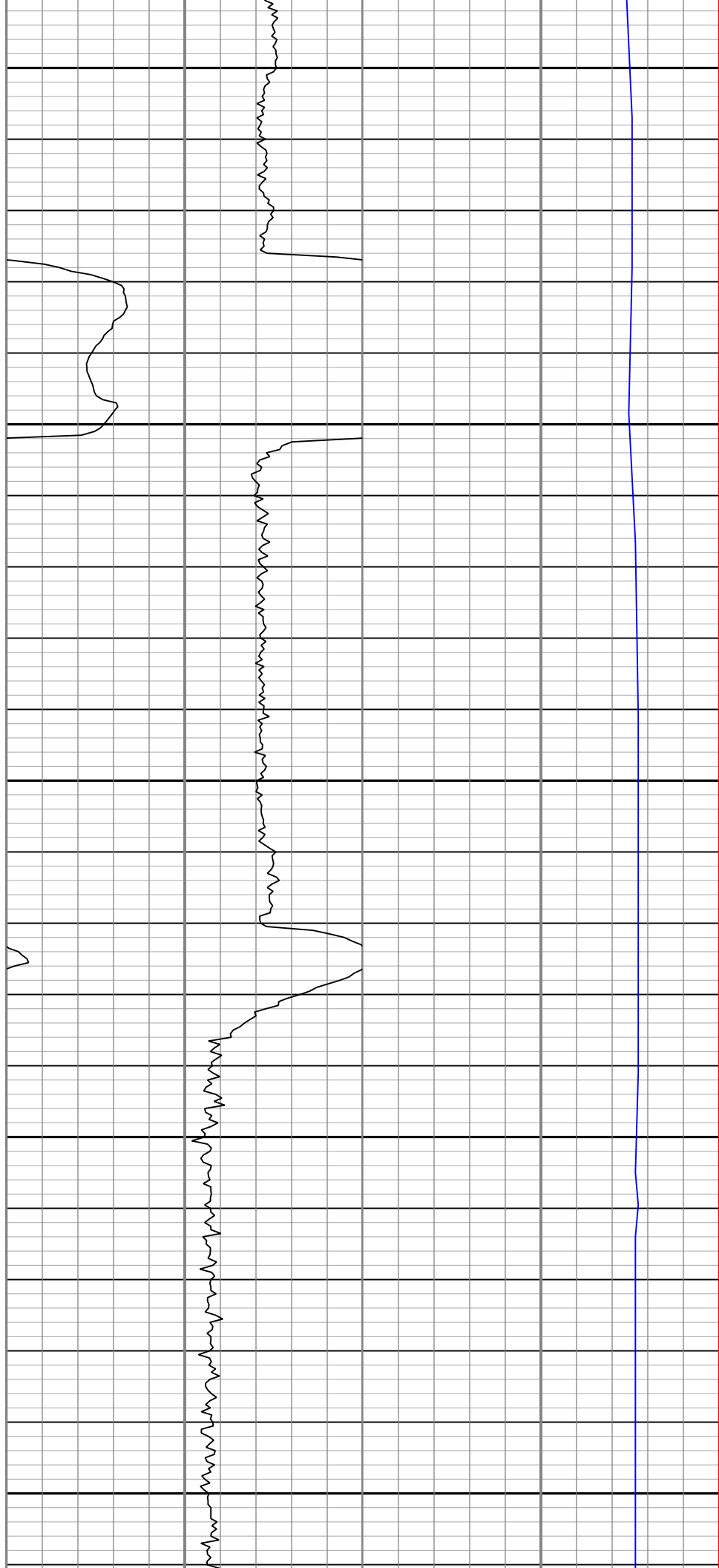
