



Memory and Realtime Log

Natural Formation Evaluation
Multiple Propagation Resistivity
Gamma Ray

Scale:

Company: Anadarko

Well: Nichols 15C-31HZ

1:240 Measured Depth

Field: Weld County (Kerr McGee)

Region: Rocky Mountains State: United States

Surface Location:

Other Services:

Latitude: 40° 9' 40.910" N

Longitude: 104° 42' 7.272" W

SEC: 6

TWP: 2S

RNG: 6SW

Elevation: 16.00 ft.

Elevations:

Permanent Datum (P.D.): Mean Sea Level

N/A

Log Measured From: Rig Floor

4897.00 ft.

Depth Reference: Driller's Depth

4881.00 ft.

Interval Logged

Dates

Magnetic Field Reference

Top: 6114.0 ft.

17/Jan/13

Dip Angle: 66.96°

Bottom: 12481.0 ft.

24/Jan/13

Azi Reference North: True

Spud Date: 15/Jan/13

Field Strength: 52832.0 nT

North Correction: 8.65°

Borehole Record

Casing Record

Hole Size	From	To	Size	Weight	From	To
8.750 in.	925.0 ft.	7826.0 ft.	9.625 in.	36.00 lb/ft	Surface	915.0 ft.
6.125 in.	7826.0 ft.	12545.0 ft.	7.000 in.	20.00 lb/ft	Surface	7817.0 ft.

Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Water Based	925.0 ft.	12545.0 ft.	8.750 in.	Intermediate	0.4° / 288.8°	86.9° / 2.1°
			6.125 in.	Lateral	89.7° / 1.7°	89.3° / 359.0°
					/	/
					/	/
					/	/
					/	/
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					/	/
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					/	/

Mud Record

Deviation Record

Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Water Based	925.0 ft.	12545.0 ft.	8.750 in.	Intermediate	0.4° / 288.8°	86.9° / 2.1°
			6.125 in.	Lateral	89.7° / 1.7°	89.3° / 359.0°
					/	/
					/	/
					/	/
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					/	/
					/	/

Acquisition System

Software Version

Other

Advantage	2.20U3	Rig:	Xtreme 24	/ Xtreme Coil Drilling Corp
PATS	6.4.1.34	Job No:	5172844	/ D&E
		District / Unit:	RMD	

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Log Run Summary

LWD Run No.	BHA Run No.	Bit Run No.	Bit Size (in.)	Bit Type	Bit Gauge Length (in.)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time				Circ.
							Top	Bottom	From	To	Start	End			
														(ft.)	(ft.)
3	3	3	8.750	PDC	2.000	Steerable	6414.0	7777.0	6760.0	7826.0	18/Jan/2013 10:21	20/Jan/2013 01:30		47.7	
4	4	4	6.125	PDC	2.000	Steerable	7777.0	11220.0	7826.0	11268.0	20/Jan/2013 21:30	22/Jan/2013 20:00		28	
5	5	5	6.125	PDC	2.000	Steerable	11220.0	12581.0	11268.0	12545.0	22/Jan/2013 06:18	24/Jan/2013 12:28		30	

Crew

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
Austin Small	15/Jan/2012	18/Jan/2012	Marcus Boucher	15/Jan/2012	25/Jan/2012	David Belek	18/Jan/2012	25/Jan/2012

Mud Properties Record

Date / Time	LWD Run No.	Measured Depth (ft.)	Mud Type	Density (ppg)	Viscosity (cp)	pH	Fluid Loss (cc)	Oil / Water	Source	Total Chlorides (ppm)	K+
19/Jan/2013 08:20	3	7311.0	Water Based	9.6	35	9.1	N/A	1 / 92	Flowline	1300	0.0
19/Jan/2013 20:23	4	7827.0	Water Based	9.9	39	8.9	N/A	1 / 91	Flowline	1000	0.0
22/Jan/2013 18:37	4	11272.0	Water Based	9.5	38	8.8	N/A	0 / 92	Flowline	800	0.0
22/Jan/2013 21:33	5	11272.0	Water Based	9.5	38	8.8	N/A	0 / 92	Flowline	800	0.0
23/Jan/2013 18:47	5	11355.0	Water Based	9.7	14	8.2	N/A	0 / 92	Flowline	500	0.0

Mnemonics

Curve	Description	Units
ROPA	Rate of Penetration, 3.0 ft. Avg.	ft/hr
GRAX	Gamma Ray Apparent, 0.5 ft Avg.	API
GRAM	Gamma Ray Apparent, 0.5 ft. Avg.	API
GRIX	Gamma Ray Data Density	points
GRIM	Gamma Ray Data Density	points
RACLM	Resistivity (AT) (LS) 400kHz – Compensated Borehole Corrected	ohm.m
RACHM	Resistivity (AT) (LS) 2MHz – Compensated Borehole Corrected	ohm.m
RPCLM	Resistivity (PD) (LS) 400kHz – Compensated Borehole Corrected	ohm.m
RPCHM	Resistivity (PD) (LS) 2MHz – Compensated Borehole Corrected	ohm.m
CACHM	Conductivity (AT) (LS) 2MHz – Compensated Borehole Corrected	mho/m
RPTHM	Time Since Drilled [RPCHM]	mins
RPSHIM	Resistivity Slide Indicator	unitless
WOBA	Weight on Bit, 1.0 ft. Avg.	kLbs
TCDX	Downhole Temperature	degF
TCDM	Downhole Temperature	degF

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (ft)	Max O.D. (in.)	Min I.D. (in.)
3	DIR	12440860	Directional	51.33	6.750	3.250
3	SRIG	10658455	Gamma	47.96	6.750	3.250
4	CS	12443432	-	83.36	5.070	1.750
4	BCPM	10214387	Telemetry	72.26	5.070	1.750
4	STAB	11853041	-	69.13	5.500	1.750
4	OTK	10485158	Directional	64.72	5.070	1.750
4	OTK	10485158	Resistivity	58.75	4.843	2.569
4	OTK	10485158	Gamma	51.56	4.843	2.569
4	OTK	10485158	Pressure	54.19	4.843	2.569
4	CS	10388981	-	47.13	5.070	1.750
5	CS	10558669	-	86.53	5.070	1.750
5	BCPM	10474705	Telemetry	75.44	5.070	1.750
5	STAB	11826085	-	72.14	5.000	1.750

5	STAB	11026083	-	72.14	0.000	1.750
5	OTK	12115270	Directional	66.78	5.066	1.750
5	OTK	12115270	Resistivity	53.60	5.066	1.750
5	APR	12115270	Resistivity	53.60	5.070	1.750
5	OTK	12115270	Gamma	62.09	5.066	1.750
5	OTK	12115270	Pressure	58.04	5.066	1.750
5	CS	10432083	-	47.20	5.070	1.750

Service and Tool Mnemonics


Mnemonic	Name	Description
APR	Resistivity	Azimuthal propagation resistivity, azimuthal propagation resistivity image
BCPM	BCPM	Mud pulse telemetry and downhole tool power module
DIR	Directional	Wellbore directional survey
OTK	OnTrak	Propagation resistivity, propagation conductivity, gamma ray, directional, annular pressure, system memory and VSS
SRIG	Inclination and Gamma	Probe based gamma ray and inclination module
STAB	Stabilizer	Stabilizer assembly
CS	Closure Sub	BHA power ring isolator allowing insertion of inert sub into electrically powered BHA

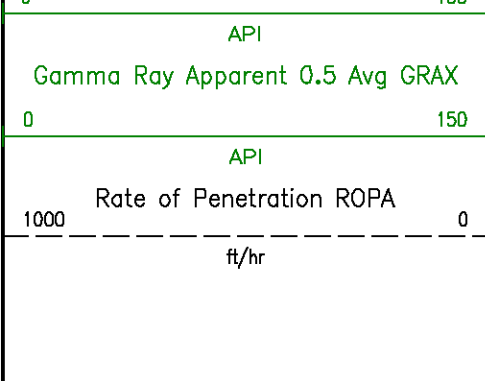
Comments

(1) Baker Hughes INTEQ run 3 utilized 6 3/4 NaviGamma services (Gamma Ray and Directional) behind a 8 3/4 inch bit and steerable assembly from 6760 to 7826 feet MD (6715 to 7307 feet TVD).
(2) Baker Hughes INTEQ runs 4 & 5 utilized 4 3/4 inch OnTrak services (Multiple Propagation Resistivity, Gamma Ray, and Directional) behind a 6 1/8 inch bit and steerable assembly from 7826 feet to 12545 feet MD (7307 to 7314 feet TVD).
(3) A sliding indicator is shown on the right edge of track 2 as a heavy line. The indicator has been depth-shifted to the resistivity sensor offset to correspond with resistivity data acquired while sliding.

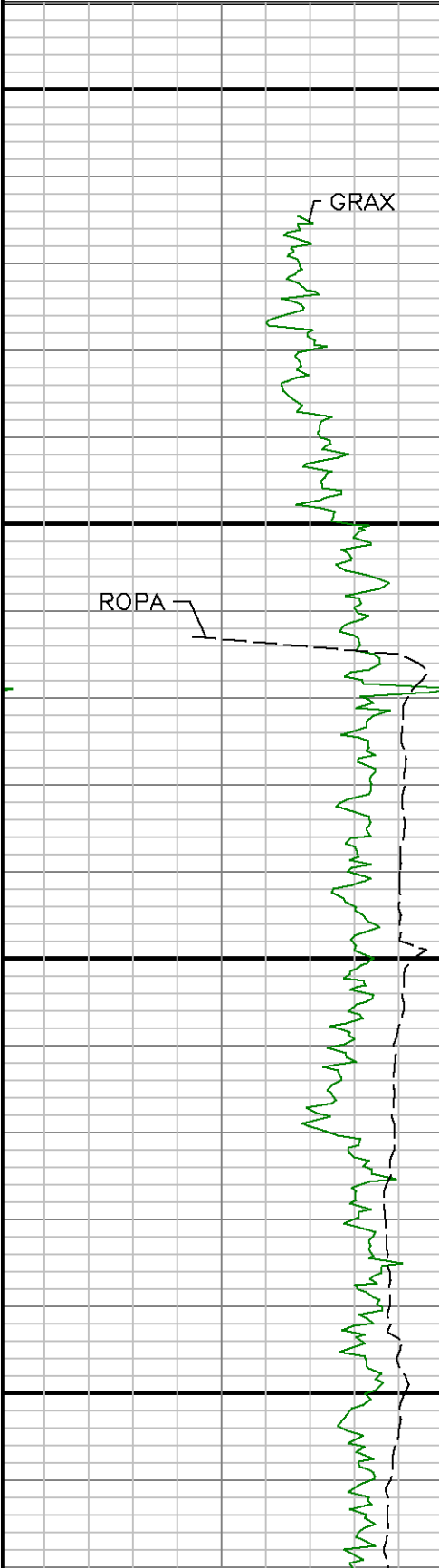
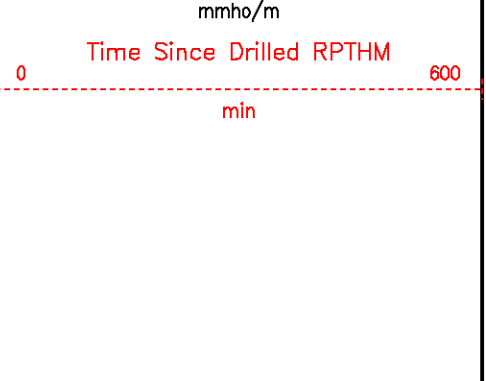
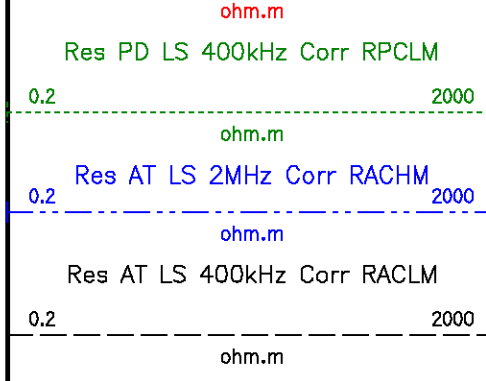
Remarks

Number	Measured Depth (ft)	Hole Section (in.)	LWD Run No.	Remark
1	6760	8.750	3	The interval from surface to 6760 feet MD (6715 feet TVD) was not logged since logging services began with the start of drilling with the curve assembly for run 3.
2	7826	8.750	3	The interval from 7775 to 7826 feet MD (7305 to 7307 feet TVD) was logged up to 41 hours after being drilled due to trip out of the hole for casing and cementing operations and picking up the lateral assembly.
3	11268	6.125	4	The interval from 11215 to 11268 feet MD (7297 to 7299 feet TVD) was logged up to 29 hours after being drilled due to trip out of the hole to change out motor and ream BHA through the lateral to bottom.
4	12545	6.125	5	The interval from 12481 to 12545 feet MD (7313 to 7314 feet TVD) was not logged due to bit sensor offset at TD.

				Company : Anadarko Well : Nichols 15C-31HZ Interval : 6690.00 - 12560.00 feet Created : 22/Jan/2013 10:30:10 PM			
Gamma Ray Apparent 0.5 ft Avg GRAM		MD feet	Res PD LS 2MHz Corr RPCHM		Con AT LS 400kHz Corr CACLM		
0	150		0.2	2000	4000	0	