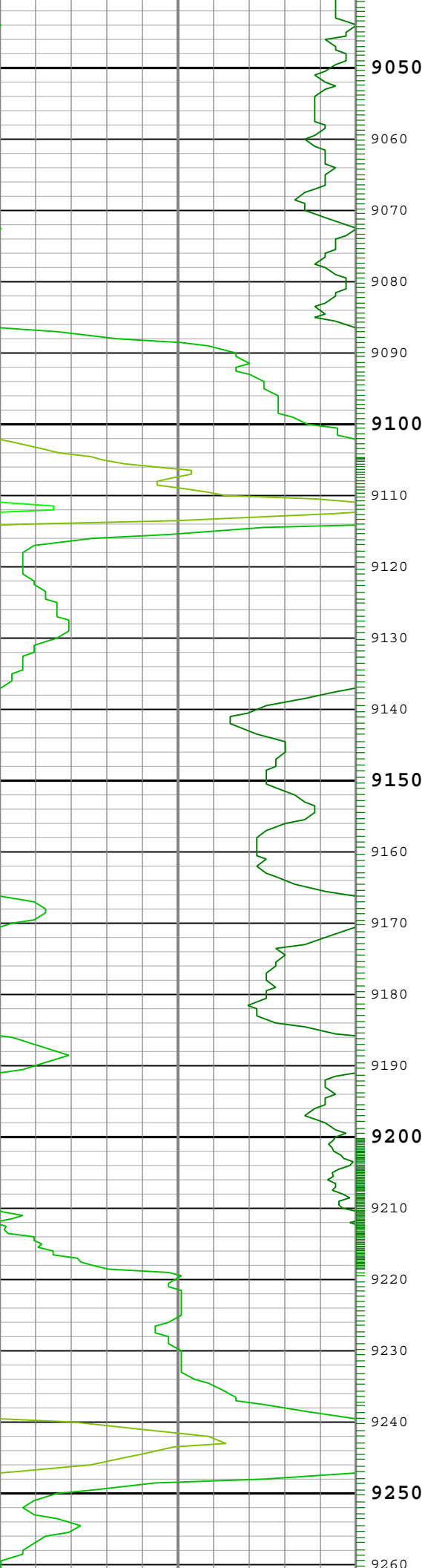


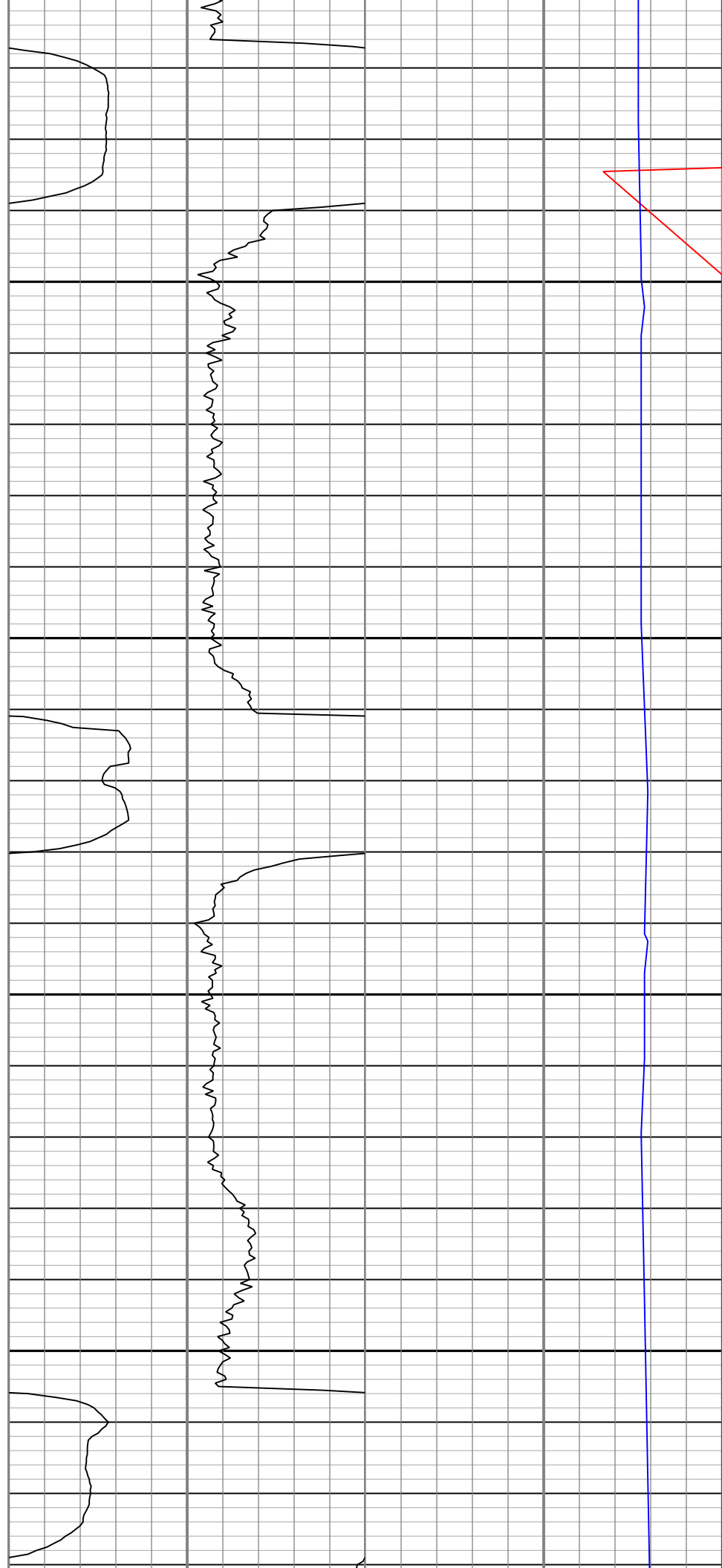
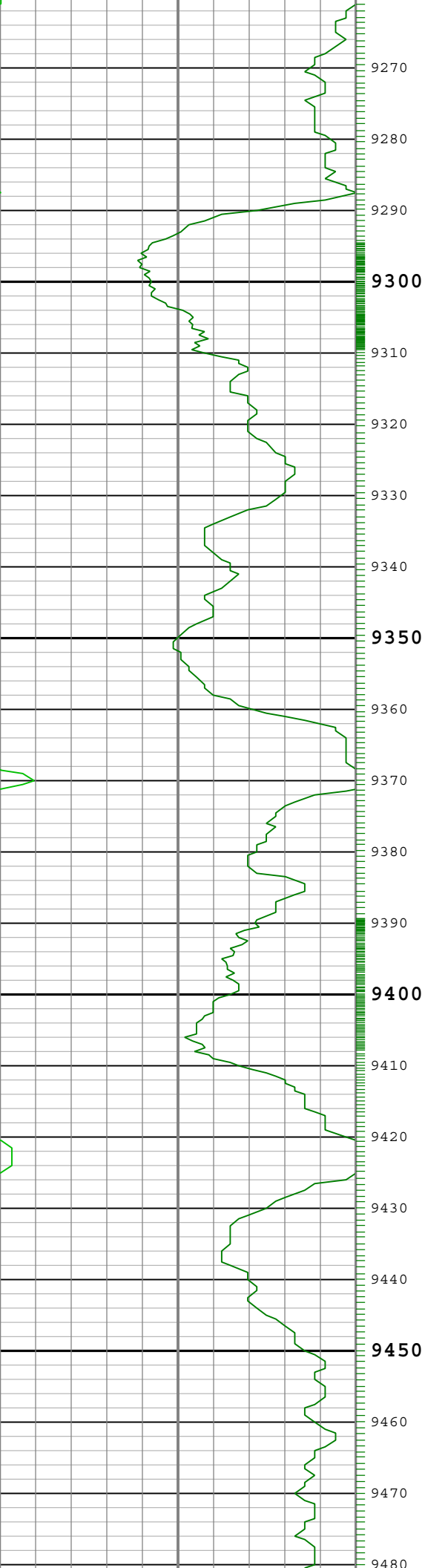