et 1:240



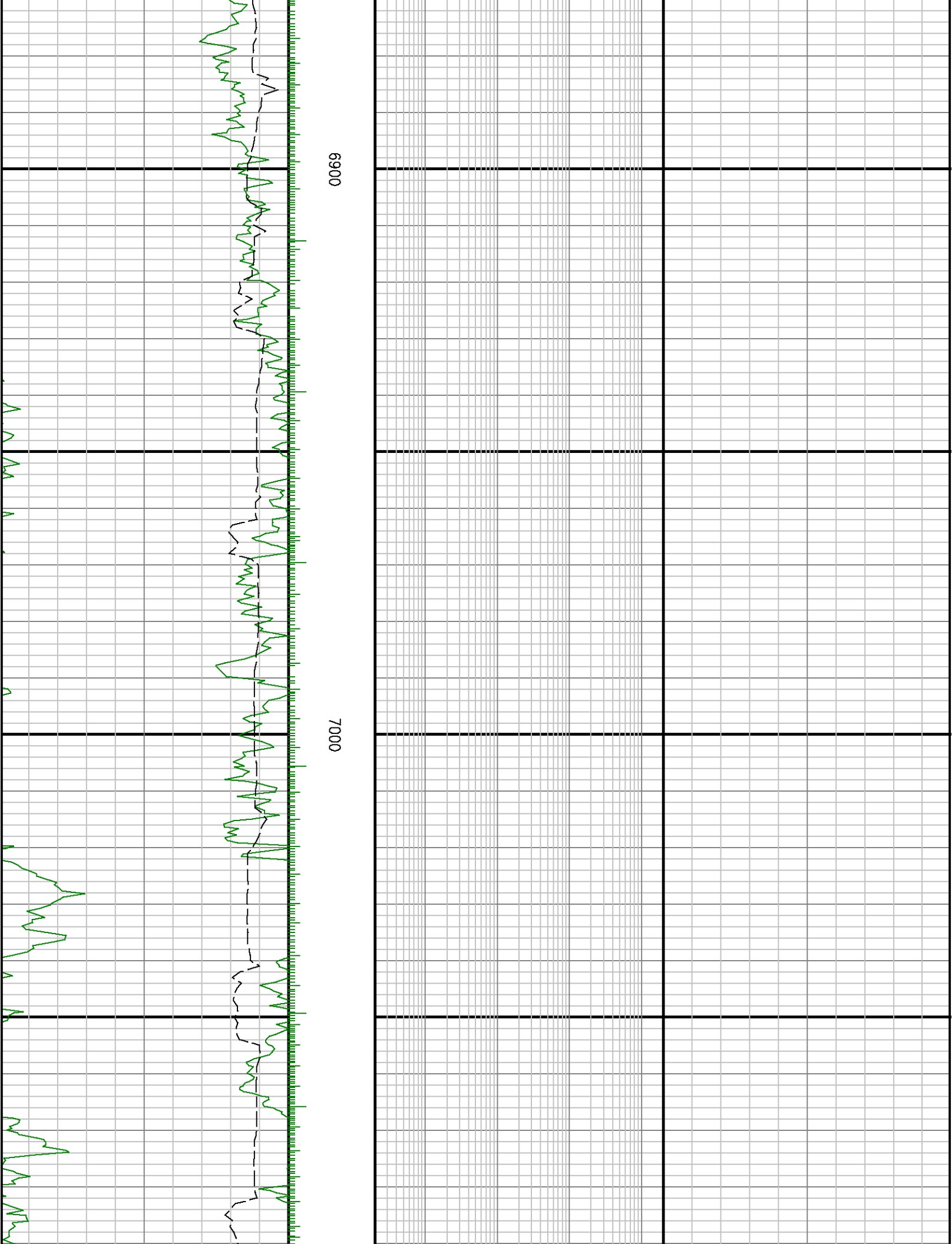
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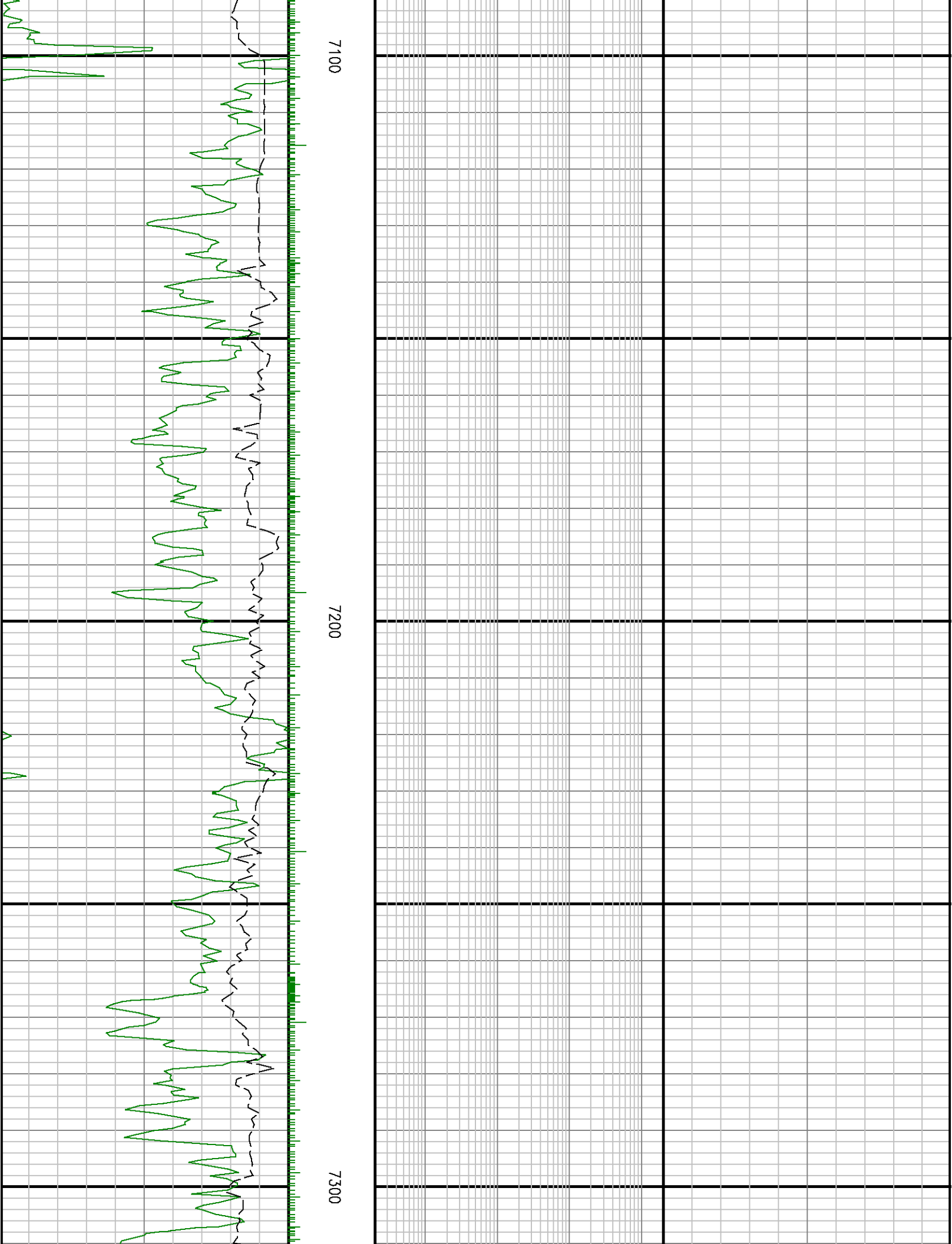
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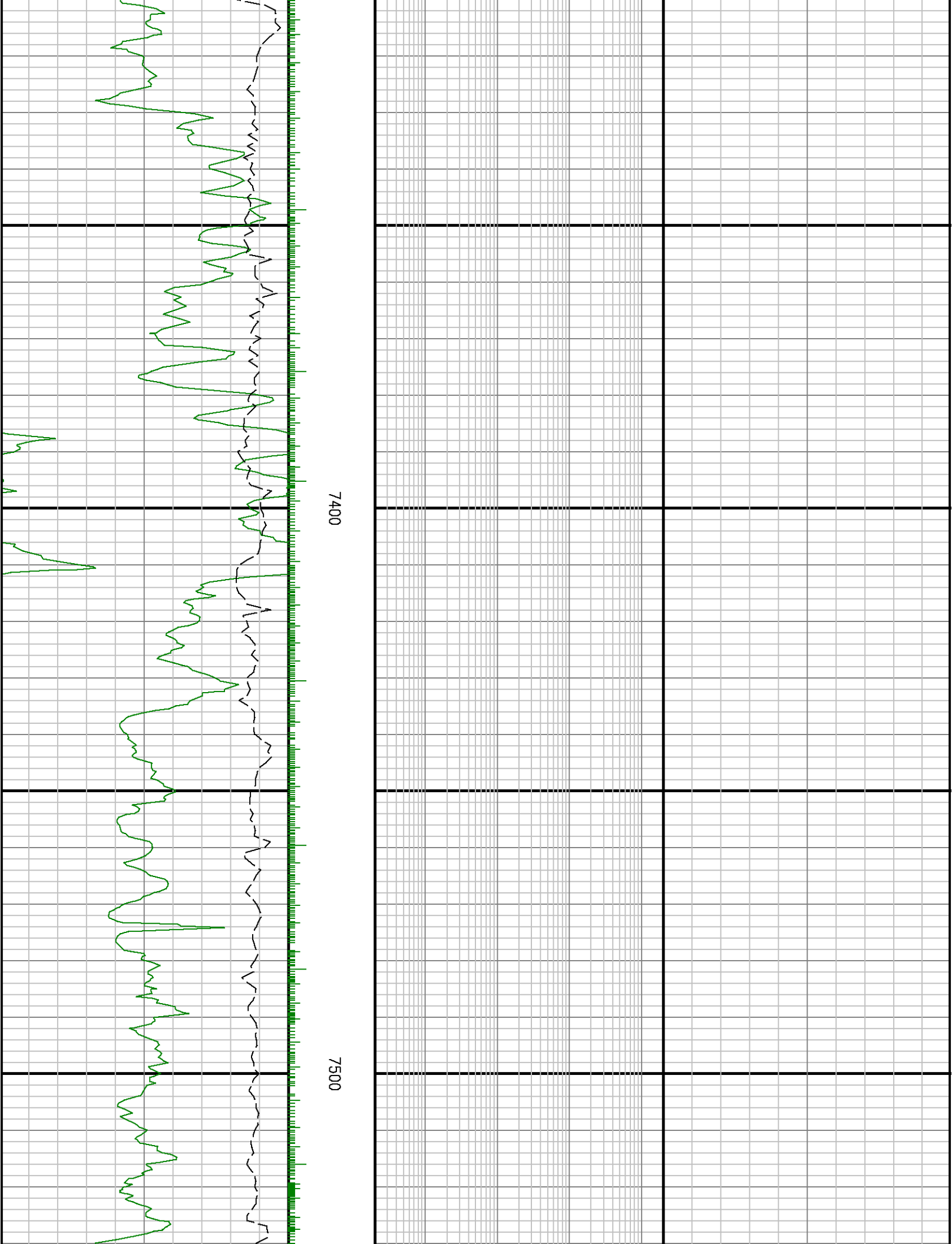
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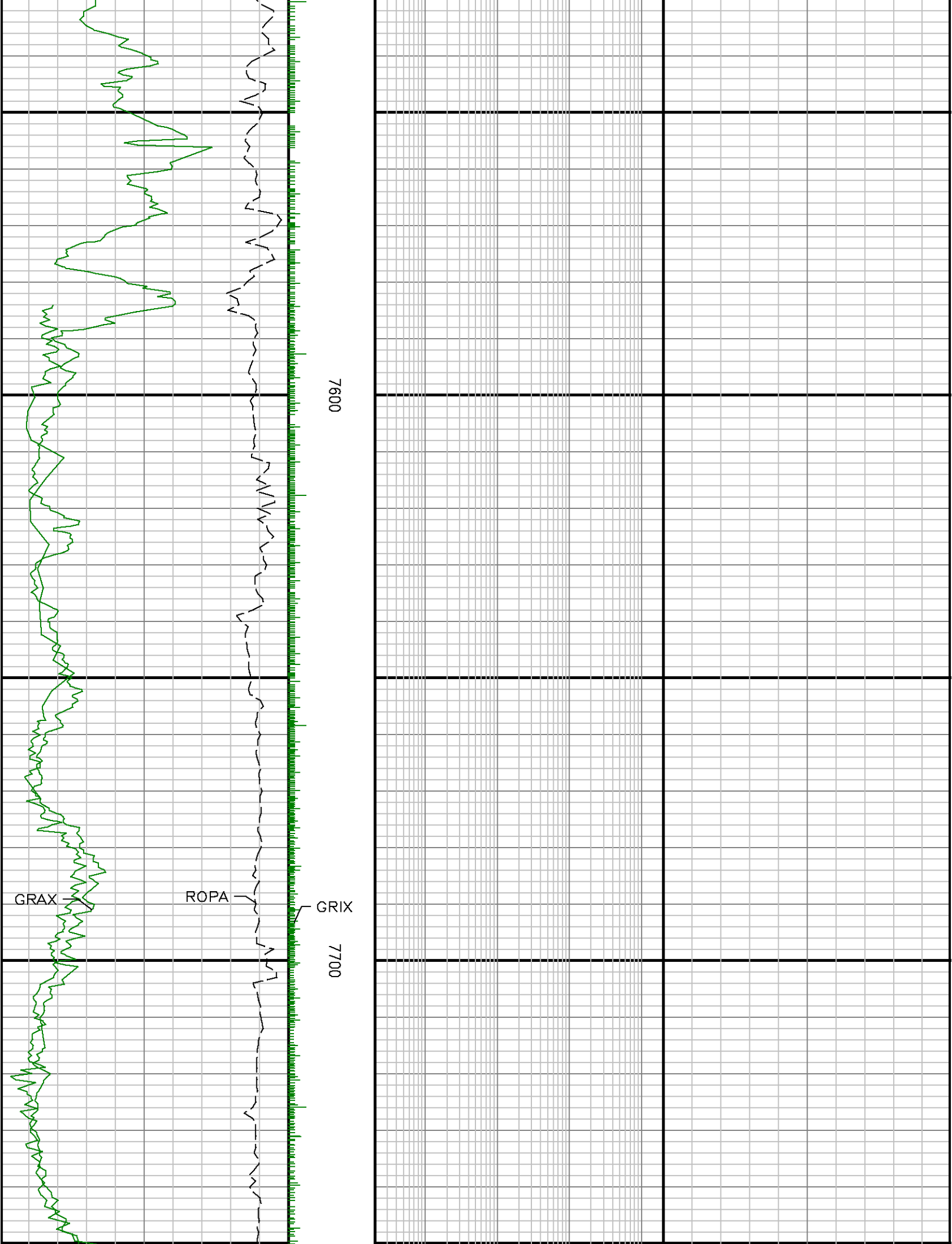
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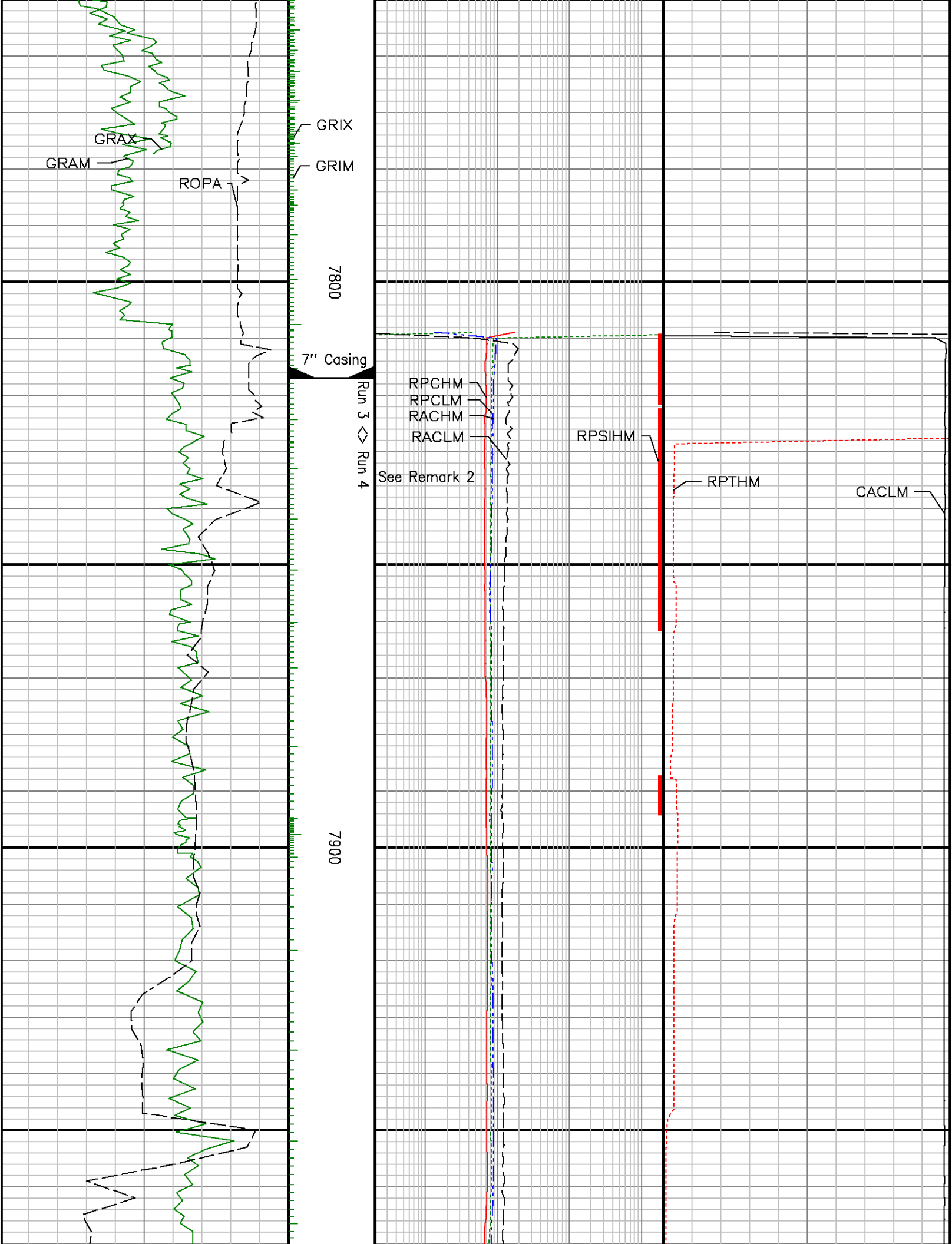
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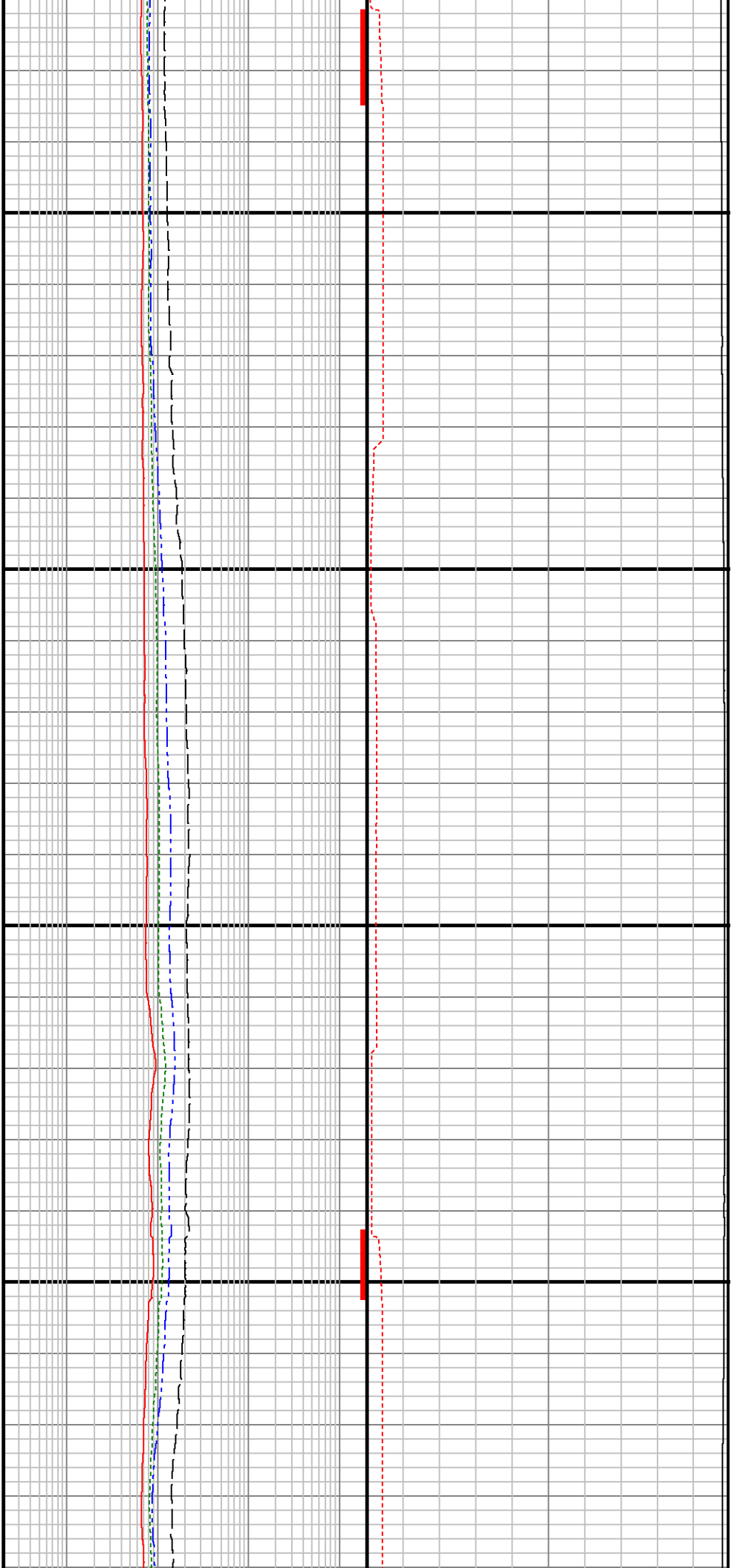