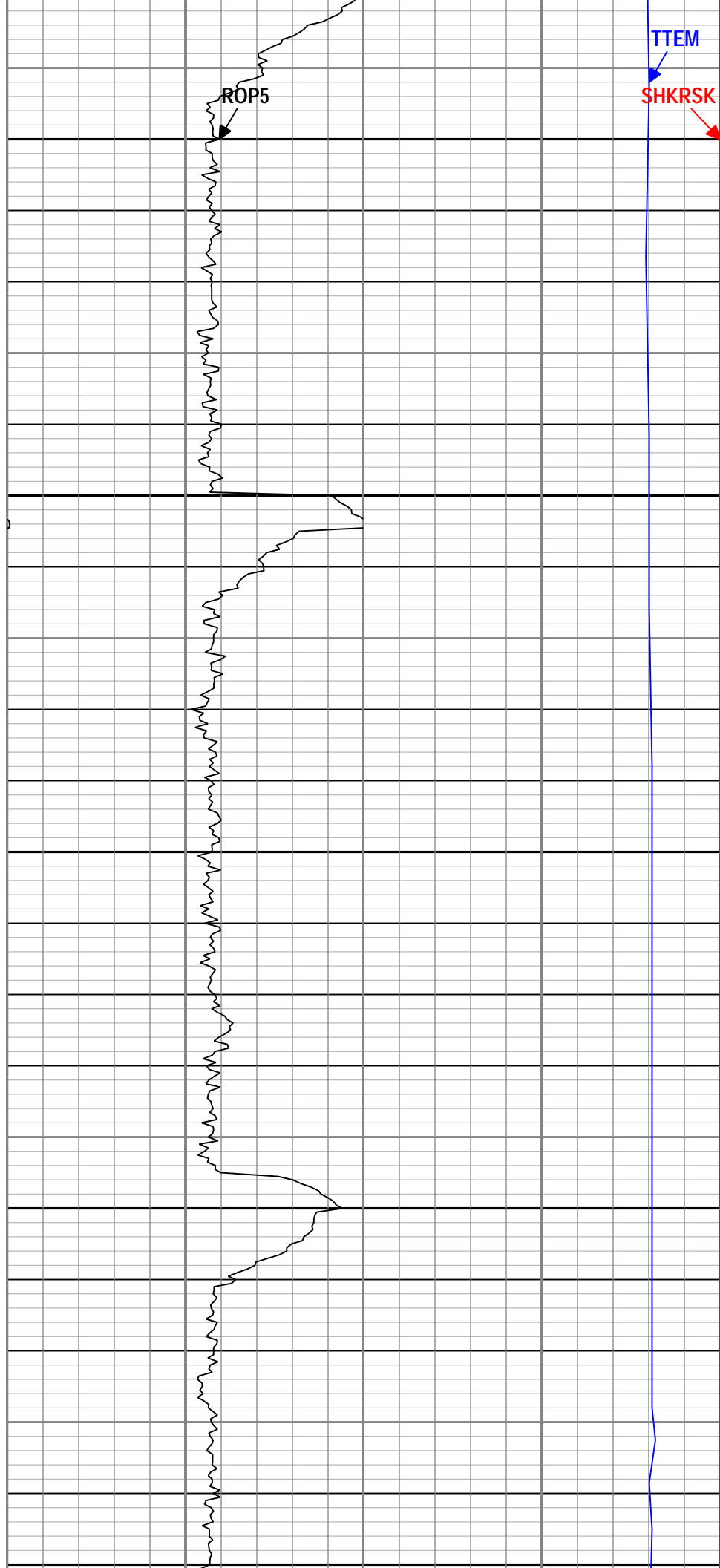
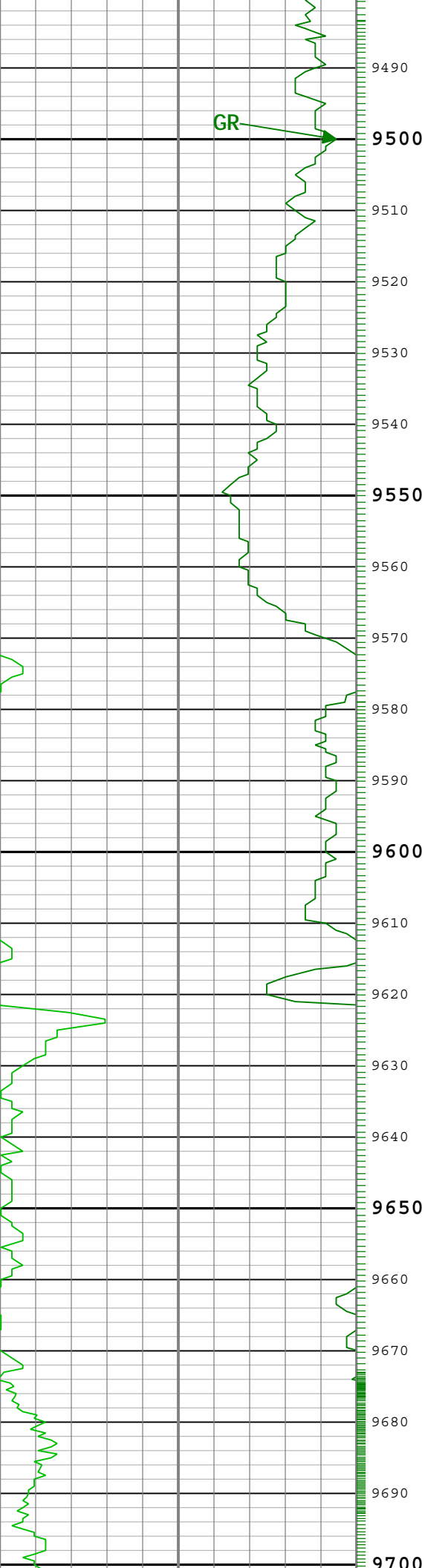