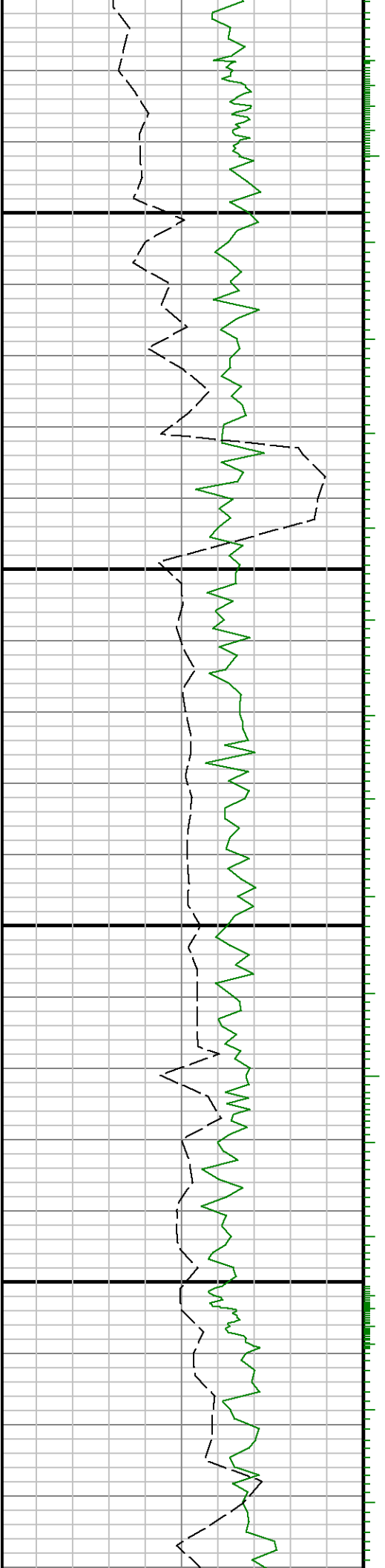


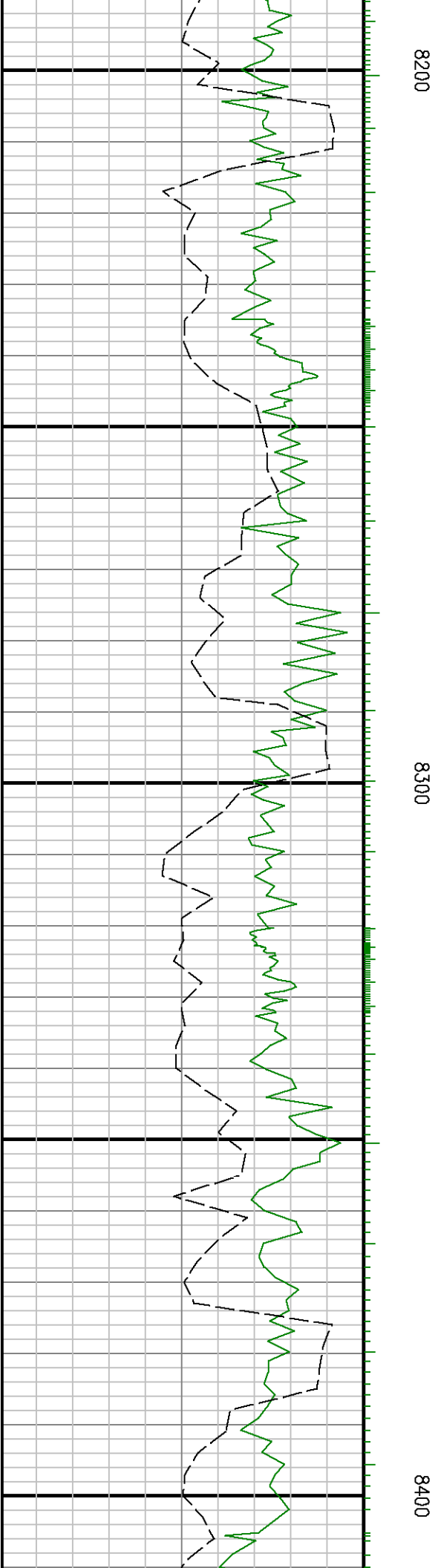
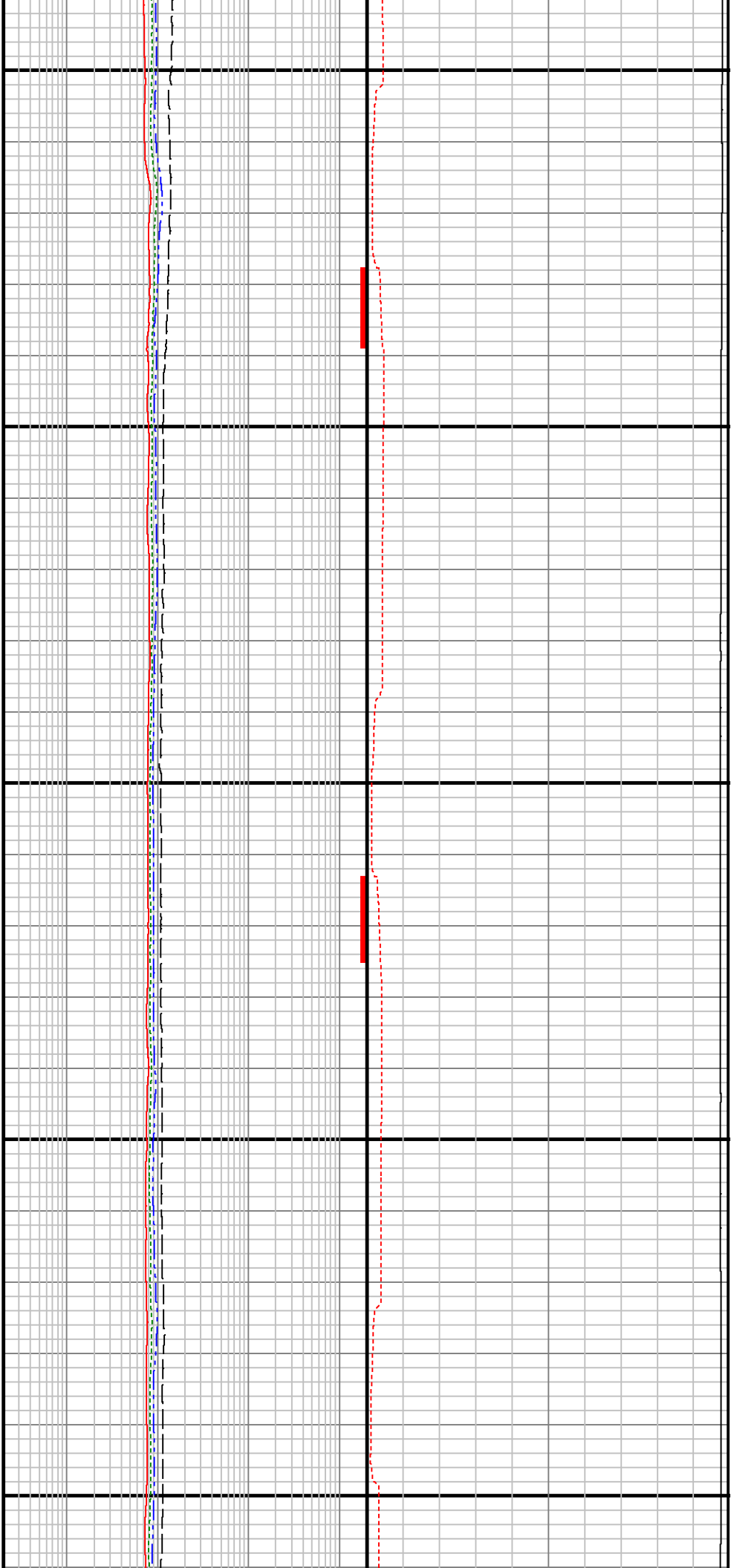


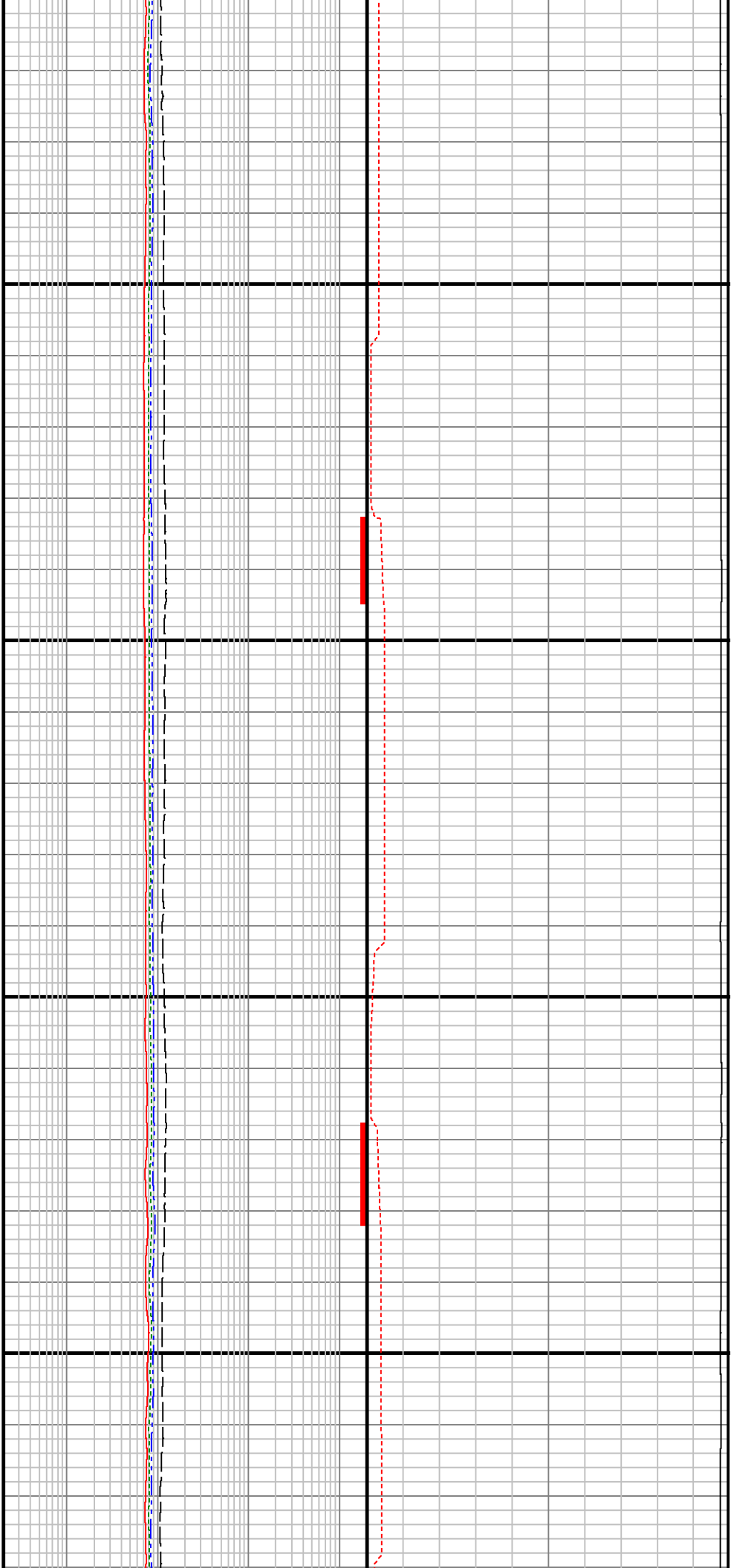


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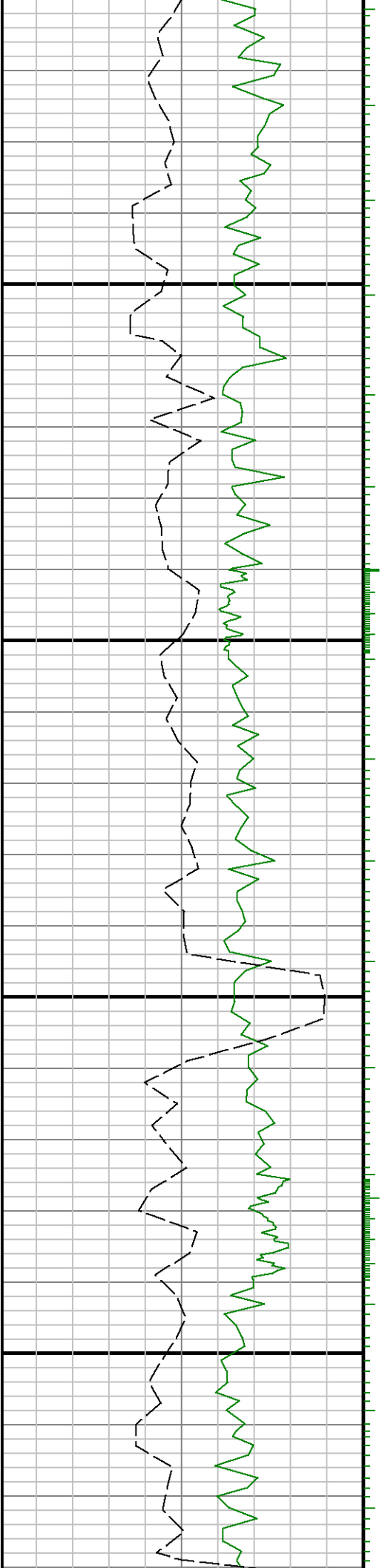


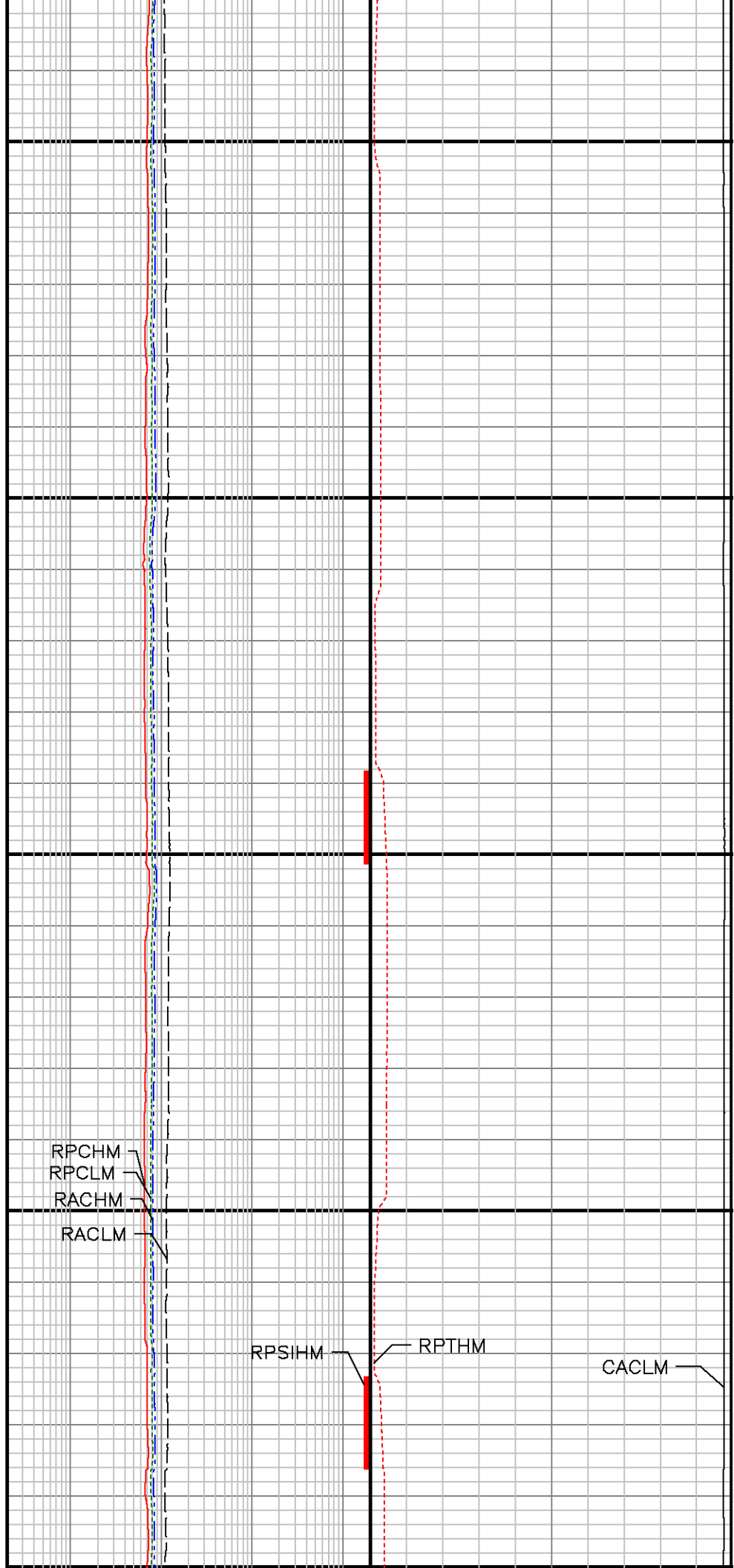
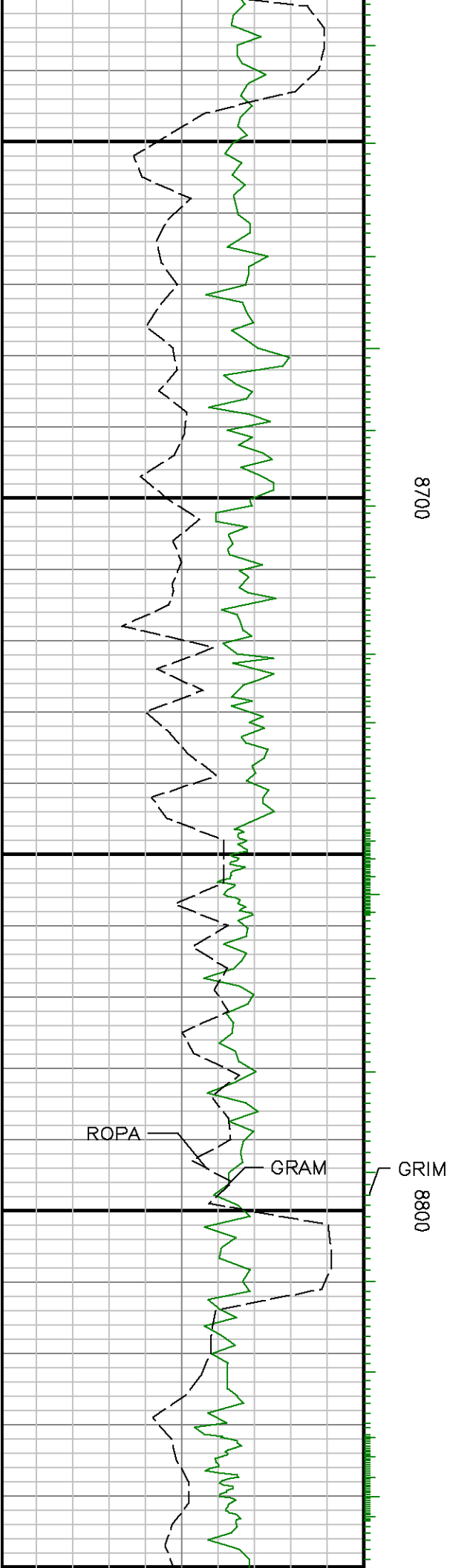