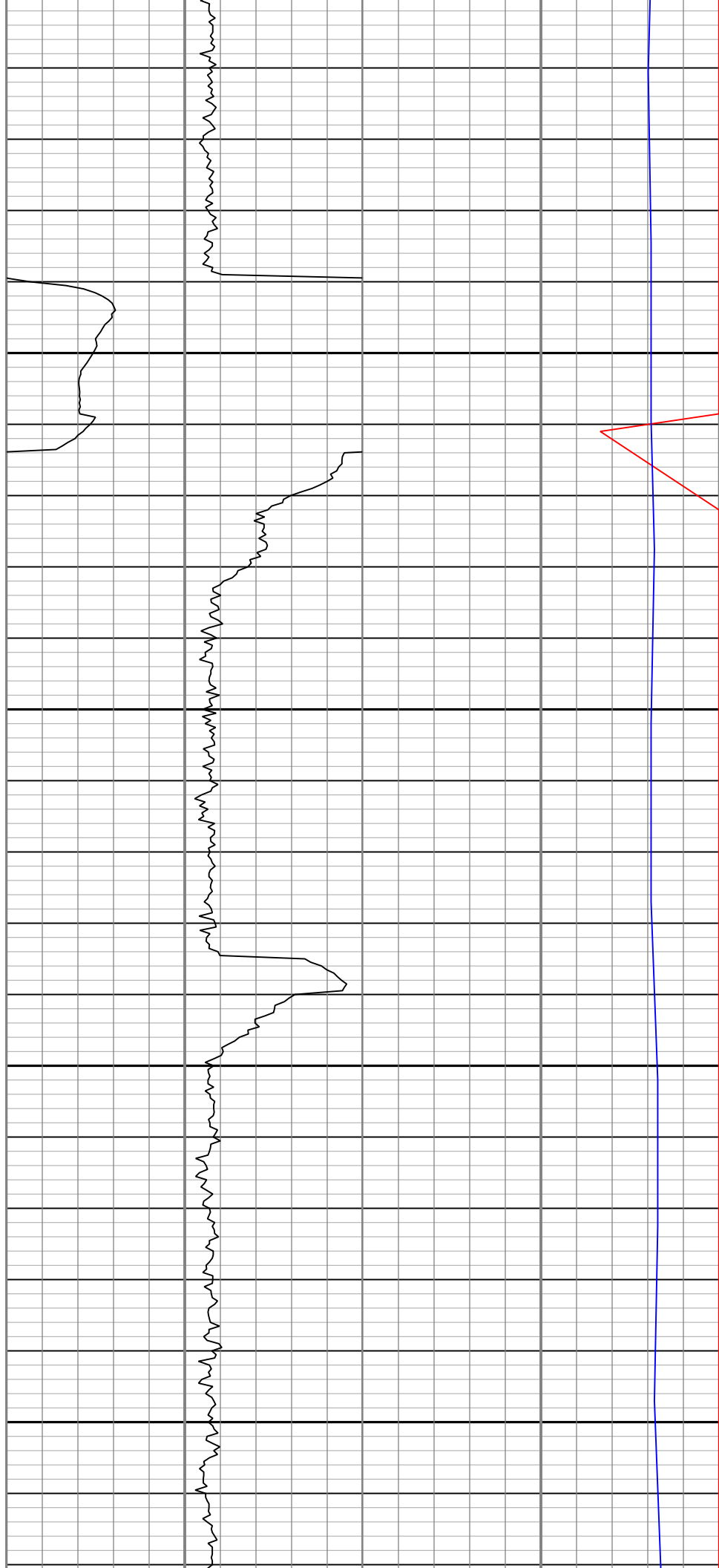
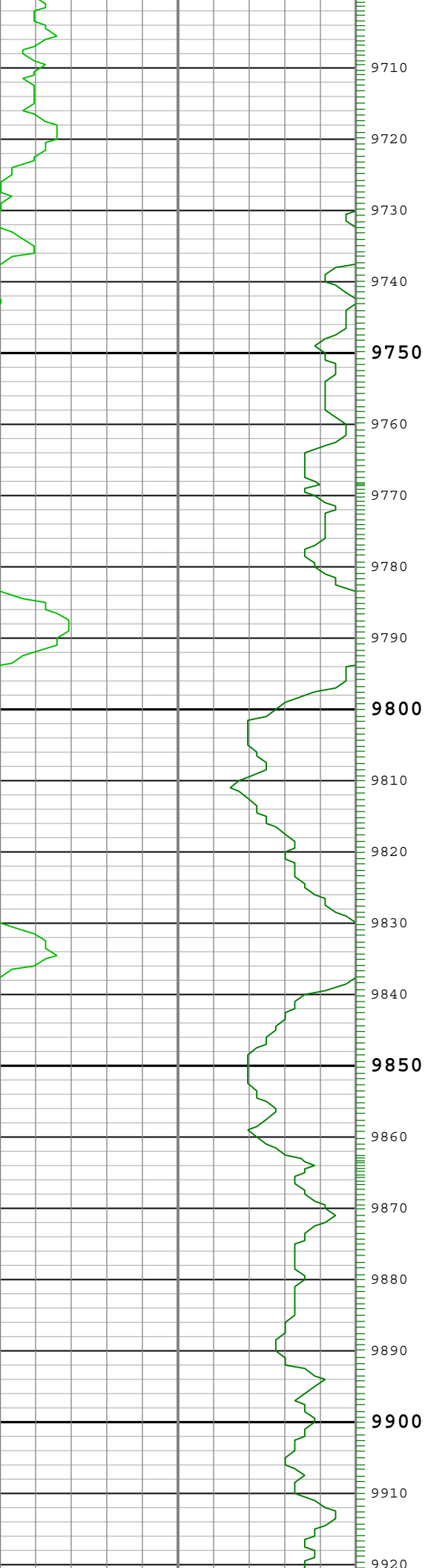