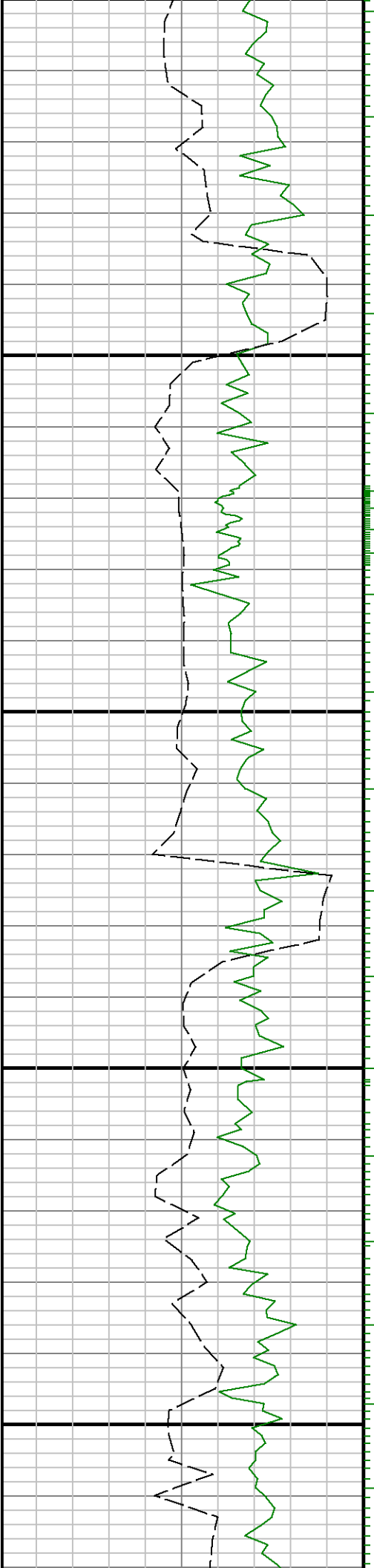


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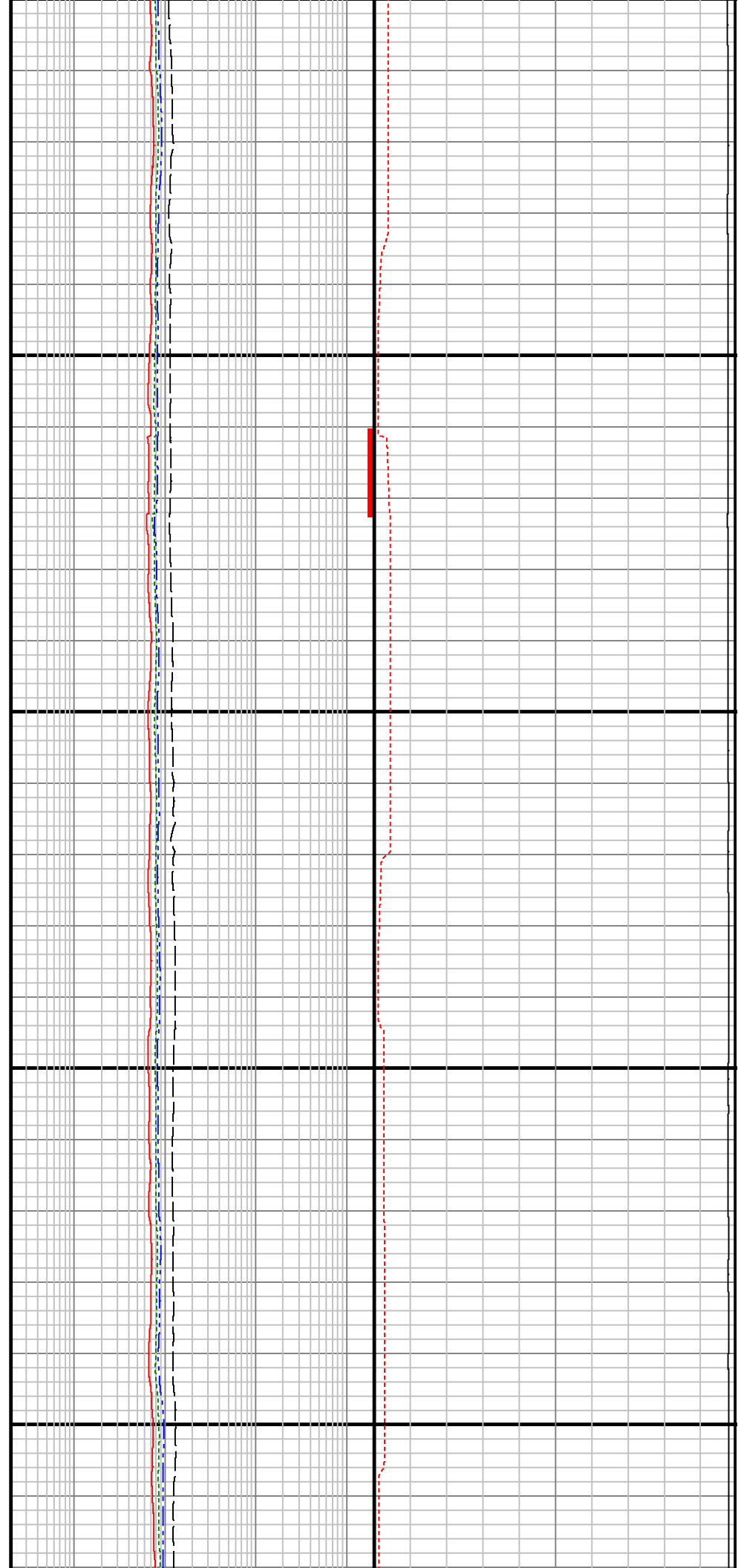


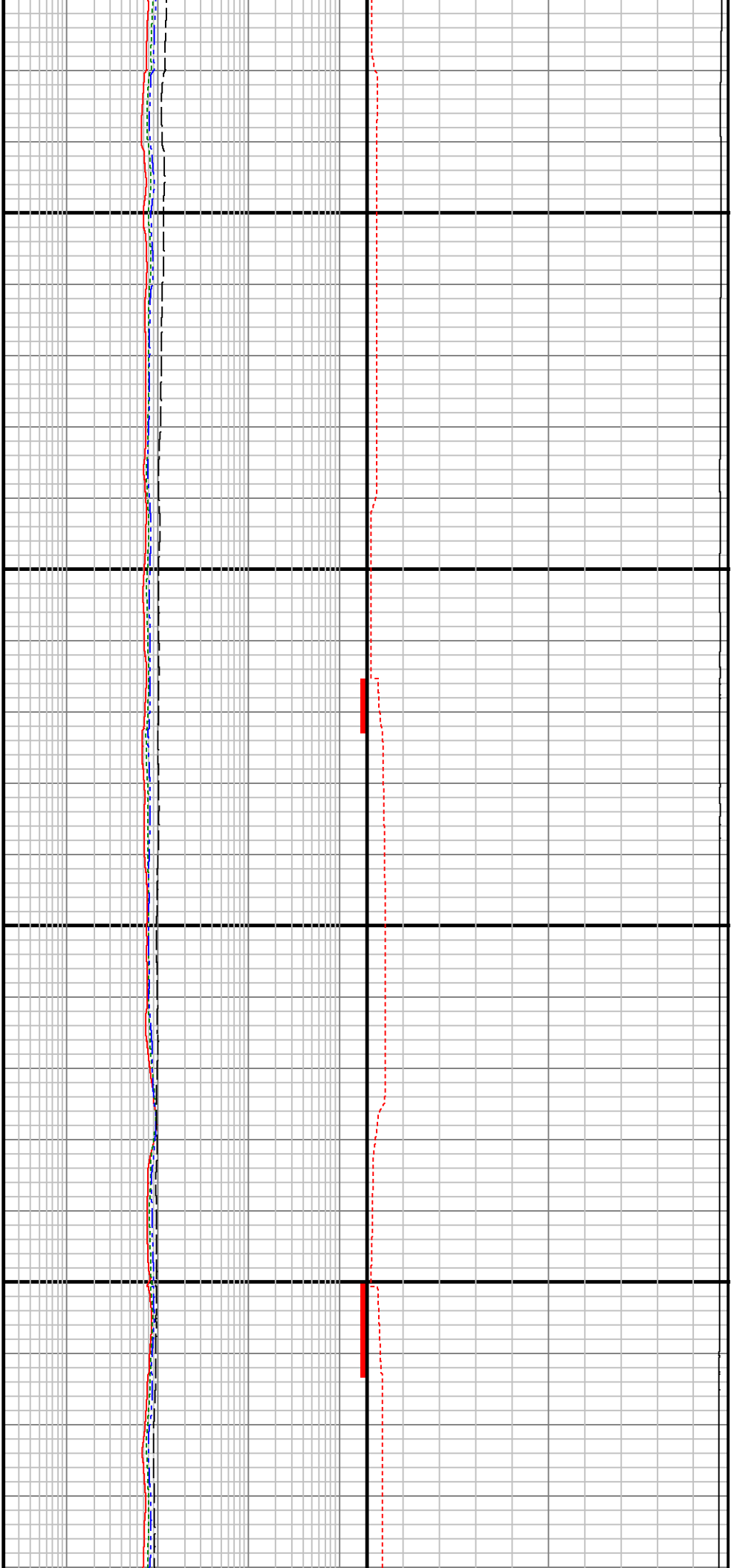




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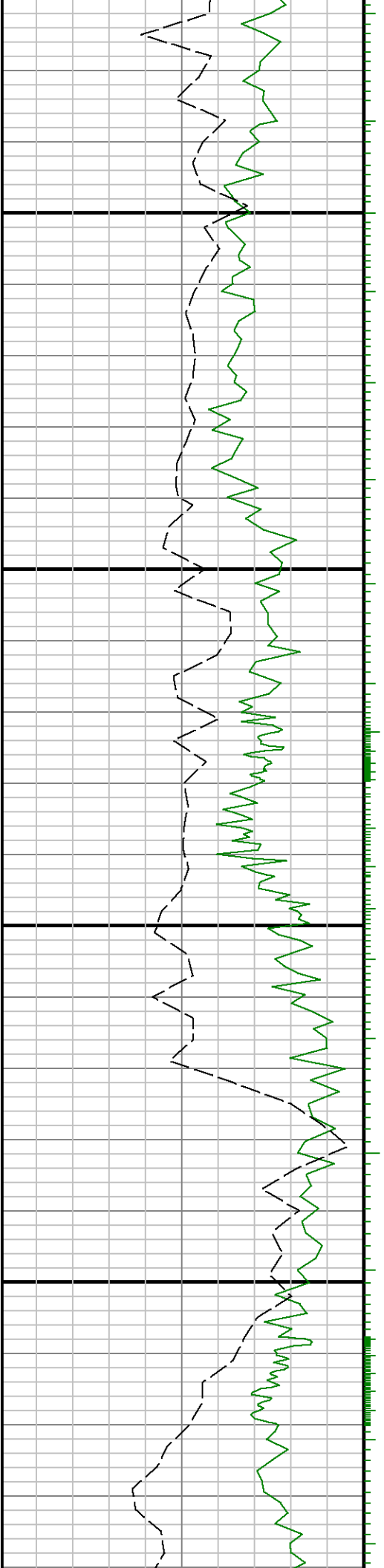
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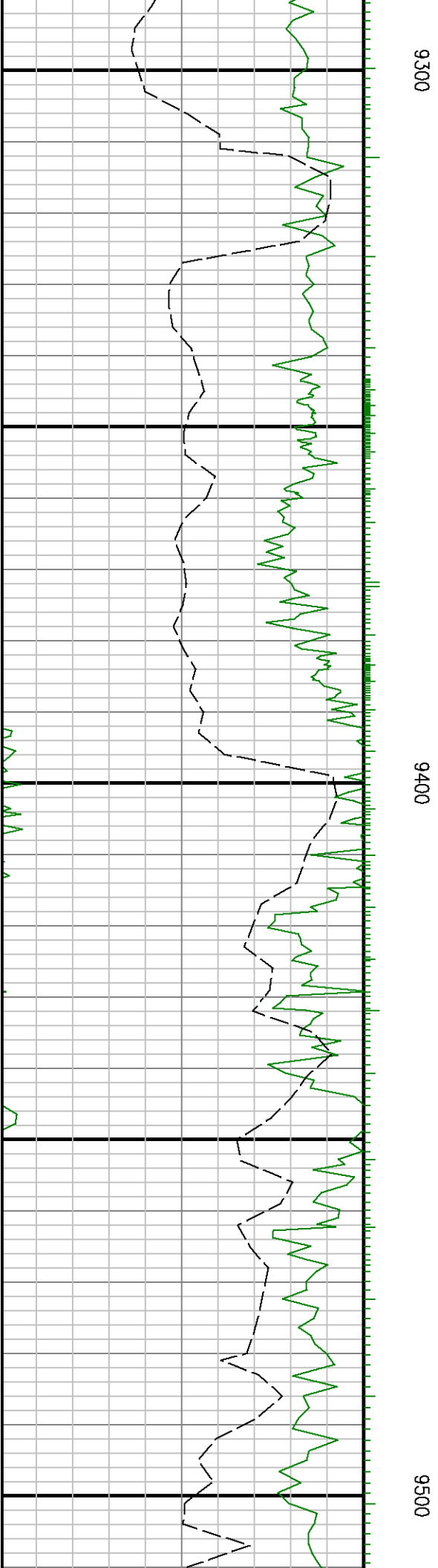
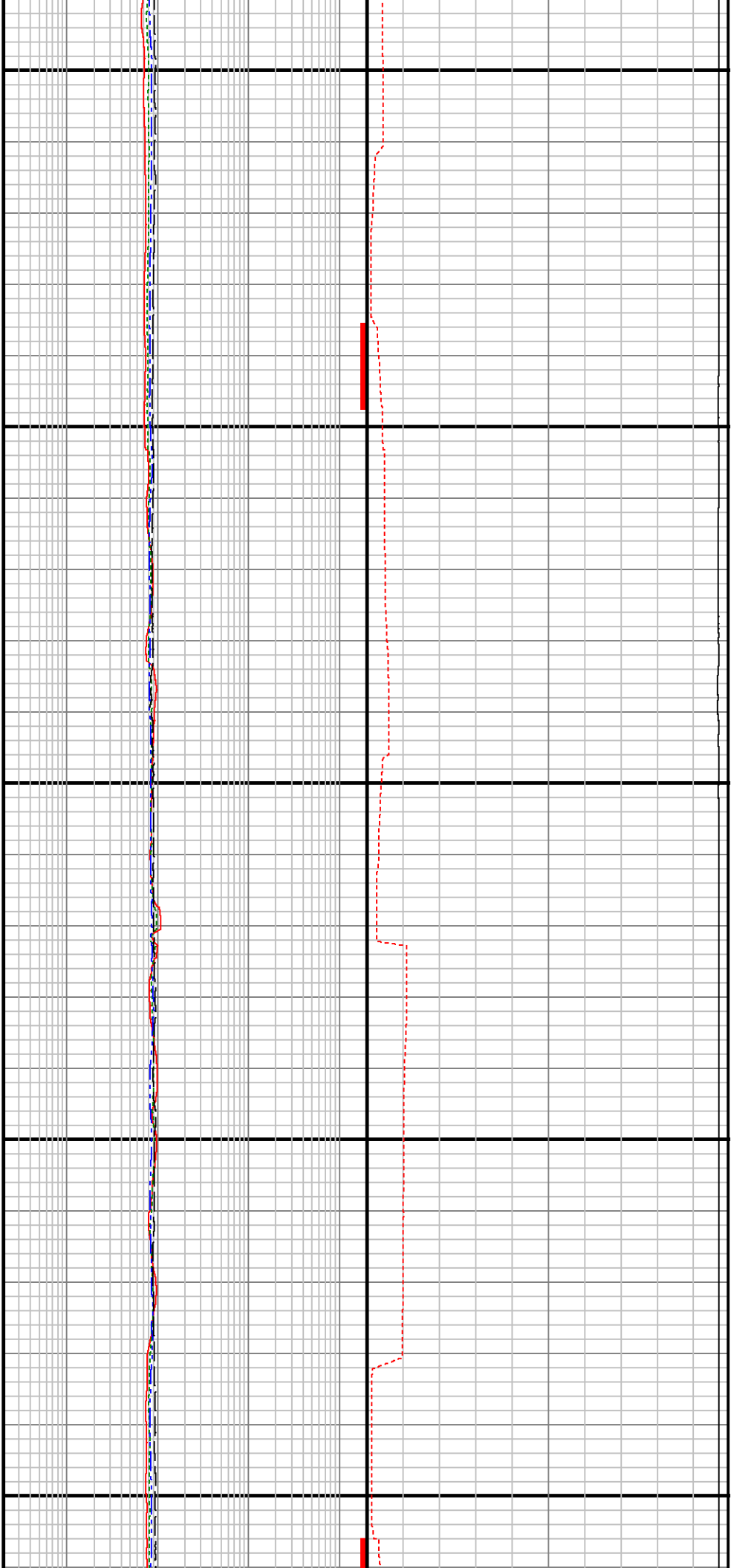