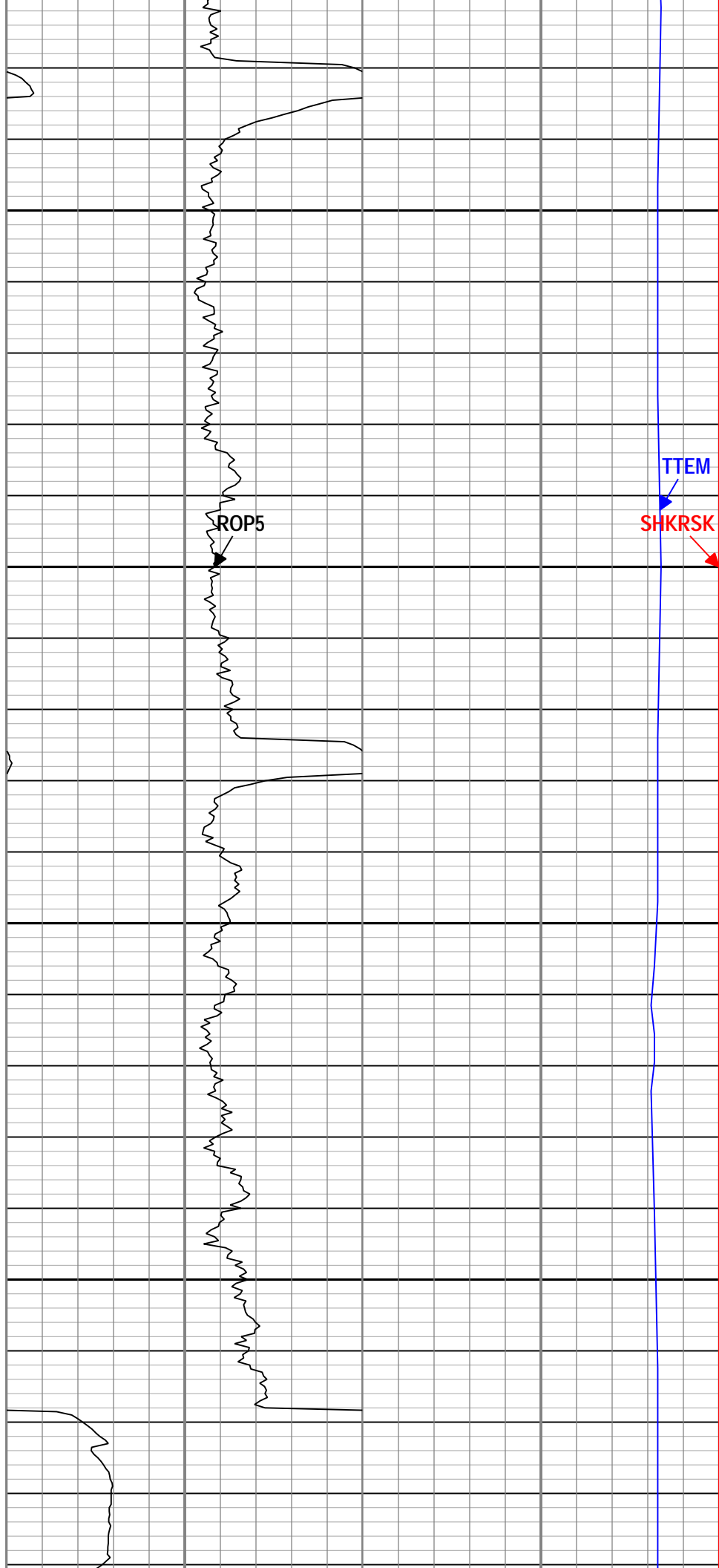
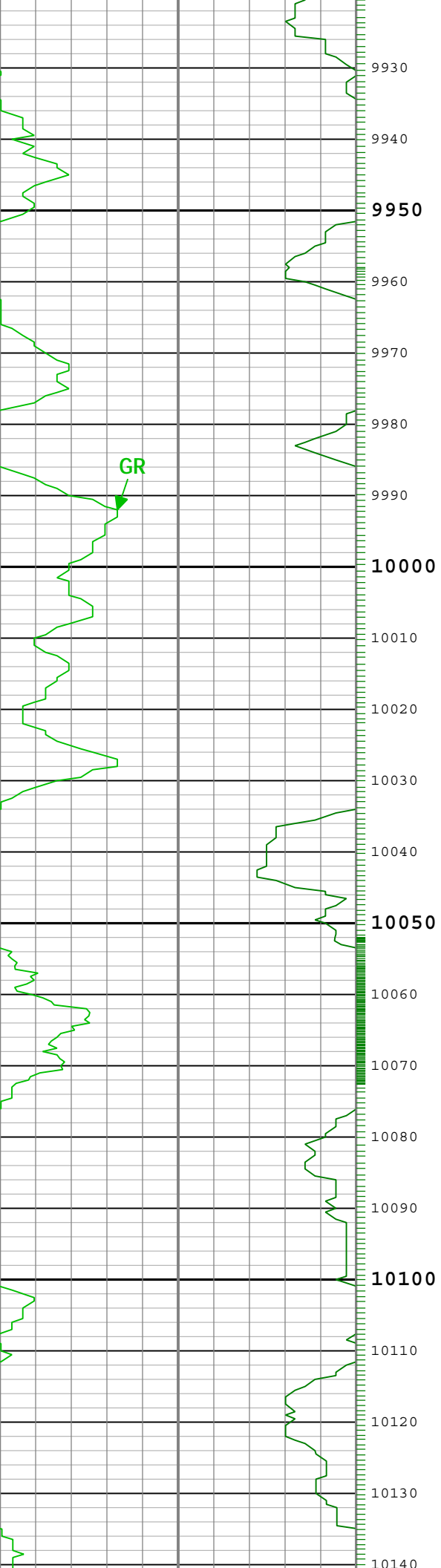