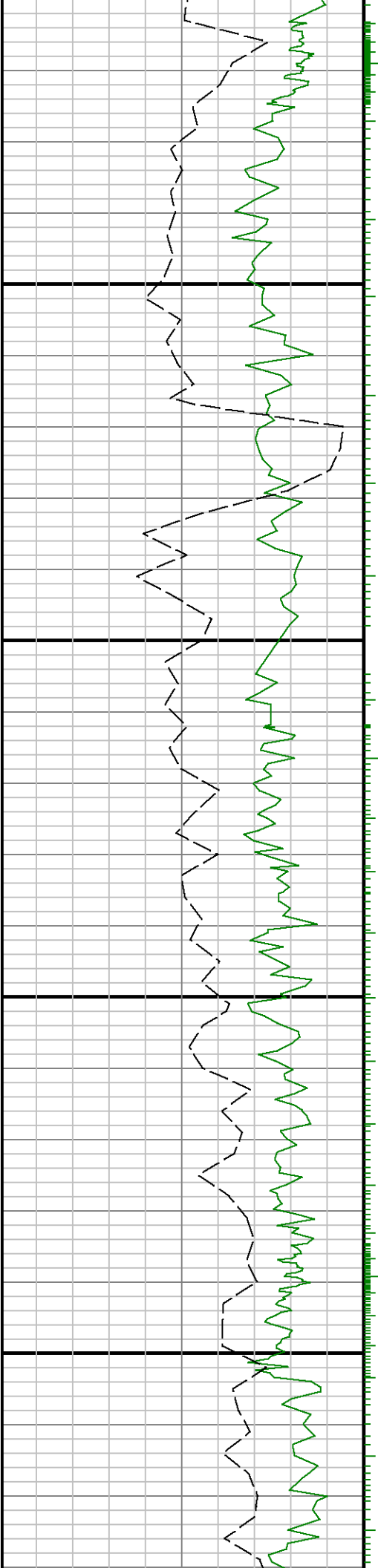


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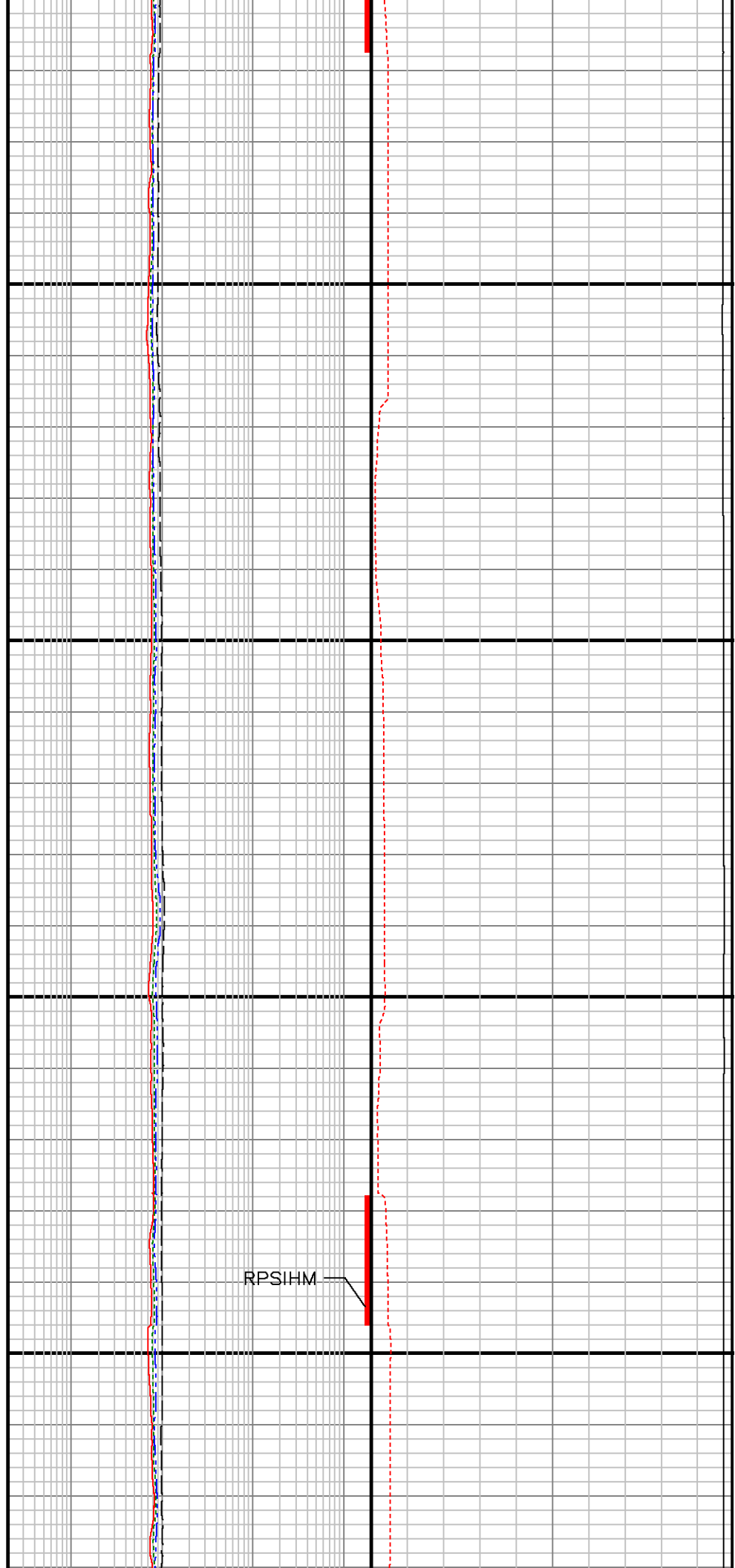


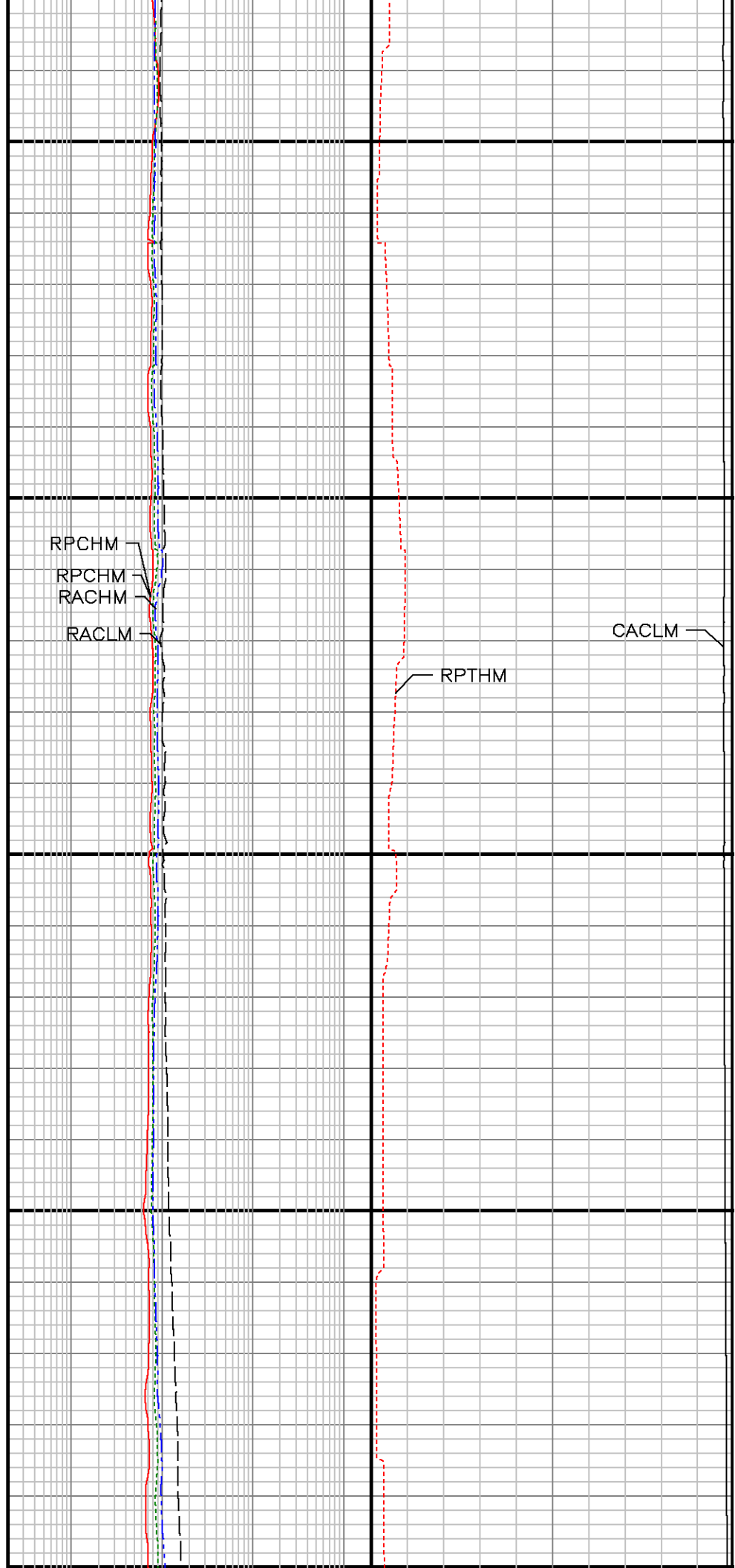
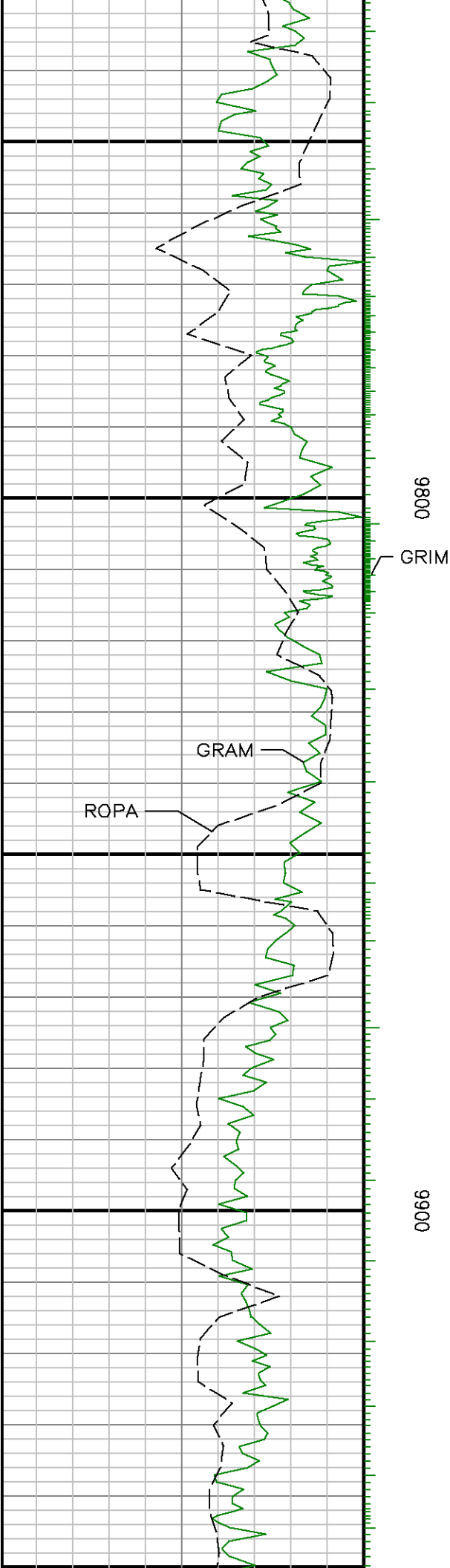


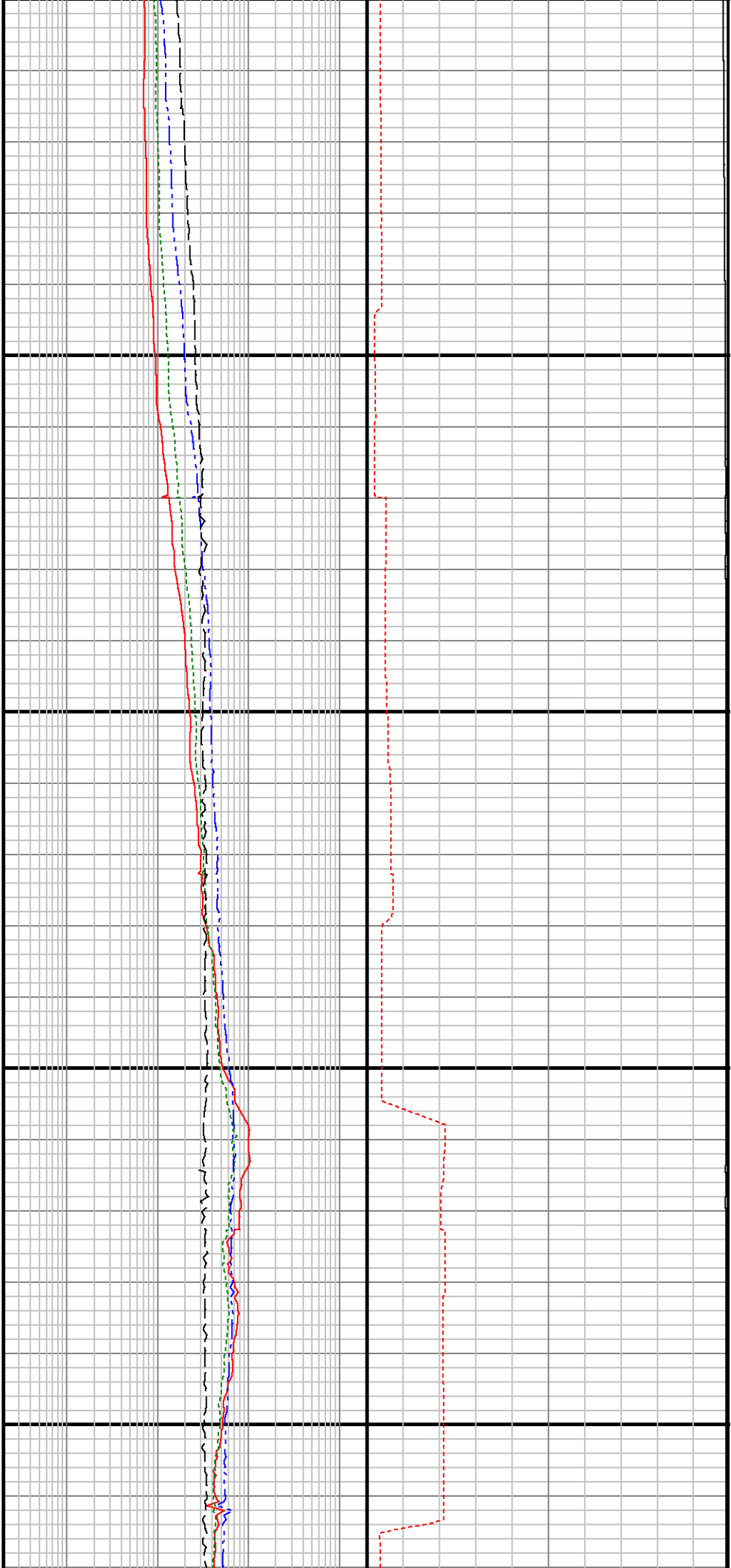


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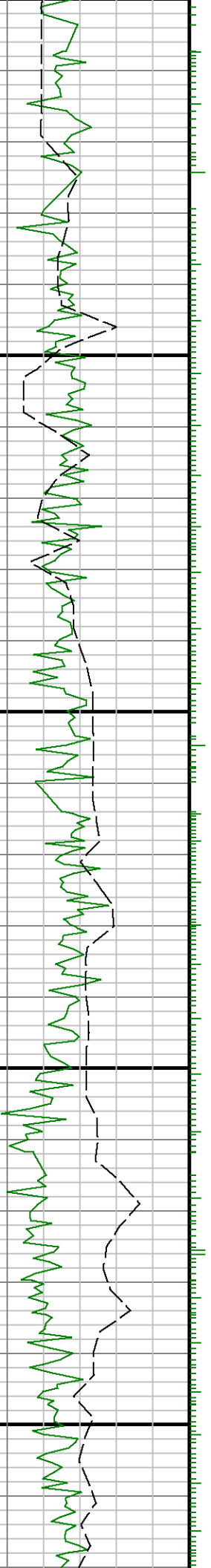


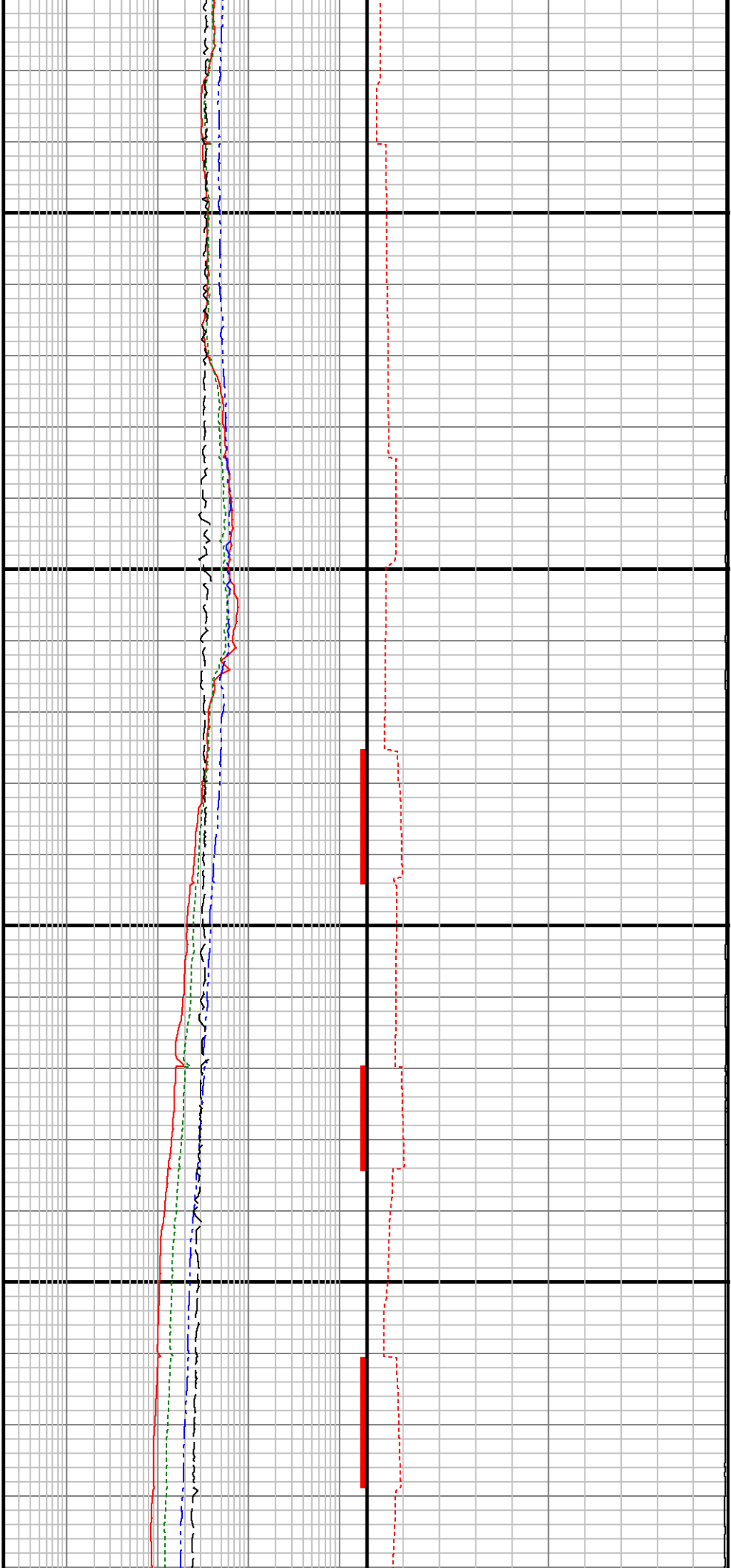




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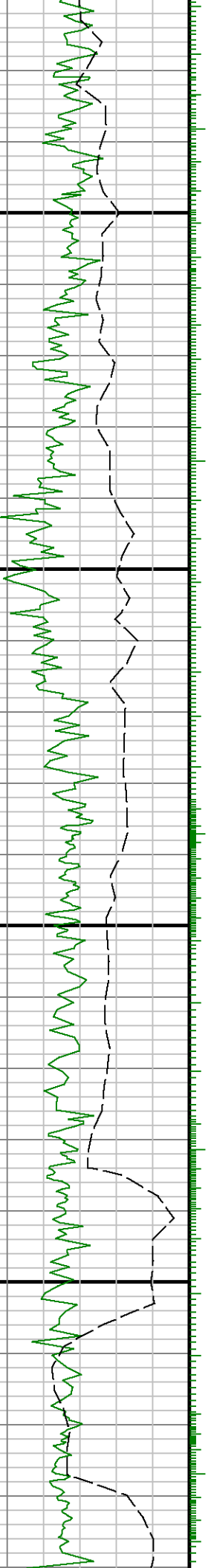
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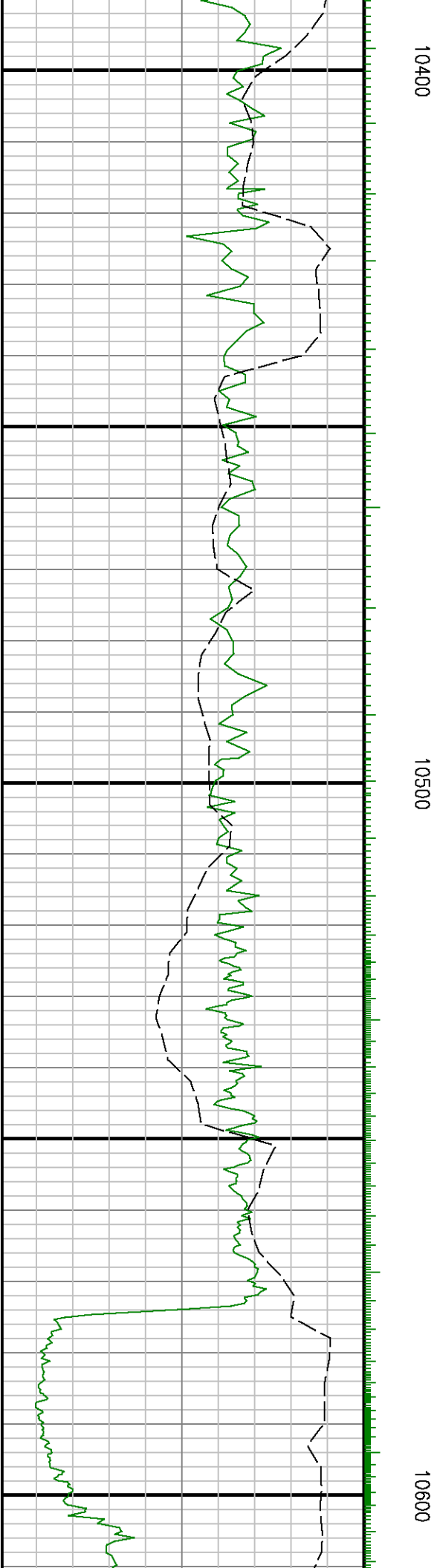
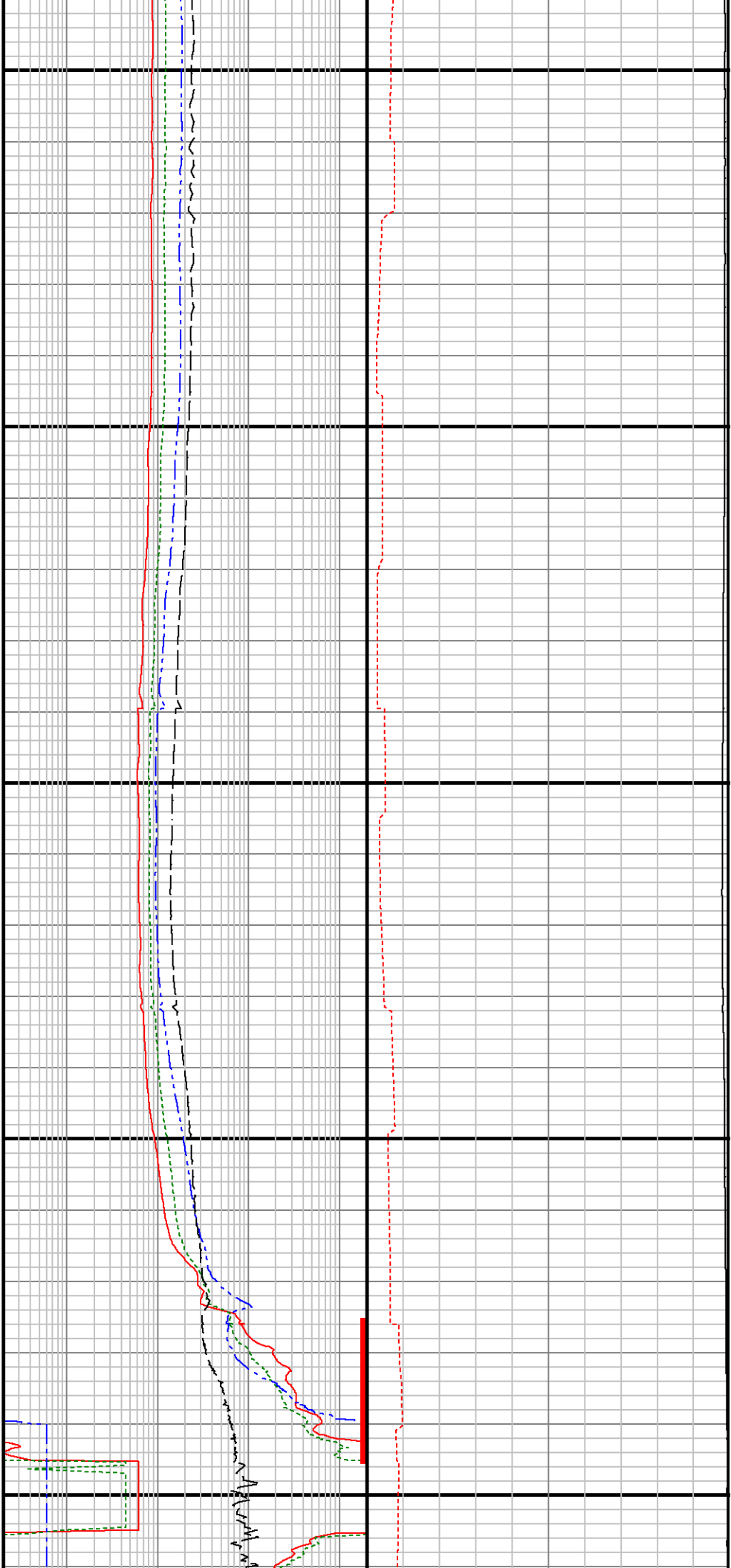