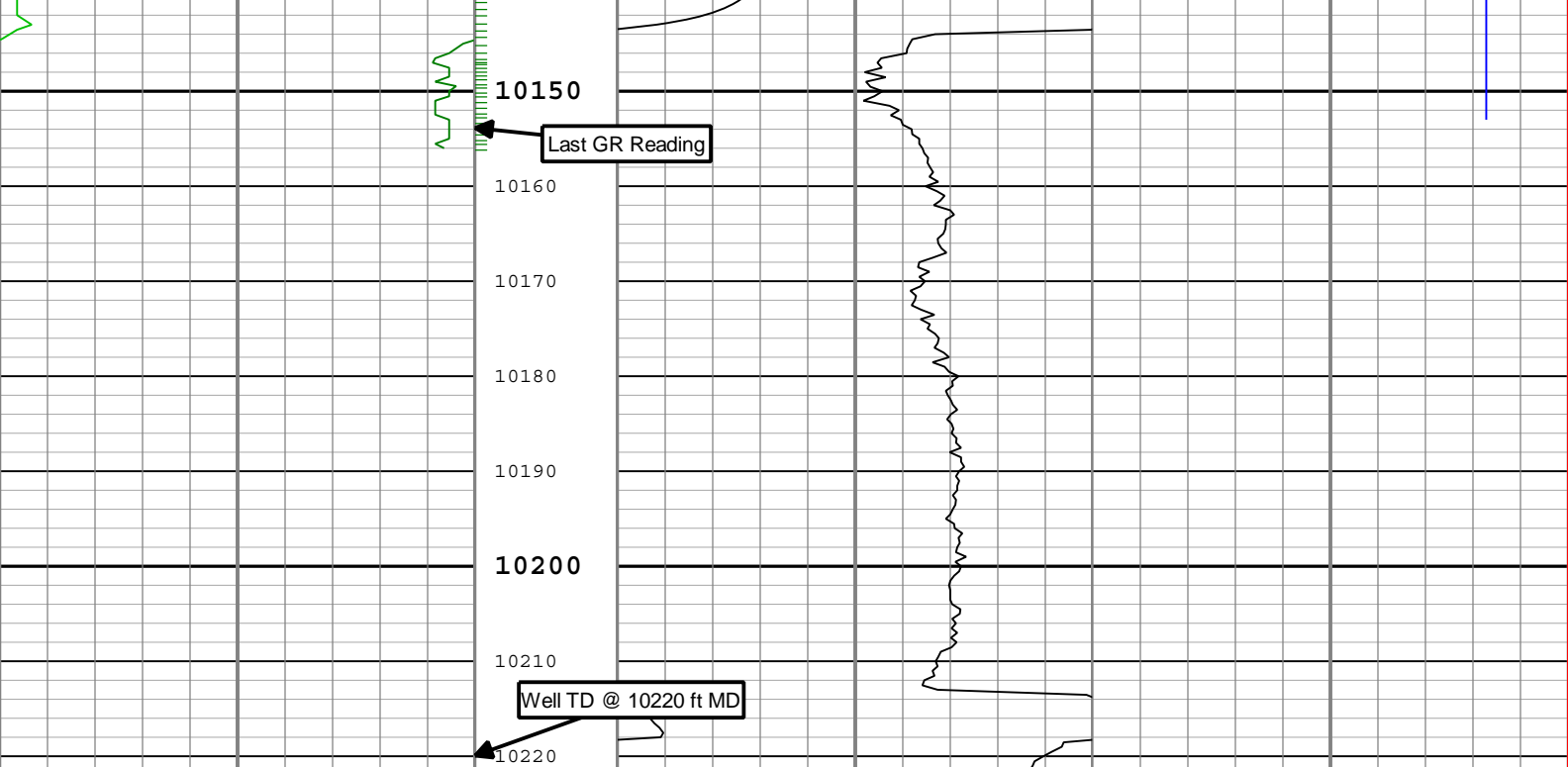












Gamma Ray (GR) SlimPulse[1] RM		
0	gAPI	150
Gamma Ray (GR) SlimPulse[1] RM		
150	gAPI	300
Gamma Ray (GR) SlimPulse[1] RM		
300	gAPI	450
Gamma Ray (GR) SlimPulse[1] RM		
450	gAPI	600
Gamma Ray (GR) SlimPulse[1] RM		
600	gAPI	750