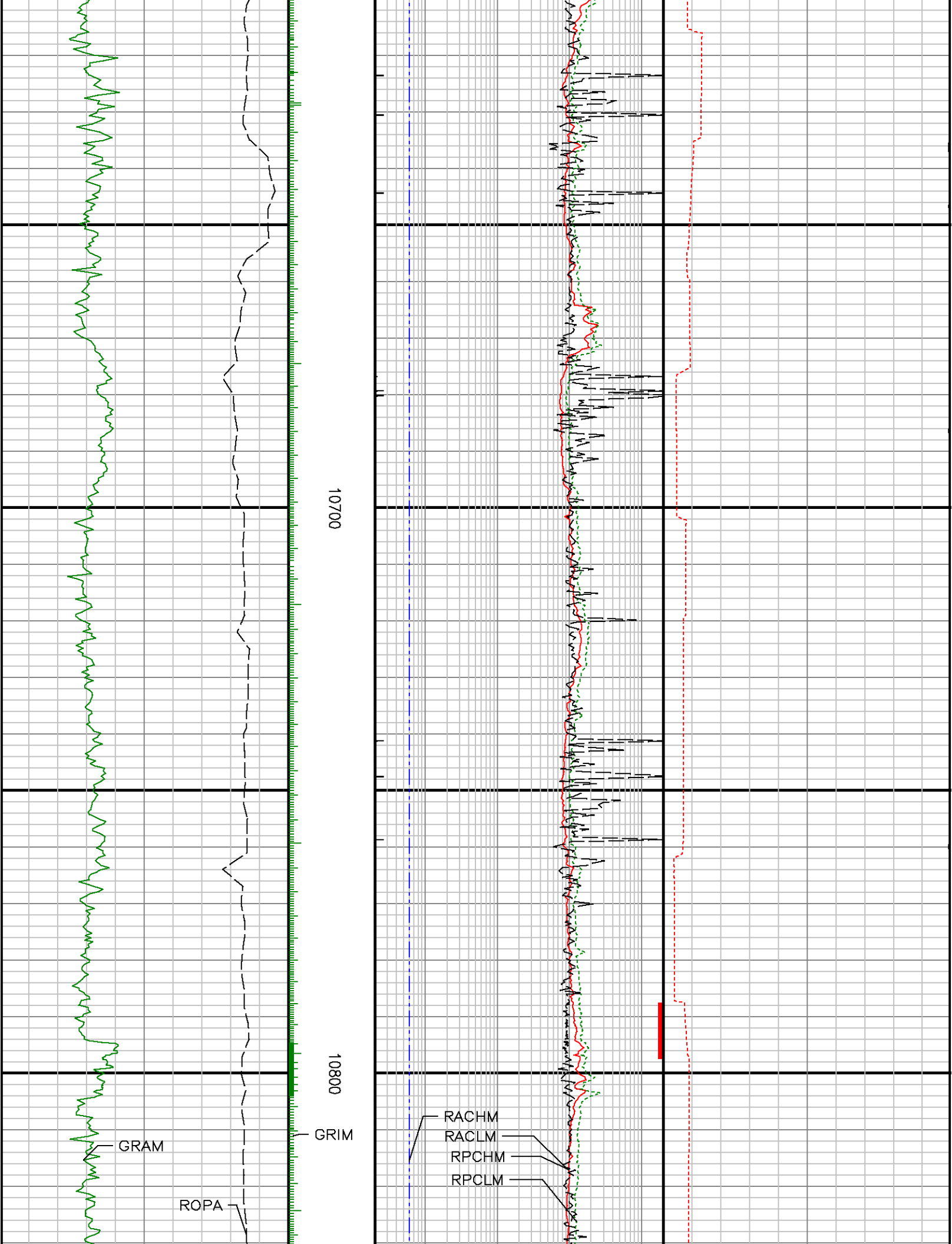


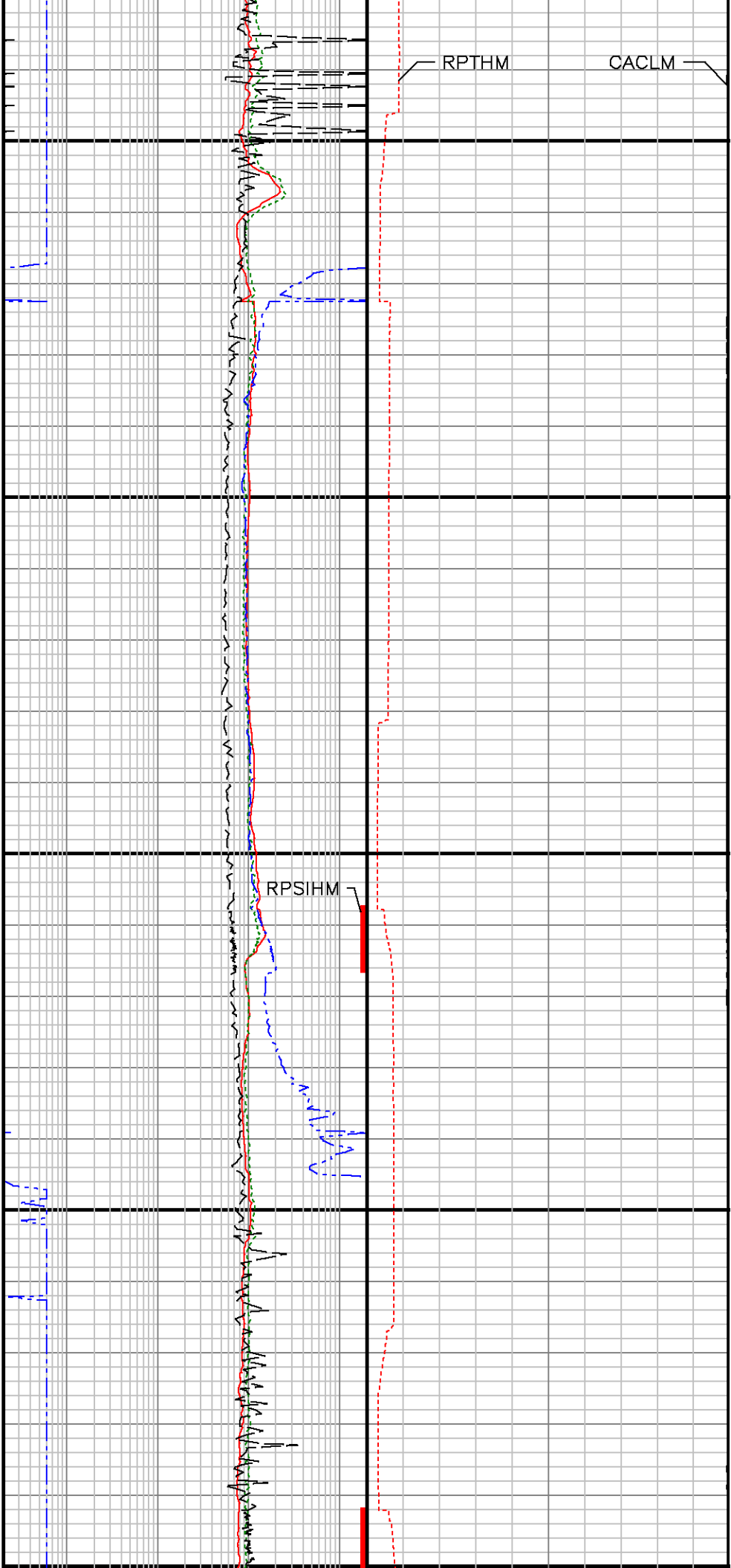
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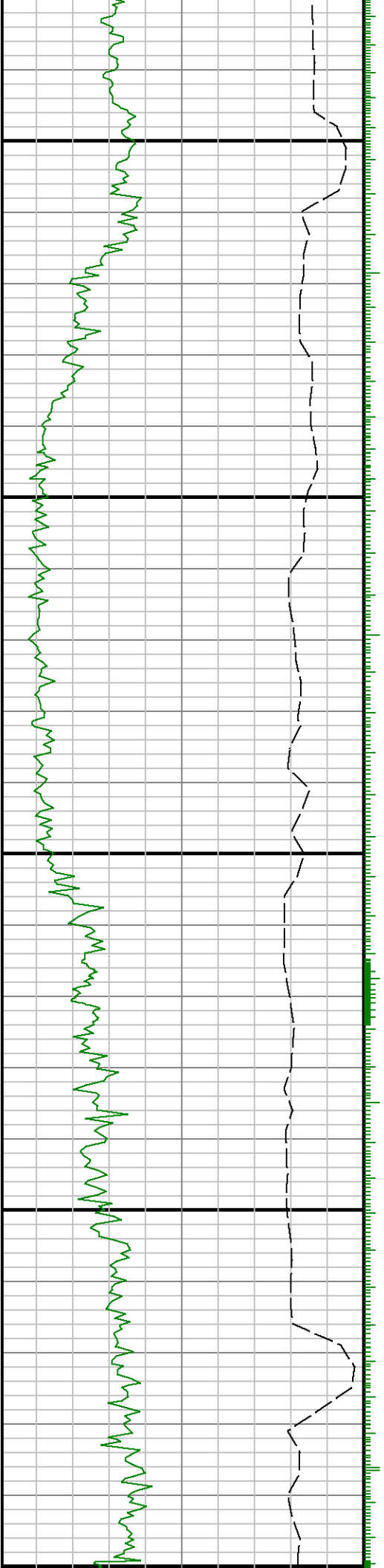






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11000



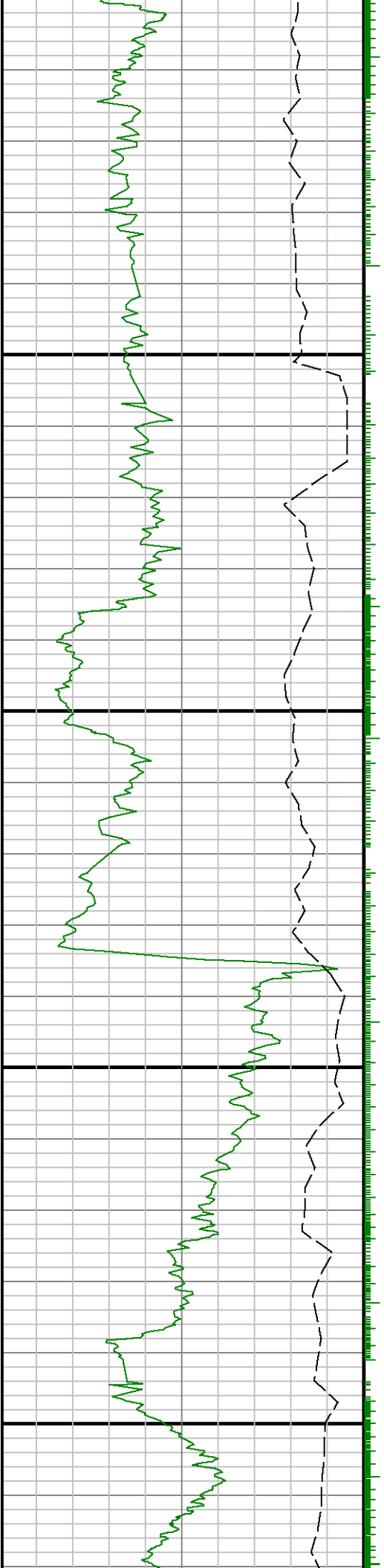


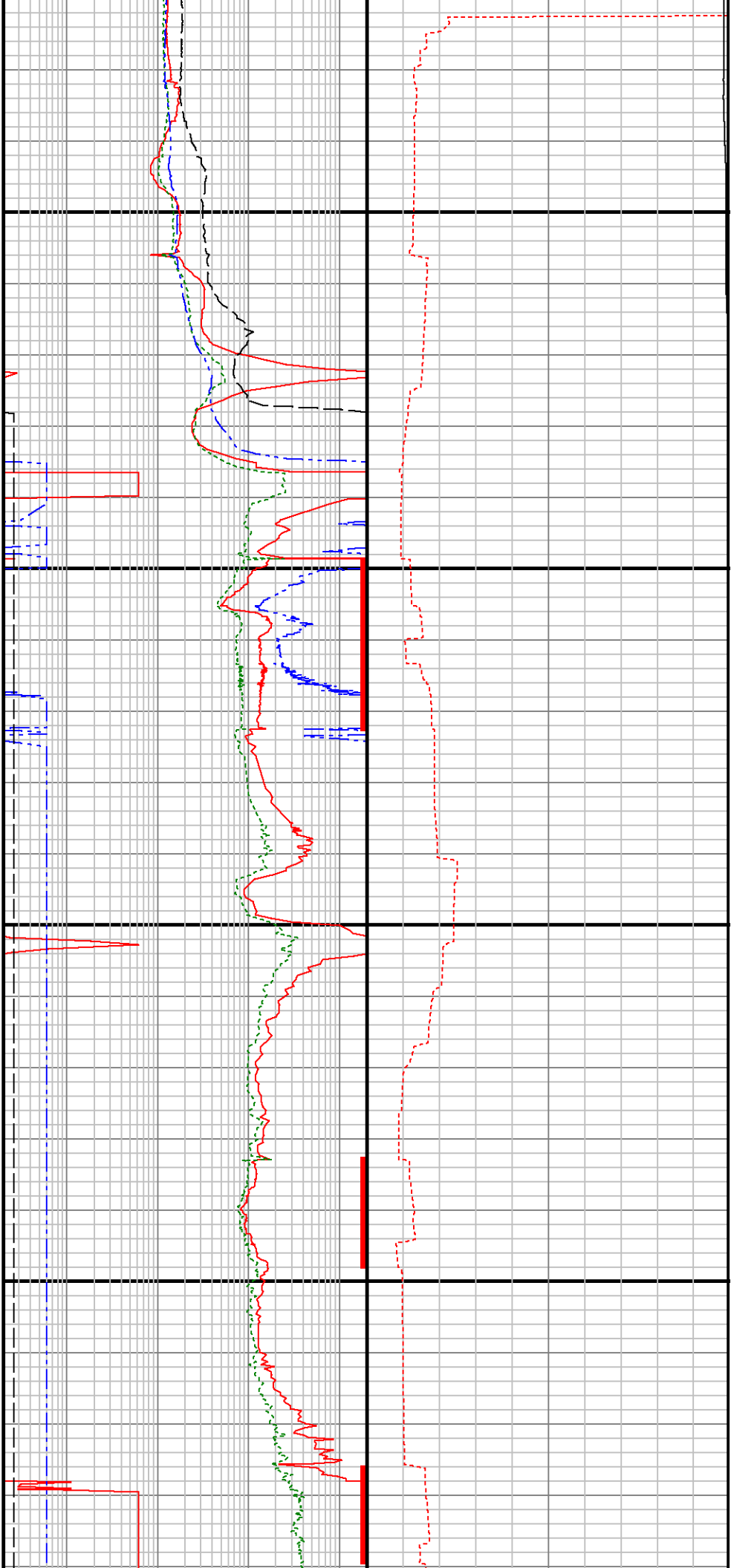
See Remark 3

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Run 4 ◇

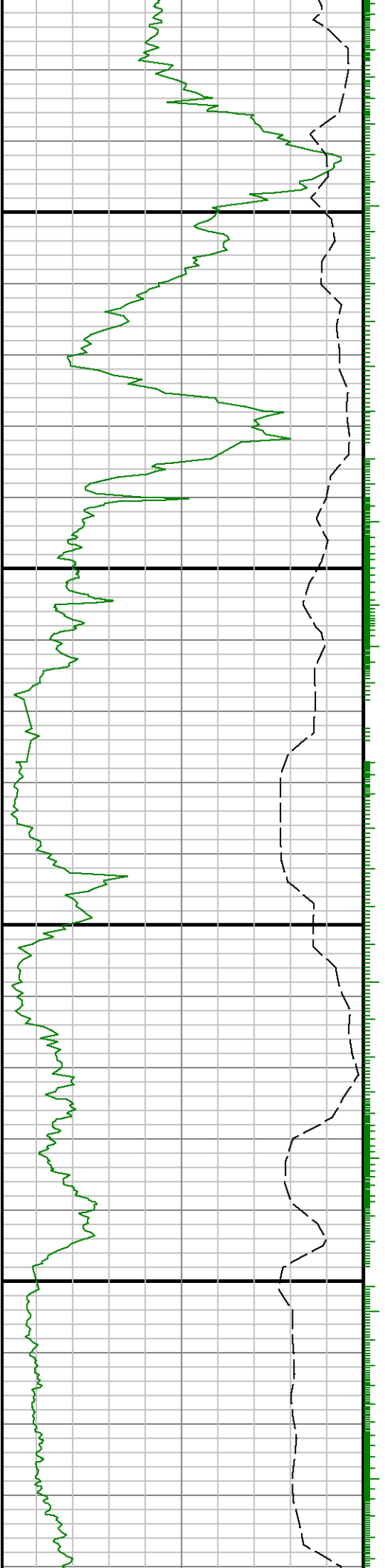


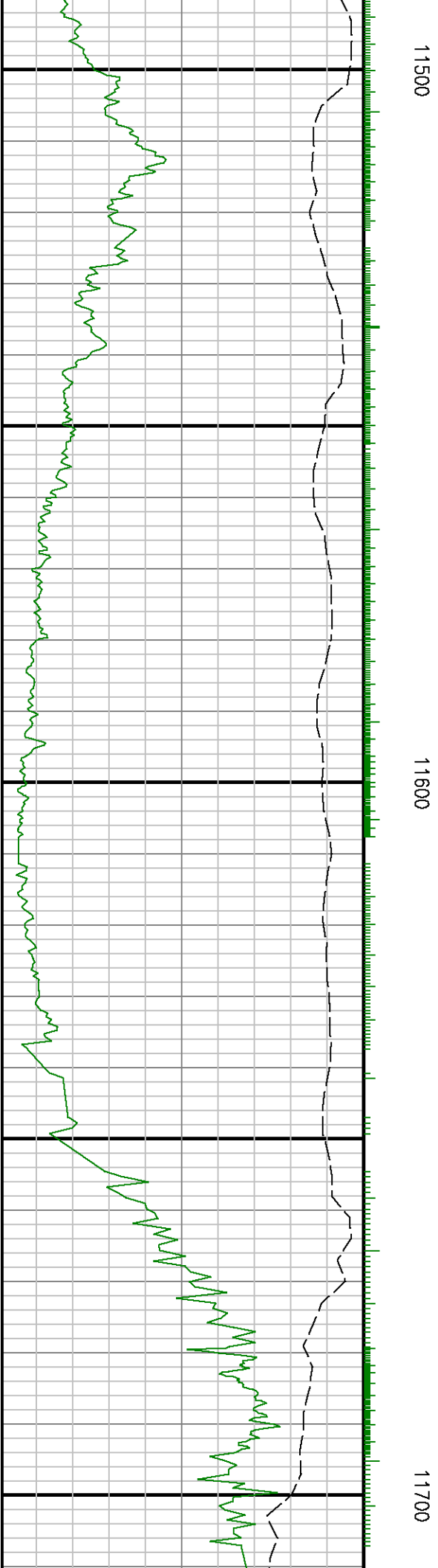
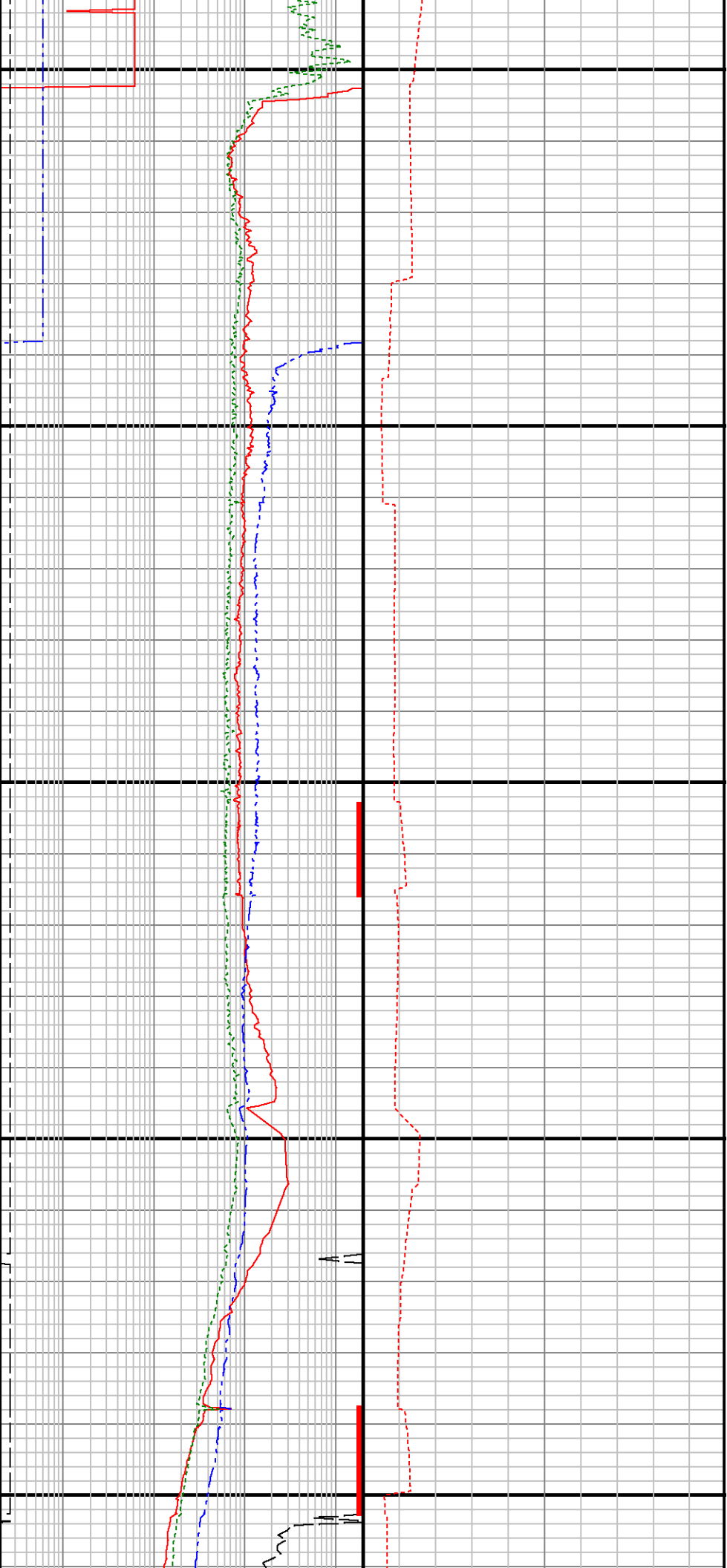


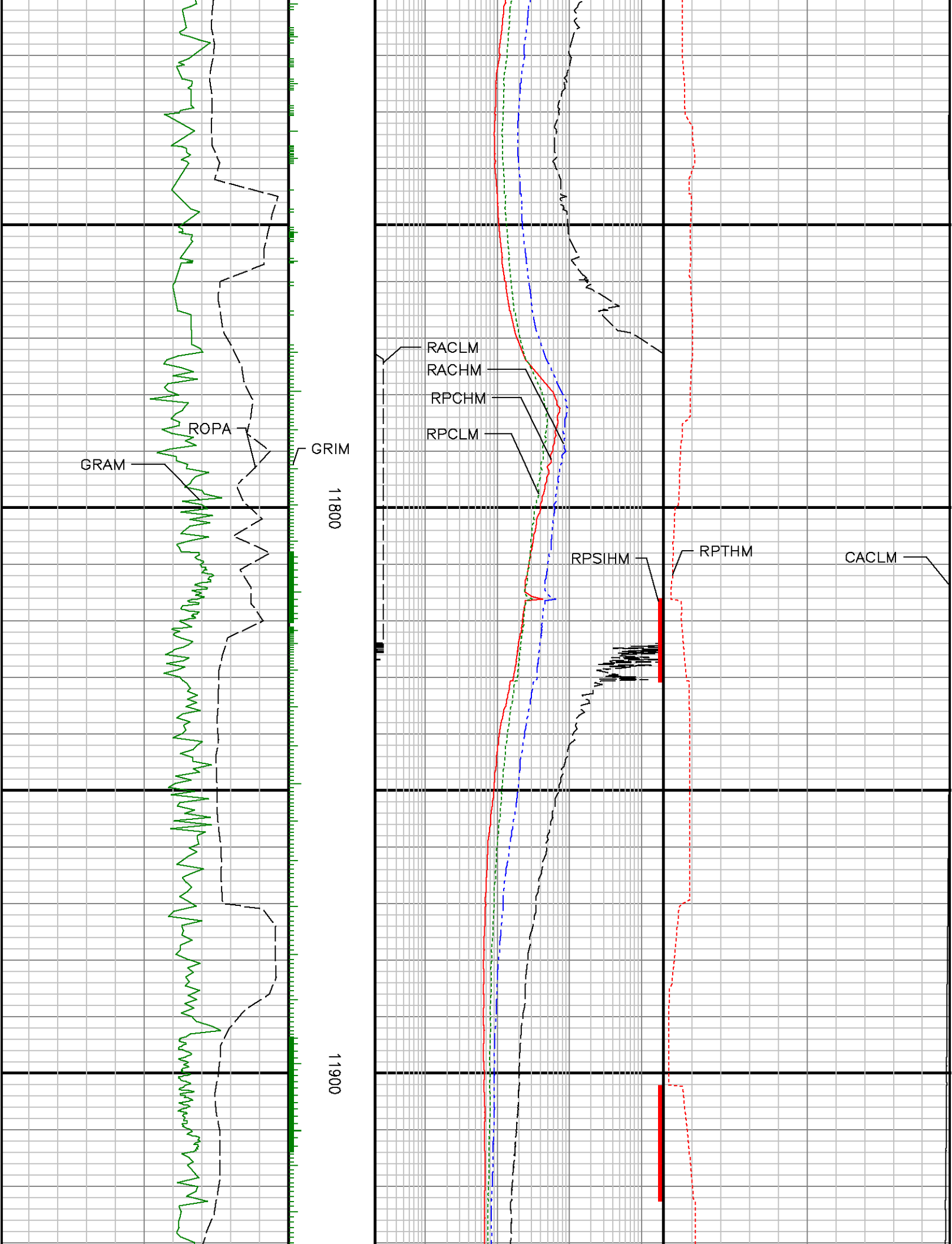
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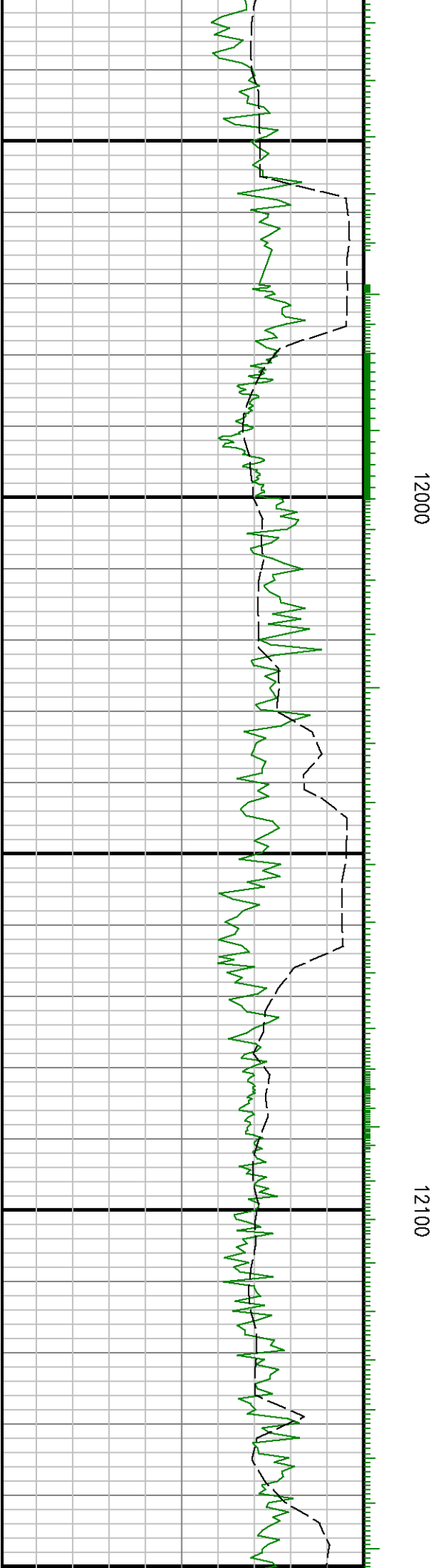
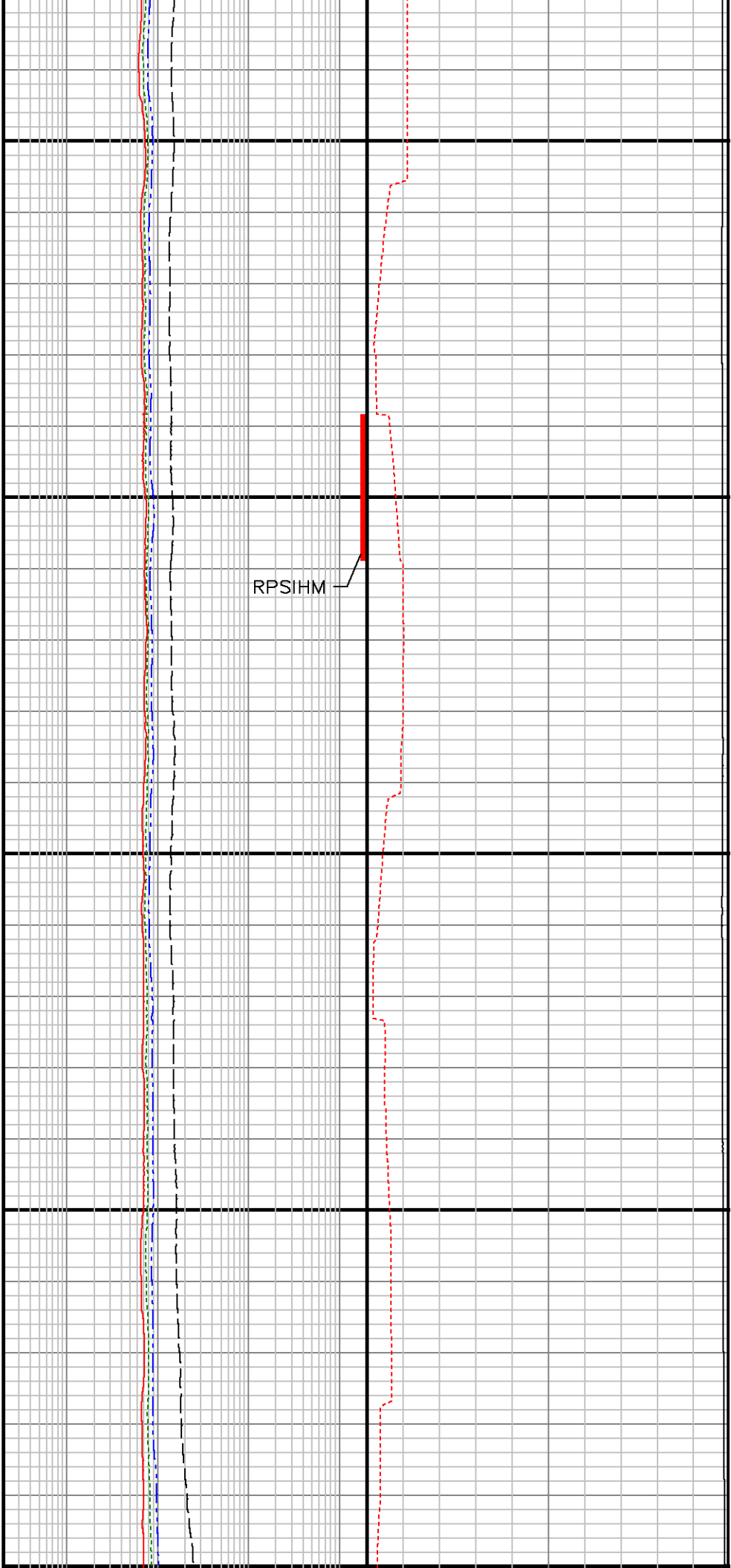
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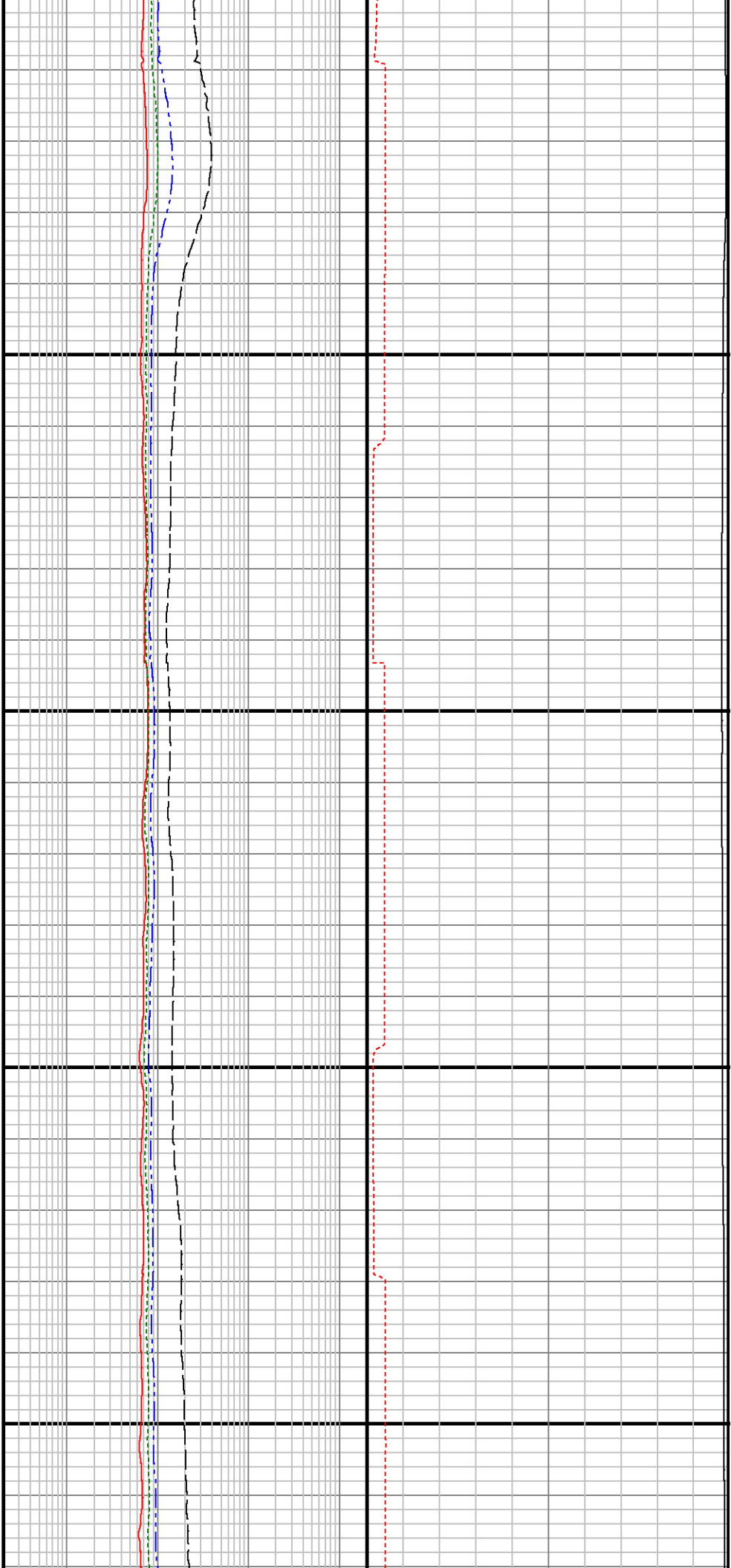
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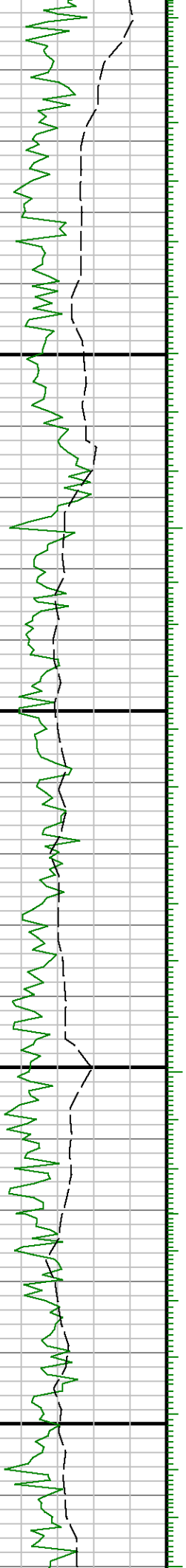


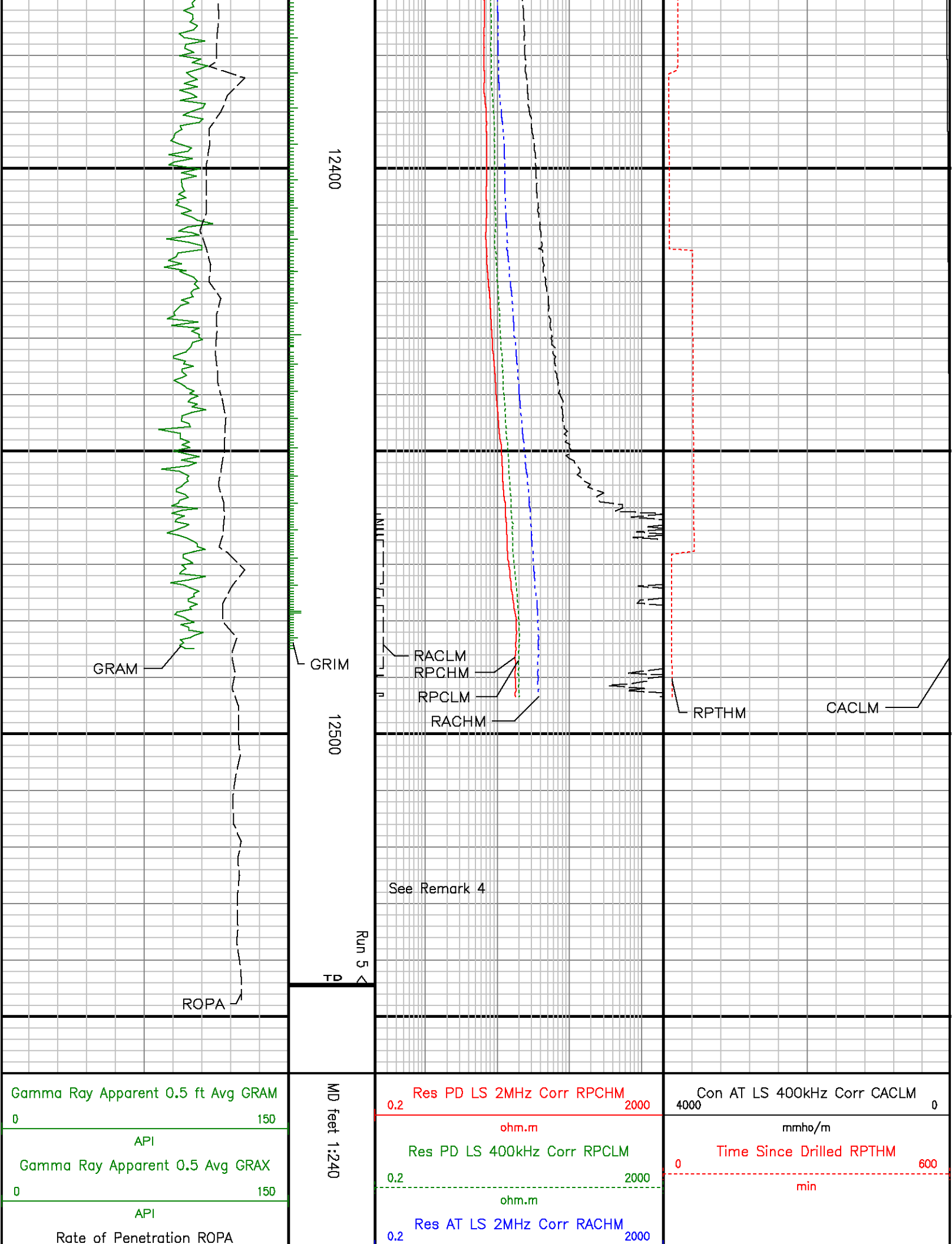




12200

12300





1000	0	ohm.m
ft/hr	Res AT LS 400kHz Corr RACLM	
	0.2	2000
	ohm.m	