Rate of penetration averaged over the last 5 ft (1.5 m) (ROP5) RT	
500	ft/h
150	

Shock Risk (SHKRSK) SlimPulse[1] RT	
3	0
Tool Temperature (TTEM) SlimPulse[1] RM	
50	degF
250	

TICKS_GR - Gamma Ray Tick Marks SlimPulse[1] RM

Description: SlimPulse Gamma Ray 1 Format: Log (SlimPulse Gamma Ray Final MD) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured
Depth Creation Date: 25-Sep-2014 16:00:36

Channel Processing Parameters

Run001: Parameters

Parameter	Description	Tool	Value	Unit
BS	Bit Size	DNMSESSION	Depth Zoned	in
DFD	Drilling Fluid Density	Borehole	Time Zoned	lbm/gal
GR_SRC	GR Source Selection	SPULSE-GEN	GAMMA_EXT	

Run001Depth Zoned Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	13.5	1182.4	1236
BS	8.75	1236	4990.17

All depth are actual.

Run001Time Zoned Parameters

Pass Drilling

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
DFD	9.1	03-Sep-2014 13:46:26	04-Sep-2014 02:30:00	1236.25	3739.17

DFD	9.8	04-Sep-2014 02:30:00	05-Sep-2014 01:19:50	3739.17	4990.17
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All depth are at tool zero.

Run002: Parameters

Parameter	Description	Tool	Value	Unit
BS	Bit Size	DNMSESSION	8.75	in
DFD	Drilling Fluid Density	Borehole	Time Zoned	lbm/gal
GR_SRC	GR Source Selection	SPULSE-GEN	GAMMA_EXT	

Run002Time Zoned Parameters

Pass Drilling

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
DFD	10	05-Sep-2014 12:13:09	05-Sep-2014 14:30:00	4950.17	5126.58
DFD	10.1	05-Sep-2014 14:30:00	06-Sep-2014 02:30:00	5126.58	5990.67
DFD	10.7	06-Sep-2014 02:30:00	06-Sep-2014 07:10:57	5990.67	5991

All depth are at tool zero.

Run003: Parameters

Parameter	Description	Tool	Value	Unit
BS	Bit Size	DNMSESSION	Depth Zoned	in
DFD	Drilling Fluid Density	Borehole	Time Zoned	lbm/gal
GR_SRC	GR Source Selection	SPULSE-GEN	GAMMA_EXT	

Run003Depth Zoned Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	8.75	5756.63	5991
BS	6.125	5991	10220

All depth are actual.

Run003Time Zoned Parameters

Pass Drilling

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
DFD	10.9	07-Sep-2014 10:54:14	07-Sep-2014 14:30:00	5900.42	6237.92
DFD	9.4	07-Sep-2014 14:30:00	08-Sep-2014 02:30:00	6237.92	8026.67
DFD	9.5	08-Sep-2014 02:30:00	08-Sep-2014 14:30:00	8026.67	8974.67
DFD	10.55	08-Sep-2014 14:30:00	09-Sep-2014 02:30:00	8974.67	10190.33
DFD	10.7	09-Sep-2014 02:30:00	09-Sep-2014 22:38:53	10190.33	10222.42

All depth are at tool zero.

Tool Control Parameters

Calibration Report

SPULSE-GEN (SlimPulse with Generic Collar) Calibration - Run Run001

Primary Equipment :	Elec. cartridge, 150C max with GR	SPEC	893
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GRGain - Gamma Ray: Blanket

Master (Time Frame File): 12:00:00 19-Jul-2014							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div></div>
Gamma Ray Calibration Gain		Master	1.0000	0.9000	1.0483	1.1000	<div><div></div><div></div><div></div><div></div></div>

SPULSE-GEN (SlimPulse with Generic Collar) Calibration - Run Run002

Primary Equipment :

GRGain - Gamma Ray: Blanket

Master (Time Frame File): 12:00:00 27-Jun-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Gamma Ray Calibration Gain		Master	1.0000	0.9000	1.0774	1.1000	

SPULSE-GEN (SlimPulse with Generic Collar) Calibration - Run Run003

Primary Equipment :

Elec. cartridge, 150C max with GR

SPEC

GRGain - Gamma Ray: Blanket

Master (Time Frame File): 12:00:00 27-Jun-2014

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Gamma Ray Calibration Gain		Master	1.0000	0.9000	1.0774	1.1000	

Company: Noble Energy**Well:** Rohn State LD03-64HN**Field:** Wattenberg**County:** Weld**State:** Colorado**Country:** USA